

HALLIBURTON

SPECTRAL DENSITY
DUAL SPACED NEUTRON
LOG

COMPANY		HARTMAN OIL CO., INC.			
WELL		HEYEN #1-2			
FIELD/BLOCK		GRAY NORTH FIELD			
COUNTY		STAFFORD			
STATE		KANSAS			
Permanent Datum		GL		Elev. 1897.0 ft	
Log measured from		KB		D.F. 1907.0 ft	
Drilling measured from		KB		G.L. 1897.0 ft	
Date		03-Jul-14			
Run No.		ONE			
Depth - Driller		4090.00 ft			
Depth - Logger		4090.0 ft			
Bottom - Logged Interval		4046.0 ft			
Top - Logged Interval		700.0 ft			
Casing - Driller		8.625 in		@	
Casing - Logger		352.0 ft		@	
Bit Size		7.875 in		@	
Type Fluid in Hole		Water Based Mud		@	
Density		9.2 ppq		60.00 s/qt	
PH		10.50 pH		9.2 cpth	
Source of Sample		MUD PIT			
Rm @ Meas. Temperature		0.450 ohmm		@ 75.00 degF	
Rmf @ Meas. Temperature		0.33 ohmm		@ 75.00 degF	
Rmc @ Meas. Temperature		0.560 ohmm		@ 75.00 degF	
Source Rmf		MEASURED		MEASURED	
Rm @ BHT		0.29 ohmm		@ 120.0 degF	
Time Since Circulation		4.0000 hr			
Time on Bottom		03-Jul-14 16:47			
Max. Rec. Temperature		120.0 degF		@ 4090.0 ft	
Equipment		11072142		LIBERAL	
Recorded By		J. BOLLOW			
Witnessed By		K. NOAH			

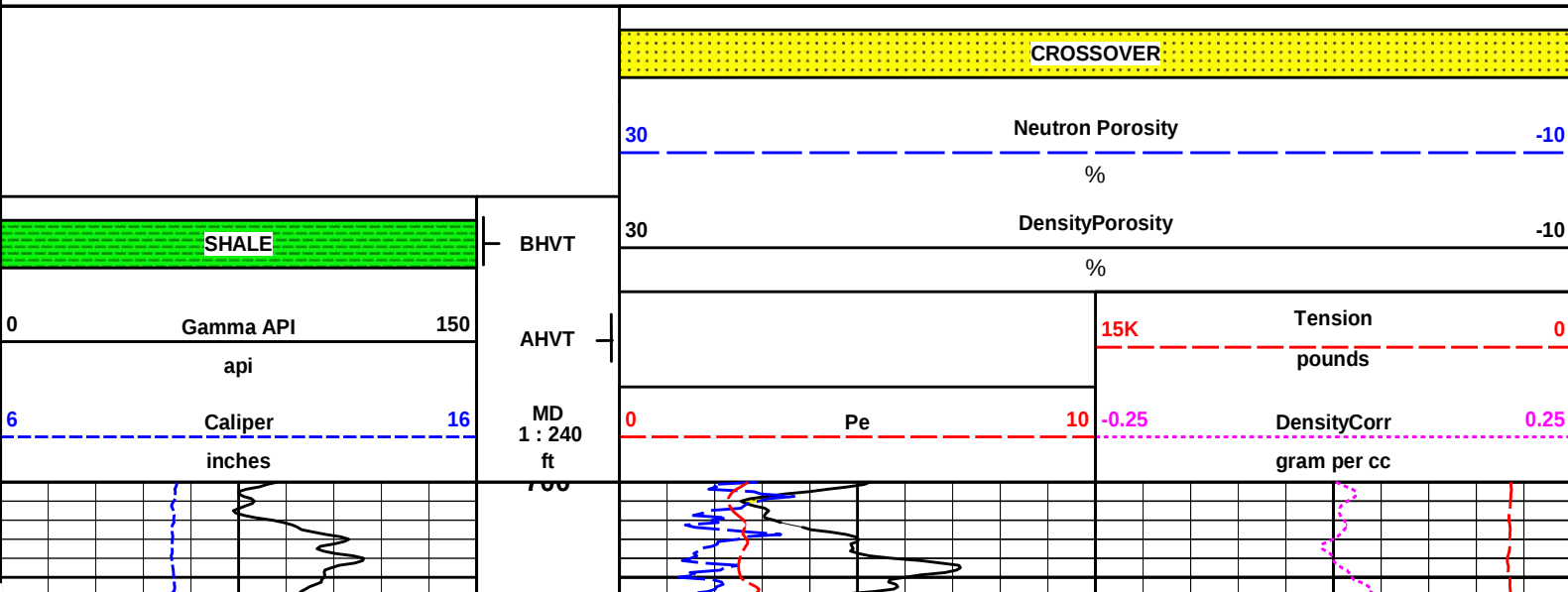
COMPANY	HARTMAN OIL CO., INC.	
WELL	HEYEN #1-2	
FIELD/BLOCK	GRAY NORTH FIELD	
COUNTY	STAFFORD	
STATE	KANSAS	
API No.	15-185-23886-00-00	
Location	(SHL) 1025' FNL & 1075' FEL SW-SW-NE-NE	
Sect. 2	Twp. 24S	Rge. 13W
Other Services: MICROLOG BSAT ACRT		

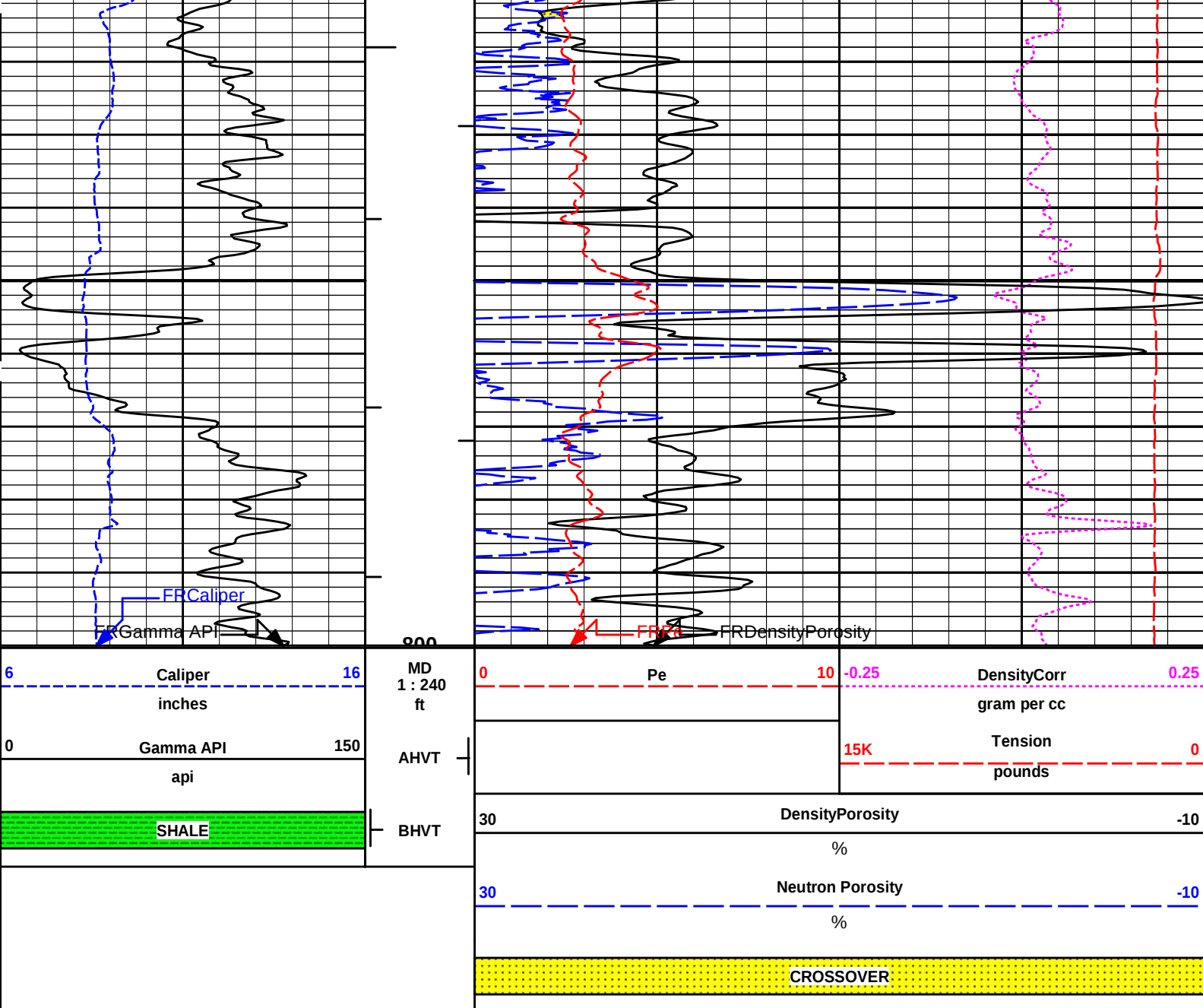
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Service Ticket No.: 901478501				API Serial No.: 15-185-23886-00-00				PGM Version: WL INSITE R4.2.0 (Build 2)							
CHANGE IN MUD TYPE OR ADDITIONAL SAMPLE						RESISTIVITY SCALE CHANGES									
Date		Sample No.				Type Log		Depth		Scale Up Hole		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.		ONE	
Serial No.		11048627		Serial No.				Serial No.		10865884		Serial No.		11055304	
Model No.		GTET		Model No.				Model No.		SDLT-I		Model No.		DSNT-I	
Diameter		3.625"		No. of Cent.				Diameter		4.5"		Diameter		3.625"	
Detector Model No.		T-102		Spacing				Log Type		GAM-GAM		Log Type		NEU-NEU	
Type		SCINT						Source Type		CS137		Source Type		AM241BE	
Length		8'		LSA [Y/N]				Serial No.		5168GW		Serial No.		DSN-424	
Distance to Source		10'		FWDA [Y/N]				Strength		1.5 CI		Strength		15 CI	
LOGGING DATA															

GENERAL				GAMMA		ACOUSTIC			DENSITY			NEUTRON		
Run	Depth		Speed	Scale		Scale		Matrix	Scale		Matrix	Scale		Matrix
No.	From	To	ft/min	L	R	L	R		L	R		L	R	
ONE	4090	3000	REC	0	150				30	-10	2.71	30	-10	LIME
ONE	800	700	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														
CHLORIDES REPORTED AT 10,300 PPM														
GTET-DSNT-SDLT-BSAT-ACRT RUN IN COMBINATION														
TODAY'S CREW: K. PIDDINGTON, E. ZAPIEN, & D. MILLER														
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														

MEASURED DEPTH
MAIN SECTION 5" PER 100'





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Plot Time: 04-Jul-14 12:33:57
Plot Range: 700 ft to 800 ft
Data: HEYEN_1-2\Well Based\DETAIL_TOP\
Plot File: \\POROI\Poroi_IQ_5_MAIN_LIB

5 INCH MAIN LOG

MEASURED DEPTH
MAIN SECTION 5" PER 100'

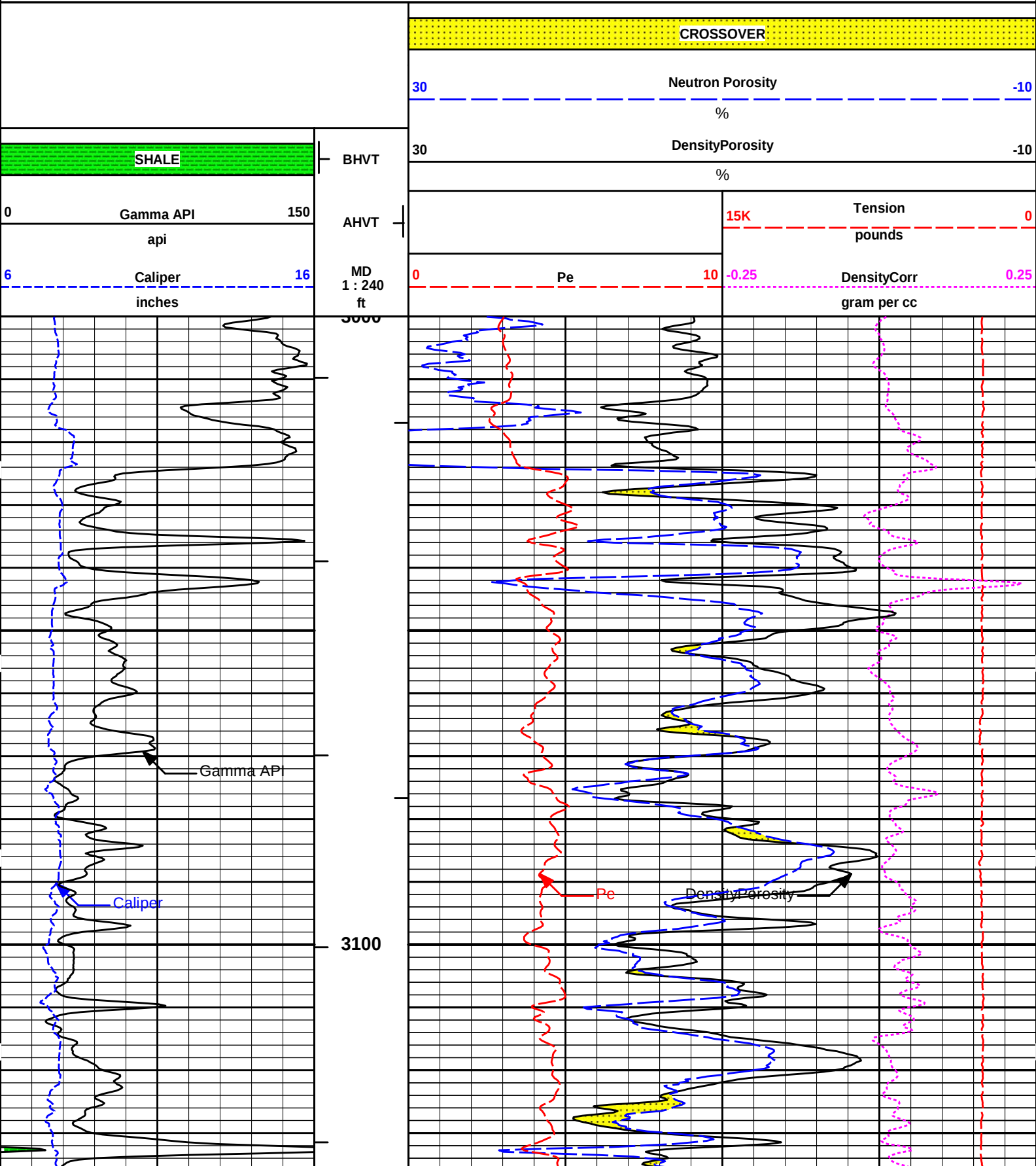
HALLIBURTON

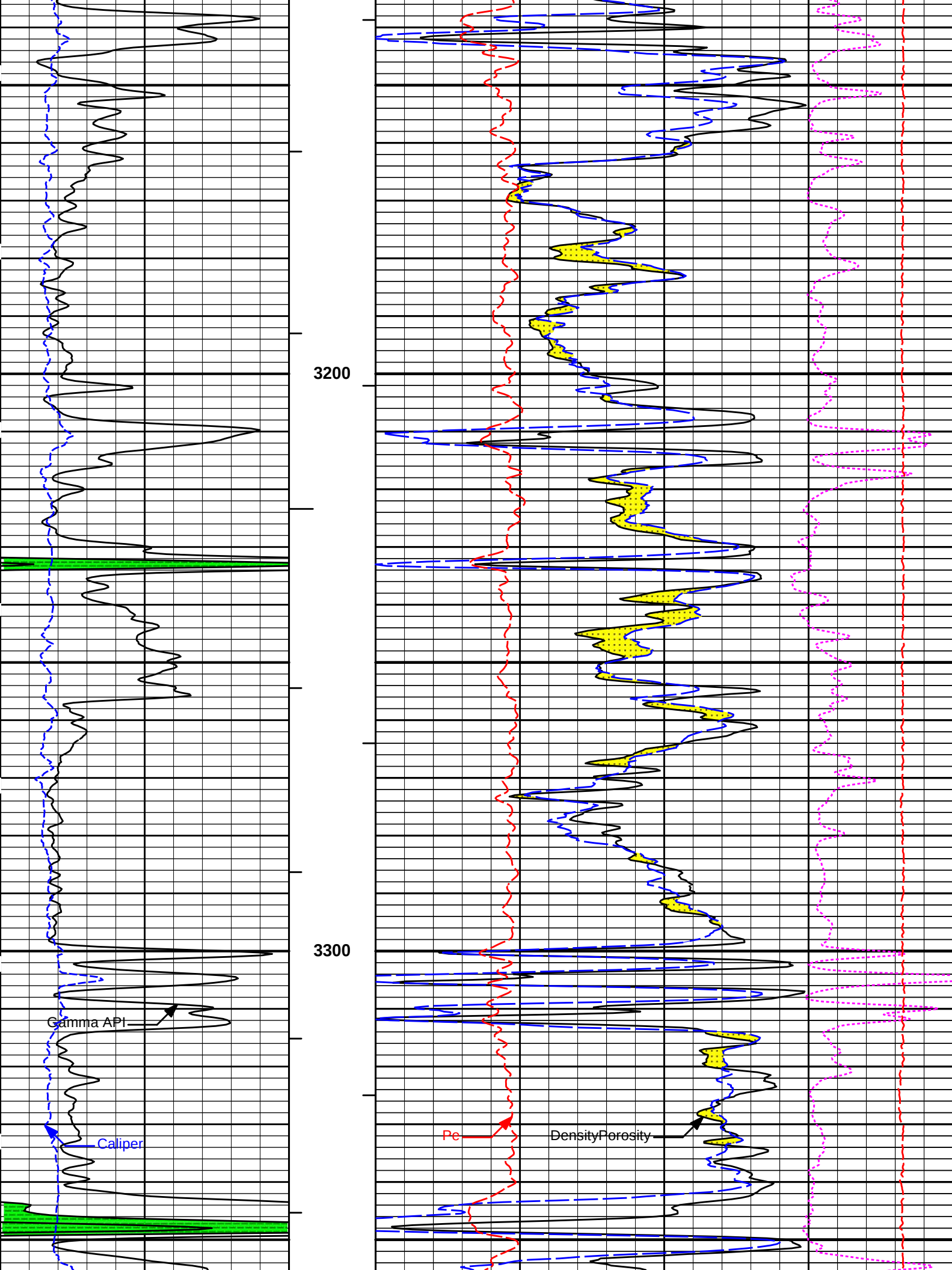
Plot Time: 04-Jul-14 12:33:57
Plot Range: 3000 ft to 4094 ft
Data: HEYEN_1-2\Well Based\DETAIL_BOTTOM\
Plot File: \\POROI\Poroi_IQ_5_MAIN_LIB

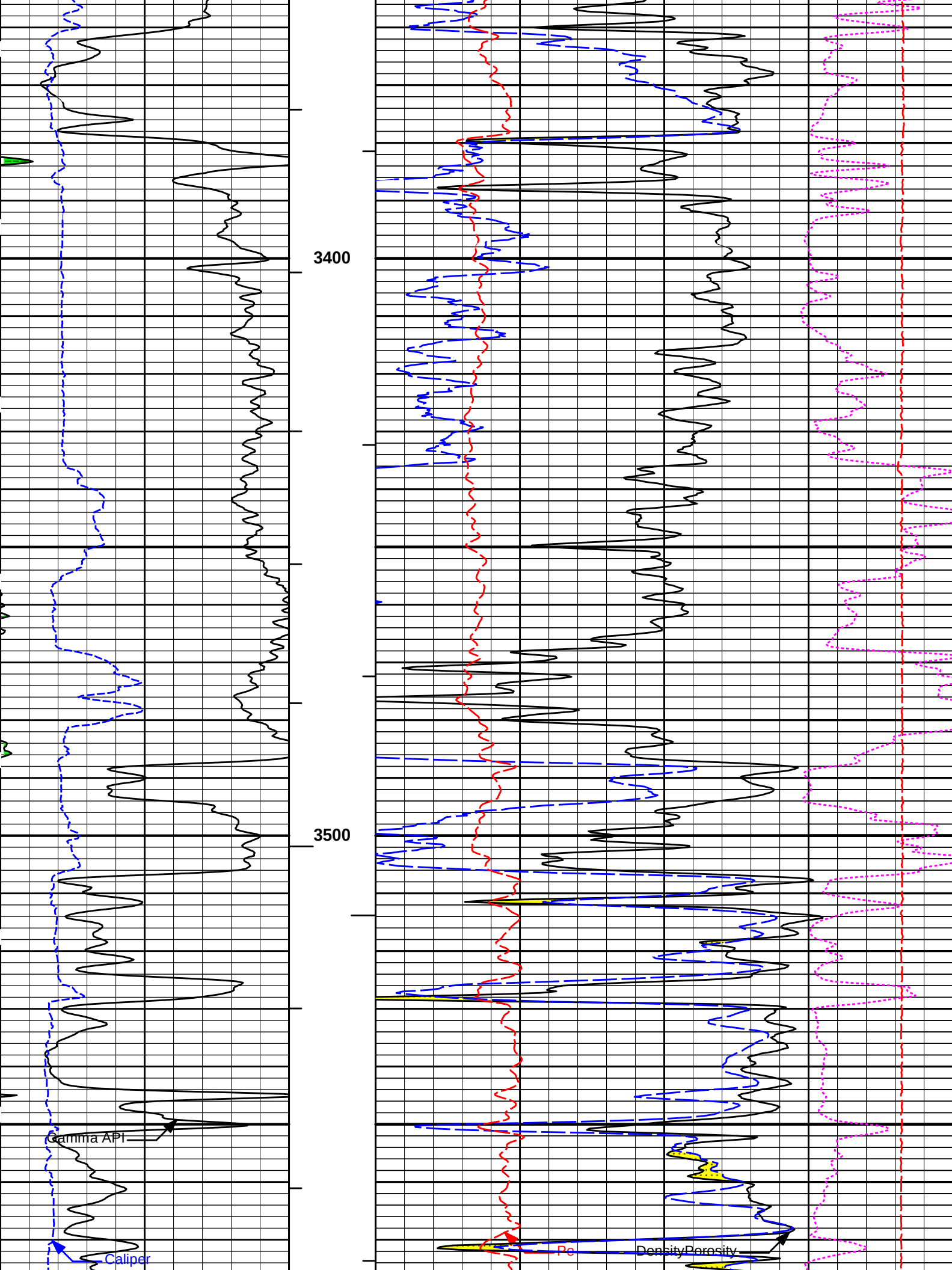
5 INCH MAIN LOG

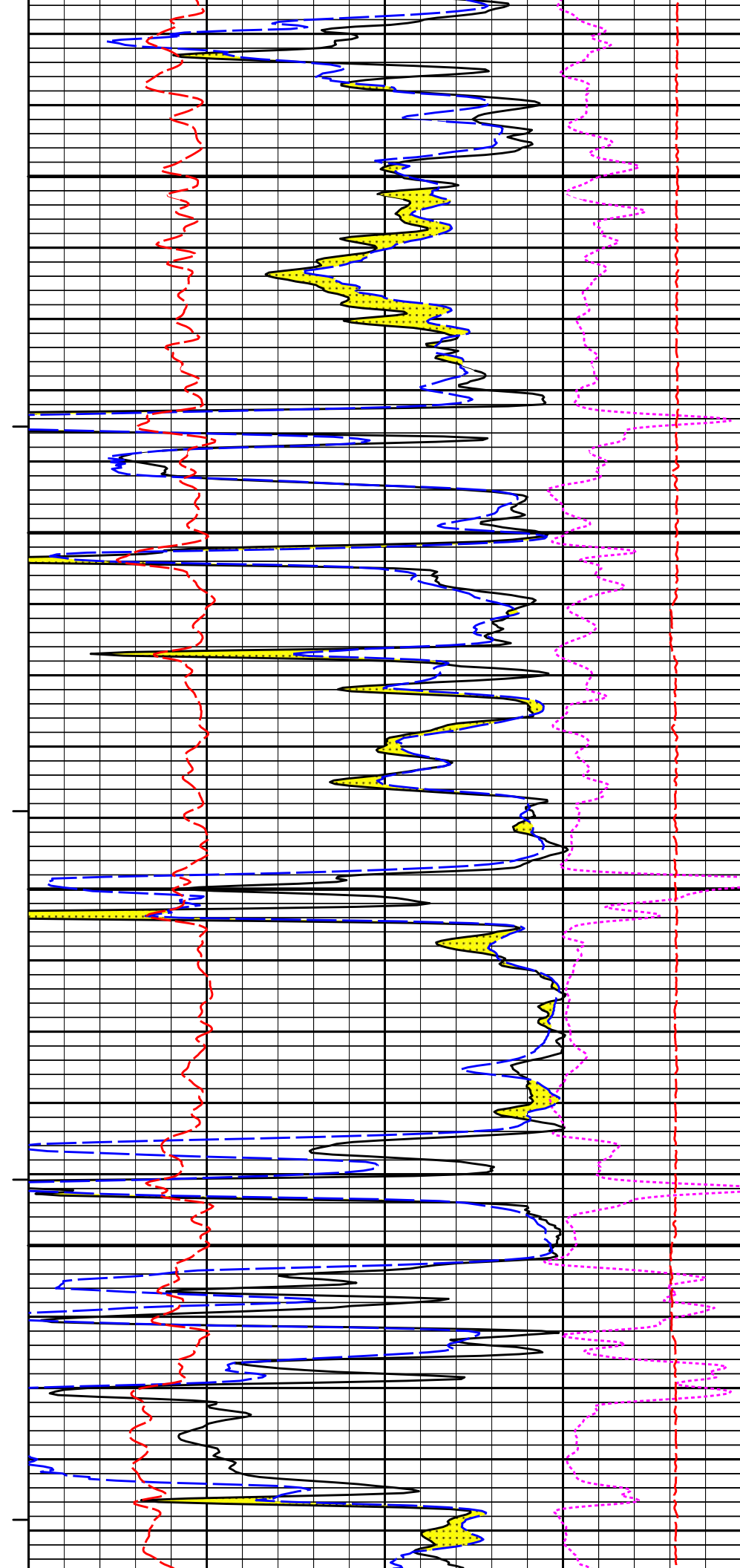
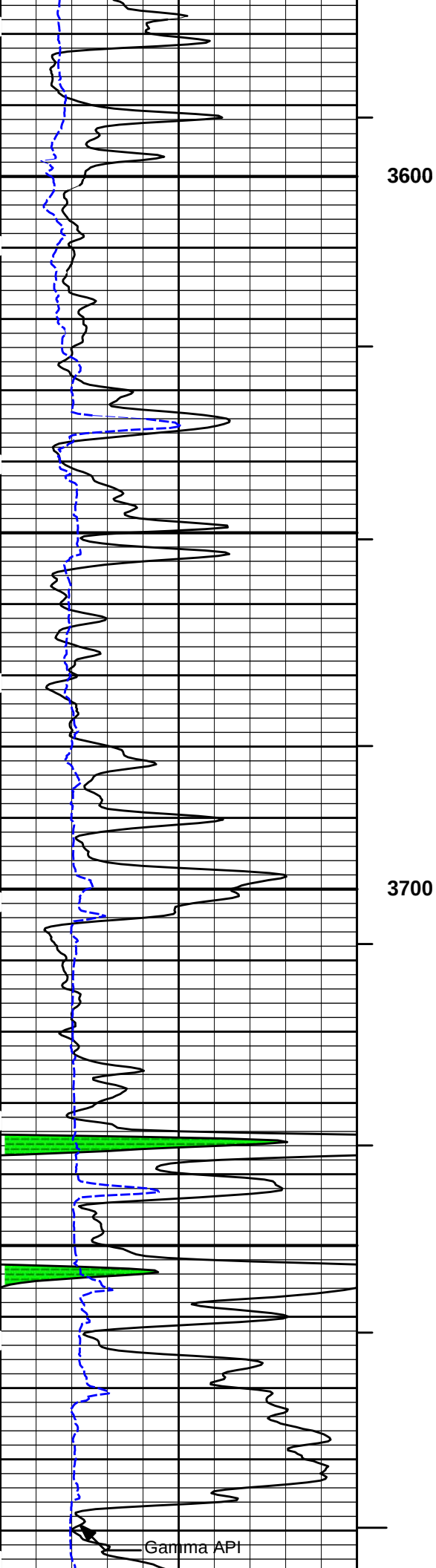
5 INCH MAIN LOG

MEASURED DEPTH
MAIN SECTION 5" PER 100'

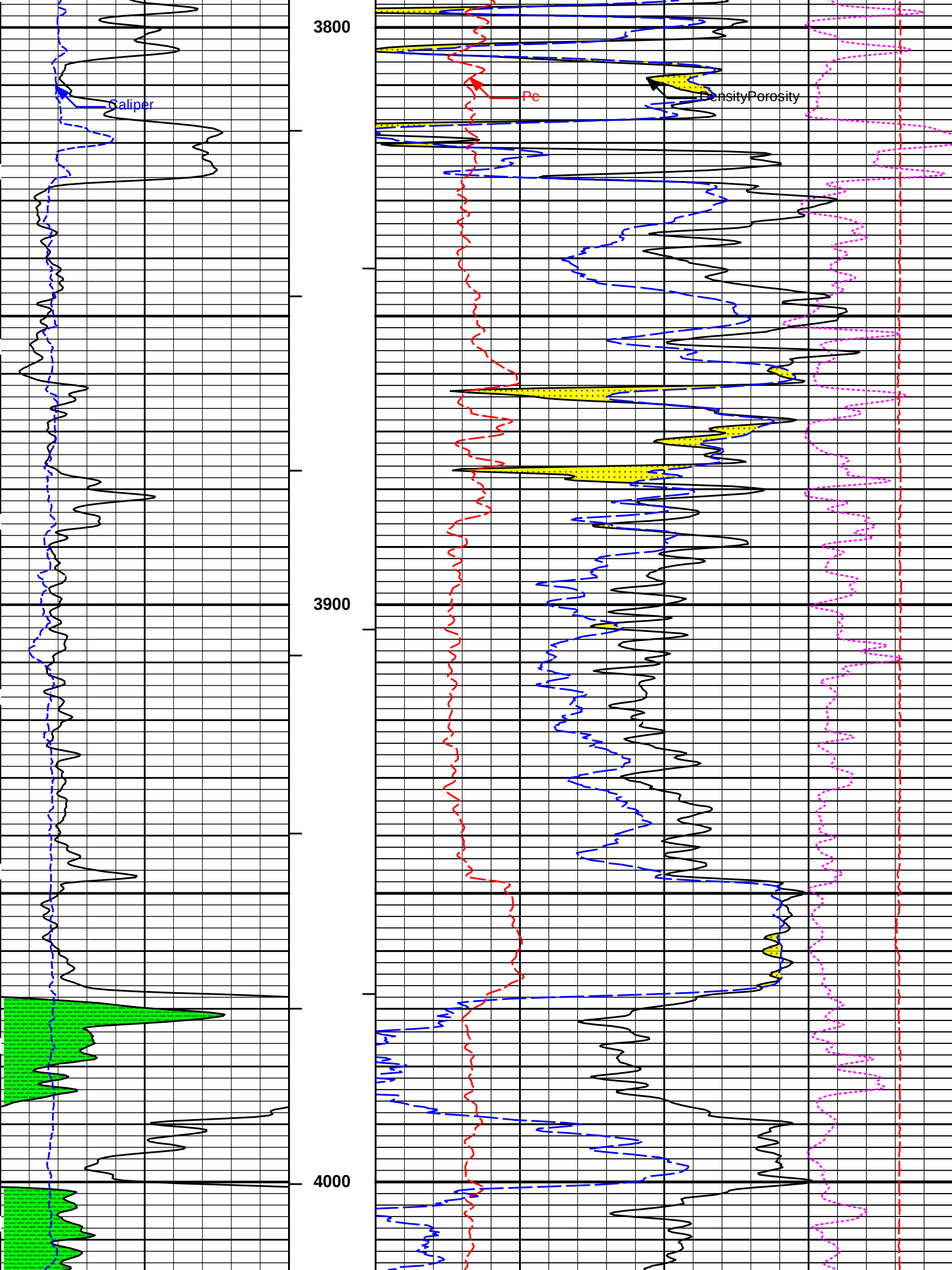


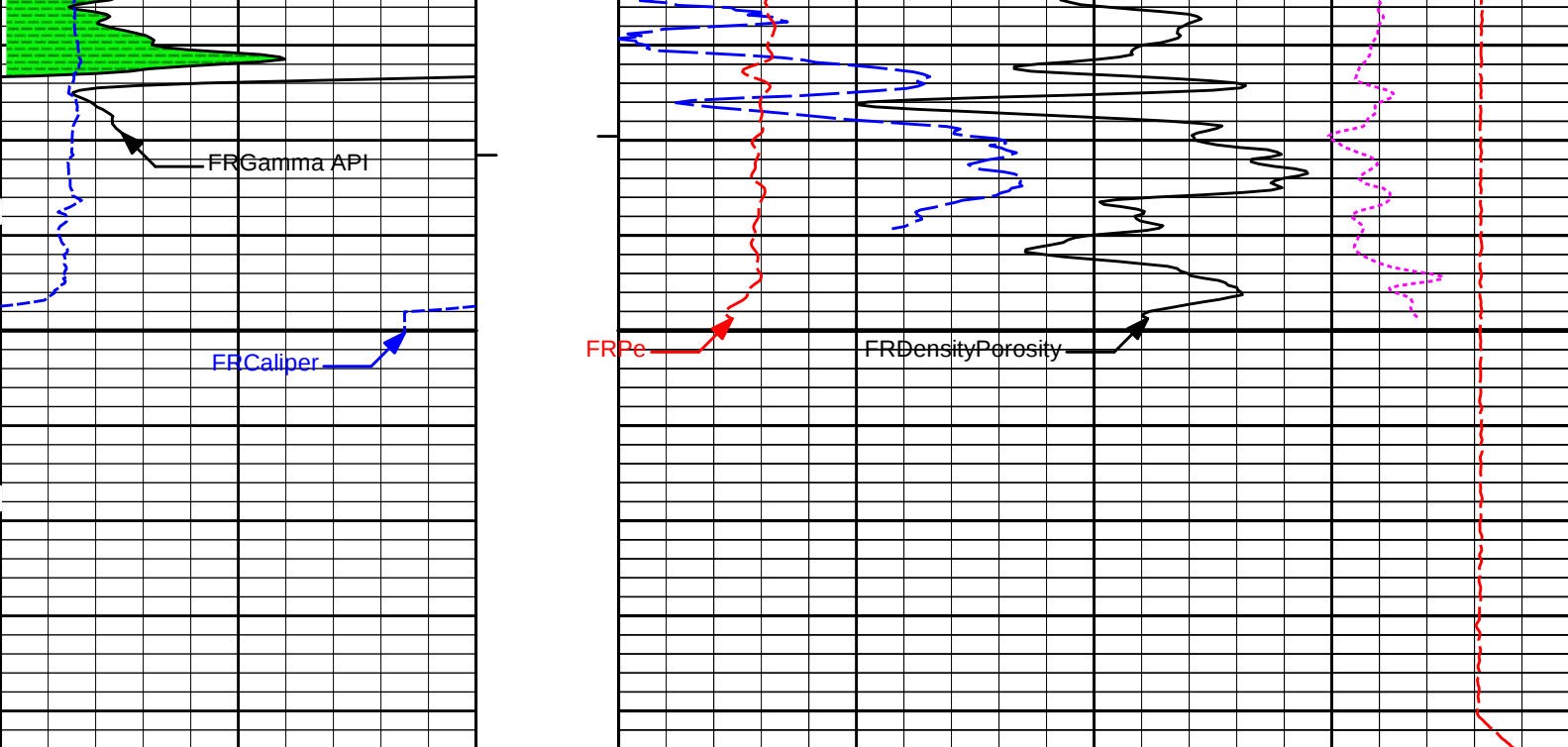






Gamma API





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: 04-Jul-14 12:33:58
Plot Range: 3000 ft to 4094 ft
Data: HEYEN_1-2\Well Based\DETAIL_BOTTOM\
Plot File: \\PORO\Poros_IQ_5_MAIN_LIB

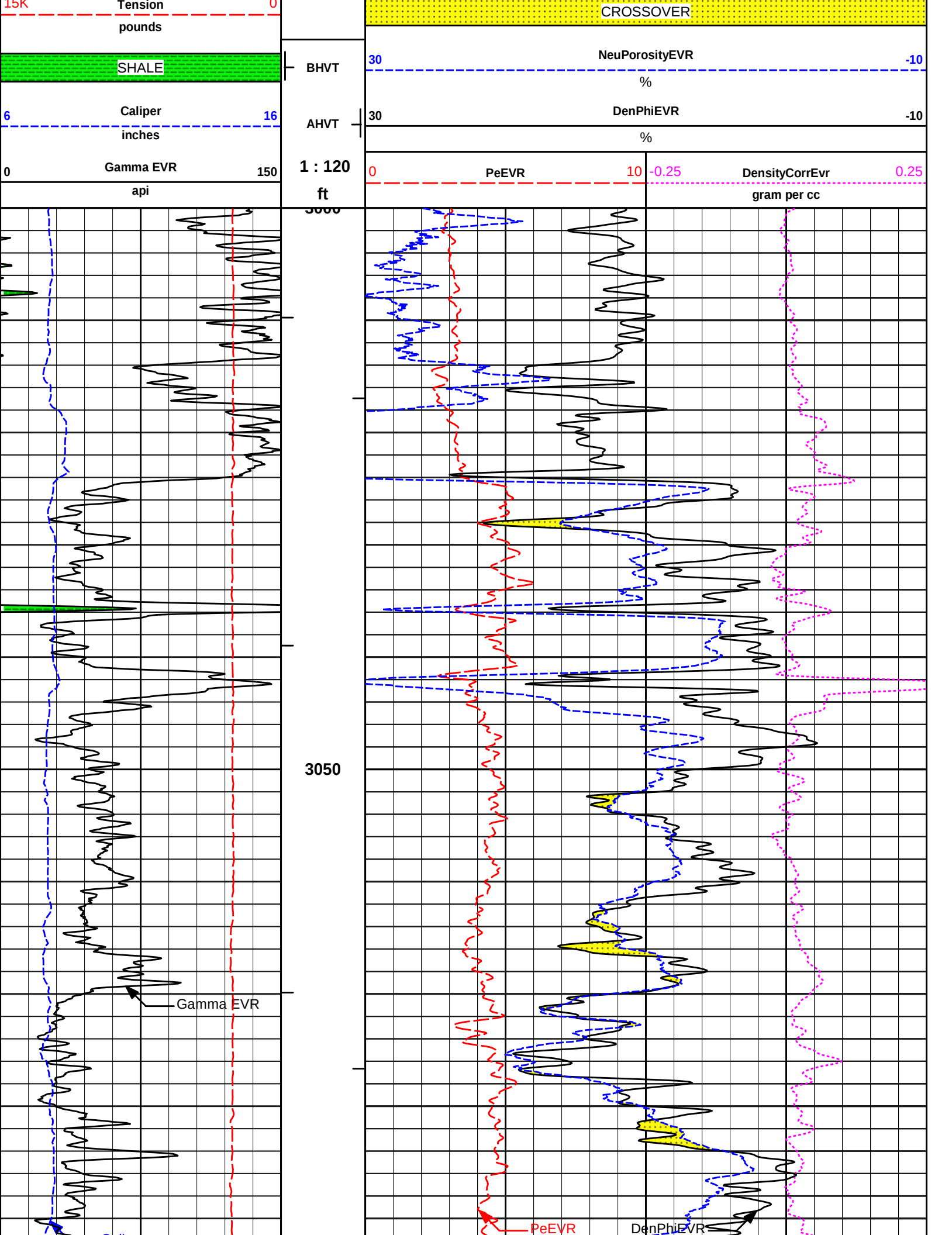
5 INCH MAIN LOG

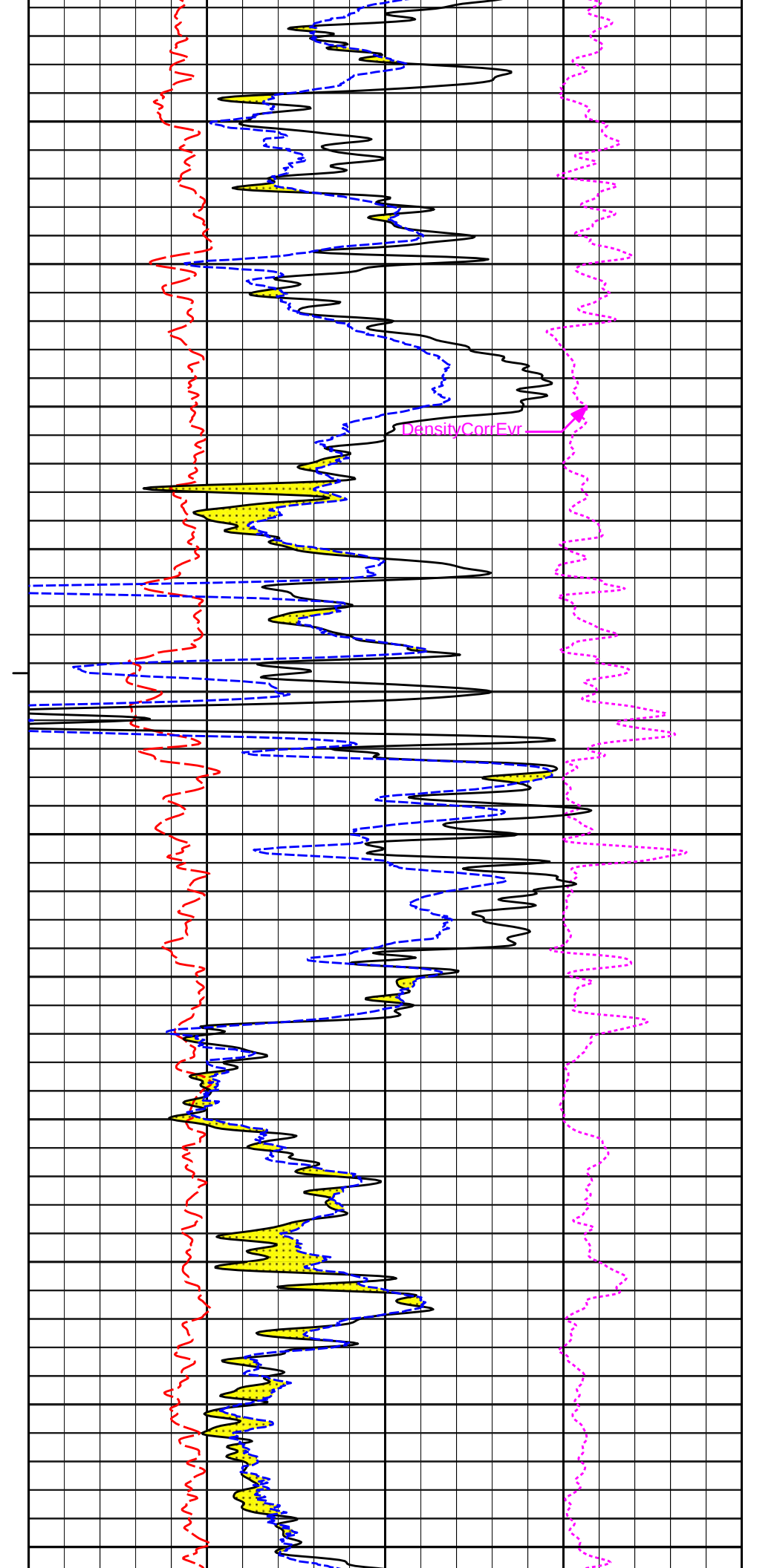
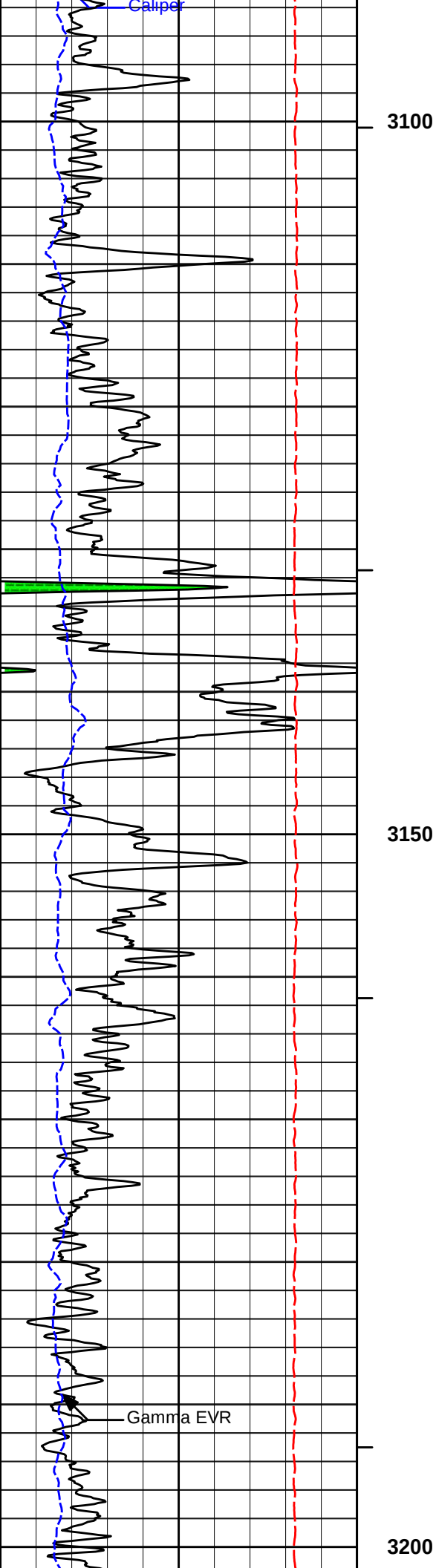
MEASURED DEPTH
MAIN SECTION 5" PER 100'

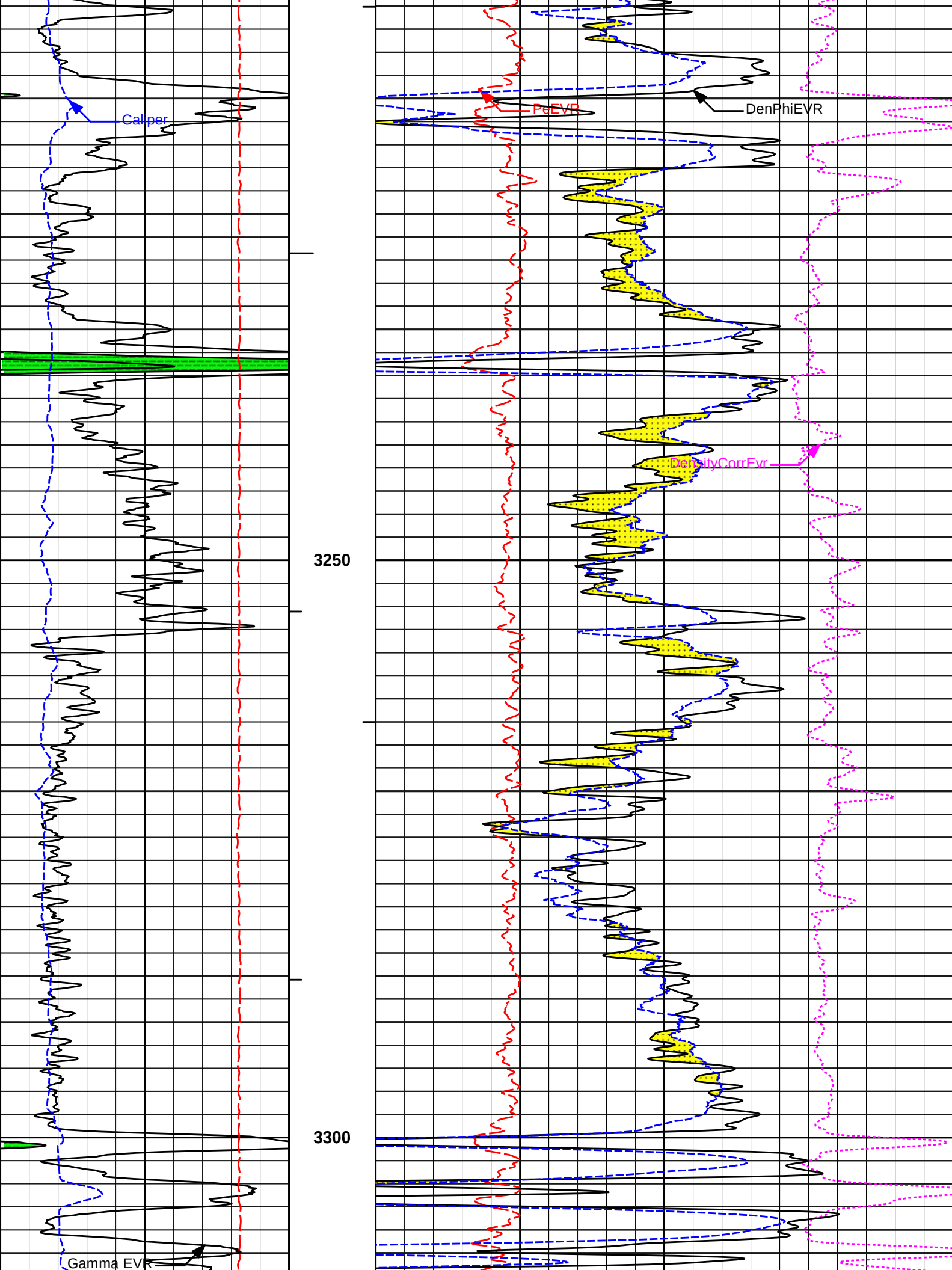
HALLIBURTON

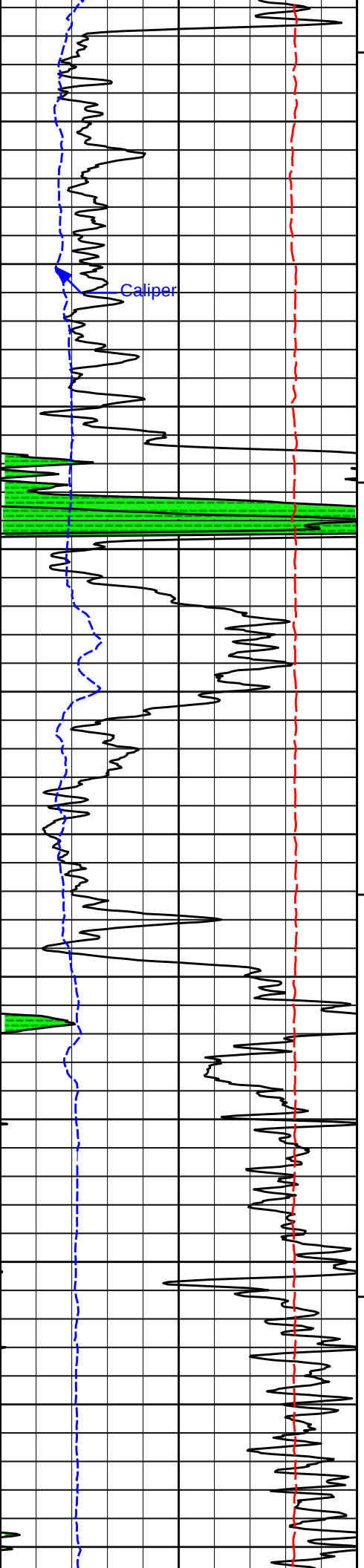
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Data: HEYEN_1-2\Well Based\DETAIL_BOTTOM*
Plot File: \\PORO\Poros_IQ_EVR_LIB

MAIN PASS EVR 10" = 100'



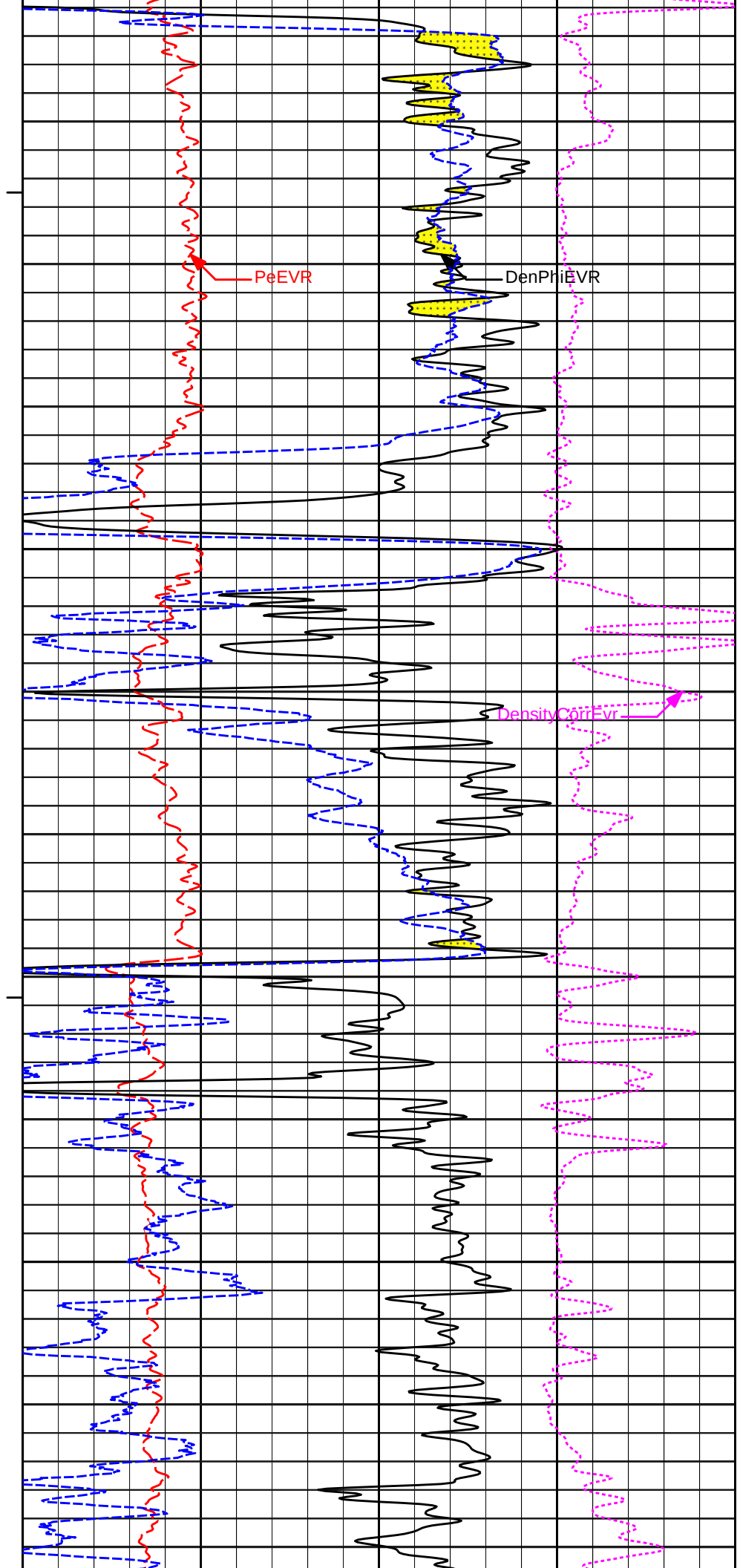


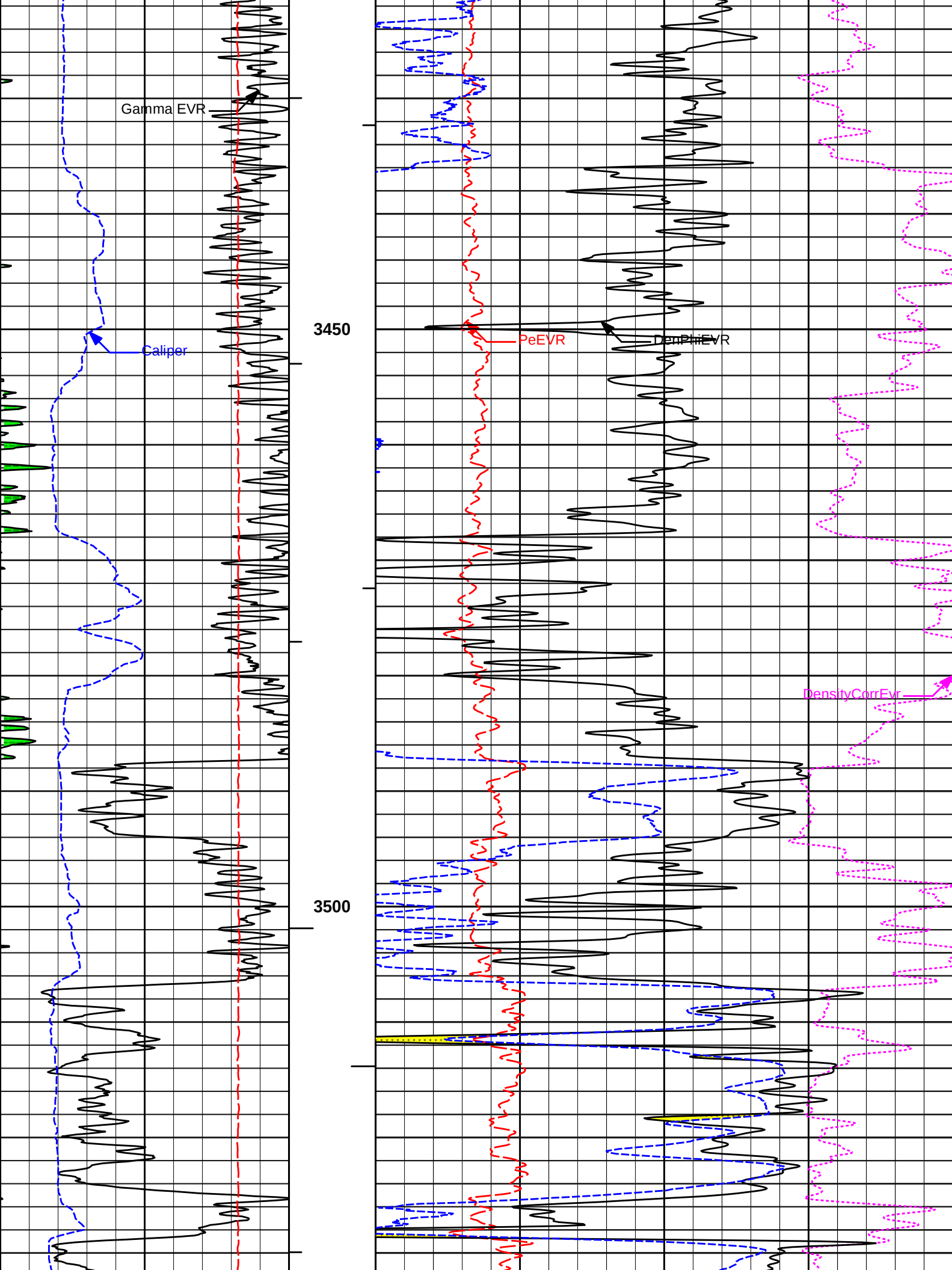


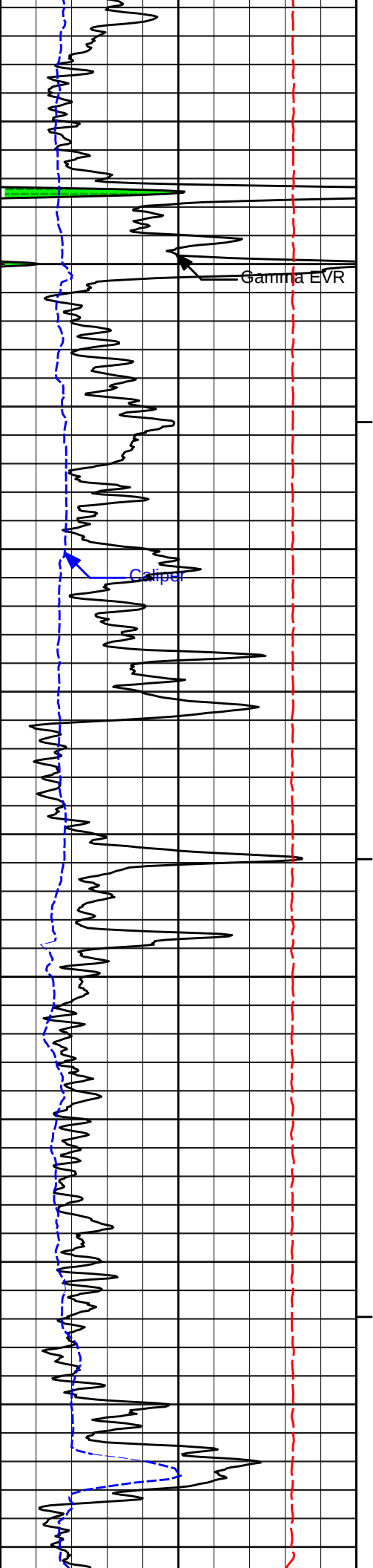


3350

3400

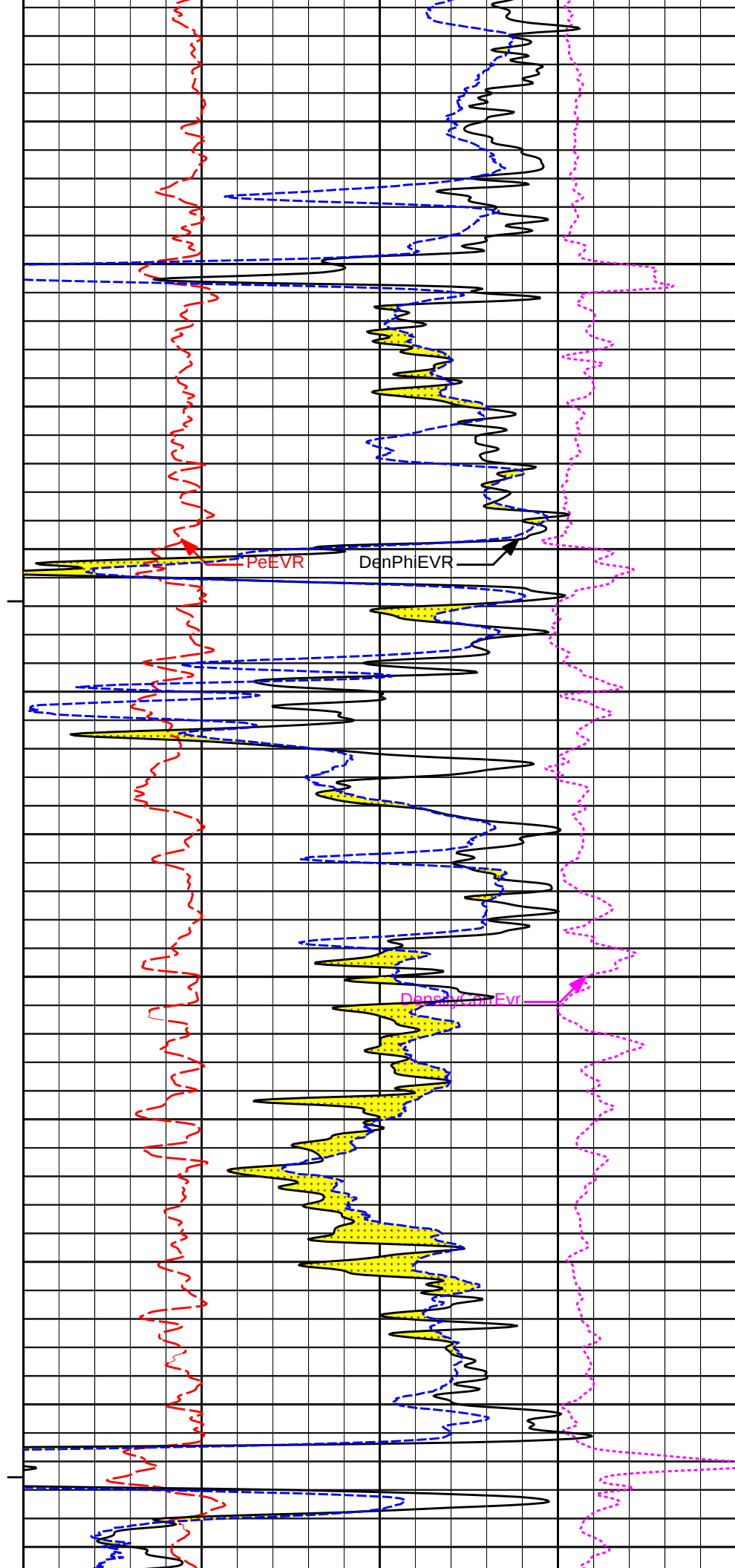


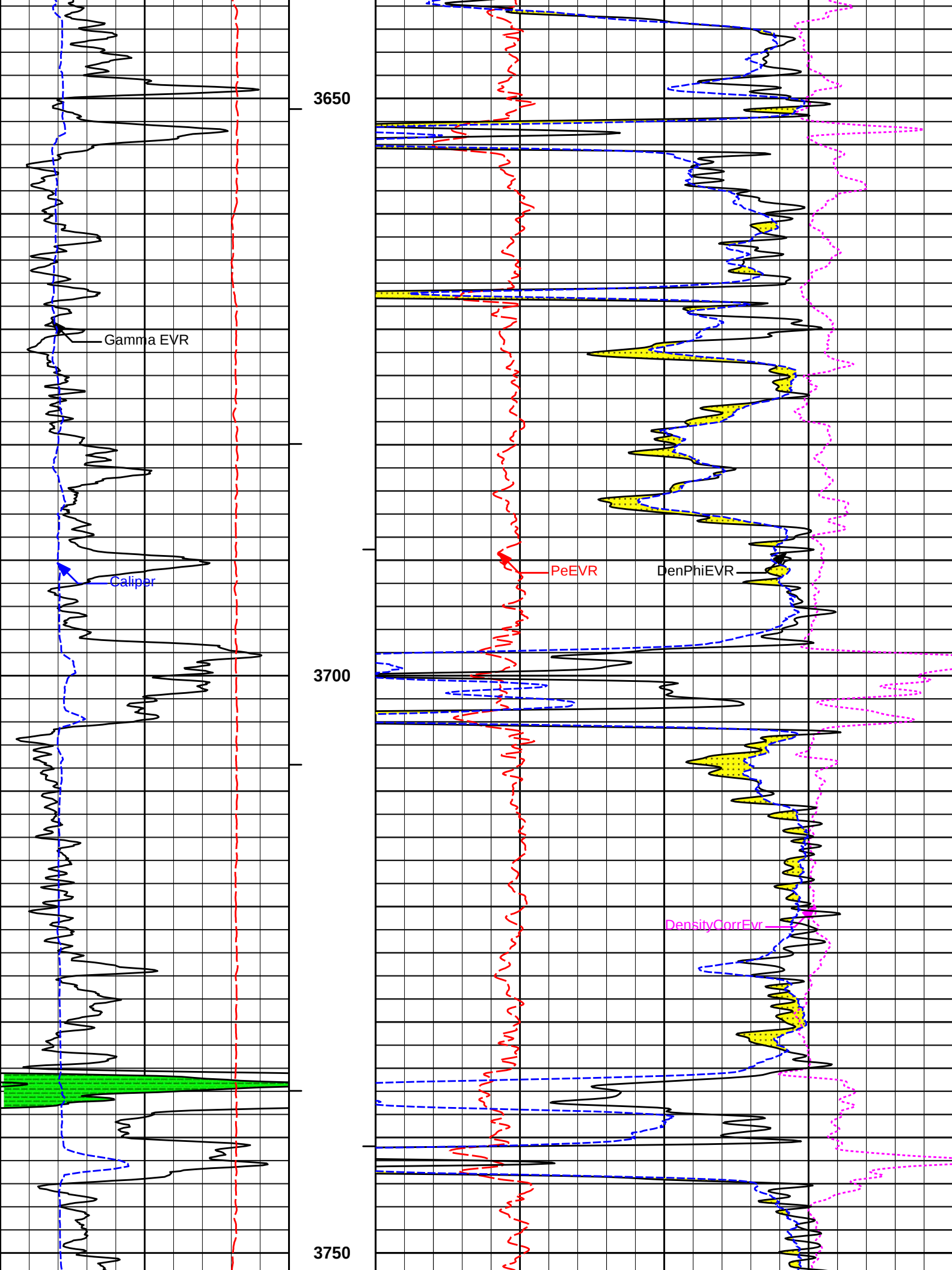


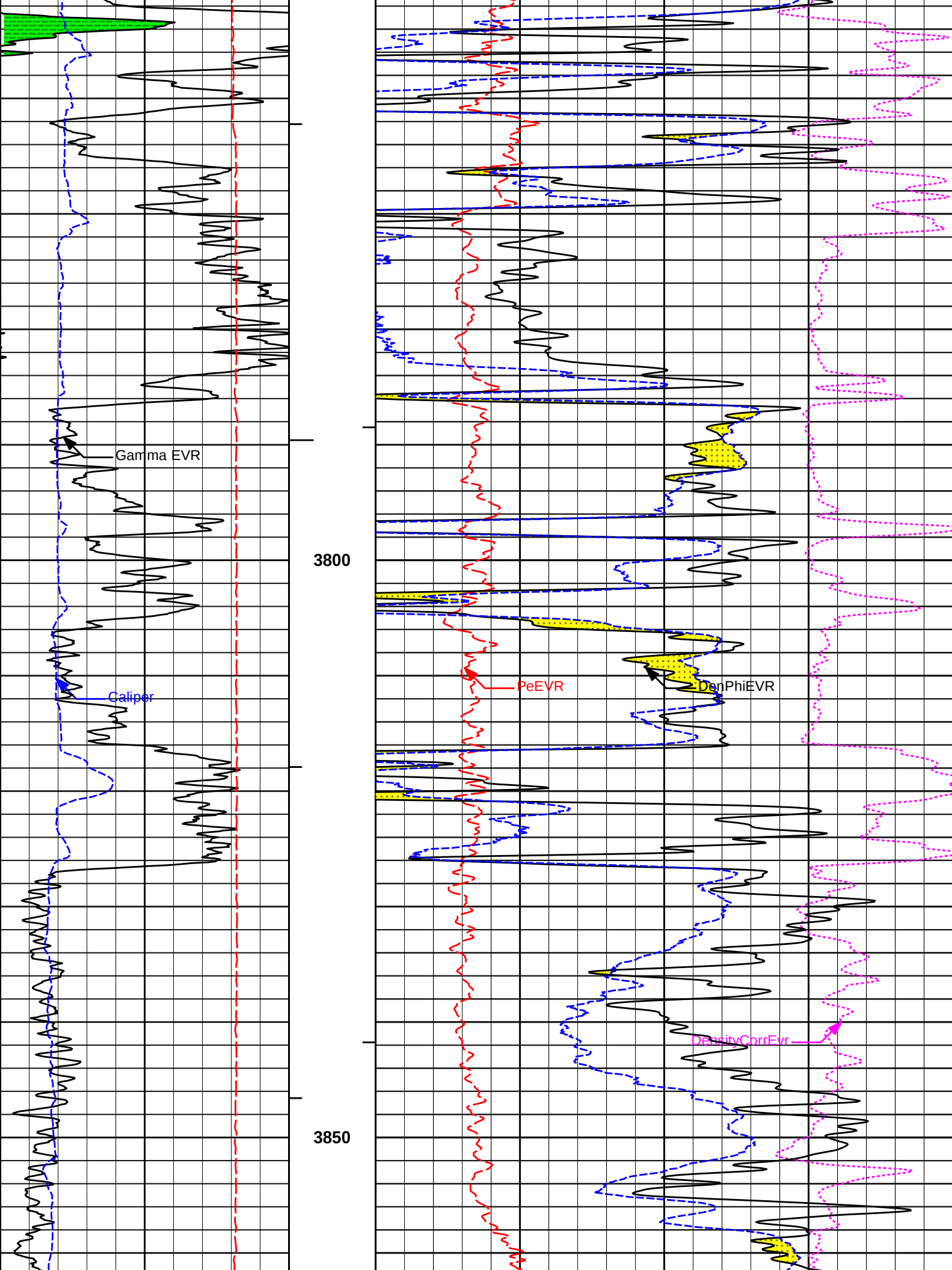


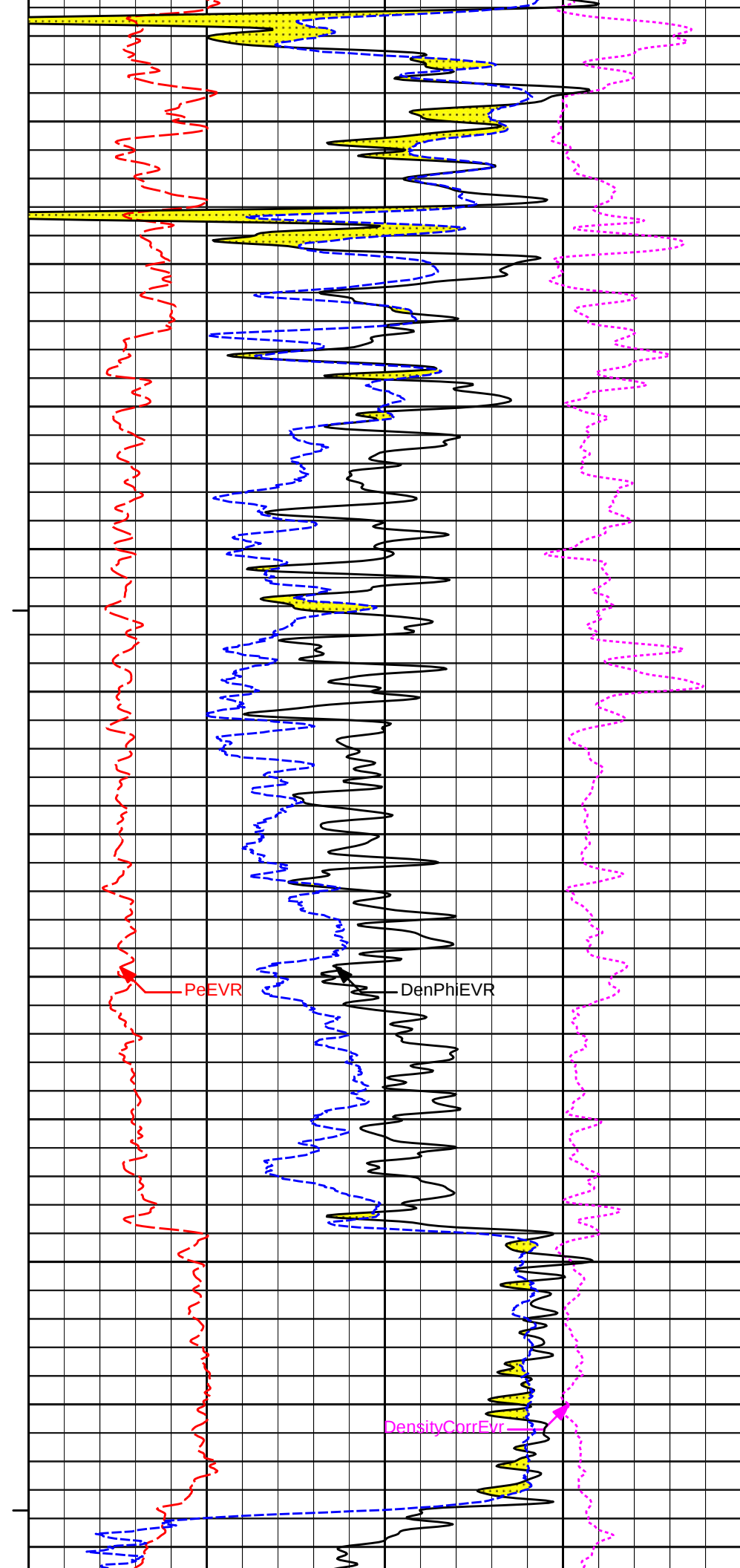
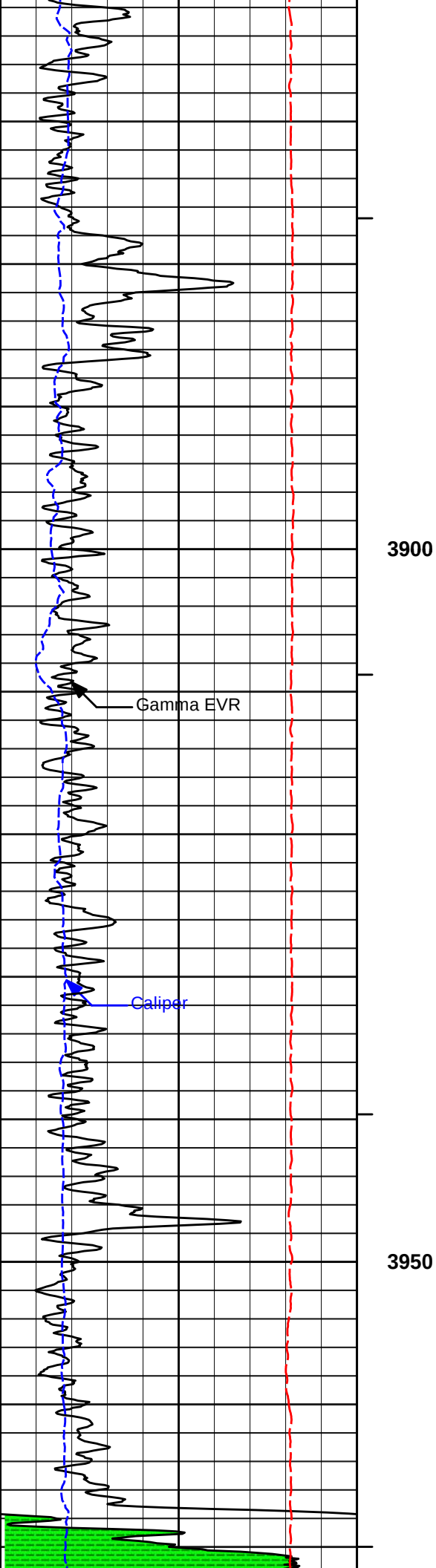
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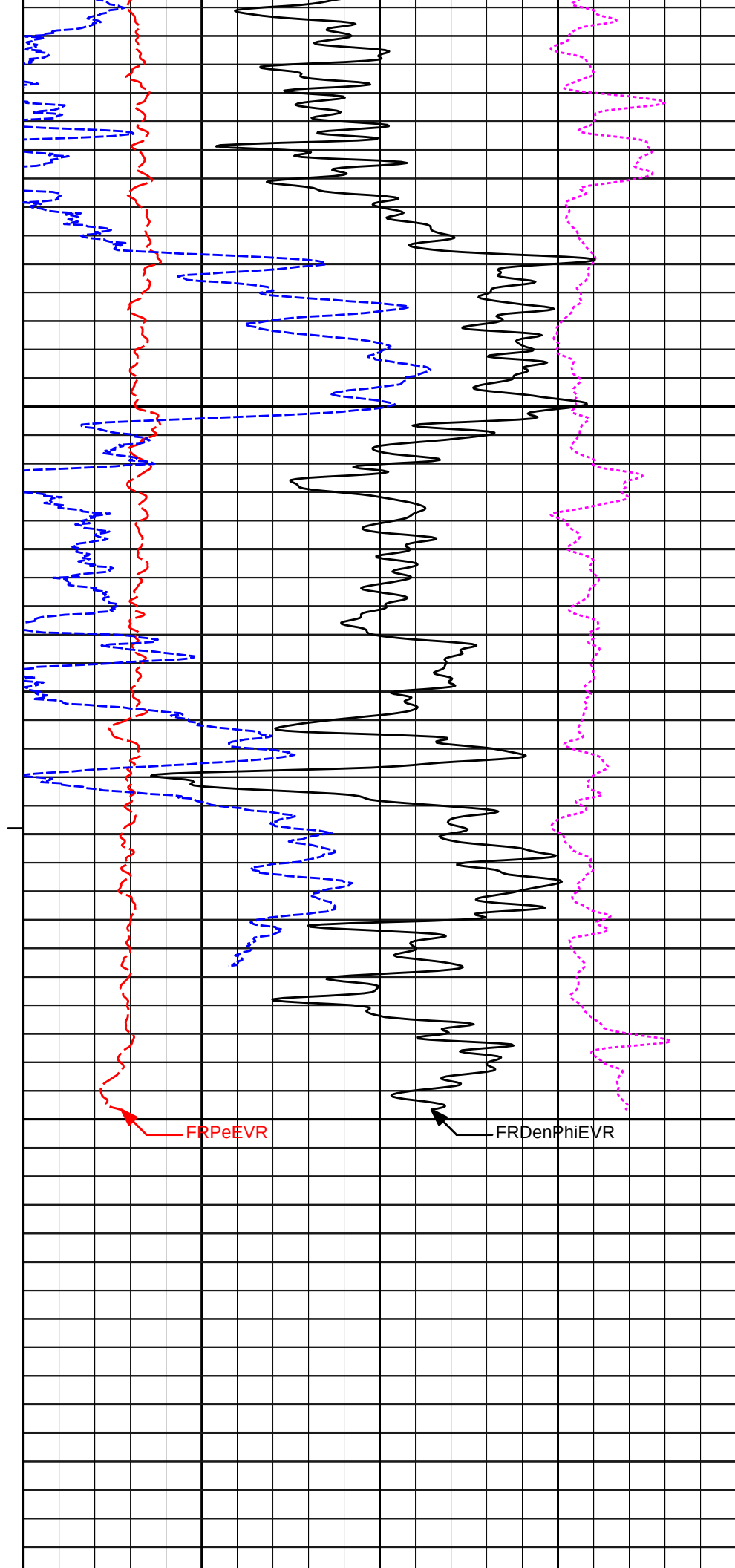
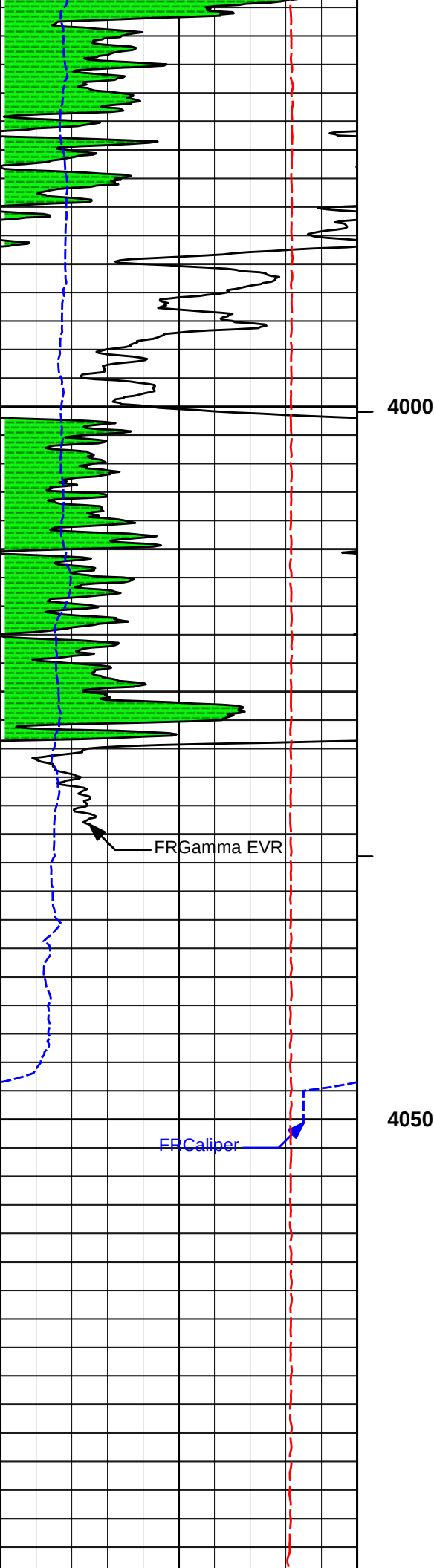
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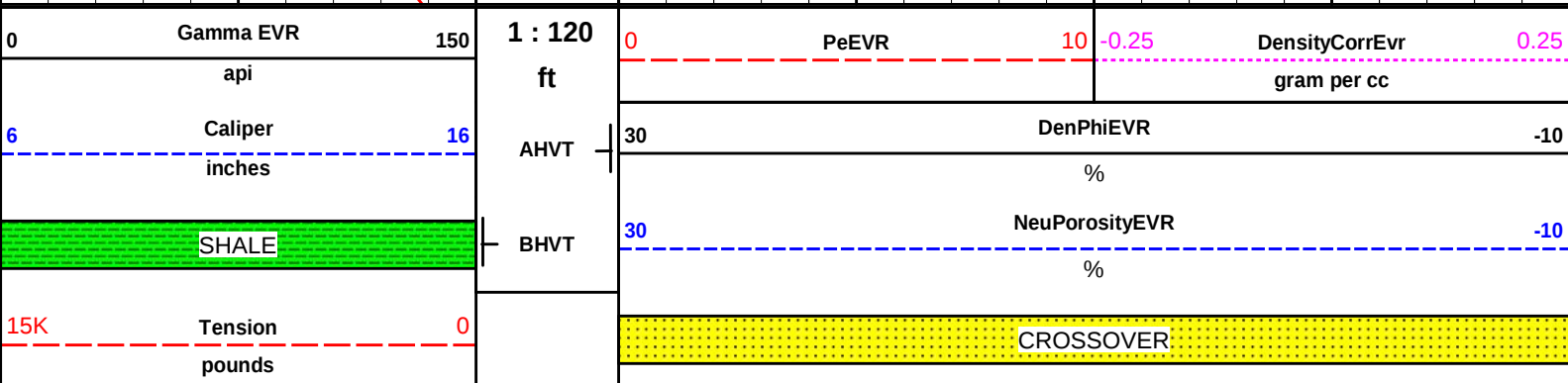
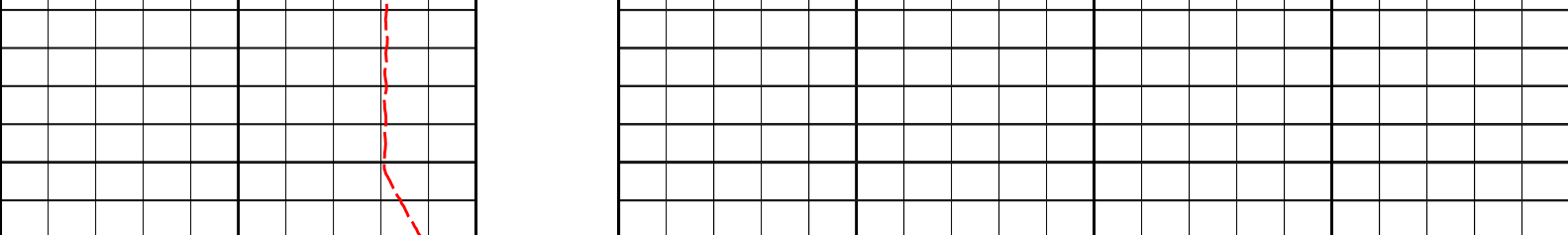












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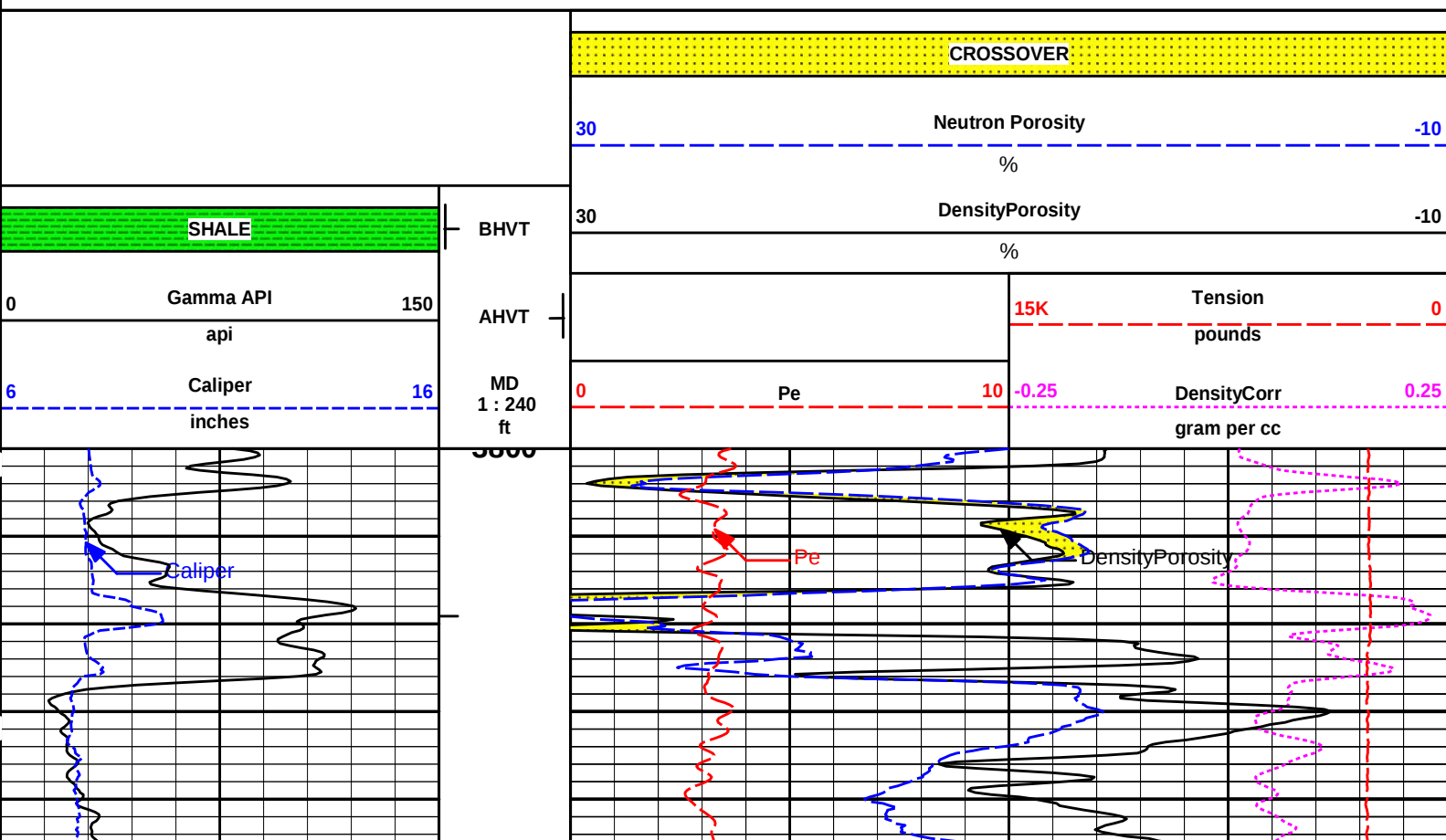
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Plot Range: 3000 ft to 4094 ft
Data: HEYEN_1-2\Well Based\DETAIL_BOTTOM*
Plot File: \\PORO\IPoro_IQ_EVR_LIB

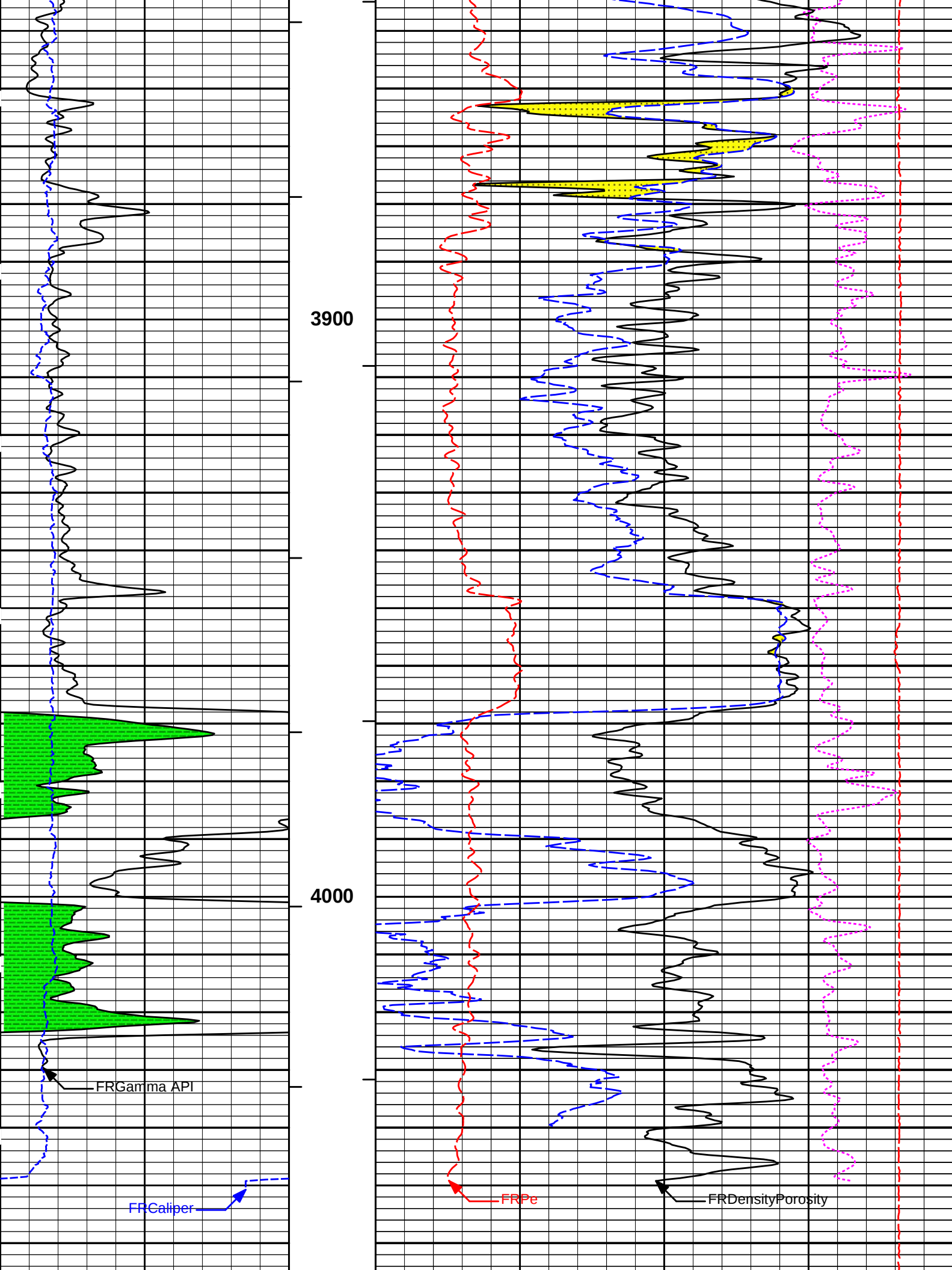
MAIN PASS EVR 10" = 100'

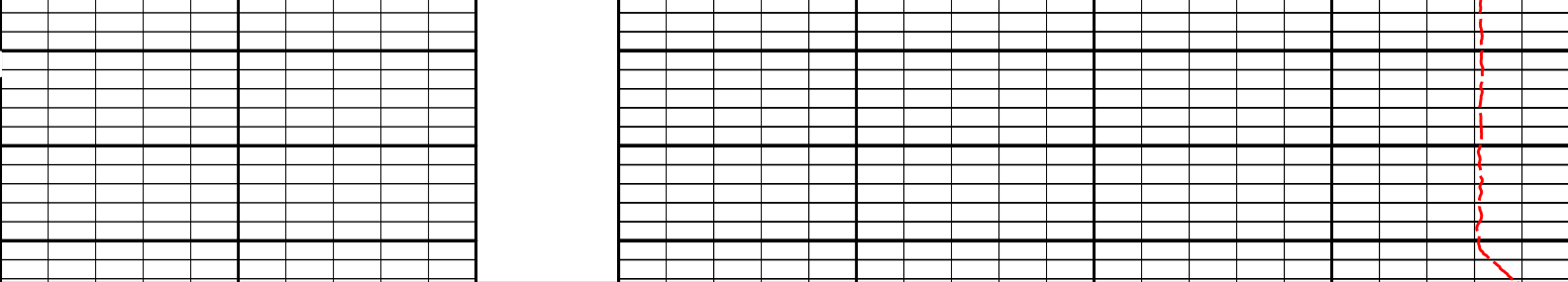
HALLIBURTON

Plot Time: 04-Jul-14 12:34:02
Plot Range: 3800 ft to 4094.5 ft
Data: HEYEN_1-2\Well Based\REPEAT\
Plot File: \\PORO\IPoro_IQ_5_REP_LIB

REPEAT SECTION







6	Caliper	16	MD	0	Pe	10	-0.25	DensityCorr	0.25
	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

Plot Time: 04-Jul-14 12:34:03
Plot Range: 3800 ft to 4094.5 ft
Data: HEYEN_1-2\Well Based\REPEAT\
Plot File: \\PORO\Poros_IQ_5_REP_LIB

REPEAT SECTION

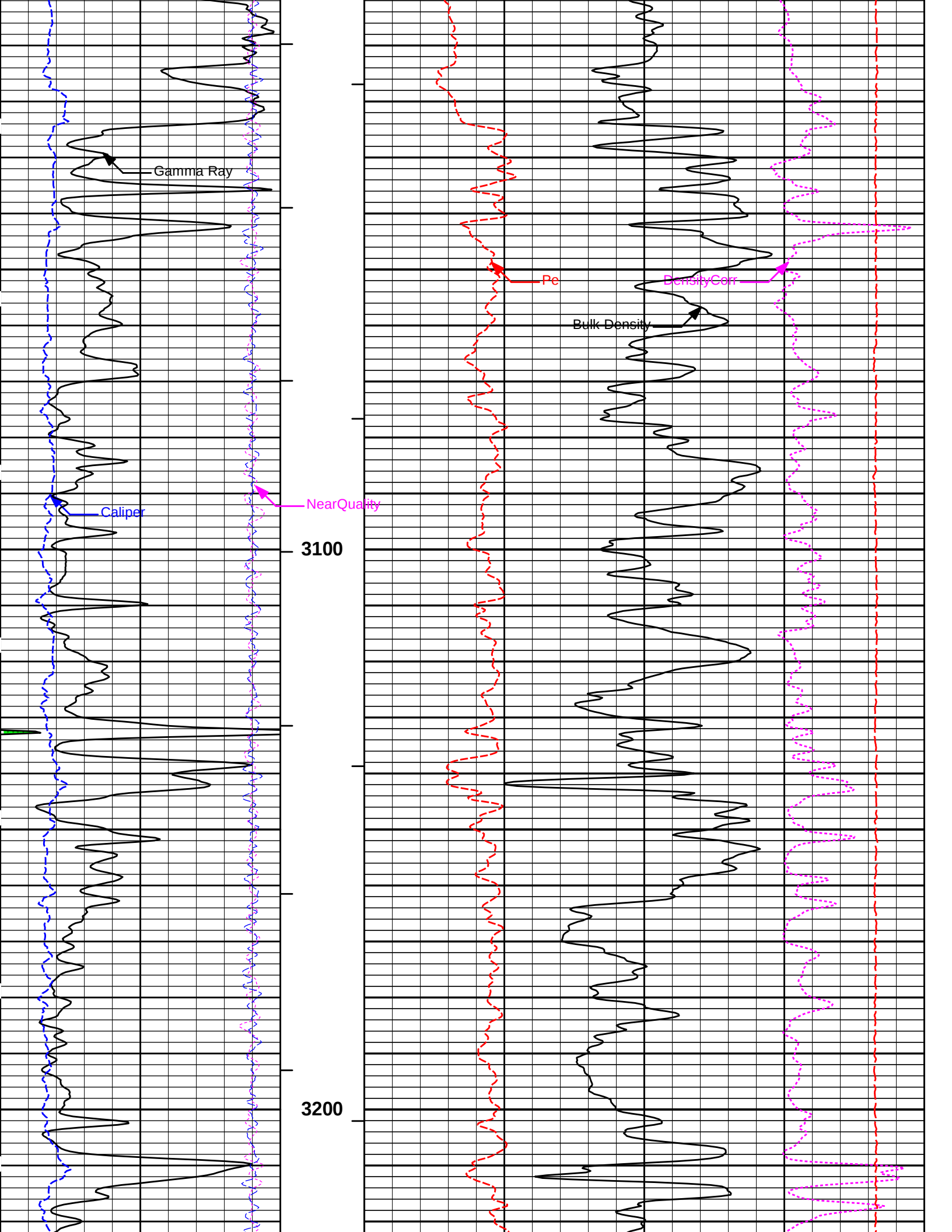
HALLIBURTON

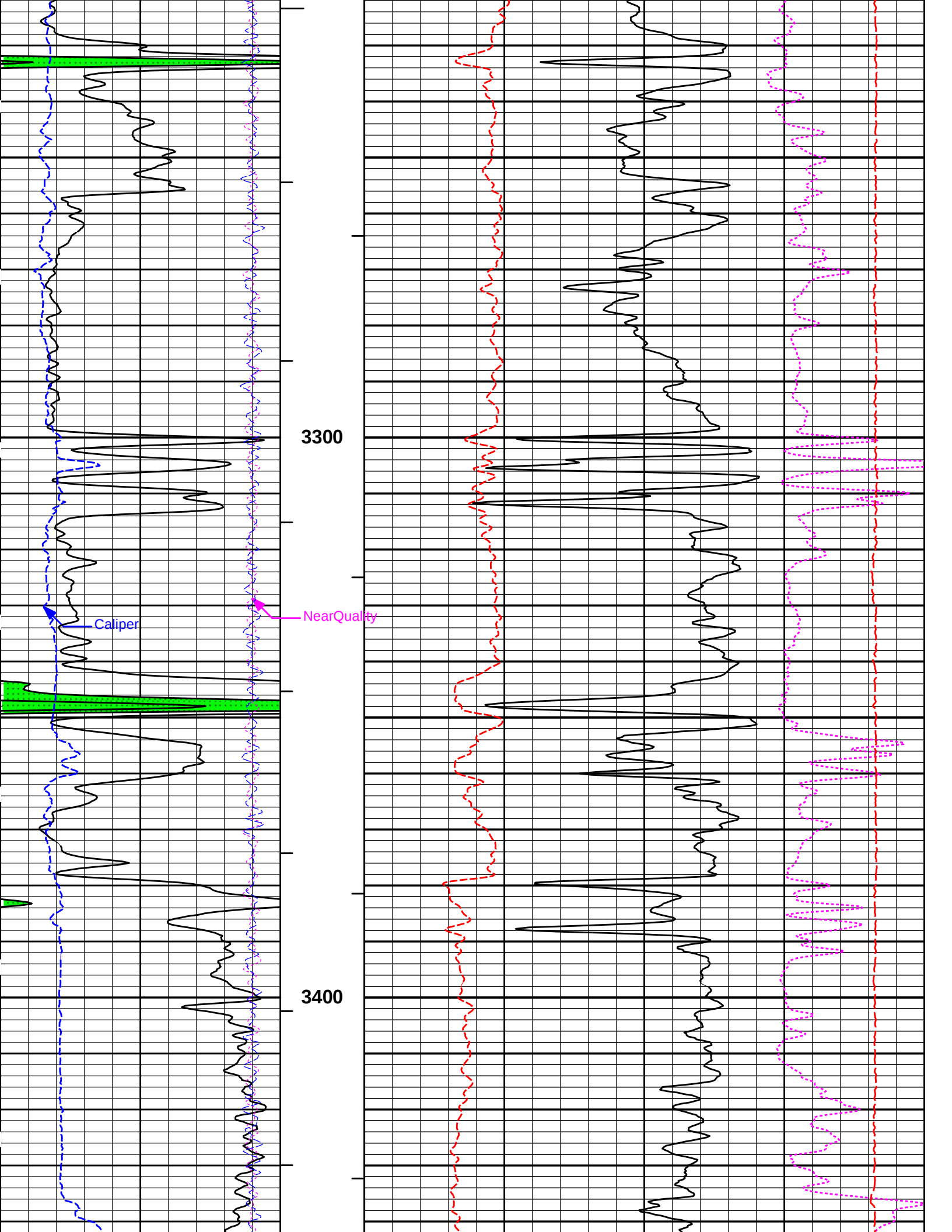
Plot Time: 04-Jul-14 12:34:03
Plot Range: 3000 ft to 4094 ft
Data: HEYEN_1-2\Well Based\DETAIL_BOTTOM\
Plot File: \\LOCAL-HEYEN_1-2\0001 SP-GTET-DSN-SDL-FLEX-BSAT-ACRT-BN\PORO\BULKD_5_MAIN_LIB

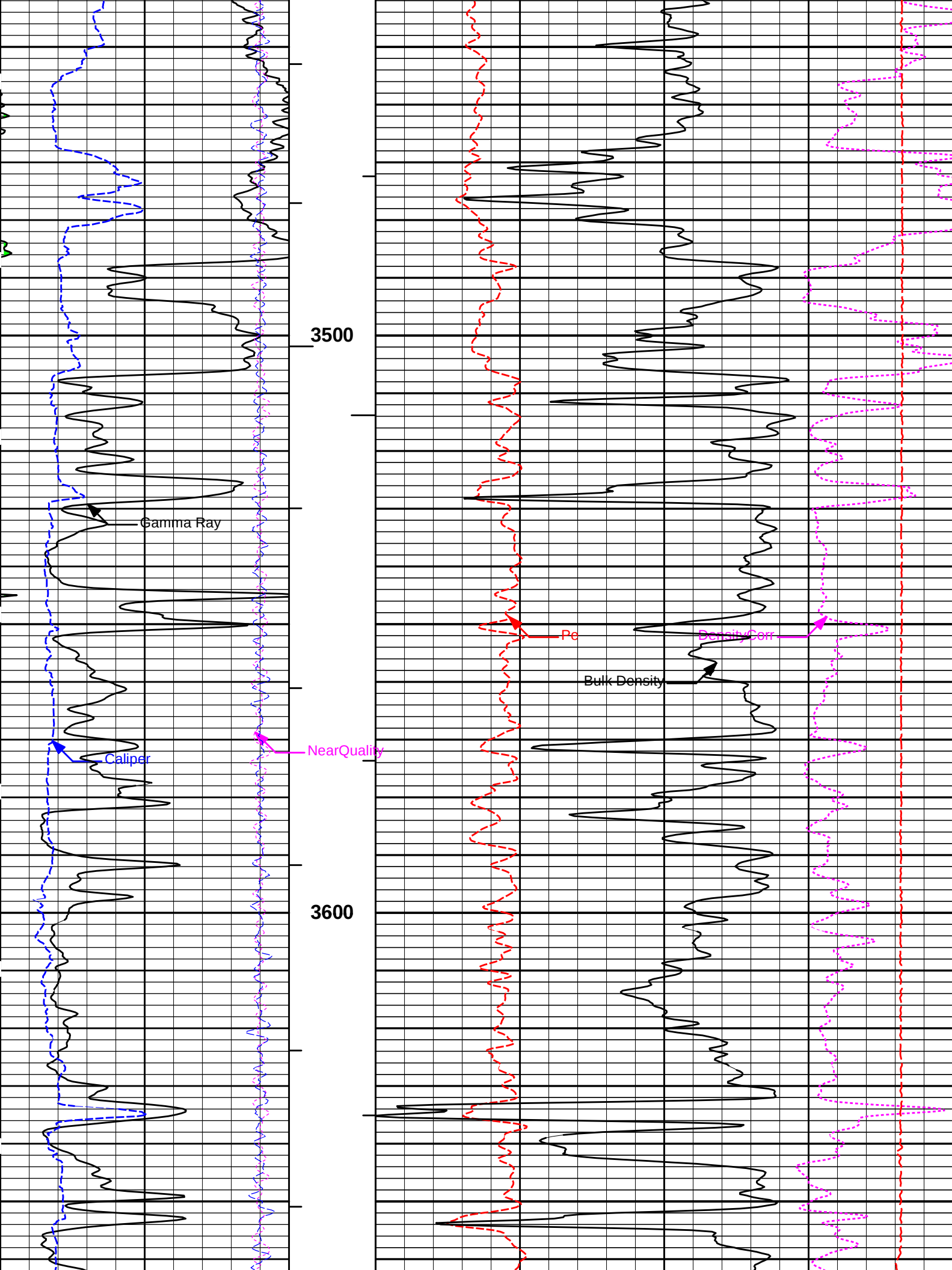
5 INCH MAIN LOG

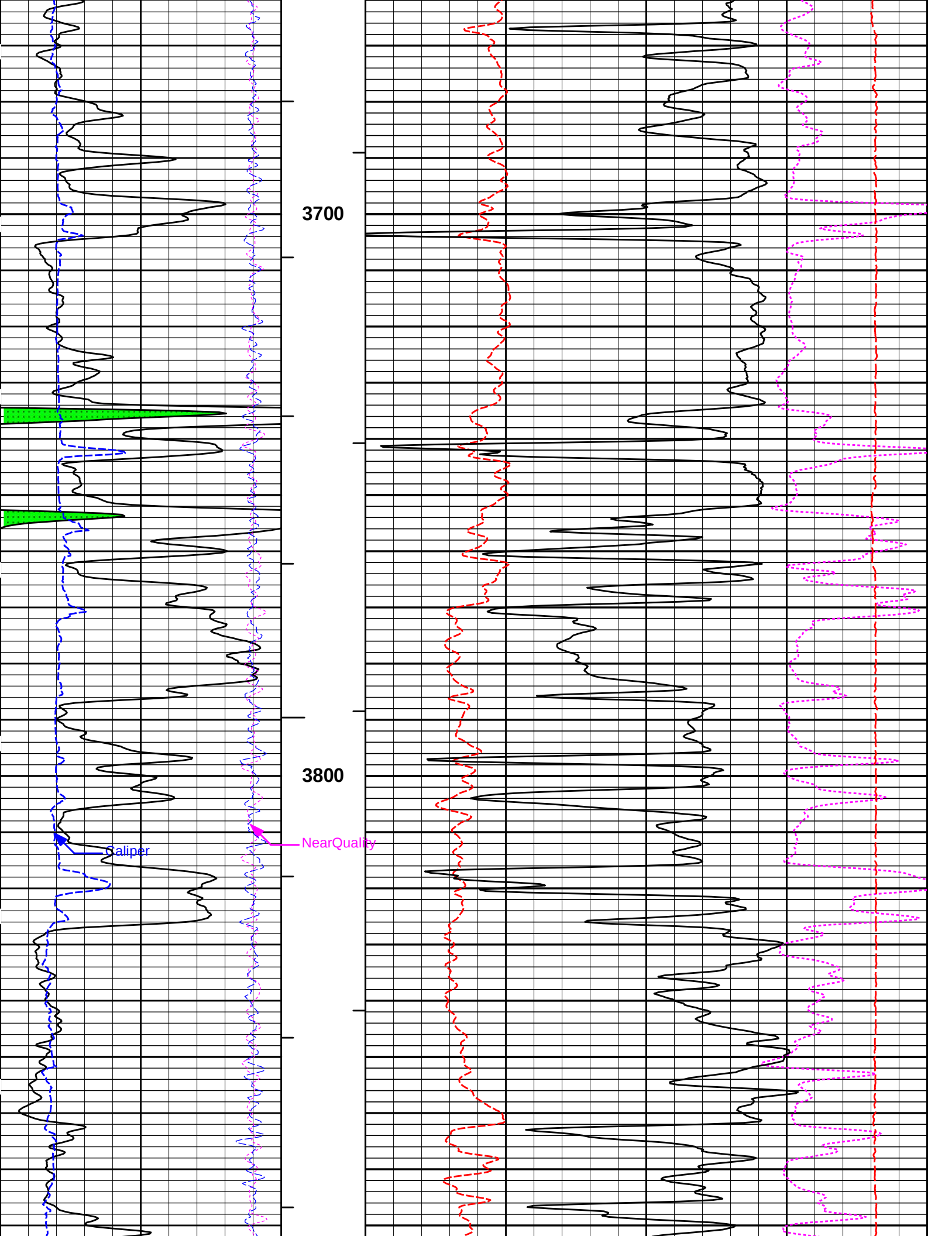
MEASURED DEPTH
MAIN SECTION 5" PER 100'

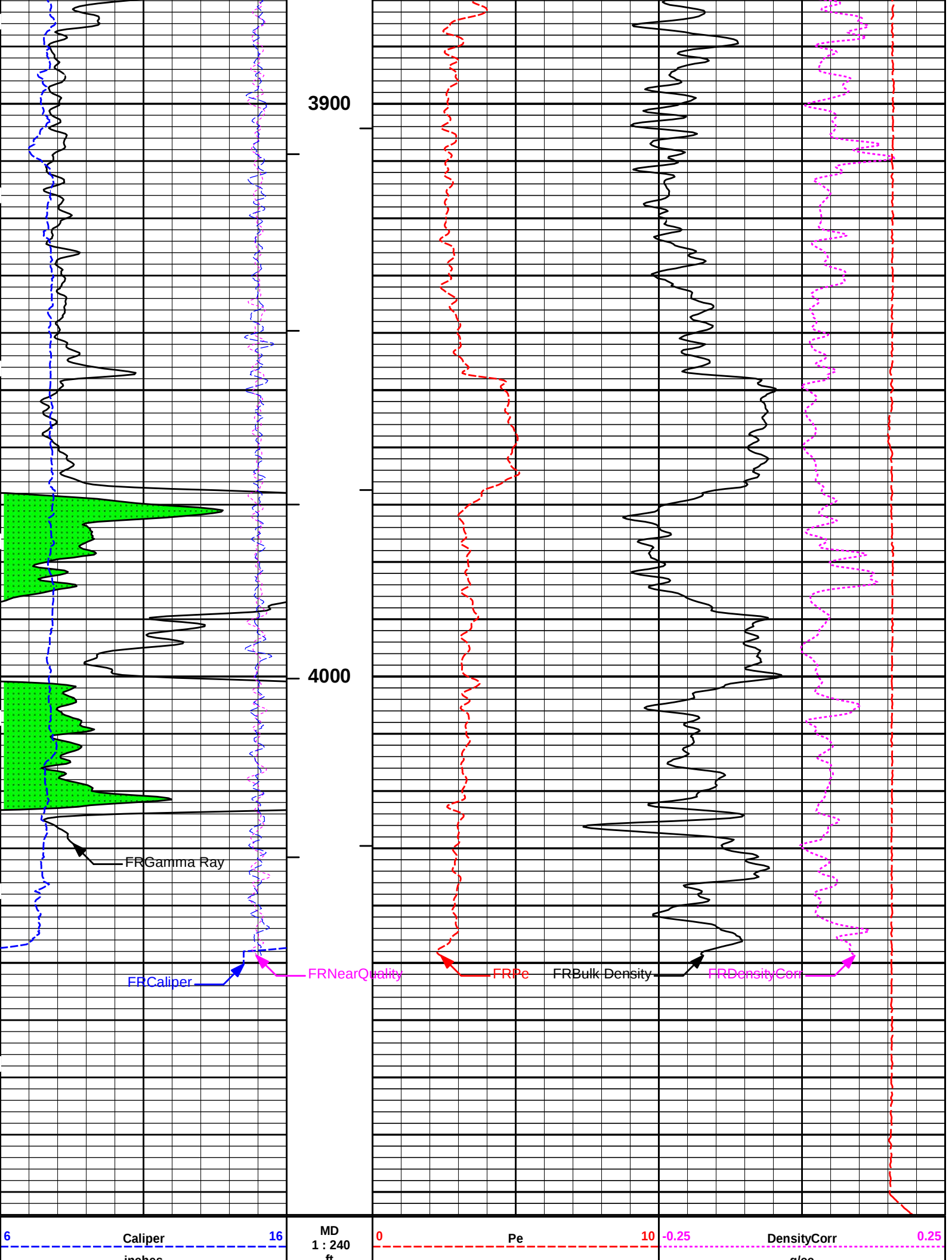
	SHALE								
0	Gamma Ray	150							
	api								
18	FarQuality	-2	BHV	2	Bulk Density				3
			ft3		g/cc				
-18	NearQuality	2	AHV			15K	Tension		0
			ft3				pounds		
6	Caliper	16	MD	0	Pe	10	-0.25	DensityCorr	0.25
	inches		1 : 240					g/cc	











inches -18 NearQuality 2	AHV ft3		g/cc 15K Tension pounds 0
18 FarQuality -2	BHV ft3	2	Bulk Density 3 g/cc
0 Gamma Ray 150 api			
SHALE			

HALLIBURTON

Plot Time: 04-Jul-14 12:34:05
Plot Range: 3000 ft to 4094 ft
Data: HEYEN_1-2\Well Based\DETAIL_BOTTOM\
Plot File: \\-LOCAL-\\HEYEN_1-2\0001 SP-GTET-DSN-SDL-FLEX-BSAT-ACRT-BN\PORO\BULKD_5_MAIN_LIB

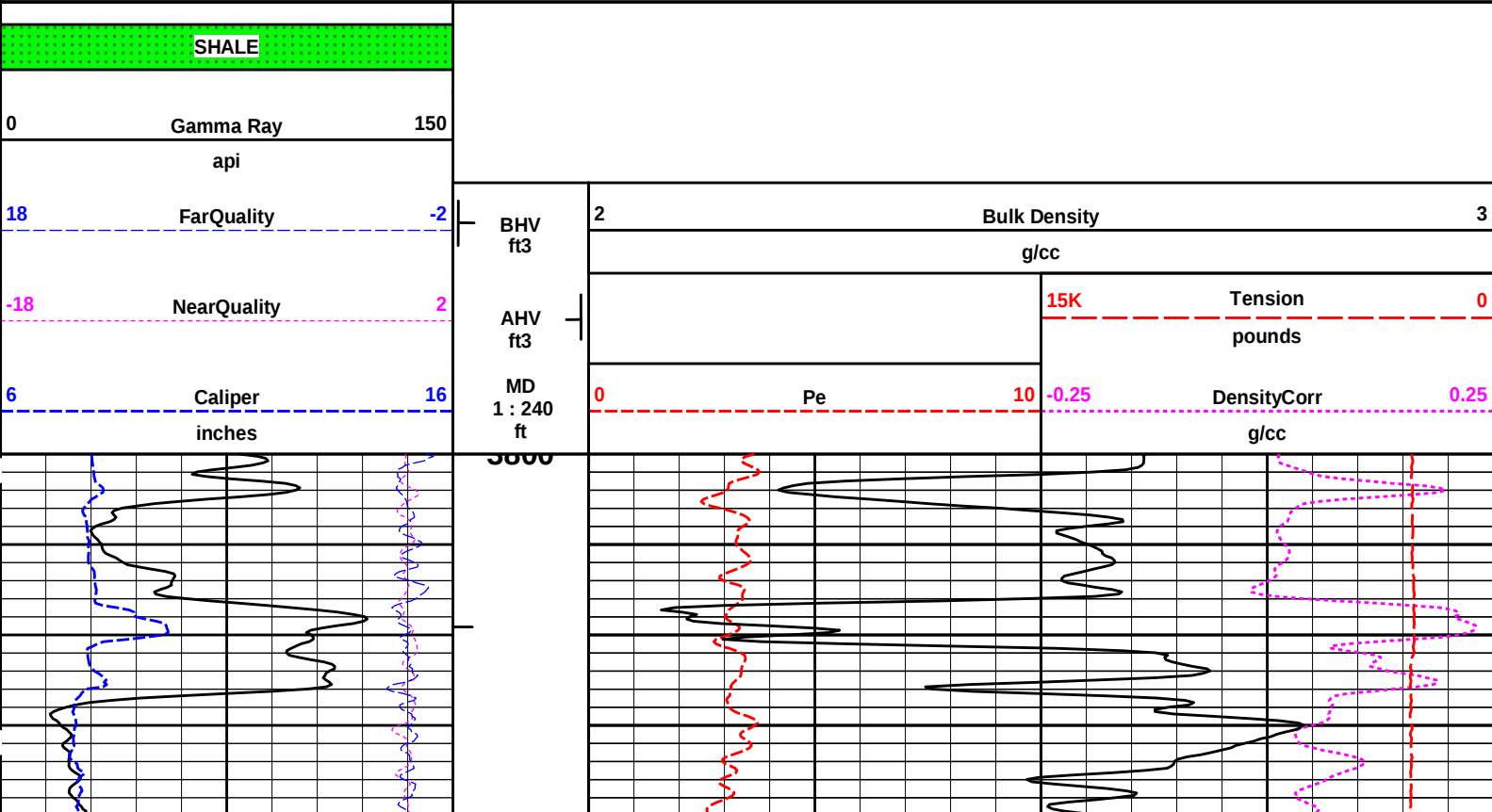
5 INCH MAIN LOG

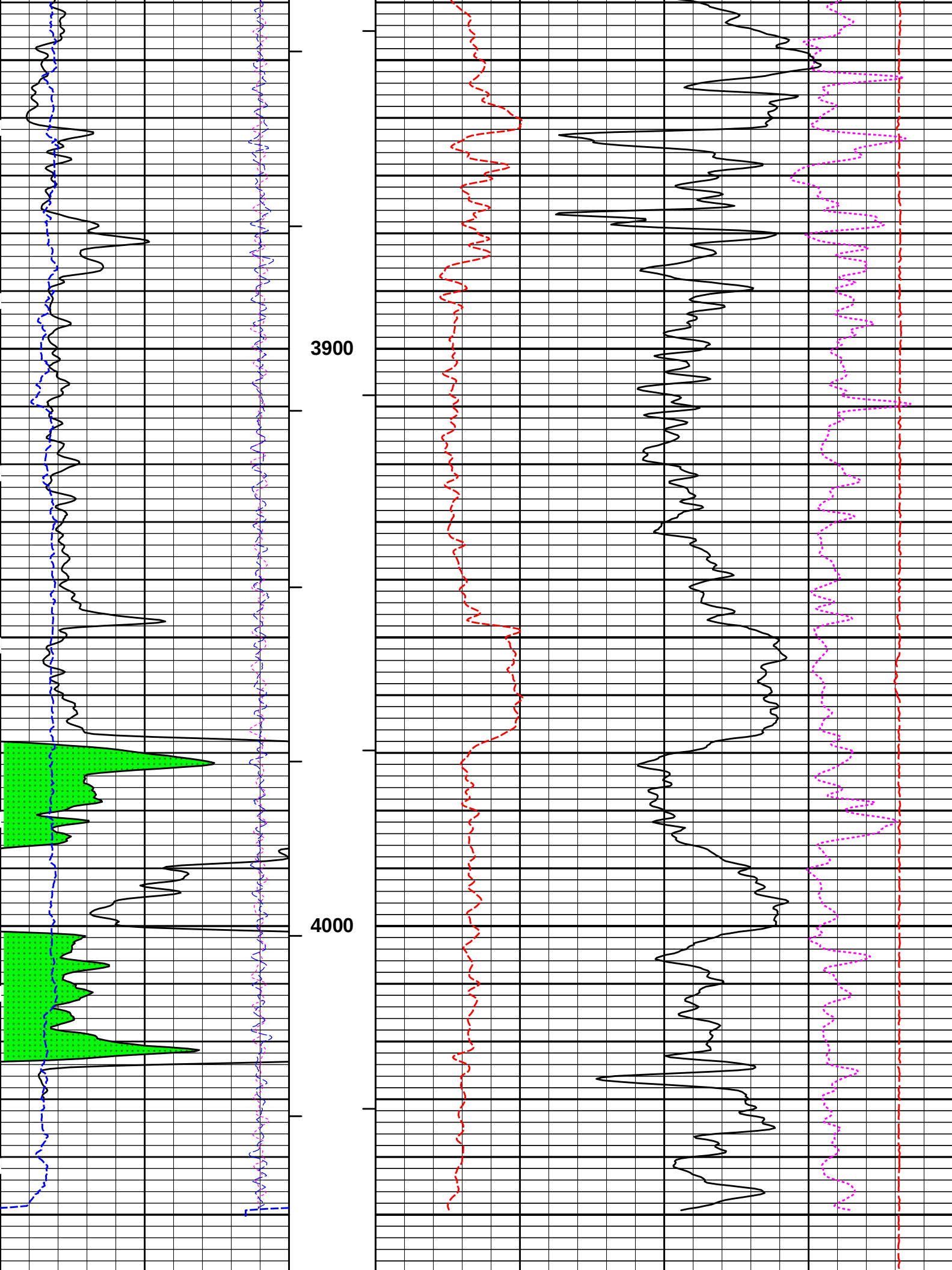
MEASURED DEPTH
MAIN SECTION 5" PER 100'

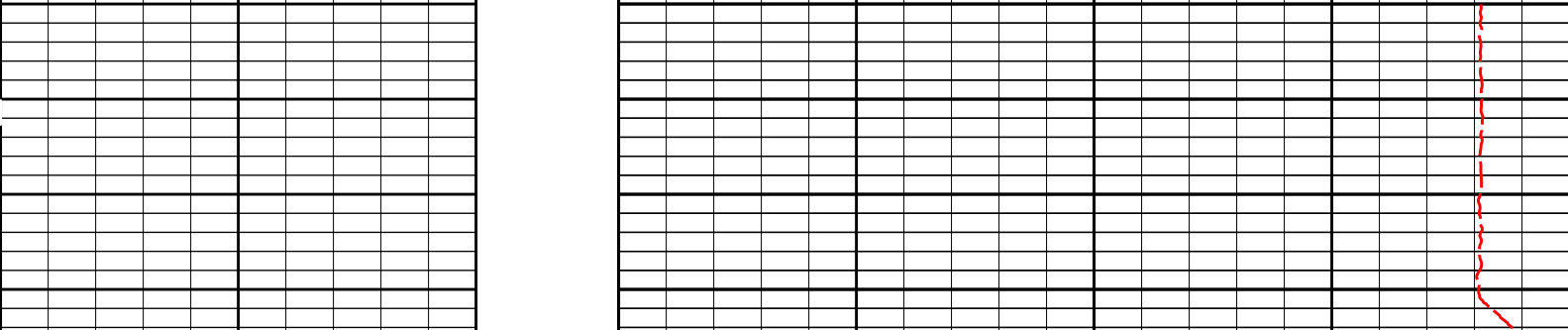
HALLIBURTON

Plot Time: 04-Jul-14 12:34:05
Plot Range: 3800 ft to 4094.5 ft
Data: HEYEN_1-2\Well Based\REPEAT\
Plot File: \\-LOCAL-\\HEYEN_1-2\0001 SP-GTET-DSN-SDL-FLEX-BSAT-ACRT-BN\PORO\BULKD_5_REP_LIB

REPEAT SECTION







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

HALLIBURTON

Plot Time: 04-Jul-14 12:34:06
Plot Range: 3800 ft to 4094.5 ft
Data: HEYEN_1-2\Well Based\REPEAT\
Plot File: \\LOCAL-HEYEN_1-2\0001 SP-GTET-DSN-SDL-FLEX-BSAT-ACRT-BN\PORO\BULKD_5_REP_LIB

REPEAT SECTION

HALLIBURTON

TOOL STRING DIAGRAM REPORT

Description	Overbody Description	O.D.	Diagram	Sensors @ Delays	Length	Accumulated Length
RWCH-12156658 135.00 lbs		Ø 3.625 in →		← Load Cell @ 76.35 ft ← BH Temperature @ 75.79 ft	6.25 ft	80.04 ft
SP Sub-12345678 60.00 lbs		Ø 3.625 in →		← SP @ 72.01 ft	3.74 ft	73.79 ft
GTET-11048627 165.00 lbs		Ø 3.625 in →		← GammaRay @ 63.99 ft	8.52 ft	70.05 ft
						61.53 ft

DSNT-11055304
174.00 lbs

Ø 3.625 in →

9.69 ft

← DSN Far @ 54.59 ft
← DSN Near @ 53.84 ft

51.84 ft

SDLT-11014296
360.00 lbs

SDLT Pad-10865884
65.00 lbs
Microlog Pad-11014296
8.00 lbs

Ø 4.500 in →

10.81 ft

Ø 4.750 in* →
Ø 4.750 in* →

Microlog @ 44.03 ft
SDL Caliper @ 43.84 ft
SDL @ 43.83 ft

41.03 ft

IQ Flex-00000001
140.00 lbs

Ø 3.625 in →

5.67 ft

35.36 ft

BSAT-10747683
300.00 lbs

Ø 3.625 in →

15.77 ft

← Sonic Receivers @ 26.84 ft

19.58 ft

ACRt Instrument-
11022962
50.00 lbs

Ø 3.625 in →

5.03 ft

14.55 ft

Regal Standoff 6_75-
00000001
20.00 lbs

Ø 6.750 in* →

← Mud Resistivity @ 13.19 ft

← ACRt @ 9.21 ft

ACRt Sonde-
11005909
200.00 lbs

Ø 3.625 in →

14.22 ft

Bull Nose-00000001
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)
RWCH	Releasable Wireline Cable Head	12156658	135.00	6.25	73.79	300.00
SP	SP Sub	12345678	60.00	3.74	70.05	300.00
GTET	Gamma Telemetry Tool	11048627	165.00	8.52	61.53	60.00
DSNT	Dual Spaced Neutron	11055304	174.00	9.69	51.84	60.00
SDLT	Spectral Density Tool	11014296	360.00	10.81	41.03	60.00
SDLP	Density Insite Pad	10865884	65.00	2.55	*	43.24
MICP	Microlog Pad	11014296	8.00	1.00	*	43.53
IQF	IQ Flex tool	00000001	140.00	5.67	35.36	300.00
BSAT	Borehole Sonic Array Tool	10747683	300.00	15.77	19.58	60.00
ACRt	Array Compensated True Resistivity Instrument Section	11022962	50.00	5.03	14.55	120.00
ACRt	Array Compensated True Resistivity Sonde Section	11005909	200.00	14.22	0.33	120.00
RSOF	Regal Standoff 6.75in	00000001	20.00	0.52	*	12.25
BLNS	Bull Nose	00000001	5.00	0.33	0.00	300.00
Total			1,682.00	80.04		
						* Not included in Total Length and Length Accumulation.
Data: HEYEN_1-2\0001 SP-GTET-DSN-SDL-FLEX-BSAT-ACRT-BN\IDLE						Date: 03-Jul-14 16:44:54

HALLIBURTON

CALIBRATION REPORT

NATURAL GAMMA RAY TOOL SHOP CALIBRATION

Tool Name: GTET - 11048627

Reference Calibration Date: 29-May-14 11:12:28

Engineer: J. BOLLLOM

Calibration Date: 03-Jul-14 08:43:55

Software Version: WL INSITE R4.2.0 (Build 2)

Calibration Version: 1

Calibrator Source S/N: Error

Calibrator API Reference:265.00 api

Equivalent Calibrator API Reference:269.6 api

Measurement	Measured	Calibrated	Units
Background	50.2	49.9	api
Background + Calibrator	321.5	319.5	api
Calibrator	271.3	269.6	api

NATURAL GAMMA RAY TOOL FIELD CALIBRATION

Tool Name: GTET - 11048627

Reference Calibration Date: 03-Jul-14 08:43:55

Engineer: J. BOLLLOM

Calibration Date: 03-Jul-14 09:10:12

Software Version: WL INSITE R4.2.0 (Build 2)

Calibration Version: 1

Calibrator Source S/N: Error

Calibrator API Reference:265.00 api

Equivalent Calibrator API Reference:269.6 api

Field Verification	Shop	Field	Units
Background	49.9	49.5	api
Background + Calibrator	319.5	316.3	api
Calibrator	269.6	266.8	api

Shop	Field	Difference	Tolerance
269.6	266.8	2.8	+/- 9.00

DUAL SPACED NEUTRON SHOP CALIBRATION

Tool Name:	DSNT - 11055304	Reference Calibration Date:	24-Apr-14 11:58:00
Engineer:	SHELDON INGERSOLL	Calibration Date:	28-May-14 13:59:07
Software Version:	WL INSITE R4.2.0 (Build 2)	Calibration Version:	1

Logging Source S/N: DSN-424
Tank Serial Number: LIBERAL WATER TANK
Reference value assigned to Tank: 51.680
Snow Block S/N: 10013313
Calibration Tank Water Temperature: 68 degF
Min. Tool Housing Outside Diameter: 3.620 in

CALIBRATION CONSTANTS			
Measurement	Prev. Value	New Value	Control Limit On New Value
Gain:	0.981	0.981	0.900 - 1.100

WATER TANK SUMMARY (Horizontal Water Tank)				
Measurement	Current Reading (Previous Coef.)	Calibrated (New Coef.)	Change	Control Limit On Change
Porosity (decg):	0.2108	0.2107	0.0002	+/- 0.0020
Calibrated Ratio:	9.72	9.72	0.006	+/- 0.050

VERIFIER		
Measurement	Value	Control Limit
Snow-Block Porosity (decg):	0.0699	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 - 11055304	Reference Calibration Date:	28-May-14 13:59:07
Engineer:	J. BOLLUM	Calibration Date:	03-Jul-14 09:05:07
Software Version:	WL INSITE R4.2.0 (Build 2)	Calibration Version:	1

Logging Source S/N: DSN-424
Snow Block S/N: 10013313

NEUTRON FIELD-CHECK SUMMARY				
	Shop	Field	Difference	Control Limit On Change
Snow-Block Porosity (decg):	0.0699	0.0590	-0.0110	+/- 0.0150

PASS/FAIL SUMMARY	
Block Change Check:	Passed
Snow Block Stat Check:	Passed
Temperature Check:	Passed

DENSITY CALIPER SHOP CALIBRATION

Tool Name:	SDLT - 11014296	Reference Calibration Date:	03-Jul-14 08:53:15
Engineer:	J. BOLLUM	Calibration Date:	03-Jul-14 08:57:49
Software Version:	WL INSITE R4.2.0 (Build 2)	Calibration Version:	1
Host Tool Name:	DSNT - 11055304		

CALIBRATION COEFFICIENTS			
Measurement	Previous Value	New Value	Control Limit On New Value
Pad Offset	-3765.63	-4253.90	-7000.00 - -1000.00
Pad Gain	0.0003890	0.0003896	0.000200 - 0.000600
Arm Offset	-3495.11	-2711.12	-5000.00 - 3000.00
Arm Gain	0.0005243	0.0004641	0.000300 - 0.000700
Arm Power	-0.000005039	-0.000000602	-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)	2.19	2.00	-0.19	+/- 0.20
Medium Ring (in)	3.93	3.75	-0.18	+/- 0.20
RING DIAMETER:				
Small Ring (in)	6.52	6.50	-0.02	+/- 0.20
Medium Ring (in)	8.39	8.25	-0.14	+/- 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 - 11014296	Reference Calibration Date:	03-Jul-14 08:57:49
Engineer:	J. BOLLUM	Calibration Date:	03-Jul-14 09:00:16
Software Version:	WL INSITE R4.2.0 (Build 2)	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	8.15	-0.10	+/- 0.15

PASS/FAIL SUMMARY	
Pad Extension Check:	Passed
Diameter Check:	Passed

SPECTRAL DENSITY SHOP CALIBRATION			
Tool Name:	SDLT Pad - 10865884	Reference Calibration Date:	28-May-14 11:06:08
Engineer:	THOMAS HYDE	Calibration Date:	13-Jun-14 09:12:43
Software Version:	WL INSITE R4.2.0 (Build 2)	Calibration Version:	1

Logging Source S/N: 5168 GW		
Aluminum Block S/N: LIBERAL ALUMINUM	Density: 2.598g/cc	Pe: 3.170
Magnesium Block S/N: LIBERAL MAGNESIUM	Density: 1.684g/cc	Pe: 2.598

DENSITY CALIBRATION SUMMARY			
Measurement	Previous Value	New Value	Control Limit
Near Bar Gain	1.0326	1.0438	0.90 - 1.10
Near Dens Gain	1.0217	1.0129	0.90 - 1.10
Near Peak Gain	1.0117	1.0130	0.90 - 1.10
Near Lith Gain	0.9801	0.9739	0.90 - 1.10
Far Bar Gain	1.0143	1.0157	0.90 - 1.10
Far Dens Gain	0.9998	1.0020	0.90 - 1.10
Far Peak Gain	0.9945	0.9935	0.90 - 1.10
Far Lith Gain	0.9663	0.9663	0.90 - 1.10
Near Bar Offset	-0.0799	-0.1861	NONE
Near Dens Offset	-0.0012	0.0743	NONE
Near Peak Offset	0.0669	0.0554	NONE
Near Lith Offset	0.3004	0.3551	NONE
Far Bar Offset	0.0513	0.0317	NONE
Far Dens Offset	0.1412	0.1177	NONE
Far Peak Offset	0.1400	0.1449	NONE
Far Lith Offset	0.2888	0.2918	NONE
Near Bar Background	800.31	800.22	700 - 1450
Near Dens Background	266.95	266.53	230 - 480
Near Peak Background	117.99	117.66	100 - 210
Near Lith Background	144.83	142.52	125 - 260
Far Bar Background	497.46	496.97	450 - 900
Far Dens Background	195.79	194.81	175 - 345
Far Peak Background	76.35	76.75	70 - 140
Far Lith Background	79.99	80.91	75 - 145

CALIBRATION BLOCK SUMMARY				
Measurement	Current Reading (Previous Coef)	Calibrated (New Coef)	Change	Control Limit On Change
MAGNESIUM				
Density (g/cc)	1.682	1.684	0.002	+/- 0.015
Pe	2.579	2.557	-0.022	+/- 0.150
ALUMINUM				
Density (g/cc)	2.594	2.598	0.004	+/- 0.01500
Pe	3.180	3.126	-0.054	+/- 0.150

TOOL SUMMARY				
Measurement	Near Detector		Far Detector	
	Value	Control Limits	Value	Control Limits
QUALITY				
Background	0.0007	+/- 0.0110	-0.0018	+/- 0.0140
Magnesium Block	-0.0006	+/- 0.0110	-0.0005	+/- 0.0140
Aluminum Block	0.0005	+/- 0.0110	-0.0006	+/- 0.0140
Resolution	8.47	6.00 - 11.50	8.85	6.00 - 11.50
Internal Verifier(B+D+P+L)	1327	1200 - 2700	849	800 - 1700

PASS/FAIL SUMMARY

Background Quality Check: Passed

Background Range 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 - 10865884	Reference Calibration Date:	13-Jun-14 09:12:43
Engineer:	J. BOLLLOM	Calibration Date:	03-Jul-14 08:43:37
Software Version:	WL INSITE R4.2.0 (Build 2)	Calibration Version:	1

Pad Temperature: 66.7 degF

DENSITY FIELD CALIBRATION SUMMARY				
Measurement	Shop	Field	Change	Control Limit +/-
Near (B+D+P+L) cps	1326.920	1328.276	1.356	14.737
Far (B+D+P+L) cps	849.440	849.271	-0.169	15.991
Near Resolution	8.47	8.50	0.030	0.50
Far Resolution	8.85	8.98	0.130	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	266.8	-----	2.8	+/- 9.00	api
DSNT-11055304						
Snow-Block Porosity	0.0699	0.0590	-----	0.0109	+/- 0.0150	decP
SDLT-11014296						
Pad Extension	3.75	3.75	-----	0.00	+/-0.10	in
Ring Diameter	8.25	8.15	-----	0.10	+/-0.15	in
SDLT Pad-10865884						
Near(B+D+P+L)	1326.920	1328.276	-----	-1.356	+/-14.737	cps
Far(B+D+P+L)	849.440	849.271	-----	0.169	+/-15.991	cps

Data: HEYEN 1-210001 SP-GTET-DSN-SDI-FLEX-BSAT-ACRT-BNIDLE Date: 03-Jul-14 16:49:36

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PARAMETERS REPORT

Depth (ft)	Tool Name	Mnemonic	Description	Value	Units
TOP-----					
	SHARED	BS	Bit Size	7.875	in
	SHARED	UBS	Use Bit Size instead of Caliper for all applications.	No	
	SHARED	MDBS	Mud Base	Water	
	SHARED	MDWT	Borehole Fluid Weight	9.200	ppg
	SHARED	WAGT	Weighting Agent	Natural	
	SHARED	BSAL	Borehole salinity	0.00	ppm
	SHARED	ESAL	Formation Salinity NaCl	0.00	ppm

SHARED	PSAL	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	4090.00	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	
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	
Rwa / CrossPlot	BHSM	Borehole Size Source Tool	SDLT	
GTET	GROK	Process Gamma Ray?	Yes	
GTET	GRSO	Gamma Tool Standoff	0.000	in
GTET	GEOK	Process Gamma Ray EVR?	Yes	
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?	Yes	
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	
DSNT	BHSM	Borehole Size Source Tool	SDLT	
SDLT	CLOK	Process Caliper Outputs?	Yes	
SDLT Pad	DNOK	Process Density?	Yes	
SDLT Pad	DNOK	Process Density EVR?	Yes	
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	
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	Wyllie	
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
ACRt Sonde	BHSM	Borehole Size Source Tool	SDLT	
BOTTOM				
Data: HEYEN_1-210001 SP-GTET-DSN-SDL-FLEX-BSAT-ACRT-BNIDLE				
Date: 03-Jul-14 16:46:36				

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INPUTS, DELAYS AND FILTERS TABLE

Mnemonic	Input Description	Delay (ft)	Filter Type	Filter Length (ft)
Depth Panel				
TENS	Tension	0.00	NO	
Rwa / CrossPlot				
TPUL	Tension Pull	80.04	NO	
BS	Bit Size	80.04	NO	
HDIA	Measured Hole Diameter	0.00	NO	
RWCH				
DHTN	DownholeTension	0.00	BLK	0.000
SP Sub				
PLTC	Plot Control Mask	72.01	NO	
SP	Spontaneous Potential	72.01	BLK	1.250
SPR	Raw Spontaneous Potential	72.01	NO	
SPO	Spontaneous Potential Offset	72.01	NO	
GTET				
TPUL	Tension Pull	63.99	NO	
GR	Natural Gamma Ray API	63.99	TRI	1.750
GRU	Unfiltered Natural Gamma Ray API	63.99	NO	
EGR	Natural Gamma Ray API with Enhanced Vertical Resolution	63.99	W	1.416 , 0.750
HDIA	Measured Hole Diameter	0.00	NO	
ACCZ	Accelerometer Z	0.00	BLK	0.083
DEVI	Inclination	0.00	NO	
DSNT				
TPUL	Tension Pull	53.74	NO	
RNDS	Near Detector Telemetry Counts	53.84	BLK	1.417
RFDS	Far Detector Telemetry Counts	54.59	TRI	0.583
DNTT	DSN Tool Temperature	53.84	NO	
DSNS	DSN Tool Status	53.74	NO	
ERND	Near Detector Telemetry Counts EVR	53.84	BLK	0.000

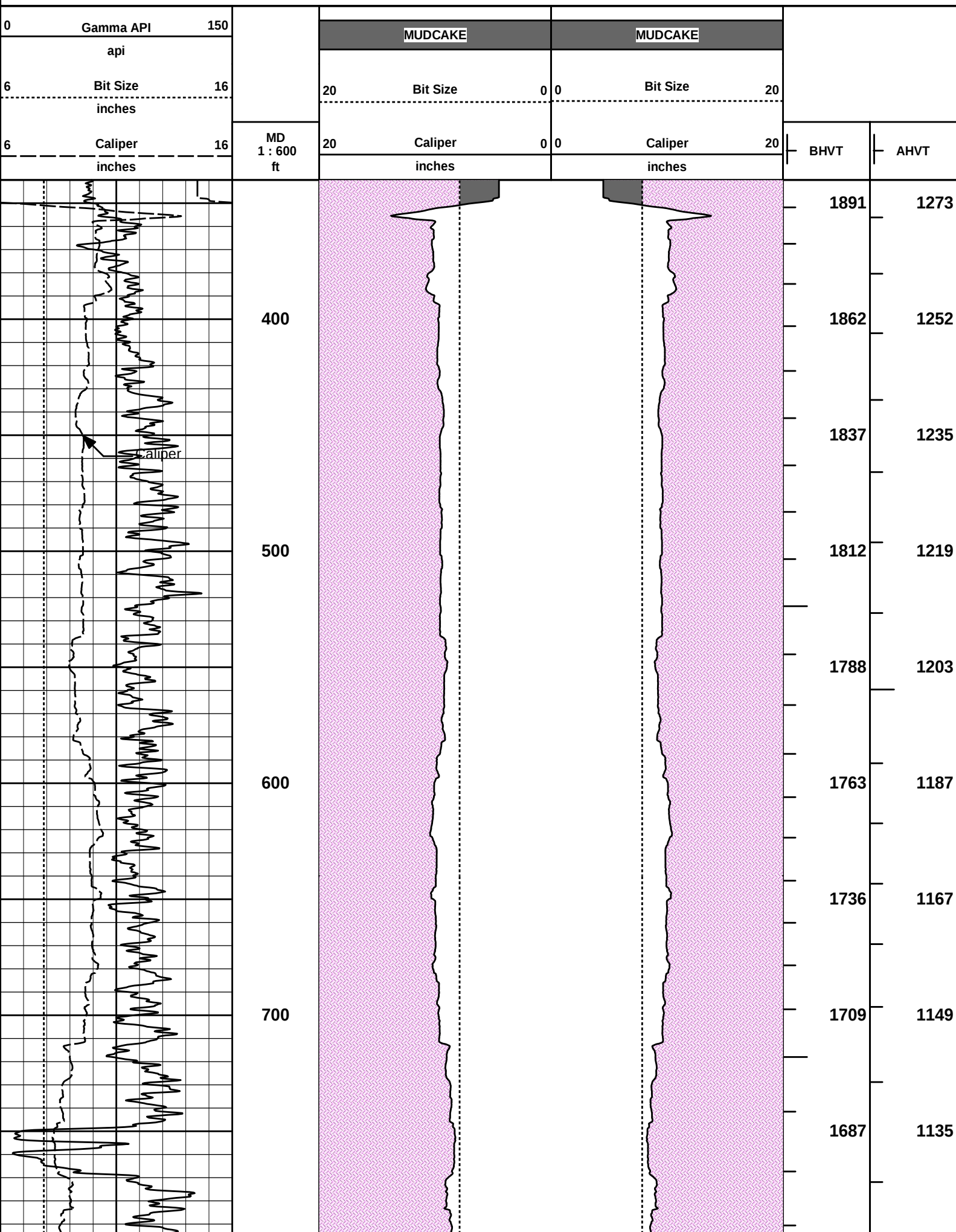
ERFD	Far Detector Telemetry Counts EVR	54.59	BLK	0.000
ENTM	DSN Tool Temperature EVR	53.84	NO	
HDIA	Measured Hole Diameter	0.00	NO	
SDLT				
TPUL	Tension Pull	43.84	NO	
PCAL	Pad Caliper	43.84	TRI	0.250
ACAL	Arm Caliper	43.84	TRI	0.250
BSAT				
TPUL	Tension Pull	26.84	NO	
STAT	Status	26.84	NO	
DLYT	Delay Time	26.84	NO	
SI	Sample Interval	26.84	NO	
TXRX	Raw Telemetry 10 Receivers	26.84	NO	
FRMC	Tool Frame Count	26.84	NO	
GMOD	Gain processing mode	19.58	NO	
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

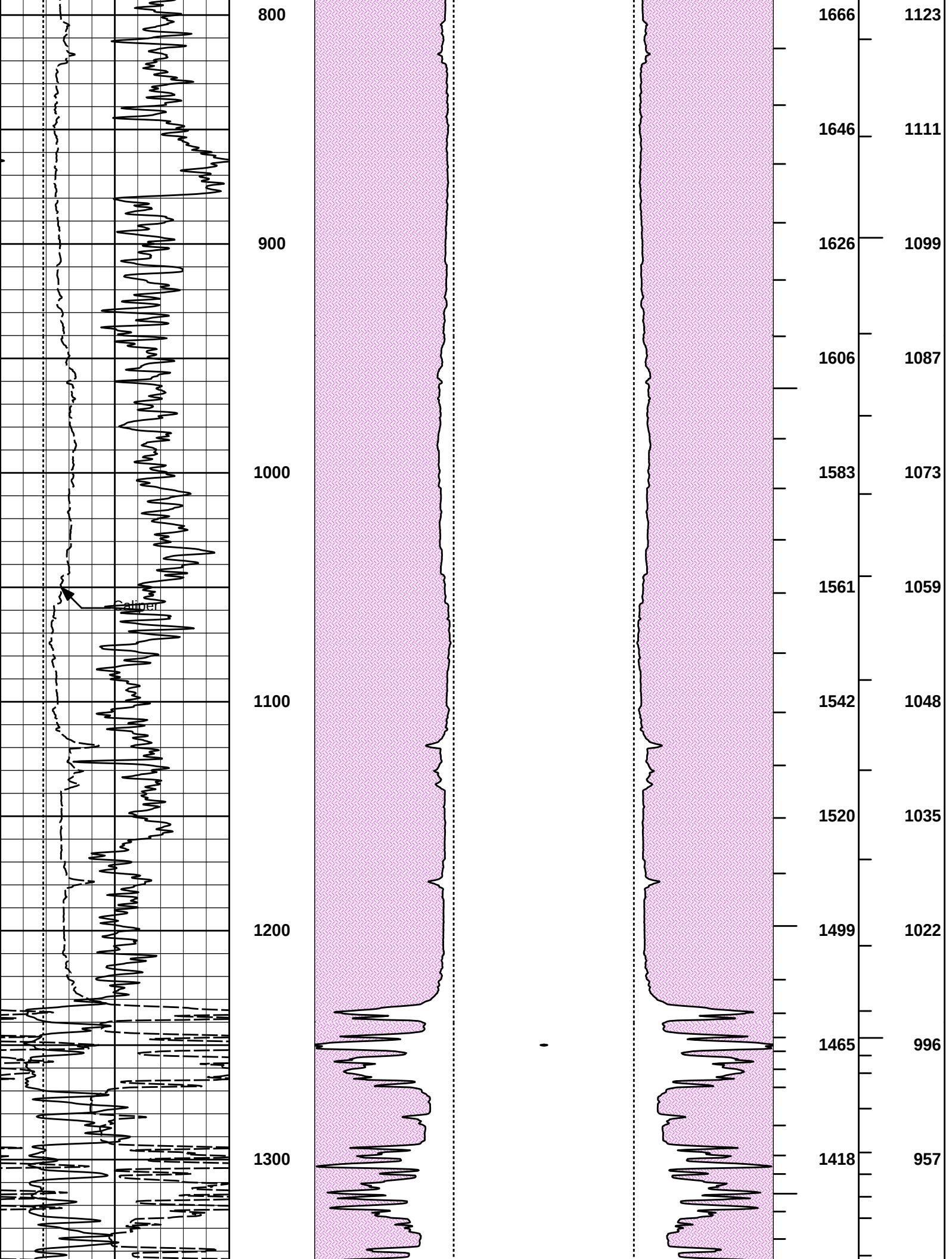
F3X0	ACRT 72KHz - 0m X Value	3.23	BLK	0.000
RMUD	Mud Resistivity	12.52	BLK	0.000
F1RT	Transmitter Reference 12 KHz Real Signal	2.73	BLK	0.000
F1XT	Transmitter Reference 12 KHz Imaginary Signal	2.73	BLK	0.000
F2RT	Transmitter Reference 36 KHz Real Signal	2.73	BLK	0.000
F2XT	Transmitter Reference 36 KHz 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	
HDIA	Measured Hole Diameter	0.00	NO	
SDLT Pad				
TPUL	Tension Pull	43.83	NO	
NAB	Near Above	43.66	BLK	0.920
NHI	Near Cesium High	43.66	BLK	0.920
NLO	Near Cesium Low	43.66	BLK	0.920
NVA	Near Valley	43.66	BLK	0.920
NBA	Near Barite	43.66	BLK	0.920
NDE	Near Density	43.66	BLK	0.920
NPK	Near Peak	43.66	BLK	0.920
NLI	Near Lithology	43.66	BLK	0.920
NBAU	Near Barite Unfiltered	43.66	BLK	0.250
NLIU	Near Lithology Unfiltered	43.66	BLK	0.250
FAB	Far Above	44.01	BLK	0.250
FHI	Far Cesium High	44.01	BLK	0.250
FLO	Far Cesium Low	44.01	BLK	0.250
FVA	Far Valley	44.01	BLK	0.250
FBA	Far Barite	44.01	BLK	0.250
FDE	Far Density	44.01	BLK	0.250
FPK	Far Peak	44.01	BLK	0.250
FLI	Far Lithology	44.01	BLK	0.250
PTMP	Pad Temperature	43.84	BLK	0.920
NHV	Near Detector High Voltage	43.24	NO	
FHV	Far Detector High Voltage	43.24	NO	
ITMP	Instrument Temperature	43.24	NO	
DDHV	Detector High Voltage	43.24	NO	
HDIA	Measured Hole Diameter	0.00	NO	
Microlog Pad				
TPUL	Tension Pull	44.03	NO	
MINV	Microlog Lateral	44.03	BLK	0.750
MNOR	Microlog Normal	44.03	BLK	0.750
Data: HEYEN_1-2\0001 SP-GTET-DSN-SDL-FLEX-BSAT-ACRT-BN\IDLE			Date: 03-Jul-14 16:46:11	

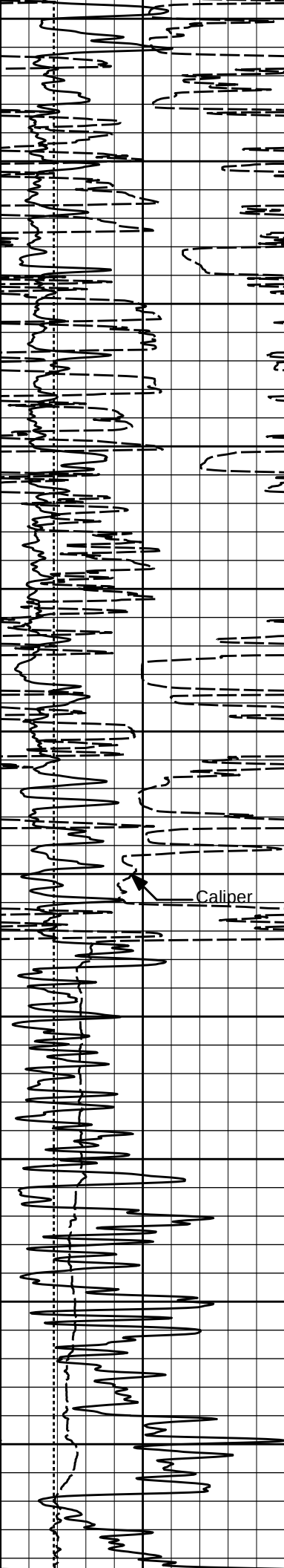
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Plot Time: 04-Jul-14 12:34:06
Plot Range: 340 ft to 4094 ft
Data: HEYEN_1-2\Well Based\CASING\
Plot File: \\LOCAL-1\HEYEN_1-2\0001 SP-GTET-DSN-SDL-FLEX-BSAT-ACRT-BN\PORO\AHV_2_IQ_LIB

ANNULAR HOLE VOLUME PLOT







1400

1500

1600

1700

1800

Caliper



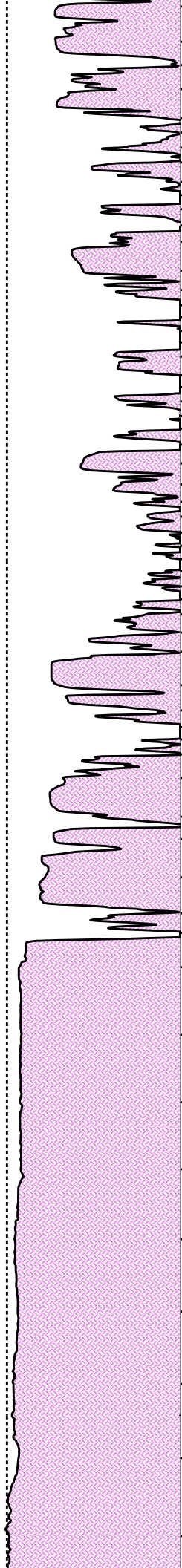
1400

1500

1600

1700

1800



1367

1301

1221

1119

1028

957

901

863

842

821

802

914

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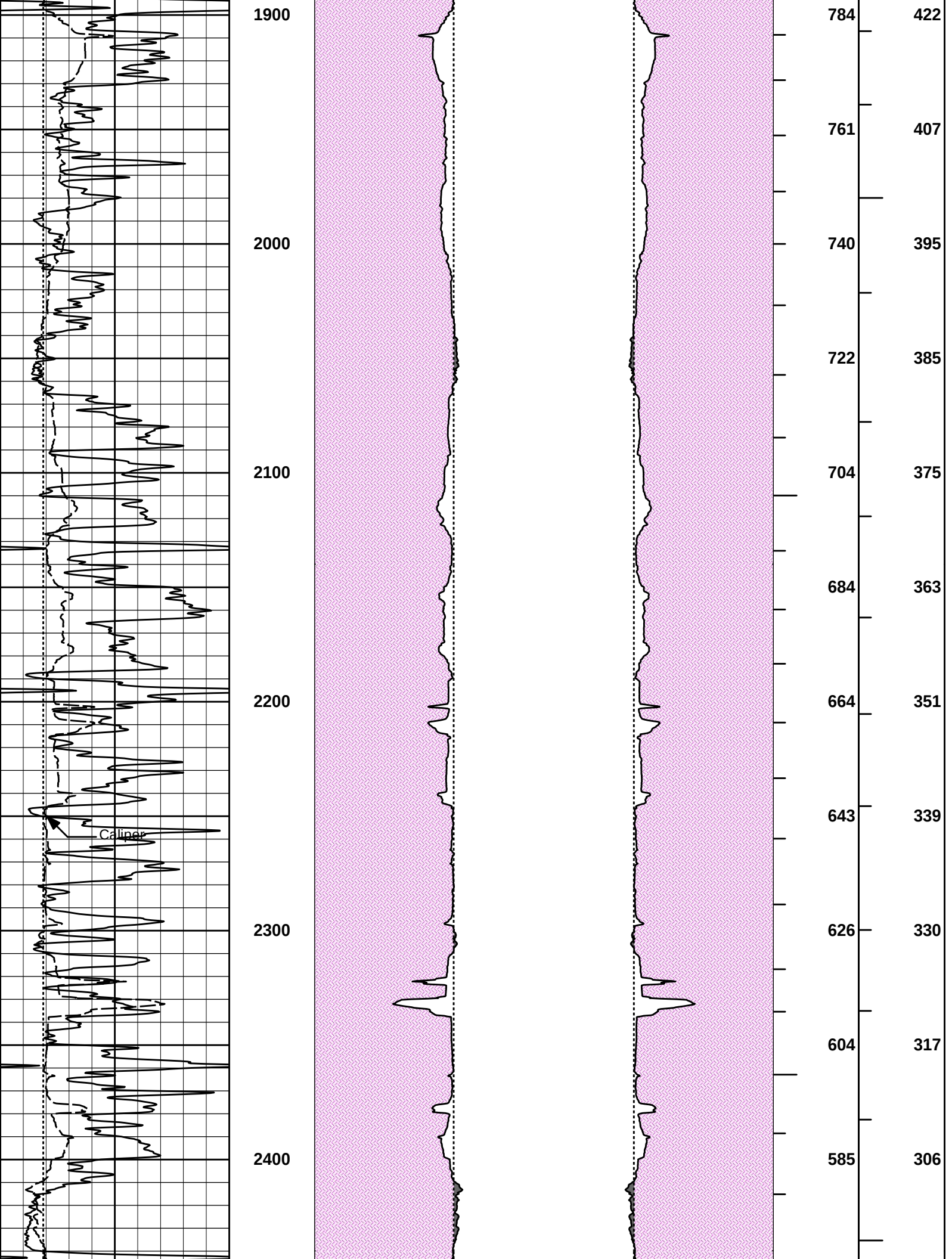
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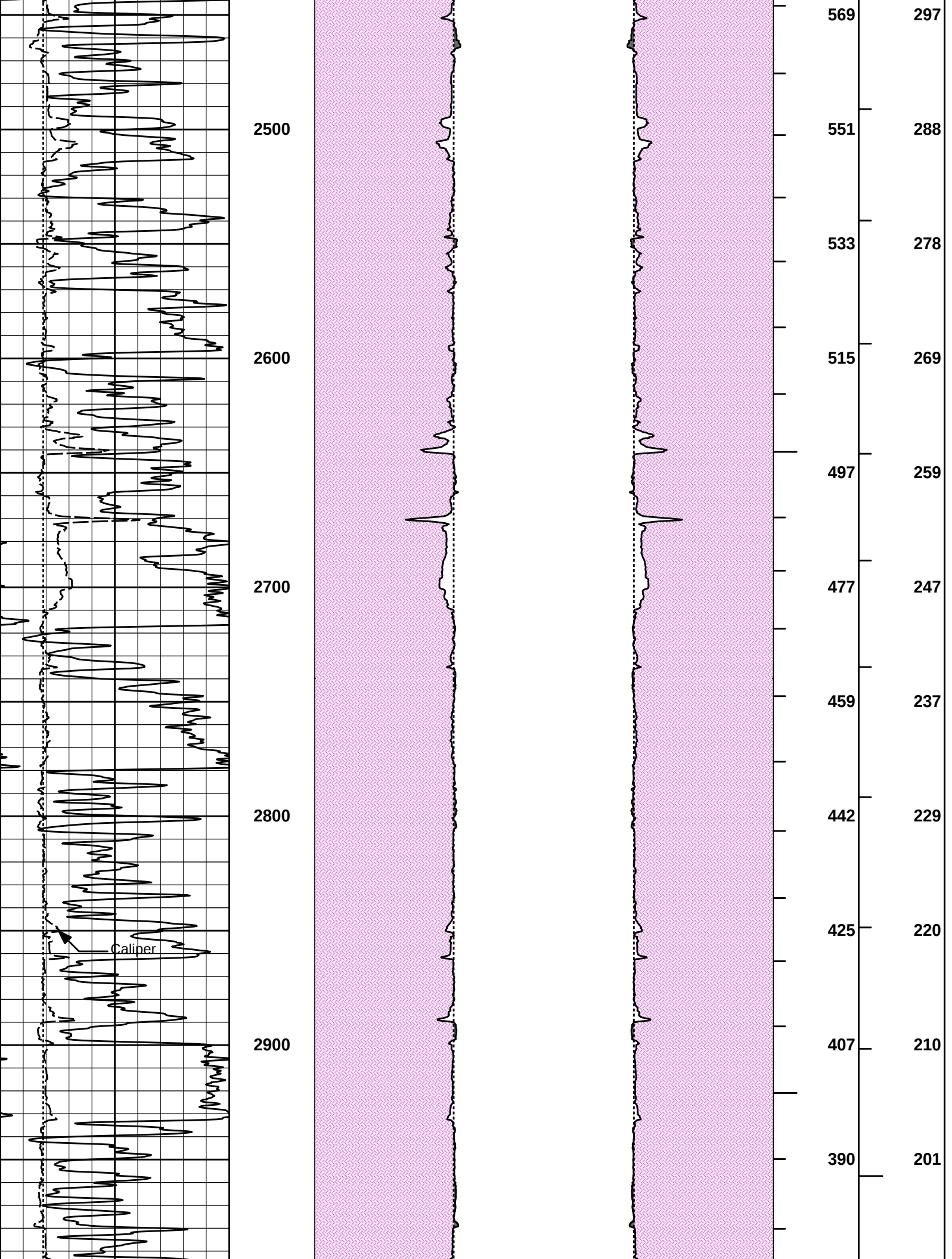
468

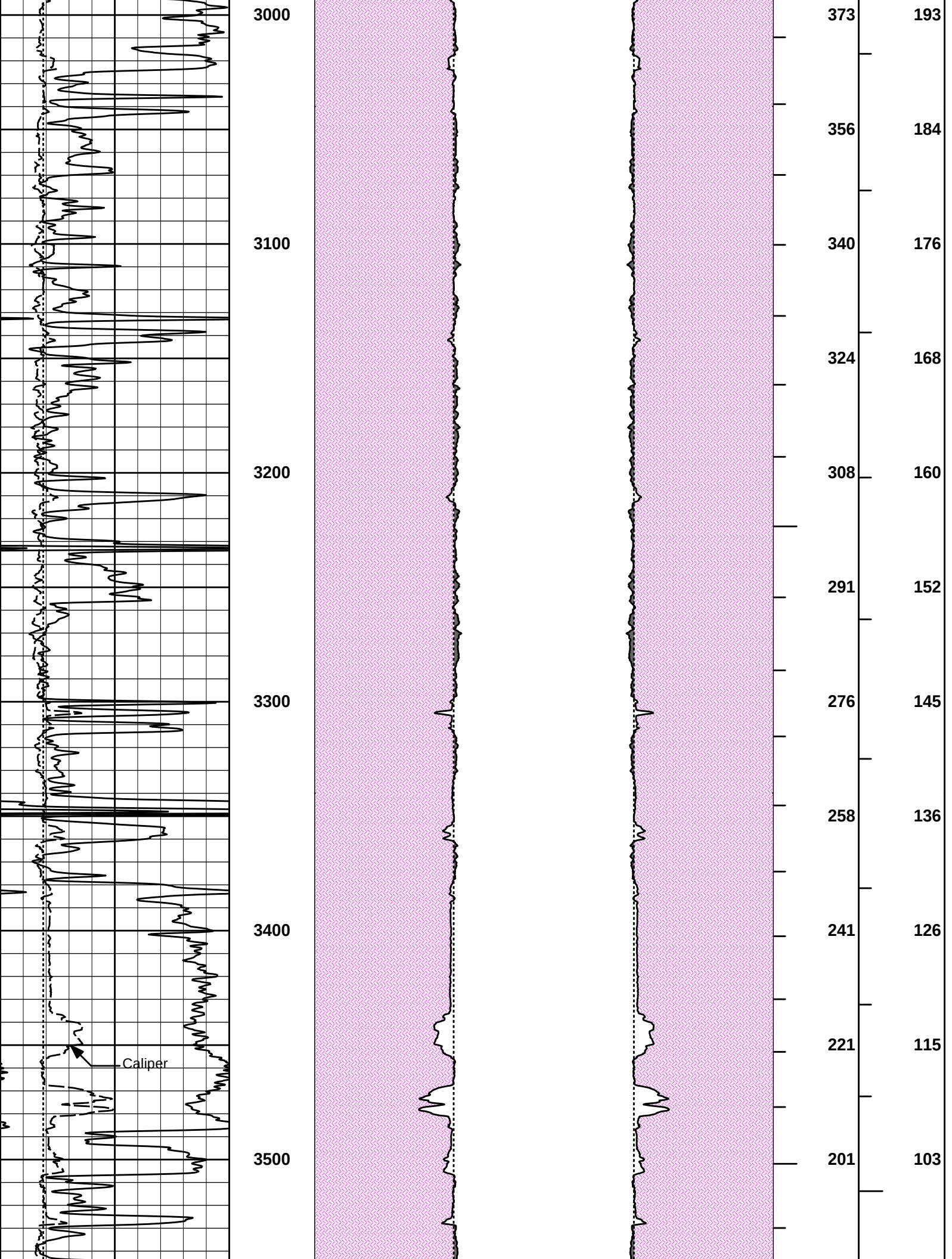
455

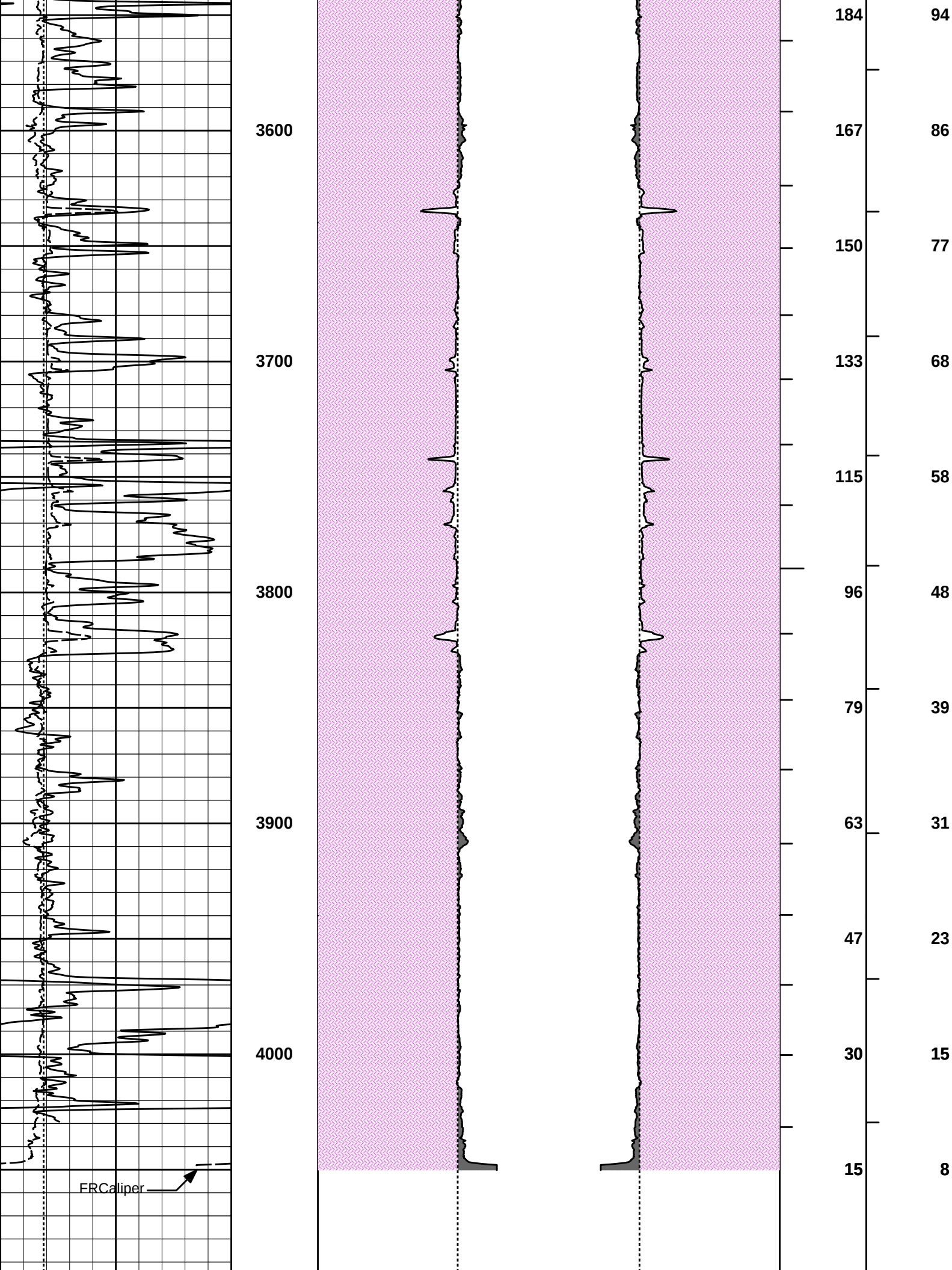
443

432









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

HALLIBURTON

Plot Time: 04-Jul-14 12:34:09**Plot Range: 340 ft to 4094 ft**

Data: HEYEN_1-2\Well Based\CASING

Plot File: \\-LOCAL-IHEYEN_1-2\0001 SP-GTET-DSN-SDL-FLEX-BSAT-ACRT-BN\PORO\AHV_2 IQ_LIB

ANNULAR HOLE VOLUME PLOT

COMPANY	HARTMAN OIL CO., INC.		
WELL	HEYEN #1-2		
FIELD	GRAY NORTH FIELD		
COUNTY	STAFFORD	STATE	KANSAS
HALLIBURTON		SPECTRAL DENSITY DUAL SPACED NEUTRON LOG	