

# HALLIBURTON

## ARRAY COMPENSATED TRUE RESISTIVITY LOG

**COMPANY SANDRIDGE ENERGY**  
**WELL MURPHY SWD 3404 1-18**  
**FIELD/BLOCK BLUFF**  
**COUNTY SUMNER**  
**STATE KANSAS**

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**WELL MURPHY SWD 3404 1-18**  
**FIELD/BLOCK BLUFF**  
**COUNTY SUMNER**  
**STATE KANSAS**

API No. 15-191-22733-00-00  
 Location (SHL) 350' FNL & 1559' FEL  
 SE-NE-NW-NE  
 Sect. 18 Twp. 34S Rge. 4W  
 Elev. 1240.0 ft  
 12.0 ft above perm. Datum  
 Other Services:  
 MICROLOG  
 DSNT, SDLT  
 WAVESONIC  
 MRIL  
 CSNG  
 IDT, ICT

Permanent Datum Log measured from KB  
 Drilling measured from KB  
 Date 07-May-14  
 Run No. ONE  
 Depth - Driller 5182.00 ft  
 Depth - Logger 5172.0 ft  
 Bottom - Logged Interval 5162.0 ft  
 Top - Logged Interval 540.0 ft  
 Casing - Driller 8.625 in @ 543.0 ft  
 Casing - Logger 540.0 ft  
 Bit Size 7.875 in  
 Type Fluid in Hole Water Based Mud  
 Density 9.5 ppq 48.00 s/qt  
 PH 10.50 pH 4.0 cphm  
 Source of Sample MUD PIT

Rm @ Meas. Temperature	0.730 ohmm	@	75.00 degF	@
Rmf @ Meas. Temperature	0.66 ohmm	@	75.00 degF	@
Rmc @ Meas. Temperature	0.890 ohmm	@	75.00 degF	@
Source Rmf	MEASURED		MEASURED	
Rmc				
Rm @ BHT	0.40 ohmm	@	143.0 degF	@
Time Since Circulation	5.0000 hr			
Time on Bottom	07-May-14 11:16			
Max. Rec. Temperature	143.0 degF	@	5172.0 ft	@
Equipment	11072142		LIBERAL	
Recorded By	J. BOLLOW			
Witnessed By	D. BARLOW			

Fold here

Service Ticket No.: 901329713      API Serial No.: 15-191-22733-00-00      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.	@		@	ONE	ACRT	N/A	1.5 S.O.	N/A
Rmc @ Meas. Temp.	@		@		I962_S909			
Source Rmf	Rmc							
Rm @ BHT	@		@					
Rmf @ BHT	@		@					
Rmc @ BHT	@		@					

EQUIPMENT DATA							
GAMMA		ACOUSTIC		DENSITY		NEUTRON	
Run No.	ONE	Run No.		Run No.		Run No.	
Serial No.	11039640	Serial No.		Serial No.		Serial No.	
Model No.	GTET	Model No.		Model No.		Model No.	
Diameter	3.625"	No. of Cent.		Diameter		Diameter	
Detector Model No.	T-102	Spacing		Log Type		Log Type	
Type	SCINT			Source Type		Source Type	
Length	8'	LSA [Y/N]		Serial No.		Serial No.	
Distance to Source	10'	FWDA [Y/N]		Strength		Strength	

LOGGING DATA

GENERAL			GAMMA		ACOUSTIC		DENSITY		NEUTRON		
Run No.	Depth		Speed	Scale		Scale		Matrix	Scale		Matrix
	From	To	ft/min	L	R	L	R		L	R	
ONE	5172	540	REC	0	150						

DIRECTIONAL INFORMATION

Maximum Deviation @ KOP @

Remarks: ANNULAR HOLE VOLUME CALCULATED FOR 5.5-INCH CASING

CHLORIDES REPORTED AT 3,000 MG/L

GTET-DSNT-SDLT-ACRT RUN IN COMBINATION

GTET-CSNG-IDT-ICT-WAVE RUN IN COMBINATION

TODAY'S CREW: F. VILLA & M. GRAHAM

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



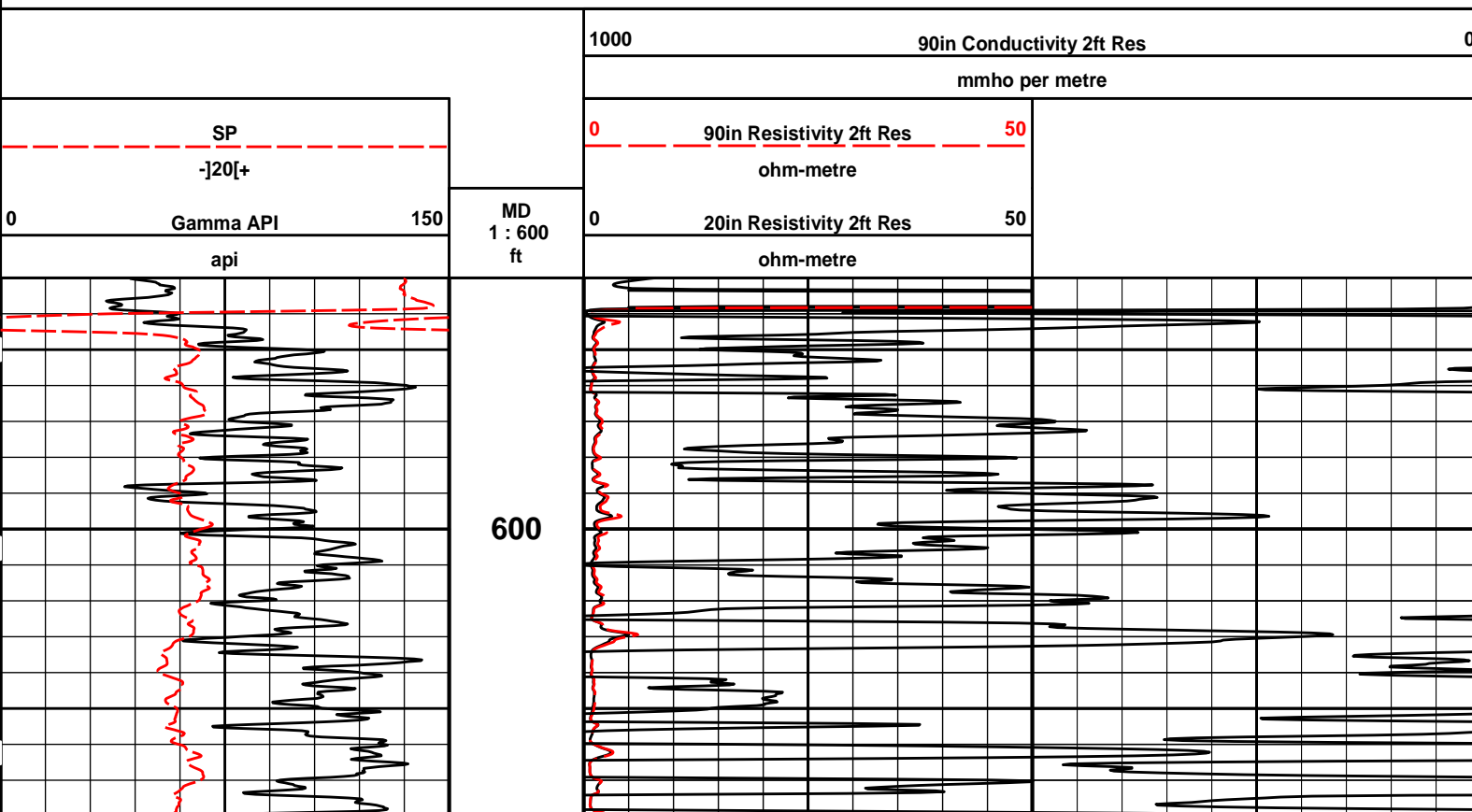
Plot Time: 07-May-14 12:15:18

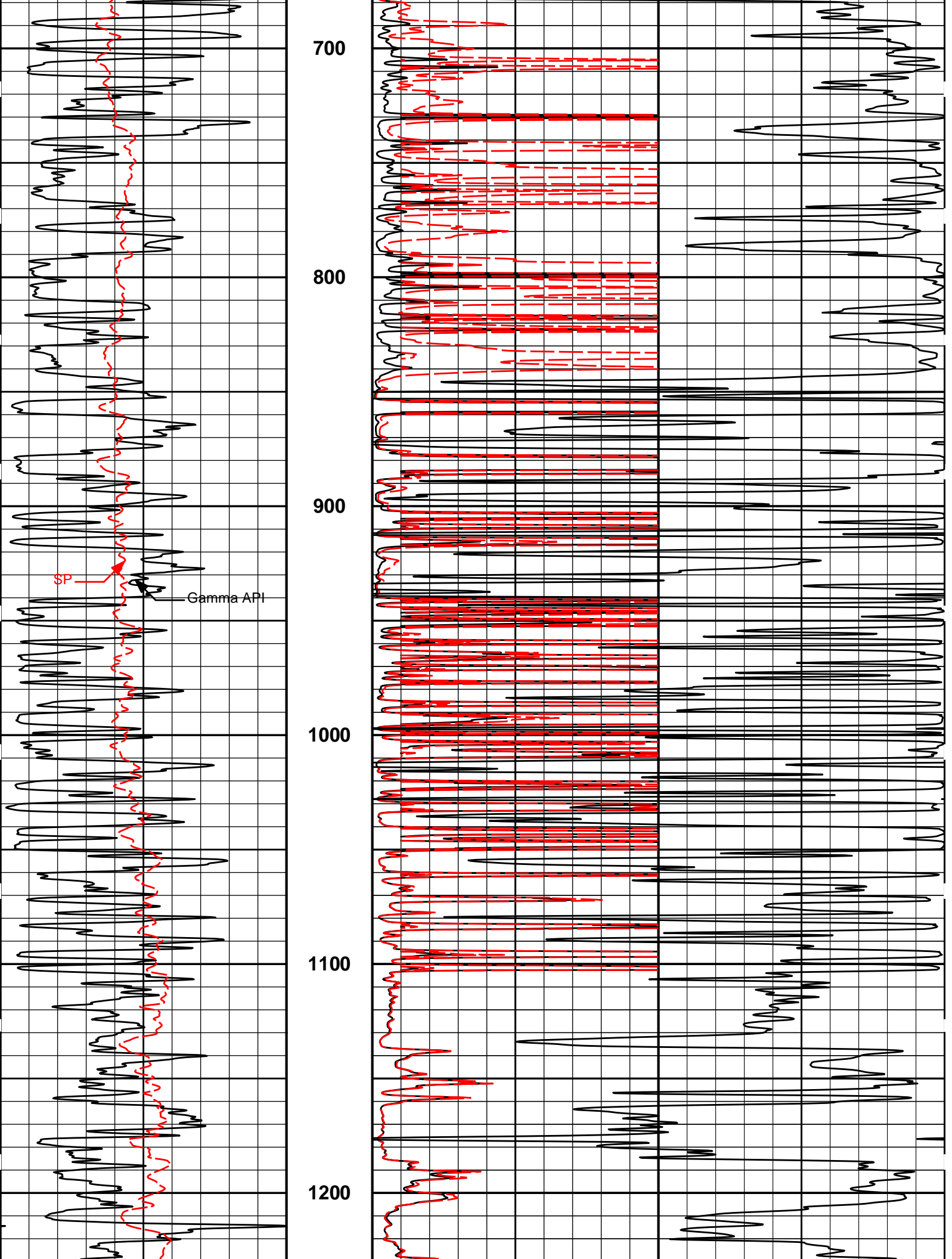
Plot Range: 530 ft to 5174.83 ft

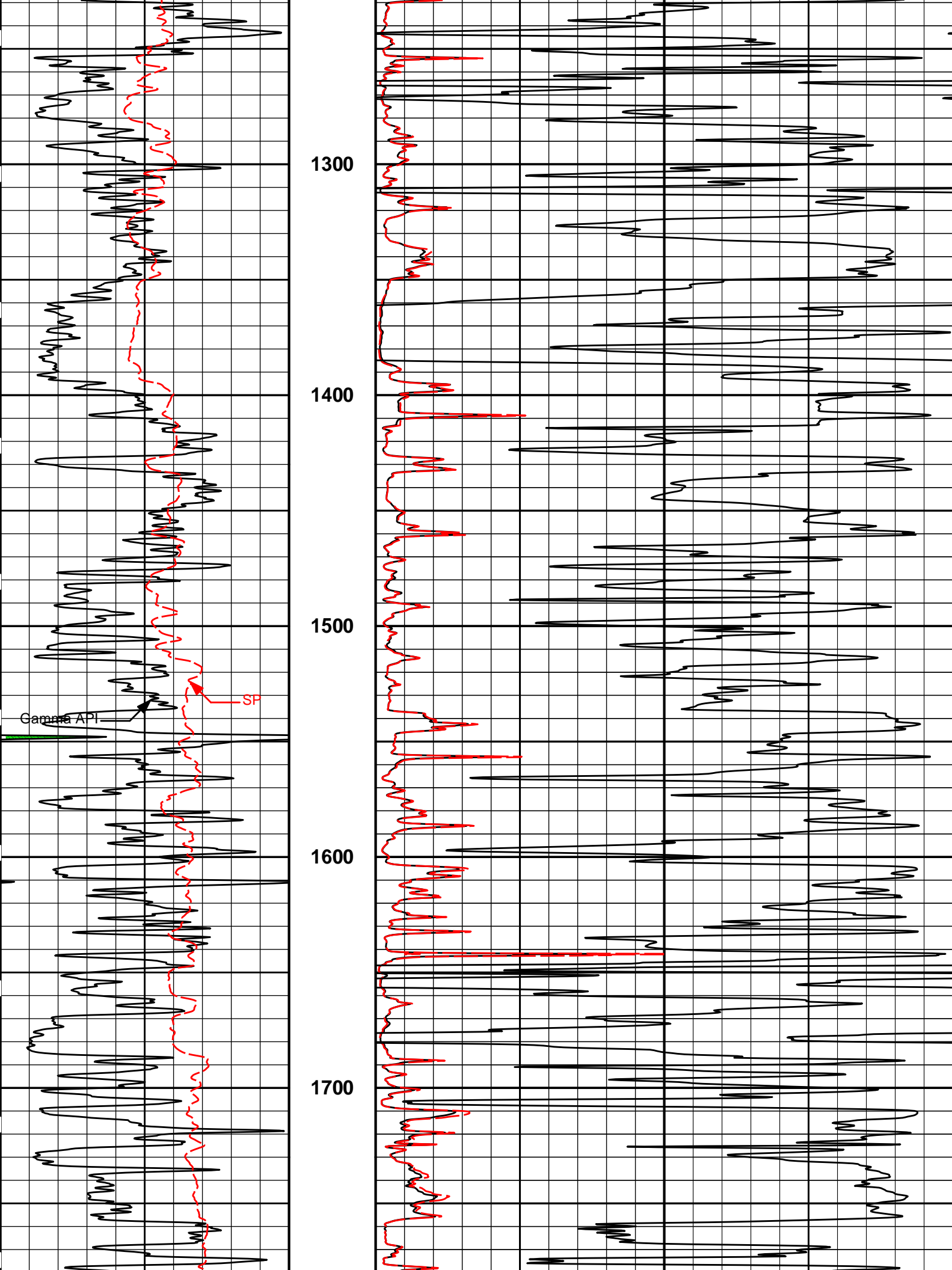
Data: MURPHY\_SW\_D\_3404\Well Based\CASING1\

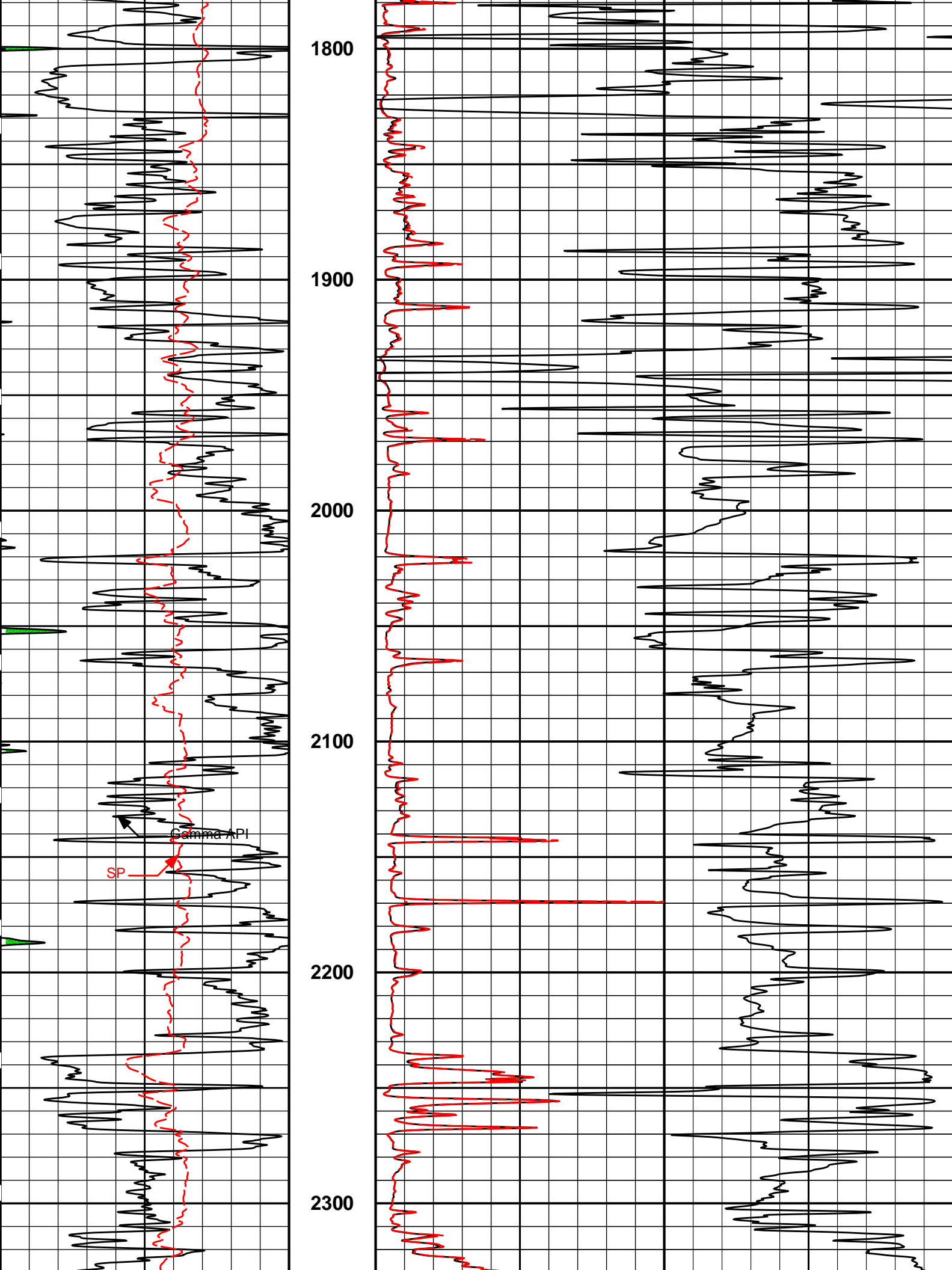
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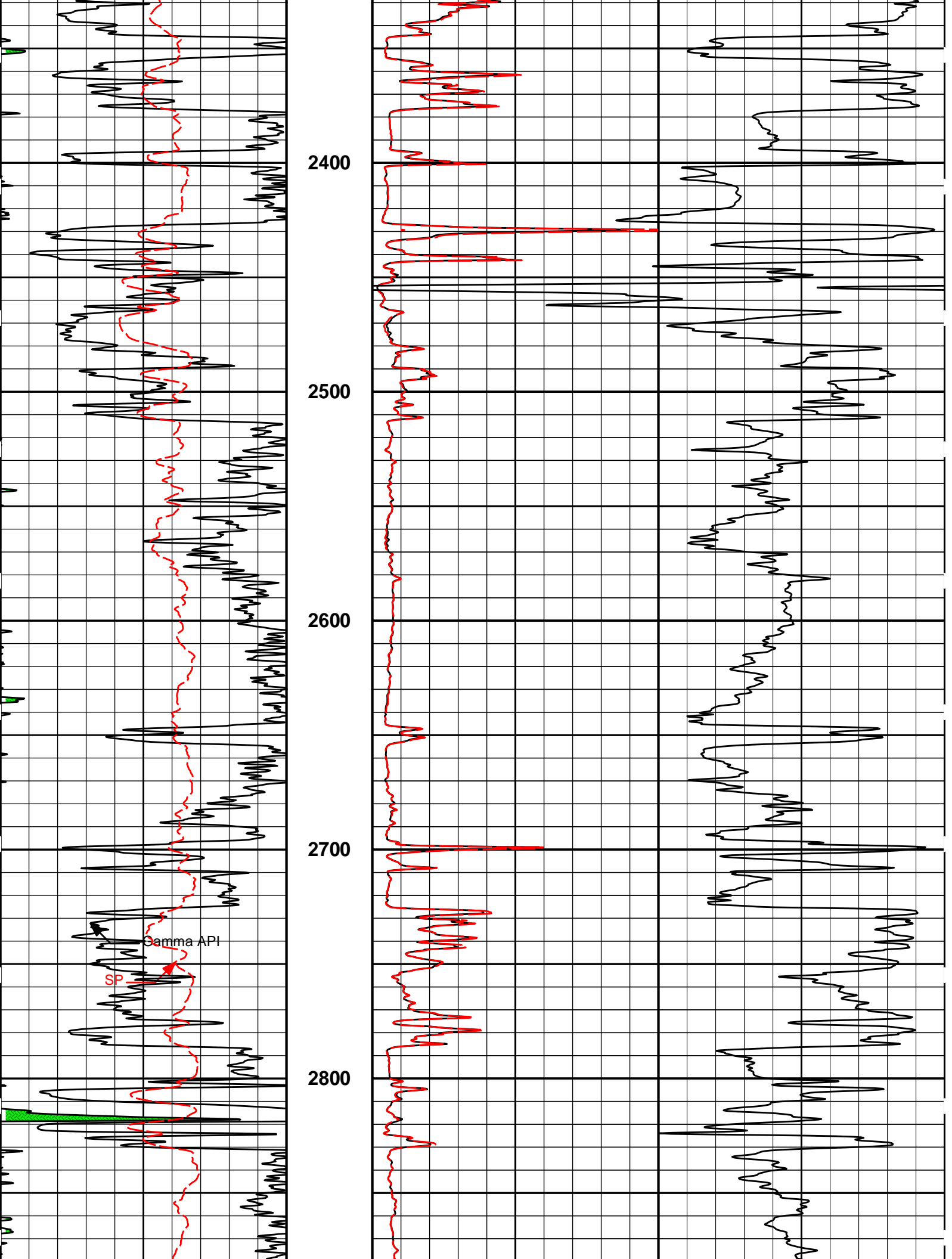
## 2 INCH MAIN LOG

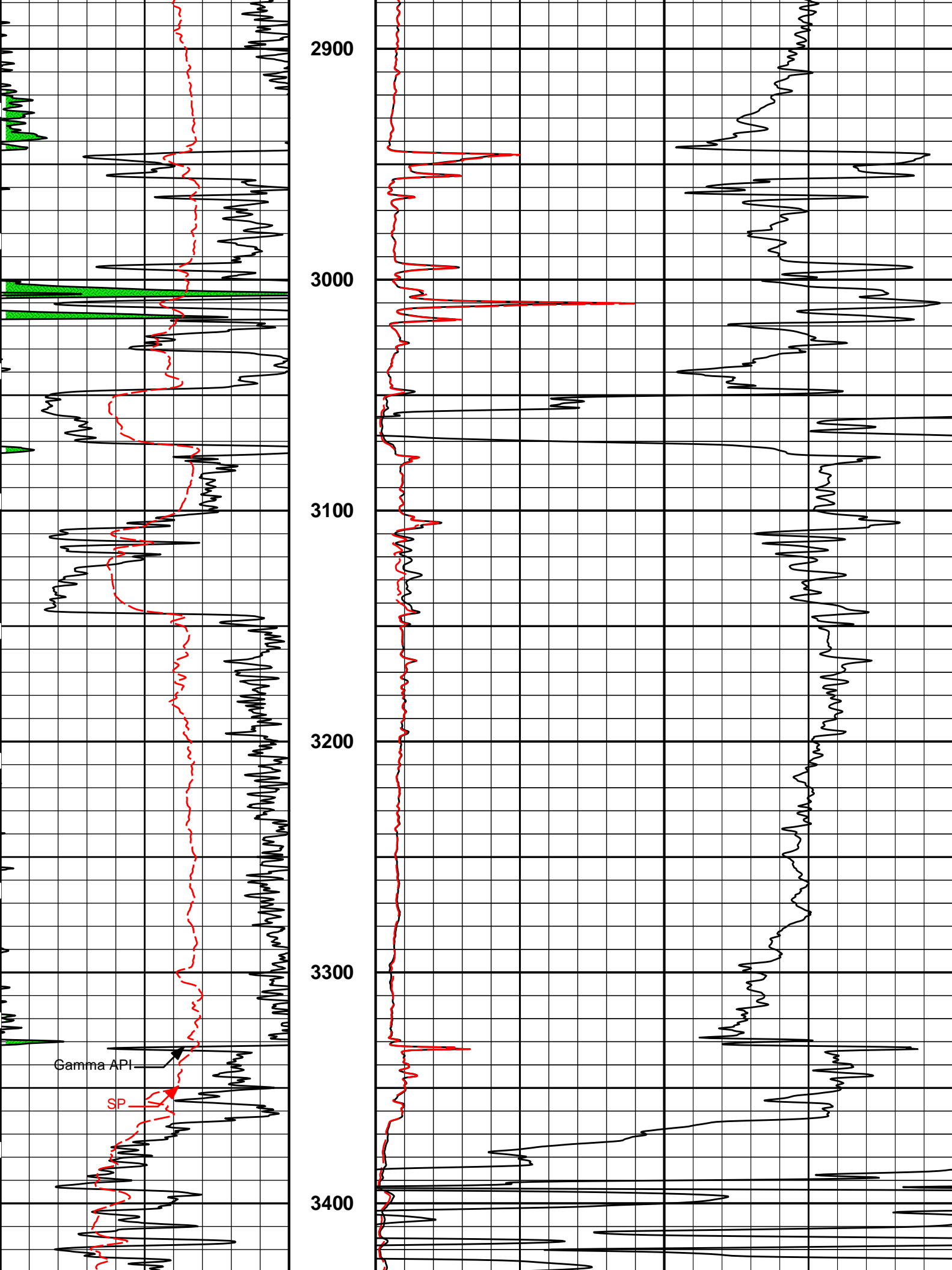












Gamma API

SP

2900

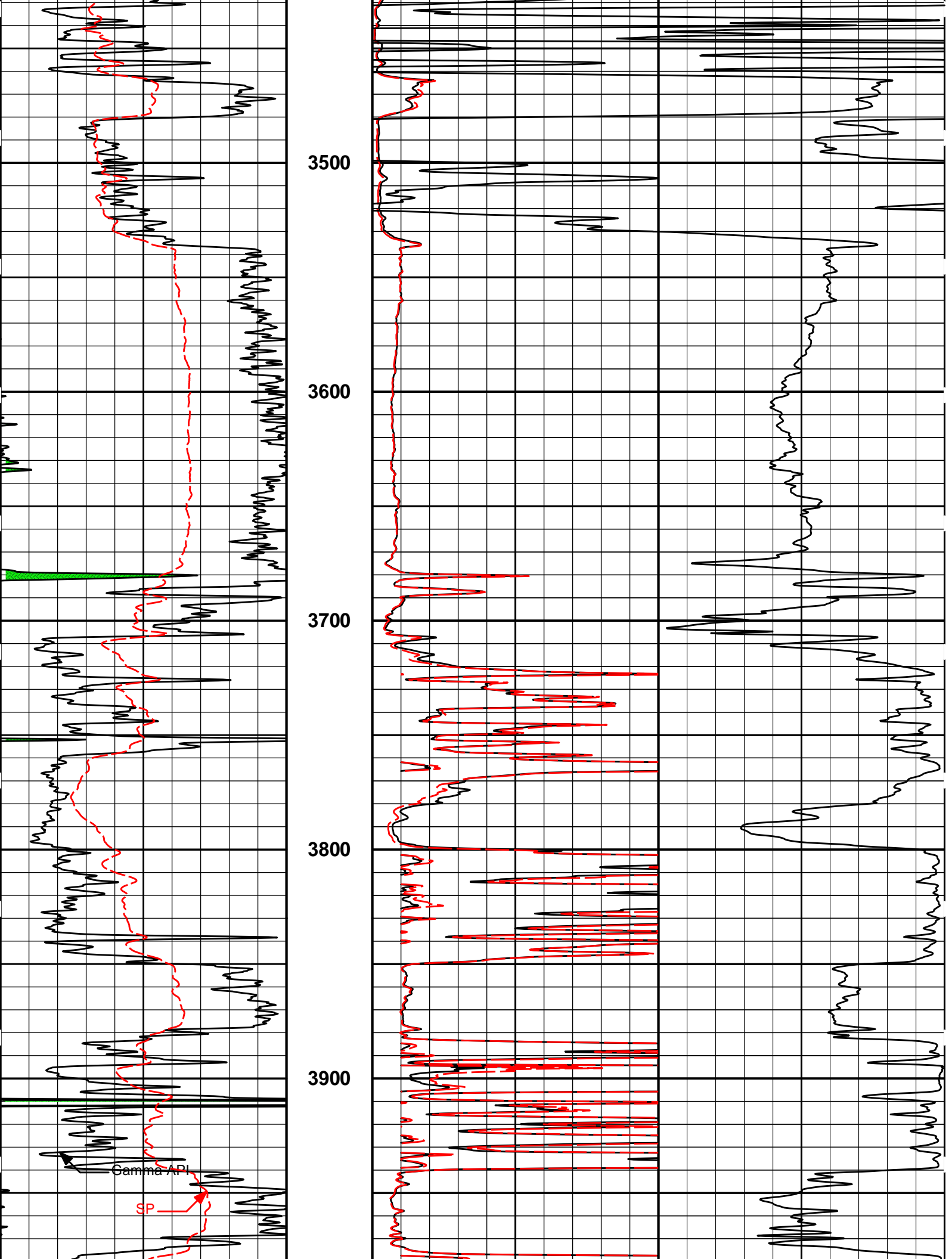
3000

3100

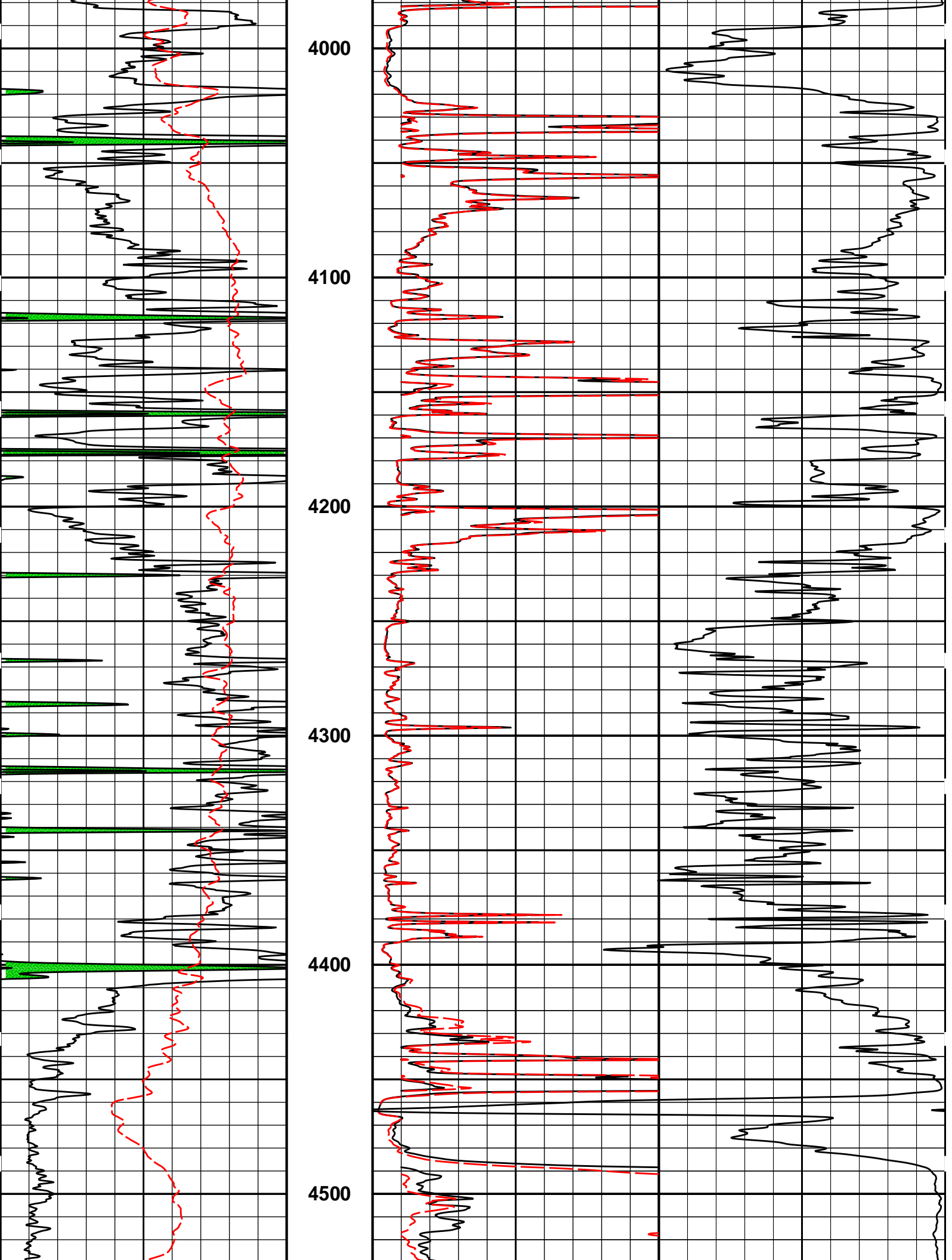
3200

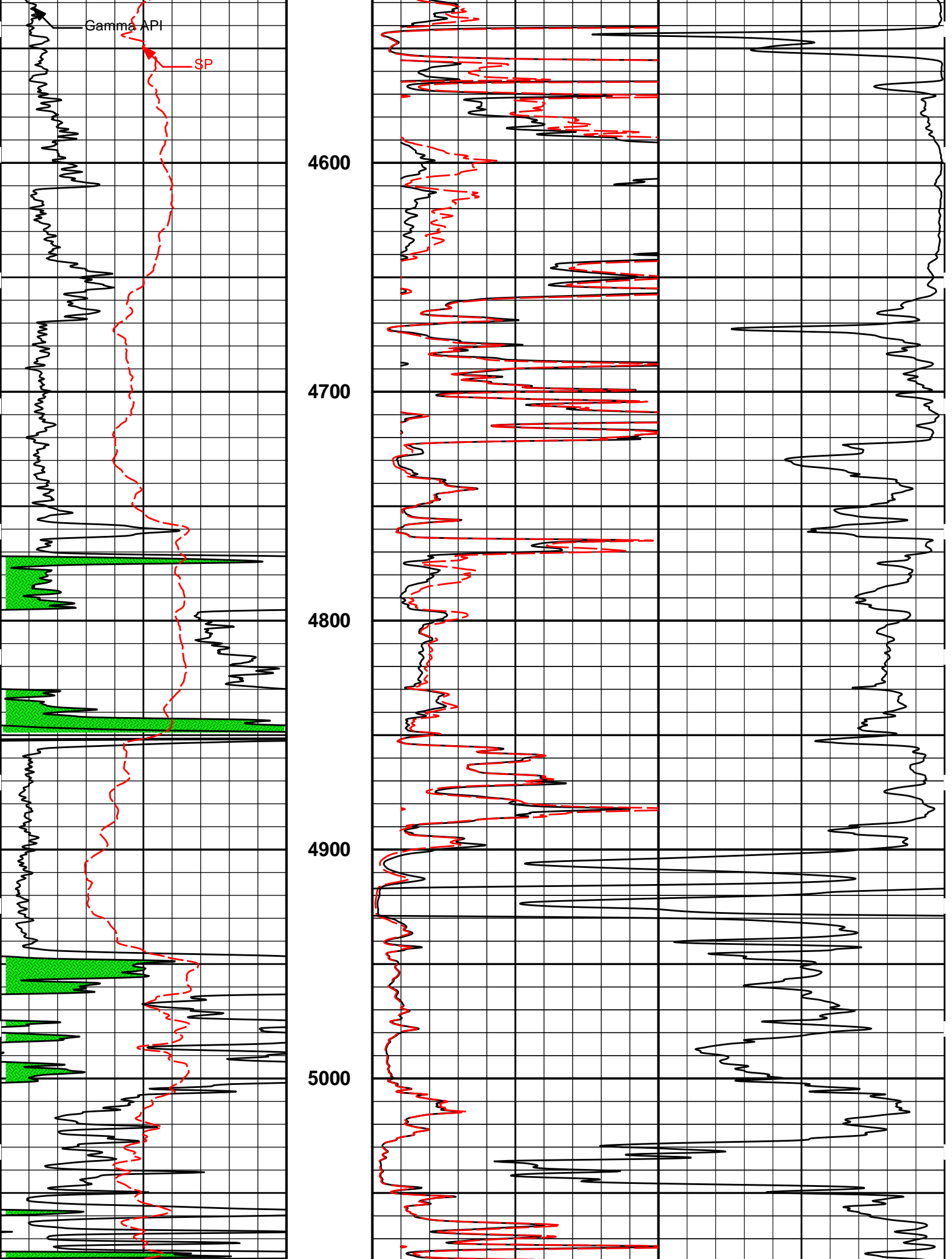
3300

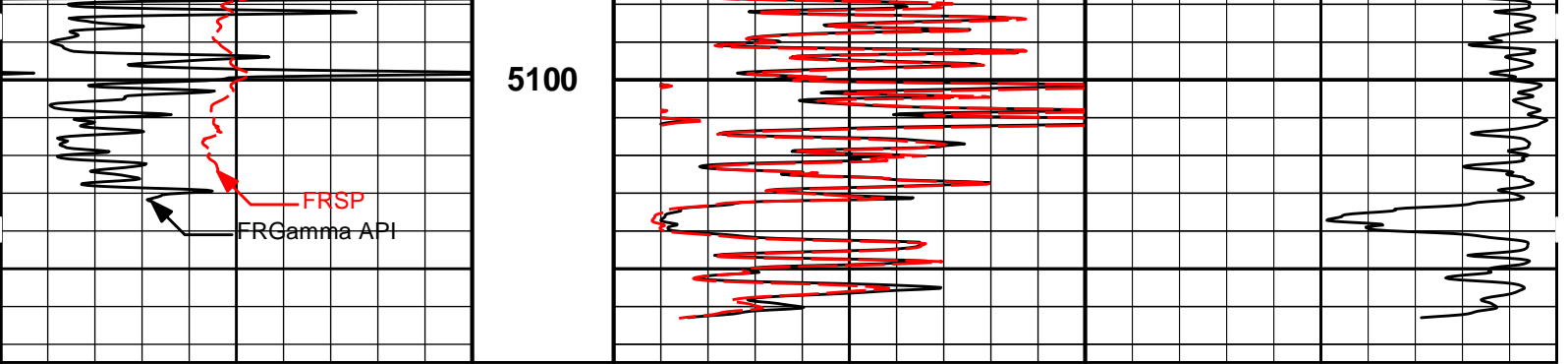
3400











0	Gamma API	150	MD 1 : 600 ft	0	20in Resistivity 2ft Res	50
	api					ohm-metre
	SP			0	90in Resistivity 2ft Res	50
	-]20[+				ohm-metre	
				1000	90in Conductivity 2ft Res	0
					mmho per metre	

**HALLIBURTON**

Plot Time: 07-May-14 12:15:20  
 Plot Range: 530 ft to 5174.83 ft  
 Data: MURPHY\_SWD\_3404\Well Based\CASING1\  
 Plot File: \\LOCAL-MURPHY\_SWD\_3404\0001 SP-GTET-DSN-SDL-ACRT-BNACRTVACRT\_2\_lib

## 2 INCH MAIN LOG

**HALLIBURTON**

Plot Time: 07-May-14 12:15:20  
 Plot Range: 2500 ft to 5174.83 ft  
 Data: MURPHY\_SWD\_3404\Well Based\DETAIL1\  
 Plot File: \\LOCAL-MURPHY\_SWD\_3404\0001 SP-GTET-DSN-SDL-ACRT-BNACRTVACRT\_5\_main\_lib

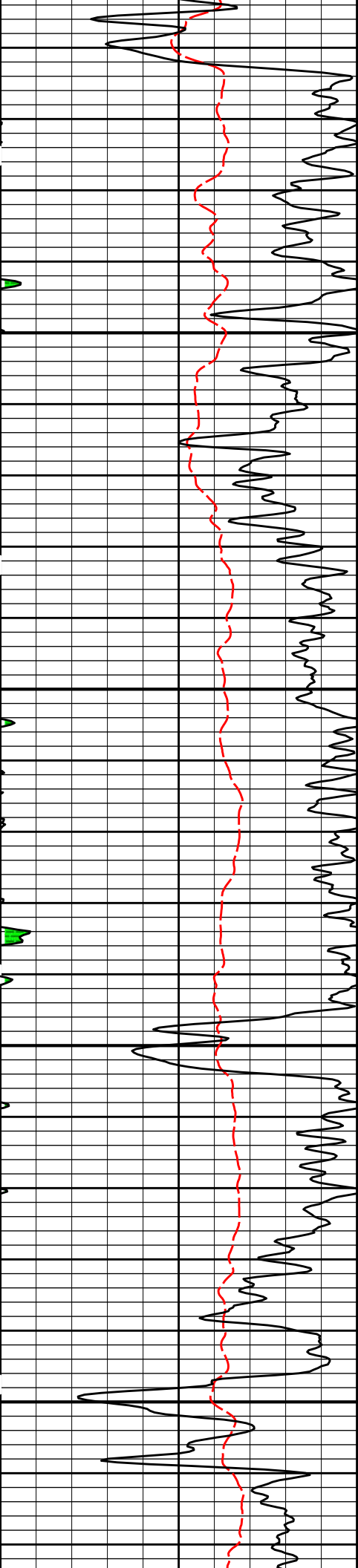
## 5 INCH MAIN LOG

MEASURED DEPTH  
 MAIN SECTION 5" PER 100'

			0.2	90in Resistivity 2ft Res	2000
				ohmm	
			0.2	60in Resistivity 2ft Res	2000
				ohmm	
			0.2	30in Resistivity 2ft Res	2000
				ohm-metre	
			0.2	20in Resistivity 2ft Res	2000
				ohmm	
			0.2	10in Resistivity 2ft Res	2000
				ohmm	
			10K	Tension	0
				pounds	

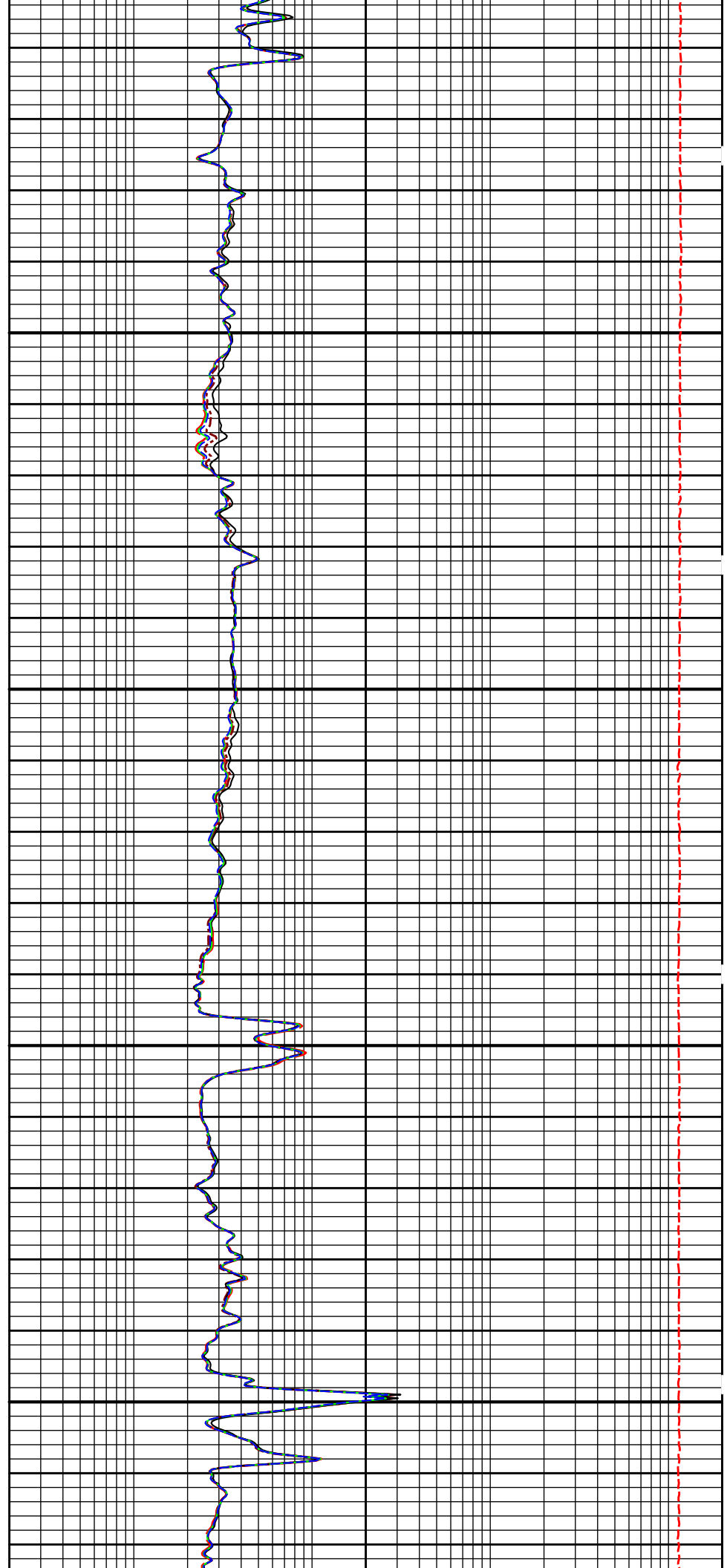
SHALE		
0	Gamma API	150
	api	
	SP	
	-]20[+	

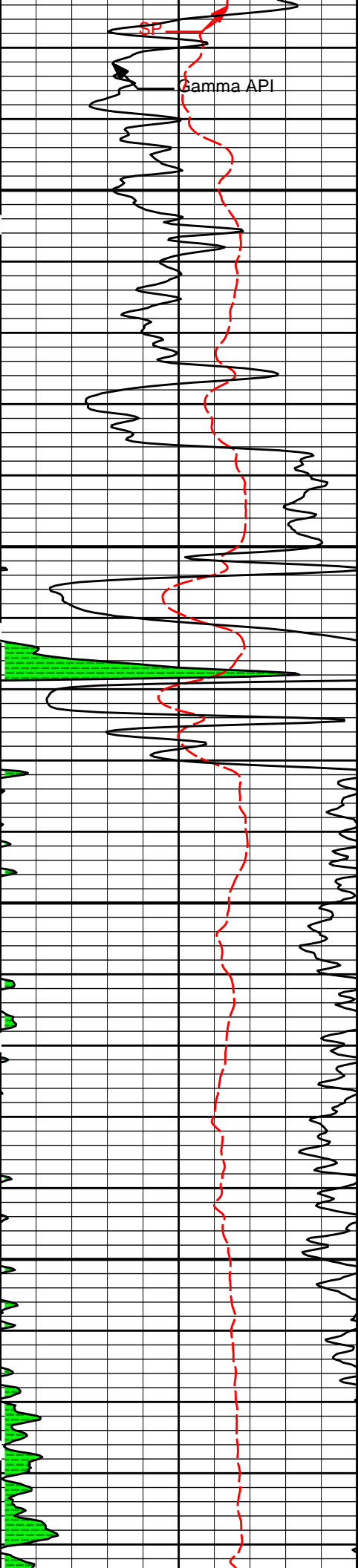
MD	1 : 240	ft
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2600

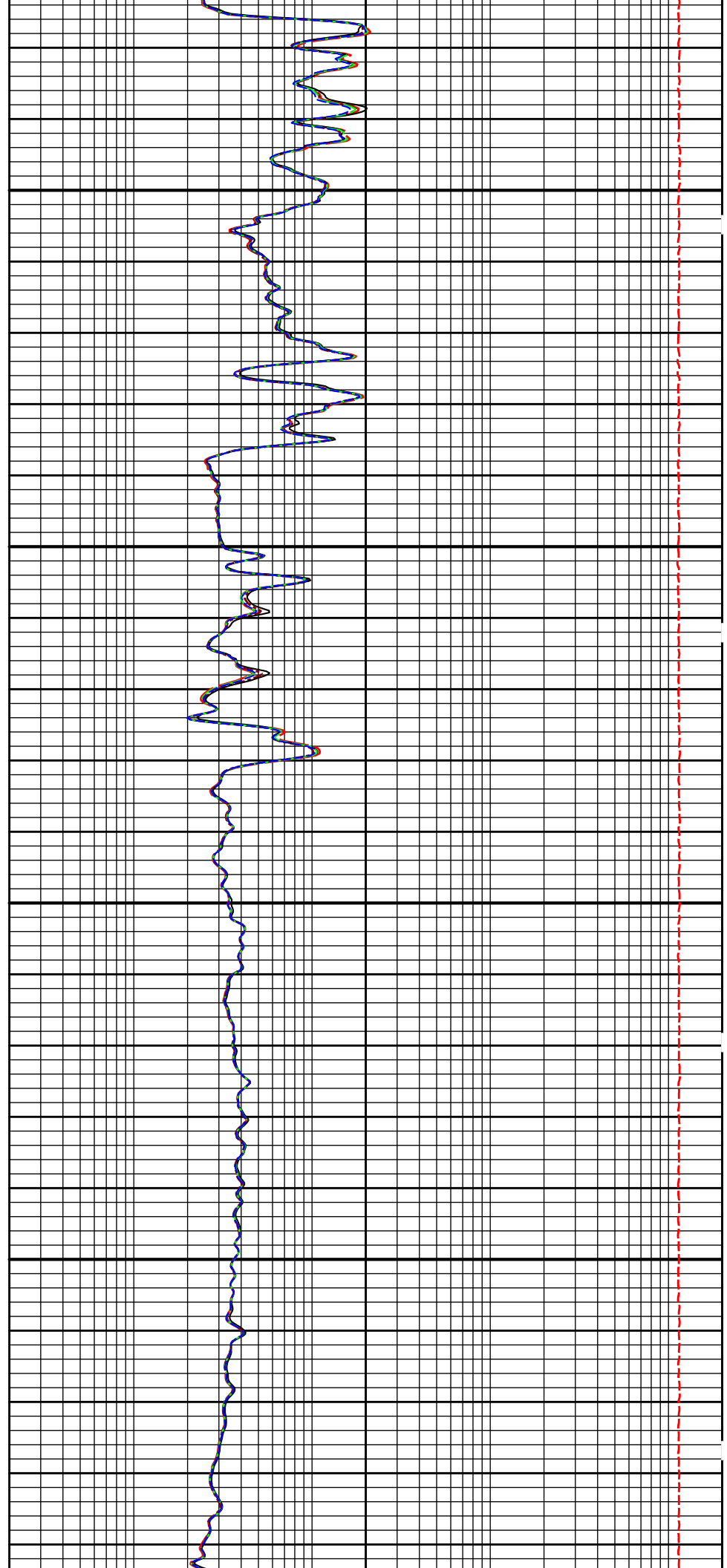
2700

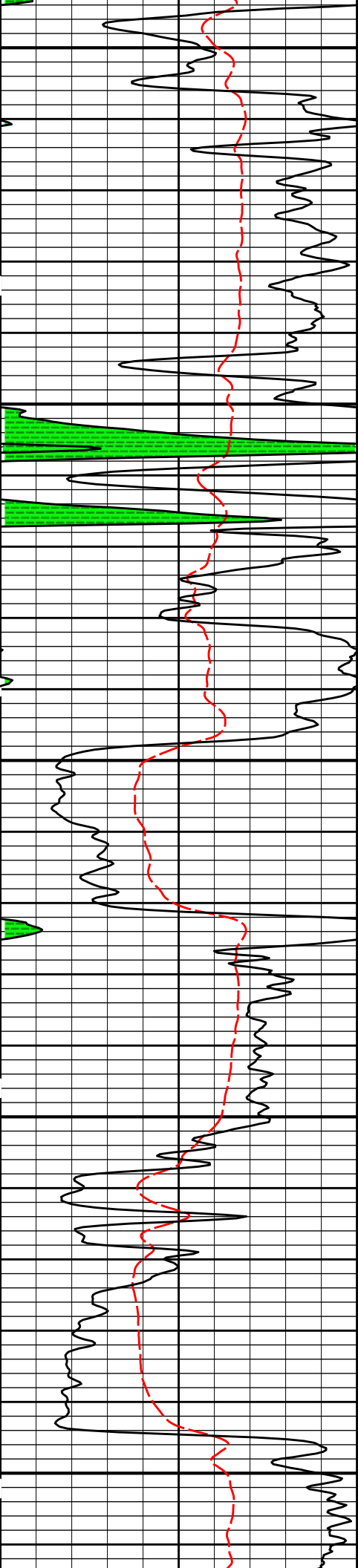




2800

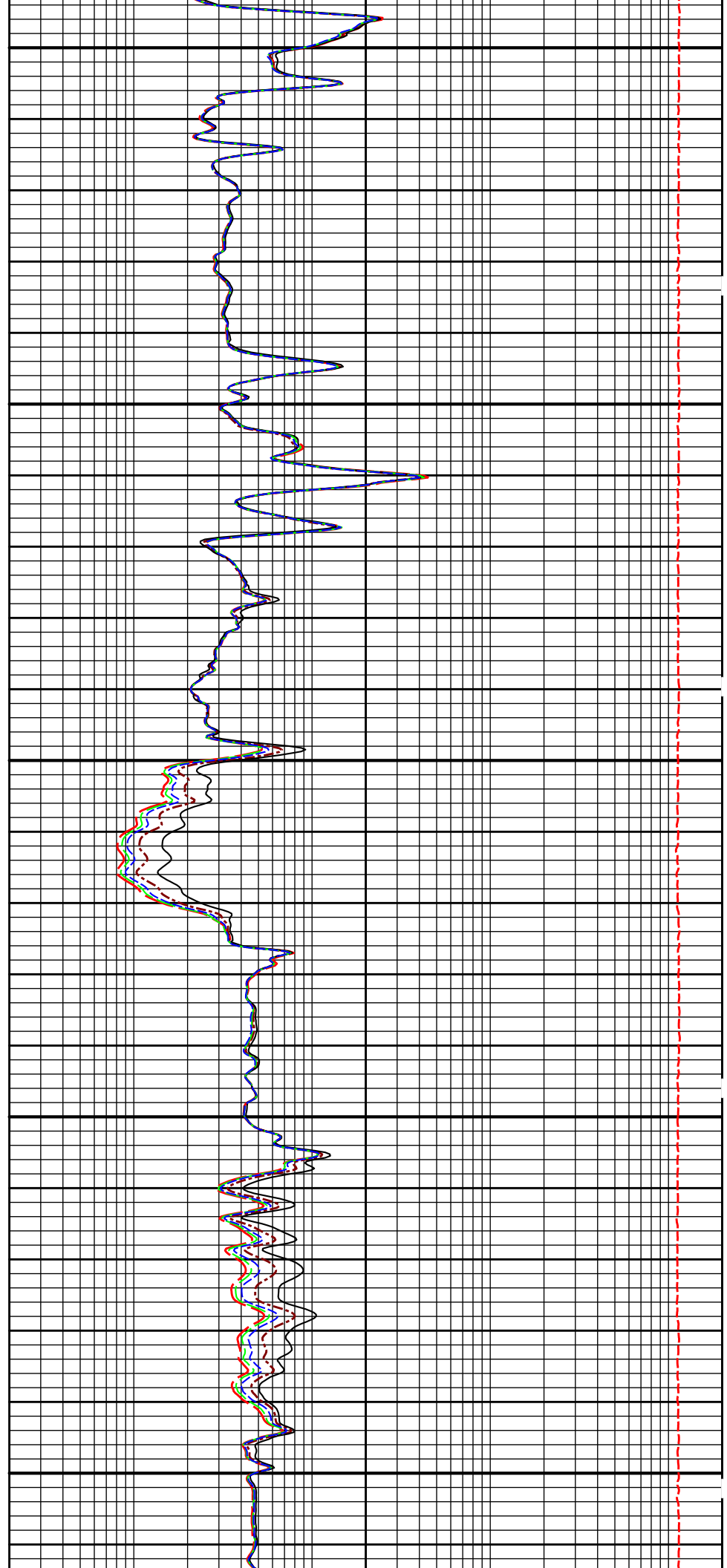
2900

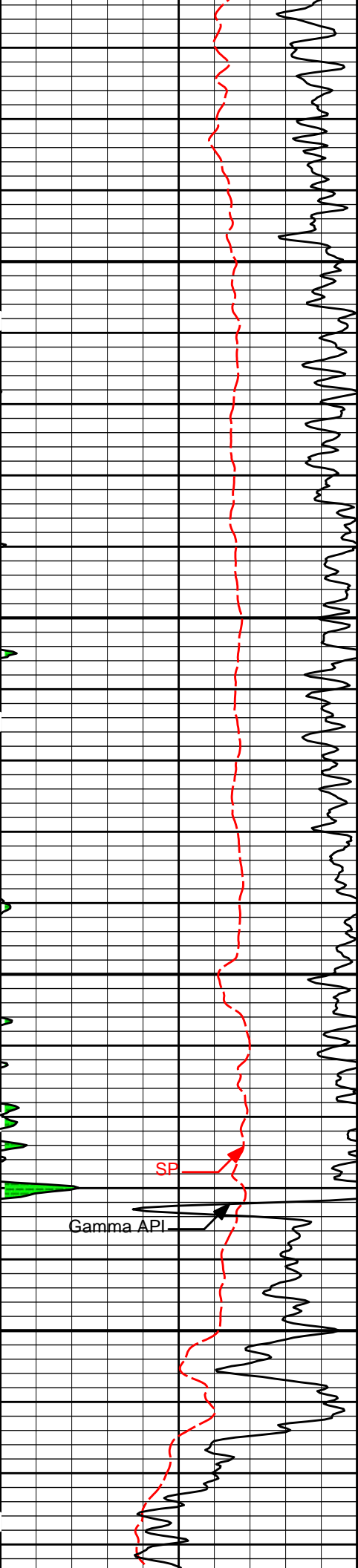




3000

3100



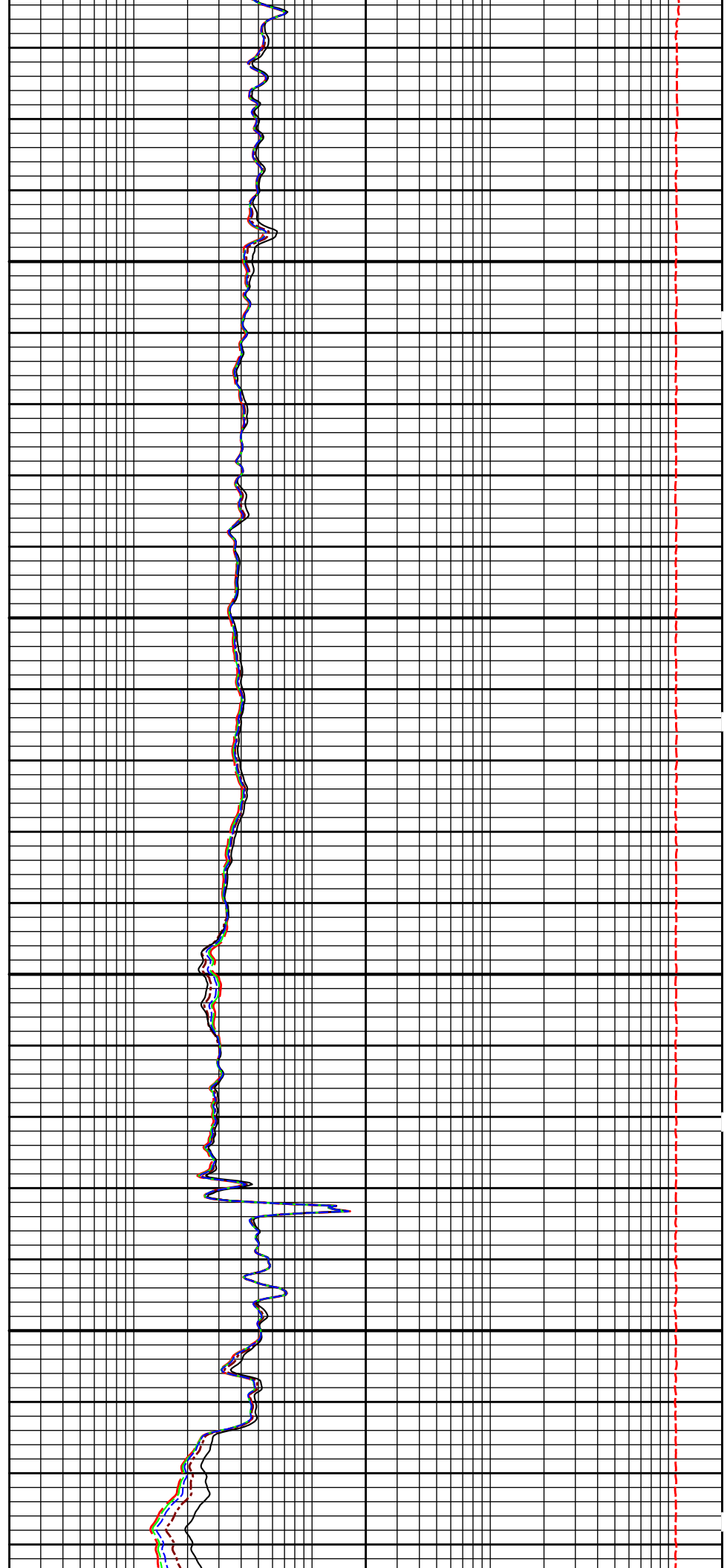


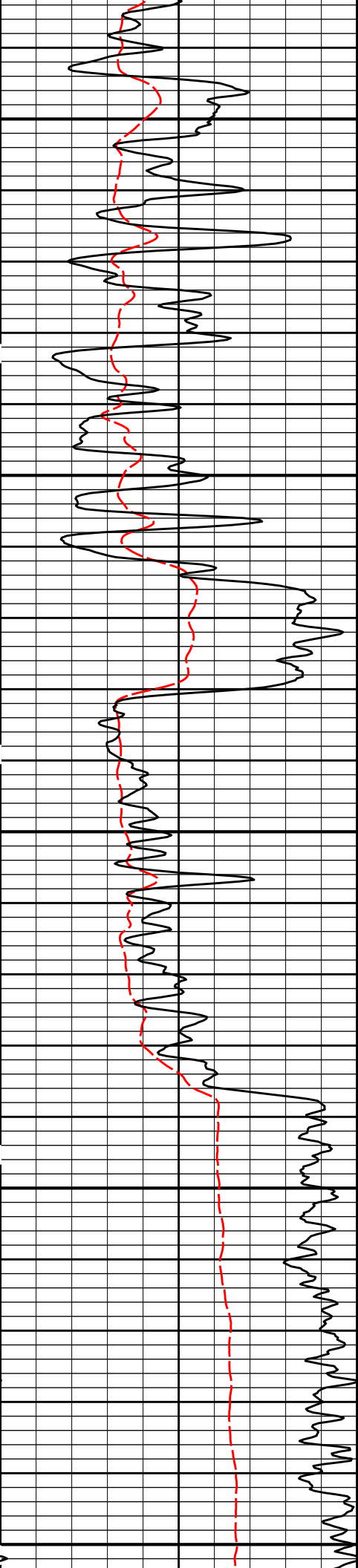
3200

3300

Gamma API

SP

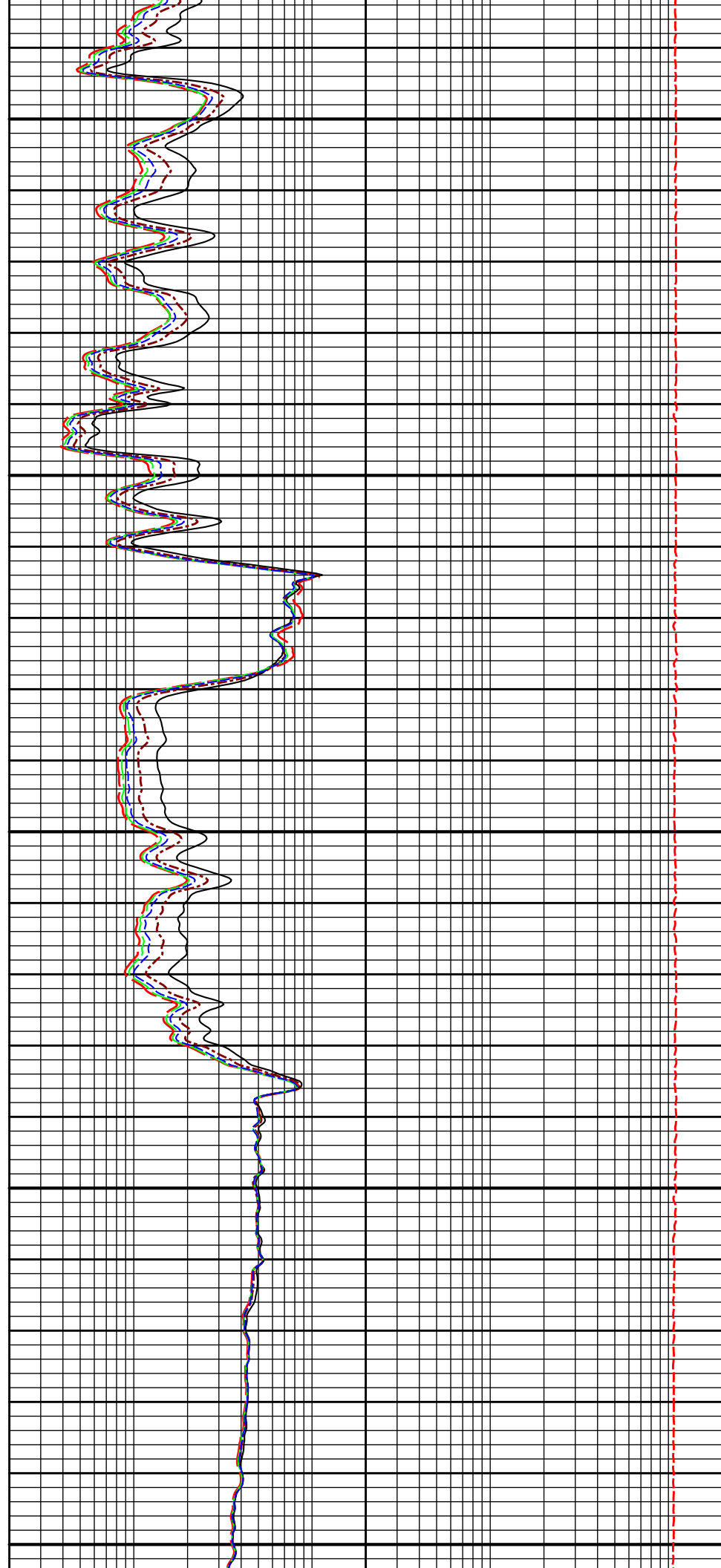




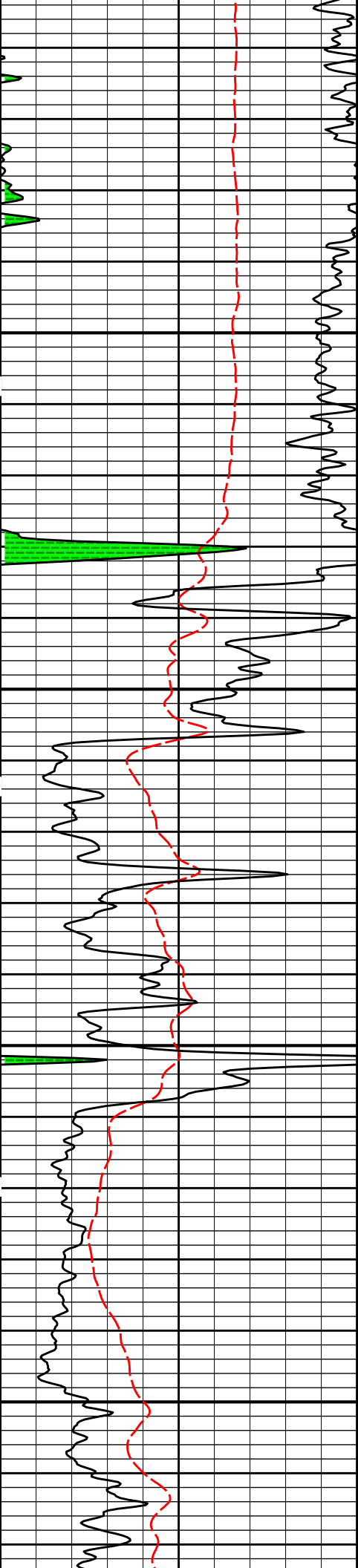
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3500

3600

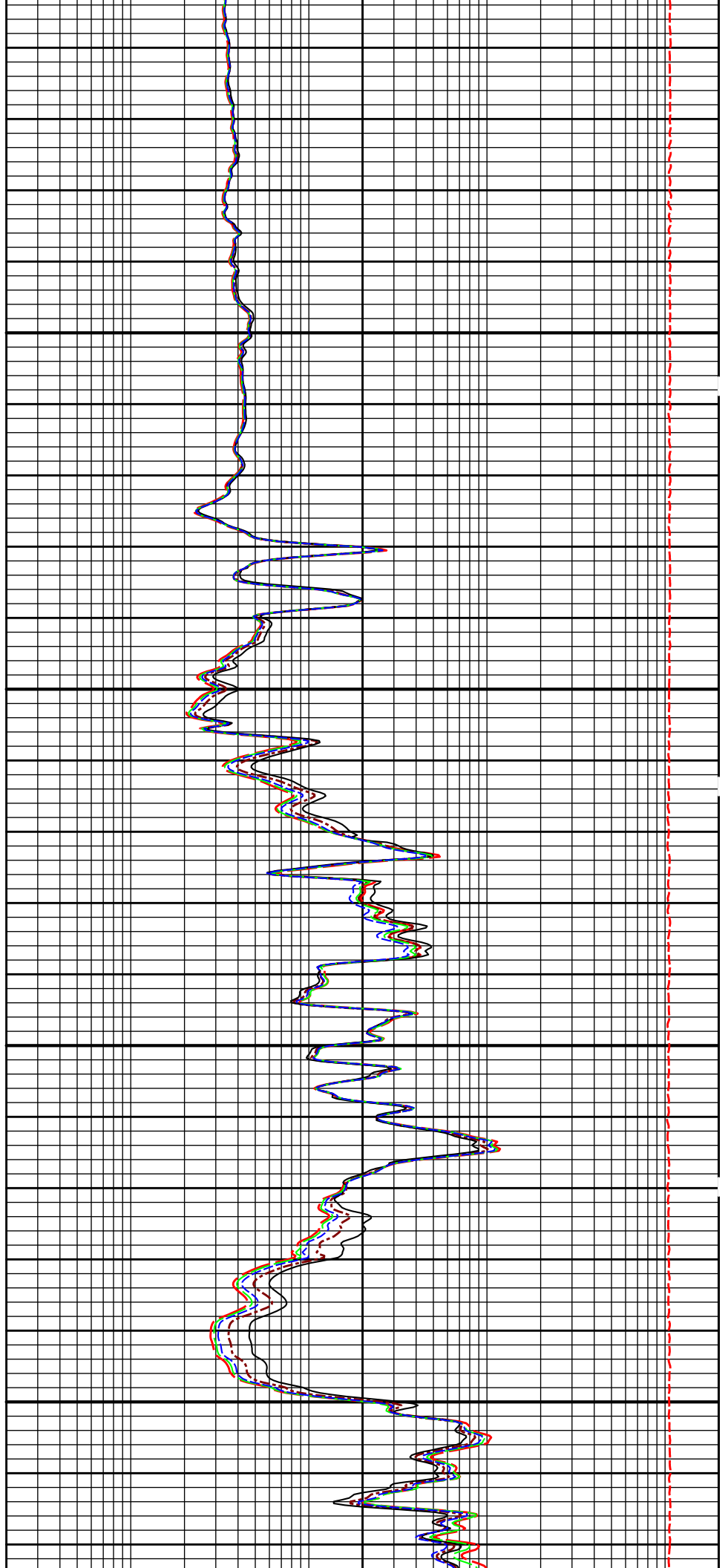


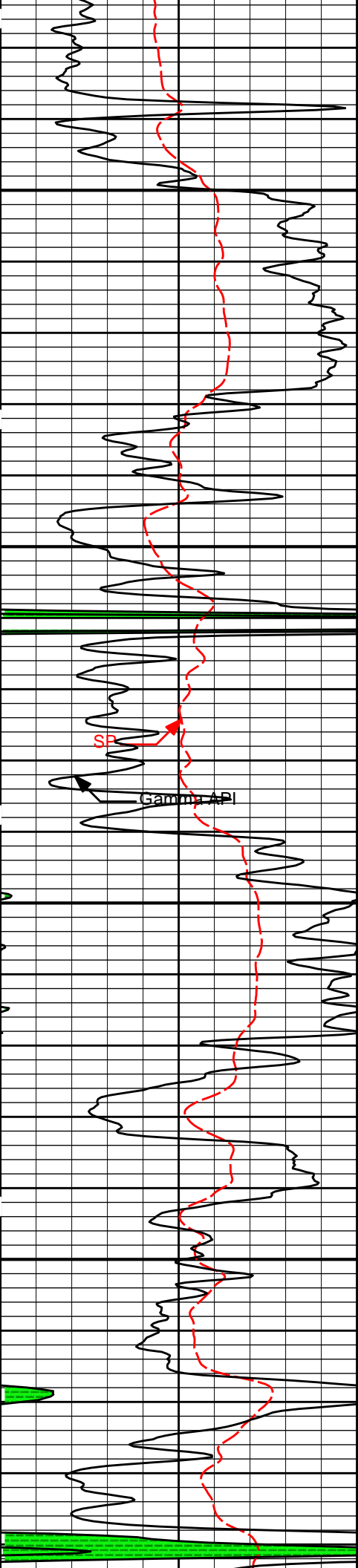




3700

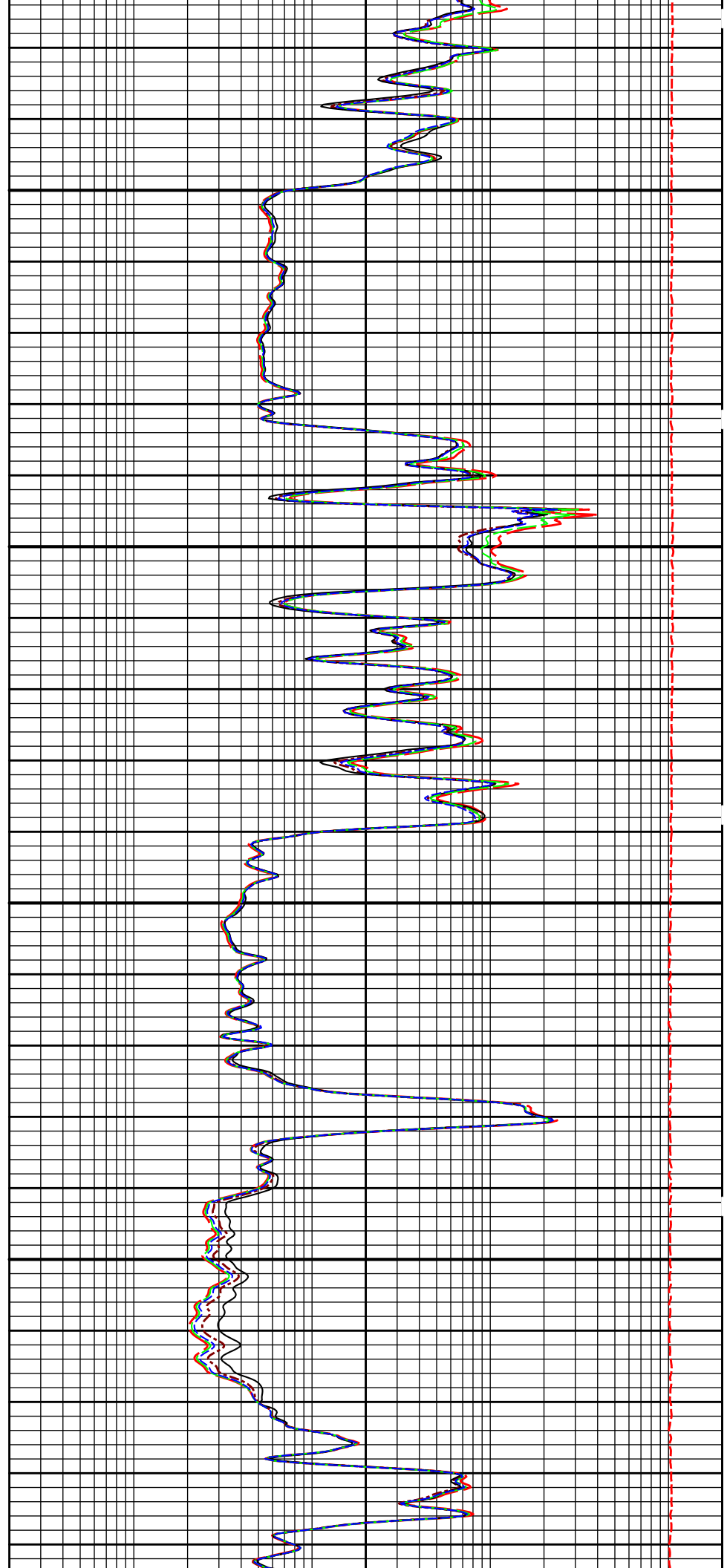
3800

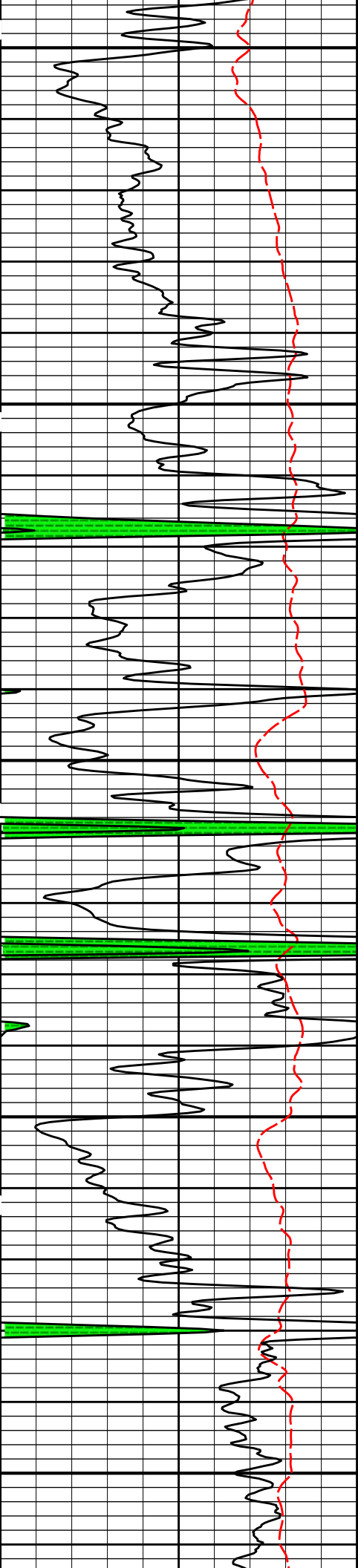




3900

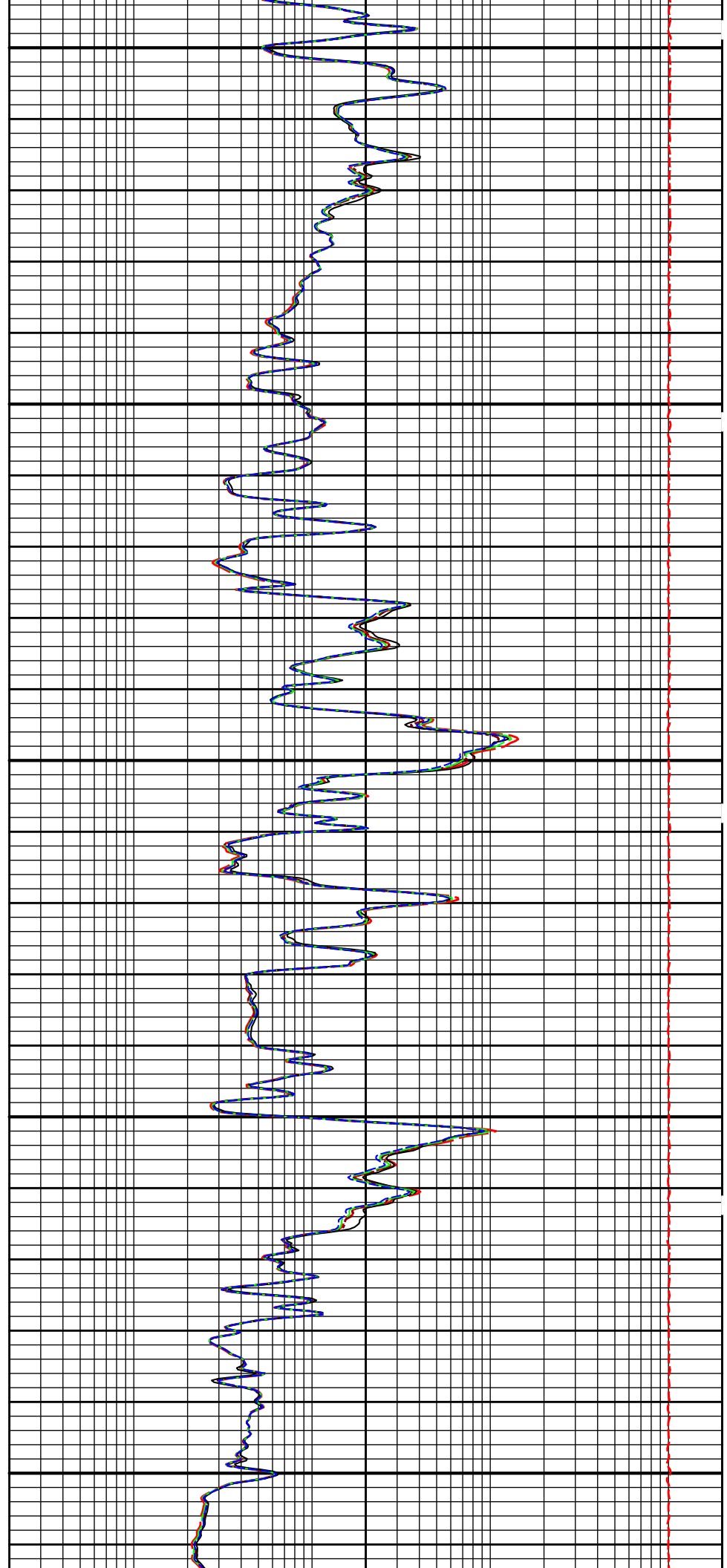
4000

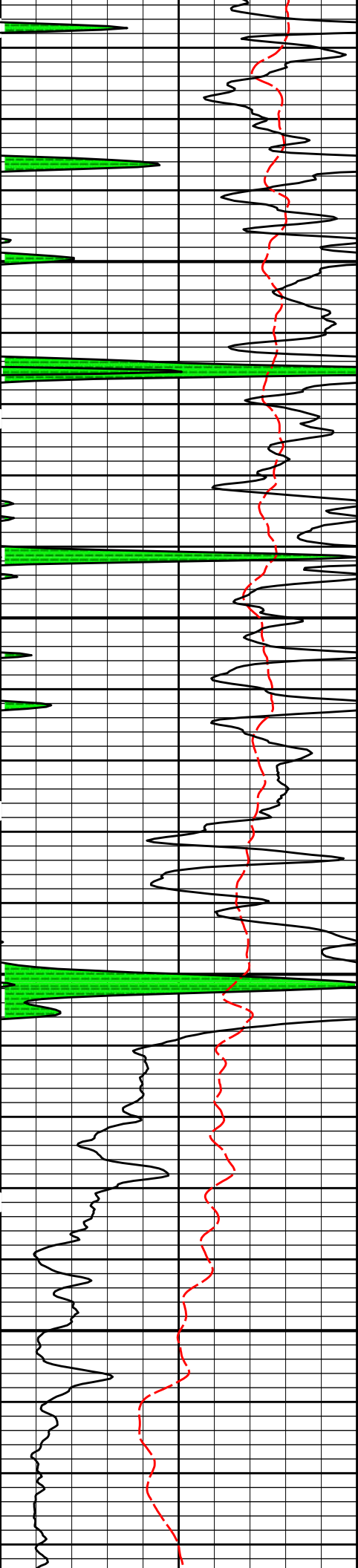




4100

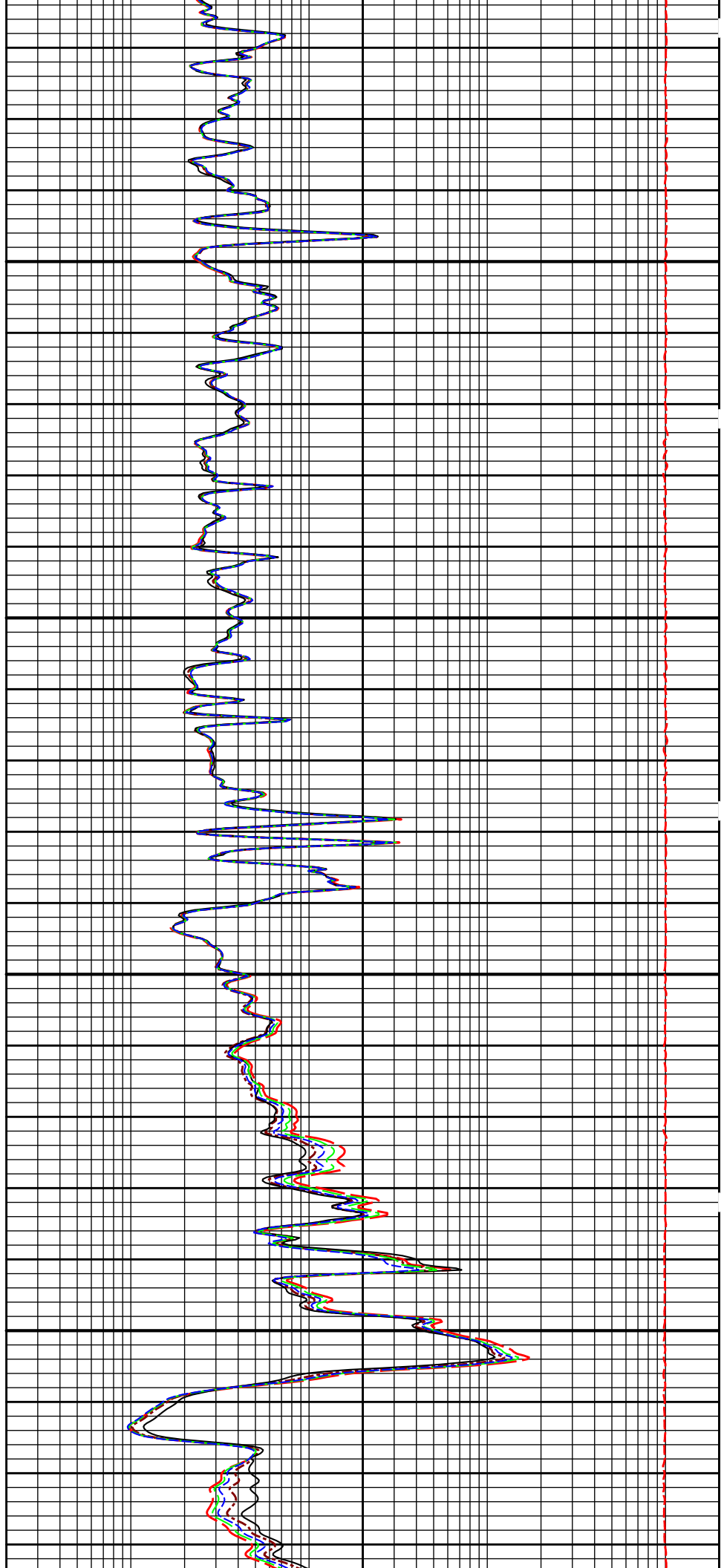
4200

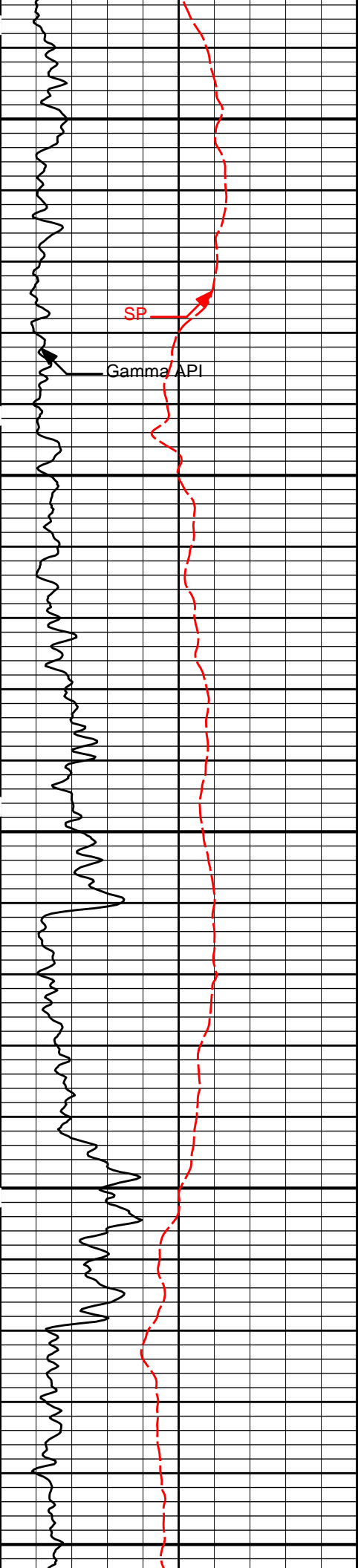




4300

4400





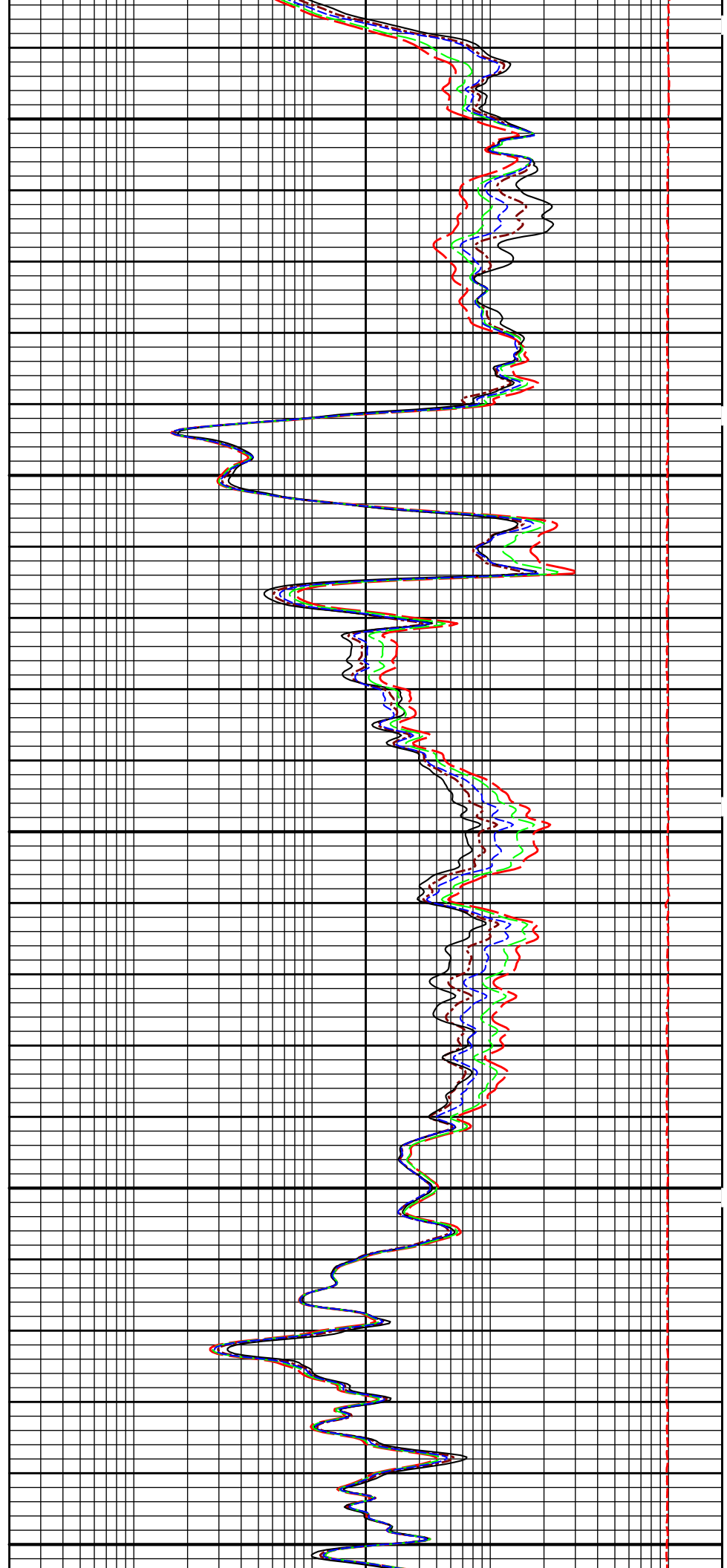
4500

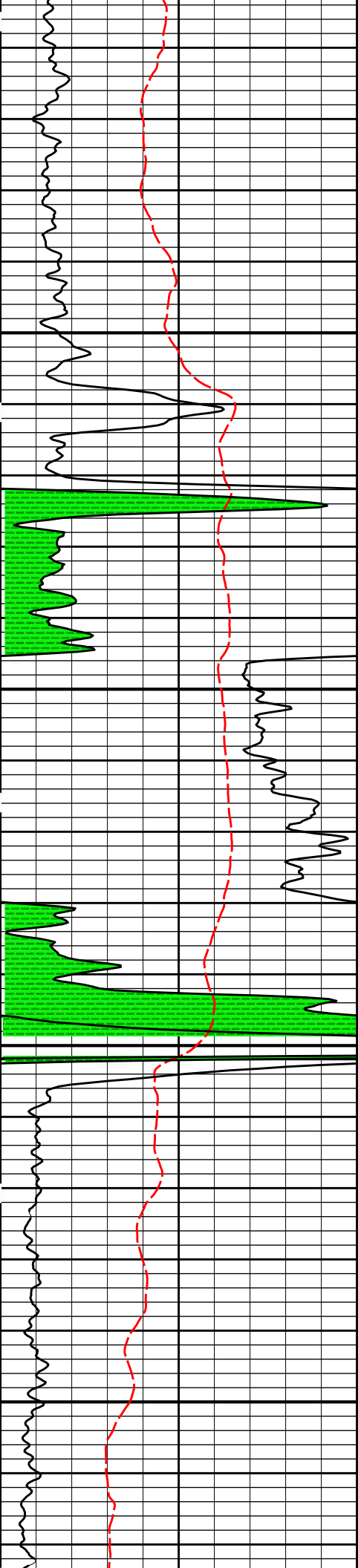
SP

Gamma API

4600

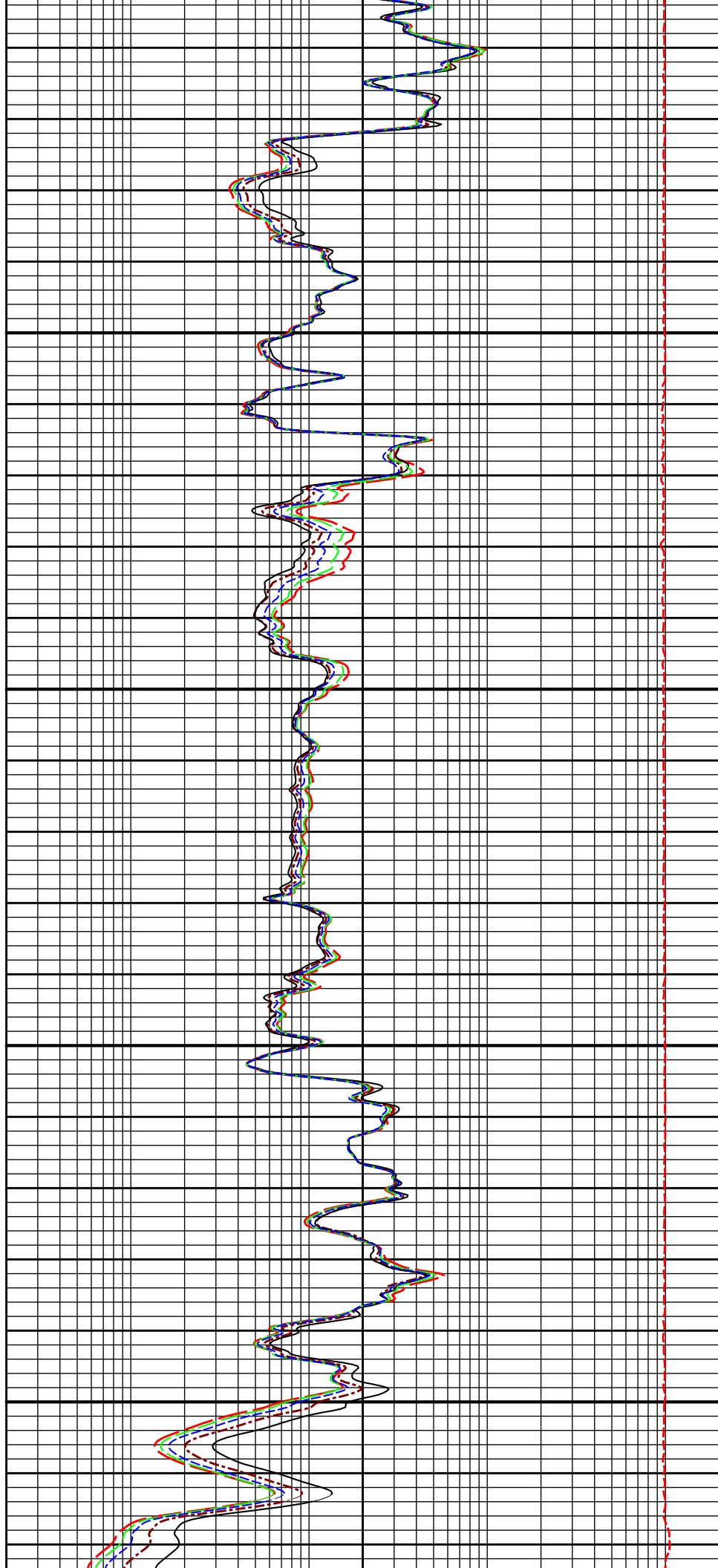
4700

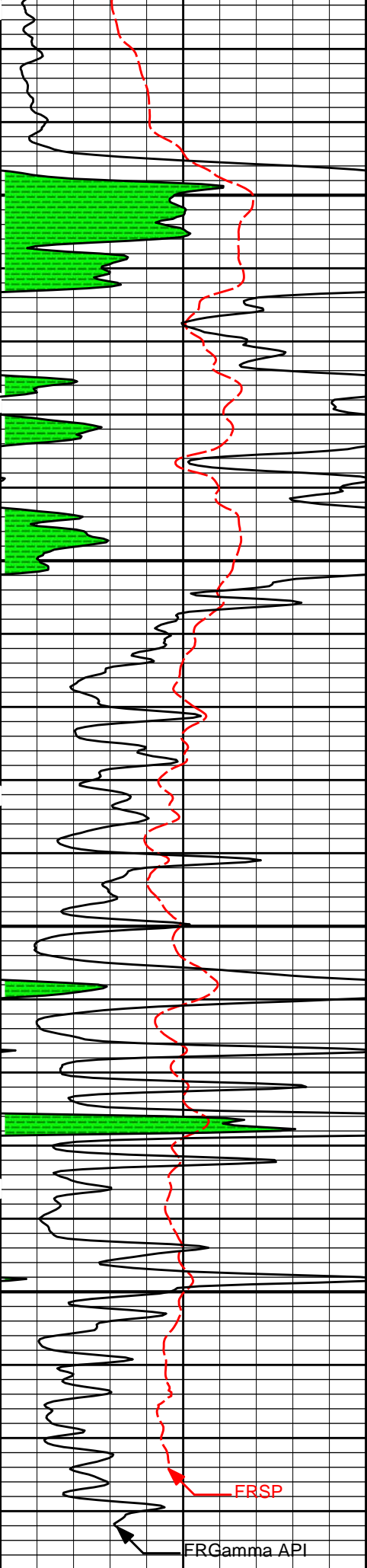




4800

4900



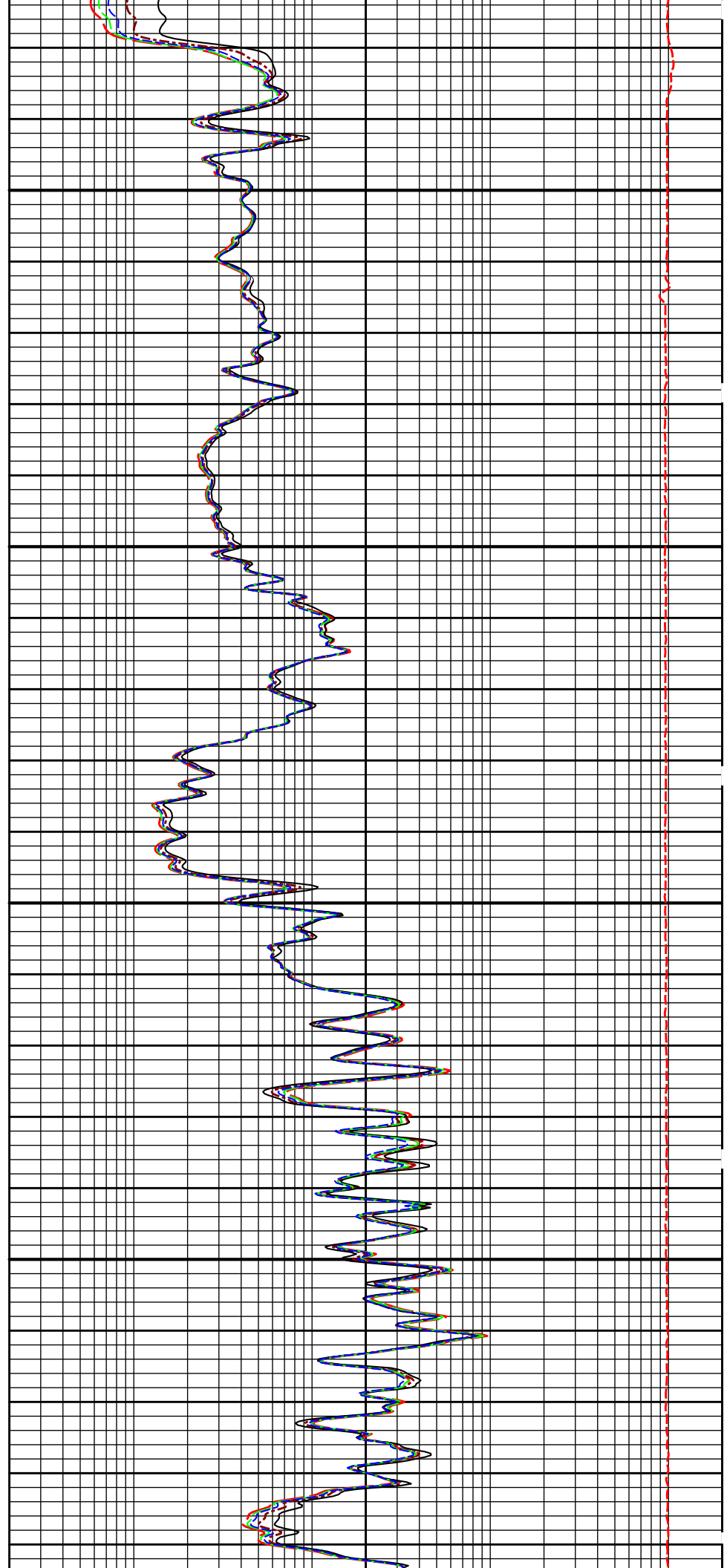


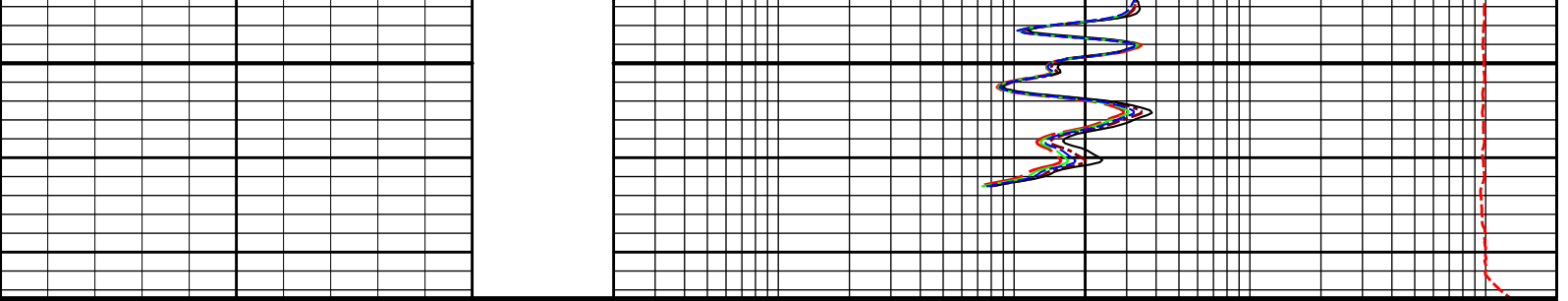
5000

5100

FRSP

ERGamma API





SP -]20[+	MD 1 : 240 ft	10K	Tension pounds	0
0      Gamma API      150 api		0.2	10in Resistivity 2ft Res	2000
SHALE		0.2	20in Resistivity 2ft Res	2000
		0.2	30in Resistivity 2ft Res	2000
		0.2	60in Resistivity 2ft Res	2000
		0.2	90in Resistivity 2ft Res	2000

**HALLIBURTON**      Plot Time: 07-May-14 12:15:22  
 Plot Range: 2500 ft to 5174.83 ft  
 Data: MURPHY\_SW\_D\_3404\Well Based\DETAIL1\  
 Plot File: \\-LOCAL-IMURPHY\_SW\_D\_3404\0001 SP-GTET-DSN-SDL-ACRT-BNACRT\ACRT\_5\_main\_lib

## 5 INCH MAIN LOG

MEASURED DEPTH  
 MAIN SECTION 5" PER 100'

**HALLIBURTON**      Plot Time: 07-May-14 12:15:22  
 Plot Range: 4900 ft to 5175.67 ft  
 Data: MURPHY\_SW\_D\_3404\Well Based\REPEAT1\  
 Plot File: \\-LOCAL-IMURPHY\_SW\_D\_3404\0001 SP-GTET-DSN-SDL-ACRT-BNACRT\ACRT\_5\_repeat\_lib

## REPEAT SECTION

	0.2	90in Resistivity 2ft Res	2000
		ohmm	
	0.2	60in Resistivity 2ft Res	2000
		ohmm	
	0.2	30in Resistivity 2ft Res	2000
		ohm-metre	
SHALE	0.2	20in Resistivity 2ft Res	2000
		ohmm	



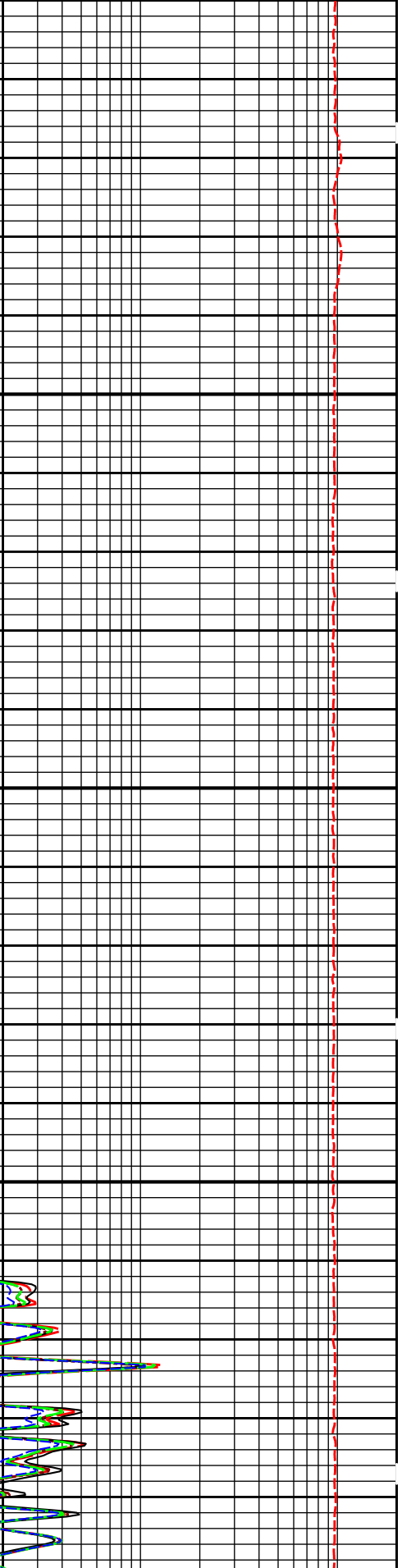
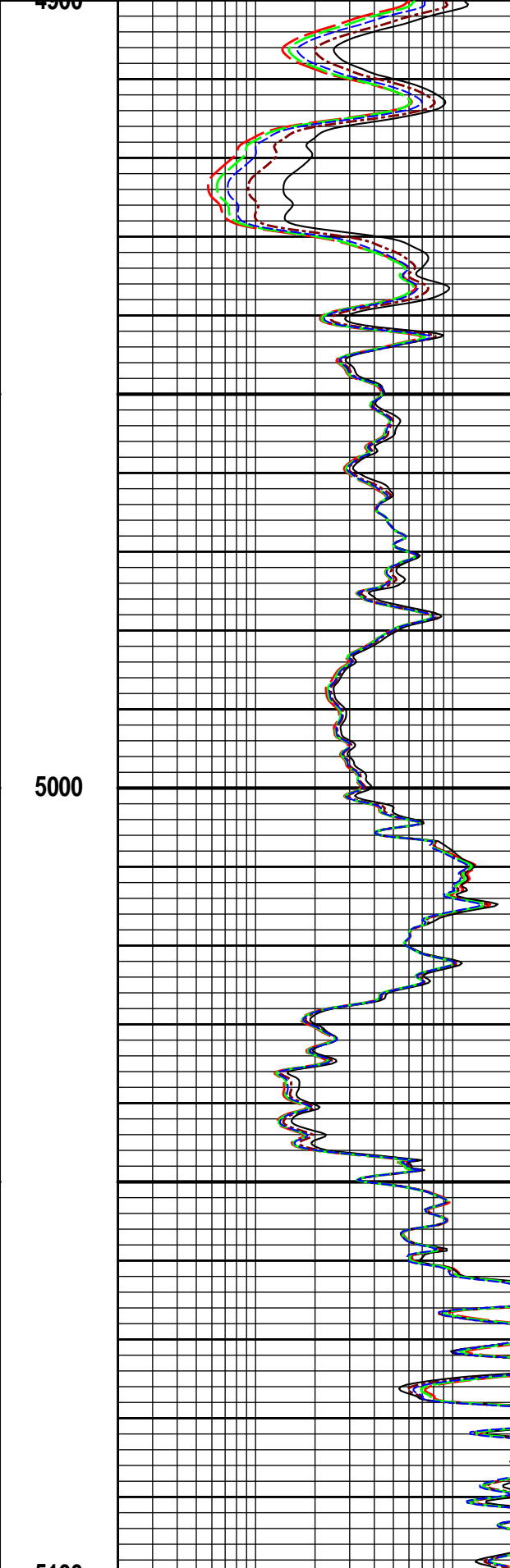
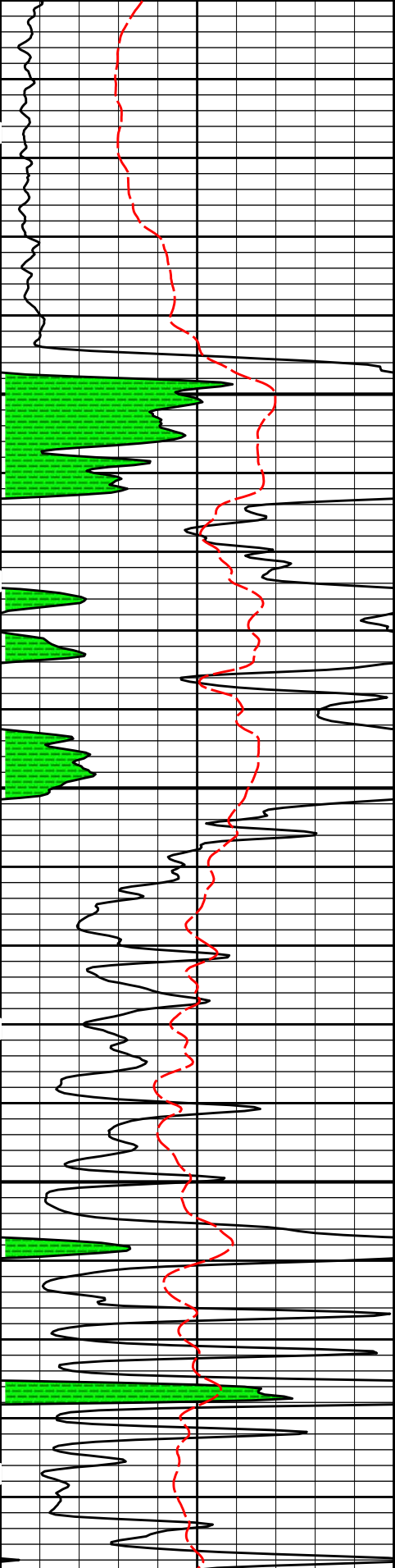
0 Gamma API 150

0.2 10in Resistivity 2ft Res 2000

api  
SP  
-120[+

MD  
1 : 240  
ft

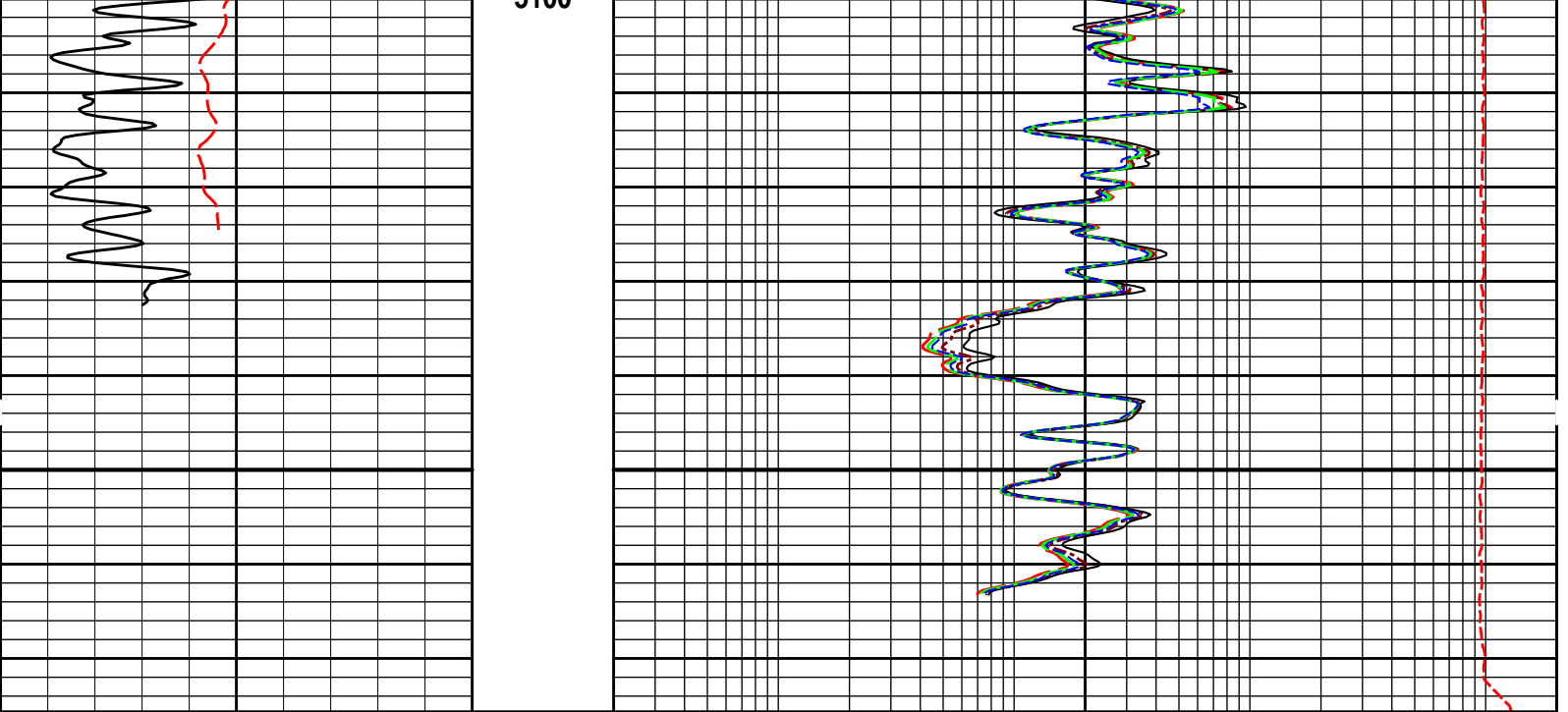
ohmm  
10K Tension  
pounds 0



4500

5000

5100



SP -120[+]	MD 1 : 240 ft	10K	Tension pounds	0
Gamma API api		0.2	10in Resistivity 2ft Res ohmm	2000
SHALE		0.2	20in Resistivity 2ft Res ohmm	2000
		0.2	30in Resistivity 2ft Res ohm-metre	2000
		0.2	60in Resistivity 2ft Res ohmm	2000
		0.2	90in Resistivity 2ft Res ohmm	2000

**HALLIBURTON**

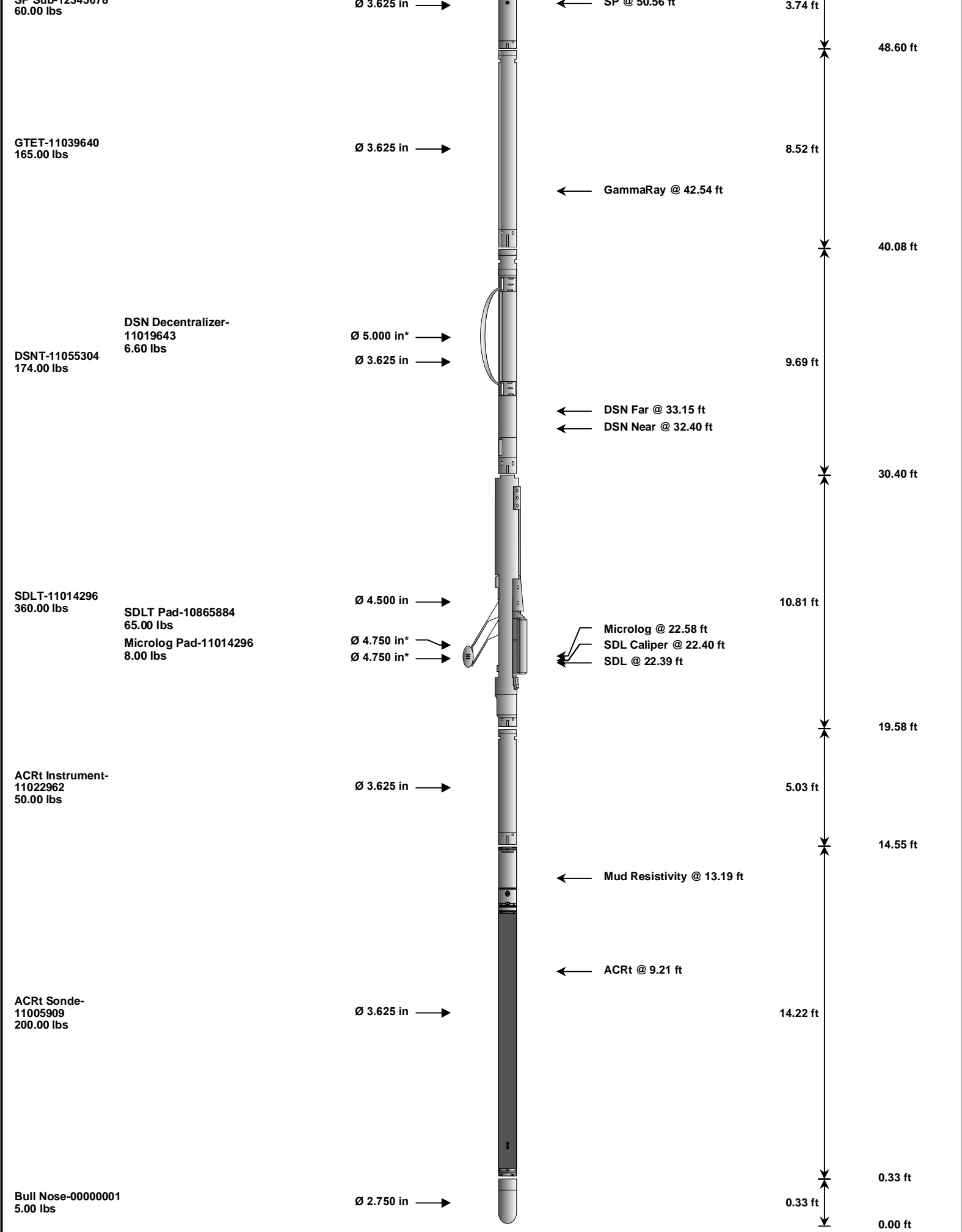
Plot Time: 07-May-14 12:15:23  
 Plot Range: 4900 ft to 5175.67 ft  
 Data: MURPHY\_SW\_D\_3404\Well Based\REPEAT1\  
 Plot File: \\-LOCAL-MURPHY\_SW\_D\_3404\0001 SP-GTET-DSN-SDL-ACRT-BNACRTACRT\_5\_repeat\_lib

## REPEAT SECTION

**HALLIBURTON**

## TOOL STRING DIAGRAM REPORT

Description	Overbody Description	O.D.	Diagram	Sensors @ Delays	Length	Accumulated Length
CH_HOS-CH_696 37.50 lbs		Ø 2.750 in		Temperature @ 55.29 ft	3.03 ft	56.32 ft
XOHD-00000001 20.00 lbs		Ø 2.750 in Ø 3.625 in			0.95 ft	53.29 ft
SP Sub-12345678						



Mnemonic	Tool Name	Serial Number	Weight (lbs)	Length (ft)	Accumulated Length (ft)	Max. Log. Speed (fpm)
	Bull Nose-00000001		5.00	0.33	0.33	0.00
	ACRt Sonde-11005909		200.00	14.22	14.55	
	ACRt Instrument-11022962		50.00	5.03	19.58	
	SDLT Pad-10865884		65.00	10.81	30.40	
	Microlog Pad-11014296		8.00	22.58	40.08	
	SDL Caliper			22.40	48.60	
	SDL @ 22.39 ft					
	DSN Decentralizer-11019643		6.60	9.69		
	DSN Far @ 33.15 ft					
	DSN Near @ 32.40 ft					
	GTET-11039640		165.00	8.52		
	GammaRay @ 42.54 ft					
	Bull Nose		60.00	3.74		
	SP @ 50.56 ft					

CH_HOS	Hostile Cable Head with Load Cell	CH_696	37.50	3.03	53.29	300.00
XOHD	Hostile to Dits Cross Over	00000001	20.00	0.95	52.34	300.00
SP	SP Sub	12345678	60.00	3.74	48.60	300.00
GTET	Gamma Telemetry Tool	11039640	165.00	8.52	40.08	60.00
DSNT	Dual Spaced Neutron	11055304	174.00	9.69	30.40	60.00
DCNT	DSN Decentralizer	11019643	6.60	5.13 *	33.73	300.00
SDLT	Spectral Density Tool	11014296	360.00	10.81	19.58	60.00
SDLP	Density Insite Pad	10865884	65.00	2.55 *	21.79	60.00
MICP	Microlog Pad	11014296	8.00	1.00 *	22.08	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
BLNS	Bull Nose	00000001	5.00	0.33	0.00	300.00
<b>Total</b>			<b>1,151.10</b>	<b>56.32</b>		
				* Not included in Total Length and Length Accumulation.		
<b>Data: MURPHY_SWD_3404\0001 SP-GTET-DSN-SDL-ACRT-BNIDLE</b>				<b>Date: 07-May-14 09:54:18</b>		

# HALLIBURTON

## CALIBRATION REPORT

NATURAL GAMMA RAY TOOL SHOP CALIBRATION			
<b>Tool Name:</b>	<b>GTET - 11039640</b>	<b>Reference Calibration Date:</b>	<b>19-Sep-13 09:56:50</b>
<b>Engineer:</b>	<b>SHELDON INGERSOLL</b>	<b>Calibration Date:</b>	<b>25-Apr-14 12:27:40</b>
<b>Software Version:</b>	<b>WL INSITE R4.2.0 (Build 2)</b>	<b>Calibration Version:</b>	<b>1</b>

Calibrator Source S/N: Error  
 Calibrator API Reference:265.00 api  
 Equivalent Calibrator API Reference:269.6 api

Measurement	Measured	Calibrated	Units
Background	61.3	60.1	api
Background + Calibrator	336.2	329.8	api
Calibrator	274.9	269.6	api

NATURAL GAMMA RAY TOOL FIELD CALIBRATION			
<b>Tool Name:</b>	<b>GTET - 11039640</b>	<b>Reference Calibration Date:</b>	<b>25-Apr-14 12:27:40</b>
<b>Engineer:</b>	<b>J. BOLLLOM</b>	<b>Calibration Date:</b>	<b>06-May-14 04:56:03</b>
<b>Software Version:</b>	<b>WL INSITE R4.2.0 (Build 2)</b>	<b>Calibration Version:</b>	<b>1</b>

Calibrator Source S/N: Error  
 Calibrator API Reference:265.00 api  
 Equivalent Calibrator API Reference:269.6 api

Field Verification	Shop	Field	Units
Background	60.1	54.9	api
Background + Calibrator	329.8	321.8	api
Calibrator	269.6	266.8	api

Shop	Field	Difference	Tolerance
269.6	266.8	2.8	+/- 9.00

ARRAY COMPENSATED TRUE RESISTIVITY SHOP CALIBRATION			
<b>Tool Name:</b>	<b>ACRt Sonde - 11005909</b>	<b>Reference Calibration Date:</b>	<b>19-Feb-14 11:25:48</b>
<b>Engineer:</b>	<b>J. BOLLLOM</b>	<b>Calibration Date:</b>	<b>20-Mar-14 10:22:54</b>
<b>Software Version:</b>	<b>WL INSITE R4.2.0 (Build 2)</b>	<b>Calibration Version:</b>	<b>1</b>
<b>Host Tool Name:</b>	<b>ACRt Instrument - 11022962</b>		

**TYPICAL GAIN RANGE**

Subarray	R12KHz			R36KHz			R72KHz		
	Lower	(mmho/m)	Upper	Lower	(mmho/m)	Upper	Lower	(mmho/m)	Upper
A1 (80")	0.95	1.0257	1.05	0.95	1.0227	1.05	0.95	1.0169	1.05
A2 (50")	0.95	1.0240	1.05	0.95	1.0204	1.05	0.95	1.0161	1.05
A3 (29")	0.95	1.0190	1.05	0.95	1.0138	1.05	0.95	1.0068	1.05
A4 (17")	0.95	1.0225	1.05	0.95	1.0134	1.05	0.95	1.0080	1.05
A5 (10")	N/A	N/A	N/A	0.95	1.0007	1.05	0.95	0.9926	1.05
A6 (6")	N/A	N/A	N/A	0.95	0.9844	1.05	0.95	0.9777	1.05

**SONDE OFFSET**

Subarray	R12KHz		R36KHz		R72KHz	
	(mmho/m)		(mmho/m)		(mmho/m)	
A1 (80")	0.275		-3.589		-5.498	
A2 (50")	-1.146		-3.575		-4.884	
A3 (29")	-14.586		-4.600		-3.100	
A4 (17")	-103.111		-30.853		-26.473	
A5 (10")	N/A		-100.106		-44.607	
A6 (6")	N/A		284.355		152.307	

**TRANSMITTER CURRENT GAIN**

**R-MUD VERIFICATION**

Signal	TRANSMITTER CURRENT GAIN			Signal	R-MUD VERIFICATION		
	Lower	R	Upper		Lower (ohm-m)	Measured (ohm-m)	Upper (ohm-m)
12K	0.6	0.88	1.3	Mud Cell	0.95	1.00	1.05
36K	1.0	1.35	2.0				
72K	1.0	1.59	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
<b>GTET-11039640</b>						
Gamma Ray Calibrator	269.6	266.8	-----	2.8	+/- 9.00	api
<b>ACRt Sonde-11005909</b>						
Mud Cell	1.00	-----	-----	0.00	-----	ohm-m

Data: MURPHY\_SWD\_3404\0001 SP-GTET-DSN-SDL-ACRT-BN\001 07-May-14 10:14 Dn @407.8f

Date: 07-May-14 10:17:28



**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	9.500	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	ST	Surface Temperature	75.0	degF
SHARED	TD	Total Well Depth	5181.00	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?	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	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	
ACRt Sonde	RTOK	Process ACRt?	Yes	
ACRt Sonde	MNSO	Minimum Tool Standoff	1.50	in

ACRt Sonde	TCS1	Temperature Correction Source	Free Hanging	
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: MURPHY_SWD_3404I0001 SP-GTET-DSN-SDL-ACRT-BN001 07-May-14 10:14 Dn @407.8f				Date: 07-May-14 10:16:46

**HALLIBURTON**

**INPUTS, DELAYS AND FILTERS TABLE**

Mnemonic	Input Description	Delay (ft)	Filter Type	Filter Length (ft)
<b>Depth Panel</b>				
TENS	Tension	0.00	NO	
<b>Rwa / CrossPlot</b>				
TPUL	Tension Pull	56.32	NO	
BS	Bit Size	56.32	NO	
HDIA	Measured Hole Diameter	0.00	NO	
<b>CH_HOS</b>				
DHTN	DownholeTension	0.00	BLK	0.000
<b>SP Sub</b>				
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	
<b>GTET</b>				
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
HDIA	Measured Hole Diameter	0.00	NO	
ACCZ	Accelerometer Z	0.00	BLK	0.083
DEVI	Inclination	0.00	NO	
<b>DSNT</b>				
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	
HDIA	Measured Hole Diameter	0.00	NO	
<b>SDLT</b>				

TPUL	Tension Pull	22.40	NO	
PCAL	Pad Caliper	22.40	TRI	0.250
ACAL	Arm Caliper	22.40	TRI	0.250
<b>ACRt Sonde</b>				
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 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	



LEDV	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	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	
HDIA	Measured Hole Diameter	0.00	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

Data: MURPHY\_SWD\_3404\0001 SP-GTET-DSN-SDL-ACRT-BN\001 07-May-14 10:14 Dn @407.8f

Date: 07-May-14 10:16:57

COMPANY	<b>SANDRIDGE ENERGY</b>		
WELL	<b>MURPHY SWD 3404 1-18</b>		
FIELD	<b>BLUFF</b>		
COUNTY	<b>SUMNER</b>	STATE	<b>KANSAS</b>

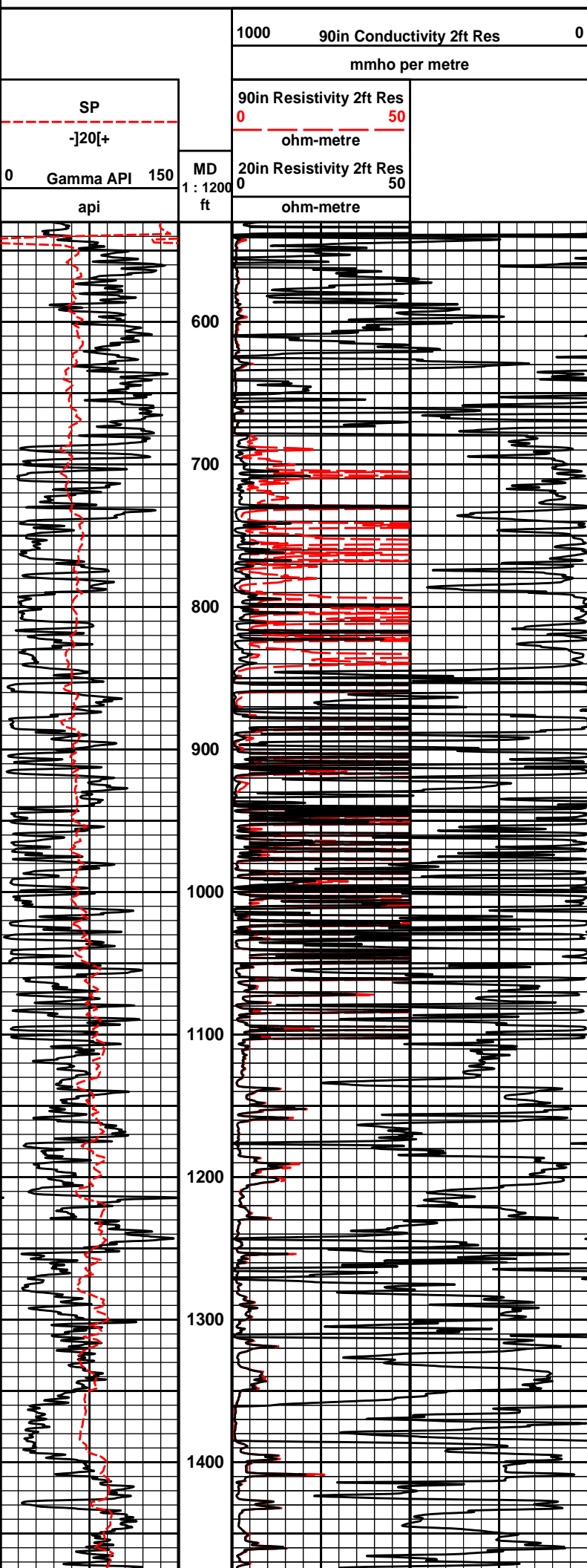
# HALLIBURTON

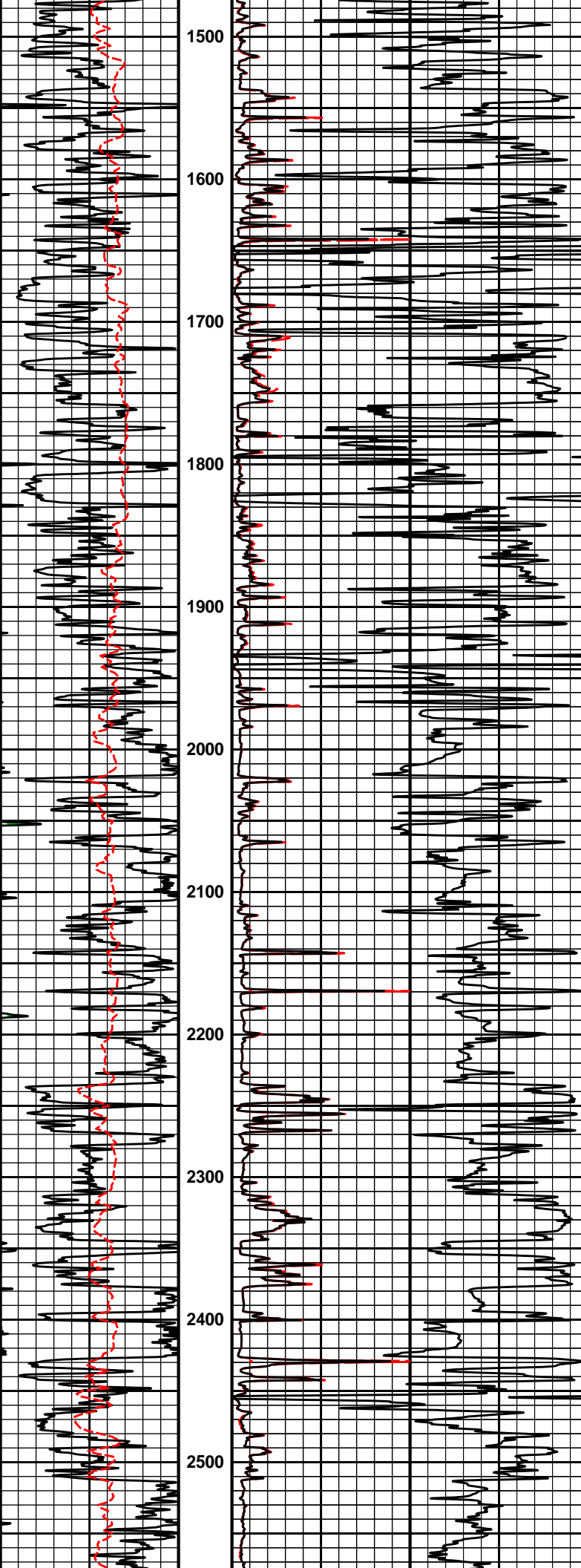
**ARRAY COMPENSATED  
TRUE RESISTIVITY  
LOG**

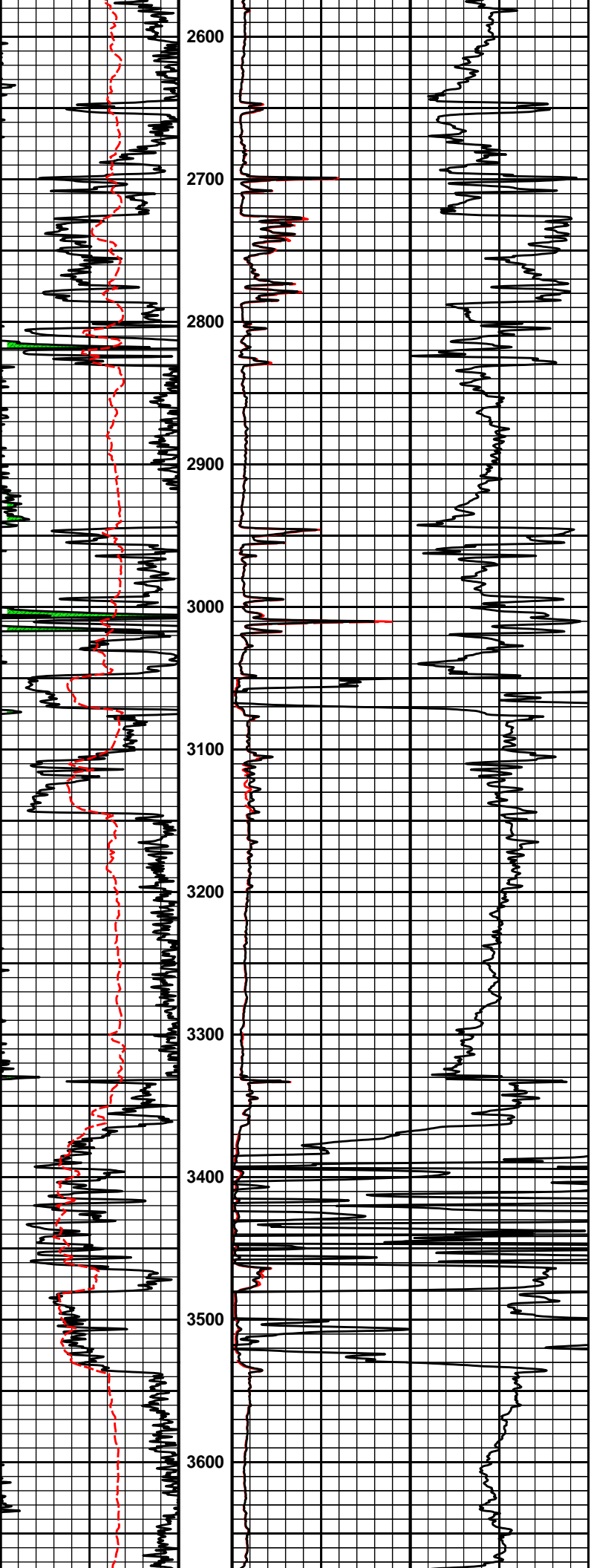
**HALLIBURTON**

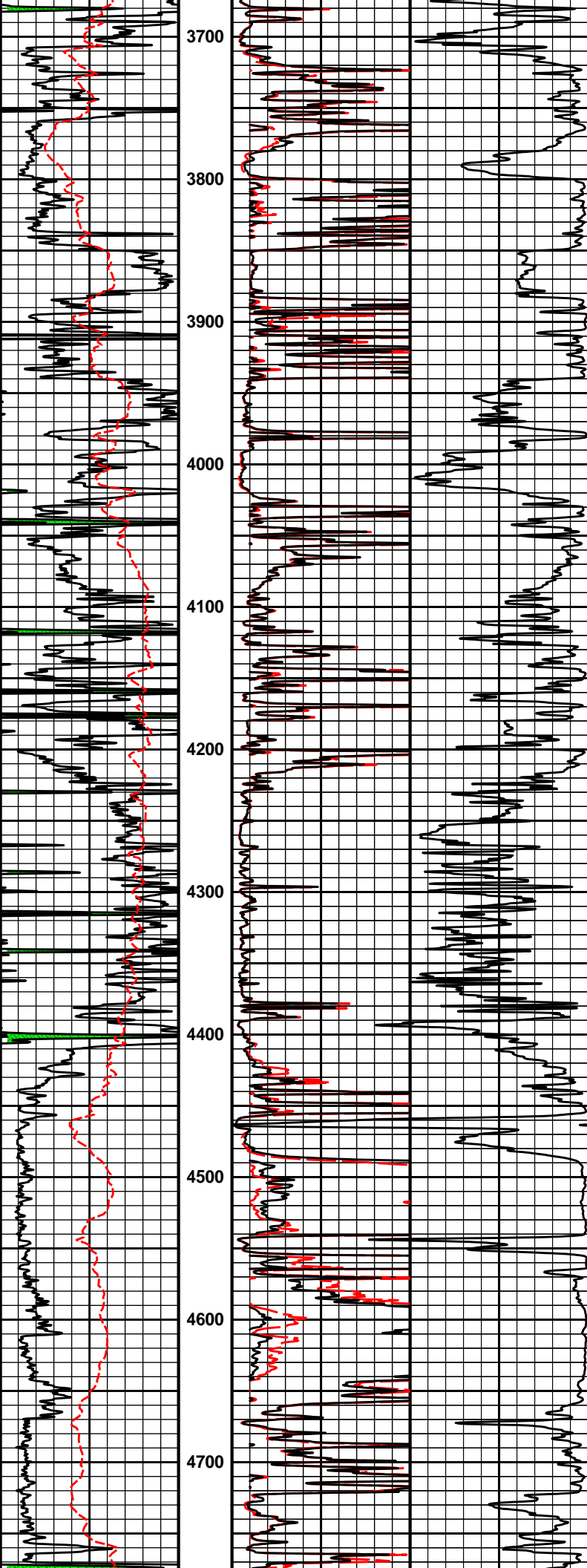
Plot Time: 07-May-14 12:15:24  
 Plot Range: 530 ft to 5163 ft  
 Data: MURPHY\_SWD\_3404\Well Based\CASING1\  
 Plot File: \\-LOCAL-MURPHY\_SWD\_3404\...ACRT\_1.lib

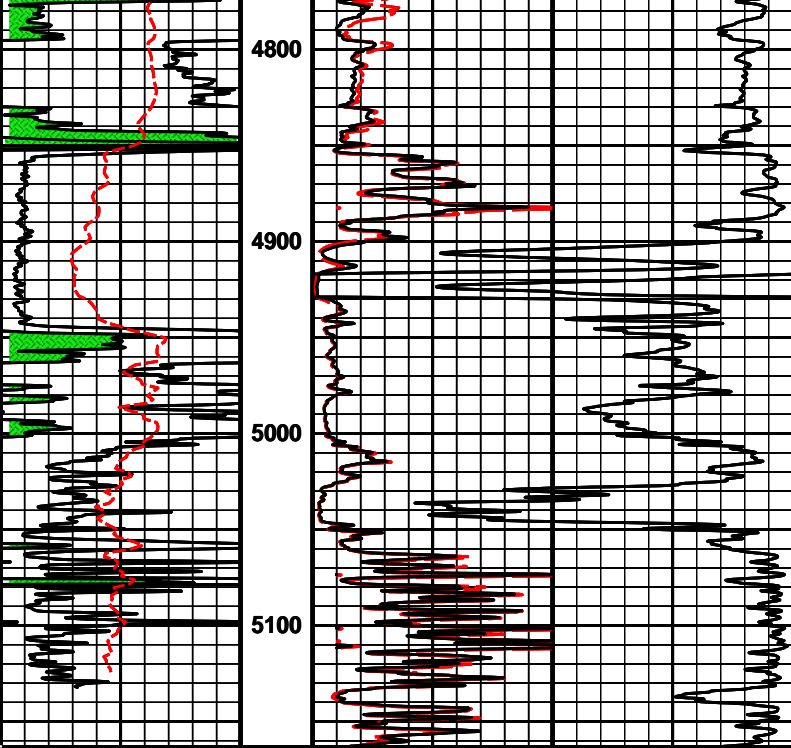
## 1 INCH MAIN LOG











0	Gamma API	150	MD	20in Resistivity 2ft Res	0	50
	api		1 : 1200	ohm-metre		
	SP		ft	90in Resistivity 2ft Res	0	50
	-]20[+			ohm-metre		
				1000	90in Conductivity 2ft Res	0
					mmho per metre	

**HALLIBURTON**  
 Plot Time: 07-May-14 12:15:25  
 Plot Range: 530 ft to 5163 ft  
 Data: MURPHY\_SWD\_3404\Well Based\CASING1\  
 Plot File: \\-LOCAL-MURPHY\_SWD\_3404...\ACRT\_1.lib

# 1 INCH MAIN LOG