



Weatherford

**COMPACT PHOTO DENSITY
COMPENSATED NEUTRON
MICRORESISTIVITY LOG**

COMPANY

COMANCHE RESOURCES CO., LLC

WELL

JAMES # 31-1

FIELD

WILDCAT

PROVINCE/COUNTY

SCOTT

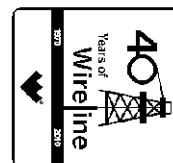
COUNTRY/STATE

U.S.A. / KANSAS

LOCATION

2300' FSL & 330' FEL

S2 NE NE SE



SEC

TWP
31
19S

RGE

34W

Other Services
MAI/MFE

Permit Number

15-171-20881

Permanent Datum G.L., Elevation 3066 feet

Log Measured From KB

Drilling Measured From K.B.

Elevations:

KB

DF

GL

feet

3077.00

3075.00

3066.00

Date

22-MAY-2012

Run Number

ONE

Depth Driller

5000.00

feet

Depth Logger

4992.00

feet

First Reading

4971.00

feet

Last Reading

3900.00

feet

Casing Driller

362.00

feet

Casing Logger

359.00

feet

Bit Size

7.875

inches

Hole Fluid Type

CHEMICAL

Density / Viscosity

9.20

lb/USg

60.00 CP

PH / Fluid Loss

11.00

5.00 ml/30Min

Sample Source

FLOWLINE

Rm @ Measured Temp

0.80 @ 71.0

ohm-m

Rmf @ Measured Temp

0.64 @ 71.0

ohm-m

Rmc @ Measured Temp

0.96 @ 71.0

ohm-m

Source Rmf / Rmc

CALC

CALC

Rm @ BHT

0.49 @ 120.0

ohm-m

Time Since Circulation

5 HOURS

Max Recorded Temp

121.00

deg F

Equipment Name

COMPACT

Equipment / Base

13096

LIB

A. GIAMBALVO

JIM SPELLMAN

TROY FOWLER

LB12-131

BOREHOLE RECORD

Last Edited: 23-MAY-2012 01:35

Bit Size
inches

7.875

Depth From
feet

359.00

Depth To
feet

4992.00

CASING RECORD

Type

Size
inches

8.625

Depth From
feet

11.00

Shoe Depth
feet

359.00

Weight
pounds/ft

24.00

REMARKS

Tools Used: MPD, MCG, MDN, MFE, MAI, MML.

Hardware: MPD: 8 inch profile plate used. MAI_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 = 202 cu. ft.

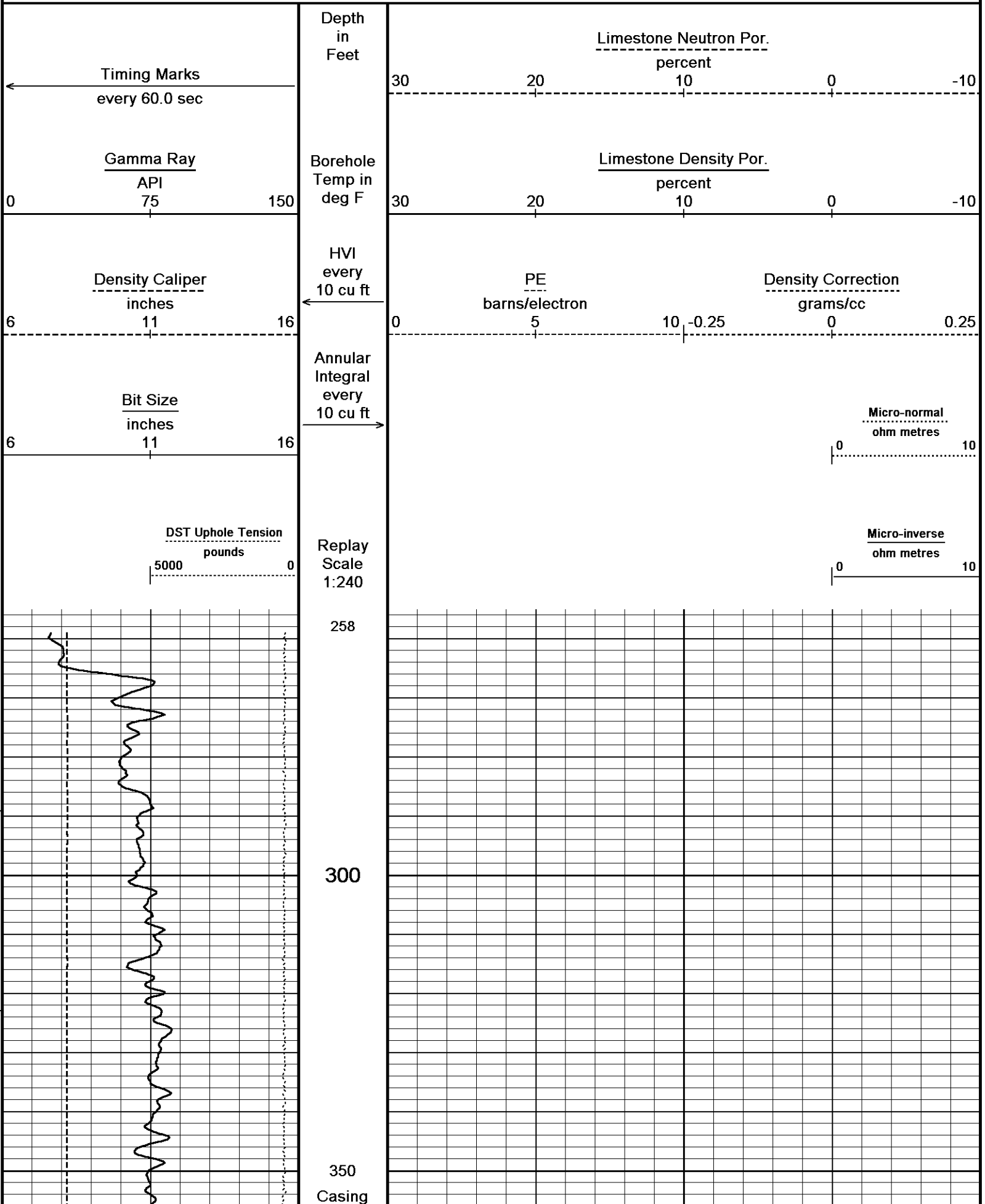
Service order #3534547

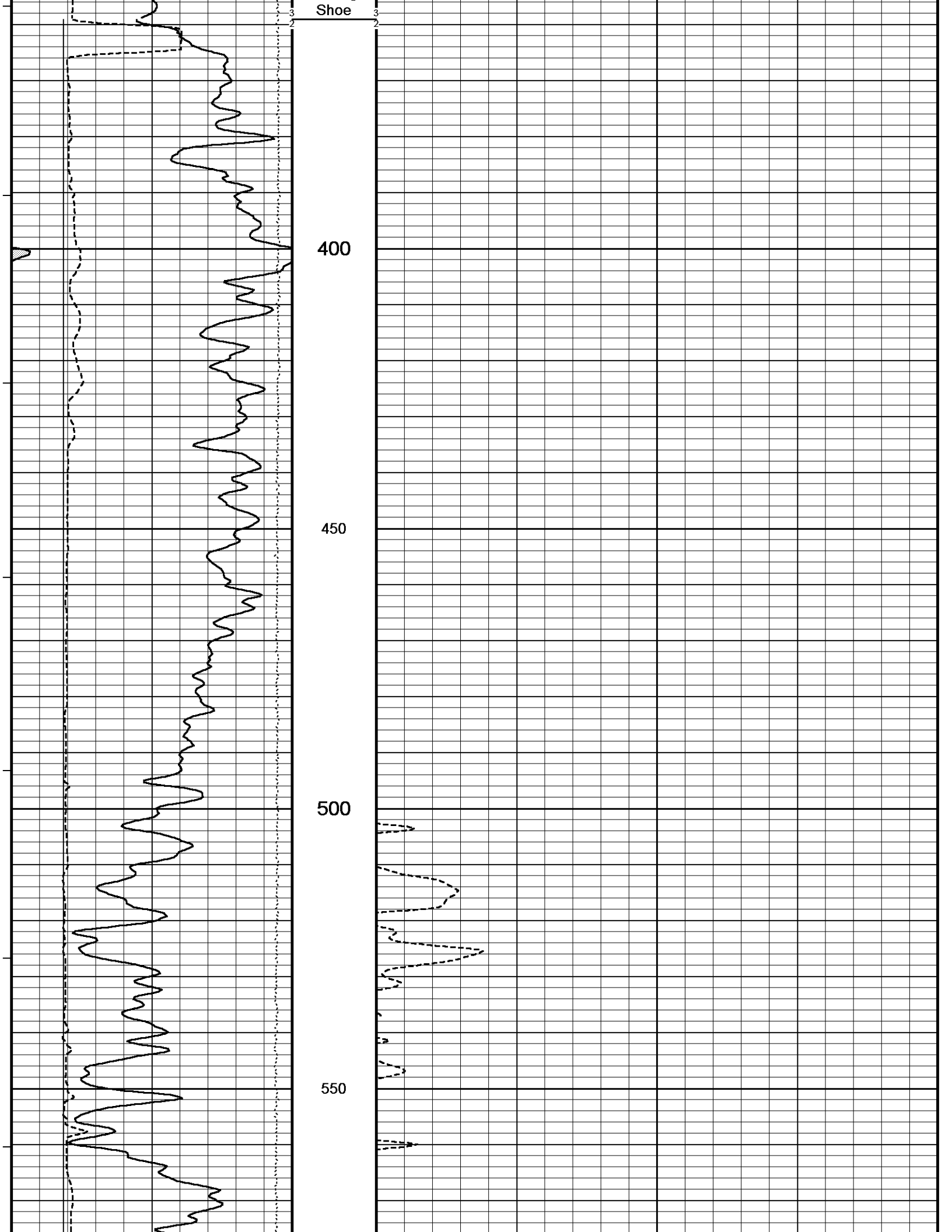
Rig: Murfin Drilling Rig #2

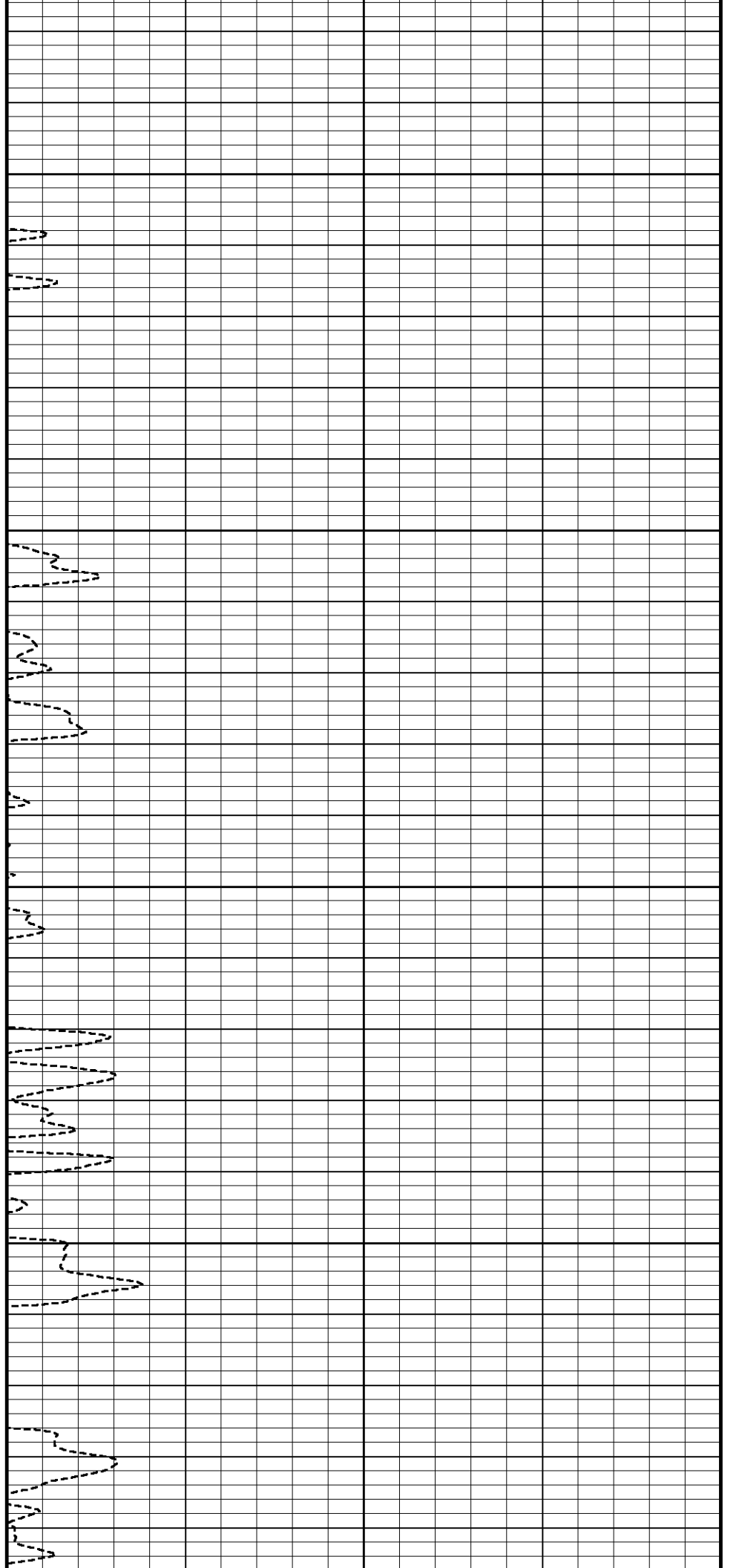
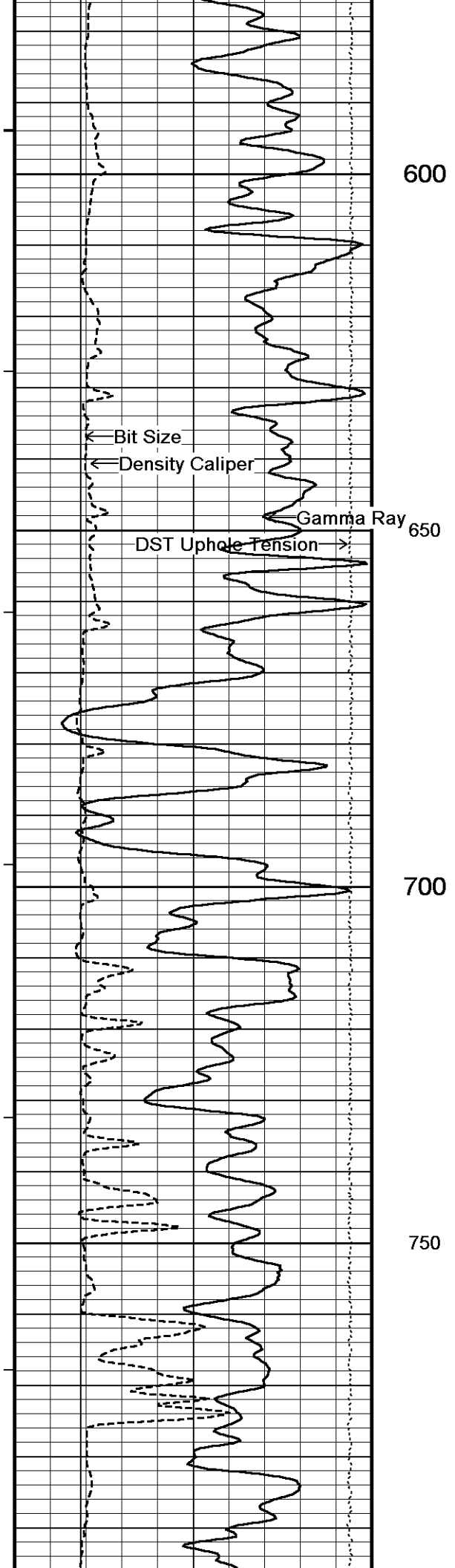
Engineer: A. Giambalvo

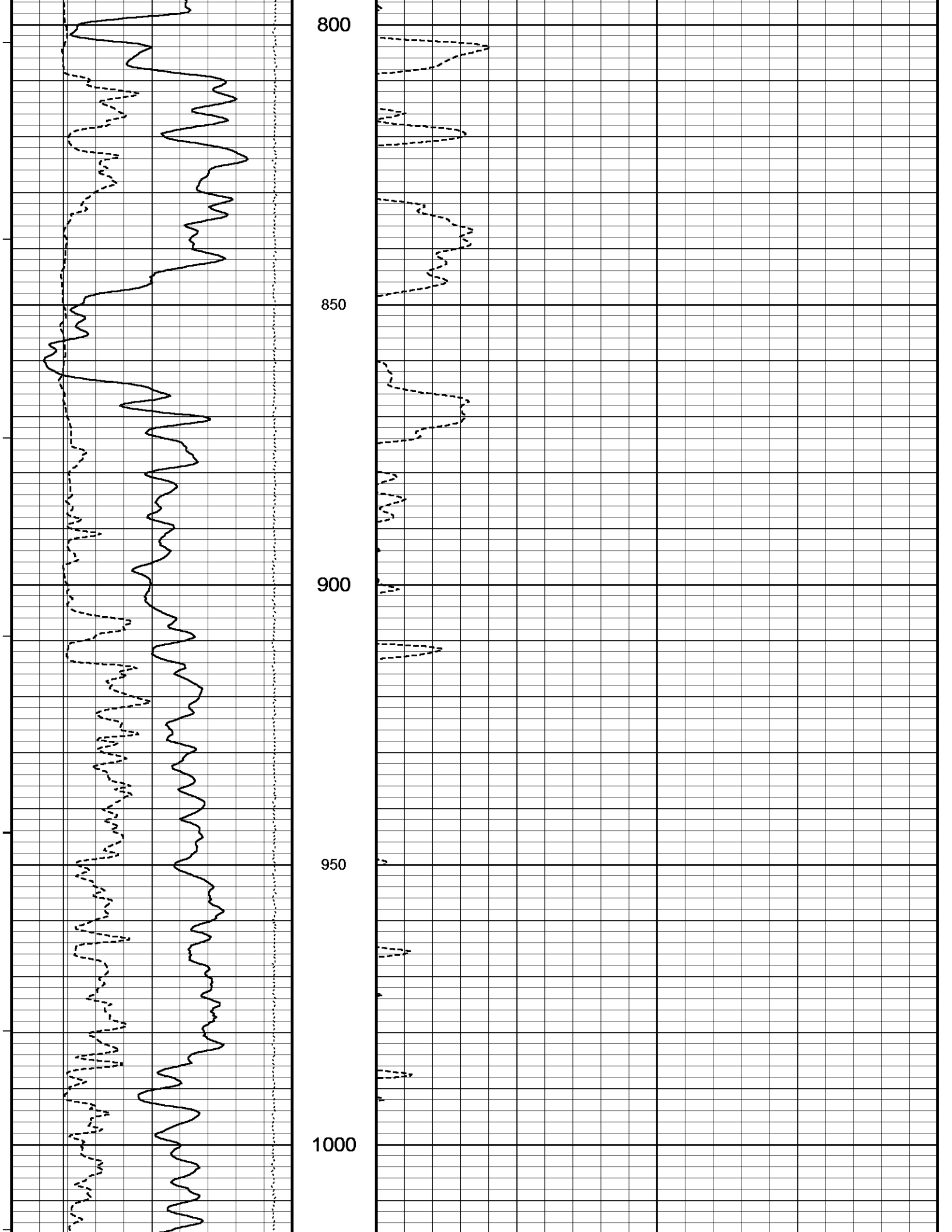
Operator(s): N. Adame

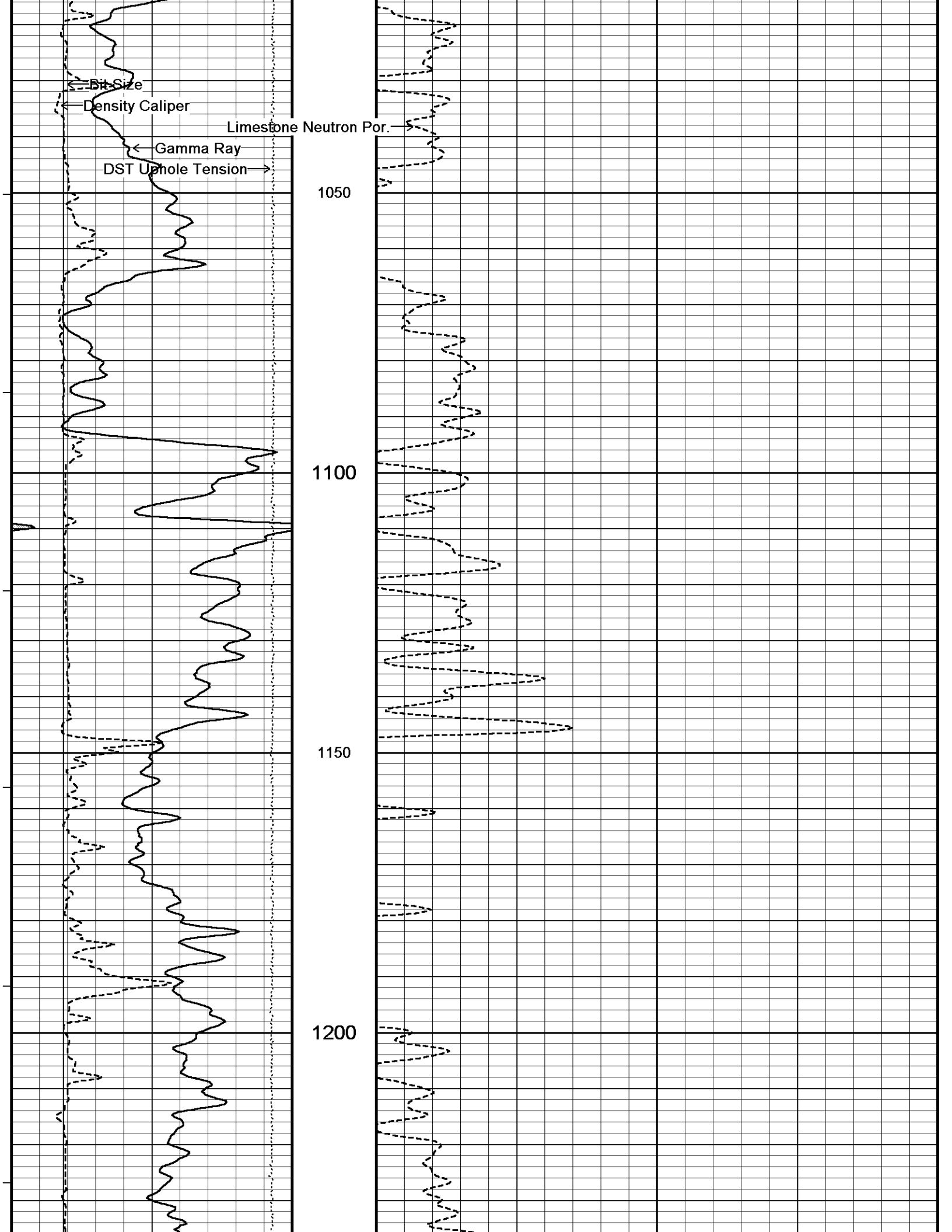
All interpretations are opinions based on inferences from electrical or other measurements and we cannot, and do not, guarantee the accuracy or correctness of any interpretations, and we shall not, except in the case of gross or wilful negligence on our part, be liable or responsible for any loss, costs,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

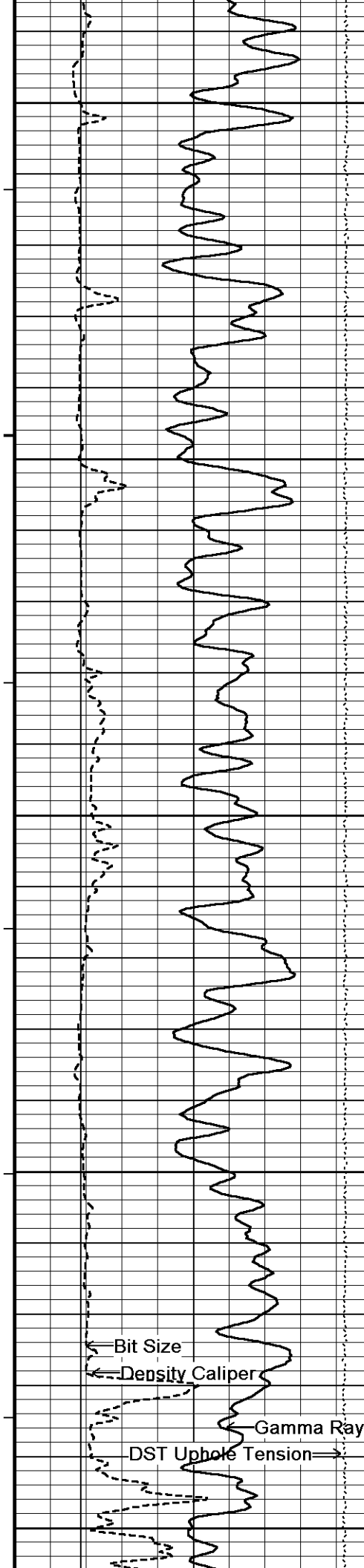












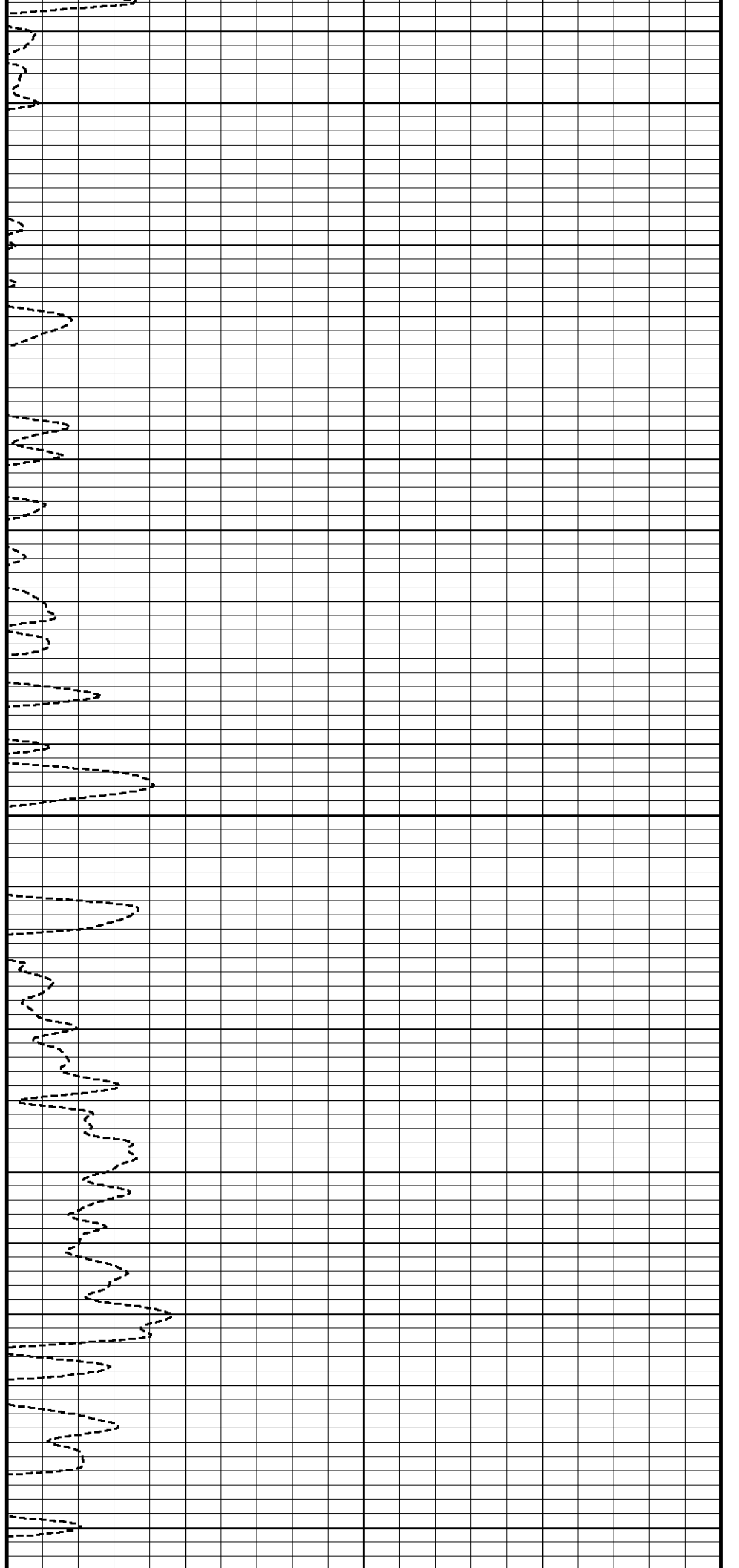
1250

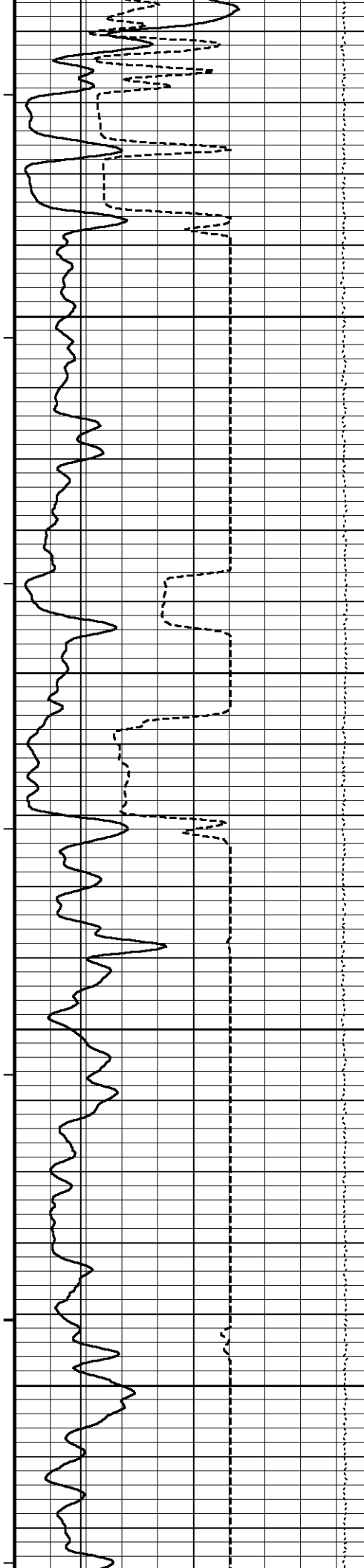
1300

1350

1400

1450



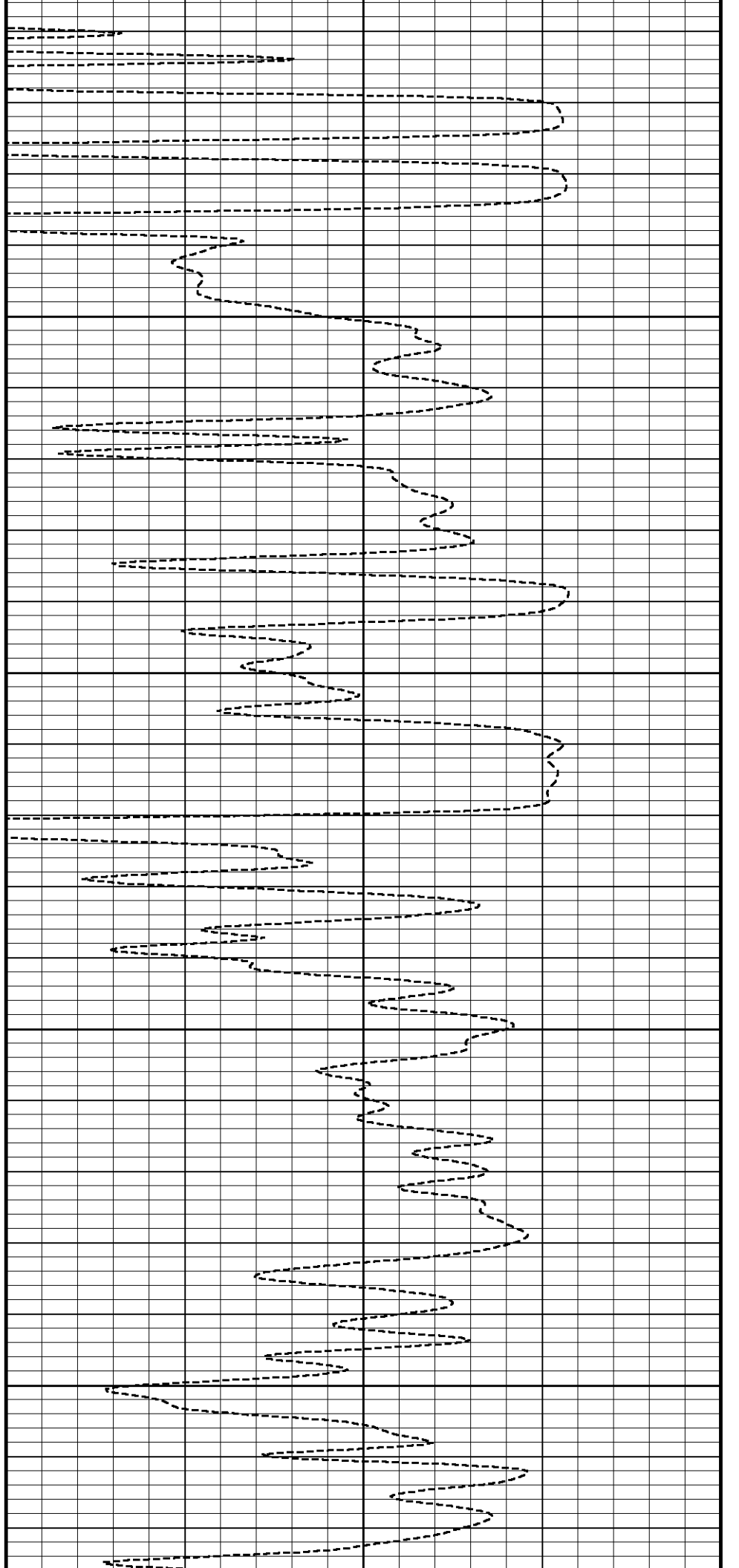


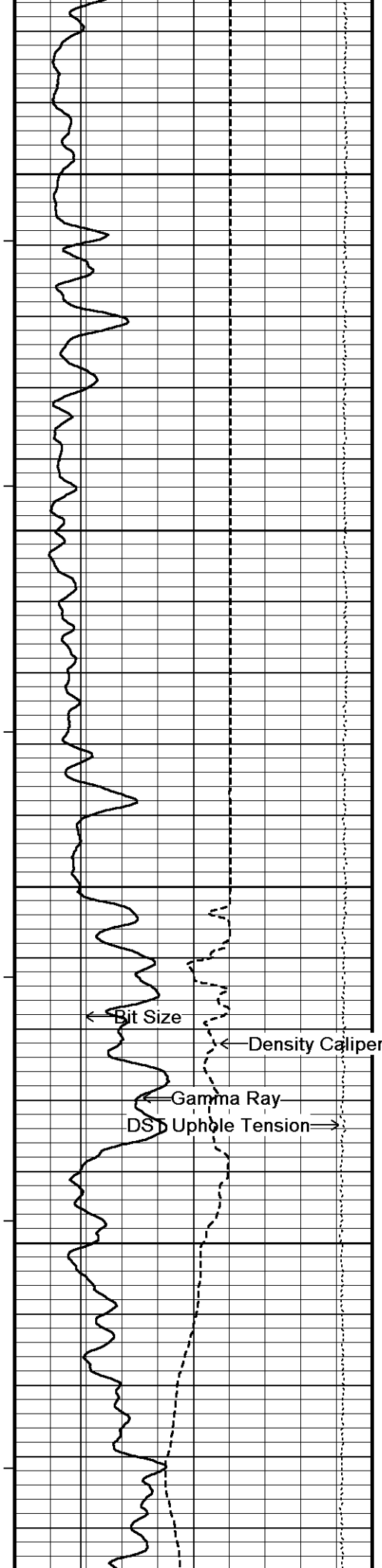
1500

1550

1600

1650





1700

1750

1800

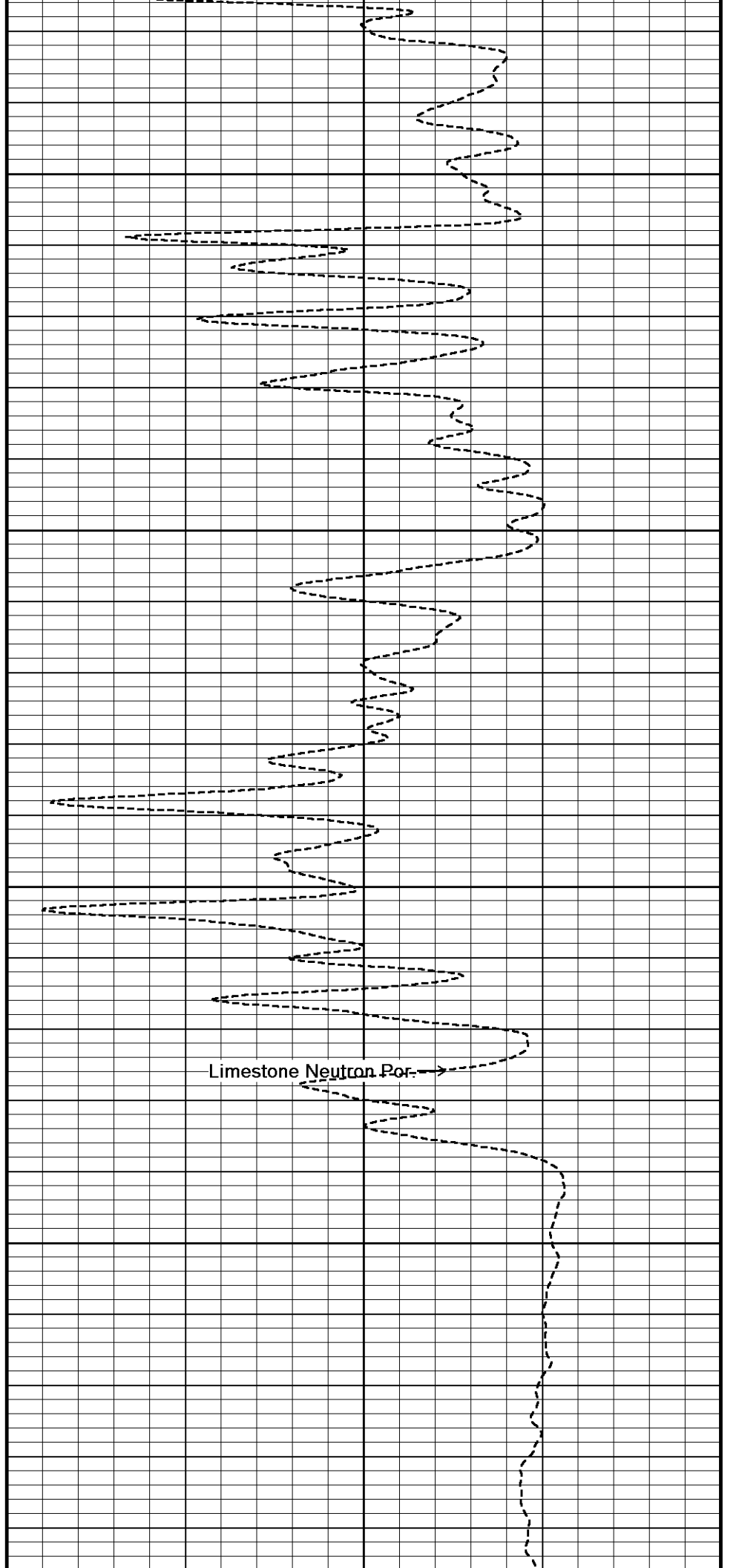
1850

← Bit Size

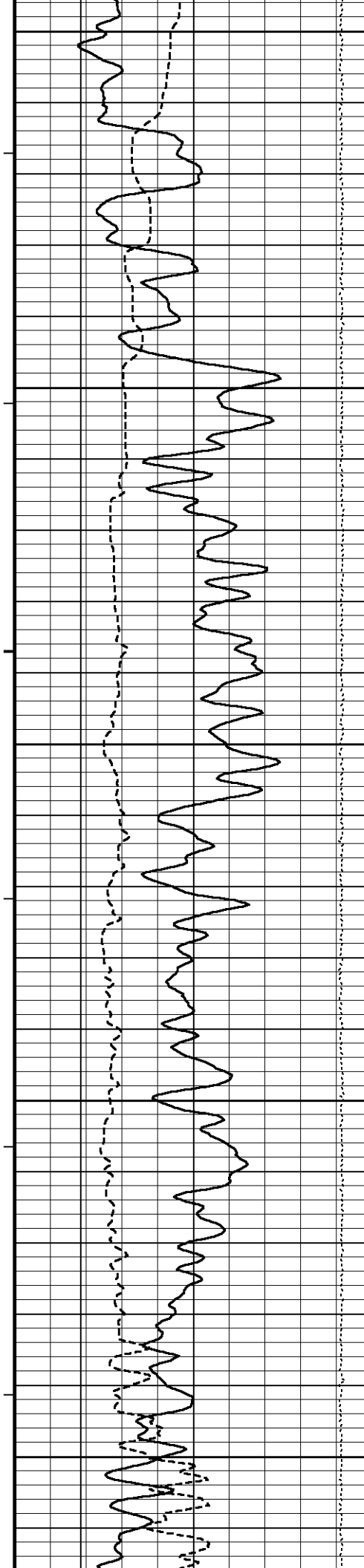
← Density Caliper

← Gamma Ray

DST Uphole Tension →



Limestone Neutron Por. →



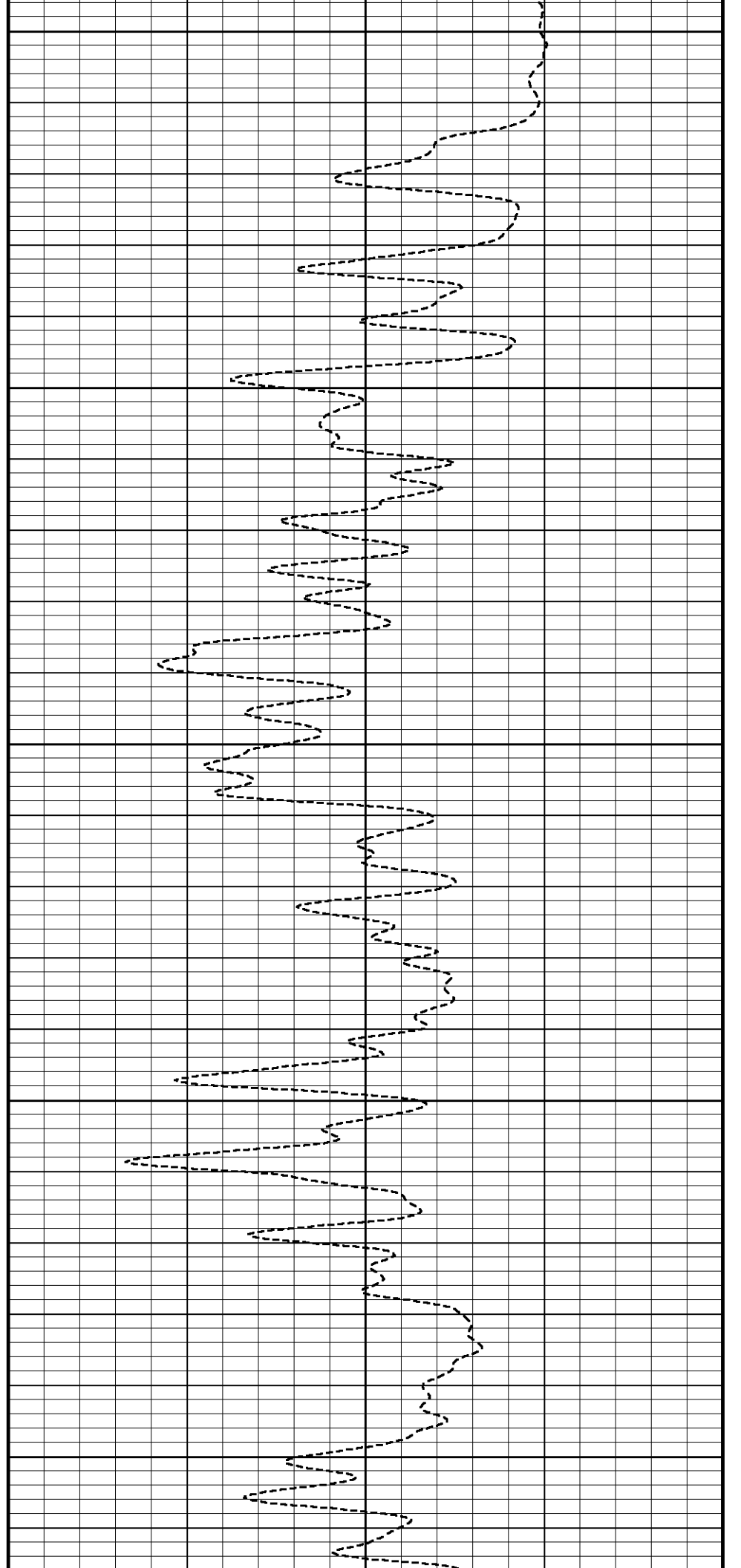
1900

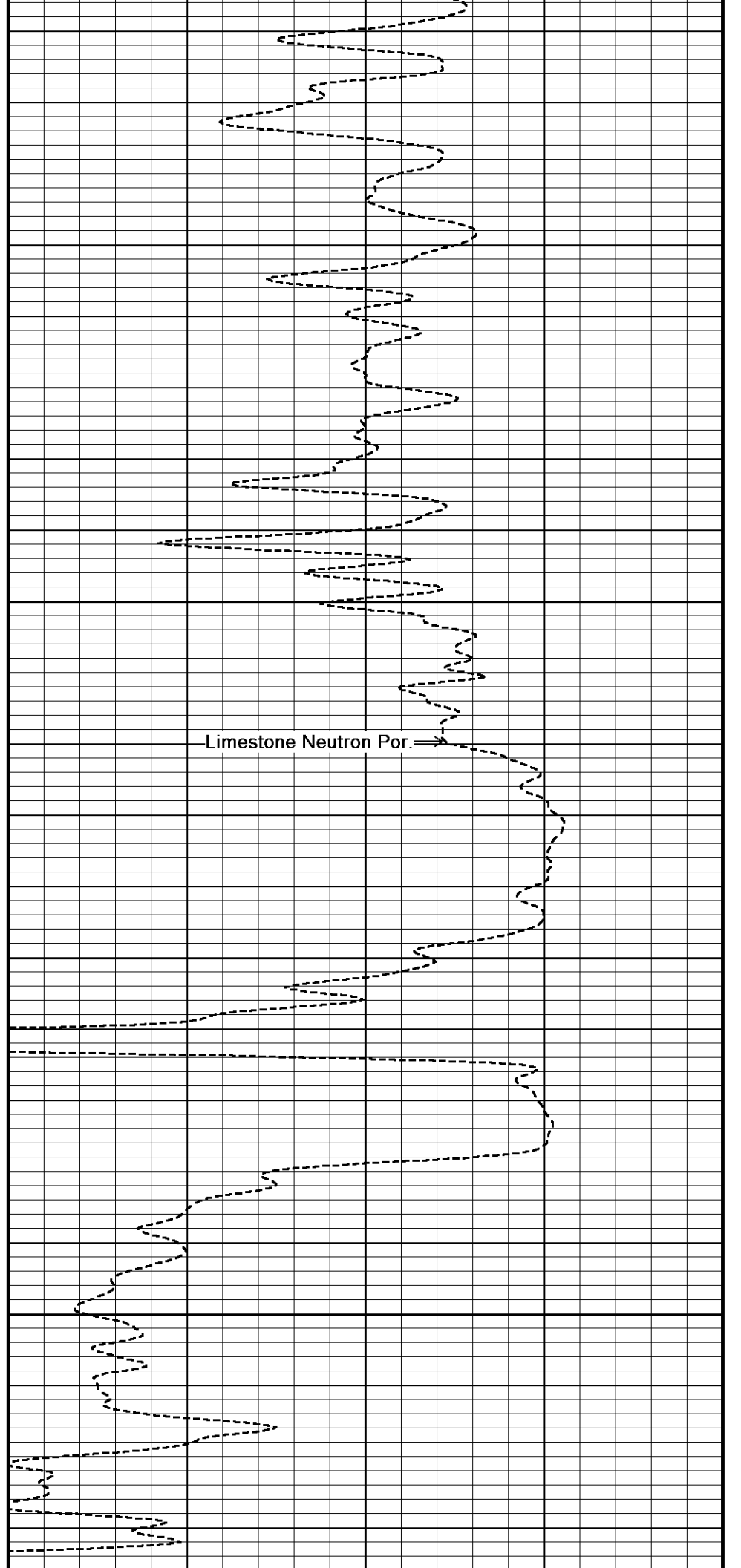
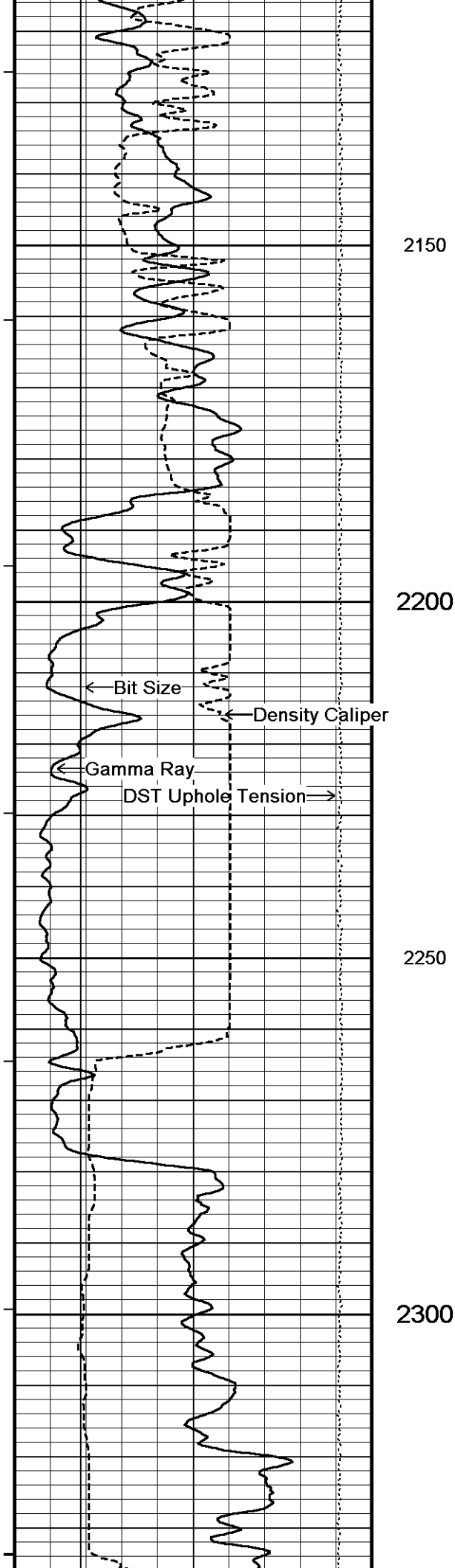
1950

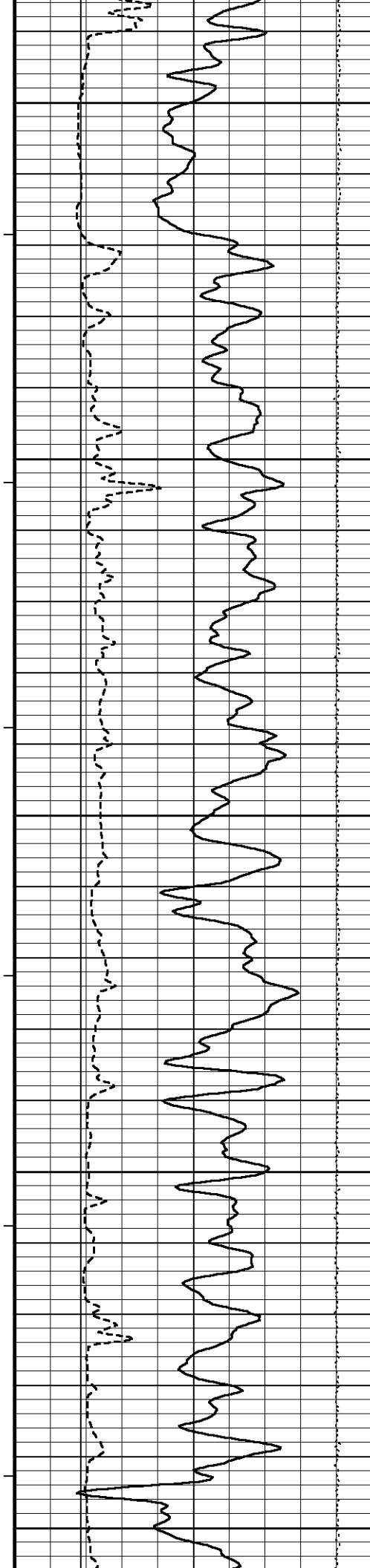
2000

2050

2100







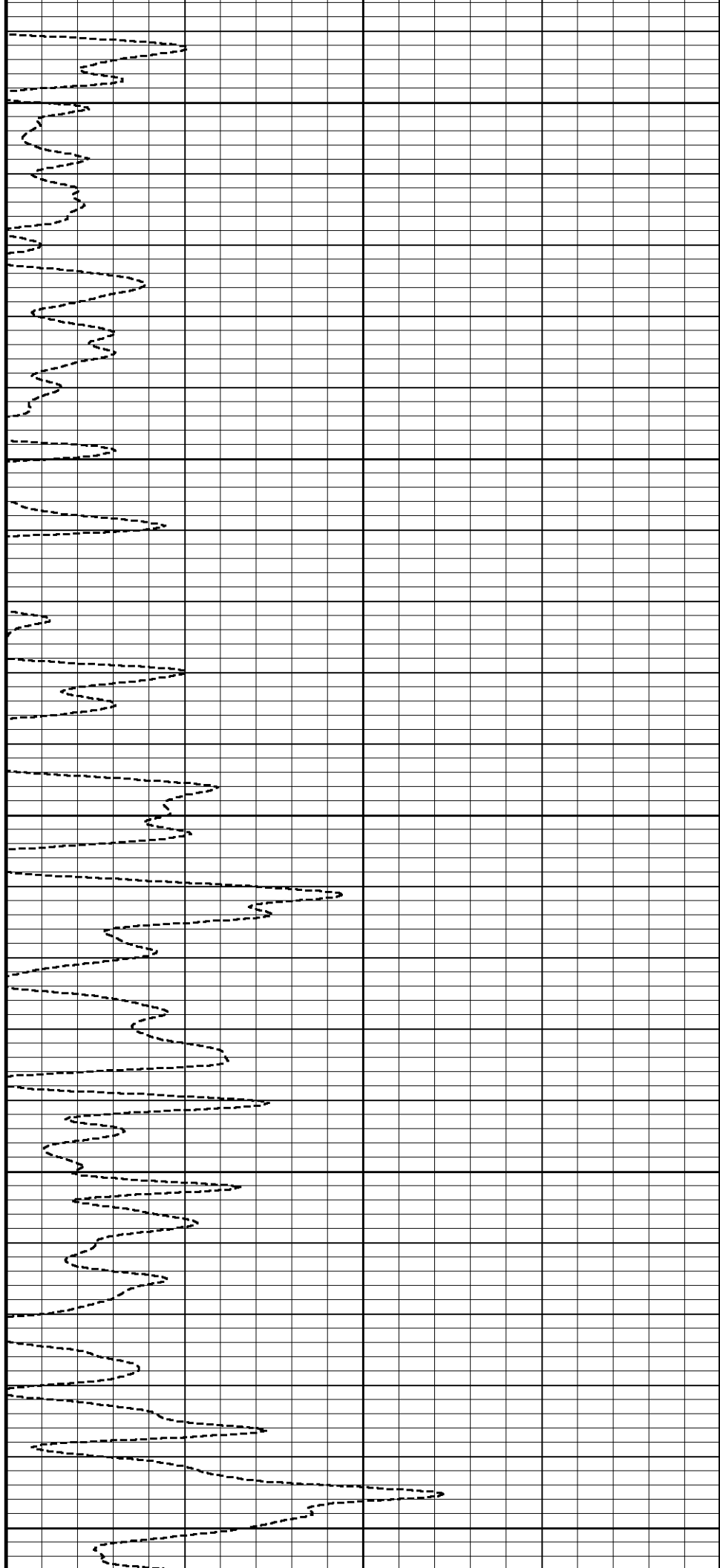
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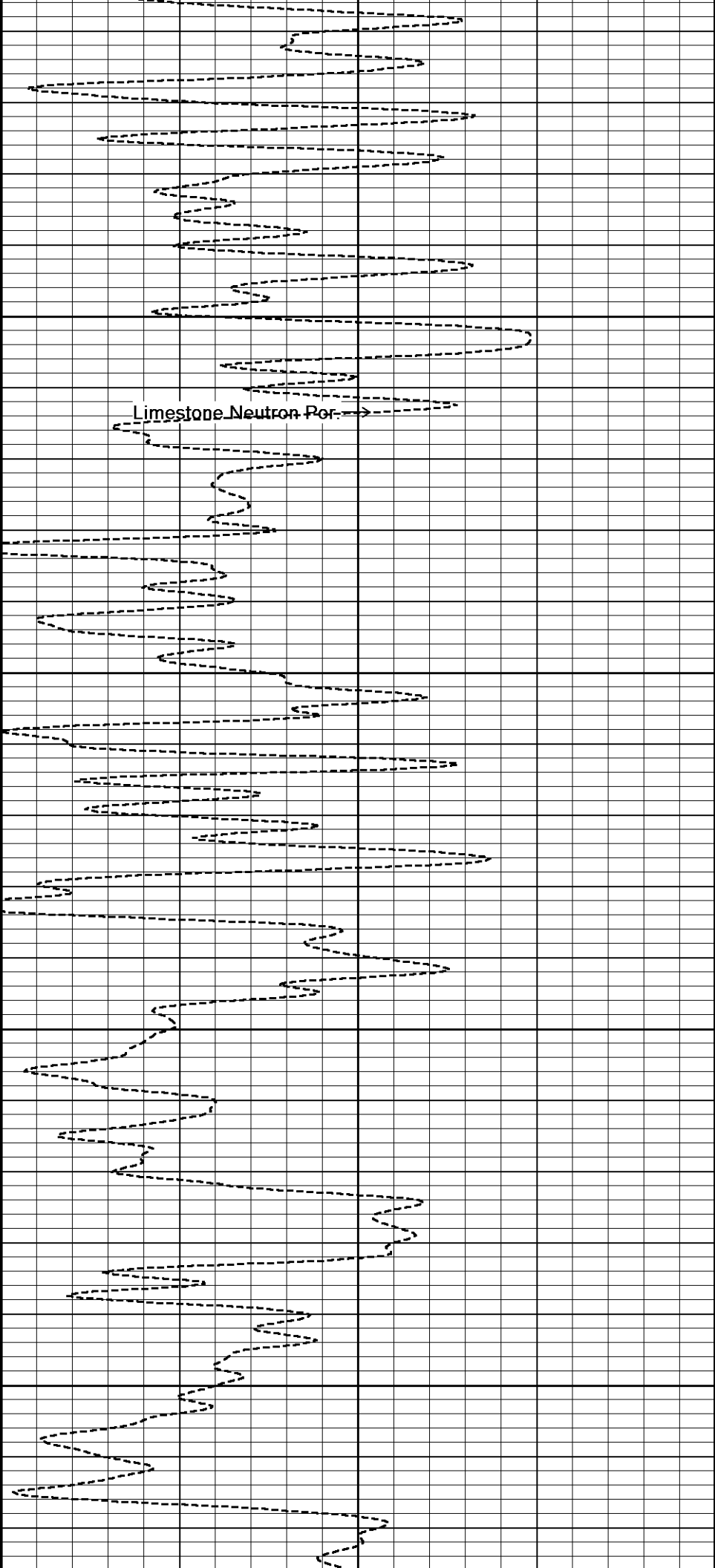
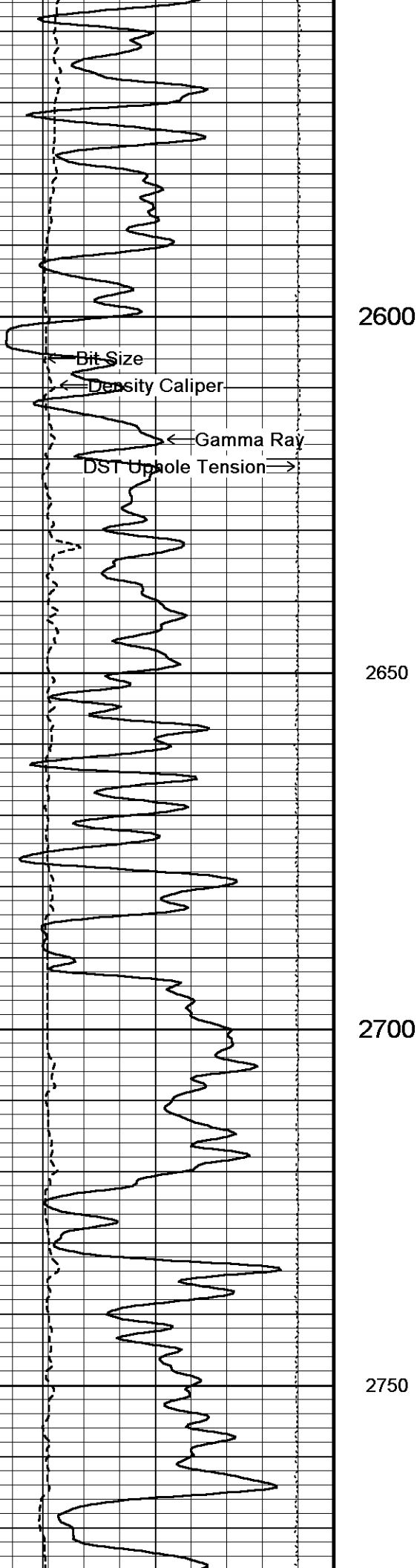
2400

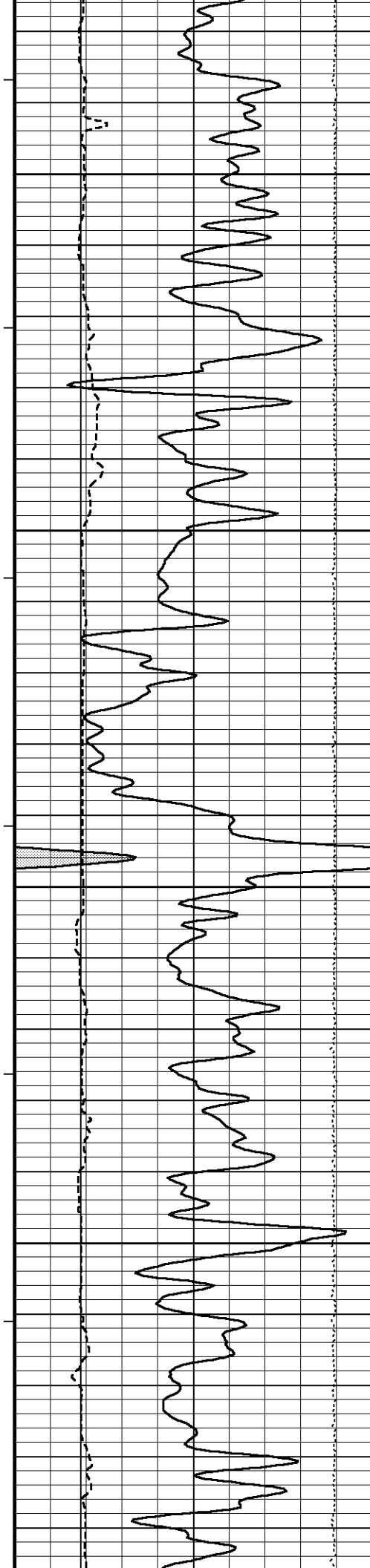
2450

2500

2550





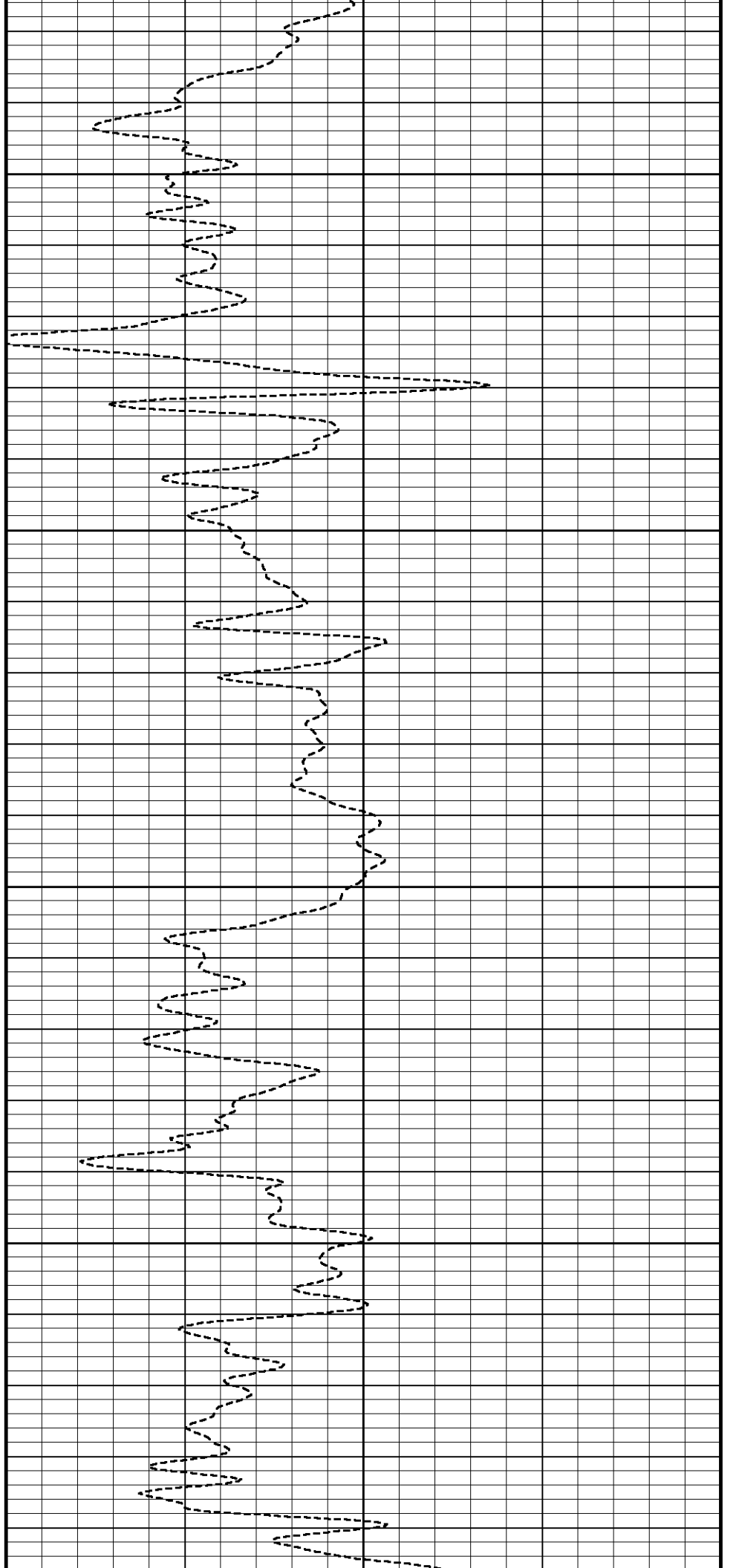


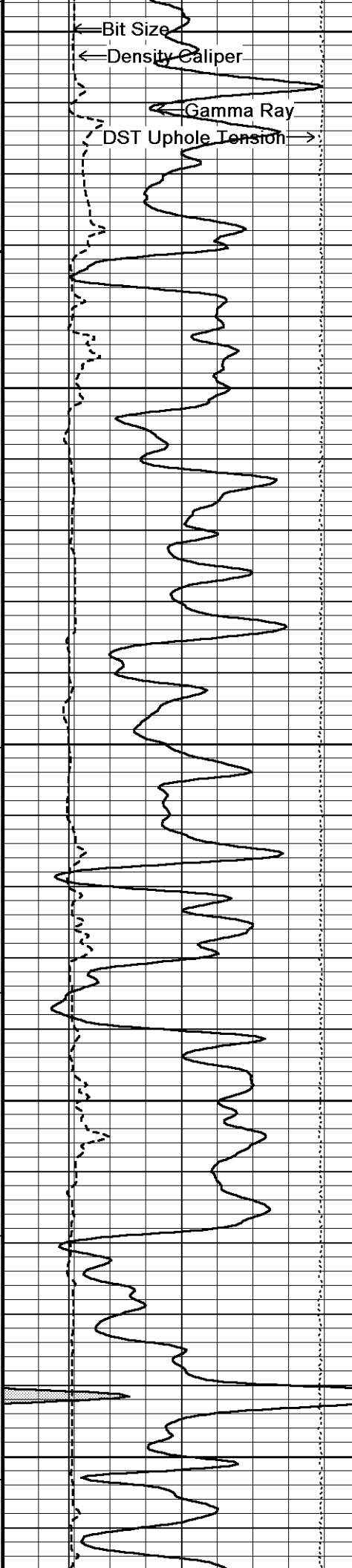
2800

2850

2900

2950





3000

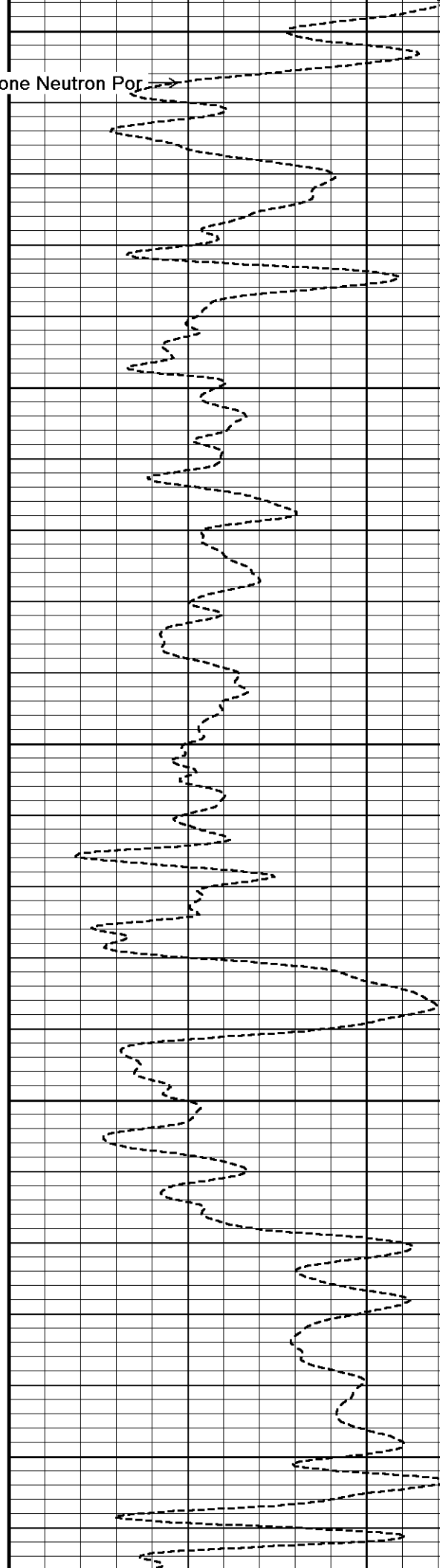
Limestone Neutron Por

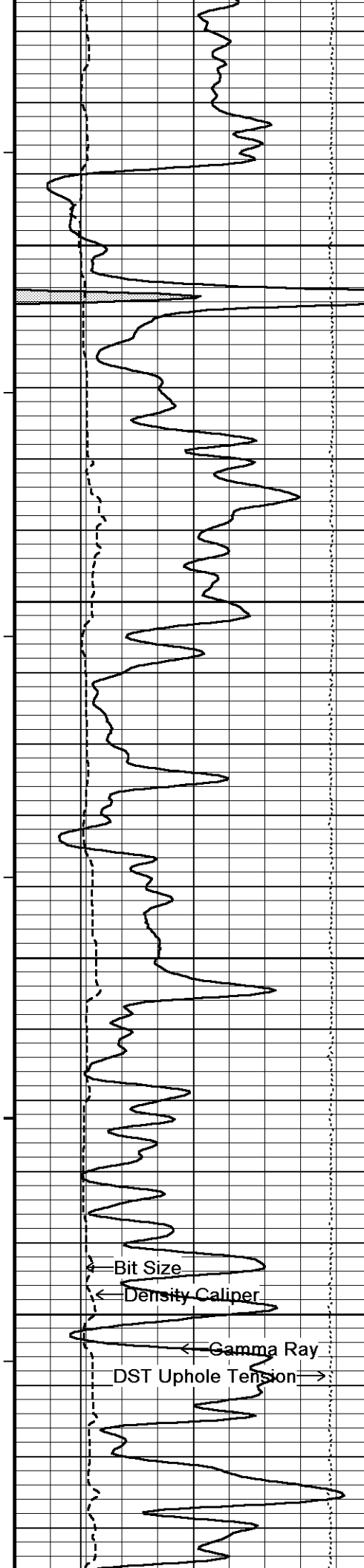
3050

3100

3150

3200





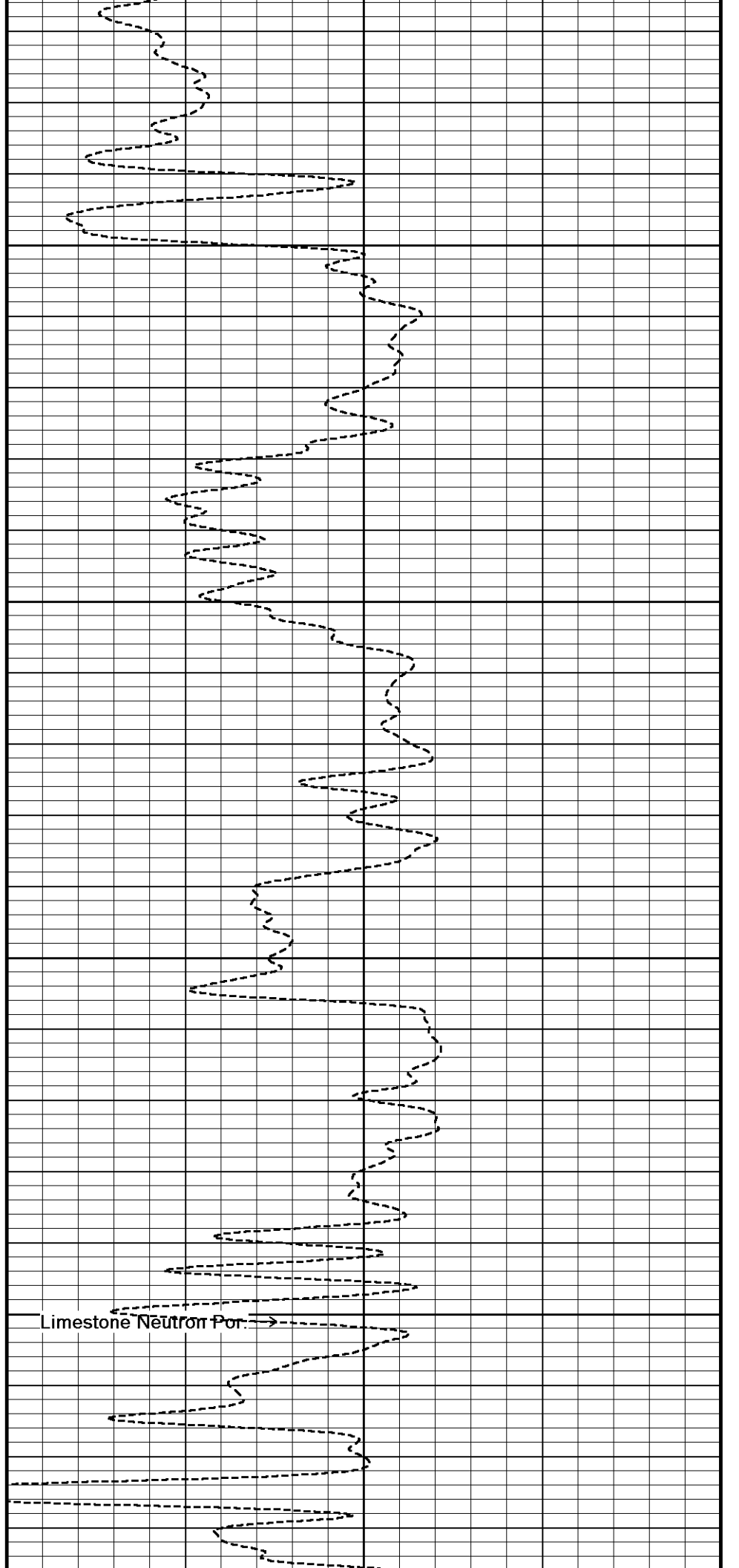
3250

3300

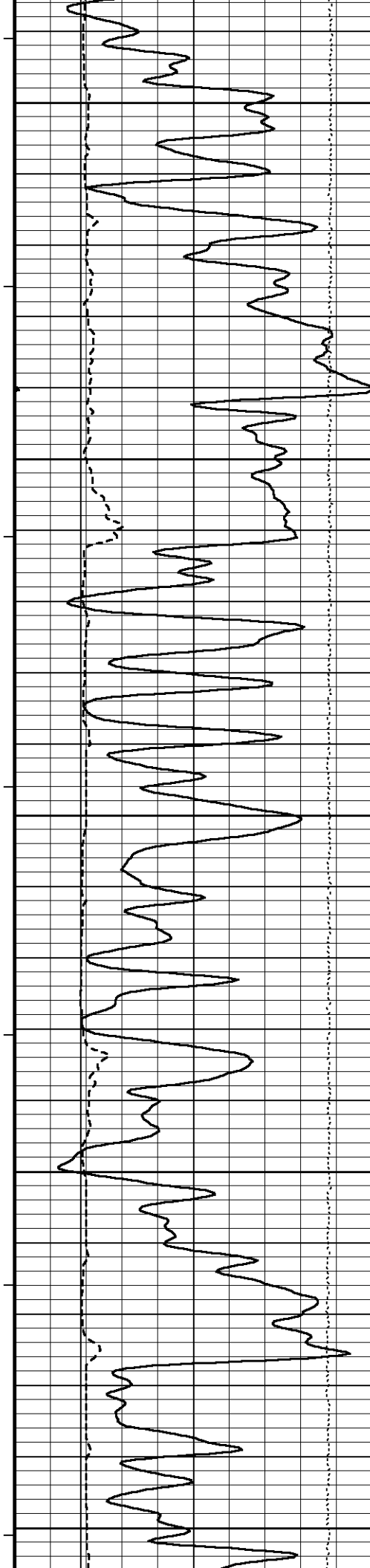
3350

3400

Bit Size
Density Caliper
Gamma Ray
DST Uphole Tension



Limestone Neutron Por.



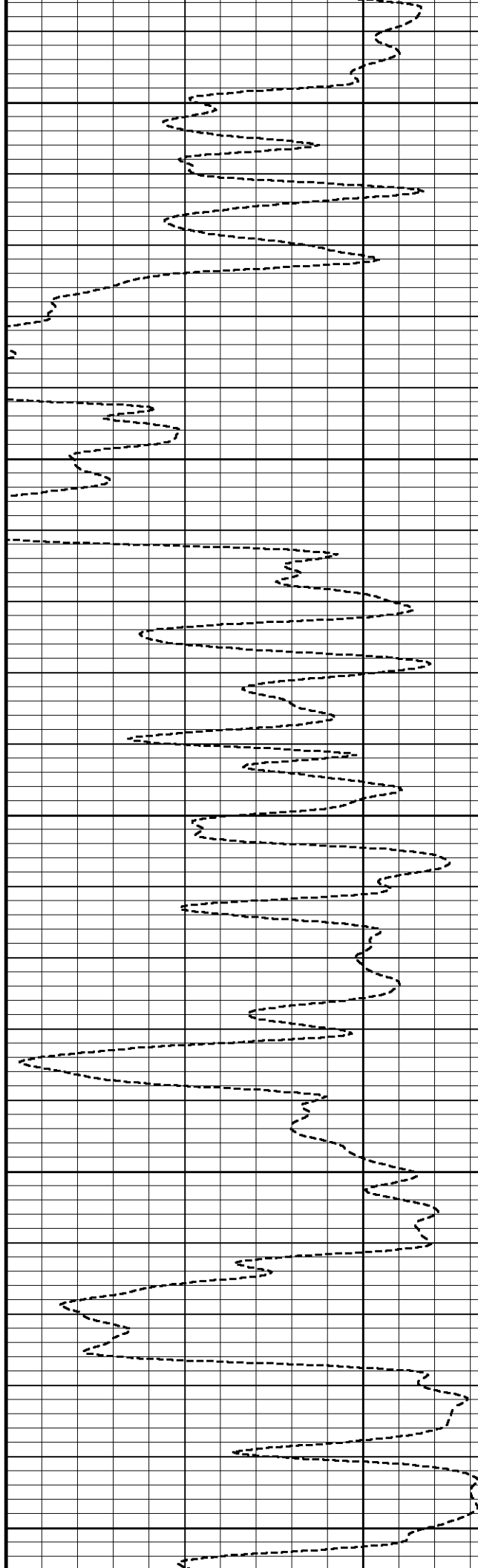
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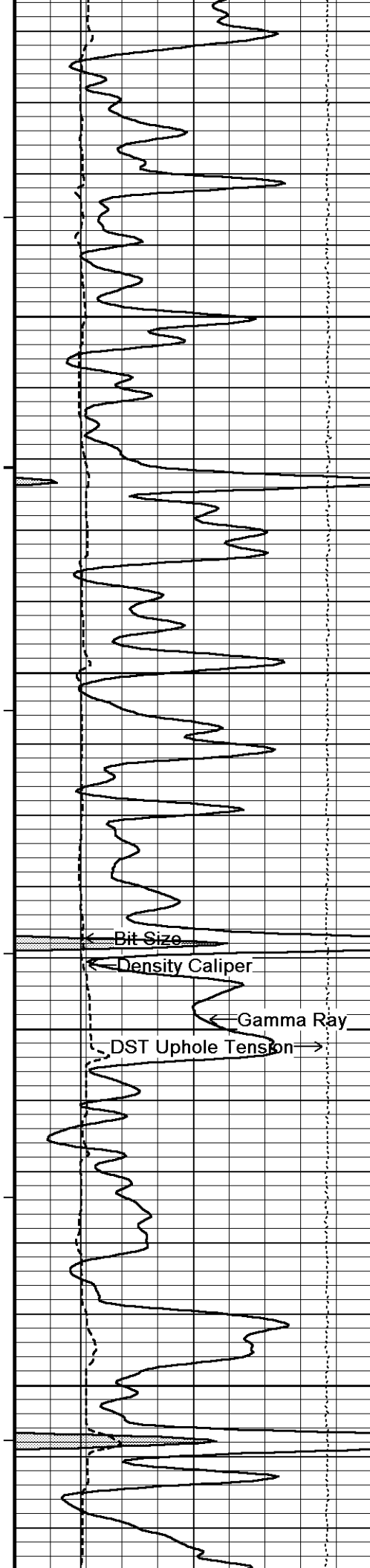
3500

3550

3600

3650



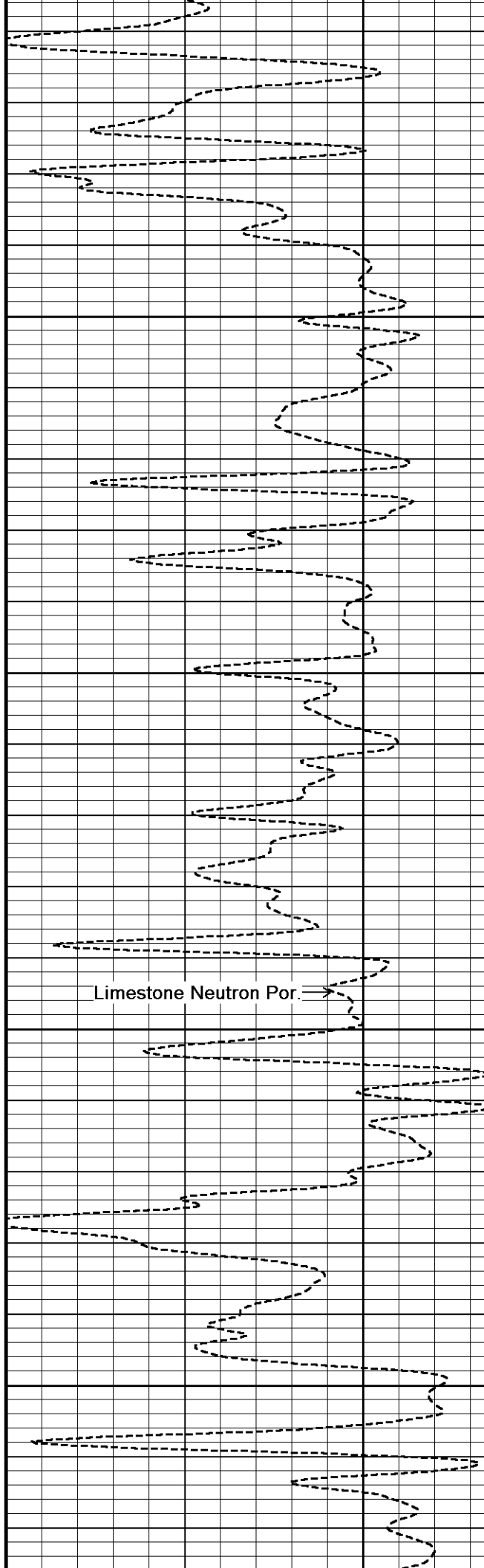


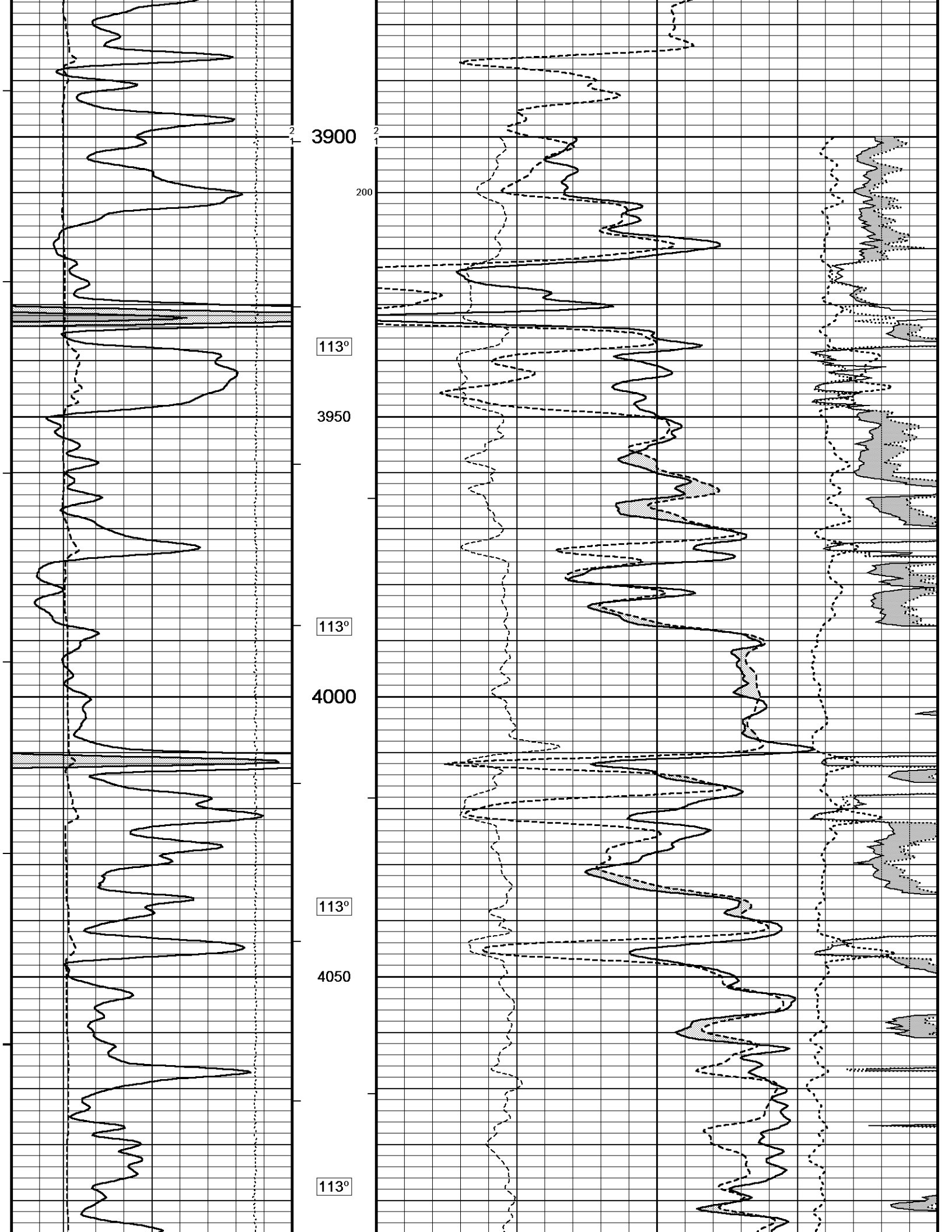
3700

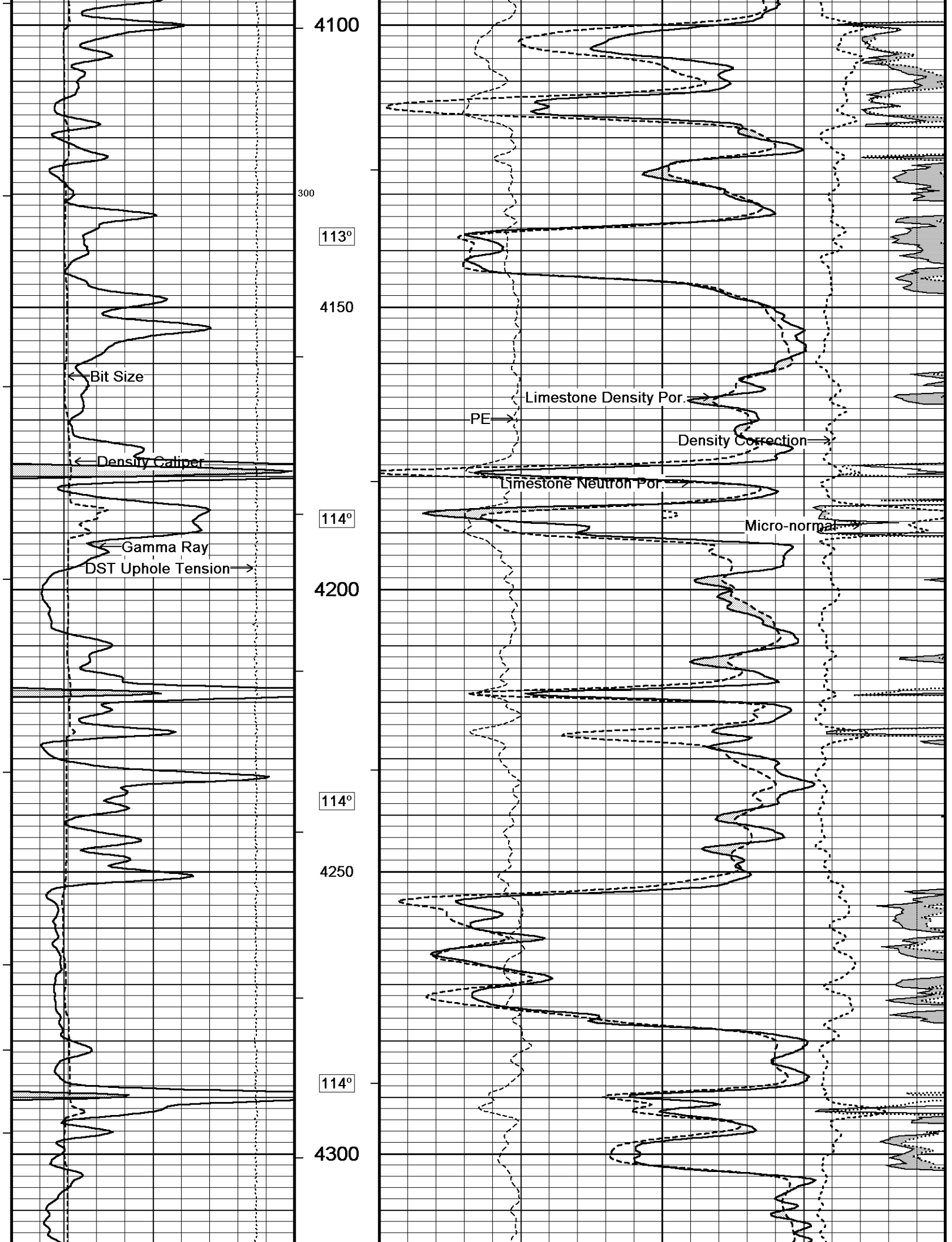
3750

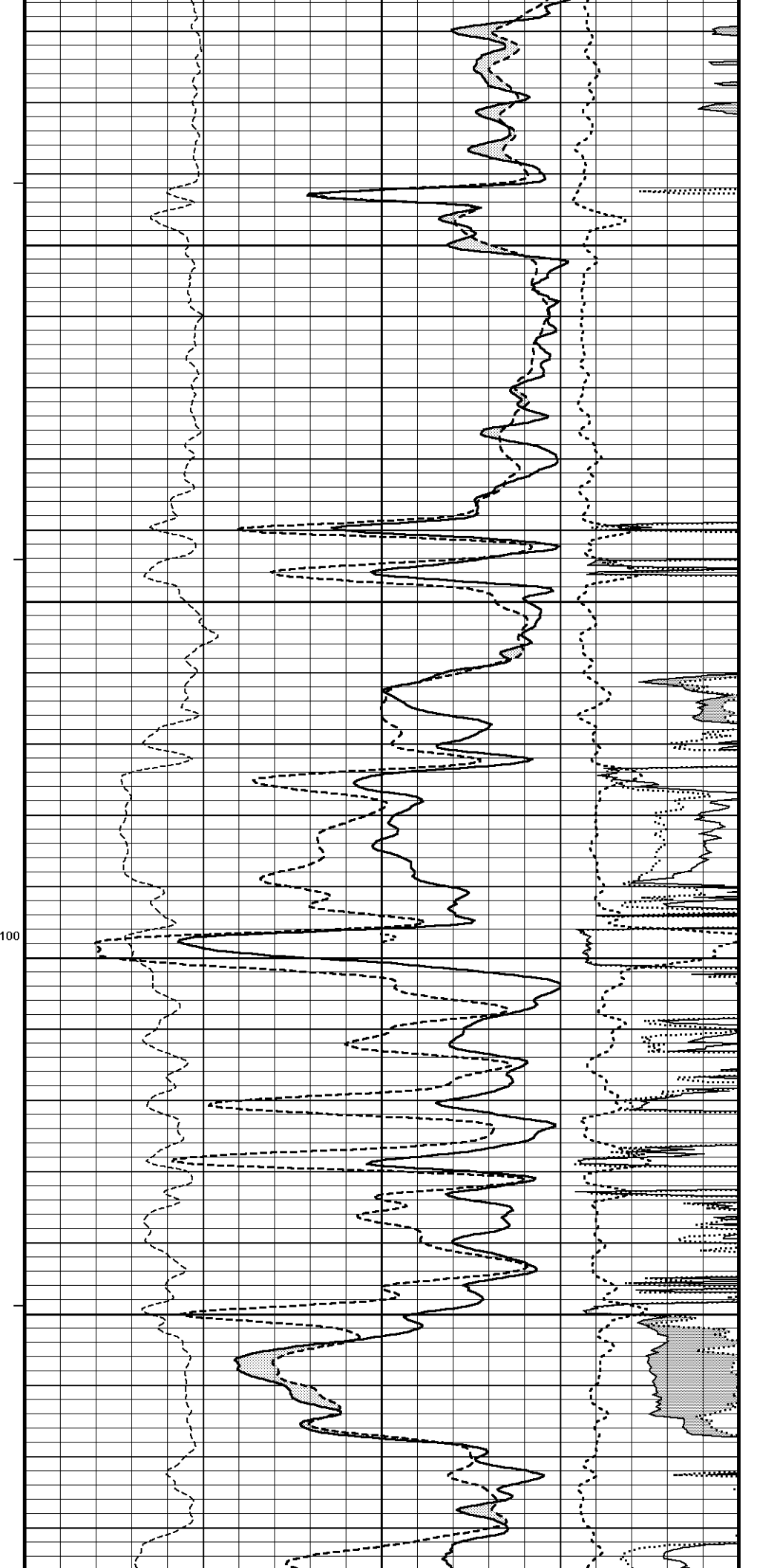
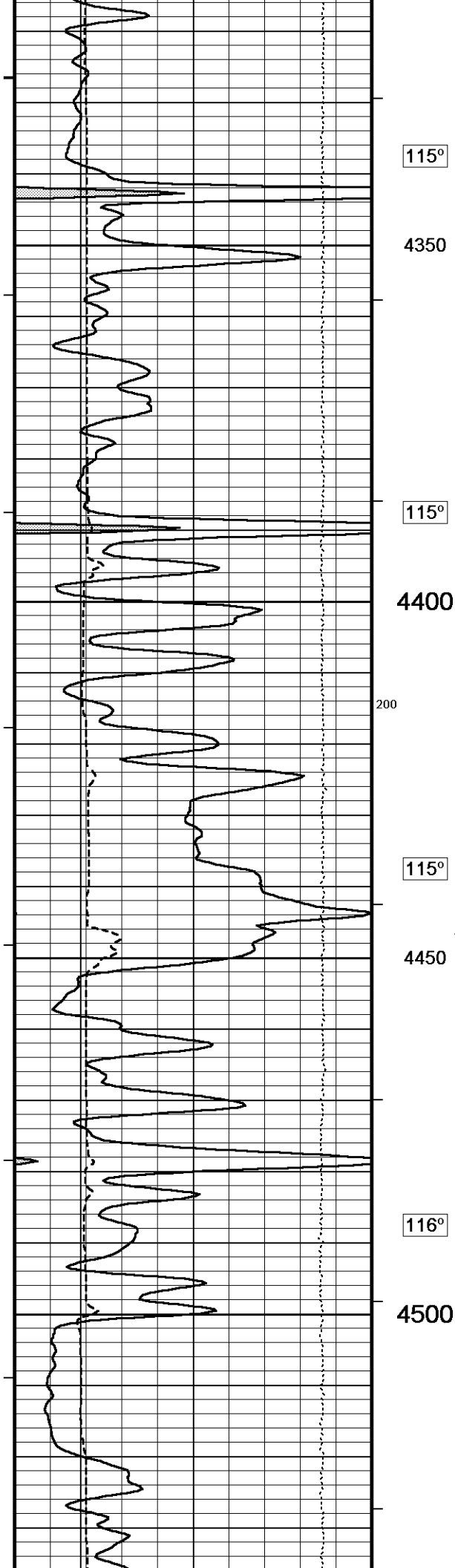
3800

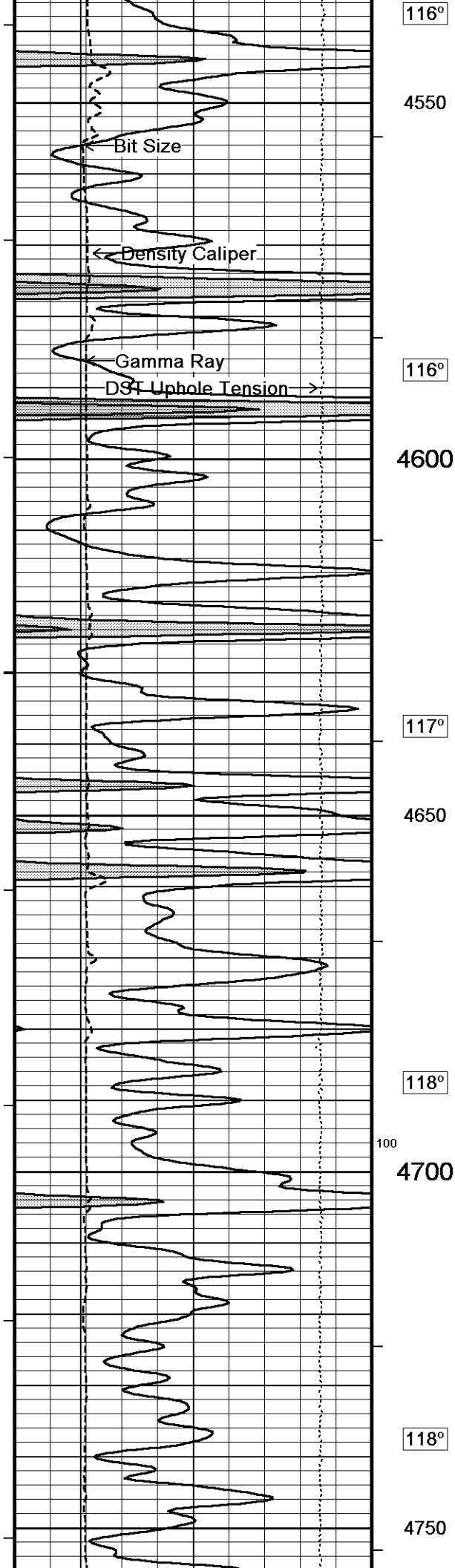
3850











116°

4550

116°

4600

117°

4650

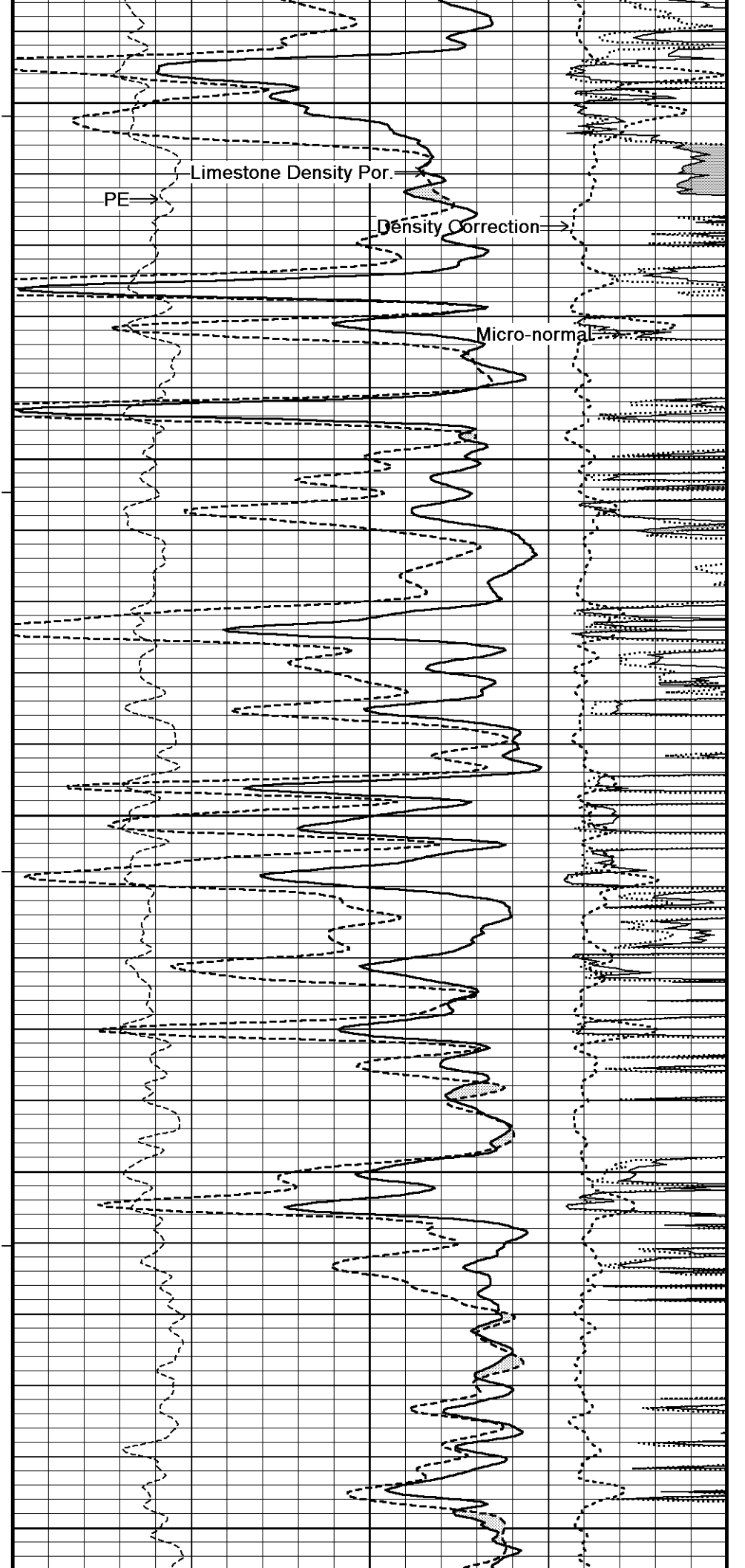
118°

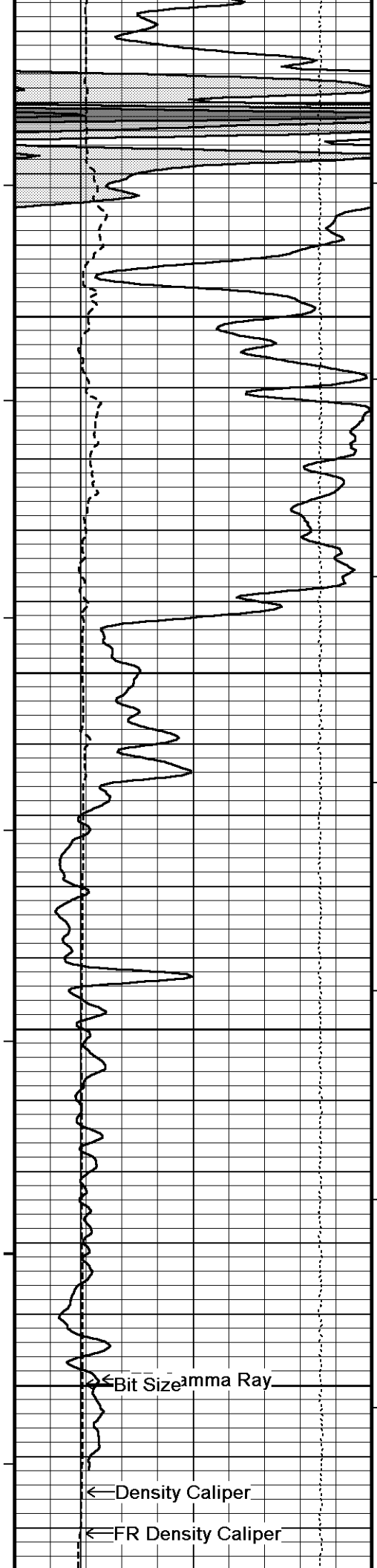
4700

118°

4750

100





119°

4800

120°

4850

121°

4900

121°

4950

PE →

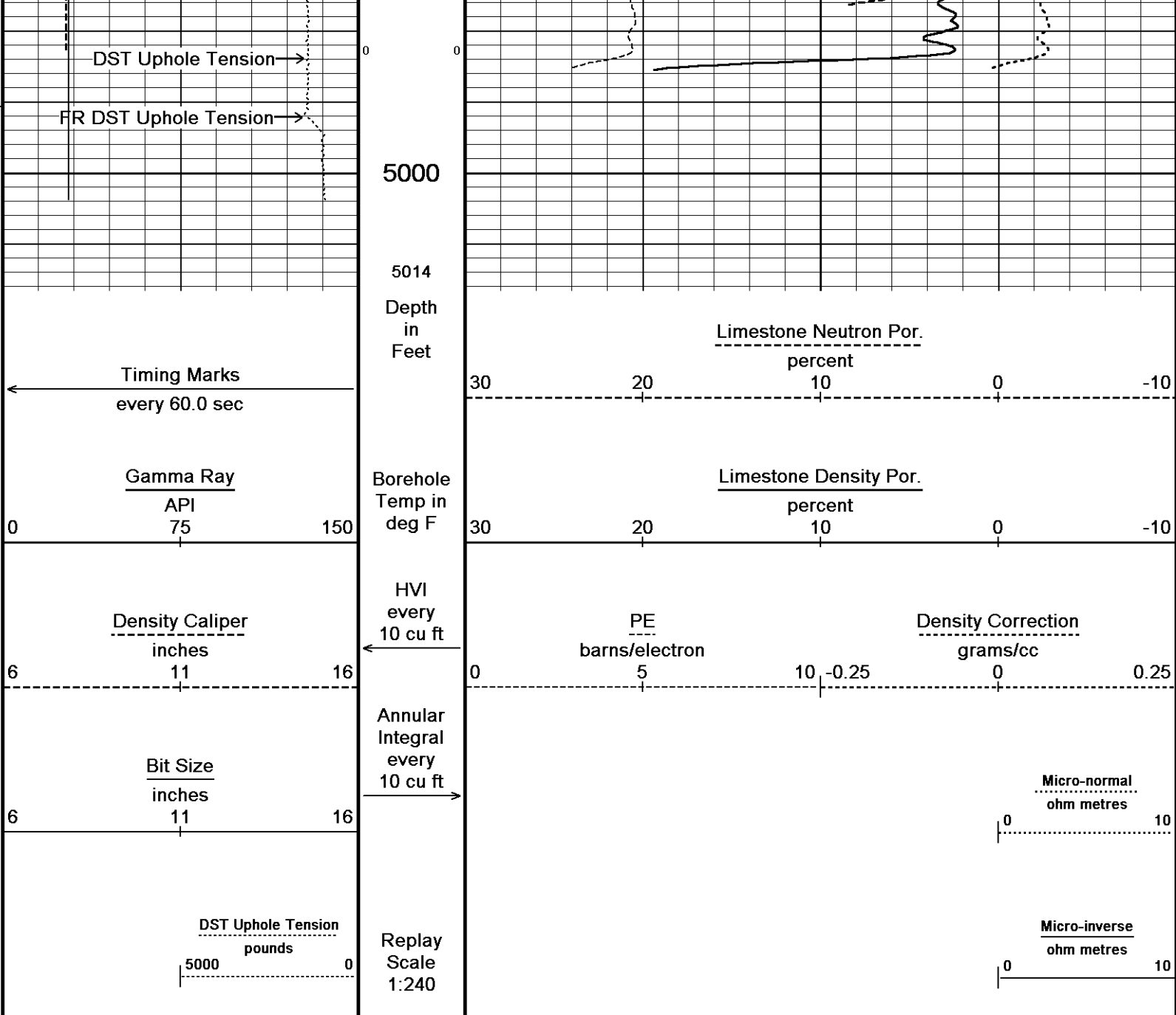
Limestone Density Por. →

Density Correction →
FR Limestone Neutron Por. →

Limestone Neutron Por. →

FR PE →

FR Limestone Density Por. →
FR Limestone Density Por. Correction →



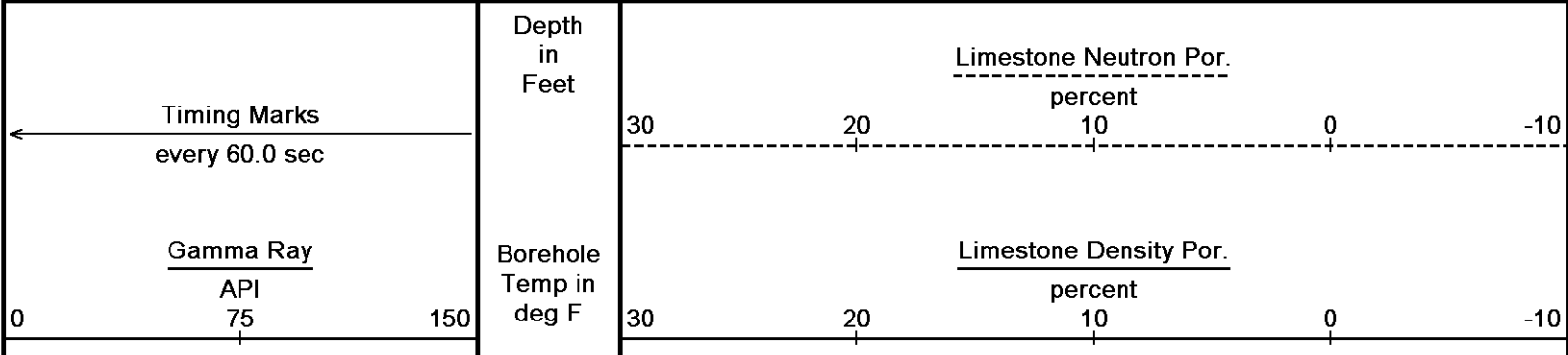
Depth Based Data - Maximum Sampling Increment 10.0cm
Filename: C:\Minimus 11_03_4044\Data\Comanche Re...Comanche Resources James # 31-1_004.dta
System Versions: Logged with 11.03.4044 Processed with 11.03.4044 Plotted with 11.03.4044

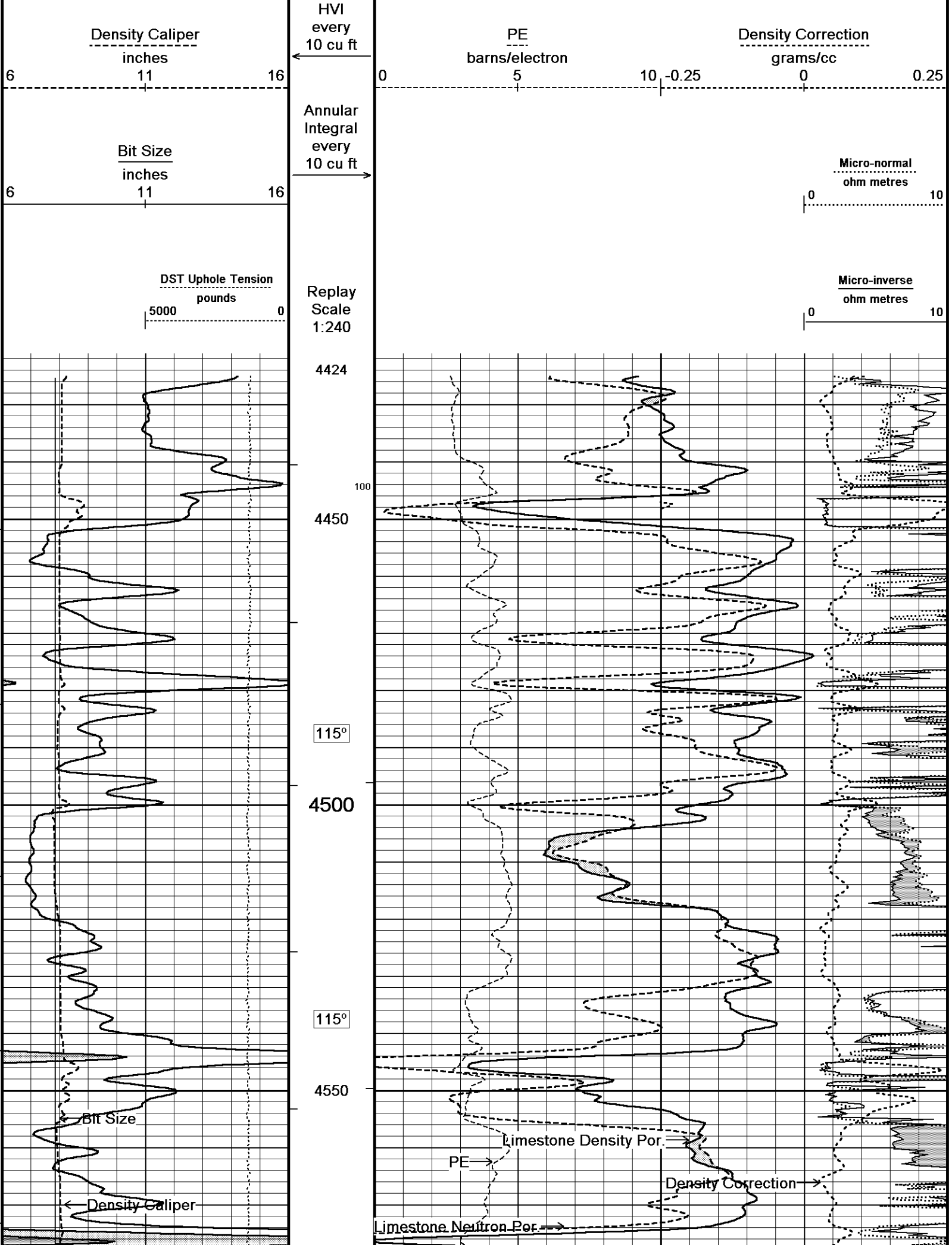
Plotted on 23-MAY-2012 02:14
Recorded on 22-MAY-2012 23:07

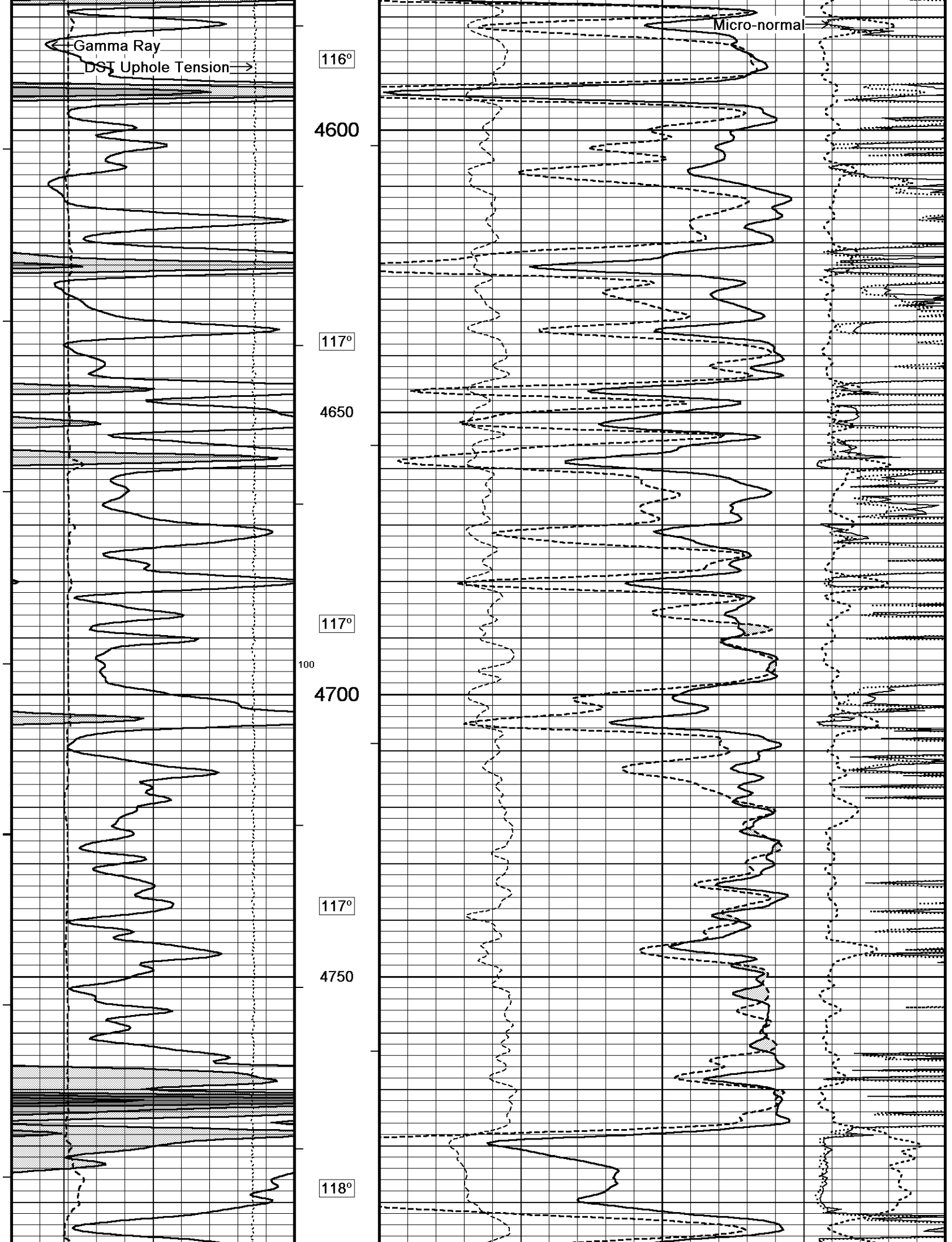
5 INCH MAIN

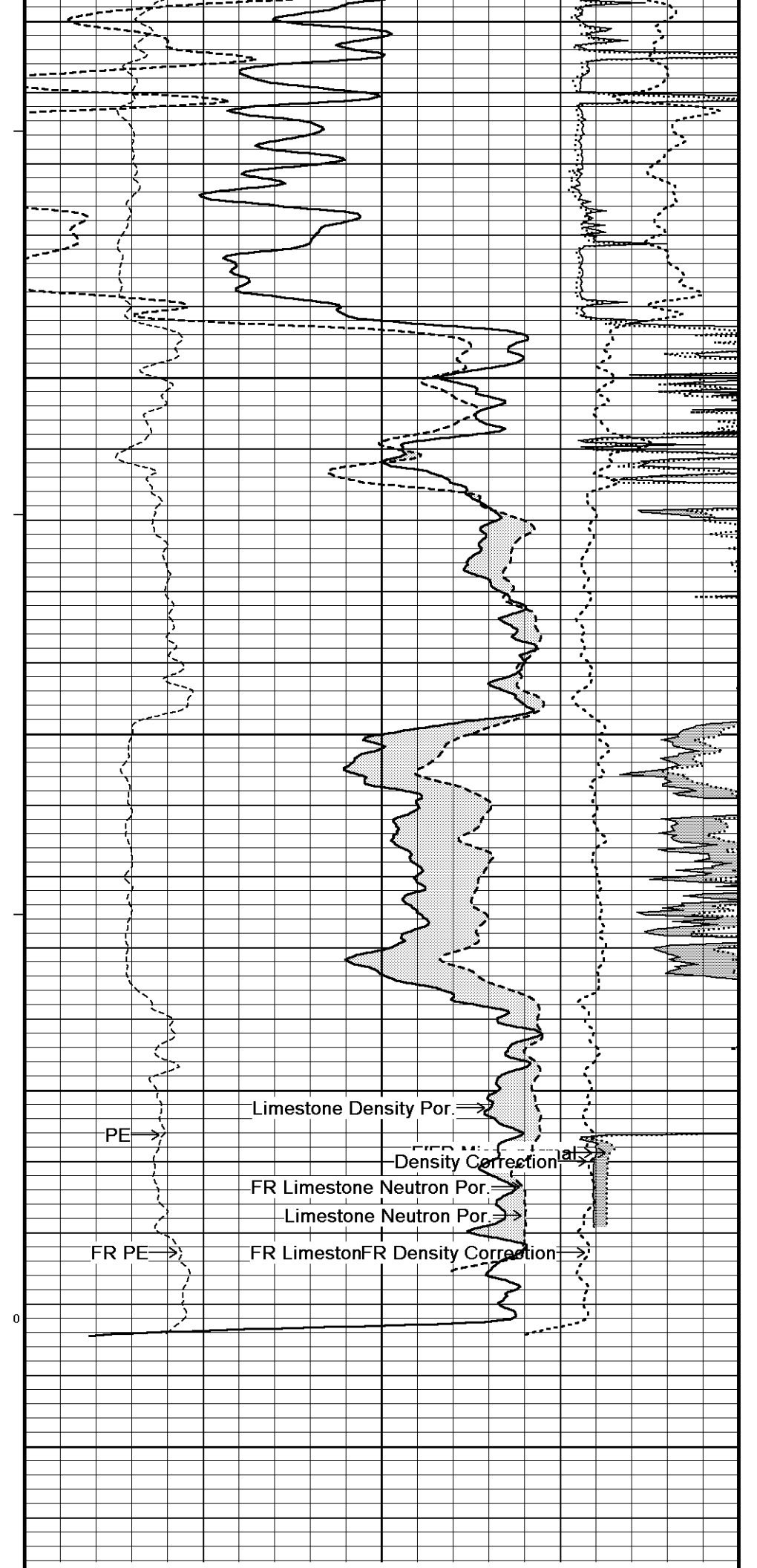
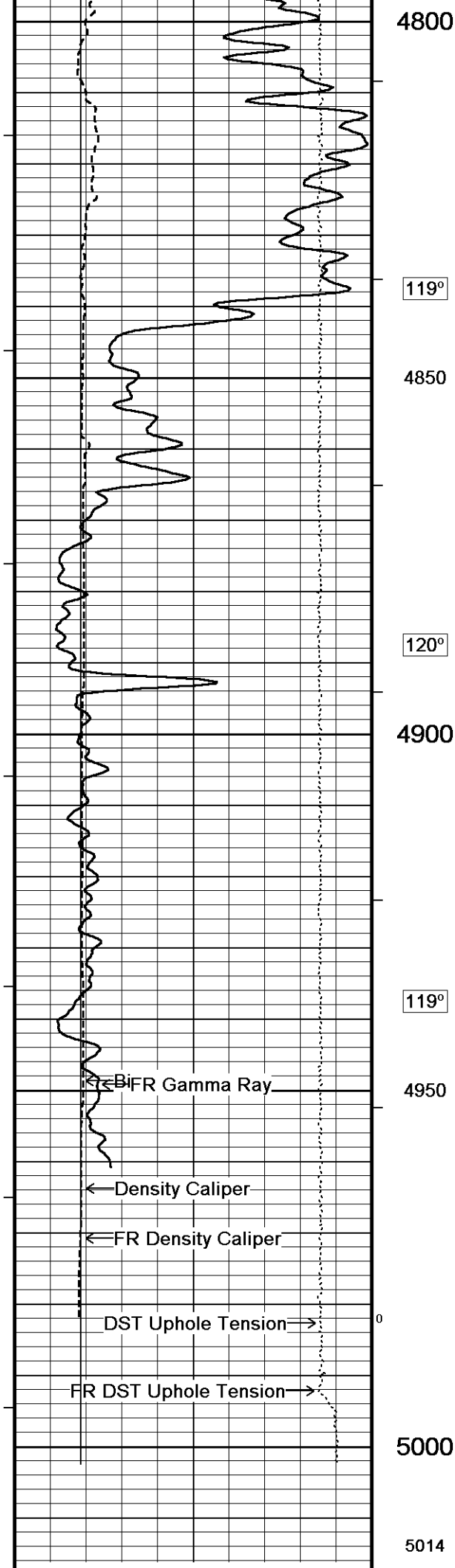
REPEAT SECTION

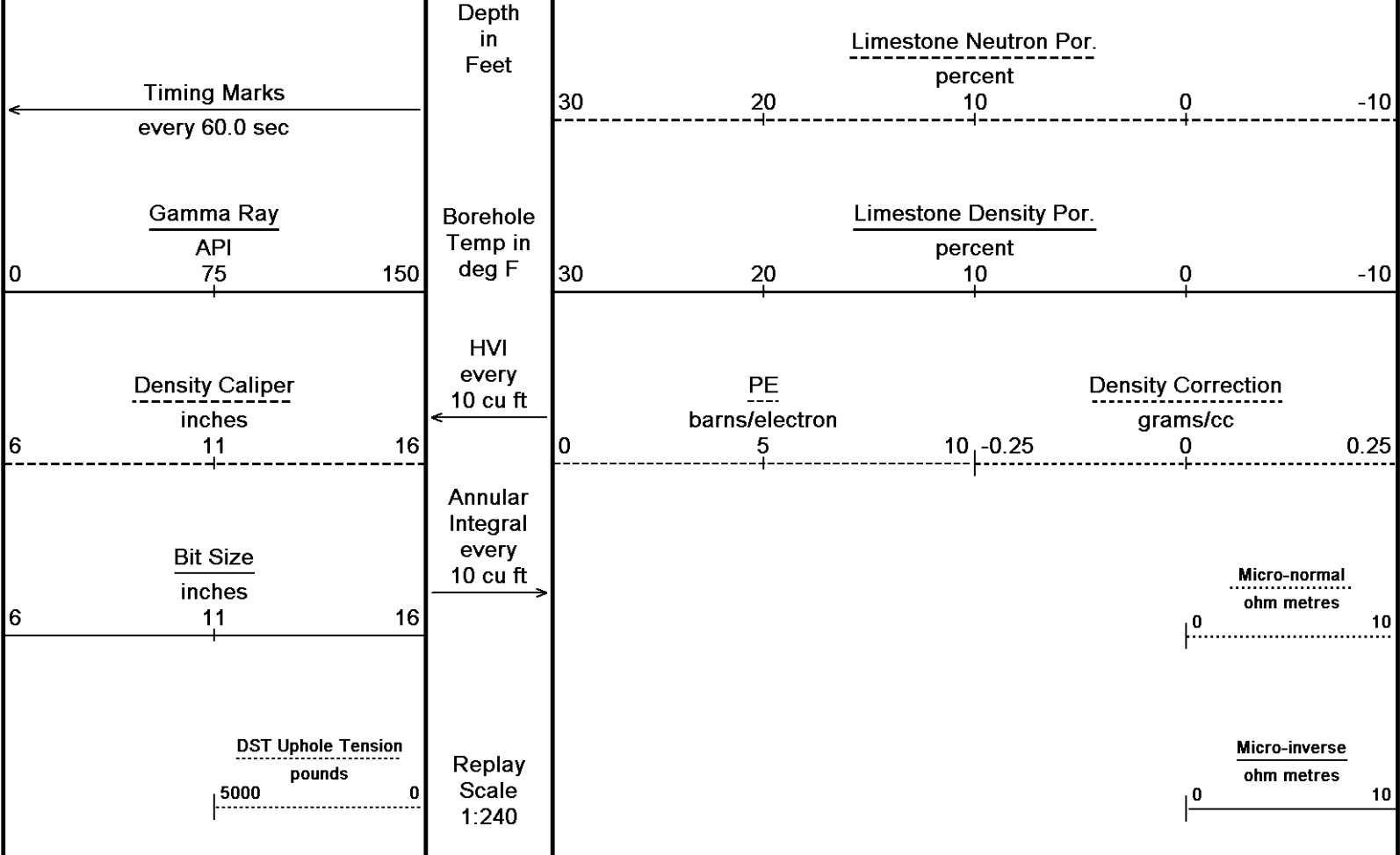
Depth Based Data - Maximum Sampling Increment 10.0cm
Filename: C:\Minimus 11_03_4044\Data\Comanche Re...Comanche Resources James # 31-1_003.dta
System Versions: Logged with 11.03.4044 Processed with 11.03.4044 Plotted with 11.03.4044









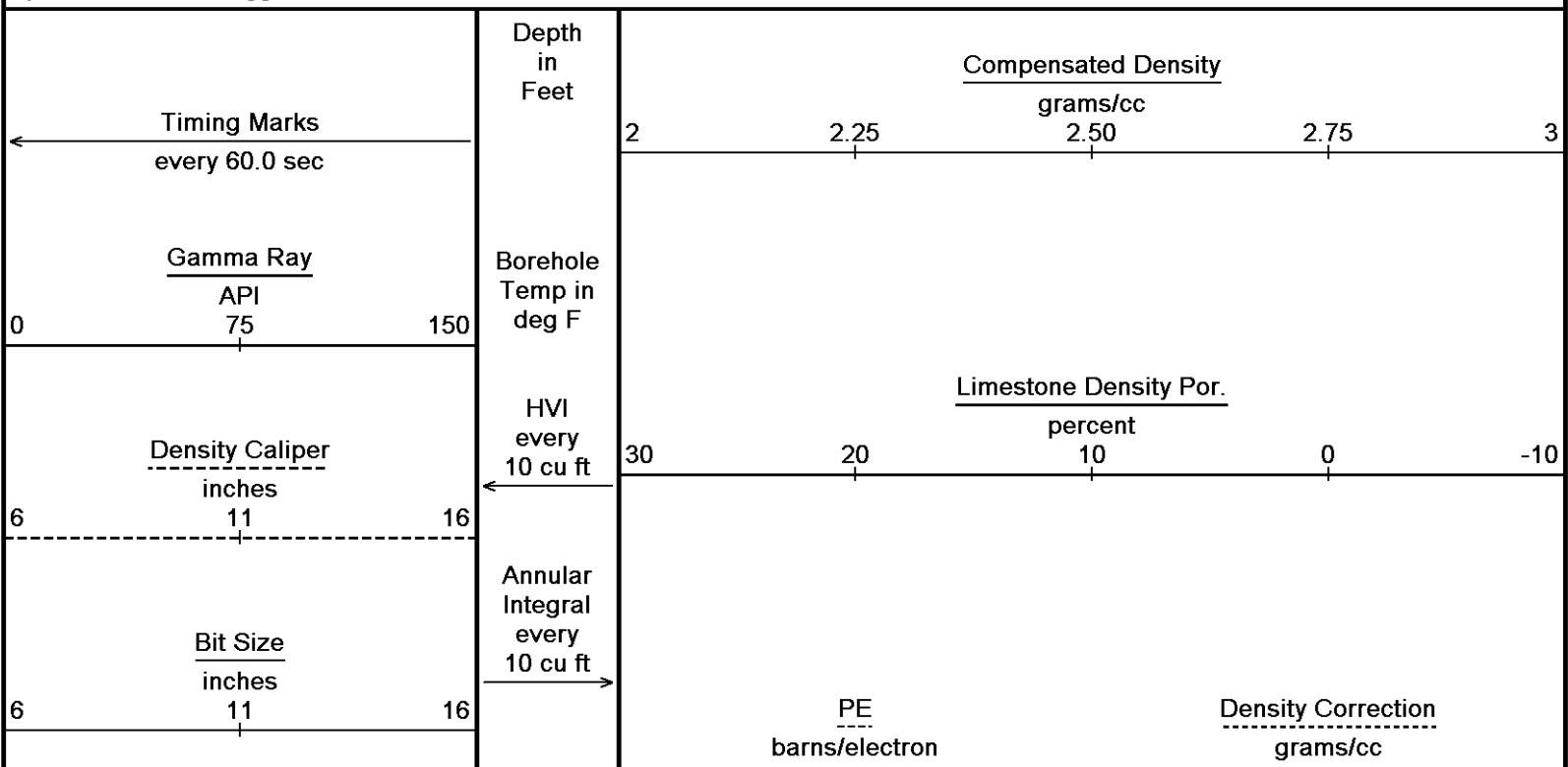


Depth Based Data - Maximum Sampling Increment 10.0cm Plotted on 23-MAY-2012 02:14
 Filename: C:\Minimus 11_03_4044\Data\Comanche Re...Comanche Resources James # 31-1_003.dta Recorded on 22-MAY-2012 22:29
 System Versions: Logged with 11.03.4044 Processed with 11.03.4044 Plotted with 11.03.4044

↑ REPEAT SECTION ↑

↓ 5 INCH MAIN ↓

Depth Based Data - Maximum Sampling Increment 10.0cm Plotted on 23-MAY-2012 02:14
 Filename: C:\Minimus 11_03_4044\Data\Comanche Re...Comanche Resources James # 31-1_004.dta Recorded on 22-MAY-2012 23:07
 System Versions: Logged with 11.03.4044 Processed with 11.03.4044 Plotted with 11.03.4044



DST Uphole Tension
pounds
5000 0

Replay
Scale
1:240

3900

200

113°

3950

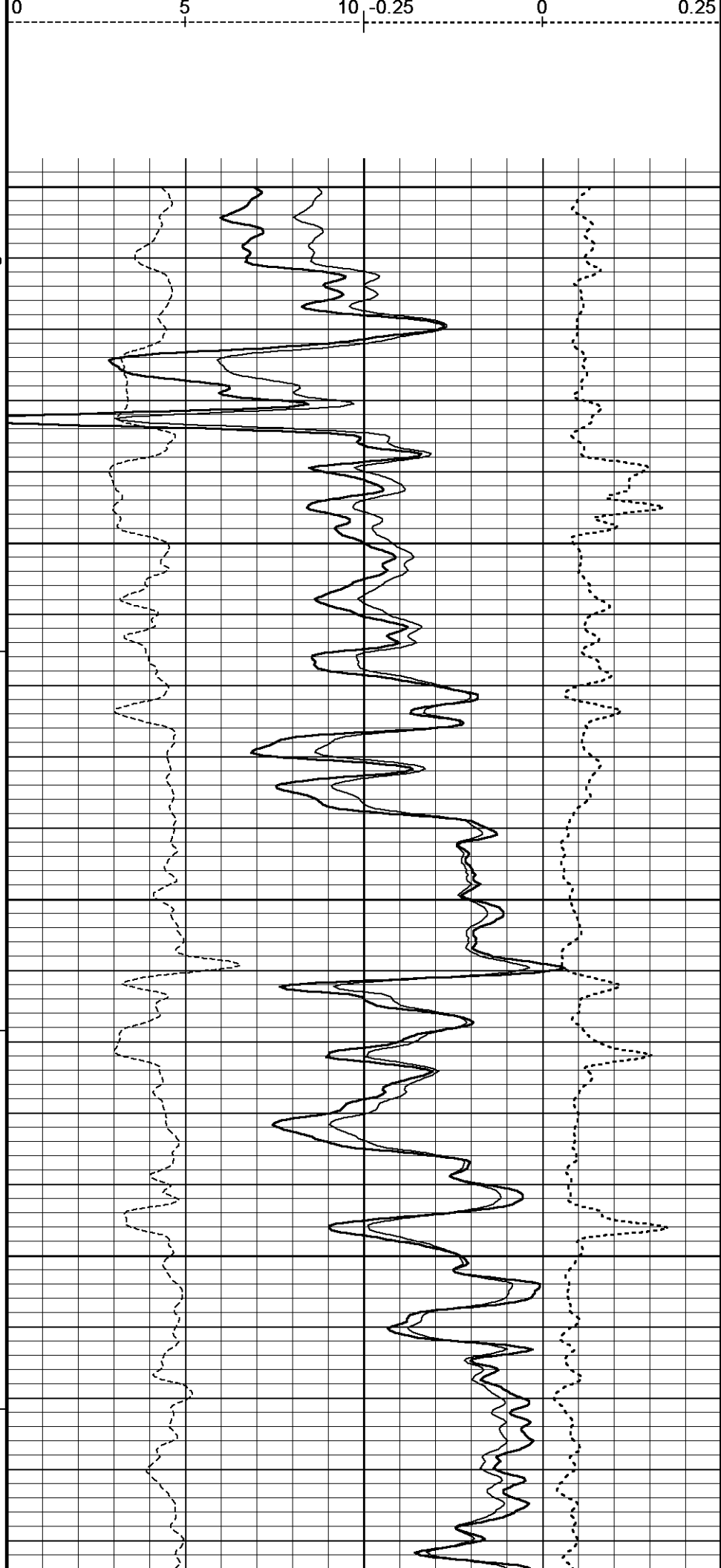
113°

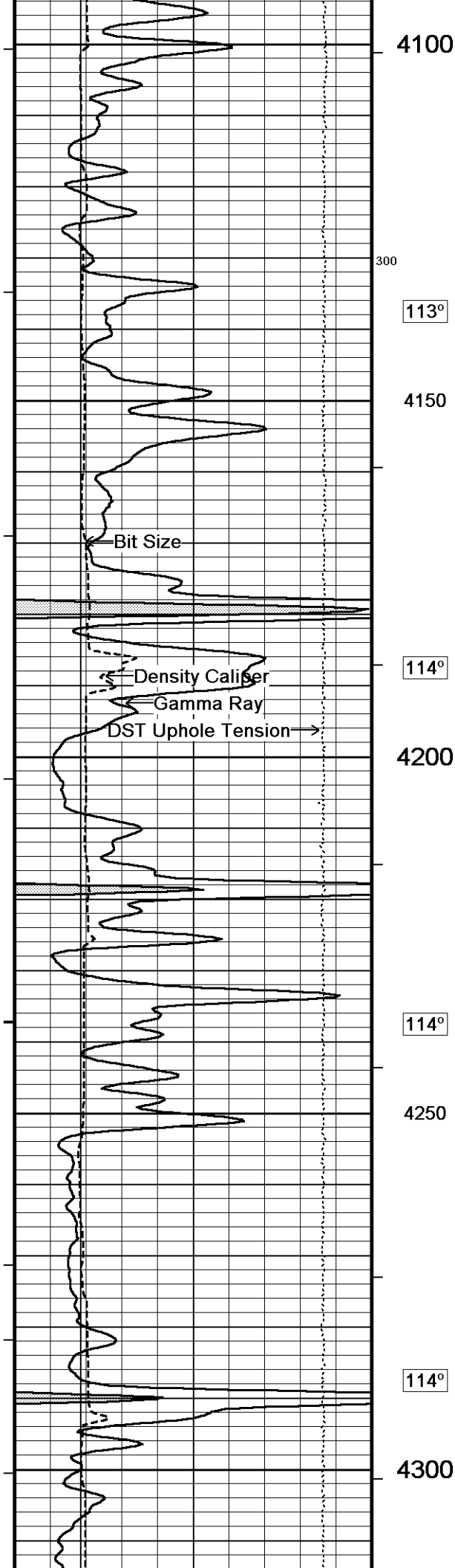
4000

113°

4050

113°





4100

300

113°

4150

Bit Size

Density Caliper

Gamma Ray

DST Uphole Tension

114°

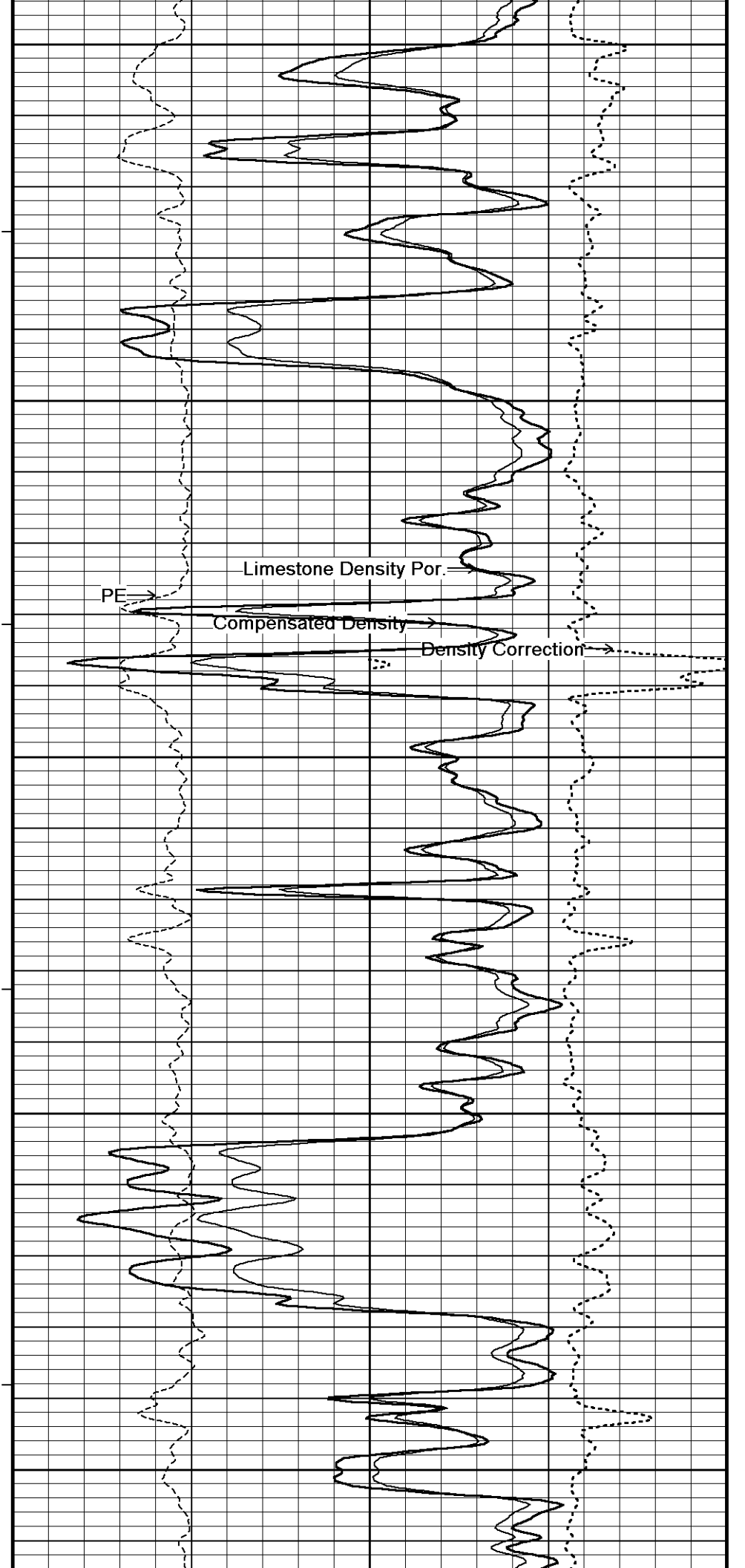
4200

114°

4250

114°

4300

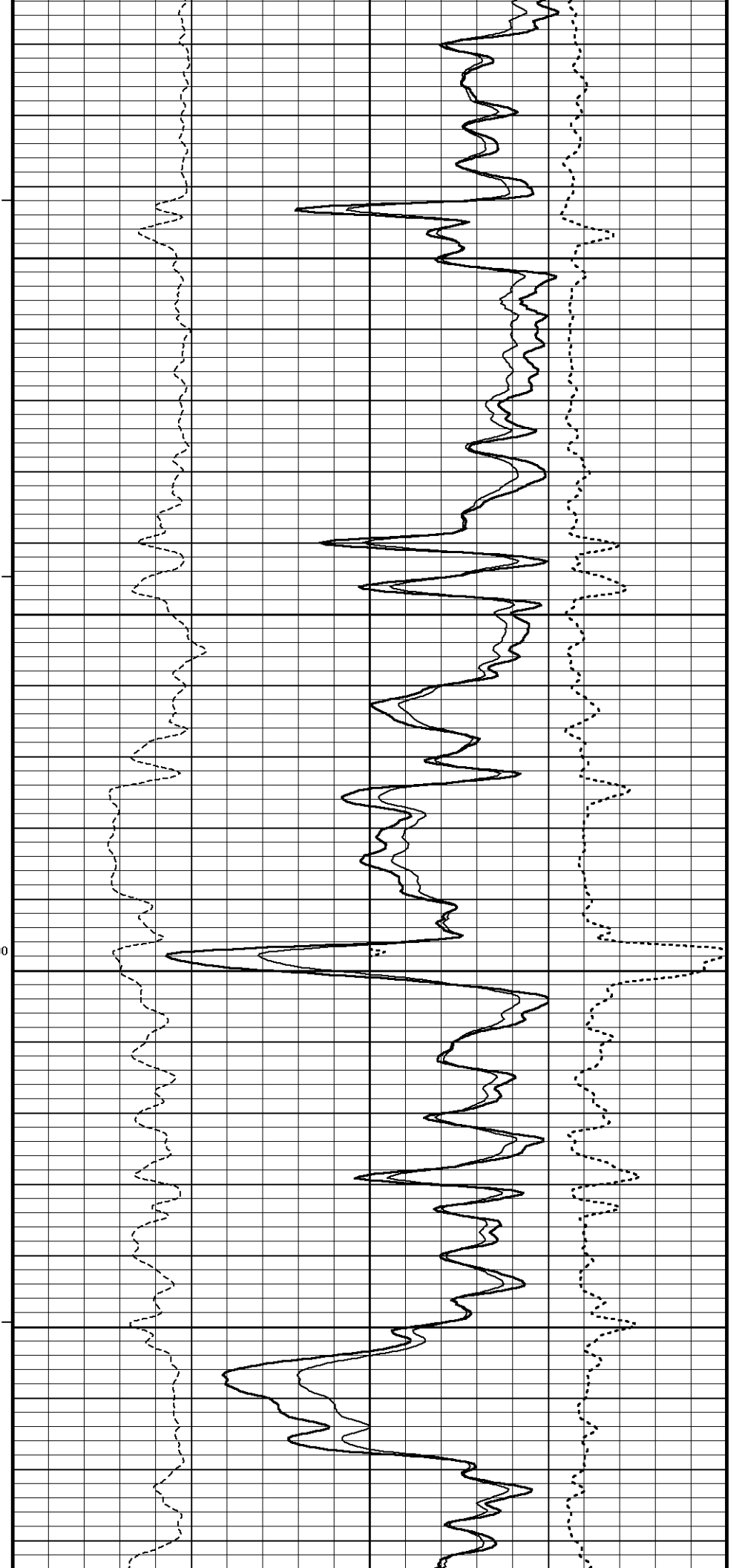
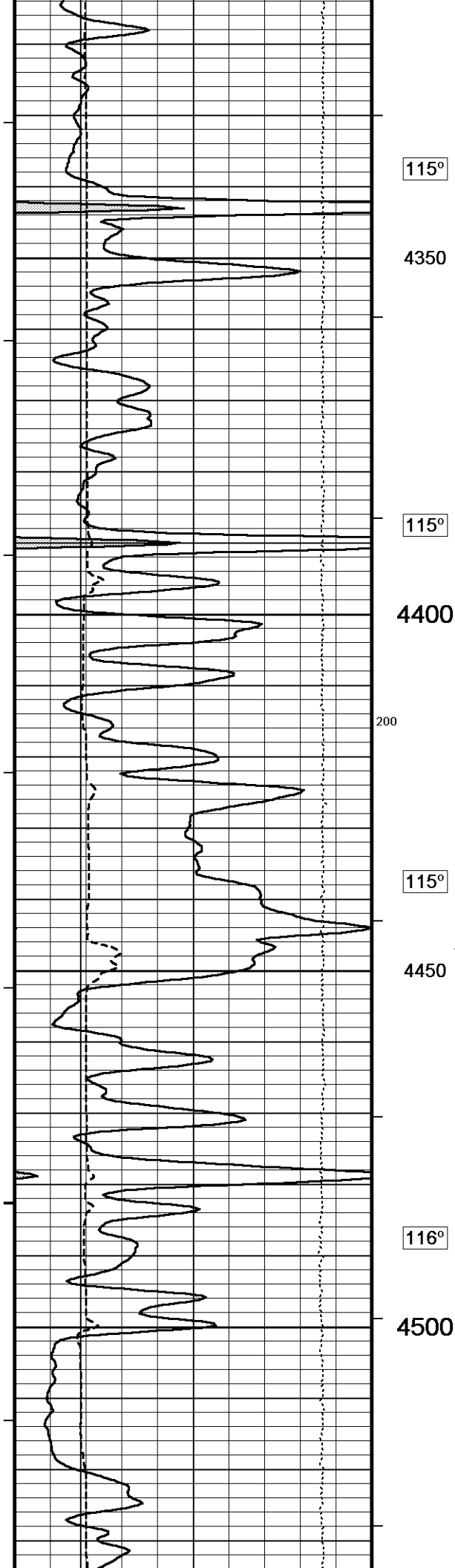


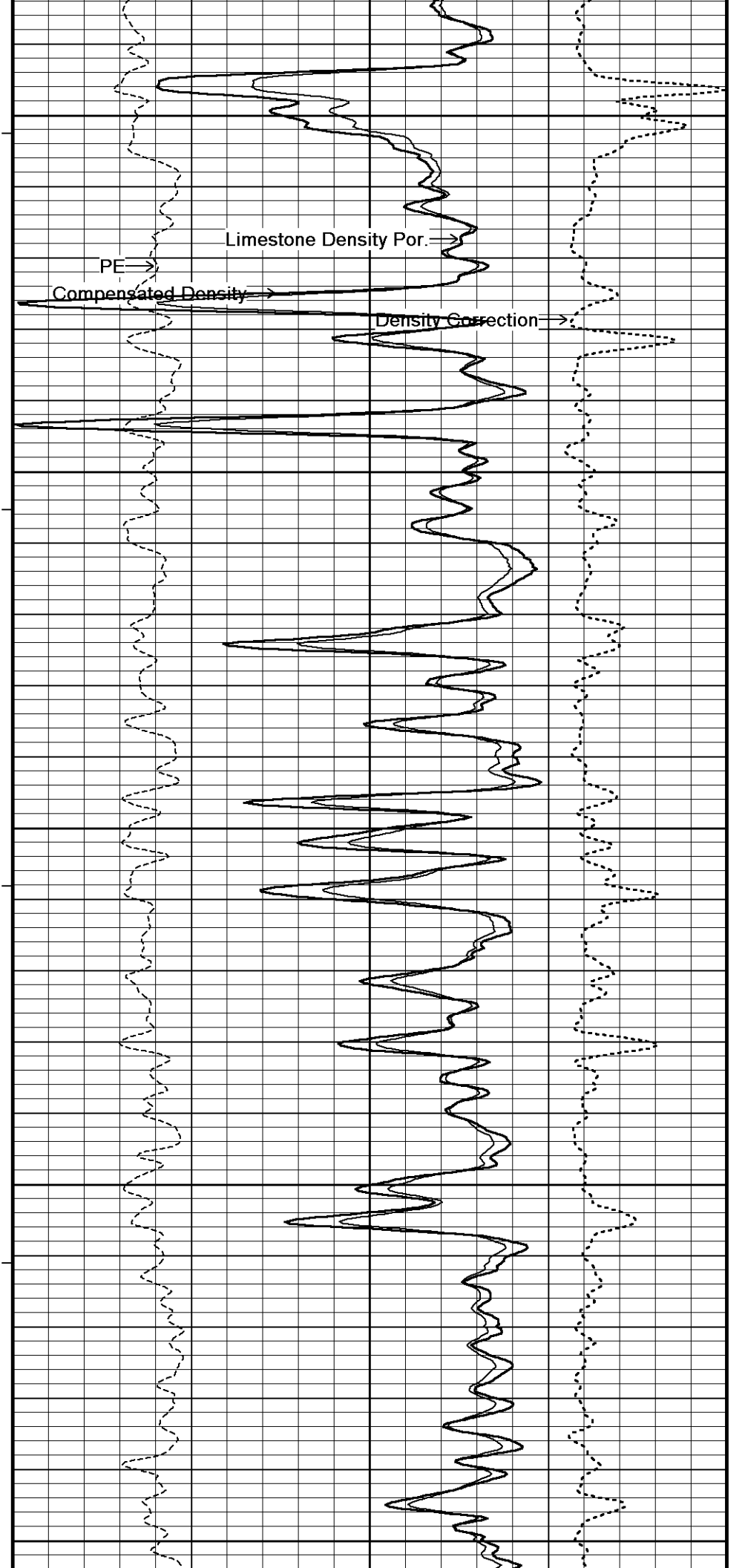
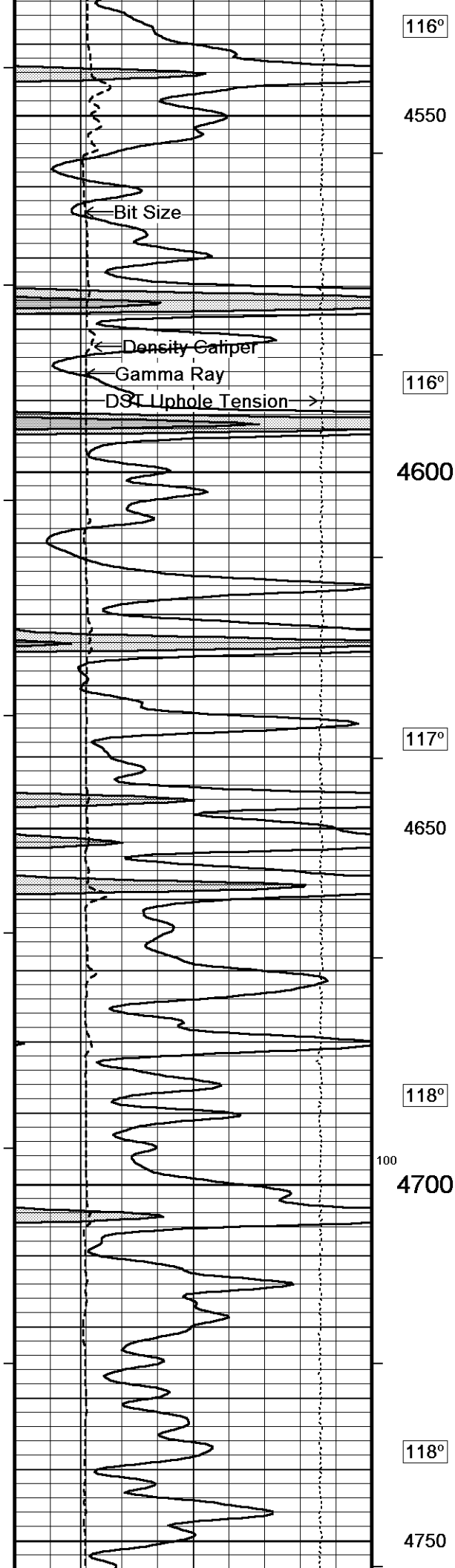
PE

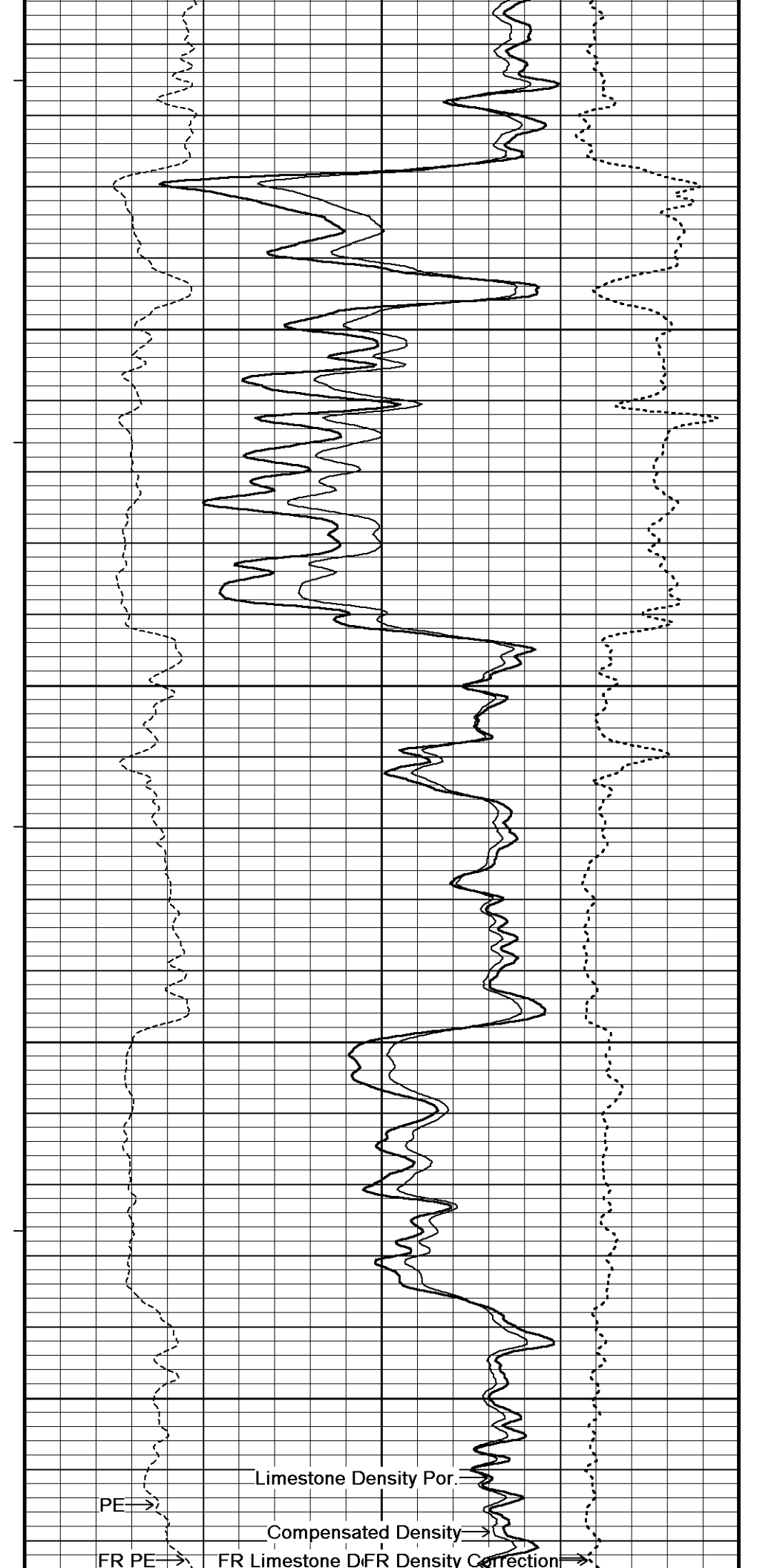
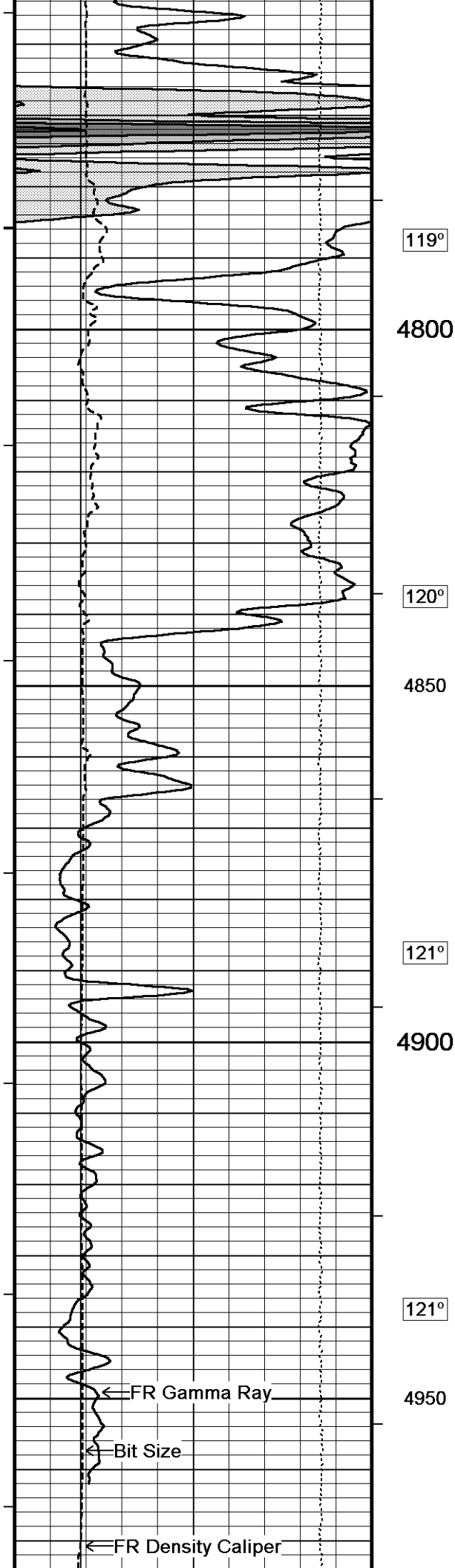
Limestone Density Por.

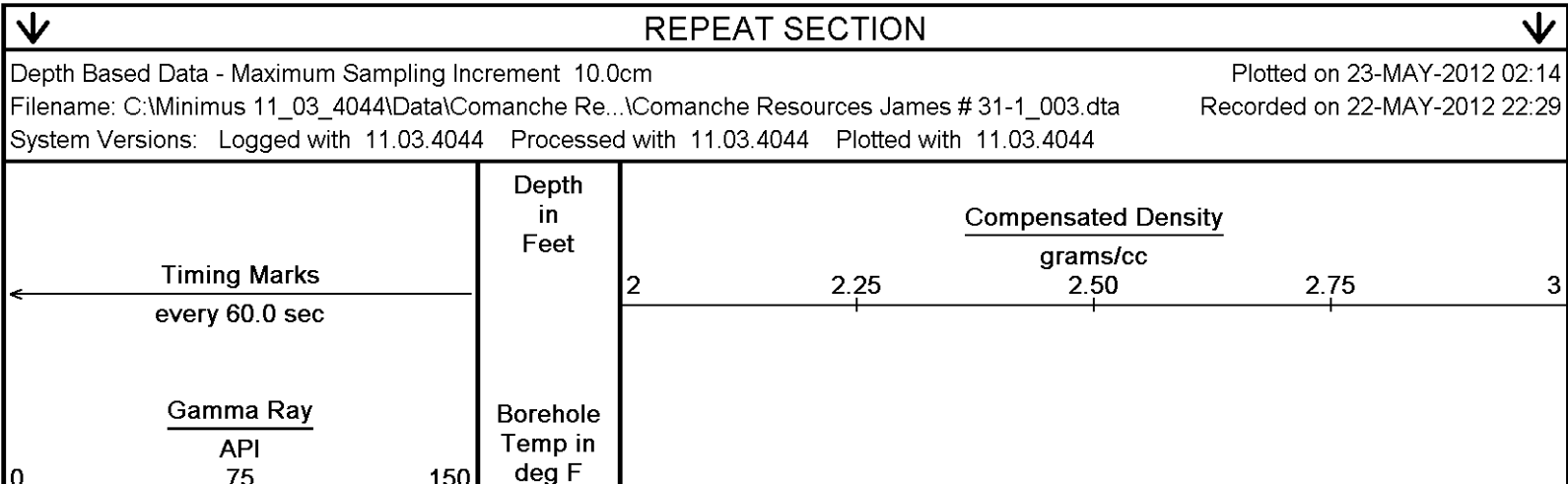
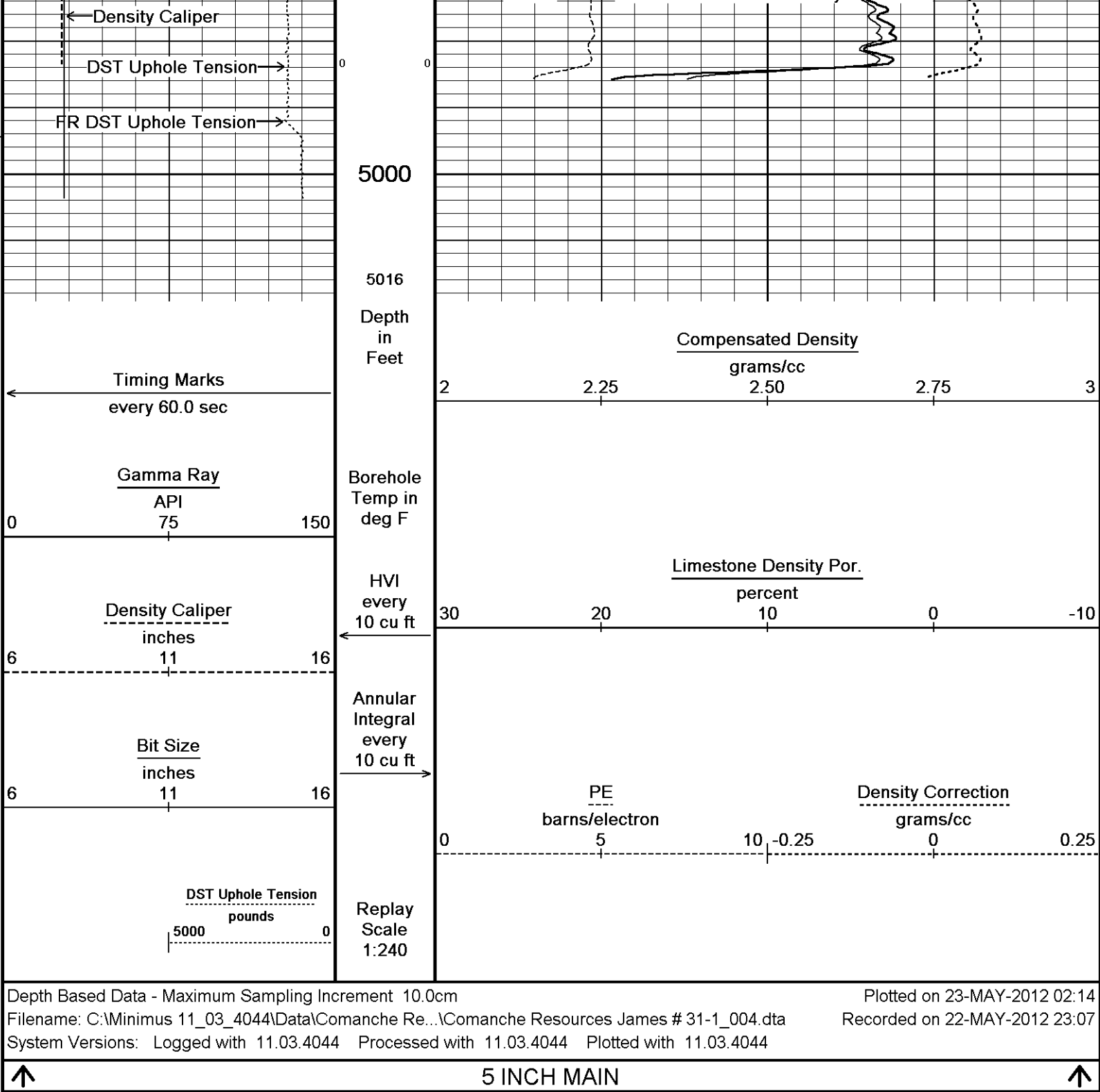
Compensated Density

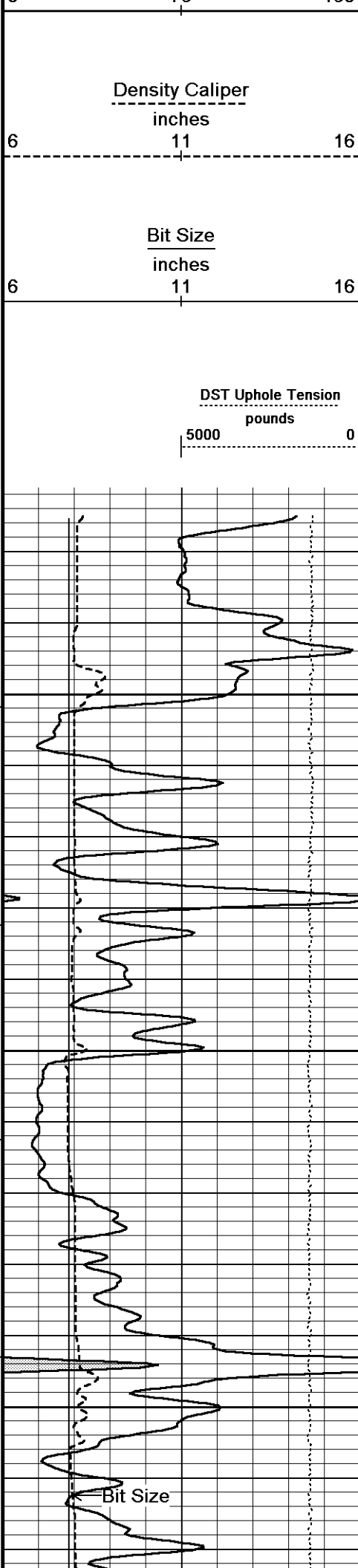
Density Correction











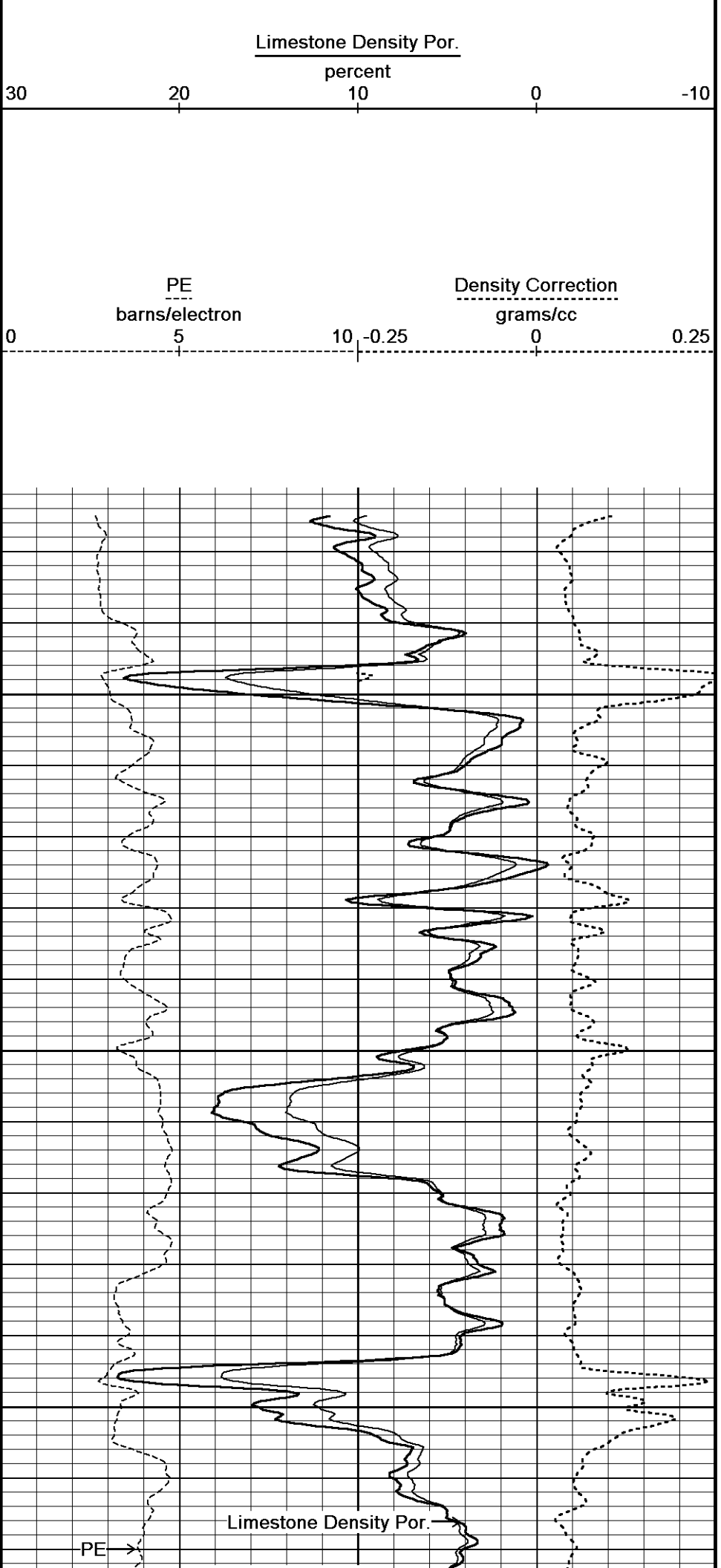
HVI
every
10 cu ft

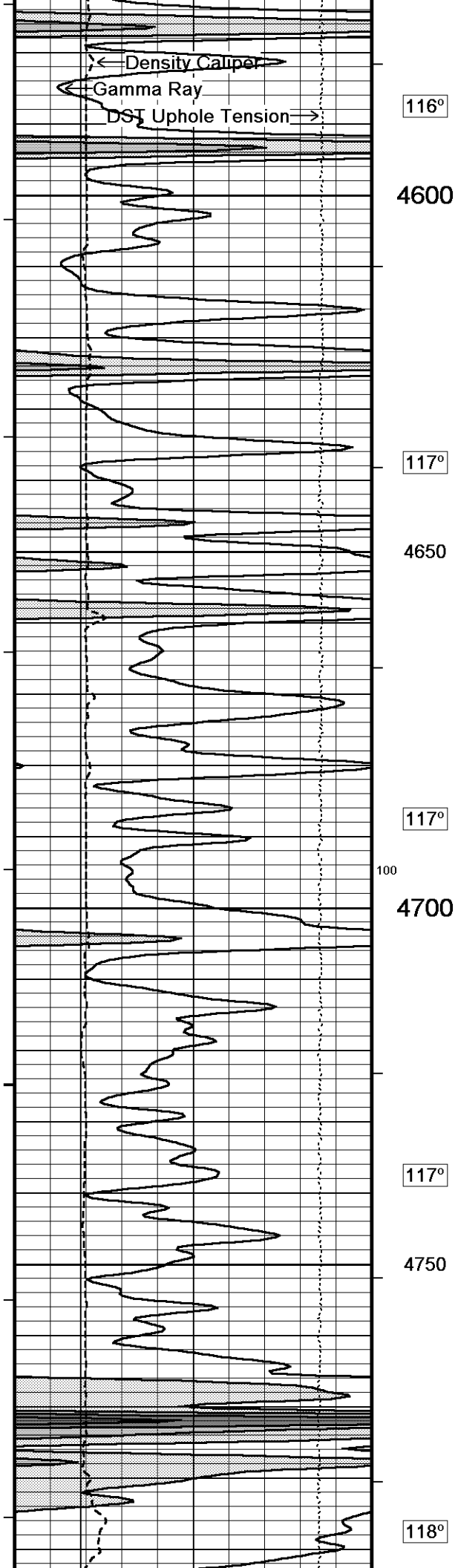
Annular
Integral
every
10 cu ft

Replay
Scale
1:240

115°

115°





116°

4600

117°

4650

117°

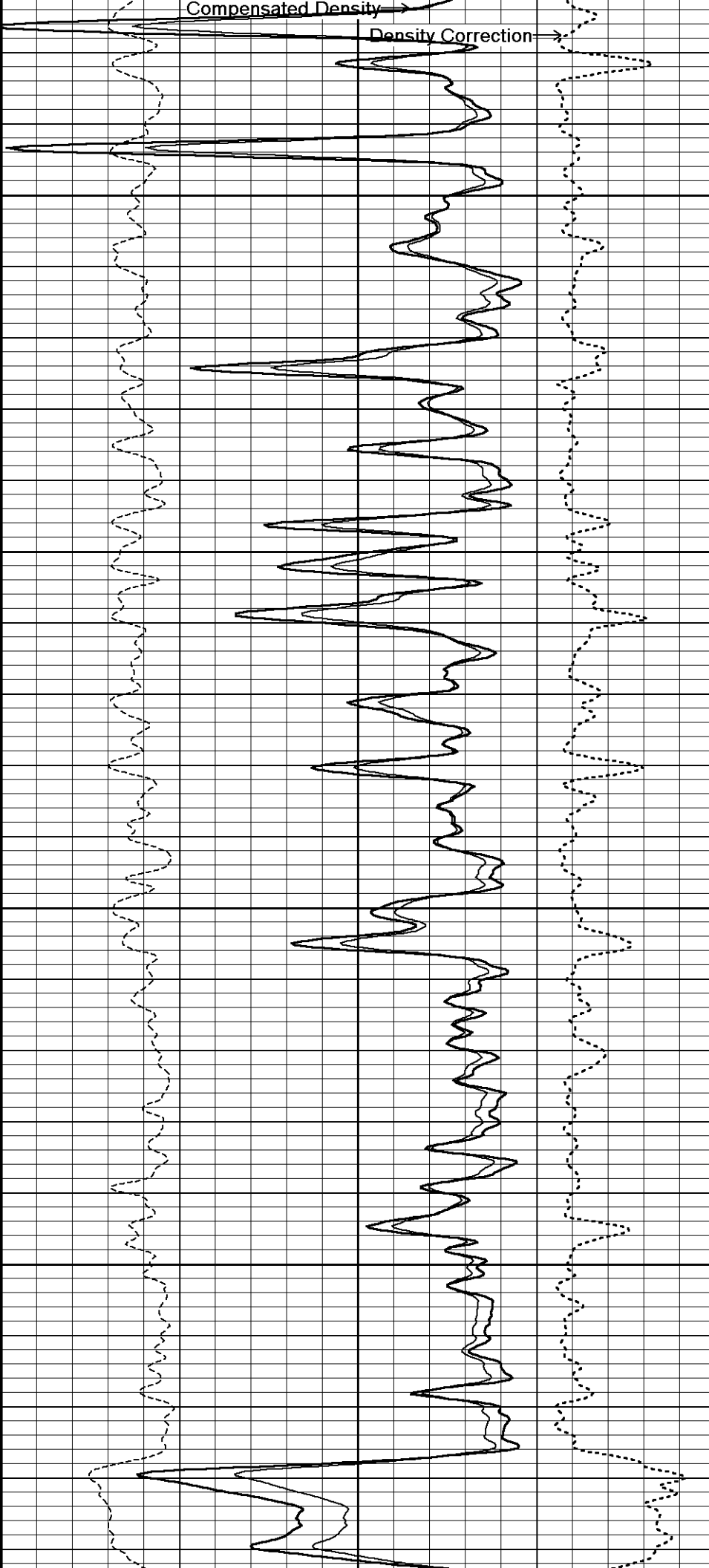
100

4700

117°

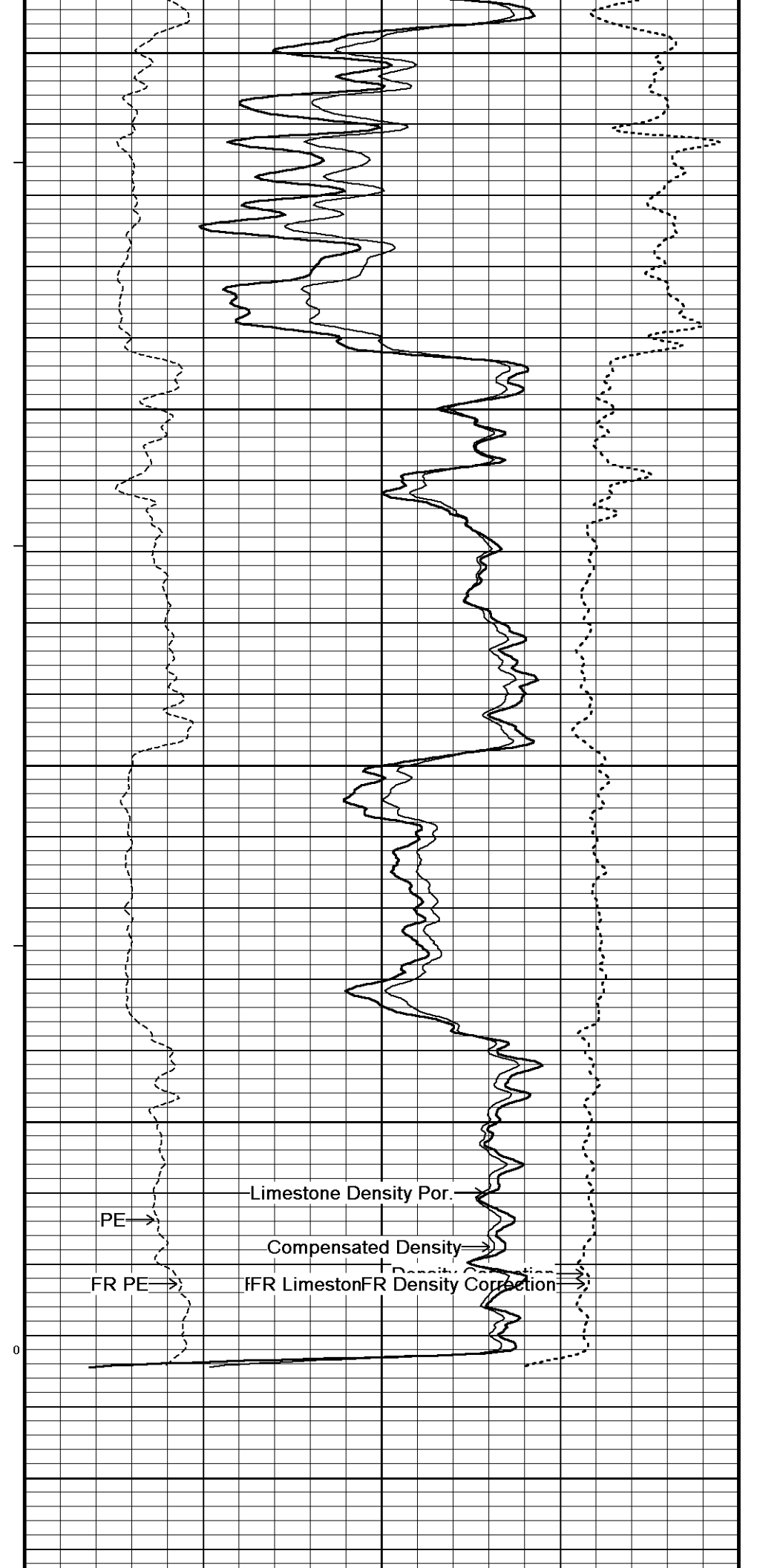
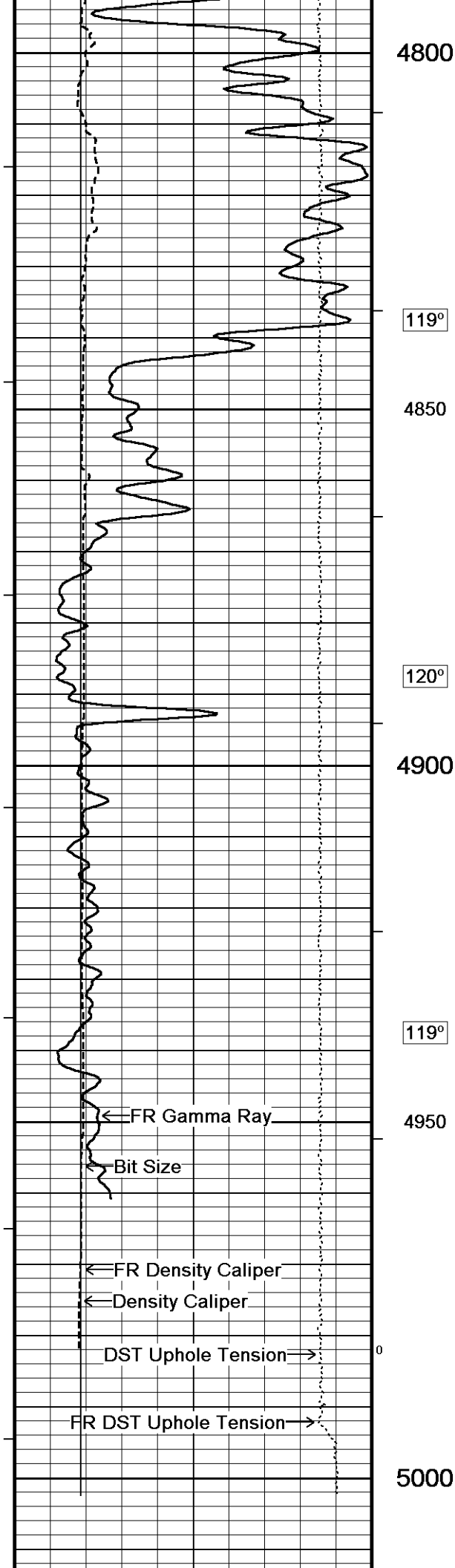
4750

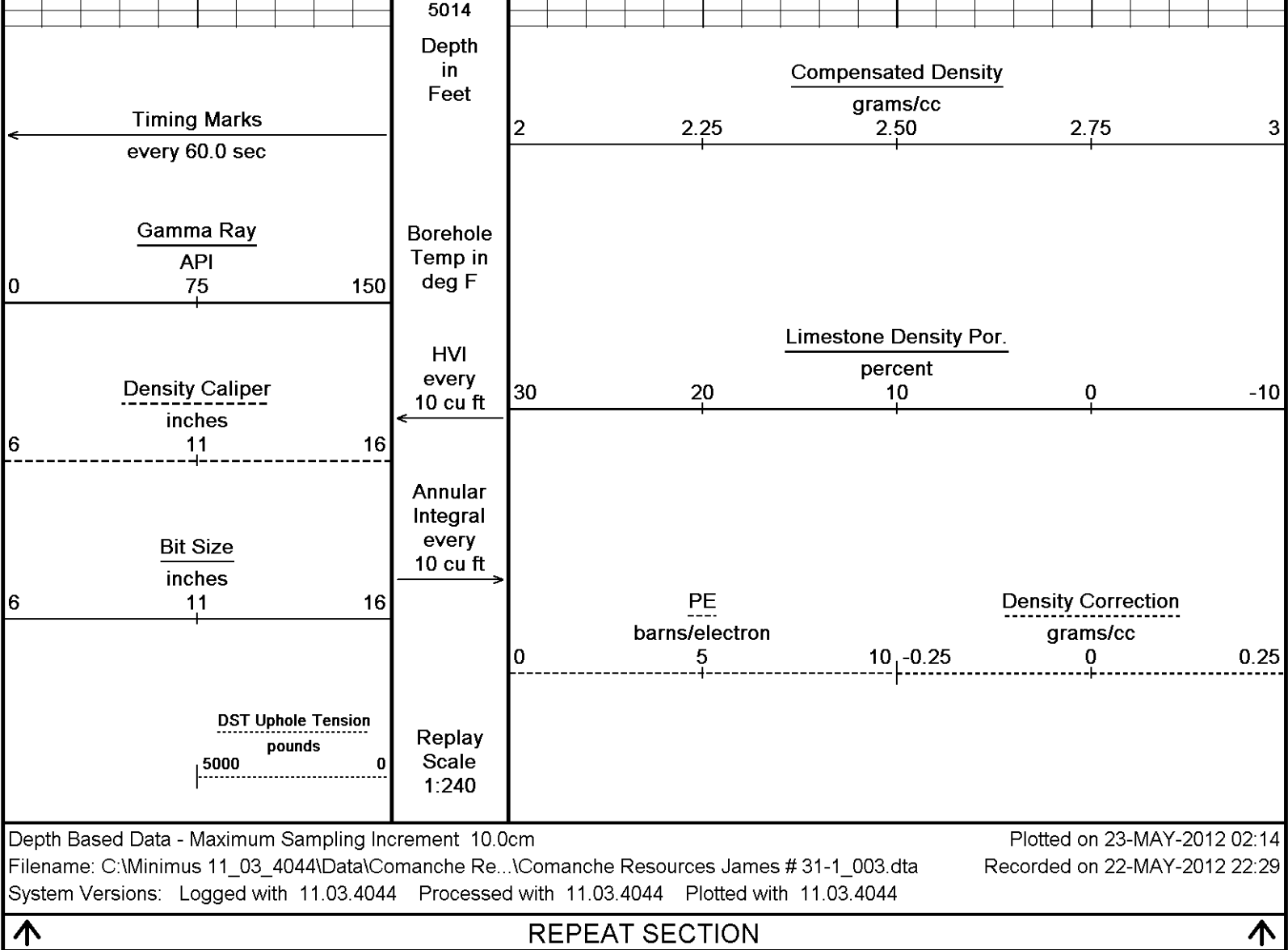
118°



Compensated Density →

Density Correction →





BEFORE SURVEY CALIBRATION		
C:\Minimus 11_03_4044\Data\Comanche Resources James # 31-1\Comanche Resources James # 31-1_004.dta		
General Constants All 000		Last Edited on 22-MAY-2012,21:31
General Parameters		
Mud Resistivity	0.800	ohm-metres
Mud Resistivity Temperature	71.000	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	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 09-MAY-2012 17:14
Reading No	Measured	Calibrated (lbs)
1	12472.43	0.00
2	13803.95	582.00

Gamma Calibration MCG-B 39			Field Calibration on 22-MAY-2012 09:29	
	Measured	Calibrated (API)		
Background	64	43		
Calibrator (Gross)	1139	768		
Calibrator (Net)	1076	725		
Gamma Constants MCG-B 39			Last Edited on 22-MAY-2012,21:31	
Gamma Calibrator Number	GRC038			
Mud Density	1.10	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 02-APR-2012,14:02	
	Measured	Calibrated (mV)		
Reference 1	100.0	100.0		
Reference 2	-100.0	-100.0		
High Resolution Temperature Calibration MCG-B 39			Field Calibration on 02-APR-2012,14:03	
	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 15-MAY-2012 17:25 Field Calibration on 22-MAY-2012 09:21	
Base Calibration				
Reading No	Measured	Calibrator Size (in)		
1	15117	5.98		
2	18514	7.97		
3	21781	9.86		
4	25834	11.92		
5	0	0.00		
6	N/A	N/A		
Field Calibration				
	Measured Caliper (in)	Actual Caliper (in)		
	6.06	5.98		
Micro Normal and Micro Inverse Calibration MML-A 4			Base Calibration on 15-MAY-2012 17:31 Field Check on 22-MAY-2012 09:23	
Base Calibration				
	Measured	Calibrated (ohm-m)		
Channel	Resistor 1	Resistor 2	Resistor 1	Resistor 2
Micro Normal	12.2	60.3	5.0	25.0
Micro Inverse	15.7	78.5	5.0	25.0
Channel	Base Check (ohm-m)	Field Check (ohm-m)		
Micro Normal	62.8	62.8		
Micro Inverse	48.2	48.2		
Micro Normal and Micro Inverse Constants MML-A 4			Last Edited on 18-MAY-2012,03:55	
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 15-MAY-2012 16:34 Field Check on 22-MAY-2012 09:39	
Base Calibration				
	Measured	Calibrated (cps)		
	Near	Far	Near	Far
	2995	90	3714	110
Ratio	33.447		33.764	
Field Calibrator at Base		Calibrated (cps)		

Field Calibration at Base	1667	Calibrated (cps)	2508
Ratio			0.664
Field Check	1665	Calibrated (cps)	2449
Ratio			0.680

Neutron Constants MDN-B.J 387			Last Edited on 22-MAY-2012,21:31		
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			
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 15-MAY-2012 17:11 Field Check on 22-MAY-2012 09:06		
Base Calibration					
	Measured	Calibrated (ohm-m)			
Reference 1	0.0	0.0			
Reference 2	963.4	126.8			
Base Check		281.4			
Field Check		281.6			

FE Constants MFE-B.J 352				Last Edited on 22-MAY-2012,21:32	
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 15-MAY-2012,14:15 Field Check on 22-MAY-2012 09:04	
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	12.1	3762.5	
2	0.0	0.0	29.5	3466.9	
3	0.0	0.0	27.2	3014.1	
4	0.0	0.0	18.7	2064.7	
Deep	0.0	0.0	15.9	1995.3	
Medium	0.0	0.0	40.1	3955.3	
Shallow	0.0	0.0	45.2	5081.6	
Array Temperature		0.0	71.5 Deg F		

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	

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
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Caliper Calibration MPD-B 35

Base Calibration on 15-MAY-2012 15:38

Field Calibration on 22-MAY-2012 09:09

Base Calibration		
Reading No	Measured	Calibrator Size (in)
1	21260	3.99
2	31424	5.98
3	41761	7.97
4	51280	9.86
5	61536	11.92
6	N/A	N/A
Field Calibration		
	Measured Caliper (in)	Actual Caliper (in)
	5.87	5.98

Photo Density Calibration MPD-B 35

Base Calibration on 15-MAY-2012 15:56

Field Check on 22-MAY-2012 09:17

Density Calibration				
Base Calibration				
		Measured	Calibrated (sdu)	
	Near	Far	Near	Far
Reference 1	62707	32170	59556	30836
Reference 2	26808	2860	24941	2541

Compact Neutron
MDN-B.J 387 LG: 5.04 ft WT: 50.7 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 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

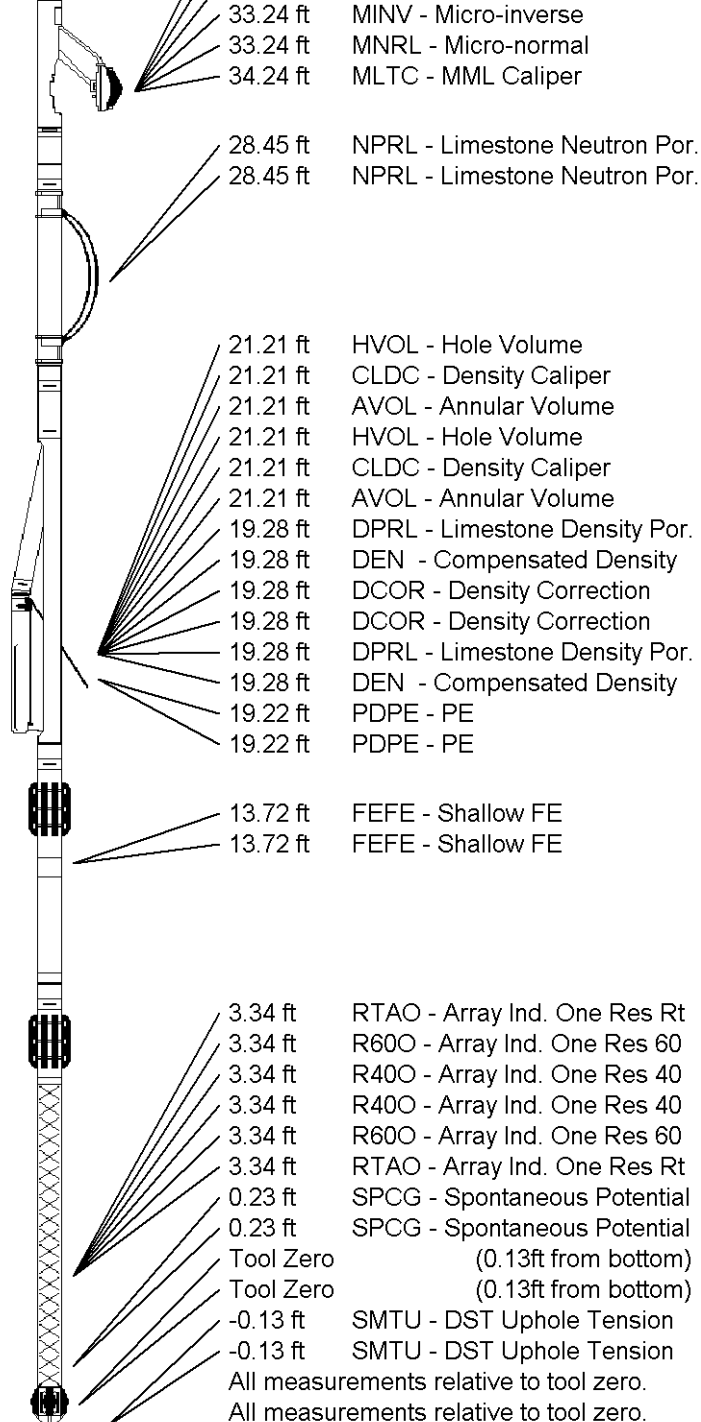
Compact Focussed Electric
MFE-B.J 352 LG: 6.05 ft WT: 48.5 lb OD: 2.24 in

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

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

Total Length: 50.55 ft Weight: 403.4 lb

Total Length: 50.55 ft Weight: 403.4 lb



COMPANY	COMANCHE RESOURCES CO., LLC
WELL	JAMES # 31-1
FIELD	WILDCAT
PROVINCE/COUNTY	SCOTT
COUNTRY/STATE	U.S.A. / KANSAS

Elevation Kelly Bushing	3077.00	feet	First Reading	4971.00	feet
Elevation Drill Floor	3075.00	feet	Depth Driller	5000.00	feet
Elevation Ground Level	3066.00	feet	Depth Logger	4992.00	feet



COMPACT PHOTO DENSITY
COMPENSATED NEUTRON
MICRORESISTIVITY LOG

