

 Weatherford [®]				COMPACT PHOTO DENSITY COMPENSATED NEUTRON MICRORESISTIVITY LOG			
COMPANY				GRAND MESA OPERATING			
WELL				BEAZLEY-CHAMBERS #2-13			
FIELD				WILDCAT			
PROVINCE/COUNTY				GOVE			
COUNTRY/STATE				U.S.A. / KANSAS			
LOCATION				330' FSL & 2389' FEL			
SEC	TWP	RGE	Other Services				
13	13S	31W	MAI/MFE				
API Number		15-063-22020					
Permit Number							
Permanent Datum G.L., Elevation 2861 feet				Elevations: feet			
Log Measured From KB				KB		2866.00	
Drilling Measured From K.B. @ 5 FEET				DF		2864.00	
				GL		2861.00	
Date	19-JUL-2012						
Run Number	ONE						
Depth Driller	4650.00			feet			
Depth Logger	4649.00			feet			
First Reading	4630.00			feet			
Last Reading	3600.00			feet			
Casing Driller	210.00			feet			
Casing Logger	208.00			feet			
Bit Size	7.875			inches			
Hole Fluid Type	CHEMICAL						
Density / Viscosity	1.12 g/cc		64.00 CP				
PH / Fluid Loss	10.00		8.00 ml/30Min				
Sample Source	FLOWLINE						
Rm @ Measured Temp	1.24 @106.0			ohm-m			
Rmf @ Measured Temp	0.99 @106.0			ohm-m			
Rmc @ Measured Temp	1.49 @106.0			ohm-m			
Source Rmf / Rmc	CALC		CALC				
Rm @ BHT	1.05 @125.0		ohm-m				
Time Since Circulation	3 HOURS						
Max Recorded Temp	125.00		deg F				
Equipment Name	COMPACT						
Equipment / Base	13096		LIB				
Recorded By	R.HOFFMAN						
Witnessed By	JOHN GOLDSMITH						
S.O. # / JOB #	3534501			LB12-187			

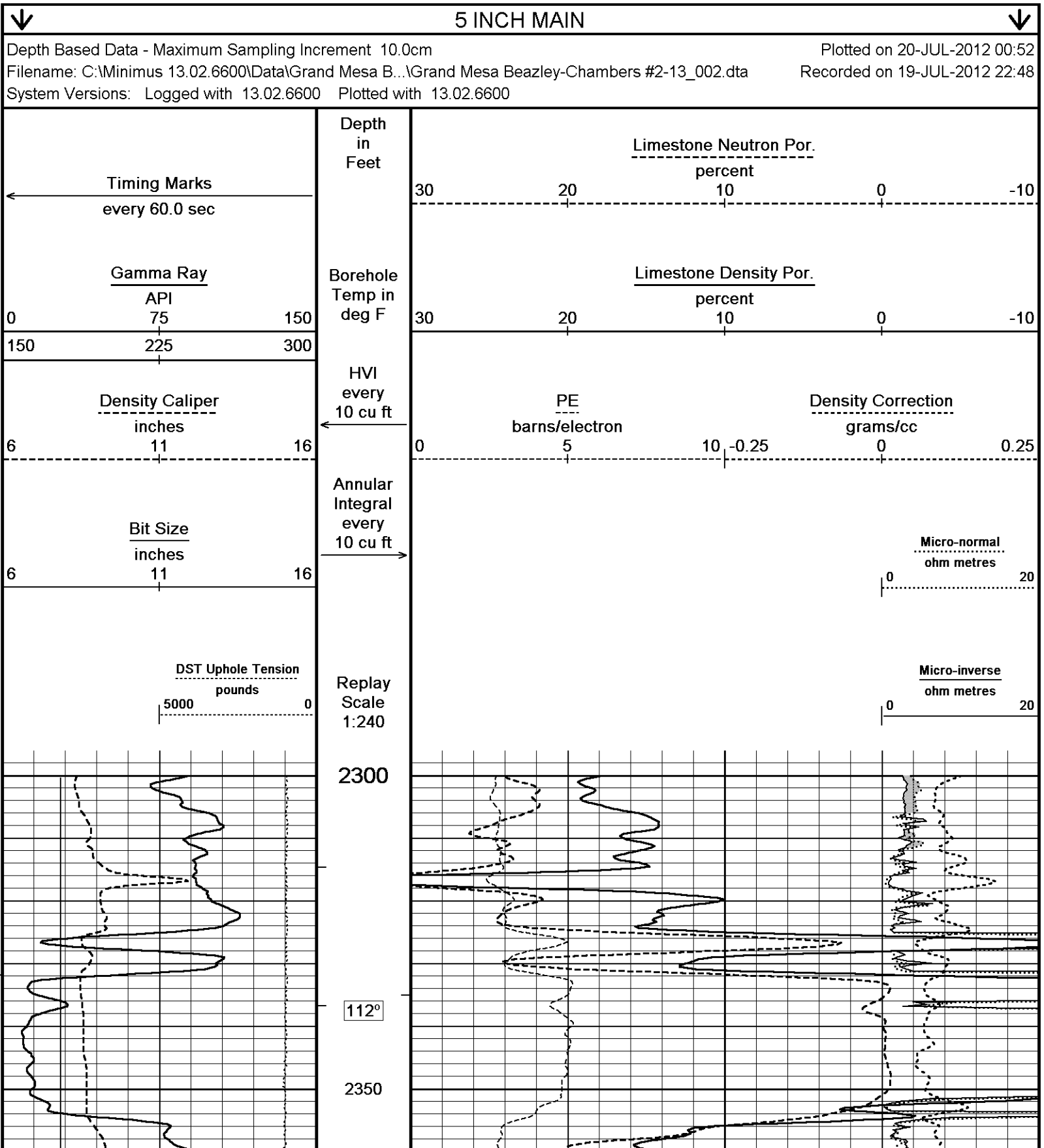
BOREHOLE RECORD					Last Edited: 20-JUL-2012 00:33
Bit Size inches		Depth From feet		Depth To feet	
7.875		208.00		4649.00	
CASING RECORD					
Type	Size inches	Depth From feet	Shoe Depth feet	Weight pounds/ft	
SURFACE	8.625	0.00	208.00	24.00	

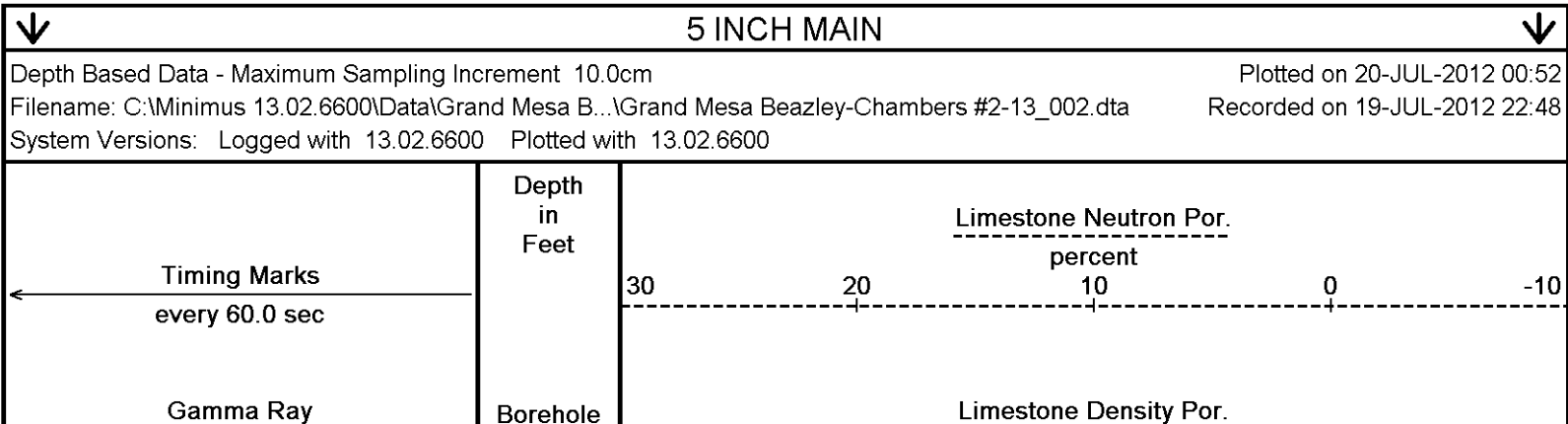
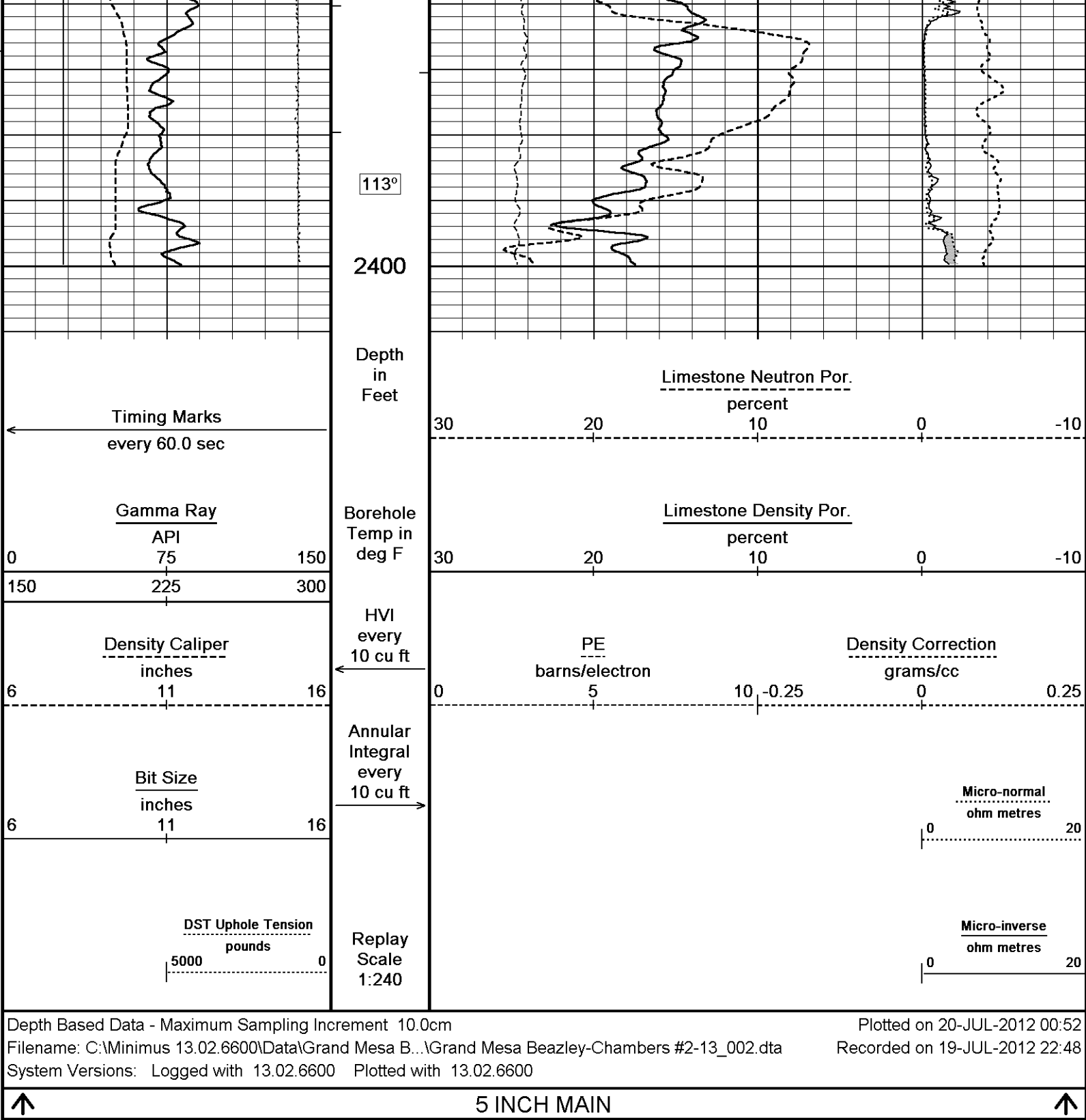
REMARKS
- SOFTWARE ISSUE: WLS 13.02.6600.
- MCG, MML, MDN, MPD, MFE, MAI RAN IN COMBINATION.
- 2.71 G/CC LIMESTONE DENSITY MATRIX USED TO CALCULATE POROSITY.
- BOREHOLE RUGOSITY, TIGHT PULLS, AND WASHOUTS WILL AFFECT DATA QUALITY.
- ALL INTERVALS LOGGED AND SCALED PER CUSTOMER'S REQUEST.
- TOTAL HOLE VOLUME FROM TD TO BOTTOM OF DRILL PIPE: 1979 CU.FT.
- ANNULAR HOLE VOLUME WITH 5.5 INCH CASING: 228 CU. FT.
- SERVICE ORDER # 3534501
- RIG: MIJRPIN #24

- ENGINEER: R. HOFFMAN

- 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.



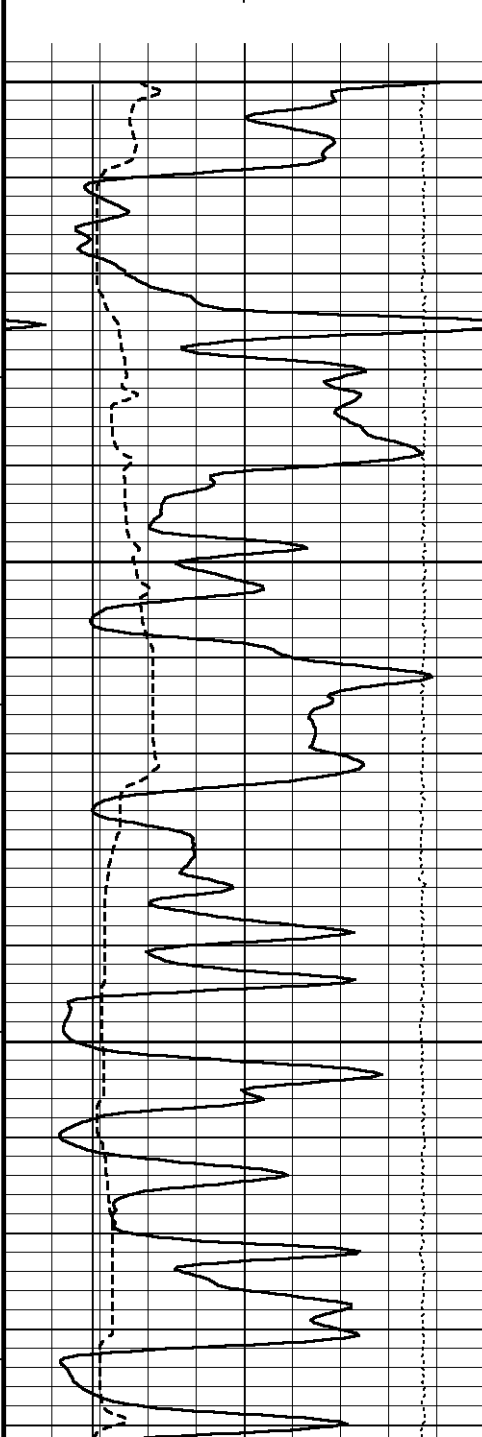


0 API 150
75
150 225 300

Density Caliper
inches
6 11 16

Bit Size
inches
6 11 16

DST Uphole Tension
pounds
5000 0

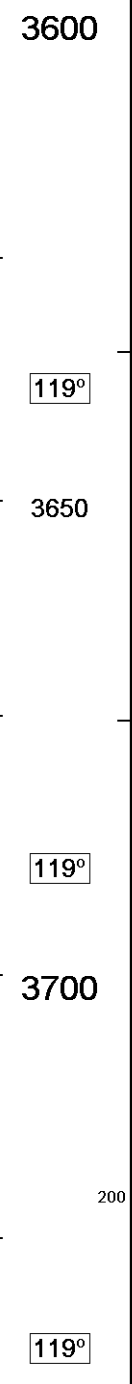


Temp in
deg F

HVI
every
10 cu ft

Annular
Integral
every
10 cu ft

Replay
Scale
1:240

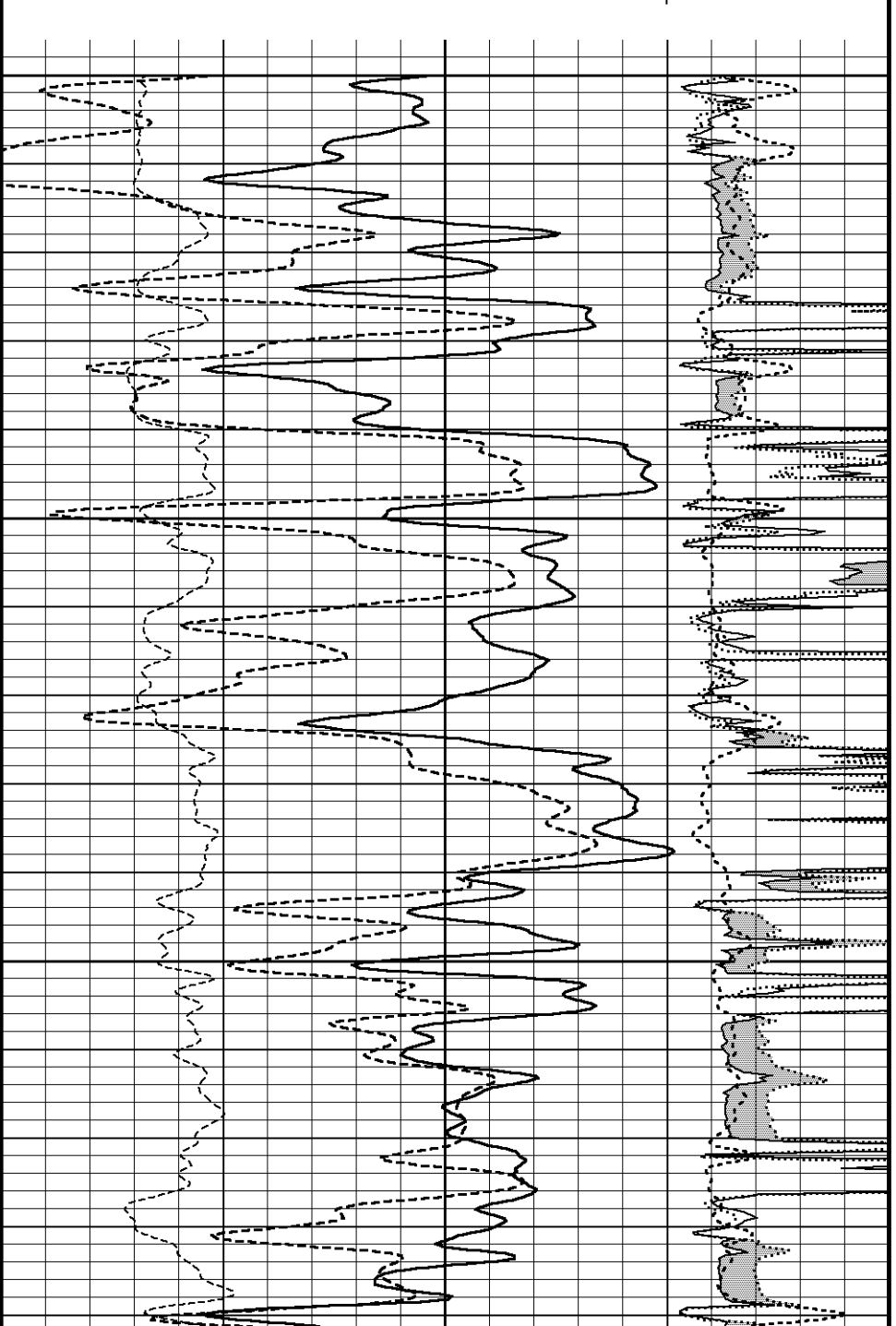


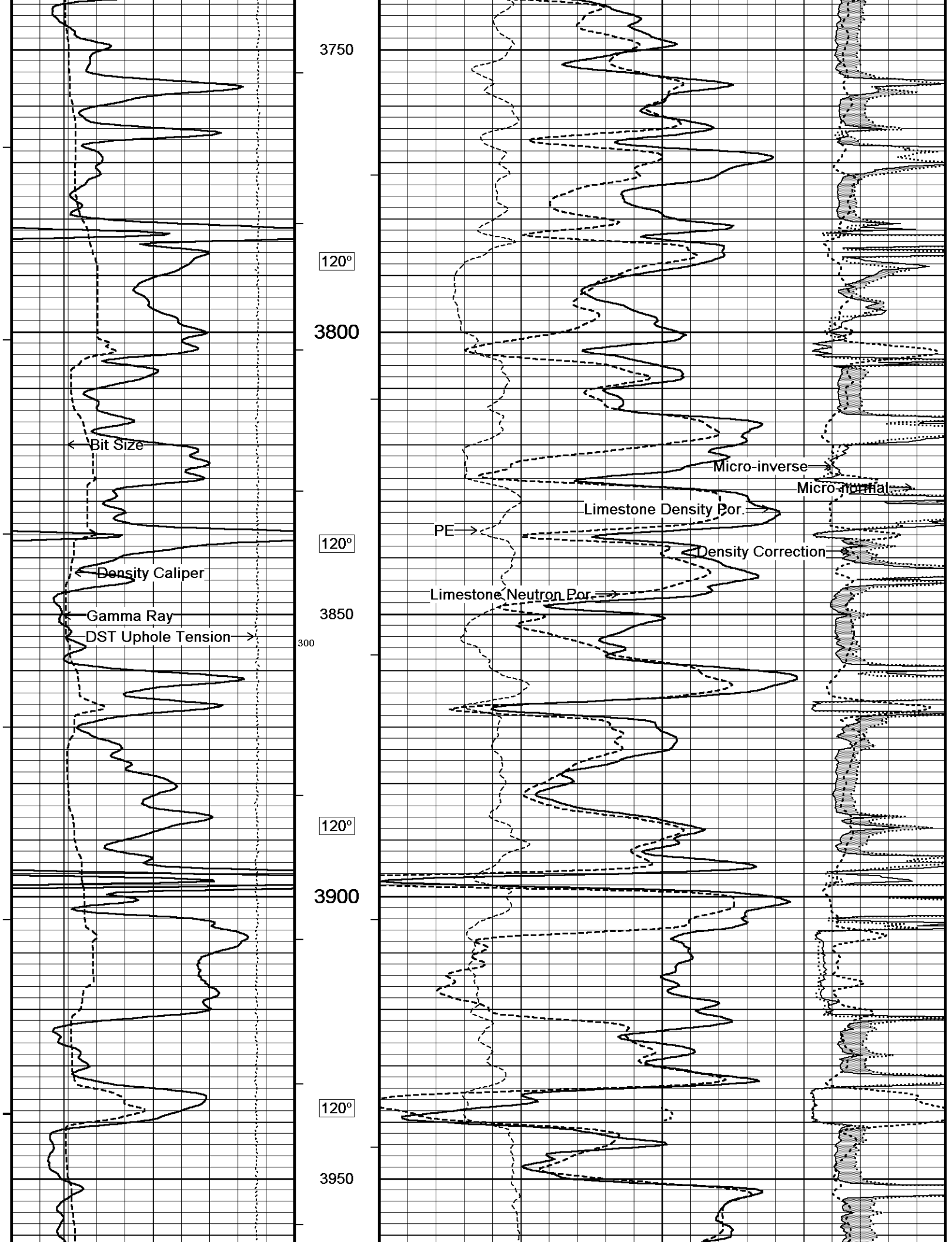
30 20 10 0 -10

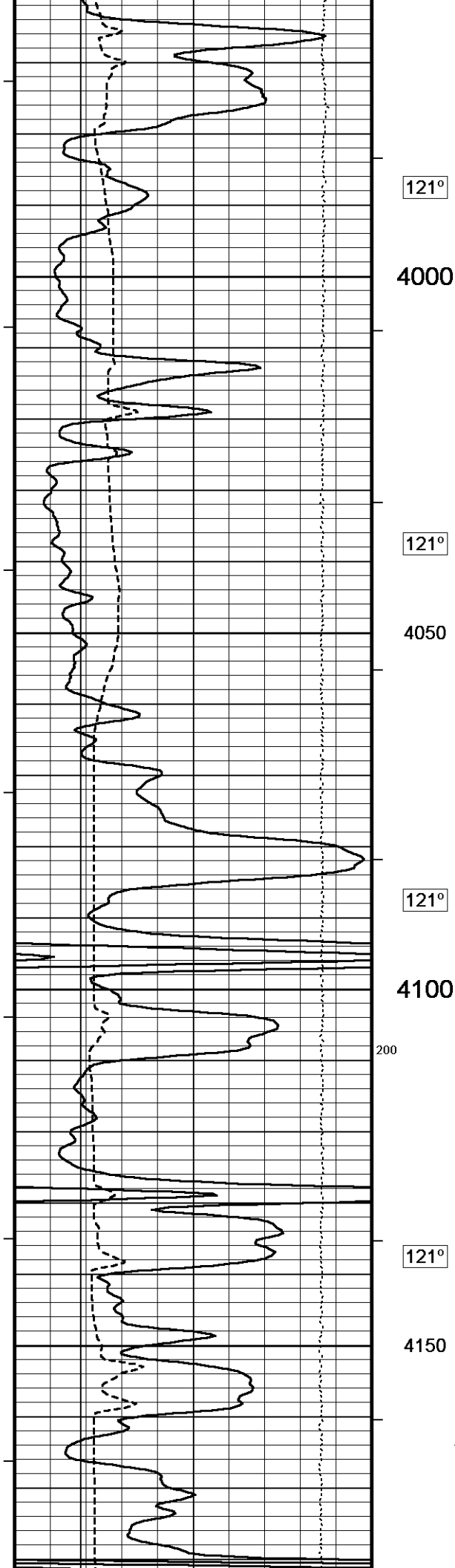
PE
barns/electron Density Correction
grams/cc
0 5 10 -0.25 0 0.25

Micro-normal
ohm metres
0 20

Micro-inverse
ohm metres
0 20







121°

4000

121°

4050

121°

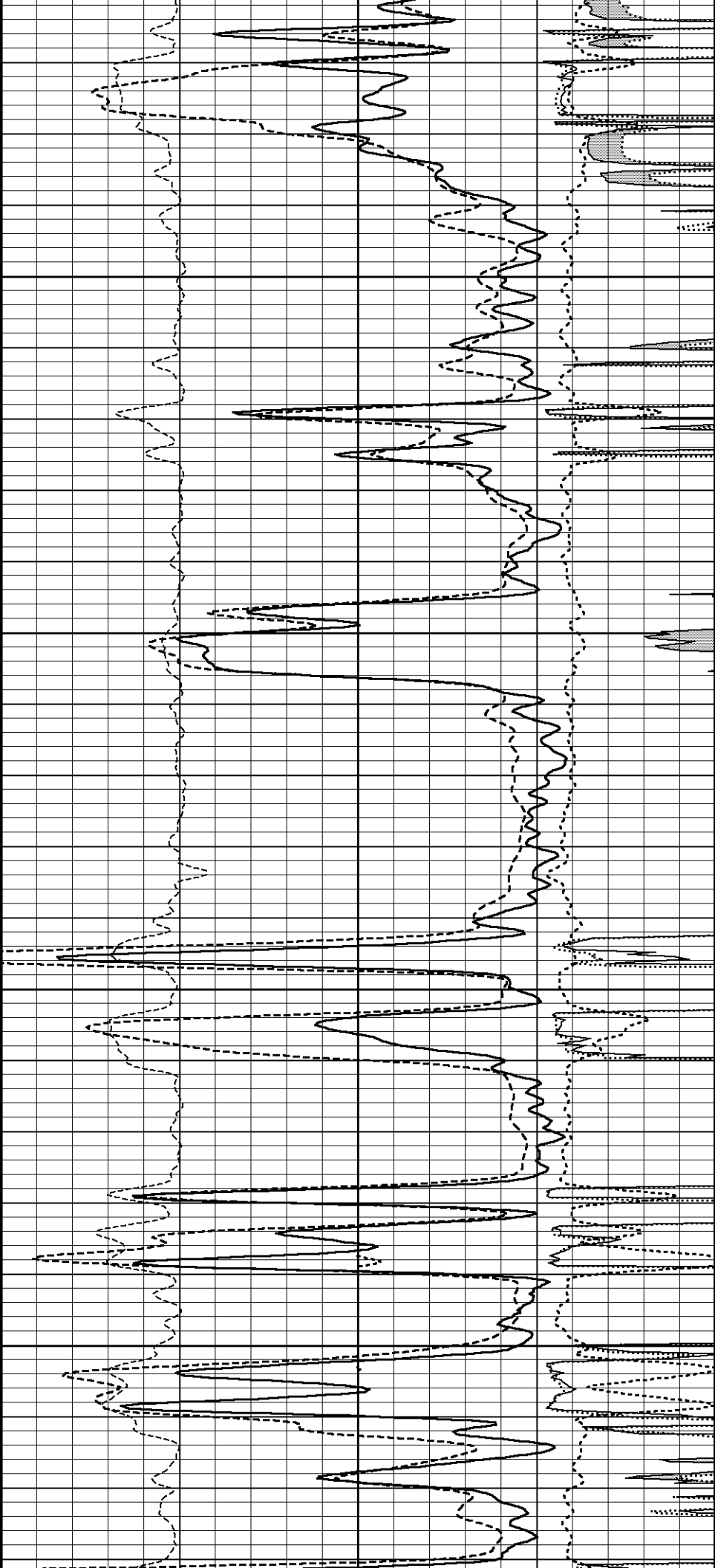
4100

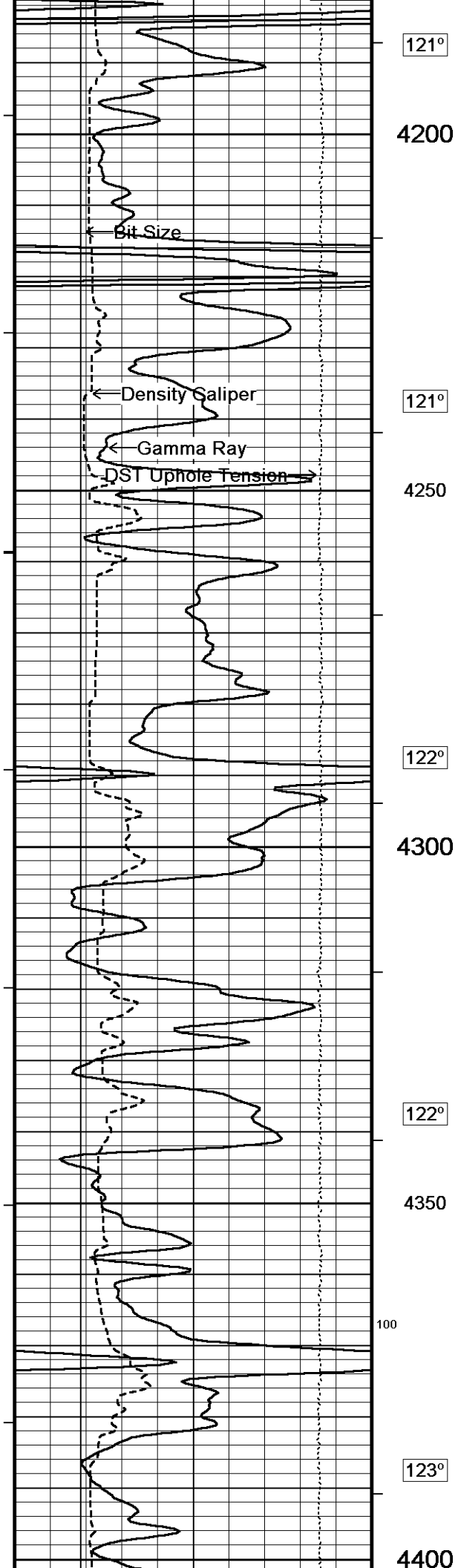
200

121°

4150

100





121°

4200

121°

4250

122°

4300

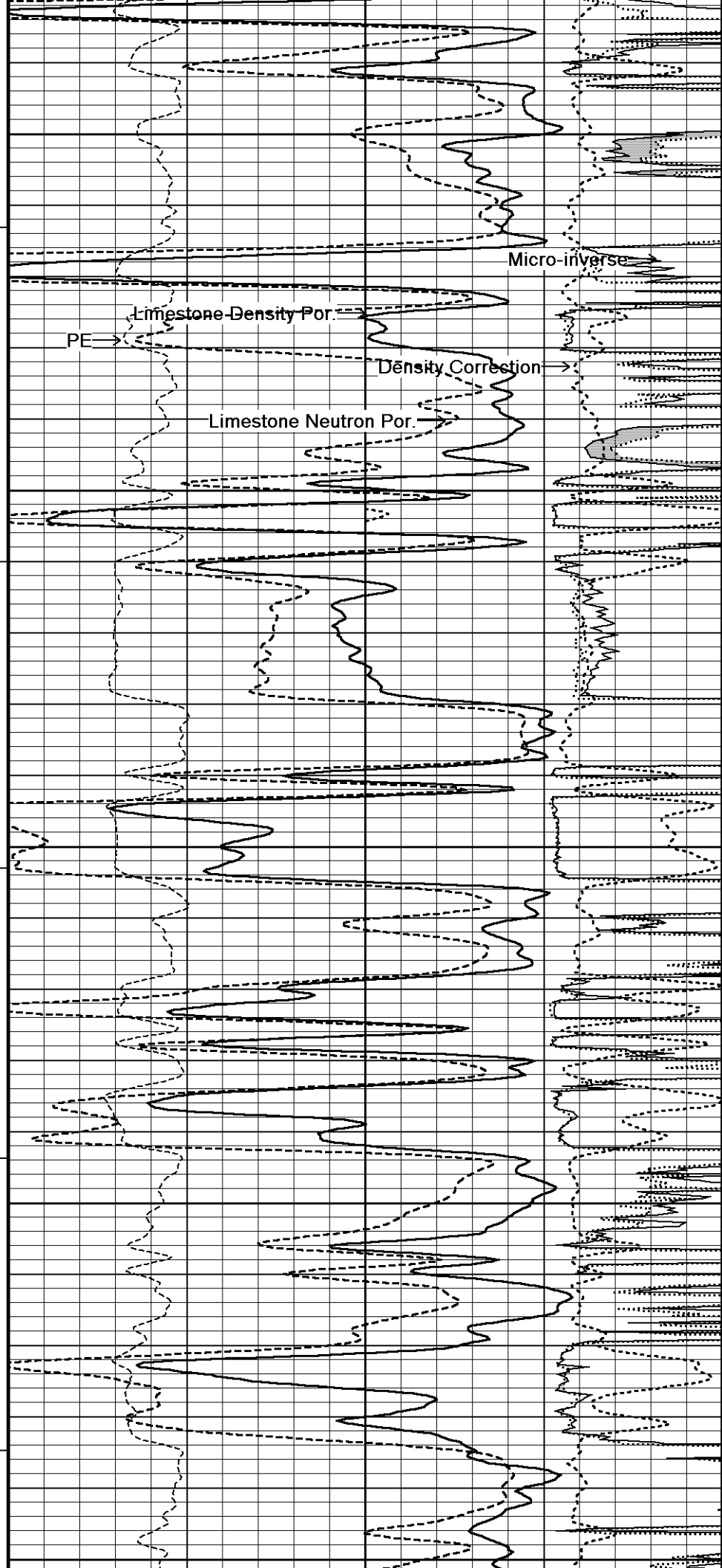
122°

4350

100

123°

4400



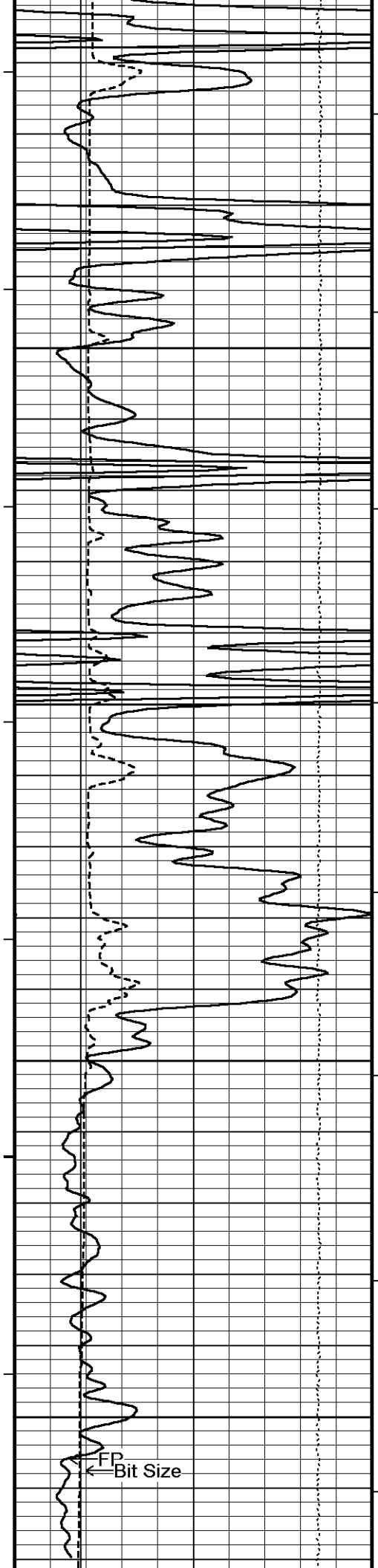
PE

Limestone-Density Por.

Limestone Neutron Por.

Density Correction

Micro-inverse



123°

4450

124°

4500

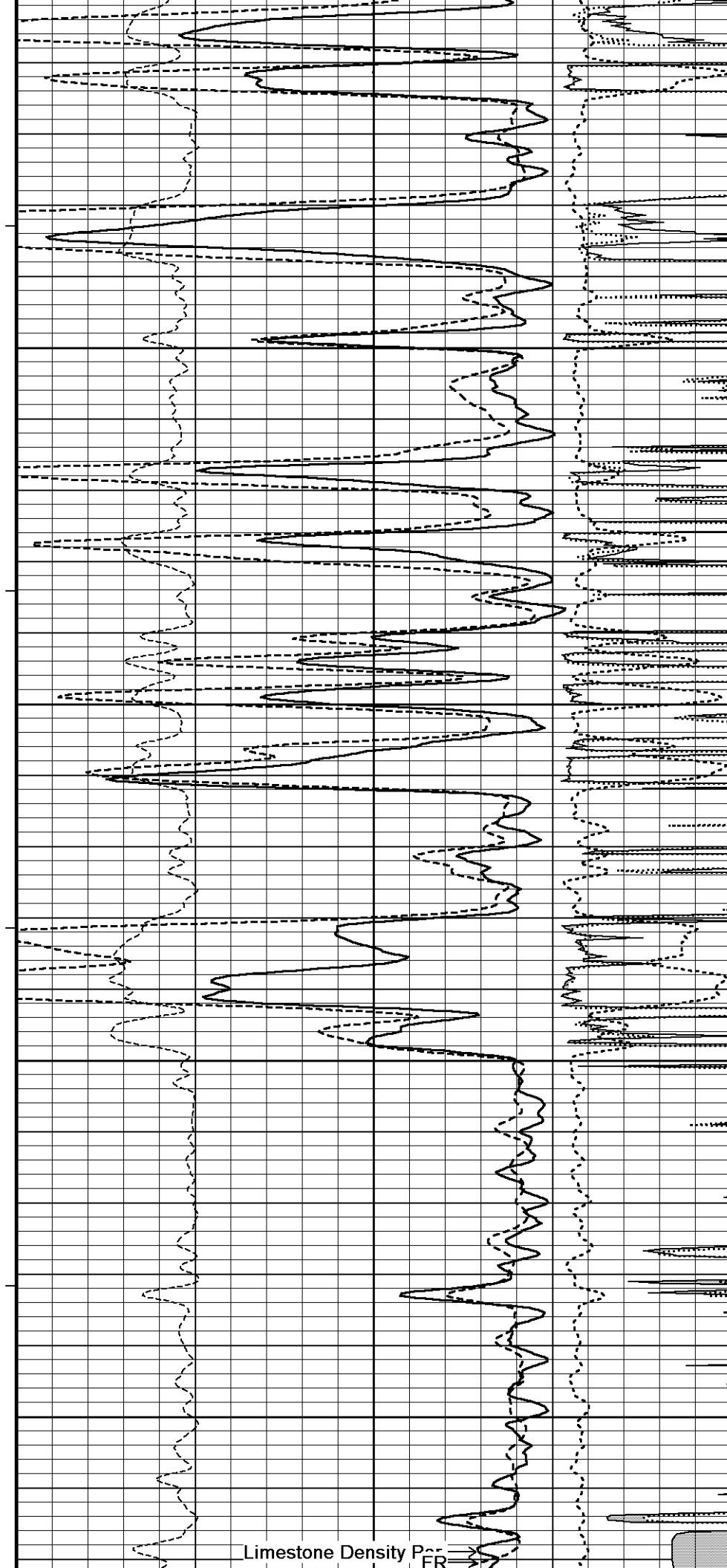
125°

4550

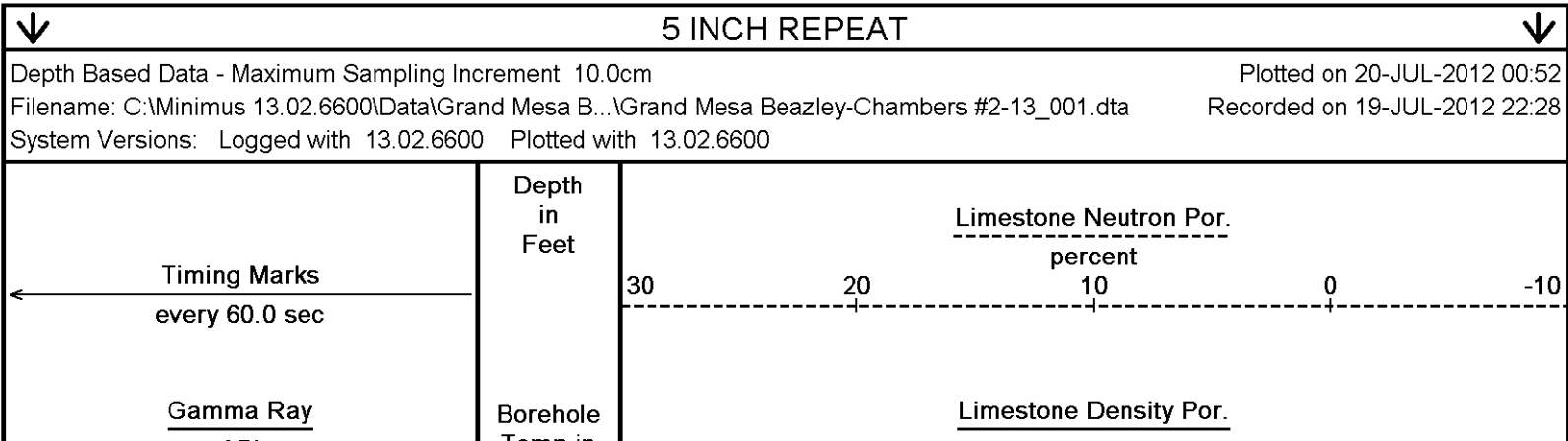
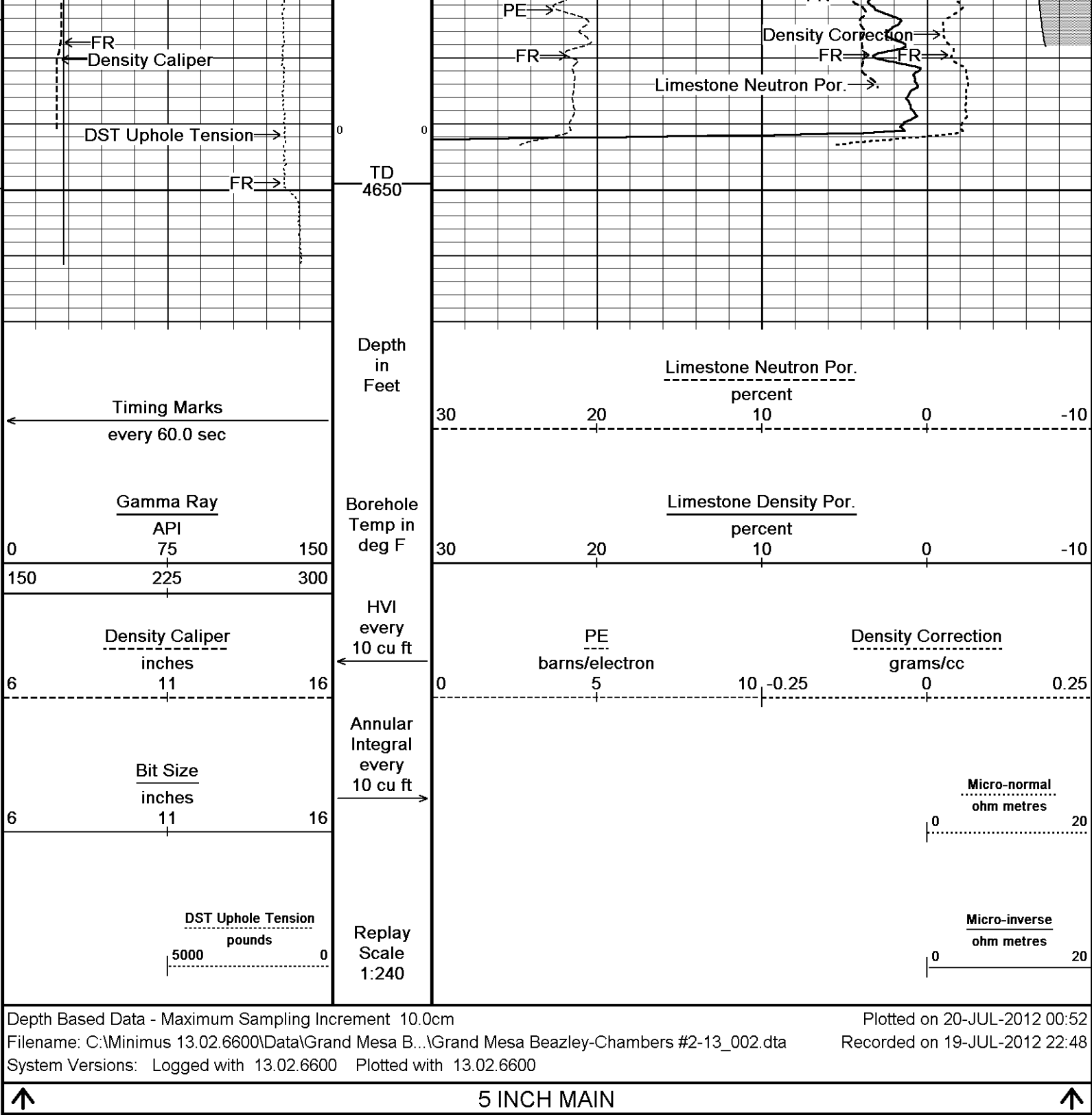
124°

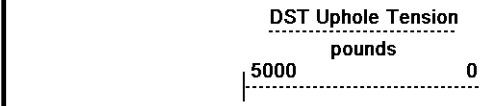
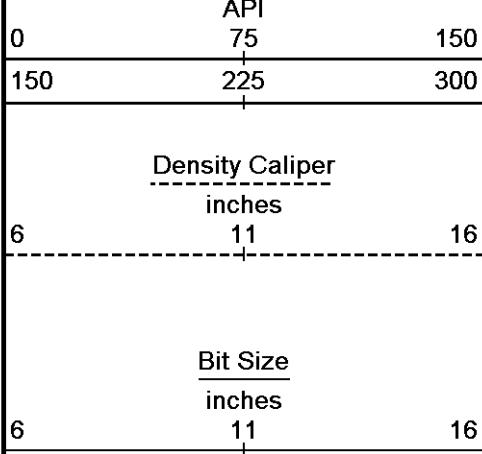
4600

FP Bit Size



Limestone Density Porosity



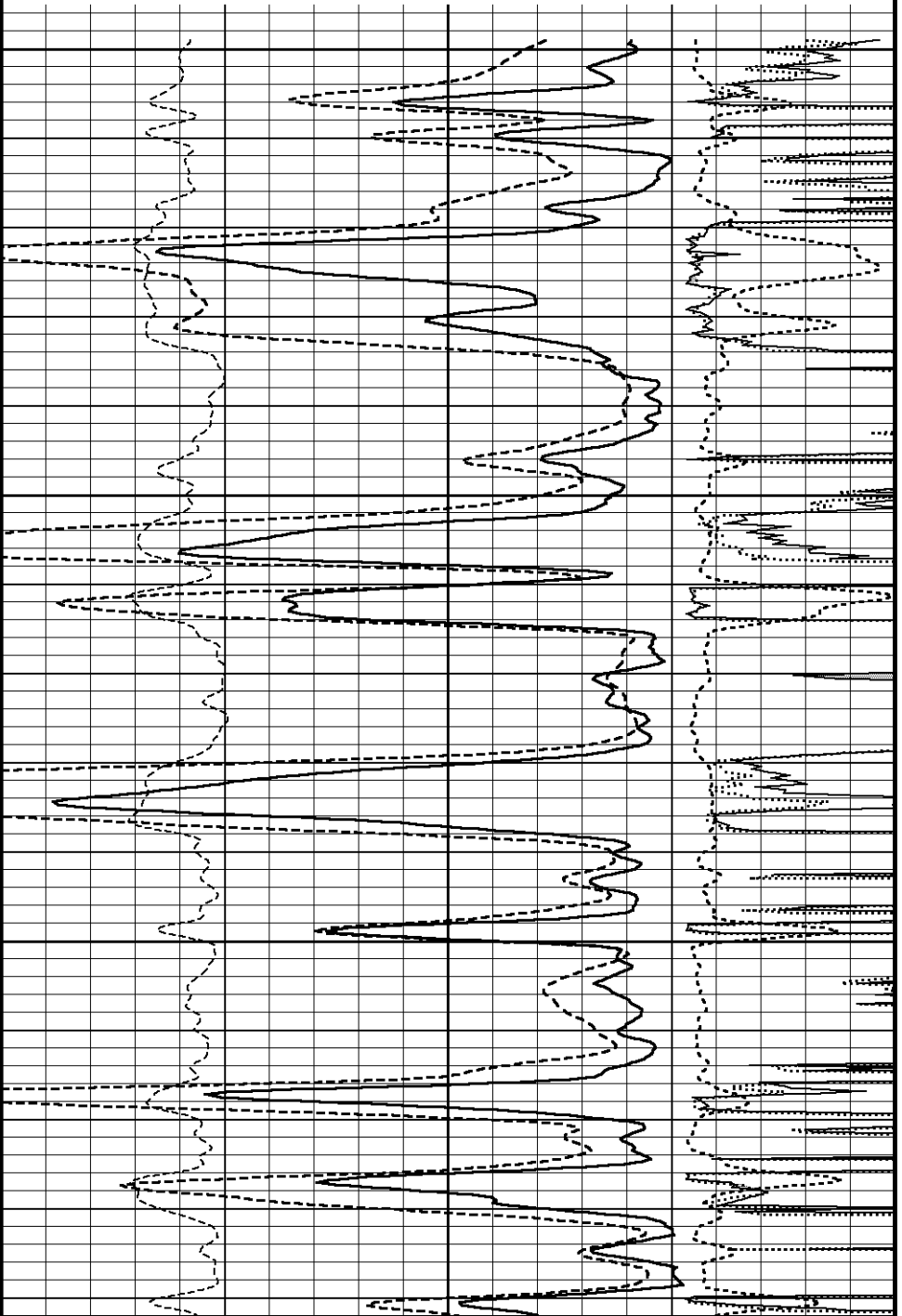
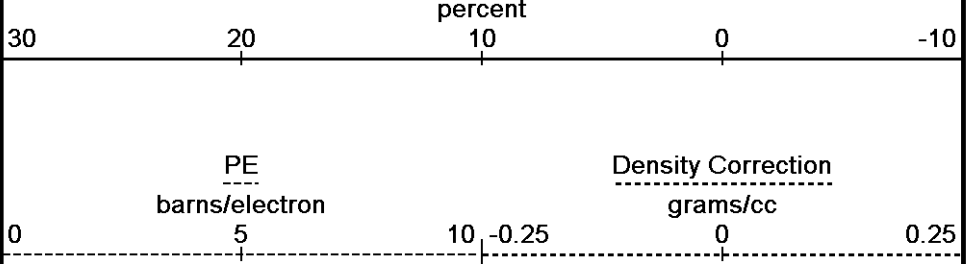


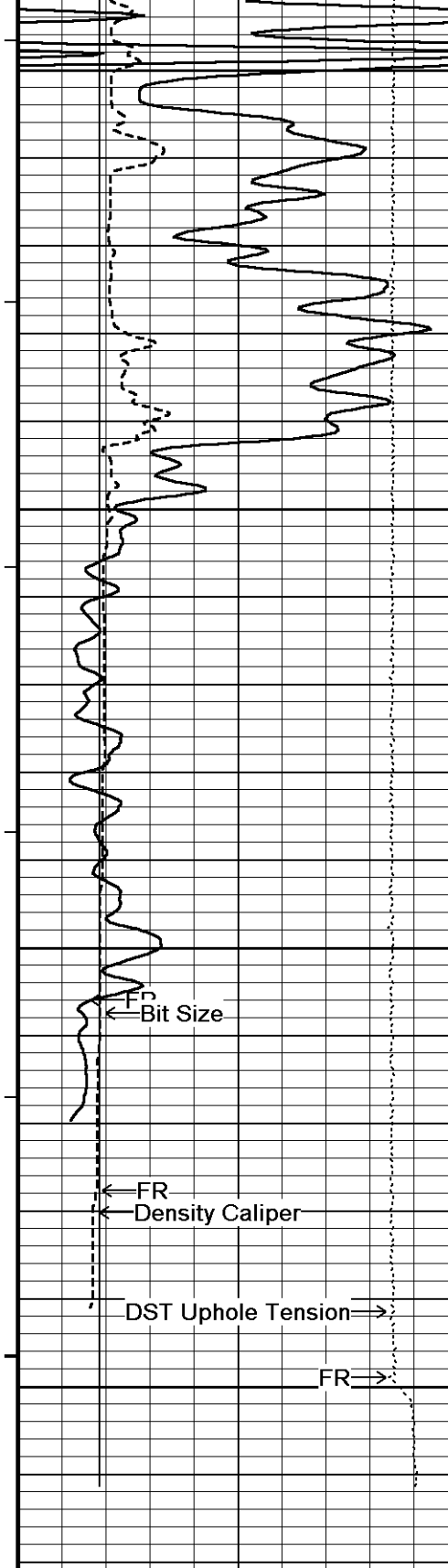
Temp in
deg F

HVI
every
10 cu ft

Annular
Integral
every
10 cu ft

Replay
Scale
1:240





4500

124°

4550

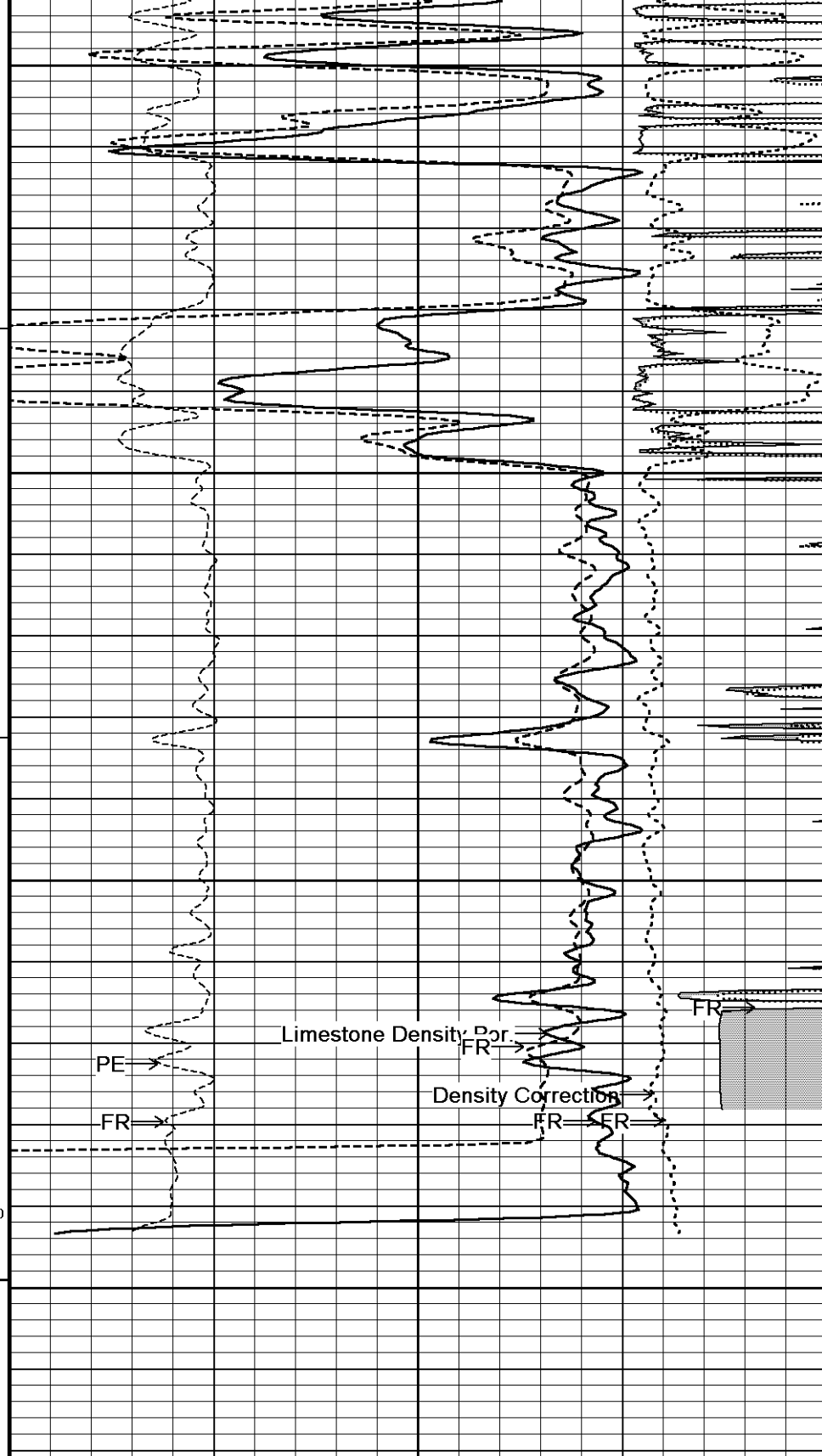
123°

4600

TD
4650

Depth
in
Feet

Borehole
Temp in
deg F

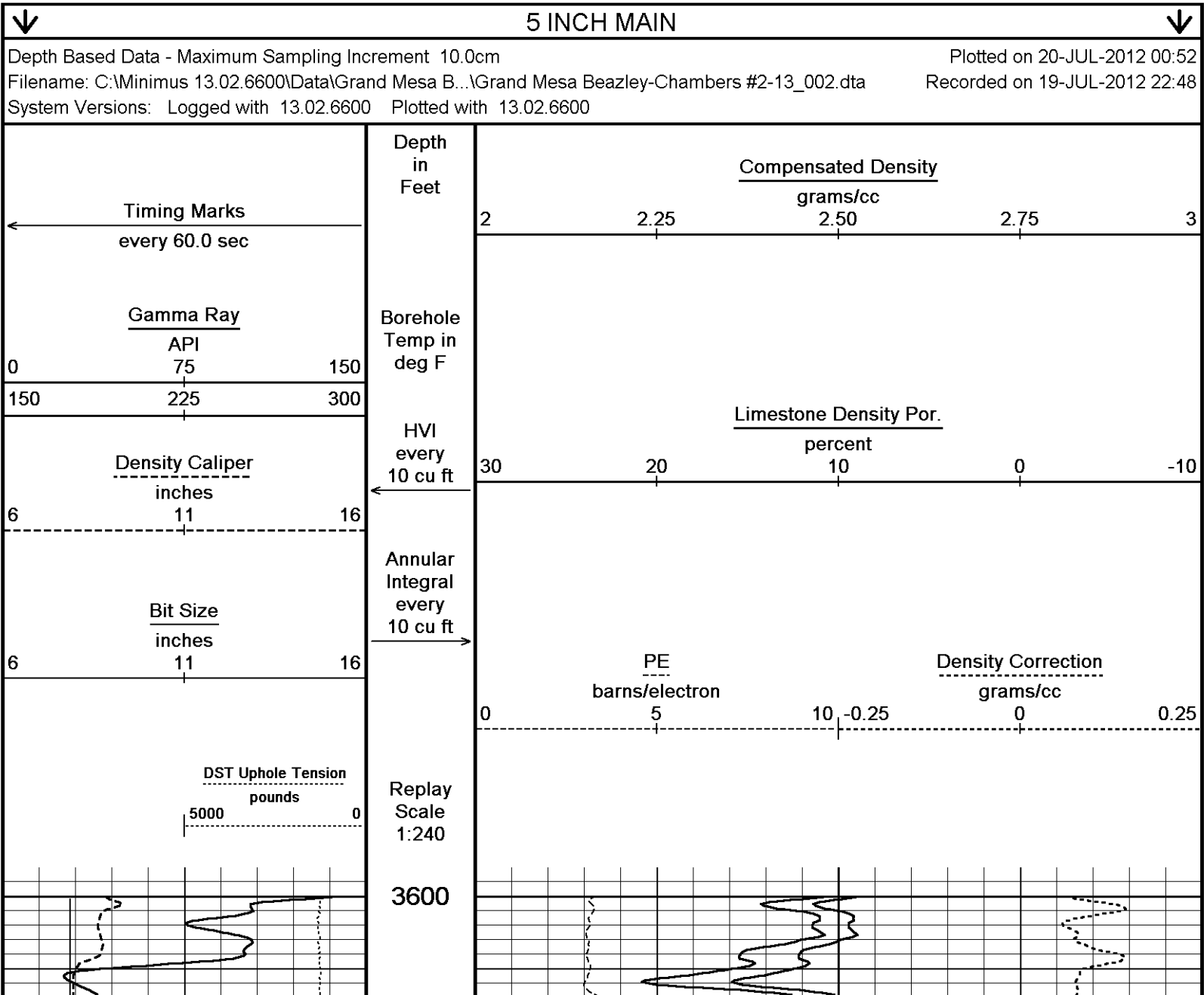
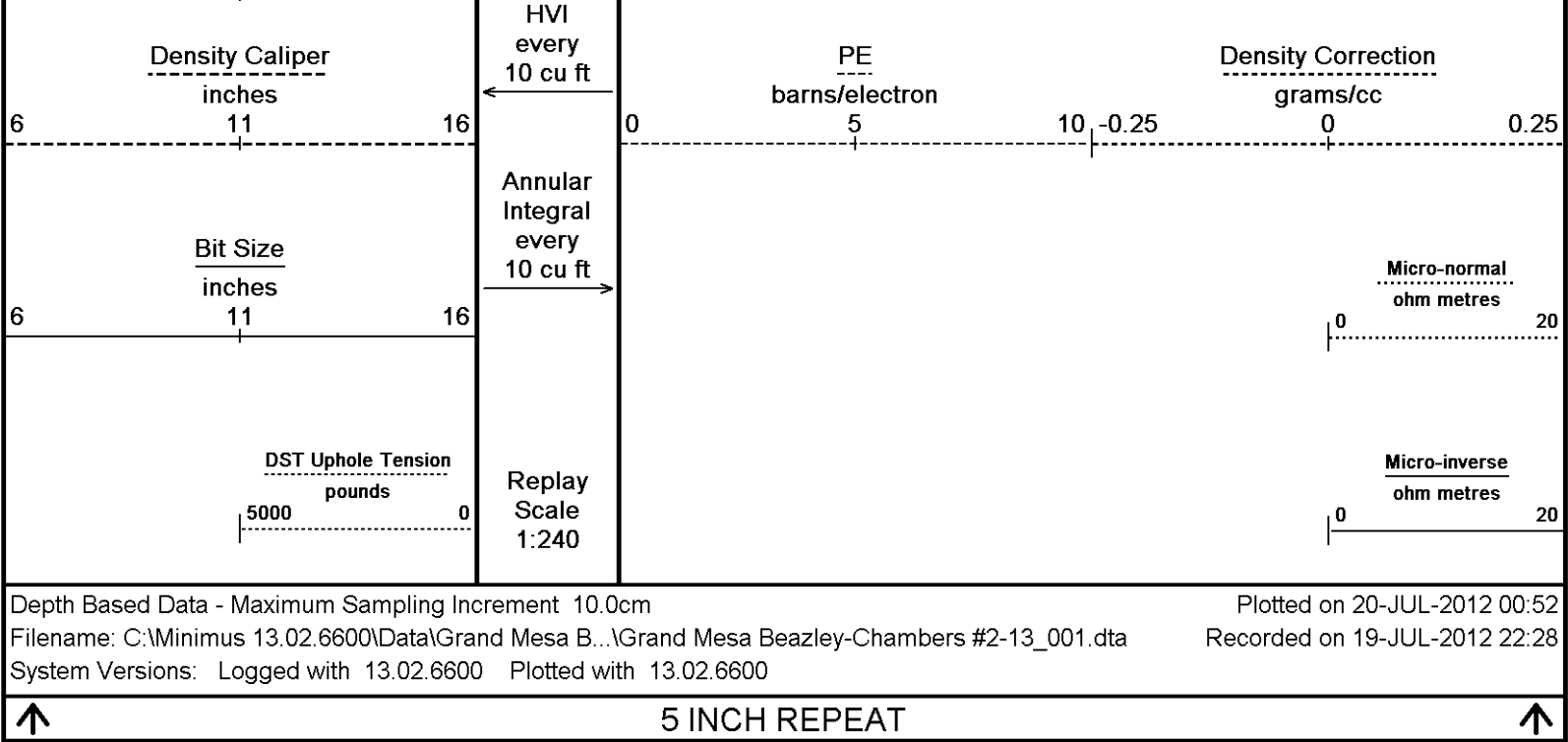


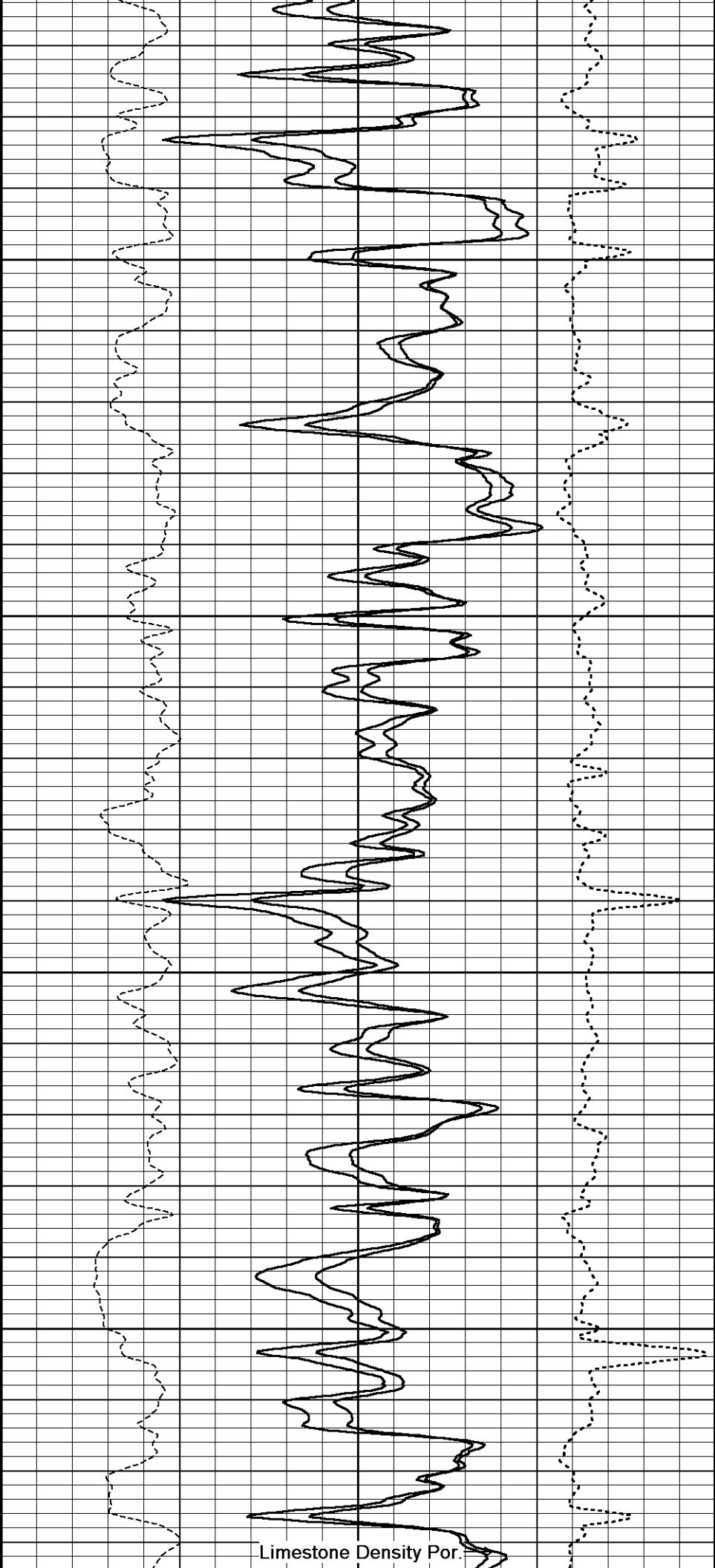
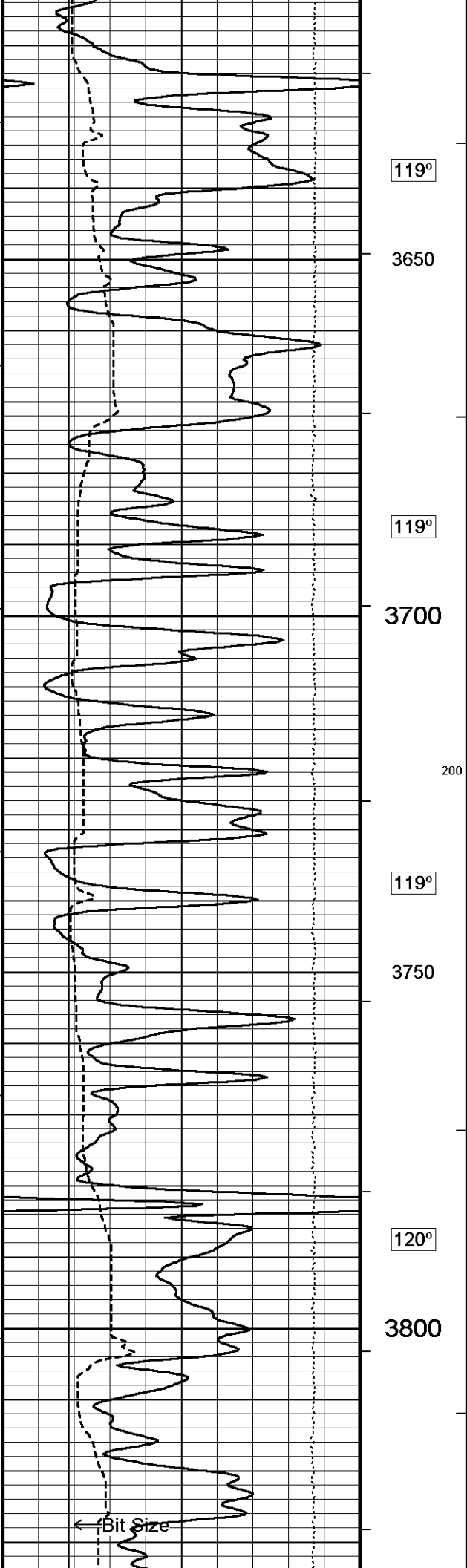
Limestone Neutron Por.
percent

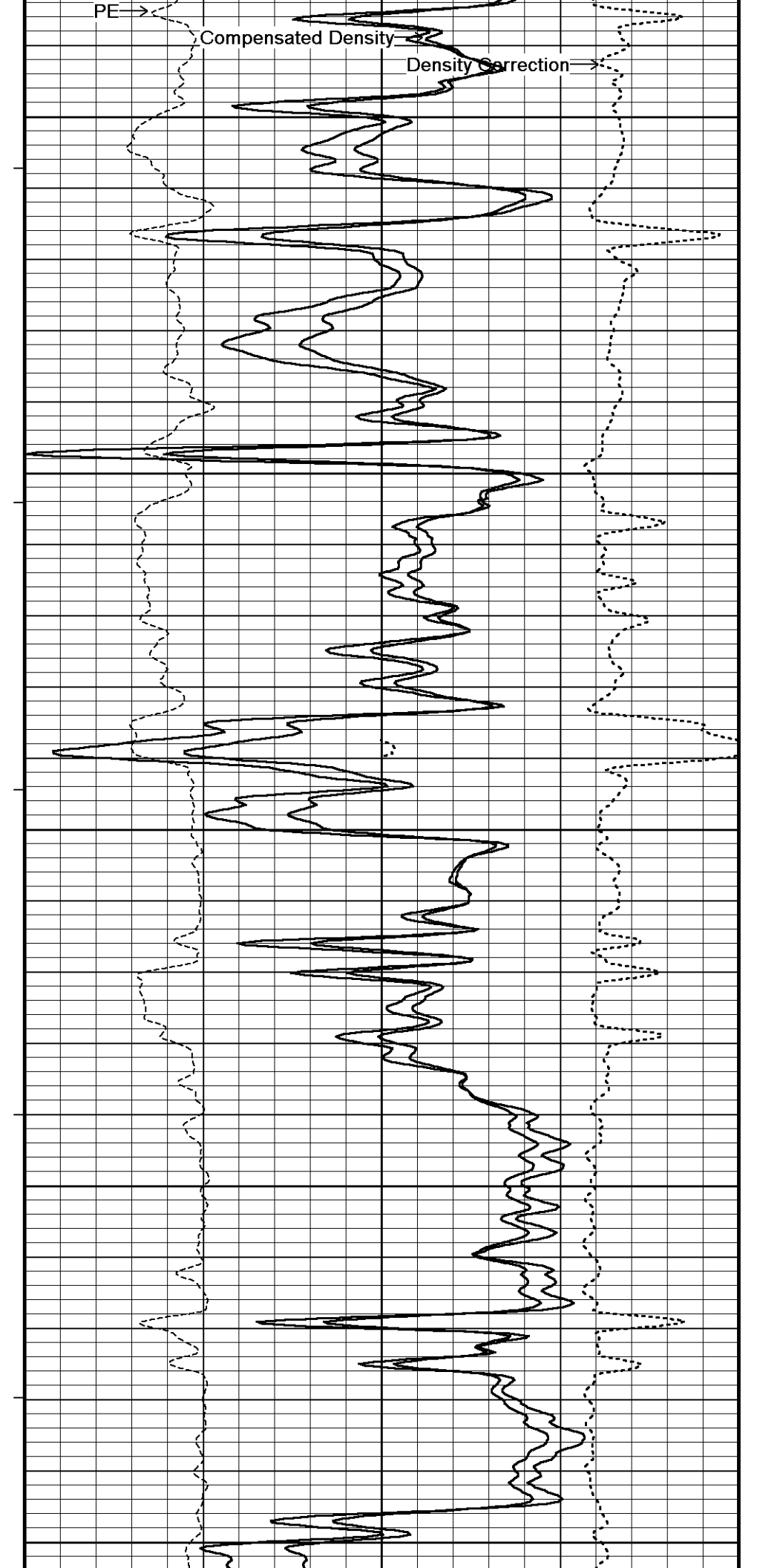
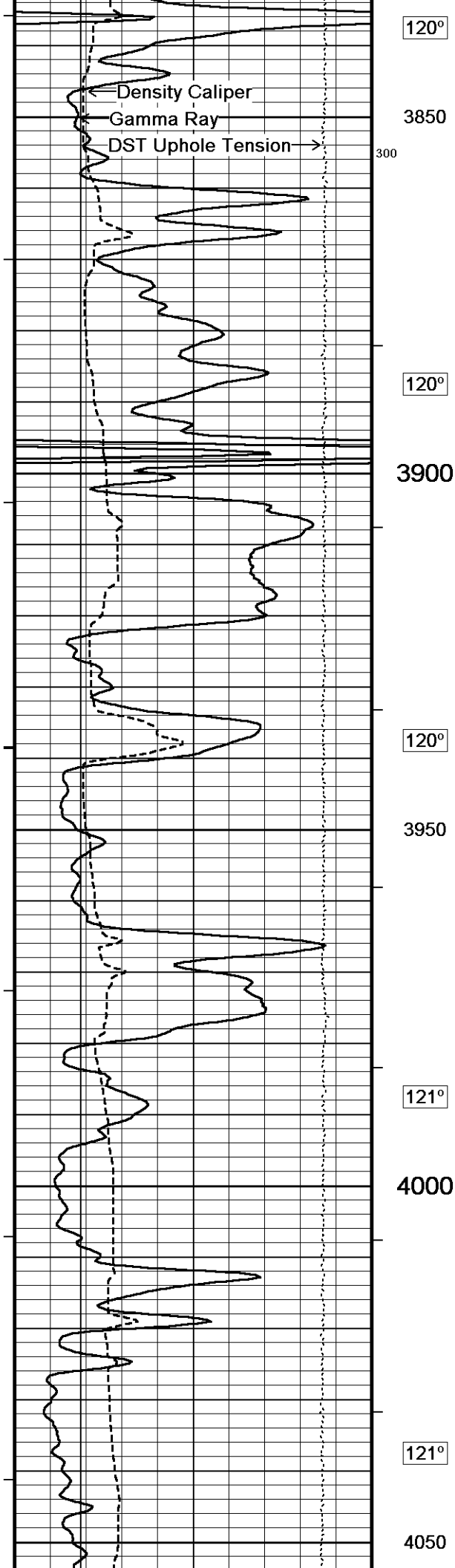
30 20 10 0 -10

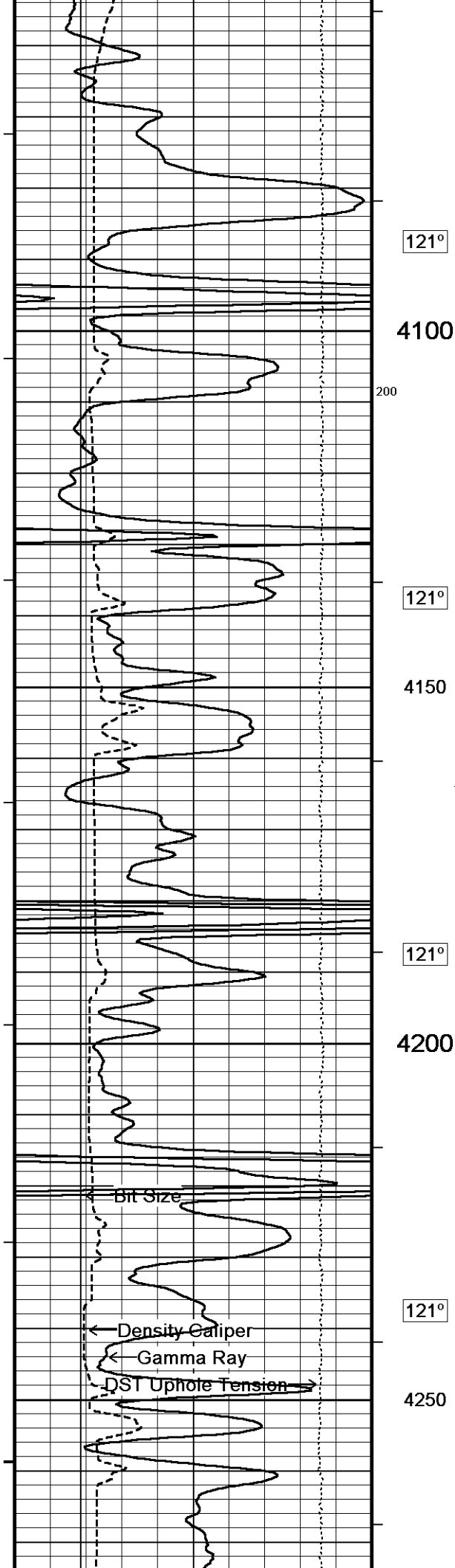
Limestone Density Por.
percent

30 20 10 0 -10









121°

4100

200

121°

4150

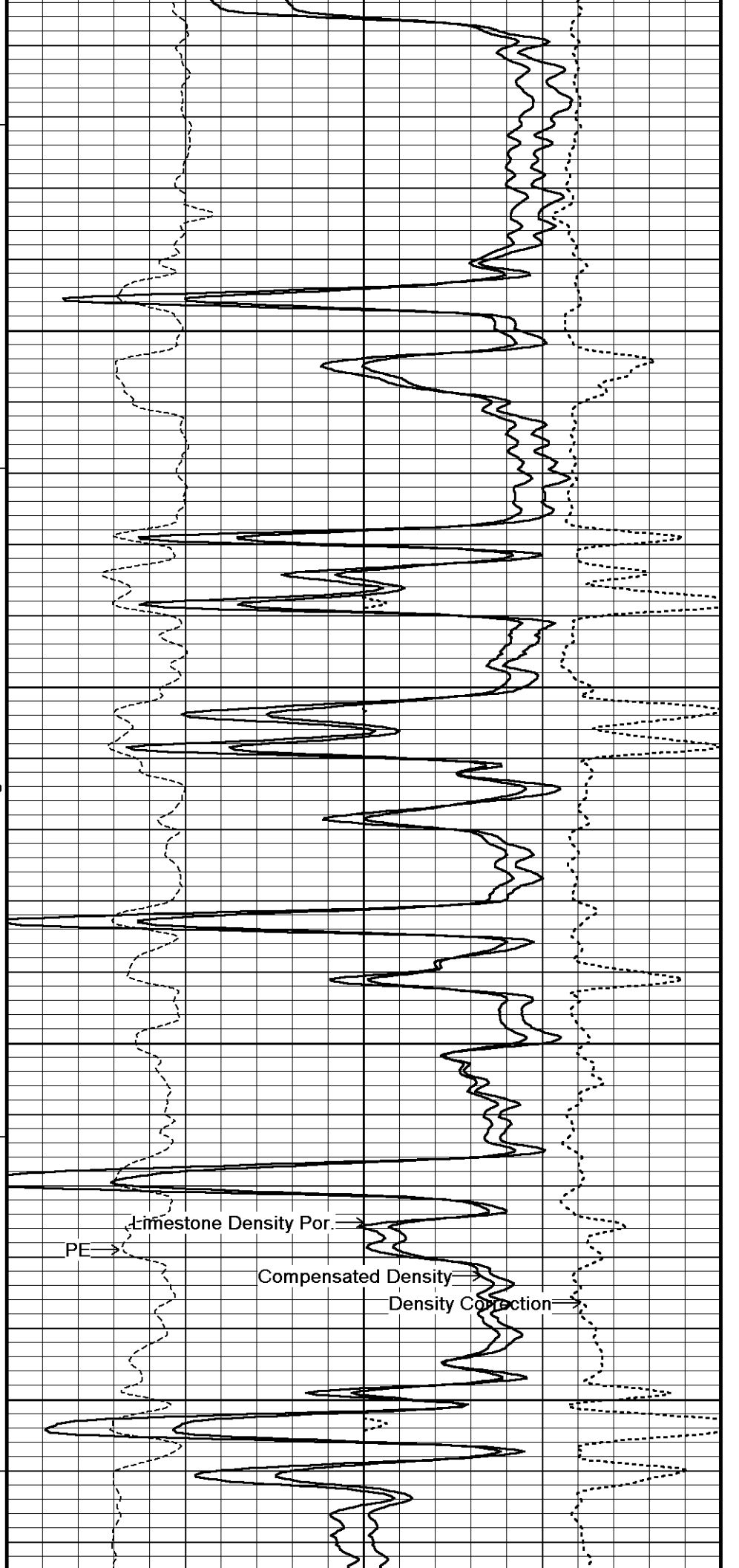
100

121°

4200

121°

4250

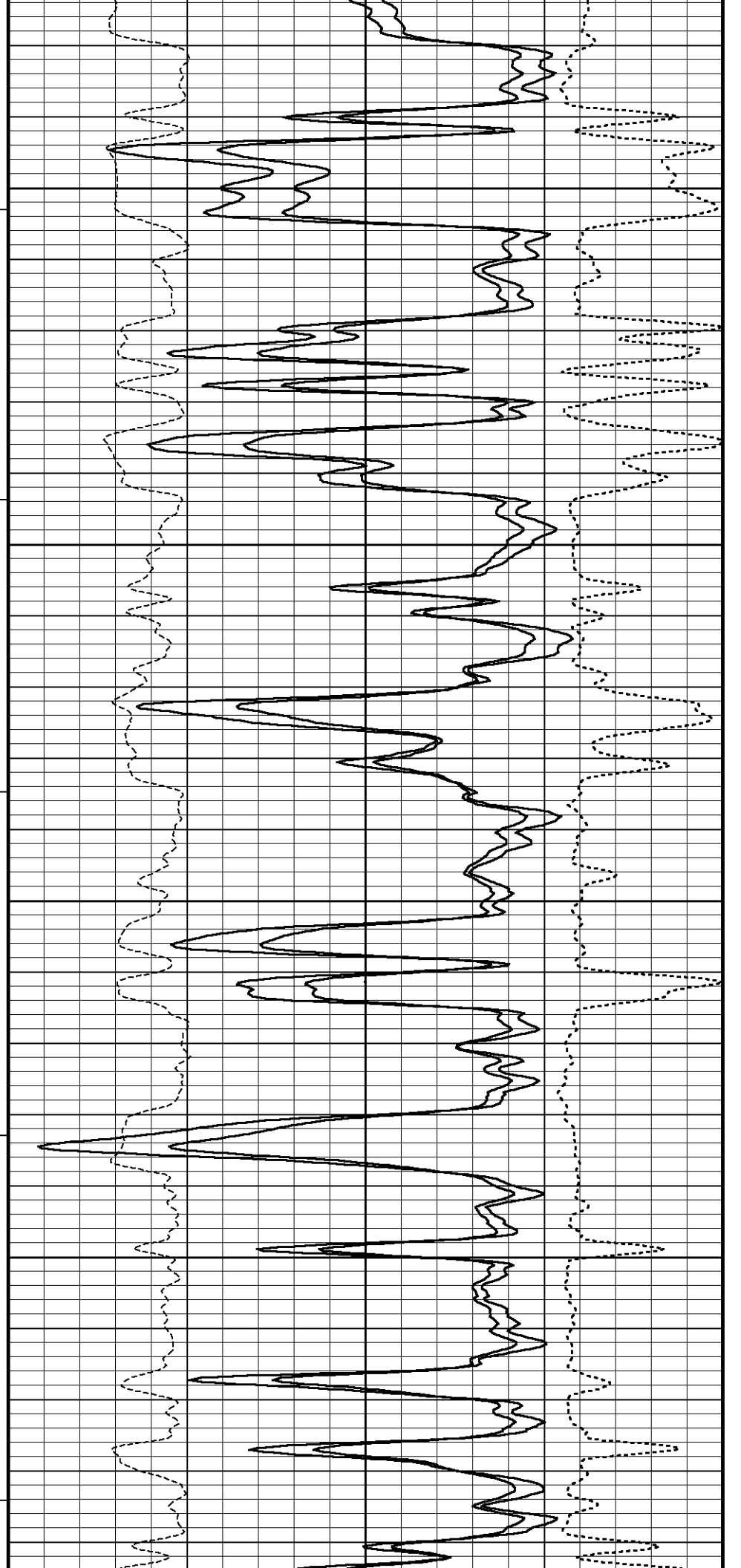
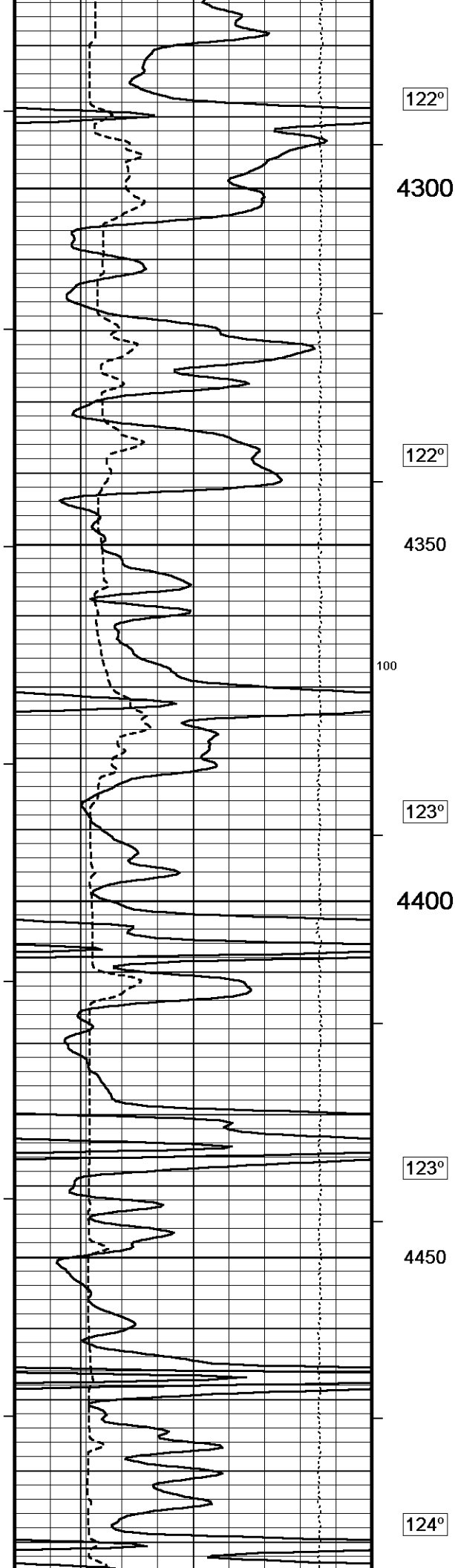


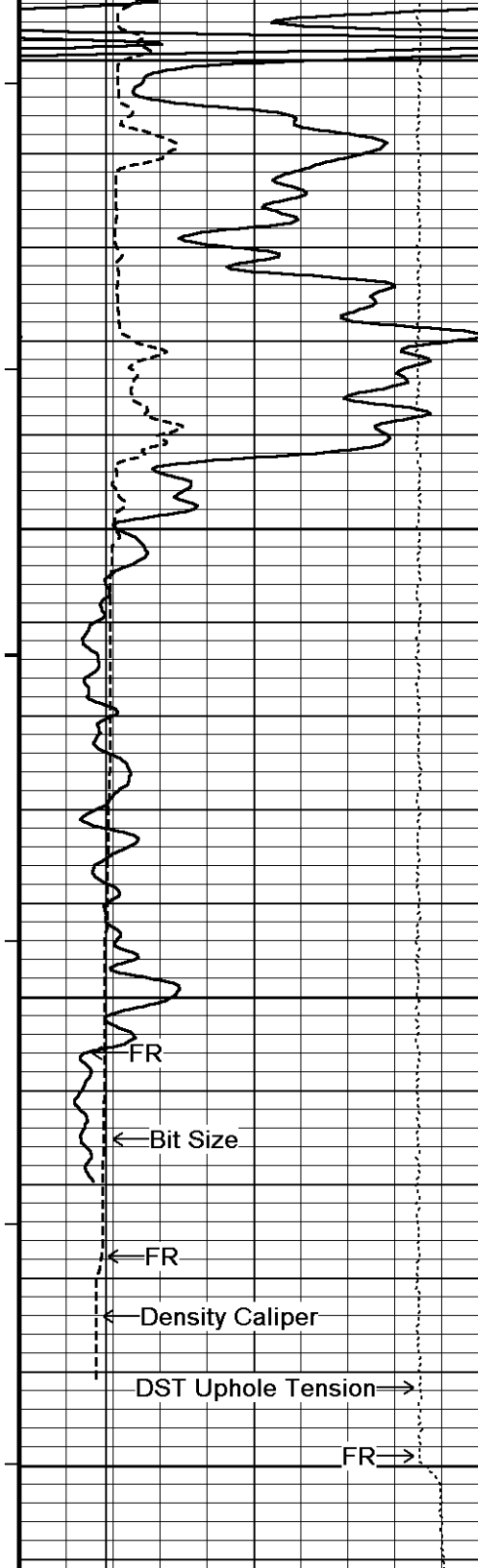
PE

Limestone Density Por.

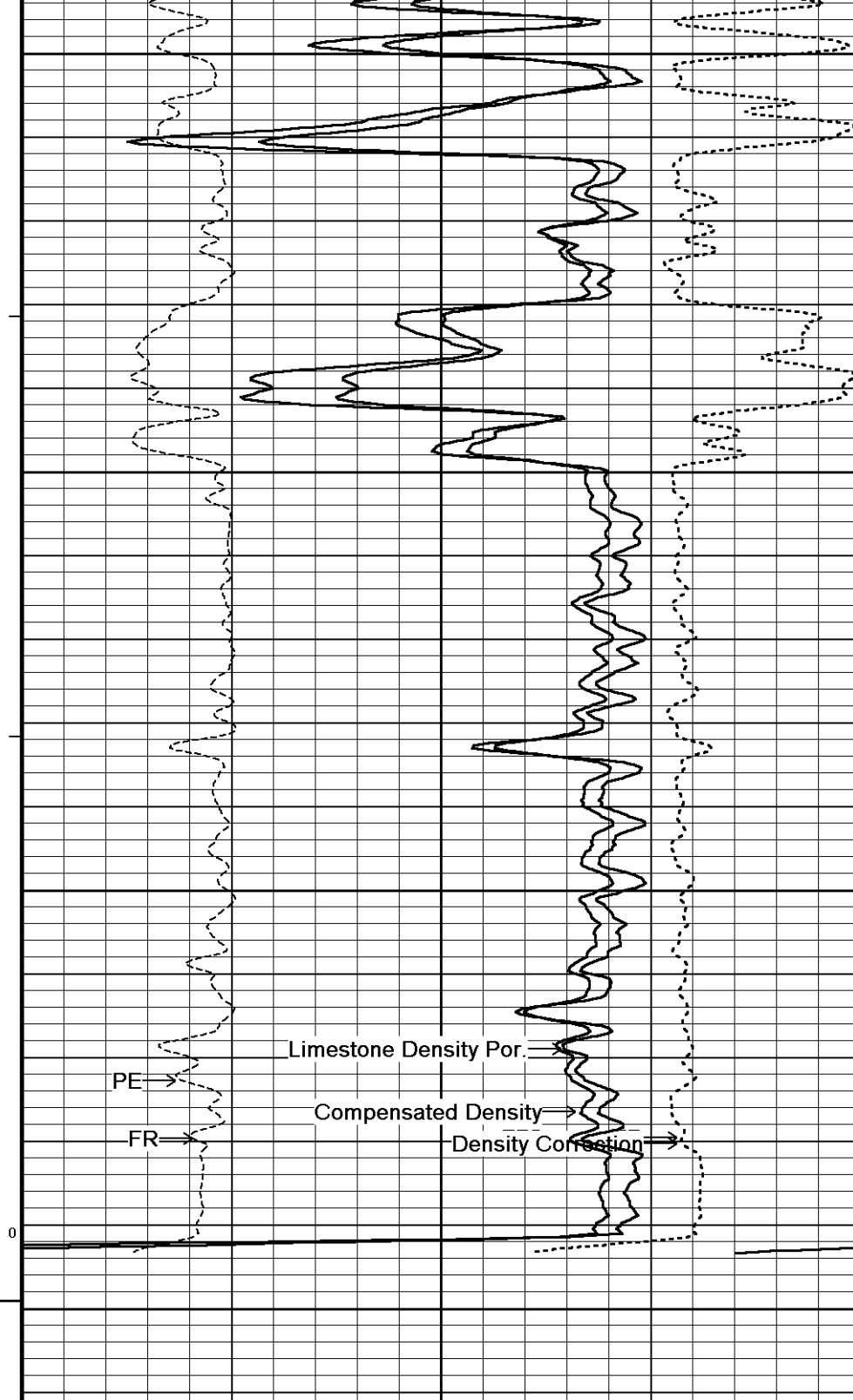
Compensated Density

Density Correction

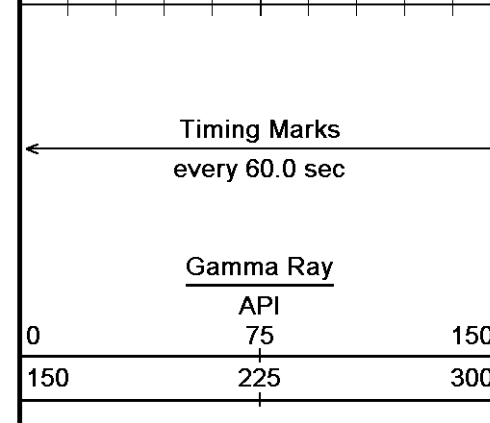




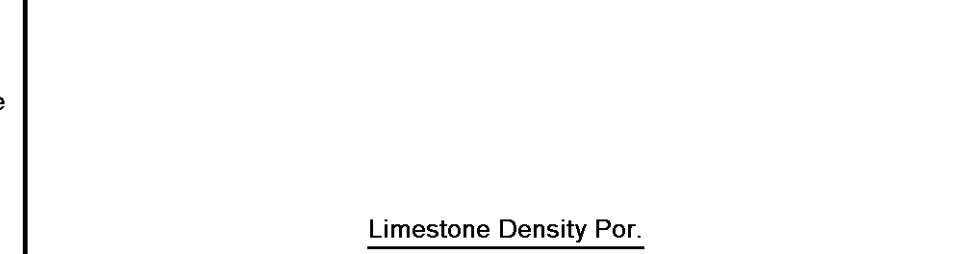
4500
125°
4550
124°
4600
FR
← Bit Size
← FR
← Density Caliper
DST Uphole Tension →
FR →
TD 4650

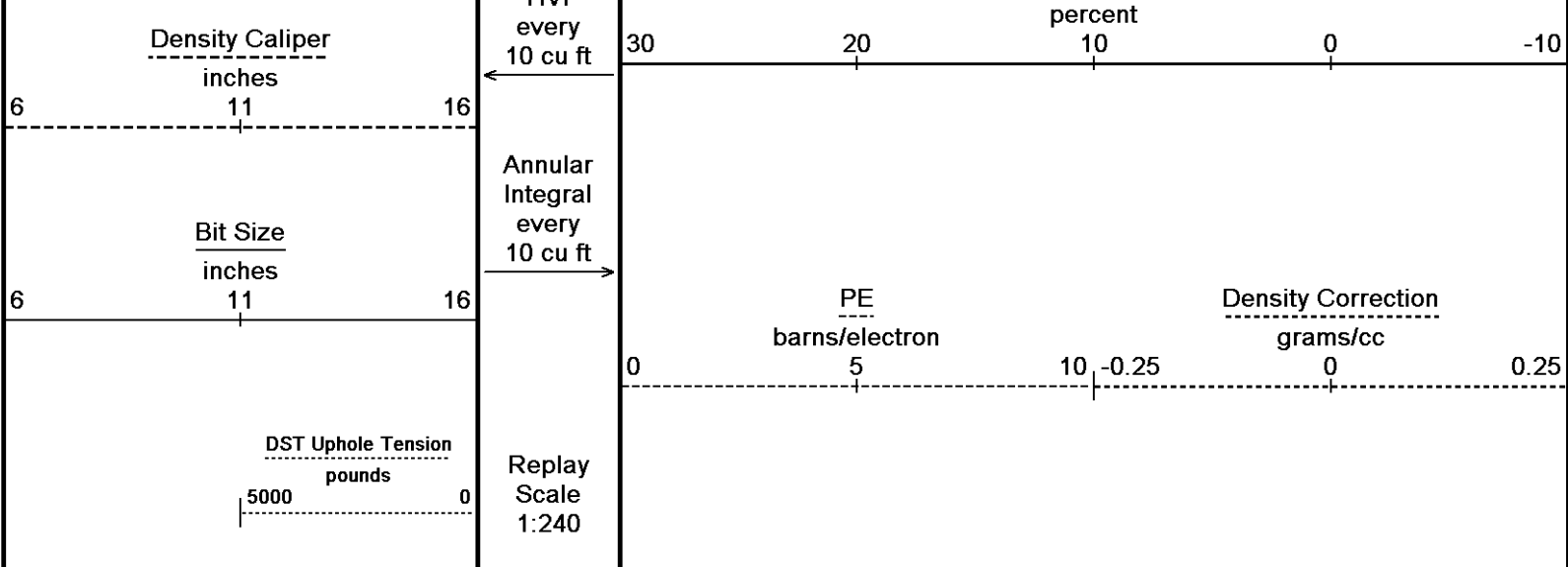


PE →
FR →
Limestone Density Por. →
Compensated Density →
Density Correction →
Compensated Density
grams/cc
2 2.25 2.50 2.75 3



Depth in Feet
Borehole Temp in deg F
HVI





Depth Based Data - Maximum Sampling Increment 10.0cm

Plotted on 20-JUL-2012 00:52

Filename: C:\Minimus 13.02.6600\Data\Grand Mesa B...\Grand Mesa Beazley-Chambers #2-13_002.dta

Recorded on 19-JUL-2012 22:48

System Versions: Logged with 13.02.6600 Plotted with 13.02.6600

↑

5 INCH MAIN

↑

↓

5 INCH REPEAT

↓

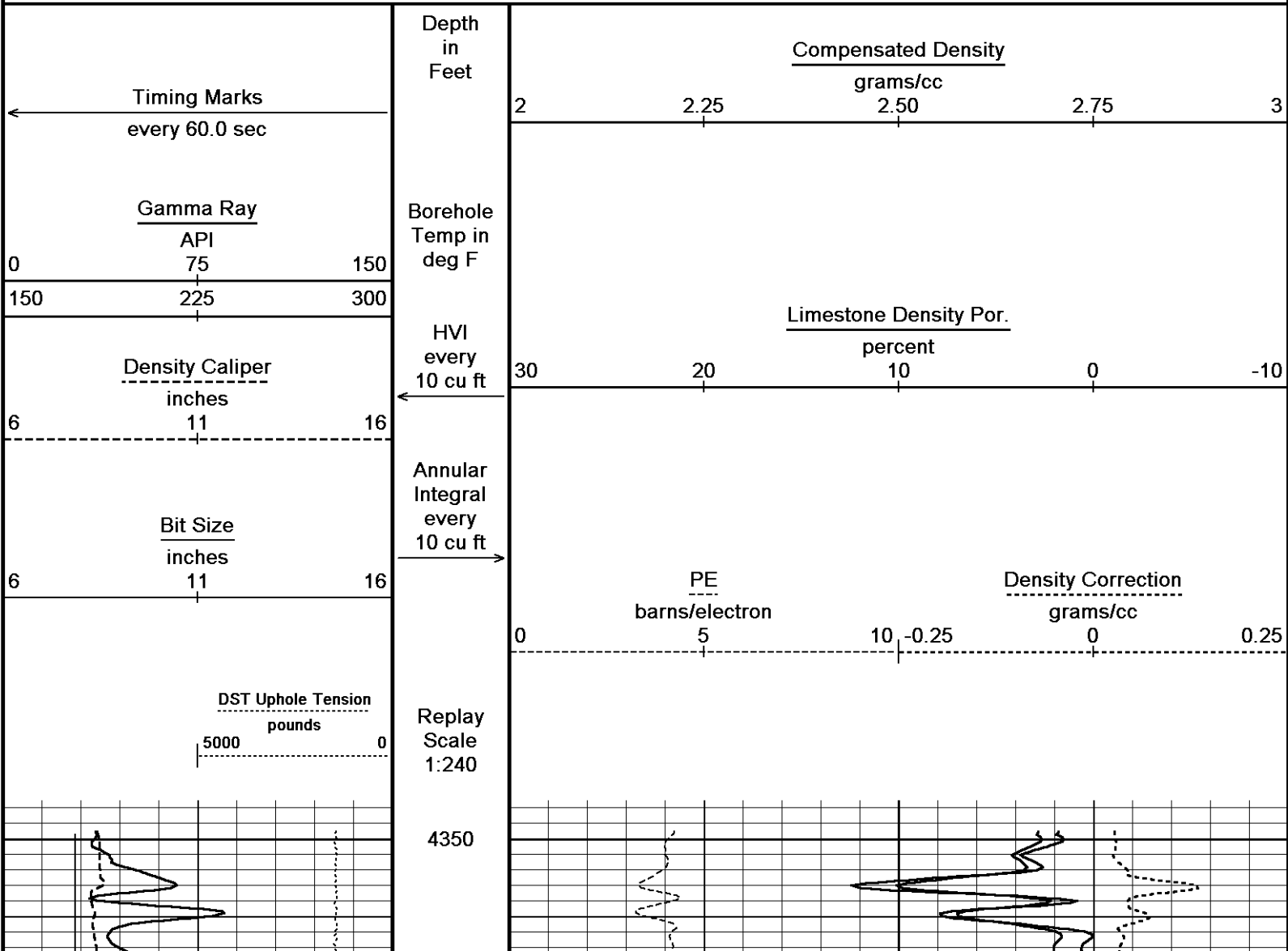
Depth Based Data - Maximum Sampling Increment 10.0cm

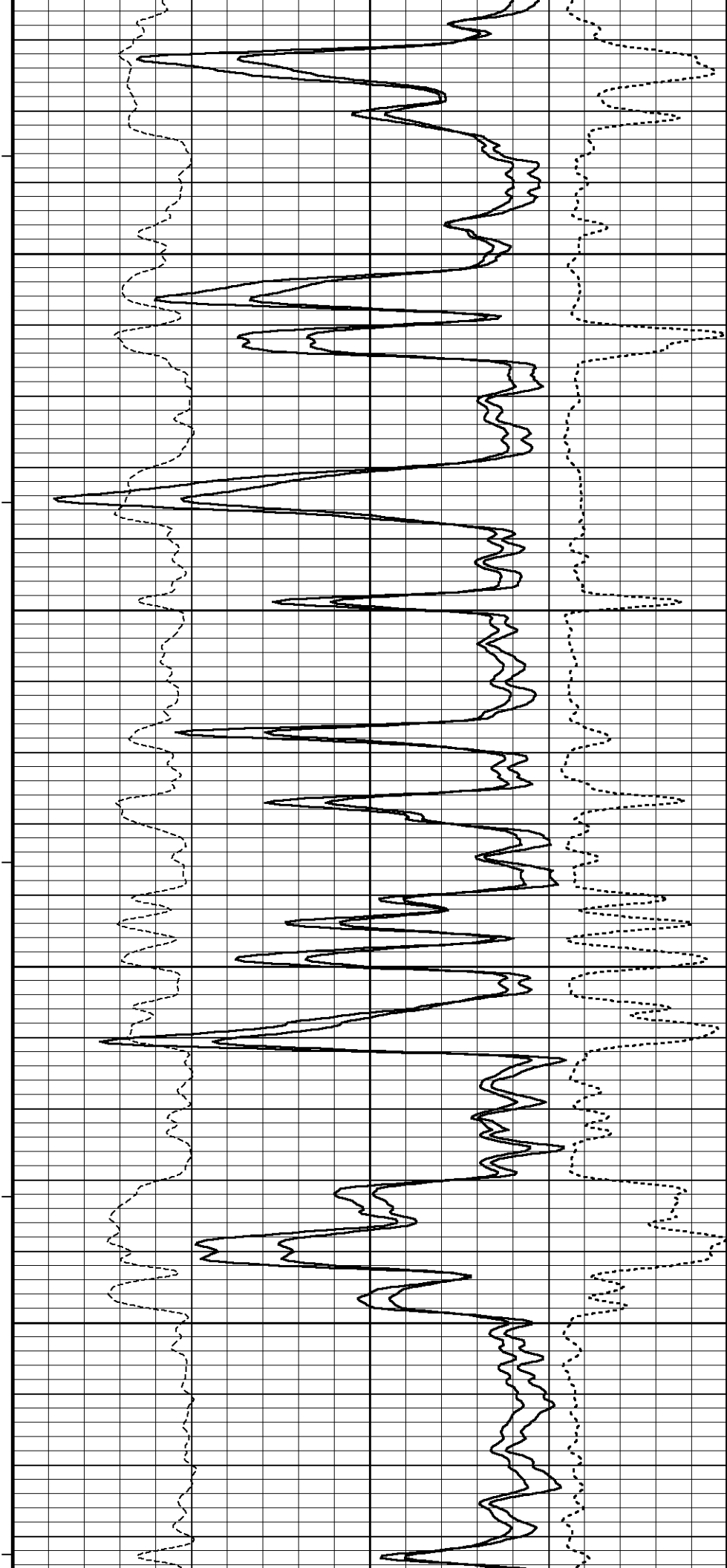
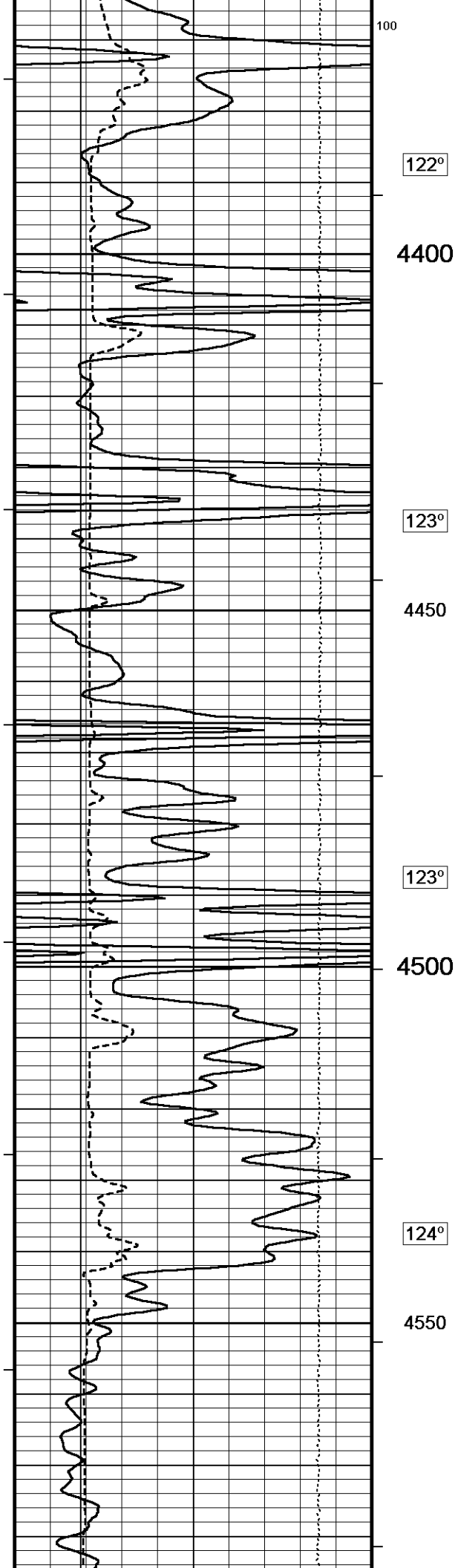
Plotted on 20-JUL-2012 00:52

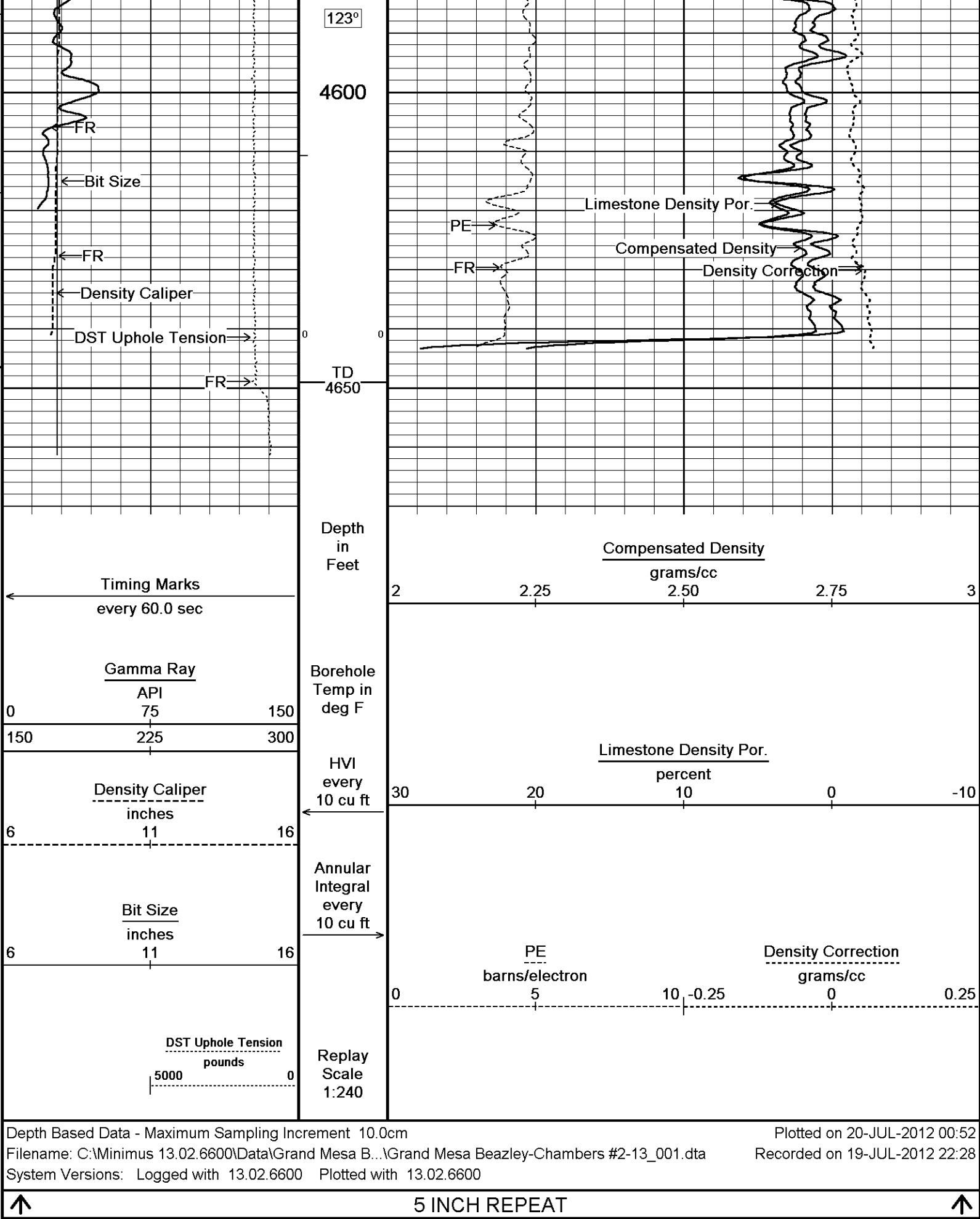
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Recorded on 19-JUL-2012 22:28

System Versions: Logged with 13.02.6600 Plotted with 13.02.6600







BEFORE SURVEY CALIBRATION

C:\Minimus 13.02.6600\Data\Grand Mesa Beazley-Chambers #2-13\Grand Mesa Beazley-Chambers #2-13_001.dta

General Parameters

Mud Resistivity	1.240	ohm-metres
Mud Resistivity Temperature	106.000	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. Four Res Rt	
RWA Constant A	0.610	
RWA Constant M	2.150	

Gamma Calibration MCG-D.K 442

Field Calibration on 19-JUL-2012 15:01

	Measured	Calibrated (API)
Background	67	44
Calibrator (Gross)	1156	769
Calibrator (Net)	1089	725

Gamma Constants MCG-D.K 442

Last Edited on 19-JUL-2012,19:23

Gamma Calibrator Number	GRC38	
Mud Density	1.12	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
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Caliper Calibration MML-A 16

Base Calibration on 17-JUL-2012 16:12

Field Calibration on 17-JUL-2012 16:13

Base Calibration

Reading No	Measured	Calibrator Size (in)
1	14596	5.98
2	17798	7.97
3	21110	9.86
4	25111	11.92
5	0	0.00
6	N/A	N/A

Field Calibration

Measured Caliper (in)	Actual Caliper (in)
5.95	5.98

Micro Normal and Micro Inverse Calibration MML-A 16

Base Calibration on 17-JUL-2012 16:16

Field Check on 17-JUL-2012 16:18

Base Calibration

	Measured	Calibrated (ohm-m)
Channel	Resistor 1 Resistor 2	Resistor 1 Resistor 2
Micro Normal	12.2 60.2	5.0 25.0

Micro Normal	12.2	66.2	6.0	26.0
Micro Inverse	15.6	78.3	5.0	25.0
Channel	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 19-JUL-2012,19:23	
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 17-JUL-2012 10:54	
				Field Check on 19-JUL-2012 15:06	
Base Calibration					
		Measured		Calibrated (cps)	
	Near	Far		Near	Far
	3220	101		3714	110
Ratio	31.859			33.764	
Field Calibrator at Base					
				Calibrated (cps)	
				1595	2289
Ratio	0.696				
Field Check					
				Calibrated (cps)	
				1604	2293
Ratio	0.699				

Neutron Constants MDN-A.B 66			Last Edited on 19-JUL-2012,19:22	
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 17-JUL-2012 15:58 Field Check on 19-JUL-2012 14:48	
Base Calibration				
	Measured	Calibrated (ohm-m)		
Reference 1	0.0	0.0		
Reference 2	964.8	126.8		
Base Check			280.6	
Field Check			280.8	

FE Constants MFE-B.J 353			Last Edited on 19-JUL-2012,19:23	
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

High Resolution Temperature Calibration MAI-A.A 167			Field Calibration on 17-JUL-2012 10:59	
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	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 19-JUL-2012 14:47

Base Calibration

Test Loop Calibration

Channel	Measured		Calibrated (mmho/m)	
	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	13.9	3837.4
2	0.0	0.0	29.8	3474.3
3	0.0	0.0	29.2	3050.4
4	0.0	0.0	19.8	2079.9
Deep	0.0	0.0	18.7	2047.1
Medium	0.0	0.0	42.2	3987.7
Shallow	0.0	0.0	43.2	5050.6

Array Temperature 0.0 89.8 Deg F

Induction Constants MAI-A.A 167

Last Edited on 19-JUL-2012,19:22

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 17-JUL-2012 14:43
Field Calibration on 19-JUL-2012 14:54

Base Calibration

Reading No	Measured	Calibrator Size (in)
1	13949	3.99
2	22435	5.98
3	31057	7.97
4	39360	9.86
5	48766	11.92
6	N/A	N/A

Field Calibration

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

Photo Density Calibration MPD-B 64

Base Calibration on 17-JUL-2012 15:04
Field Check on 19-JUL-2012 14:53

Density Calibration

Base Calibration	Measured		Calibrated (sdu)	
	Near	Far	Near	Far
Reference 1	59921	33969	59556	30836
Reference 2	25388	2962	24941	2541

Field Check at Base

1193.4 1388.8

Field Check

1193.0 1385.0

PE Calibration

Base Calibration	Measured			Calibrated
	WS	WH	Ratio	Ratio
Background	214	1064		
Reference 1	22602	59722	0.382	0.371
Reference 2	6872	25249	0.275	0.272

Field Check at Base

214.1 1063.8

Field Check

216.1 1066.2

Density Constants MPD-B 64

Last Edited on 19-JUL-2012,19:19

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	1.12 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

Down-hole Tension Calibration SMS 0

Field Calibration on 19-JUL-2012 21:42

Reading No	Measured	Calibrated (lbs)
1	16140.20	0.00

DOWNHOLE EQUIPMENT

C:\Minimus 13.02.6600\Data\Grand Mesa Beazley-Chambers #2-13\Grand Mesa Beazley-Chambers #2-13_001.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-D.K 442 LG: 8.70 ft WT: 63.9 lb OD: 2.24 in

Compact Micro-log

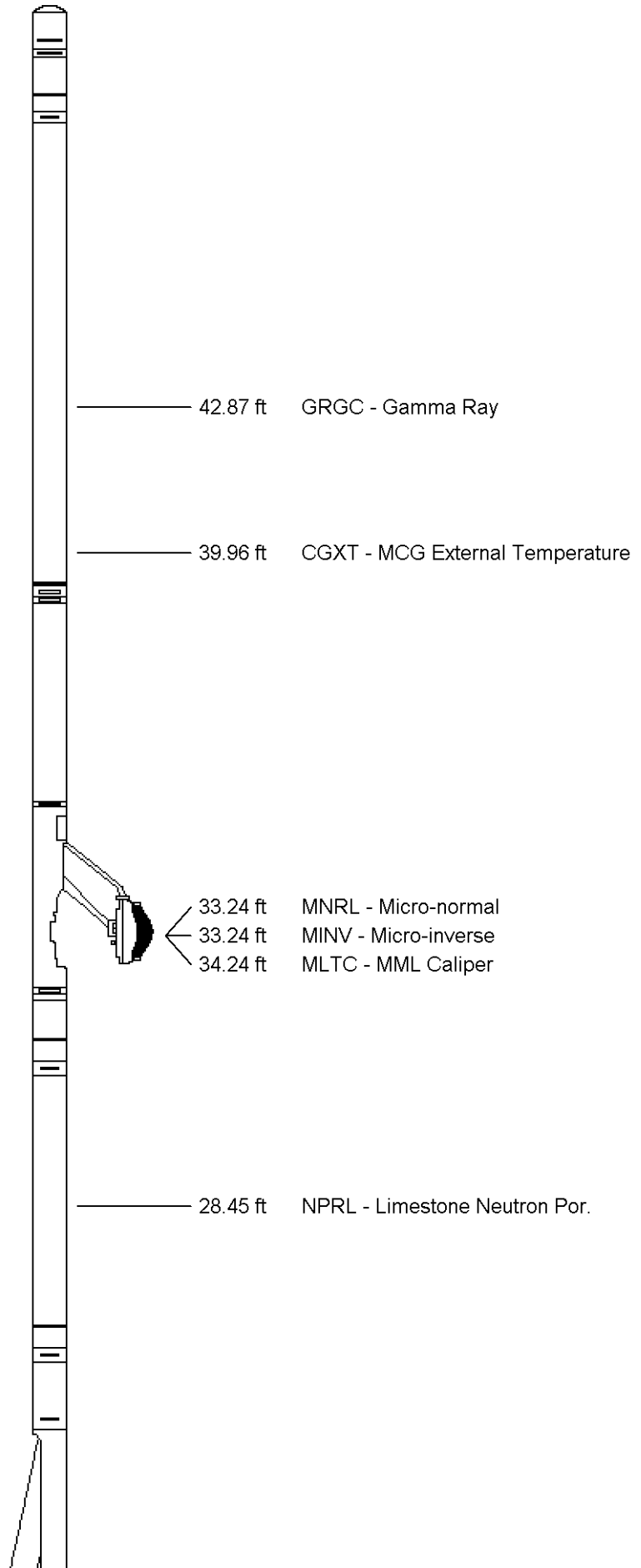
MML-A 16 LG: 7.97 ft WT: 81.6 lb OD: 2.24 in

Compact Neutron

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

Compact Density/Caliper

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



21.21 ft CLDC - Density Caliper
21.21 ft HVOL - Hole Volume
21.21 ft AVOL - Annular Volume
19.28 ft DCOR - Density Correction
19.28 ft DEN - Compensated Density
19.28 ft DPRL - Limestone Density Por.
19.22 ft PDPE - PE

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

13.72 ft FEFE - Shallow FE

Compact Induction
MAI-A.A 167 LG: 10.81 ft WT: 48.5 lb OD: 2.24 in

3.34 ft R60O - Array Ind. One Res 60
3.34 ft RTAO - Array Ind. One Res Rt
3.34 ft R40O - Array Ind. One Res 40

0.23 ft SPCG - Spontaneous Potential

Tool Zero (0.13ft from bottom)
-0.13 ft SMTU - DST Uphole Tension

Total Length: 49.73 ft Weight: 399.0 lb

All measurements relative to tool zero.

COMPANY	GRAND MESA OPERATING
WELL	BEAZLEY-CHAMBERS #2-13
FIELD	WILDCAT
PROVINCE/COUNTY	GOVE
COUNTRY/STATE	U.S.A. / KANSAS

Elevation Kelly Bushing	2866.00	feet	First Reading	4630.00	feet
Elevation Drill Floor	2864.00	feet	Depth Driller	4650.00	feet
Elevation Ground Level	2861.00	feet	Depth Logger	4649.00	feet



COMPACT PHOTO DENSITY

