



**Weatherford**

**COMPACT PHOTO DENSITY  
COMPENSATED NEUTRON**

COMPANY

O'BRIEN ENERGY RESOURCES CORP.

WELL

ARDREY #3-35

FIELD

ARDREY

PROVINCE/COUNTY

CLARK

COUNTRY/STATE

U.S.A. / KANSAS

LOCATION

335' FSL & 1601' FEL

SEC 30

TWP 35S

RGE 24W

Other Services  
MAI/MFE

Latitude

Longitude

API Number 15-025-21572

Permanent Datum GL, Elevation 2533 feet

Log Measured From KB

Drilling Measured From KB @ 12 FEET

Date 07-MAR-2014

Run Number

ONE

Service Order

7036-81366181

Depth Driller

5700.00

Depth Logger

5692.00

First Reading

5672.72

Last Reading

4000.00

Casing Driller

732.00

Casing Logger

731.00

Bit Size

7.875

Hole Fluid Type

CHEMICAL

Density / Viscosity

9.20

lb/USg

47.00

CP

PH / Fluid Loss

9.00

10.00

ml/30Min

Sample Source

MUDPIT

Rm @ Measured Temp

0.95 @ 75.0

ohm-m

Rmf @ Measured Temp

0.76 @ 75.0

ohm-m

Rmc @ Measured Temp

1.14 @ 75.0

ohm-m

Source Rmf / Rmc

CALC

CALC

Rm @ BHT

0.62 @ 118.0

ohm-m

Time Since Circulation

4 HOURS

Max Recorded Temp

118.00

deg F

Equipment / Base

13096

LIB

Recorded By

DEREK CARTER

Witnessed By

PETER DEBENHAM

Job #

LB14-065

Elevations:  
KB 2545.00  
DF 2543.00  
GL 2533.00

**BOREHOLE RECORD**

Last Edited: 07-MAR-2014 03:28

| Bit Size<br>inches | Depth From<br>feet | Depth To<br>feet |
|--------------------|--------------------|------------------|
| 7.875              | 720.00             | 5700.00          |

**CASING RECORD**

| Type    | Size<br>inches | Depth From<br>feet | Shoe Depth<br>feet | Weight<br>pounds/ft |
|---------|----------------|--------------------|--------------------|---------------------|
| SURFACE | 8.625          | 0.00               | 720.00             | 24.00               |

**REMARKS**

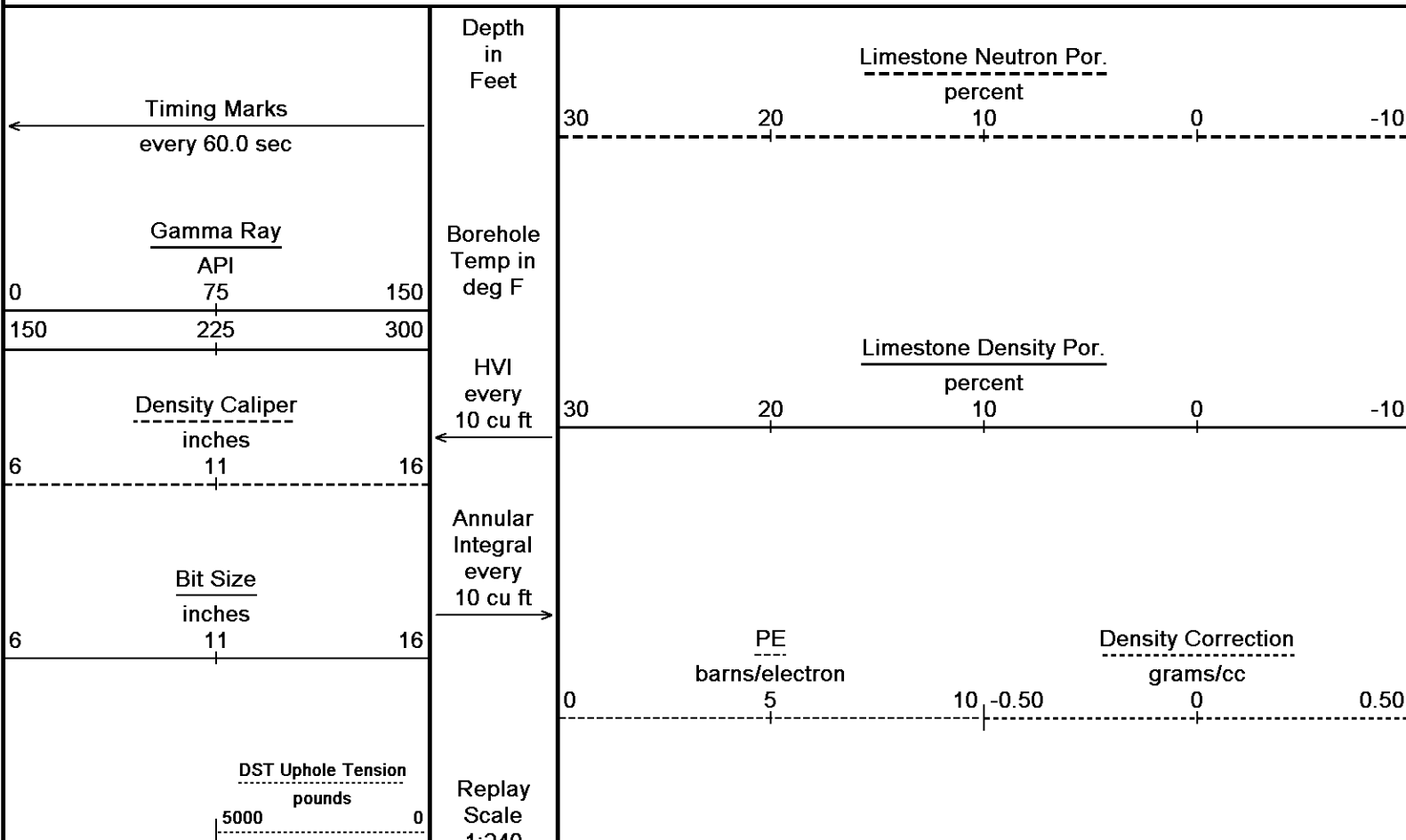
- SOFTWARE ISSUE: WLS 13.08.2113
- TOOL STRING: MCG, MML, MDN, MPD, MFE, MAI RUN IN COMBINATION
- HARDWARE:  
MDN: DUAL BOWSPRING ECCENTRALIZER  
MFE: 1 X 0.5 INCH STANDOFF  
MAI: 2 X 0.5 INCH STANDOFF
- 2.71 G/CC LIMESTONE DENSITY MATRIX USED TO CALCULATE POROSITY
- BOREHOLE RUGOSITY, TIGHT PULLS, AND WASHOUTS WILL AFFECT DATA QUALITY
- ALL INTERVALS LOGGED AND SCALED PER CUSTOMER'S REQUEST
- CUSTOMER REQUESTED A HI-RES REPEAT PASS; CUSTOMER ALSO REQUESTED THE REPEAT PASS POROSITIES BE PRESENTED ON A SANDSTONE MATRIX ONLY

- TOTAL HOLE VOLUME FROM TD TO SURFACE CASING: 2290 CU. FT.
- ANNULAR HOLE VOLUME WITH 4.5 INCH CASING FROM TD TO 4000 FT.: 380 CU. FT.
- SERVICE ORDER # 7036-81366181
- RIG: DUKE DRILLING #4
- ENGINEER: DEREK CARTER
- JUNIOR FIELD ENGINEER: BEN WELDIN
- OPERATOR: NICOLAS ADAME
- LTD OF 5692 FT. (DTD 5700 FT.) DETERMINED TO BE ACCEPTABLE BY COMPANY MAN AND GEOLOGIST
- SP CURVE HAS DISCONTINUITY AT 4253 FT. AFTER WHICH THE SP CURVE IS SHIFTED UP; THE CAUSE OF THIS IS UNKNOWN

In interpreting, communicating or providing information and/or making recommendations, either written or oral, as to logs or test or other data, type or amount of material, or Work or other service to be furnished, or manner of performance, or in predicting results to be obtained, the Contractor will give the Company the benefit of the Contractor's best judgment based on its experience and will perform all such Work in a good and workmanlike manner. Any interpretation of test or other data, and any recommendation or reservoir description based upon such interpretations, are opinions based upon inferences from measurements and empirical relationships and assumptions, which inferences and assumptions are not infallible, and with respect to which professional engineers and analysts may differ. ACCORDINGLY ANY INTERPRETATION OR RECOMMENDATION RESULTING FROM THE SERVICES WILL BE AT THE SOLE RISK OF THE COMPANY, AND THE CONTRACTOR CANNOT AND DOES NOT WARRANT THE ACCURACY, CORRECTNESS OR COMPLETENESS OF ANY SUCH INTERPRETATION OR RECOMMENDATION, WHICH INTERPRETATIONS AND RECOMMENDATIONS SHOULD NOT, THEREFORE, UNDER ANY CIRCUMSTANCES BE RELIED UPON AS THE SOLE OR MAIN BASIS FOR ANY DRILLING, COMPLETION, WELL TREATMENT, PRODUCTION OR FINANCIAL DECISION, OR ANY PROCEDURE INVOLVING ANY RISK TO THE SAFETY OF ANY DRILLING ACTIVITY, DRILLING RIG OR ITS CREW OR ANY OTHER INDIVIDUAL. THE COMPANY HAS FULL RESPONSIBILITY FOR ALL DECISIONS CONCERNING THE SERVICES.

**5 INCH LIMESTONE MAIN**

Depth Based Data - Maximum Sampling Increment 10.0cm Plotted on 07-MAR-2014 10:56  
 Filename: C:\Minimus\13.08\Logs\30 O'Brien Energ...\O'Brien Energy Resources Ardrey #3-35 Main.dta Recorded on 07-MAR-2014 07:02  
 System Versions: Logged with 13.08.2113 Processed with 13.08.2113 Plotted with 13.08.2113



1.240

4000

103°

4050

103°

4100

104°

4150

104°

500 4200

Bit Size

Density Caliper

Gamma Ray

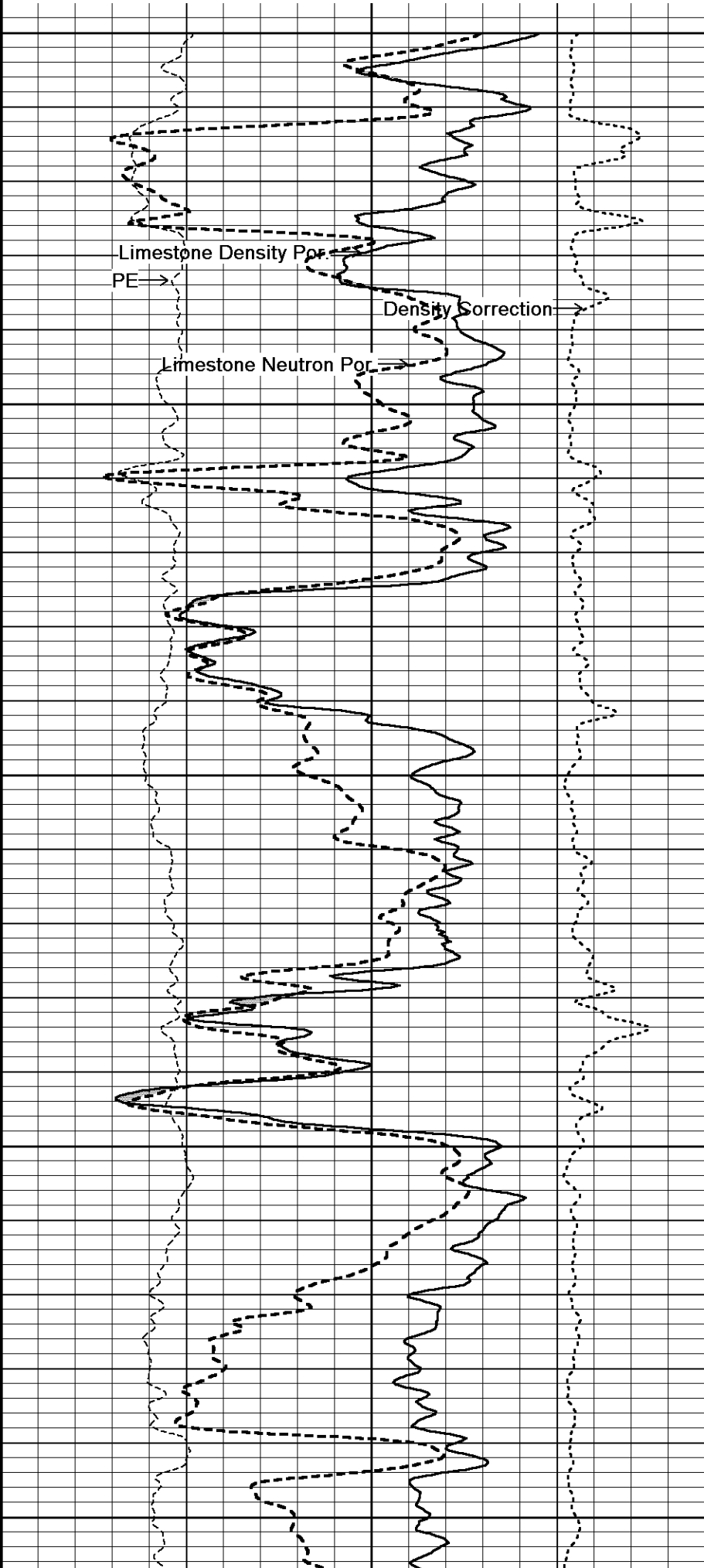
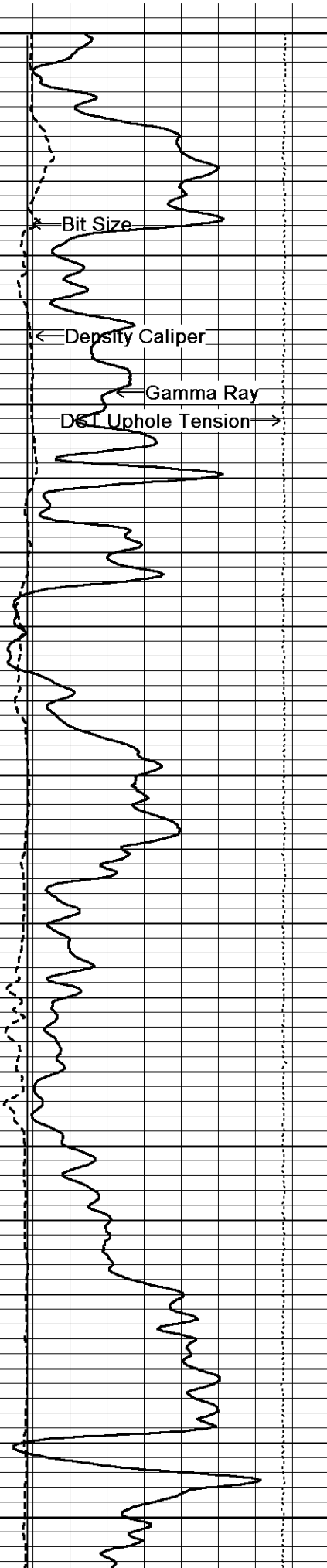
D&T Uphole Tension

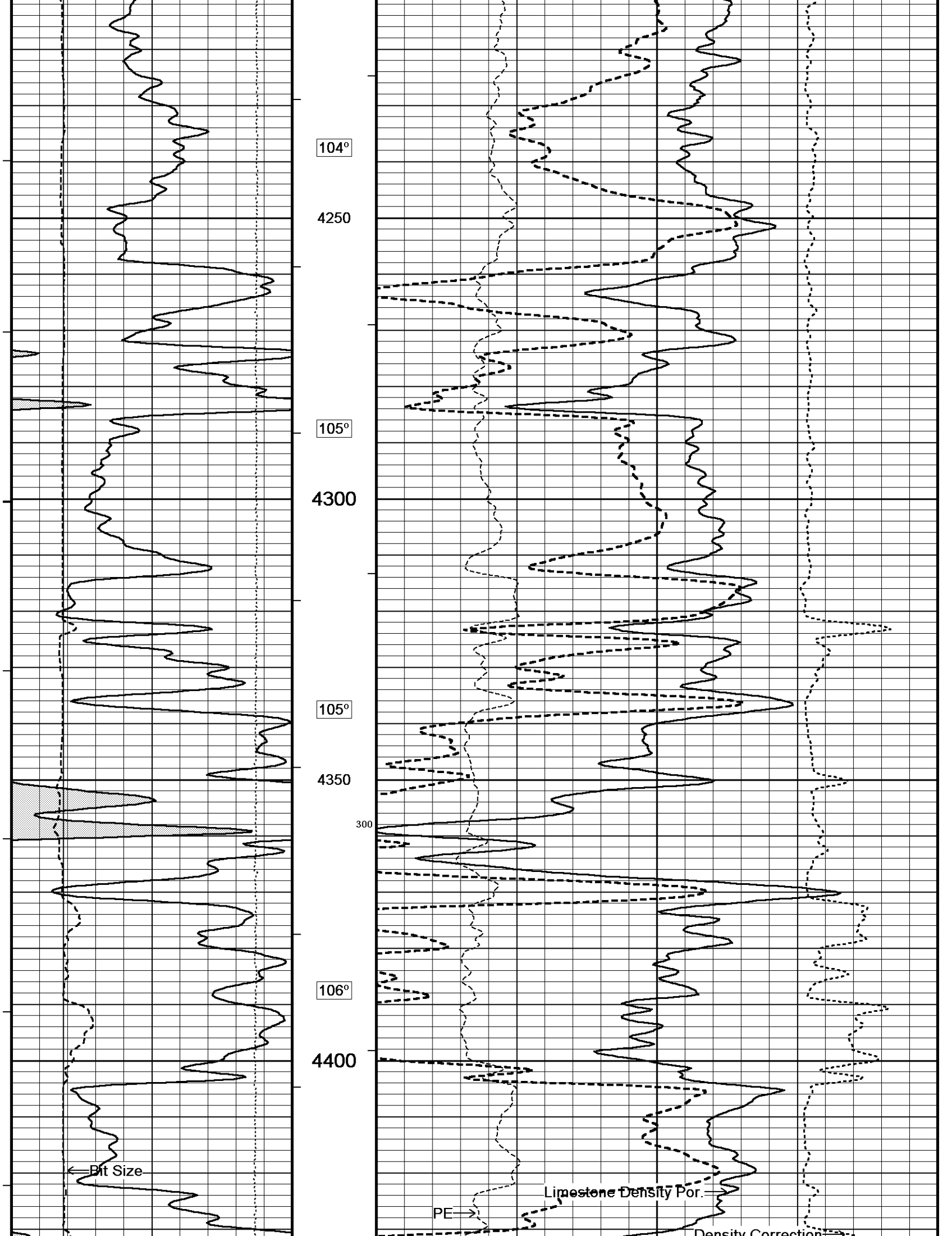
Limestone Density Por

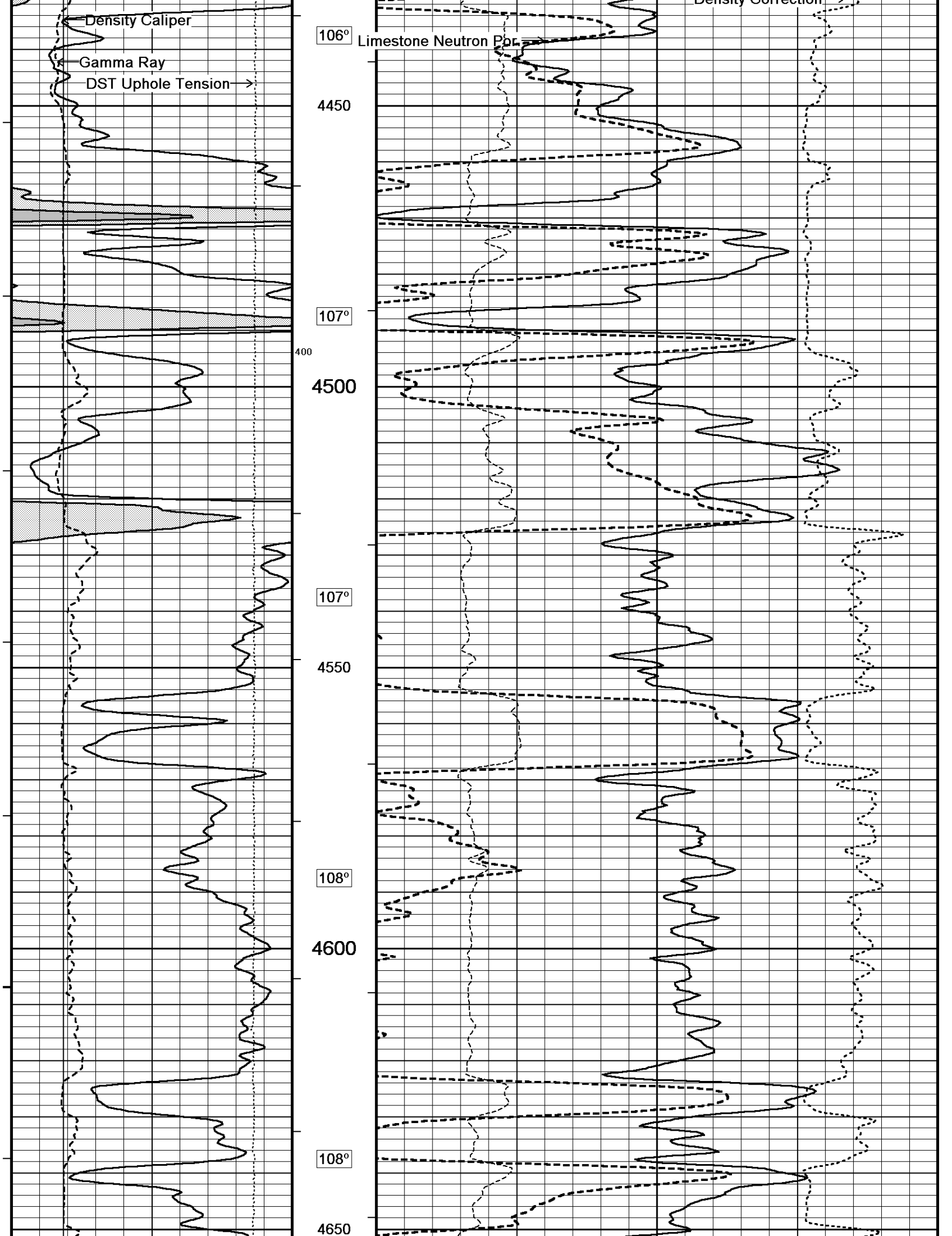
PE

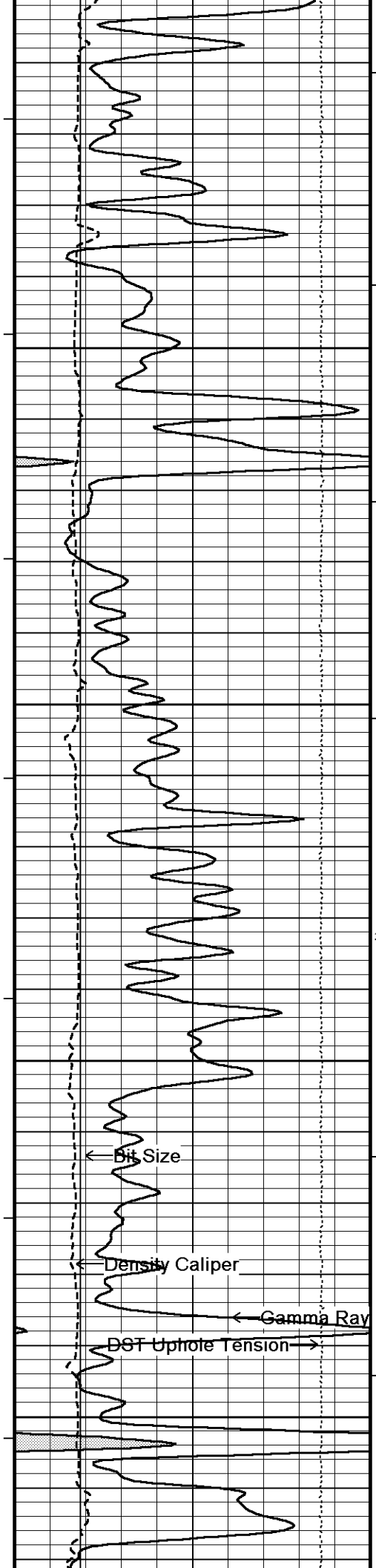
Density Correction

Limestone Neutron Por









109°

4700

109°

4750

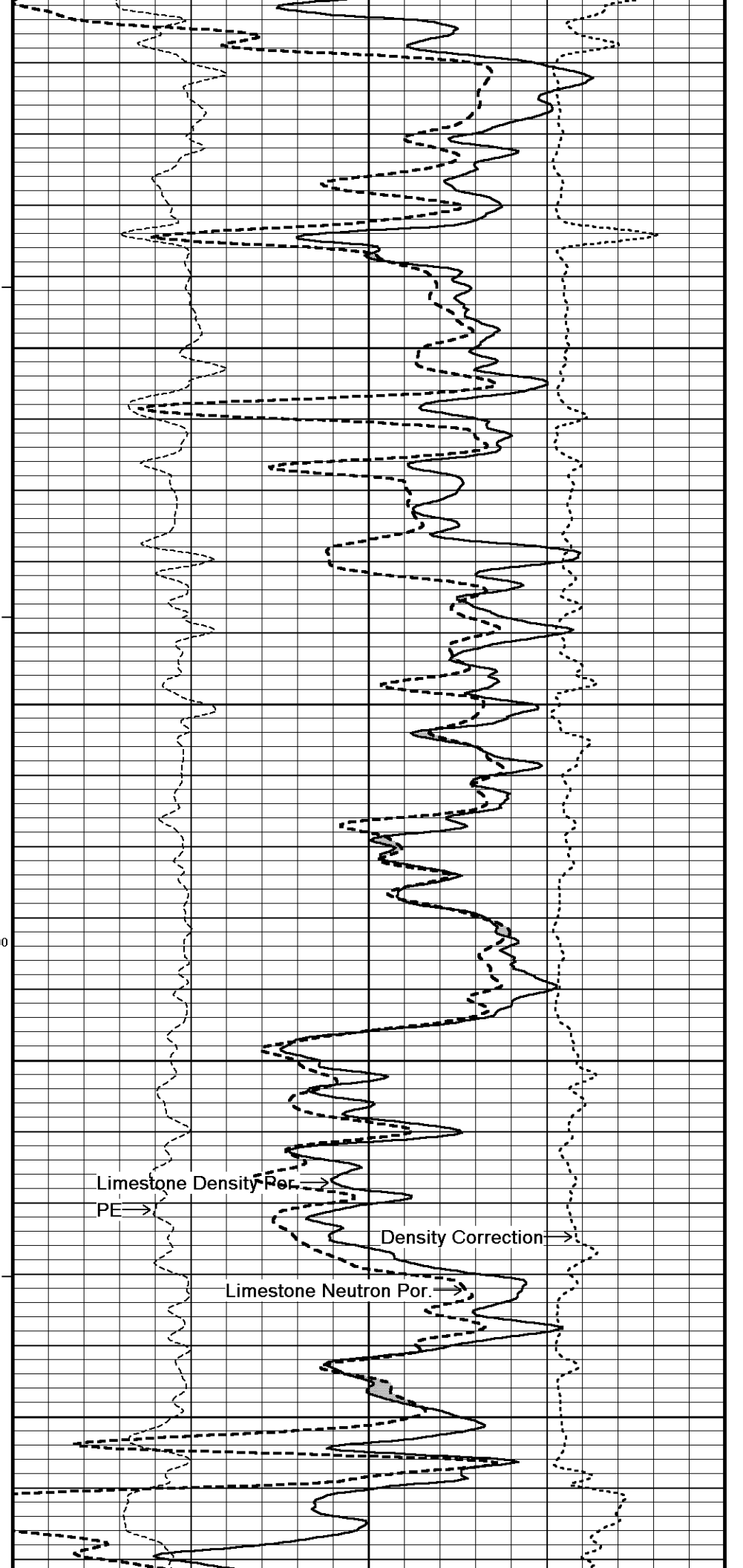
300 200

110°

4800

110°

4850

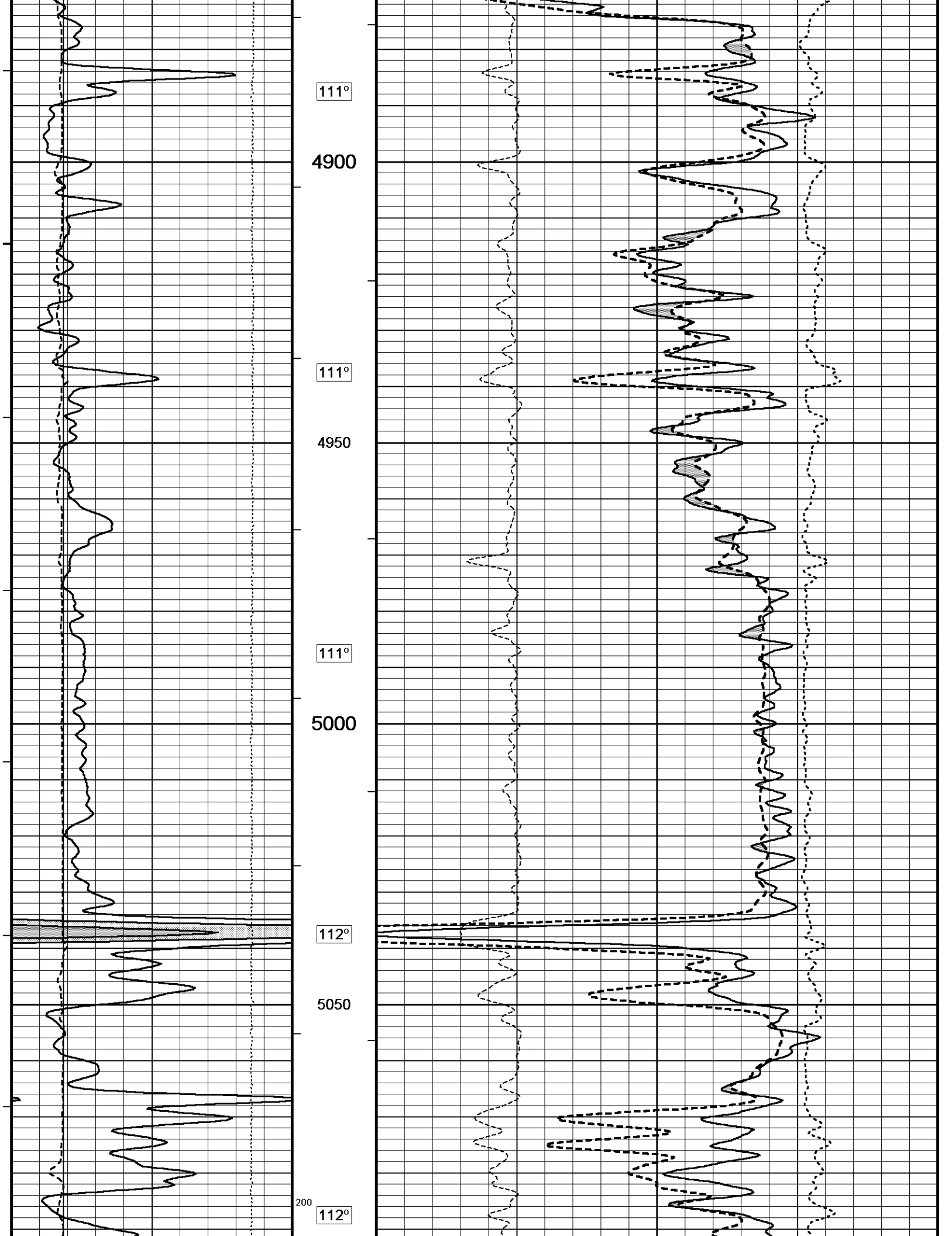


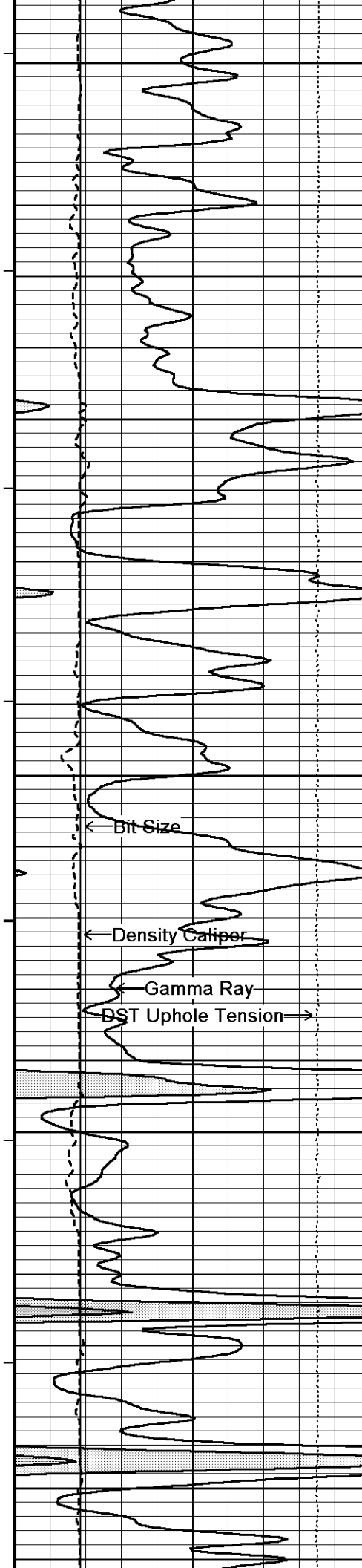
Limestone Density Por.

PE

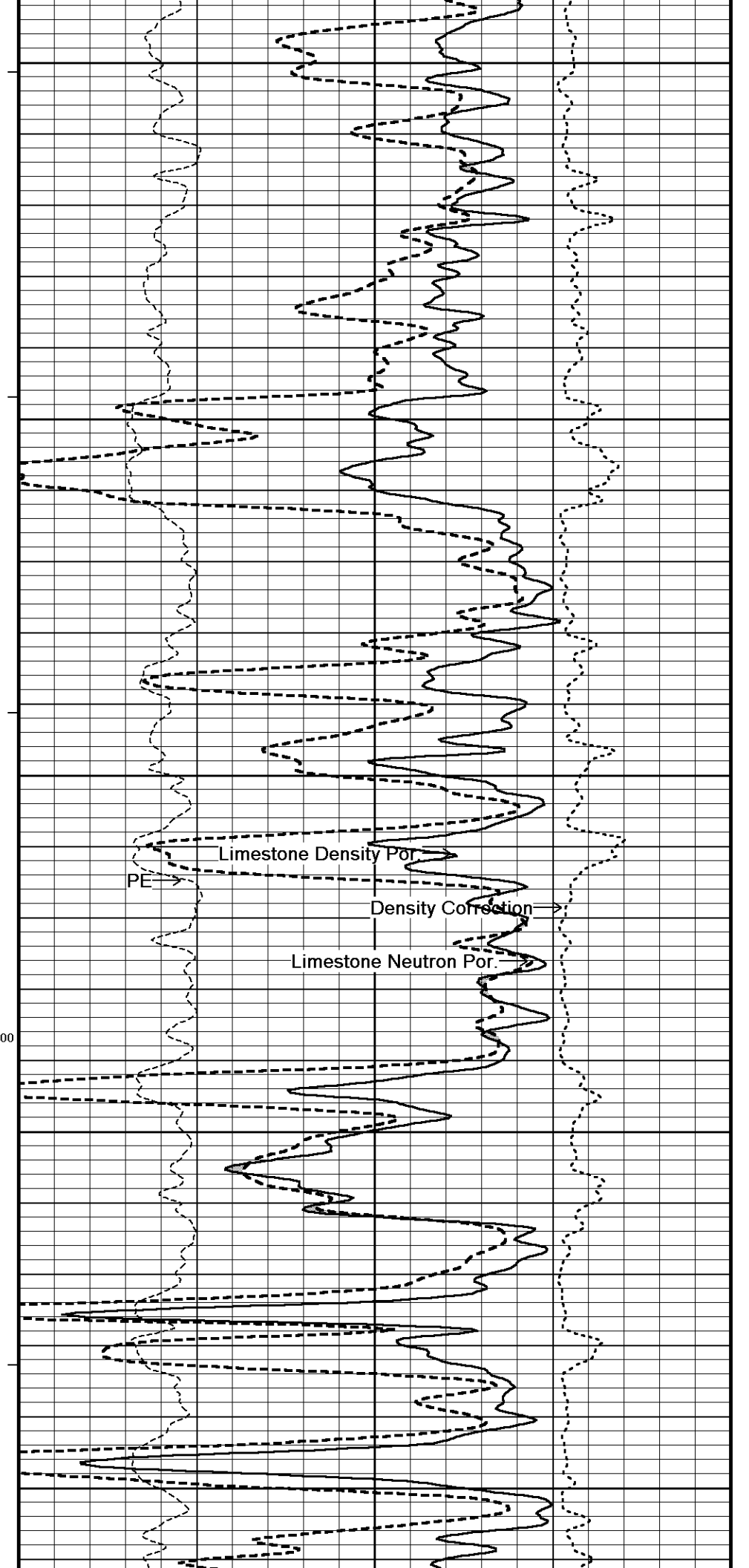
Density Correction

Limestone Neutron Por.

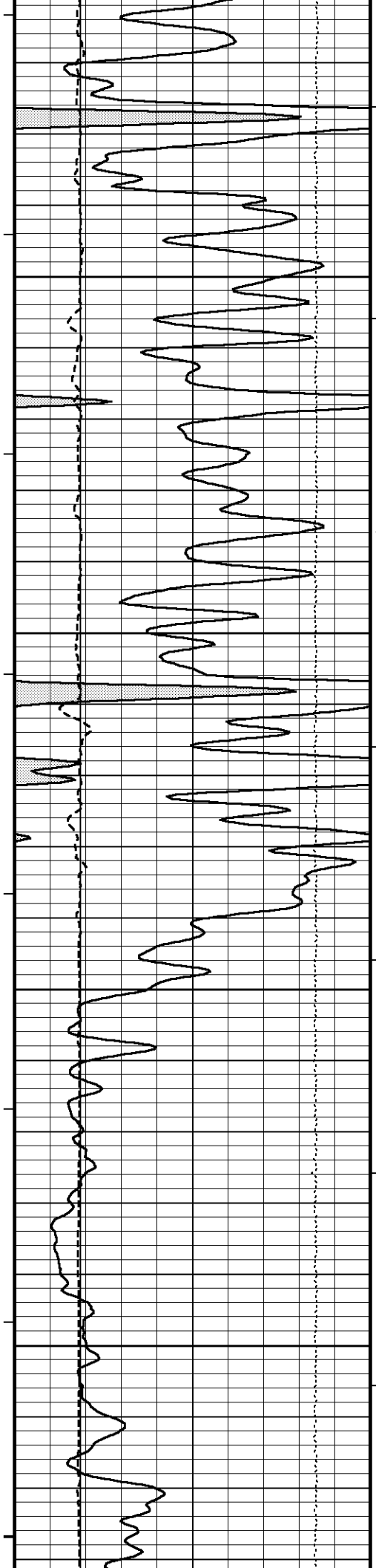




5100  
113°  
5150  
113°  
5200  
113°  
5250  
113°  
5300



Limestone Density Por.  
PE  
Density Correction  
Limestone Neutron Por.



114°

5350

100  
115°

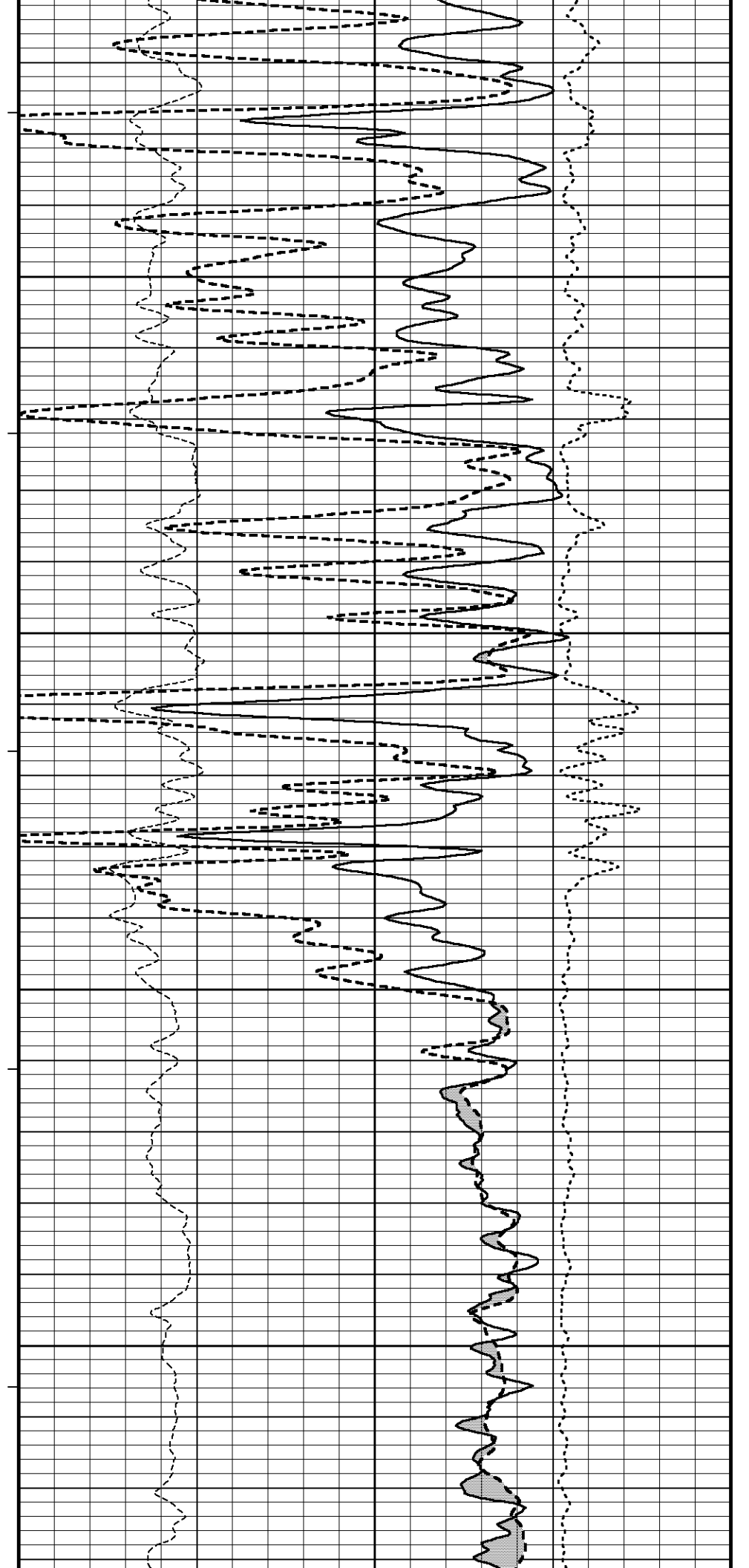
5400

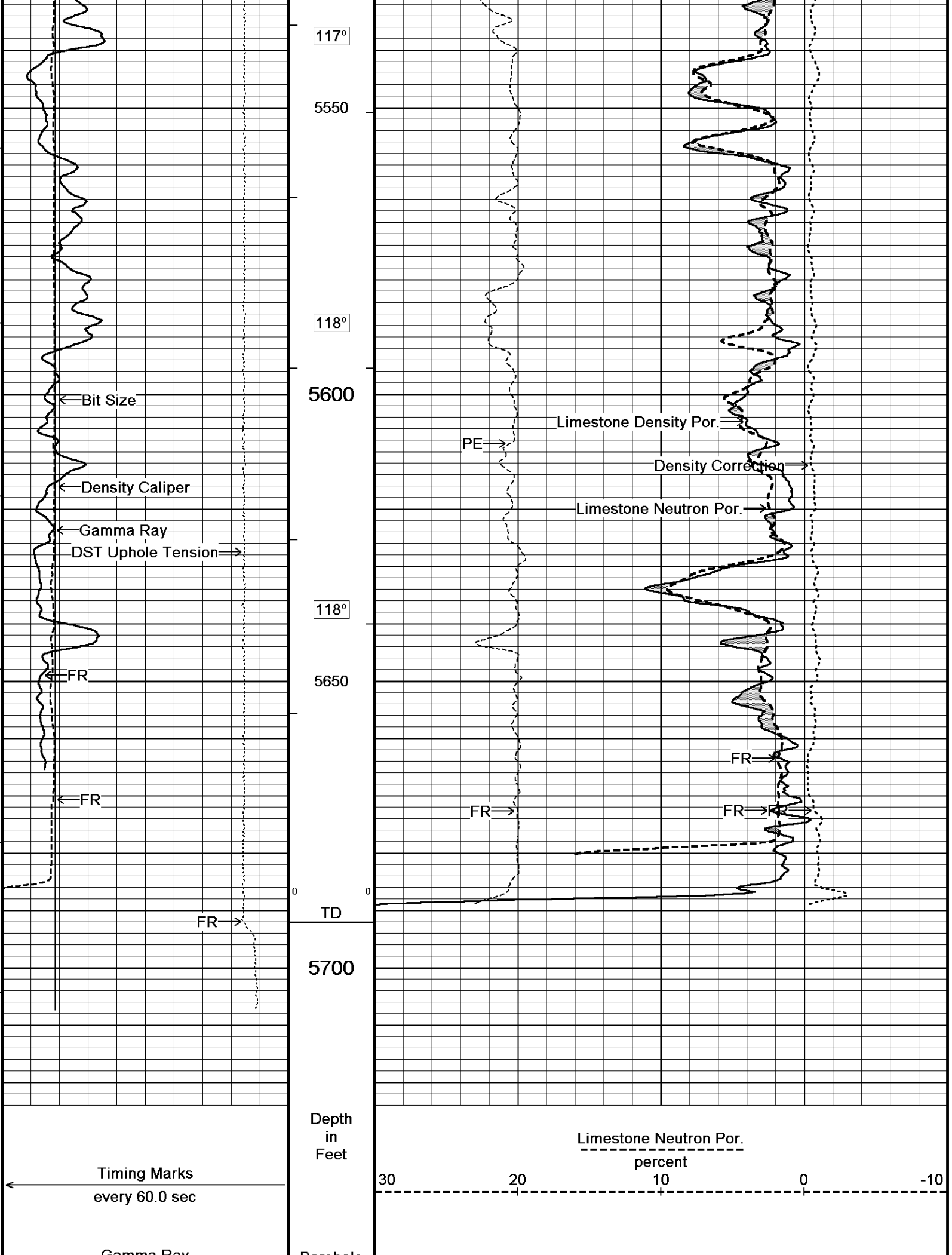
116°

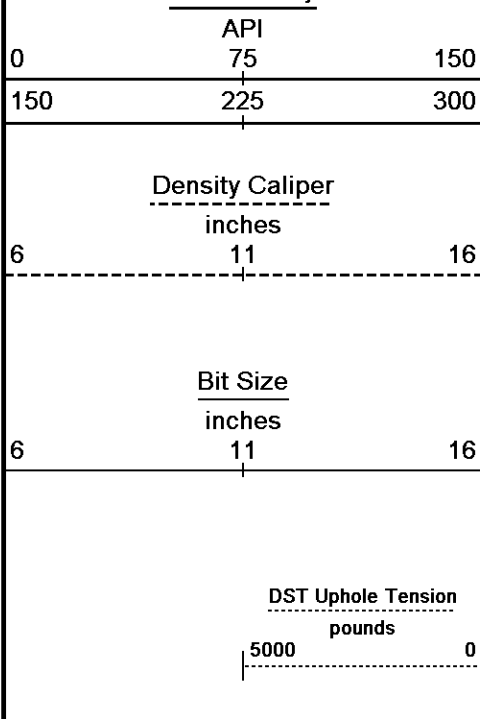
5450

117°

5500





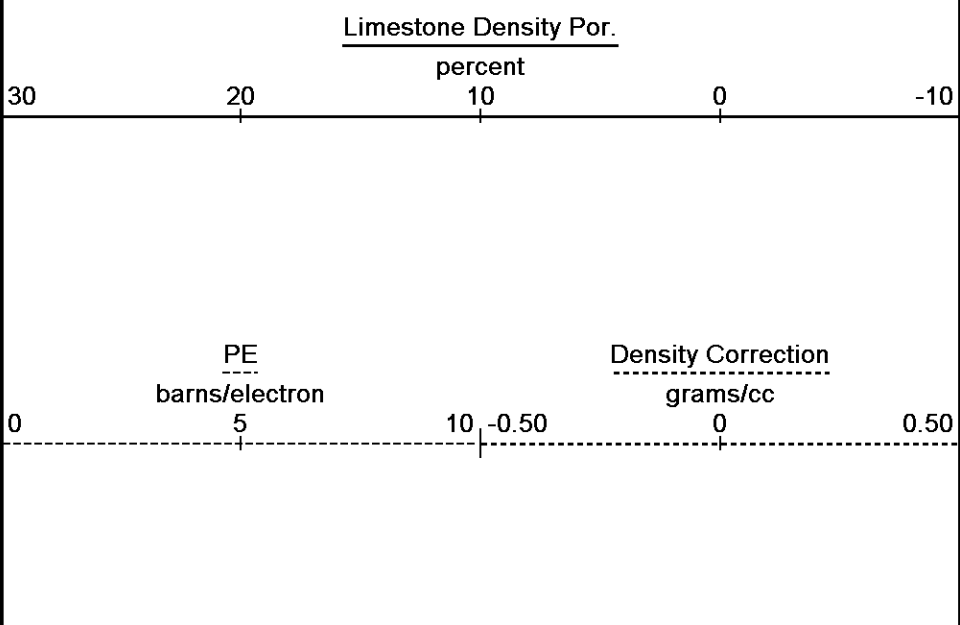


Temp in deg F

HVI every 10 cu ft

Annular Integral every 10 cu ft

Replay Scale 1:240

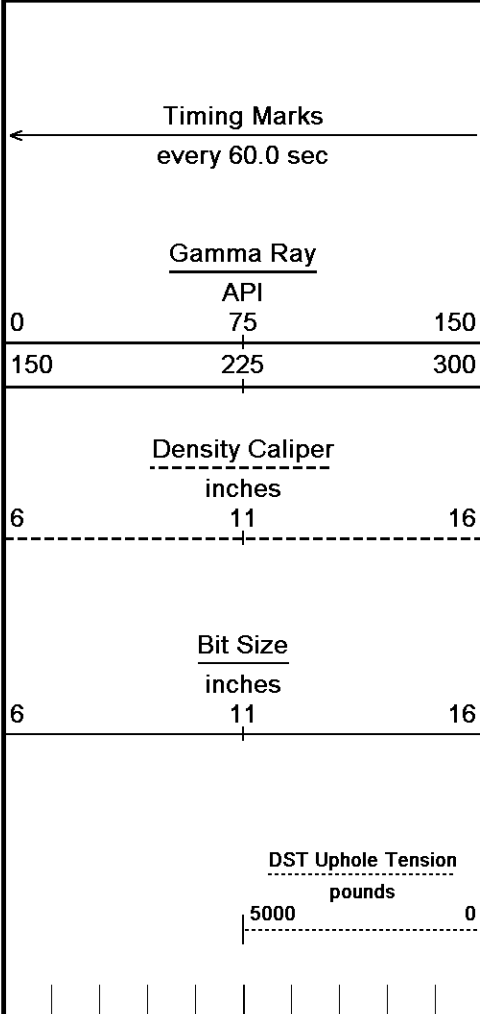


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5 INCH LIMESTONE MAIN

10 INCH HI RESOLUTION

Depth Based Data - Maximum Sampling Increment 2.5cm Plotted on 07-MAR-2014 10:56  
 Filename: C:\Minimus\13.08\Log\30 O'Bri...O'Brien Energy Resources Ardrey #3-35 Hi-Resolution.dta Recorded on 07-MAR-2014 05:59  
 System Versions: Logged with 13.08.2113 Processed with 13.08.2113 Plotted with 13.08.2113



Depth in Feet

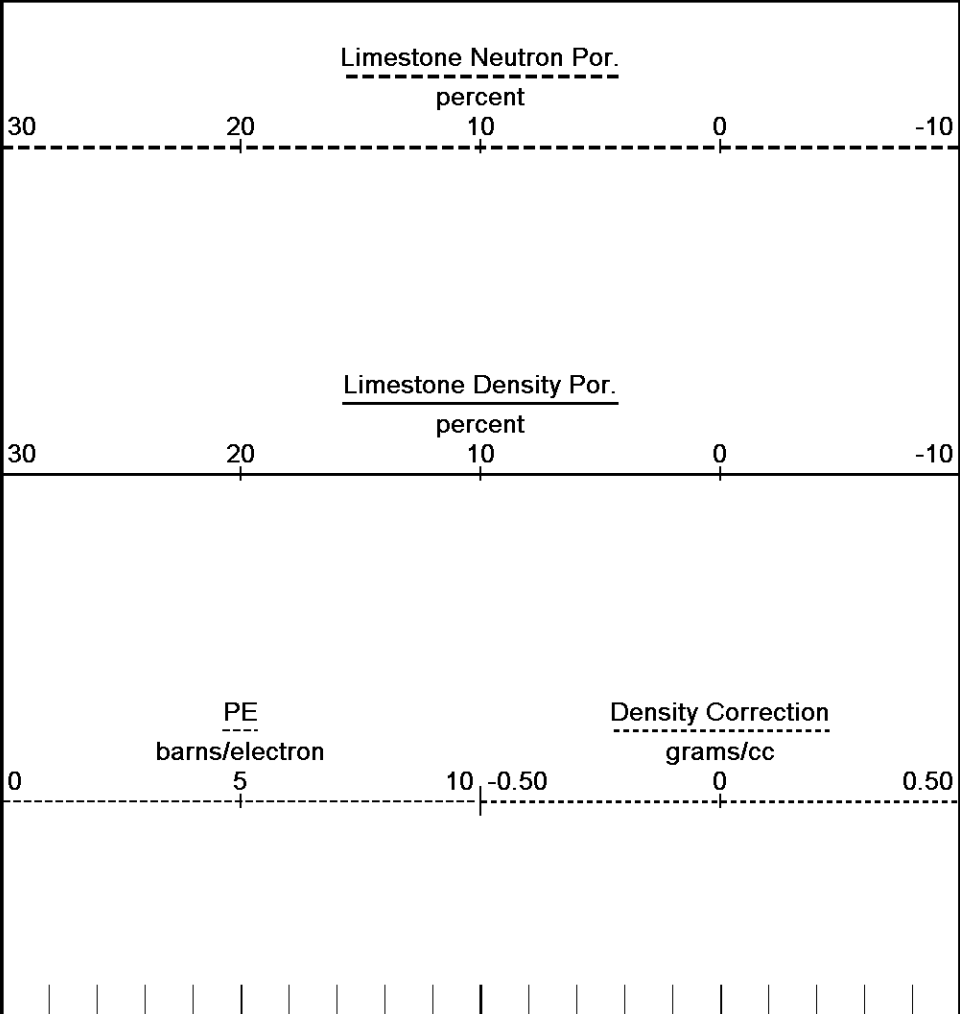
Borehole Temp in deg F

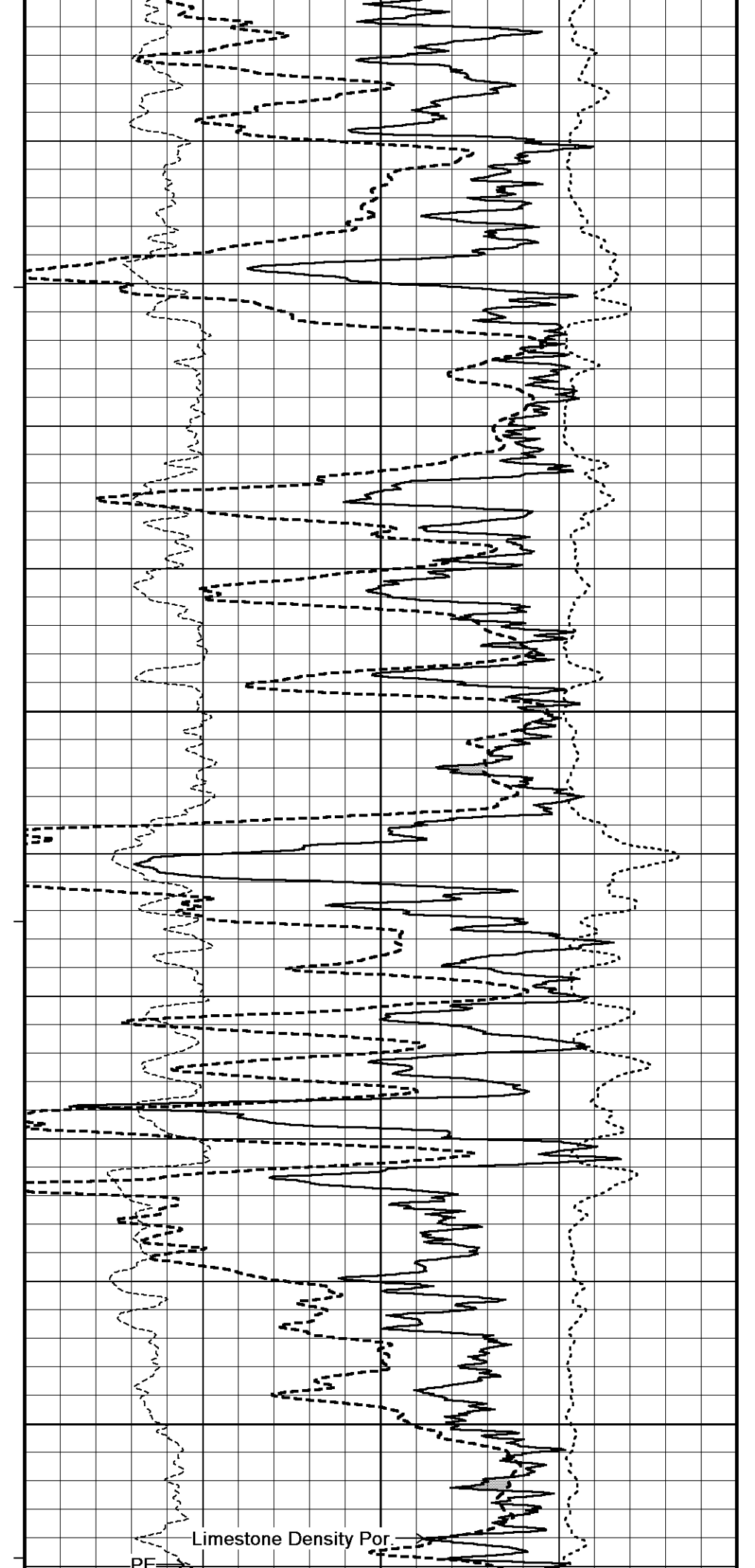
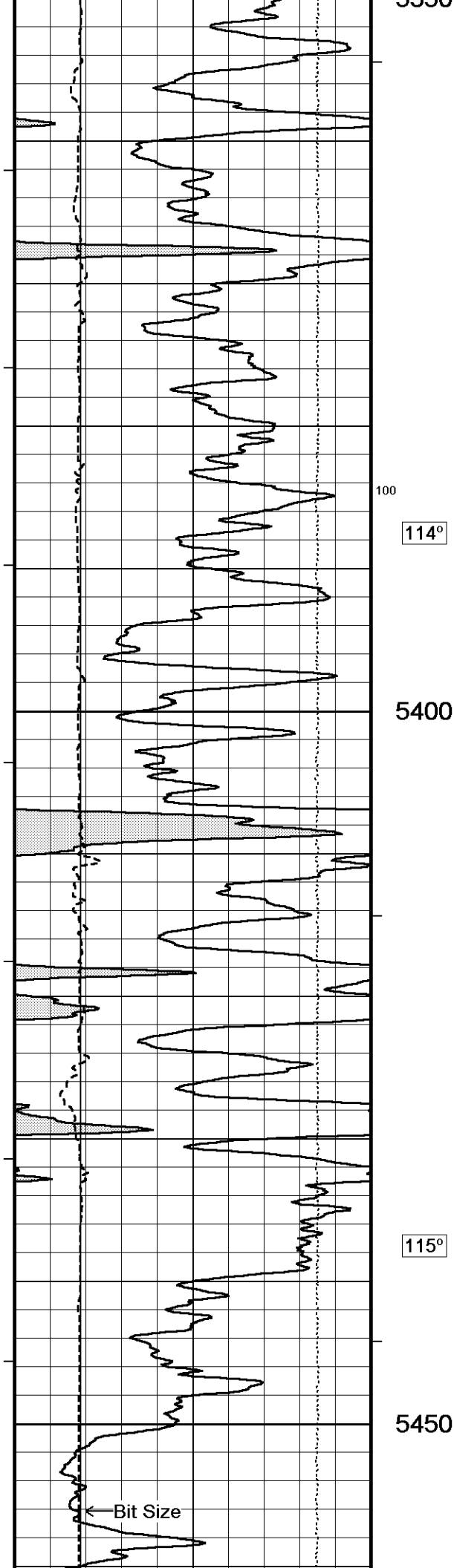
HVI every 10 cu ft

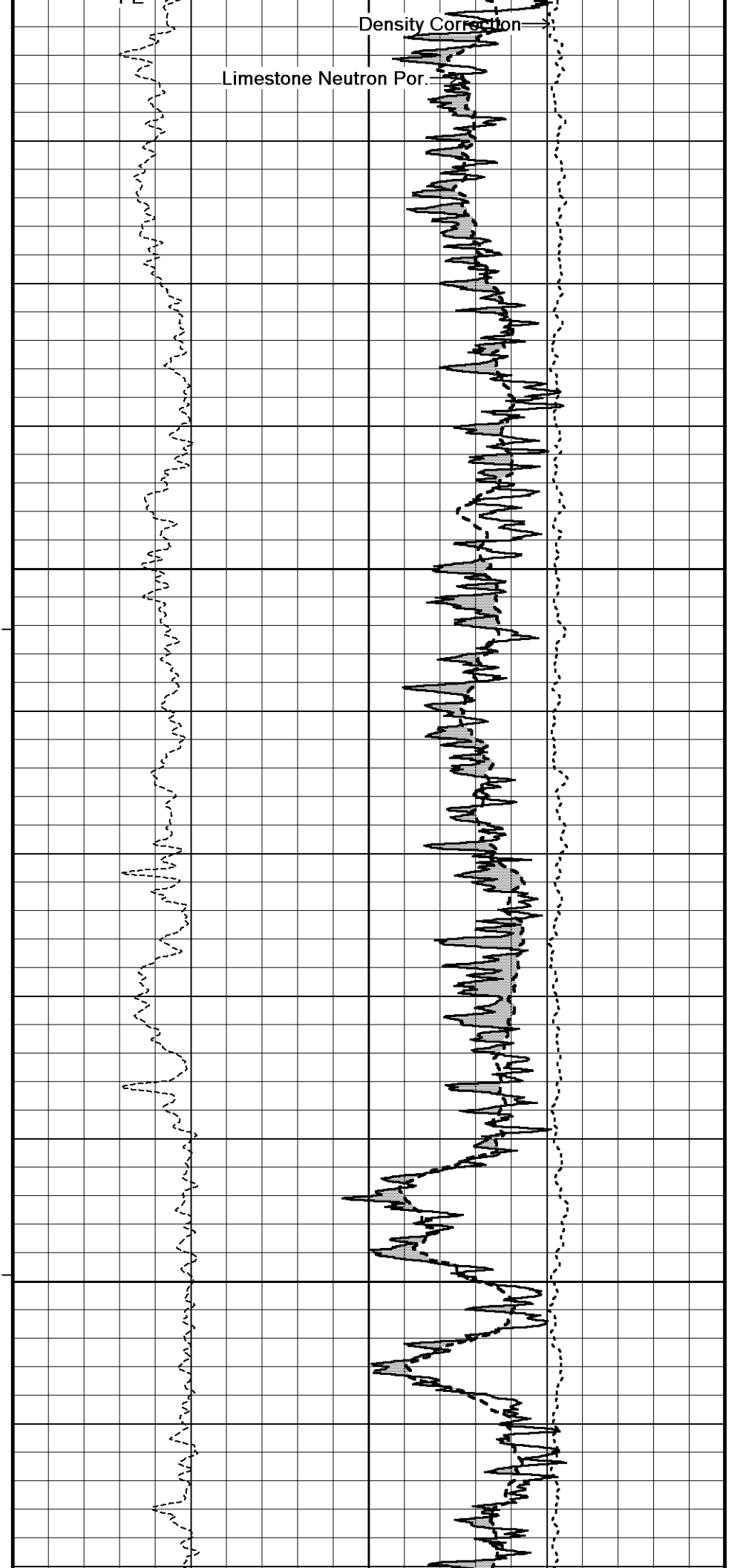
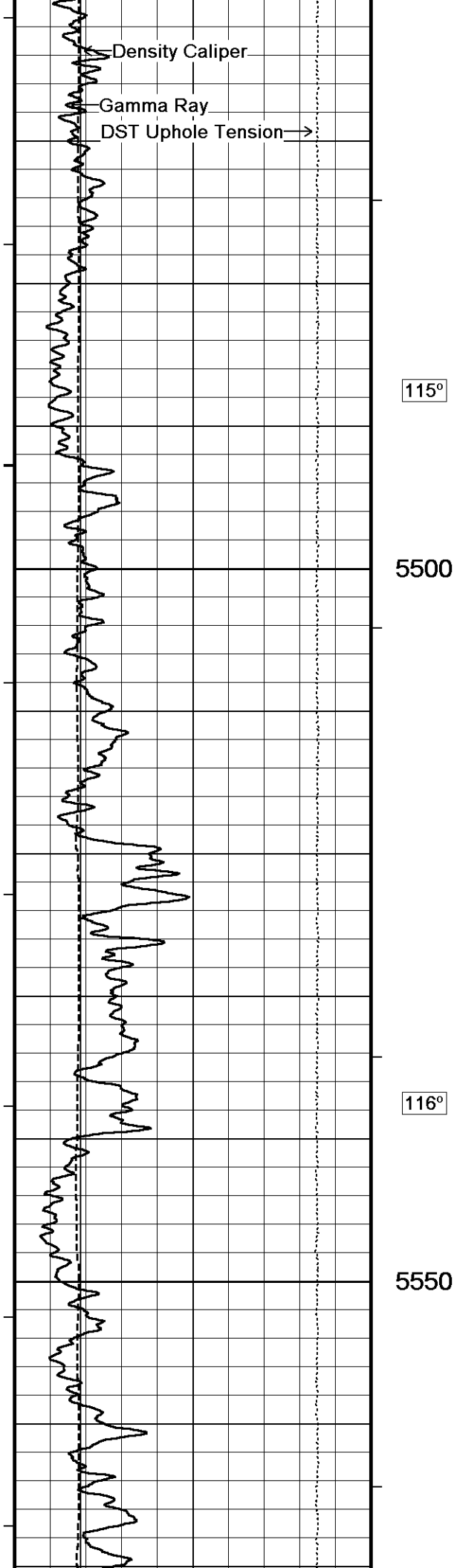
Annular Integral every 10 cu ft

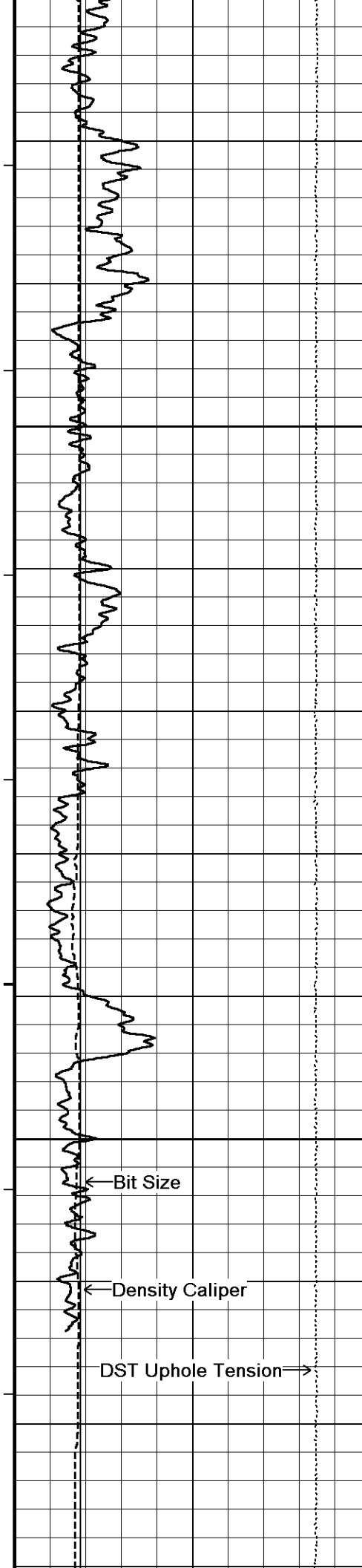
Replay Scale 1:120

5350







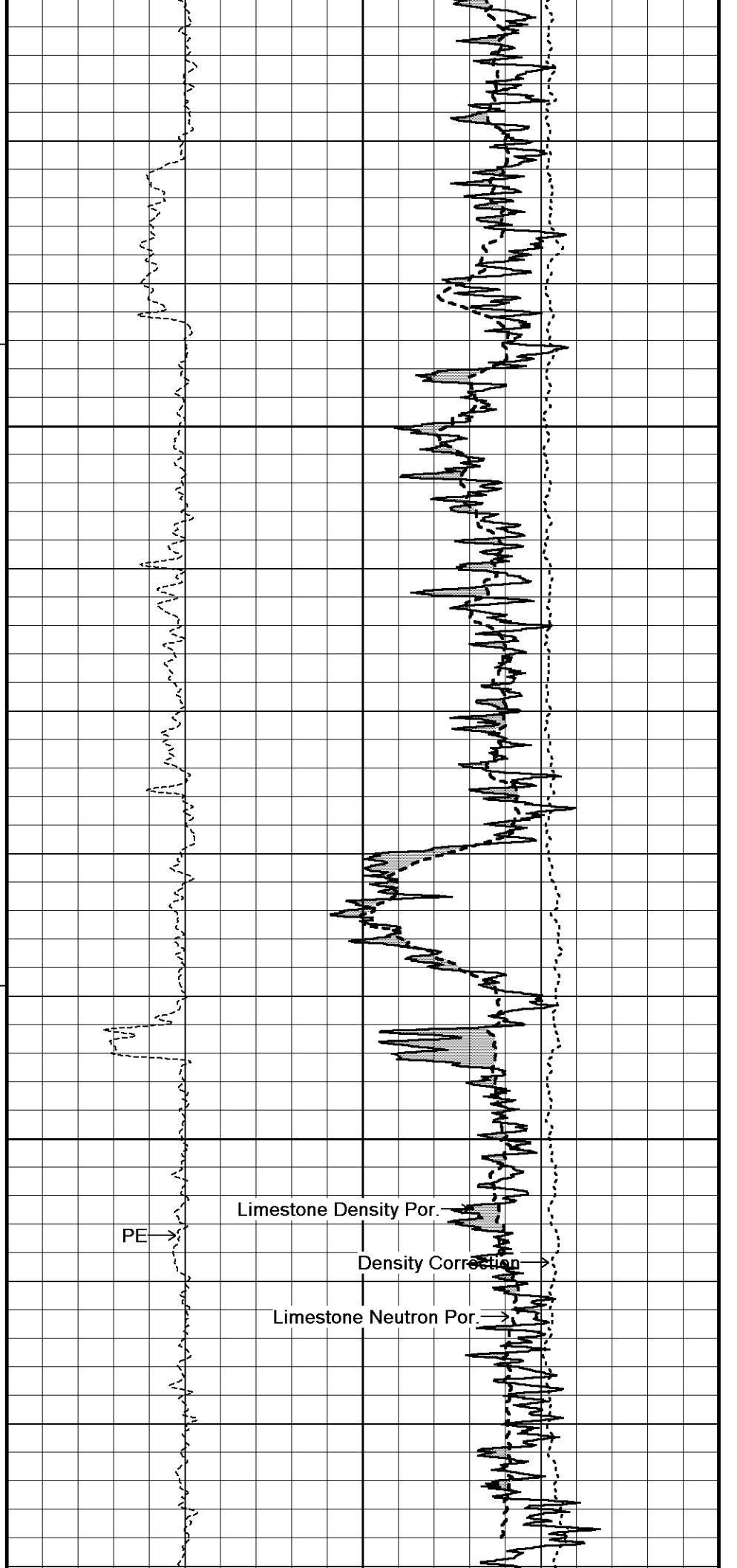


117°

5600

117°

5650

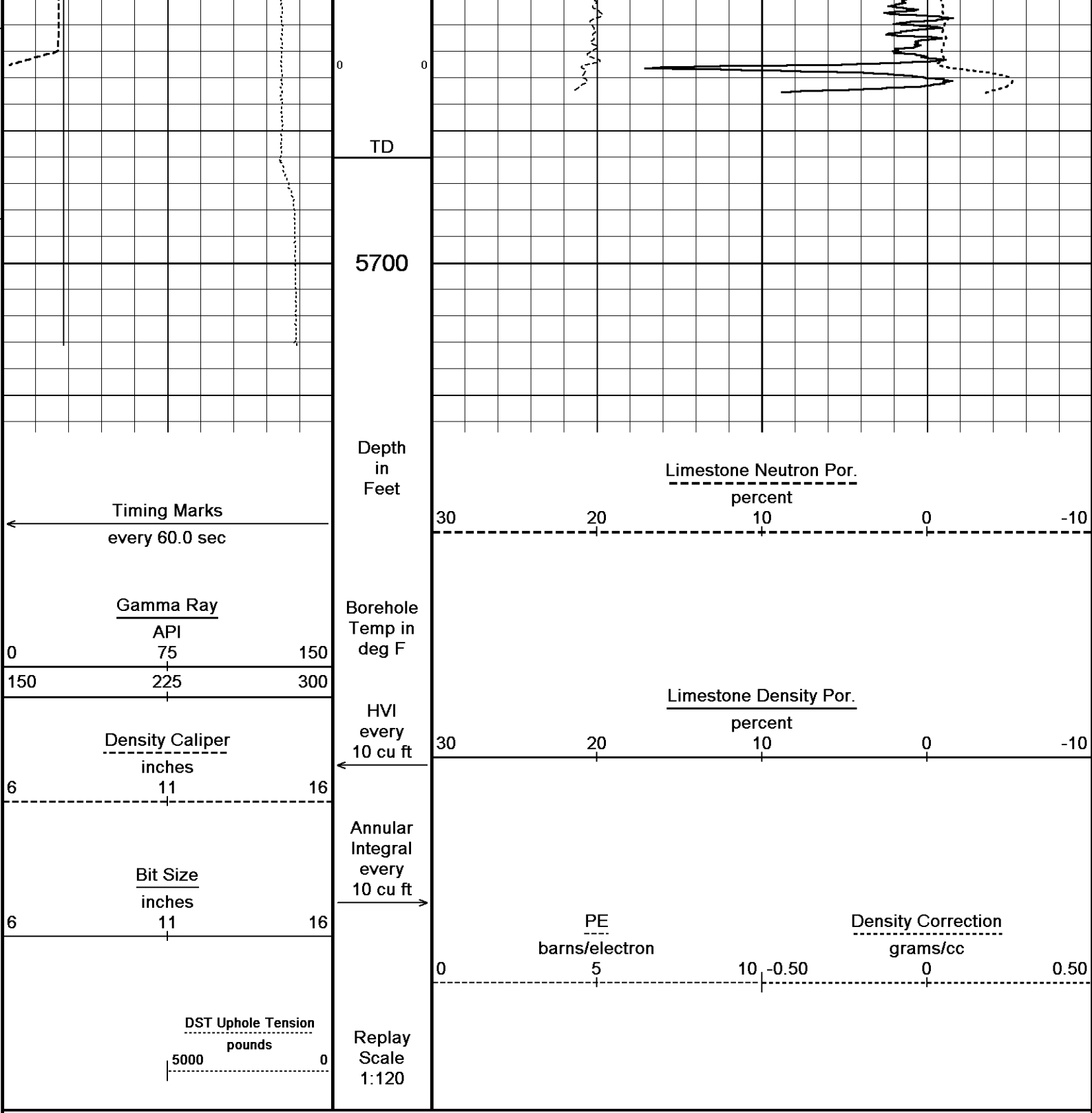


PE

Limestone Density Por.

Density Correction

Limestone Neutron Por.



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↑ **10 INCH HI RESOLUTION** ↑

↓ **REPEAT SECTION** ↓

Depth Based Data - Maximum Sampling Increment 10.0cm  
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every 60.0 sec

Gamma Ray

API

|     |     |     |
|-----|-----|-----|
| 0   | 75  | 150 |
| 150 | 225 | 300 |

Borehole Temp in deg F

Density Caliper

inches

|   |    |    |
|---|----|----|
| 6 | 11 | 16 |
|---|----|----|

HVI every 10 cu ft

Bit Size

inches

|   |    |    |
|---|----|----|
| 6 | 11 | 16 |
|---|----|----|

Annular Integral every 10 cu ft

DST Uphole Tension

pounds

|      |   |
|------|---|
| 5000 | 0 |
|------|---|

Replay Scale 1:240

Limestone Density Por.

percent

|    |    |    |   |     |
|----|----|----|---|-----|
| 30 | 20 | 10 | 0 | -10 |
|----|----|----|---|-----|

PE

barns/electron

|   |   |    |       |   |      |
|---|---|----|-------|---|------|
| 0 | 5 | 10 | -0.50 | 0 | 0.50 |
|---|---|----|-------|---|------|

Density Correction

grams/cc



5350

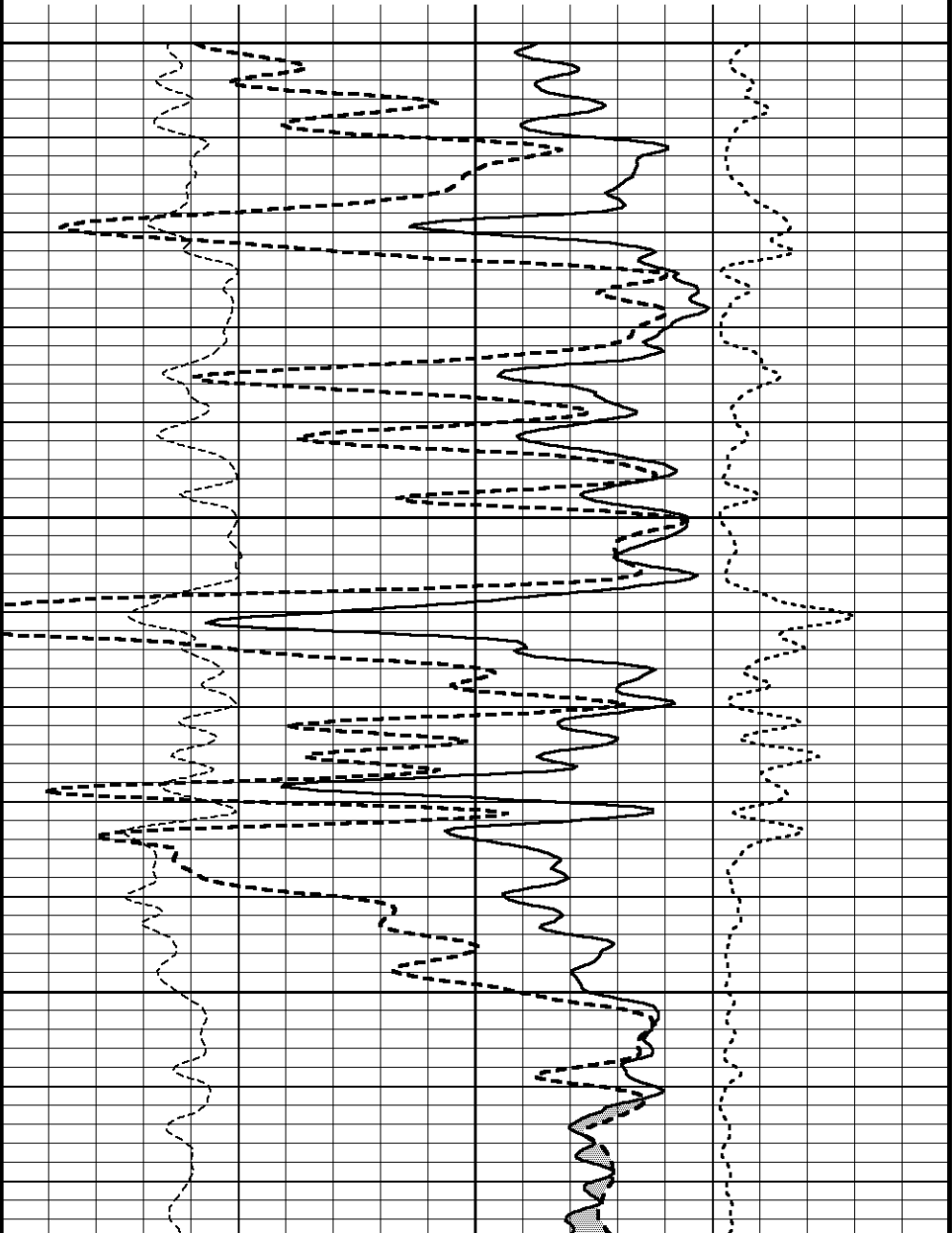
100

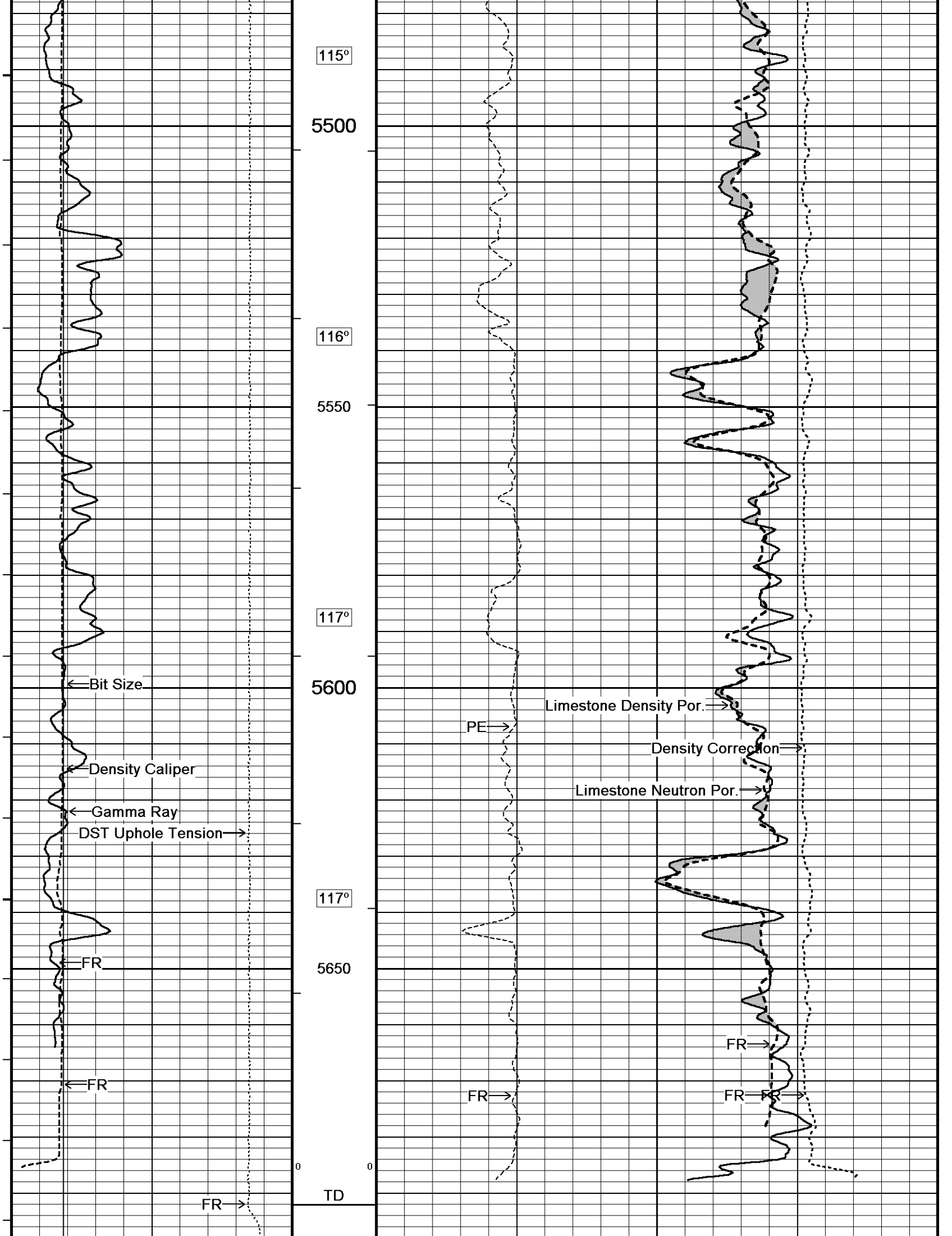
114°

5400

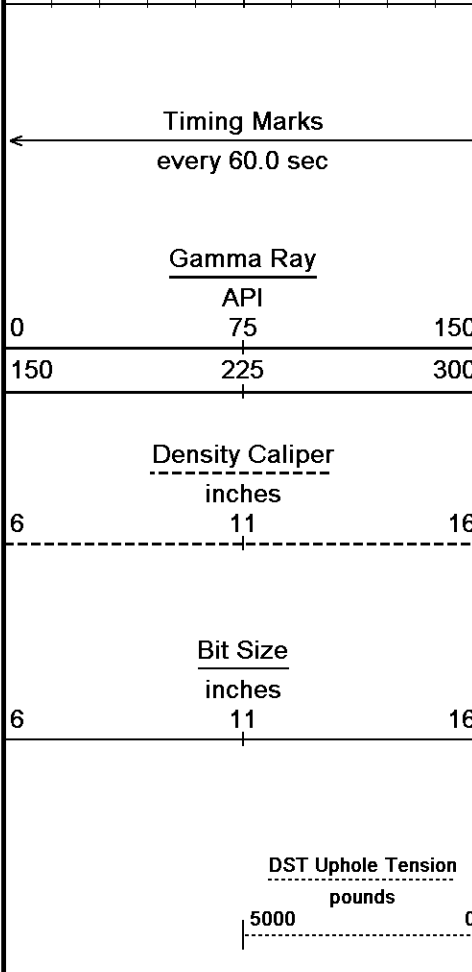
115°

5450





5700



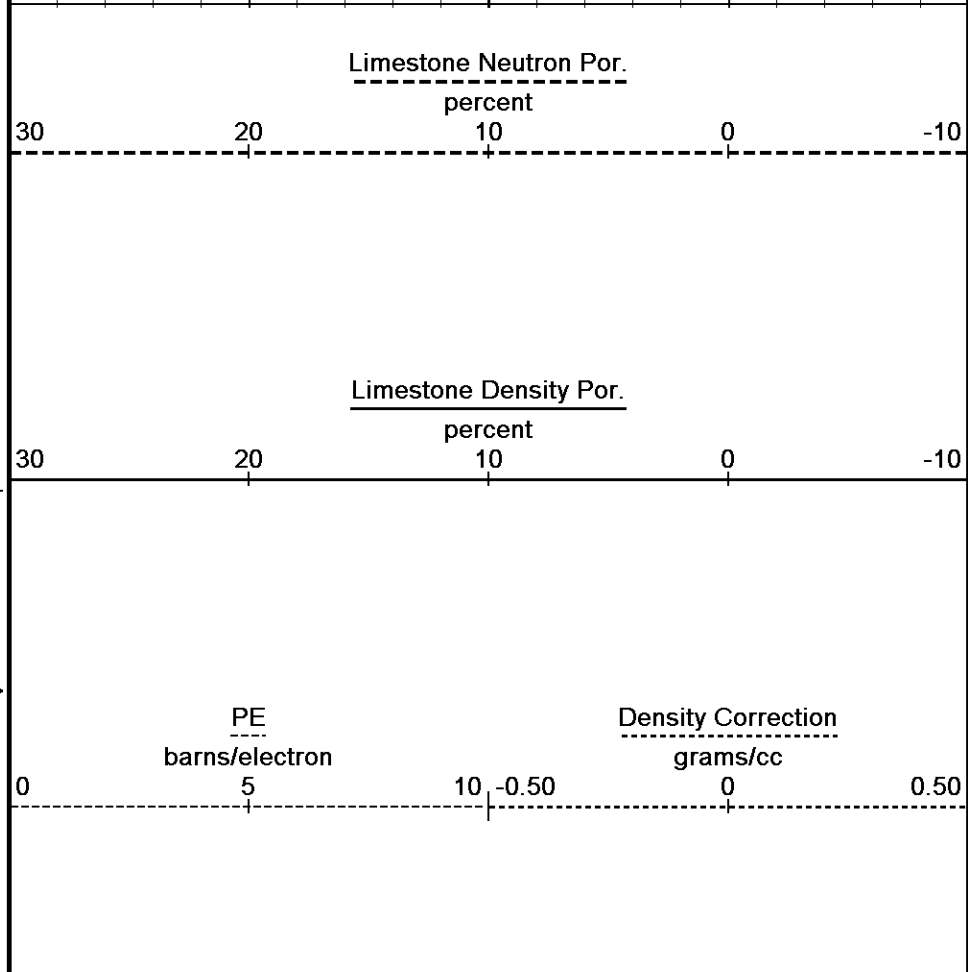
Depth in Feet

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 07-MAR-2014 10:56

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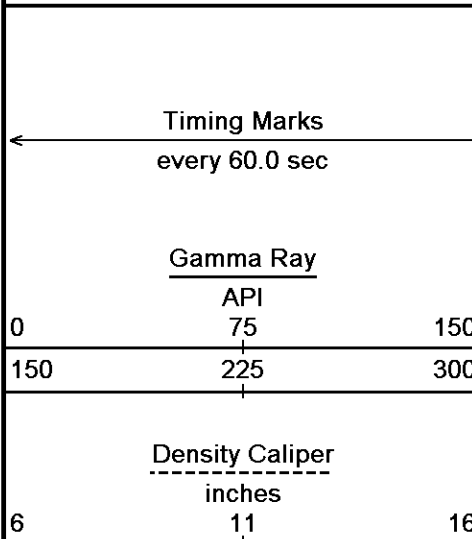
↑ REPEAT SECTION ↑

↓ 5 INCH BULK DENSITY MAIN ↓

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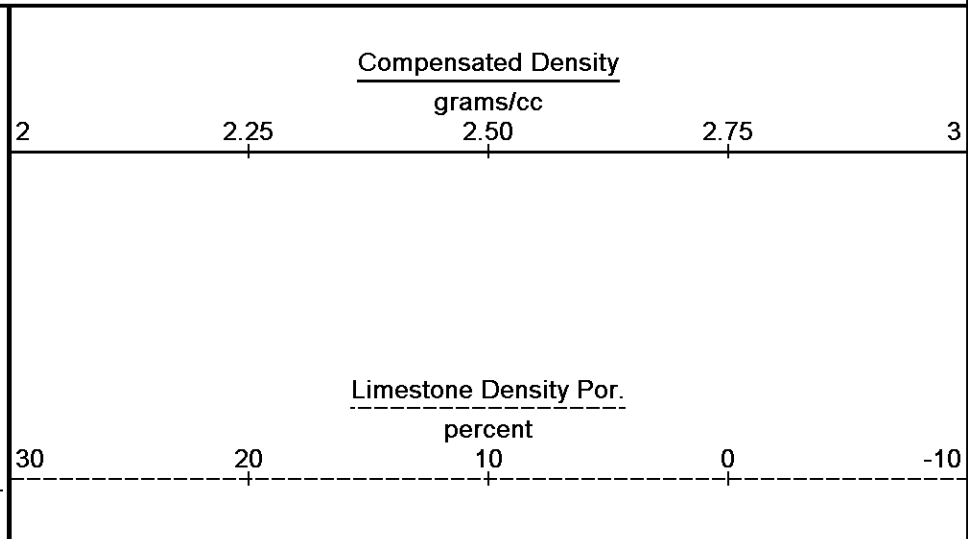
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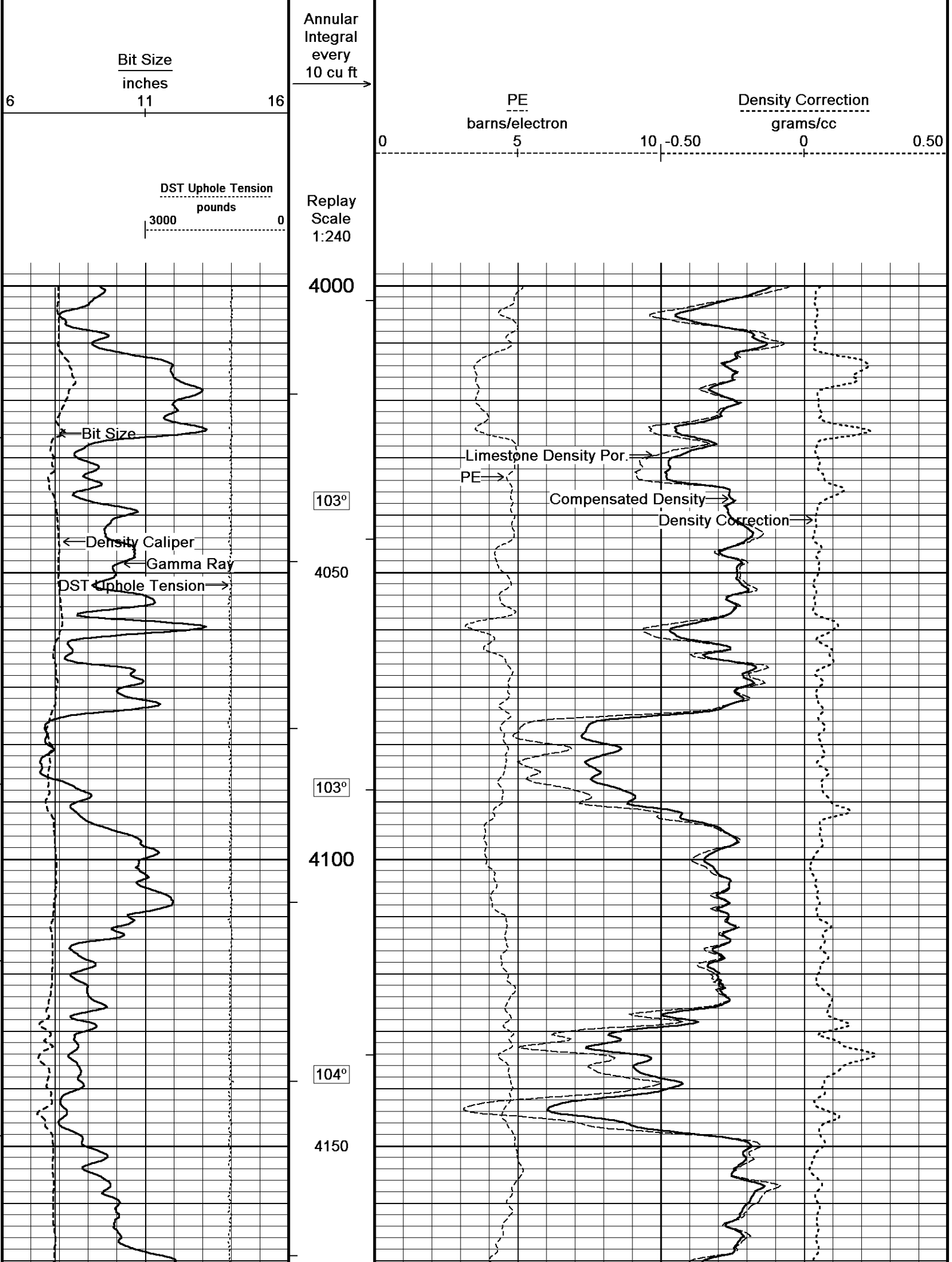


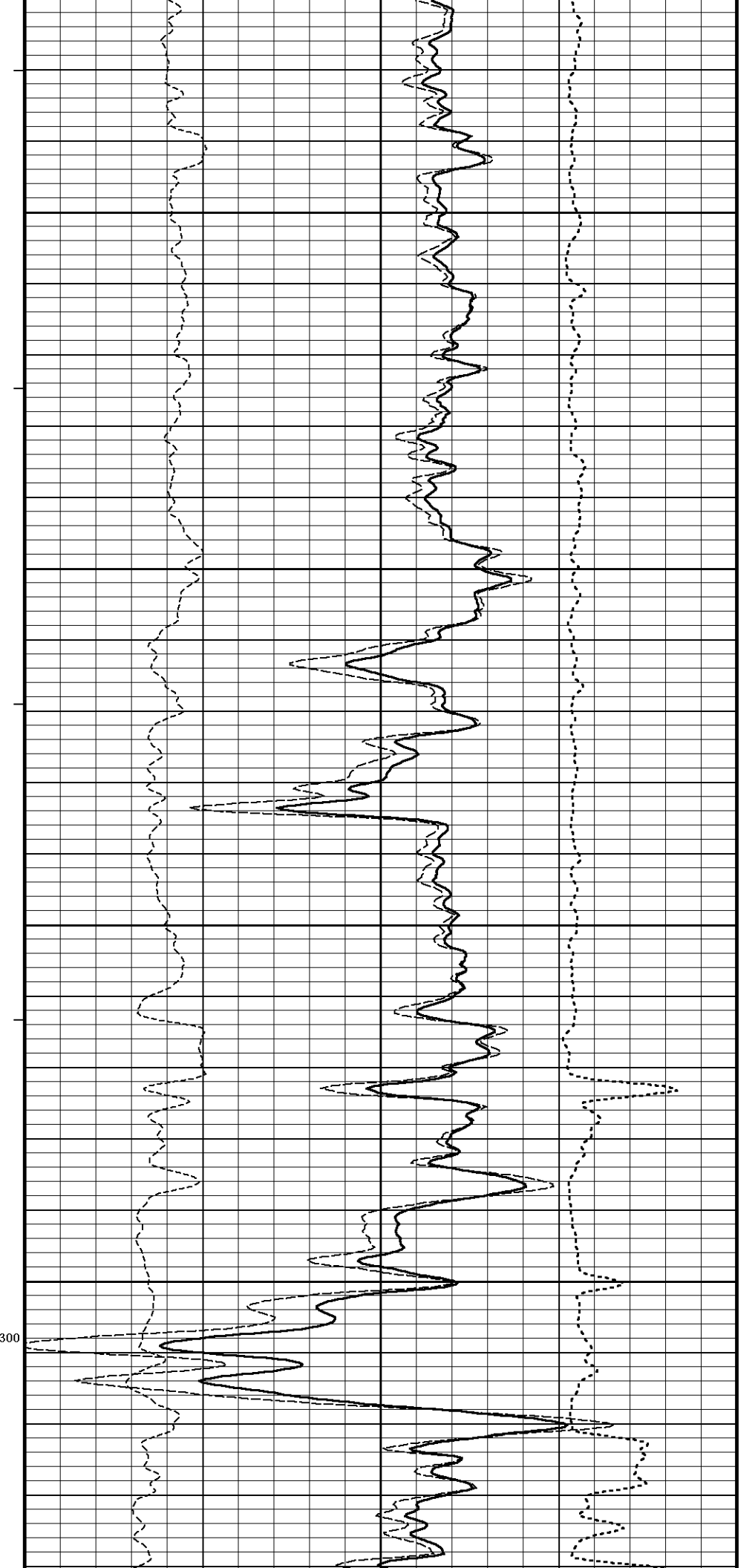
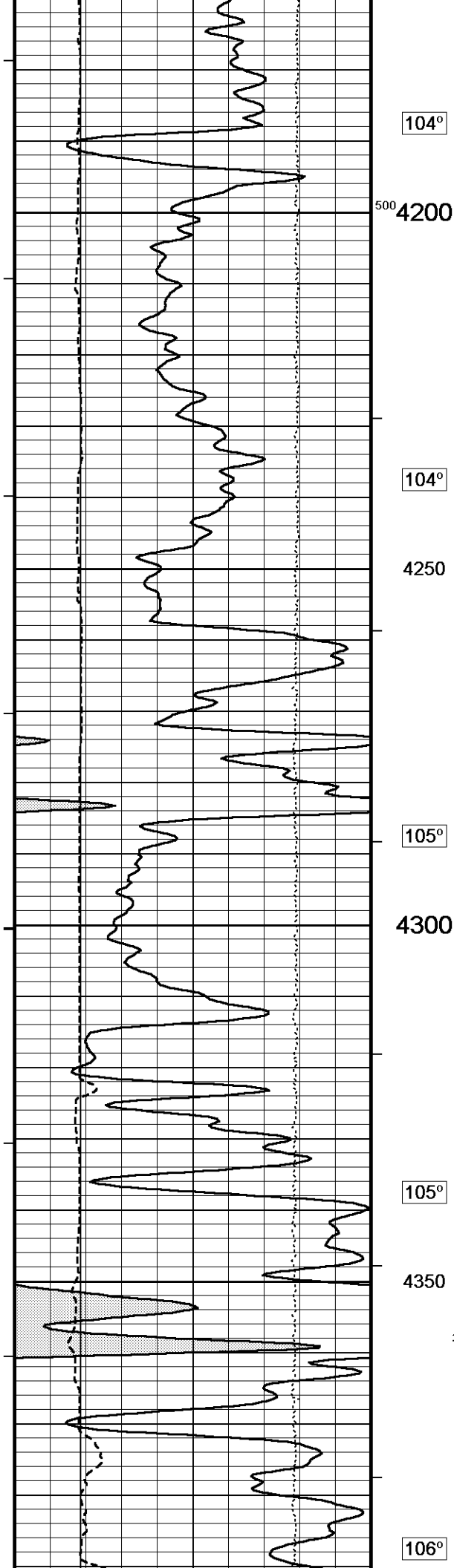
Depth in Feet

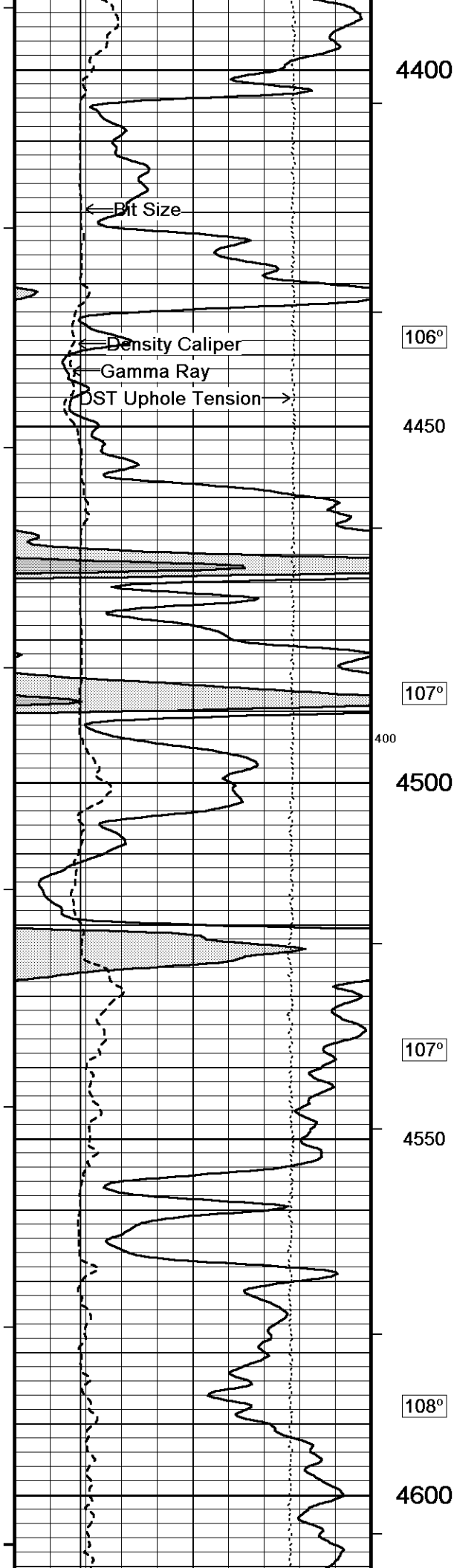
Borehole Temp in deg F

HVI every 10 cu ft

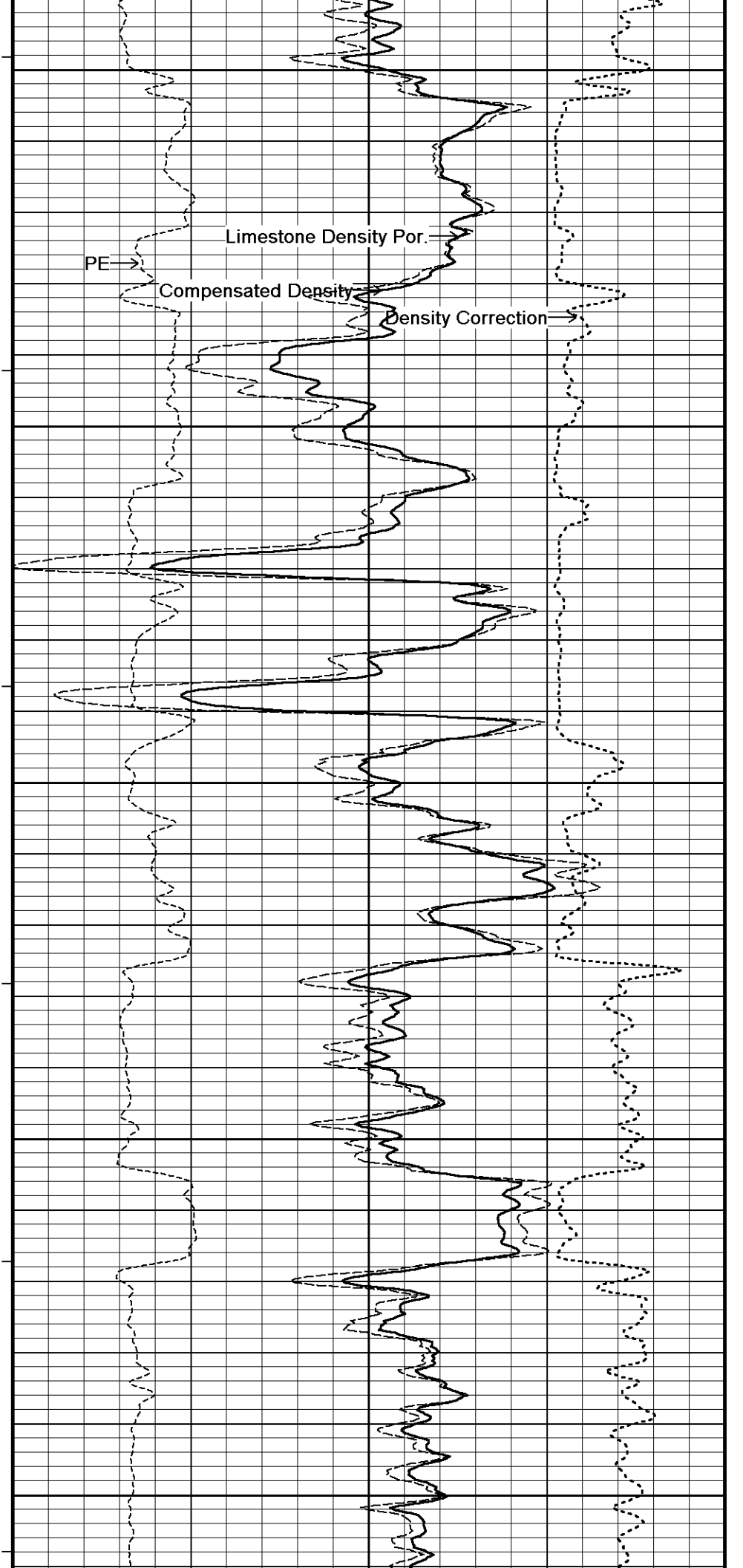


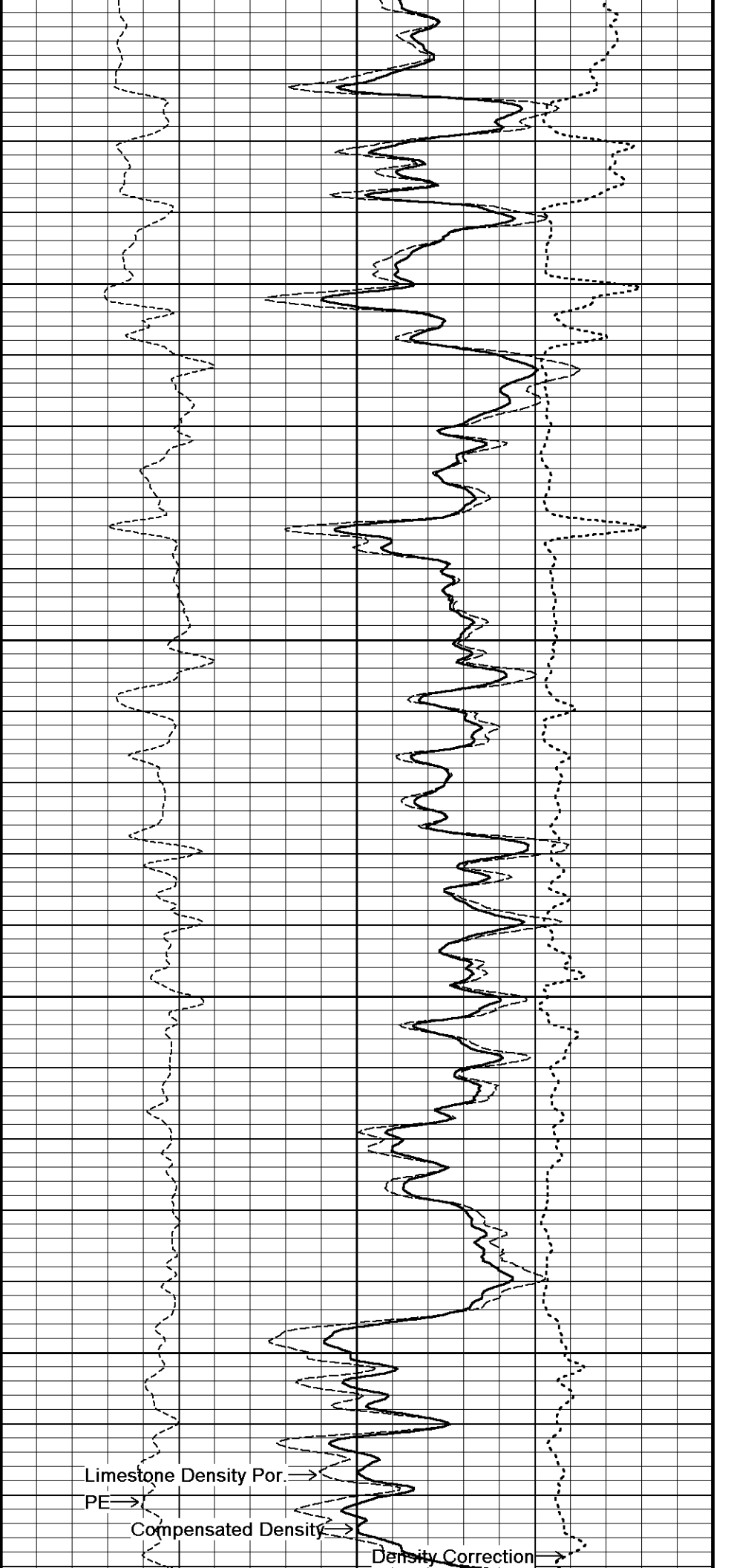
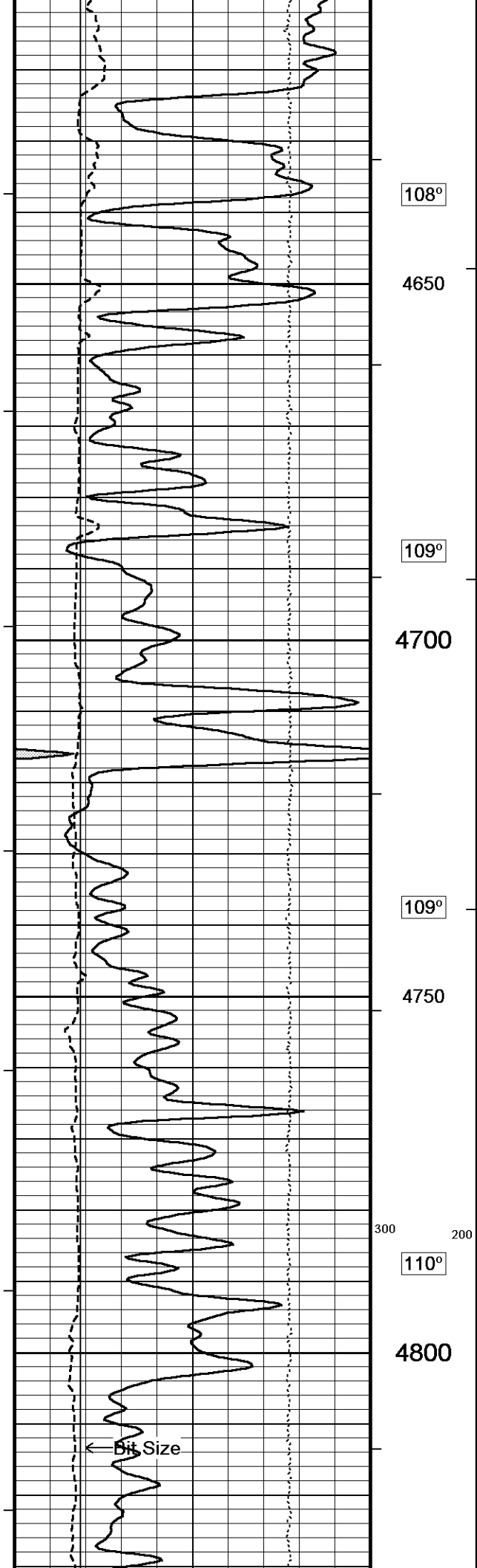


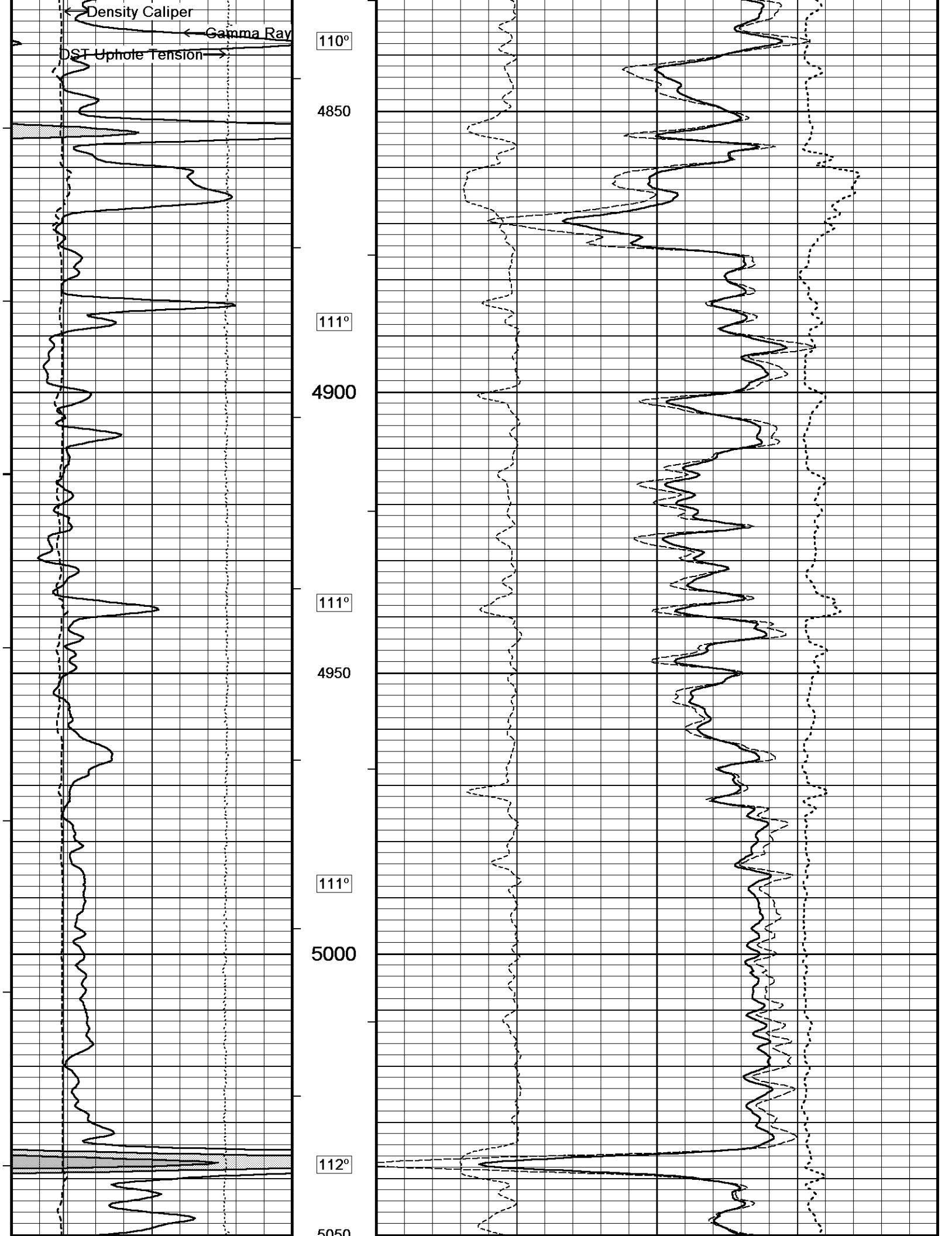


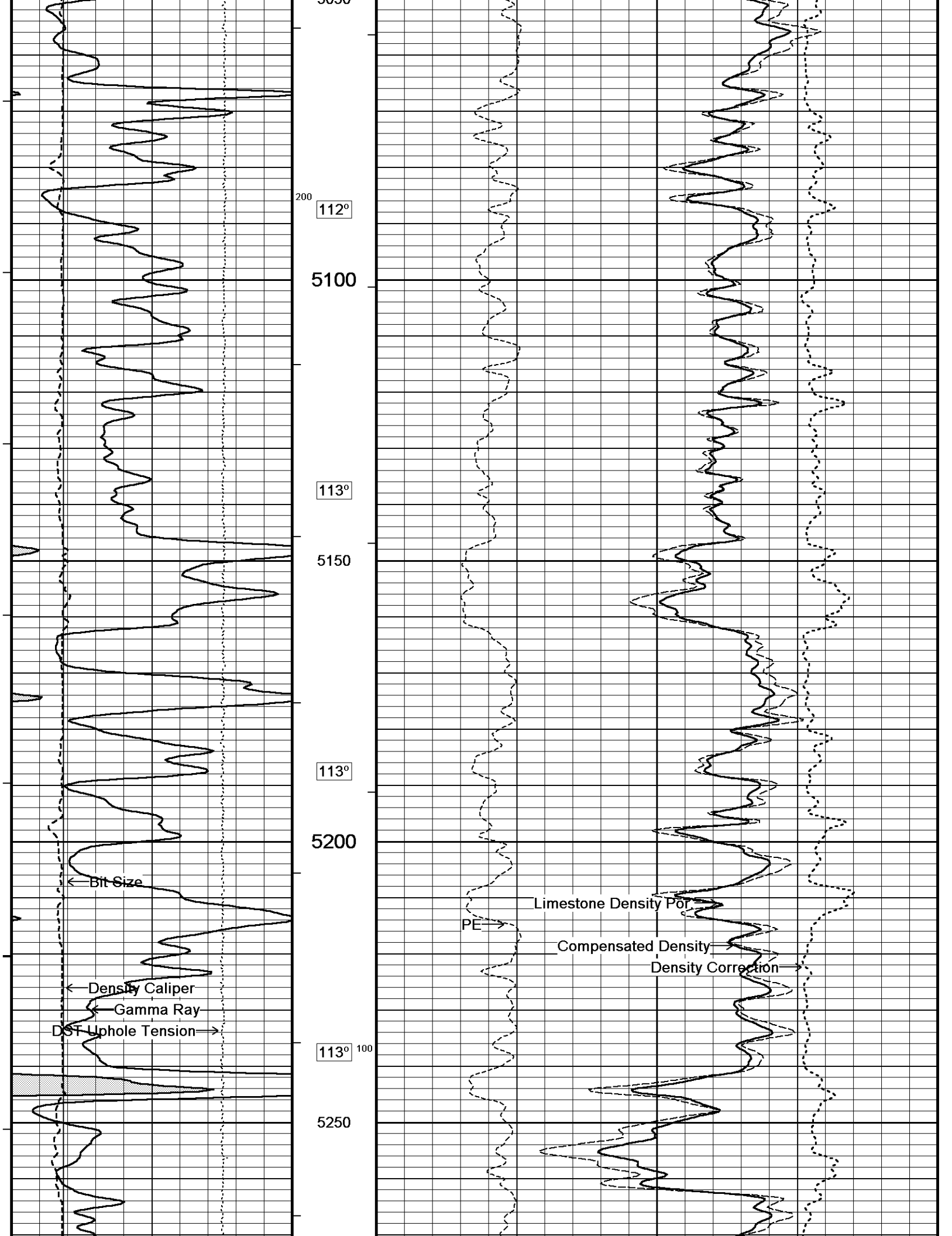


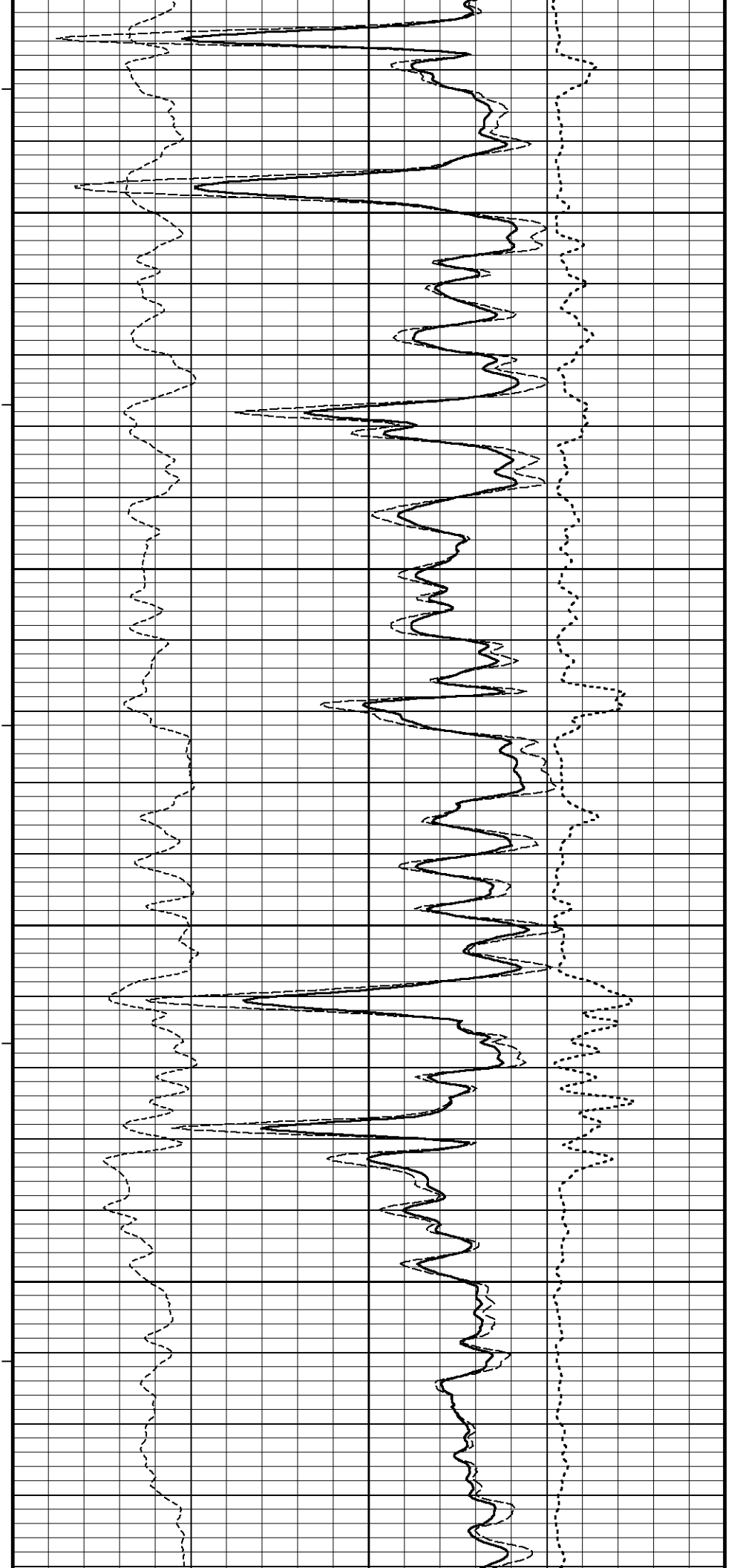
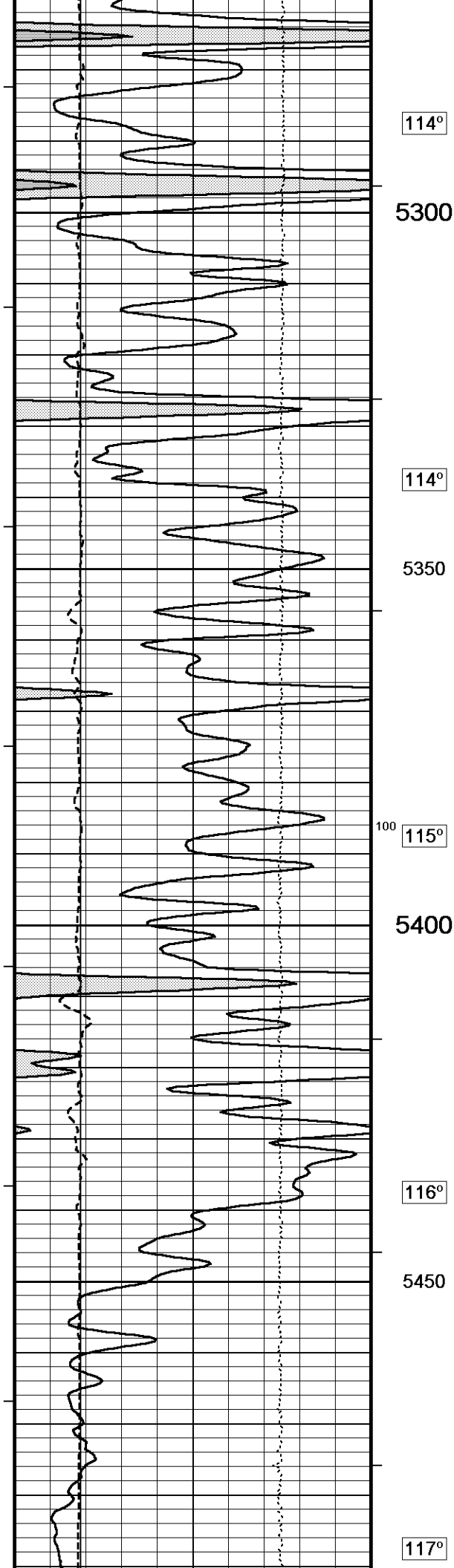
4400  
106°  
4450  
107°  
400  
4500  
107°  
4550  
108°  
4600

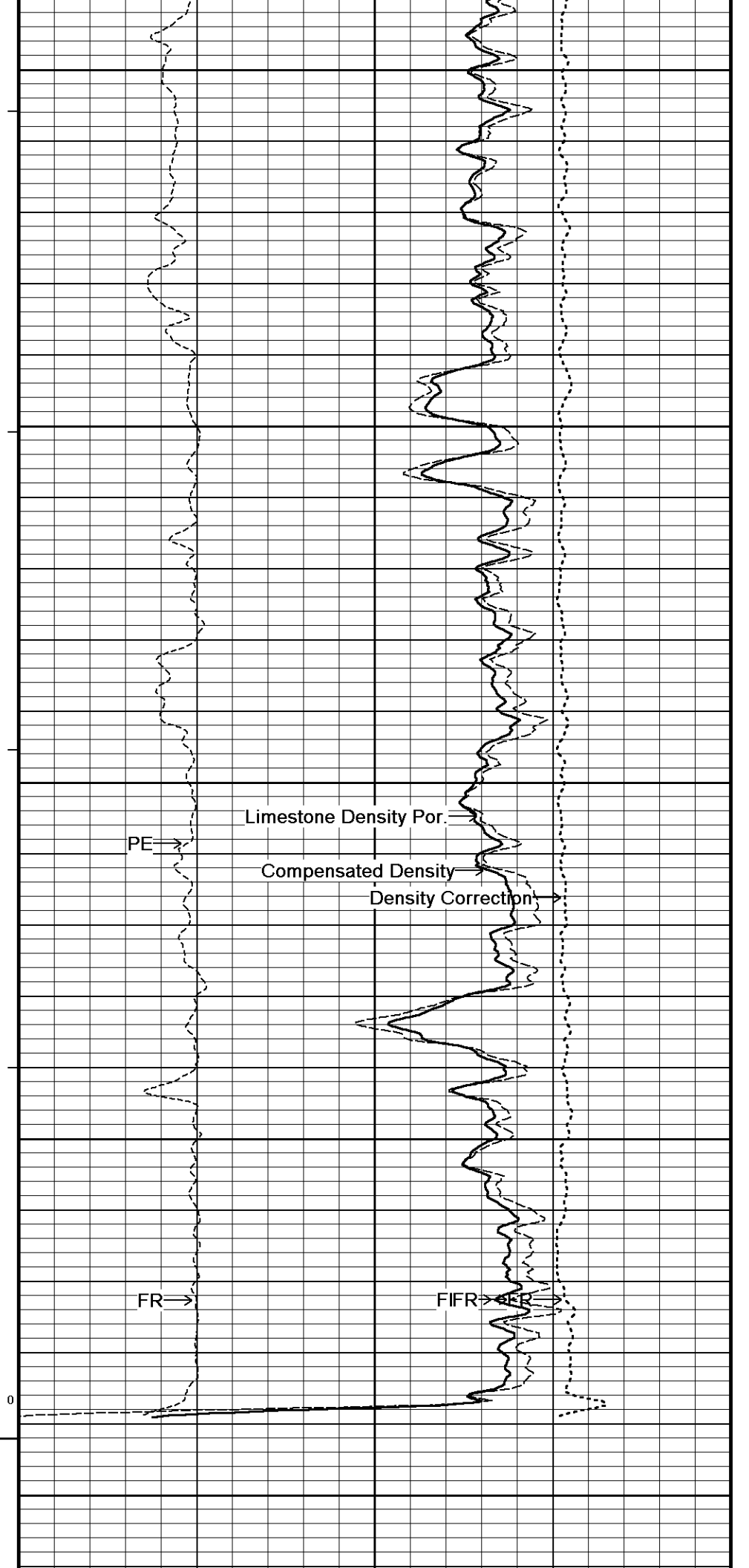
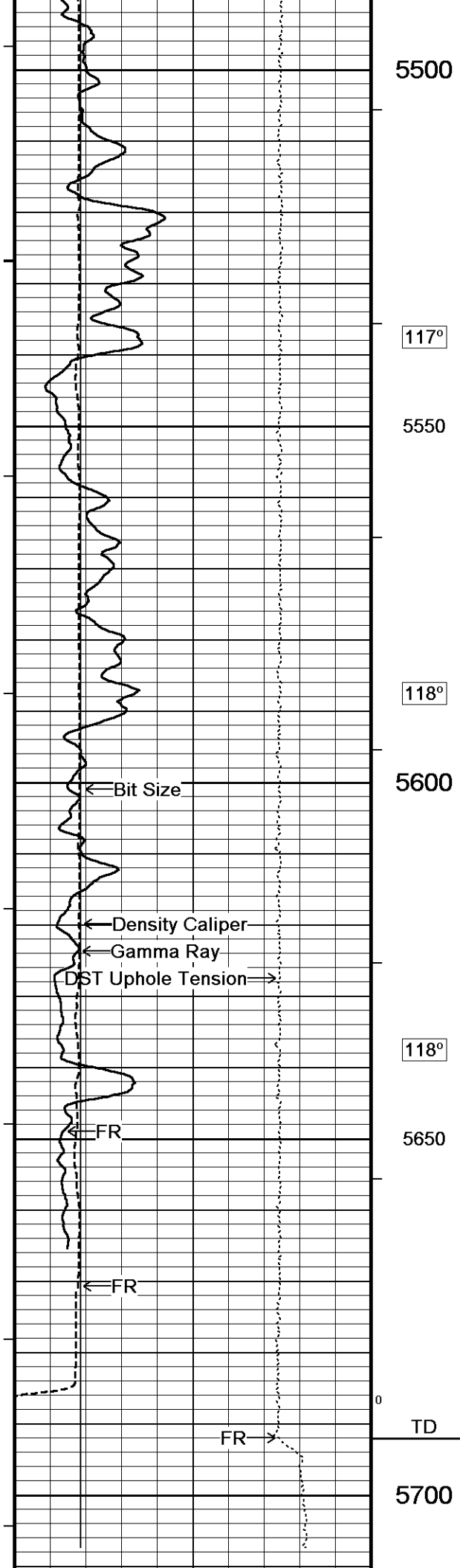


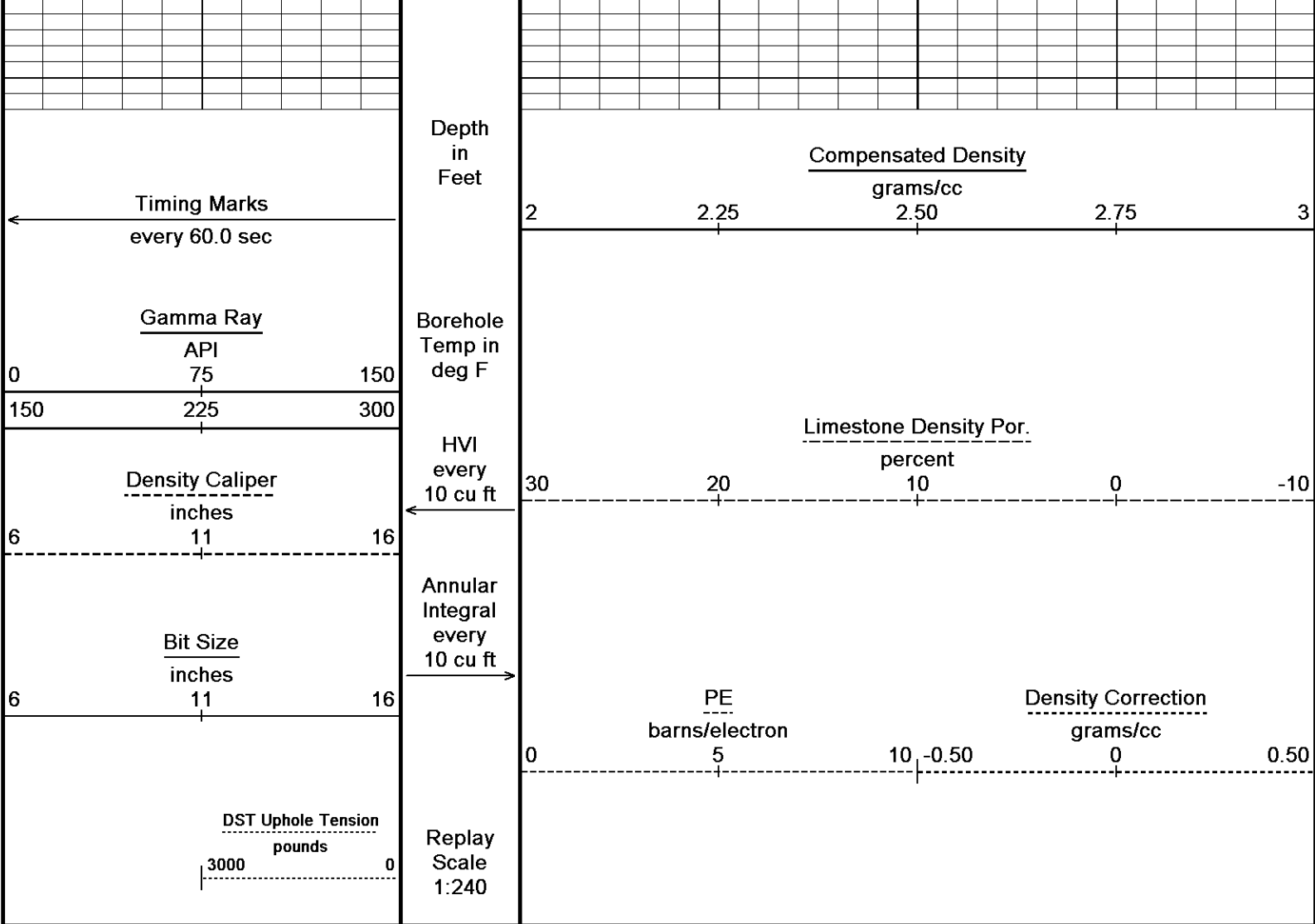










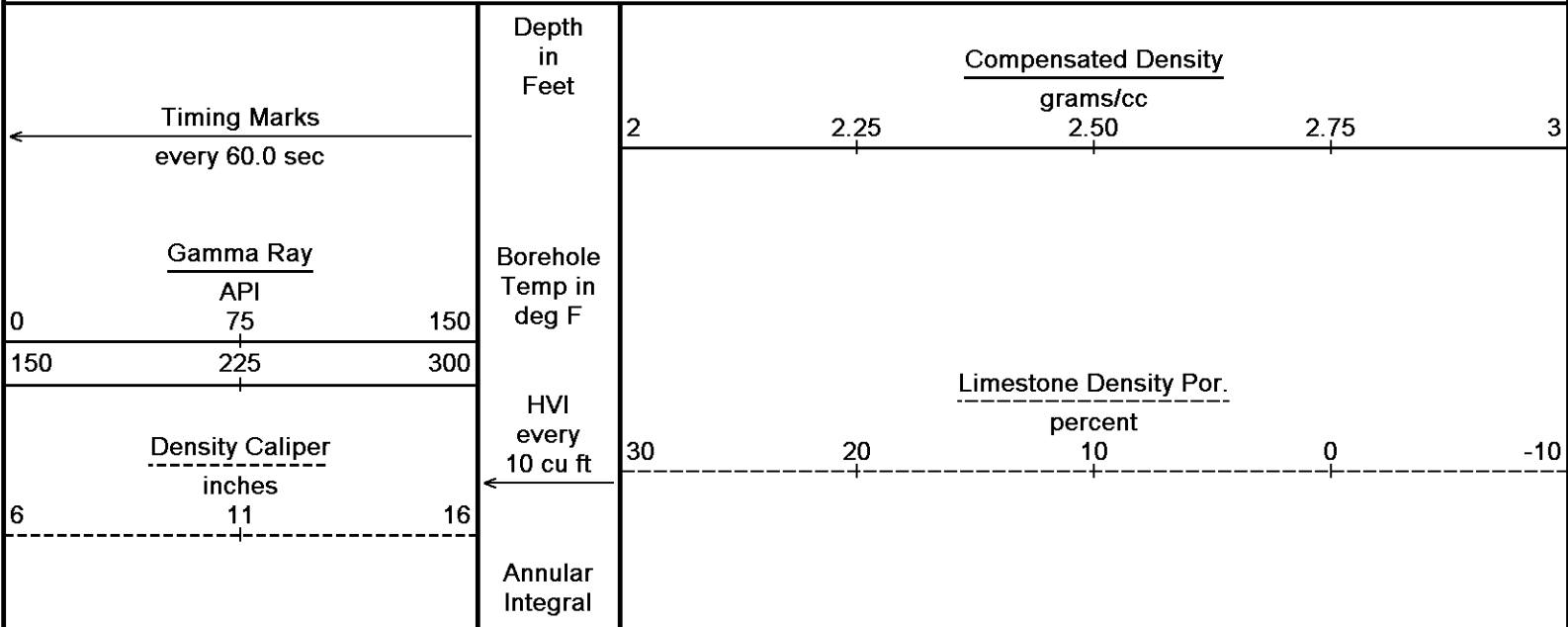


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5 INCH BULK DENSITY MAIN

10 INCH HI RESOLUTION

Depth Based Data - Maximum Sampling Increment 2.5cm  
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Bit Size  
inches

6 11 16

every  
10 cu ft

PE  
barns/electron

Density Correction  
grams/cc

0 5 10 -0.50 0 0.50

DST Uphole Tension  
pounds

3000 0

Replay  
Scale  
1:120

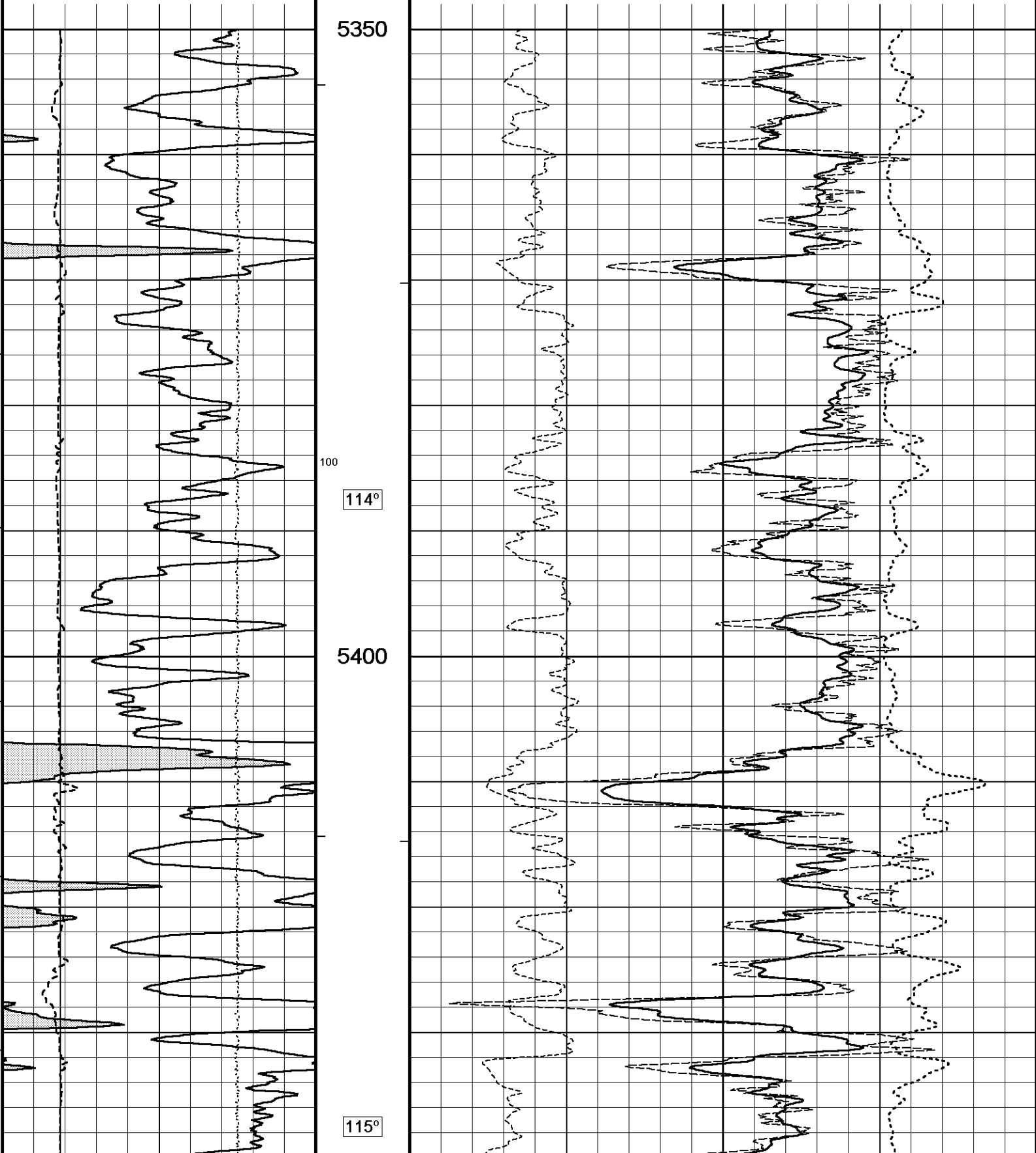
5350

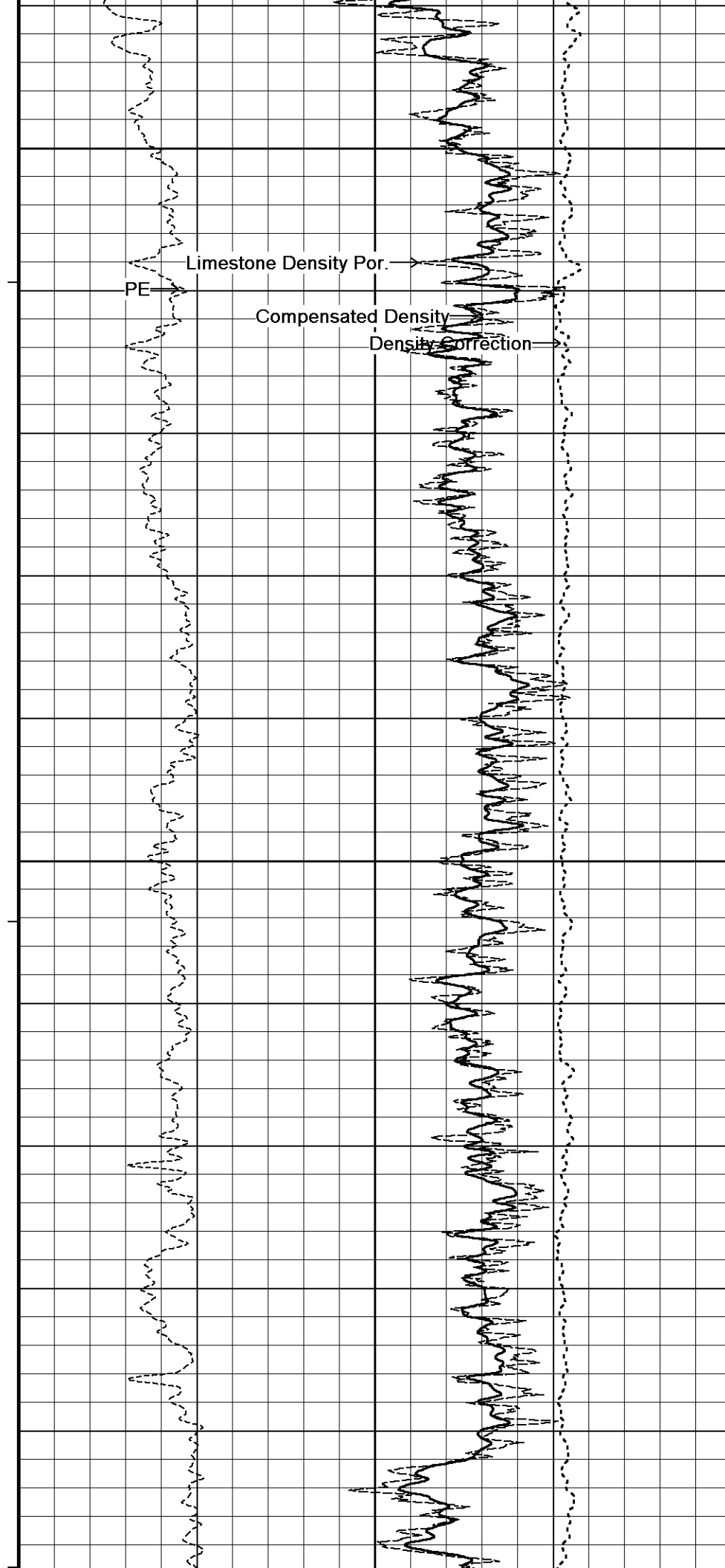
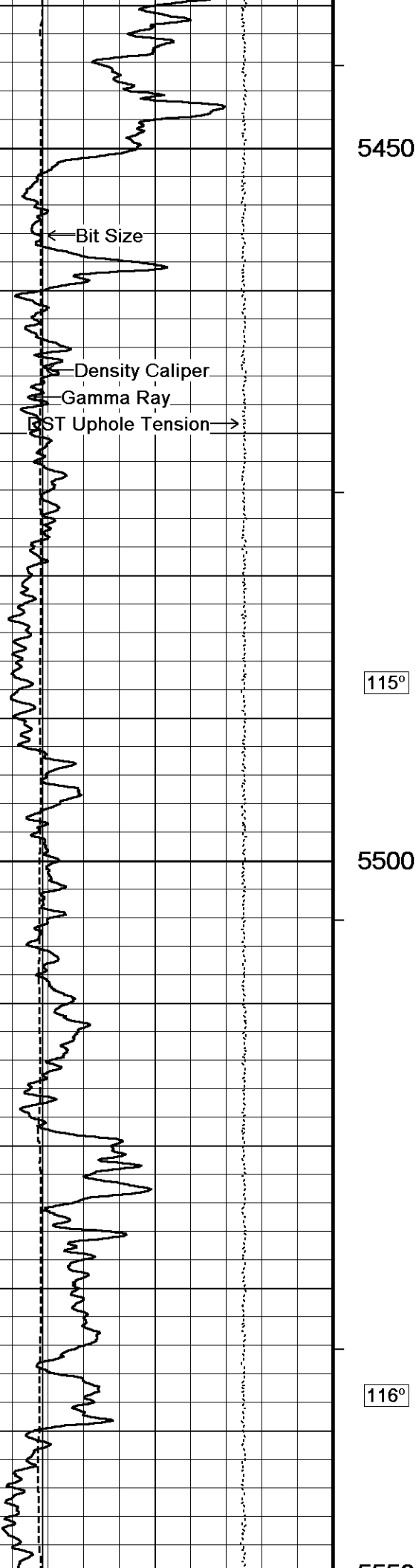
100

114°

5400

115°





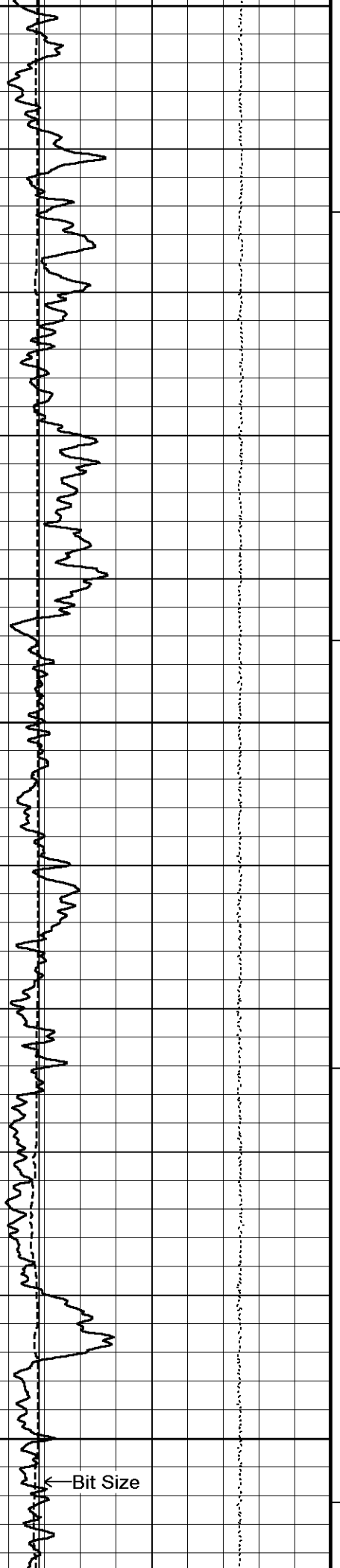
5550

117°

5600

117°

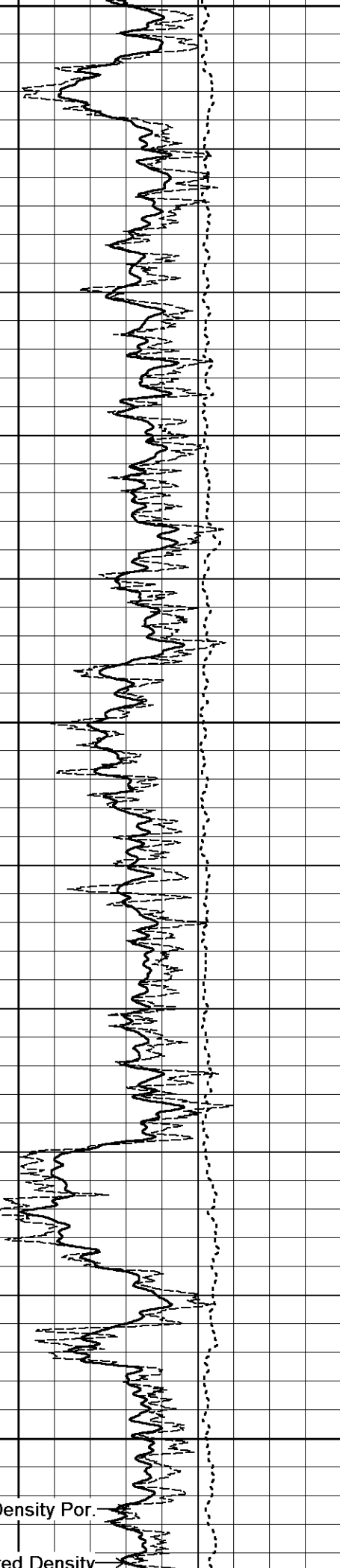
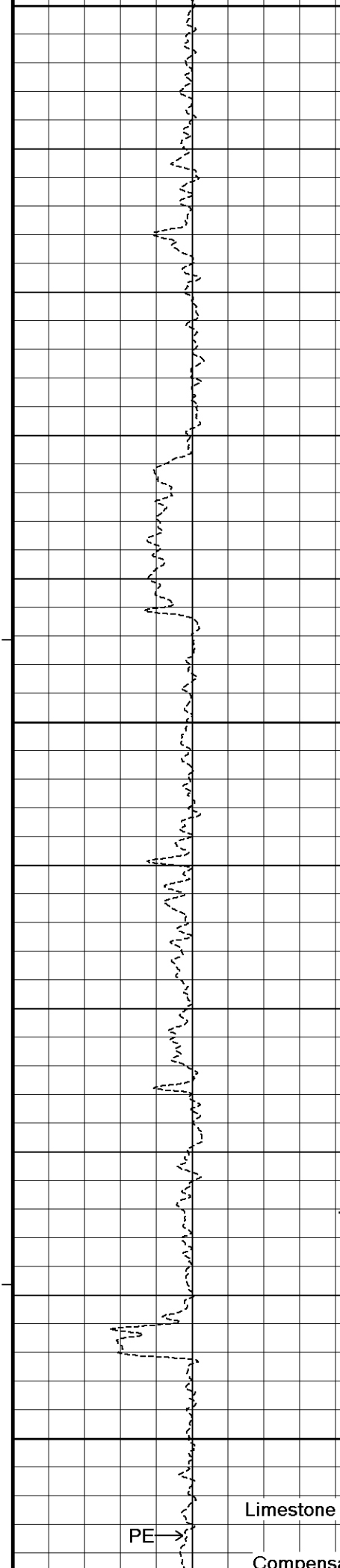
5650



PE

Limestone Density Por.

Compensated Density

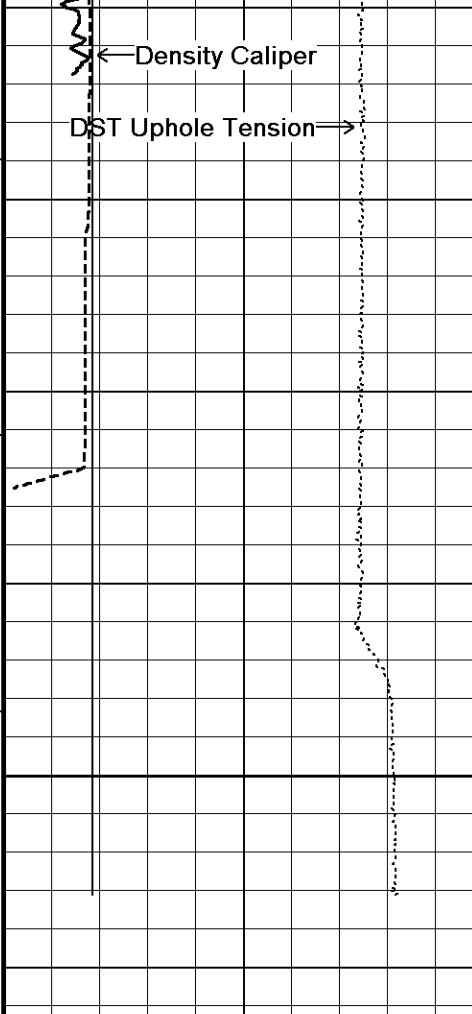


Bit Size

PE

Limestone Density Por.

Compensated Density



TD

5700

Depth  
in  
Feet

Timing Marks  
every 60.0 sec

Gamma Ray

|     |     |     |
|-----|-----|-----|
| API |     |     |
| 0   | 75  | 150 |
| 150 | 225 | 300 |

Borehole  
Temp in  
deg F

Density Caliper

|        |    |    |
|--------|----|----|
| inches |    |    |
| 6      | 11 | 16 |

HVI  
every  
10 cu ft

Bit Size

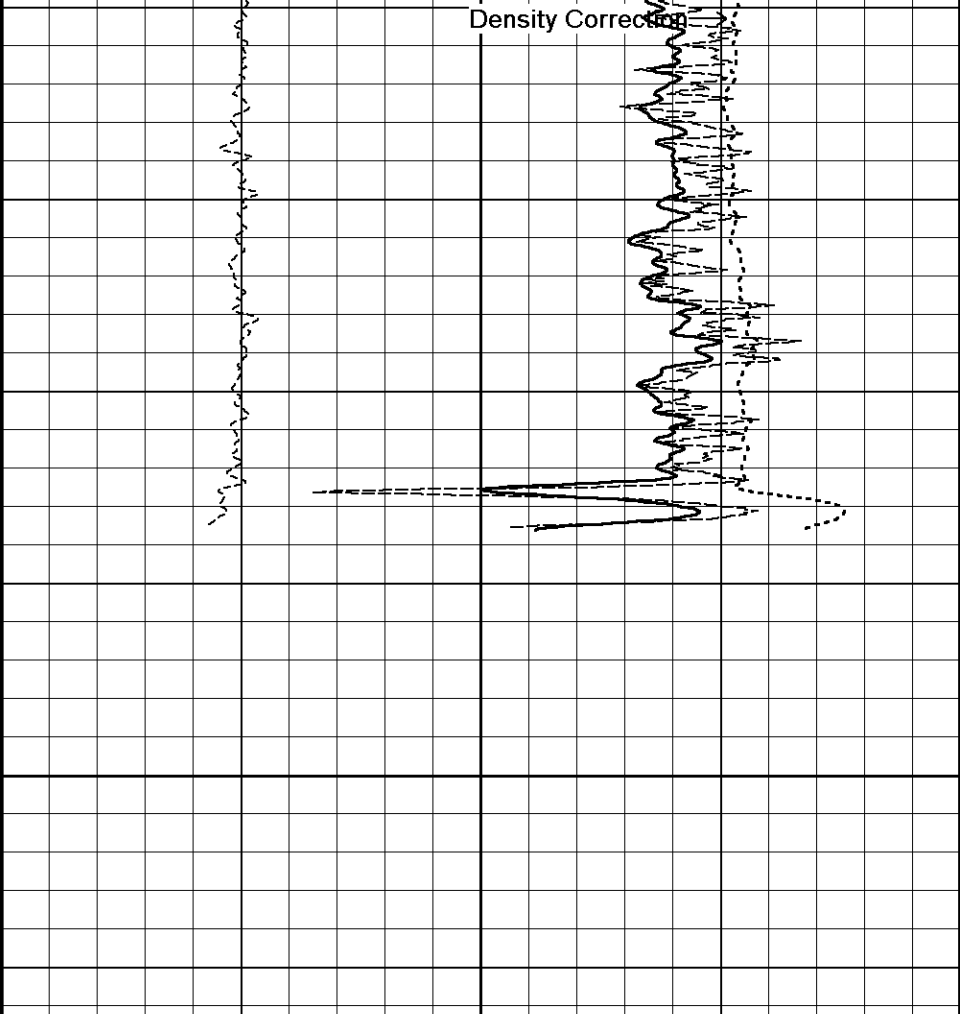
|        |    |    |
|--------|----|----|
| inches |    |    |
| 6      | 11 | 16 |

Annular  
Integral  
every  
10 cu ft

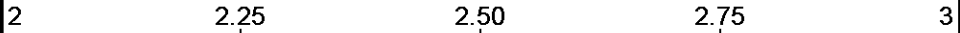
DST Uphole Tension

|        |  |   |
|--------|--|---|
| pounds |  |   |
| 3000   |  | 0 |

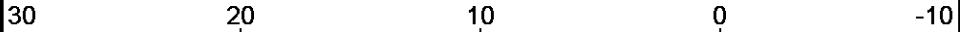
Replay  
Scale  
1:120



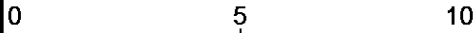
Compensated Density  
grams/cc



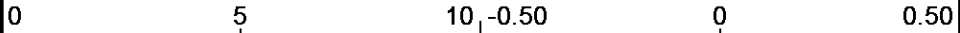
Limestone Density Por.  
percent



PE  
barns/electron



Density Correction  
grams/cc



REPEAT SECTION

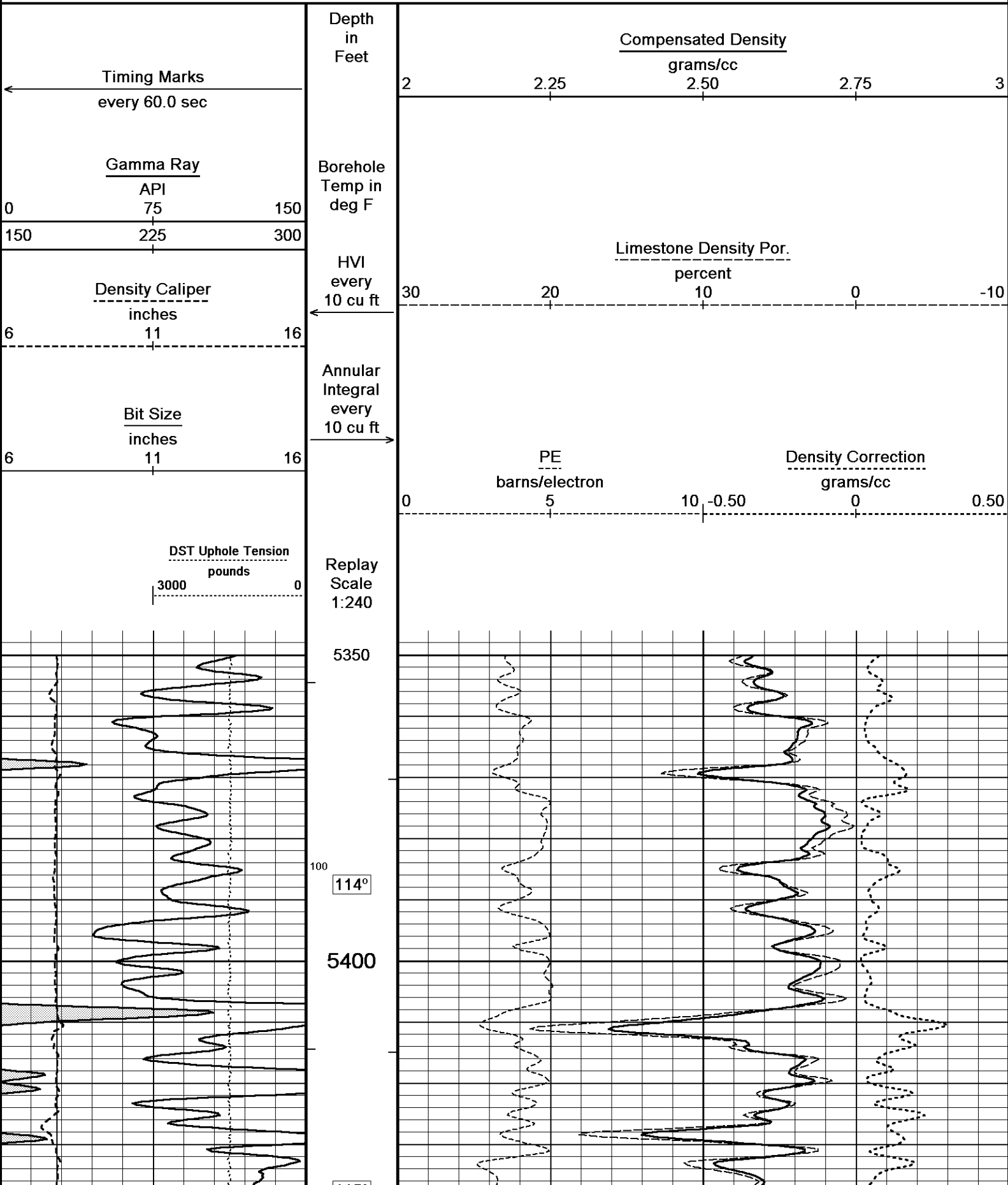
Depth Based Data - Maximum Sampling Increment 10.0cm

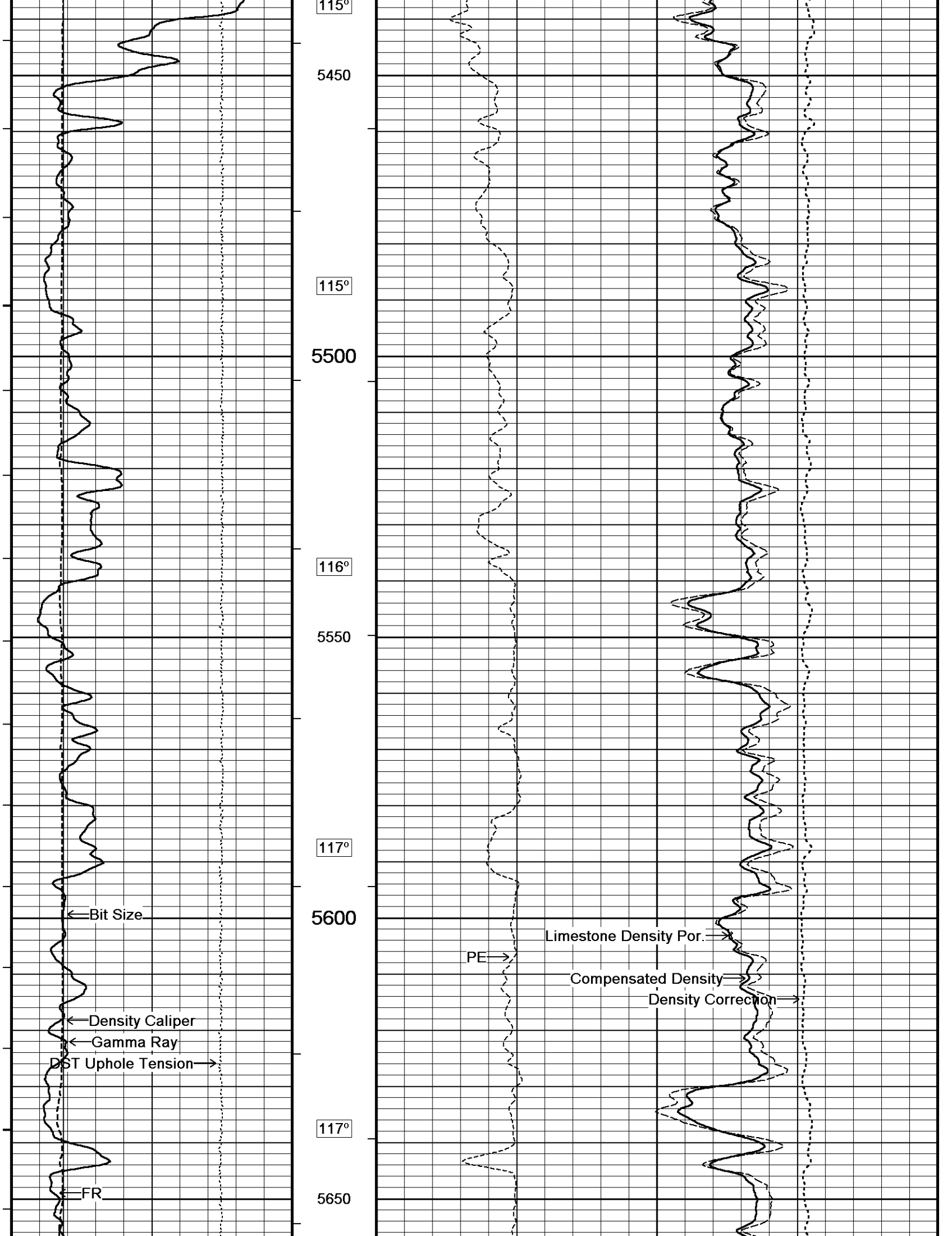
Plotted on 07-MAR-2014 10:57

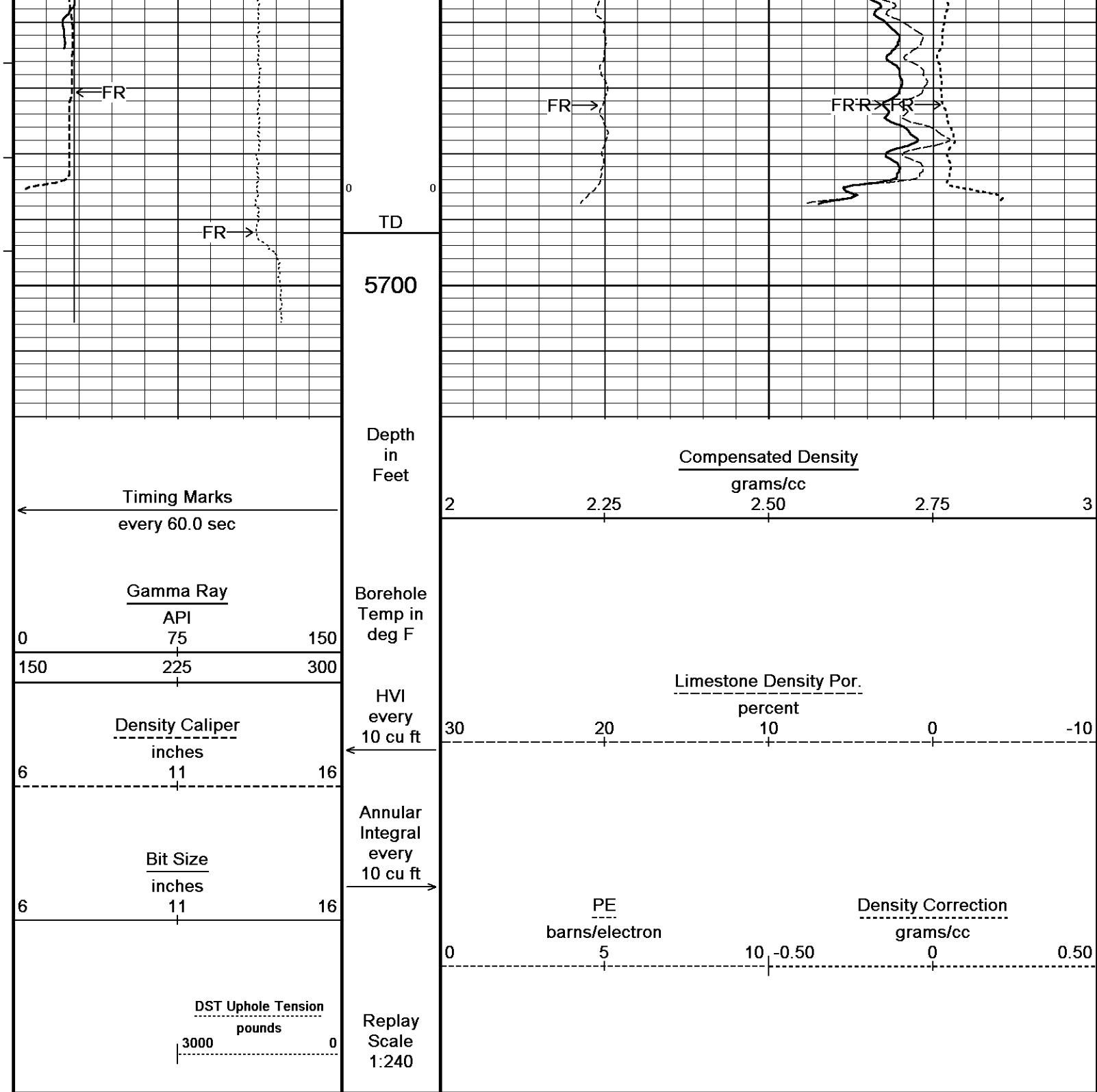
Filename: C:\Minimus\13.08\Logs\30 O'Brien Energ... \o'brien energy resources ardrey #3-35 Repeat.dta

Recorded on 07-MAR-2014 05:59

System Versions: Logged with 13.08.2113 Processed with 13.08.2113 Plotted with 13.08.2113







Depth Based Data - Maximum Sampling Increment 10.0cm  
 Plotted on 07-MAR-2014 10:57  
 Filename: C:\Minimus\13.08\Log\30 O'Brien Energ...\o'brien energy resources ardrey #3-35 Repeat.dta  
 Recorded on 07-MAR-2014 05:59  
 System Versions: Logged with 13.08.2113 Processed with 13.08.2113 Plotted with 13.08.2113

REPEAT SECTION

**BEFORE SURVEY CALIBRATION**  
 C:\Minimus\13.08\Log\30 O'Brien Energy Resources Ardrey #3-35\O'Brien Energy Resources Ardrey #3-35 Main.dta

General Constants All 000 Last Edited on 07-MAR-2014,04:02

|                             |          |            |
|-----------------------------|----------|------------|
| General Parameters          |          |            |
| Mud Resistivity             | 0.950    | ohm-metres |
| Mud Resistivity Temperature | 75.000   | degrees F  |
| Water Level                 | 0.000    | feet       |
| Borehole Fluid 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                                 | 4.500           | inches |  |
| Caliper for Differential Caliper                        | None            |        |  |

|                     |                       |  |  |
|---------------------|-----------------------|--|--|
| Rwa Parameters      |                       |  |  |
| Porosity used       | Crossplot Porosity    |  |  |
| Resistivity used    | Array Ind. One Res Rt |  |  |
| RWA Constant A      | 1.000                 |  |  |
| RWA Constant M      | 2.000                 |  |  |
| SW/APOR Tool Source | 0.000                 |  |  |

**Gamma Calibration MCG-B 39**

Field Calibration on 06-MAR-2014 18:04

|                    |          |                  |
|--------------------|----------|------------------|
|                    | Measured | Calibrated (API) |
| Background         | 66       | 44               |
| Calibrator (Gross) | 1142     | 769              |
| Calibrator (Net)   | 1076     | 725              |

**Gamma Constants MCG-B 39**

Last Edited on 07-MAR-2014,03:30

|                               |                 |       |
|-------------------------------|-----------------|-------|
| Gamma Calibrator Number       | GRC038          |       |
| Mud Density                   | 1.10            | gm/cc |
| Caliper Source for Processing | Density Caliper |       |
| Tool Position                 | Eccentred       |       |
| Concentration of KCl          |                 | kppm  |
| K Mud Type                    | Chloride        |       |
| K Mud Concentration           | 0.00            | %     |

**High Resolution Temperature Constants MCG-B 39**

Last Edited on

|                   |    |
|-------------------|----|
| Pre-filter Length | 11 |
|-------------------|----|

**Caliper Calibration MPD-C.A 216**

Base Calibration on 22-FEB-2014,15:53  
Field Calibration on 06-MAR-2014 18:12

|                   |                       |                      |  |
|-------------------|-----------------------|----------------------|--|
| Base Calibration  |                       |                      |  |
| Reading No        | Measured              | Calibrator Size (in) |  |
| 1                 | 16592                 | 3.99                 |  |
| 2                 | 26576                 | 5.98                 |  |
| 3                 | 36592                 | 7.97                 |  |
| 4                 | 46339                 | 9.86                 |  |
| 5                 | 57568                 | 11.92                |  |
| 6                 | N/A                   | N/A                  |  |
| Field Calibration |                       |                      |  |
|                   | Measured Caliper (in) | Actual Caliper (in)  |  |
|                   | 7.93                  | 7.97                 |  |

**Photo Density Calibration MPD-C.A 216**

Base Calibration on 22-FEB-2014 16:16  
Field Check on 06-MAR-2014 17:47

|                     |        |          |       |                  |
|---------------------|--------|----------|-------|------------------|
| Density Calibration |        |          |       |                  |
| Base Calibration    |        |          |       |                  |
|                     |        | Measured |       | Calibrated (sdu) |
|                     | Near   | Far      | Near  | Far              |
| Background          | 1119   | 1310     |       |                  |
| Reference 1         | 60811  | 31547    | 59556 | 30836            |
| Reference 2         | 25154  | 2777     | 24941 | 2541             |
| Field Check at Base |        |          |       |                  |
|                     | 1118.7 | 1309.8   |       |                  |
| Field Check         |        |          |       |                  |
|                     | 1111.0 | 1305.9   |       |                  |

**PE Calibration**

|                  |       |       |       |                  |
|------------------|-------|-------|-------|------------------|
| Base Calibration |       |       |       |                  |
|                  | WS    | WH    | Ratio | Calibrated Ratio |
| Background       | 202   | 998   |       |                  |
| Reference 1      | 25204 | 60611 | 0.419 | 0.371            |
| Reference 2      | 7179  | 25020 | 0.290 | 0.272            |

Field Check at Base  
201.9      997.7

Field Check  
199.7      991.4

Density Constants MPD-C.A 216

Last Edited on 07-MAR-2014,03:29

|                               |                   |       |
|-------------------------------|-------------------|-------|
| 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            |       |
| <b>Matrix Density (gm/cc)</b> | <b>Depth (ft)</b> |       |
| 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                          | 0.00              |       |

DOWNHOLE EQUIPMENT

C:\Minimus\13.08\Logs\30 O'Brien Energy Resources Ardrey #3-35\O'Brien Energy Resources Ardrey #3-35 Main.dta

3/8" Triple Cone Cable Head (MCB C A)  
MCB-C.A 5 LG: 1.58 ft WT: 15.4 lb OD: 2.244 in

Compact Comms Gamma  
MCG-B 39 LG: 8.70 ft WT: 63.9 lb OD: 2.244 in

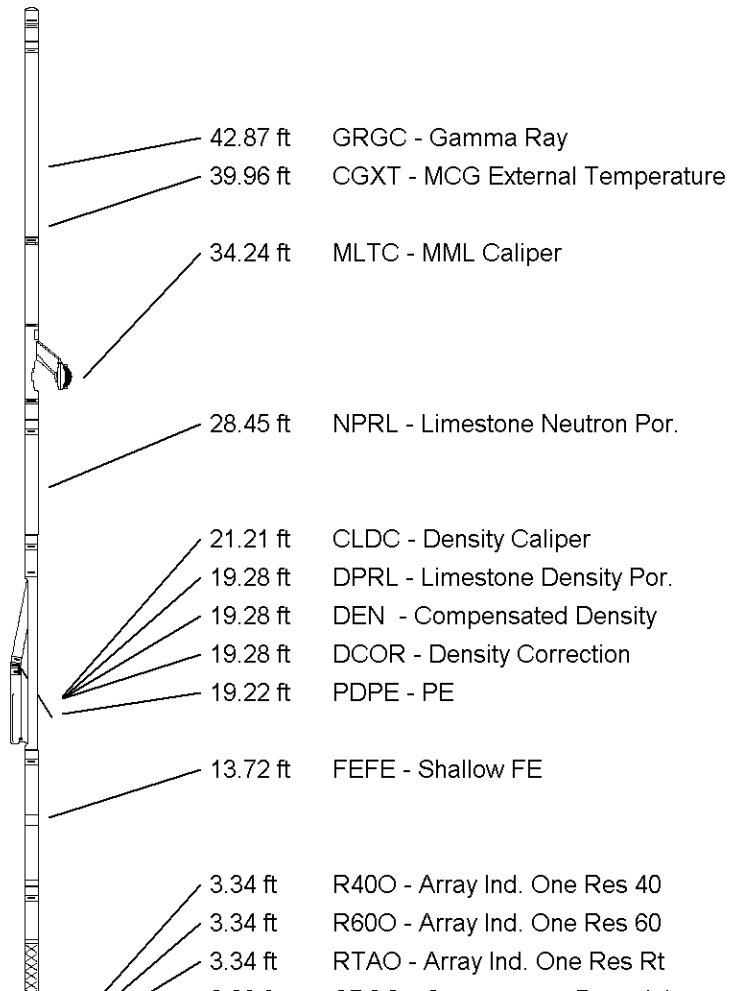
Compact Micro-log  
MML-A 3 LG: 7.97 ft WT: 81.6 lb OD: 2.240 in

Compact Neutron  
MDN-A.B 66 LG: 5.04 ft WT: 50.7 lb OD: 2.244 in

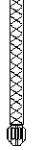
Compact Density/Caliper  
MPD-C.A 216 LG: 9.59 ft WT: 90.4 lb OD: 2.449 in

Compact Focused Electric  
MFE-A.A 135 LG: 6.05 ft WT: 48.5 lb OD: 2.244 in

Compact Induction  
MAI-A.A 167 LG: 10.81 ft WT: 48.5 lb OD: 2.244 in



Total Length: 49.73 ft Weight: 399.0 lb



0.23 ft SPCG - Spontaneous Potential  
Tool Zero (0.13ft from bottom)  
All measurements relative to tool zero.

COMPANY O'BRIEN ENERGY RESOURCES CORP.  
WELL ARDREY #3-35  
FIELD ARDREY  
PROVINCE/COUNTY CLARK  
COUNTRY/STATE U.S.A. / KANSAS

|                         |         |      |               |         |      |
|-------------------------|---------|------|---------------|---------|------|
| Elevation Kelly Bushing | 2545.00 | feet | First Reading | 5672.72 | feet |
| Elevation Drill Floor   | 2543.00 | feet | Depth Driller | 5700.00 | feet |
| Elevation Ground Level  | 2533.00 | feet | Depth Logger  | 5692.00 | feet |



**Weatherford**<sup>®</sup>

COMPACT PHOTO DENSITY  
COMPENSATED NEUTRON