

HALLIBURTON				SPECTRAL DENSITY DUAL SPACED NEUTRON LOG			
COMPANY WELL FIELD/BLOCK COUNTY STATE				CMX, INC BLACK WIDOW OWWO 1-29 HARDING PRATT KANSAS			
Permanent Datum Log measured from Drilling measured from				COMPANY WELL FIELD/BLOCK COUNTY STATE			
Date Run No. Depth - Driller Depth - Logger Bottom - Logged Interval Top - Logged Interval Casing - Driller Casing - Logger Bit Size Type Fluid in Hole Density PH Source of Sample Rm @ Meas. Temperature Rmf @ Meas. Temperature Rmc @ Meas. Temperature Source Rmf Rm @ BHT Time Since Circulation Time on Bottom Max. Rec. Temperature Equipment Recorded By Witnessed By				API No. Location Sect. 29 Twp. 29S Rge. 11W Elev. 1861.0 ft GL KB KB 9.0 ft above perm. Datum Elev.: K.B. D.F. G.L. 1870.0 ft 1870.0 ft 1861.0 ft Other Services: GTET DSNT SDLT BSAT ACRT			
19-Oct-17 ONE 4748.0 ft 4738.0 ft 4730.0 ft 353.0 ft 8.625 in 353.0 ft 7.875 in Water Based Mud 8.5 ppg 9.50 pH FLOWLINE 0.55 ohmm 0.63 ohmm 0.47 ohmm MEAS 0.21 ohmm 03.37 hr 19-Oct-17 00:37 120.00 degF @ 4736.0 ft 12156883 MICHAEL RICHTER LEAH KASTEN				CMX, INC BLACK WIDOW OWWO 1-29 HARDING PRATT KANSAS			

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Service Ticket No.: 904369081						API No.: 15-151-20320-00				PGM Version: WL INSITE R5.0.5 (Build 8)					
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.		@		@				ONE	ACRT	NONE		CENT		N/A	
Rmc @ Meas. Temp.		@		@					I-11055059						
Source Rmf	Rmc								S-11038385						
Rm @ BHT		@		@											
Rmf @ BHT		@		@											
Rmc @ BHT		@		@											
EQUIPMENT DATA															
GAMMA				ACOUSTIC				DENSITY				NEUTRON			
Run No.	ONE			Run No.	ONE			Run No.	ONE			Run No.	ONE		
Serial No.	11021139			Serial No.	10939049			Serial No.	10865881			Serial No.	11019641		
Model No.	GTET			Model No.	BSAT			Model No.	SDLT			Model No.	DSNT		
Diameter	3.625"			No. of Cent.	2			Diameter	6.0"			Diameter	3.625"		
Detector Model No.	GTET			Spacing	0.5"			Log Type	GAM-GAM			Log Type	NEU-NEU		
Type	SCINT							Source Type	Cs-137			Source Type	Am241Be		
Length	8"			LSA [Y/N]				Serial No.	5155GW			Serial No.	DSN-436		
Distance to Source	N/A			FWDA [Y/N]				Strength	1.5 Ci			Strength	15 Ci		
LOGGING DATA															
GENERAL				GAMMA		ACOUSTIC			DENSITY			NEUTRON			
Run	Depth		Speed	Scale		Scale		Matrix	Scale		Matrix	Scale		Matrix	
No.	From	To	ft/min	L	R	L	R		L	R		L	R		
ONE	TD	CSG	RED	0	150	30	-10	47.6 us/ft	30	-10	2.71 g/cc	30	-10	LIME	

DIRECTIONAL INFORMATION														
Maximum Deviation @								KOP @						
CLIENT REPORTED VERTICAL WELL														
Remarks: GTET-DSNT-SDLT RUN IN COMBINTION														
GTET-BSAT-ACRT RUN IN COMBINATION														
ANNULAR HOLE VOLUME CALCULATED FOR 5.5 INCH CASING														
DETAILED SECTION LOGGED UP TO 1.950 FT AS PER CLIENT REQUEST														
CHLORDES REPORTED AT 8500 PPM														
NO POST-CALS COMPLETED AS PER CLIENT REQUEST														
RIG: DUKE DRILLING RIG #4														
CREW: K. FITZPATRICK, R. BLANKENSHIP														
THANK YOU FOR CHOOSING HALLIBURTON ENERGY SERVICES -- EL RENO, OK -- 405.298.9685														
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														

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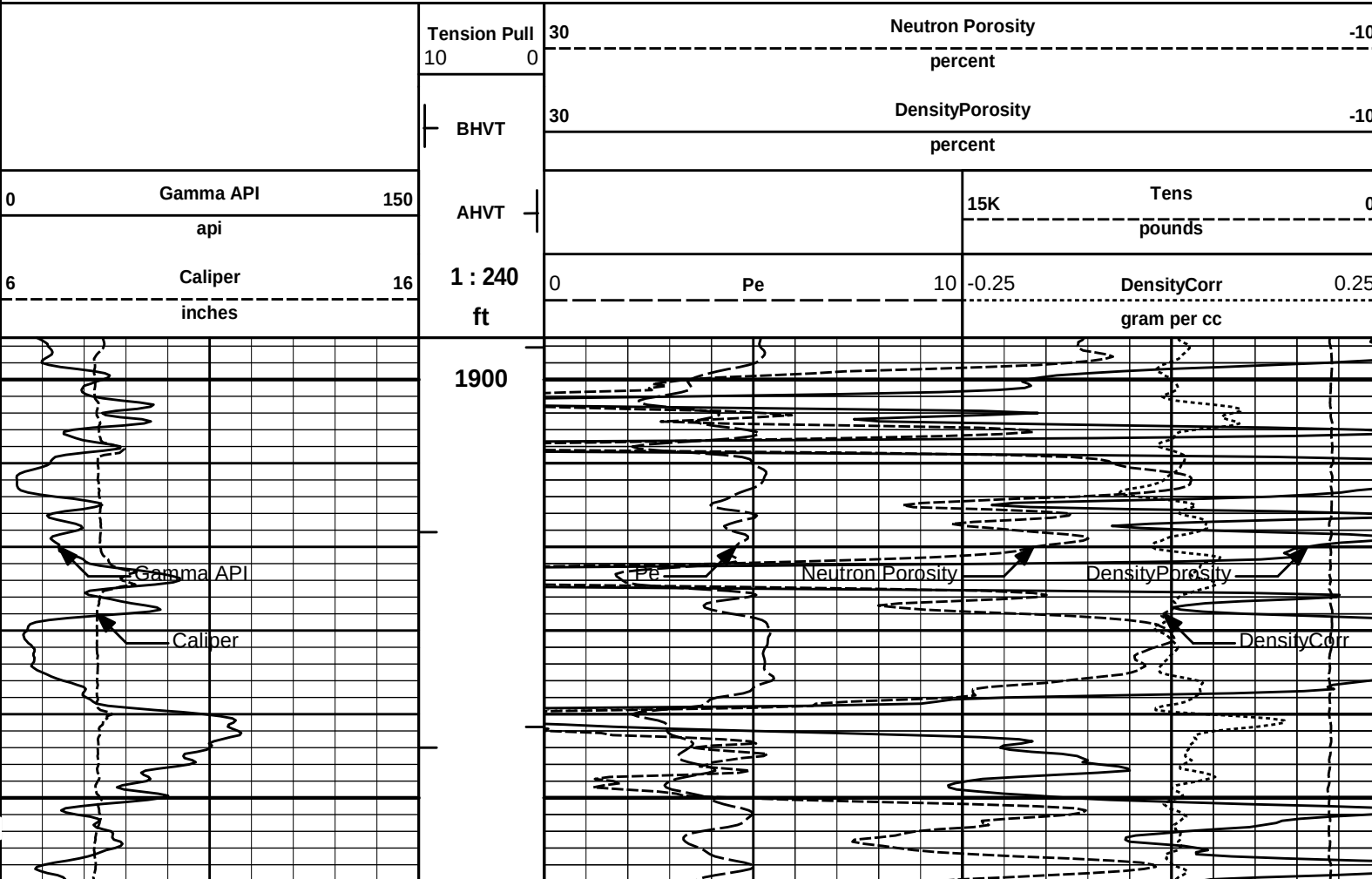
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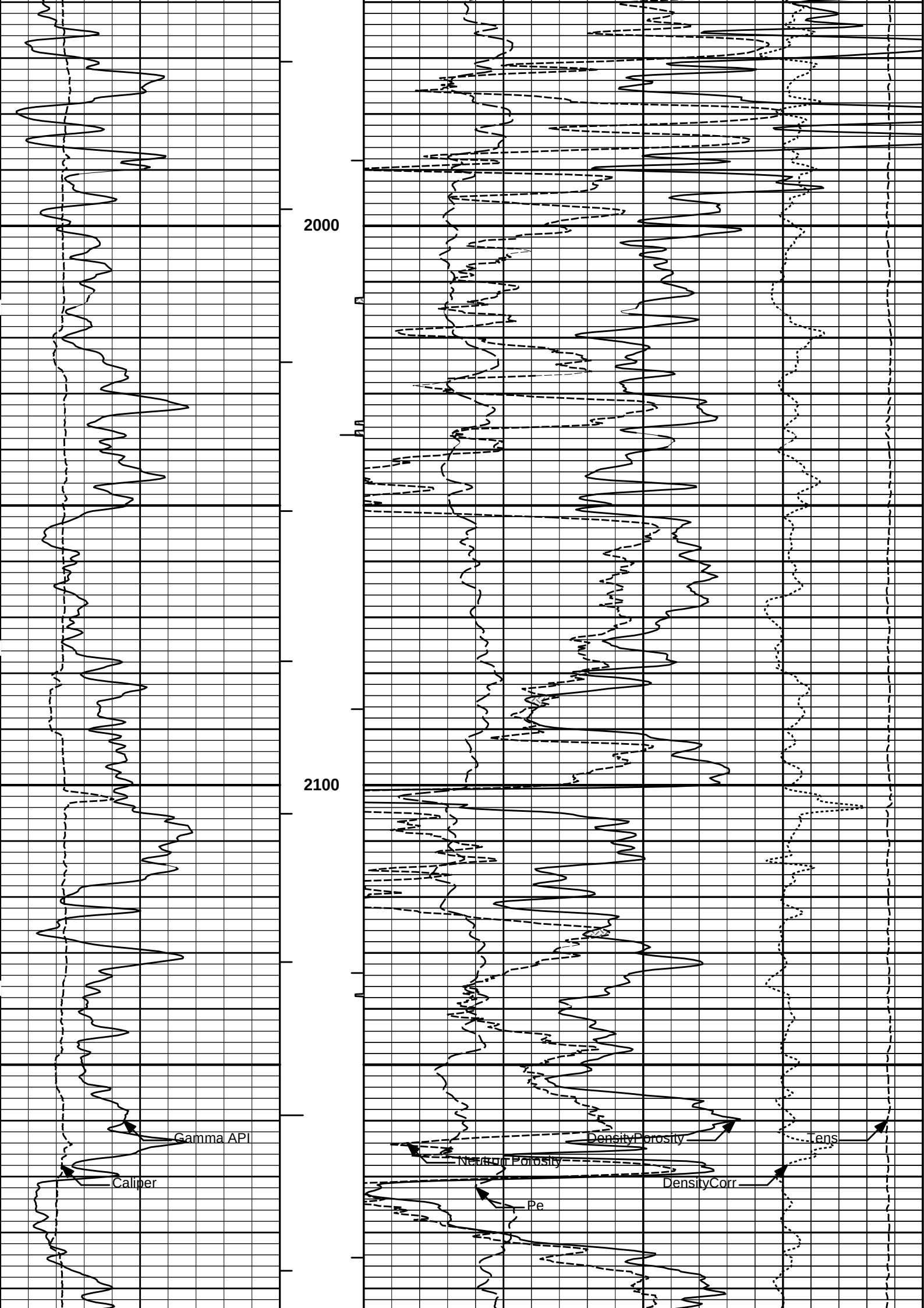
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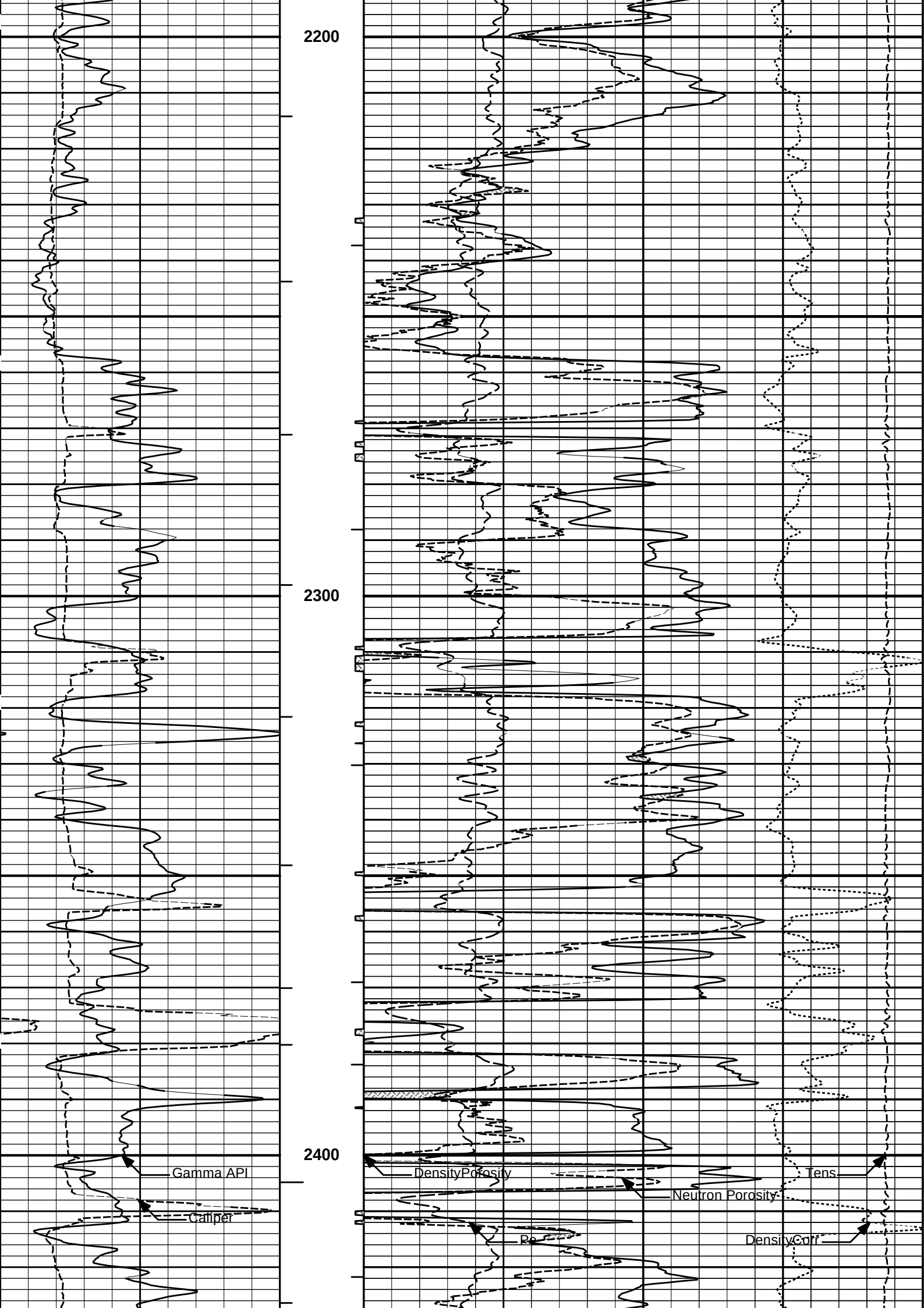
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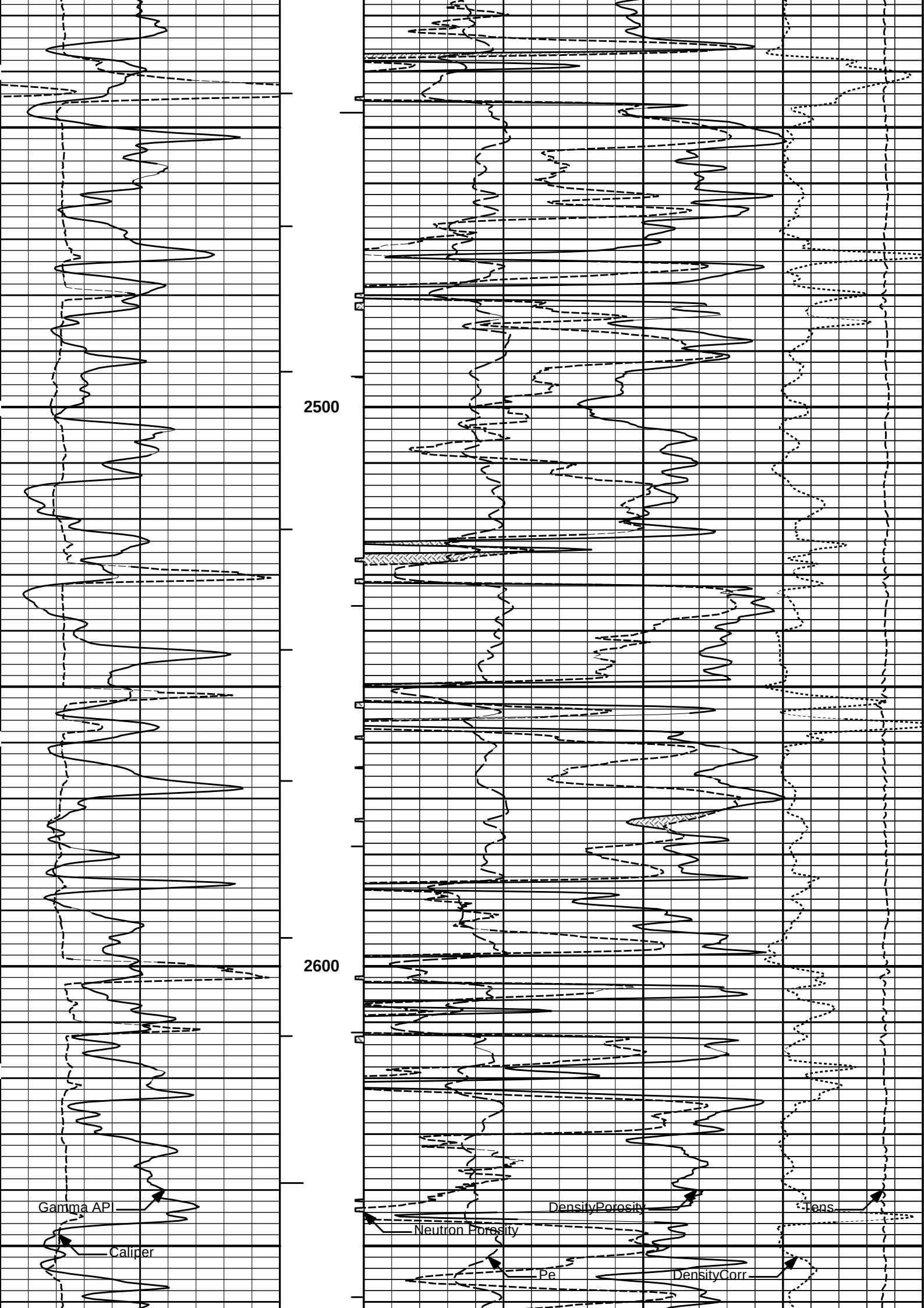
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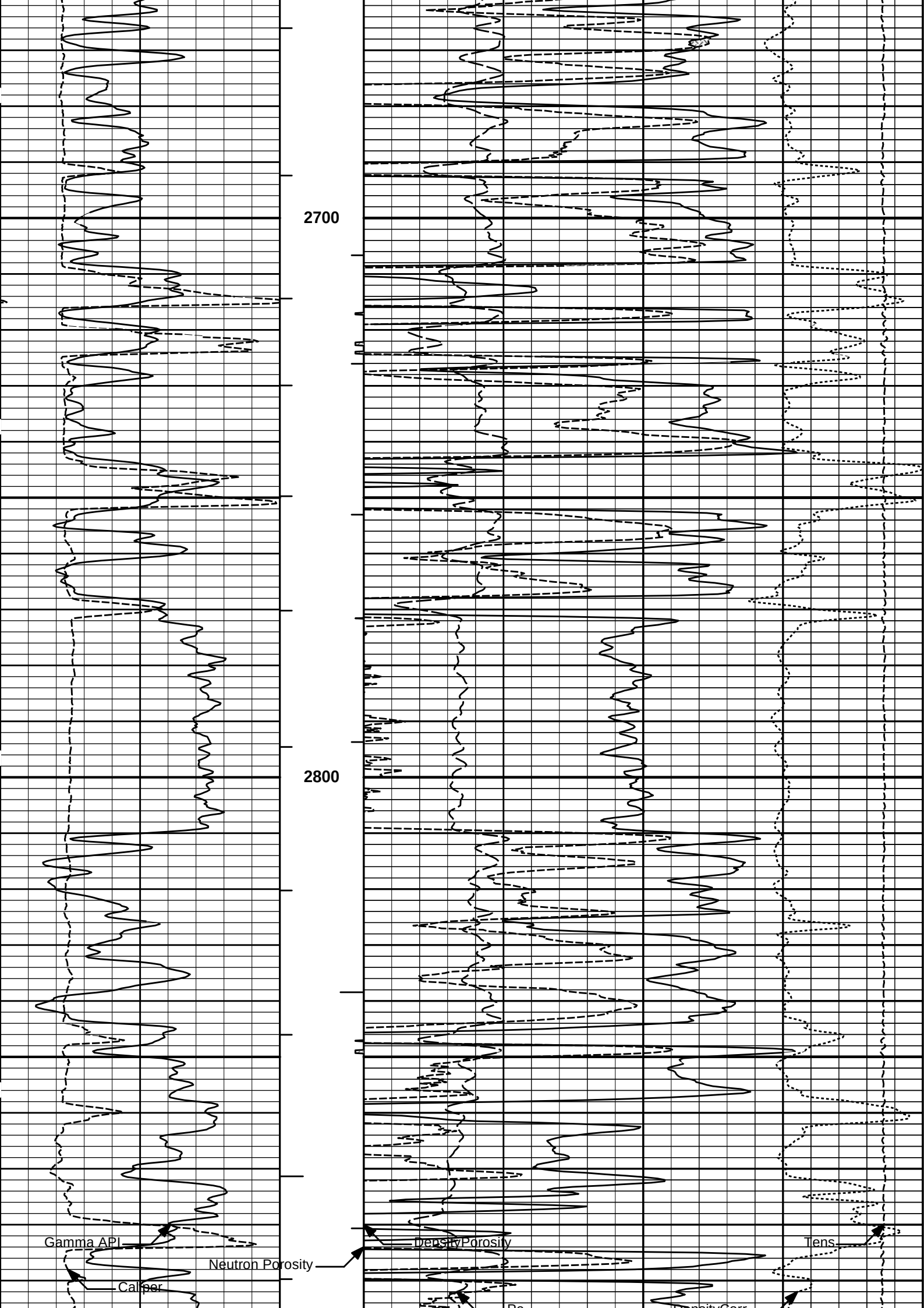
5 INCH MAIN LOG

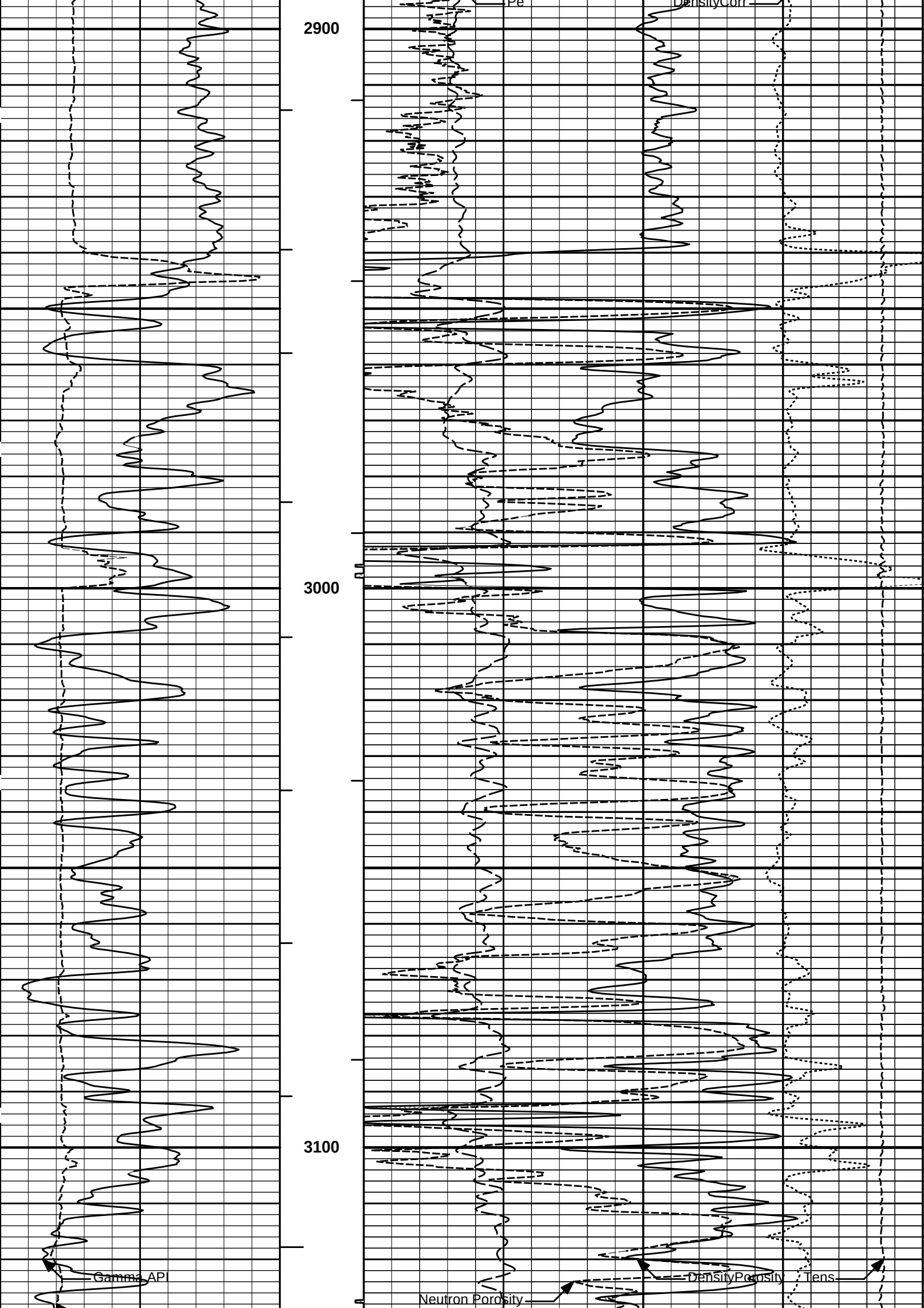


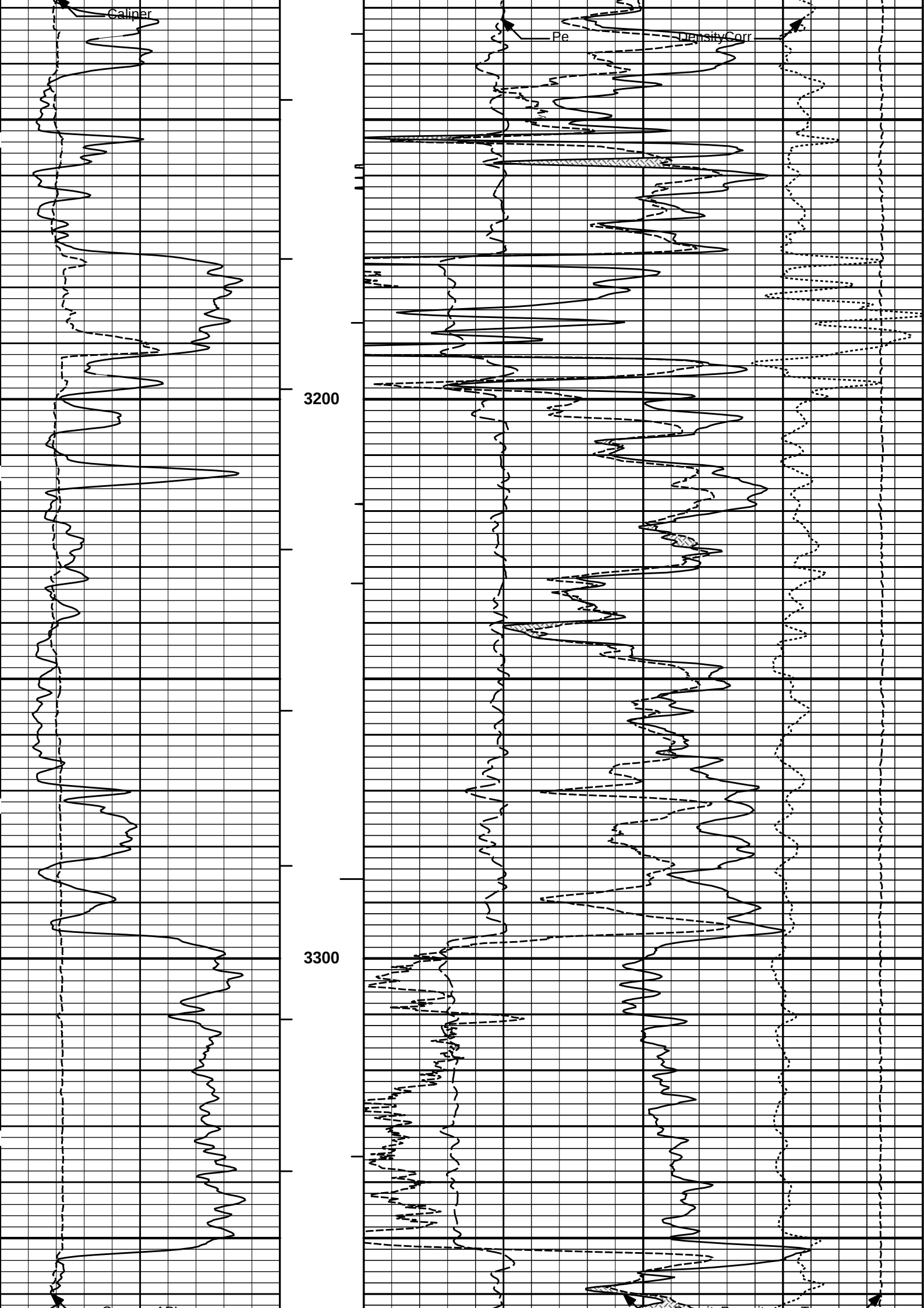


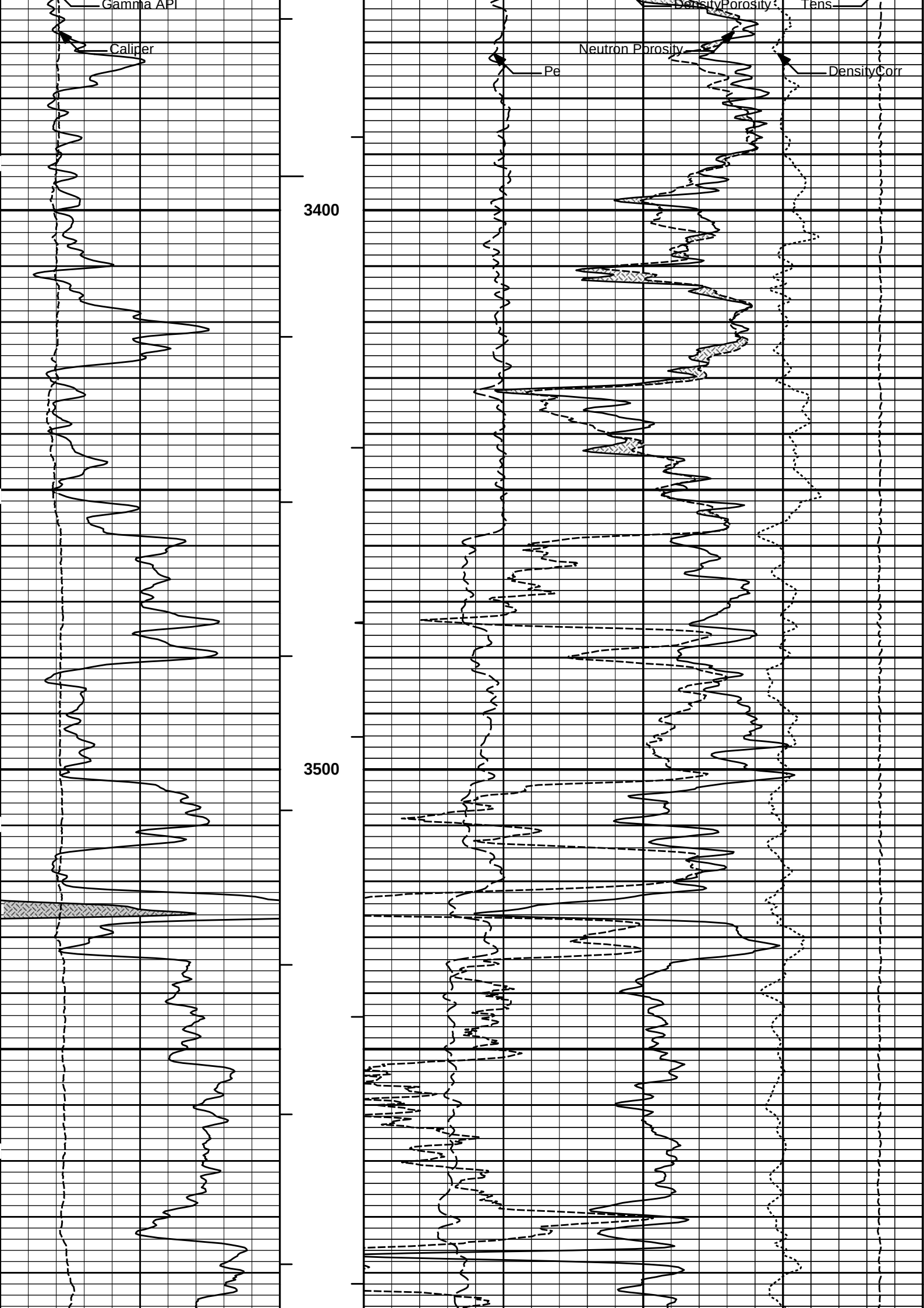


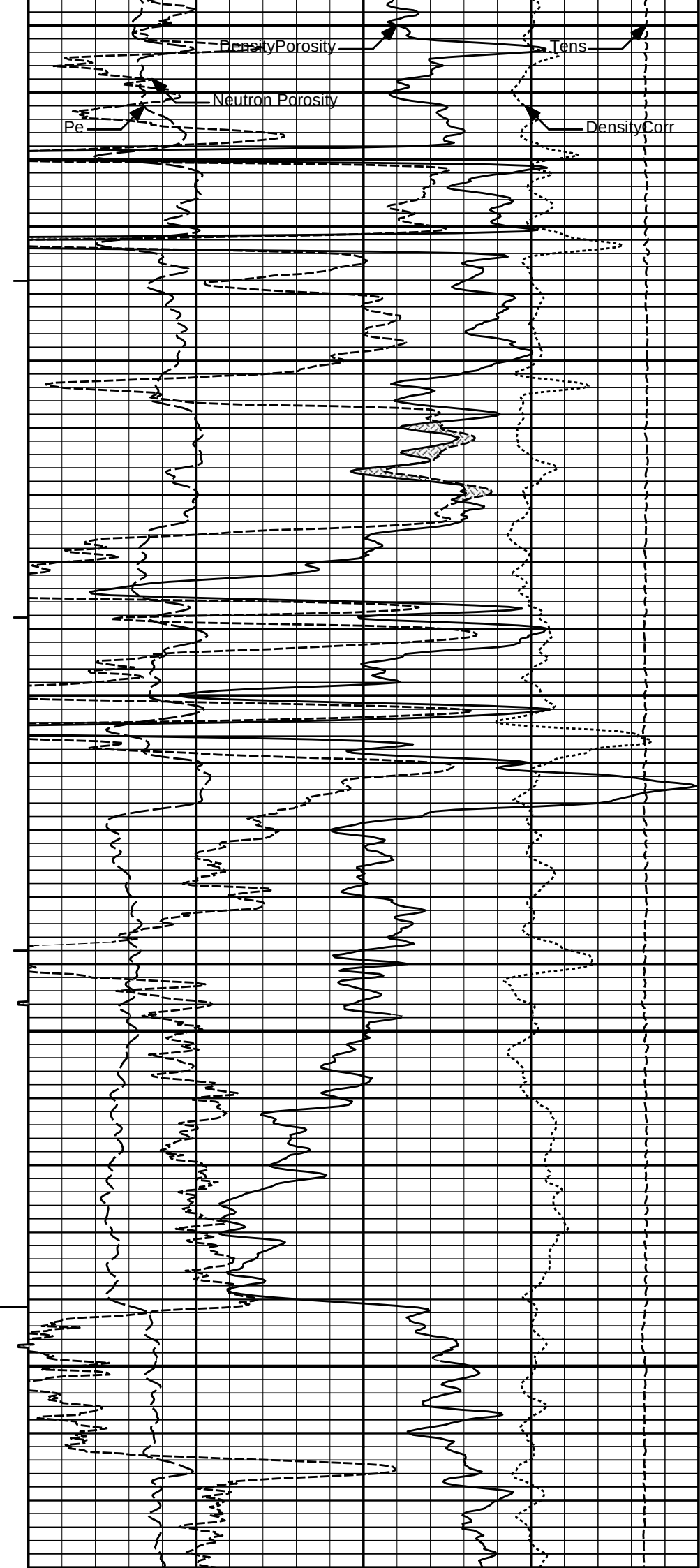
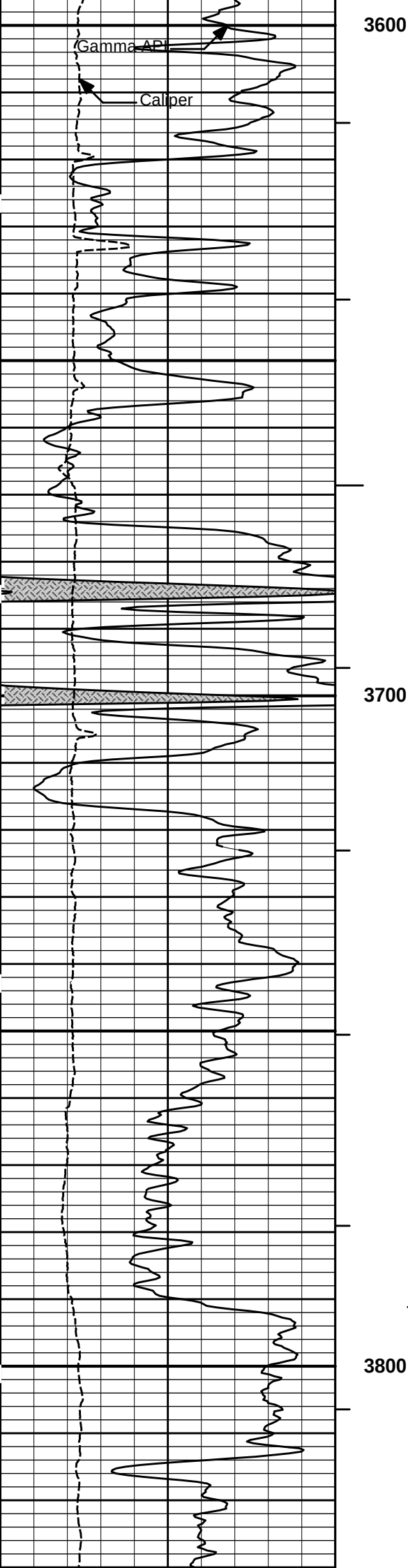


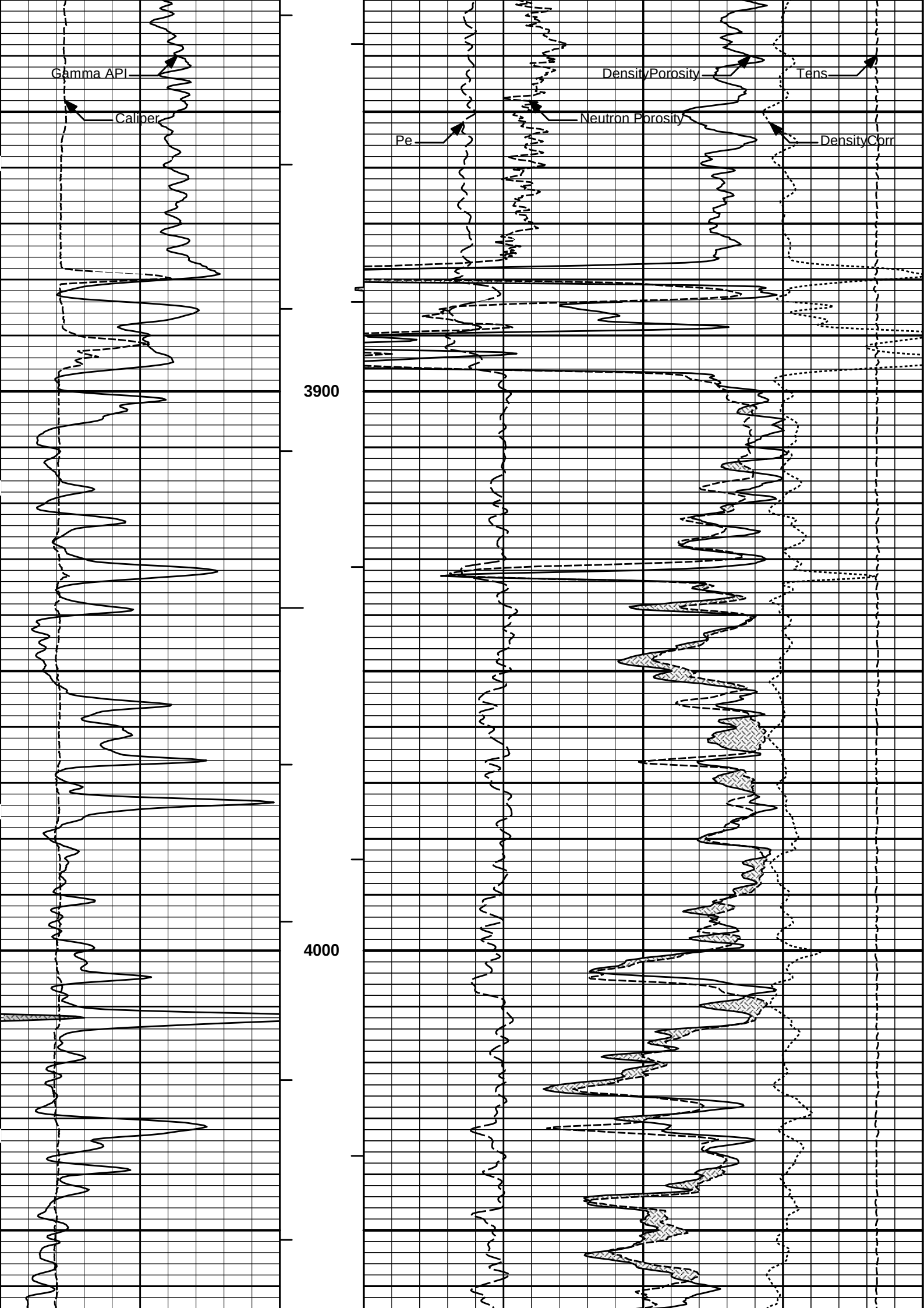


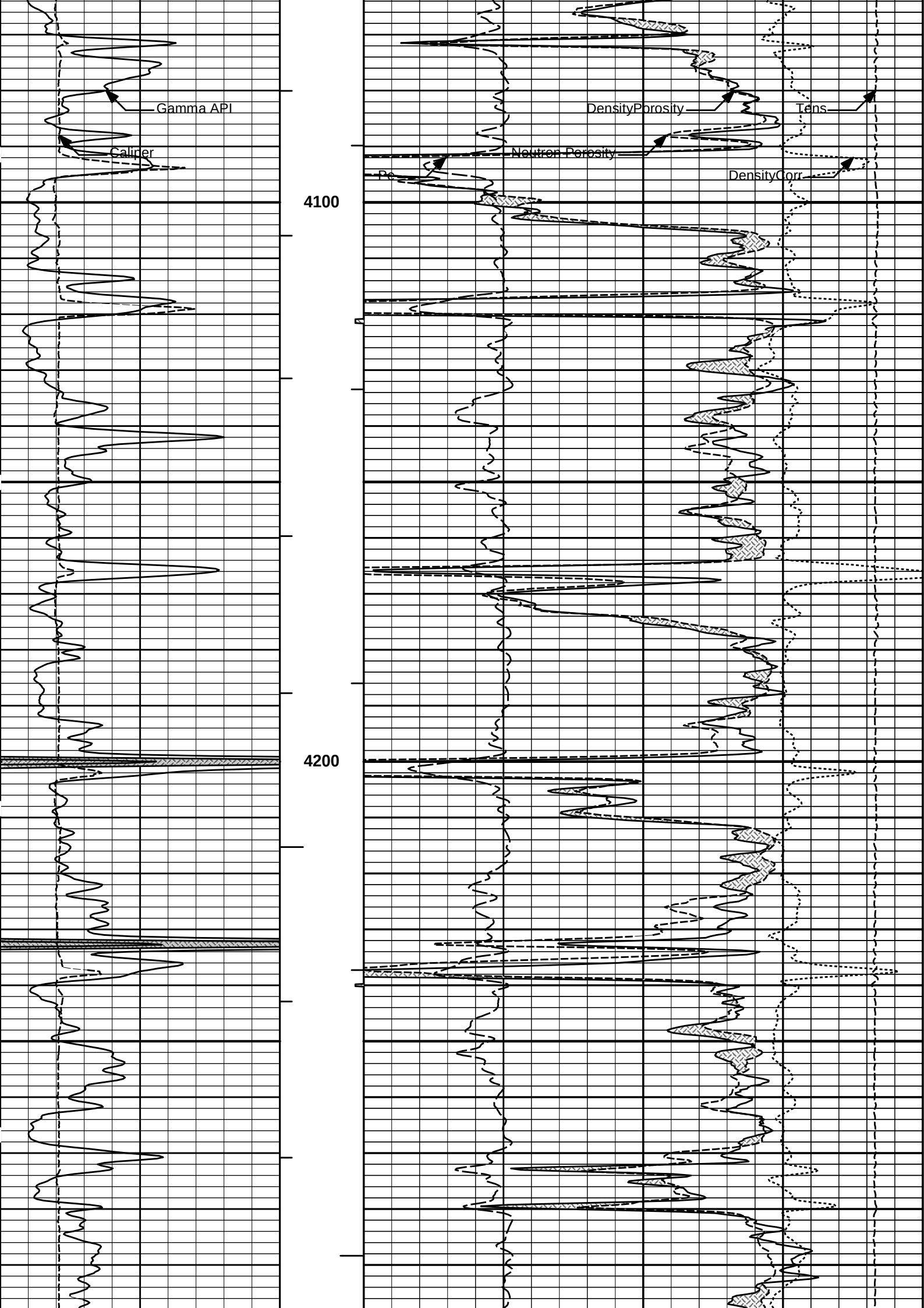


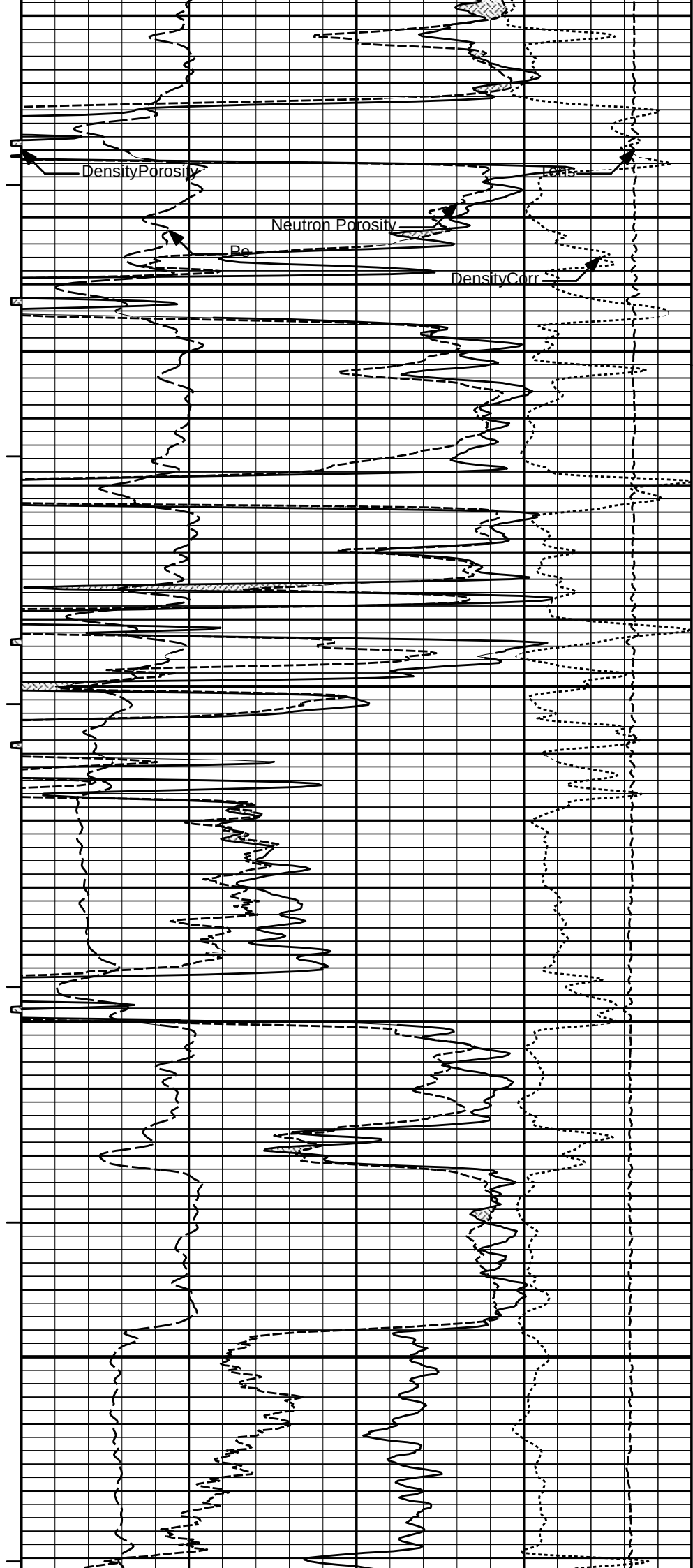
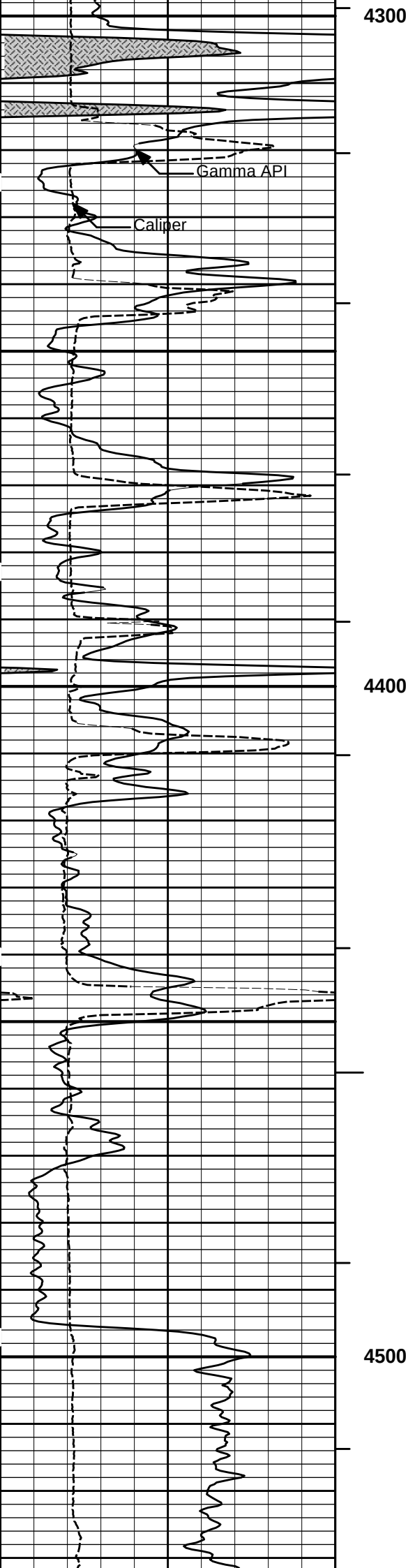


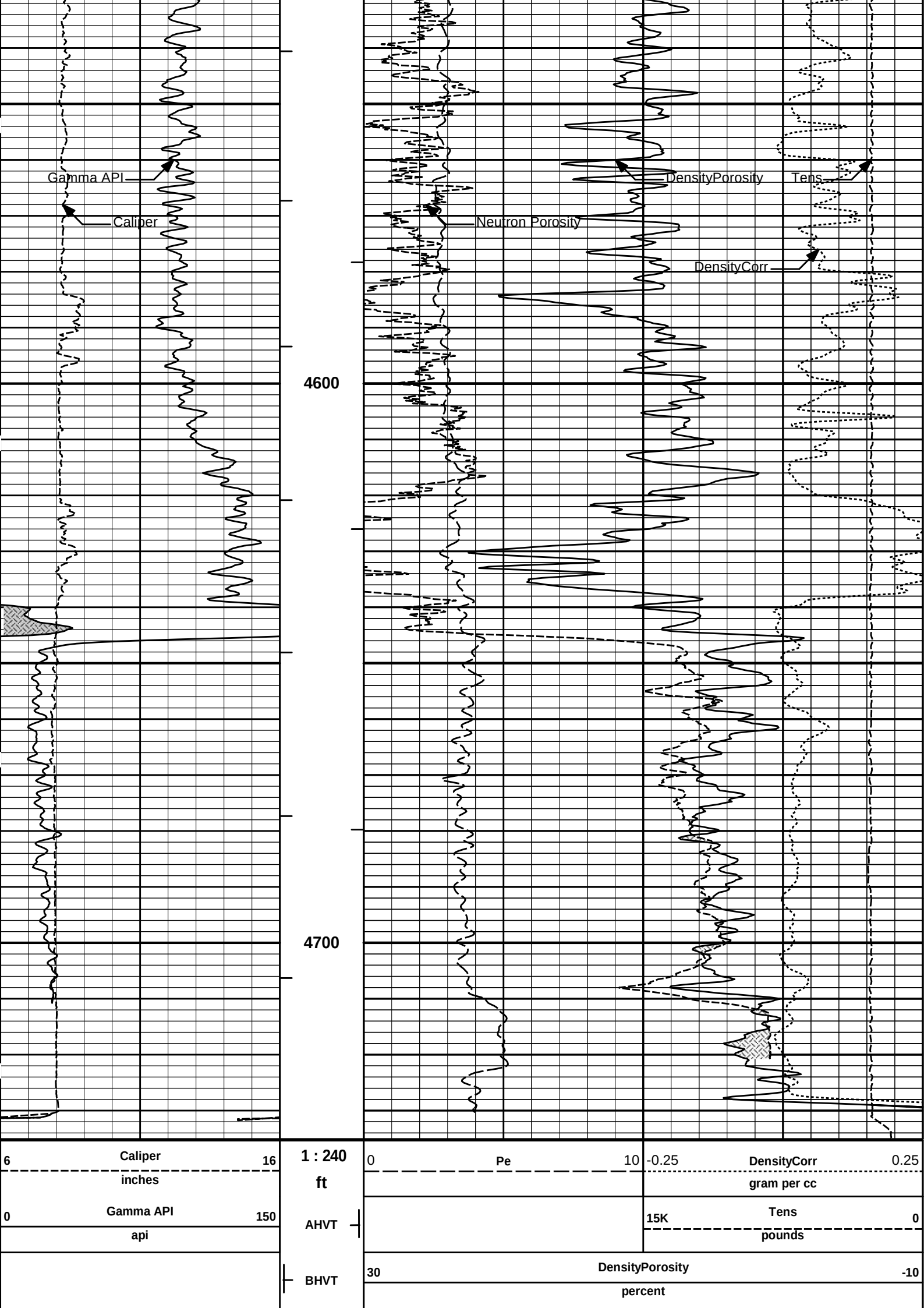


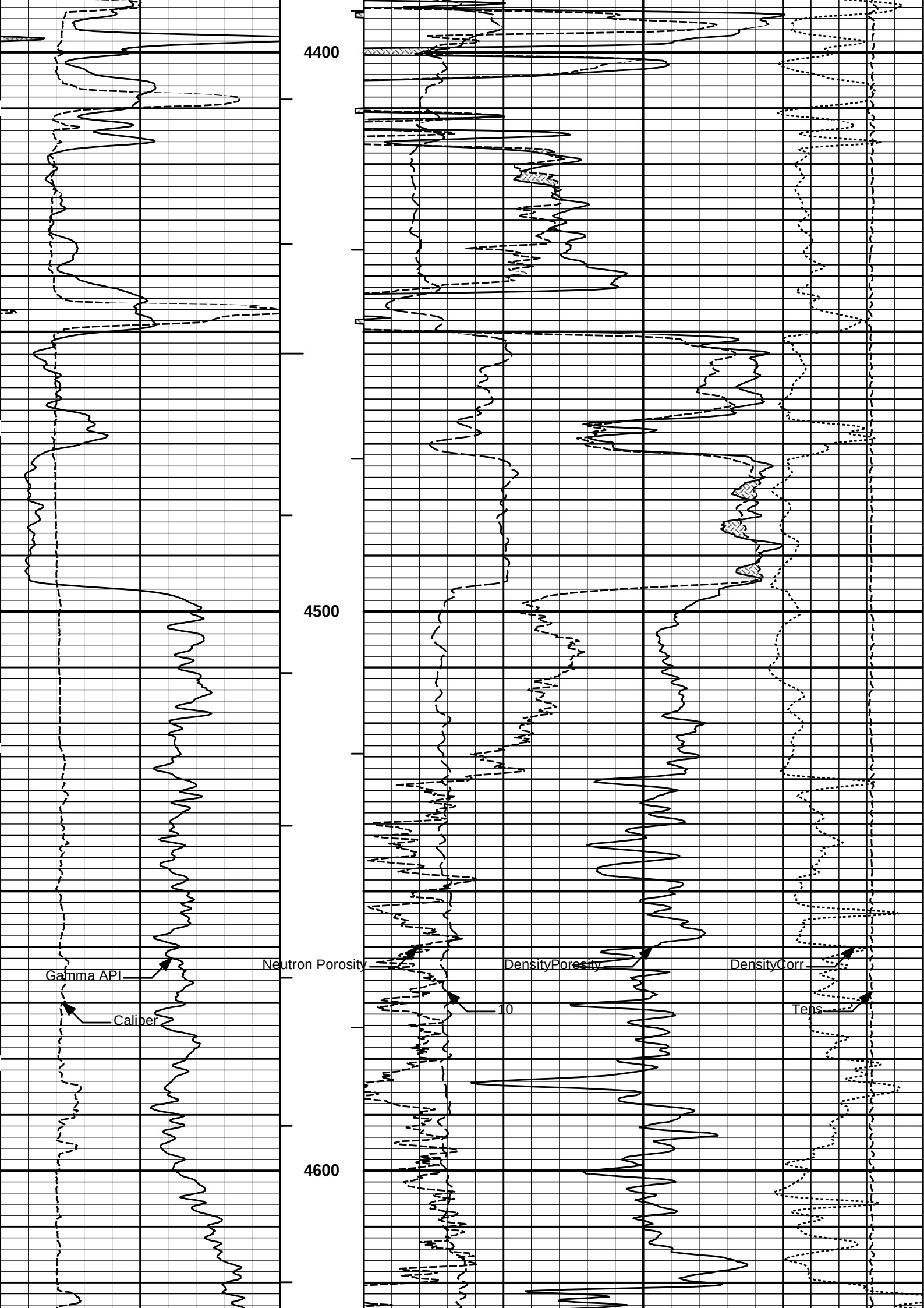


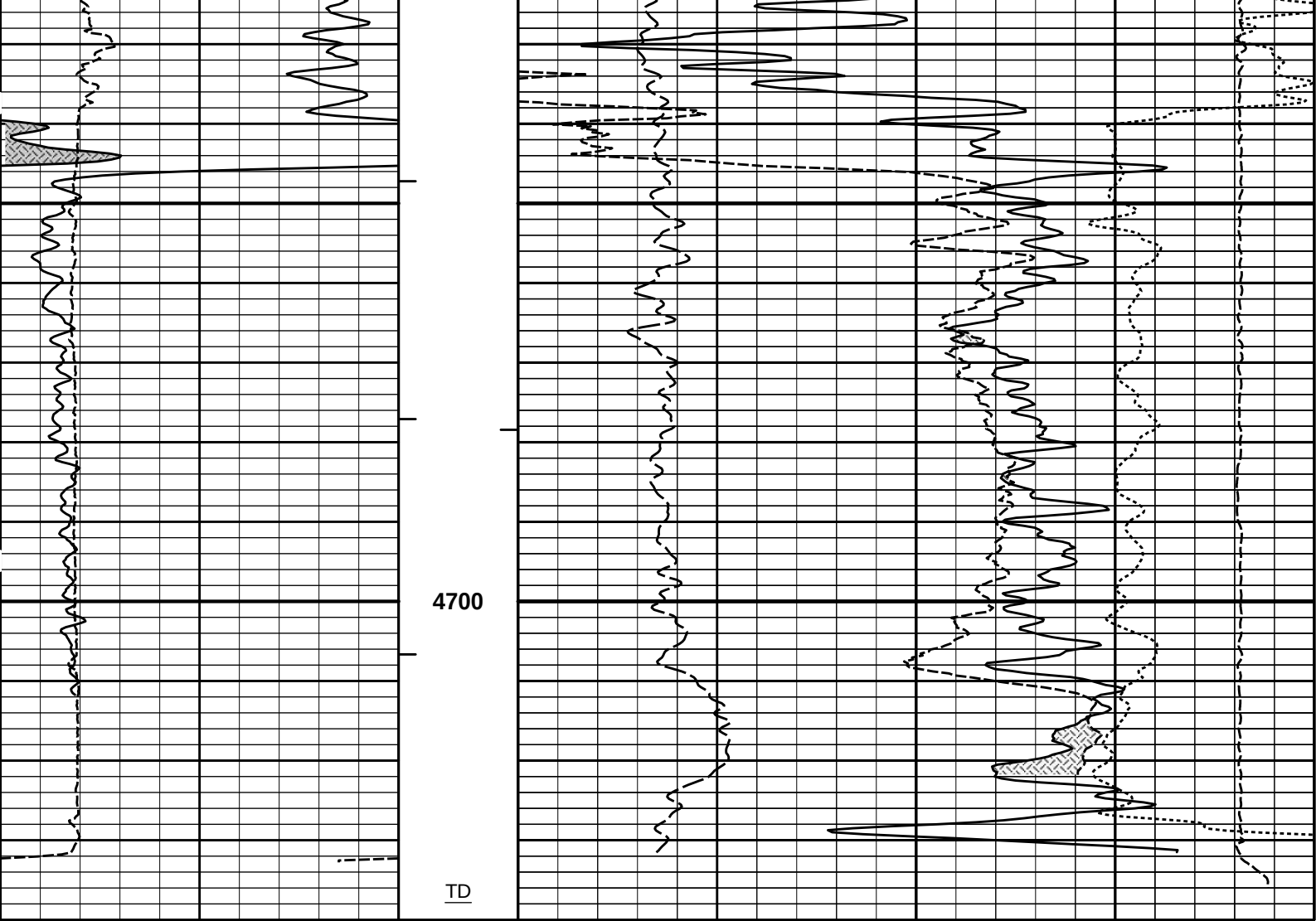












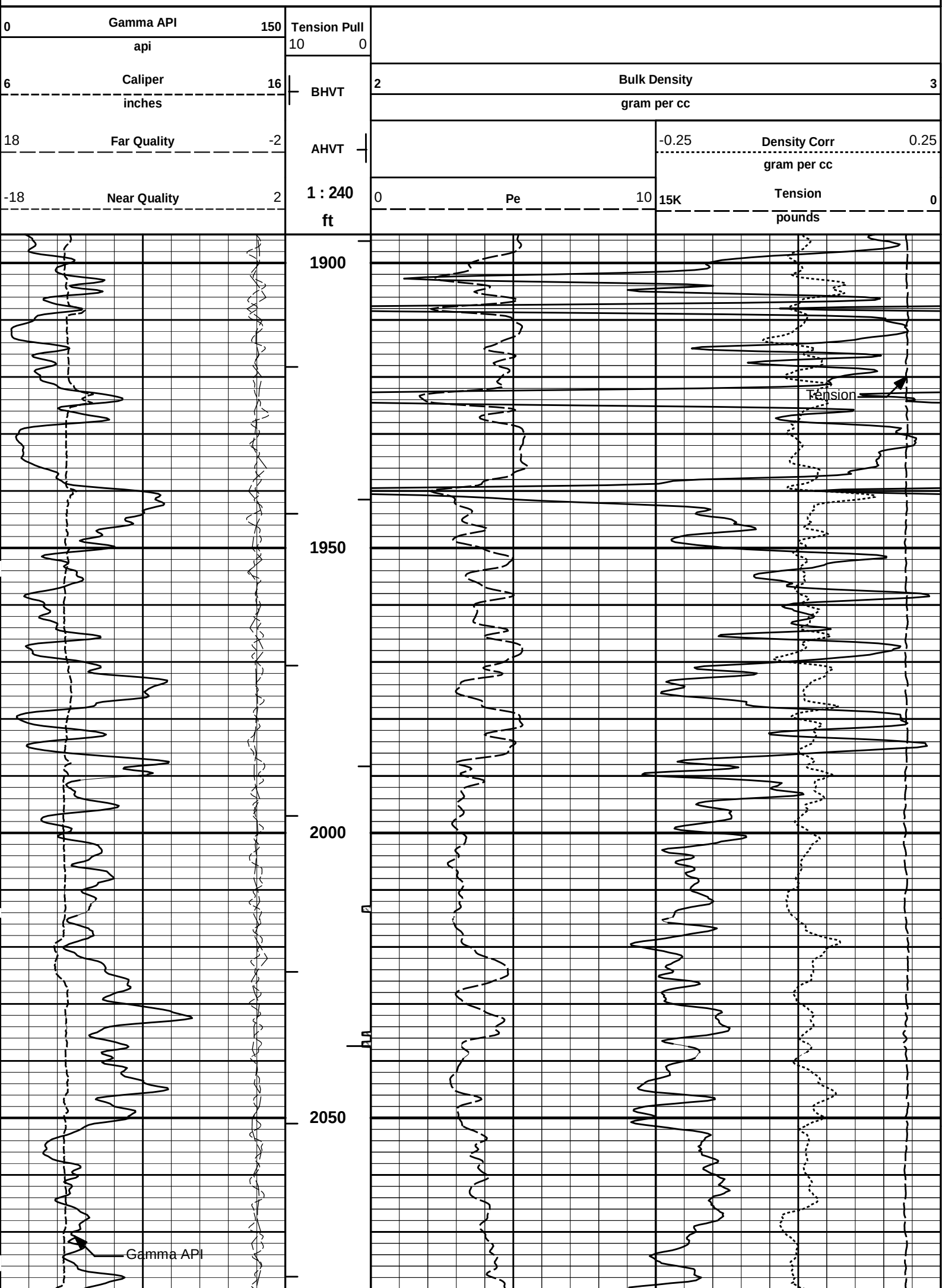
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	inches		ft					gram per cc	
0	Gamma API	150	AHVT				15K	Tens	0
	api							pounds	
			BHVT	30				DensityPorosity	-10
								percent	
			Tension Pull	30				Neutron Porosity	-10
			10	0				percent	

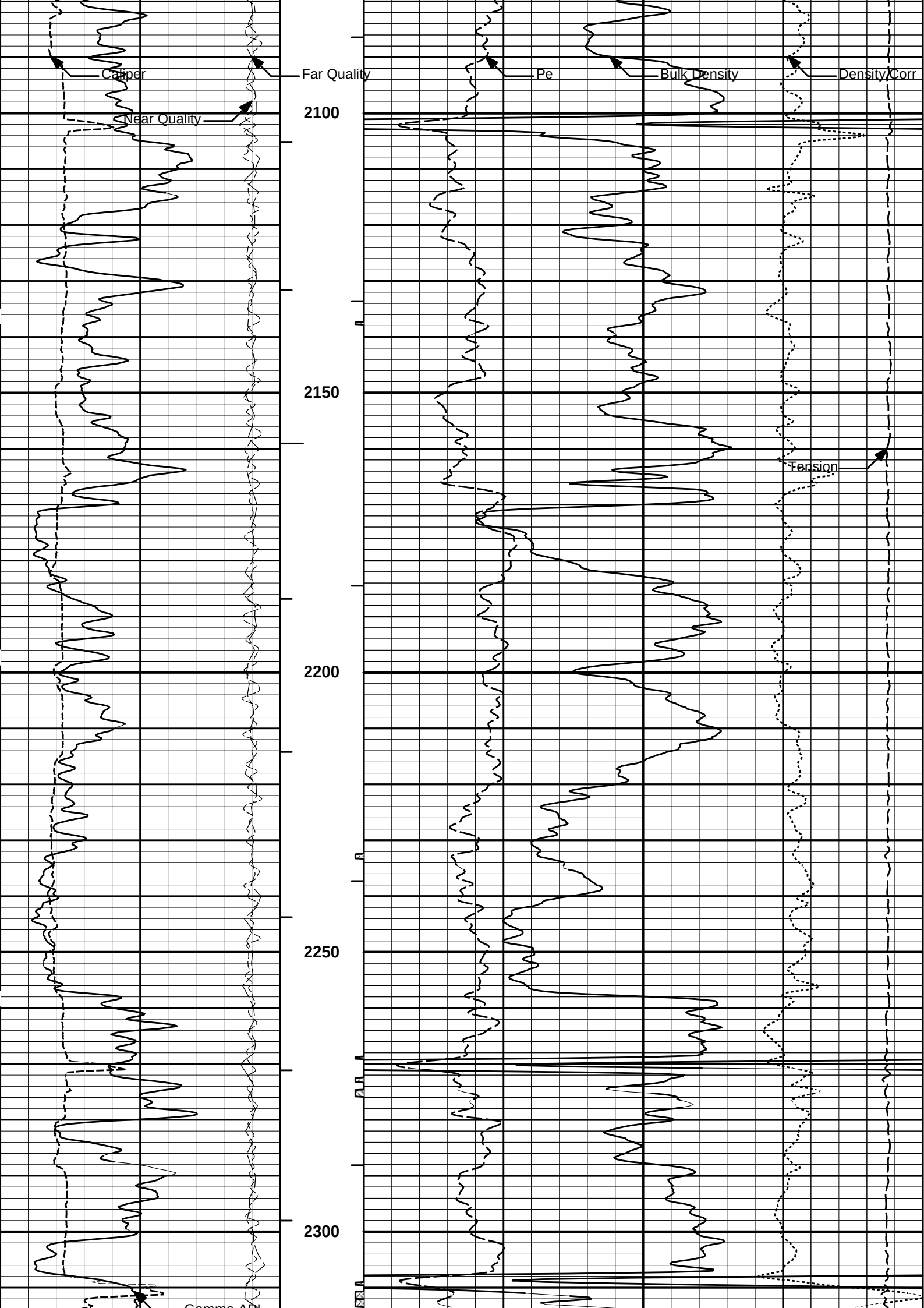
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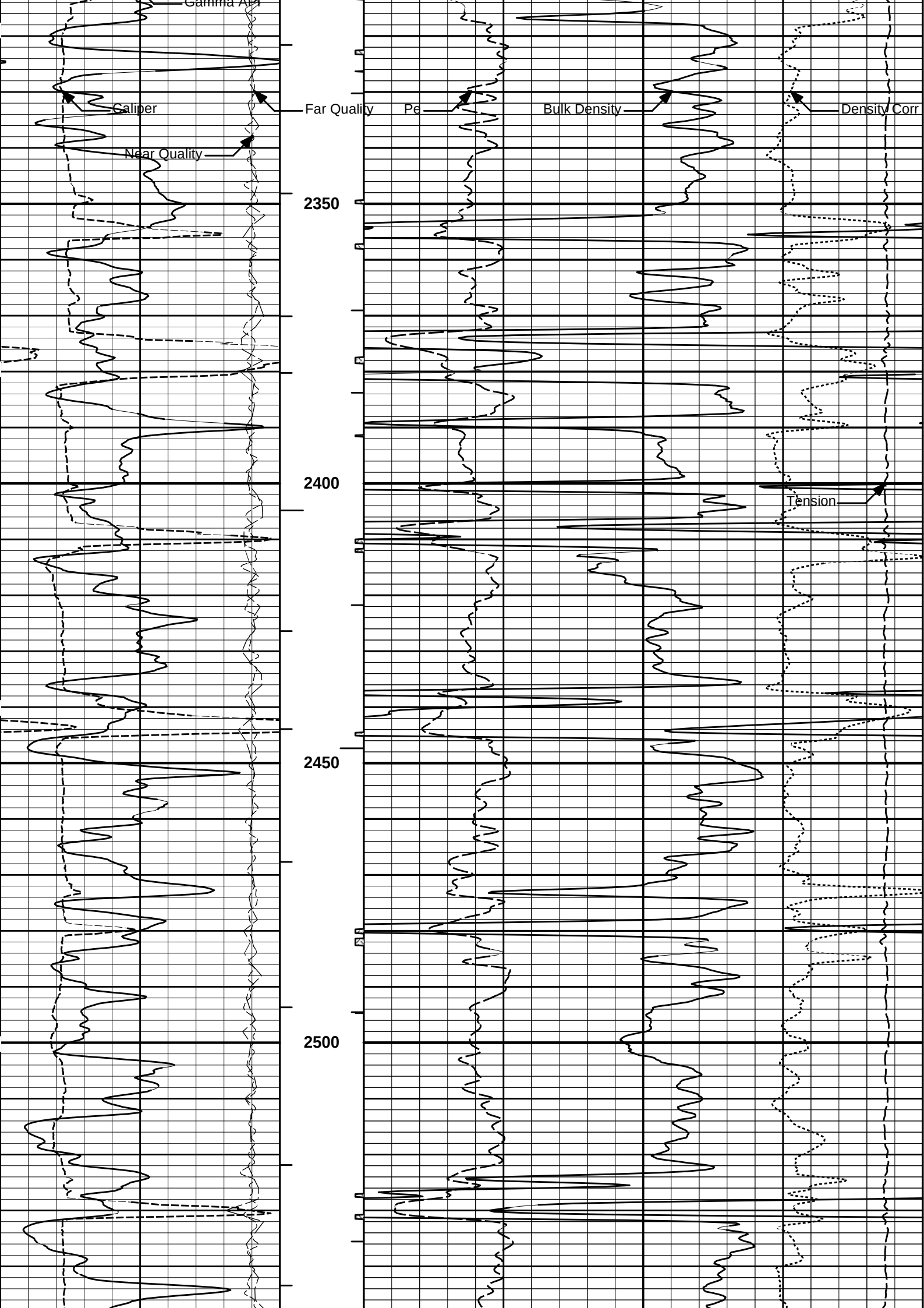
REPEAT SECTION

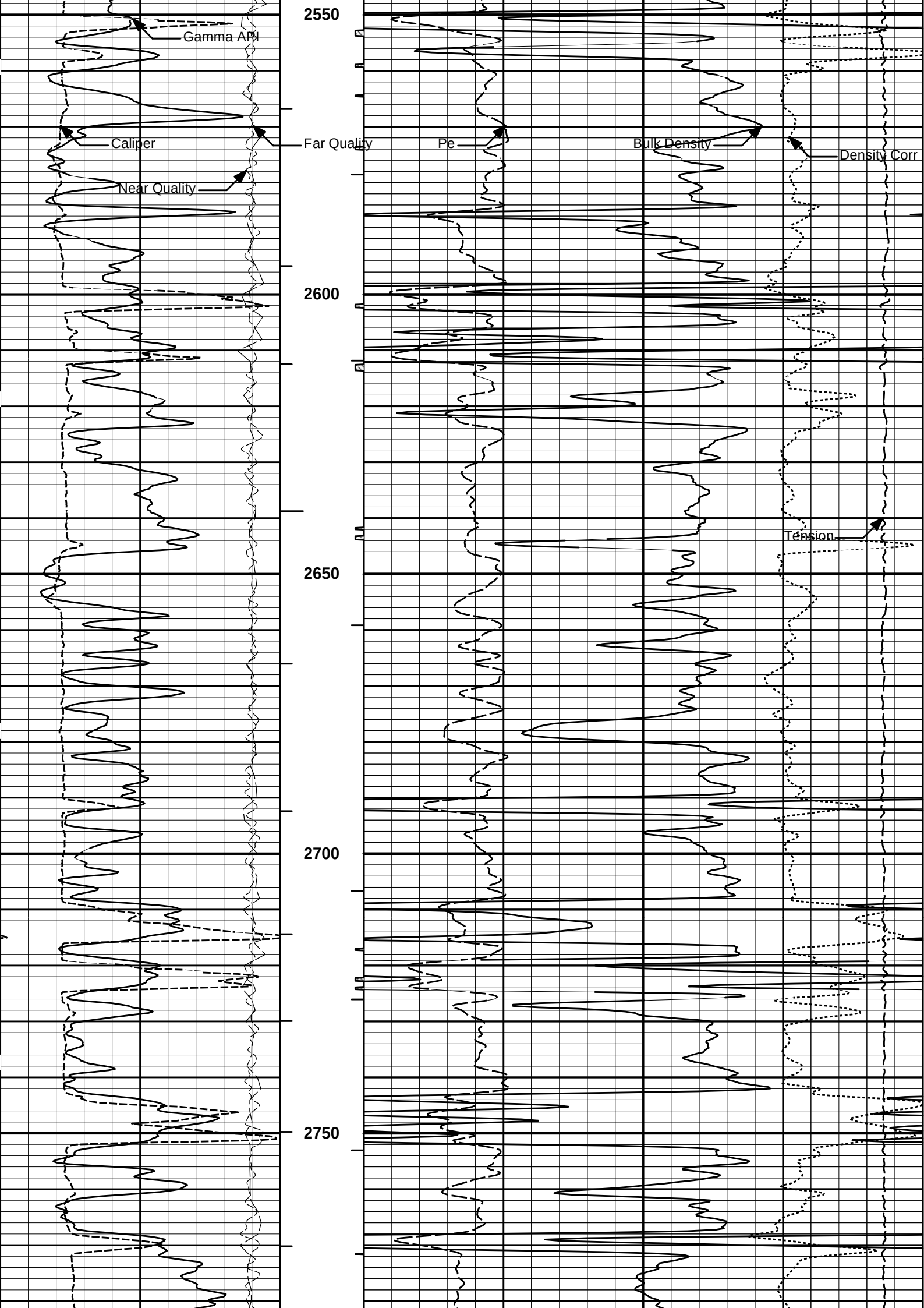
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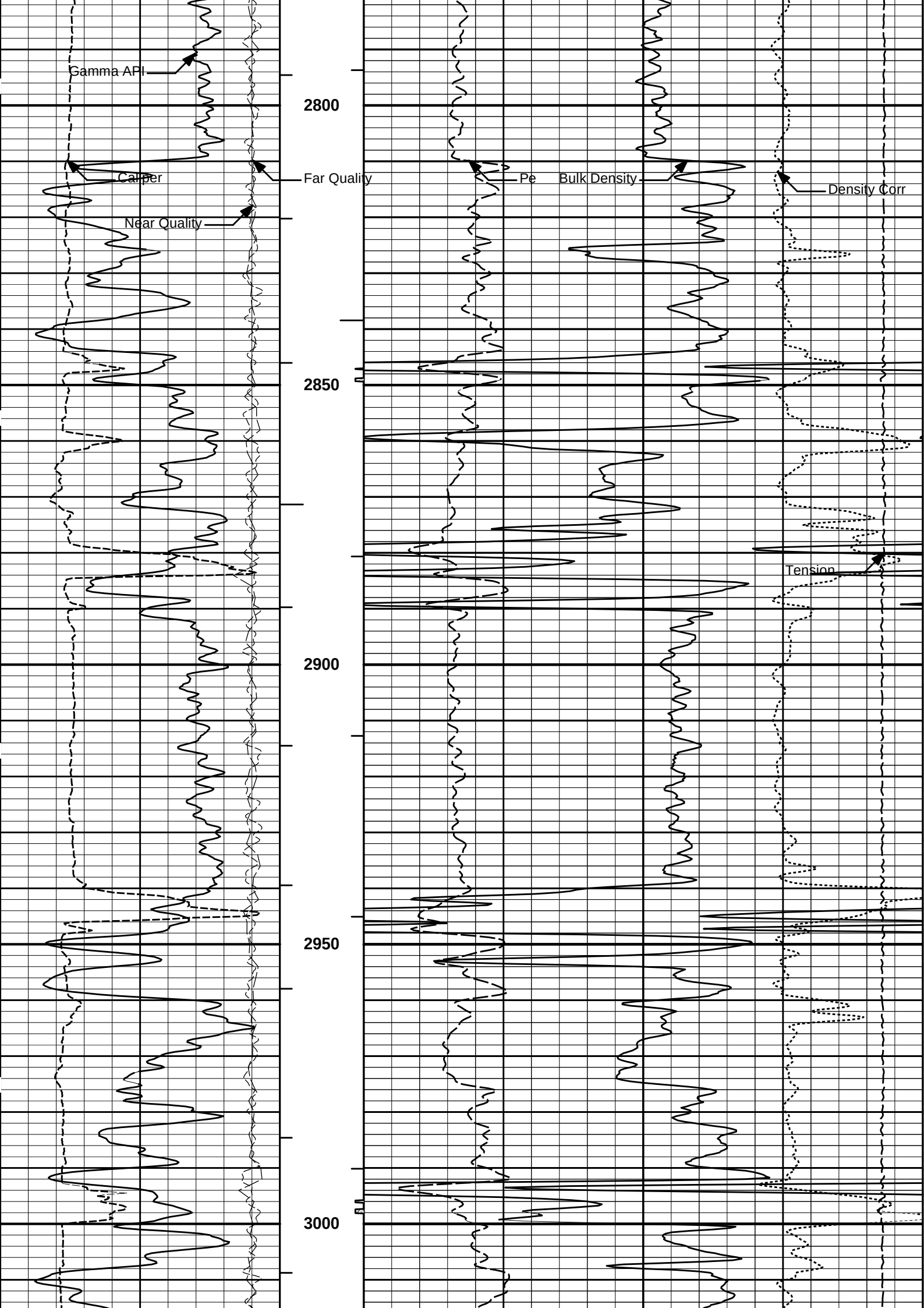
5 INCH MAIN LOG

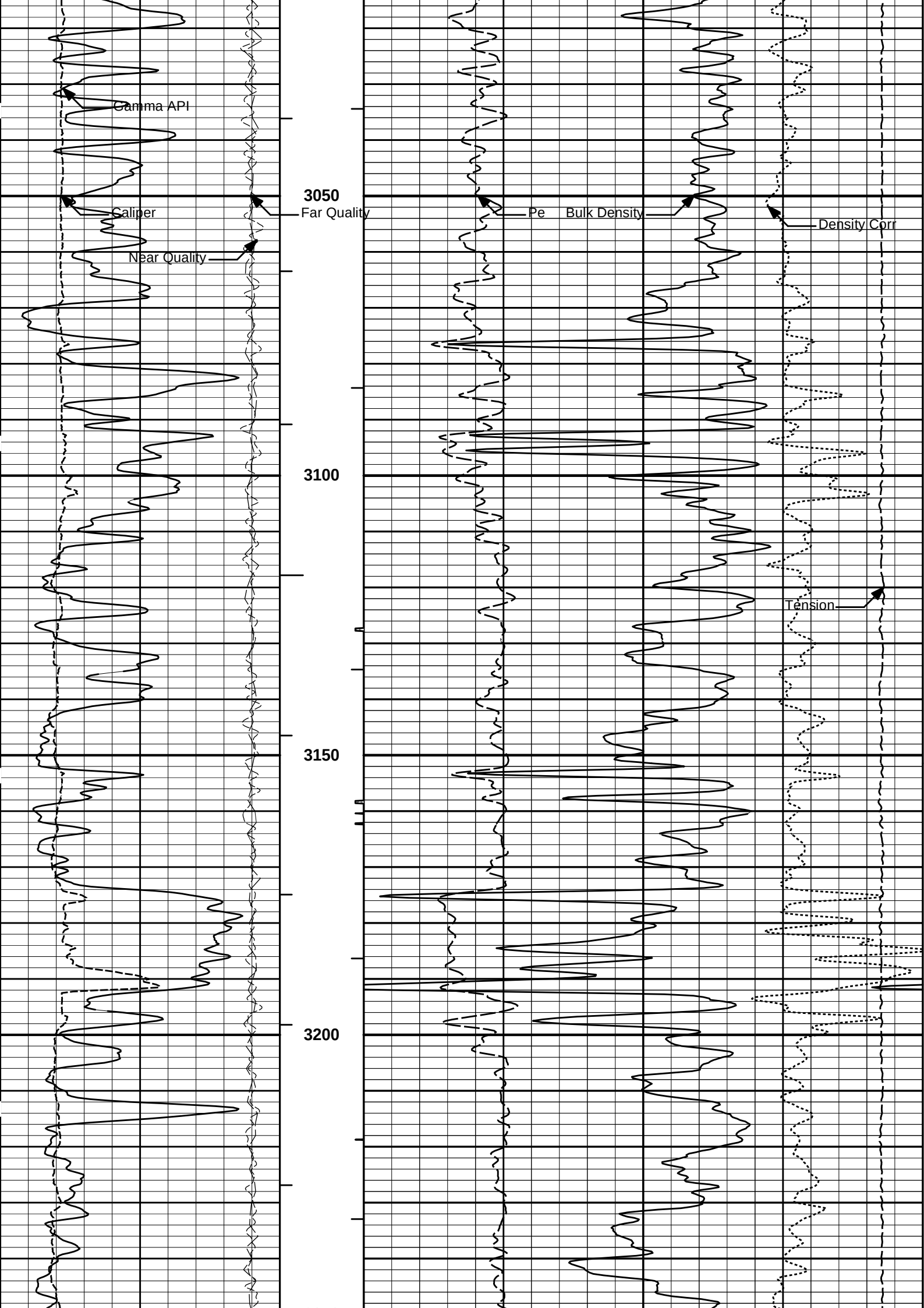


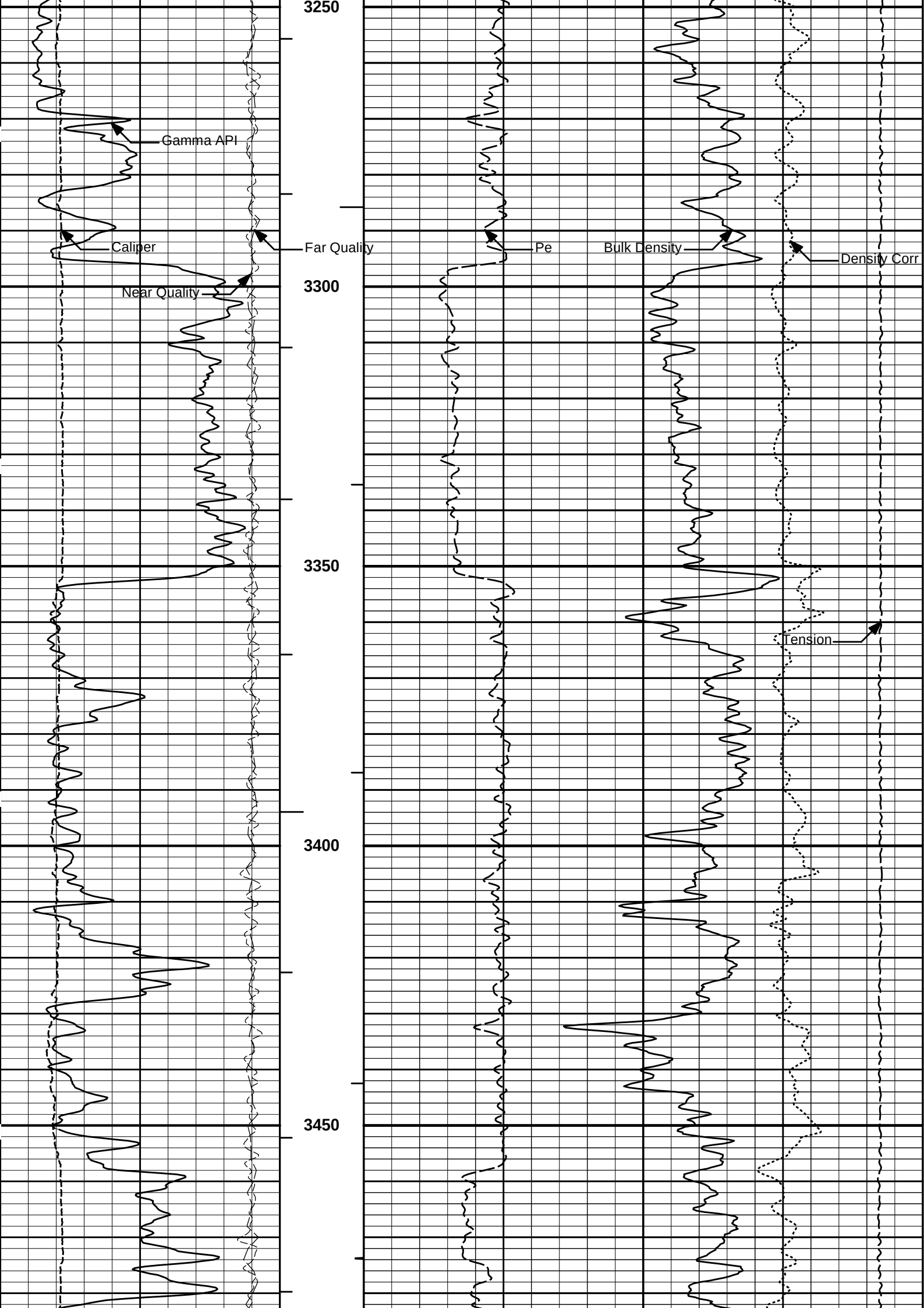


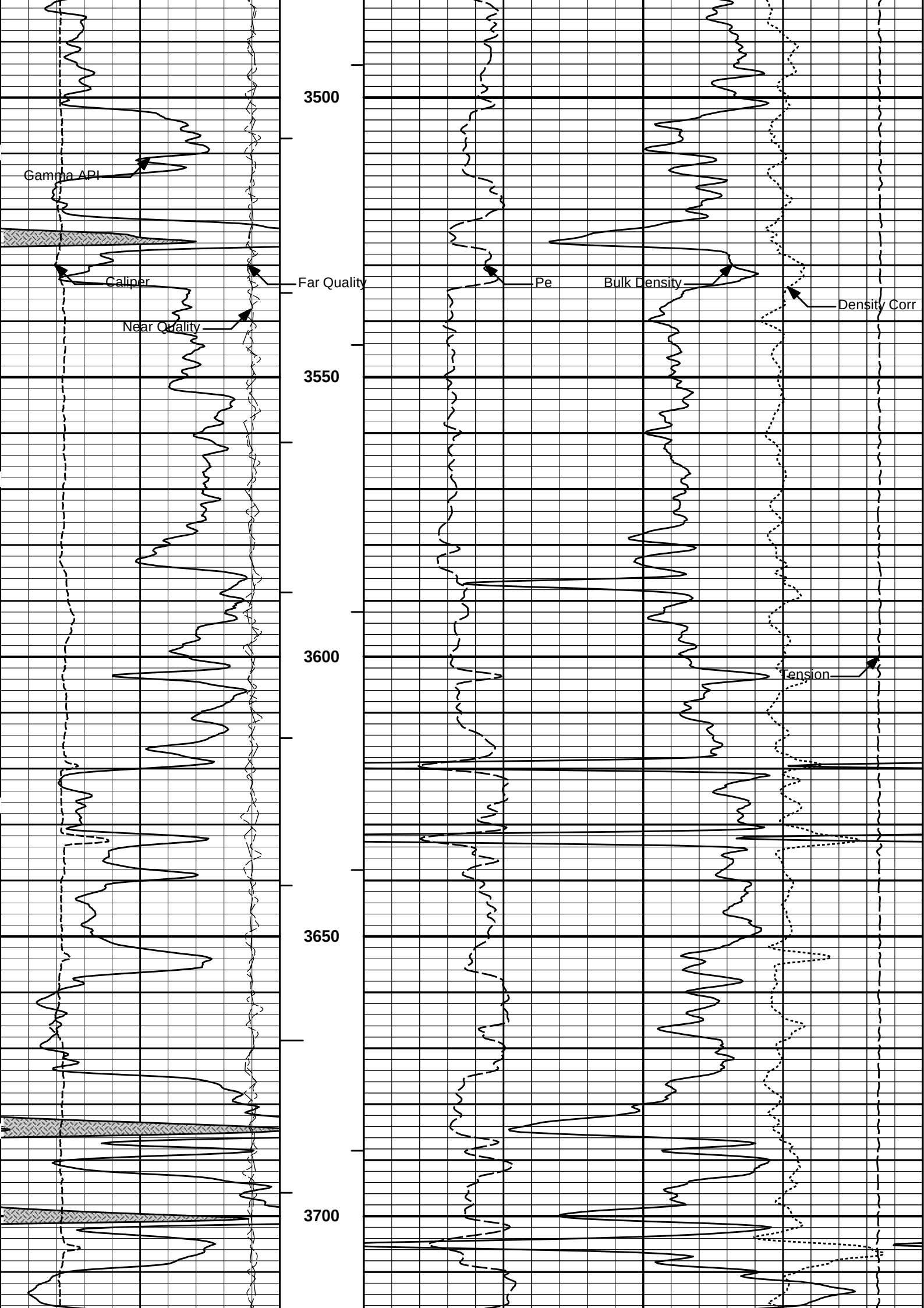


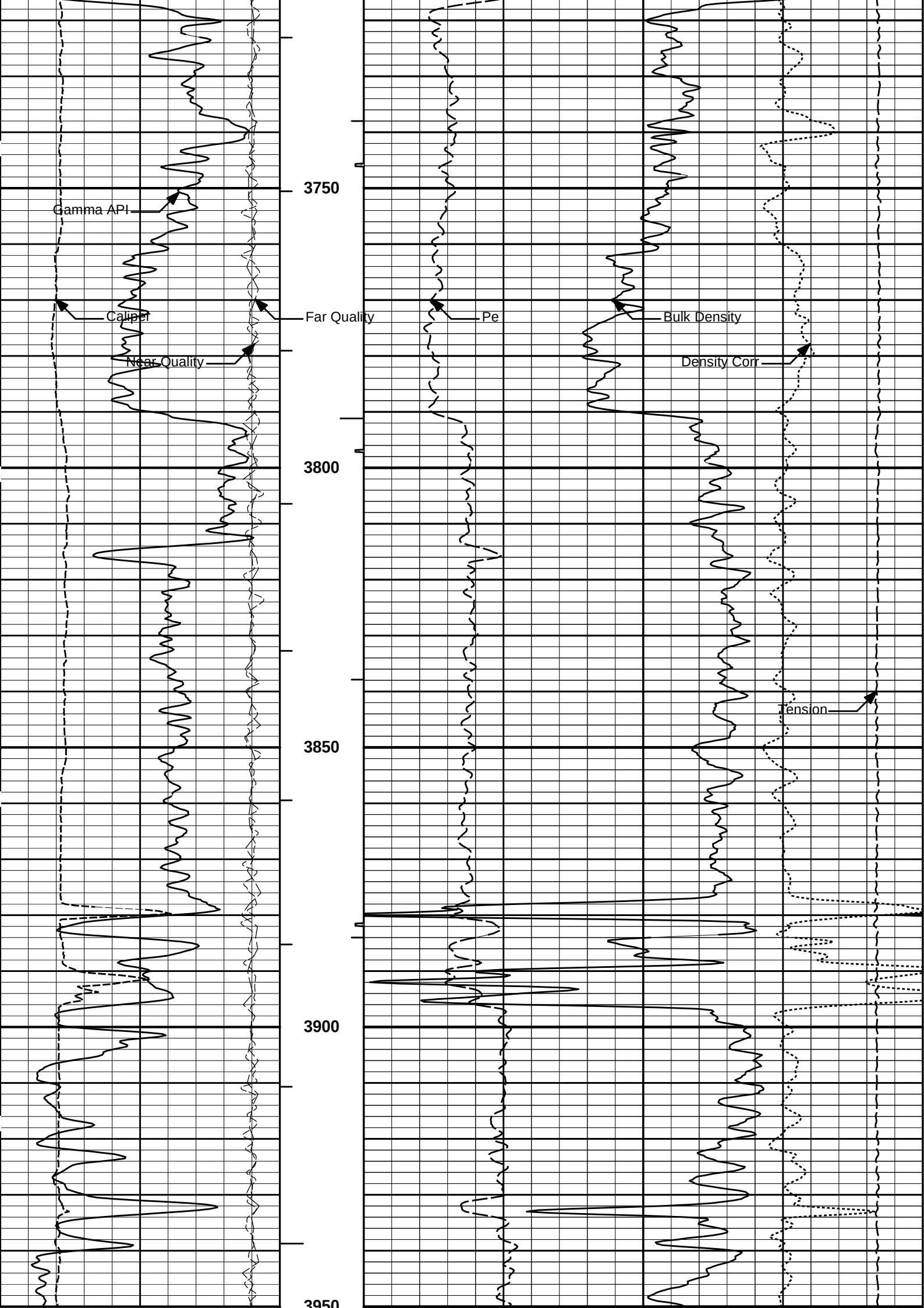


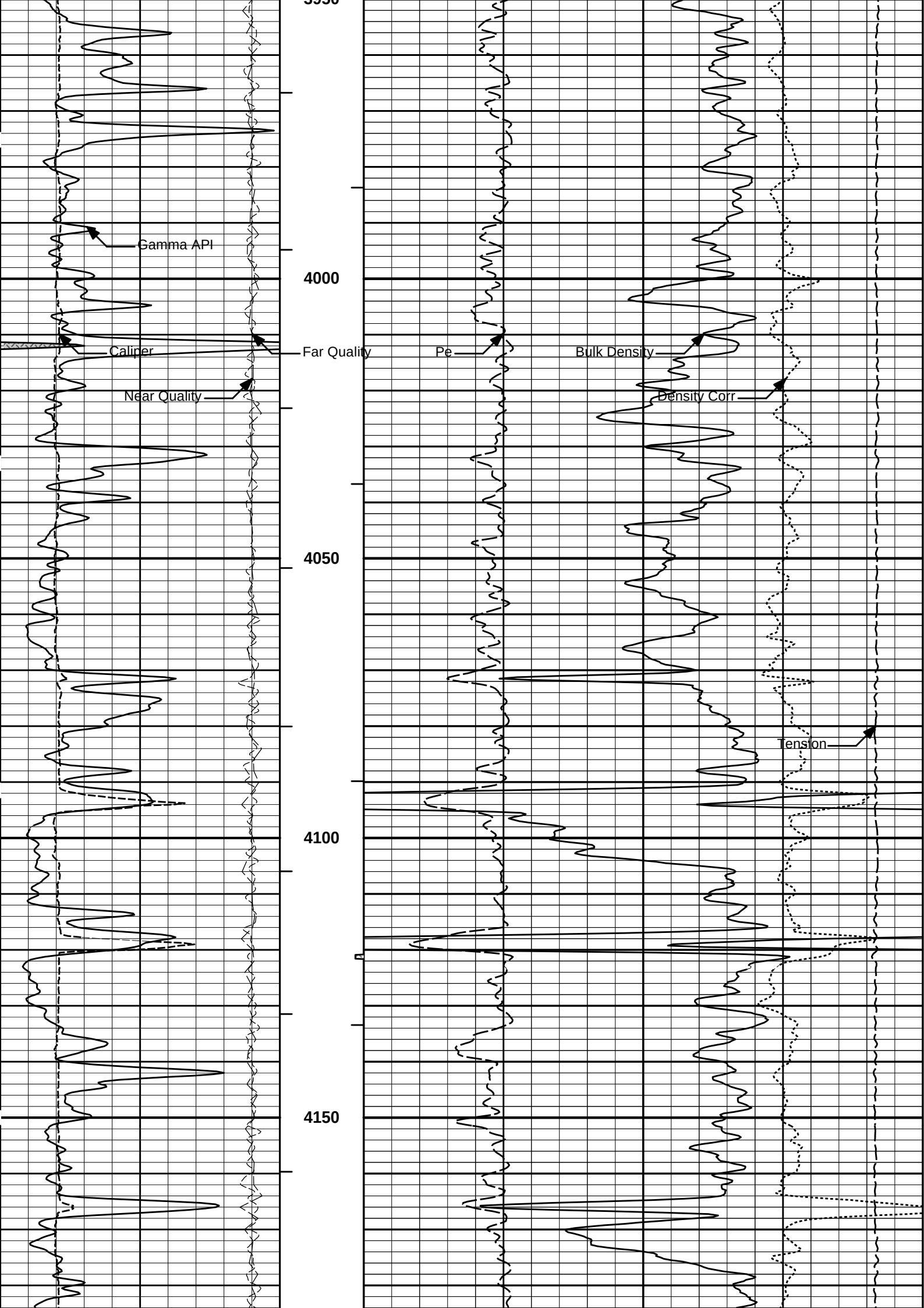


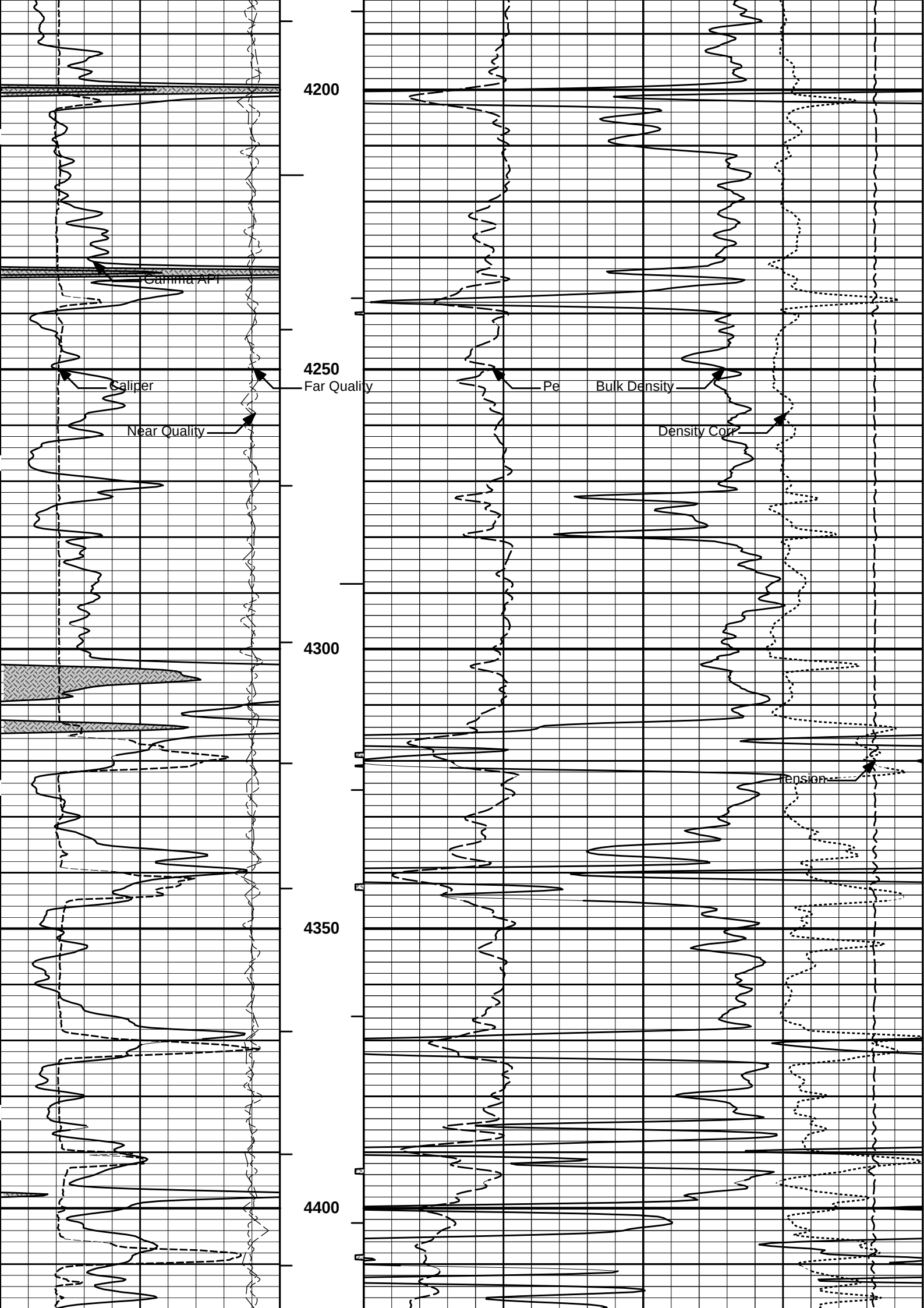


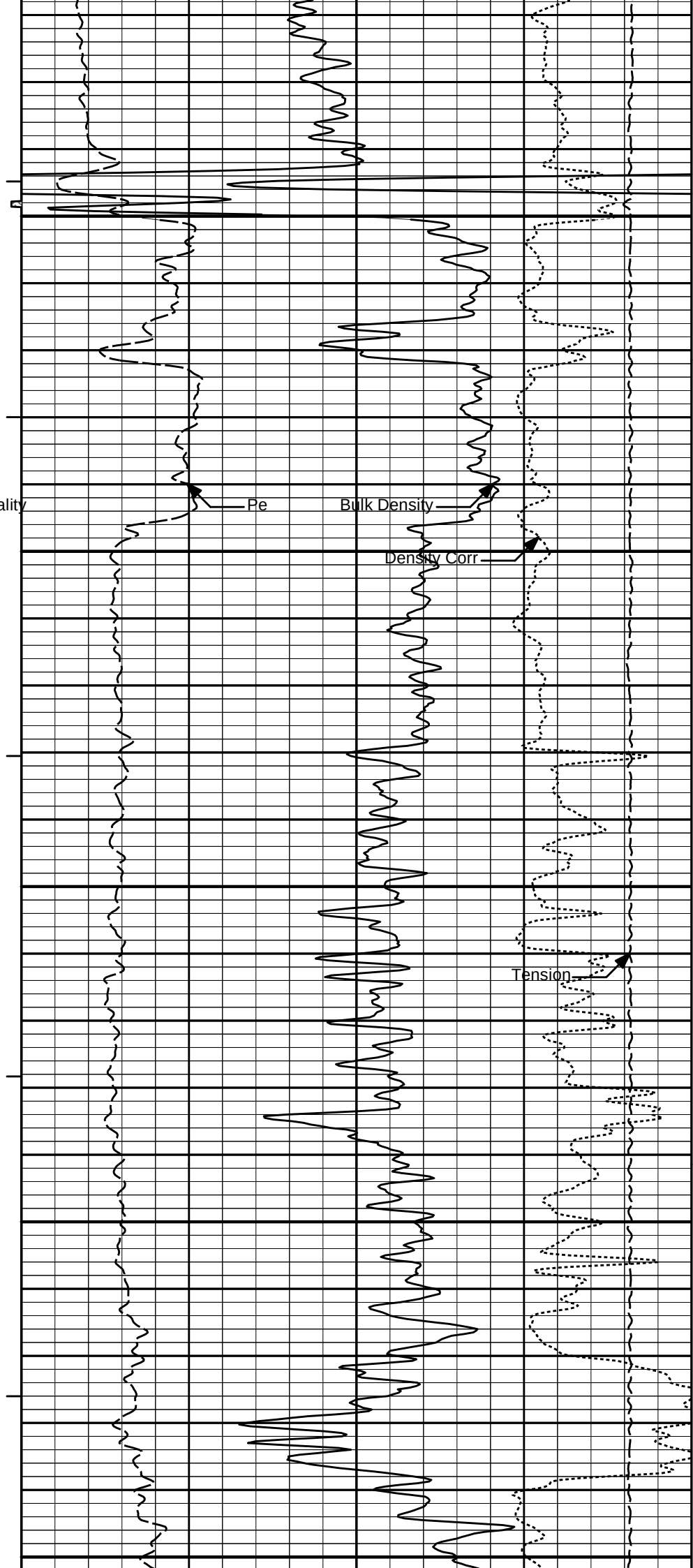
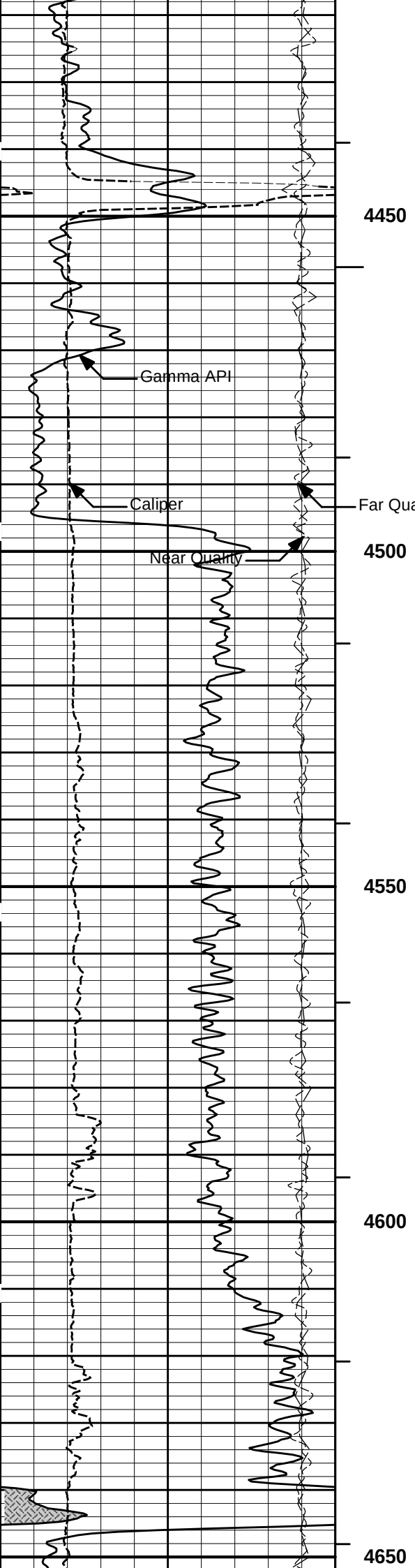


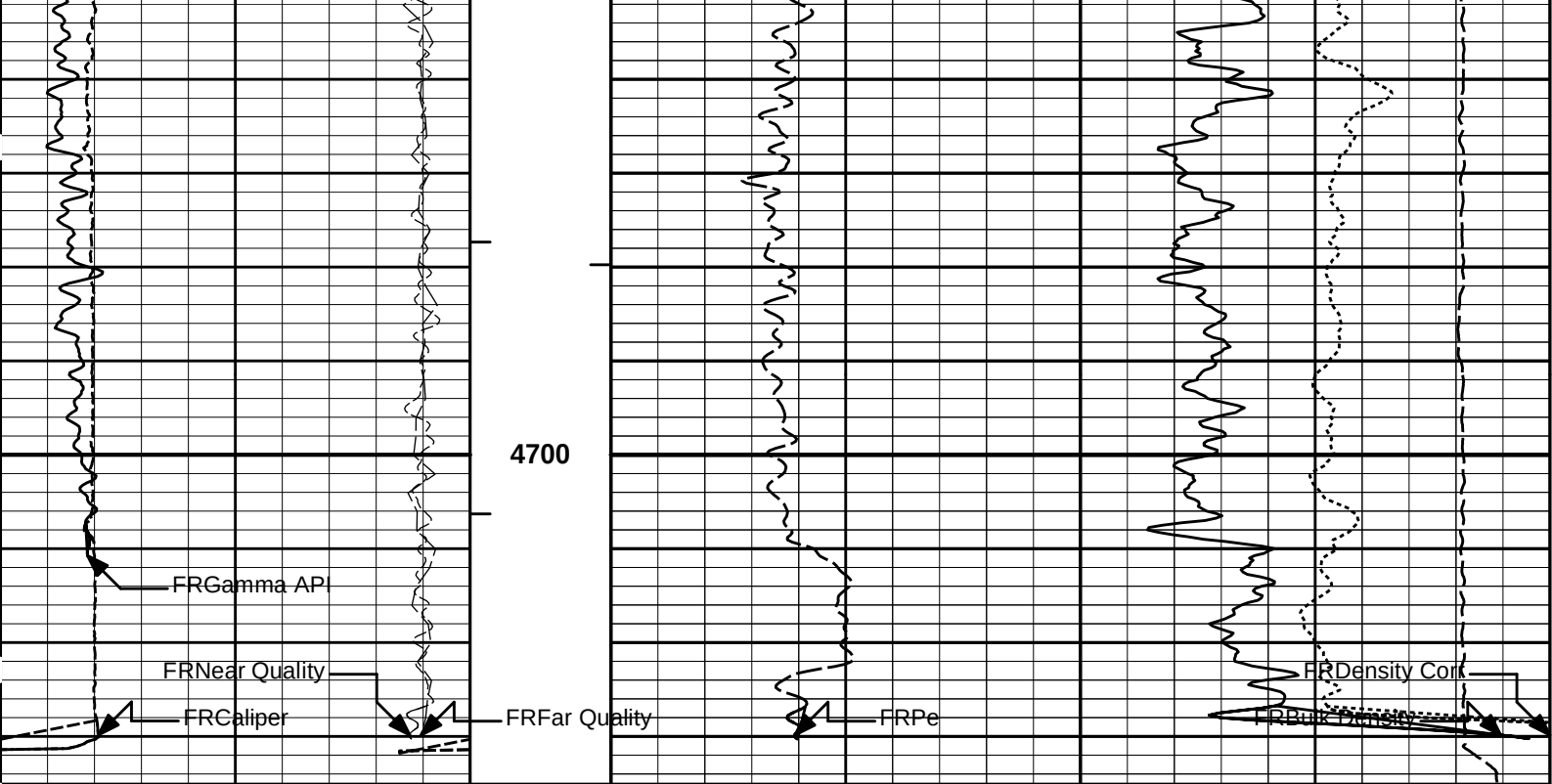












-18	Near Quality	2	1 : 240 ft	0	Pe	10	15K	Tension	0
								pounds	
18	Far Quality	-2	AHVT				-0.25	Density Corr	0.25
								gram per cc	
6	Caliper	16	BHVT	2	Bulk Density				3
	inches				gram per cc				
0	Gamma API	150	Tension Pull						
	api		10 0						

HALLIBURTON

Plot Time: 19-Oct-17 09:11:49
Plot Range: 1895 ft to 4735.08 ft
Data: CMX_BLACK WIDOW\Well Based\RUN 3 MAIN\
Plot File: \\PORO\1_Bulk_5_mainx

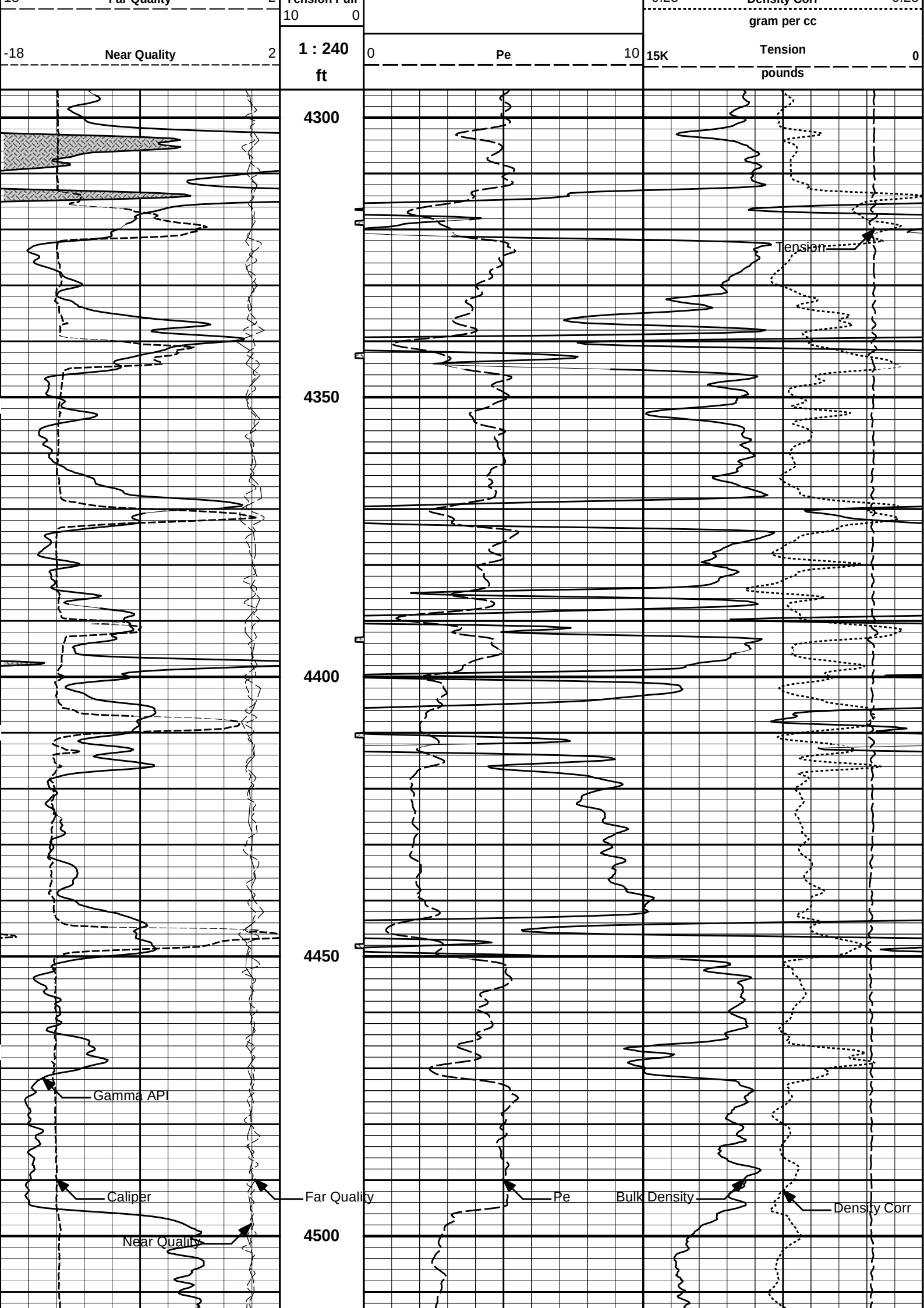
5 INCH MAIN LOG

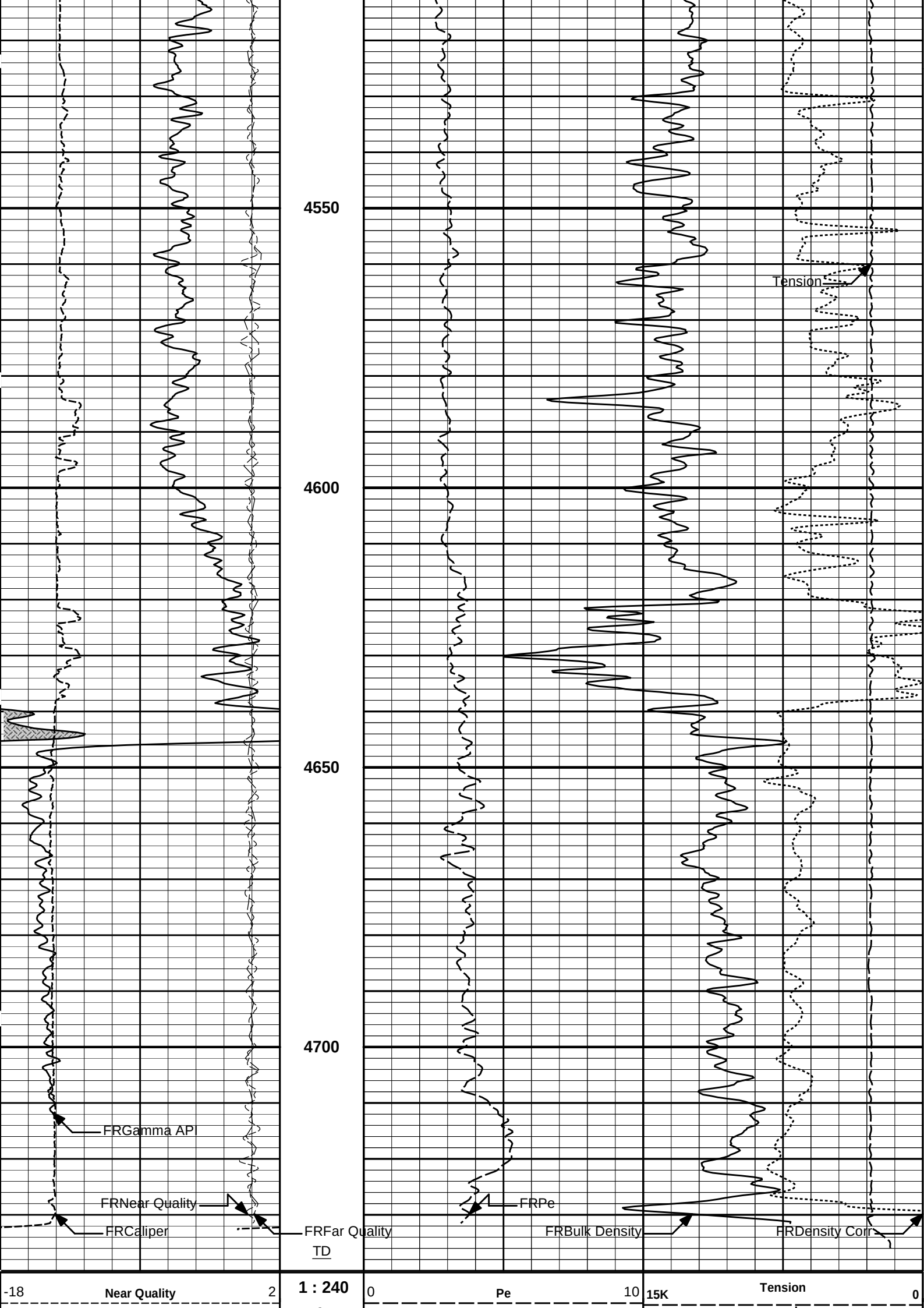
HALLIBURTON

Plot Time: 19-Oct-17 09:11:49
Plot Range: 4295 ft to 4740 ft
Data: CMX_BLACK WIDOW\Well Based\RUN 3 REPEAT\
Plot File: \\PORO\1_Bulk_5_rptx

REPEAT SECTION

0	Gamma API	150							
	api								
6	Caliper	16		2	Bulk Density				3
	inches				gram per cc				
18	Far Quality	-2	Tension Pull				-0.25	Density Corr	0.25





		ft		pounds	
18	Far Quality	-2	Tension Pull 10 0	-0.25	Density Corr 0.25
				gram per cc	
6	Caliper	16		2	Bulk Density 3
inches				gram per cc	
0	Gamma API	150			
api					
HALLIBURTON Plot Time: 19-Oct-17 09:11:52 Plot Range: 4295 ft to 4740 ft Data: CMX_BLACK WIDOW\Well Based\RUN 3 REPEAT\ Plot File: \\PORO\1_Bulk_5_rptx					
REPEAT SECTION					
HALLIBURTON PARAMETERS REPORT					
Depth (ft)	Tool Name	Mnemonic	Description	Value	Units
TOP					
	SHARED	BS	Bit Size	7.875	in
	SHARED	UBS	Use Bit Size instead of Caliper for all applications.	No	
	SHARED	MDBS	Mud Base	Water	
	SHARED	MDWT	Borehole Fluid Weight	8.500	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	0.500	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	CSTR	Compressive Strength	1000.00	psia
	SHARED	ST	Surface Temperature	75.0	degF
	SHARED	TD	Total Well Depth	4738.00	ft
	SHARED	BHT	Bottom Hole Temperature	120.0	degF
	SHARED	SVTM	Navigation and Survey Master Tool	NONE	
	SHARED	AZTM	High Res Z Accelerometer Master Tool	GTET	
	SHARED	TEMM	CBM Temperature Master Tool	GTET	
	Rwa / CrossPlot	XPOK	Process Crossplot?	Yes	
	Rwa / CrossPlot	FCHO	Select Source of F	Density	
	Rwa / CrossPlot	AFAC	Archie A factor	0.6200	
	Rwa / CrossPlot	MFAC	Archie M factor	2.1500	
	Rwa / CrossPlot	RMFR	Rmf Reference	0.10	ohmm
	Rwa / CrossPlot	TMFR	Rmf Ref Temp	75.00	degF
	Rwa / CrossPlot	RWA	Resistivity of Formation Water	0.05	ohmm
	Rwa / CrossPlot	ADP	Use Air Porosity to calculate CrossplotPhi	No	
	Rwa / CrossPlot	BHSM	Borehole Size Source Tool	SDLT	

CrossPlot	ROIN	Input for RO Calculation	Rwa	
Rwa / CrossPlot	GROK	Process Gamma Ray?	Yes	
GTET	GEOK	Process Gamma Ray EVR?	No	
GTET	TPOS	Tool Position for Gamma Ray Tools.	Eccentered	
GTET	BHSM	Borehole Size Source Tool	SDLT	
DSNT	DNOK	Process DSN?	Yes	
DSNT	DEOK	Process DSN EVR?	No	
DSNT	NLIT	Neutron Lithology	Limestone	
DSNT	DNSO	DSN Standoff - 0.25 in (6.35 mm) Recommended	0.250	in
DSNT	DNTT	Temperature Correction Type	Gradient	
DSNT	DNTT	Top Zone Temperature Value	75.0	degF
DSNT	DNBT	DSN Bottom Zone Temperature Value	120.0	degF
DSNT	DTDT	Top Depth for Temperature Gradient Calculation (Measured Depth)	0	ft
DSNT	DBDT	Bottom Zone Temperature Depth (Measured Depth)	4738	ft
DSNT	DPRS	DSN Pressure Correction Type	Gradient	
DSNT	DNTP	DSN Top Zone Pressure Value	14.70	psia
DSNT	DNBP	DSN Bottom Zone Pressure Value	2200.00	psia
DSNT	DTDP	Top Depth for Pressure Gradient Calculation (Measured Depth)	0	ft
DSNT	DNDP	Bottom Zone Pressure Depth (Measured Depth)	4738	ft
DSNT	SHCO	View More Correction Options	No	
DSNT	UTVD	Use TVD for Gradient Corrections?	No	
DSNT	LHWT	Logging Horizontal Water Tank?	No	
DSNT	BHSM	Borehole Size Source Tool	SDLT	
SDLT	CLOK	Process Caliper Outputs?	Yes	
Microlog Pad	MLOK	Process MicroLog Outputs?	Yes	
SDLT Pad	DNOK	Process Density?	Yes	
SDLT Pad	DNOK	Process Density EVR?	No	
SDLT Pad	CB	Logging Calibration Blocks?	No	
SDLT Pad	SPVT	SDLT Pad Temperature Valid?	Yes	
SDLT Pad	DTWN	Disable temperature warning	No	
SDLT Pad	DMA	Formation Density Matrix	2.710	g/cc
SDLT Pad	DFL	Formation Density Fluid	1.000	g/cc
SDLT Pad	BHSM	Borehole Size Source Tool	SDLT	
BOTTOM				
Data: CMX_BLACK WIDOW\0003 GTET-DSNT-SDLT\IDLE			Date: 19-Oct-17 06:50:36	

HALLIBURTON				
CALIBRATION REPORT				
NATURAL GAMMA RAY TOOL SHOP CALIBRATION				
Tool Name:	GTET - 11021139	Reference Calibration Date:	23-Sep-17 12:22:06	
Engineer:	WHITLOCK	Calibration Date:	06-Oct-17 11:06:34	
Software Version:	WL INSITE R5.0.5 (Build 8)	Calibration Version:	1	
Calibrator Source S/N: TB79				
Calibrator API Reference:222.00 api				
Equivalent Calibrator API Reference:225.9 api				
Measurement	Measured	Calibrated	Units	
Background	25.7	25.8	api	
Background + Calibrator	250.7	251.7	api	
Calibrator	225.0	225.9	api	
NATURAL GAMMA RAY TOOL FIELD CALIBRATION				
Tool Name:	GTET - 11021139	Reference Calibration Date:	06-Oct-17 11:06:34	

Tool Name:	GTE1 - 11021139	Reference Calibration Date:	06-Oct-17 11:06:34
Engineer:	WHITLOCK	Calibration Date:	06-Oct-17 11:10:24
Software Version:	WL INSITE R5.0.5 (Build 8)	Calibration Version:	1
Calibrator Source S/N: TB79			
Calibrator API Reference:222.00 api			
Equivalent Calibrator API Reference:225.9 api			
Field Verification	Shop	Field	Units
Background	25.8	24.9	api
Background + Calibrator	251.7	254.1	api
Calibrator	225.9	229.3	api
Shop	Field	Difference	Tolerance
225.9	229.3	-3.4	+/- 9.00

DUAL SPACED NEUTRON SHOP CALIBRATION				
Tool Name:	DSNT - 11019641	Reference Calibration Date:	09-Mar-17 12:55:14	
Engineer:	MICHAEL RICHTER	Calibration Date:	03-Aug-17 00:00:13	
Software Version:	WL INSITE R5.0.5 (Build 8)	Calibration Version:	1	
Logging Source S/N: DSN-436				
Tank Serial Number: EL RENO				
Reference value assigned to Tank: 56.100				
Snow Block S/N: 12156883				
Calibration Tank Water Temperature: 72 degF				
Min. Tool Housing Outside Diameter: 3.625 in				
CALIBRATION CONSTANTS				
Measurement	Prev. Value	New Value	Control Limit On New Value	
Gain:	0.98292	0.97957	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):	0.2369	0.2358	0.0011	+/- 0.0020
Calibrated Ratio:	10.5957	10.5596	0.036	+/- 0.050
VERIFIER				
Measurement	Value	Control Limit		
Snow-Block Porosity (decp):	0.0729	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 - 11019641		Reference Calibration Date:	03-Aug-17 00:00:13
Engineer:	WHITLOCK		Calibration Date:	06-Oct-17 10:38:01
Software Version:	WL INSITE R5.0.5 (Build 8)		Calibration Version:	1
Logging Source S/N: DSN-436				
Snow Block S/N: 12156883				
NEUTRON FIELD-CHECK SUMMARY				
	Shop	Field	Difference	Control Limit On Change
Snow-Block Porosity (decp):	0.0729	0.0661	-0.0067	+/- 0.0150

PASS/FAIL SUMMARY			
Block Change Check:		Passed	
Snow Block Stat Check:		Passed	
Temperature Check:		Passed	
DENSITY CALIPER SHOP CALIBRATION			
Tool Name:	SDLT - 10950477	Reference Calibration Date:	01-May-17 14:54:51
Engineer:	MICHAEL RICHTER	Calibration Date:	03-Aug-17 00:54:14
Software Version:	WL INSITE R5.0.5 (Build 8)	Calibration Version:	1
Host Tool Name:	DSNT - 11019641		
CALIBRATION COEFFICIENTS			
Measurement	Previous Value	New Value	Control Limit On New Value
Pad Offset	-4023.44	-4016.07	-7000.00 - -1000.00
Pad Gain	0.0003896	0.0004020	0.0002000 - 0.0006000
Arm Offset	-3983.20	-4321.26	-5000.00 - 3000.00
Arm Gain	0.0005552	0.0005858	0.000300 - 0.000700
Arm Power	-0.000008048	-0.000009559	-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)	1.94	2.00	0.06 +/- 0.20
Medium Ring (in)	3.63	3.75	0.12 +/- 0.20
RING DIAMETER:			
Small Ring (in)	6.58	6.50	-0.08 +/- 0.20
Medium Ring (in)	8.26	8.25	-0.01 +/- 0.20
Large Ring (in)	14.98	15.00	0.02 +/- 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 - 10950477	Reference Calibration Date:	03-Aug-17 00:54:14
Engineer:	WHITLOCK	Calibration Date:	06-Oct-17 10:12:52
Software Version:	WL INSITE R5.0.5 (Build 8)	Calibration Version:	1
MEASURED CALIPER VALUES			
Measurement	Shop	Field	Change Control Limit On New Value
Pad Extension	3.75	3.81	0.06 +/- 0.10
Ring Diameter	8.25	8.27	0.02 +/- 0.15
PASS/FAIL SUMMARY			
Pad Extension Check:		Passed	
Diameter Check:		Passed	
MICRO LOG SHOP CALIBRATION			
Tool Name:	Microlog Pad - 11950477	Reference Calibration Date:	01-Jan-70 00:00:00
Engineer:	COTHREN	Calibration Date:	02-Nov-16 14:57:23
Software Version:	WL INSITE R5.0.5 (Build 8)	Calibration Version:	1
Host Tool Name:	DSNT - 11019641		

CALIBRATION COEFFICIENT SUMMARY					
Measurement	Micro Log Normal		Micro Log Lateral		Units
	Measured	Calibrated	Measured	Calibrated	
Tool Zero	23.04	23.04	6.13	6.13	ohmm
Calibration Point #1	0.00	0.00	0.00	0.00	ohmm
Calibration Point #2	20.00	20.00	20.00	20.00	ohmm
Internal Reference	6.61	6.61	-6364.81	-6364.81	ohmm
Measurement	Micro Log Normal Tool Value		Micro Log Lateral Tool Value		Units
Tool Zero	-1.17		1.18		V
Calibration Point #1	7538.52		7.98		V
Calibration Point #2	993.75		-14.23		V
Internal Reference	5374.24		7076.90		V

MICRO LOG FIELD CHECK			
Tool Name:	Microlog Pad - 11950477	Reference Calibration Date:	02-Nov-16 14:57:23
Engineer:	COTHREN	Calibration Date:	02-Nov-16 14:58:07
Software Version:	WL INSITE R5.0.5 (Build 8)	Calibration Version:	1

Measurement	Micro Log Normal		Micro Log Lateral		Units
	Shop	Field	Shop	Field	
Tool Zero	23.04	23.04	6.13	6.86	ohmm
Internal Reference	6.61	6.61	-6364.81	-6365.98	ohmm
Summary					
Signal	Shop	Field	Difference		Tolerance
Microlog Normal	6.61	6.61	0.00		+/- 0.80
Microlog Lateral	-6364.81	-6365.98	1.17		+/- 0.80

SPECTRAL DENSITY SHOP CALIBRATION			
Tool Name:	SDLT Pad - 10865881	Reference Calibration Date:	25-May-17 13:00:56
Engineer:	MICHAEL RICHTER	Calibration Date:	03-Aug-17 00:24:51
Software Version:	WL INSITE R5.0.5 (Build 8)	Calibration Version:	1

Logging Source S/N: 5155GW		
Aluminum Block S/N: EL RENO	Density: 2.581g/cc	Pe: 3.170
Magnesium Block S/N: EL RENO MG	Density: 1.687g/cc	Pe: 2.594

DENSITY CALIBRATION SUMMARY			
Measurement	Previous Value	New Value	Control Limit
Near Bar Gain	1.0463	1.0034	0.90 - 1.10
Near Dens Gain	1.0284	0.9950	0.90 - 1.10
Near Peak Gain	1.0729	1.0167	0.90 - 1.10
Near Lith Gain	1.0746	1.0336	0.90 - 1.10
Far Bar Gain	1.0129	1.0051	0.90 - 1.10
Far Dens Gain	1.0003	0.9962	0.90 - 1.10
Far Peak Gain	0.9976	0.9944	0.90 - 1.10
Far Lith Gain	0.9826	0.9743	0.90 - 1.10
Near Bar Offset	-0.1428	0.2514	NONE
Near Dens Offset	-0.0128	0.2829	NONE
Near Peak Offset	-0.3966	0.0698	NONE
Near Lith Offset	-0.4539	-0.1151	NONE
Far Bar Offset	0.0785	0.1512	NONE
Far Dens Offset	0.1829	0.2198	NONE
Far Peak Offset	0.2071	0.2291	NONE
Far Lith Offset	0.2870	0.3441	NONE

Far Lith Onset	0.2879	0.3441	NONE
Near Bar Background	945.33	941.41	700 - 1450
Near Dens Background	314.07	313.06	230 - 480
Near Peak Background	136.63	136.06	100 - 210
Near Lith Background	167.65	166.64	125 - 260
Far Bar Background	612.64	609.60	450 - 900
Far Dens Background	239.40	236.68	175 - 345
Far Peak Background	93.82	92.78	70 - 140
Far Lith Background	98.35	97.58	75 - 145

CALIBRATION BLOCK SUMMARY

Measurement	Current Reading (Previous Coef)	Calibrated (New Coef)	Change	Control Limit On Change
MAGNESIUM				
Density (g/cc)	1.687	1.687	0.000	+/- 0.015
Pe	2.508	2.559	0.051	+/- 0.150
ALUMINUM				
Density (g/cc)	2.574	2.581	0.007	+/- 0.01500
Pe	3.077	3.132	0.055	+/- 0.150

TOOL SUMMARY

Measurement	Near Detector		Far Detector	
	Value	Control Limits	Value	Control Limits
QUALITY				
Background	-0.0012	+/- 0.0110	-0.0009	+/- 0.0140
Magnesium Block	-0.0005	+/- 0.0110	-0.0028	+/- 0.0140
Aluminum Block	0.0001	+/- 0.0110	0.0005	+/- 0.0140
Resolution	9.65	6.00 - 11.50	8.93	6.00 - 11.50
Internal Verifier(B+D+P+L)	1557	1200 - 2700	1037	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 - 10865881	Reference Calibration Date:	03-Aug-17 00:24:51
Engineer:	WHITLOCK	Calibration Date:	06-Oct-17 10:20:28
Software Version:	WL INSITE R5.0.5 (Build 8)	Calibration Version:	1

Pad Temperature: 75.2 degF

DENSITY FIELD CALIBRATION SUMMARY

Measurement	Shop	Field	Change	Control Limit +/-
Near (B+D+P+L) cps	1557.176	1550.265	-6.911	15.882
Far (B+D+P+L) cps	1036.648	1031.525	-5.123	17.142
Near Resolution	9.65	9.64	-0.010	0.50
Far Resolution	8.93	8.95	0.020	1.00

PASS/FAIL SUMMARY

Bkg Quality Check:	Passed
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CALIBRATION SUMMARY

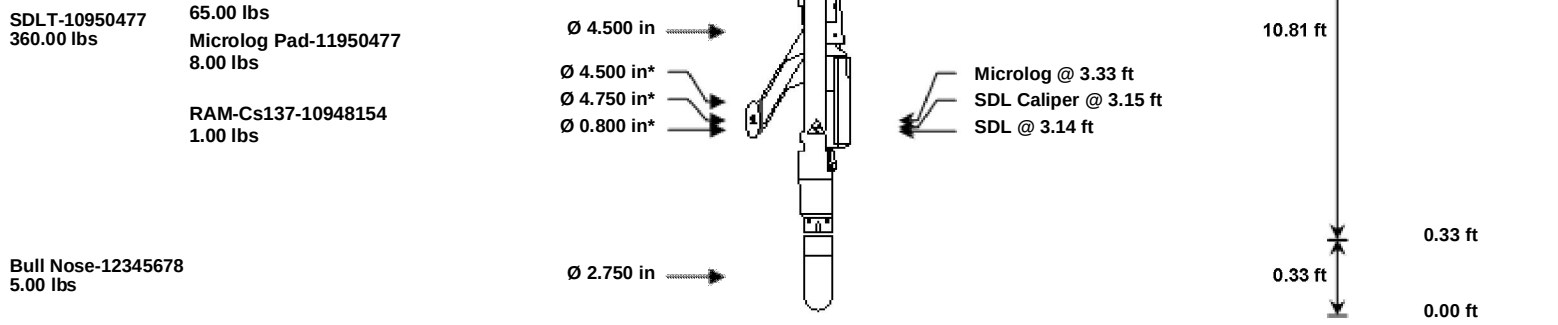
Sensor	Shop	Field	Post	Difference	Tolerance	Units
GTET-11021139						
Gamma Ray Calibrator	225.9	229.3	-----	-3.4	+/- 9.00	api
DSNT-11019641						
Snow-Block Porosity	0.0729	0.0661	-----	0.0068	+/- 0.0150	decp
SDLT-10950477						
Pad Extension	3.75	3.81	-----	-0.06	+/-0.10	in
Ring Diameter	8.25	8.27	-----	-0.02	+/-0.15	in
Microlog Pad-11950477						
MicroLog Normal	6.61	6.61	-----	0.00	+/-0.80	ohmm
MicroLog Lateral	-6364.81	-6365.98	-----	1.17	+/-0.80	ohmm
SDLT Pad-10865881						
Near(B+D+P+L)	1557.176	1550.265	-----	6.911	+/-15.882	cps
Far(B+D+P+L)	1036.648	1031.525	-----	5.123	+/-17.142	cps

Data: CMX_BLACK WIDOW\0003 GTET-DSNT-SDLT\IDLE Date: 19-Oct-17 06:50:53

HALLIBURTON

TOOL STRING DIAGRAM REPORT

Description	Overbody Description	O.D.	Diagram	Sensors @ Delays	Length	Accumulated Length
CH_HOS_I 37.50 lbs		Ø 2.750 in →		← Temperature @ 36.04 ft	2.25 ft	36.29 ft
XOHD-12345678 20.00 lbs		Ø 2.750 in → Ø 3.625 in →			0.95 ft	34.04 ft
SP Sub-10904995 60.00 lbs		Ø 3.625 in →		← SP @ 31.31 ft	3.74 ft	33.09 ft
				← Z-Accelerometer @ 28.90 ft		29.35 ft
GTET-11021139 165.00 lbs		Ø 3.625 in →		← GammaRay @ 23.29 ft	8.52 ft	
						20.83 ft
DSN Decentralizer- 11020487 6.60 lbs		Ø 5.000 in* → Ø 3.625 in →		← DSN Far @ 13.90 ft ← DSN Near @ 13.15 ft	9.69 ft	
DSNT-11019641 174.00 lbs						11.15 ft
SDLT Pad-10865881						



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_HOS_I	37.50	2.25	34.04	300.00
XOHD	Hostile to Dits Cross Over	12345678	20.00	0.95	33.09	300.00
SP	SP Sub	10904995	60.00	3.74	29.35	300.00
GTET	Gamma Telemetry Tool	11021139	165.00	8.52	20.83	60.00
DSNT	Dual Spaced Neutron	11019641	174.00	9.69	11.15	60.00
DCNT	DSN Decentralizer	11020487	6.60	5.13	* 14.48	300.00
SDLT	Spectral Density Tool	10950477	360.00	10.81	0.33	60.00
SDLP	Density Insite Pad	10865881	65.00	2.55	* 2.54	60.00
Cs137	Logging Source, SDLT-I, 1.78 Ci - Cs137	10948154	1.00	0.80	* 2.77	300.00
MICP	Microlog Pad	11950477	8.00	1.00	* 2.83	60.00
BLNS	Bull Nose	12345678	5.00	0.33	0.00	300.00
Total			902.10	36.29		
						* Not included in Total Length and Length Accumulation.
Data: CMX_BLACK WIDOW\0003 GTET-DSNT-SDLT\IDLE						Date: 19-Oct-17 06:50:04

COMPANY

CMX, INC

WELL

BLACK WIDOW OWWO 1-29

FIELD

HARDING

COUNTY

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STATE

KANSAS

HALLIBURTON

SPECTRAL DENSITY
DUAL SPACED NEUTRON
LOG