HALLIBURTON

SPECTRAL DENSITY DUAL SPACED NEUTRON LOG

COMPANY **OXY USA INC.**

WELL **DRUSSEL E-3**

FIELD/BLOCK **HUGOTON GAS AREA**

COUNTY **FINNEY** STATE **KANSAS**

COMPANY	OXY USA INC.
WELL	DRUSSEL E-3
FIELD/BLOCK	HUGOTON GAS AREA
COUNTY	FINNEY
STATE	KANSAS

API No. 15055222390000

Location (SHL) 1924' FSL & 985' FWL
NW SE NW SW

Sect. 36 Twp. 25S Rge. 33W

Other Services:
MICROLOG
ACRT
BSAT

Permanent Datum	GL	Elev. 2904.0 ft	Elev.: K.B. 2915.0 ft
Log measured from	KB	, 11.0 ft above perm. Datum	D.F. 2914.0 ft
Drilling measured from	KB		G.L. 2904.0 ft

Date		01-Oct-13					
Run No.		ONE					
Depth - Driller		5295.00 ft					
Depth - Logger		5292.0 ft					
Bottom - Logged Interval		5248.0 ft					
Top - Logged Interval		3800.0 ft					
Casing - Driller		8.625 in @ 1648.0 ft		@		@	
Casing - Logger		1646.0 ft					
Bit Size		7.875 in		@		@	
Type Fluid in Hole		WATER BASED MUD					
Density	Viscosity	9.6 ppg	34.00 s/qt				
PH	Fluid Loss	9.30 pH	9.2 cptm				
Source of Sample		MUD PIT					
Rm @ Meas. Temperature		1.050 ohmm @ 75.00 degF		@		@	
Rmf @ Meas. Temperature		0.90 ohmm @ 75.00 degF		@		@	
Rmc @ Meas. Temperature		1.400 ohmm @ 75.00 degF		@		@	
Source Rmf	Rmc	MEASURED	MEASURED				
Rm @ BHT		0.57 ohmm @ 144.0 degF		@		@	
Time Since Circulation		5.0 hr					
Time on Bottom		01-Oct-13 22:12					
Max. Rec. Temperature		144.0 degF @ 5292.0 ft		@		@	
Equipment	Location	11230668	LIBERAL				
Recorded By		J. BOLLOM					
Witnessed By		J. LEWTON					

Fold here

PGM Version: WL INSITE R3.8.4 (Build 5)

Service Ticket No.: 900785360 API Serial No.: 15055222390000

CHANGE IN MUD TYPE OR ADDITIONAL SAMPLE

RESISTIVITY SCALE CHANGES

Date	Sample No.			Type Log	Depth	Scale Up Hole	Scale Down Hole	
Depth-Driller								
Type Fluid in Hole								
Density	Viscosity							
Ph	Fluid Loss							
Source of Sample								
Rm @ Meas. Temp		@	@					
Rmf @ Meas. Temp.		@	@					
Rmc @ Meas. Temp.		@	@					
Source Rmf	Rmc							
Rm @ BHT		@	@					
Rmf @ BHT		@	@					
Rmc @ BHT		@	@					

RESISTIVITY EQUIPMENT DATA

		Run No.	Tool Type & No.	Pad Type	Tool Pos.	Other	
Source of Sample							
Rm @ Meas. Temp		@					
Rmf @ Meas. Temp.		@					
Rmc @ Meas. Temp.		@					
Source Rmf	Rmc						
Rm @ BHT		@					
Rmf @ BHT		@					
Rmc @ BHT		@					

EQUIPMENT DATA

GAMMA			ACOUSTIC					DENSITY				NEUTRON							
Run No.	ONE		Run No.					Run No.	ONE			Run No.	ONE						
Serial No.	10748374		Serial No.					Serial No.	10714945			Serial No.	10755066						
Model No.	GTET		Model No.					Model No.	SDLT-I			Model No.	DSNT-I						
Diameter	3.625"		No. of Cent.					Diameter	4.5"			Diameter	3.625"						
Detector Model No.	T-102		Spacing					Log Type	GAM-GAM			Log Type	NEU-NEU						
Type	SCINT							Source Type	CS137			Source Type	AM241						
Length	8'		LSA [Y/N]					Serial No.	5073GW			Serial No.	DSN-436						
Distance to Source	10'		FWDA [Y/N]					Strength	1.5 CI			Strength	15 CI						

LOGGING DATA

GENERAL			GAMMA		ACOUSTIC			DENSITY			NEUTRON		
Run	Depth		Speed	Scale		Scale		Matrix	Scale		Matrix	Scale		Matrix
No.	From	To	ft/min	L	R	L	R		L	R		L	R	
ONE	5292	3800	REC	0	150				30	-10	2.71	30	-10	LIME

DIRECTIONAL INFORMATION

Maximum Deviation @	KOP @

Remarks: ANNULAR HOLE VOLUME CALCULATED FOR 5.5-INCH CASING

CHLORIDES REPORTED AT 4,000 MG/L

LCM REPORTED AT 3 LB/BBL

GTET-DSNT-SDLT-BSAT-ACRT RUN IN COMBINATION

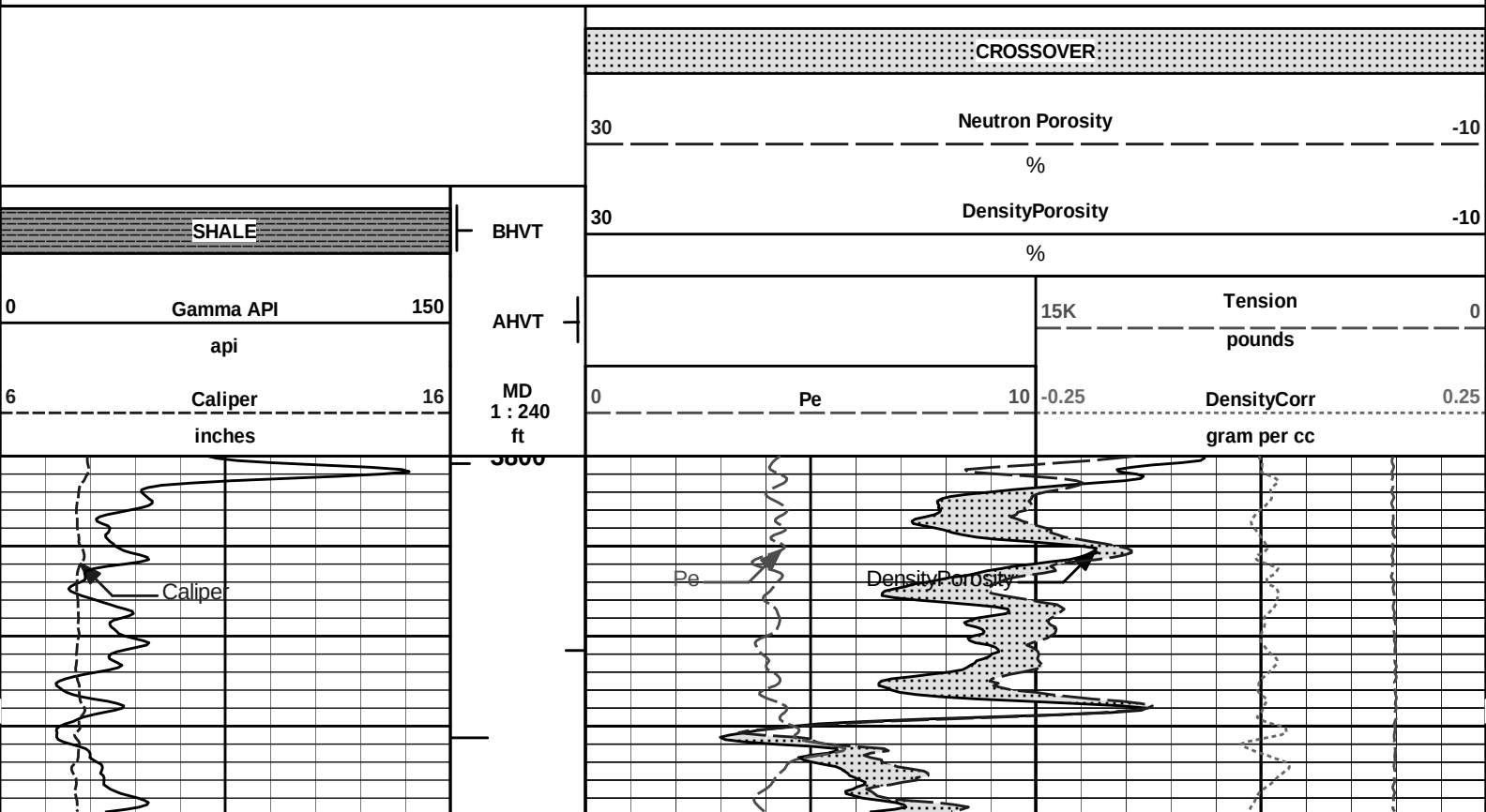
TODAY'S CREW: K. KING & V. JAIME

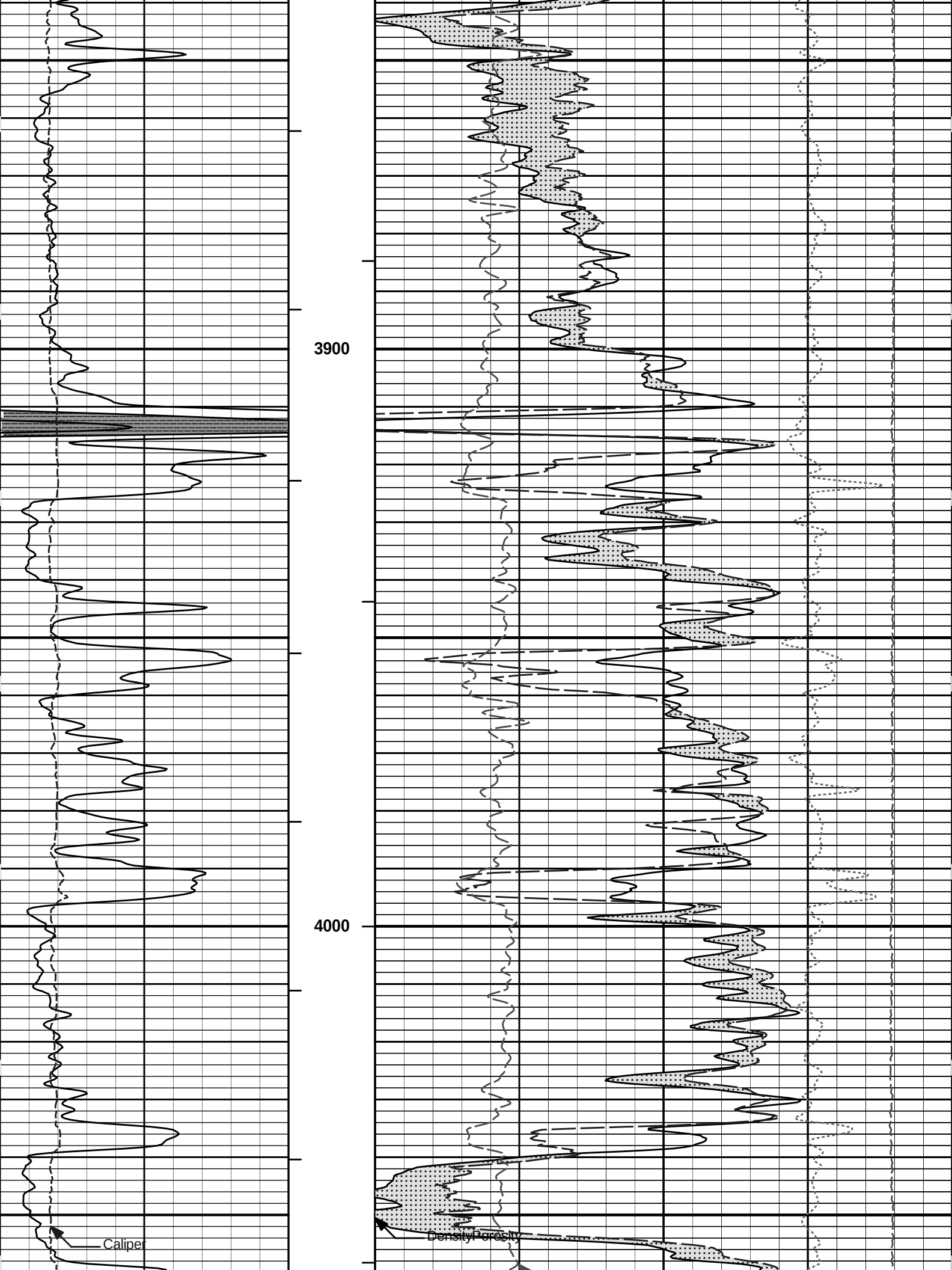
THANK YOU FOR CHOOSING HALLIBURTON ENERGY SERVICES LIBERAL, KS. 620-624-8123

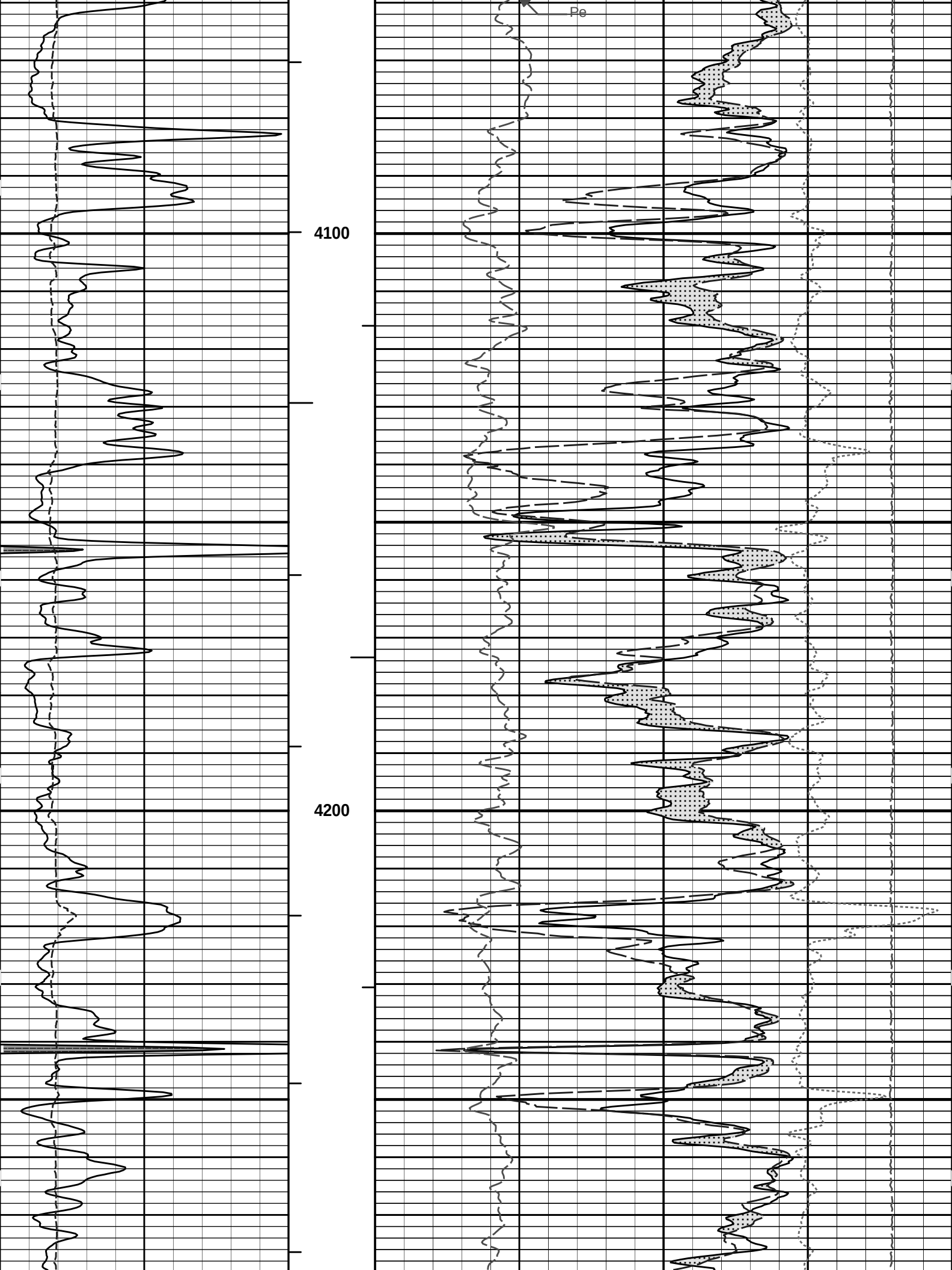
HALLIBURTON

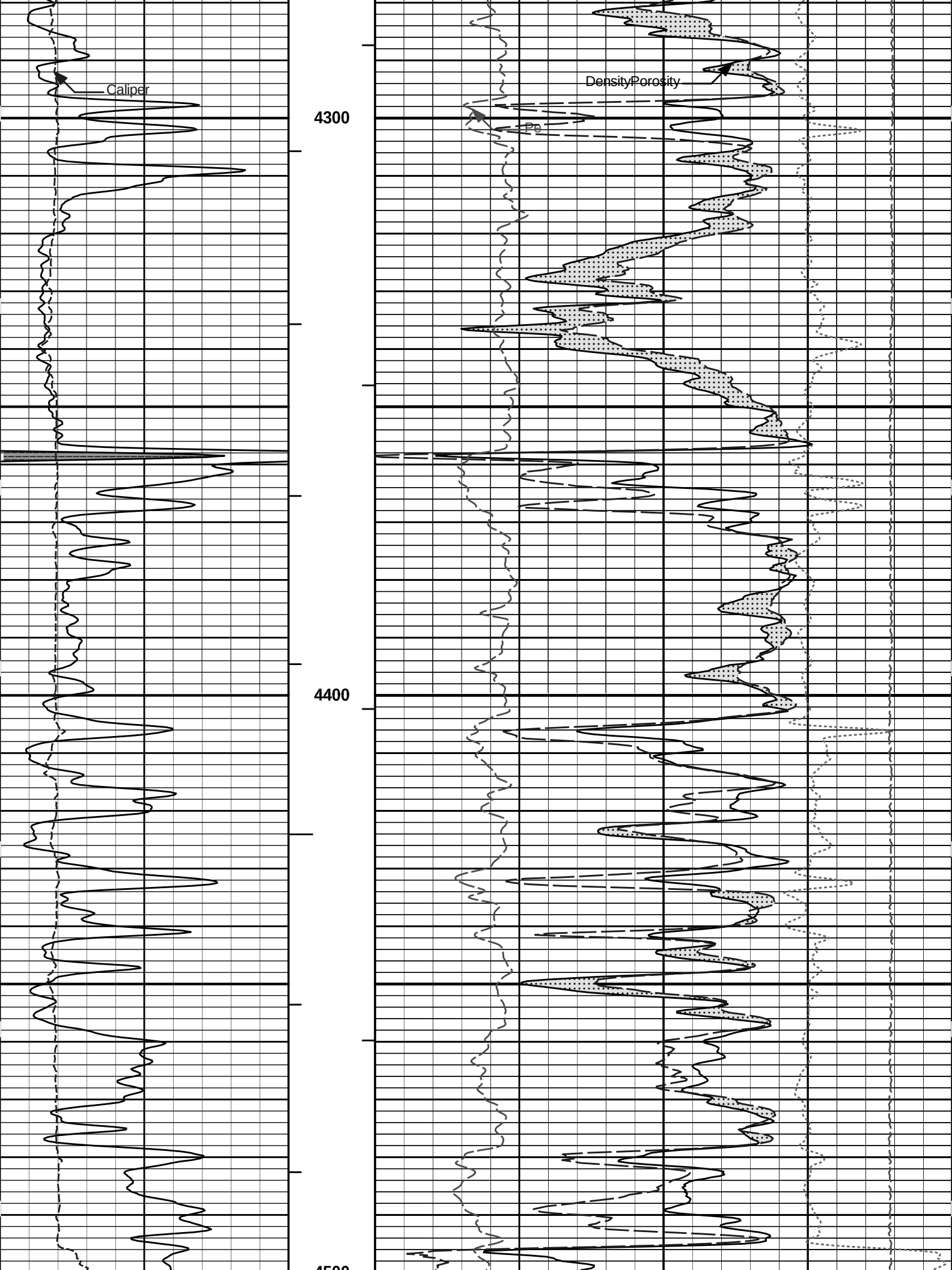
Plot Time: 02-Oct-13 00:32:14
Plot Range: 3800 ft to 5295.5 ft
Data: DRUSSEL_E-3\Well Based\DETAIL
Plot File: \\PORO\Poro_IQ_5_MAIN_LIB

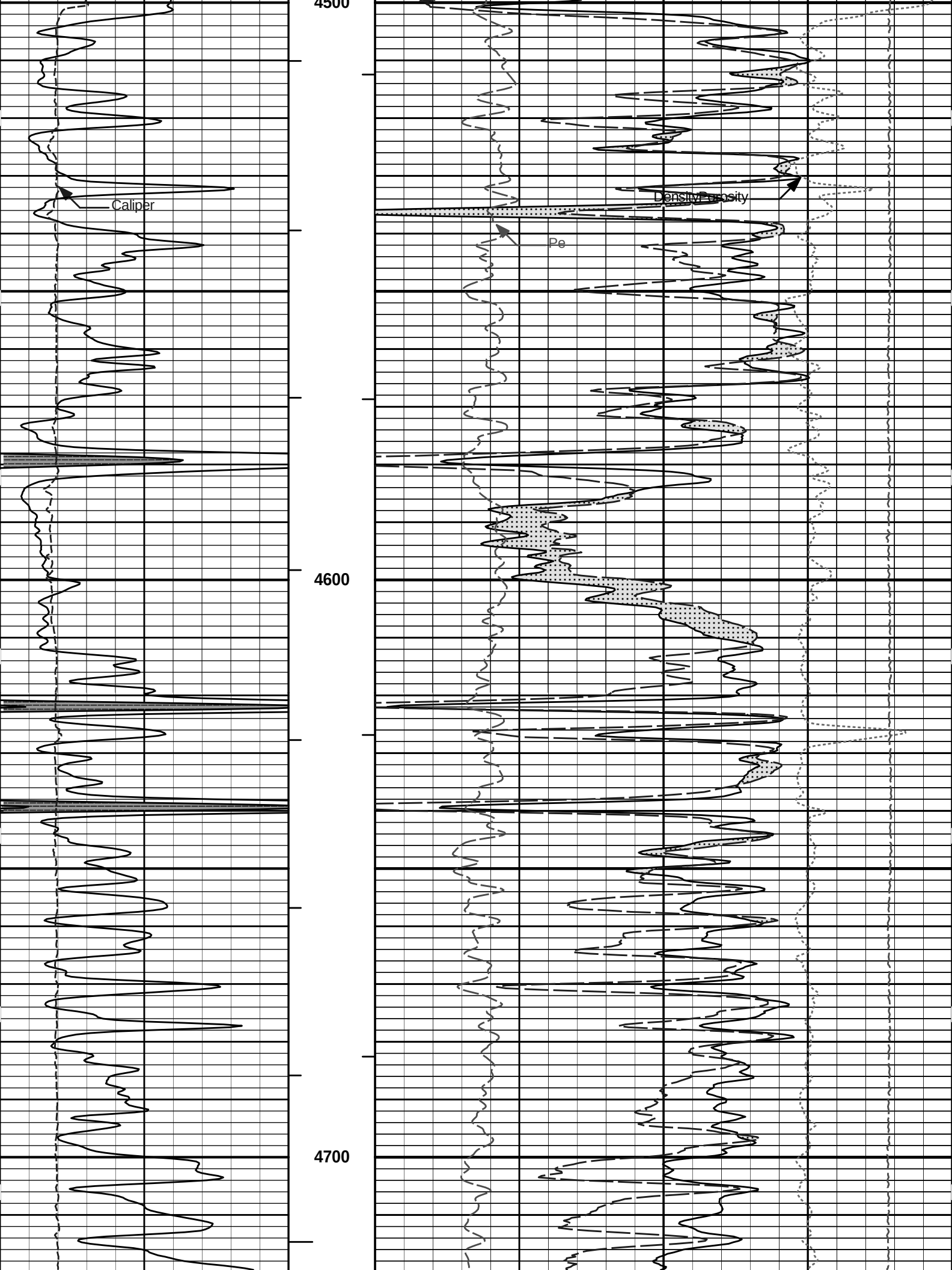
5 INCH MAIN LOG

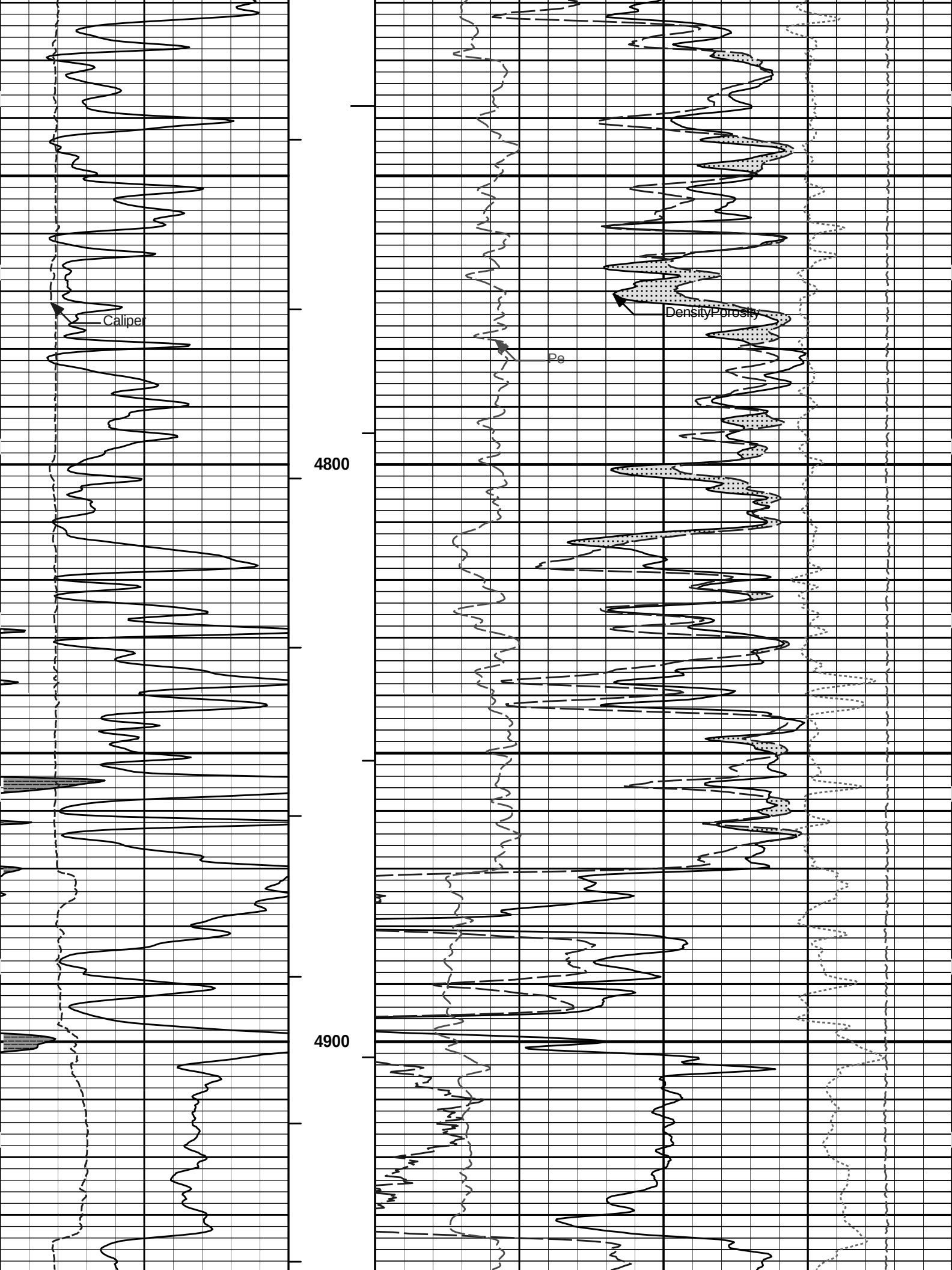


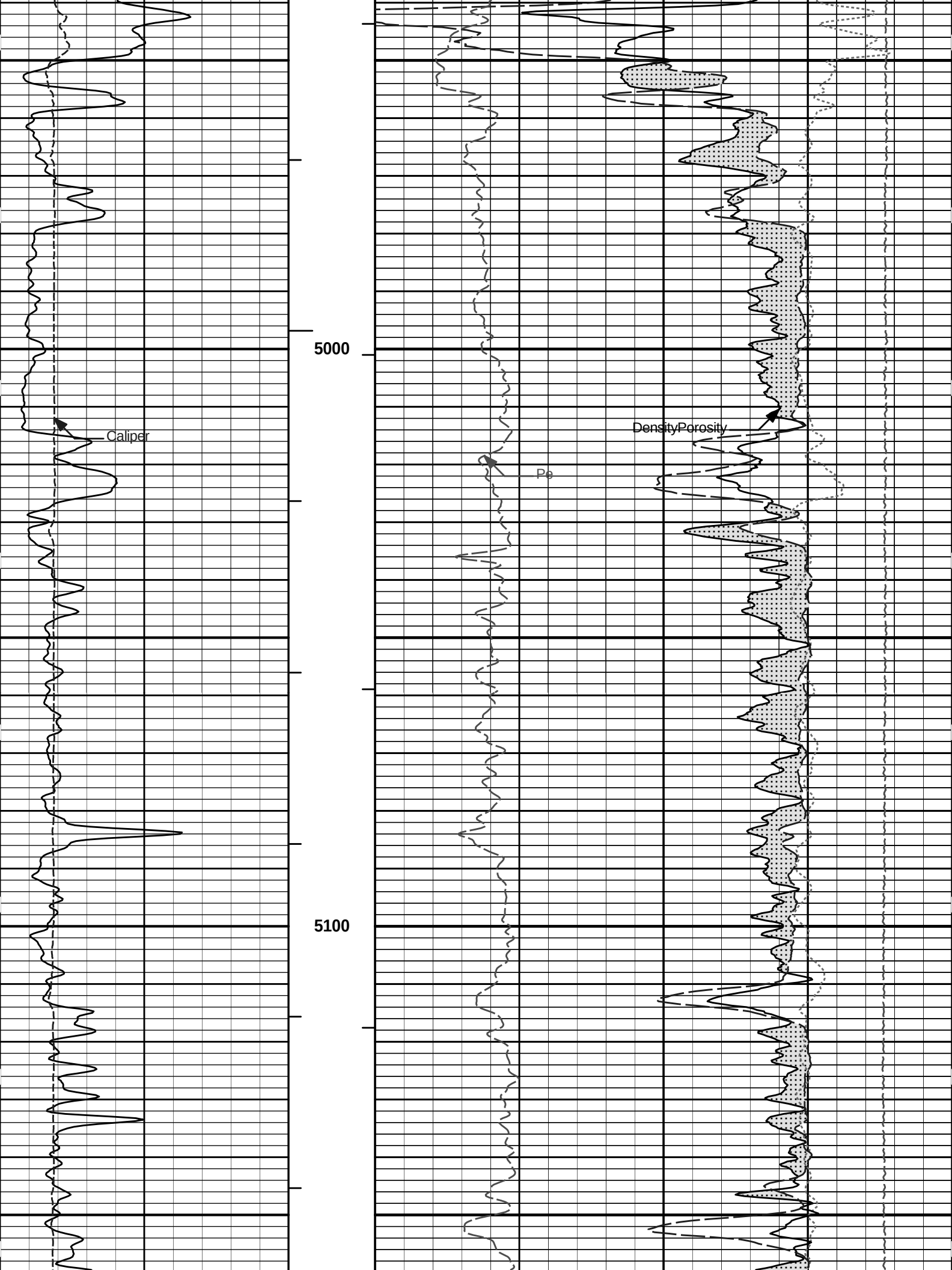

3900
4000
Caliper
Density Porosity

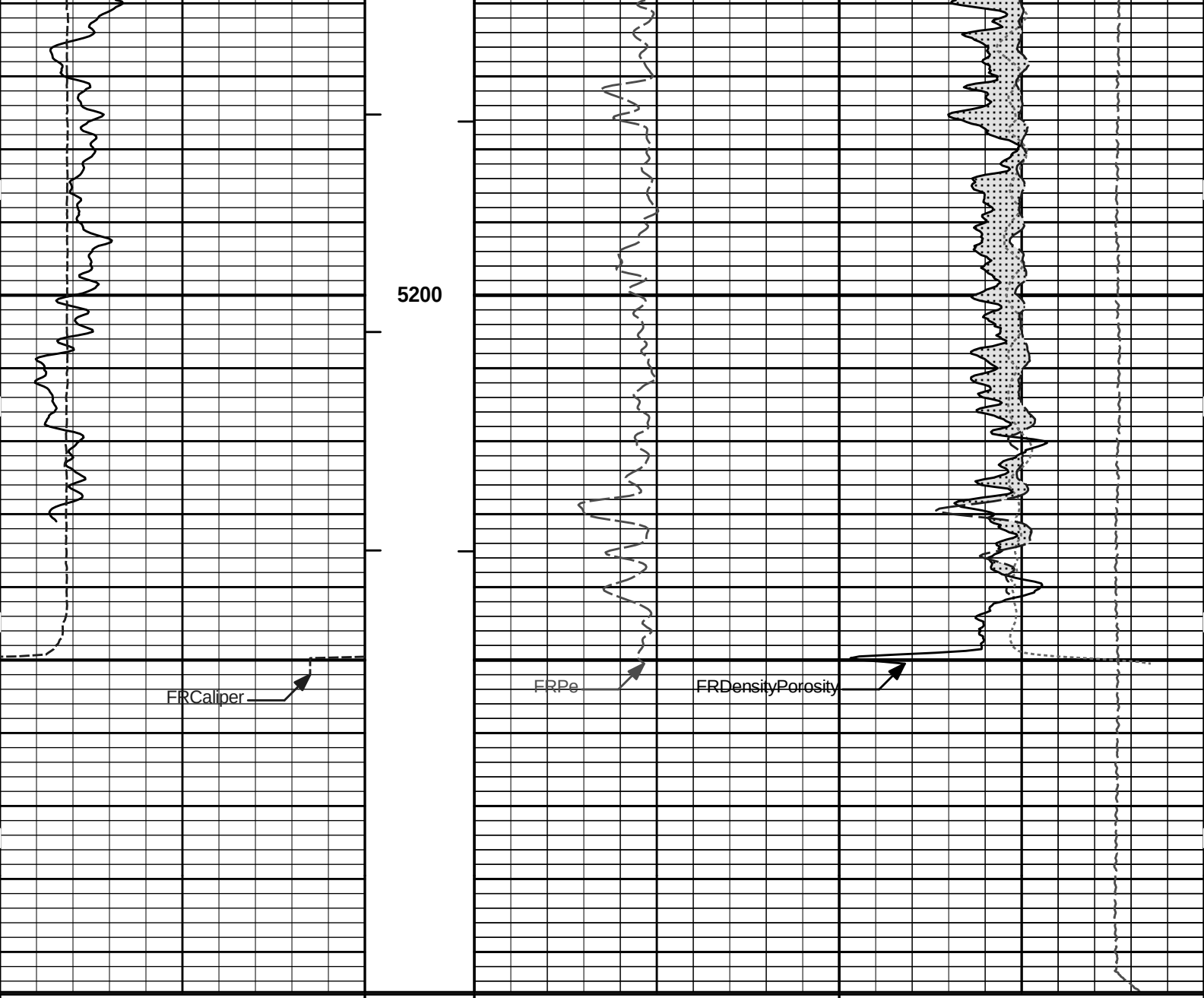

Pe
4100
4200


Caliper
DensityPorosity
Pe
4300
4400
4500


4500
Caliper
Density porosity
Pe
4600
4700


Caliper
Density Prosity
Pe
4800
4900


5000
5100
Caliper
Pe
DensityPorosity



6 Caliper 16 inches	MD 1 : 240 ft	0 Pe 10 -0.25 DensityCorr 0.25 gram per cc
0 Gamma API 150 api	AHVT	15K Tension 0 pounds
SHALE	BHVT	30 DensityPorosity -10 % 30 Neutron Porosity -10 % CROSSOVER

HALLIBURTON

Plot Time: 02-Oct-13 00:32:17
Plot Range: 3800 ft to 5295.5 ft
Data: DRUSSEL_E-3\Well Based\DETAIL\
Plot File: \\PORO\Poro_IQ_5_MAIN_LIB

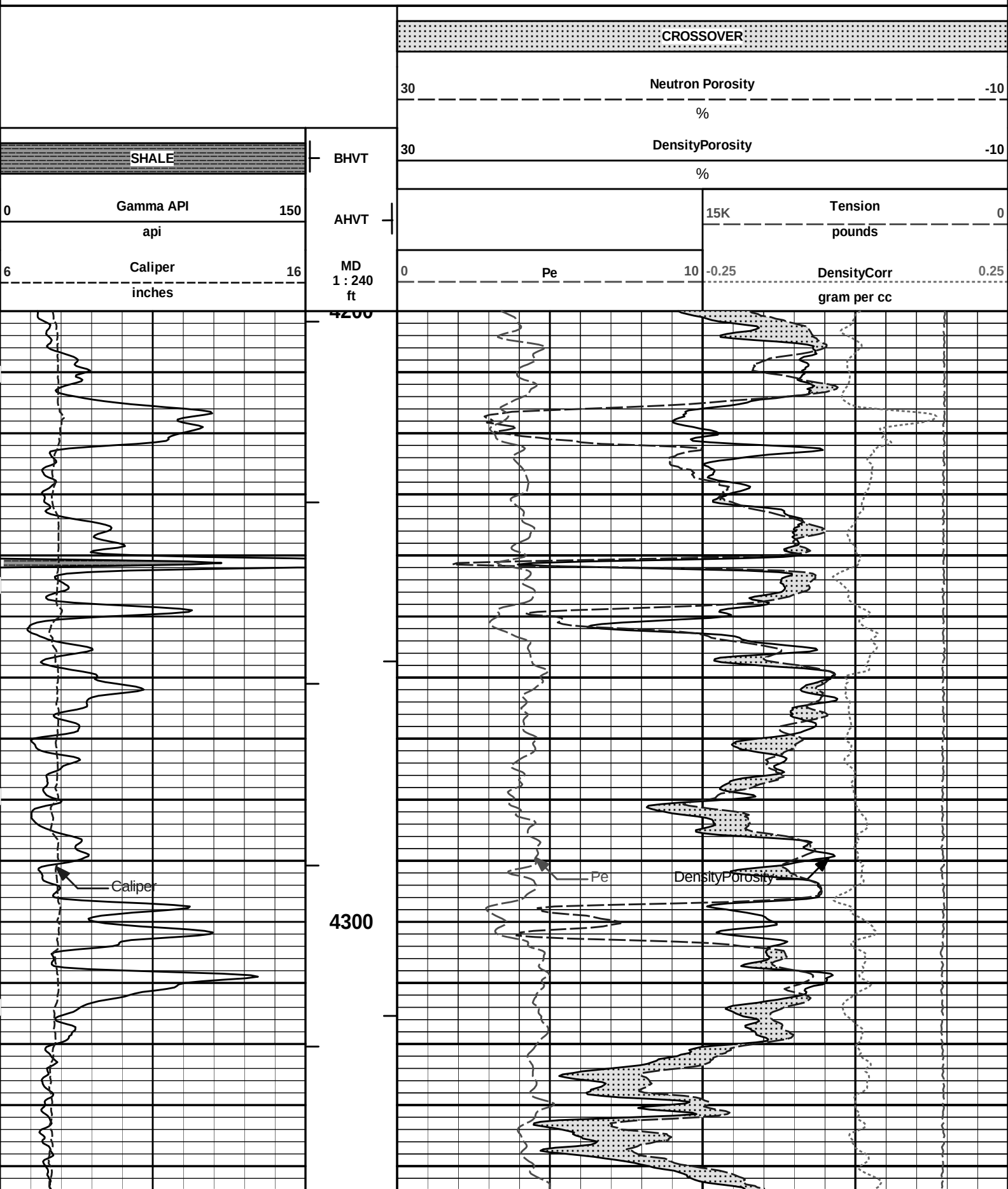
5 INCH MAIN LOG

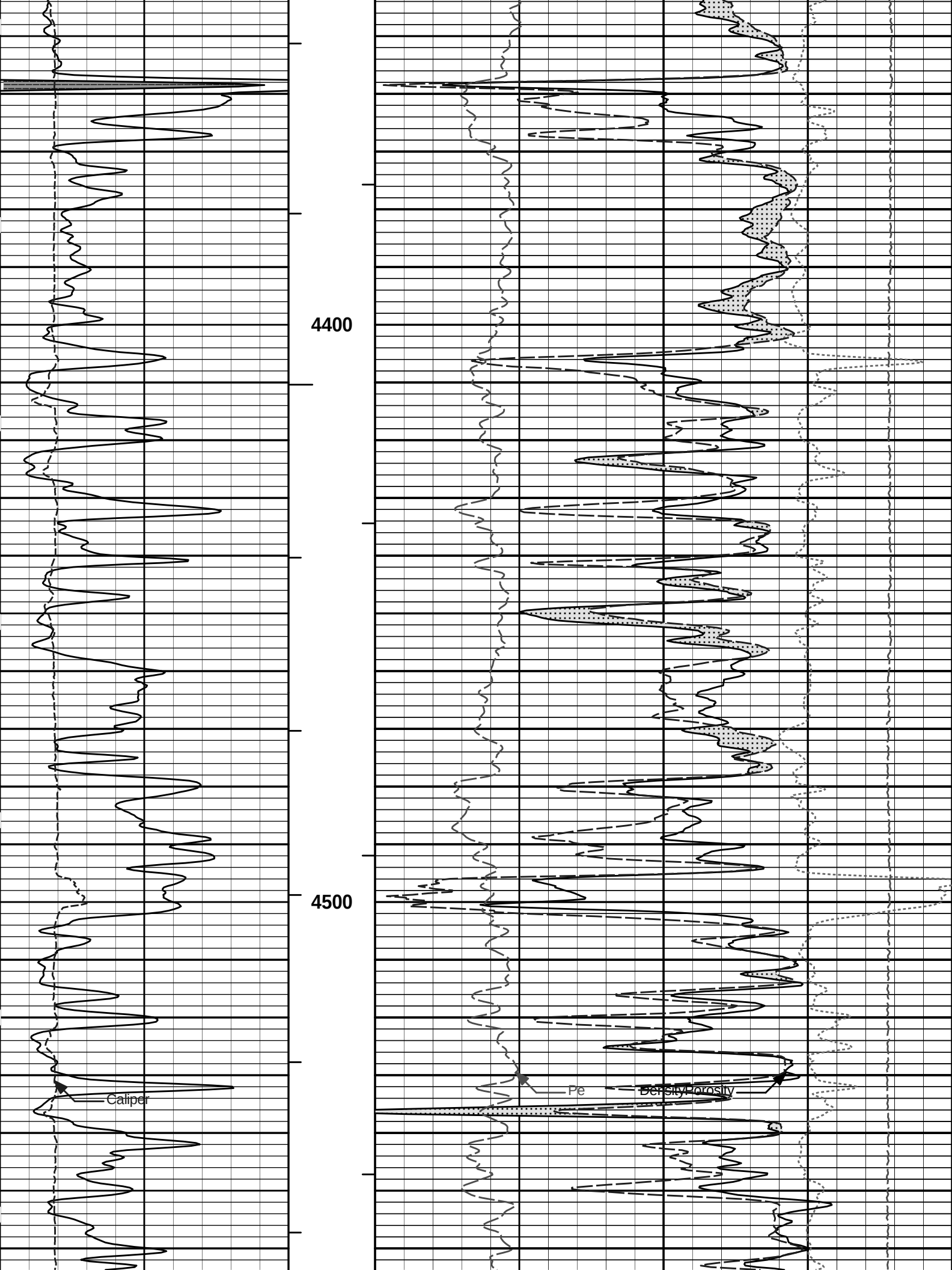
HALLIBURTON

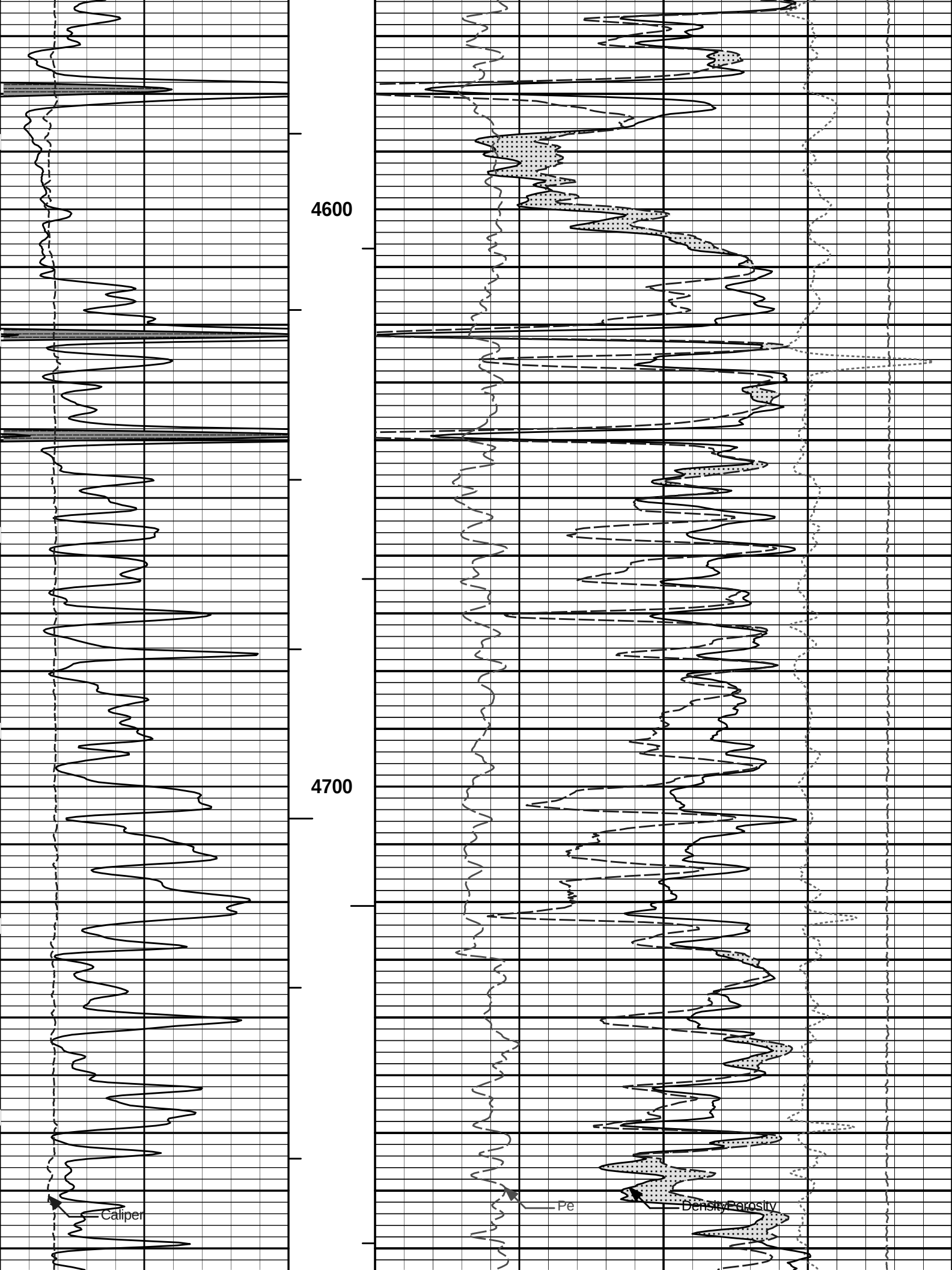
Plot Time: 02-Oct-13 00:32:17

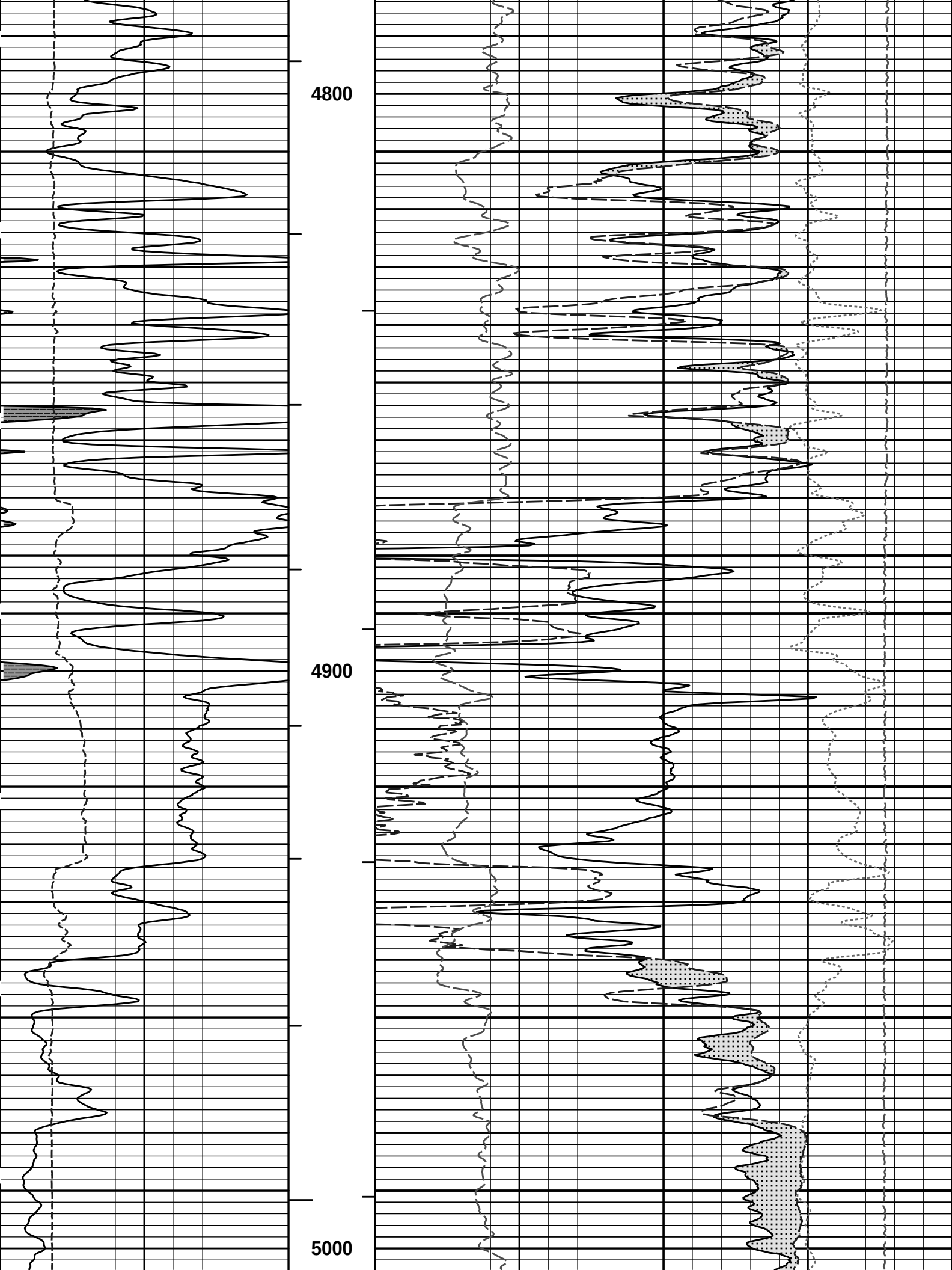
Plot Range: 4200 ft to 5295.08 ft
Data: DRUSSEL_E-3\Well Based\REPEAT\
Plot File: \\PORO\Poro_IQ_5_REP_LIB

REPEAT SECTION




4400
4500
Caliper
Pe
Density/Porosity


4600
4700
Caliper
Pe
DensityPorosity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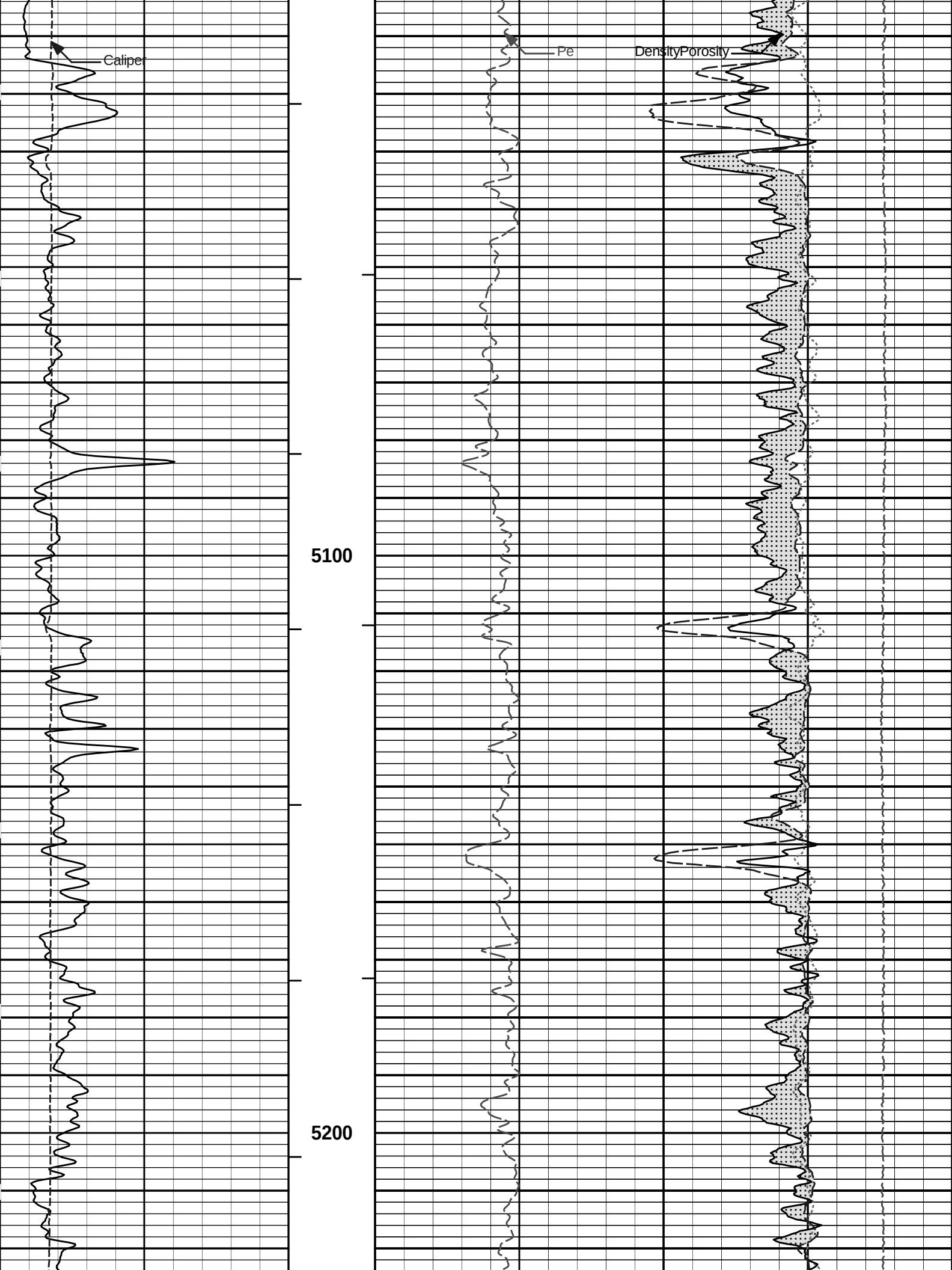
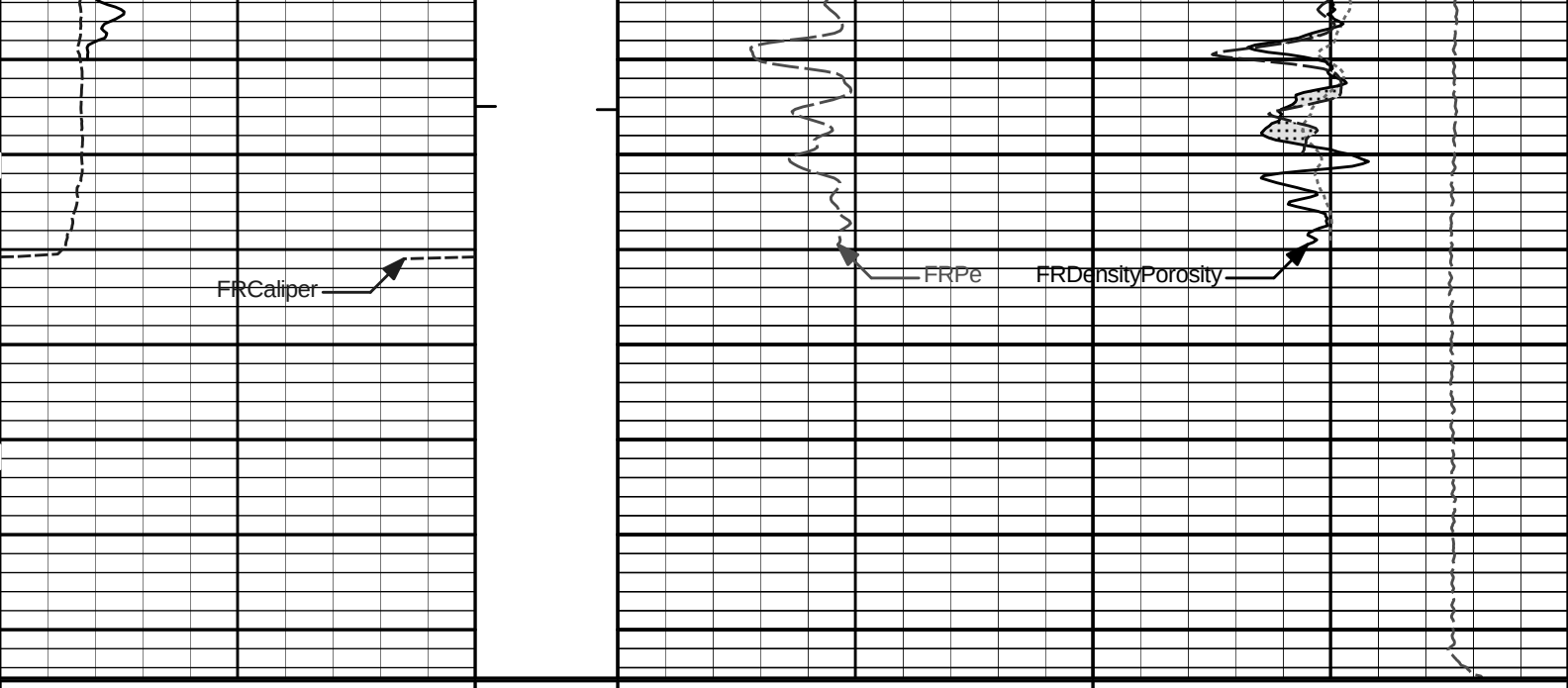
4900
5000


Caliper
Pe
DensityPorosity
5100
5200



6 Caliper 16
inches

0 Gamma API 150
api

SHALE

MD
1 : 240
ft

AHVT

BHVT

0 Pe 10

-0.25 DensityCorr 0.25
gram per cc

15K Tension 0
pounds

30 DensityPorosity -10
%

30 Neutron Porosity -10
%

CROSSOVER

HALLIBURTON

Plot Time: 02-Oct-13 00:32:19
Plot Range: 4200 ft to 5295.08 ft
Data: DRUSSEL_E-3\Well Based\REPEAT\
Plot File: \\PORO\Poro_IQ_5_REP_LIB

REPEAT SECTION

HALLIBURTON

Plot Time: 02-Oct-13 00:32:19
Plot Range: 3800 ft to 5295.5 ft
Data: DRUSSEL_E-3\Well Based\DETAIL\
Plot File: \\-LOCAL-\DRUSSEL_E-3\0001 SP-GTET-DSN-SDL-FLEX-BSAT-ACRT-BN\PORO\BULKD_5_MAIN_LIB

5 INCH MAIN LOG

SHALE

0 Gamma Ray 150
api

18 FarQuality -2

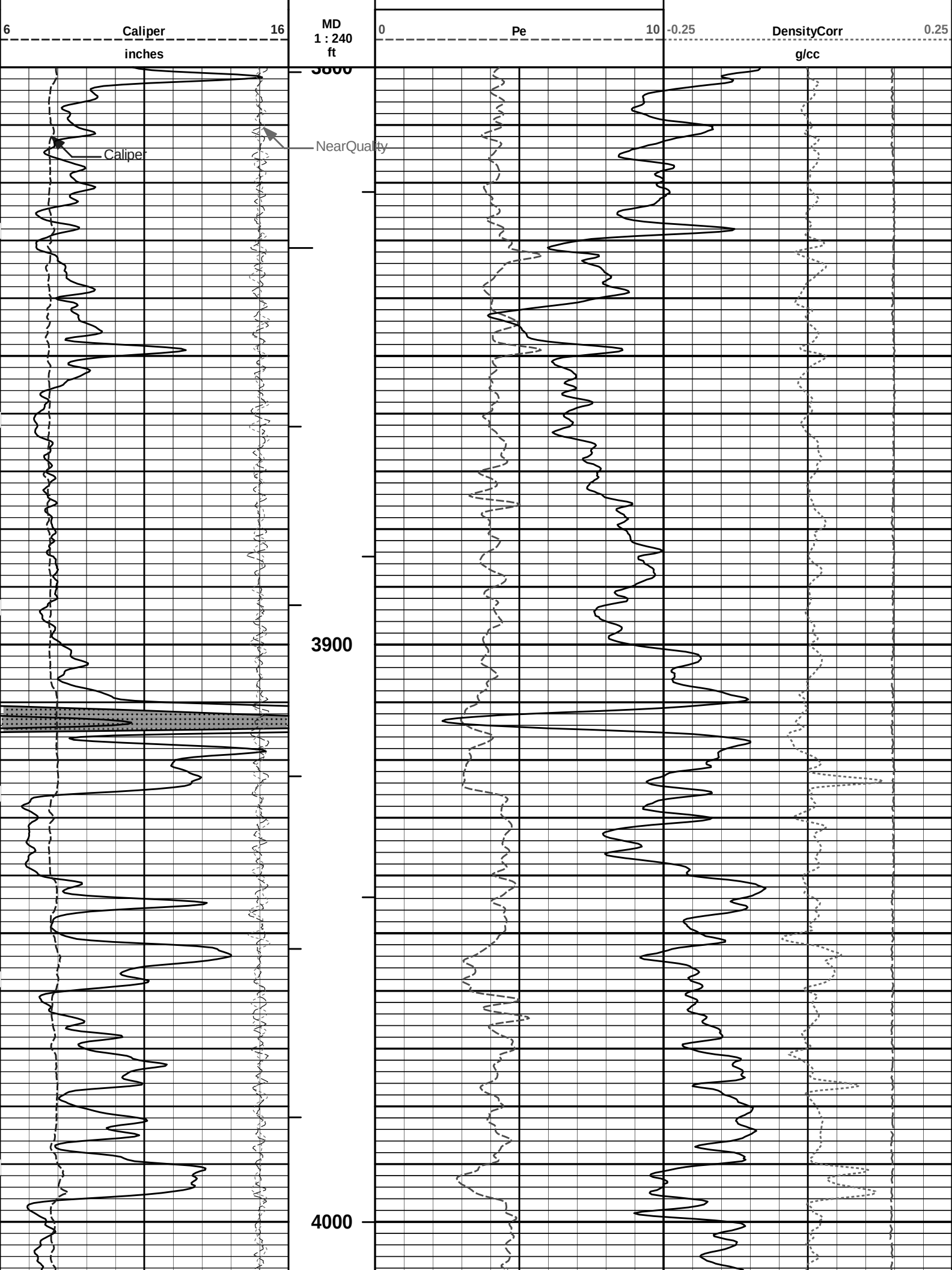
-18 NearQuality 2

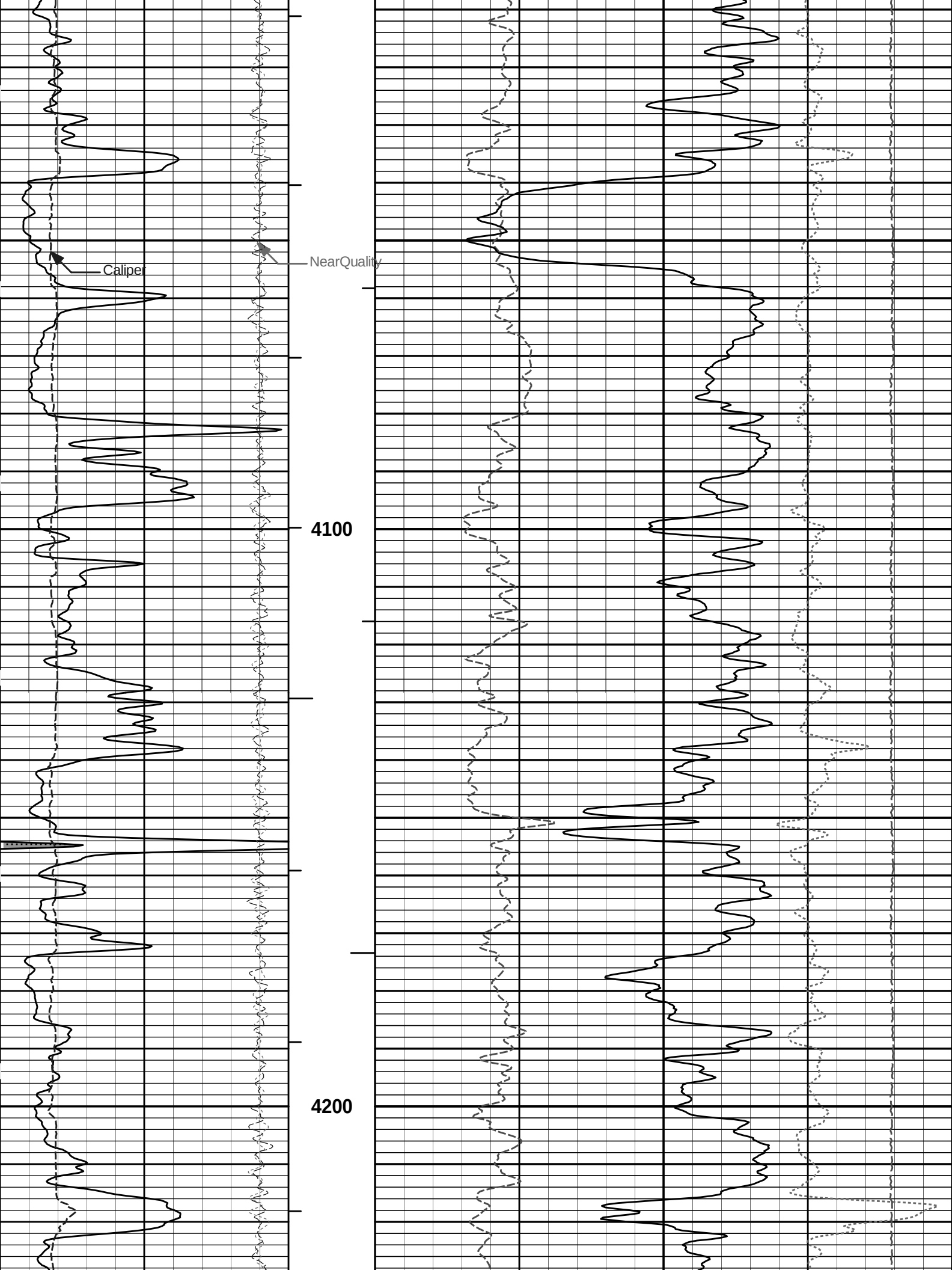
BHV
ft3

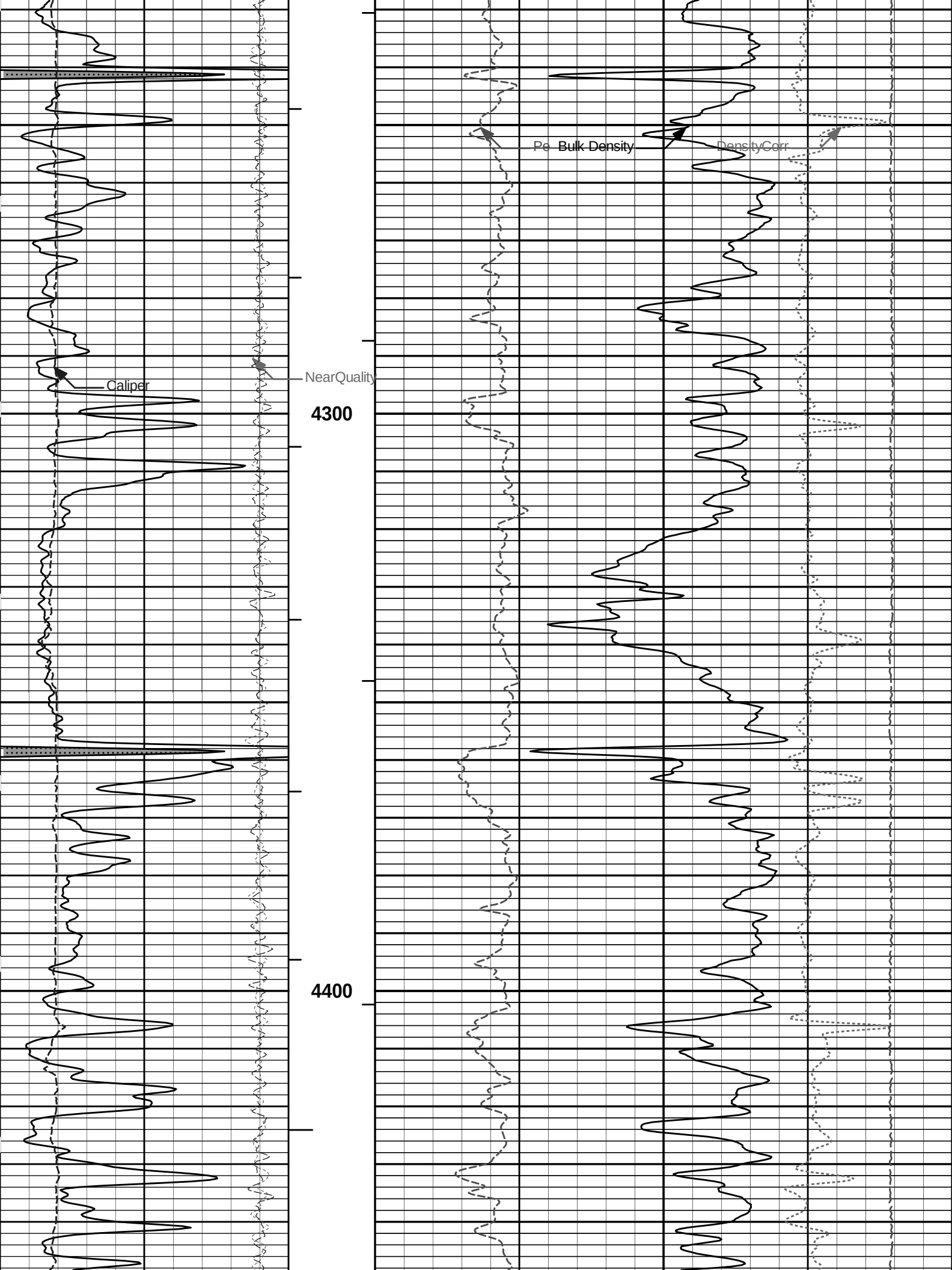
AHV
ft3

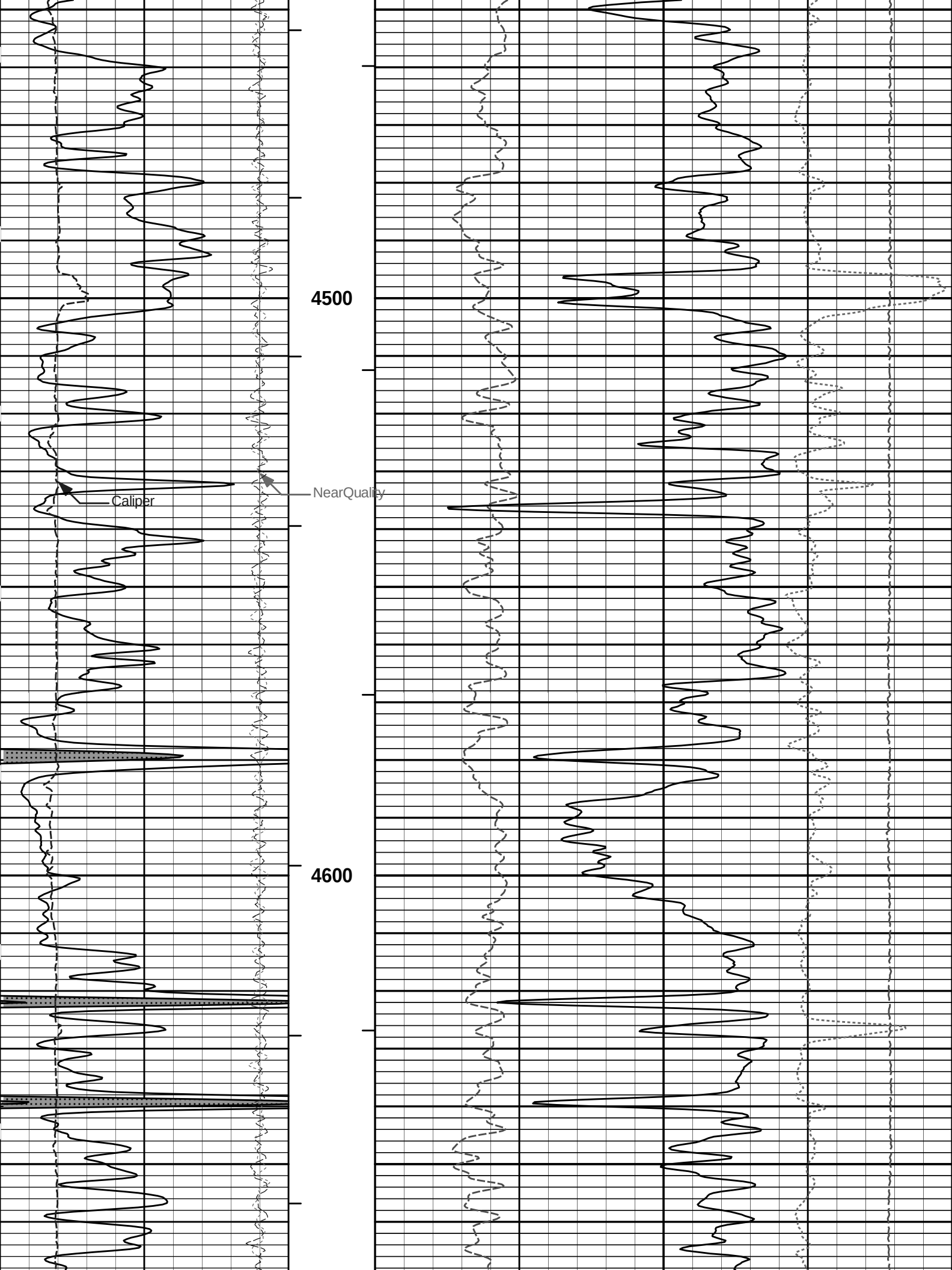
2 Bulk Density 3
g/cc

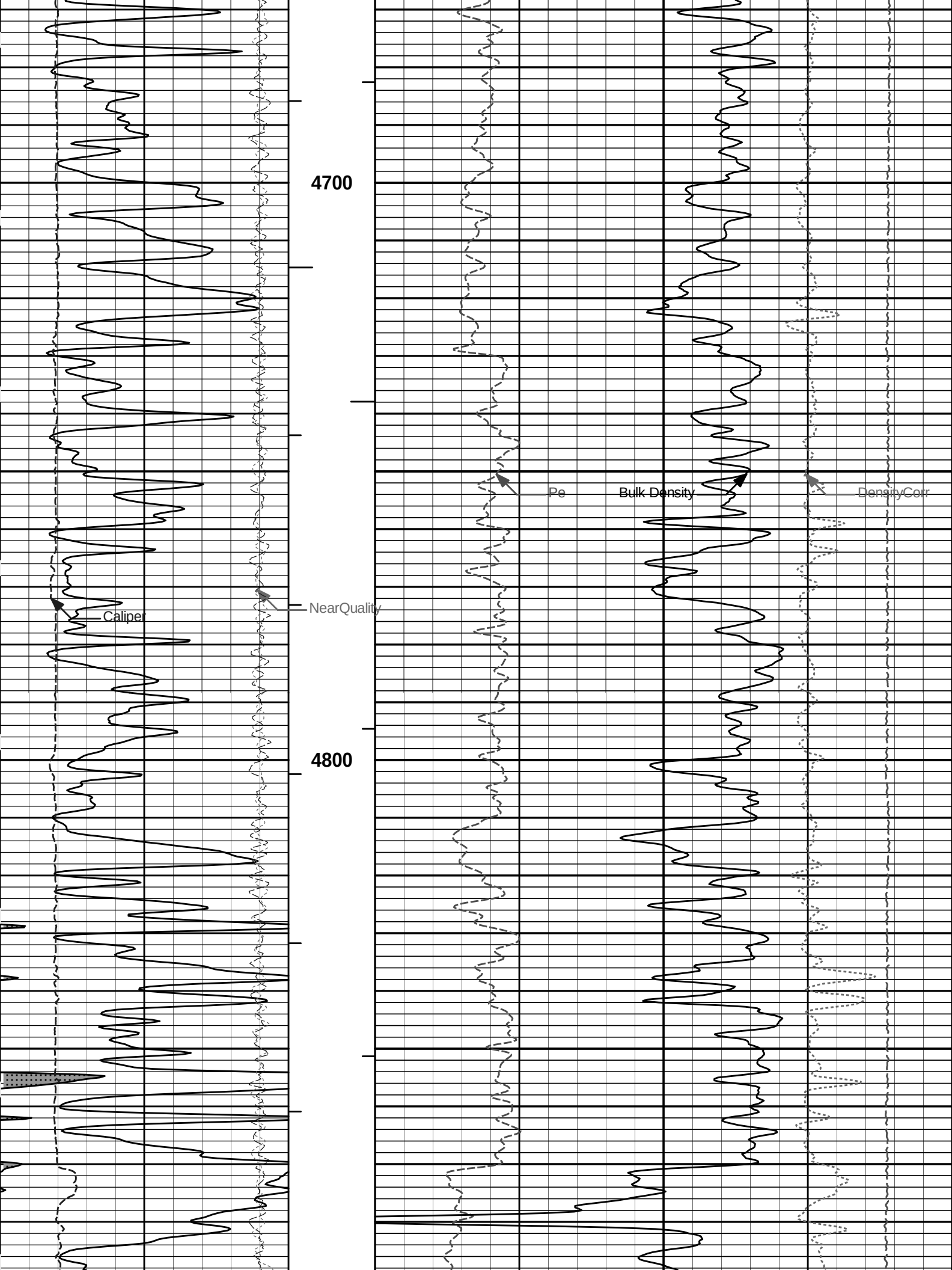
15K Tension 0
pounds

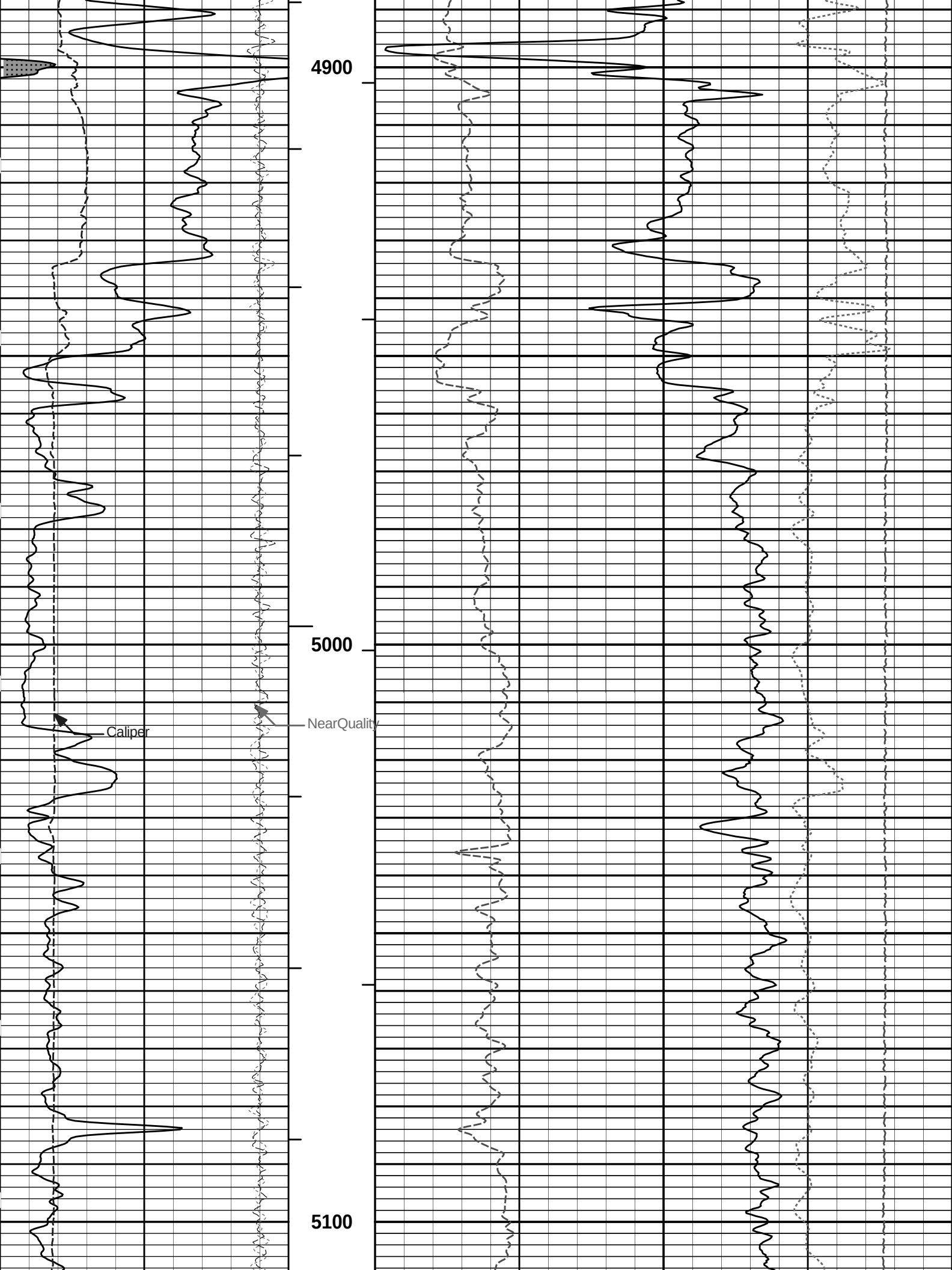

6
Caliper
16
inches
MD
1 : 240
ft
0
Pe
10
-0.25
DensityCorr
0.25
g/cc
Caliper
NearQuality
3900
4000


Caliper
NearQuality
4100
4200


Caliper
NearQuality
4300
Pe
Bulk Density
DensityCorr
4400


4500
4600
Caliper
NearQuality


4700
4800
Caliper
NearQuality
Pe
Bulk Density
DensityCorr


4900
5000
5100
Caliper
NearQuality

6 Caliper 16 inches	MD 1 : 240 ft	0 Pe 10 | -0.25 DensityCorr 0.25 g/cc
-18 NearQuality 2	AHV ft3	15K Tension 0 pounds
18 FarQuality -2	BHV ft3	2 Bulk Density 3 g/cc

0 Gamma Ray 150

api

SHALE

HALLIBURTON

Plot Time: 02-Oct-13 00:32:22
Plot Range: 3800 ft to 5295.5 ft
Data: DRUSSEL_E-3\Well Based\DETAIL\
Plot File: \\-LOCAL-\DRUSSEL_E-3\0001 SP-GTET-DSN-SDL-FLEX-BSAT-ACRT-BN\PORO\BULKD_5_MAIN_LIB

5 INCH MAIN LOG

HALLIBURTON

Plot Time: 02-Oct-13 00:32:22
Plot Range: 4200 ft to 5295.08 ft
Data: DRUSSEL_E-3\Well Based\REPEAT\
Plot File: \\-LOCAL-\DRUSSEL_E-3\0001 SP-GTET-DSN-SDL-FLEX-BSAT-ACRT-BN\PORO\BULKD_5_REP_LIB

REPEAT SECTION

SHALE

0 Gamma Ray 150

api

18 FarQuality -2

-18 NearQuality 2

6 Caliper 16

inches

BHV ft3

AHV ft3

MD 1 : 240 ft

2 Bulk Density 3

g/cc

15K Tension 0

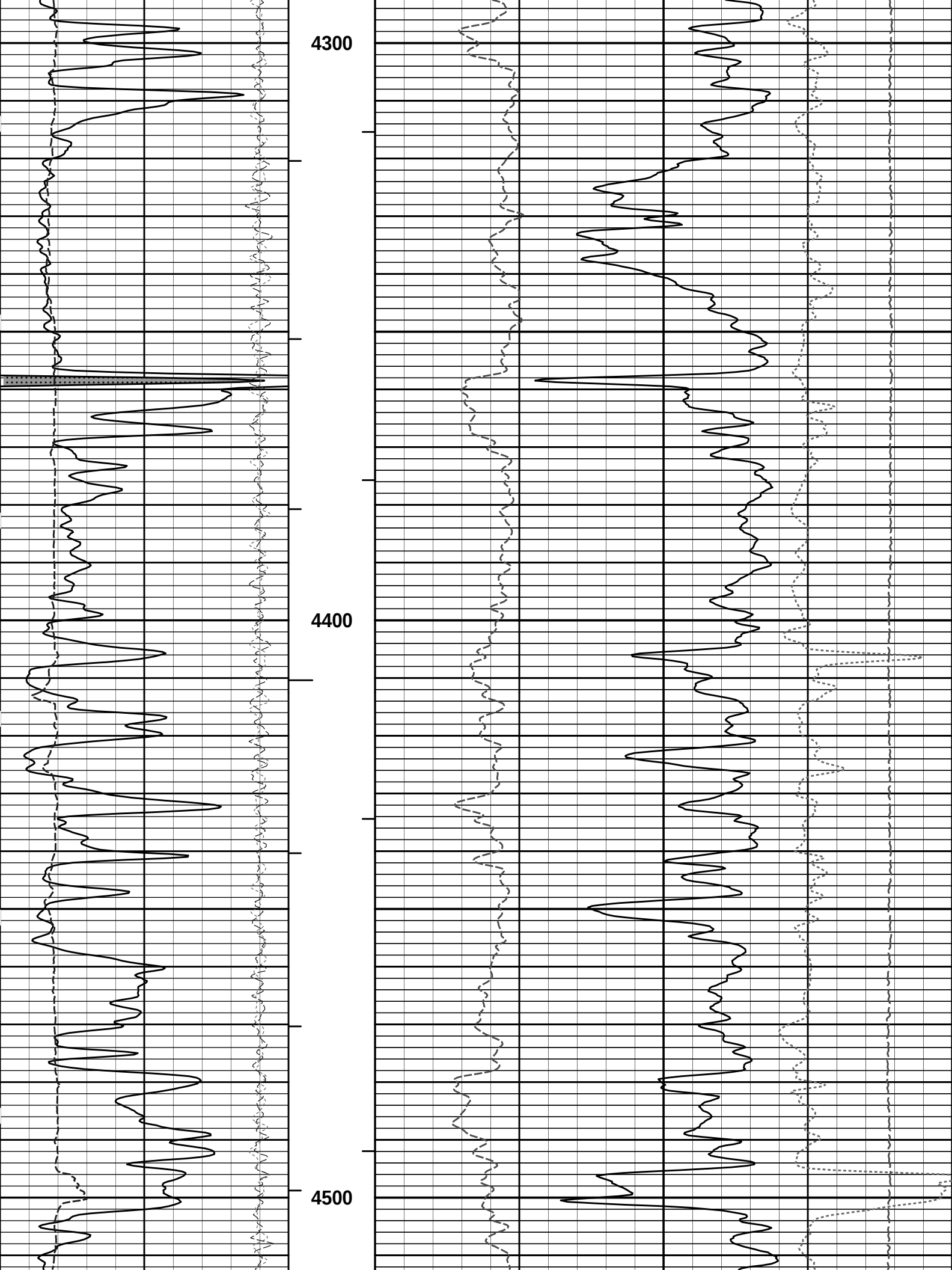
pounds

0 Pe 10

-0.25 DensityCorr 0.25

g/cc

4200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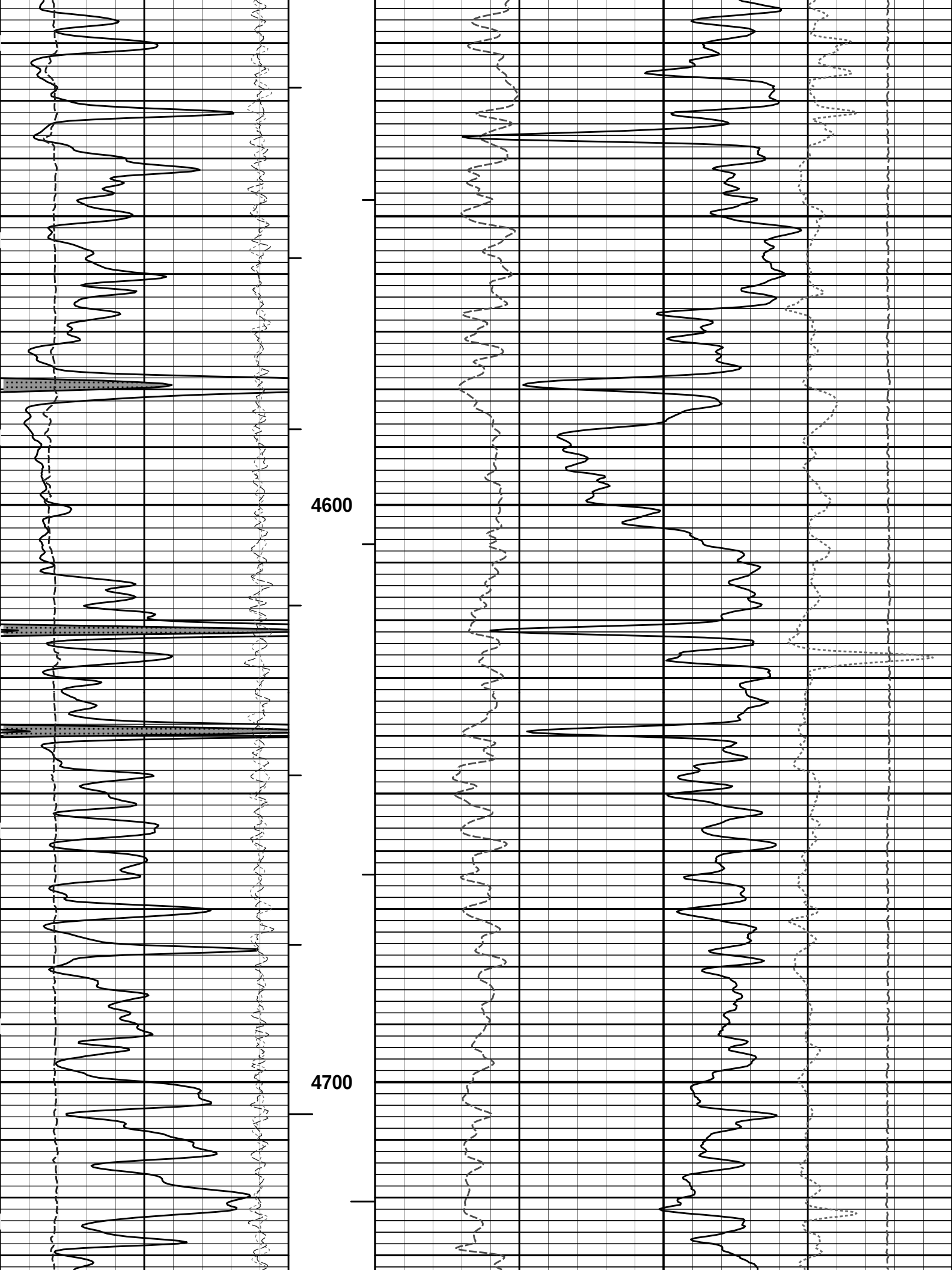
4500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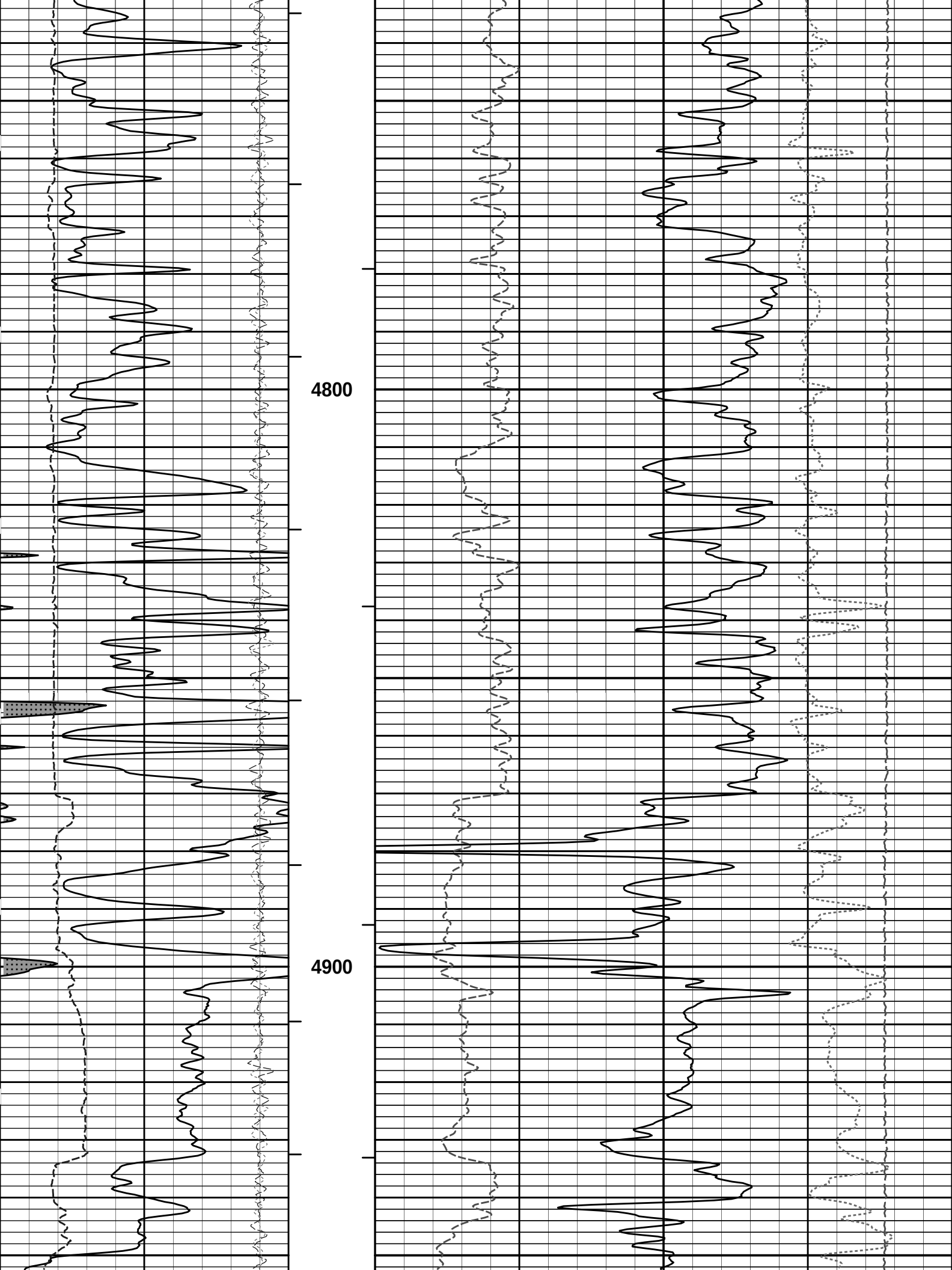
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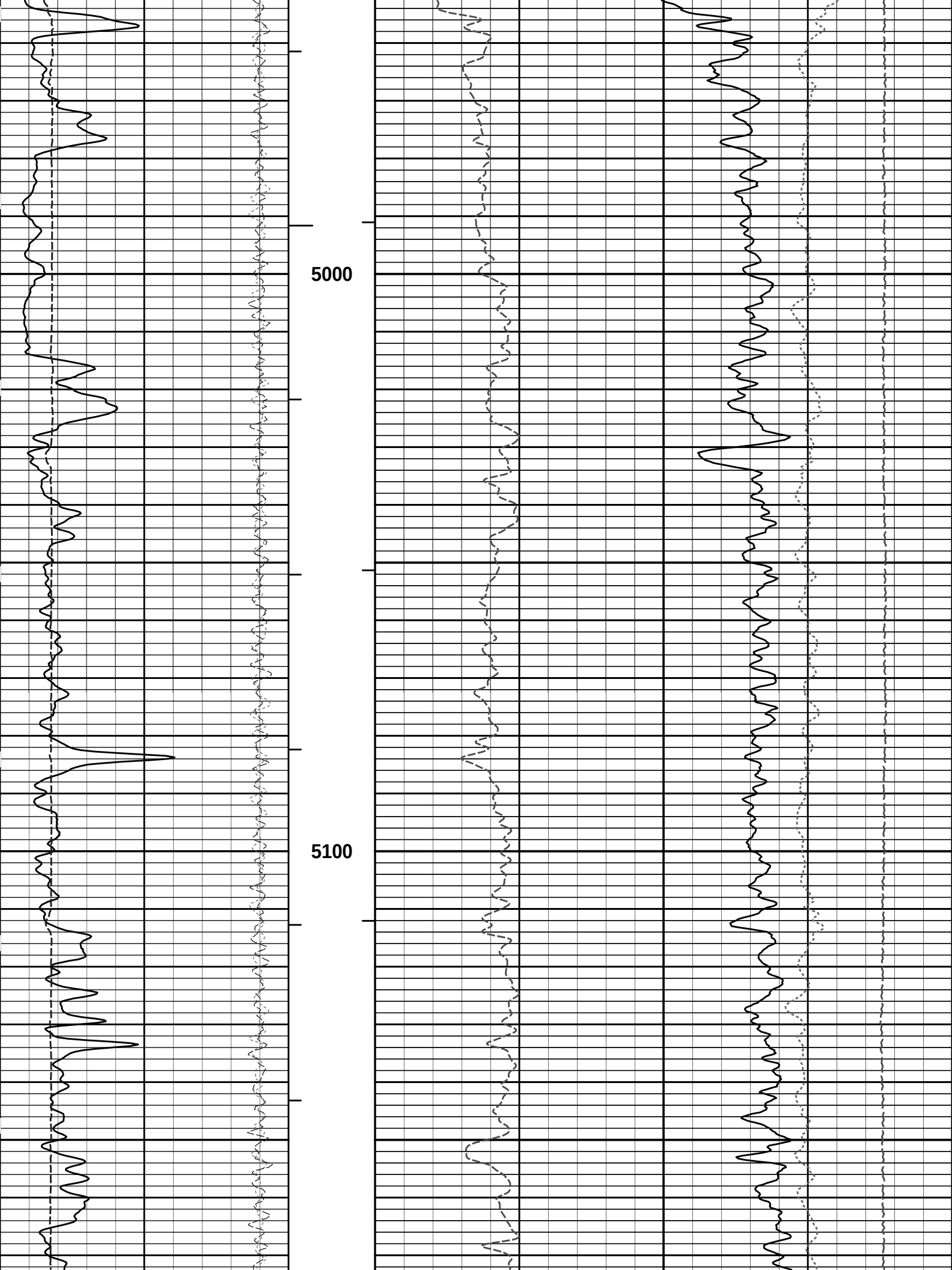
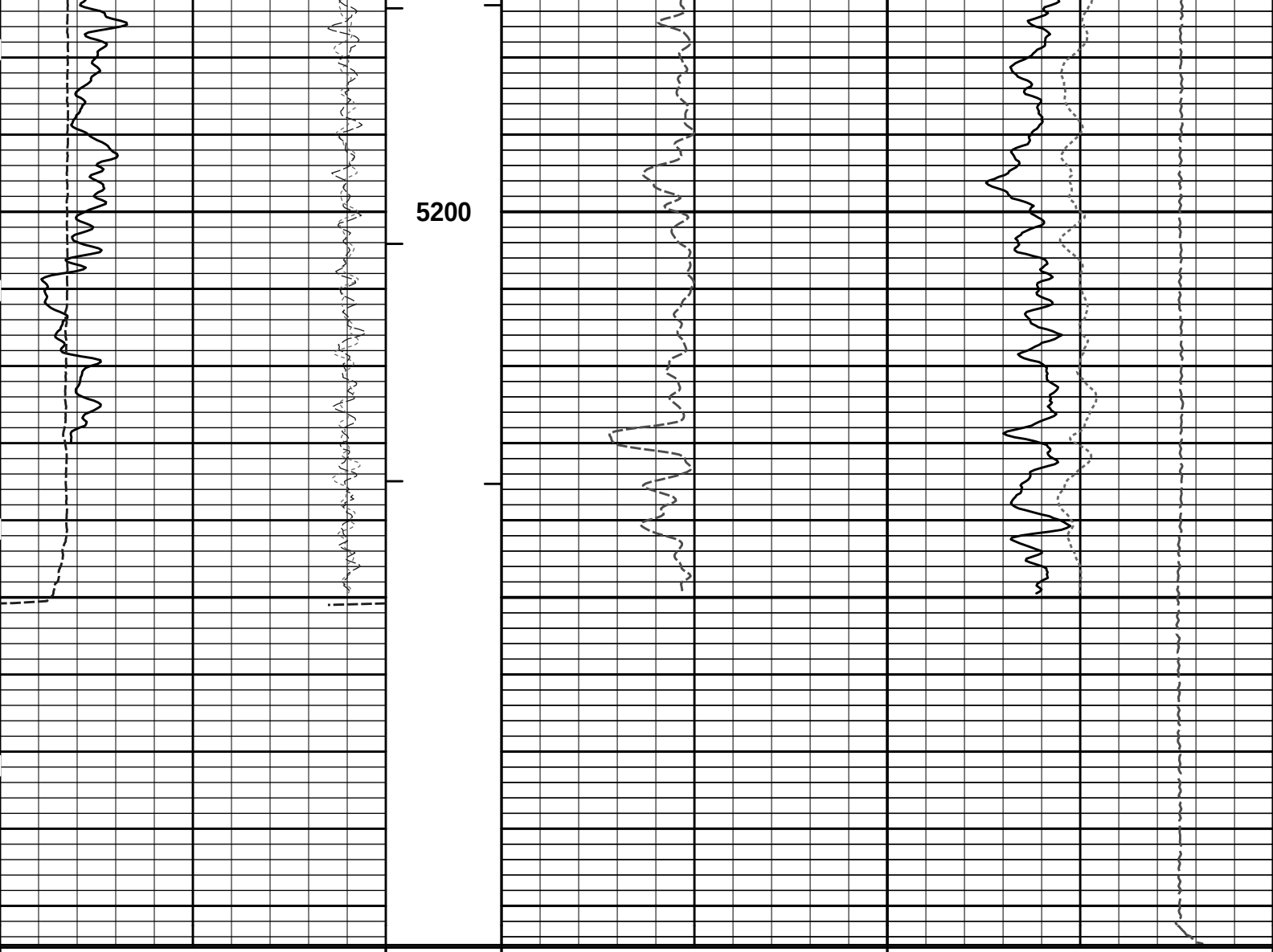

5000
5100



6 Caliper 16	MD 1 : 240 ft	0 Pe 10 / -0.25 DensityCorr 0.25
inches		g/cc
-18 NearQuality 2	AHV ft3	15K Tension 0
		pounds
18 FarQuality -2	BHV ft3	2 Bulk Density 3
		g/cc
0 Gamma Ray 150		
api		
SHALE		

HALLIBURTON

Plot Time: 02-Oct-13 00:32:24
Plot Range: 4200 ft to 5295.08 ft
Data: DRUSSEL_E-3\Well Based\REPEAT\
Plot File: \\-LOCAL-\DRUSSEL_E-3\0001 SP-GTET-DSN-SDL-FLEX-BSAT-ACRT-BN\PORO\BULKD_5_REP_LIB

REPEAT SECTION

HALLIBURTON

TOOL STRING DIAGRAM REPORT

Description	Overbody Description	O.D.	Diagram	Sensors @ Delays	Length	Accumulated Length
						80.04 ft
RWCH-12027542 135.00 lbs		Ø 3.625 in		Load Cell @ 76.35 ft BH Temperature @ 75.79 ft	6.25 ft	
						73.79 ft
SP Sub-12345678 60.00 lbs		Ø 3.625 in		SP @ 72.01 ft	3.74 ft	
						70.05 ft
GTET-10748374 165.00 lbs		Ø 3.625 in		GammaRay @ 63.99 ft	8.52 ft	
						61.53 ft
	DSN Decentralizer - Large Hole-00000001 6.60 lbs	Ø 5.000 in*				
DSNT-10755066 174.00 lbs		Ø 3.625 in		DSN Far @ 54.59 ft DSN Near @ 53.84 ft	9.69 ft	
						51.84 ft
SDLT-10685803 360.00 lbs		Ø 4.500 in			10.81 ft	
	SDLT Pad-10714945 65.00 lbs			Microlog @ 44.03 ft SDL Caliper @ 43.84 ft SDL @ 43.83 ft		
	Microlog Pad-10685803 8.00 lbs	Ø 4.750 in* Ø 4.750 in*				
						41.03 ft
IQ Flex-10000954 140.00 lbs		Ø 3.625 in			5.67 ft	
						35.36 ft
	Centralizer 25-00000002 8.00 lbs	Ø 4.000 in*				
BSAT-10747684		Ø 3.625 in			17.77 ft	

Mnemonic	Tool Name	Serial Number	Weight (lbs)	Length (ft)		Accumulated Length (ft)	Max.Log. Speed (fpm)
RWCH	Releasable Wireline Cable Head	12027542	135.00	6.25		73.79	300.00
SP	SP Sub	12345678	60.00	3.74		70.05	300.00
GTET	Gamma Telemetry Tool	10748374	165.00	8.52		61.53	60.00
DSNT	Dual Spaced Neutron	10755066	174.00	9.69		51.84	60.00
DCNT	DSN Decentralizer Large Hole	00000001	6.60	9.42	*	55.17	300.00
SDLT	Spectral Density Tool	10685803	360.00	10.81		41.03	60.00
MICP	Microlog Pad	10685803	8.00	1.00	*	43.53	60.00
SDLP	Density Insite Pad	10714945	65.00	2.55	*	43.24	60.00
IQF	IQ Flex tool	10000954	140.00	5.67		35.36	300.00
BSAT	Borehole Sonic Array Tool	10747684	300.00	15.77		19.58	60.00
OBCEN	Centralizer - 25 in. Overbody	00000002	8.00	2.08	*	32.51	300.00
ACRt	Array Compensated True Resistivity Instrument Section	10929776	50.00	5.03		14.55	300.00
OBCEN	Centralizer - 25 in. Overbody	00000003	8.00	2.08	*	15.87	300.00
ACRt	Array Compensated True Resistivity Sonde Section	10929775	200.00	14.22		0.33	300.00
BLNS	Bull Nose	00000001	5.00	0.33		0.00	300.00
Total			**1,684.60**	**80.04**			

* Not included in Total Length and Length Accumulation.

Data: DRUSSEL_E-3\0001 SP-GTET-DSN-SDL-FLEX-BSAT-ACRT-BN\IDLE **Date: 01-Oct-13 21:19:59**

HALLIBURTON

CALIBRATION REPORT

NATURAL GAMMA RAY TOOL SHOP CALIBRATION

Tool Name: GTET - 10748374 | **Reference Calibration Date:** 02-Aug-13 14:20:06

Engineer: THOMAS HYDE | **Calibration Date:** 03-Sep-13 10:36:47

Software Version: WL INSITE R3.8.4 (Build 5) | **Calibration Version:** 1

Calibrator Source S/N: TB-185

Calibrator API Reference:228.00 api

Equivalent Calibrator API Reference:232.0 api

Measurement	Measured	Calibrated	Units
Background	44.2	44.4	api
Background + Calibrator	275.0	276.4	api
Calibrator	230.8	232.0	api

NATURAL GAMMA RAY TOOL FIELD CALIBRATION

Tool Name: GTET - 10748374 | **Reference Calibration Date:** 03-Sep-13 10:36:47

Engineer: S. INGERSOLL | **Calibration Date:** 30-Sep-13 20:11:26

Software Version: WL INSITE R3.8.4 (Build 5) | **Calibration Version:** 1

Calibrator Source S/N: TB-185

Calibrator API Reference:228.00 api

Equivalent Calibrator API Reference:232.0 api

Field Verification	Shop	Field	Units
Background	44.4	66.4	api
Background + Calibrator	276.4	298.2	api
Calibrator	232.0	231.8	api

Shop	Field	Difference	Tolerance
232.0	231.8	0.2	+/- 9.00

DUAL SPACED NEUTRON SHOP CALIBRATION

Tool Name: DSNT - 10755066 | **Reference Calibration Date:** 01-Jul-13 16:27:31

Engineer: THOMAS HYDE | **Calibration Date:** 05-Sep-13 10:15:26

Software Version: WL INSITE R3.8.4 (Build 5) | **Calibration Version:** 1

Logging Source S/N: DSN-436

Tank Serial Number: 105060

Reference value assigned to Tank: 51.680

Snow Block S/N: 08910

Calibration Tank Water Temperature: 70 degF

Min. Tool Housing Outside Diameter: 3.620 in

CALIBRATION CONSTANTS

Measurement	Prev. Value	New Value	Control Limit On New Value
Gain:	0.952	0.949	0.900 - 1.100

WATER TANK SUMMARY (Horizontal Water Tank)

Measurement	Current Reading (Previous Coef.)	Calibrated (New Coef.)	Change	Control Limit On Change
Porosity (decp):	0.2114	0.2107	0.0008	+/- 0.0020
Calibrated Ratio:	9.74	9.72	0.026	+/- 0.050

VERIFIER

Measurement	Value	Control Limit
Snow-Block Porosity (decp):	0.0594	0.02000 - 0.09000

PASS/FAIL SUMMARY	
Background Check:	Passed
Gain-Range Check:	Passed
Snow-Block Check:	Passed

DUAL SPACED NEUTRON FIELD CALIBRATION

Tool Name:	**DSNT - 10755066**	**Reference Calibration Date:**	**05-Sep-13 10:15:26**
Engineer:	**S. INGERSOLL**	**Calibration Date:**	**30-Sep-13 20:14:04**
Software Version:	**WL INSITE R3.8.4 (Build 5)**	**Calibration Version:**	**1**

Logging Source S/N: DSN-436

Snow Block S/N: 08910

NEUTRON FIELD-CHECK SUMMARY				
	Shop	**Field**	**Difference**	**Control Limit On Change**
Snow-Block Porosity (decp):	0.0594	0.0566	-0.0028	+/- 0.0150

PASS/FAIL SUMMARY	
Block Change Check:	Passed
Snow Block Stat Check:	Passed
Temperature Check:	Passed

DENSITY CALIPER SHOP CALIBRATION

Tool Name:	**SDLT - 10685803**	**Reference Calibration Date:**	**07-Aug-13 16:03:28**
Engineer:	**THOMAS HYDE**	**Calibration Date:**	**05-Sep-13 09:46:41**
Software Version:	**WL INSITE R3.8.4 (Build 5)**	**Calibration Version:**	**1**
Host Tool Name:	**DSNT - 10755066**		

CALIBRATION COEFFICIENTS			
Measurement	**Previous Value**	**New Value**	**Control Limit On New Value**
Pad Offset	-4540.73	-5035.21	-7000.00 - -1000.00
Pad Gain	0.0003893	0.0004015	0.000200 - 0.000600
Arm Offset	-2828.82	-2028.23	-5000.00 - 3000.00
Arm Gain	0.0005533	0.0005309	0.000300 - 0.000700
Arm Power	-0.000007296	-0.000006519	-0.000010000 - 0.000010000

The ring diameter is computed from: DIAMETER = PAD EXTENSION + ARM EXTENSION + TOOL DIAMETER

Tool Diameter: 4.50 in

CALIBRATION RINGS				
Measurement	**Current Reading (Previous Coeff.)**	**Calibrated (New Coeff.)**	**Change**	**Control Limit On New Value**
PAD EXTENSION:				
Small Ring (in)	2.13	2.00	-0.13	+/- 0.20
Medium Ring (in)	3.83	3.75	-0.08	+/- 0.20
RING DIAMETER:				
Small Ring (in)	6.36	6.50	0.14	+/- 0.20
Medium Ring (in)	8.19	8.25	0.06	+/- 0.20
Large Ring (in)	15.10	15.00	-0.10	+/- 0.20

PASS/FAIL SUMMARY	
Calibration-Coefficients Range Check:	Passed
Ring-Measurement Check:	Passed

PASS/FAIL SUMMARY	
Calibration-Coefficients Range Check:	Passed

Calibration-Coefficients Range Check: Passed

SDLT CALIPER FIELD CALIBRATION

Tool Name:	**SDLT - 10685803**	**Reference Calibration Date:**	**05-Sep-13 09:46:41**
Engineer:	**S. INGERSOLL**	**Calibration Date:**	**30-Sep-13 20:18:00**
Software Version:	**WL INSITE R3.8.4 (Build 5)**	**Calibration Version:**	**1**

MEASURED CALIPER VALUES

Measurement	Shop	Field	Change	Control Limit On New Value
Pad Extension	3.75	3.66	-0.09	+/- 0.10
Ring Diameter	8.25	8.34	0.09	+/- 0.15

PASS/FAIL SUMMARY

Pad Extension Check:	Passed
Diameter Check:	Passed

SPECTRAL DENSITY SHOP CALIBRATION

Tool Name:	**SDLT Pad - 10714945**	**Reference Calibration Date:**	**08-Aug-13 14:33:02**
Engineer:	**THOMAS HYDE**	**Calibration Date:**	**05-Sep-13 09:09:01**
Software Version:	**WL INSITE R3.8.4 (Build 5)**	**Calibration Version:**	**1**

Logging Source S/N: 5073GW

Aluminum Block S/N: LIBERAL ALUMINUM	Density: 2.598g/cc	Pe: 3.170
Magnesium Block S/N: LIBERAL MAG BLOCK	Density: 1.684g/cc	Pe: 2.598

DENSITY CALIBRATION SUMMARY

Measurement	Previous Value	New Value	Control Limit
Near Bar Gain	1.0388	1.0085	0.90 - 1.10
Near Dens Gain	1.0170	0.9997	0.90 - 1.10
Near Peak Gain	1.0228	0.9751	0.90 - 1.10
Near Lith Gain	0.9941	0.9320	0.90 - 1.10
Far Bar Gain	1.0113	1.0097	0.90 - 1.10
Far Dens Gain	1.0021	0.9993	0.90 - 1.10
Far Peak Gain	0.9966	0.9933	0.90 - 1.10
Far Lith Gain	0.9720	0.9693	0.90 - 1.10
Near Bar Offset	-0.0733	0.2064	NONE
Near Dens Offset	0.0979	0.2553	NONE
Near Peak Offset	0.0284	0.4332	NONE
Near Lith Offset	0.2218	0.7457	NONE
Far Bar Offset	0.0922	0.1155	NONE
Far Dens Offset	0.1623	0.1874	NONE
Far Peak Offset	0.2014	0.2290	NONE
Far Lith Offset	0.3537	0.3758	NONE
Near Bar Background	969.80	966.00	700 - 1450
Near Dens Background	321.20	319.70	230 - 480
Near Peak Background	141.23	140.22	100 - 210
Near Lith Background	172.03	169.95	125 - 260
Far Bar Background	493.95	494.14	450 - 900
Far Dens Background	192.00	191.86	175 - 345
Far Peak Background	75.79	75.83	70 - 140
Far Lith Background	79.52	79.76	75 - 145

CALIBRATION BLOCK SUMMARY

Measurement	Current Reading (Previous Coef)	Calibrated (New Coef)	Change	Control Limit On Change
MAGNESIUM				
Density (g/cc)	1.682	1.684	0.002	+/- 0.015
Pe	2.571	2.564	-0.007	+/- 0.150
ALUMINUM				
Density (g/cc)	2.588	2.598	0.010	+/- 0.01500
Pe	3.185	3.133	-0.052	+/- 0.150

TOOL SUMMARY

Measurement	Near Detector		Far Detector	
	Value	Control Limits	Value	Control Limits
QUALITY				
Background	-0.0007	+/- 0.0110	-0.0031	+/- 0.0140
Magnesium Block	-0.0014	+/- 0.0110	0.0001	+/- 0.0140
Aluminum Block	-0.0002	+/- 0.0110	0.0007	+/- 0.0140
Resolution	9.84	6.00 - 11.50	9.12	6.00 - 11.50
Internal Verifier(B+D+P+L)	1596	1200 - 2700	842	800 - 1700

PASS/FAIL SUMMARY	
Background Quality Check:	Passed
Background Range Check:	Passed
Background Resolution Check:	Passed
Background Verification Check:	Passed
Magnesium Quality Check:	Passed
Aluminum Quality Check:	Passed
Gains Check:	Passed
Changes in Calibration Blocks:	Passed

SPECTRAL DENSITY FIELD CHECK

Tool Name: SDLT Pad - 10714945
Reference Calibration Date: 05-Sep-13 09:09:01
Engineer: S. INGERSOLL
Calibration Date: 30-Sep-13 20:21:33
Software Version: WL INSITE R3.8.4 (Build 5)
Calibration Version: 1

Pad Temperature: 82.3 degF

DENSITY FIELD CALIBRATION SUMMARY

Measurement	Shop	Field	Change	Control Limit +/-
Near (B+D+P+L) cps	1595.873	1596.740	0.867	16.065
Far (B+D+P+L) cps	841.591	839.762	-1.829	15.940
Near Resolution	9.84	9.94	0.100	0.50
Far Resolution	9.12	9.36	0.240	1.00

PASS/FAIL SUMMARY	
Bkg Quality Check:	Passed
Bkg Resolution Check:	Passed
Bkg Verification Check:	Passed

CALIBRATION SUMMARY

Sensor	Shop	Field	Post	Difference	Tolerance	Units
GTET-10748374						

Gamma Ray Calibrator	232.0	231.8	----------	0.2	+/- 9.00	api
DSNT-10755066						
Snow-Block Porosity	0.0594	0.0566	----------	0.0028	+/- 0.0150	decp
SDLT-10685803						
Pad Extension	3.75	3.66	----------	0.09	+/-0.10	in
Ring Diameter	8.25	8.34	----------	-0.09	+/-0.15	in
SDLT Pad-10714945						
Near(B+D+P+L)	1595.873	1596.740	----------	-0.867	+/-16.065	cps
Far(B+D+P+L)	841.591	839.762	----------	1.829	+/-15.940	cps

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PARAMETERS REPORT

Depth (ft)	Tool Name	Mnemonic	Description	Value	Units
TOP					
	SHARED	BS	Bit Size	7.875	in
	SHARED	UBS	Use Bit Size instead of Caliper for all applications.	No	
	SHARED	MDBS	Mud Base	Water	
	SHARED	MDWT	Borehole Fluid Weight	9.600	ppg
	SHARED	WAGT	Weighting Agent	Natural	
	SHARED	BSAL	Borehole salinity	0.00	ppm
	SHARED	FSAL	Formation Salinity NaCl	0.00	ppm
	SHARED	KPCT	Percent K in Mud by Weight?	0.00	%
	SHARED	RMUD	Mud Resistivity	2.000	ohmm
	SHARED	TRM	Temperature of Mud	75.0	degF
	SHARED	CSD	Logging Interval is Cased?	No	
	SHARED	ICOD	AHV Casing OD	5.500	in
	SHARED	ST	Surface Temperature	75.0	degF
	SHARED	TD	Total Well Depth	5295.00	ft
	SHARED	BHT	Bottom Hole Temperature	200.0	degF
	SHARED	SVTM	Navigation and Survey Master Tool	NONE	
	SHARED	AZTM	High Res Z Accelerometer Master Tool	GTET	
	SHARED	TEMM	Temperature Master Tool	NONE	
	SHARED	BHSM	Borehole Size Master Tool	NONE	
	Rwa / CrossPlot	XPOK	Process Crossplot?	Yes	
	Rwa / CrossPlot	FCHO	Select Source of F	Automatic	
	Rwa / CrossPlot	AFAC	Archie A factor	0.6200	
	Rwa / CrossPlot	MFAC	Archie M factor	2.1500	
	Rwa / CrossPlot	RMFR	Rmf Reference	0.10	ohmm
	Rwa / CrossPlot	TMFR	Rmf Ref Temp	75.00	degF
	Rwa / CrossPlot	RWA	Resistivity of Formation Water	0.05	ohmm
	Rwa / CrossPlot	ADP	Use Air Porosity to calculate CrossplotPhi	No	
	GTET	GROK	Process Gamma Ray?	Yes	
	GTET	GRSO	Gamma Tool Standoff	0.000	in
	GTET	GEOK	Process Gamma Ray EVR?	No	
	GTET	TPOS	Tool Position for Gamma Ray Tools.	Eccentered	
	DSNT	DNOK	Process DSN?	Yes	
	DSNT	DEOK	Process DSN EVR?	No	
	DSNT	NLIT	Neutron Lithology	Limestone	

	DSNT	DNSO	DSN Standoff - 0.25 in (6.35 mm) Recommended	0.250	in
	DSNT	DNTP	Temperature Correction Type	None	
	DSNT	DPRS	DSN Pressure Correction Type	None	
	DSNT	SHCO	View More Correction Options	No	
	DSNT	UTVD	Use TVD for Gradient Corrections?	No	
	DSNT	LHWT	Logging Horizontal Water Tank?	No	
	SDLT	CLOK	Process Caliper Outputs?	Yes	
	SDLT Pad	DNOK	Process Density?	Yes	
	SDLT Pad	DNOK	Process Density EVR?	No	
	SDLT Pad	CB	Logging Calibration Blocks?	No	
	SDLT Pad	SPVT	SDLT Pad Temperature Valid?	Yes	
	SDLT Pad	DTWN	Disable temperature warning	No	
	SDLT Pad	DMA	Formation Density Matrix	2.710	g/cc
	SDLT Pad	DFL	Formation Density Fluid	1.000	g/cc
	Microlog Pad	MLOK	Process MicroLog Outputs?	Yes	
	BSAT	MBOK	Compute BCAS Results?	Yes	
	BSAT	FLLO	Frequency Filter Low Pass Value?	5000	Hz
	BSAT	FLHI	Frequency Filter High Pass Value?	27000	Hz
	BSAT	DTFL	Delta -T Fluid	189.00	uspf
	BSAT	DTMT	Delta -T Matrix Type	User define	
	BSAT	DTMA	Delta -T Matrix	47.00	uspf
	BSAT	DTSH	Delta -T Shale	100.00	uspf
	BSAT	SPEQ	Acoustic Porosity Equation	Wylie	
	ACRt Sonde	RTOK	Process ACRt?	Yes	
	ACRt Sonde	MNSO	Minimum Tool Standoff	1.50	in
	ACRt Sonde	TCS1	Temperature Correction Source	FP Lwr & FP Upr	
	ACRt Sonde	TPOS	Tool Position	Free Hanging	
	ACRt Sonde	RMOP	Rmud Source	Mud Cell	
	ACRt Sonde	RMIN	Minimum Resistivity for MAP	0.20	ohmm
	ACRt Sonde	RMIN	Maximum Resistivity for MAP	200.00	ohmm
	ACRt Sonde	THQY	Threshold Quality	0.50	
	ACRt Sonde	MRFX	Fixed mud resistivity	2000	ohmm
BOTTOM					

Data: DRUSSEL_E-3\0001 SP-GTET-DSN-SDL-FLEX-BSAT-ACRT-BN\IDLE **Date: 01-Oct-13 21:23:57**

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INPUTS, DELAYS AND FILTERS TABLE

Mnemonic	Input Description	Delay (ft)	Filter Type	Filter Length (ft)
	Depth Panel			
TENS	Tension	0.00	NO	
	RWCH			
DHTN	DownholeTension	0.00	BLK	0.000
	SP Sub			
PLTC	Plot Control Mask	72.01	NO	
SP	Spontaneous Potential	72.01	BLK	1.250
SPR	Raw Spontaneous Potential	72.01	NO	
SPO	Spontaneous Potential Offset	72.01	NO	
	GTET			
TRUL	Tension Pull	63.99	NO	

TPUL	Tension Pull	63.99	NO	
GR	Natural Gamma Ray API	63.99	TRI	1.750
GRU	Unfiltered Natural Gamma Ray API	63.99	NO	
EGR	Natural Gamma Ray API with Enhanced Vertical Resolution	63.99	W	1.416 , 0.750
ACCZ	Accelerometer Z	0.00	BLK	0.083
DEVI	Inclination	0.00	NO	

DSNT				
TPUL	Tension Pull	53.74	NO	
RNDS	Near Detector Telemetry Counts	53.84	BLK	1.417
RFDS	Far Detector Telemetry Counts	54.59	TRI	0.583
DNTT	DSN Tool Temperature	53.84	NO	
DSNS	DSN Tool Status	53.74	NO	
ERND	Near Detector Telemetry Counts EVR	53.84	BLK	0.000
ERFD	Far Detector Telemetry Counts EVR	54.59	BLK	0.000
ENTM	DSN Tool Temperature EVR	53.84	NO	

SDLT				
TPUL	Tension Pull	43.84	NO	
PCAL	Pad Caliper	43.84	TRI	0.250
ACAL	Arm Caliper	43.84	TRI	0.250

BSAT				
TPUL	Tension Pull	26.84	NO	
STAT	Status	26.84	NO	
DLYT	Delay Time	26.84	NO	
SI	Sample Interval	26.84	NO	
TXRX	Raw Telemetry 10 Receivers	26.84	NO	
FRMC	Tool Frame Count	26.84	NO	
GMOD	Gain processing mode	19.58	NO	

ACRt Sonde				
TPUL	Tension Pull	2.73	NO	
F1R1	ACRT 12KHz - 80in R value	8.98	BLK	0.000
F1X1	ACRT 12KHz - 80in X value	8.98	BLK	0.000
F1R2	ACRT 12KHz - 50in R value	6.48	BLK	0.000
F1X2	ACRT 12KHz - 50in X value	6.48	BLK	0.000
F1R3	ACRT 12KHz - 29in R value	4.98	BLK	0.000
F1X3	ACRT 12KHz - 29in X value	4.98	BLK	0.000
F1R4	ACRT 12KHz - 17in R value	3.98	BLK	0.000
F1X4	ACRT 12KHz - 17in X value	3.98	BLK	0.000
F1R5	ACRT 12KHz - 10in R value	3.48	BLK	0.000
F1X5	ACRT 12KHz - 10in X value	3.48	BLK	0.000
F1R6	ACRT 12KHz - 6in R value	3.23	BLK	0.000
F1X6	ACRT 12KHz - 6in X value	3.23	BLK	0.000
F2R1	ACRT 36KHz - 80in R value	8.98	BLK	0.000
F2X1	ACRT 36KHz - 80in X value	8.98	BLK	0.000
F2R2	ACRT 36KHz - 50in R value	6.48	BLK	0.000
F2X2	ACRT 36KHz - 50in X value	6.48	BLK	0.000
F2R3	ACRT 36KHz - 29in R value	4.98	BLK	0.000
F2X3	ACRT 36KHz - 29in X value	4.98	BLK	0.000
F2R4	ACRT 36KHz - 17in R value	3.98	BLK	0.000
F2X4	ACRT 36KHz - 17in X value	3.98	BLK	0.000
F2R5	ACRT 36KHz - 10in R value	3.48	BLK	0.000
F2X5	ACRT 36KHz - 10in X value	3.48	BLK	0.000
F2R6	ACRT 36KHz - 6in R value	3.23	BLK	0.000

F2X6	ACRT 36KHz - 6in X value	3.23	BLK	0.000
F3R1	ACRT 72KHz - 80in R value	8.98	BLK	0.000
F3X1	ACRT 72KHz - 80in X value	8.98	BLK	0.000
F3R2	ACRT 72KHz - 50in R value	6.48	BLK	0.000
F3X2	ACRT 72KHz - 50in X value	6.48	BLK	0.000
F3R3	ACRT 72KHz - 29in R value	4.98	BLK	0.000
F3X3	ACRT 72KHz - 29in X value	4.98	BLK	0.000
F3R4	ACRT 72KHz - 17in R value	3.98	BLK	0.000
F3X4	ACRT 72KHz - 17in X value	3.98	BLK	0.000
F3R5	ACRT 72KHz - 10in R value	3.48	BLK	0.000
F3X5	ACRT 72KHz - 10in X value	3.48	BLK	0.000
F3R6	ACRT 72KHz - 6in R value	3.23	BLK	0.000
F3X6	ACRT 72KHz - 6in X value	3.23	BLK	0.000
RMUD	Mud Resistivity	12.52	BLK	0.000
F1RT	Transmitter Current Raw 12K X Receiver	2.73	BLK	0.000
F1XT	Transmitter Reference 12 KHz Imaginary Signal	2.73	BLK	0.000
F2RT	Transmitter Reference 36 KHz Real Signal	2.73	BLK	0.000
F2XT	Transmitter Reference 36 KHz Imaginary Signal	2.73	BLK	0.000
F3RT	Transmitter Reference 72 KHz Real Signal	2.73	BLK	0.000
F3XT	Transmitter Reference 72 KHz Imaginary Signal	2.73	BLK	0.000
TFPU	Upper Feedpipe Temperature Calculated	2.73	BLK	0.000
TFPL	Lower Feedpipe Temperature Calculated	2.73	BLK	0.000
ITMP	Instrument Temperature	2.73	BLK	0.000
TCVA	Temperature Correction Values Loop Off	2.73	NO	
TIDV	Instrument Temperature Derivative	2.73	NO	
TUDV	Upper Temperature Derivative	2.73	NO	
TLDV	Lower Temperature Derivative	2.73	NO	
TRBD	Receiver Board Temperature	2.73	NO	

SDLT Pad

TPUL	Tension Pull	43.83	NO	
NAB	Near Above	43.66	BLK	0.920
NHI	Near Cesium High	43.66	BLK	0.920
NLO	Near Cesium Low	43.66	BLK	0.920
NVA	Near Valley	43.66	BLK	0.920
NBA	Near Barite	43.66	BLK	0.920
NDE	Near Density	43.66	BLK	0.920
NPK	Near Peak	43.66	BLK	0.920
NLI	Near Lithology	43.66	BLK	0.920
NBAU	Near Barite Unfiltered	43.66	BLK	0.250
NLIU	Near Lithology Unfiltered	43.66	BLK	0.250
FAB	Far Above	44.01	BLK	0.250
FHI	Far Cesium High	44.01	BLK	0.250
FLO	Far Cesium Low	44.01	BLK	0.250
FVA	Far Valley	44.01	BLK	0.250
FBA	Far Barite	44.01	BLK	0.250
FDE	Far Density	44.01	BLK	0.250
FPK	Far Peak	44.01	BLK	0.250
FLI	Far Lithology	44.01	BLK	0.250
PTMP	Pad Temperature	43.84	BLK	0.920
NHV	Near Detector High Voltage	43.24	NO	
FHV	Far Detector High Voltage	43.24	NO	
ITMP	Instrument Temperature	43.24	NO	
DDHV	Detector High Voltage	43.24	NO	

Microlog Pad

TPUL	Tension Pull	44.03	NO	
MINV	Microlog Lateral	44.03	BLK	0.750
MNOR	Microlog Normal	44.03	BLK	0.750

Data: DRUSSEL_E-3\0001 SP-GTET-DSN-SDL-FLEX-BSAT-ACRT-BN\IDLE **Date: 01-Oct-13 21:22:30**

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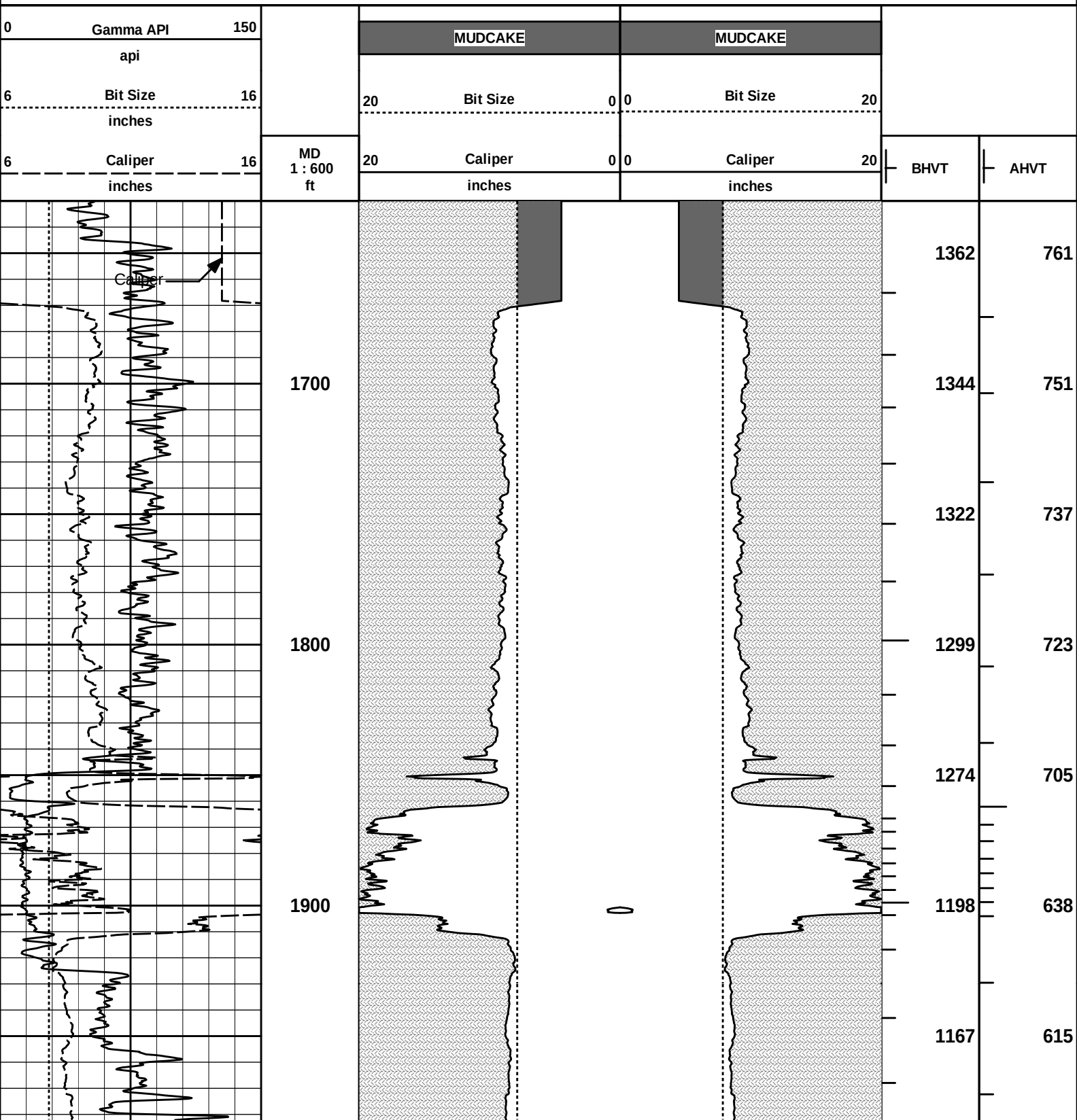
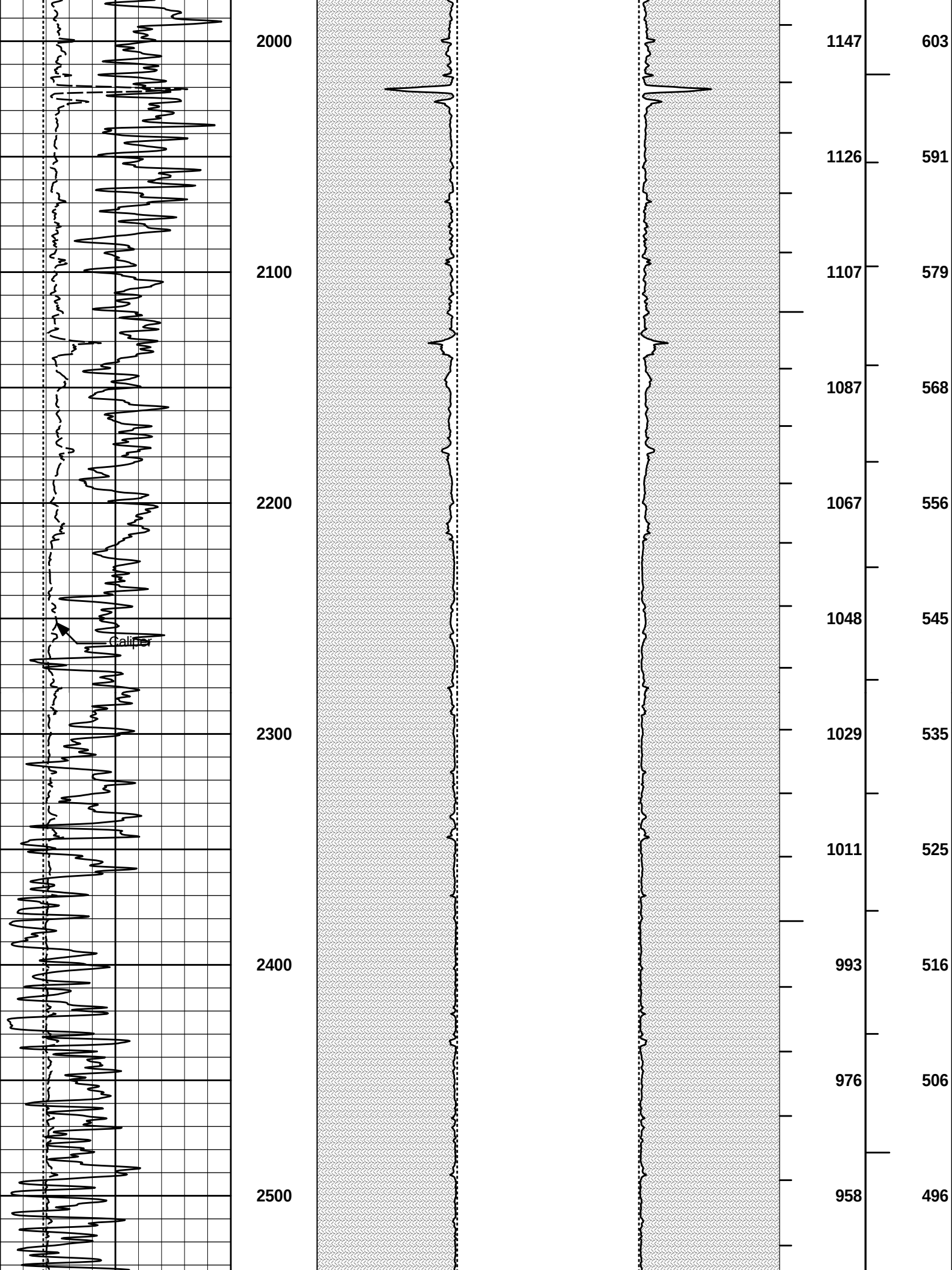
Plot Time: 02-Oct-13 00:32:24
Plot Range: 1630 ft to 5295.5 ft
Data: DRUSSEL_E-3\Well Based\CASING
Plot File: \\-LOCAL-\DRUSSEL_E-3\0001 SP-GTET-DSN-SDL-FLEX-BSAT-ACRT-BN\PORO\AHV_2_IQ_LIB

ANNULAR HOLE VOLUME PLOT

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Caliper
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506
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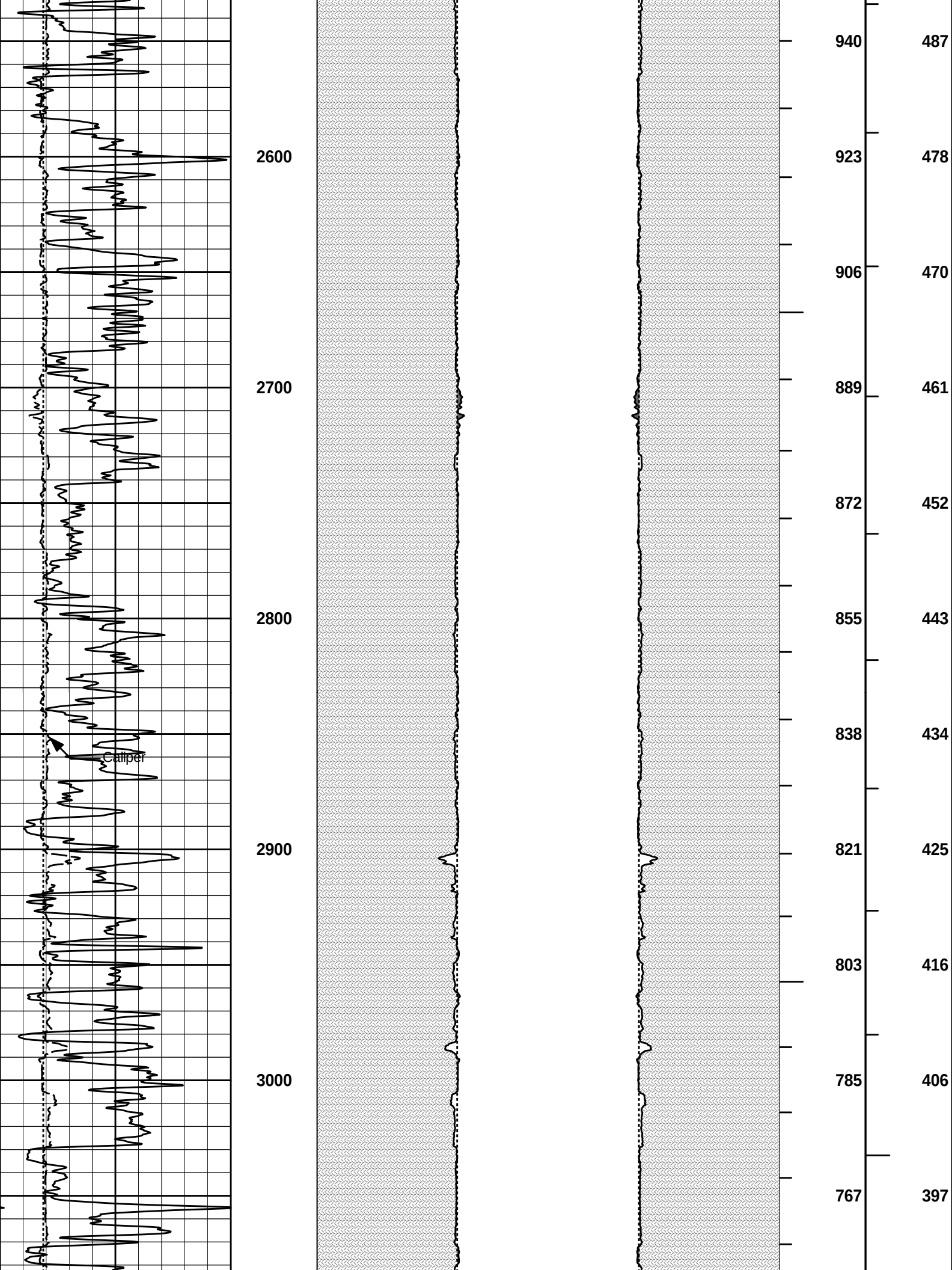
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Caliper
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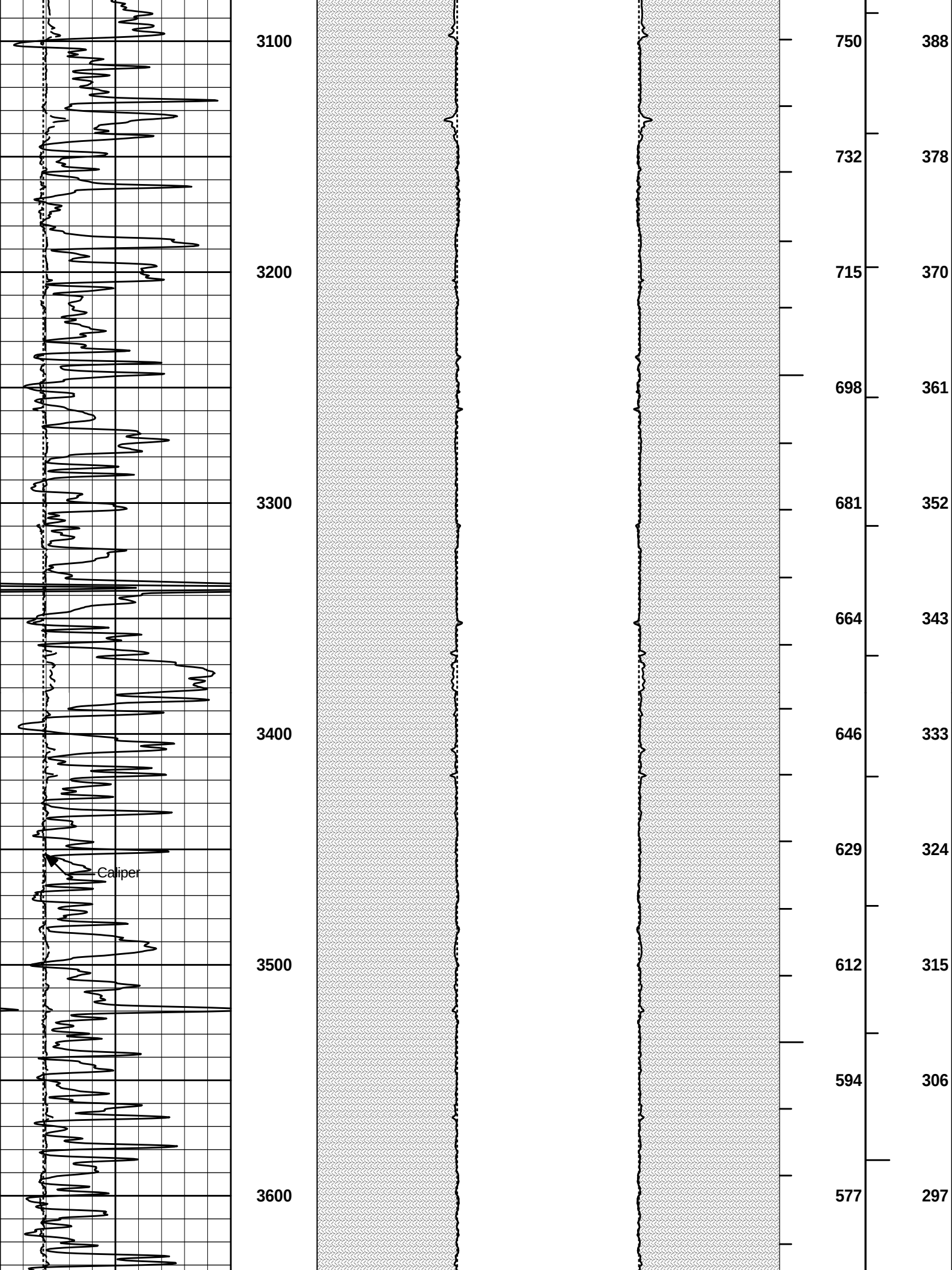
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3500
3600
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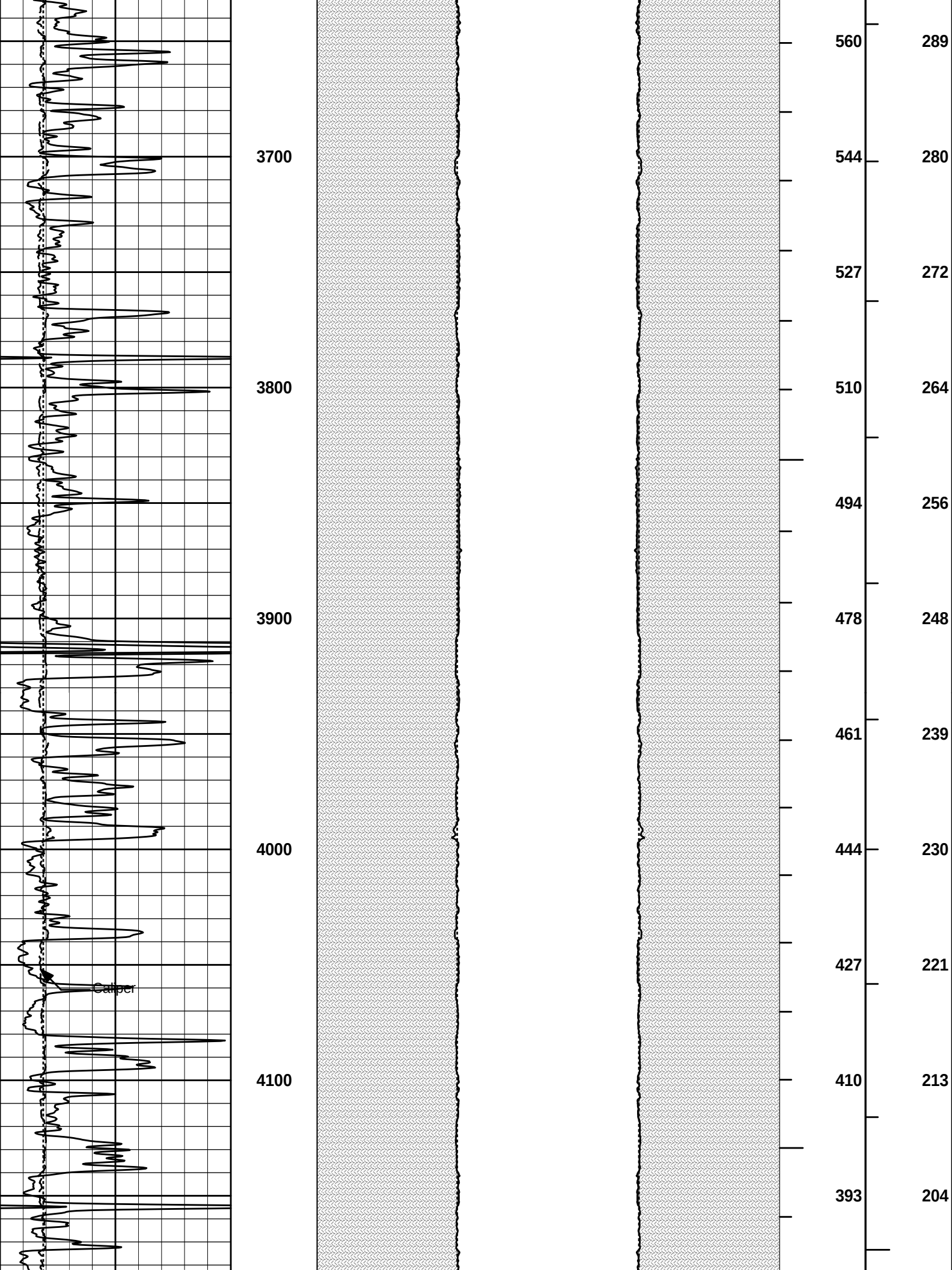
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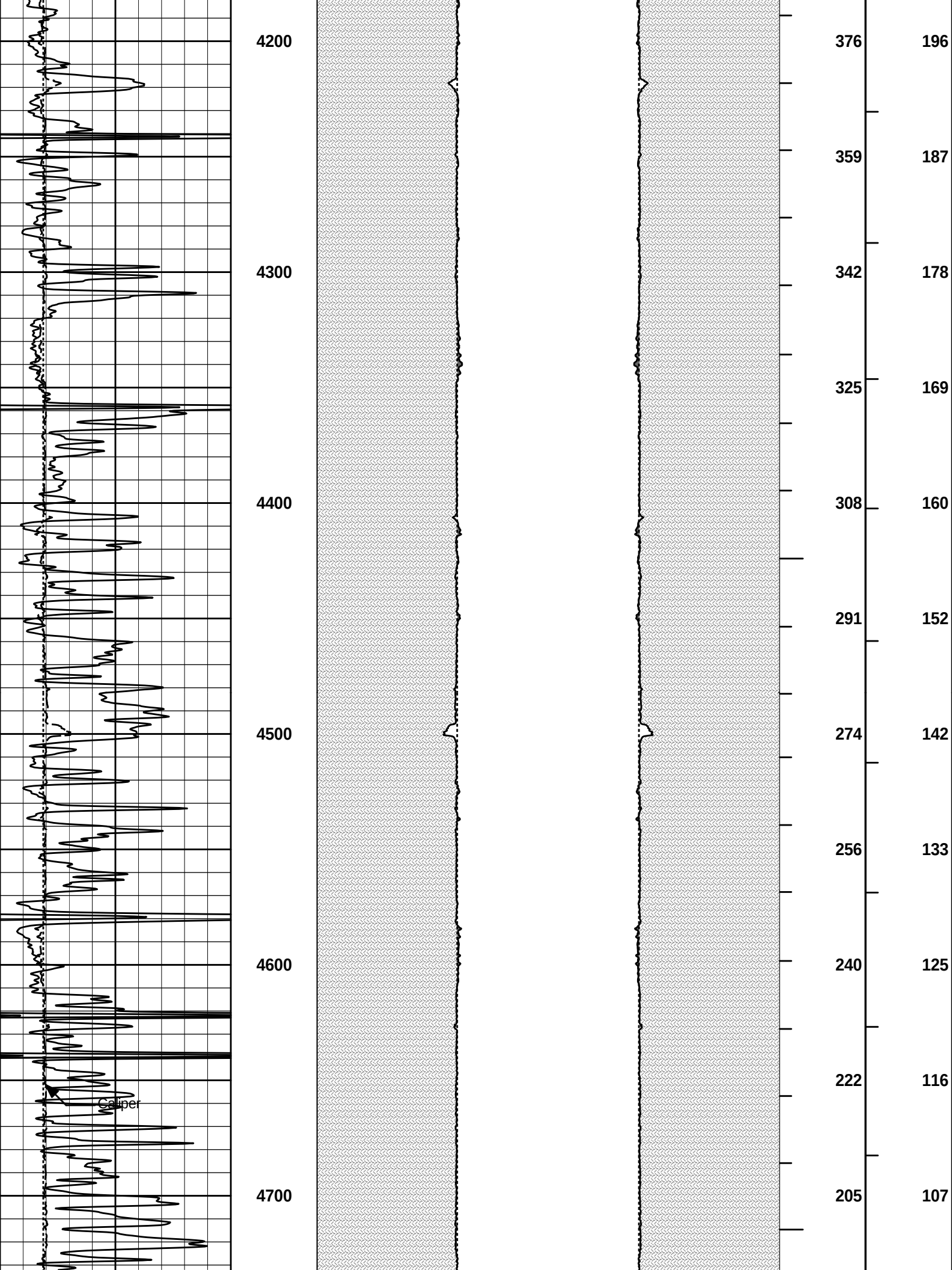
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4700
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359
342
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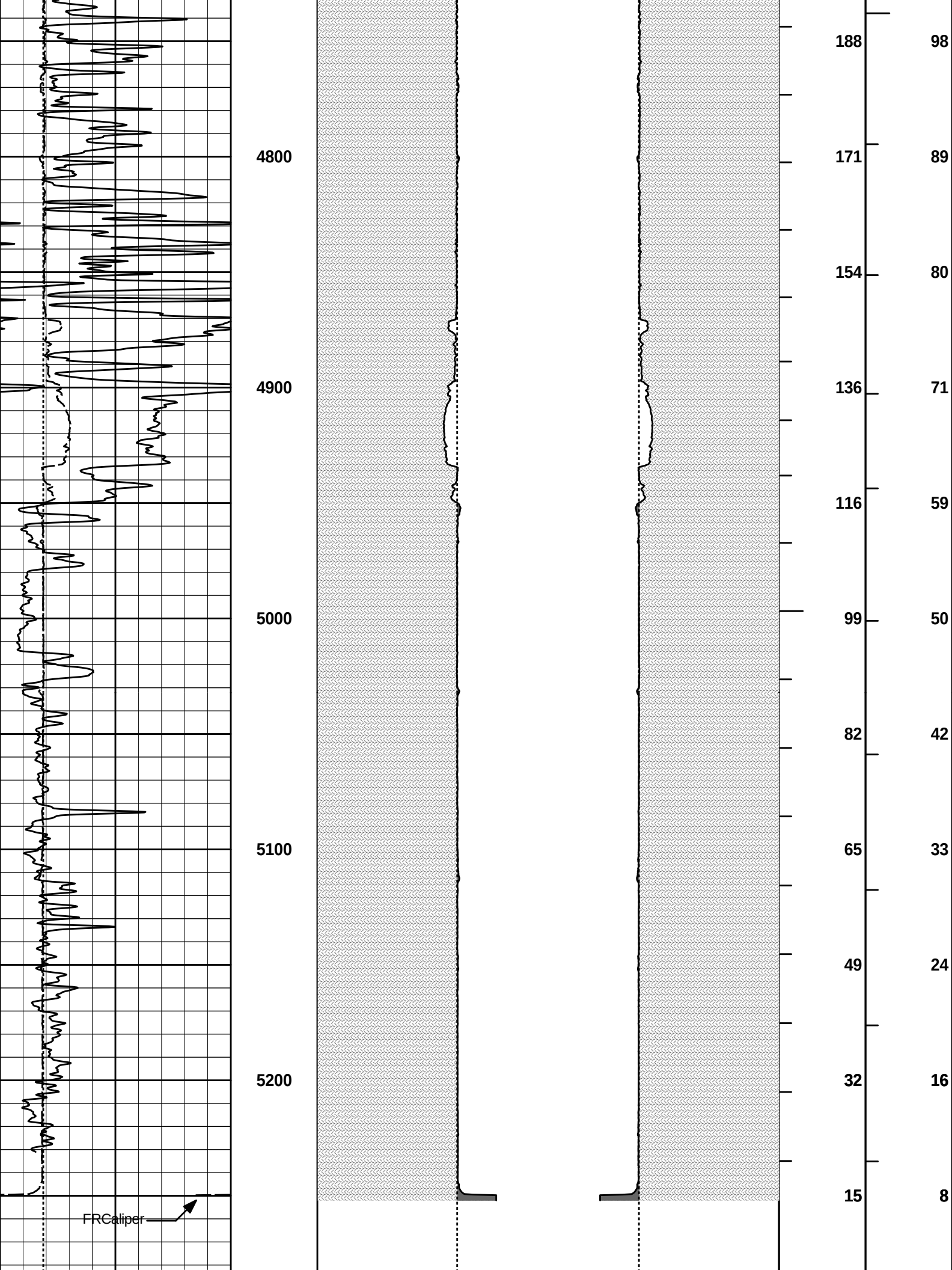
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8
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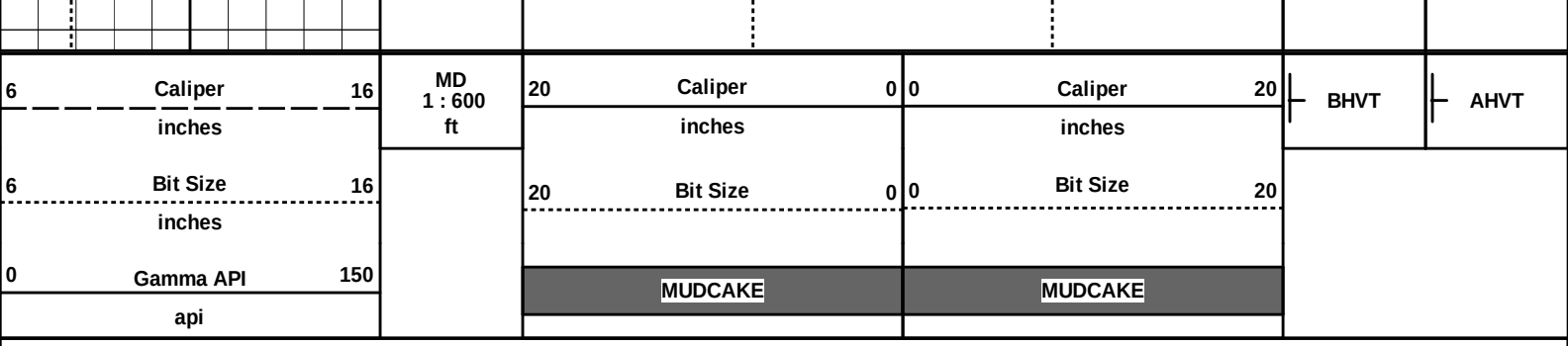

HALLIBURTON

Plot Time: 02-Oct-13 00:32:31
Plot Range: 1630 ft to 5295.5 ft
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Plot File: \\-LOCAL-\DRUSSEL_E-3\0001 SP-GTET-DSN-SDL-FLEX-BSAT-ACRT-BN\PORO\AHV_2_IQ_LIB

ANNULAR HOLE VOLUME PLOT

COMPANY	**OXY USA INC.**
WELL	**DRUSSEL E-3**
FIELD	**HUGOTON GAS AREA**
COUNTY	**FINNEY** STATE **KANSAS**

HALLIBURTON

SPECTRAL DENSITY
DUAL SPACED NEUTRON
LOG