



Weatherford

**COMPACT PHOTO DENSITY
COMPENSATED NEUTRON
MICRORESISTIVITY LOG**

COMPANY		SHAKESPEARE OIL COMPANY		
WELL		TUCKER #1-9		
FIELD		WILDCAT		
PROVINCE/COUNTY		SCOTT		
COUNTRY/STATE		UNITED STATES / KANSAS		
LOCATION		400' FSL & 600' FEL SE/4		
SEC	TWP	RGE	Other Services	
9	16S	34W	MAI/MFE	
API Number		15-171-20947	MML	
Permit Number			MSS	
Permanent Datum G.L., Elevation 3130 feet				Elevations:
Log Measured From KB				KB 3140.00
Drilling Measured From K.B. @ 10 FEET				DF 3139.00
				GL 3130.00
Date	12-JUN-2013			
Run Number	ONE			
Service Order	3537763			
Depth Driller	4864.00			feet
Depth Logger	4863.00			feet
First Reading	4830.00			feet
Last Reading	3800.00			feet
Casing Driller	267.00			feet
Casing Logger	264.00			feet
Bit Size	7.880			inches
Hole Fluid Type	CHEMICAL			
Density / Viscosity	9.40	lb/USg	56.00	CP
PH / Fluid Loss	9.50		9.60	ml/30Min
Sample Source	MUDPIT			
Rm @ Measured Temp	0.66 @ 85.0			ohm-m
Rmf @ Measured Temp	0.53 @ 85.0			ohm-m
Rmc @ Measured Temp	0.79 @ 85.0			ohm-m
Source Rmf / Rmc	CALC		CALC	
Rm @ BHT	0.48 @ 116.0			ohm-m
Time Since Circulation	4 HOURS			
Max Recorded Temp	116.00			deg F
Equipment / Base	13096		LIB	
Recorded By	W. STAMBAUGH			
Witnessed By	TIM PRIEST			
IOB#	LB13-173			

BOREHOLE RECORD					Last Edited: 12-JUN-2013 21:41
Bit Size inches		Depth From feet		Depth To feet	
7.875		264.00		4863.00	
CASING RECORD					
Type	Size inches	Depth From feet	Shoe Depth feet	Weight pounds/ft	
SURFACE	8.625	0.00	264.00	24.00	

REMARKS
- SOFTWARE ISSUE: WLS 13.05.9583.
- MCG, MML, MDN, MPD, MFE, MSS, MAI RUN IN COMBINATION. - HARDWARE: DUAL BOWSPRING USED ON MDN. 0.5 INCH STANDOFF USED ON MFE. TWO 0.5 INCH STANDOFFS USED ON MSS. 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: 2370 CU. FT.
- ANNULAR HOLE VOLUME WITH 5.5 INCH CASING FROM TD TO SURFACE CASING: 1610 CU. FT.

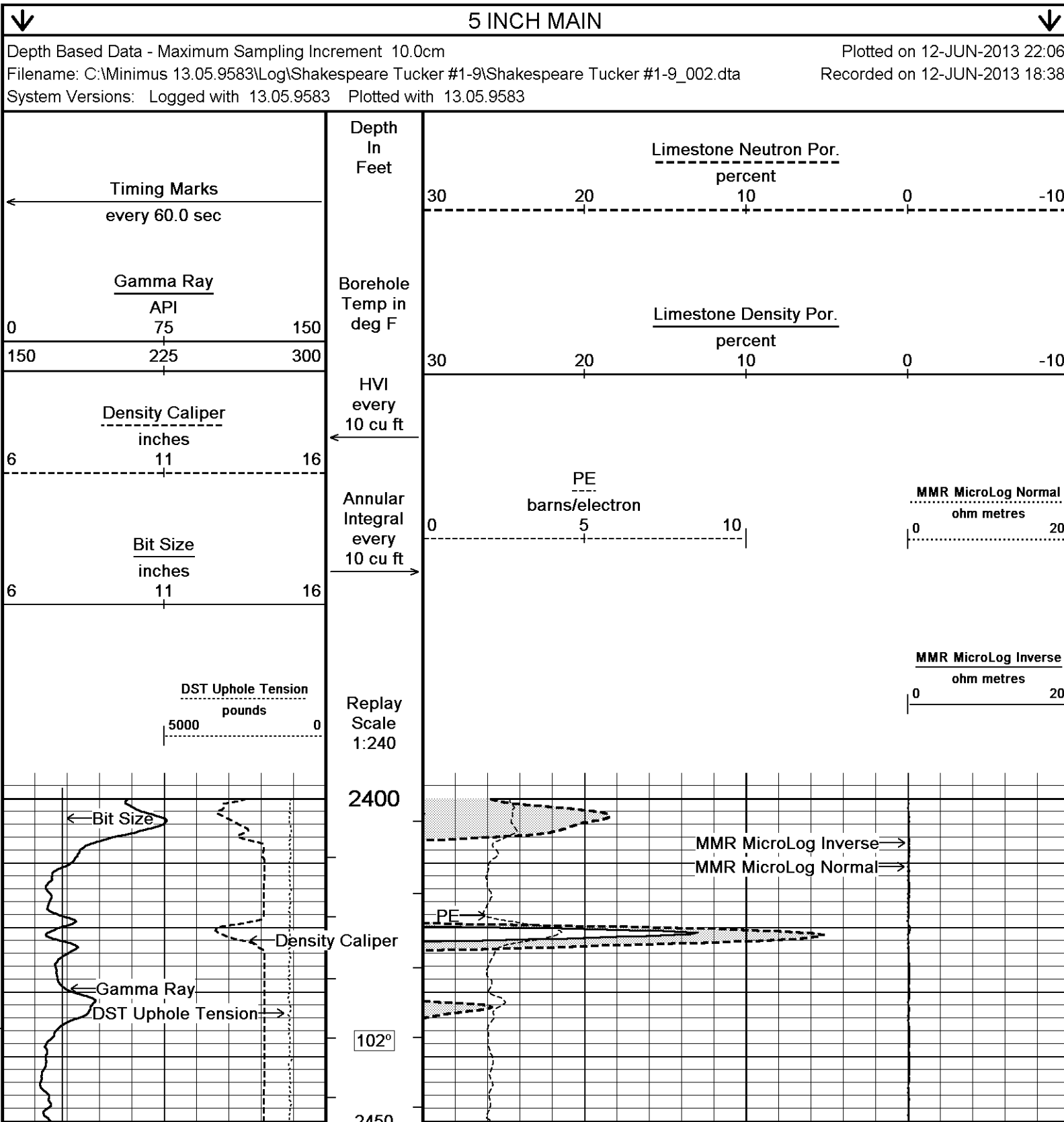
- SERVICE ORDER # 3537763.

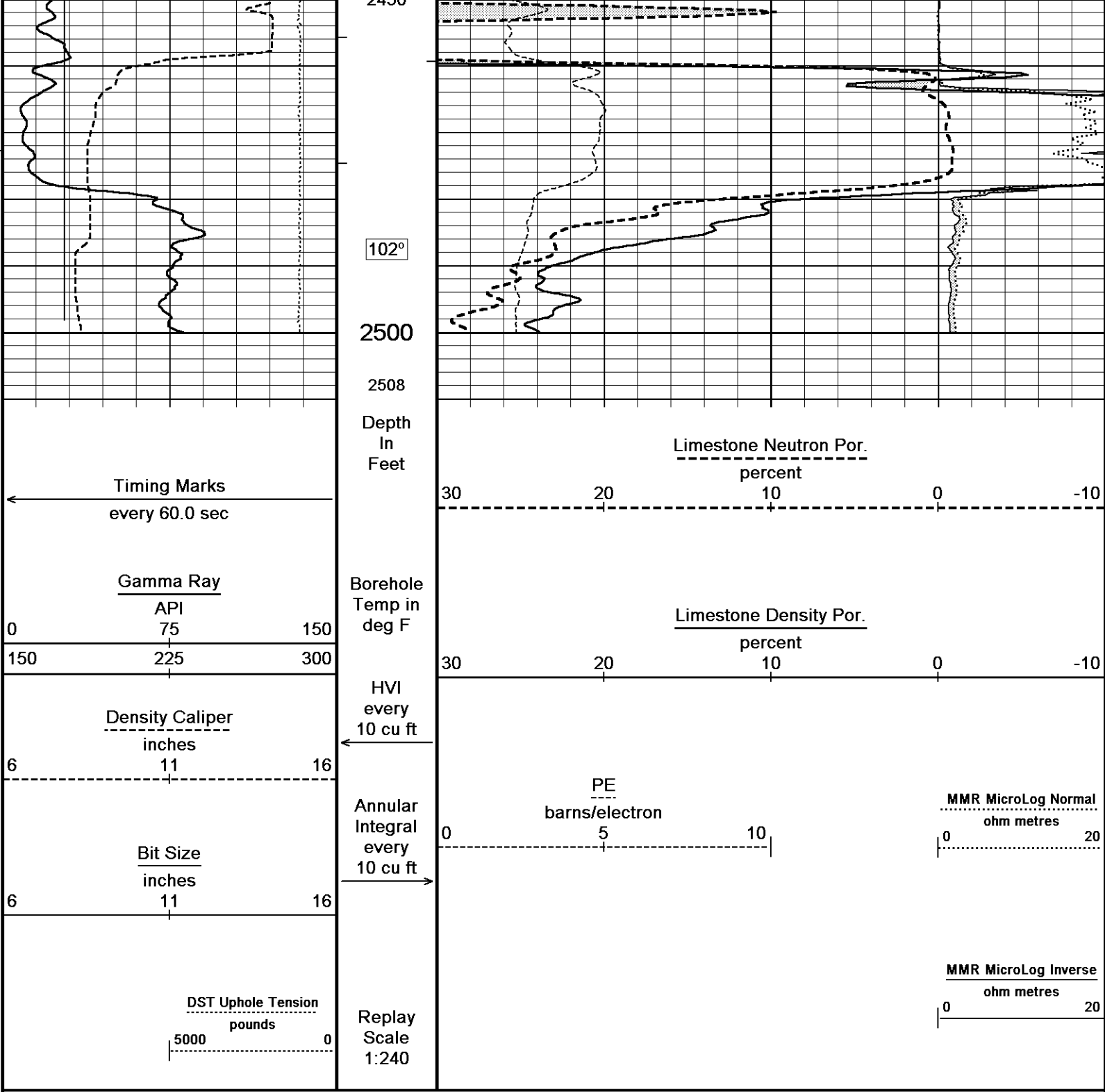
- RIG: HD DRILLING #2.

- ENGINEER: WILLIAM STAMBAUGH

- OPERATOR(S): K. RINEHART, M. HERNANDEZ

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.



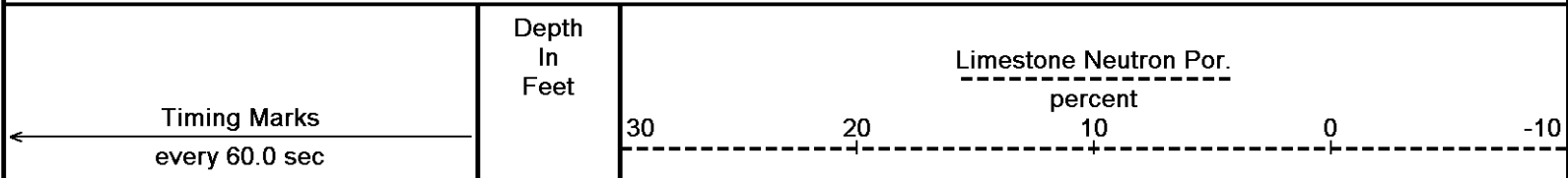


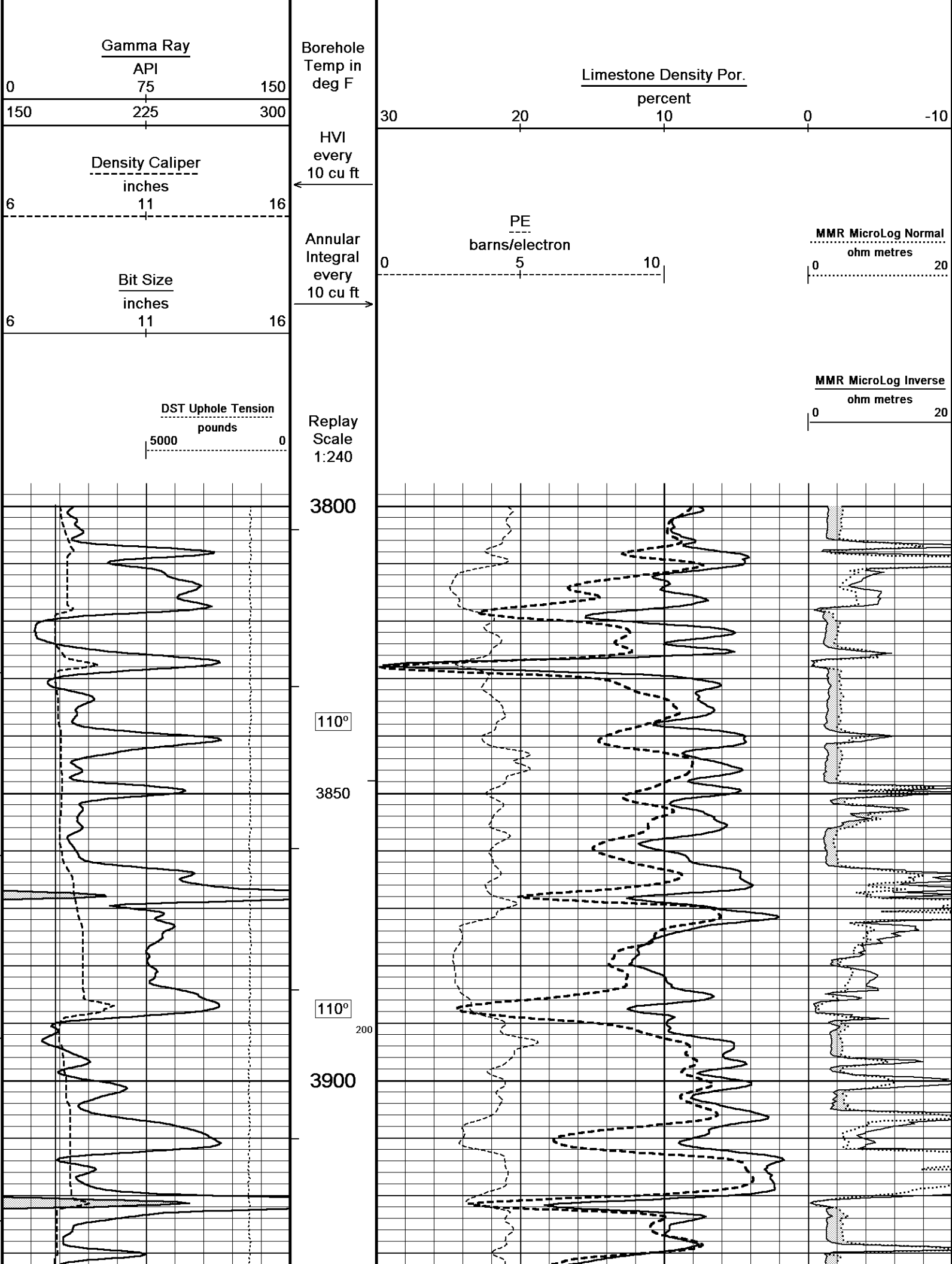
Depth Based Data - Maximum Sampling Increment 10.0cm Plotted on 12-JUN-2013 22:06
Filename: C:\Minimus 13.05.9583\Log\Shakespeare Tucker #1-9\Shakespeare Tucker #1-9_002.dta Recorded on 12-JUN-2013 18:38
System Versions: Logged with 13.05.9583 Plotted with 13.05.9583

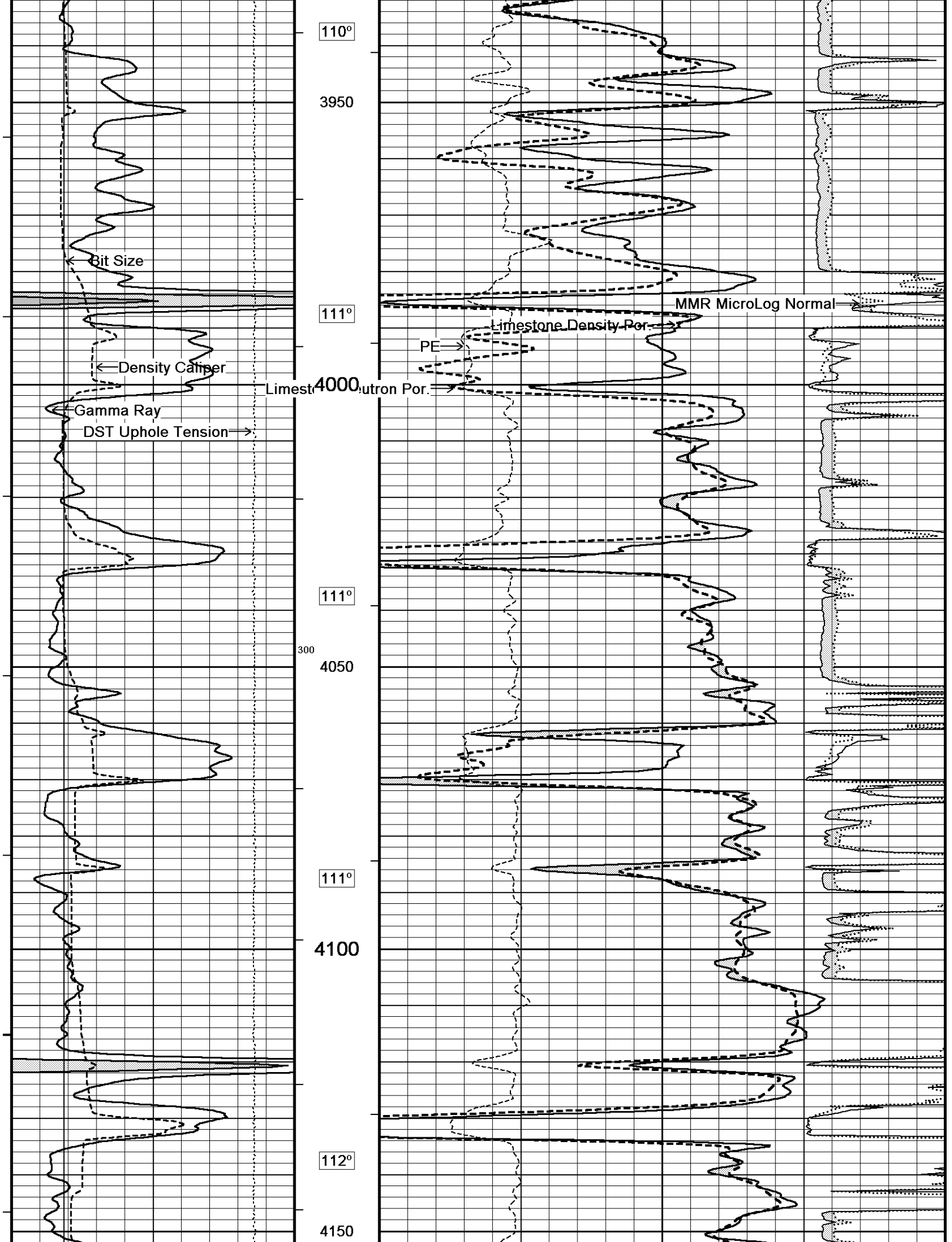
5 INCH MAIN

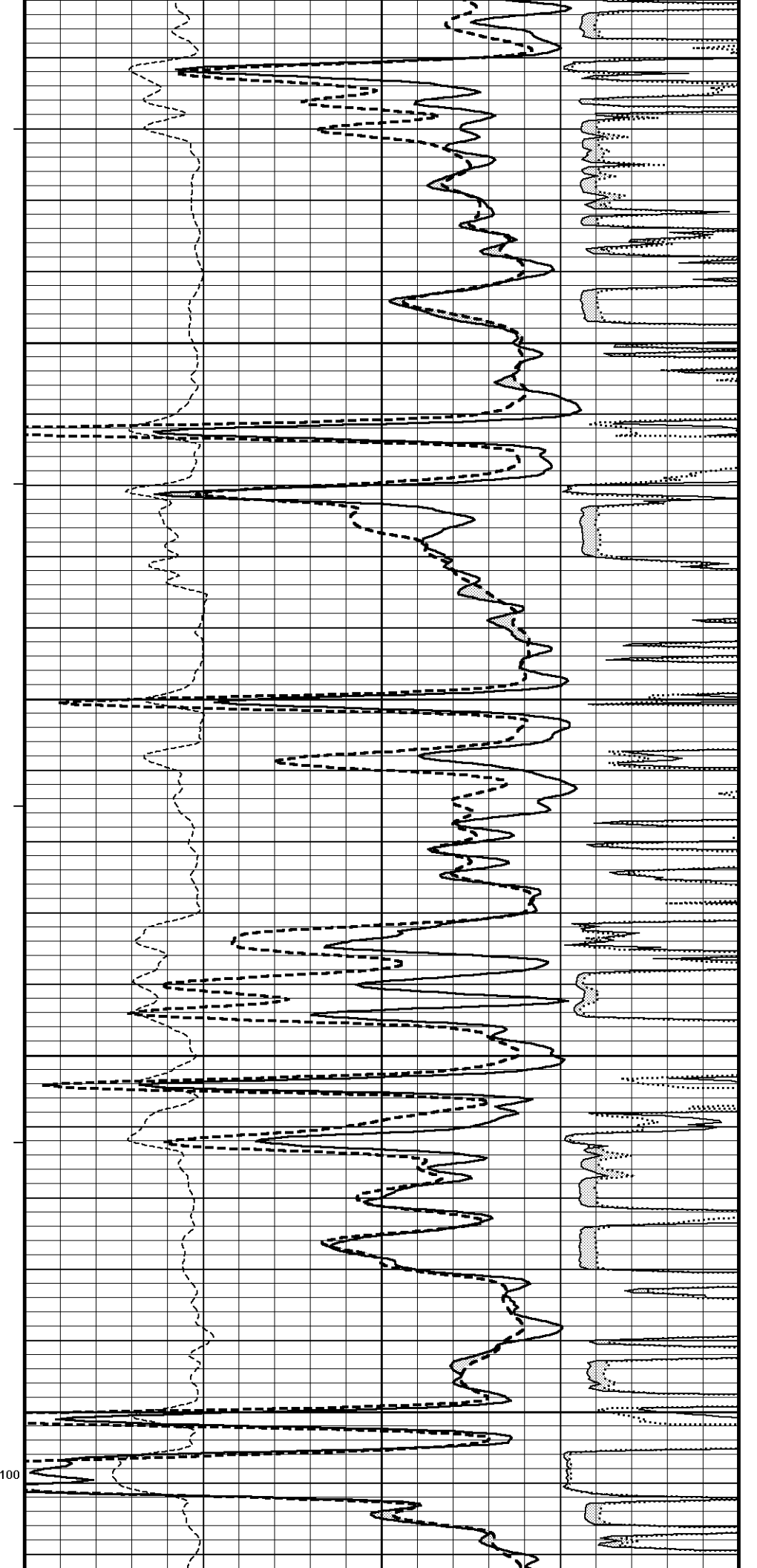
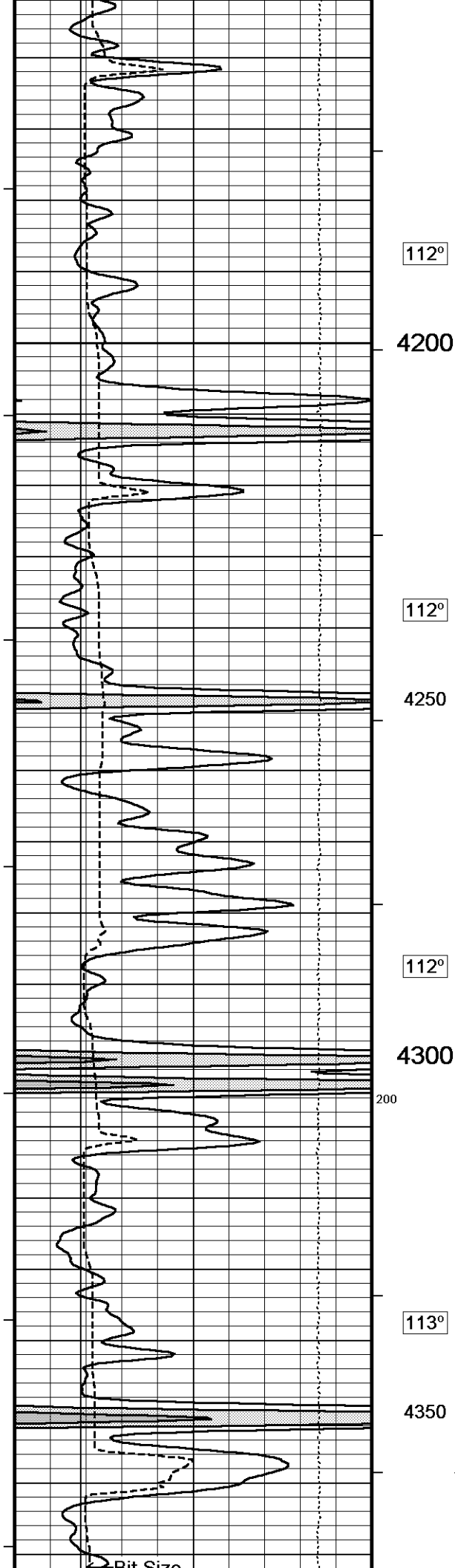
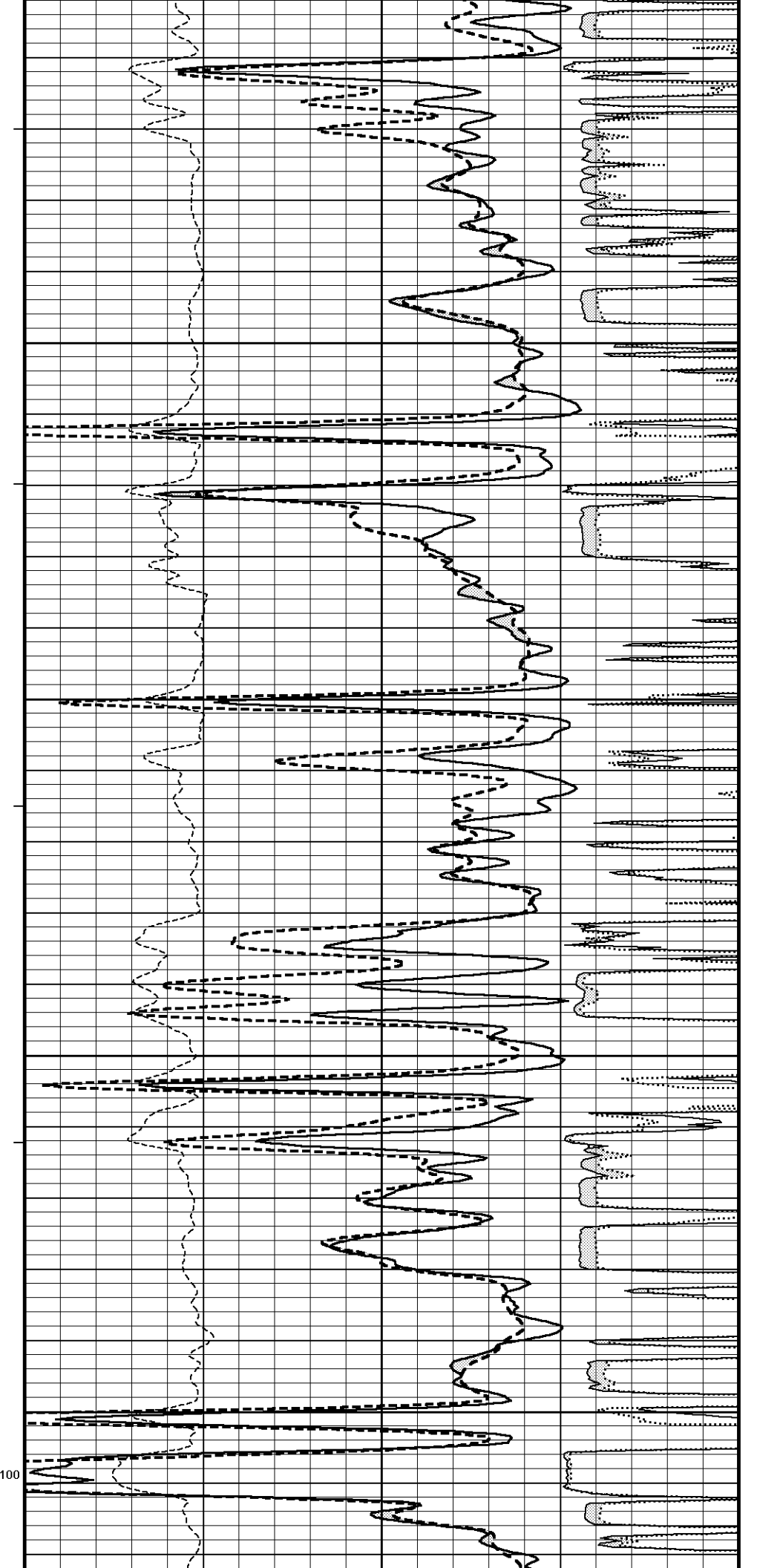
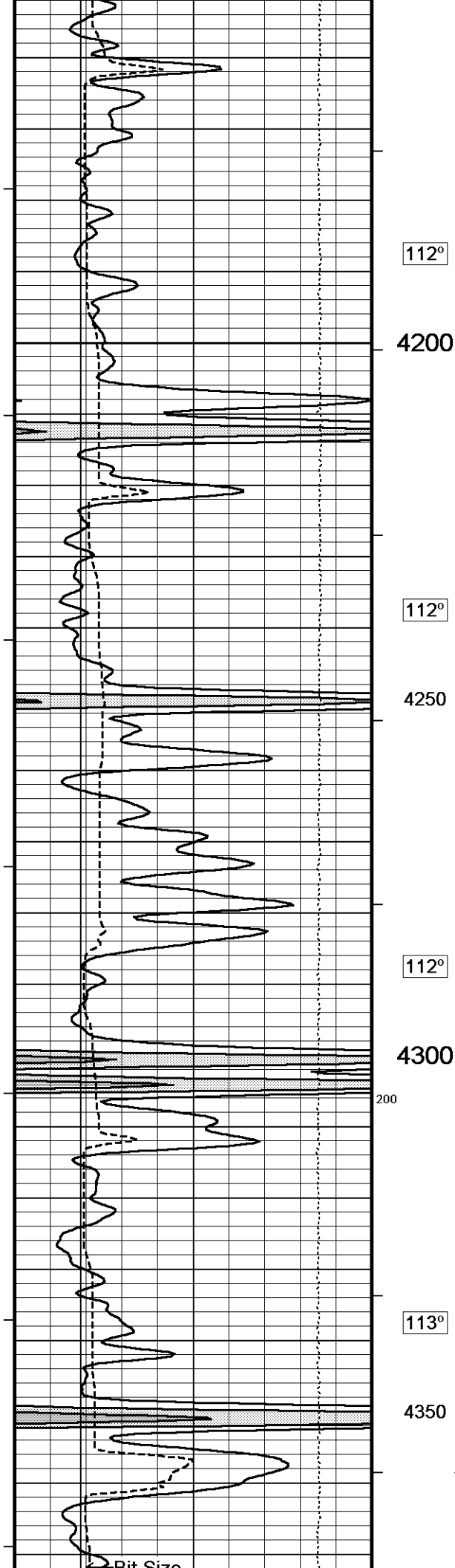
5 INCH MAIN

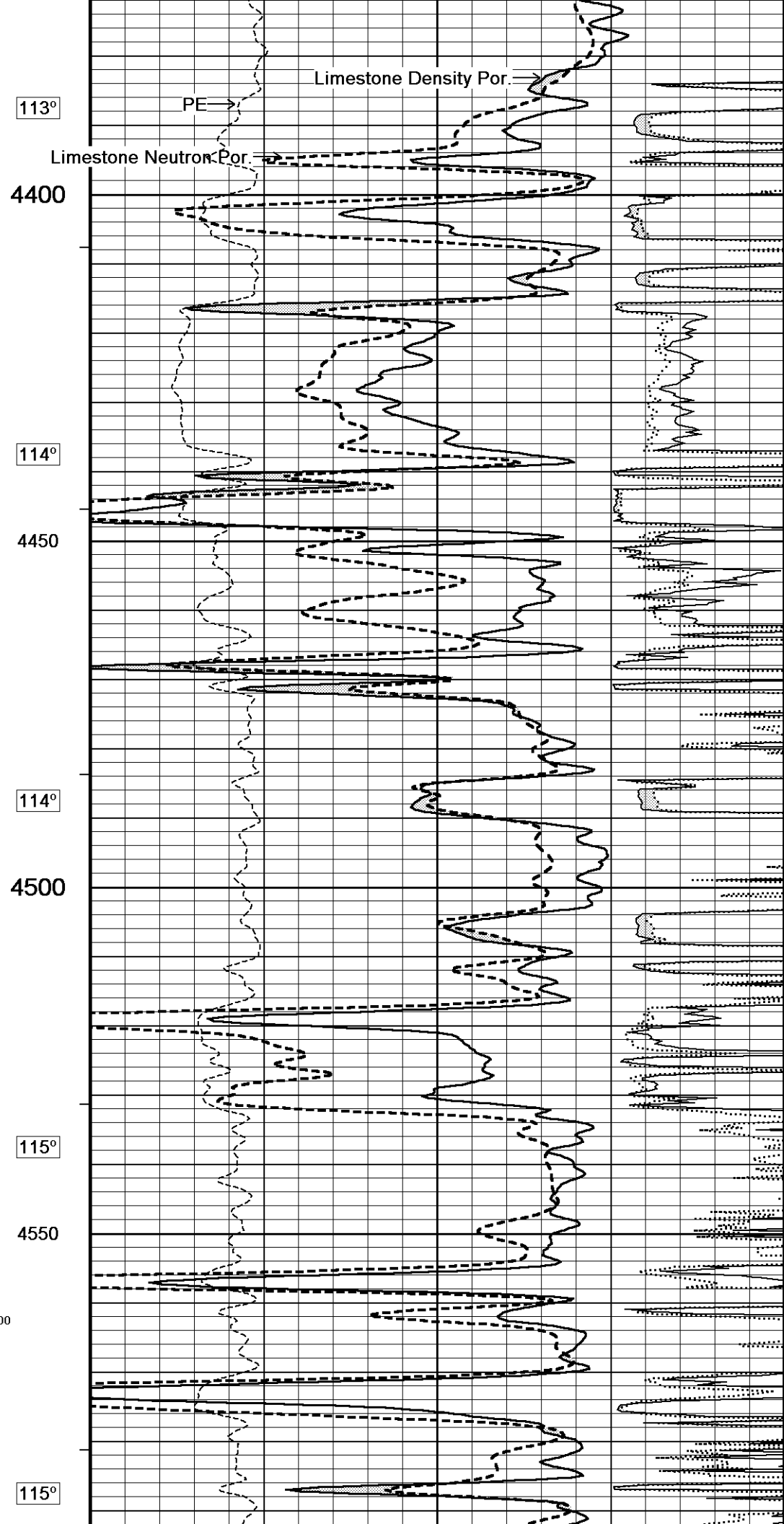
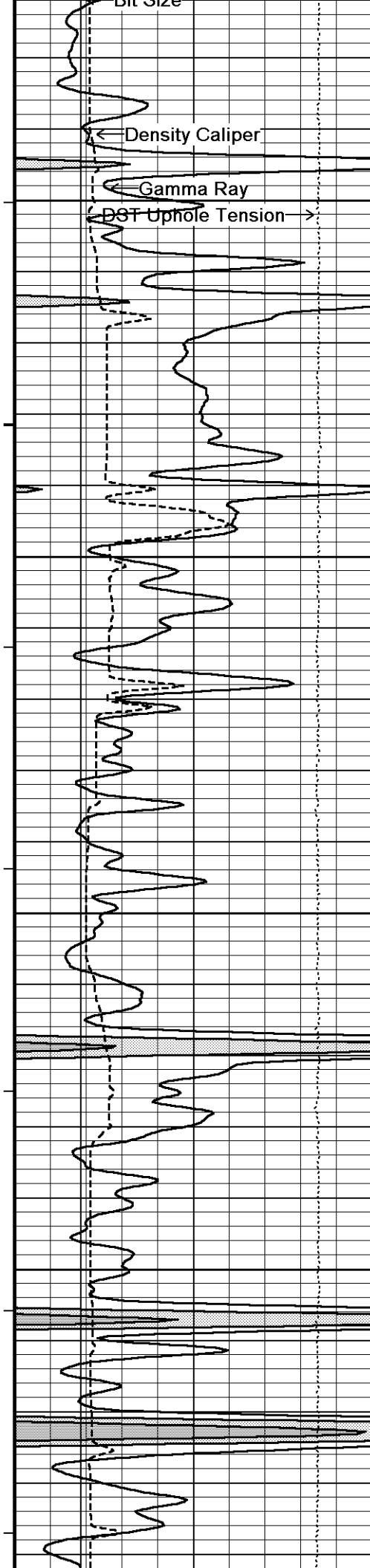
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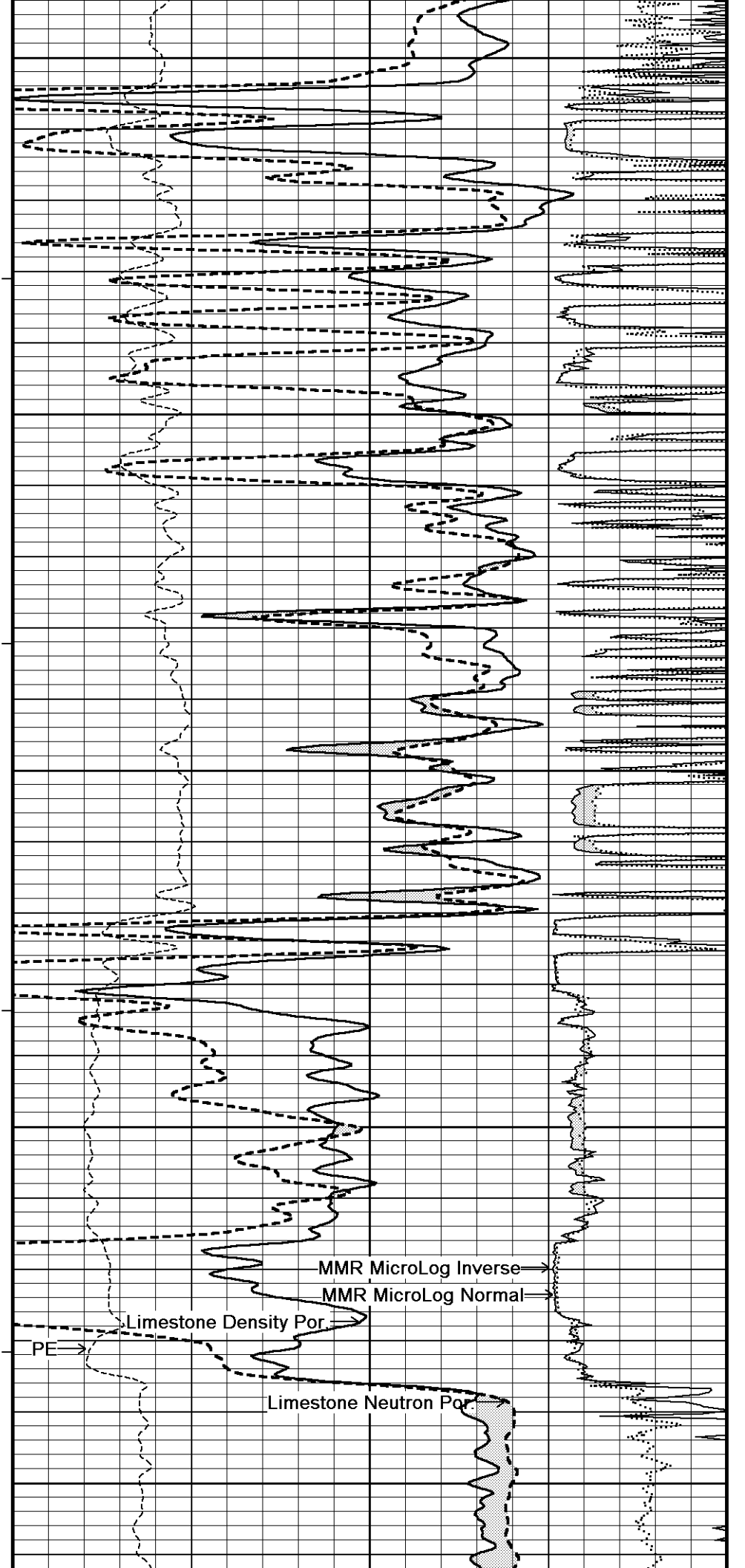
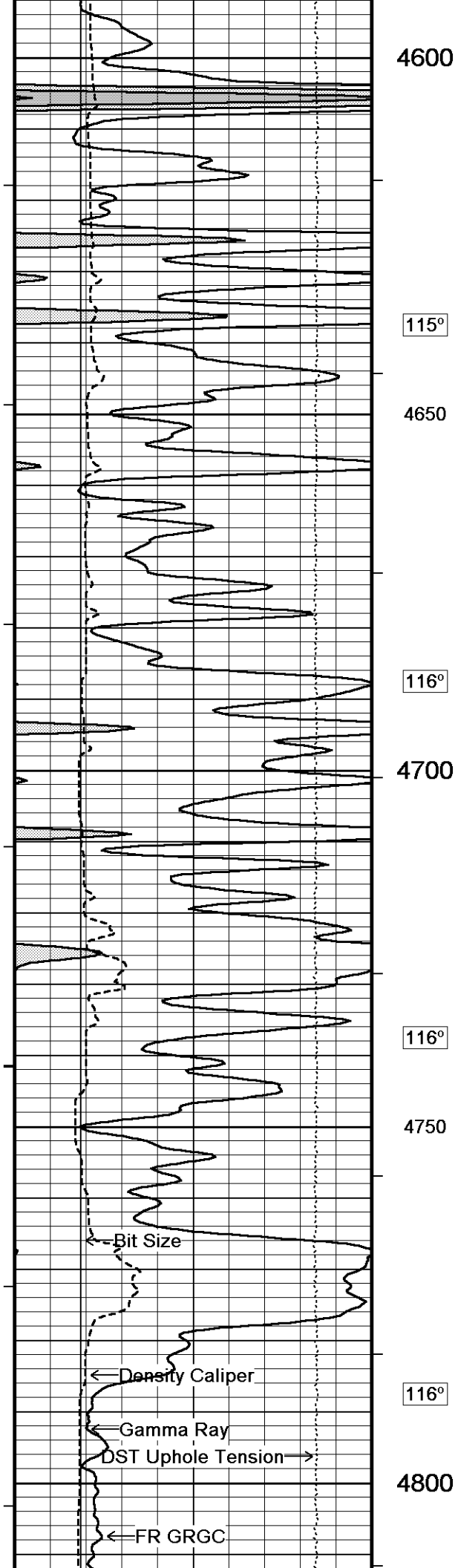


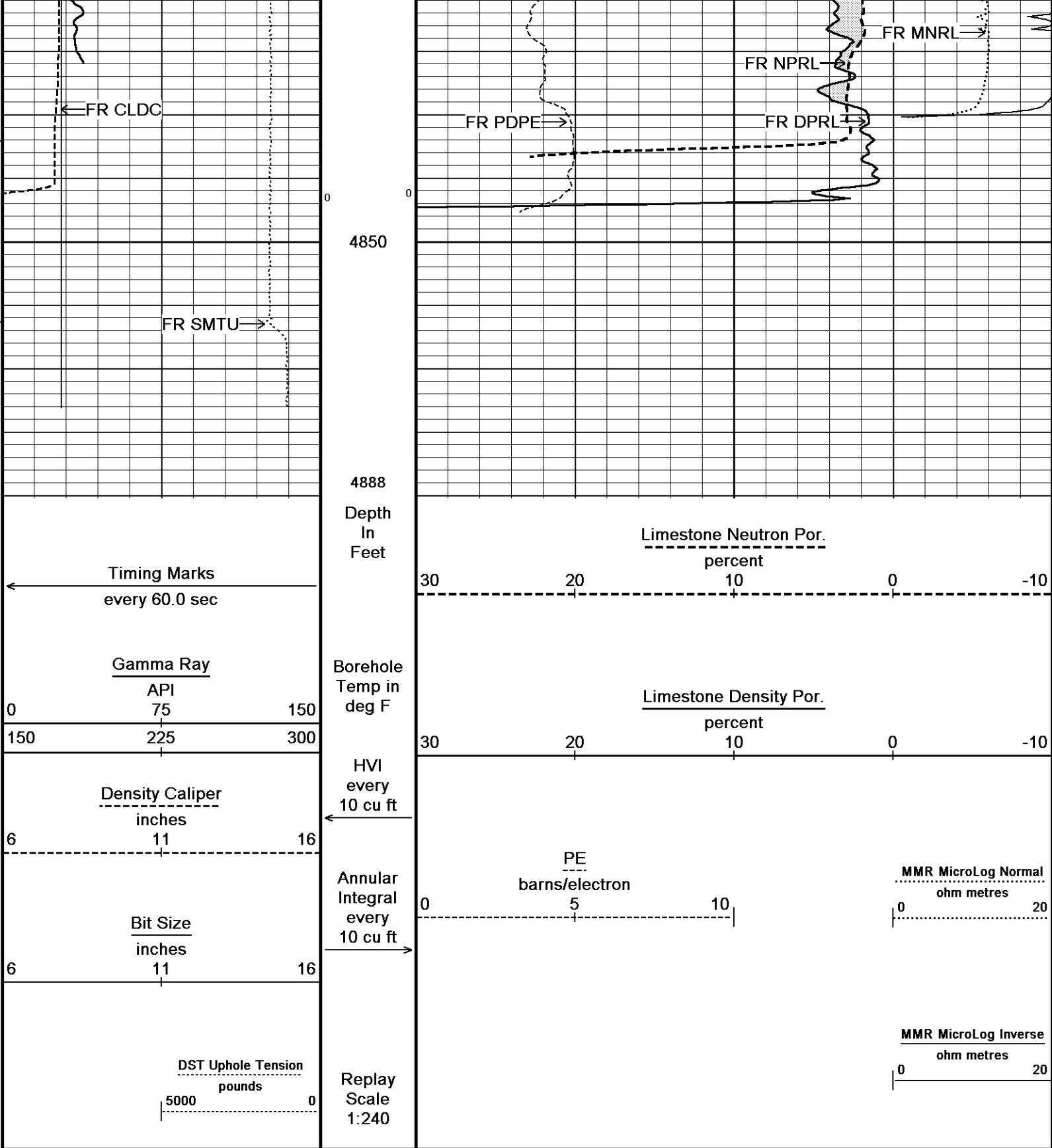












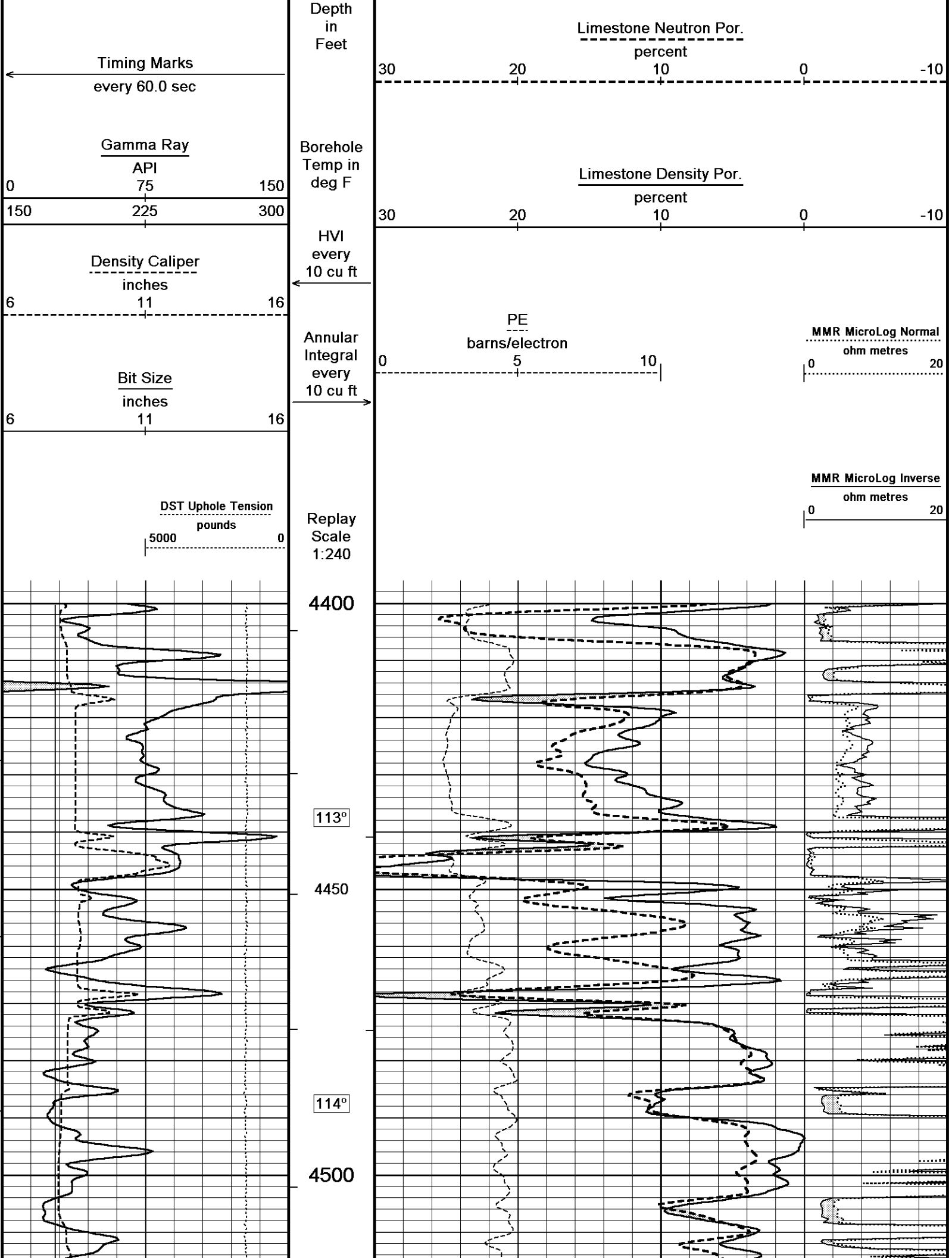
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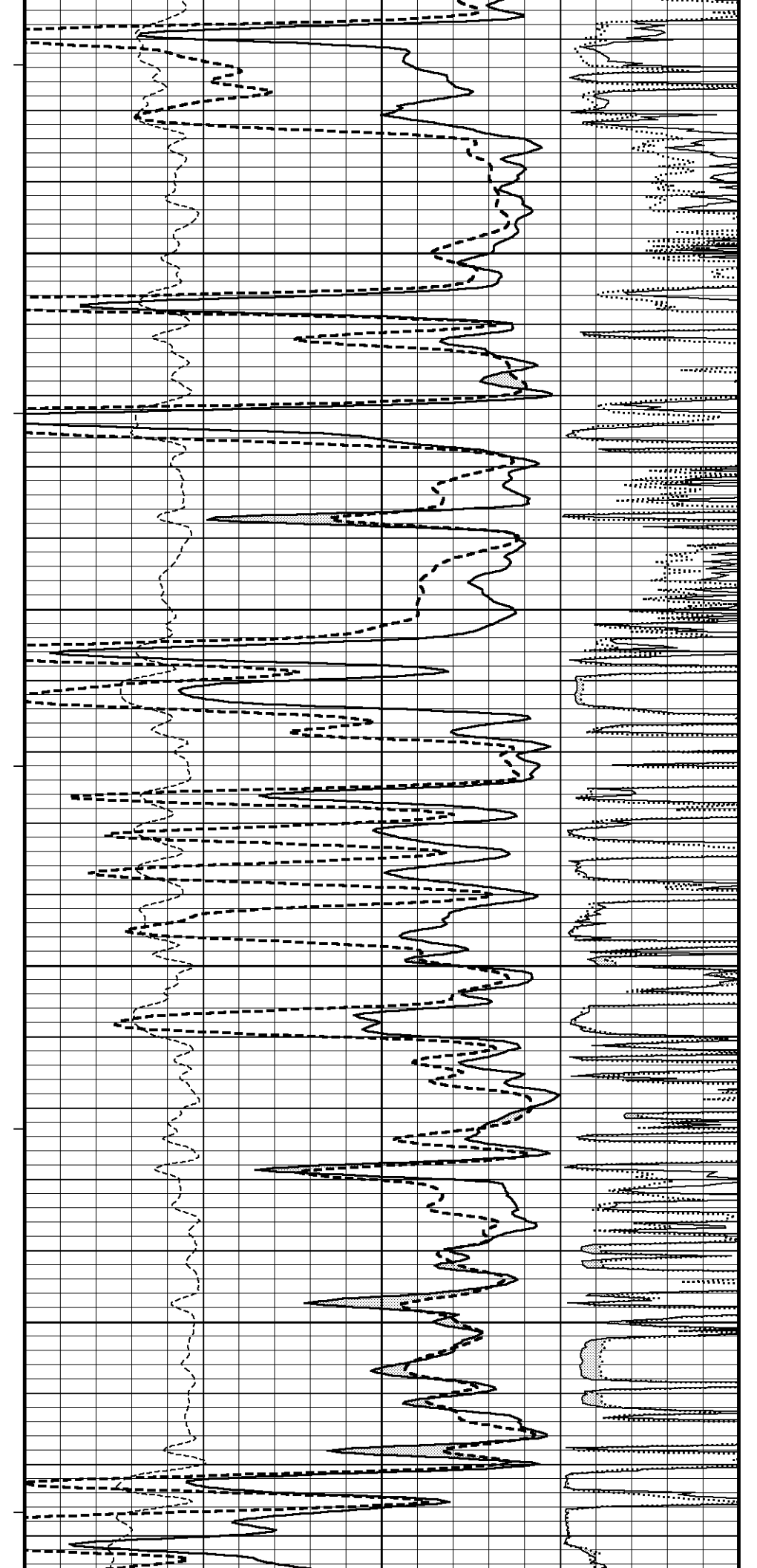
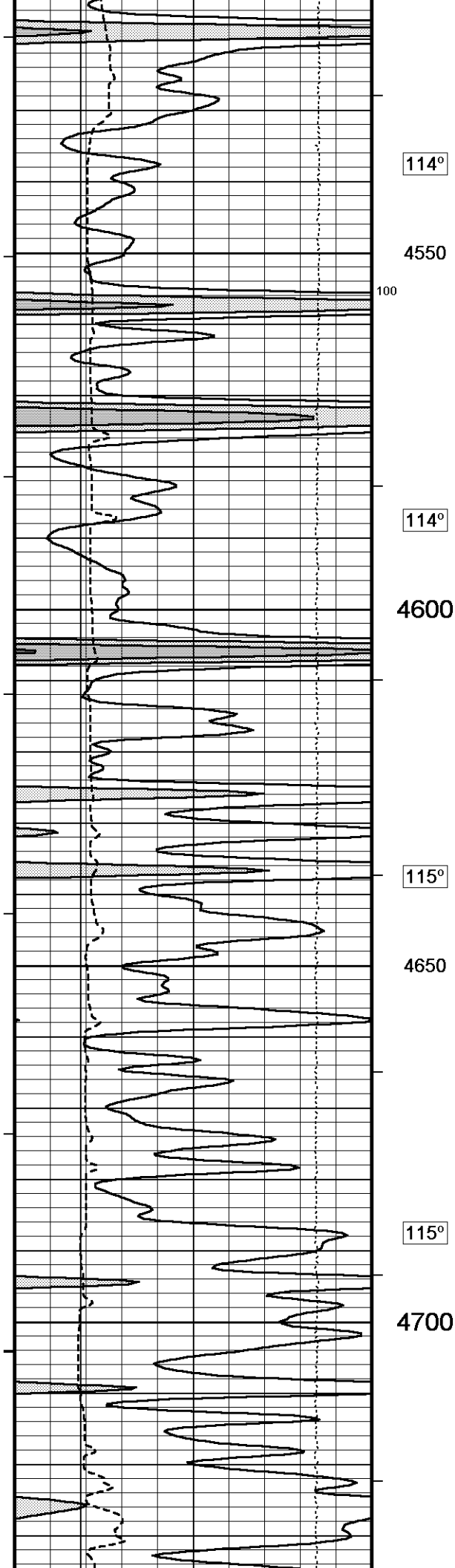
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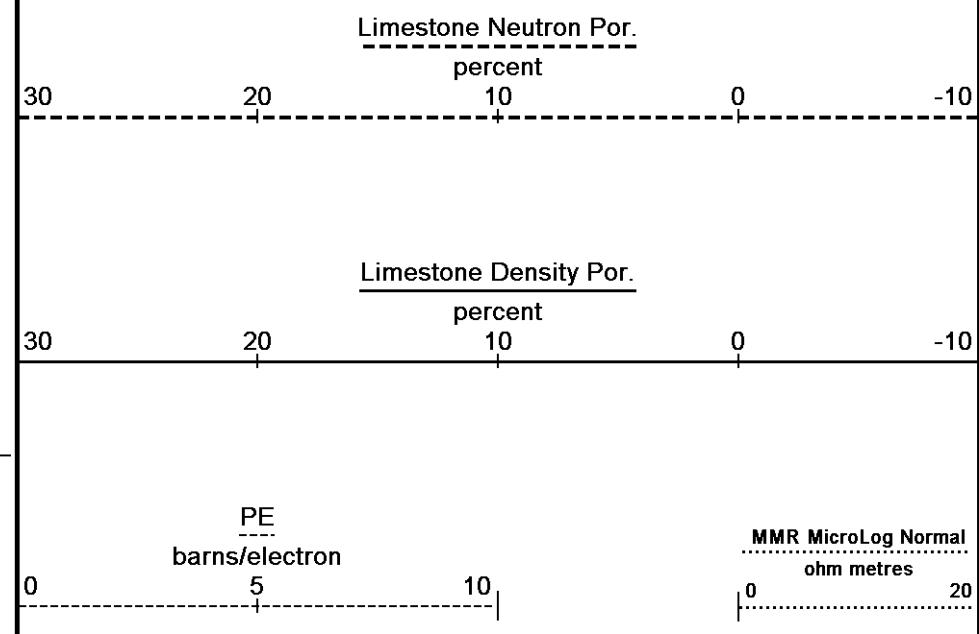
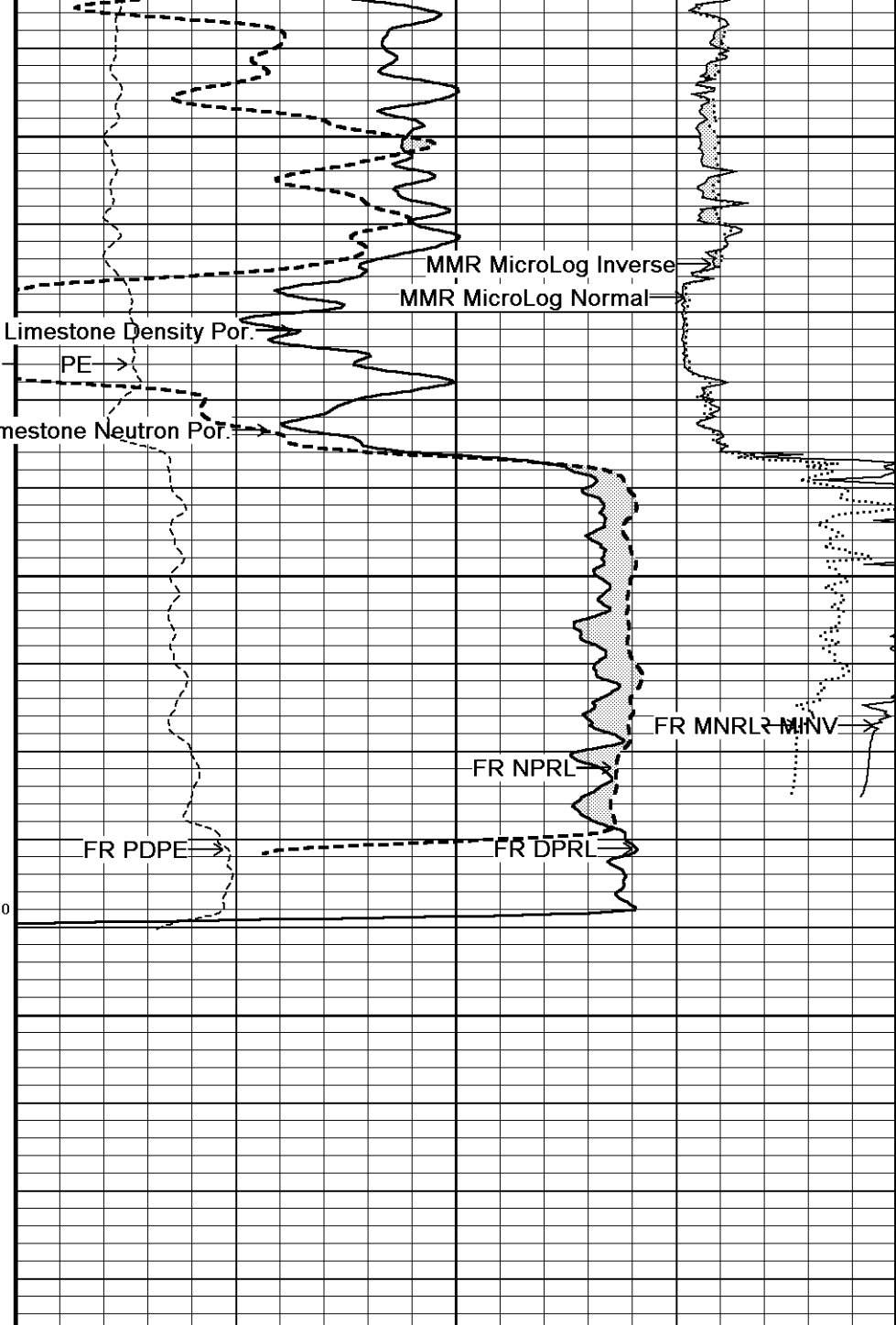
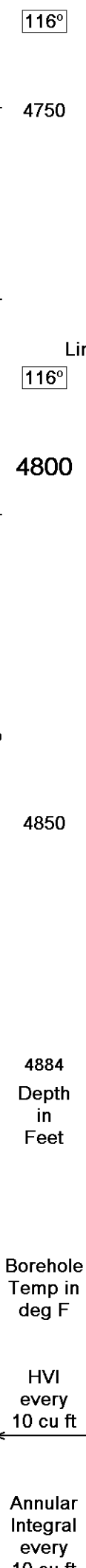
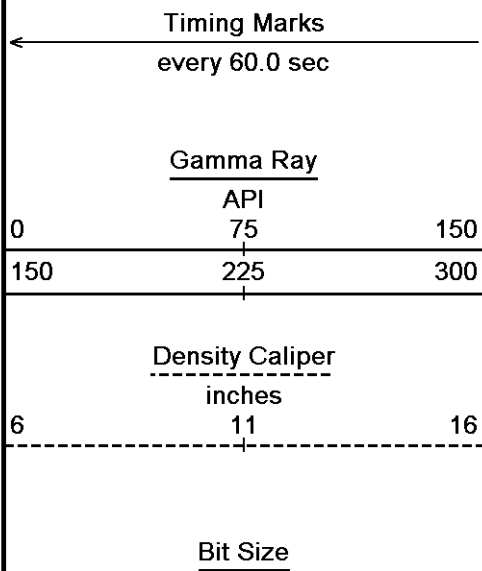
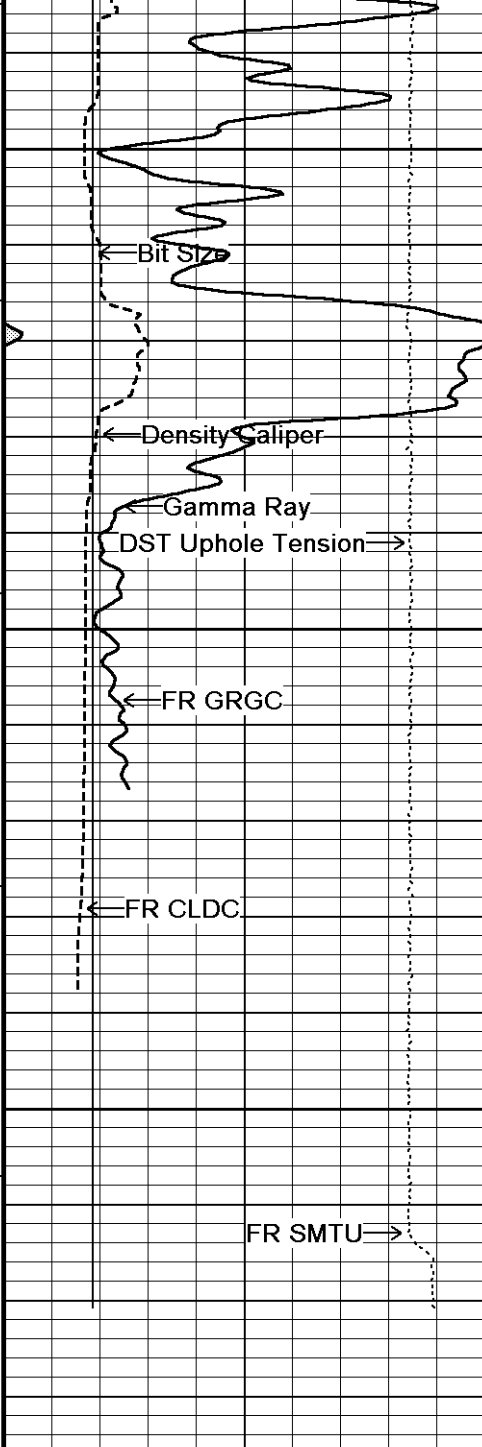
REPEAT SECTION

Depth Based Data - Maximum Sampling Increment 10.0cm
Filename: C:\Minimus 13.05.9583\Log\Shakespeare Tucker #1-9\Shakespeare Tucker #1-9_001.dta
System Versions: Logged with 13.05.9583 Plotted with 13.05.9583

Plotted on 12-JUN-2013 22:06
Recorded on 12-JUN-2013 18:07







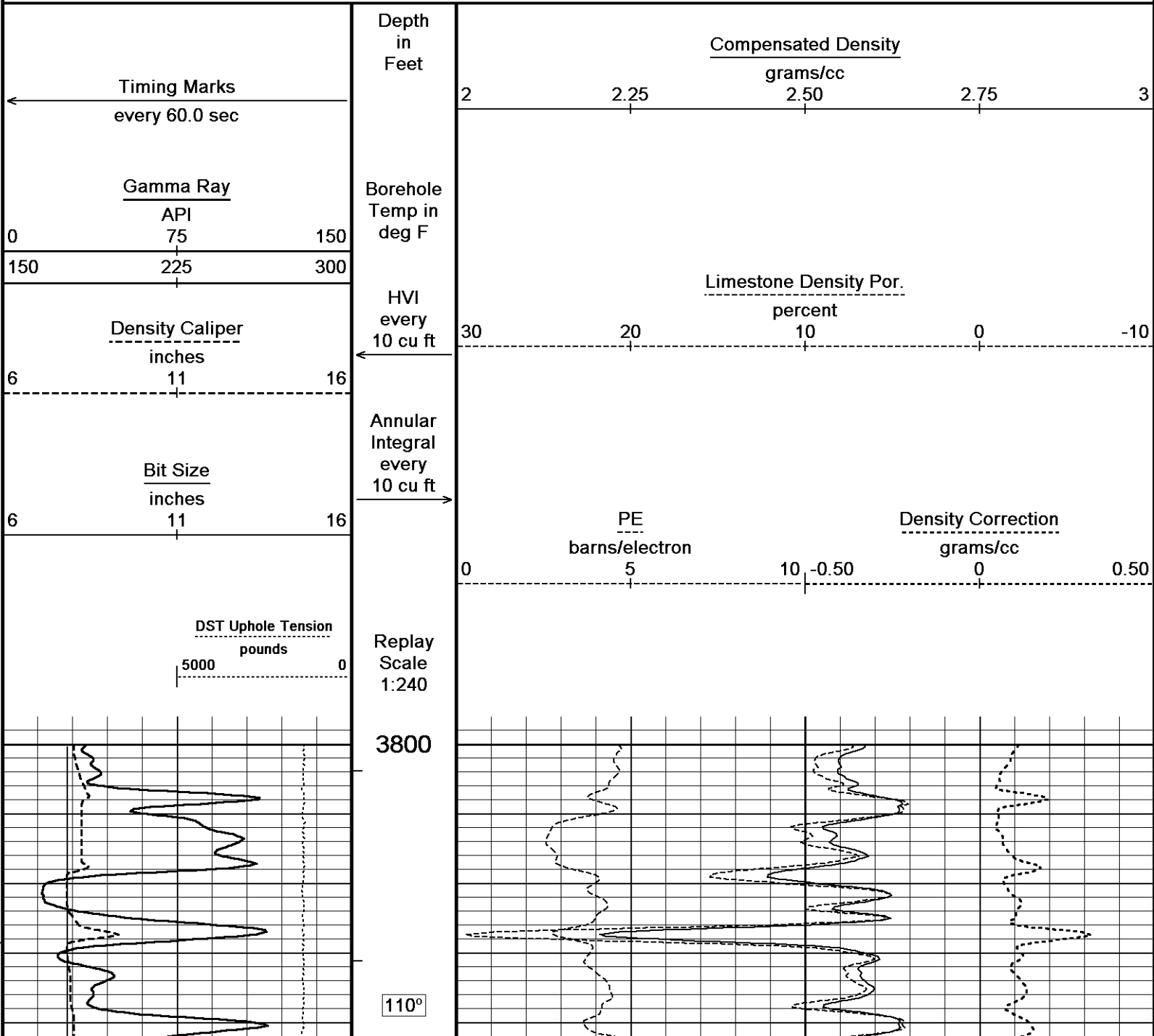


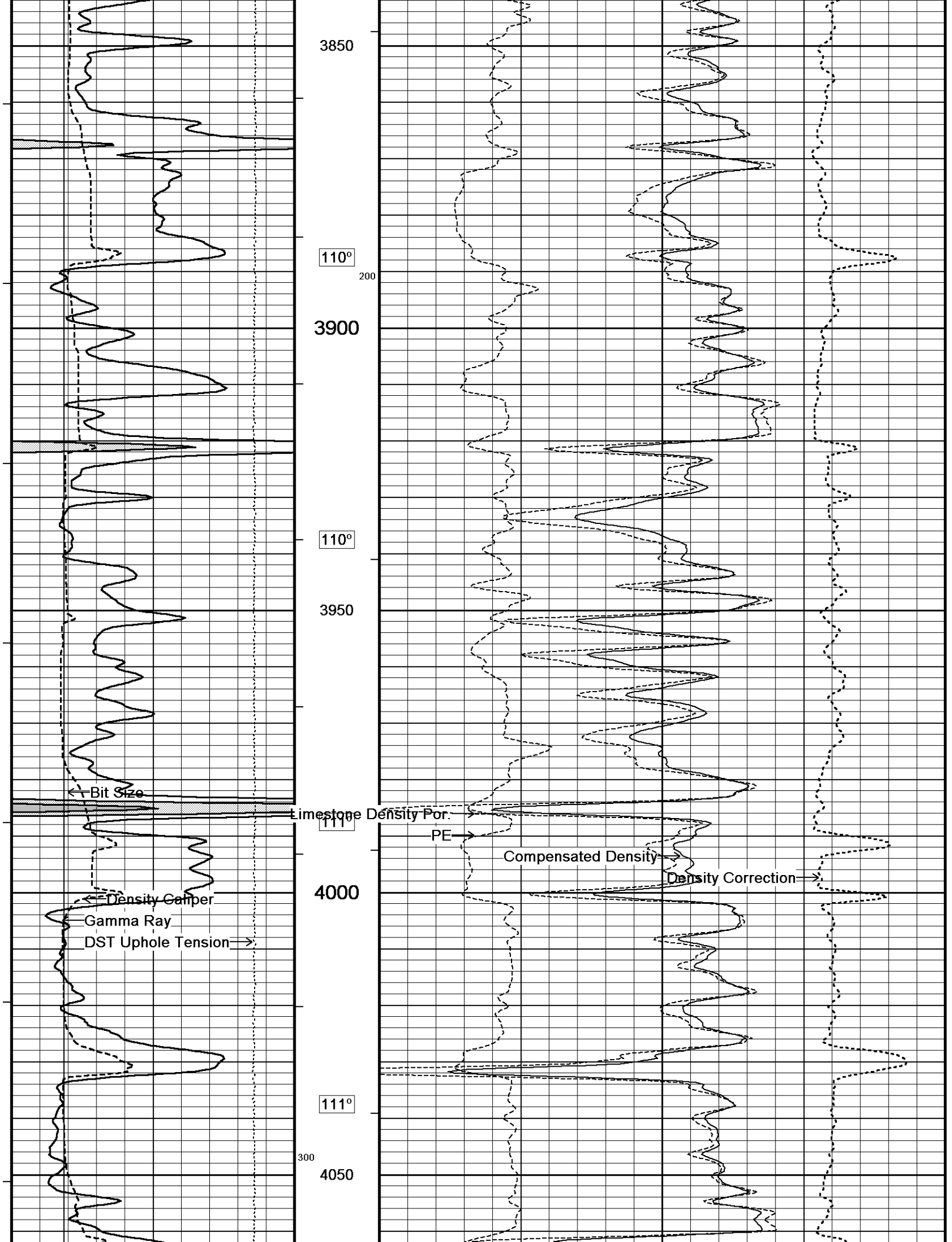
Depth Based Data - Maximum Sampling Increment 10.0cm Filename: C:\Minimus 13.05.9583\Log\Shakespeare Tucker #1-9\Shakespeare Tucker #1-9_001.dta System Versions: Logged with 13.05.9583 Plotted with 13.05.9583	Plotted on 12-JUN-2013 22:06 Recorded on 12-JUN-2013 18:07
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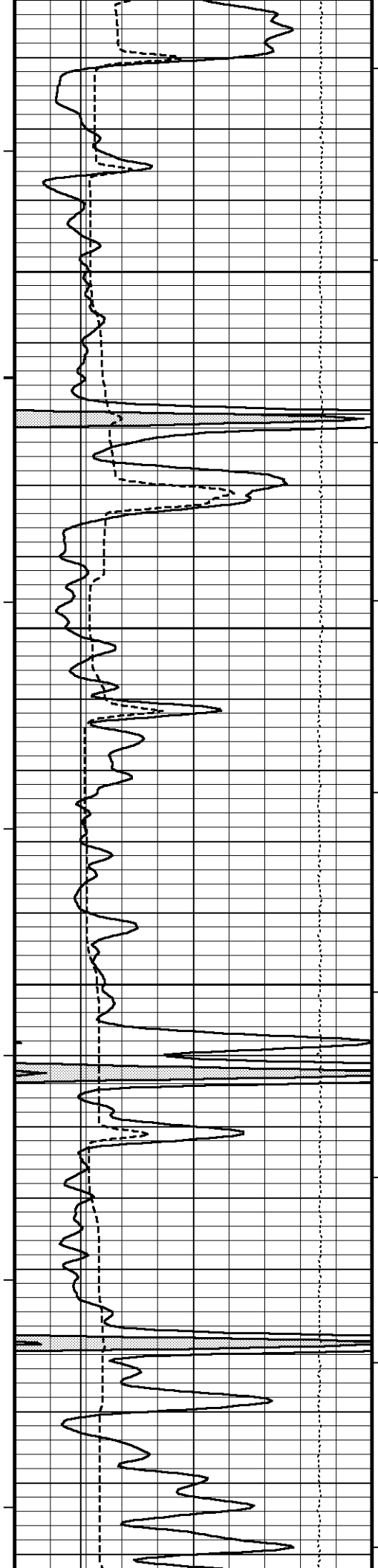
↑	REPEAT SECTION	↑
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Depth Based Data - Maximum Sampling Increment 10.0cm Filename: C:\Minimus 13.05.9583\Log\Shakespeare Tucker #1-9\Shakespeare Tucker #1-9_002.dta System Versions: Logged with 13.05.9583 Plotted with 13.05.9583	Plotted on 12-JUN-2013 22:06 Recorded on 12-JUN-2013 18:38
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111°

4100

112°

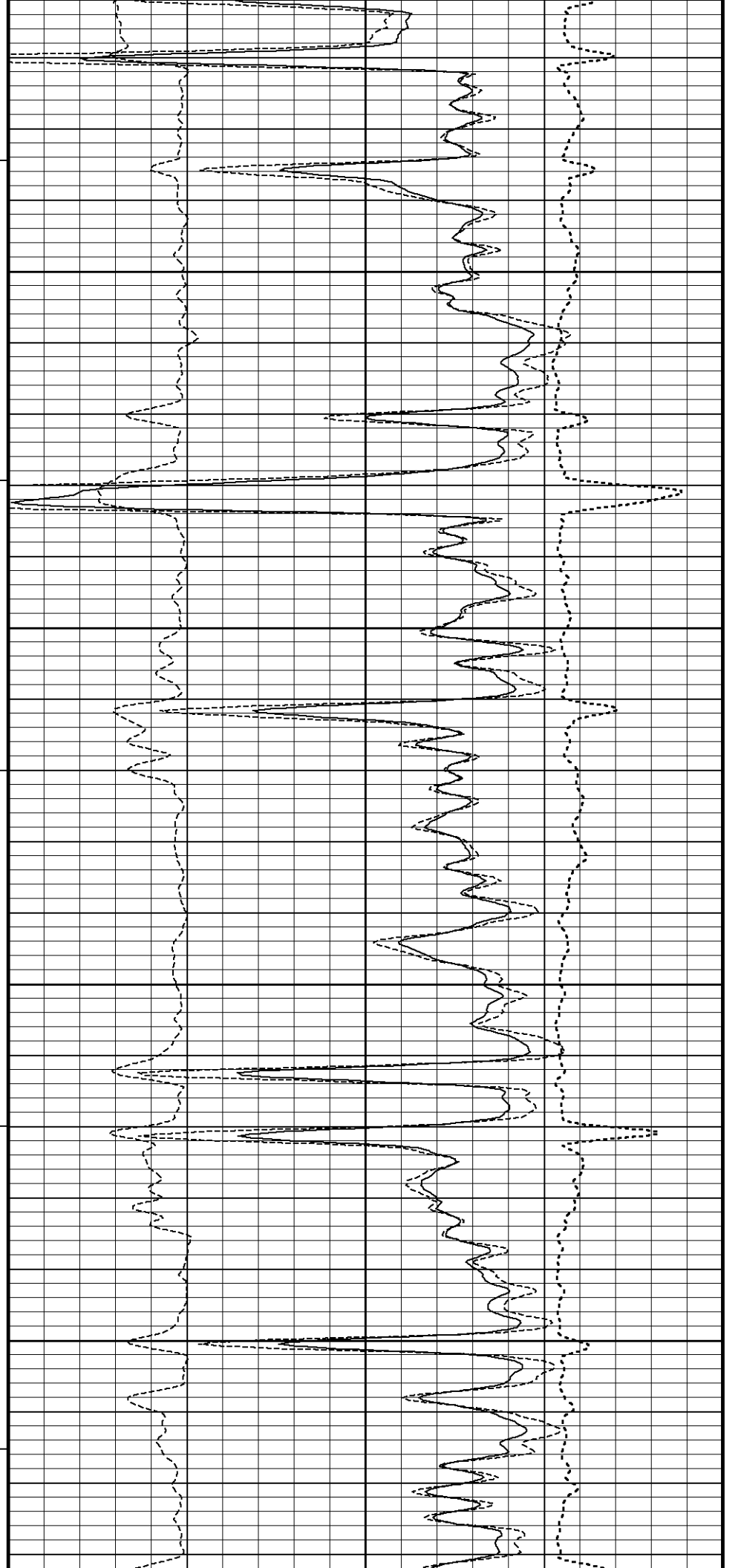
4150

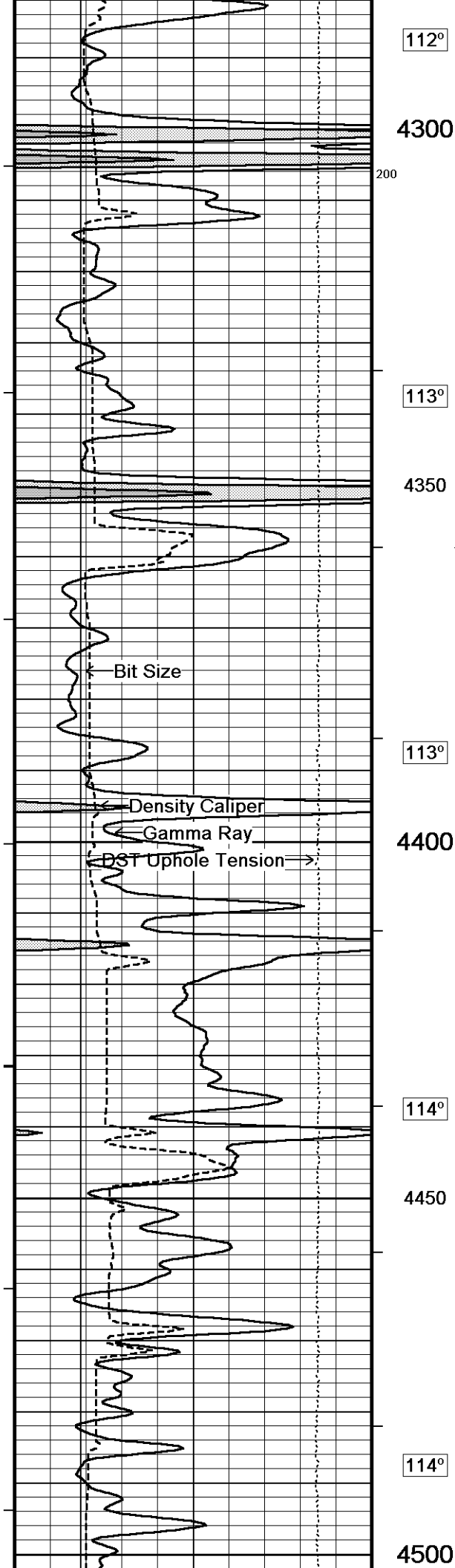
112°

4200

112°

4250





112°

4300

200

113°

4350

100

113°

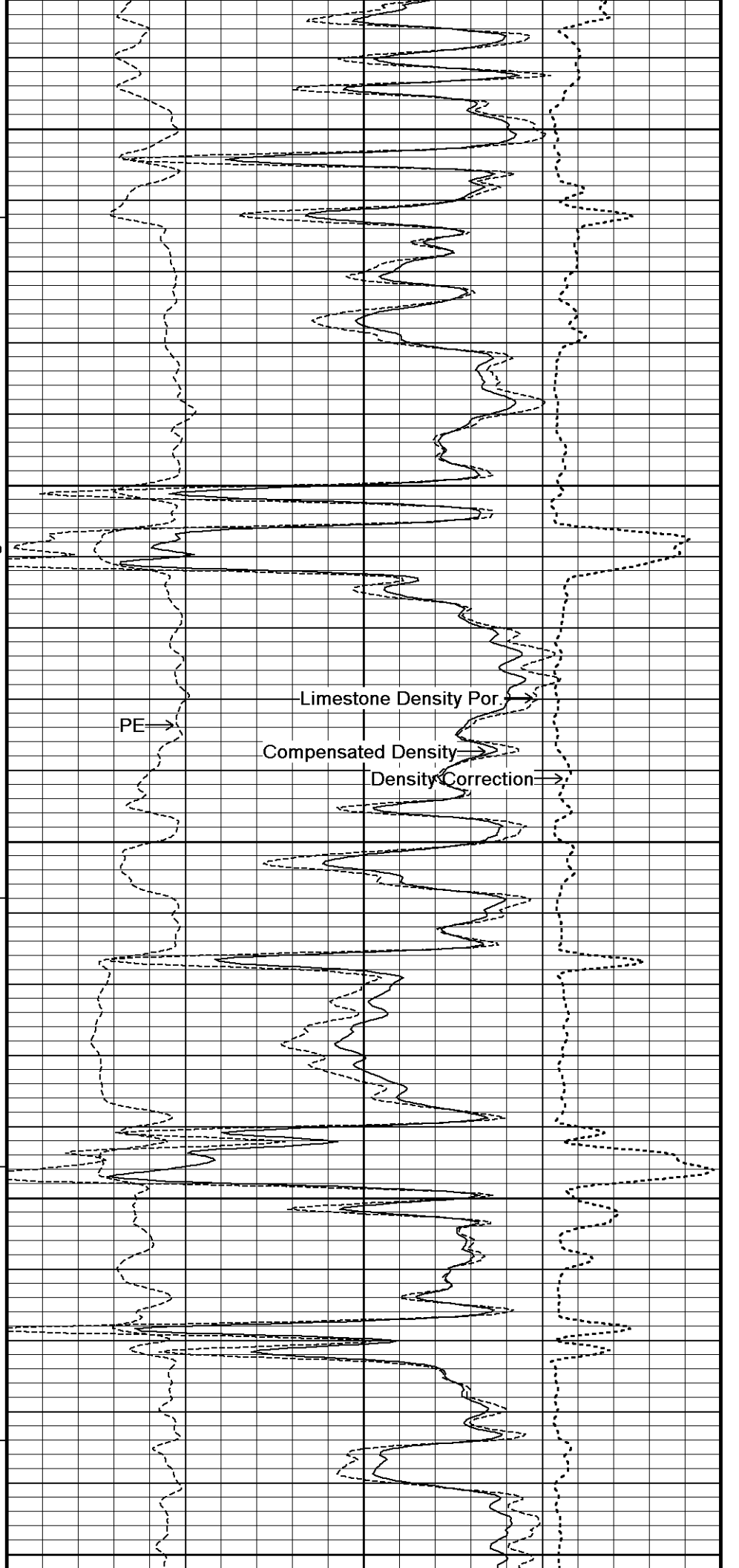
4400

114°

4450

114°

4500

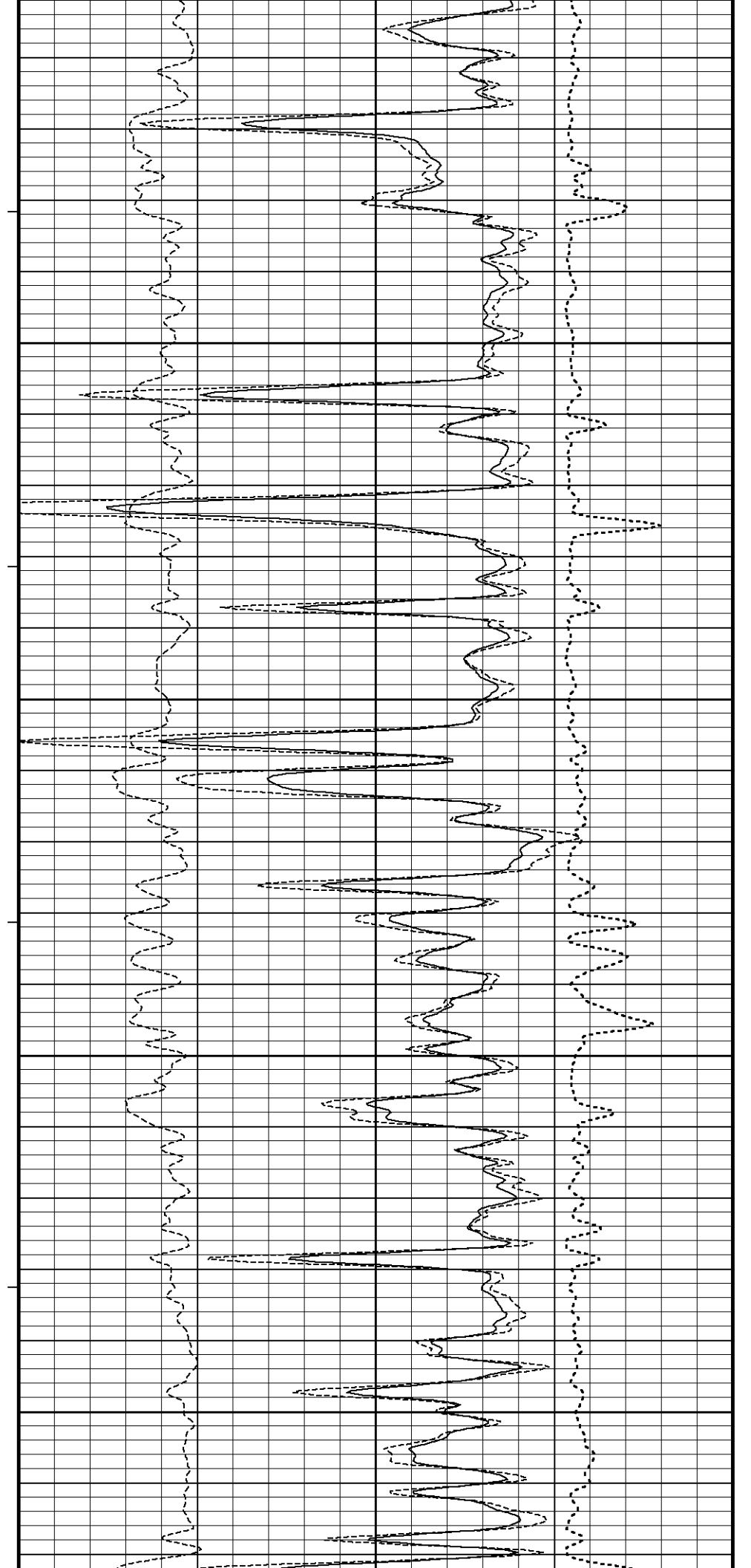
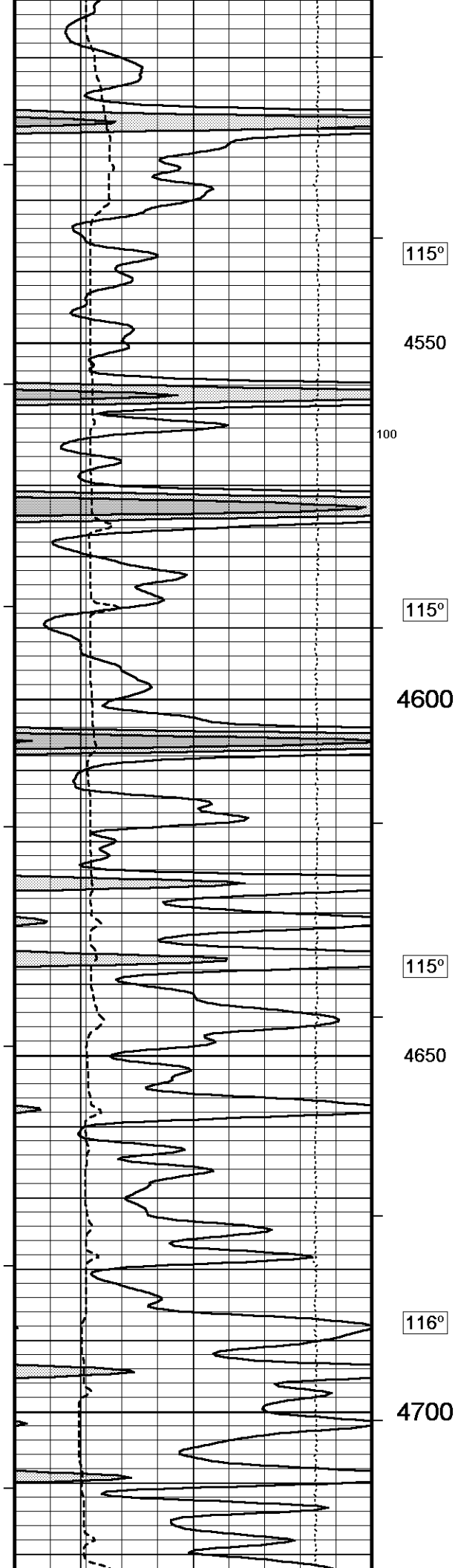


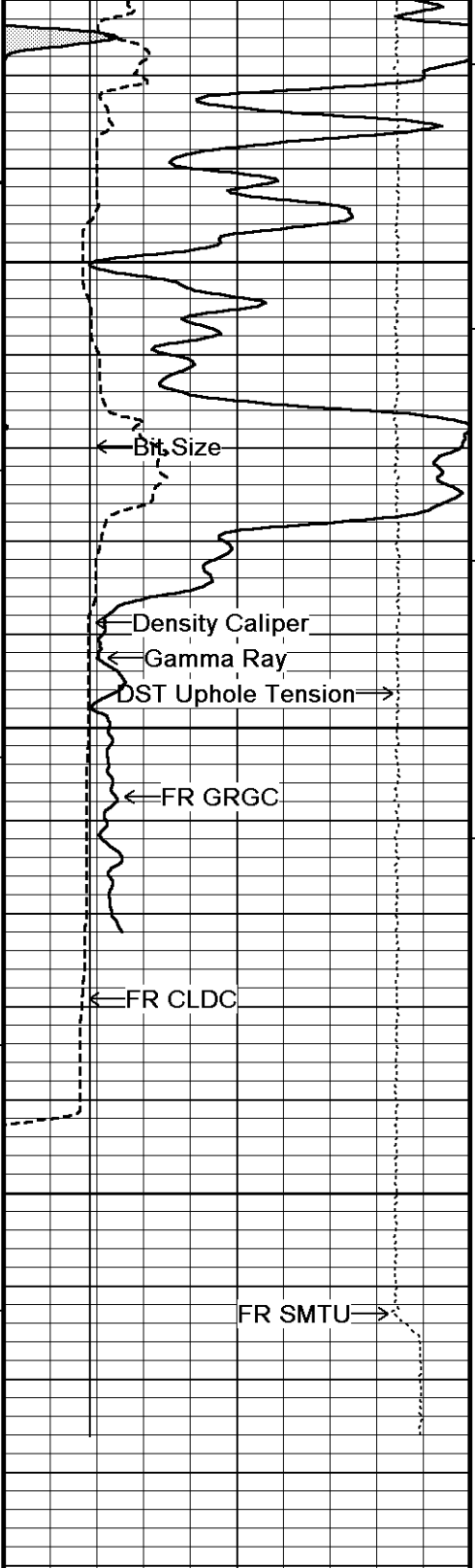
PE

Limestone Density Por

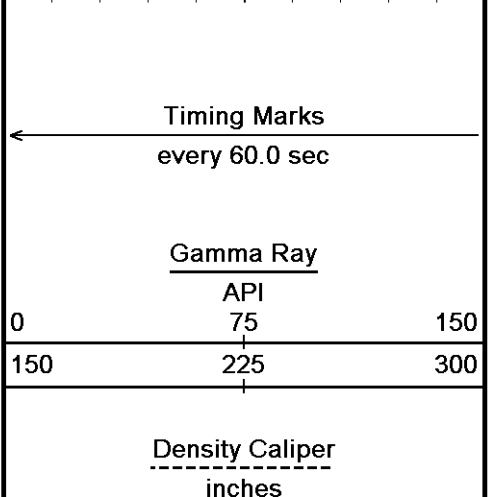
Compensated Density

Density Correction

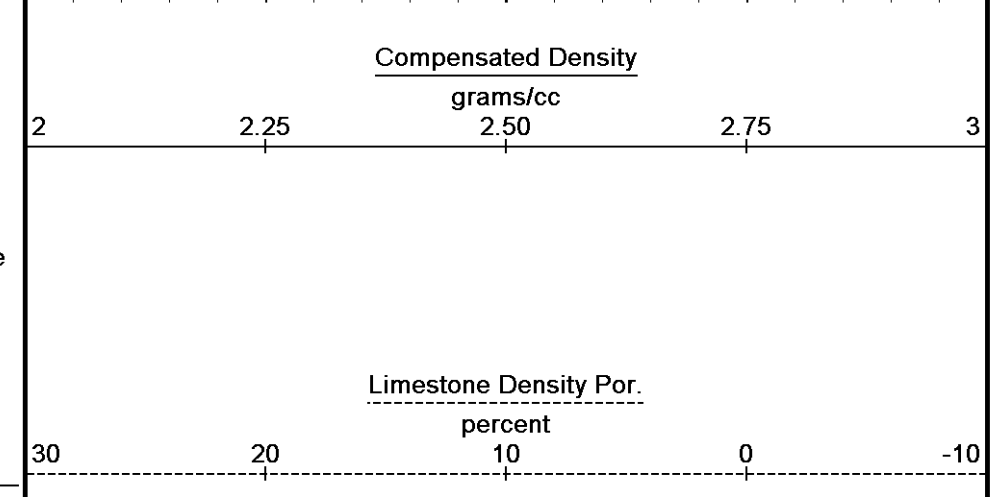
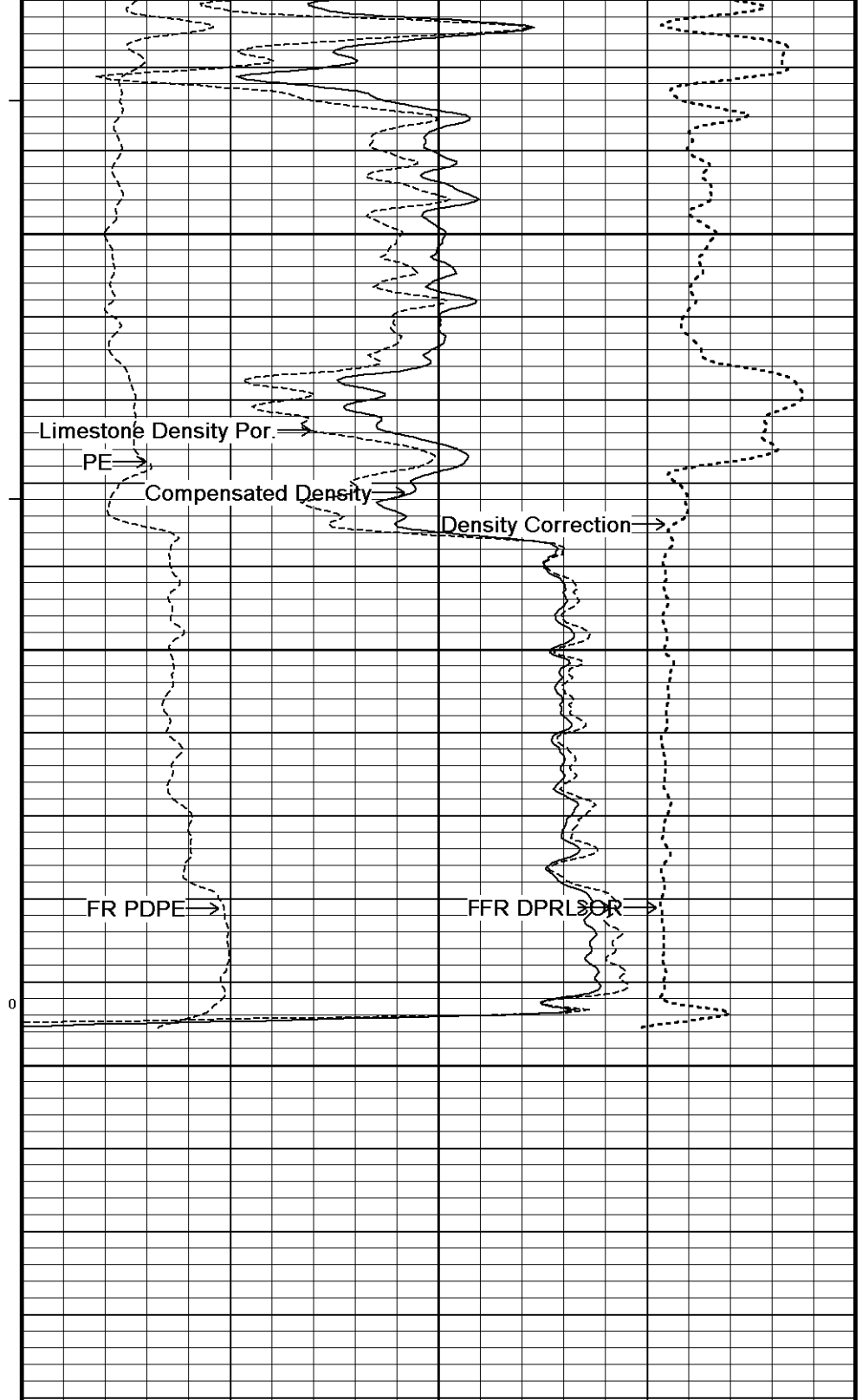




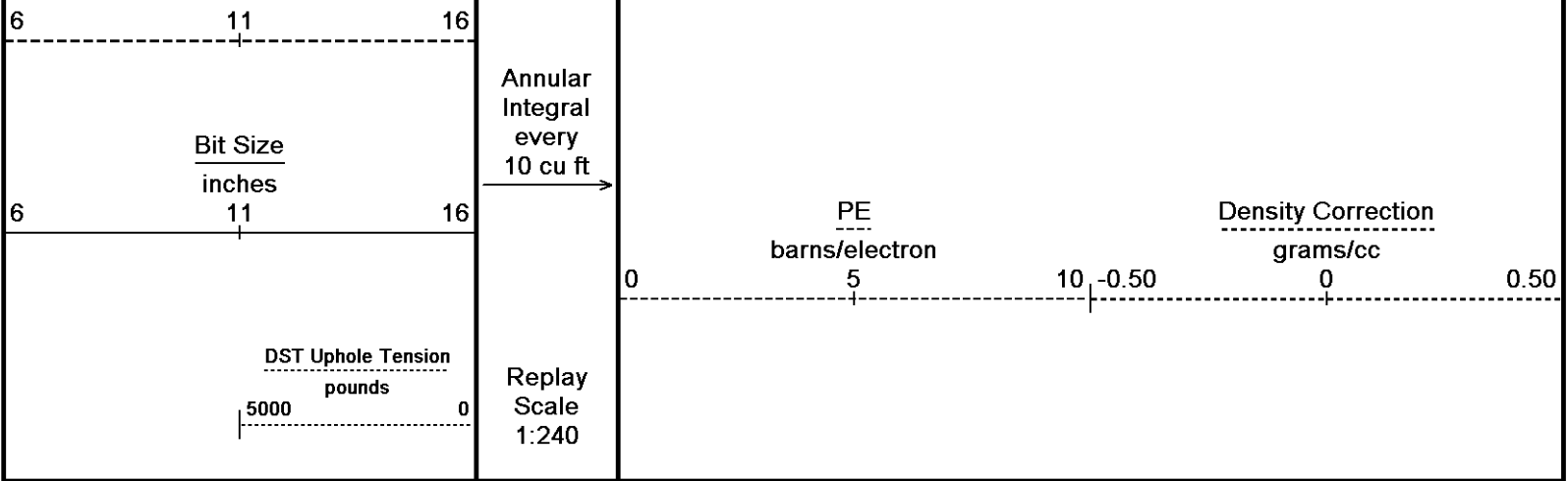
116°
4750
116°
4800
0
4850
4888
Depth in Feet



Timing Marks
every 60.0 sec
Gamma Ray
API
0 75 150
150 225 300
Density Caliper
inches
HVI
every
10 cu ft



Compensated Density
grams/cc
2 2.25 2.50 2.75 3
Limestone Density Por.
percent
30 20 10 0 -10



Depth Based Data - Maximum Sampling Increment 10.0cm

Plotted on 12-JUN-2013 22:06

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Recorded on 12-JUN-2013 18:38

System Versions: Logged with 13.05.9583 Plotted with 13.05.9583

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5 INCH MAIN

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REPEAT SECTION

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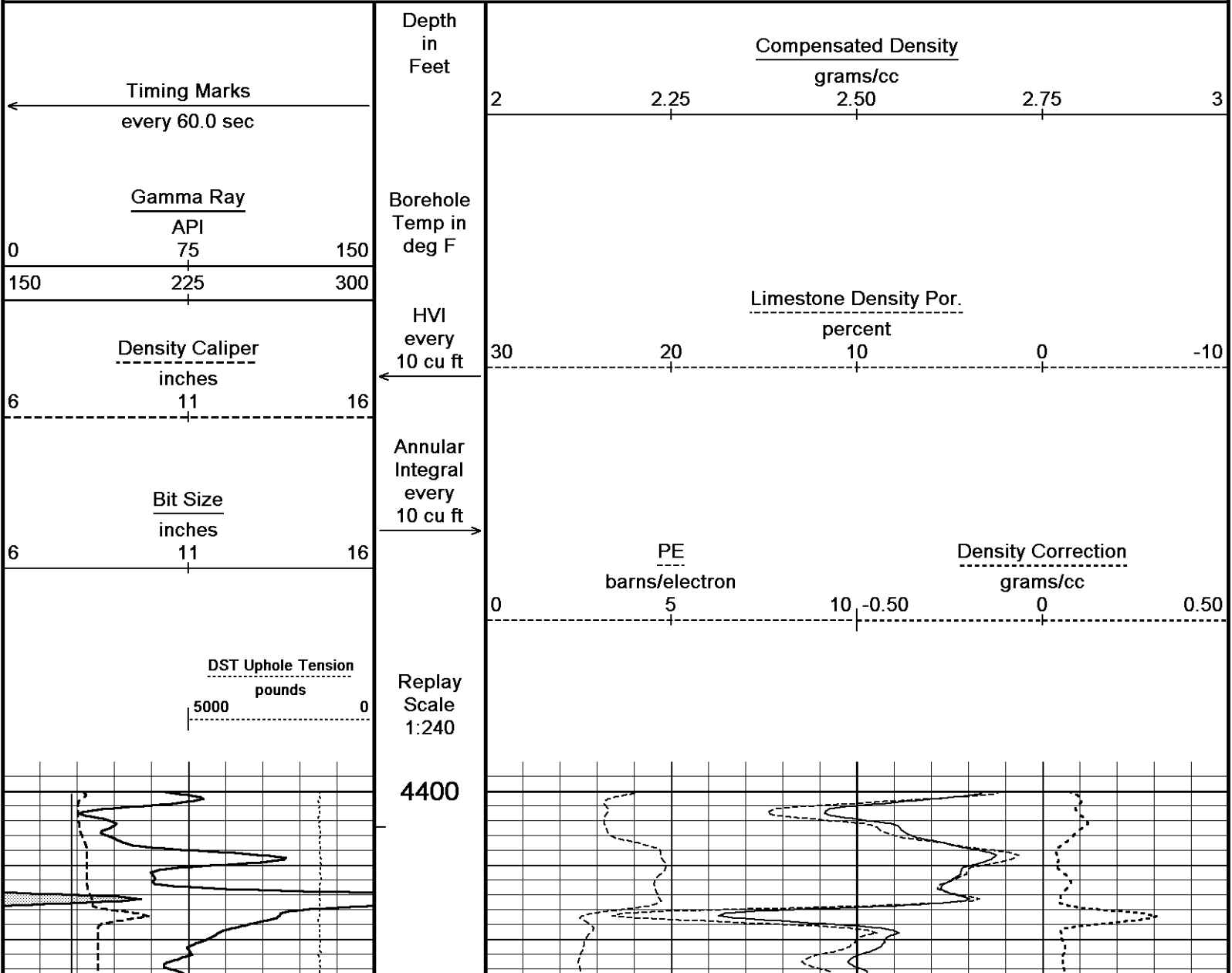
Depth Based Data - Maximum Sampling Increment 10.0cm

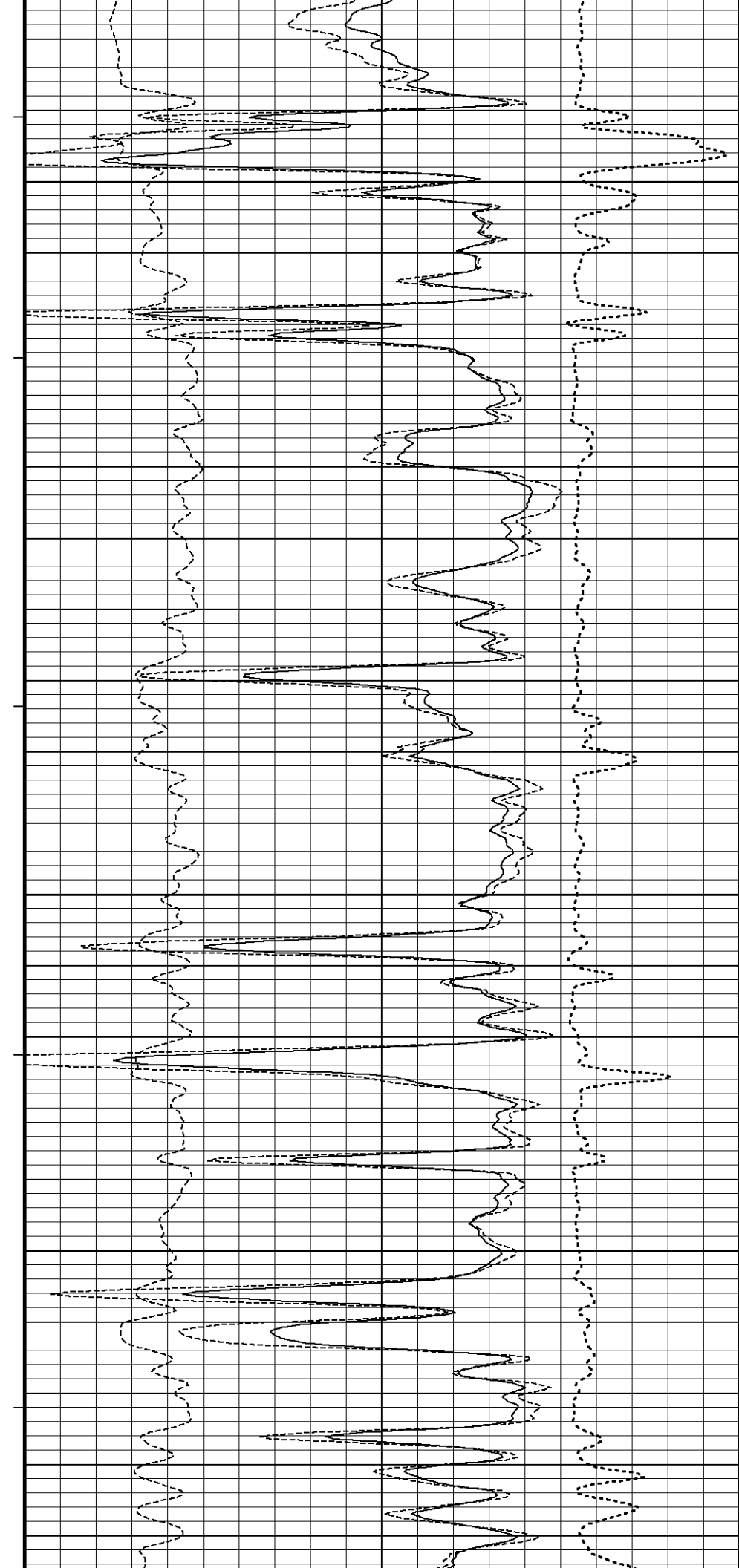
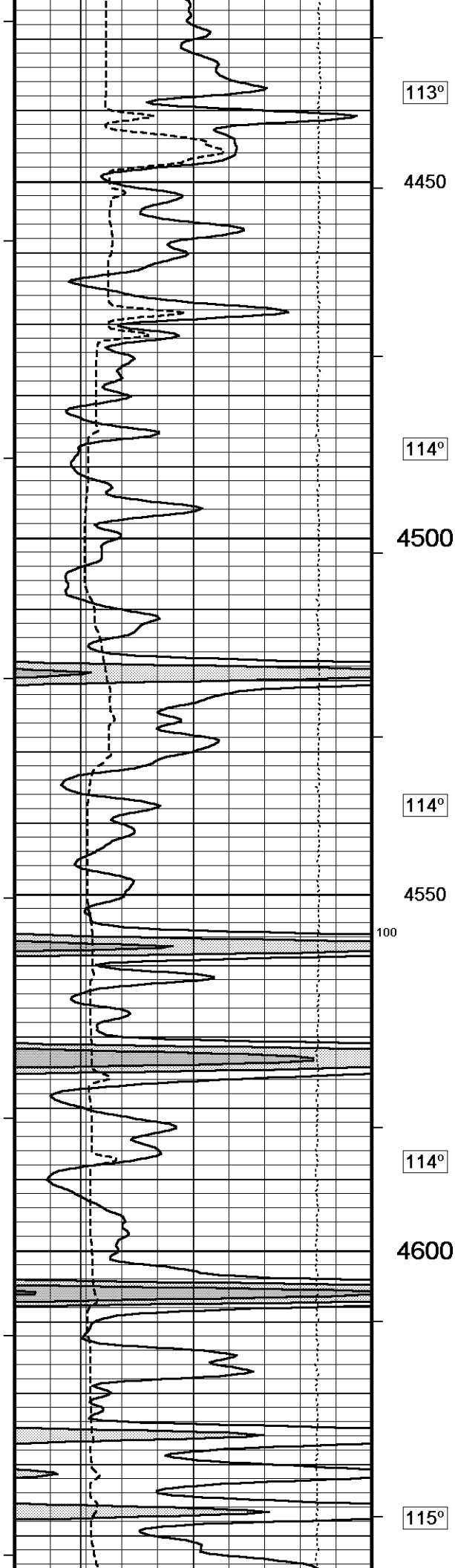
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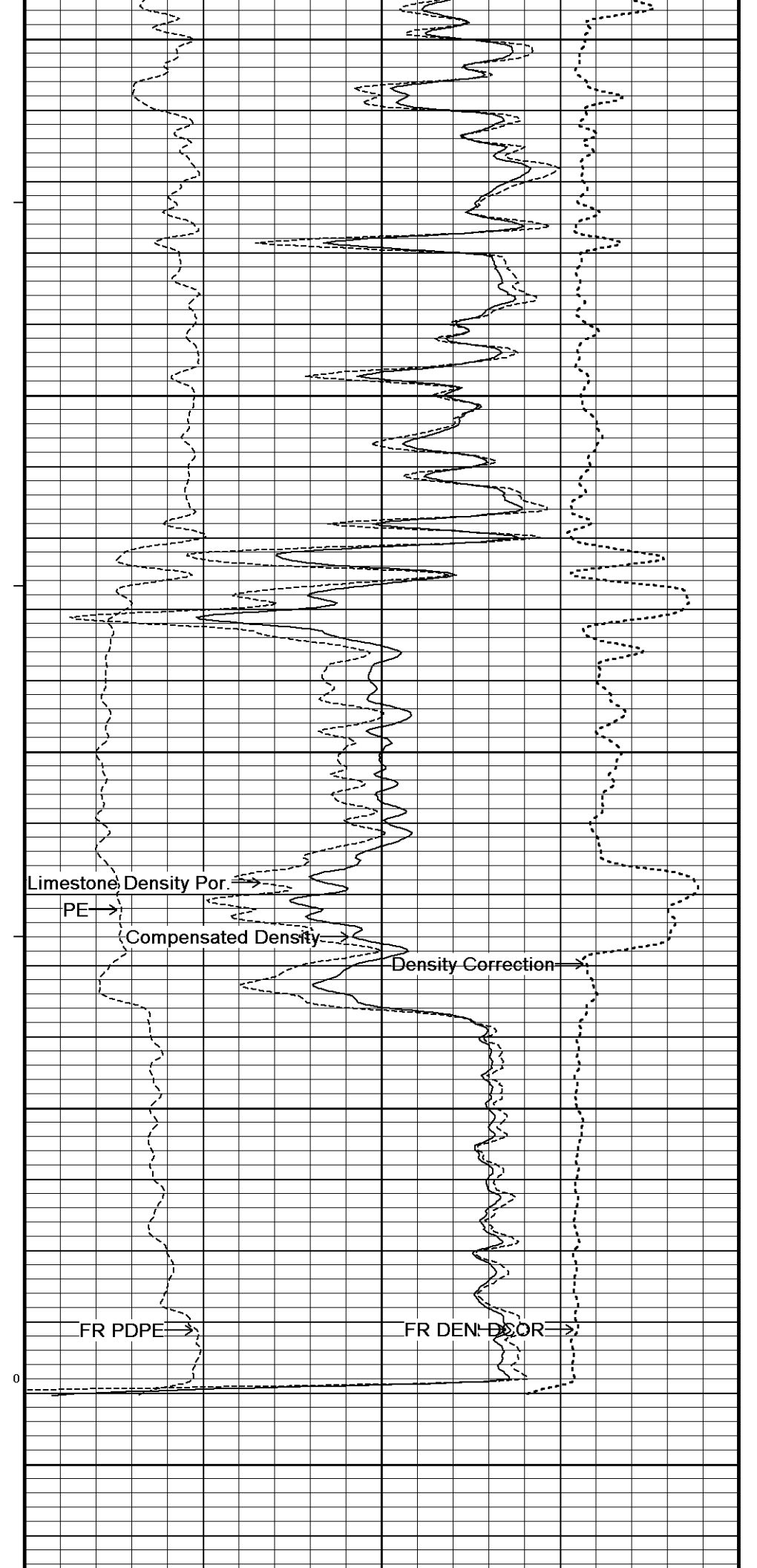
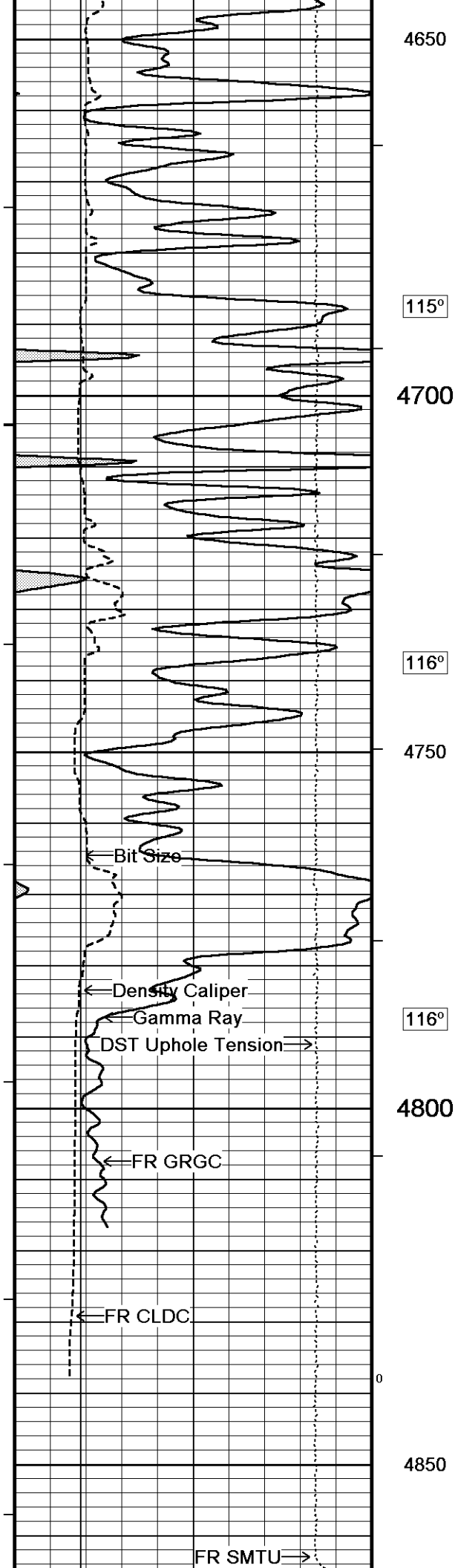
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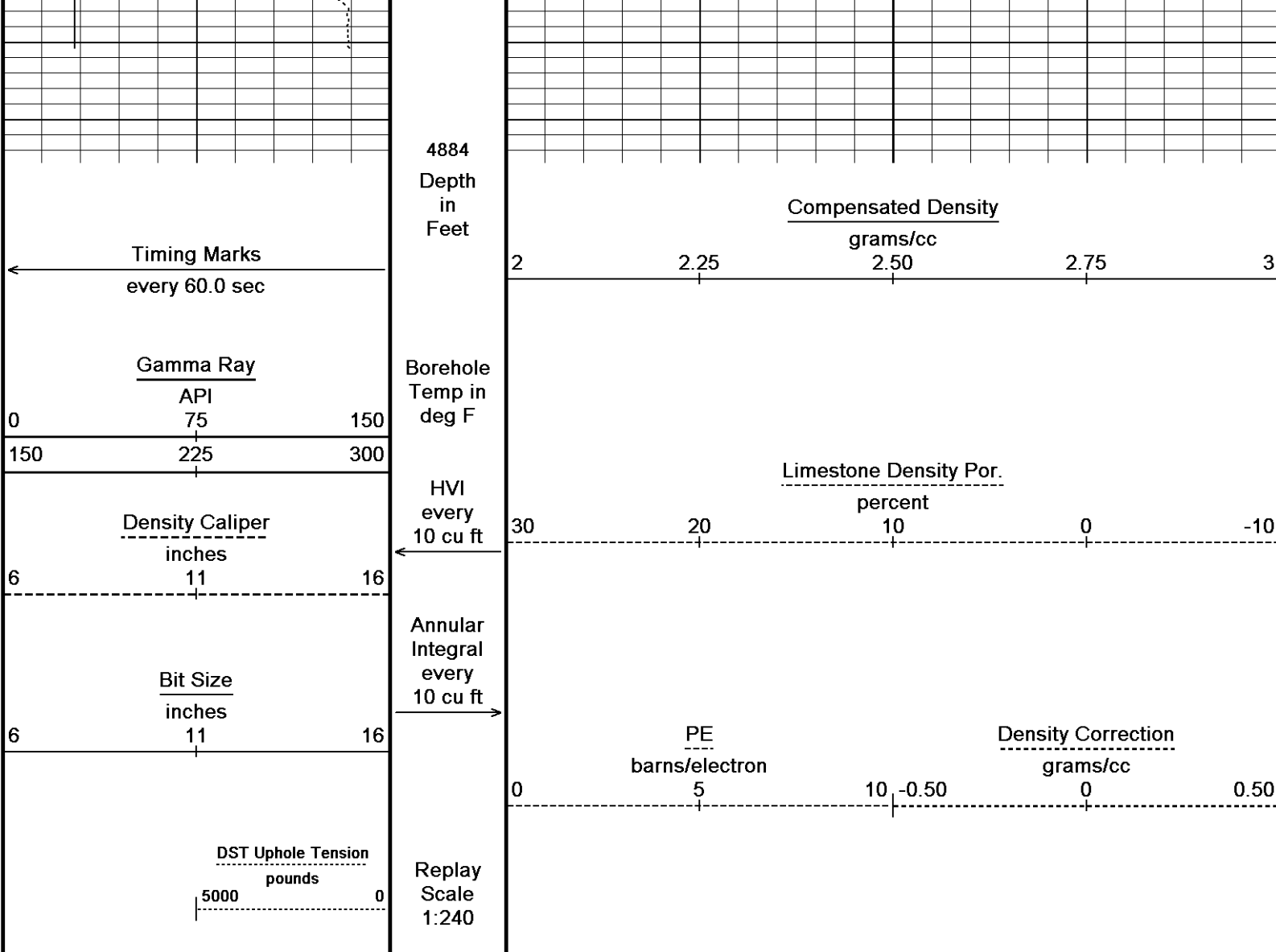
Recorded on 12-JUN-2013 18:07

System Versions: Logged with 13.05.9583 Plotted with 13.05.9583









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Plotted on 12-JUN-2013 22:06
 Recorded on 12-JUN-2013 18:07

↑ REPEAT SECTION ↑

BEFORE SURVEY CALIBRATION			
C:\Minimus 13.05.9583\Log\Shakespeare Tucker #1-9\Shakespeare Tucker #1-9_002.dta			
General Constants All 000		Last Edited on 12-JUN-2013,17:30	
General Parameters			
Mud Resistivity	0.660	ohm-metres	
Mud Resistivity Temperature	85.000	degrees F	
Water Level	0.000	feet	
Borehole Fluid Processing	Wet Hole		
Hole/Annular Volume and Differential Caliper Parameters			
HVOL Method	Single Caliper		
HVOL Caliper 1	Density Caliper		
HVOL Caliper 2	N/A		
Annular Volume Diameter	5.500	inches	
Caliper for Differential Caliper	Density Caliper		
Rwa Parameters			
Porosity used	Base Density Porosity		
Resistivity used	Array Ind. Four Res Rt		
RWA Constant A	0.610		
RWA Constant M	2.150		
QWABCD Tool Constant	0.000		

Down-hole Tension Calibration SMS 0

Field Calibration on 12-JUN-2013 16:56

Reading No	Measured	Calibrated (lbs)
1	13838.82	0.00
2	15058.89	471.80

Gamma Calibration MCG-B 39

Field Calibration on 11-JUN-2013 10:19

	Measured	Calibrated (API)
Background	64	43
Calibrator (Gross)	1144	768
Calibrator (Net)	1080	725

Gamma Constants MCG-B 39

Last Edited on 12-JUN-2013,00:38

Gamma Calibrator Number	GRC38	
Mud Density	1.13	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

Field Calibration on 11-JUN-2013,10:13

	Measured	Calibrated (mV)
Reference 1	105.8	100.0
Reference 2	-94.3	-100.0

High Resolution Temperature Calibration MCG-B 39

Field Calibration on 11-JUN-2013,10:13

	Measured	Calibrated(Deg F)
Lower	50.00	50.00
Upper	75.00	75.00

High Resolution Temperature Constants MCG-B 39

Last Edited on 11-JUN-2013,10:13

Pre-filter Length	11
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Caliper Calibration MML-A 3

Base Calibration on 05-JUN-2013 15:43

Field Calibration on 11-JUN-2013 10:13

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)
6.11	5.98

Micro Normal and Micro Inverse Calibration MML-A 3

Base Calibration on 05-JUN-2013 15:36

Field Check on 11-JUN-2013 10:11

Base Calibration				
Channel	Resistor 1	Measured Resistor 2	Calibrated (ohm-m) 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 11-JUN-2013,10:06

Pad Type	8-12 in Soft Rubber Inflatable 006-9011-159	
Micro Normal K Factor	1.0000	
Micro Inverse K Factor	1.0000	
Standoff Offset	N/A	inches

Base Calibration

	Measured		Calibrated (cps)	
	Near	Far	Near	Far
	3145	98	3714	110
Ratio	32.215		33.764	

Field Calibrator at Base

	Calibrated (cps)
	1654 2365
Ratio	0.699

Field Check

	Calibrated (cps)
	1626 2372
Ratio	0.696

Neutron Constants MDN-A.B 66

Last Edited on 11-JUN-2013,10:19

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 11-JUN-2013 09:59

Base Calibration

	Measured	Calibrated (ohm-m)
Reference 1	0.0	0.0
Reference 2	964.9	126.8
Base Check		280.9
Field Check		280.7

FE Constants MFE-B.J 353

Last Edited on 11-JUN-2013,09:56

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

Sonic Constants MSS-A.A 126

Last Edited on 27-MAY-2013,04:34

Maximum Boundary Contrast	100.00	micro-sec/ft
Fluid Transit Time	189.00	micro-sec/ft
Limestone Transit Time	47.50	micro-sec/ft
Sandstone Transit Time	55.50	micro-sec/ft
Dolomite Transit Time	43.50	micro-sec/ft
Sonic used for Porosities	3-5' Compensated	
Correction for Sonde Skew	Applied	
Cycle Stretch Algorithm	Applied	
MN3FT	0.00	micro-sec
MX3FT	1500.00	micro-sec
Hunt-Raymer Constant	83.13	micro-sec/ft

Sonde Mode	Compensated
Hole Type	Open Hole

Sonde Parameters

	Measured	Calibrated
Offset	0.0000	0.0000
Free Pipe	0.0000	

Peak Amplitude Source

Waveform	Start Time (micro-sec)	Width (micro-sec)	Pre Gain	Start Gain	Discriminator (mV)
3'	N/A	N/A	N/A	N/A	N/A
4'	N/A	N/A	N/A	N/A	N/A
5'	N/A	N/A	N/A	N/A	N/A
6'	N/A	N/A	N/A	N/A	N/A

Processed Fixed Gate Parameters

Waveform Used For Processing	N/A		
Start Time (micro-sec)	End Time (micro-sec)	Discriminator (mV)	Depth (ft)
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	0.00	0.00	0.00

Full Waveform Parameters

Use 3' Waveform to derive TR	No
Use 4' Waveform to derive TR	No
Use 5' Waveform to derive TR	No
Use 6' Waveform to derive TR	No
3' Waveform Discriminator Level	0.30 mV
4' Waveform Discriminator Level	0.30 mV
5' Waveform Discriminator Level	0.15 mV
6' Waveform Discriminator Level	0.15 mV
3' Waveform Filter	
4' Waveform Filter	
5' Waveform Filter	
6' Waveform Filter	
Semblance Level	0.50
Semblance Window Width	120.00 micro-sec
Sonic 1 Despiker	100.00 micro-sec/ft
Sonic 2 Despiker	100.00 micro-sec/ft

Induction Calibration MAI-A.A 167

Base Calibration on 19-APR-2013,13:41
Field Check on 11-JUN-2013 09:55

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			13.6	3837.4
2			29.7	3475.1
3			29.2	3051.7
4			19.8	2081.0
Deep			18.7	2048.5
Medium			42.2	3989.1
Shallow			43.1	5050.7

Array Temperature 83.1 Deg F

Induction Constants MAI-A.A 167

Last Edited on 11-JUN-2013,09:53

Induction Model	RtAP-WRM
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Caliper for Borehole Corr.	Density Caliper	
Hole Size for Borehole Correction	2.500	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 28-MAY-2013,04:23

	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 28-MAY-2013,04:23

Pre-filter Length	11
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Caliper Calibration MPD-B 64

Base Calibration on 21-MAY-2013 17:34
Field Calibration on 11-JUN-2013 10:02

Base Calibration		
Reading No	Measured	Calibrator Size (in)
1	14464	3.99
2	23406	5.98
3	32206	7.97
4	40368	9.86
5	50018	11.92
6	N/A	N/A
Field Calibration		
	Measured Caliper (in)	Actual Caliper (in)
	5.97	5.98

Photo Density Calibration MPD-B 64

Base Calibration on 21-MAY-2013 17:55
Field Check on 11-JUN-2013 10:06

Density Calibration				
Base Calibration				
		Measured	Calibrated (sdu)	
	Near	Far	Near	Far
Reference 1	60105	33685	59556	30836
Reference 2	25286	2917	24941	2541

Field Check at Base

1165.8 1353.6

Field Check

1164.4 1354.5

PE Calibration

Base Calibration	WS	Measured WH	Ratio	Calibrated Ratio
Background	210	1037		
Reference 1	22619	59903	0.381	0.371
Reference 2	6846	25146	0.275	0.272

Field Check at Base

210.2 1037.2

Field Check

211.3 1036.2

Density Constants MPD-B 64

Last Edited on 12-JUN-2013,00:37

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	1.13 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	0.00

DOWNHOLE EQUIPMENT

C:\Minimus 13.05.9583\Log\Shakespeare Tucker #1-9\Shakespeare Tucker #1-9_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

Compact Micro-log

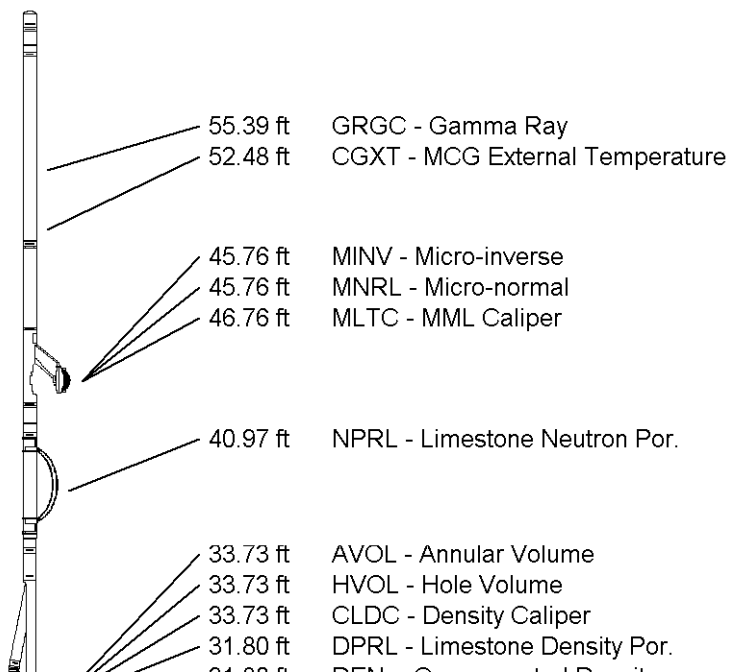
MML-A 3 LG: 7.97 ft WT: 81.6 lb OD: 2.24 in

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

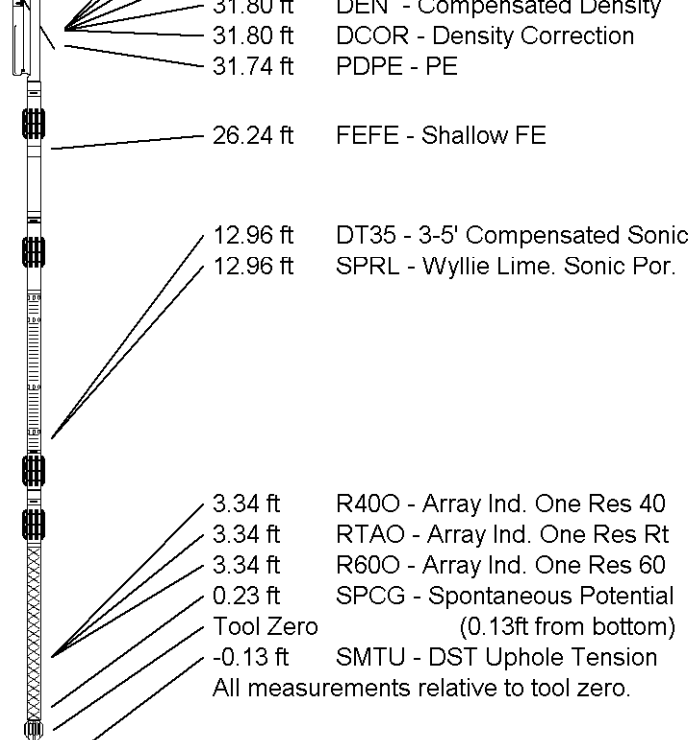


Compact Focussed Electric
MFE-B.J 353 LG: 6.05 ft WT: 48.5 lb OD: 2.24 in

Compact Sonic
MSS-A.A 126 LG: 12.52 ft WT: 72.8 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: 62.25 ft Weight: 471.8 lb



COMPANY	SHAKESPEARE OIL COMPANY
WELL	TUCKER #1-9
FIELD	WILDCAT
PROVINCE/COUNTY	SCOTT
COUNTRY/STATE	UNITED STATES / KANSAS

Elevation Kelly Bushing	3140.00	feet	First Reading	4830.00	feet
Elevation Drill Floor	3139.00	feet	Depth Driller	4864.00	feet
Elevation Ground Level	3130.00	feet	Depth Logger	4863.00	feet



Weatherford®

COMPACT PHOTO DENSITY
COMPENSATED NEUTRON
MICRORESISTIVITY LOG