

HALLBURTON

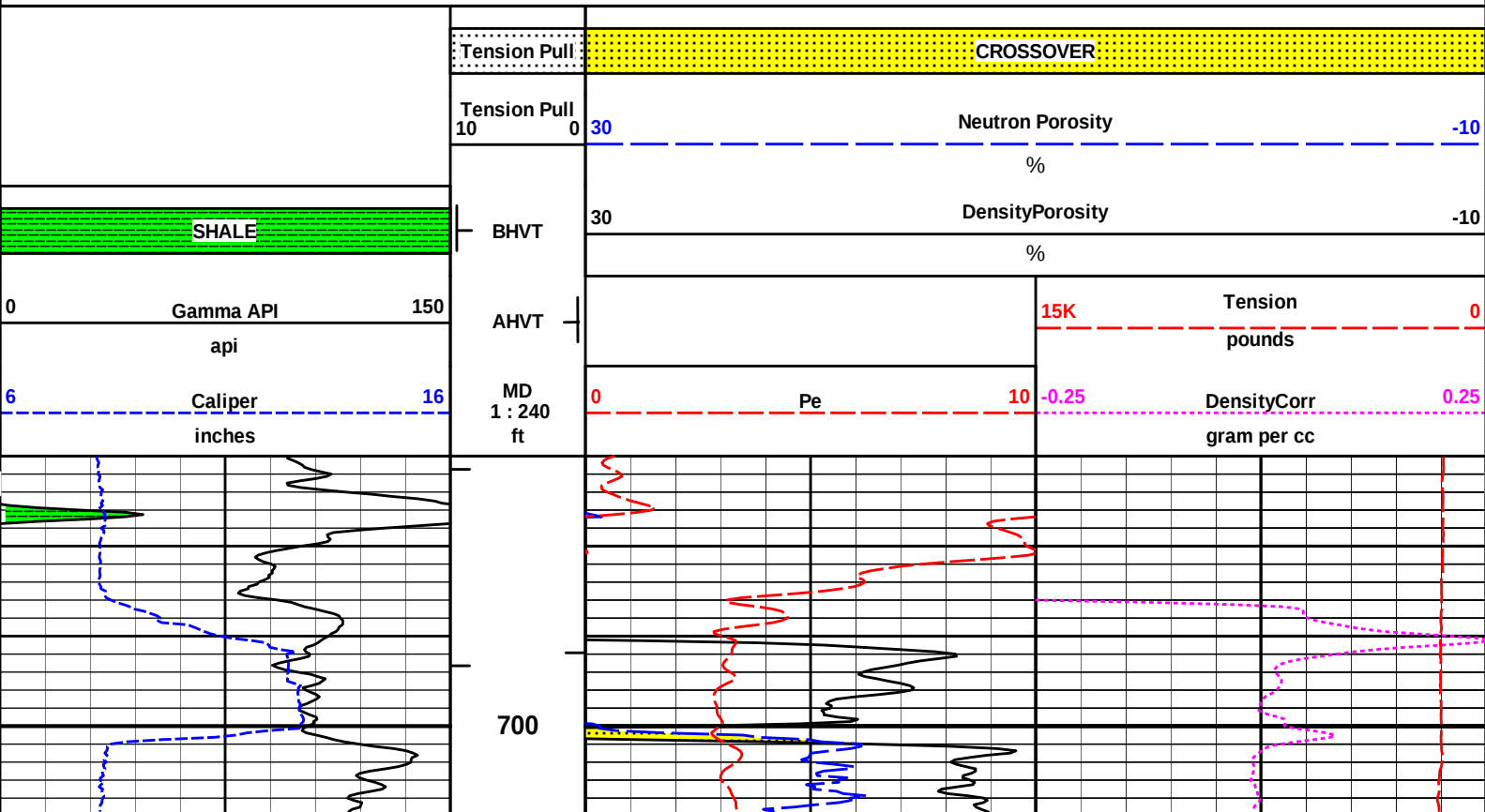
DUAL SPACED NEUTRON
SPECTRAL DENSITY
LOG

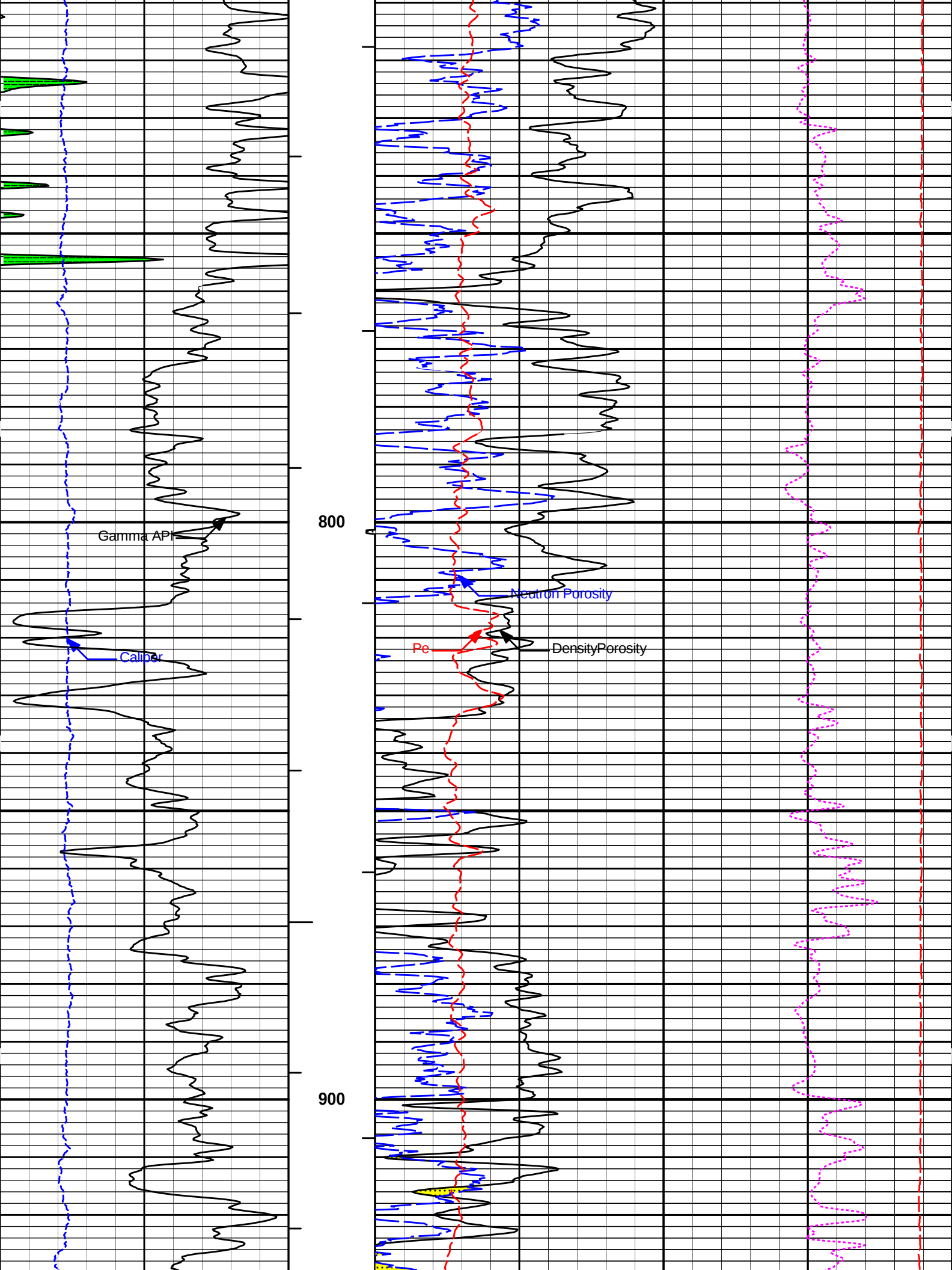
COMPANY				PIONEER NATURAL RESOURCES USA, INC.							
WELL				JARVIS ET AL ATU 1							
FIELD/BLOCK				HUGOTON-PANOMA							
COUNTY				GRANT							
STATE				KANSAS							
Permanent Datum		GL		Sect. 23		Twp. 29S		Rge. 37W		Other Services: ACRT MICRO	
Log measured from		KB								Elev.: K.B. 3075.0 ft	
Drilling measured from		KB								D.F. 3075.0 ft	
										G.L. 3063.0 ft	
Date		14-Jul-13									
Run No.		ONE									
Depth - Driller		3000.00 ft									
Depth - Logger		3002.0 ft									
Bottom - Logged Interval		2980.0 ft									
Top - Logged Interval		688.0 ft									
Casing - Driller		8.625 in		@		690.0 ft		@			
Casing - Logger		688.0 ft									
Bit Size		7.875 in						@			
Type Fluid in Hole		WATER BASED MUD									
Density		8.8 ppg		27.00 s/qt							
PH		12.00 pH									
Source of Sample		FLOWLINE									
Rm @ Meas. Temperature		0.780 ohmm		@		76.00 degF		@			
Rmf @ Meas. Temperature		0.65 ohmm		@		76.00 degF		@			
Rmc @ Meas. Temperature		0.900 ohmm		@		76.00 degF		@			
Source Rmf		Rmc		MEASURED							
Rm @ BHT		0.56 ohmm		@		109.0 degF		@			
Time Since Circulation		6.0 hr									
Time on Bottom		14-Jul-13 09:10									
Max. Rec. Temperature		109.0 degF		@		3002.0 ft		@			
Equipment		Location		10546696		LIBERAL					
Recorded By		THOMAS HYDE									
Witnessed By		B. MICHALCHUK				K. SWAFFORD					

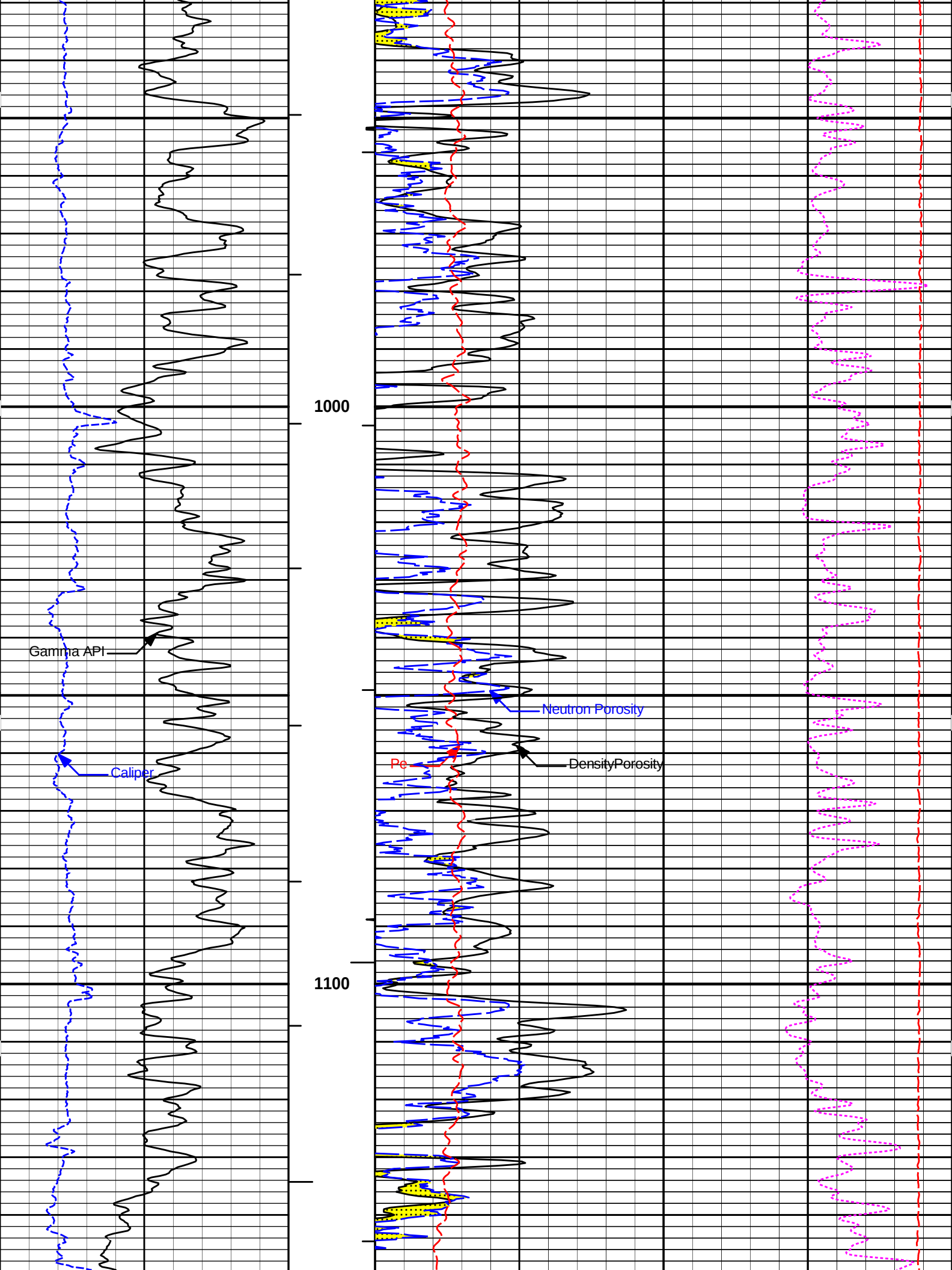
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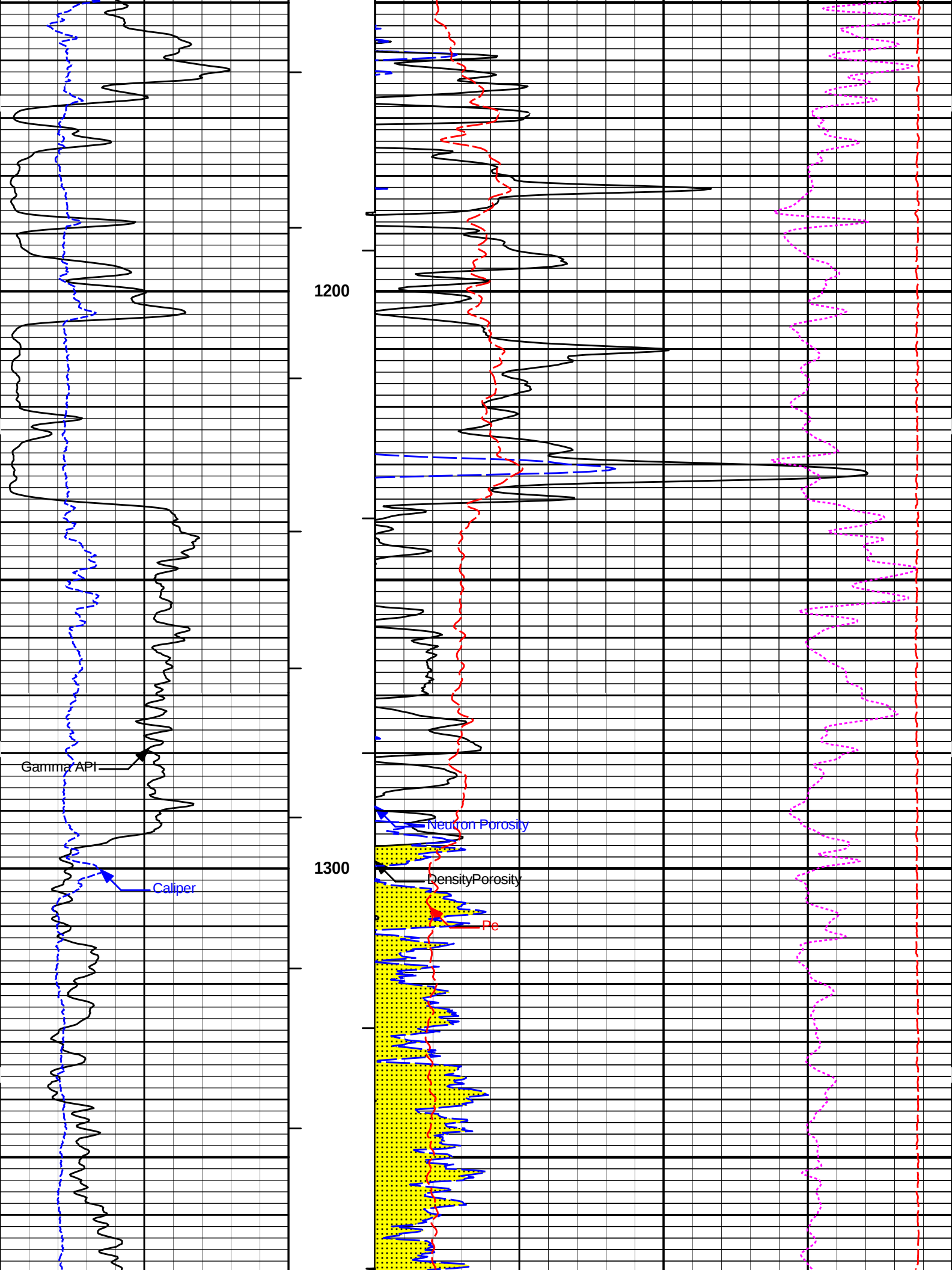
Service Ticket No.: 900587570				API Serial No.: 15-067-21741				PGM Version: WL INSITE R3.8.4 (Build 5)							
CHANGE IN MUD TYPE OR ADDITIONAL SAMPLE						RESISTIVITY SCALE CHANGES									
Date		Sample No.				Type Log		Depth		Scale Up Hole		Scale Down Hole			
Depth-Driller															
Type Fluid 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.		ONE	
Serial No.		11048627		Serial No.				Serial No.		10950489		Serial No.		11019643	
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.		5168 GW		Serial No.		DSN-424	
Distance to Source		10'		FWDA [Y/N]				Strength		1.5 Ci		Strength		15 Ci	
LOGGING DATA															

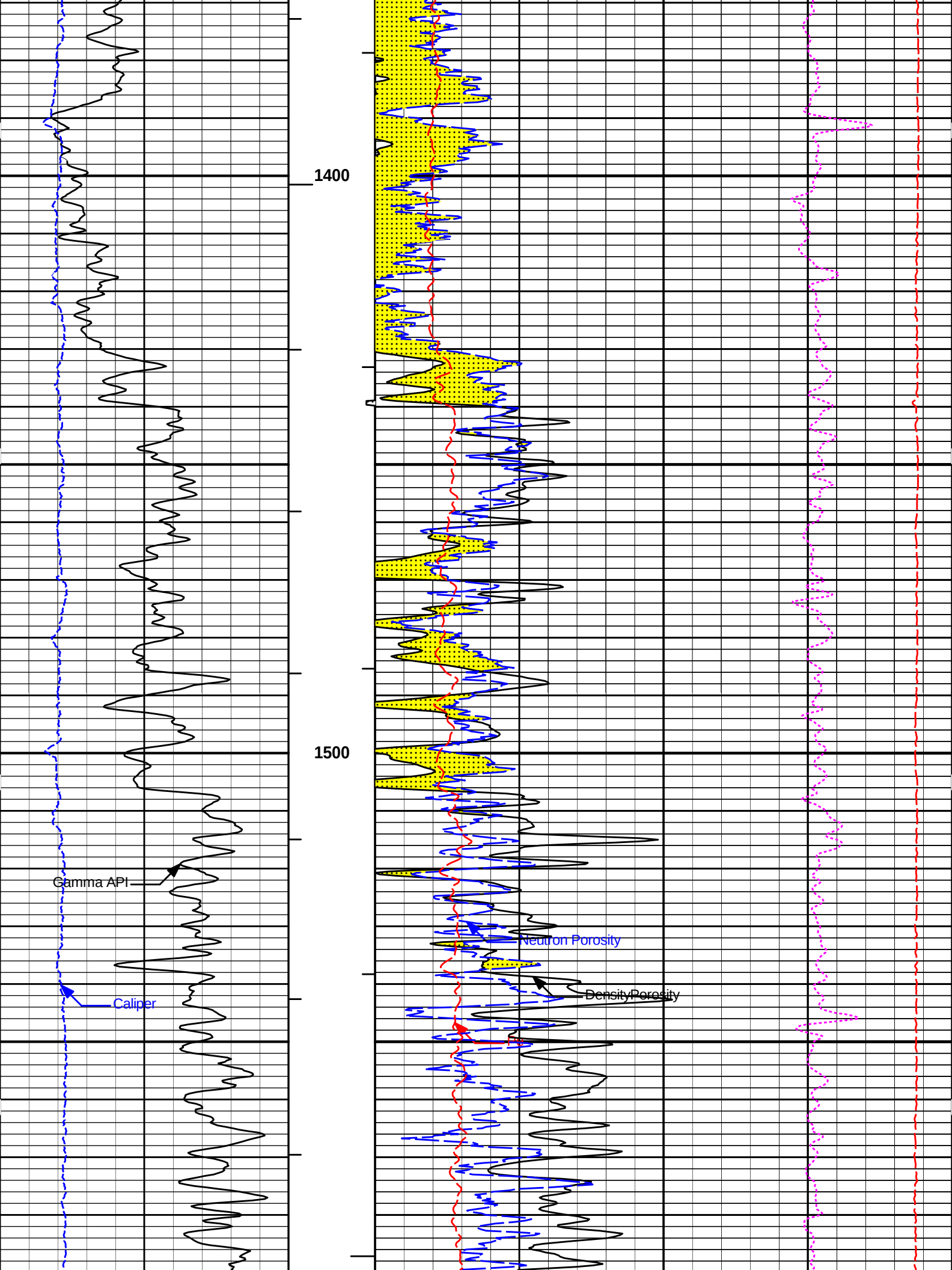
GENERAL			GAMMA		ACOUSTIC			DENSITY			NEUTRON			
Run	Depth		Speed	Scale		Scale		Matrix	Scale		Matrix	Scale		Matrix
No.	From	To	ft/min	L	R	L	R		L	R		L	R	
ONE	3002	688	REC	0	150				30	-10	2.71	30	-10	LIME
ONE	3002	2300							30	-10	2.87	30	-10	DOLO
DIRECTIONAL INFORMATION														
Maximum Deviation @								KOP @						
Remarks: ANNULAR HOLE VOLUME CALCULATED FOR 5.5 INCH CASING														
CHLORIDES REPORTED AT 1000 MG/L														
TODAY'S CREW M. GRAHAM T. GRAYSON														
THANK YOU FOR CHOOSING HALLIBURTON ENERGY SERVICES LIBERAL, KANSAS 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														

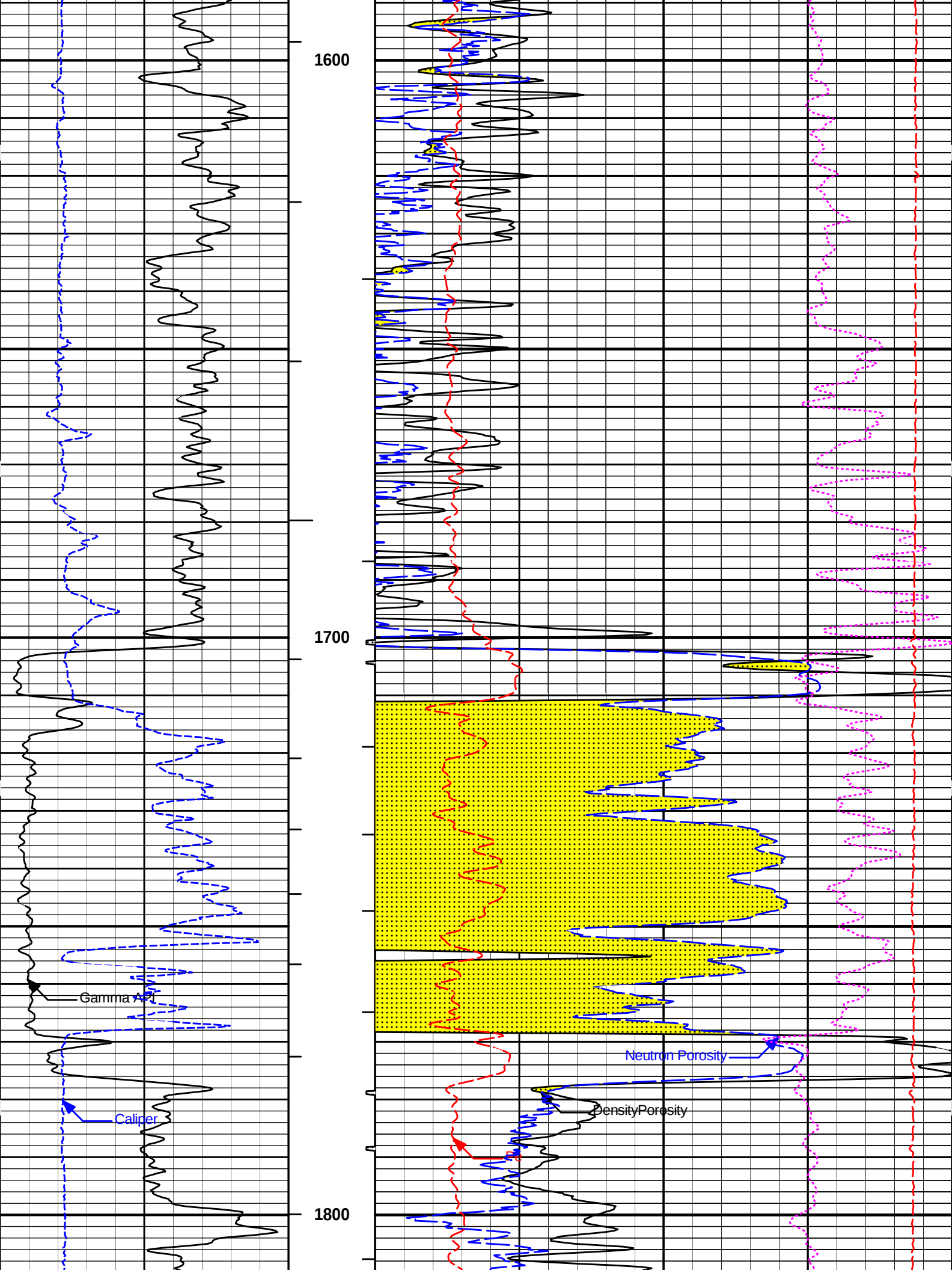


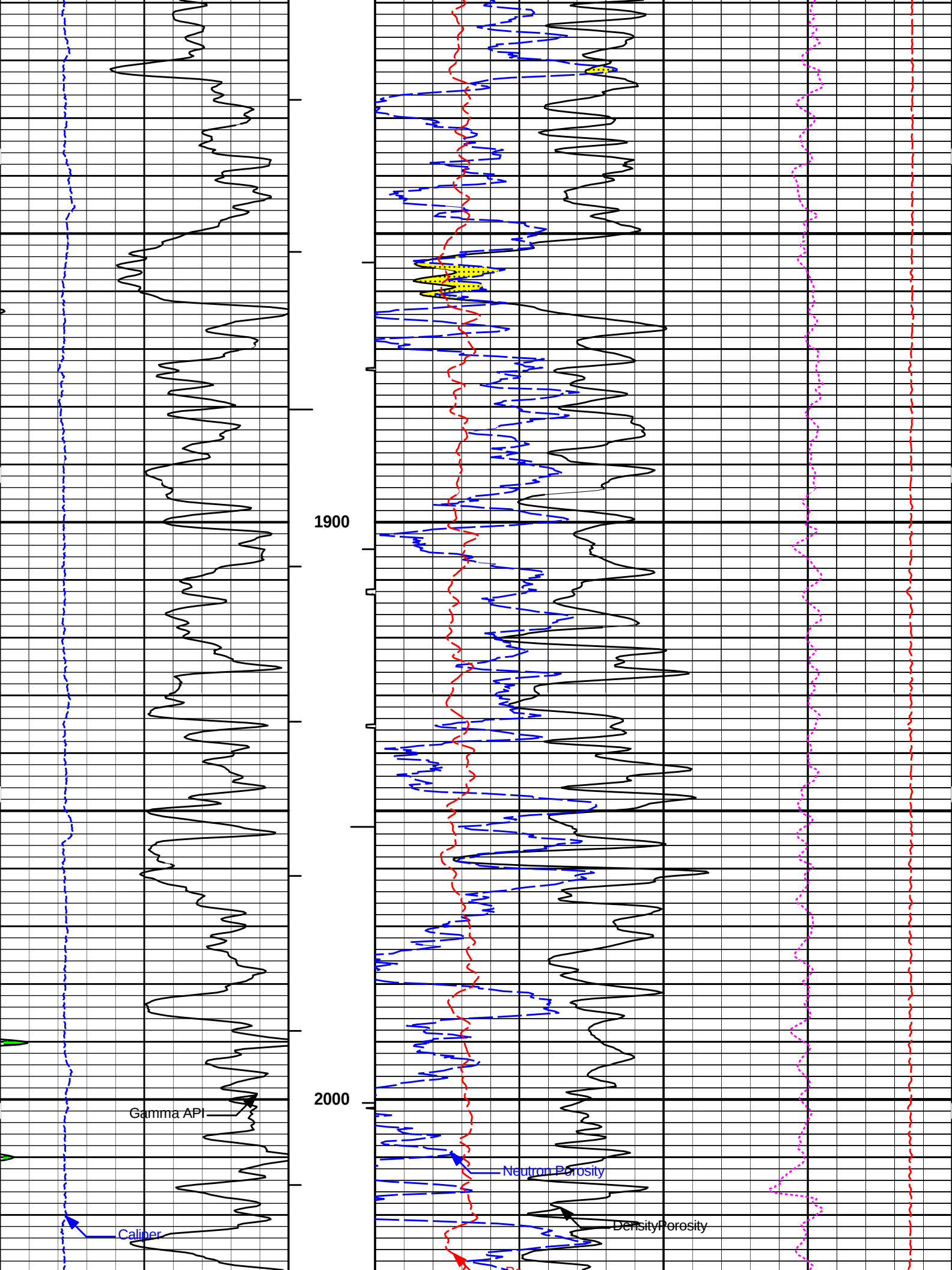


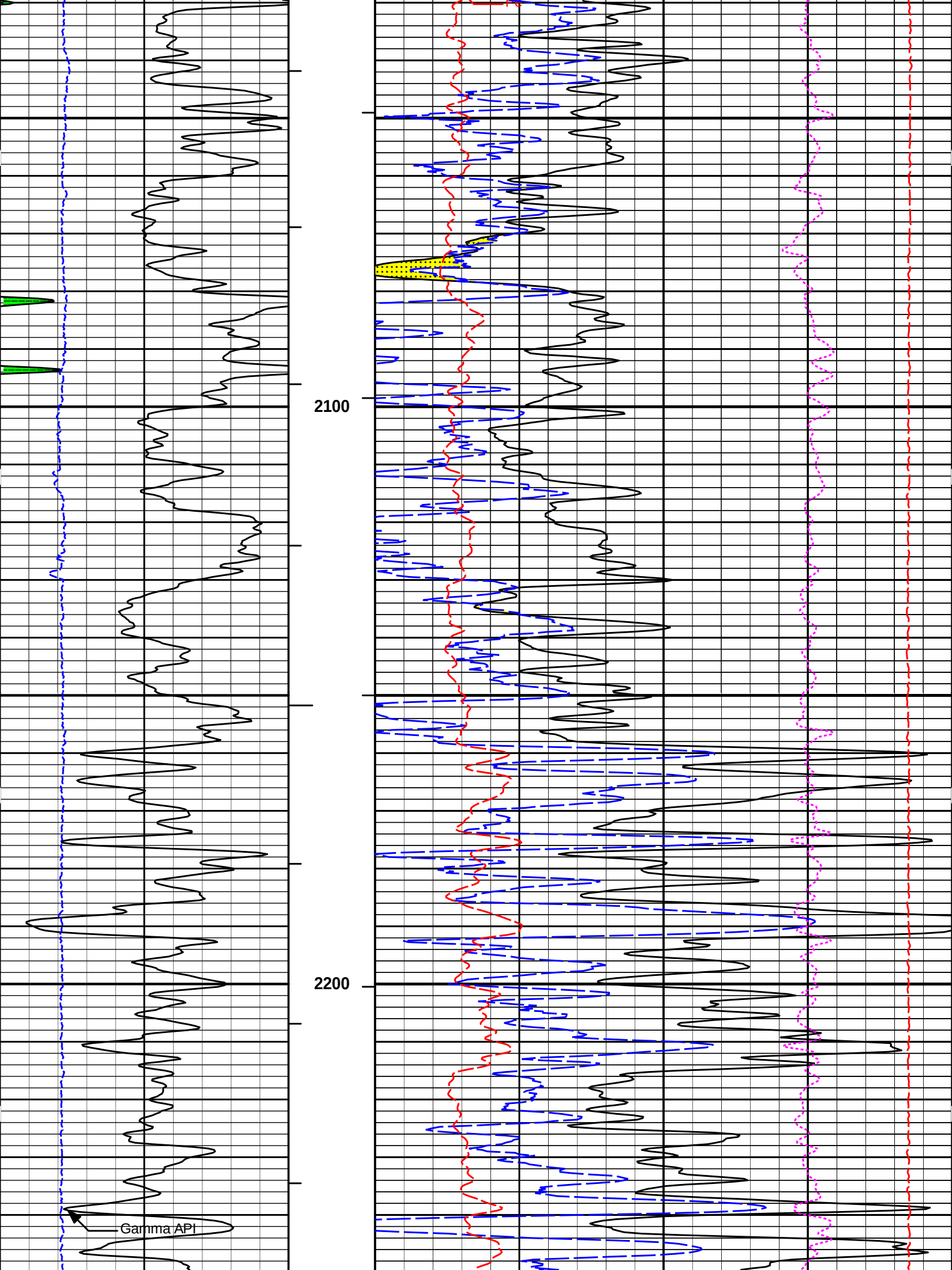


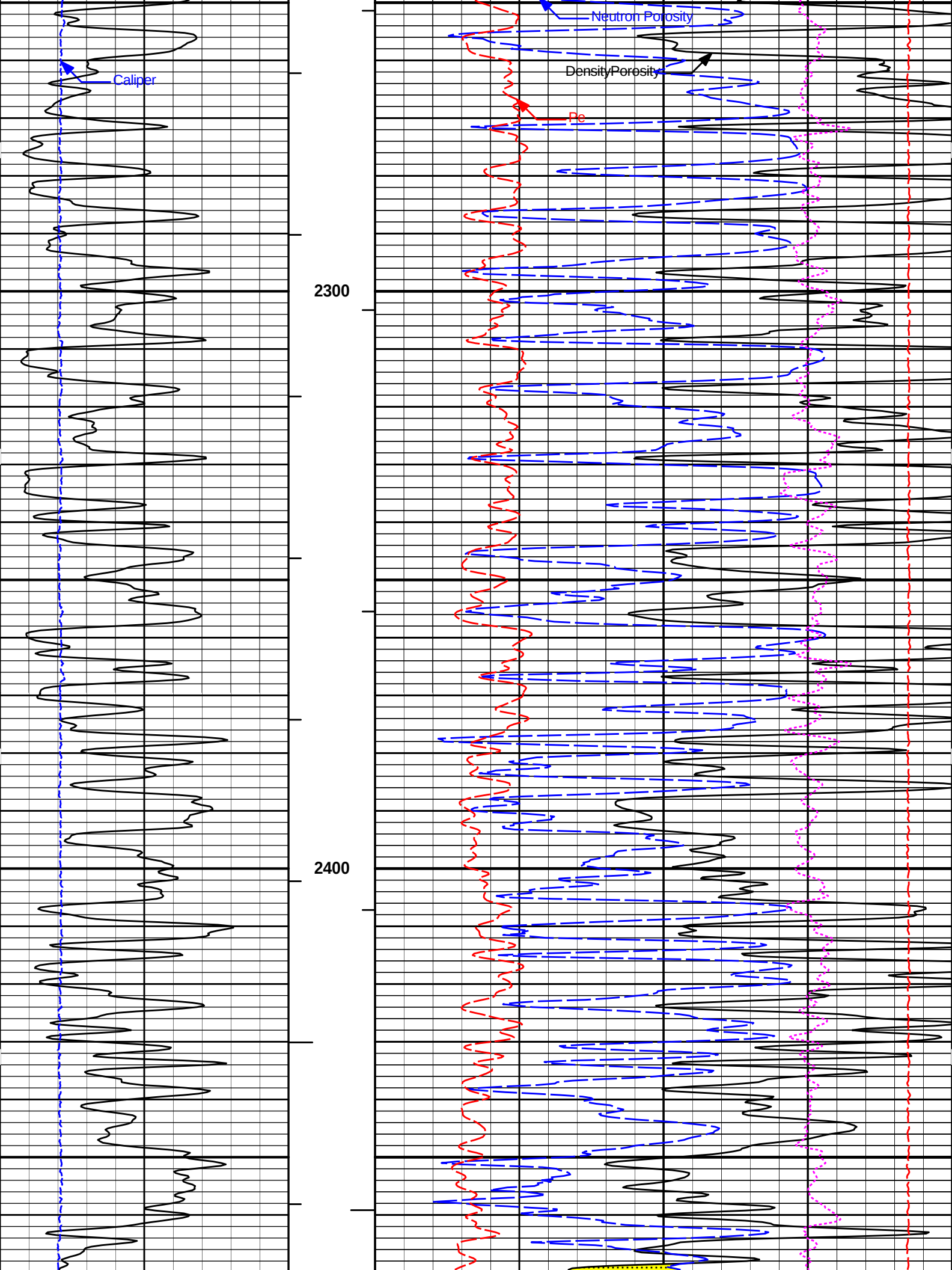


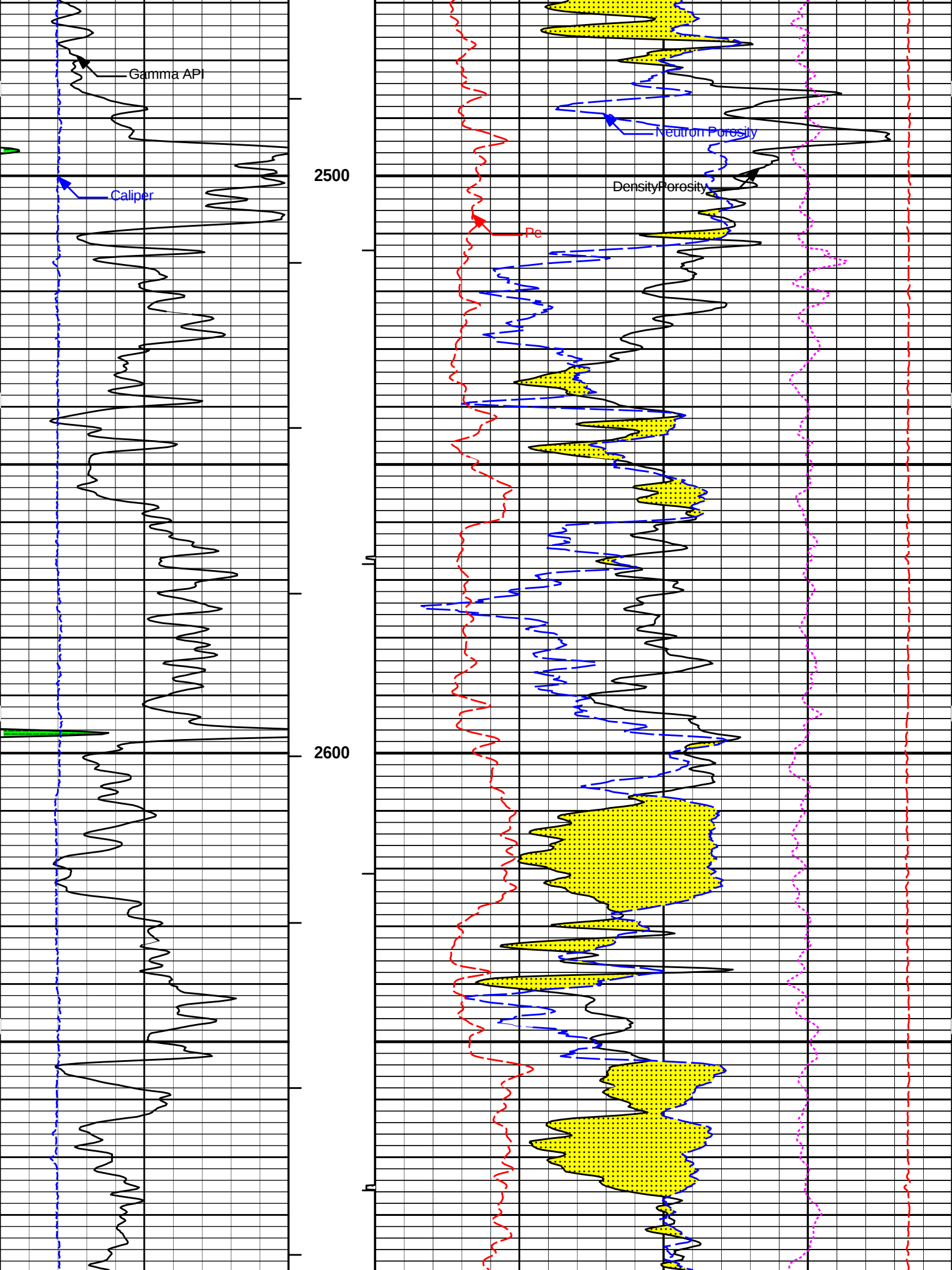


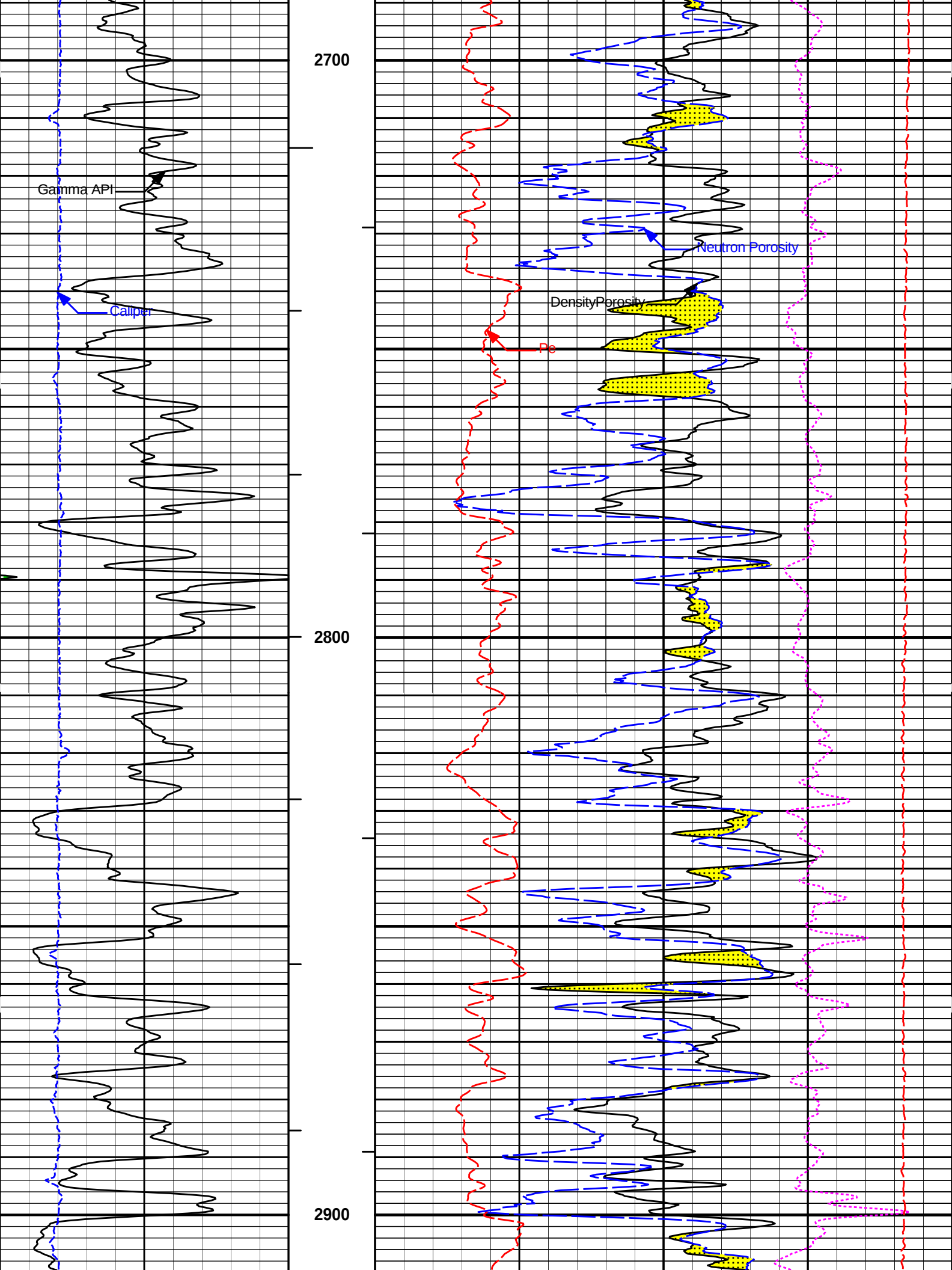


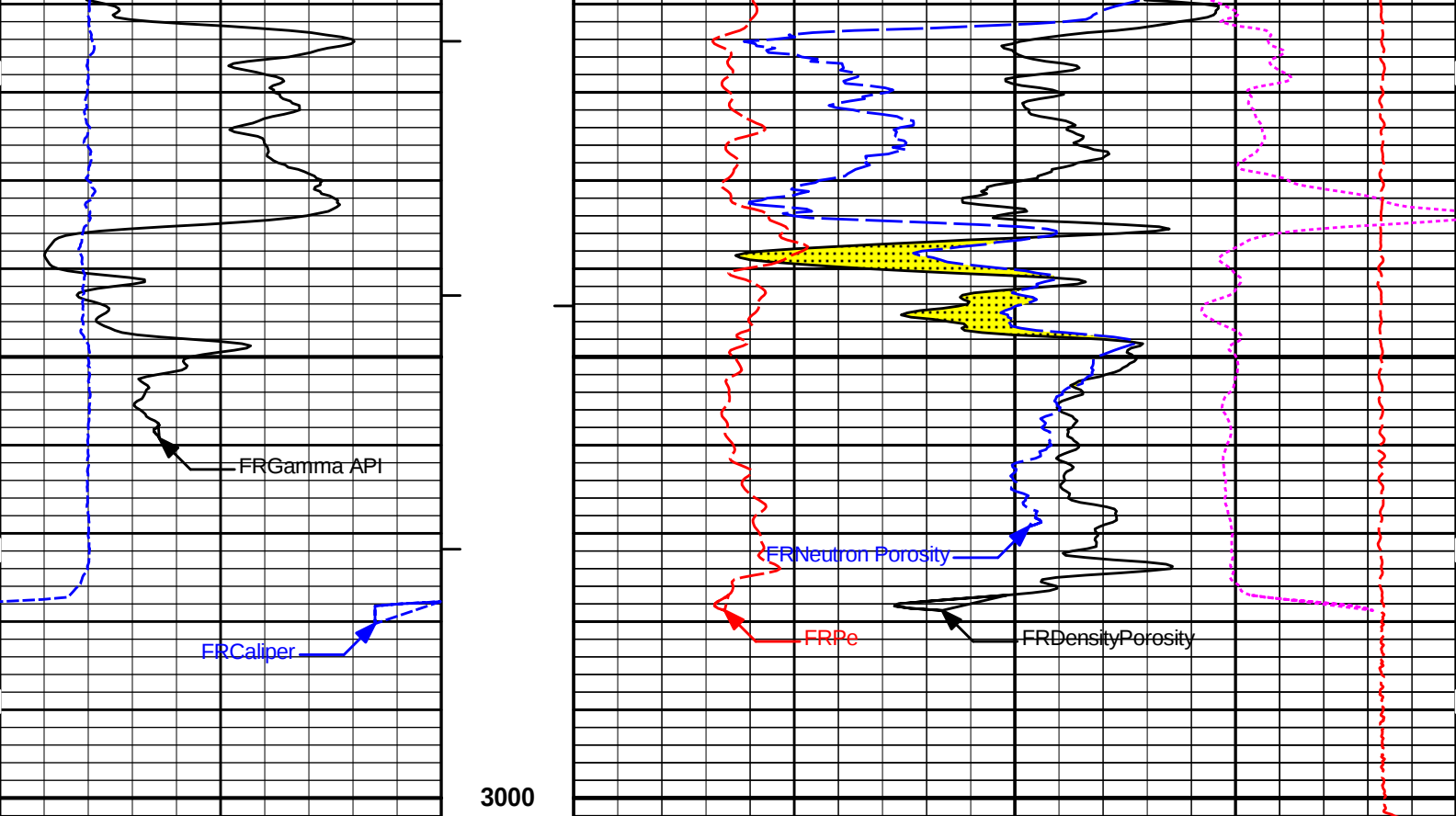












6	Caliper	16	MD	0	Pe	10	-0.25	DensityCorr	0.25
	inches		1 : 240					gram per cc	
0	Gamma API	150	ft						
	api		AHVT				15K	Tension	0
								pounds	
			BHVT	30				DensityPorosity	-10
								%	
			Tension Pull	10	0	30		Neutron Porosity	-10
								%	
			Tension Pull					CROSSOVER	

HALLIBURTON

Plot Time: 14-Jul-13 11:53:21
Plot Range: 670 ft to 3002.5 ft
Data: JARVIS_ATU_1\Well Based\DAQ-0001-003\
Plot File: \\PORO\Porosity_IQ_5_MAIN_LIB

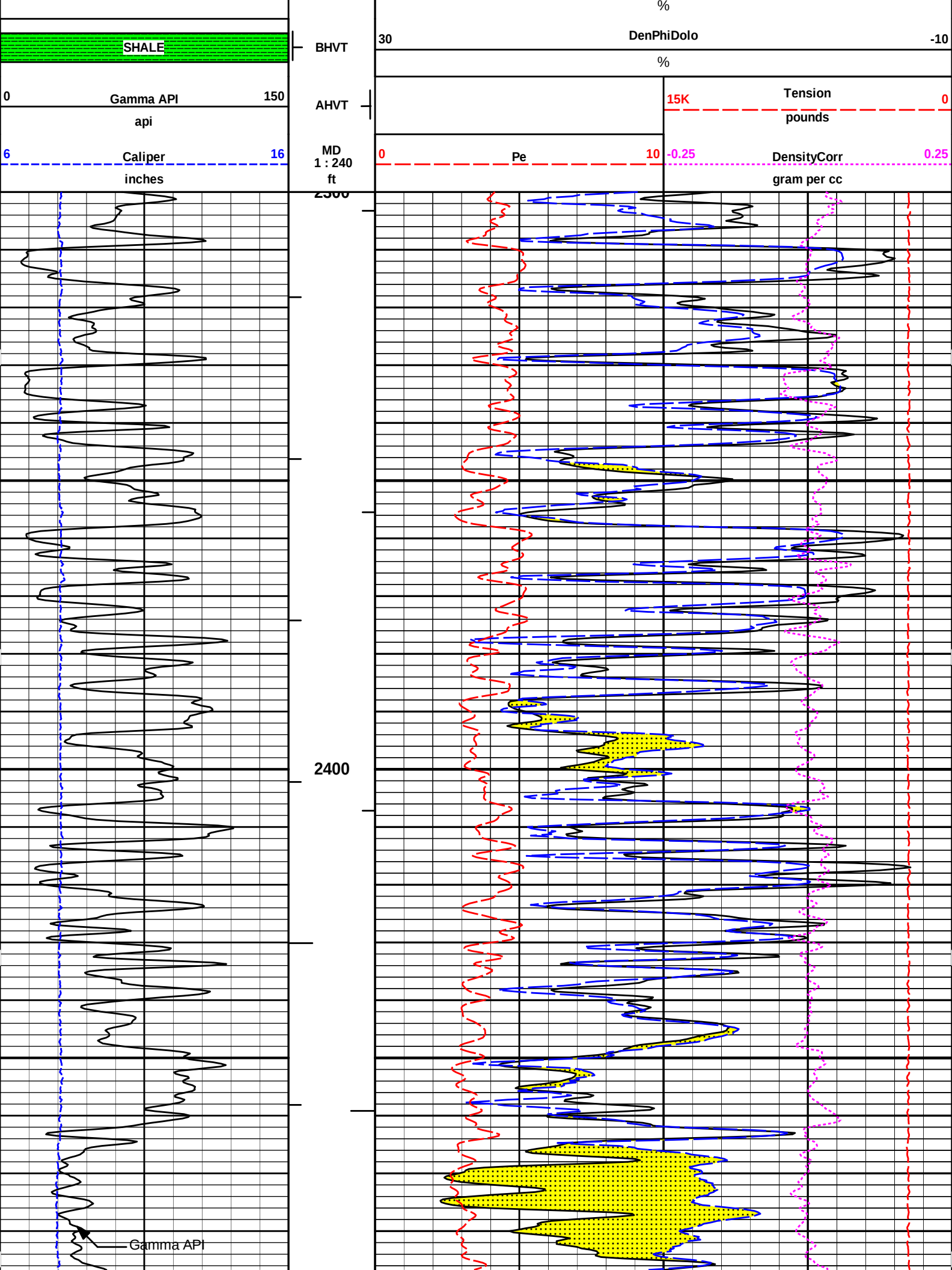
5 INCH MAIN LOG

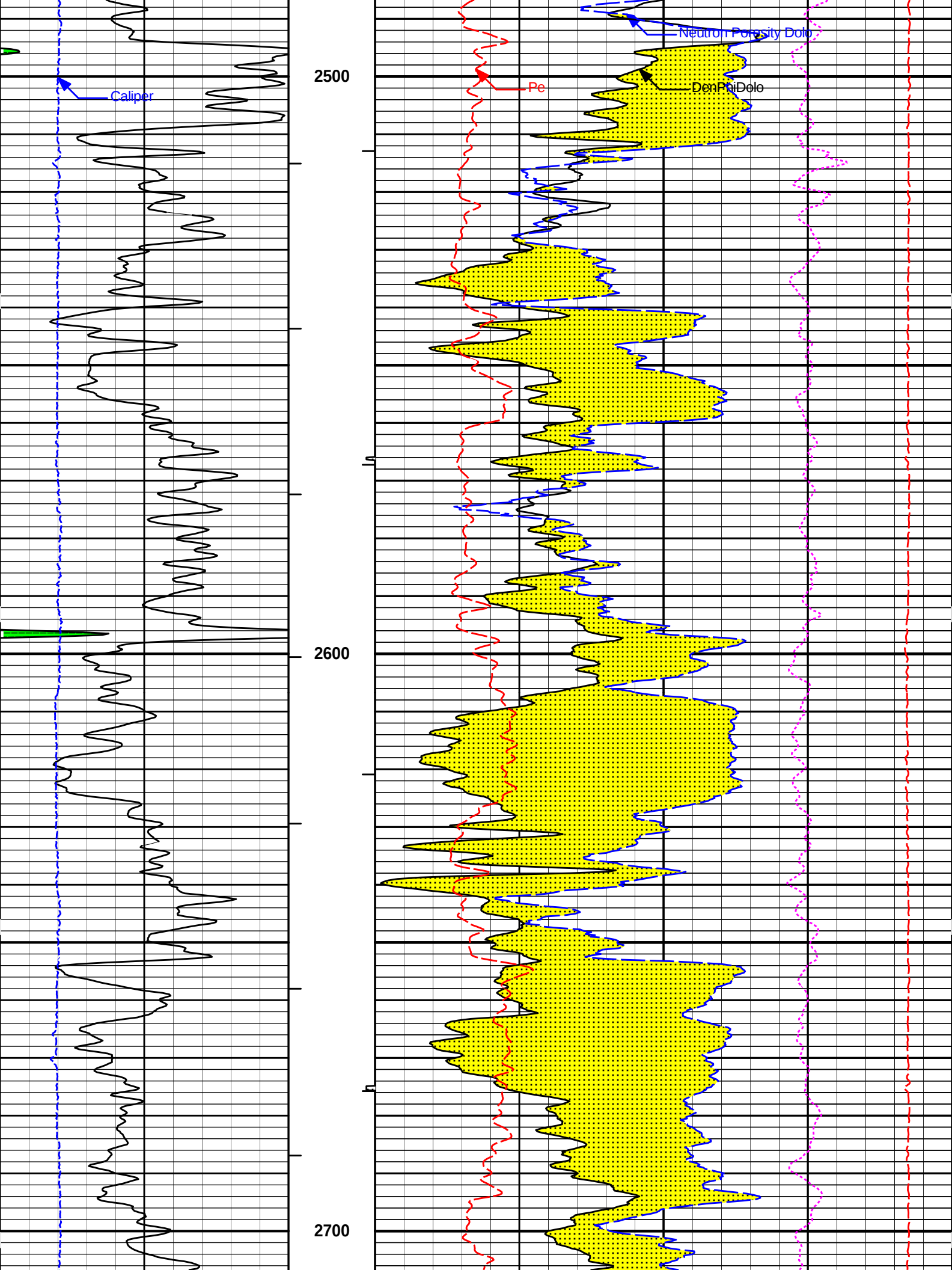
HALLIBURTON

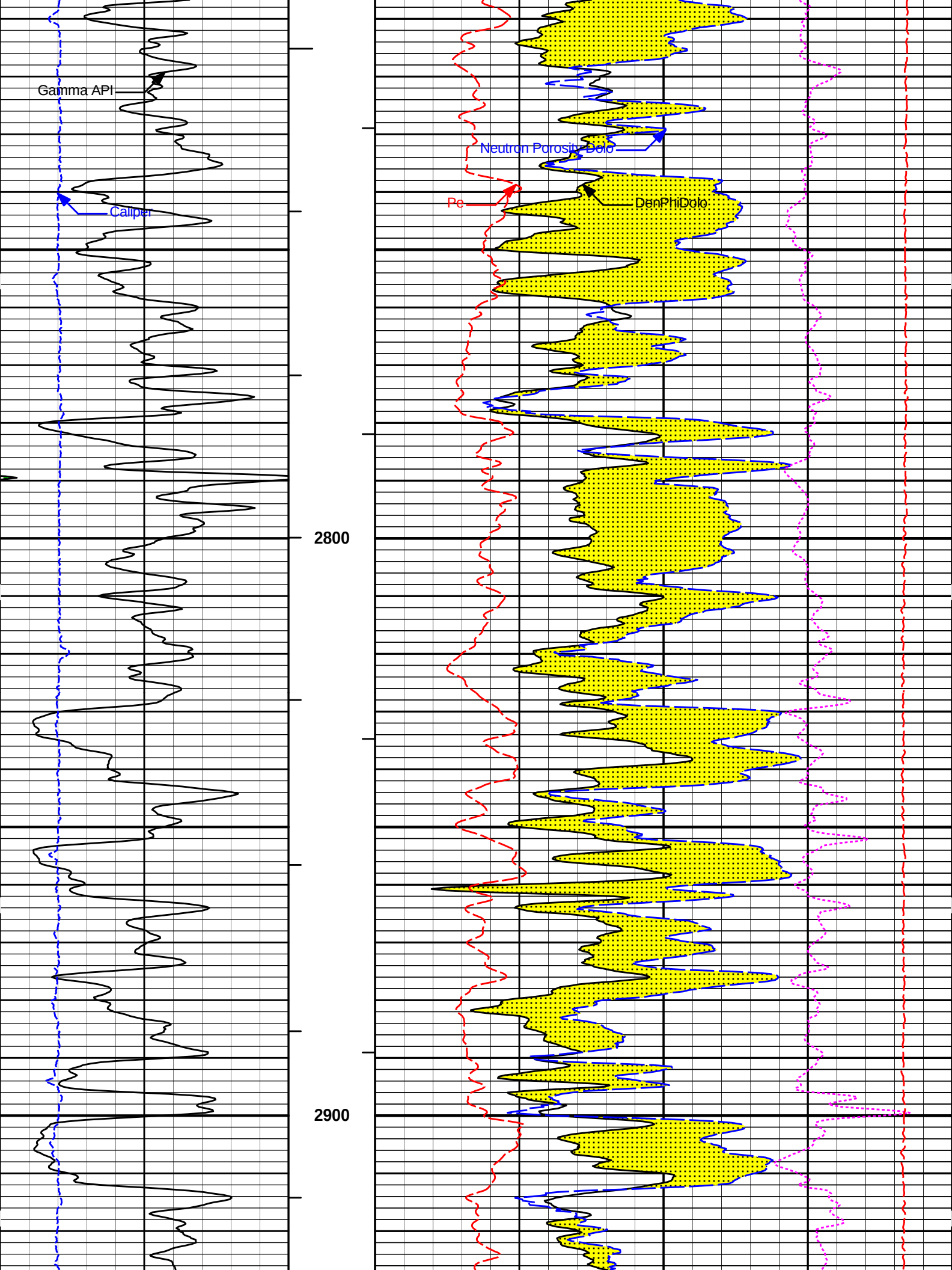
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Plot Range: 2300 ft to 3002.5 ft
Data: JARVIS_ATU_1\Well Based\DAQ-0001-003\
Plot File: \\PORO\Porosity_IQ_5_MAIN_LIB

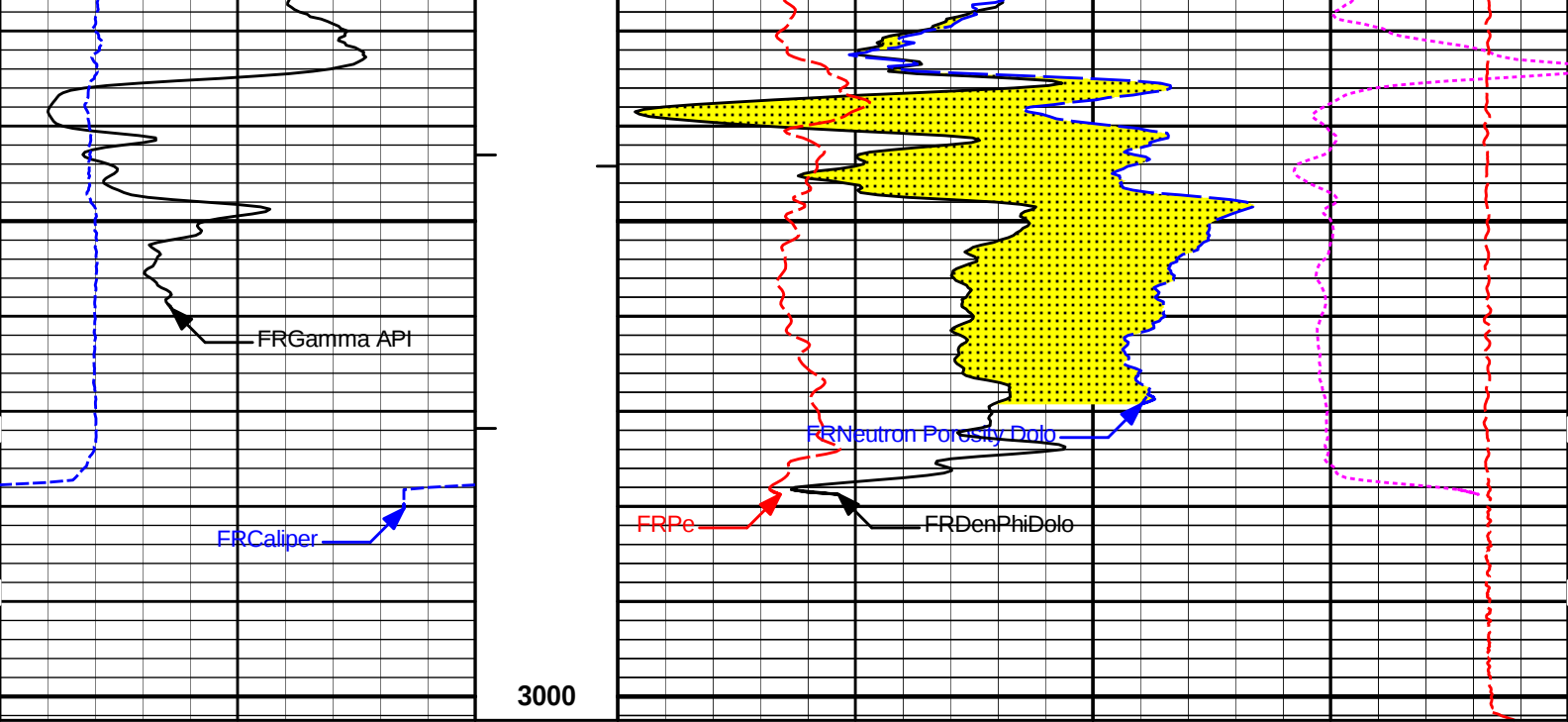
5 INCH MAIN LOG DOLOMITE

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









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

HALLIBURTON

Plot Time: 14-Jul-13 11:53:24
Plot Range: 2300 ft to 3002.5 ft
Data: JARVIS_ATU_1\Well Based\DAQ-0001-003\
Plot File: \\PORO\Porosity_Q_5_MAIN_LIB

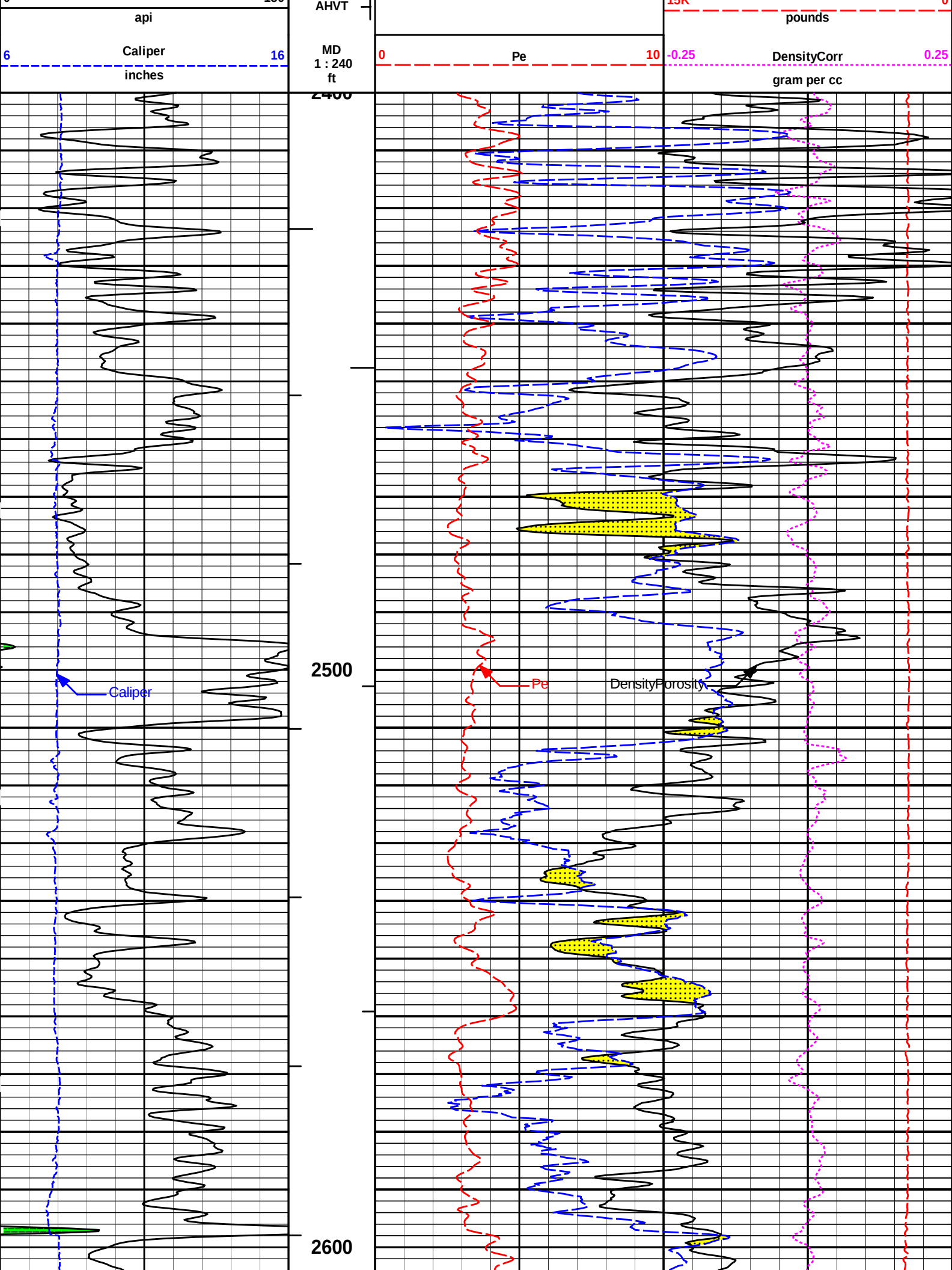
5 INCH MAIN LOG DOLOMITE

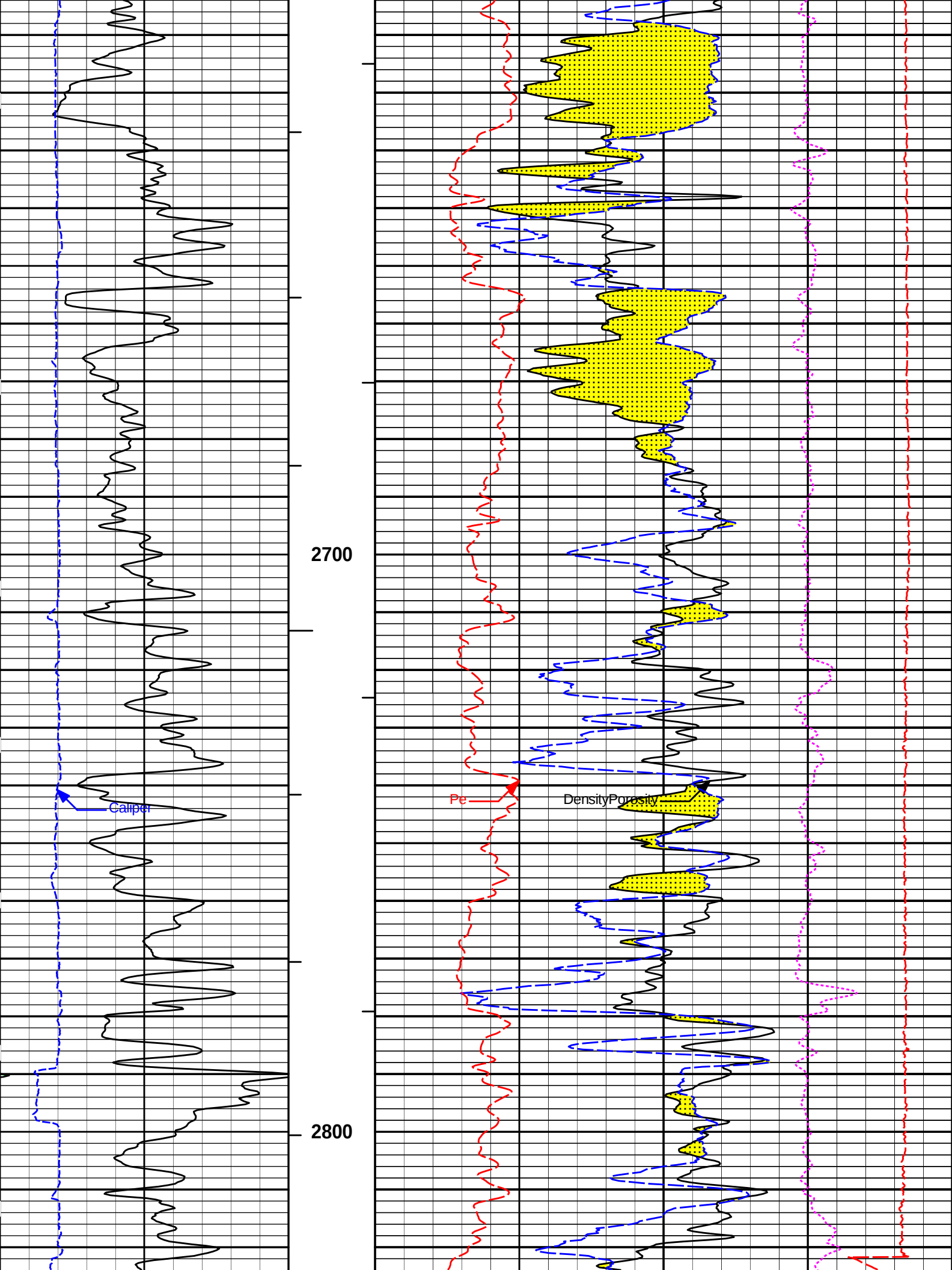
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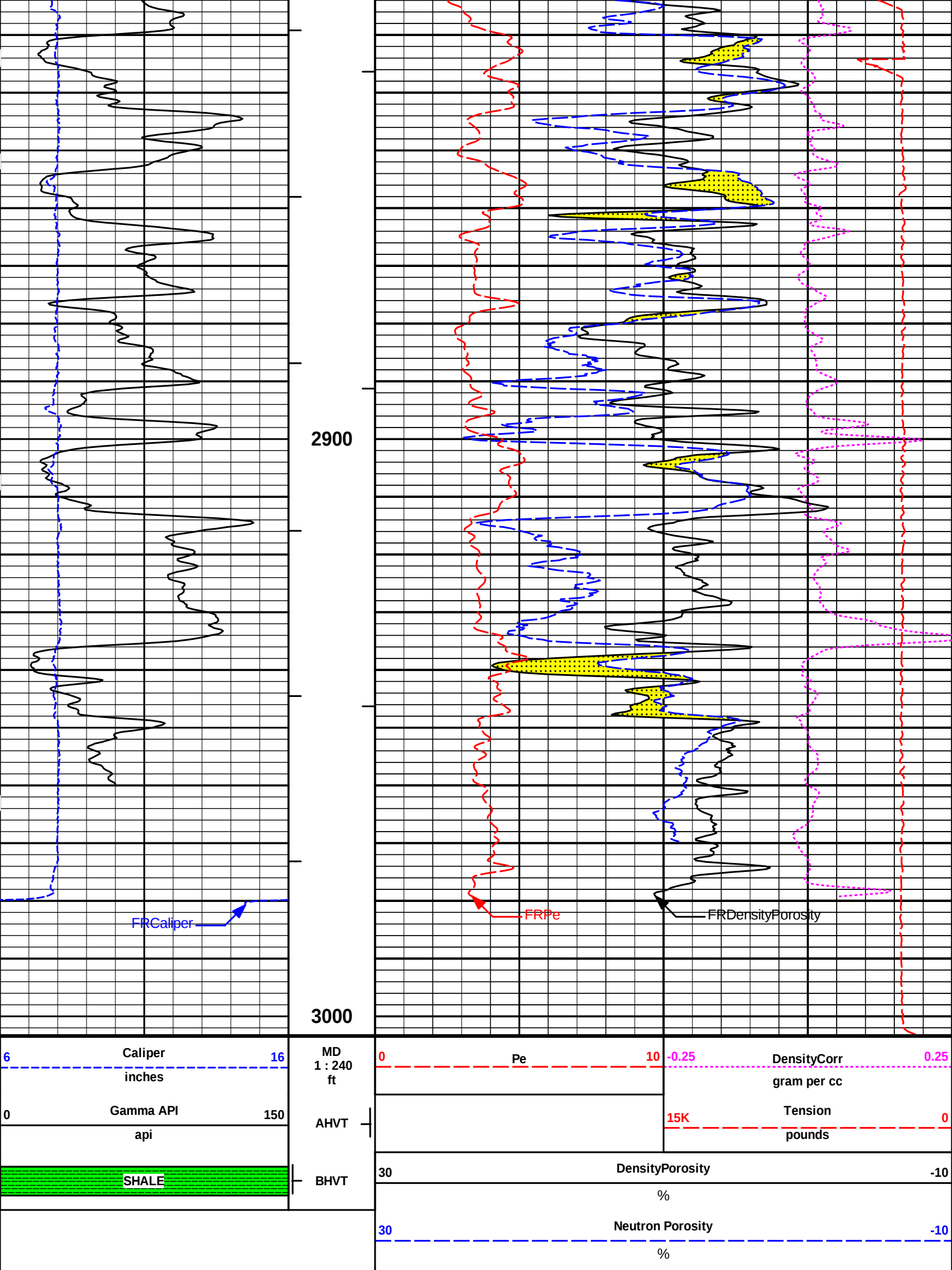
Plot Time: 14-Jul-13 11:53:24
Plot Range: 2400 ft to 3003.25 ft
Data: JARVIS_ATU_1\Well Based\DAQ-0001-002\
Plot File: \\PORO\Porosity_Q_5_REP_LIB

REPEAT SECTION

		CROSSOVER	
		30 Neutron Porosity -10 %	
SHALE		30 DensityPorosity -10 %	
0 Gamma API 150		15K Tension	







2900

3000

FRCaliper

FRPe

FRDensityPorosity

6	Caliper	16
inches		
0	Gamma API	150
api		

MD
1 : 240
ft

AHVT

BHVT

SHALE

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

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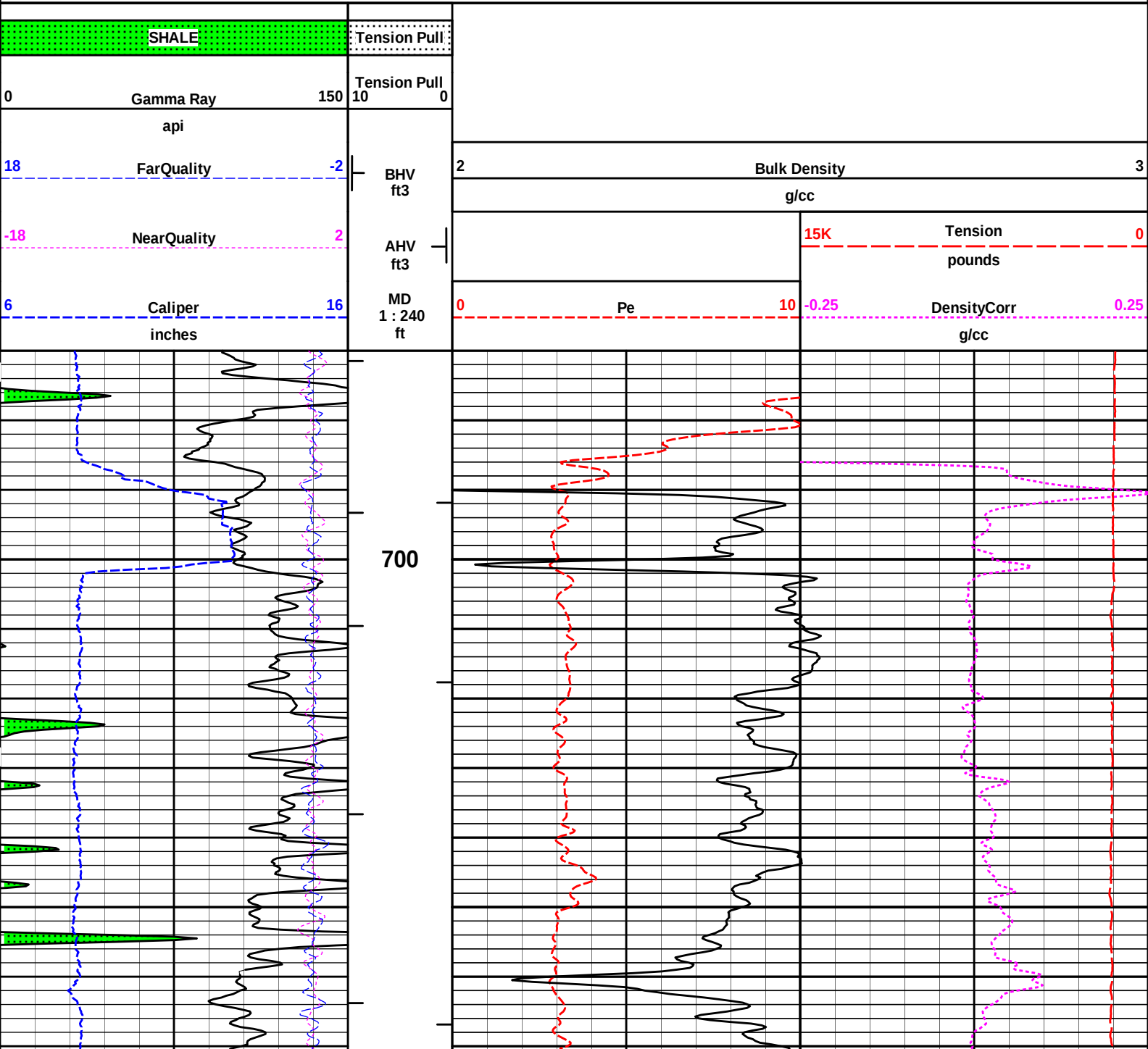
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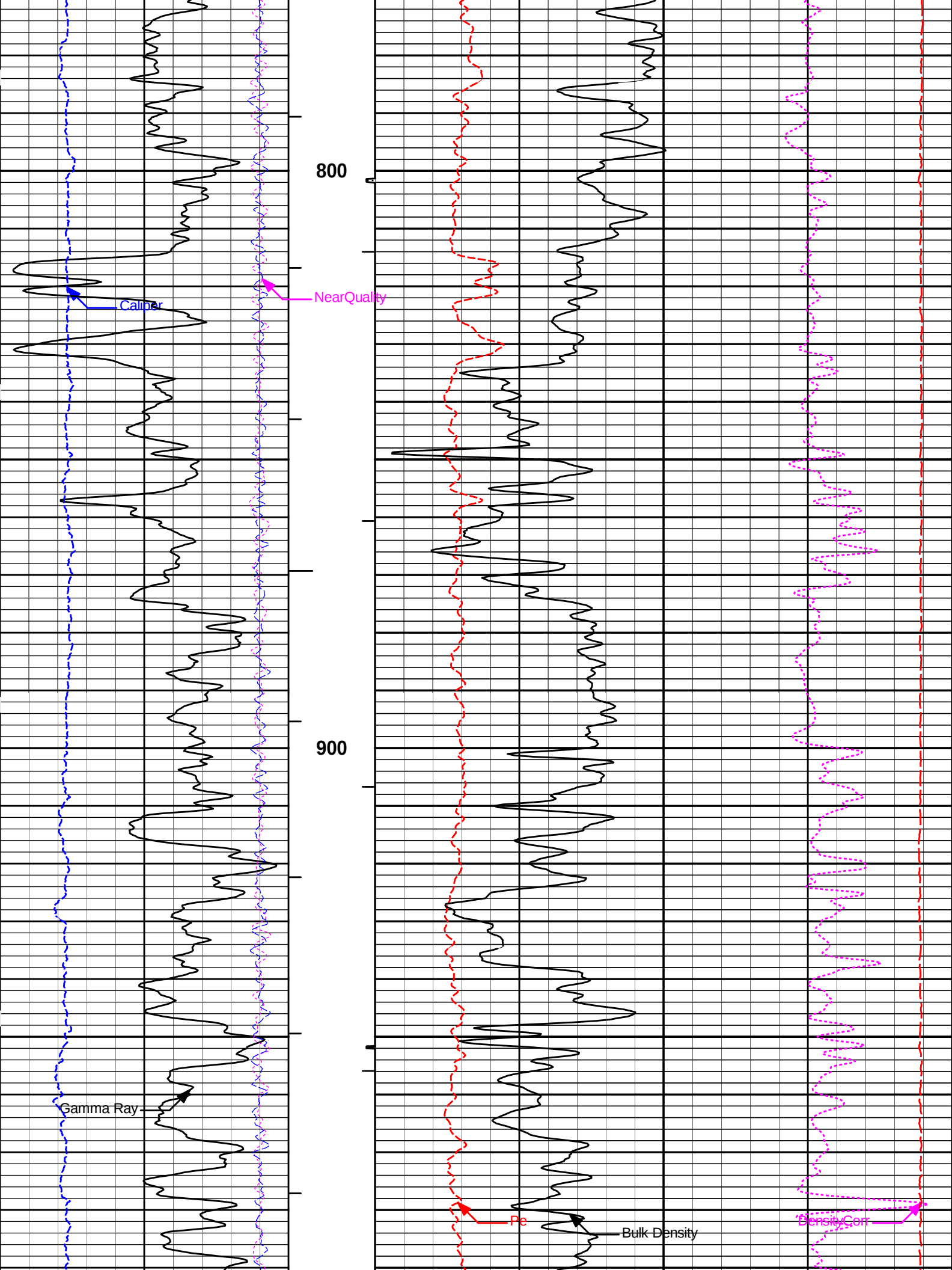
REPEAT SECTION

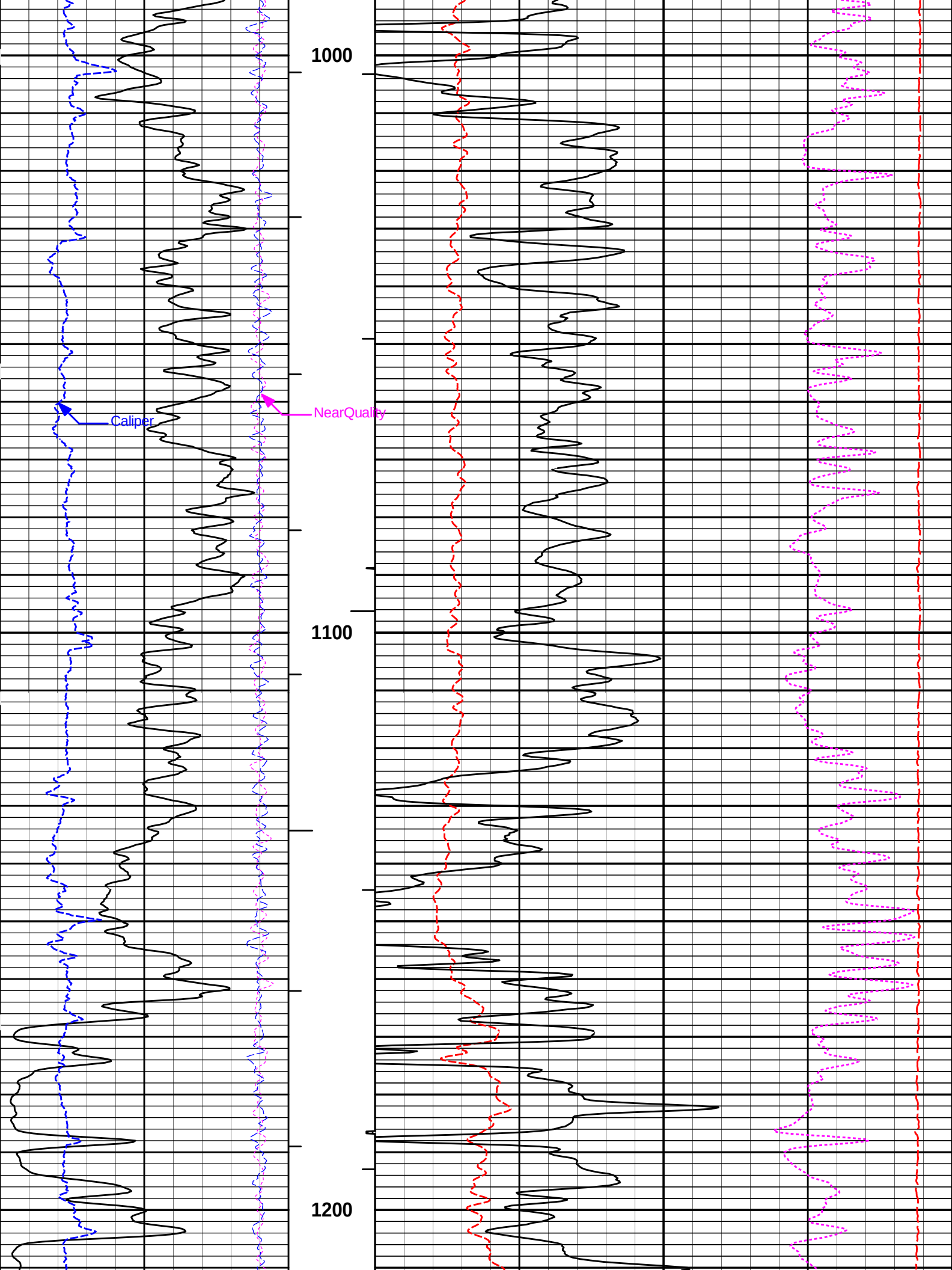
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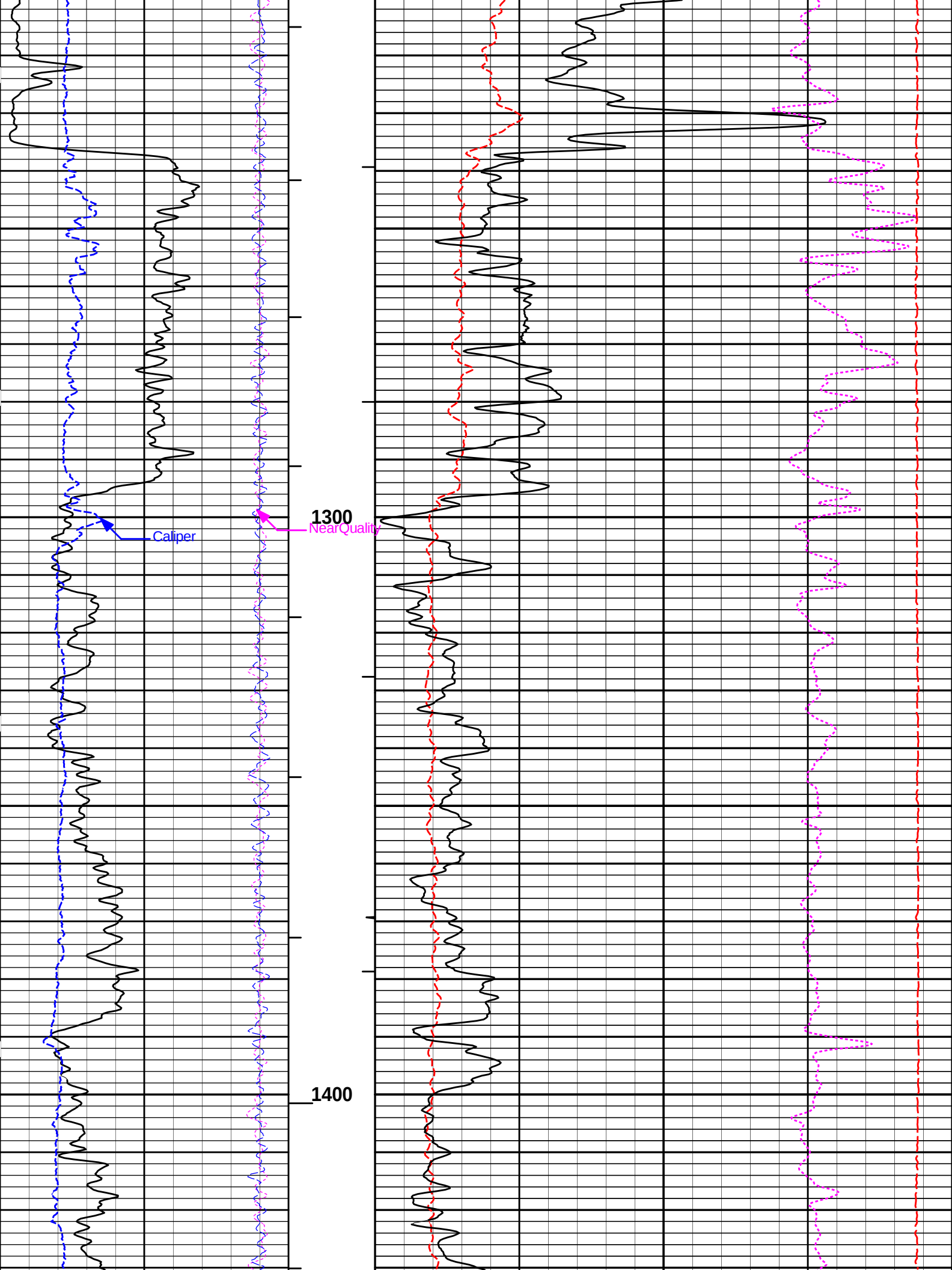
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Data: JARVIS_ATU_1\Well Based\DAQ-0001-003\
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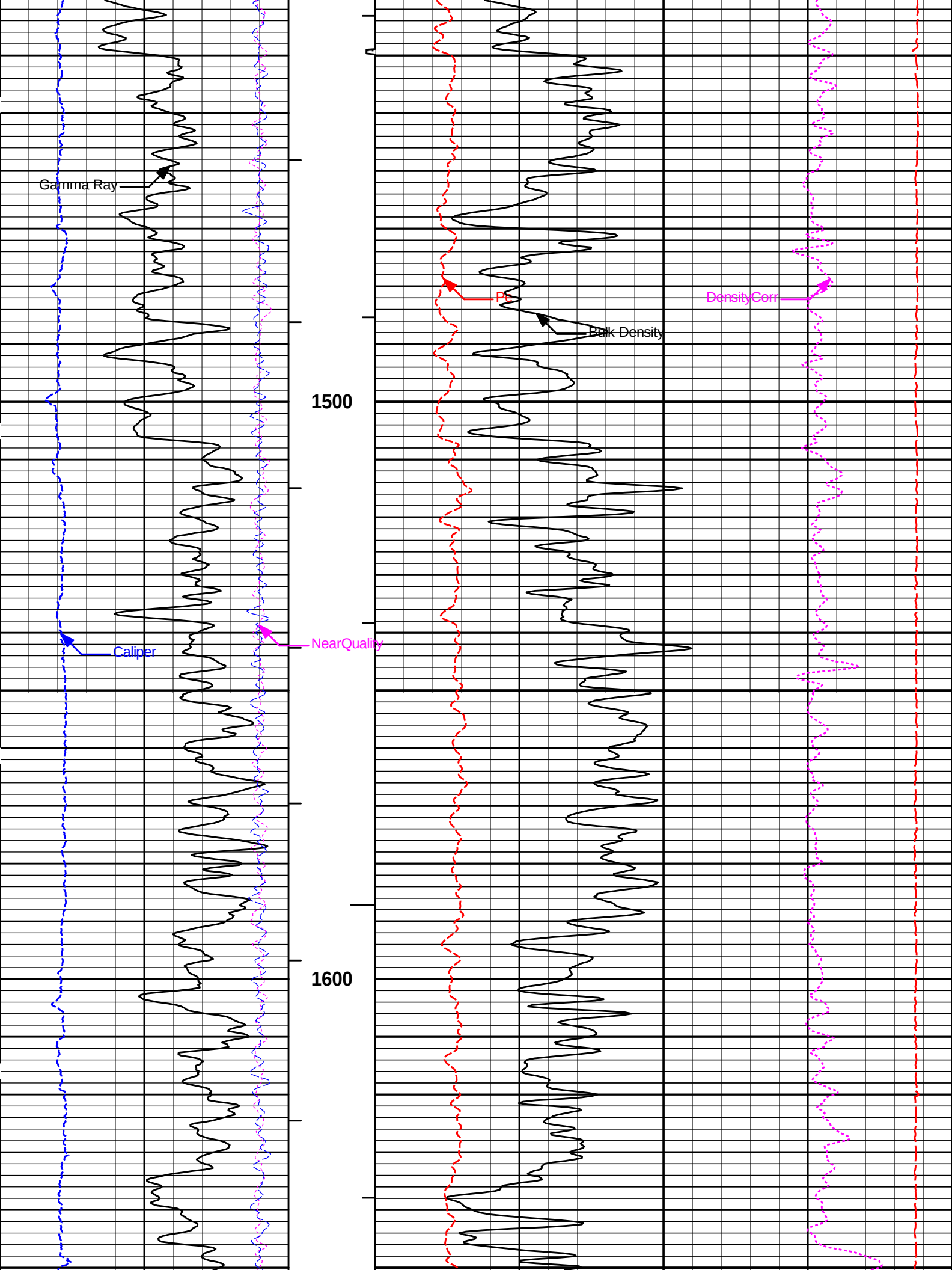
5 INCH MAIN LOG

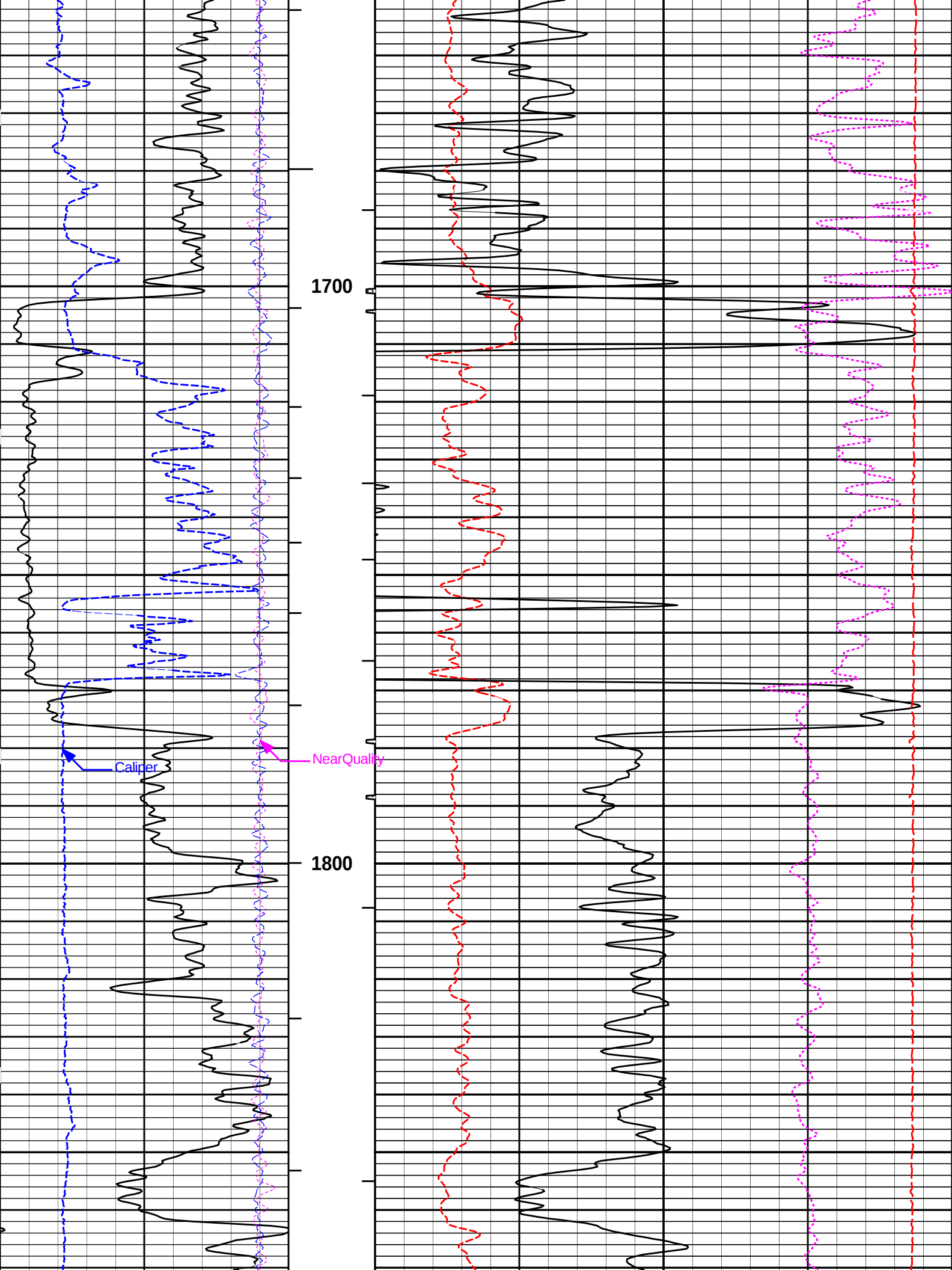


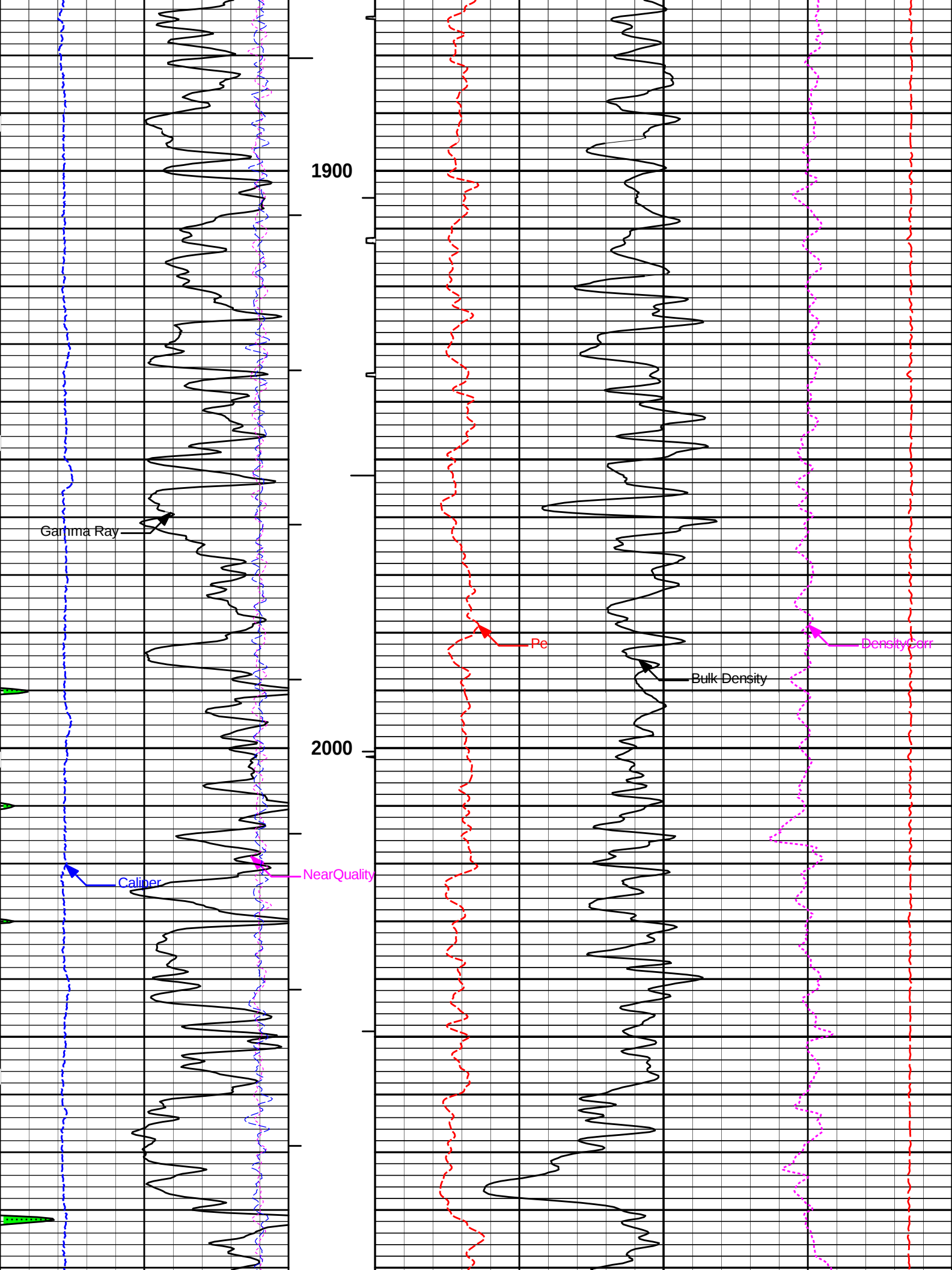


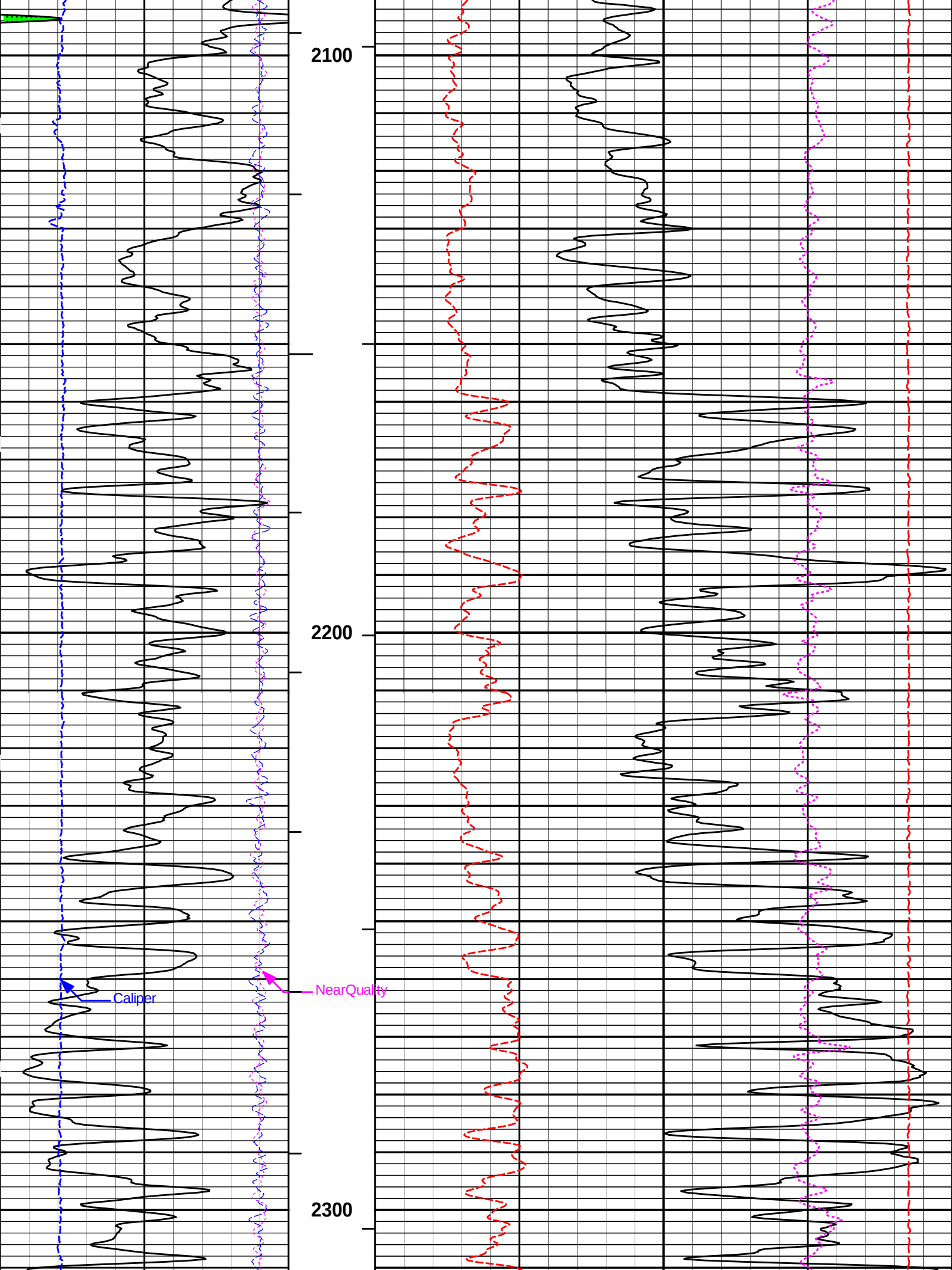


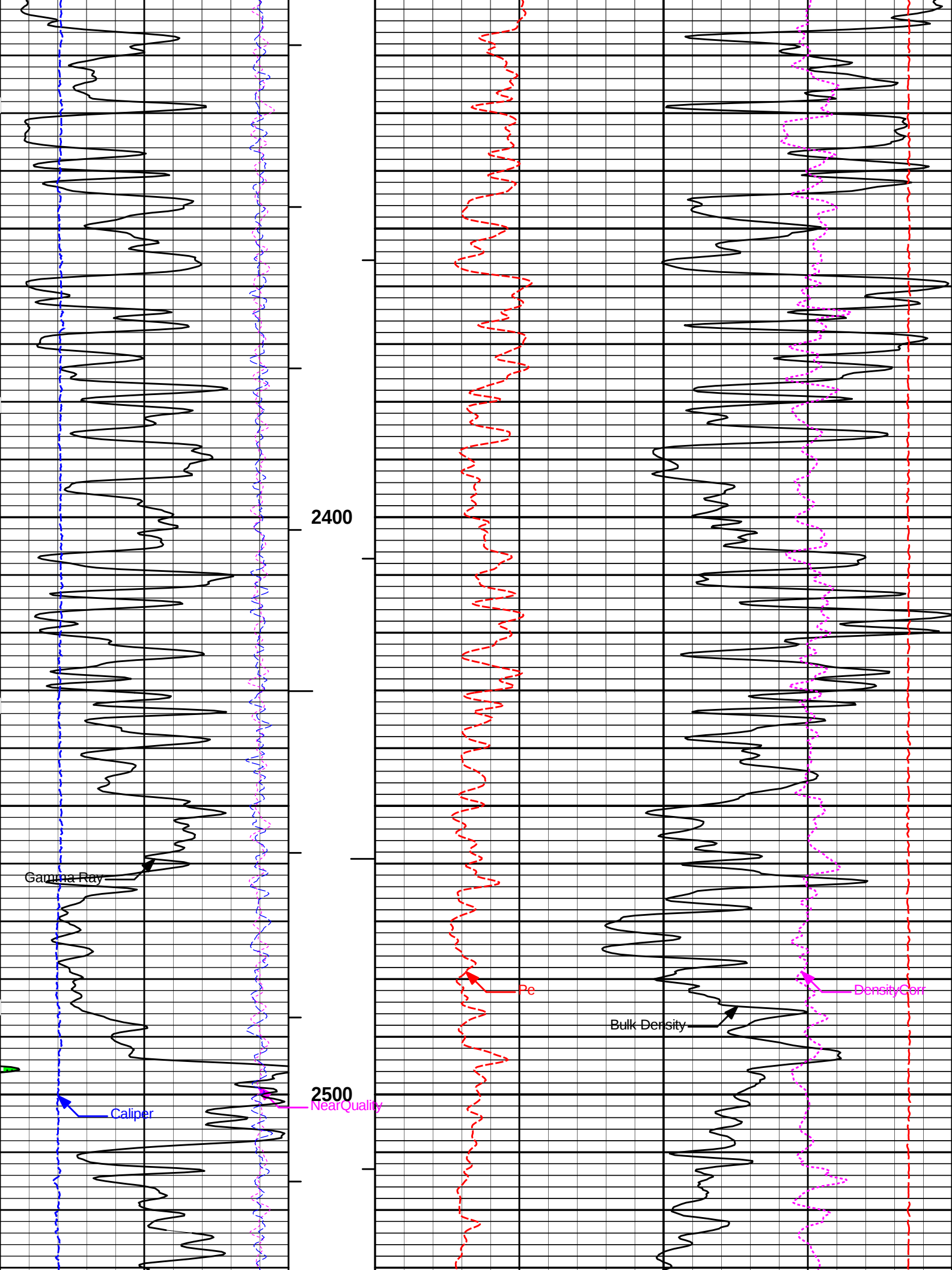


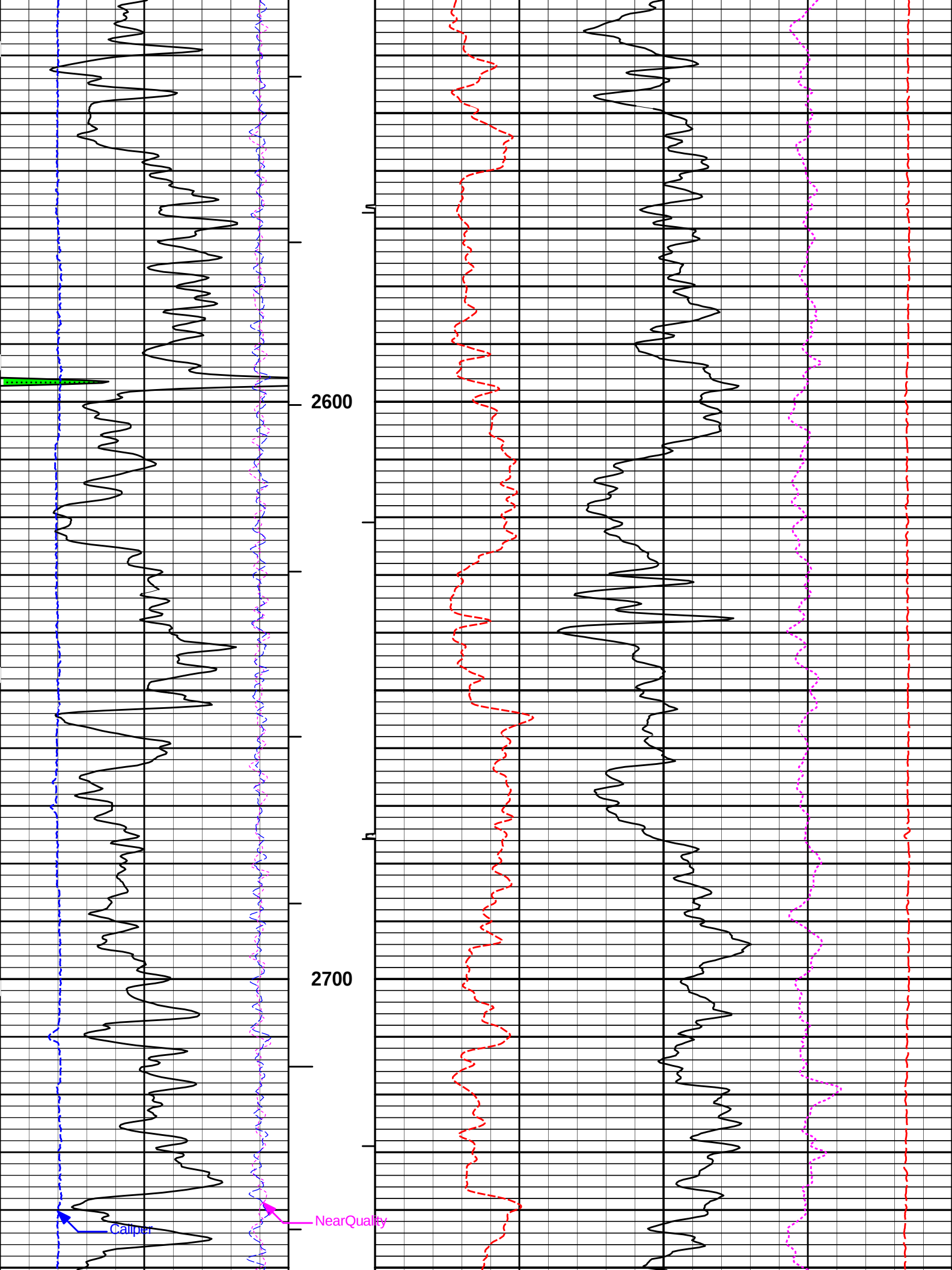


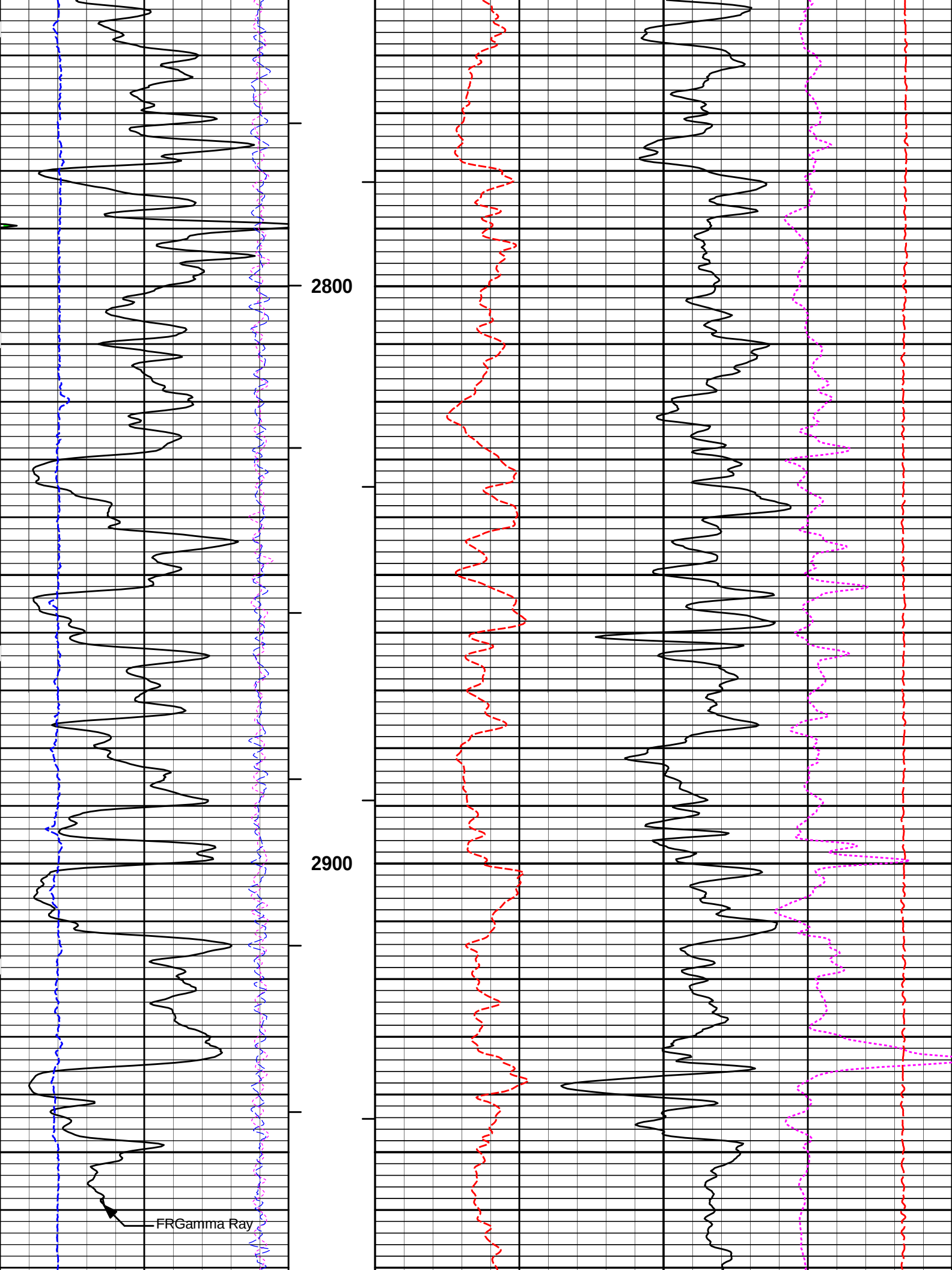


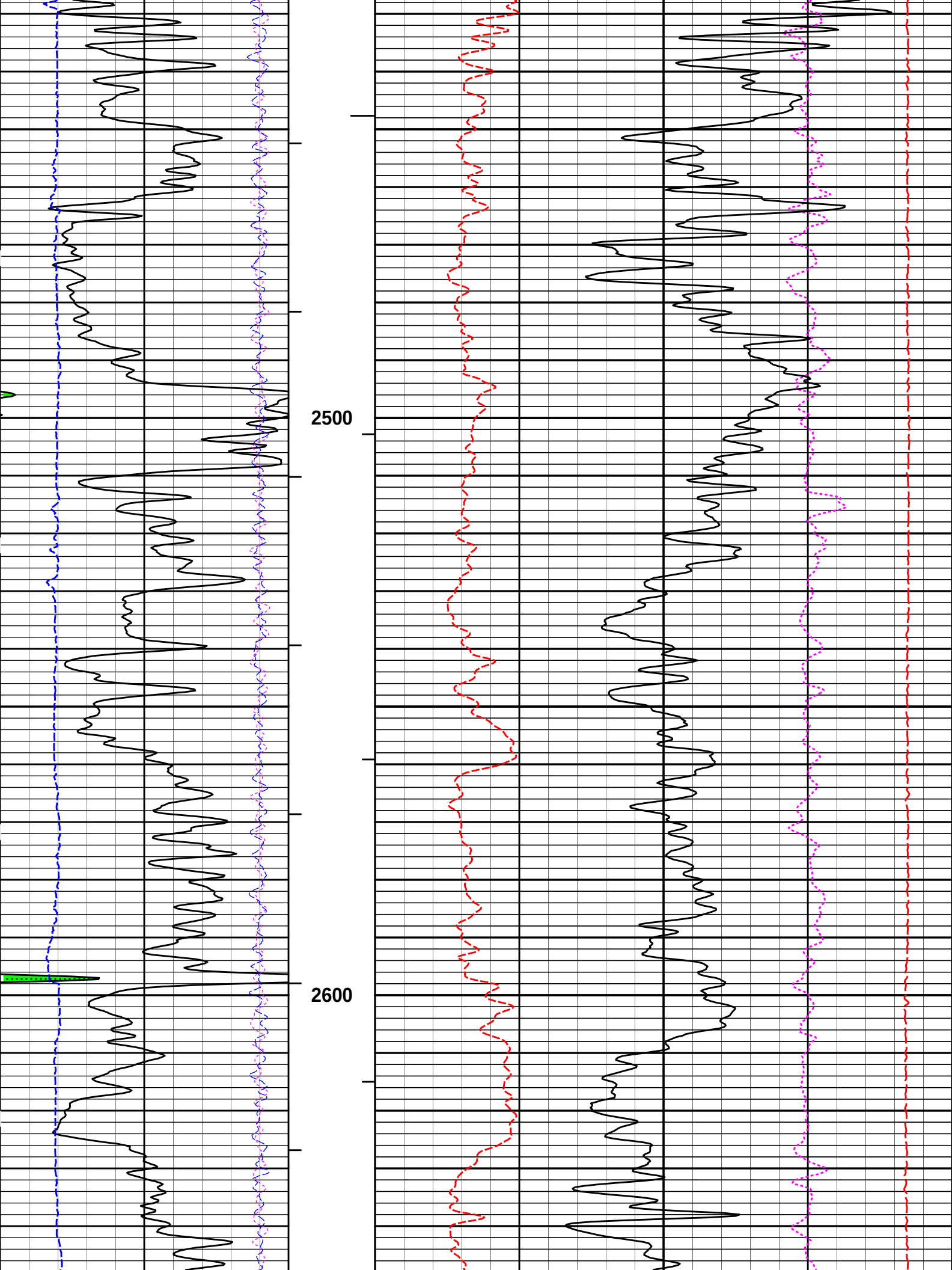


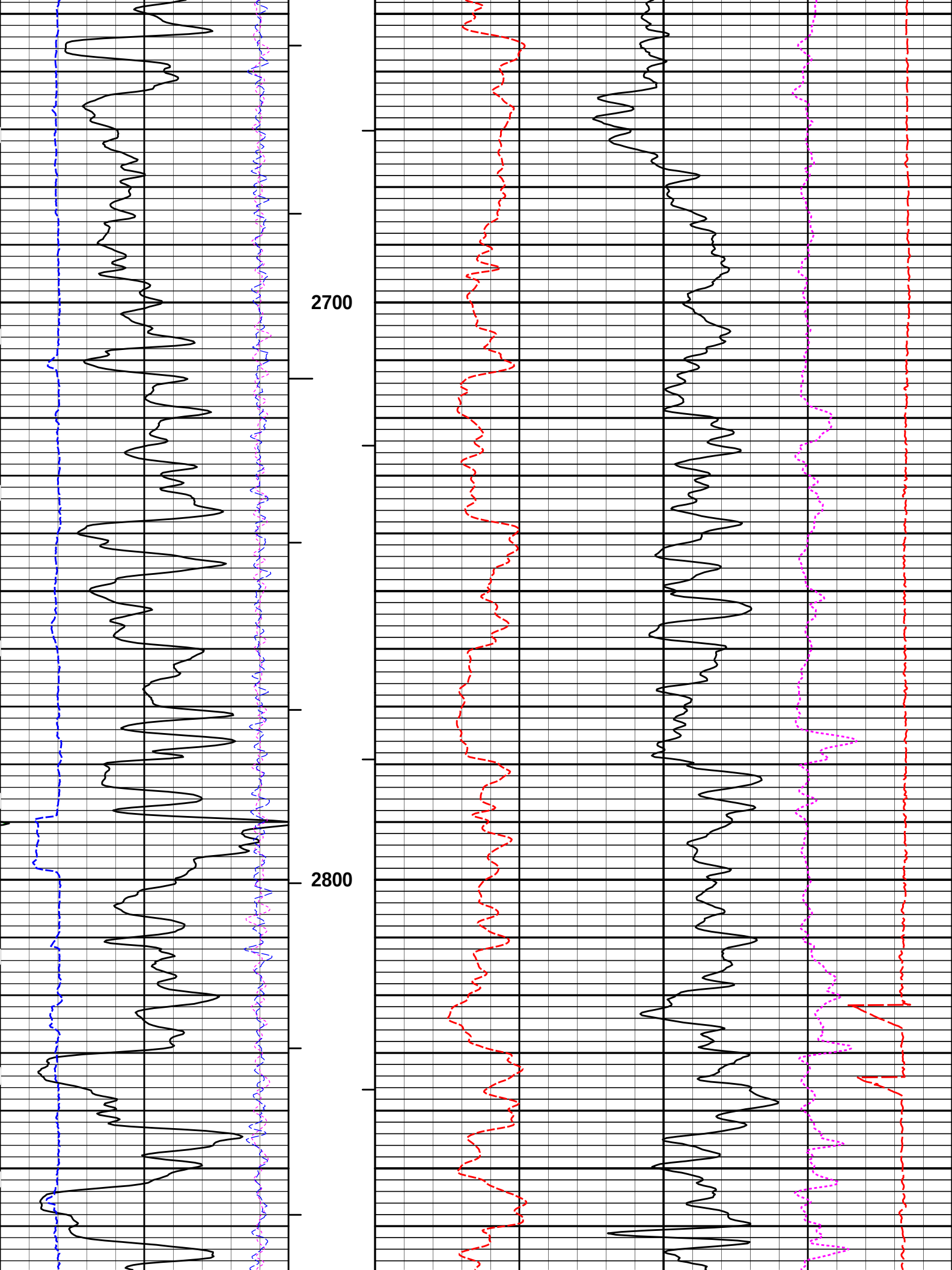


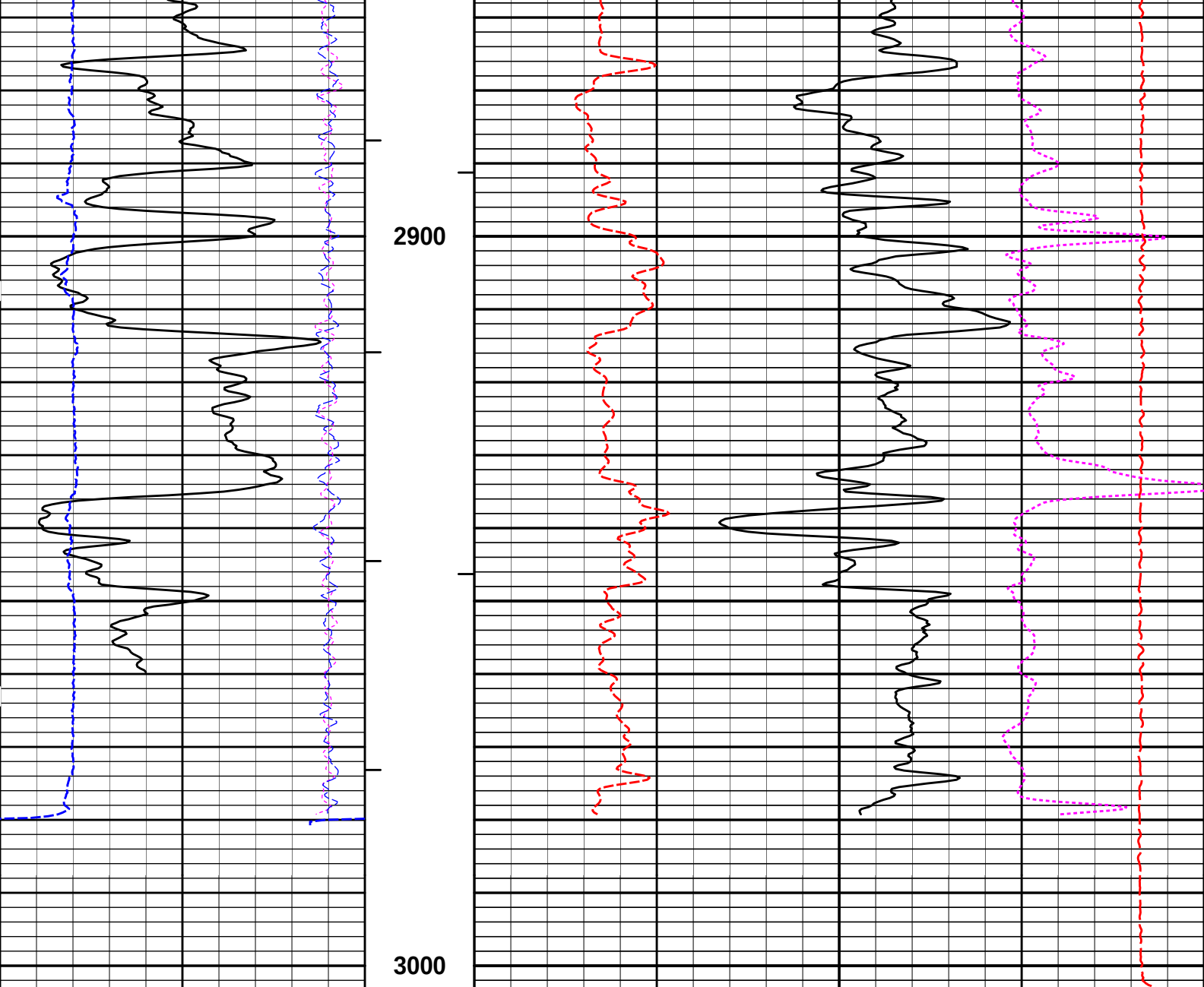






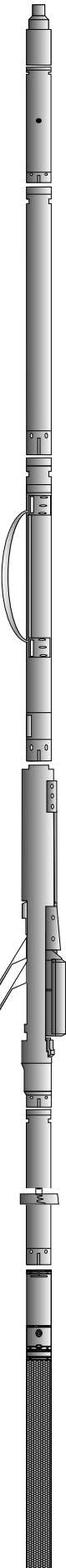






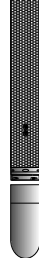
6 Caliper 16 -18 NearQuality 2 18 FarQuality -2 0 Gamma Ray 150 api SHALE	MD 1 : 240 ft AHV ft3 BHV ft3	0 Pe 10 15K 2 Bulk Density 3 g/cc	-0.25 DensityCorr 0.25 g/cc	
			0 Tension 0 pounds	

TOOL STRING DIAGRAM REPORT

Description	Overbody Description	O.D.	Diagram	Sensors @ Delays	Length	Accumulated Length
Cable Head Tension-00046696 30.00 lbs		Ø 3.625 in →		← Load Cell @ 53.34 ft	2.00 ft	54.34 ft
SP Sub-11441455 60.00 lbs		Ø 3.625 in →		← SP @ 50.56 ft	3.74 ft	52.34 ft
GTET-11048627 165.00 lbs		Ø 3.625 in →		← GammaRay @ 42.54 ft	8.52 ft	48.60 ft
DSNT-11019643 174.00 lbs	DSN Decentralizer- 11005605 6.60 lbs	Ø 5.000 in* → Ø 3.625 in →		← DSN Far @ 33.15 ft ← DSN Near @ 32.40 ft	9.69 ft	40.08 ft
SDLT-10950489 360.00 lbs	SDLT Pad-10844781 65.00 lbs Microlog Pad-10950489 8.00 lbs	Ø 4.500 in → Ø 4.750 in* → Ø 4.750 in* →		Microlog @ 22.58 ft SDL Caliper @ 22.40 ft SDL @ 22.39 ft	10.81 ft	30.40 ft
ACRt Instrument- 11055059 50.00 lbs	Regal Standoff 6_75- 00000044 20.00 lbs	Ø 3.625 in → Ø 6.750 in* →			5.03 ft	19.58 ft
ACRt Sonde- 11038385 200.00 lbs		Ø 3.625 in →		← Mud Resistivity @ 13.19 ft ← ACRt @ 9.21 ft	14.22 ft	14.55 ft

Bull Nose-00000029
5.00 lbs

Ø 2.750 in →



0.33 ft
0.33 ft
0.00 ft

Mnemonic		Tool Name	Serial Number	Weight (lbs)	Length (ft)	Accumulated Length (ft)	Max.Log. Speed (fpm)
CHT	Cable Head with Load Cell		00046696	30.00	2.00	52.34	300.00
SP	SP Sub		11441455	60.00	3.74	48.60	300.00
GTET	Gamma Telemetry Tool		11048627	165.00	8.52	40.08	60.00
DSNT	Dual Spaced Neutron		11019643	174.00	9.69	30.40	60.00
DCNT	DSN Decentralizer		11005605	6.60	5.13	* 33.73	300.00
SDLT	Spectral Density Tool		10950489	360.00	10.81	19.58	60.00
SDLP	Density Insite Pad		10844781	65.00	2.55	* 21.79	60.00
MICP	Microlog Pad		10950489	8.00	1.00	* 22.08	60.00
ACRt	Array Compensated True Resistivity Instrument Section		11055059	50.00	5.03	14.55	300.00
RSOF	Regal Standoff 6.75in		00000044	20.00	0.52	* 16.57	300.00
ACRt	Array Compensated True Resistivity Sonde Section		11038385	200.00	14.22	0.33	300.00
BLNS	Bull Nose		00000029	5.00	0.33	0.00	300.00
Total				1,143.60	54.34		
* Not included in Total Length and Length Accumulation.							
Data: JARVIS_ATU_1\0001 SP-GTET-DSN-SDL-ACRT-BNIDLE							
Date: 14-Jul-13 08:59:58							

HALLIBURTON

CALIBRATION REPORT

NATURAL GAMMA RAY TOOL SHOP CALIBRATION

Tool Name: GTET - 11048627

Reference Calibration Date: 17-Jun-13 14:38:32

Engineer: THOMAS HYDE

Calibration Date: 02-Jul-13 07:19:00

Software Version: WL INSITE R3.8.4 (Build 5)

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	51.2	51.2	api
Background + Calibrator	320.3	320.9	api
Calibrator	269.2	269.6	api

NATURAL GAMMA RAY TOOL FIELD CALIBRATION

Tool Name: GTET - 11048627

Reference Calibration Date: 02-Jul-13 07:19:00

Engineer: THOMAS HYDE

Calibration Date: 14-Jul-13 09:05:44

Software Version: WL INSITE R3.8.4 (Build 5)

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	51.2	16.3	api
Background + Calibrator	320.9	288.4	api
Calibrator	269.6	272.1	api

Shop	Field	Difference	Tolerance
269.6	272.1	-2.5	+/- 9.00

DUAL SPACED NEUTRON SHOP CALIBRATION

Tool Name:	DSNT - 11019643	Reference Calibration Date:	20-May-13 09:14:09
Engineer:	THOMAS HYDE	Calibration Date:	03-Jul-13 10:31:49
Software Version:	WL INSITE R3.8.4 (Build 5)	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: 72 degF
Min. Tool Housing Outside Diameter: 3.620 in

CALIBRATION CONSTANTS			
Measurement	Prev. Value	New Value	Control Limit On New Value
Gain:	0.948	0.952	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):	0.2094	0.2107	0.0013	+/- 0.0020
Calibrated Ratio:	9.67	9.72	0.043	+/- 0.050

VERIFIER		
Measurement	Value	Control Limit
Snow-Block Porosity (decP):	0.0555	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:	03-Jul-13 10:31:49
Engineer:	THOMAS HYDE	Calibration Date:	14-Jul-13 09:07:27
Software Version:	WL INSITE R3.8.4 (Build 5)	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):	0.0555	0.0555	-0.0000	+/- 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:	03-Jul-13 09:46:35
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Engineer: THOMAS HYDE		Calibration Date: 03-Jul-13 09:50:19		
Software Version: WL INSITE R3.8.4 (Build 5)		Calibration Version: 1		
Host Tool Name: DSNT - 11019643				
The ring diameter is computed from: DIAMETER = PAD EXTENSION + ARM EXTENSION + TOOL DIAMETER Tool Diameter: 4.50 in	CALIBRATION COEFFICIENTS			
	Measurement	Previous Value	New Value	Control Limit On New Value
	Pad Offset	-2122.30	-2267.57	-7000.00 - -1000.00
	Pad Gain	0.0004008	0.0004115	0.000200 - 0.000600
	Arm Offset	-1044.39	-900.40	-5000.00 - 3000.00
	Arm Gain	0.0005568	0.0005664	0.000300 - 0.000700
	Arm Power	-0.000007864	-0.000008420	-0.000010000 - 0.000010000
	CALIBRATION RINGS			
	Measurement	Current Reading (Previous Coeff.)	Calibrated (New Coeff.)	Change Control Limit On New Value
	PAD EXTENSION:			
	Small Ring (in)	2.01	2.00	-0.01 +/- 0.20
	Medium Ring (in)	3.71	3.75	0.04 +/- 0.20
	RING DIAMETER:			
	Small Ring (in)	6.46	6.50	0.04 +/- 0.20
	Medium Ring (in)	8.19	8.25	0.06 +/- 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 - 10950489		Reference Calibration Date: 03-Jul-13 09:50:19	
Engineer: THOMAS HYDE		Calibration Date: 14-Jul-13 09:08:30	
Software Version: WL INSITE R3.8.4 (Build 5)		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	8.28	0.03 +/- 0.15
	PASS/FAIL SUMMARY			
	Pad Extension Check:		Passed	
	Diameter Check:		Passed	

SPECTRAL DENSITY SHOP CALIBRATION			
Tool Name: SDLT Pad - 10844781		Reference Calibration Date: 20-May-13 08:08:55	
Engineer: THOMAS HYDE		Calibration Date: 03-Jul-13 08:21:57	
Software Version: WL INSITE R3.8.4 (Build 5)		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	1.0458	1.0311	0.90 - 1.10
Near Dens Gain	1.0273	0.9973	0.90 - 1.10
Near Peak Gain	1.0263	0.9891	0.90 - 1.10
Near Lith Gain	1.0002	0.9628	0.90 - 1.10
Far Bar Gain	1.0131	1.0116	0.90 - 1.10
Far Dens Gain	0.9998	1.0013	0.90 - 1.10
Far Peak Gain	0.9931	0.9942	0.90 - 1.10
Far Lith Gain	0.9703	0.9710	0.90 - 1.10
Near Bar Offset	-0.2267	-0.0895	NONE
Near Dens Offset	-0.0660	0.2008	NONE
Near Peak Offset	-0.0561	0.2568	NONE
Near Lith Offset	0.1465	0.4560	NONE
Far Bar Offset	0.0158	0.0296	NONE
Far Dens Offset	0.1191	0.1076	NONE
Far Peak Offset	0.1370	0.1276	NONE
Far Lith Offset	0.2745	0.2663	NONE
Near Bar Background	799.54	801.75	700 - 1450
Near Dens Background	263.01	263.54	230 - 480
Near Peak Background	114.80	114.31	100 - 210
Near Lith Background	140.52	141.49	125 - 260
Far Bar Background	523.76	523.29	450 - 900
Far Dens Background	205.92	203.86	175 - 345
Far Peak Background	82.46	82.37	70 - 140
Far Lith Background	83.92	83.28	75 - 145

CALIBRATION BLOCK SUMMARY				
Measurement	Current Reading (Previous Coef)	Calibrated (New Coef)	Change	Control Limit On Change
MAGNESIUM				
Density (g/cc)	1.685	1.684	-0.001	+/- 0.015
Pe	2.515	2.562	0.047	+/- 0.150
ALUMINUM				
Density (g/cc)	2.591	2.598	0.007	+/- 0.01500
Pe	3.123	3.131	0.008	+/- 0.150

TOOL SUMMARY				
Measurement	Near Detector		Far Detector	
	Value	Control Limits	Value	Control Limits
QUALITY				
Background	-0.0016	+/- 0.0110	-0.0015	+/- 0.0140
Magnesium Block	-0.0008	+/- 0.0110	-0.0041	+/- 0.0140
Aluminum Block	-0.0005	+/- 0.0110	-0.0004	+/- 0.0140
Resolution	9.34	6.00 - 11.50	8.79	6.00 - 11.50
Internal Verifier(B+D+P+L)	1321	1200 - 2700	893	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 - 10844781Reference Calibration Date:03-Jul-13 08:21:57

Engineer:THOMAS HYDECalibration Date:14-Jul-13 09:12:54

Software Version:WL INSITE R3.8.4 (Build 5)Calibration Version:1

Pad Temperature: 82.3 degF

DENSITY FIELD CALIBRATION SUMMARY

Measurement	Shop	Field	Change	Control Limit +/-
Near (B+D+P+L) cps	1321.091	1322.619	1.528	14.707
Far (B+D+P+L) cps	892.795	892.658	-0.137	16.268
Near Resolution	9.34	9.33	-0.010	0.50
Far Resolution	8.79	8.80	0.010	1.00

PASS/FAIL SUMMARY

Bkg Quality Check:Passed

Bkg Resolution Check:Passed

Bkg Verification Check:Passed

CALIBRATION SUMMARY

Sensor	Shop	Field	Post	Difference	Tolerance	Units
GTET-11048627						
Gamma Ray Calibrator	269.6	272.1	-----	-2.5	+/- 9.00	api
DSNT-11019643						
Snow-Block Porosity	0.0555	0.0555	-----	0.0000	+/- 0.0150	decp
SDLT-10950489						
Pad Extension	3.75	3.78	-----	-0.03	+/-0.10	in
Ring Diameter	8.25	8.28	-----	-0.03	+/-0.15	in
SDLT Pad-10844781						
Near(B+D+P+L)	1321.091	1322.619	-----	-1.528	+/-14.707	cps
Far(B+D+P+L)	892.795	892.658	-----	0.137	+/-16.268	cps

Data: JARVIS ATU 10001 SP-GTET-DSN-SDL -ACRT-BNWDLE

Date: 14-Jul-13 09:25:02

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	8.800	ppg
	SHARED	WAGT	Weighting Agent	Natural	
	SHARED	BSAL	Borehole salinity	0.00	ppm
	SHARED	FSAL	Formation Salinity NaCl	0.00	ppm
	SHARED	KPCT	Percent K in Mud by Weight?	0.00	%

	SHARED	RMUD	Mud Resistivity	2.000	ohmm
	SHARED	TRM	Temperature of Mud	76.0	degF
	SHARED	CSD	Logging Interval is Cased?	No	
	SHARED	ICOD	AHV Casing OD	5.500	in
	SHARED	ST	Surface Temperature	76.0	degF
	SHARED	TD	Total Well Depth	3000.00	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	
	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
	ACRt Sonde	RTOK	Process ACRt?	Yes	
	ACRt Sonde	MNSO	Minimum Tool Standoff	1.50	in
	ACRt Sonde	TCS1	Temperature Correction Source	FP Lwr & FP Up	
	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					



INPUTS, DELAYS AND FILTERS TABLE

Mnemonic	Input Description	Delay (ft)	Filter Type	Filter Length (ft)
Depth Panel				
TENS	Tension	0.00	NO	
Cable Head Tension				
DHTN	DownholeTension	0.00	BLK	0.000
SP Sub				
PLTC	Plot Control Mask	50.56	NO	
SP	Spontaneous Potential	50.56	BLK	1.250
SPR	Raw Spontaneous Potential	50.56	NO	
SPO	Spontaneous Potential Offset	50.56	NO	
GTET				
TPUL	Tension Pull	42.54	NO	
GR	Natural Gamma Ray API	42.54	TRI	1.750
GRU	Unfiltered Natural Gamma Ray API	42.54	NO	
EGR	Natural Gamma Ray API with Enhanced Vertical Resolution	42.54	W	1.416 , 0.750
ACCZ	Accelerometer Z	0.00	BLK	0.083
DEVI	Inclination	0.00	NO	
DSNT				
TPUL	Tension Pull	32.30	NO	
RNDS	Near Detector Telemetry Counts	32.40	BLK	1.417
RFDS	Far Detector Telemetry Counts	33.15	TRI	0.583
DNTT	DSN Tool Temperature	32.40	NO	
DSNS	DSN Tool Status	32.30	NO	
ERND	Near Detector Telemetry Counts EVR	32.40	BLK	0.000
ERFD	Far Detector Telemetry Counts EVR	33.15	BLK	0.000
ENTM	DSN Tool Temperature EVR	32.40	NO	
SDLT				
TPUL	Tension Pull	22.40	NO	
PCAL	Pad Caliper	22.40	TRI	0.250
ACAL	Arm Caliper	22.40	TRI	0.250
ACRt Sonde				
TPUL	Tension Pull	2.73	NO	
F1R1	ACRT 12KHz - 80in R value	8.98	BLK	0.000
F1X1	ACRT 12KHz - 80in X value	8.98	BLK	0.000
F1R2	ACRT 12KHz - 50in R value	6.48	BLK	0.000
F1X2	ACRT 12KHz - 50in X value	6.48	BLK	0.000
F1R3	ACRT 12KHz - 29in R value	4.98	BLK	0.000
F1X3	ACRT 12KHz - 29in X value	4.98	BLK	0.000
F1R4	ACRT 12KHz - 17in R value	3.98	BLK	0.000
F1X4	ACRT 12KHz - 17in X value	3.98	BLK	0.000
F1R5	ACRT 12KHz - 10in R value	3.48	BLK	0.000
F1X5	ACRT 12KHz - 10in X value	3.48	BLK	0.000

F1R6	ACRT 12KHz - 6in R value	3.23	BLK	0.000
F1X6	ACRT 12KHz - 6in X value	3.23	BLK	0.000
F2R1	ACRT 36KHz - 80in R value	8.98	BLK	0.000
F2X1	ACRT 36KHz - 80in X value	8.98	BLK	0.000
F2R2	ACRT 36KHz - 50in R value	6.48	BLK	0.000
F2X2	ACRT 36KHz - 50in X value	6.48	BLK	0.000
F2R3	ACRT 36KHz - 29in R value	4.98	BLK	0.000
F2X3	ACRT 36KHz - 29in X value	4.98	BLK	0.000
F2R4	ACRT 36KHz - 17in R value	3.98	BLK	0.000
F2X4	ACRT 36KHz - 17in X value	3.98	BLK	0.000
F2R5	ACRT 36KHz - 10in R value	3.48	BLK	0.000
F2X5	ACRT 36KHz - 10in X value	3.48	BLK	0.000
F2R6	ACRT 36KHz - 6in R value	3.23	BLK	0.000
F2X6	ACRT 36KHz - 6in X value	3.23	BLK	0.000
F3R1	ACRT 72KHz - 80in R value	8.98	BLK	0.000
F3X1	ACRT 72KHz - 80in X value	8.98	BLK	0.000
F3R2	ACRT 72KHz - 50in R value	6.48	BLK	0.000
F3X2	ACRT 72KHz - 50in X value	6.48	BLK	0.000
F3R3	ACRT 72KHz - 29in R value	4.98	BLK	0.000
F3X3	ACRT 72KHz - 29in X value	4.98	BLK	0.000
F3R4	ACRT 72KHz - 17in R value	3.98	BLK	0.000
F3X4	ACRT 72KHz - 17in X value	3.98	BLK	0.000
F3R5	ACRT 72KHz - 10in R value	3.48	BLK	0.000
F3X5	ACRT 72KHz - 10in X value	3.48	BLK	0.000
F3R6	ACRT 72KHz - 6in R value	3.23	BLK	0.000
F3X6	ACRT 72KHz - 6in X value	3.23	BLK	0.000
RMUD	Mud Resistivity	12.52	BLK	0.000
F1RT	Transmitter Current Raw 12K X Receiver	2.73	BLK	0.000
F1XT	Transmitter Reference 12 KHz Imaginary Signal	2.73	BLK	0.000
F2RT	Transmitter Reference 36 KHz Real Signal	2.73	BLK	0.000
F2XT	Transmitter Reference 36 KHz Imaginary Signal	2.73	BLK	0.000
F3RT	Transmitter Reference 72 KHz Real Signal	2.73	BLK	0.000
F3XT	Transmitter Reference 72 KHz Imaginary Signal	2.73	BLK	0.000
TFPU	Upper Feedpipe Temperature Calculated	2.73	BLK	0.000
TFPL	Lower Feedpipe Temperature Calculated	2.73	BLK	0.000
ITMP	Instrument Temperature	2.73	BLK	0.000
TCVA	Temperature Correction Values Loop Off	2.73	NO	
TIDV	Instrument Temperature Derivative	2.73	NO	
TUDV	Upper Temperature Derivative	2.73	NO	
TLDV	Lower Temperature Derivative	2.73	NO	
TRBD	Receiver Board Temperature	2.73	NO	

Microlog Pad				
TPUL	Tension Pull	22.58	NO	
MINV	Microlog Lateral	22.58	BLK	0.750
MNOR	Microlog Normal	22.58	BLK	0.750

SDLT Pad				
TPUL	Tension Pull	22.39	NO	
NAB	Near Above	22.21	BLK	0.920
NHI	Near Cesium High	22.21	BLK	0.920
NLO	Near Cesium Low	22.21	BLK	0.920
NVA	Near Valley	22.21	BLK	0.920
NBA	Near Barite	22.21	BLK	0.920
NDE	Near Density	22.21	BLK	0.920

NPK	Near Peak	22.21	BLK	0.920
NLI	Near Lithology	22.21	BLK	0.920
NBAU	Near Barite Unfiltered	22.21	BLK	0.250
NLIU	Near Lithology Unfiltered	22.21	BLK	0.250
FAB	Far Above	22.56	BLK	0.250
FHI	Far Cesium High	22.56	BLK	0.250
FLO	Far Cesium Low	22.56	BLK	0.250
FVA	Far Valley	22.56	BLK	0.250
FBA	Far Barite	22.56	BLK	0.250
FDE	Far Density	22.56	BLK	0.250
FPK	Far Peak	22.56	BLK	0.250
FLI	Far Lithology	22.56	BLK	0.250
PTMP	Pad Temperature	22.40	BLK	0.920
NHV	Near Detector High Voltage	21.79	NO	
FHV	Far Detector High Voltage	21.79	NO	
ITMP	Instrument Temperature	21.79	NO	
DDHV	Detector High Voltage	21.79	NO	

Data: JARVIS_ATU_1\0001 SP-GTET-DSN-SDL-ACRT-BN\IDLE

Date: 14-Jul-13 09:25:32



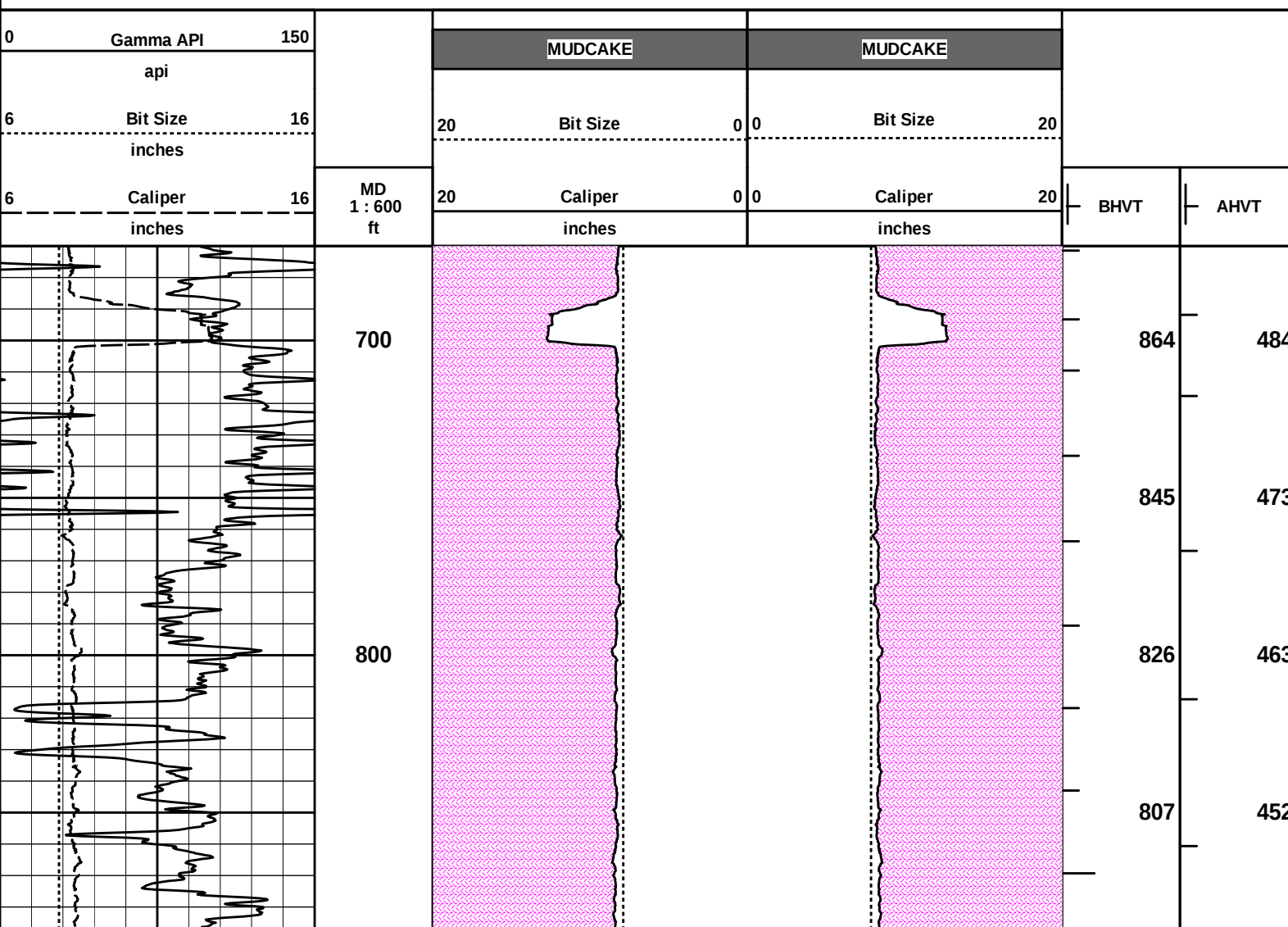
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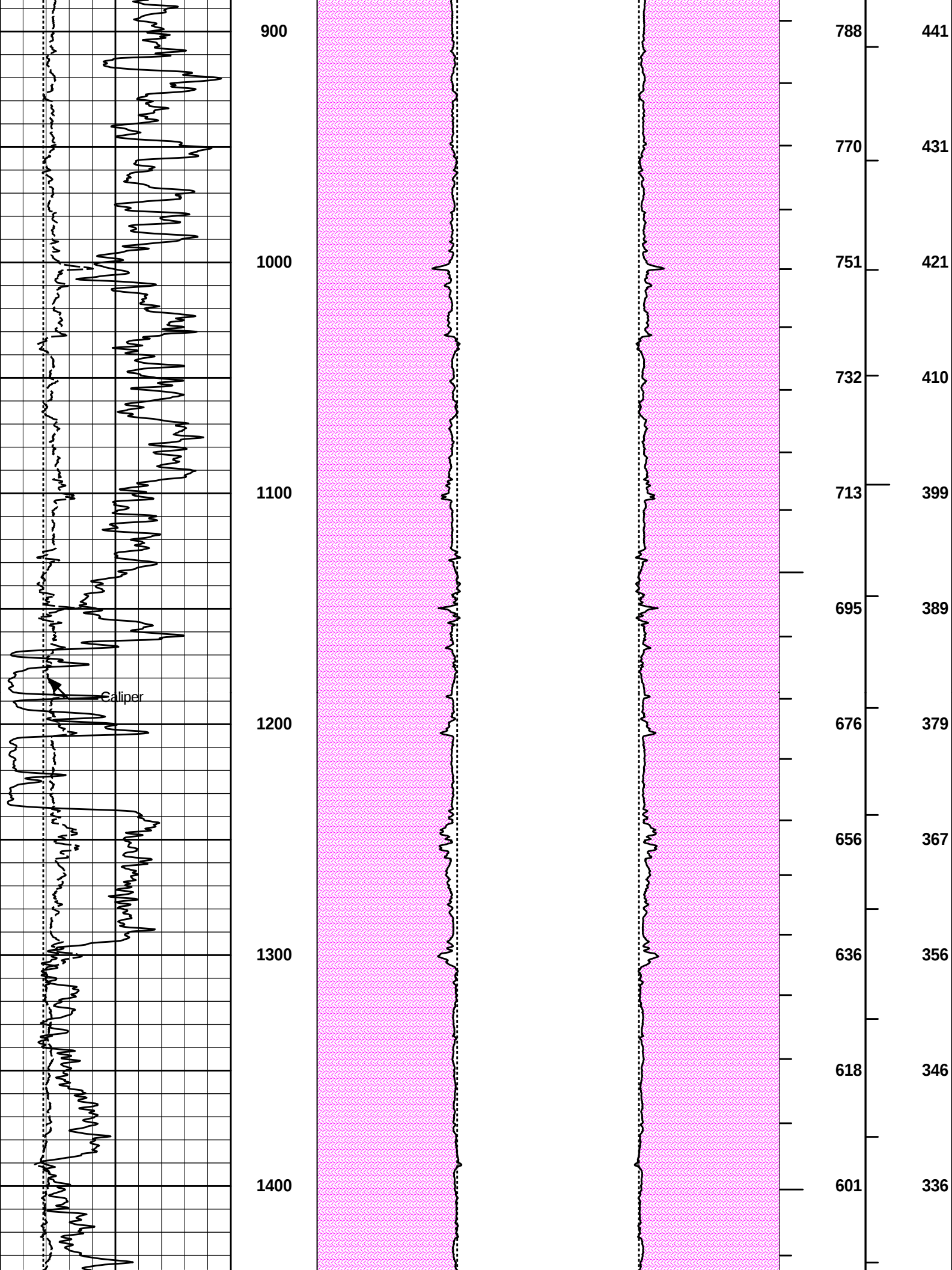
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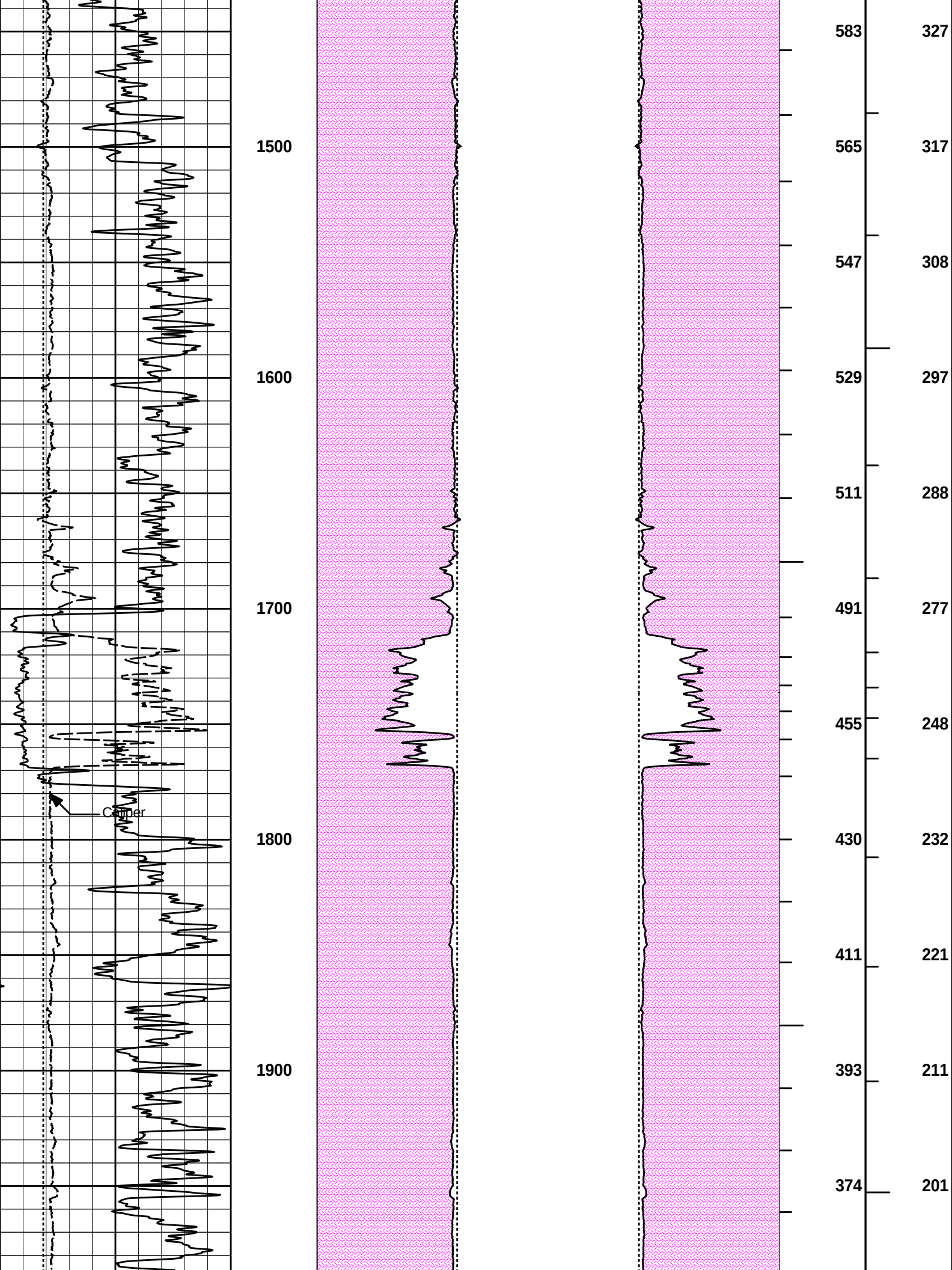
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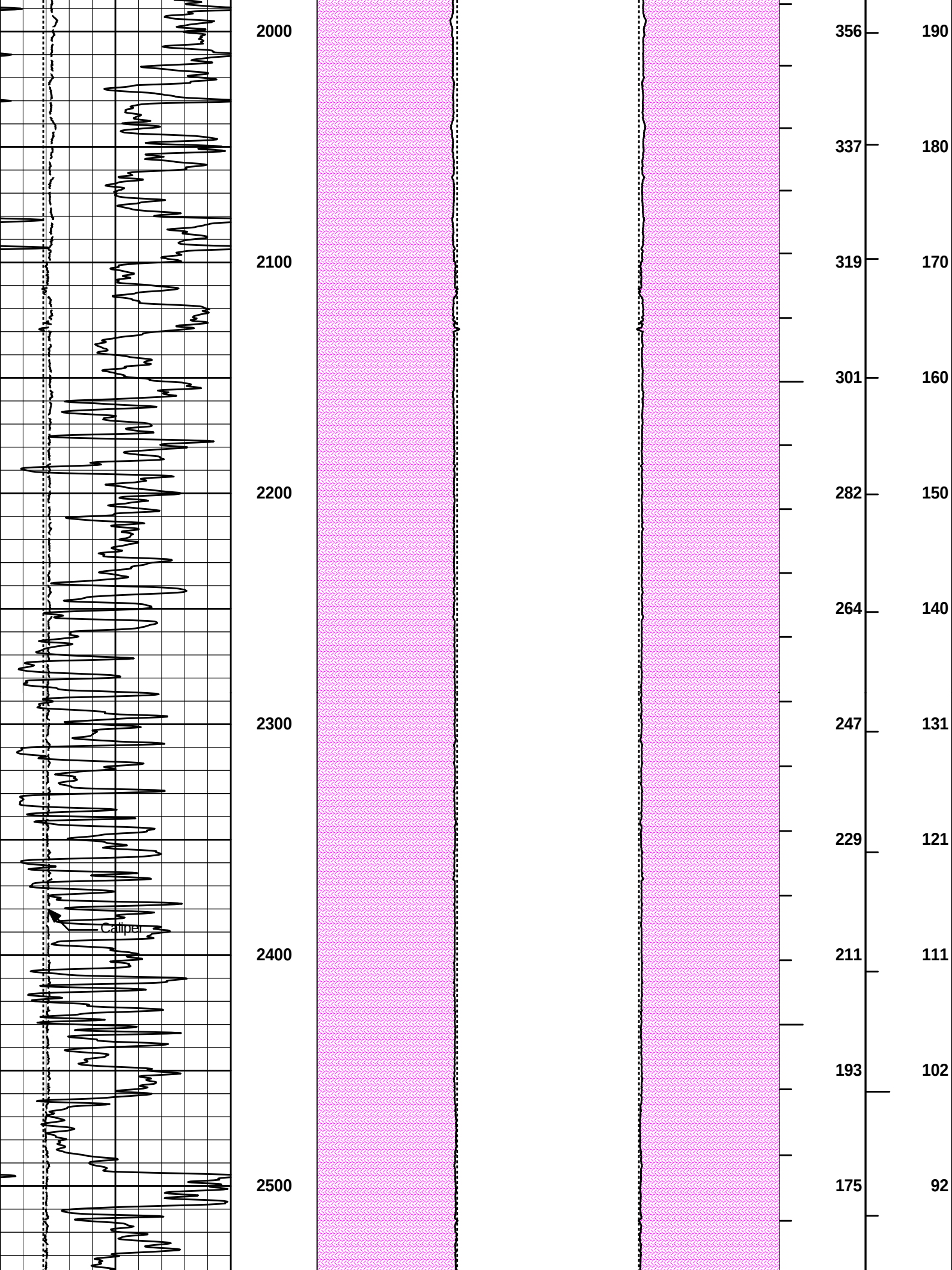
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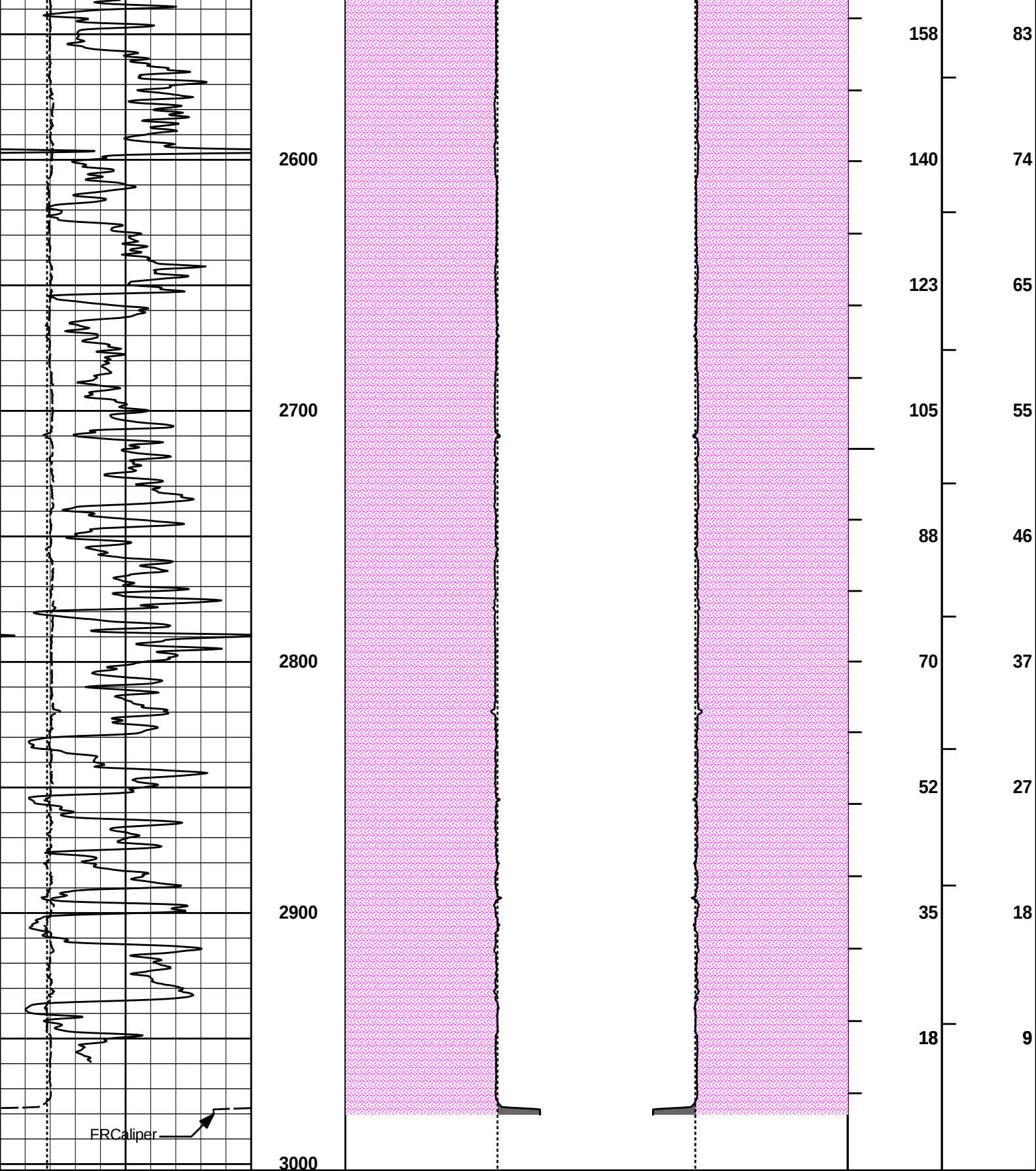
ANNULAR HOLE VOLUME PLOT











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

ANNULAR HOLE VOLUME PLOT

COMPANY	PIONEER NATURAL RESOURCES USA, INC.		
WELL	JARVIS ET AL ATU 1		
FIELD	HUGOTON-PANOMA		
COUNTY	GRANT	STATE	KANSAS
HALLIBURTON		DUAL SPACED NEUTRON SPECTRAL DENSITY LOG	