

**SPECTRAL DENSITY
DUAL SPACED NEUTRON
LOG**

Fold here

Survey Ticket No.: 903576066						API No.: 15055224380000						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		FREE		N/A	
Rmc @ Meas. Temp.				@				@				I-11026095							
Source Rmf		Rmc		CALC		CALC						S-11005908							
Rm @ BHT				0.64 ohmm @ 127 degF				@											
Rmf @ BHT				0.54 ohmm @ 127 degF				@											
Rmc @ BHT				0.74 ohmm @ 127 degF				@											
EQUIPMENT DATA																			
GAMMA				ACOUSTIC				DENSITY				NEUTRON							
Run No.		ONE		Run No.		ONE		Run No.		ONE		Run No.		ONE					
Serial No.		11048627		Serial No.		10939050		Serial No.		10809130		Serial No.		11019643					
Model No.		GTET		Model No.		BSAT		Model No.		SDLT		Model No.		DSNT					
Diameter		3.625"		No. of Cent.		0		Diameter		4.5"		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.		5168GW		Serial No.		DSN-424					
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	REC	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-BSAT-ACRT RUN IN COMBINATION																	
ANNULAR HOLE VOLUME CALCULATED FOR 5.5 INCH CASING																	
POROSITY & MICROLOG LOGGED TO 3700' AS PER CLIENT REQUEST																	
CHLORIDES REPORTED AT 1700ppm																	
NO POST-CALS COMPLETED AS PER CLIENT REQUEST																	
DUKE RIG 9																	
CREW: J. ROBERSON, B. BARISHMAN																	
THANK YOU FOR CHOOSING HALLIBURTON ENERGY SERVICES -- EL RENO, OK -- 405.278.9685																	
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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Plot Time: 03-Oct-16 09:32:11

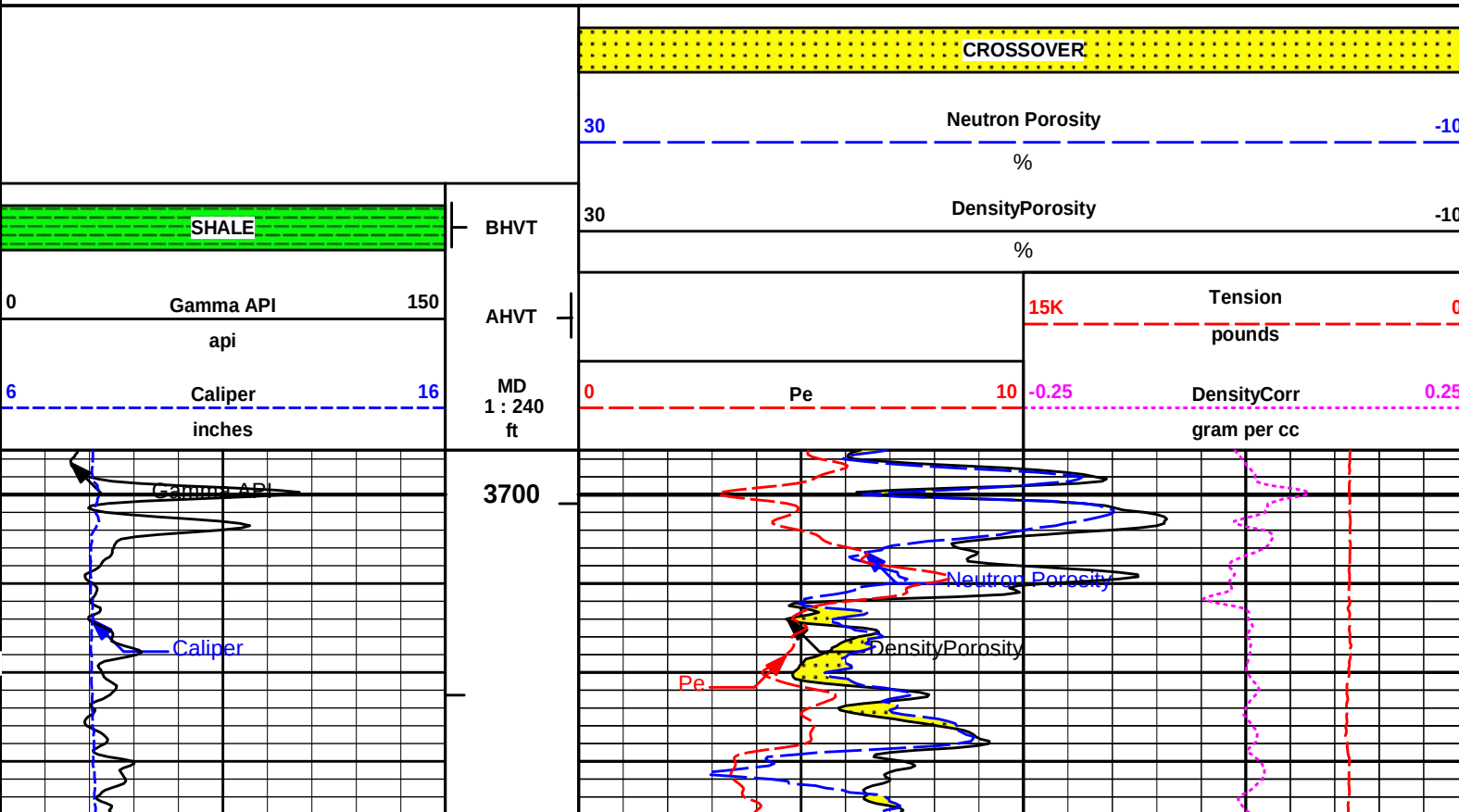
Plot Range: 3695 ft to 5208 ft

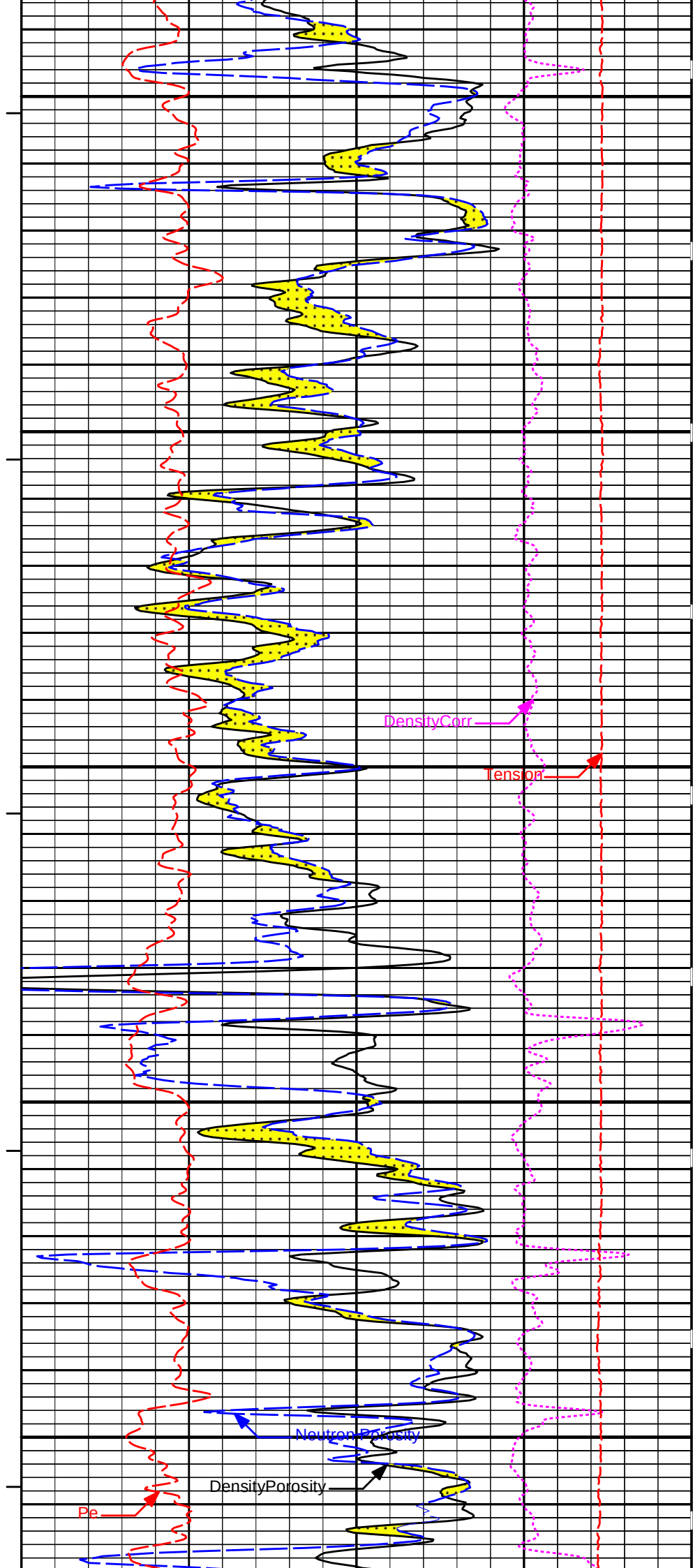
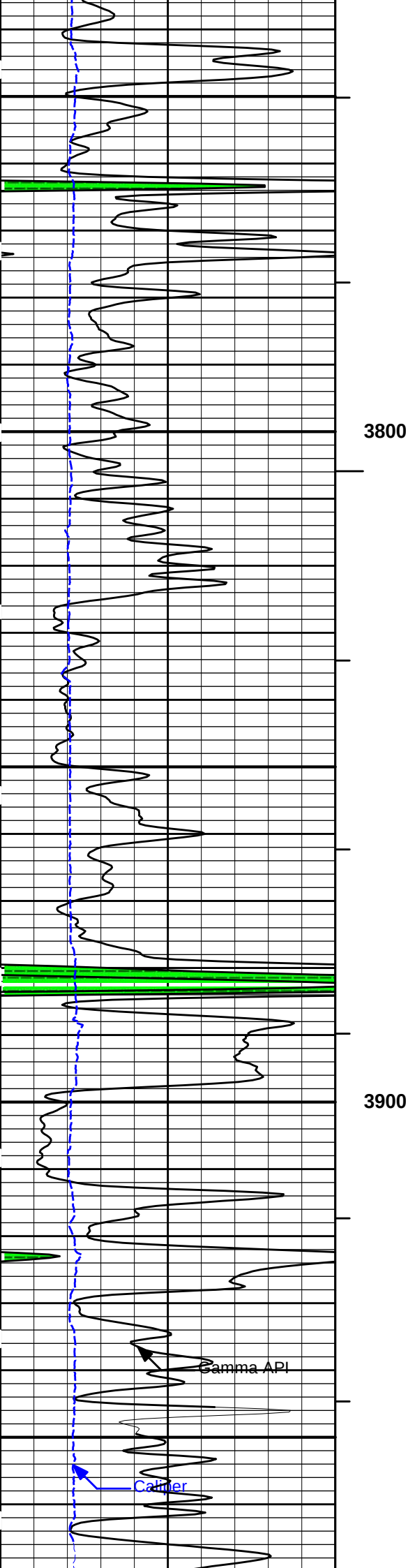
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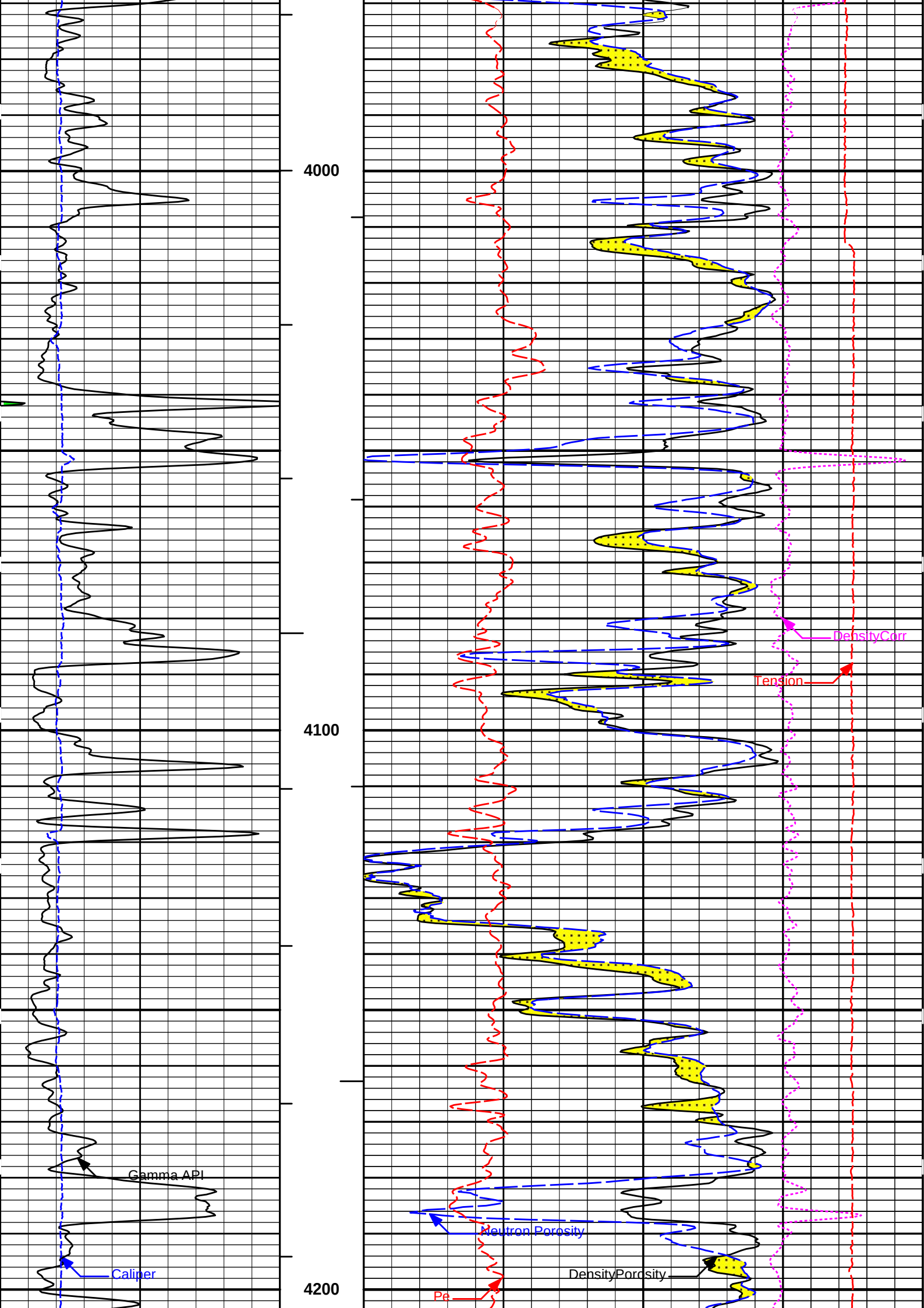
Plot File: \\POROSITY\Porosity_Q_5_MAIN_LIB

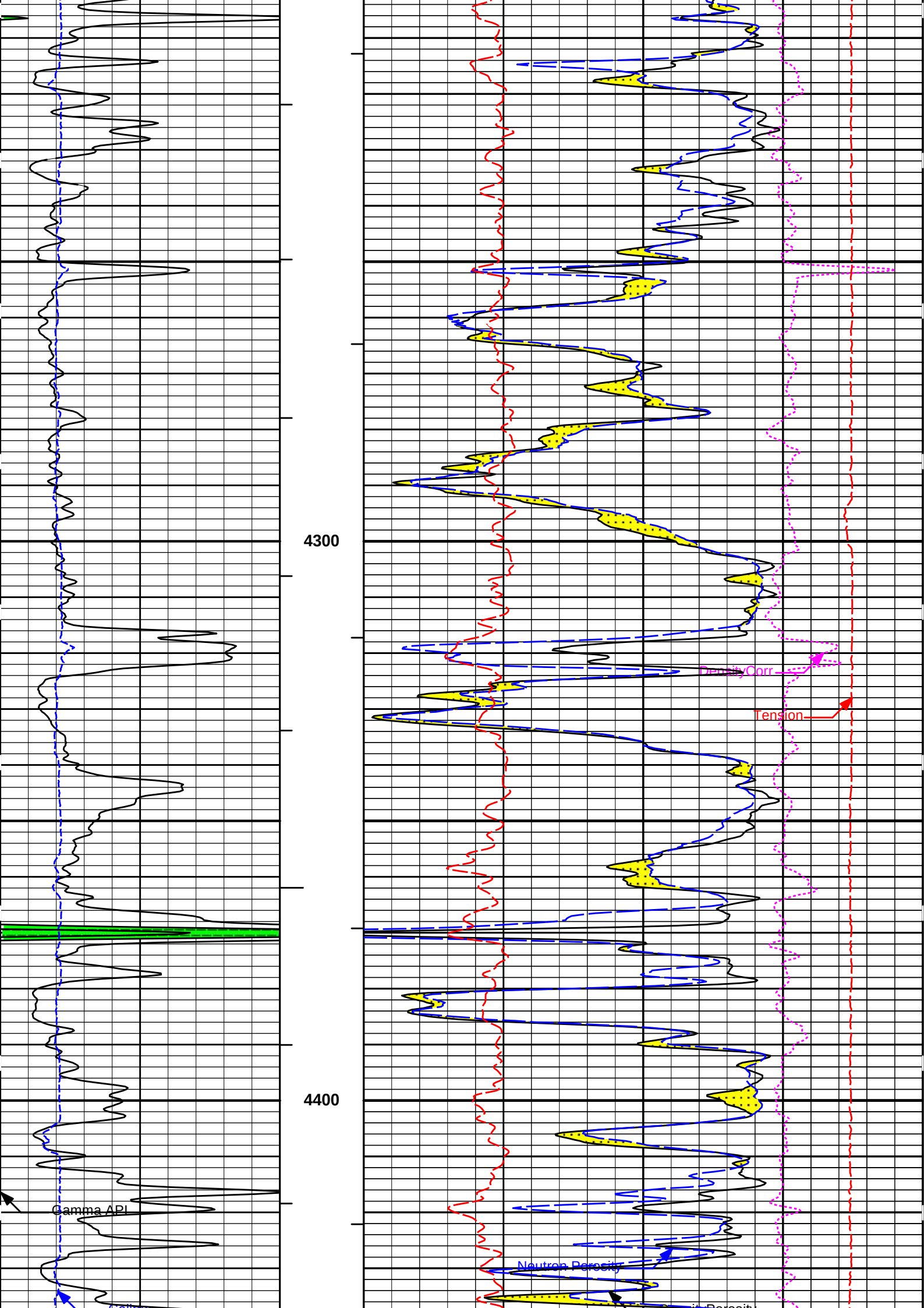
5 INCH MAIN LOG

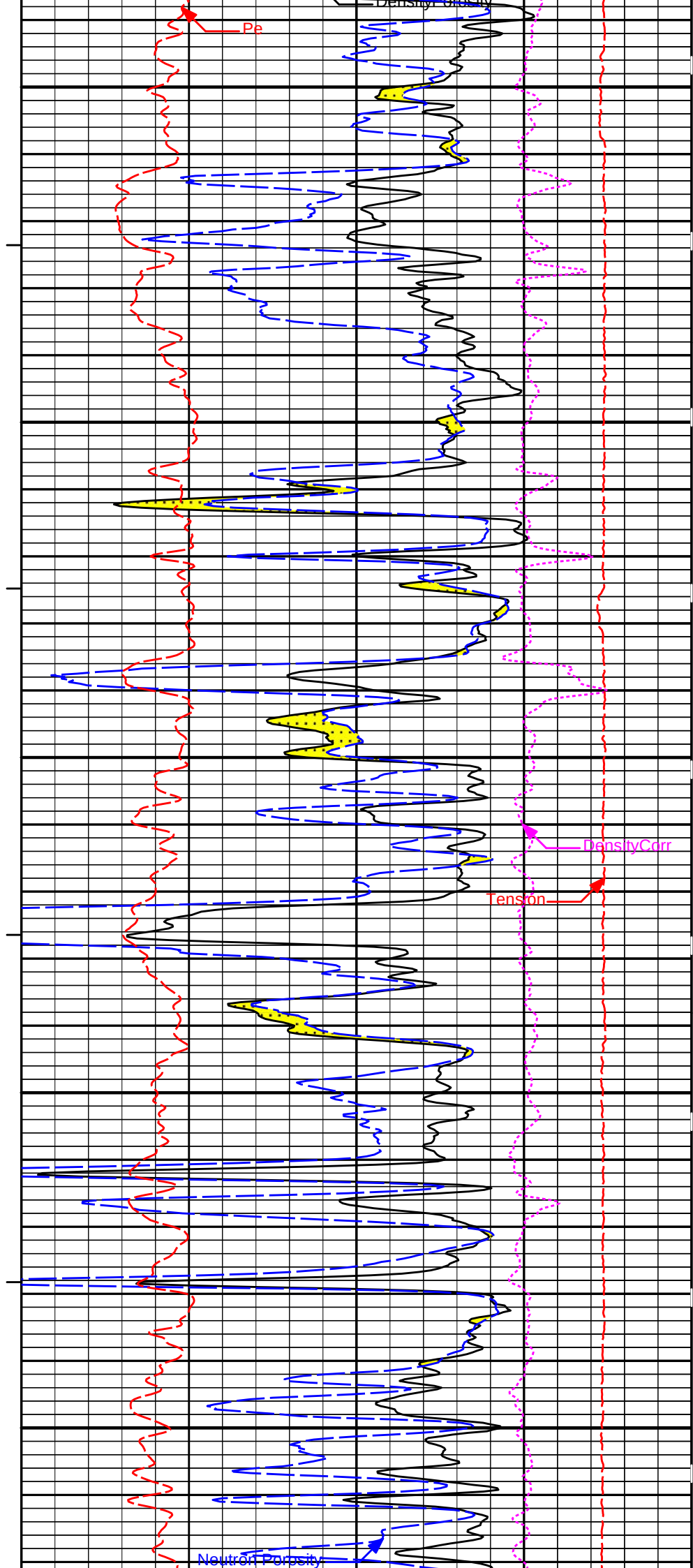
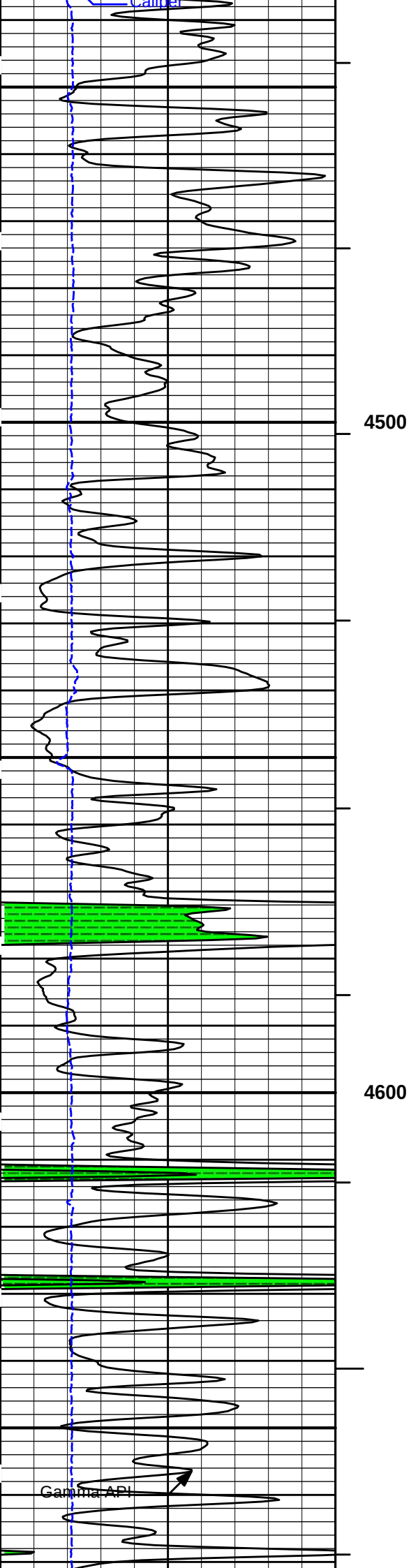
MEASURED DEPTH
MAIN SECTION 5" PER 100'

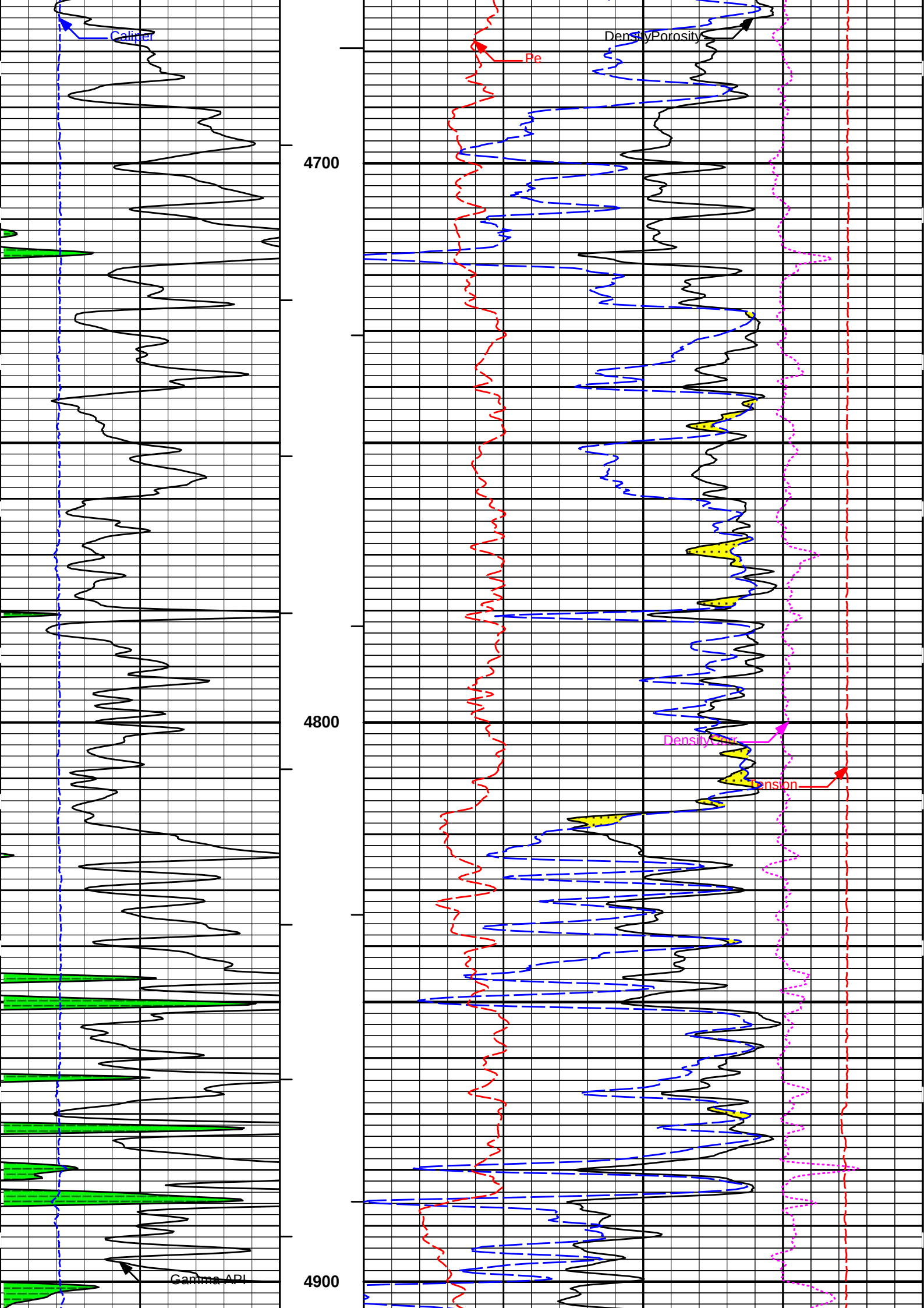


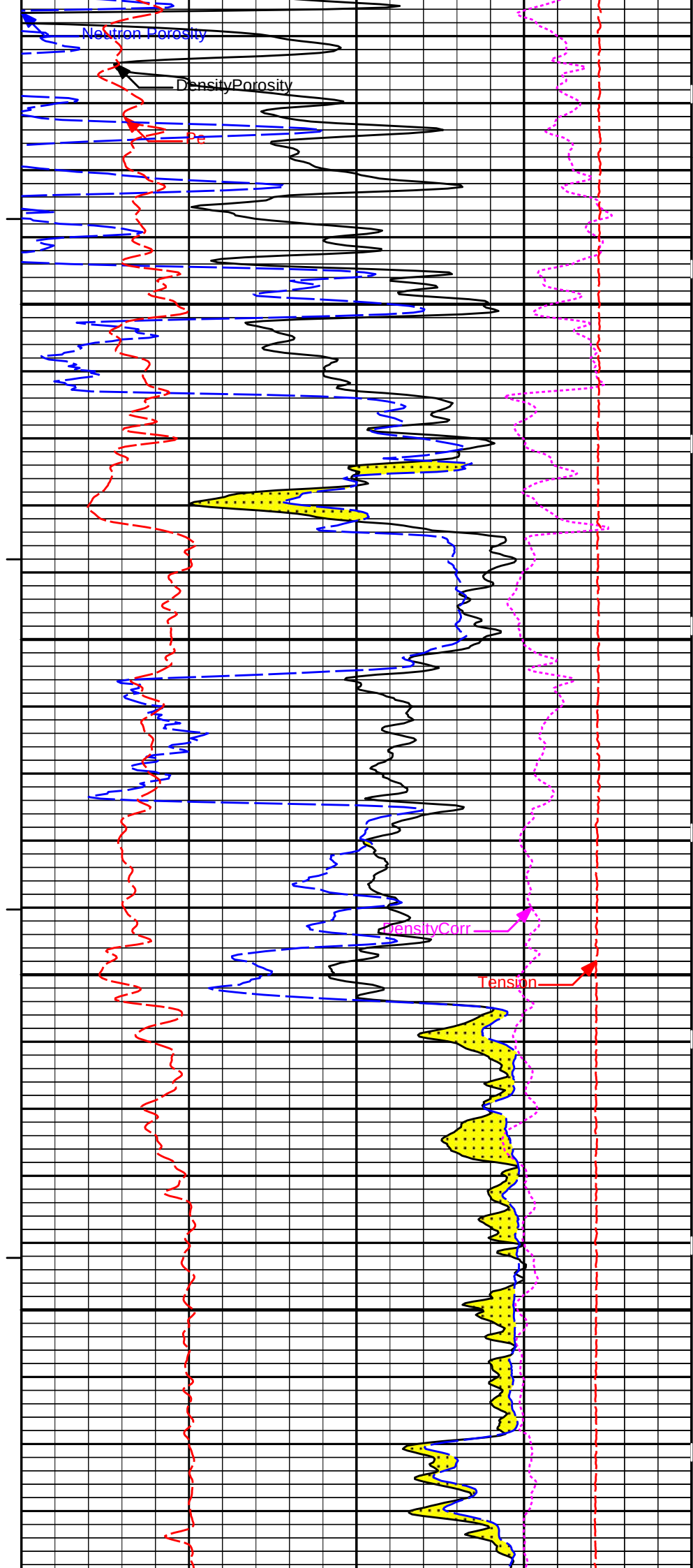
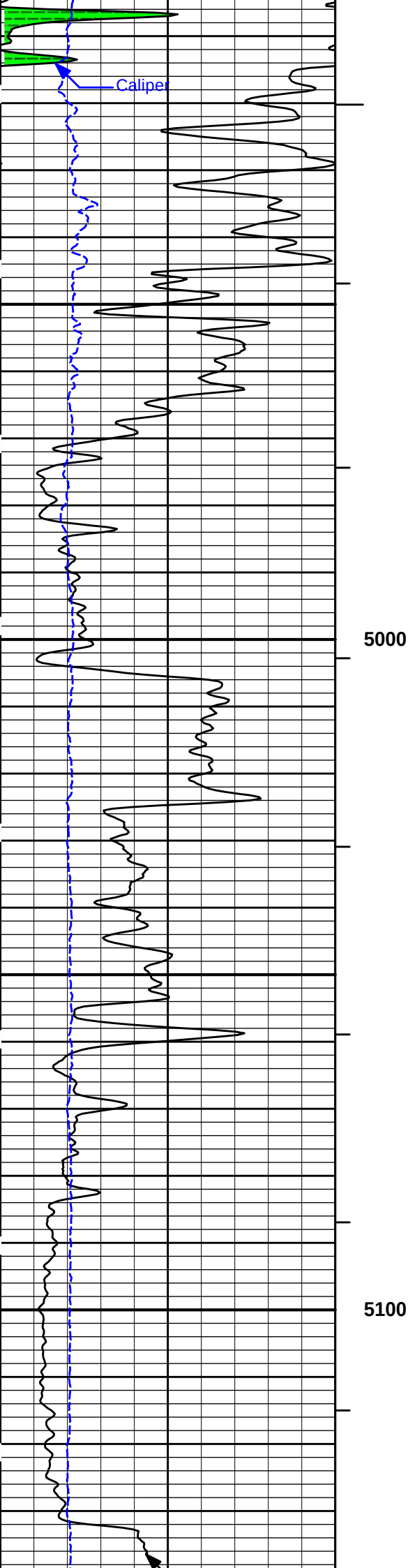


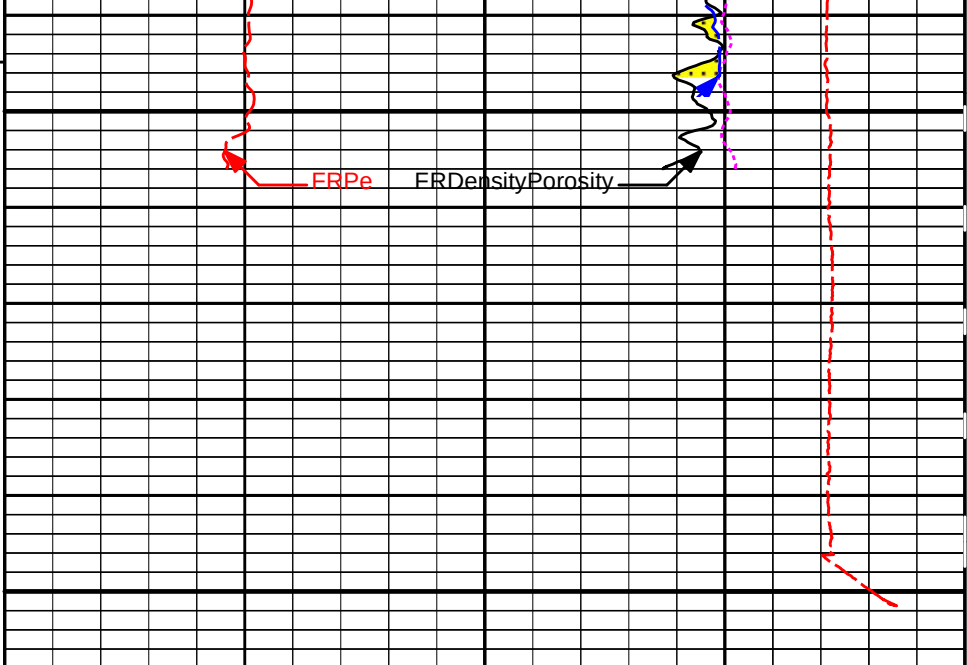
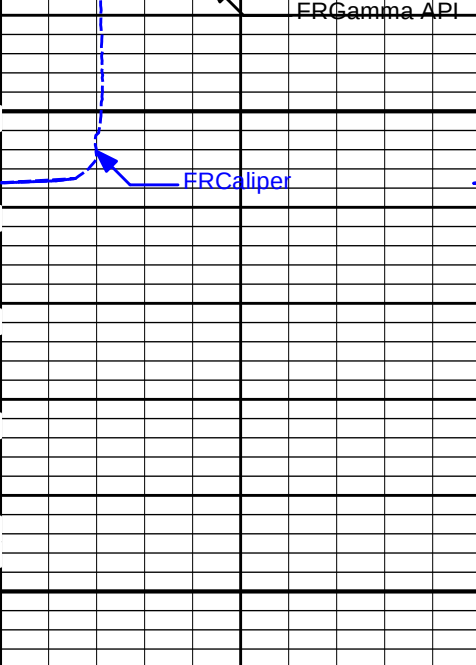












6	Caliper	16	MD 1 : 240 ft	0	Pe	10	-0.25	DensityCorr	0.25
	inches							gram per cc	
0	Gamma API	150	AHVT				15K	Tension	0
	api							pounds	
SHALE			BHVT	30	DensityPorosity				-10
								%	
				30	Neutron Porosity				-10
							%		
				CROSSOVER					

HALLIBURTON

Plot Time: 03-Oct-16 09:32:13
Plot Range: 3695 ft to 5208 ft
Data: MERIT JONES19-1\Well Based\DAQ-0001-004\
Plot File: \\POROSITY\Poro IQ 5 MAIN LIB

5 INCH MAIN LOG

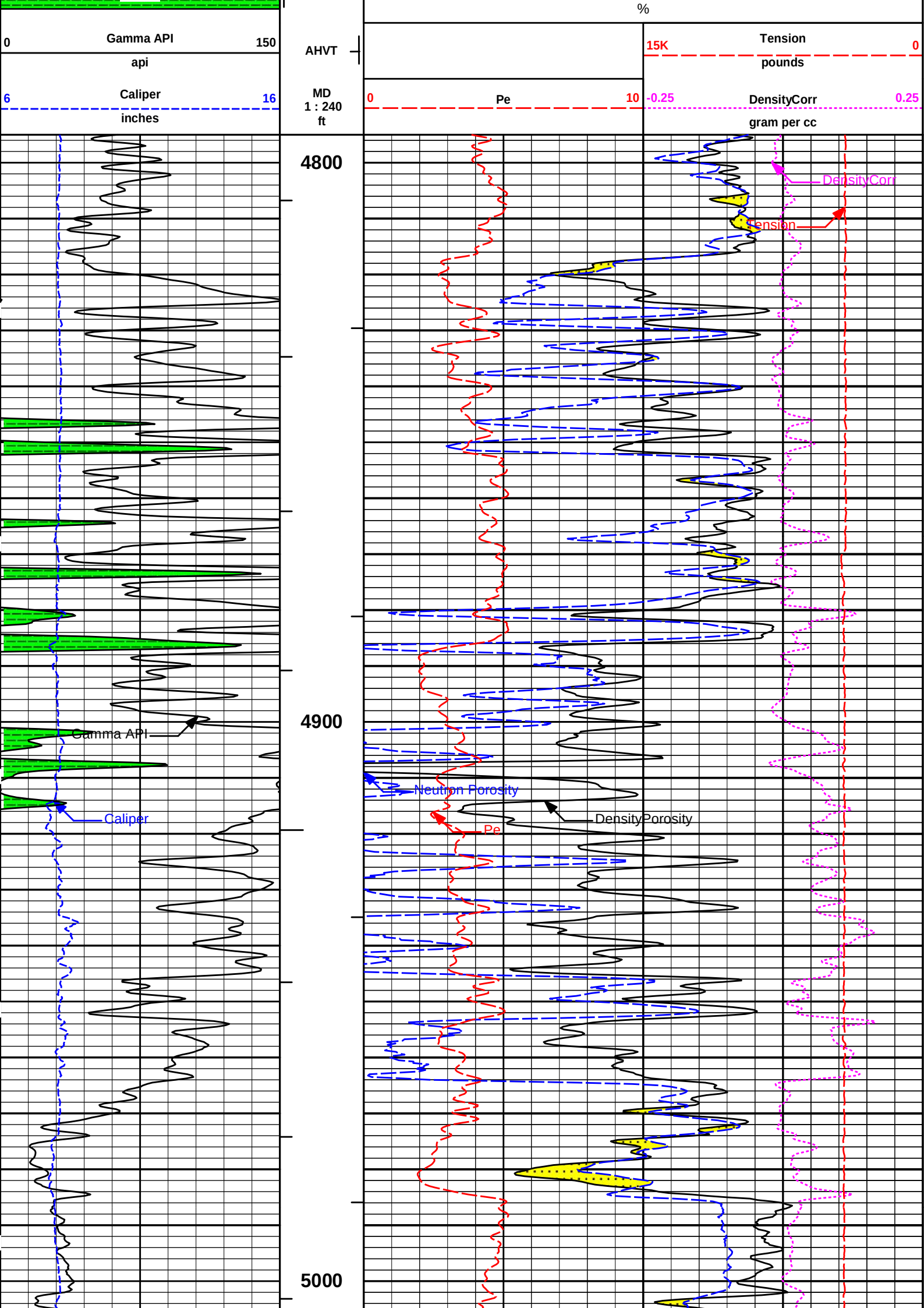
MEASURED DEPTH
MAIN SECTION 5" PER 100'

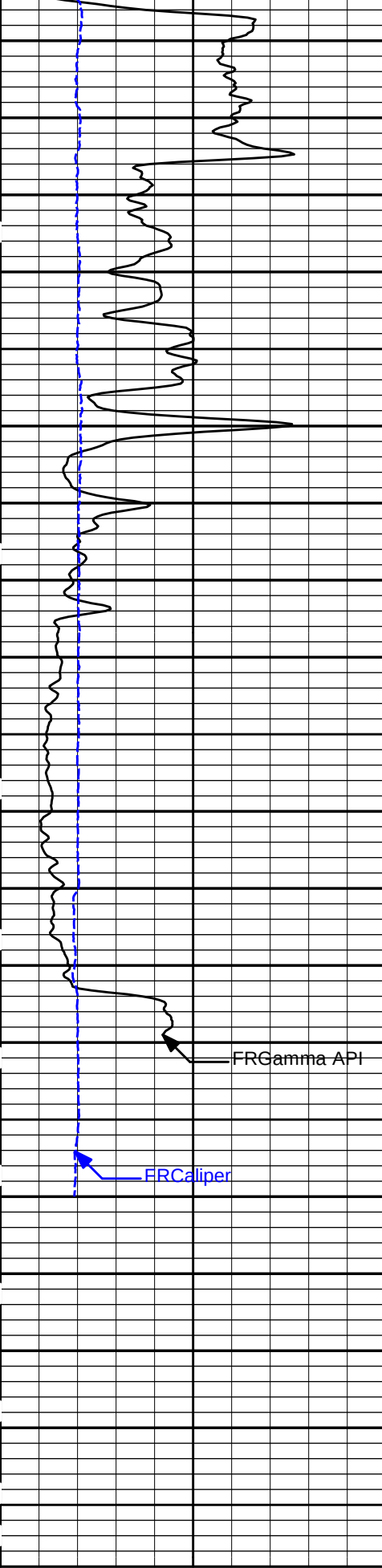
HALLIBURTON

Plot Time: 03-Oct-16 09:32:13
Plot Range: 4795 ft to 5208 ft
Data: MERIT JONES19-1\Well Based\DAQ-0001-003\
Plot File: \\POROSITY\Poro IQ 5_REP_LIB

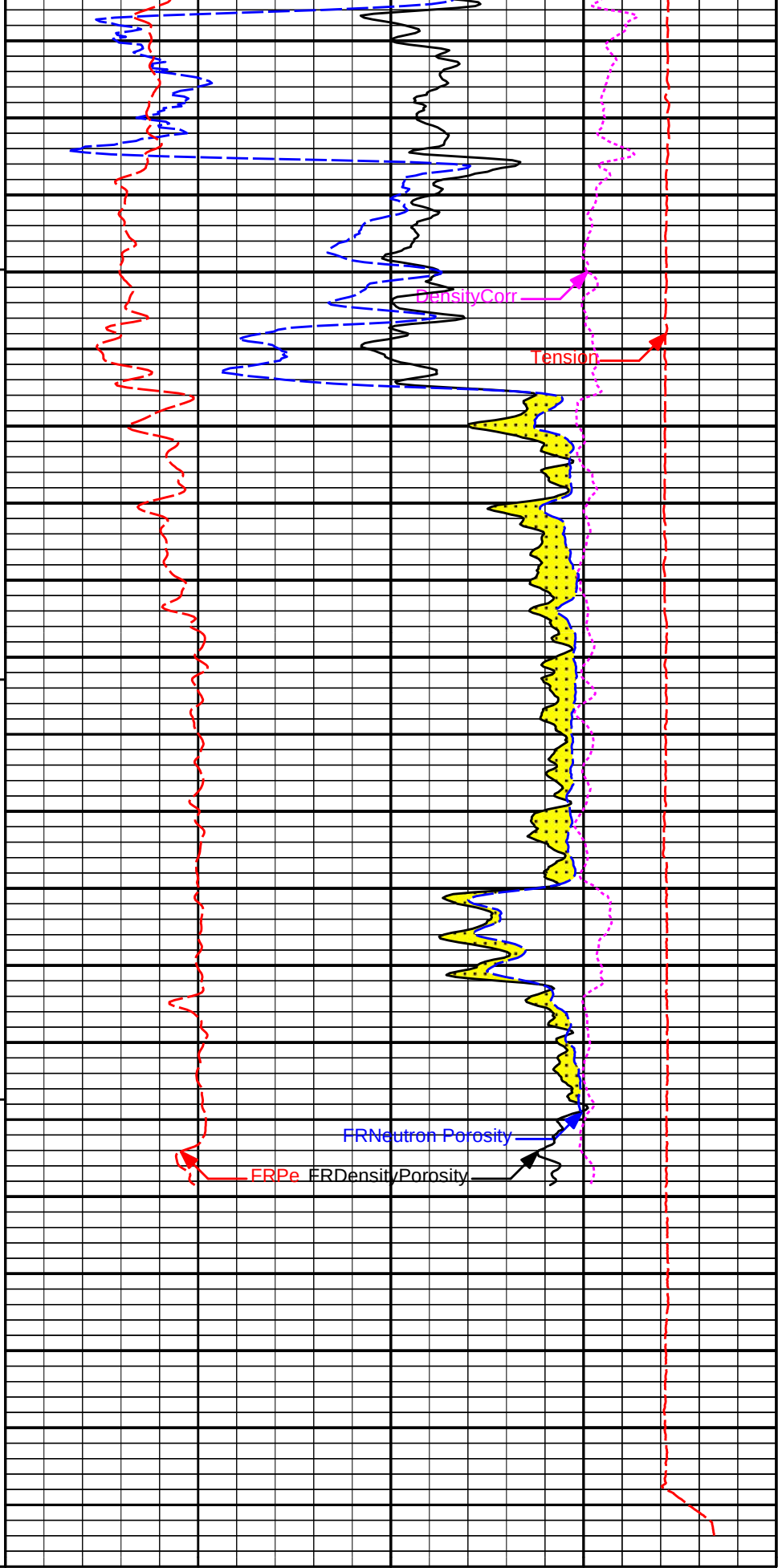
REPEAT SECTION

		CROSSOVER	
		Neutron Porosity	-10
		%	
SHALE	BHVT	DensityPorosity	-10





TD
5200



6	Caliper	16
	inches	
0	Gamma API	150
	api	
	SHALE	

MD
1 : 240
ft

AHVT

BHVT

0	Pe	10	-0.25	DensityCorr	0.25
				gram per cc	
			15K	Tension	0
				pounds	
30	DensityPorosity				-10
	%				

-10

CROSSOVER

REPEAT SECTION

5 INCH MAIN LOG

SHALE

150

-2

2

16

MD
1 : 240
ft

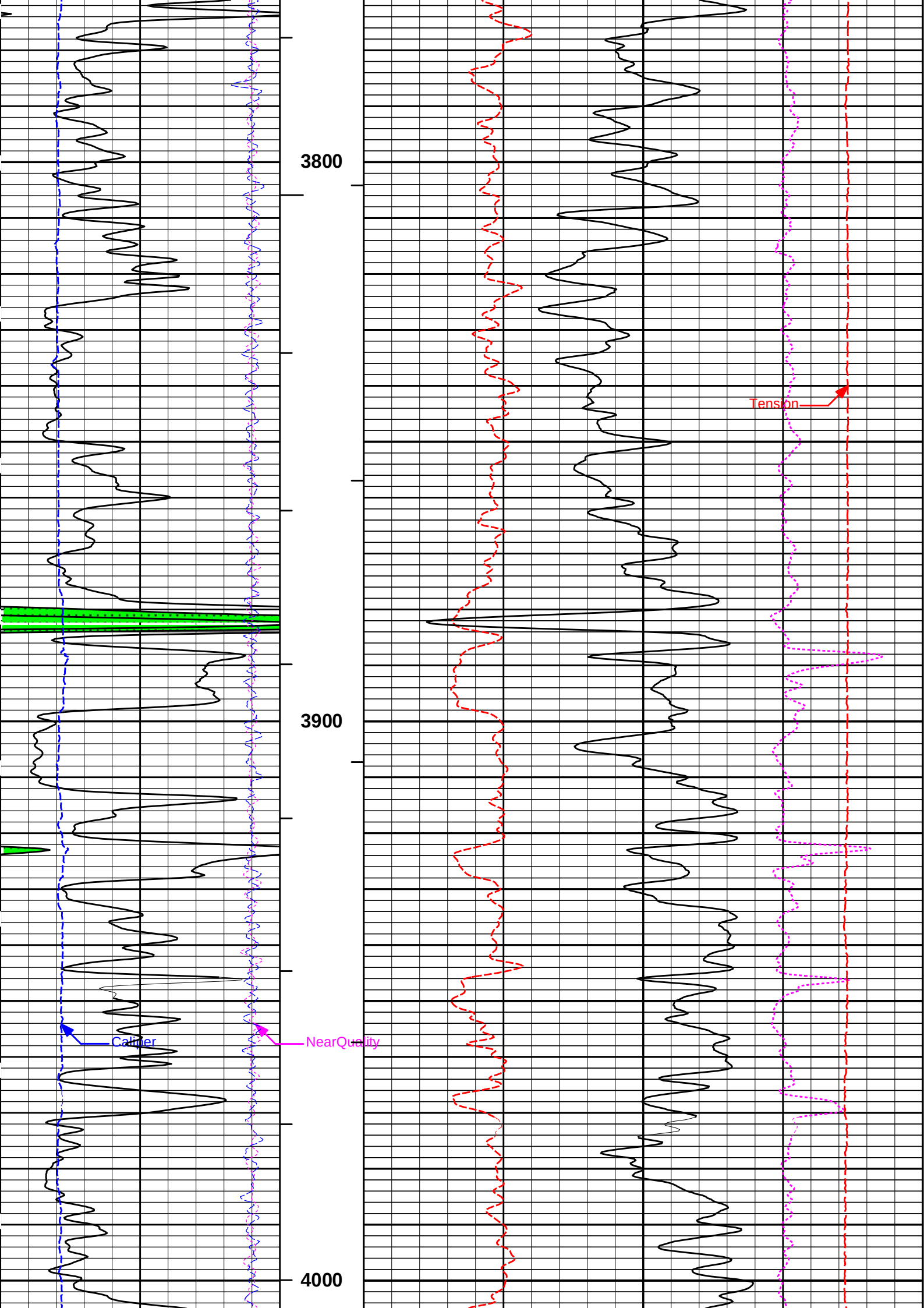
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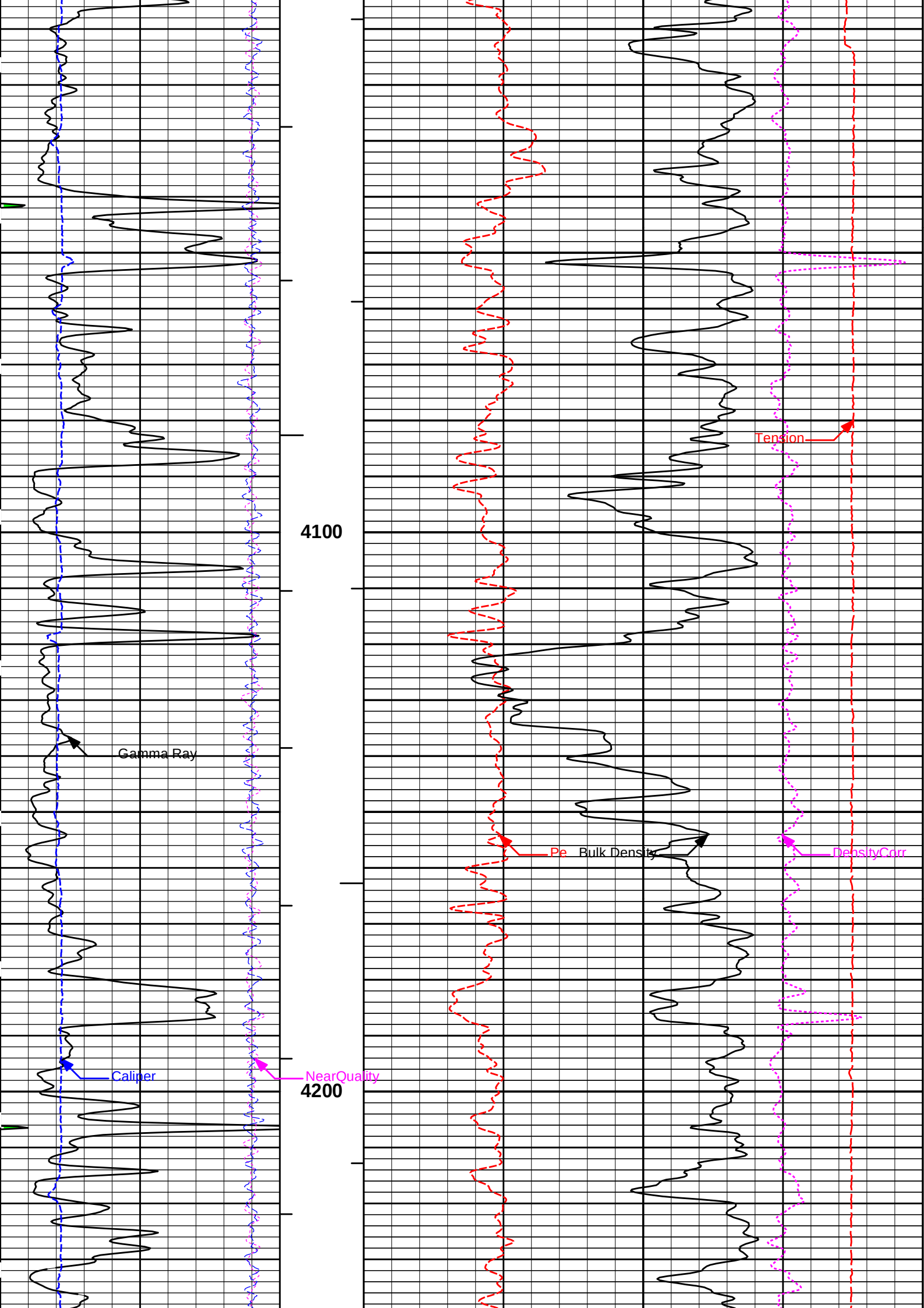
pounds

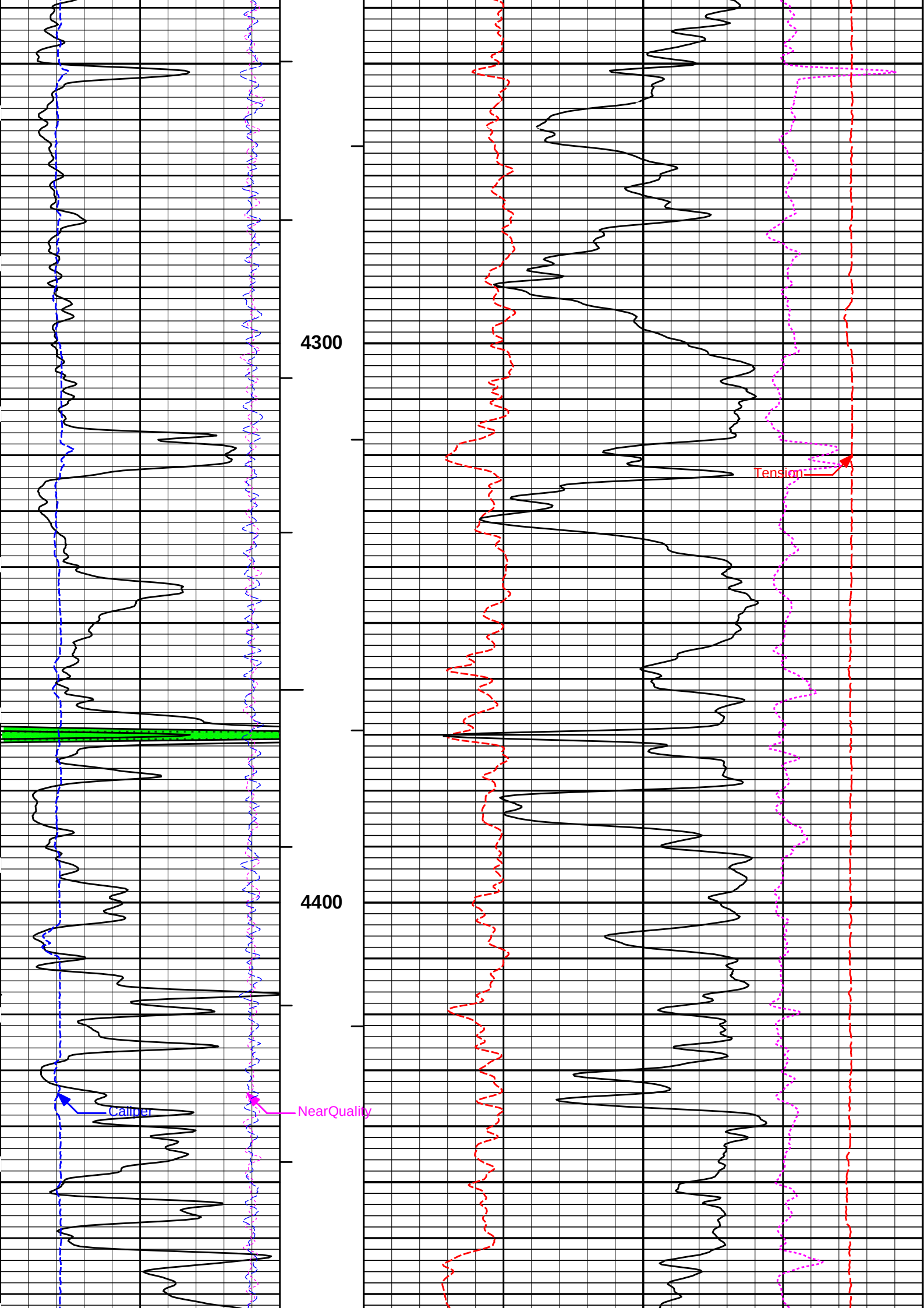
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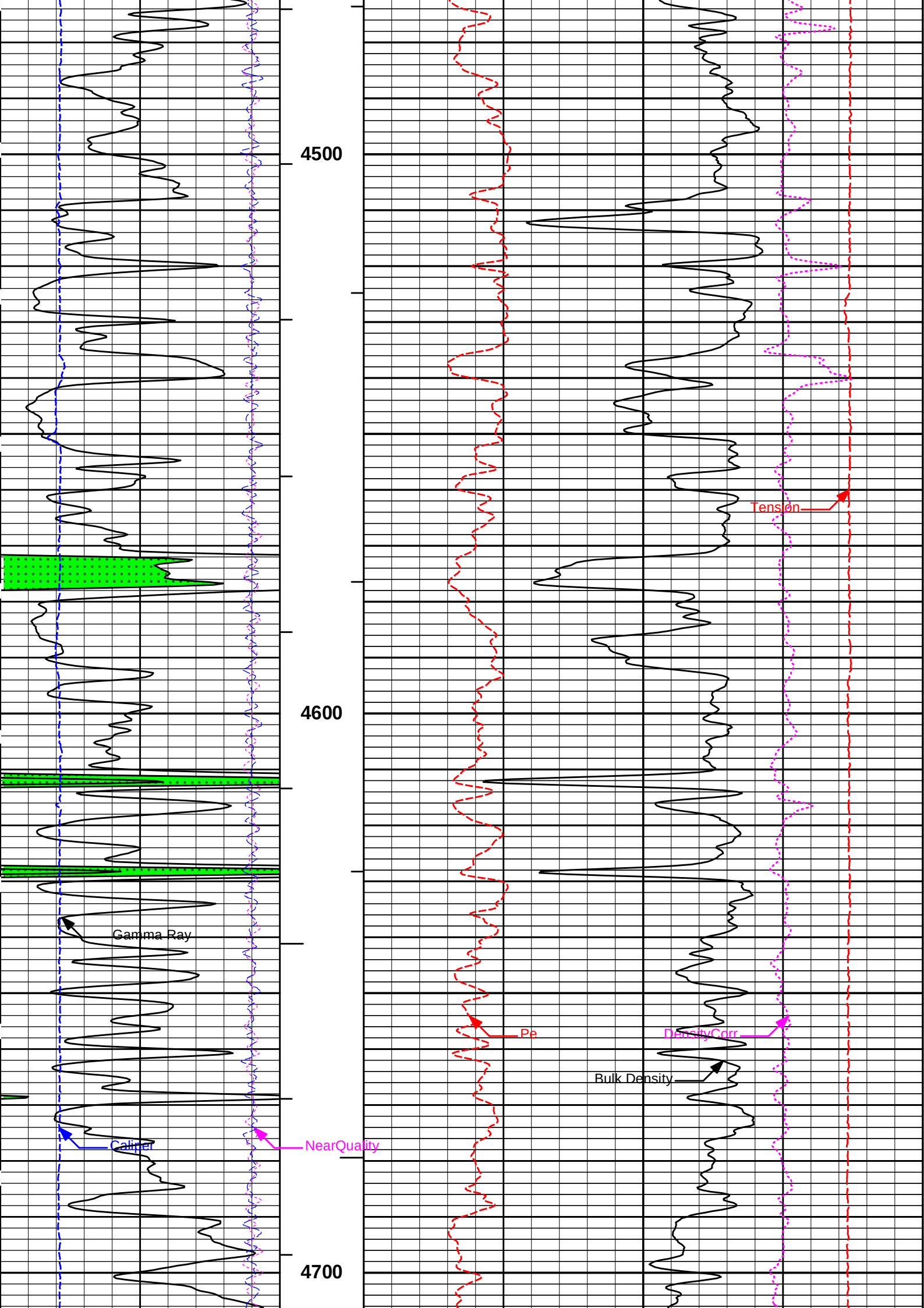
0.25

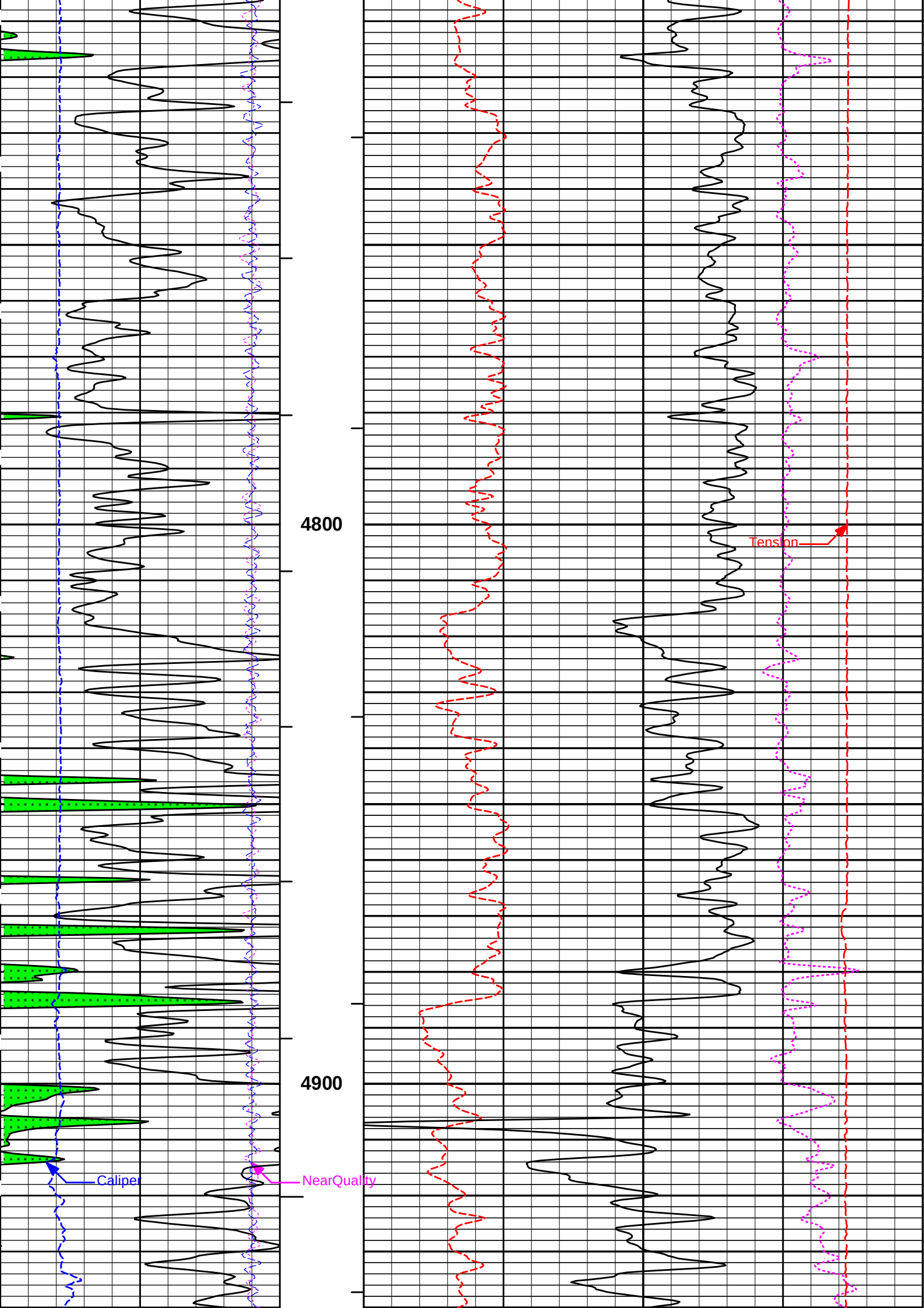
— NearQuality

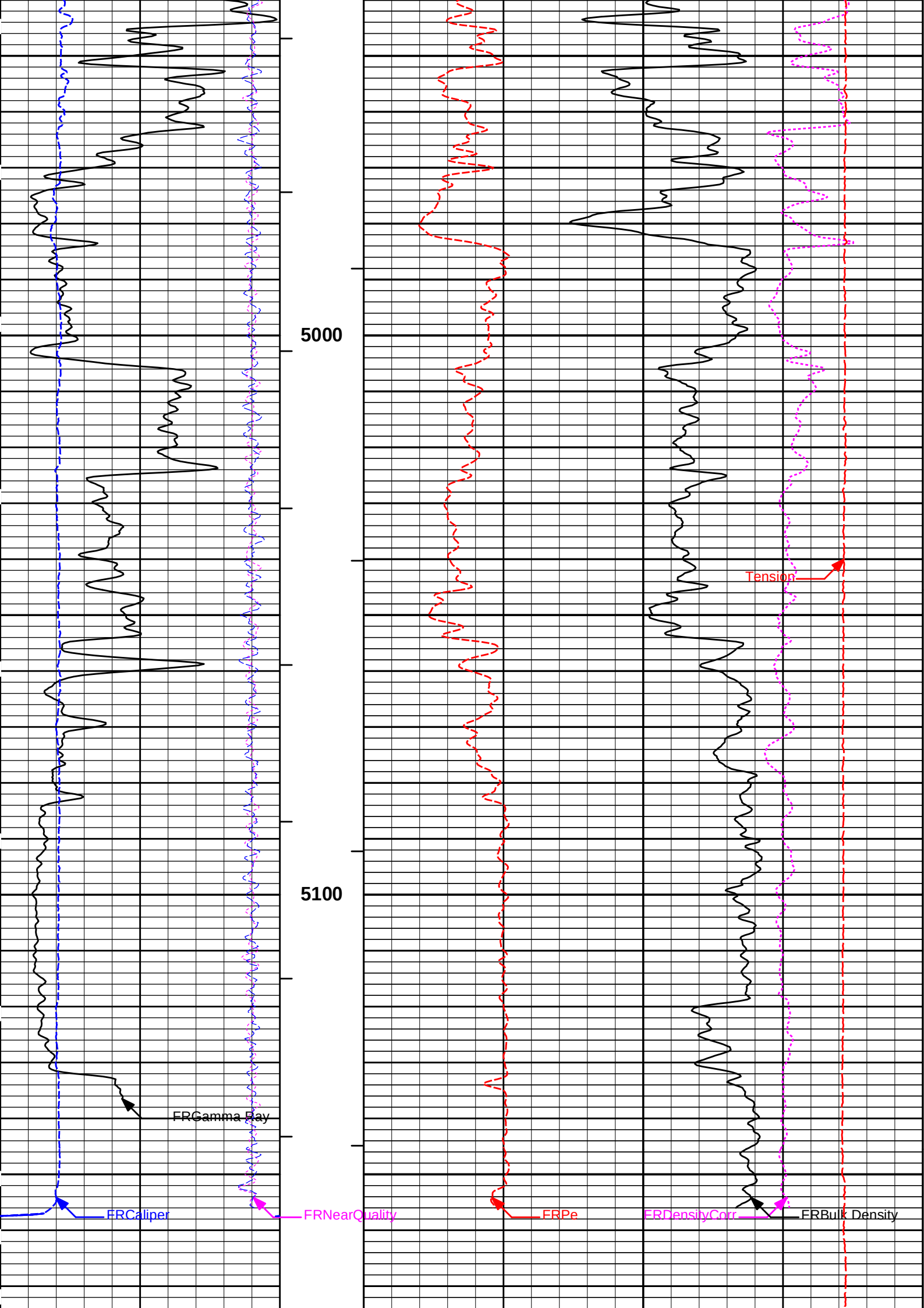


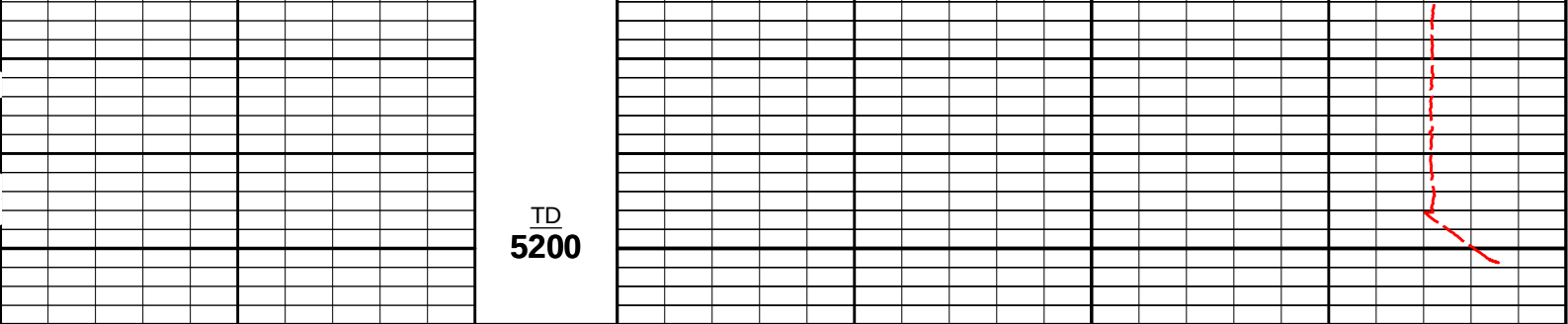












6	Caliper	16	MD 1 : 240 ft	0	Pe	10	-0.25	DensityCorr	0.25
	inches								
-18	NearQuality	2	AHV ft3				15K	Tension	0
								pounds	
18	FarQuality	-2	BH ft3	2	Bulk Density				3
					g/cc				
0	Gamma Ray	150							
	api								
	SHALE								

HALLIBURTON

Plot Time: 03-Oct-16 09:32:17
Plot Range: 3695 ft to 5208 ft
Data: MERIT JONES19-1\Well Based\DAQ-0001-004\
Plot File: \\-LOCAL-MERIT JONES19-1\0001 GTET-DSN-SDL-BSAT-ACRT\POROSITY\BULKD_5_MAIN_LIB

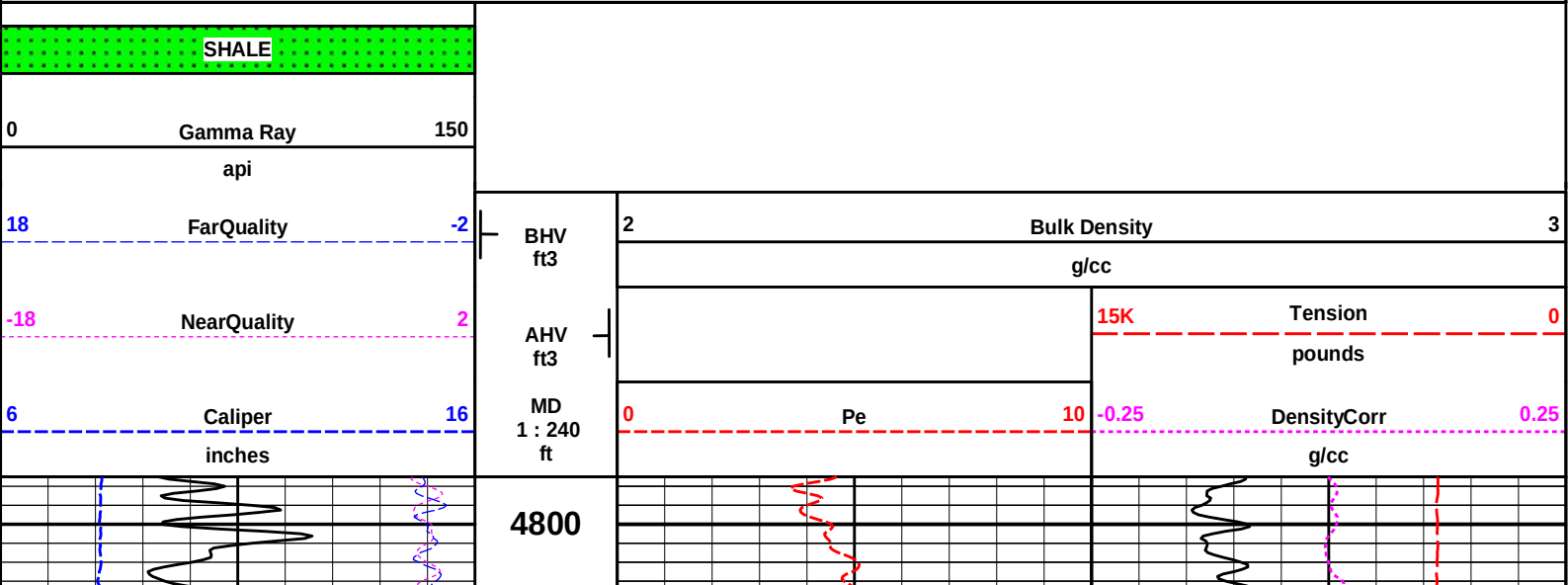
5 INCH MAIN LOG

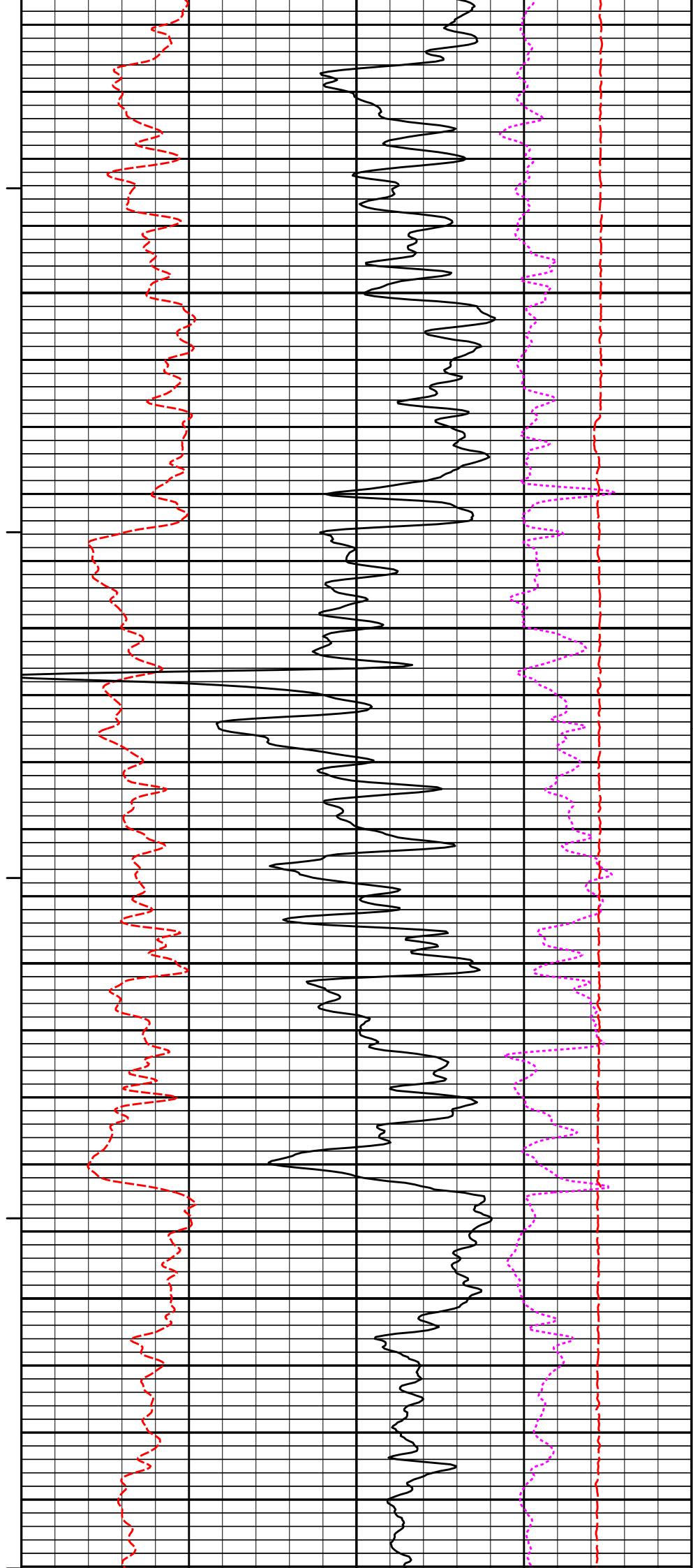
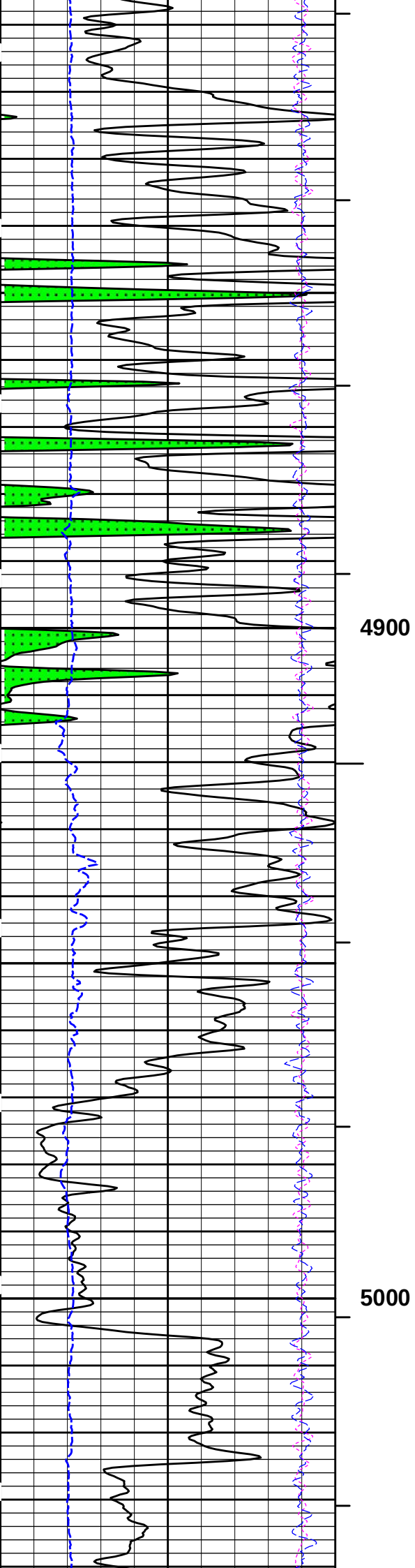
MEASURED DEPTH
MAIN SECTION 5" PER 100'

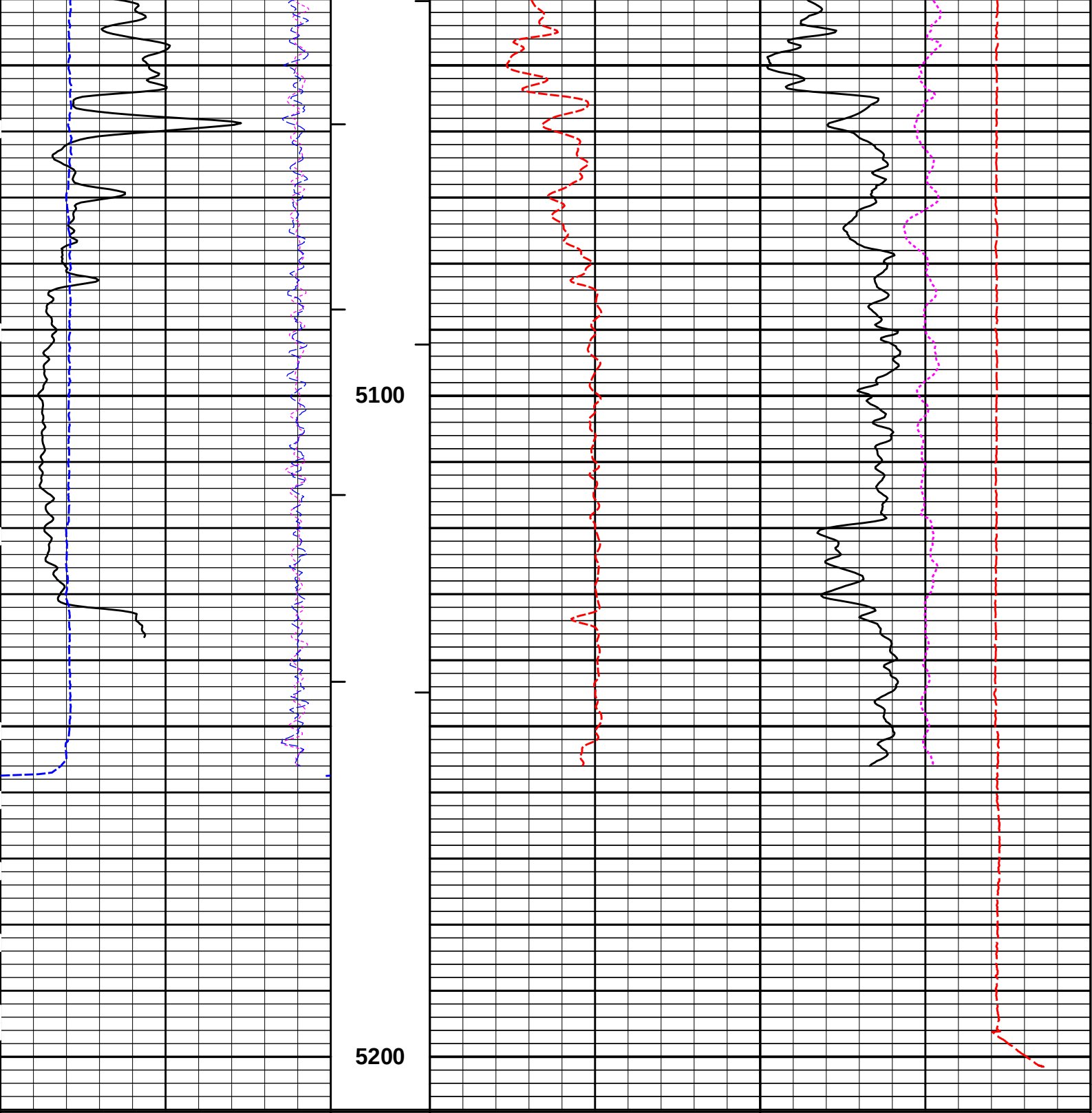
HALLIBURTON

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Plot Range: 4795 ft to 5208 ft
Data: MERIT JONES19-1\Well Based\DAQ-0001-004\
Plot File: \\-LOCAL-MERIT JONES19-1\0001 GTET-DSN-SDL-BSAT-ACRT\POROSITY\BULKD_5_REP_LIB

REPEAT SECTION







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

HALLIBURTON

Plot Time: 03-Oct-16 09:32:19
Plot Range: 4795 ft to 5208 ft
Data: MERIT JONES19-1\Well Based\DAQ-0001-004\
Plot File: \\LOCAL\MERIT JONES19-1\0001 GTET-DSN-SDL-BSAT-ACRT\POROSITY\BULKD_5_REP_LIB

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	8.700	ppg
	SHARED	WAGT	Weighting Agent	Natural	
	SHARED	BSAL	Borehole salinity	0.00	ppm
	SHARED	FSAL	Formation Salinity NaCl	0.00	ppm
	SHARED	KPCT	Percent K in Mud by Weight?	0.00	%
	SHARED	RMUD	Mud Resistivity	1.400	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	5200.00	ft
	SHARED	BHT	Bottom Hole Temperature	137.0	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	
	Rwa / CrossPlot	ROIN	Input for RO Calculation	Rwa	
	GTET	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	DSNO	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	137.0	degF
	DSNT	DTDT	Top Depth for Temperature Gradient Calculation (Measured Depth)	0	ft
	DSNT	DBDT	Bottom Zone Temperature Depth (Measured Depth)	5200	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	2352.00	psia
DSNT	DTDP	Top Depth for Pressure Gradient Calculation (Measured Depth)	0	ft
DSNT	DNDP	Bottom Zone Pressure Depth (Measured Depth)	5200	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	
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 Pore 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	1.19	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	RMAX	Maximum Resistivity for MAP	200.00	ohmm
ACRt Sonde	THQY	Threshold Quality	0.50	
ACRt Sonde	MRFX	Fixed mud resistivity	2000	ohmm
ACRt Sonde	BHSM	Borehole Size Source Tool	SDLT	
ACRt Sonde	MBFL	Apply Corkscrew Effect?	No	



CALIBRATION REPORT

NATURAL GAMMA RAY TOOL SHOP CALIBRATION

Tool Name:

GTET - 11048627

Reference Calibration Date:

25-Jul-16 10:06:29

Engineer:

MICHAEL RICHTER

Calibration Date:

19-Sep-16 03:51:24

Software Version:

WL INSITE R5.0.5 (Build 8)

Calibration Version:

1

Calibrator Source S/N: TB-146

Calibrator API Reference:265.00 api

Equivalent Calibrator API Reference:269.6 api

Measurement	Measured	Calibrated	Units
Background	48.3	49.7	api
Background + Calibrator	310.1	319.4	api

Calibrator		261.8	269.6	api
NATURAL GAMMA RAY TOOL FIELD CALIBRATION				
Tool Name:	GTET - 11048627		Reference Calibration Date:	19-Sep-16 03:51:24
Engineer:	MICHAEL RICHTER		Calibration Date:	19-Sep-16 03:55:07
Software Version:	WL INSITE R5.0.5 (Build 8)		Calibration Version:	1
Calibrator Source S/N: TB-146				
Calibrator API Reference:265.00 api				
Equivalent Calibrator API Reference:269.6 api				
Field Verification		Shop	Field	Units
Background		49.7	49.4	api
Background + Calibrator		319.4	321.6	api
Calibrator		269.6	272.2	api
Shop		Field	Difference	Tolerance
269.6		272.2	-2.6	+/- 9.00

ACCELEROMETER SHOP CALIBRATION				
Tool Name:	GTET - 11048627		Reference Calibration Date:	15-May-09 12:42:57
Engineer:	W.MILLER		Calibration Date:	13-Jan-10 16:35:19
Software Version:	WL INSITE R2.6.1 (Build 9)		Calibration Version:	1
Horizontal-1 Telemetry		Horizontal-2 Telemetry	Vertical Telemetry	Units
-78.18		-48.18	-16407.09	cnts
Coefficient		Coefficient Value	Tolerance	
Gain		-0.000061	-----	
Offset		-0.004	-----	
Noise		0.0003	0.0000 - 0.0030	
Orientation		Measured	Tolerance	Calibrated
Horizontal		0.00	-0.10 - 0.10	0.00
Vertical		1.00	0.90 - 1.10	1.00
				Tolerance
				-0.10 - 0.10
				0.90 - 1.10

DUAL SPACED NEUTRON SHOP CALIBRATION				
Tool Name:	DSNT - 11019643		Reference Calibration Date:	25-Jul-16 13:05:22
Engineer:	COTHREN		Calibration Date:	29-Aug-16 10:19:59
Software Version:	WL INSITE R5.0.5 (Build 8)		Calibration Version:	1
Logging Source S/N: DSN-424				
Tank Serial Number: 12345678				
Reference value assigned to Tank: 56.100				
Snow Block S/N: 12345678				
Calibration Tank Water Temperature: 79 degF				
Min. Tool Housing Outside Diameter: 3.625 in				
CALIBRATION CONSTANTS				
Measurement	Prev. Value	New Value	Control Limit On New Value	
Gain:	0.99590	0.99664	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):	0.2355	0.2358	0.0002	+/- 0.0020
Calibrated Ratio:	10.5518	10.5597	0.008	+/- 0.050

VERIFIER

Measurement	Value	Control Limit
Snow-Block Porosity (decp):	0.0788	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: 29-Aug-16 10:19:59

Engineer: MICHAEL RICHTER

Calibration Date: 19-Sep-16 04:20:18

Software Version: WL INSITE R5.0.5 (Build 8)

Calibration Version: 1

Logging Source S/N: DSN-424

Snow Block S/N: 12345678

NEUTRON FIELD-CHECK SUMMARY

	Shop	Field	Difference	Control Limit On Change
Snow-Block Porosity (decp):	0.0788	0.0747	-0.0040	+/- 0.0150

PASS/FAIL SUMMARY

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

DENSITY CALIPER SHOP CALIBRATION

Tool Name: SDLT - 10950489

Reference Calibration Date: 16-Jun-16 11:07:12

Engineer: COTHREN

Calibration Date: 25-Jul-16 09:22:10

Software Version: WL INSITE R5.0.0 (Build 4)

Calibration Version: 1

Host Tool Name: DSNT - 11019643

CALIBRATION COEFFICIENTS

Measurement	Previous Value	New Value	Control Limit On New Value
Pad Offset	-3798.26	-3922.84	-7000.00 - -1000.00
Pad Gain	0.0003847	0.0003897	0.0002000 - 0.0006000
Arm Offset	-3606.28	-3528.51	-5000.00 - 3000.00
Arm Gain	0.0004697	0.0004727	0.000300 - 0.000700
Arm Power	-0.000002187	-0.000002590	-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)	2.02	2.00	-0.02	+/- 0.20
Medium Ring (in)	3.75	3.75	0.00	+/- 0.20
RING DIAMETER:				
Small Ring (in)	6.50	6.50	0.00	+/- 0.20
Medium Ring (in)	8.25	8.25	0.00	+/- 0.20
Large Ring (in)	15.05	15.00	-0.05	+/- 0.20

PASS/FAIL SUMMARY

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

PASS/FAIL SUMMARY

Calibration-Coefficients Range Check:	Passed
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SDLT CALIPER FIELD CALIBRATION						
Tool Name: SDLT - 10950489		Reference Calibration Date: 25-Jul-16 09:22:10				
Engineer: COTHREN		Calibration Date: 31-Aug-16 13:24:18				
Software Version: WL INSITE R5.0.0 (Build 4)		Calibration Version: 1				
	MEASURED CALIPER VALUES					
	Measurement	Shop	Field	Change	Control Limit On New Value	
	Pad Extension	3.75	3.75	-0.00	+/- 0.10	
	Ring Diameter	8.25	8.25	0.00	+/- 0.15	
	PASS/FAIL SUMMARY					
	Pad Extension Check:			Passed		
	Diameter Check:			Passed		
	MICRO LOG SHOP CALIBRATION					
	Tool Name: Microlog Pad - 10950489		Reference Calibration Date: 27-Apr-16 11:53:42			
	Engineer: COTHREN		Calibration Date: 31-Aug-16 13:13:23			
Software Version: WL INSITE R5.0.0 (Build 4)		Calibration Version: 1				
Host Tool Name: DSNT - 11019643						
	CALIBRATION COEFFICIENT SUMMARY					
	Measurement	Micro Log Normal		Micro Log Lateral		Units
		Measured	Calibrated	Measured	Calibrated	
	Tool Zero	-0.09	-0.16	-0.00	0.00	ohmm
	Calibration Point #1	0.07	0.00	-0.00	0.00	ohmm
	Calibration Point #2	20.12	20.00	20.05	20.00	ohmm
	Internal Reference	19.96	19.85	20.02	19.98	ohmm
	Measurement	Micro Log Normal Tool Value		Micro Log Lateral Tool Value		Units
	Tool Zero	0.86		1.61		V
	Calibration Point #1	42.97		1.49		V
	Calibration Point #2	5401.29		7035.52		V
	Internal Reference	5360.42		7027.77		V
	MICRO LOG FIELD CHECK					
	Tool Name: Microlog Pad - 10950489		Reference Calibration Date: 31-Aug-16 13:13:23			
	Engineer: MICHAEL RICHTER		Calibration Date: 19-Sep-16 03:50:00			
	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	-0.16	-0.16	0.00	-0.00	ohmm
	Internal Reference	19.85	19.81	19.98	19.93	ohmm
	Summary					
	Signal	Shop	Field	Difference	Tolerance	
	Microlog Normal	19.85	19.81	0.04	+/- 0.80	
	Microlog Lateral	19.98	19.93	0.05	+/- 0.80	
SPECTRAL DENSITY SHOP CALIBRATION						
Tool Name: SDLT Pad - 10809130		Reference Calibration Date: 20-Sep-16 18:52:33				
Engineer: MICHAEL RICHTER		Calibration Date: 20-Sep-16 19:12:21				
Software Version: WL INSITE R5.0.5 (Build 8)		Calibration Version: 1				
Logging Source S/N: 5168GW						
Aluminum Block S/N: EL RENO STD ALUMINUM		Density: 2.581g/cc		Pe: 3.170		

Density Calibration Summary			
Measurement	Previous Value	New Value	Control Limit
Near Bar Gain	1.0161	1.0173	0.90 - 1.10
Near Dens Gain	1.0063	1.0121	0.90 - 1.10
Near Peak Gain	1.0263	1.0331	0.90 - 1.10
Near Lith Gain	1.0105	1.0195	0.90 - 1.10
Far Bar Gain	1.0085	1.0081	0.90 - 1.10
Far Dens Gain	0.9965	0.9977	0.90 - 1.10
Far Peak Gain	0.9924	0.9943	0.90 - 1.10
Far Lith Gain	0.9660	0.9686	0.90 - 1.10
Near Bar Offset	0.1282	0.1180	NONE
Near Dens Offset	0.2103	0.1594	NONE
Near Peak Offset	0.0408	-0.0167	NONE
Near Lith Offset	0.1030	0.0282	NONE
Far Bar Offset	0.1030	0.1076	NONE
Far Dens Offset	0.1909	0.1806	NONE
Far Peak Offset	0.1805	0.1648	NONE
Far Lith Offset	0.3081	0.2908	NONE
Near Bar Background	766.30	767.24	700 - 1450
Near Dens Background	249.77	248.74	230 - 480
Near Peak Background	108.31	108.16	100 - 210
Near Lith Background	137.31	136.46	125 - 260
Far Bar Background	489.41	488.55	450 - 900
Far Dens Background	189.75	189.17	175 - 345
Far Peak Background	74.26	73.67	70 - 140
Far Lith Background	76.56	77.78	75 - 145

Calibration Block Summary				
Measurement	Current Reading (Previous Coef)	Calibrated (New Coef)	Change	Control Limit On Change
MAGNESIUM				
Density (g/cc)	1.686	1.686	-0.000	+/- 0.015
Pe	2.568	2.566	-0.002	+/- 0.150
ALUMINUM				
Density (g/cc)	2.580	2.580	-0.000	+/- 0.01500
Pe	3.129	3.140	0.011	+/- 0.150

Tool Summary				
Measurement	Near Detector		Far Detector	
	Value	Control Limits	Value	Control Limits
QUALITY				
Background	-0.0002	+/- 0.0110	0.0011	+/- 0.0140
Magnesium Block	-0.0002	+/- 0.0110	-0.0011	+/- 0.0140
Aluminum Block	-0.0005	+/- 0.0110	-0.0013	+/- 0.0140
Resolution	8.93	6.00 - 11.50	9.26	6.00 - 11.50
Internal Verifier(B+D+P+L)	1261	1200 - 2700	829	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 - 10809130	Reference Calibration Date:	20-Sep-16 19:12:21
Engineer:	MICHAEL RICHTER	Calibration Date:	20-Sep-16 19:25:09
Software Version:	WL INSITE R5.0.5 (Build 8)	Calibration Version:	1

Pad Temperature: 98.6 degF

DENSITY FIELD CALIBRATION SUMMARY				
Measurement	Shop	Field	Change	Control Limit +/-
Near (B+D+P+L) cps	1260.593	1263.897	3.304	14.390
Far (B+D+P+L) cps	829.172	828.619	-0.553	15.859
Near Resolution	8.93	8.95	0.020	0.50
Far Resolution	9.26	9.34	0.080	1.00

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

BSAT FIELD CASING CHECK

Tool Name:	BSAT - 10939050	Calibration Date:	14-Mar-08 11:12:27
Engineer:	STEPHEN WEEKS		
Software Version:	WL INSITE R2.0 (Build 22)	Calibration Version:	1

Pre-Log Check	Check Depth	Shop	Field	Difference	Tolerance	Units
Delta-T Compensated	2073.28	57000000.00	56.55	56,999,943.4500	1.00	uspf

ARRAY COMPENSATED TRUE RESISTIVITY SHOP CALIBRATION

Tool Name:	ACRt Sonde - 11005908	Reference Calibration Date:	11-Feb-16 16:29:25
Engineer:	COTHREN	Calibration Date:	12-Aug-16 13:26:15
Software Version:	WL INSITE R5.0.0 (Build 4)	Calibration Version:	1
Host Tool Name:	ACRt Instrument - 11026095		

TYPICAL GAIN RANGE

Subarray	R12KHz			R36KHz			R72KHz		
	Lower	(mmho/m)	Upper	Lower	(mmho/m)	Upper	Lower	(mmho/m)	Upper
A1 (80")	0.95	1.0135	1.05	0.95	1.0147	1.05	0.95	1.0138	1.05
A2 (50")	0.95	1.0132	1.05	0.95	1.0141	1.05	0.95	1.0145	1.05
A3 (29")	0.95	1.0168	1.05	0.95	1.0159	1.05	0.95	1.0125	1.05
A4 (17")	0.95	1.0187	1.05	0.95	1.0162	1.05	0.95	1.0159	1.05
A5 (10")	N/A	N/A	N/A	0.95	1.0102	1.05	0.95	1.0090	1.05
A6 (6")	N/A	N/A	N/A	0.95	0.9965	1.05	0.95	0.9948	1.05

SONDE OFFSET

Subarray	R12KHz			R36KHz			R72KHz		
	(mmho/m)			(mmho/m)			(mmho/m)		
A1 (80")	-1.059			-4.210			-5.543		
A2 (50")	-2.329			-4.106			-4.965		
A3 (29")	-14.294			-4.266			-3.590		
A4 (17")	-94.979			-29.799			-24.810		
A5 (10")	N/A			-110.669			-49.440		
A6 (6")	N/A			354.482			178.239		

TRANSMITTER CURRENT GAIN				R-MUD VERIFICATION			
Signal	Lower	R	Upper	Signal	Lower (ohm-m)	Measured (ohm-m)	Upper (ohm-m)
12K	0.6	0.96	1.3	Mud Cell	0.95	1.00	1.05
36K	1.0	1.95	2.0				
72K	1.0	1.29	2.0				
PASS/FAIL SUMMARY							
GAIN RANGE CHK				PASS			
SONDE OFFSET CHK				PASS			
TOOL OK TO LOG							

QUALITY CHECK SHOP CALIBRATION			
Tool Name:	ACRt Sonde - 11005908	Reference Calibration Date:	01-Jan-70 00:00:00
Engineer:	COTHREN	Calibration Date:	12-Aug-16 13:27:48
Software Version:	WL INSITE R5.0.0 (Build 4)	Calibration Version:	1
Host Tool Name:	ACRt Instrument - 11026095		

STANDARD DEVIATIONS									
	R12KHz			R36KHz			R72KHz		
	Measured (mmho/m)	Expected (mmho/m)	Pass/Fail	Measured (mmho/m)	Expected (mmho/m)	Pass/Fail	Measured (mmho/m)	Expected (mmho/m)	Pass/Fail
A1 (80")	0.000	< 0.750	Pass	0.000	< 0.750	Pass	0.000	< 0.750	Pass
A2 (50")	0.000	< 0.750	Pass	0.000	< 0.750	Pass	0.000	< 0.750	Pass
A3 (29")	0.000	< 0.750	Pass	0.000	< 0.750	Pass	0.000	< 0.750	Pass
A4 (17")	0.000	< 0.750	Pass	0.000	< 0.750	Pass	0.000	< 0.750	Pass
A5 (10")	0.000	< 0.750	Pass	0.000	< 0.750	Pass	0.000	< 0.750	Pass
A6 (6")	0.000	< 0.750	Pass	0.000	< 0.750	Pass	0.000	< 0.750	Pass

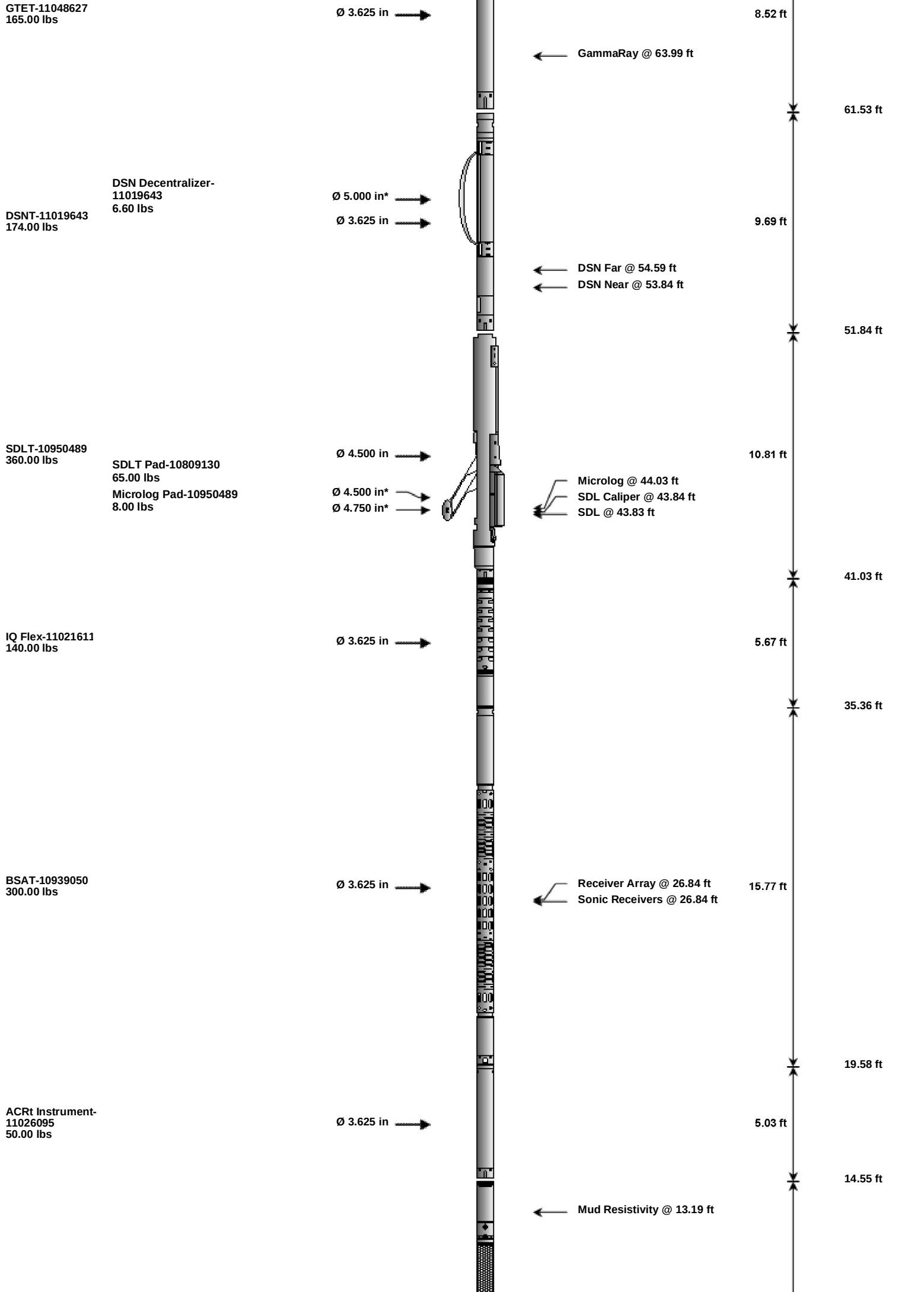
AVERAGES									
	R12KHz			R36KHz			R72KHz		
	Measured (mmho/m)	Expected (mmho/m)	Pass/Fail	Measured (mmho/m)	Expected (mmho/m)	Pass/Fail	Measured (mmho/m)	Expected (mmho/m)	Pass/Fail
A1 (80")	0.000	< 0.500	Pass	-0.001	> -0.500	Pass	-0.007	> -0.500	Pass
A2 (50")	0.000	< 0.500	Pass	-0.001	> -0.500	Pass	-0.006	> -0.500	Pass
A3 (29")	-0.000	< 0.500	Pass	-0.001	> -0.500	Pass	-0.004	> -0.500	Pass
A4 (17")	-0.003	> -0.500	Pass	-0.008	> -0.500	Pass	-0.027	> -0.500	Pass
A5 (10")	-0.014	> -0.500	Pass	-0.027	> -0.500	Pass	-0.051	> -0.500	Pass
A6 (6")	0.016	< 0.500	Pass	0.077	< 0.500	Pass	0.167	< 0.500	Pass

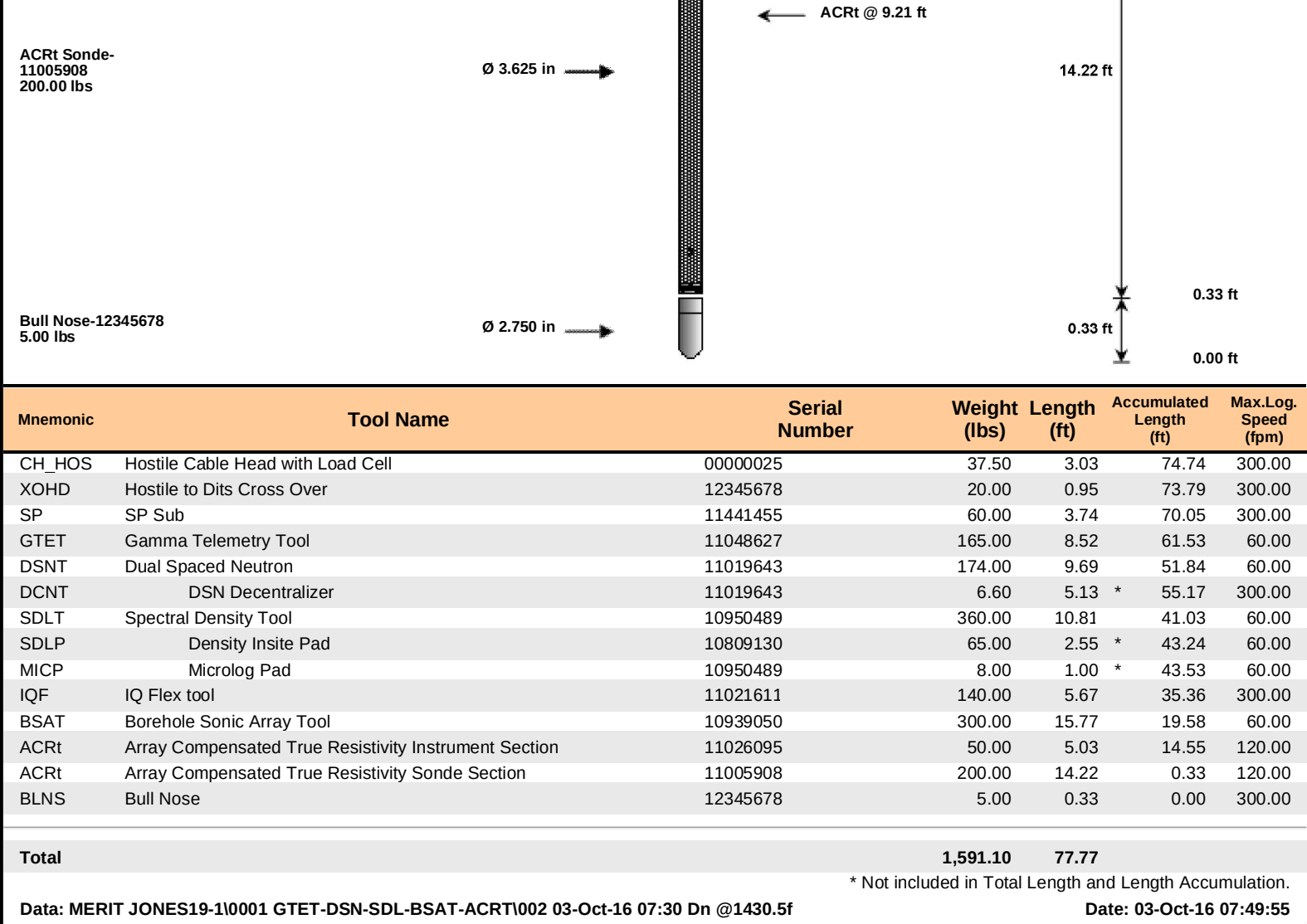
GAIN TOLERANCE					
R12KHz					
	Measured (mmho/m)	Last Month (mmho/m)	Difference (mmho/m)	Tolerance (mmho/m)	Pass/Fail
A1 (80")	-225046368.000	0.000	225046368.000	0.000	Fail
A2 (50")	-217510448.000	0.000	217510448.000	0.000	Fail
A3 (29")	-219967248.000	0.000	219967248.000	0.000	Fail
A4 (17")	-212691200.000	0.000	212691200.000	0.000	Fail
A5 (10")	-215709056.000	0.000	215709056.000	0.000	Fail
A6 (6")	-216889824.000	0.000	216889824.000	0.000	Fail
R36KHz					
	Measured (mmho/m)	Last Month (mmho/m)	Difference (mmho/m)	Tolerance (mmho/m)	Pass/Fail
A1 (80")	54712204.000	0.000	54712204.000	0.000	Fail
A2 (50")	48487788.000	0.000	48487788.000	0.000	Fail

A3 (29")	44360180.000	0.000	44360180.000	0.000	Fail
A4 (17")	34211224.000	0.000	34211224.000	0.000	Fail
A5 (10")	39219516.000	0.000	39219516.000	0.000	Fail
A6 (6")	37696152.000	0.000	37696152.000	0.000	Fail
R72KHz					
	Measured (mmho/m)	Last Month (mmho/m)	Difference (mmho/m)	Tolerance (mmho/m)	Pass/Fail
A1 (80")	-95728048.000	0.000	95728048.000	0.000	Fail
A2 (50")	-92629472.000	0.000	92629472.000	0.000	Fail
A3 (29")	-90945320.000	0.000	90945320.000	0.000	Fail
A4 (17")	-89221312.000	0.000	89221312.000	0.000	Fail
A5 (10")	-89166472.000	0.000	89166472.000	0.000	Fail
A6 (6")	-87750248.000	0.000	87750248.000	0.000	Fail
PASS/FAIL SUMMARY					
Std Deviation Verification				Pass	
Average Verification				Pass	
Gain Tolerance Verification				Fail	

CALIBRATION SUMMARY						
Sensor	Shop	Field	Post	Difference	Tolerance	Units
GTET-11048627						
Gamma Ray Calibrator	269.6	272.2	-----	-2.6	+/- 9.00	api
DSNT-11019643						
Snow-Block Porosity	0.0788	0.0747	-----	0.0041	+/- 0.0150	decp
SDLT-10950489						
Pad Extension	3.75	3.75	-----	0.00	+/-0.10	in
Ring Diameter	8.25	8.25	-----	0.00	+/-0.15	in
Microlog Pad-10950489						
MicroLog Normal	19.85	19.81	-----	0.04	+/-0.80	ohmm
MicroLog Lateral	19.98	19.93	-----	0.05	+/-0.80	ohmm
SDLT Pad-10809130						
Near(B+D+P+L)	1260.593	1263.897	-----	-3.304	+/-14.390	cps
Far(B+D+P+L)	829.172	828.619	-----	0.553	+/-15.859	cps
ACRt Sonde-11005908						
Mud Cell	1.00	-----	-----	0	-----	ohm-m
Data: MERIT JONES19-1\0001 GTET-DSN-SDL-BSAT-ACRT\IDLE					Date: 03-Oct-16 08:26:52	

HALLIBURTON						
TOOL STRING DIAGRAM REPORT						
Description	Overbody Description	O.D.	Diagram	Sensors @ Delays	Length	Accumulated Length
CH_HOS-00000025 37.50 lbs		Ø 2.750 in		Temperature @ 76.74 ft	3.03 ft	77.77 ft
XOHD-12345678 20.00 lbs		Ø 2.750 in Ø 3.625 in			0.95 ft	74.74 ft
SP Sub-11441455 60.00 lbs		Ø 3.625 in		SP @ 72.01 ft	3.74 ft	73.79 ft
				Z-Accelerometer @ 69.60 ft		70.05 ft





COMPANY

MERIT ENERGY COMPANY, LLC

WELL

JONES 19-1

FIELD

WILDCAT

COUNTY

FINNEY

STATE

KANSAS

HALLIBURTON

SPECTRAL DENSITY
DUAL SPACED NEUTRON
LOG