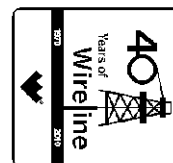




Weatherford

**COMPACT PHOTO DENSITY
COMPENSATED NEUTRON
MICRORESISTIVITY LOG**

COMPANY **M&M EXPLORATION, INC**
WELL **Z BAR 16-4 SWD**
FIELD **AETNA NE**
PROVINCE/COUNTY **BARBER**
COUNTRY/STATE **U.S.A. / KANSAS**
LOCATION **400' FNL & 530' FWL**
NW/4



SEC	TWP	RGE	Other Services	
16	34S	14W	MAI/MFE	
API Number	15-007-23843	MML		
Permit Number				
Permanent Datum G.L., Elevation 1559 feet				
Log Measured From KB				Elevations: KB 1571.00
Drilling Measured From K.B.				DF 1569.00
				GL 1559.00
Date	06-MAY-2012			
Run Number	ONE			
Depth Driller	5330.00	feet		
Depth Logger	5327.00	feet		
First Reading	5308.00	feet		
Last Reading	3800.00	feet		
Casing Driller	916.00	feet		
Casing Logger	917.00	feet		
Bit Size	7.875	inches		
Hole Fluid Type	CHEMICAL			
Density / Viscosity	8.80 lb/USg	48.00 CP		
PH / Fluid Loss	9.00	10.80 ml/30Min		
Sample Source	FLOWLINE			
Rm @ Measured Temp	1.02 @ 73.0	ohm-m		
Rmf @ Measured Temp	0.82 @ 73.0	ohm-m		
Rmc @ Measured Temp	1.22 @ 73.0	ohm-m		
Source Rmf / Rmc	CALC	CALC		
Rm @ BHT	0.61 @125.0	ohm-m		
Time Since Circulation	4 HOURS			
Max Recorded Temp	125.00	deg F		
Equipment Name	COMPACT			
Equipment / Base	13096	LIB		
Recorded By	F. MARTINS			
Witnessed By	B. BROCK			
S.O. / JOB #	3534534			LB12-114

BOREHOLE RECORD

Last Edited: 06-MAY-2012 14:02

Bit Size inches	Depth From feet	Depth To feet
7.875	917.00	5327.00

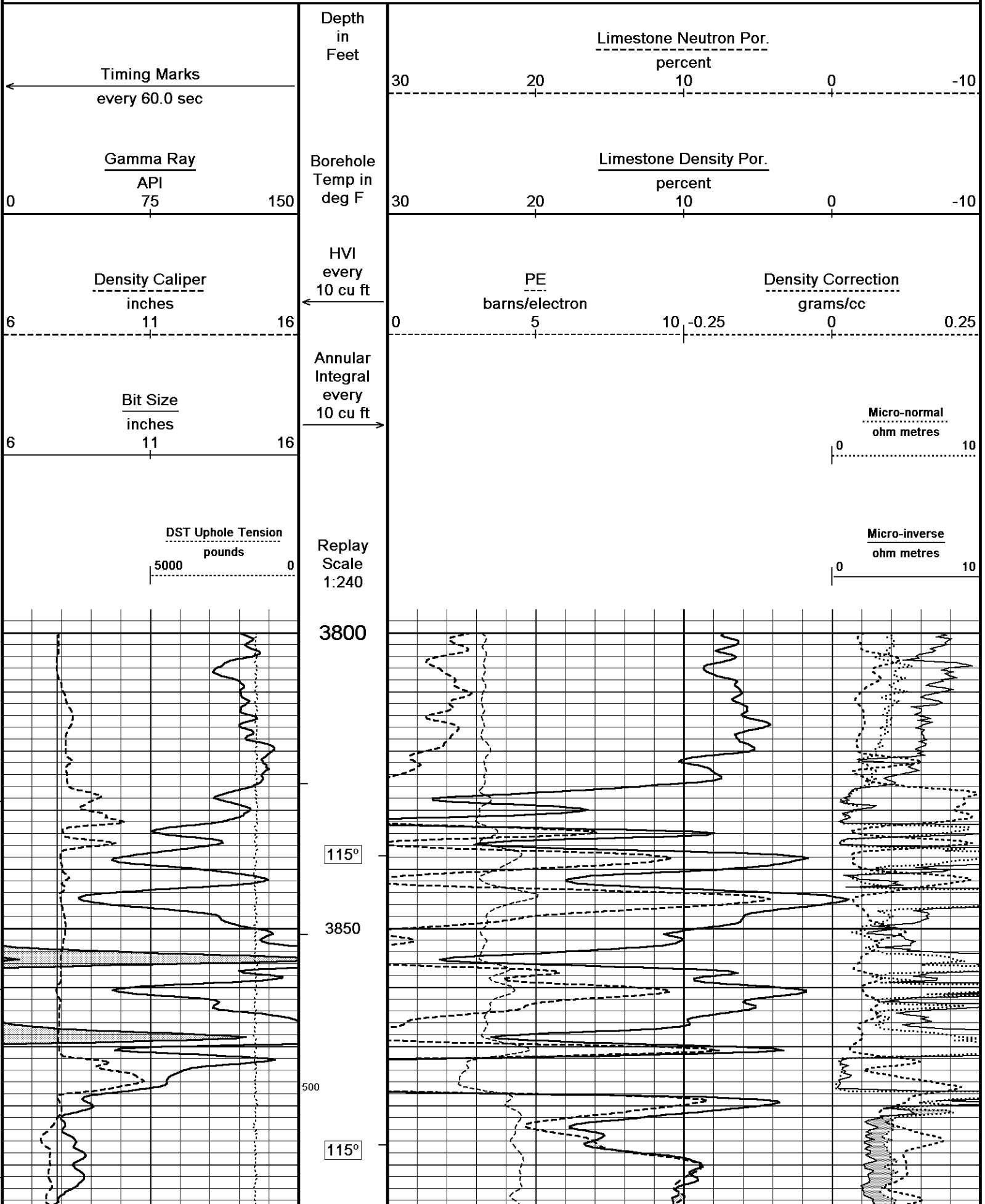
CASING RECORD

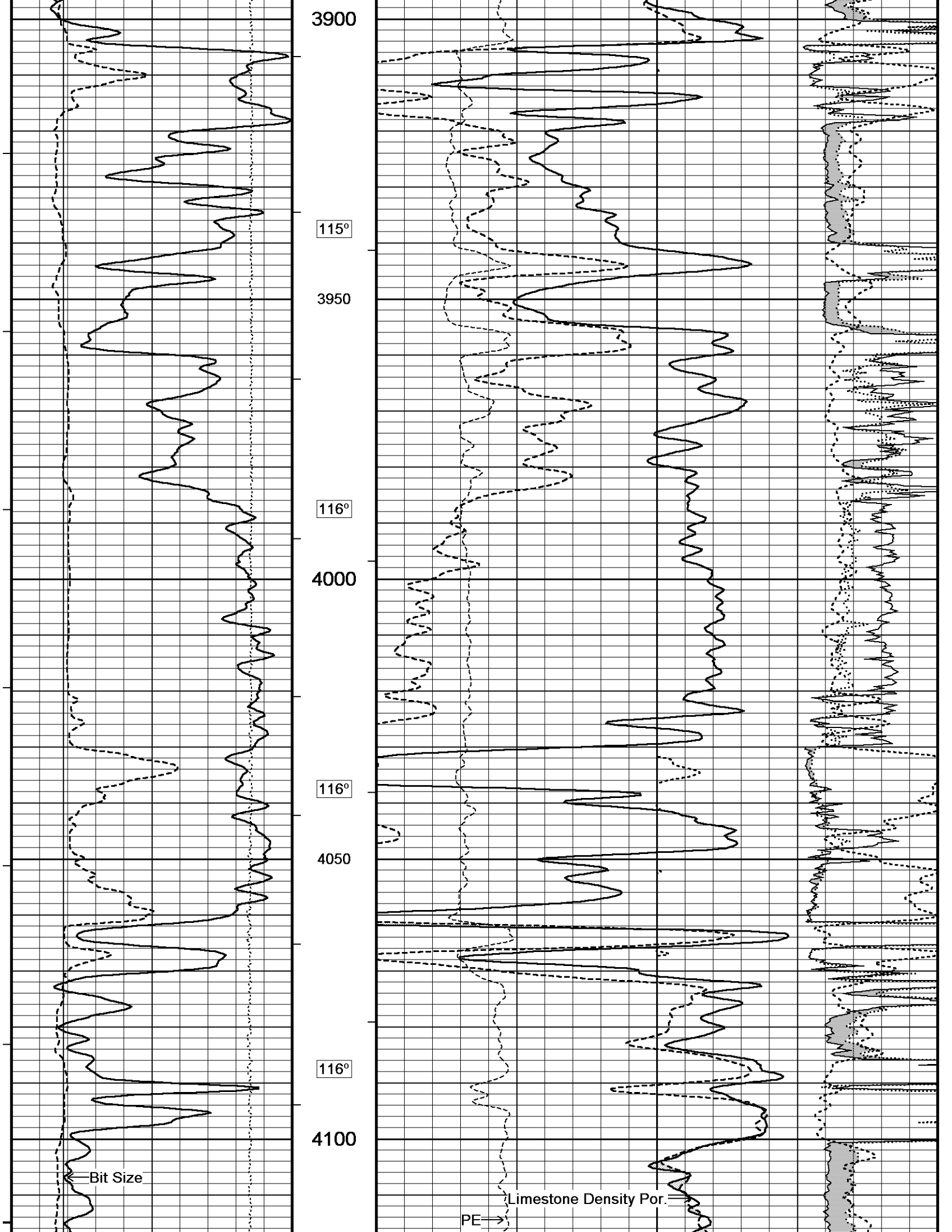
Type	Size inches	Depth From feet	Shoe Depth feet	Weight pounds/ft
SURFACE	8.625	0.00	917.00	24.00

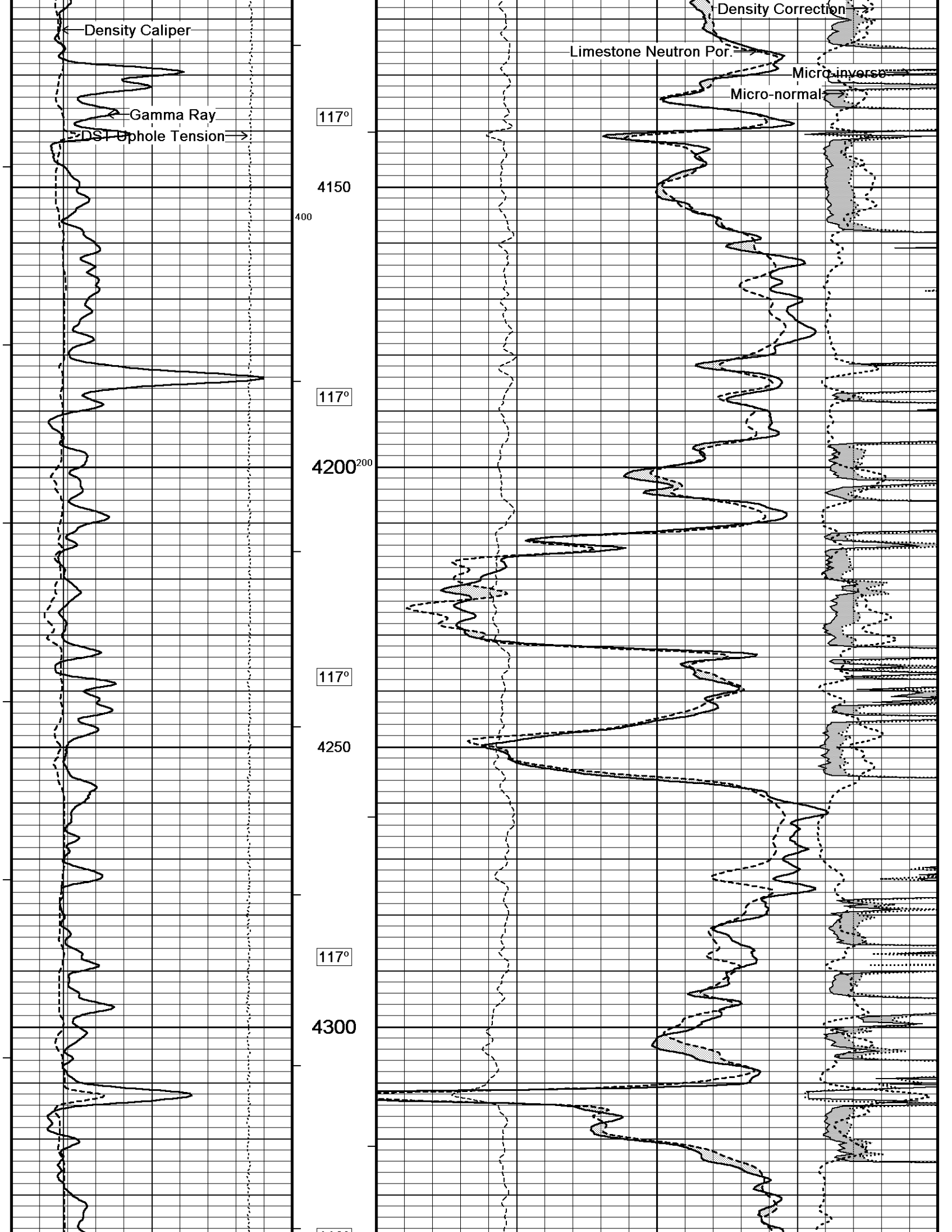
REMARKS

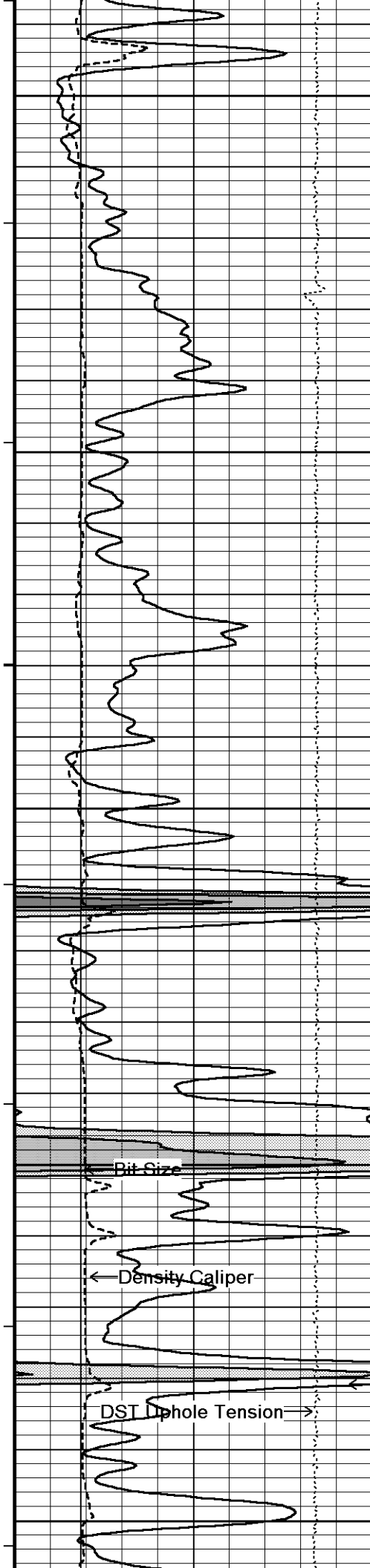
Tools Used: MPD, MCG, MDN, MFE, MAI, MML.
Hardware: MPD: 8 inch profile plate used. MAI and MFE: 0.5 Inch standoffs used. MDN: Dual Bowspring used.
2.71 G/CC Limestone density matrix used to calculate porosity.
Borehole rugosity, tight pulls, and washouts will affect data quality.
All intervals logged and scaled per customer's request.
Annular volume with 5.5 inch production casing = 280 cu. ft
Service Order #3534534
Rig: Southwind # 70
Engineer: F.Martins
Operator(s): K. Rinehart

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.

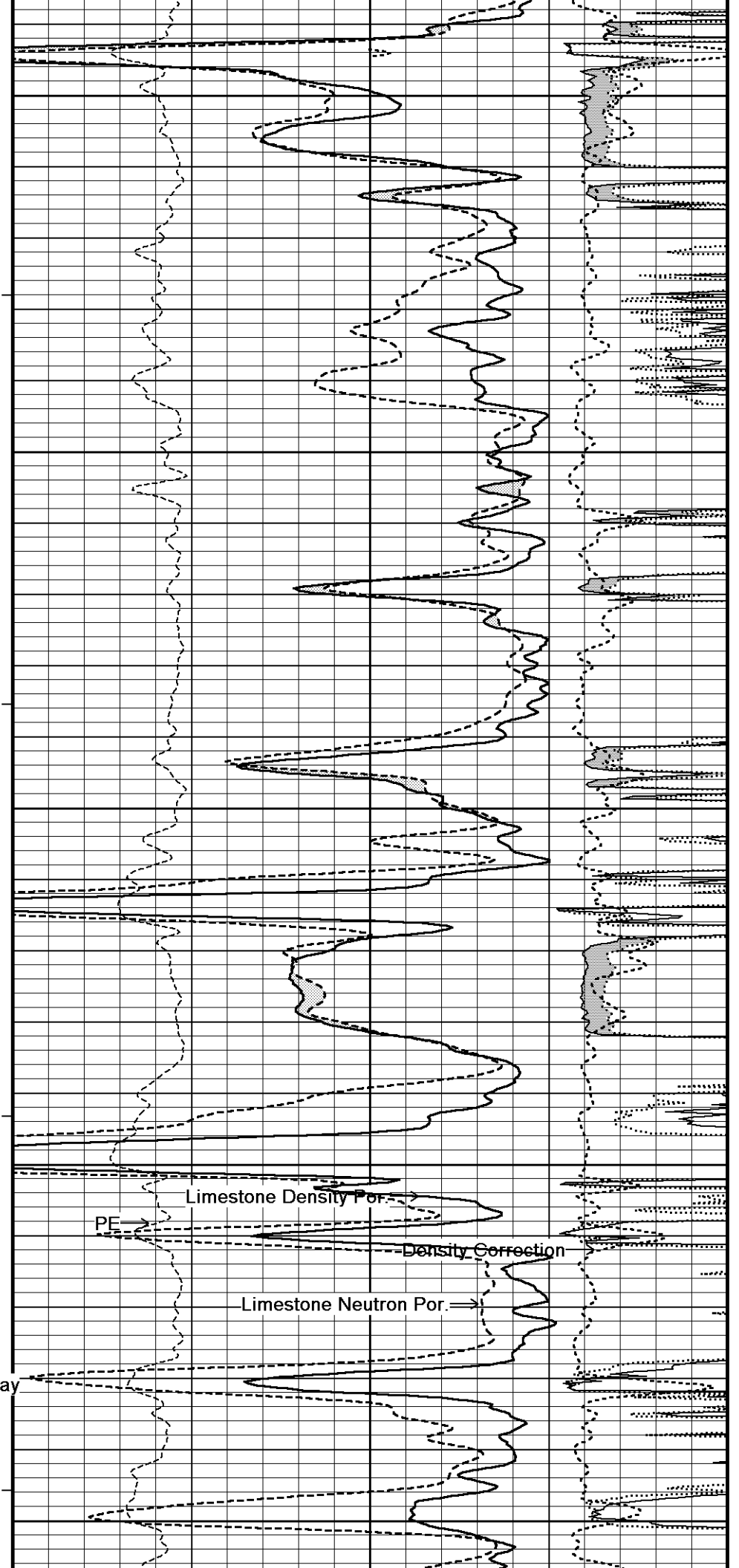


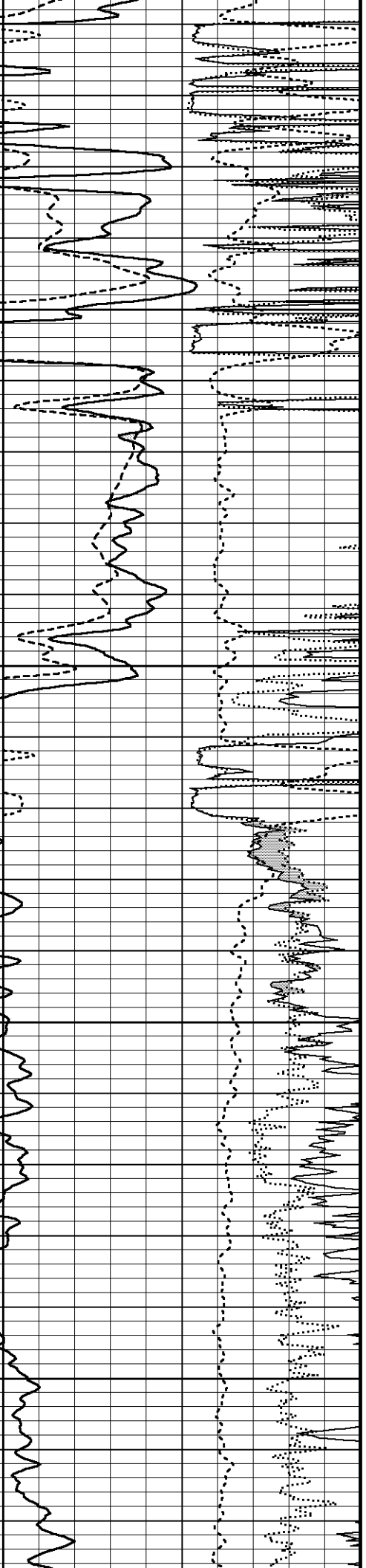
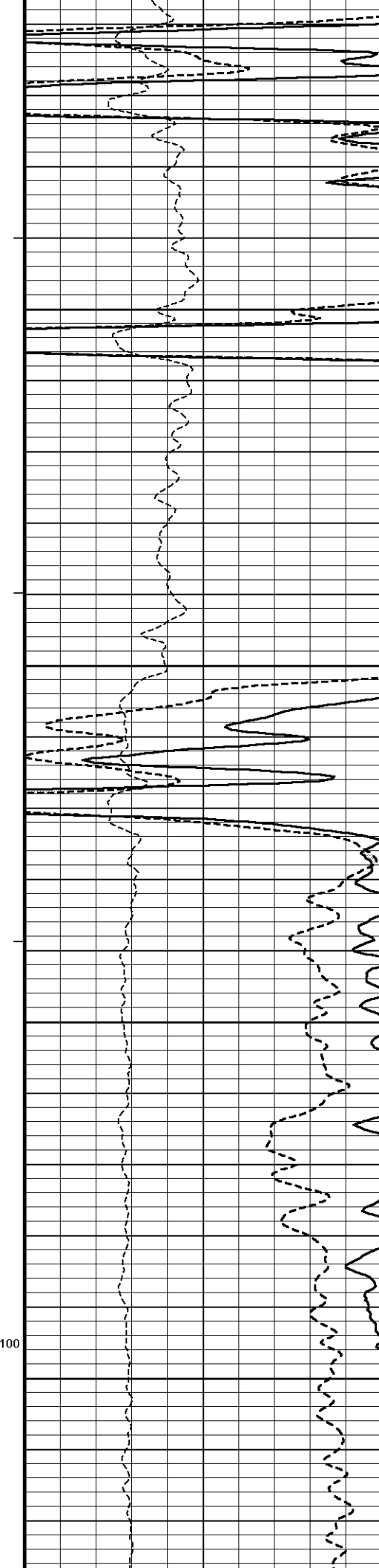
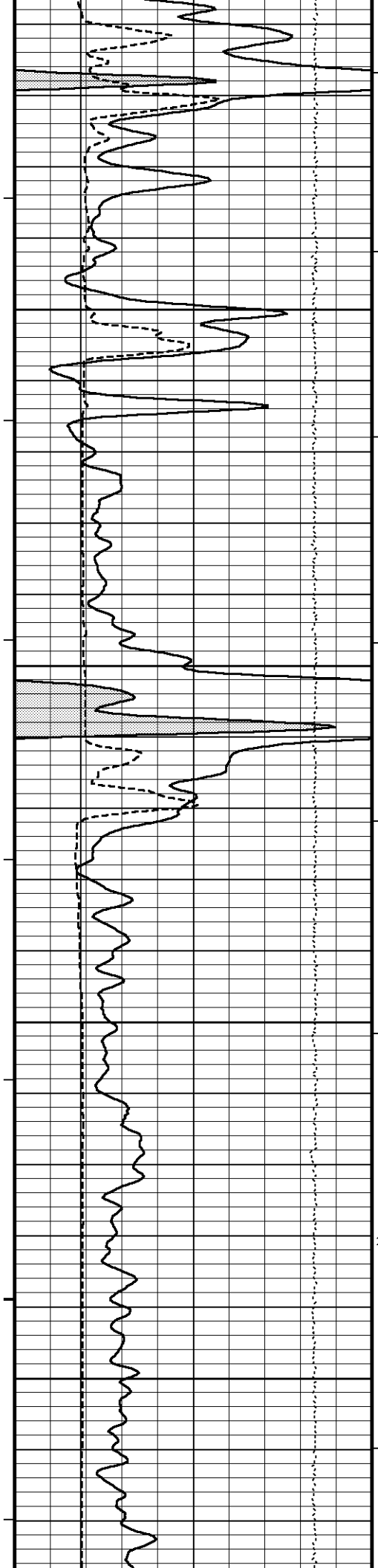


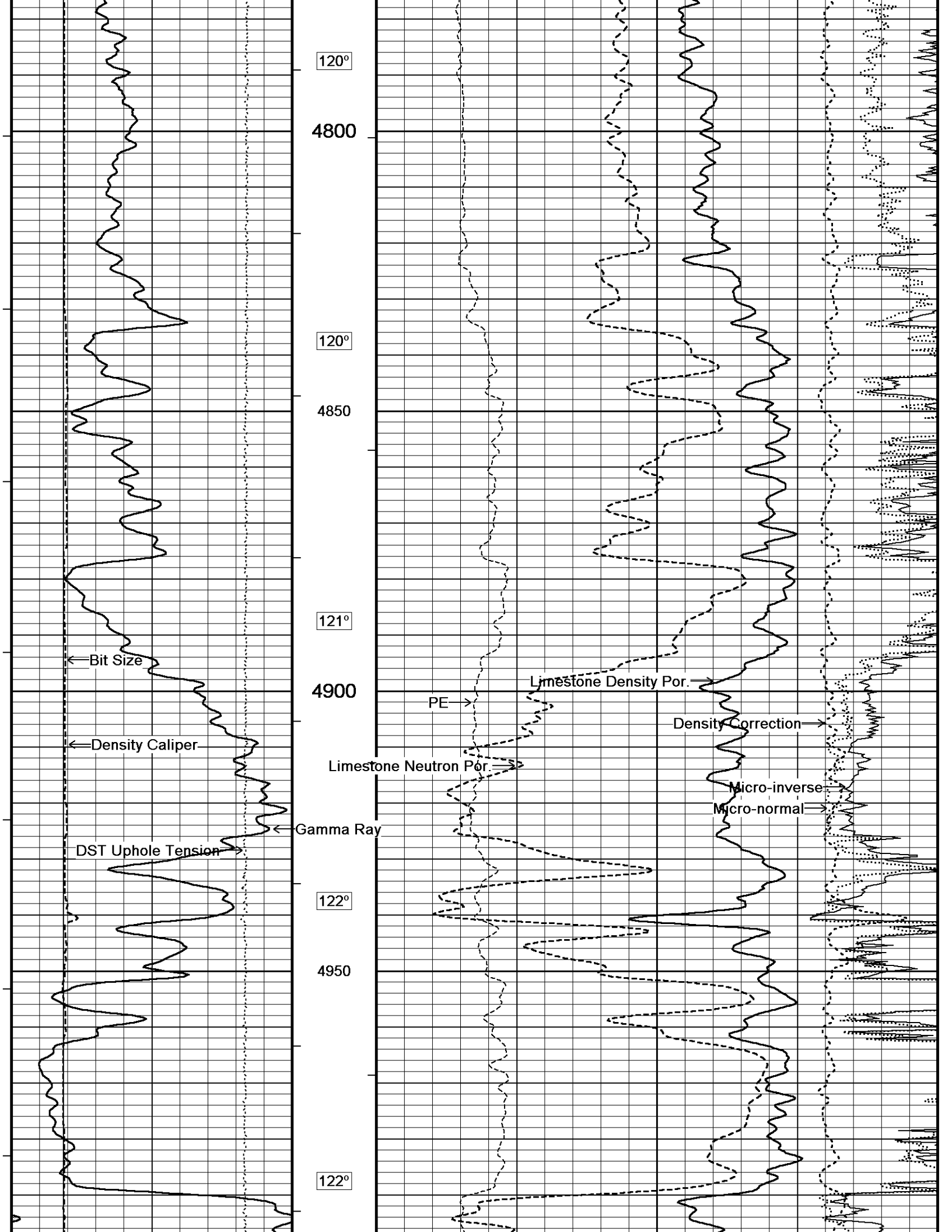


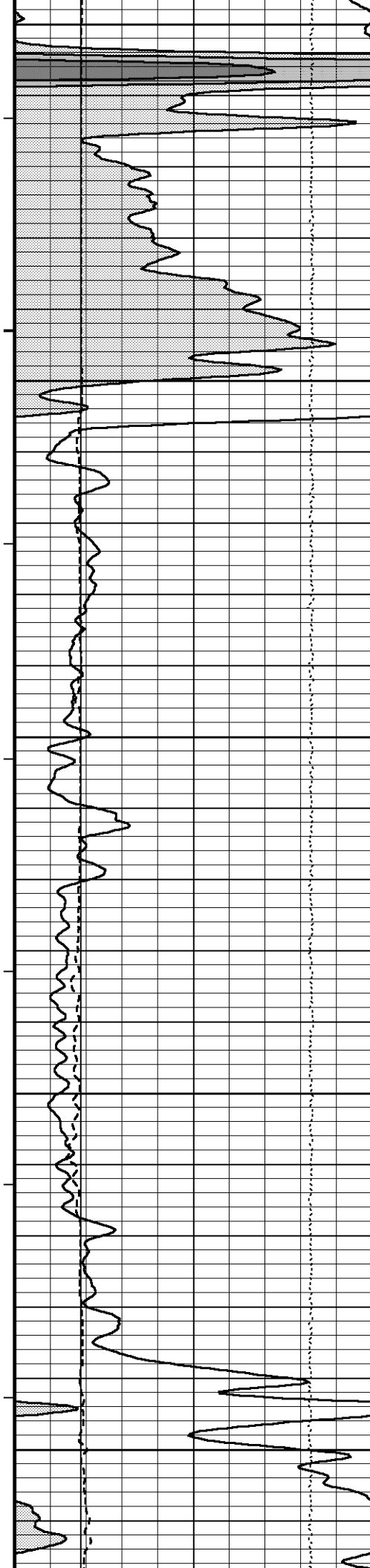


118°
4350
118°
4400
118°
4450
300
118°
4500
118°
4550









5000

100

122°

5050

123°

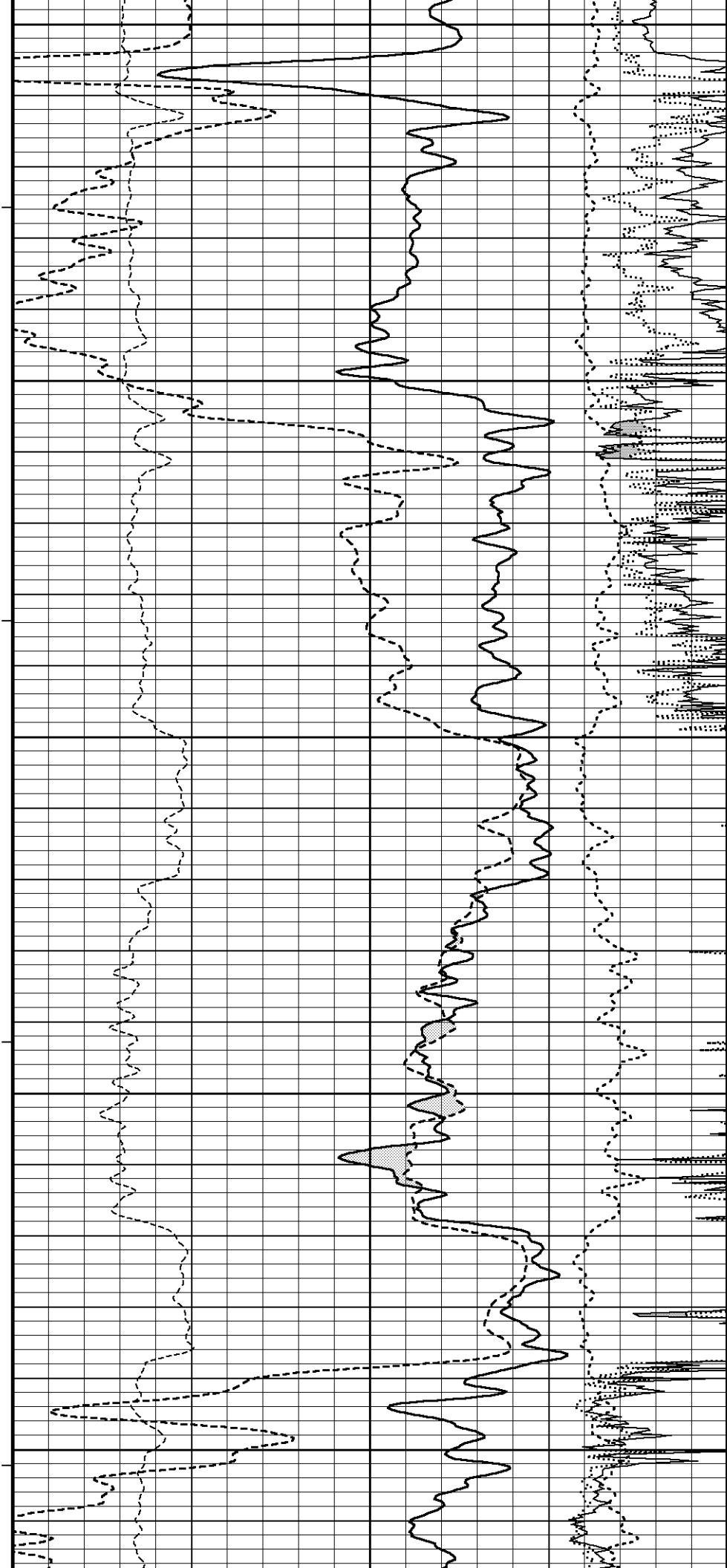
5100

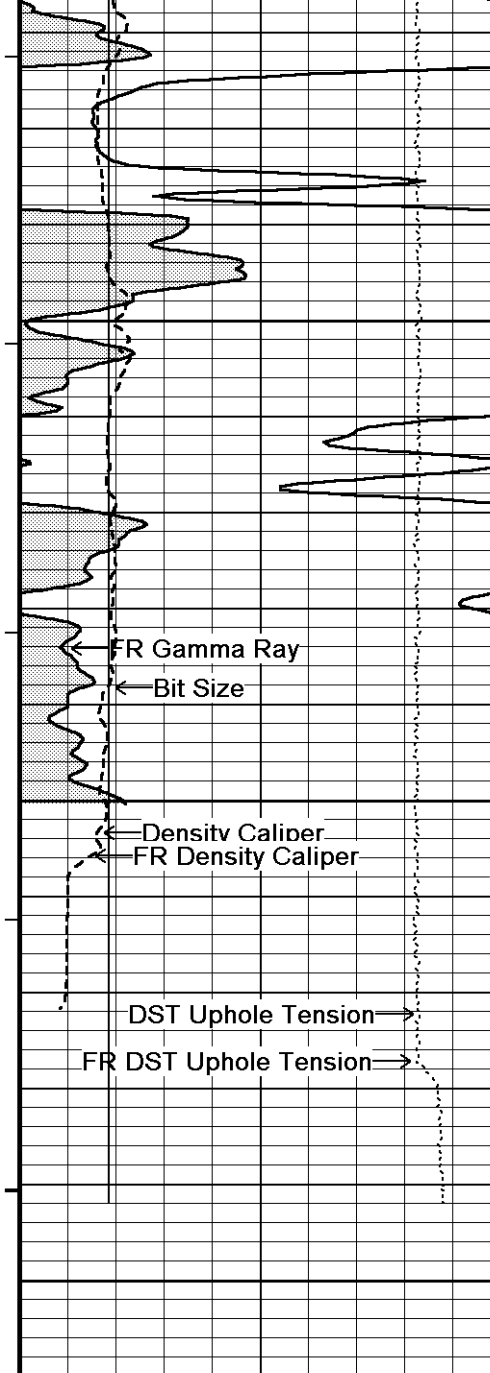
123°

5150

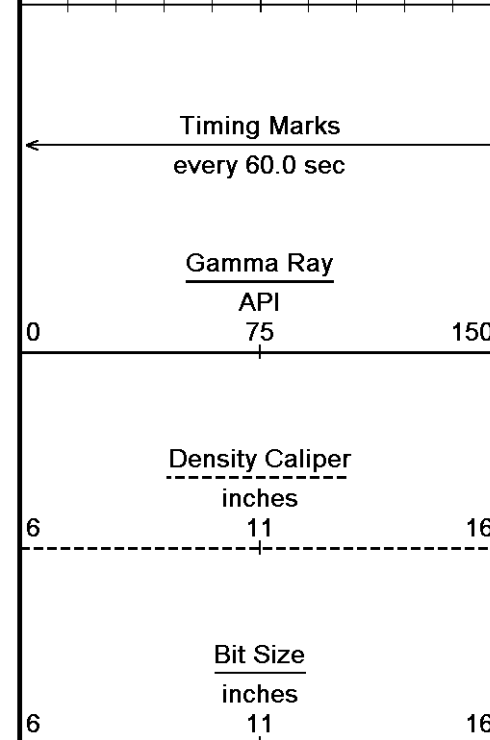
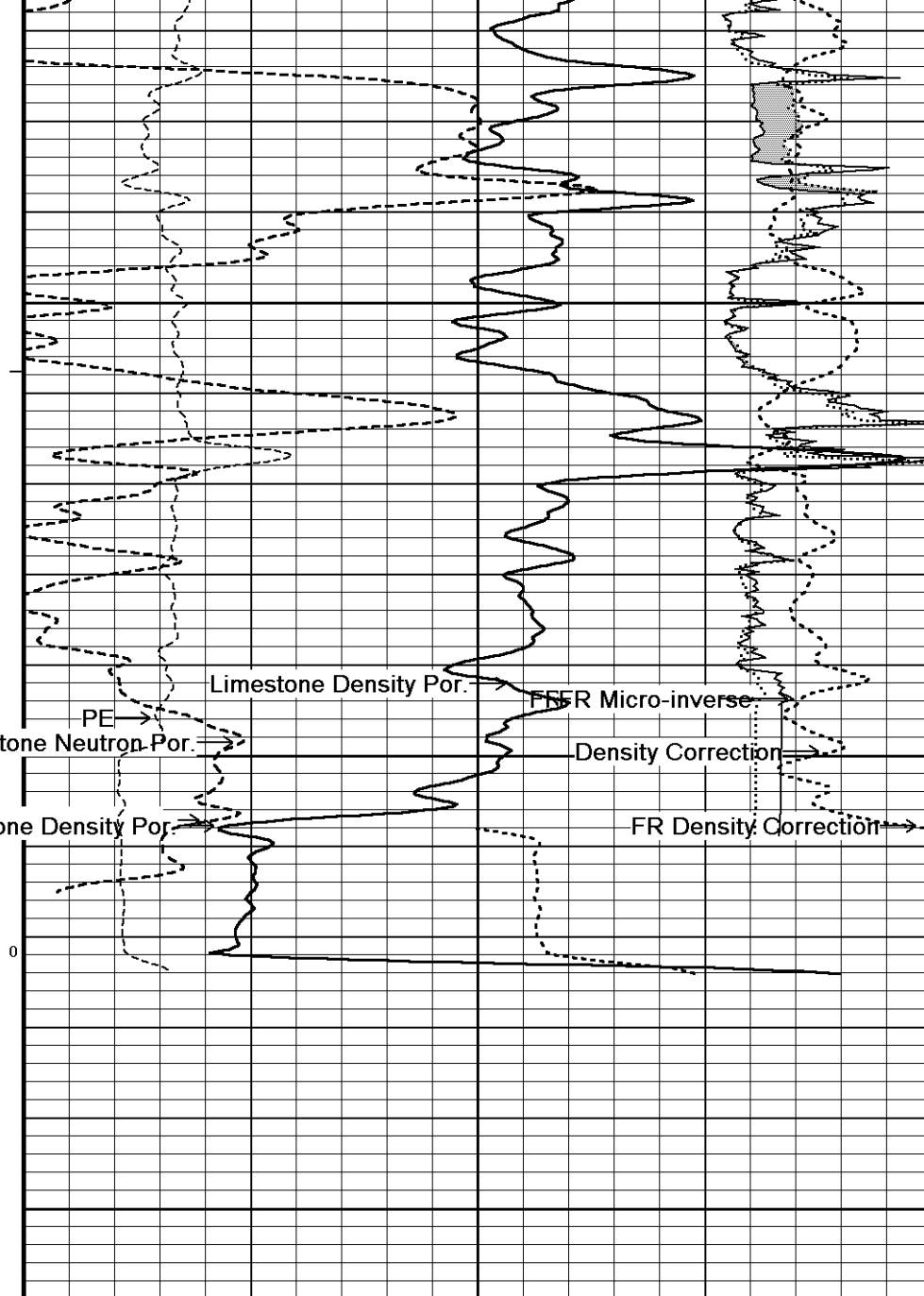
123°

5200

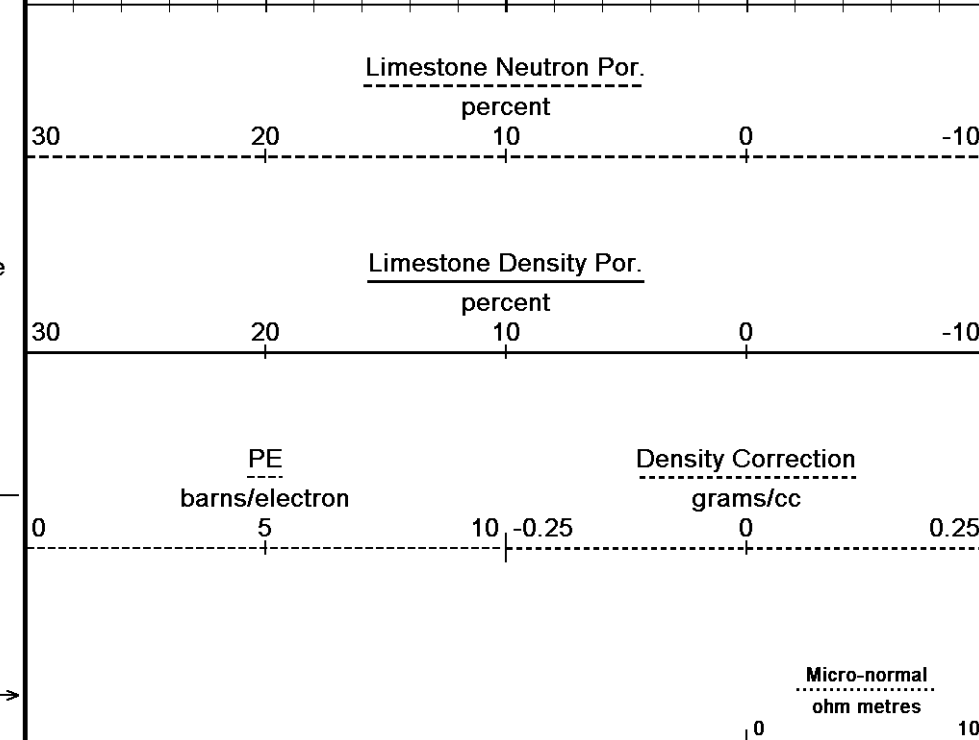




124°
5250
125°
5300
5350
5358
Depth in Feet



Borehole Temp in deg F
HVI every 10 cu ft
Annular Integral every 10 cu ft

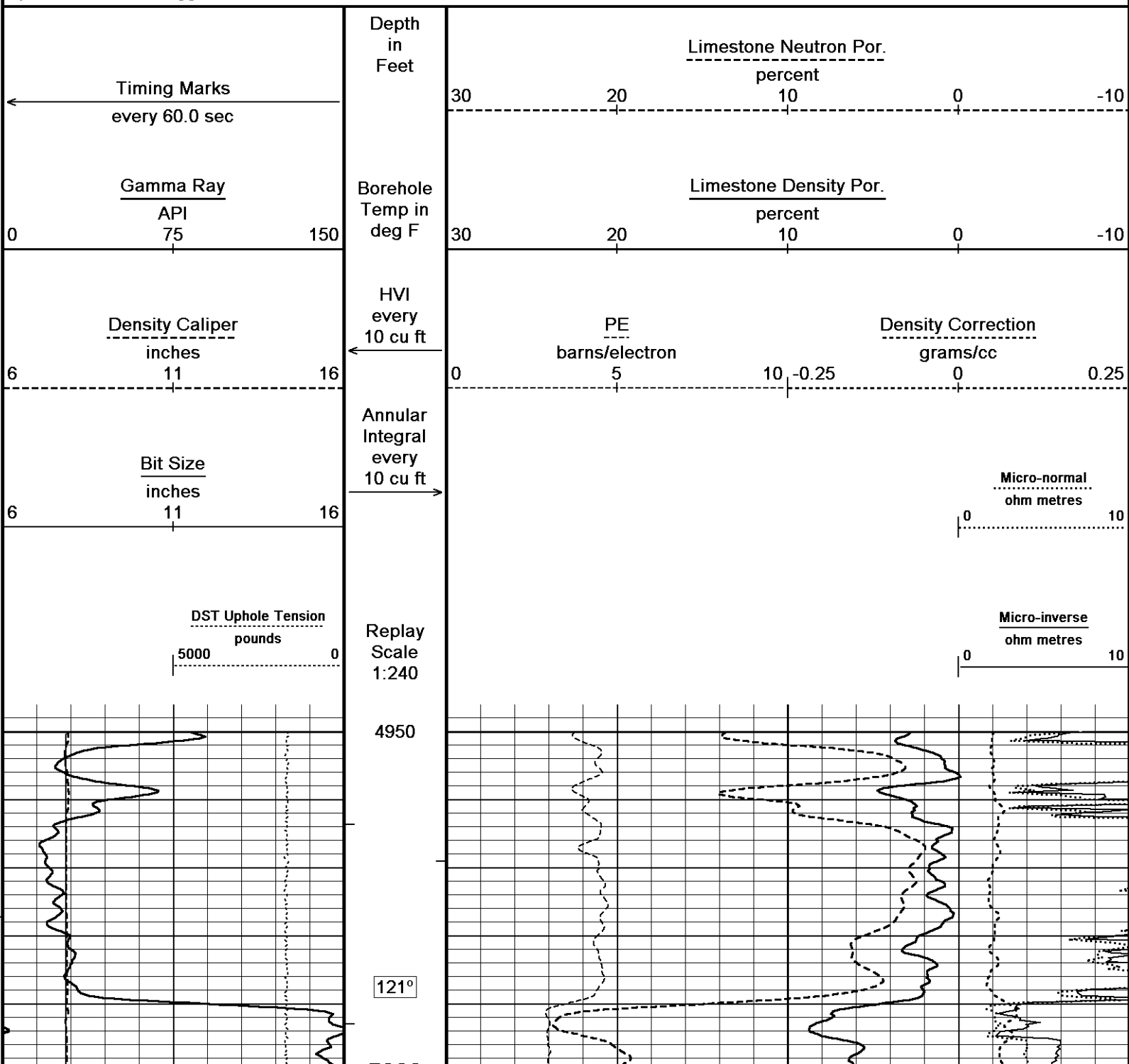


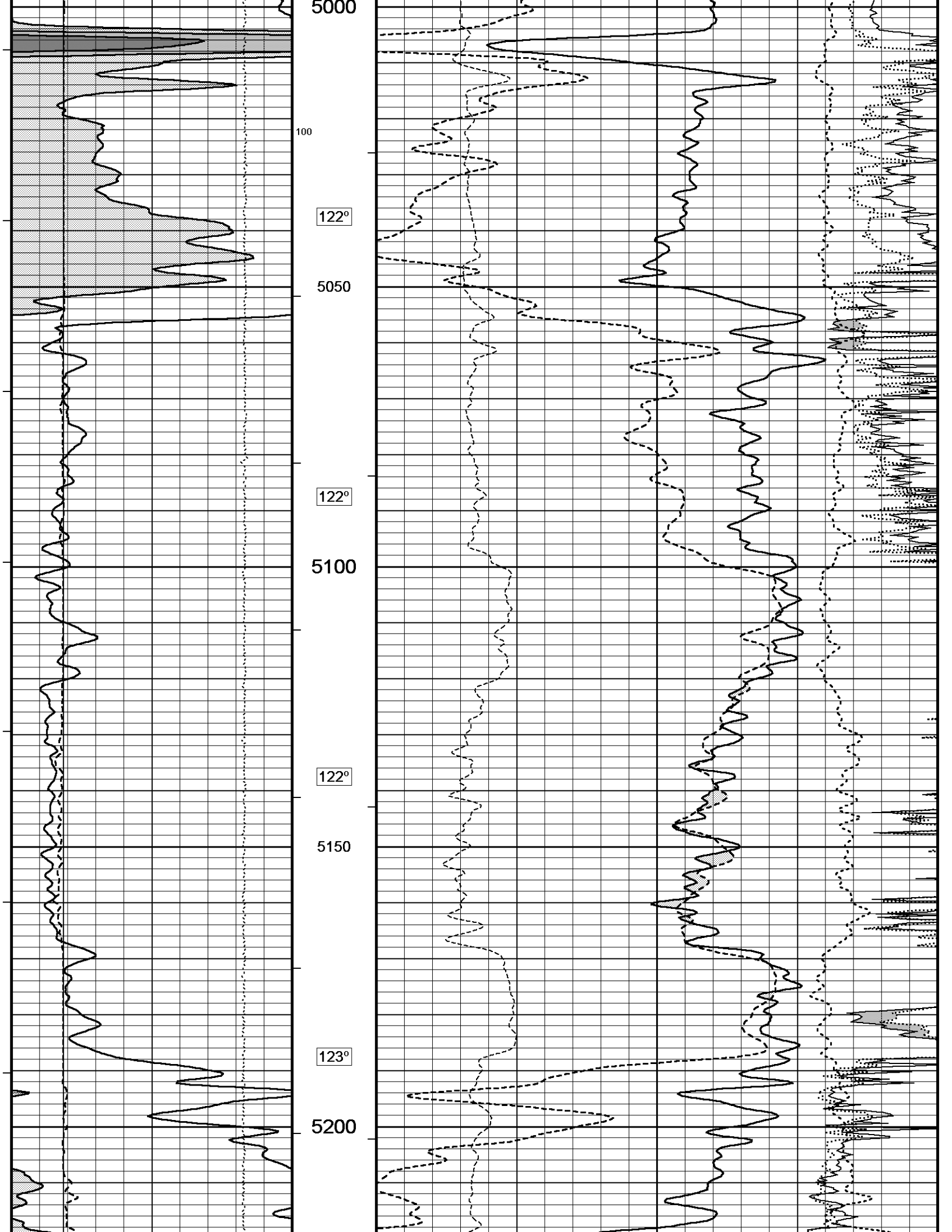


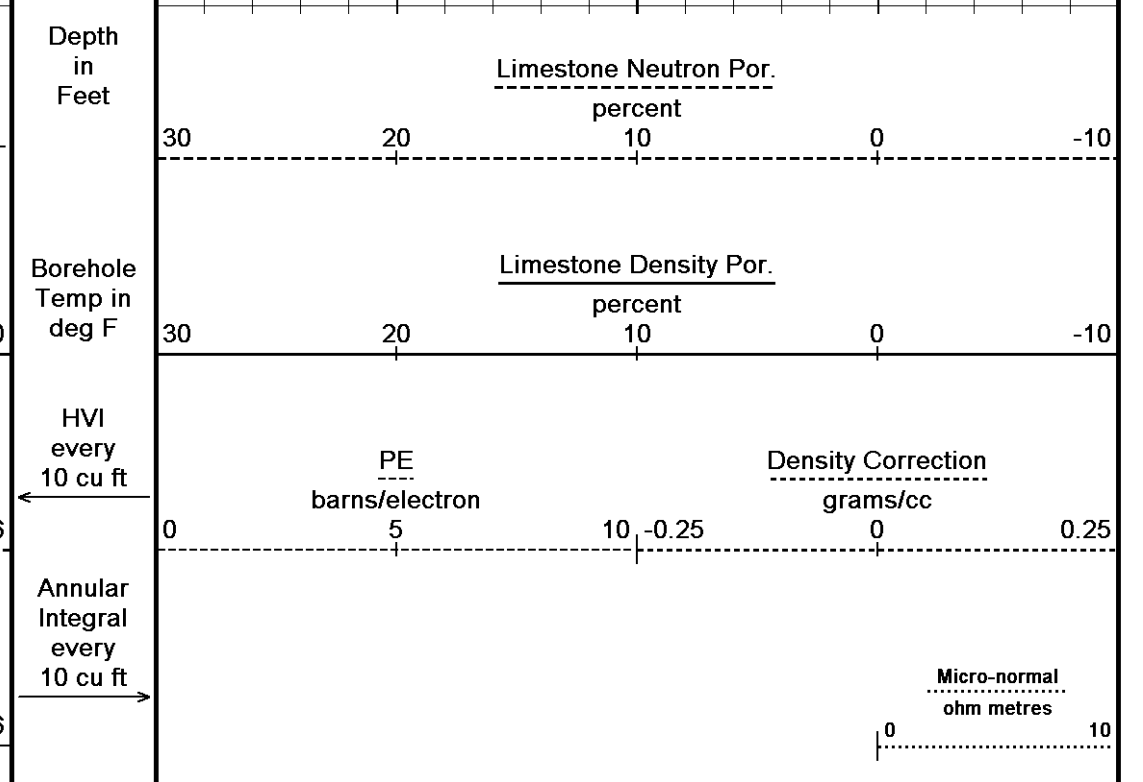
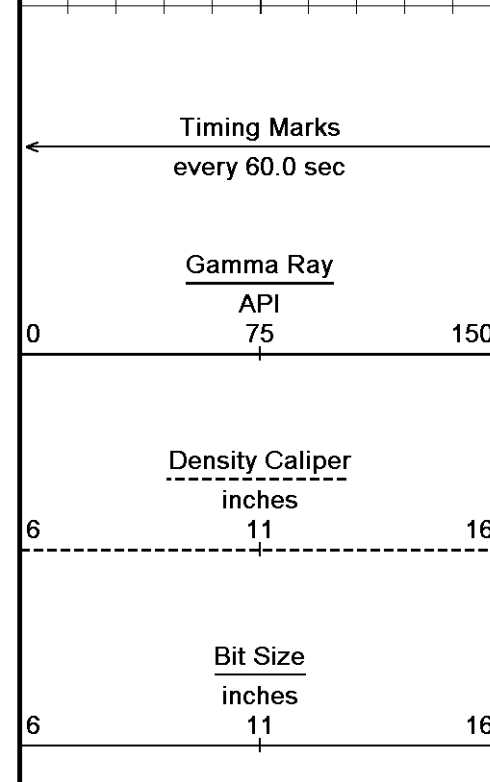
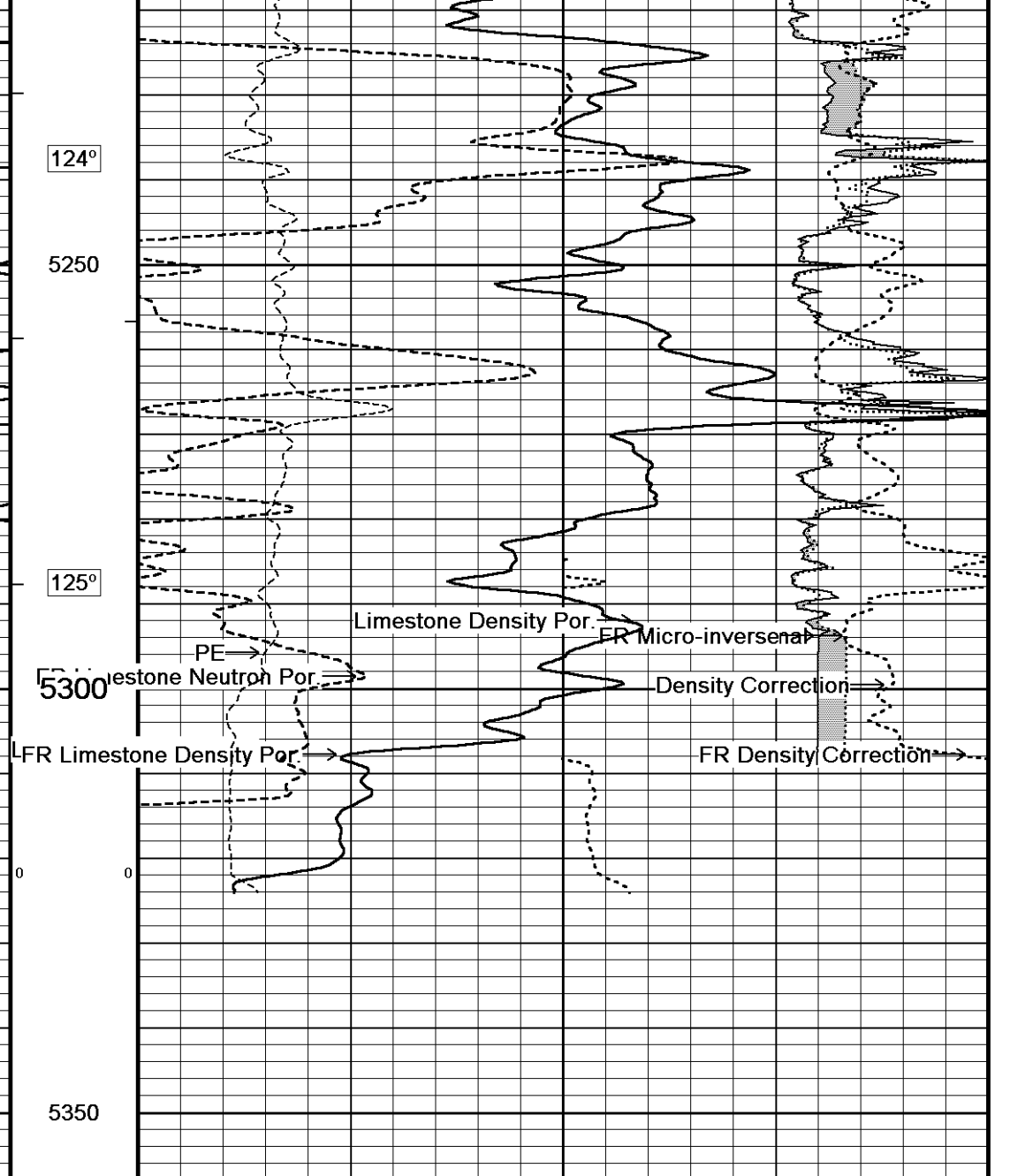
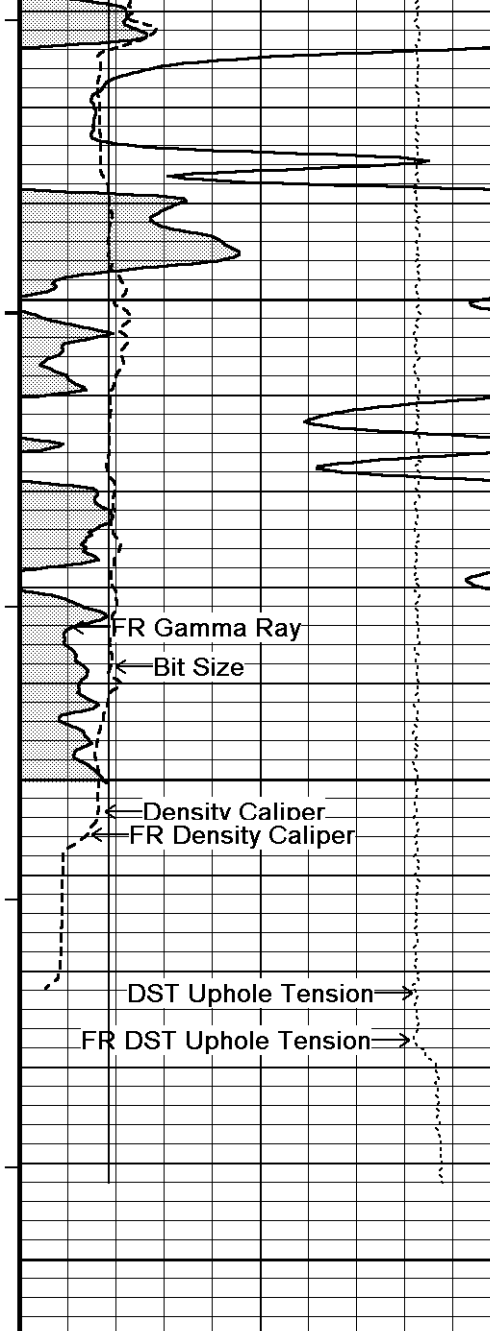
Depth Based Data - Maximum Sampling Increment 10.0cm	Plotted on 06-MAY-2012 14:03
Filename: C:\Minimus 11_03_4044\Data\MM Exploration...\MM Exploration Z Bar # 16-4 SWD5_003.dta	Recorded on 06-MAY-2012 11:46
System Versions: Logged with 11.03.4044 Processed with 11.03.4044 Plotted with 11.03.4044	

↑	5 INCH MAIN	↑
---	-------------	---

↓	REPEAT SECTION	↓
Depth Based Data - Maximum Sampling Increment 10.0cm	Plotted on 06-MAY-2012 14:03	
Filename: C:\Minimus 11_03_4044\Data\MM Exploration...\MM Exploration Z Bar # 16-4 SWD5_002.dta	Recorded on 06-MAY-2012 11:24	
System Versions: Logged with 11.03.4044 Processed with 11.03.4044 Plotted with 11.03.4044		







DST Uphole Tension
pounds

50000

Replay
Scale
1:240

Micro-inverse
ohm metres

010

Depth Based Data - Maximum Sampling Increment 10.0cmPlotted on 06-MAY-2012 14:03
Filename: C:\Minimus 11_03_4044\Data\MM Exploration...\MM Exploration Z Bar # 16-4 SWD5_002.dtaRecorded on 06-MAY-2012 11:24
System Versions: Logged with 11.03.4044 Processed with 11.03.4044 Plotted with 11.03.4044

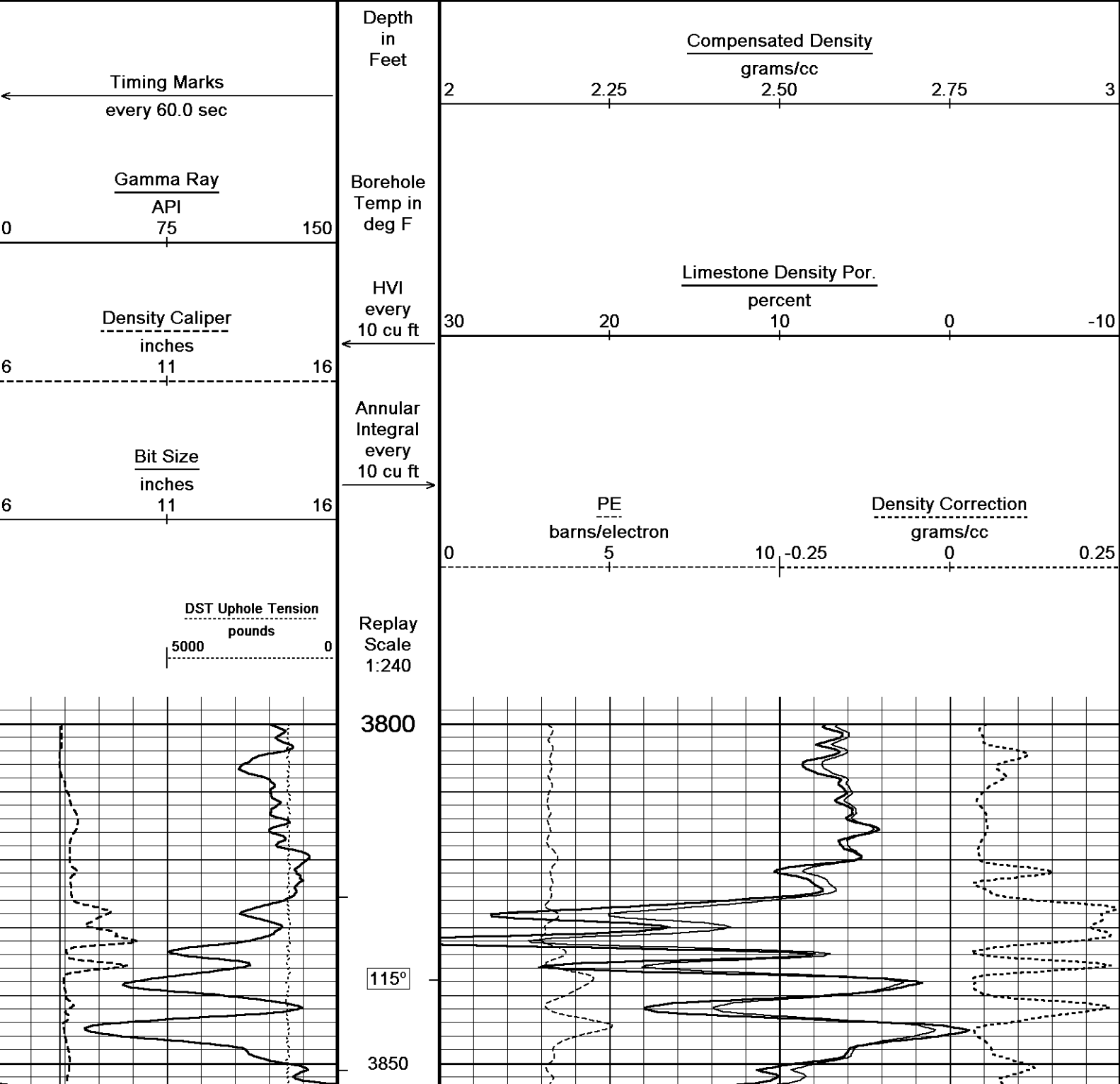
↑REPEAT SECTION↑

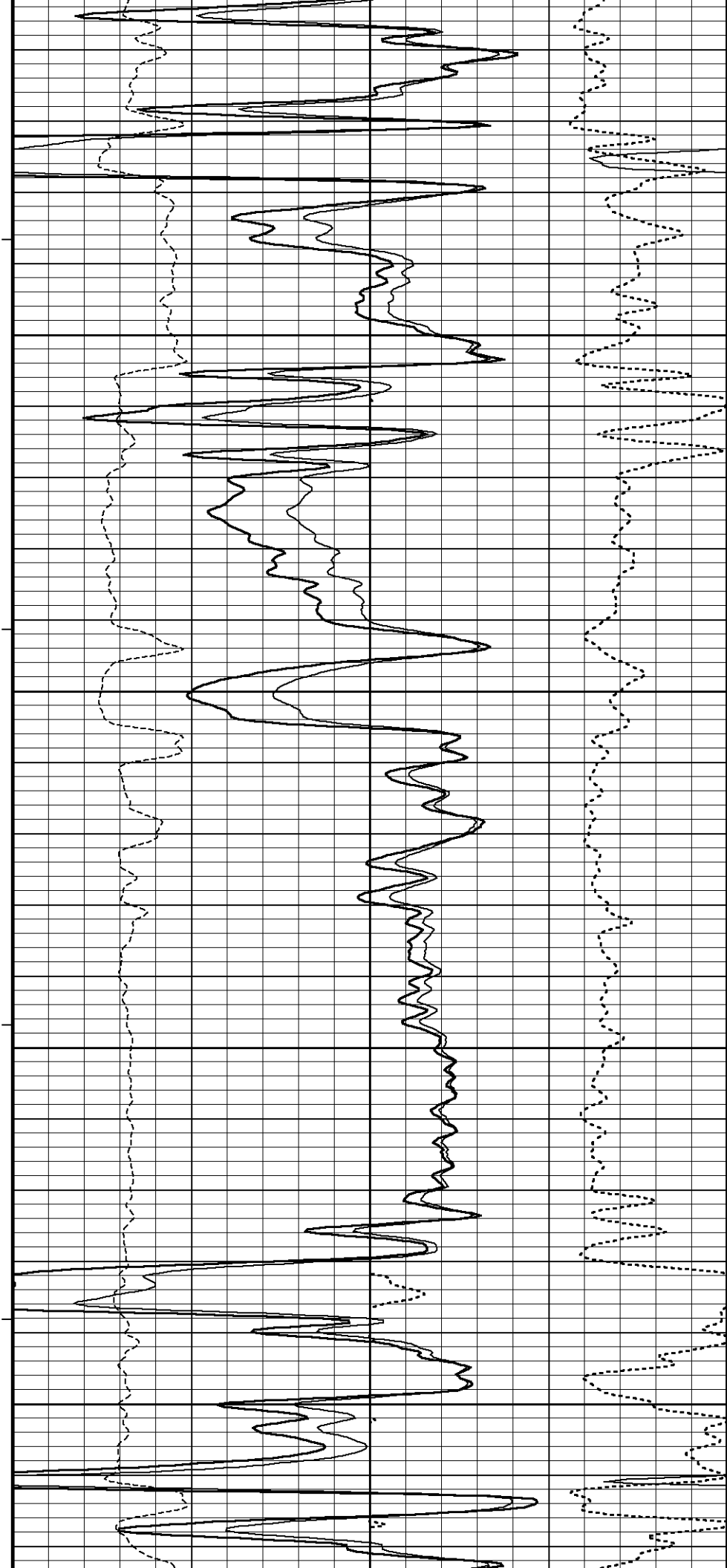
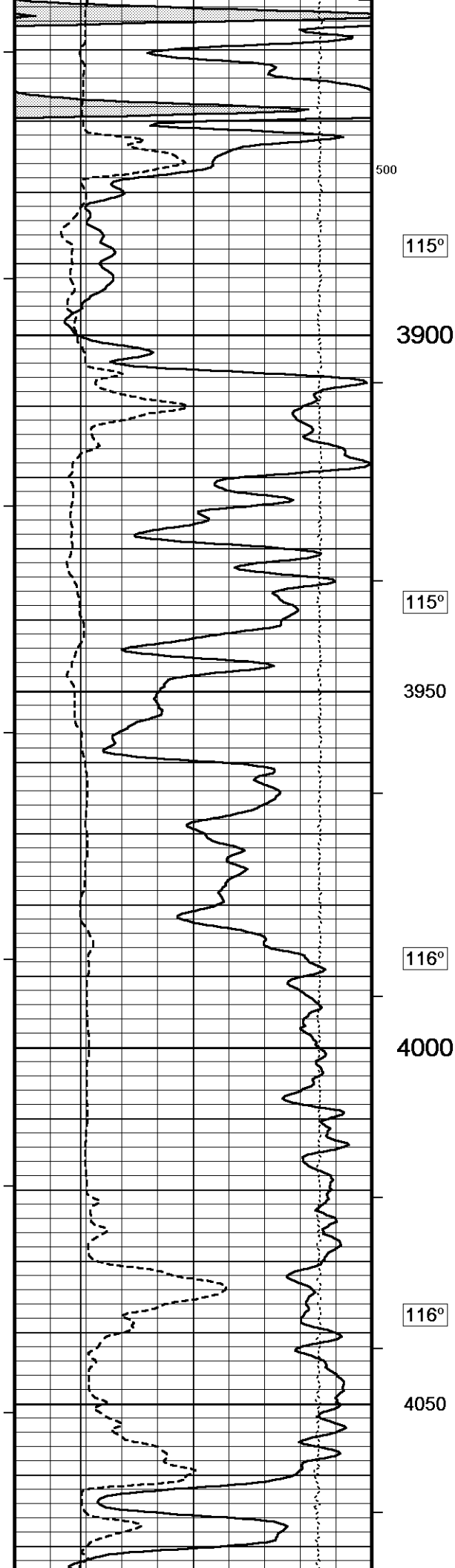
↓

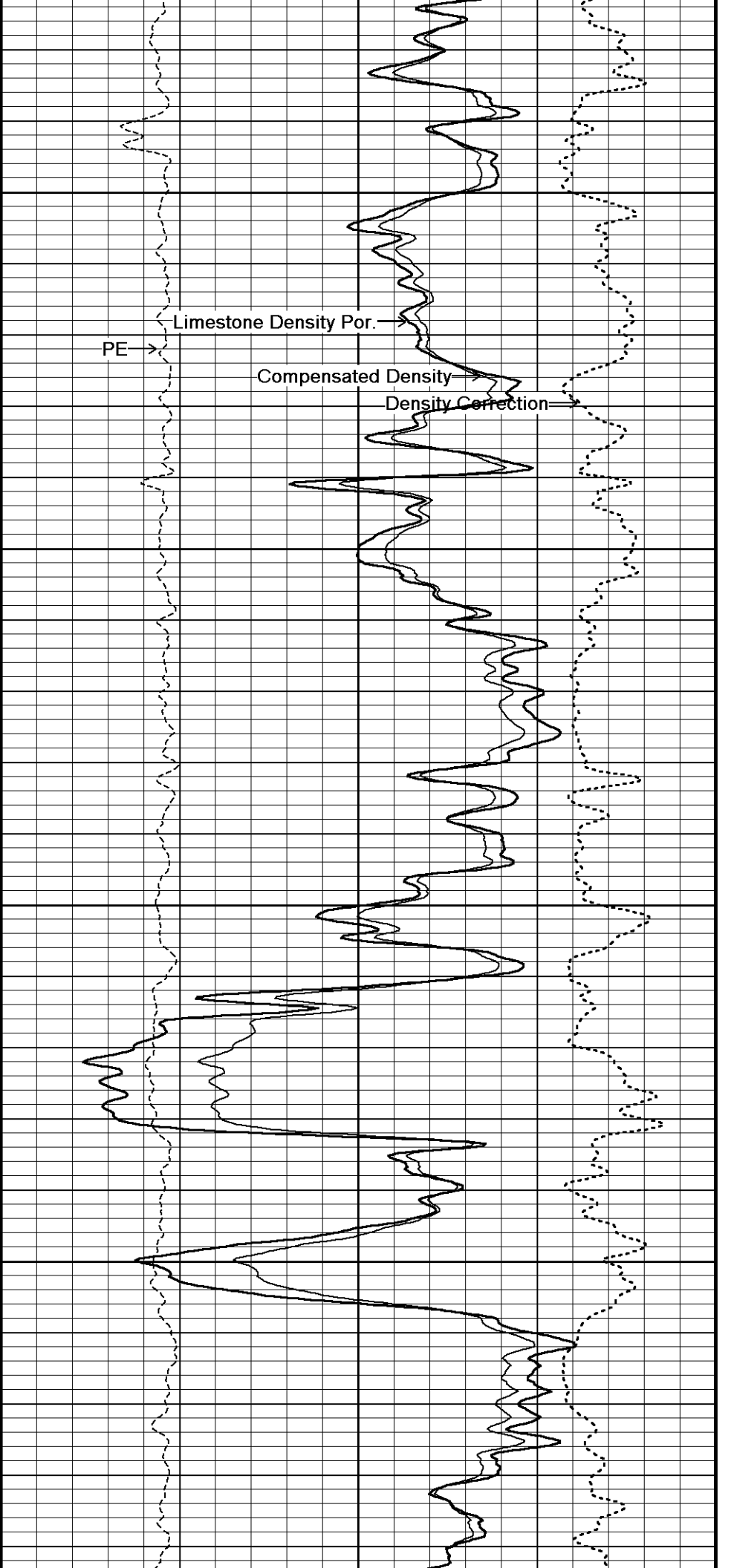
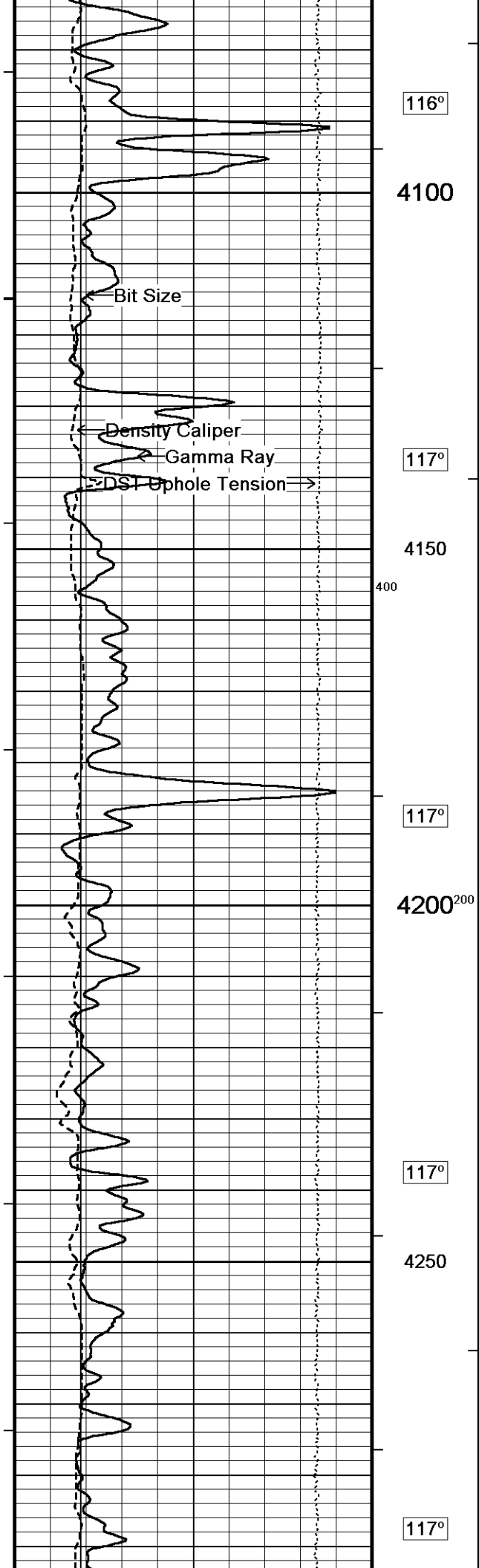
5 INCH MAIN

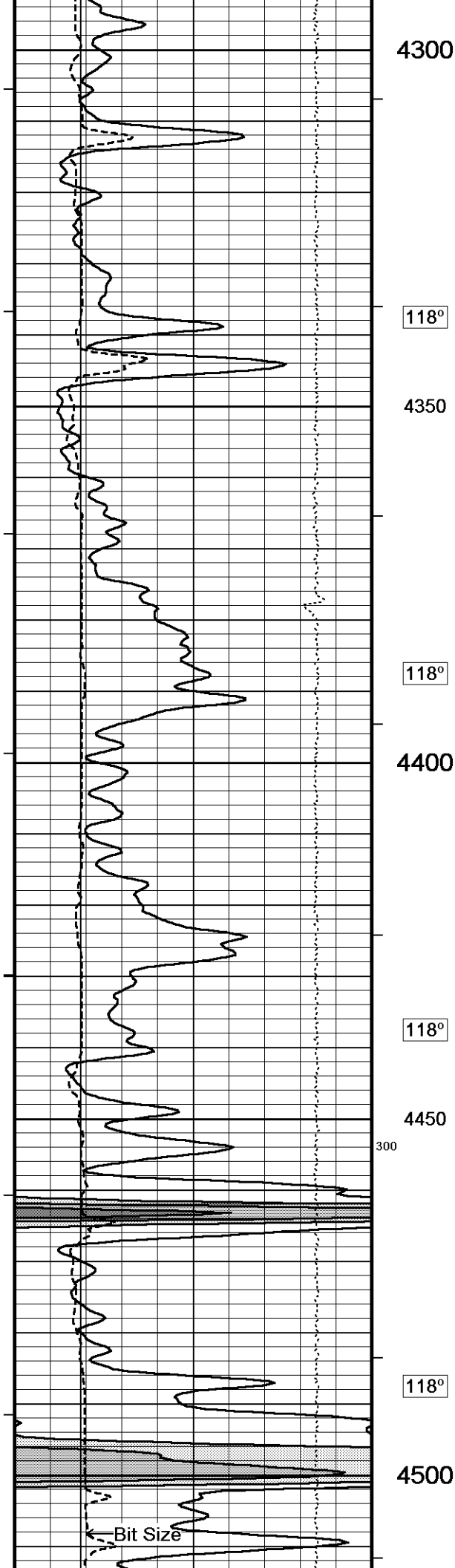
↓

Depth Based Data - Maximum Sampling Increment 10.0cmPlotted on 06-MAY-2012 14:03
Filename: C:\Minimus 11_03_4044\Data\MM Exploration...\MM Exploration Z Bar # 16-4 SWD5_003.dtaRecorded on 06-MAY-2012 11:46
System Versions: Logged with 11.03.4044 Processed with 11.03.4044 Plotted with 11.03.4044









4300

118°

4350

118°

4400

118°

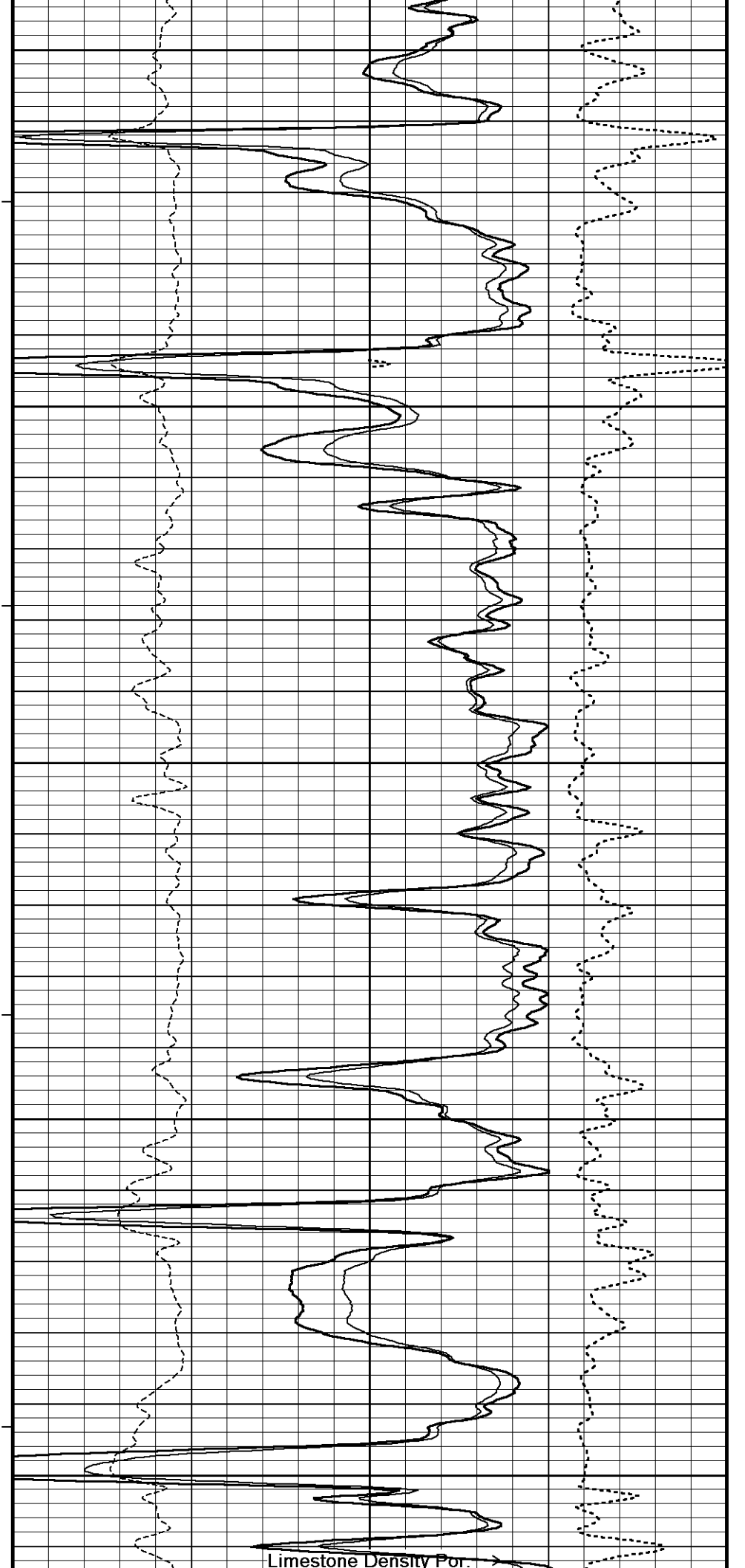
4450

300

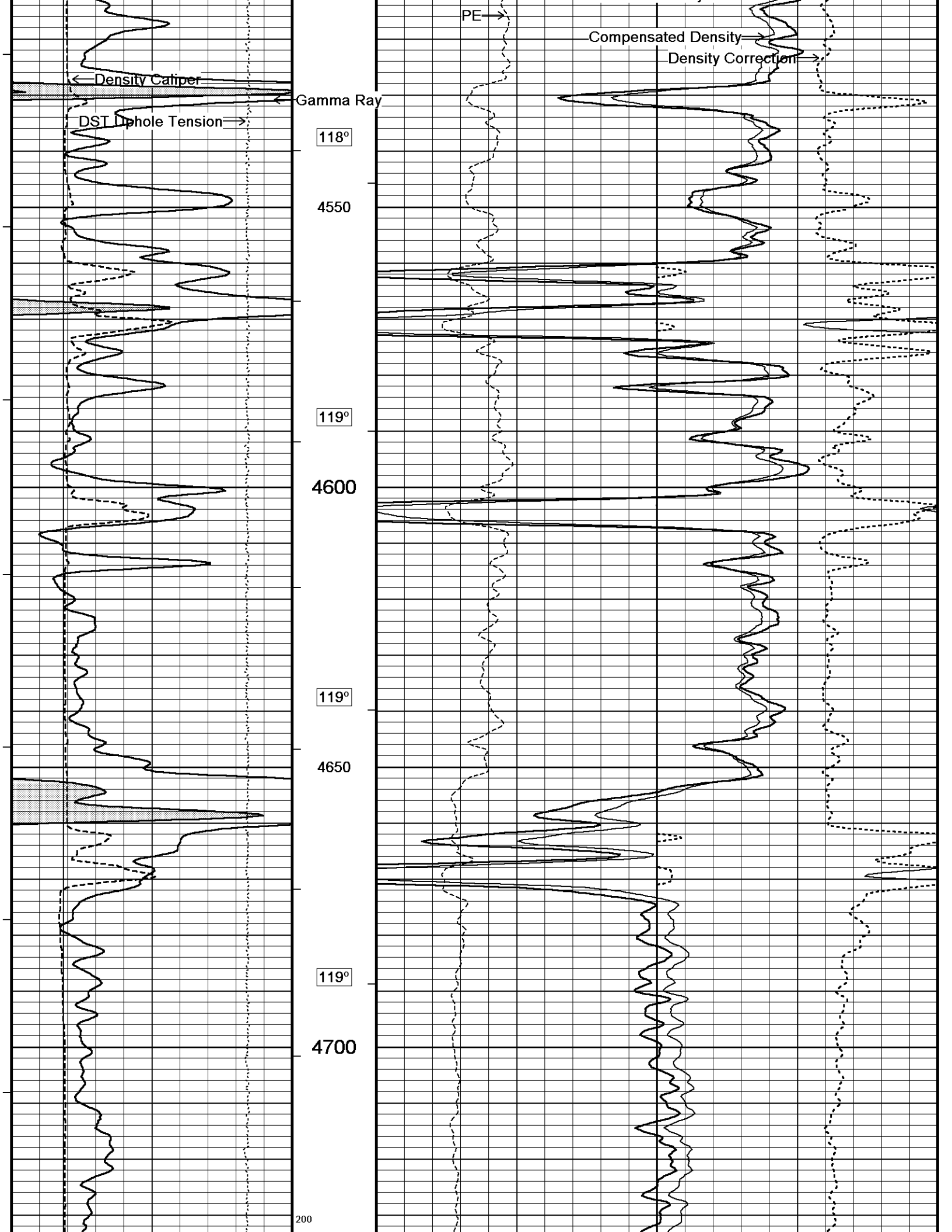
118°

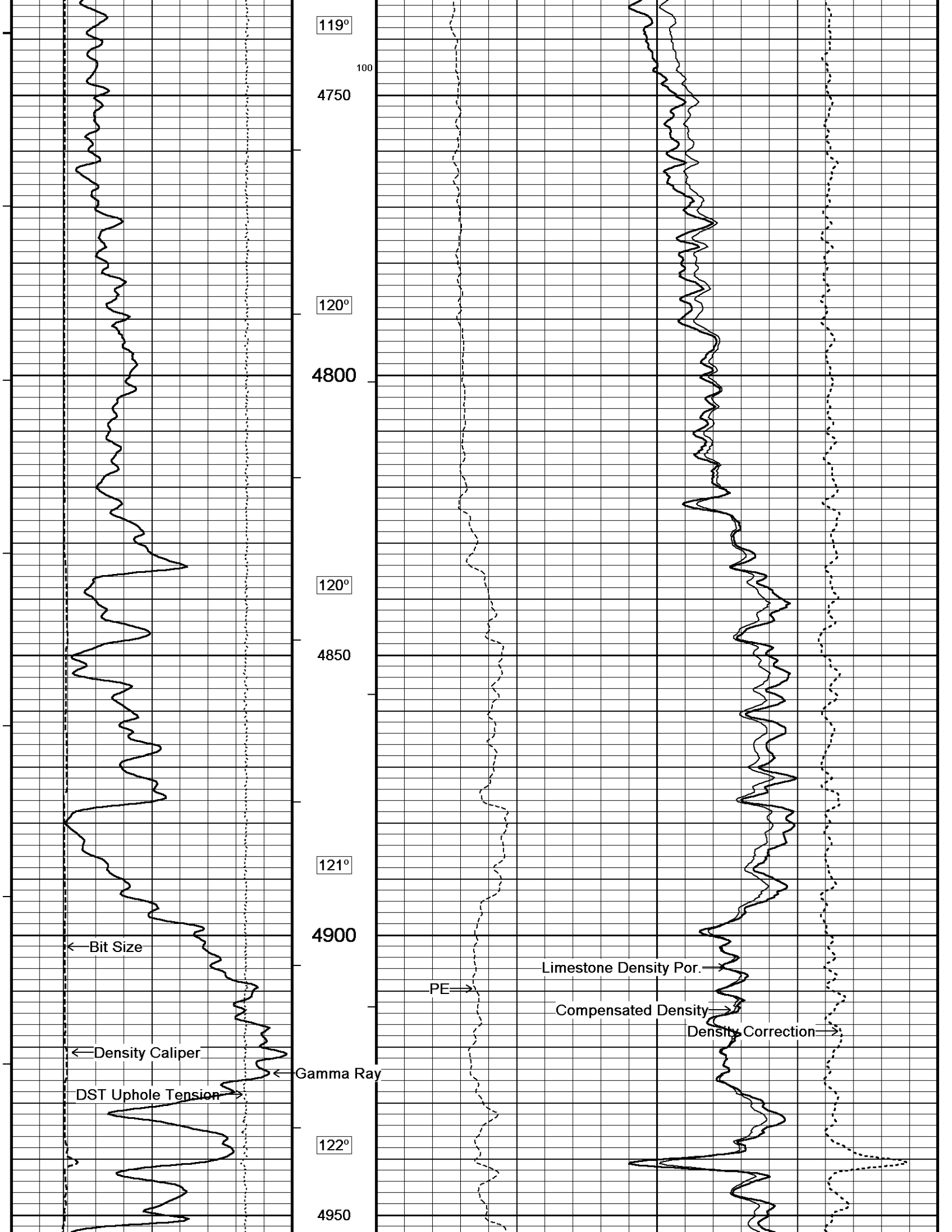
4500

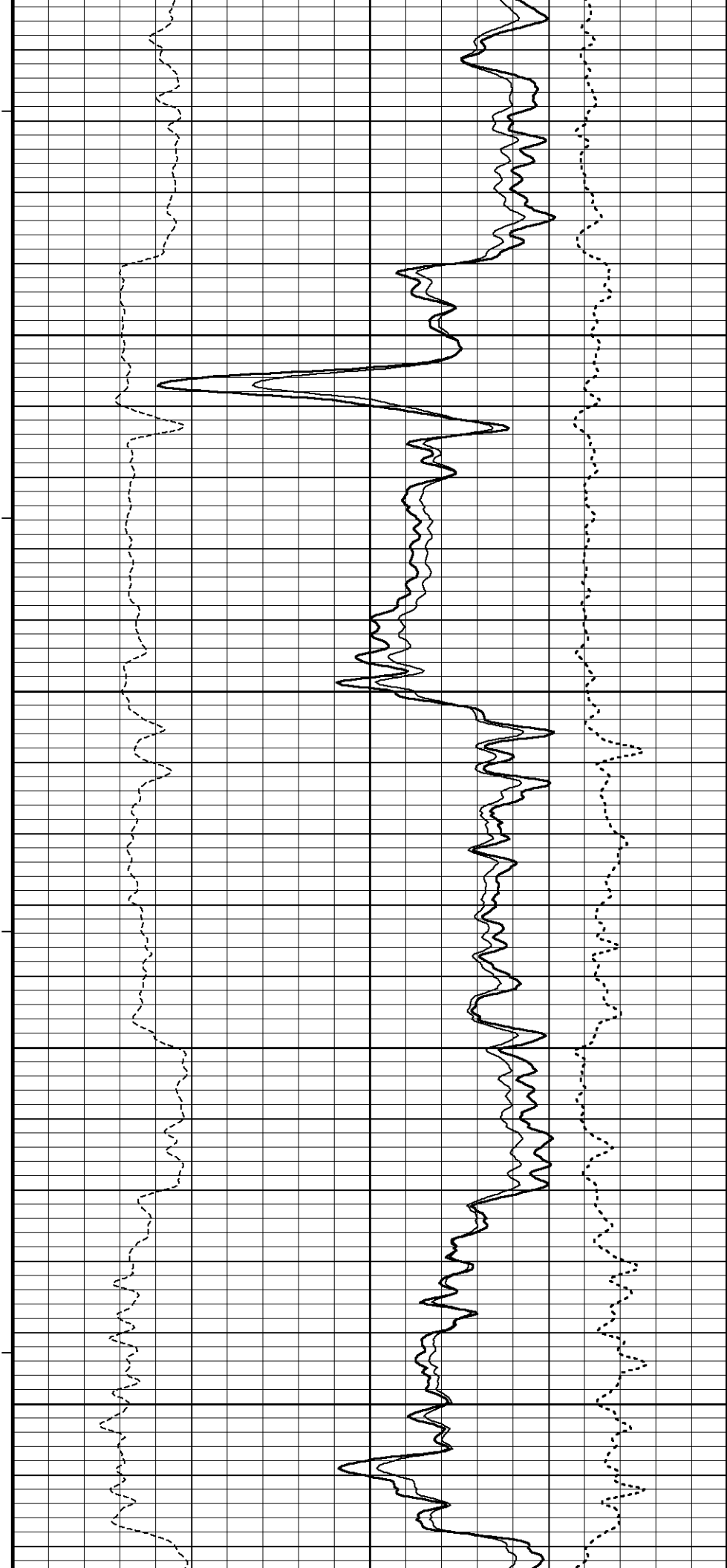
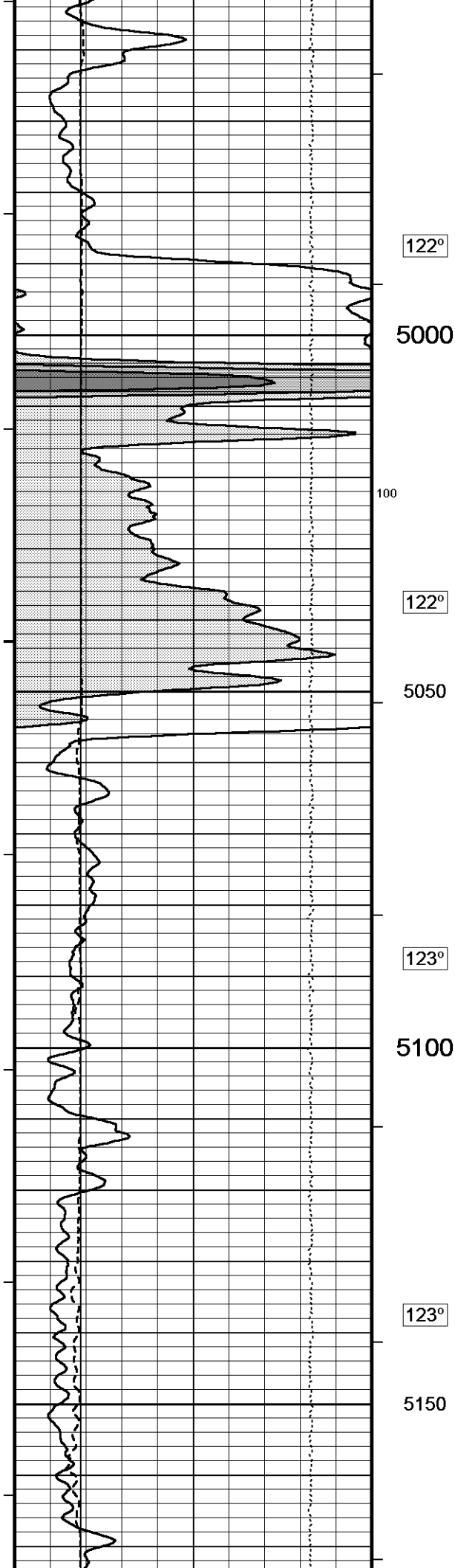
Bit Size

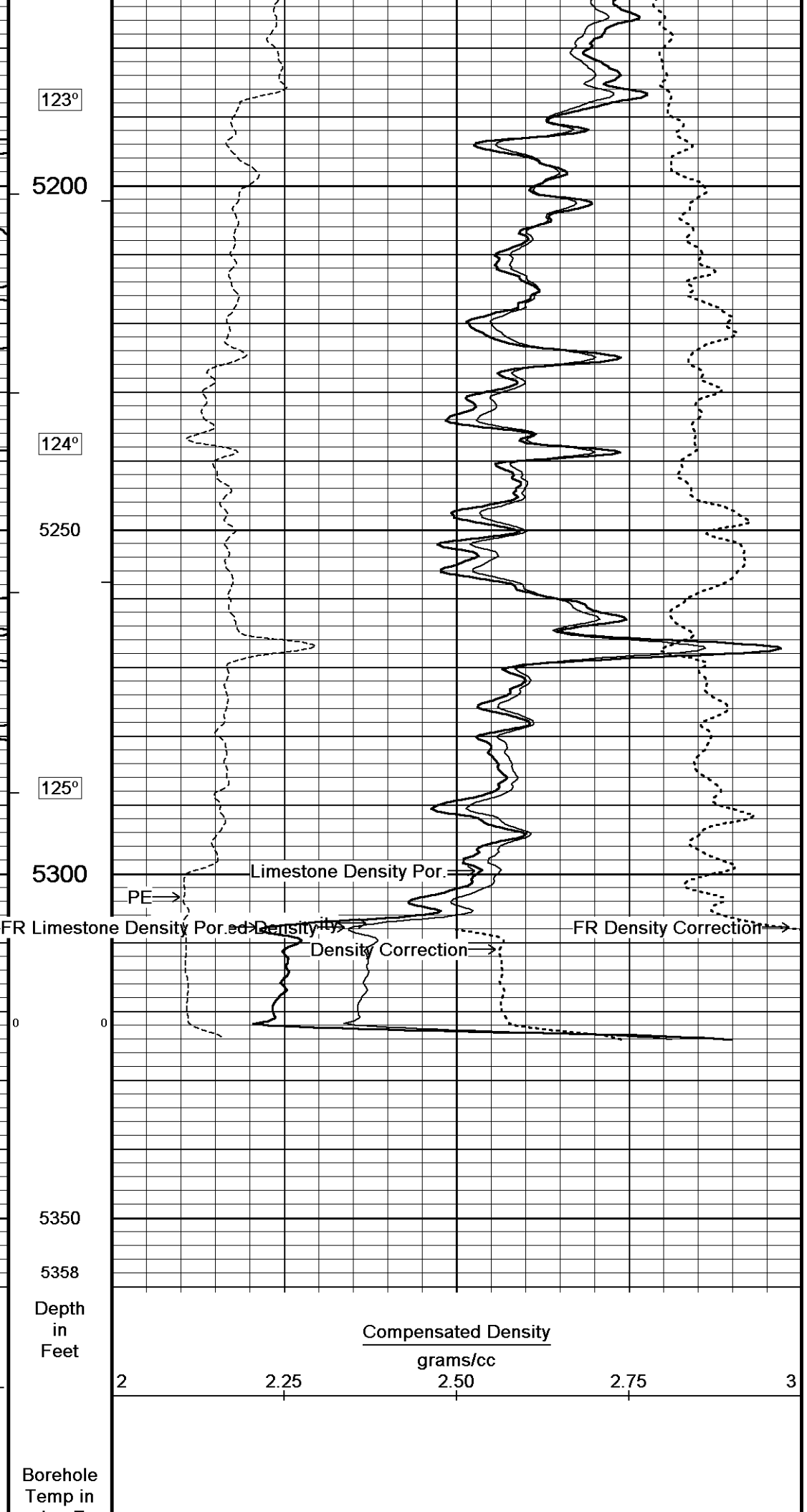
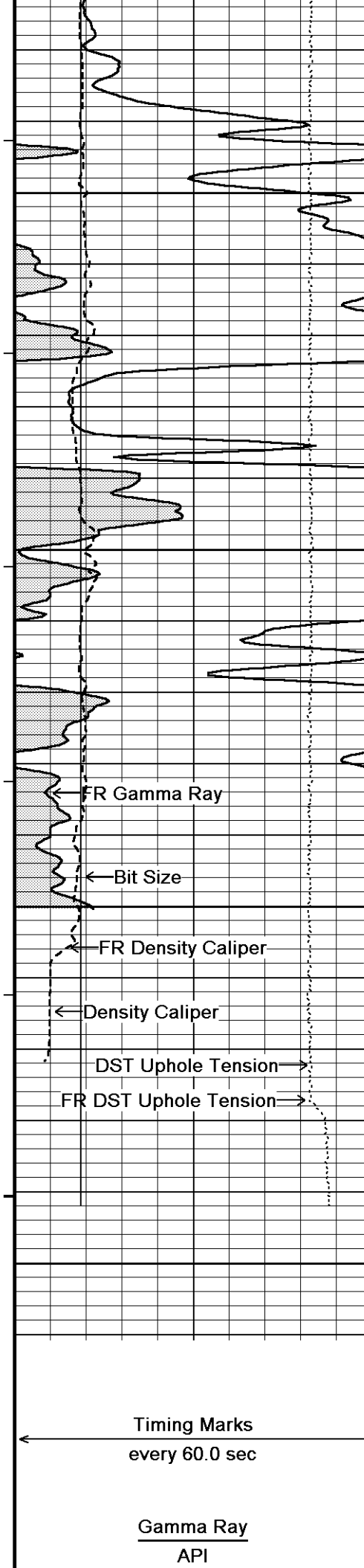


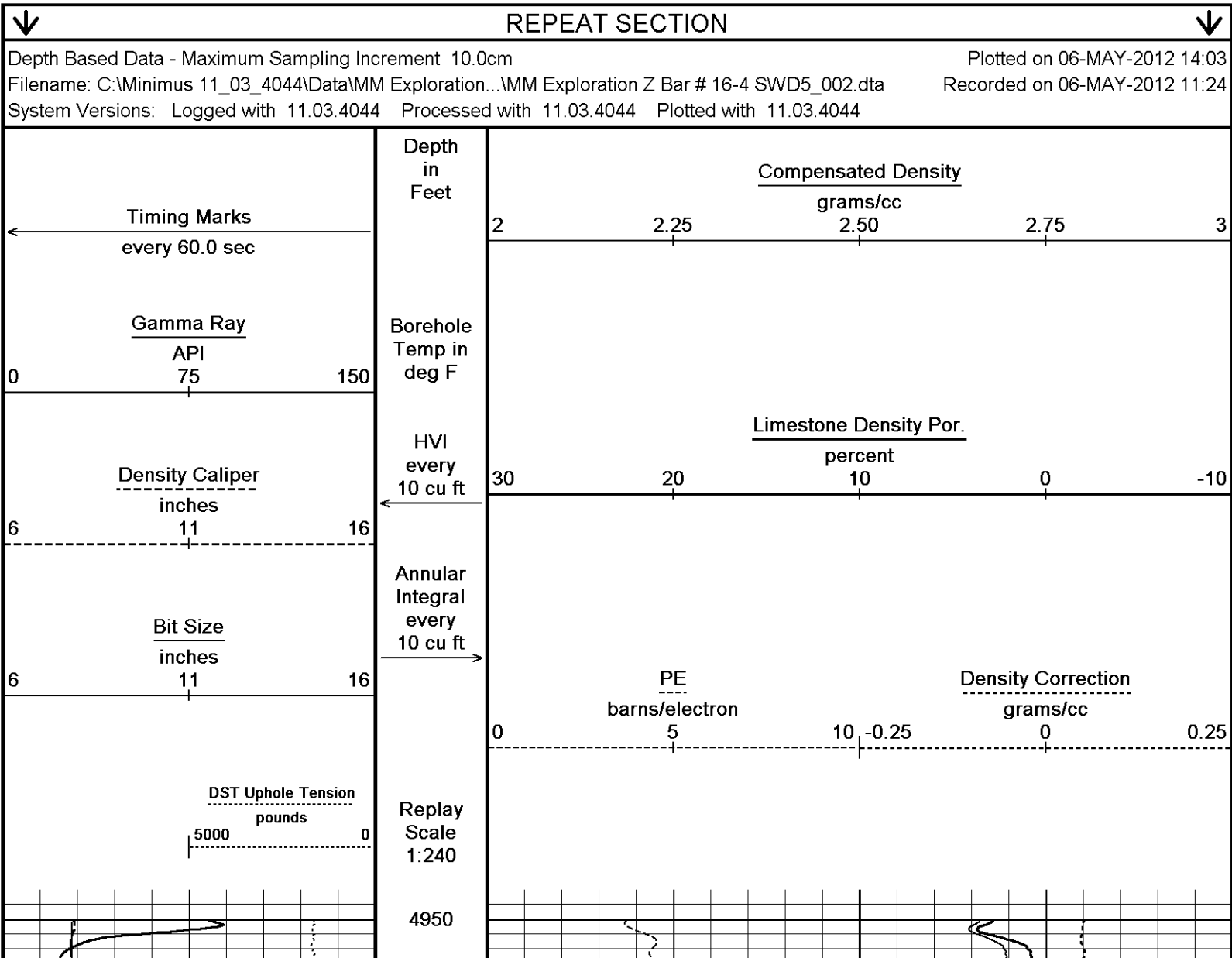
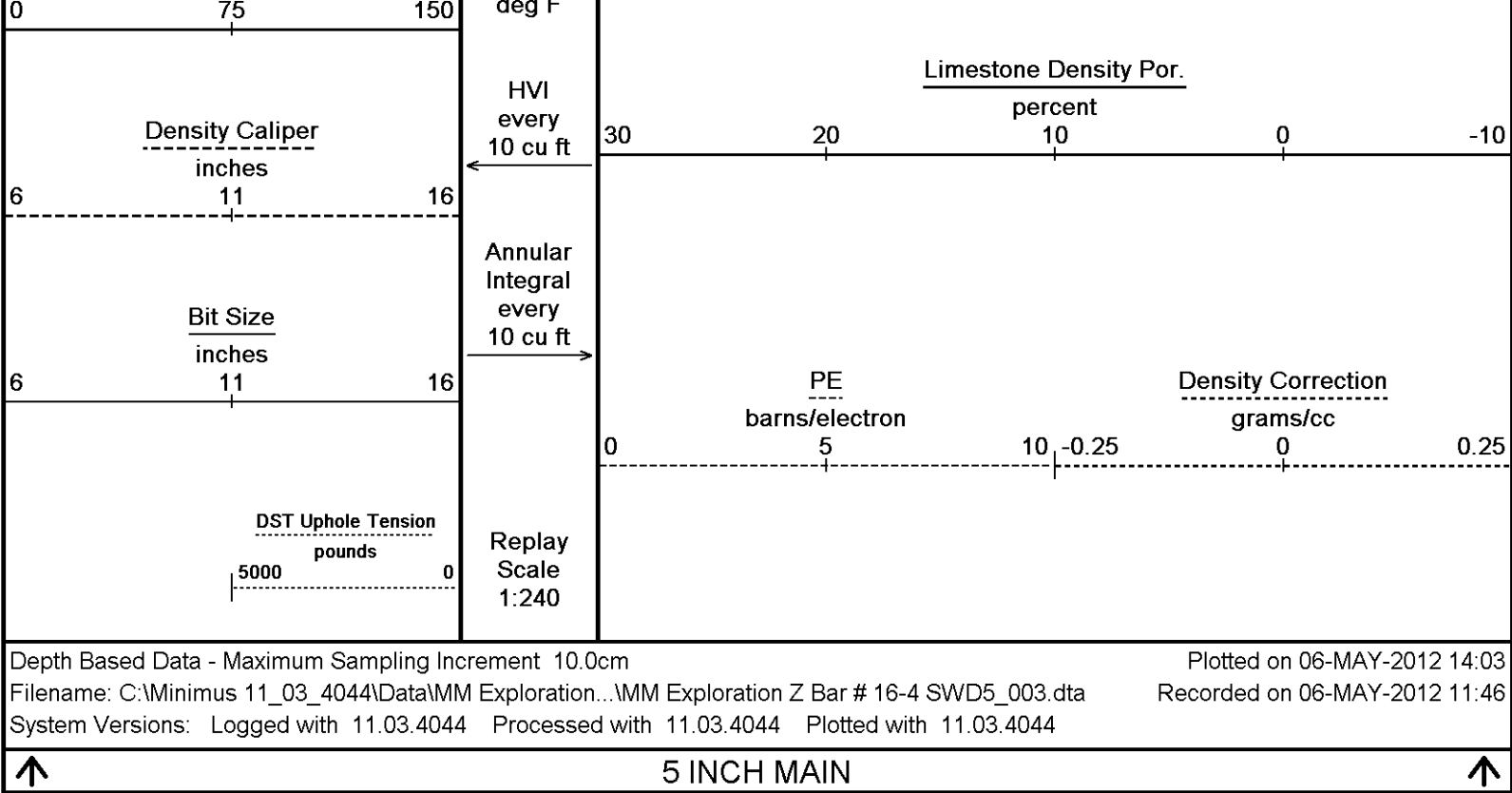
Limestone Density Por.

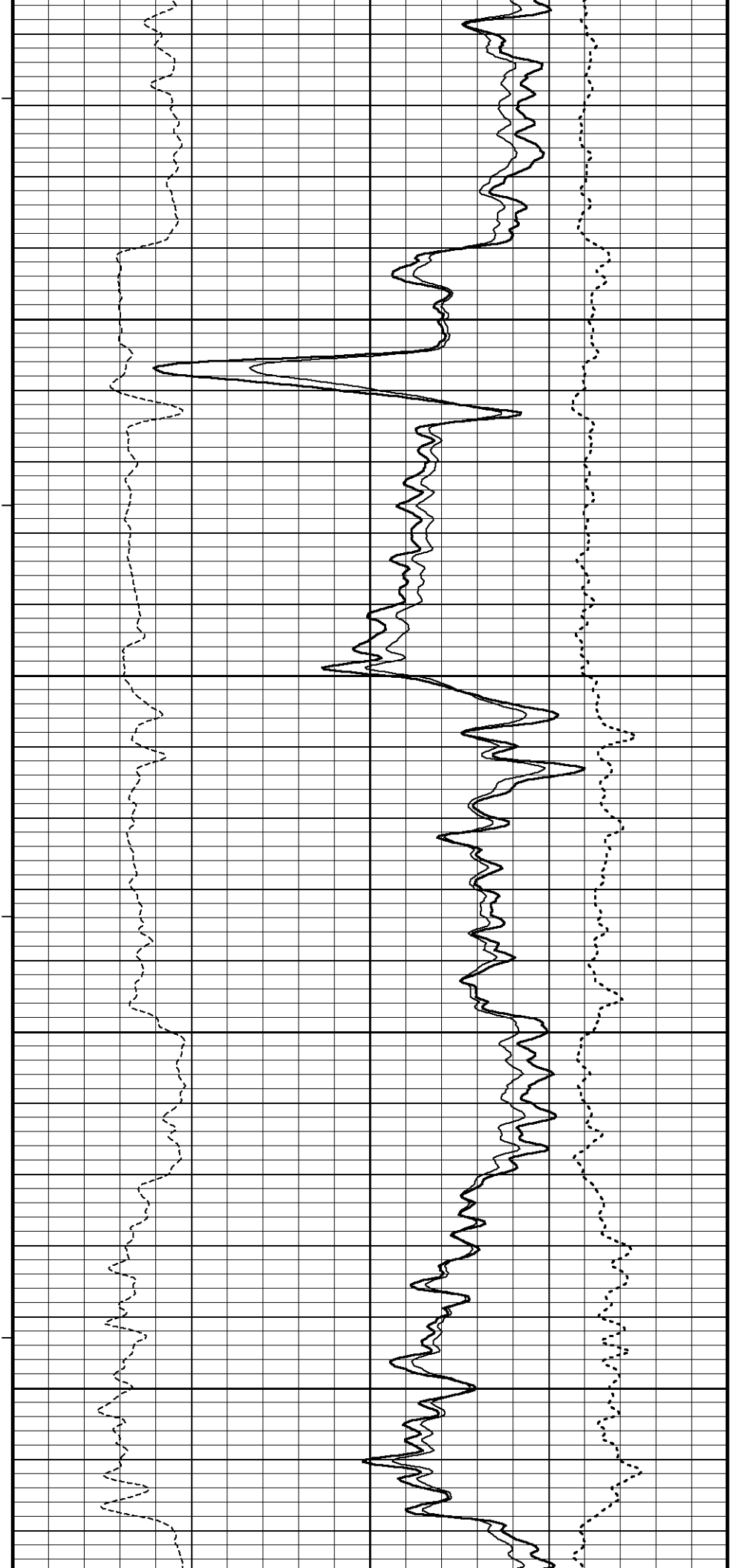
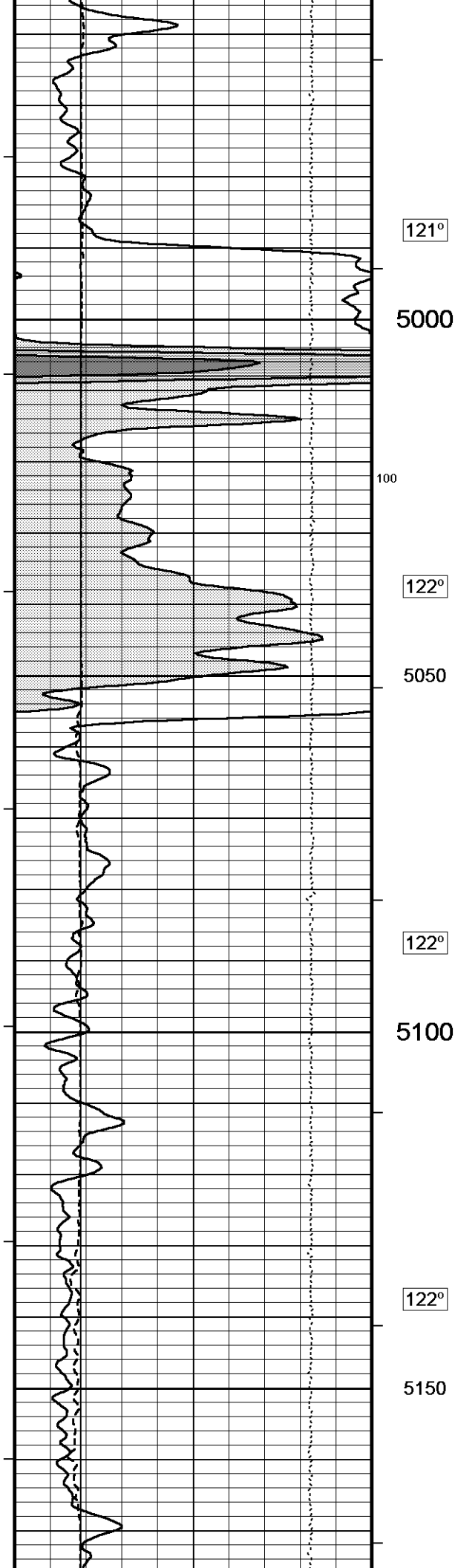


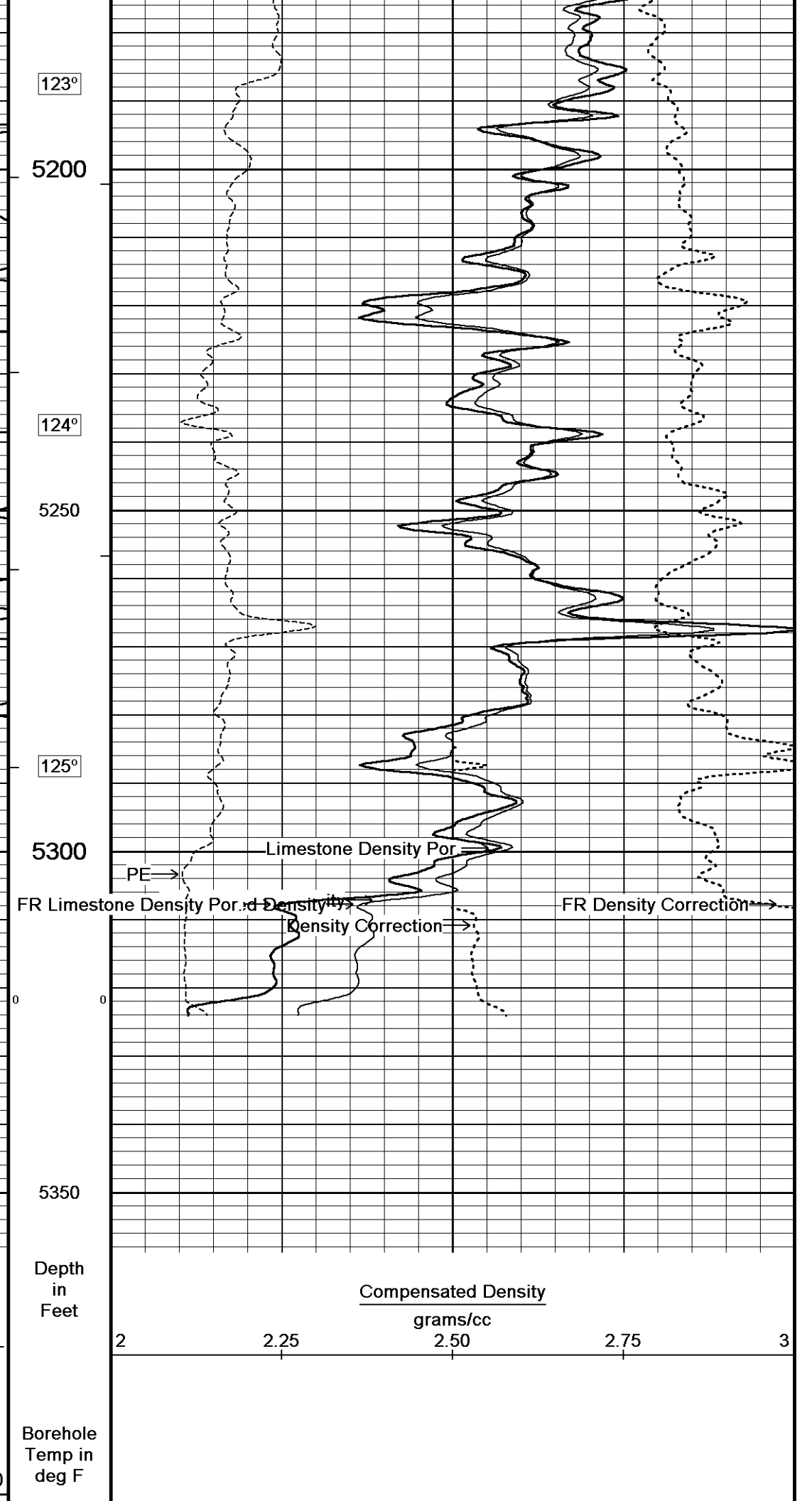
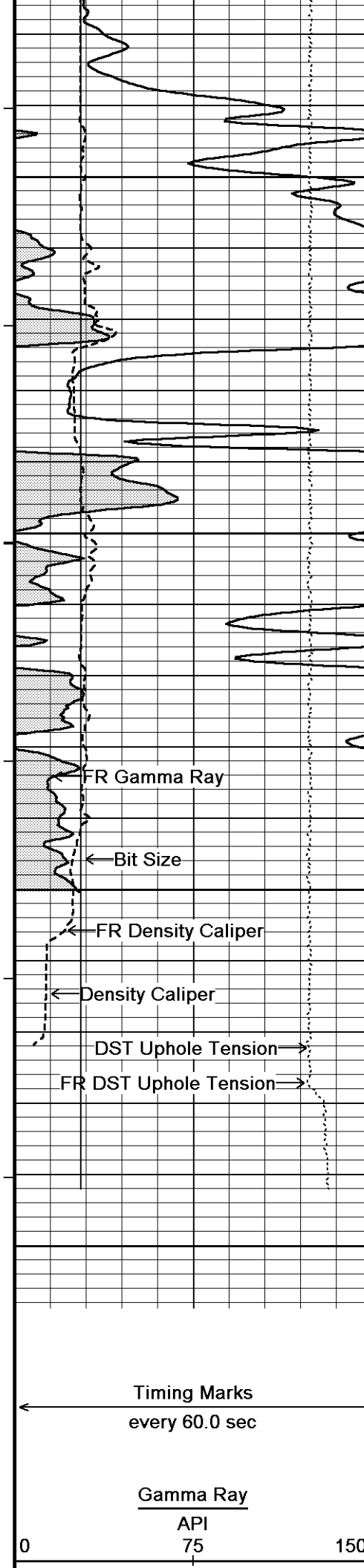


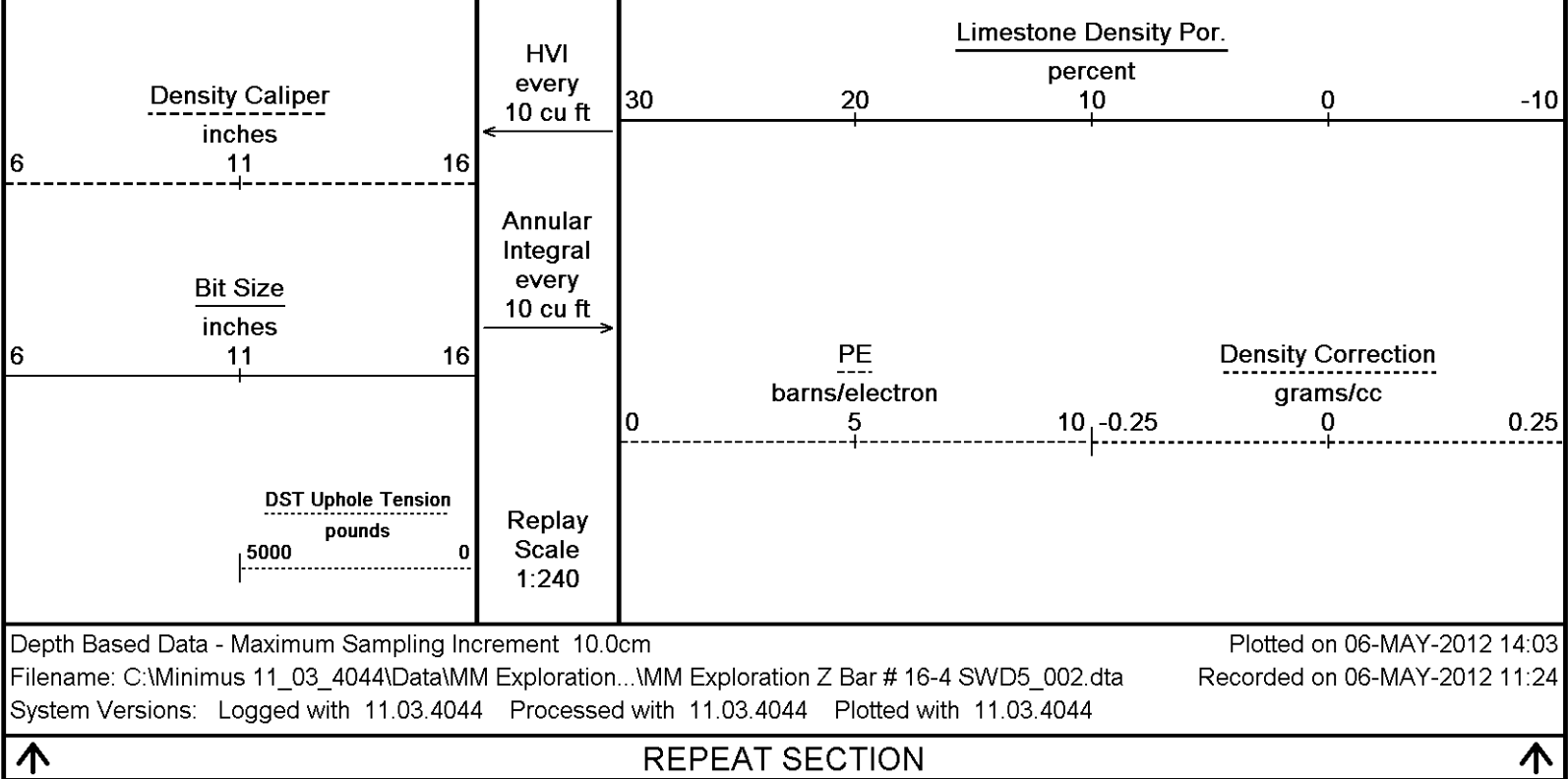












BEFORE SURVEY CALIBRATION			
C:\Minimus 11_03_4044\Data\MM Exploration Z Bar # 16-4 SWD\MM Exploration Z Bar # 16-4 SWD5_003.dta			
General Constants All 000		Last Edited on 0C4060A13004,	
General Parameters			
Mud Resistivity	1.020	ohm-metres	
Mud Resistivity Temperature	73.000	degrees F	
Water Level	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	None		
Rwa Parameters			
Porosity used	Limestone Density Por.		
Resistivity used	Array Ind. One Res Rt		
RWA Constant A	0.610		
RWA Constant M	2.150		
Down-hole Tension Calibration SMS 0		Field Calibration on 23-FEB-2012 23:25	
Reading No	Measured	Calibrated (lbs)	
1	13693.36	0.00	
2	14387.39	407.90	
Gamma Calibration MCG-B 39		Field Calibration on 0C4060532000	
	Measured	Calibrated (API)	
Background	45	30	
Calibrator (Gross)	726	486	
Calibrator (Net)	681	456	
Gamma Constants MCG-B 39		Last Edited on 0C4060A13004,	
Gamma Calibrator Number	GRC141		
Mud Density	1.05	gm/cc	
Caliper Source for Processing	Density Caliper		
Tool Position	Eccentred		

Concentration of KCl		0.00	kppm
SP Calibration MCG-B 39		Field Calibration on 0C30B0F0100C	
	Measured	Calibrated (mV)	
Reference 1	101.0	100.0	
Reference 2	-99.7	-100.0	
High Resolution Temperature Calibration MCG-B 39		Field Calibration on 0C317000C008,	
	Measured	Calibrated(Deg F)	
Lower	50.00	50.00	
Upper	100.00	100.00	
High Resolution Temperature Constants MCG-B 39		Last Edited on	
Pre-filter Length		11	
Caliper Calibration MML-A 4		Base Calibration on 0C3170021008, Field Calibration on 0C4060524000	
Base Calibration			
Reading No	Measured	Calibrator Size (in)	
1	15017	5.98	
2	18447	7.97	
3	21786	9.86	
4	25801	11.92	
5	0	0.00	
6	N/A	N/A	
Field Calibration			
	Measured Caliper (in)	Actual Caliper (in)	
	6.08	5.98	
Micro Normal and Micro Inverse Calibration MML-A 4		Base Calibration on 0C3170023008, Field Check on 0C4060525000	
Base Calibration			
Channel	Resistor 1	Measured Resistor 2	Calibrated (ohm-m) 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	62.9		62.9
Micro Inverse	48.3		48.3
Micro Normal and Micro Inverse Constants MML-A 4		Last Edited on 0C4060A13004,	
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-B.J 387		Base Calibration on 0C31C0938008 Field Check on 0C4060537000	
Base Calibration			
	Measured	Calibrated (cps)	
	Near Far	Near Far	
	2956 91	3714 110	
Ratio	32.635	33.764	
Field Calibrator at Base		Calibrated (cps)	
		2214 3169	
Ratio		0.699	
Field Check		Calibrated (cps)	
		2202 3182	
Ratio		0.692	
Neutron Constants MDN-B.J 387		Last Edited on 06-MAY-2012,10:54	
Neutron Source Id		P0204NN	
Neutron Jig Number		NEDC117	
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
Formation Fluid Salinity Source	Constant Value	
Formation Fluid Salinity	0.00	kppm
Barite Mud Correction	Not Applied	

FE Calibration MFE-B.J 352		Base Calibration on 0C31B0831004 Field Check on 0C4060523000	
Base Calibration			
	Measured	Calibrated (ohm-m)	
Reference 1	0.0	0.0	
Reference 2	963.7	126.8	
Base Check		281.5	
Field Check		281.5	

FE Constants MFE-B.J 352			Last Edited on 0C4060A09004,		
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 178				Base Calibration on 0C31B0B06000, Field Check on 0C4060521000	
Base Calibration					
Test Loop Calibration		Measured		Calibrated (mmho/m)	
Channel	Low	High	Low	High	
1	17.6	484.7	9.3	966.2	
2	6.2	391.4	7.6	821.4	
3	4.0	264.5	5.2	566.0	
4	2.3	135.1	2.6	279.2	
Array Temperature		77.0	Deg F		
Channel	Base Check (mmho/m)		Field Check (mmho/m)		
	Low	High	Low	High	
1	0.0	0.0	12.3	3762.6	
2	0.0	0.0	29.6	3466.9	
3	0.0	0.0	27.3	3014.1	
4	0.0	0.0	18.8	2064.7	
Deep	0.0	0.0	15.9	1995.3	
Medium	0.0	0.0	40.3	3955.3	
Shallow	0.0	0.0	45.3	5081.7	
Array Temperature		0.0	72.7	Deg F	

Induction Constants MAI-A.A 178		Last Edited on 0C4060A08004,	
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	Constant Value		
Temp. for Rm Corr.	N/A		

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 178				
				Field Calibration on 0C4030110004,
	Measured	Calibrated(Deg F)		
Lower	32.00	32.00		
Upper	68.00	68.00		
High Resolution Temperature Constants MAI-A.A 178				
				Last Edited on 0C4060522000,
Pre-filter Length		11		
Photo Density Calibration MPD-B 35				
				Base Calibration on 0C31C0B00008
				Field Check on 0C406052B000
Density Calibration				
Base Calibration		Measured		Calibrated (sdu)
	Near	Far	Near	Far
Reference 1	62298	31871	59556	30836
Reference 2	26887	2863	24941	2541
Field Check at Base				
	1142.9	1359.1		
Field Check				
	1145.7	1361.2		
PE Calibration				
Base Calibration		Measured		Calibrated
	WS	WH	Ratio	Ratio
Background	204	1008		
Reference 1	23049	62096	0.374	0.371
Reference 2	7079	26739	0.267	0.272
Field Check at Base				
	204.4	1008.1		
Field Check				
	206.4	1011.8		
Density Constants MPD-B 35				
				Last Edited on 0C4060A0A004,
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	1.05	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

Caliper Calibration MPD-B 35

Base Calibration on 0C31C0A2C008
Field Calibration on 0C4060527000

Base Calibration

Reading No	Measured	Calibrator Size (in)
1	20688	3.99
2	30944	5.98
3	41312	7.97
4	50976	9.86
5	61184	11.92
6	N/A	N/A

Field Calibration

Measured Caliper (in)	Actual Caliper (in)
5.99	5.98

DOWNHOLE EQUIPMENT

C:\Minimus 11_03_4044\Data\MM Exploration Z Bar # 16-4 SWD\MM Exploration Z Bar # 16-4 SWD5_003.dta

Compact Comms Gamma
MCG-B 39 LG: 8.70 ft WT: 63.9 lb OD: 2.24 in

Compact Micro-log
MML-A 4 LG: 7.97 ft WT: 81.6 lb OD: 2.24 in

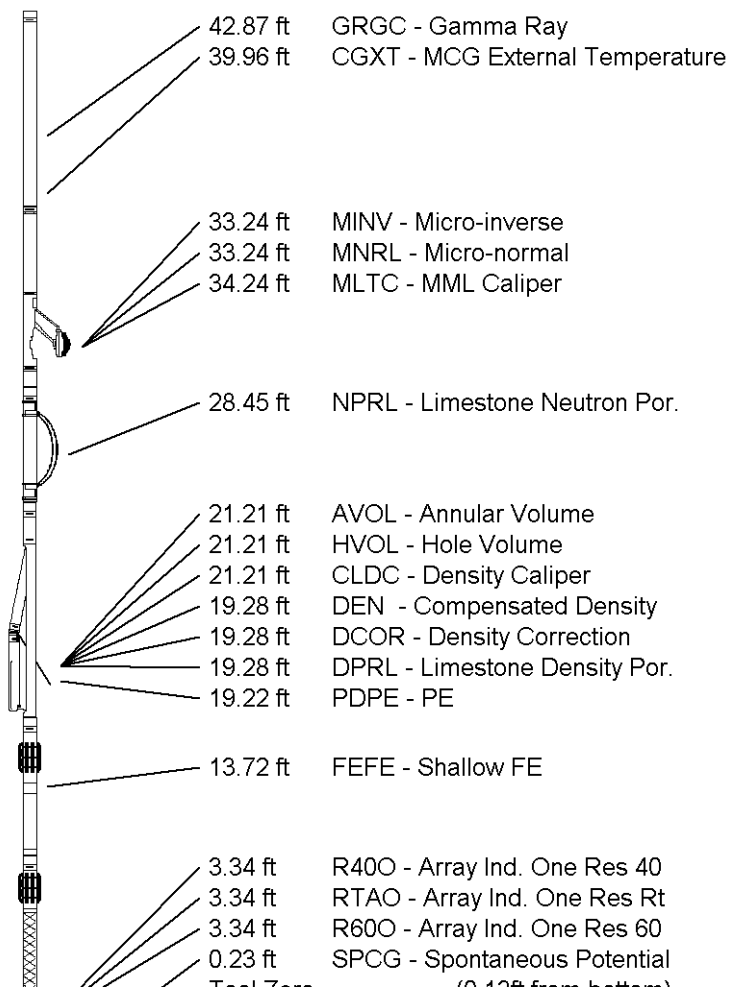
Compact Neutron
MDN-B.J 387 LG: 5.04 ft WT: 50.7 lb OD: 2.24 in

Compact Density/Caliper
MPD-B 35 LG: 9.59 ft WT: 90.4 lb OD: 2.45 in

Compact Focussed Electric
MFE-B.J 352 LG: 6.05 ft WT: 48.5 lb OD: 2.24 in

Compact Induction
MAI-A.A 178 LG: 10.81 ft WT: 48.5 lb OD: 2.24 in

Total Length: 48.16 ft Weight: 383.6 lb





Tool Zero (0.13ft from bottom)
 -0.13 ft SMTU - DST Uphole Tension
 All measurements relative to tool zero.

COMPANY	M&M EXPLORATION, INC
WELL	Z BAR 16-4 SWD
FIELD	AETNA NE
PROVINCE/COUNTY	BARBER
COUNTRY/STATE	U.S.A. / KANSAS

Elevation Kelly Bushing	1571.00	feet	First Reading	5308.00	feet
Elevation Drill Floor	1569.00	feet	Depth Driller	5330.00	feet
Elevation Ground Level	1559.00	feet	Depth Logger	5327.00	feet



COMPACT PHOTO DENSITY
 COMPENSATED NEUTRON
 MICRORESISTIVITY LOG

