



Weatherford

**COMPACT PHOTO DENSITY
COMPENSATED NEUTRON
MICRORESISTIVITY LOG**

COMPANY

SHAKESPEARE OIL COMPANY, INC.

WELL

OTILEY #1-8

FIELD

WILDCAT

PROVINCE/COUNTY

LOGAN

COUNTRY/STATE

U.S.A. / KANSAS

LOCATION

2301' FSL & 2270' FEL

SE/4

SEC TWP RGE Other Services

8 14S 32W MA/MI/FE

API Number 15-109-21098 MSS

Permit Number

Permanent Datum G.L., Elevation 2843 feet

Log Measured From KB

Drilling Measured From K.B.

Elevations:
KB 2853.00 feet
DF 2852.00
GL 2843.00

Date 15-SEP-2012

Run Number ONE

Depth Driller 4600.00 feet

Depth Logger 4599.00 feet

First Reading 4567.00 feet

Last Reading 3600.00 feet

Casing Driller 222.00 feet

Casing Logger 222.00 feet

Bit Size 7.875 inches

Hole Fluid Type CHEMICAL

Density / Viscosity 9.20 lb/USg 58.00 CP

PH / Fluid Loss 10.50 9.20 ml/30Min

Sample Source FLOWLINE

Rm @ Measured Temp 0.51 @ 88.0 ohm-m

Rmf @ Measured Temp 0.41 @ 88.0 ohm-m

Rmc @ Measured Temp 0.61 @ 88.0 ohm-m

Source Rmf / Rmc CALC CALC

Rm @ BHT 0.41 @ 111.0 ohm-m

Time Since Circulation 4 HOURS

Max Recorded Temp 111.00 deg F

Equipment Name COMPACT

Equipment / Base 13096 LIB

Recorded By LYNN SCOTT

Witnessed By TIM PRIEST

S.O.# / JOB# 3537885

LB12-252

BOREHOLE RECORD

Last Edited: 15-SEP-2012 22:29

Bit Size
inches

7.875

Depth From
feet

222.00

Depth To
feet

4599.00

CASING RECORD

Type

Size
inches

8.625

Depth From
feet

0.00

Shoe Depth
feet

222.00

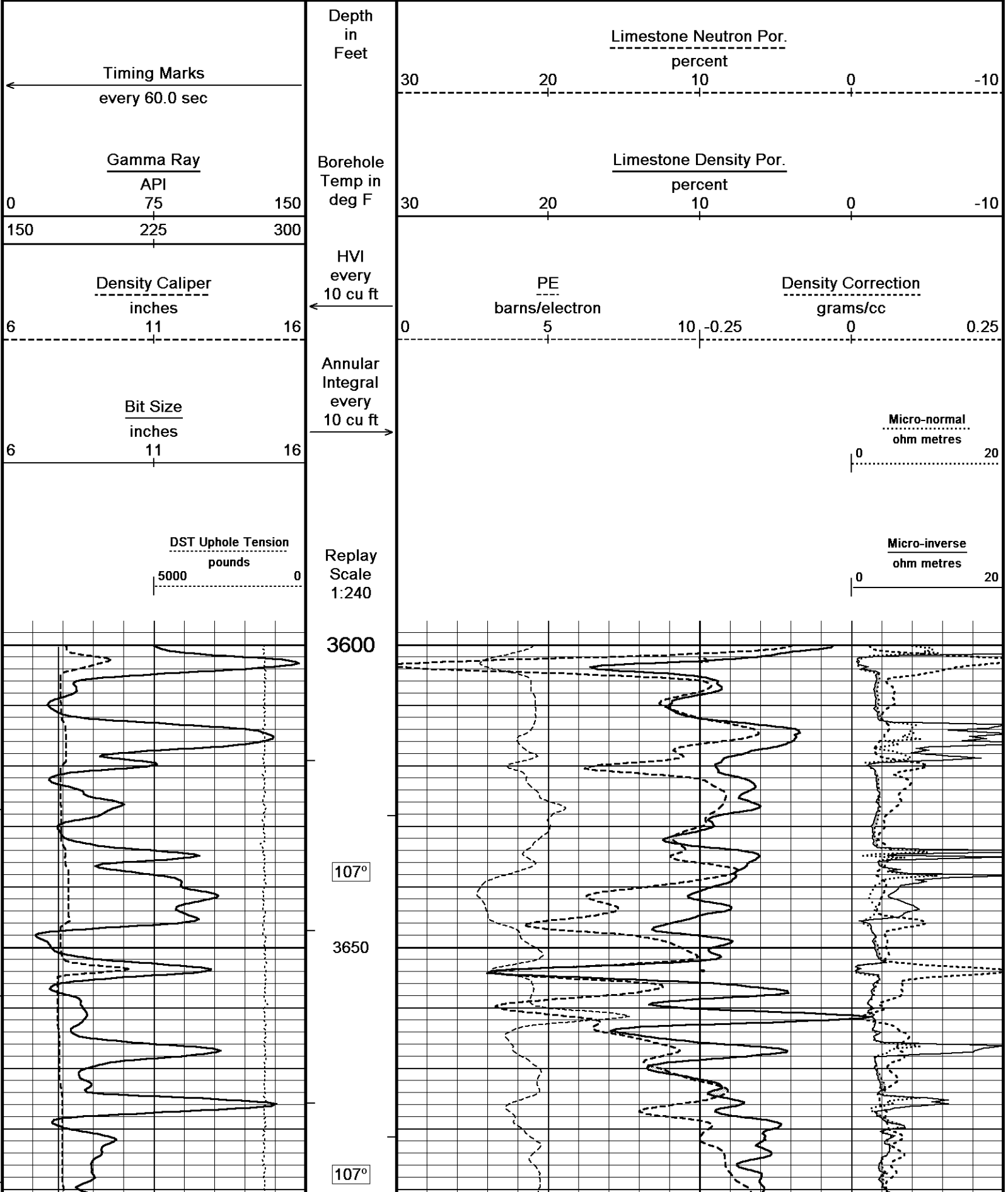
Weight
pounds/ft

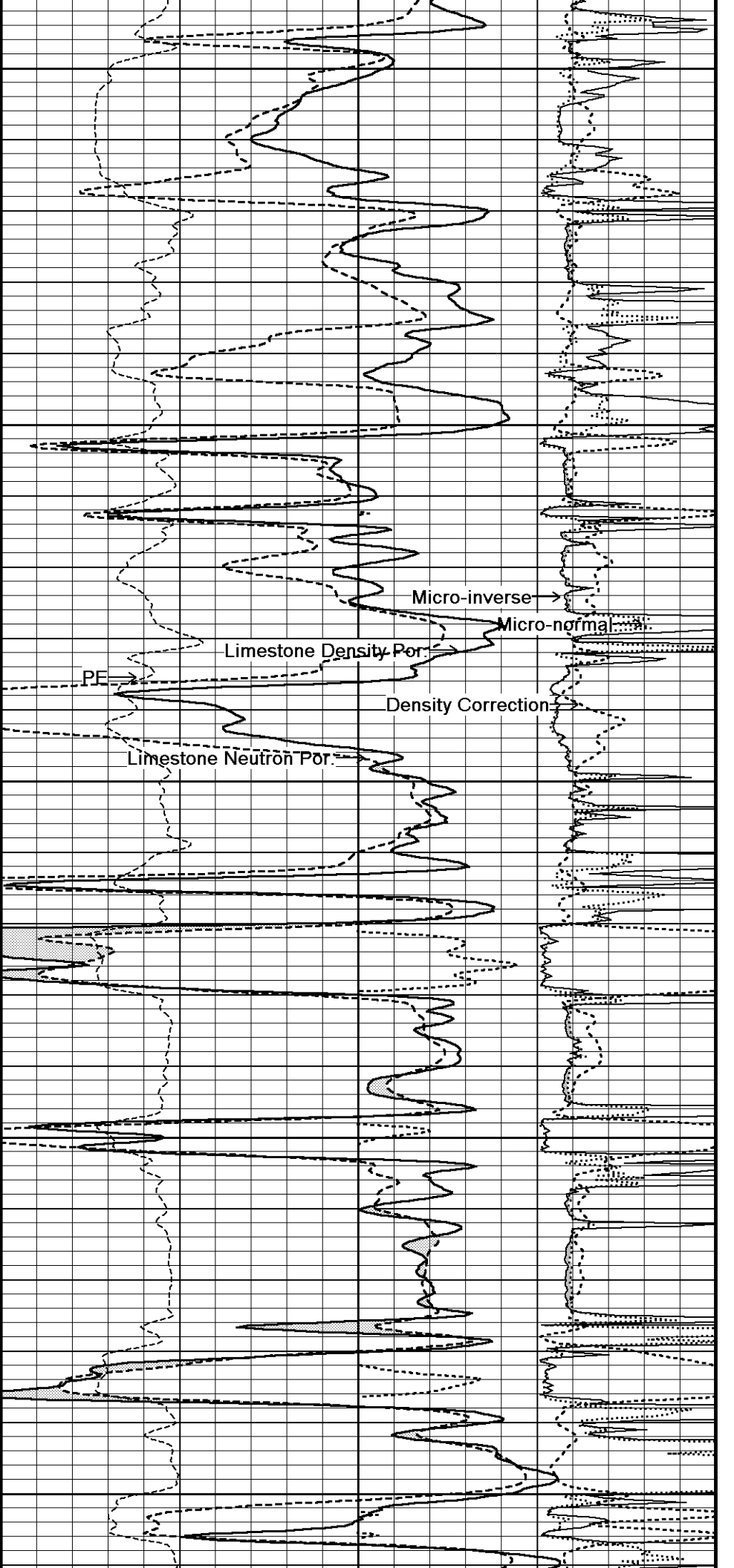
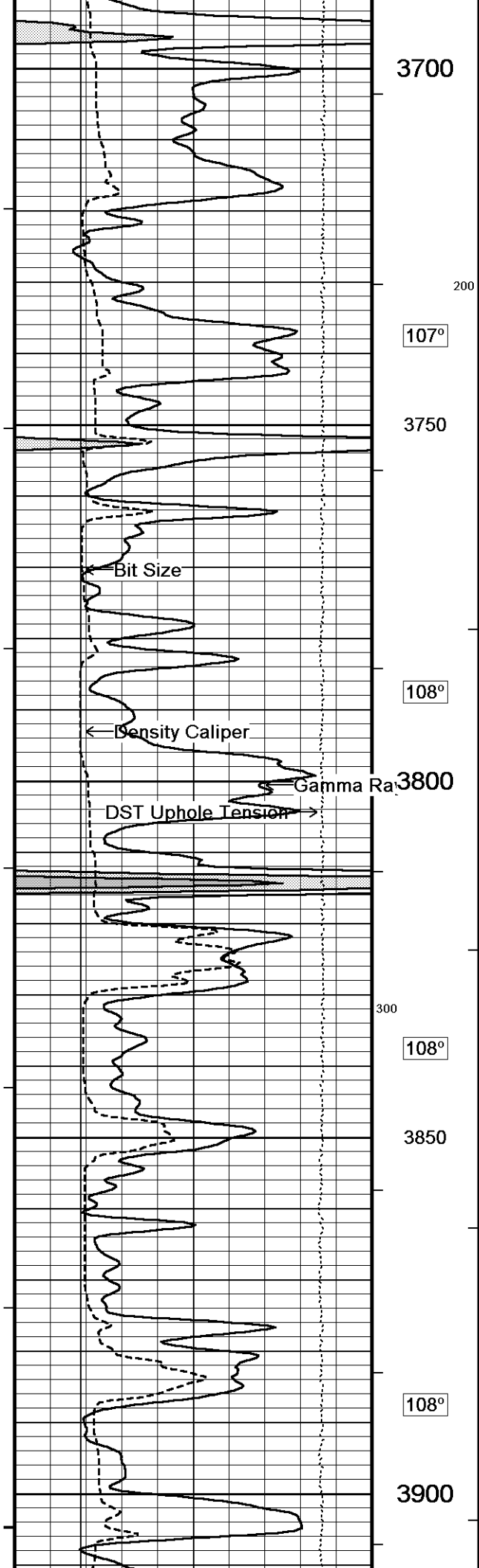
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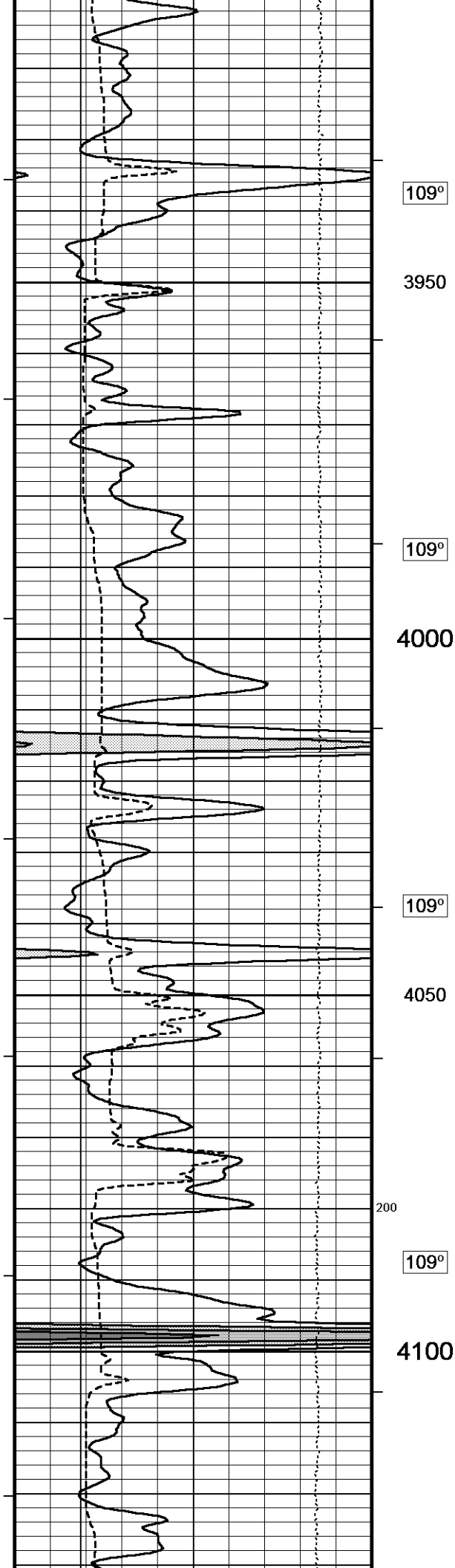
REMARKS

Tools Used: MPD, MCG, MDN, MFE, MAI, MSS, MML
Hardware: MPD: 8 inch profile plate used. MAI, MFE, and MSS: 0.5 Inch standoffs used. MDN: Dual Bowspring used.
2.71 G/CC Limestone density matrix used to calculate porosity.
Sonic porosity calculated using 47.5 usec/ft Limestone scale.
Borehole rugosity, tight pulls, and washouts will affect data quality.
All intervals logged and scaled per customer's request.
Annular volume with 5.5 inch production casing from TD to the top of detail = 224 cubic feet
Total hole volume from TD to Surface casing= 2034 cubic feet
Service order #3537885
Rig: HD #2
Engineer: L. Scott
Operator(s): B. Reeves

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.







109°

3950

109°

4000

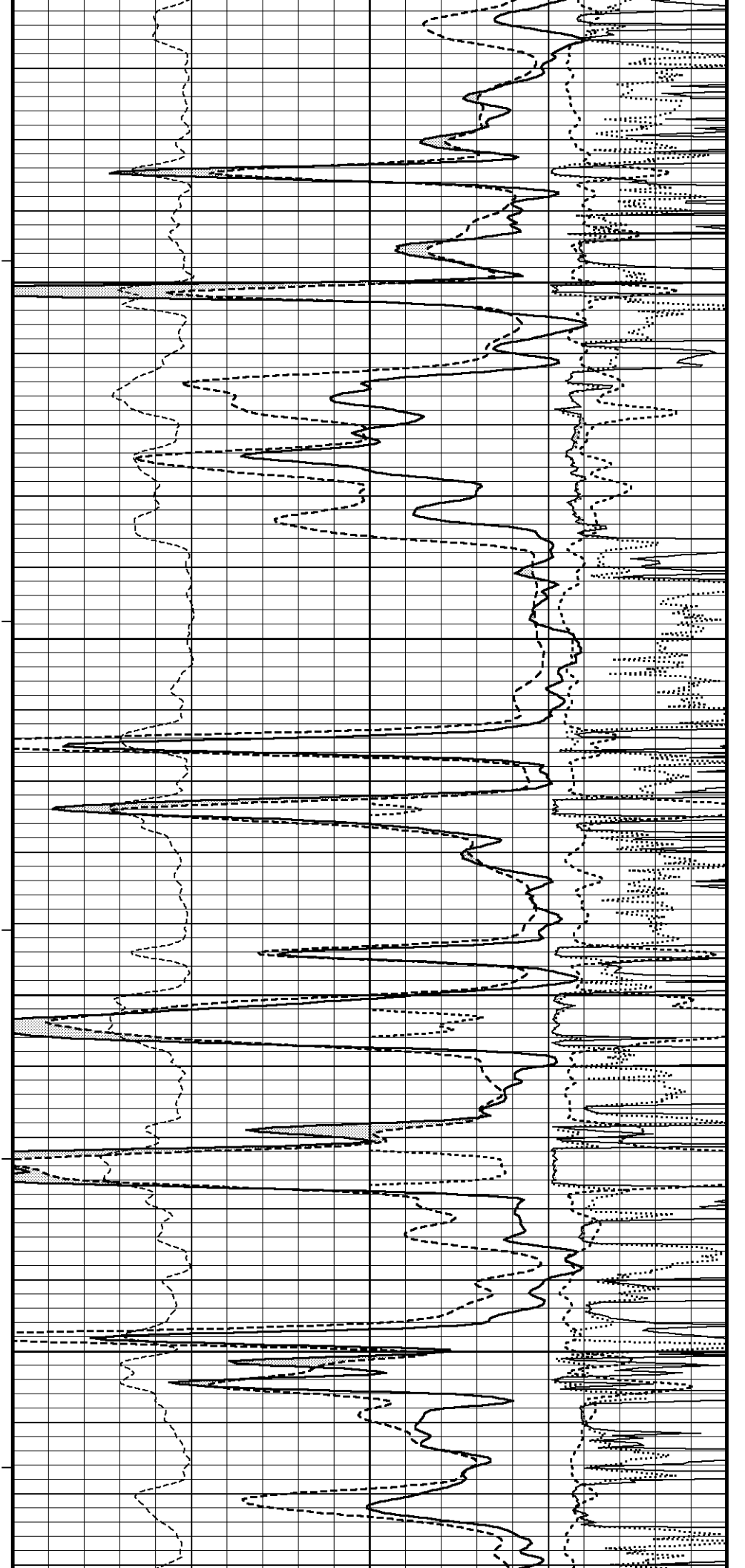
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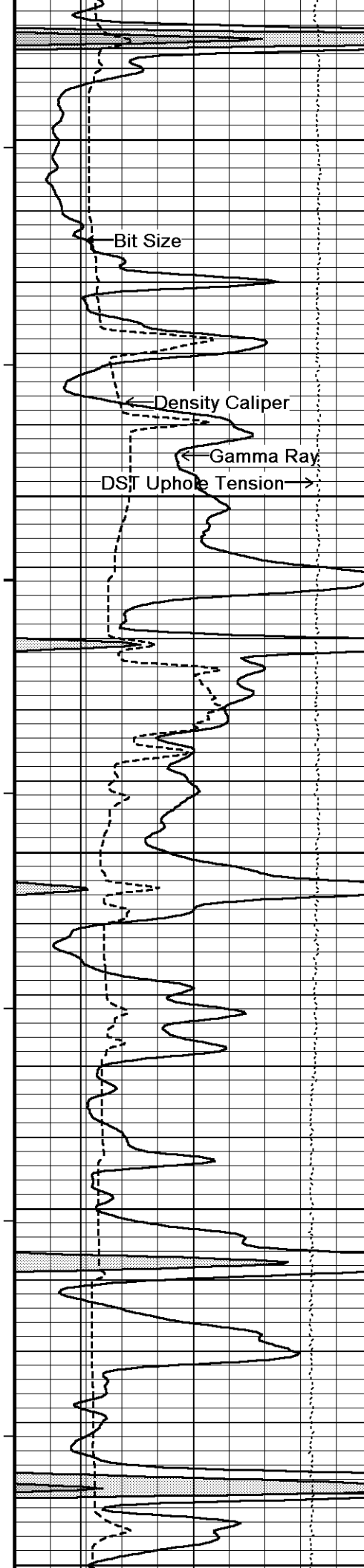
4050

200

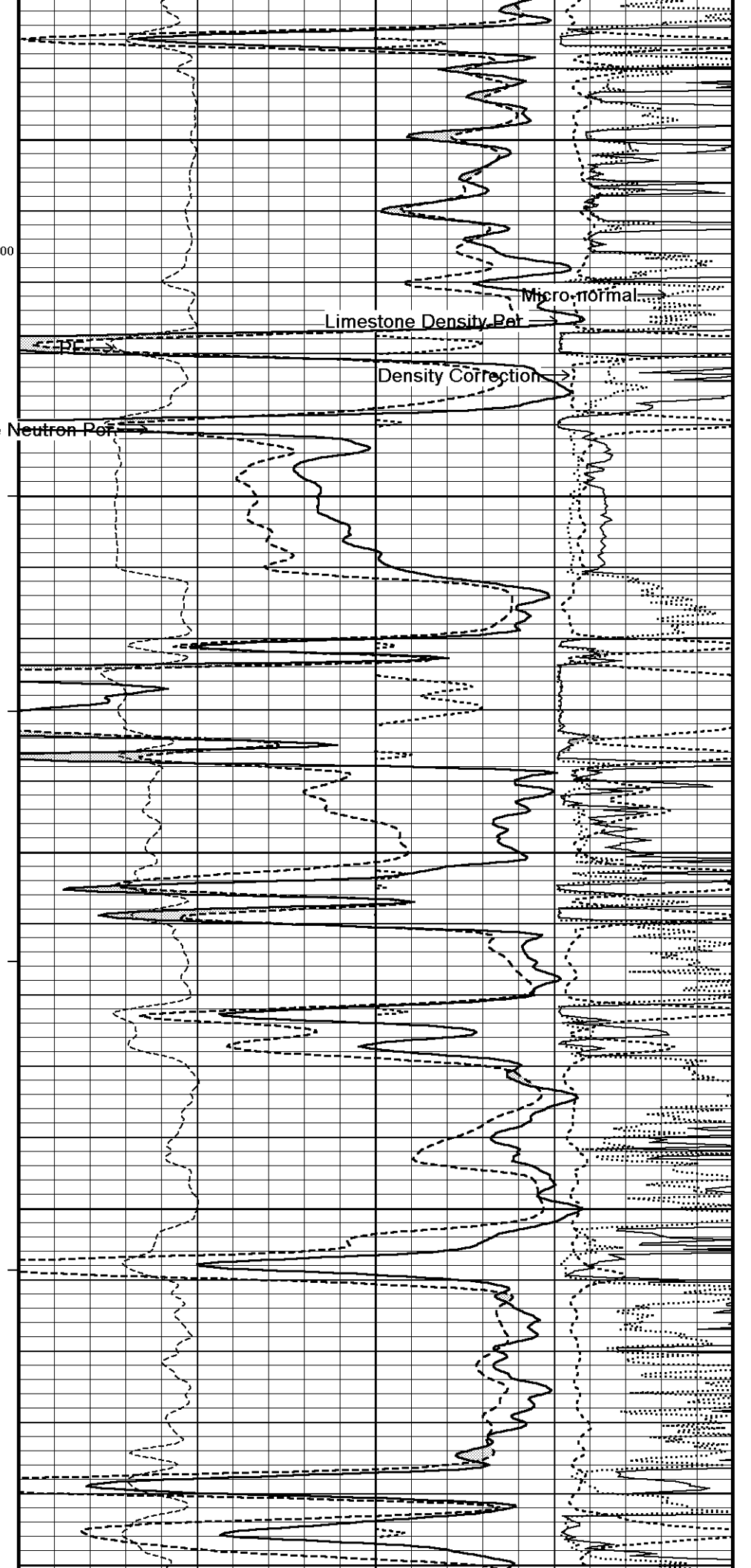
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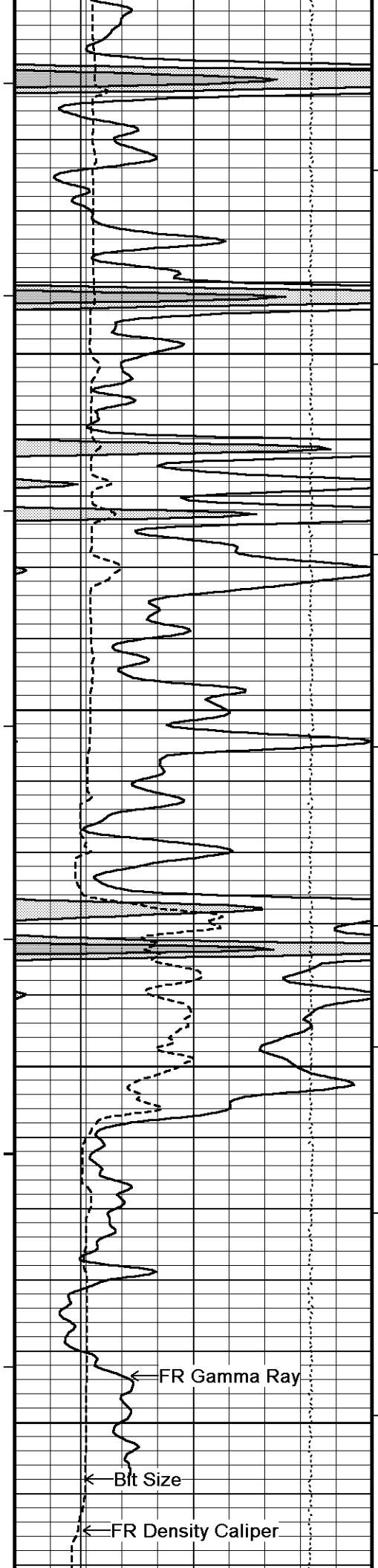
4100





110°
4150
100
110°
4200
110°
4250
110°
4300
100
111°
4350





111°

4400

111°

4450

112°

4500

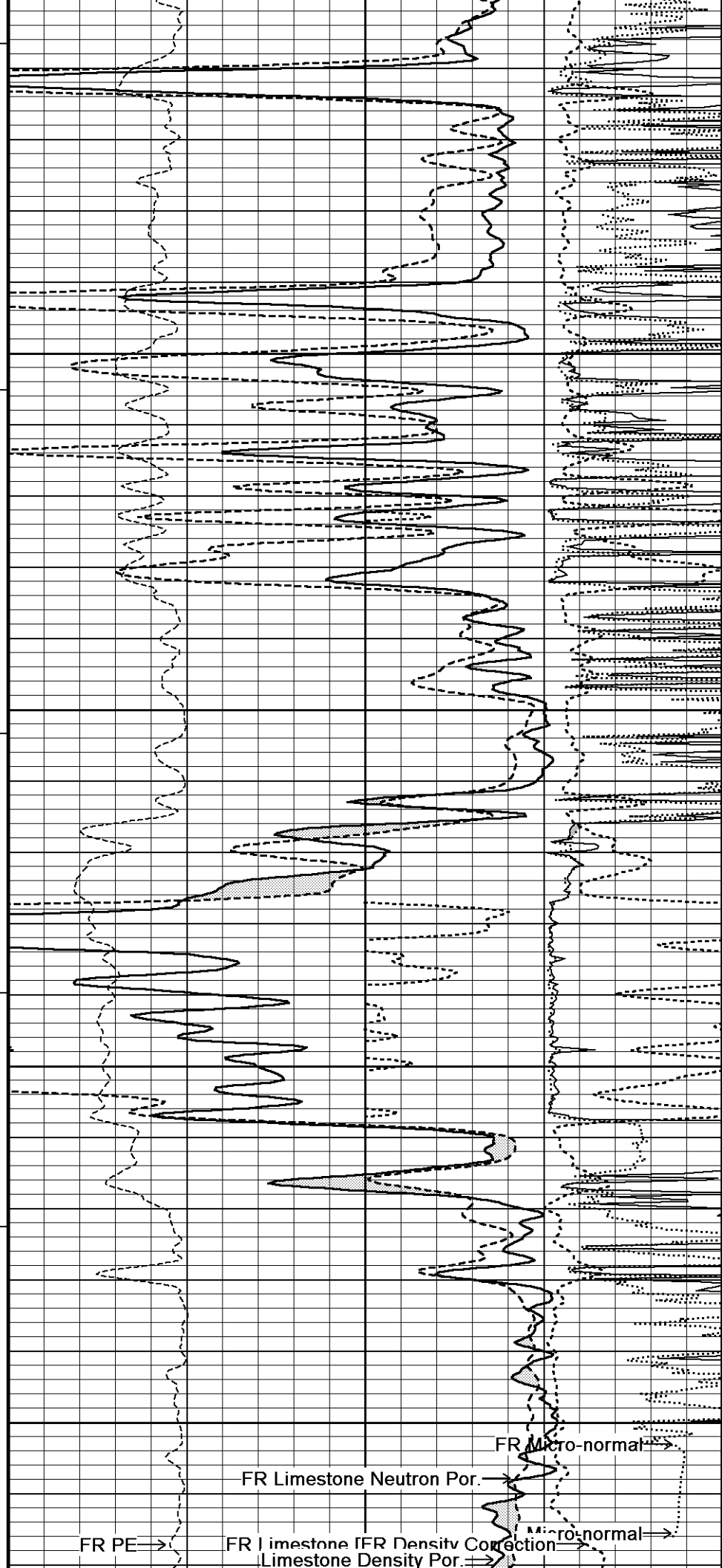
111°

4550

FR Gamma Ray

Bit Size

FR Density Caliper



FR PE

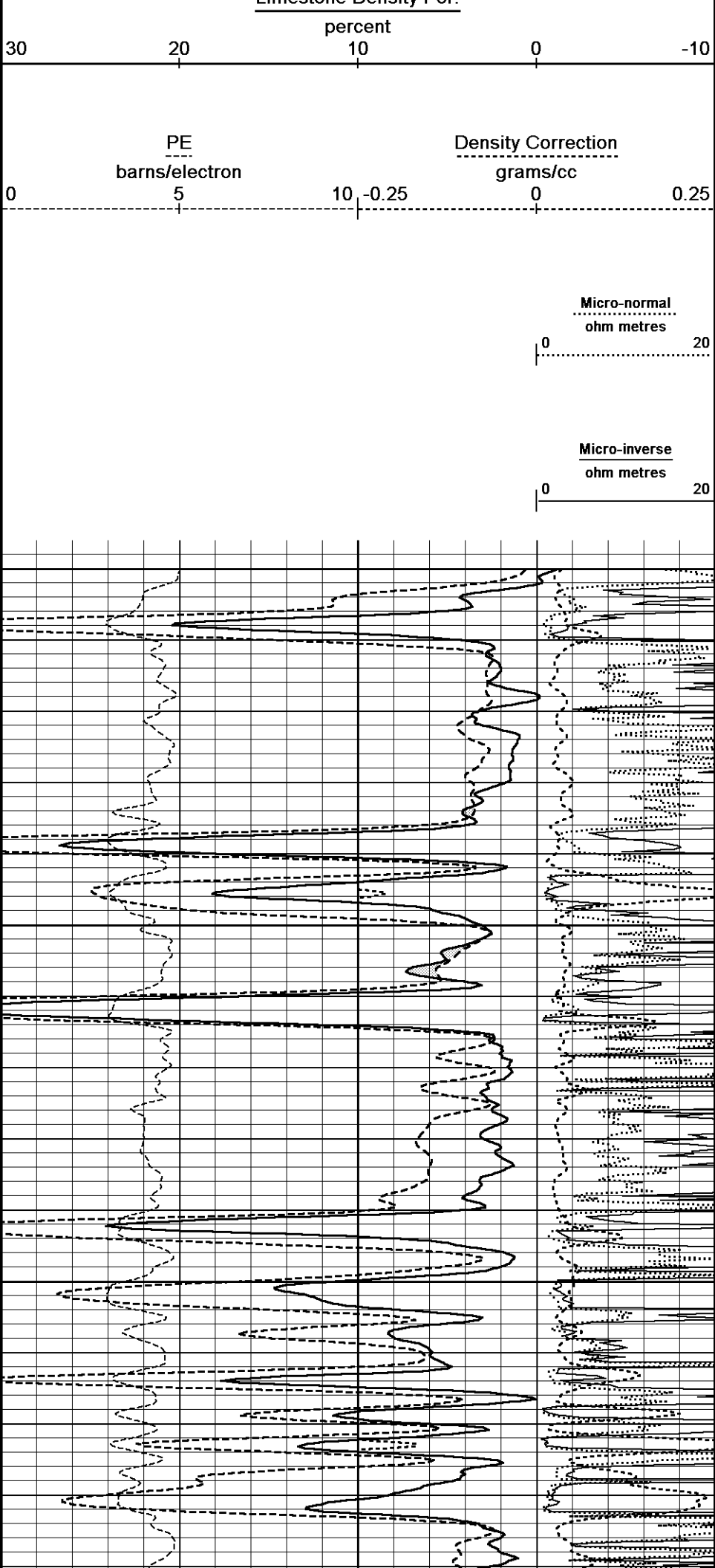
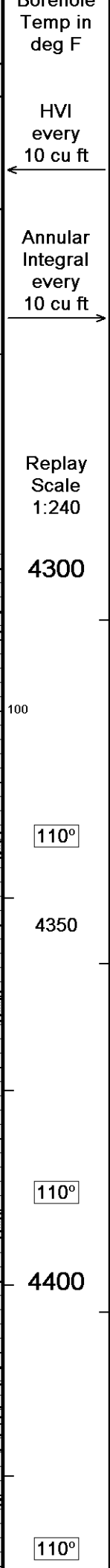
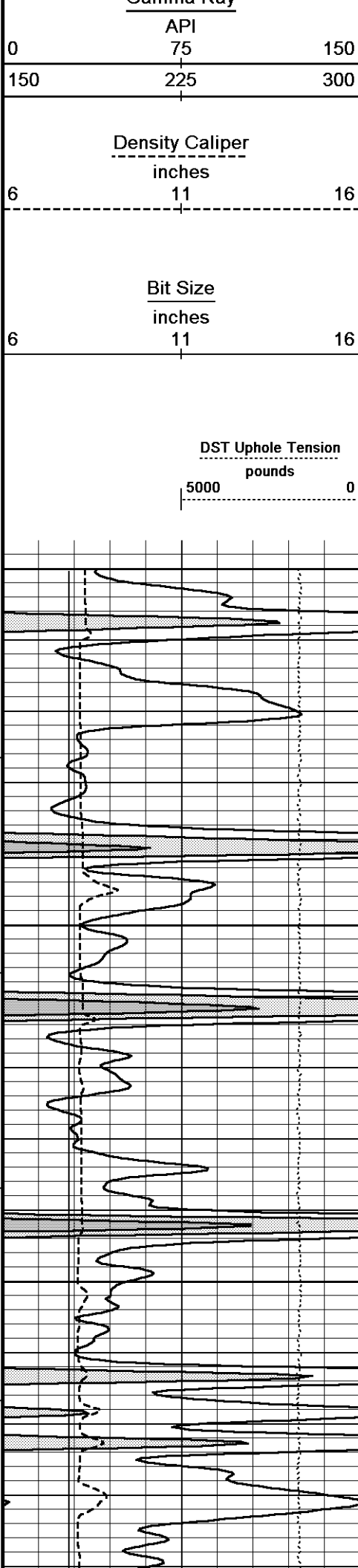
FR Limestone Neutron Por.

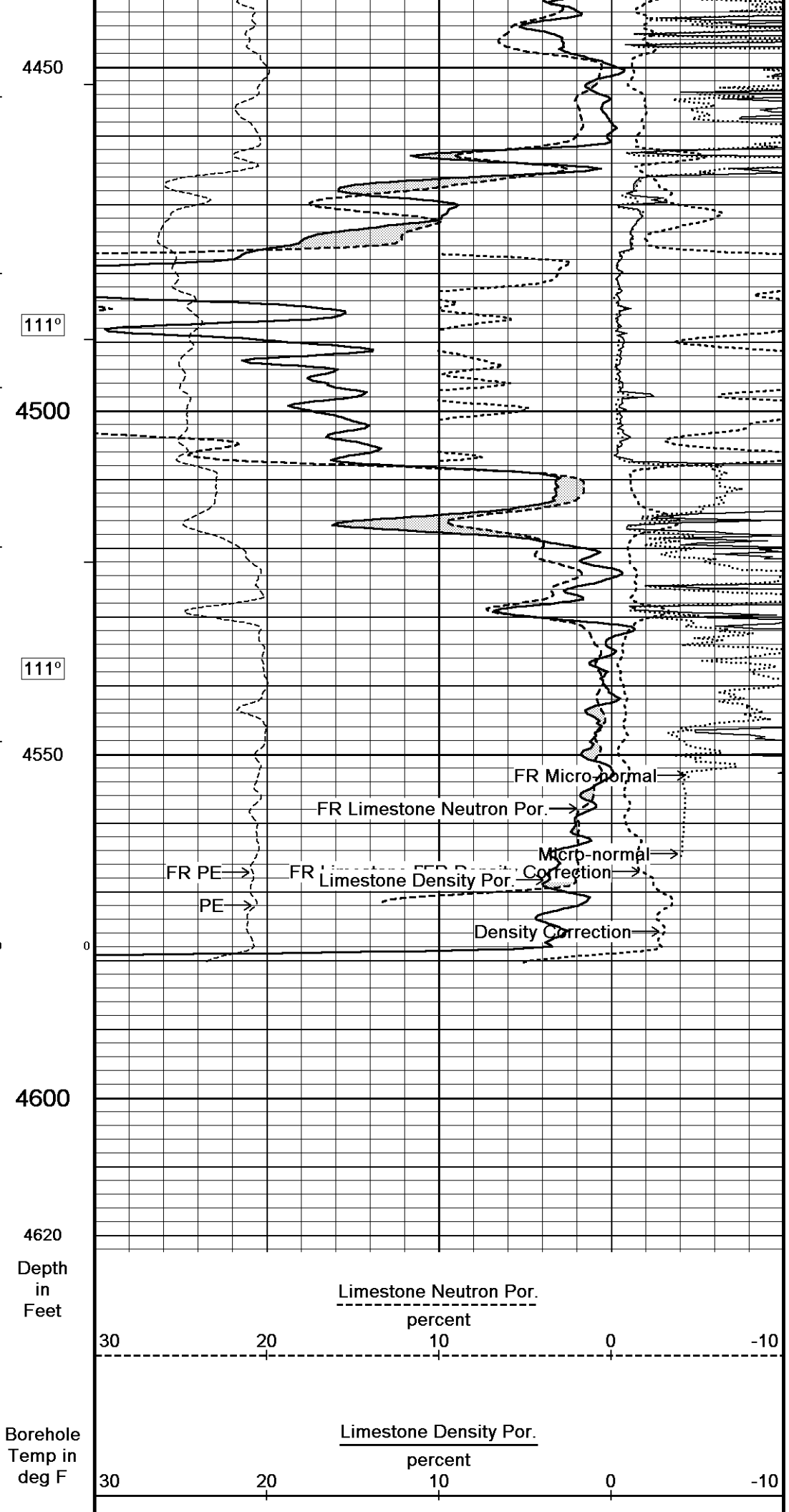
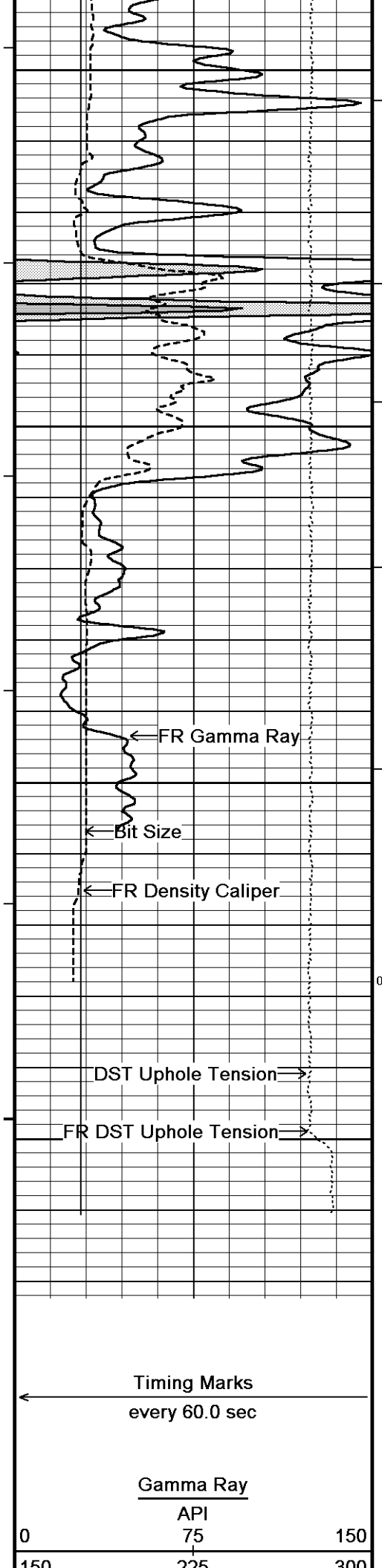
FR Limestone IFR Density Correction

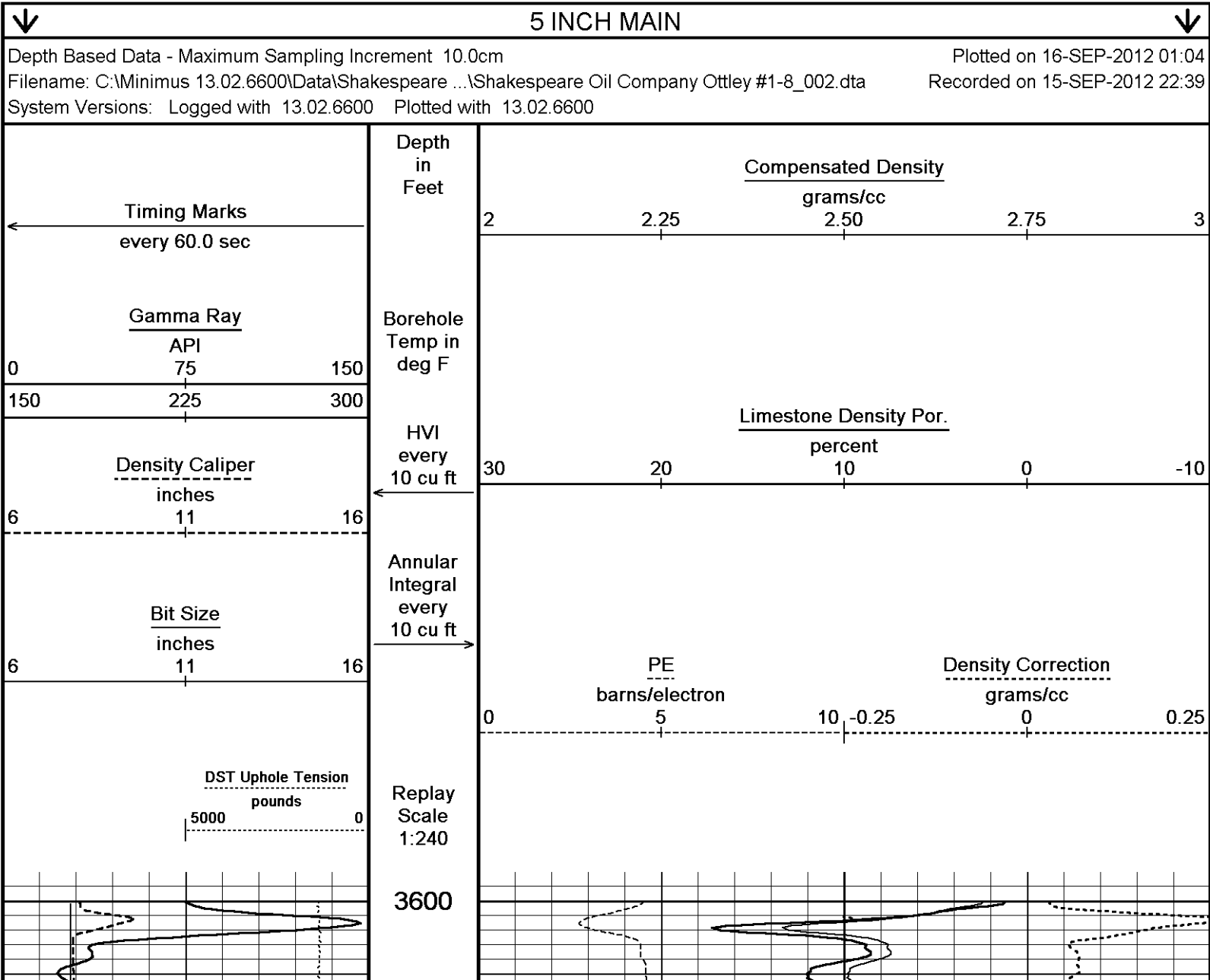
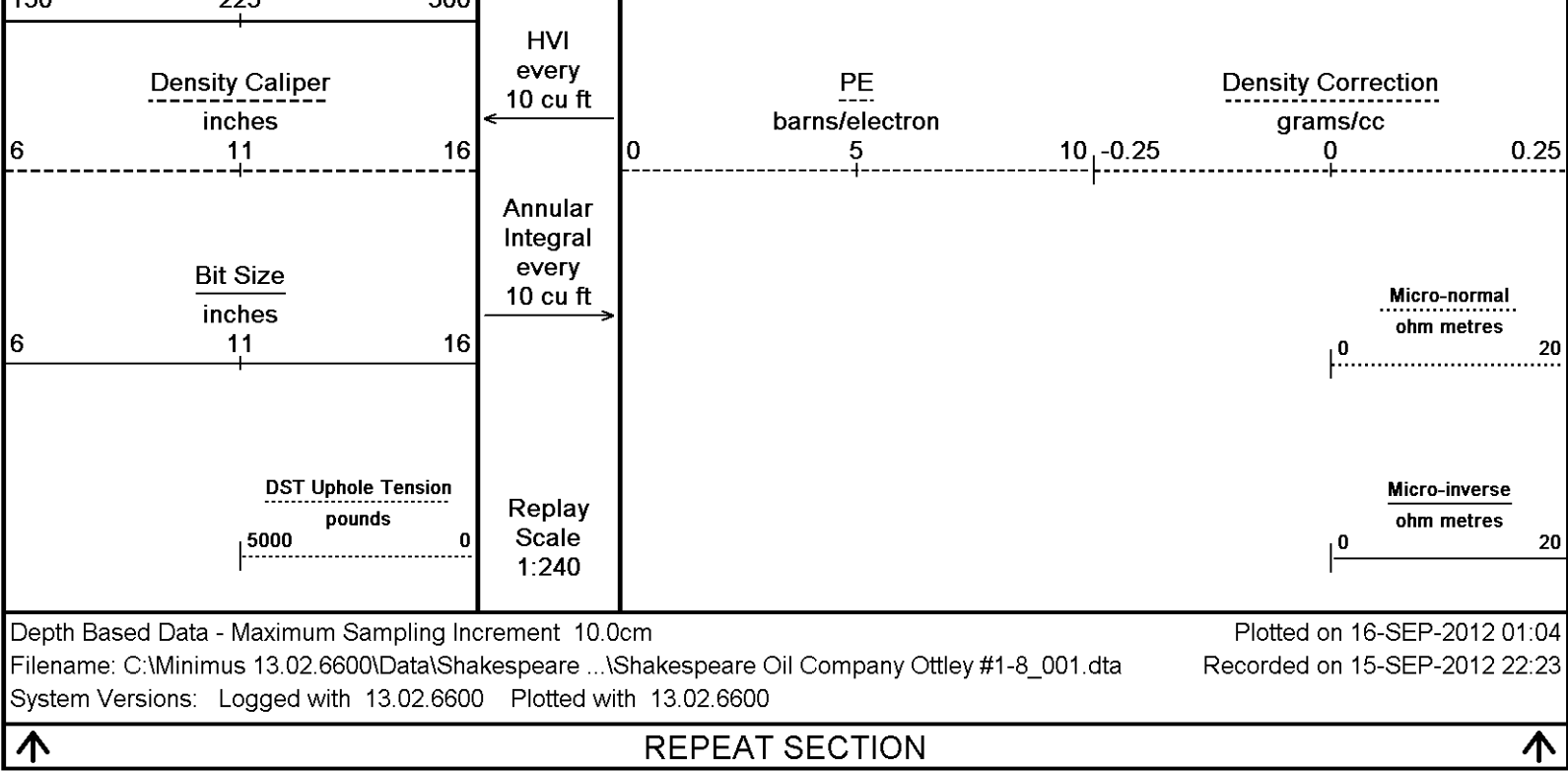
FR Limestone Density Por.

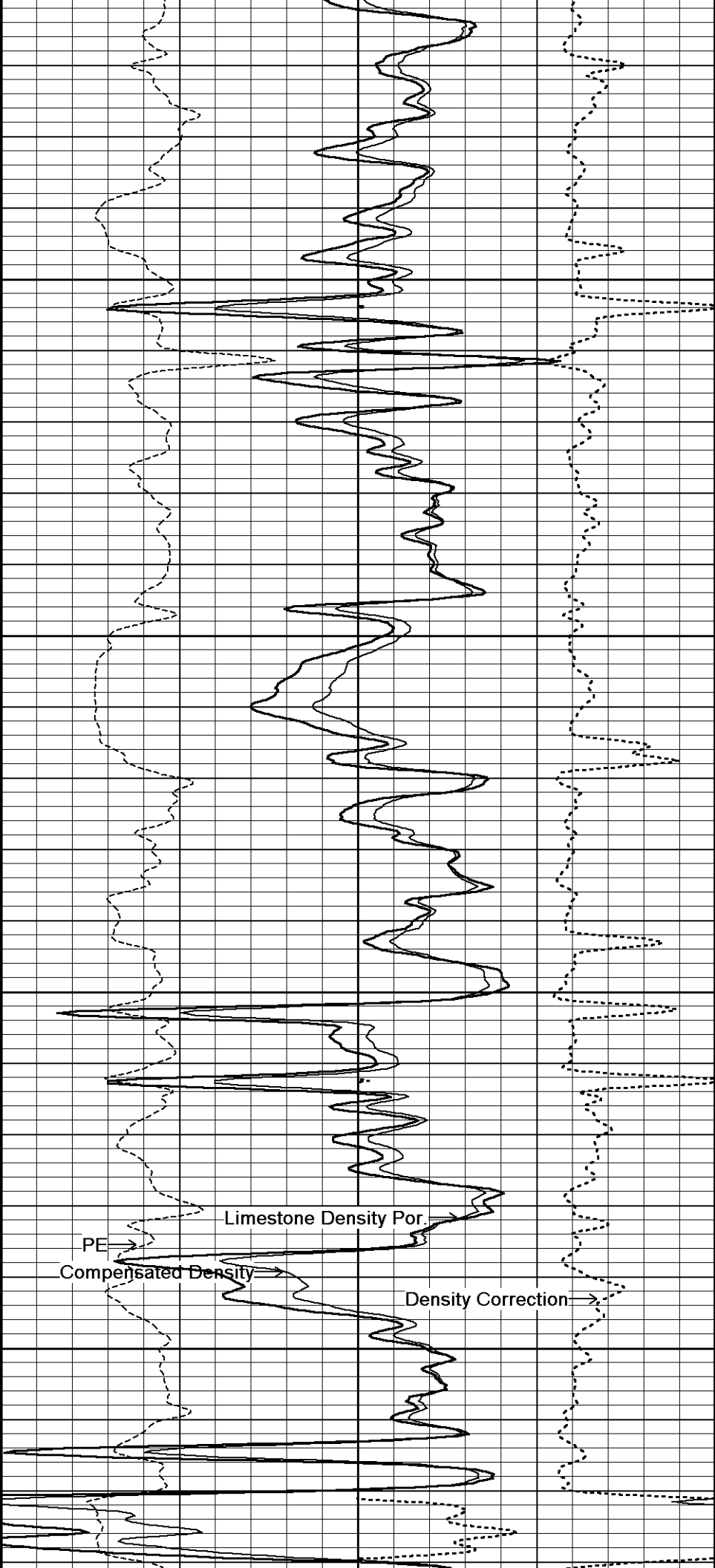
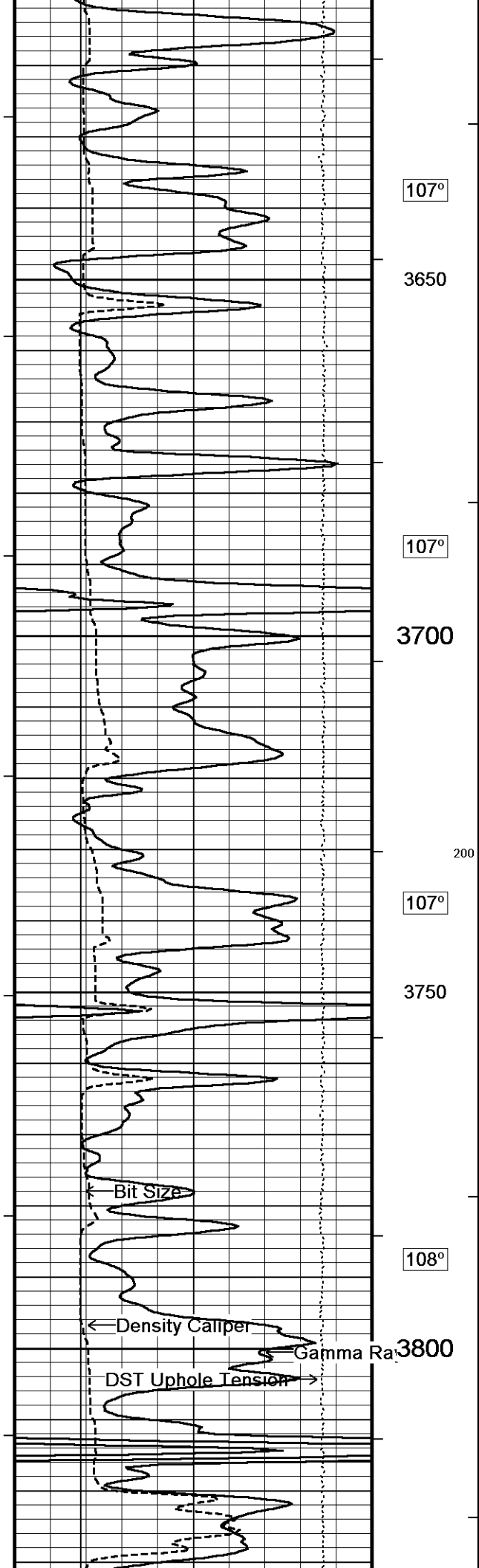
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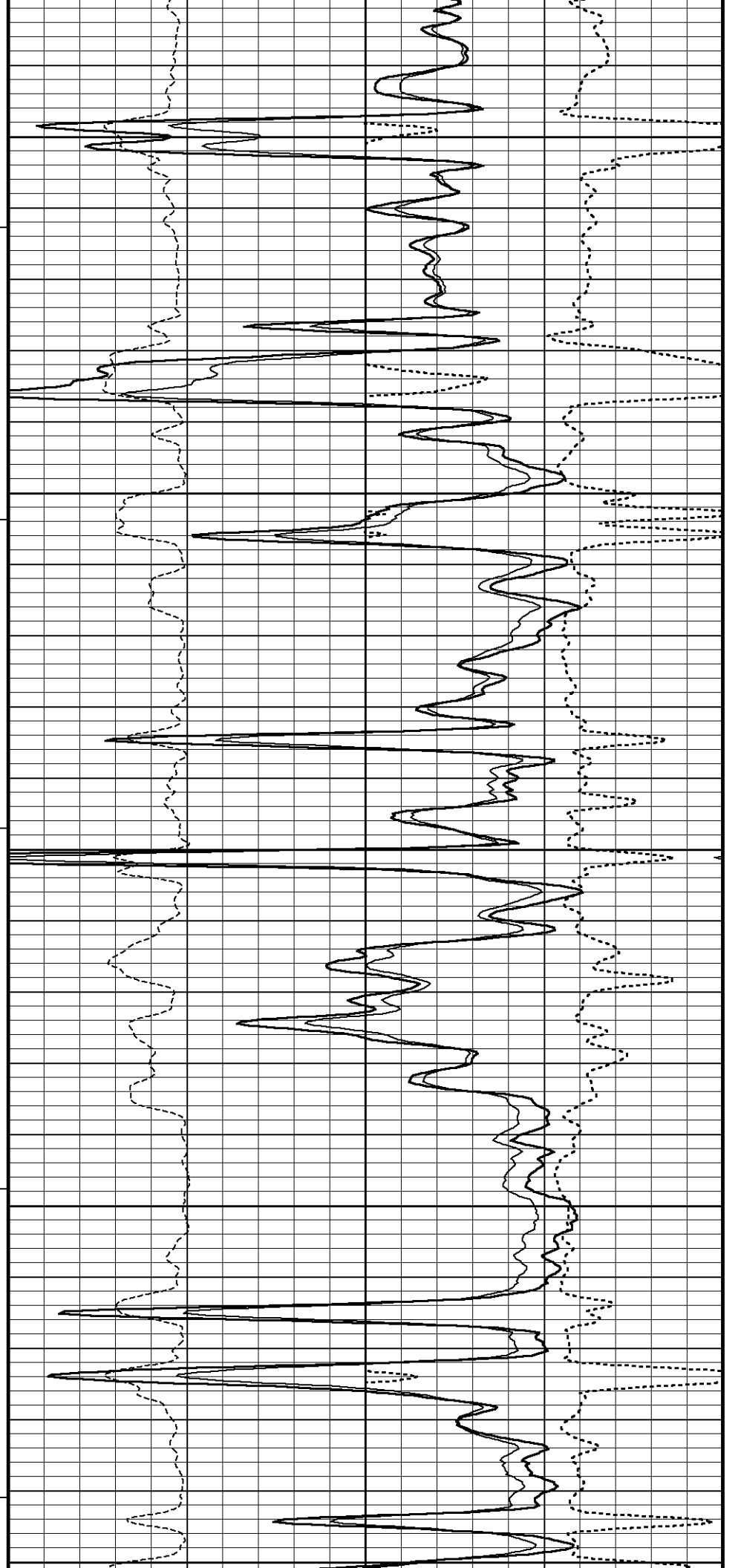
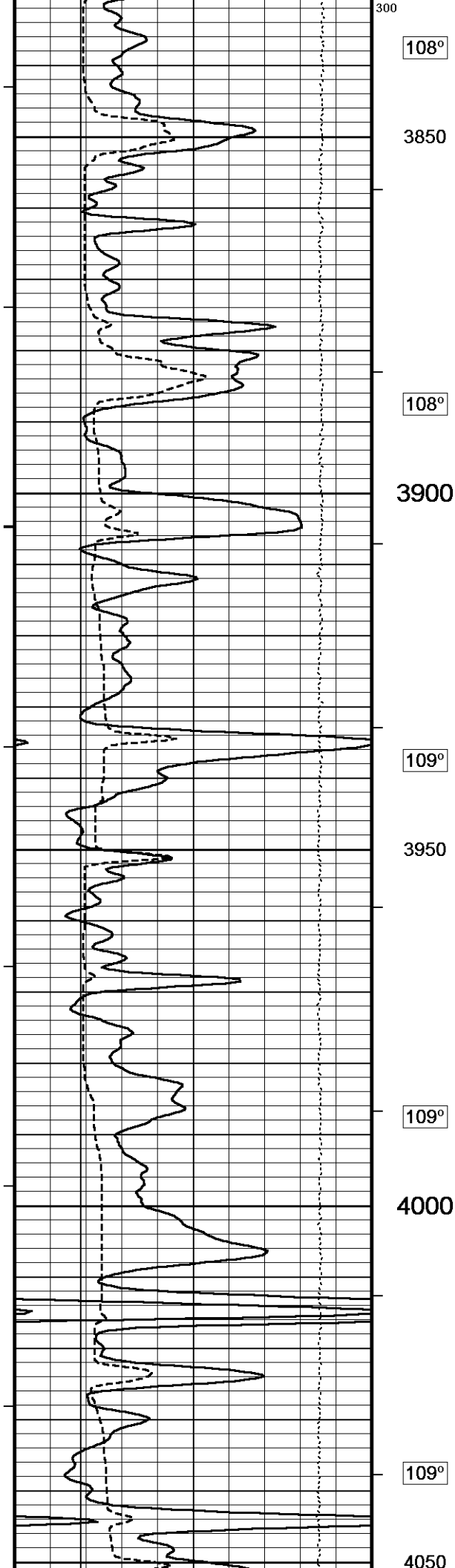
Micro-normal

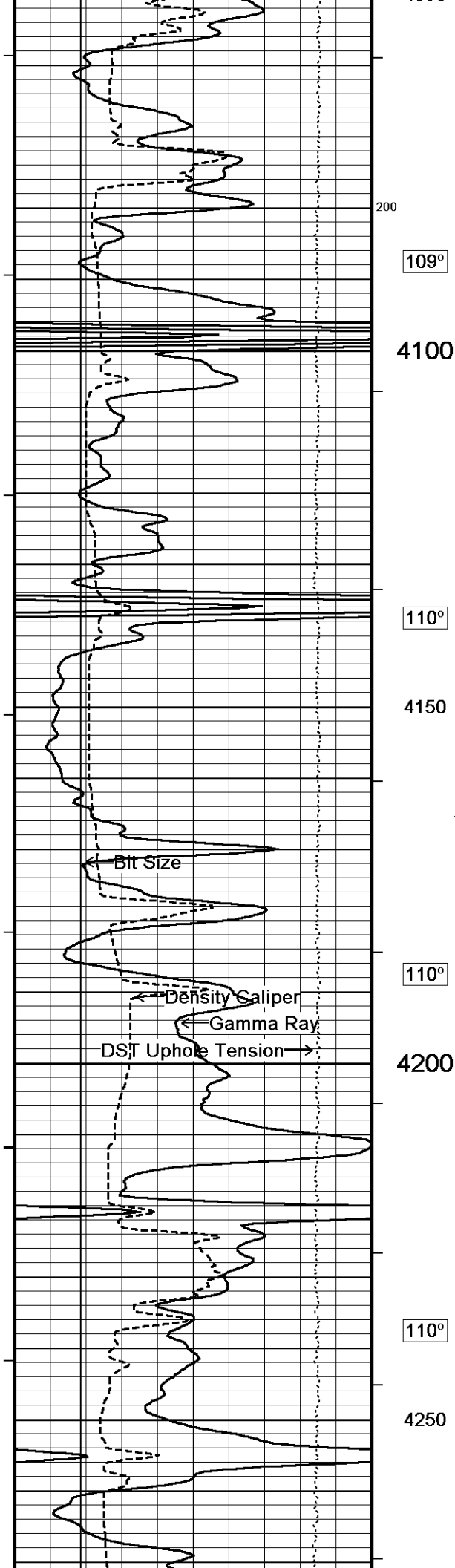










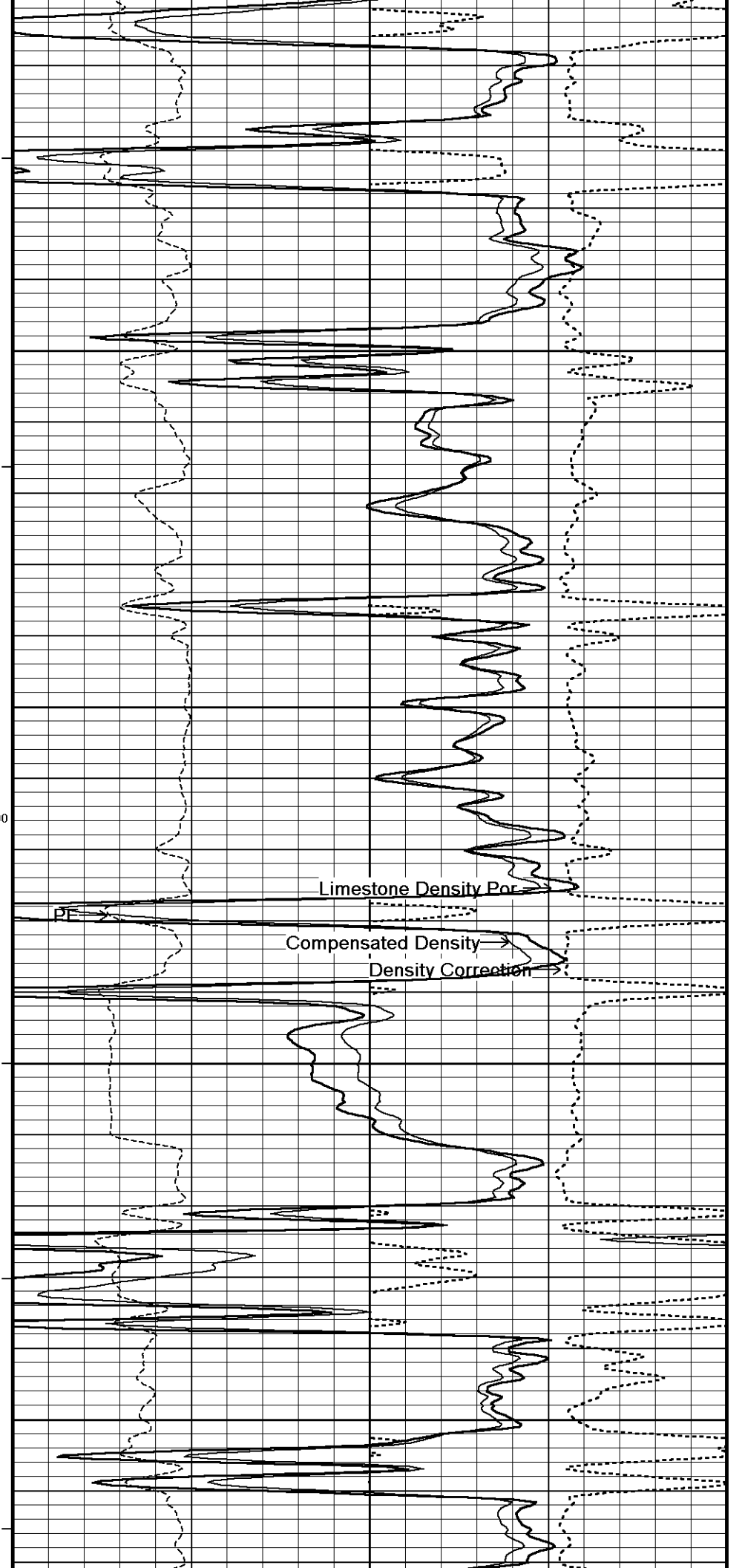


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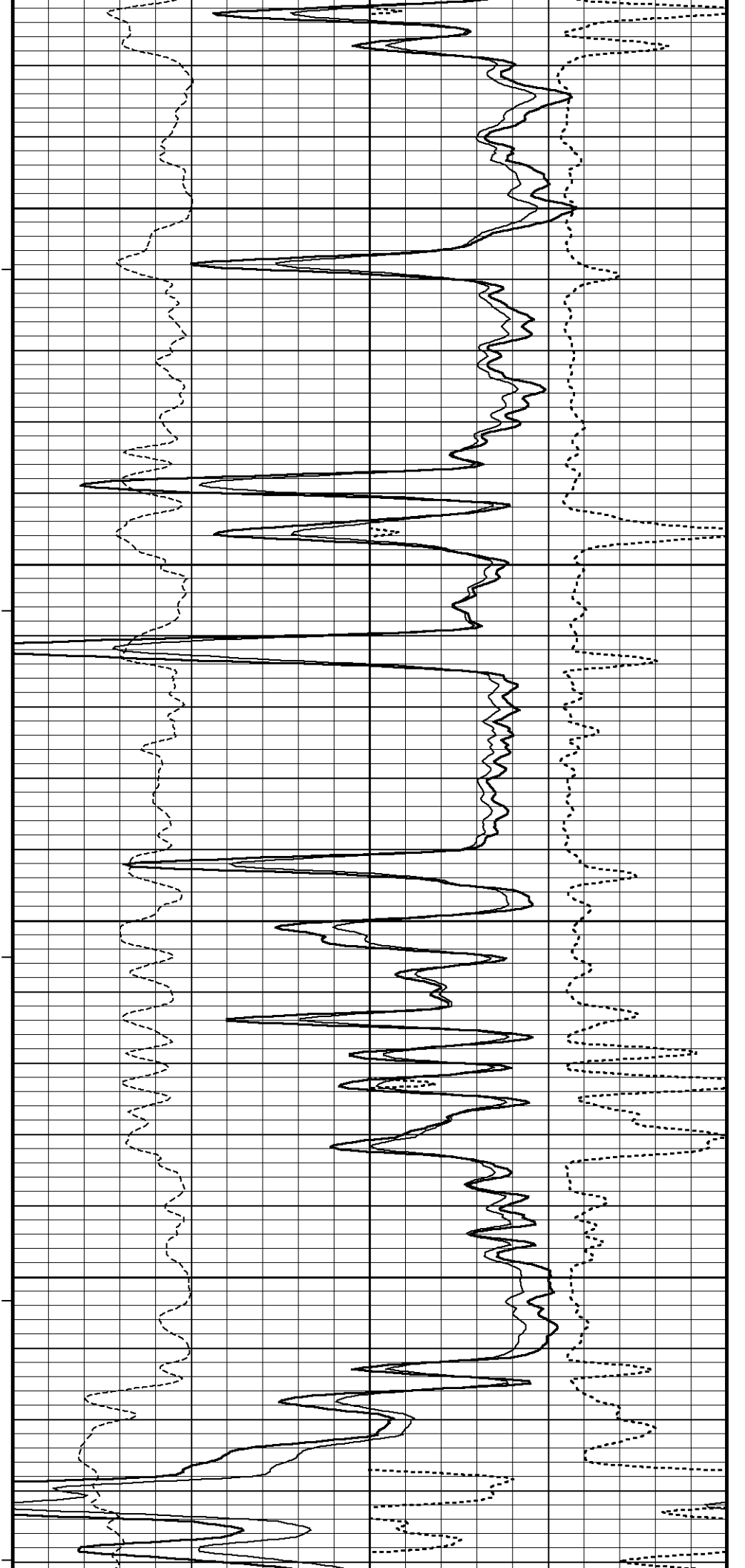
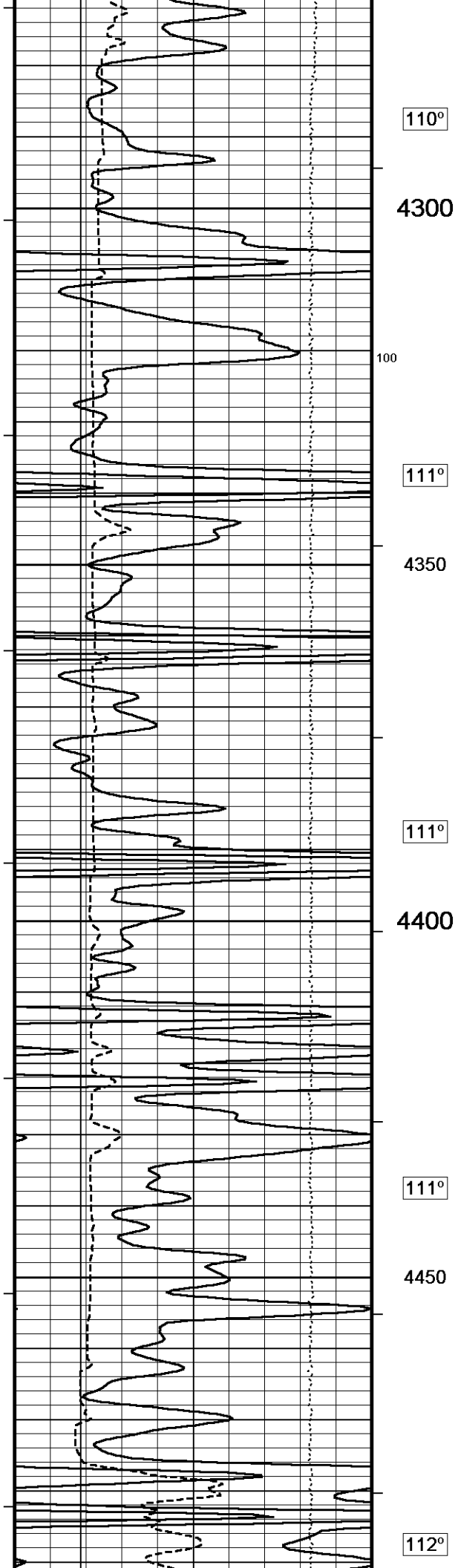
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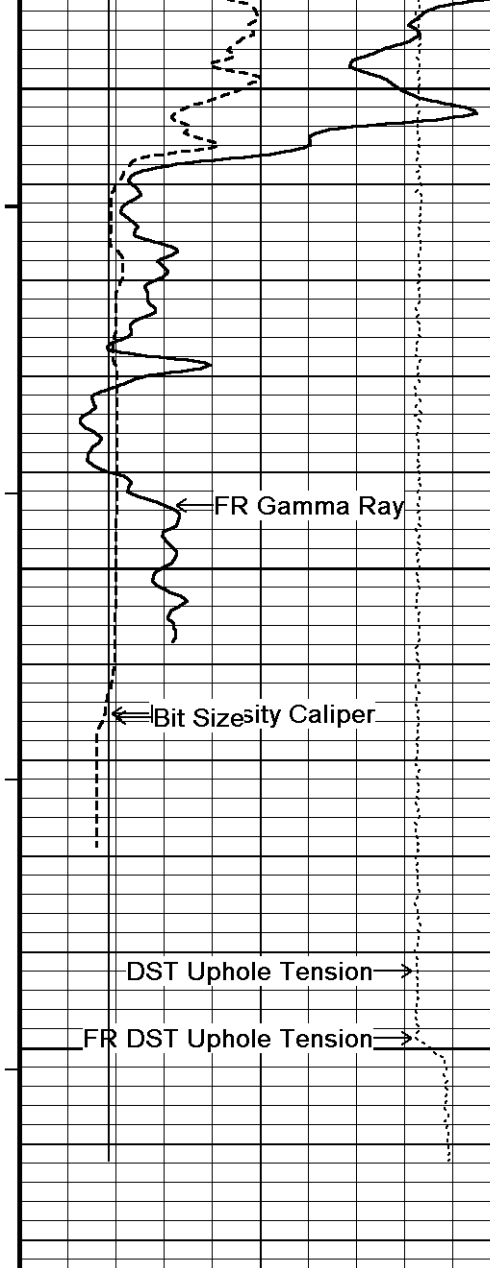
110°

110°



PE





4500

111°

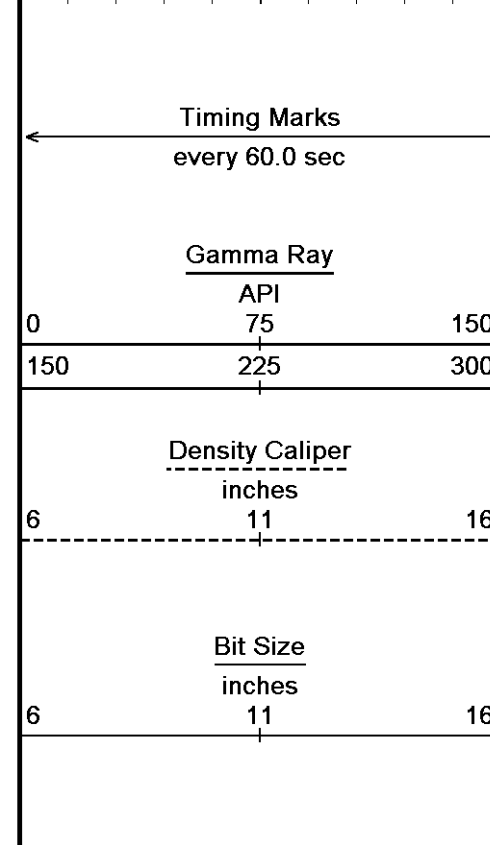
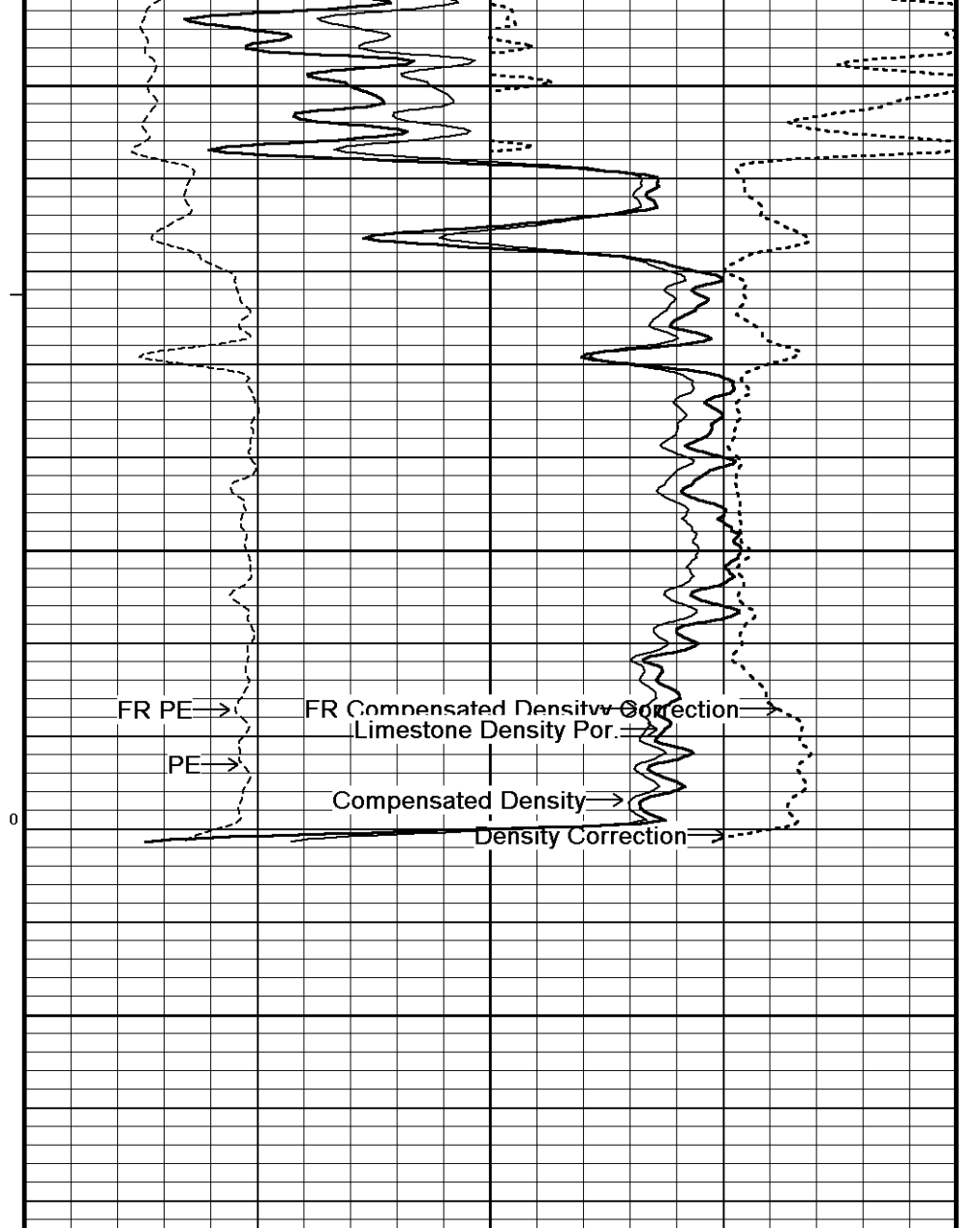
4550

0

4600

4620

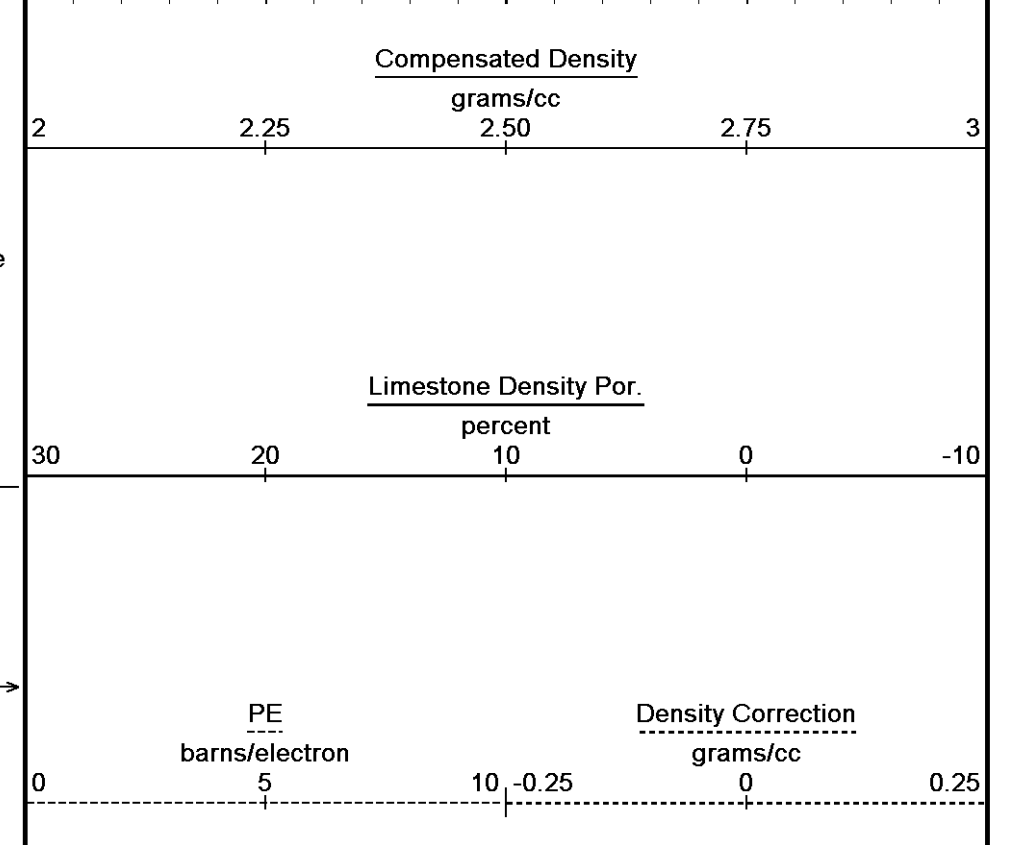
Depth in Feet

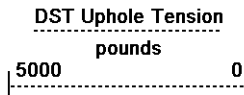


Borehole Temp in deg F

HVI every 10 cu ft

Annular Integral every 10 cu ft





Replay
Scale
1:240

Depth Based Data - Maximum Sampling Increment 10.0cm

Plotted on 16-SEP-2012 01:04

Filename: C:\Minimus 13.02.6600\Data\Shakespeare ...\Shakespeare Oil Company Ottley #1-8_002.dta

Recorded on 15-SEP-2012 22:39

System Versions: Logged with 13.02.6600 Plotted with 13.02.6600



5 INCH MAIN



REPEAT SECTION



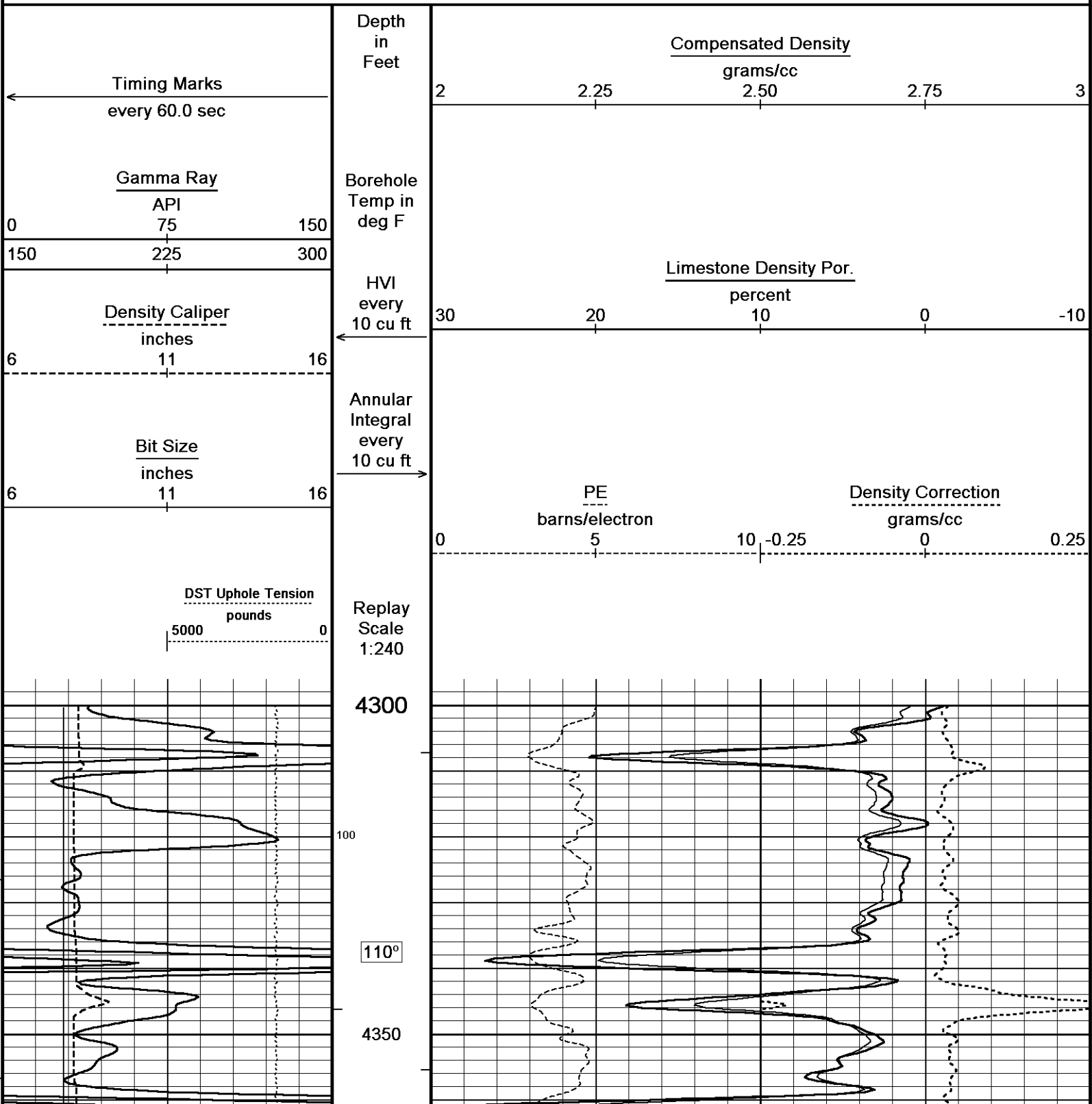
Depth Based Data - Maximum Sampling Increment 10.0cm

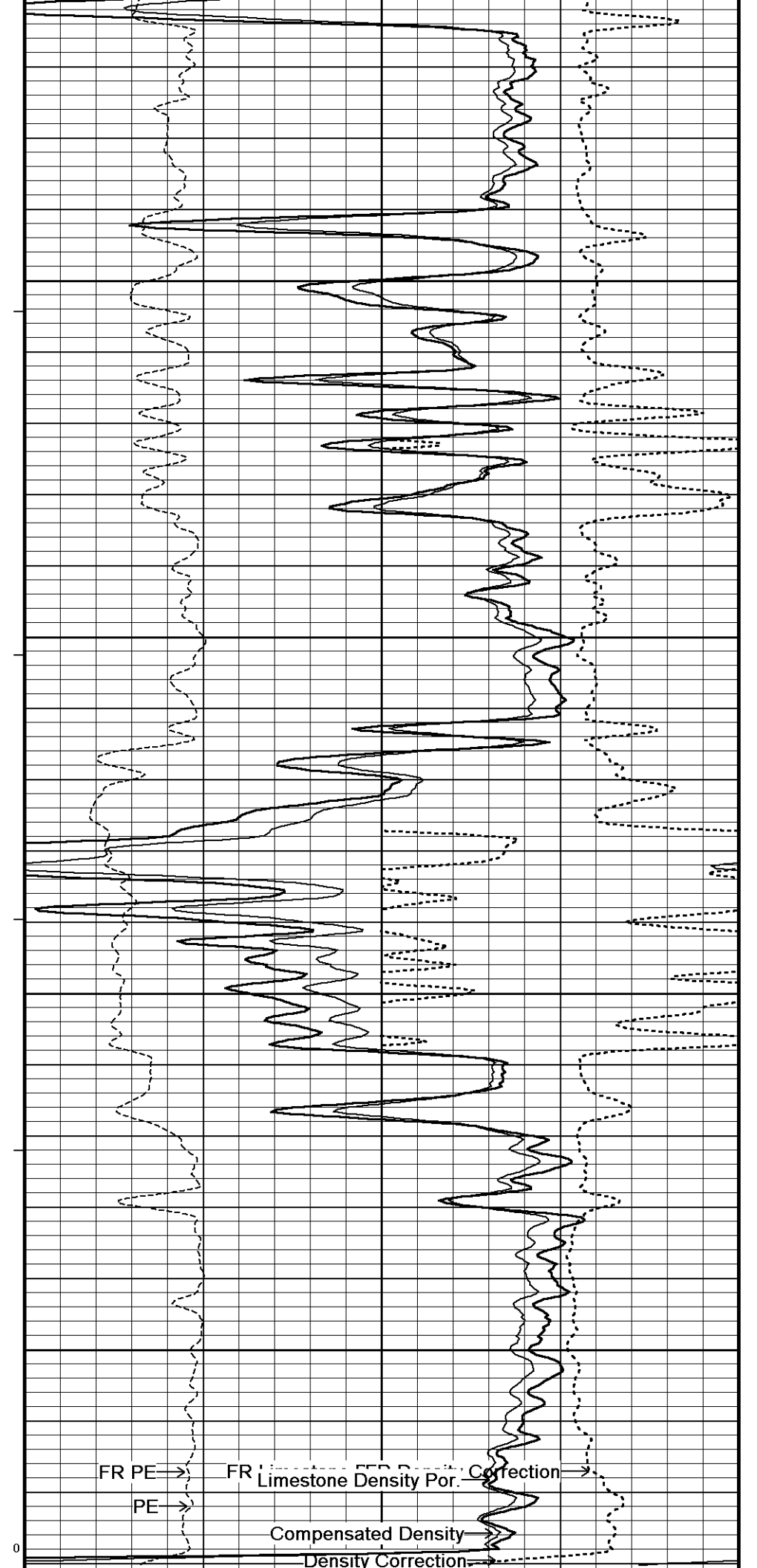
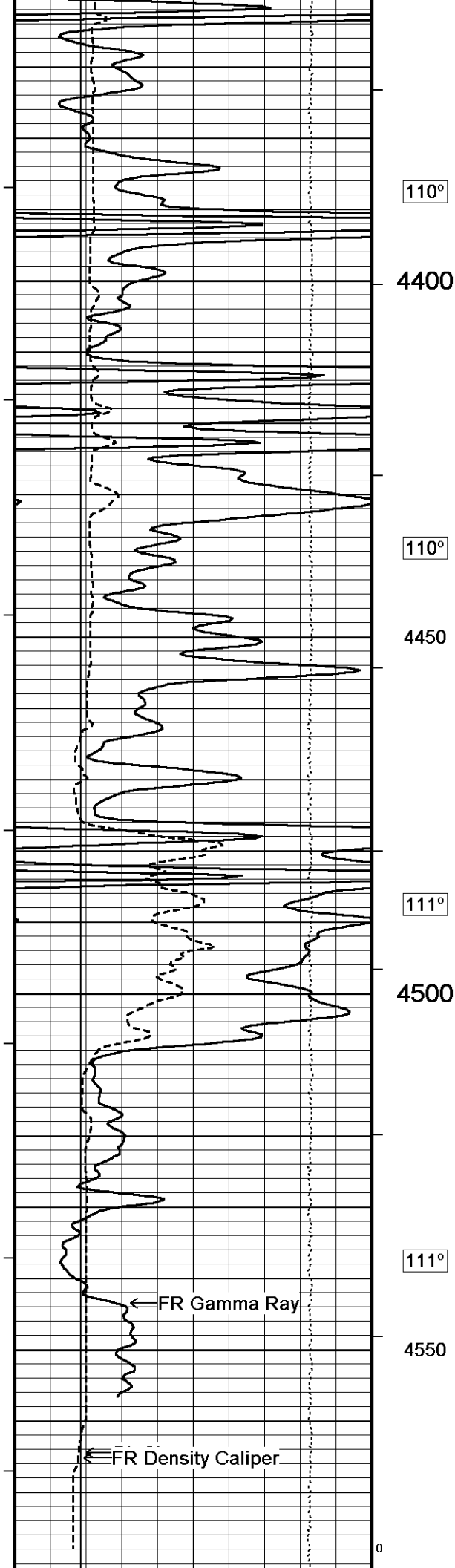
Plotted on 16-SEP-2012 01:04

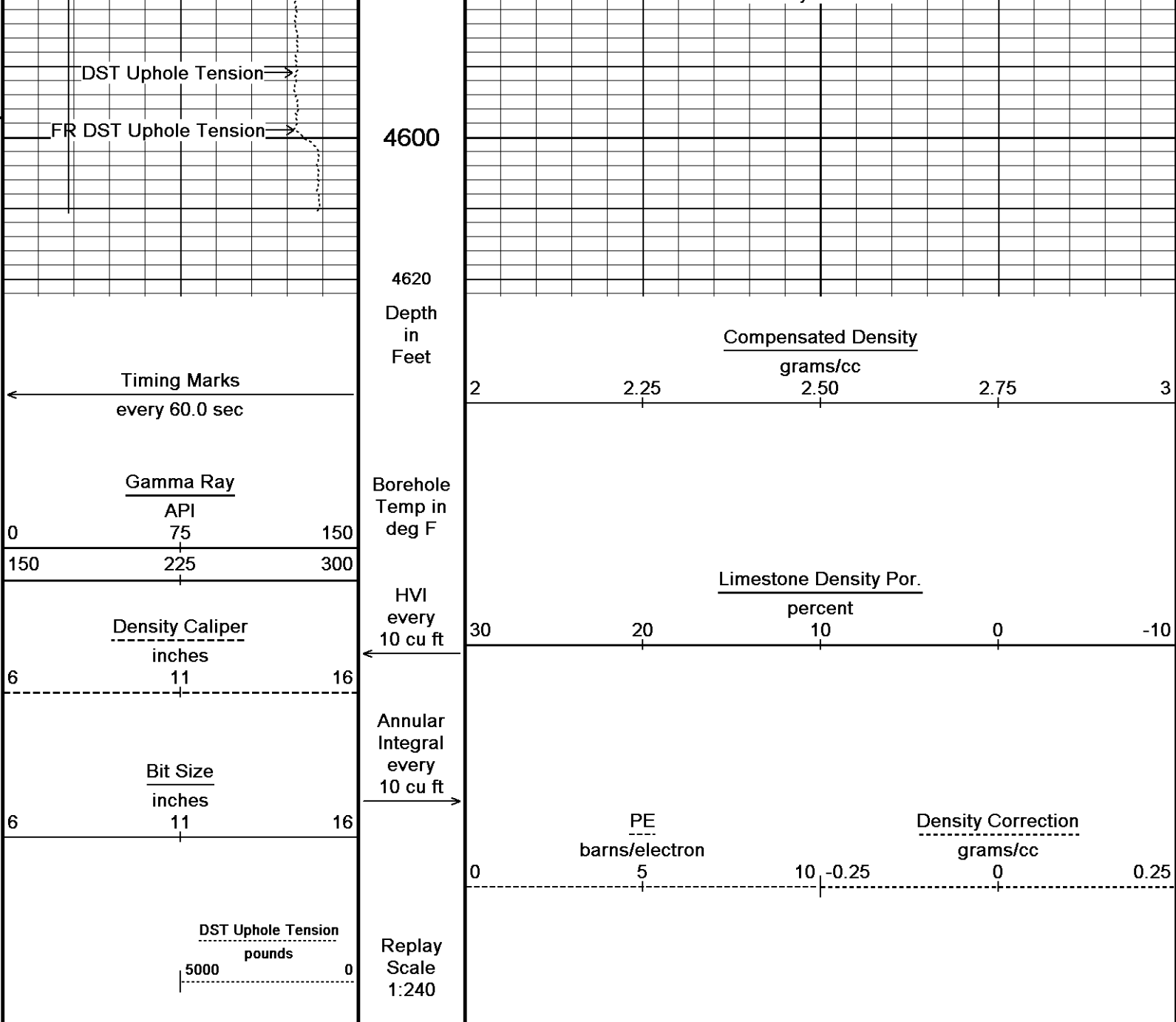
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Recorded on 15-SEP-2012 22:23

System Versions: Logged with 13.02.6600 Plotted with 13.02.6600







Depth Based Data - Maximum Sampling Increment 10.0cm
Filename: C:\Minimus 13.02.6600\Data\Shakespeare Oil Company Ottley #1-8_001.dta
System Versions: Logged with 13.02.6600 Plotted with 13.02.6600

↑ REPEAT SECTION ↑

BEFORE SURVEY CALIBRATION
C:\Minimus 13.02.6600\Data\Shakespeare Oil Company Ottley 1-8\Shakespeare Oil Company Ottley #1-8_001.dta

General Constants All 000 Last Edited on 15-SEP-2012,21:35

General Parameters		
Mud Resistivity	0.510	ohm-metres
Mud Resistivity Temperature	88.000	degrees F
Water Level	0.000	feet
Density/Neutron 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		Base Density Porosity	
Porosity used		Array Ind. Four Res Rt	
Resistivity used		0.610	
RWA Constant A		2.150	
RWA Constant M			
Down-hole Tension Calibration SMS 0			
Field Calibration on 10-SEP-2012 04:28			
Reading No	Measured	Calibrated (lbs)	
1	15456.86	0.00	
2	16071.78	384.00	
Gamma Calibration MCG-D.K 442			
Field Calibration on 15-SEP-2012 17:27			
	Measured	Calibrated (API)	
Background	72	49	
Calibrator (Gross)	1147	774	
Calibrator (Net)	1074	725	
Gamma Constants MCG-D.K 442			
Last Edited on 15-SEP-2012,21:26			
Gamma Calibrator Number	GRC38		
Mud Density	1.10	gm/cc	
Caliper Source for Processing	Density Caliper		
Tool Position	Eccentred		
Concentration of KCl	0.00	kppm	
SP Calibration MCG-D.K 442			
Field Calibration on 17-JUL-2012 16:34			
	Measured	Calibrated (mV)	
Reference 1	100.2	100.0	
Reference 2	-99.9	-100.0	
High Resolution Temperature Calibration MCG-D.K 442			
Field Calibration on 17-JUL-2012,16:35			
	Measured	Calibrated(Deg F)	
Lower	50.00	50.00	
Upper	100.00	100.00	
High Resolution Temperature Constants MCG-D.K 442			
Last Edited on			
Pre-filter Length	11		
Caliper Calibration MML-A 16			
Base Calibration		Field Calibration on 15-SEP-2012 17:20	
Reading No	Measured	Calibrator Size (in)	
1	13823	5.98	
2	16876	7.97	
3	20058	9.86	
4	23883	11.92	
5	0	0.00	
6	N/A	N/A	
Field Calibration			
	Measured Caliper (in)	Actual Caliper (in)	
	6.02	5.98	
Micro Normal and Micro Inverse Calibration MML-A 16			
Base Calibration		Field Check on 15-SEP-2012 17:21	
	Measured	Calibrated (ohm-m)	
Channel	Resistor 1	Resistor 2	Resistor 1
Micro Normal	12.1	60.2	5.0
Micro Inverse	15.6	78.3	5.0
	Base Check (ohm-m)	Field Check (ohm-m)	
Micro Normal	62.9	62.9	
Micro Inverse	48.2	48.2	
Micro Normal and Micro Inverse Constants MML-A 16			
Last Edited on 15-SEP-2012,17:20			
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

Neutron Calibration MDN-A.B 66

Base Calibration on 07-SEP-2012 14:38
Field Check on 15-SEP-2012 17:32

Base Calibration

	Measured		Calibrated (cps)	
	Near	Far	Near	Far
	3154	98	3714	110
Ratio	32.161		33.764	

Field Calibrator at Base

	Calibrated (cps)	
	1643	2350
Ratio	0.699	

Field Check

	Calibrated (cps)	
	1632	2346
Ratio	0.696	

Neutron Constants MDN-A.B 66

Last Edited on 15-SEP-2012,17:28

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	Constant Value	
Formation Pressure	0.00	kpsi
Temperature Source	Constant Value	
Temperature	68.00	degrees F
Mud Salinity	0.00	kppm
Salinity Correction	Not Applied	
Formation Fluid Salinity Source	Constant Value	
Formation Fluid Salinity	0.00	kppm
Barite Mud Correction	Not Applied	

FE Calibration MFE-B.J 353

Base Calibration on 27-AUG-2012 09:28
Field Check on 15-SEP-2012 17:12

Base Calibration

	Measured	Calibrated (ohm-m)
Reference 1	0.0	0.0
Reference 2	964.3	126.8

Base Check	281.0
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Field Check	281.0
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FE Constants MFE-B.J 353

Last Edited on 15-SEP-2012,17:11

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 15-SEP-2012,21:16

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 Sonic	
Correction for Sonde Skew	Applied	
Cycle Stretch Algorithm	Applied	

MN3FT	N/A	micro-sec
MX3FT	N/A	micro-sec
Hunt-Raymer Constant	83.13	micro-sec/ft

Sonde Mode	Compensated
Hole Type	Open Hole

Sonde Parameters

	Measured	Calibrated
Offset	N/A	0.0000
Free Pipe	N/A	N/A
Peak Amplitude Source	N/A	

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)	N/A	
N/A	N/A	N/A		
N/A	N/A	N/A		N/A
N/A	N/A	N/A		N/A
N/A	N/A	N/A		N/A
N/A	N/A	N/A		N/A

Full Waveform Parameters

Use 3' Waveform to derive TR	N/A	
Use 4' Waveform to derive TR	N/A	
Use 5' Waveform to derive TR	N/A	
Use 6' Waveform to derive TR	N/A	
3' Waveform Discriminator Level	N/A	mV
4' Waveform Discriminator Level	N/A	mV
5' Waveform Discriminator Level	N/A	mV
6' Waveform Discriminator Level	N/A	mV
3' Waveform Filter	N/A	
4' Waveform Filter	N/A	
5' Waveform Filter	N/A	
6' Waveform Filter	N/A	
Semblance Level	N/A	
Semblance Window Width	N/A	micro-sec
Sonic 1 Despiker	N/A	N/A
Sonic 2 Despiker	N/A	N/A

High Resolution Temperature Calibration MAI-A.A 167			Field Calibration on 17-JUL-2012,13:53
	Measured	Calibrated(Deg F)	
Lower	1.00	33.80	
Upper	11.00	51.80	

High Resolution Temperature Constants MAI-A.A 167		Last Edited on 17-JUL-2012,13:49
Pre-filter Length	11	

Induction Calibration MAI-A.A 167	Base Calibration on 17-JUL-2012,13:55
	Field Check on 15-SEP-2012 17:10

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	Low	0.0	High	0.0	Low	13.3	High	3839.2
2		0.0		0.0		29.7		3476.8
3		0.0		0.0		29.2		3053.0
4		0.0		0.0		19.8		2081.7
Deep		0.0		0.0		18.7		2049.0
Medium		0.0		0.0		42.2		3991.1
Shallow		0.0		0.0		43.0		5053.9
Array Temperature				0.0			79.1	Deg F

Induction Constants MAI-A.A 167

Last Edited on 15-SEP-2012,21:16

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
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	

Caliper Calibration MPD-B 64

Base Calibration on 07-SEP-2012 15:19

Field Calibration on 15-SEP-2012 17:14

Base Calibration		
Reading No	Measured	Calibrator Size (in)
1	12187	3.99
2	20933	5.98
3	29363	7.97
4	37866	9.86
5	47152	11.92
6	N/A	N/A
Field Calibration		
	Measured Caliper (in)	Actual Caliper (in)
	5.92	5.98

Photo Density Calibration MPD-B 64

Base Calibration on 07-SEP-2012 15:36

Field Check on 15-SEP-2012 17:19

Density Calibration				
Base Calibration		Measured	Calibrated (sdu)	
	Near	Far	Near	Far
Reference 1	63262	35109	59556	30836

Reference 2 26458 3017 24941 2541

Field Check at Base

1187.6 1377.3

Field Check

1184.2 1371.4

PE Calibration

Base Calibration

Measured

Calibrated

WS

WH

Ratio

Ratio

Background

215

1060

Reference 1

23956

63052

0.383

0.371

Reference 2

7220

26320

0.277

0.272

Field Check at Base

215.3

1059.6

Field Check

212.7

1055.5

Density Constants MPD-B 64

Last Edited on 15-SEP-2012,21:26

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)

2.87

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 13.02.6600\Data\Shakespeare Oil Company Ottley 1-8\Shakespeare Oil Company Ottley #1-8_001.dta

Compact Comms Gamma

MCG-D.K 442 LG: 8.70 ft WT: 63.9 lb OD: 2.24 in

55.39 ft

GRGC - Gamma Ray

52.48 ft

CGXT - MCG External Temperature

Compact Micro-log

MML-A 16 LG: 7.97 ft WT: 81.6 lb OD: 2.24 in

45.76 ft

MINV - Micro-inverse

45.76 ft

MNRL - Micro-normal

46.76 ft

MLTC - MML Caliper

Compact Neutron

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

40.97 ft

NPRL - Limestone Neutron Por.

Compact Density/Caliper

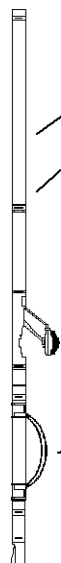
MPD-B 64 LG: 9.59 ft WT: 90.4 lb OD: 2.45 in

33.73 ft

AVOL - Annular Volume

33.73 ft

HVOL - Hole Volume

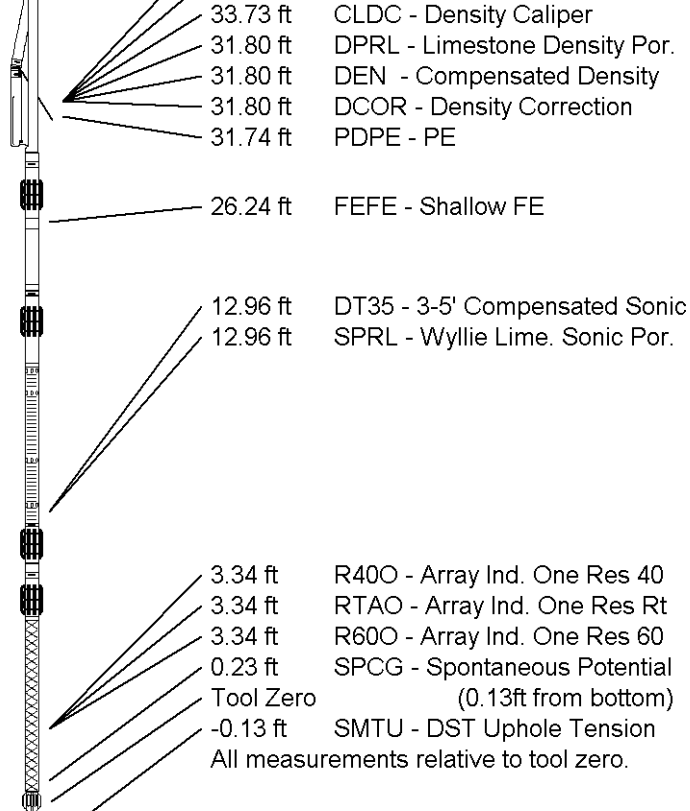


Compact Focussed Electric
MFE-B.J 353 LG: 6.05 ft WT: 48.5 lb OD: 2.24 in

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: 60.68 ft Weight: 456.4 lb



COMPANY	SHAKESPEARE OIL COMPANY, INC.
WELL	OTTLEY #1-8
FIELD	WILDCAT
PROVINCE/COUNTY	LOGAN
COUNTRY/STATE	U.S.A. / KANSAS

Elevation Kelly Bushing	2853.00	feet	First Reading	4567.00	feet
Elevation Drill Floor	2852.00	feet	Depth Driller	4600.00	feet
Elevation Ground Level	2843.00	feet	Depth Logger	4599.00	feet



Weatherford®

COMPACT PHOTO DENSITY
COMPENSATED NEUTRON
MICRORESISTIVITY LOG