HALLIBURTON

SPECTRAL DENSITY DUAL SPACED NEUTRON LOG

COMPANY **OXY USA INC**

WELL **GRIFFIN C-1**

FIELD **HUGOTON GAS AREA**

COUNTY **HASKELL** STATE **KANSAS**

OXY USA INC
COMPANY
GRIFFIN C-1
WELL
HUGOTON GAS AREA
FIELD
HASKELL
COUNTY
KANSAS
STATE

API No. 15-081-22005-00-00

Location 1816' FNL & 2120' FWL
SW NE SE NW

Sect. 11 Twp. 28S Rge. 33W

Other Services:
MICROLOG
ACRT
BSAT

Permanent Datum	GL	Elev. 2979.6 ft	Elev.: K.B. 2983.6 ft
Log measured from	KB	, 14.0 ft above perm. Datum	D.F. 2982.6 ft
Drilling measured from	KB		G.L. 2979.6 ft

Date		02-Dec-12					
Run No.		ONE					
Depth - Driller		5796.00 ft					
Depth - Logger		5765.0 ft					
Bottom - Logged Interval		5721.0 ft					
Top - Logged Interval		4000.0 ft					
Casing - Driller		8.625 in	@ 1806.0 ft	@		@	
Casing - Logger		1804.0 ft					
Bit Size		7.875 in		@		@	
Type Fluid in Hole		WATER BASED MUD					
Density	Viscosity	9.2 ppg	48.00 s/qt				
PH	Fluid Loss	9.70 pH	9.2 cptm				
Source of Sample		FLOW LINE					
Rm @ Meas. Temperature		1.050 ohmm	@ 75.00 degF	@		@	
Rmf @ Meas. Temperature		0.88 ohmm	@ 75.00 degF	@		@	
Rmc @ Meas. Temperature		1.250 ohmm	@ 75.00 degF	@		@	
Source Rmf	Rmc	MEASURED	MEASURED				
Rm @ BHT		0.57 ohmm	@ 143.0 degF	@		@	
Time Since Circulation		9.0 hr					
Time on Bottom		02-Dec-12 16:34					
Max. Rec. Temperature		143.0 degF	@ 5765.0 ft	@		@	
Equipment	Location	10546696	LIBERAL				
Recorded By		J. BOLLOM					
Witnessed By		C. WYLIE		E. ZION			

Fold here

Service Ticket No.: 900041481 API Serial No.: 15-081-22005-00-00 PGM Version: WL INSITE R3.6.0 (Build 3)

CHANGE IN MUD TYPE OR ADDITIONAL SAMPLE

RESISTIVITY SCALE CHANGES

	Sample No.	Type Log	Depth	Scale Up Hole	Scale Down Hole
Date					
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
	@	@	@		
	@	@	@		
	@	@	@		
		@	@		
		@	@		
		@	@		

EQUIPMENT DATA

GAMMA		ACOUSTIC		DENSITY		NEUTRON	
Run No.	ONE	Run No.		Run No.	ONE	Run No.	ONE
Serial No.	11039640	Serial No.		Serial No.	10844781	Serial No.	11019643
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.	GTET	Spacing		Log Type	GAM-GAM	Log Type	NEU-NEU
Type	SCINT			Source Type	CS137	Source Type	AM241BE
Length	8'	LSA [Y/N]		Serial No.	5168GW	Serial No.	DSN-424
Distance to Source	10'	FWDA [Y/N]		Strength	1.5 CI	Strength	15 CI

LOGGING DATA

GAMMA RAY | ACOUSTIC | DENSITY | NEUTRON

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	5765	4000	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 2,000 MG/L

LCM REPORTED AT 6 LB/BBL

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

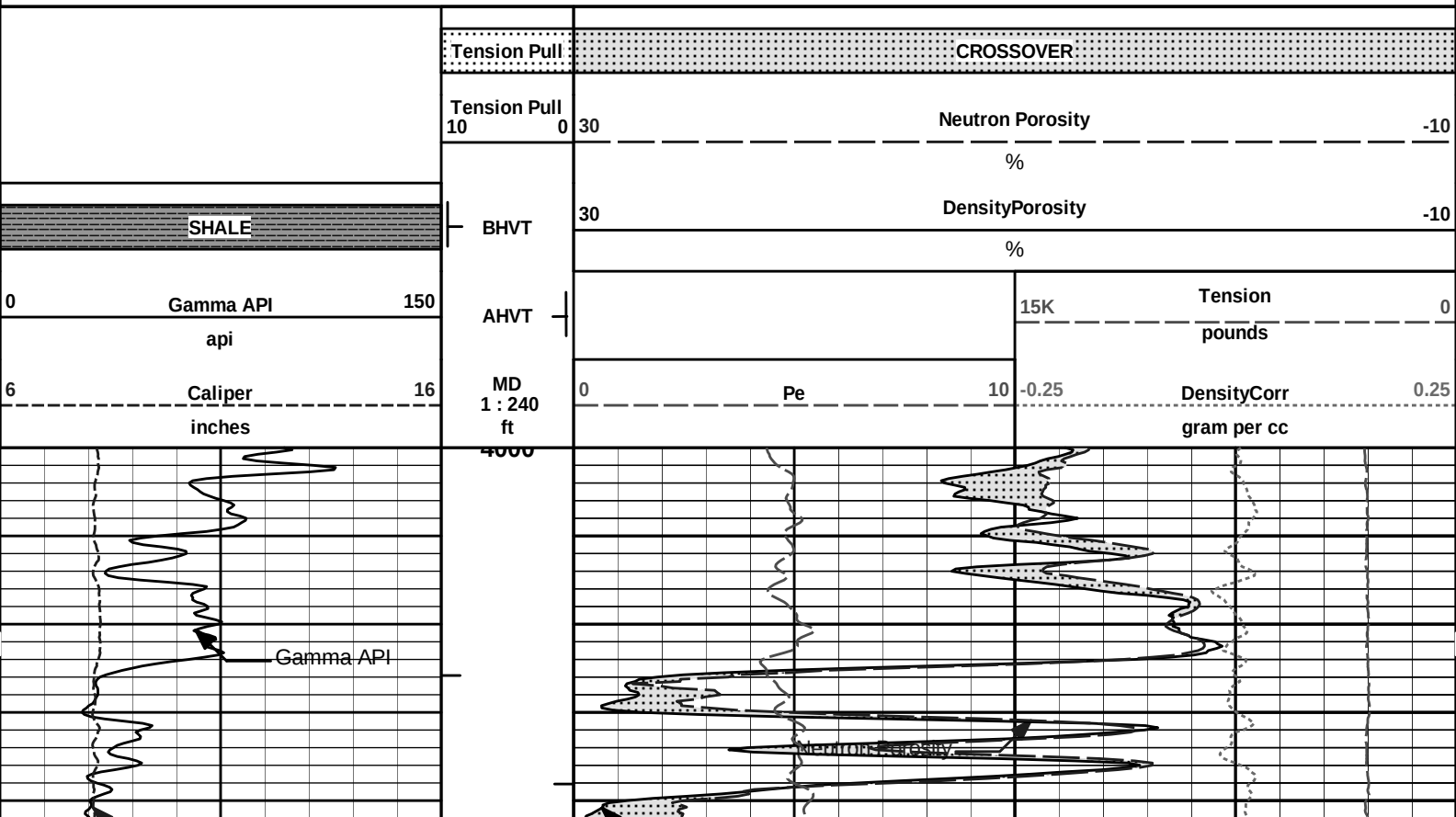
TODAY'S CREW: M. GRAHAM & V. JAIME

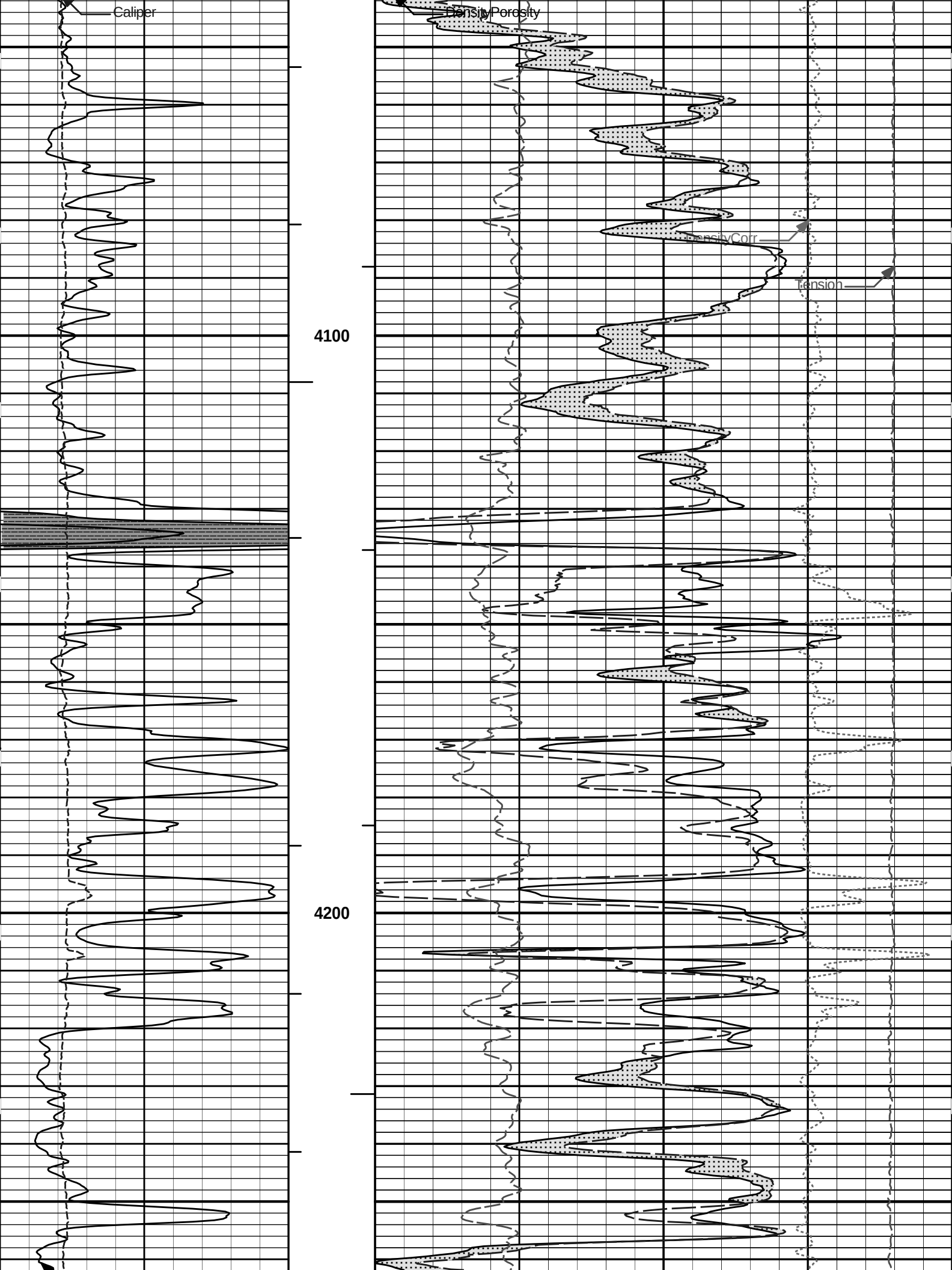
THANK YOU FOR CHOOSING HALLIBURTON ENERGY SERVICES

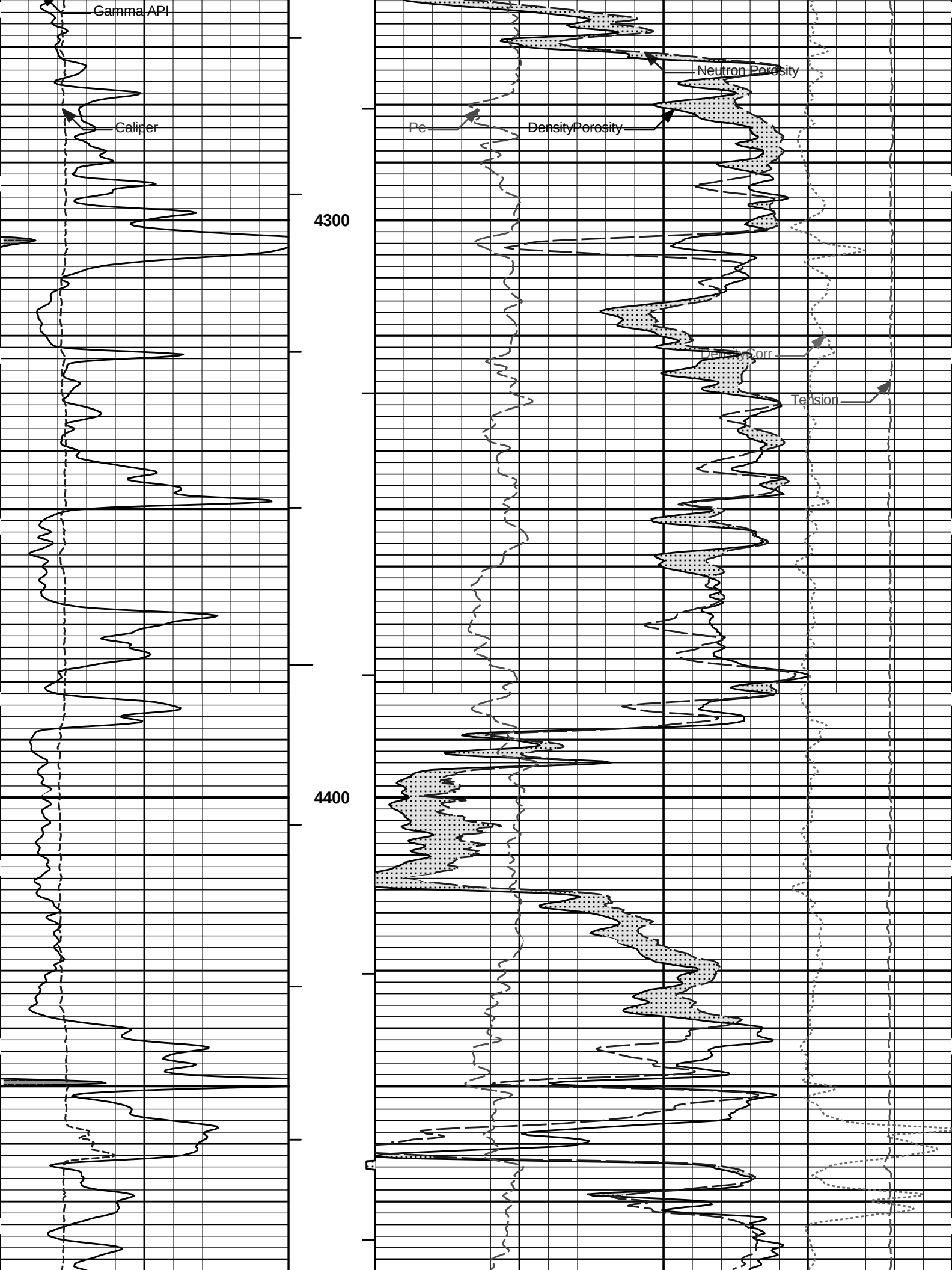
HALLIBURTON

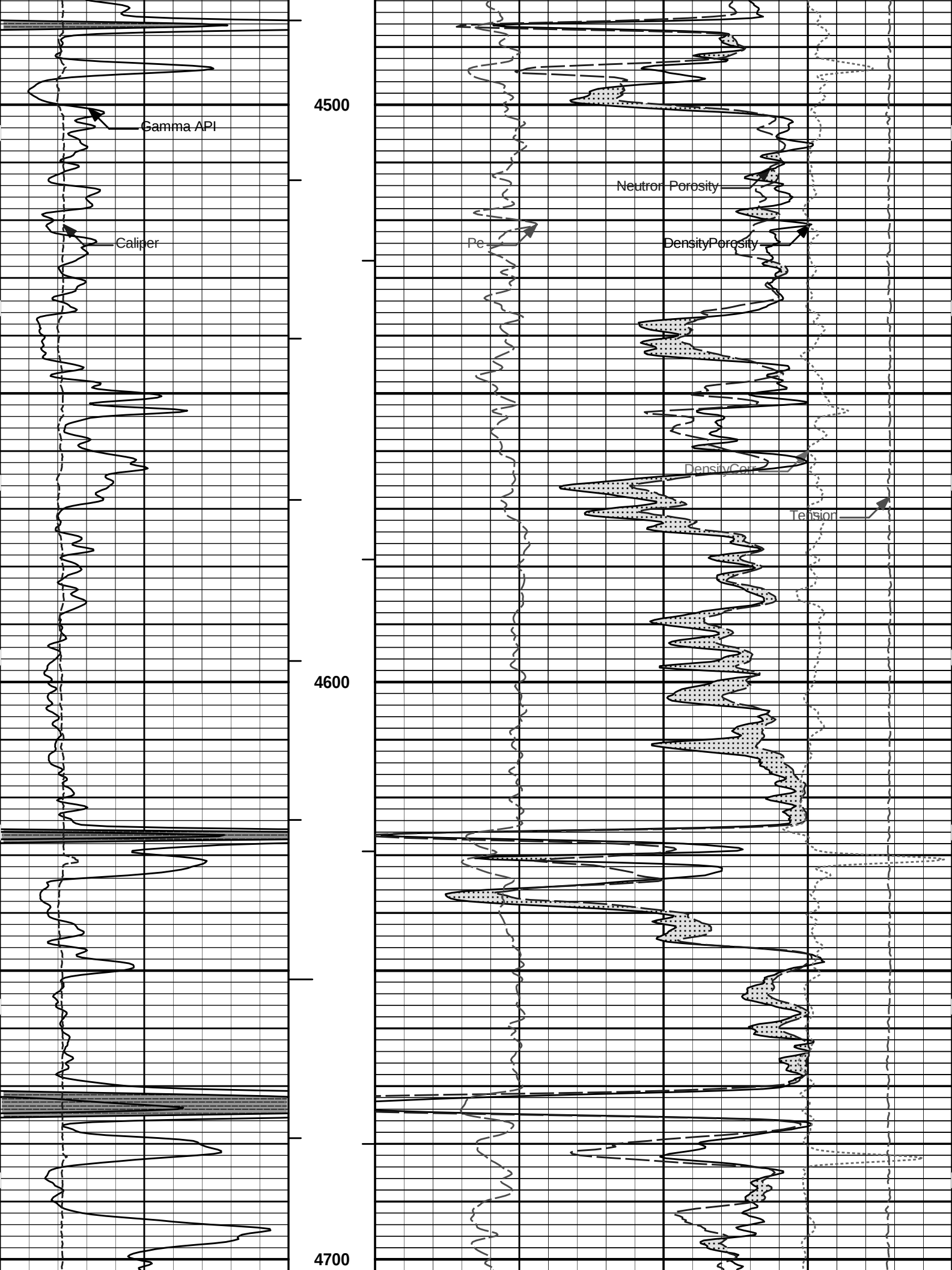
Plot Time: 02-Dec-12 20:27:05
Plot Range: 4000 ft to 5767.92 ft
Data: GRIFFIN_C_1\Well Based\DETAIL
Plot File: \\PORO\Poro_IQ_5_MAIN_LIB

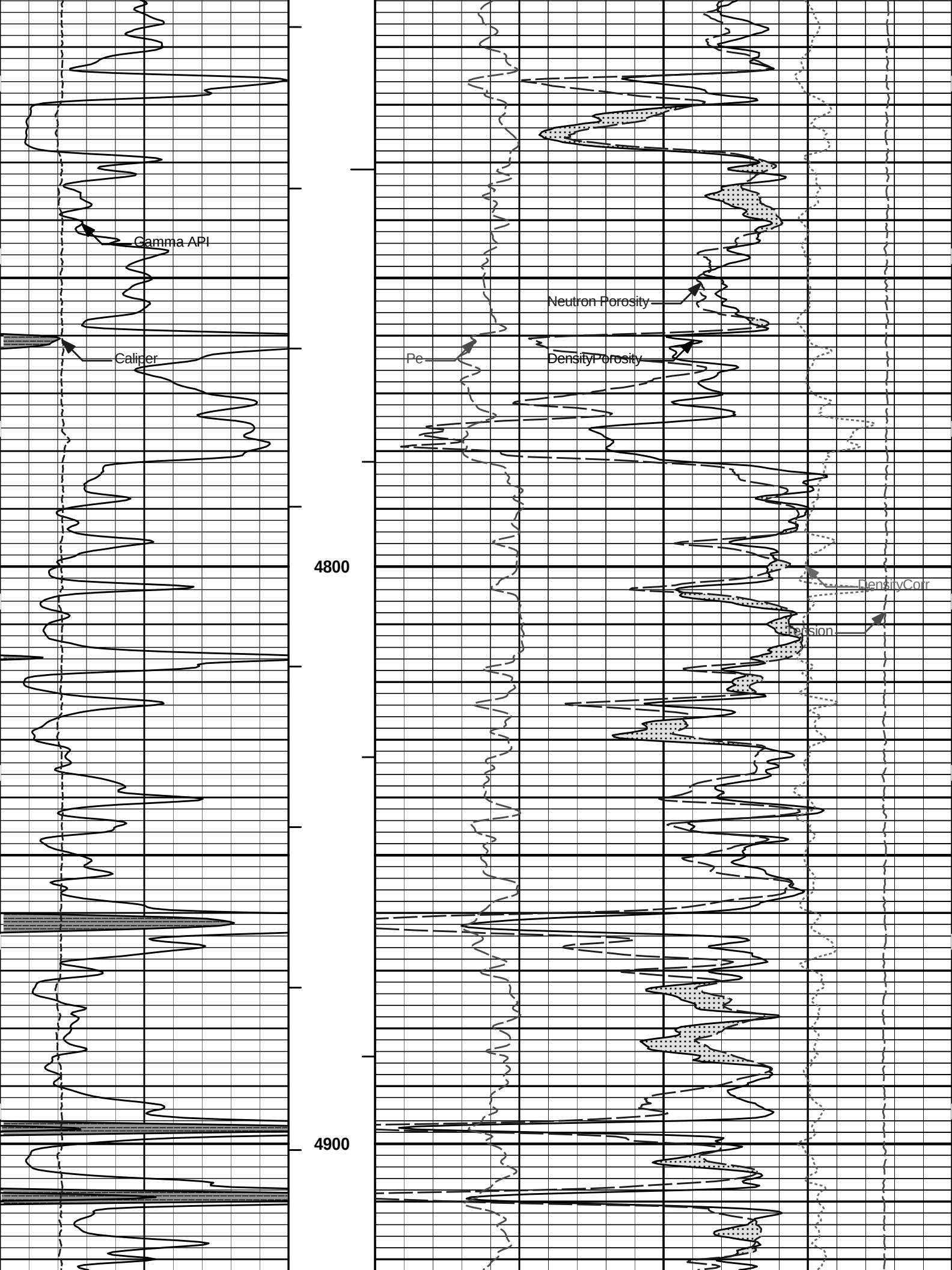
5 INCH MAIN LOG

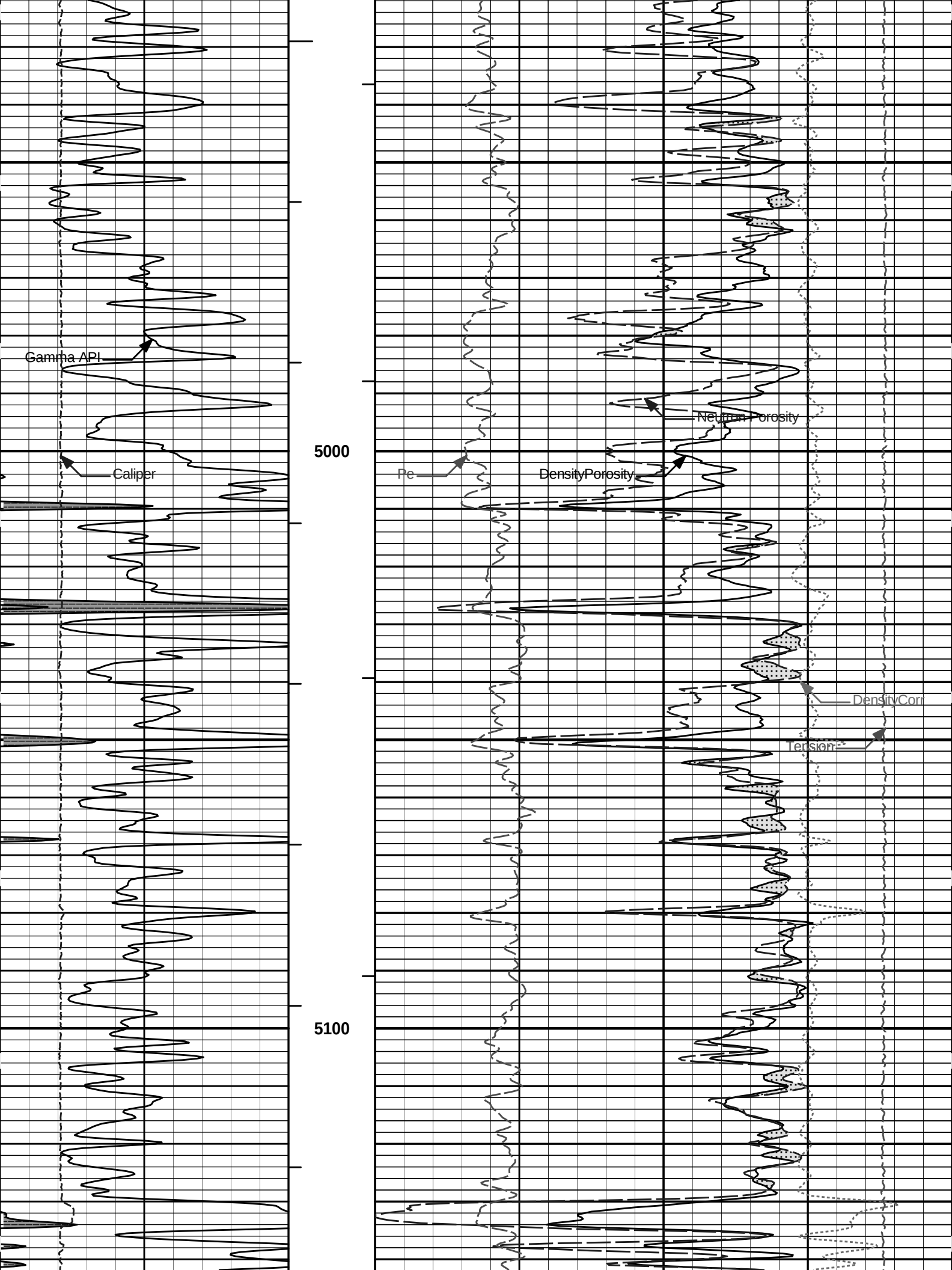


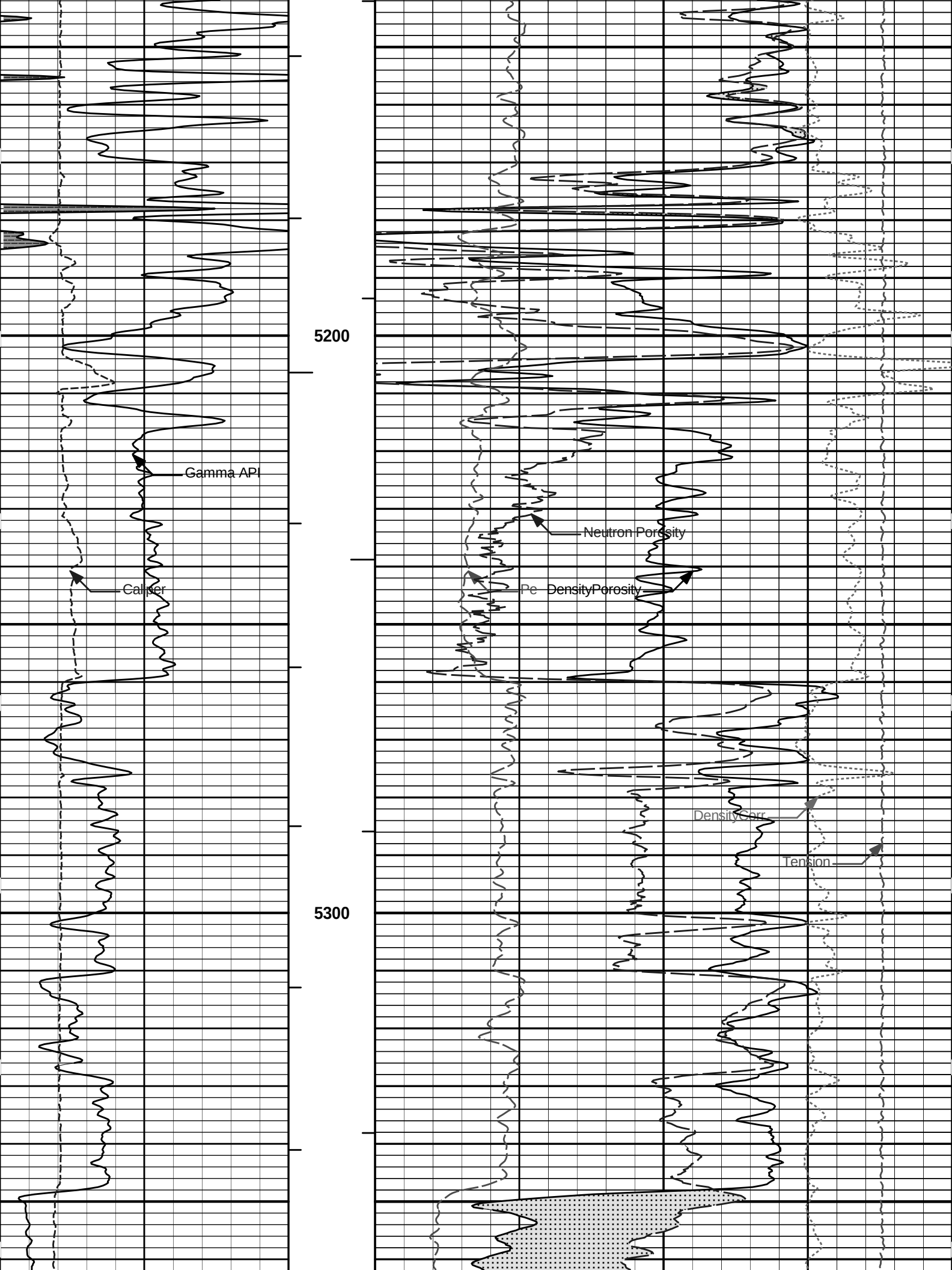

Caliper
DensityPorosity
DensityCorr
Tension
4100
4200

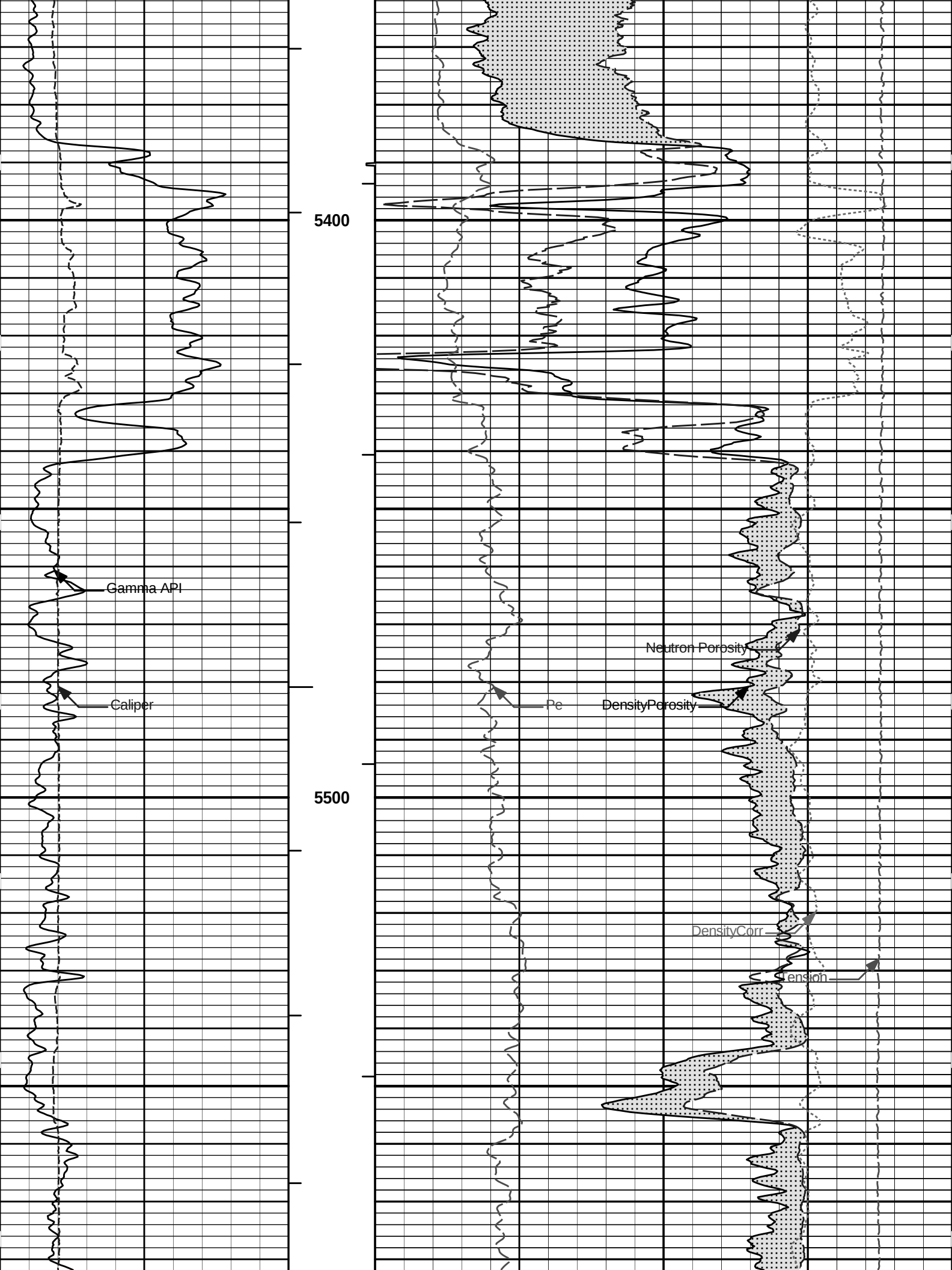

Gamma API
Caliper
Pe
DensityPorosity
Neutron Porosity
DensityCorr
Tension
4300
4400

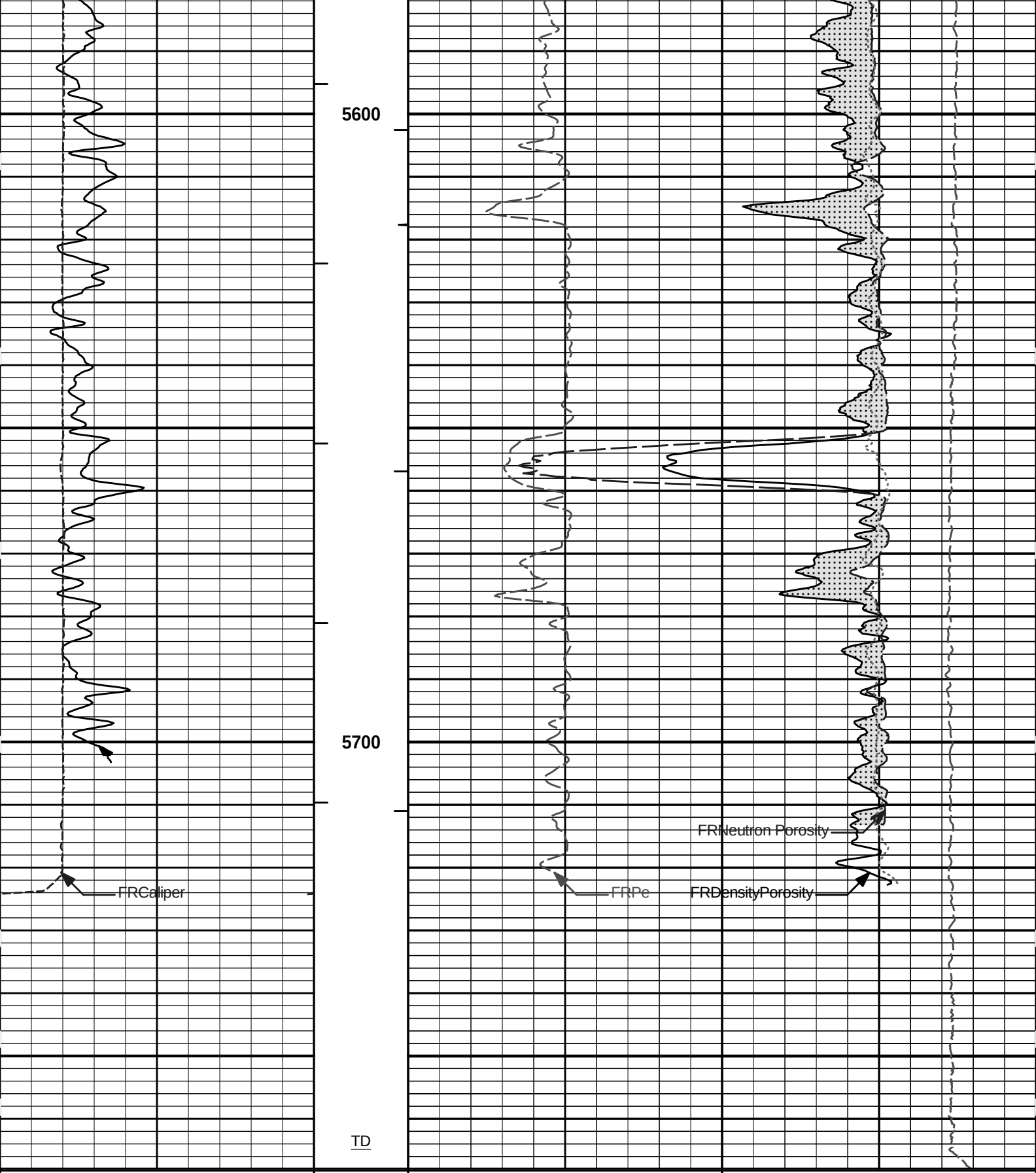

Gamma API
Caliper
4500
4600
4700
Neutron Porosity
Pe
DensityPorosity
DensityCorr
Tension


Gamma API
Caliper
Neutron Porosity
Pe
DensityPorosity
DensityCorr
4800
4900


Gamma API
Caliper
5000
Pe
DensityPorosity
NeutronPorosity
DensityCorr
Tension
5100


5200
5300
Gamma API
Caliper
Neutron Porosity
Pe
DensityPorosity
DensityCorr
Tension


5400
5500
Gamma API
Caliper
Pe
Neutron Porosity
DensityPorosity
DensityCorr
Tension



6 Caliper 16
inches

0 Gamma API 150
api

SHALE

MD
1 : 240
ft

AHVT

BHVT

Tension Pull
10 0

0 Pe 10

-0.25 DensityCorr 0.25
gram per cc

15K Tension 0
pounds

30 DensityPorosity -10
%

30 Neutron Porosity -10

10 0 30 -10

%

Tension Pull CROSSOVER

HALLIBURTON

Plot Time: 02-Dec-12 20:27:28
Plot Range: 4000 ft to 5767.92 ft
Data: GRIFFIN_C_1\Well Based\DETAIL\
Plot File: \\PORO\Poro_IQ_5_MAIN_LIB

5 INCH MAIN LOG

HALLIBURTON

Plot Time: 02-Dec-12 20:27:29
Plot Range: 5100 ft to 5770.92 ft
Data: GRIFFIN_C_1\Well Based\REPEAT\
Plot File: \\PORO\Poro_IQ_5_REP_LIB

REPEAT SECTION

CROSSOVER

30 Neutron Porosity -10

%

30 DensityPorosity -10

%

SHALE BHVT

0 Gamma API 150

api

AHVT

15K Tension 0

pounds

6 Caliper 16

inches

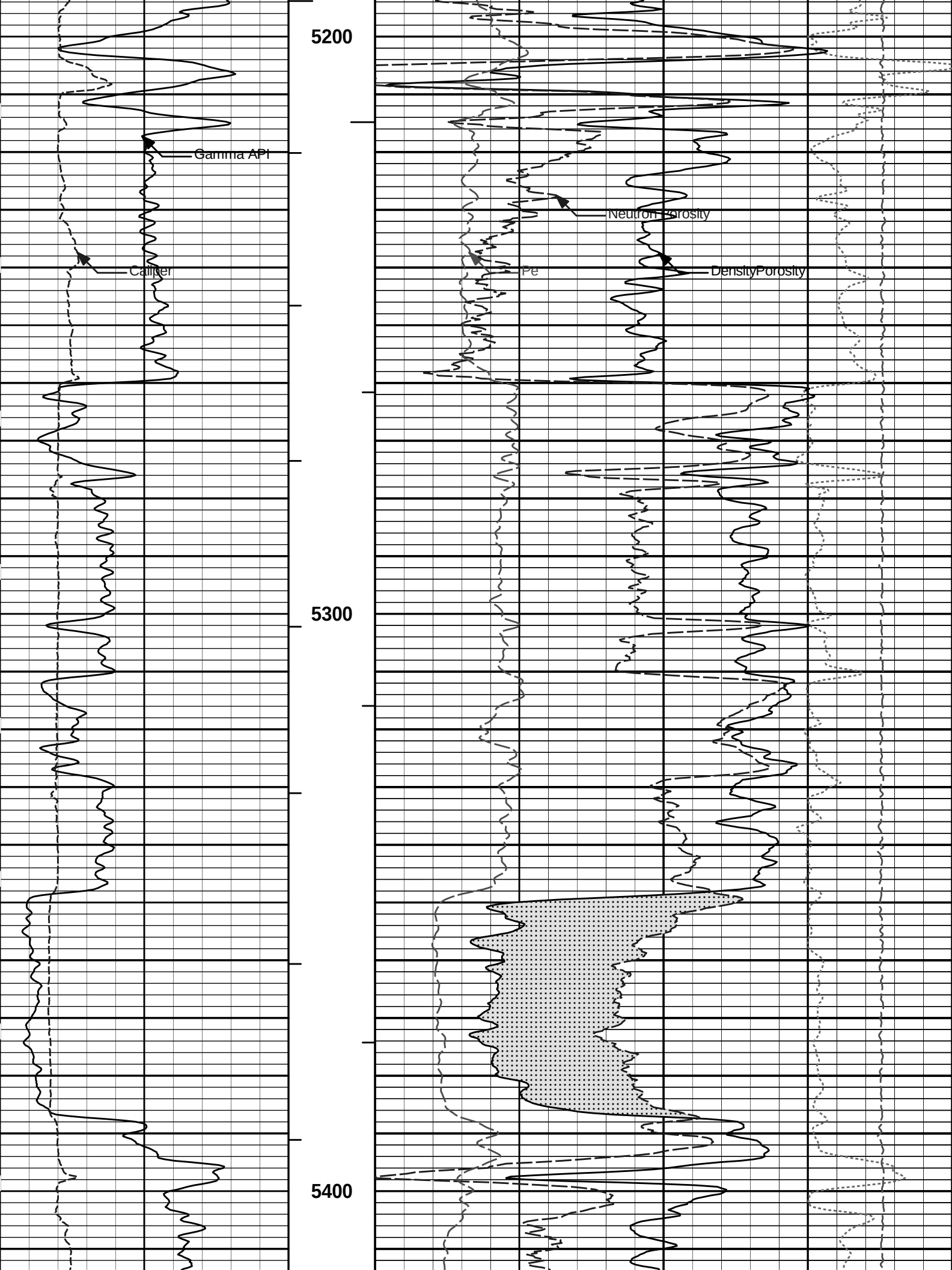
MD
1 : 240
ft

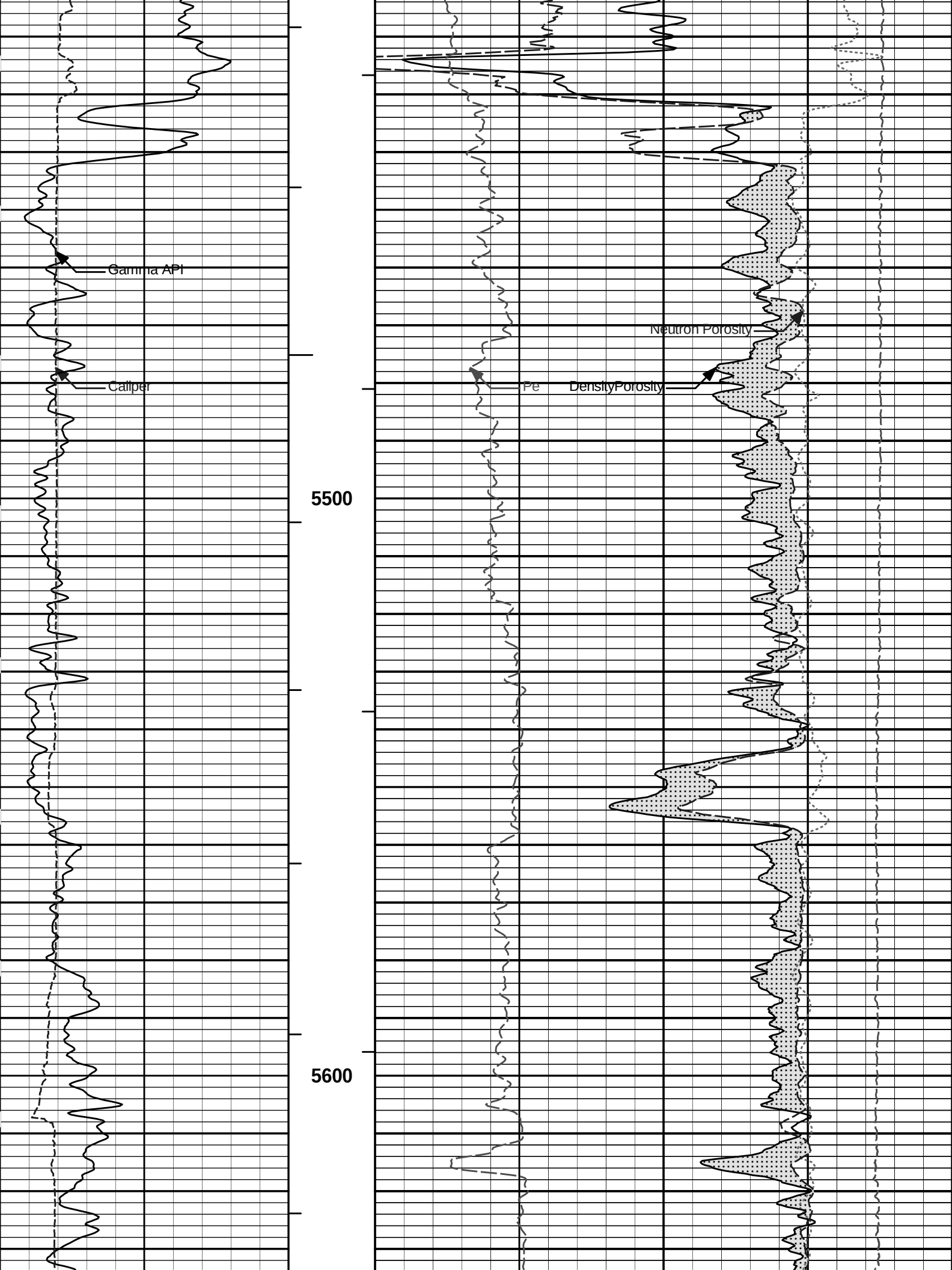
0 Pe 10

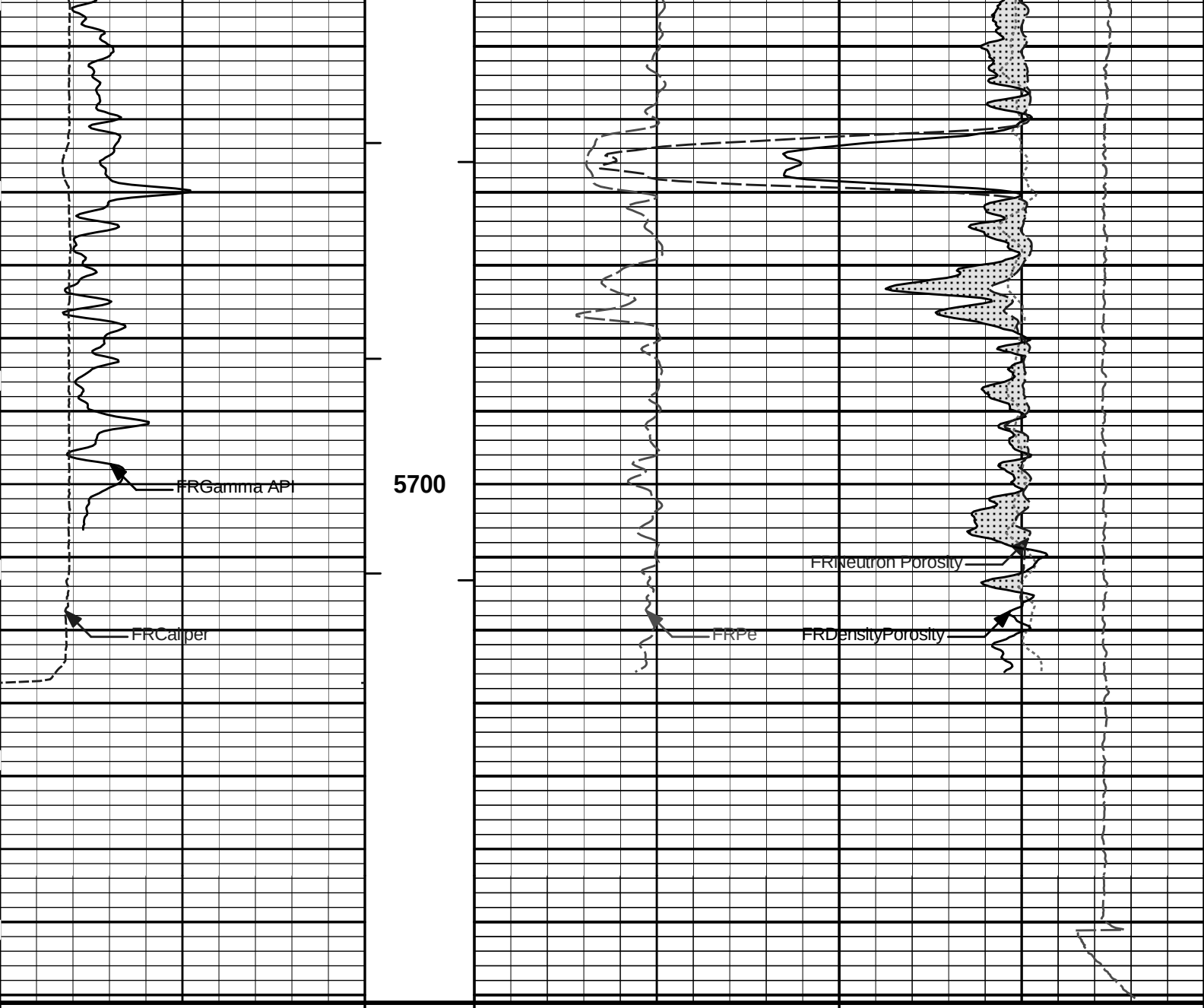
-0.25 DensityCorr 0.25

gram per cc

5100


5200
5300
5400
Gamma API
Caliper
Neutron Porosity
Pe
DensityPorosity


Gamma API
Caliper
Neutron Porosity
Pe
DensityPorosity
5500
5600



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-Dec-12 20:27:38
Plot Range: 5100 ft to 5770.92 ft
Data: GRIFFIN_C_1\Well Based\REPEAT\
Plot File: \\PORO\Poro_IQ_5_REP_LIB

REPEAT SECTION

HALLIBURTON

HALLIBURTON

Plot Time: 02-Dec-12 20:27:38
Plot Range: 4000 ft to 5767.92 ft
Data: GRIFFIN_C_1\Well Based\DETAIL\
Plot File: \\-LOCAL-\GRIFFIN_C_1\0001 SP-GTET-DSN-SDL-FLEX-BSAT-ACRT-CH\PORO\BULKD_5_MAIN_LIB

5 INCH MAIN LOG

SHALE

Tension Pull

0 Gamma Ray 150
api

18 FarQuality -2

-18 NearQuality 2

6 Caliper 16
inches

Tension Pull
10 0

BHV
ft3

AHV
ft3

MD
1 : 240
ft

2 Bulk Density 3
g/cc

0 Pe 10

15K Tension 0
pounds

-0.25 DensityCorr 0.25
g/cc

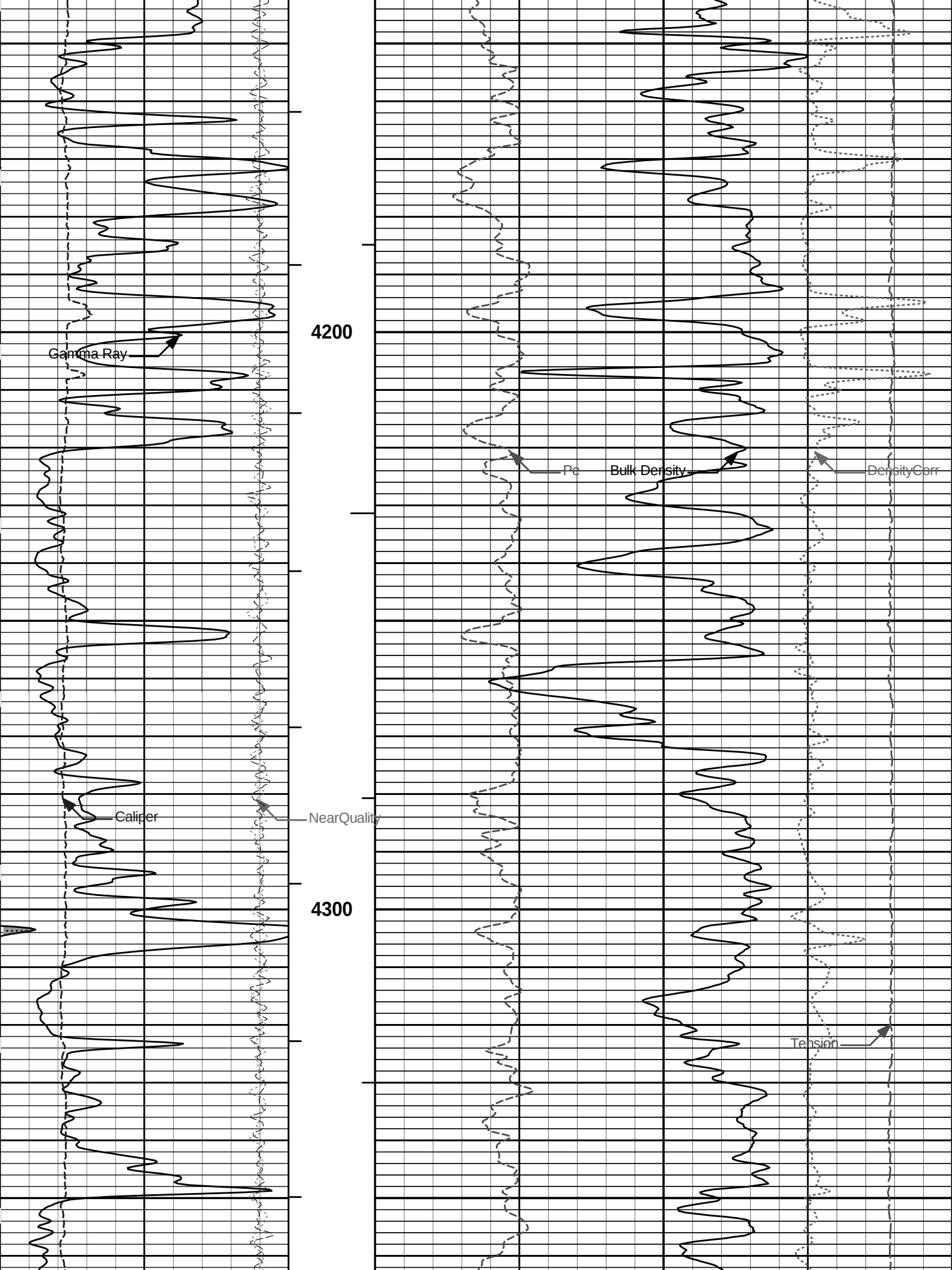
4000

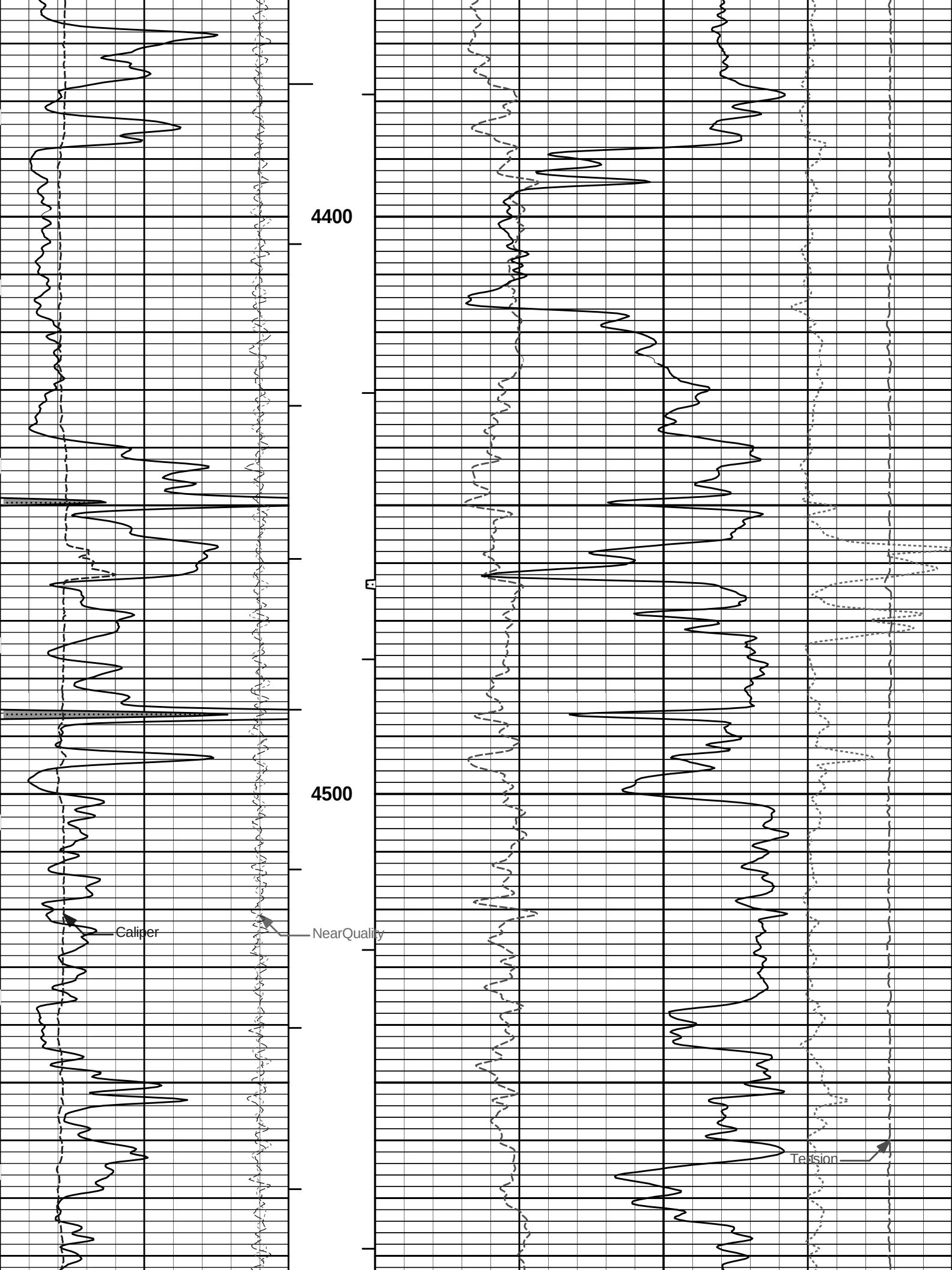
Caliper

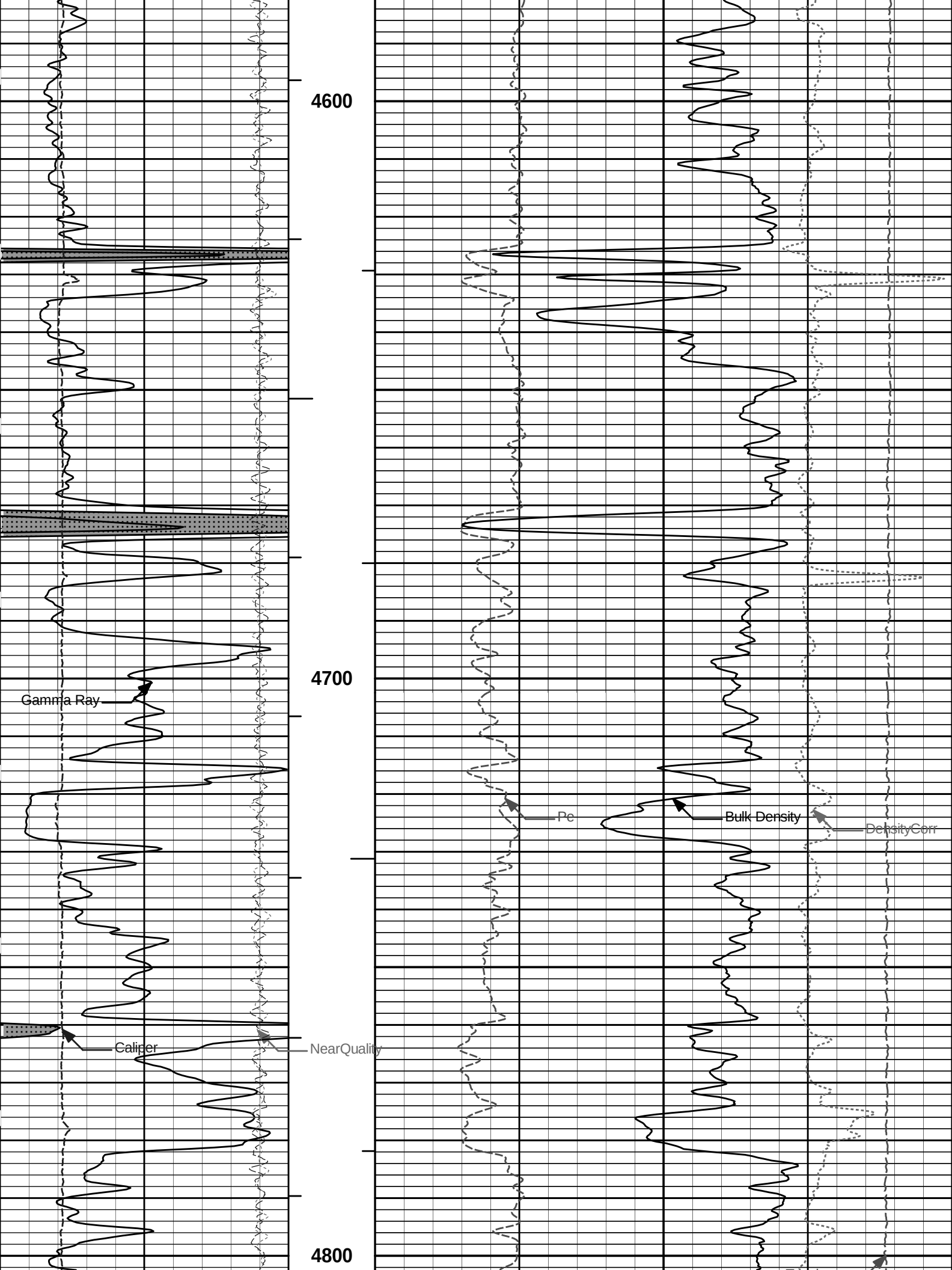
NearQuality

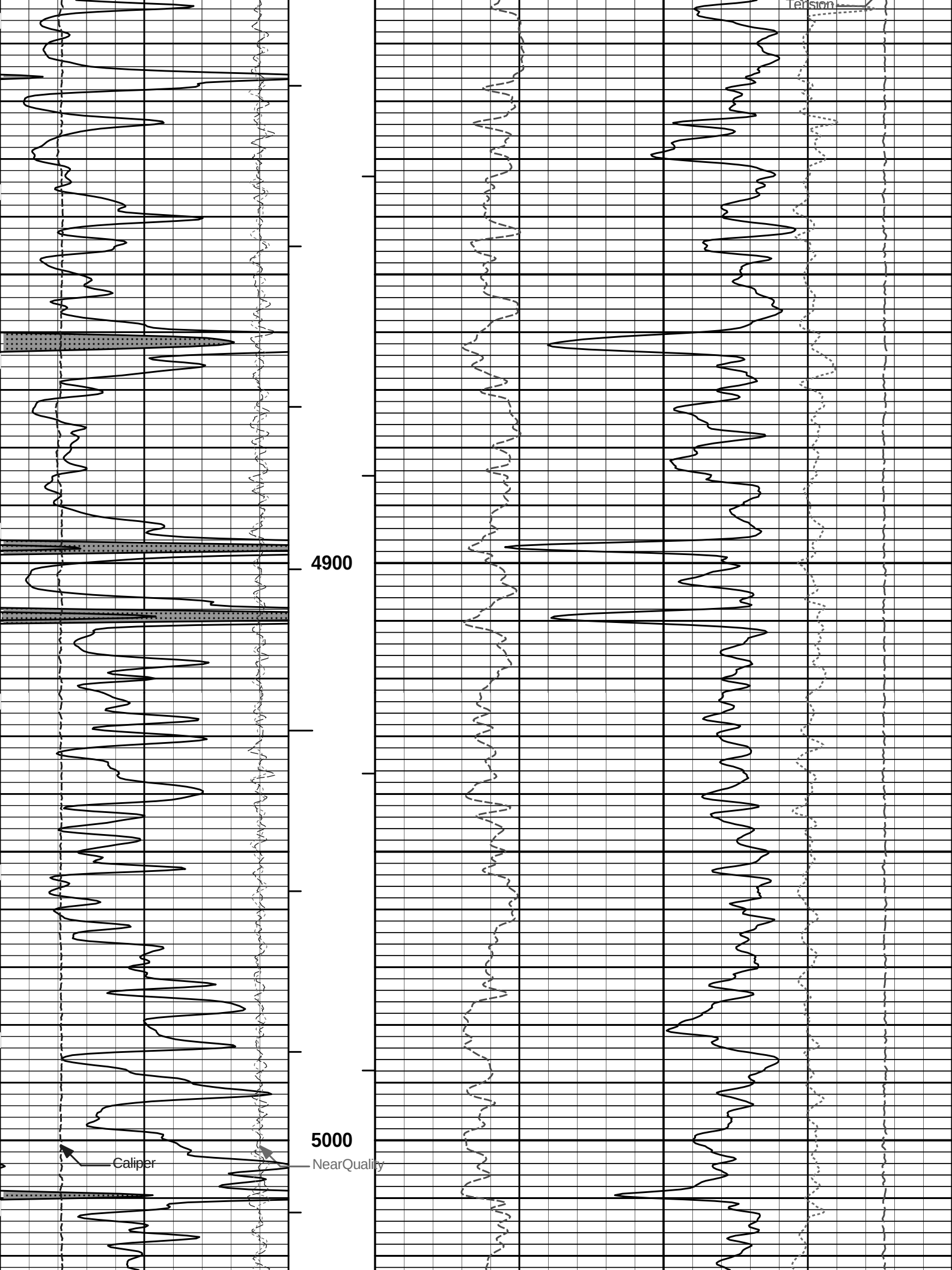
Tension

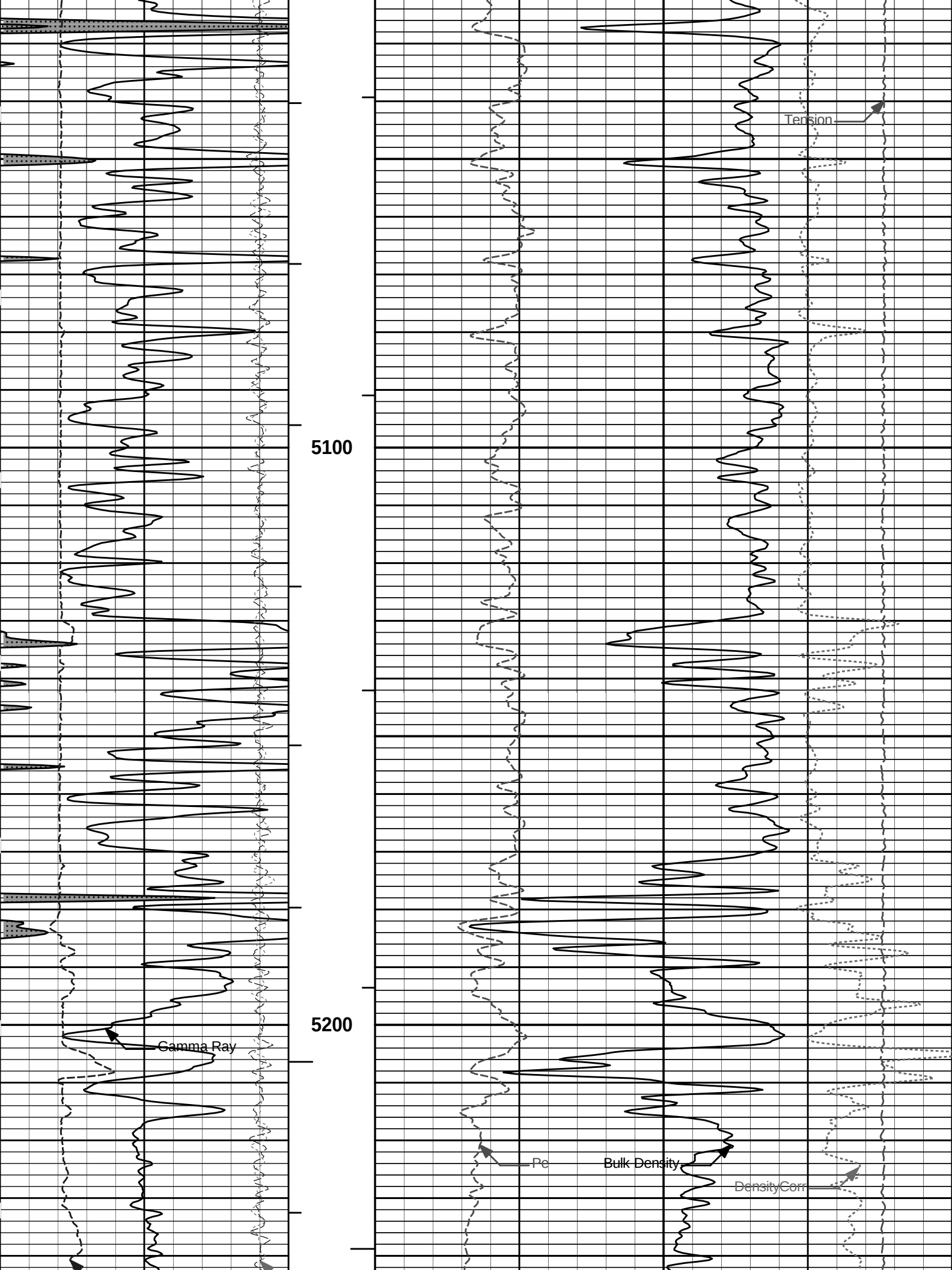
4100

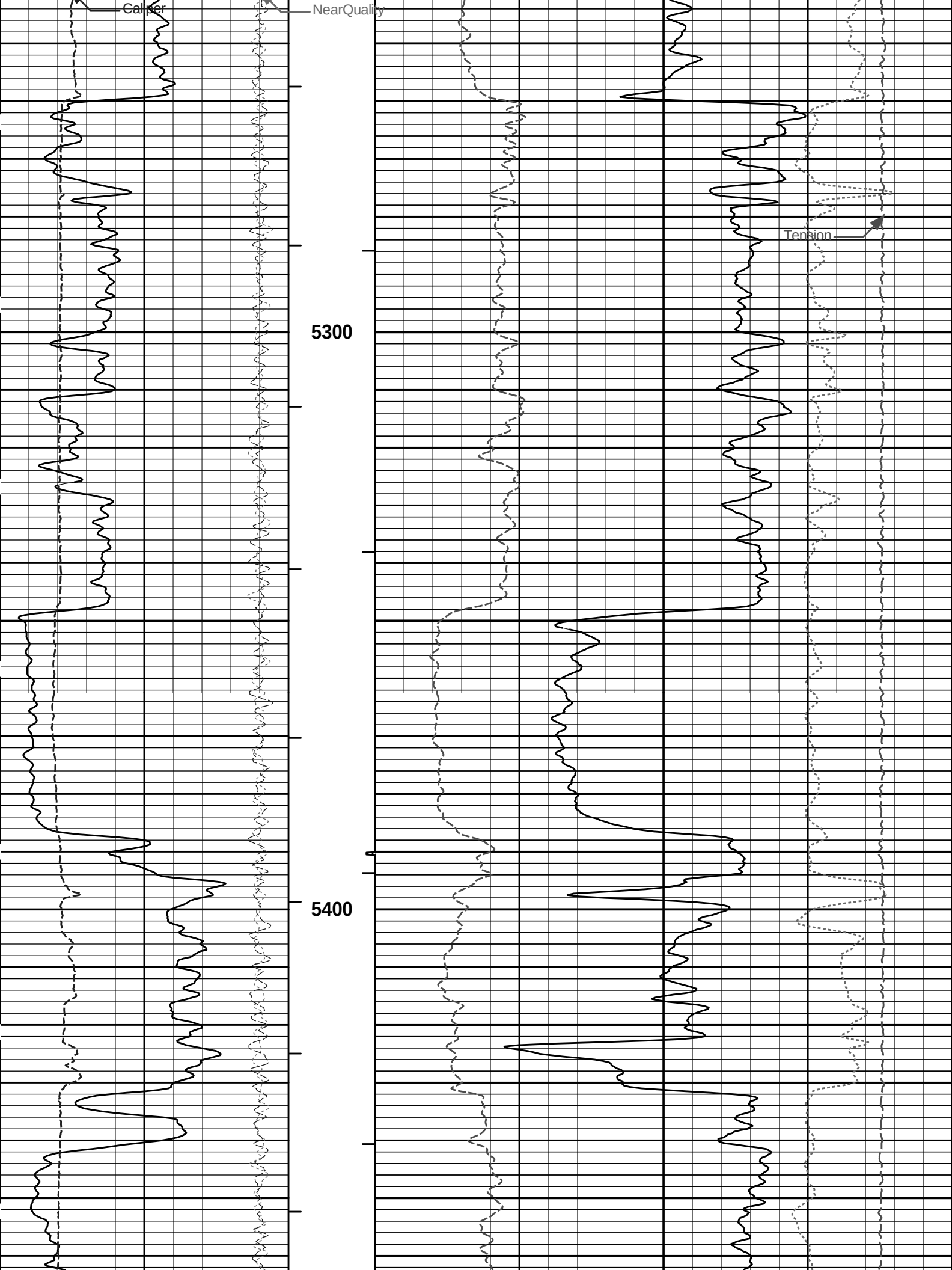

4200
Gamma Ray
Pe
Bulk Density
DensityCorr
Caliper
NearQuality
4300
Tension

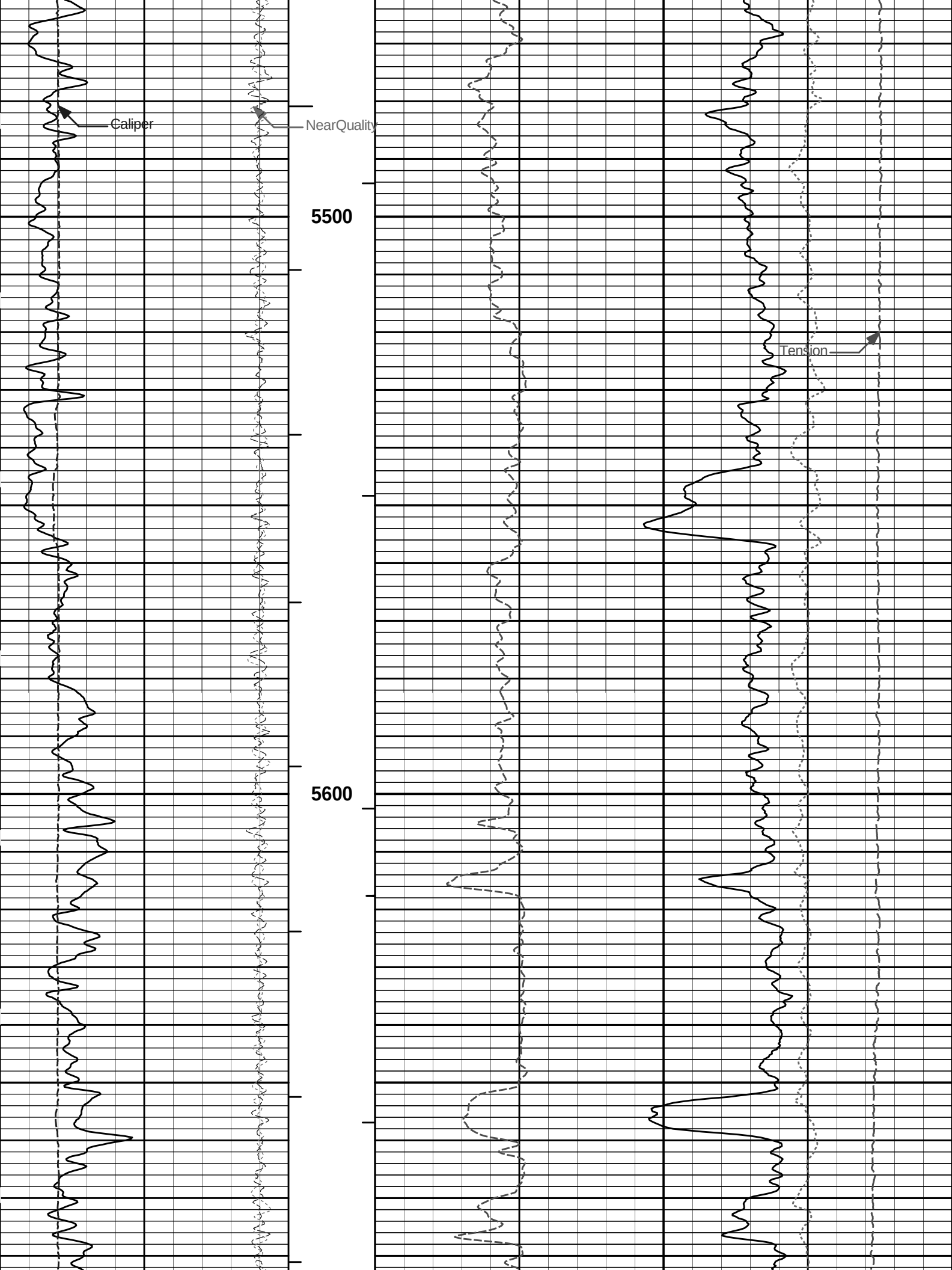

4400
4500
Caliper
NearQuality
Tension

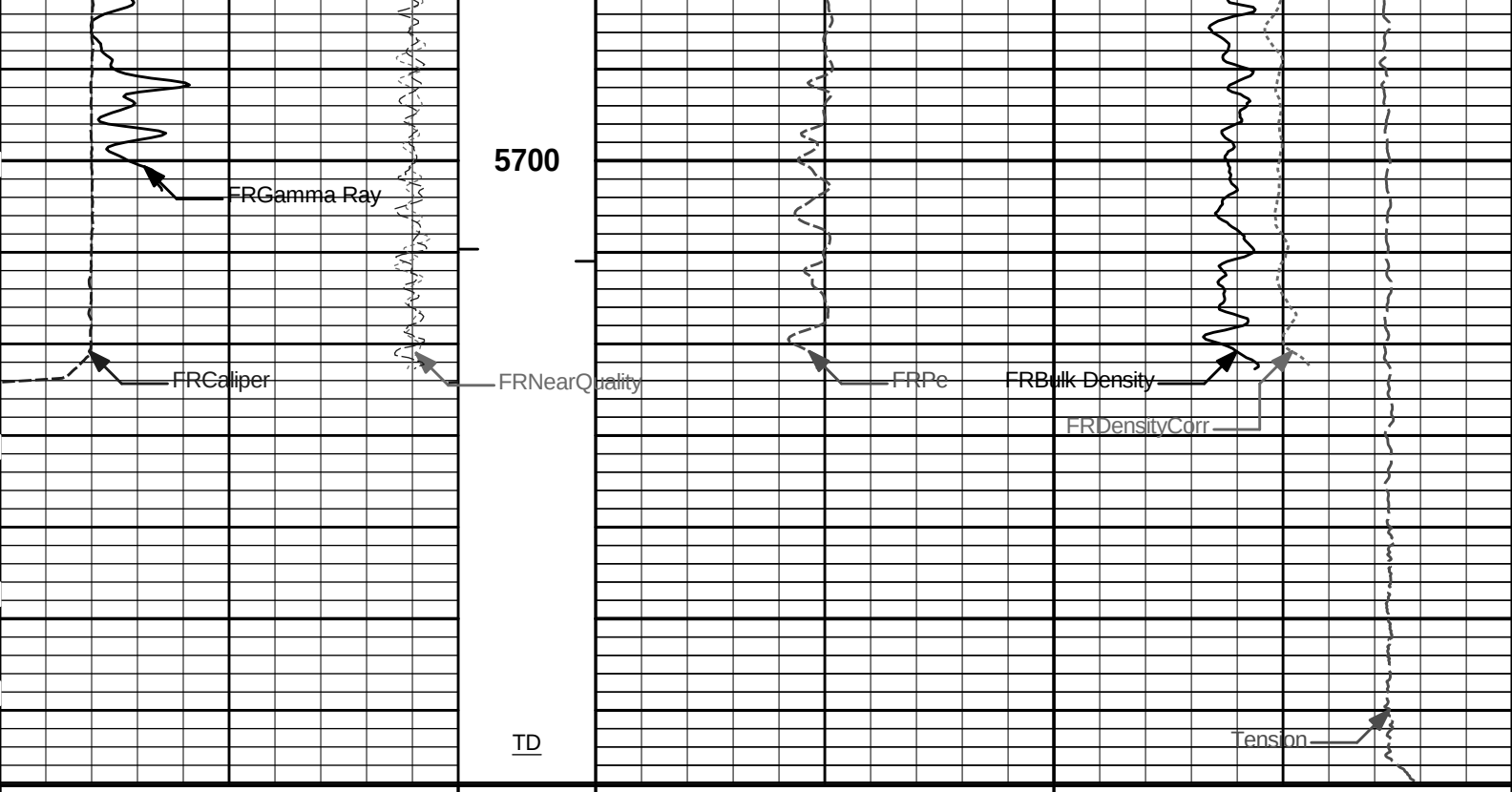

4600
4700
4800
Gamma Ray
Caliper
NearQuality
Pe
Bulk Density
DensityCorr


Tension
4900
5000
Caliper
NearQuality


5100
5200
Tension
Gamma Ray
Pe
Bulk Density
DensityCorr


Caliper
NearQuality
Tension
5300
5400


Caliper
NearQuality
5500
Tension
5600



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

-0.25 DensityCorr 0.25	
g/cc	
15K Tension 0	
pounds	

HALLIBURTON

Plot Time: 02-Dec-12 20:27:51
Plot Range: 4000 ft to 5767.92 ft
Data: GRIFFIN_C_1\Well Based\DETAIL\
Plot File: \\-LOCAL-\GRIFFIN_C_1\0001 SP-GTET-DSN-SDL-FLEX-BSAT-ACRT-CH\PORO\BULKD_5_MAIN_LIB

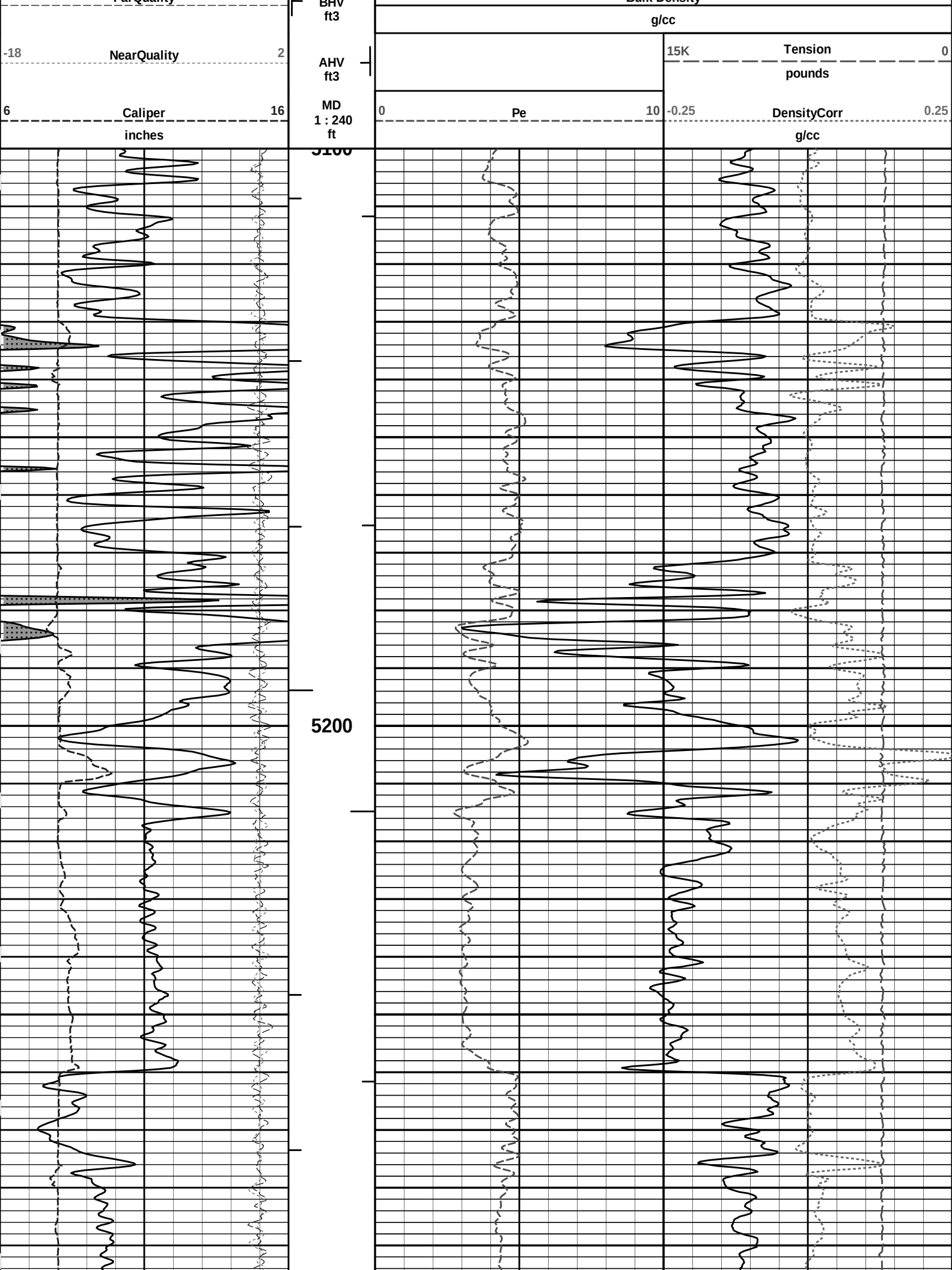
5 INCH MAIN LOG

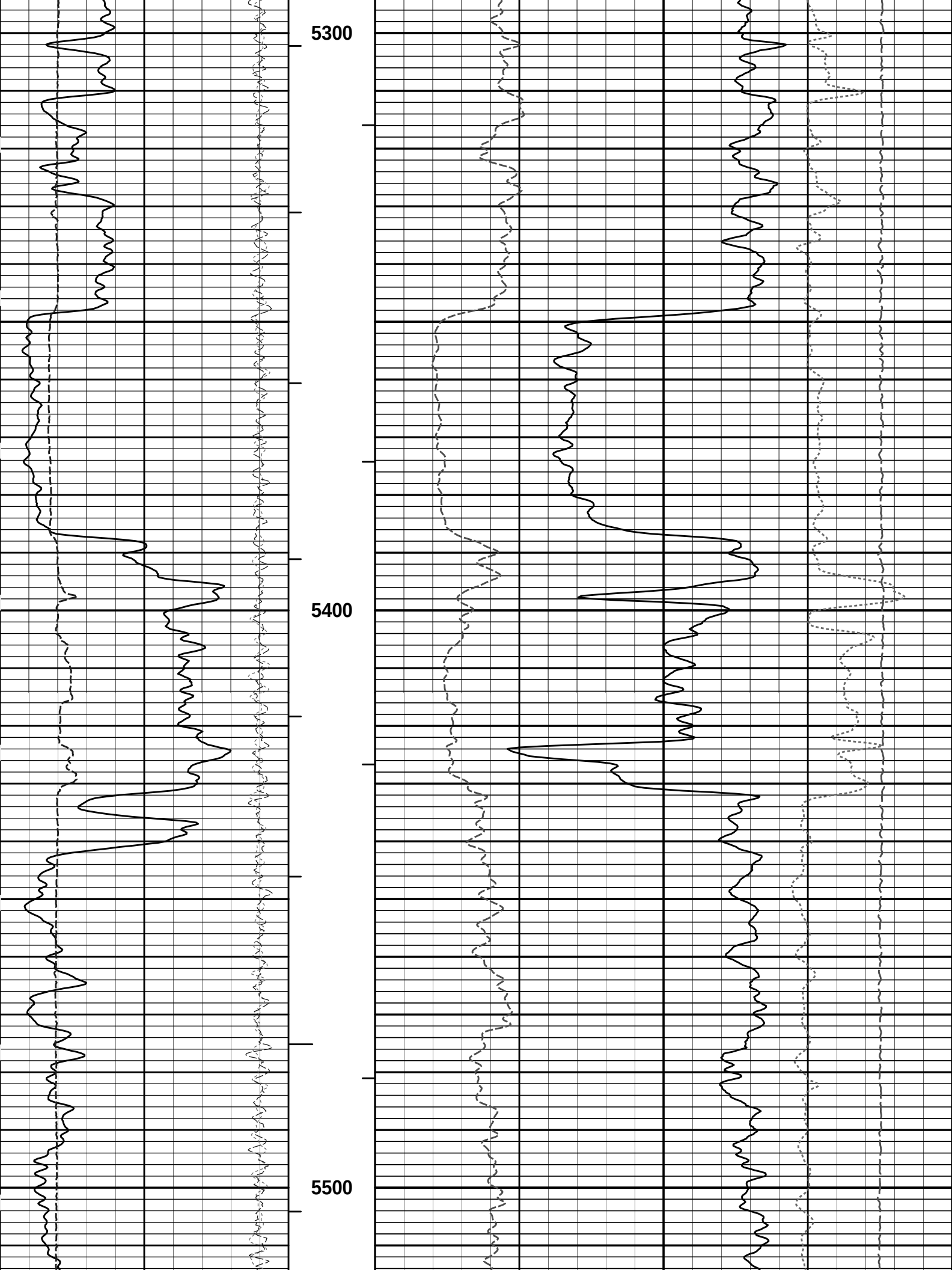
HALLIBURTON

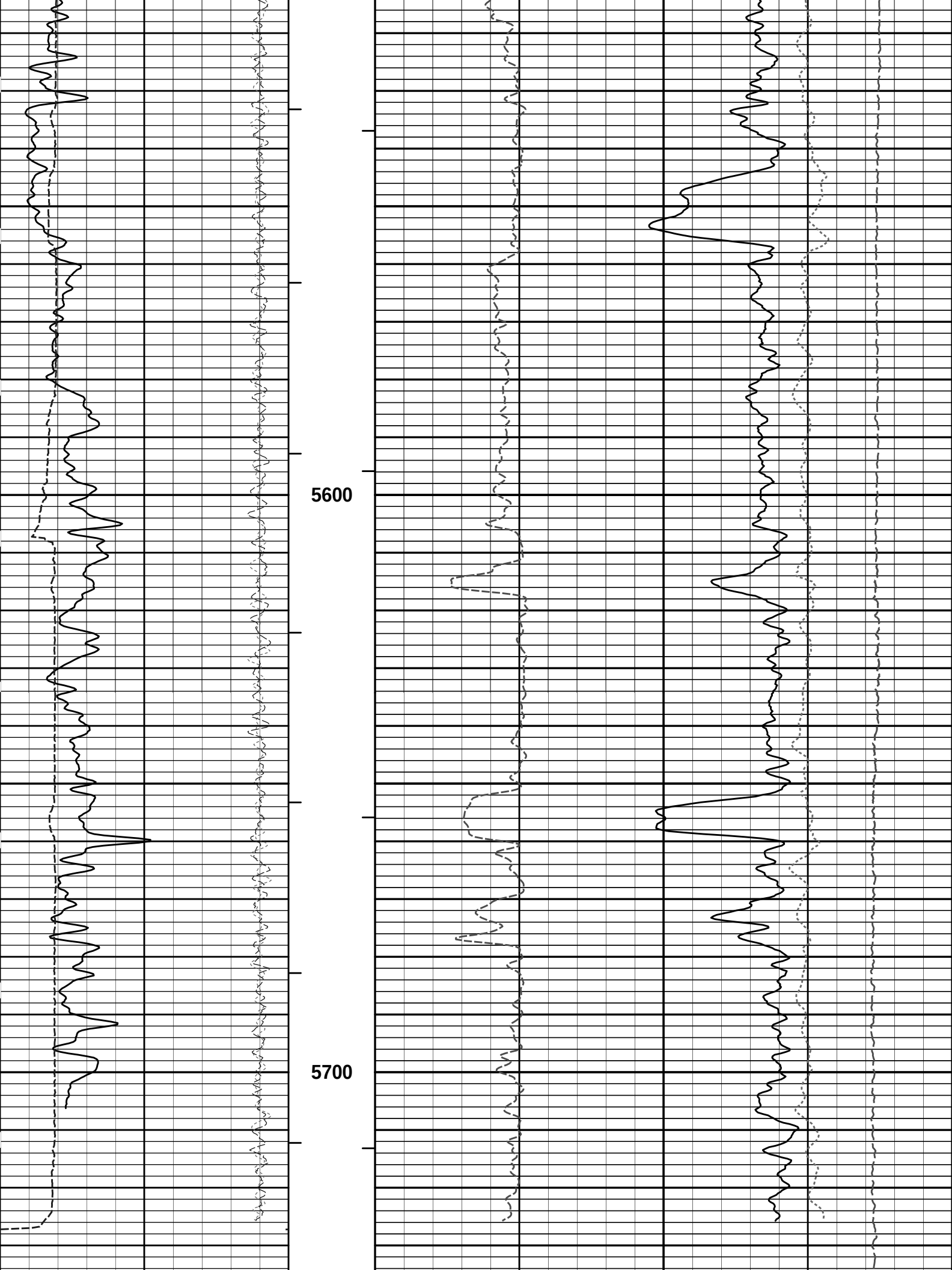
Plot Time: 02-Dec-12 20:27:51
Plot Range: 5100 ft to 5770.92 ft
Data: GRIFFIN_C_1\Well Based\REPEAT\
Plot File: \\-LOCAL-\GRIFFIN_C_1\0001 SP-GTET-DSN-SDL-FLEX-BSAT-ACRT-CH\PORO\BULKD_5_REP_LIB

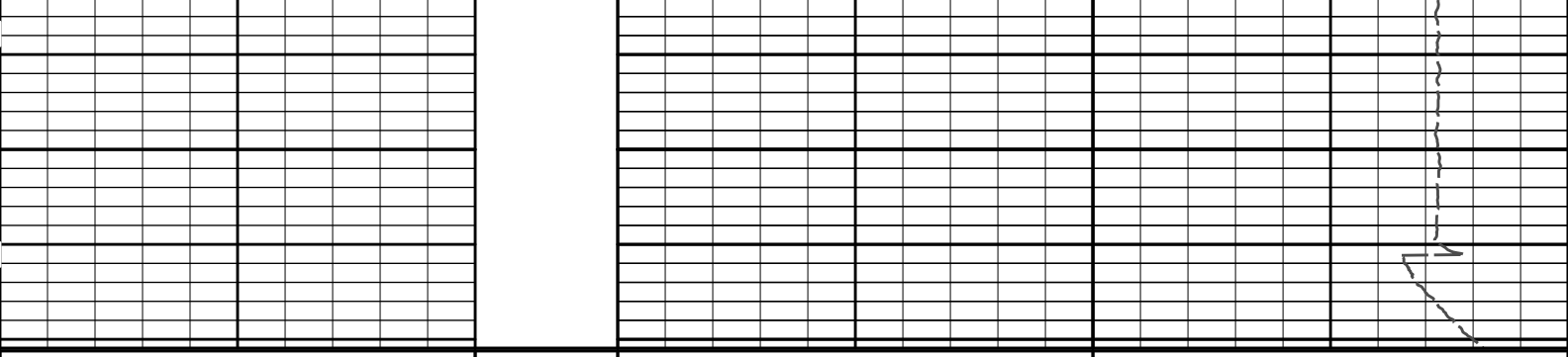
REPEAT SECTION

SHALE	
0 Gamma Ray 150	
api	
18 FarQuality -2	BHV ft3
	2 Bulk Density 3
	g/cc


FarQuality
-18
NearQuality
2
6
Caliper
16
inches
BHV
ft3
AHV
ft3
MD
1 : 240
ft
Bulk Density
g/cc
15K
Tension
0
pounds
0
Pe
10
-0.25
DensityCorr
0.25
g/cc
5100
5200


5300
5400
5500


5600
5700



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

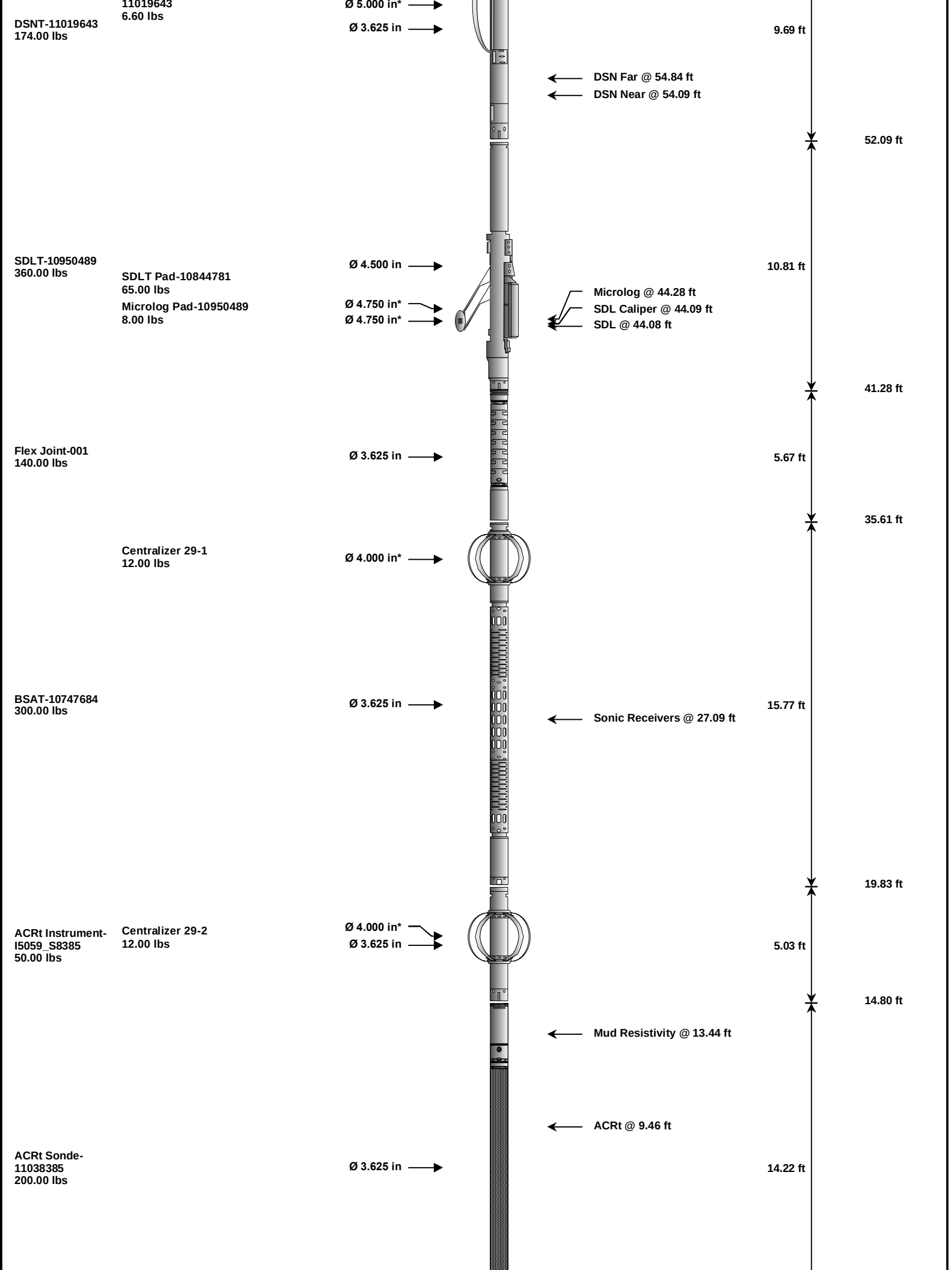
Plot Time: 02-Dec-12 20:27:56
Plot Range: 5100 ft to 5770.92 ft
Data: GRIFFIN_C_1\Well Based\REPEAT\
Plot File: \\-LOCAL-\GRIFFIN_C_1\0001 SP-GTET-DSN-SDL-FLEX-BSAT-ACRT-CH\PORO\BULKD_5_REP_LIB

REPEAT SECTION

HALLIBURTON

TOOL STRING DIAGRAM REPORT

Description	Overbody Description	O.D.	Diagram	Sensors @ Delays	Length	Accumulated Length
						77.06 ft
CH_HOS-CH_696 37.50 lbs		Ø 2.750 in		← Temperature @ 76.03 ft	3.03 ft	
						74.03 ft
SP Sub-11441455 60.00 lbs		Ø 3.625 in		← SP @ 72.26 ft	3.74 ft	
						70.30 ft
GTET-11039640 165.00 lbs		Ø 3.625 in		← GammaRay @ 64.23 ft	8.52 ft	
						61.78 ft
	DSN Decentralizer-					


11019643
6.60 lbs
Ø 5.000 in*
DSNT-11019643
174.00 lbs
Ø 3.625 in
9.69 ft
DSN Far @ 54.84 ft
DSN Near @ 54.09 ft
52.09 ft
SDLT-10950489
360.00 lbs
Ø 4.500 in
10.81 ft
SDLT Pad-10844781
65.00 lbs
Microlog Pad-10950489
8.00 lbs
Ø 4.750 in*
Ø 4.750 in*
Microlog @ 44.28 ft
SDL Caliper @ 44.09 ft
SDL @ 44.08 ft
41.28 ft
Flex Joint-001
140.00 lbs
Ø 3.625 in
5.67 ft
35.61 ft
Centralizer 29-1
12.00 lbs
Ø 4.000 in*
BSAT-10747684
300.00 lbs
Ø 3.625 in
15.77 ft
Sonic Receivers @ 27.09 ft
19.83 ft
ACRt Instrument-
I5059_S8385
50.00 lbs
Centralizer 29-2
12.00 lbs
Ø 4.000 in*
Ø 3.625 in
5.03 ft
14.80 ft
Mud Resistivity @ 13.44 ft
ACRt @ 9.46 ft
ACRt Sonde-
11038385
200.00 lbs
Ø 3.625 in
14.22 ft

Cabbage Head-
TRK696
10.00 lbs

Mnemonic	Tool Name	Serial Number	Weight (lbs)	Length (ft)		Accumulated Length (ft)	Max.Log. Speed (fpm)
CH_HOS	Hostile Cable Head with Load Cell	CH_696	37.50	3.03		74.03	300.00
SP	SP Sub	11441455	60.00	3.74		70.30	300.00
GTET	Gamma Telemetry Tool	11039640	165.00	8.52		61.78	60.00
DSNT	Dual Spaced Neutron	11019643	174.00	9.69		52.09	60.00
DCNT	DSN Decentralizer	11019643	6.60	5.13	*	55.42	300.00
SDLT	Spectral Density Tool	10950489	360.00	10.81		41.28	60.00
MICP	Microlog Pad	10950489	8.00	1.00	*	43.78	60.00
SDLP	Density Insite Pad	10844781	65.00	2.55	*	43.49	60.00
FLEX	Flex Joint	001	140.00	5.67		35.61	300.00
BSAT	Borehole Sonic Array Tool	10747684	300.00	15.77		19.83	60.00
OBCEN	Centralizer - 29 in.Overbody	1	12.00	2.42	*	32.77	300.00
ACRt	Array Compensated True Resistivity Instrument Section	I5059_S8385	50.00	5.03		14.80	300.00
OBCEN	Centralizer - 29 in.Overbody	2	12.00	2.42	*	16.39	300.00
ACRt	Array Compensated True Resistivity Sonde Section	11038385	200.00	14.22		0.58	300.00
CBHD	Cabbage Head	TRK696	10.00	0.58		0.00	300.00
Total			**1,600.10**	**77.06**			

* Not included in Total Length and Length Accumulation.

Data: GRIFFIN_C_1\0001 SP-GTET-DSN-SDL-FLEX-BSAT-ACRT-CH\IDLE **Date: 02-Dec-12 16:58:15**

HALLIBURTON

CALIBRATION REPORT

NATURAL GAMMA RAY TOOL SHOP CALIBRATION

Tool Name: GTET - 11039640 **Reference Calibration Date:** 25-Sep-12 15:48:12

Engineer: T. HYDE **Calibration Date:** 02-Nov-12 10:48:45

Software Version: WL INSITE R3.6.0 (Build 3) **Calibration Version:** 1

Calibrator Source S/N: TB146

Calibrator API Reference:265.00 api

Equivalent Calibrator API Reference:269.6 api

Measurement	Measured	Calibrated	Units
Background	63.1	62.7	api
Background + Calibrator	334.4	332.3	api
Calibrator	271.3	269.6	api

NATURAL GAMMA RAY TOOL FIELD CALIBRATION

Tool Name: GTET - 11039640 **Reference Calibration Date:** 02-Nov-12 10:48:45

Engineer: T. HYDE **Calibration Date:** 02-Dec-12 16:39:31

Software Version: WL INSITE R3.6.0 (Build 3) **Calibration Version:** 1

Calibrator Source S/N: TB146

Calibrator API Reference:265.00 api

Equivalent Calibrator API Reference:269.6 api

Field Verification	Shop	Field	Units
Background	62.7	54.6	api
Background + Calibrator	332.3	318.3	api
Calibrator	269.6	263.7	api

Shop	Field	Difference	Tolerance
269.6	263.7	5.9	+/- 9.00

DUAL SPACED NEUTRON SHOP CALIBRATION

Tool Name: DSNT - 11019643 **Reference Calibration Date:** 10-Aug-12 09:57:43

Engineer: T. HYDE **Calibration Date:** 15-Oct-12 10:00:41

Software Version: WL INSITE R3.6.0 (Build 3) **Calibration Version:** 1

Logging Source S/N: 696

Tank Serial Number: LIBERAL_NEUTRON

Reference value assigned to Tank: 51.680

Snow Block S/N: 696

Calibration Tank Water Temperature: 75 degF

Min. Tool Housing Outside Diameter: 3.620 in

CALIBRATION CONSTANTS

Measurement	Prev. Value	New Value	Control Limit On New Value
Gain:	0.952	0.956	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):	0.2093	0.2107	0.0013	+/- 0.0020
Calibrated Ratio:	9.67	9.72	0.044	+/- 0.050

VERIFIER

Measurement	Value	Control Limit
Snow-Block Porosity (decp):	0.0649	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 - 11019643 **Reference Calibration Date:** 15-Oct-12 10:00:41

Engineer: T. HYDE **Calibration Date:** 02-Dec-12 16:43:08

Software Version: WL INSITE R3.6.0 (Build 3) **Calibration Version:** 1

Logging Source S/N: 696

Snow Block S/N: 696

NEUTRON FIELD-CHECK SUMMARY

	Shop	Field	Difference	Control Limit On Change
Snow-Block Porosity (decp):	0.0649	0.0581	-0.0068	+/- 0.0150

PASS/FAIL SUMMARY

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

DENSITY CALIPER SHOP CALIBRATION

Tool Name: SDLT - 10950489 **Reference Calibration Date:** 15-Oct-12 11:14:18

Engineer:	**S. INGERSOLL**	**Calibration Date:**	**19-Nov-12 16:10:38**
Software Version:	**WL INSITE R3.6.0 (Build 3)**	**Calibration Version:**	**1**
Host Tool Name:	**DSNT - 11019643**		

CALIBRATION COEFFICIENTS

Measurement	Previous Value	New Value	Control Limit On New Value
Pad Offset	-2128.38	-2019.81	-7000.00 - -1000.00
Pad Gain	0.0004035	0.0004003	0.000200 - 0.000600
Arm Offset	153.69	-1027.54	-5000.00 - 3000.00
Arm Gain	0.0004767	0.0005720	0.000300 - 0.000700
Arm Power	-0.000003537	-0.000008935	-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)	1.97	2.00	0.03	+/- 0.20
Medium Ring (in)	3.74	3.75	0.01	+/- 0.20
RING DIAMETER:				
Small Ring (in)	6.69	6.50	-0.19	+/- 0.20
Medium Ring (in)	8.22	8.25	0.03	+/- 0.20
Large Ring (in)	15.05	15.00	-0.05	+/- 0.20

PASS/FAIL SUMMARY

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

PASS/FAIL SUMMARY

Calibration-Coefficients Range Check:	Passed

SPECTRAL DENSITY SHOP CALIBRATION

Tool Name:	**SDLT Pad - 10844781**	**Reference Calibration Date:**	**15-Oct-12 10:46:28**
Engineer:	**S. INGERSOLL**	**Calibration Date:**	**19-Nov-12 15:27:03**
Software Version:	**WL INSITE R3.6.0 (Build 3)**	**Calibration Version:**	**1**

Logging Source S/N: 5168GW

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	1.0387	1.0289	0.90 - 1.10
Near Dens Gain	1.0191	1.0211	0.90 - 1.10
Near Peak Gain	1.0131	1.0191	0.90 - 1.10
Near Lith Gain	0.9962	1.0080	0.90 - 1.10
Far Bar Gain	1.0143	1.0134	0.90 - 1.10
Far Dens Gain	1.0005	1.0005	0.90 - 1.10
Far Peak Gain	0.9978	0.9970	0.90 - 1.10
Far Lith Gain	0.9766	0.9763	0.90 - 1.10
Near Bar Offset	-0.1525	-0.0666	NONE
Near Dens Offset	0.0153	-0.0031	NONE
Near Peak Offset	0.0726	0.0181	NONE
Near Lith Offset	0.2040	0.1033	NONE

Far Bar Offset	0.0103	0.0149	NONE
Far Dens Offset	0.1212	0.1185	NONE
Far Peak Offset	0.1147	0.1199	NONE
Far Lith Offset	0.2613	0.2603	NONE
Near Bar Background	813.25	808.86	700 - 1450
Near Dens Background	266.76	265.41	230 - 480
Near Peak Background	116.49	115.66	100 - 210
Near Lith Background	144.19	143.86	125 - 260
Far Bar Background	529.63	526.45	450 - 900
Far Dens Background	208.02	208.46	175 - 345
Far Peak Background	83.54	82.80	70 - 140
Far Lith Background	86.07	85.51	75 - 145

CALIBRATION BLOCK SUMMARY

Measurement	Current Reading (Previous Coef)	Calibrated (New Coef)	Change	Control Limit On Change
MAGNESIUM				
Density (g/cc)	1.685	1.684	-0.001	+/- 0.015
Pe	2.562	2.554	-0.008	+/- 0.150
ALUMINUM				
Density (g/cc)	2.599	2.598	-0.001	+/- 0.01500
Pe	3.106	3.122	0.016	+/- 0.150

TOOL SUMMARY

Measurement	Near Detector		Far Detector	
	Value	Control Limits	Value	Control Limits
QUALITY				
Background	0.0001	+/- 0.0110	-0.0026	+/- 0.0140
Magnesium Block	-0.0002	+/- 0.0110	-0.0014	+/- 0.0140
Aluminum Block	-0.0019	+/- 0.0110	-0.0002	+/- 0.0140
Resolution	9.35	6.00 - 11.50	8.83	6.00 - 11.50
Internal Verifier(B+D+P+L)	1334	1200 - 2700	903	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 - 10844781 **Reference Calibration Date:** 19-Nov-12 15:27:03

Engineer: T. HYDE **Calibration Date:** 02-Dec-12 16:40:16

Software Version: WL INSITE R3.6.0 (Build 3) **Calibration Version:** 1

Pad Temperature: 69.1 degF

DENSITY FIELD CALIBRATION SUMMARY

Measurement	Shop	Field	Change	Control Limit +/-

Near (B+D+P+L) cps	1333.790	1337.580	3.790	14.773
Far (B+D+P+L) cps	903.217	911.707	8.490	16.334
Near Resolution	9.35	9.50	0.150	0.50
Far Resolution	8.83	9.52	0.690	1.00

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

SDLT CALIPER FIELD CALIBRATION

Tool Name: SDLT - 10950489 **Reference Calibration Date:** 19-Nov-12 16:10:38

Engineer: T. HYDE **Calibration Date:** 02-Dec-12 16:45:06

Software Version: WL INSITE R3.6.0 (Build 3) **Calibration Version:** 1

MEASURED CALIPER VALUES

Measurement	Shop	Field	Change	Control Limit On New Value
Pad Extension	3.75	3.69	-0.06	+/- 0.10
Ring Diameter	8.25	8.37	0.12	+/- 0.15

PASS/FAIL SUMMARY	
Pad Extension Check:	Passed
Diameter Check:	Passed

CALIBRATION SUMMARY

Sensor	Shop	Field	Post	Difference	Tolerance	Units
GTET-11039640						
Gamma Ray Calibrator	269.6	263.7	----------	5.9	+/- 9.00	api
DSNT-11019643						
Snow-Block Porosity	0.0649	0.0581	----------	0.0068	+/- 0.0150	decp
SDLT-10950489						
Pad Extension	3.75	3.69	----------	0.06	+/-0.10	in
Ring Diameter	8.25	8.37	----------	-0.12	+/-0.15	in
SDLT Pad-10844781						
Near(B+D+P+L)	1333.790	1337.580	----------	-3.790	+/-14.773	cps
Far(B+D+P+L)	903.217	911.707	----------	-8.490	+/-16.334	cps

Data: GRIFFIN_C_1\0001 SP-GTET-DSN-SDL-FLEX-BSAT-ACRT-CH\IDLE **Date: 02-Dec-12 17:00:54**

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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	9.200	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	5796.00	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	47.60	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: GRIFFIN_C_1\0001 SP-GTET-DSN-SDL-FLEX-BSAT-ACRT-CH\IDLE **Date: 02-Dec-12 16:59:27**

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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	
	CH_HOS			
DHTN	DownholeTension	0.00	BLK	0.000
	SP Sub			
PLTC	Plot Control Mask	72.25	NO	
SP	Spontaneous Potential	72.25	BLK	1.250
SPR	Raw Spontaneous Potential	72.25	NO	
SPO	Spontaneous Potential Offset	72.25	NO	
	GTET			
TPUL	Tension Pull	64.23	NO	
GR	Natural Gamma Ray API	64.23	TRI	1.750
GRU	Unfiltered Natural Gamma Ray API	64.23	NO	
EGR	Natural Gamma Ray API with Enhanced Vertical Resolution	64.23	W	1.416 , 0.750
ACCZ	Accelerometer Z	0.00	BLK	0.083
DEVI	Inclination	0.00	NO	
	DSNT			
TPUL	Tension Pull	53.99	NO	
RNDS	Near Detector Telemetry Counts	54.09	BLK	1.417
RFDS	Far Detector Telemetry Counts	54.84	TRI	0.583
DNTT	DSN Tool Temperature	54.09	NO	
DSNS	DSN Tool Status	53.99	NO	
ERND	Near Detector Telemetry Counts EVR	54.09	BLK	0.000
ERFD	Far Detector Telemetry Counts EVR	54.84	BLK	0.000
ENTM	DSN Tool Temperature EVR	54.09	NO	
	SDLT			
TPUL	Tension Pull	44.09	NO	
PCAL	Pad Caliper	44.09	TRI	0.250
ACAL	Arm Caliper	44.09	TRI	0.250
	BSAT			
TPUL	Tension Pull	27.09	NO	
STAT	Status	27.09	NO	
DLYT	Delay Time	27.09	NO	

SI	Sample Interval	27.09	NO	
TXRX	Raw Telemetry 10 Receivers	27.09	NO	
FRMC	Tool Frame Count	27.09	NO	
GMOD	Gain processing mode	19.83	NO	
	ACRt Sonde			
TPUL	Tension Pull	2.97	NO	
F1R1	ACRT 12KHz - 80in R value	9.22	BLK	0.000
F1X1	ACRT 12KHz - 80in X value	9.22	BLK	0.000
F1R2	ACRT 12KHz - 50in R value	6.72	BLK	0.000
F1X2	ACRT 12KHz - 50in X value	6.72	BLK	0.000
F1R3	ACRT 12KHz - 29in R value	5.22	BLK	0.000
F1X3	ACRT 12KHz - 29in X value	5.22	BLK	0.000
F1R4	ACRT 12KHz - 17in R value	4.22	BLK	0.000
F1X4	ACRT 12KHz - 17in X value	4.22	BLK	0.000
F1R5	ACRT 12KHz - 10in R value	3.72	BLK	0.000
F1X5	ACRT 12KHz - 10in X value	3.72	BLK	0.000
F1R6	ACRT 12KHz - 6in R value	3.47	BLK	0.000
F1X6	ACRT 12KHz - 6in X value	3.47	BLK	0.000
F2R1	ACRT 36KHz - 80in R value	9.22	BLK	0.000
F2X1	ACRT 36KHz - 80in X value	9.22	BLK	0.000
F2R2	ACRT 36KHz - 50in R value	6.72	BLK	0.000
F2X2	ACRT 36KHz - 50in X value	6.72	BLK	0.000
F2R3	ACRT 36KHz - 29in R value	5.22	BLK	0.000
F2X3	ACRT 36KHz - 29in X value	5.22	BLK	0.000
F2R4	ACRT 36KHz - 17in R value	4.22	BLK	0.000
F2X4	ACRT 36KHz - 17in X value	4.22	BLK	0.000
F2R5	ACRT 36KHz - 10in R value	3.72	BLK	0.000
F2X5	ACRT 36KHz - 10in X value	3.72	BLK	0.000
F2R6	ACRT 36KHz - 6in R value	3.47	BLK	0.000
F2X6	ACRT 36KHz - 6in X value	3.47	BLK	0.000
F3R1	ACRT 72KHz - 80in R value	9.22	BLK	0.000
F3X1	ACRT 72KHz - 80in X value	9.22	BLK	0.000
F3R2	ACRT 72KHz - 50in R value	6.72	BLK	0.000
F3X2	ACRT 72KHz - 50in X value	6.72	BLK	0.000
F3R3	ACRT 72KHz - 29in R value	5.22	BLK	0.000
F3X3	ACRT 72KHz - 29in X value	5.22	BLK	0.000
F3R4	ACRT 72KHz - 17in R value	4.22	BLK	0.000
F3X4	ACRT 72KHz - 17in X value	4.22	BLK	0.000
F3R5	ACRT 72KHz - 10in R value	3.72	BLK	0.000
F3X5	ACRT 72KHz - 10in X value	3.72	BLK	0.000
F3R6	ACRT 72KHz - 6in R value	3.47	BLK	0.000
F3X6	ACRT 72KHz - 6in X value	3.47	BLK	0.000
RMUD	Mud Resistivity	12.76	BLK	0.000
F1RT	Transmitter Reference 12 KHz Real Signal	2.97	BLK	0.000
F1XT	Transmitter Reference 12 KHz Imaginary Signal	2.97	BLK	0.000
F2RT	Transmitter Reference 36 KHz Real Signal	2.97	BLK	0.000
F2XT	Transmitter Reference 36 KHz Imaginary Signal	2.97	BLK	0.000
F3RT	Transmitter Reference 72 KHz Real Signal	2.97	BLK	0.000
F3XT	Transmitter Reference 72 KHz Imaginary Signal	2.97	BLK	0.000
TFPU	Upper Feedpipe Temperature Calculated	2.97	BLK	0.000
TFPL	Lower Feedpipe Temperature Calculated	2.97	BLK	0.000
ITMP	Instrument Temperature	2.97	BLK	0.000
TCVA	Temperature Correction Values Loop Off	2.97	NO	
TIDV	Instrument Temperature Derivative	2.97	NO	
TUDV	Upper Temperature Derivative	2.97	NO	

TLDV	Lower Temperature Derivative	2.97	NO	
TRBD	Receiver Board Temperature	2.97	NO	

SDLT Pad				
TPUL	Tension Pull	44.08	NO	
NAB	Near Above	43.90	BLK	0.920
NHI	Near Cesium High	43.90	BLK	0.920
NLO	Near Cesium Low	43.90	BLK	0.920
NVA	Near Valley	43.90	BLK	0.920
NBA	Near Barite	43.90	BLK	0.920
NDE	Near Density	43.90	BLK	0.920
NPK	Near Peak	43.90	BLK	0.920
NLI	Near Lithology	43.90	BLK	0.920
NBAU	Near Barite Unfiltered	43.90	BLK	0.250
NLIU	Near Lithology Unfiltered	43.90	BLK	0.250
FAB	Far Above	44.26	BLK	0.250
FHI	Far Cesium High	44.26	BLK	0.250
FLO	Far Cesium Low	44.26	BLK	0.250
FVA	Far Valley	44.26	BLK	0.250
FBA	Far Barite	44.26	BLK	0.250
FDE	Far Density	44.26	BLK	0.250
FPK	Far Peak	44.26	BLK	0.250
FLI	Far Lithology	44.26	BLK	0.250
PTMP	Pad Temperature	44.09	BLK	0.920
NHV	Near Detector High Voltage	43.49	NO	
FHV	Far Detector High Voltage	43.49	NO	
ITMP	Instrument Temperature	43.49	NO	
DDHV	Detector High Voltage	43.49	NO	

Microlog Pad				
TPUL	Tension Pull	44.28	NO	
MINV	Microlog Lateral	44.28	BLK	0.750
MNOR	Microlog Normal	44.28	BLK	0.750

Data: GRIFFIN_C_1\0001 SP-GTET-DSN-SDL-FLEX-BSAT-ACRT-CH\IDLE **Date: 02-Dec-12 16:59:39**

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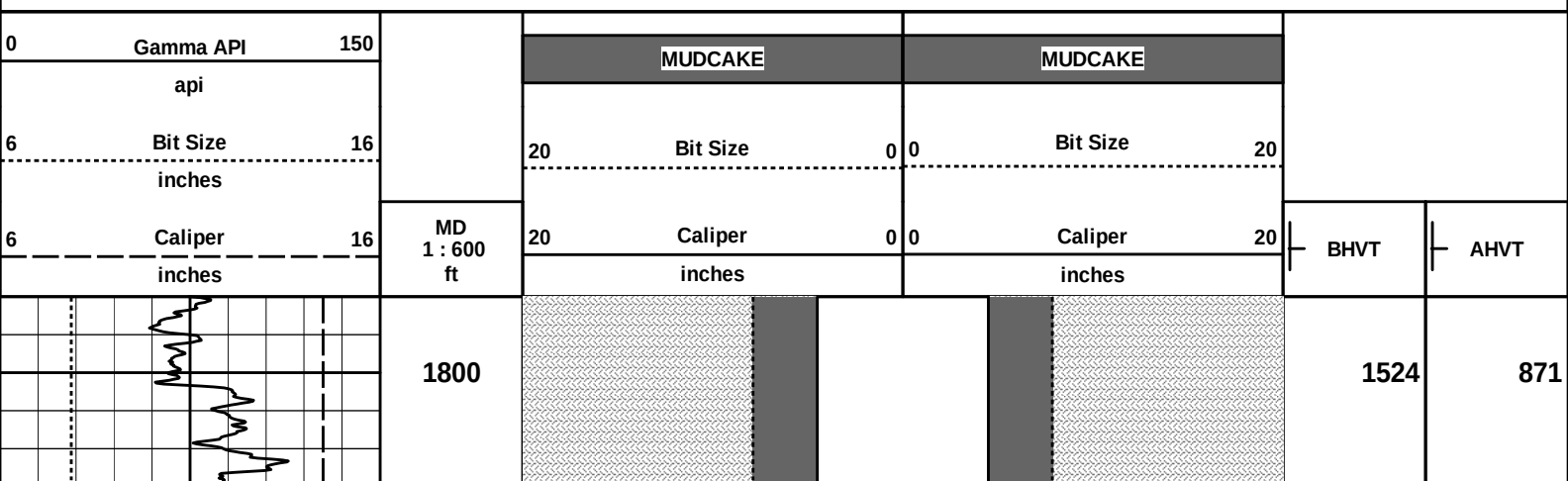
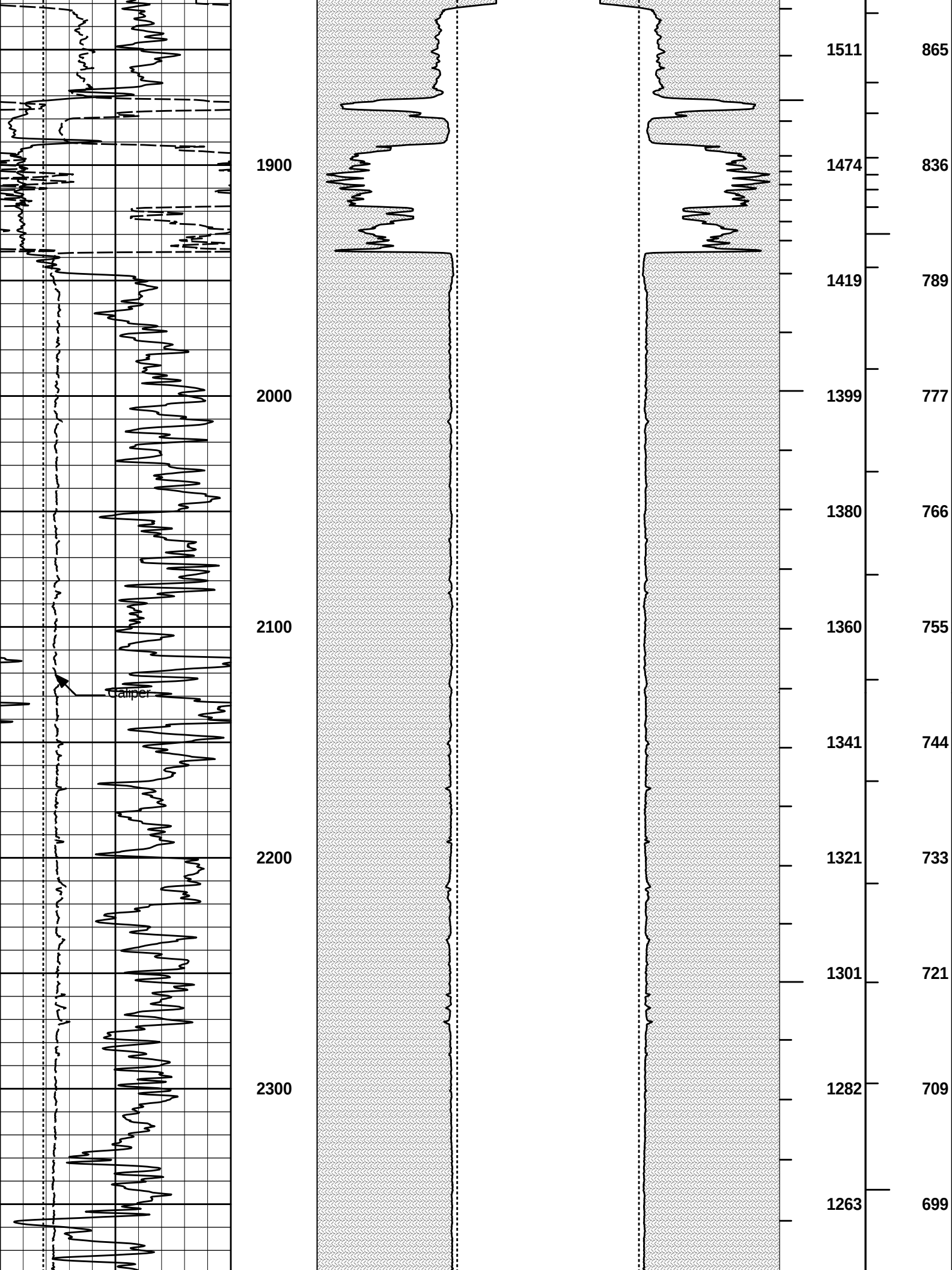
Plot Time: 02-Dec-12 20:27:57
Plot Range: 1780 ft to 5767.92 ft
Data: GRIFFIN_C_1\Well Based\CASING
Plot File: \\-LOCAL-\GRIFFIN_C_1\0001 SP-GTET-DSN-SDL-FLEX-BSAT-ACRT-CH\PORO\AHV_2_IQ_LIB

ANNULAR HOLE VOLUME PLOT




1900
2000
2100
2200
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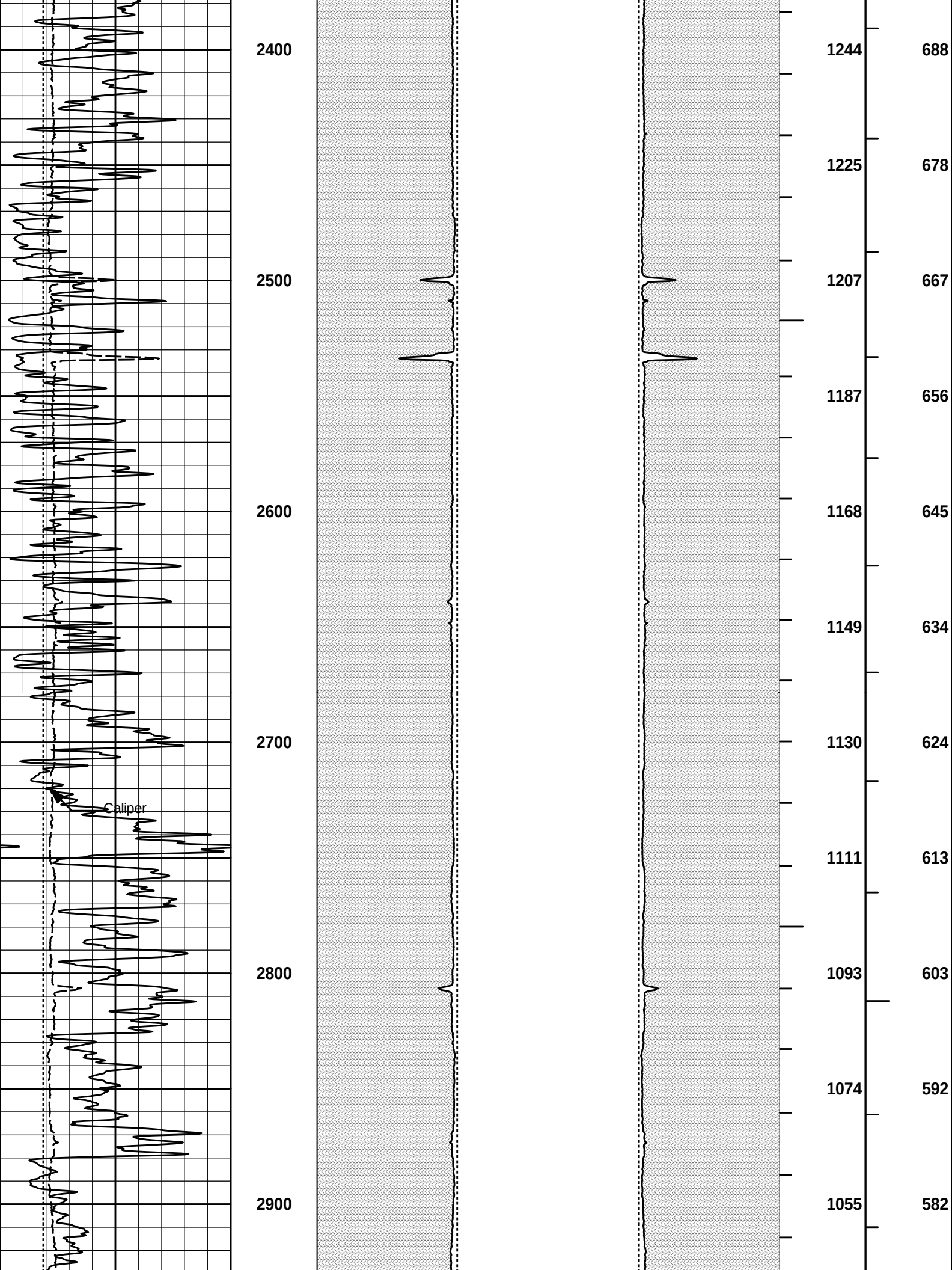
Caliper
1511
865
1474
836
1419
789
1399
777
1380
766
1360
755
1341
744
1321
733
1301
721
1282
709
1263
699


2400
2500
2600
2700
2800
2900
Caliper
1244
1225
1207
1187
1168
1149
1130
1111
1093
1074
1055
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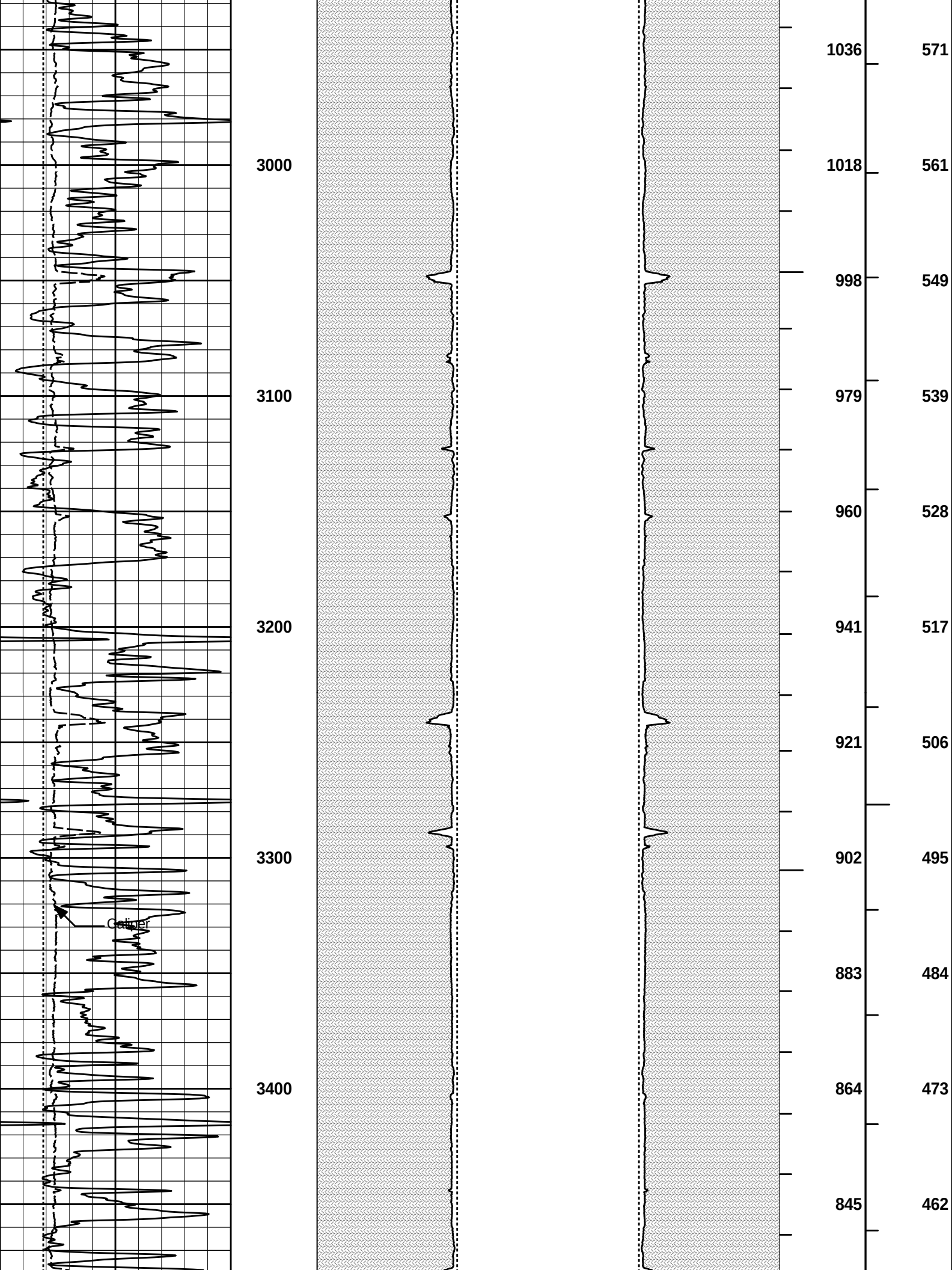
678
667
656
645
634
624
613
603
592
582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3100
3200
3300
3400
Caliper
1036
1018
998
979
960
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902
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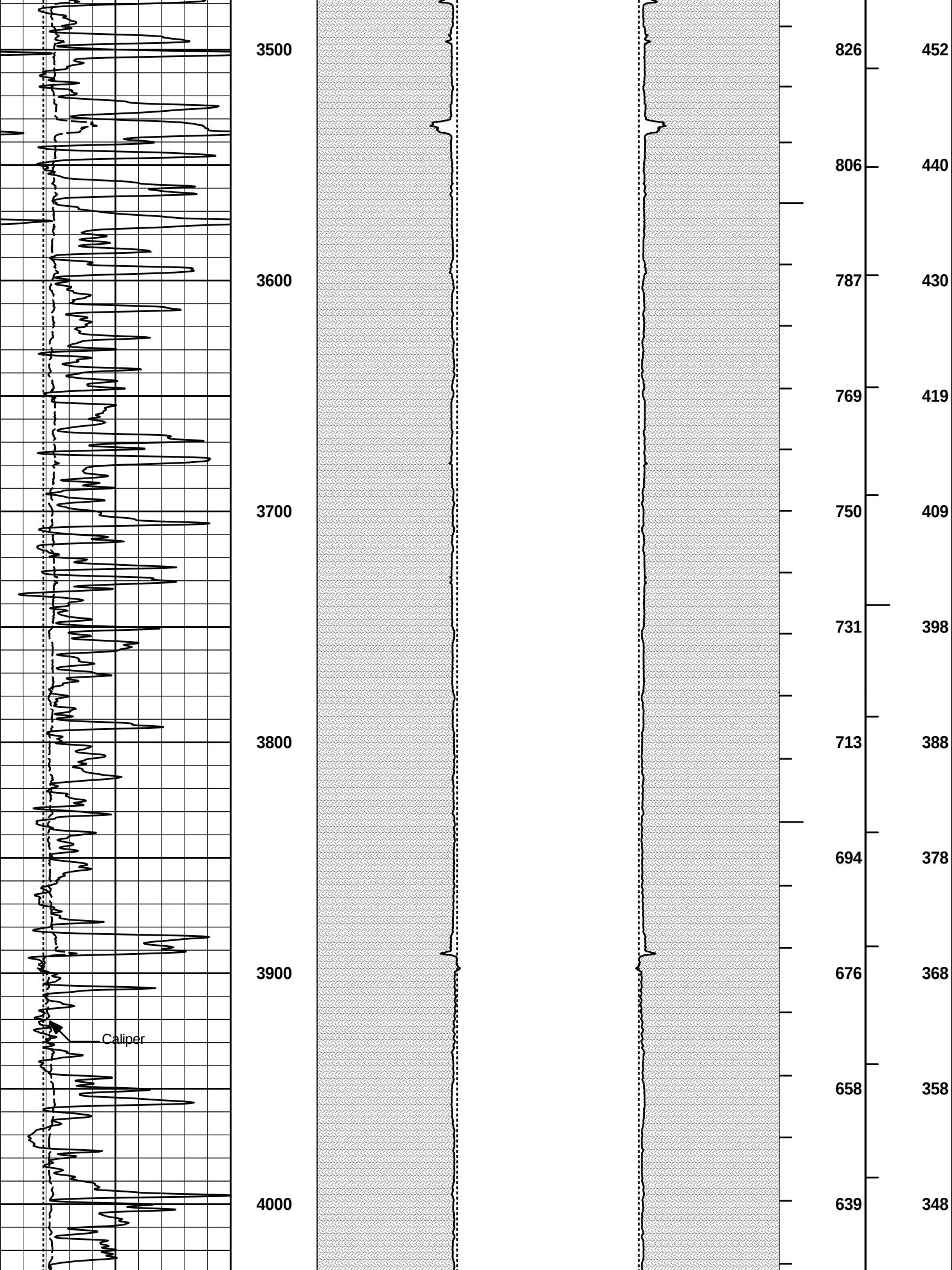
3500
3600
3700
3800
3900
4000
Caliper
826
806
787
769
750
731
713
694
676
658
639
452
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430
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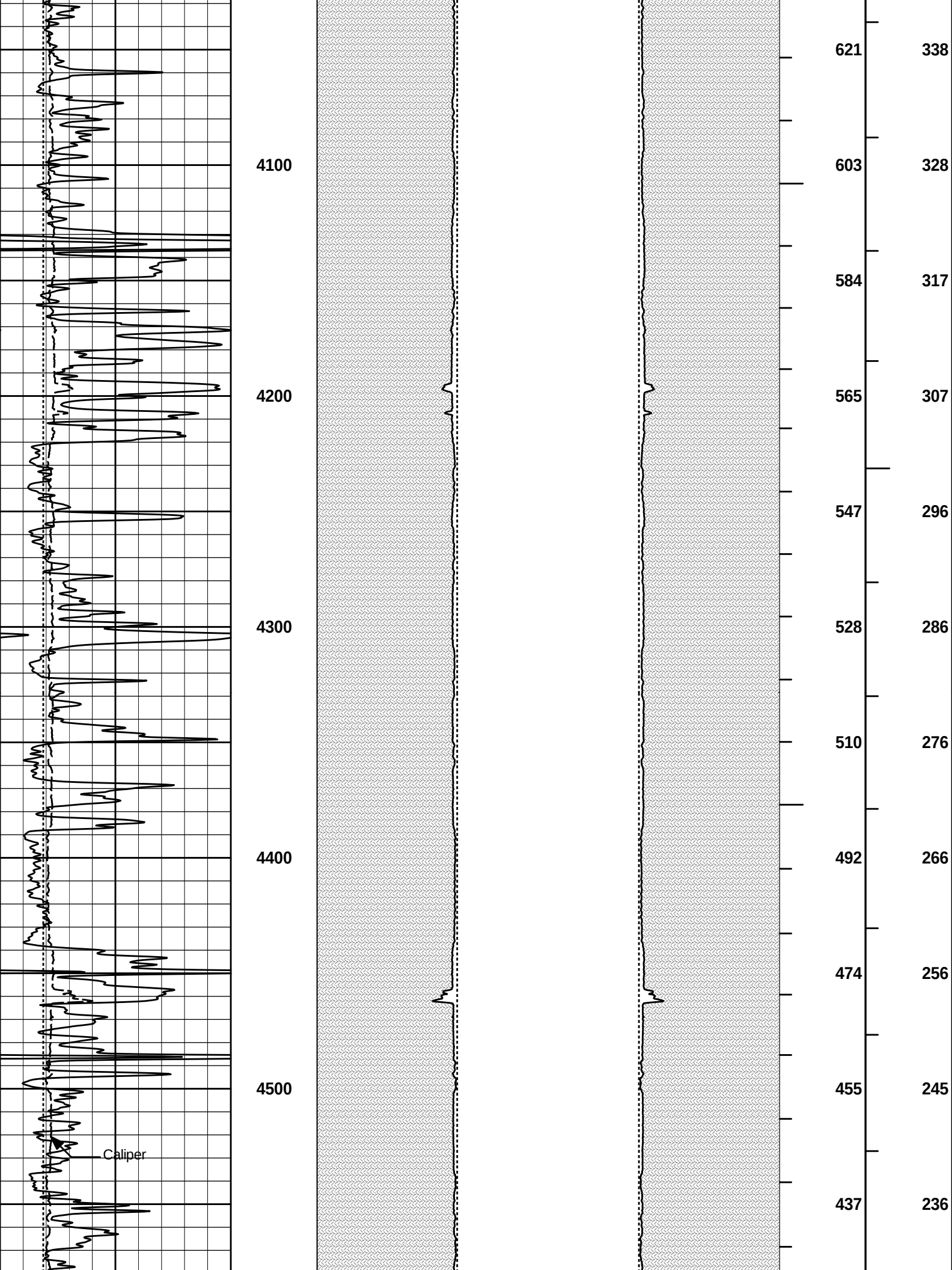
368
358
348


4100
4200
4300
4400
4500
Caliper
621
603
584
565
547
528
510
492
474
455
437
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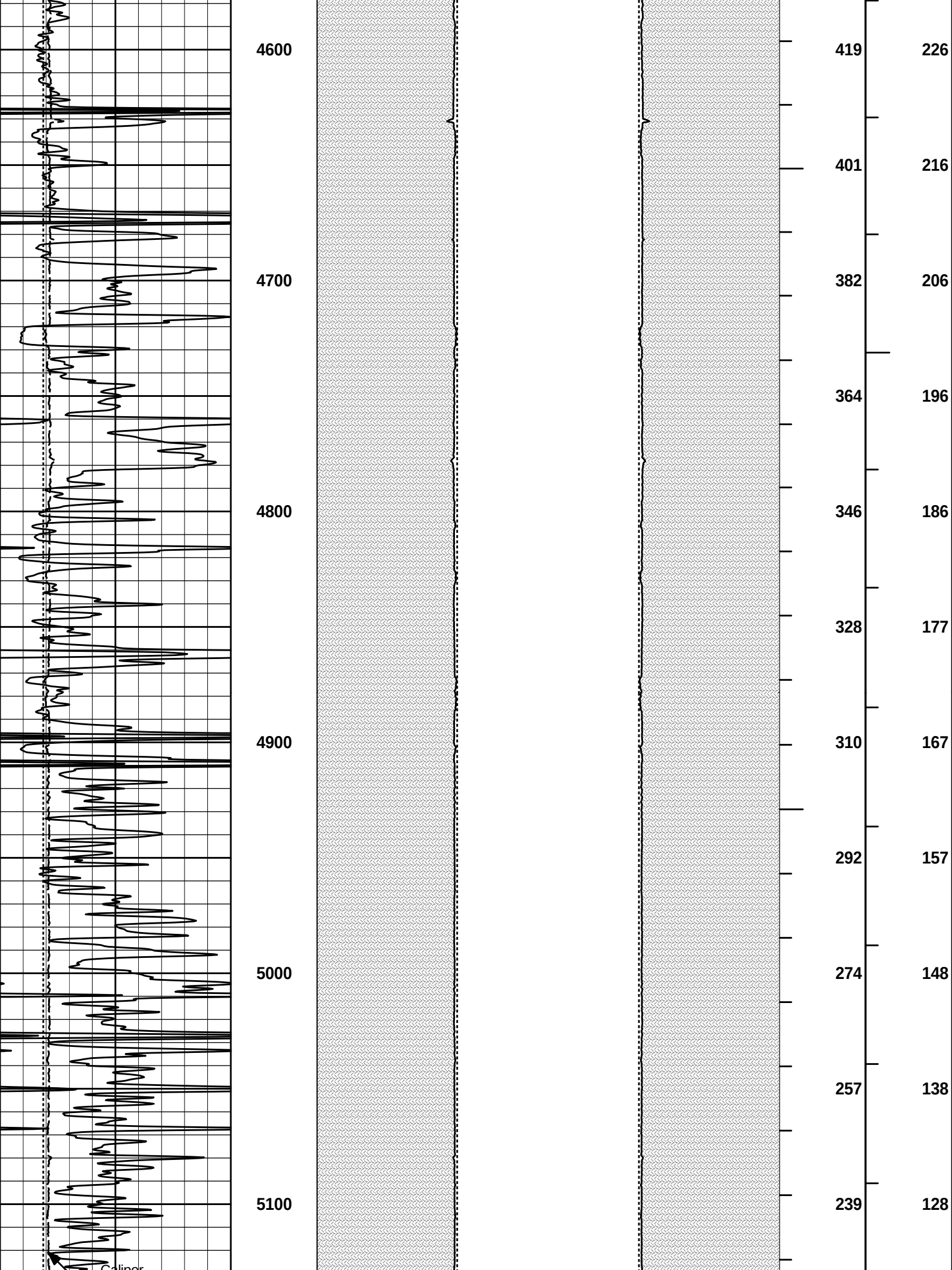
317
307
296
286
276
266
256
245
236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4800
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5100
419
401
382
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206
196
186
177
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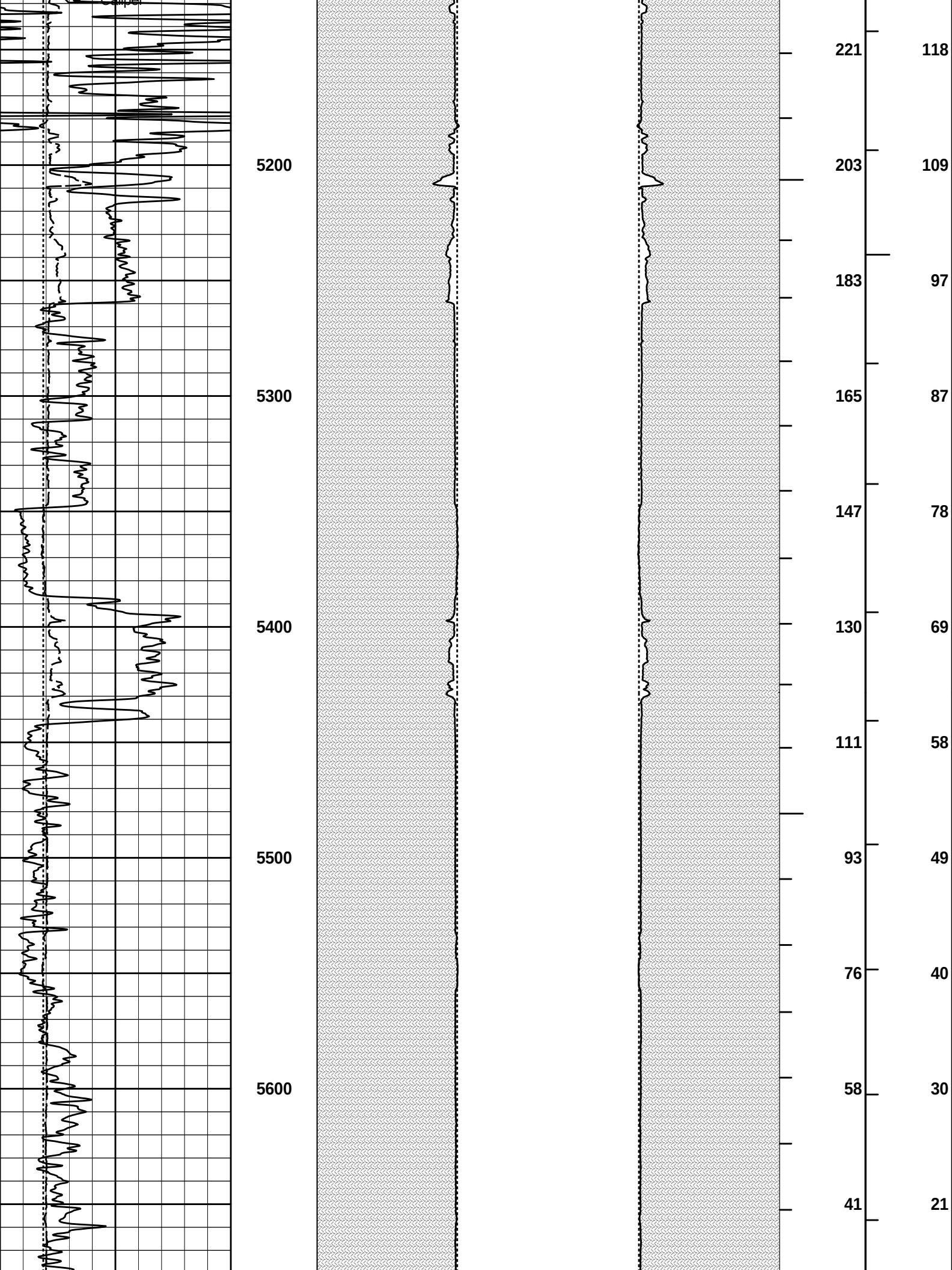
157
148
138
128
Caliper


Caliper
5200
5300
5400
5500
5600
221
203
183
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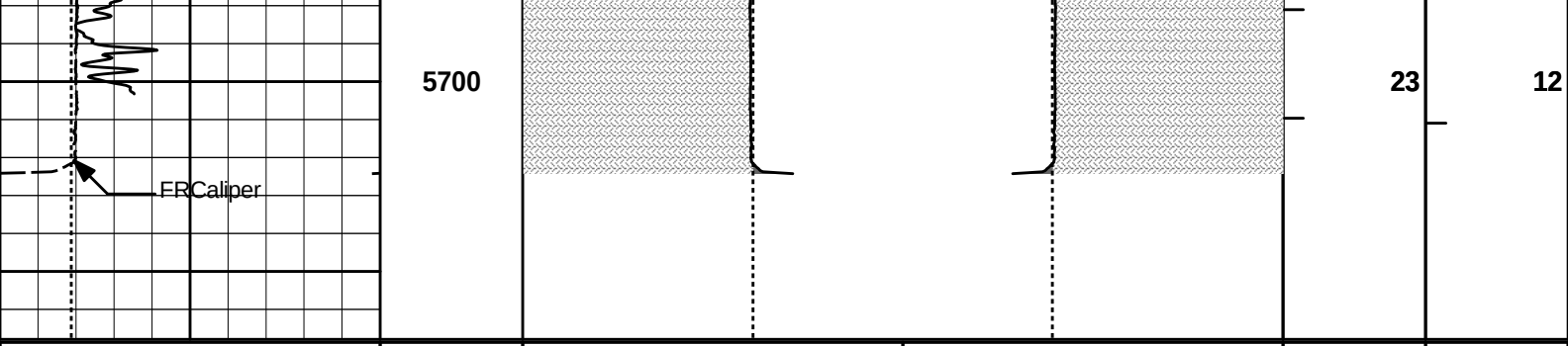

6 Caliper 16 inches	MD 1 : 600 ft	20 Caliper 0 inches	0 Caliper 20 inches	BHVT	AHVT
6 Bit Size 16 inches		20 Bit Size 0	0 Bit Size 20		
0 Gamma API 150 api		MUDCAKE	MUDCAKE		

HALLIBURTON

Plot Time: 02-Dec-12 20:28:14
Plot Range: 1780 ft to 5767.92 ft
Data: GRIFFIN_C_1\Well Based\CASING
Plot File: \\-LOCAL-\GRIFFIN_C_1\0001 SP-GTET-DSN-SDL-FLEX-BSAT-ACRT-CH\PORO\AHV_2_IQ_LIB

ANNULAR HOLE VOLUME PLOT

COMPANY	**OXY USA INC**		
WELL	**GRIFFIN C-1**		
FIELD	**HUGOTON GAS AREA**		
COUNTY	**HASKELL**	STATE	**KANSAS**

HALLIBURTON

SPECTRAL DENSITY
DUAL SPACED NEUTRON
LOG