HALLIBURTON

SPECTRAL DENSITY DUAL SPACED NEUTRON LOG

COMPANY	OXY USA INC
WELL	ANSHUTZ A-1
FIELD	SANTA FE NORTH
COUNTY	HASKELL
STATE	KANSAS

COMPANY OXY USA INC
WELL ANSHUTZ A-1
FIELD SANTA FE NORTH
COUNTY HASKELL STATE KANSAS

API No. 15-081-21980
Location 2280' FSL & 2310' FWL
Sect. 1 Twp. 28S Rge. 33W

Other Services:
MICRO
BSAT
ACRT

Permanent Datum	GL	Elev. 2945.0 ft	Elev.: K.B.	2959.0 ft
Log measured from	KB	14.0 ft above perm. Datum	D.F.	2958.0 ft
Drilling measured from	KB		G.L.	2945.0 ft

Date	21-Jul-12		
Run No.	ONE		
Depth - Driller	5663.00 ft		
Depth - Logger	5651.0 ft		
Bottom - Logged Interval	5613.0 ft		
Top - Logged Interval	4000.0 ft		
Casing - Driller	8.625 in @ 1819.0 ft	@	
Casing - Logger	1818.0 ft		
Bit Size	7.875 in	@	
Type Fluid in Hole	WATER BASED MUD		
Density / Viscosity	9.5 ppg / 60.00 s/qt		
PH / Fluid Loss	9.00 pH / 5.6 cptm		
Source of Sample	FLOW LINE		
Rm @ Meas. Temperature	0.770 ohmm @ 90.00 degF	@	
Rmf @ Meas. Temperature	0.85 ohmm @ 72.00 degF	@	
Rmc @ Meas. Temperature	1.000 ohmm @ 72.00 degF	@	
Source Rmf / Rmc	MEAS / MEAS		
Rm @ BHT	0.41 ohmm @ 148.0 degF	@	
Time Since Circulation	13.7 hr		
Time on Bottom	21-Jul-12 15:10		
Max. Rec. Temperature	148.0 degF @ 5651.0 ft	@	
Equipment / Location	10546696 / LIBERAL		
Recorded By	C. HAVERKAMP		
Witnessed By	D. PRATT		

Fold here

Service Ticket No.: 9502781 API Serial No.: 15-081-21980 PGM Version: WL INSITE R3.6.0 (Build 3)

CHANGE IN MUD TYPE OR ADDITIONAL SAMPLE

Date	Sample No.				
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 SCALE CHANGES

Type Log	Depth	Scale Up Hole	Scale Down Hole

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.	11048627	Serial No.		Serial No.	P81	Serial No.	1109643
Model No.	GTET	Model No.		Model No.	SDLT	Model No.	DSNT
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	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

GENERAL		GAMMA		ACOUSTIC		DENSITY		NEUTRON	
Logging Unit No.	10546696	Logging Unit No.	10546696	Logging Unit No.	10546696	Logging Unit No.	10546696	Logging Unit No.	10546696
Logging Unit Location	LIBERAL	Logging Unit Location	LIBERAL	Logging Unit Location	LIBERAL	Logging Unit Location	LIBERAL	Logging Unit Location	LIBERAL
Recorded By	C. HAVERKAMP	Recorded By	C. HAVERKAMP	Recorded By	C. HAVERKAMP	Recorded By	C. HAVERKAMP	Recorded By	C. HAVERKAMP
Witnessed By	D. PRATT	Witnessed By	D. PRATT	Witnessed By	D. PRATT	Witnessed By	D. PRATT	Witnessed By	D. PRATT

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	5651'	4000'	REC	0	150				30	-10	2.71	30	-10	LIME

DIRECTIONAL INFORMATION

Maximum Deviation @	KOP @

Remarks: SP-GTET-DSNT-SDLT-BSAT-ACRT RAN IN COMBINATION.

ANNULAR HOLE VOLUME CALCULATED FOR 5.5 INCH CASING.

CHLORIDES REPORTED AT 5500 MG/L.

LCM REPORTED AT 2 LB/BBL.

POST TOOL SURVEYS NOT PERFORMED PER CUSTOMER REQUEST.

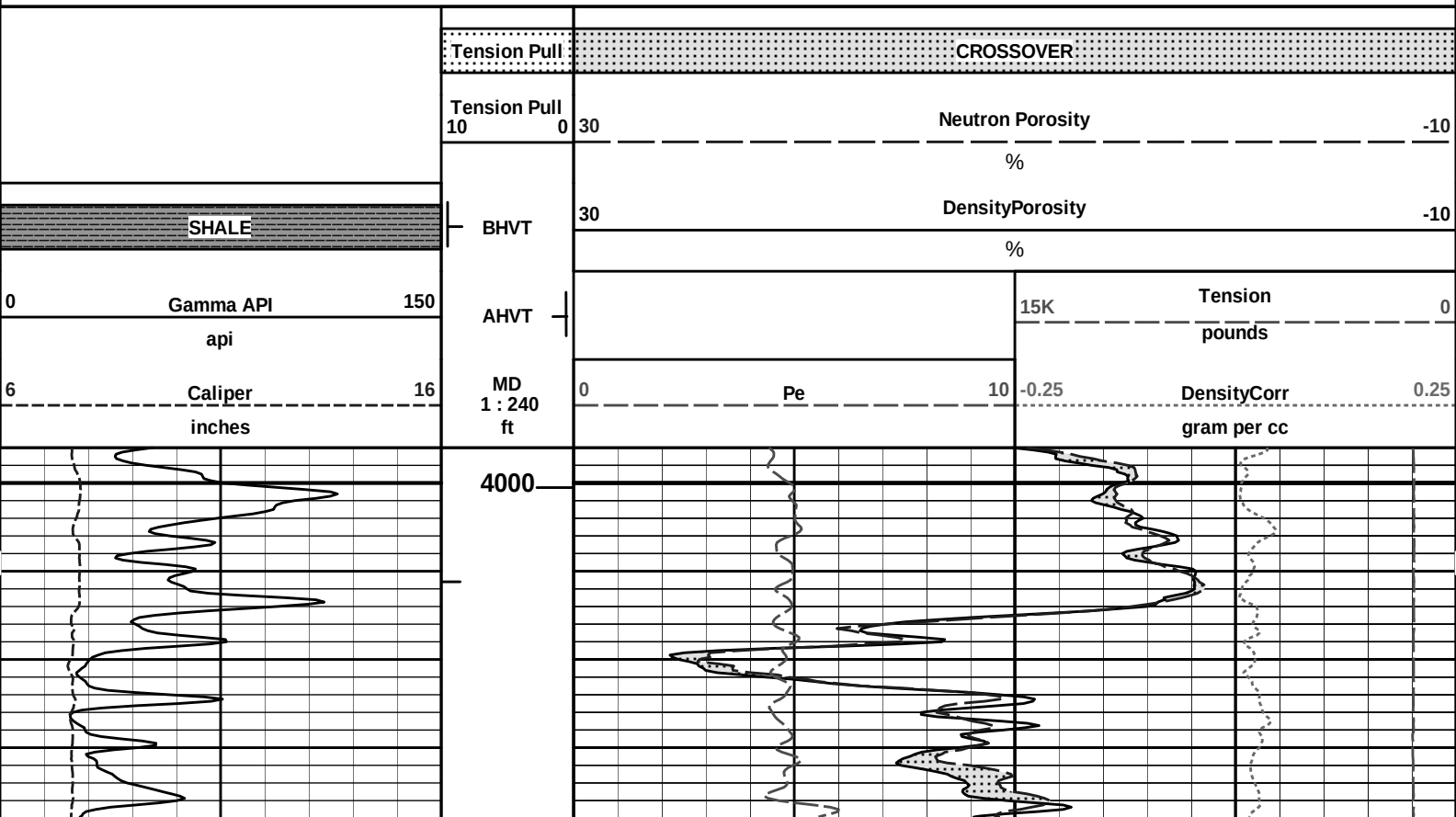
YOUR CREW: P. COBLE, V. JAIME

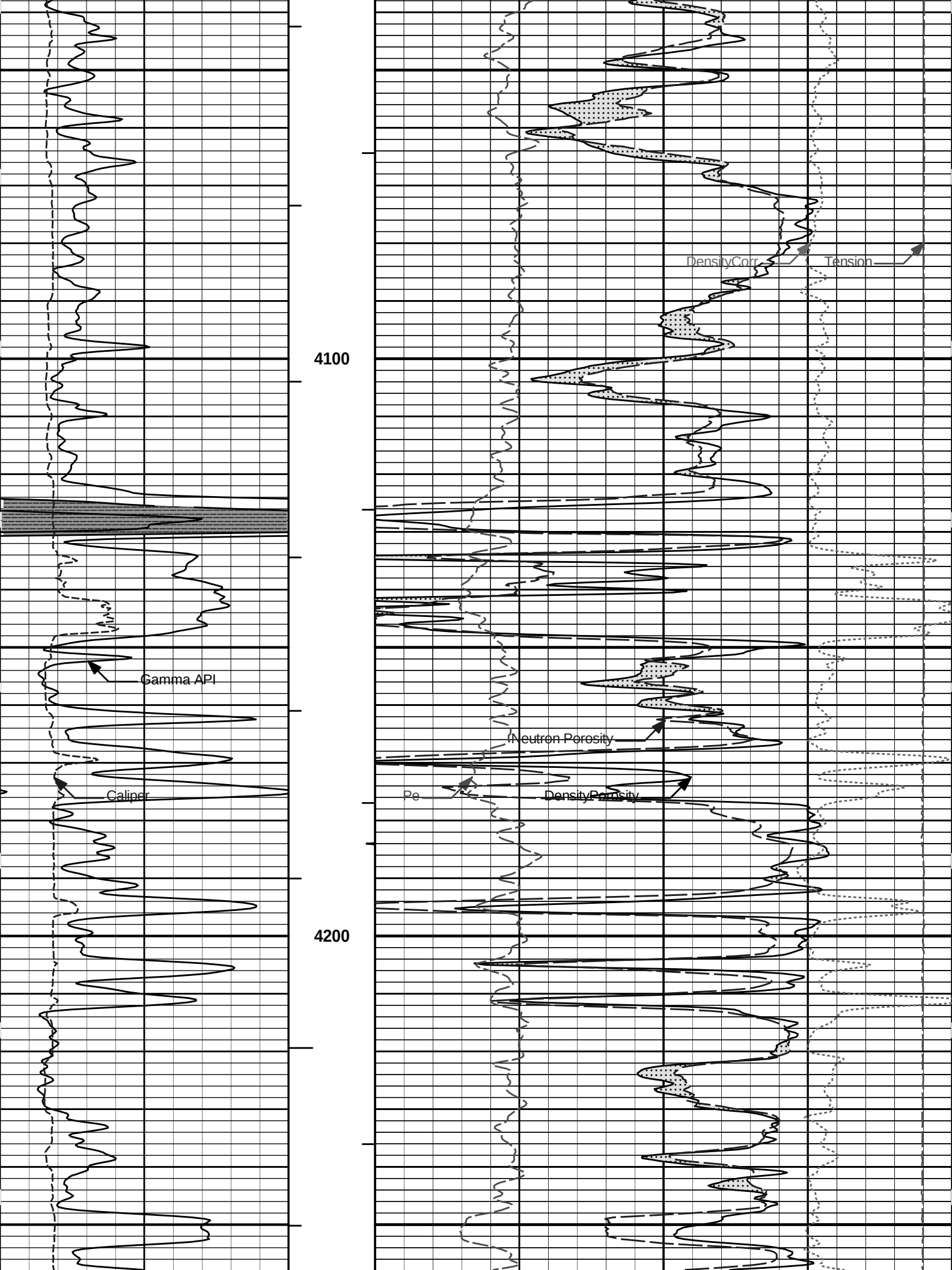
THANK YOU FOR CHOOSING HALLIBURTON ENERGY SERVICES. LIBERAL, KS 620-624-8123

HALLIBURTON

Plot Time: 21-Jul-12 17:04:34
Plot Range: 3996 ft to 5658.08 ft
Data: ANSHUTZ_A_1\Well Based\R1_DETAIL
Plot File: \\PORO\Poro_IQ_5_MAIN_LIB

5 INCH MAIN LOG

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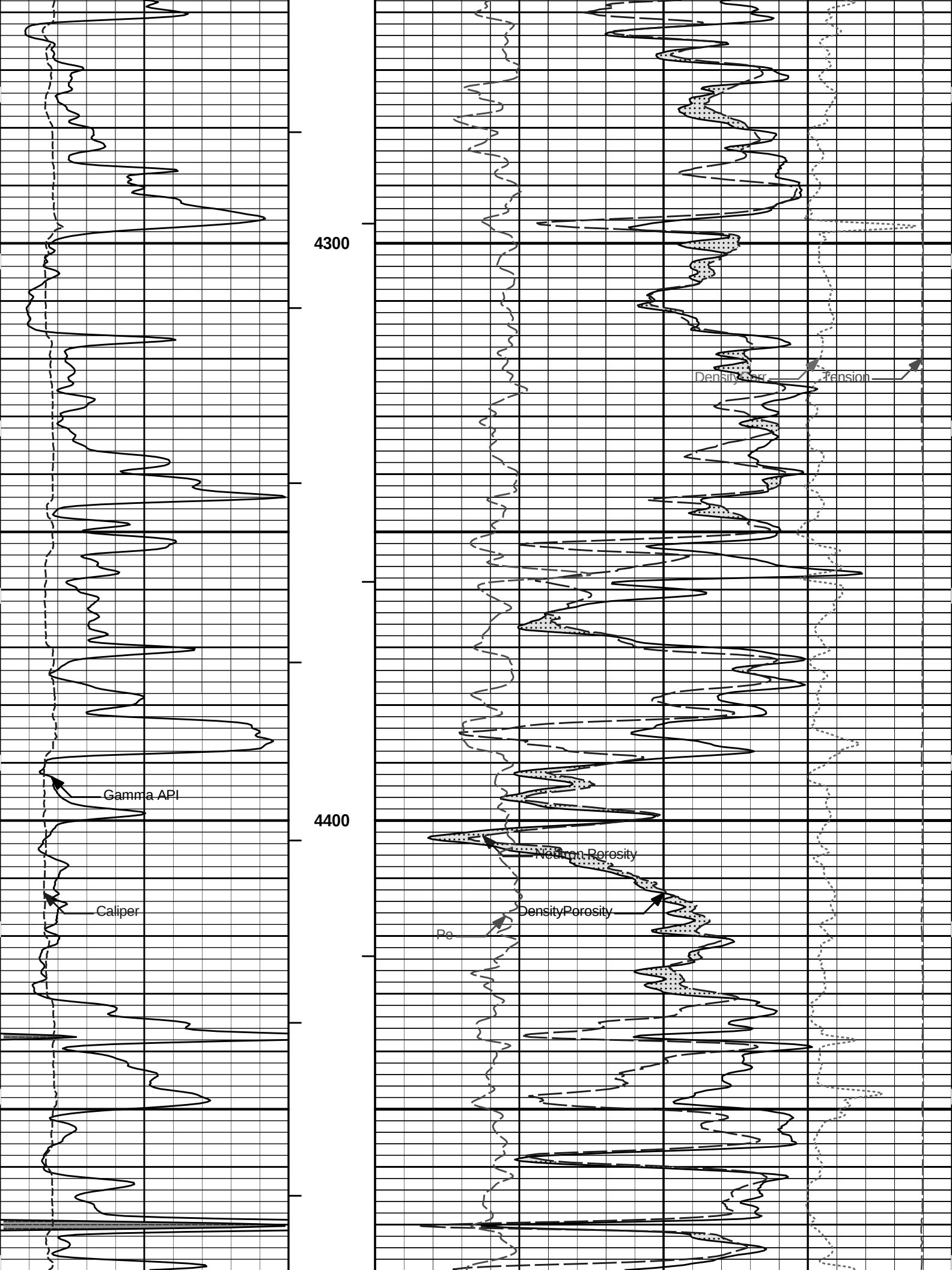
Tension
4100
Gamma API
Neutron Porosity
Caliper
Pe
DensityPorosity
4200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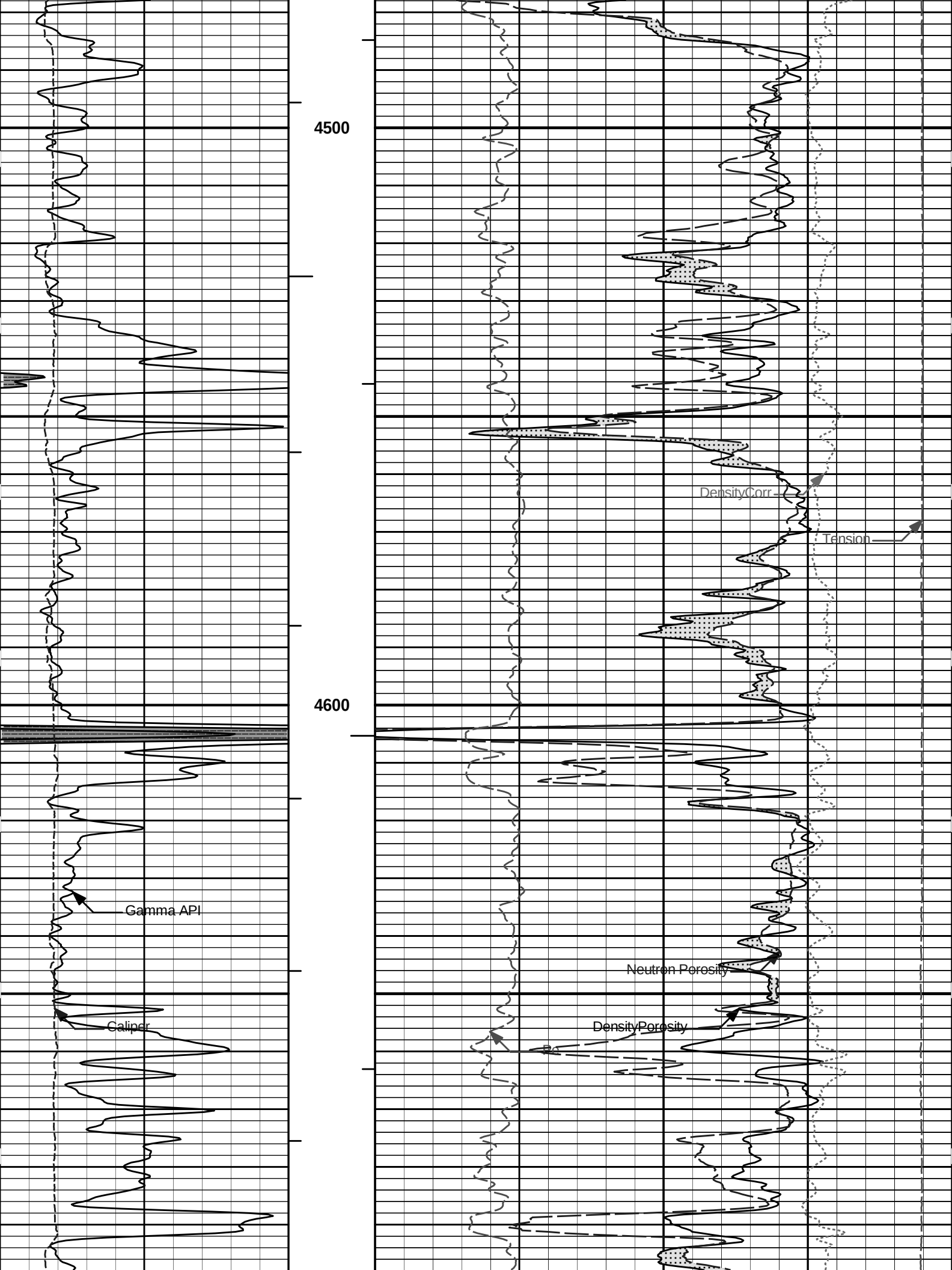
Caliper
Density Corr
Tension
Neutron Porosity
DensityPorosity
Pe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Tension
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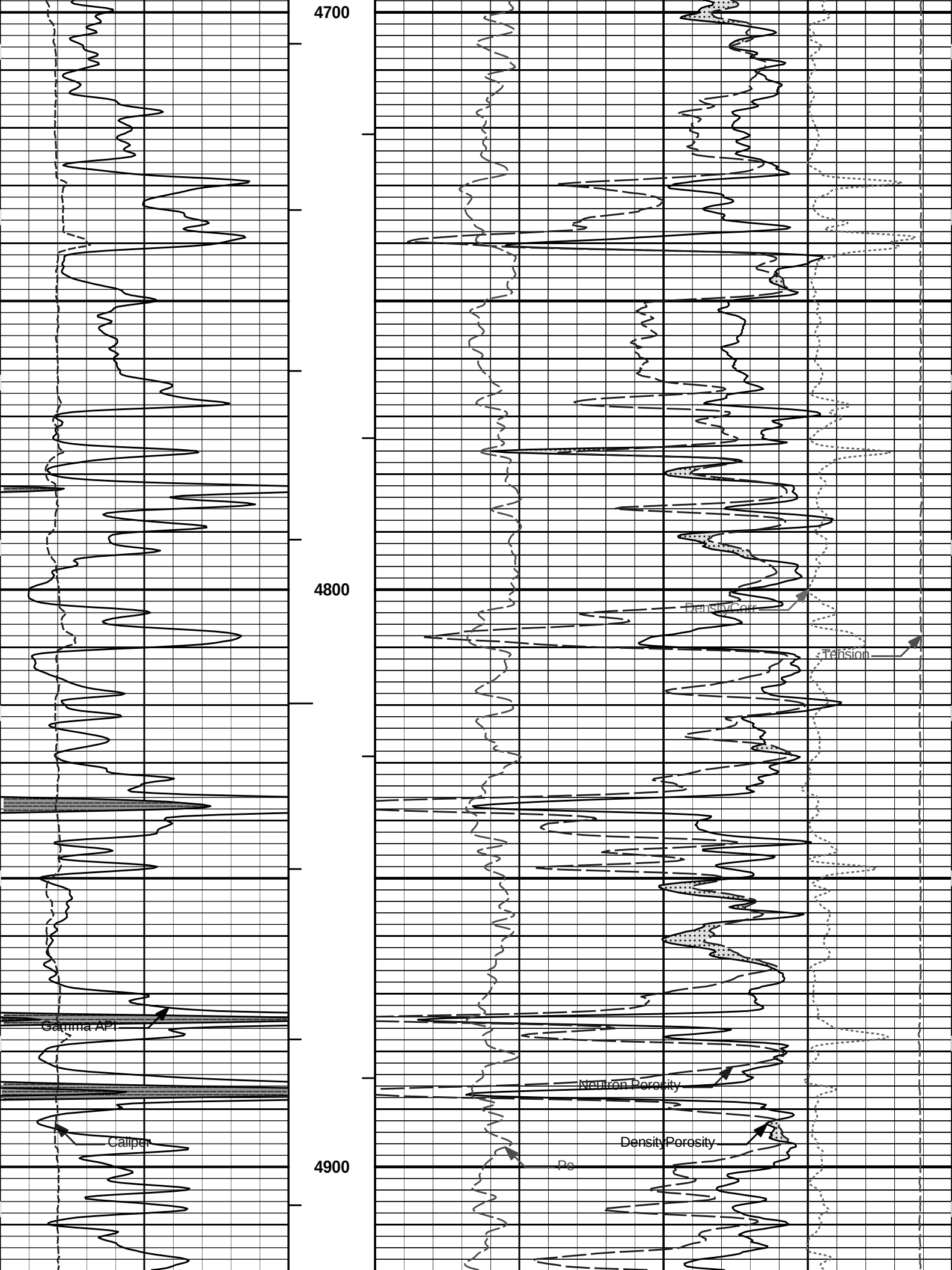
Pe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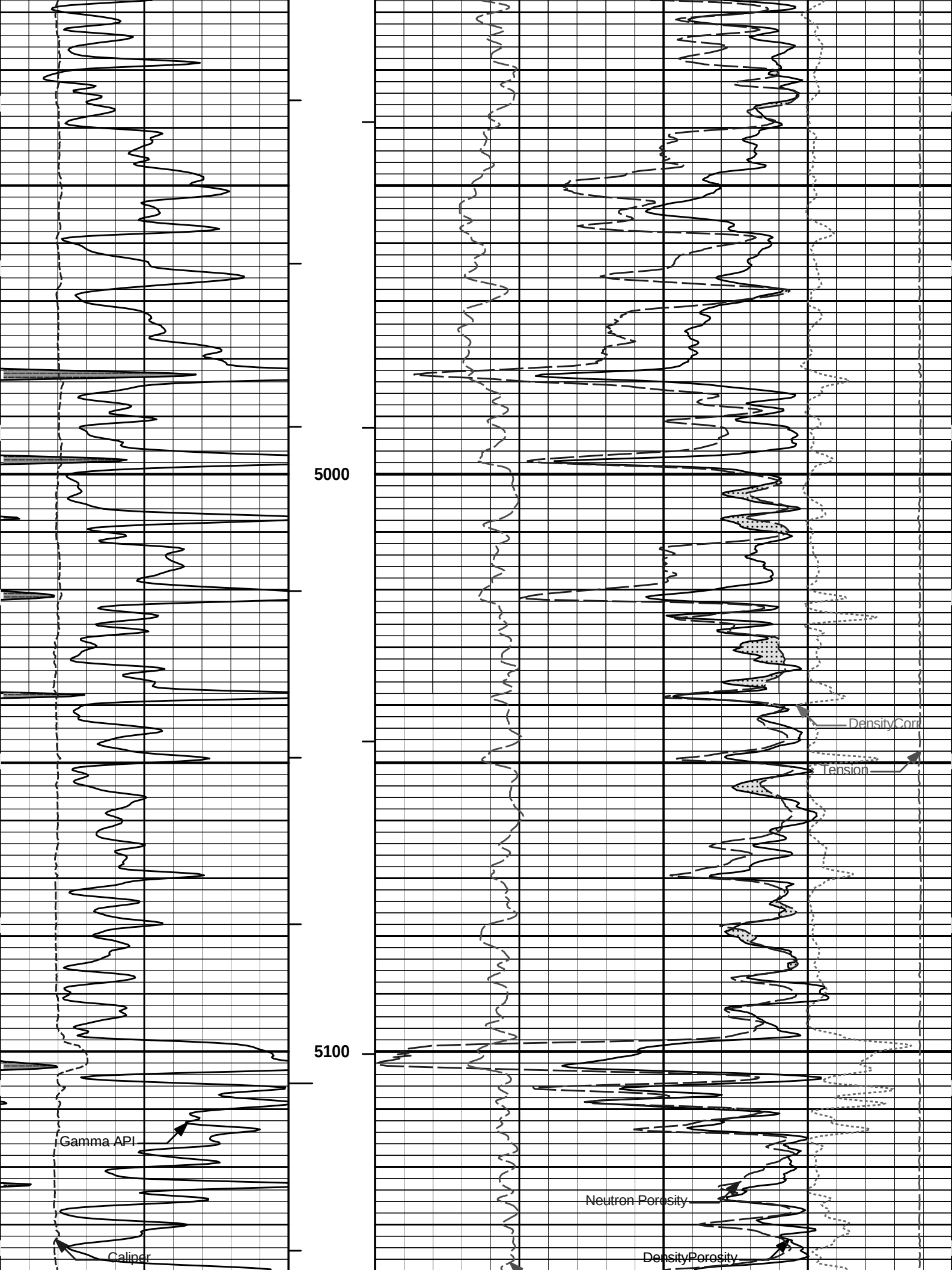
4800
4900
Density Corr
Tension
Gamma API
Neutron Porosity
Caliper
Density Porosity
Pe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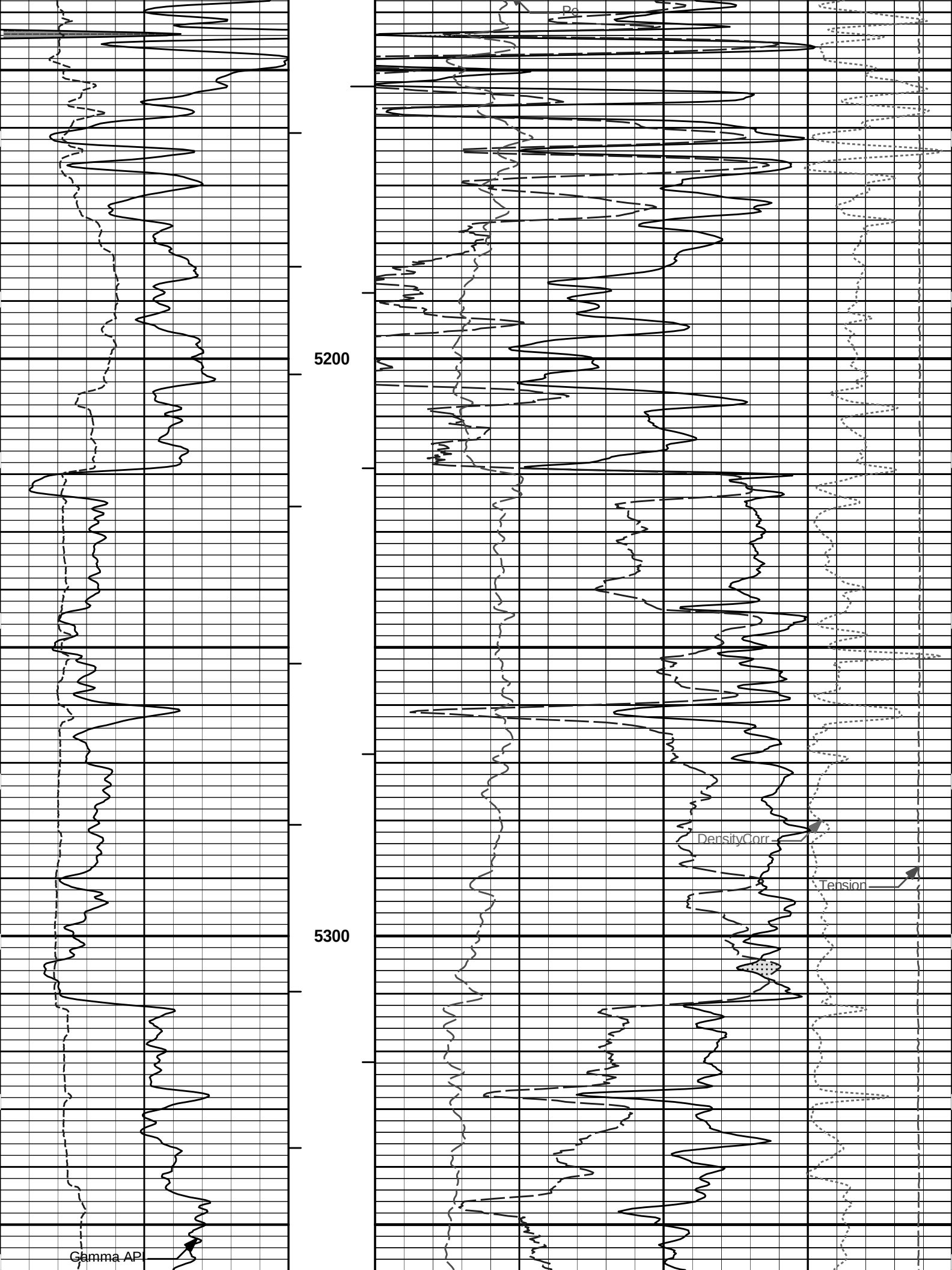
5100
DensityCorr
Tension
Gamma API
Caliper
Neutron Porosity
DensityPorosity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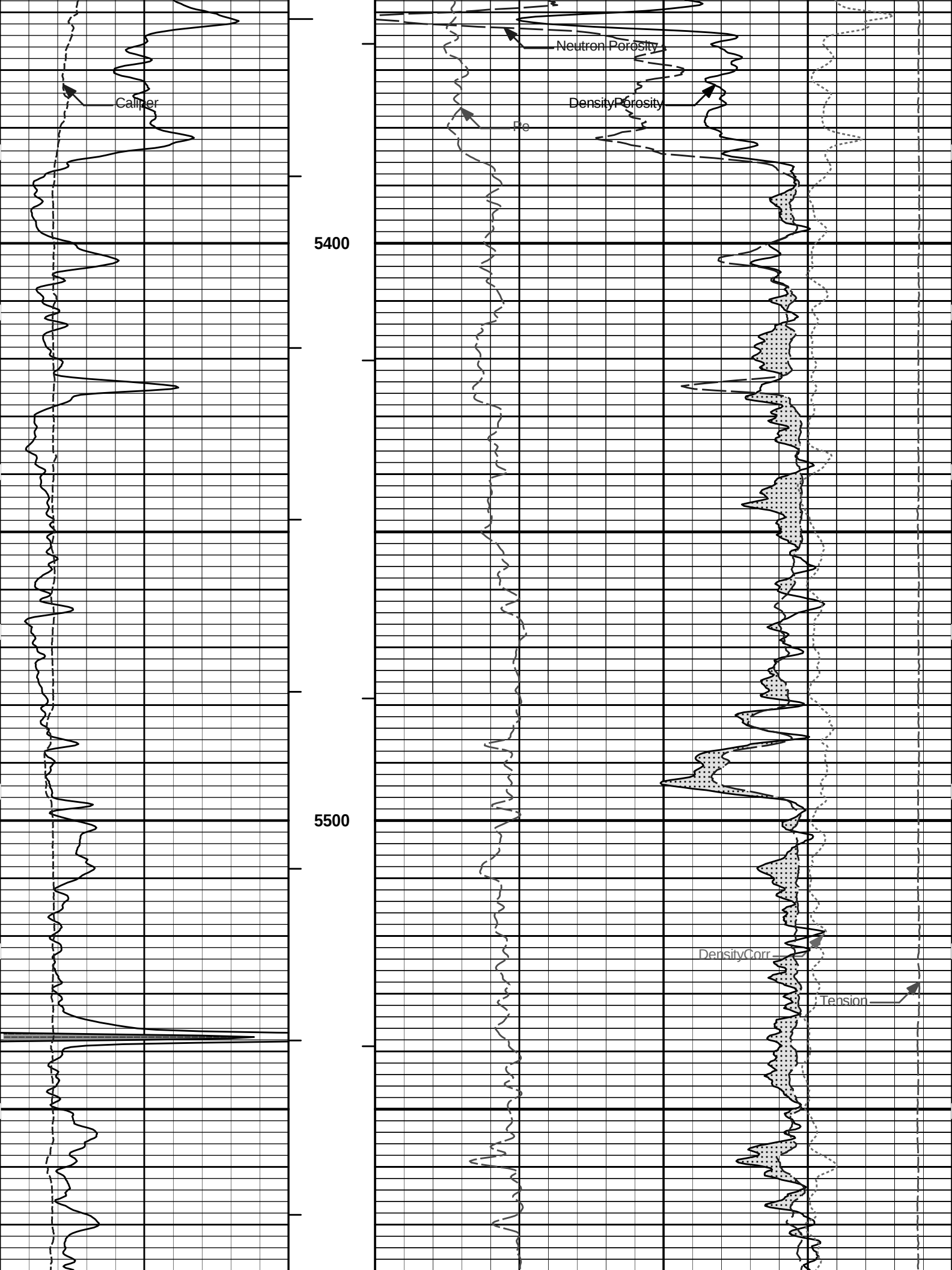
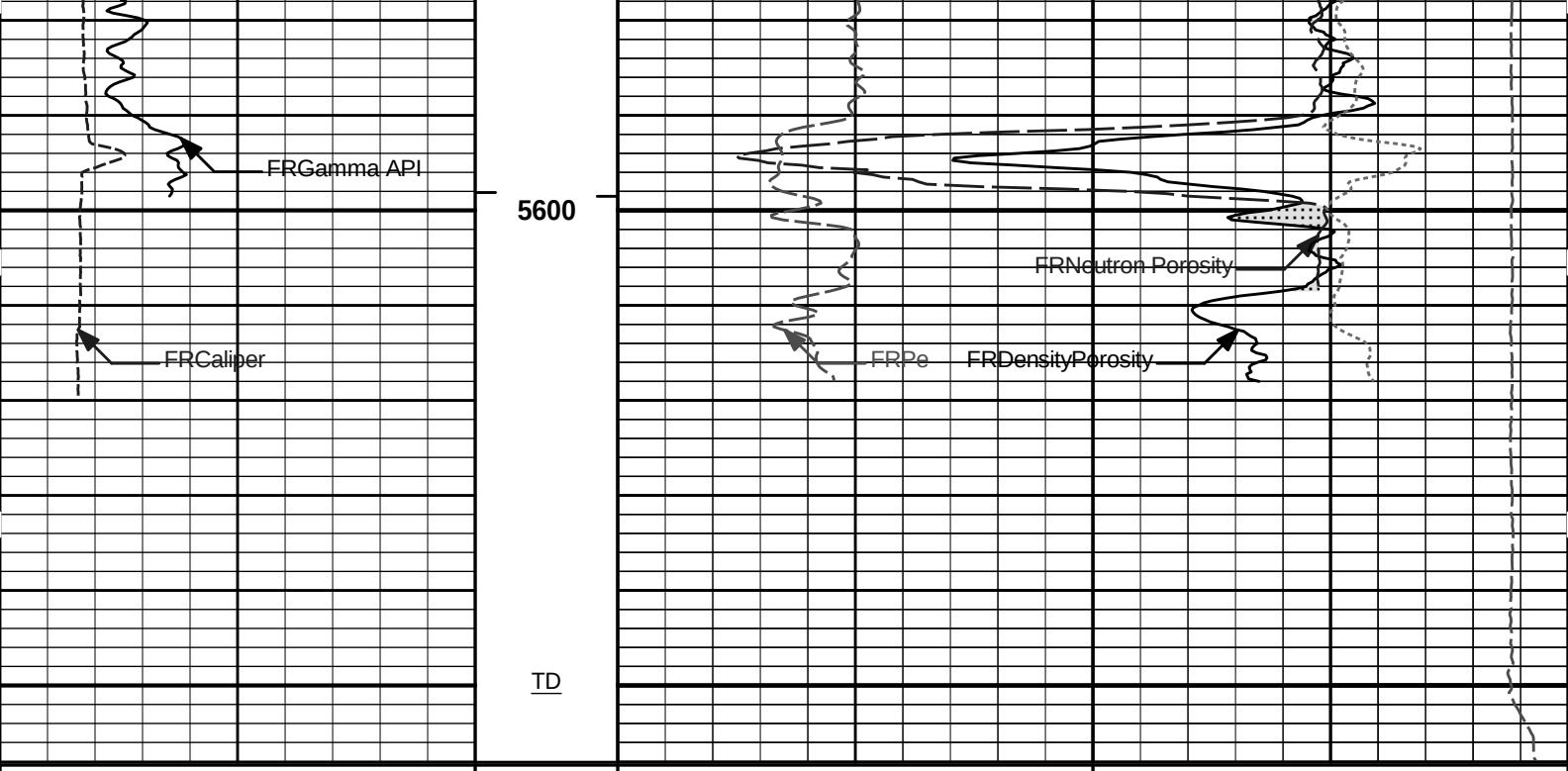
5200
5300
DensityCorr
Tension
Gamma API


Caliper
Neutron Porosity
DensityPorosity
Pe
5400
5500
DensityCorr
Tension



6 Caliper 16
inches

0 Gamma API 150
api

SHALE

MD
1 : 240
ft

AHVT

BHVT

Tension Pull
10 0

Tension Pull

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: 21-Jul-12 17:04:44
Plot Range: 3996 ft to 5658.08 ft
Data: ANSHUTZ_A_1\Well Based\R1_DETAIL\
Plot File: \\PORO\Poro_IQ_5_MAIN_LIB

5 INCH MAIN LOG

HALLIBURTON

Plot Time: 21-Jul-12 17:04:45
Plot Range: 4996 ft to 5655.33 ft
Data: ANSHUTZ_A_1\Well Based\R1_REPEAT\
Plot File: \\PORO\Poro_IQ_5_REP_LIB

REPEAT SECTION

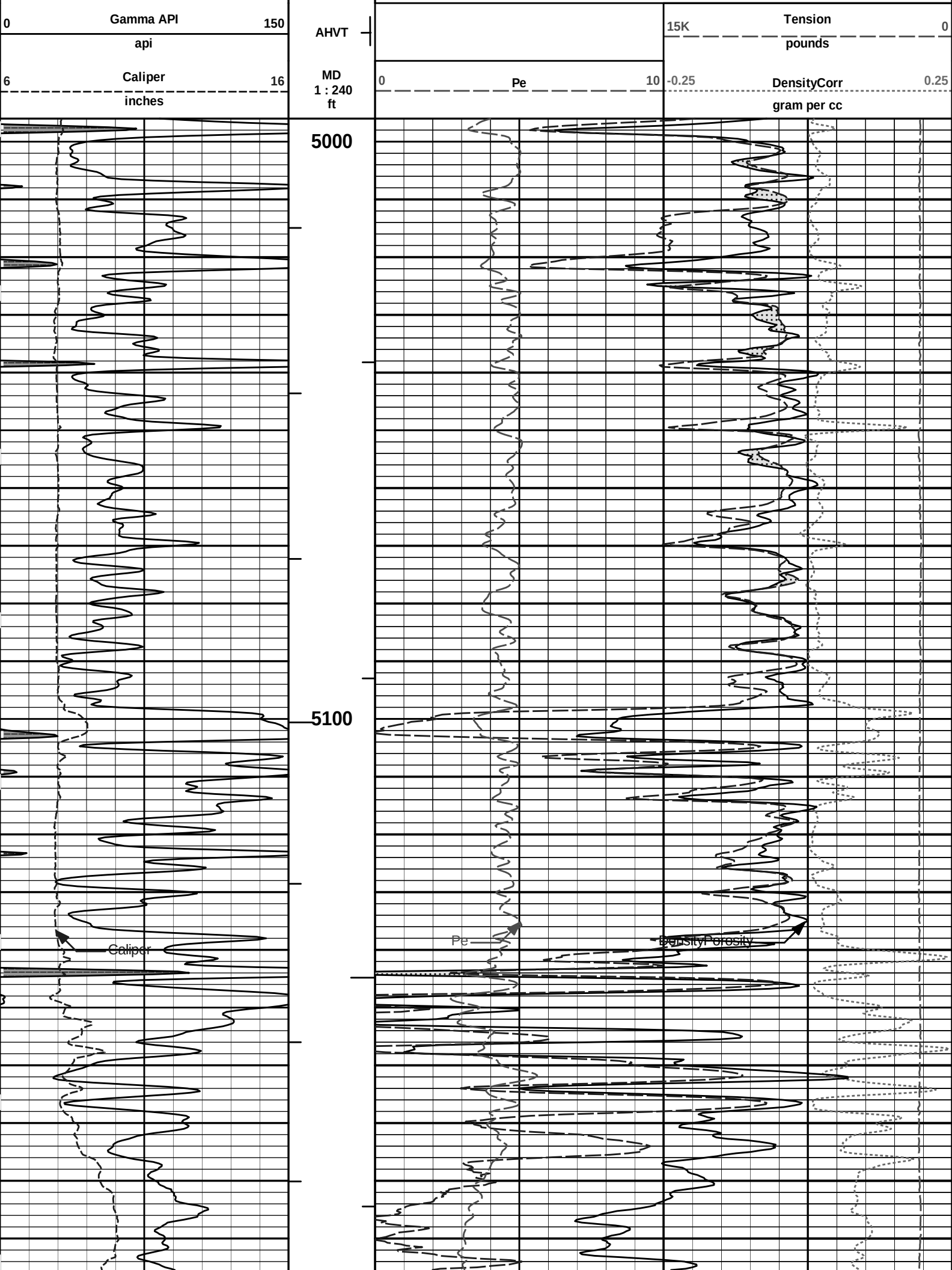
CROSSOVER

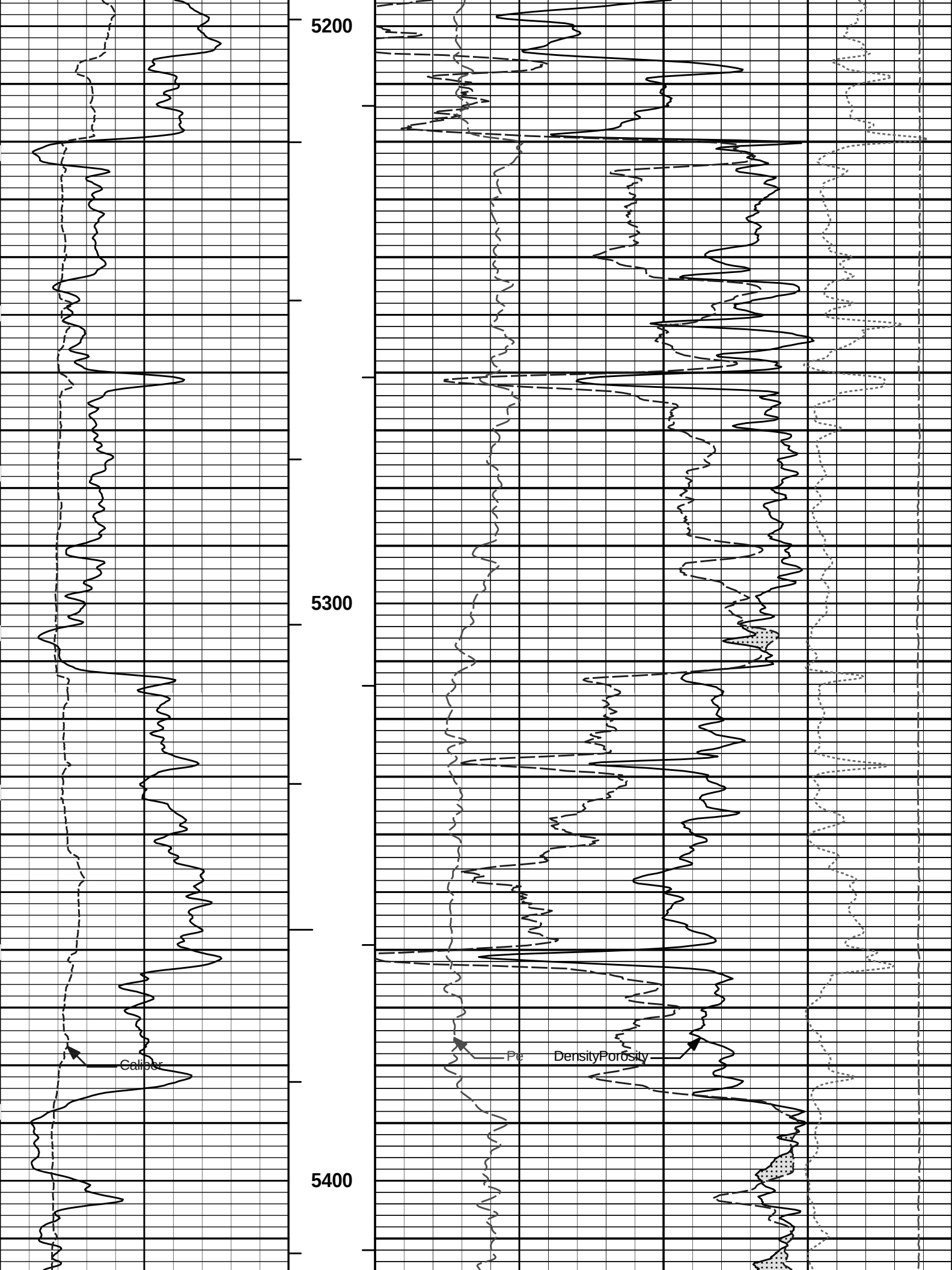
30 Neutron Porosity -10
%

SHALE

BHVT

30 DensityPorosity -10
%


0
Gamma API
150
api
6
Caliper
16
inches
AHVT
MD
1 : 240
ft
0
Pe
10
15K
Tension
0
pounds
-0.25
DensityCorr
0.25
gram per cc
5000
5100
Caliper
Pe
DensityPorosity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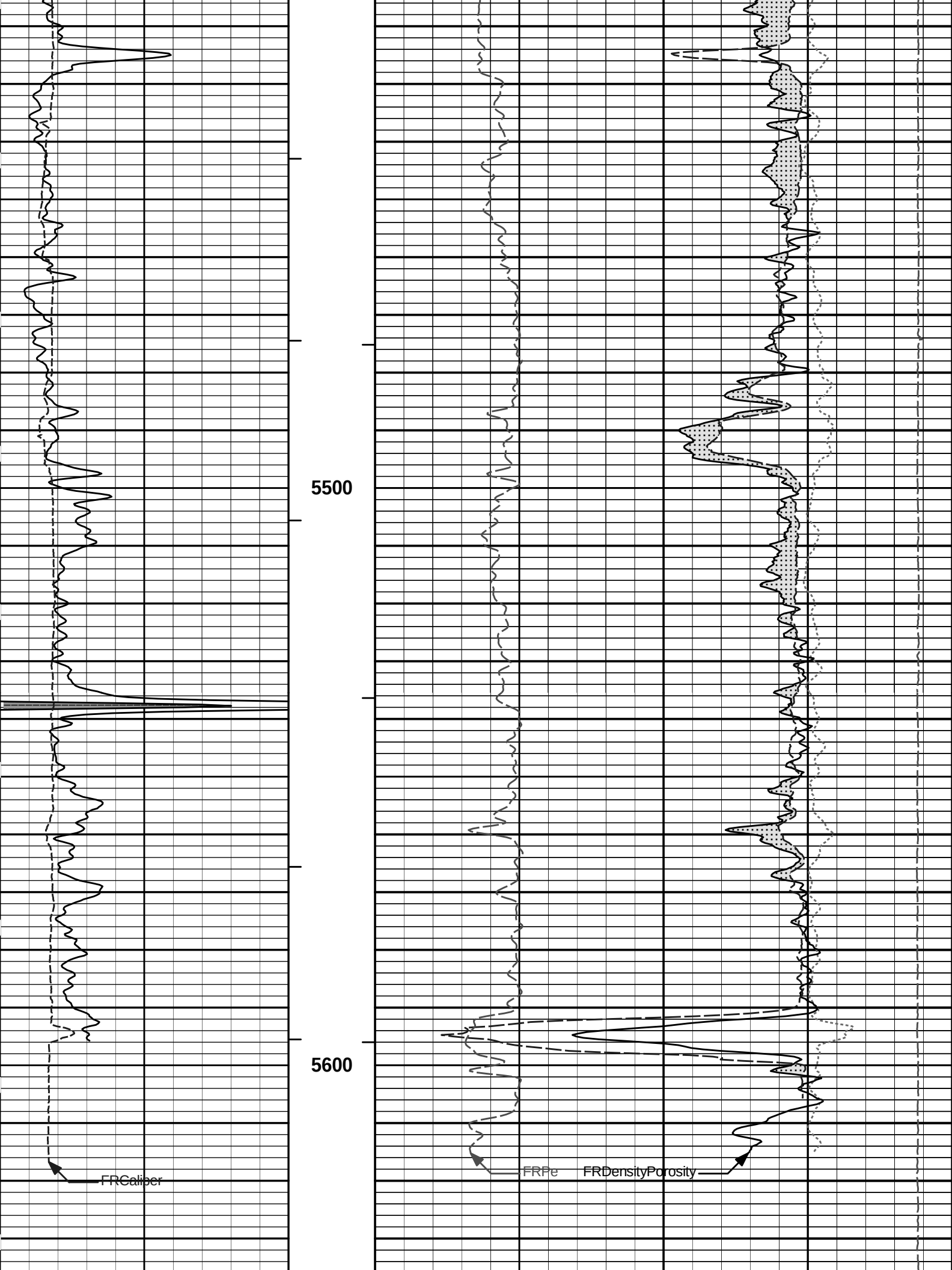
5400
Caliber
Pe
DensityPorosity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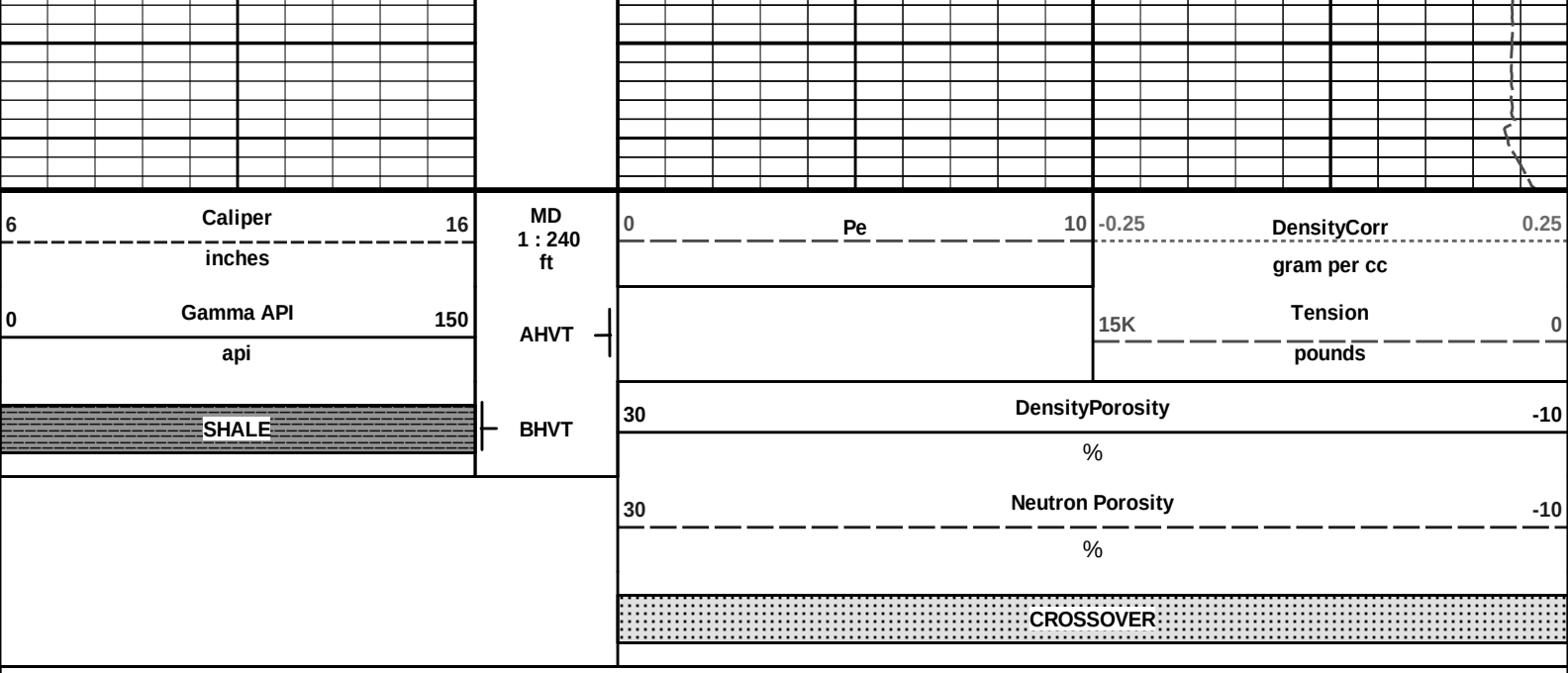
FRCaliber
FRPe
FRDensityPorosity



HALLIBURTON

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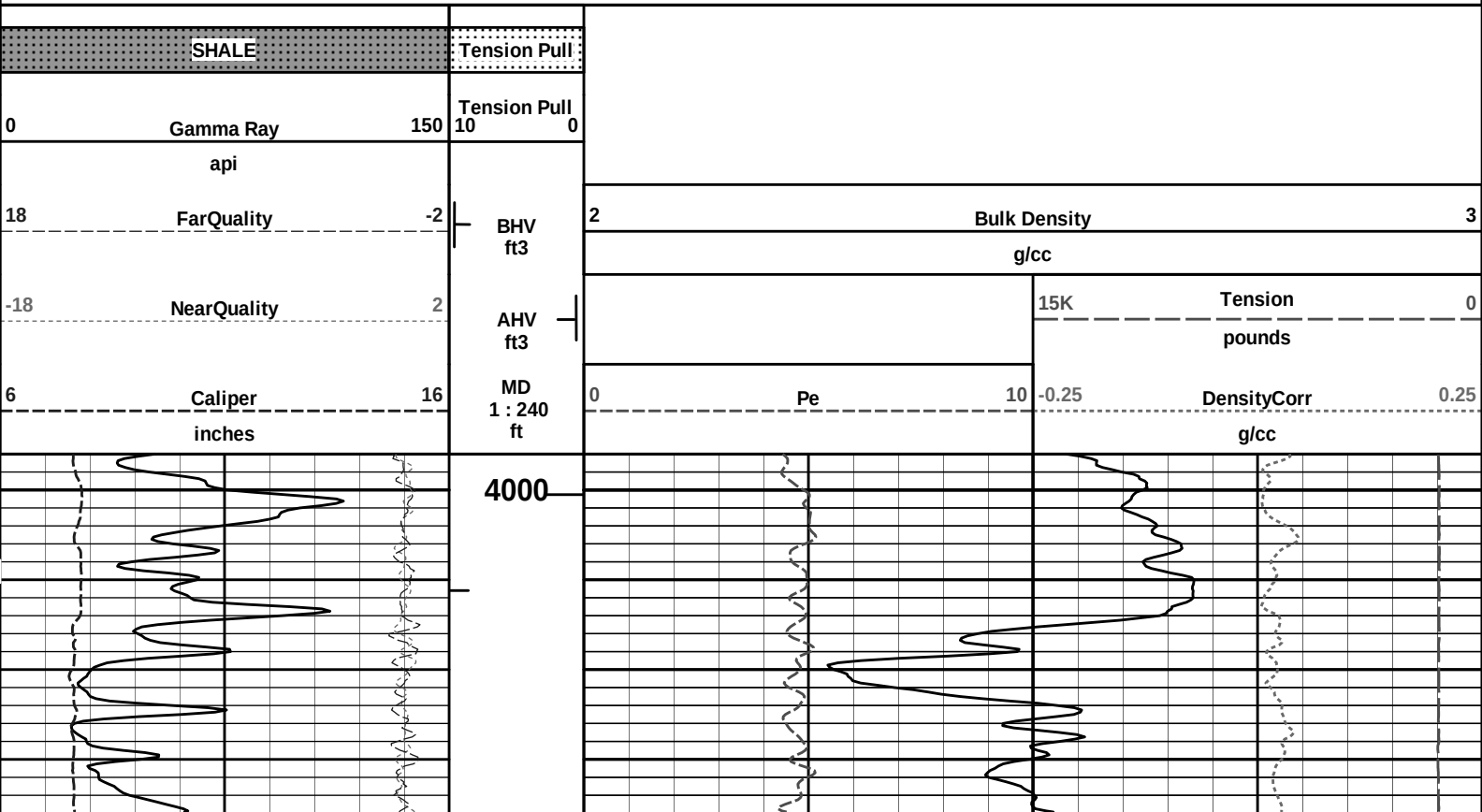
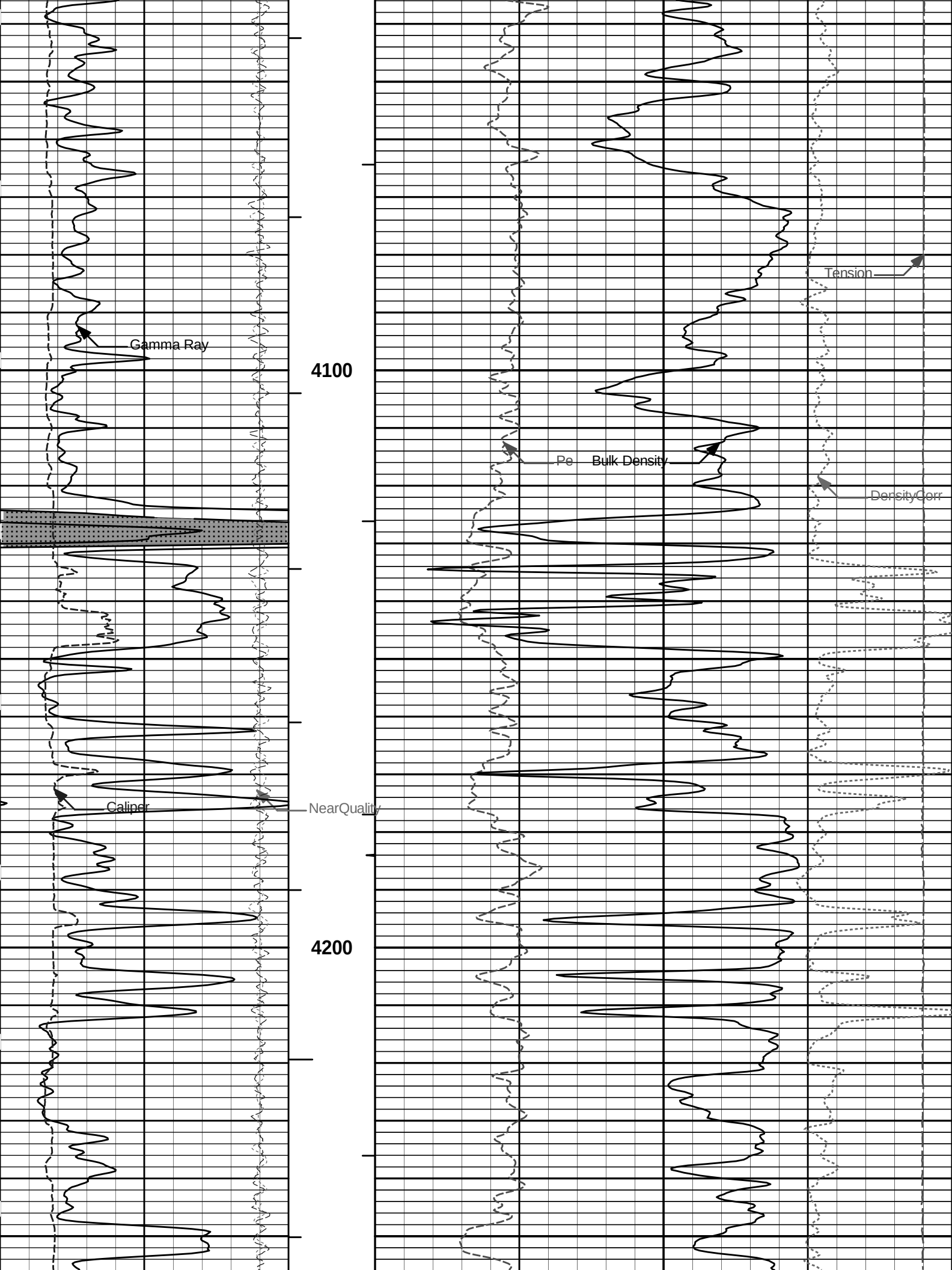
REPEAT SECTION

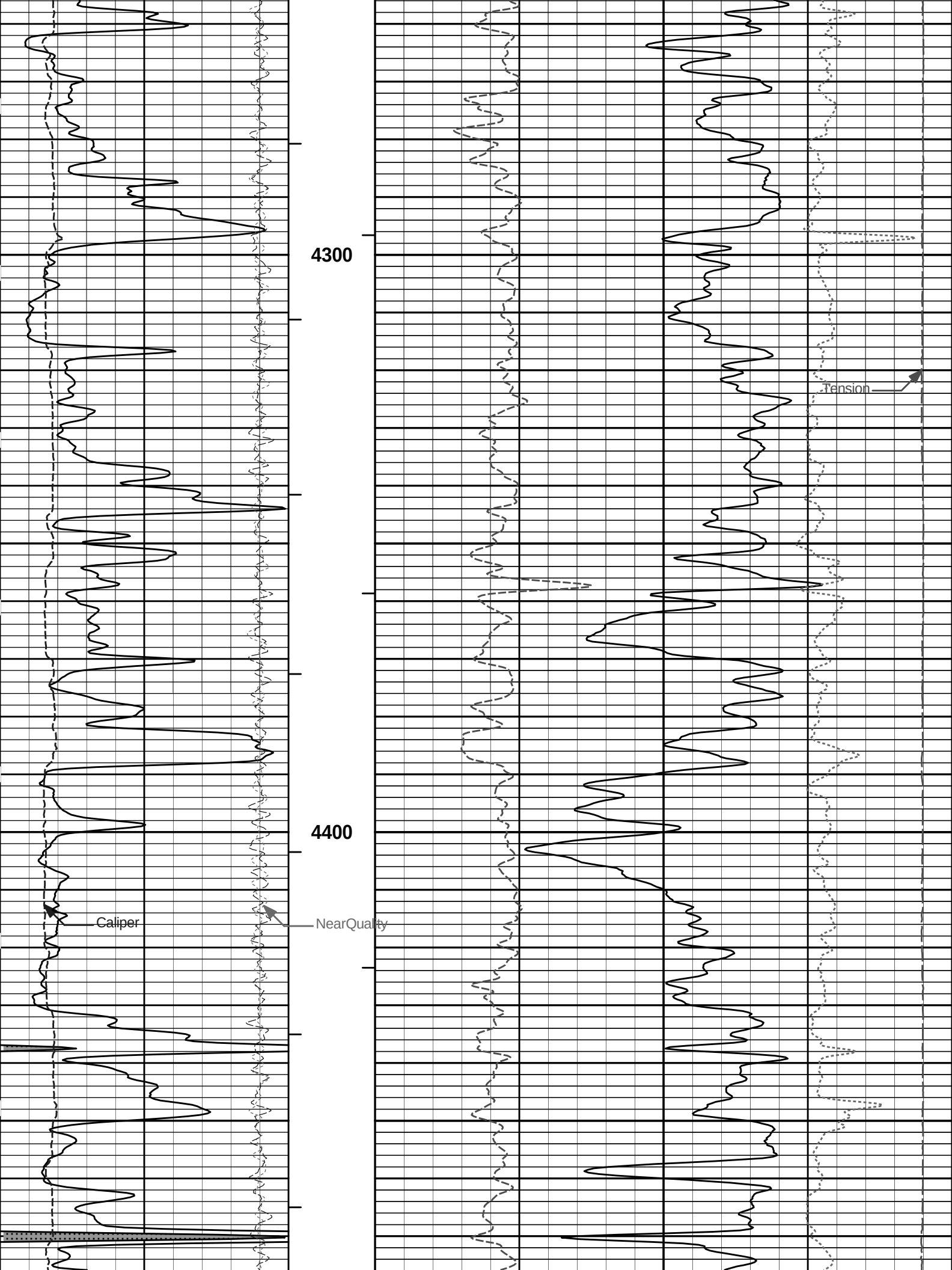
HALLIBURTON

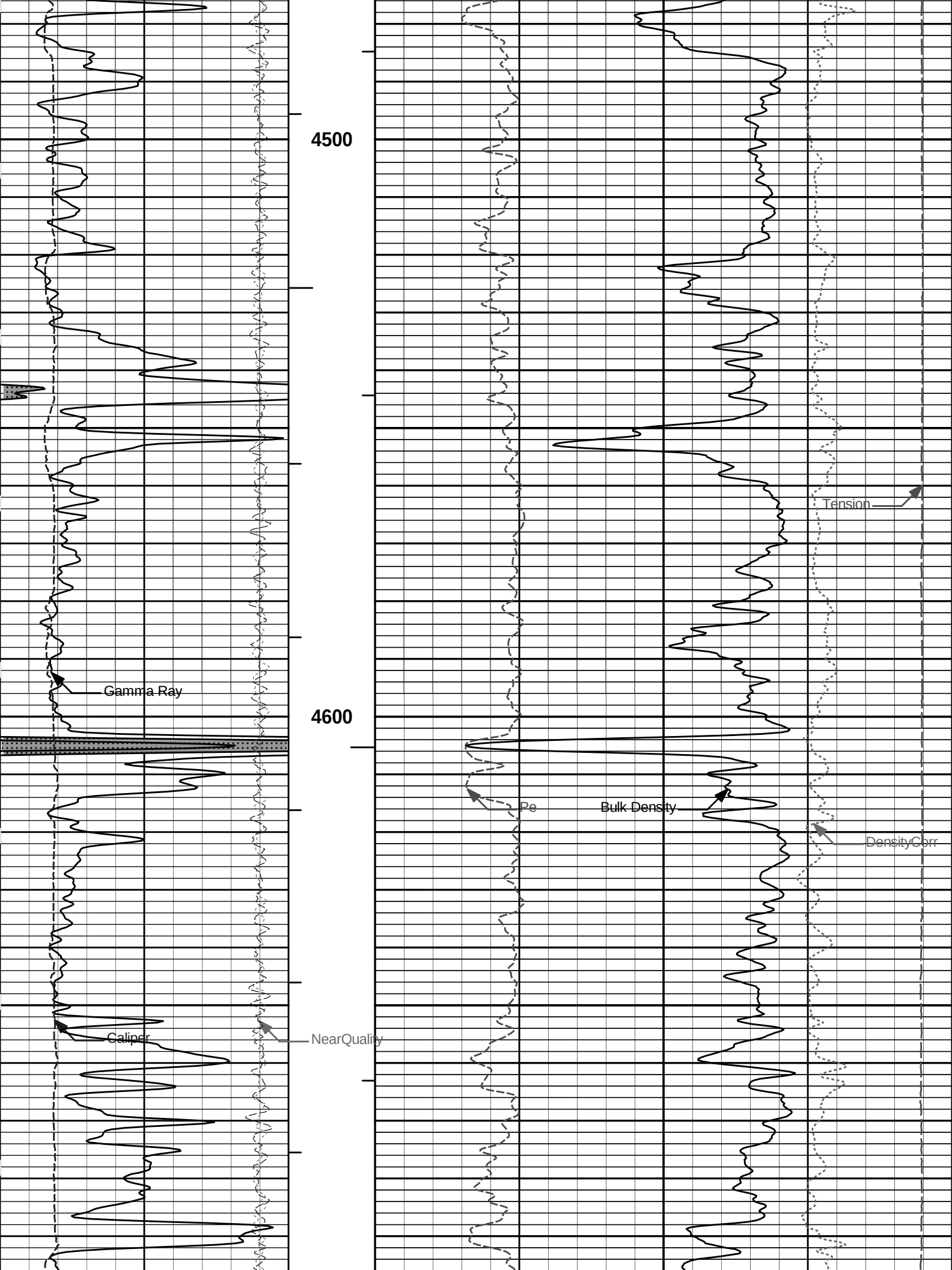
Plot Time: 21-Jul-12 17:04:50
Plot Range: 3996 ft to 5658.08 ft
Data: ANSHUTZ_A_1\Well Based\R1_DETAIL\
Plot File: \\-LOCAL-\ANSHUTZ_A_1\0001 SP-GTET-DSN-SDL-BSAT-ACRT-CH\PORO\BULKD_5_MAIN_LIB

5 INCH MAIN LOG




Gamma Ray
4100
Pe
Bulk Density
Tension
DensityCorr
Caliper
NearQuality
4200


4300
4400
Caliper
NearQuality
Tension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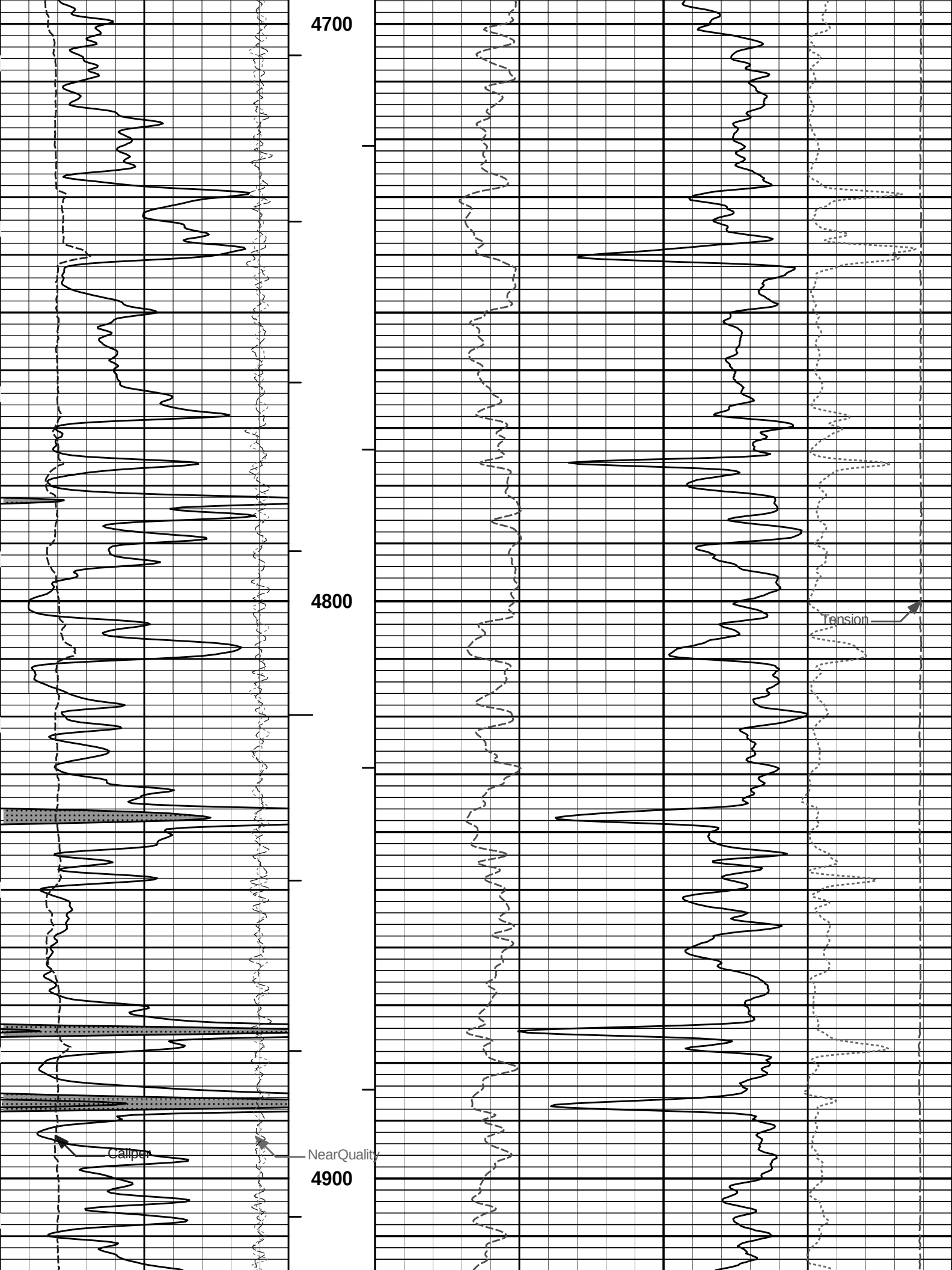
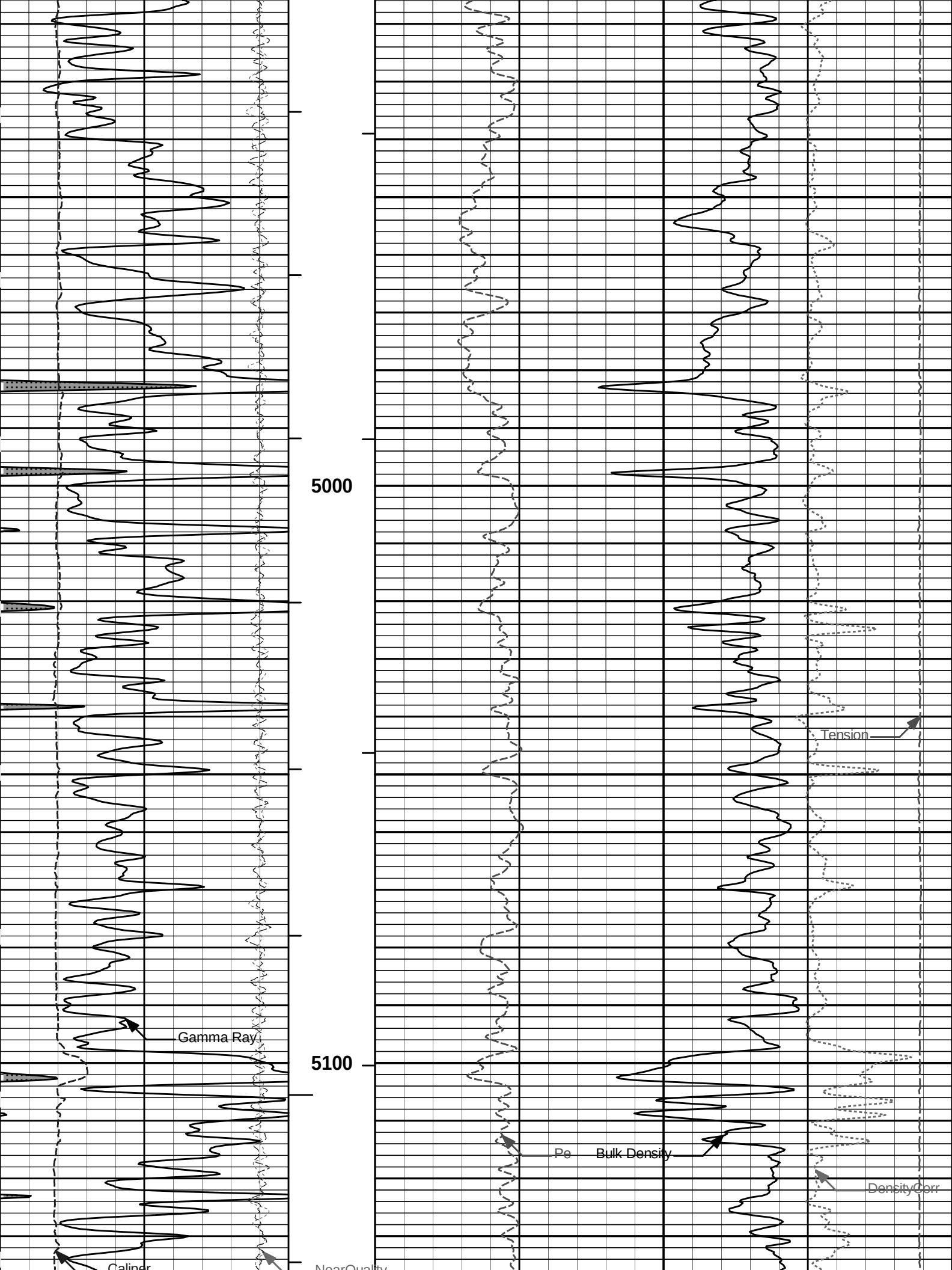
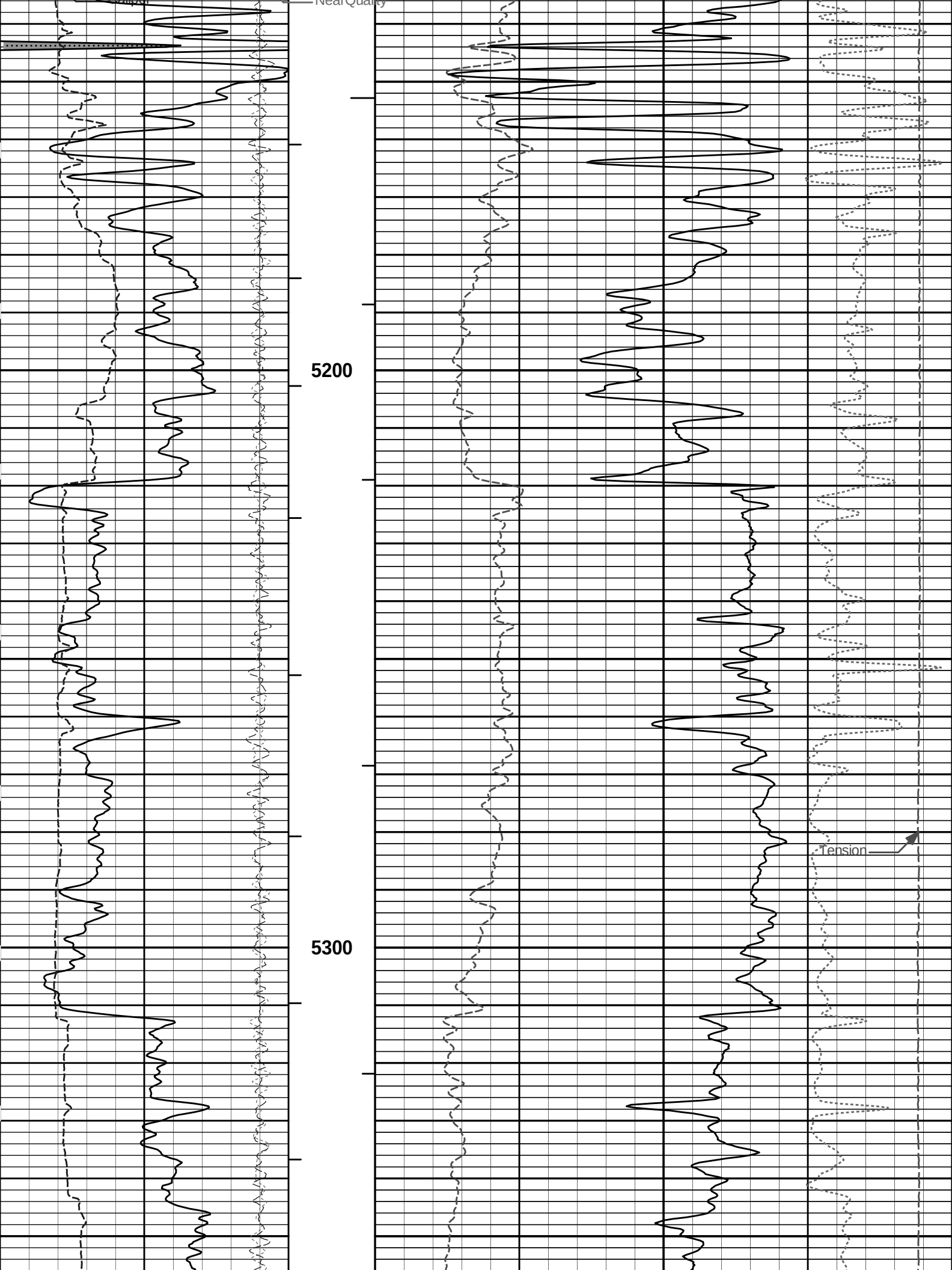
4600
Gamma Ray
Caliper
NearQuality
Pe
Bulk Density
Tension
DensityCorr


4700
4800
4900
Tension
Caliper
NearQuality


5000
5100
Gamma Ray
Caliper
NearQuality
Pe
Bulk Density
Tension
DensityCorr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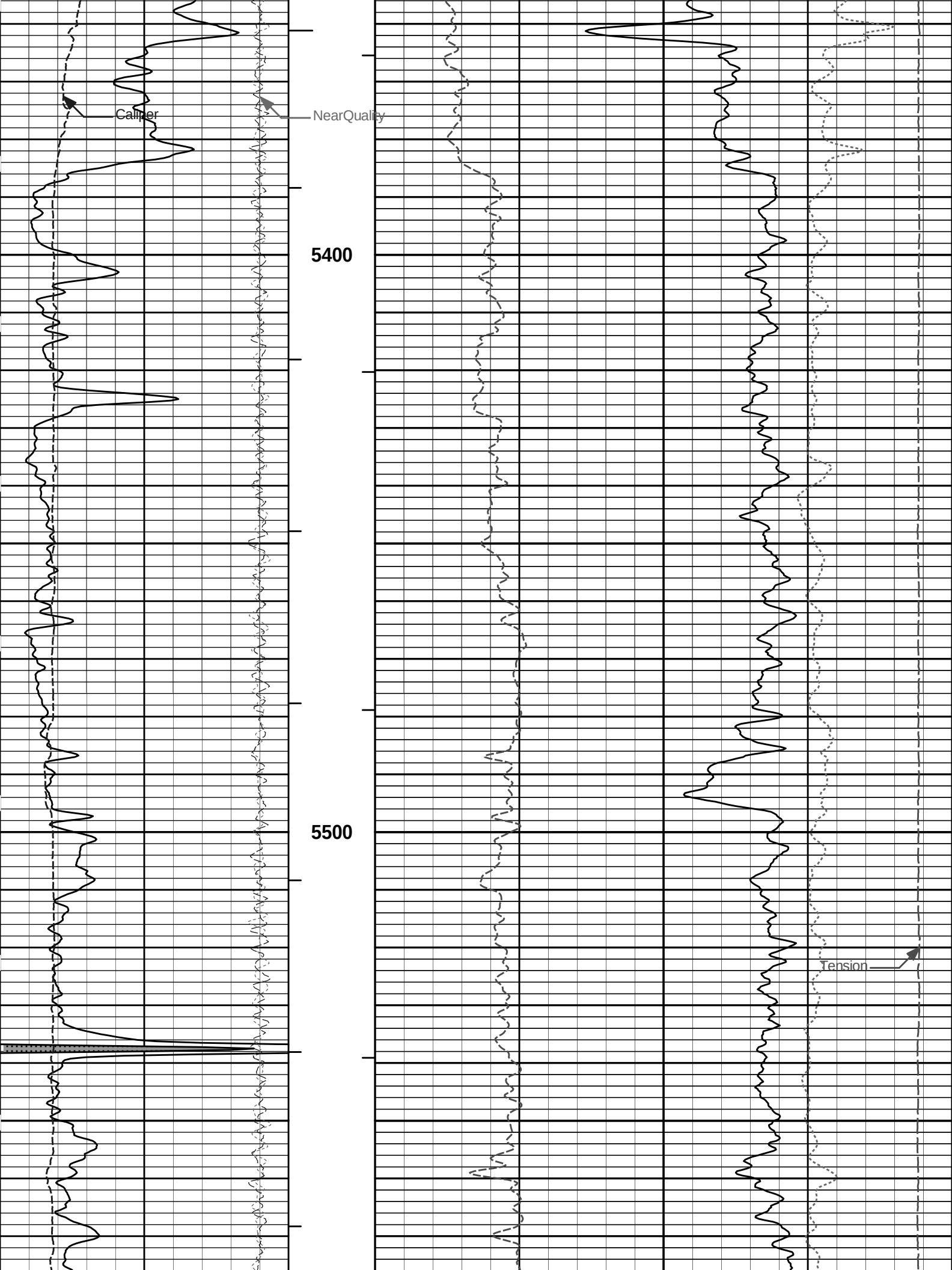
5200
5300
Tension


Caliper
NearQuality
5400
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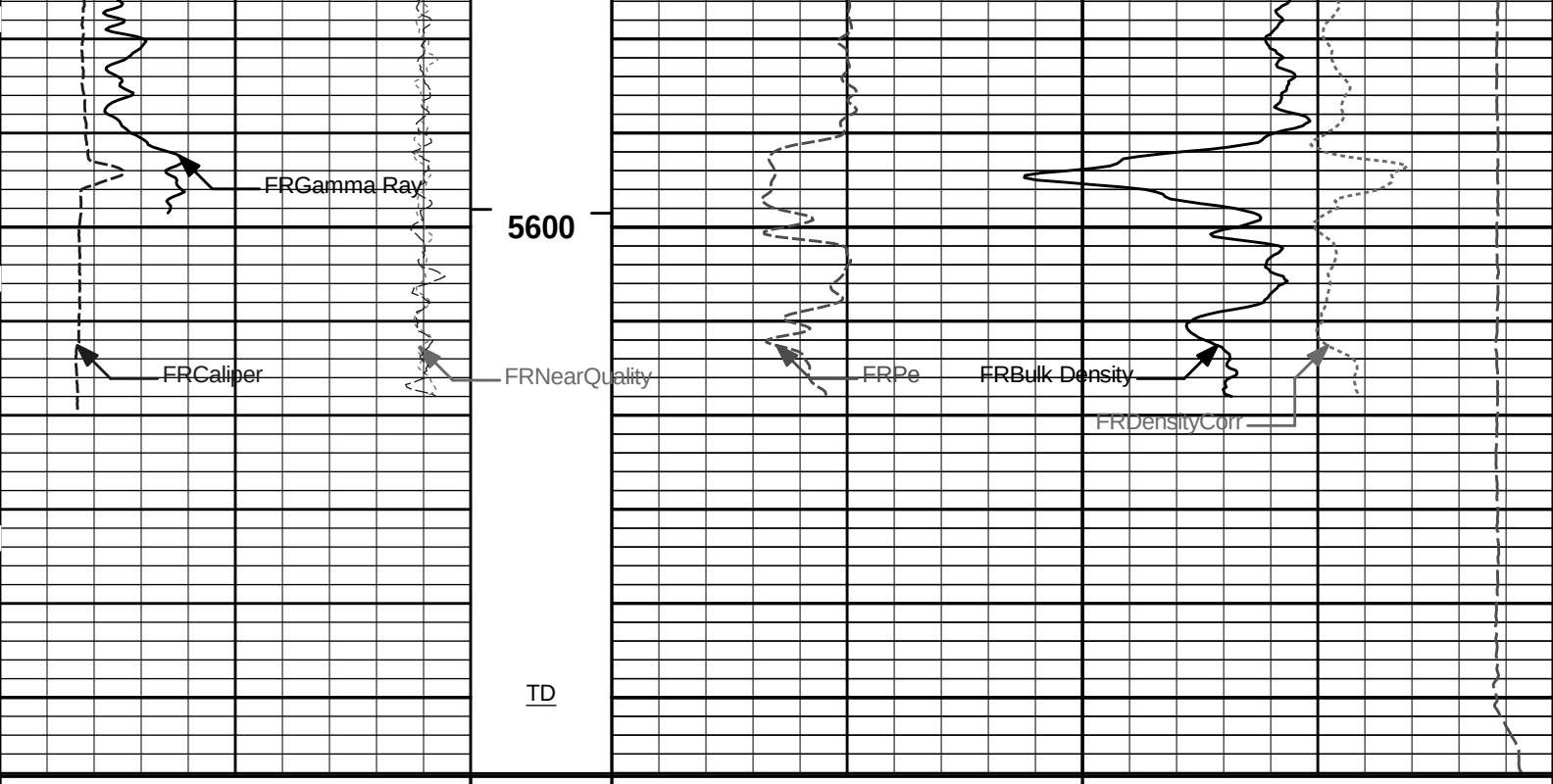
Tension



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	Tension Pull 10 0	
SHALE	Tension Pull	

HALLIBURTON

Plot Time: 21-Jul-12 17:04:52
Plot Range: 3996 ft to 5658.08 ft
Data: ANSHUTZ_A_1\Well Based\R1_DETAIL\
Plot File: \\-LOCAL-\ANSHUTZ_A_1\0001 SP-GTET-DSN-SDL-BSAT-ACRT-CH\PORO\BULKD_5_MAIN_LIB

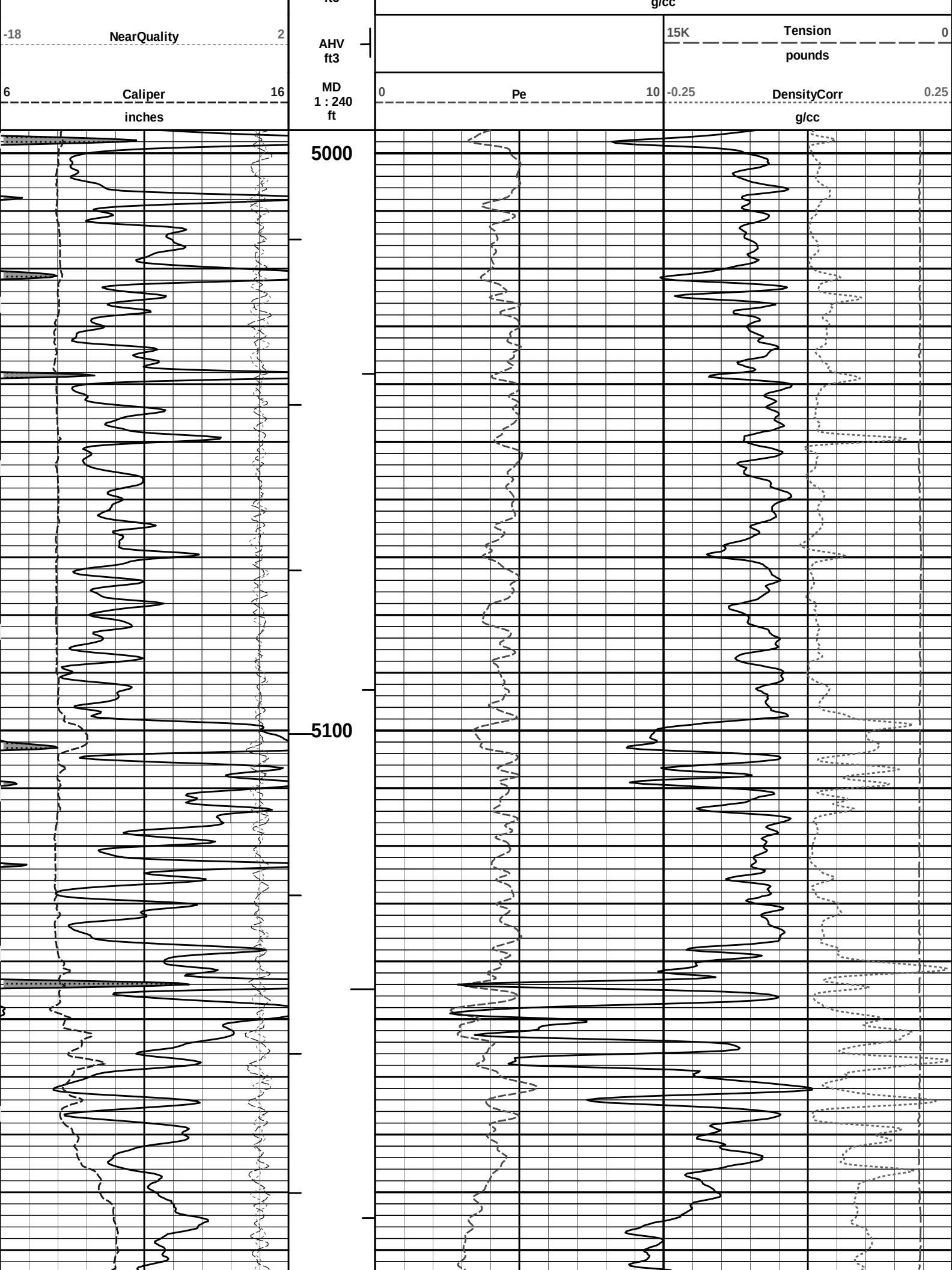
5 INCH MAIN LOG

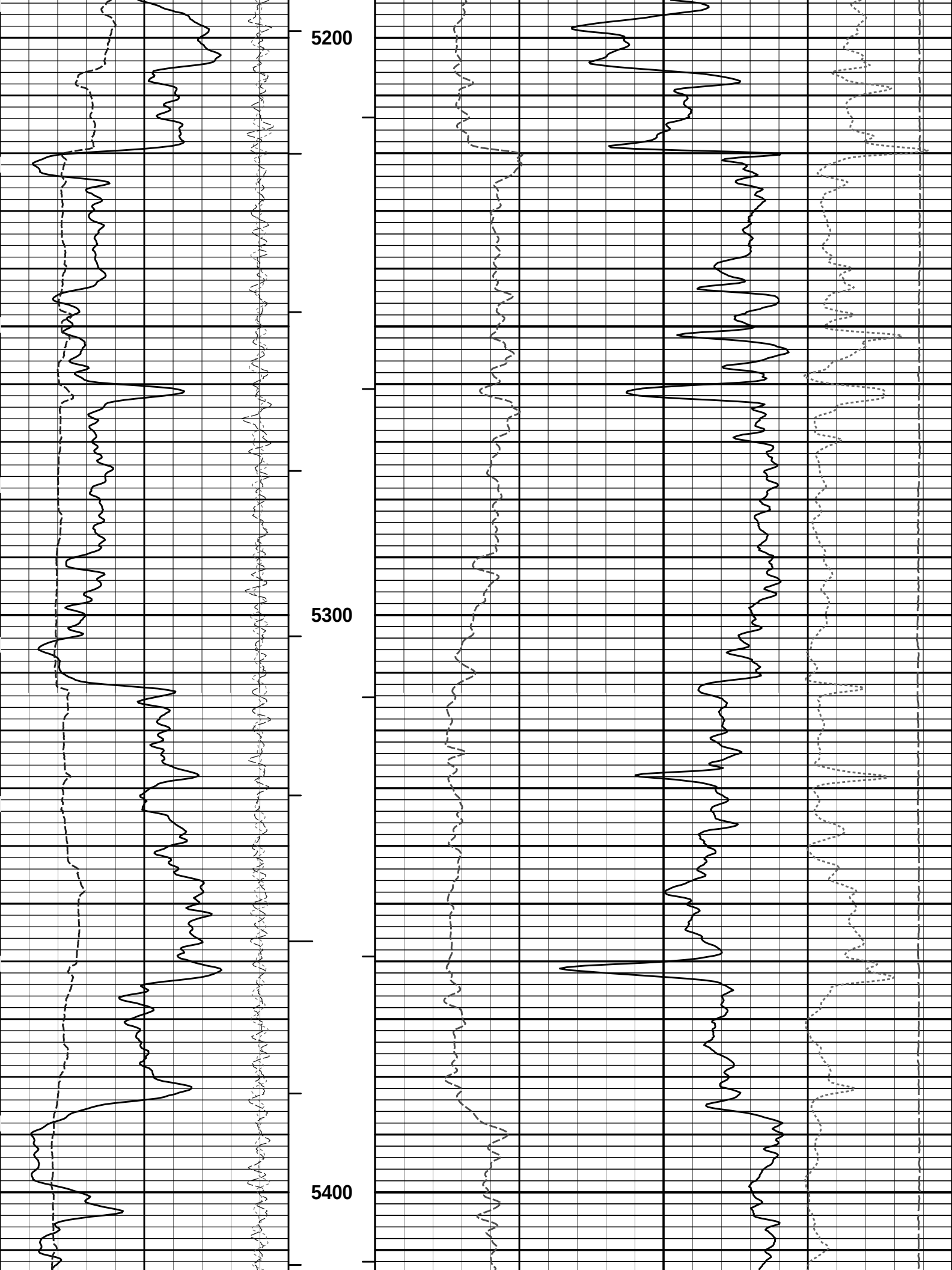
HALLIBURTON

Plot Time: 21-Jul-12 17:04:53
Plot Range: 4996 ft to 5655.33 ft
Data: ANSHUTZ_A_1\Well Based\R1_REPEAT\
Plot File: \\-LOCAL-\ANSHUTZ_A_1\0001 SP-GTET-DSN-SDL-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


g/cc
-18
NearQuality
2
AHV
ft3
15K
Tension
0
pounds
6
Caliper
16
MD
1 : 240
ft
0
Pe
10
-0.25
DensityCorr
0.25
inches
g/cc
5000
5100


5200
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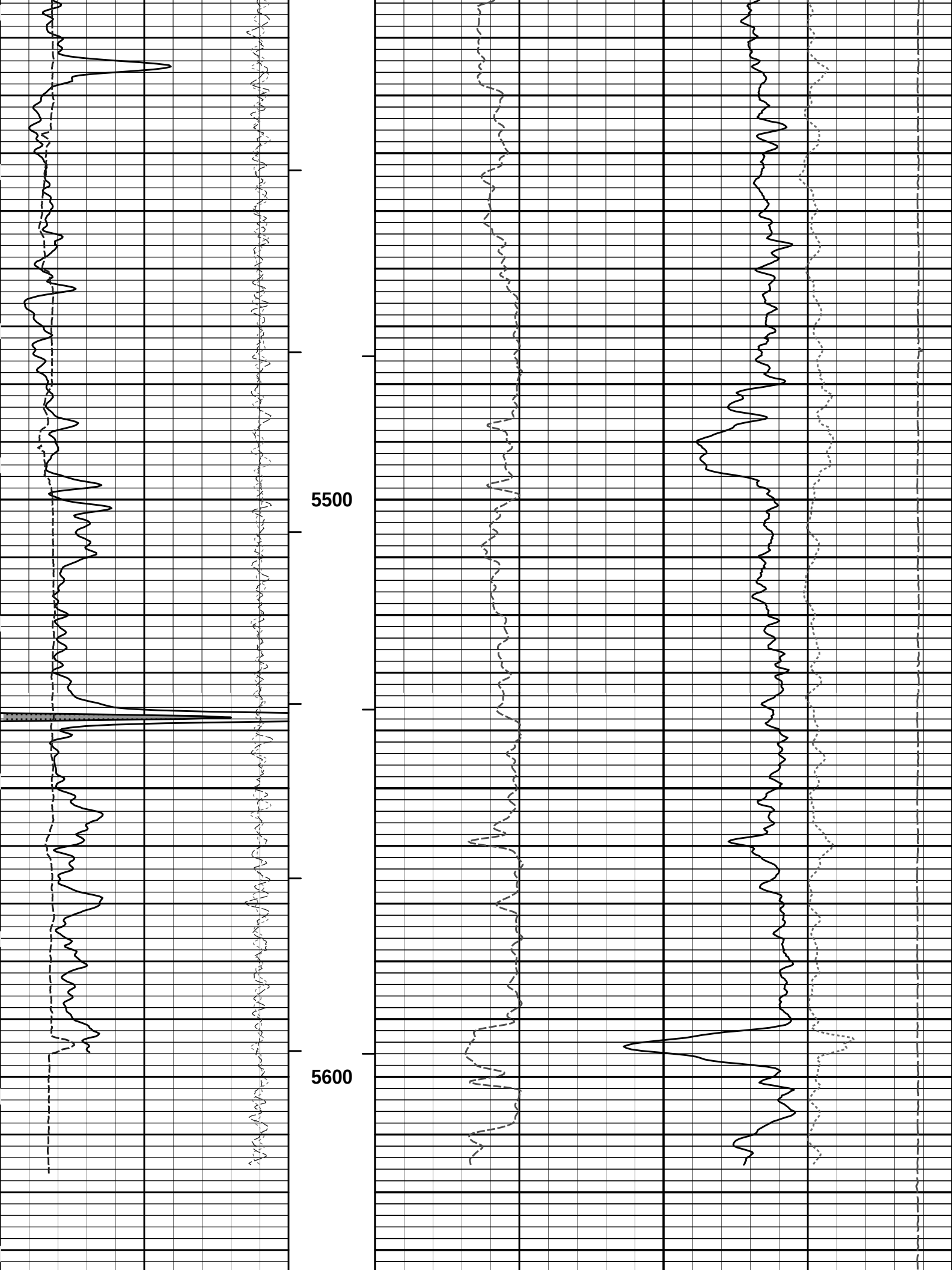
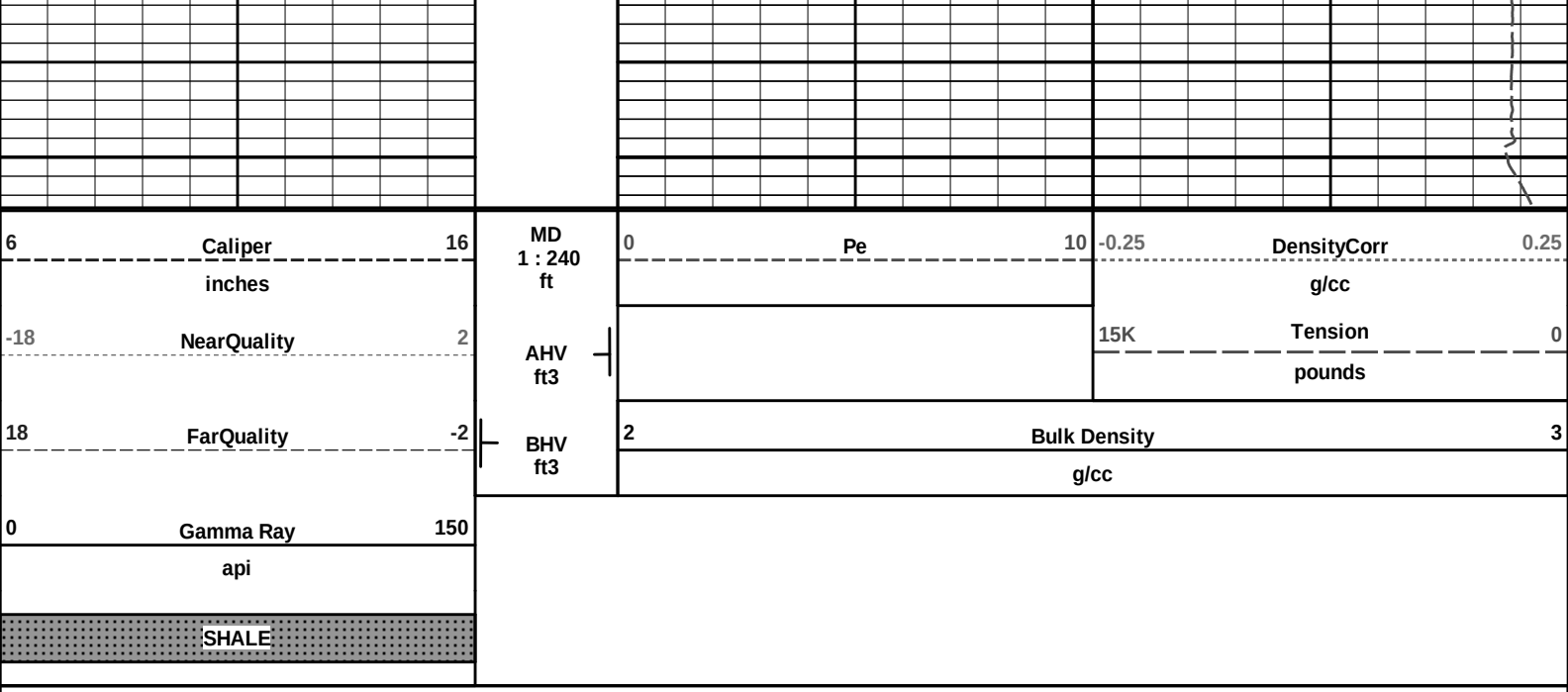
5400


5500
5600



HALLIBURTON

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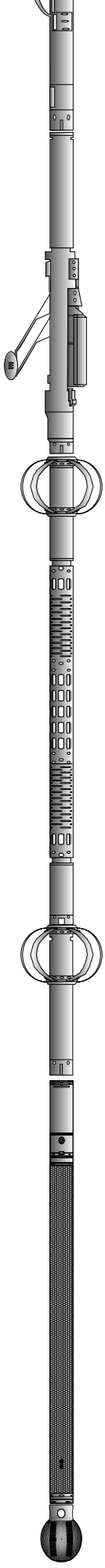
Plot File: \\-LOCAL-\ANSHUTZ_A_1\0001 SP-GTET-DSN-SDL-BSAT-ACRT-CH\PORO\BULKD_5_REP_LIB

REPEAT SECTION

HALLIBURTON

TOOL STRING DIAGRAM REPORT

Description	Overbody Description	O.D.	Diagram	Sensors @ Delays	Length	Accumulated Length
						72.34 ft
CH_HOS-CH_696 37.50 lbs		Ø 2.750 in		← Temperature @ 71.31 ft	3.03 ft	
						69.31 ft
XOHD-TRK696 20.00 lbs		Ø 2.750 in Ø 3.625 in			0.95 ft	
						68.36 ft
SP Sub-11441455 60.00 lbs		Ø 3.625 in		← SP @ 66.59 ft	3.74 ft	
						64.63 ft
GTET-11048627 165.00 lbs		Ø 3.625 in		← GammaRay @ 58.56 ft	8.52 ft	
						56.11 ft
DSNT-11019643 174.00 lbs	DSN Decentralizer- 11005605 6.60 lbs	Ø 5.000 in* Ø 3.625 in			9.69 ft	



DSN Far @ 49.17 ft
DSN Near @ 48.42 ft
46.42 ft
SDLT-I43_M489
360.00 lbs
Ø 4.500 in
10.81 ft
SDLT Pad-P81
65.00 lbs
Microlog @ 38.61 ft
Ø 4.750 in*
Microlog Pad-M489
8.00 lbs
SDL Caliper @ 38.42 ft
Ø 4.750 in*
SDL @ 38.41 ft
35.61 ft
Centralizer 25-001
8.00 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
Centralizer 25-002
8.00 lbs
Ø 4.000 in*
ACRt Instrument-
I5059_S8385
50.00 lbs
Ø 3.625 in
5.03 ft
14.80 ft
Mud Resistivity @ 13.44 ft
ACRt @ 9.46 ft
ACRt Sonde-
I5059_S8385
200.00 lbs
Ø 3.625 in
14.22 ft
0.58 ft
Cabbage Head-
TRK696
10.00 lbs
Ø 3.625 in
Ø 6.000 in
0.58 ft
0.00 ft

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		69.31	300.00
XOHD	Hostile to Dits Cross Over	TRK696	20.00	0.95		68.36	300.00
SP	SP Sub	11441455	60.00	3.74		64.63	300.00
GTET	Gamma Telemetry Tool	11048627	165.00	8.52		56.11	60.00
DSNT	Dual Spaced Neutron	11019643	174.00	9.69		46.42	60.00
DCNT	DSN Decentralizer	11005605	6.60	5.13	*	49.75	300.00
SDLT	Spectral Density Tool	I43 M489	360.00	10.81		35.61	60.00
MICP	Microlog Pad	M489	8.00	1.00	*	38.11	60.00
SDLP	Density Insite Pad	P81	65.00	2.55	*	37.82	60.00
BSAT	Borehole Sonic Array Tool	10747684	300.00	15.77		19.83	60.00
OBCEN	Centralizer - 25 in. Overbody	001	8.00	2.08	*	33.53	300.00
ACRt	Array Compensated True Resistivity Instrument Section	I5059_S8385	50.00	5.03		14.80	300.00
OBCEN	Centralizer - 25 in. Overbody	002	8.00	2.08	*	17.83	300.00
ACRt	Array Compensated True Resistivity Sonde Section	I5059_S8385	200.00	14.22		0.58	300.00
CBHD	Cabbage Head	TRK696	10.00	0.58		0.00	300.00
Total			**1,472.10**	**72.34**			

* Not included in Total Length and Length Accumulation.

Data: ANSHUTZ_A_1\0001 SP-GTET-DSN-SDL-BSAT-ACRT-CH\IDLE **Date: 21-Jul-12 12:59:52**

HALLIBURTON

CALIBRATION REPORT

NATURAL GAMMA RAY TOOL SHOP CALIBRATION

Tool Name: GTET - 11048627 **Reference Calibration Date:** 13-Jul-12 10:53:33

Engineer: C. HAVERKAMP **Calibration Date:** 20-Jul-12 19:29:36

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	50.0	47.3	api
Background + Calibrator	330.2	312.3	api
Calibrator	262.3	265.0	api

NATURAL GAMMA RAY TOOL FIELD CALIBRATION

Tool Name: GTET - 11048627 **Reference Calibration Date:** 20-Jul-12 19:29:36

Engineer: C. HAVERKAMP **Calibration Date:** 20-Jul-12 19:35:27

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	47.3	50.6	api
Background + Calibrator	312.3	311.1	api
Calibrator	265.0	260.5	api

Shop	Field	Difference	Tolerance
265.0	260.5	4.5	+/- 9.00

DUAL SPACED NEUTRON SHOP CALIBRATION

Tool Name: DSNT - 11019643 **Reference Calibration Date:** 13-Jul-12 10:27:47

Engineer: T. HYDE **Calibration Date:** 13-Jul-12 10:44:01

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

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: 78 degF
Min. Tool Housing Outside Diameter: 3.625 in

CALIBRATION CONSTANTS

Measurement	Prev. Value	New Value	Control Limit On New Value
Gain:	0.949	0.947	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):	0.2113	0.2110	0.0003	+/- 0.0020
Calibrated Ratio:	9.74	9.73	0.011	+/- 0.050

VERIFIER

Measurement	Value	Control Limit
Snow-Block Porosity (decp):	0.0636	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:**	**13-Jul-12 10:44:01**
Engineer:	**C. HAVERKAMP**	**Calibration Date:**	**20-Jul-12 19:33:24**
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):	0.0636	0.0772	0.0136	+/- 0.0150

PASS/FAIL SUMMARY

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

DENSITY CALIPER SHOP CALIBRATION

Tool Name:	**SDLT - I43_M489**	**Reference Calibration Date:**	**12-Jul-12 11:52:19**
Engineer:	**T. HYDE**	**Calibration Date:**	**12-Jul-12 11:56:20**
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	-1931.94	-2130.51	-7000.00 - -1000.00

Pad Gain	0.0003956	0.0004016	0.000200 - 0.000600
Arm Offset	-746.21	-714.63	-5000.00 - 3000.00
Arm Gain	0.0005387	0.0005524	0.000300 - 0.000700
Arm Power	-0.000007005	-0.000007671	-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)	2.05	2.00	-0.05	+/- 0.20
Medium Ring (in)	3.77	3.75	-0.02	+/- 0.20
RING DIAMETER:				
Small Ring (in)	6.52	6.50	-0.02	+/- 0.20
Medium Ring (in)	8.24	8.25	0.01	+/- 0.20
Large Ring (in)	15.00	15.00	0.00	+/- 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 - P81**	**Reference Calibration Date:**	**12-Jul-12 11:10:03**
Engineer:	**T. HYDE**	**Calibration Date:**	**12-Jul-12 11:29:25**
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	1.0494	1.0276	0.90 - 1.10
Near Dens Gain	1.0245	1.0237	0.90 - 1.10
Near Peak Gain	1.0209	1.0117	0.90 - 1.10
Near Lith Gain	0.9944	0.9741	0.90 - 1.10
Far Bar Gain	1.0166	1.0157	0.90 - 1.10
Far Dens Gain	1.0025	1.0013	0.90 - 1.10
Far Peak Gain	0.9952	0.9951	0.90 - 1.10
Far Lith Gain	0.9728	0.9724	0.90 - 1.10
Near Bar Offset	-0.2421	-0.0440	NONE
Near Dens Offset	-0.0236	-0.0173	NONE
Near Peak Offset	0.0150	0.0901	NONE
Near Lith Offset	0.2244	0.3908	NONE
Far Bar Offset	0.0031	0.0070	NONE
Far Dens Offset	0.1122	0.1198	NONE
Far Peak Offset	0.1497	0.1484	NONE
Far Lith Offset	0.2992	0.3010	NONE
Near Bar Background	820.30	817.64	700 - 1450
Near Dens Background	268.11	268.51	230 - 480
Near Peak Background	118.01	117.58	100 - 210

Near Peak Background	118.01	117.58	100 - 210
Near Lith Background	145.20	145.39	125 - 260
Far Bar Background	532.97	531.83	450 - 900
Far Dens Background	209.40	210.36	175 - 345
Far Peak Background	84.28	85.05	70 - 140
Far Lith Background	86.17	86.29	75 - 145

CALIBRATION BLOCK SUMMARY

Measurement	Current Reading (Previous Coef)	Calibrated (New Coef)	Change	Control Limit On Change
MAGNESIUM				
Density (g/cc)	1.683	1.684	0.001	+/- 0.015
Pe	2.552	2.564	0.012	+/- 0.150
ALUMINUM				
Density (g/cc)	2.595	2.598	0.003	+/- 0.01500
Pe	3.127	3.133	0.006	+/- 0.150

TOOL SUMMARY

Measurement	Near Detector		Far Detector	
	Value	Control Limits	Value	Control Limits
QUALITY				
Background	-0.0001	+/- 0.0110	0.0021	+/- 0.0140
Magnesium Block	0.0001	+/- 0.0110	-0.0011	+/- 0.0140
Aluminum Block	-0.0010	+/- 0.0110	0.0004	+/- 0.0140
Resolution	9.41	6.00 - 11.50	8.86	6.00 - 11.50
Internal Verifier(B+D+P+L)	1349	1200 - 2700	914	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 - P81 **Reference Calibration Date:** 12-Jul-12 11:29:25

Engineer: C. HAVERKAMP **Calibration Date:** 20-Jul-12 19:28:42

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

Pad Temperature: 107.0 degF

DENSITY FIELD CALIBRATION SUMMARY

Measurement	Shop	Field	Change	Control Limit +/-
Near (B+D+P+L) cps	1349.120	1351.956	2.836	14.852
Far (B+D+P+L) cps	913.515	920.978	7.463	16.398
Near Resolution	9.41	9.65	0.240	0.50
Far Resolution	8.86	9.33	0.470	1.00

PASS/FAIL SUMMARY

Bkg Quality Check:	Passed

Bkg Resolution Check:	Passed
Bkg Verification Check:	Passed

SDLT CALIPER FIELD CALIBRATION

Tool Name:	**SDLT - I43_M489**	**Reference Calibration Date:**	**12-Jul-12 11:56:20**
Engineer:	**C. HAVERKAMP**	**Calibration Date:**	**20-Jul-12 19:36:24**
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	3.71	-0.04	+/- 0.10
Ring Diameter	8.25	8.16	-0.09	+/- 0.15

PASS/FAIL SUMMARY

Pad Extension Check:	Passed
Diameter Check:	Passed

CALIBRATION SUMMARY

Sensor	Shop	Field	Post	Difference	Tolerance	Units
GTET-11048627						
Gamma Ray Calibrator	265.0	260.5	----------	4.5	+/- 9.00	api
DSNT-11019643						
Snow-Block Porosity	0.0636	0.0772	----------	-0.0136	+/- 0.0150	decp
SDLT-I43_M489						
Pad Extension	3.75	3.71	----------	0.04	+/-0.10	in
Ring Diameter	8.25	8.16	----------	0.09	+/-0.15	in
SDLT Pad-P81						
Near(B+D+P+L)	1349.120	1351.956	----------	-2.836	+/-14.852	cps
Far(B+D+P+L)	913.515	920.978	----------	-7.463	+/-16.398	cps

Data: ANSHUTZ_A_1\0001 SP-GTET-DSN-SDL-BSAT-ACRT-CH\IDLE **Date: 21-Jul-12 13:43:34**

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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	9.500	ppg
	SHARED	WAGT	Weighting Agent	Natural	
	SHARED	BSAL	Borehole salinity	5500.00	ppm
	SHARED	FSAL	Formation Salinity NaCl	0.00	ppm
	SHARED	KPCT	Percent K in Mud by Weight?	0.00	%
	SHARED	RMUD	Mud Resistivity	0.750	ohmm
	SHARED	TRM	Temperature of Mud	90.0	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	5663.00	ft
	SHARED	BHT	Bottom Hole Temperature	140.0	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?	No	
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

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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	66.58	NO	
SP	Spontaneous Potential	66.58	BLK	1.250
SPR	Raw Spontaneous Potential	66.58	NO	
SPO	Spontaneous Potential Offset	66.58	NO	
	GTET			
TPUL	Tension Pull	58.56	NO	
GR	Natural Gamma Ray API	58.56	TRI	1.750
GRU	Unfiltered Natural Gamma Ray API	58.56	NO	
EGR	Natural Gamma Ray API with Enhanced Vertical Resolution	58.56	W	1.416 , 0.750
ACCZ	Accelerometer Z	0.00	BLK	0.083
DEVI	Inclination	0.00	NO	
	DSNT			
TPUL	Tension Pull	48.32	NO	
RNDS	Near Detector Telemetry Counts	48.42	BLK	1.417
RFDS	Far Detector Telemetry Counts	49.17	TRI	0.583
DNTT	DSN Tool Temperature	48.42	NO	
DSNS	DSN Tool Status	48.32	NO	
ERND	Near Detector Telemetry Counts EVR	48.42	BLK	0.000
ERFD	Far Detector Telemetry Counts EVR	49.17	BLK	0.000
ENTM	DSN Tool Temperature EVR	48.42	NO	
	SDLT			
TPUL	Tension Pull	38.42	NO	
PCAL	Pad Caliper	38.42	TRI	0.250
ACAL	Arm Caliper	38.42	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	38.41	NO	
NAB	Near Above	38.24	BLK	0.920
NHI	Near Cesium High	38.24	BLK	0.920
NLO	Near Cesium Low	38.24	BLK	0.920
NVA	Near Valley	38.24	BLK	0.920
NBA	Near Barite	38.24	BLK	0.920
NDE	Near Density	38.24	BLK	0.920
NPK	Near Peak	38.24	BLK	0.920
NLI	Near Lithology	38.24	BLK	0.920

NLI	Near Lithology	38.24	BLK	0.920
NBAU	Near Barite Unfiltered	38.24	BLK	0.250
NLIU	Near Lithology Unfiltered	38.24	BLK	0.250
FAB	Far Above	38.58	BLK	0.250
FHI	Far Cesium High	38.58	BLK	0.250
FLO	Far Cesium Low	38.58	BLK	0.250
FVA	Far Valley	38.58	BLK	0.250
FBA	Far Barite	38.58	BLK	0.250
FDE	Far Density	38.58	BLK	0.250
FPK	Far Peak	38.58	BLK	0.250
FLI	Far Lithology	38.58	BLK	0.250
PTMP	Pad Temperature	38.42	BLK	0.920
NHV	Near Detector High Voltage	37.81	NO	
FHV	Far Detector High Voltage	37.81	NO	
ITMP	Instrument Temperature	37.81	NO	
DDHV	Detector High Voltage	37.81	NO	
	Microlog Pad			
TPUL	Tension Pull	38.60	NO	
MINV	Microlog Lateral	38.60	BLK	0.750
MNOR	Microlog Normal	38.60	BLK	0.750

Data: ANSHUTZ_A_1\0001 SP-GTET-DSN-SDL-BSAT-ACRT-CH\IDLE **Date: 21-Jul-12 13:36:12**

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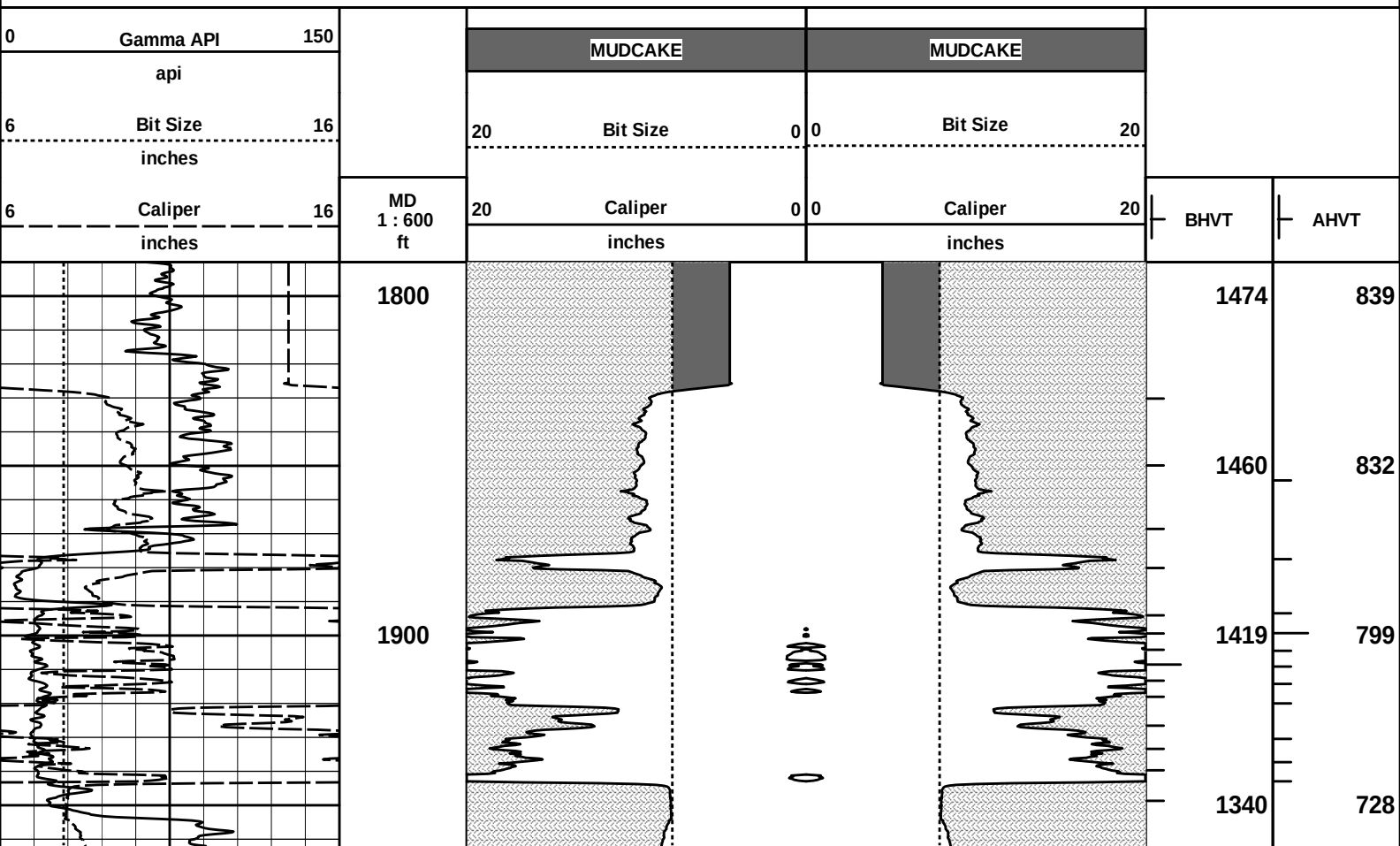
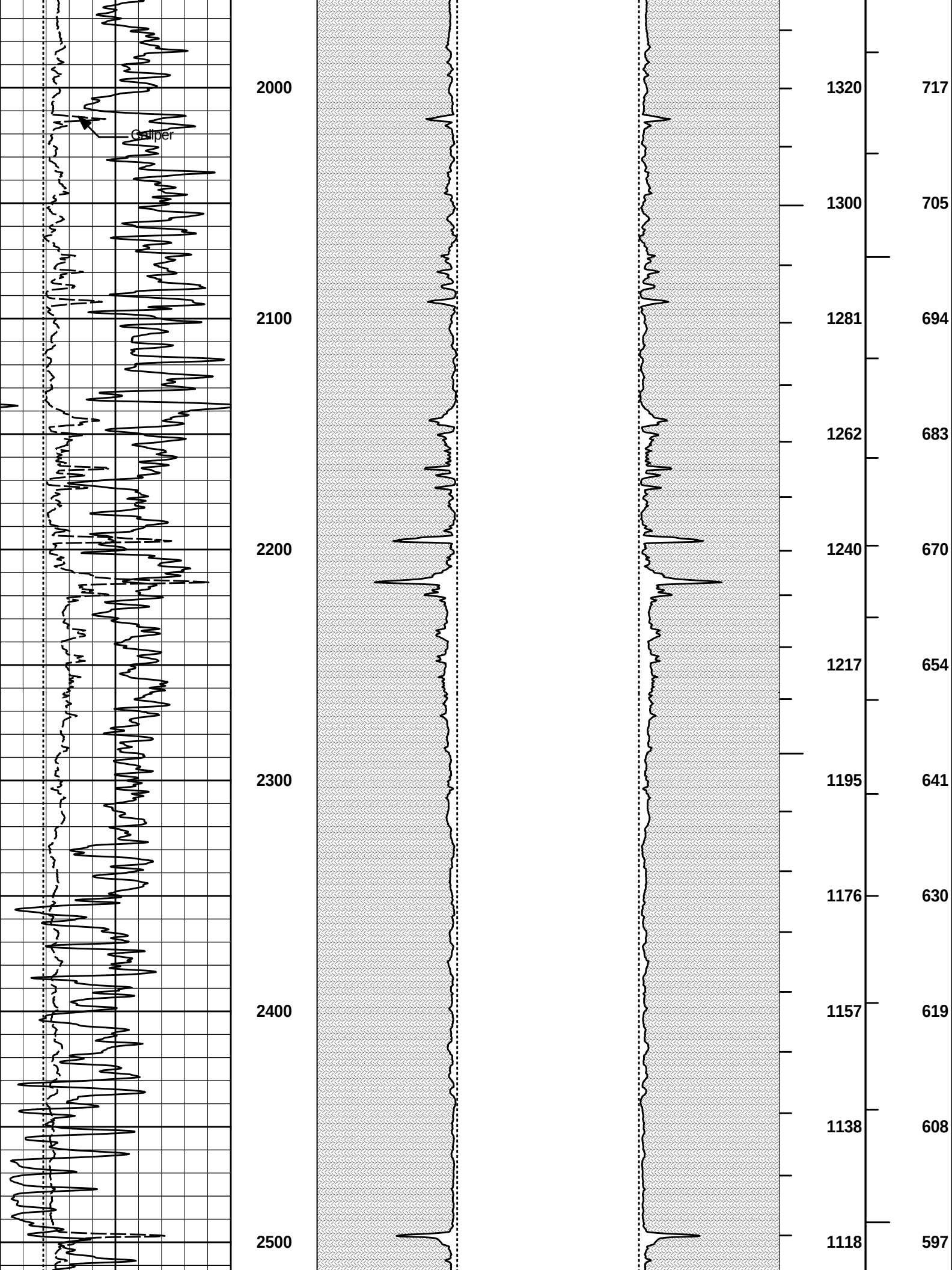
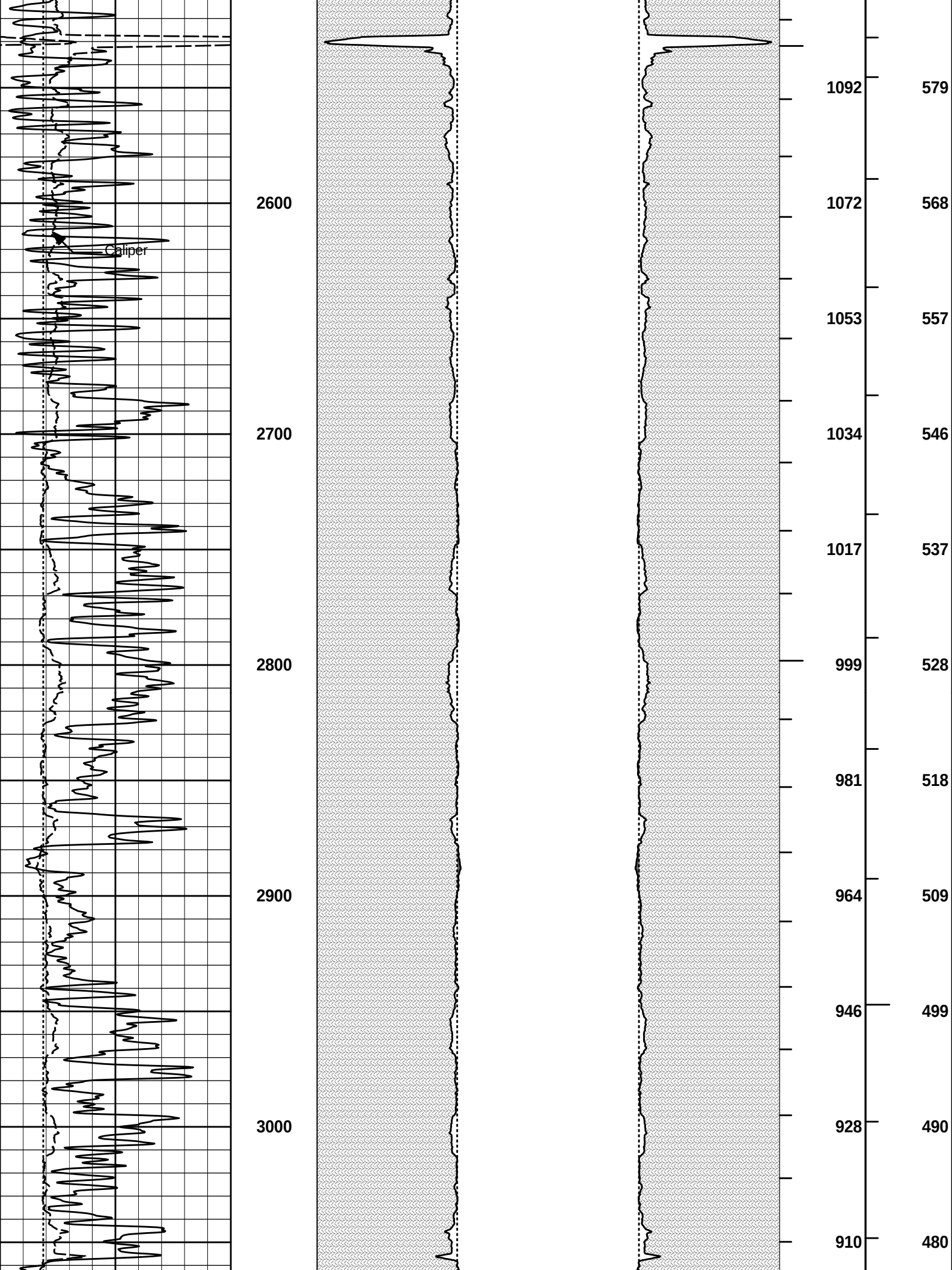
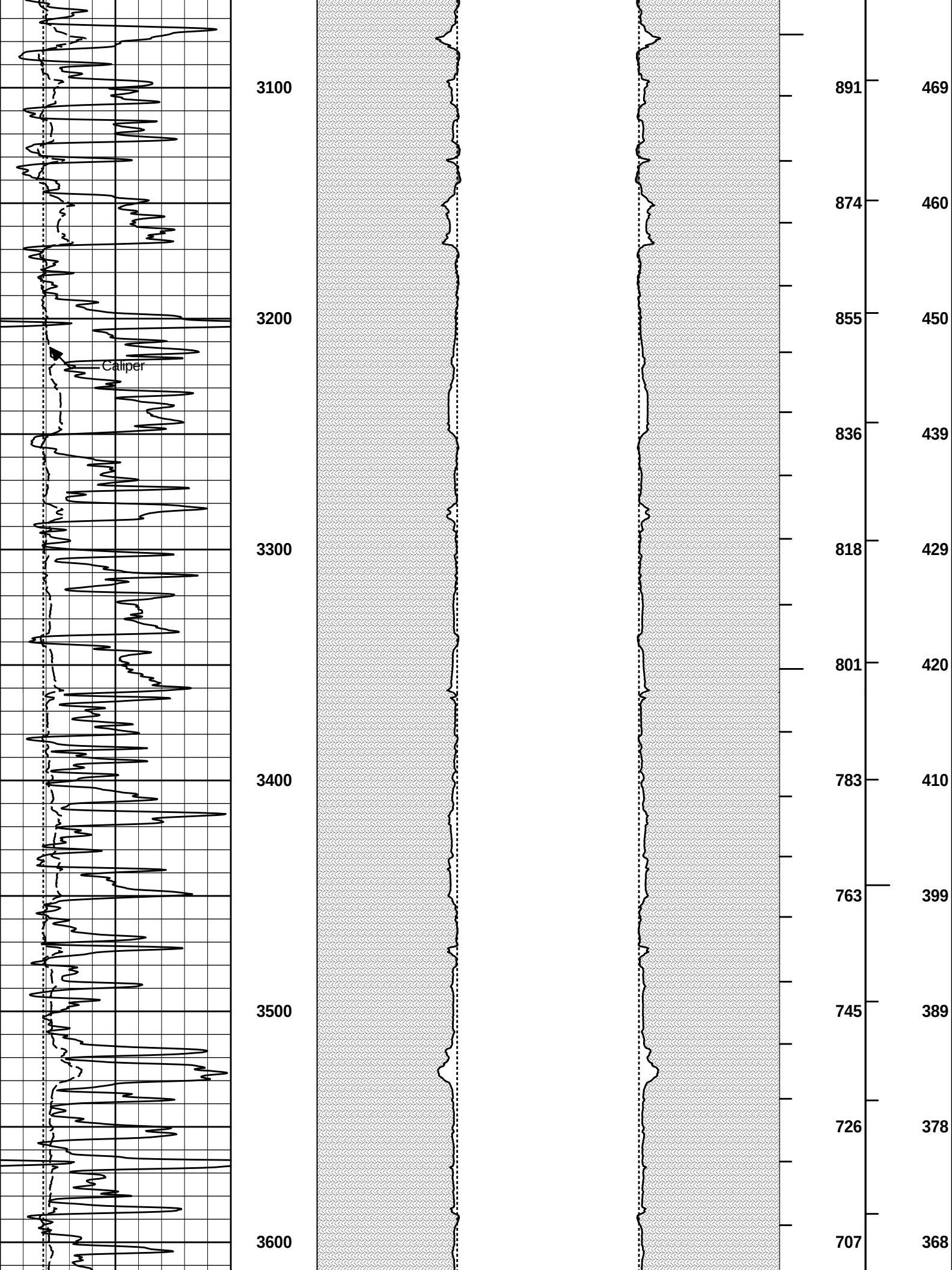
Plot Time: 21-Jul-12 17:04:55
Plot Range: 1790 ft to 5658.08 ft
Data: ANSHUTZ_A_1\Well Based\R1_CASING
Plot File: \\-LOCAL-\ANSHUTZ_A_1\0001 SP-GTET-DSN-SDL-BSAT-ACRT-CH\PORO\AHV_2_IQ_LIB

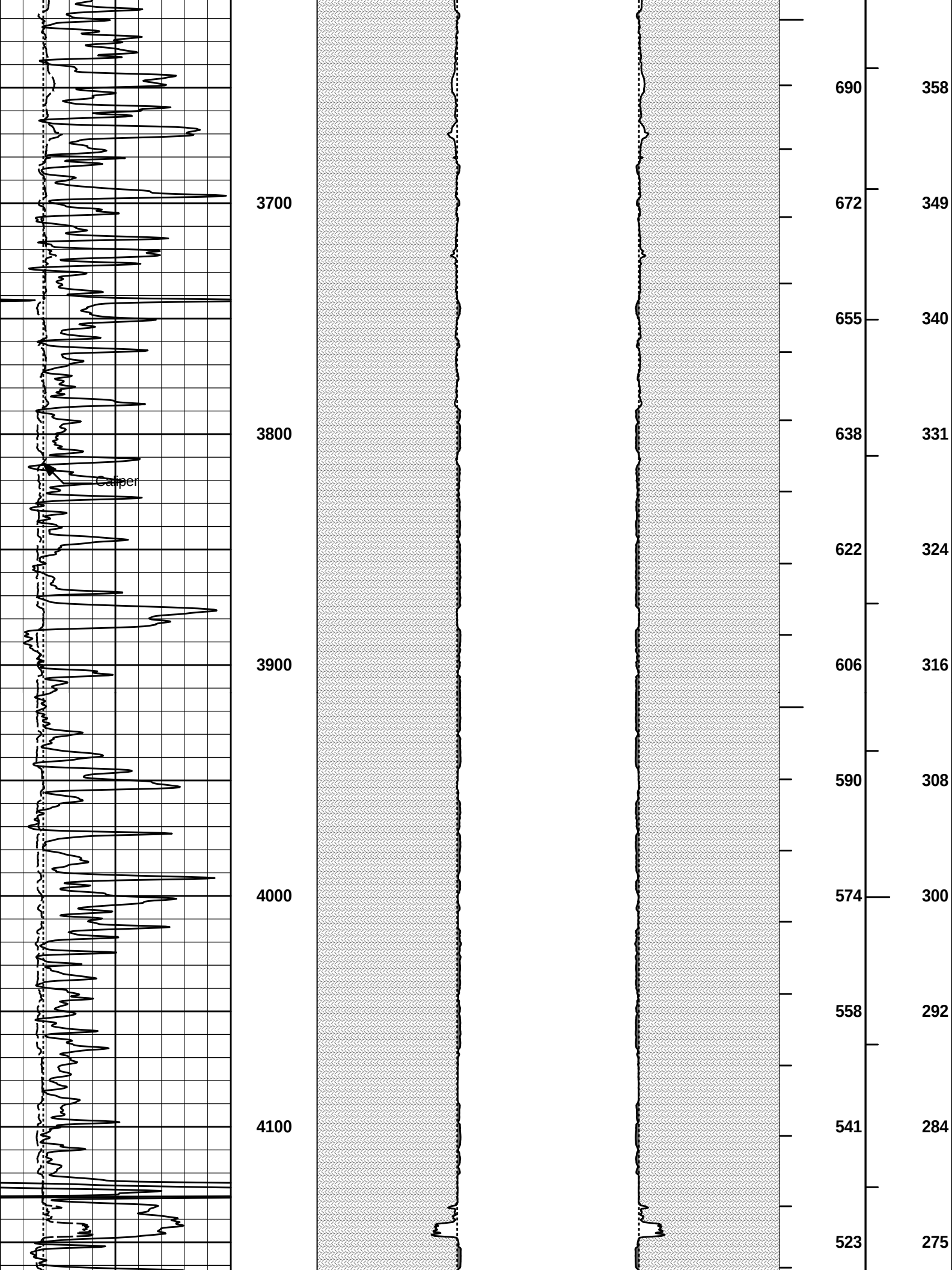
ANNULAR HOLE VOLUME PLOT

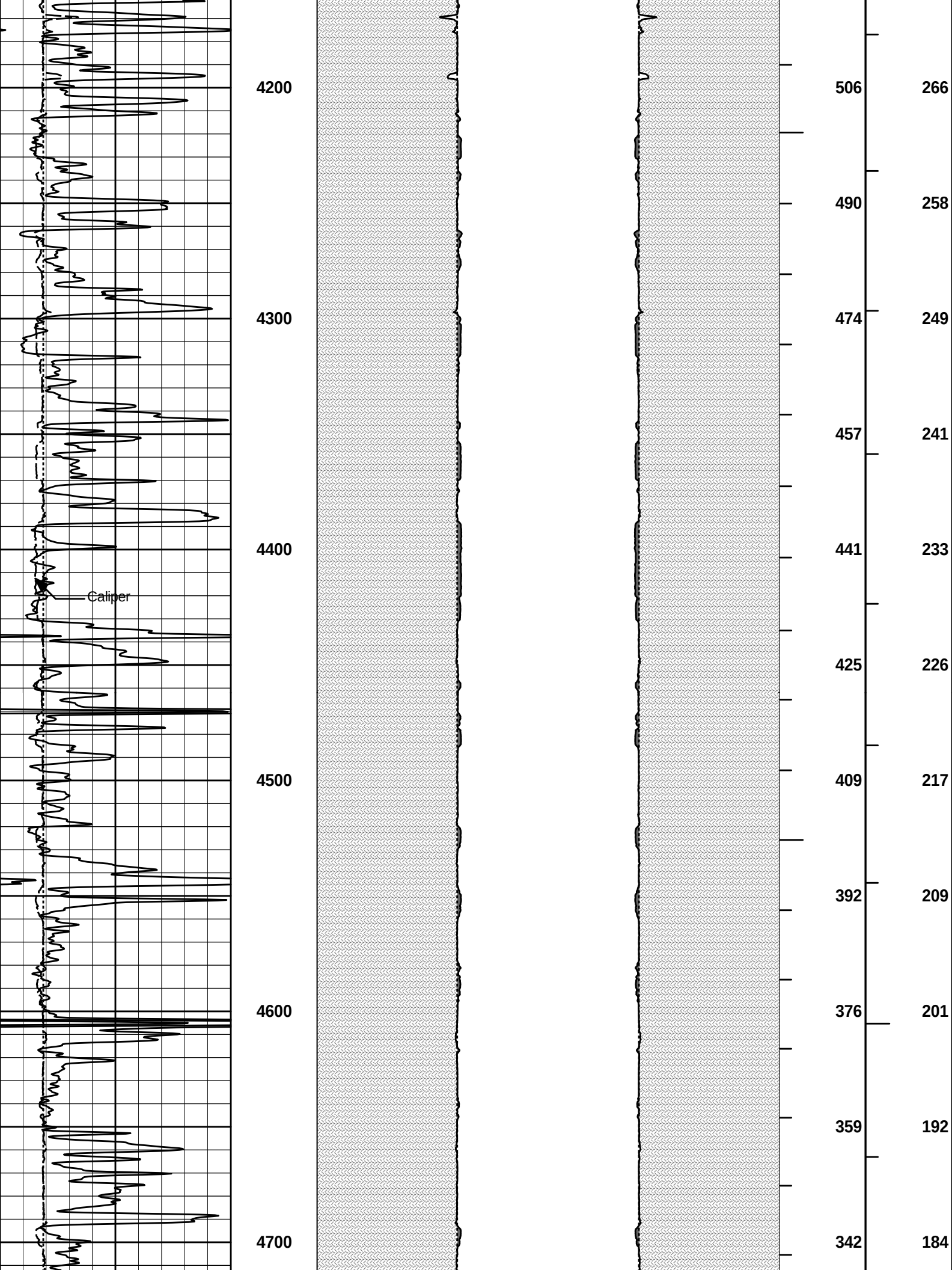



Caliper
2000
2100
2200
2300
2400
2500
1320
1300
1281
1262
1240
1217
1195
1176
1157
1138
1118
717
705
694
683
670
654
641
630
619
608
597


Caliper
2600
2700
2800
2900
3000
1092
1072
1053
1034
1017
999
981
964
946
928
910
579
568
557
546
537
528
518
509
499
490
480


3100
3200
3300
3400
3500
3600
Caliper
891
874
855
836
818
801
783
763
745
726
707
469
460
450
439
429
420
410
399
389
378
368


3700
3800
3900
4000
4100
Caliper
690
672
655
638
622
606
590
574
558
541
523
358
349
340
331
324
316
308
300
292
284
275


4200
4300
4400
4500
4600
4700
Caliper
506
490
474
457
441
425
409
392
376
359
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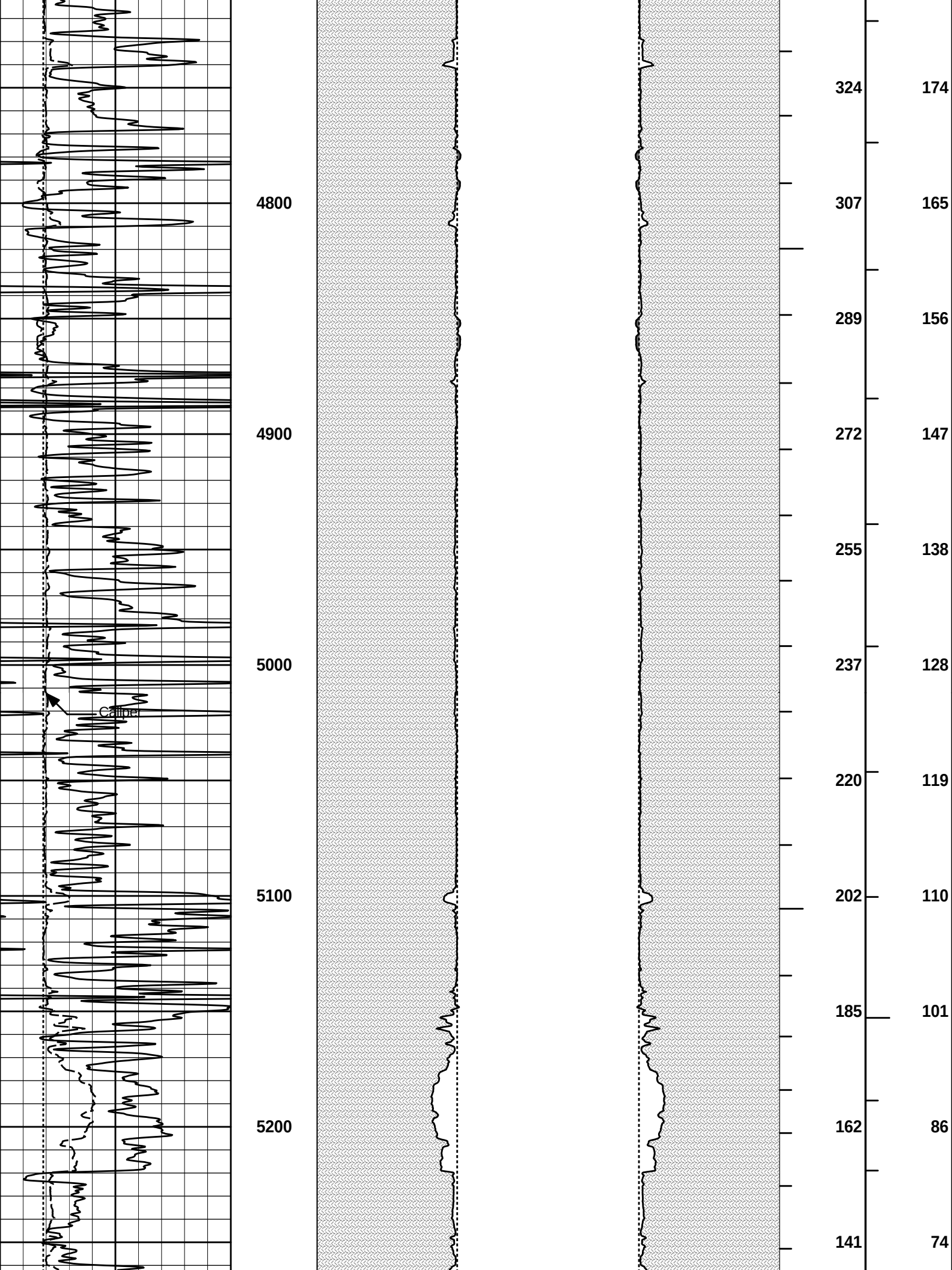
258
249
241
233
226
217
209
201
192
184


4800
4900
5000
5100
5200
Caliper
324
307
289
272
255
237
220
202
185
162
141
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156
147
138
128
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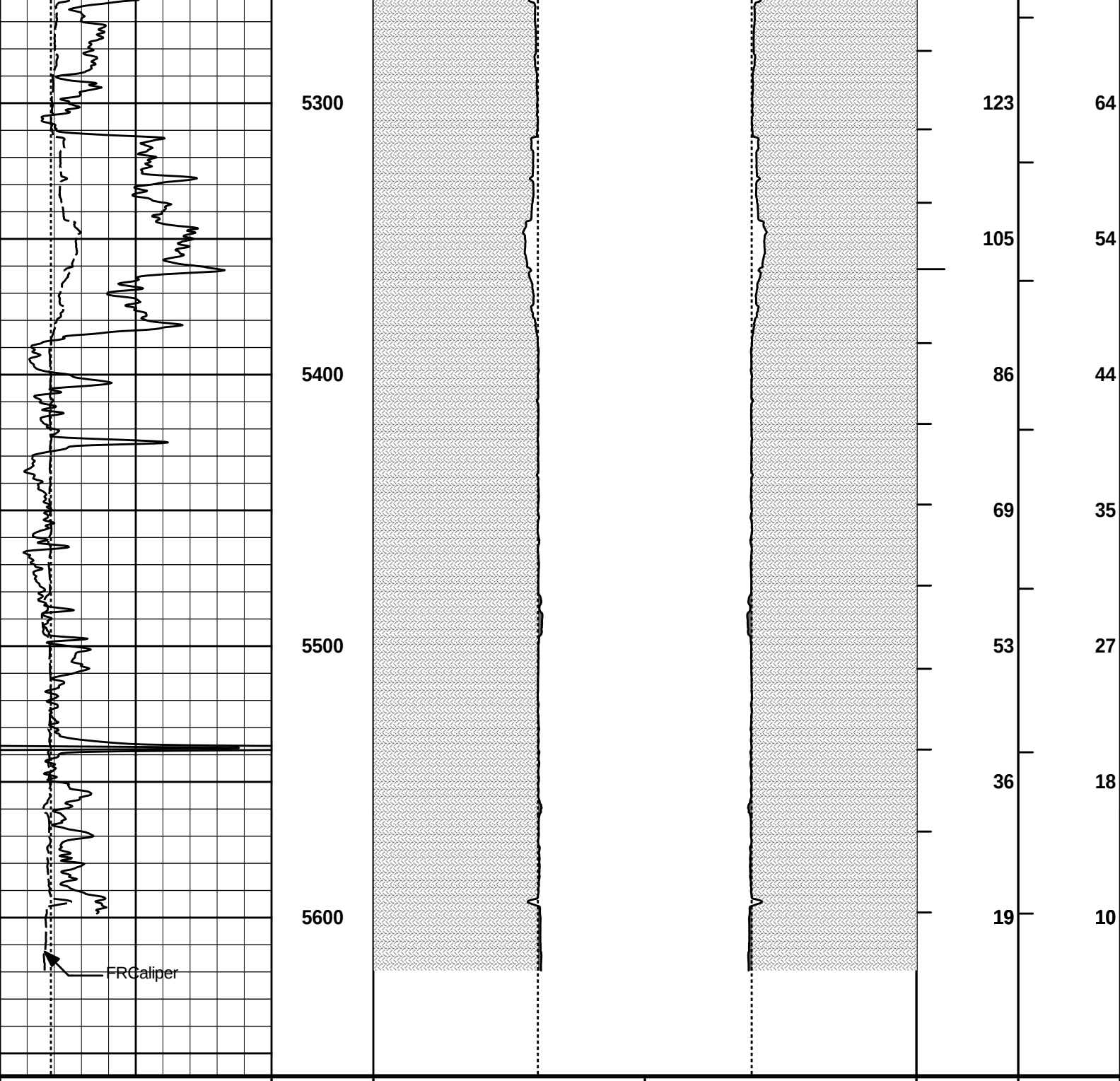
110
101
86
74



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

HALLIBURTON

Plot Time: 21-Jul-12 17:05:04
Plot Range: 1790 ft to 5658.08 ft
Data: ANSHUTZ_A_1\Well Based\R1_CASING\
Plot File: \\-LOCAL-\ANSHUTZ_A_1\0001 SP-GTET-DSN-SDL-BSAT-ACRT-CH\PORO\AHV_2_IQ_LIB

ANNULAR HOLE VOLUME PLOT

COMPANY	**OXY USA INC**		
WELL	**ANSHUTZ A-1**		
FIELD	**SANTA FE NORTH**		
COUNTY	**HASKELL**	STATE	**KANSAS**

HALLIBURTON

SPECTRAL DENSITY
DUAL SPACED NEUTRON
LOG