

# HALLIBURTON

## DUAL SPACED NEUTRON SPECTRAL DENSITY LOG

COMPANY		MERIT ENERGY	
WELL		ELLIOT D-1	
FIELD/BLOCK		HUGOTON GAS AREA	
COUNTY		HASKELL	
STATE		KANSAS	
Permanent Datum	GL	Elev. 2980.0 ft	
Log measured from	KB		
Drilling measured from	KB	15.0 ft above perm. Datum	
Date	08-Jun-14		
Run No.	ONE		
Depth - Driller	5664.00 ft		
Depth - Logger	5647.0 ft		
Bottom - Logged Interval	5603		
Top - Logged Interval	3700		
Casing - Driller	8.625 in @ 1766.0 ft		
Casing - Logger	1706.0 ft		
Bit Size	7.875 in		
Type Fluid in Hole	Water Based Mud		
Density	9.1 ppq	33.00 s/qt	
PH	10.00 pH	10.0 cpm	
Source of Sample	MUD PIT		
Rm @ Meas. Temperature	0.480 ohmm @ 90.00 degF		
Rmf @ Meas. Temperature	0.41 ohmm @ 90.00 degF		
Rmc @ Meas. Temperature	0.540 ohmm @ 90.00 degF		
Source Rmf	Rmc	CALCULATED	CALCULATED
Rm @ BHT	0.31 ohmm @ 144.0 degF		
Time Since Circulation	13.5000 hr		
Time on Bottom	08-Jun-14 05:56		
Max. Rec. Temperature	144.0 degF @ 5647.0 ft		
Equipment	11230668 LIBERAL		
Recorded By	SHELDON INGERSOLL		
Witnessed By	J. BALLEW	A. GARNER	

Fold here

Service Ticket No.: 9011411179		API Serial No.: 15081220650000		PGM Version: WL INSITE R4.2.0 (Build 2)			
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				RESISTIVITY EQUIPMENT DATA			
Rm @ Meas. Temp	@	@		Run No.	Tool Type & No.	Pad Type	Tool Pos.
Rmf @ Meas. Temp.	@	@		ONE	ACRT	N/A	CENT
Rmc @ Meas. Temp.	@	@			10800784		
Source Rmf	Rmc						
Rm @ BHT	@	@					
Rmf @ BHT	@	@					
Rmc @ BHT	@	@					
EQUIPMENT DATA							
GAMMA		ACOUSTIC		DENSITY		NEUTRON	
Run No.	ONE	Run No.	ONE	Run No.	ONE	Run No.	ONE
Serial No.	10748374	Serial No.	10747684	Serial No.	10673790	Serial No.	10735145
Model No.	GTET	Model No.	BSAT	Model No.	SDLT	Model No.	DSNT
Diameter	3.625"	No. of Cent.	2	Diameter	5.3"	Diameter	3.625"
Detector Model No.	T-102	Spacing	.5'	Log Type	GAM-GAM	Log Type	NEU-NEU
Type	SCINT			Source Type	CS-137	Source Type	AM-241BE
Length	8"	LSA [Y/N]		Serial No.	5073GW	Serial No.	DSN-436
Distance to Source	N/A	FWDA [Y/N]		Strength	1.5 CI	Strength	15 CI
LOGGING DATA							

GENERAL			GAMMA		ACOUSTIC		DENSITY			NEUTRON				
Run No.	Depth		Speed	Scale		Scale		Matrix	Scale		Matrix	Scale		Matrix
	From	To	ft/min	L	R	L	R		L	R		L	R	
ONE	5647	1706	REC	0	150	30	-10	47.6 us/ft	30	-10	2.71 gm/cc	30	-10	LIME

DIRECTIONAL INFORMATION

Maximum Deviation @ KOP @

Remarks: ANNULAR HOLE VOLUME CALCULATED FOR 5.5 INCH CASING.  
 CHLORIDES REPORTED AT 11000 mg/L.

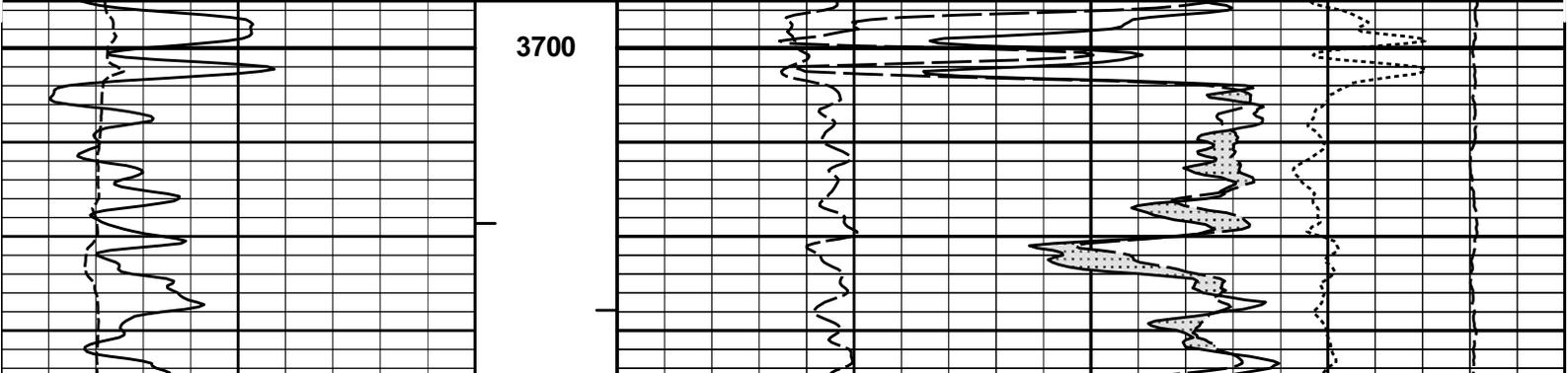
HALLIBURTON DOES NOT GUARANTEE THE ACCURACY OF ANY INTERPRETATION OF THE LOG DATA, CONVERSION OF LOG DATA TO PHYSICAL ROCK PARAMETERS OR RECOMMENDATIONS WHICH MAY BE GIVEN BY HALLIBURTON PERSONNEL OR WHICH APPEAR ON THE LOG OR IN ANY OTHER FORM. ANY USER OF SUCH DATA, INTERPRETATIONS, CONVERSIONS, OR RECOMMENDATIONS AGREES THAT HALLIBURTON IS NOT RESPONSIBLE EXCEPT WHERE DUE TO GROSS NEGLIGENCE OR WILLFUL MISCONDUCT, FOR ANY LOSS, DAMAGES, OR EXPENSES RESULTING FROM THE USE THEREOF.

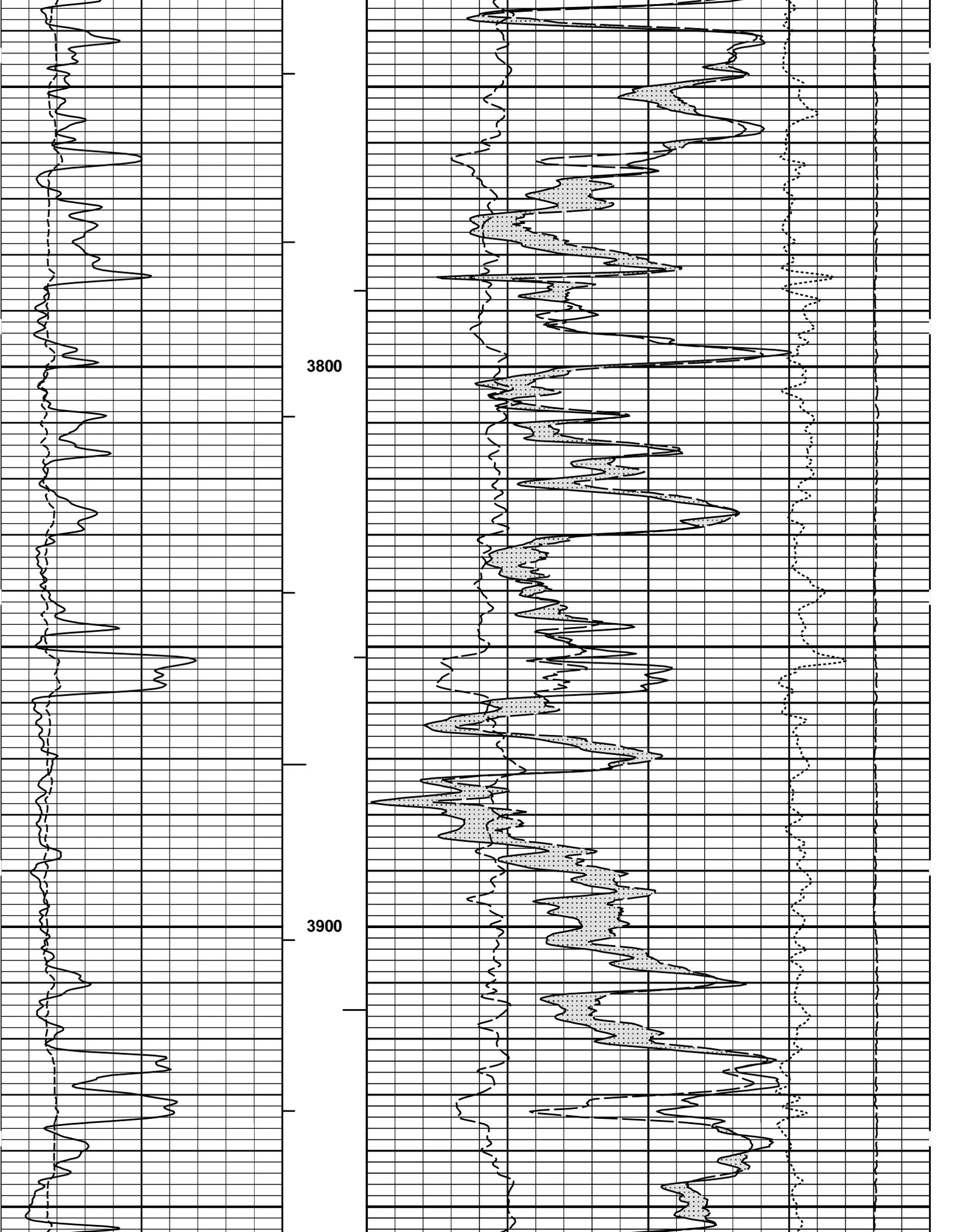
HALLIBURTON

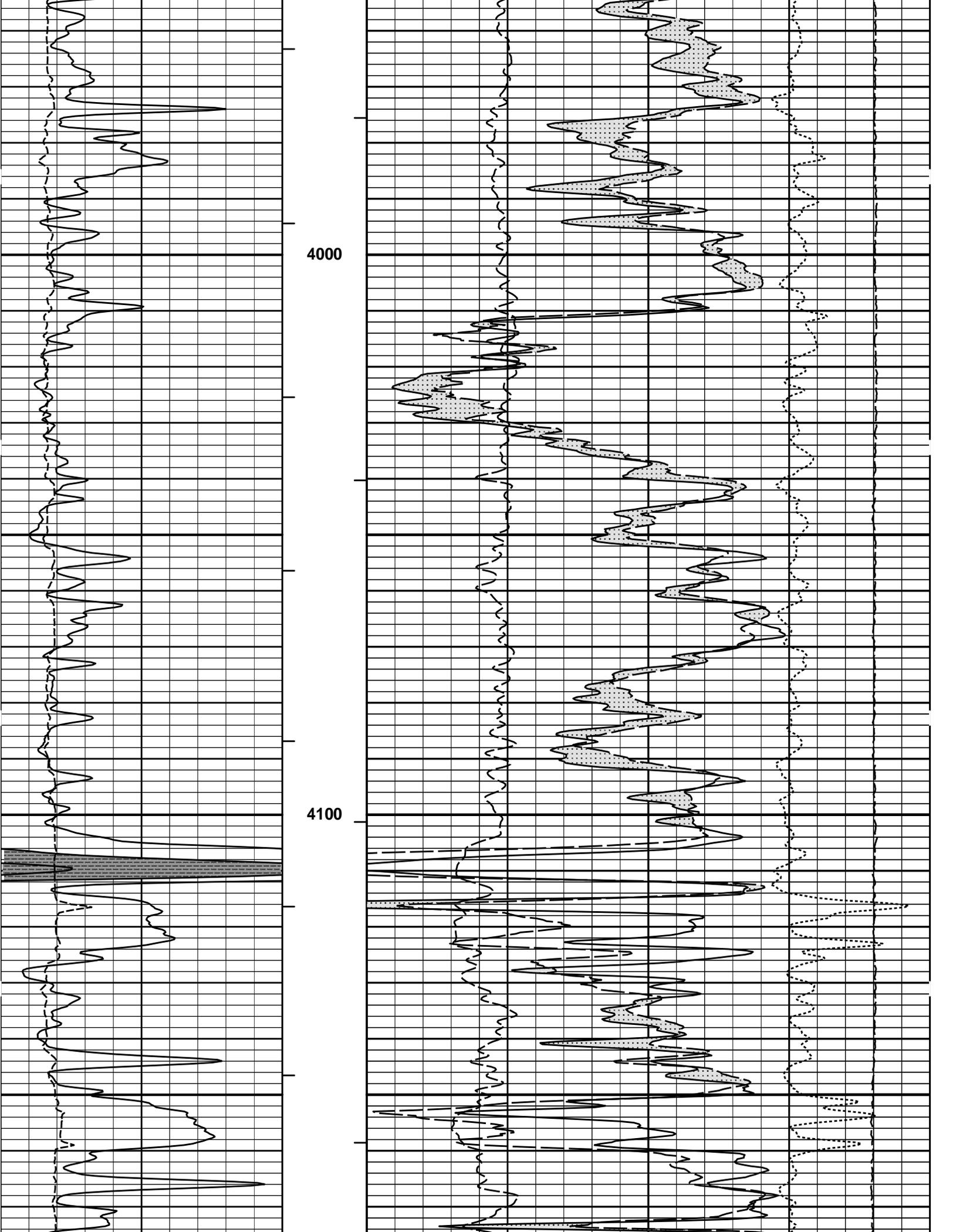
**HALLIBURTON** Plot Time: 08-Jun-14 07:34:21  
 Plot Range: 3695 ft to 5648.25 ft  
 Data: ELLIOT\_D-1\Well Based\R1 DETAIL\  
 Plot File: \\POROSITY\Poro\_IQ\_5\_MAIN\_LIB

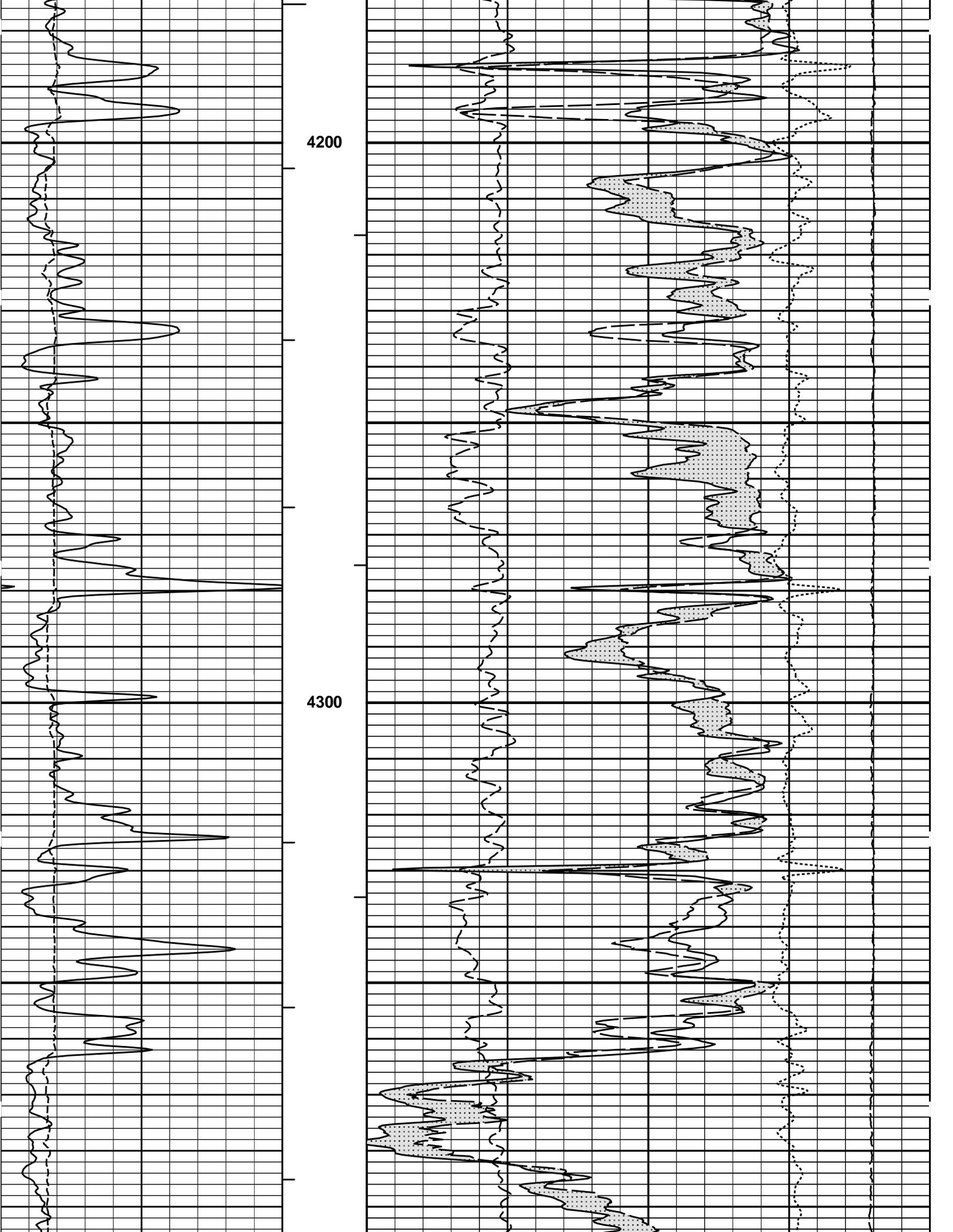
## 5 INCH MAIN LOG

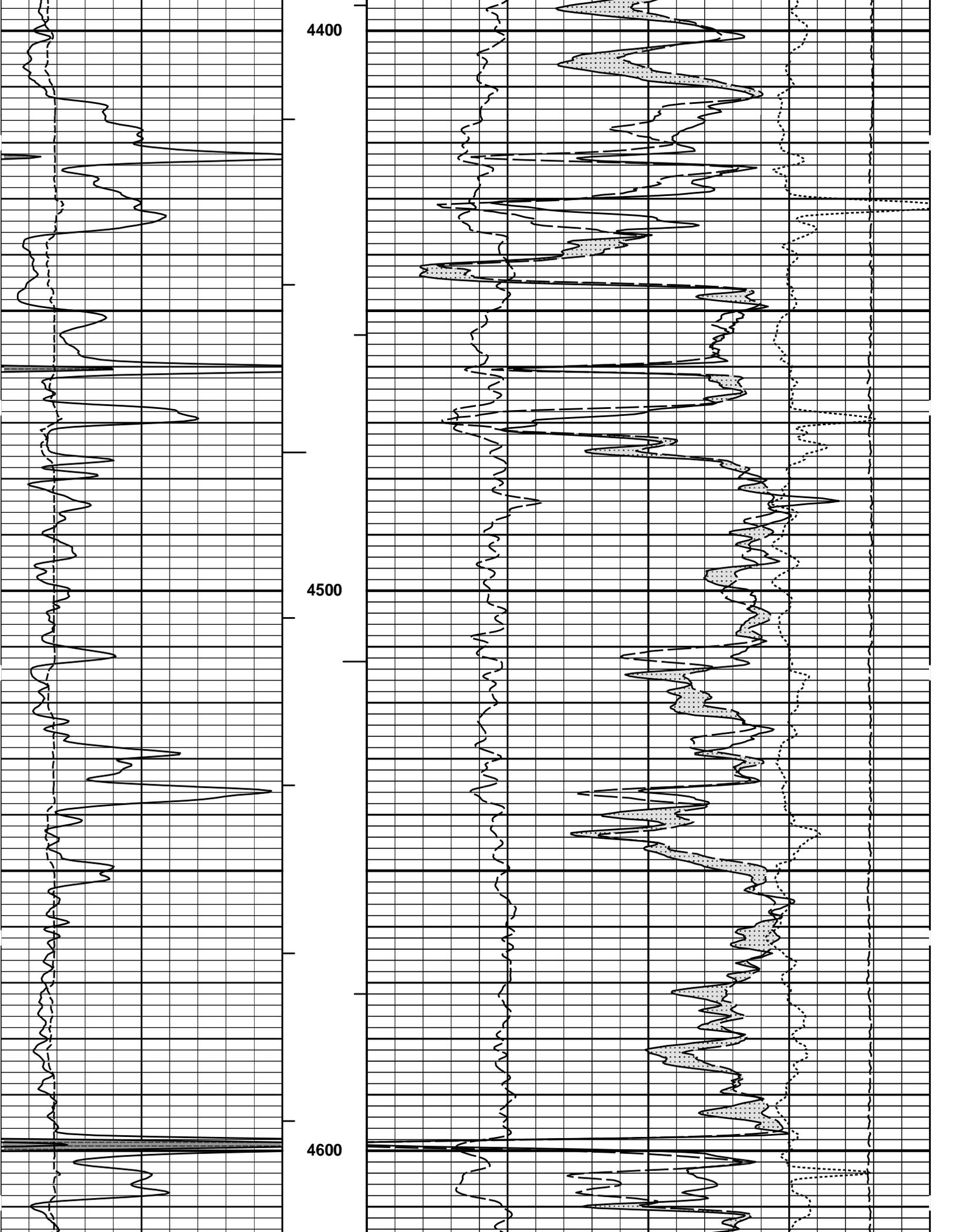
		CROSSOVER			
		30	Neutron Porosity		-10
		%			
		30	Density Porosity		-10
		%			
SHALE		0	Gamma API	150	AHVT
		api		15K	Tension
				pounds	0
6	Caliper	0	Pe	10	-0.25
		16	inches	MD	0.25
		1 : 240			DensityCorr
		ft			gram per cc

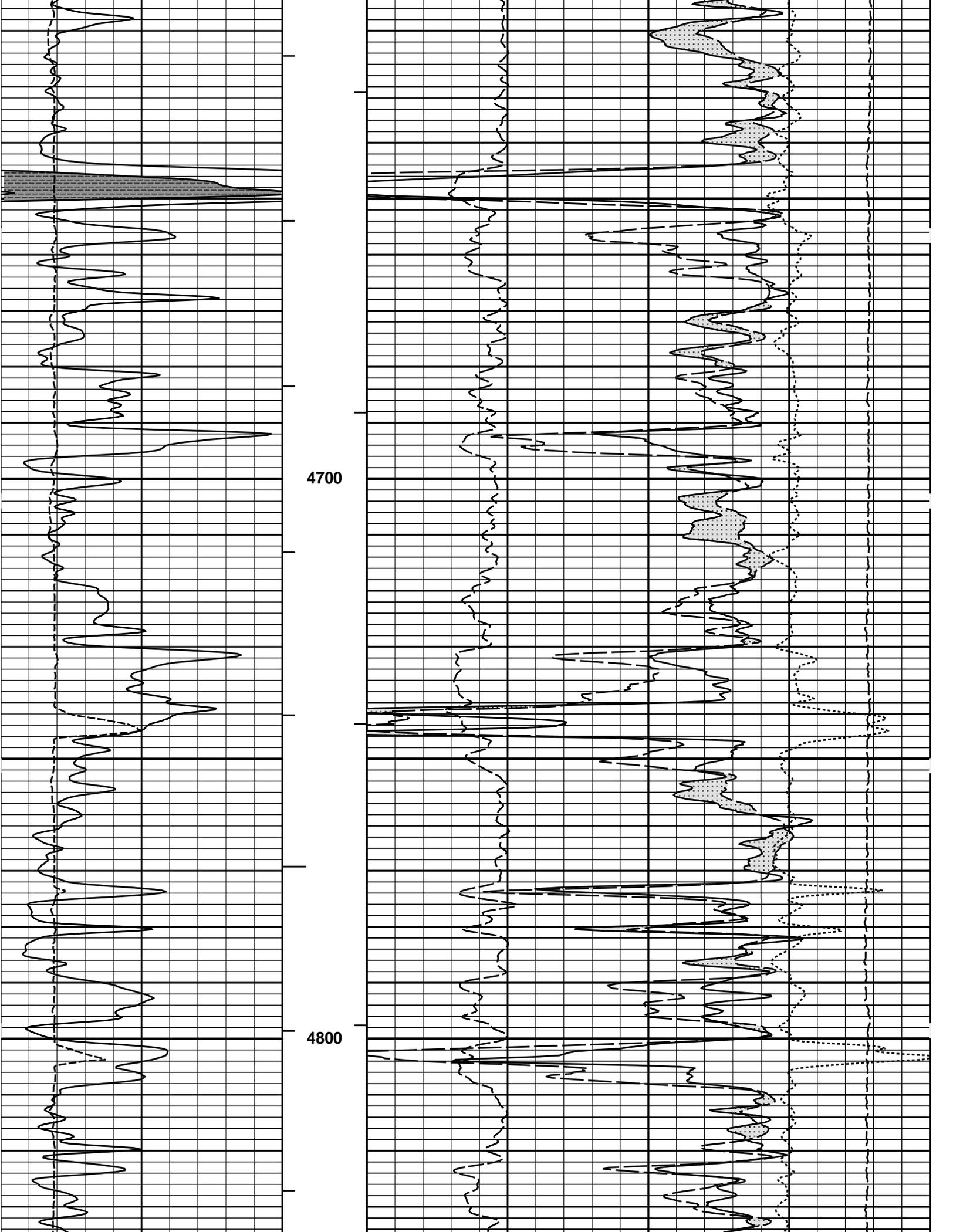


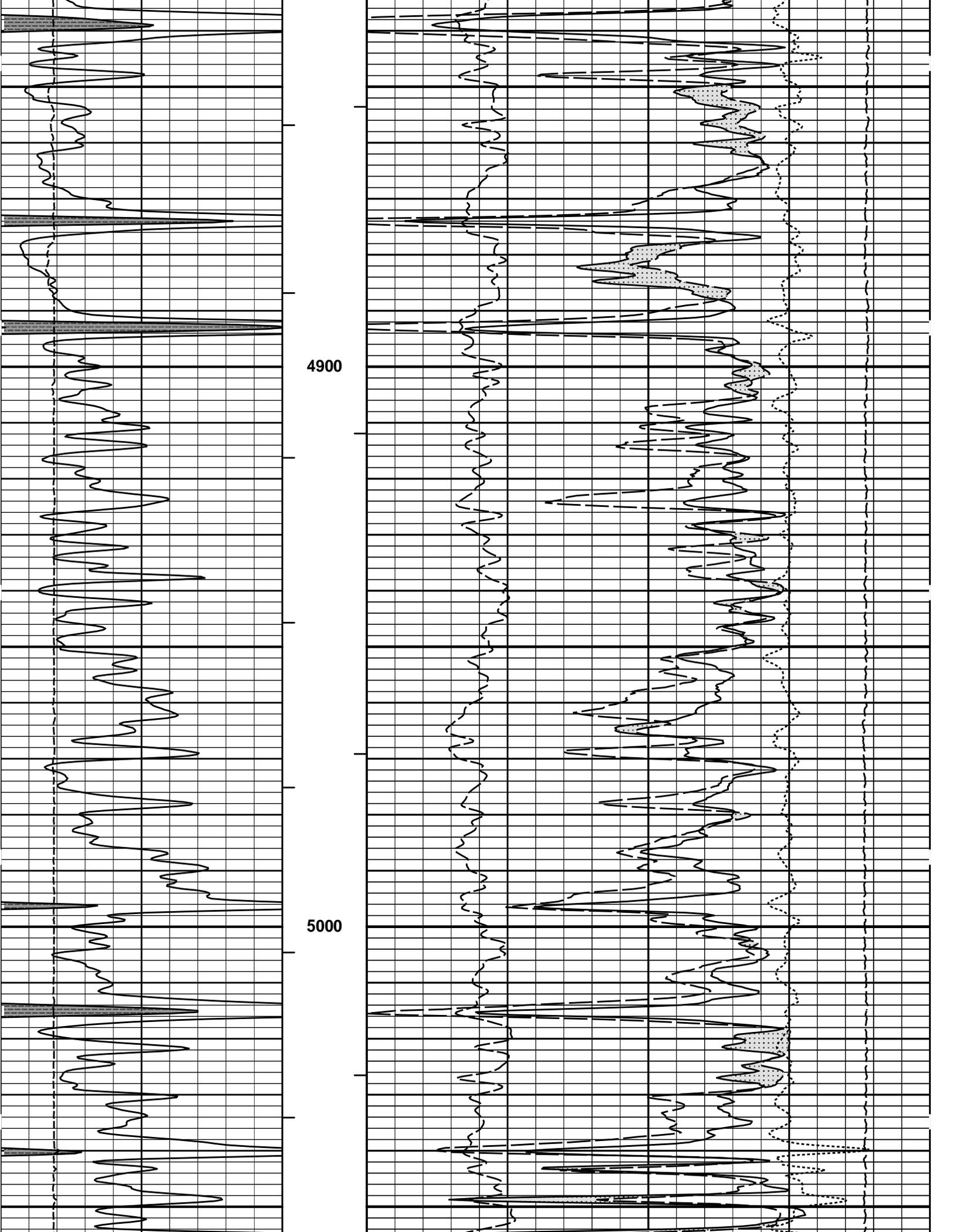


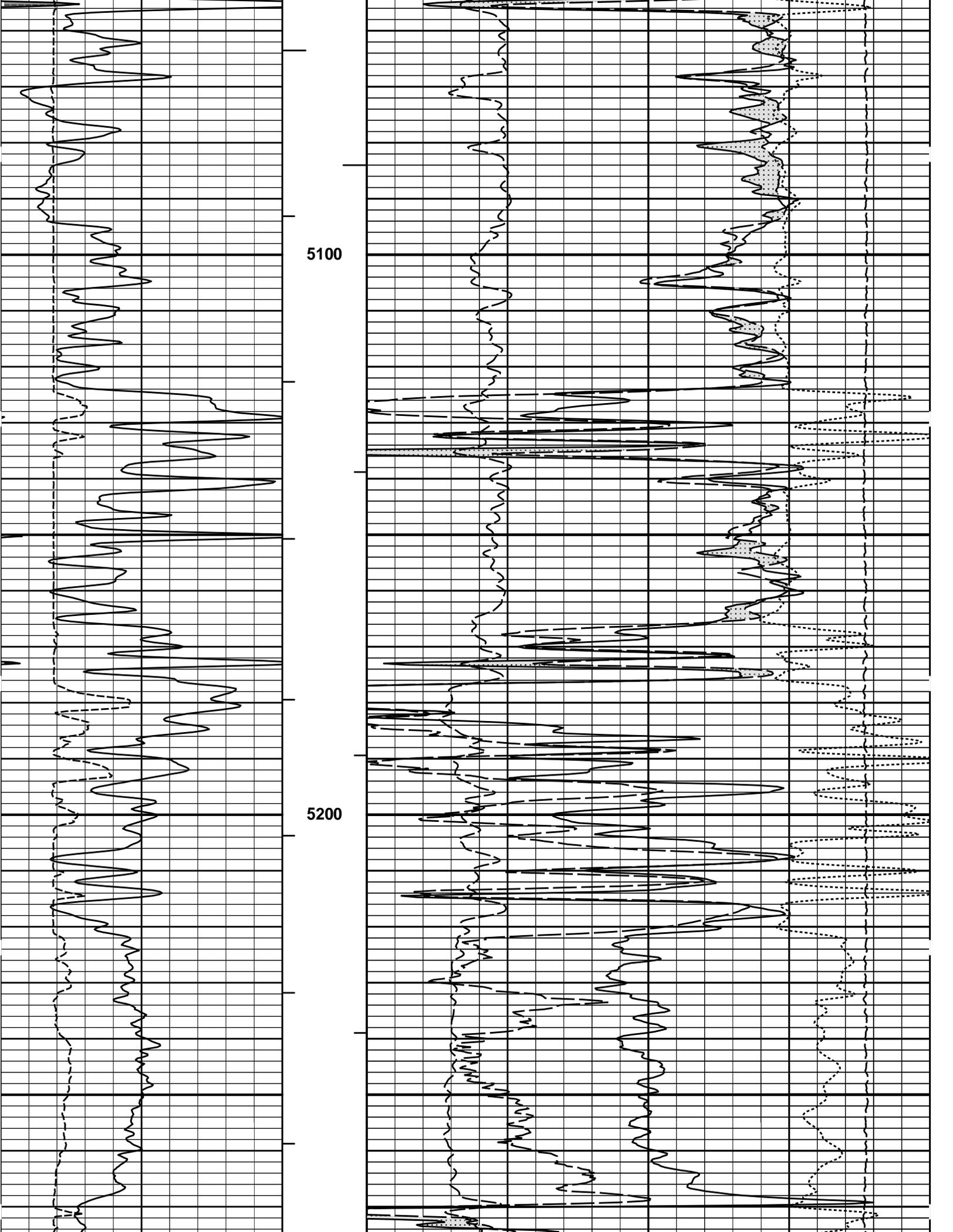


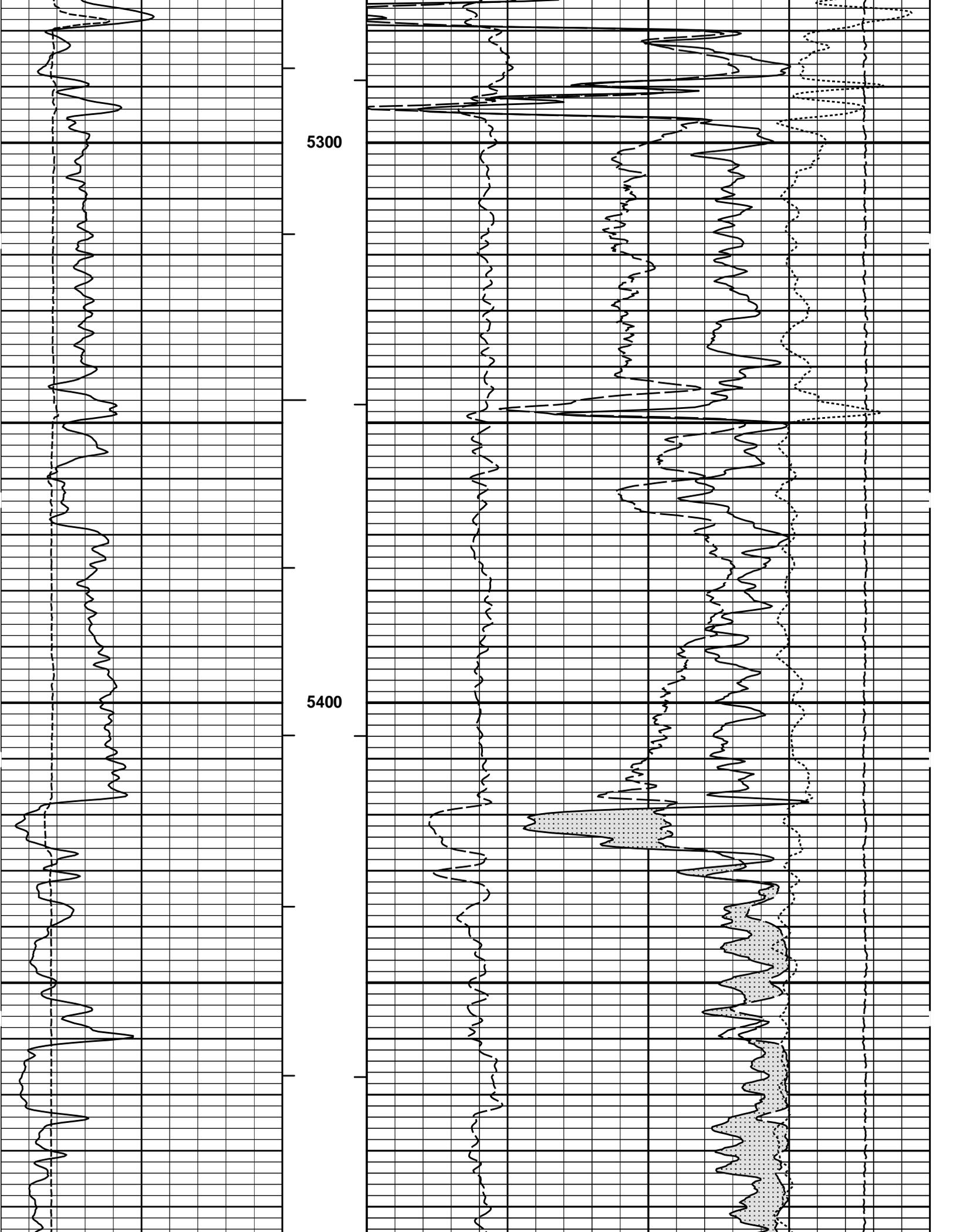


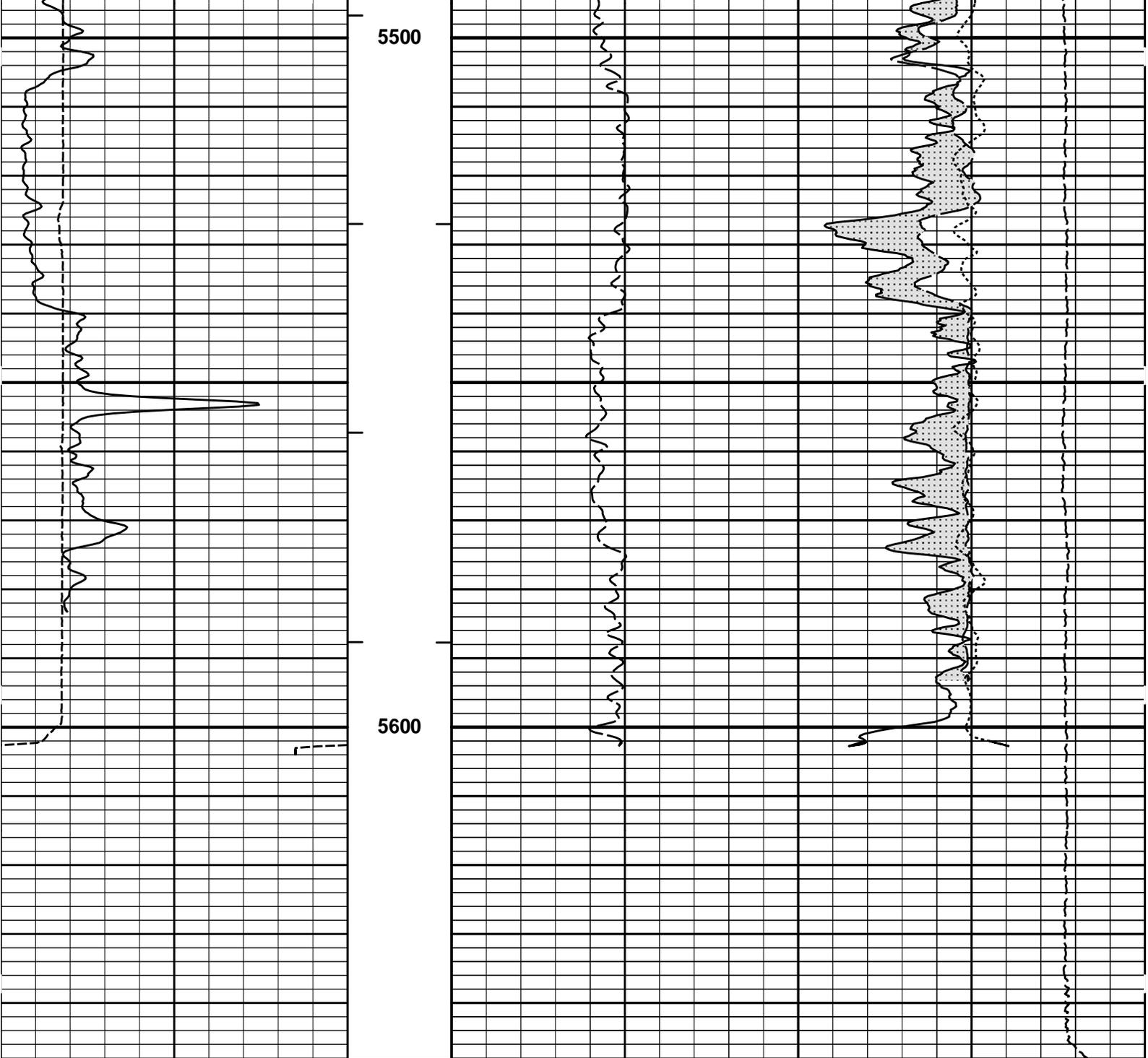












6	Caliper	16	MD	0	Pe	10	-0.25	DensityCorr	0.25
	inches		1 : 240					gram per cc	
0	Gamma API	150	AHVT				15K	Tension	0
	api							pounds	
	SHALE		BHVT	30	DensityPorosity				-10
					%				
				30	Neutron Porosity				-10
					%				
					CROSSOVER				

**HALLIBURTON**

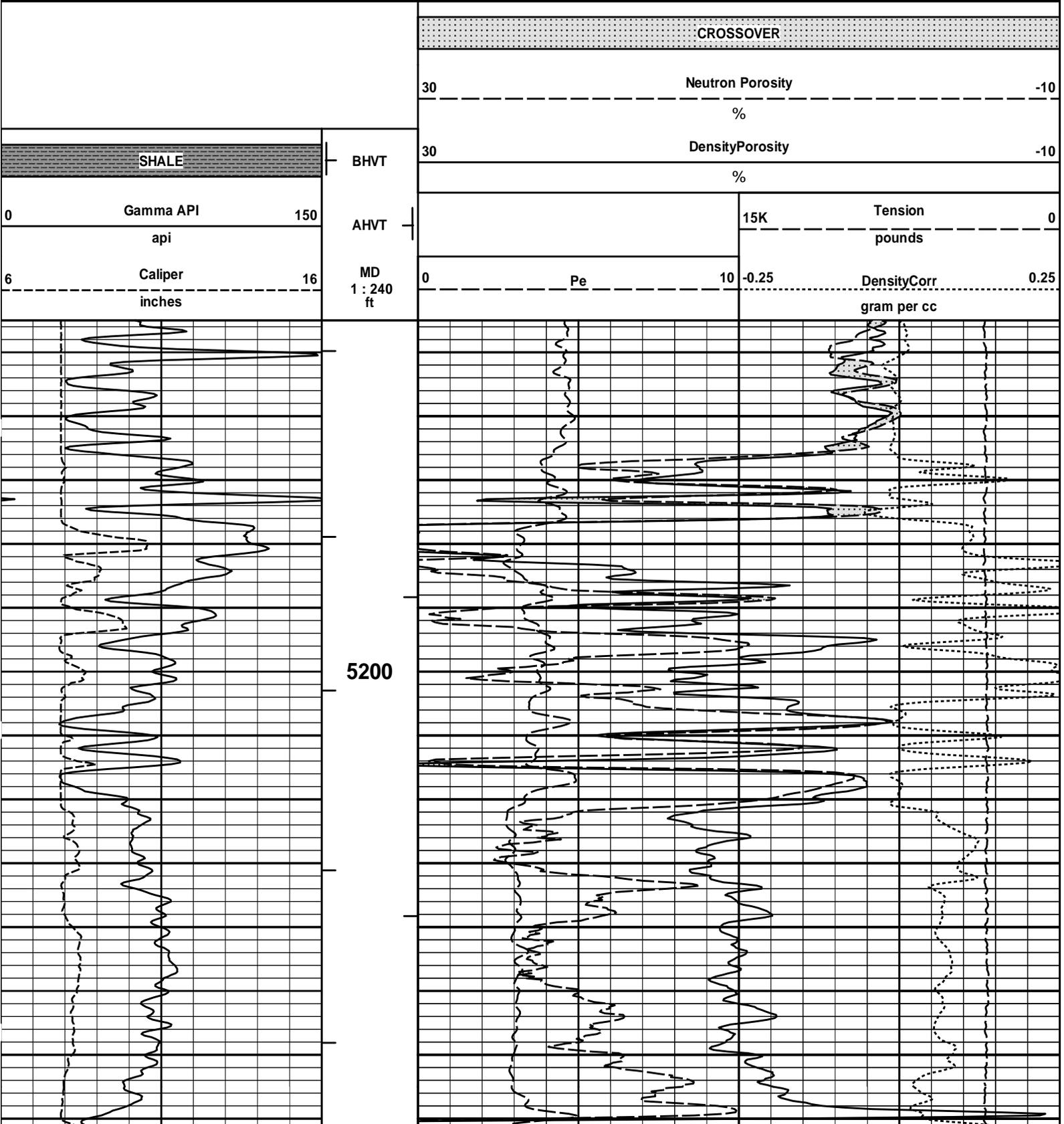
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 Plot Range: 3695 ft to 5648.25 ft  
 Data: ELLIOT\_D-1\Well Based\R1 DETAIL\  
 Plot File: \\POROSITY\Porosity\_IQ\_5\_MAIN\_LIB

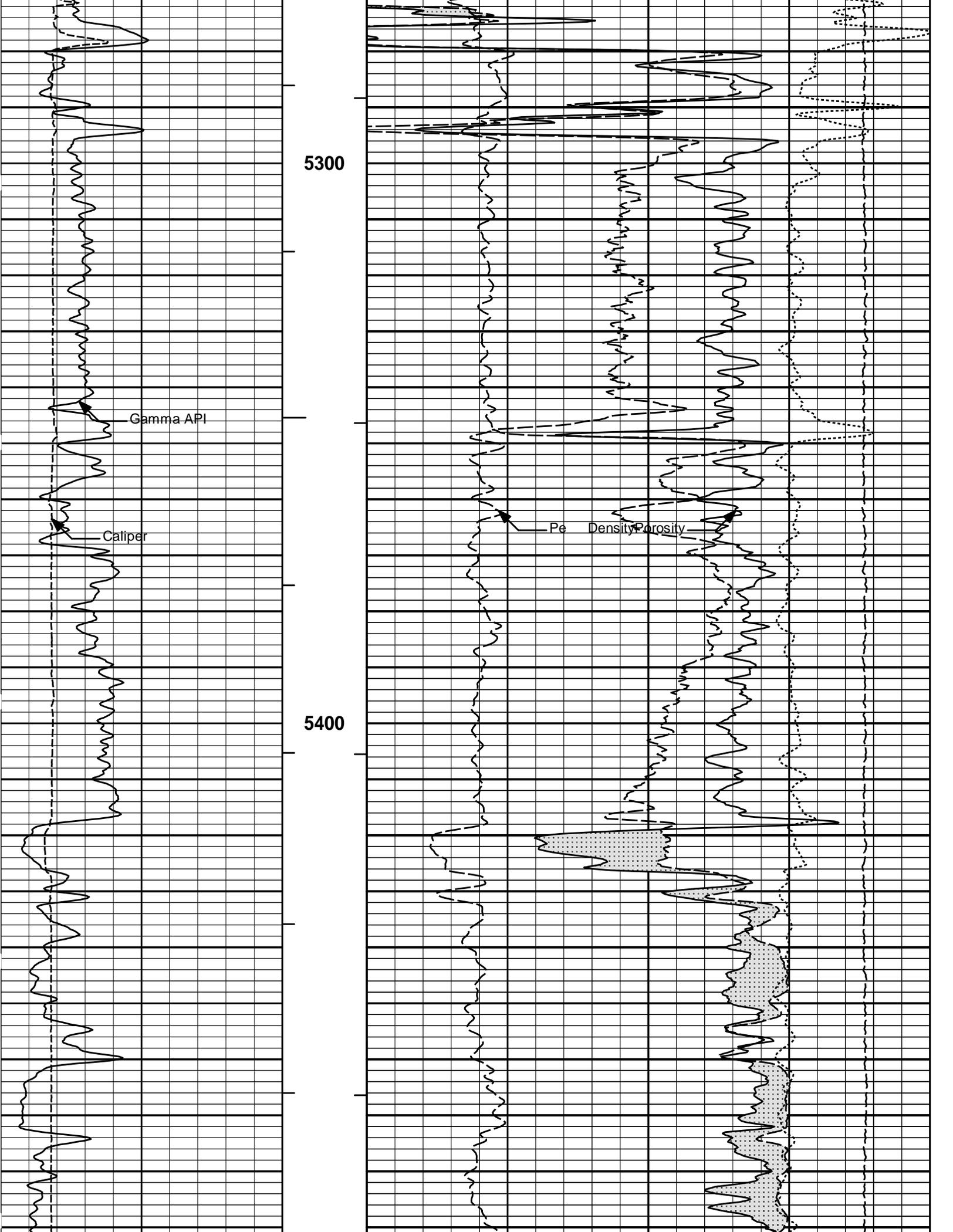
# 5 INCH MAIN LOG

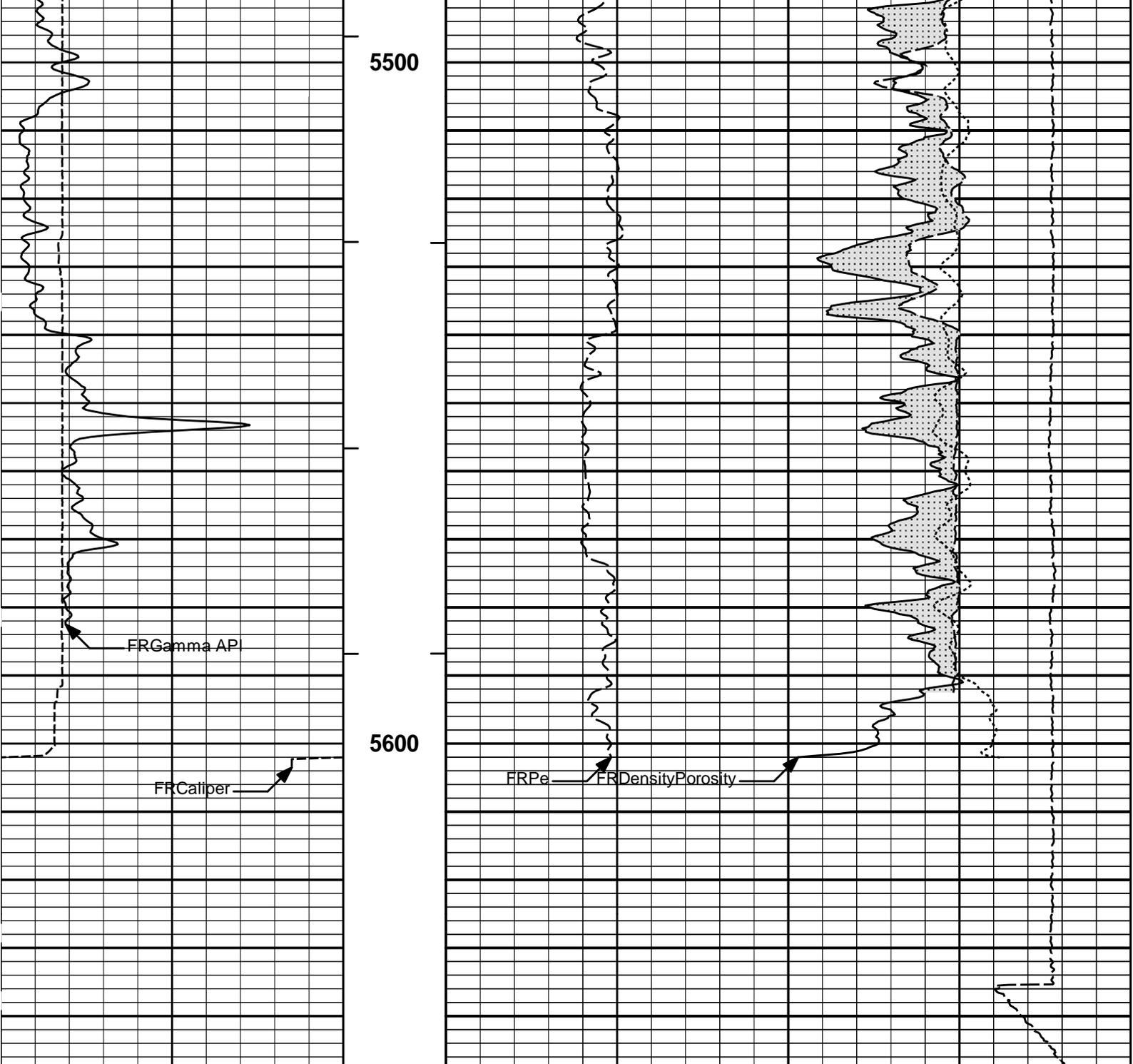
**HALLIBURTON**

Plot Time: 08-Jun-14 07:34:24  
 Plot Range: 5145 ft to 5647.33 ft  
 Data: ELLIOT\_D-1\Well Based\R1 REPEAT\  
 Plot File: \\POROSITY\Porosity\_IQ\_5\_REP\_LIB

## REPEAT SECTION







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

**HALLIBURTON**

Plot Time: 08-Jun-14 07:34:26  
 Plot Range: 5145 ft to 5647.33 ft  
 Data: ELLIOT\_D-1\Well Based\R1 REPEAT\  
 Plot File: \\POROSITY\Poro\_IQ\_5\_REP\_LIB

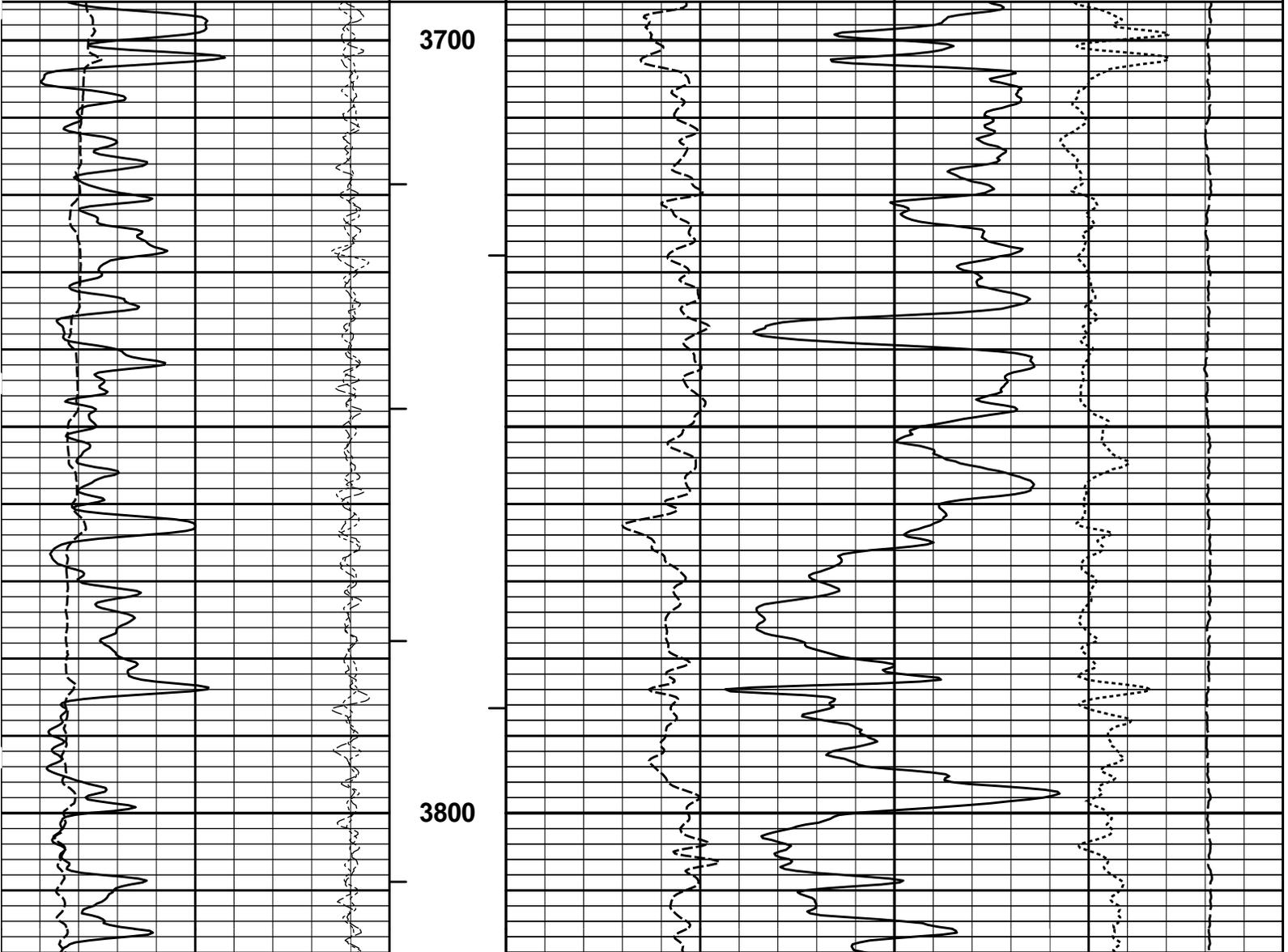
# REPEAT SECTION

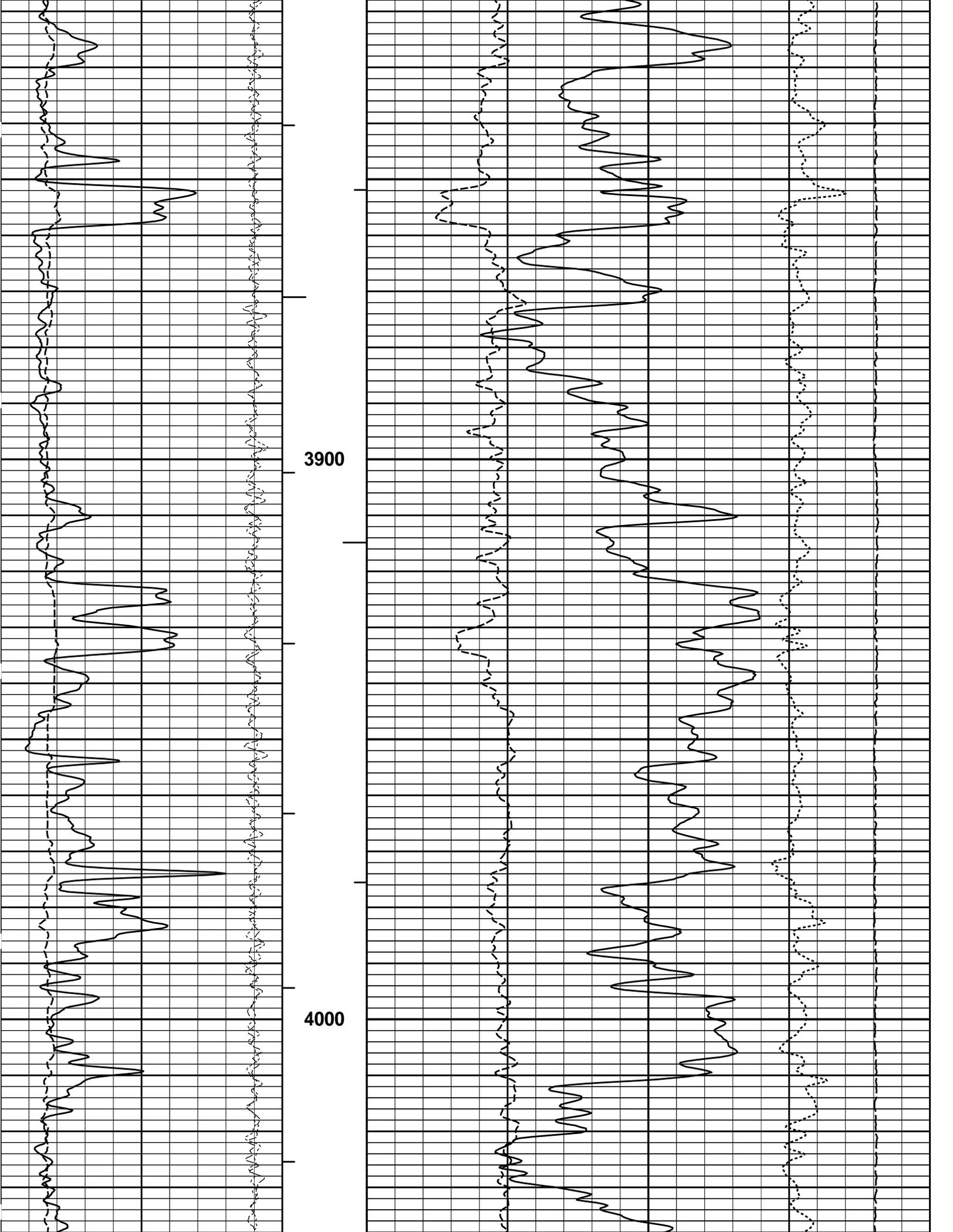
**HALLIBURTON**

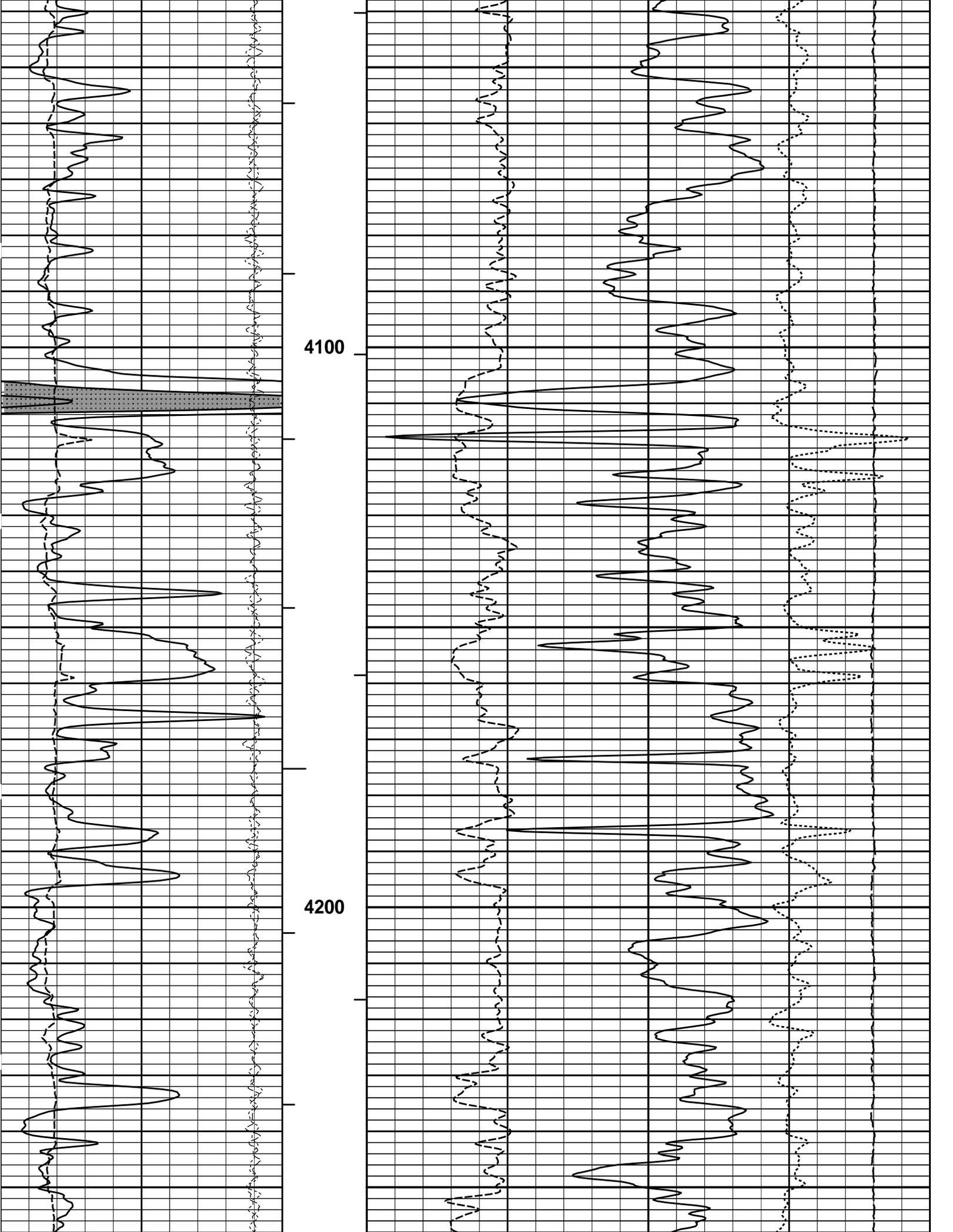
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 Plot Range: 3695 ft to 5648.25 ft  
 Data: ELLIOT\_D-1Well BasedR1 DETAIL\  
 Plot File: \\-LOCAL-IPOROSITY\BULKD\_5\_MAIN\_LIB

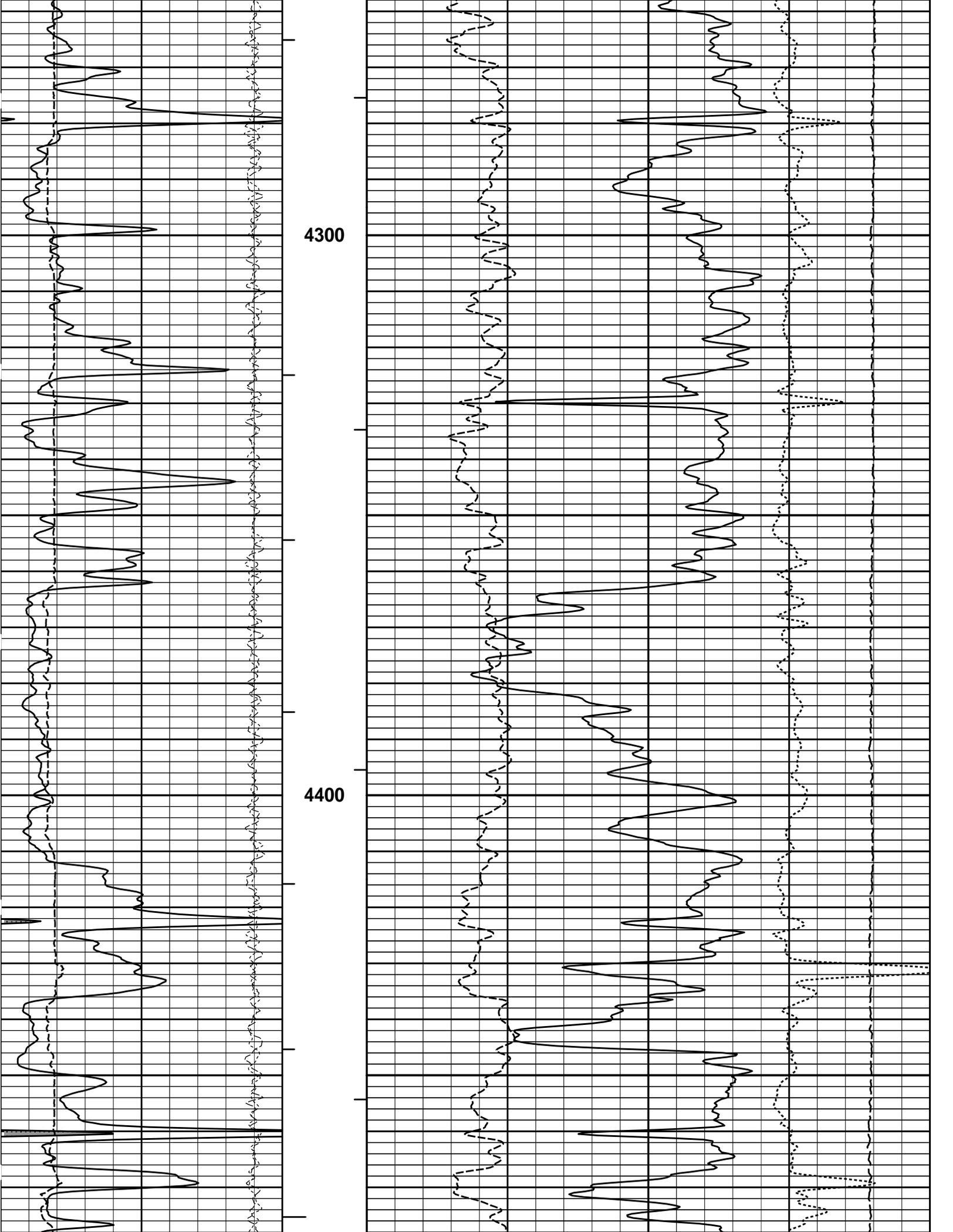
## 5 INCH MAIN LOG

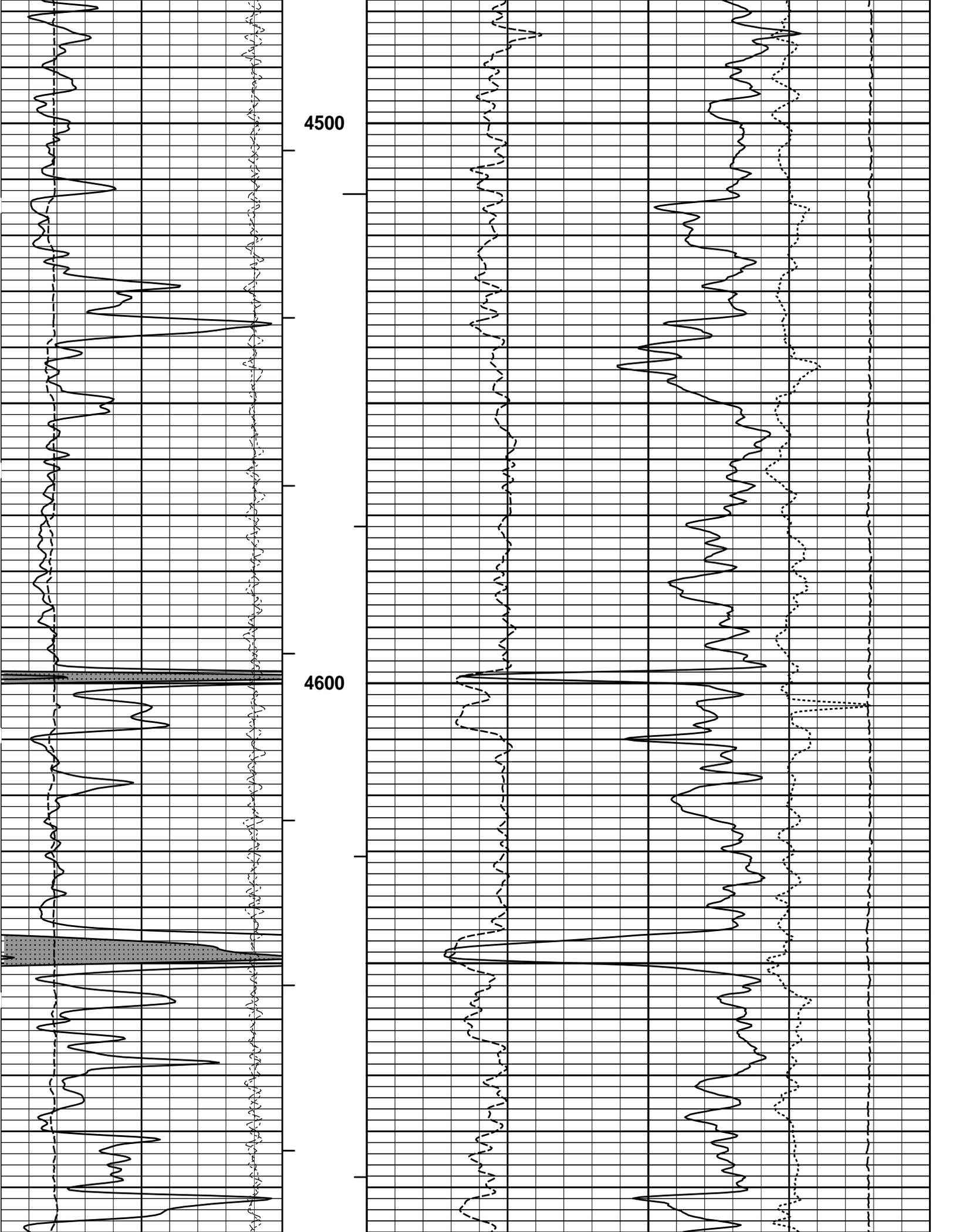
SHALE			
0	Gamma Ray api	150	
18	FarQuality	-2	BHV ft3
			Bulk Density g/cc
-18	NearQuality	2	AHV ft3
			15K Tension pounds
6	Caliper inches	16	MD 1 : 240 ft
			Pe
			DensityCorr g/cc

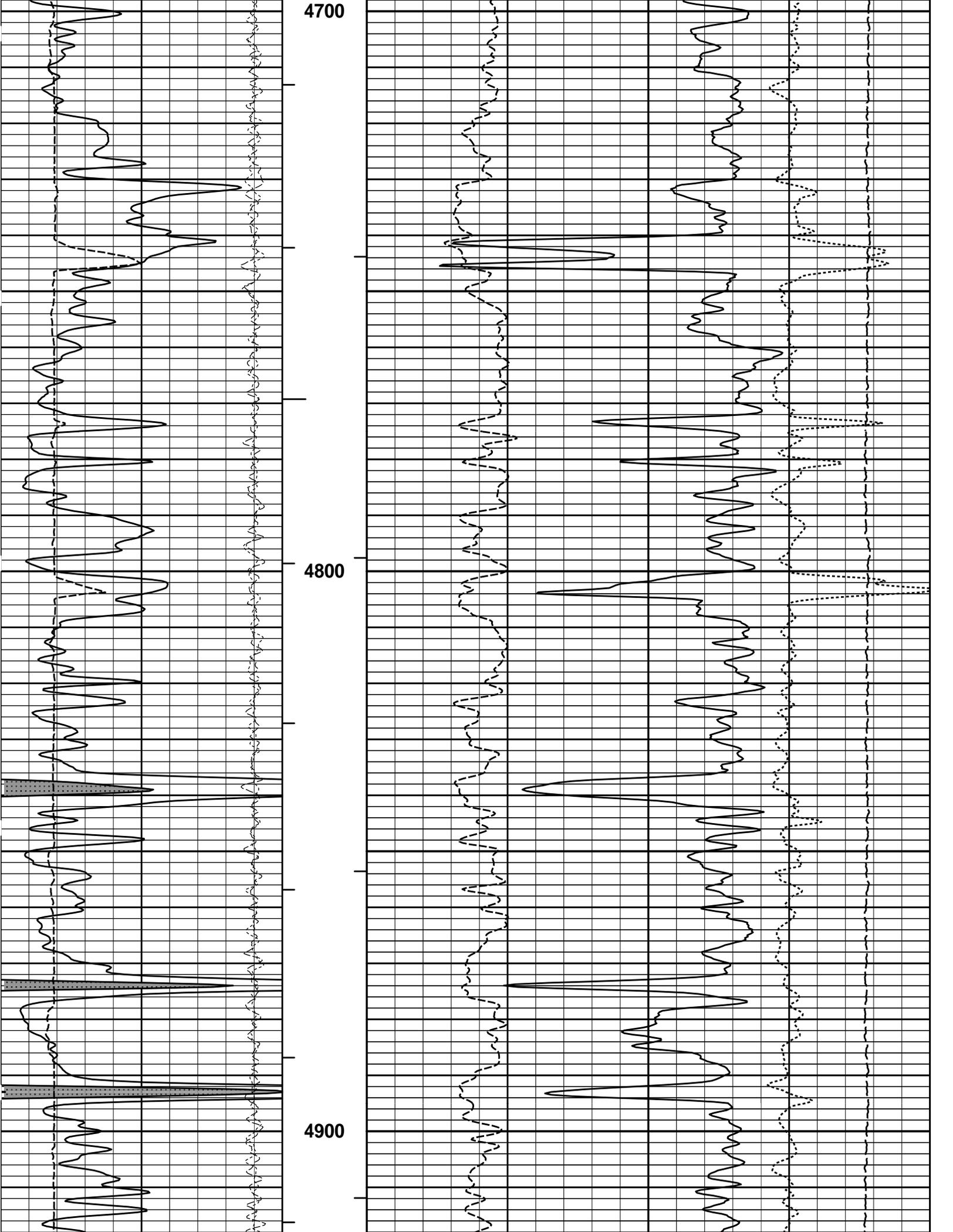


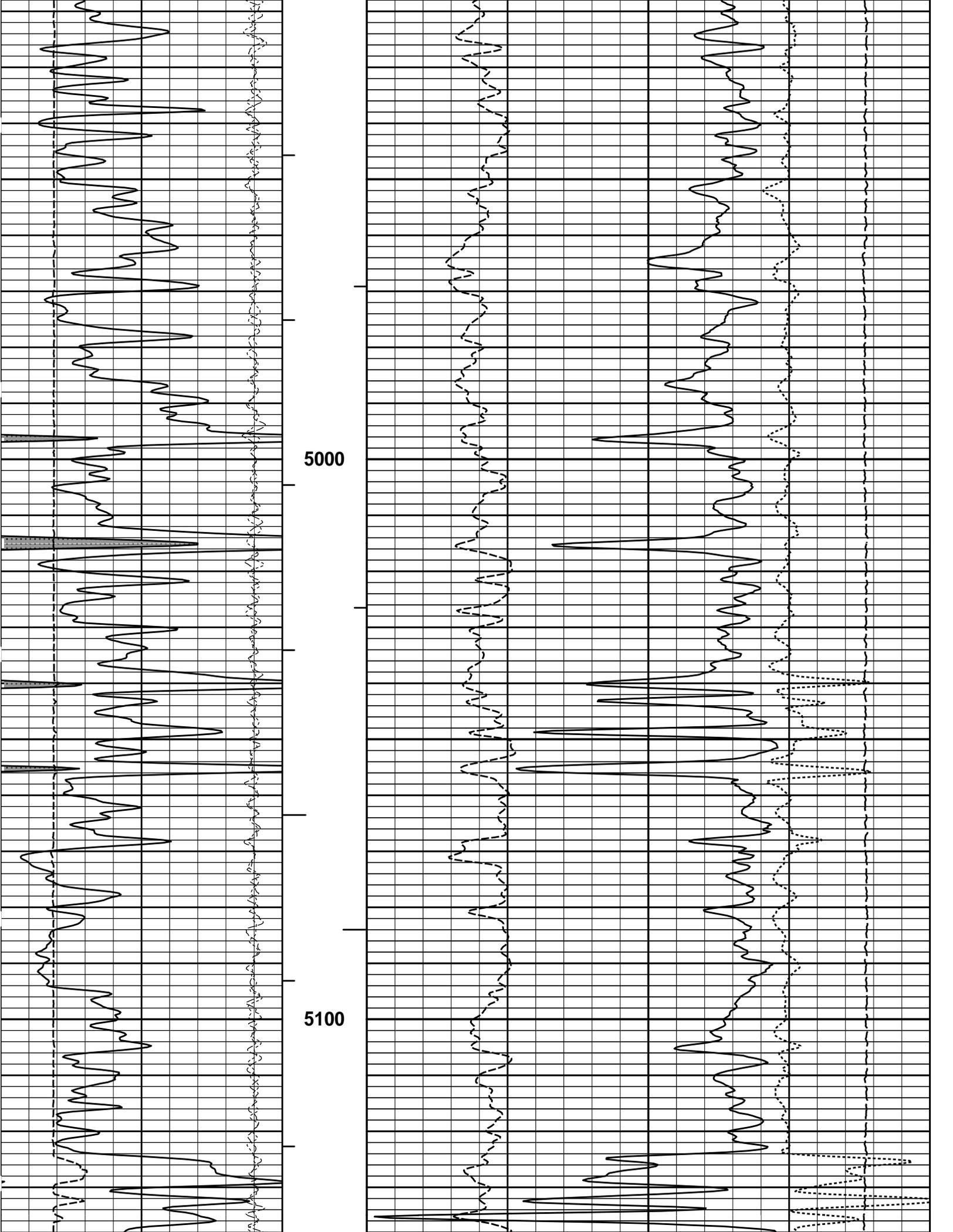


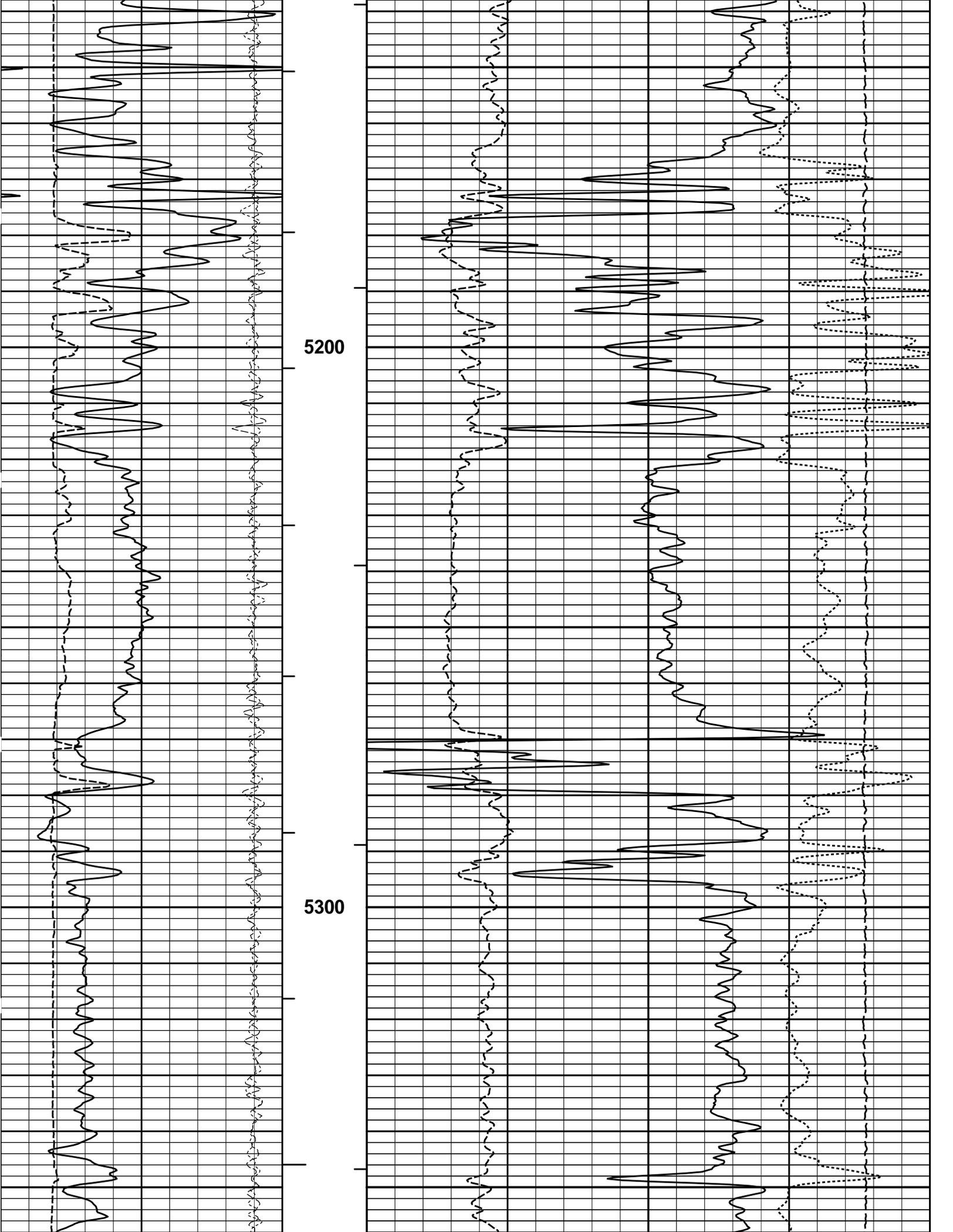


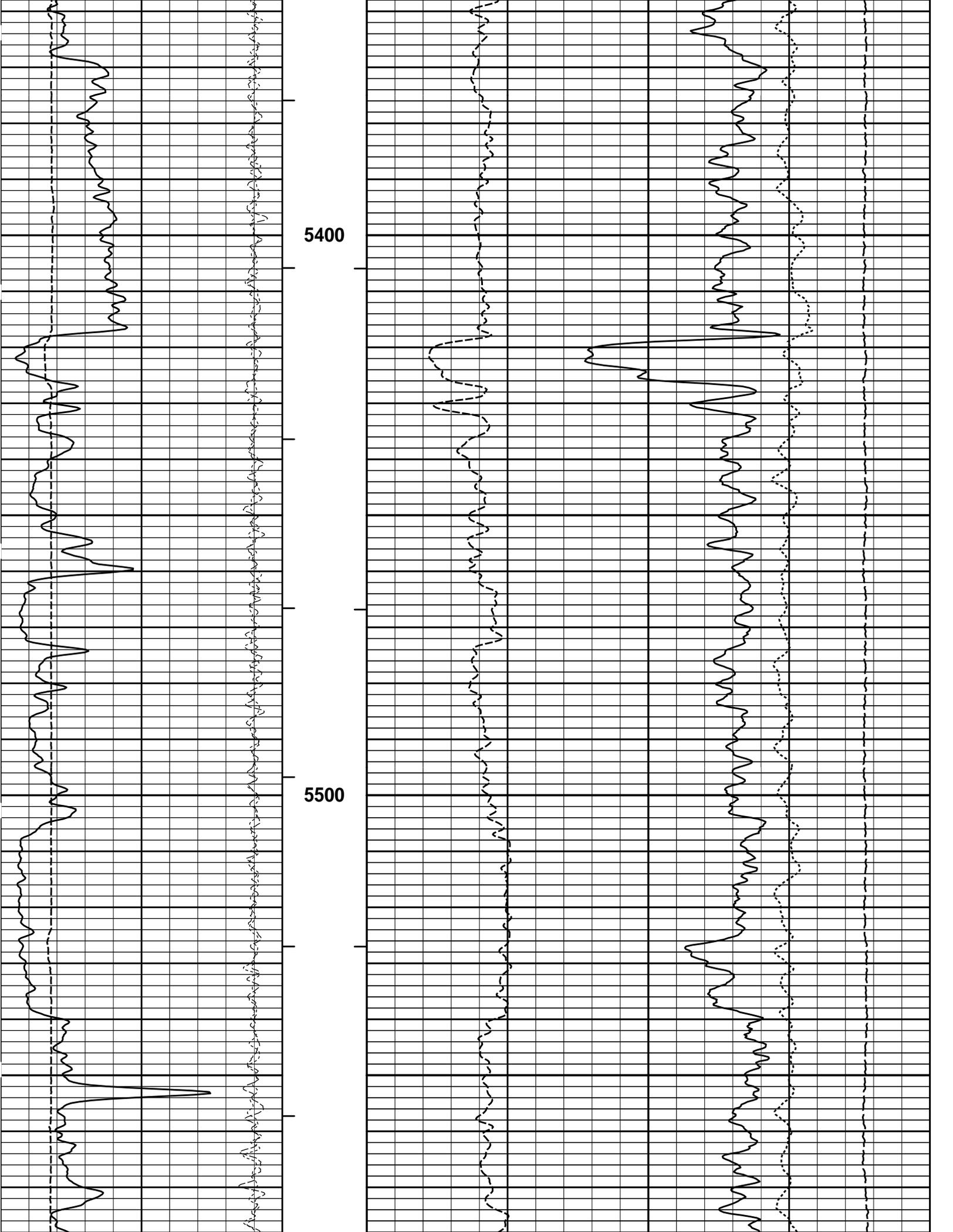




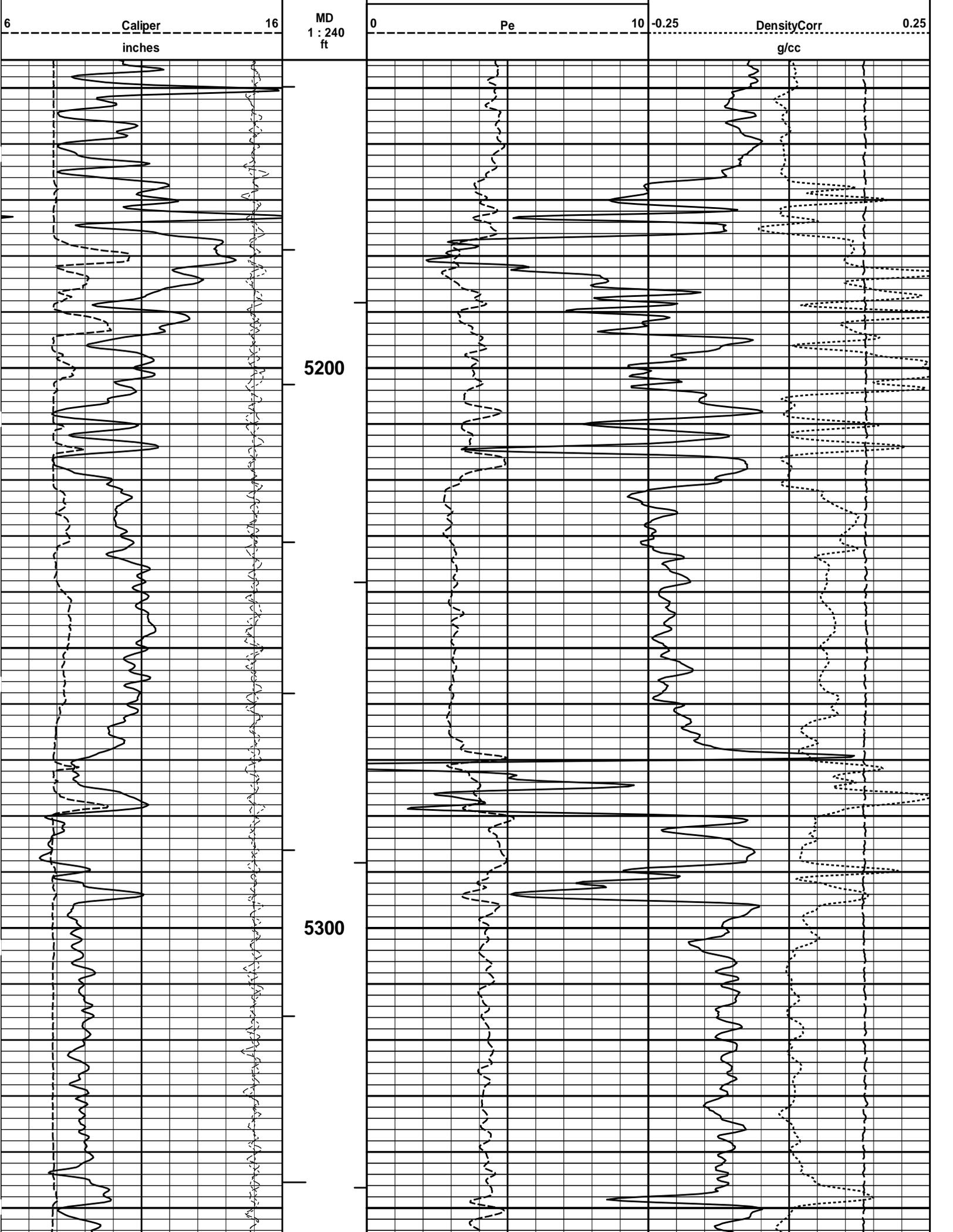


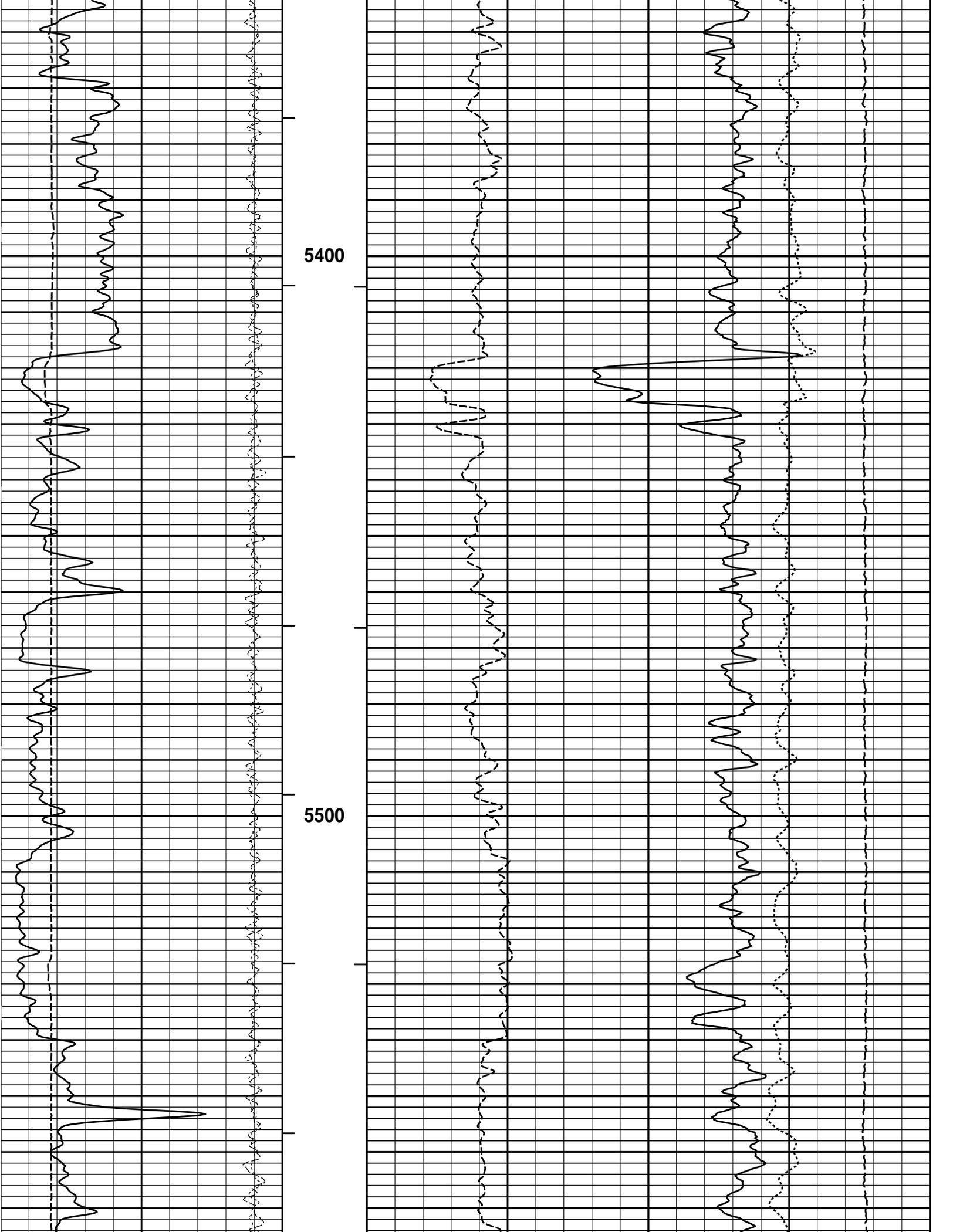


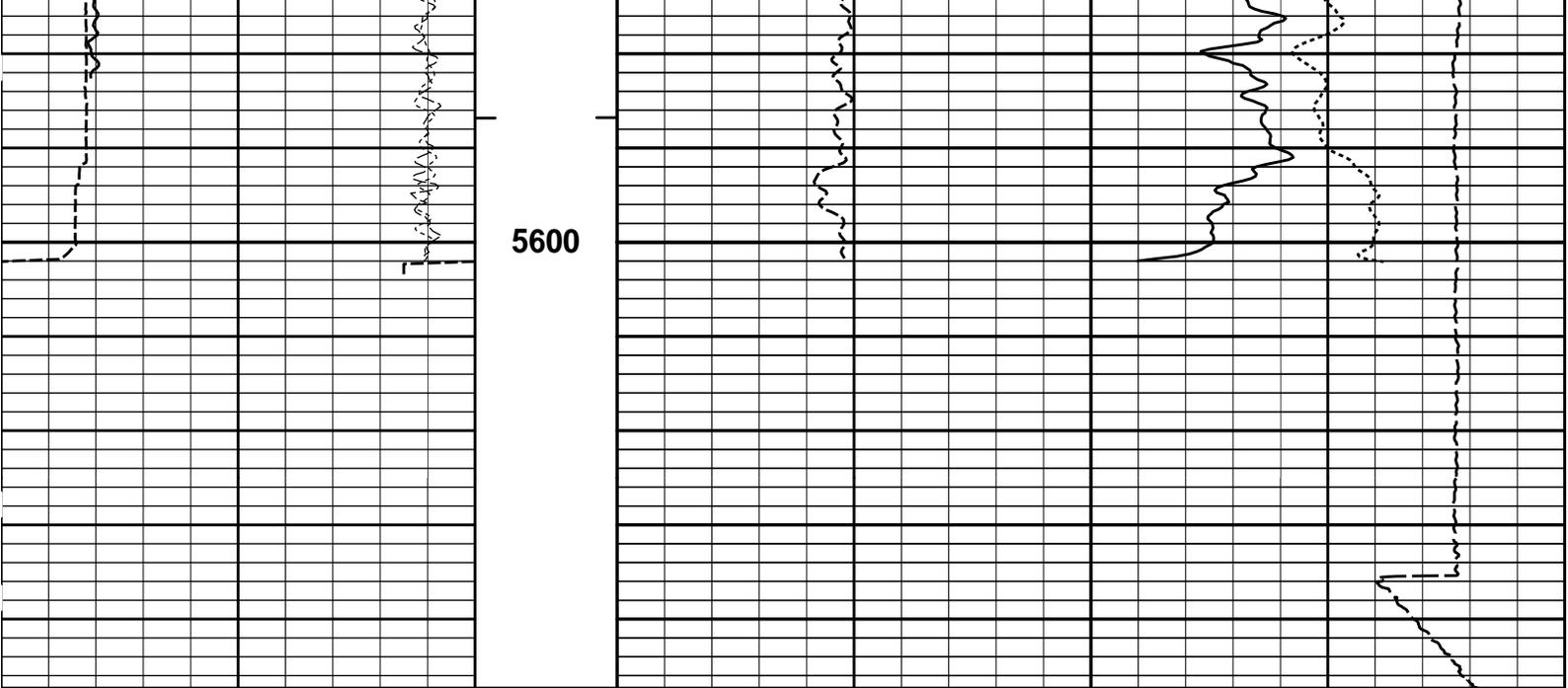












6	Caliper	16	MD 1 : 240 ft	0	Pe	10	-0.25	DensityCorr	0.25
	inches							g/cc	
-18	NearQuality	2	AHV ft3				15K	Tension	0
								pounds	
18	FarQuality	-2	BHV ft3	2	Bulk Density				3
					g/cc				
0	Gamma Ray	150							
	api								
	SHALE								

**HALLIBURTON**

Plot Time: 08-Jun-14 07:34:30  
 Plot Range: 5145 ft to 5647.33 ft  
 Data: ELLIOT\_D-1\Well Based\R1 REPEAT\  
 Plot File: \\-LOCAL-IPOROSITY\BULKD\_5\_REP\_LIB

**REPEAT SECTION**

**HALLIBURTON**

**TOOL STRING DIAGRAM REPORT**

Description	Overbody Description	O.D.	Diagram	Sensors @ Delays	Length	Accumulated Length
RWCH-12156658 135.00 lbs		∅ 3.625 in →			6.25 ft	80.04 ft
SP Sub-12345678 60.00 lbs		∅ 3.625 in →		← SP @ 72.01 ft	3.74 ft	73.79 ft

GTET-10748374  
165.00 lbs

Ø 3.625 in →

8.52 ft

70.05 ft

← GammaRay @ 63.99 ft

61.53 ft

DSNT-10735145  
174.00 lbs

DSN Decentralizer-  
10735145  
6.60 lbs

Ø 5.000 in\* →

Ø 3.625 in →

9.69 ft

← DSN Far @ 54.59 ft  
← DSN Near @ 53.84 ft

51.84 ft

SDLT-10673803  
360.00 lbs

SDLT Pad-10673790  
65.00 lbs  
Microlog Pad-10673803  
8.00 lbs

Ø 4.500 in →

Ø 4.750 in\* →

Ø 4.750 in\* →

10.81 ft

Microlog @ 44.03 ft  
SDL Caliper @ 43.84 ft  
SDL @ 43.83 ft

41.03 ft

Flex Joint-12345678  
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  
300.00 lbs

Ø 3.625 in →

15.77 ft

← Sonic Receivers @ 26.84 ft

19.58 ft

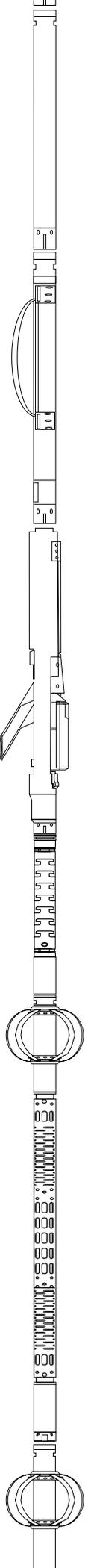
ACRt Instrument-  
10811256  
50.00 lbs

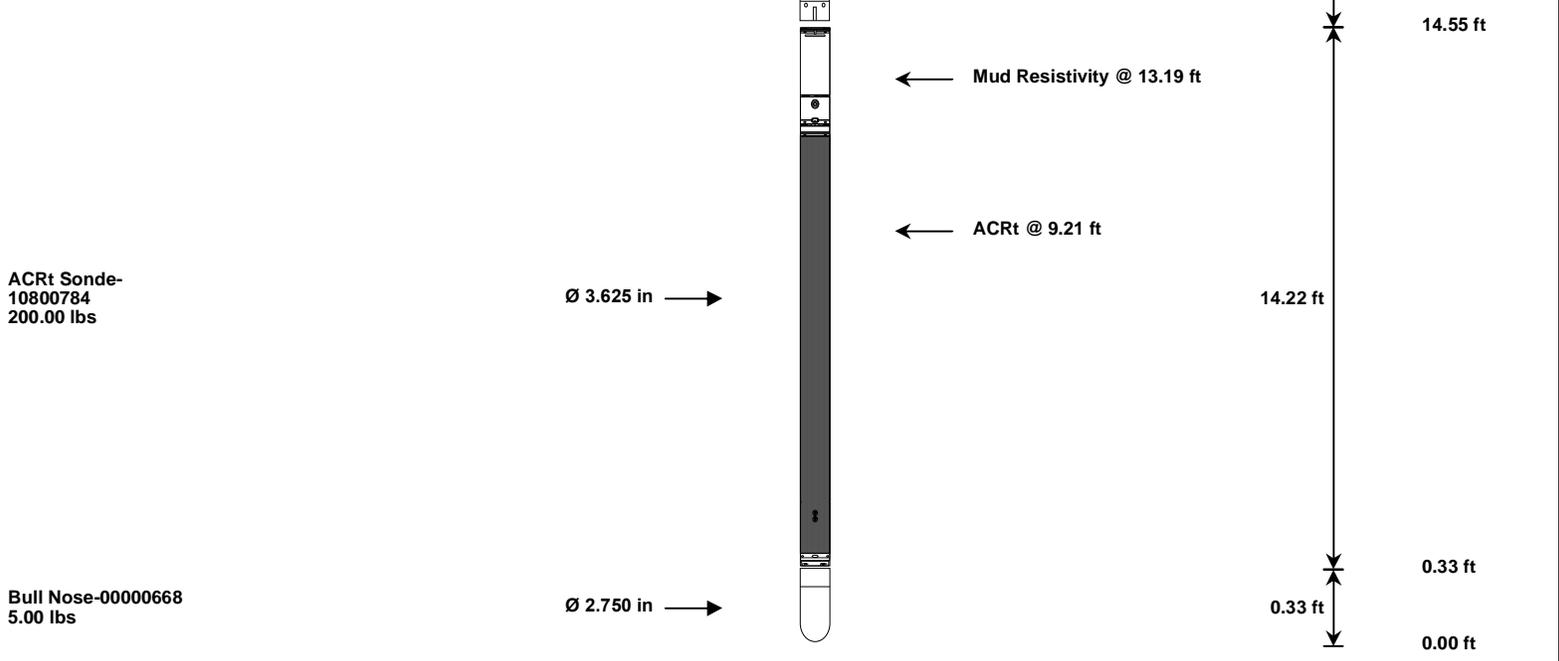
Centralizer 25-00000001  
8.00 lbs

Ø 4.000 in\* →

Ø 3.625 in →

5.03 ft





Mnemonic	Tool Name	Serial Number	Weight (lbs)	Length (ft)	Accumulated Length (ft)	Max.Log. Speed (fpm)
RWCH	Releasable Wireline Cable Head	12156658	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	10735145	174.00	9.69	51.84	60.00
DCNT	DSN Decentralizer	10735145	6.60	5.13 *	55.17	300.00
SDLT	Spectral Density Tool	10673803	360.00	10.81	41.03	60.00
SDLP	Density Insite Pad	10673790	65.00	2.55 *	43.24	60.00
MICP	Microlog Pad	10673803	8.00	1.00 *	43.53	60.00
FLEX	Flex Joint	12345678	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 *	32.89	300.00
ACRt	Array Compensated True Resistivity Instrument Section	10811256	50.00	5.03	14.55	120.00
OBCEN	Centralizer - 25 in. Overbody	00000001	8.00	2.08 *	16.57	300.00
ACRt	Array Compensated True Resistivity Sonde Section	10800784	200.00	14.22	0.33	120.00
BLNS	Bull Nose	00000668	5.00	0.33	0.00	300.00
<b>Total</b>			<b>1,684.60</b>	<b>80.04</b>		

\* Not included in Total Length and Length Accumulation.

Data: ELLIOT\_D-1\0001 SP-GTET-DSNT-SDLT-FLEX-BSAT-ACRT-BNIDLE

Date: 08-Jun-14 02:58:10

# HALLIBURTON

## 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	9.100	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	1.000	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	5664.00	ft
SHARED	BHT	Bottom Hole Temperature	135.0	degF
SHARED	SVTM	Navigation and Survey Master Tool	NONE	
SHARED	AZTM	High Res Z Accelerometer Master Tool	GTET	
SHARED	TEMM	Temperature Master Tool	NONE	
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	
Rwa / CrossPlot	BHSM	Borehole Size Source Tool	SDLT	
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	
GTET	BHSM	Borehole Size Source Tool	SDLT	
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	
DSNT	BHSM	Borehole Size Source Tool	SDLT	
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
SDLT Pad	BHSM	Borehole Size Source Tool	SDLT	
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	47.60	uspf
BSAT	DTSH	Delta -T Shale	100.00	uspf
BSAT	SPEQ	Acoustic Porosity Equation	Wylie	
ACBt Sende	BTOK	Process ACBt?	Yes	

ACRt Sonde	RTOR	Process ACRt?	Yes	
ACRt Sonde	MNSO	Minimum Tool Standoff	1.50	in
ACRt Sonde	TCS1	Temperature Correction Source	FP Lwr & FP Up	
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
ACRt Sonde	BHSM	Borehole Size Source Tool	SDLT	

BOTTOM

Data: ELLIOT\_D-1\0001 SP-GTET-DSNT-SDLT-FLEX-BSAT-ACRT-BN\008 08-Jun-14 06:30 Up @5648.5f

Date: 08-Jun-14 07:18:35

# HALLIBURTON

## CALIBRATION REPORT

### NATURAL GAMMA RAY TOOL SHOP CALIBRATION

<b>Tool Name:</b>	<b>GTET - 10748374</b>	<b>Reference Calibration Date:</b>	<b>18-Mar-14 09:50:24</b>
<b>Engineer:</b>	<b>J. BOLLLOM</b>	<b>Calibration Date:</b>	<b>30-May-14 14:03:06</b>
<b>Software Version:</b>	<b>WL INSITE R4.2.0 (Build 2)</b>	<b>Calibration Version:</b>	<b>1</b>

Calibrator Source S/N: TB-185  
 Calibrator API Reference:228.00 api  
 Equivalent Calibrator API Reference:232.0 api

Measurement	Measured	Calibrated	Units
Background	33.8	33.6	api
Background + Calibrator	267.1	265.6	api
Calibrator	233.3	232.0	api

### NATURAL GAMMA RAY TOOL FIELD CALIBRATION

<b>Tool Name:</b>	<b>GTET - 10748374</b>	<b>Reference Calibration Date:</b>	<b>30-May-14 14:03:06</b>
<b>Engineer:</b>	<b>SHELDON INGERSOLL</b>	<b>Calibration Date:</b>	<b>07-Jun-14 14:41:44</b>
<b>Software Version:</b>	<b>WL INSITE R4.2.0 (Build 2)</b>	<b>Calibration Version:</b>	<b>1</b>

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	33.6	40.4	api
Background + Calibrator	265.6	264.6	api
Calibrator	232.0	224.2	api

Shop	Field	Difference	Tolerance
232.0	224.2	7.8	+/- 9.00

### DUAL SPACED NEUTRON SHOP CALIBRATION

<b>Tool Name:</b>	<b>DSNT - 10735145</b>	<b>Reference Calibration Date:</b>	<b>05-May-14 09:35:44</b>
<b>Engineer:</b>	<b>J. BOLLLOM</b>	<b>Calibration Date:</b>	<b>30-May-14 15:09:57</b>
<b>Software Version:</b>	<b>WL INSITE R4.2.0 (Build 2)</b>	<b>Calibration Version:</b>	<b>1</b>

Logging Source S/N: DSN-436  
 Tank Serial Number: LIBERAL  
 Reference value assigned to Tank: 51.680

**CALIBRATION CONSTANTS**

Measurement	Prev. Value	New Value	Control Limit On New Value
Gain:	0.951	0.956	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):	0.2092	0.2107	0.0014	+/- 0.0020
Calibrated Ratio:	9.67	9.72	0.049	+/- 0.050

**VERIFIER**

Measurement	Value	Control Limit
Snow-Block Porosity (decp):	0.0605	0.02000 - 0.09000

**PASS/FAIL SUMMARY**

Background Check:	Passed
Gain-Range Check:	Passed
Snow-Block Check:	Passed

**DUAL SPACED NEUTRON FIELD CALIBRATION**

<b>Tool Name:</b> DSNT - 10735145	<b>Reference Calibration Date:</b> 30-May-14 15:09:57
<b>Engineer:</b> SHELDON INGERSOLL	<b>Calibration Date:</b> 07-Jun-14 14:47:57
<b>Software Version:</b> WL INSITE R4.2.0 (Build 2)	<b>Calibration Version:</b> 1

Logging Source S/N: DSN-436

Snow Block S/N: 668

**NEUTRON FIELD-CHECK SUMMARY**

	Shop	Field	Difference	Control Limit On Change
Snow-Block Porosity (decp):	0.0605	0.0677	0.0072	+/- 0.0150

**PASS/FAIL SUMMARY**

Block Change Check:	Passed
Snow Block Stat Check:	Passed
Temperature Check:	Passed

**DENSITY CALIPER SHOP CALIBRATION**

<b>Tool Name:</b> SDLT - 10673803	<b>Reference Calibration Date:</b> 19-Feb-14 11:36:45
<b>Engineer:</b> thomas hyde	<b>Calibration Date:</b> 18-Mar-14 10:01:07
<b>Software Version:</b> WL INSITE R4.2.0 (Build 2)	<b>Calibration Version:</b> 1
<b>Host Tool Name:</b> DSNT - 10735145	

**CALIBRATION COEFFICIENTS**

Measurement	Previous Value	New Value	Control Limit On New Value
Pad Offset	-4075.69	-4085.93	-7000.00 - -1000.00
Pad Gain	0.0003810	0.0003931	0.000200 - 0.000600
Arm Offset	-4794.44	-4798.17	-5000.00 - 3000.00
Arm Gain	0.0005107	0.0004777	0.000300 - 0.000700
Arm Power	-0.000005244	-0.000002983	-0.000010000 - 0.000010000

The ring diameter is computed from:  $\text{DIAMETER} = \text{PAD EXTENSION} + \text{ARM EXTENSION} + \text{TOOL DIAMETER}$

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)	1.94	2.00	0.06	+/- 0.20
Medium Ring (in)	3.64	3.75	0.11	+/- 0.20
RING DIAMETER:				
Small Ring (in)	6.63	6.50	-0.13	+/- 0.20
Medium Ring (in)	8.45	8.25	-0.20	+/- 0.20
Large Ring (in)	15.08	15.00	-0.08	+/- 0.20

**PASS/FAIL SUMMARY**

Calibration-Coefficients Range Check: Passed  
 Ring-Measurement Check: Passed

**PASS/FAIL SUMMARY**

Calibration-Coefficients Range Check: Passed

**SDLT CALIPER FIELD CALIBRATION**

**Tool Name:** SDLT - 10673803      **Reference Calibration Date:** 18-Mar-14 10:01:07  
**Engineer:** SHELDON INGERSOLL      **Calibration Date:** 07-Jun-14 14:42:23  
**Software Version:** WL INSITE R4.2.0 (Build 2)      **Calibration Version:** 1

**MEASURED CALIPER VALUES**

Measurement	Shop	Field	Change	Control Limit On New Value
Pad Extension	3.75	3.74	-0.01	+/- 0.10
Ring Diameter	8.25	8.26	0.01	+/- 0.15

**PASS/FAIL SUMMARY**

Pad Extension Check: Passed  
 Diameter Check: Passed

**SPECTRAL DENSITY SHOP CALIBRATION**

**Tool Name:** SDLT Pad - 10673790      **Reference Calibration Date:** 02-May-14 16:07:32  
**Engineer:** J. BOLLLOM      **Calibration Date:** 30-May-14 14:22:19  
**Software Version:** WL INSITE R4.2.0 (Build 2)      **Calibration Version:** 1

Logging Source S/N: 5073 GW

Aluminum Block S/N: LIBERAL

Density: 2.598g/cc

Pe: 3.170

Magnesium Block S/N: LIBERAL

Density: 1.684g/cc

Pe: 2.598

**DENSITY CALIBRATION SUMMARY**

Measurement	Previous Value	New Value	Control Limit
Near Bar Gain	1.0154	1.0225	0.90 - 1.10
Near Dens Gain	1.0022	0.9956	0.90 - 1.10
Near Peak Gain	1.0005	0.9760	0.90 - 1.10
Near Lith Gain	0.9764	0.9473	0.90 - 1.10
Far Bar Gain	1.0103	1.0114	0.90 - 1.10
Far Dens Gain	0.9983	0.9978	0.90 - 1.10
Far Peak Gain	0.9899	0.9903	0.90 - 1.10
Far Lith Gain	0.9592	0.9567	0.90 - 1.10

Near Bar Offset	0.1275	0.0641	NONE
Near Dens Offset	0.2399	0.2962	NONE
Near Peak Offset	0.2598	0.4564	NONE
Near Lith Offset	0.4487	0.6769	NONE
Far Bar Offset	0.1000	0.0948	NONE
Far Dens Offset	0.1703	0.1795	NONE
Far Peak Offset	0.1935	0.1922	NONE
Far Lith Offset	0.3443	0.3611	NONE

Near Bar Background	845.87	845.52	700 - 1450
Near Dens Background	277.30	275.40	230 - 480
Near Peak Background	121.08	120.99	100 - 210
Near Lith Background	150.20	149.60	125 - 260
Far Bar Background	567.39	565.80	450 - 900
Far Dens Background	222.91	222.66	175 - 345
Far Peak Background	87.89	87.52	70 - 140
Far Lith Background	92.06	92.21	75 - 145

**CALIBRATION BLOCK SUMMARY**

Measurement	Current Reading (Previous Coef)	Calibrated (New Coef)	Change	Control Limit On Change
<b>MAGNESIUM</b>				
Density (g/cc)	1.689	1.684	-0.005	+/- 0.015
Pe	2.459	2.562	0.103	+/- 0.150
<b>ALUMINUM</b>				
Density (g/cc)	2.601	2.598	-0.003	+/- 0.01500
Pe	3.087	3.131	0.044	+/- 0.150

**TOOL SUMMARY**

Measurement	Near Detector		Far Detector	
	Value	Control Limits	Value	Control Limits
<b>QUALITY</b>				
Background	-0.0014	+/- 0.0110	-0.0010	+/- 0.0140
Magnesium Block	-0.0001	+/- 0.0110	-0.0005	+/- 0.0140
Aluminum Block	-0.0006	+/- 0.0110	0.0007	+/- 0.0140
Resolution	8.57	6.00 - 11.50	8.92	6.00 - 11.50
Internal Verifier(B+D+P+L)	1392	1200 - 2700	968	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**

<b>Tool Name:</b> SDLT Pad - 10673790	<b>Reference Calibration Date:</b> 30-May-14 14:22:19
<b>Engineer:</b> SHELDON INGERSOLL	<b>Calibration Date:</b> 07-Jun-14 14:41:59
<b>Software Version:</b> WL INSITE R4.2.0 (Build 2)	<b>Calibration Version:</b> 1

**DENSITY FIELD CALIBRATION SUMMARY**

Measurement	Shop	Field	Change	Control Limit +/-
Near (B+D+P+L) cps	1391.512	1395.674	4.162	15.068
Far (B+D+P+L) cps	968.196	960.354	-7.842	16.735
Near Resolution	8.57	8.59	0.020	0.50
Far Resolution	8.92	8.98	0.060	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
<b>GTET-10748374</b>						
Gamma Ray Calibrator	232.0	224.2	-----	7.8	+/- 9.00	api
<b>DSNT-10735145</b>						
Snow-Block Porosity	0.0605	0.0677	-----	-0.0072	+/- 0.0150	decp
<b>SDLT-10673803</b>						
Pad Extension	3.75	3.74	-----	0.01	+/-0.10	in
Ring Diameter	8.25	8.26	-----	-0.01	+/-0.15	in
<b>SDLT Pad-10673790</b>						
Near(B+D+P+L)	1391.512	1395.674	-----	-4.162	+/-15.068	cps
Far(B+D+P+L)	968.196	960.354	-----	7.842	+/-16.735	cps

Data: ELLIOT D-1\0001 SP-GTET-DSNT-SDLT-FLEX-BSAT-ACRT-BN\008 08-Jun-14 06:30 Up @5648.5f Date: 08-Jun-14 07:19:07

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**INPUTS, DELAYS AND FILTERS TABLE**

Mnemonic	Input Description	Delay (ft)	Filter Type	Filter Length (ft)
<b>Depth Panel</b>				
TENS	Tension	0.00	NO	
<b>Rwa / CrossPlot</b>				
TPUL	Tension Pull	80.04	NO	
BS	Bit Size	80.04	NO	
HDIA	Measured Hole Diameter	0.00	NO	
<b>RWCH</b>				
DHTN	DownholeTension	0.00	BLK	0.000
<b>SP Sub</b>				
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	
<b>GTET</b>				
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
HDIA	Measured Hole Diameter	0.00	NO	
ACCZ	Accelerometer Z	0.00	BLK	0.083
DEVI	Inclination	0.00	NO	
<b>DSNT</b>				
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	
ERNR	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	
HDIA	Measured Hole Diameter	0.00	NO	
<b>SDLT</b>				
TPUL	Tension Pull	43.84	NO	
PCAL	Pad Caliper	43.84	TRI	0.250
ACAL	Arm Caliper	43.84	TRI	0.250
<b>BSAT</b>				
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	
<b>ACRt Sonde</b>				
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 Reference 12 KHz Real Signal	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	
HDIA	Measured Hole Diameter	0.00	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	
HDIA	Measured Hole Diameter	0.00	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: ELLIOT\_D-1\0001 SP-GTET-DSNT-SDLT-FLEX-BSAT-ACRT-BN\008 08-Jun-14 06:30 Up @5648.5f

Date: 08-Jun-14 07:18:10

COMPANY	<b>MERIT ENERGY</b>		
WELL	<b>ELLIOT D-1</b>		
FIELD	<b>HUGOTON GAS AREA</b>		
COUNTY	<b>HASKELL</b>	STATE	<b>KANSAS</b>

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**DUAL SPACED NEUTRON  
SPECTRAL DENSITY  
LOG**