



Weatherford

**COMPACT PHOTO DENSITY
COMPENSATED NEUTRON**

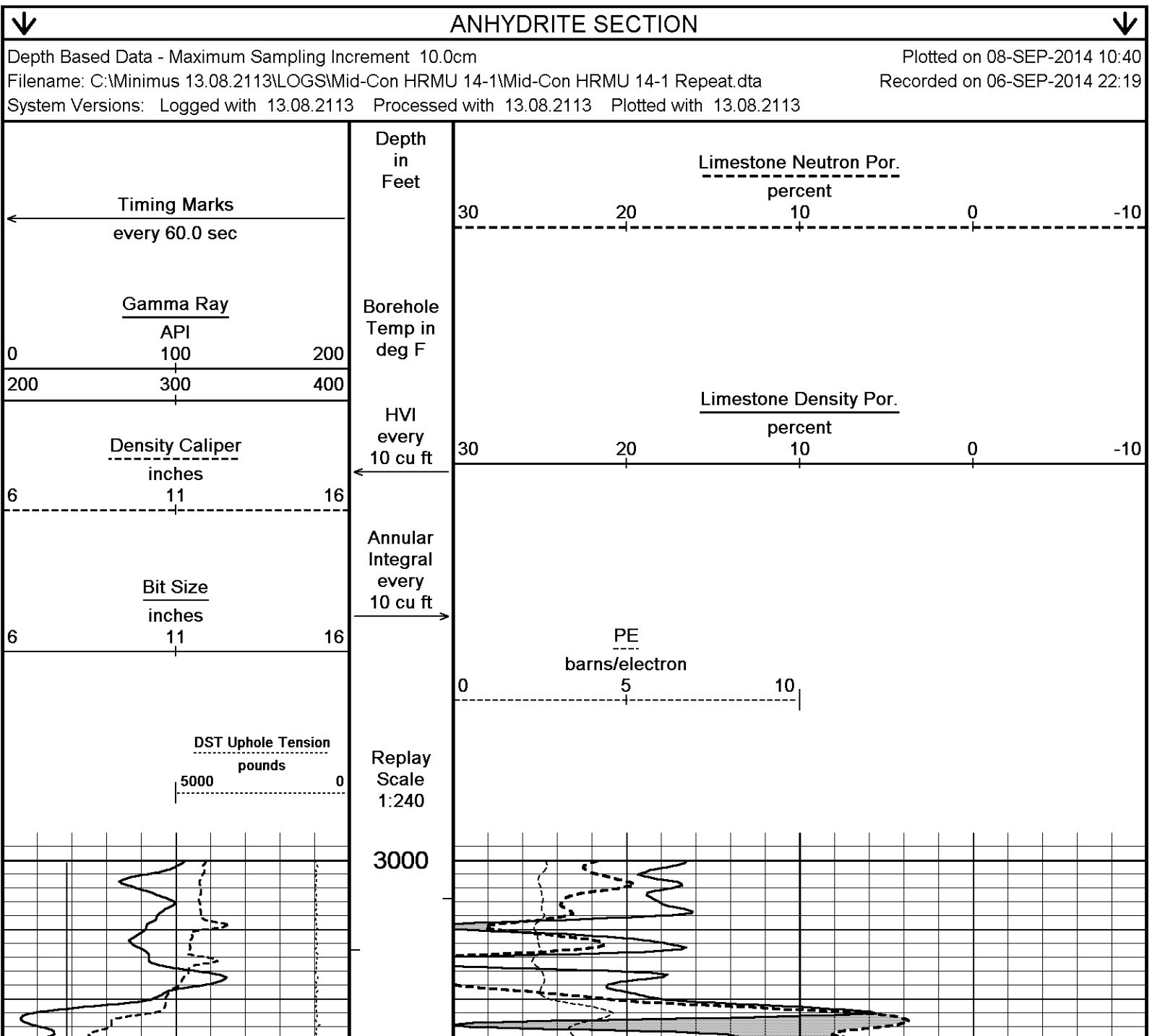
COMPANY	MID-CON ENERGY OPERATING, INC.			
WELL	HRMU 14-1			
FIELD	HARKER RANCH MORROW UNIT			
PROVINCE/COUNTY	CHEYENNE			
COUNTRY/STATE	U.S.A. / COLORADO			
LOCATION	469' FSL & 1320' FWL OF SW/4			
SEC 1	TWP 13S	RGE 43W	Other Services	
Latitude				MAI/MFE
Longitude				
API Number	05-017-0714800			
Permanent Datum GL, Elevation	4028.59 feet			Elevations:
Log Measured From	KB			KB 4045.19
Drilling Measured From	KB @ 16.6 feet			DF 4043.19
				GL 4028.59
Date	06-SEP-2014			
Run Number	TWO			
Service Order	7577-97212326			
Depth Driller	5350.00			feet
Depth Logger	5349.00			feet
First Reading	5329.91			feet
Last Reading	4349.00			feet
Casing Driller	626.00			feet
Casing Logger	632.00			feet
Bit Size	7.875			inches
Hole Fluid Type	CHEMICAL			
Density / Viscosity	8.50 lb/USg			20.00 CP
PH / Fluid Loss	11.00			8.80 ml/30Min
Sample Source	MUD PIT			
Rm @ Measured Temp	1.51 @ 96.0			ohm-m
Rmf @ Measured Temp	1.21 @ 96.0			ohm-m
Rmc @ Measured Temp	1.81 @ 96.0			ohm-m
Source Rmf / Rmc	CALC	CALC		
Rm @ BHT	1.12 @ 131.0			ohm-m
Time Since Circulation	3.5 HOURS			
Max Recorded Temp	131.00			deg F
Equipment / Base	13244			LIB
Recorded By	JEFFREY RANDLE			
Witnessed By	CLINT ARNOLD			
JOB #	LB14-264			

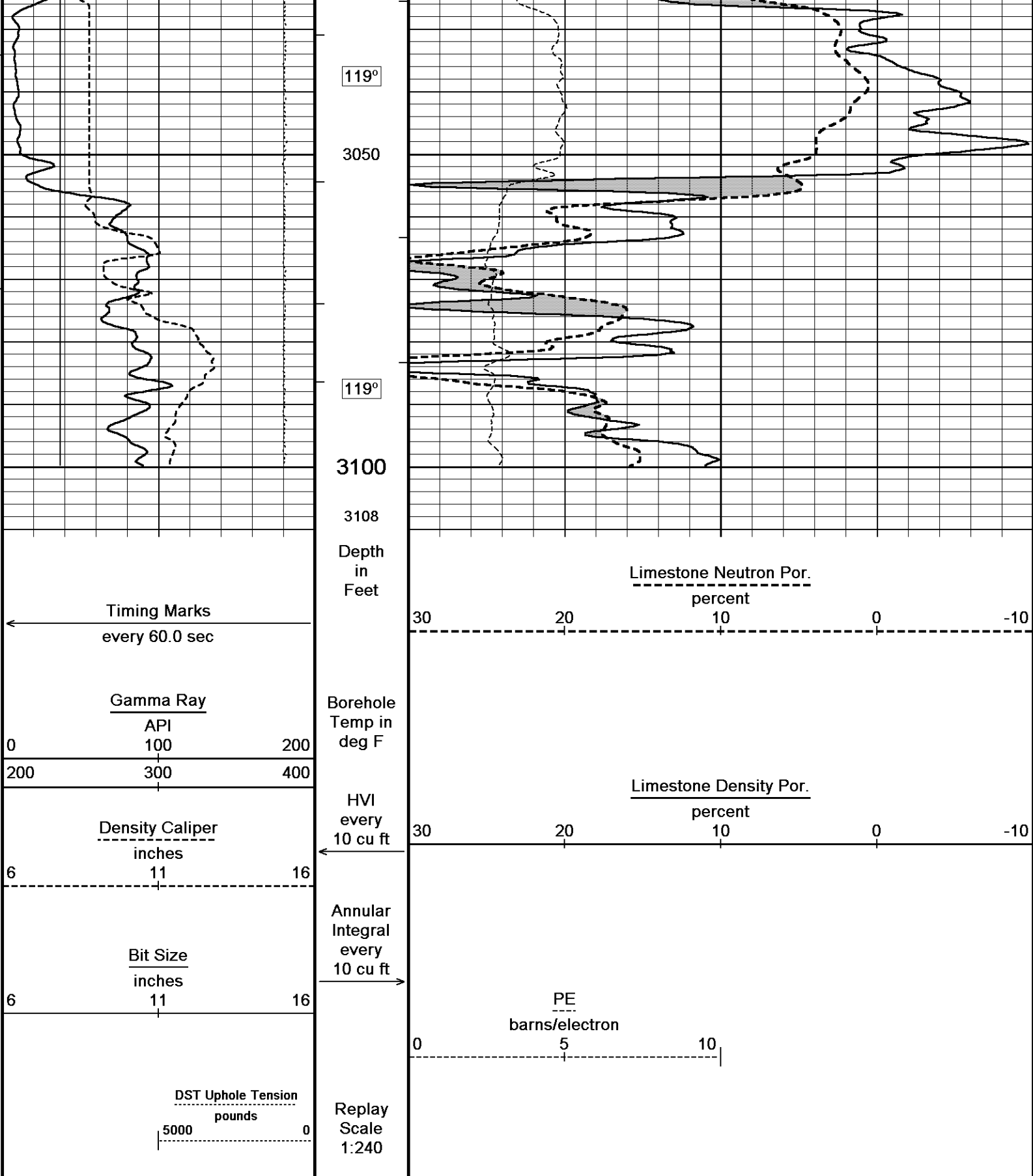
BOREHOLE RECORD					Last Edited: 06-SEP-2014 20:43
Bit Size inches		Depth From feet		Depth To feet	
7.875		626.00		5350.00	
CASING RECORD					
Type	Size inches	Depth From feet	Shoe Depth feet	Weight pounds/ft	
SURFACE	8.625	0.00	626.00	24.00	

REMARKS
- SOFTWARE ISSUE: WLS 13.08.2113.
- RUN ONE: MCG, MDN, MPD, MFE, MAI RUN IN COMBINATION. - HARDWARE: DUAL BOWSPRING USED ON MDN. 0.5 INCH STANDOFF USED ON MFE. 0.5 INCH STANDOFF USED ON MAI.
- 2.71 G/CC LIMESTONE DENSITY MATRIX USED TO CALCULATE POROSITY.
- 2.65 G/CC SANDSTONE 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: 2327 CU.FT.
- ANNUAL HOLE VOLUME WITH 5.5 INCH PRODUCTION CASING FROM TD TO 4349 FEET: 253 CU.FT.

- RIG: WILDCAT DRILLING #1.
- ENGINEER: J. RANDLE.
- OPERATOR: J. LaPOINT, S. LARES.

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\LOGS\Mid-Con HRMU 14-1\Mid-Con HRMU 14-1 Repeat.dta
System Versions: Logged with 13.08.2113 Processed with 13.08.2113 Plotted with 13.08.2113

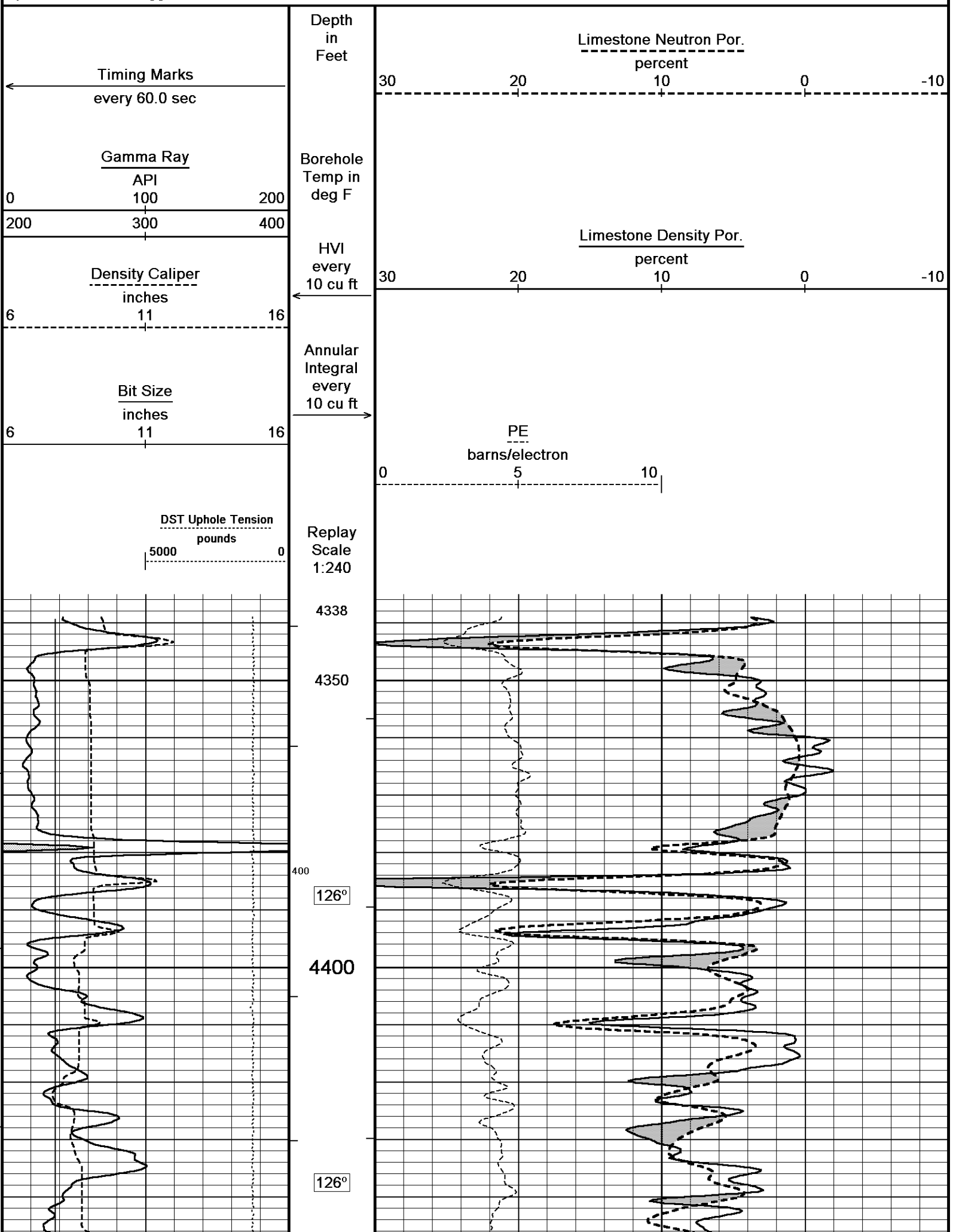
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Recorded on 06-SEP-2014 22:19

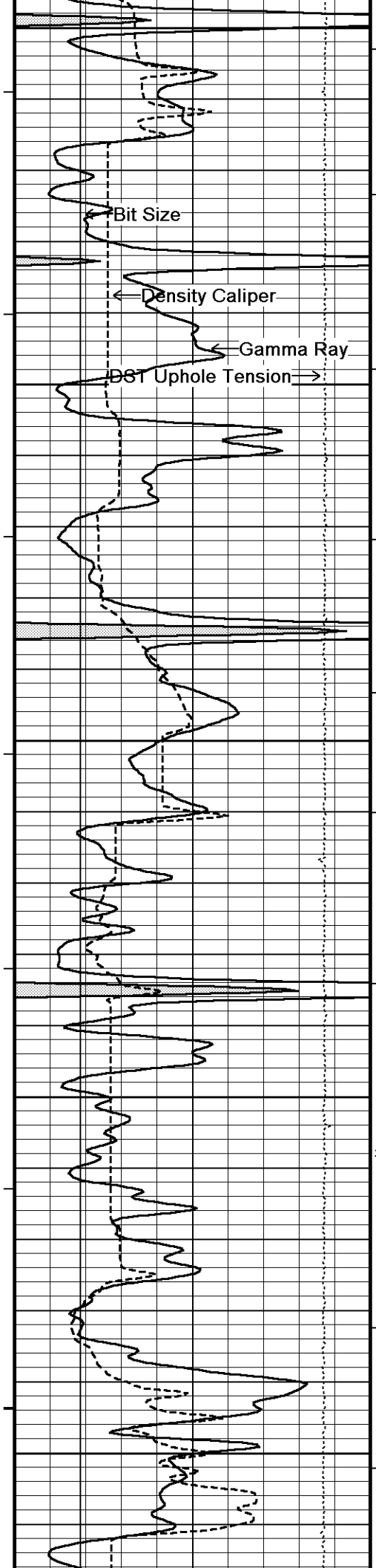
↑ ANHYDRITE SECTION ↑

↓ 5 INCH LIMESTONE MAIN ↓

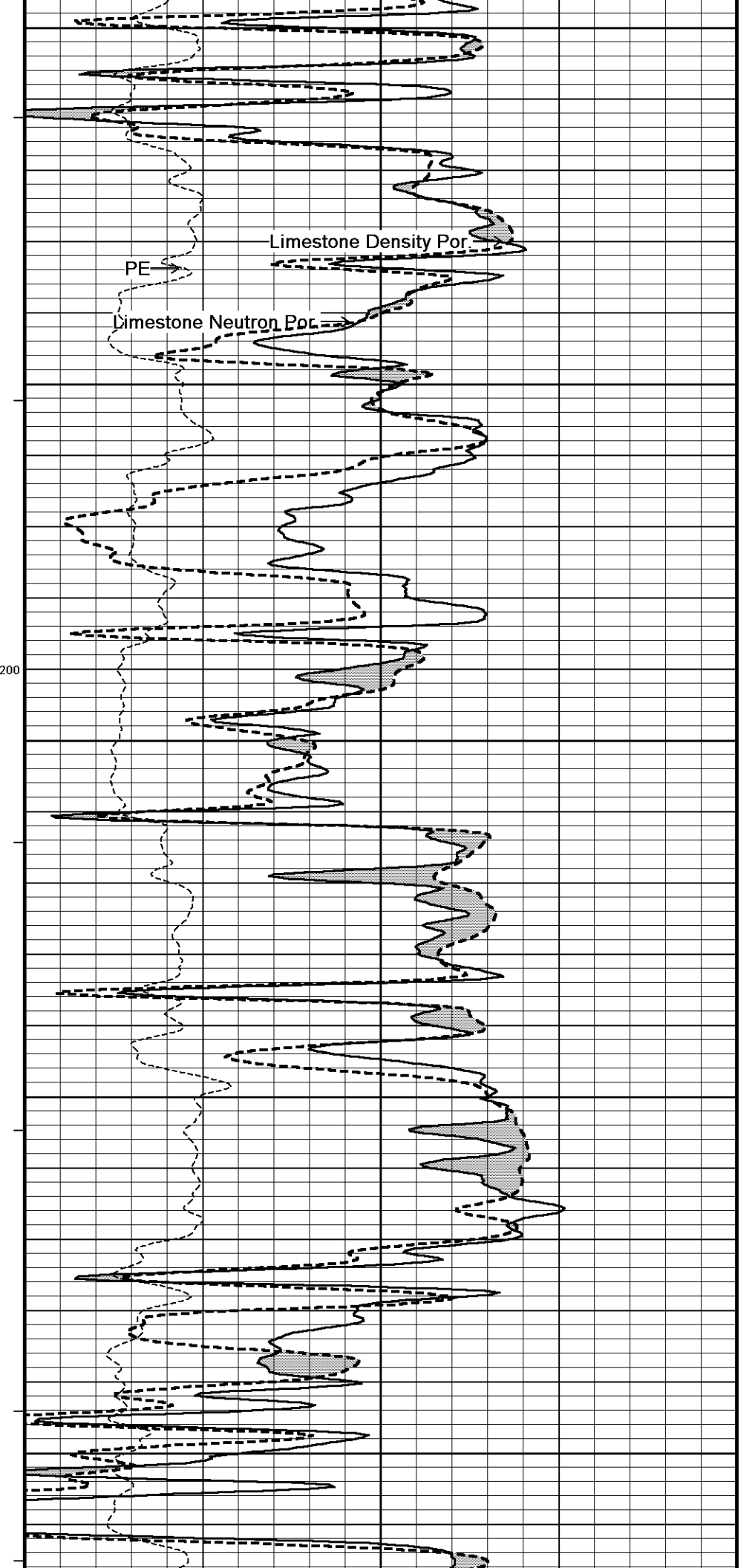
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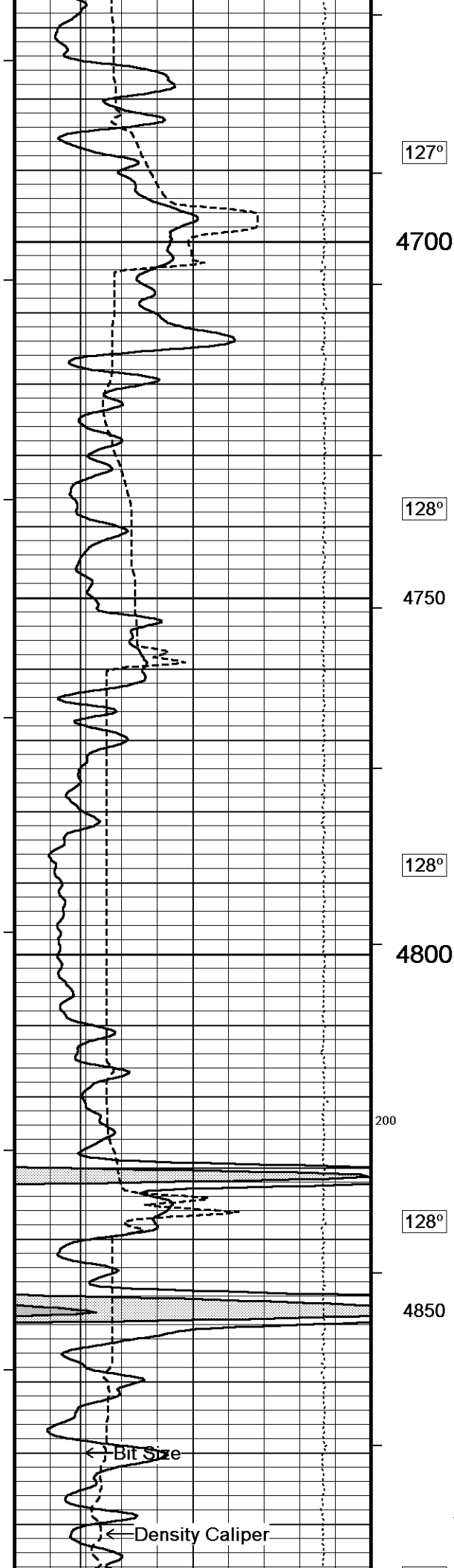
Plotted on 08-SEP-2014 10:40
Recorded on 06-SEP-2014 22:19





4450
127°
4500
127°
4550
127°
4600
127°
4650





127°

4700

128°

4750

128°

4800

200

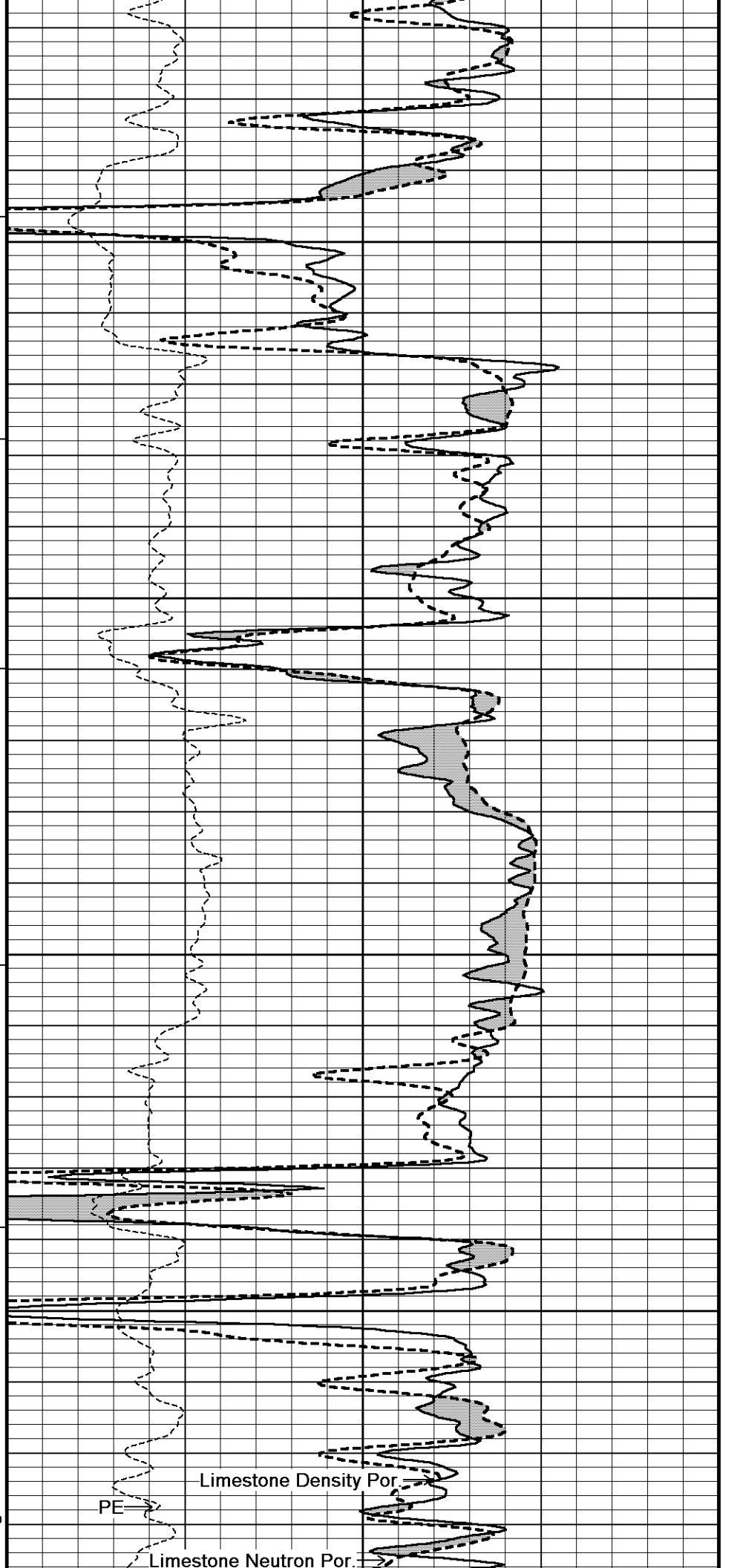
128°

4850

Bit Size

Density Caliper

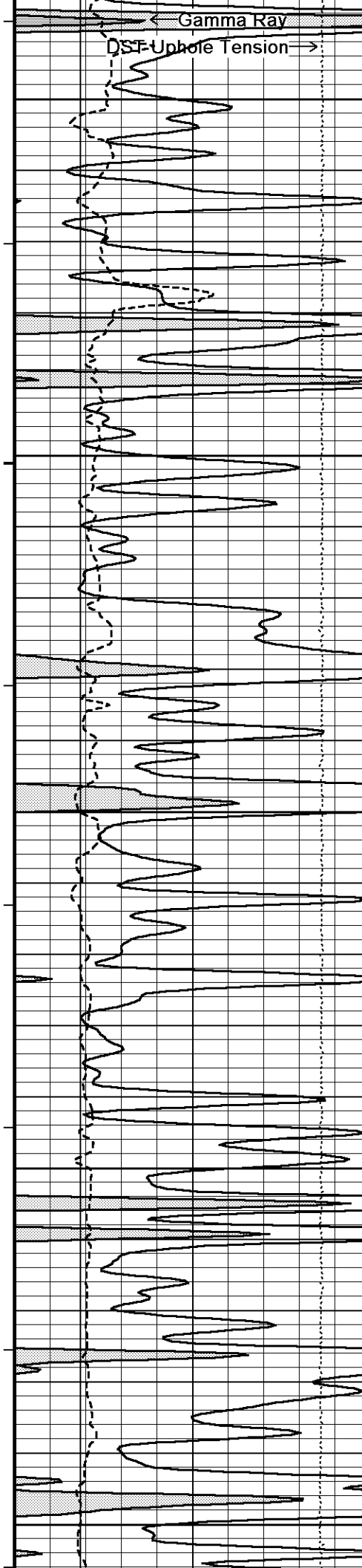
100



PE

Limestone Density Por.

Limestone Neutron Por.



128°

4900

129°

4950

129°

5000

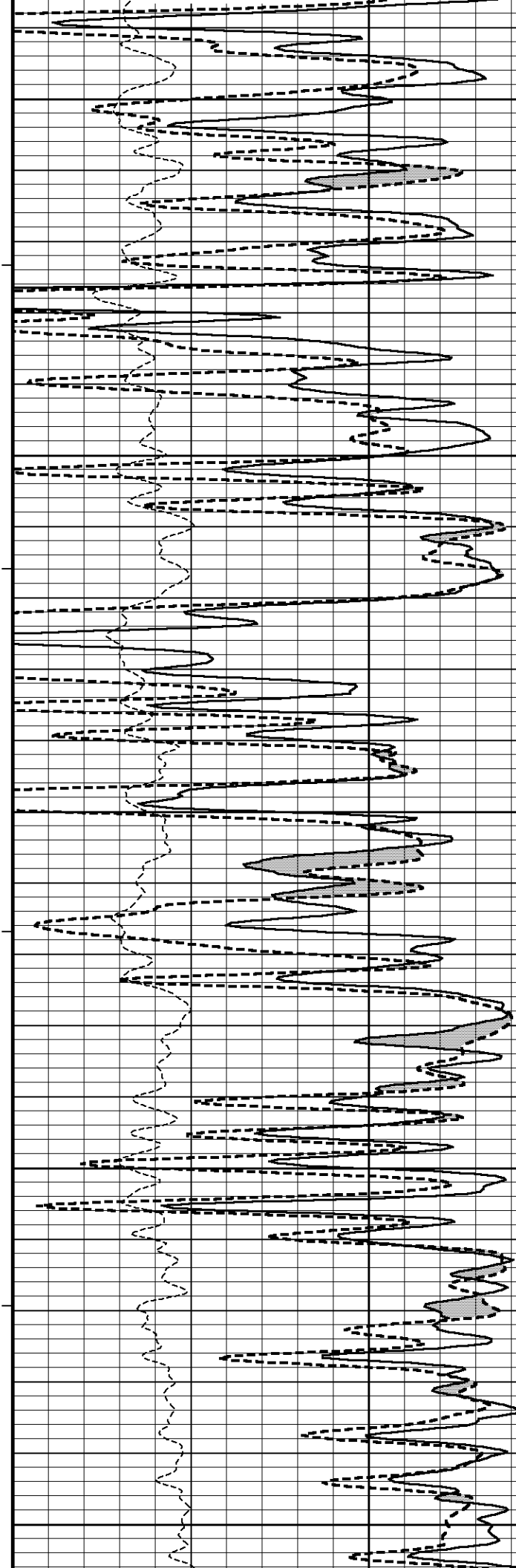
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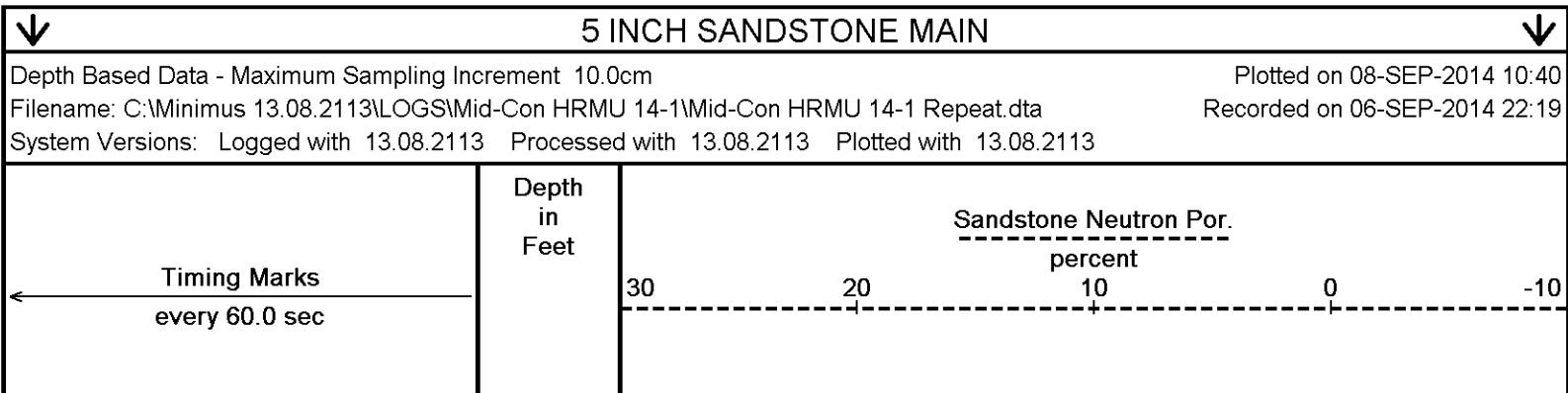
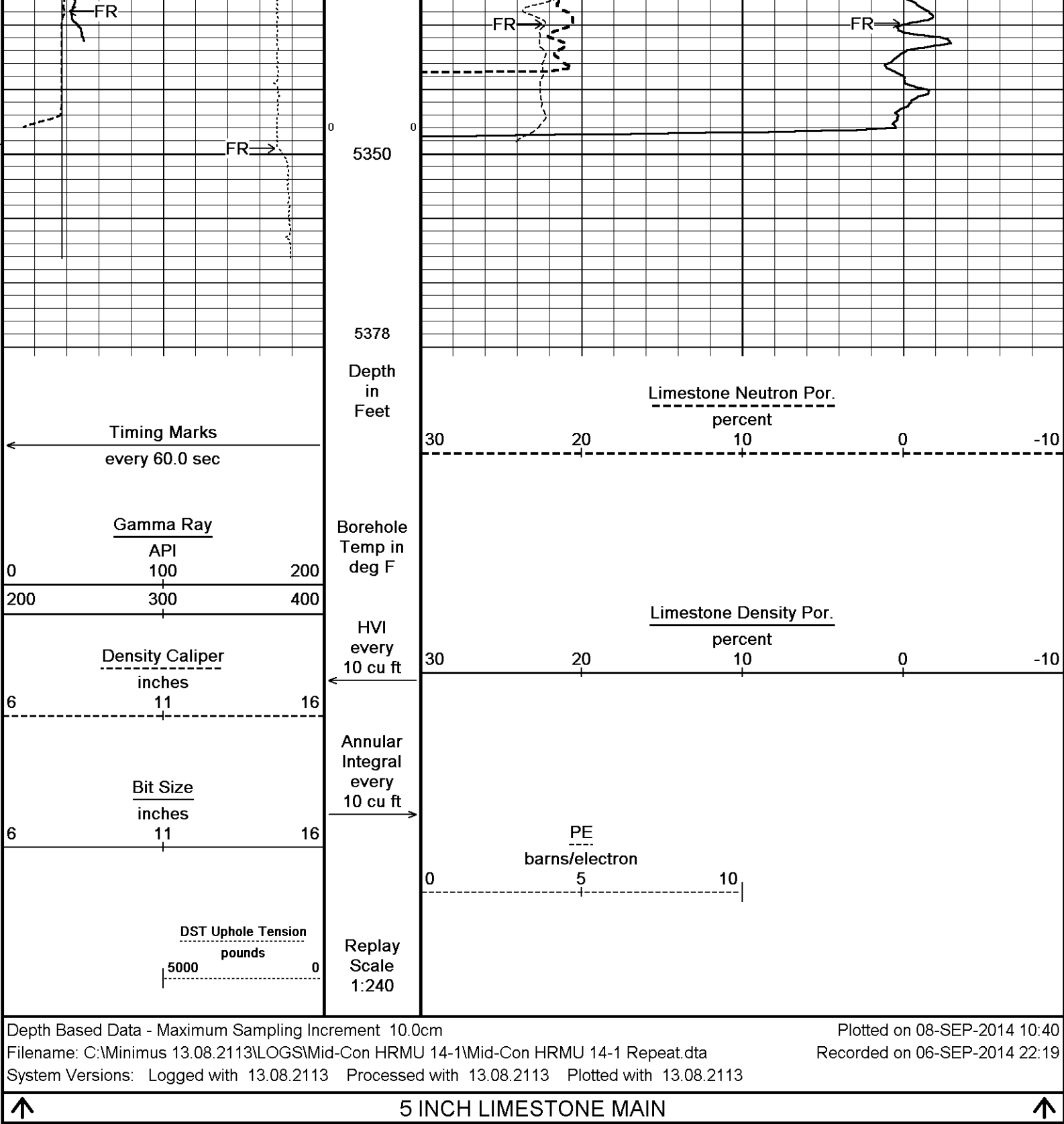
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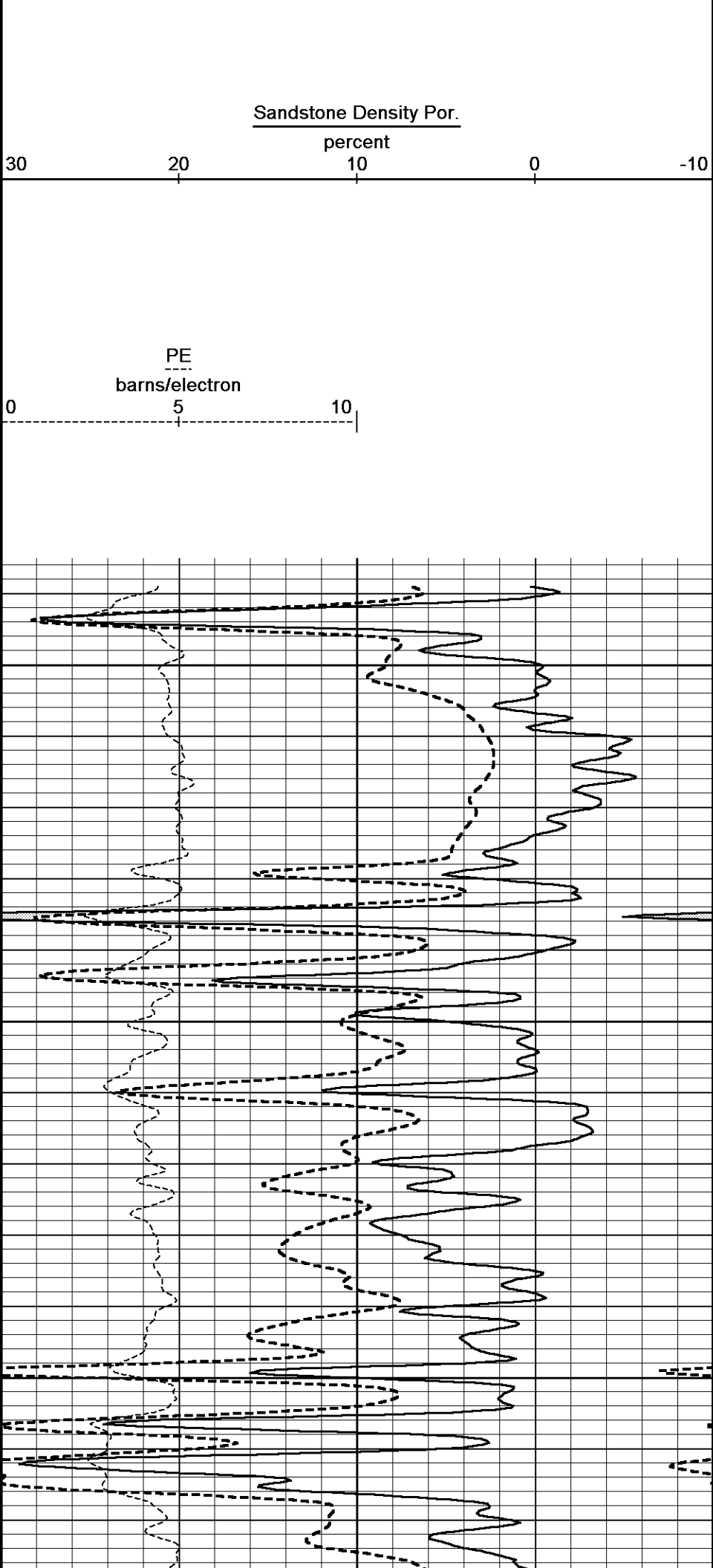
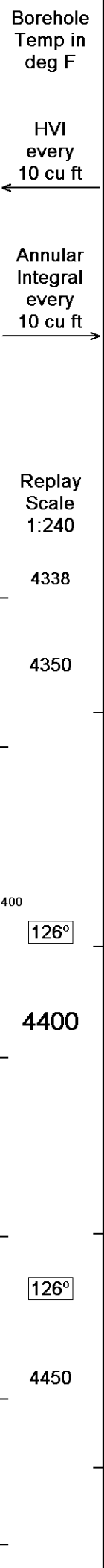
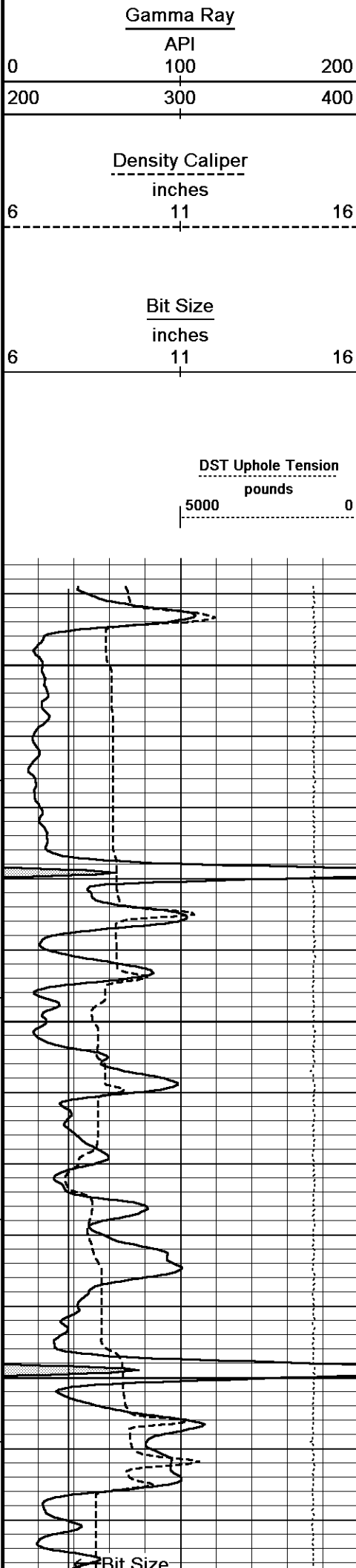
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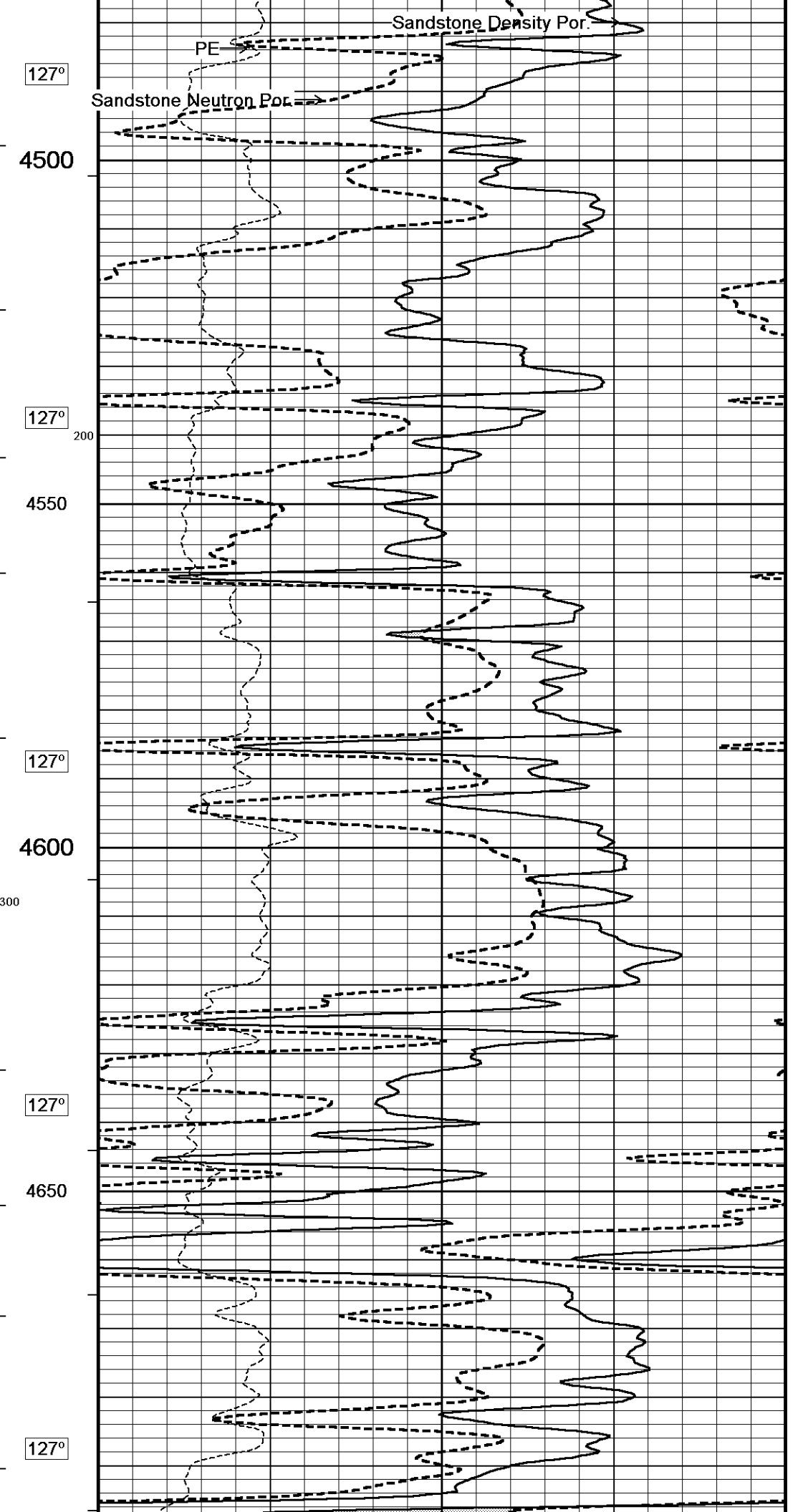
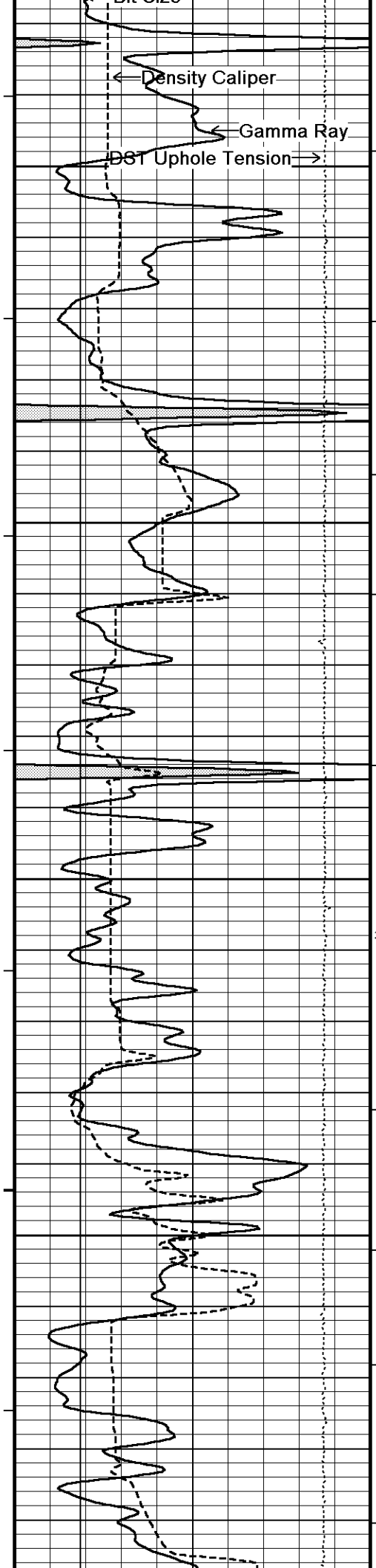
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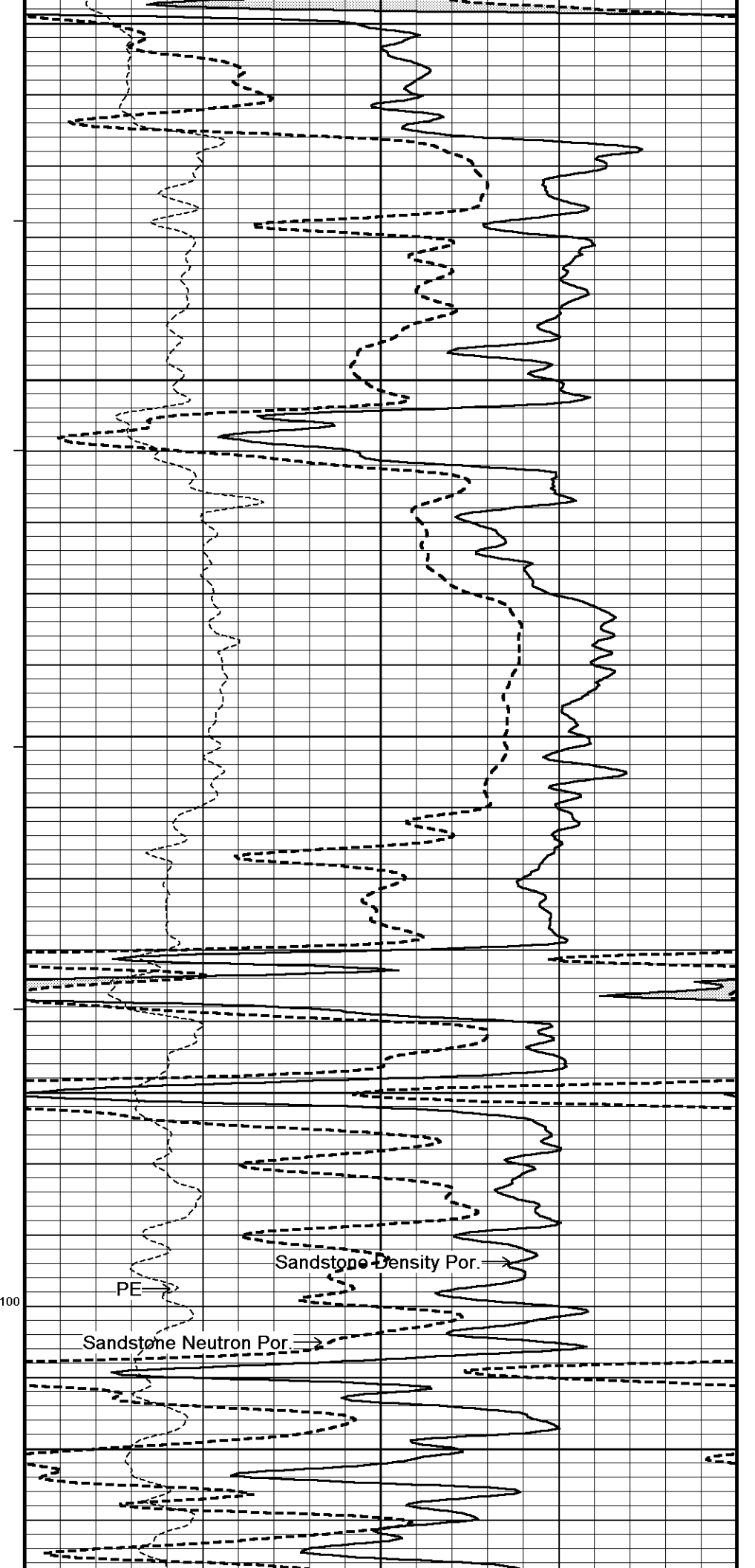
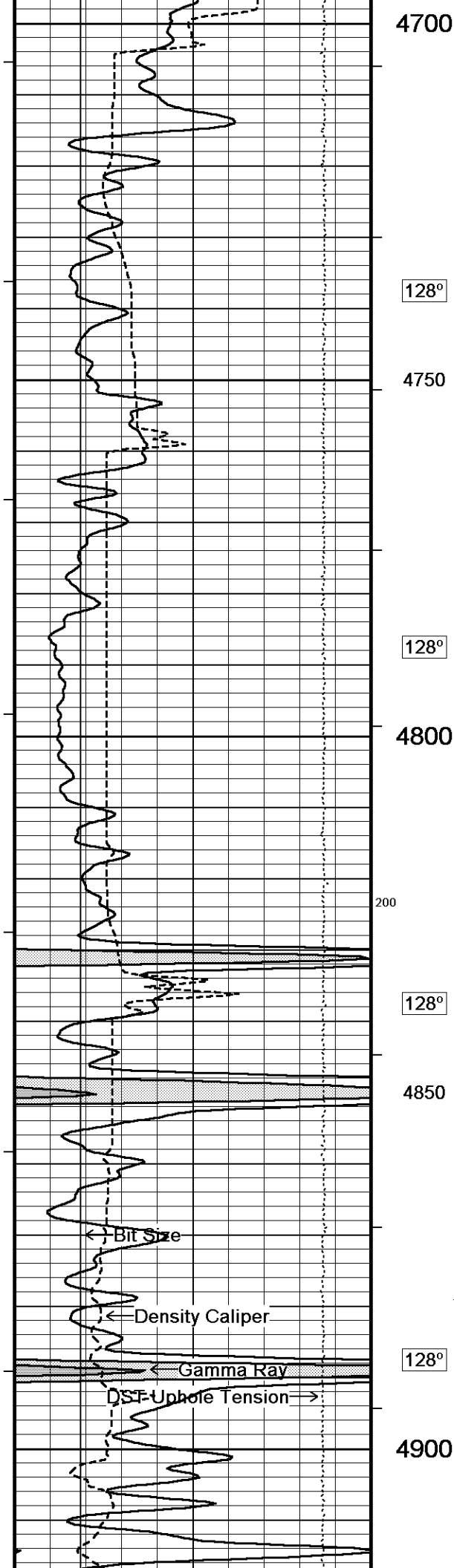
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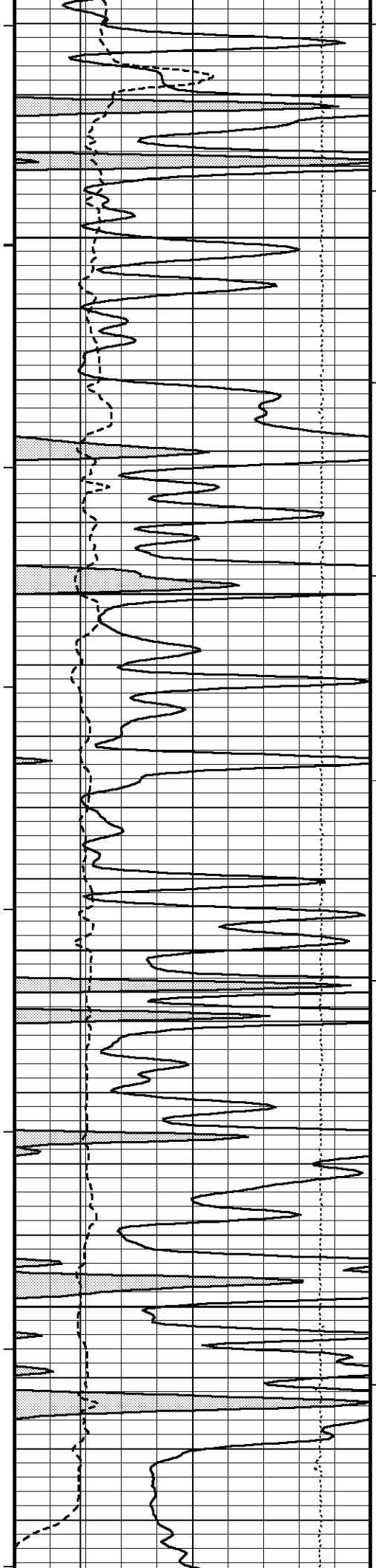












129°

4950

129°

5000

130°

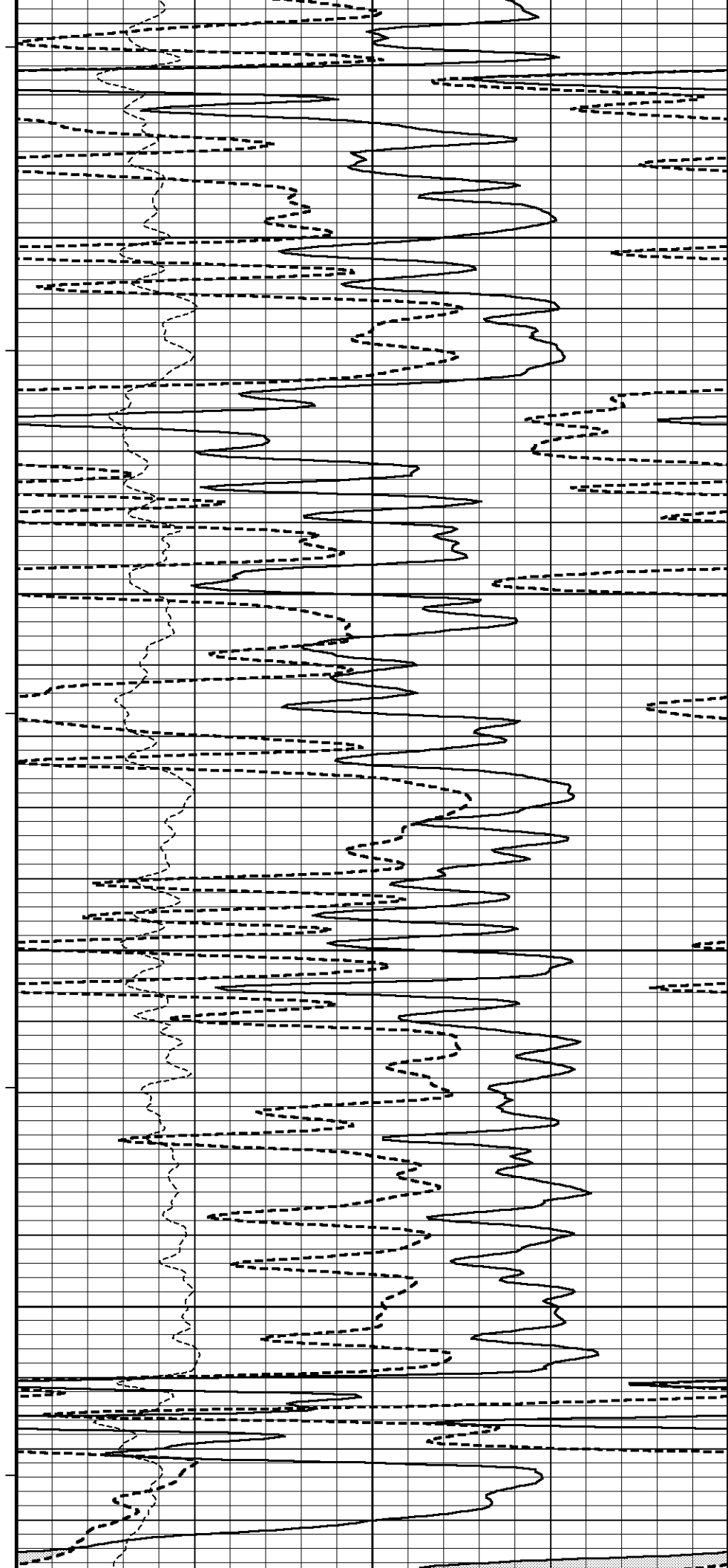
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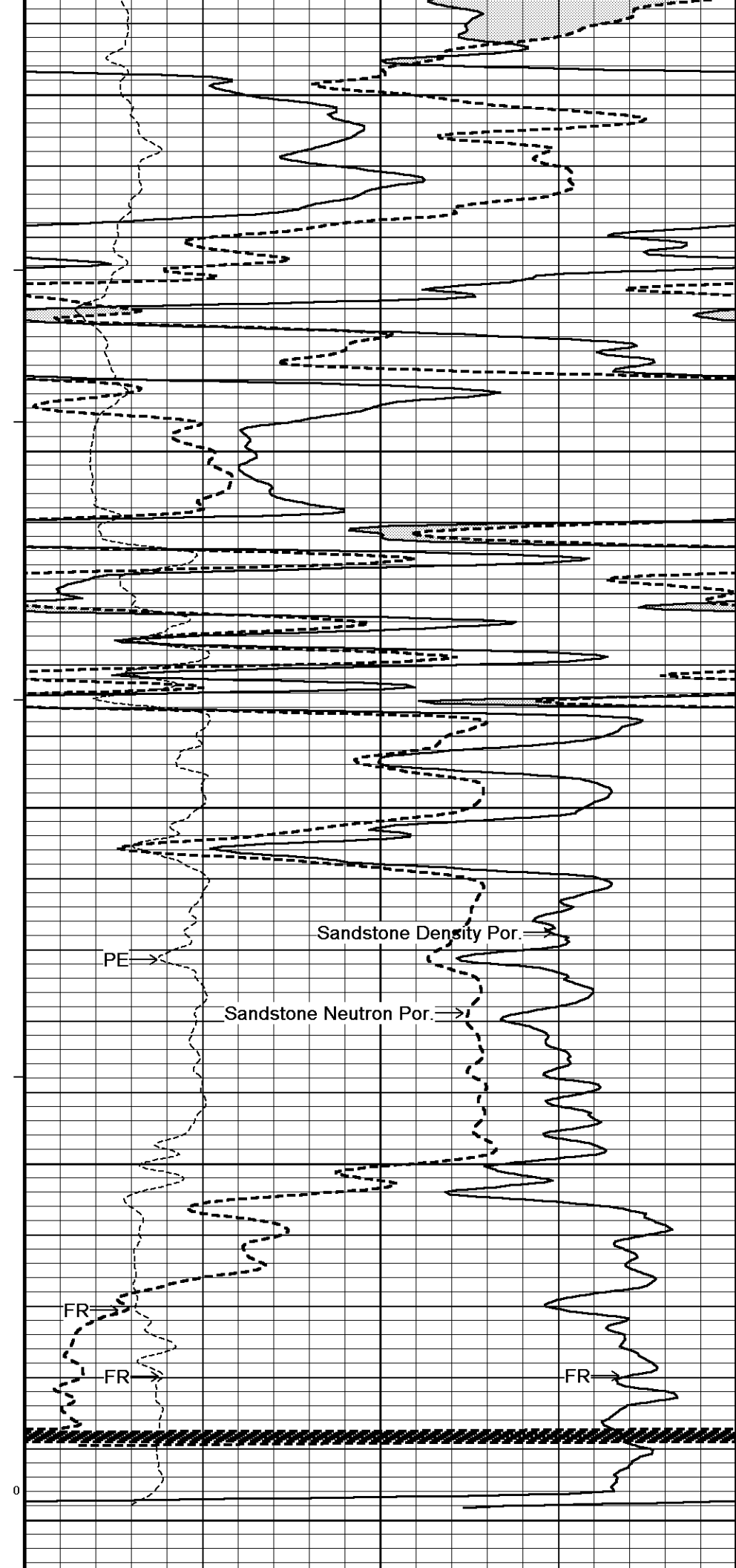
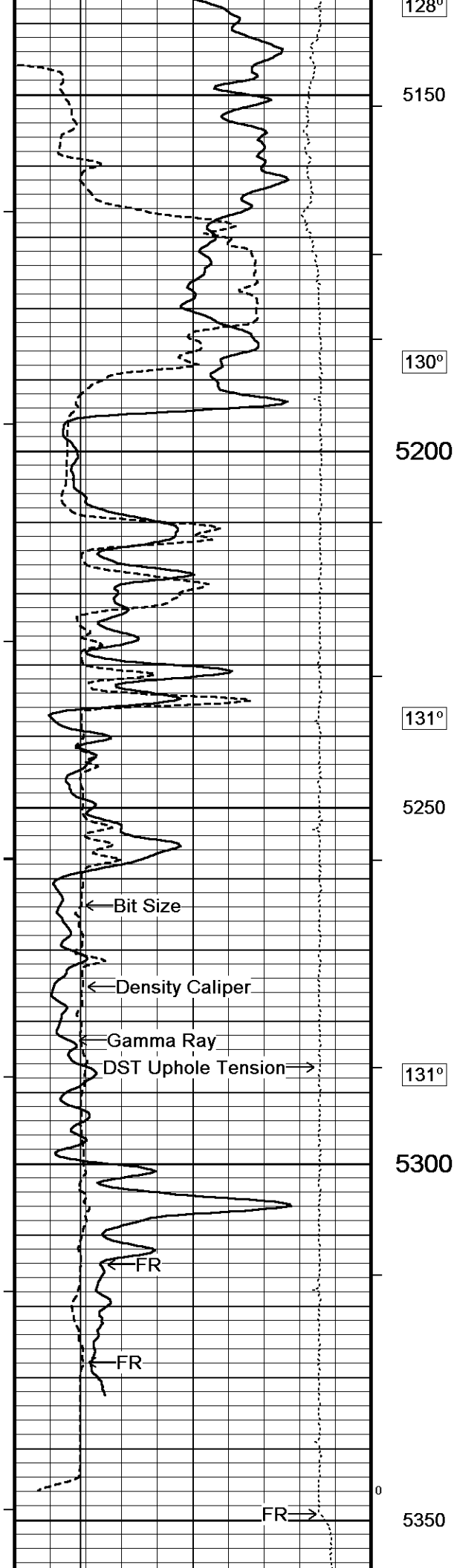
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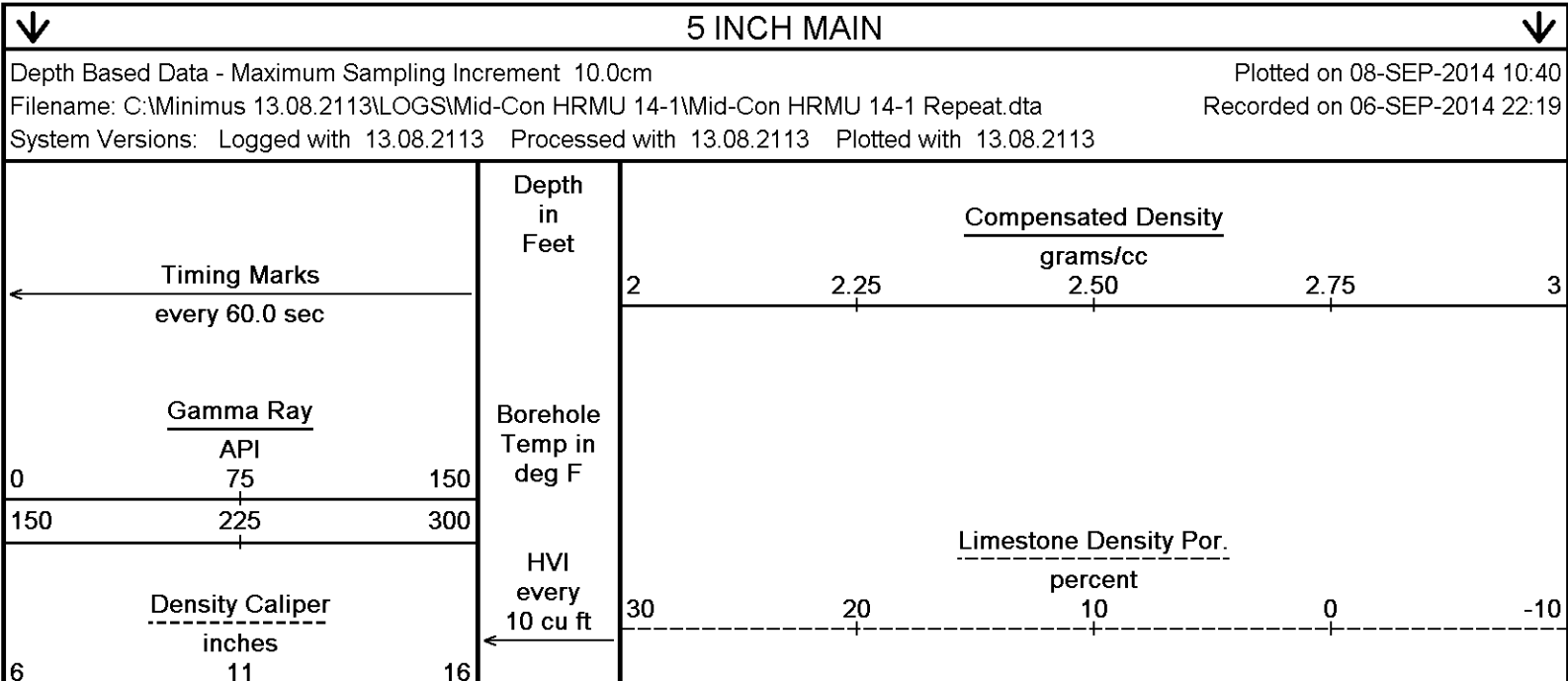
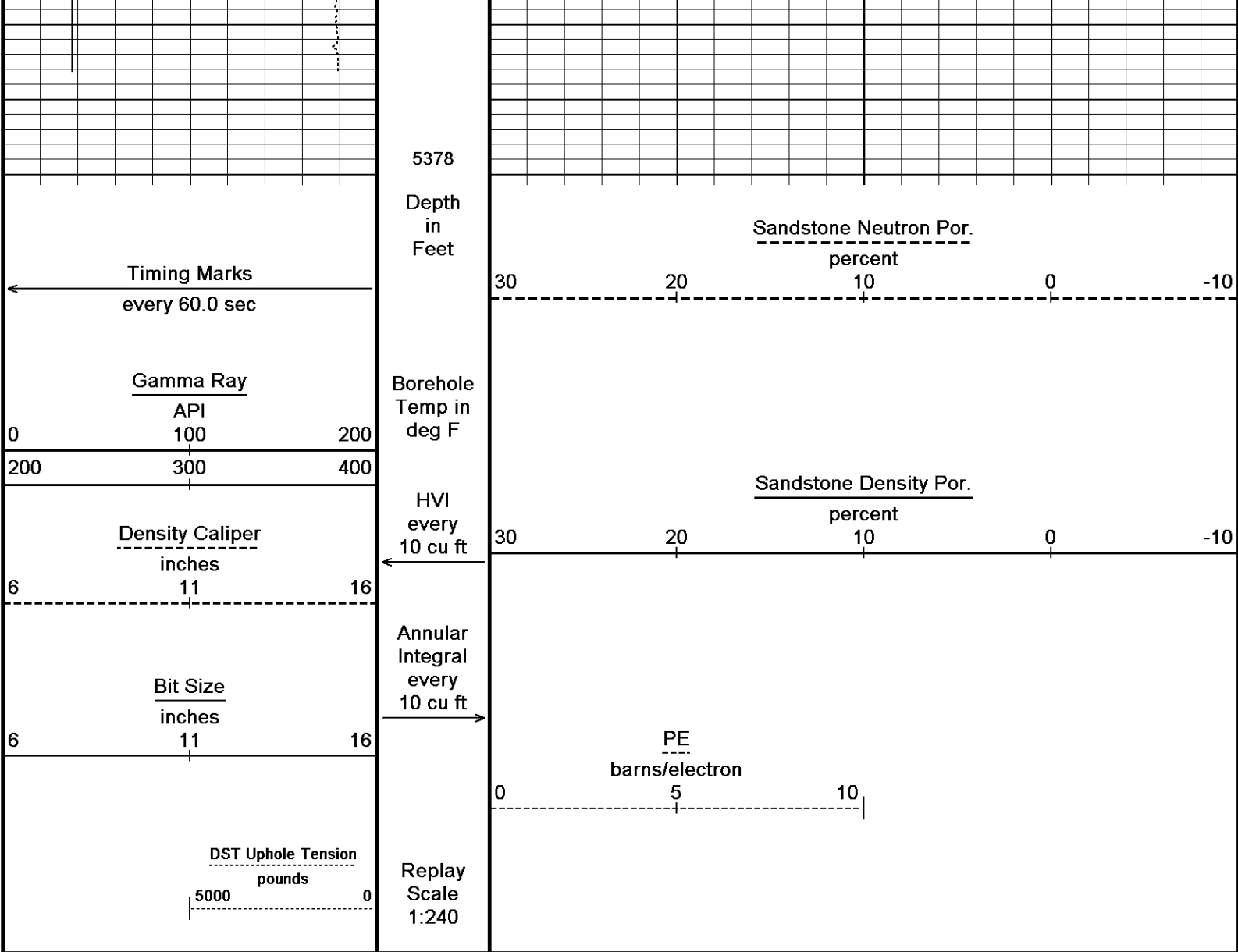
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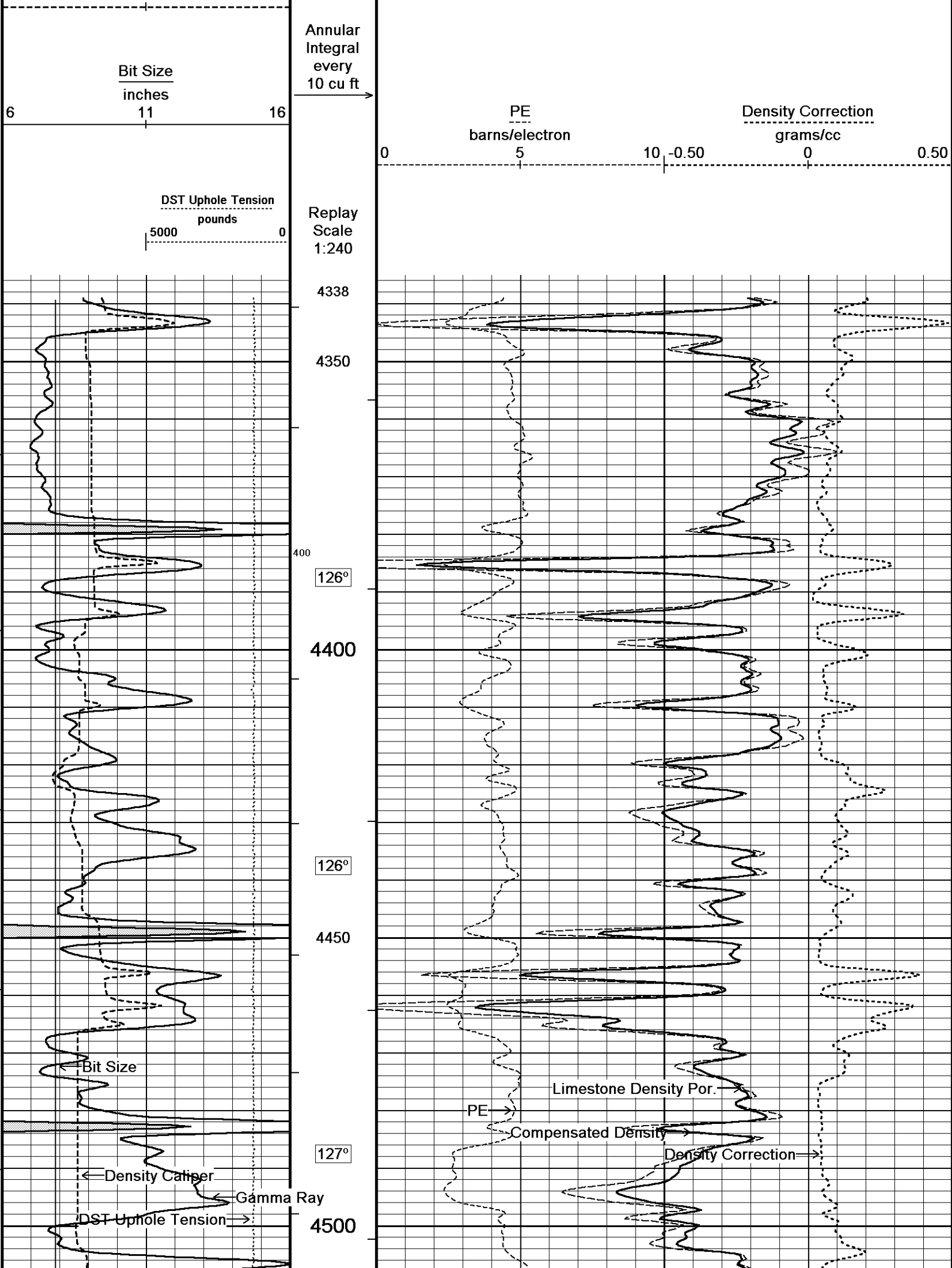
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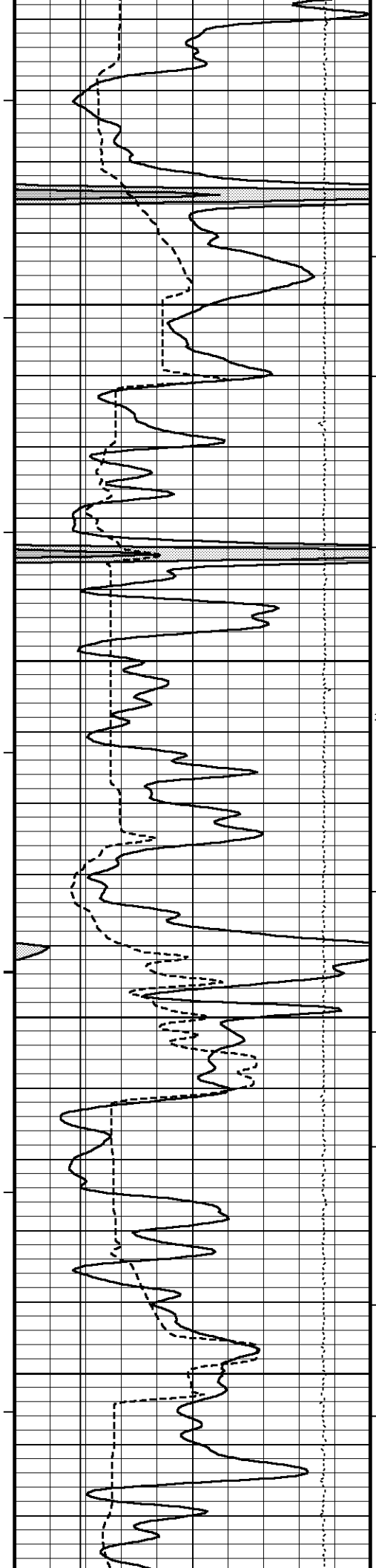
129°











127°

200

4550

127°

4600

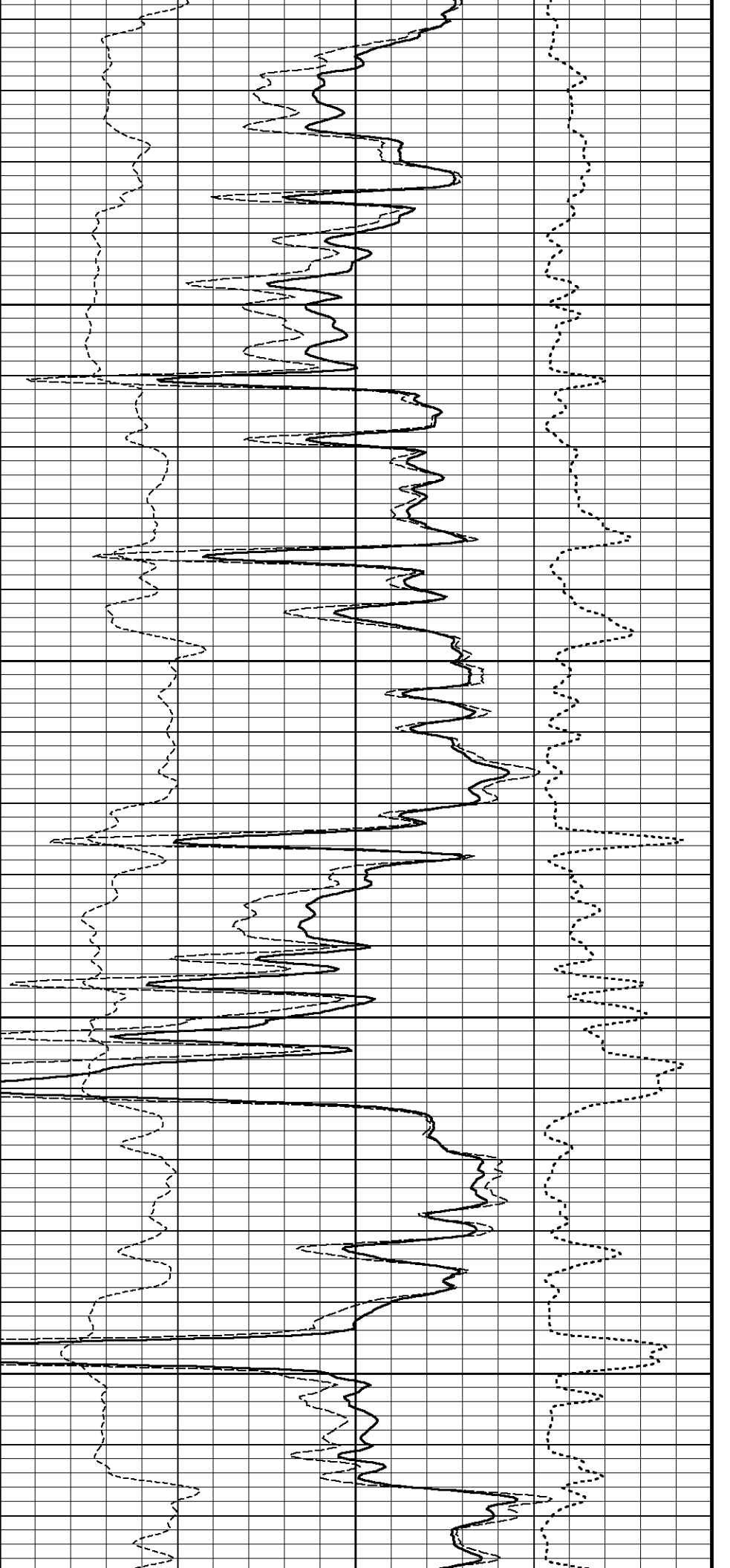
300

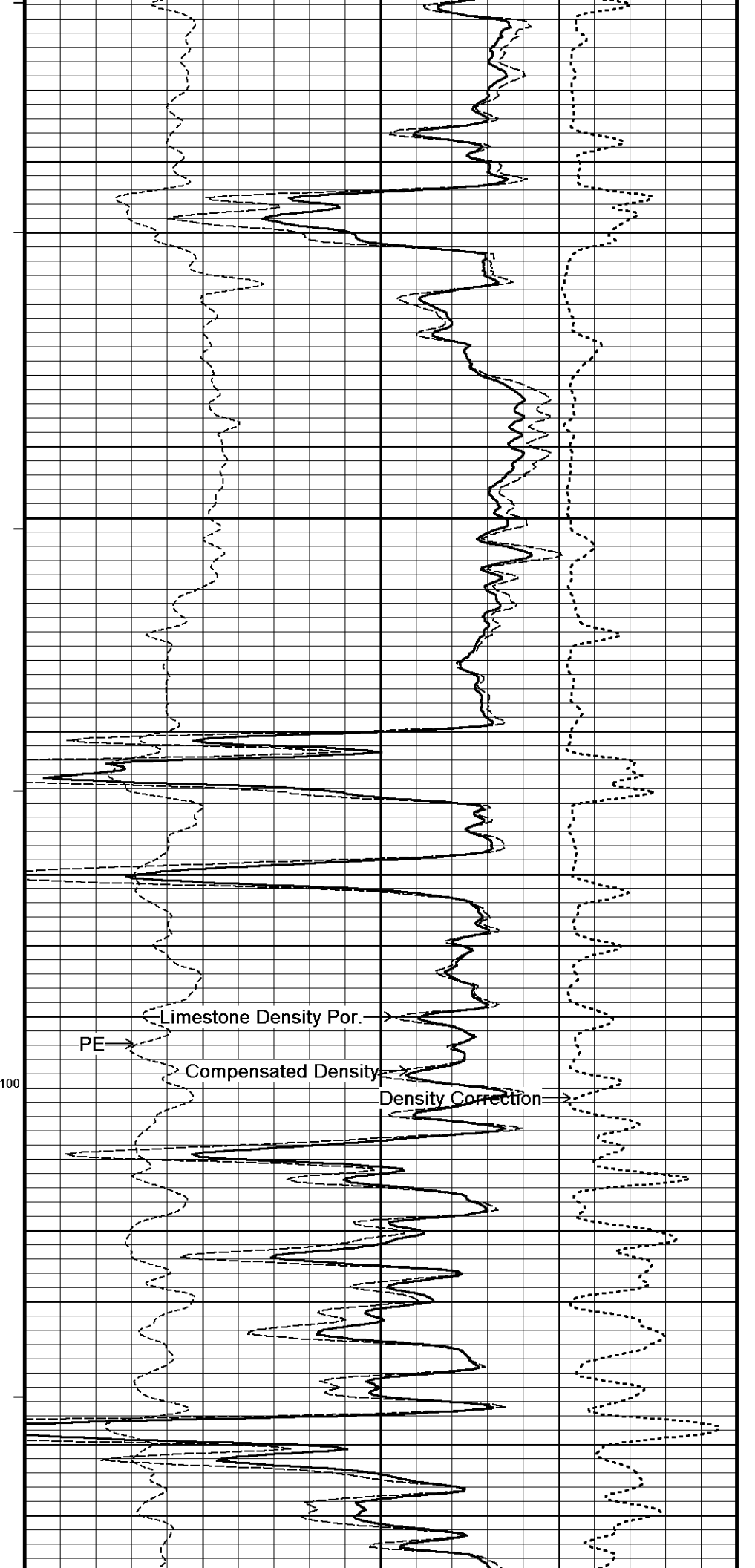
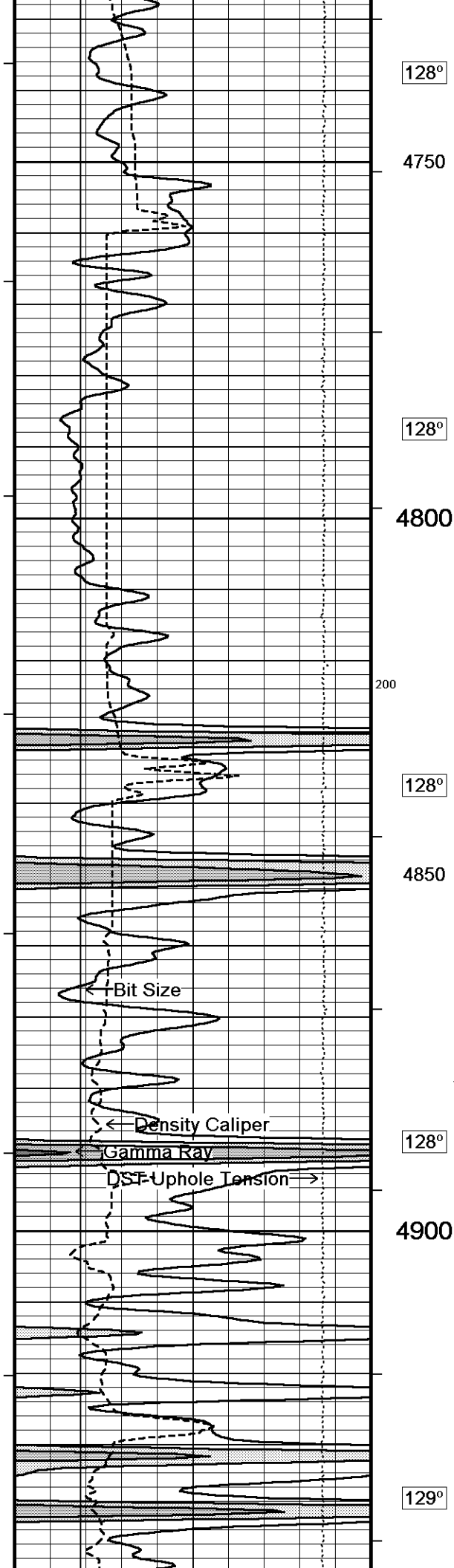
127°

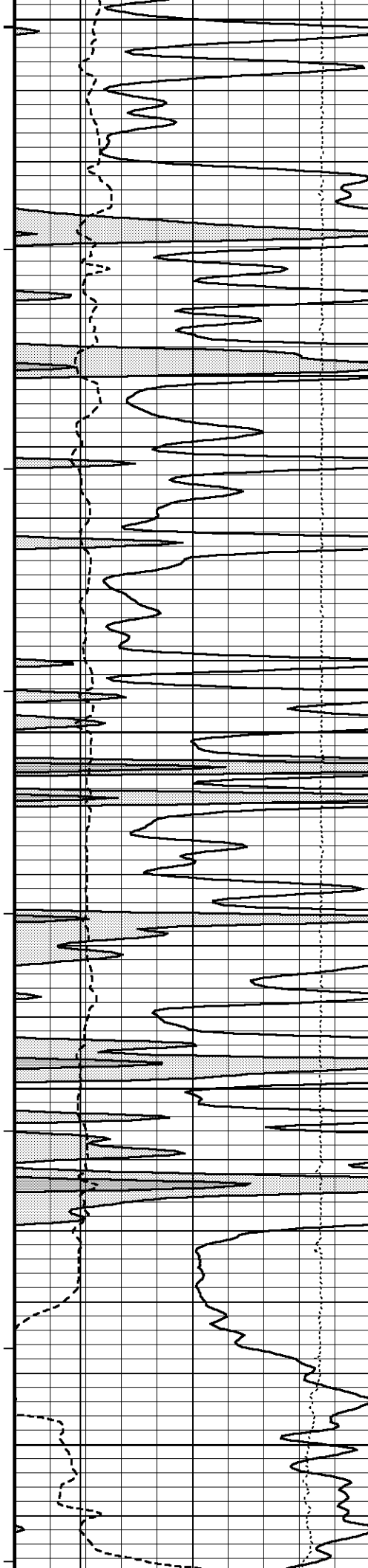
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127°

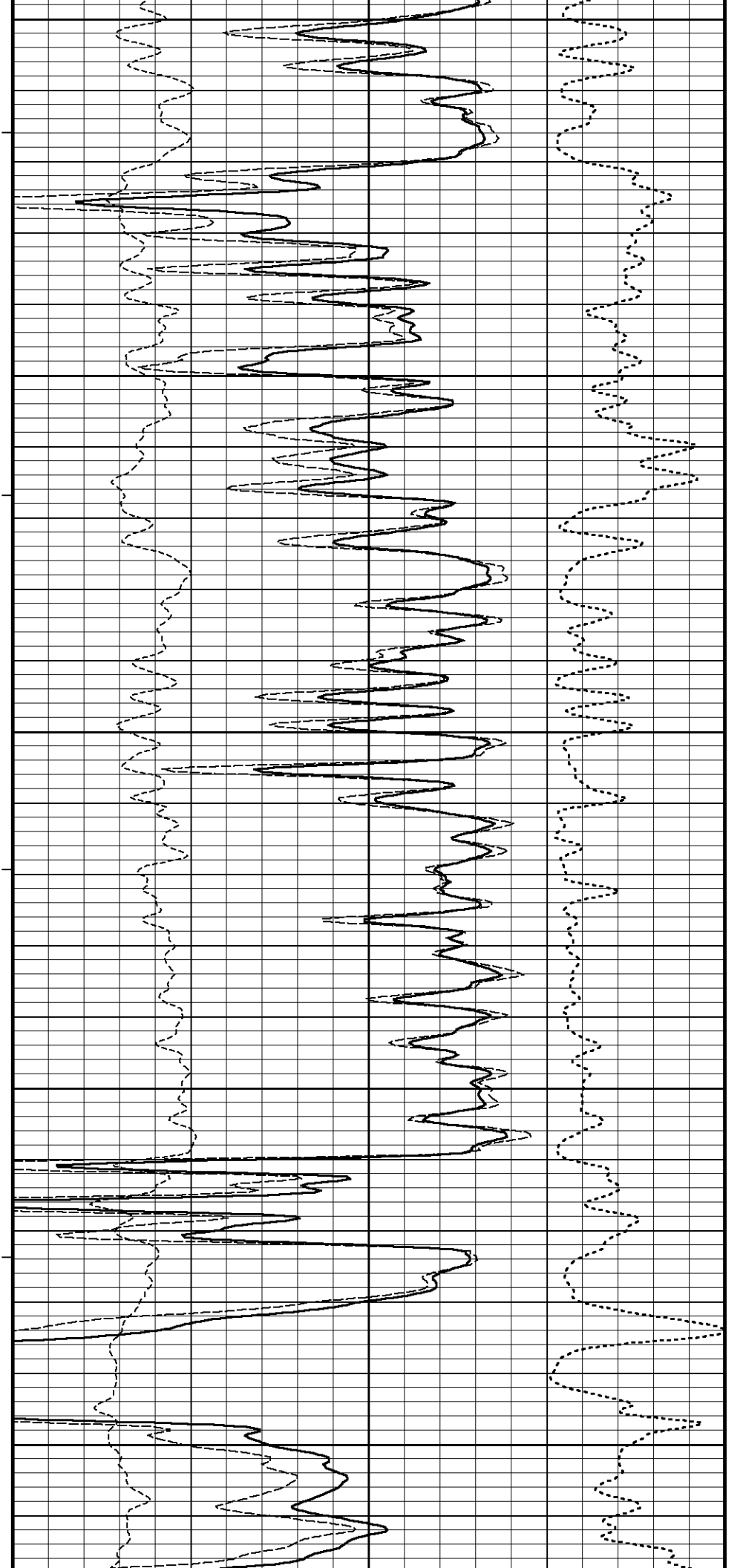
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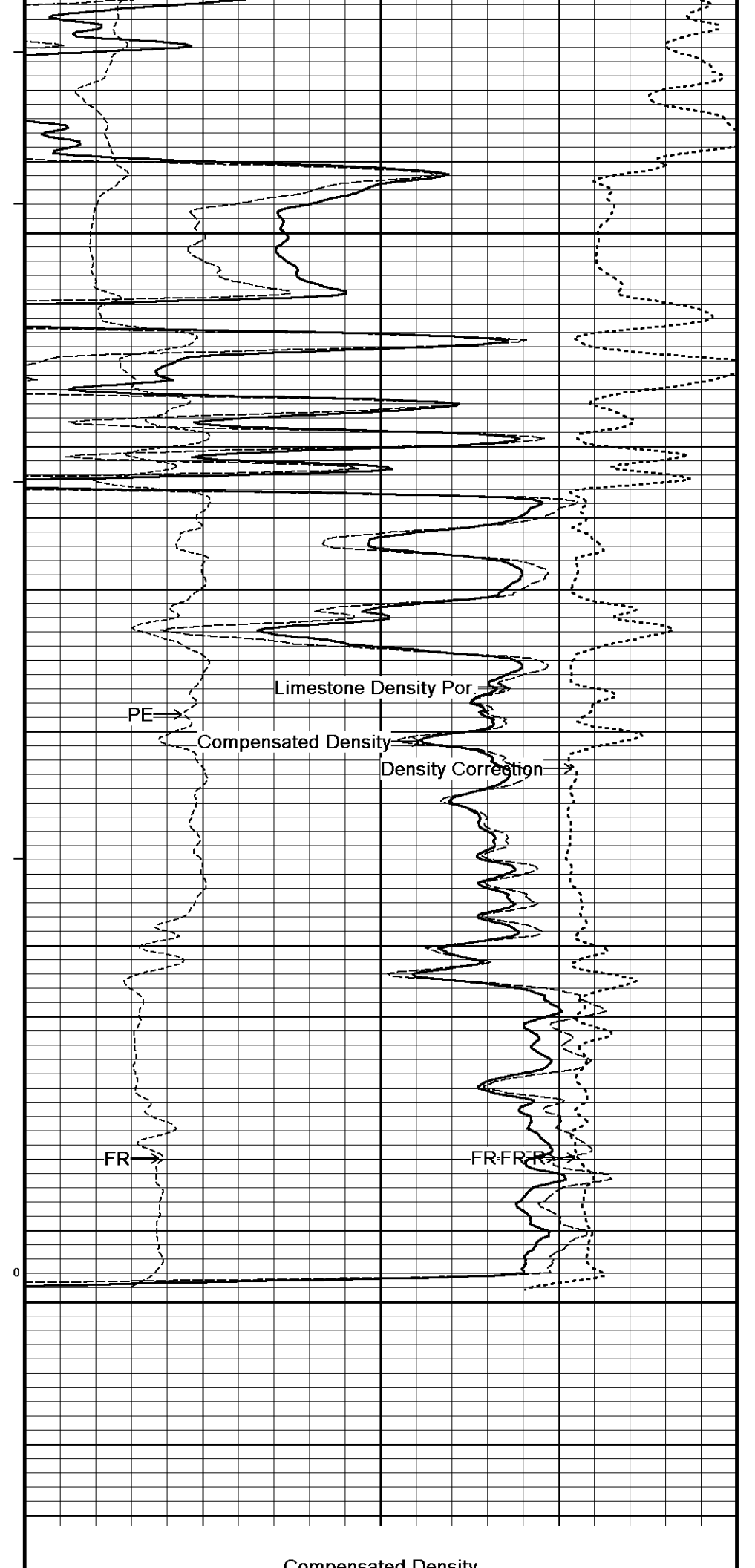
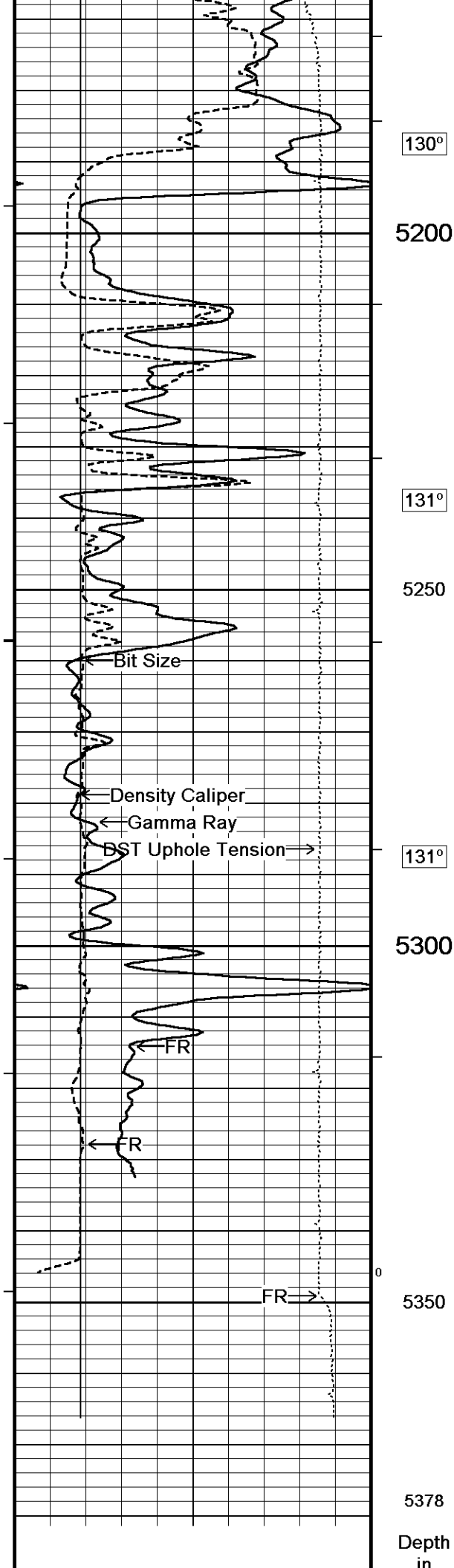


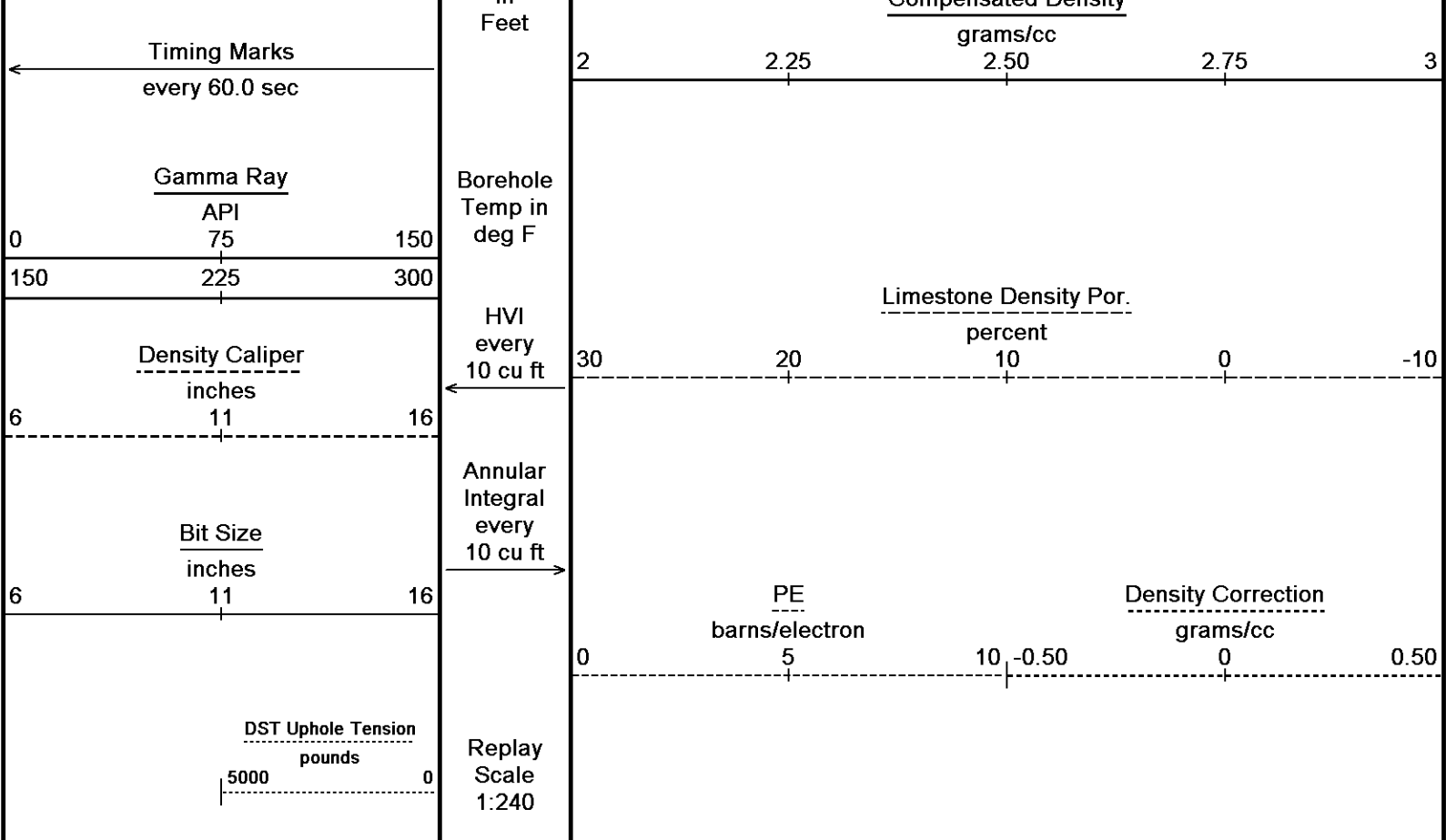




4950
129°
5000
130°
5050
100
129°
5100
128°
5150







Depth Based Data - Maximum Sampling Increment 10.0cm
 Plotted on 08-SEP-2014 10:40
 Filename: C:\Minimus 13.08.2113\LOGS\Mid-Con HRMU 14-1\Mid-Con HRMU 14-1 Repeat.dta
 Recorded on 06-SEP-2014 22:19
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↑ 5 INCH MAIN ↑

BEFORE SURVEY CALIBRATION			
C:\Minimus 13.08.2113\LOGS\Mid-Con HRMU 14-1\Mid-Con HRMU 14-1 Repeat.dta			
General Constants All 000			Last Edited on 06-SEP-2014,20:43
General Parameters			
Mud Resistivity	1.510	ohm-metres	
Mud Resistivity Temperature	96.000	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		
Down-hole Tension Calibration SMS 0			Field Calibration on 06-SEP-2014 21:23
Reading No	Measured	Calibrated (lbs)	
1	15737.84	0.00	
2	16034.73	326.30	
SP Calibration MCG-C 208			Field Calibration on 05-SEP-2014 13:40

Reference 1	Measured	Calibrated (mV)	
Reference 2	99.8	98.7	
	-97.8	-98.9	
High Resolution Temperature Calibration MCG-C 208			Field Calibration on 23-JAN-2014,17:11
	Measured	Calibrated(Deg F)	
Lower	50.00	50.00	
Upper	75.00	75.00	
High Resolution Temperature Constants MCG-C 208			Last Edited on 23-JAN-2014,17:11
Pre-filter Length	11		
Gamma Calibration MCG-C 208			Field Calibration on 05-SEP-2014 13:53
	Measured	Calibrated (API)	
Background	66	45	
Calibrator (Gross)	1122	770	
Calibrator (Net)	1056	725	
Gamma Constants MCG-C 208			Last Edited on 06-SEP-2014,20:43
Gamma Calibrator Number	GRC038		
Mud Density	1.02	gm/cc	
Caliper Source for Processing	Density Caliper		
Tool Position	Eccentred		
Concentration of KCl		kppm	
K Mud Type	Chloride		
K Mud Concentration	0.00	%	
Neutron Calibration MDN-B.J 387			Base Calibration on 31-JUL-2014 11:36 Field Check on 05-SEP-2014 13:58
Base Calibration			
	Measured	Calibrated (cps)	
	Near Far	Near Far	
	2985 92	3714 110	
Ratio	32.470	33.764	
Field Calibrator at Base			
		Calibrated (cps)	
		1675 2460	
Ratio		0.681	
Field Check			
		Calibrated (cps)	
		1683 2443	
Ratio		0.689	
Neutron Constants MDN-B.J 387			Last Edited on 06-SEP-2014,20:42
Neutron Source Id	P58125B		
Neutron Jig Number	5824NE		
Epithermal Neutron			
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	None		
Formation Pressure	N/A	kpsi	
Temperature Source	Constant Value		
Temperature	68.00	degrees F	
Mud Salinity	0.00	kppm	
Salinity Correction	Not Applied		
Formation Fluid Salinity Source	None		
Formation Fluid Salinity	N/A	kppm	
Barite Mud Correction	Not Applied		
FE Calibration MFE-A.A 55			Base Calibration on 05-SEP-2014 14:08 Field Check on 05-SEP-2014 14:12
Base Calibration			
	Measured	Calibrated (ohm-m)	
Reference 1	0.0	0.0	

Reference 2	951.0	126.8
Base Check		281.6
Field Check		281.6

FE Constants MFE-A.A 55		Last Edited on 06-SEP-2014,20:42	
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 5				Base Calibration on 21-JAN-2014,09:50	
				Field Check on 05-SEP-2014 13:23	
Base Calibration					
Test Loop Calibration		Measured		Calibrated (mmho/m)	
Channel	Low	High	Low	High	
1	16.3	470.8	9.3	966.2	
2	5.6	376.1	7.6	821.4	
3	2.6	266.1	5.2	566.0	
4	1.6	130.0	2.6	279.2	
Array Temperature		71.1	Deg F		
Channel	Base Check (mmho/m)		Field Check (mmho/m)		
	Low	High	Low	High	
1	0.0	0.0	15.2	3862.7	
2	0.0	0.0	31.8	3591.0	
3	0.0	0.0	29.8	2971.7	
4	0.0	0.0	20.8	2126.4	
Deep			18.5	1912.4	
Medium			43.1	3861.6	
Shallow			47.4	5372.8	
Array Temperature		0.0	73.9	Deg F	

Induction Constants MAI-A.A 5		Last Edited on 06-SEP-2014,20:42	
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 5		
	Measured	Calibrated(Deg F)
Lower	50.00	50.00
Upper	75.00	75.00
High Resolution Temperature Constants MAI-A.A 5		
Pre-filter Length	11	
Caliper Calibration MPD-D.A 481		
Base Calibration		Base Calibration on 23-AUG-2014 13:39
Field Calibration		Field Calibration on 05-SEP-2014 13:28
Reading No	Measured	Calibrator Size (in)
1	17257	3.99
2	27352	5.98
3	37398	7.97
4	47224	9.86
5	58327	11.92
6	N/A	N/A
Field Calibration		
	Measured Caliper (in)	Actual Caliper (in)
	7.95	7.97
Photo Density Calibration MPD-D.A 481		
Density Calibration		Base Calibration on 23-AUG-2014 14:06
Base Calibration		Field Check on 05-SEP-2014 13:32
	Measured	Calibrated (sdu)
	Near	Far
Background	1216	1426
Reference 1	55706	26385
Reference 2	22306	2607
Field Check at Base		
	1215.9	1425.6
Field Check		
	1213.8	1423.6
PE Calibration		
Base Calibration		Calibrated
	Measured	Ratio
	WS	WH
Background	232	1087
Reference 1	24125	55503
Reference 2	6847	22166
Field Check at Base		
	232.2	1087.0
Field Check		
	230.3	1084.6
Density Constants MPD-D.A 481		
Last Edited on 06-SEP-2014,20:42		
Density Source Id	P50557B	
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	1.02	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	
0.00	0.00	

DOWNHOLE EQUIPMENT

C:\Minimus 13.08.2113\LOGS\Mid-Con HRMU 14-1\Mid-Con HRMU 14-1 Repeat.dta

CBH-C, Cablehead, 11 pin
CBH-C 265 LG: 2.40 ft WT: 24.3 lb OD: 2.240 in

Compact Comms Gamma
MCG-C 208 LG: 8.70 ft WT: 63.9 lb OD: 2.240 in

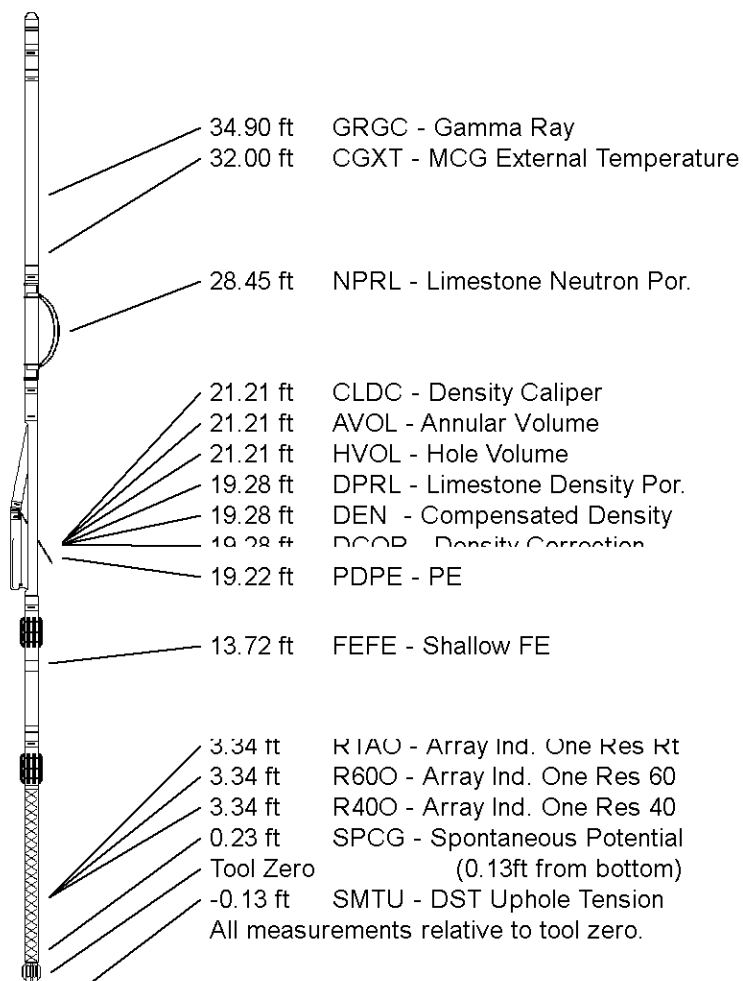
Compact Neutron
MDN-B.J 387 LG: 5.04 ft WT: 50.7 lb OD: 2.244 in

Compact Density/Caliper
MPD-D.A 481 LG: 9.59 ft WT: 90.4 lb OD: 2.449 in

Compact Focussed Electric
MFE-A.A 55 LG: 6.05 ft WT: 48.5 lb OD: 2.244 in

Compact Induction
MAI-A.A 5 LG: 10.81 ft WT: 48.5 lb OD: 2.244 in

Total Length: 42.59 ft Weight: 326.3 lb



COMPANY	MID-CON ENERGY OPERATING, INC.
WELL	HRMU 14-1
FIELD	HARKER RANCH MORROW UNIT
PROVINCE/COUNTY	CHEYENNE
COUNTRY/STATE	U.S.A. / COLORADO

Elevation Kelly Bushing	4045.19	feet	First Reading	5329.91	feet
Elevation Drill Floor	4043.19	feet	Depth Driller	5350.00	feet
Elevation Ground Level	4028.59	feet	Depth Logger	5349.00	feet



COMPACT PHOTO DENSITY

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COMPENSATED NEUTRON