



Weatherford

**COMPACT PHOTO DENSITY
COMPENSATED NEUTRON
MICRORESISTIVITY LOG**

COMPANY	PETROSANTANDER (USA) INC.				
WELL	UNRUH #6				
FIELD	CHRISTABELLE (MORROW)				
PROVINCE/COUNTY	KEARNY				
COUNTRY/STATE	U.S.A. / KANSAS				
LOCATION	1305' FNL & 1285' FEL				
SEC 13	TWP 21S	RGE 35W	Other Services		
Latitude			MAI/MFE		
Longitude					
API Number	15-093-21925				
Permanent Datum GL, Elevation	3063 feet				
Log Measured From	KB		Elevations: KB 3075.00 DF 3073.00 GL 3063.00		
Drilling Measured From	KB @ 12 FEET				
Date	23-AUG-2014				
Run Number	ONE				
Service Order	7960-95982809				
Depth Driller	4970.00		feet		
Depth Logger	4966.00		feet		
First Reading	4946.78		feet		
Last Reading	523.00		feet		
Casing Driller	520.00		feet		
Casing Logger	523.00		feet		
Bit Size	7.857		inches		
Hole Fluid Type	WBM				
Density / Viscosity	9.30	lb/USg	43.00	CP	
PH / Fluid Loss	8.50		12.00	ml/30Min	
Sample Source	MUDPIT				
Rm @ Measured Temp	0.57 @ 75.0		ohm-m		
Rmf @ Measured Temp	0.46 @ 75.0		ohm-m		
Rmc @ Measured Temp	0.68 @ 75.0		ohm-m		
Source Rmf / Rmc	CALC		CALC		
Rm @ BHT	0.37 @120.0		ohm-m		
Time Since Circulation	4 HOURS				
Max Recorded Temp	123.00		deg F		
Equipment / Base	13096		LIB		
Recorded By	DEREK CARTER				
Witnessed By	WES HANSEN		JAKE HINES		
JOB #	LB14-247				

BOREHOLE RECORD					Last Edited: 23-AUG-2014 11:56
Bit Size inches		Depth From feet		Depth To feet	
7.857		520.00		4970.00	
CASING RECORD					
Type	Size inches	Depth From feet	Shoe Depth feet	Weight pounds/ft	
SURFACE	8.625	0.00	520.00	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
- TOTAL HOLE VOLUME FROM TD TO SURFACE CASING: 2010 CU. FT.
- ANNUJILAR HOLE VOLUME WITH 5.5 INCH CASING FROM TD TO SURFACE CASING: 1280 CU. FT.

- SERVICE ORDER #: 7960-95982809

- RIG: VAL #1

- ENGINEER: DEREK CARTER

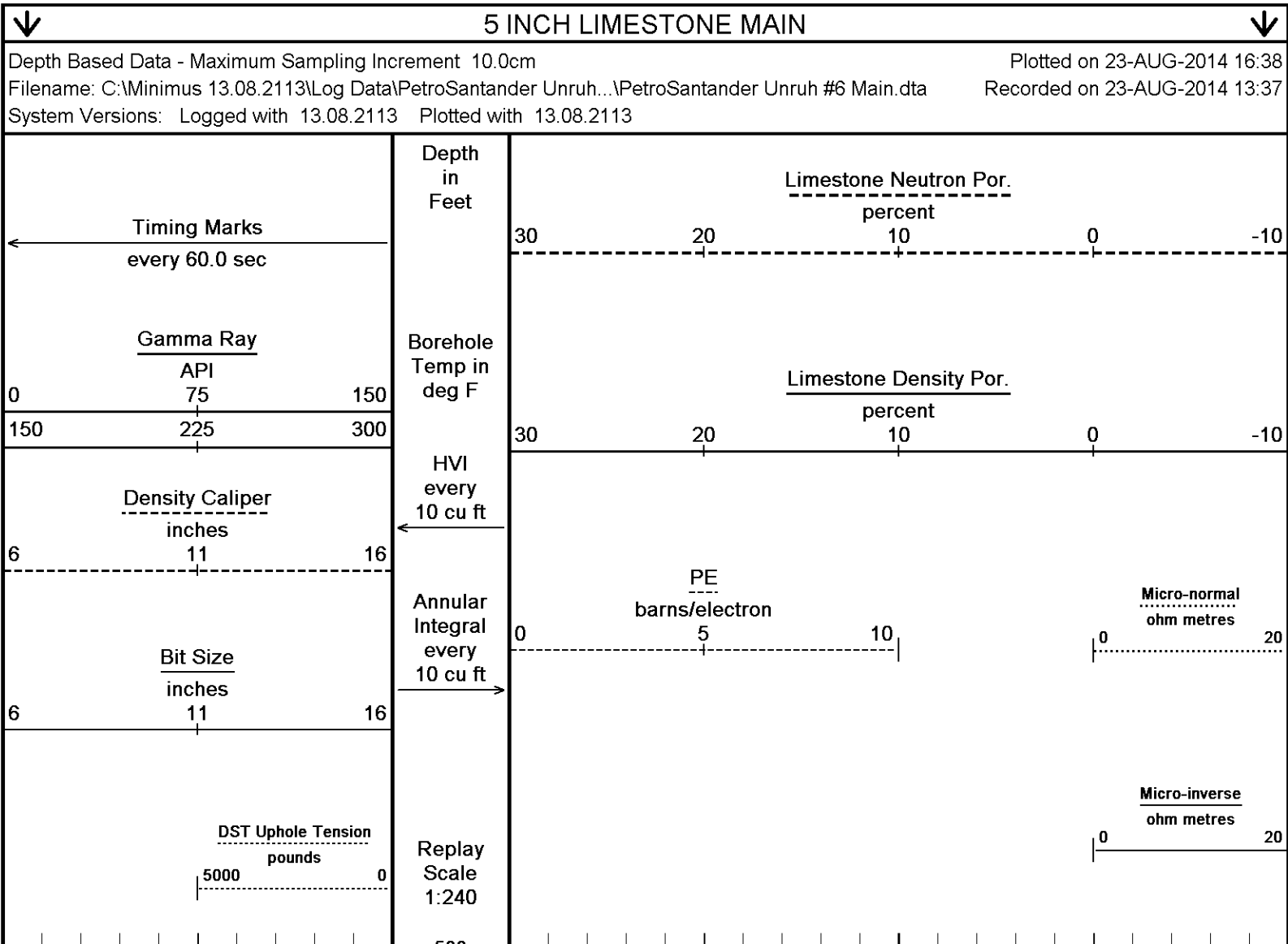
- JUNIOR FIELD ENGINEER: JAKE HINES

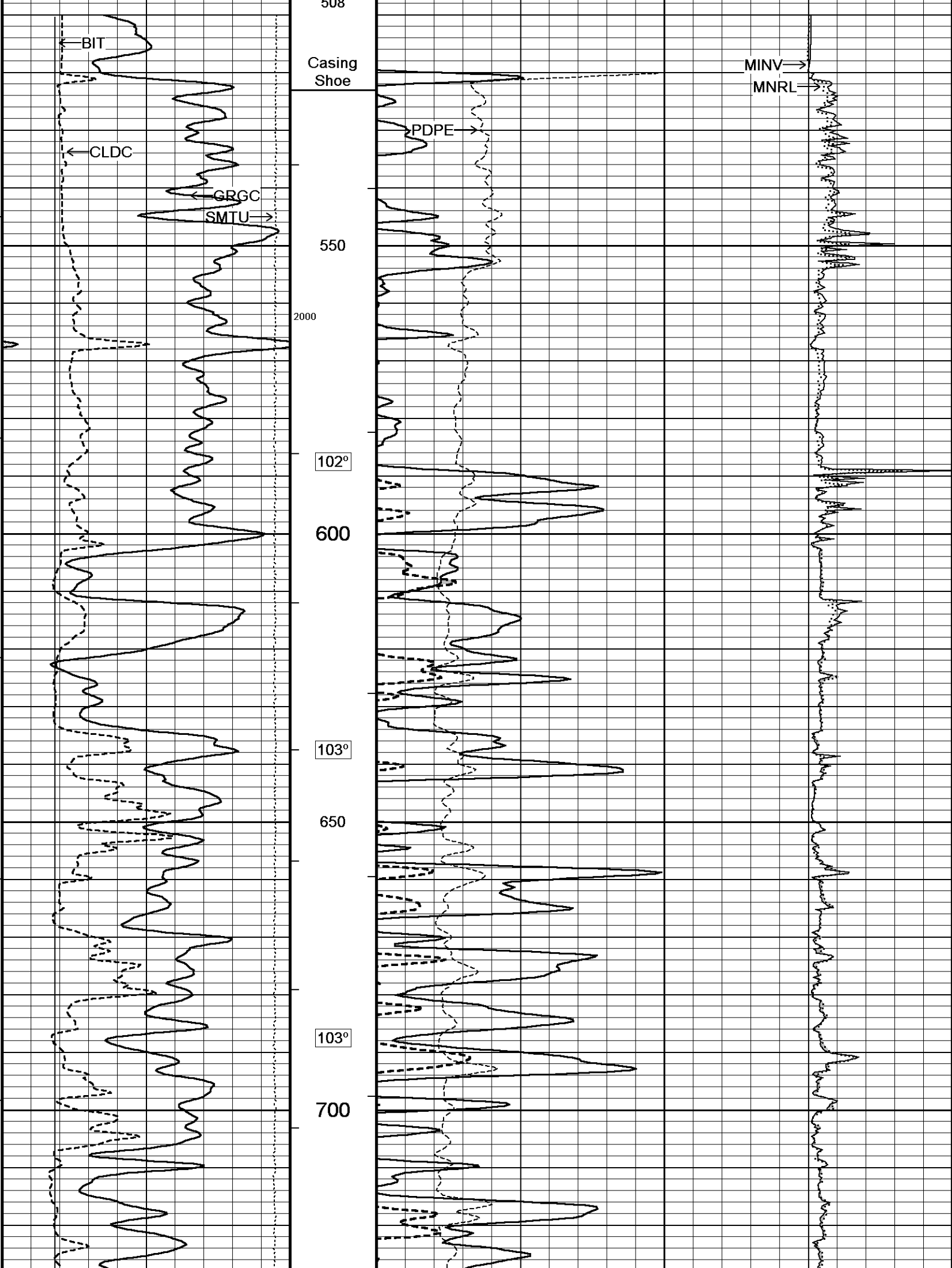
- OPERATOR: CARLOS RAMIREZ

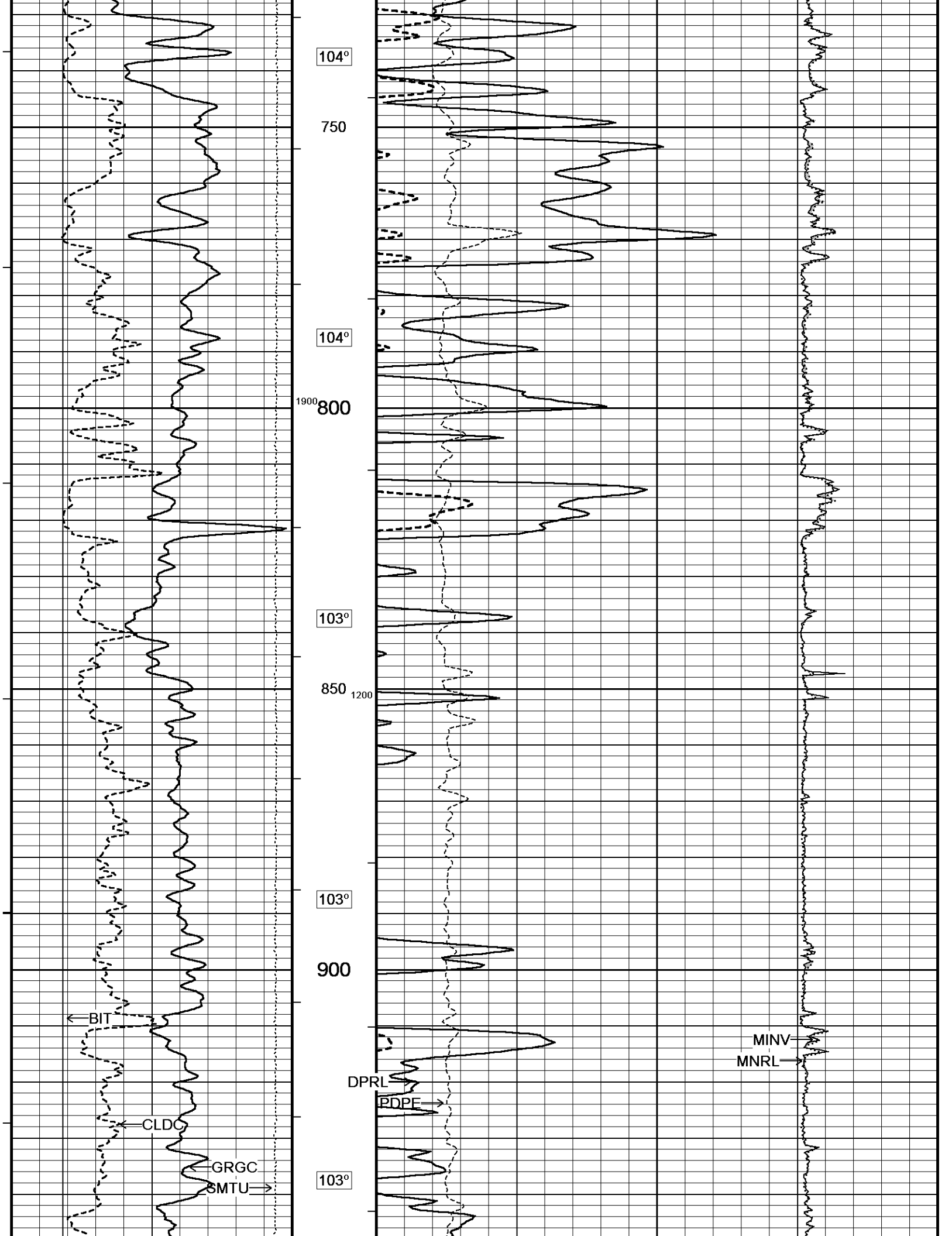
- HIT LEDGE WHILE RIH AT 1481 FT.; PULLED OF AND WORKED PAST WITH NO FURTHER PROBLEMS

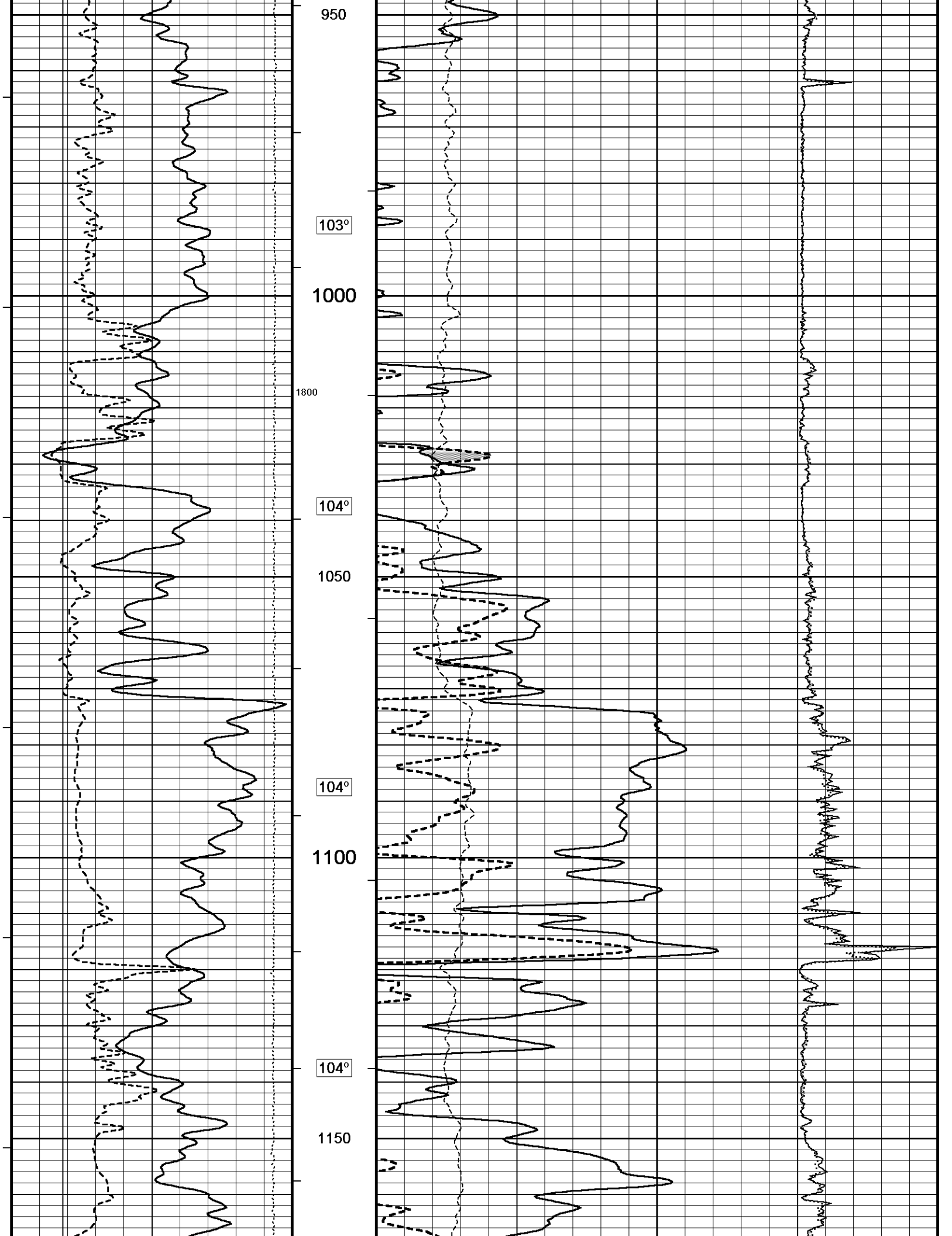
- SP CURVE APPEARS TO HAVE ERRATIC NOISE AT INTERVALS BUT CLEANS UP AT TIMES; LIKELY CAUSE IS DUE TO LARGE AMOUNT OF PRODUCTION MACHINERY NEAR LOCATION

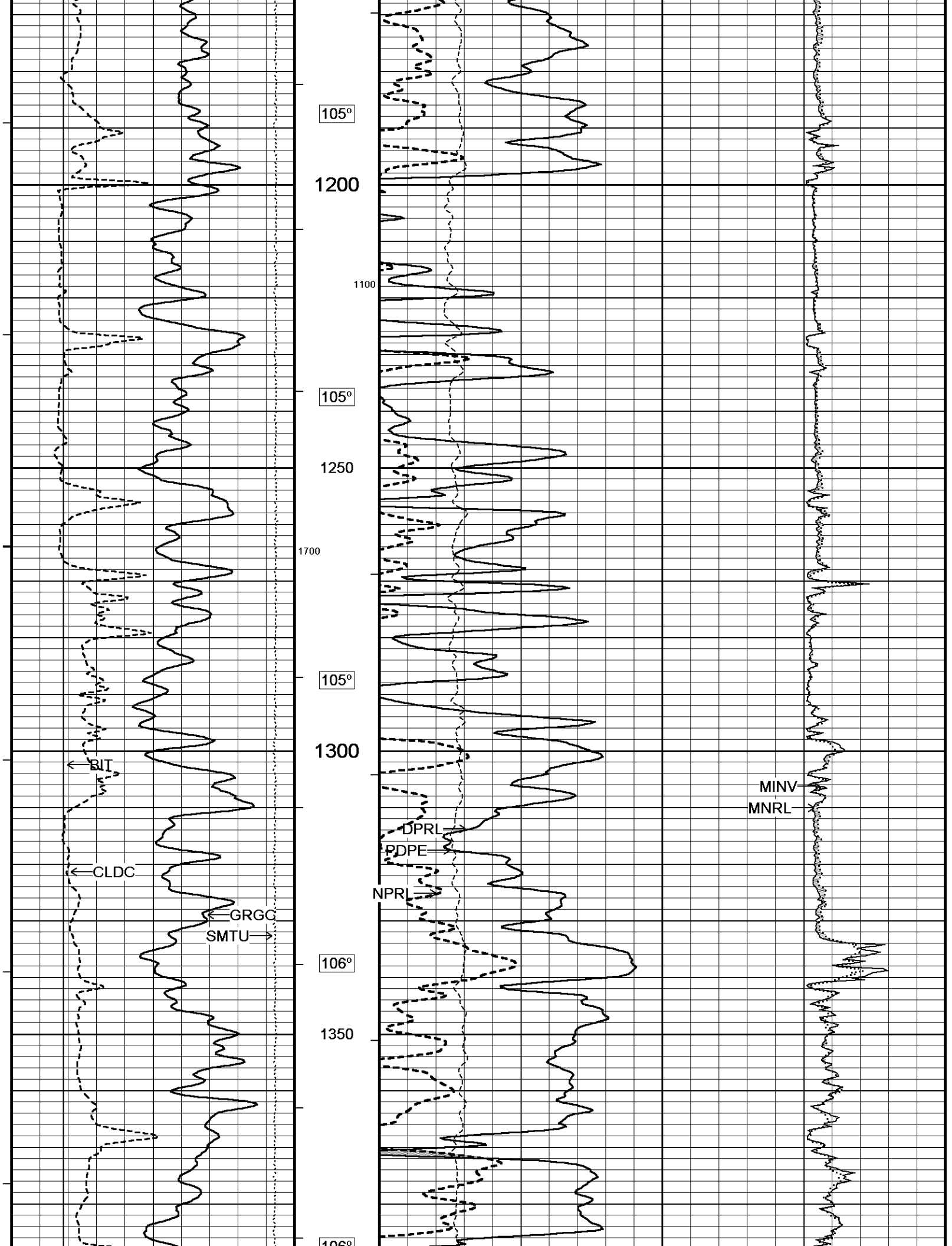
In interpreting, communicating or providing information and/or making recommendations, either written or oral, as to logs or test or other data, type or amount of material, or Work or other service to be furnished, or manner of performance, or in predicting results to be obtained, the Contractor will 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.

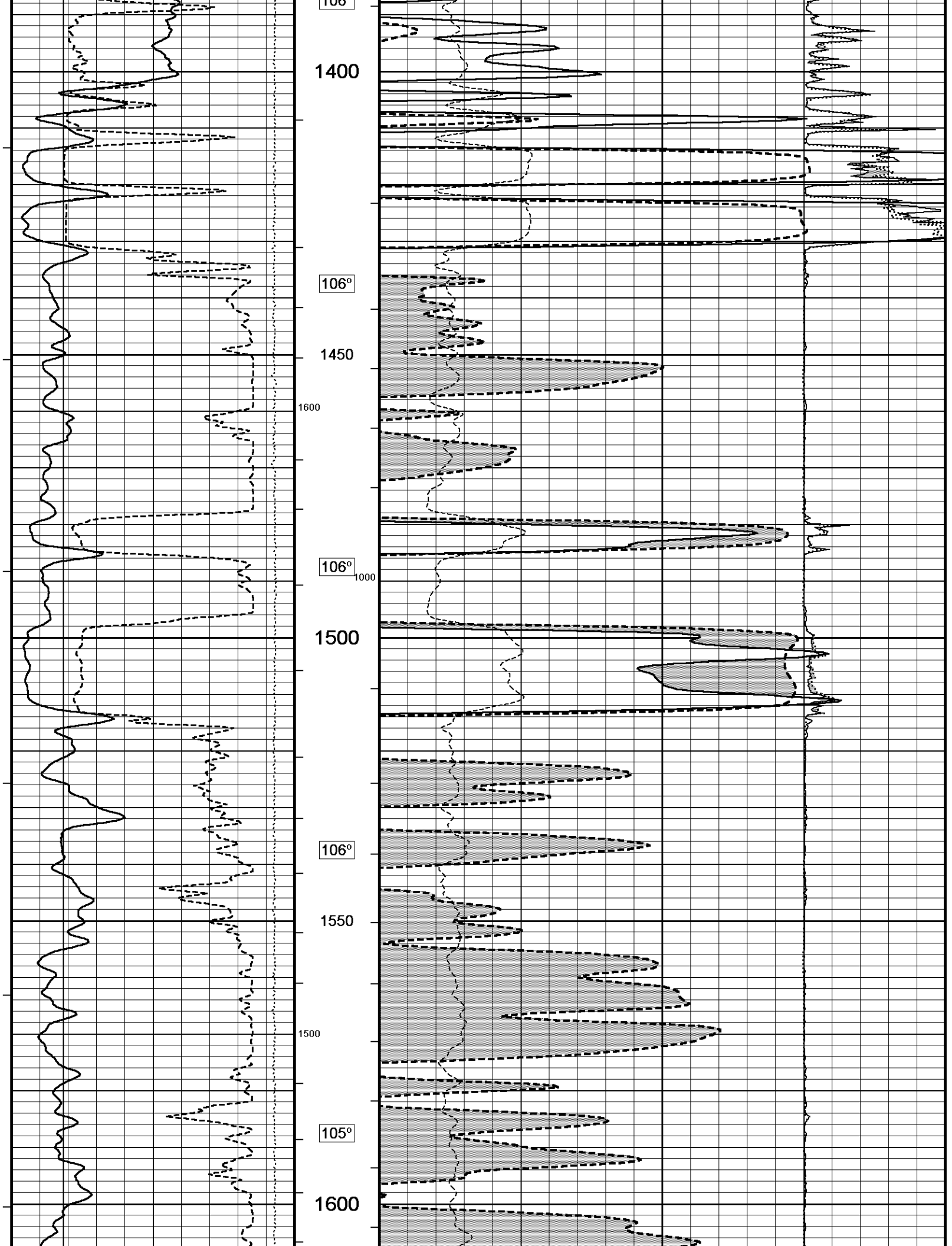


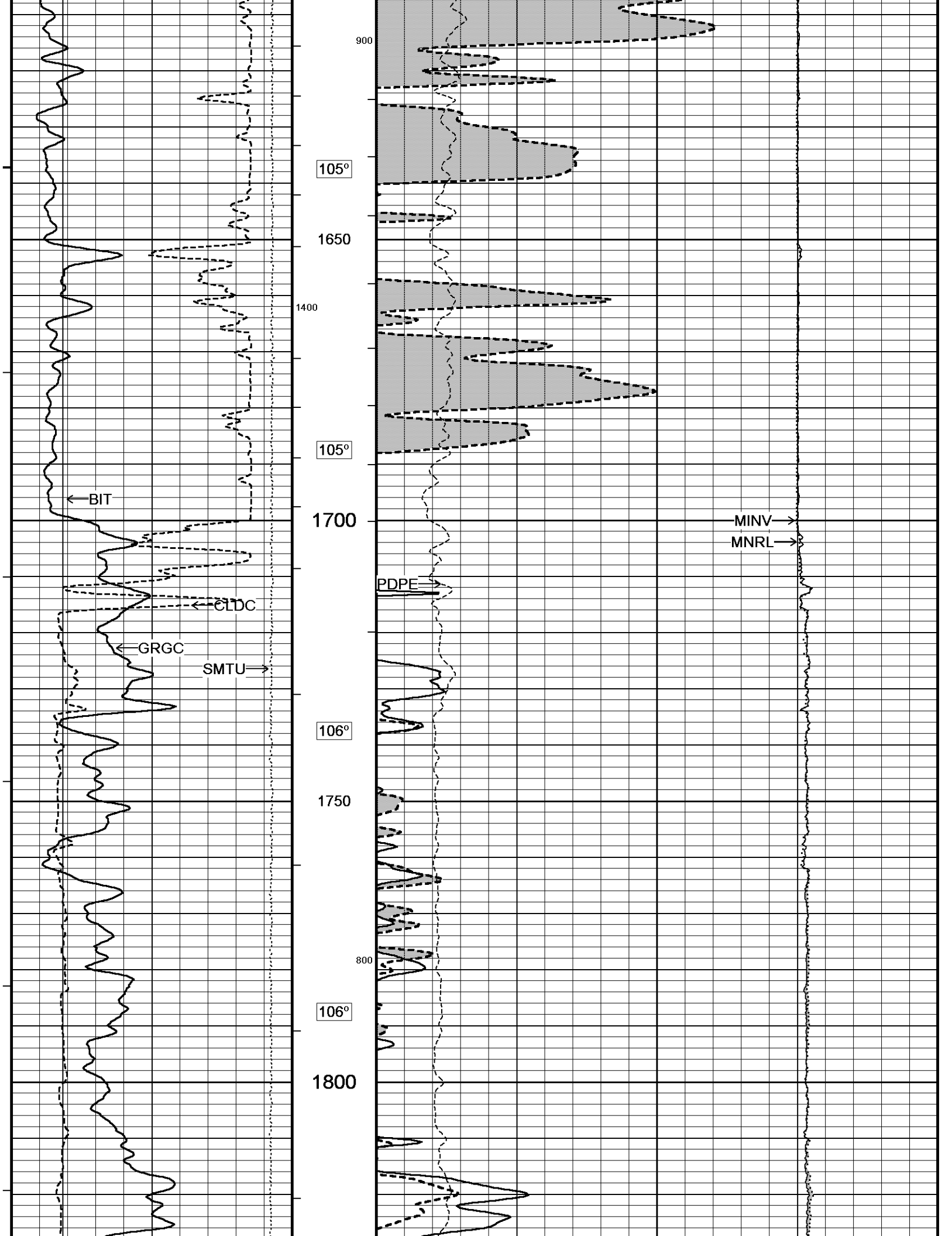


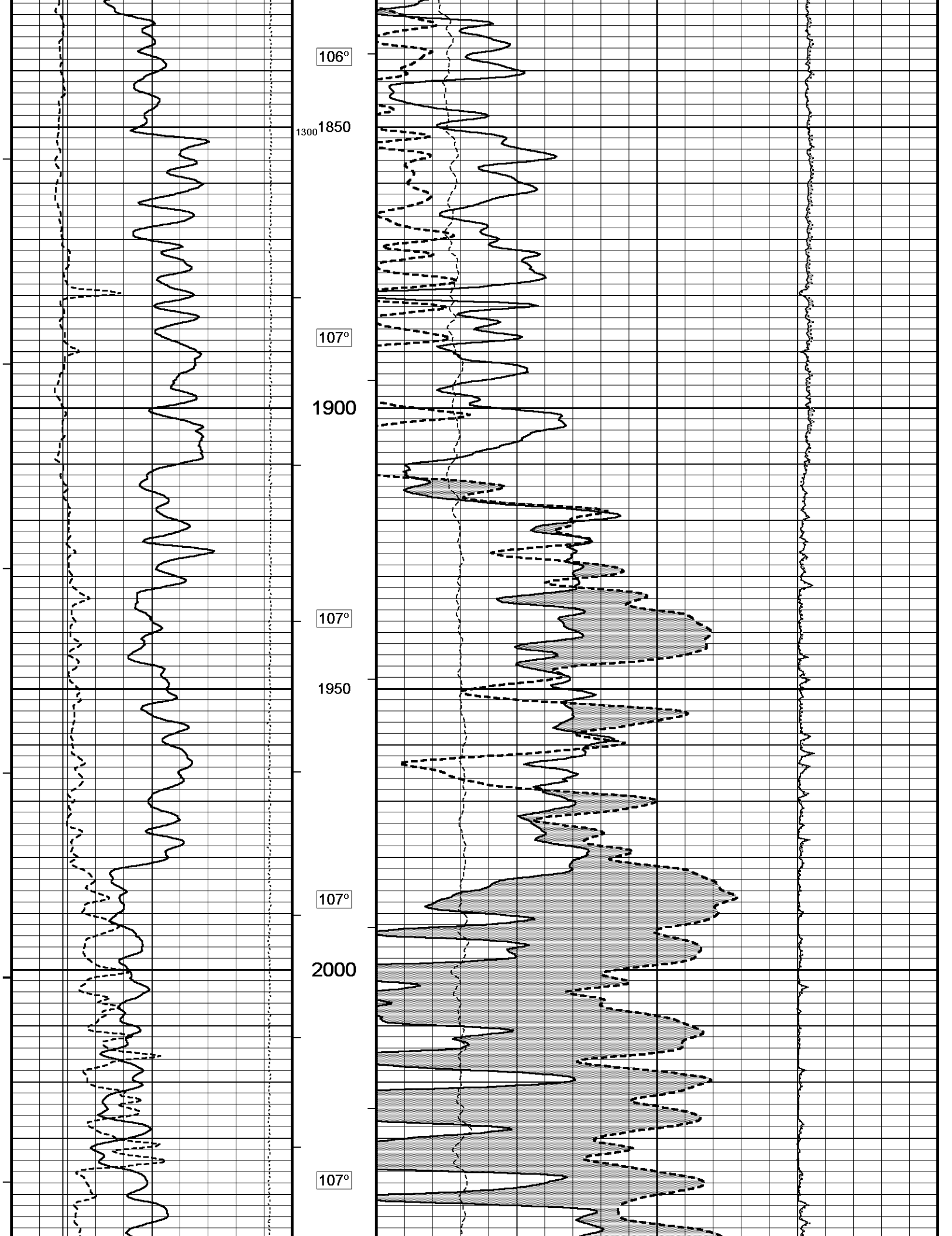


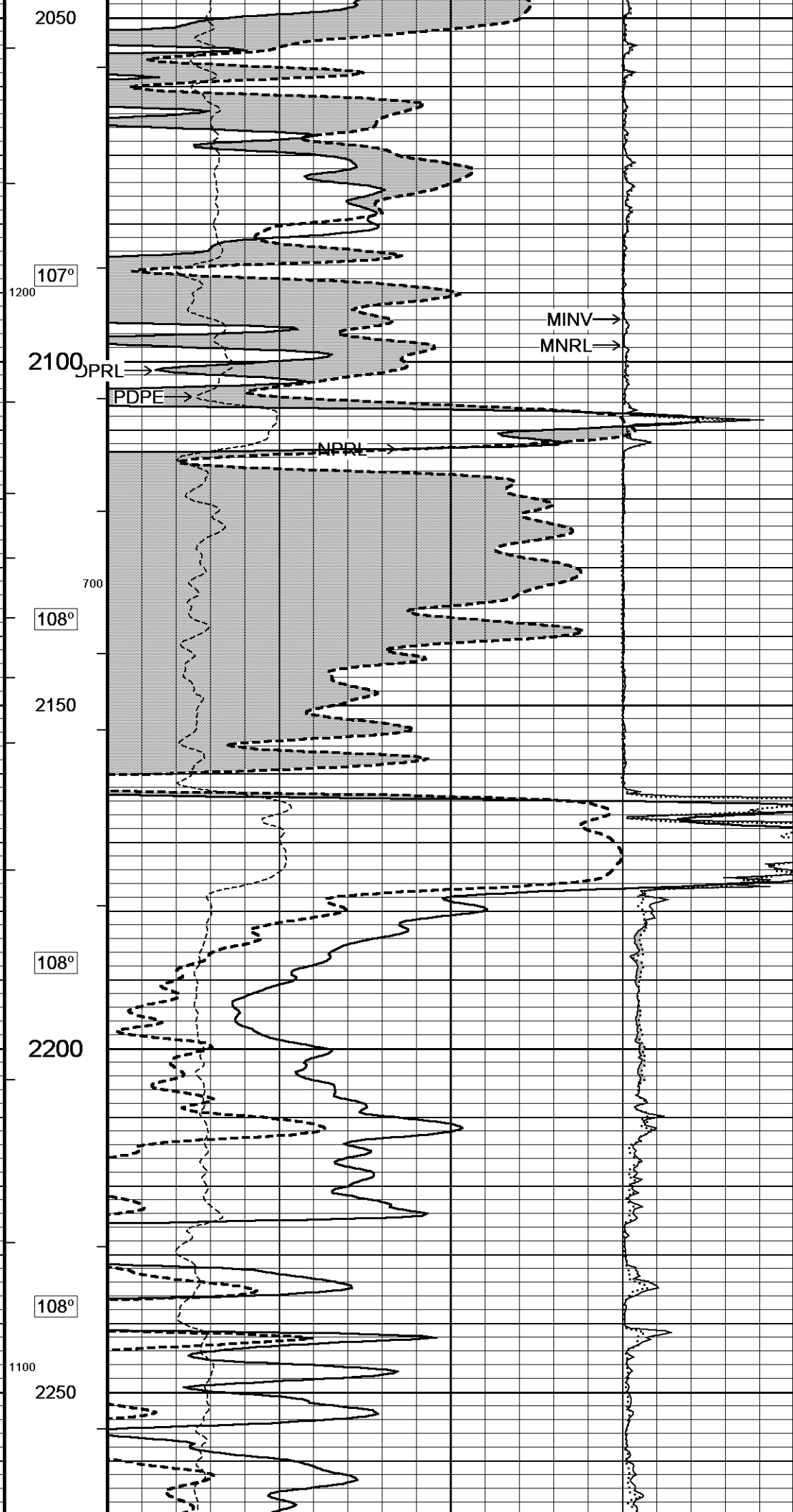
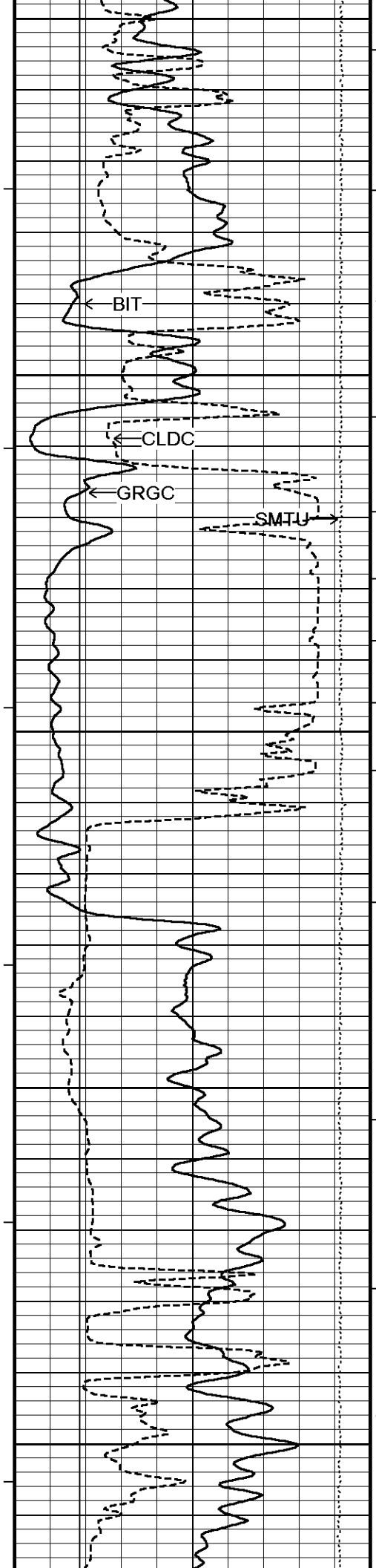


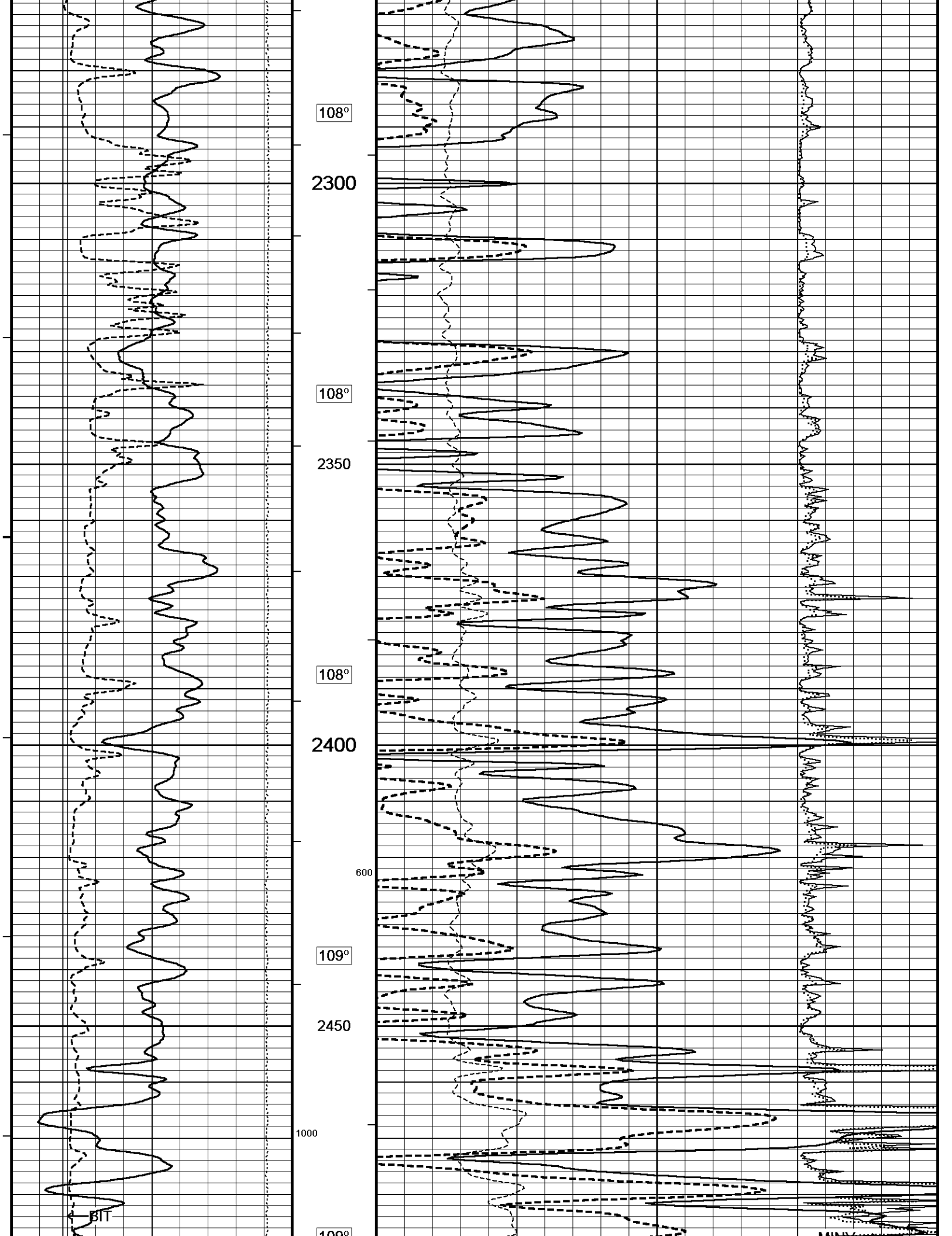


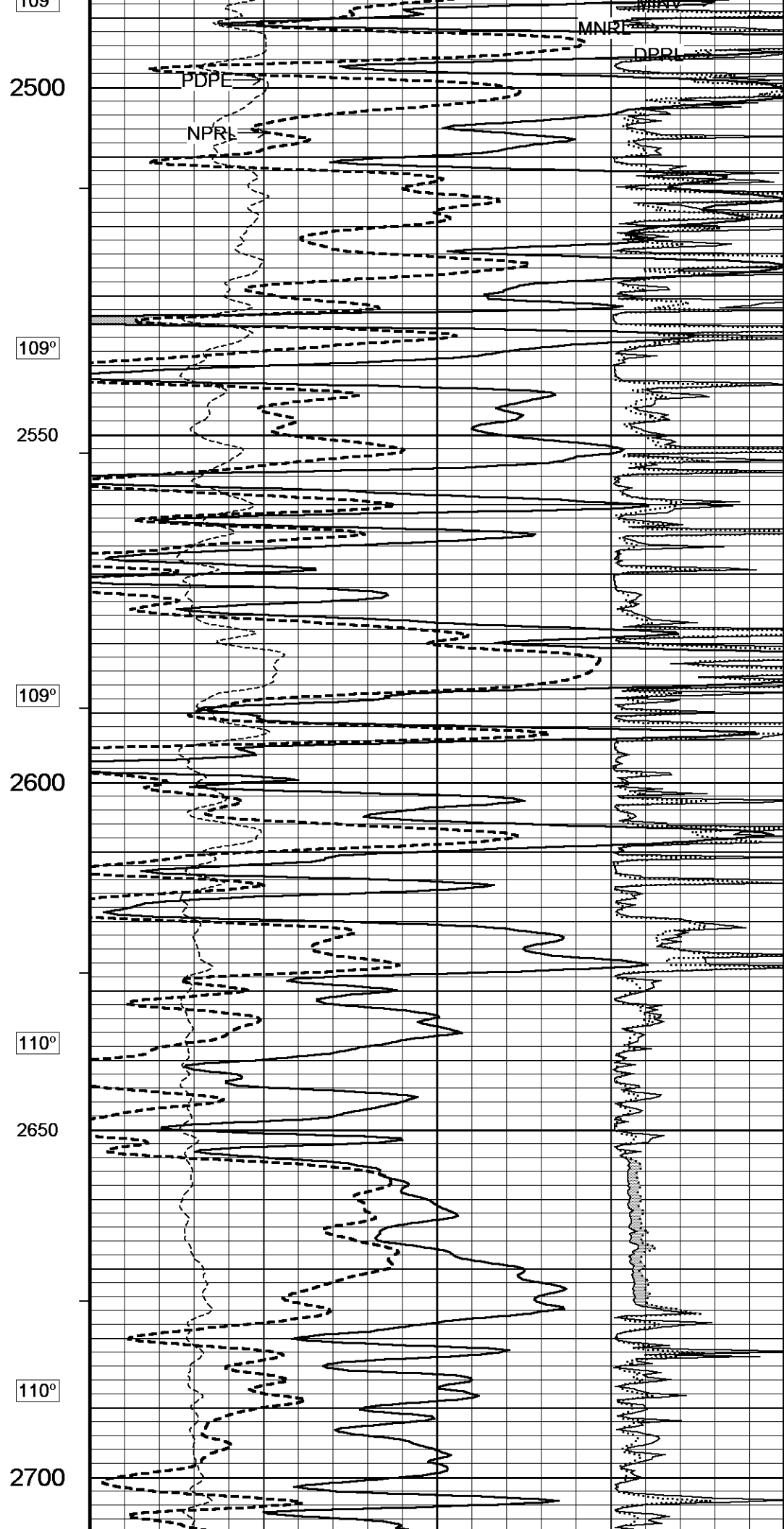
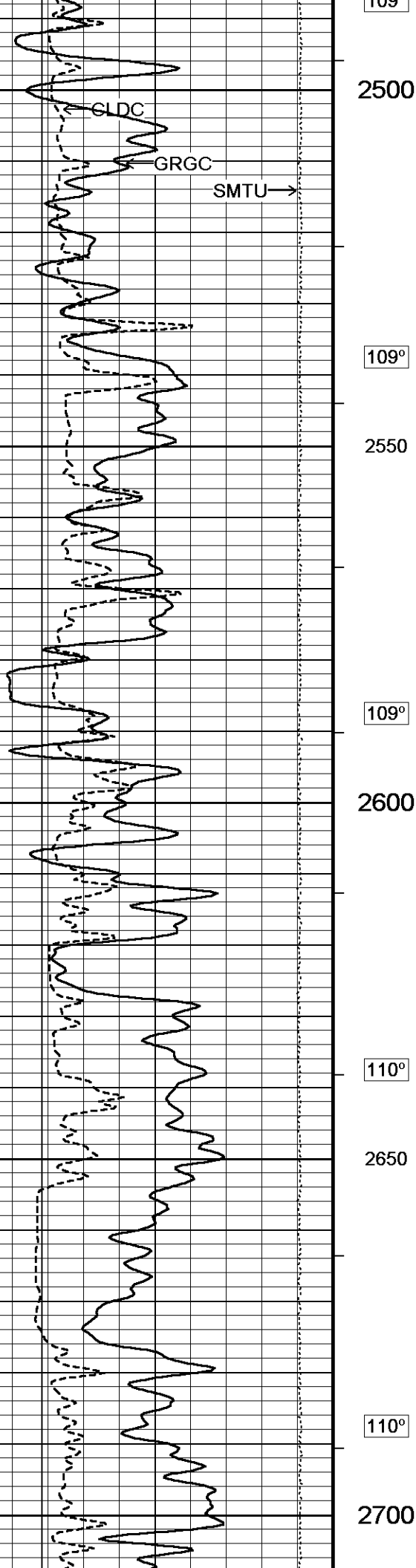


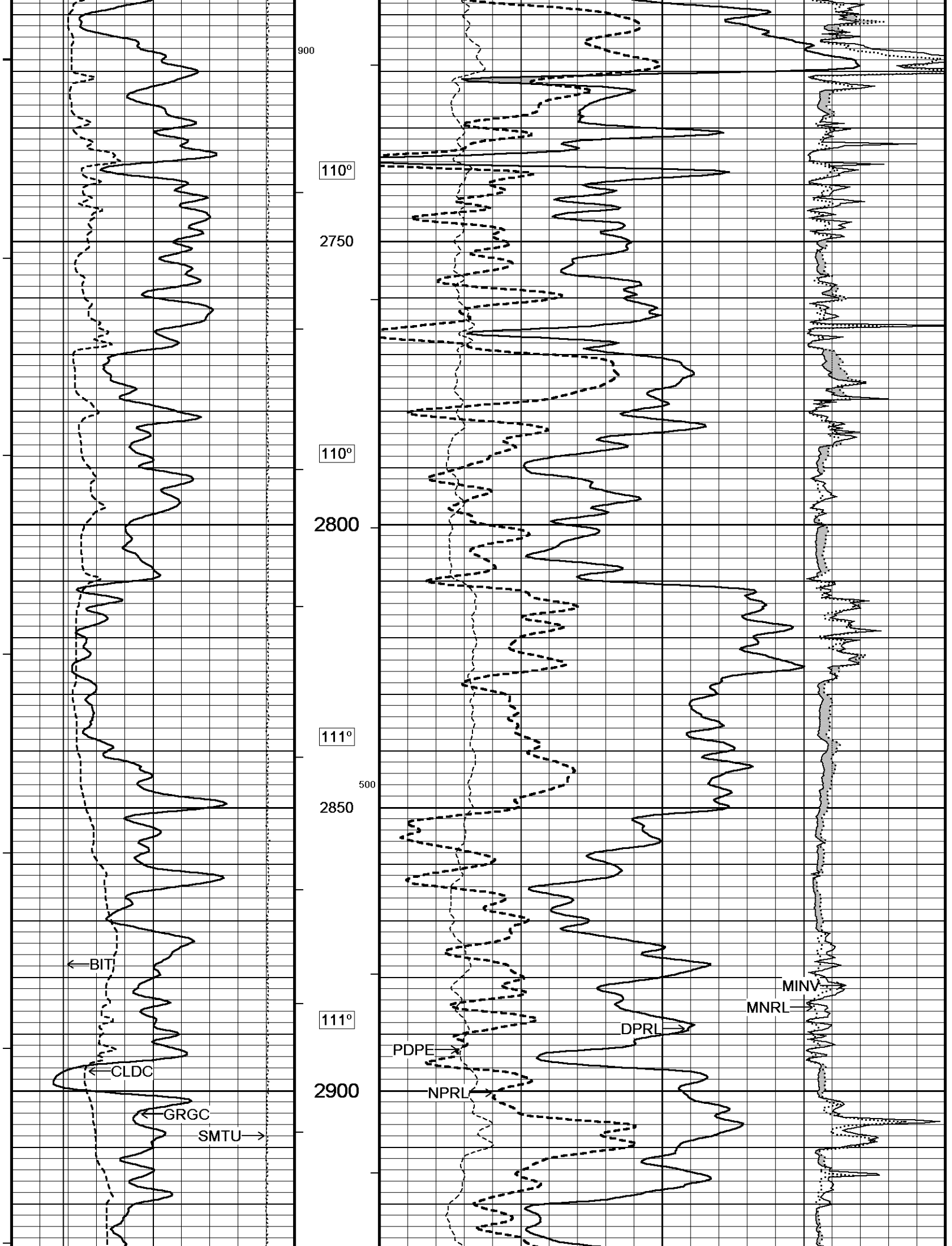


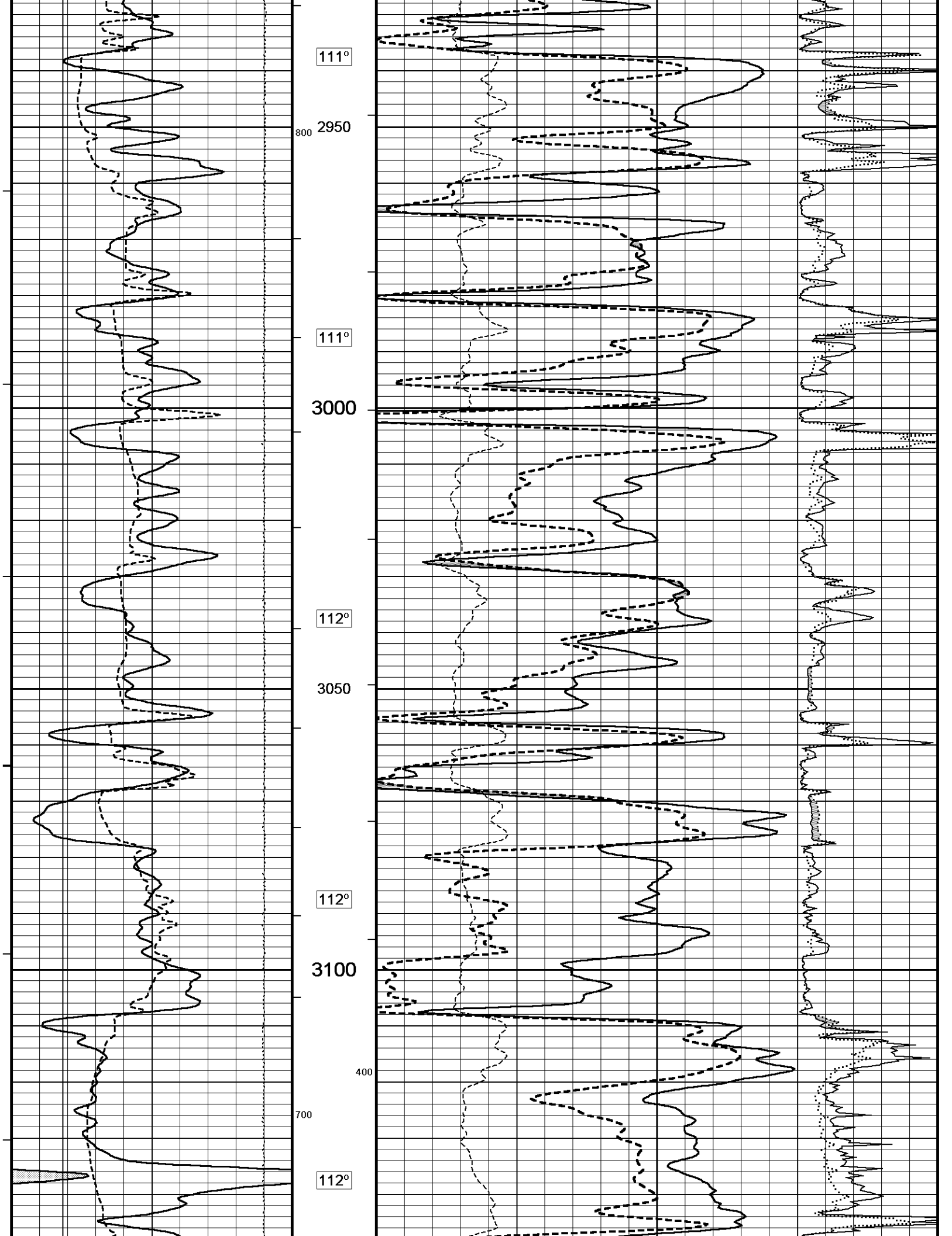


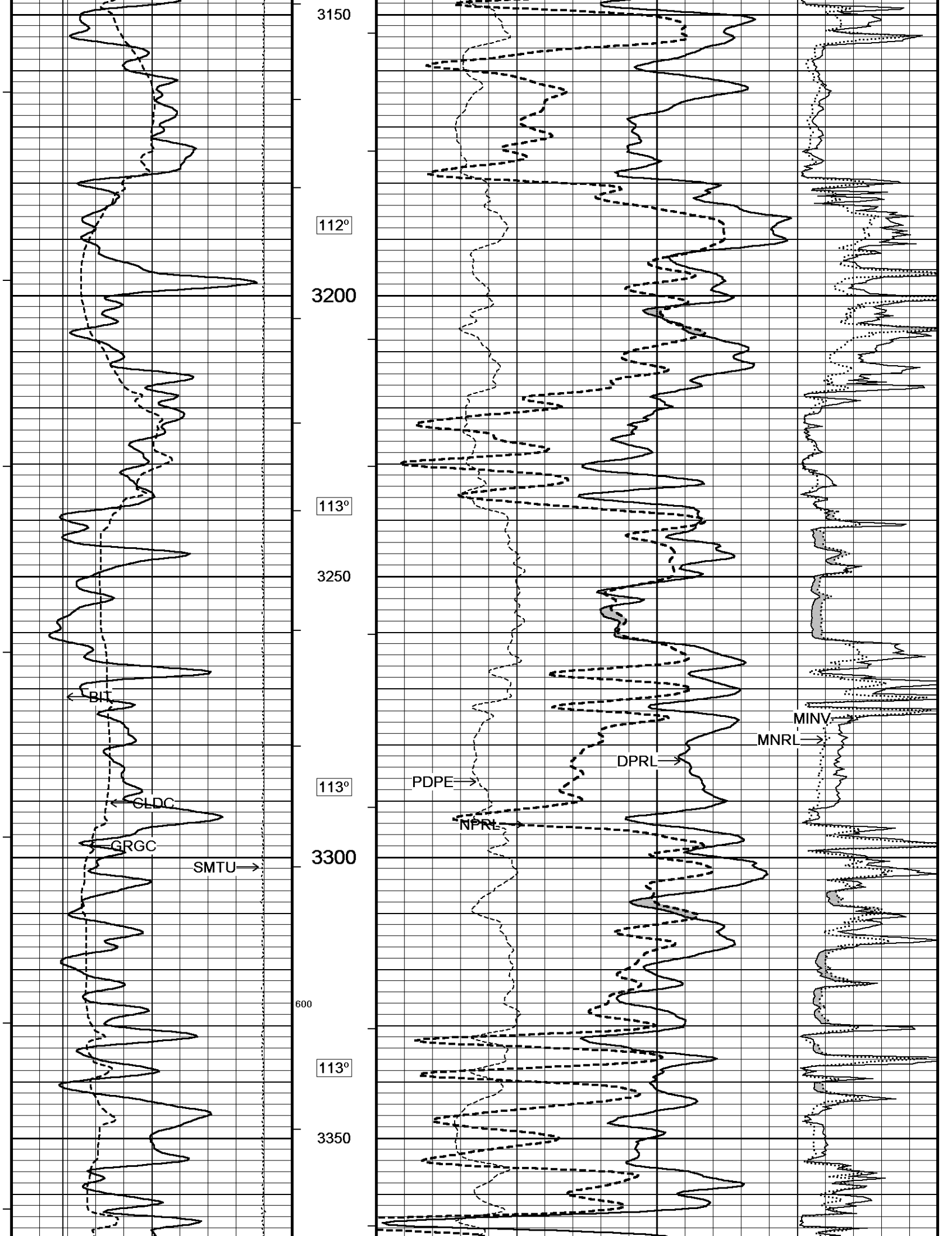


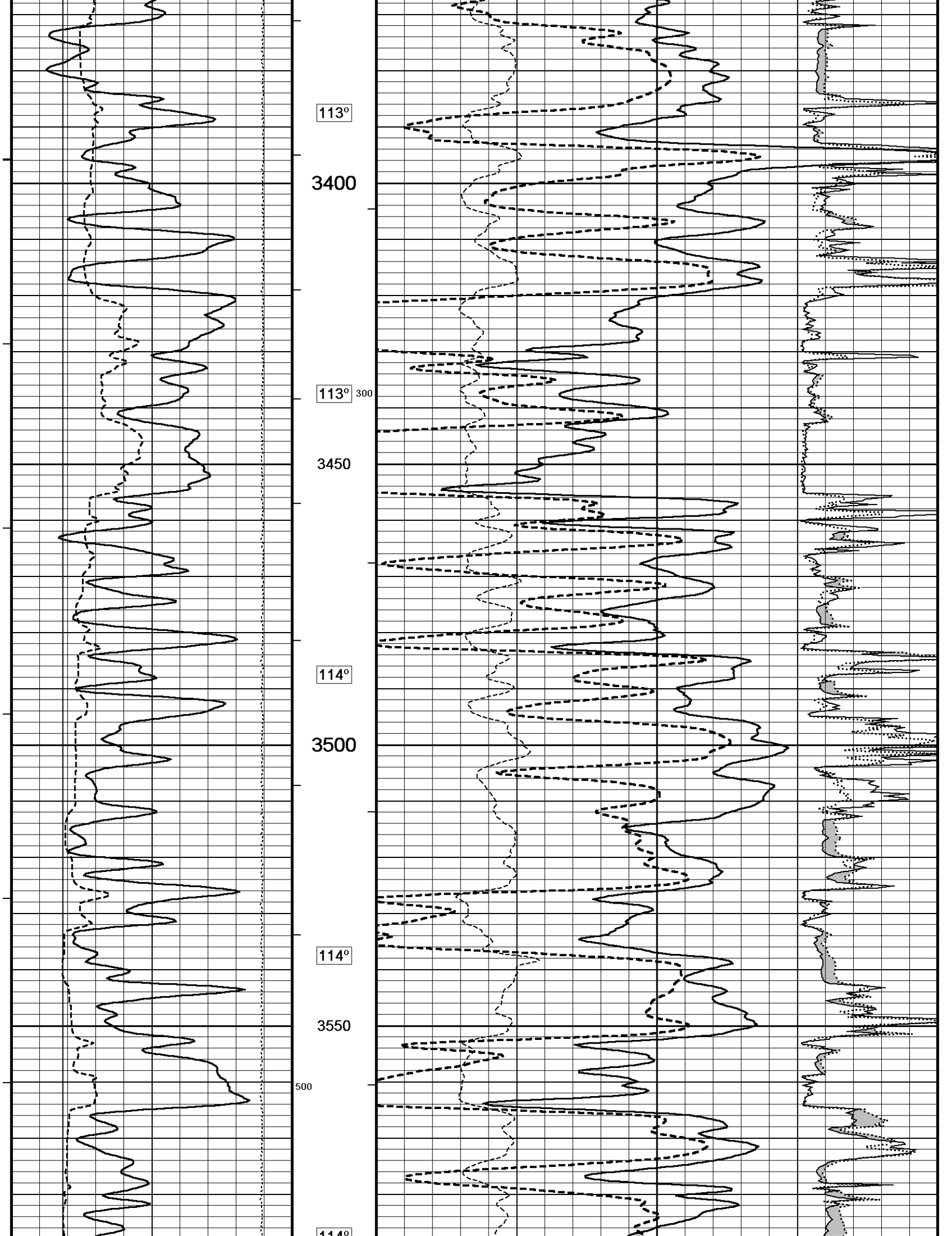


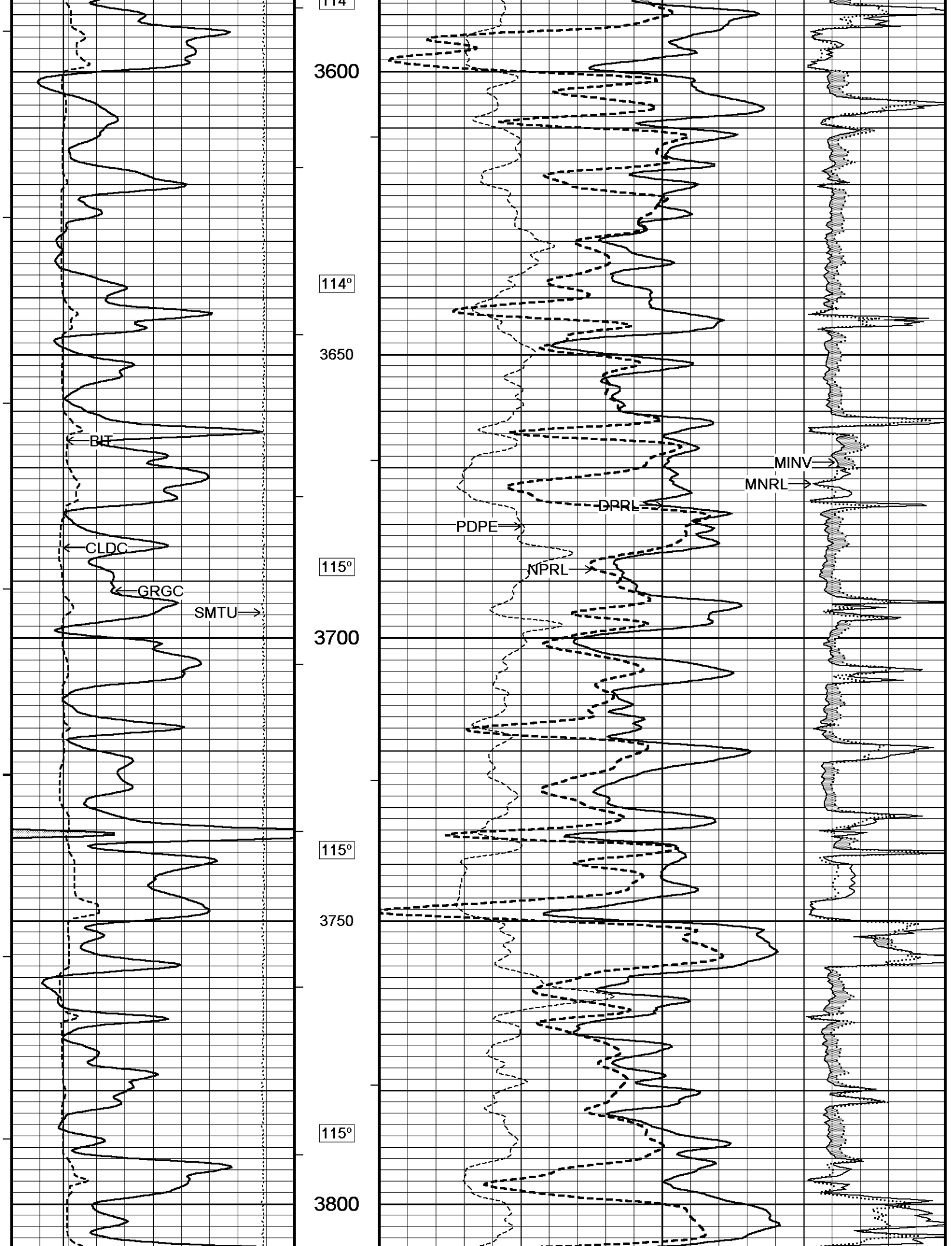


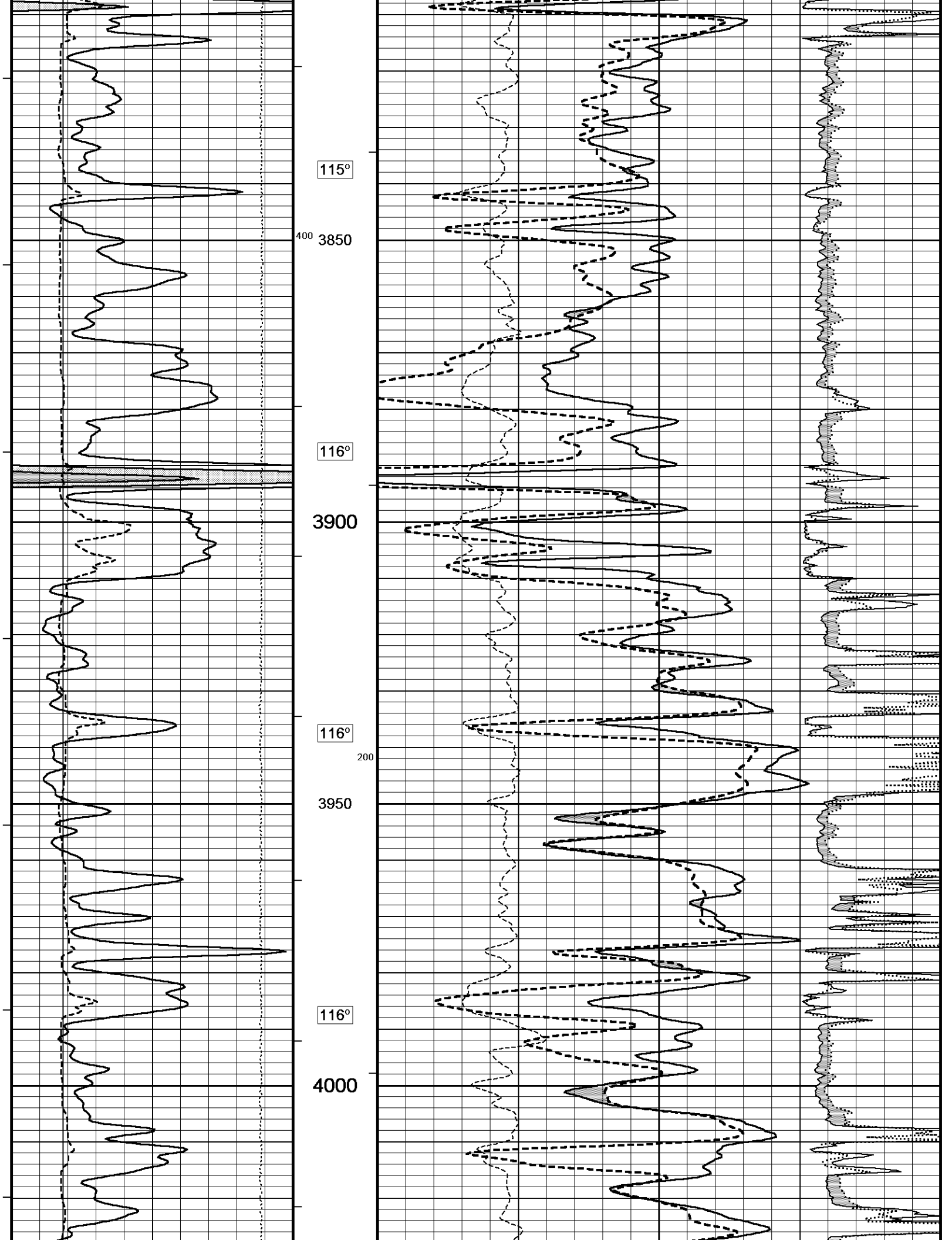


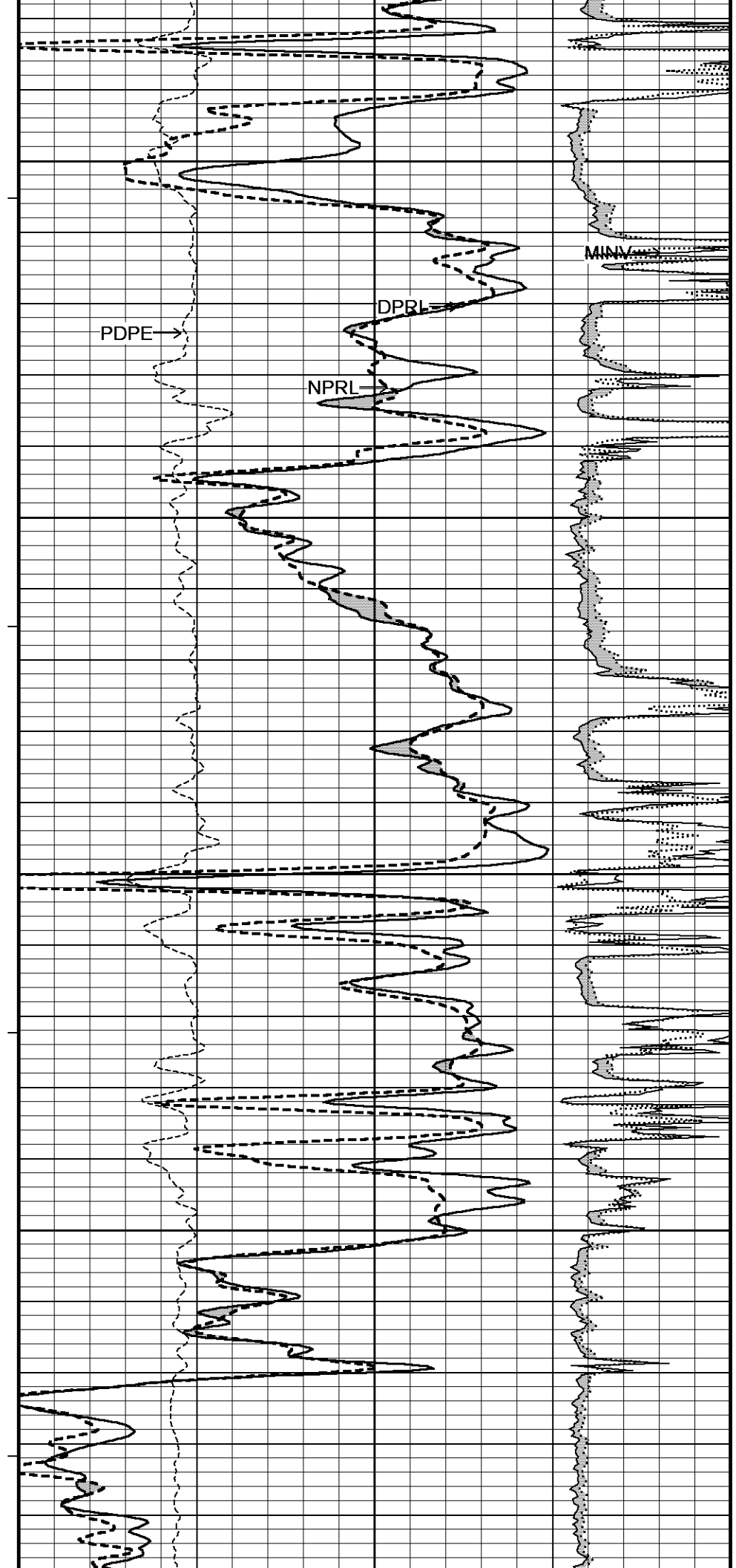
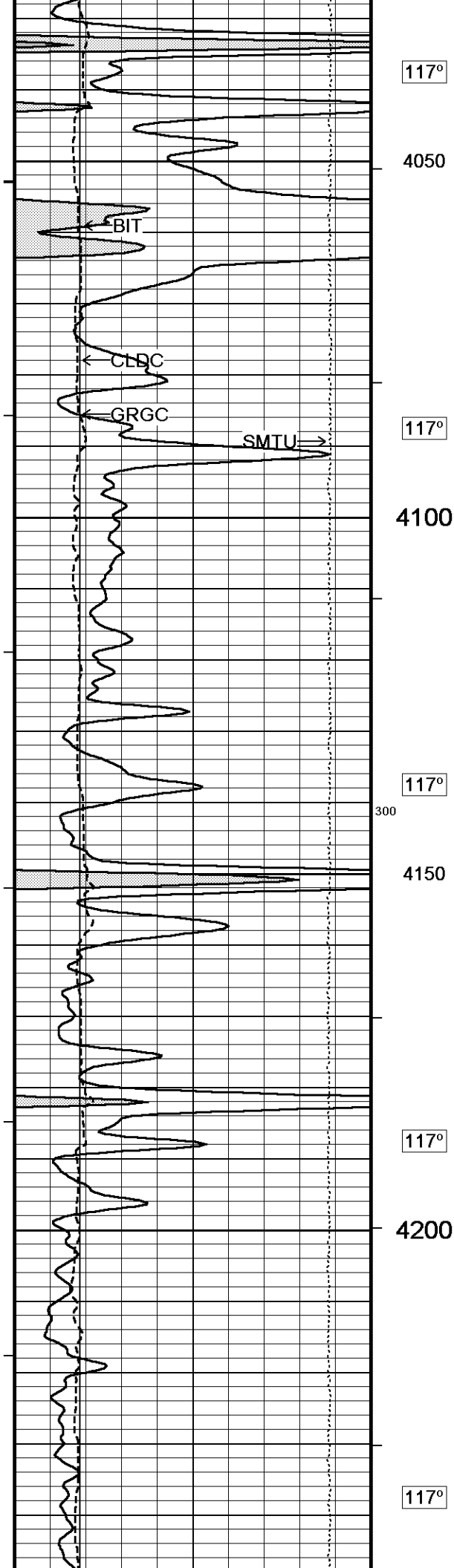


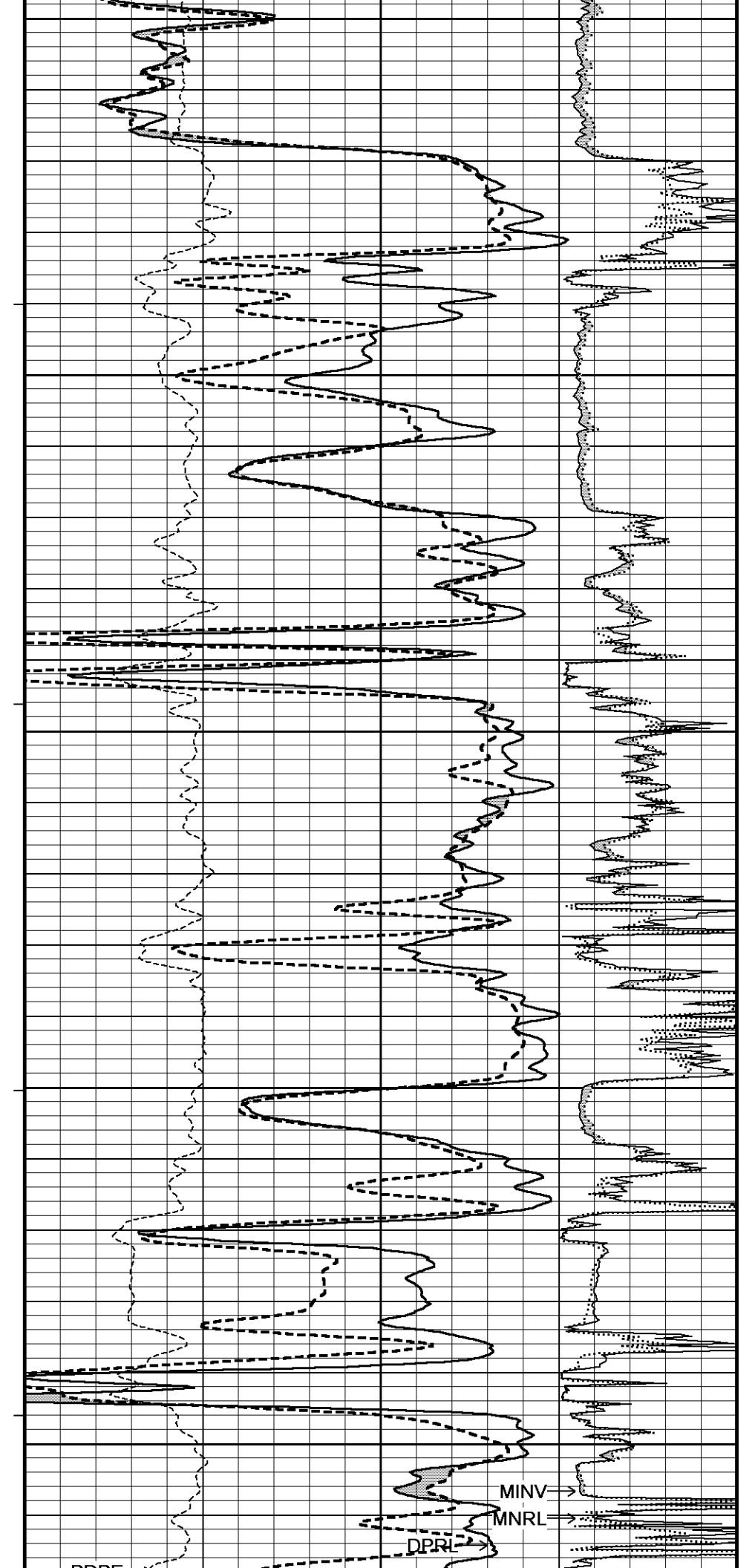
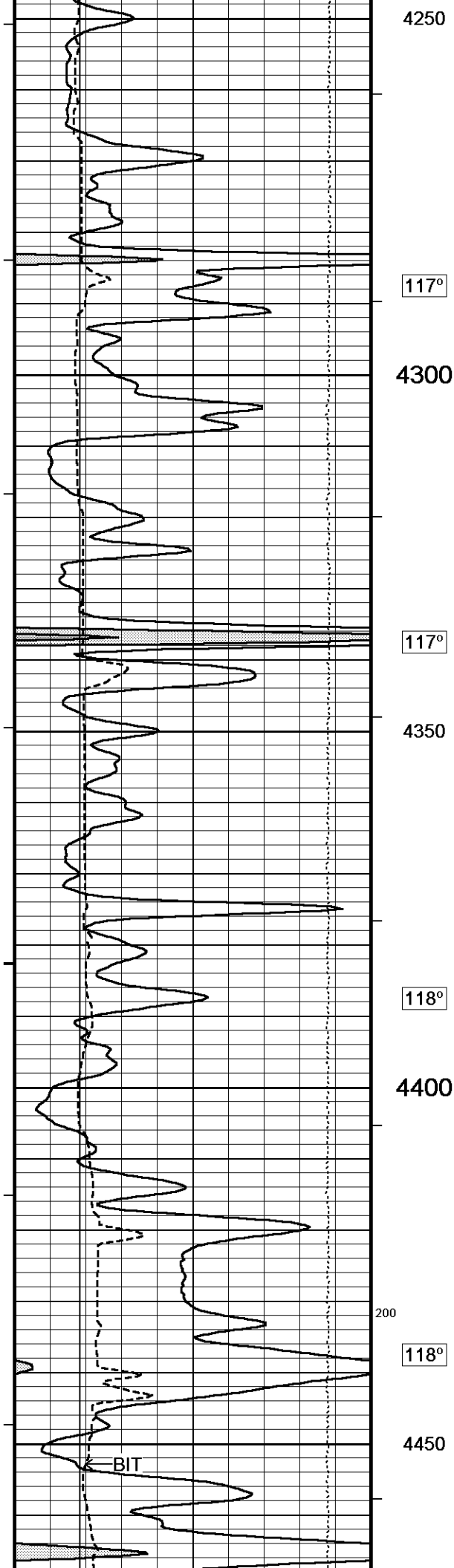


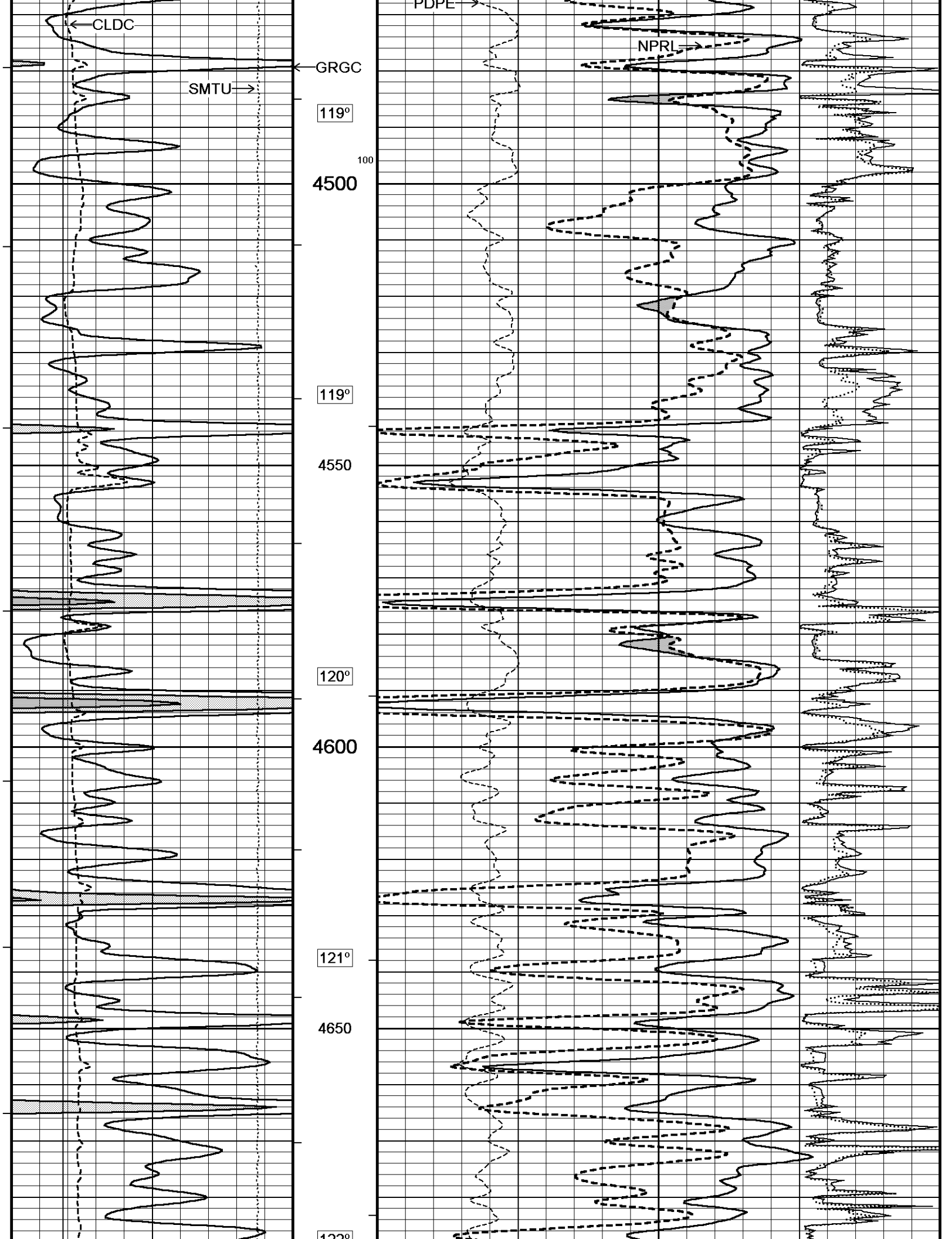


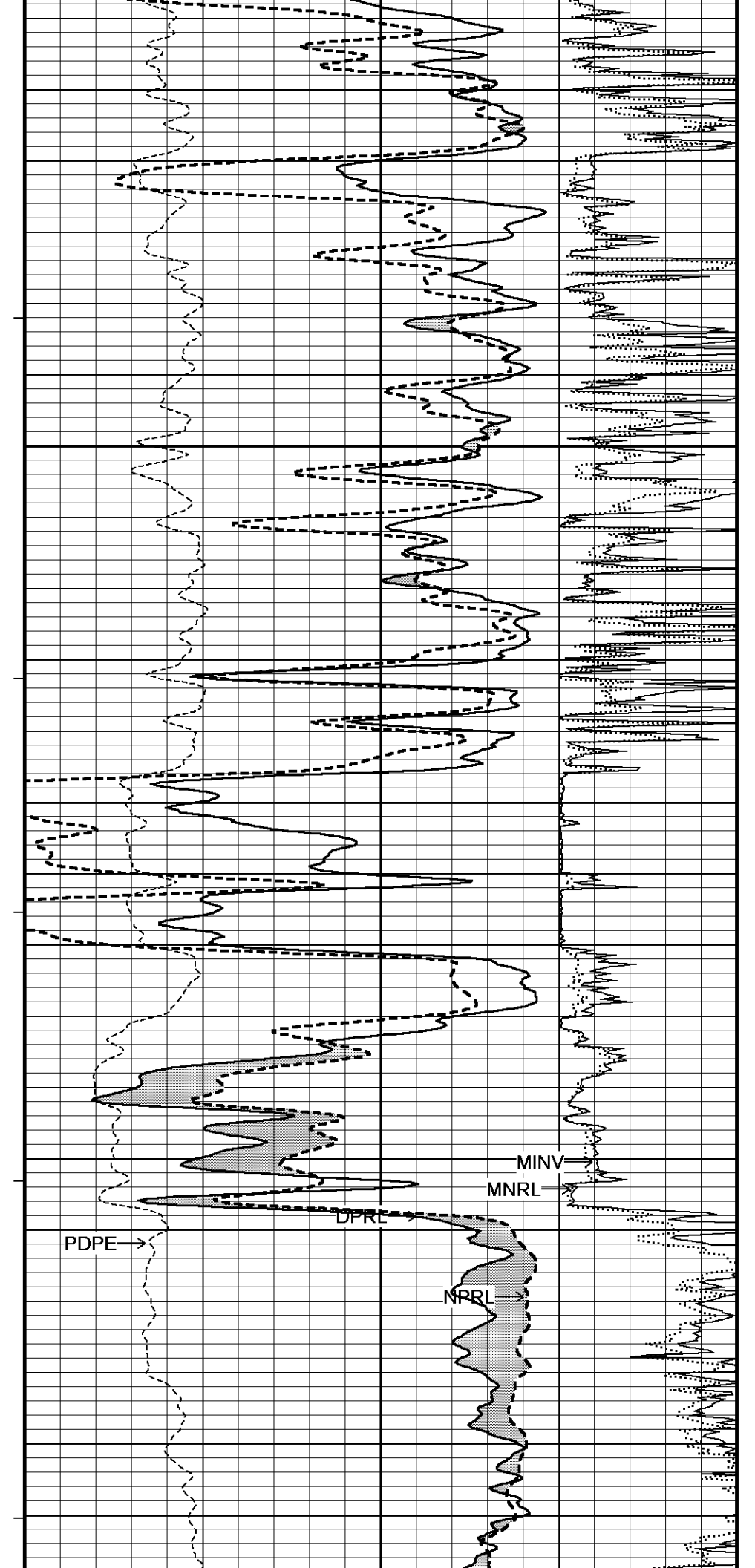
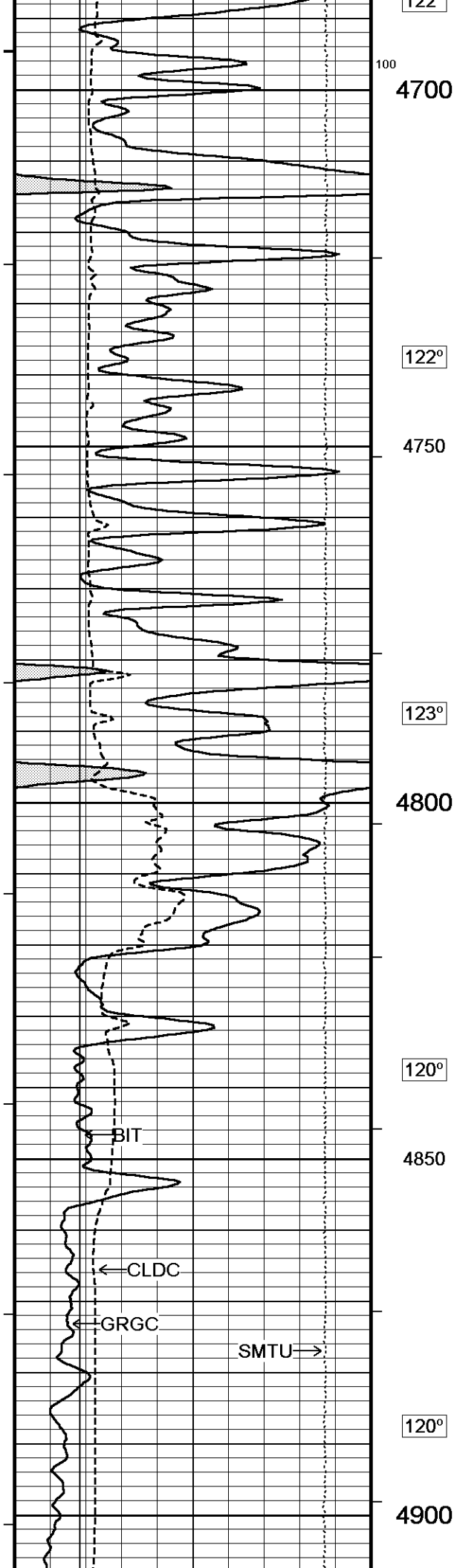


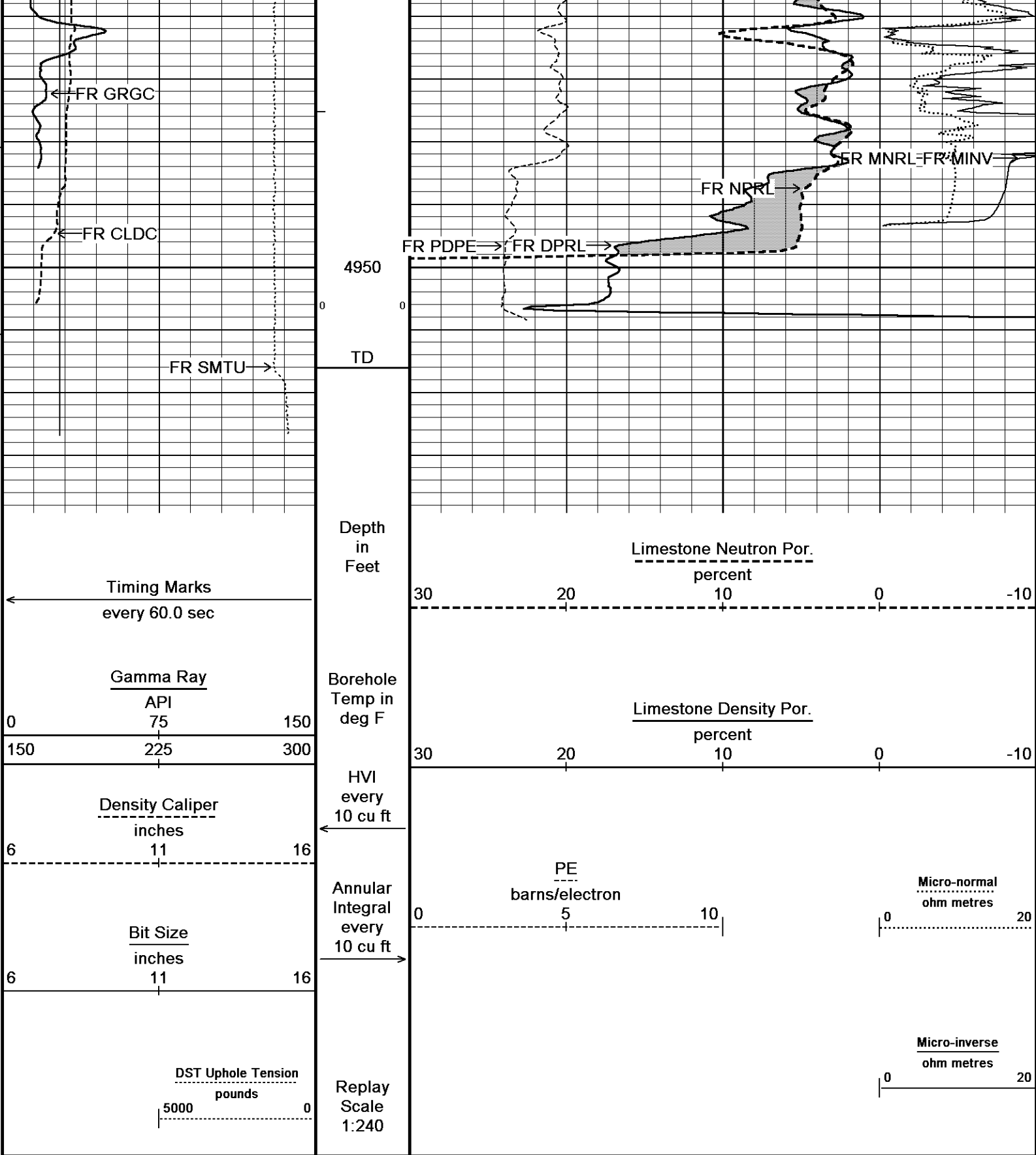










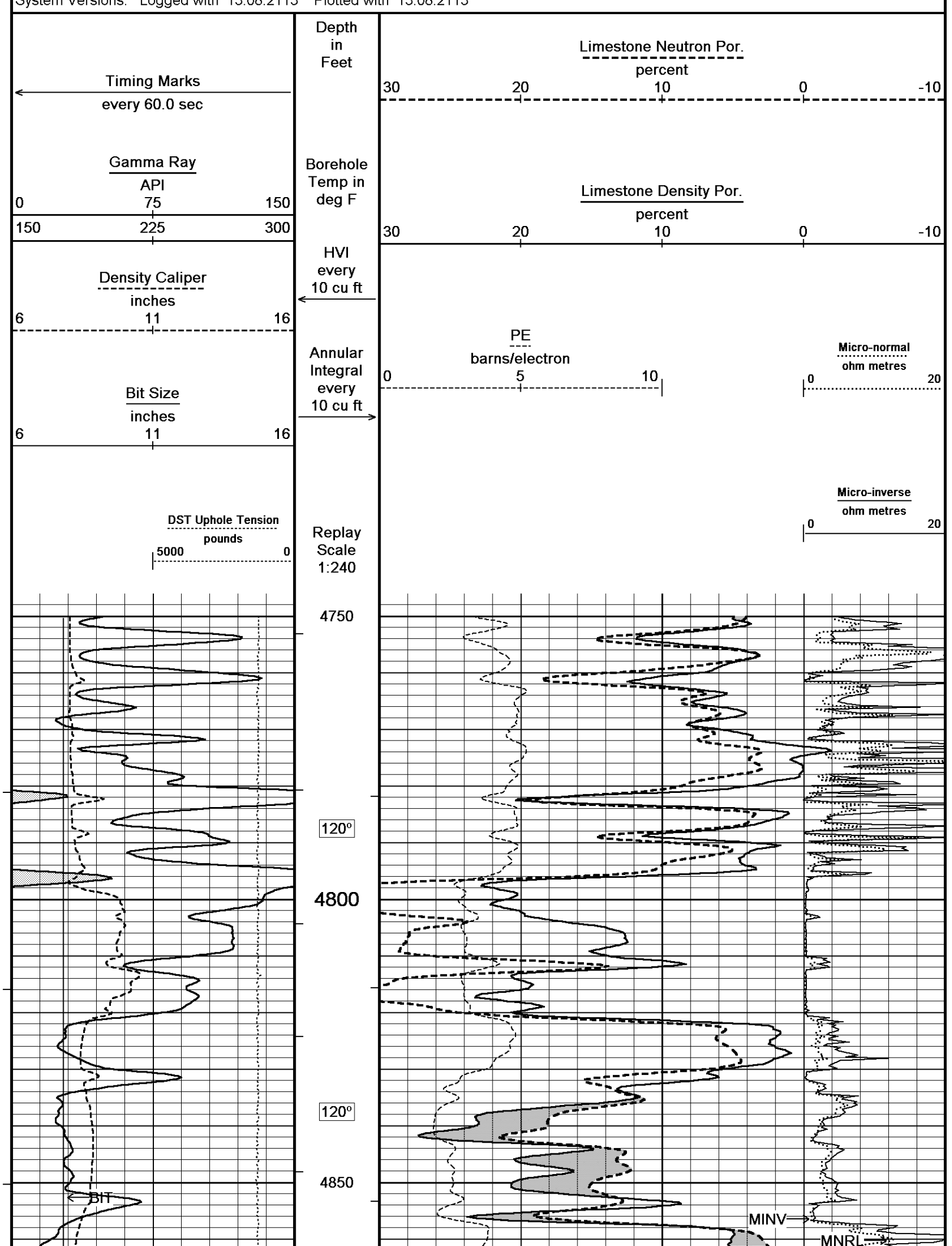


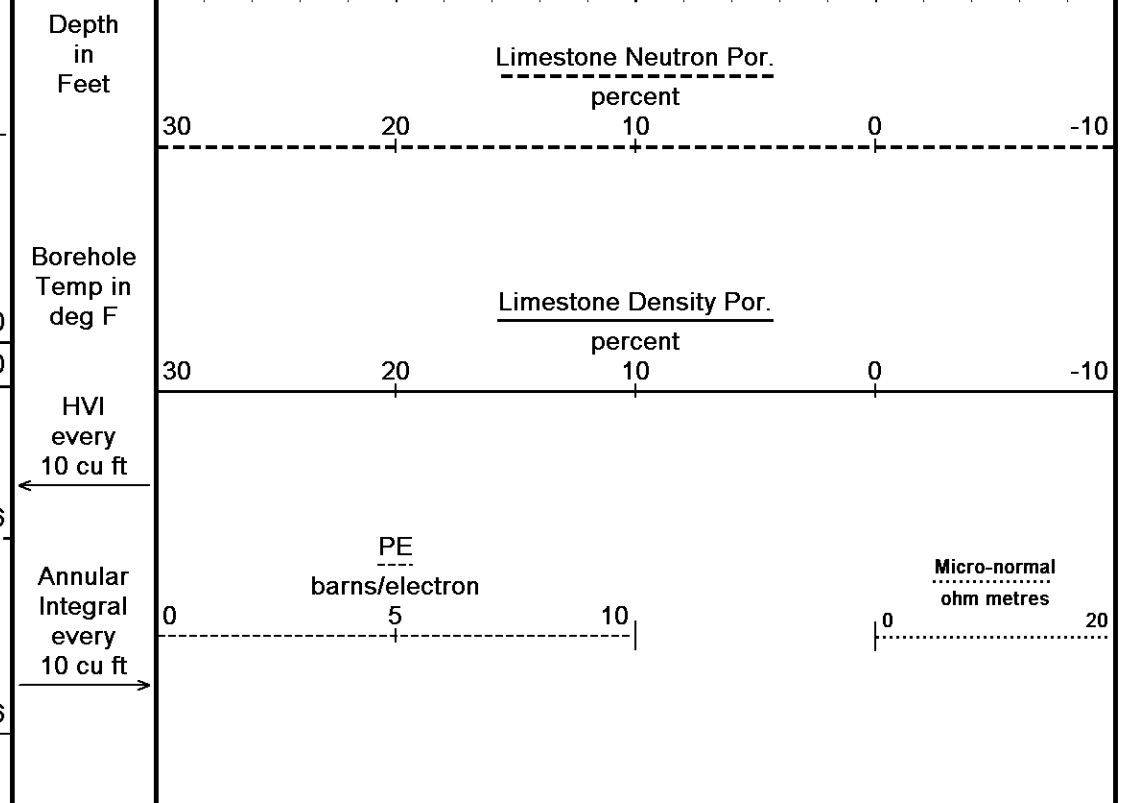
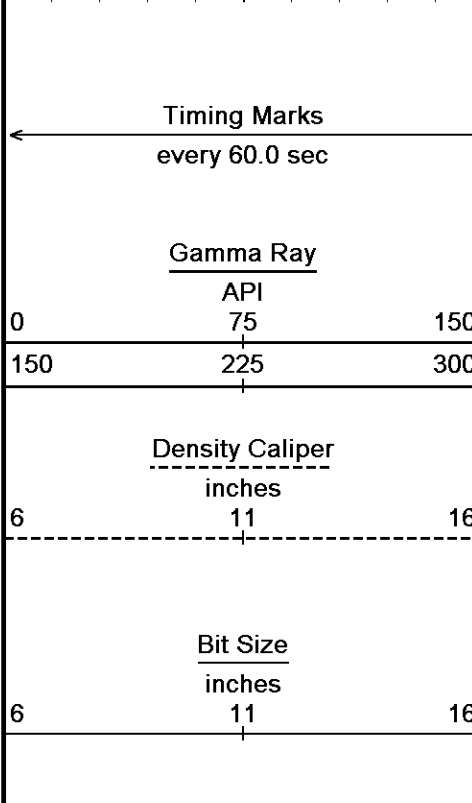
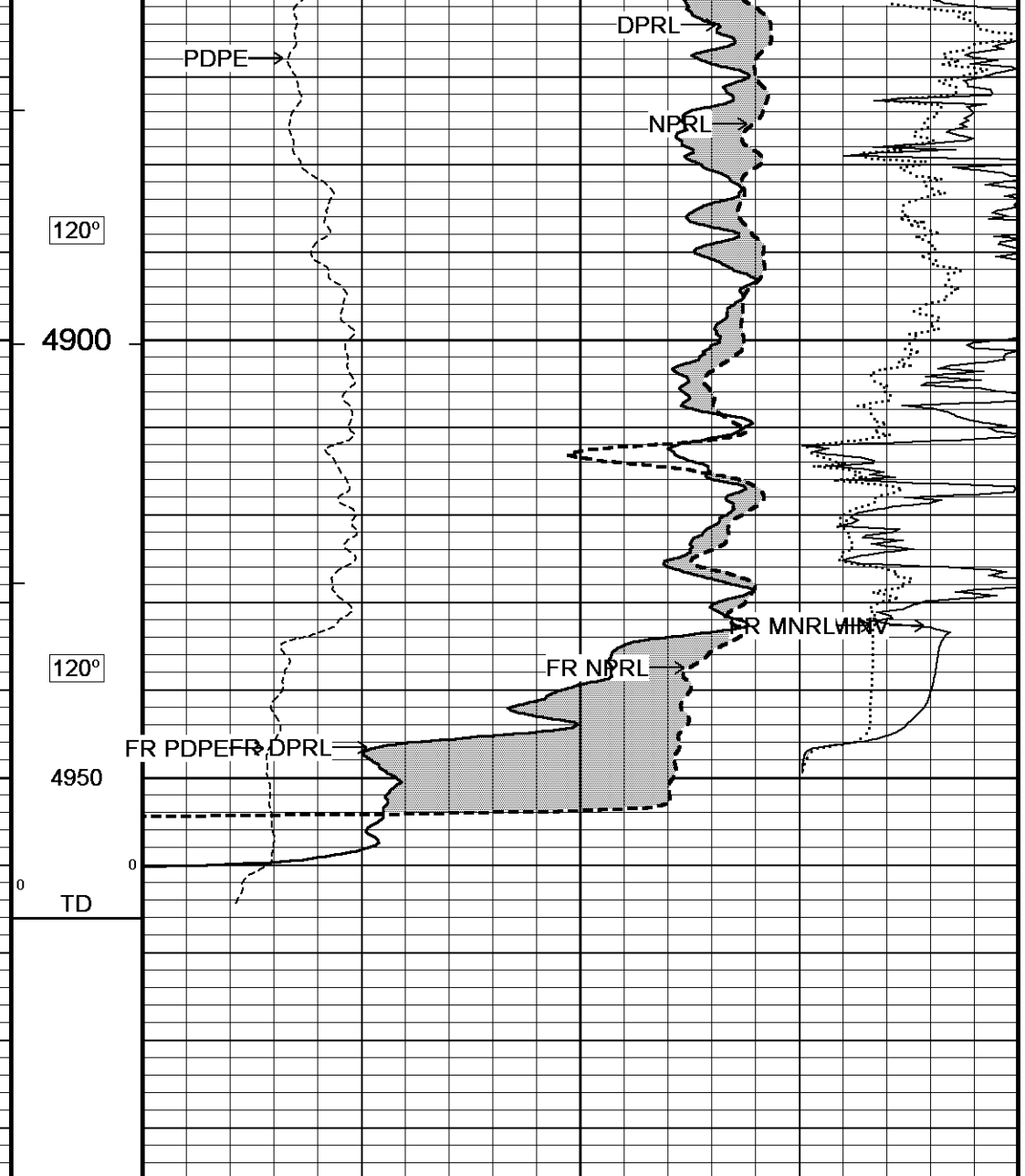
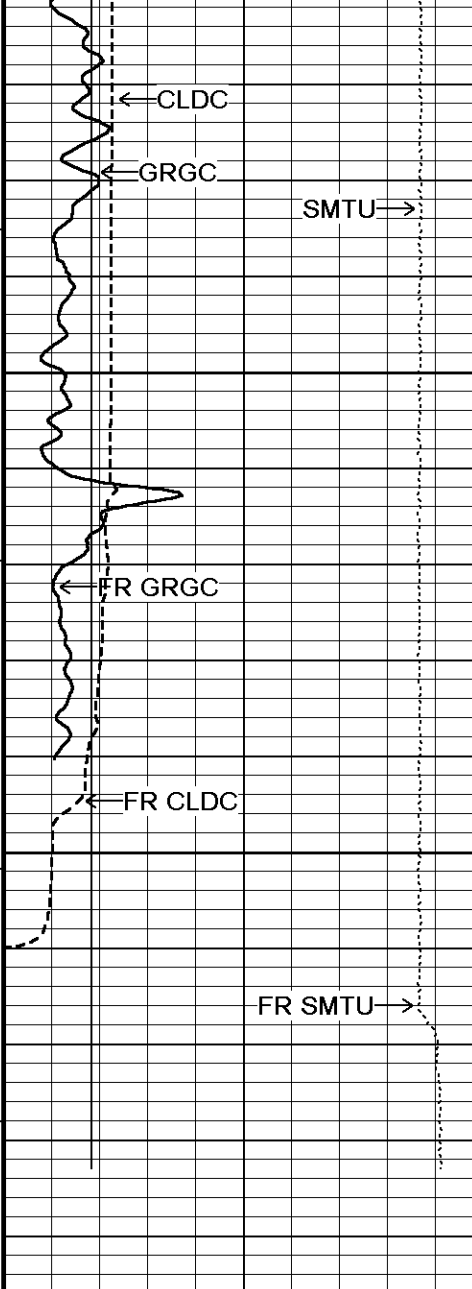
Depth Based Data - Maximum Sampling Increment 10.0cm
Filename: C:\Minimus 13.08.2113\Log Data\PetroSantander Unruh...\PetroSantander Unruh #6 Main.dta
System Versions: Logged with 13.08.2113 Plotted with 13.08.2113

5 INCH LIMESTONE MAIN

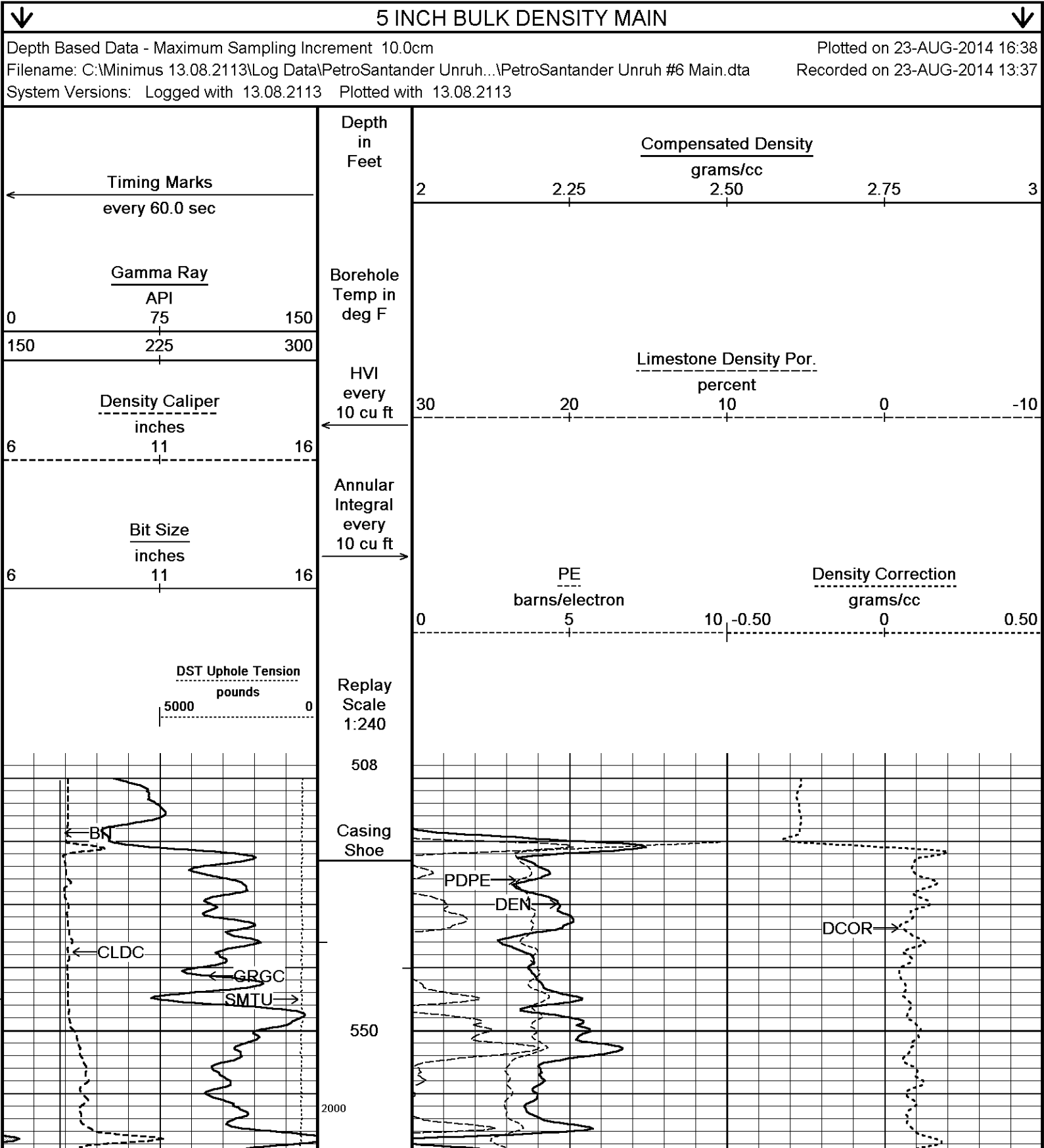
REPEAT SECTION

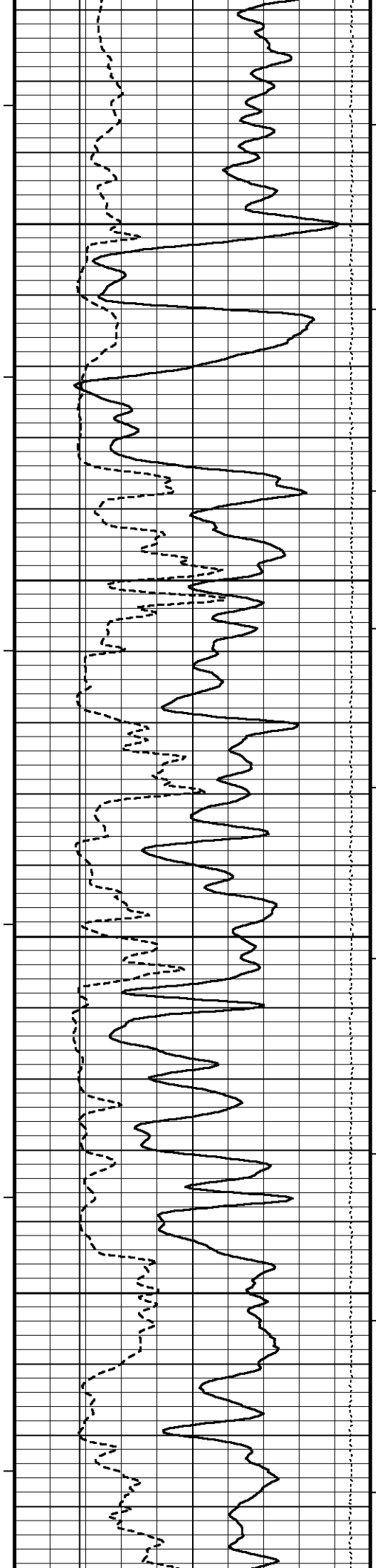
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Filename: C:\Minimus 13.08.2113\Log Data\PetroSantander Unruh...\PetroSantander Unruh #6 Repeat.dta
System Versions: Logged with 13.08.2113 Plotted with 13.08.2113





DST Uphole Tension pounds 50000	Replay Scale 1:240	ohm metres 020
Depth Based Data - Maximum Sampling Increment 10.0cm		Plotted on 23-AUG-2014 16:38
Filename: C:\Minimus 13.08.2113\Log Data\PetroSantander Unruh...\PetroSantander Unruh #6 Repeat.dta		Recorded on 23-AUG-2014 13:22
System Versions: Logged with 13.08.2113 Plotted with 13.08.2113		
REPEAT SECTION		





102°

600

103°

650

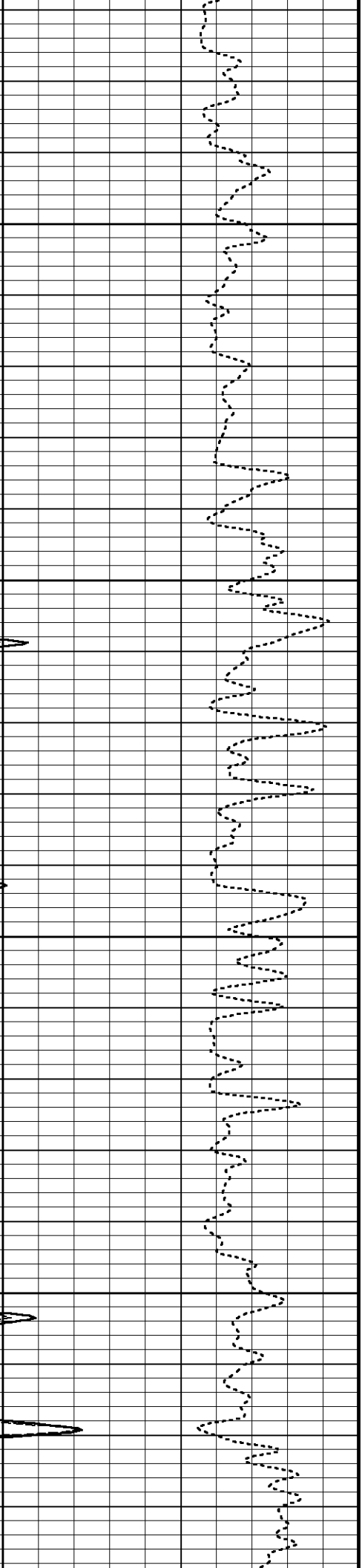
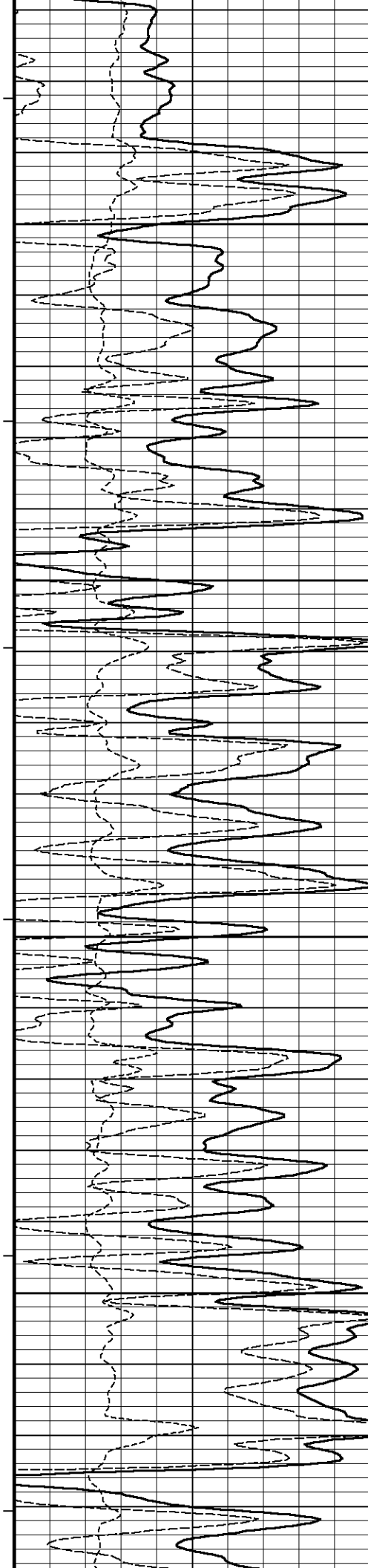
103°

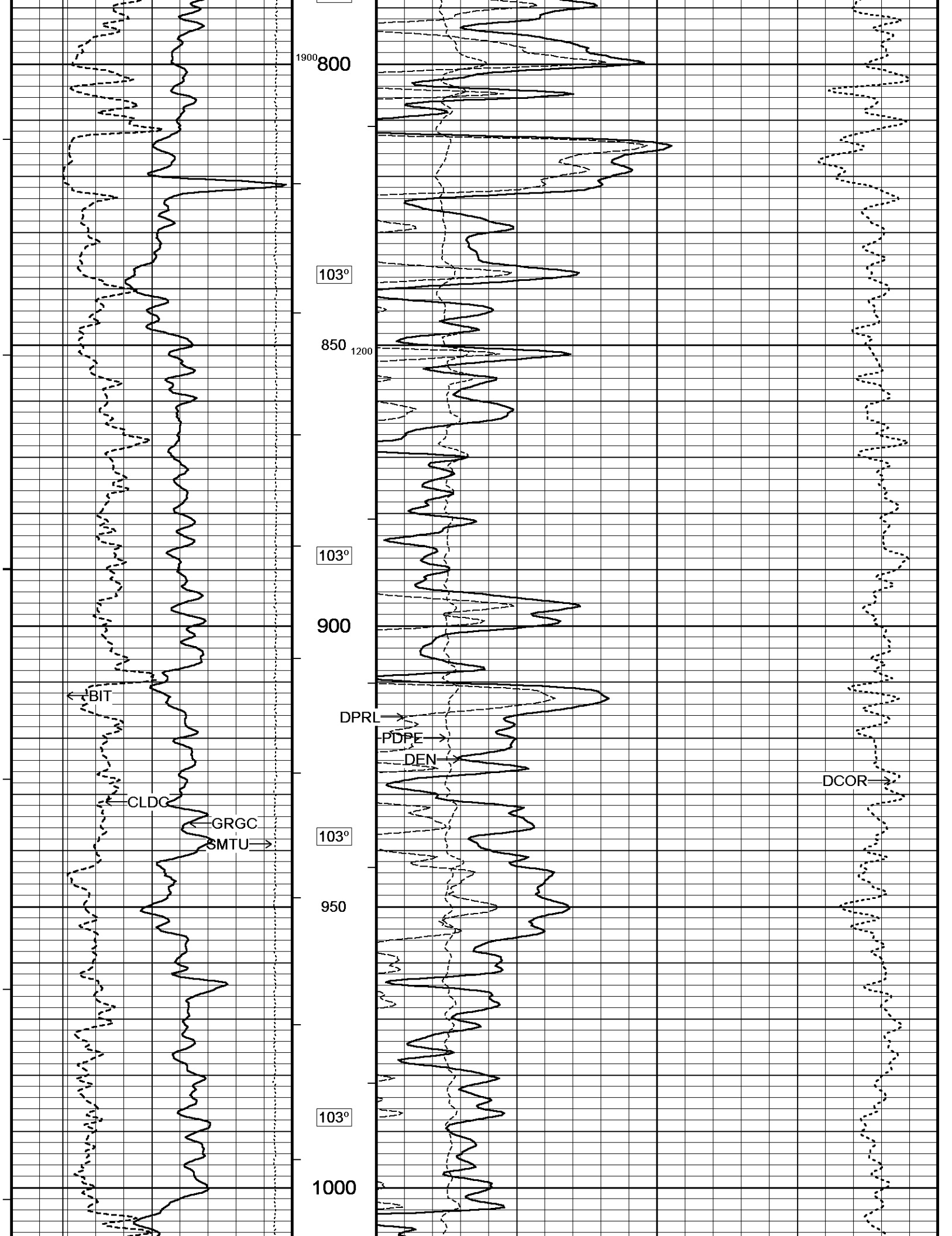
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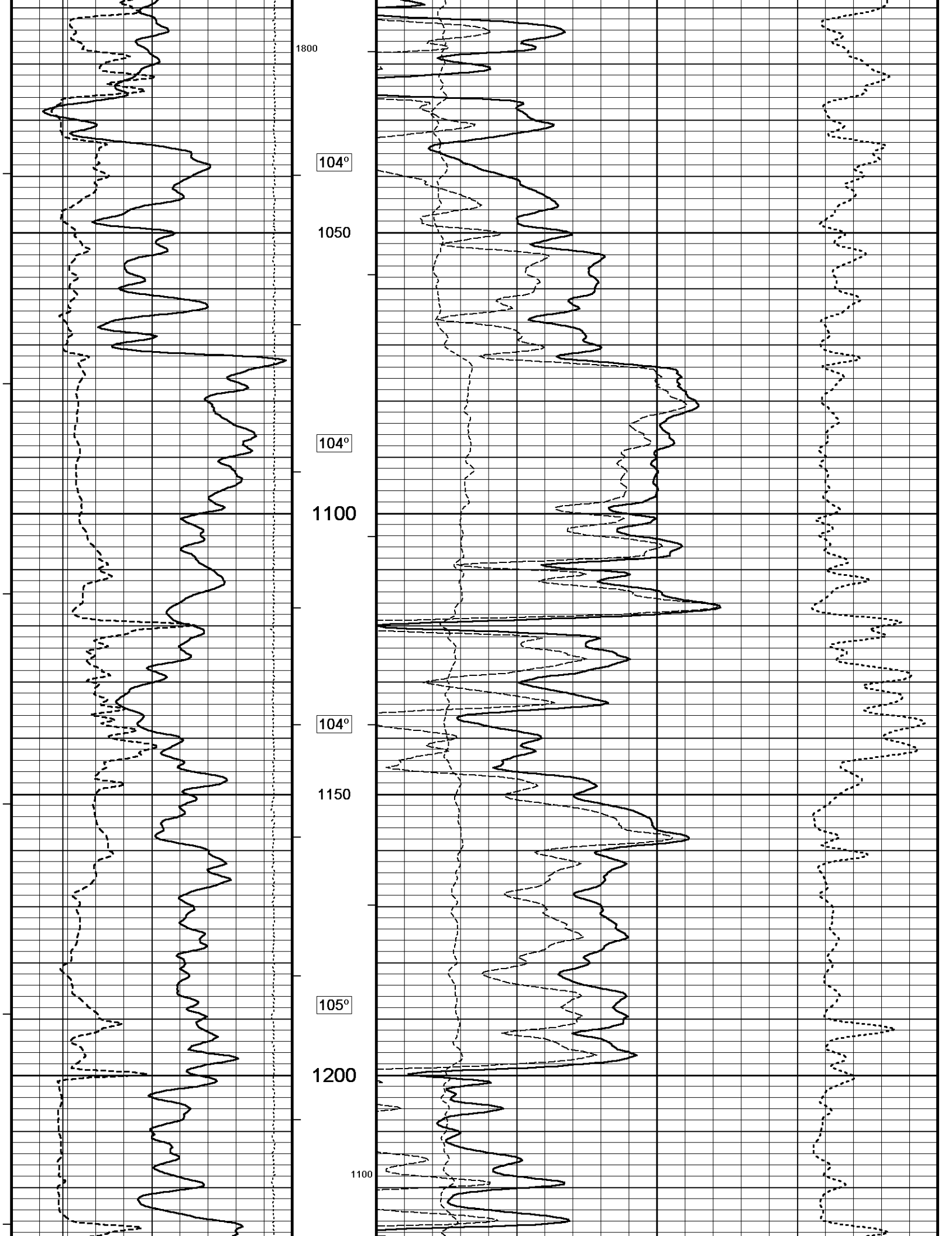
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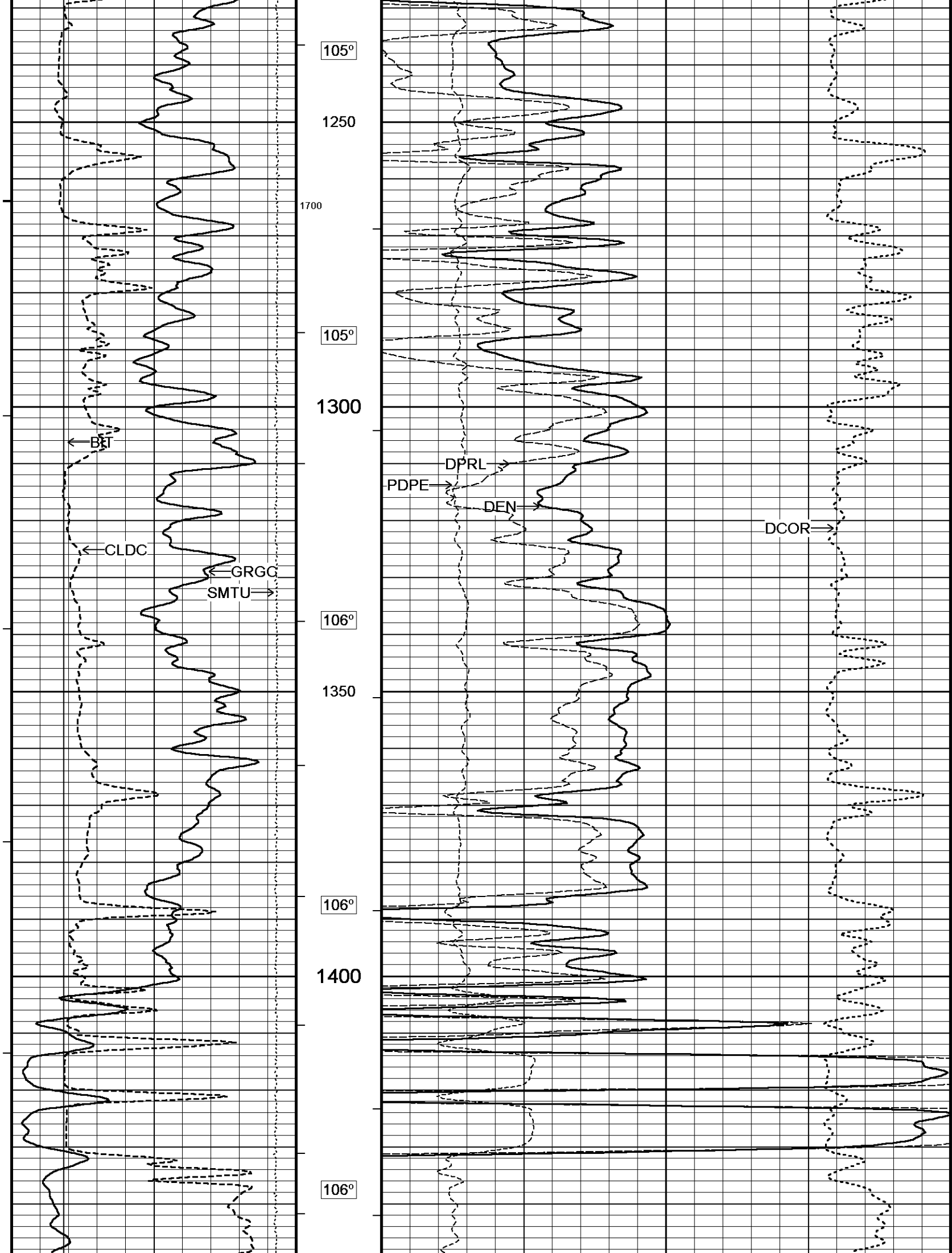
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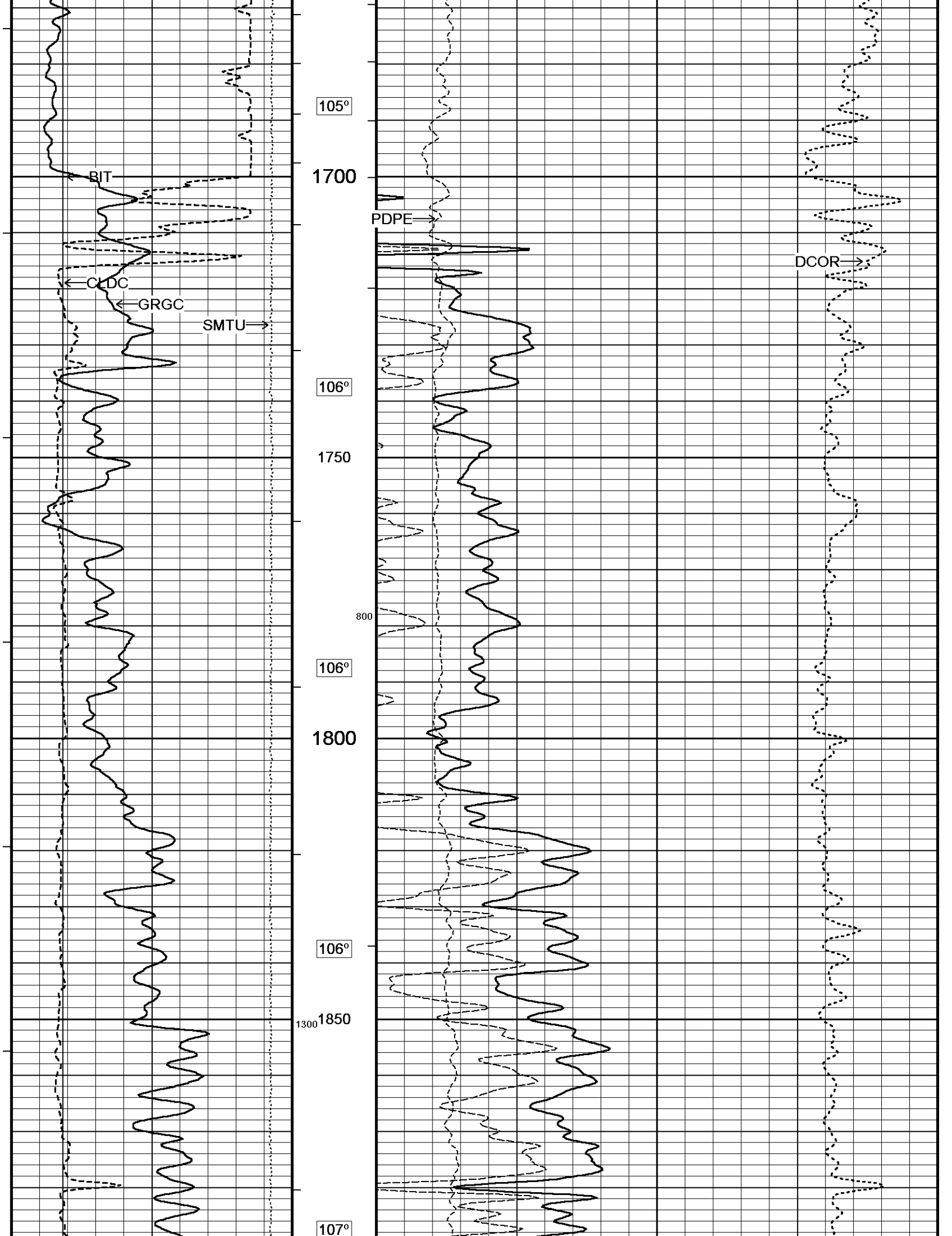
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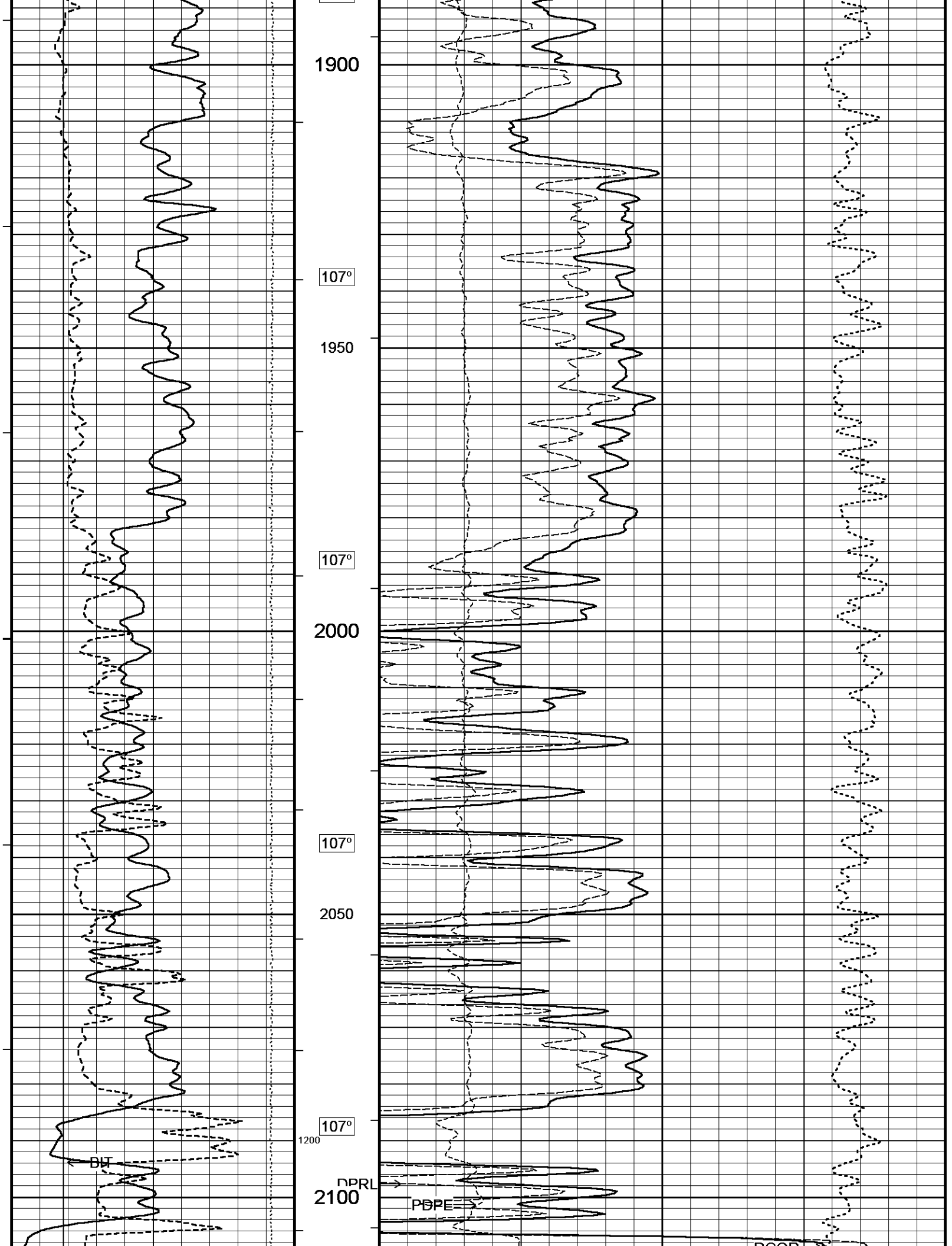


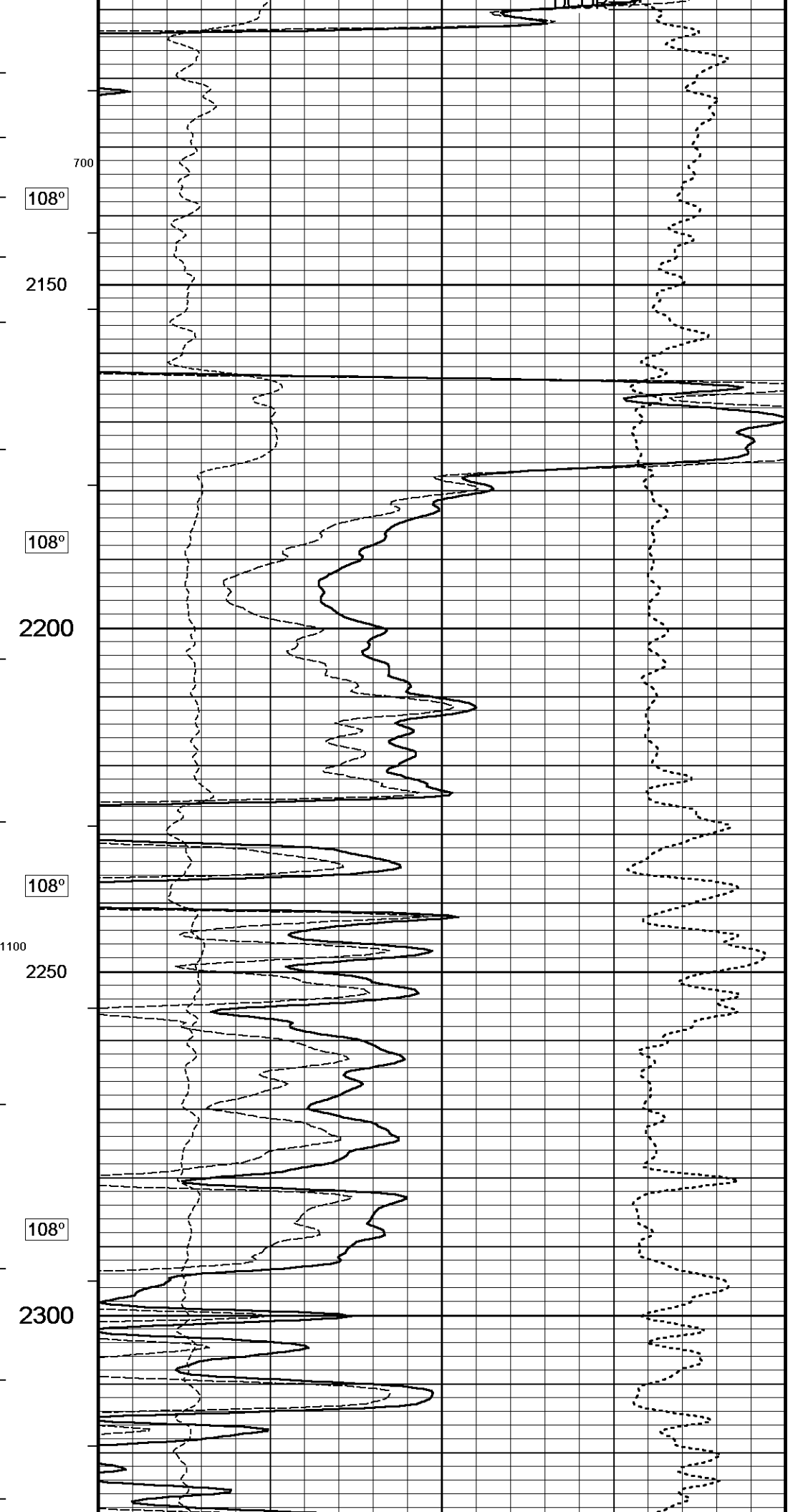
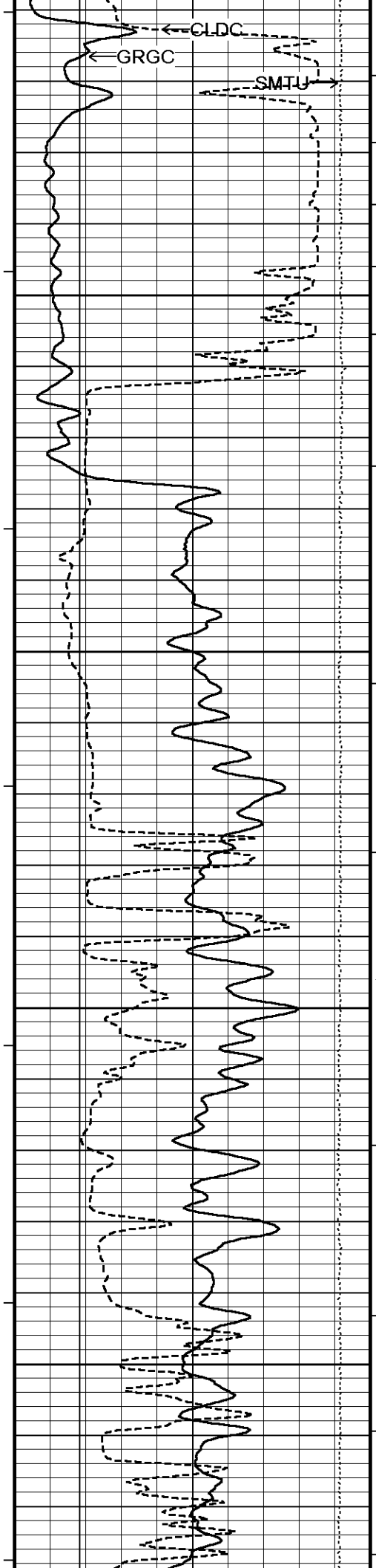


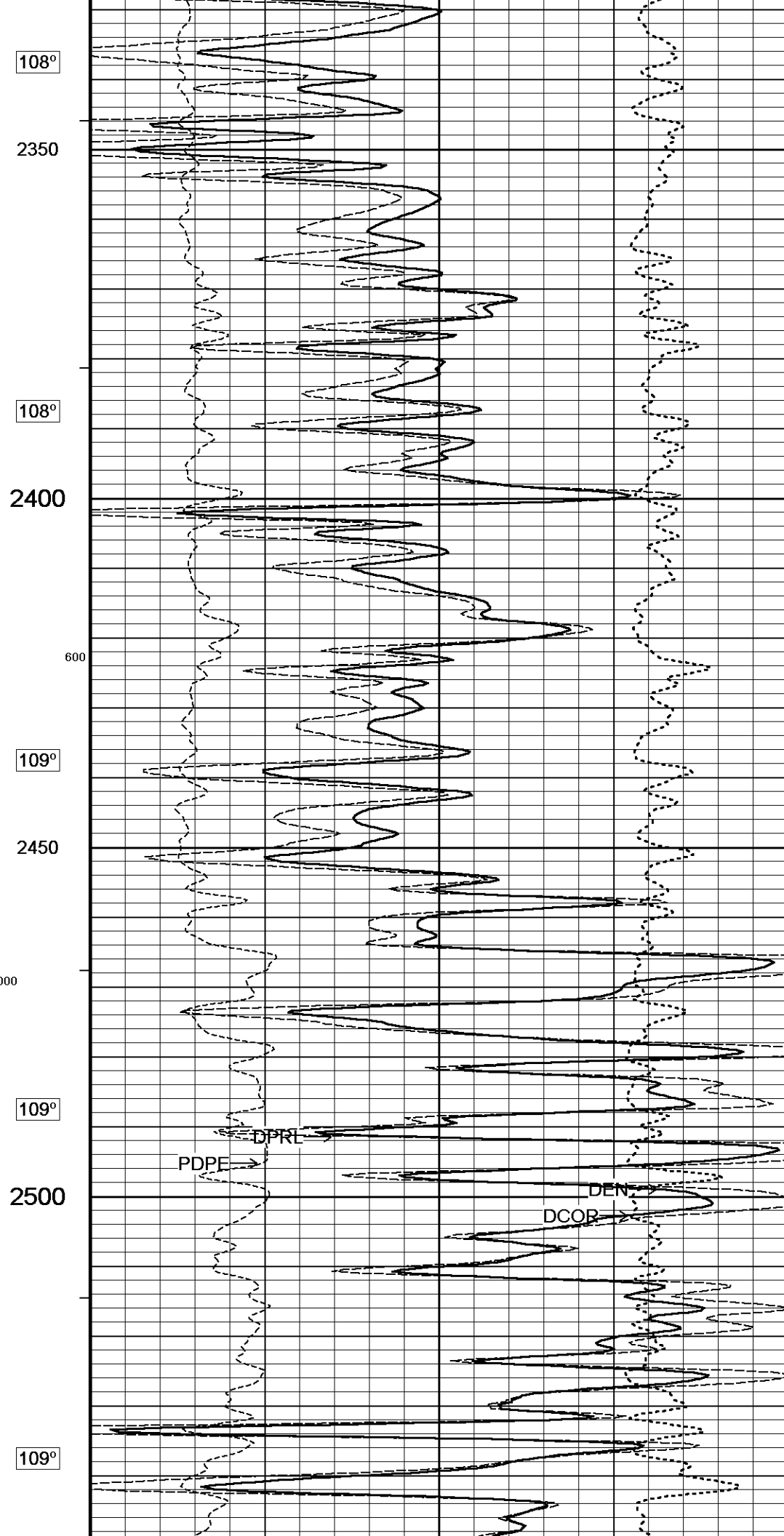
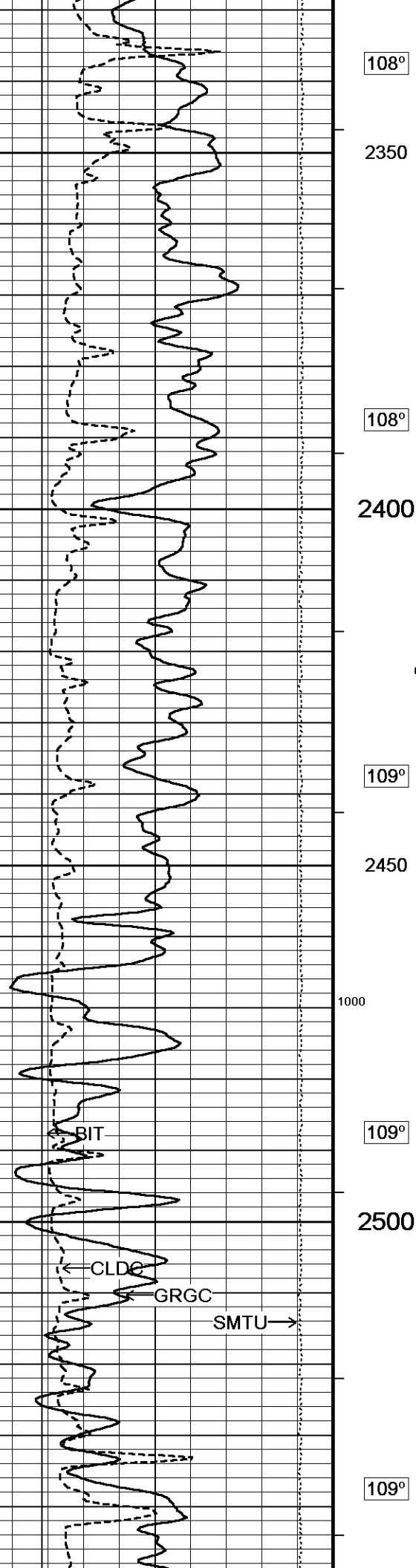


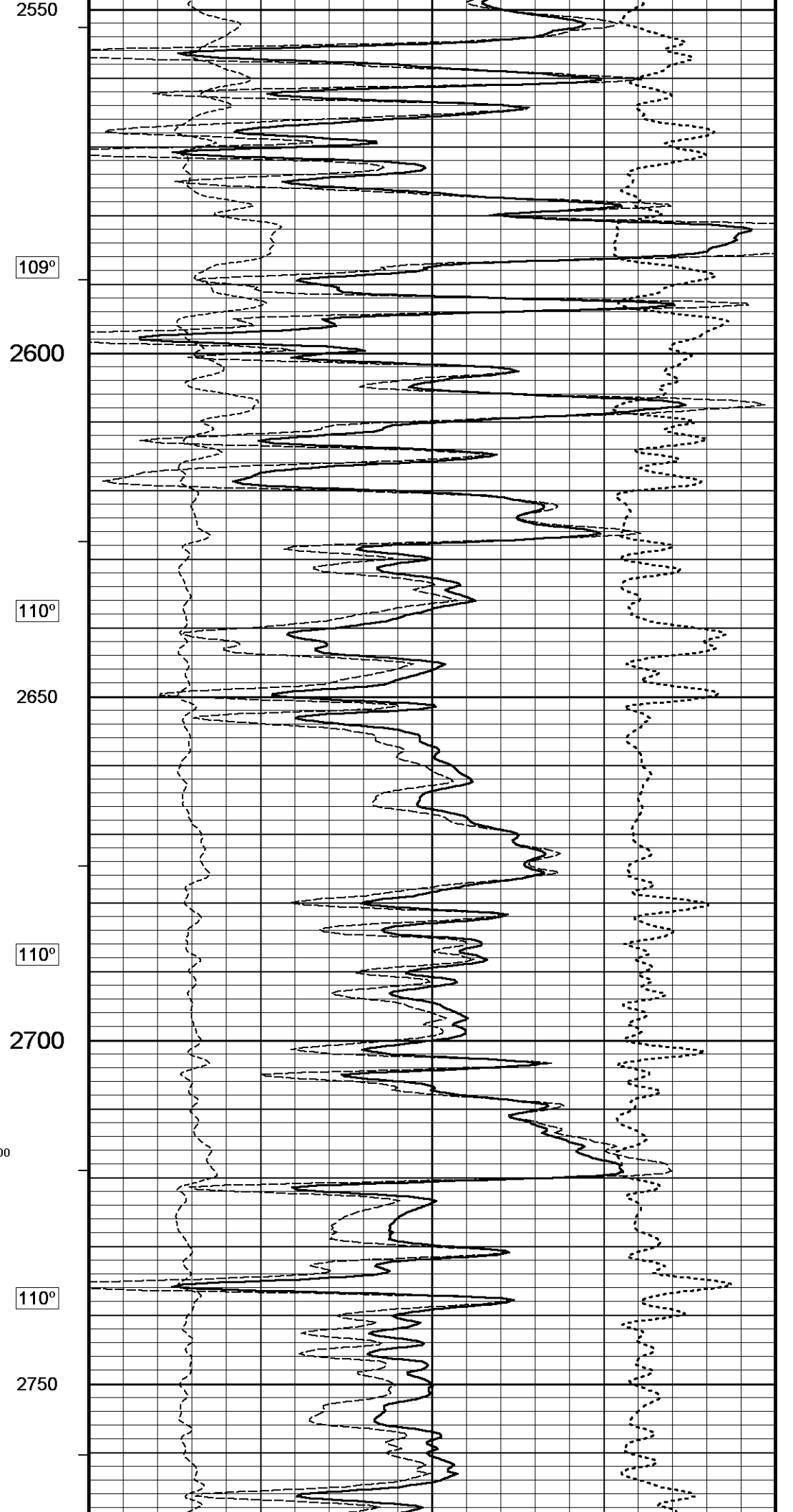
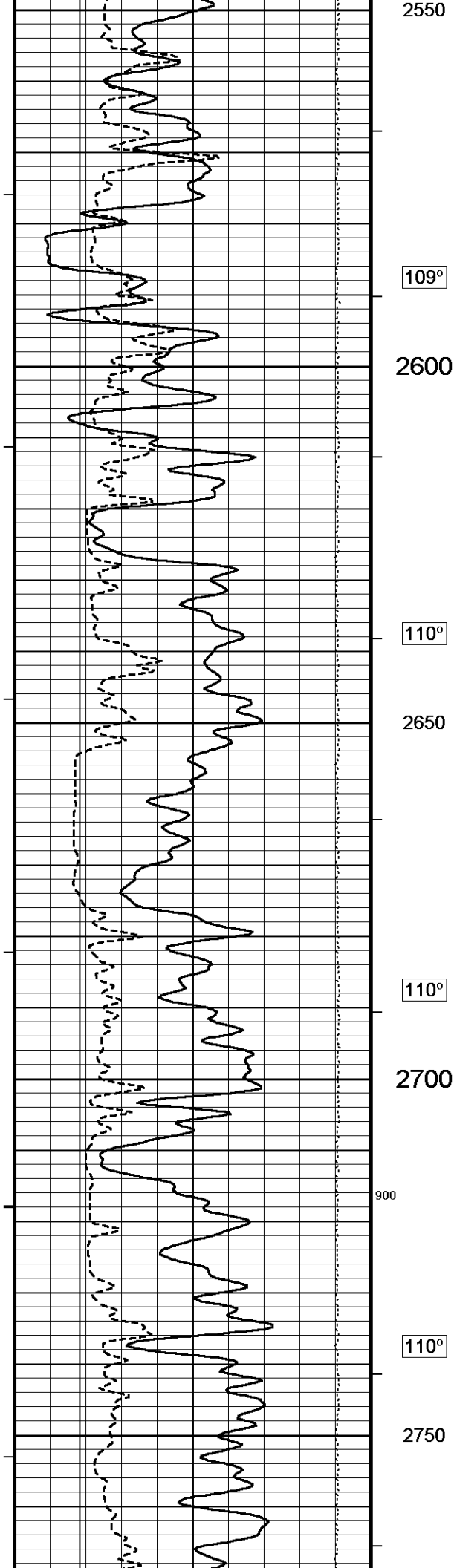


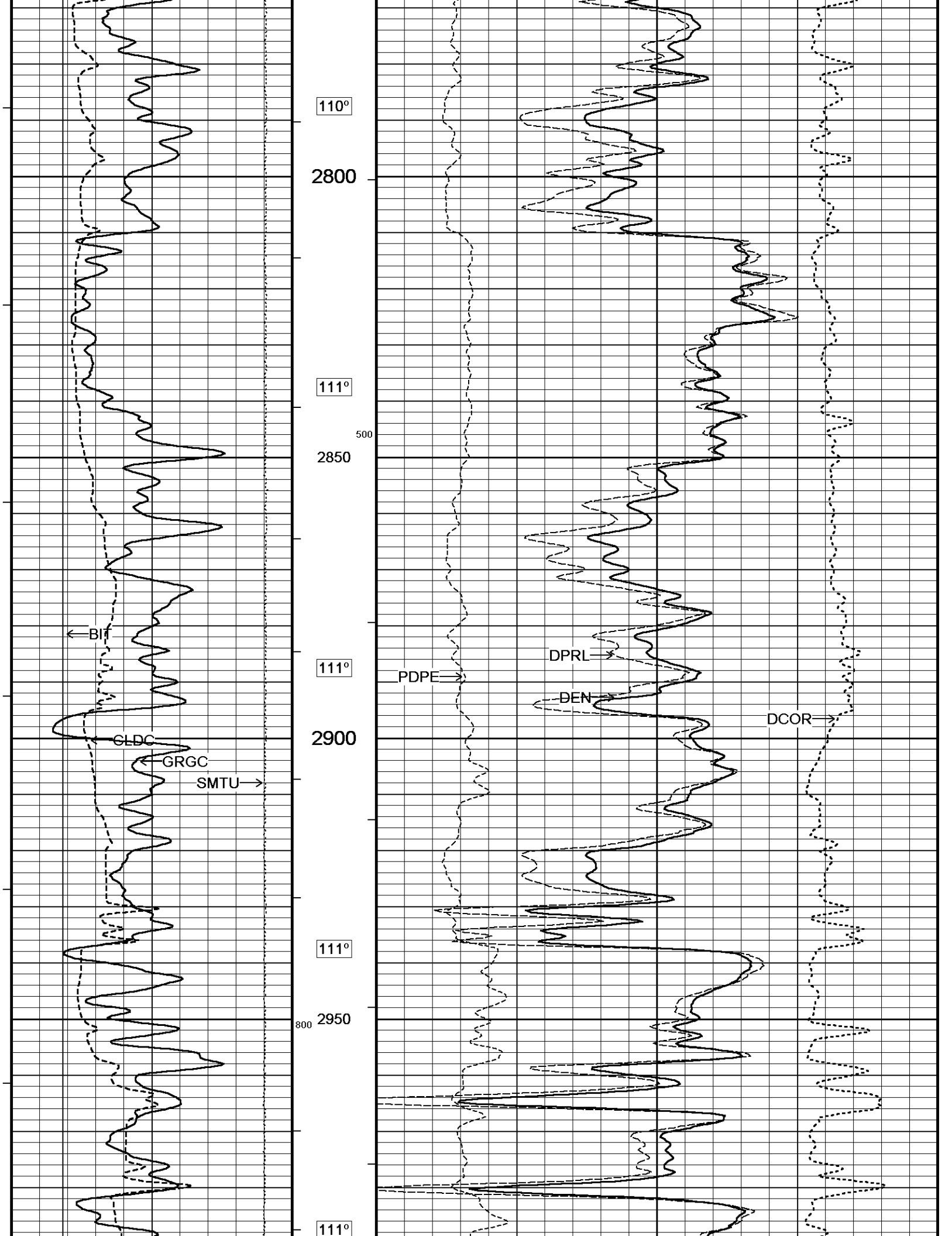


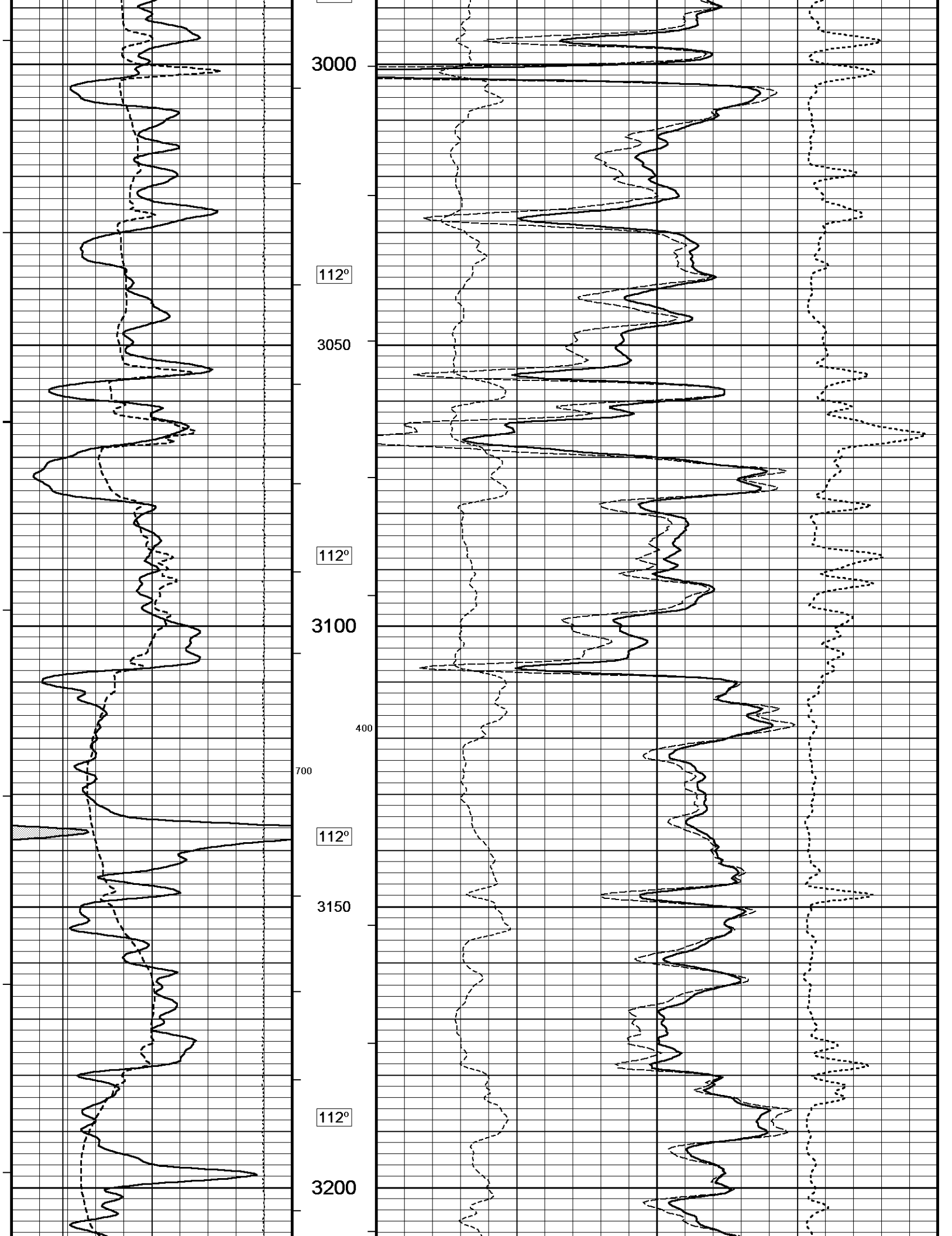


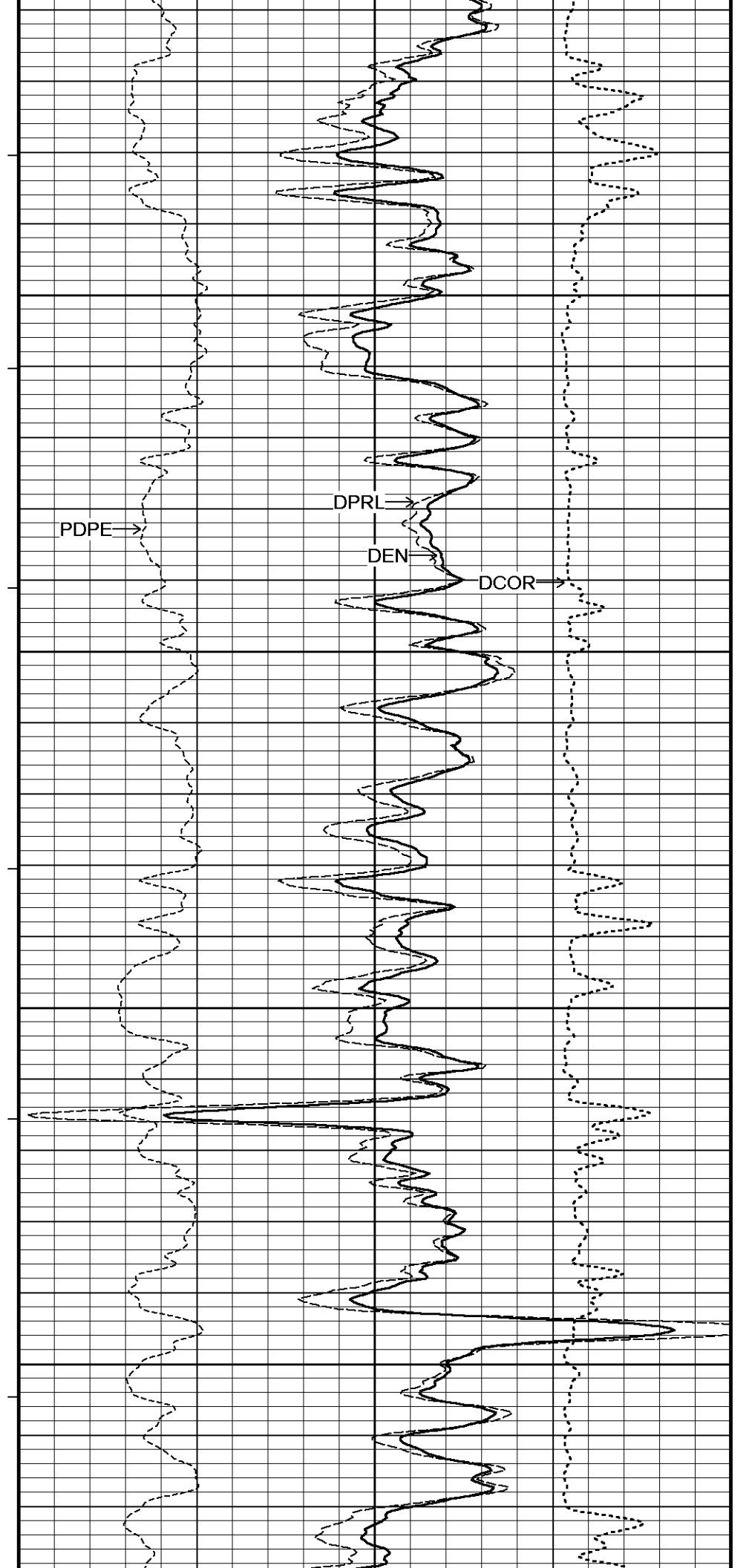
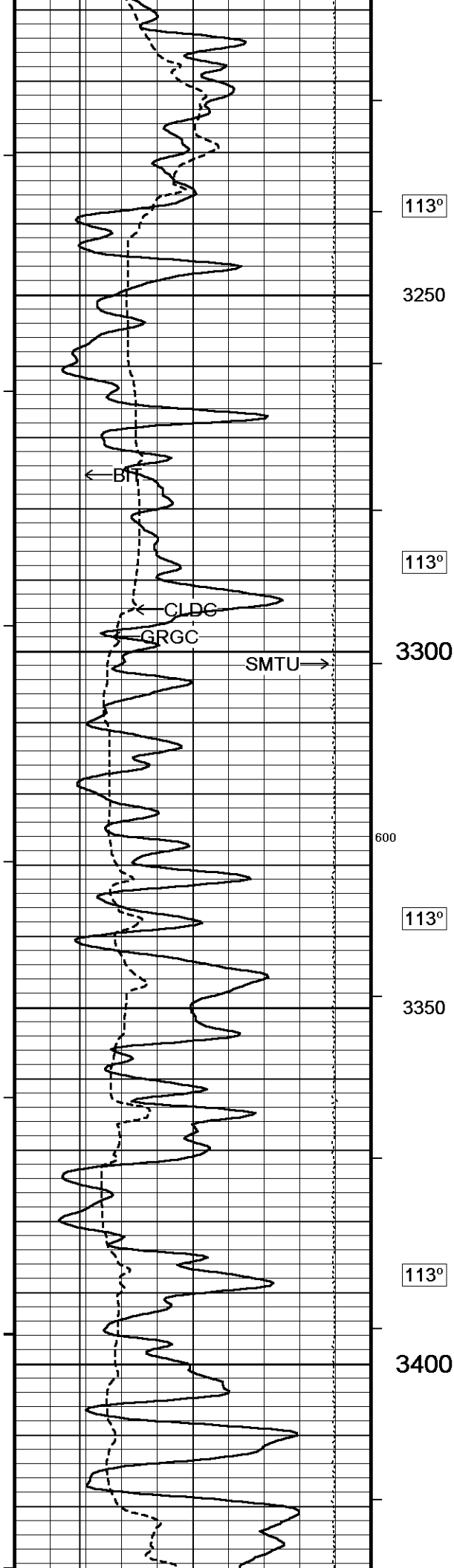


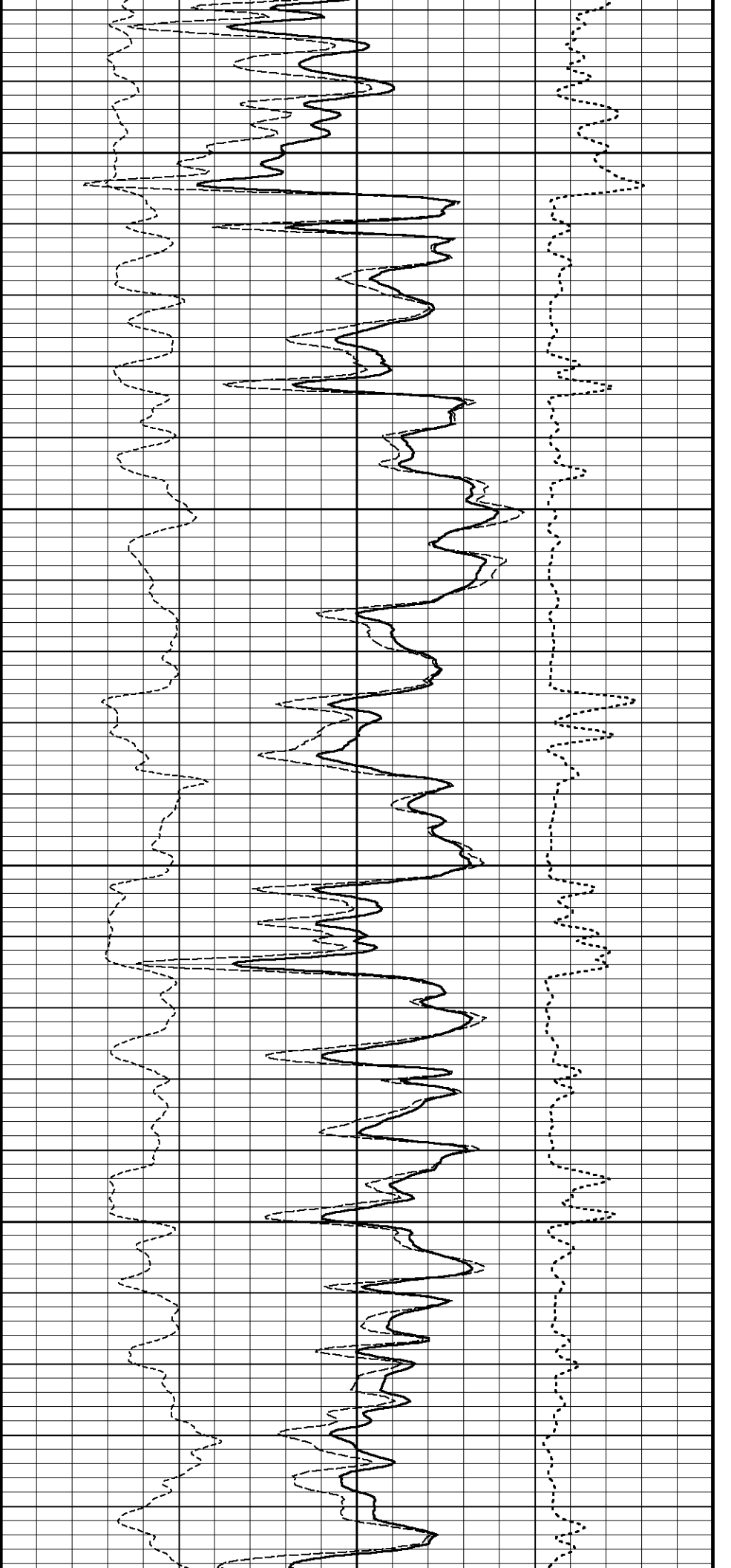
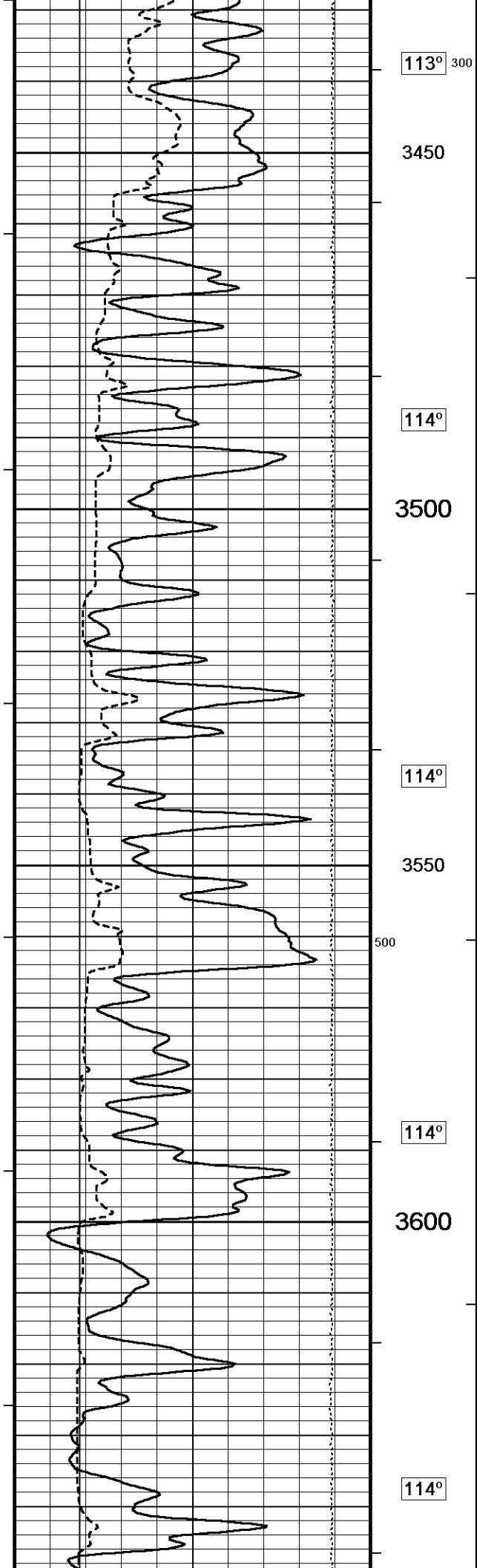


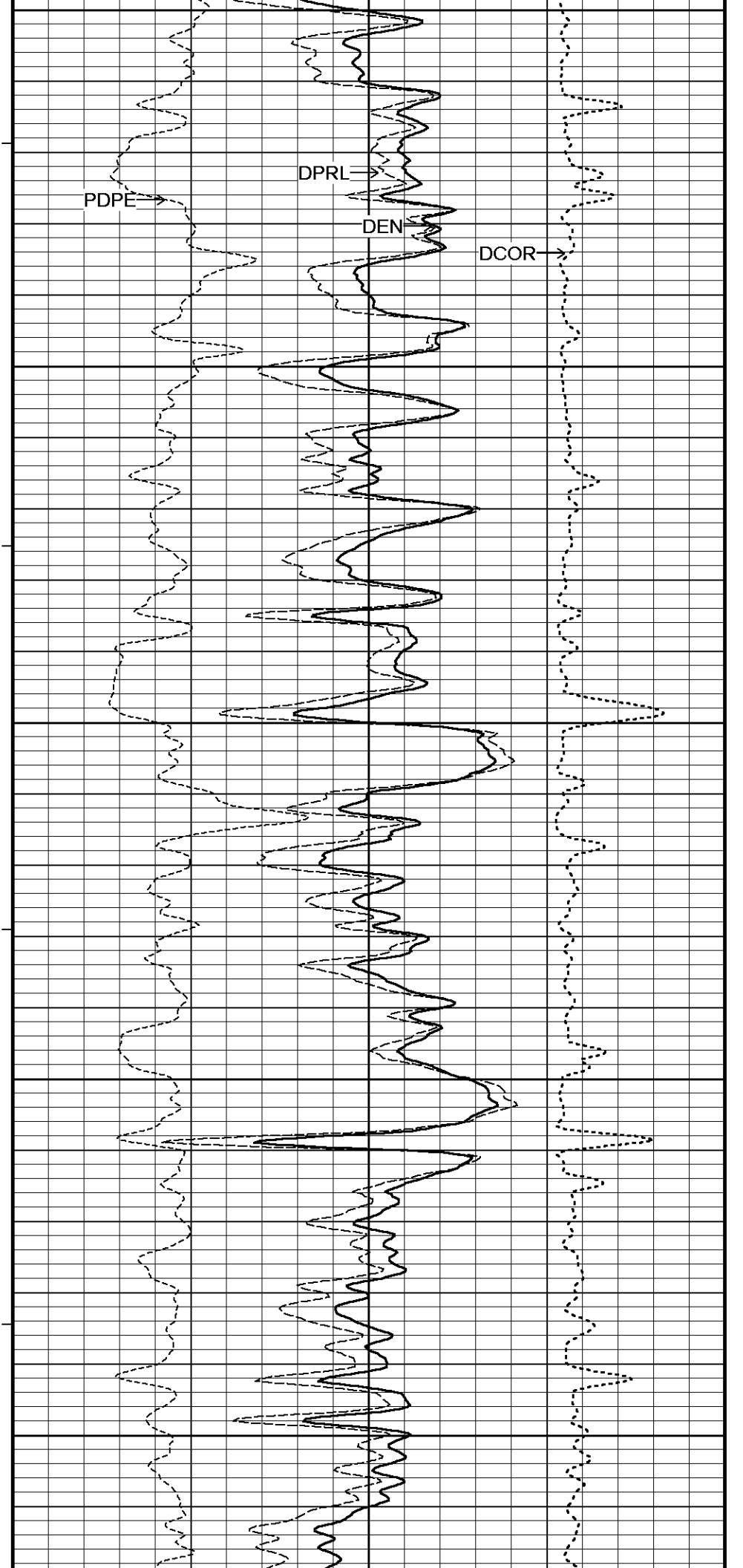
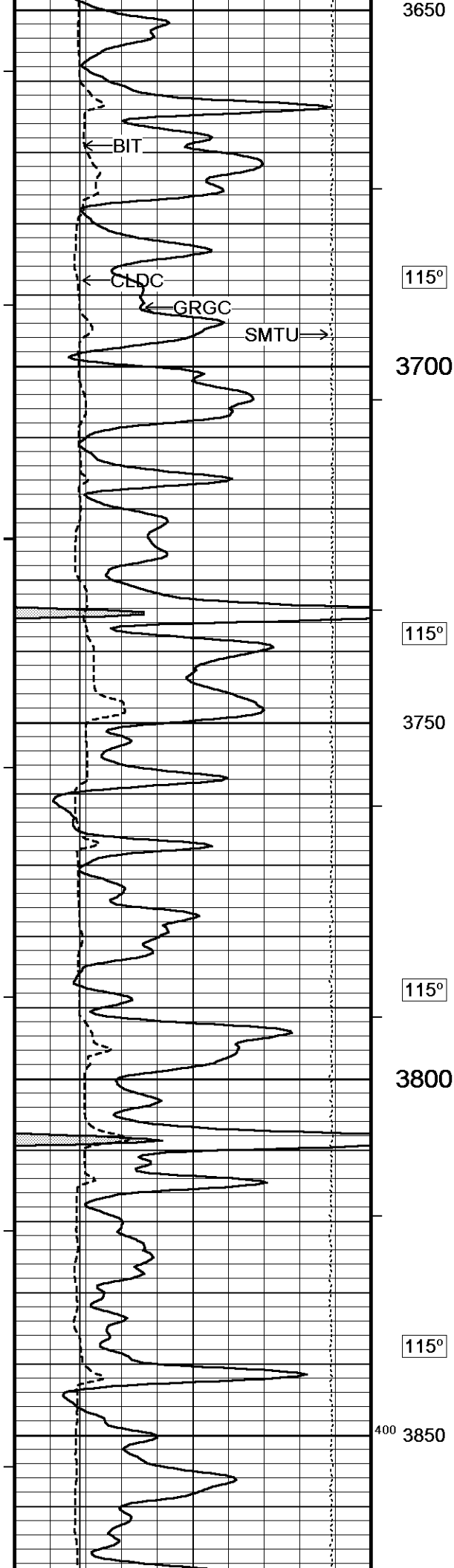


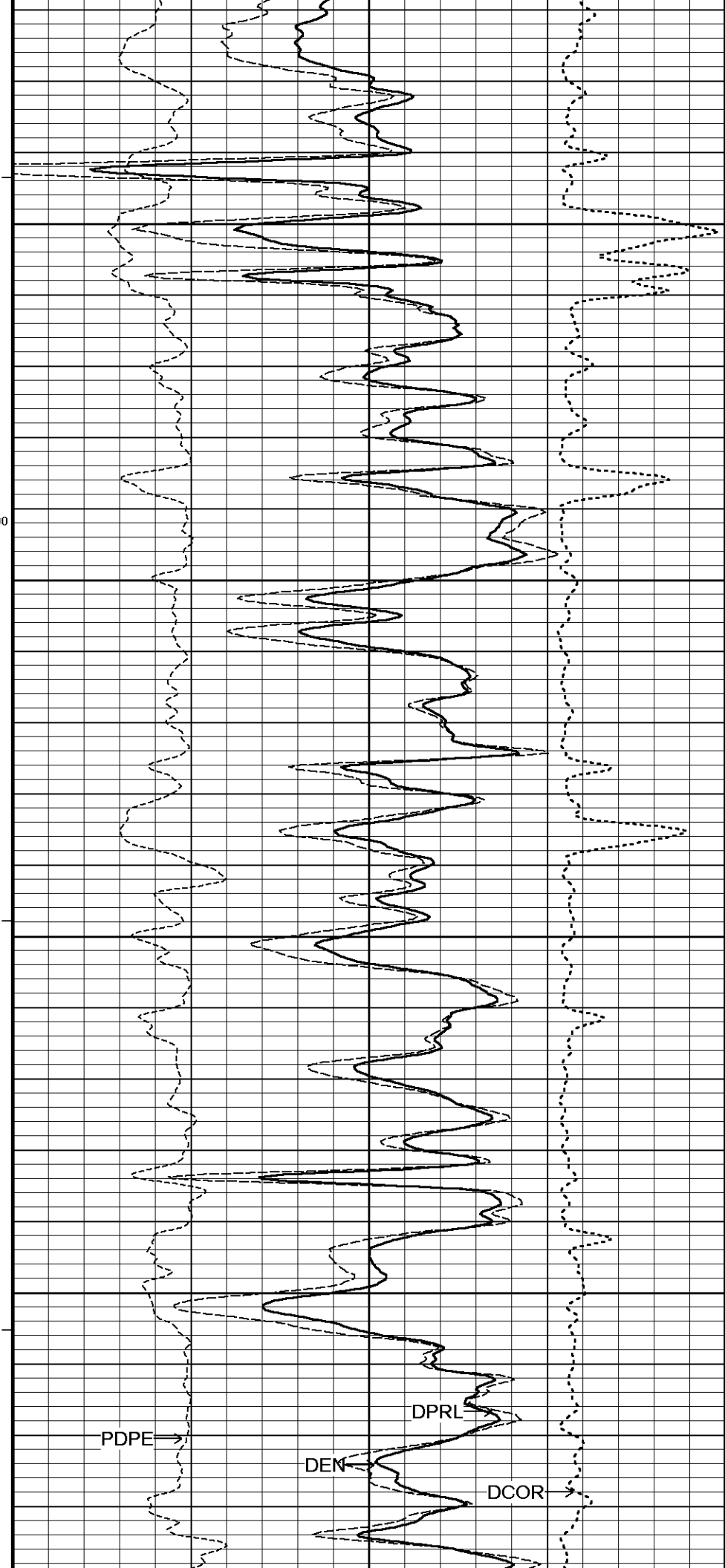
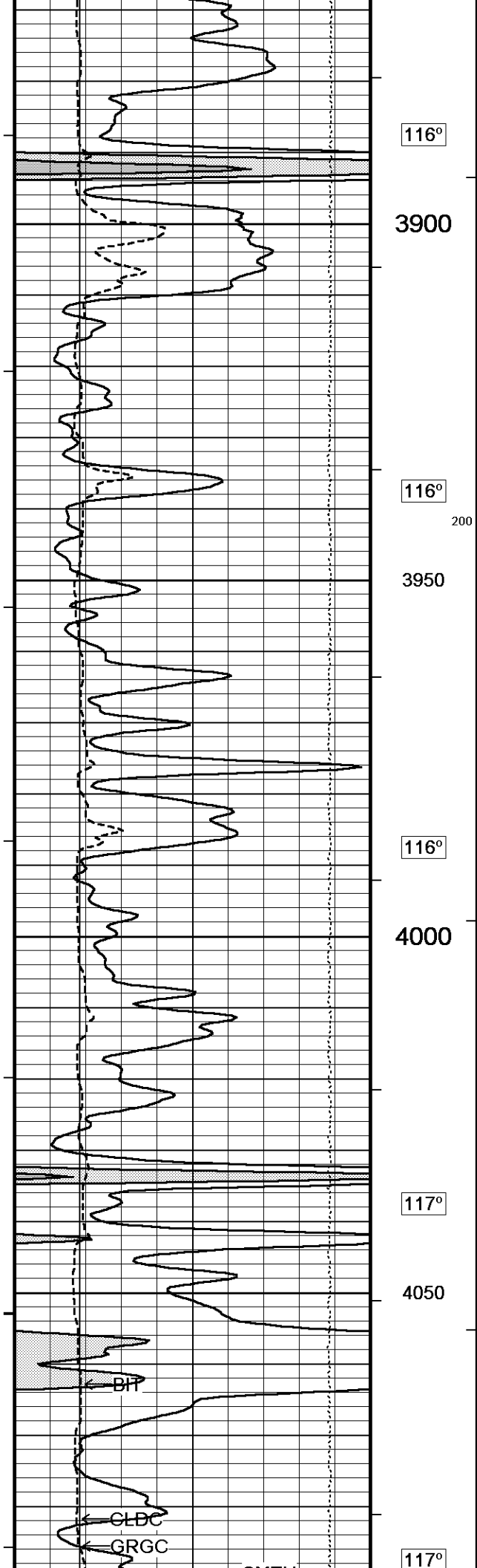


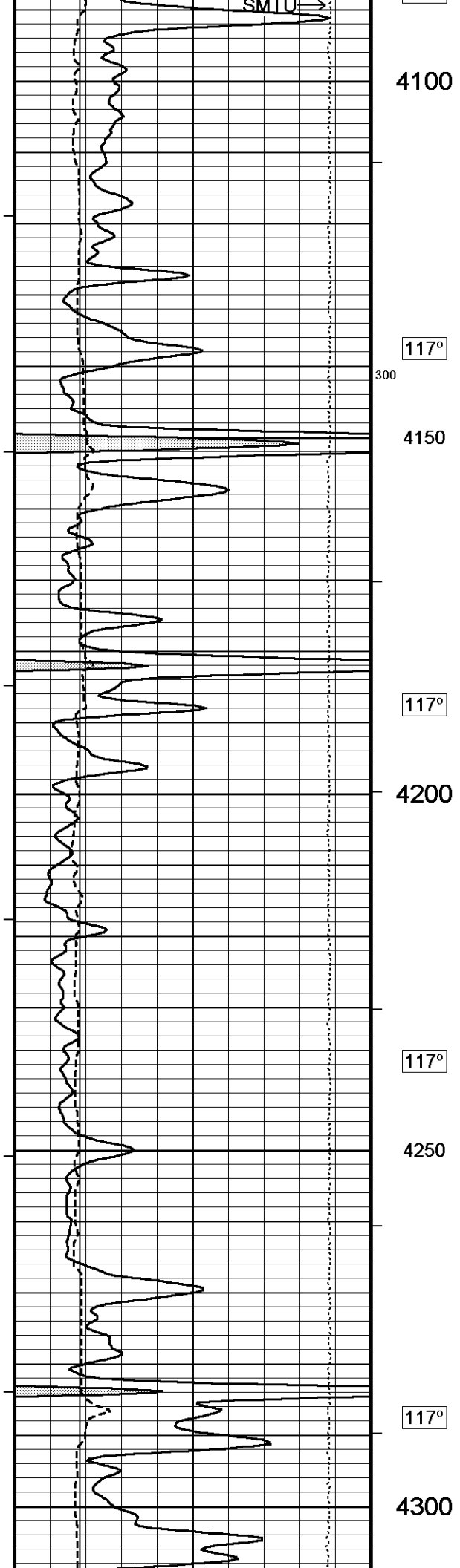










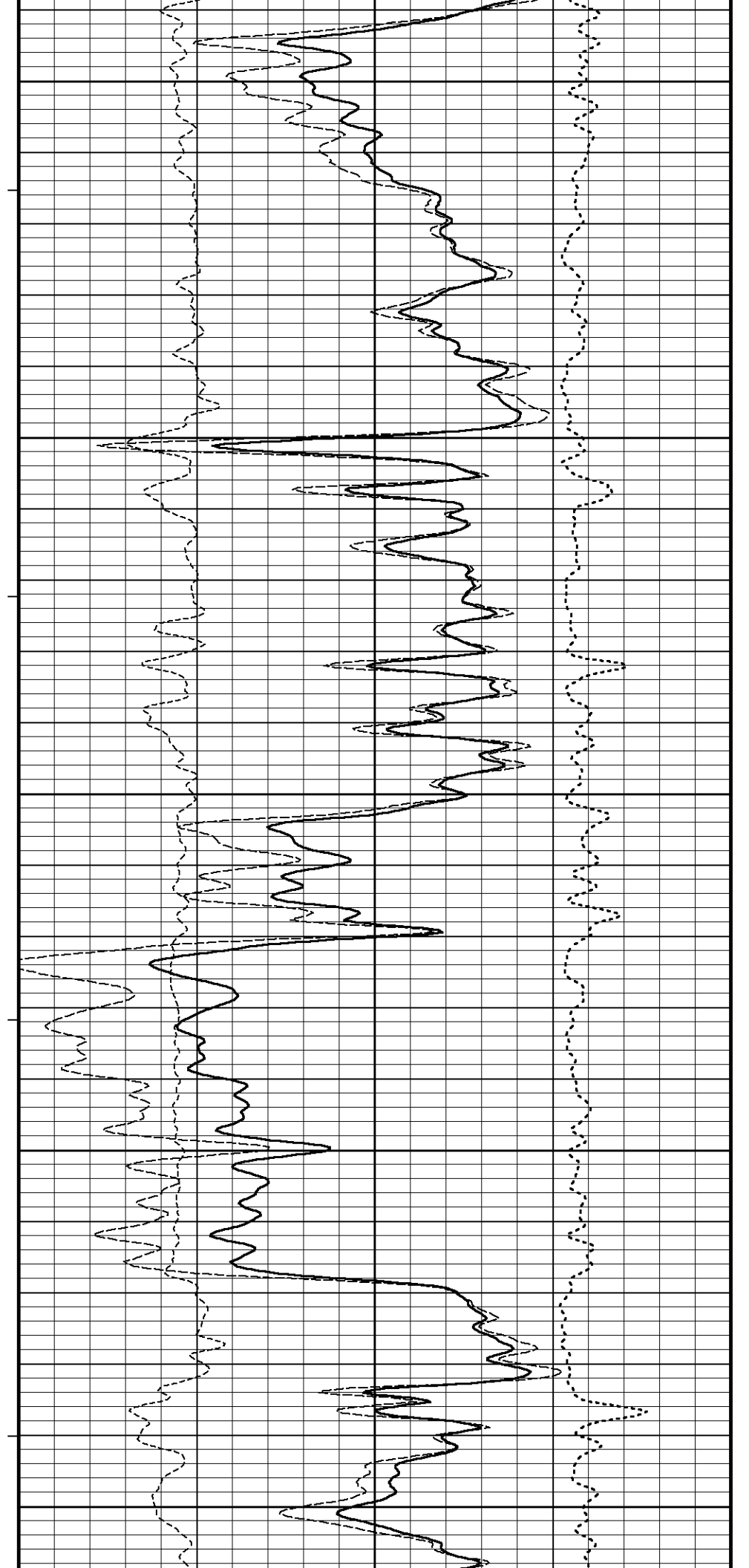


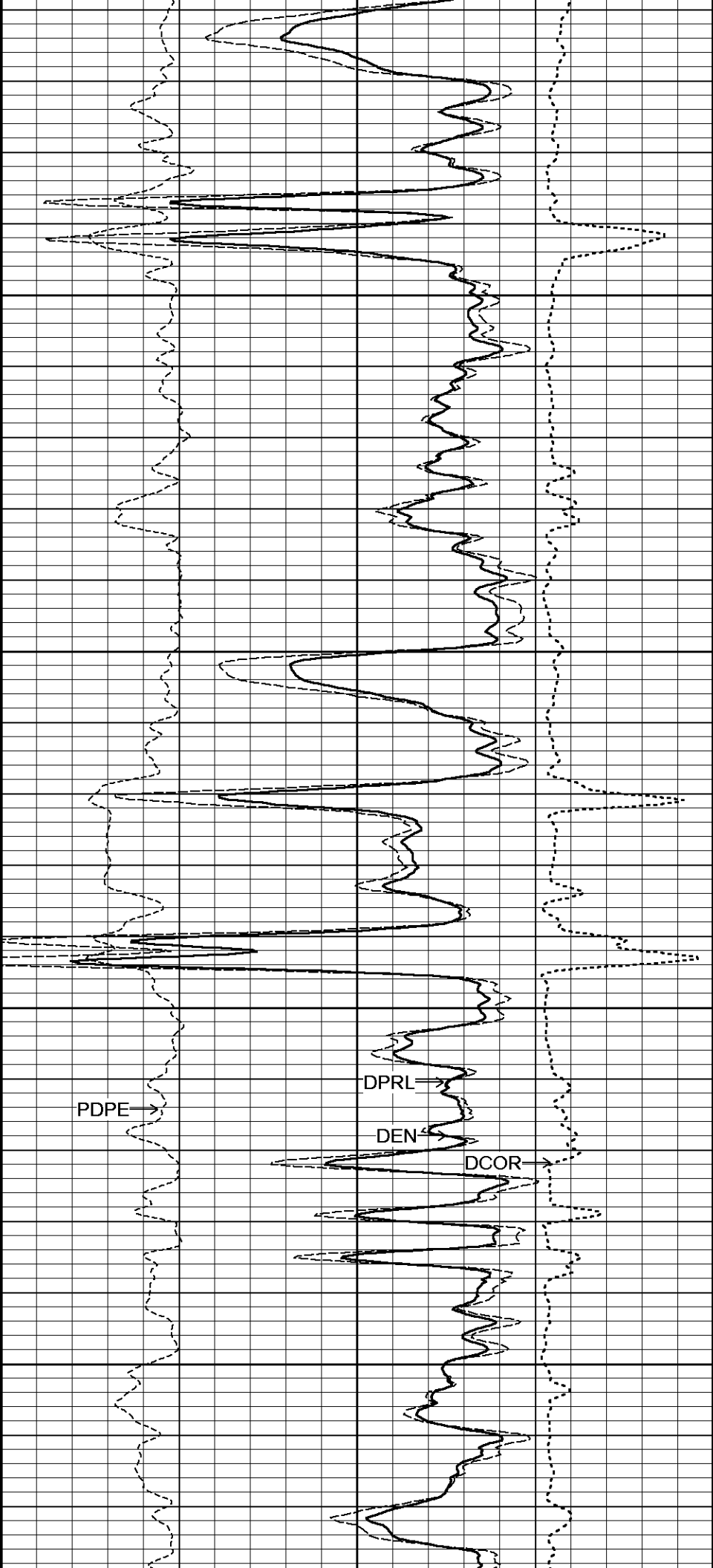
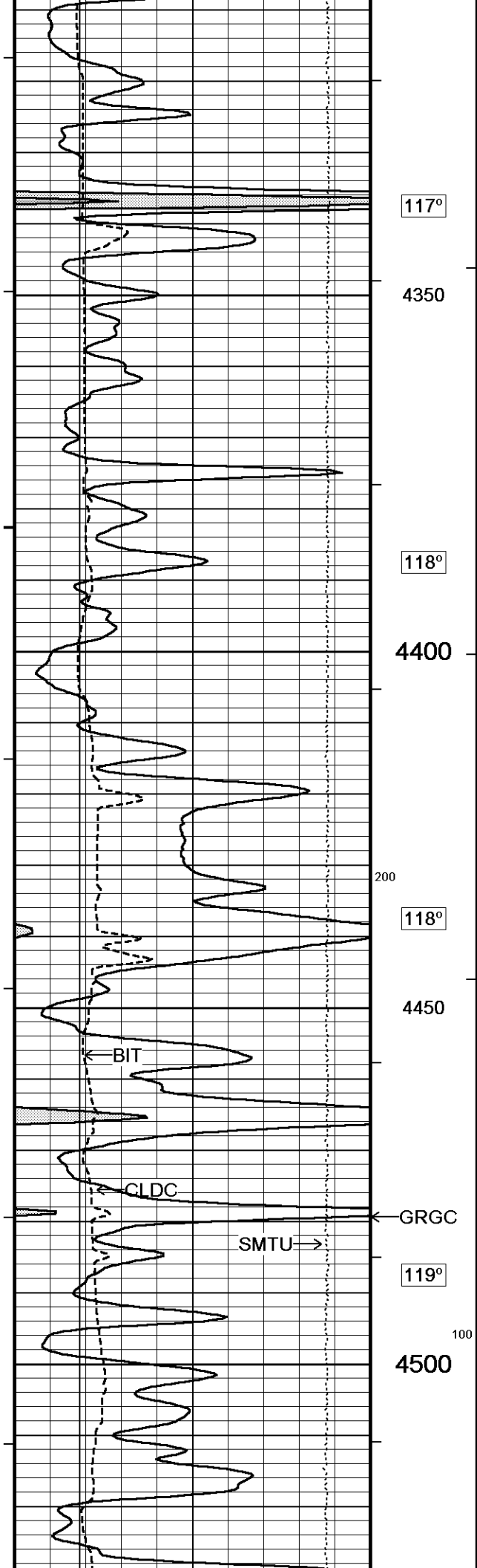
117°

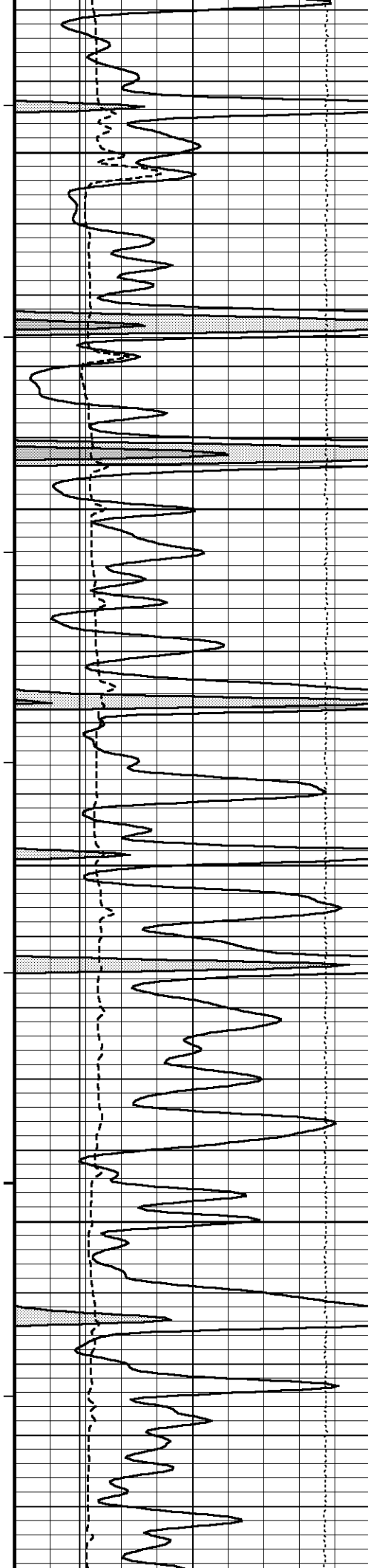
117°

117°

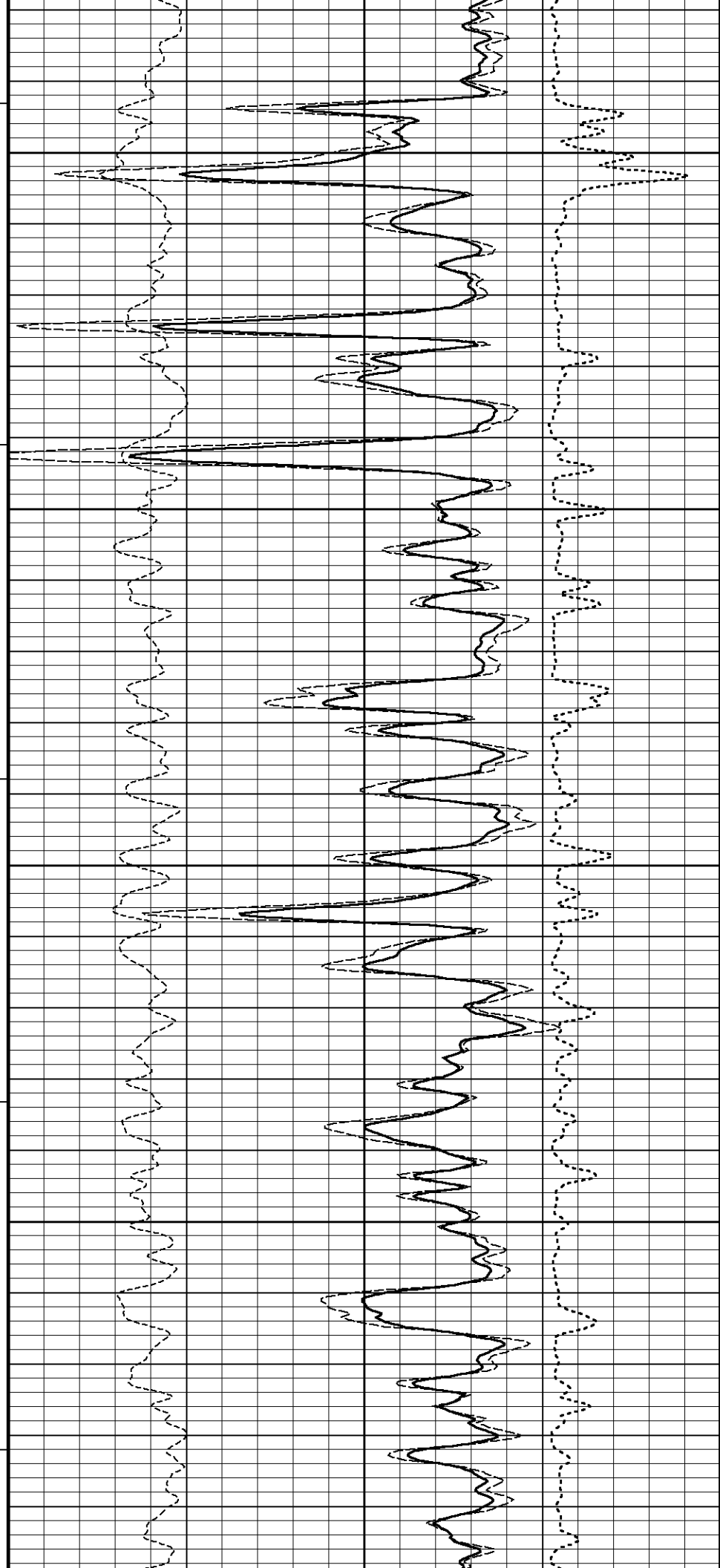
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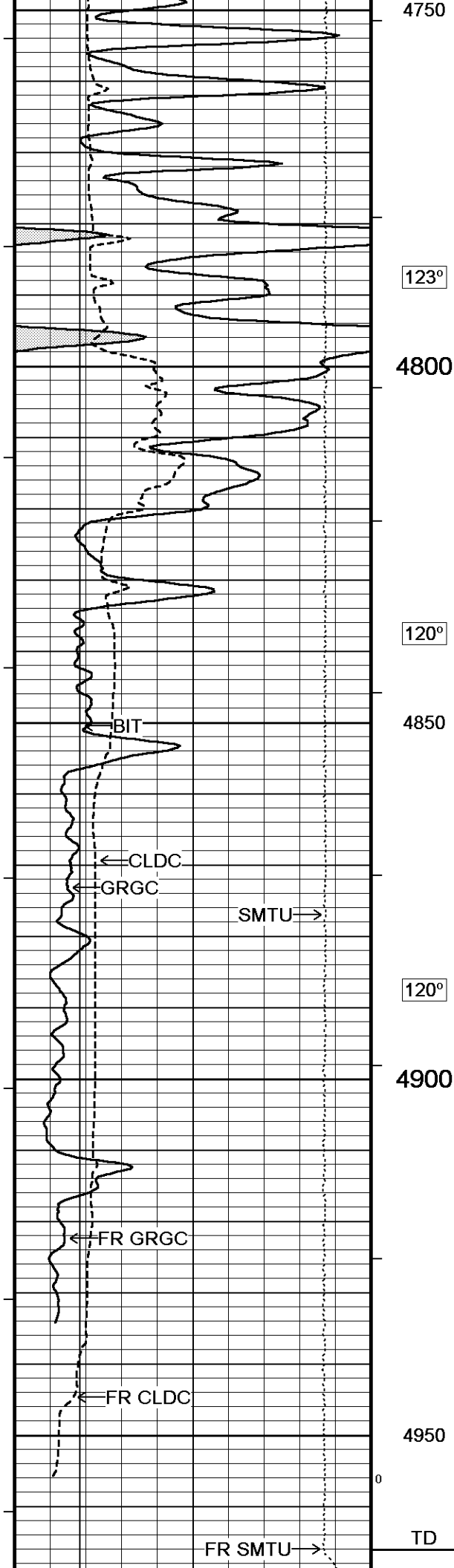




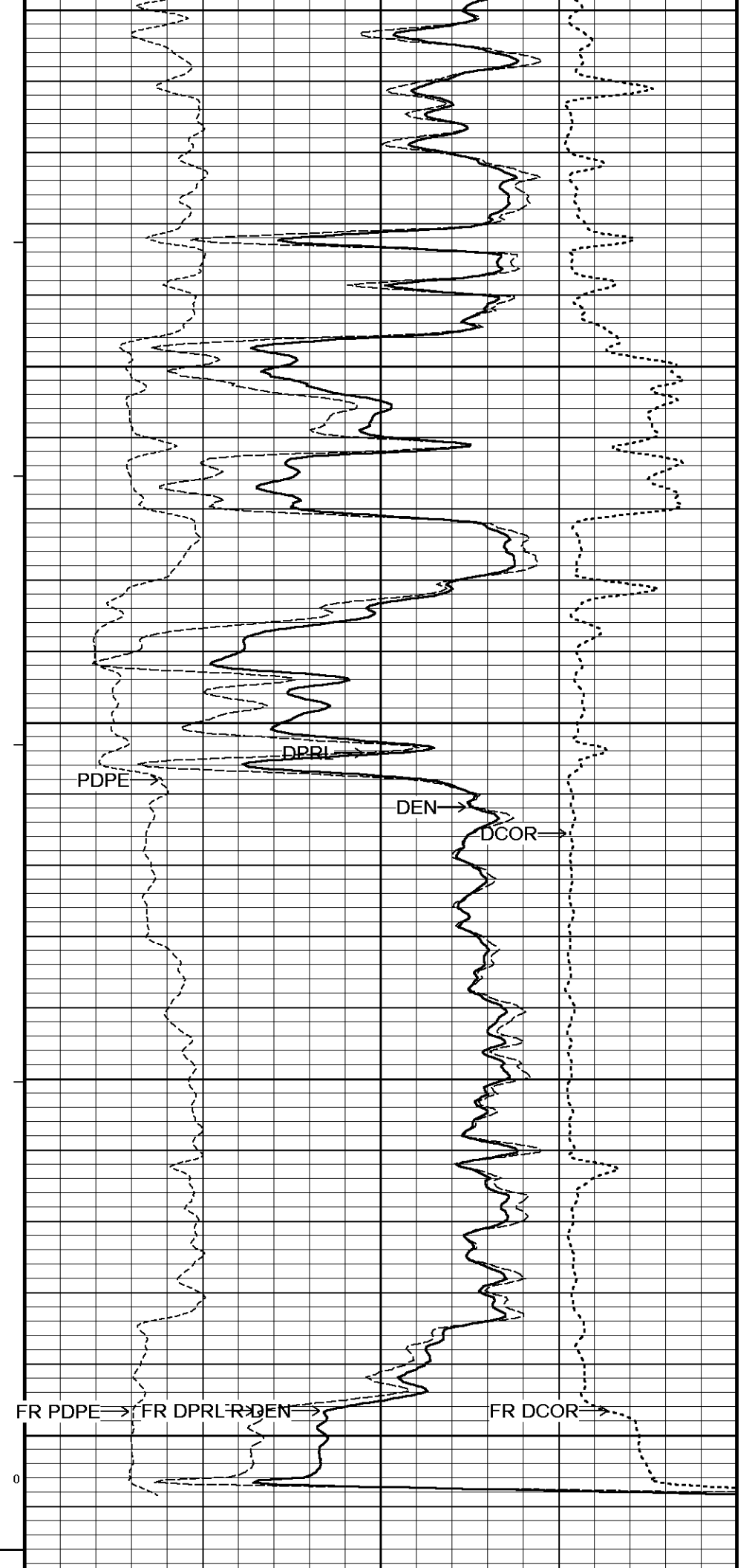


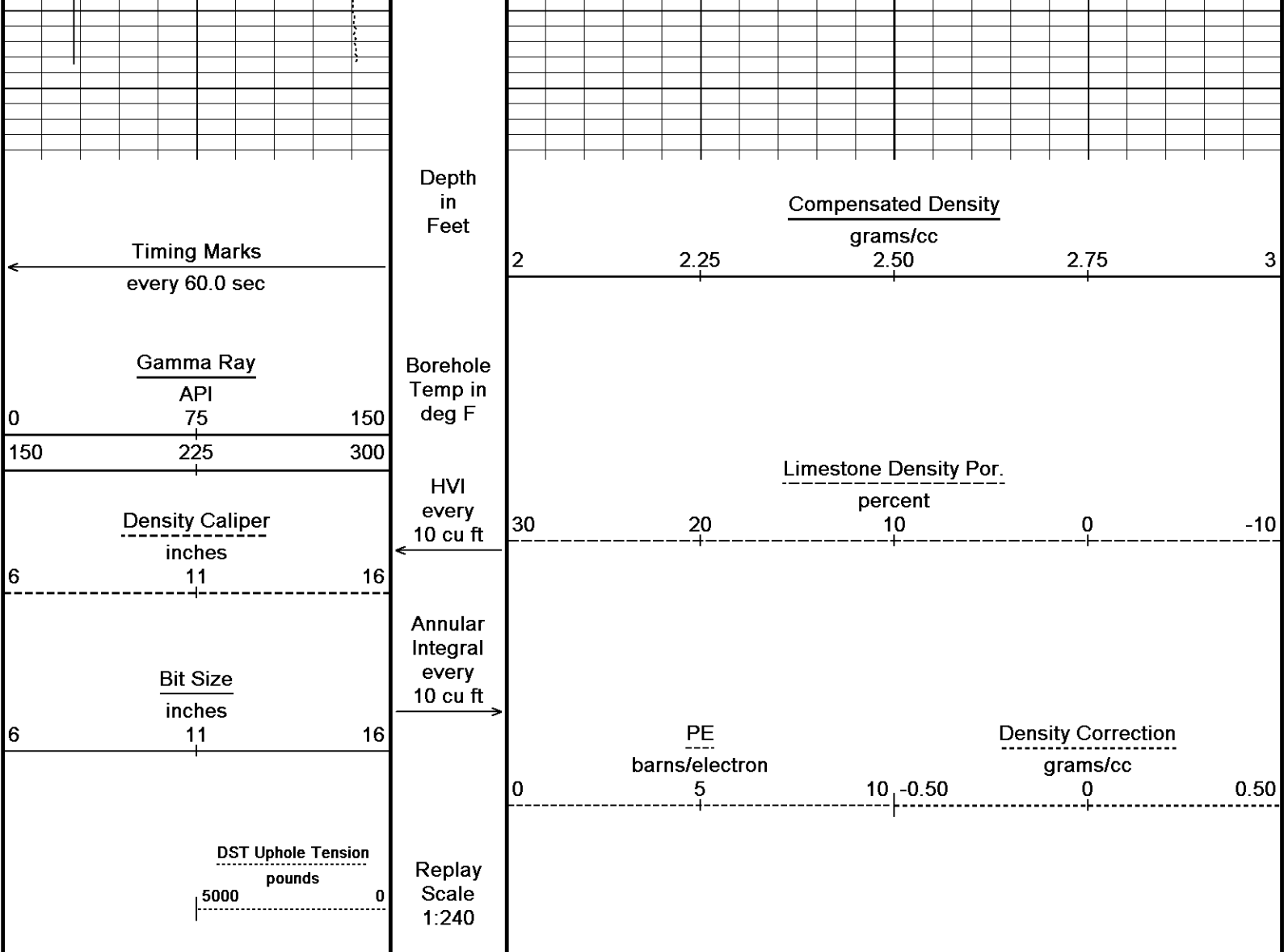
119°
4550
120°
4600
121°
4650
122°
100
4700
122°





4750
123°
4800
120°
4850
120°
4900
4950
0
TD

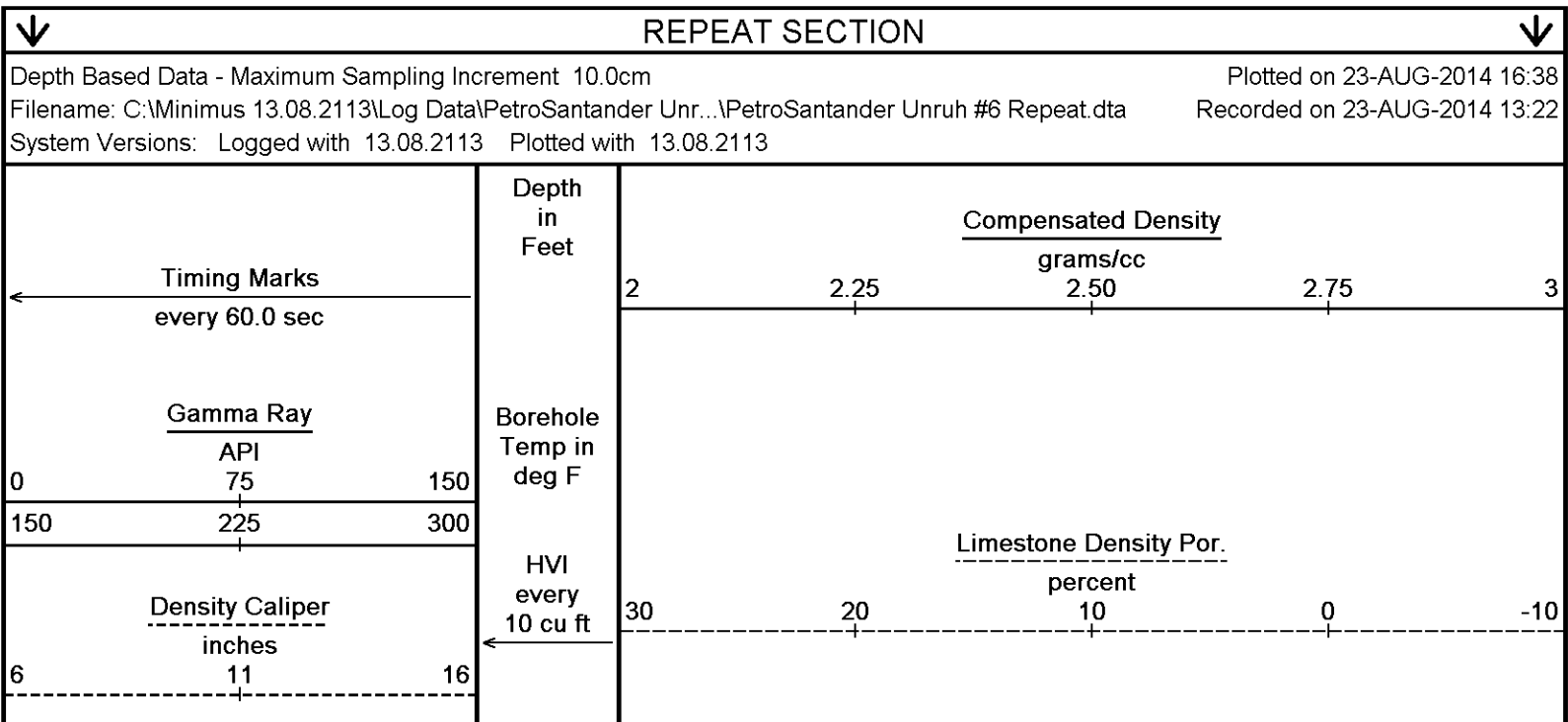


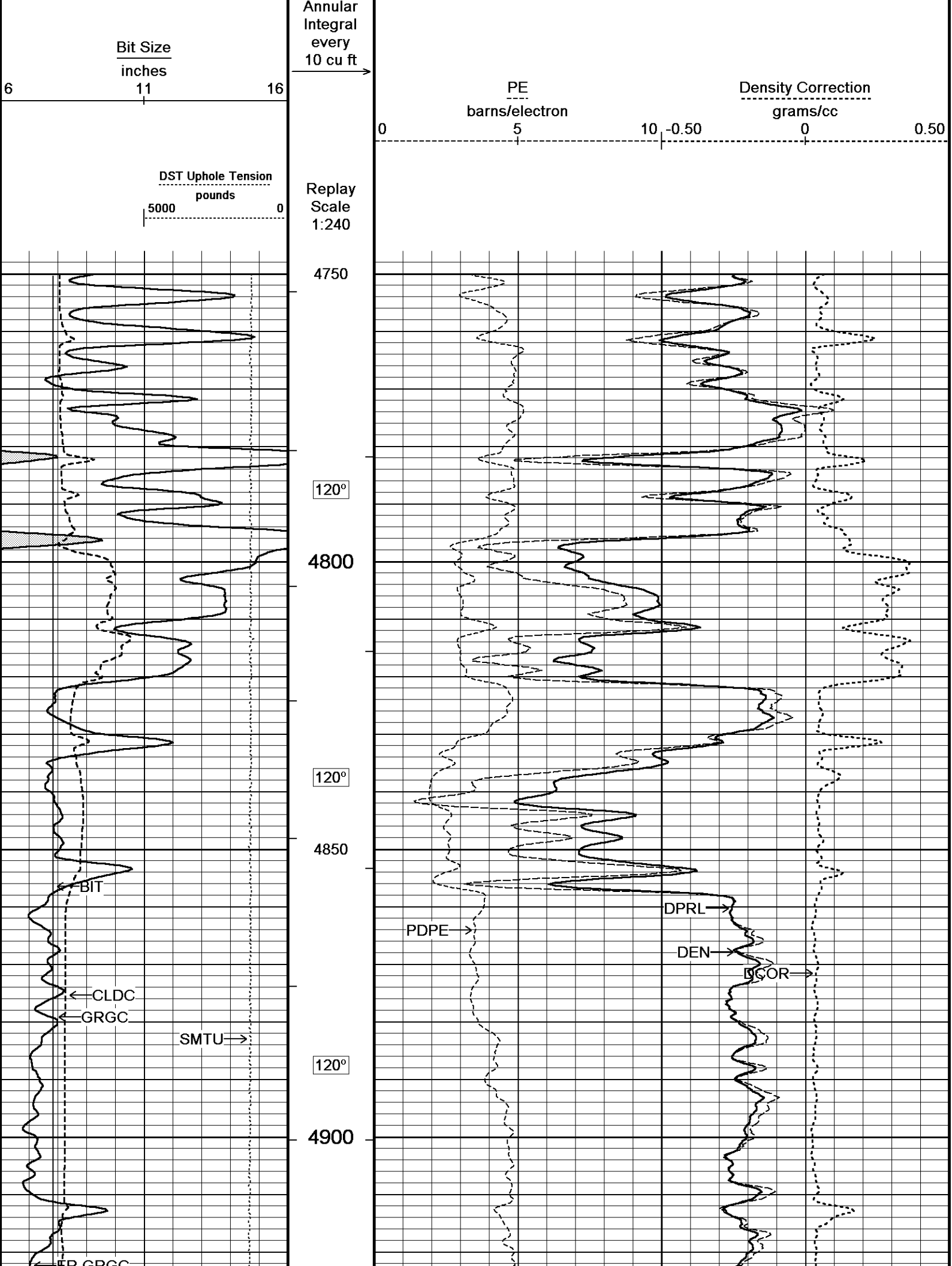


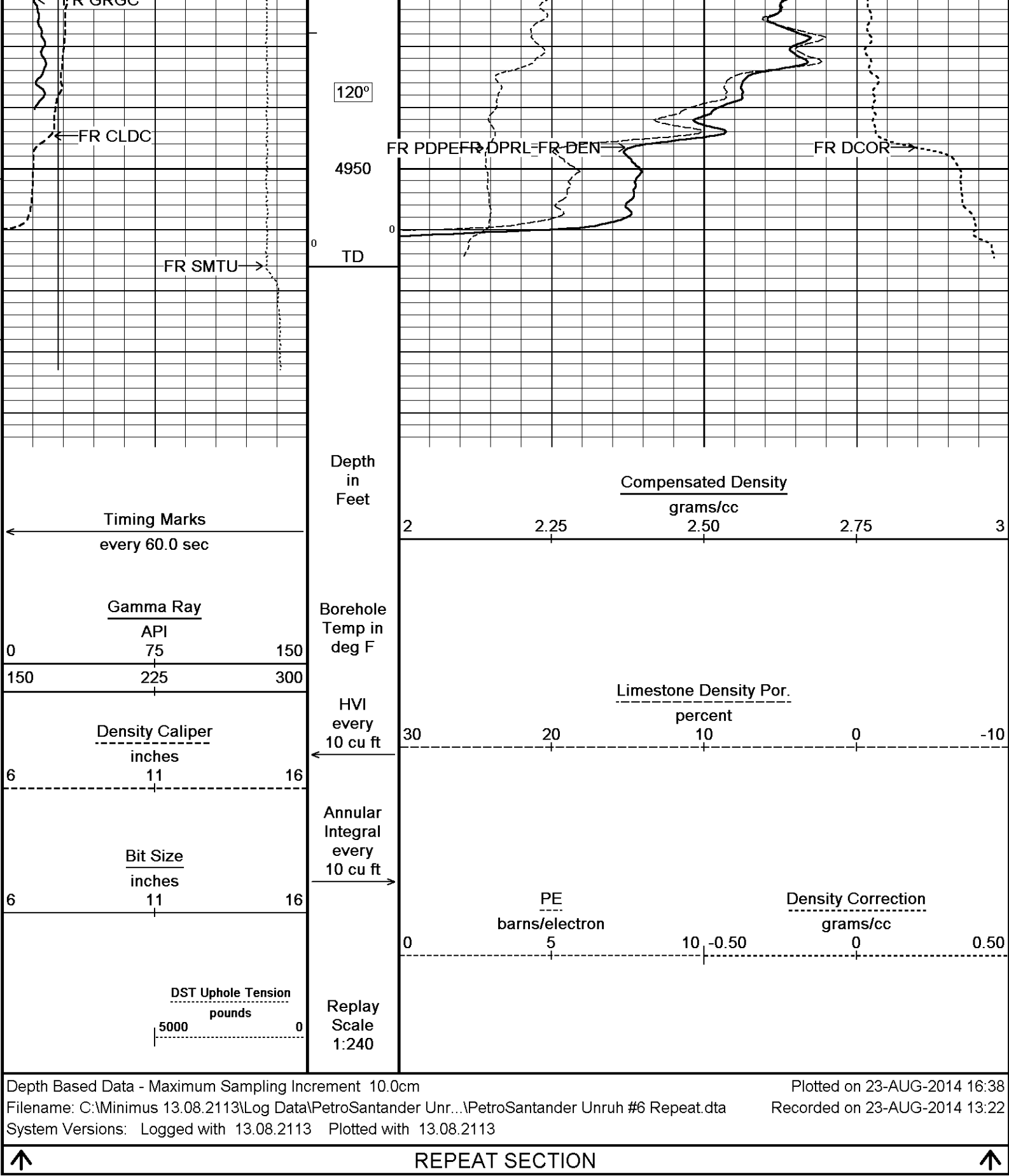
Depth Based Data - Maximum Sampling Increment 10.0cm
Filename: C:\Minimus 13.08.2113\Log Data\PetroSantander Unruh...\PetroSantander Unruh #6 Main.dta
System Versions: Logged with 13.08.2113 Plotted with 13.08.2113

Plotted on 23-AUG-2014 16:38
Recorded on 23-AUG-2014 13:37

5 INCH BULK DENSITY MAIN







BEFORE SURVEY CALIBRATION		
C:\Minimus 13.08.2113\Log Data\PetroSantander Unruh #6\PetroSantander Unruh #6 Main.dta		
General Constants All 000	Last Edited on 19-AUG-2014,14:47	
General Parameters		
Mud Resistivity	1.480	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	5.500	inches
Caliper for Differential Caliper	None	
Rwa Parameters		
Porosity used	Crossplot Porosity	
Resistivity used	Array Ind. One Res Rt	
RWA Constant A	0.610	
RWA Constant M	2.150	
SW/APOR Tool Source	0.000	
Gamma Calibration MCG-B 39		
	Measured	Calibrated (API)
Background	67	45
Calibrator (Gross)	1144	770
Calibrator (Net)	1077	725
Gamma Constants MCG-B 39		
		Field Calibration on 23-AUG-2014 08:30
Gamma Calibrator Number	GRC038	
Mud Density	1.12	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 Calibration MCG-B 39		
	Measured	Calibrated(Deg F)
Lower	10.00	10.00
Upper	100.00	100.00
High Resolution Temperature Constants MCG-B 39		
		Last Edited on 02-MAY-2014,08:36
Pre-filter Length	11	
Caliper Calibration MPD-B 103		
		Base Calibration on 05-AUG-2014 11:04
Base Calibration		Field Calibration on 23-AUG-2014 07:30
Reading No	Measured	Calibrator Size (in)
1	13922	3.99
2	22576	5.96
3	31328	7.98
4	39552	9.85
5	48880	11.92
6	N/A	N/A
Field Calibration		
	Measured Caliper (in)	Actual Caliper (in)
	7.94	7.97
Photo Density Calibration MPD-B 103		
		Base Calibration on 05-AUG-2014 13:34
Density Calibration		Field Check on 23-AUG-2014 07:28
Base Calibration	Measured	Calibrated (sdu)
	Near Far	Near Far
Background	1057 1213	
Reference 1	58408 29979	59556 30836
Reference 2	24379 2613	24941 2541
Field Check at Base		
	1056.8 1212.9	
Field Check		

Field Check

1056.7

1207.8

PE Calibration

Base Calibration

	WS	WH	Ratio	Calibrated Ratio
Background	190	946		
Reference 1	23042	58225	0.399	0.371
Reference 2	6677	24258	0.278	0.272

Field Check at Base

189.6 945.6

Field Check

187.0 946.7

Density Constants MPD-B 103

Last Edited on 23-AUG-2014,12:02

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	

DOWNHOLE EQUIPMENT

C:\Minimus 13.08.2113\Log Data\PetroSantander Unruh #6\PetroSantander Unruh #6 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-Resistivity

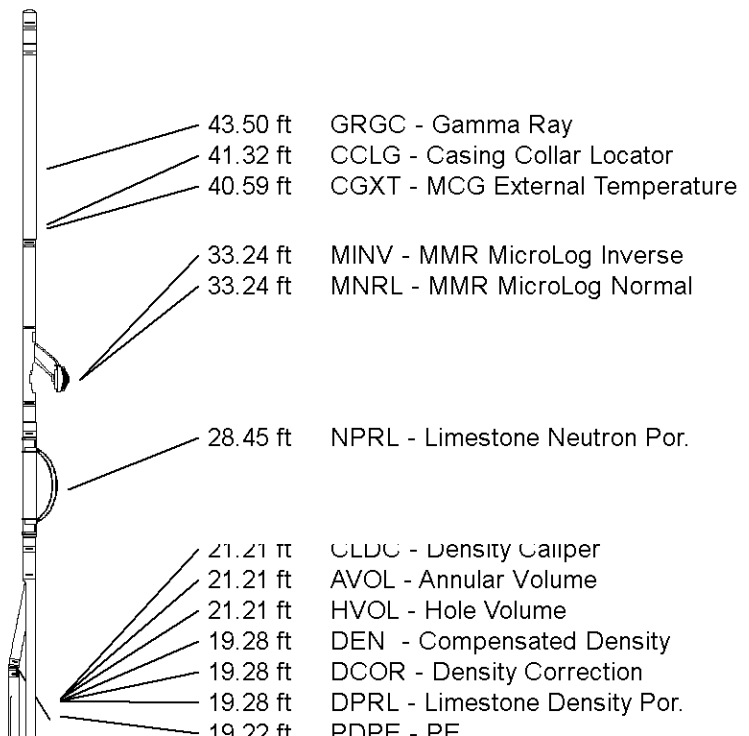
MMR-B.A 98 LG: 8.59 ft WT: 81.6 lb OD: 4.882 in

Compact Neutron

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

Compact Density/Caliper

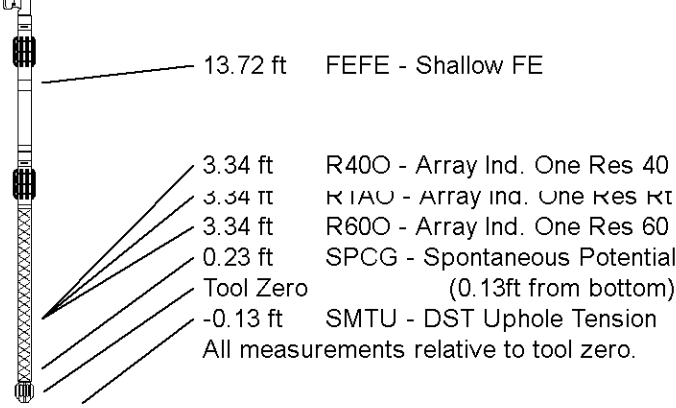
MPD-B 103 LG: 9.59 ft WT: 90.4 lb OD: 2.449 in



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

Compact Induction
MAI-A.A 111 LG: 10.81 ft WT: 48.5 lb OD: 2.244 in

Total Length: 50.36 ft Weight: 399.0 lb



COMPANY	PETROSANTANDER (USA) INC.
WELL	UNRUH #6
FIELD	CHRISTABELLE (MORROW)
PROVINCE/COUNTY	KEARNY
COUNTRY/STATE	U.S.A. / KANSAS

Elevation Kelly Bushing	3075.00	feet	First Reading	4946.78	feet
Elevation Drill Floor	3073.00	feet	Depth Driller	4970.00	feet
Elevation Ground Level	3063.00	feet	Depth Logger	4966.00	feet



Weatherford®

COMPACT PHOTO DENSITY
COMPENSATED NEUTRON
MICRORESISTIVITY LOG