

HALLIBURTON

MICROLOG

COMPANY				MERIT ENERGY COMPANY			
WELL				UNRUH 1-7			
FIELD/BLOCK				WILDCAT			
COUNTY				HASKELL			
STATE				KANSAS			
Permanent Datum		GL		API No.		Other Services:	
Log measured from		KB		Location		GTET	
Drilling measured from		KB		(SHL) 1883' FSL & 2638' FWL		DSNT	
				NE SE NE SW		SDLT	
						MICROLOG	
						BSAT	
						ACRT	
Date		23-Jan-18		Sect. 7		Twp. 29S	
Run No.		ONE				Rge. 33W	
Depth - Driller		5600.0 ft					
Depth - Logger		5602.0 ft					
Bottom - Logged Interval		5564.0 ft					
Top - Logged Interval		1743.0 ft					
Casing - Driller		8.625 in		@ 1744.0 ft		@	
Casing - Logger		1743.0 ft					
Bit Size		7.875 in				@	
Type Fluid in Hole		Water Based Mud					
Density		9.2 ppg		64.00 s/qt			
PH		11.50 pH		5.6 cpm			
Source of Sample		MUD PIT					
Rm @ Meas. Temperature		1.10 ohmm		@ 75.00 degF		@	
Rmf @ Meas. Temperature		0.88 ohmm		@ 75.00 degF		@	
Rmc @ Meas. Temperature		1.32 ohmm		@ 75.00 degF		@	
Source Rmf		CALC		CALC			
Rm @ BHT		0.62 ohmm		@ 138.0 degF		@	
Time Since Circulation		5.00 hr					
Time on Bottom		23-Jan-18 16:59					
Max. Rec. Temperature		139.33 degF		@ 5391.2 ft		@	
Equipment		12147634		EL RENO			
Recorded By		JORGE ORLANDO PEREZ		SEAN WOLTEWATH			
Witnessed By		MARTIN LANGE					

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Service Ticket No.: 904583538						API No.: 15-081-22170-01						PGM Version: WL INSITE R5.0.5 (Build 8)					
CHANGE IN MUD TYPE OR ADDITIONAL SAMPLE								RESISTIVITY SCALE CHANGES									
Date	Sample No.							Type Log	Depth	Scale Up Hole			Scale Down Hole				
Depth-Driller																	
Type Fluid in Hole																	
Density	Viscosity																
Ph	Fluid Loss																
Source of Sample								RESISTIVITY EQUIPMENT DATA									
Rm @ Meas. Temp		@				@		Run No.	Tool Type & No.	Pad Type		Tool Pos.		Other			
Rmf @ Meas. Temp.		@				@		ONE	ACRT	N/A		1.50 in S.O.		N/A			
Rmc @ Meas. Temp.		@				@			I-12109517								
Source Rmf	Rmc								S-12109515								
Rm @ BHT		@				@											
Rmf @ BHT		@				@											
Rmc @ BHT		@				@											
EQUIPMENT DATA																	
GAMMA				ACOUSTIC				DENSITY				NEUTRON					
Run No.		ONE		Run No.		ONE		Run No.		ONE		Run No.		ONE			
Serial No.		11958947		Serial No.		10747683		Serial No.		10960494		Serial No.		11055304			
Model No.		GTET		Model No.		BSAT		Model No.		SDLT		Model No.		DSNT			
Diameter		3.625"		No. of Cent.		0		Diameter		5.5"		Diameter		3.625"			
Detector Model No.		T-102		Spacing		N/A		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		N/A		FWDA [Y/N]				Strength		1.5 Ci		Strength		15.0 Ci			
LOGGING DATA																	
GENERAL				GAMMA		ACOUSTIC			DENSITY			NEUTRON					
Run	Depth		Speed	Scale		Scale		Matrix	Scale		Matrix	Scale		Matrix			
No.	From	To	ft/min	L	R	L	R		L	R		L	R				
ONE	TD	5250	REC	0	150	30	-10	47.6 us/ft	30	-10	2.71 gm/cc	30	-10	LIME			

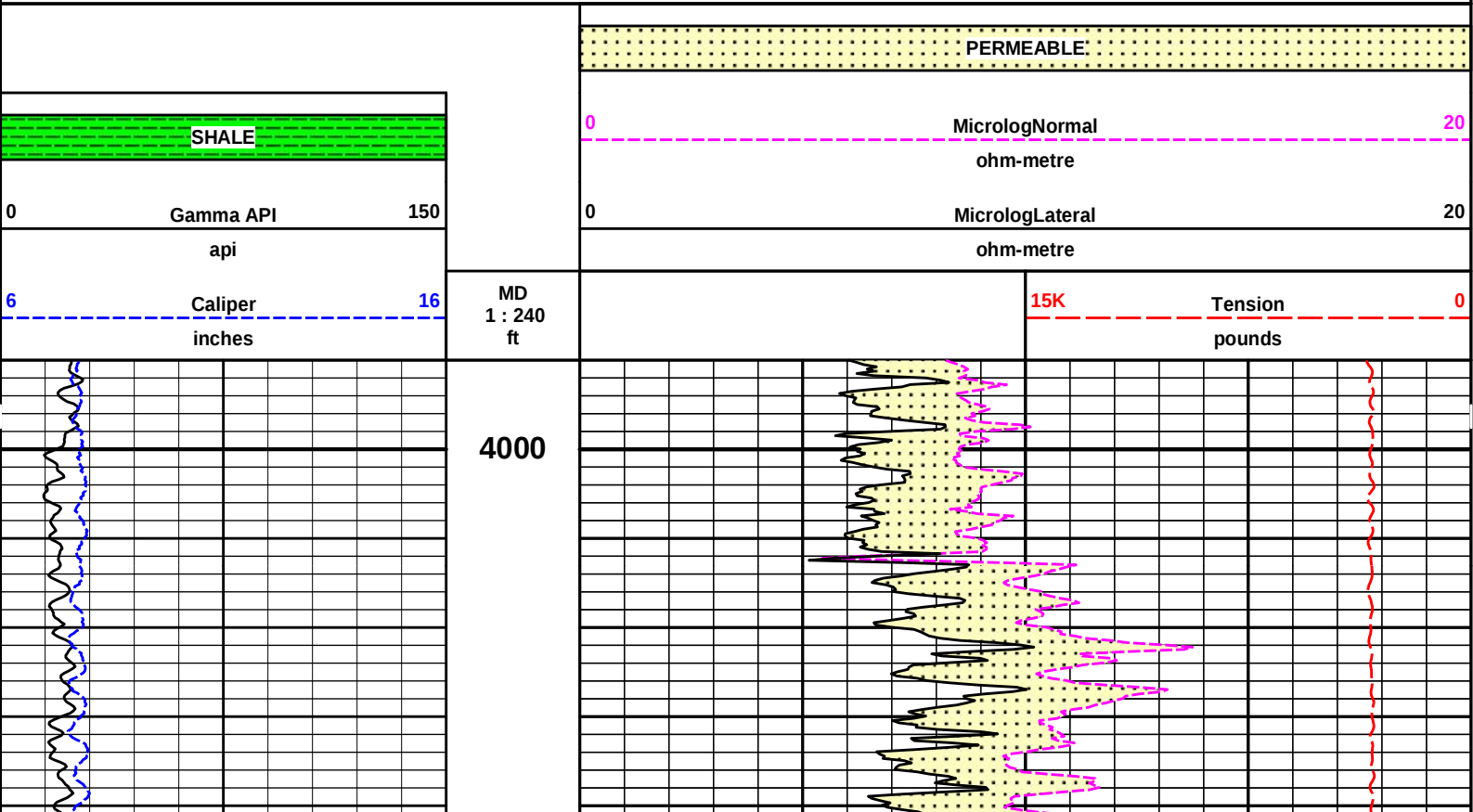
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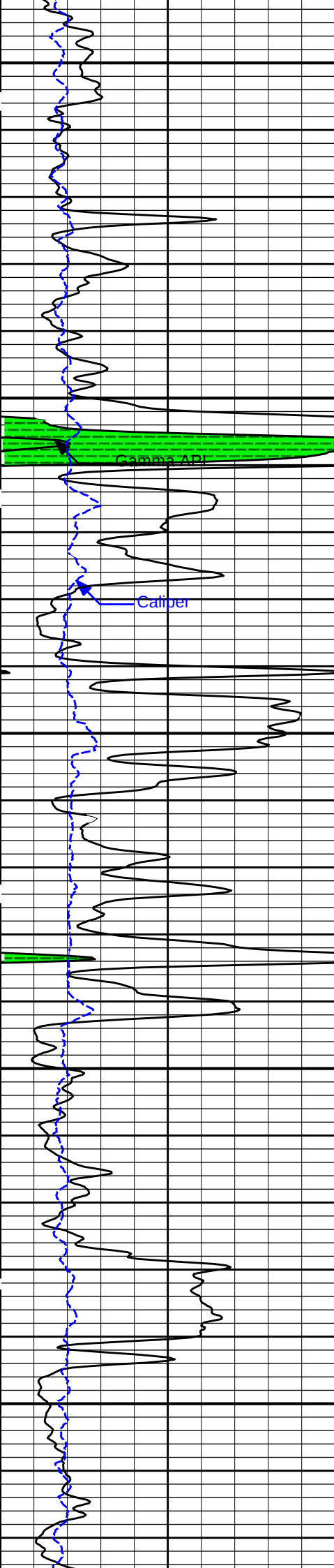
HALLIBURTON

Plot Time: 23-Jan-18 20:08:19
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Data: MERIT_UNRUH1-7\Well Based\MAIN\
Plot File: \\-LOCAL-\MERIT_UNRUH1-7\Well Based\MICROLOG\Microlog_IQ_5_main.lib

5 INCH MAIN LOG

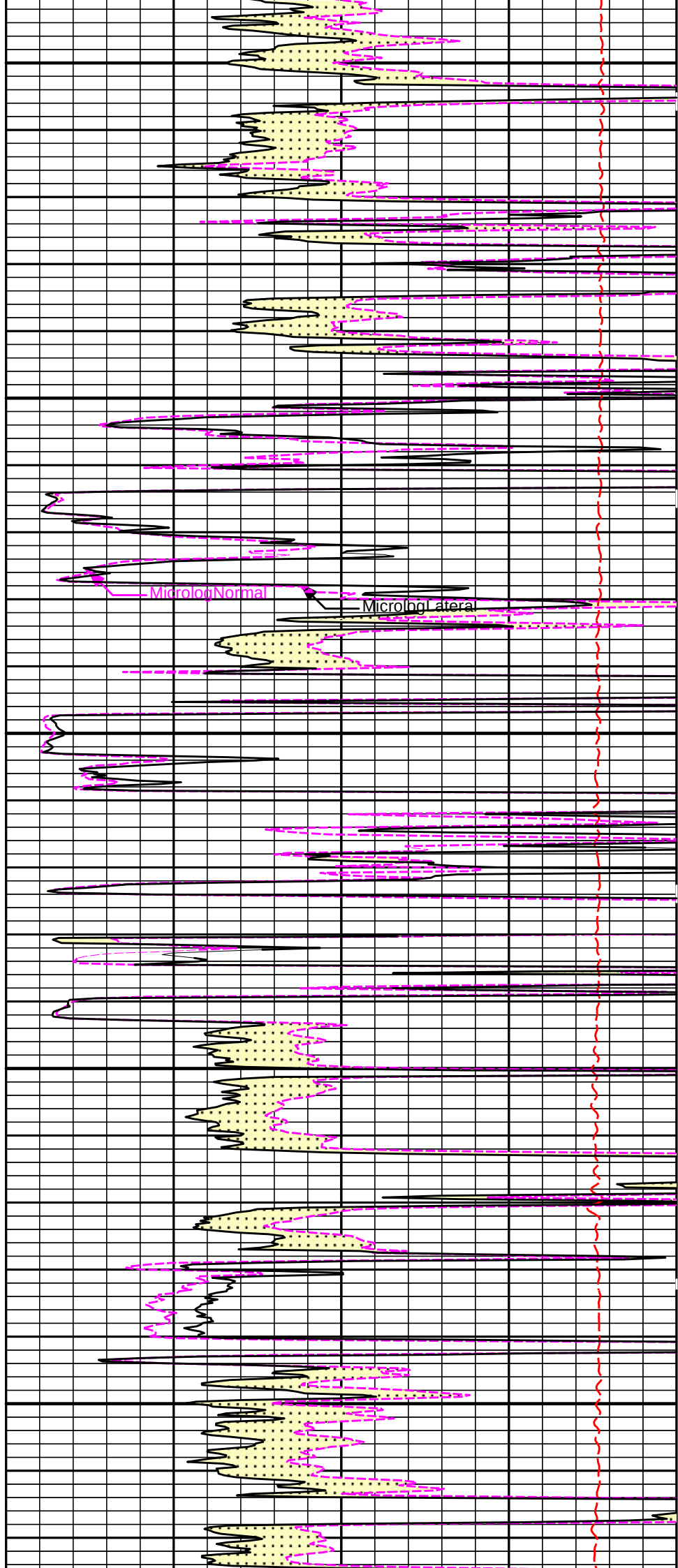
MEASURED DEPTH
MAIN LOG 5" PER 100'

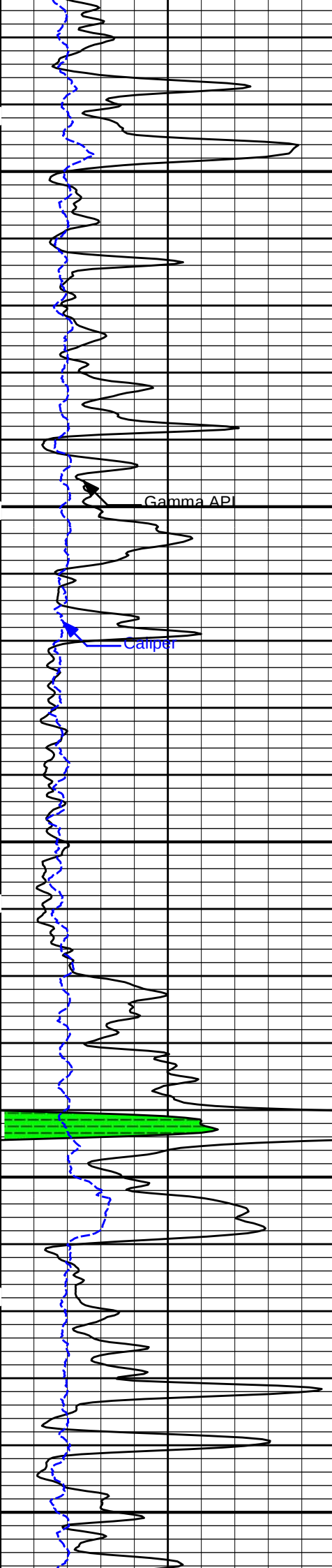




4100

4200

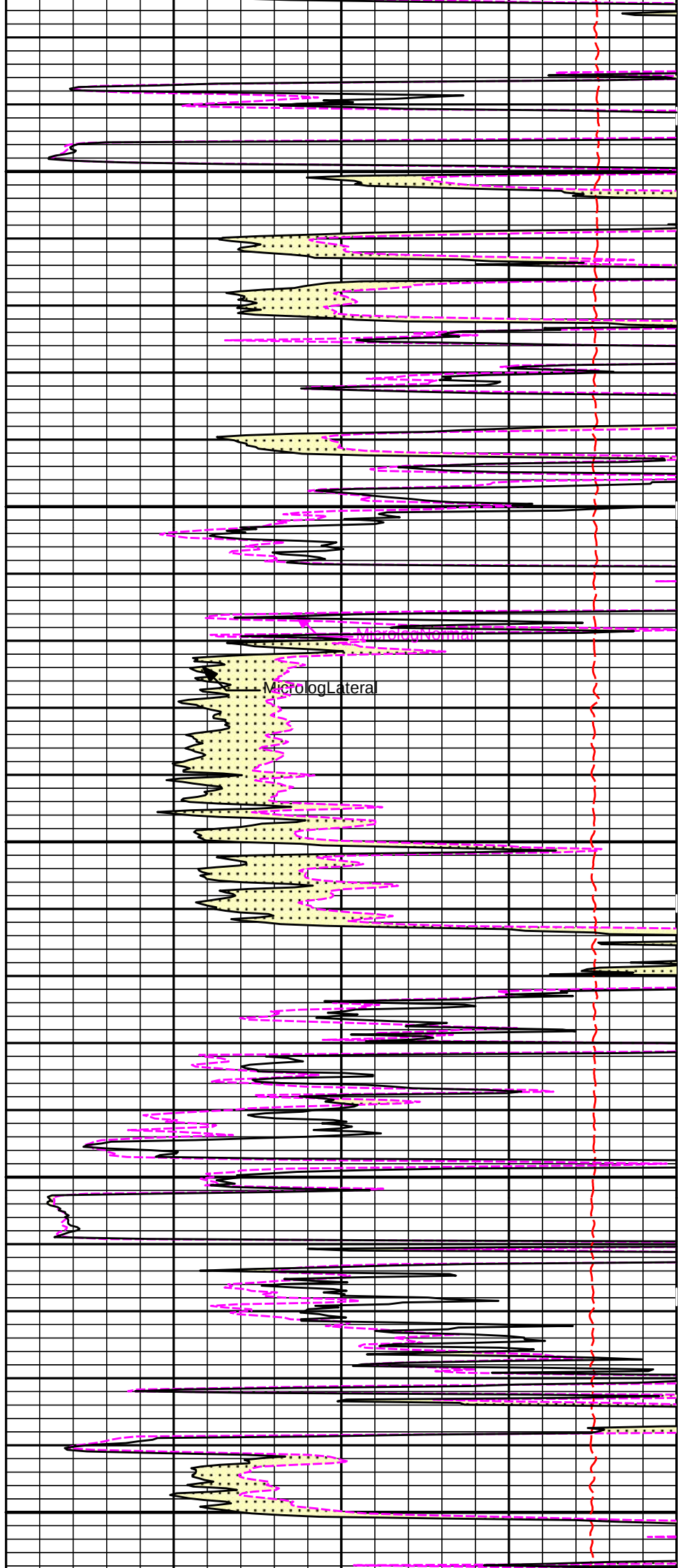


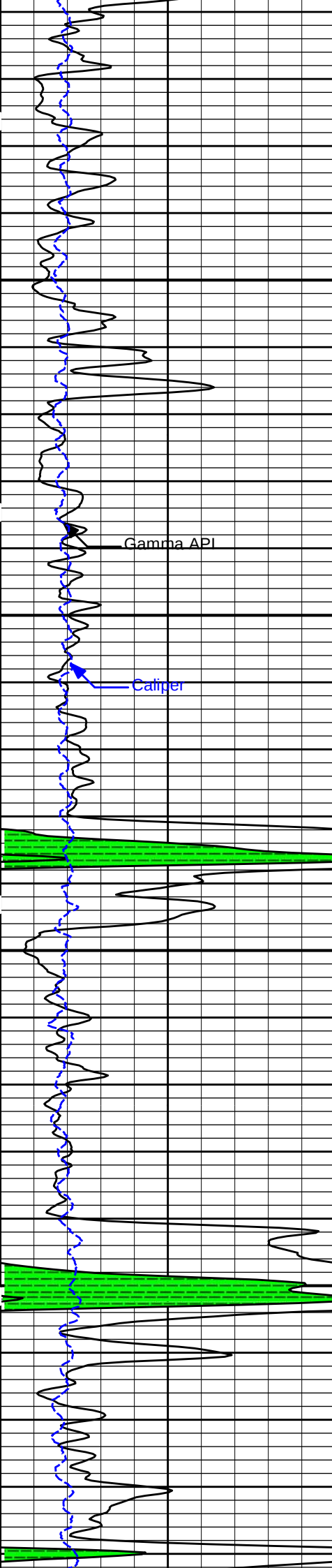


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4400

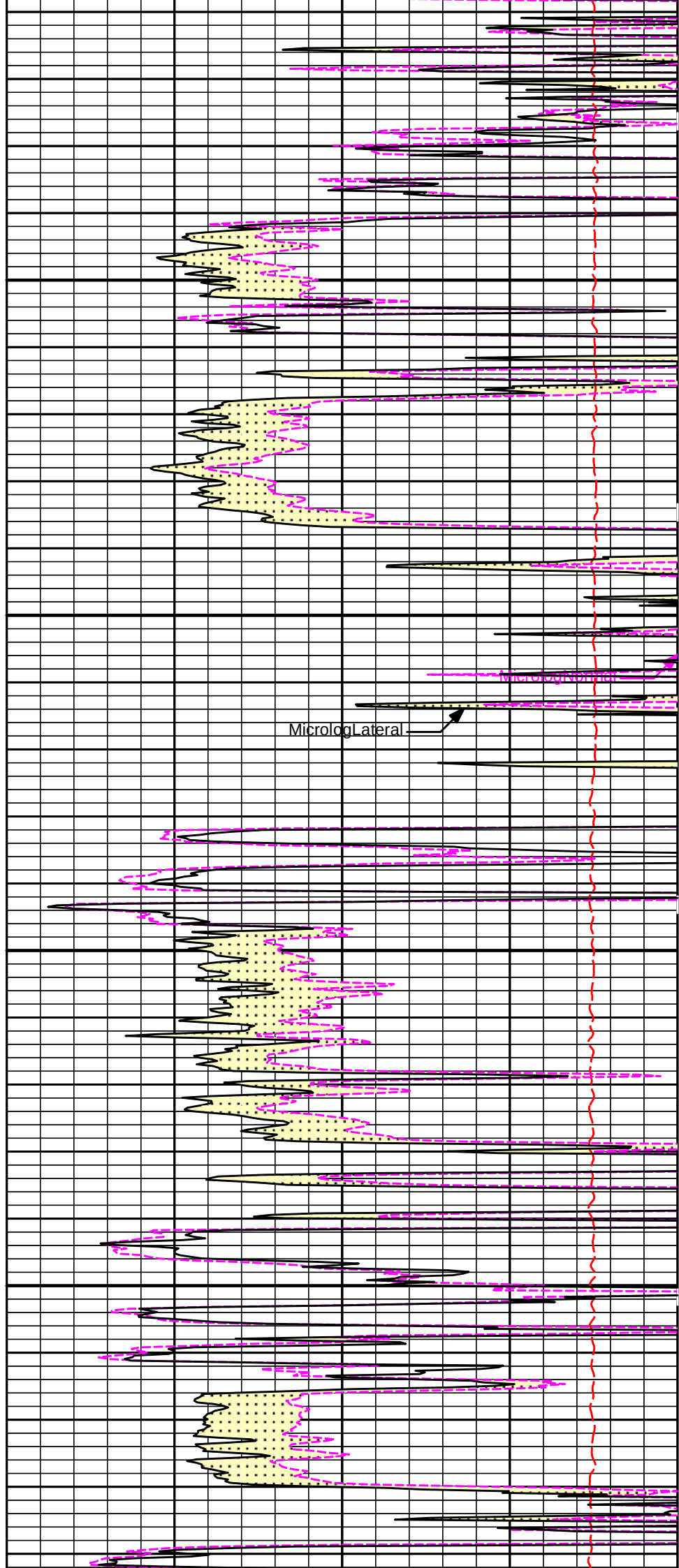
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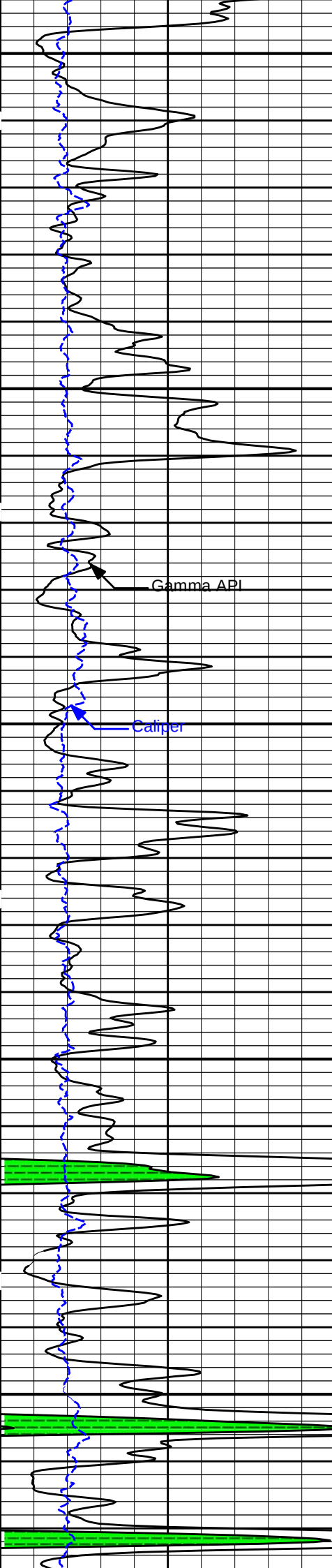




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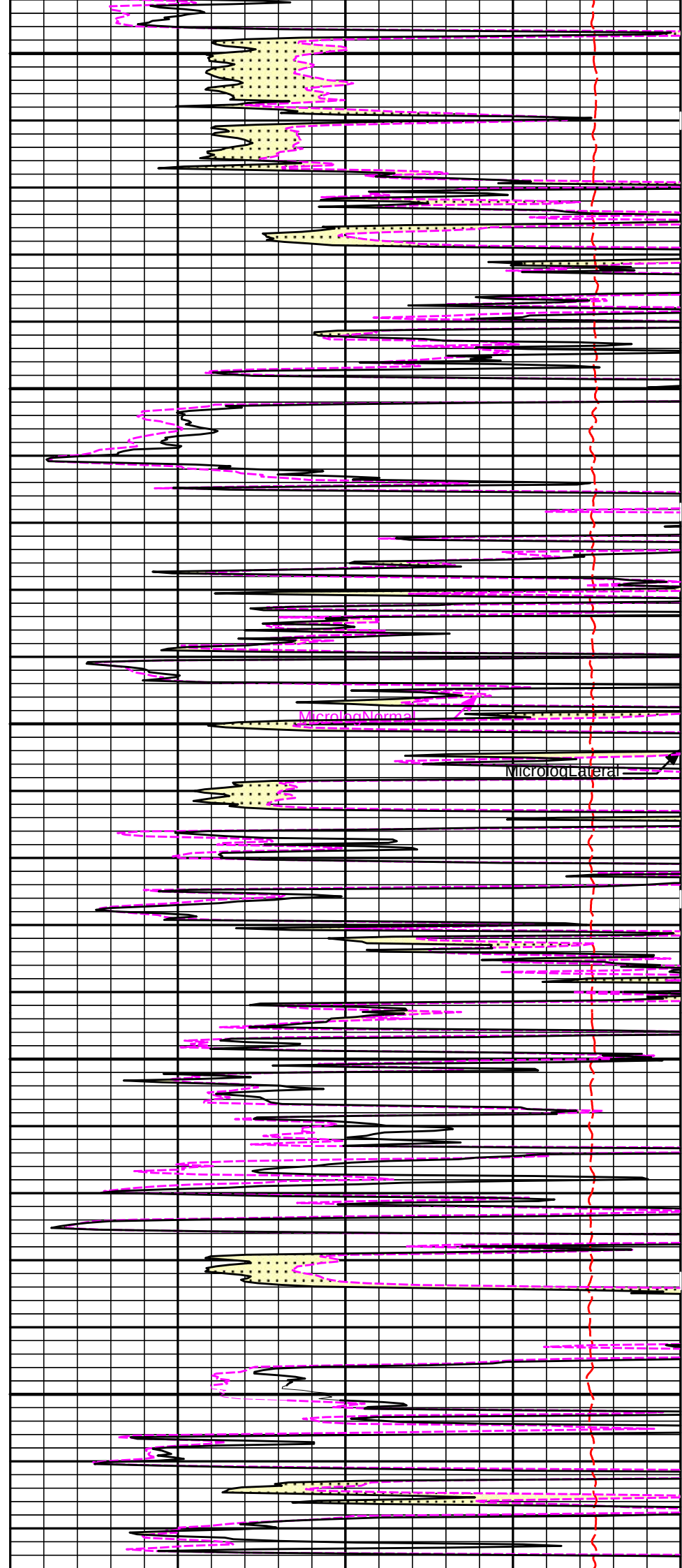
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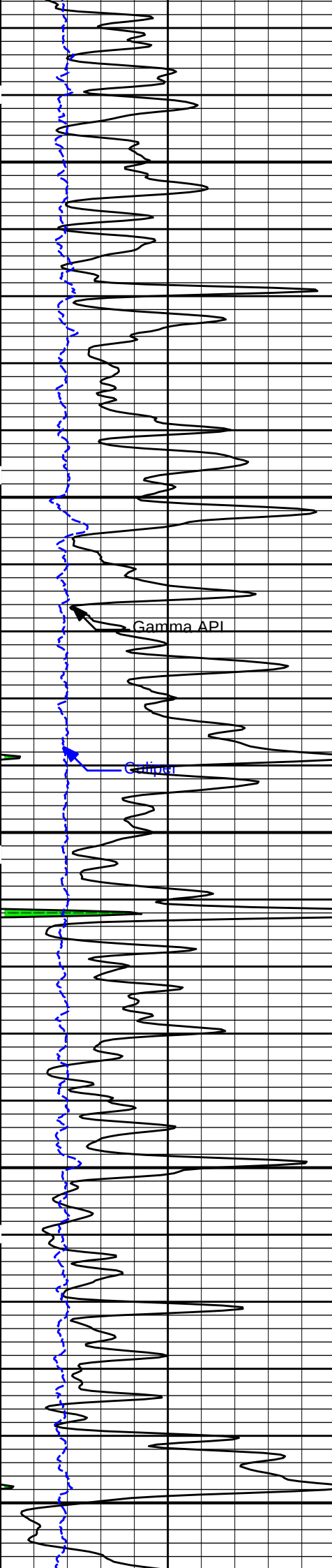




4800

4900





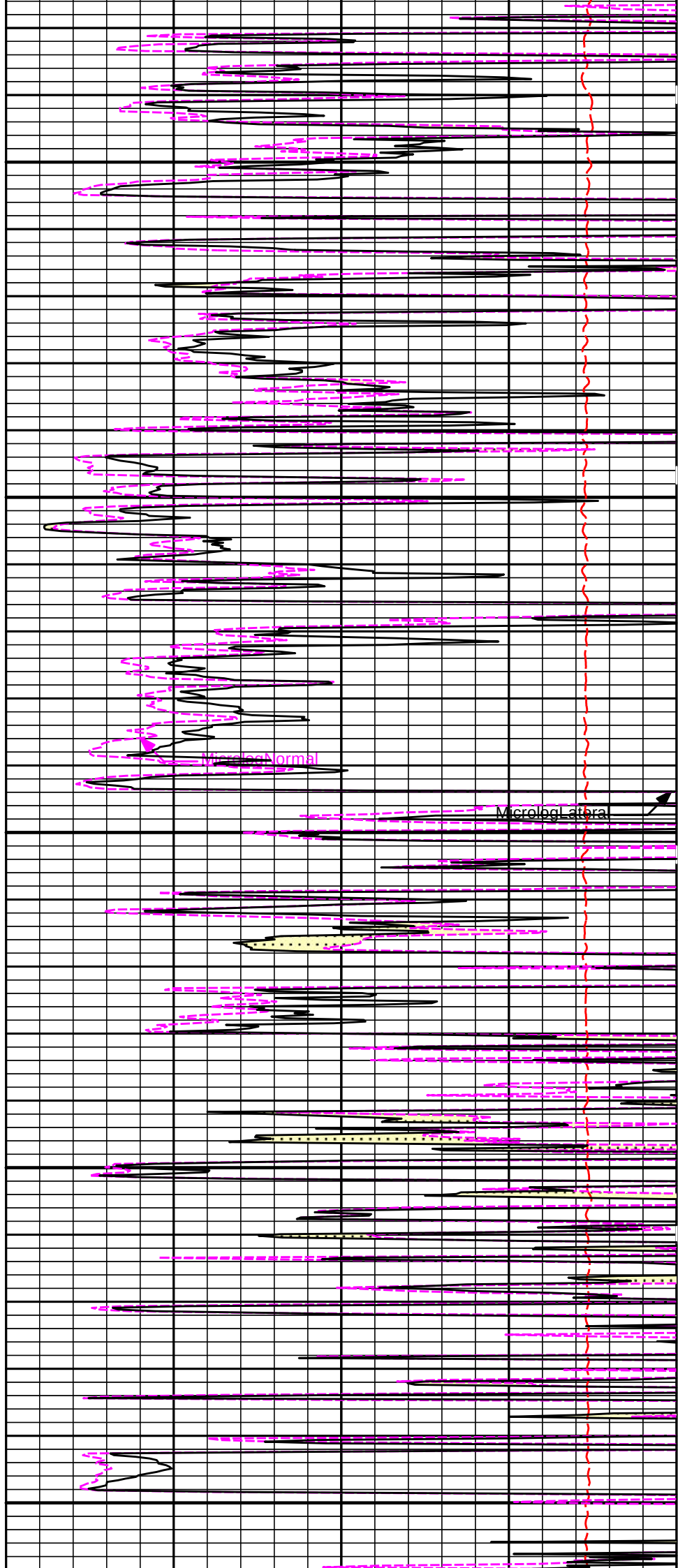
5000

Gamma API

Gamma

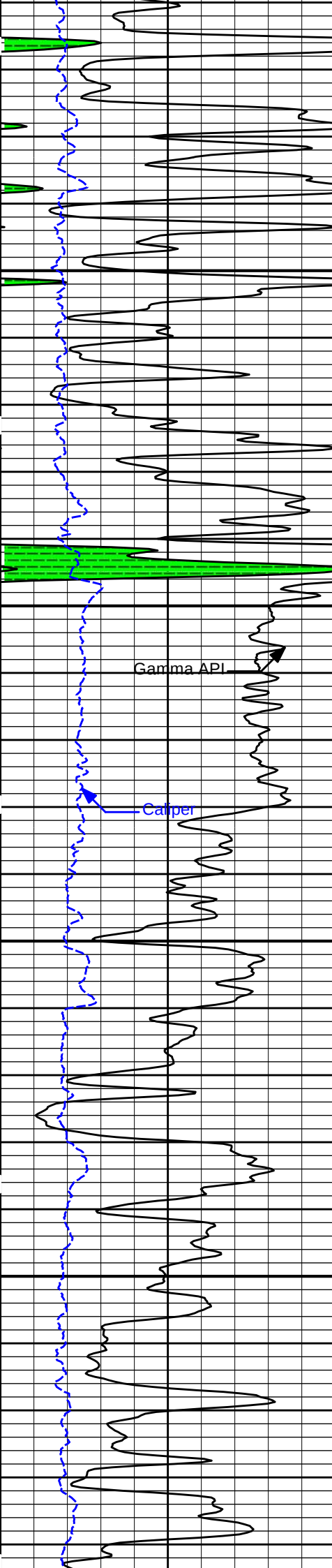
5100

5200



Microlog Normal

Microlog lateral

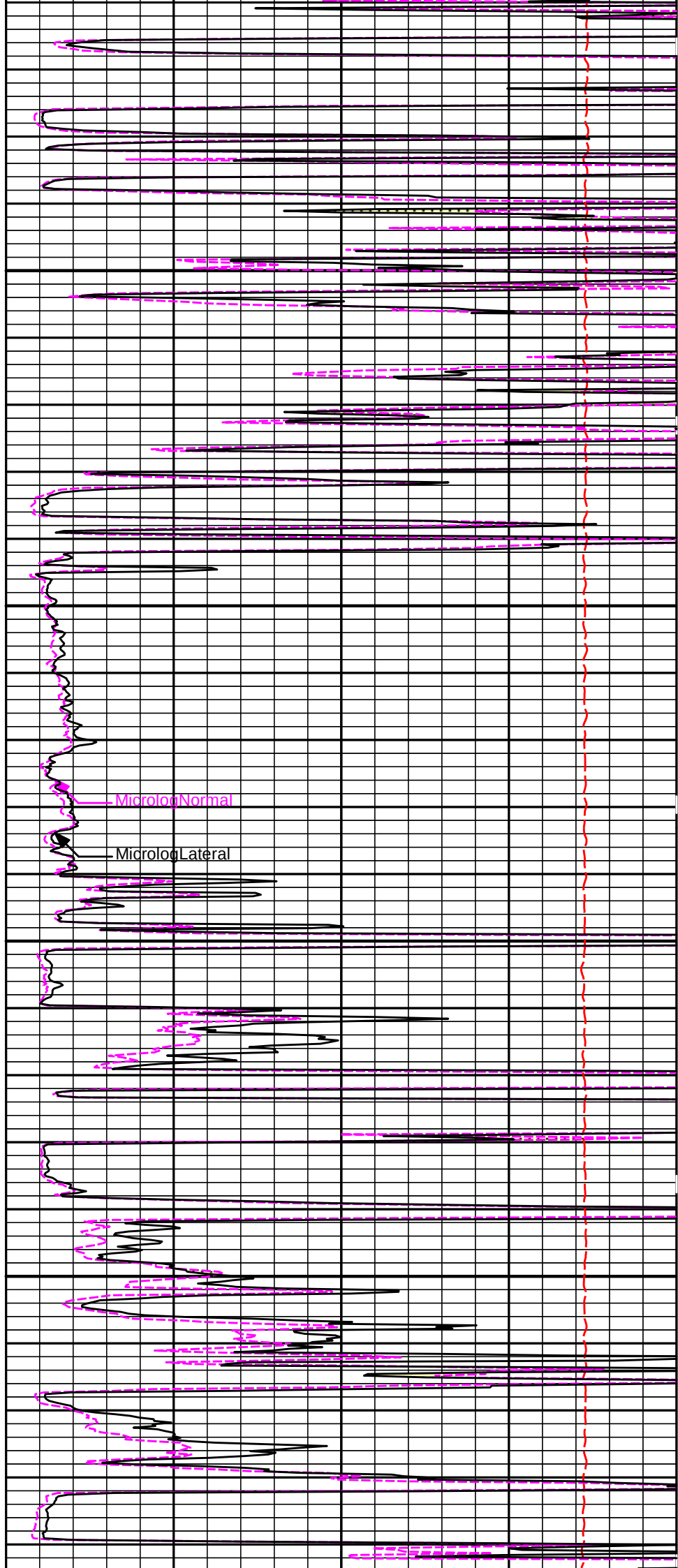


5300

Gamma API

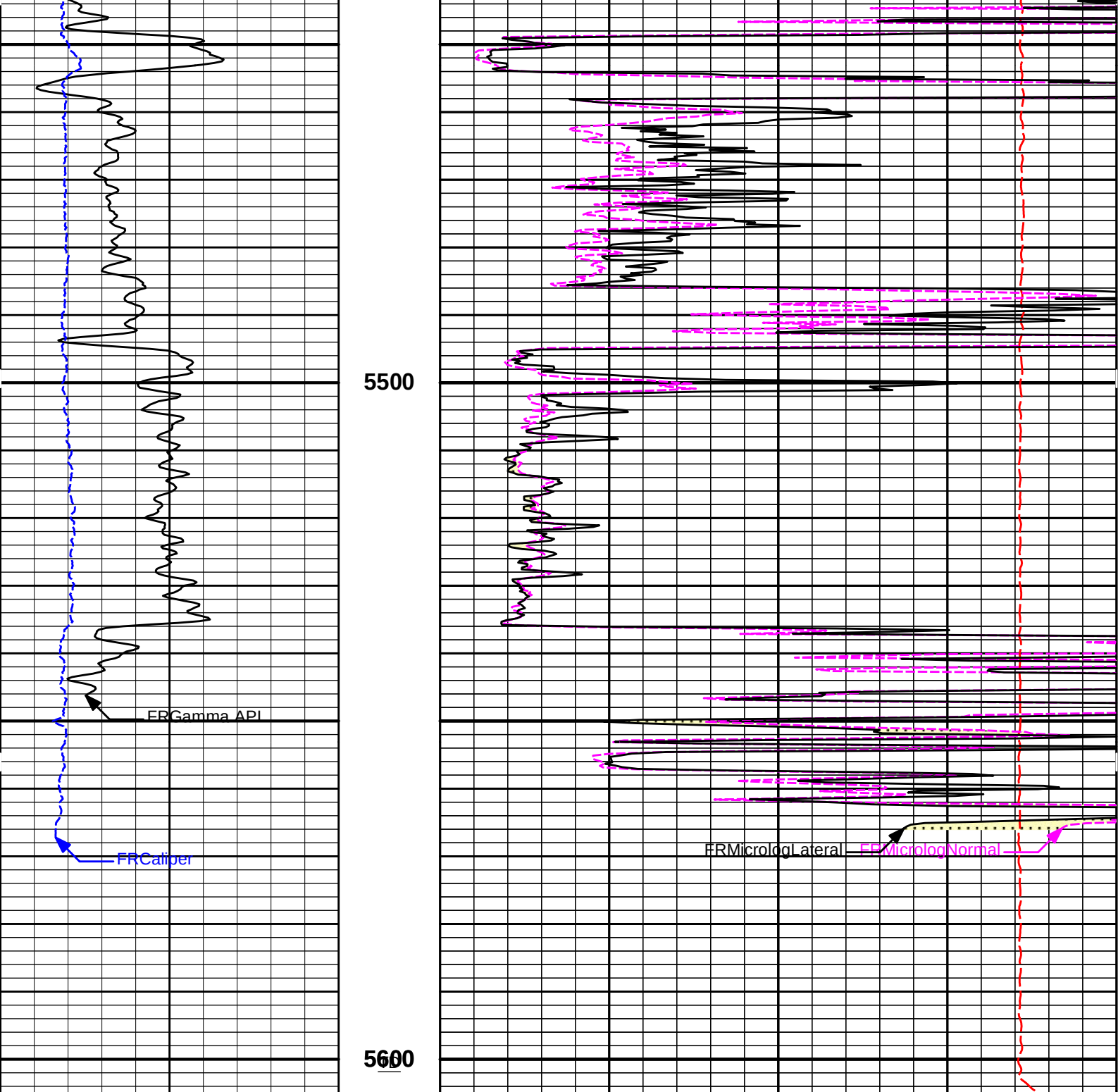
Caliper

5400



MicrologNormal

MicrologLateral



6 Caliper inches 0 Gamma API api 150 SHALE	MD 1 : 240 ft	15K Tension pounds 0	
		0 MicrologLateral ohm-metre 20	
		0 MicrologNormal ohm-metre 20	
		PERMEABLE	

HALLIBURTON

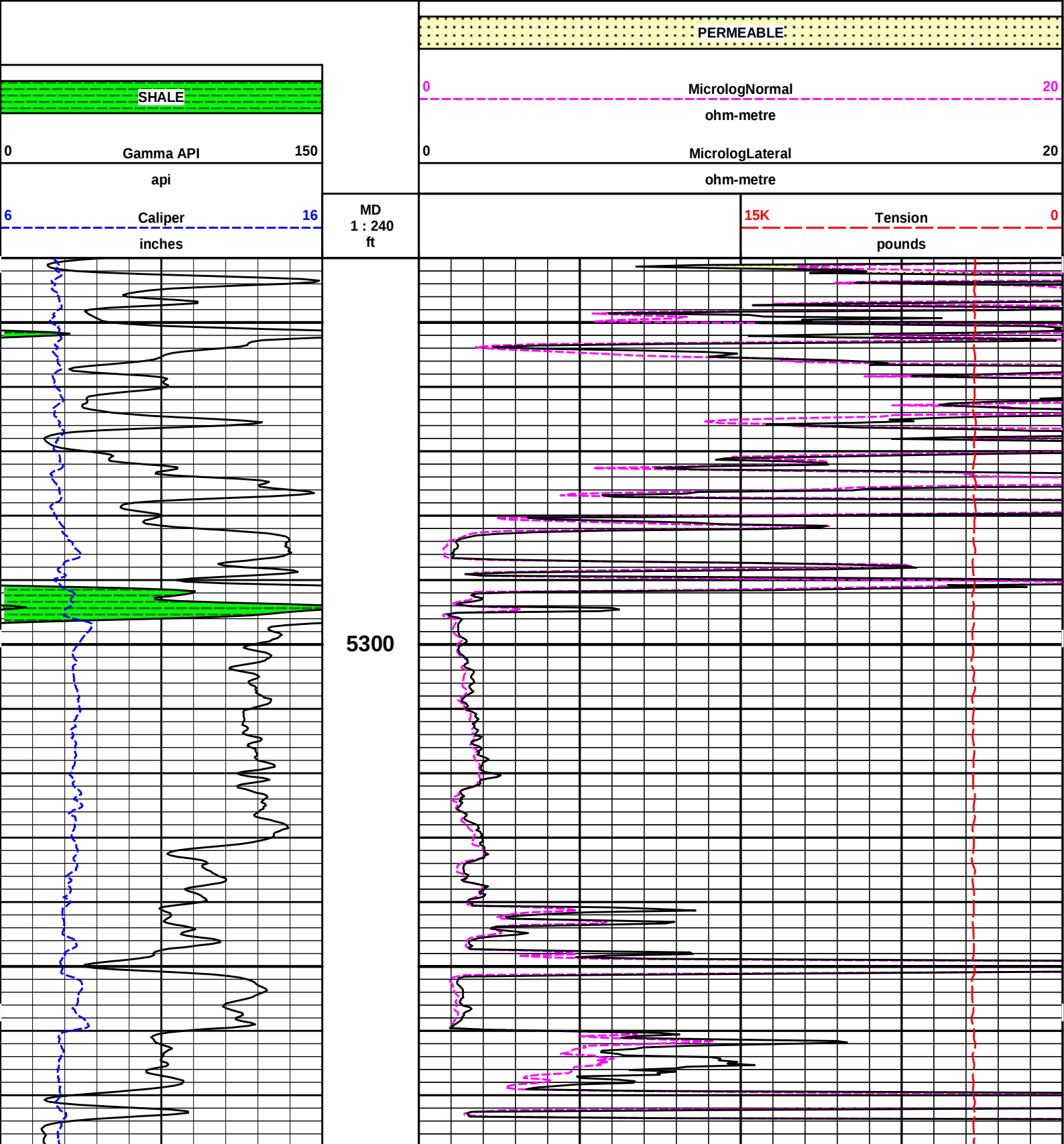
Plot Time: 23-Jan-18 20:08:24
Plot Range: 3990 ft to 5605.25 ft
Data: MERIT_UNRUH1-7\Well Based\MAIN\
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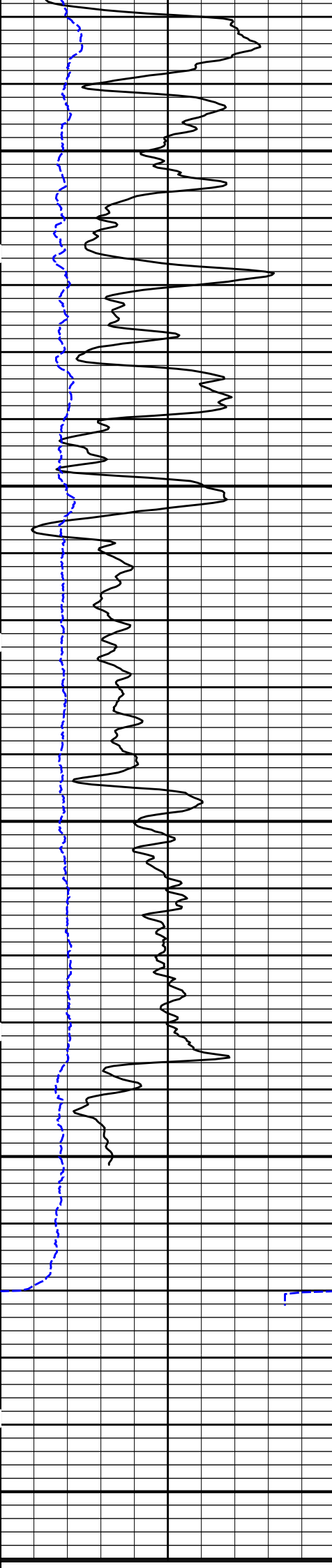
5 INCH MAIN LOG

HALLIBURTON

Plot Time: 23-Jan-18 20:08:24
Plot Range: 5240 ft to 5610.08 ft
Data: MERIT_UNRUH1-7\Well Based\REPEAT\
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REPEAT SECTION

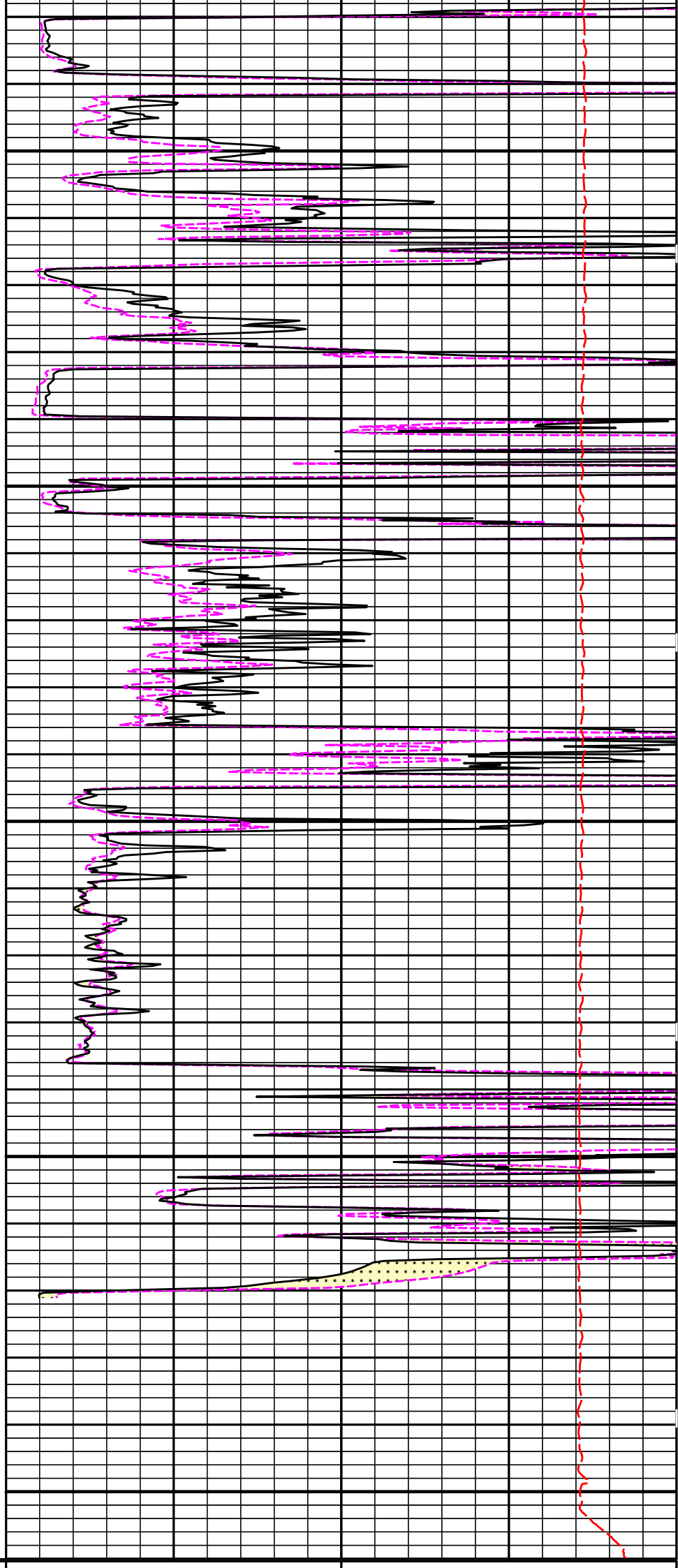




5400

5500

5600



6	Caliper	16	MD	1 : 240	ft	15K	Tension	0
	inches						pounds	
0	Gamma API	150		0	MicrologLateral			20
	api				ohm-metre			
	SHALE			0	MicrologNormal			20
					ohm-metre			
					PERMEABLE			

HALLIBURTON

Plot Time: 23-Jan-18 20:08:27
Plot Range: 5240 ft to 5610.08 ft
Data: MERIT_UNRUH1-7\Well Based\REPEAT\
Plot File: \\-LOCAL-\\MERIT_UNRUH1-7\Well Based\MICROLOG\Microlog_IQ_5_rep_lib

REPEAT SECTION

HALLIBURTON

TOOL STRING DIAGRAM REPORT

Description	Overbody Description	O.D.	Diagram	Sensors @ Delays	Length	Accumulated Length
CH_HOS-11459024 37.50 lbs		Ø 2.750 in		← Temperature @ 67.33 ft	2.50 ft	67.83 ft
XOHD-11572809 20.00 lbs		Ø 2.750 in Ø 3.625 in		← Z-Accelerometer @ 63.93 ft	0.95 ft	65.33 ft 64.38 ft
GTET-11958947 165.00 lbs		Ø 3.625 in		← GammaRay @ 58.32 ft	8.52 ft	55.86 ft
DSNT-11055304 174.00 lbs	DSN Decentralizer-11055304 6.60 lbs	Ø 5.000 in* Ø 3.625 in		← DSN Far @ 48.92 ft ← DSN Near @ 48.17 ft	9.69 ft	46.17 ft
SDLT-10960494 360.00 lbs	SDLT Pad-10844781 65.00 lbs Microlog Pad-10960494 8.00 lbs RAM-Cs137-00005168 1.00 lbs	Ø 4.500 in Ø 4.500 in* Ø 4.750 in* Ø 0.800 in*		Microlog @ 38.36 ft SDL Caliper @ 38.17 ft SDL @ 38.16 ft	10.81 ft	35.36 ft

BSAT-10747683
300.00 lbs

Ø 3.625 in →

Receiver Array @ 26.84 ft
Sonic Receivers @ 26.84 ft

15.77 ft

ACRt Instrument-
12109517
50.00 lbs

Ø 3.625 in →

5.03 ft

ALAT Standoff OD 6-
12345678
11.60 lbs

Ø 6.000 in* →

Mud Resistivity @ 13.19 ft

19.58 ft

14.55 ft

ACRt Sonde-
12109515
200.00 lbs

Ø 3.625 in →

14.22 ft

ACRt @ 9.21 ft

SP Ring-12109515
0.00 lbs

Ø 3.625 in* →

SP @ 1.61 ft

0.33 ft

Bull Nose-12345678
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)
CH_HOS	Hostile Cable Head with Load Cell	11459024	37.50	2.50	65.33	300.00
XOHD	Hostile to Dits Cross Over	11572809	20.00	0.95	64.38	300.00
GTET	Gamma Telemetry Tool	11958947	165.00	8.52	55.86	60.00
DSNT	Dual Spaced Neutron	11055304	174.00	9.69	46.17	60.00
DCNT	DSN Decentralizer	11055304	6.60	5.13	* 49.50	300.00
SDLT	Spectral Density Tool	10960494	360.00	10.81	35.36	60.00
SDLP	Density Insite Pad	10844781	65.00	2.55	* 37.57	60.00
Cs137	Logging Source, SDLT-I, 1.78 Ci - Cs137	00005168	1.00	0.80	* 37.80	300.00
MICP	Microlog Pad	10960494	8.00	1.00	* 37.86	60.00
BSAT	Borehole Sonic Array Tool	10747683	300.00	15.77	19.58	60.00
ACRt	Array Compensated True Resistivity Instrument Section	12109517	50.00	5.03	14.55	120.00
ACRt	Array Compensated True Resistivity Sonde Section	12109515	200.00	14.22	0.33	120.00
SP	SP Ring	12109515	0.00	0.25	* 1.61	300.00
ALATS	Array Laterolog Tool OD 6 Standoff	12345678	11.60	1.00	* 12.98	60.00
BLNS	Bull Nose	12345678	5.00	0.33	0.00	300.00

Total **1,403.70** **67.83**

* Not included in Total Length and Length Accumulation.

Data: MERIT_UNRUH1-710001 GTET-DSNT-SDLT-BSAT-ACRT1004 23-Jan-18 17:53 Up @5605.8f

Date: 23-Jan-18 18:06:27

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	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	75.0	degF
	SHARED	CSD	Logging Interval is Cased?	No	
	SHARED	ICOD	AHV Casing OD	5.500	in
	SHARED	CSTR	Compressive Strength	1000.00	psia
	SHARED	ST	Surface Temperature	75.0	degF
	SHARED	TD	Total Well Depth	5600.00	ft
	SHARED	BHT	Bottom Hole Temperature	140.0	degF
	SHARED	SVTM	Navigation and Survey Master Tool	NONE	
	SHARED	AZTM	High Res Z Accelerometer Master Tool	GTET	
	SHARED	TEMM	CBM Temperature Master Tool	GTET	
	Rwa / CrossPlot	XPOK	Process Crossplot?	Yes	
	Rwa / CrossPlot	FCHO	Select Source of F	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	
	Rwa / CrossPlot	ROIN	Input for RO Calculation	Rwa	
	GTET	GROK	Process Gamma Ray?	Yes	
	GTET	GEOK	Process Gamma Ray EVR?	No	
	GTET	TPOS	Tool Position for Gamma Ray Tools.	Eccentered	
	GTET	BHSM	Borehole Size Source Tool	SDLT	
	DSNT	DNOK	Process DSN?	Yes	
	DSNT	DEOK	Process DSN EVR?	No	
	DSNT	NLIT	Neutron Lithology	Limestone	
	DSNT	DSNO	DSN Standoff - 0.25 in (6.35 mm) Recommended	0.250	in
	DSNT	DNTT	Temperature Correction Type	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	
	Microlog Pad	MLOK	Process MicroLog Outputs?	Yes	
	SDLT Pad	DNOK	Process Density?	Yes	
	SDLT Pad	DNOK	Process Density EVR?	No	
	SDLT Pad	CB	Logging Calibration Blocks?	No	

SDLT Pad	SPVT	SDLT Pad Temperature Valid?	Yes	
SDLT Pad	DTWN	Disable temperature warning	No	
SDLT Pad	DMA	Formation Density Matrix	2.710	g/cc
SDLT Pad	DFL	Formation Density Fluid	1.000	g/cc
SDLT Pad	BHSM	Borehole Size Source Tool	SDLT	
BSAT	MBOK	Compute BCAS Results?	Yes	
BSAT	FLLO	Frequency Filter Low Pass Value?	5000	Hz
BSAT	FLHI	Frequency Filter High Pass Value?	27000	Hz
BSAT	DTFL	Delta -T Pore Fluid	189.00	uspf
BSAT	DTMT	Delta -T Matrix Type	User define	
BSAT	DTMA	Delta -T Matrix	47.60	uspf
BSAT	DTSH	Delta -T Shale	100.00	uspf
BSAT	SPEQ	Acoustic Porosity Equation	Wylie	
ACRt Sonde	RTOK	Process ACRT?	Yes	
ACRt Sonde	MNSO	Minimum Tool Standoff	1.50	in
ACRt Sonde	TCS1	Temperature Correction Source	FP Lwr & FP Upr	
ACRt Sonde	TPOS	Tool Position	Eccentered	
ACRt Sonde	RMOP	Rmud Source	Mud Cell	
ACRt Sonde	RMIN	Minimum Resistivity for MAP	0.20	ohmm
ACRt Sonde	RMAX	Maximum Resistivity for MAP	200.00	ohmm
ACRt Sonde	THQY	Threshold Quality	0.50	
ACRt Sonde	MRFX	Fixed mud resistivity	2000	ohmm
ACRt Sonde	BHSM	Borehole Size Source Tool	SDLT	
ACRt Sonde	MBFL	Apply Corkscrew Effect?	No	
BOTTOM-----				
Data: MERIT_UNRUH1-7I0001 GTET-DSNT-SDLT-BSAT-ACRTI004 23-Jan-18 17:53 Up @5605.8f				Date: 23-Jan-18 18:29:56

HALLIBURTON

CALIBRATION REPORT

NATURAL GAMMA RAY TOOL SHOP CALIBRATION

Tool Name:GTET - 11958947

Engineer:HARRIS

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

Reference Calibration Date:08-Dec-17 09:10:57

Calibration Date:08-Dec-17 09:13:31

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	33.1	32.7	api
Background + Calibrator	267.5	264.7	api
Calibrator	234.4	232.0	api

NATURAL GAMMA RAY TOOL FIELD CALIBRATION

Tool Name:GTET - 11958947

Engineer:JORGE ORLANDO PEREZ

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

Reference Calibration Date:08-Dec-17 09:13:31

Calibration Date:14-Jan-18 10:40:47

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	32.7	22.9	api
Background + Calibrator	264.7	255.8	api
Calibrator	232.0	232.9	api

Shop		Field		Difference		Tolerance	
232.0		232.9		-0.9		+/- 9.00	

DUAL SPACED NEUTRON SHOP CALIBRATION

Tool Name: DSNT - 11055304

Reference Calibration Date: 26-Dec-17 10:04:12

Engineer: JORGE ORLANDO PEREZ

Calibration Date: 26-Dec-17 10:24:08

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

Calibration Version: 1

Logging Source S/N: DSN-424

Tank Serial Number: 12345678

Reference value assigned to Tank: 56.100

Snow Block S/N: 12345678

Calibration Tank Water Temperature: 68 degF

Min. Tool Housing Outside Diameter: 3.625 in

CALIBRATION CONSTANTS

Measurement	Prev. Value	New Value	Control Limit On New Value
Gain:	1.03005	1.02655	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):	0.2368	0.2358	0.0011	+/- 0.0020
Calibrated Ratio:	10.5954	10.5595	0.036	+/- 0.050

VERIFIER

Measurement	Value	Control Limit
Snow-Block Porosity (decp):	0.0338	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: 26-Dec-17 10:24:08

Engineer: JORGE ORLANDO PEREZ

Calibration Date: 14-Jan-18 10:26:02

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

Calibration Version: 1

Logging Source S/N: DSN-424

Snow Block S/N: 12345678

NEUTRON FIELD-CHECK SUMMARY

	Shop	Field	Difference	Control Limit On Change
Snow-Block Porosity (decp):	0.0338	0.0474	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 - 10960494

Reference Calibration Date: 20-Aug-17 12:41:21

Engineer: JORGE ORLANDO PEREZ

Calibration Date: 09-Dec-17 12:48:22

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

Calibration Version: 1

Host Tool Name: DSNT - 11055304

CALIBRATION COEFFICIENTS			
Measurement	Previous Value	New Value	Control Limit On New Value
Pad Offset	-2993.12	-3003.48	-7000.00 - -1000.00
Pad Gain	0.0003799	0.0003806	0.0002000 - 0.0006000
Arm Offset	-746.82	-1647.28	-5000.00 - 3000.00
Arm Gain	0.0004486	0.0005279	0.000300 - 0.000700
Arm Power	-0.000001023	-0.000005848	-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)	6.64	6.50	-0.14	+/- 0.20
Medium Ring (in)	8.21	8.25	0.04	+/- 0.20
Large Ring (in)	14.95	15.00	0.05	+/- 0.20

PASS/FAIL SUMMARY	
Calibration-Coefficients Range Check:	Passed
Ring-Measurement Check:	Passed
PASS/FAIL SUMMARY	
Calibration-Coefficients Range Check:	Passed

SDLT CALIPER FIELD CALIBRATION			
Tool Name:	SDLT - 10960494	Reference Calibration Date:	09-Dec-17 12:48:22
Engineer:	JORGE ORLANDO PEREZ	Calibration Date:	14-Jan-18 09:50:40
Software Version:	WL INSITE R5.0.5 (Build 8)	Calibration Version:	1

MEASURED CALIPER VALUES				
Measurement	Shop	Field	Change	Control Limit On New Value
Pad Extension	3.75	3.75	-0.00	+/- 0.10
Ring Diameter	8.25	8.25	0.00	+/- 0.15
PASS/FAIL SUMMARY				
Pad Extension Check:			Passed	
Diameter Check:			Passed	

MICRO LOG SHOP CALIBRATION			
Tool Name:	Microlog Pad - 10960494	Reference Calibration Date:	24-Nov-17 11:21:38
Engineer:	JORGE ORLANDO PEREZ	Calibration Date:	24-Nov-17 11:23:09
Software Version:	WL INSITE R5.0.5 (Build 8)	Calibration Version:	1
Host Tool Name:	DSNT - 11055304		

CALIBRATION COEFFICIENT SUMMARY					
Measurement	Micro Log Normal		Micro Log Lateral		Units
	Measured	Calibrated	Measured	Calibrated	
Tool Zero	-0.18	-0.17	-0.00	0.00	ohmm
Calibration Point #1	-0.01	0.00	-0.00	0.00	ohmm
Calibration Point #2	20.00	20.00	20.00	20.00	ohmm
Internal Reference	19.83	19.83	19.99	19.99	ohmm
Measurement	Micro Log Normal Tool Value		Micro Log Lateral Tool Value		Units

Tool Zero	-1.46	0.65	V
Calibration Point #1	44.89	0.58	V
Calibration Point #2	5370.73	6909.13	V
Internal Reference	5324.87	6905.27	V

MICRO LOG FIELD CHECK			
Tool Name:	Microlog Pad - 10960494	Reference Calibration Date:	24-Nov-17 11:23:09
Engineer:	JORGE ORLANDO PEREZ	Calibration Date:	14-Jan-18 10:36:41
Software Version:	WL INSITE R5.0.5 (Build 8)	Calibration Version:	1

Measurement	Micro Log Normal		Micro Log Lateral		Units
	Shop	Field	Shop	Field	
Tool Zero	-0.17	-0.17	0.00	-0.00	ohmm
Internal Reference	19.83	19.77	19.99	19.93	ohmm
Summary					
Signal	Shop	Field	Difference		Tolerance
Microlog Normal	19.83	19.77	0.06		+/- 0.80
Microlog Lateral	19.99	19.93	0.06		+/- 0.80

SPECTRAL DENSITY SHOP CALIBRATION			
Tool Name:	SDLT Pad - 10844781	Reference Calibration Date:	13-Mar-17 10:24:03
Engineer:	JORGE ORLANDO PEREZ	Calibration Date:	09-Dec-17 11:03:23
Software Version:	WL INSITE R5.0.5 (Build 8)	Calibration Version:	1

Logging Source S/N: 5168GW			
Aluminum Block S/N: EL RENO STD ALUMINUM		Density: 2.581g/cc	Pe: 3.170
Magnesium Block S/N: EL RENO		Density: 1.687g/cc	Pe: 2.594
DENSITY CALIBRATION SUMMARY			
Measurement	Previous Value	New Value	Control Limit
Near Bar Gain	1.0364	1.0186	0.90 - 1.10
Near Dens Gain	1.0238	1.0069	0.90 - 1.10
Near Peak Gain	1.0221	1.0079	0.90 - 1.10
Near Lith Gain	1.0552	1.0294	0.90 - 1.10
Far Bar Gain	1.0145	1.0123	0.90 - 1.10
Far Dens Gain	1.0038	0.9989	0.90 - 1.10
Far Peak Gain	1.0000	0.9971	0.90 - 1.10
Far Lith Gain	0.9816	0.9753	0.90 - 1.10
Near Bar Offset	-0.0376	0.1365	NONE
Near Dens Offset	0.0482	0.2065	NONE
Near Peak Offset	0.0495	0.1754	NONE
Near Lith Offset	-0.2247	-0.0123	NONE
Far Bar Offset	0.1095	0.1369	NONE
Far Dens Offset	0.1904	0.2360	NONE
Far Peak Offset	0.2182	0.2309	NONE
Far Lith Offset	0.3442	0.3659	NONE
Near Bar Background	733.33	732.60	700 - 1450
Near Dens Background	239.77	241.62	230 - 480
Near Peak Background	105.24	104.56	100 - 210
Near Lith Background	129.58	128.06	125 - 260
Far Bar Background	478.31	473.96	450 - 900
Far Dens Background	188.83	186.91	175 - 345
Far Peak Background	74.80	74.19	70 - 140
Far Lith Background	77.92	76.67	75 - 145
CALIBRATION BLOCK SUMMARY			

CALIBRATION BLOCK SUMMARY				
Measurement	Current Reading (Previous Coef)	Calibrated (New Coef)	Change	Control Limit On Change
MAGNESIUM				
Density (g/cc)	1.675	1.687	0.012	+/- 0.015
Pe	2.474	2.559	0.085	+/- 0.150
ALUMINUM				
Density (g/cc)	2.566	2.581	0.015	+/- 0.01500
Pe	3.051	3.132	0.081	+/- 0.150
TOOL SUMMARY				
Measurement	Near Detector		Far Detector	
	Value	Control Limits	Value	Control Limits
QUALITY				
Background	-0.0007	+/- 0.0110	-0.0009	+/- 0.0140
Magnesium Block	-0.0007	+/- 0.0110	-0.0029	+/- 0.0140
Aluminum Block	-0.0007	+/- 0.0110	0.0006	+/- 0.0140
Resolution	9.59	6.00 - 11.50	8.79	6.00 - 11.50
Internal Verifier(B+D+P+L)	1207	1200 - 2700	812	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 - 10844781	Reference Calibration Date:	09-Dec-17 11:03:23
Engineer:	JORGE ORLANDO PEREZ	Calibration Date:	14-Jan-18 10:40:37
Software Version:	WL INSITE R5.0.5 (Build 8)	Calibration Version:	1

Pad Temperature: 64.7 degF

DENSITY FIELD CALIBRATION SUMMARY				
Measurement	Shop	Field	Change	Control Limit +/-
Near (B+D+P+L) cps	1206.834	1193.624	-13.210	14.101
Far (B+D+P+L) cps	811.738	805.890	-5.848	15.745
Near Resolution	9.59	9.63	0.040	0.50
Far Resolution	8.79	8.79	0.000	1.00

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

ARRAY COMPENSATED TRUE RESISTIVITY SHOP CALIBRATION			
Tool Name:	ACRt Sonde - 12109515	Reference Calibration Date:	29-Oct-17 12:16:12
Engineer:	T. HYDE	Calibration Date:	29-Oct-17 12:24:54
Software Version:	WL INSITE R5.0.5 (Build 8)	Calibration Version:	1
Host Tool Name:	ACRt Instrument - 12109517		

TYPICAL GAIN RANGE			
Subarray	R12KHz	R36KHz	R72KHz
The following table provides the typical gain range for the R12KHz, R36KHz, and R72KHz subarrays. The gain range is defined as the range of resistivity values that can be measured with a given subarray. The gain range is typically 10:1, meaning that the maximum measurable resistivity is 10 times the minimum measurable resistivity.			

Lower		(mmho/m)	Upper	Lower	(mmho/m)	Upper	Lower	(mmho/m)	Upper	
A1 (80")		0.95	1.0368	1.05	0.95	1.0182	1.05	0.95	1.0111	1.05
A2 (50")		0.95	1.0429	1.05	0.95	1.0254	1.05	0.95	1.0223	1.05
A3 (29")		0.95	1.0376	1.05	0.95	1.0194	1.05	0.95	1.0142	1.05
A4 (17")		0.95	1.0291	1.05	0.95	1.0092	1.05	0.95	1.0057	1.05
A5 (10")		N/A	N/A	N/A	0.95	1.0106	1.05	0.95	1.0054	1.05
A6 (6")		N/A	N/A	N/A	0.95	0.9936	1.05	0.95	0.9891	1.05
SONDE OFFSET										
Subarray	R12KHz			R36KHz			R72KHz			
(mmho/m)			(mmho/m)			(mmho/m)				
A1 (80")		0.969		-4.404		-5.779				
A2 (50")		-0.369		-3.928		-4.960				
A3 (29")		-14.206		-4.603		-3.606				
A4 (17")		-109.510		-33.682		-25.617				
A5 (10")		N/A		-87.571		-39.325				
A6 (6")		N/A		296.317		152.747				
TRANSMITTER CURRENT GAIN						R-MUD VERIFICATION				
Signal	Lower	R	Upper			Signal	Lower (ohm-m)	Measured (ohm-m)	Upper (ohm-m)	
12K	0.6	0.90	1.3			Mud Cell	0.95	1.00	1.05	
36K	1.0	1.90	2.0							
72K	1.0	1.14	2.0							
PASS/FAIL SUMMARY										
GAIN RANGE CHK						PASS				
SONDE OFFSET CHK						PASS				
TOOL OK TO LOG										

CALIBRATION SUMMARY						
Sensor	Shop	Field	Post	Difference	Tolerance	Units
GTET-11958947						
Gamma Ray Calibrator	232.0	232.9	-----	-0.9	+/- 9.00	api
DSNT-11055304						
Snow-Block Porosity	0.0338	0.0474	-----	-0.0136	+/- 0.0150	decp
SDLT-10960494						
Pad Extension	3.75	3.75	-----	0.00	+/-0.10	in
Ring Diameter	8.25	8.25	-----	0.00	+/-0.15	in
Microlog Pad-10960494						
MicroLog Normal	19.83	19.77	-----	0.06	+/-0.80	ohmm
MicroLog Lateral	19.99	19.93	-----	0.06	+/-0.80	ohmm
SDLT Pad-10844781						
Near(B+D+P+L)	1206.834	1193.624	-----	13.210	+/-14.101	cps
Far(B+D+P+L)	811.738	805.890	-----	5.848	+/-15.745	cps
ACRt Sonde-12109515						
Mud Cell	1.00	-----	-----	0	-----	ohm-m

Data: MERIT_UNRUH1-7I0001 GTET-DSNT-SDLT-BSAT-ACRTIDLE	Date: 23-Jan-18 18:30:47
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COMPANY	MERIT ENERGY COMPANY
WELL	UNRUH 1-7
FIELD	WILDCAT

COUNTY	HASKELL	STATE	KANSAS
HALLIBURTON		MICROLOG	