



**Weatherford**<sup>®</sup>

**COMPENSATED SONIC  
COMPENSATED NEUTRON  
POROSITY LOG**

COMPANY WESTERN OPERATING COMPANY  
 WELL FOX #2-8  
 FIELD HELFRICH  
 PROVINCE/COUNTY HAMILTON  
 COUNTRY/STATE U.S.A. / KANSAS  
 LOCATION 1150' FNL & 1320' FWL  
 S2 S2 N2 NW

SEC 8 TWP 25S RGE 42W Other Services  
 API Number 15-075-20869  
 Permit Number  
 Permanent Datum GL, Elevation 3647 feet  
 Log Measured From KB  
 Drilling Measured From KB @ 11 FEET

Elevations:  
 KB 3658.00 feet  
 DF 3657.00  
 GL 3647.00

Date	7-JUL-2013
Run Number	ONE
Service Order	3539897
Depth Driller	5467.00 feet
Depth Logger	5460.00 feet
First Reading	5447.00 feet
Last Reading	924.00 feet
Casing Driller	924.00 feet
Casing Logger	924.00 feet
Bit Size	7.875 inches
Hole Fluid Type	CHEMICAL
Density / Viscosity	9.40 lb/USg 56.00 CP
PH / Fluid Loss	9.00 9.60 ml/30Min
Sample Source	FLOWLINE
Rm @ Measured Temp	0.91 @ 85.0 ohm-m
Rmf @ Measured Temp	0.73 @ 85.0 ohm-m
Rmc @ Measured Temp	0.67 @ 85.0 ohm-m
Source Rmf / Rmc	CALC CALC
Rm @ BHT	0.61 @127.0 ohm-m
Time Since Circulation	4 HOURS
Max Recorded Temp	127.00 deg F
Equipment / Base	13057 LIB
Recorded By	W. STAMBAUGH
Witnessed By	PETER DEBENHAM
JOB #	LB13-196

**BOREHOLE RECORD**

Last Edited: 08-JUL-2013 21:16

Bit Size inches	Depth From feet	Depth To feet
7.875	924.00	5460.00

**CASING RECORD**

Type	Size inches	Depth From feet	Shoe Depth feet	Weight pounds/ft
SURFACE	8.625	0.00	924.00	24.00

**REMARKS**

- SOFTWARE ISSUE: WLS 13.04.8492.
- MCG, MML, MDN, MPD, MFE, MSS, MAI RAN IN COMBINATION.
  - HARDWARE: DUAL BOWSPRING USED ON MDN.
  - 0.5 INCH STANDOFF USED ON MFE.
  - TWO 0.5 INCH STANDOFFS USED ON MSS.
  - 0.5 INCH STANDOFF USED ON MAI.
- 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 SURFACE CASING: 2350 CU. FT.
- ANNULAR HOLE VOLUME WITH 5.5 INCH PRODUCTION CASING FROM TD TO SURFACE CASING: 1620 CU. FT.

- RIG: MURFIN DRILLING RIG #21.

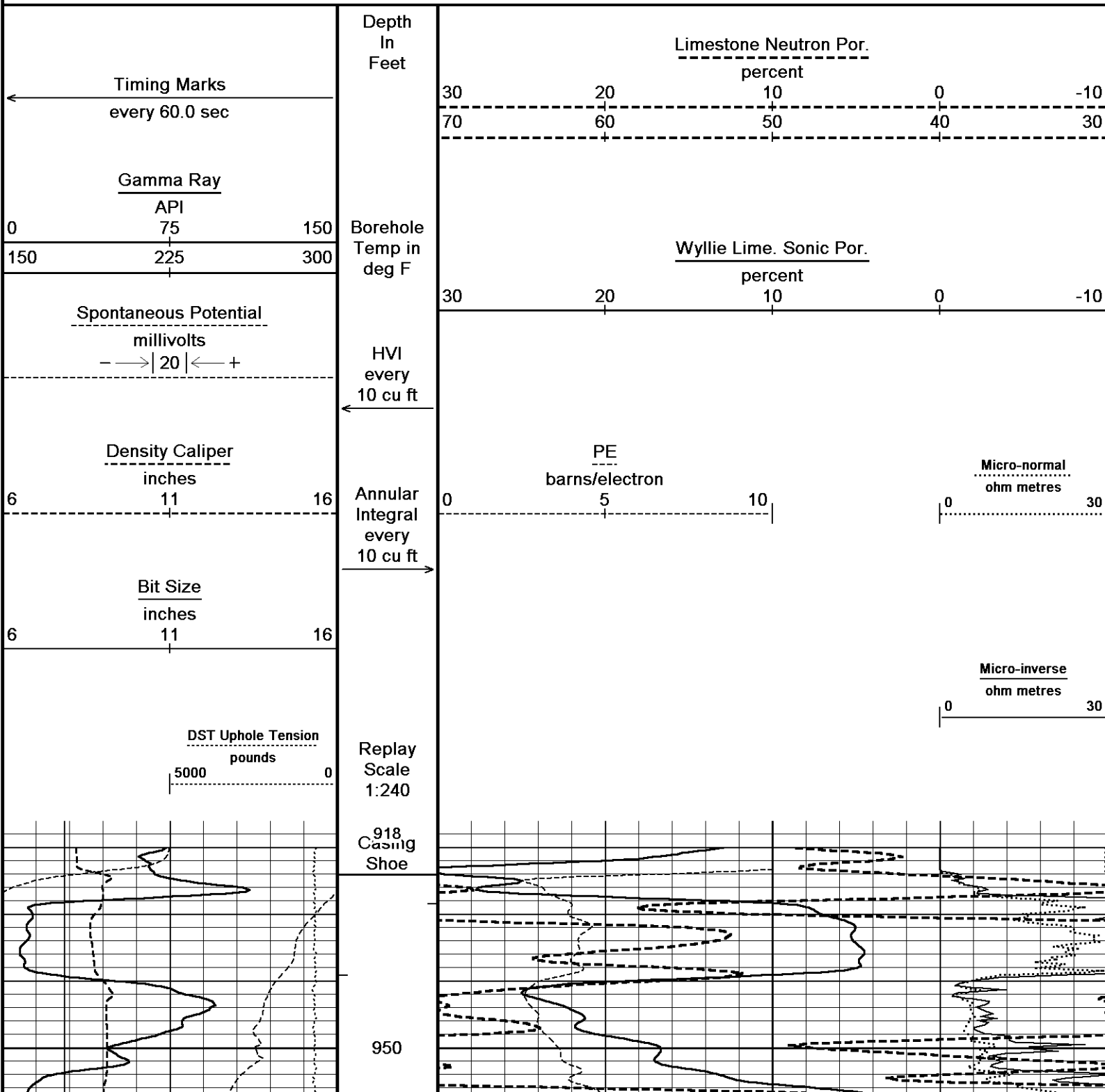
- ENGINEER: W. STAMBAUGH

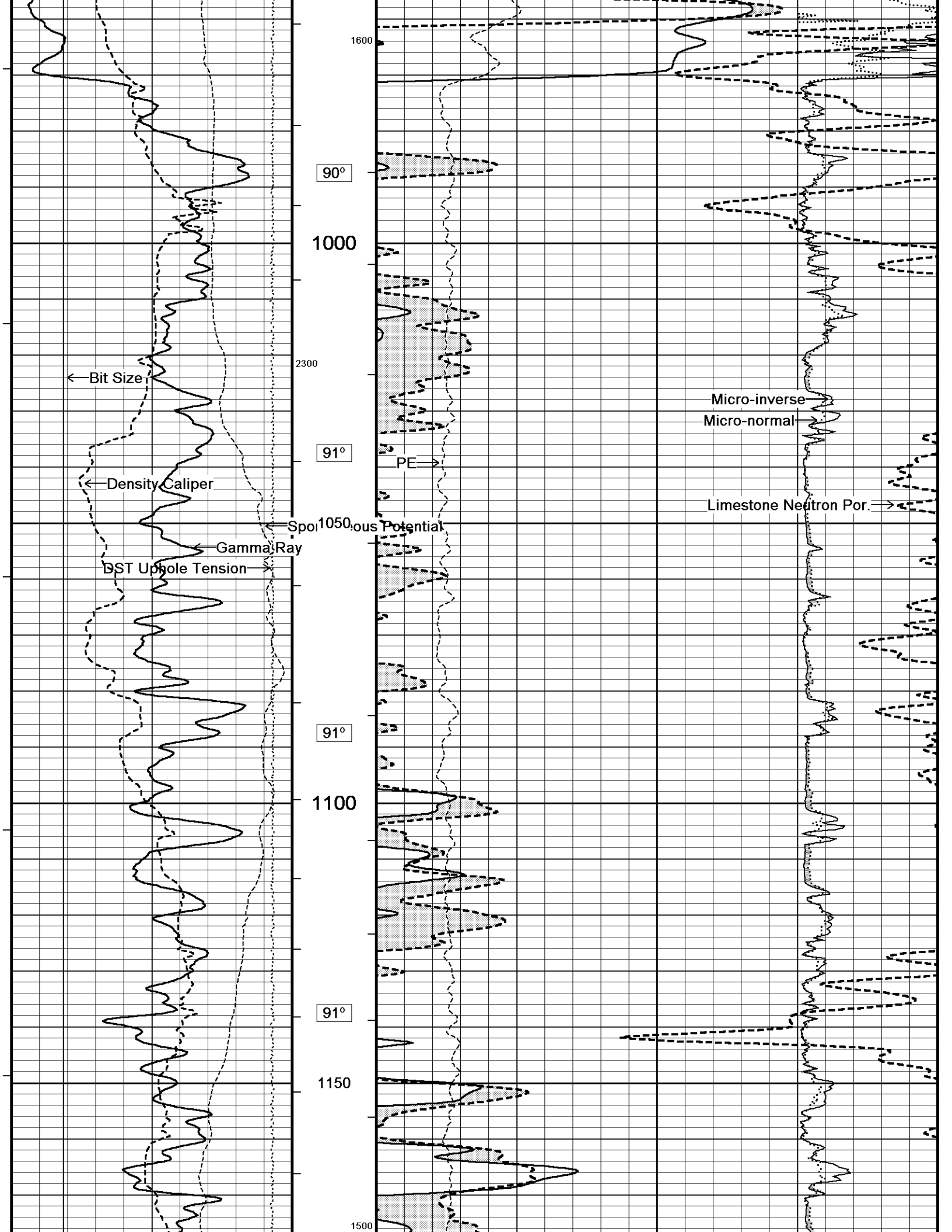
- OPERATOR(S): D. CANADAY

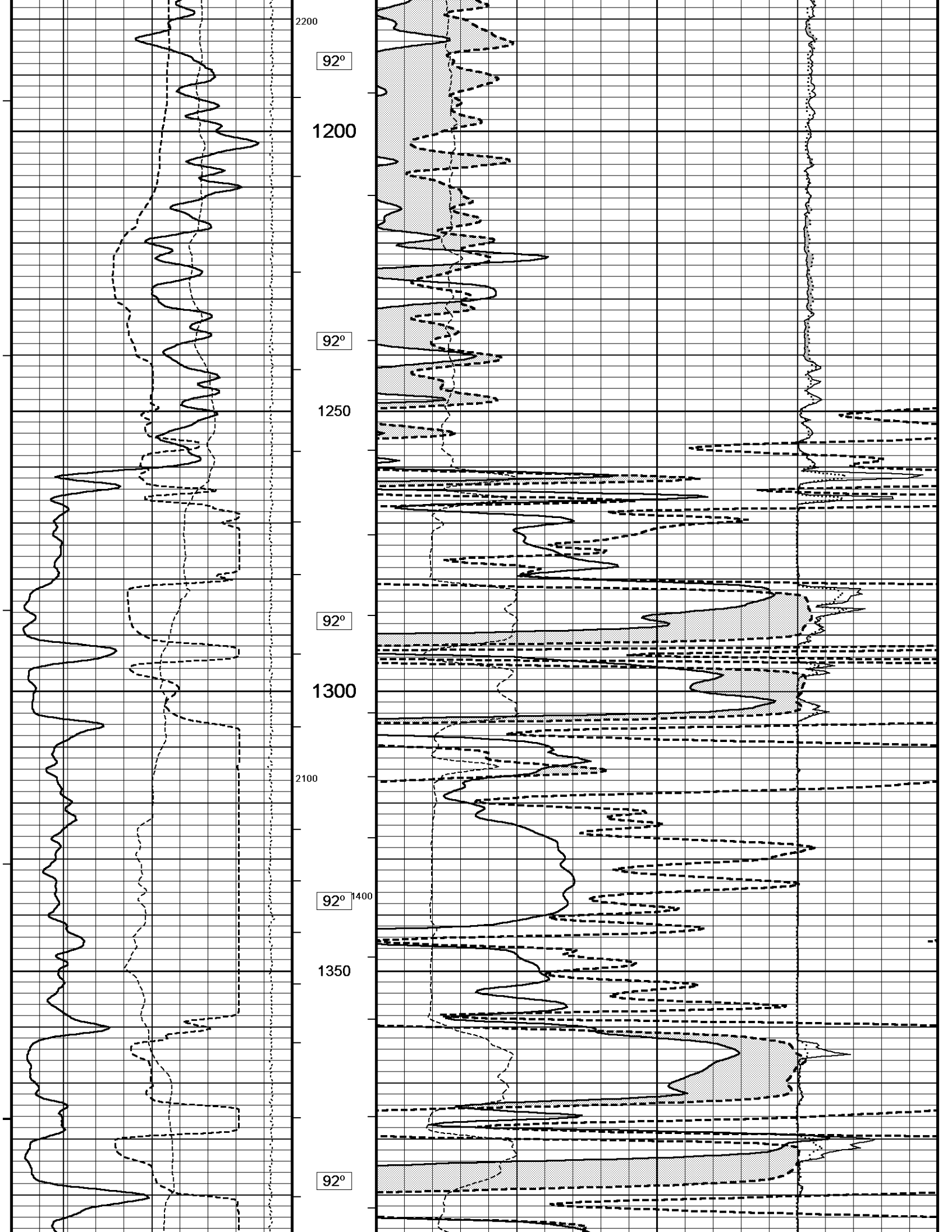
All interpretations are opinions based on inferences from electrical or other measurements and we cannot, and do not, guarantee the accuracy or correctness of any interpretations, and we shall not, except in the case of gross or wilful negligence on our part, be liable or responsible for any loss, costs,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

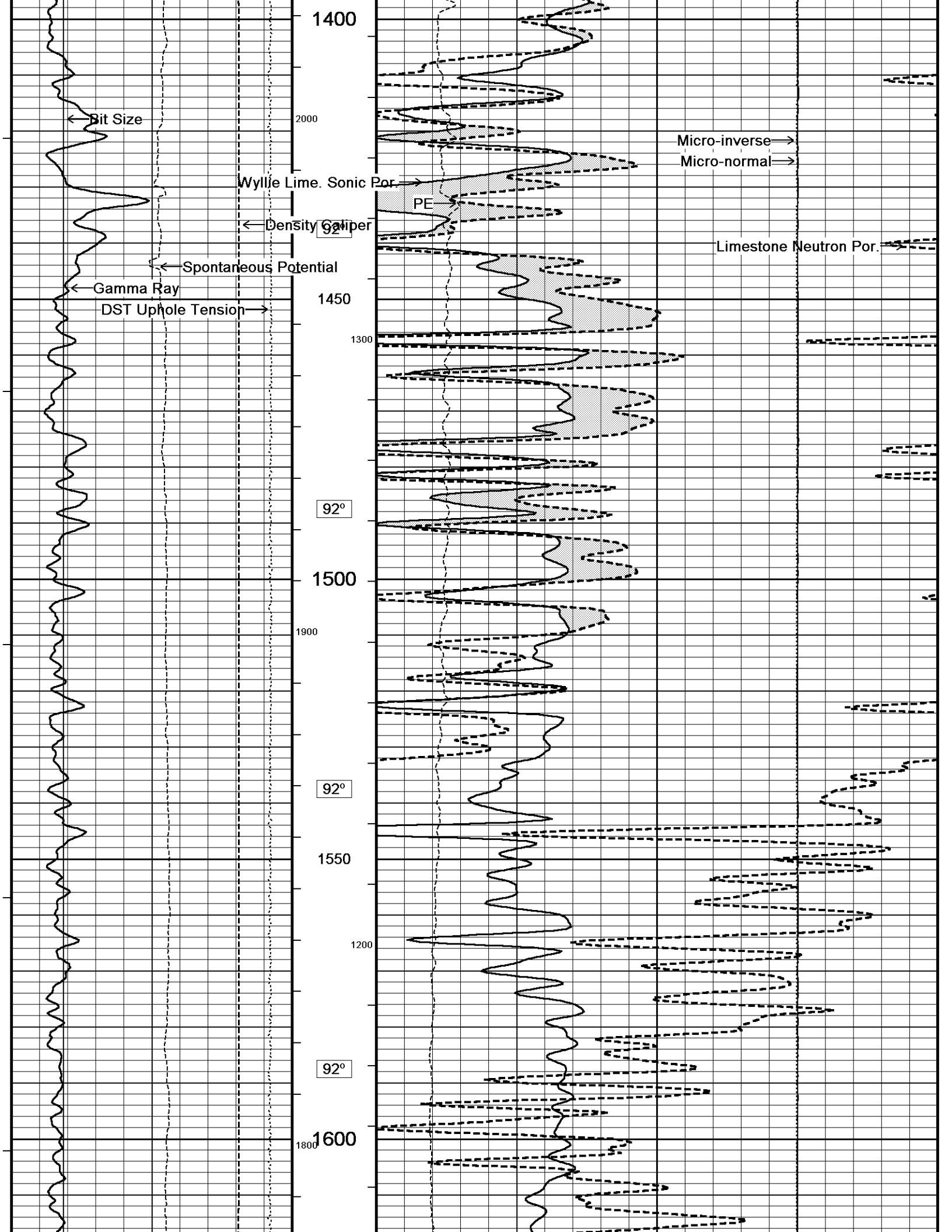
**5 INCH MAIN**

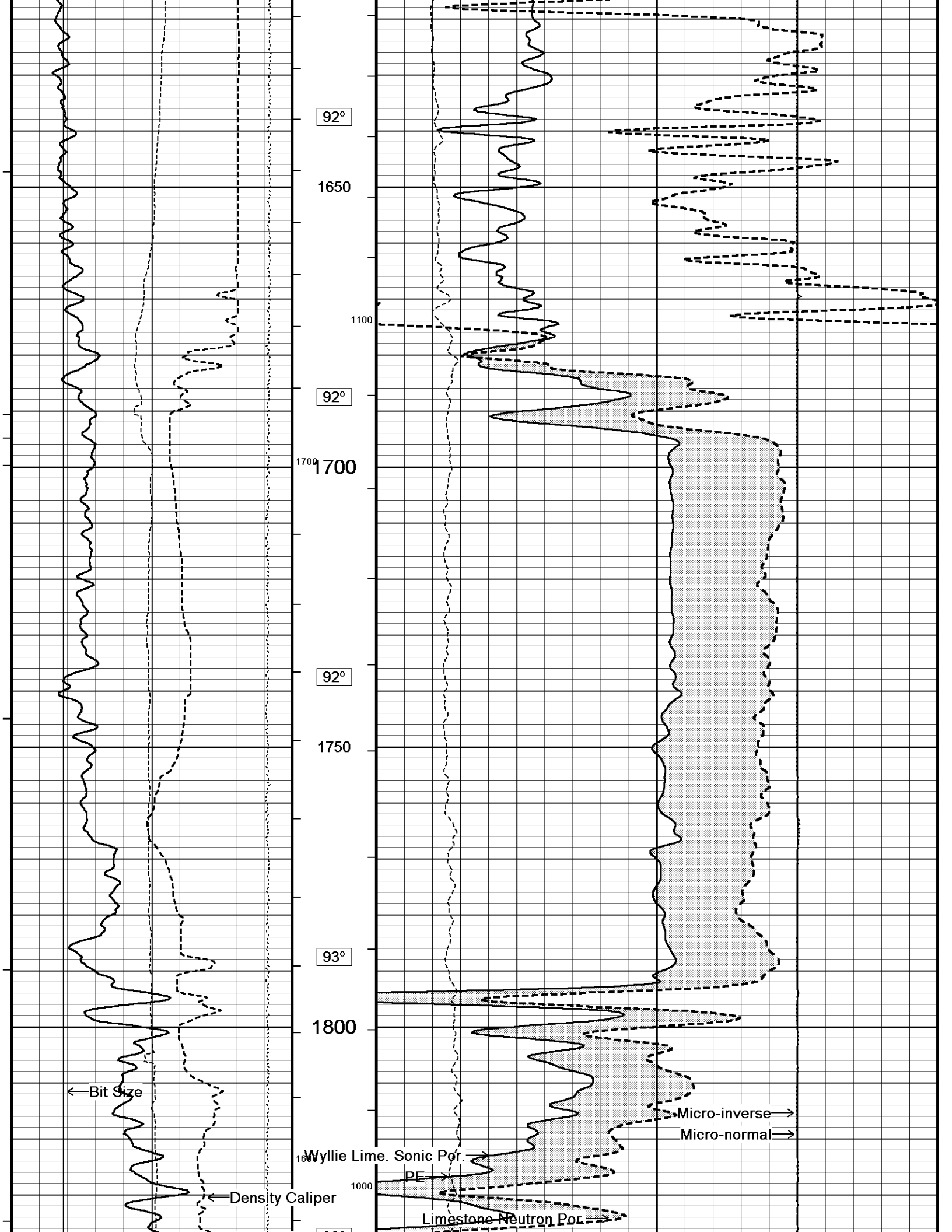
Depth Based Data - Maximum Sampling Increment 10.0cm Plotted on 08-JUL-2013 21:20  
 Filename: C:\Minimus 13.05.9583\Logs\Western Op...Western Operating Company FOX #2-8\_003.dta Recorded on 08-JUL-2013 17:58  
 System Versions: Logged with 13.05.9583 Processed with 13.05.9583 Plotted with 13.05.9583

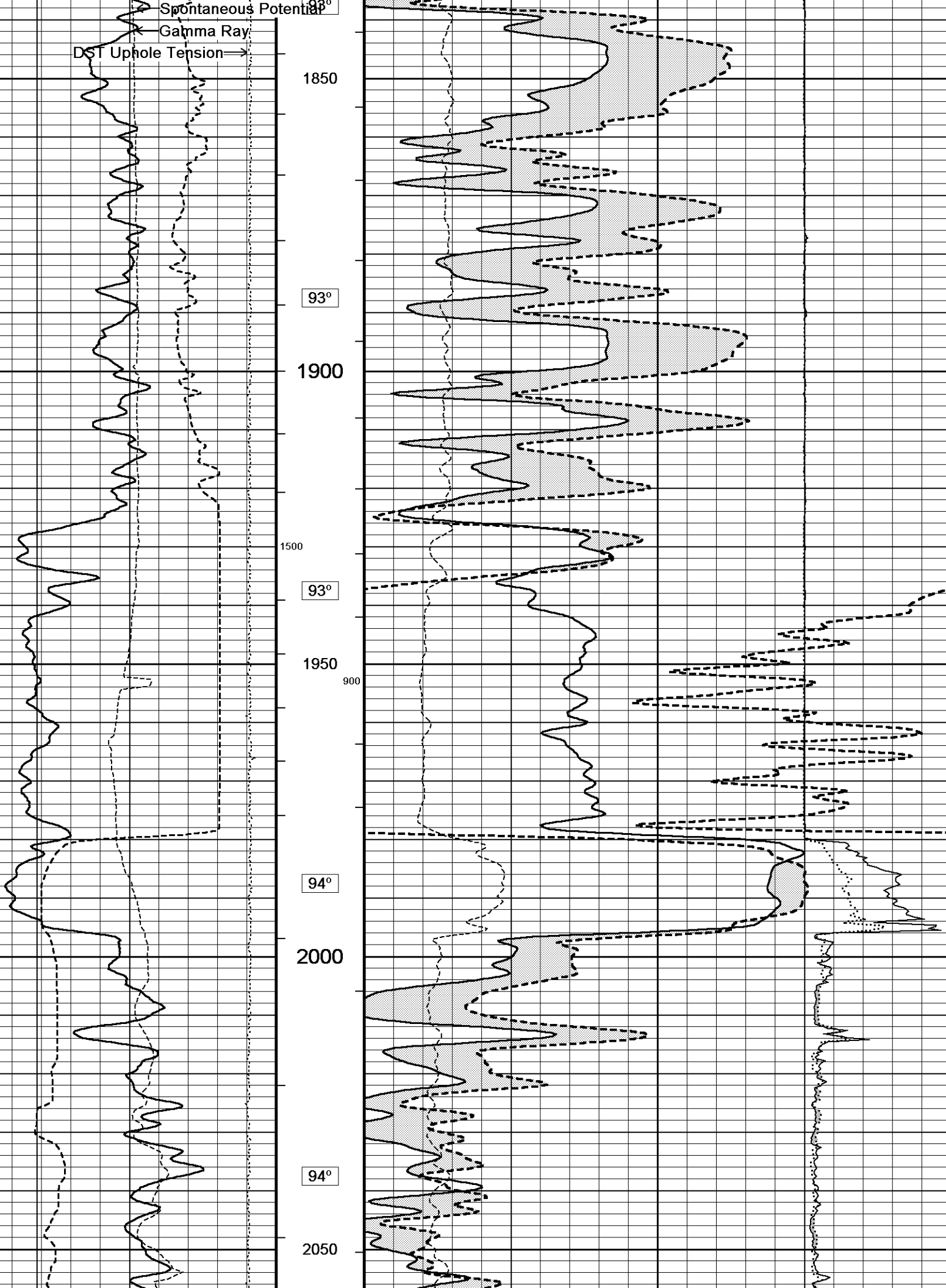


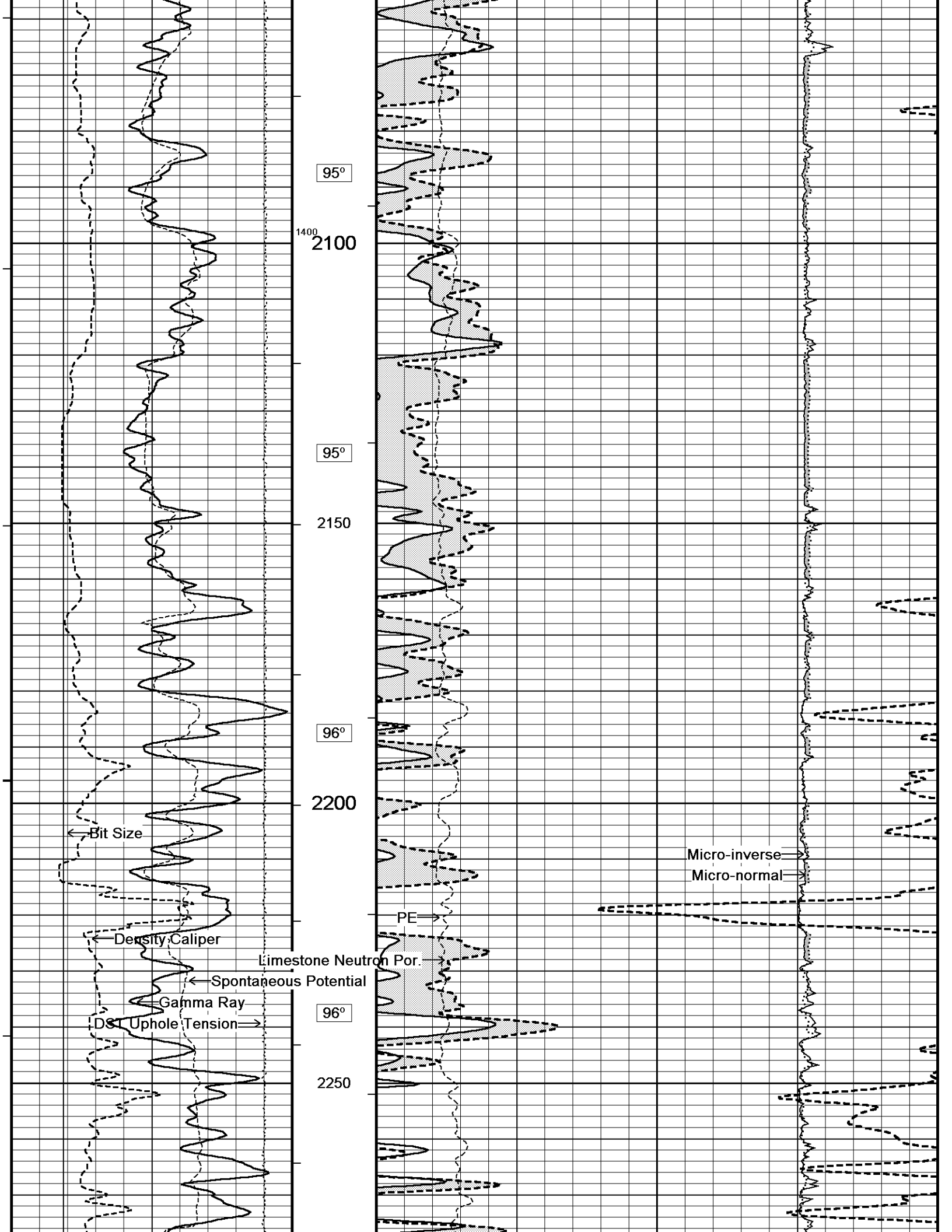


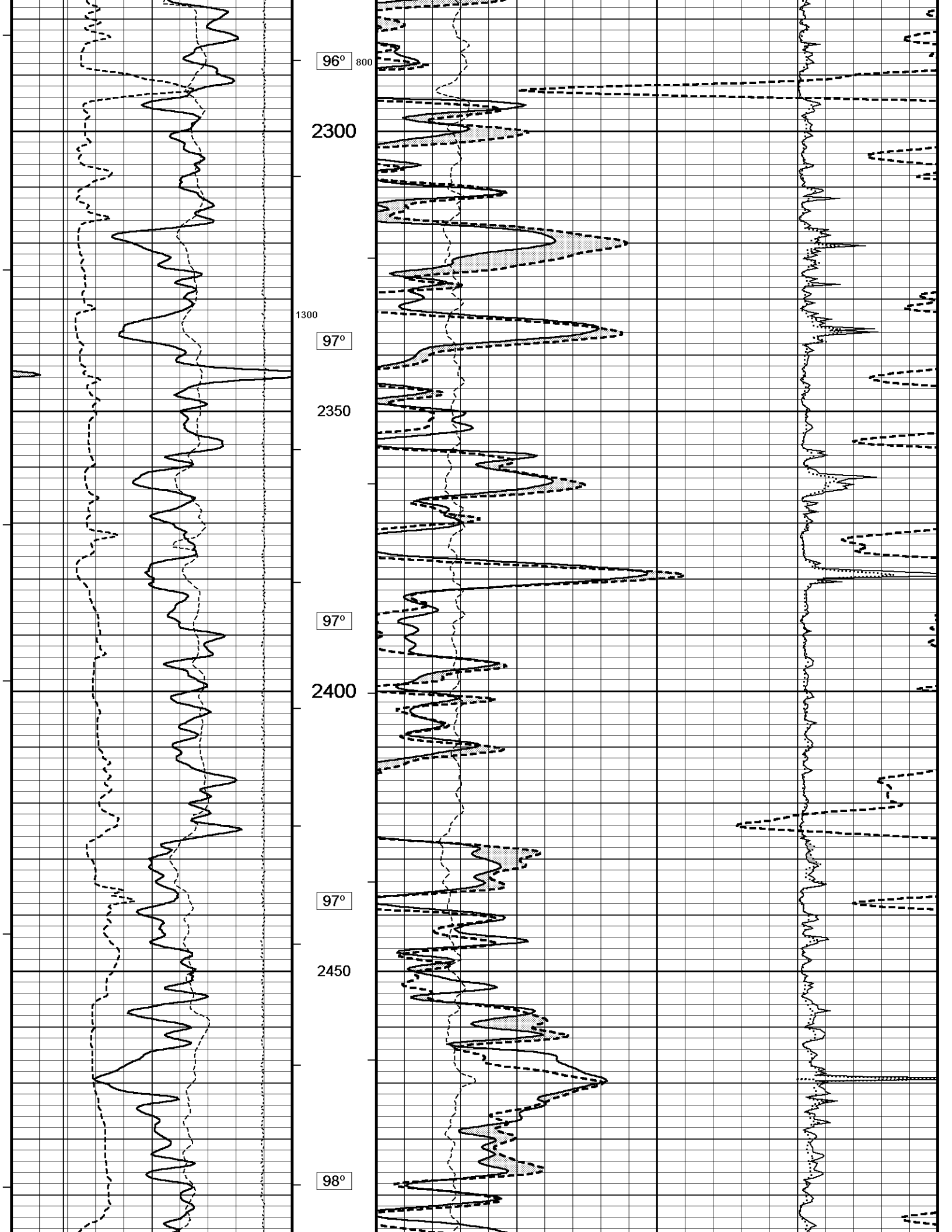


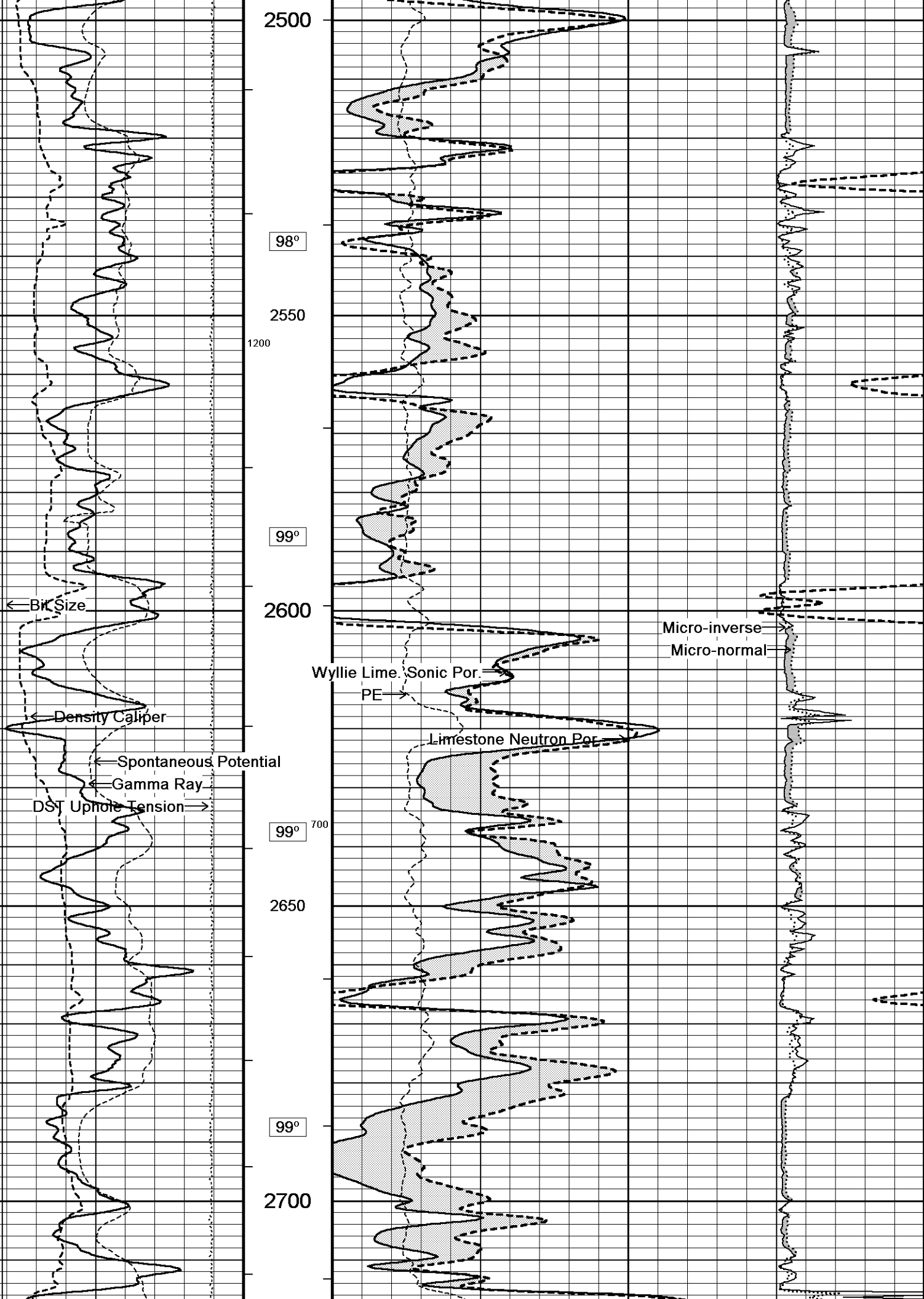


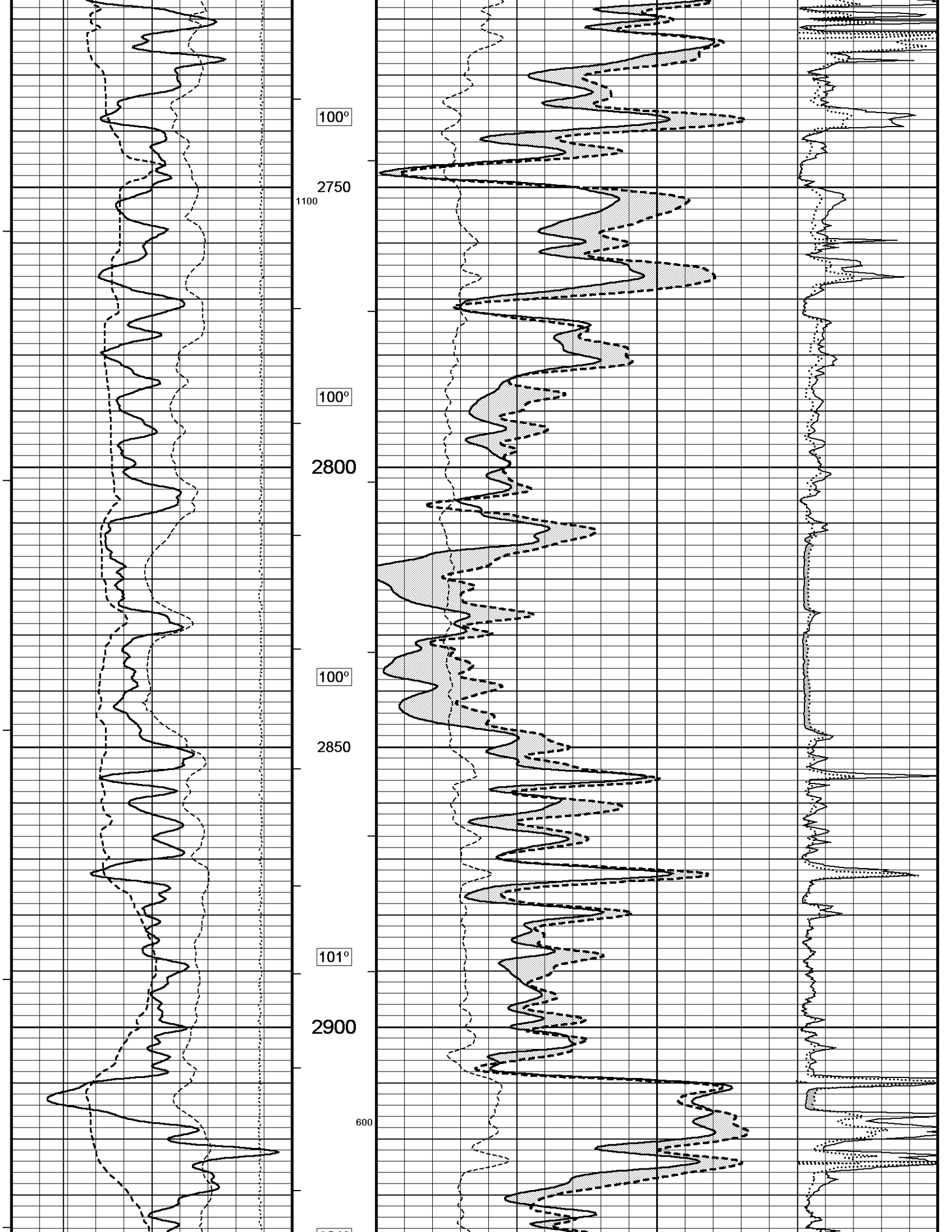


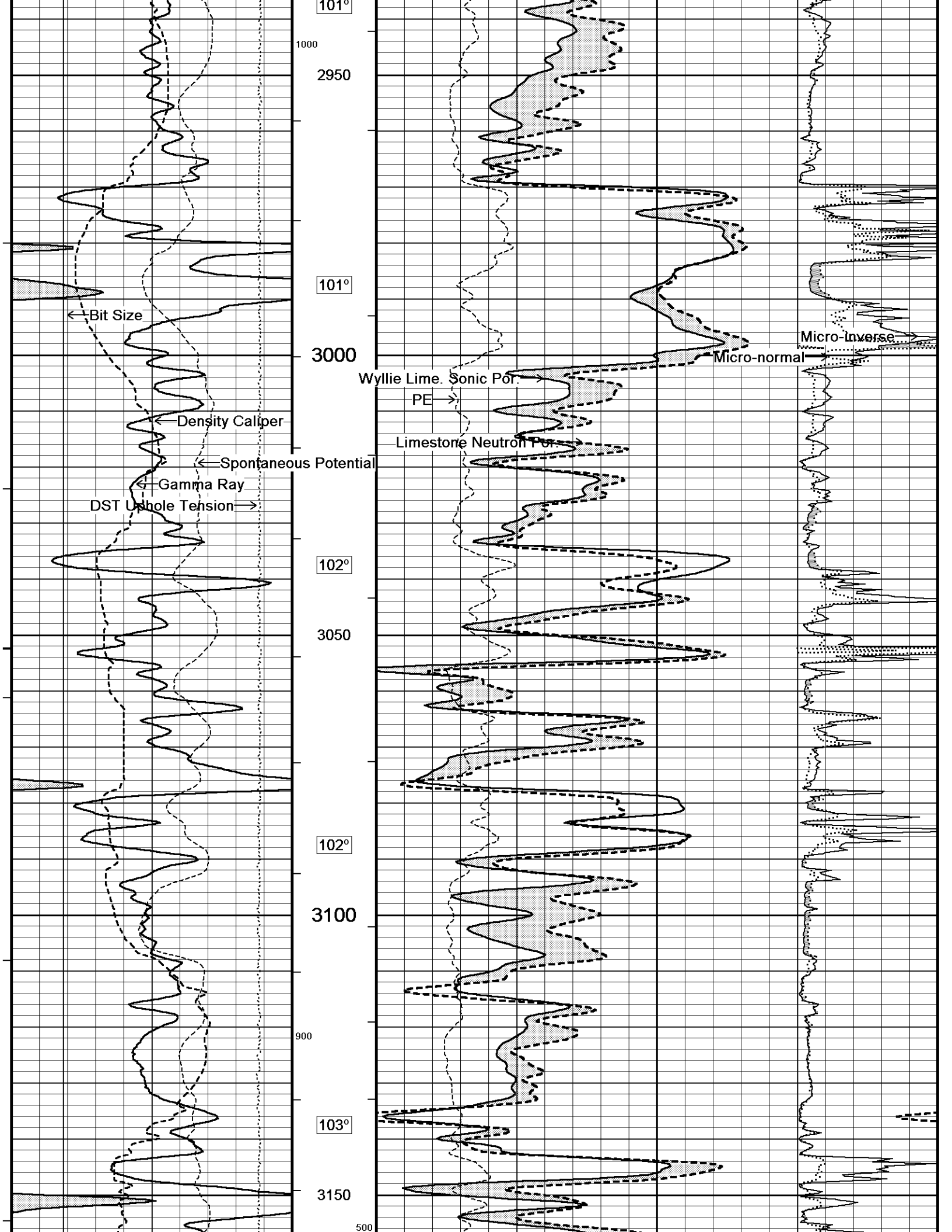


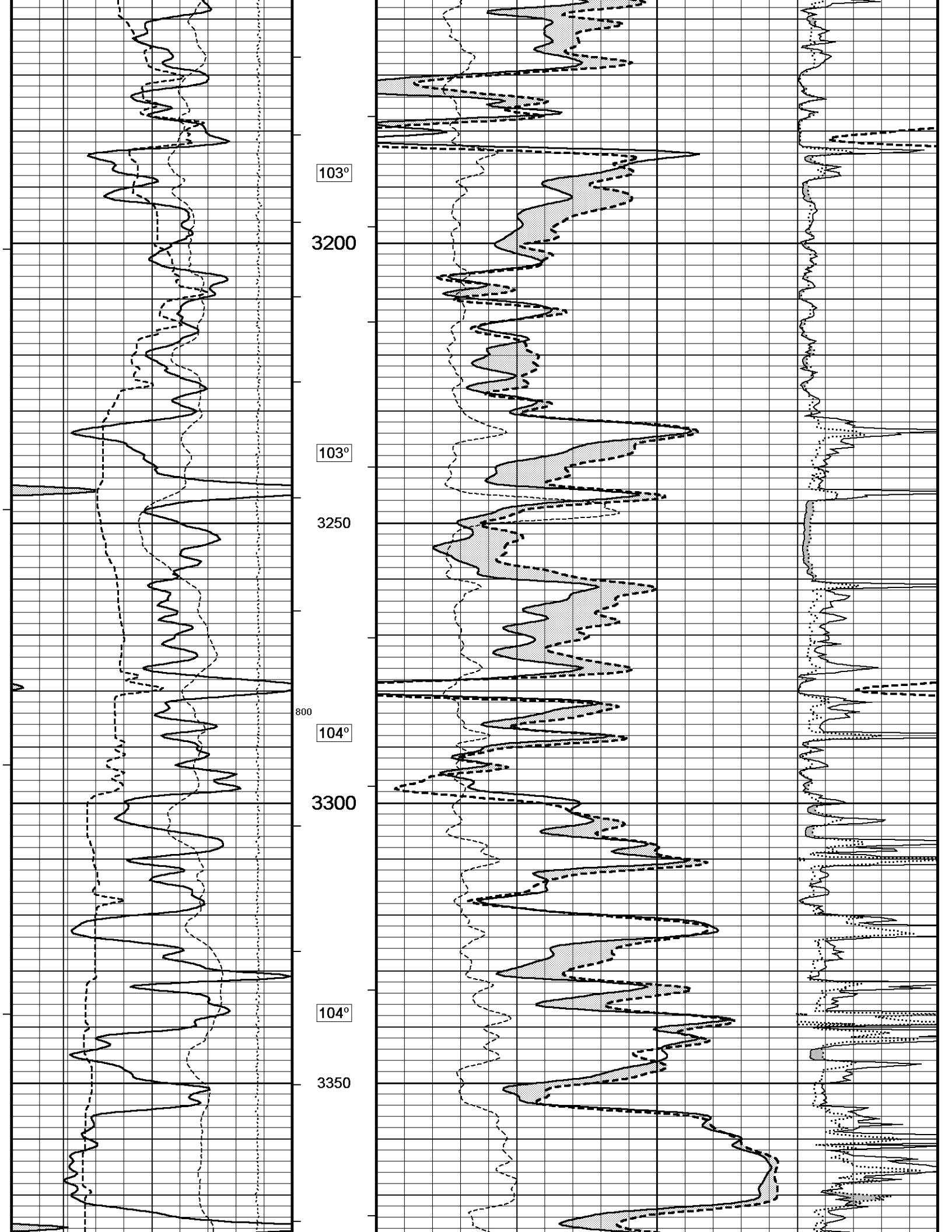


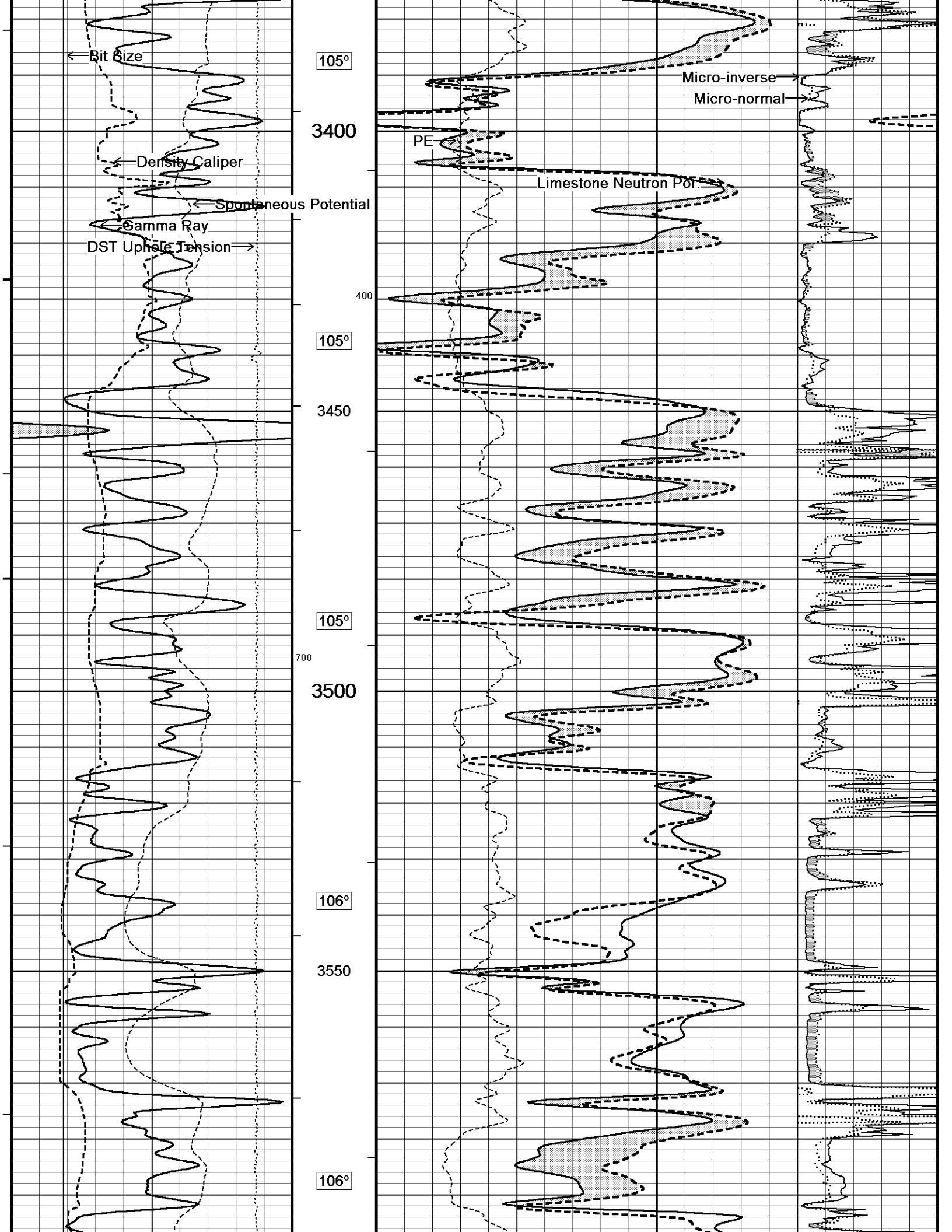


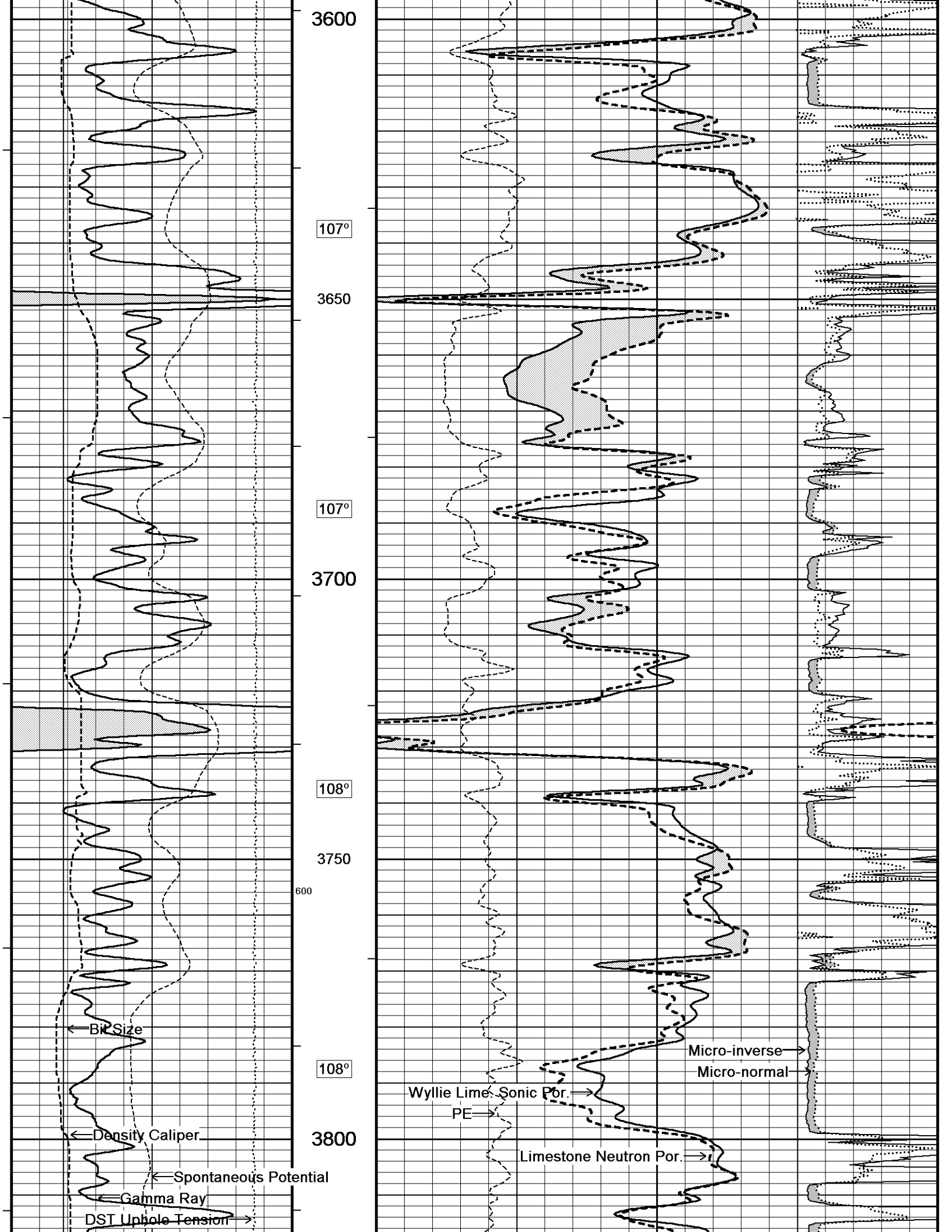


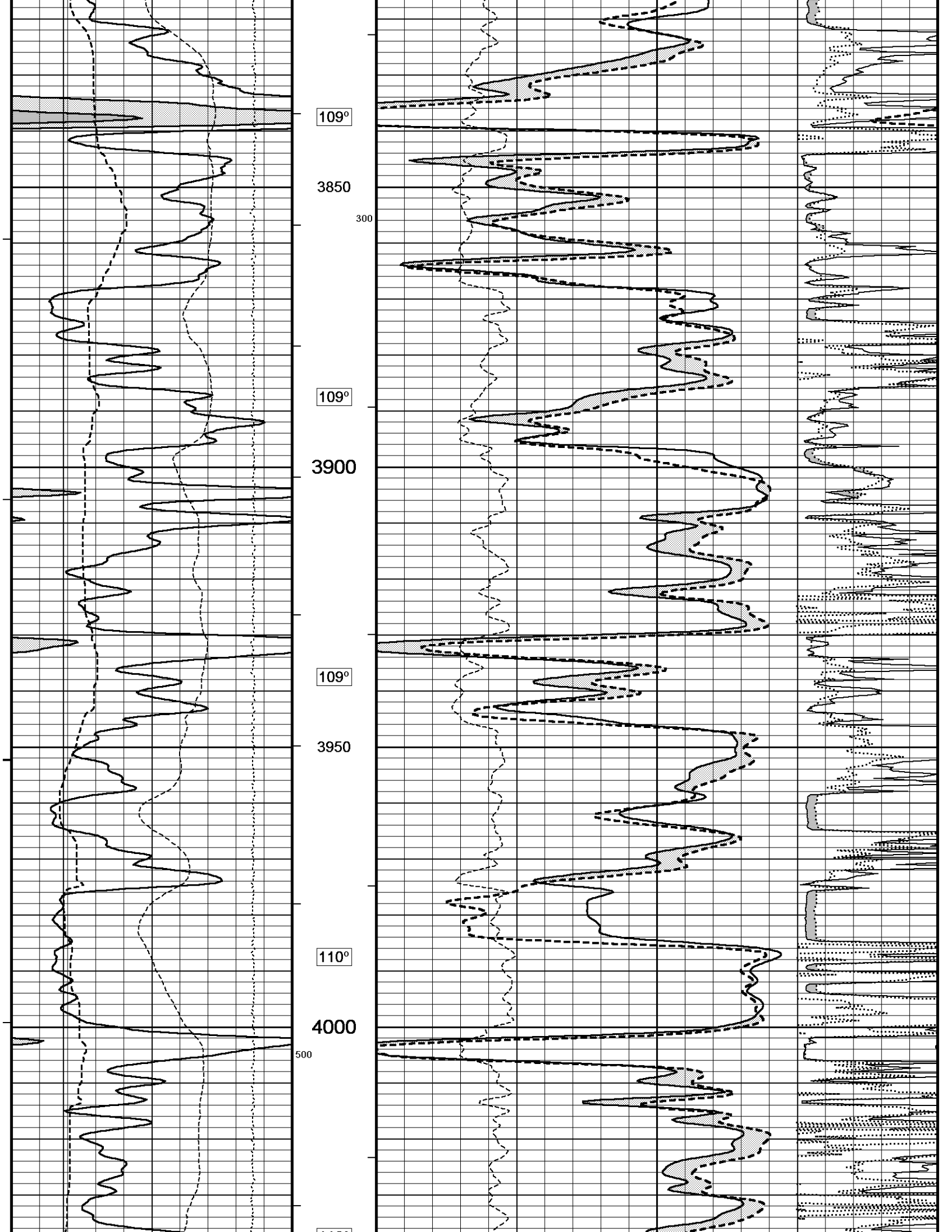


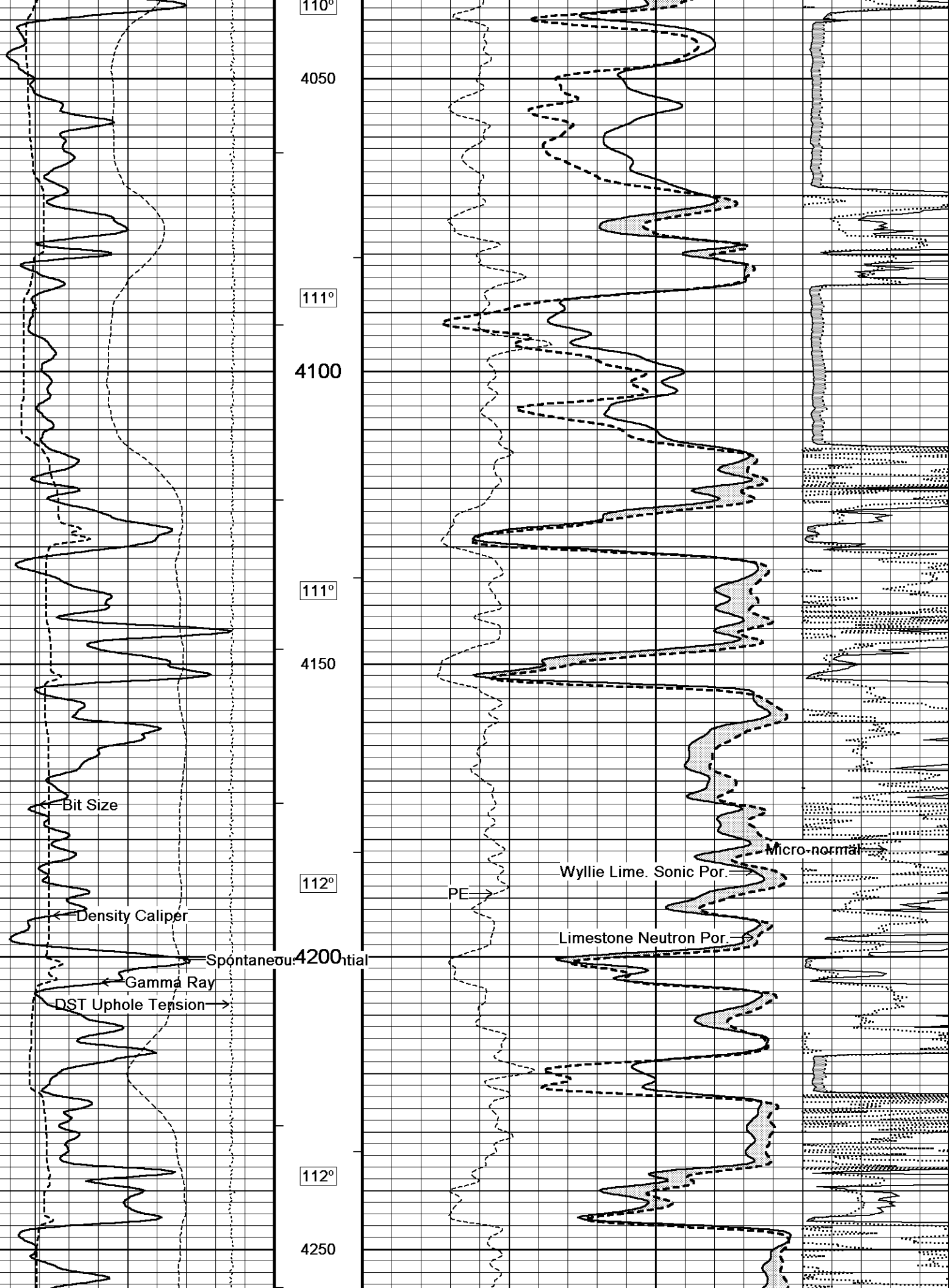


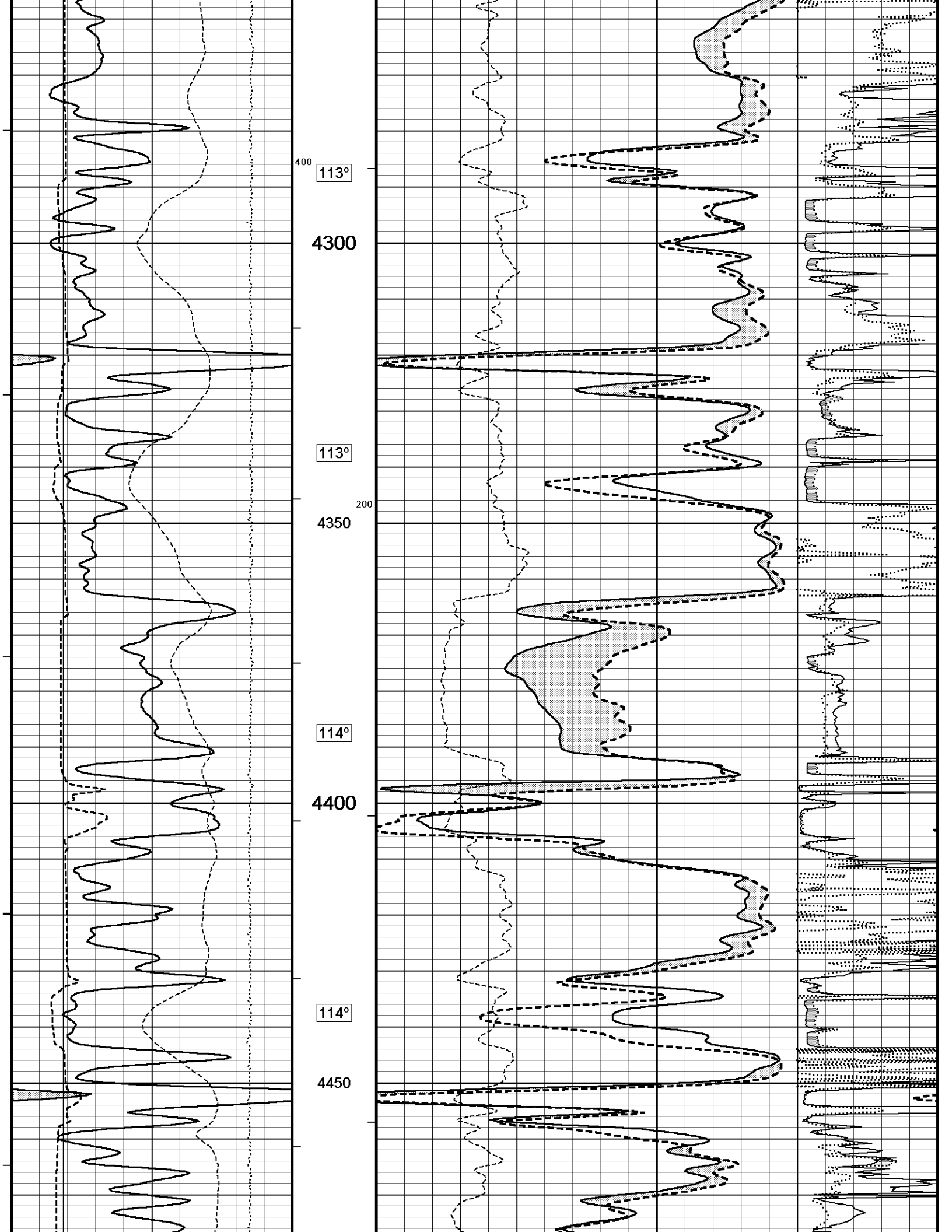


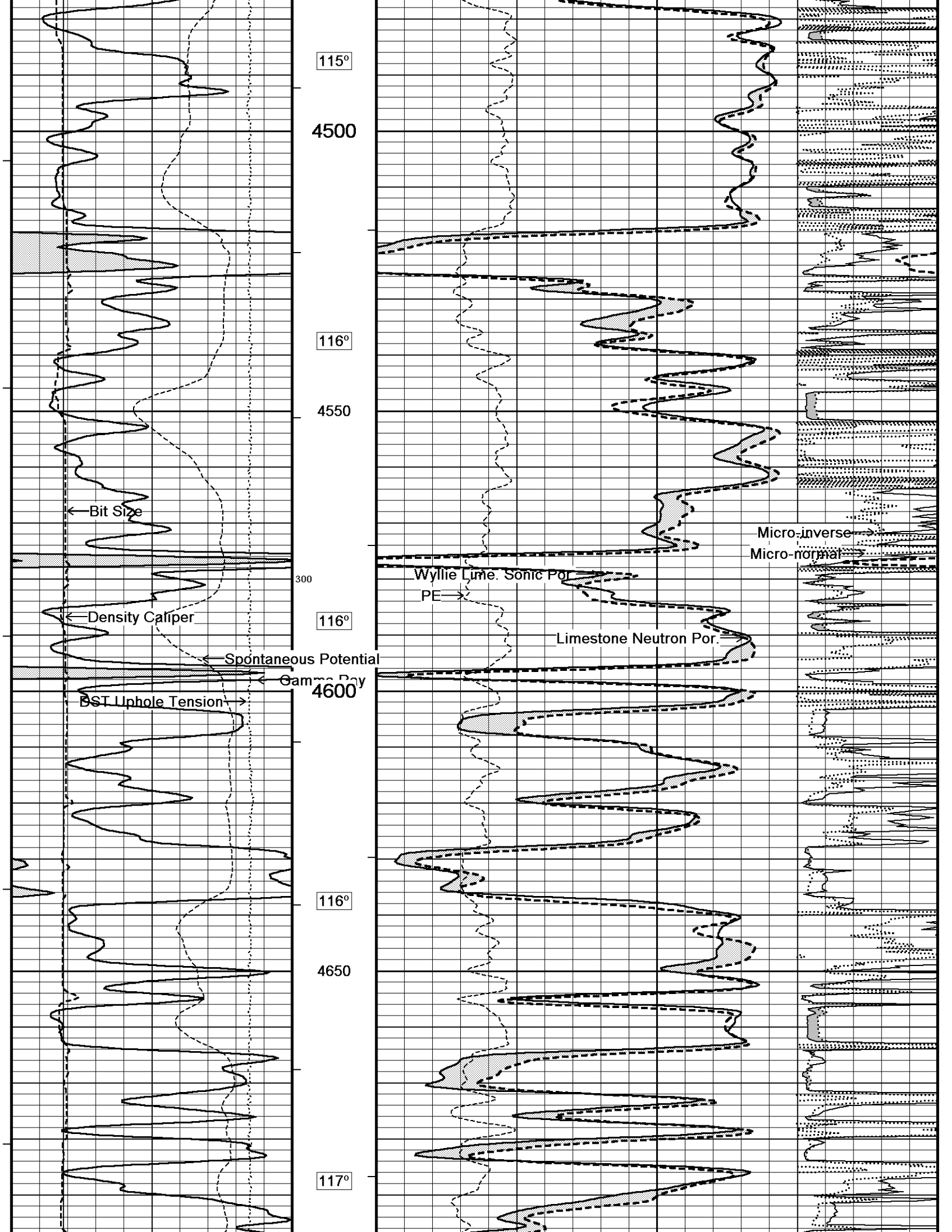


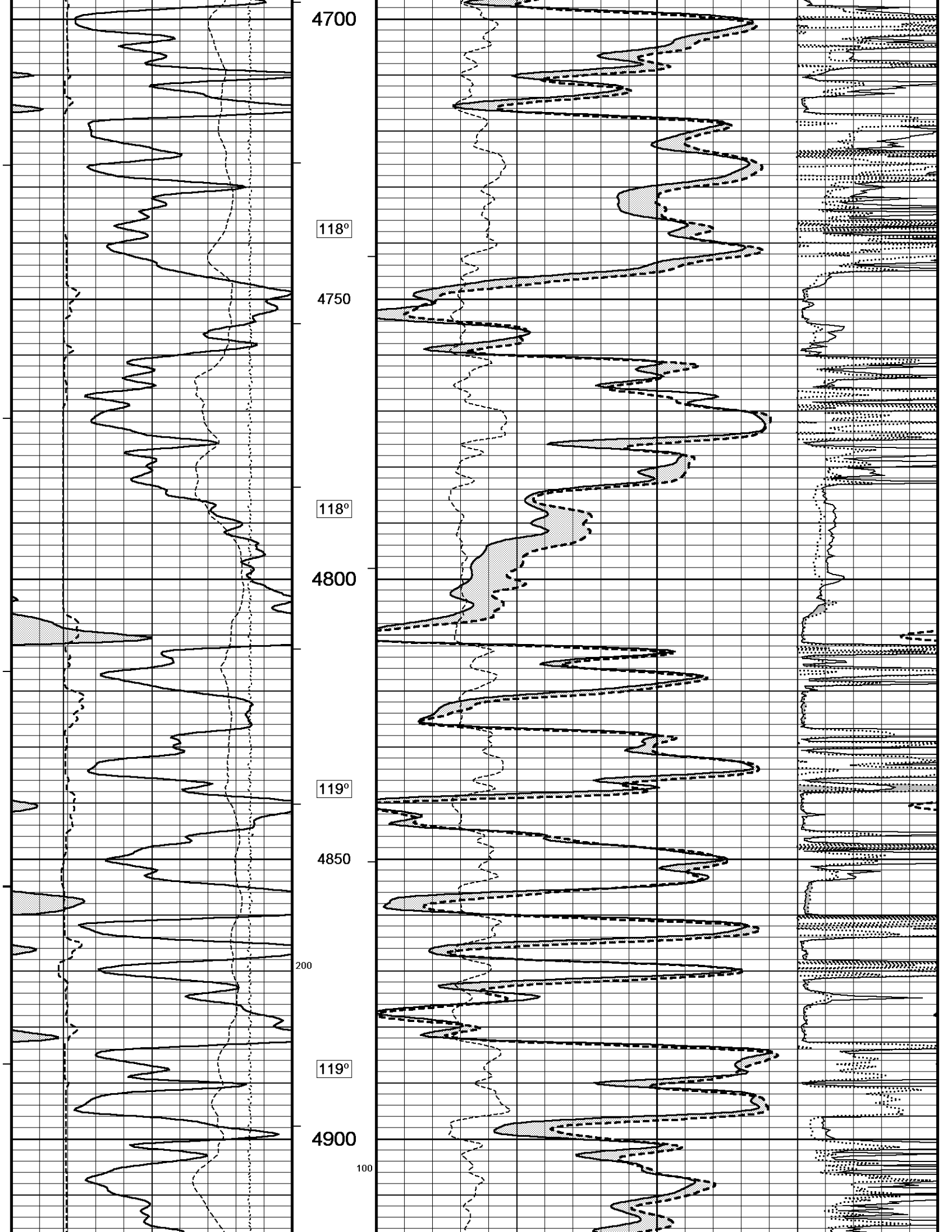


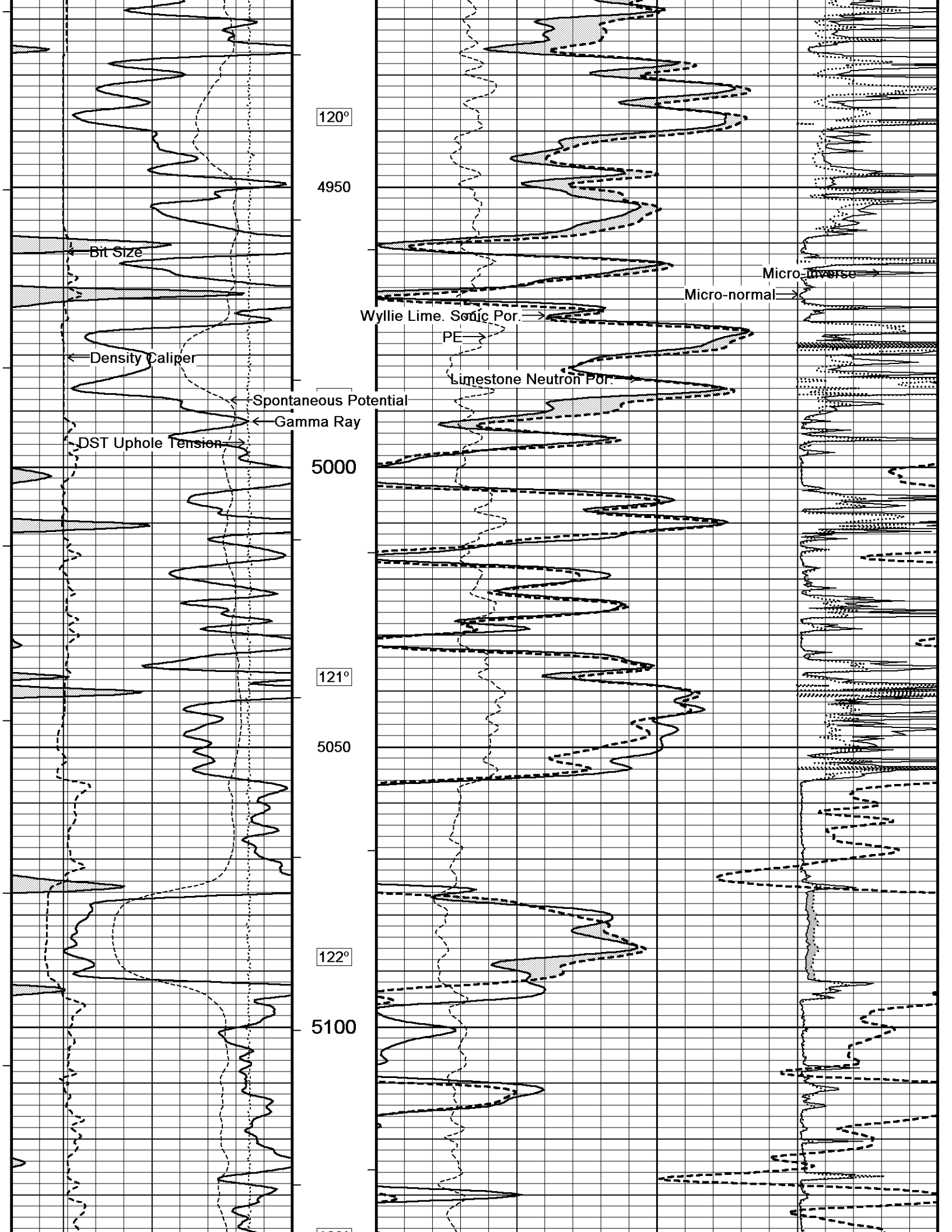


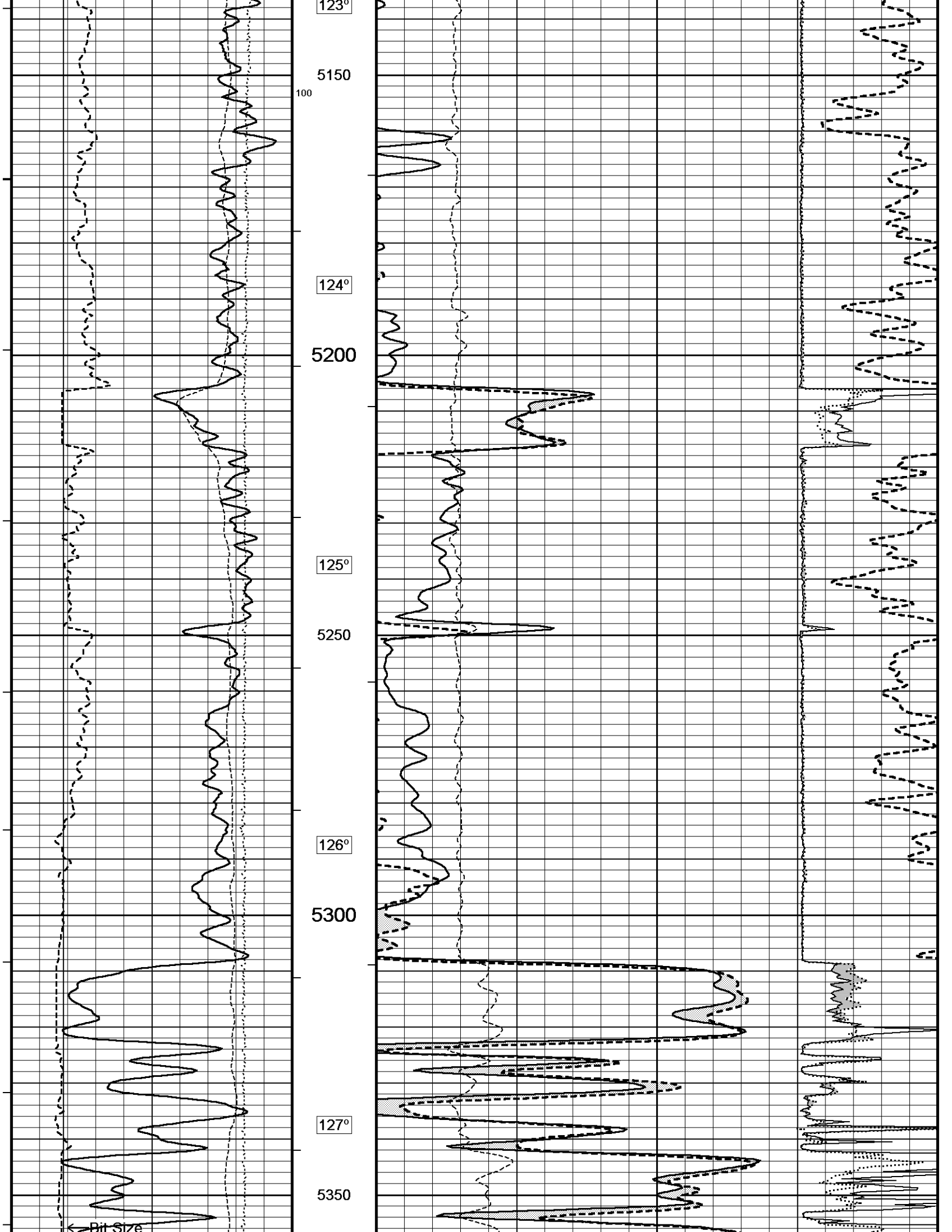


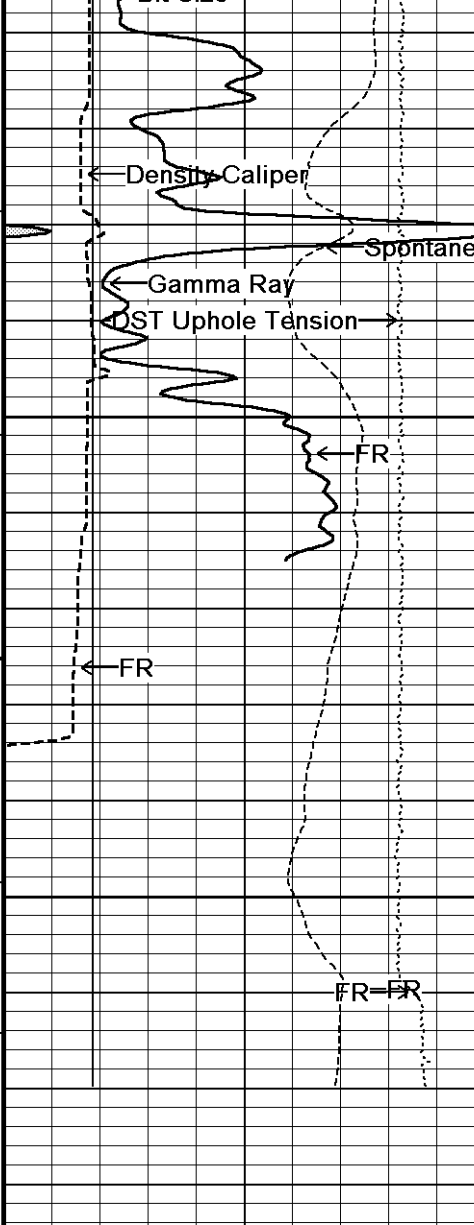




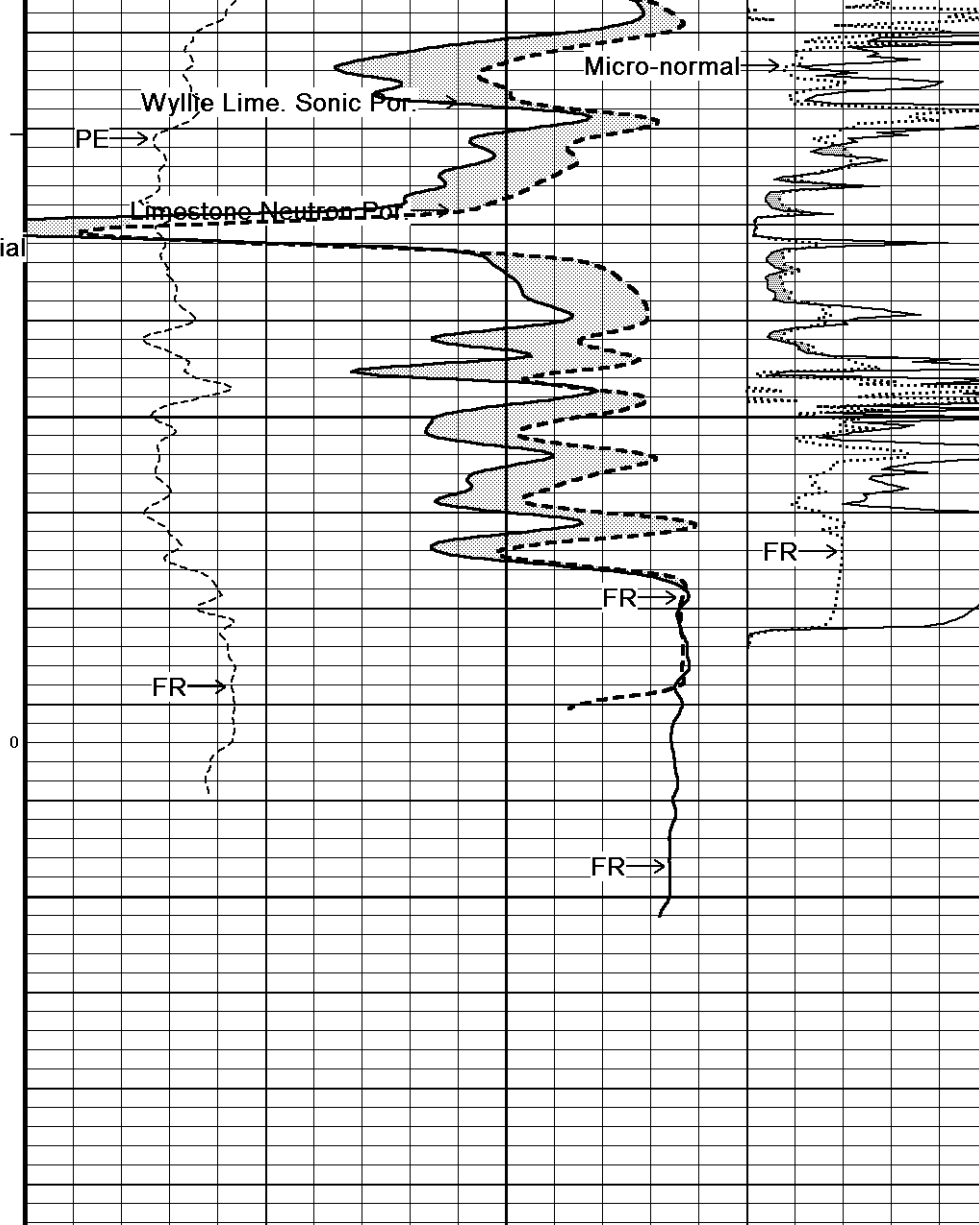








127°  
5400  
0  
5450



Timing Marks  
every 60.0 sec

Gamma Ray  
API  
0 75 150  
150 225 300

Spontaneous Potential  
millivolts  
- -> | 20 | <- +

Density Caliper  
inches  
6 11 16

Bit Size  
inches

5484  
Depth  
In  
Feet

Borehole  
Temp in  
deg F

HVI  
every  
10 cu ft

Annular  
Integral  
every  
10 cu ft

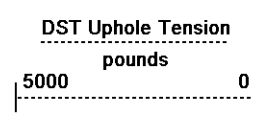
Limestone Neutron Por.  
percent  
30 20 10 0 -10  
70 60 50 40 30

Wyllie Lime. Sonic Por.  
percent  
30 20 10 0 -10

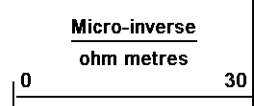
PE  
barns/electron  
0 5 10

Micro-normal  
ohm metres  
0 30

6 inches 11 16



Replay  
Scale  
1:240



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↑ 5 INCH MAIN ↑

### DOWNHOLE EQUIPMENT

C:\Minimus 13.05.9583\Logs\Western Operating Company FOX #2-8\Western Operating Company FOX #2-8\_003.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-Resistivity  
 MMR-A 11 LG: 8.59 ft WT: 81.6 lb OD: 4.88 in

Compact Neutron  
 MDN-A.B 65 LG: 5.04 ft WT: 50.7 lb OD: 2.24 in

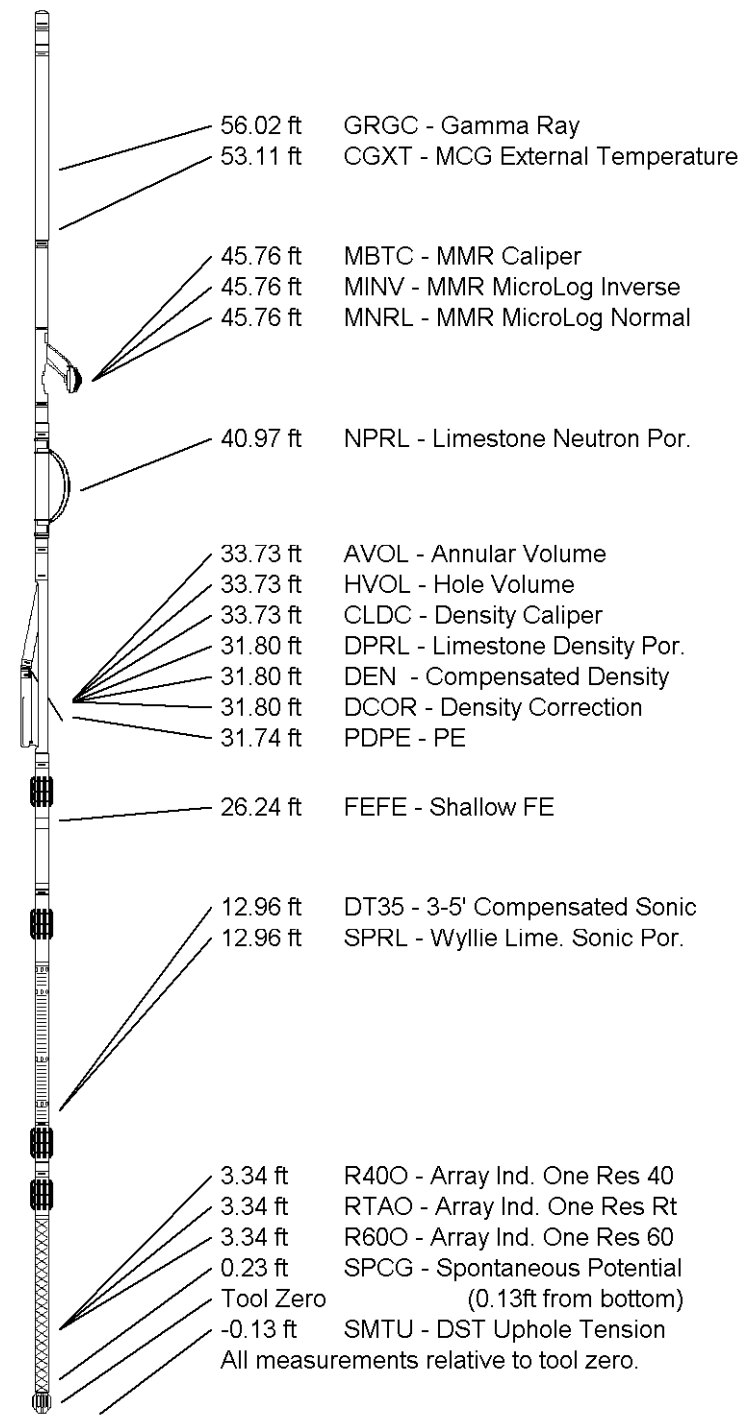
Compact Density/Caliper  
 MPD-B 64 LG: 9.59 ft WT: 90.4 lb OD: 2.45 in

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

Compact Sonic  
 MSS-C.K 368 LG: 12.52 ft WT: 72.8 lb OD: 2.24 in

Compact Induction  
 MAI-A.A 45 LG: 10.81 ft WT: 48.5 lb OD: 2.24 in

Total Length: 62.88 ft Weight: 471.8 lb



COMPANY	WESTERN OPERATING COMPANY
WELL	FOX #2-8
FIELD	HELFRICH
PROVINCE/COUNTY	HAMILTON
COUNTRY/STATE	U.S.A. / KANSAS

Elevation Kelly Bushing	3658.00	feet	First Reading	5447.00	feet
Elevation Drill Floor	3657.00	feet	Depth Driller	5467.00	feet
Elevation Ground Level	3647.00	feet	Depth Logger	5460.00	feet



**Weatherford**<sup>®</sup>

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POROSITY LOG