

HALLIBURTON

SPECTRAL DENSITY
DUAL SPACED NEUTRON
LOG

COMPANY		OXY USA INC	
WELL		GARDEN CITY T-2	
FIELD		GARDEN CITY	
COUNTY		FINNEY	
STATE		KANSAS	
Permanent Datum		GL	Elev. 2969.0 ft
Log measured from		KB	D.F. 2979.0 ft
Drilling measured from		KB	G.L. 2969.0 ft
Date		04-Mar-12	
Run No.		ONE	
Depth - Driller		5120.00 ft	
Depth - Logger		5100.0 ft	
Bottom - Logged Interval		5062.0 ft	
Top - Logged Interval		1810.0 ft	
Casing - Driller		8.625 in @ 1819.0 ft	
Casing - Logger		1810.0 ft	
Bit Size		7.875 in	@
Type Fluid in Hole		WATER BASED MUD	
Density	Viscosity	9.2 ppq	44.00 s/qt
PH	Fluid Loss	10.00 pH	8.8 cpm
Source of Sample		FLOW LINE	
Rm @ Meas. Temperature		1.660 ohmm @ 46.00 degF	@
Rmf @ Meas. Temperature		1.75 ohmm @ 38.00 degF	@
Rmc @ Meas. Temperature		2.200 ohmm @ 38.00 degF	@
Source Rmf	Rmc	MEAS	MEAS
Rm @ BHT		0.71 ohmm @ 113.0 degF	@
Time Since Circulation		12.0 hr	
Time on Bottom		04-Mar-12 00:42	
Max. Rec. Temperature		113.0 degF @ 5100.0 ft	@
Equipment	Location	10546696	LIBERAL
Recorded By		J. BOLLOM	C. HAVERKAMP
Witnessed By		A. GARNER	D. PRATT

COMPANY	OXY USA INC
WELL	GARDEN CITY T-2
FIELD	GARDEN CITY
COUNTY	FINNEY
STATE	KANSAS
API No.	15-055-22127
Location	954' FNL & 795' FEL
Other Services:	ACRT BSAT MICROLOG
Sect. 29	Twp. 23S
Rge.	34W

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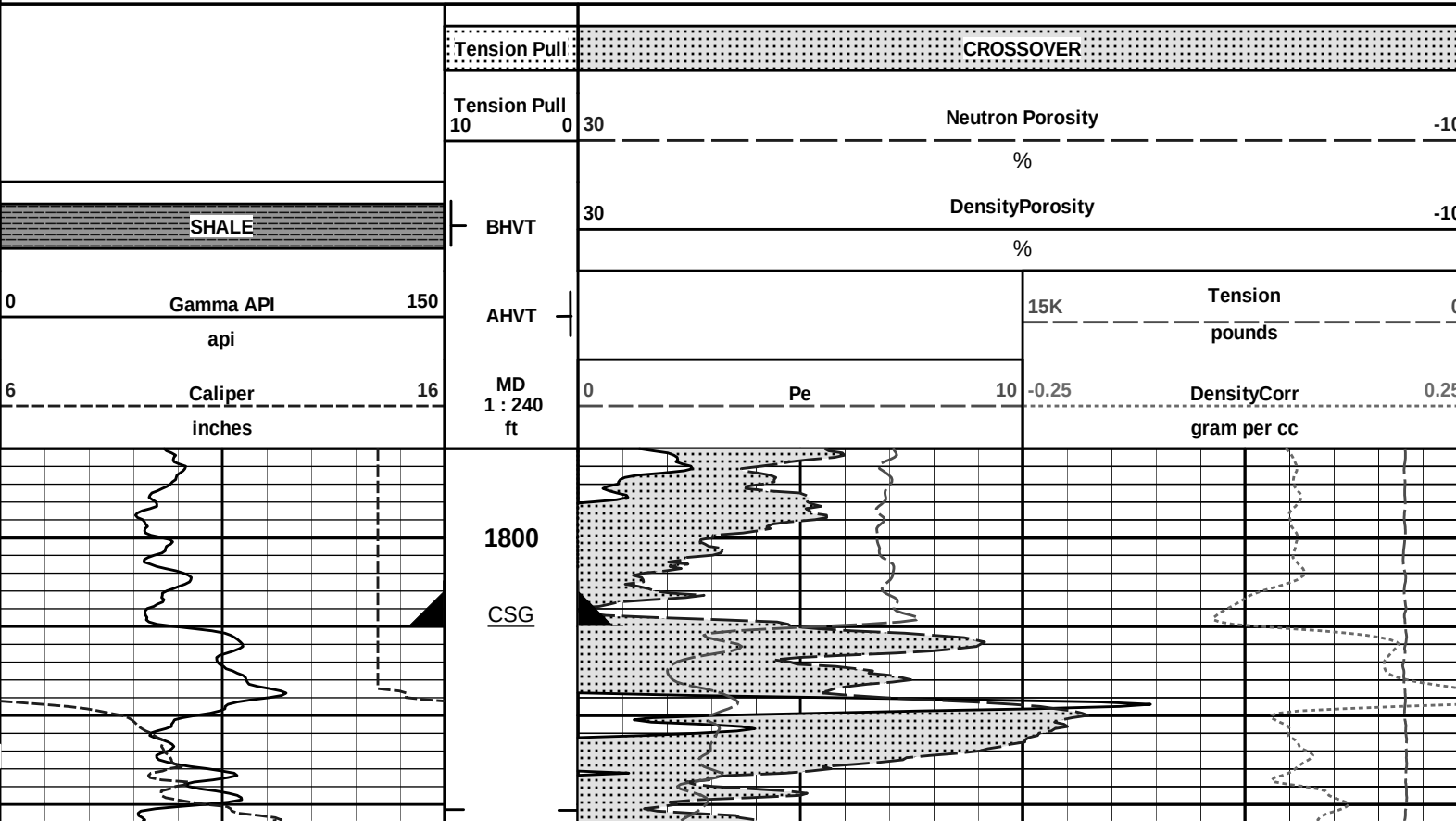
Service Ticket No.: 9323210				API Serial No.: 15-055-22127				PGM Version: WL INSITE R3.4.2 (Build 2)			
CHANGE IN MUD TYPE OR ADDITIONAL SAMPLE						RESISTIVITY SCALE CHANGES					
Date		Sample No.				Type Log	Depth	Scale Up Hole		Scale Down Hole	
Depth-Driller											
Type Fluid in Hole											
Density		Viscosity									
Ph		Fluid Loss									
Source of Sample						RESISTIVITY EQUIPMENT DATA					
Rm @ Meas. Temp		@		@		Run No.	Tool Type & No.	Pad Type	Tool Pos.	Other	
Rmf @ Meas. Temp.		@		@							
Rmc @ Meas. Temp.		@		@							
Source Rmf		Rmc									
Rm @ BHT		@		@							
Rmf @ BHT		@		@							
Rmc @ BHT		@		@							
EQUIPMENT DATA											
GAMMA				ACOUSTIC				DENSITY		NEUTRON	
Run No.		ONE		Run No.		Run No.		ONE		Run No.	
Serial No.		11039640		Serial No.		Serial No.		I43_M469		Serial No.	
Model No.		GTET		Model No.		Model No.		SDLT-I		Model No.	
Diameter		3.625"		No. of Cent.		Diameter		4.5"		Diameter	
Detector Model No.		GTET		Spacing		Log Type		GAM-GAM		Log Type	
Type		SCINT				Source Type		CS137		Source Type	
Length		8'		LSA [Y/N]		Serial No.		5168GW		Serial No.	
Distance to Source		10'		FWDA [Y/N]		Strength		1.5 CI		Strength	
LOGGING DATA											
GENERAL				GAMMA		ACOUSTIC		DENSITY		NEUTRON	

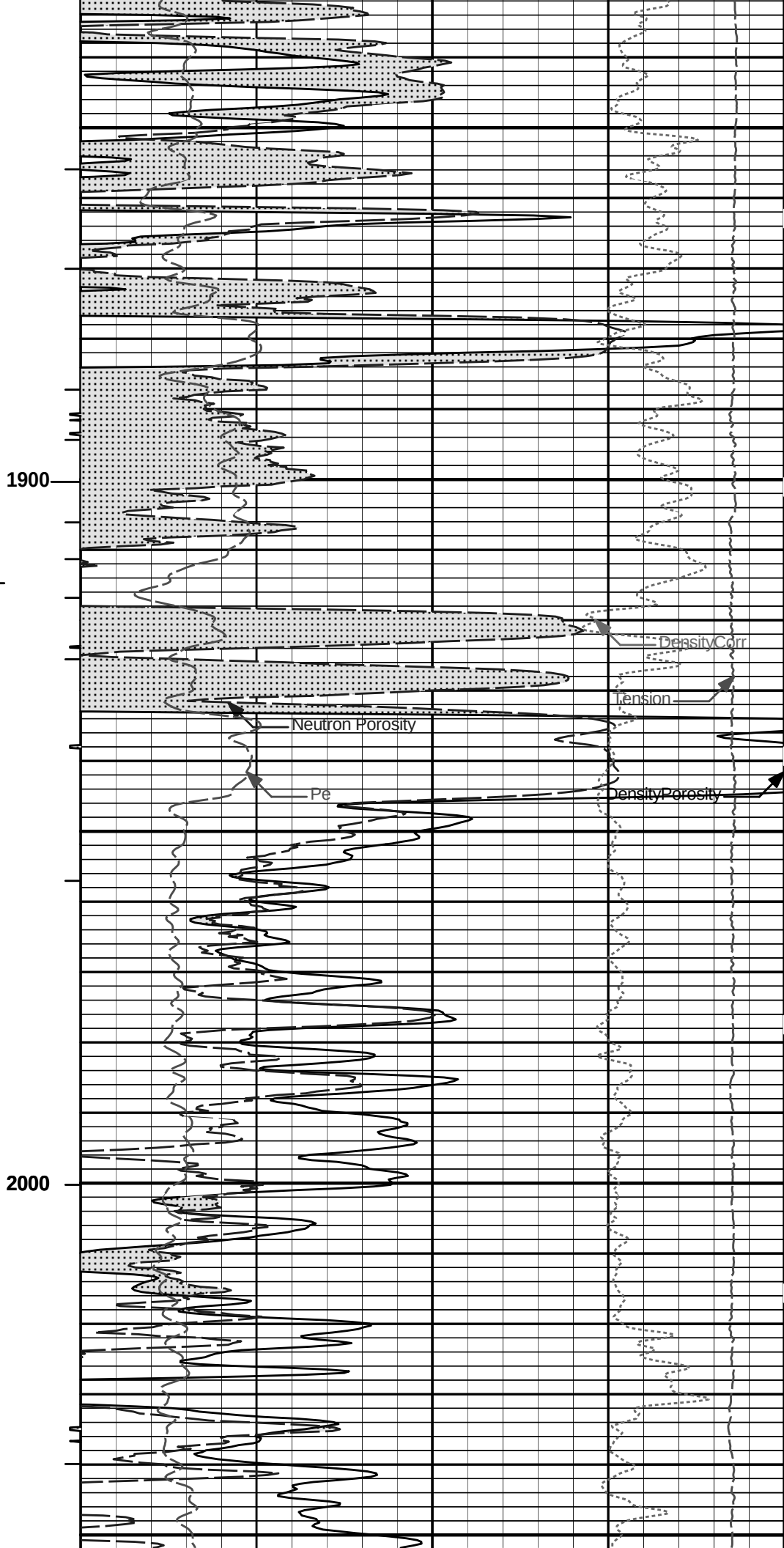
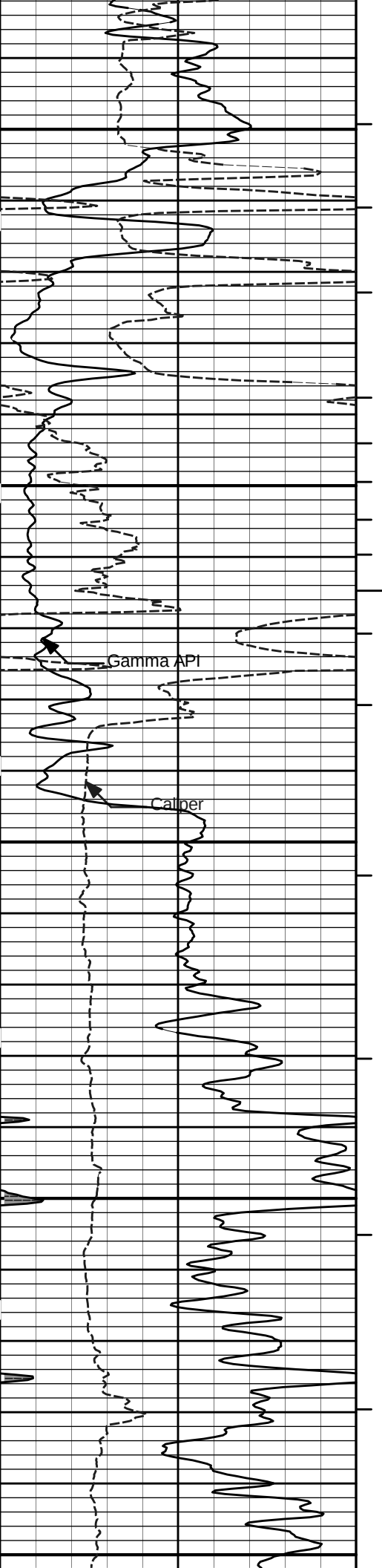
GENERAL			GAMMA		ACOUSTIC		DENSITY		NEUTRON					
Run	Depth		Speed	Scale		Scale		Matrix	Scale		Matrix	Scale		Matrix
No.	From	To	ft/min	L	R	L	R		L	R		L	R	
ONE	5100	1810	REC	0	150				30	-10	2.71	30	-10	LIME
DIRECTIONAL INFORMATION														
Maximum Deviation @								KOP @						
Remarks: ANNULAR HOLE VOLUME CALCULATED FOR 5.5-INCH CASING														
LCM REPORTED AT 2 LB/BBL														
CHLORIDES REPORTED 1700 MG/L														
POST TOOL SURVEYS NOT PERFORMED DUE TO TEMPERATURE														
TODAY'S CREW: K. KING, V. JAIME														
THANK YOU FOR CHOOSING HALLIBURTON ENERGY SERVICES LIBERAL, KS. 620-624-8123														
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														

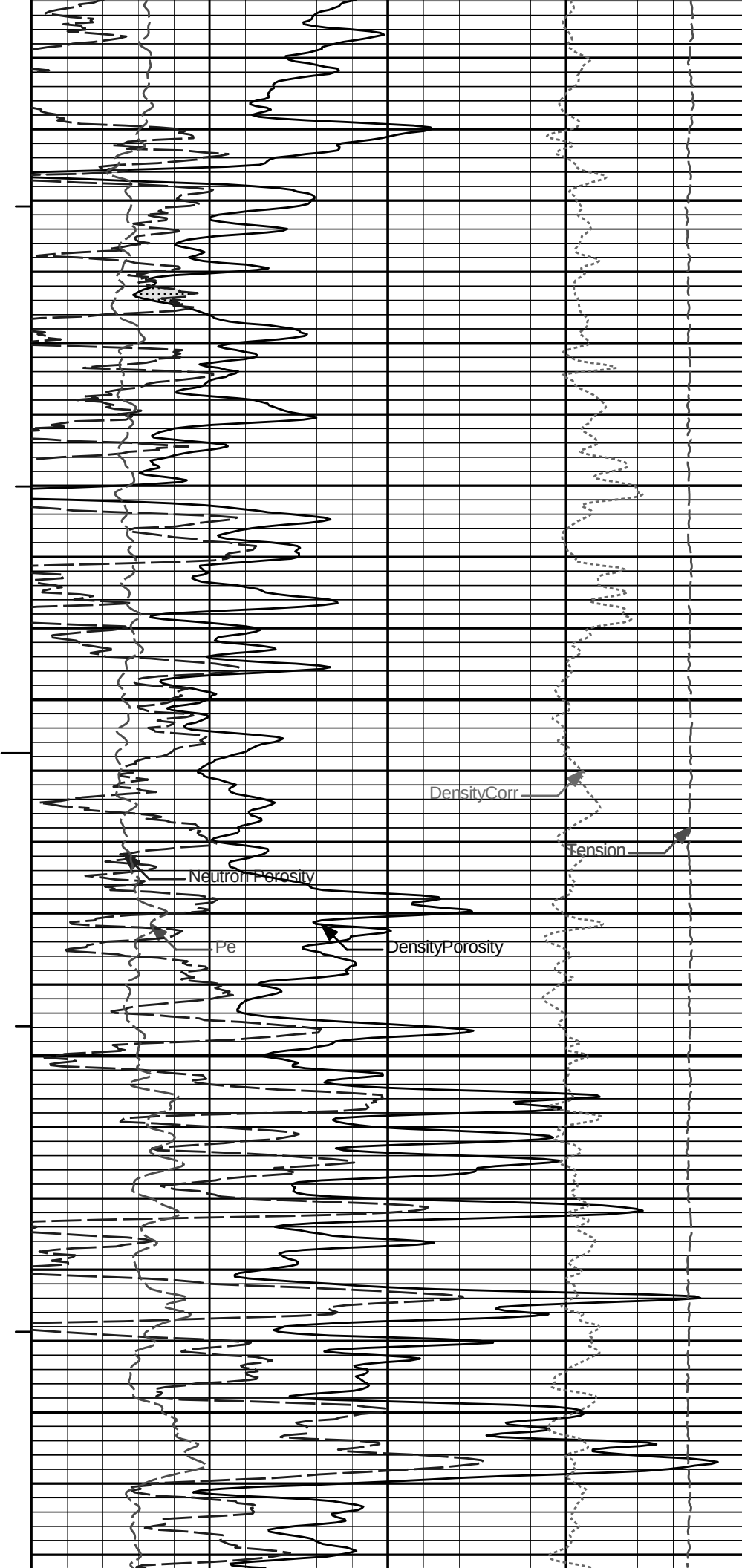
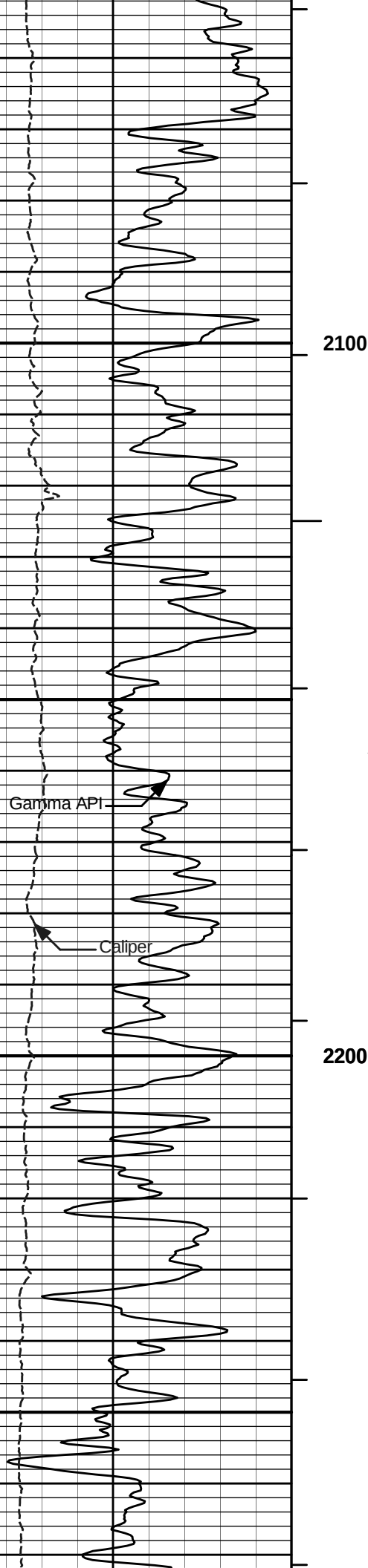
HALLIBURTON

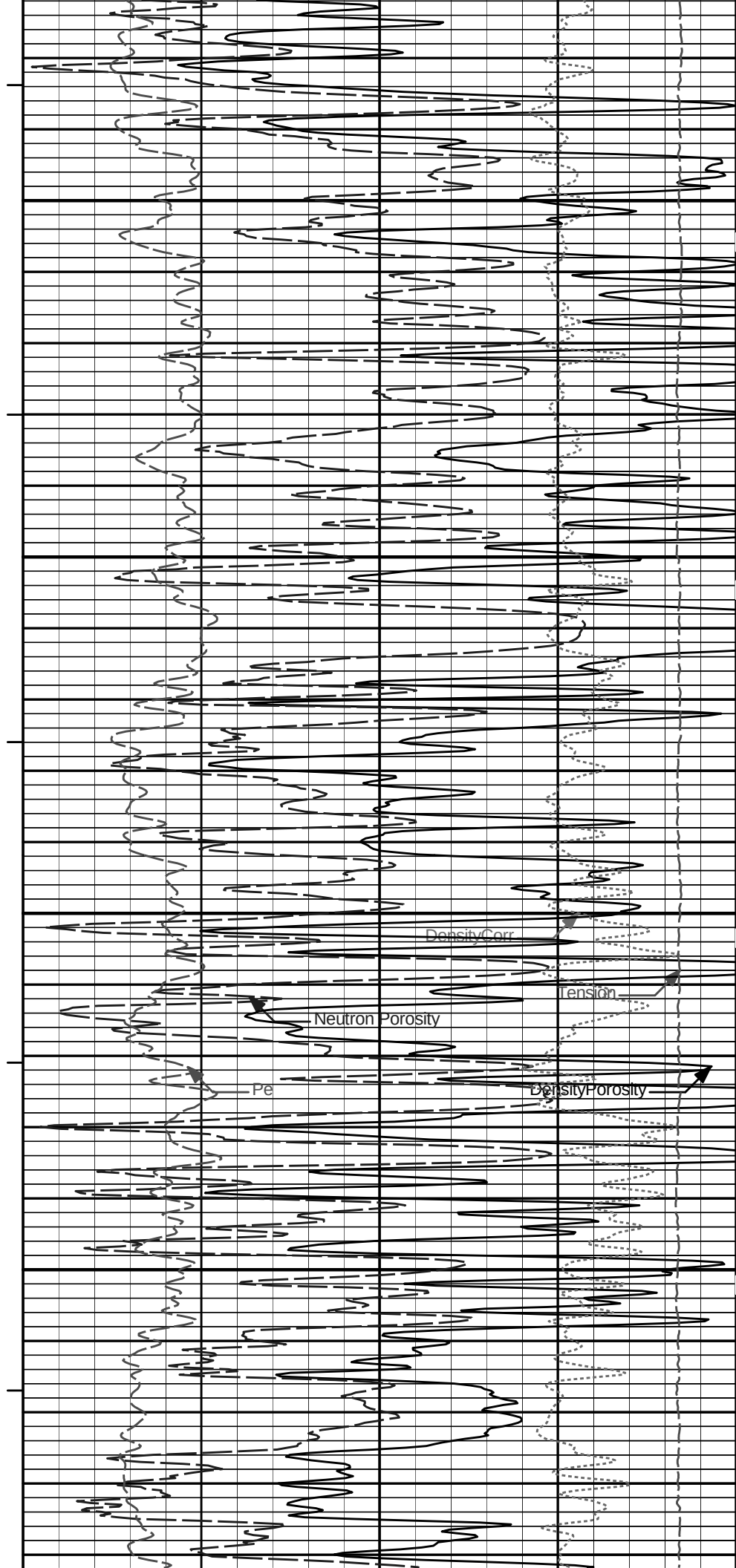
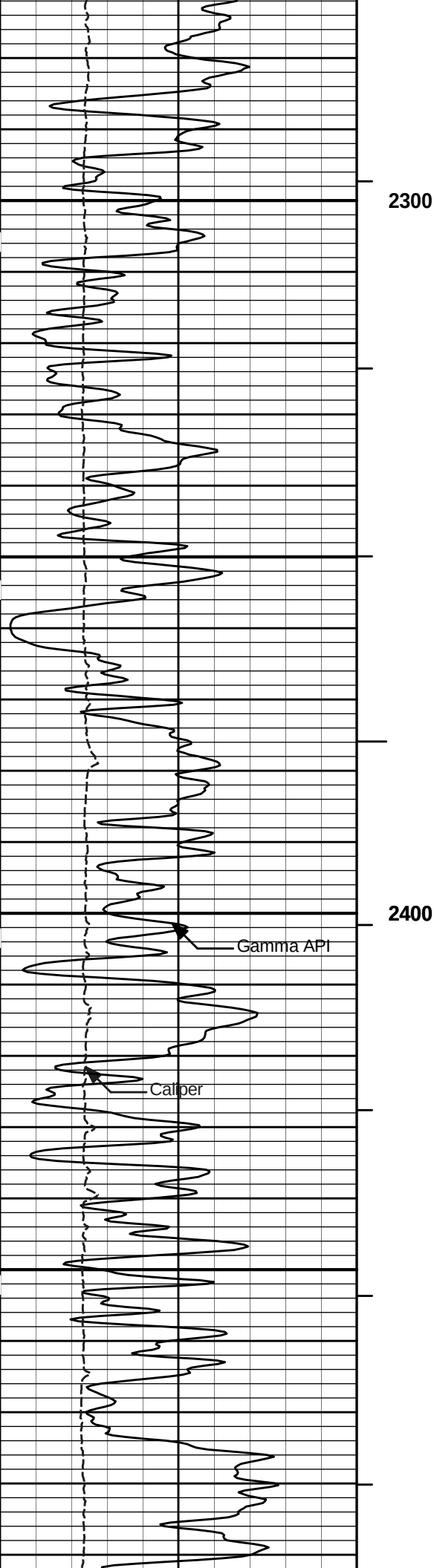
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Data: GARDEN_CITY_T_2\Well Based\DETAIL\
Plot File: \\PORO\Porosity IQ 5 MAIN LIB

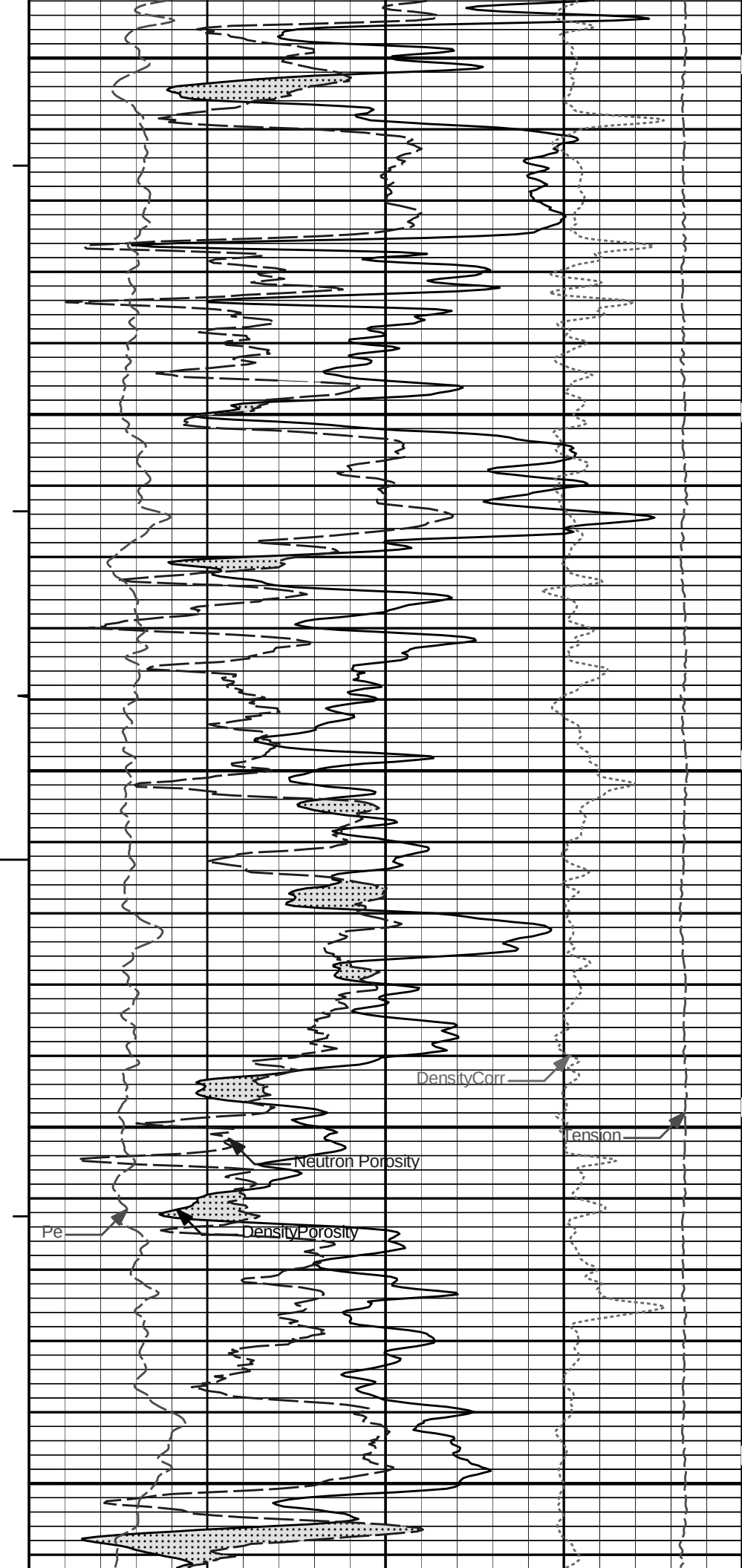
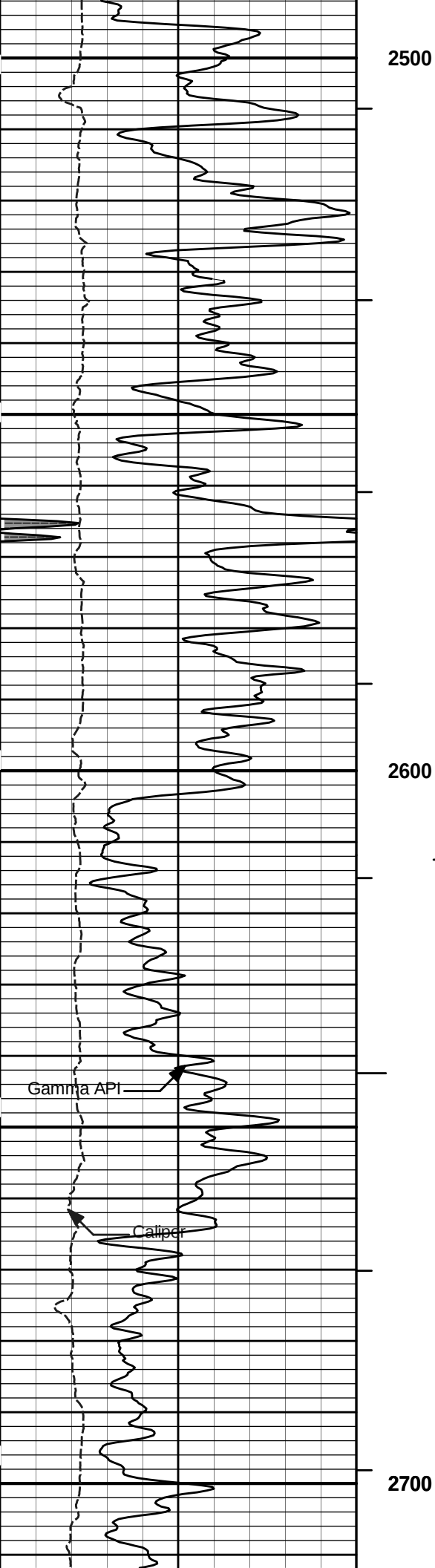
5 INCH MAIN LOG

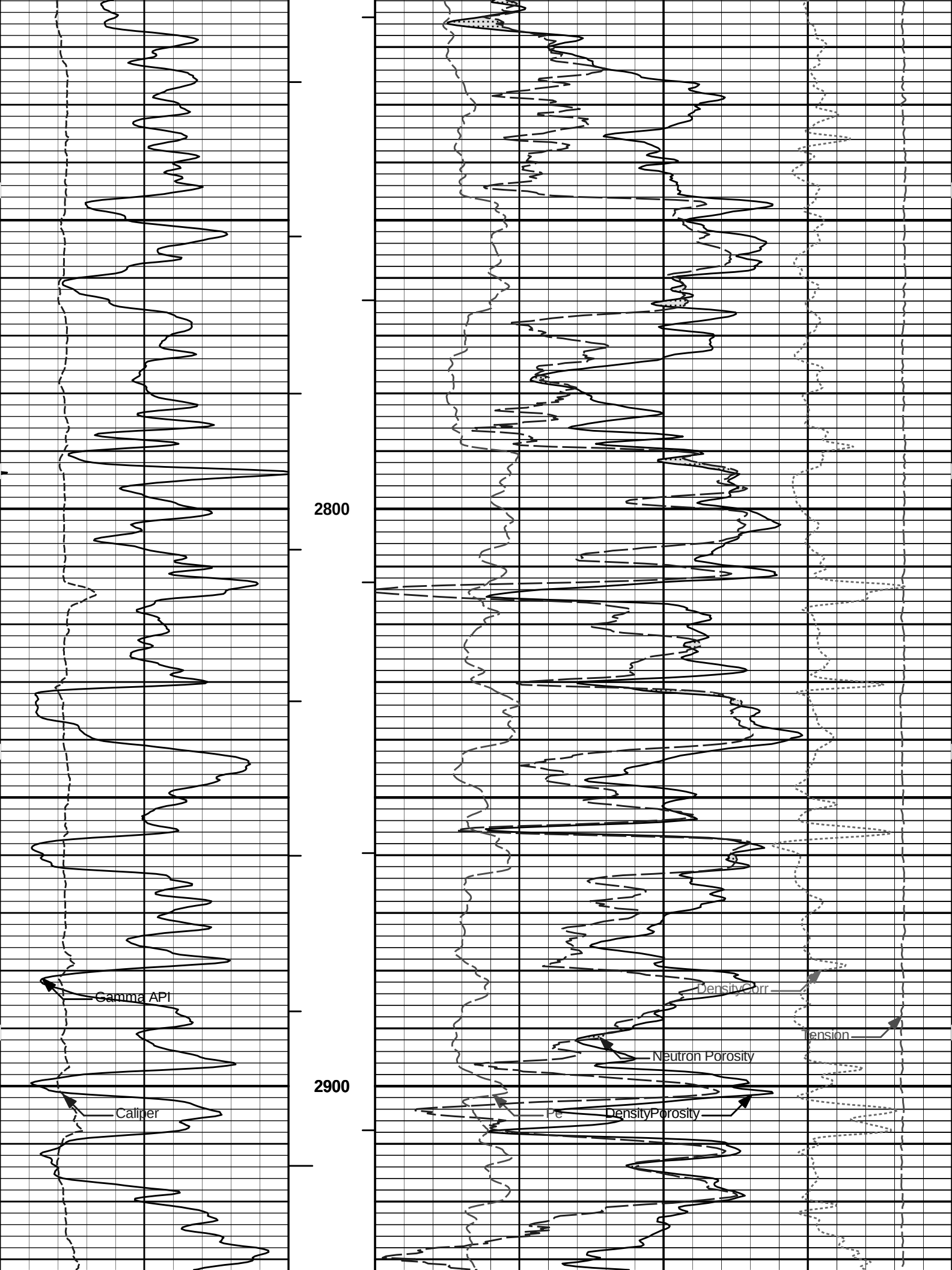


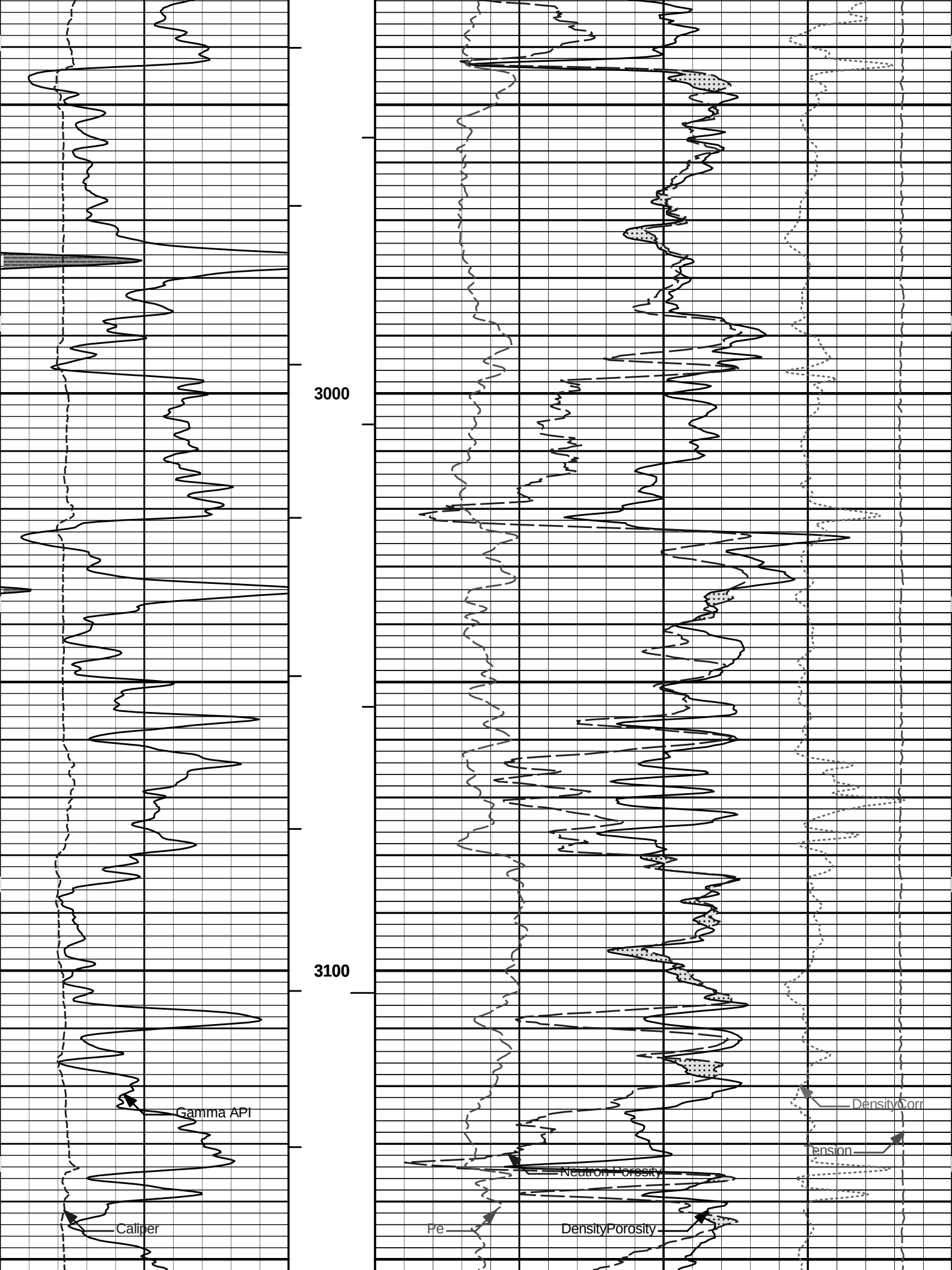


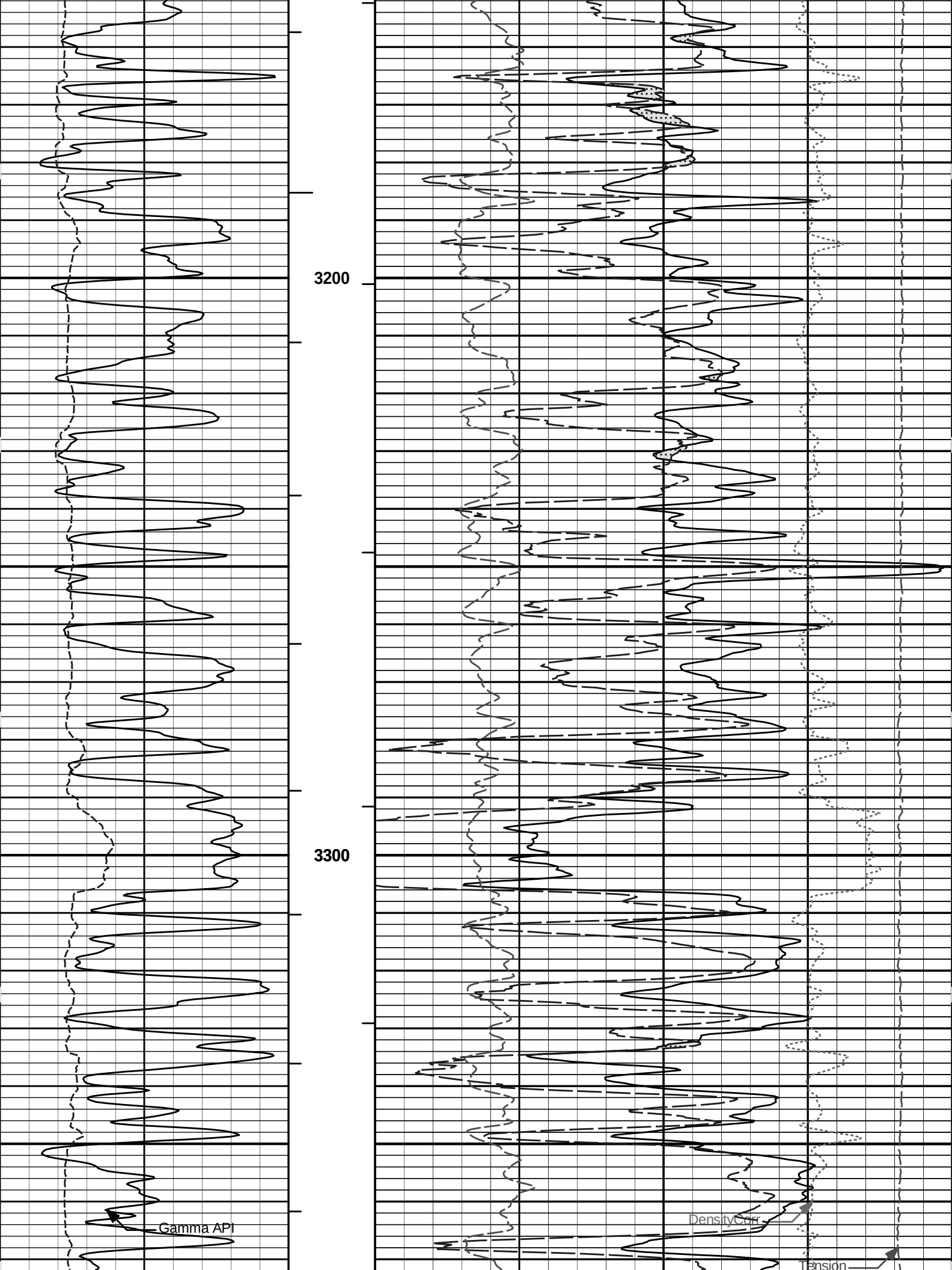


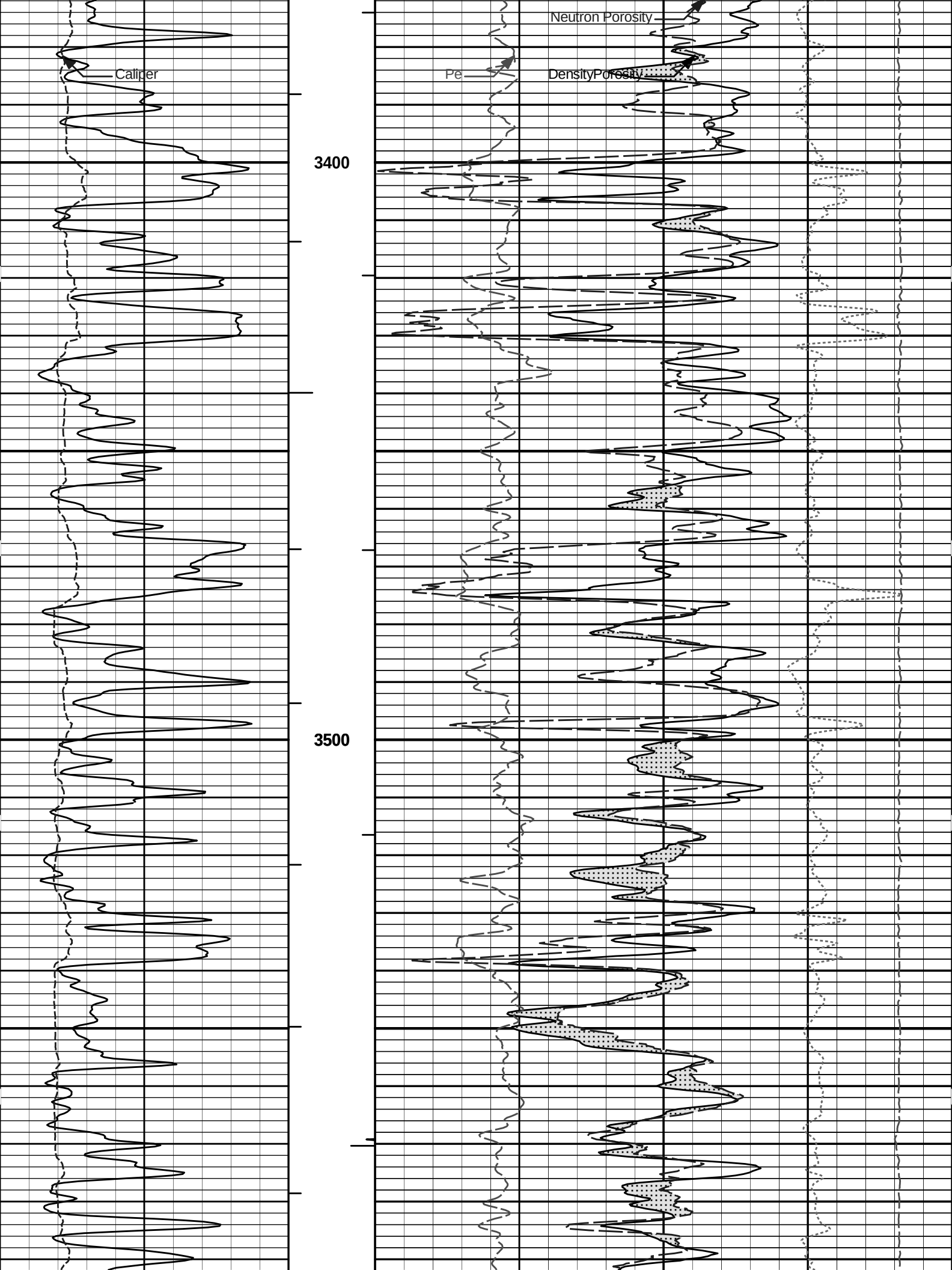


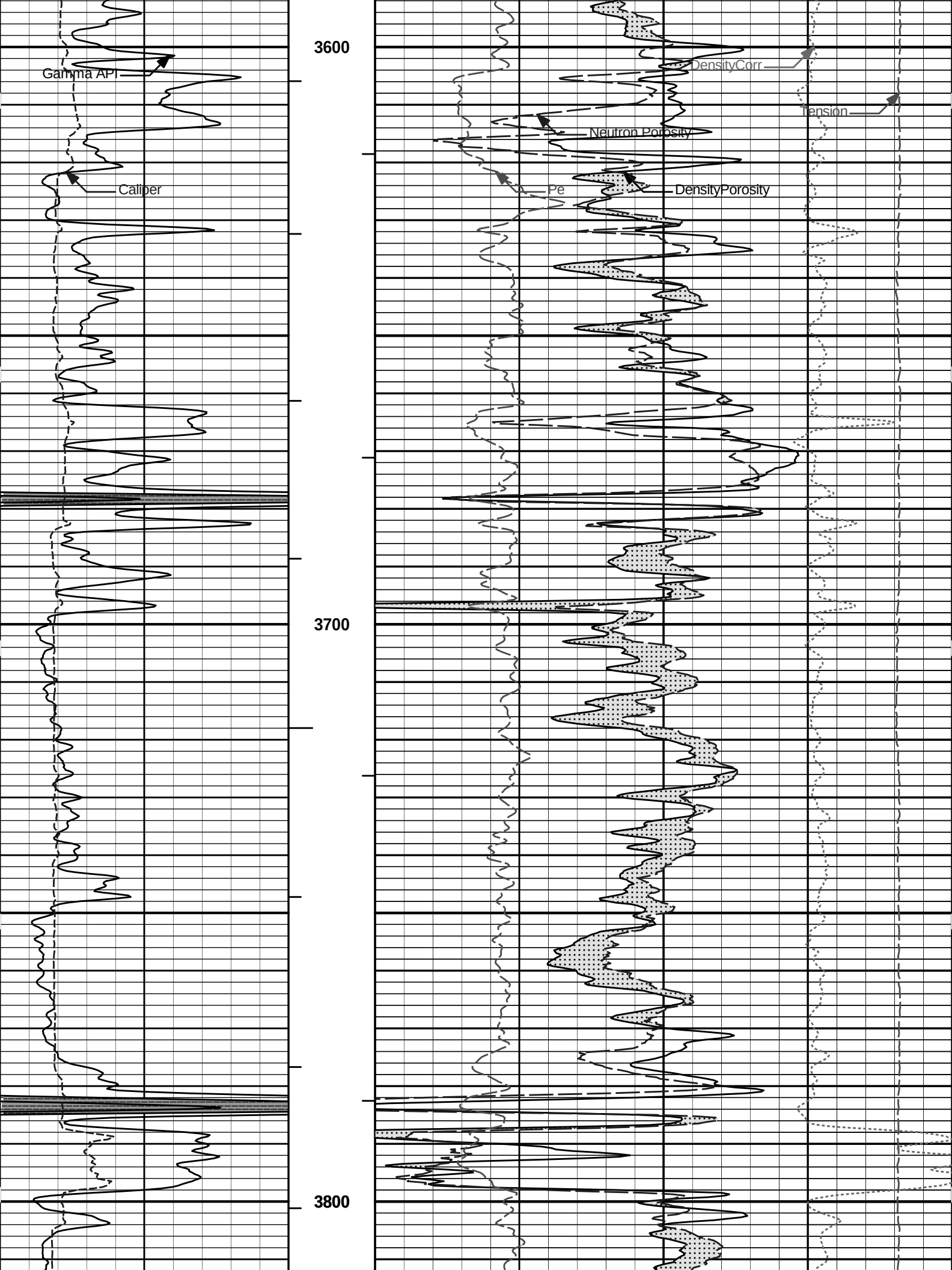


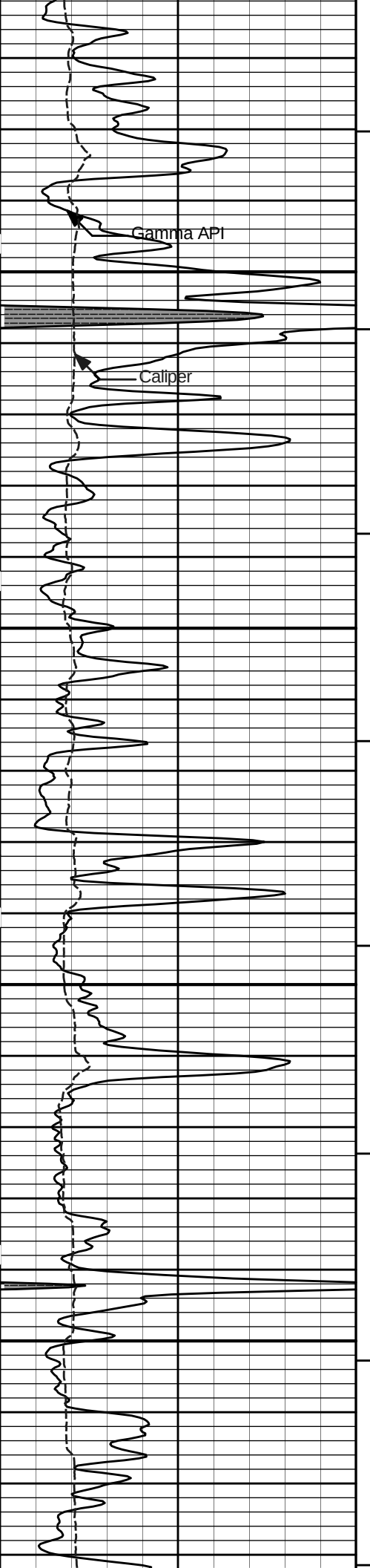






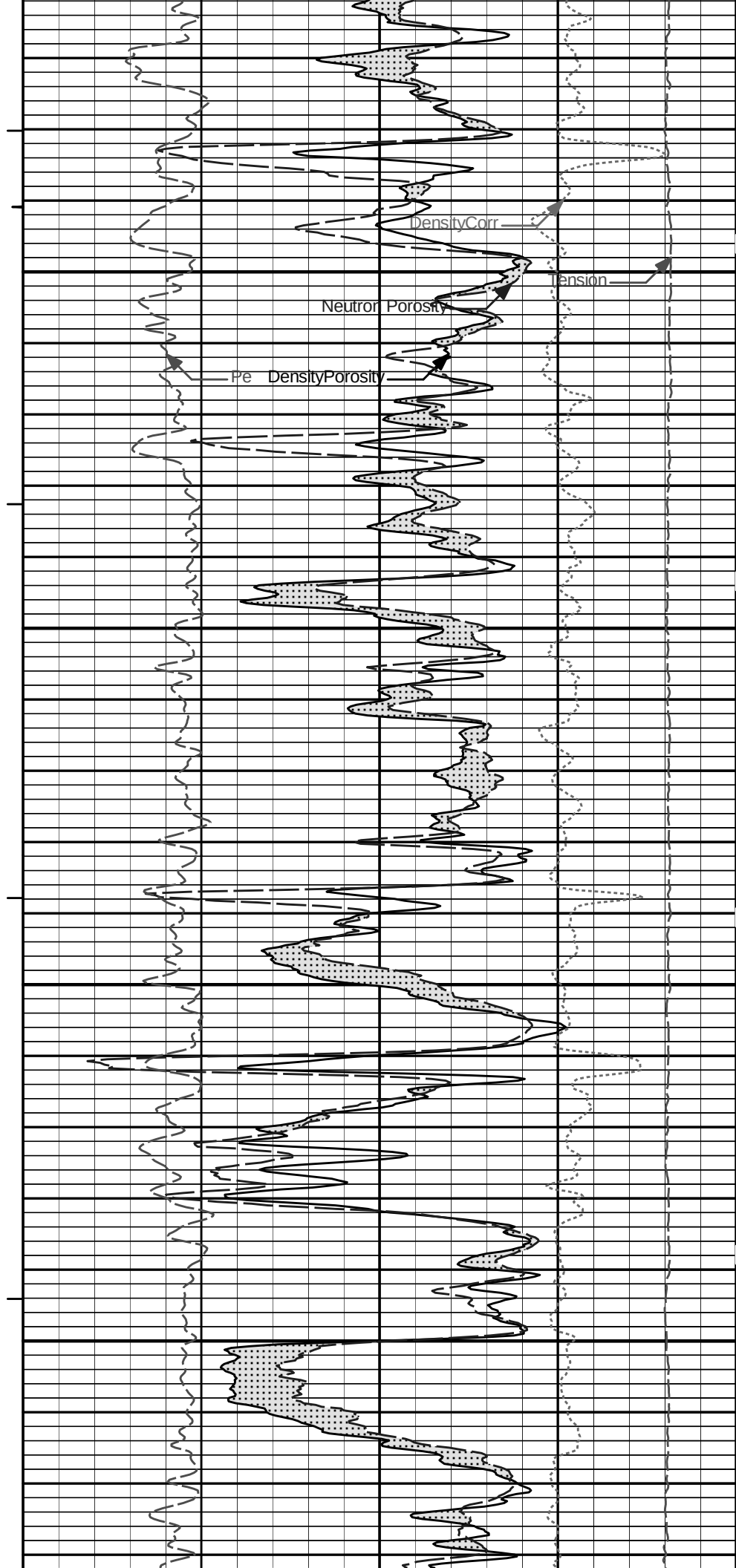


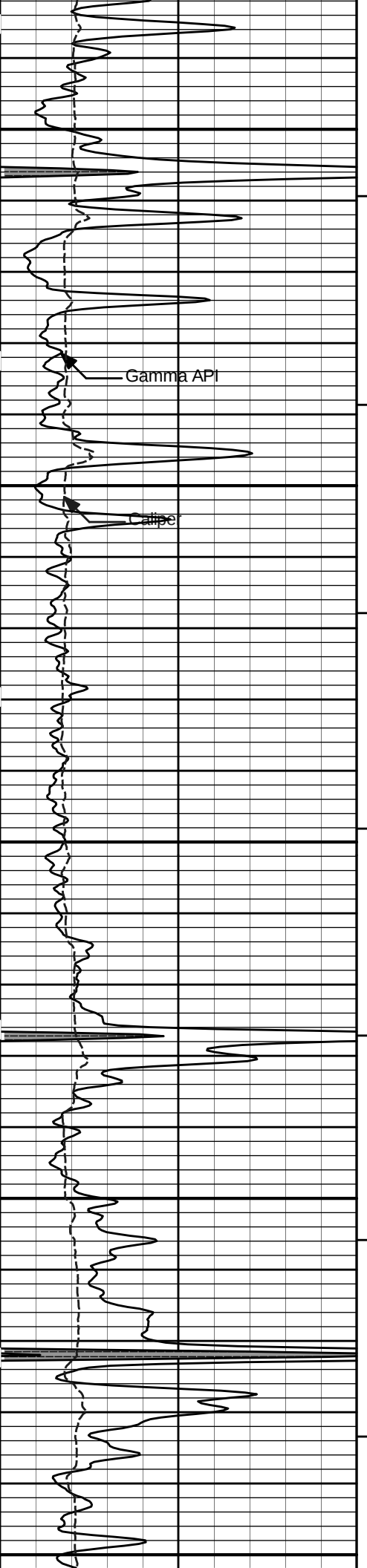




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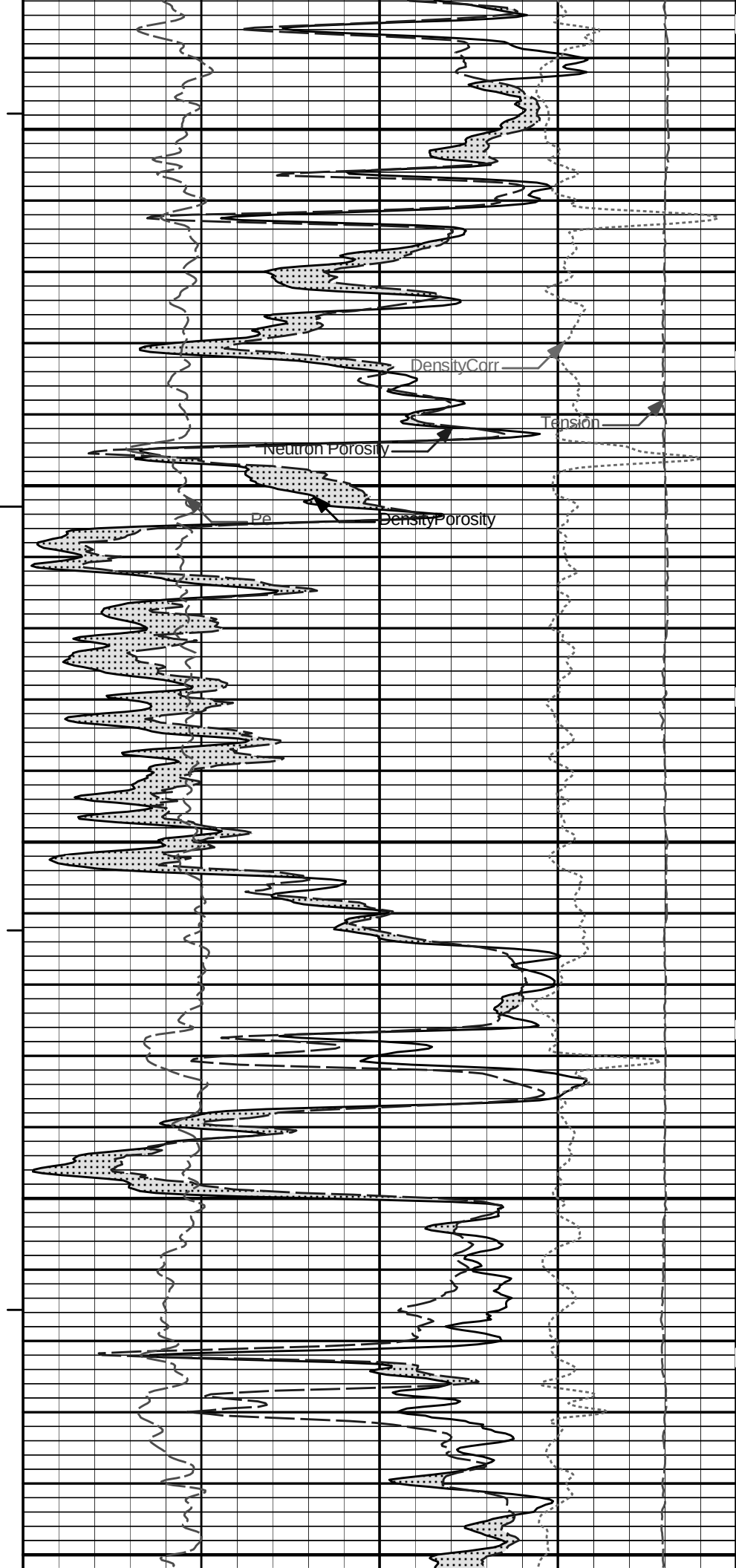
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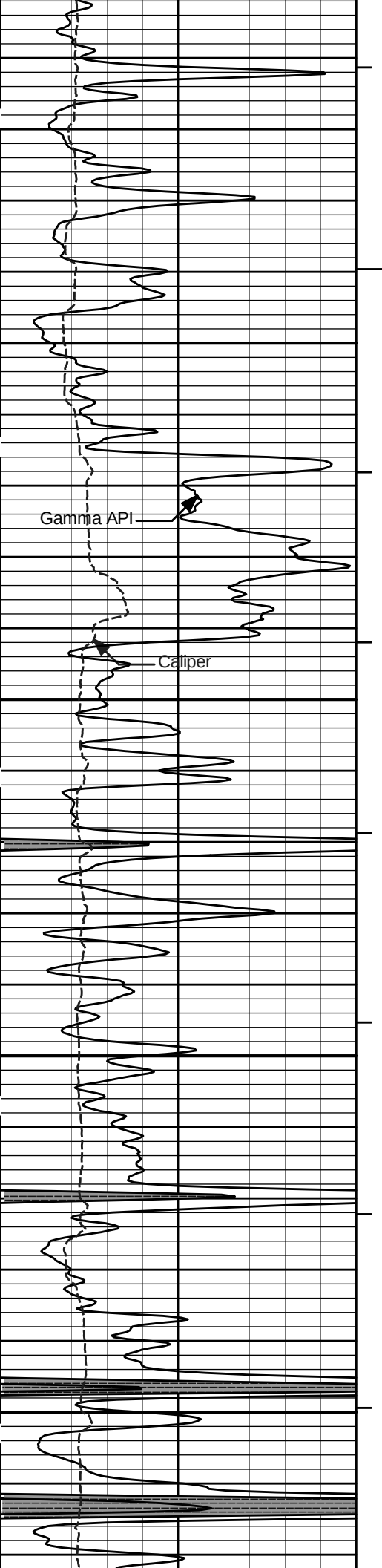




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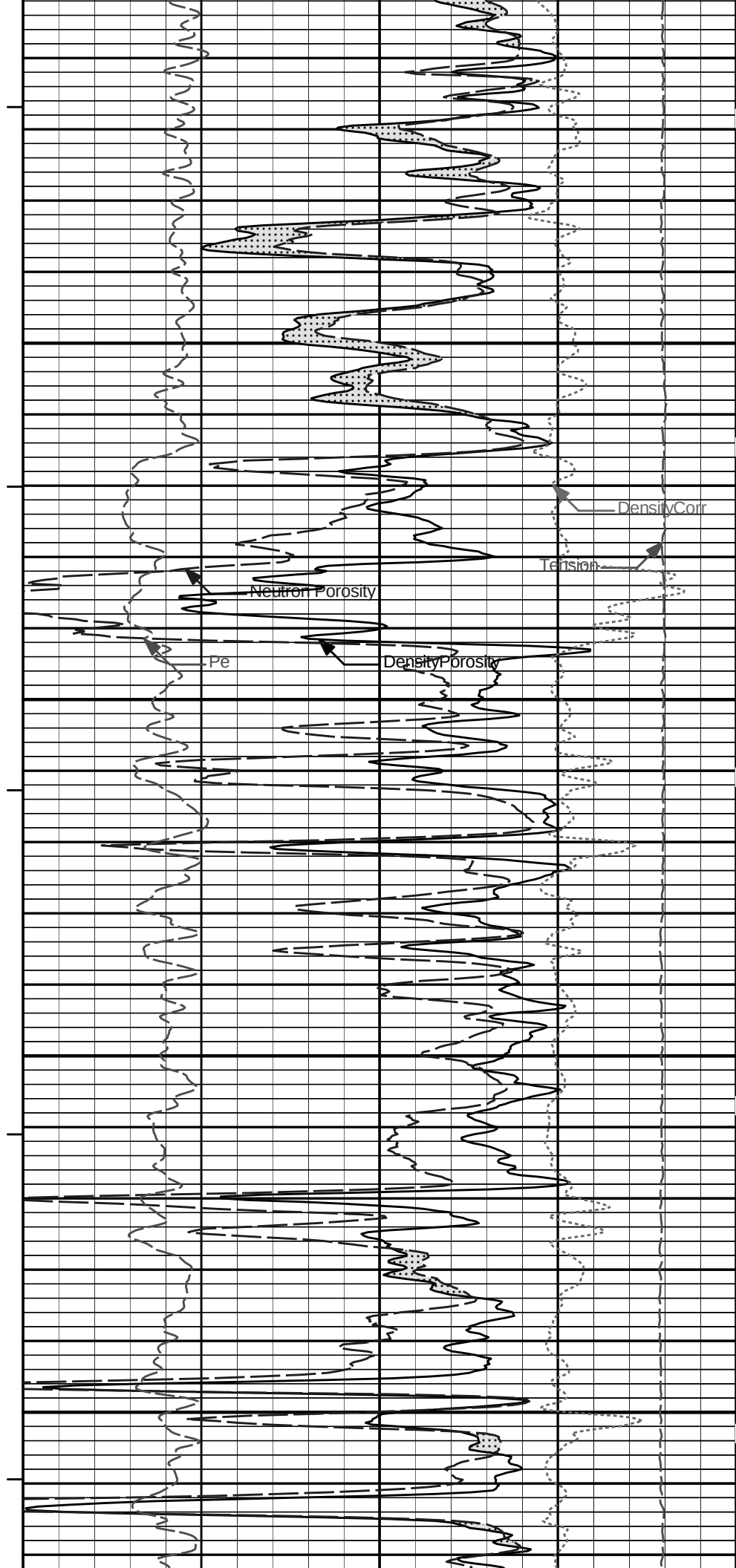
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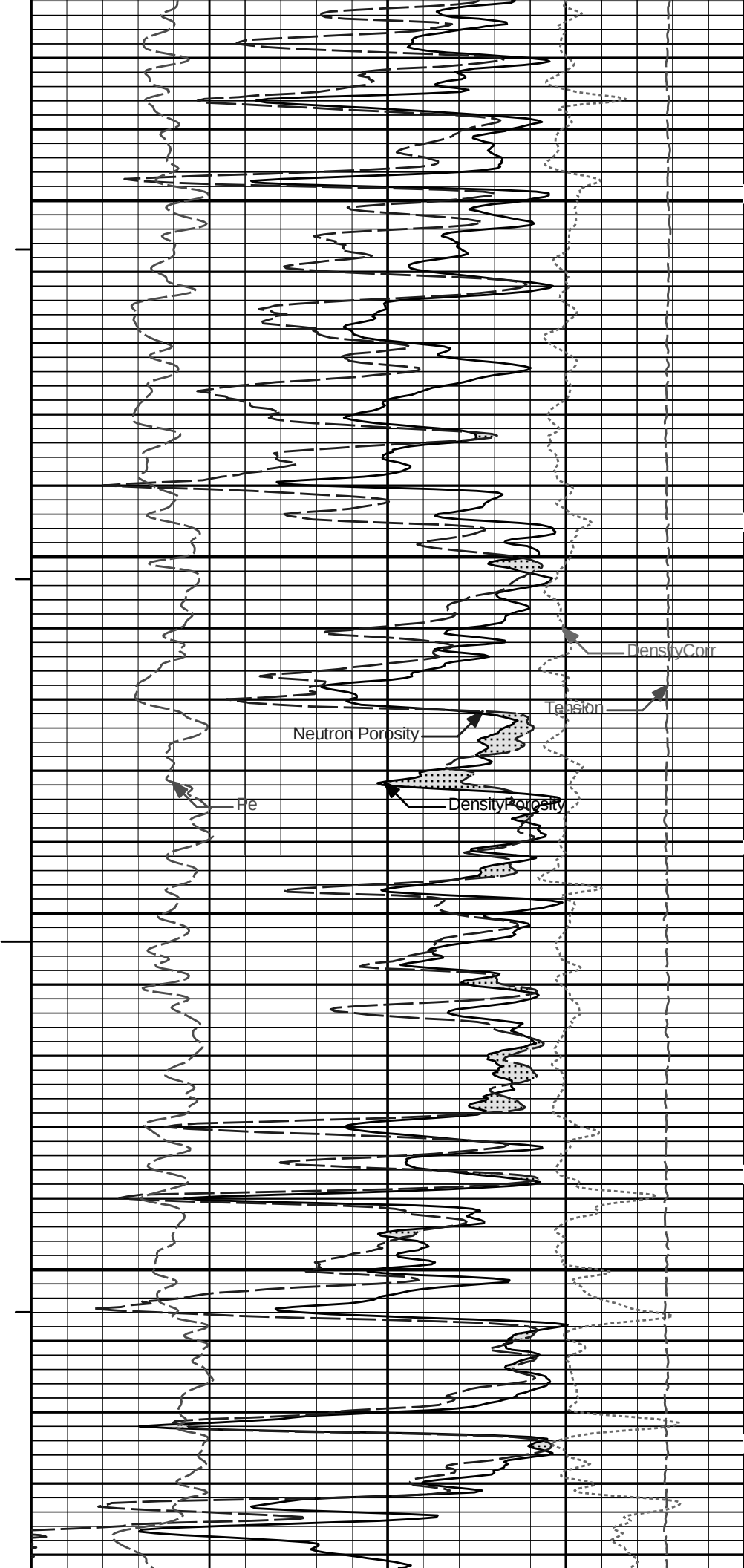
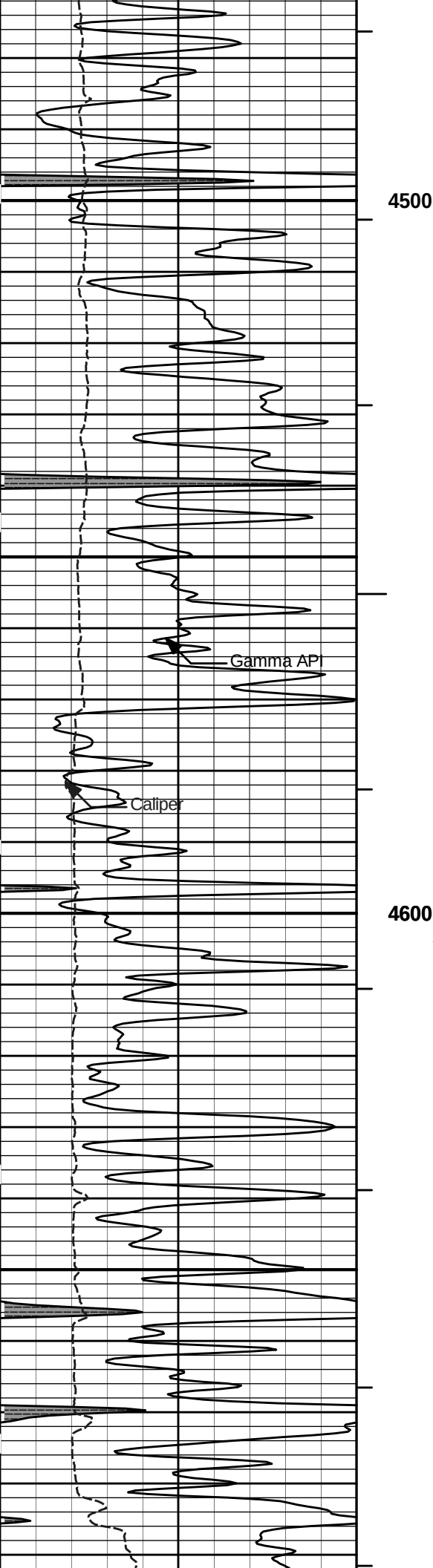


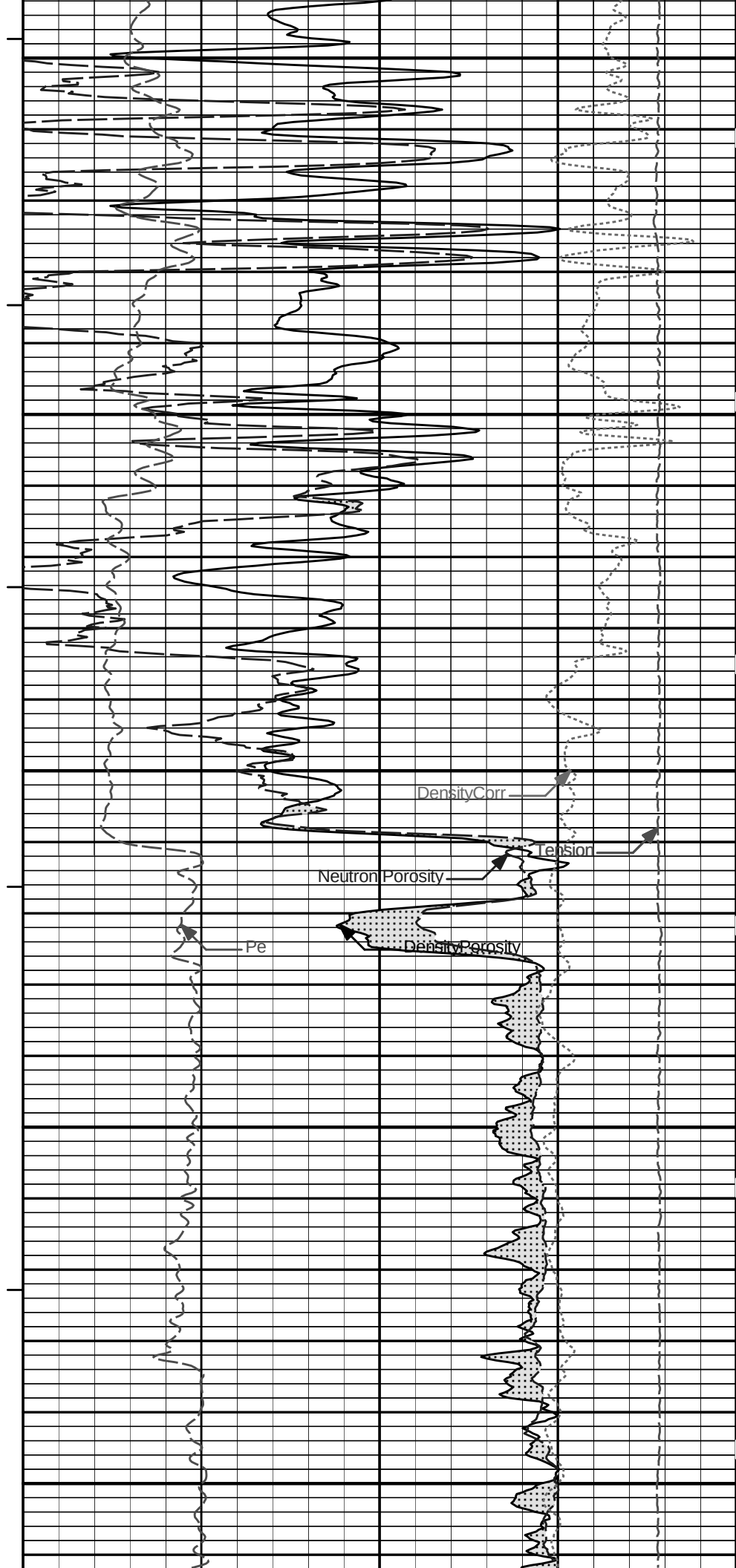
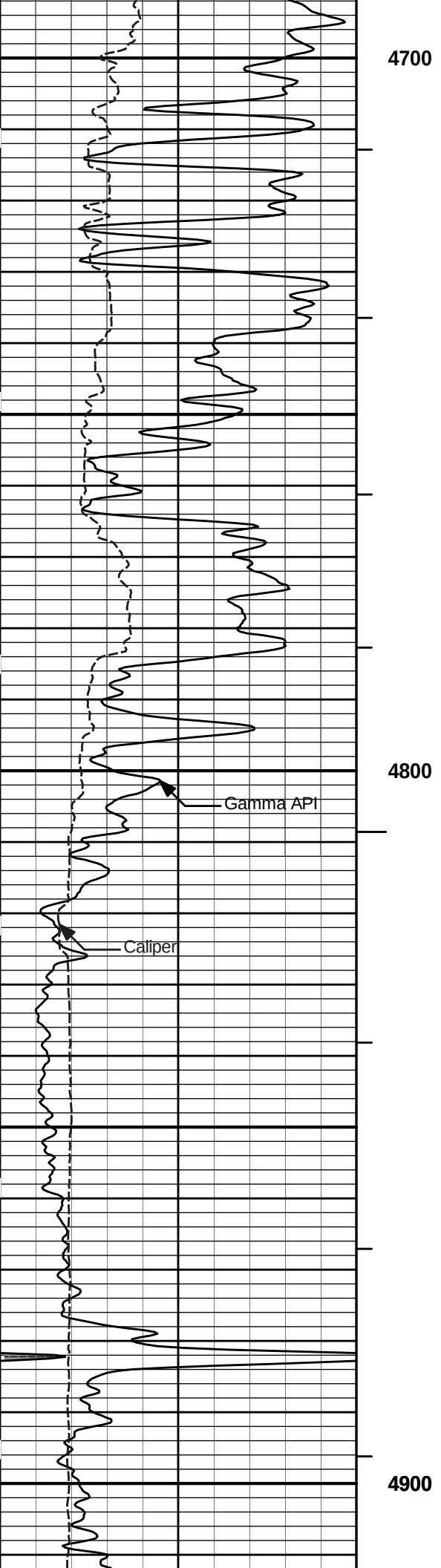


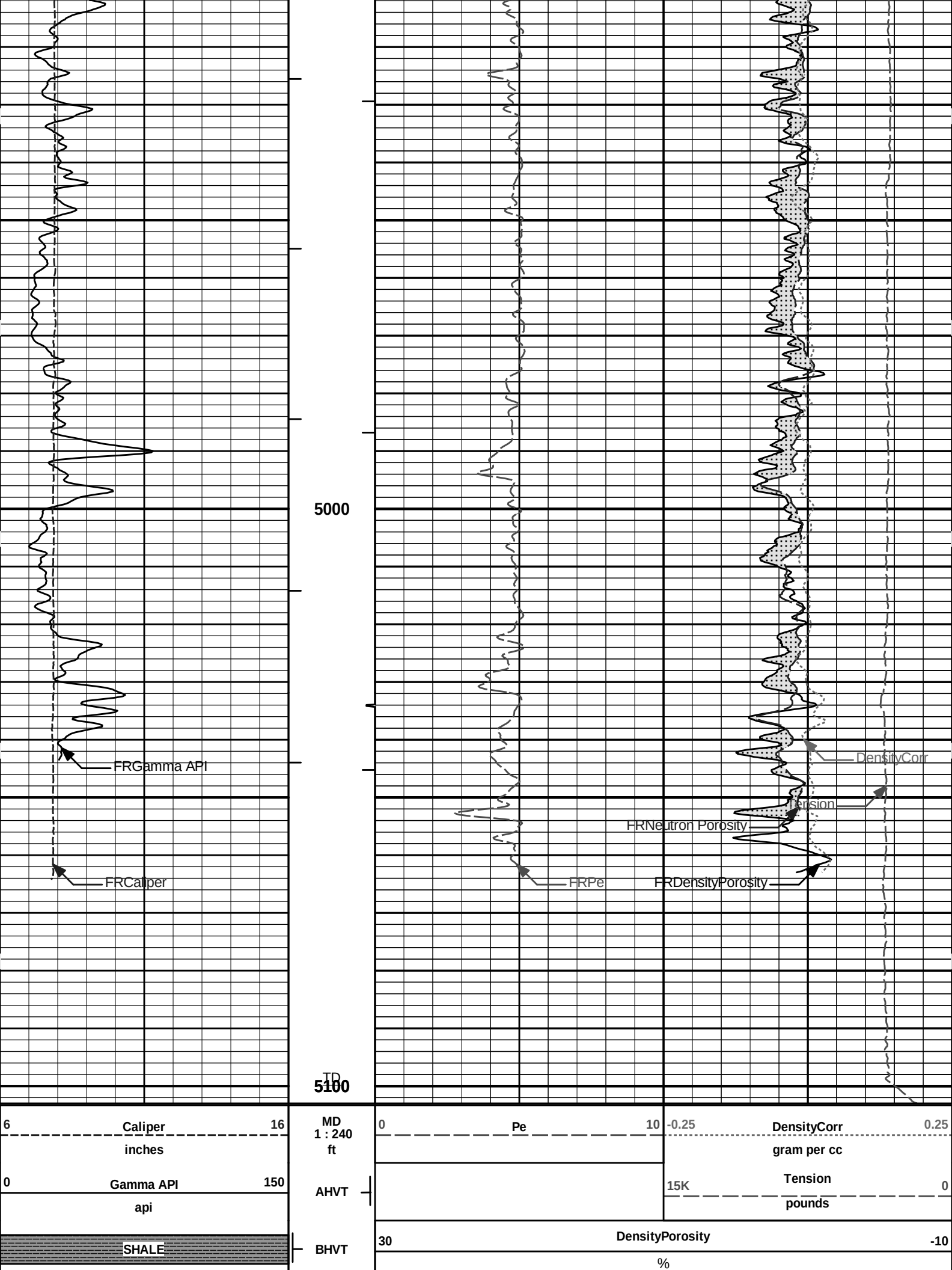
4300

4400









	Tension Pull	10	0	30	Neutron Porosity	-10
					%	
	Tension Pull	CROSSOVER				

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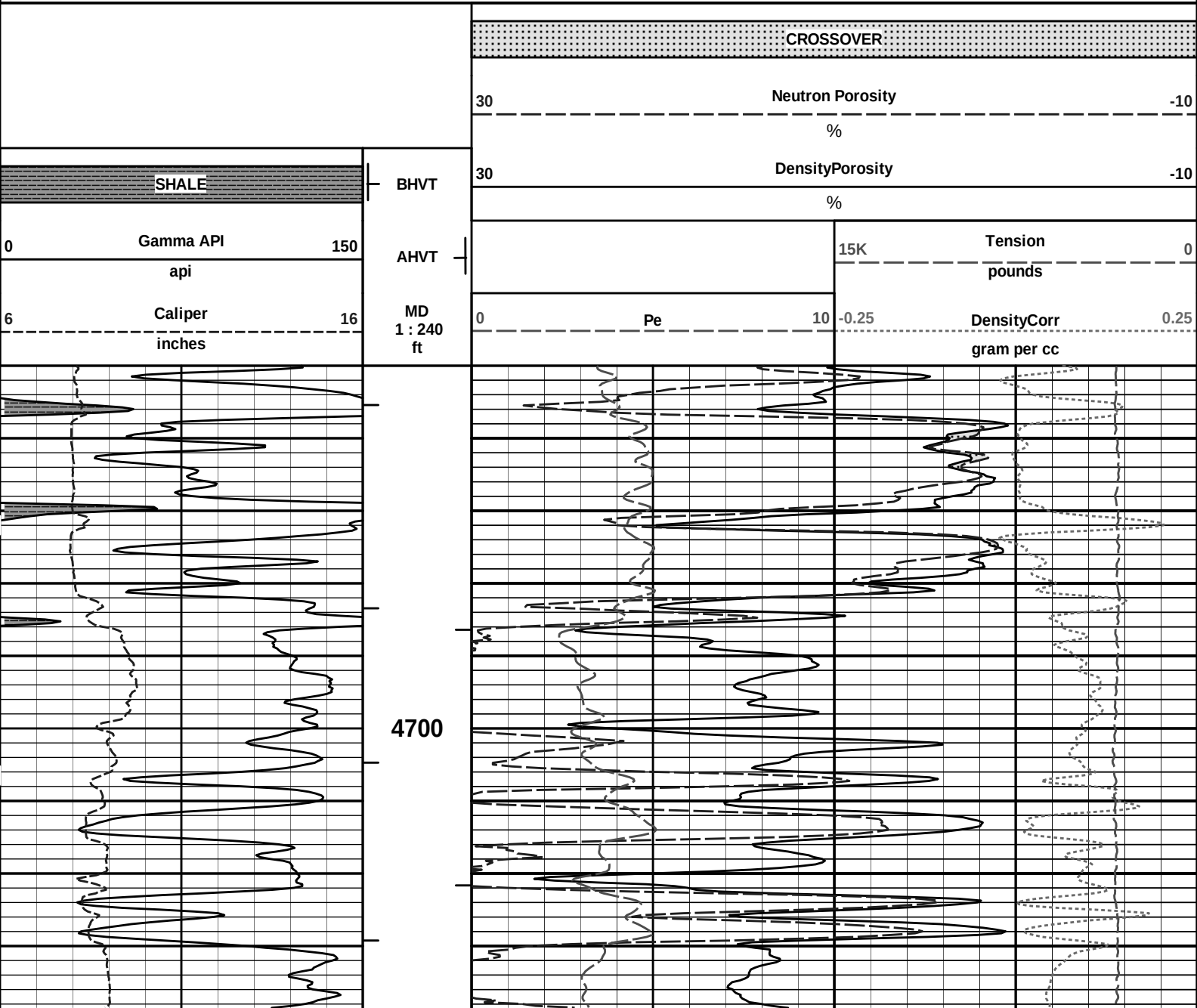
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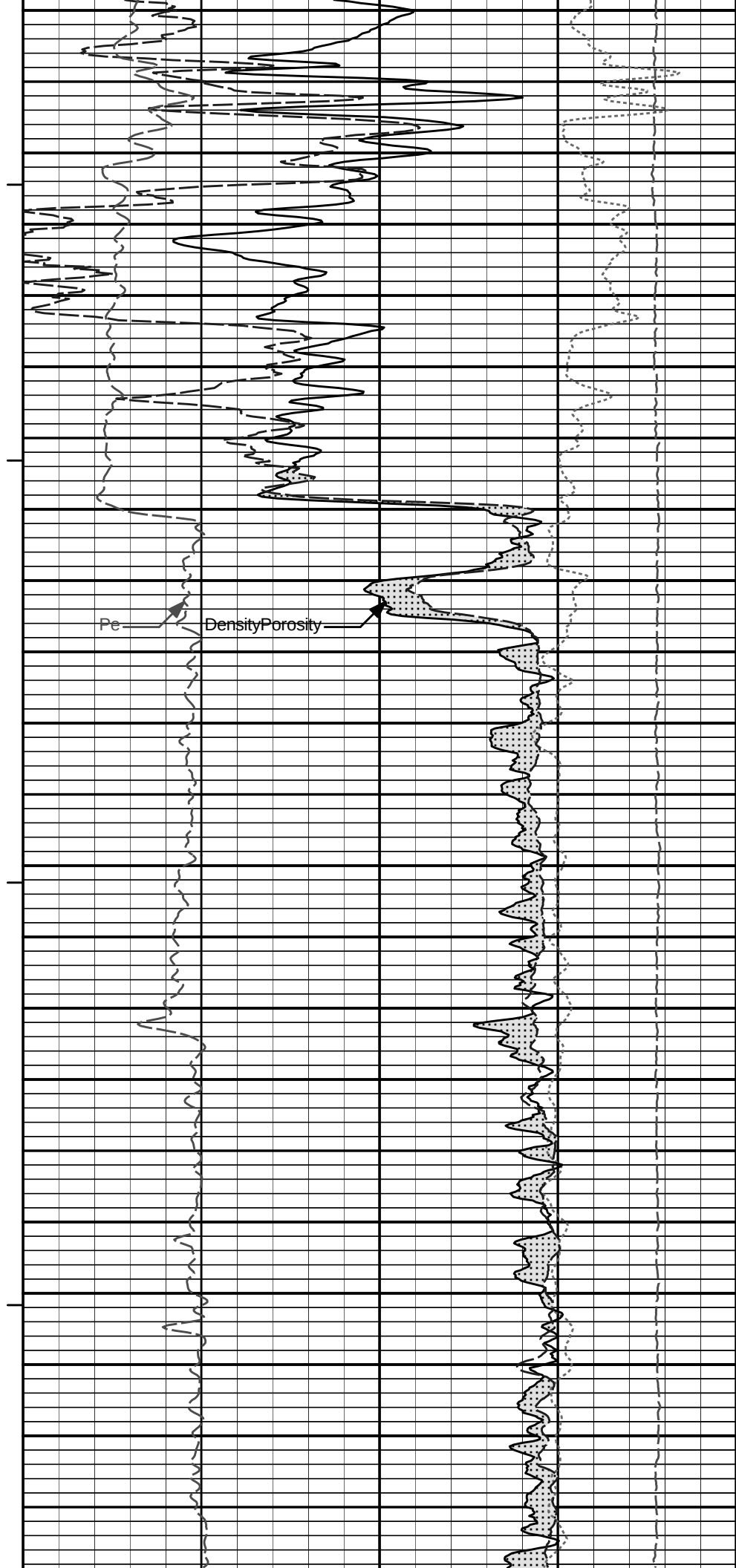
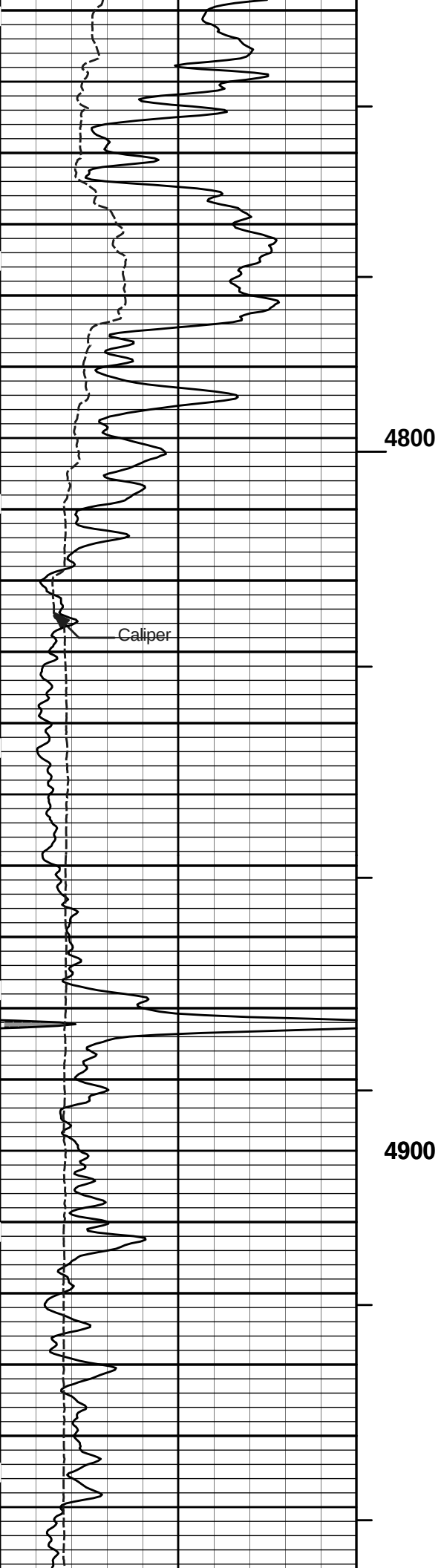
5 INCH MAIN LOG

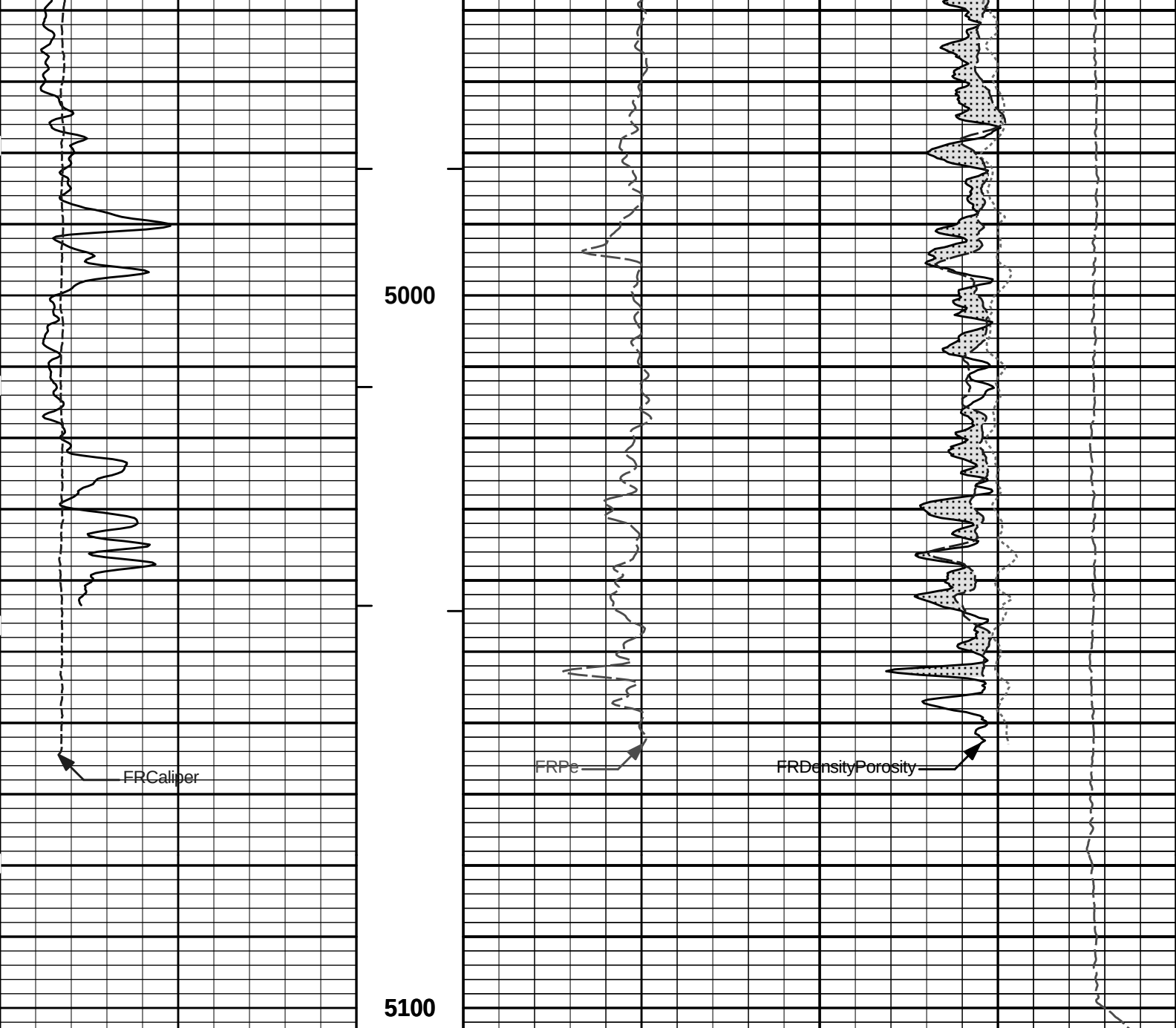
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Data: GARDEN_CITY_T_2\Well Based\REPEAT\
Plot File: \\PORO\IPoro_IQ_5_REP_LIB

REPEAT SECTION







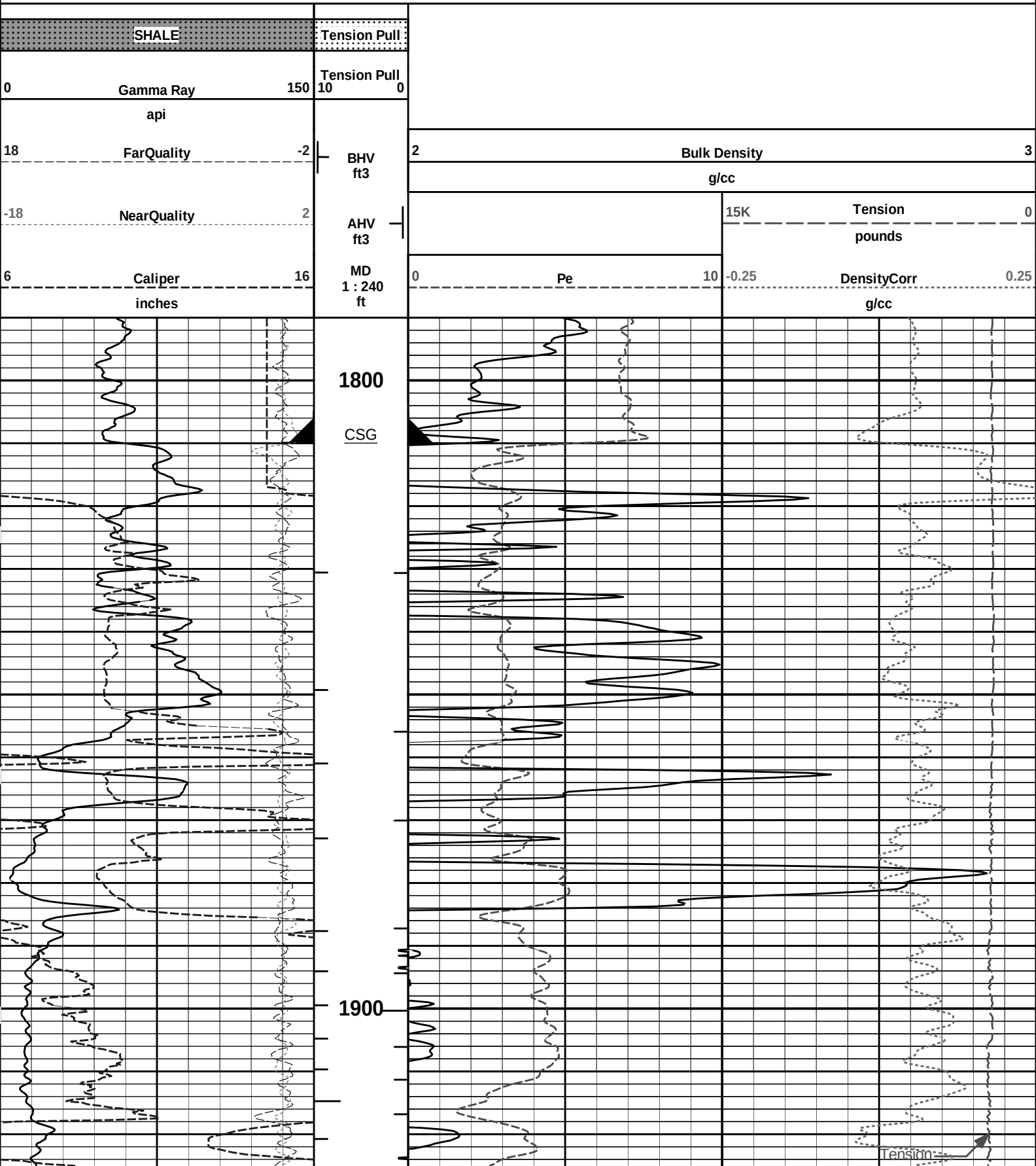
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	inches		1 : 240					gram per cc	
0	Gamma API	150	AHVT				15K	Tension	0
	api							pounds	
	SHALE		BHVT	30	DensityPorosity				-10
					%				
				30	Neutron Porosity				-10
					%				
					CROSSOVER				

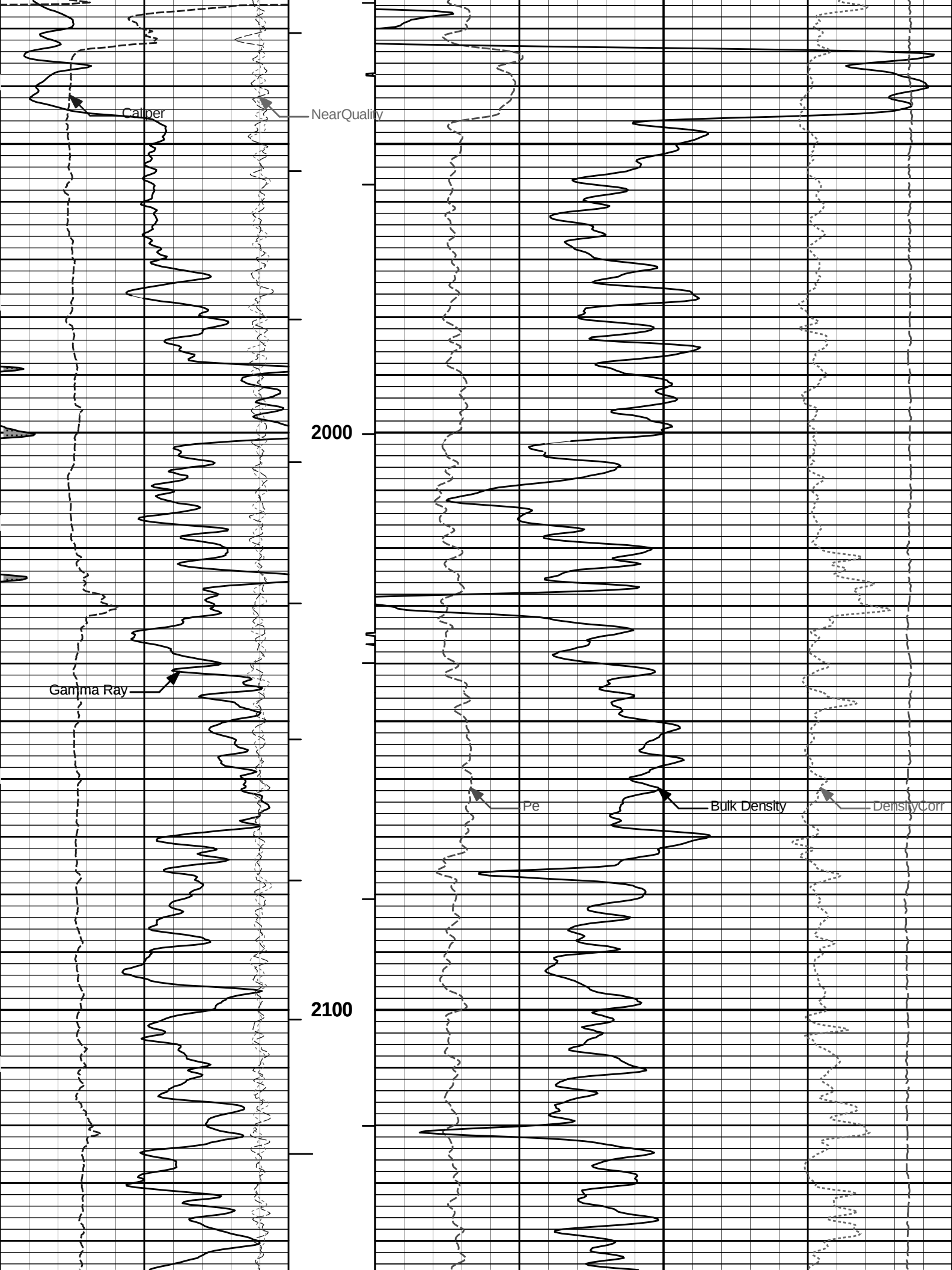
HALLIBURTON

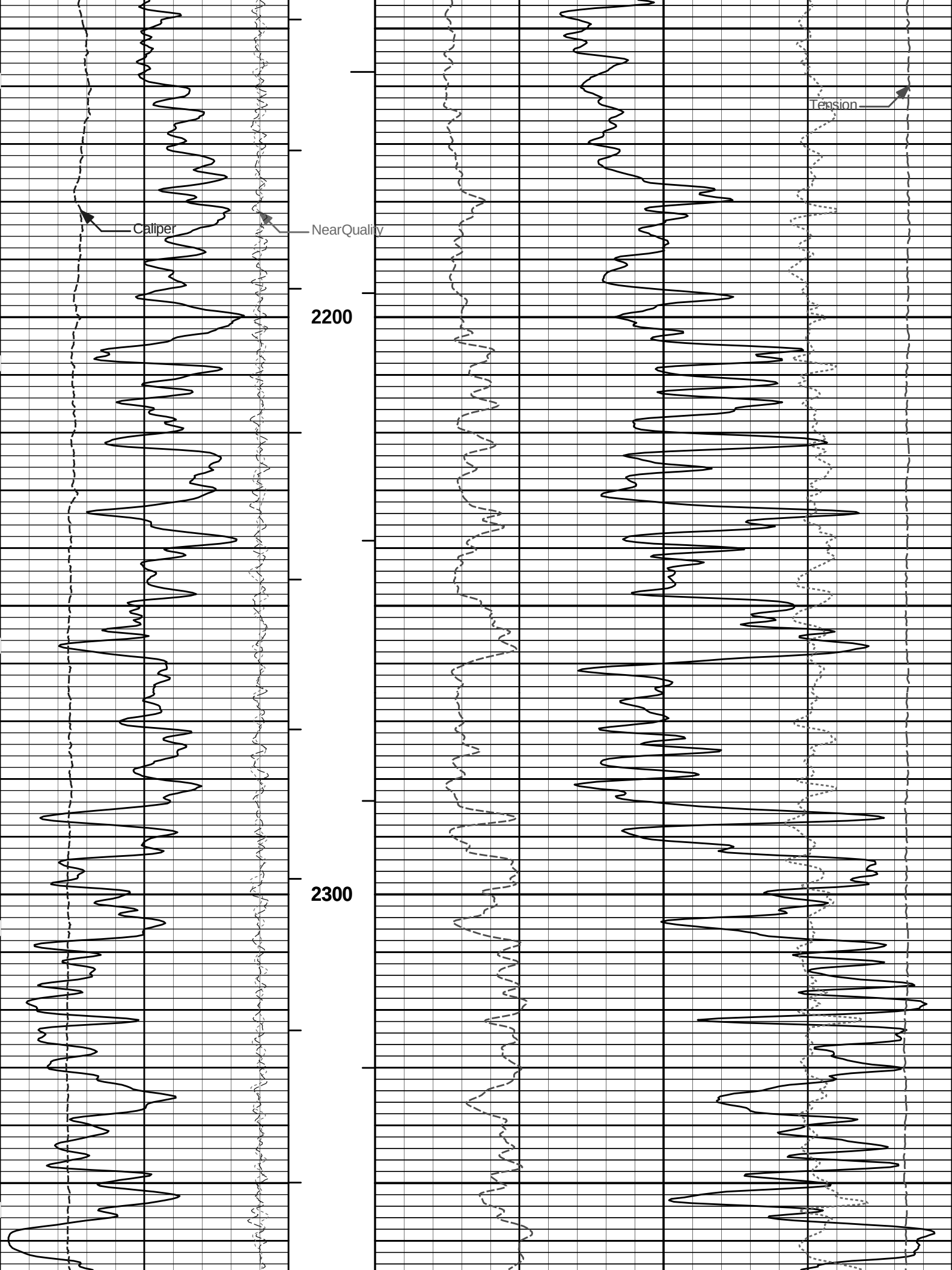
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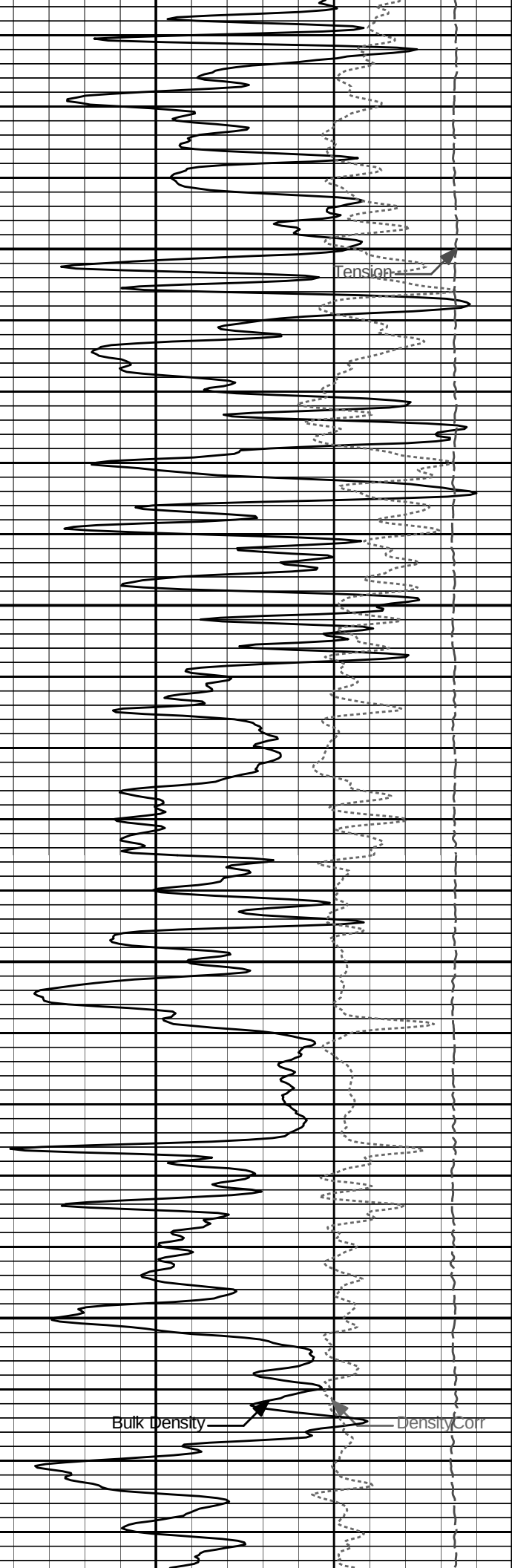
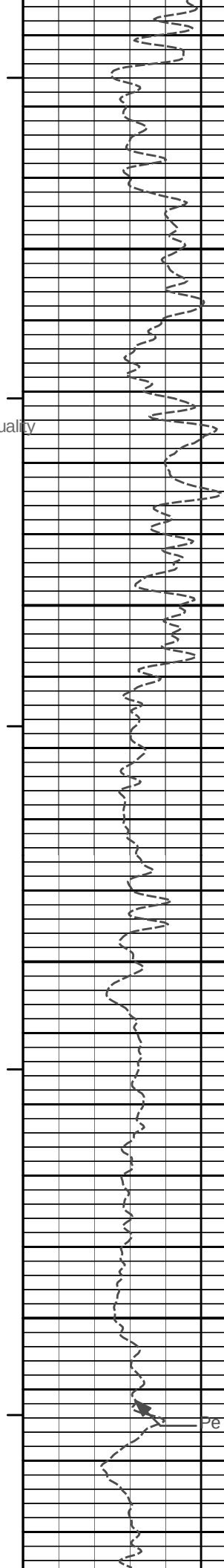
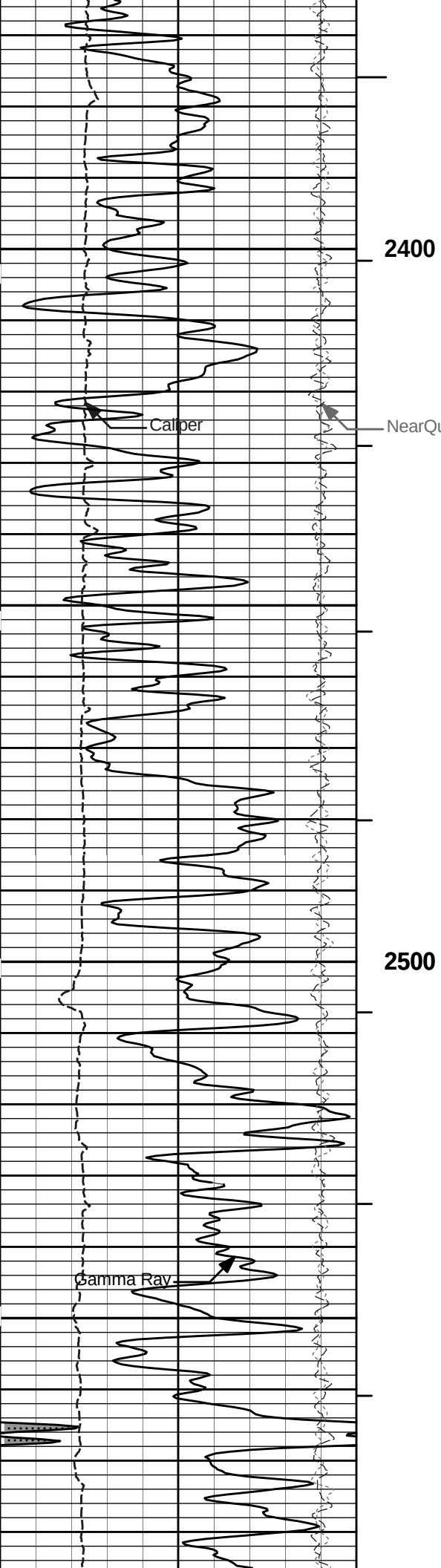
REPEAT SECTION

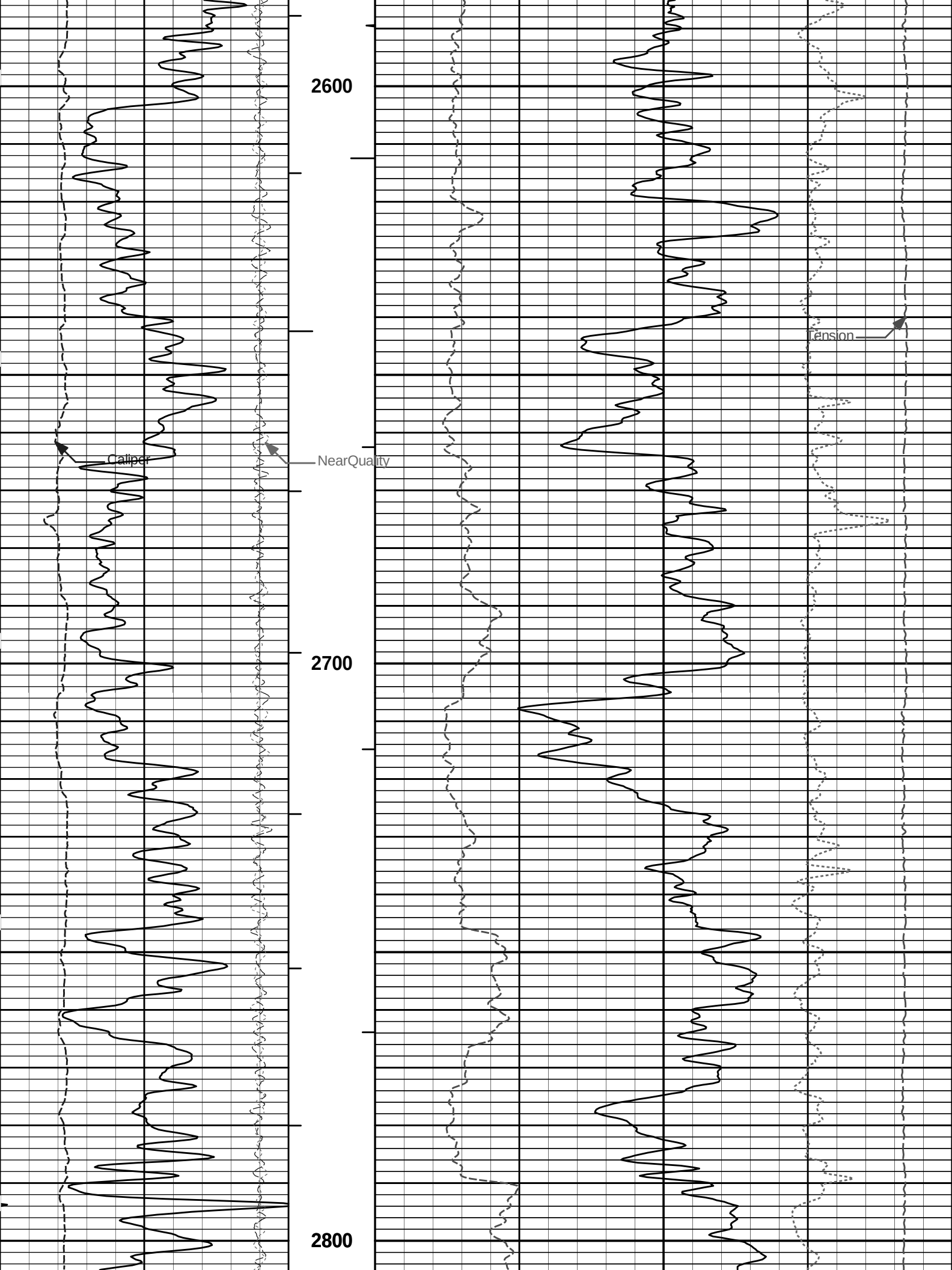
5 INCH MAIN LOG

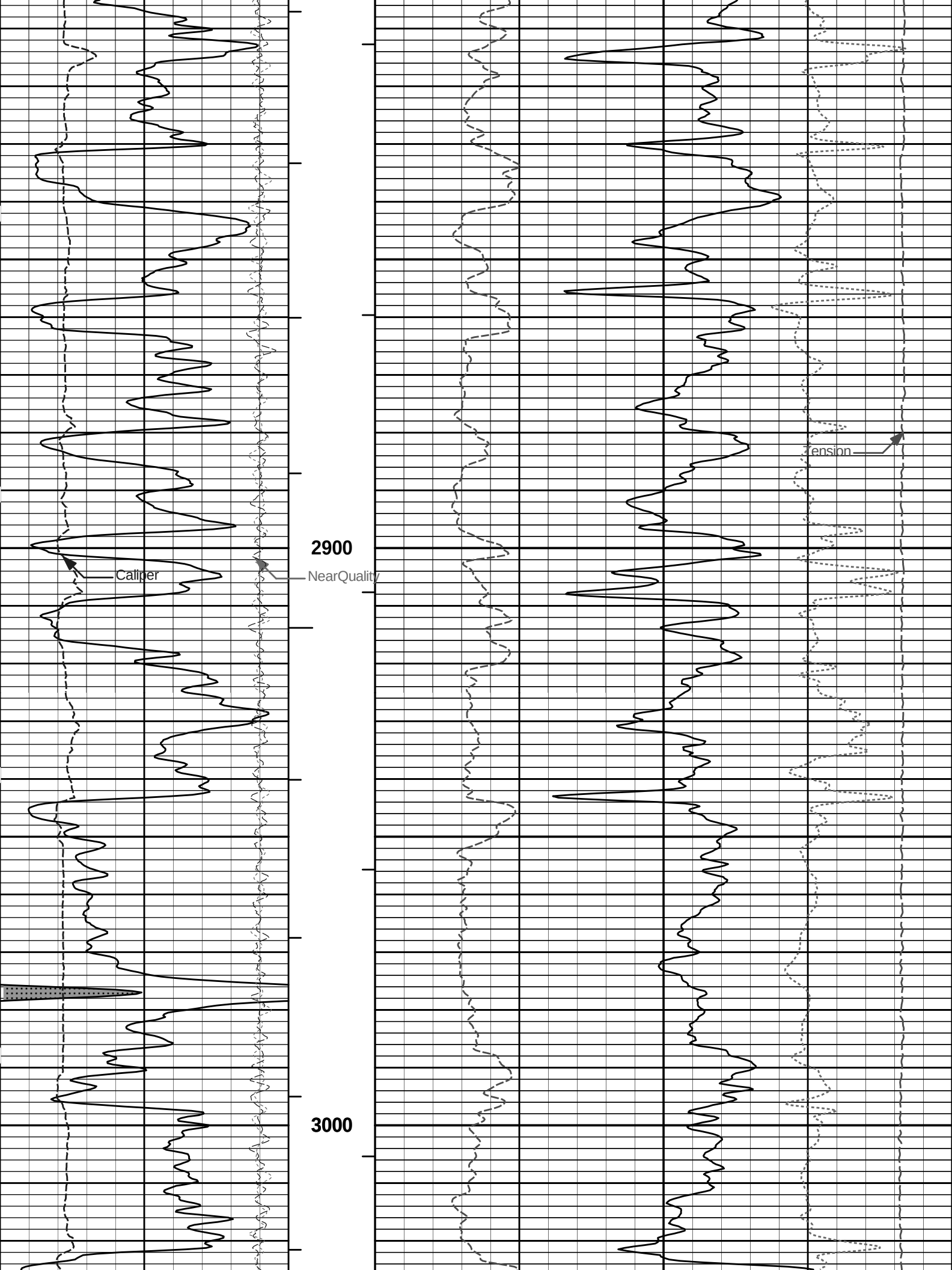


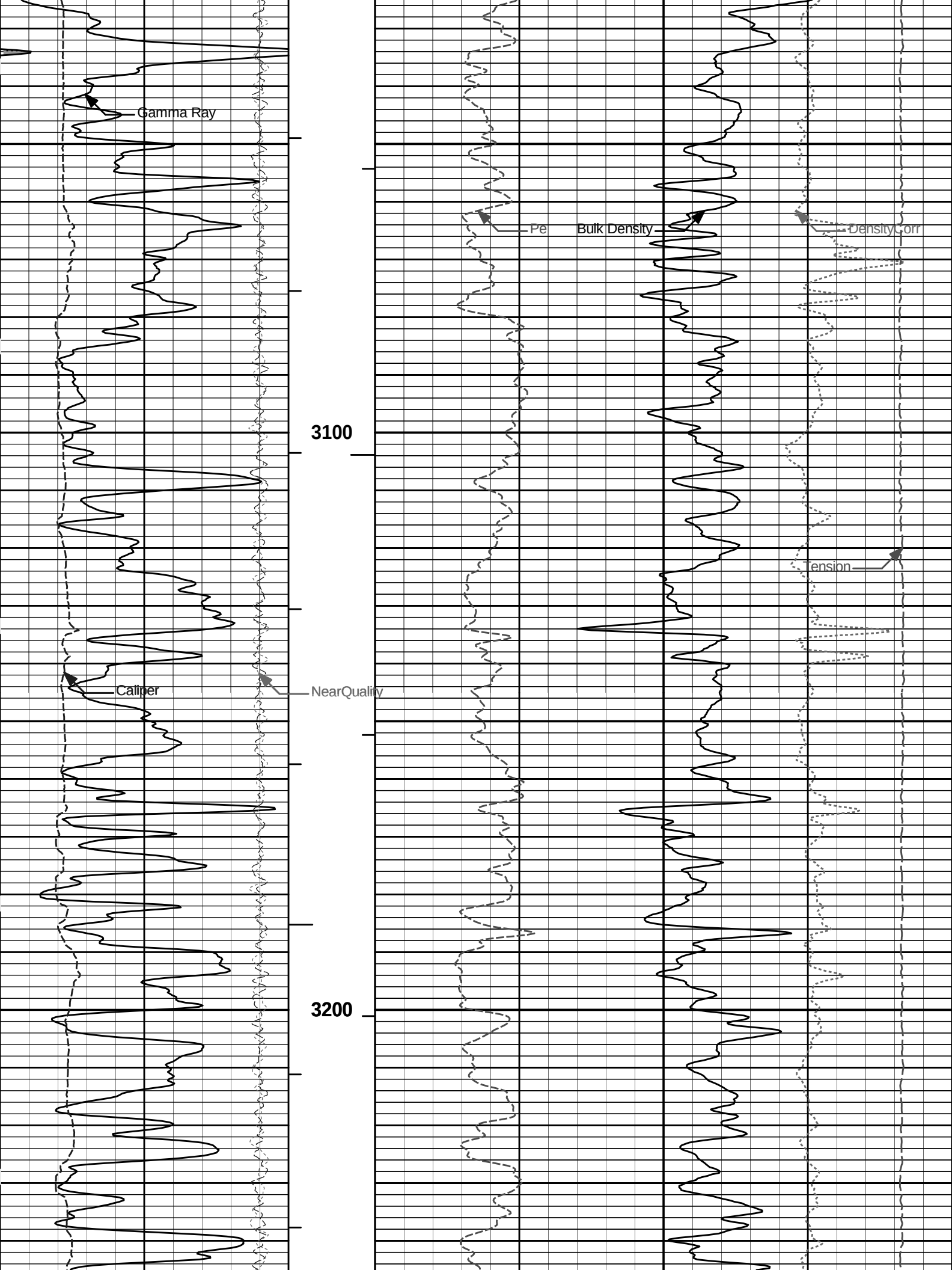


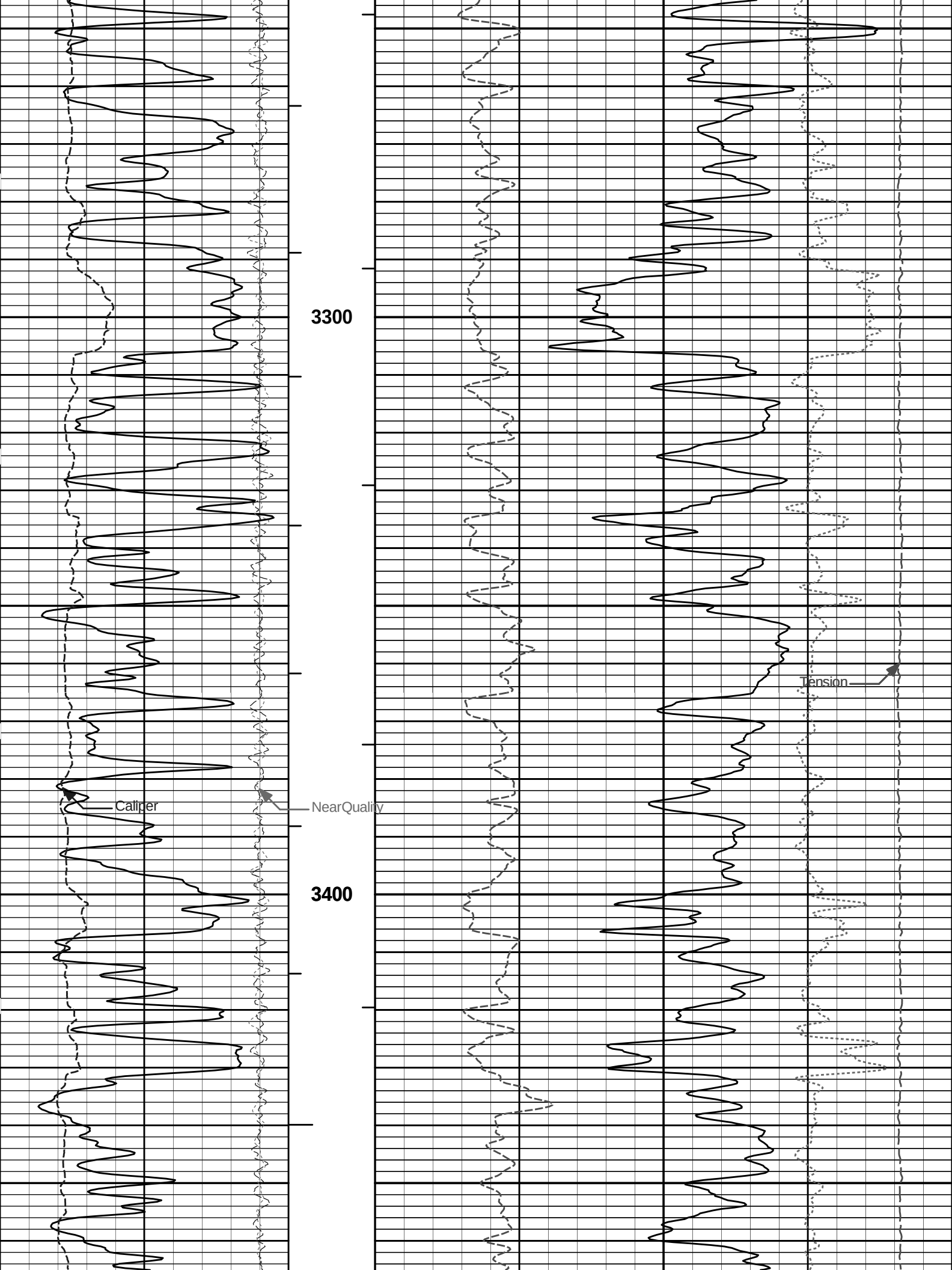


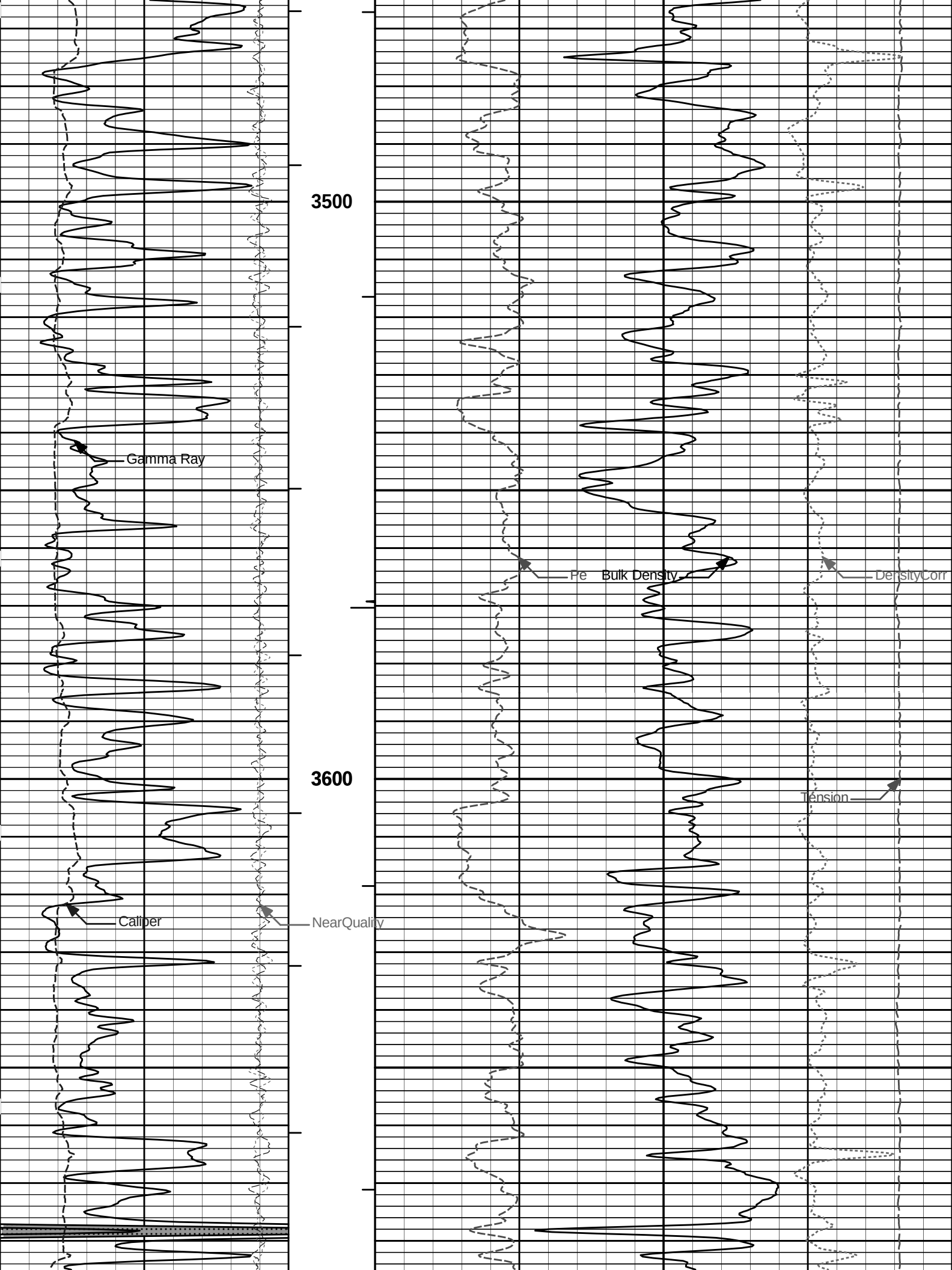


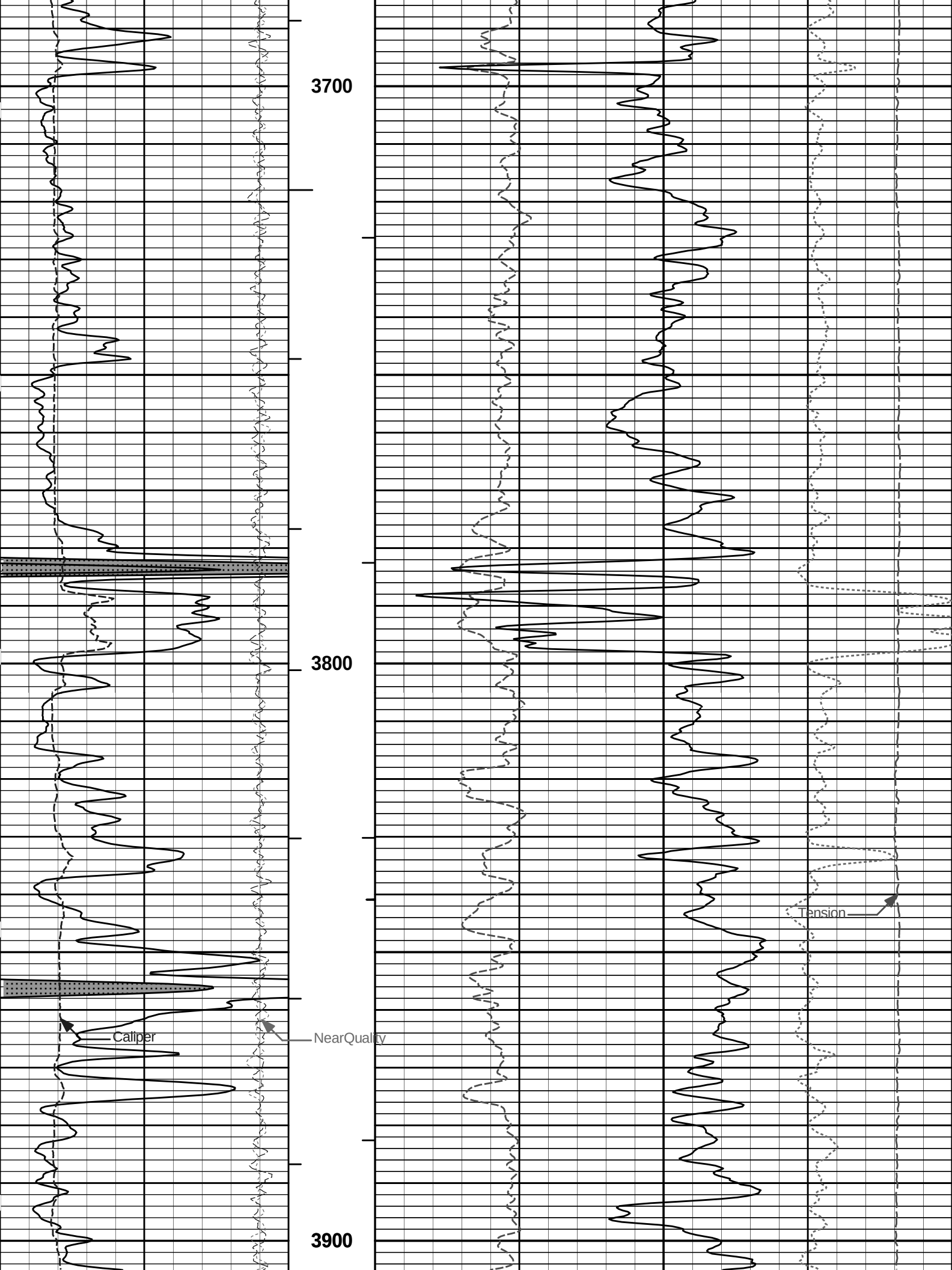


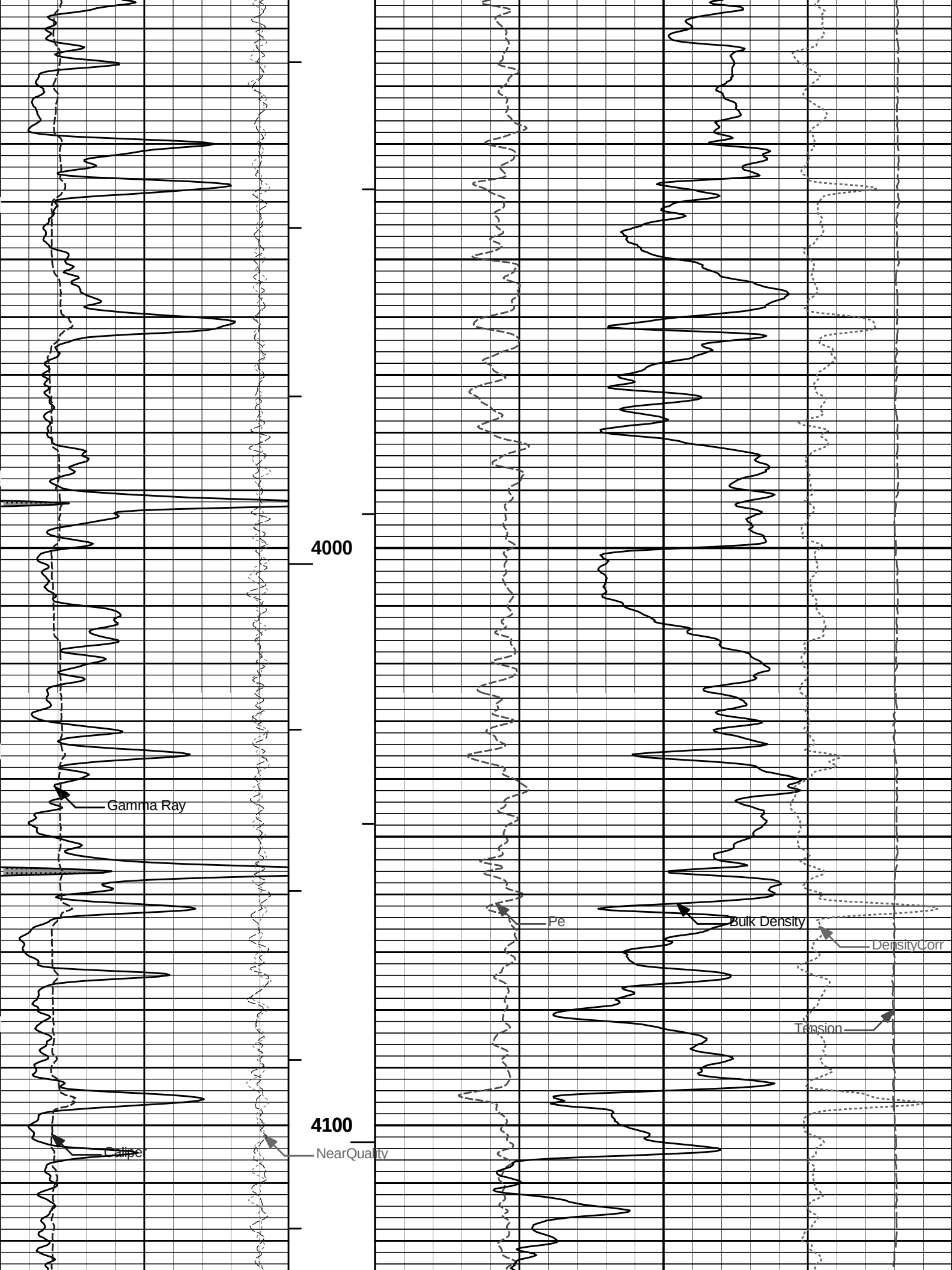


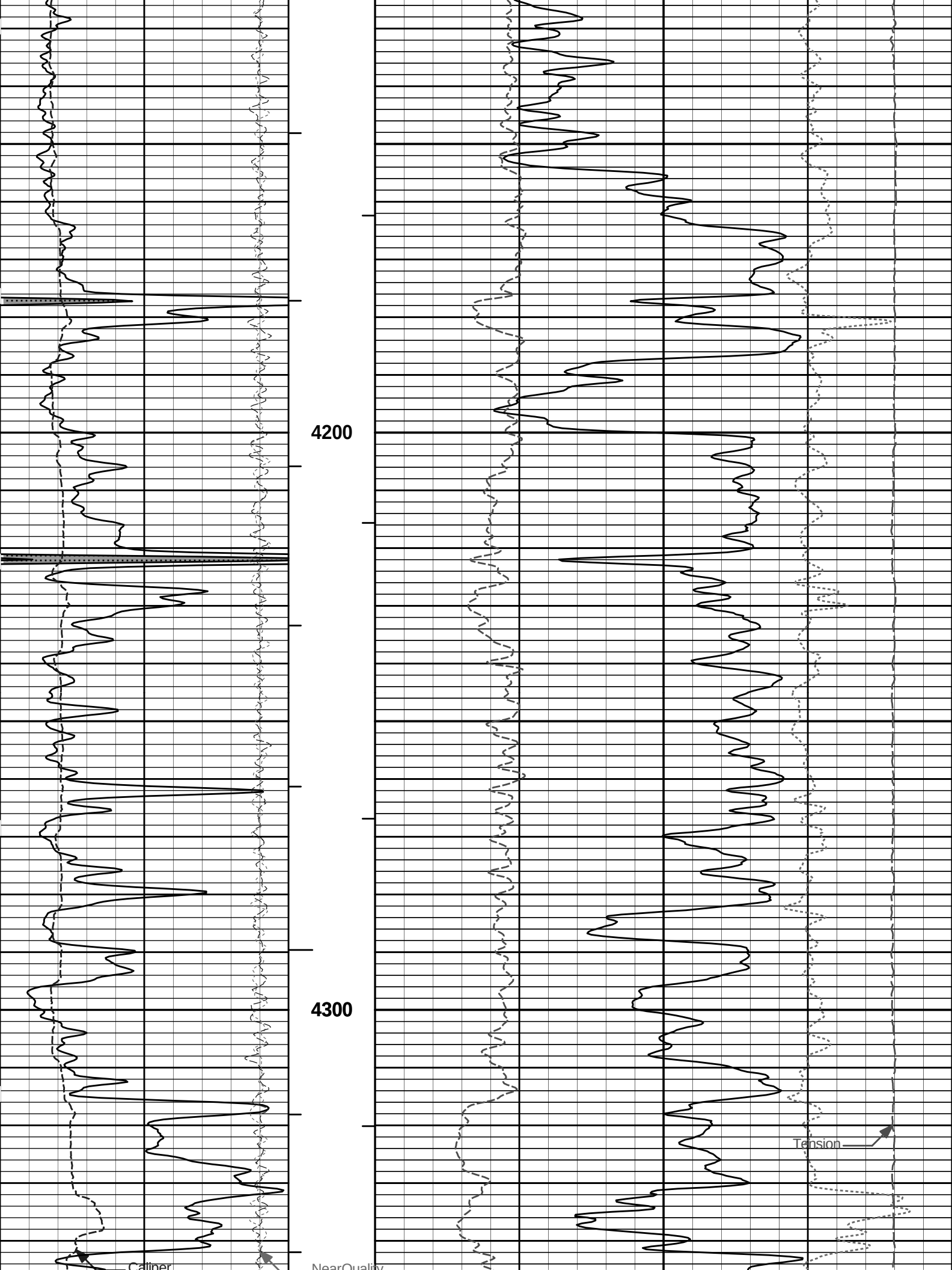


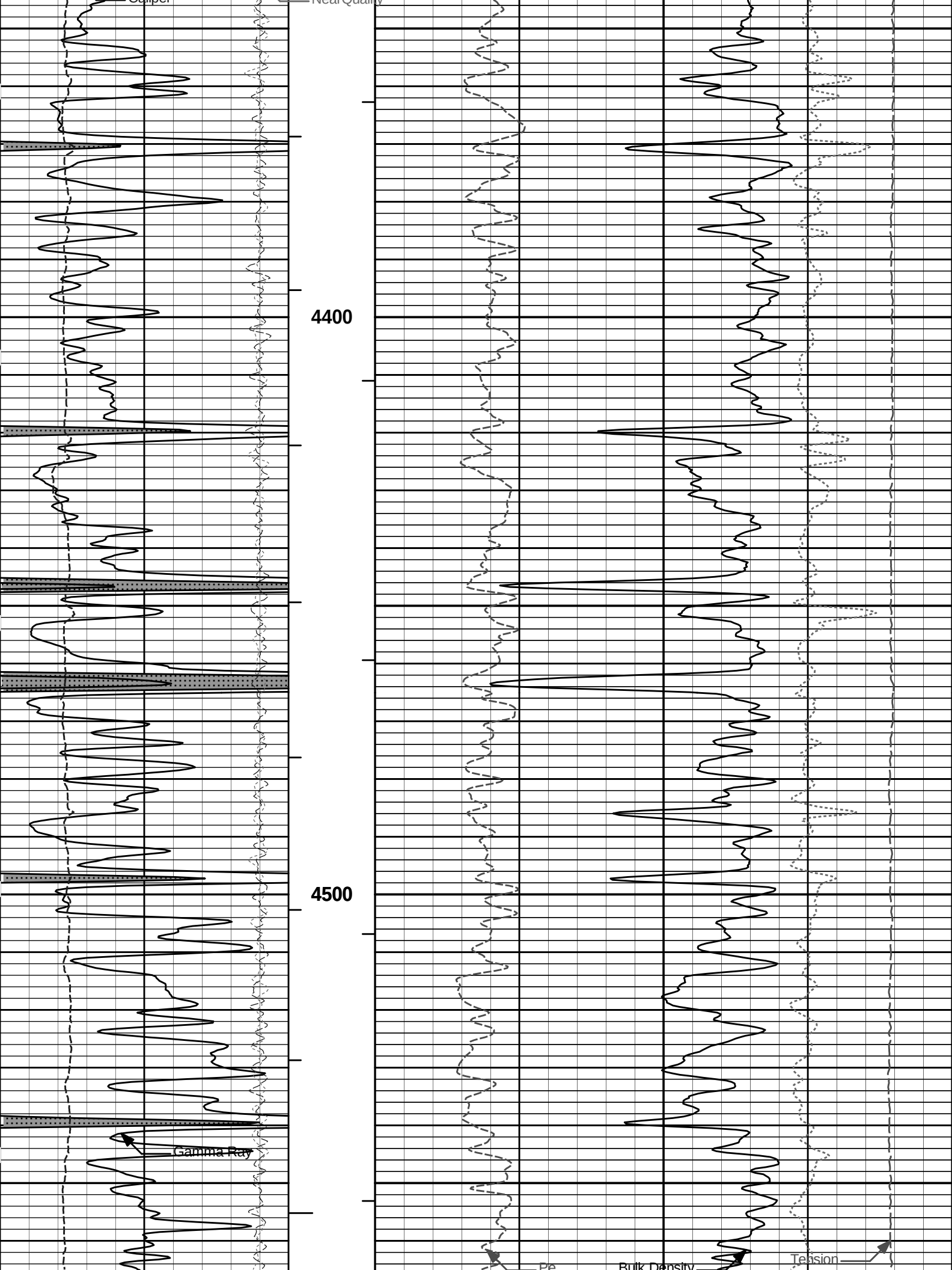


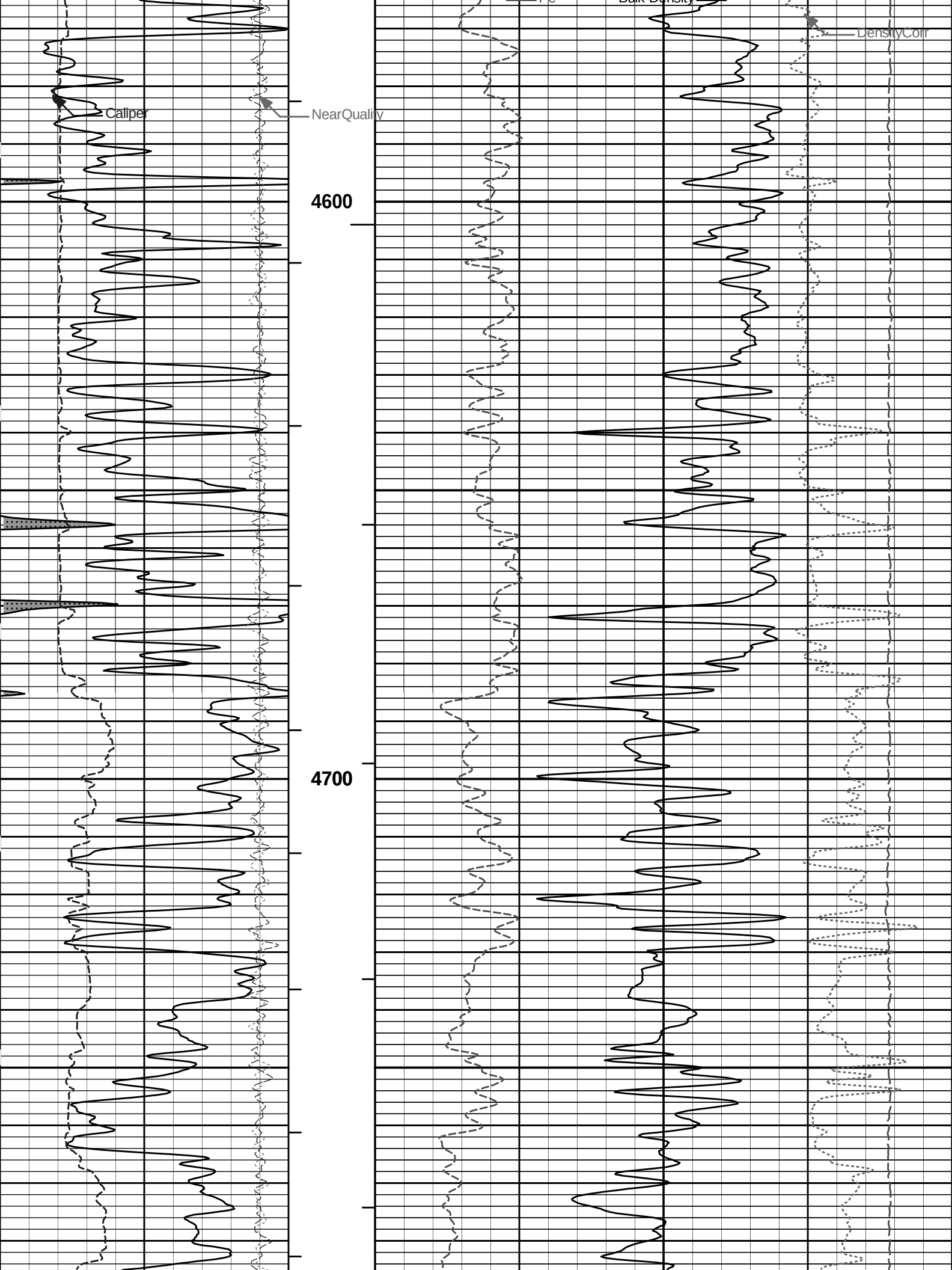




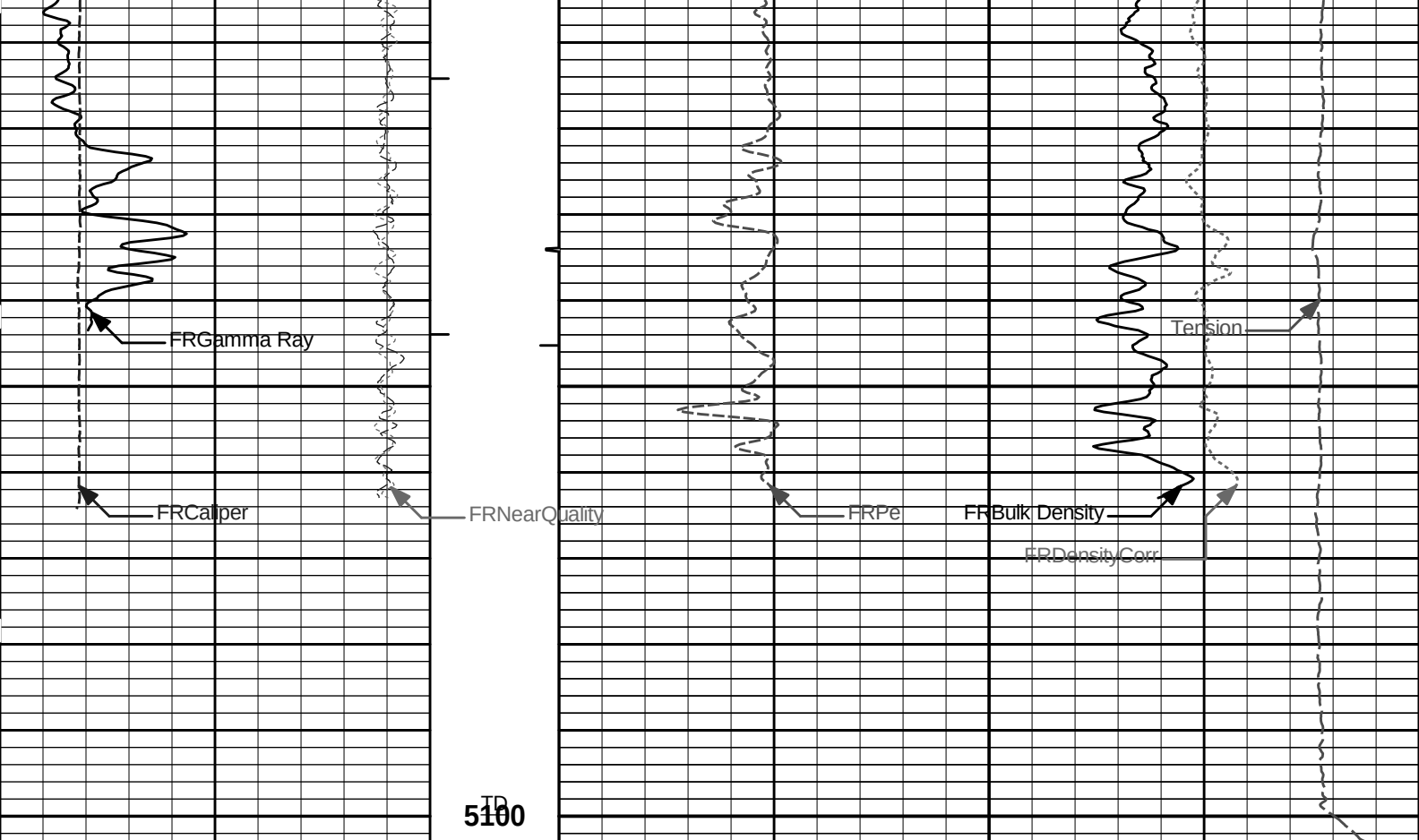












6	Caliper	16	MD	0	Pe	10	-0.25	DensityCorr	0.25
	inches		1 : 240					g/cc	
-18	NearQuality	2	AHV				15K	Tension	0
			ft3					pounds	
18	FarQuality	-2	BHV	2	Bulk Density				
			ft3		g/cc				
0	Gamma Ray	150	Tension Pull						
	api		10	0					
SHALE			Tension Pull						

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Plot Time: 04-Mar-12 04:51:03
Plot Range: 1790 ft to 5103 ft
Data: GARDEN_CITY_T_2\Well Based\DETAIL\
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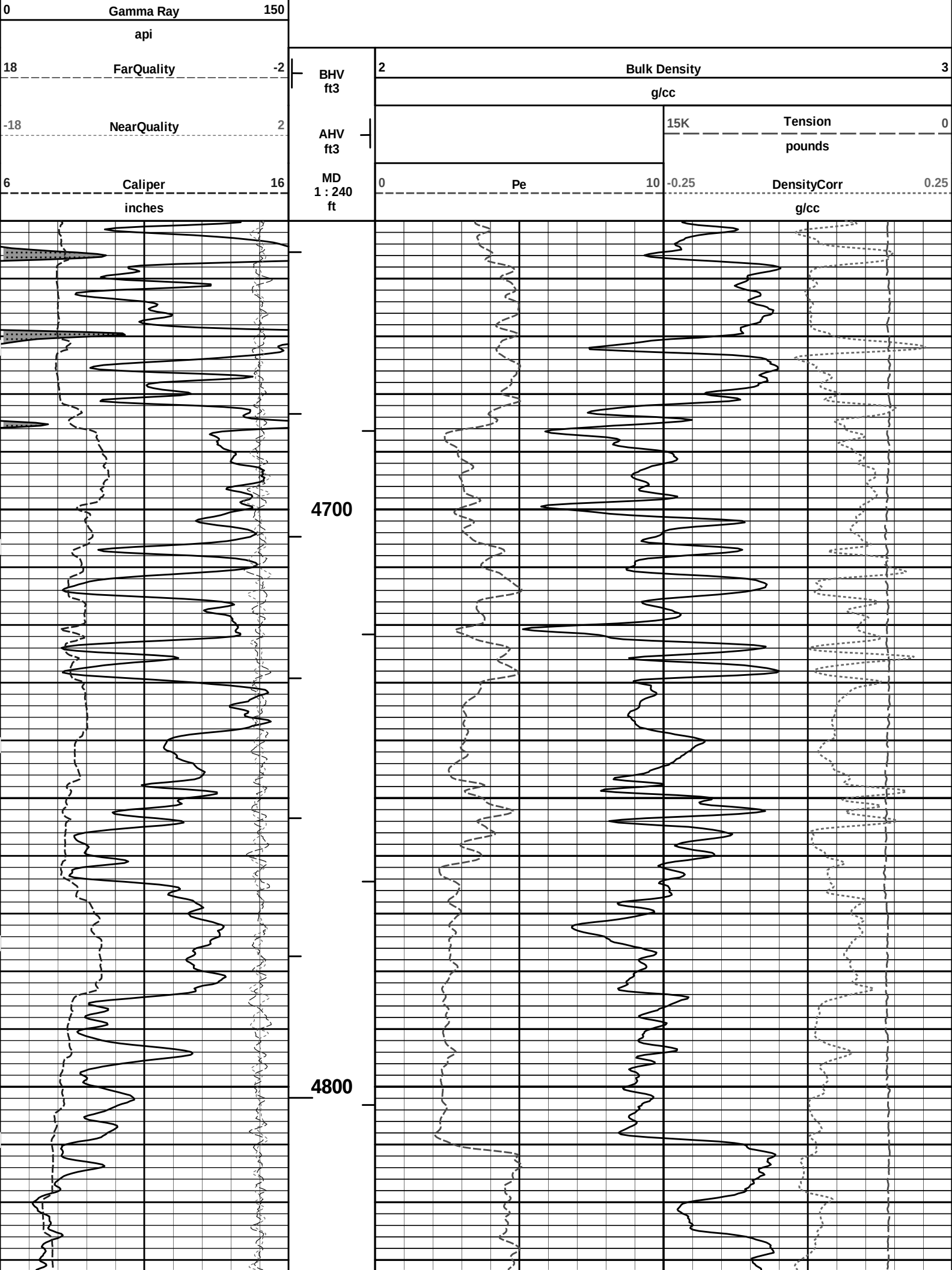
5 INCH MAIN LOG

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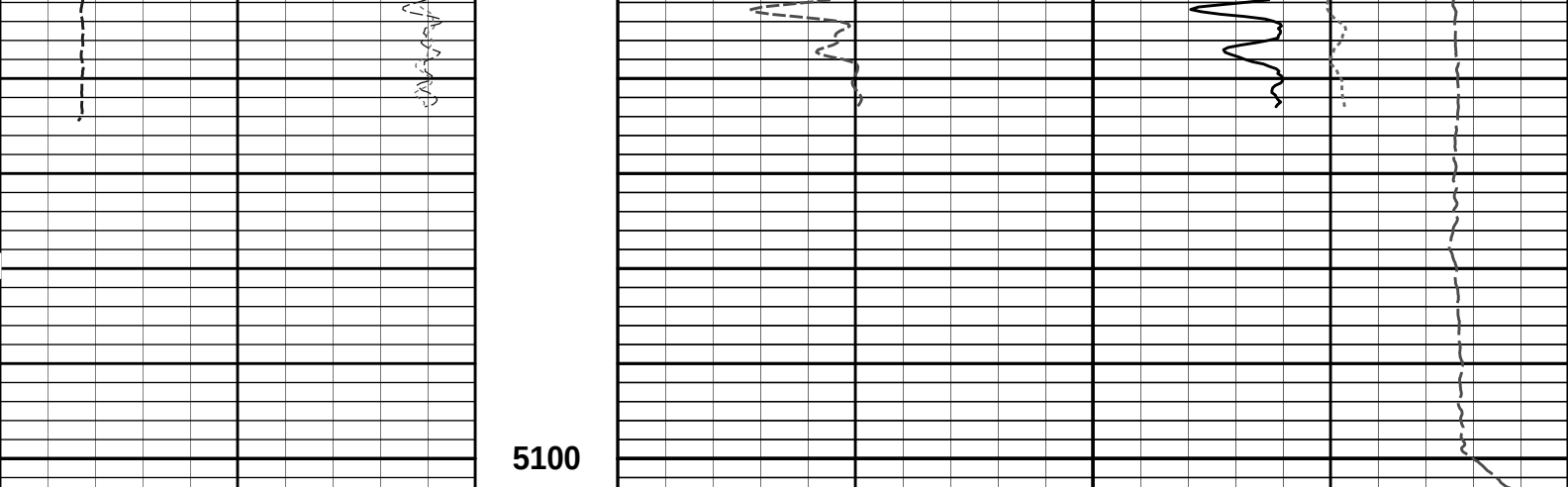
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REPEAT SECTION

SHALE







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

HALLIBURTON

Plot Time: 04-Mar-12 04:51:04
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Plot File: \\LOCAL-IGARDEN_CITY_T_2\0001 SP-GTET-DSN-SDL-BSAT-ACRT-CH\PORO\BULKD_5_REP_LIB

REPEAT SECTION

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TOOL STRING DIAGRAM REPORT

Description	Overbody Description	O.D.	Diagram	Sensors @ Delays	Length	Accumulated Length
CH_HOS-CH_696 37.50 lbs		Ø 2.750 in →		← Temperature @ 70.36 ft	3.03 ft	71.39 ft
SP Sub-001 60.00 lbs		Ø 3.625 in →		← SP @ 66.59 ft	3.74 ft	68.36 ft
						64.63 ft
GTET-11039640 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 →

← DSN Far @ 49.17 ft

← DSN Near @ 48.42 ft

9.69 ft

46.42 ft

SDLT-I43_M469
360.00 lbs

SDLT Pad-P81
65.00 lbs

Microlog Pad-M469
8.00 lbs

Ø 4.500 in →

Ø 4.750 in* →

Ø 4.750 in* →

Microlog @ 38.61 ft

SDL Caliper @ 38.42 ft

SDL @ 38.41 ft

10.81 ft

35.61 ft

BSAT-10747684
300.00 lbs

Ø 3.625 in →

← Sonic Receivers @ 27.09 ft

15.77 ft

19.83 ft

ACRt Instrument-
I962
50.00 lbs

Ø 3.625 in →

← Mud Resistivity @ 13.44 ft

5.03 ft

14.80 ft

ACRt Sonde-
I962_S909
200.00 lbs

Ø 3.625 in →

← ACRt @ 9.46 ft

14.22 ft

56.11 ft

Cabbage Head- TRK696 10.00 lbs		Ø 3.625 in Ø 6.000 in  		0.58 ft 0.58 ft	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	68.36	300.00
SP	SP Sub	001	60.00	3.74	64.63	300.00
GTET	Gamma Telemetry Tool	11039640	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_M469	360.00	10.81	35.61	60.00
MICP	Microlog Pad	M469	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
ACRt	Array Compensated True Resistivity Instrument Section	I962	50.00	5.03	14.80	300.00
ACRt	Array Compensated True Resistivity	I962_S909	200.00	14.22	0.58	300.00
CBHD	Cabbage Head	TRK696	10.00	0.58	0.00	300.00
Total			1,436.10	71.39	* Not included in Total Length and Length Accumulation.	
Data: GARDEN_CITY_T_2I0001 SP-GTET-DSN-SDL-BSAT-ACRT-CHi003 04-Mar-12 02:58 Up @5103.3f					Date: 04-Mar-12 03:38:41	

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CALIBRATION REPORT

NATURAL GAMMA RAY TOOL SHOP CALIBRATION			
Tool Name:	GTET - 11039640	Reference Calibration Date:	27-Jan-12 07:52:04
Engineer:	C. MARLOWE	Calibration Date:	22-Feb-12 20:28:49
Software Version:	WL INSITE R3.4.2 (Build 2)	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	48.5	48.8	api
Background + Calibrator	316.6	318.4	api
Calibrator	268.1	269.6	api
NATURAL GAMMA RAY TOOL FIELD CALIBRATION			
Tool Name:	GTET - 11039640	Reference Calibration Date:	22-Feb-12 20:28:49
Engineer:	J. BOLLUM	Calibration Date:	04-Mar-12 01:08:21
Software Version:	WL INSITE R3.4.2 (Build 2)	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	48.8	37.4	api
Background + Calibrator	318.4	304.3	api
Calibrator	269.6	266.9	api
Shop	Field	Difference	Tolerance
269.6	266.9	2.7	+/- 9.00
DUAL SPACED NEUTRON SHOP CALIBRATION			

Tool Name:	DSNT - 11019643	Reference Calibration Date:	16-Feb-12 08:54:03
Engineer:	C.PARKER	Calibration Date:	16-Feb-12 09:05:04
Software Version:	WL INSITE R3.4.2 (Build 2)	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: 62 degF
Min. Tool Housing Outside Diameter: 3.625 in

CALIBRATION CONSTANTS			
Measurement	Prev. Value	New Value	Control Limit On New Value

Gain:	0.955	0.956	0.900 - 1.100
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WATER TANK SUMMARY (Horizontal Water Tank)				
Measurement	Current Reading (Previous Coef.)	Calibrated (New Coef.)	Change	Control Limit On Change

Porosity (decp):	0.2107	0.2110	0.0002	+/- 0.0020
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Calibrated Ratio:	9.72	9.73	0.007	+/- 0.050
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VERIFIER		
Measurement	Value	Control Limit

Snow-Block Porosity (decp):	0.0734	0.02000 - 0.09000
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PASS/FAIL SUMMARY	
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Background Check:	Passed
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Gain-Range Check:	Passed
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Snow-Block Check:	Passed
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DUAL SPACED NEUTRON FIELD CALIBRATION			
Tool Name:	DSNT - 11019643	Reference Calibration Date:	16-Feb-12 09:05:04
Engineer:	J. BOLLON	Calibration Date:	04-Mar-12 01:15:09
Software Version:	WL INSITE R3.4.2 (Build 2)	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):	0.0734	0.0673	-0.0062	+/- 0.0150
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PASS/FAIL SUMMARY	
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Block Change Check:	Passed
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Snow Block Stat Check:	Passed
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Temperature Check:	Passed
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DENSITY CALIPER SHOP CALIBRATION			
Tool Name:	SDLT - I43_M469	Reference Calibration Date:	16-Feb-12 10:03:14
Engineer:	C.PARKER	Calibration Date:	16-Feb-12 10:07:31
Software Version:	WL INSITE R3.4.2 (Build 2)	Calibration Version:	1

CALIBRATION COEFFICIENTS			
Measurement	Previous Value	New Value	Control Limit On

Measurement	Previous Value	New Value	New Value
Pad Offset	-1784.89	-1917.62	-7000.00 - -1000.00
Pad Gain	0.0003910	0.0003971	0.000200 - 0.000600
Arm Offset	-330.31	-137.08	-5000.00 - 3000.00
Arm Gain	0.0005187	0.0005069	0.000300 - 0.000700
Arm Power	-0.000006098	-0.000005316	-0.000010 - 0.000010

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)	2.02	2.00	-0.02	+/- 0.20
Medium Ring (in)	3.74	3.75	0.01	+/- 0.20
RING DIAMETER:				
Small Ring (in)	6.50	6.50	0.00	+/- 0.20
Medium Ring (in)	8.28	8.25	-0.03	+/- 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

SDLT CALIPER FIELD CALIBRATION

Tool Name:	SDLT - I43_M469	Reference Calibration Date:	16-Feb-12 10:07:31
Engineer:	J. BOLLLOM	Calibration Date:	04-Mar-12 01:17:34
Software Version:	WL INSITE R3.4.2 (Build 2)	Calibration Version:	1

MEASURED CALIPER VALUES				
Measurement	Shop	Field	Change	Control Limit On New Value
Pad Extension	3.75	3.78	0.03	+/- 0.10
Ring Diameter	8.25	8.37	0.12	+/- 0.15
PASS/FAIL SUMMARY				
Pad Extension Check:			Passed	
Diameter Check:			Passed	

ARRAY COMPENSATED TRUE RESISTIVITY SHOP CALIBRATION

Tool Name:	ACRt Sonde - I962_S909	Reference Calibration Date:	24-Jan-12 09:31:40
Engineer:	C. HAVERKAMP	Calibration Date:	24-Feb-12 13:24:09
Software Version:	WL INSITE R3.4.2 (Build 2)	Calibration Version:	1

TYPICAL GAIN RANGE

Subarray	R12KHz			R36KHz			R72KHz		
	Lower	(mmho/m)	Upper	Lower	(mmho/m)	Upper	Lower	(mmho/m)	Upper
A1 (80")	0.95	1.0168	1.05	0.95	1.0229	1.05	0.95	1.0207	1.05
A2 (50")	0.95	1.0114	1.05	0.95	1.0172	1.05	0.95	1.0165	1.05
A3 (29")	0.95	1.0025	1.05	0.95	1.0075	1.05	0.95	1.0045	1.05
A4 (17")	0.95	1.0042	1.05	0.95	1.0069	1.05	0.95	1.0066	1.05
A5 (10")	N/A	N/A	N/A	0.95	1.0047	1.05	0.95	1.0023	1.05
A6 (6")	N/A	N/A	N/A	0.95	0.9883	1.05	0.95	0.9861	1.05

TYPICAL SONDE OFFSET RANGE									
Subarray	R12KHz			R36KHz			R72KHz		
	Lower	(mmho/m)	Upper	Lower	(mmho/m)	Upper	Lower	(mmho/m)	Upper
A1 (80")	-5	-0.741	2	-6	-4.230	-2	-8	-4.258	-2
A2 (50")	-7	-1.770	-1	-6	-3.669	-2	-7	-4.211	-2
A3 (29")	-27	-14.223	-9	-9	-4.442	-3	-7	-2.621	-1
A4 (17")	-180	-101.737	-60	-45	-30.295	-15	-39	-25.948	-13
A5 (10")	N/A	N/A	N/A	-150	-100.527	-50	-80	-45.910	-10
A6 (6")	N/A	N/A	N/A	175	282.721	525	90	148.160	270

TRANSMITTER CURRENT GAIN					R-MUD VERIFICATION			
Signal	Lower	R	Upper		Signal	Lower (ohm-m)	Measured (ohm-m)	Upper (ohm-m)
12K		0.6	0.8813	1.3	Mud Cell	0.95	1.002	1.05
36K		1.0	1.3484	2.0				
72K		1.0	1.5779	2.0				

SPECTRAL DENSITY SHOP CALIBRATION									
Tool Name:	SDLT Pad - P81					Reference Calibration Date:	16-Feb-12 09:32:29		
Engineer:	C.PARKER					Calibration Date:	16-Feb-12 09:50:51		
Software Version:	WL INSITE R3.4.2 (Build 2)					Calibration Version:	1		

Logging Source S/N: 5168GW
 Aluminum Block S/N: LIBERAL
 Magnesium Block S/N: LIBERAL

Density: 2.598g/cc
 Density: 1.684g/cc

Pe: 3.170
 Pe: 2.598

DENSITY CALIBRATION SUMMARY			
Measurement	Previous Value	New Value	Control Limit
Near Bar Gain	1.0007	1.0390	0.90 - 1.10
Near Dens Gain	0.9863	1.0240	0.90 - 1.10
Near Peak Gain	0.9638	1.0214	0.90 - 1.10
Near Lith Gain	0.9505	0.9895	0.90 - 1.10
Far Bar Gain	1.0070	1.0126	0.90 - 1.10
Far Dens Gain	0.9953	1.0029	0.90 - 1.10
Far Peak Gain	0.9892	0.9950	0.90 - 1.10
Far Lith Gain	0.9673	0.9741	0.90 - 1.10
Near Bar Offset	0.1494	-0.1966	NONE
Near Dens Offset	0.2613	-0.0657	NONE
Near Peak Offset	0.4387	-0.0378	NONE
Near Lith Offset	0.5394	0.2188	NONE
Far Bar Offset	0.0283	-0.0164	NONE
Far Dens Offset	0.1237	0.0609	NONE
Far Peak Offset	0.1380	0.0956	NONE
Far Lith Offset	0.2818	0.2321	NONE
Near Bar Background	823.63	824.58	700 - 1450
Near Dens Background	269.31	269.85	230 - 480
Near Peak Background	117.39	117.18	100 - 210
Near Lith Background	146.50	146.84	125 - 260
Far Bar Background	536.19	537.63	450 - 900
Far Dens Background	209.96	210.26	175 - 345
Far Peak Background	83.75	84.87	70 - 140
Far Lith Background	88.57	87.09	75 - 145

CALIBRATION BLOCK SUMMARY				
Measurement	Current Reading (Previous Coef)	Calibrated (New Coef)	Change	Control Limit On Change
MAGNESIUM				
Density (g/cc)	1.679	1.684	0.005	+/- 0.015
Pe	2.565	2.557	-0.008	+/- 0.150
ALUMINUM				
Density (g/cc)	2.597	2.598	0.001	+/- 0.01500
Pe	3.116	3.126	0.010	+/- 0.150

TOOL SUMMARY				
Measurement	Near Detector		Far Detector	
	Value	Control Limits	Value	Control Limits
QUALITY				
Background	0.0011	+/- 0.0110	0.0000	+/- 0.0140
Magnesium Block	-0.0008	+/- 0.0110	-0.0013	+/- 0.0140
Aluminum Block	-0.0006	+/- 0.0110	-0.0011	+/- 0.0140
Resolution	9.43	6.00 - 11.50	8.92	6.00 - 11.50
Internal Verifier(B+D+P+L)	1358	1200 - 2700	920	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:	16-Feb-12 09:50:51
Engineer:	J. BOLLLOM	Calibration Date:	04-Mar-12 01:08:51
Software Version:	WL INSITE R3.4.2 (Build 2)	Calibration Version:	1

Pad Temperature: 40.0 degF

DENSITY FIELD CALIBRATION SUMMARY				
Measurement	Shop	Field	Change	Control Limit +/-
Near (B+D+P+L) cps	1358.449	1358.840	0.391	14.900
Far (B+D+P+L) cps	919.854	923.840	3.986	16.438
Near Resolution	9.43	9.75	0.320	0.50
Far Resolution	8.92	9.35	0.430	1.00

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

MICRO LOG SHOP CALIBRATION

Tool Name:	Microlog Pad - M469	Reference Calibration Date:	20-Jan-12 09:25:17
Engineer:	C.PARKER	Calibration Date:	16-Feb-12 10:13:03

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	1700.00	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	5120.00	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	DMA	Formation Density Matrix	2.710	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	
BOTTOM				
Data: GARDEN_CITY_T_2I0001 SP-GTET-DSN-SDL-BSAT-ACRT-CHI003 04-Mar-12 02:58 Up @5103.3f				Date: 04-Mar-12 03:40:58

HALLIBURTON				
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	
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
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	

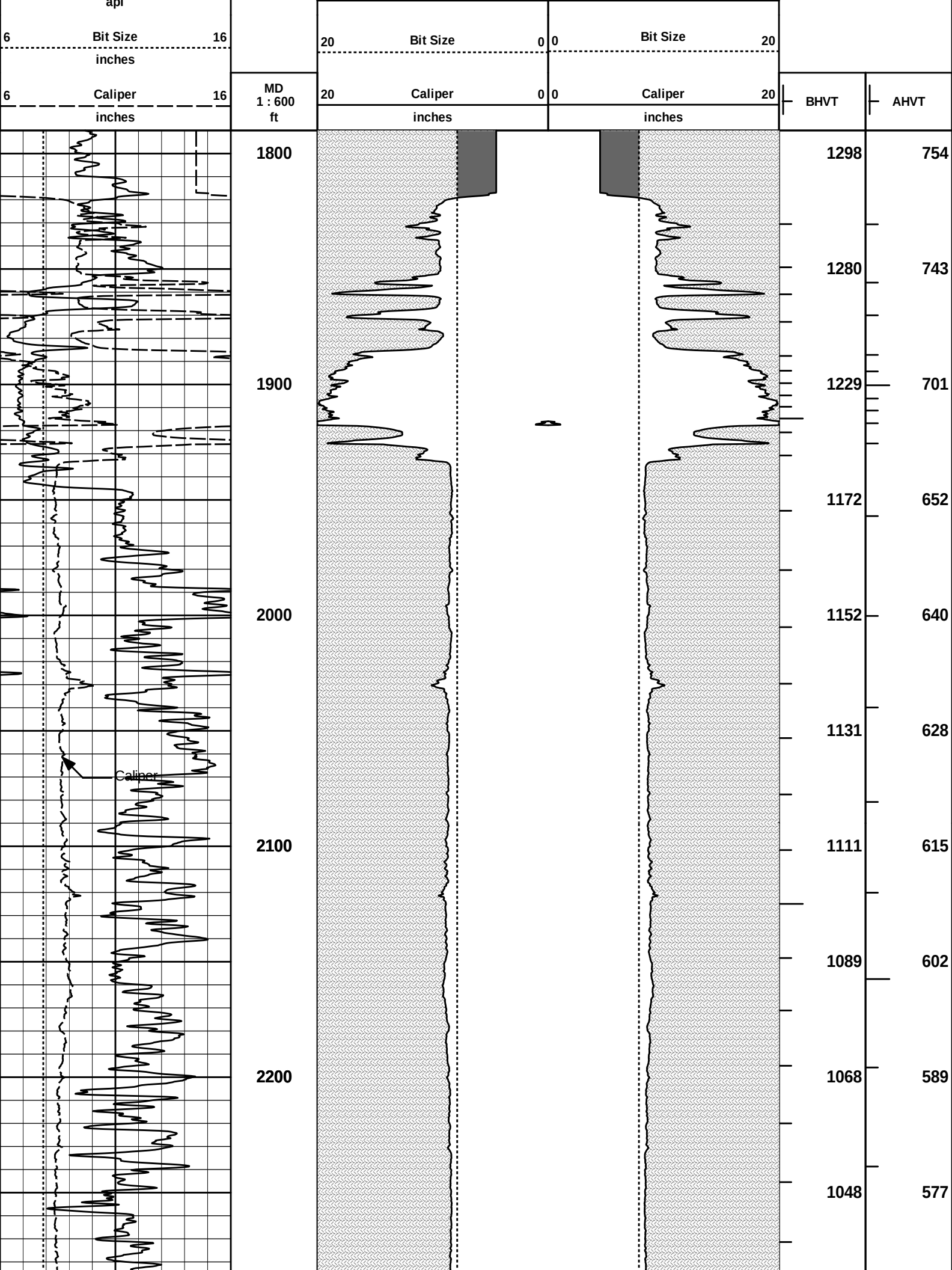
Microlog Pad				
TPUL	Tension Pull	38.60	NO	
MINV	Microlog Lateral	38.60	BLK	0.750
MNOR	Microlog Normal	38.60	BLK	0.750

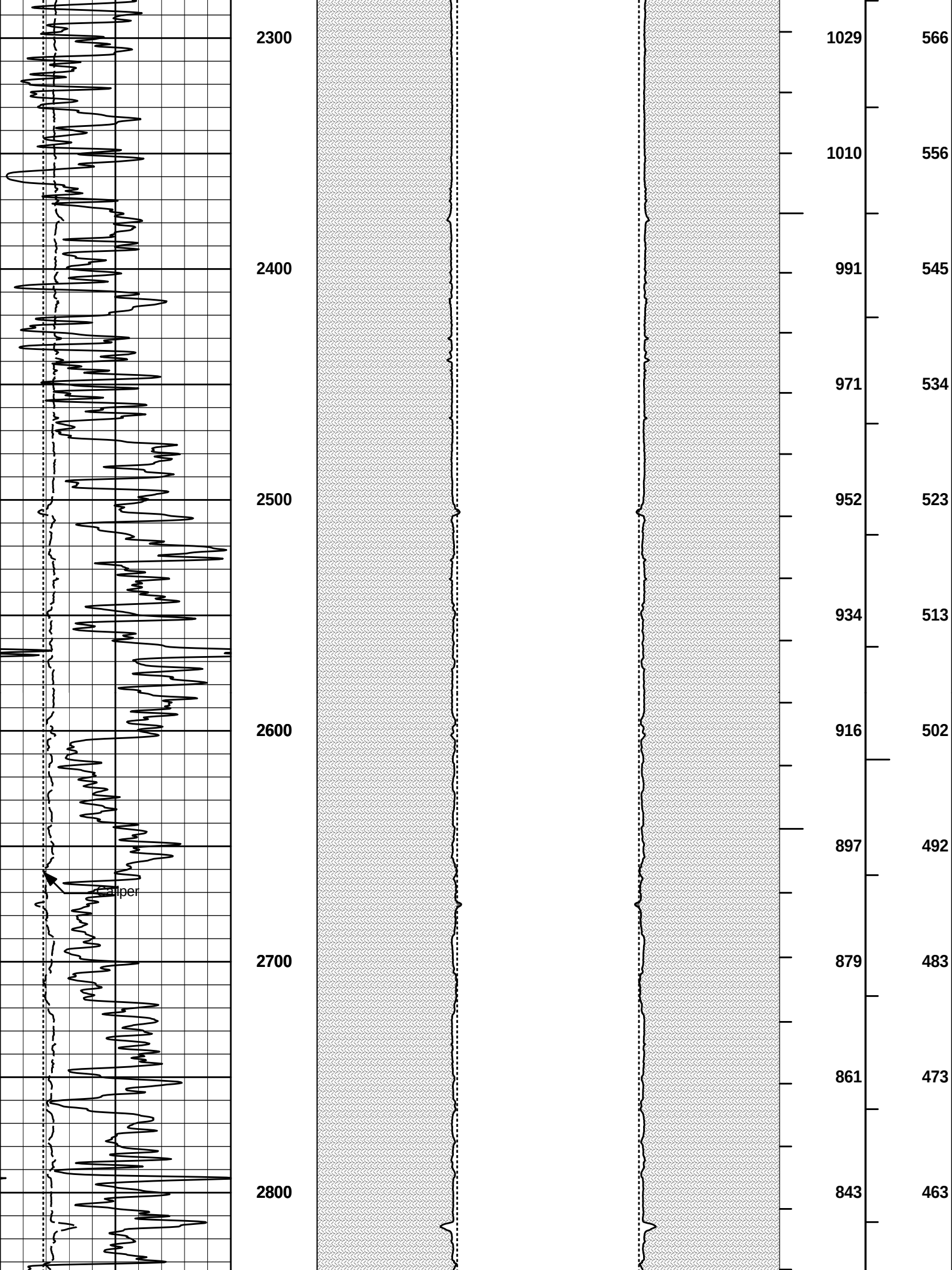
Data: GARDEN_CITY_T_2I0001 SP-GTET-DSN-SDL-BSAT-ACRT-CHI003 04-Mar-12 02:58 Up @5103.3f Date: 04-Mar-12 03:39:06

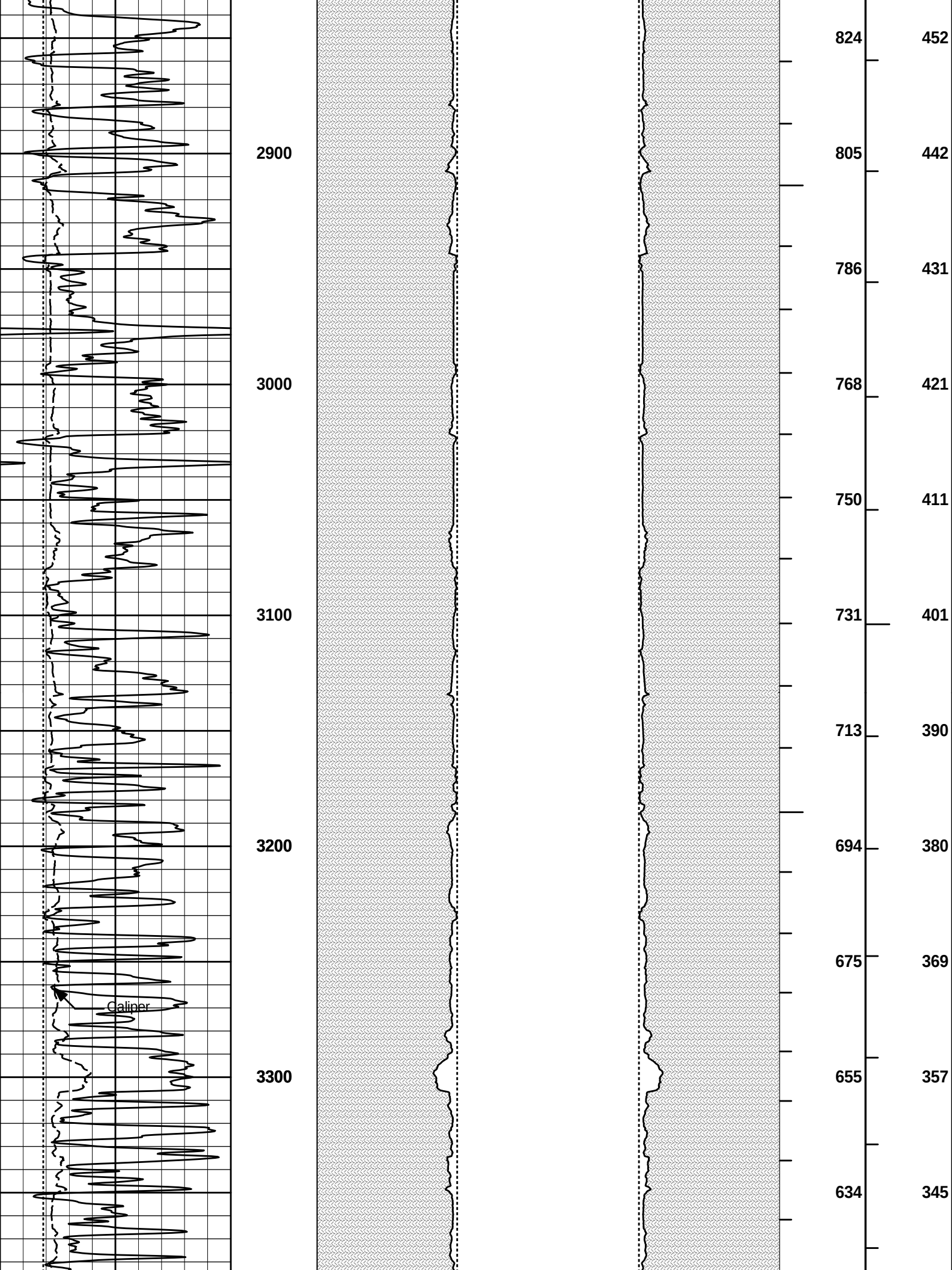
Plot Time: 04-Mar-12 04:51:04
Plot Range: 1790 ft to 5103 ft
Data: GARDEN_CITY_T_2IWell Based\DETAIL\
Plot File: \\LOCAL-IGARDEN_CITY_T_2I0001 SP-GTET-DSN-SDL-BSAT-ACRT-CHI\PORO\AHV_2_IQ_LIB

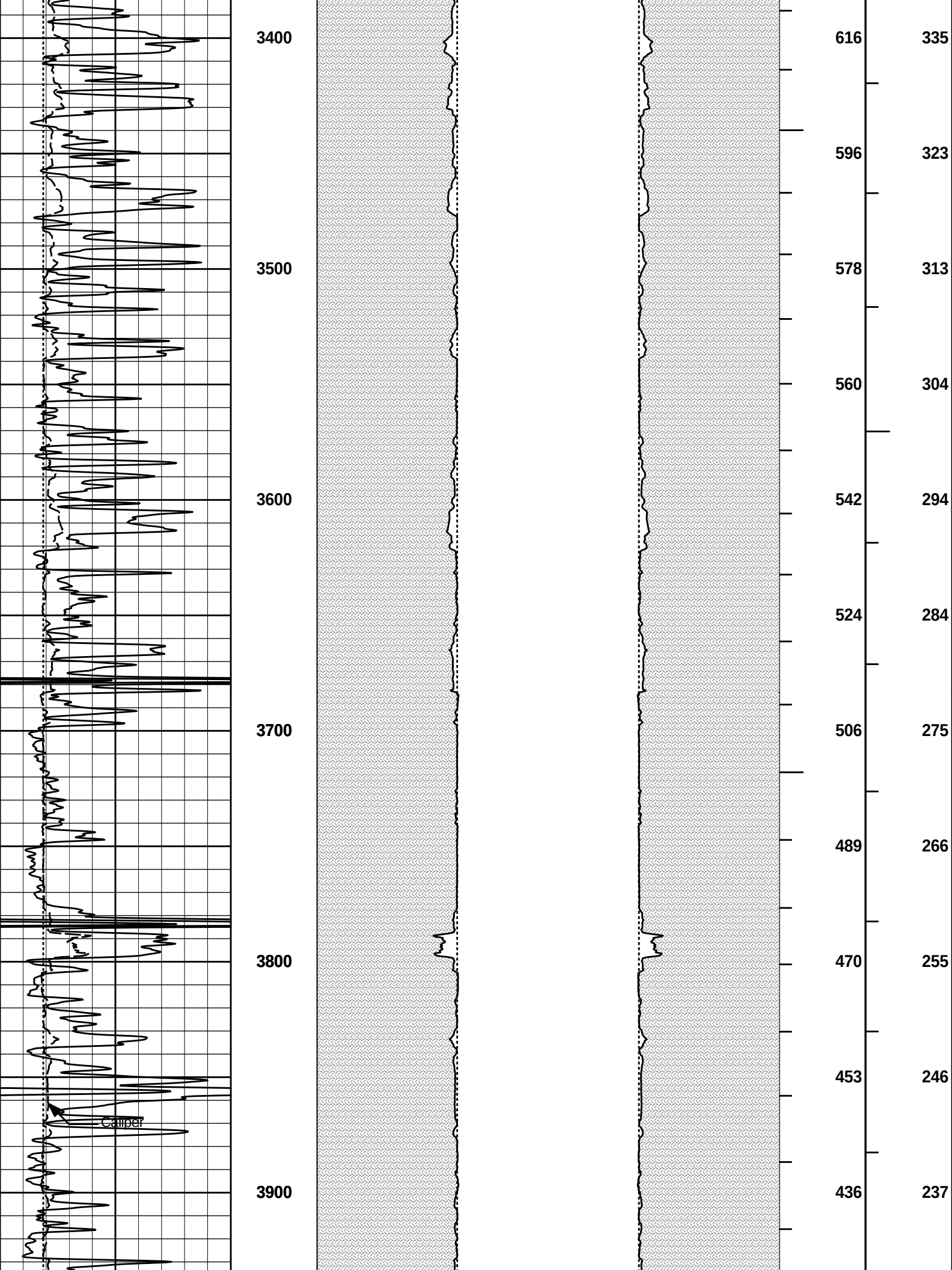
ANNULAR HOLE VOLUME PLOT

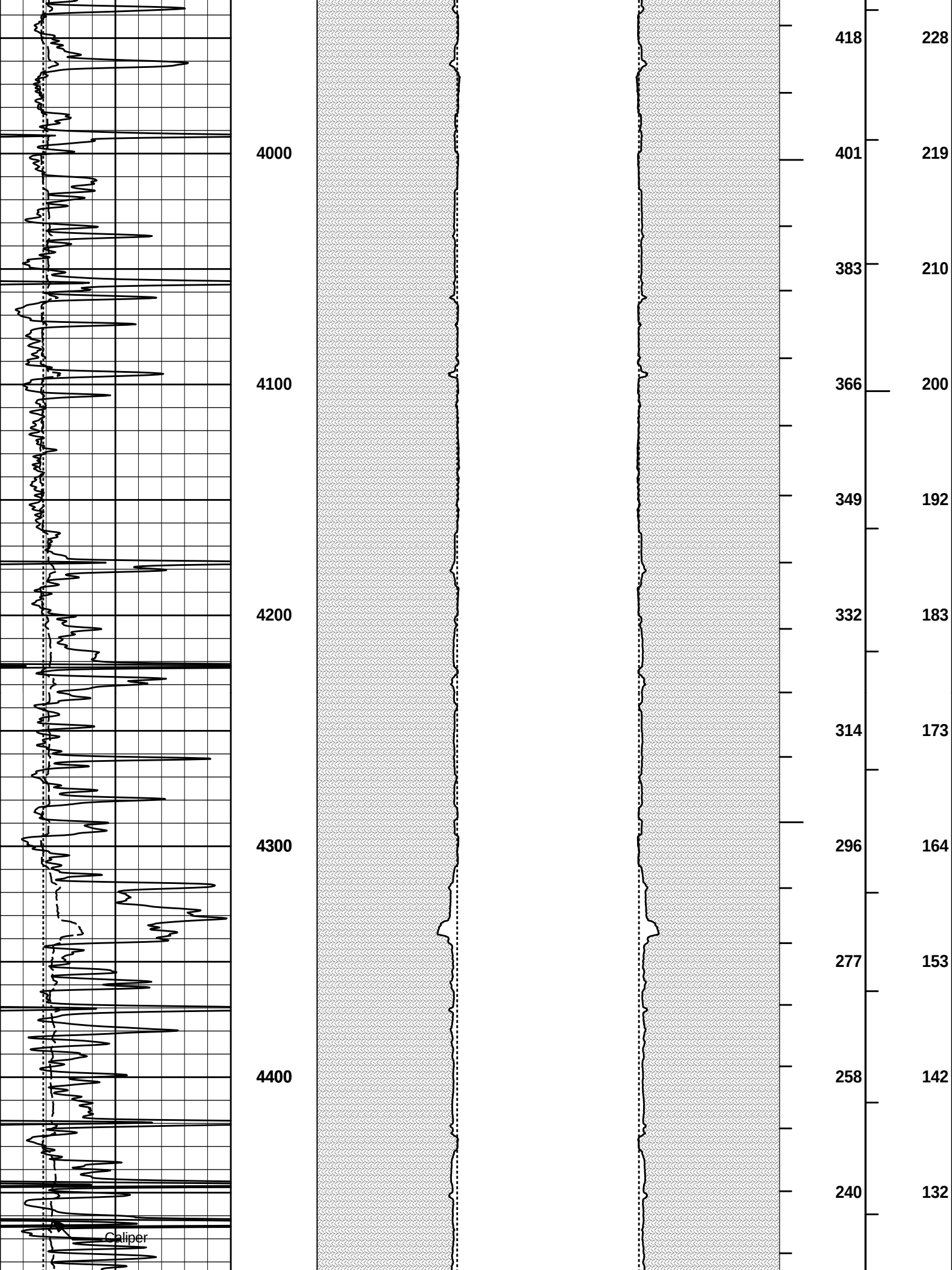
0	Gamma API	150			
			MUDCAKE	MUDCAKE	

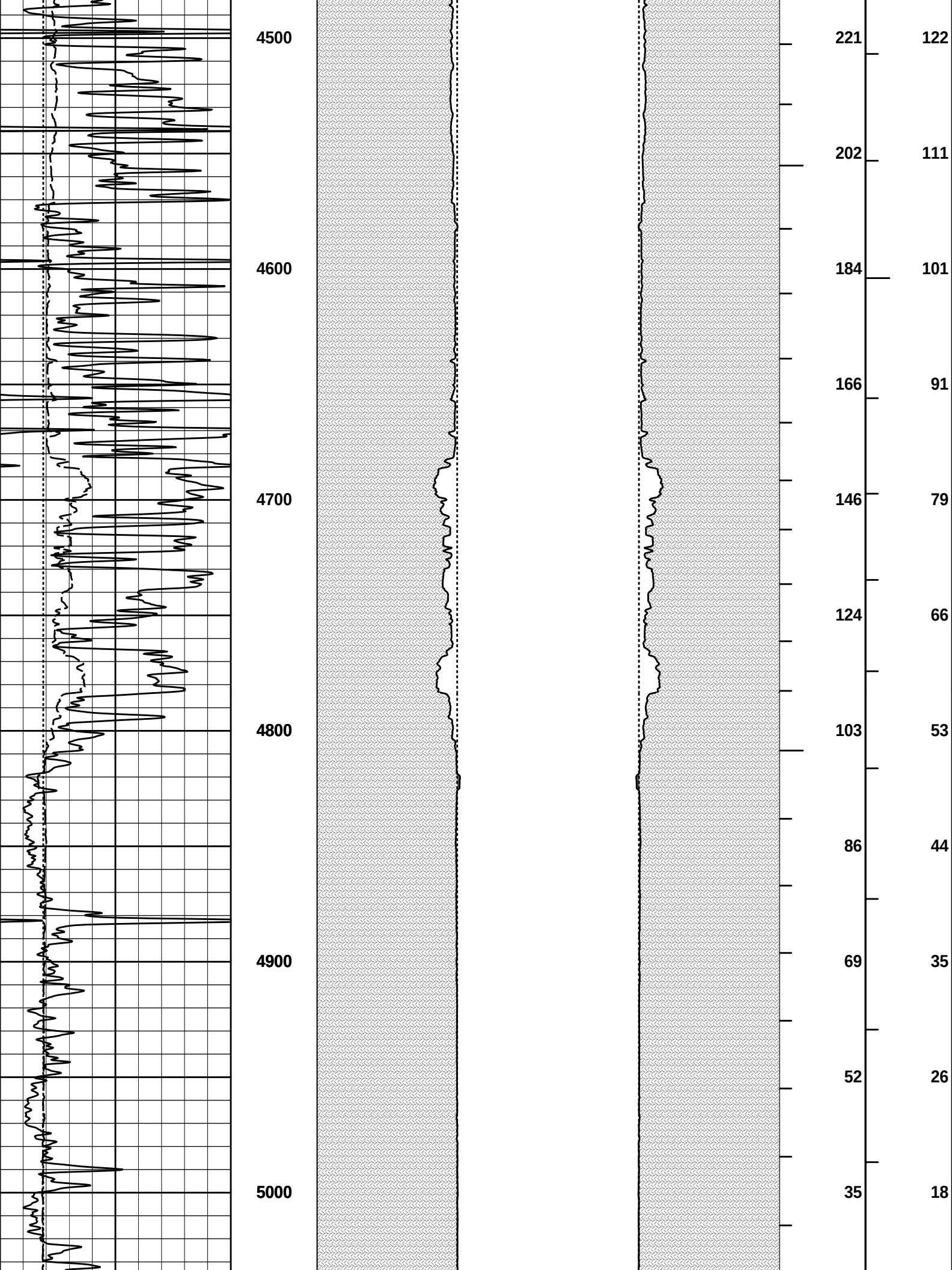


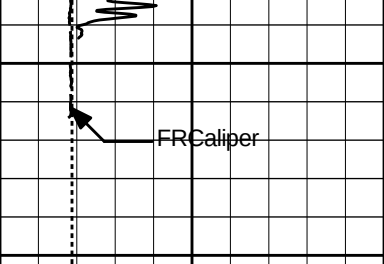
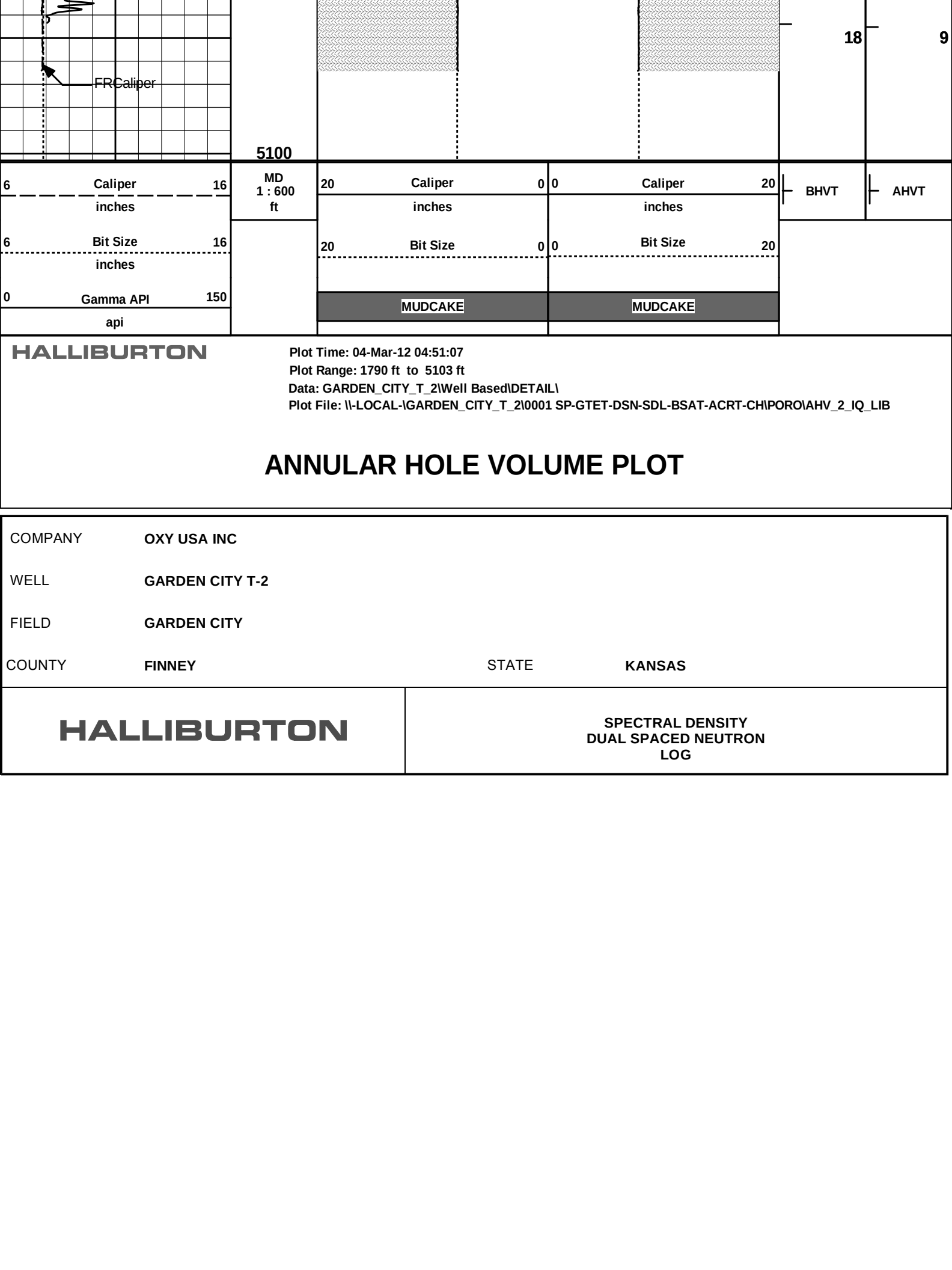












6	Caliper	16
	inches	
6	Bit Size	16
	inches	
0	Gamma API	150
	api	

5100
MD 1 : 600 ft

20	Caliper	0	0
	inches		
20	Bit Size	0	0
	MUDCAKE		

20	Caliper	20
	inches	
20	Bit Size	20
	MUDCAKE	

18	9
BHVT	AHVT

HALLIBURTON

Plot Time: 04-Mar-12 04:51:07

Plot Range: 1790 ft to 5103 ft

Data: GARDEN_CITY_T_2\Well Based\DETAIL\

Plot File: \\LOCAL-IGARDEN_CITY_T_2\0001 SP-GTET-DSN-SDL-BSAT-ACRT-CHIPORO\AHV_2_IQ_LIB

ANNULAR HOLE VOLUME PLOT

COMPANY	OXY USA INC
WELL	GARDEN CITY T-2
FIELD	GARDEN CITY
COUNTY	FINNEY
STATE	KANSAS
HALLIBURTON	SPECTRAL DENSITY DUAL SPACED NEUTRON LOG