HALLIBURTON

DUAL SPACED NEUTRON SPECTRAL DENSITY LOG

COMPANY HERMAN L. LOEB, LLC.
WELL RANDEL 3-20
FIELD/BLOCK EINSEL NORTH
COUNTY KIOWA
STATE KANSAS

COMPANY **HERMAN L. LOEB, LLC.**

WELL **RANDEL 3-20**

FIELD/BLOCK **EINSEL NORTH**

COUNTY **KIOWA** STATE **KANSAS**

API No. 15-097-21807-00-00

Location (SHL) 2360' FSL & 1930' FEL
NW-NE-NW-SE

Sect. 20 Twp. 27S Rge. 18W

Other Services:
DSN / SDL
MICROLOG
ACRT
MRIL

Permanent Datum	GL	Elev. 2188.0 ft	Elev.: K.B. 2201.0 ft
Log measured from	KB	, 13.0 ft above perm. Datum	D.F. 2200.0 ft
Drilling measured from	KB		G.L. 2188.0 ft

Date		10-Sep-14					
Run No.		ONE					
Depth - Driller		4827.00 ft					
Depth - Logger		4826.0 ft					
Bottom - Logged Interval		4822					
Top - Logged Interval		3900					
Casing - Driller		8.625 in @ 647.0 ft		@		@	
Casing - Logger		647.0 ft					
Bit Size		7.875 in		@		@	
Type Fluid in Hole		Water Based Mud					
Density	Viscosity	9.1 ppg	54.00 s/qt				
PH	Fluid Loss	10.50 pH	9.6 cptm				
Source of Sample		MUD PIT					
Rm @ Meas. Temperature		0.560 ohmm @ 90.00 degF		@		@	
Rmf @ Meas. Temperature		0.48 ohmm @ 90.00 degF		@		@	
Rmc @ Meas. Temperature		0.644 ohmm @ 90.00 degF		@		@	
Source Rmf	Rmc	CALCULATED	CALCULATED				
Rm @ BHT		0.41 ohmm @ 127.0 degF		@		@	
Time Since Circulation		4.0000 hr					
Time on Bottom		10-Sep-14 17:47					
Max. Rec. Temperature		127.0 degF @ 4826.0 ft		@		@	
Equipment	Location	11230668	LIBERAL				
Recorded By		SHELDON INGERSOLL					
Witnessed By		J. CHRISTENSEN					

Fold here

Service Ticket No.: 901655684 API Serial No.: 15-097-21807-00-00 PGM Version: WL INSITE R4.2.0 (Build 2)

CHANGE IN MUD TYPE OR ADDITIONAL SAMPLE

RESISTIVITY SCALE CHANGES

| | | | | | | |

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	2.71 gm/cc	30	-10	LIME

DIRECTIONAL INFORMATION

Maximum Deviation	@	KOP	@

Remarks: ANNULAR HOLE VOLUME CALCULATED FOR 5.5 INCH CASING.

CHLORIDES REPORTED AT 7000 ppm.

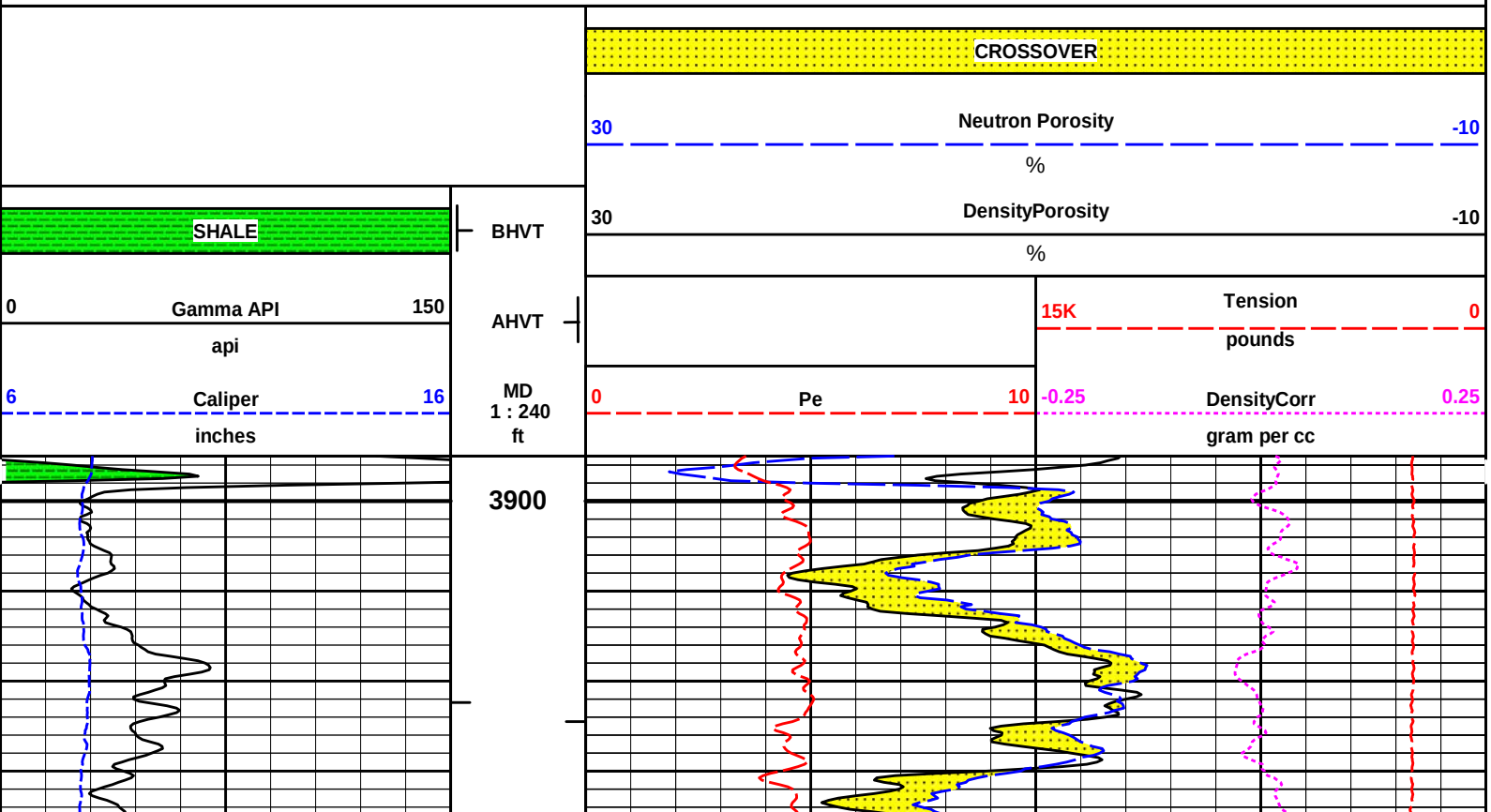
HALLIBURTON DOES NOT GUARANTEE THE ACCURACY OF ANY INTERPRETATION OF THE LOG DATA, CONVERSION OF LOG DATA TO PHYSICAL ROCK PARAMETERS OR RECOMMENDATIONS WHICH MAY BE GIVEN BY HALLIBURTON PERSONNEL OR WHICH APPEAR ON THE LOG OR IN ANY OTHER FORM. ANY USER OF SUCH DATA, INTERPRETATIONS, CONVERSIONS, OR RECOMMENDATIONS AGREES THAT HALLIBURTON IS NOT RESPONSIBLE EXCEPT WHERE DUE TO GROSS NEGLIGENCE OR WILLFUL MISCONDUCT, FOR ANY LOSS, DAMAGES, OR EXPENSES RESULTING FROM THE USE THEREOF.

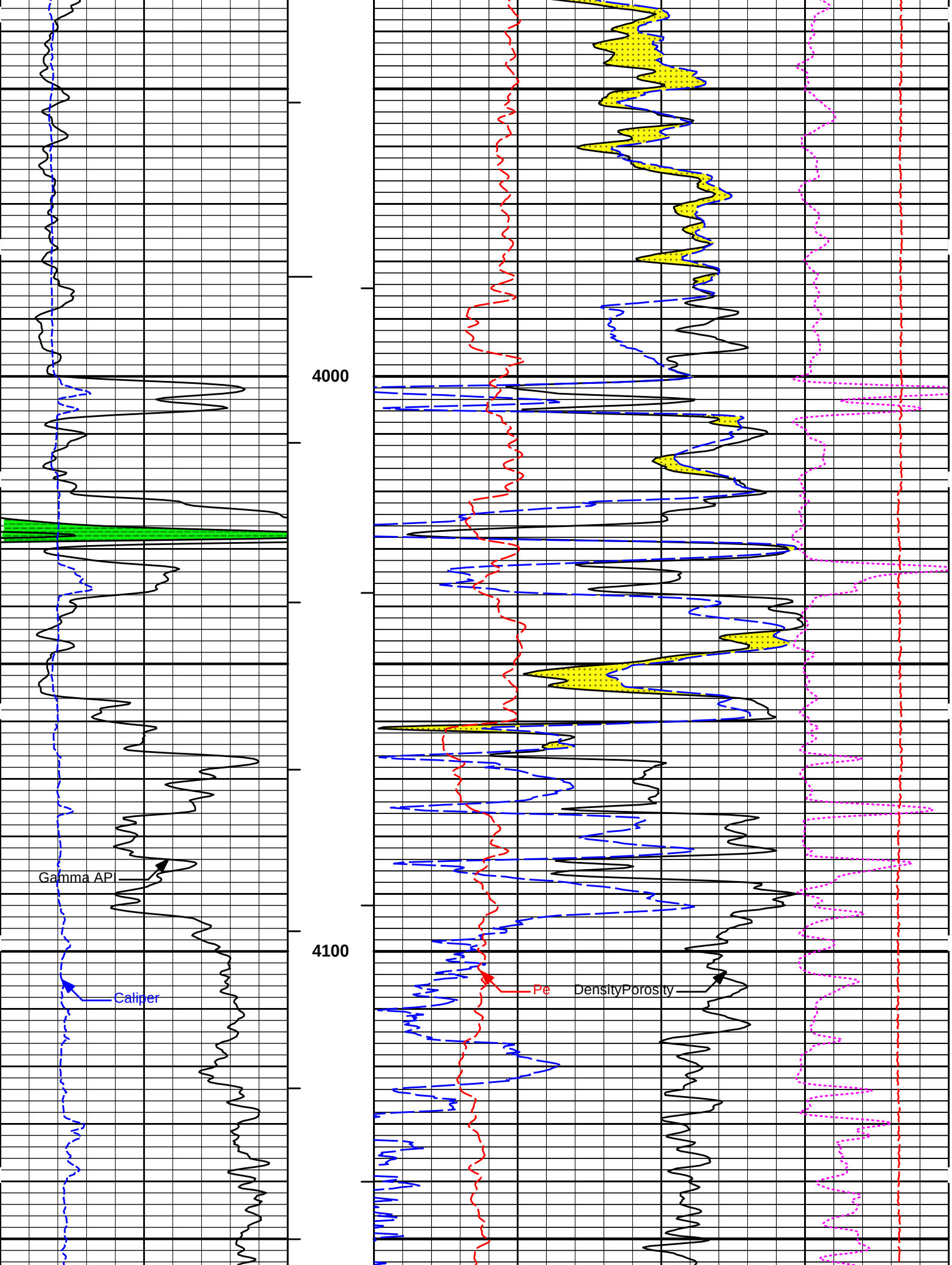
HALLIBURTON

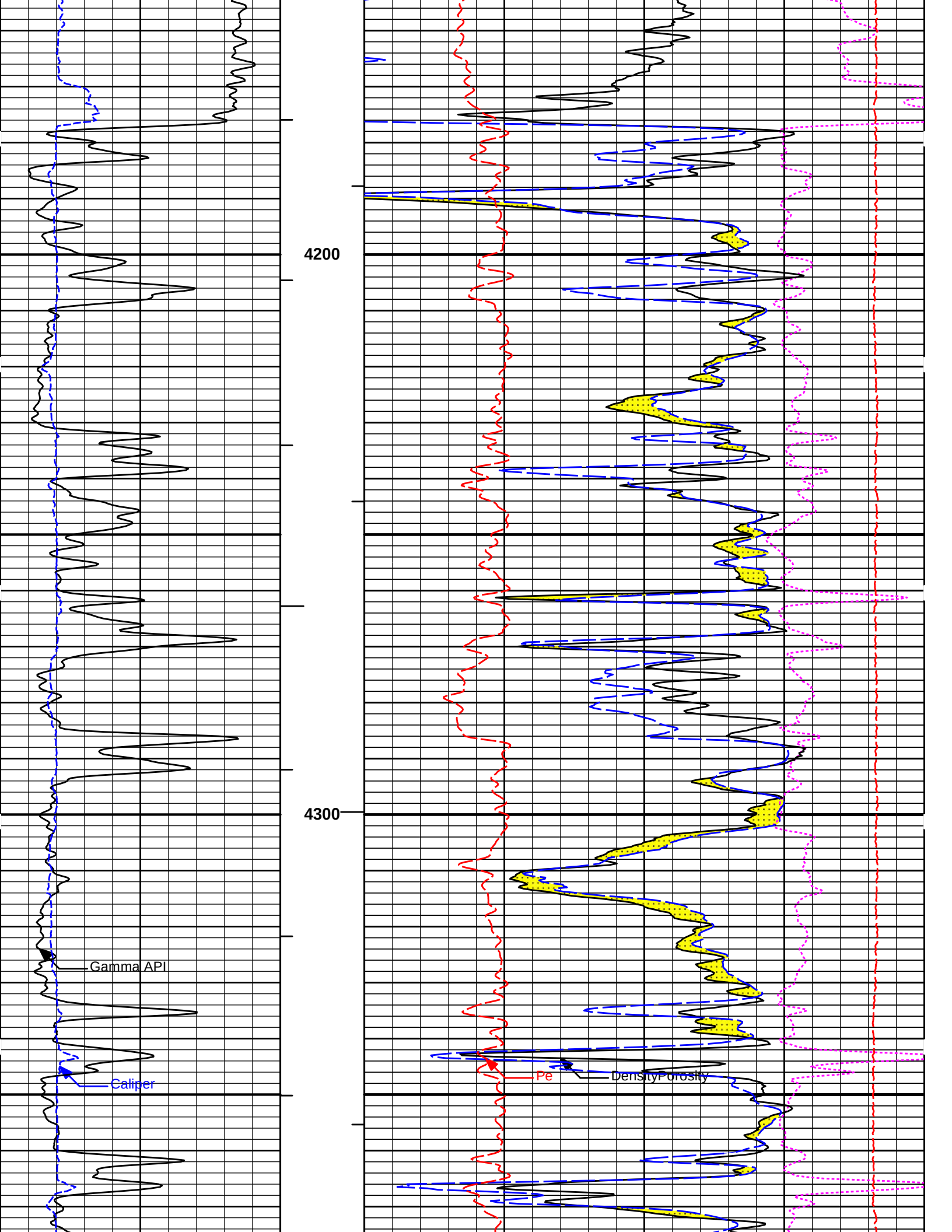
HALLIBURTON

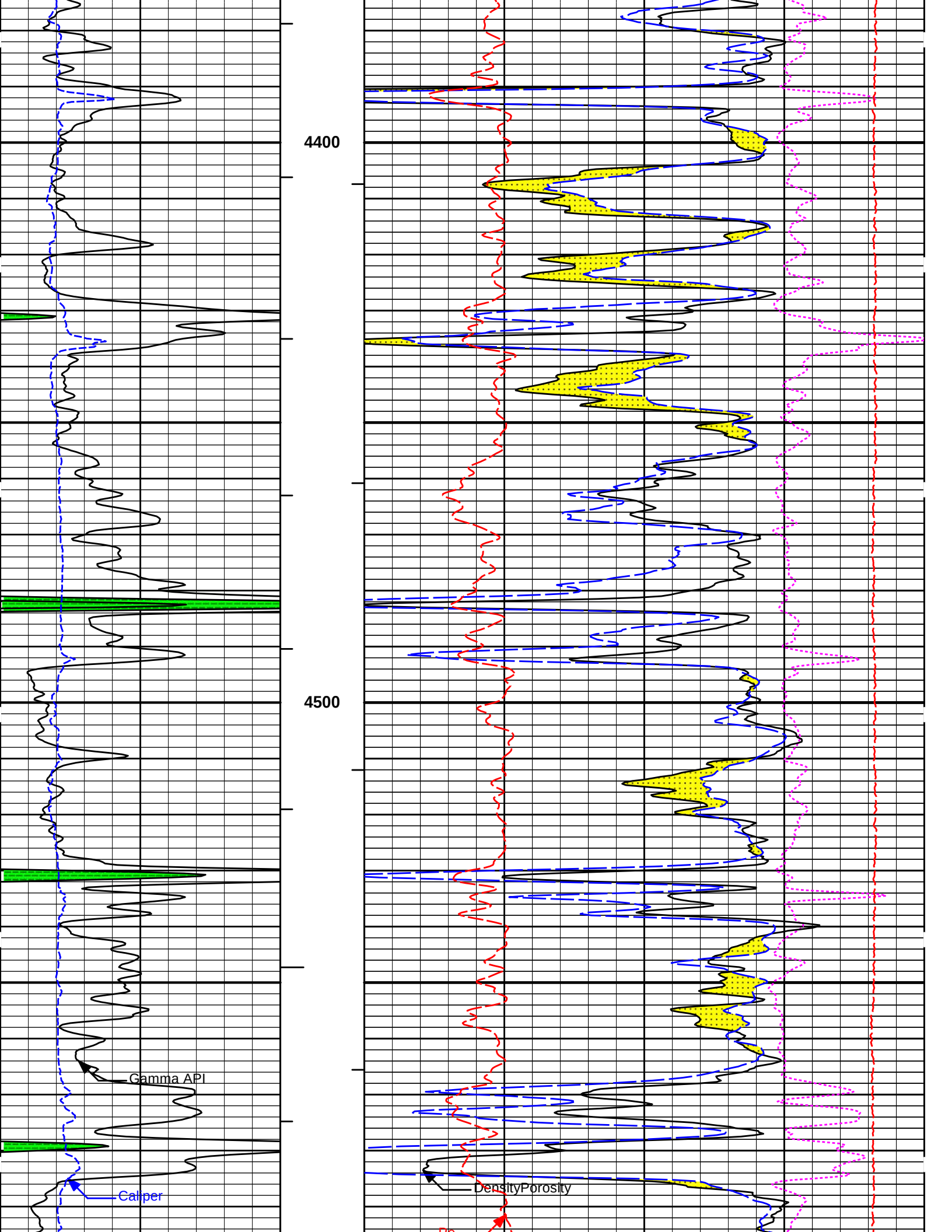
Plot Time: 10-Sep-14 20:33:01
Plot Range: 3895 ft to 4828.83 ft
Data: RANDEL_3-20\Well Based\R1 DETAIL
Plot File: \\POROSITY\Poro_IQ_5_MAIN_LIB

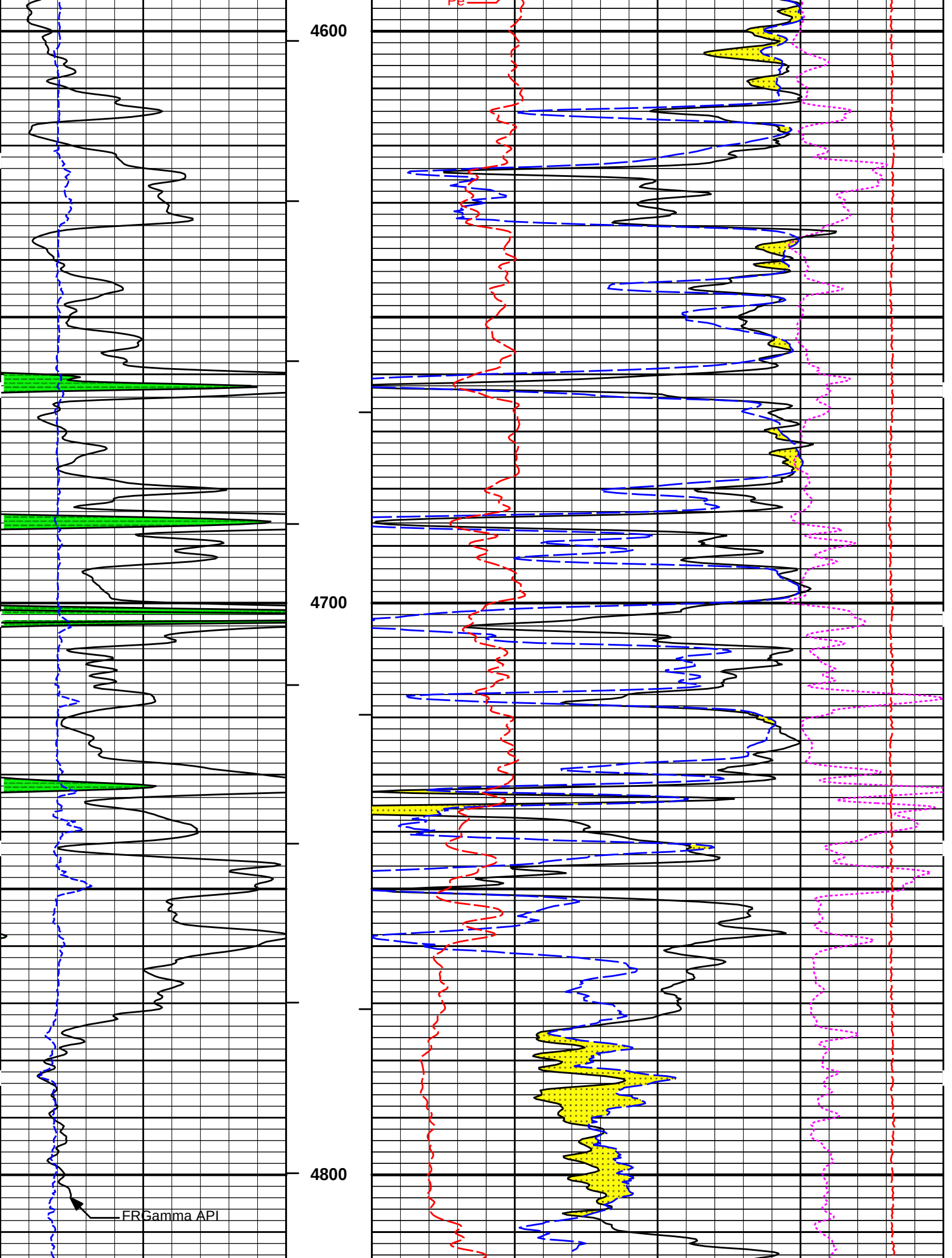
5 INCH MAIN LOG

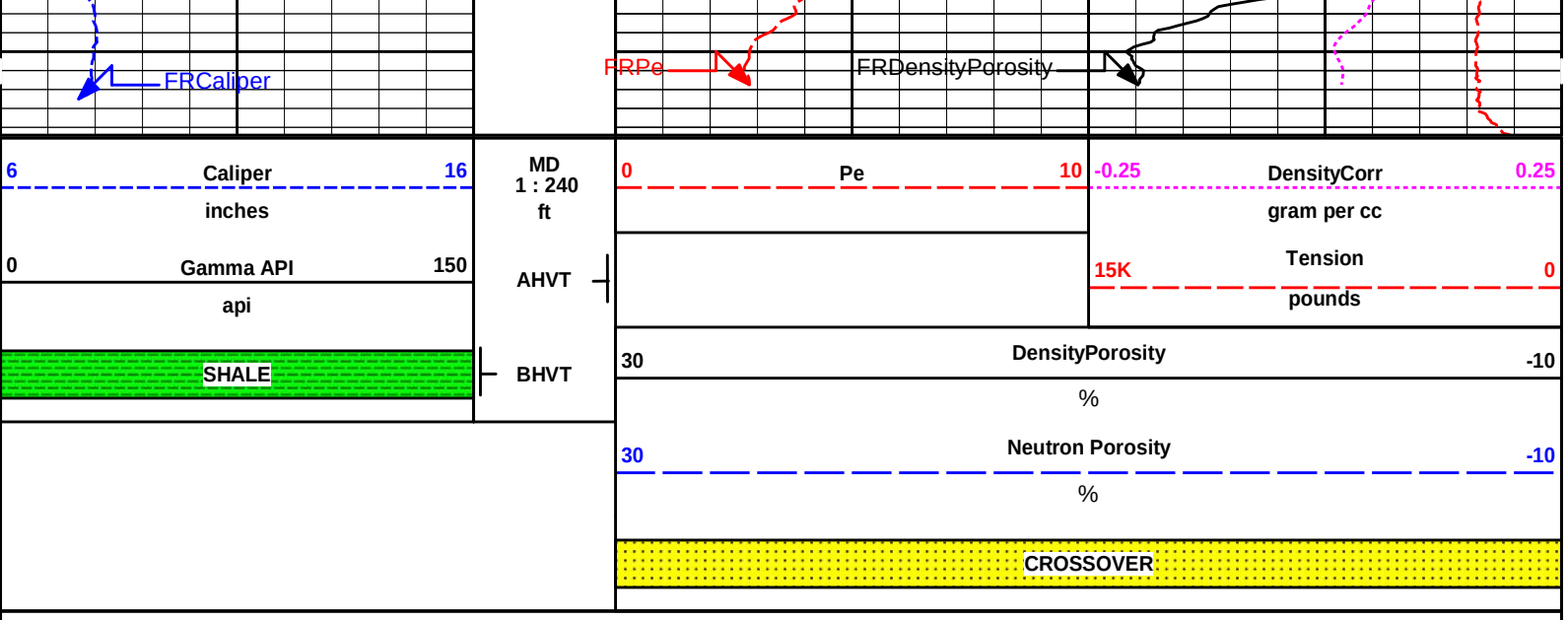



4000
4100
Gamma API
Caliper
Pe
DensityPorosity


4200
4300
Gamma API
Caliper
Pe
DensityPorosity


4400
4500
Gamma API
Caliper
DensityPorosity


Pe
4600
4700
4800
FRGamma API



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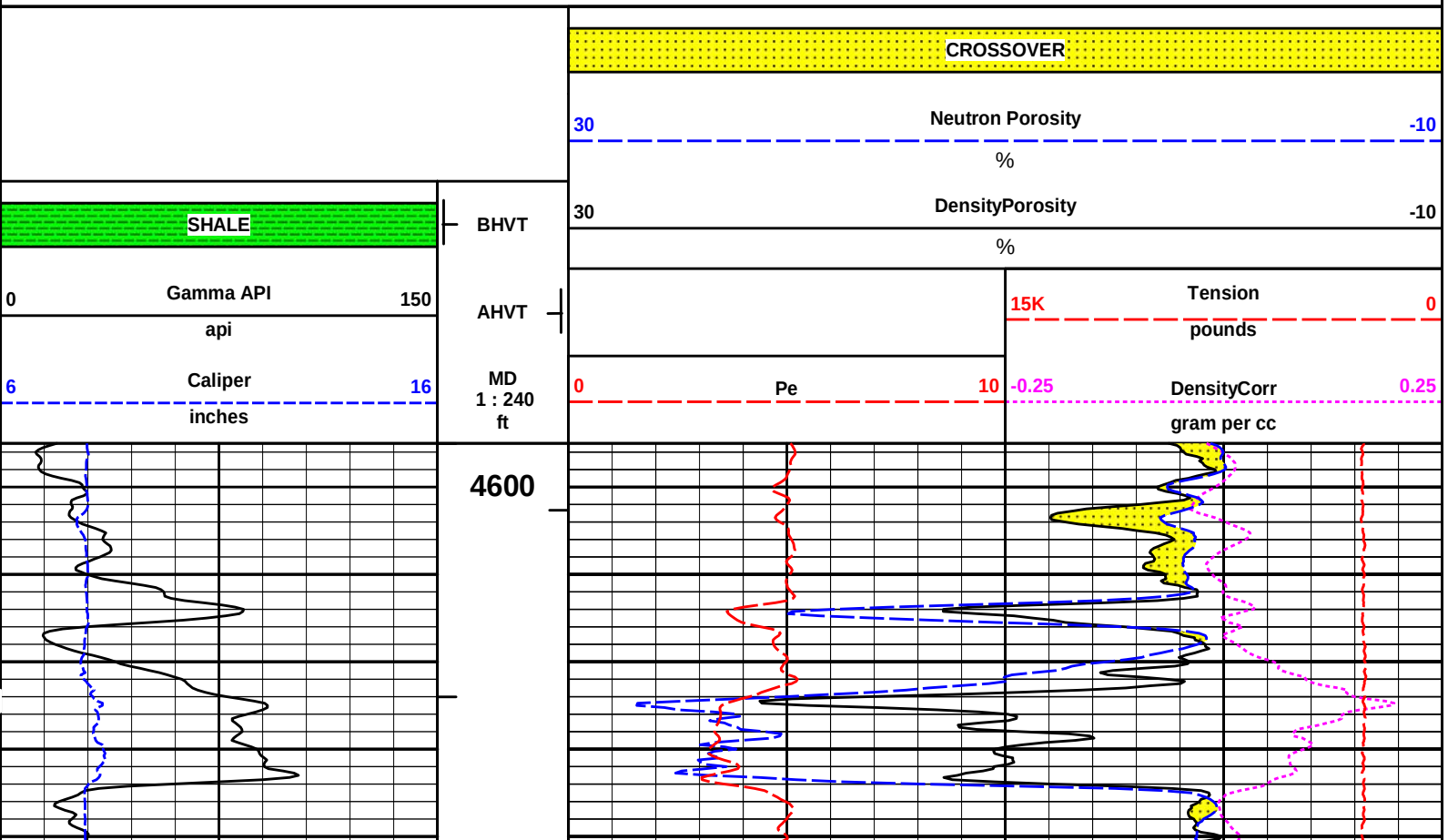
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Data: RANDEL_3-20\Well Based\R1 DETAIL\
Plot File: \\POROSITY\Poro_IQ_5_MAIN_LIB

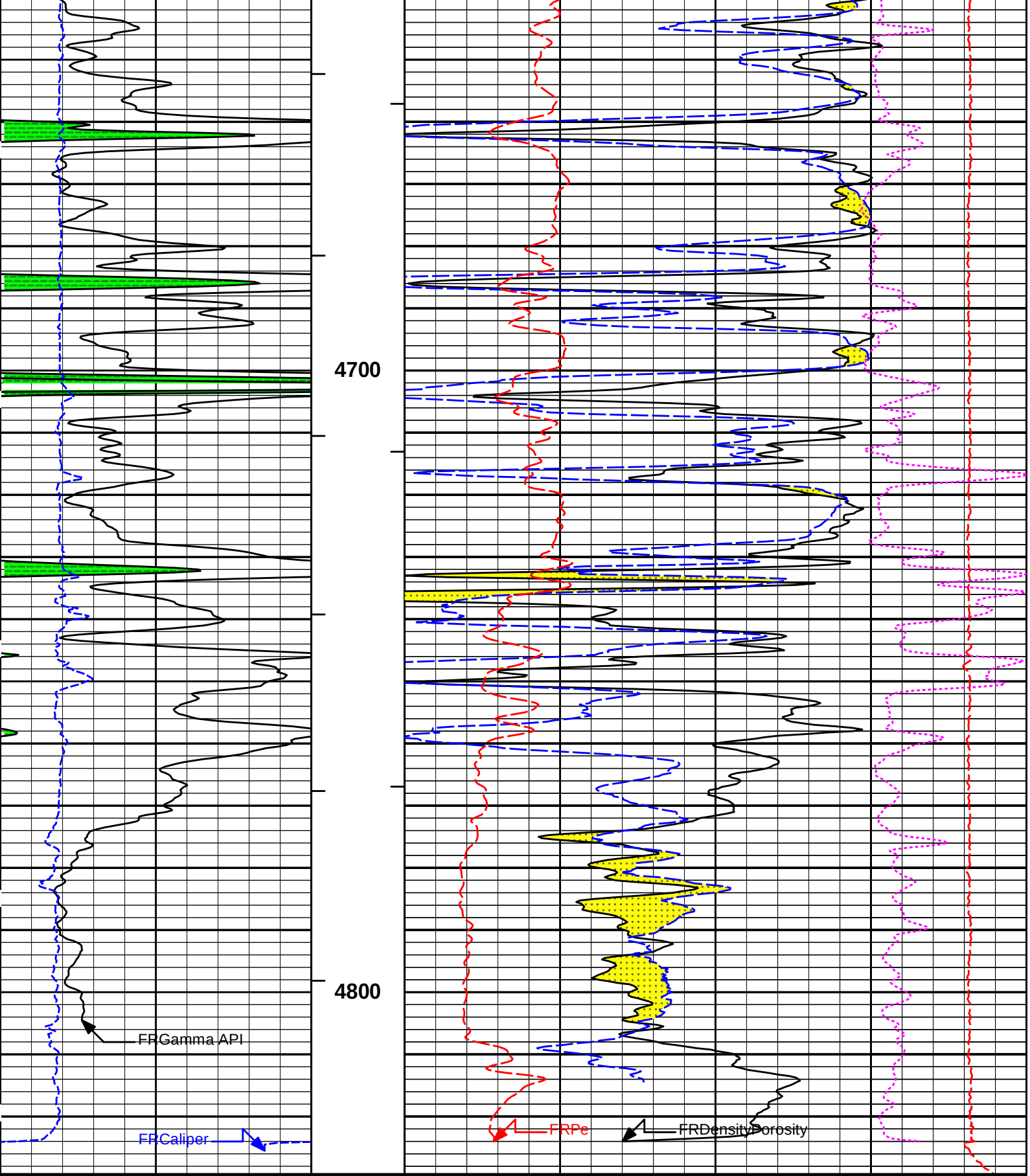
5 INCH MAIN LOG

HALLIBURTON

Plot Time: 10-Sep-14 20:33:04
Plot Range: 4595 ft to 4829.25 ft
Data: RANDEL_3-20\Well Based\R1 REPEAT\
Plot File: \\POROSITY\Poro_IQ_5_REP_LIB

REPEAT SECTION





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

30 Neutron Porosity -10

%

CROSSOVER

HALLIBURTON

Plot Time: 10-Sep-14 20:33:05
Plot Range: 4595 ft to 4829.25 ft
Data: RANDEL_3-20\Well Based\R1 REPEAT\
Plot File: \\POROSITY\Poro_IQ_5_REP_LIB

REPEAT SECTION

HALLIBURTON

Plot Time: 10-Sep-14 20:33:05
Plot Range: 3895 ft to 4828.83 ft
Data: RANDEL_3-20\Well Based\R1 DETAIL\
Plot File: \\-LOCAL-\RANDEL_3-20\Well Based\POROSITY\BULKD_5_MAIN_LIB

5 INCH MAIN LOG

SHALE

0 Gamma Ray 150
api

18 FarQuality -2

-18 NearQuality 2

6 Caliper 16
inches

BHV
ft3

AHV
ft3

MD
1 : 240
ft

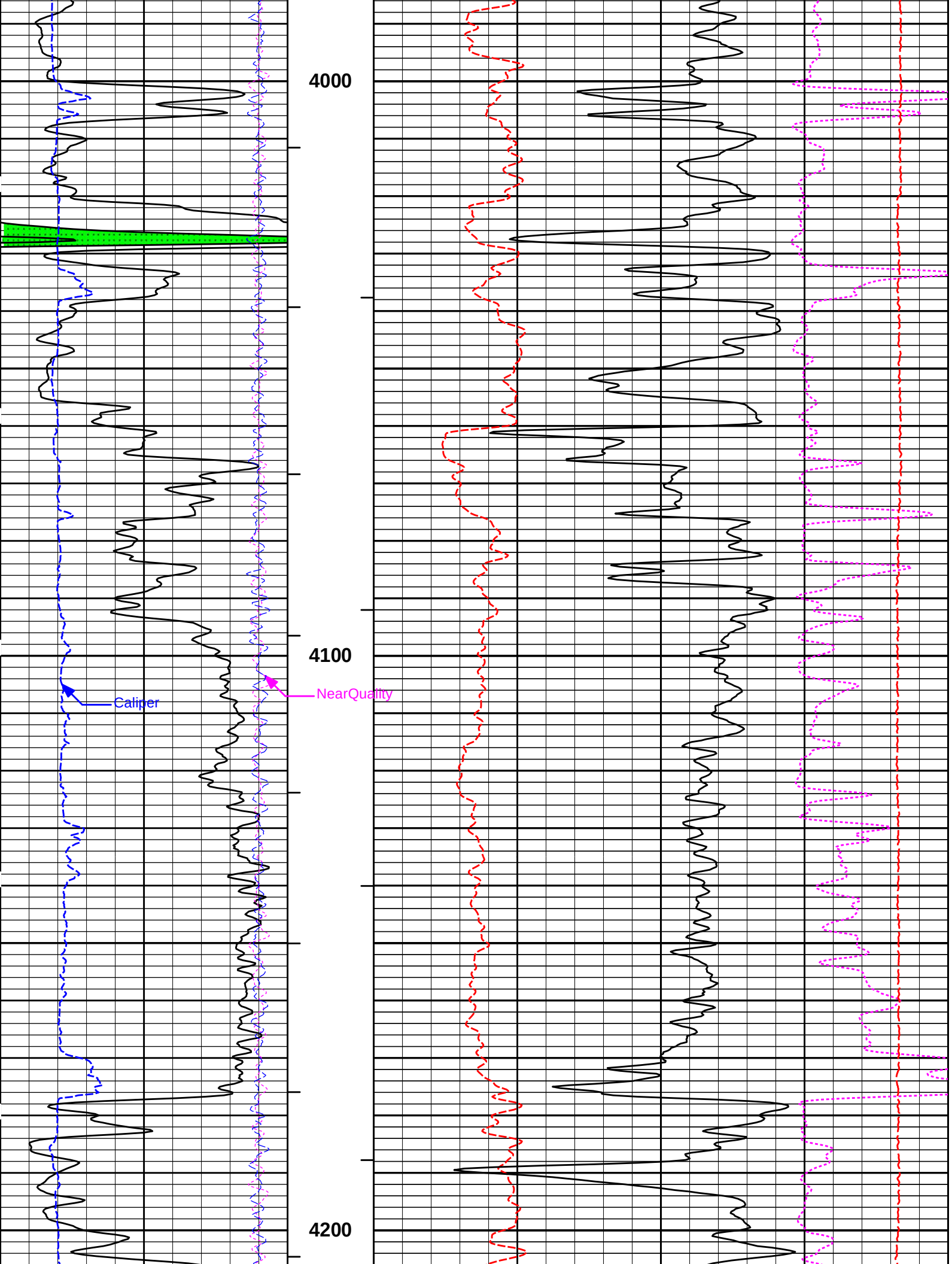
2 Bulk Density 3
g/cc

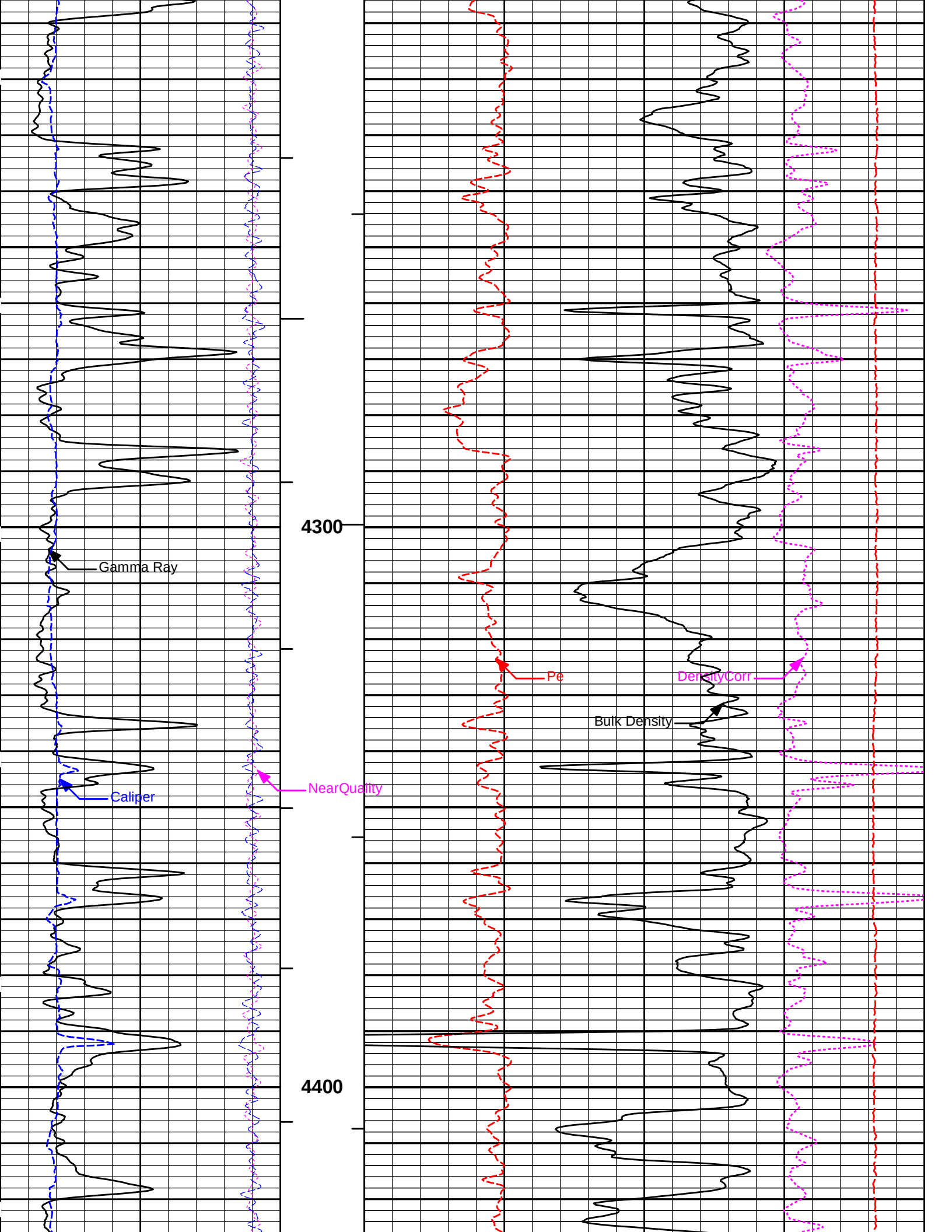
15K Tension 0
pounds

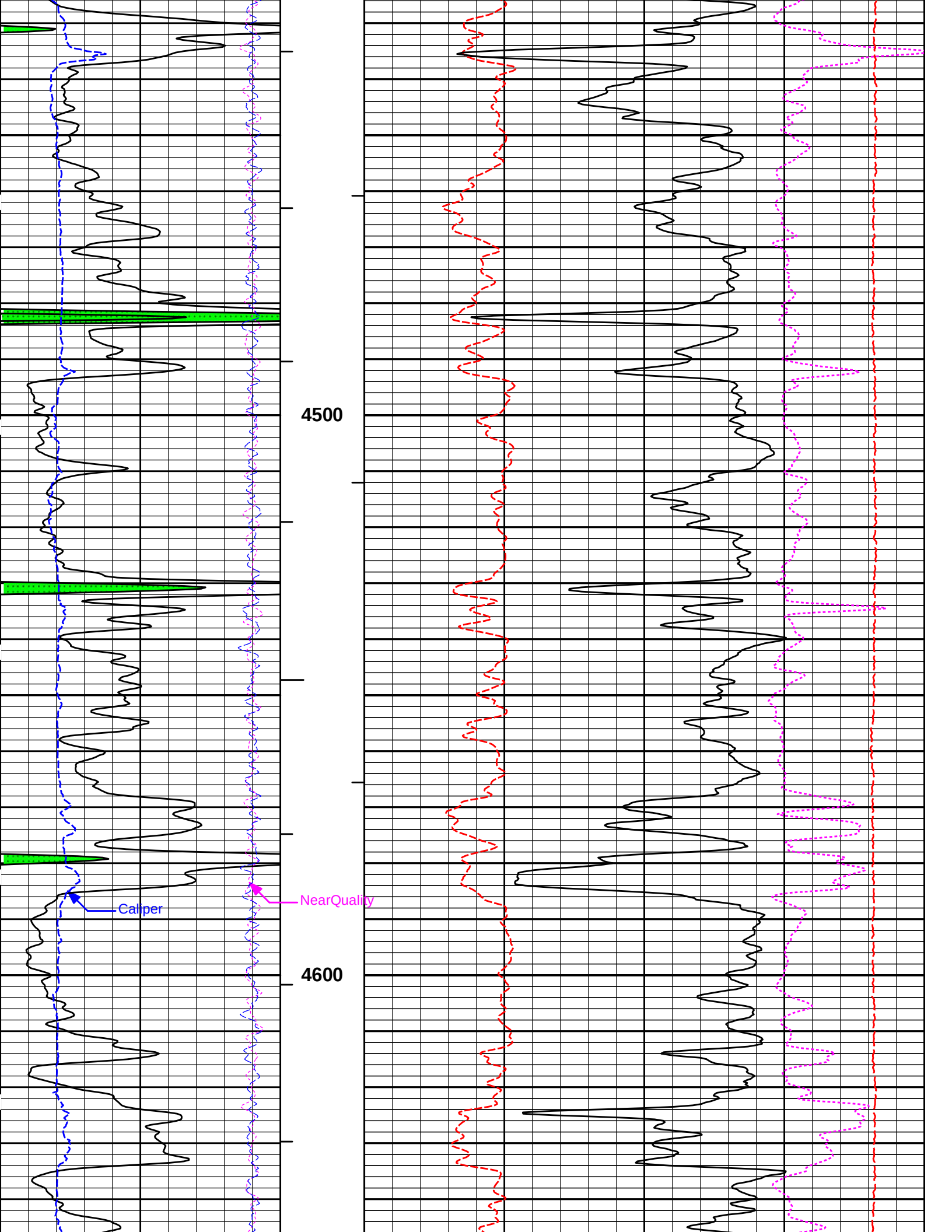
0 Pe 10

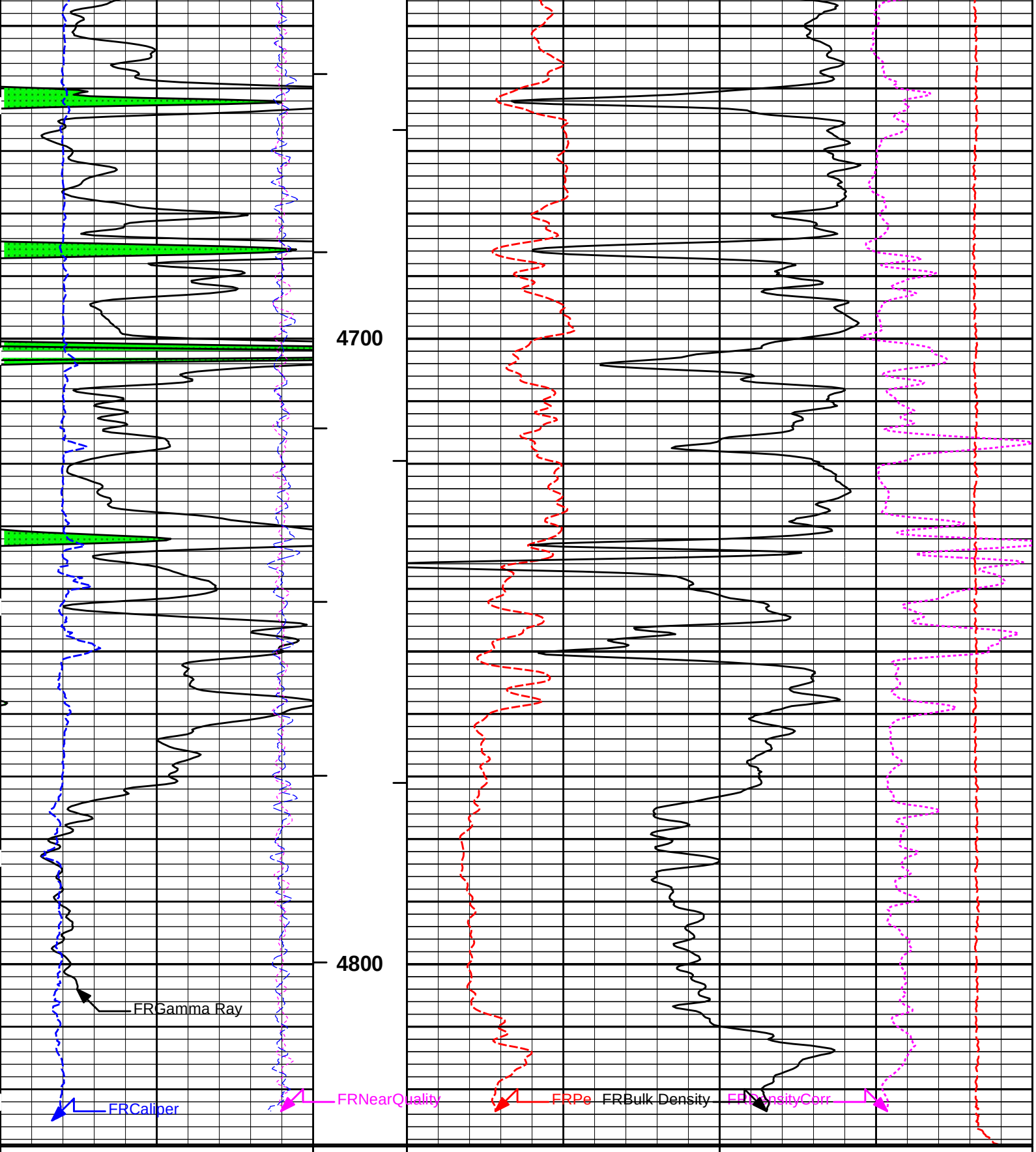
-0.25 DensityCorr 0.25
g/cc

3900


4000
4100
4200
Caliper
NearQuality


4300
4400
Gamma Ray
Caliper
NearQuality
Pe
DensityCorr
Bulk Density


4500
4600
Caliper
NearQuality



6 Caliper 16	MD 1 : 240 ft	0 Pe 10
inches		
-18 NearQuality 2	AHV ft3	
18 FarQuality -2	BHV ft3	2 Bulk Density 3
		g/cc
0 Gamma Ray 150		

-0.25 DensityCorr 0.25	
g/cc	
15K Tension 0	
pounds	

api

SHALE

HALLIBURTON

Plot Time: 10-Sep-14 20:33:07
Plot Range: 3895 ft to 4828.83 ft
Data: RANDEL_3-20\Well Based\R1 DETAIL\
Plot File: \\-LOCAL-\RANDEL_3-20\Well Based\POROSITY\BULKD_5_MAIN_LIB

5 INCH MAIN LOG

HALLIBURTON

Plot Time: 10-Sep-14 20:33:07
Plot Range: 4595 ft to 4829.25 ft
Data: RANDEL_3-20\Well Based\R1 REPEAT\
Plot File: \\-LOCAL-\RANDEL_3-20\Well Based\POROSITY\BULKD_5_REP_LIB

REPEAT SECTION

SHALE

0 Gamma Ray 150
api

18 FarQuality -2

-18 NearQuality 2

6 Caliper 16
inches

BHV
ft3

AHV
ft3

MD
1 : 240
ft

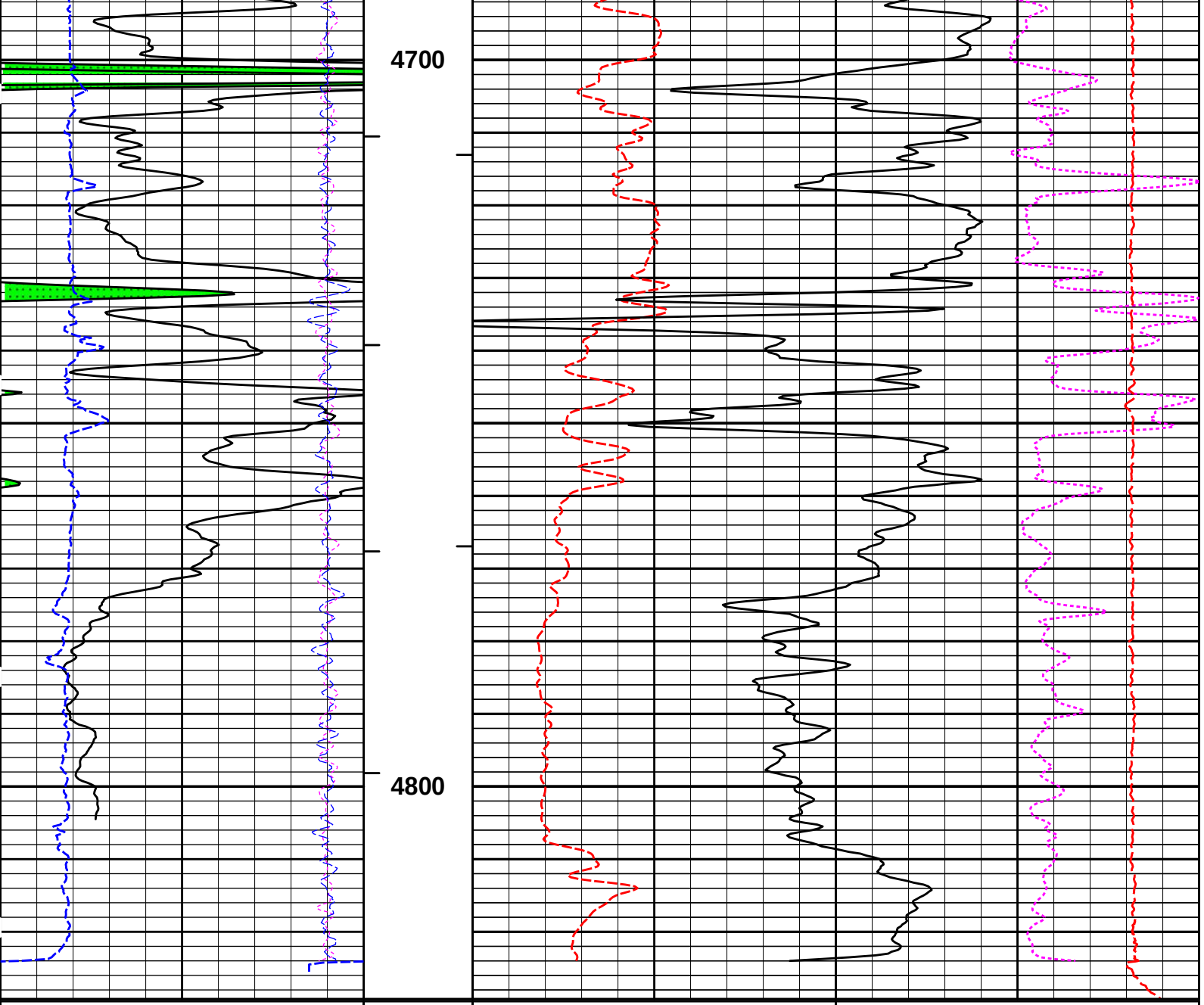
2 Bulk Density 3
g/cc

15K Tension 0
pounds

0 Pe 10

-0.25 DensityCorr 0.25
g/cc

4600



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

HALLIBURTON

Plot Time: 10-Sep-14 20:33:09
Plot Range: 4595 ft to 4829.25 ft
Data: RANDEL_3-20\Well Based\R1 REPEAT\
Plot File: \\-LOCAL-\RANDEL_3-20\Well Based\POROSITY\BULKD_5_REP_LIB

REPEAT SECTION

HALLIBURTON

TOOL STRING DIAGRAM REPORT

Description	Overbody Description	O.D.	Diagram	Sensors @ Delays	Length	Accumulated Length
						39.70 ft
RWCH-12156658 135.00 lbs		Ø 3.625 in		Load Cell @ 36.02 ft BH Temperature @ 35.45 ft	6.25 ft	
						33.45 ft
SP Sub-12345678 60.00 lbs		Ø 3.625 in		SP @ 31.67 ft	3.74 ft	
						29.71 ft
GTET-10748374 165.00 lbs		Ø 3.625 in		GammaRay @ 23.65 ft	8.52 ft	
						21.19 ft
DSNT-10755066 174.00 lbs	DSN Decentralizer-10735145 6.60 lbs	Ø 5.000 in* Ø 3.625 in		DSN Far @ 14.26 ft DSN Near @ 13.51 ft	9.69 ft	
						11.51 ft
SDLT-10685803 360.00 lbs	SDLT Pad-10714945 65.00 lbs Microlog Pad-10685803 8.00 lbs	Ø 4.500 in Ø 4.750 in* Ø 4.750 in*		Microlog @ 3.69 ft SDL Caliper @ 3.51 ft SDL @ 3.50 ft	10.81 ft	
						0.69 ft
RBP-25K-00000001 16.00 lbs		Ø 4.750 in Ø 3.370 in			0.36 ft	
						0.33 ft
Bull Nose-00000668 5.00 lbs		Ø 2.750 in			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	33.45	300.00
SP	SP Sub	12345678	60.00	3.74	29.71	300.00
GTET	Gamma Telemetry Tool	10748374	165.00	8.52	21.19	60.00
DSNT	Dual Spaced Neutron	10755066	174.00	9.69	11.51	60.00

DCNT	DSN Decentralizer	10735145	6.60	5.13	*	14.84	300.00
SDLT	Spectral Density Tool	10685803	360.00	10.81		0.69	60.00
SDLP	Density Insite Pad	10714945	65.00	2.55	*	2.90	60.00
MICP	Microlog Pad	10685803	8.00	1.00	*	3.19	60.00
BLNS	Bull Plug	00000001	16.00	0.36		0.33	300.00
BLNS	Bull Nose	00000668	5.00	0.33		0.00	300.00
Total			**994.60**	**39.70**			

* Not included in Total Length and Length Accumulation.

Data: RANDEL_3-20\0001 GTET-DSN-SDL-BP\IDLE **Date: 10-Sep-14 17:42:22**

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	9.100	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	1.000	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	4827.00	ft
	SHARED	BHT	Bottom Hole Temperature	125.0	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?	No	
	GTET	TPOS	Tool Position for Gamma Ray Tools.	Eccentered	
	GTET	BHSM	Borehole Size Source Tool	SDLT	
	DSNT	DNOK	Process DSN?	Yes	

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	
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?	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	
Microlog Pad	MLOK	Process MicroLog Outputs?	Yes	

BOTTOM

Data: RANDEL_3-20\0001 GTET-DSN-SDL-BP\004 10-Sep-14 18:38 Up @4829.0f **Date: 10-Sep-14 19:11:06**

HALLIBURTON

CALIBRATION REPORT

NATURAL GAMMA RAY TOOL SHOP CALIBRATION

Tool Name:	**GTET - 10748374**	**Reference Calibration Date:**	**02-Jul-14 13:05:19**
Engineer:	**SUHAIL BISHTI**	**Calibration Date:**	**19-Aug-14 17:33:09**
Software Version:	**WL INSITE R4.2.0 (Build 2)**	**Calibration Version:**	**1**

Calibrator Source S/N: TB-185

Calibrator API Reference:228.00 api

Equivalent Calibrator API Reference:232.0 api

Measurement	Measured	Calibrated	Units
Background	45.2	45.3	api
Background + Calibrator	276.7	277.3	api
Calibrator	231.5	232.0	api

NATURAL GAMMA RAY TOOL FIELD CALIBRATION

Tool Name:	**GTET - 10748374**	**Reference Calibration Date:**	**19-Aug-14 17:33:09**
Engineer:	**JORGE ORLANDO PEREZ**	**Calibration Date:**	**04-Sep-14 18:28:51**
Software Version:	**WL INSITE R4.2.0 (Build 2)**	**Calibration Version:**	**1**

Calibrator Source S/N: TB-185

Calibrator API Reference:228.00 api

Equivalent Calibrator API Reference:232.0 api

Field Verification	Shop	Field	Units
Background	45.3	44.0	api
Background + Calibrator	277.3	276.5	api
Calibrator	232.0	232.4	api

Shop	Field	Difference	Tolerance

Shop	Field	Difference	Tolerance
232.0	232.4	-0.4	+/- 9.00

DUAL SPACED NEUTRON SHOP CALIBRATION

Tool Name: DSNT - 10755066 **Reference Calibration Date:** 02-Jul-14 14:22:03

Engineer: SUHAIL BISHTI **Calibration Date:** 20-Aug-14 11:22:48

Software Version: WL INSITE R4.2.0 (Build 2) **Calibration Version:** 1

Logging Source S/N: DSN-436

Tank Serial Number: LIBERAL

Reference value assigned to Tank: 51.680

Snow Block S/N: 668

Calibration Tank Water Temperature: 80 degF

Min. Tool Housing Outside Diameter: 3.625 in

CALIBRATION CONSTANTS

Measurement	Prev. Value	New Value	Control Limit On New Value
Gain:	0.945	0.946	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):	0.2108	0.2110	0.0001	+/- 0.0020
Calibrated Ratio:	9.72	9.73	0.005	+/- 0.050

VERIFIER

Measurement	Value	Control Limit
Snow-Block Porosity (decp):	0.0610	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 - 10755066 **Reference Calibration Date:** 20-Aug-14 11:22:48

Engineer: JORGE ORLANDO PEREZ **Calibration Date:** 04-Sep-14 13:54:58

Software Version: WL INSITE R4.2.0 (Build 2) **Calibration Version:** 1

Logging Source S/N: DSN-436

Snow Block S/N: 668

NEUTRON FIELD-CHECK SUMMARY

	Shop	Field	Difference	Control Limit On Change
Snow-Block Porosity (decp):	0.0610	0.0746	0.0136	+/- 0.0150

PASS/FAIL SUMMARY

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

DENSITY CALIPER SHOP CALIBRATION

Tool Name: SDLT - 10685803 **Reference Calibration Date:** 04-Sep-14 18:38:16

Engineer: J. BOLLOM **Calibration Date:** 04-Sep-14 18:42:33

Software Version:	**WL INSITE R4.2.0 (Build 2)**	**Calibration Version:**	**1**
Host Tool Name:	**DSNT - 10755066**		

CALIBRATION COEFFICIENTS

Measurement	Previous Value	New Value	Control Limit On New Value
Pad Offset	-4479.02	-4510.28	-7000.00 - -1000.00
Pad Gain	0.0003805	0.0003819	0.000200 - 0.000600
Arm Offset	-3507.50	-3665.19	-5000.00 - 3000.00
Arm Gain	0.0004378	0.0004740	0.000300 - 0.000700
Arm Power	0.000000875	-0.000002234	-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)	2.00	2.00	0.00	+/- 0.20
Medium Ring (in)	3.75	3.75	0.00	+/- 0.20
RING DIAMETER:				
Small Ring (in)	6.45	6.50	0.05	+/- 0.20
Medium Ring (in)	8.14	8.25	0.11	+/- 0.20
Large Ring (in)	15.02	15.00	-0.02	+/- 0.20

PASS/FAIL SUMMARY

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

PASS/FAIL SUMMARY

Calibration-Coefficients Range Check:	Passed

SDLT CALIPER FIELD CALIBRATION

Tool Name:	**SDLT - 10685803**	**Reference Calibration Date:**	**04-Sep-14 18:42:33**
Engineer:	**J. BOLLOM**	**Calibration Date:**	**04-Sep-14 18:44:11**
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	8.34	0.09	+/- 0.15

PASS/FAIL SUMMARY

Pad Extension Check:	Passed
Diameter Check:	Passed

SPECTRAL DENSITY SHOP CALIBRATION

Tool Name:	**SDLT Pad - 10714945**	**Reference Calibration Date:**	**20-Aug-14 14:20:19**
Engineer:	**SUHAIL BISHTI**	**Calibration Date:**	**20-Aug-14 14:38:07**
Software Version:	**WL INSITE R4.2.0 (Build 2)**	**Calibration Version:**	**1**

Logging Source S/N: 5073 GW

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	1.0235	1.0340	0.90 - 1.10
Near Dens Gain	1.0049	1.0065	0.90 - 1.10
Near Peak Gain	0.9922	1.0061	0.90 - 1.10
Near Lith Gain	0.9748	1.0044	0.90 - 1.10
Far Bar Gain	1.0071	1.0053	0.90 - 1.10
Far Dens Gain	0.9953	0.9960	0.90 - 1.10
Far Peak Gain	0.9912	0.9884	0.90 - 1.10
Far Lith Gain	0.9648	0.9647	0.90 - 1.10
Near Bar Offset	0.0989	0.0043	NONE
Near Dens Offset	0.2382	0.2262	NONE
Near Peak Offset	0.3240	0.2124	NONE
Near Lith Offset	0.4249	0.1827	NONE
Far Bar Offset	0.1389	0.1560	NONE
Far Dens Offset	0.2208	0.2118	NONE
Far Peak Offset	0.2339	0.2577	NONE
Far Lith Offset	0.3879	0.3889	NONE
Near Bar Background	943.61	943.32	700 - 1450
Near Dens Background	315.04	313.81	230 - 480
Near Peak Background	136.70	137.09	100 - 210
Near Lith Background	167.21	166.35	125 - 260
Far Bar Background	480.60	483.86	450 - 900
Far Dens Background	188.22	186.79	175 - 345
Far Peak Background	73.47	73.07	70 - 140
Far Lith Background	76.86	77.43	75 - 145

CALIBRATION BLOCK SUMMARY

Measurement	Current Reading (Previous Coef)	Calibrated (New Coef)	Change	Control Limit On Change
MAGNESIUM				
Density (g/cc)	1.681	1.684	0.003	+/- 0.015
Pe	2.605	2.567	-0.038	+/- 0.150
ALUMINUM				
Density (g/cc)	2.598	2.598	0.000	+/- 0.01500
Pe	3.137	3.136	-0.001	+/- 0.150

TOOL SUMMARY

Measurement	Near Detector		Far Detector	
	Value	Control Limits	Value	Control Limits
QUALITY				
Background	0.0009	+/- 0.0110	0.0025	+/- 0.0140
Magnesium Block	-0.0002	+/- 0.0110	-0.0010	+/- 0.0140
Aluminum Block	-0.0010	+/- 0.0110	-0.0004	+/- 0.0140
Resolution	9.95	6.00 - 11.50	9.13	6.00 - 11.50
Internal Verifier(B+D+P+L)	1561	1200 - 2700	821	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 - 10714945**	**Reference Calibration Date:**	**20-Aug-14 14:38:07**
Engineer:	**J. BOLLOM**	**Calibration Date:**	**04-Sep-14 18:29:32**
Software Version:	**WL INSITE R4.2.0 (Build 2)**	**Calibration Version:**	**1**

Pad Temperature: 92.9 degF

DENSITY FIELD CALIBRATION SUMMARY

Measurement	Shop	Field	Change	Control Limit +/-
Near (B+D+P+L) cps	1560.571	1556.189	-4.382	15.898
Far (B+D+P+L) cps	821.153	826.180	5.027	15.807
Near Resolution	9.95	9.84	-0.110	0.50
Far Resolution	9.13	9.30	0.170	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-10748374						
Gamma Ray Calibrator	232.0	232.4	----------	-0.4	+/- 9.00	api
DSNT-10755066						
Snow-Block Porosity	0.0610	0.0746	----------	-0.0136	+/- 0.0150	decp
SDLT-10685803						
Pad Extension	3.75	3.75	----------	0.00	+/-0.10	in
Ring Diameter	8.25	8.34	----------	-0.09	+/-0.15	in
SDLT Pad-10714945						
Near(B+D+P+L)	1560.571	1556.189	----------	4.382	+/-15.898	cps
Far(B+D+P+L)	821.153	826.180	----------	-5.027	+/-15.807	cps

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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	39.70	NO	
BS	Bit Size	39.70	NO	
HDIA	Measured Hole Diameter	0.00	NO	
RWCH				
DHTN	DownholeTension	0.00	BLK	0.000

SP Sub				
PLTC	Plot Control Mask	31.67	NO	
SP	Spontaneous Potential	31.67	BLK	1.250
SPR	Raw Spontaneous Potential	31.67	NO	
SPO	Spontaneous Potential Offset	31.67	NO	
GTET				
TPUL	Tension Pull	23.65	NO	
GR	Natural Gamma Ray API	23.65	TRI	1.750
GRU	Unfiltered Natural Gamma Ray API	23.65	NO	
EGR	Natural Gamma Ray API with Enhanced Vertical Resolution	23.65	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	13.41	NO	
RNDS	Near Detector Telemetry Counts	13.51	BLK	1.417
RFDS	Far Detector Telemetry Counts	14.26	TRI	0.583
DNTT	DSN Tool Temperature	13.51	NO	
DSNS	DSN Tool Status	13.41	NO	
ERND	Near Detector Telemetry Counts EVR	13.51	BLK	0.000
ERFD	Far Detector Telemetry Counts EVR	14.26	BLK	0.000
ENTM	DSN Tool Temperature EVR	13.51	NO	
HDIA	Measured Hole Diameter	0.00	NO	
SDLT				
TPUL	Tension Pull	3.51	NO	
PCAL	Pad Caliper	3.51	TRI	0.250
ACAL	Arm Caliper	3.51	TRI	0.250
SDLT Pad				
TPUL	Tension Pull	3.50	NO	
NAB	Near Above	3.32	BLK	0.920
NHI	Near Cesium High	3.32	BLK	0.920
NLO	Near Cesium Low	3.32	BLK	0.920
NVA	Near Valley	3.32	BLK	0.920
NBA	Near Barite	3.32	BLK	0.920
NDE	Near Density	3.32	BLK	0.920
NPK	Near Peak	3.32	BLK	0.920
NLI	Near Lithology	3.32	BLK	0.920
NBAU	Near Barite Unfiltered	3.32	BLK	0.250
NLIU	Near Lithology Unfiltered	3.32	BLK	0.250
FAB	Far Above	3.67	BLK	0.250
FHI	Far Cesium High	3.67	BLK	0.250
FLO	Far Cesium Low	3.67	BLK	0.250
FVA	Far Valley	3.67	BLK	0.250
FBA	Far Barite	3.67	BLK	0.250
FDE	Far Density	3.67	BLK	0.250
FPK	Far Peak	3.67	BLK	0.250
FLI	Far Lithology	3.67	BLK	0.250
PTMP	Pad Temperature	3.51	BLK	0.920
NHV	Near Detector High Voltage	2.90	NO	
FHV	Far Detector High Voltage	2.90	NO	
ITMP	Instrument Temperature	2.90	NO	
DDHV	Detector High Voltage	2.90	NO	

HDIA	Measured Hole Diameter	0.00	NO	

Microlog Pad

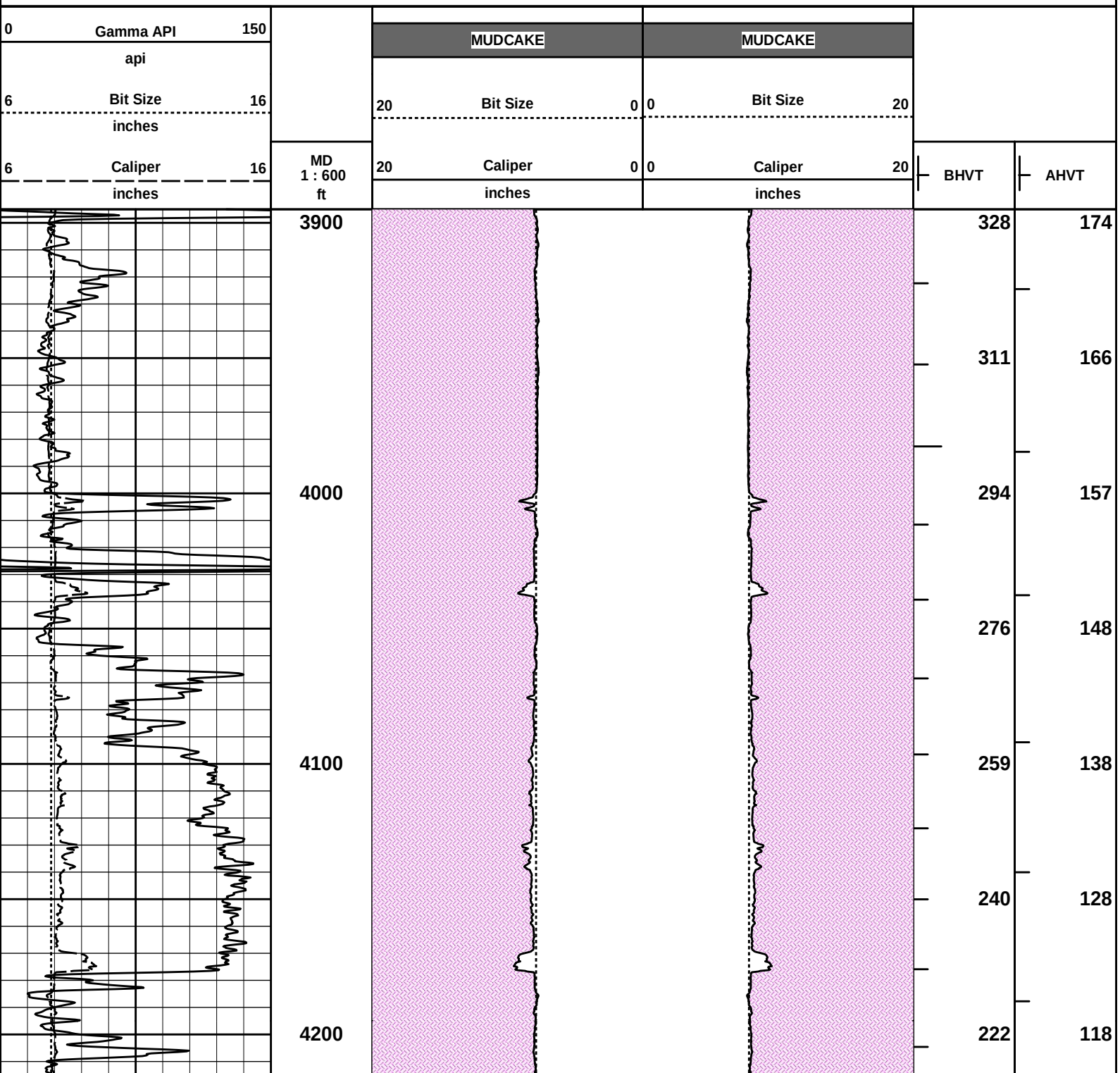
TPUL	Tension Pull	3.69	NO	
MINV	Microlog Lateral	3.69	BLK	0.750
MNOR	Microlog Normal	3.69	BLK	0.750

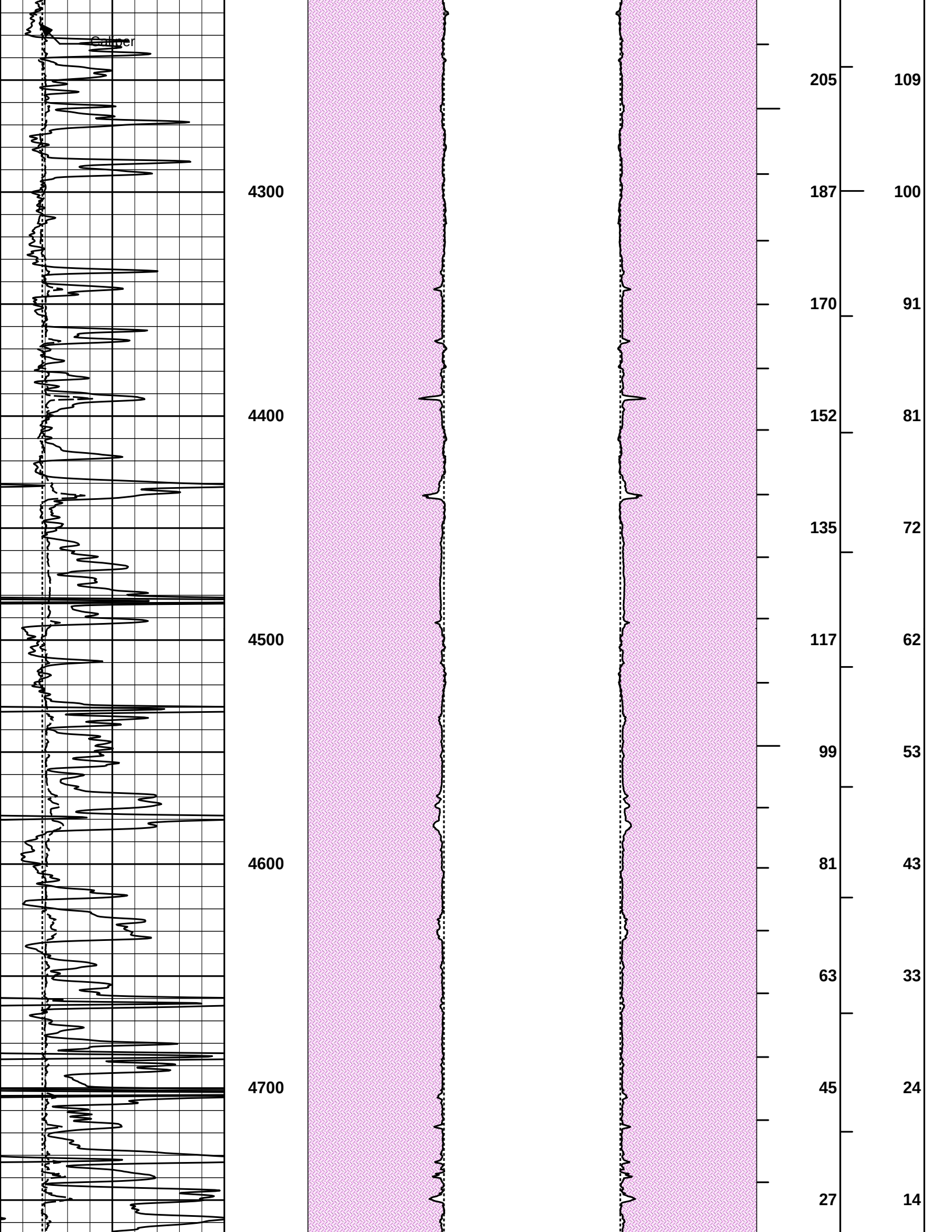
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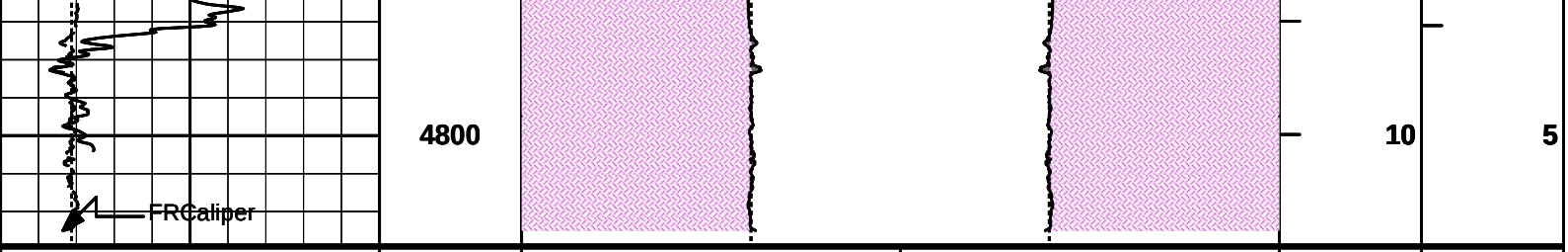
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Plot Time: 10-Sep-14 20:33:09
Plot Range: 3895 ft to 4828.83 ft
Data: RANDEL_3-20\Well Based\R1 DETAIL
Plot File: \\-LOCAL-\RANDEL_3-20\Well Based\POROSITY\AHV_2_IQ_LIB

ANNULAR HOLE VOLUME PLOT




Caliper
4300
4400
4500
4600
4700
205
187
170
152
135
117
99
81
63
45
27
109
100
91
81
72
62
53
43
33
24
14



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

HALLIBURTON

Plot Time: 10-Sep-14 20:33:11
Plot Range: 3895 ft to 4828.83 ft
Data: RANDEL_3-20\Well Based\R1 DETAIL
Plot File: \\-LOCAL-\RANDEL_3-20\Well Based\POROSITY\AHV_2_IQ_LIB

ANNULAR HOLE VOLUME PLOT

COMPANY	**HERMAN L. LOEB, LLC.**		
WELL	**RANDEL 3-20**		
FIELD	**EINSEL NORTH**		
COUNTY	**KIOWA**	STATE	**KANSAS**

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DUAL SPACED NEUTRON SPECTRAL DENSITY LOG