



**Weatherford**

**COMPACT PHOTO DENSITY  
COMPENSATED NEUTRON  
MICRORESISTIVITY LOG**

COMPANY	O'BRIEN RESOURCES, LLC.		
WELL	PECK 1 #2		
FIELD	WILDCAT		
PROVINCE/COUNTY LANE	U.S.A. / KANSAS		
COUNTRY/STATE	2455' FNL & 2072' FWL		
LOCATION	Other Services		
SEC 1	TWP 18S	RGE 29W	MML
Latitude	MAI/MFE		
Longitude	MML		
API Number	15-101-22495		
Permanent Datum GL, Elevation	2748 feet		
Log Measured From	KB		
Drilling Measured From	KB		
Date	08-MAR-2014		
Run Number	ONE		
Service Order	4558-81483267		
Depth Driller	4665.00	feet	Elevations: 2755.00
Depth Logger	4668.00	feet	KB 2753.00
First Reading	4649.00	feet	DF 2748.00
Last Reading	3600.00	feet	GL 2748.00
Casing Driller	265.00	feet	
Casing Logger	266.00	feet	
Bit Size	7.875	inches	
Hole Fluid Type	CHEMICAL		
Density / Viscosity	9.30 lb/USg	48.00 CP	
PH / Fluid Loss	10.00	6.80 ml/30Min	
Sample Source	FLOWLINE		
Rm @ Measured Temp	1.28 @ 76.0	ohm-m	
Rmf @ Measured Temp	1.02 @ 76.0	ohm-m	
Rmc @ Measured Temp	1.54 @ 76.0	ohm-m	
Source Rmf / Rmc	CALC	CALC	
Rm @ BHT	0.88 @ 111.0	ohm-m	
Time Since Circulation	3 HOURS		
Max Recorded Temp	111.00	deg F	
Equipment / Base	13244	LIB	
Recorded By	ADAM SILL		
Witnessed By	KURT TALBOTT		
JOB #	LB14-066		

BOREHOLE RECORD			Last Edited: 08-MAR-2014 14:35
Bit Size inches	Depth From feet	Depth To feet	
7.875	265.00	4665.00	
CASING RECORD			
Type	Size inches	Depth From feet	Shoe Depth feet
SURFACE	8.625	0.00	265.00
			Weight pounds/ft
			24.00

**REMARKS**

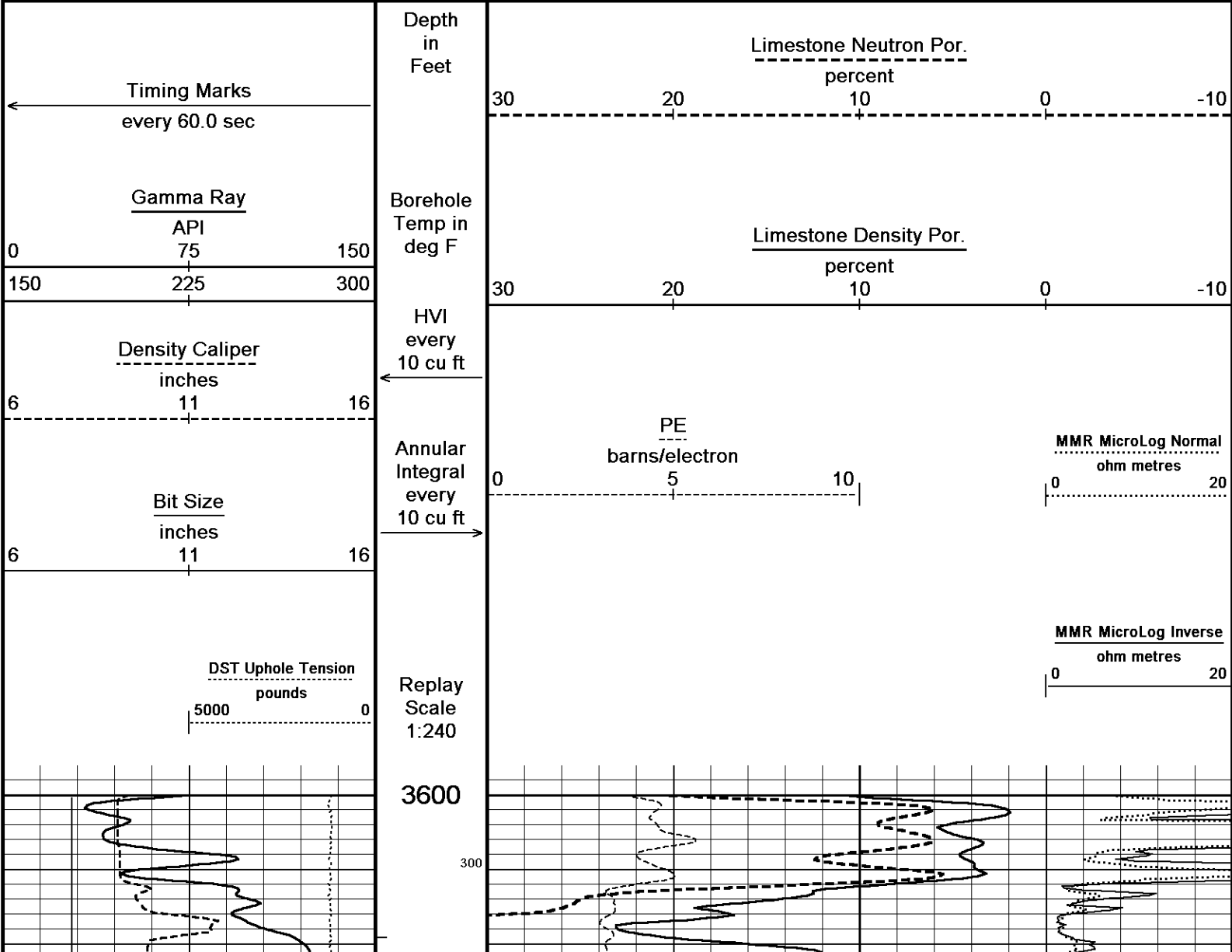
- SOFTWARE ISSUE: WLS 13.08.2113.
- RUN ONE: MCG, MML, MDN, MPD, MFE, MAI RUN IN COMBINATION.
  - HARDWARE: DUAL BOWSPRING USED ON MDN.
  - 0.5 INCH STANDOFF USED ON MFE.
  - 0.5 INCH STANDOFF USED ON MAI.
- 2.71 G/CC LIMESTONE DENSITY MATRIX USED TO CALCULATE POROSITY.
- BOREHOLE RUGOSITY, TIGHT PULLS, AND WASHOUTS WILL AFFECT DATA QUALITY.
- ALL INTERVALS LOGGED AND SCALED PER CUSTOMER'S REQUEST.
- TOTAL HOLE VOLUME FROM TD TO SURFACE CASING: 2074 CU.FT.
- ANNULAR HOLE VOLUME WITH 4.5 INCH PRODUCTION CASING FROM TD TO 3600 FEET: 302 CU.FT.
- RIG: MAVERICK DRILLING 102

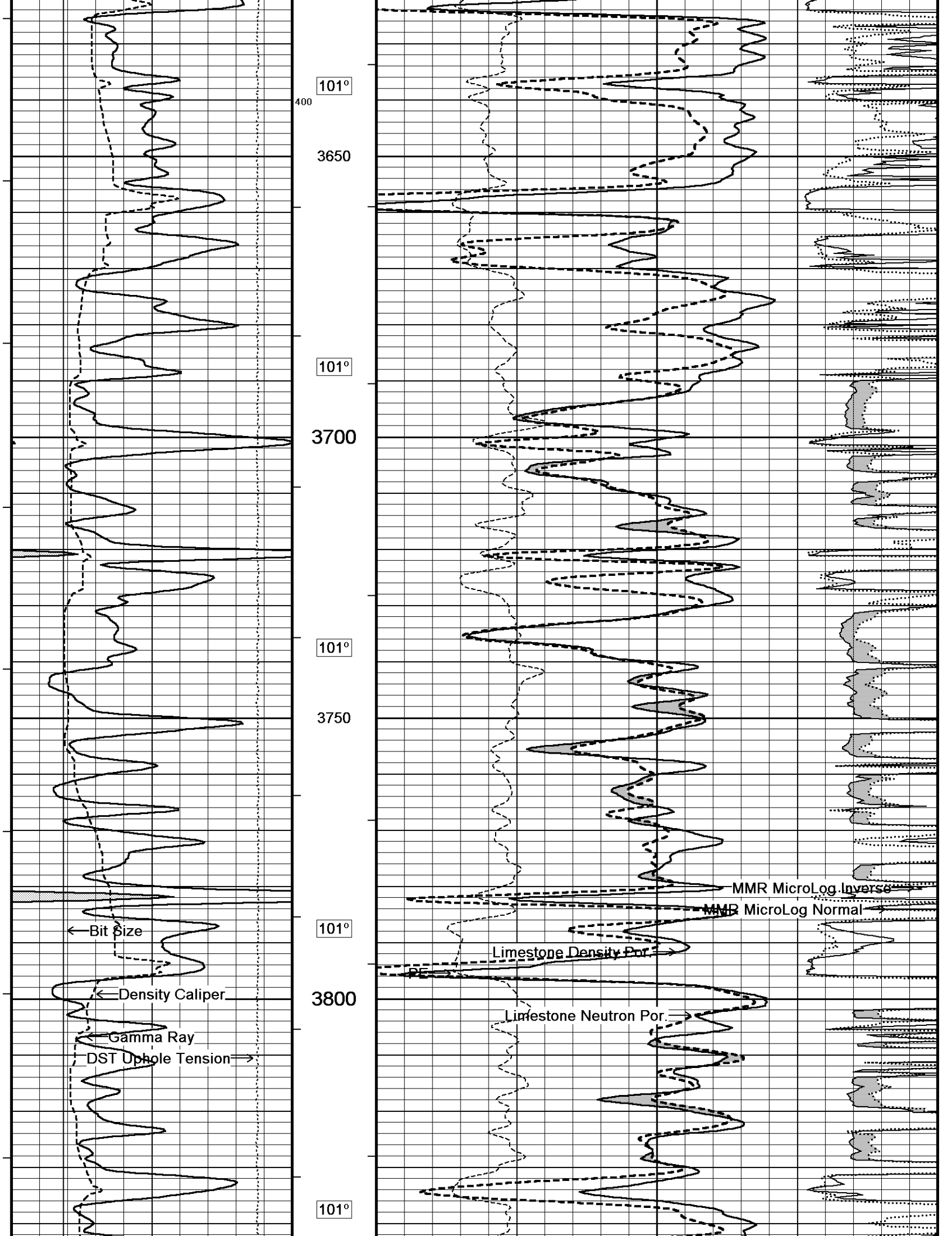
- ENGINEER: A. SILL.
- JUNIOR FIELD ENGINEER: J. RANDLE.
- OPERATOR: J. LaPOINT.

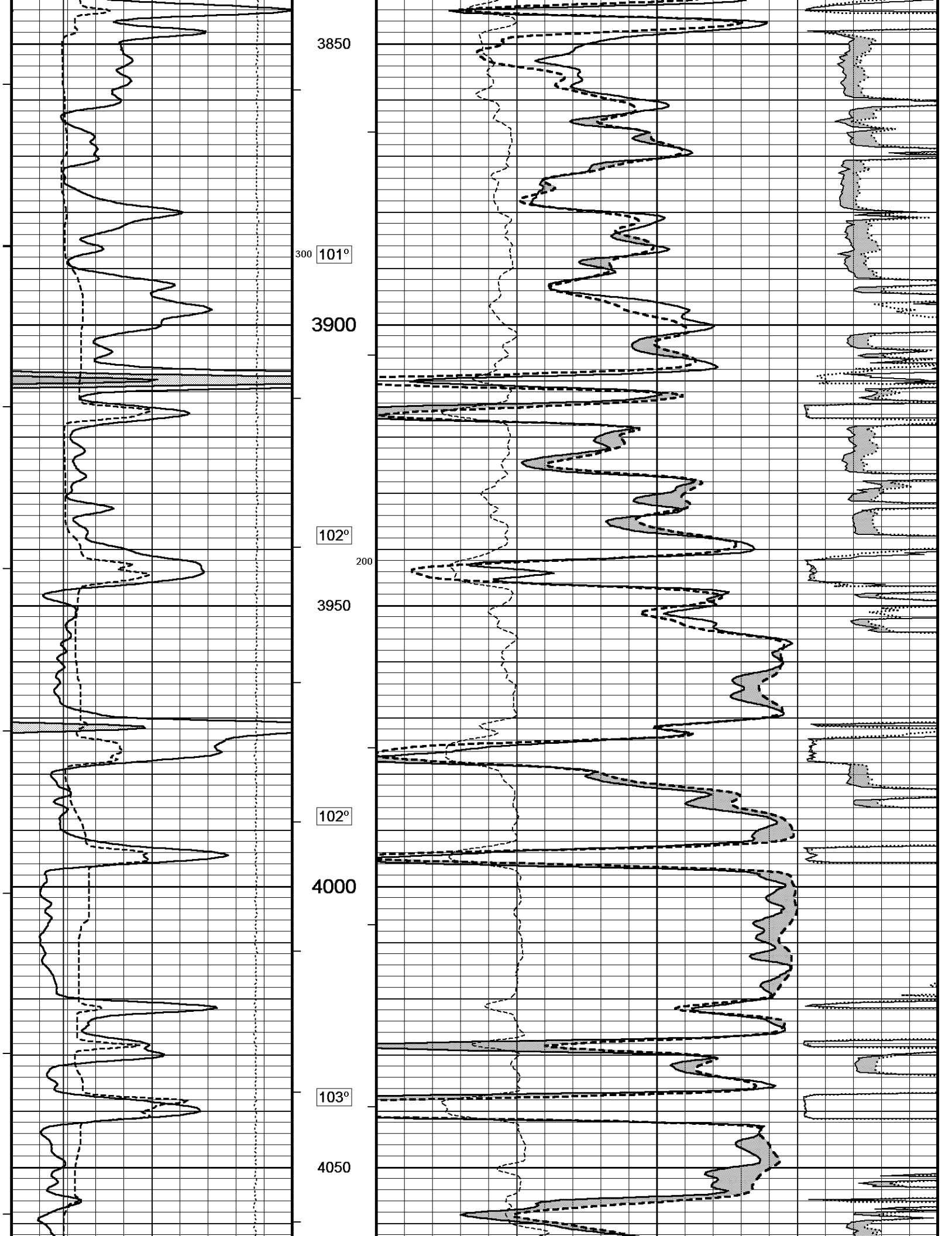
In interpreting, communicating or providing information and/or making recommendations, either written or oral, as to logs or test or other data, type or amount of material, or Work or other service to be furnished, or manner of performance, or in predicting results to be obtained, the Contractor will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

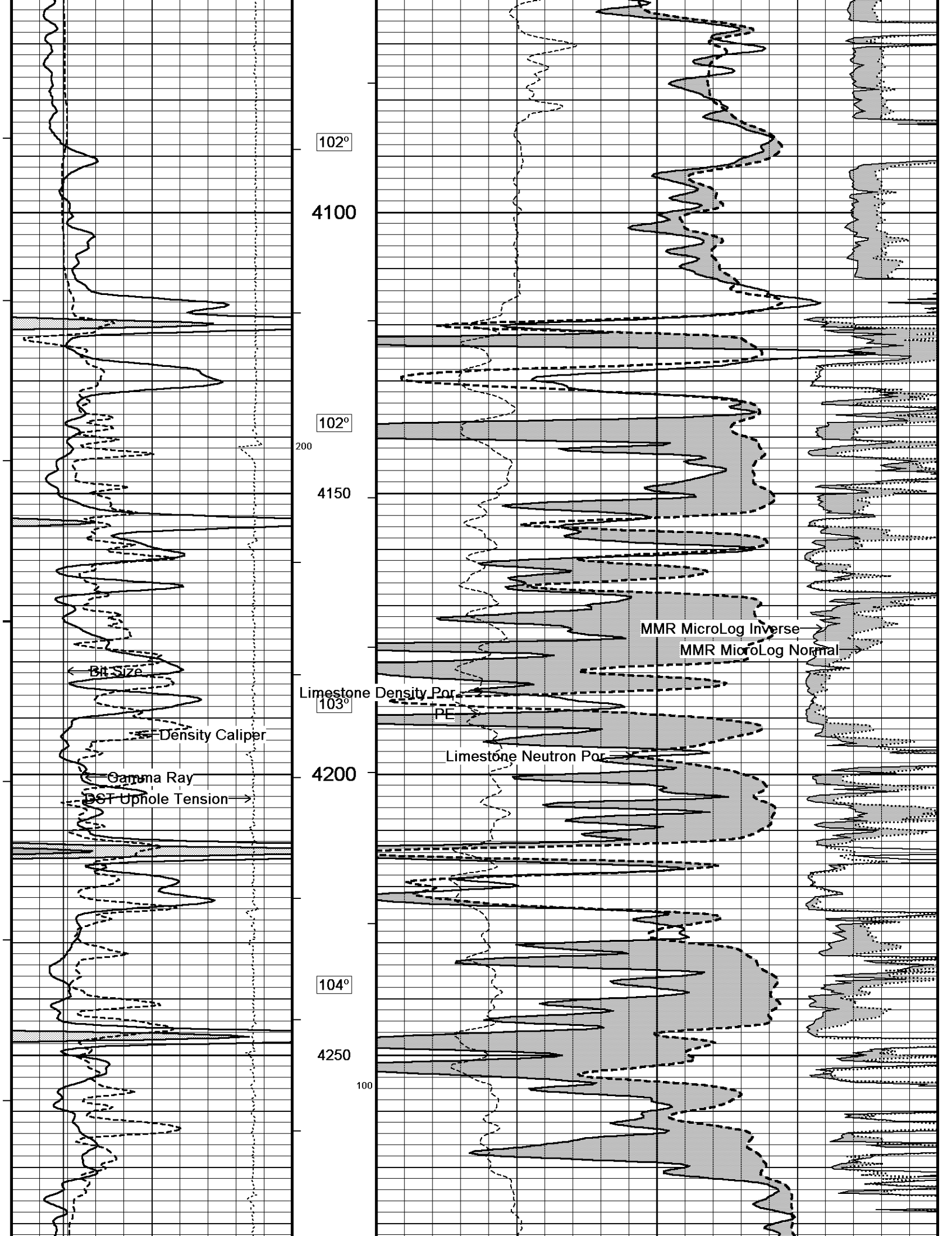
**5 INCH MAIN**

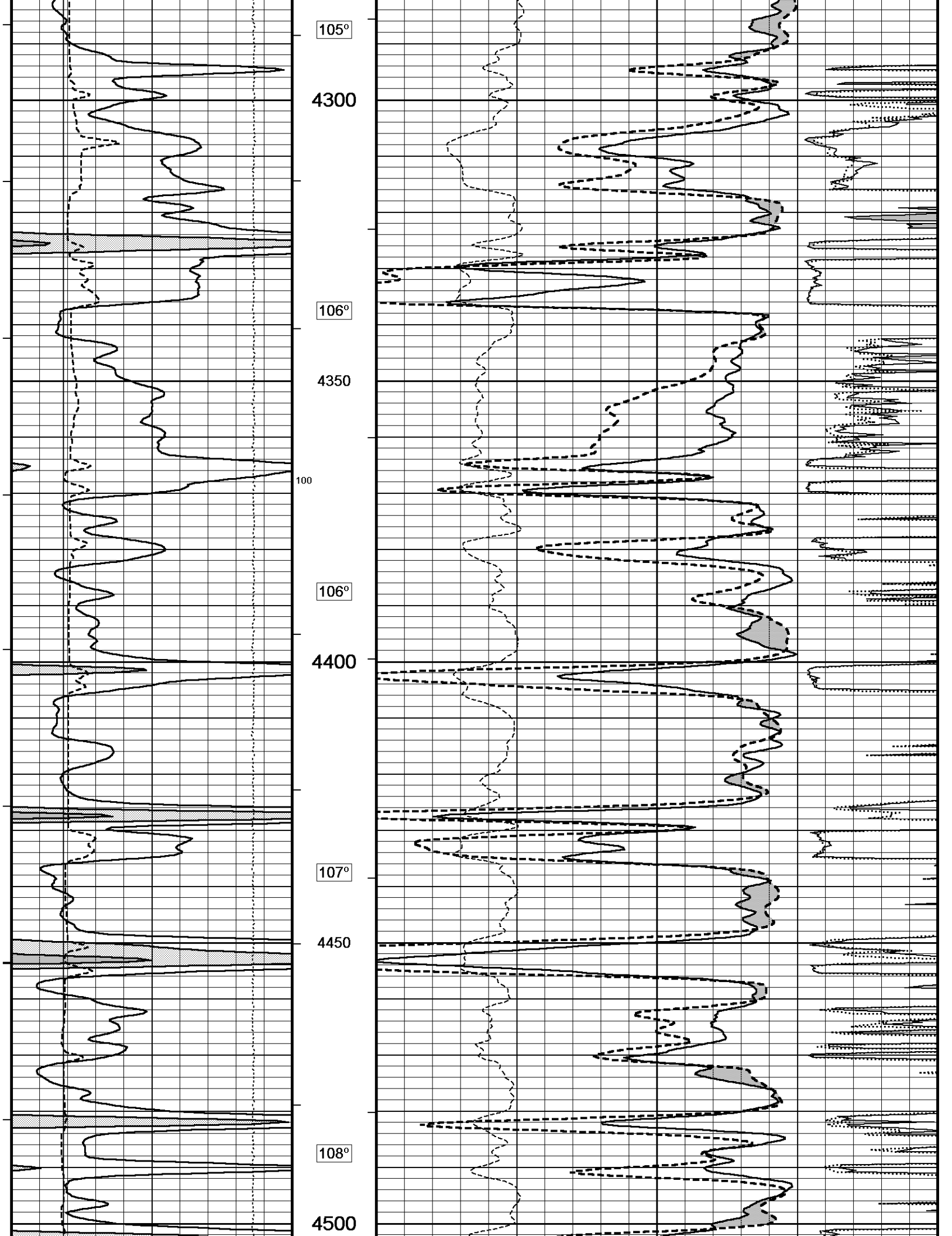
Depth Based Data - Maximum Sampling Increment 10.0cm Plotted on 08-MAR-2014 20:18  
 Filename: C:\Minimus 13.08.2113\Logs\O'BRIEN PECK 1 #2\O'BRIEN PECK 1 #2\_003.dta Recorded on 08-MAR-2014 16:42  
 System Versions: Logged with 13.08.2113 Processed with 13.08.2113 Plotted with 13.08.2113

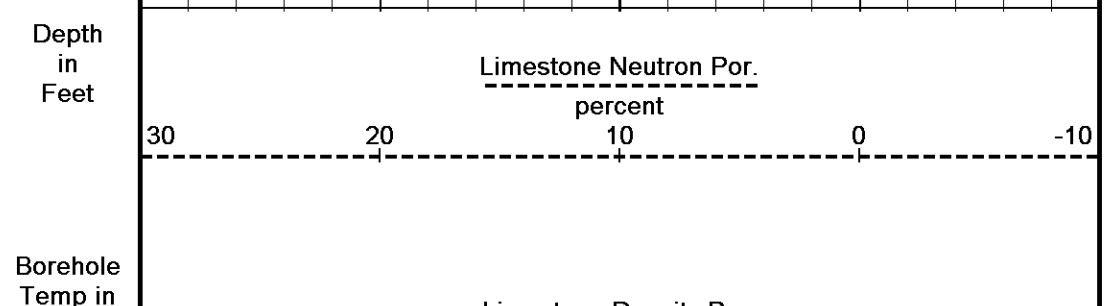
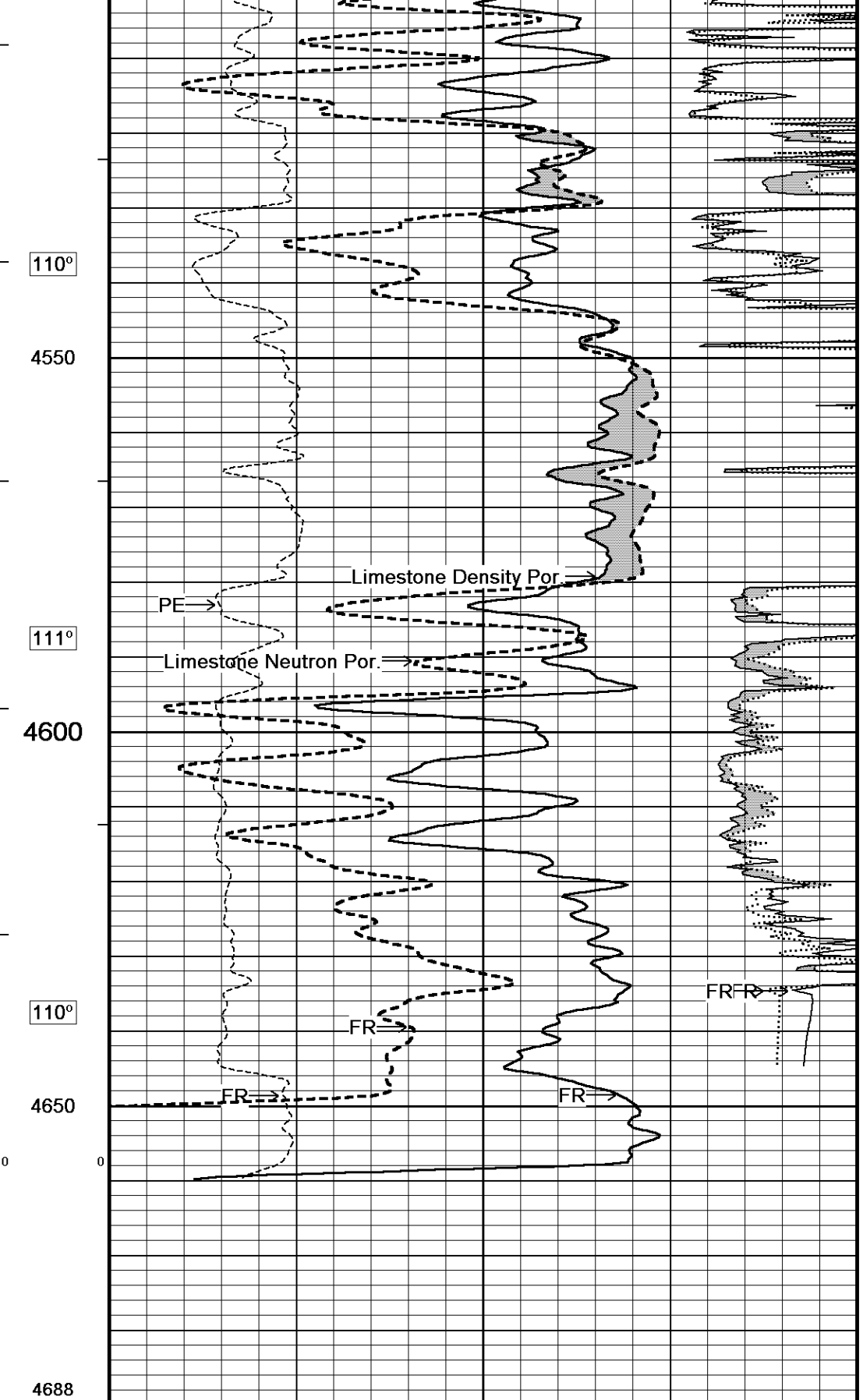
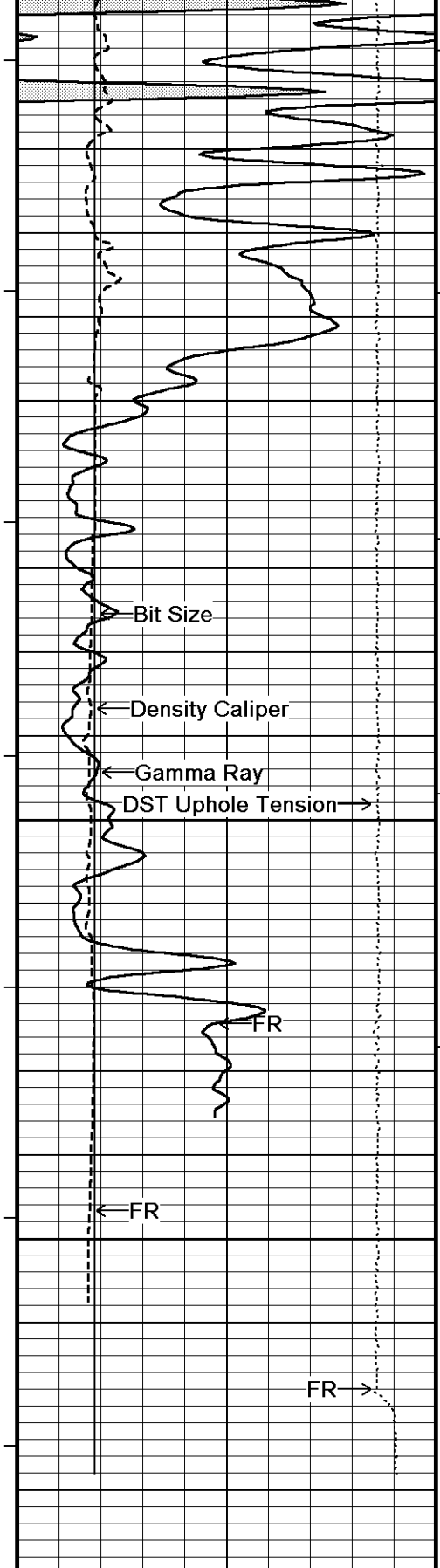








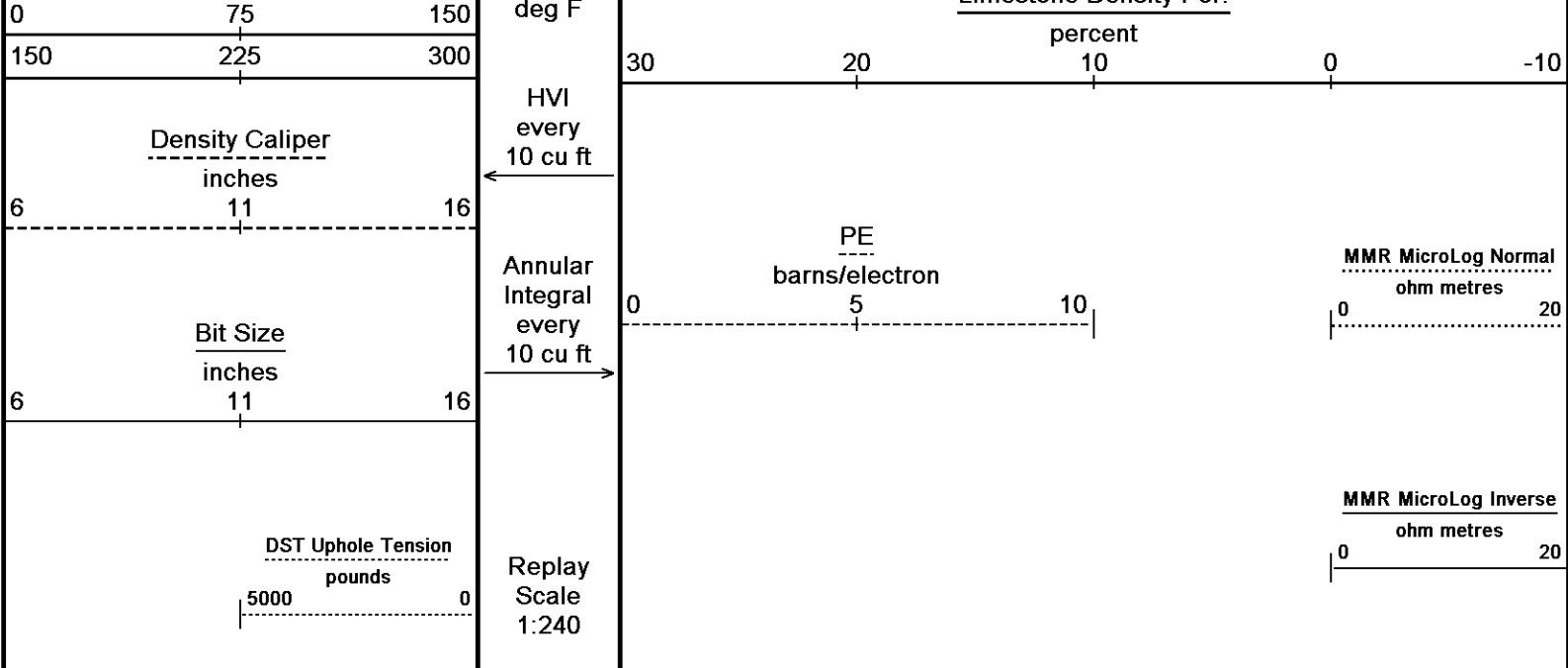




Timing Marks every 60.0 sec

Gamma Ray API

Borehole Temp in

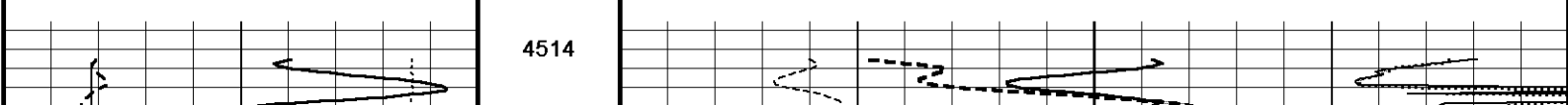
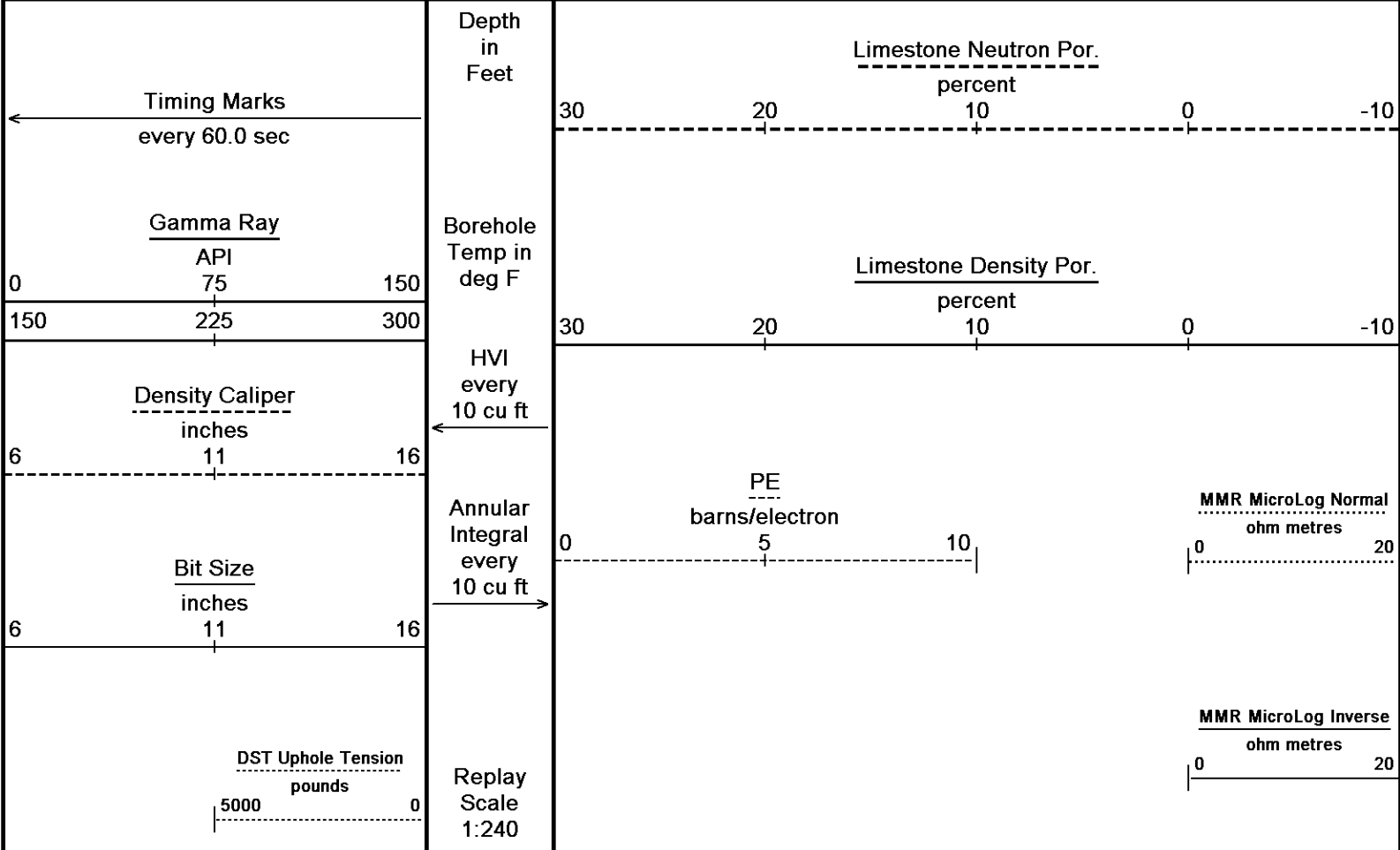


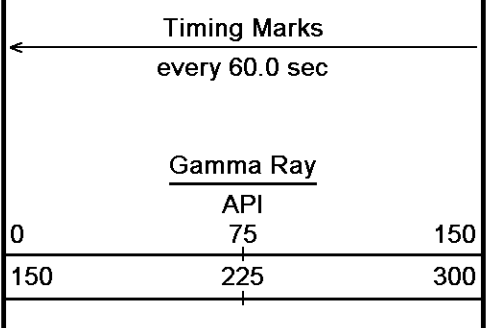
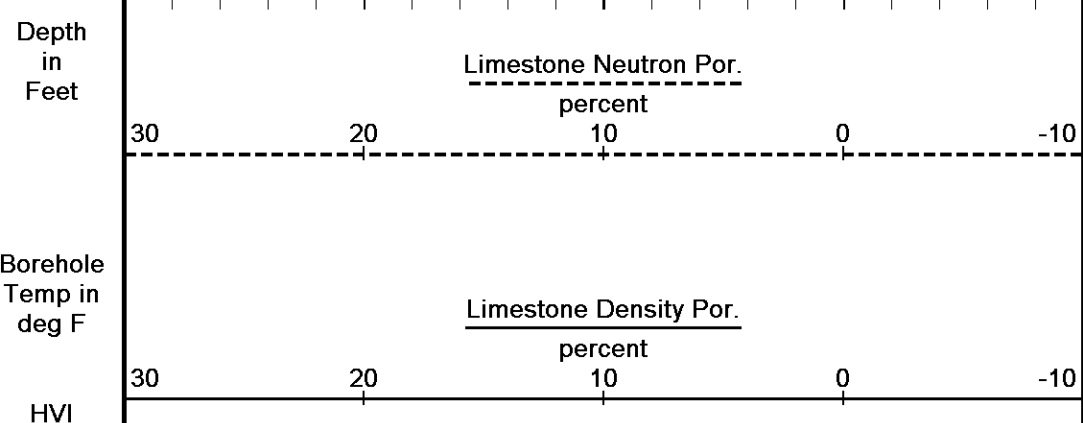
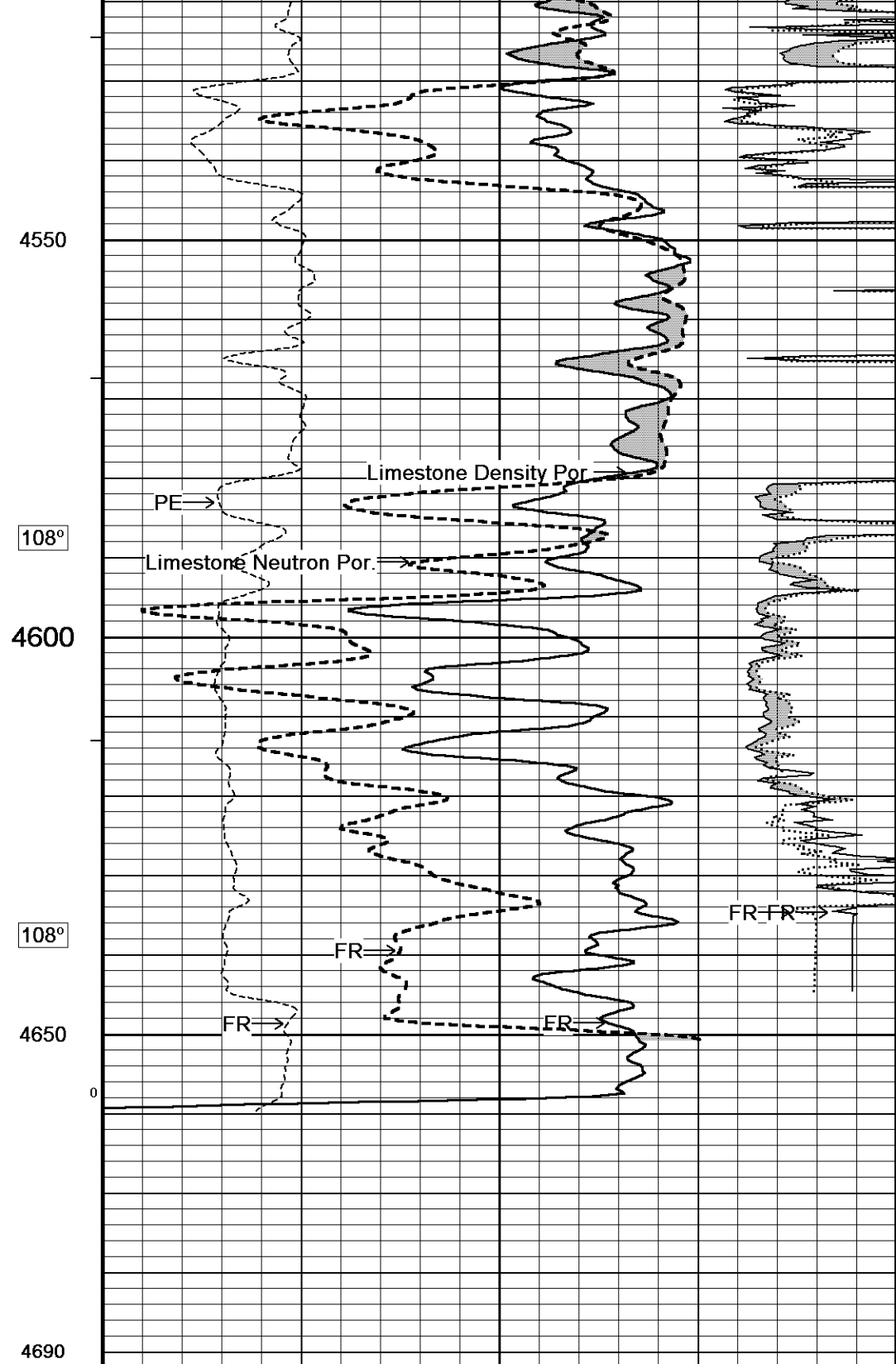
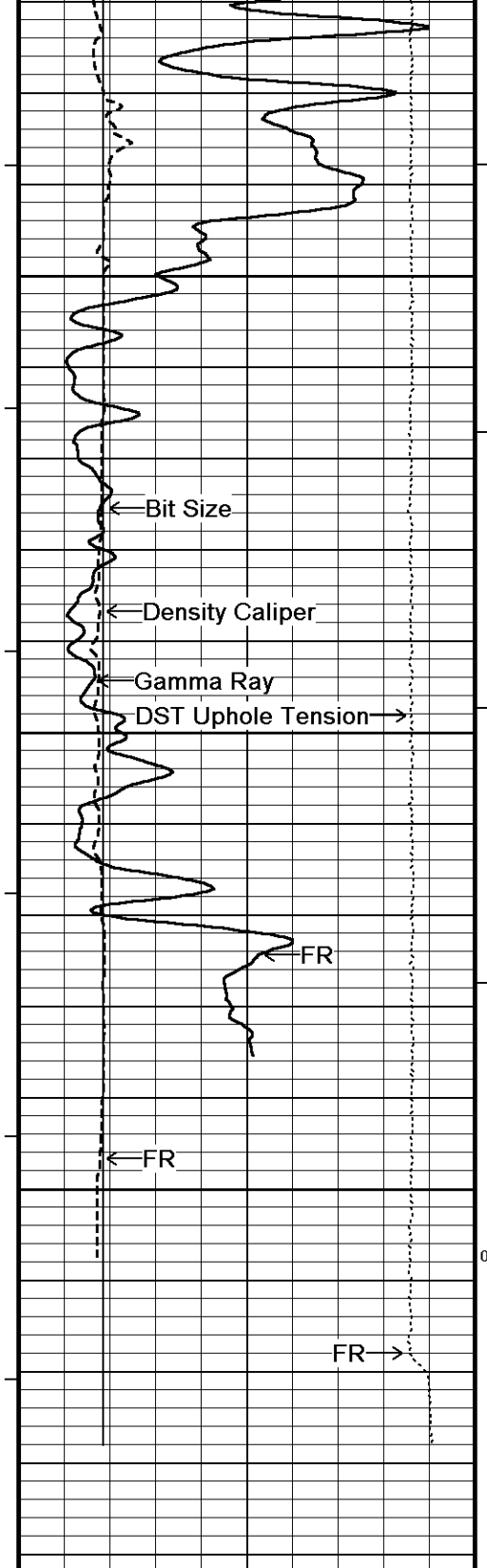
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↑ 5 INCH MAIN ↑

↓ REPEAT SECTION ↓

Depth Based Data - Maximum Sampling Increment 10.0cm Plotted on 08-MAR-2014 20:18  
 Filename: C:\Minimus 13.08.2113\Logs\O'BRIEN PECK 1 #2\O'BRIEN PECK 1 #2\_002.dta Recorded on 08-MAR-2014 16:18  
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Depth in Feet

Borehole Temp in deg F

HVI every

4550

108°

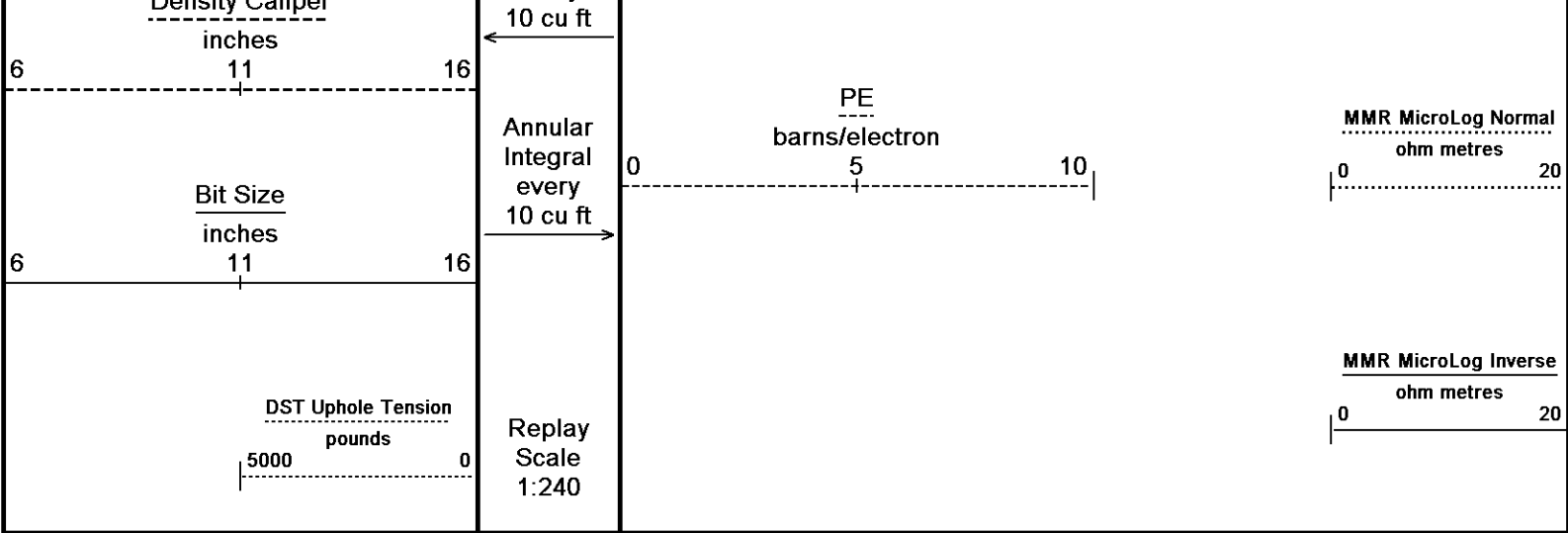
4600

108°

4650

0

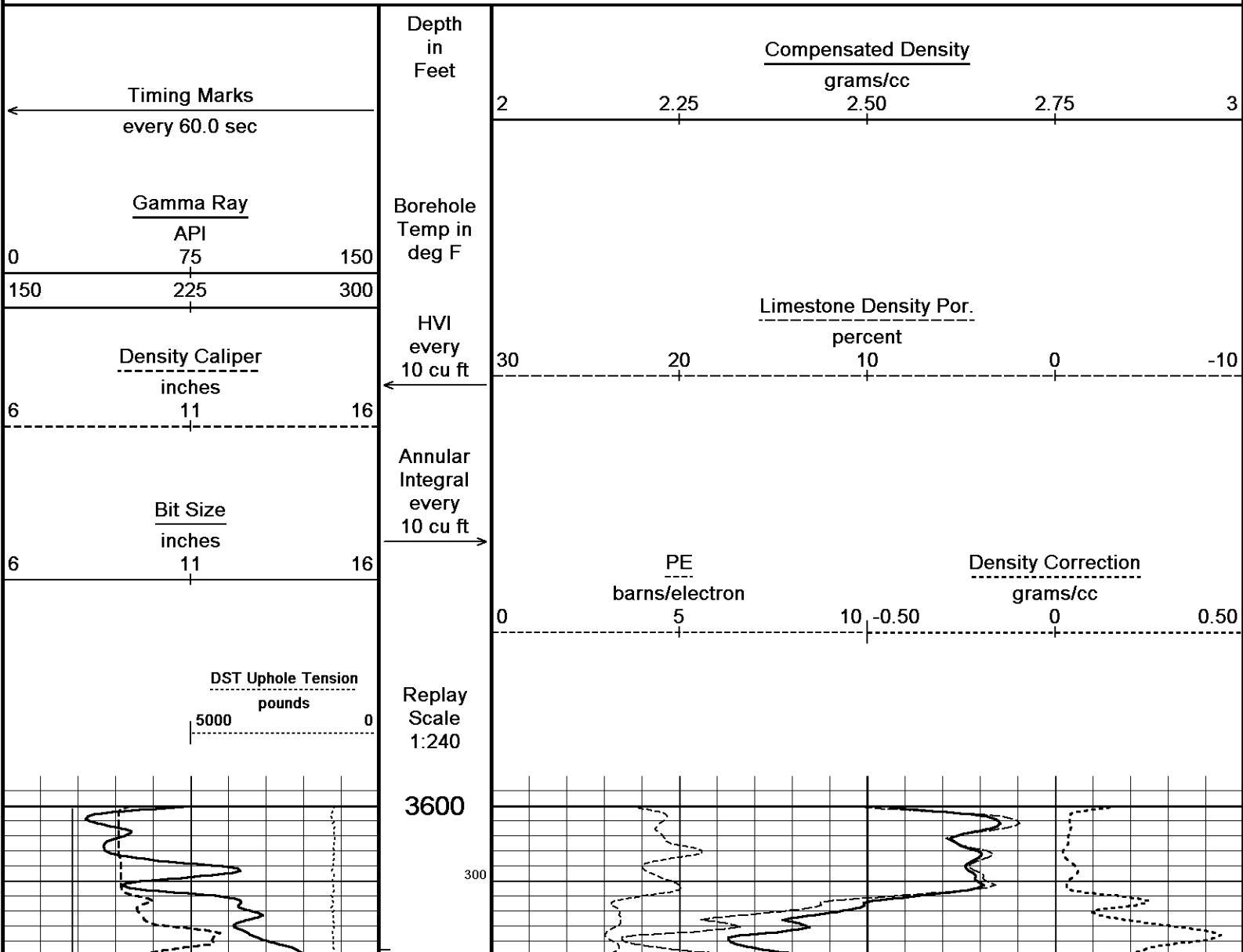
4690

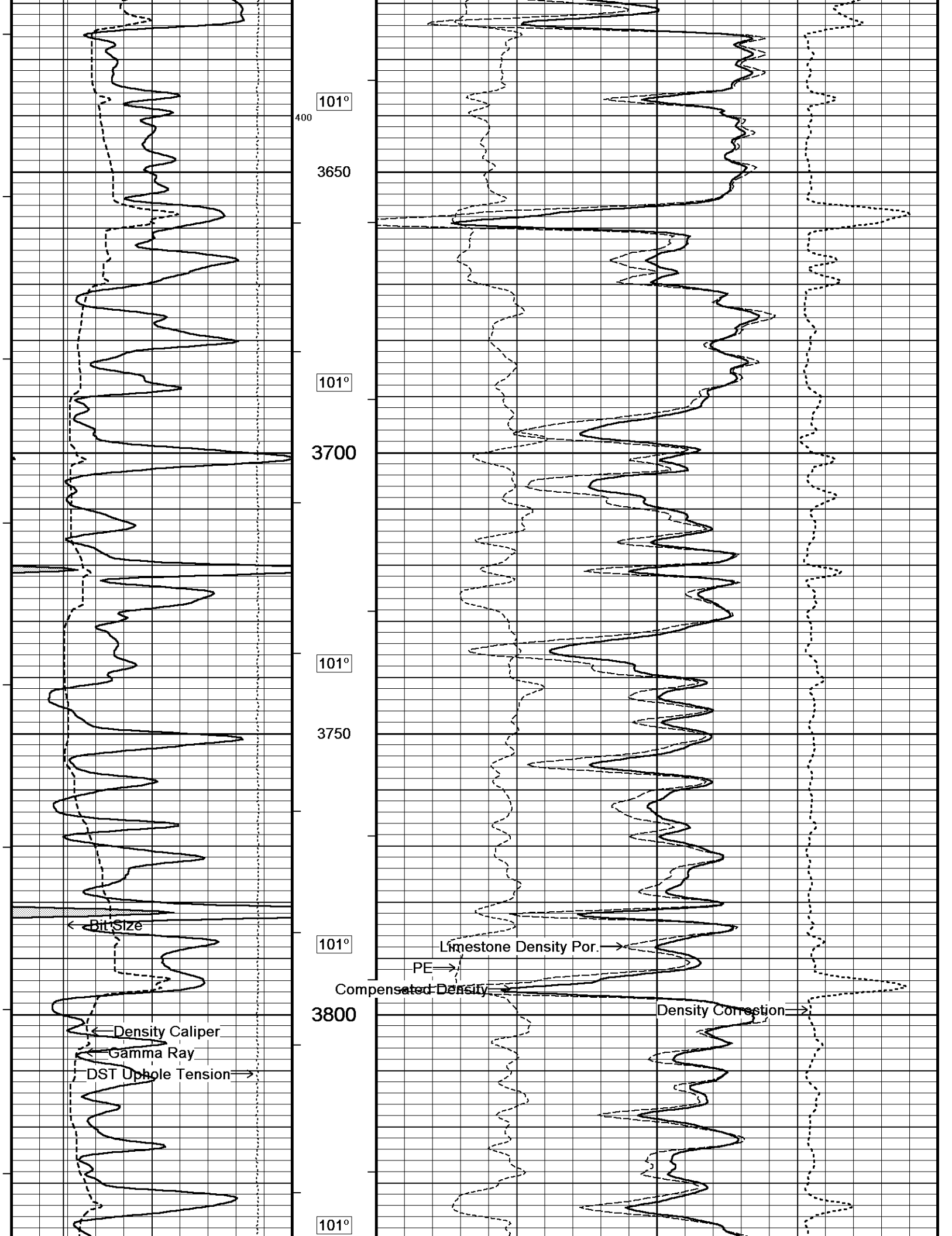


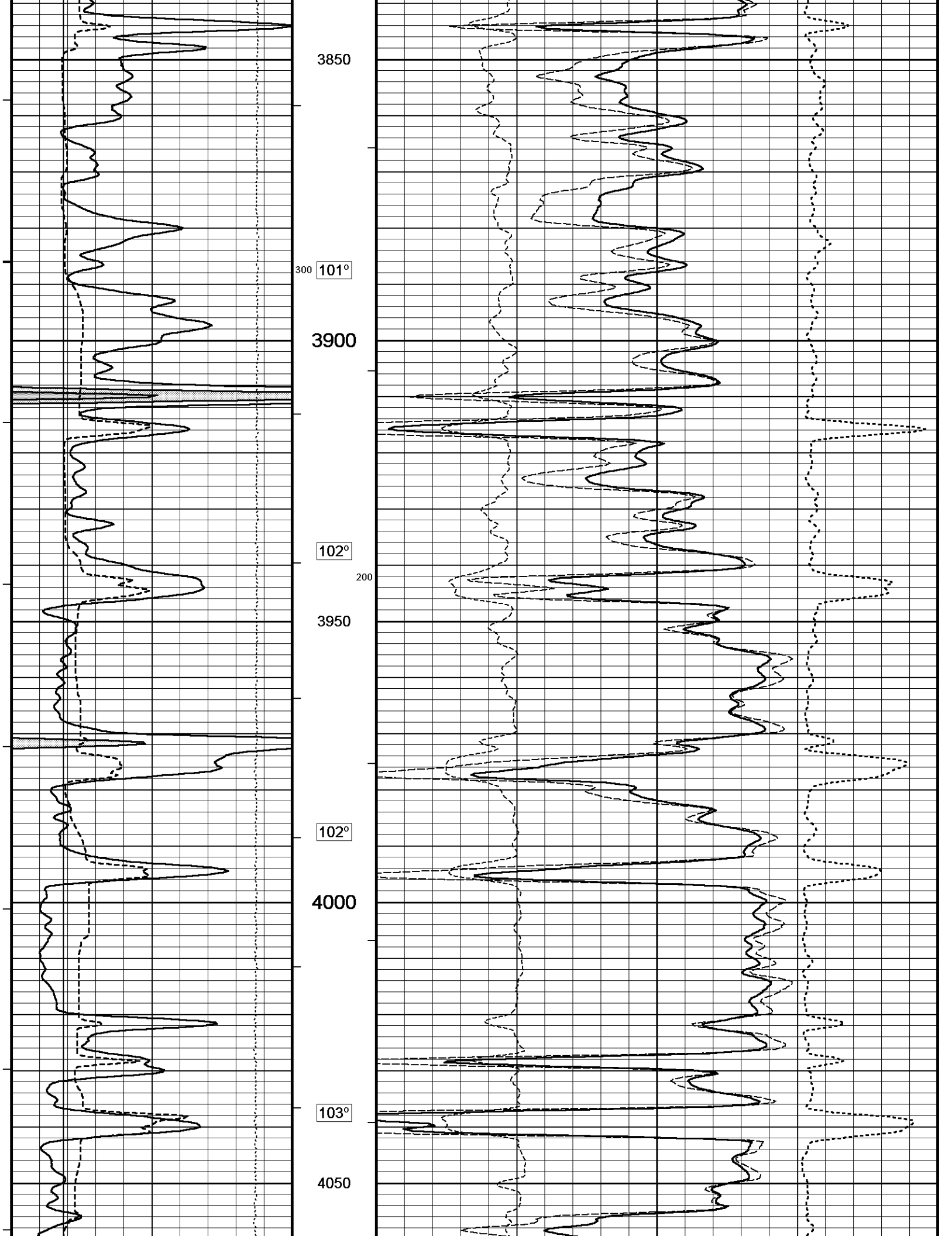
↑ REPEAT SECTION ↑

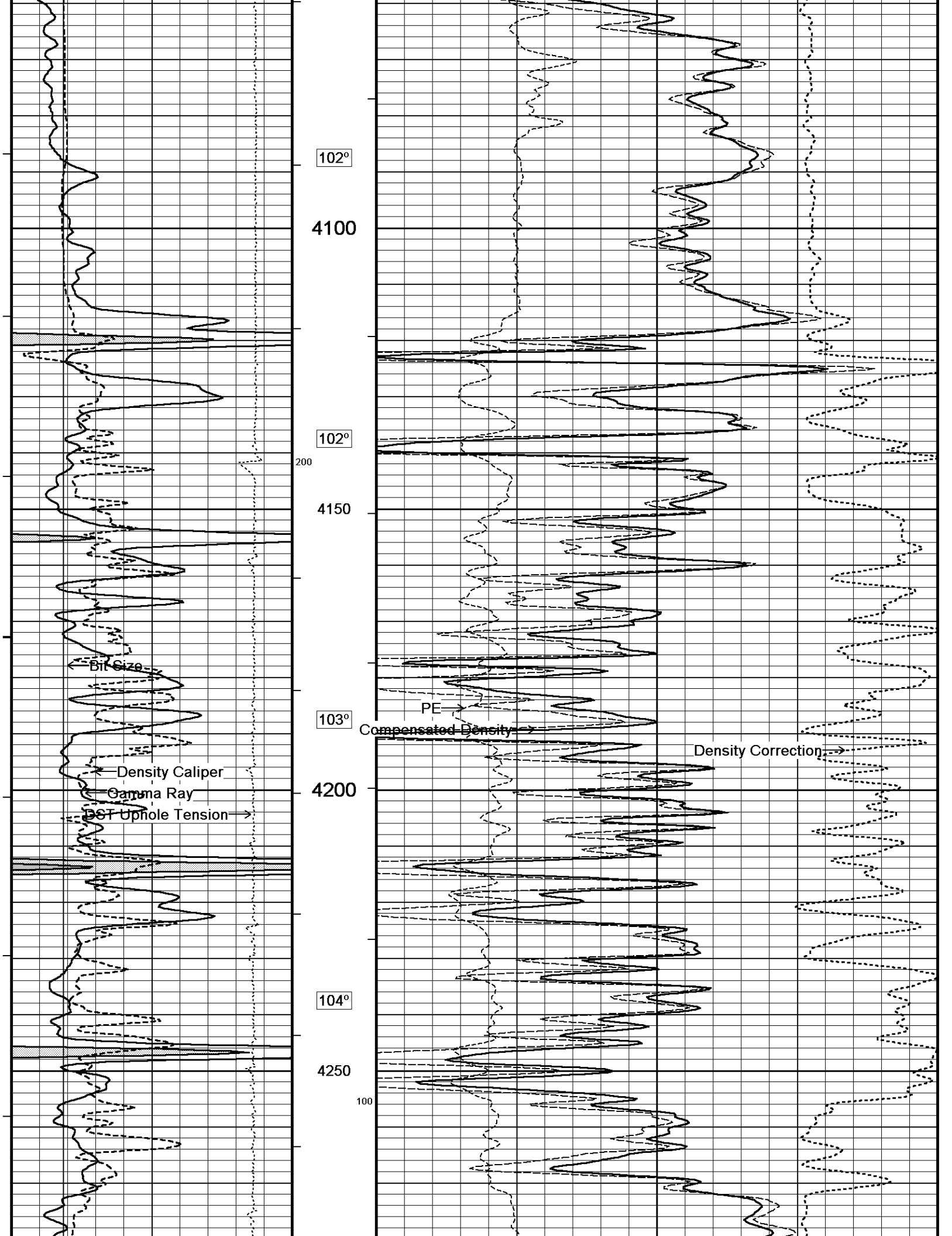
↓ 5 INCH MAIN ↓

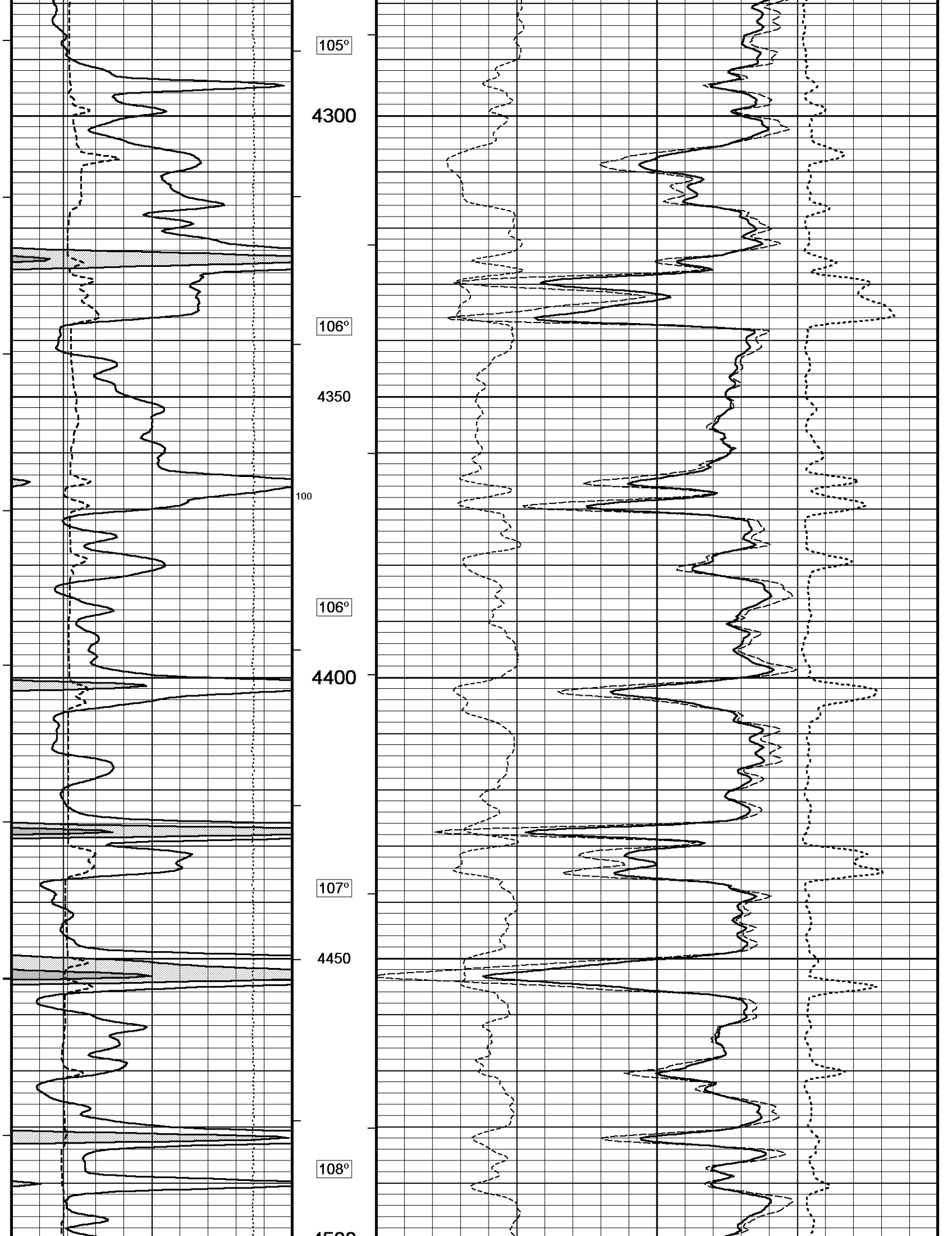
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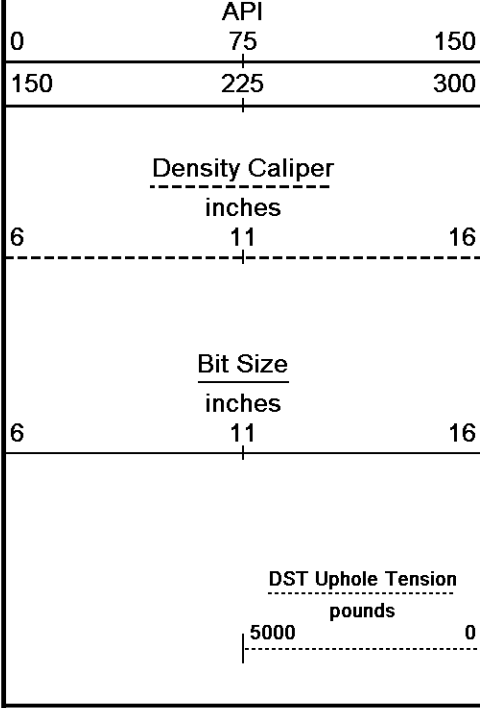










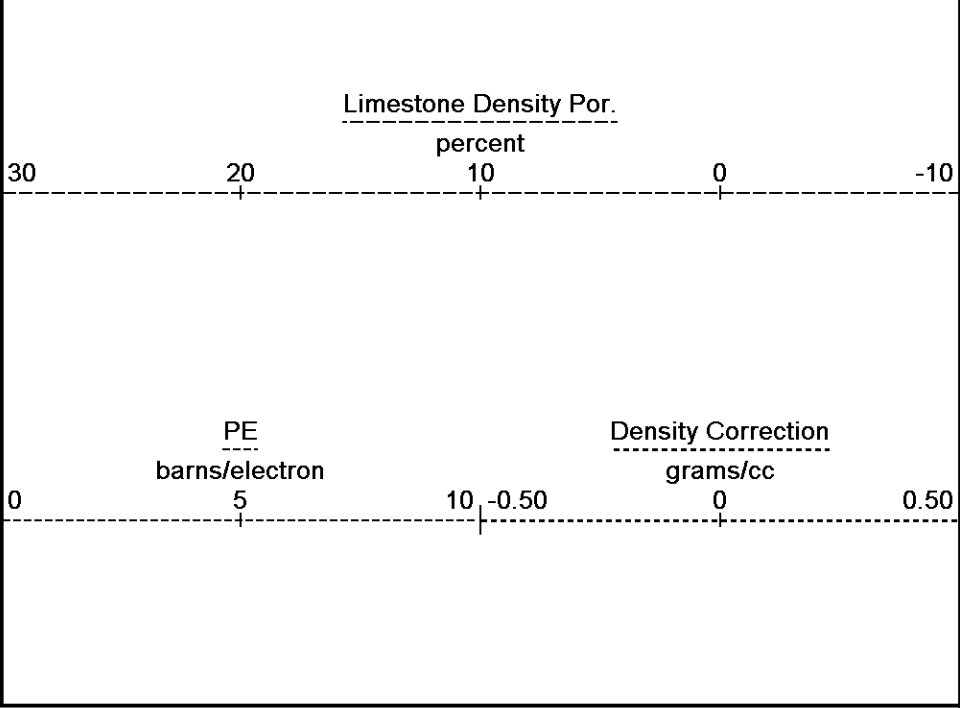


Temp in deg F

HVI every 10 cu ft

Annular Integral every 10 cu ft

Replay Scale 1:240

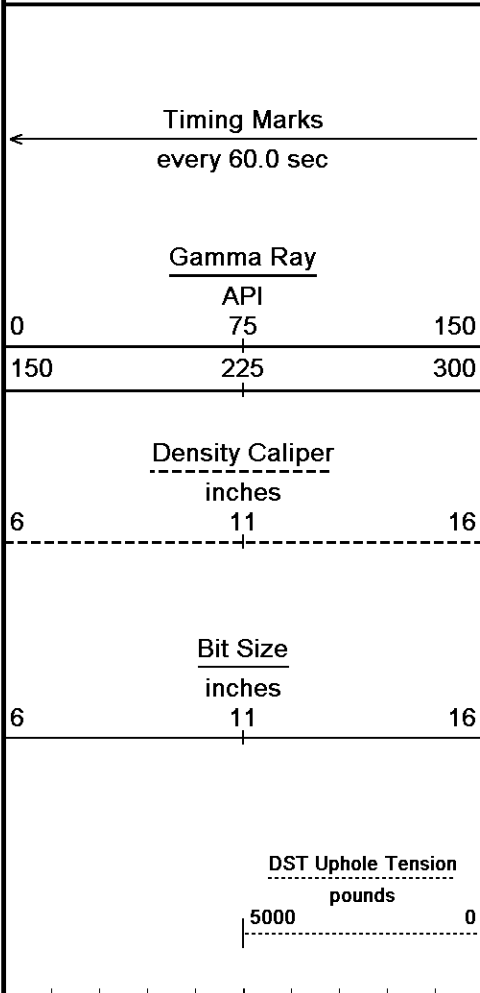


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5 INCH MAIN

REPEAT SECTION

Depth Based Data - Maximum Sampling Increment 10.0cm Plotted on 08-MAR-2014 20:18  
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Depth in Feet

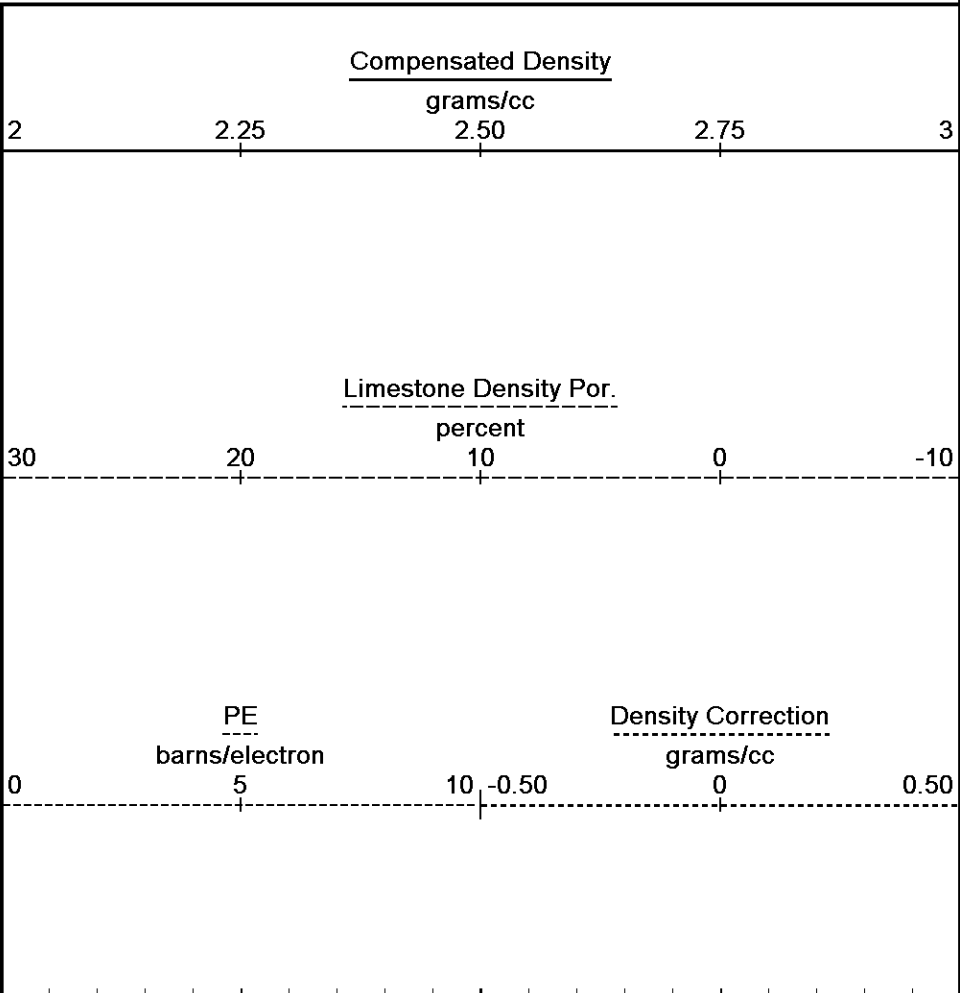
Borehole Temp in deg F

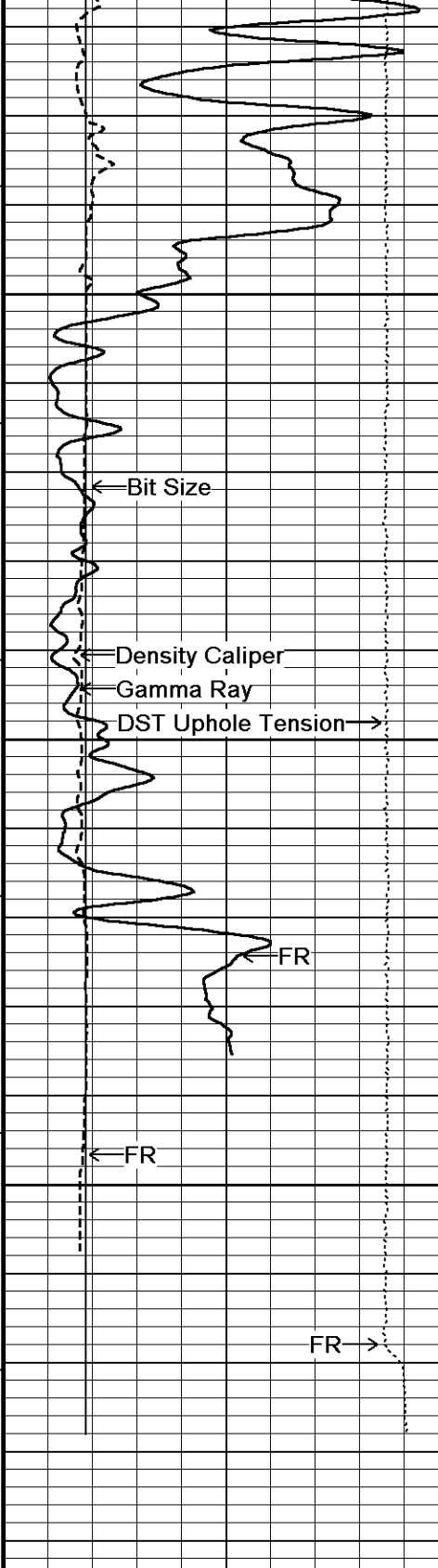
HVI every 10 cu ft

Annular Integral every 10 cu ft

Replay Scale 1:240

4514





4550

108°

4600

108°

4650

4690

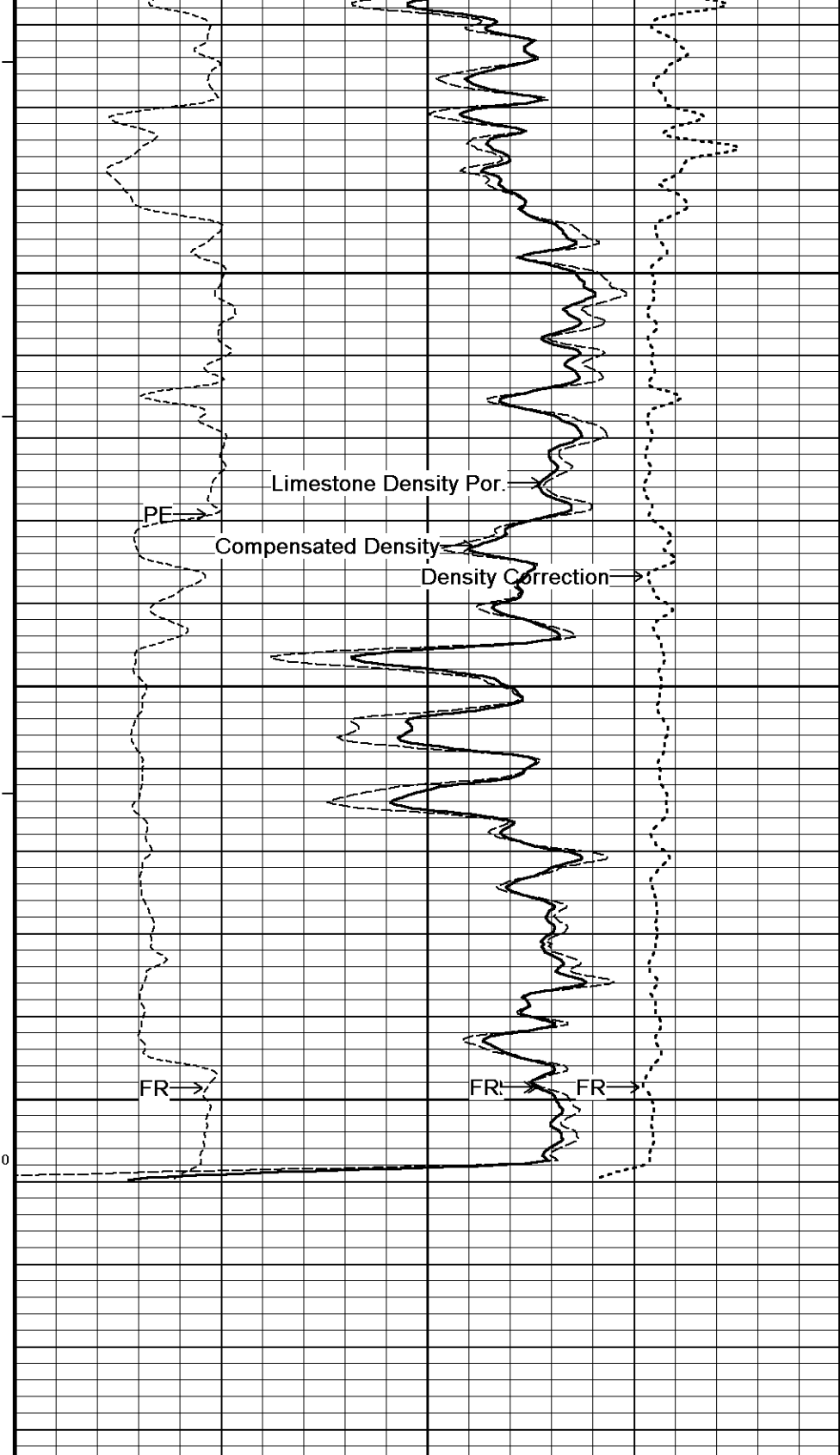
Depth  
in  
Feet

← Timing Marks  
every 60.0 sec

Gamma Ray			
	API		
0	75	150	
150	225	300	

Borehole  
Temp in  
deg F

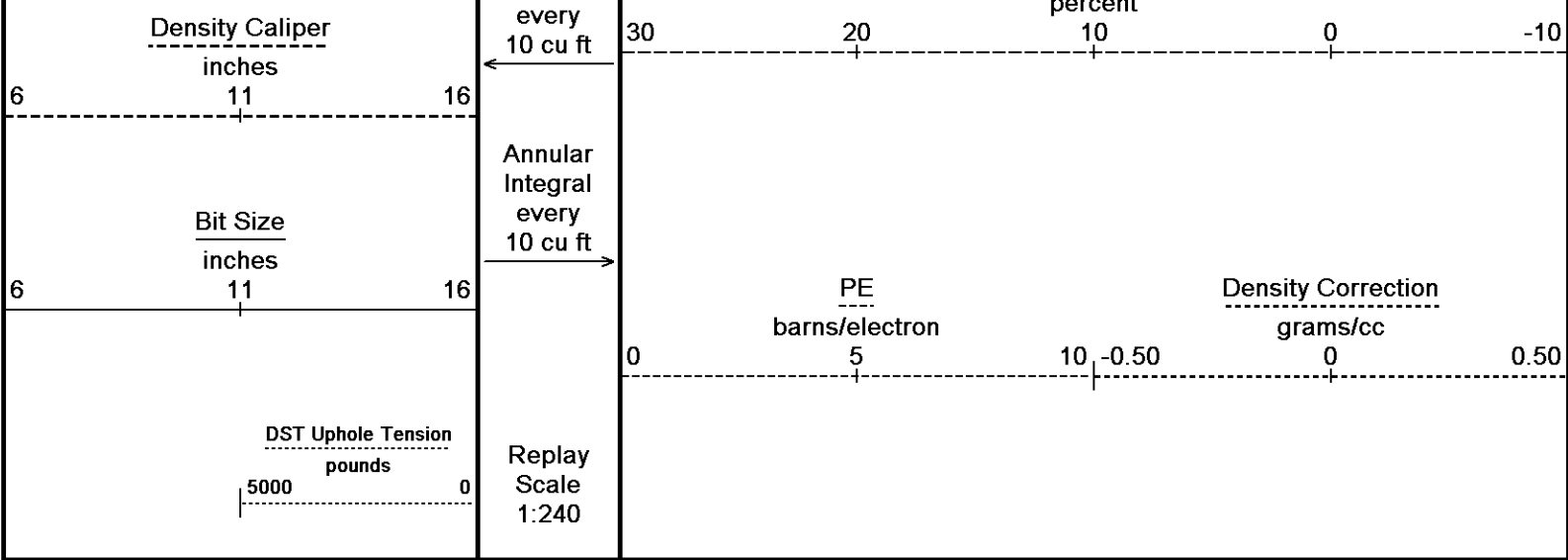
HVI



Compensated Density  
grams/cc

2      2.25      2.50      2.75      3

Limestone Density Por.  
percent



Depth Based Data - Maximum Sampling Increment 10.0cm Plotted on 08-MAR-2014 20:18  
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 System Versions: Logged with 13.08.2113 Processed with 13.08.2113 Plotted with 13.08.2113

↑ REPEAT SECTION ↑

## BEFORE SURVEY CALIBRATION

C:\Minimus 13.08.2113\Logs\O'BRIEN PECK 1 #2\O'BRIEN PECK 1 #2\_003.dta

General Constants All 000 Last Edited on 08-MAR-2014,16:32

<b>General Parameters</b>		
Mud Resistivity	1.280	ohm-metres
Mud Resistivity Temperature	76.000	degrees F
Water Level	0.000	feet
Borehole Fluid Processing	Wet Hole	
<b>Hole/Annular Volume and Differential Caliper Parameters</b>		
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	
<b>Rwa Parameters</b>		
Porosity used	Base Density Porosity	
Resistivity used	Array Ind. One 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 27-FEB-2014 09:36

Reading No	Measured	Calibrated (lbs)
1	15338.18	0.00
2	15806.32	400.00

### Gamma Calibration MCG-C 150 Field Calibration on 08-MAR-2014 10:58

	Measured	Calibrated (API)
Background	71	48
Calibrator (Gross)	1145	773
Calibrator (Net)	1074	725

### Gamma Constants MCG-C 150 Last Edited on 08-MAR-2014,14:57

Gamma Calibrator Number	GRC038	
Mud Density	1.12	gm/cc
Caliper Source for Processing	Density Caliper	
Tool Position	Eccentred	
Concentration of KCl		kppm

K Mud Type	Chloride	0.00	%
K Mud Concentration			

SP Calibration MCG-C 150			Field Calibration on 08-MAR-2014,10:58
	Measured	Calibrated (mV)	
Reference 1	100.2	98.8	
Reference 2	-97.4	-99.0	

High Resolution Temperature Calibration MCG-C 150			Field Calibration on 08-MAR-2014,10:59
	Measured	Calibrated(Deg F)	
Lower	50.00	50.00	
Upper	75.00	75.00	

High Resolution Temperature Constants MCG-C 150			Last Edited on 08-MAR-2014,10:59
Pre-filter Length	11		

Caliper Calibration MMR-C.A 248			Base Calibration on 23-JAN-2014 16:52	Field Calibration on 08-MAR-2014 10:44
Base Calibration				
Reading No	Measured	Calibrator Size (in)		
1	13431	5.98		
2	16626	7.97		
3	19813	9.86		
4	23733	11.92		
5	0	0.00		
6	N/A	N/A		
Field Calibration				
	Measured Caliper (in)	Actual Caliper (in)		
	7.98	7.97		

Micro Normal and Micro Inverse Calibration MMR-C.A 248					Base Calibration on 24-FEB-2014 11:45	Field Check on 08-MAR-2014 10:45
Base Calibration						
Channel	Resistor 1	Resistor 2	Measured	Resistor 1	Resistor 2	Calibrated (ohm-m)
Micro Normal	9.9	49.5	49.5	5.1	25.6	25.6
Micro Inverse	9.9	49.5	49.5	3.4	16.9	16.9
Channel	Base Check (ohm-m)		Field Check (ohm-m)			
Micro Normal	93.9		93.9			
Micro Inverse	62.2		62.2			

Micro Normal and Micro Inverse Constants MMR-C.A 248				Last Edited on 23-JAN-2014,17:04
Pad Type	8-12 in Soft Rubber Inflatable 006-9011-159			
Micro Normal K Factor	0.5110			
Micro Inverse K Factor	0.3380			
Standoff Offset	0.0000	inches		

Neutron Calibration MDN-B.J 387					Base Calibration on 21-JAN-2014 13:56	Field Check on 08-MAR-2014 11:03
Base Calibration						
		Measured	Calibrated (cps)			
	Near	Far	Near	Far		
	2848	86	3714	110		
Ratio	32.942		33.764			
Field Calibrator at Base			Calibrated (cps)			
			1737	2564		
Ratio			0.677			
Field Check			Calibrated (cps)			
			1718	2552		
Ratio			0.673			

Neutron Constants MDN-B.J 387			Last Edited on 08-MAR-2014,14:56
Neutron Source Id	P58125B		
Neutron Jig Number	5824NE		
Epithermal Neutron			

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-A.A 55

Base Calibration on 21-JAN-2014 15:20  
Field Check on 08-MAR-2014 10:35

Base Calibration		
	Measured	Calibrated (ohm-m)
Reference 1	0.0	0.0
Reference 2	951.8	126.8
Base Check		281.4
Field Check		281.5

FE Constants MFE-A.A 55

Last Edited on 08-MAR-2014,14:55

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 5

Base Calibration on 21-JAN-2014,09:50  
Field Check on 08-MAR-2014 10:35

Base Calibration					
Test Loop Calibration		Measured		Calibrated (mmho/m)	
Channel	Low	High	Low	High	
1	16.3	470.8	9.3	966.2	
2	5.6	376.1	7.6	821.4	
3	2.6	266.1	5.2	566.0	
4	1.6	130.0	2.6	279.2	
Array Temperature		71.1	Deg F		
Channel	Base Check (mmho/m)		Field Check (mmho/m)		
	Low	High	Low	High	
1			14.2	3864.1	
2			31.7	3592.9	
3			29.8	2973.5	
4			20.8	2127.9	
Deep			18.4	1913.8	
Medium			43.1	3863.9	
Shallow			47.1	5375.4	
Array Temperature			55.8	Deg F	

Induction Constants MAI-A.A 5

Last Edited on 08-MAR-2014,14:55

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	45.00	degrees	
Stand-off Fin Width	0.5000	inches	



Density Shoe Profile	8 inch	
Caliper Source for Processing	Density Caliper	
PE Correction to Density	Not Applied	
Mud Density	1.12	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-B 64**

Base Calibration on 13-FEB-2014 15:49  
Field Calibration on 08-MAR-2014 10:37

**Base Calibration**

Reading No	Measured	Calibrator Size (in)
1	16976	3.99
2	26016	5.98
3	34528	7.97
4	42943	9.86
5	52224	11.92
6	N/A	N/A

**Field Calibration**

Measured Caliper (in)	Actual Caliper (in)
7.95	7.97

**DOWNHOLE EQUIPMENT**

C:\Minimus 13.08.2113\Logs\O'BRIEN PECK 1 #2\O'BRIEN PECK 1 #2\_003.dta

CBH-C, Cablehead, 11 pin  
CBH-C 0 LG: 2.40 ft WT: 24.3 lb OD: 2.244 in

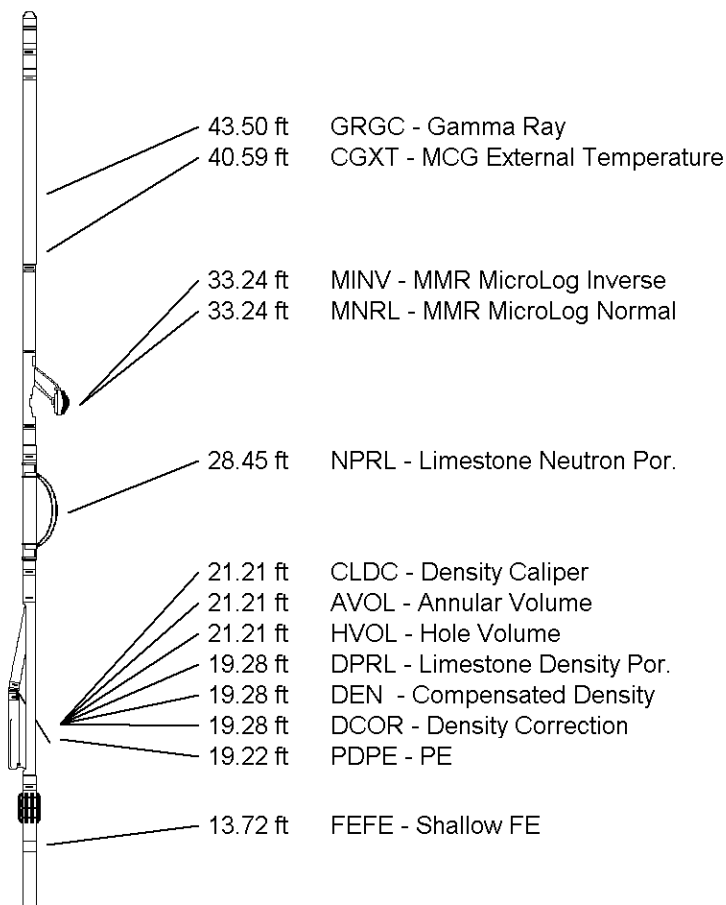
Compact Comms Gamma  
MCG-C 150 LG: 8.70 ft WT: 63.9 lb OD: 2.244 in

Compact Micro-Resistivity  
MMR-C.A 248 LG: 8.59 ft WT: 81.6 lb OD: 4.882 in

Compact Neutron  
MDN-B.J 387 LG: 5.04 ft WT: 50.7 lb OD: 2.244 in

Compact Density/Caliper  
MPD-B 64 LG: 9.59 ft WT: 90.4 lb OD: 2.449 in

Compact Focussed Electric  
MFE-A.A 55 LG: 6.05 ft WT: 48.5 lb OD: 2.244 in



Compact Induction  
 MAI-A.A 5 LG: 10.81 ft WT: 48.5 lb OD: 2.244 in

Total Length: 51.18 ft Weight: 407.9 lb



3.34 ft R400 - Array Ind. One Res 40  
 3.34 ft R600 - Array Ind. One Res 60  
 3.34 ft RTAO - Array Ind. One Res Rt  
 0.23 ft SPCG - Spontaneous Potential  
 Tool Zero (0.13ft from bottom)  
 -0.13 ft SMTU - DST Uphole Tension  
 All measurements relative to tool zero.

COMPANY O'BRIEN RESOURCES, LLC.  
 WELL PECK 1 #2  
 FIELD WILDCAT  
 PROVINCE/COUNTY LANE  
 COUNTRY/STATE U.S.A. / KANSAS

Elevation Kelly Bushing	2755.00	feet	First Reading	4649.00	feet
Elevation Drill Floor	2753.00	feet	Depth Driller	4665.00	feet
Elevation Ground Level	2748.00	feet	Depth Logger	4668.00	feet



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COMPACT PHOTO DENSITY  
 COMPENSATED NEUTRON  
 MICRORESISTIVITY LOG