

**Weatherford****COMPACT PHOTO DENSITY
COMPENSATED NEUTRON**

COMPANY

SHAKESPEARE OIL COMPANY, INC.

WELL

FREY 3-9

FIELD

STRATFORD WEST

PROVINCE/COUNTY

LOGAN

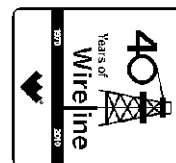
COUNTRY/STATE

U.S.A./KANSAS

LOCATION

2520' FSL & 1000' FEL

SE/4



SEC TW/P RGE Other Services

9 13S 32W

MML

API Number 15-109-20993

MAL/MFE

Permit Number

MSS

Permanent Datum G.L., Elevation 2989 feet

Log Measured From K.B. @ 10 FEET above Permanent Datum

Drilling Measured From K.B.

Elevations:
KB 2999.00
DF 2997.00
GL 2989.00

Date 02-MAY-2011

Run Number ONE

Depth Driller 4710.00 feet

Depth Logger 4706.00 feet

First Reading 4670.00 feet

Last Reading 2450.00 feet

Casing Driller 224.00 feet

Casing Logger 224.00 feet

Bit Size 7.875 inches

Hole Fluid Type CHEMICAL

Density / Viscosity 9.40 lb/USg 57.00 CP

PH / Fluid Loss 9.50 9.60 ml/30Min

Sample Source FLOWLINE

Rm @ Measured Temp 1.25 @ 75.0 ohm-m

Rmf @ Measured Temp 1.0 @ 75.0 ohm-m

Rmc @ Measured Temp 1.50 @ 75.0 ohm-m

Source Rmf / Rmc CALC CALC

Rm @ BHT 0.83 @ 113.0 ohm-m

Time Since Circulation 4 hours

Max Recorded Temp 113.00 deg F

Equipment Name COMPACT

Equipment / Base 13025 LIB

Recorded By S. TOTTEY

Witnessed By STEVE DAVIS

S.O. #/JOB # 3529184 LB11-097

BOREHOLE RECORD

Last Edited: 02-MAY-2011 09:43

Bit Size
inches

7.875

Depth From
feet

224.00

Depth To
feet

4706.00

CASING RECORD

Type

Size
inches

8.625

Depth From
feet

0.00

Shoe Depth
feet

224.00

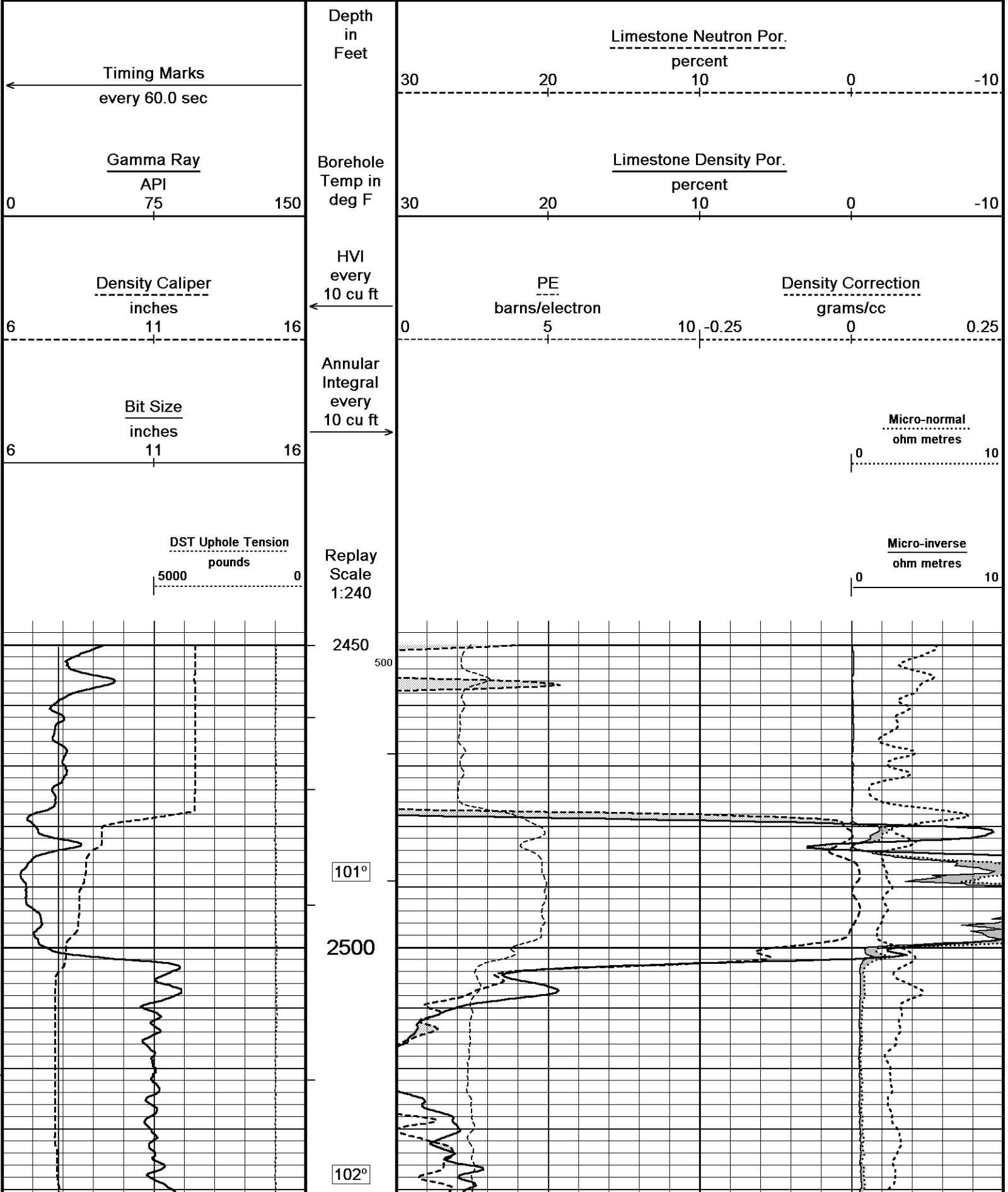
Weight
pounds/ft

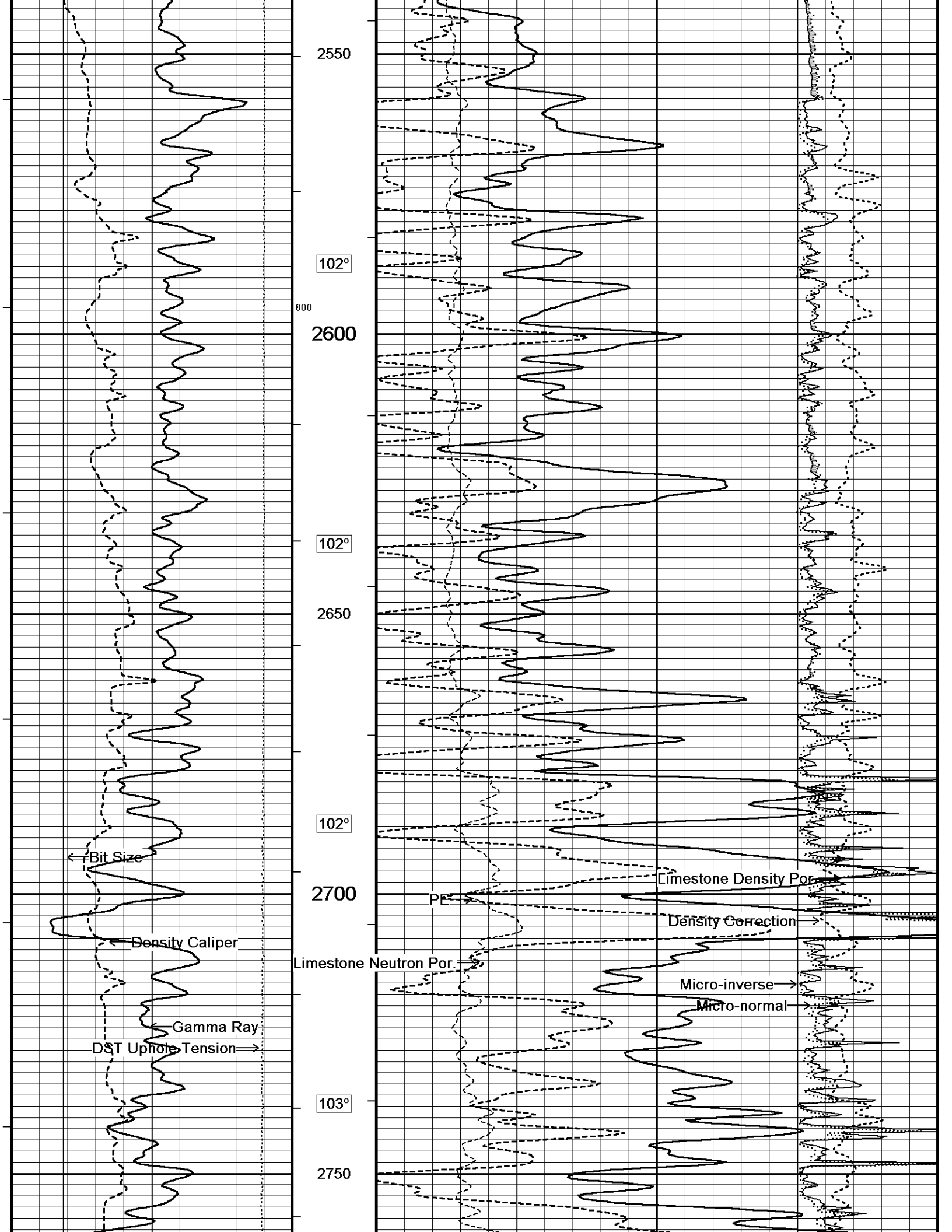
24.00

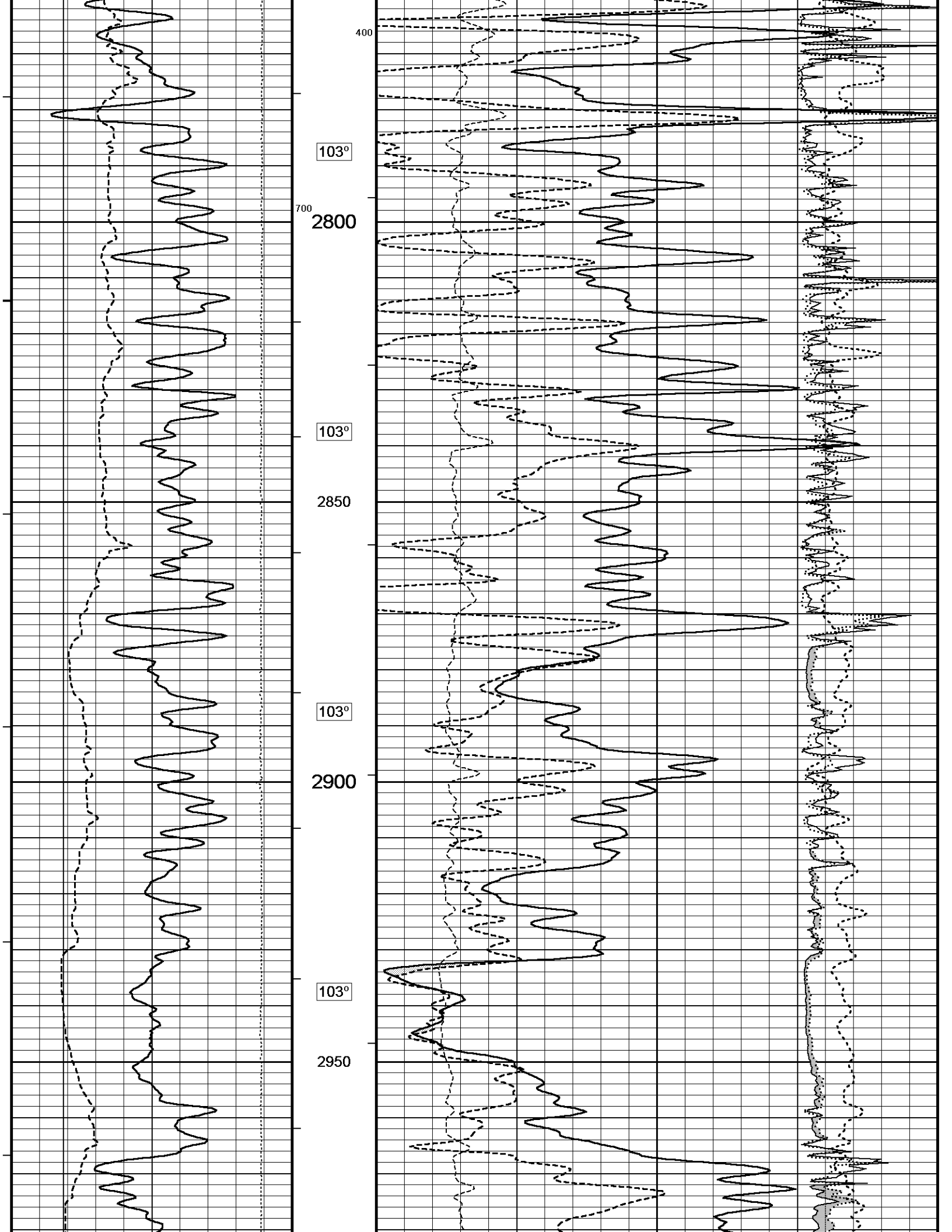
REMARKS

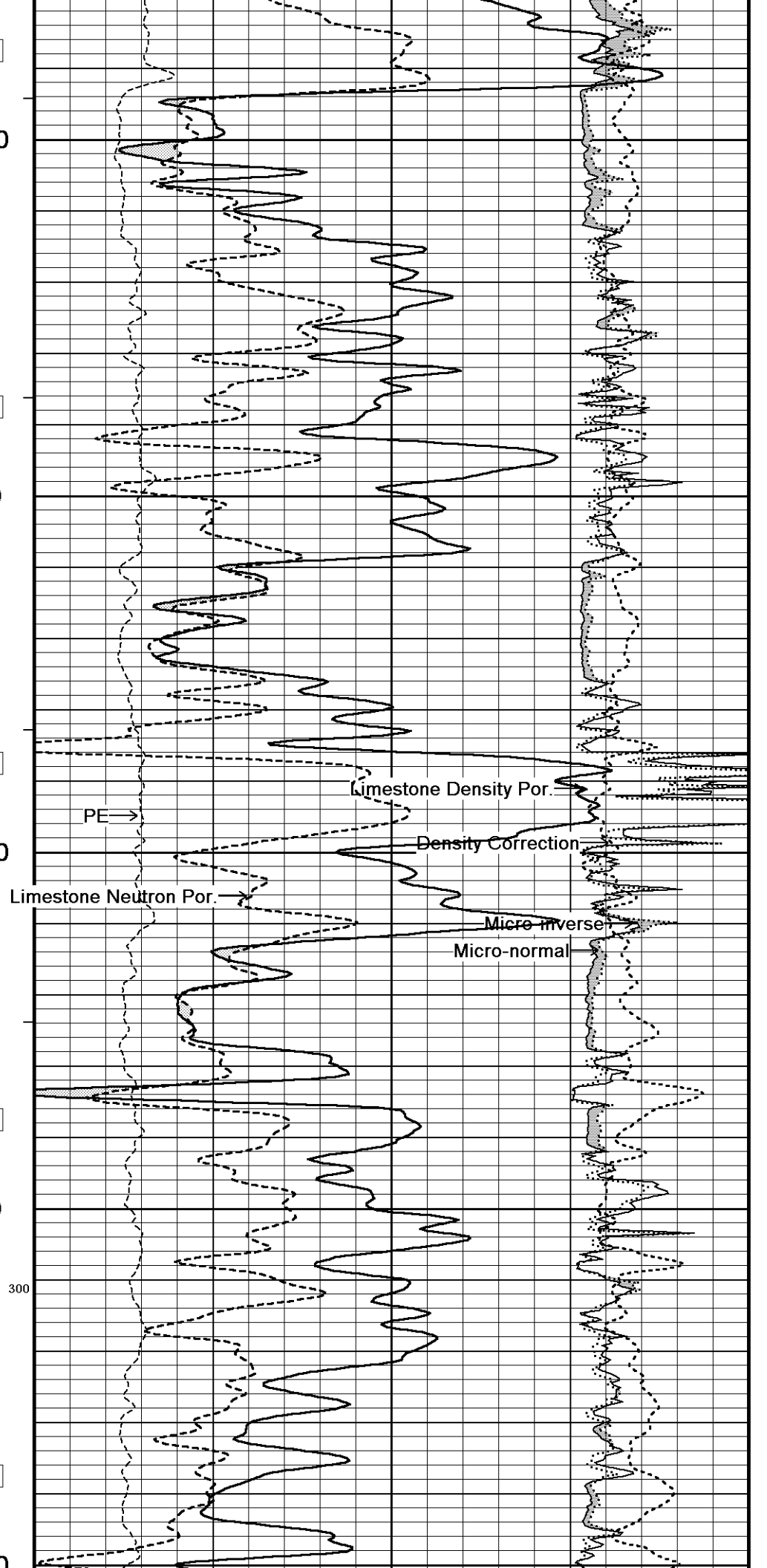
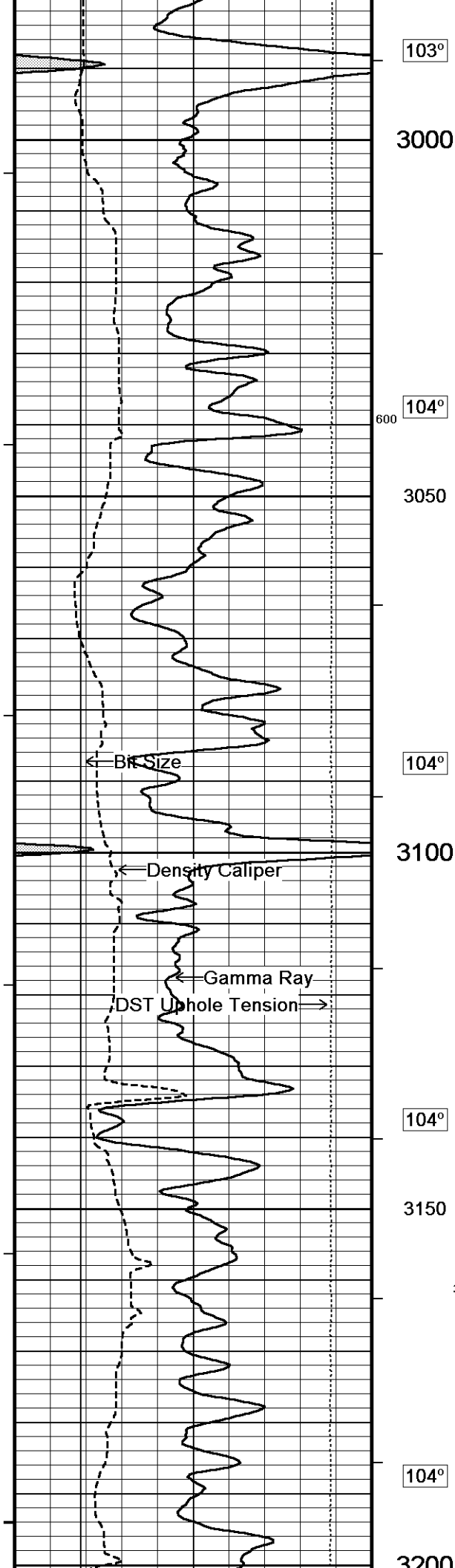
Tools Used: MAI, MPD, MCG, MDN, MML, MFE, SKJ, MSS
Hardware: MPD: 8 inch profile plate. MAI, MSS and MFE: 0.5 Inch standoffs used. MDN: Dual Bowspring used.
2.71 G/CC Limestone density matrix used to calculate porosity.
Sonic porosity calculated on a limestone scale (47.5 usec/ft).
Borehole rugosity, 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 = 520 cu. ft.
Total hole volume with out production casing= 900 cu. ft.
Service order #3529184
Rig: H-D Drilling #2
Engineer: S. Tottey, A. Sill
Operator(s): J. LaPoint

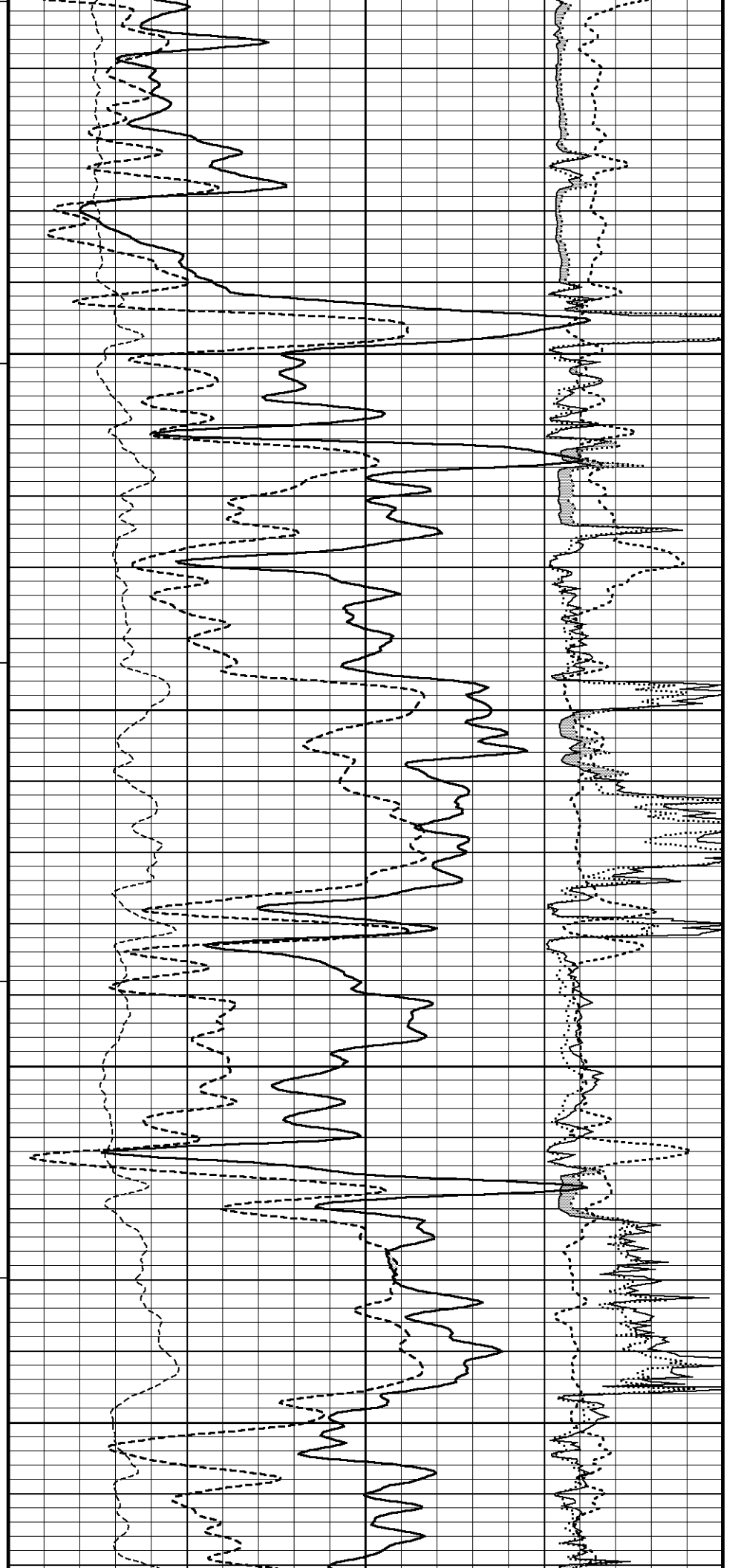
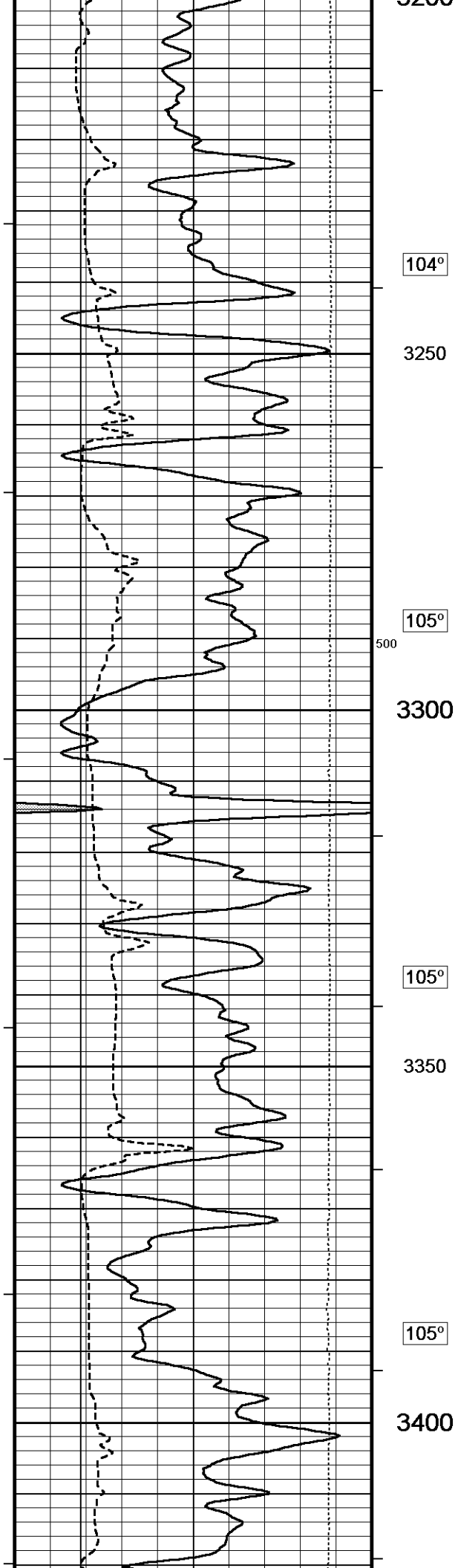
All interpretations are opinions based on inferences from electrical or other measurements and we cannot, and do not, guarantee the accuracy or correctness of any interpretations, and we shall not, except in the case of gross or wilful negligence on our part, be liable or responsible for any loss, costs,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

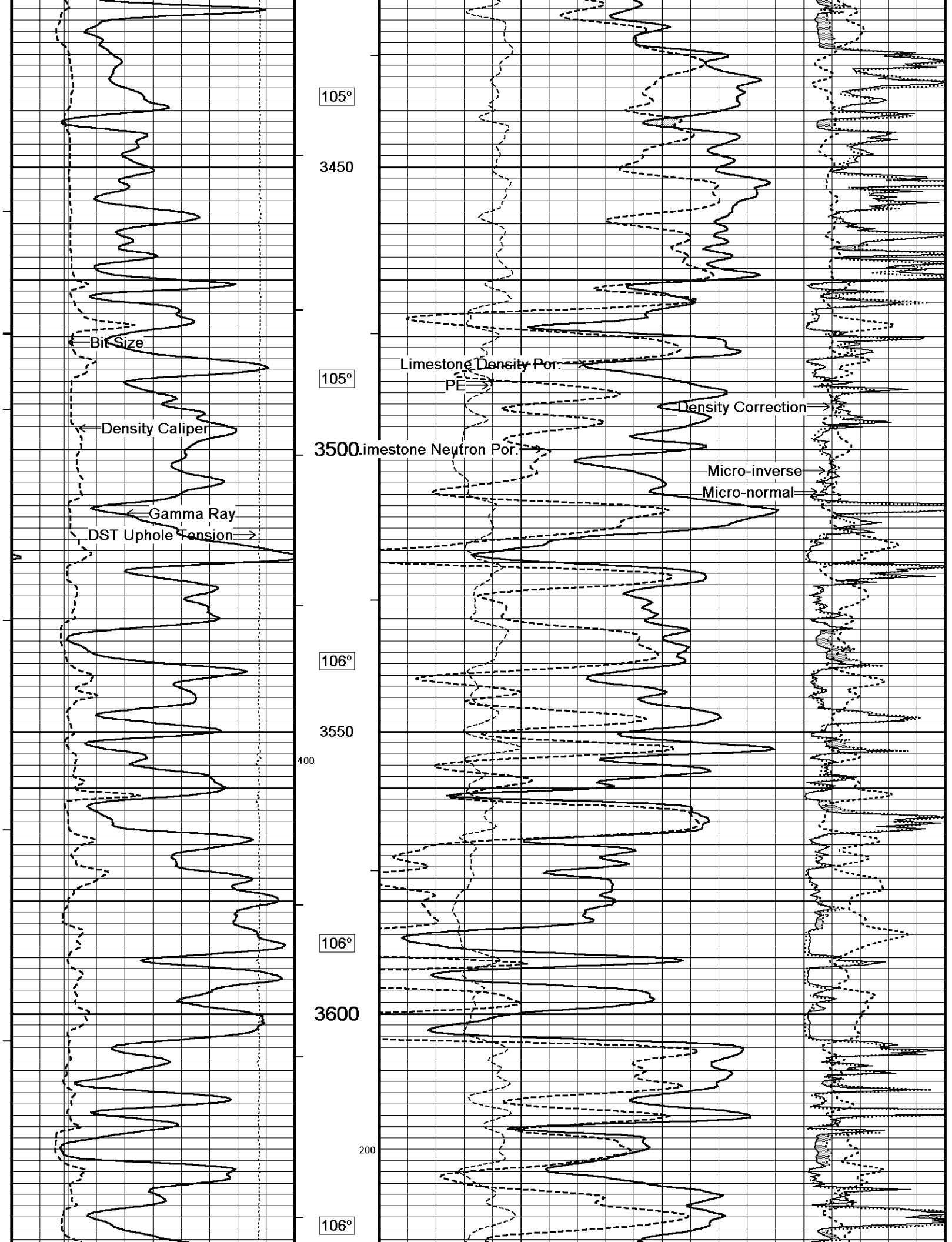


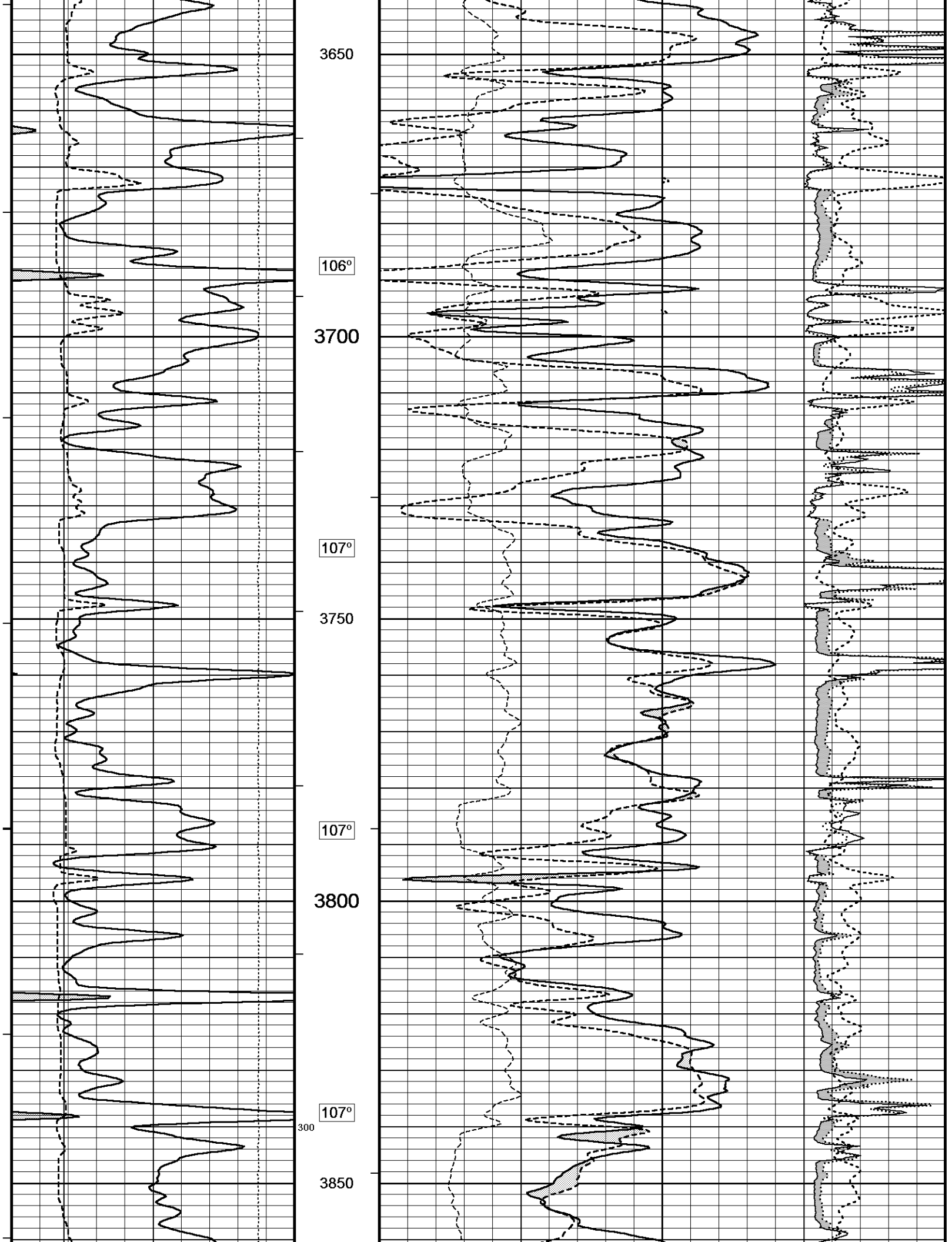


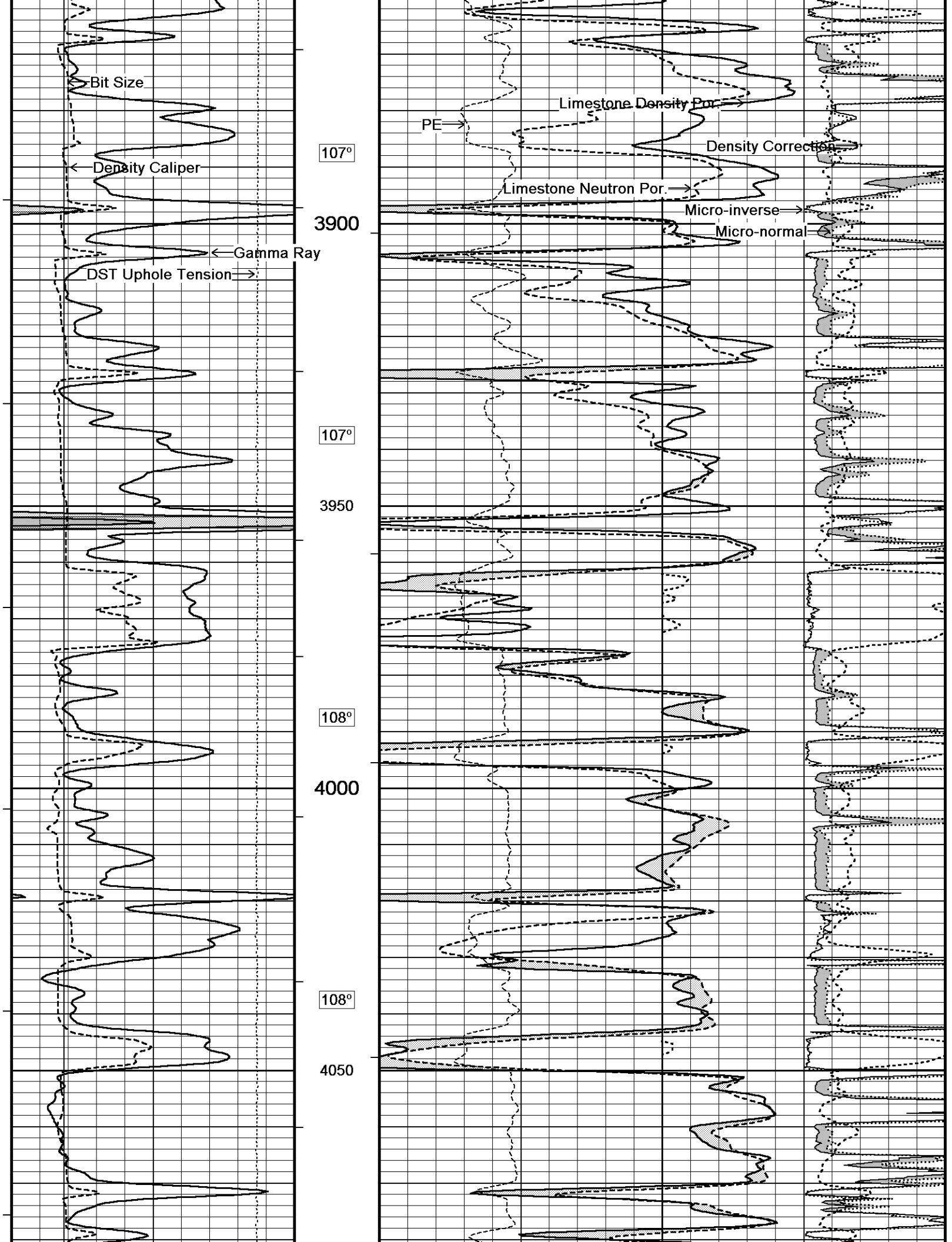


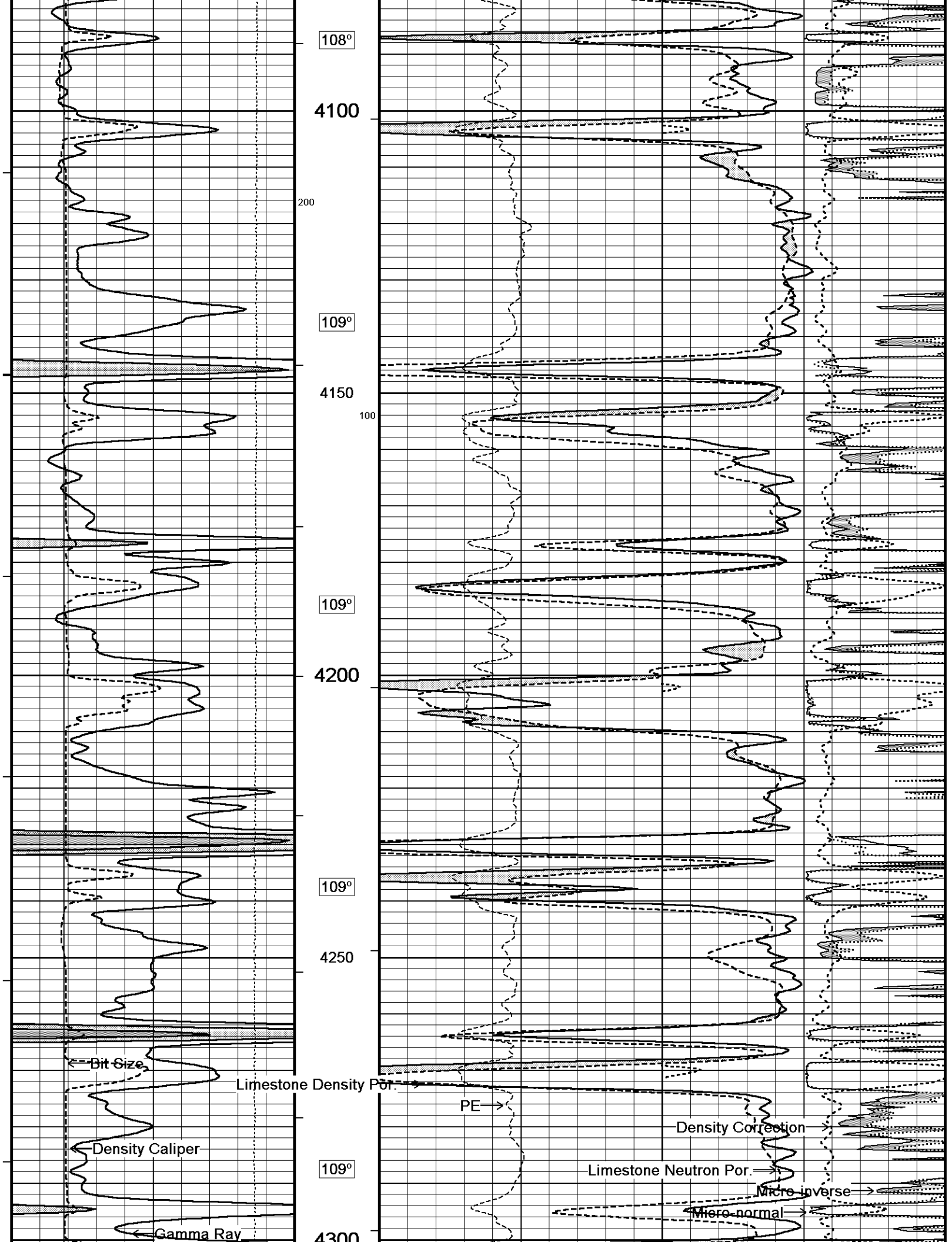


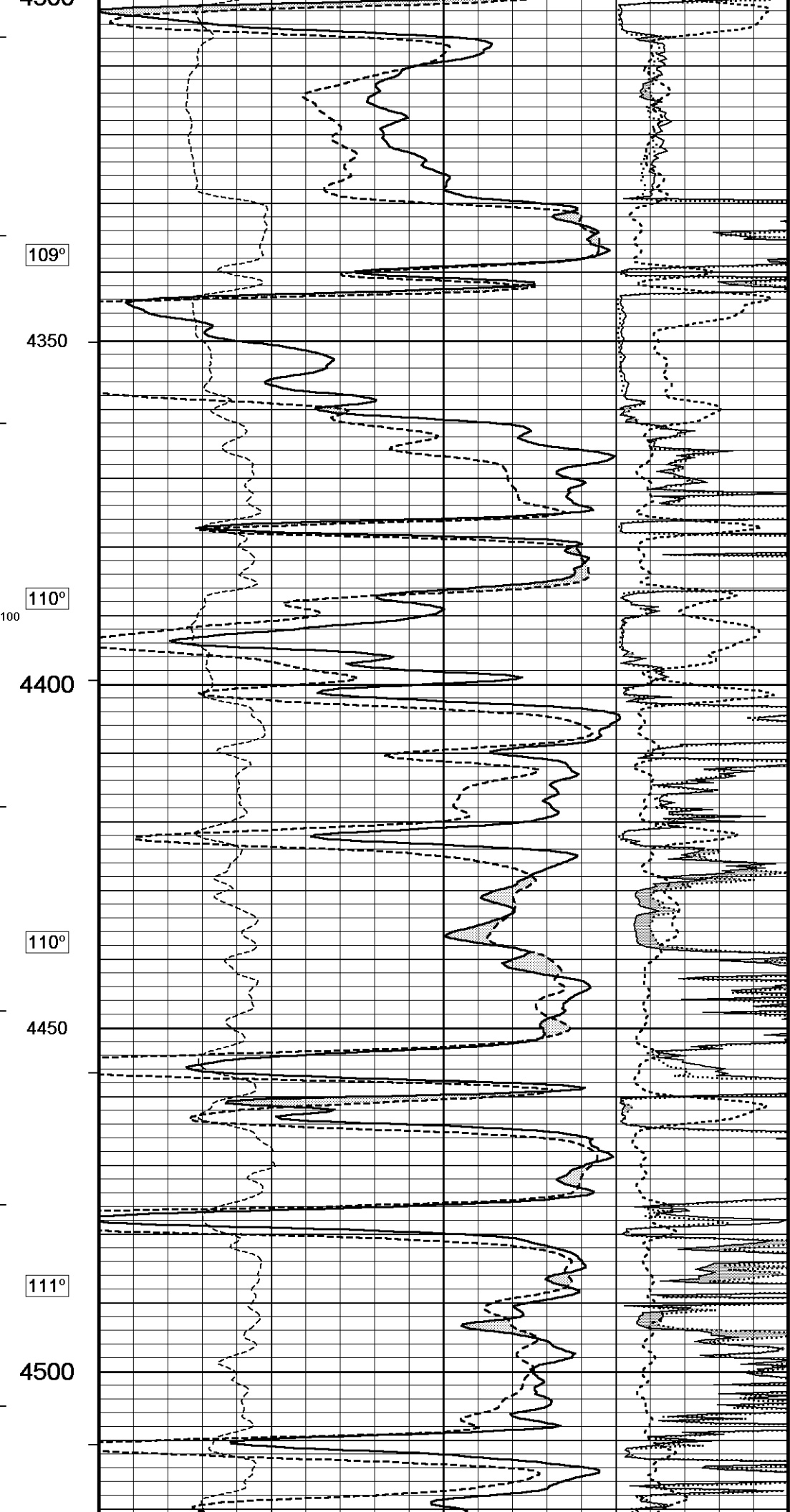
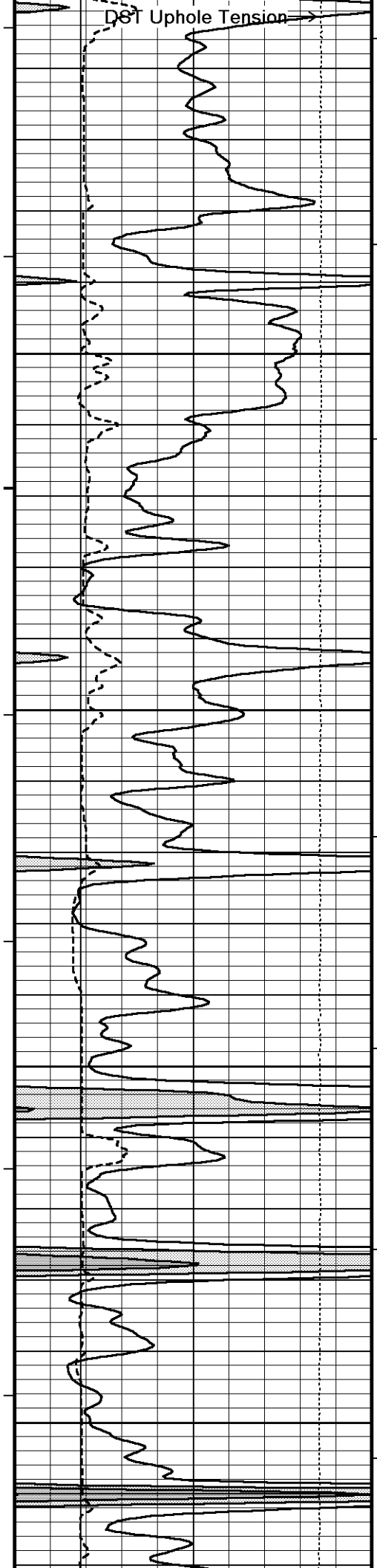


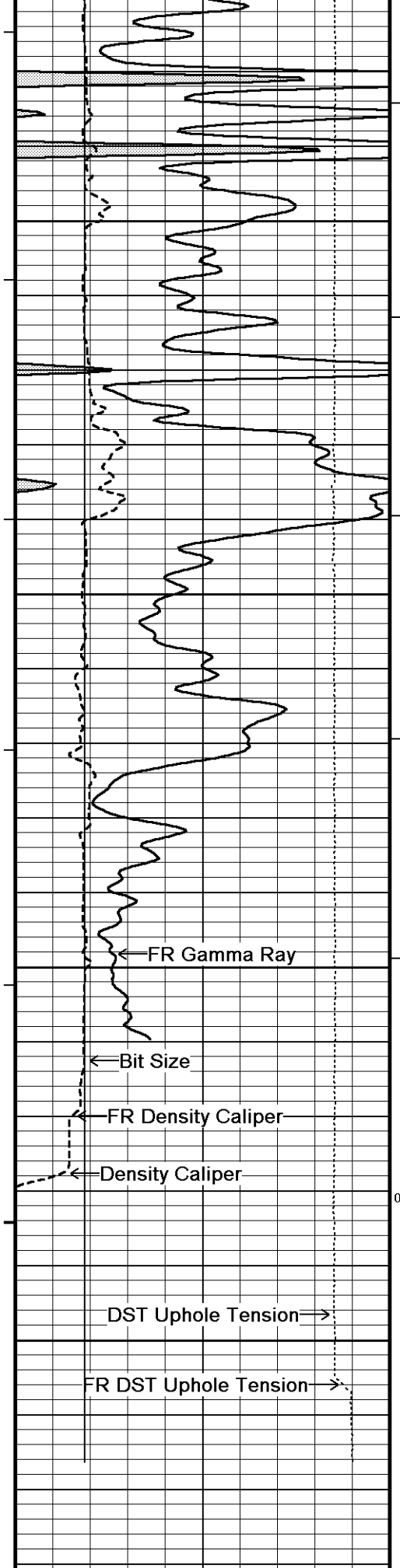




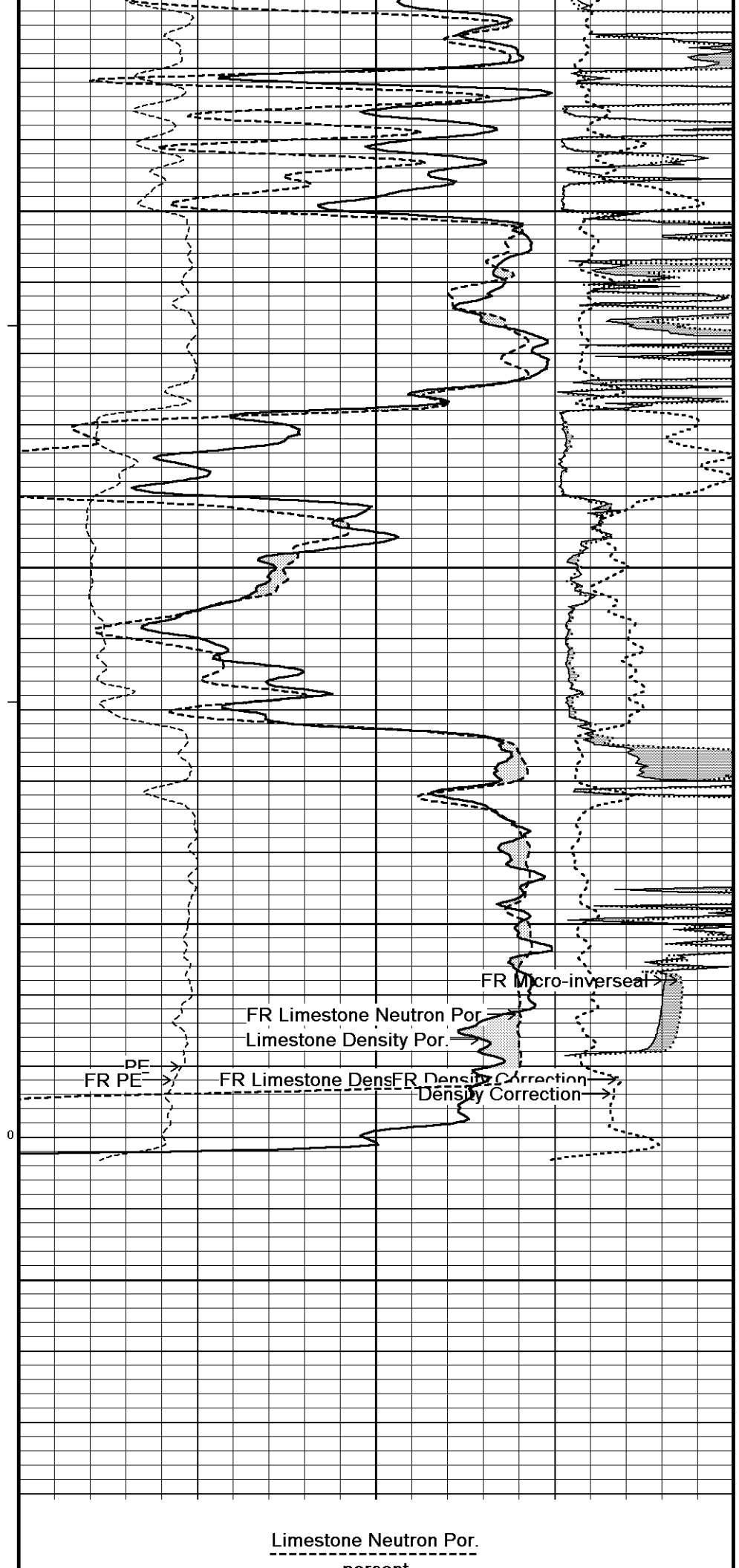


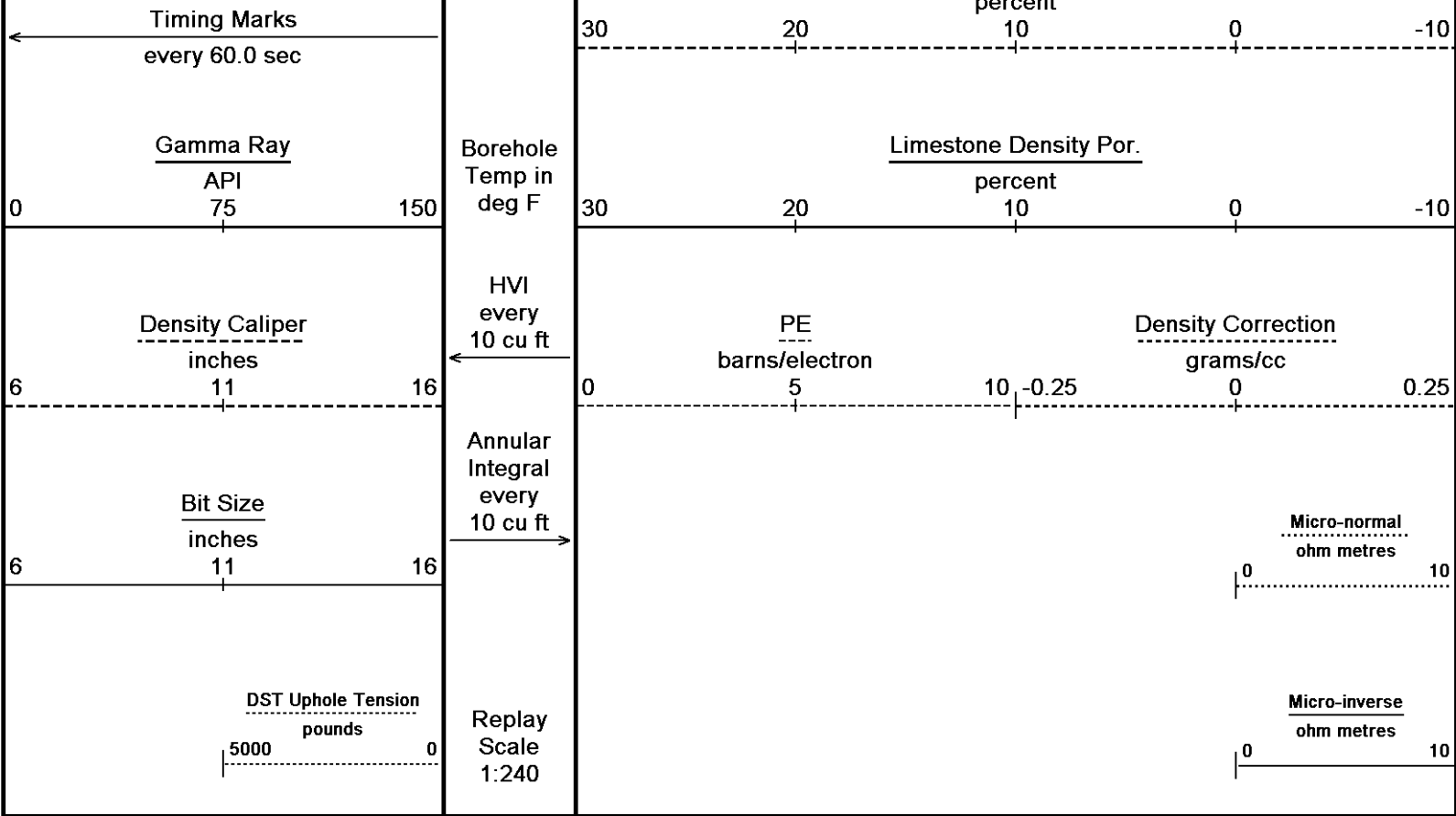






112°
4550
113°
4600
113°
4650
0
4700
4728
Depth
in
Feet





Depth Based Data - Maximum Sampling Increment 10.0cmPlotted on 02-MAY-2011 10:38

Filename: C:\Minimus 11.03.2789\Data\Shakespear Frey 3-9\Frey 3-9_002 spooled section1.dtaRecorded on 02-MAY-2011 09:30

System Versions: Logged with 11.03.2789Plotted with 11.03.2789

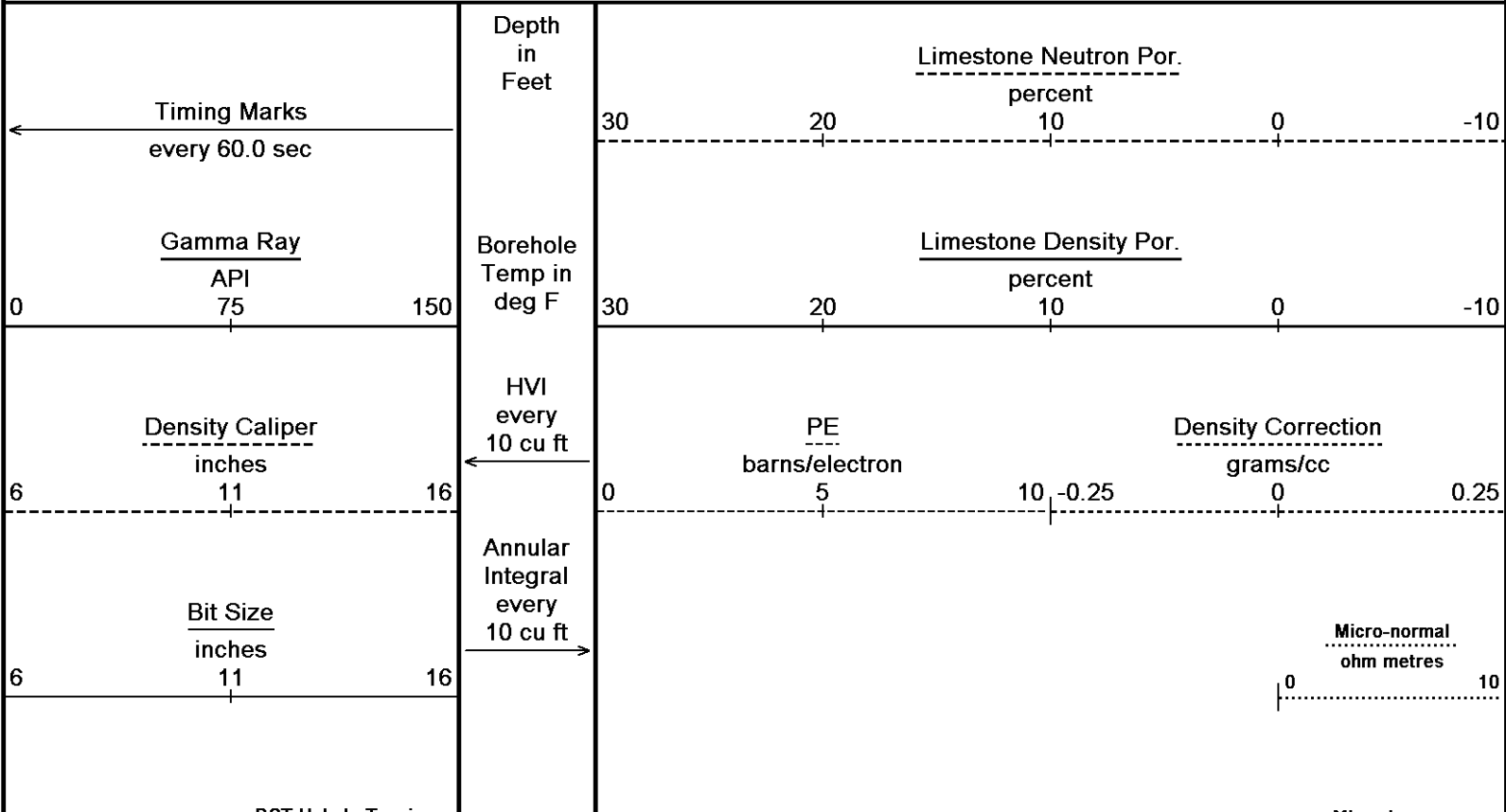
↑5 INCH MAIN↑

↓REPEAT SECTION↓

Depth Based Data - Maximum Sampling Increment 10.0cmPlotted on 02-MAY-2011 10:38

Filename: C:\Minimus 11.03.2789\Data\Shakespear Frey 3-9\Frey 3-9_001.dtaRecorded on 02-MAY-2011 07:53

System Versions: Logged with 11.03.2789Plotted with 11.03.2789



DS1 Up-hole Tension
pounds

5000 0

Replay
Scale
1:240

Micro-inverse
ohm metres

0 10

4450

109°

4500

110°

4550

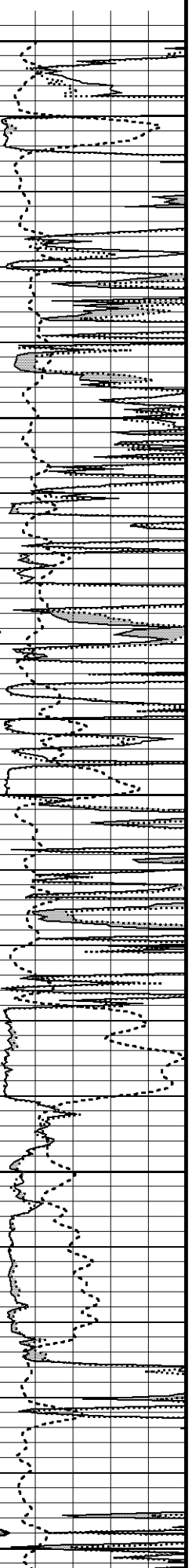
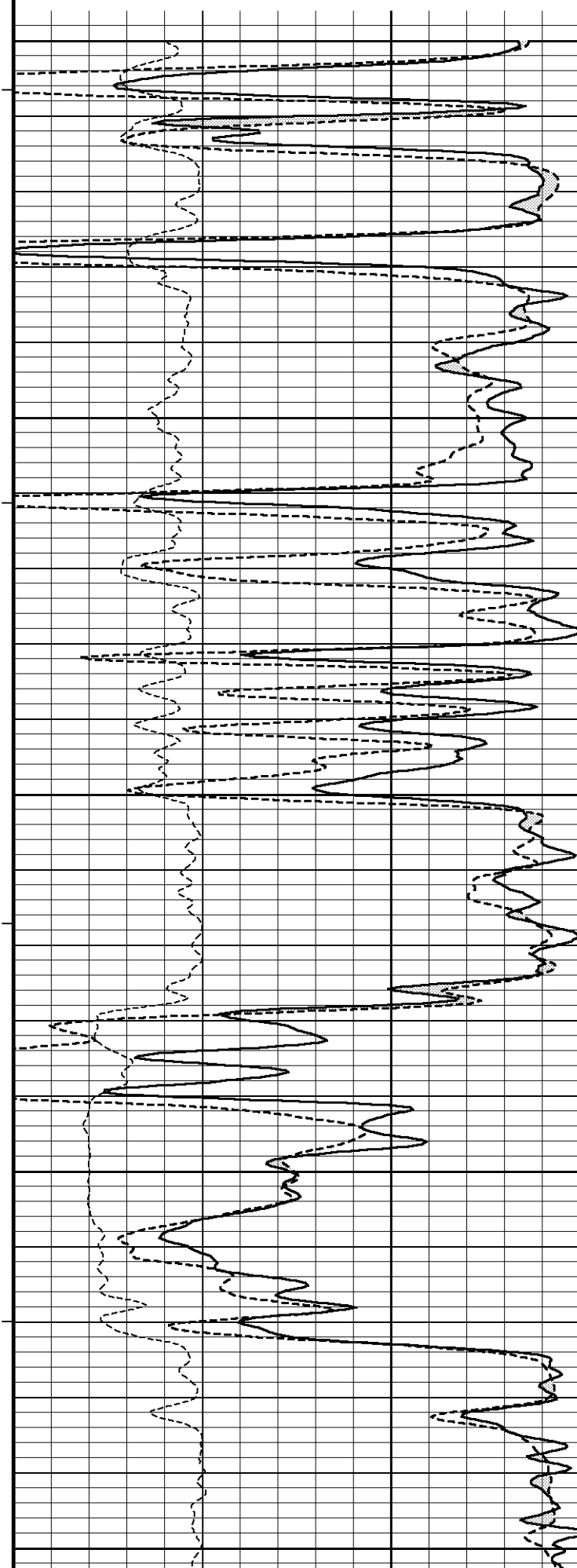
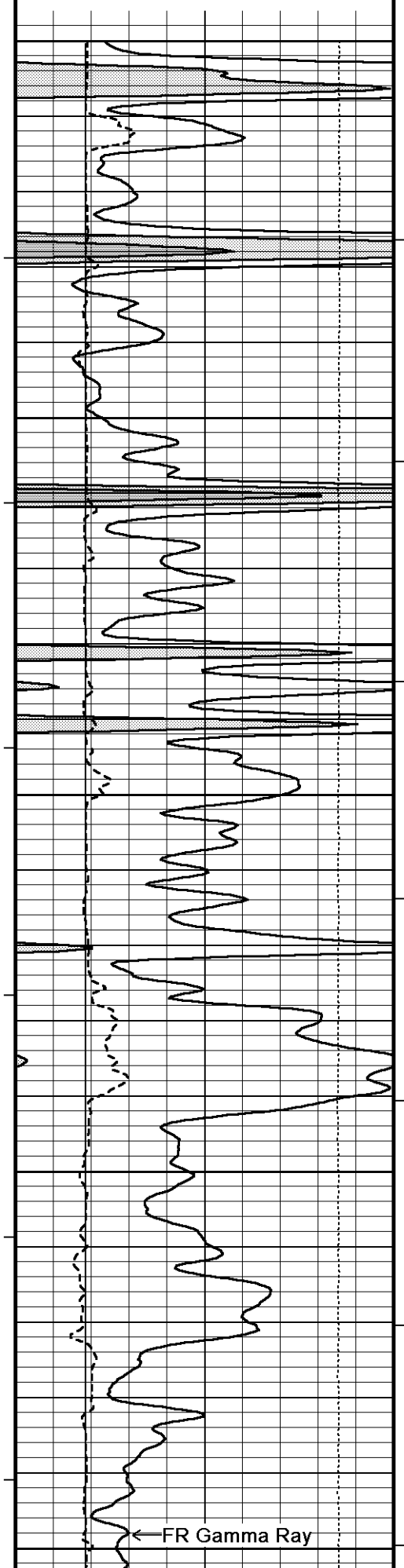
111°

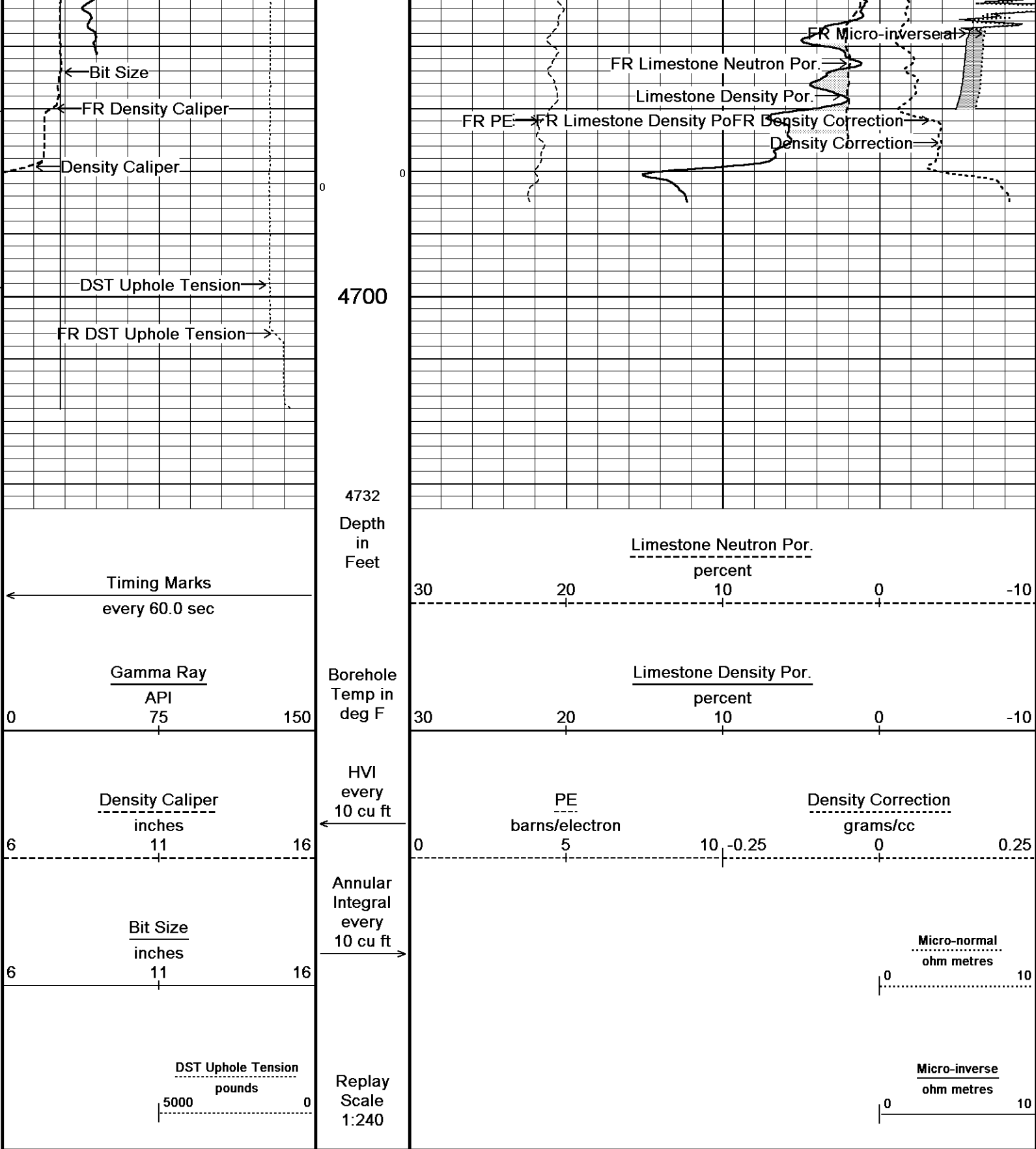
4600

111°

4650

← FR Gamma Ray



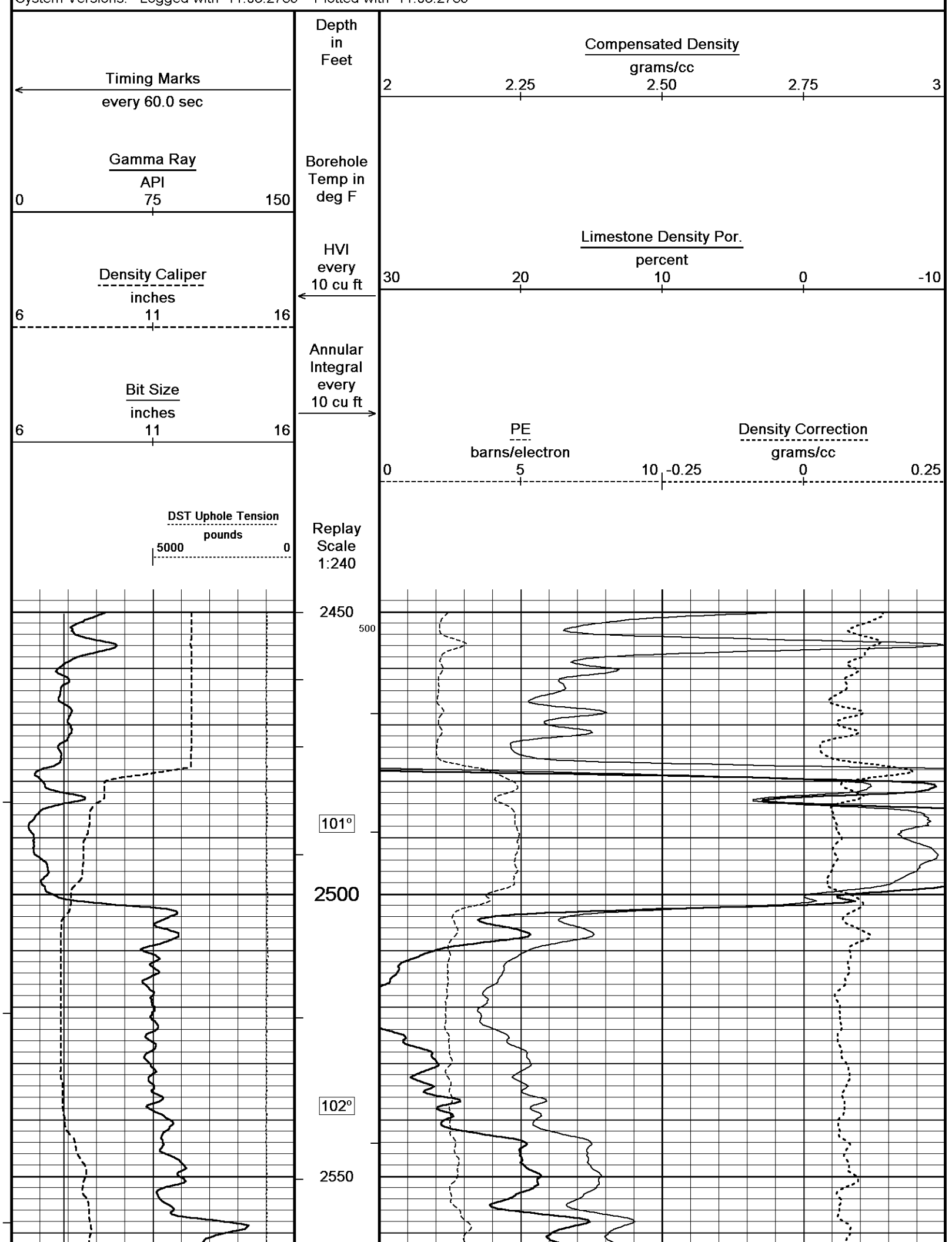


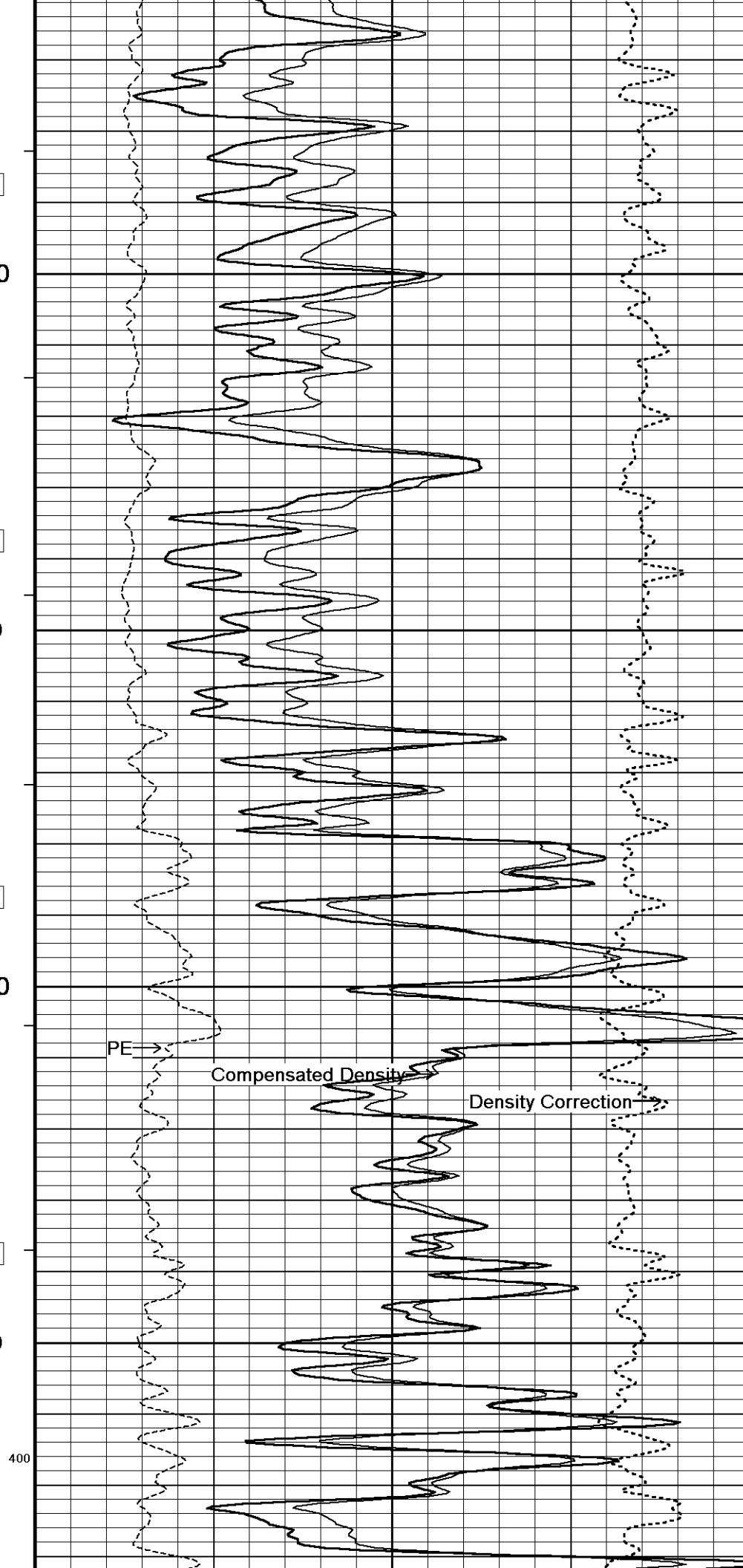
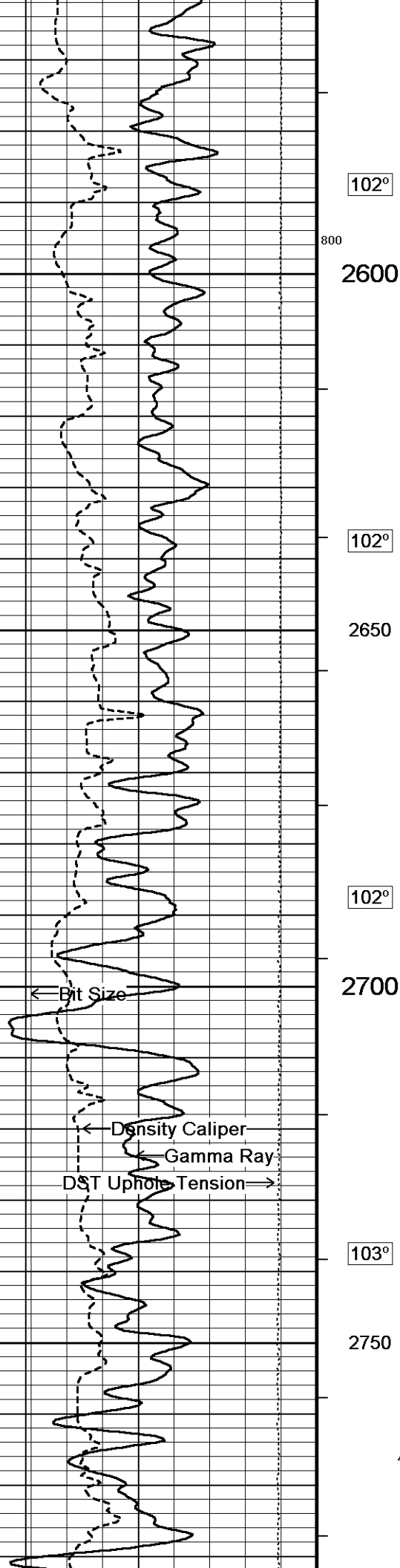
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System Versions: Logged with 11.03.2789 Plotted with 11.03.2789
Plotted on 02-MAY-2011 10:38
Recorded on 02-MAY-2011 07:53

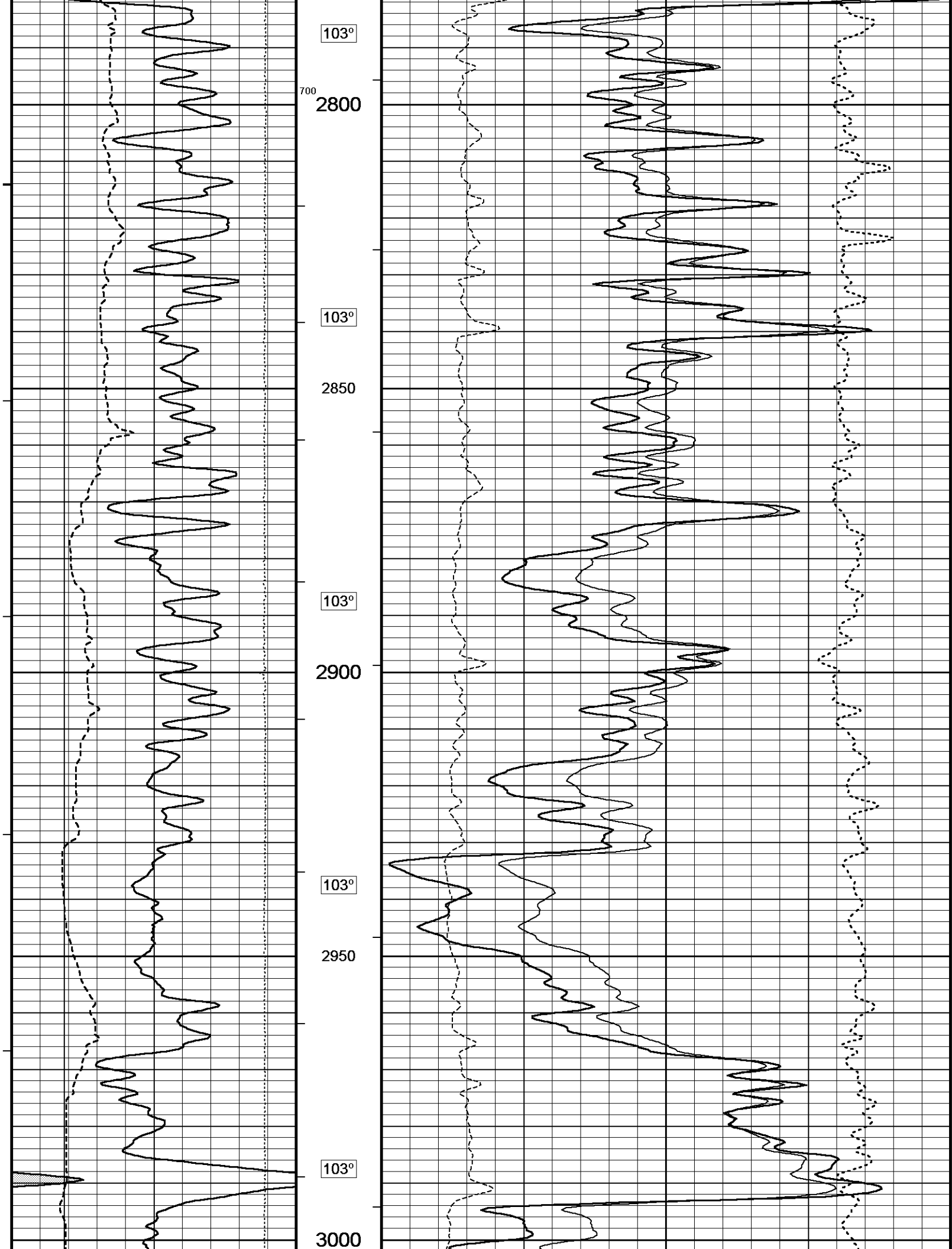
↑ REPEAT SECTION ↑

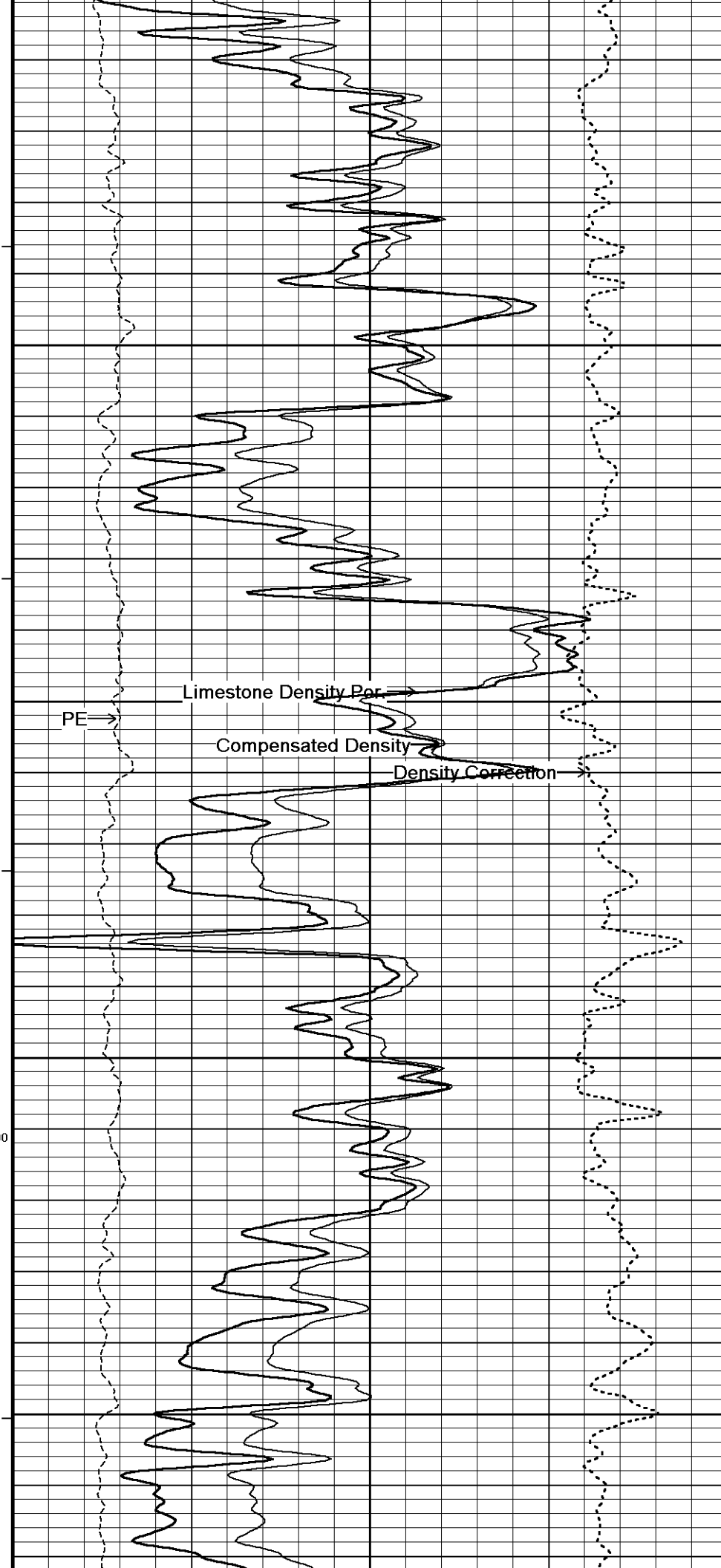
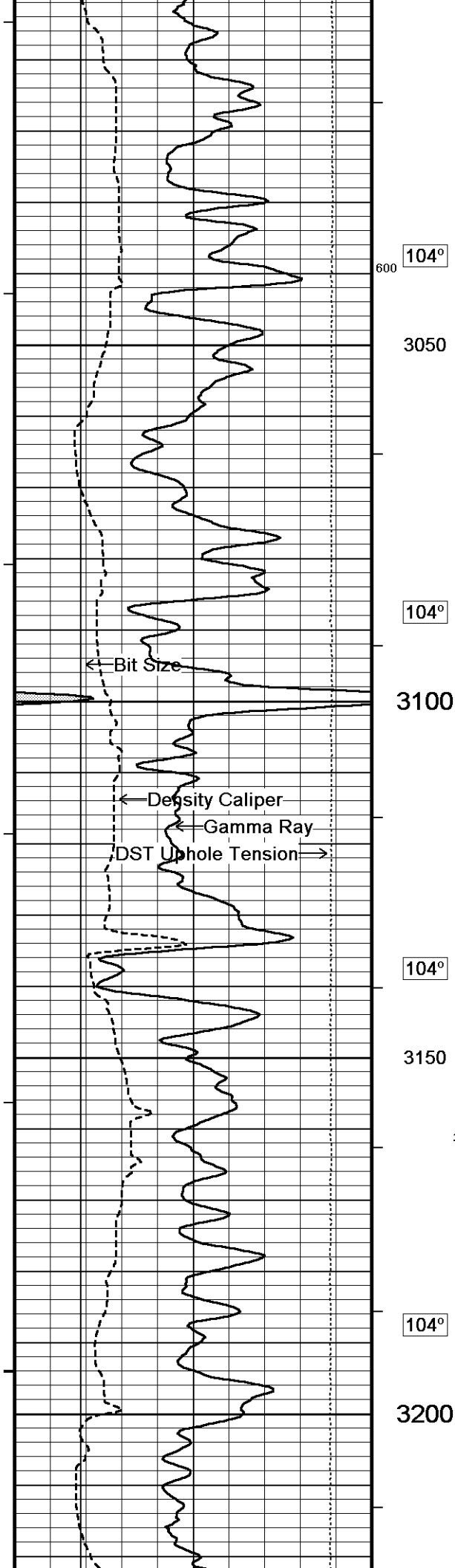
↓ 5 INCH MAIN ↓

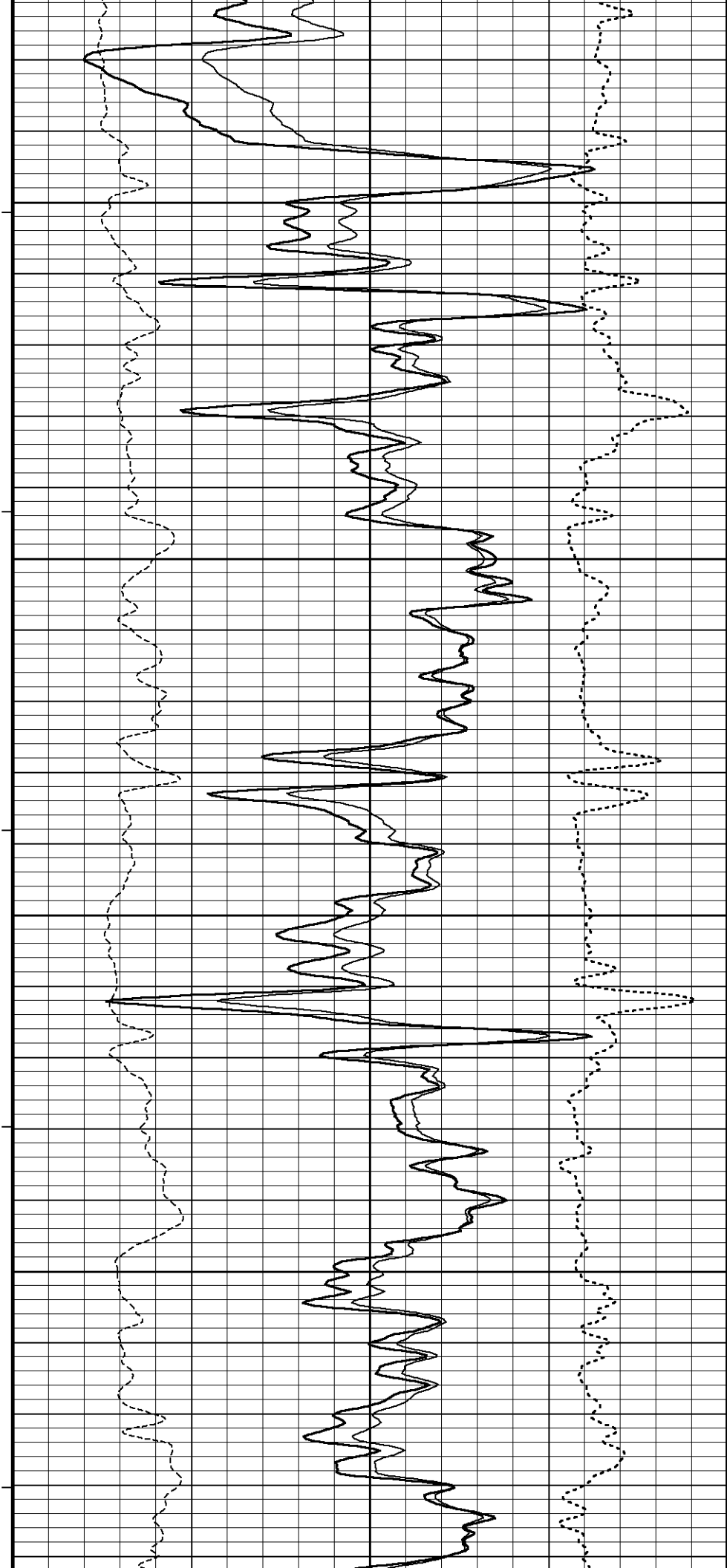
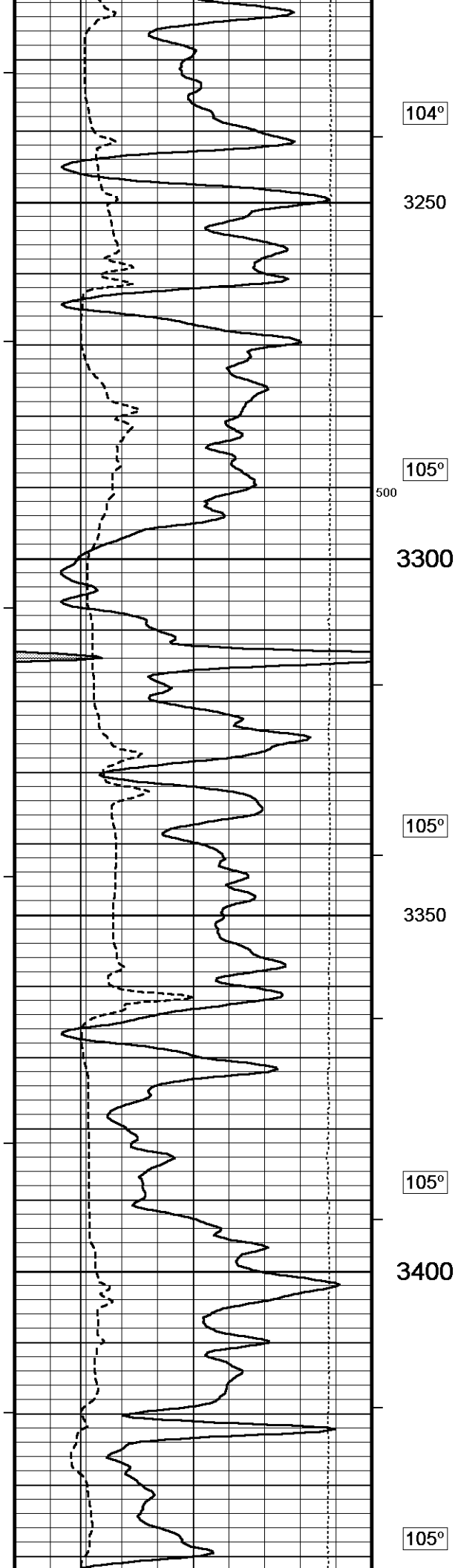
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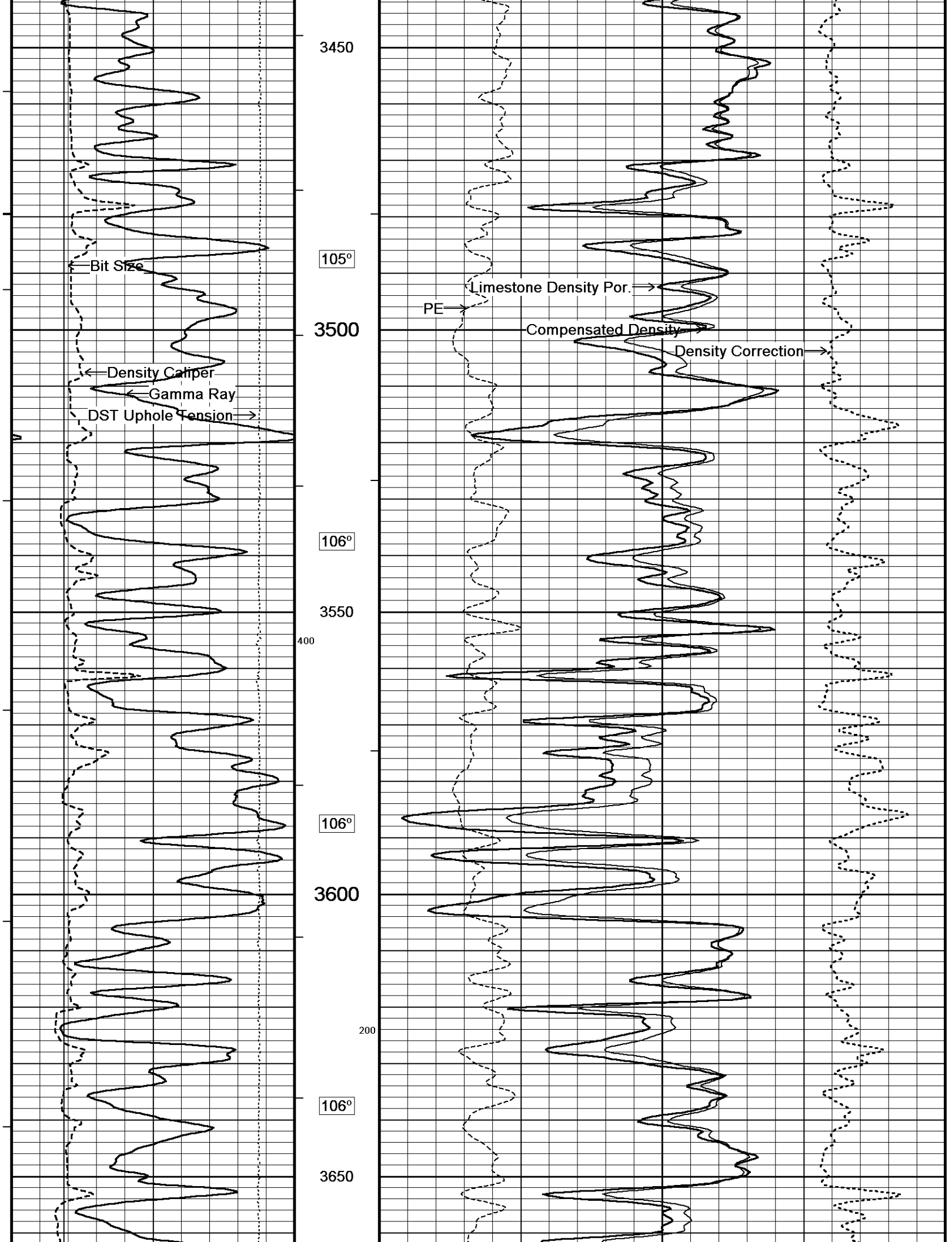


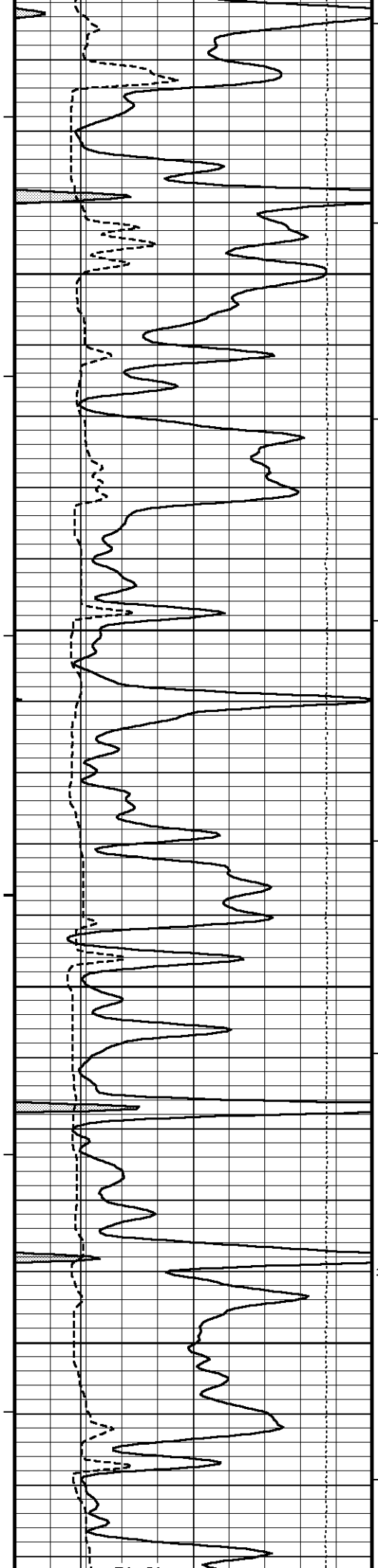




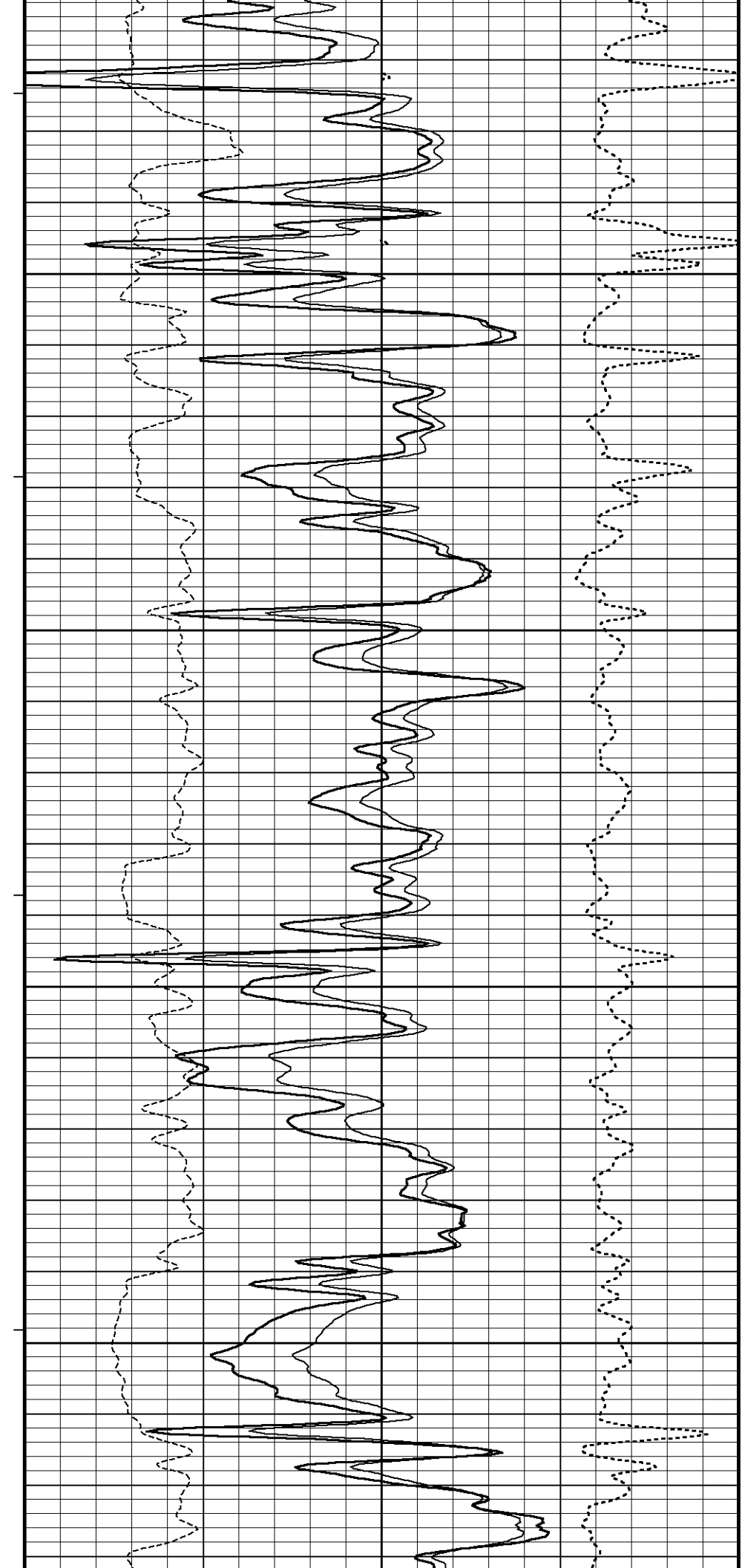


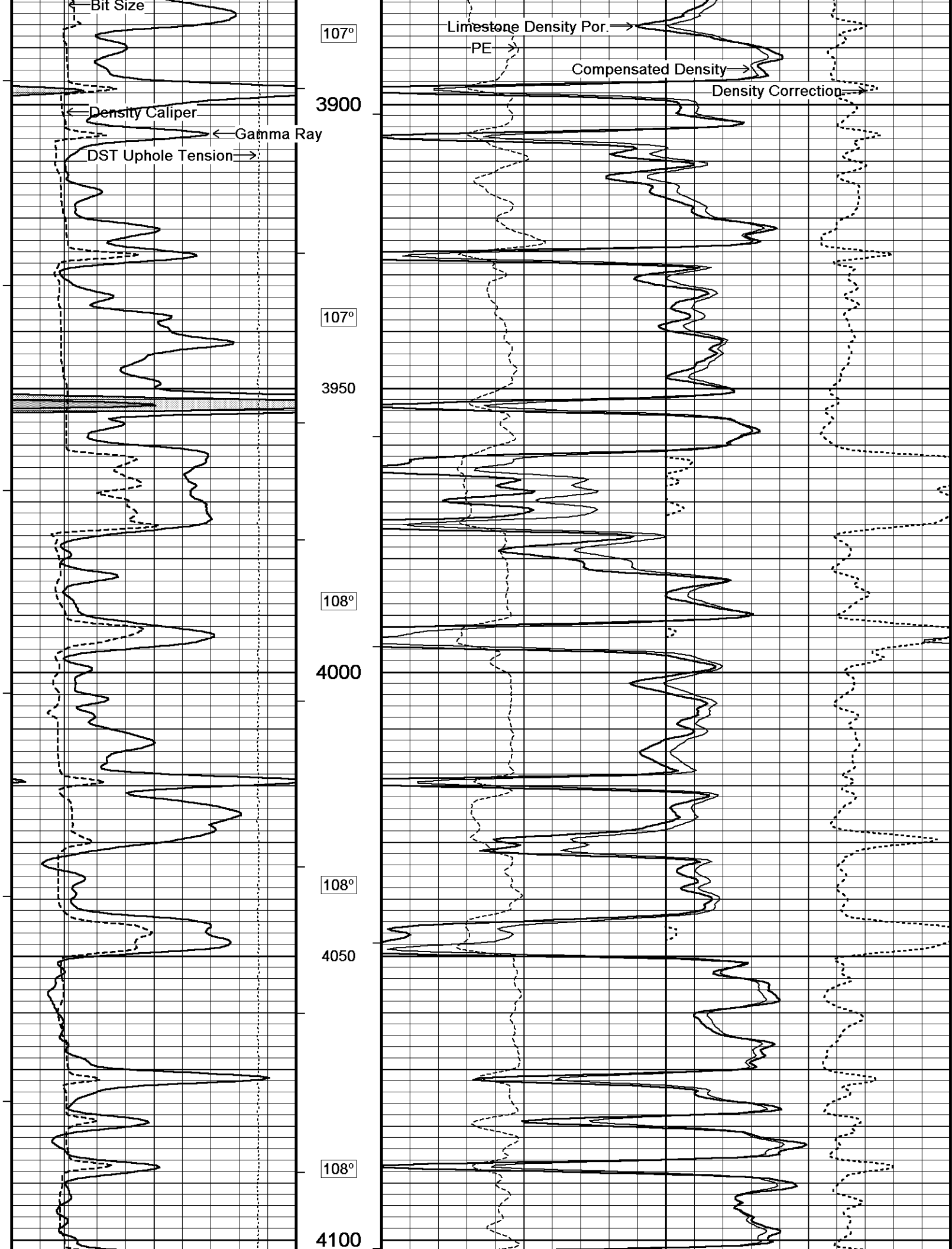


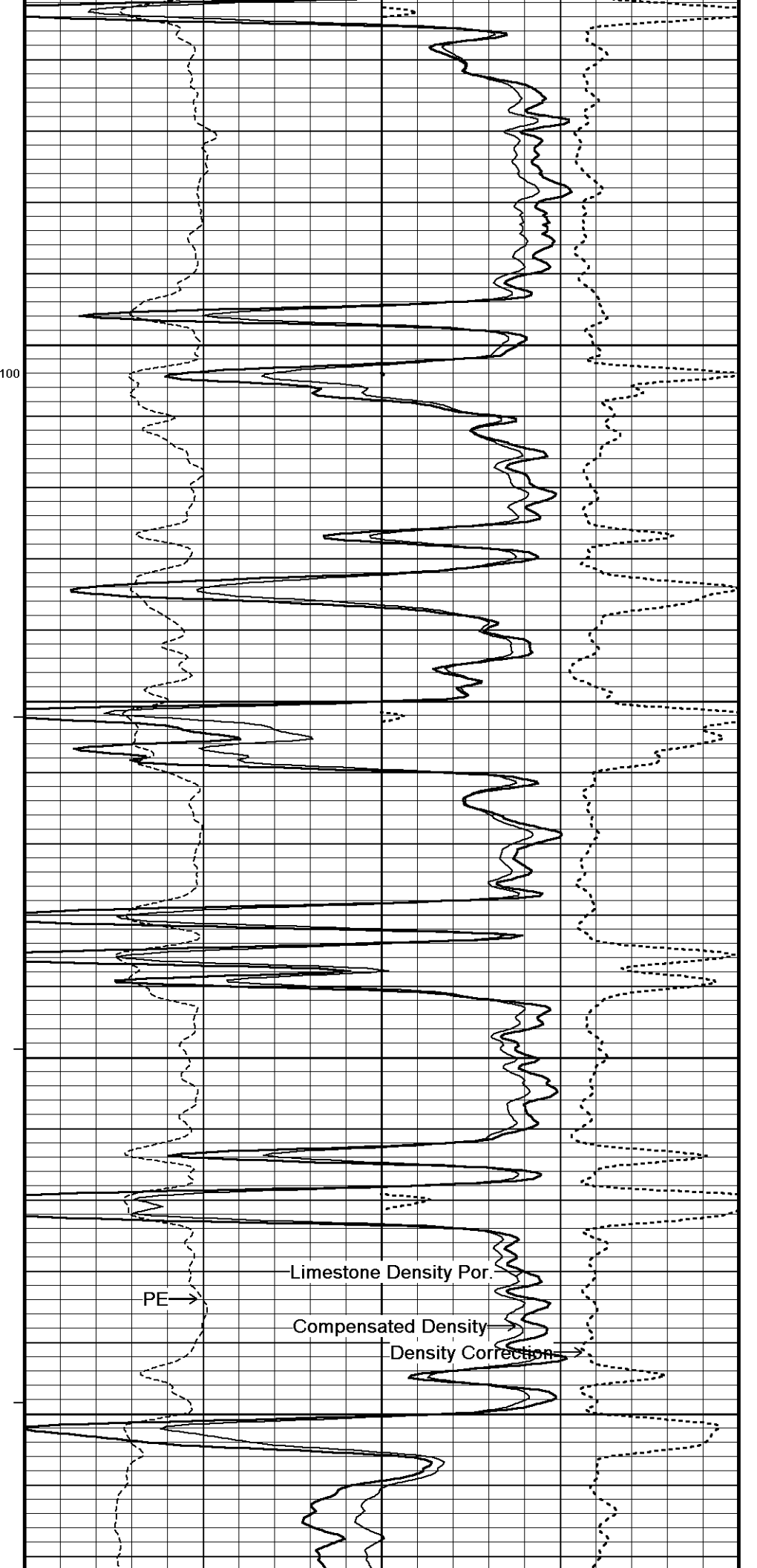
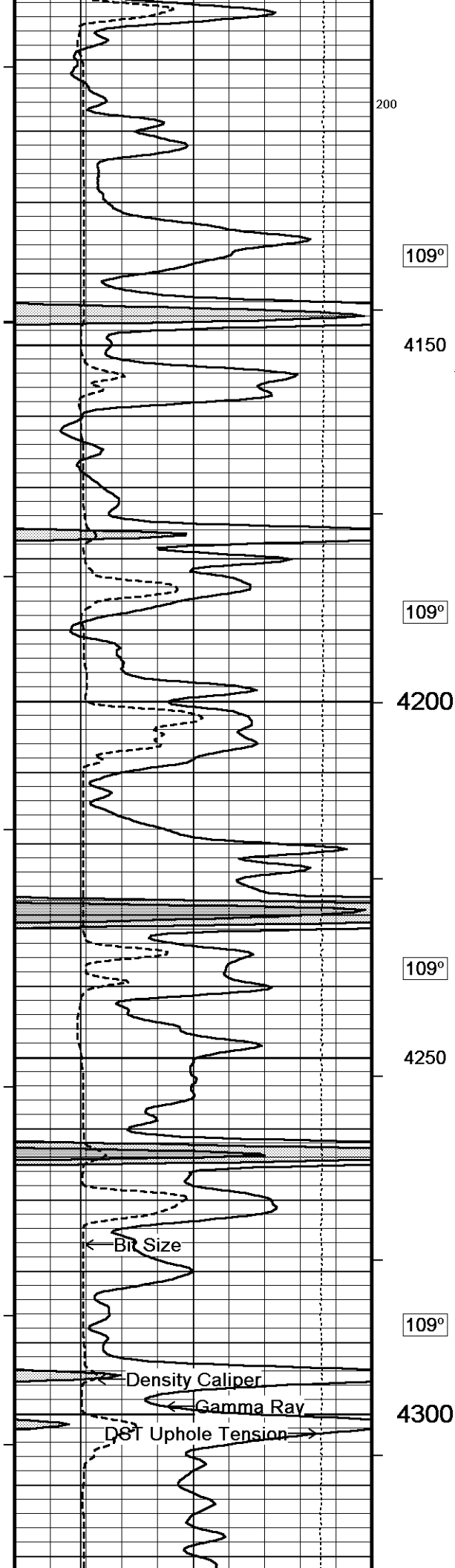


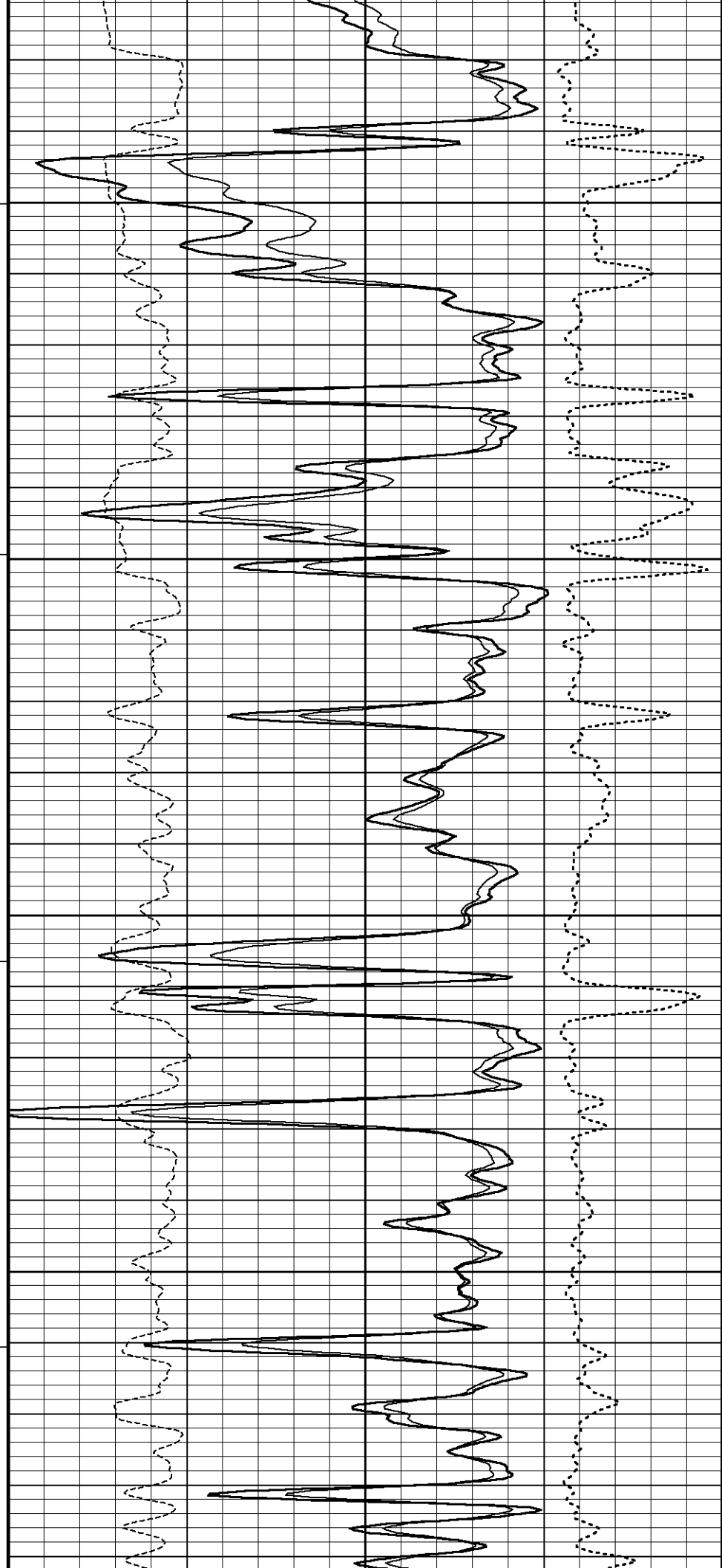
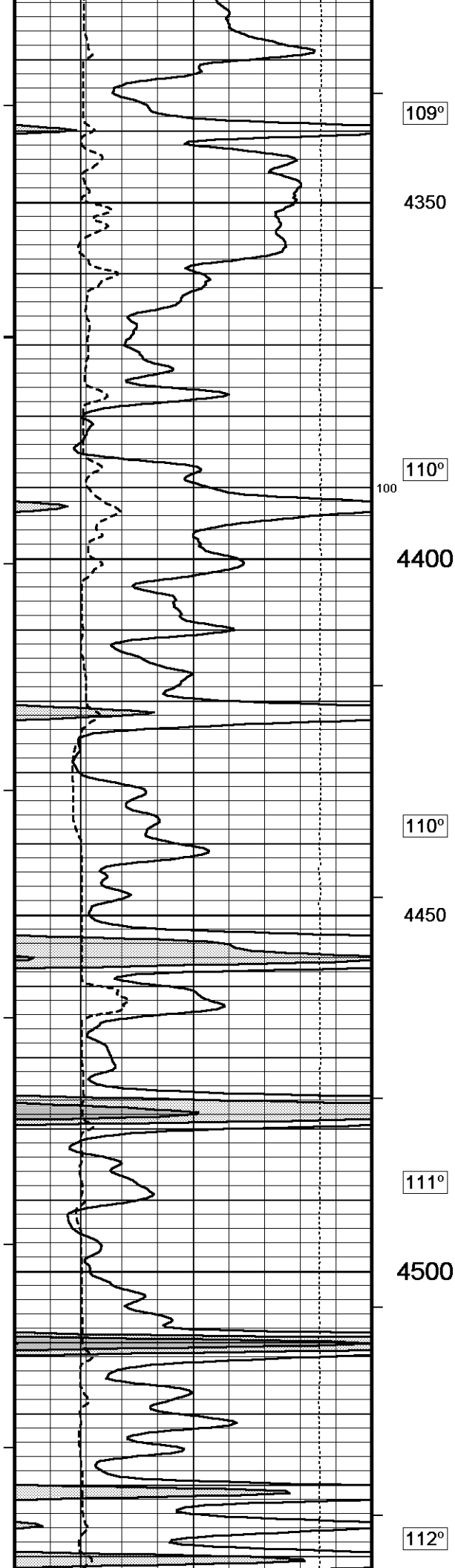


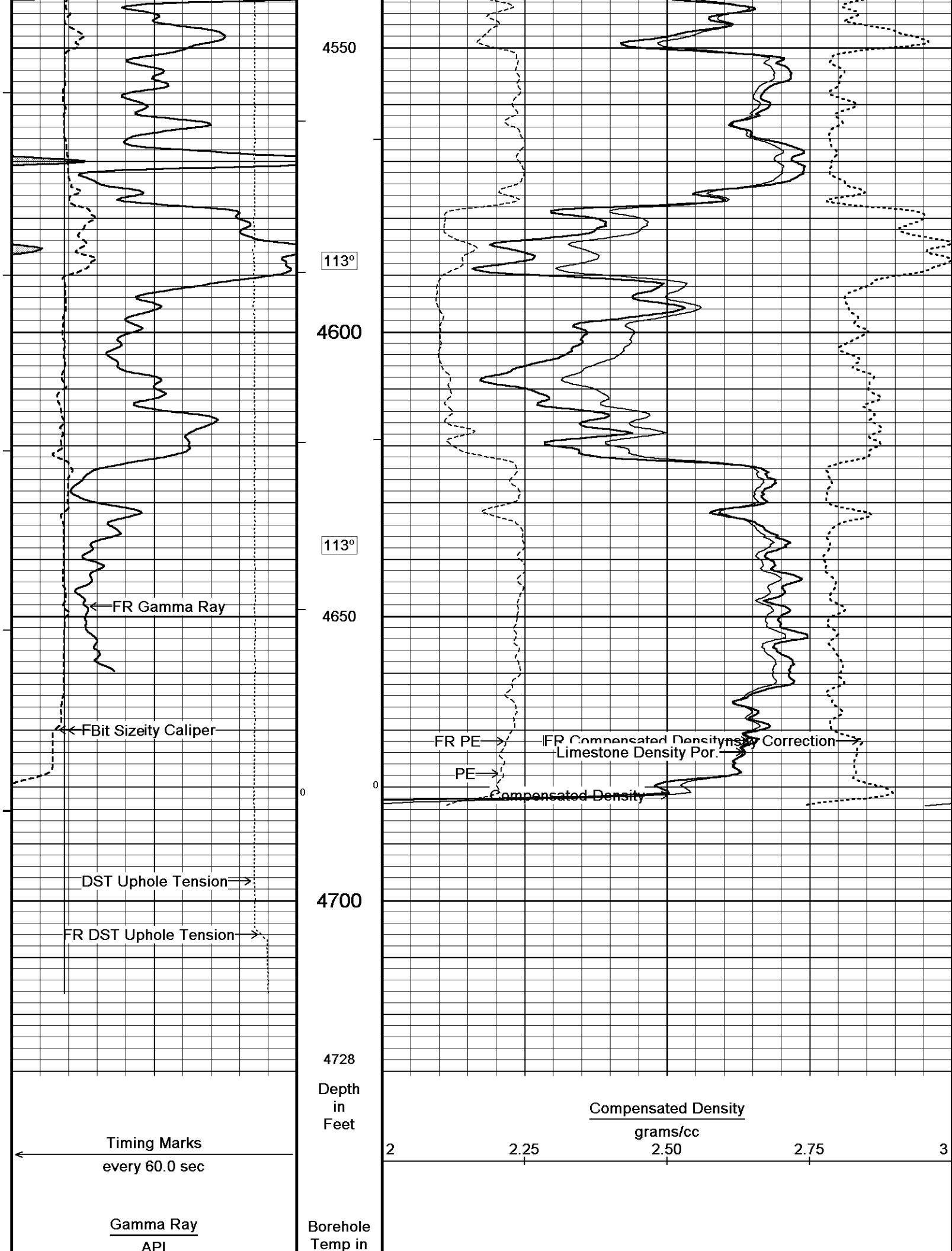
106°
3700
107°
3750
107°
3800
107°
3850

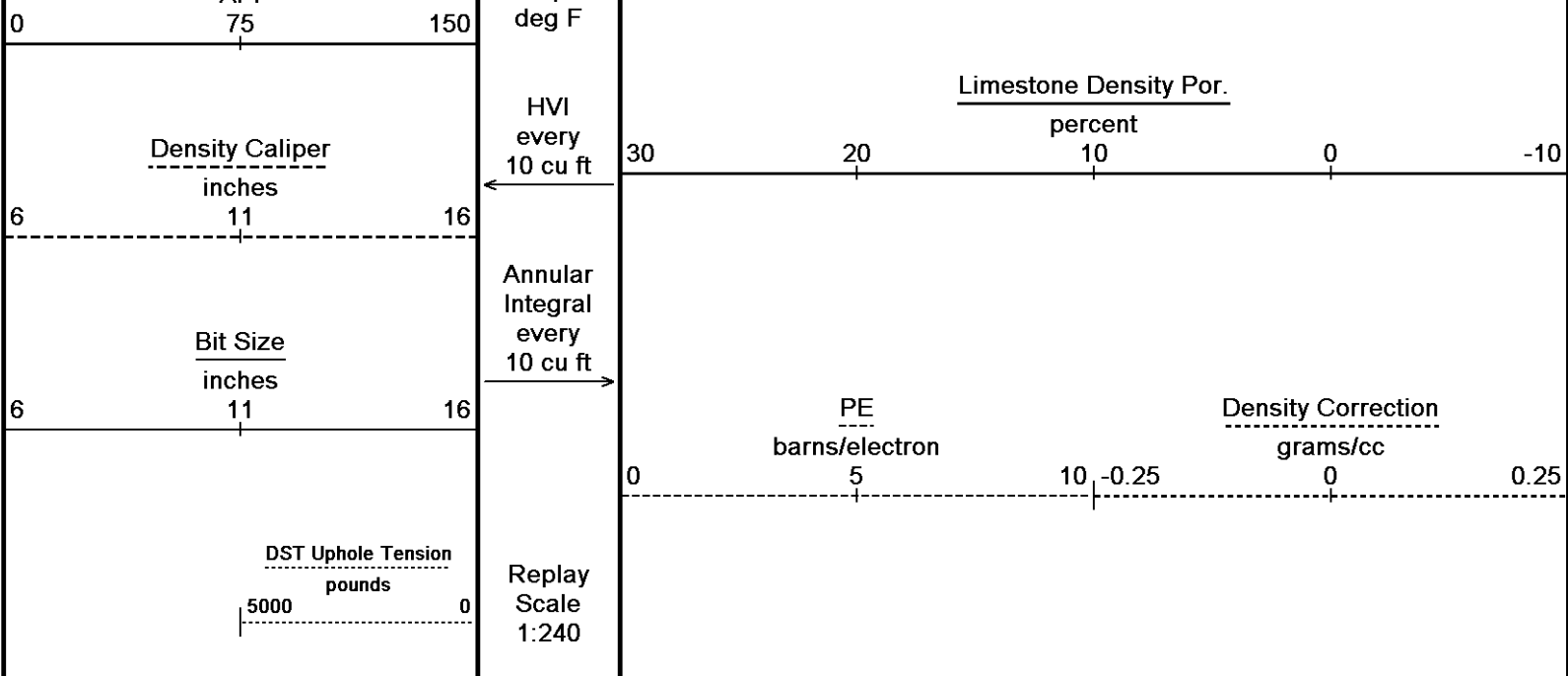












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Plotted on 02-MAY-2011 10:38
Recorded on 02-MAY-2011 09:30

↑

5 INCH MAIN

↑

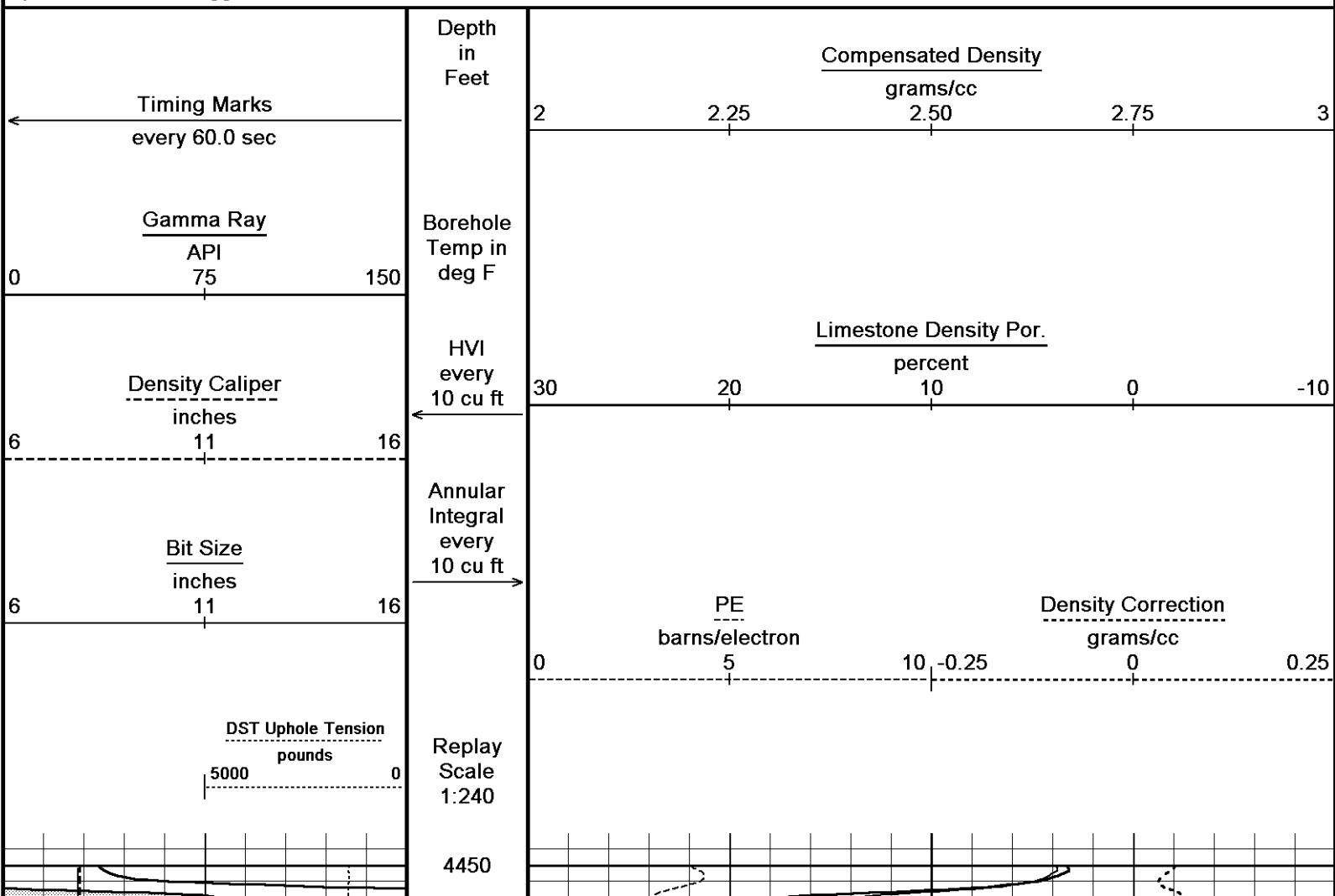
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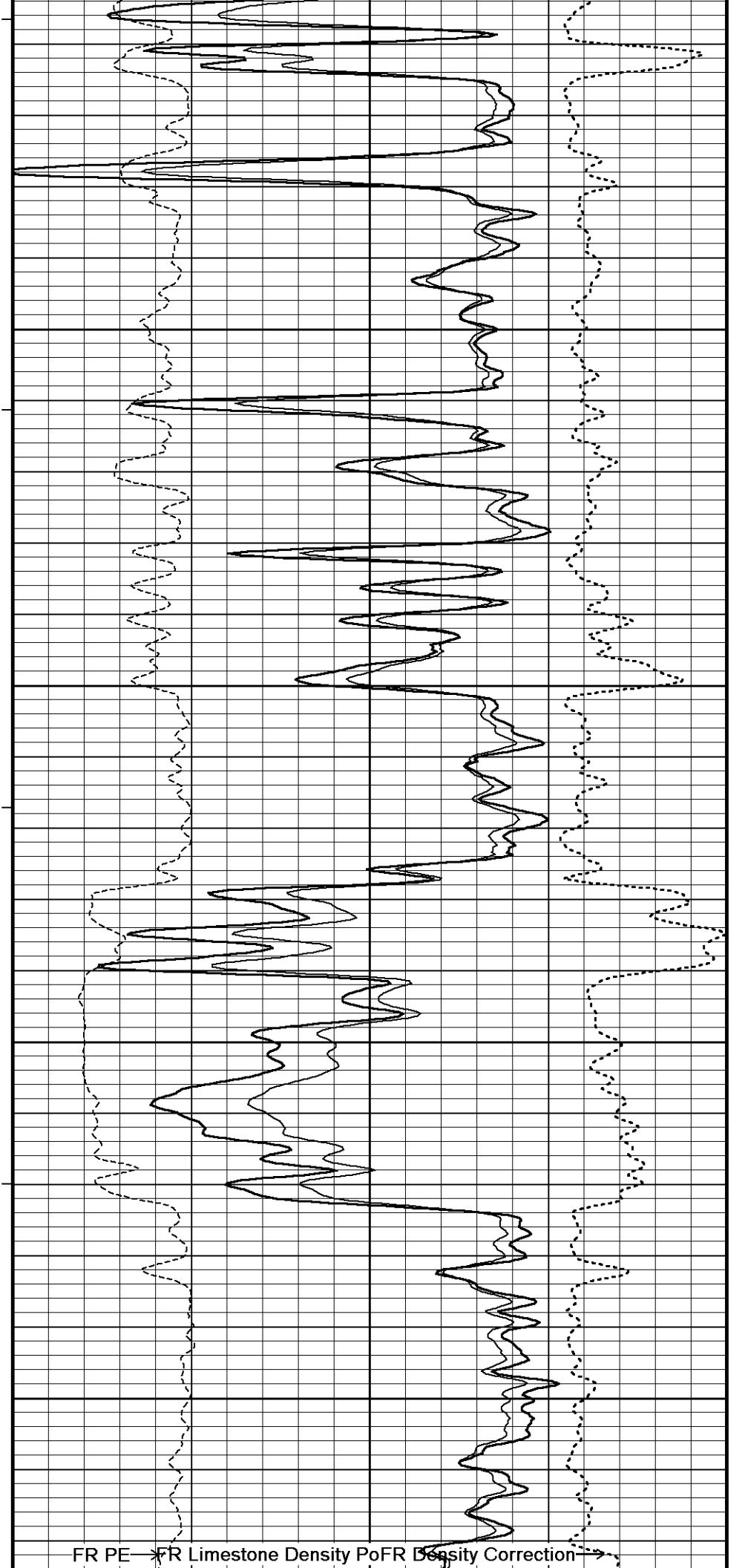
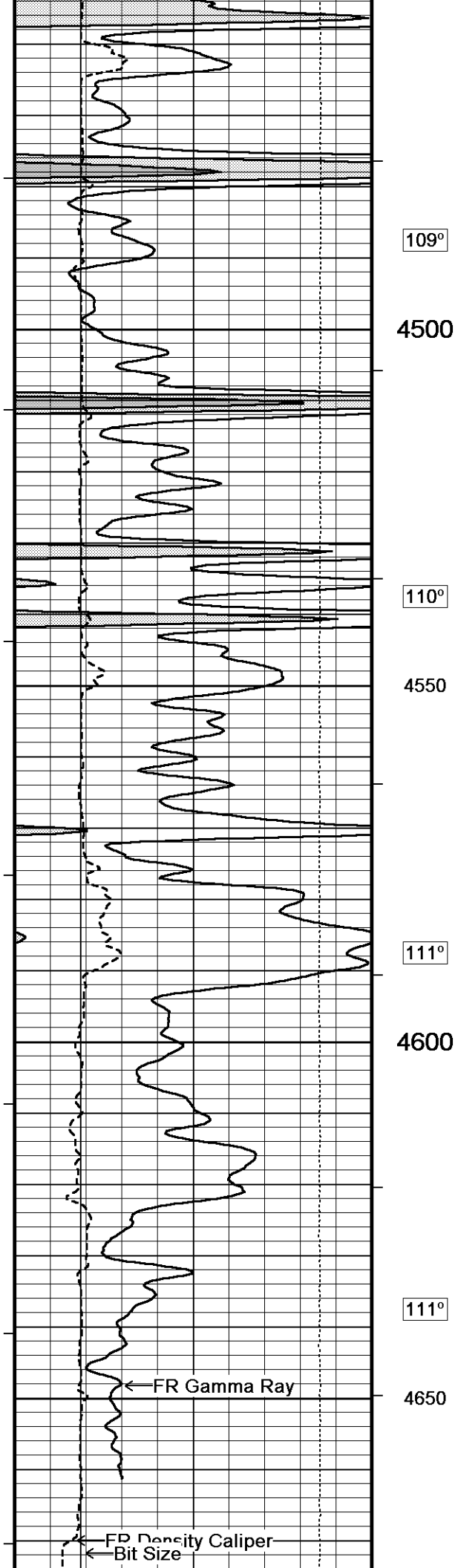
REPEAT SECTION

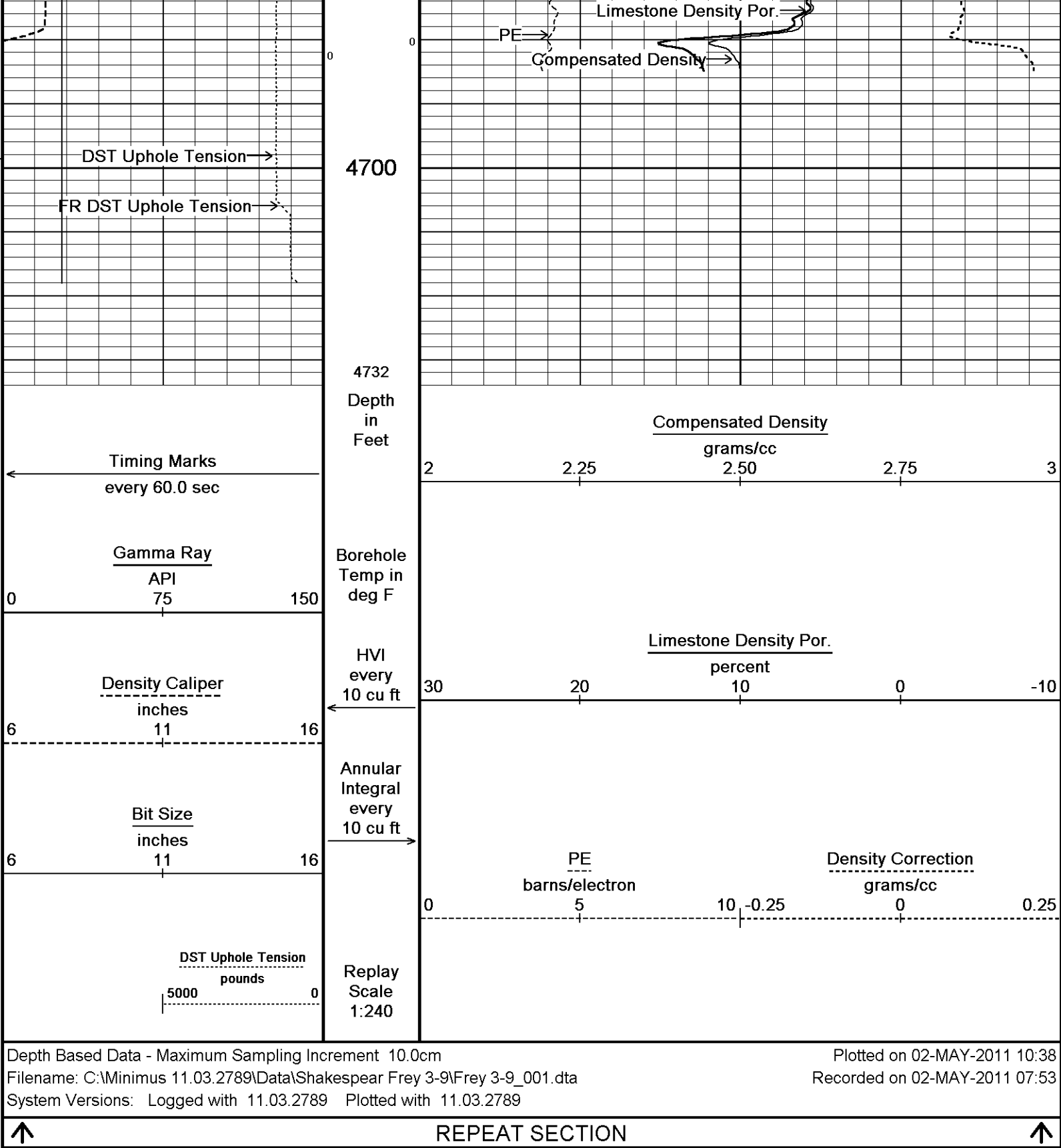
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System Versions: Logged with 11.03.2789 Plotted with 11.03.2789

Plotted on 02-MAY-2011 10:38
Recorded on 02-MAY-2011 07:53







BEFORE SURVEY CALIBRATION		
C:\Minimus 11.03.2789\Data\Shakespear Frey 3-9\Frey 3-9.dta		
General Constants All 000		Last Edited on 02-MAY-2011,06:38
General Parameters		
Mud Resistivity	1.250	ohm-metres
Mud Resistivity Temperature	75.000	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					
Porosity used	Base Density Porosity				
Resistivity used	Array Ind. One Res Rt				
RWA Constant A	0.610				
RWA Constant M	2.150				
Down-hole Tension Calibration All 000					
			Field Calibration on 30-JUN-2010		
Reading No	Measured	Calibrated (lbs)			
1	14112.01	10.00			
2	15164.79	427.00			
Down-hole Tension Calibration SMS 0					
			Field Calibration on 30-JUN-2010		
Reading No	Measured	Calibrated (lbs)			
1	14112.01	10.00			
2	15164.79	427.00			
High Resolution Temperature Calibration MCG-C 139					
			Field Calibration on 03-SEP-2010,11:23		
	Measured	Calibrated(Deg F)			
Lower	50.00	50.00			
Upper	75.00	75.00			
High Resolution Temperature Constants MCG-C 139					
			Last Edited on		
Pre-filter Length	11				
SP Calibration MCG-C 139					
			Field Calibration on 04-MAR-2011 06:37		
	Measured	Calibrated (mV)			
Reference 1	103.7	100.0			
Reference 2	-96.9	-100.0			
Gamma Calibration MCG-C 139					
			Field Calibration on 25-APR-2011 20:54		
	Measured	Calibrated (API)			
Background	92	61			
Calibrator (Gross)	1187	786			
Calibrator (Net)	1095	725			
Gamma Constants MCG-C 139					
			Last Edited on 28-APR-2011,22:25		
Gamma Calibrator Number	grc38				
Mud Density	1.08	gm/cc			
Caliper Source for Processing	Density Caliper				
Tool Position	Eccentred				
Concentration of KCl	0.00	kppm			
Micro Normal and Micro Inverse Calibration MML-A 16					
			Base Calibration on 11-MAR-2011 11:10		
			Field Check on 25-APR-2011 20:38		
Base Calibration					
Channel	Resistor 1	Measured		Calibrated (ohm-m)	
		Resistor 2	Resistor 1	Resistor 2	
Micro Normal	12.2	60.2	2.6	12.8	
Micro Inverse	15.6	78.3	1.7	8.4	
Channel	Base Check (ohm-m)		Field Check (ohm-m)		
Micro Normal	32.1		32.1		
Micro Inverse	16.3		16.3		
Micro Normal and Micro Inverse Constants MML-A 16				Last Edited on 11-APR-2011,09:08	
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	N/A inches				

Caliper Calibration MML-A 16

Base Calibration on 11-MAR-2011 11:20
Field Calibration on 25-APR-2011 20:37

Base Calibration

Reading No	Measured	Calibrator Size (in)
1	13875	5.98
2	17350	7.97
3	20581	9.86
4	24656	11.92
5	0	0.00
6	N/A	N/A

Field Calibration

Measured Caliper (in)	Actual Caliper (in)
6.03	5.98

Neutron Calibration MDN-A.B 66

Base Calibration on 11-MAR-2011 13:54
Field Check on 25-APR-2011 20:50

Base Calibration

	Measured		Calibrated (cps)	
	Near	Far	Near	Far
	3091	97	3714	110
Ratio	31.957		33.764	

Field Calibrator at Base

	Calibrated (cps)	
	1660	2371
Ratio	0.700	

Field Check

	Calibrated (cps)	
	1673	2396
Ratio	0.698	

Neutron Constants MDN-A.B 66

Last Edited on 28-APR-2011,22:25

Neutron Source Id	P58125B	
Neutron Jig Number	5824NE	
Epithermal Neutron	No	
Caliper Source for Processing	Density Caliper	
Stand-off	0.00	inches
Mud Density	1.08	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
Formation Fluid Salinity Source	Constant Value	
Formation Fluid Salinity	0.00	kppm
Barite Mud Correction	Not Applied	

FE Calibration MFE-A.A 52

Base Calibration on 11-MAR-2011 10:55
Field Check on 25-APR-2011 20:34

Base Calibration

	Measured	Calibrated (ohm-m)
Reference 1	0.0	0.0
Reference 2	965.7	126.8
Base Check		279.9
Field Check		279.9

FE Constants MFE-A.A 52

Last Edited on 28-APR-2011,22:25

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

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

Field Calibration on 17-JAN-2011,18:32

	Measured	Calibrated(Deg F)
Lower	1.00	33.80
Upper	11.00	51.80

Last Edited on

Pre-filter Length	11
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Base Calibration on 11-MAR-2011,09:58

Field Check on 25-APR-2011 20:33

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		0.0	0.0	12.0	3842.1
2		0.0	0.0	29.3	3480.2
3		0.0	0.0	28.9	3055.9
4		0.0	0.0	19.7	2083.5
Deep		0.0	0.0	18.4	2050.7
Medium		0.0	0.0	42.1	3995.2
Shallow		0.0	0.0	42.5	5059.1
Array Temperature		0.0		57.8 Deg F	

Induction Constants MAI-A.A 167				Last Edited on 24-APR-2011,22:39	
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 35			Base Calibration on 11-MAR-2011 11:34
			Field Calibration on 25-APR-2011 20:40
Base Calibration			
Reading No	Measured	Calibrator Size (in)	
1	17936	3.99	
2	28079	5.98	
3	38384	7.97	
4	48048	9.86	
5	59047	11.92	
6	N/A	N/A	

Field Calibration

Measured Caliper (in)
6.02Actual Caliper (in)
5.98

Photo Density Calibration MPD-B 35

Base Calibration on 11-MAR-2011 11:54
Field Check on 25-APR-2011 20:44

Density Calibration

Base Calibration

Measured

Calibrated (sdu)

	Near	Far	Near	Far
Reference 1	57876	27553	59556	30836
Reference 2	23524	2615	24941	2541

Field Check at Base

1175.2 1398.5

Field Check

1171.2 1390.3

PE Calibration

Base Calibration

Measured

Calibrated

	WS	WH	Ratio	Ratio
Background	211	1039		
Reference 1	21426	57673	0.375	0.371
Reference 2	6234	23377	0.270	0.272

Field Check at Base

211.2 1039.0

Field Check

210.1 1035.0

Density Constants MPD-B 35

Last Edited on 02-MAY-2011,06:38

Density Source Id	p50557b
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 (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

C:\Minimus 11.03.2789\Data\Shakespear Frey 3-9\Frey 3-9.dta

Compact Comms Gamma
MCG-C 139 LG: 8.70 ft WT: 63.9 lb OD: 2.24 in57.56 ft GRGC - Gamma Ray
54.65 ft CGXT - MCG External TemperatureCompact Micro-log
MML-A 16 LG: 7.97 ft WT: 81.6 lb OD: 2.24 in47.93 ft MINV - Micro-inverse
47.03 ft MINPL - Micro-normal

MML-A 16 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 35 LG: 9.59 ft WT: 90.4 lb OD: 2.45 in

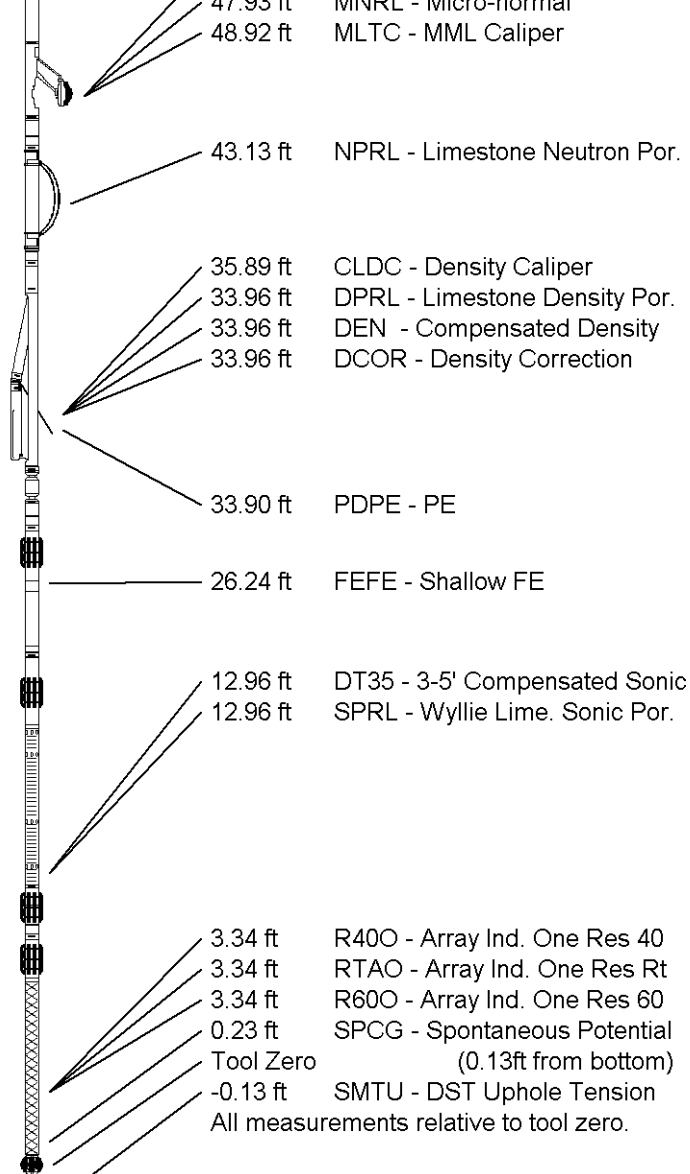
SKJ-D.A Compact Knuckle Joint
SKJ-D.A 36 LG: 2.17 ft WT: 24.3 lb OD: 2.24 in

Compact Focussed Electric
MFE-A.A 52 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: 62.84 ft Weight: 480.6 lb



COMPANY	SHAKESPEAR OIL COMPANY, INC.
WELL	FREY 3-9
FIELD	STRATFORD WEST
PROVINCE/COUNTY	LOGAN
COUNTRY/STATE	U.S.A./KANSAS

Elevation Kelly Bushing	2999.00	feet	First Reading		feet
Elevation Drill Floor	2997.00	feet	Depth Driller	4710.00	feet
Elevation Ground Level	2989.00	feet	Depth Logger		feet



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