

Induction Array Log

Company Okland Oil Company
Well Liberty1-8
Field Willowdale NW
County Kingman State Kansas

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Field Willowdale NW
County Kingman
State Kansas

Location: 1217' FNL & * 1626' FWL
SEC 8 TWP 29S RGE 9W
Permanent Datum G. L. Elevation 1711 ft.
Log Measured From K. B. , 13 ft. above perm. datum
Drilling Measured From K. B. G. L. Elevation 1724 ft.
CNL, LDT, MEL, MAS
D.F. 1723 ft.
G. L. 1711 ft.

Date	13-Sept-2016
Run Number	One
Depth Driller	4650'
Depth Logger	4650'
Bottom Logged Interval	4649'
Top Log Interval	200'
Casing Driller	8.625" @ 223'
Casing Logger	225'
Bit Size	7.875"
Type Fluid in Hole	WBM
Density / Viscosity	9.3 / 64
pH / Fluid Loss	10.5 / 8
Source of Sample	Mud Pit
Rm @ Meas. Temp	0.97 @ 85 °F
Rmf @ Meas. Temp	0.73 @ 85 °F
Rmc @ Meas. Temp	1.46 @ 85 °F
Source of Rmf / Rmc	Calculated
Rm @ BHT	0.70 @ 117 °F
Time Circulation Stopped	15:30
Time Logger on Bottom	16:30
Maximum Recorded Temperature	117 °F
Equipment Number	11007
Location	OKC
Recorded By	B. Oetting
Witnessed By	G. Alletag / A. Watson

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Equipment and Log Data

Service Order: 23348

Gamma		Density		Neutron		Sonic		IAT	
Run No.	One	Run No.	One	Run No.	One	Run No.	One	Run No.	One
Serial No.	47	Serial No.	110	Serial No.	71	Serial No.	38SS	Serial No.	106
O.D.	3.375 in.	Source No.	50129B	Source No.	50202G	Centralizers	2	Standoffs	2 @ 0.5"
		O.D.	4.5 in.	O.D.	3.375 in.	O.D.	3.375 in.	O.D.	3.875 in.

Logging Pass Data

General		Gamma		Density		Neutron		Sonic		IAT	
		Scales		Scales		Scales		Scales		Scales	
Run	Depths	Left	Right	Left	Right	Matrix	Left	Right	Matrix	Left	Right
One	TD CSG	0	150	0.3	-0.1	2.71 g/cc	0.3	-0.1	Lime	0.3	-0.1

All interpretations are opinions based on inferences from electrical or other measurements and we cannot and do not guarantee the accuracy or correctness of any interpretation, and we shall not, except in the case of gross or willful negligence on our part, be liable or responsible for any loss, costs, damages, or expenses incurred or sustained by anyone resulting from any interpretation made by any of our officers, agents or employees. These interpretations are also subject to our general terms and conditions set out in our current Price Schedule.

Comments

Toolstring ran as per tool sketch,
2.71 g/cc Matrix Density used to calculate LDT porosity
Limestone Matrix used to calculate Neutron porosity
47.6 usec/ft Matrix used to calculate MAS porosity
5.5" production casing used to calculate annular hole volume.

Chlorides: 3900 ppm
LCM 4 #bbl
LCM can effect LDT and MEL readings

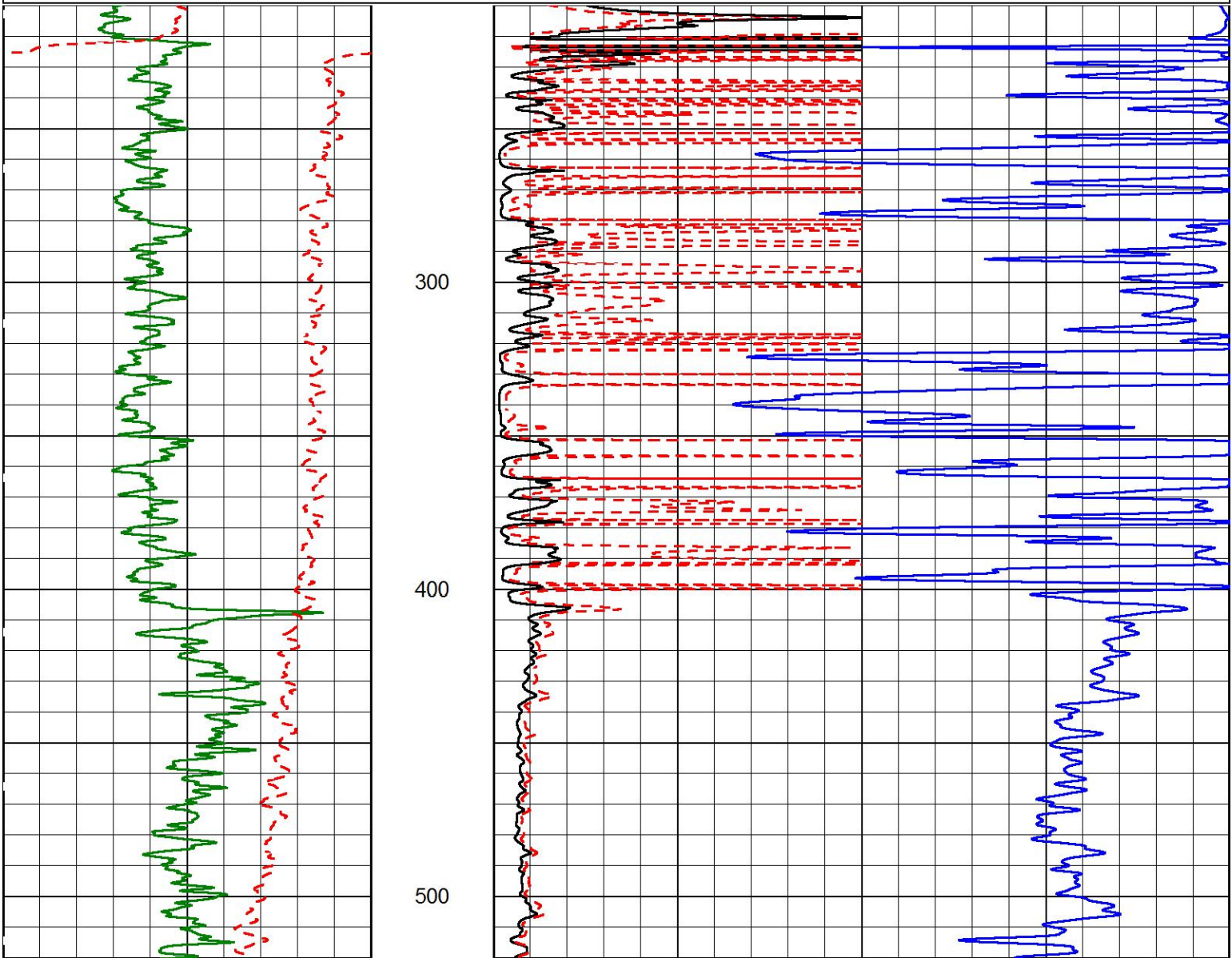
YOUR CREW TODAY: J. Bennett, B. Barton
THANK YOU FOR CHOOSING ALLIED WIRELINE. OKLAHOMA CITY, OK. (405) 445-7135.

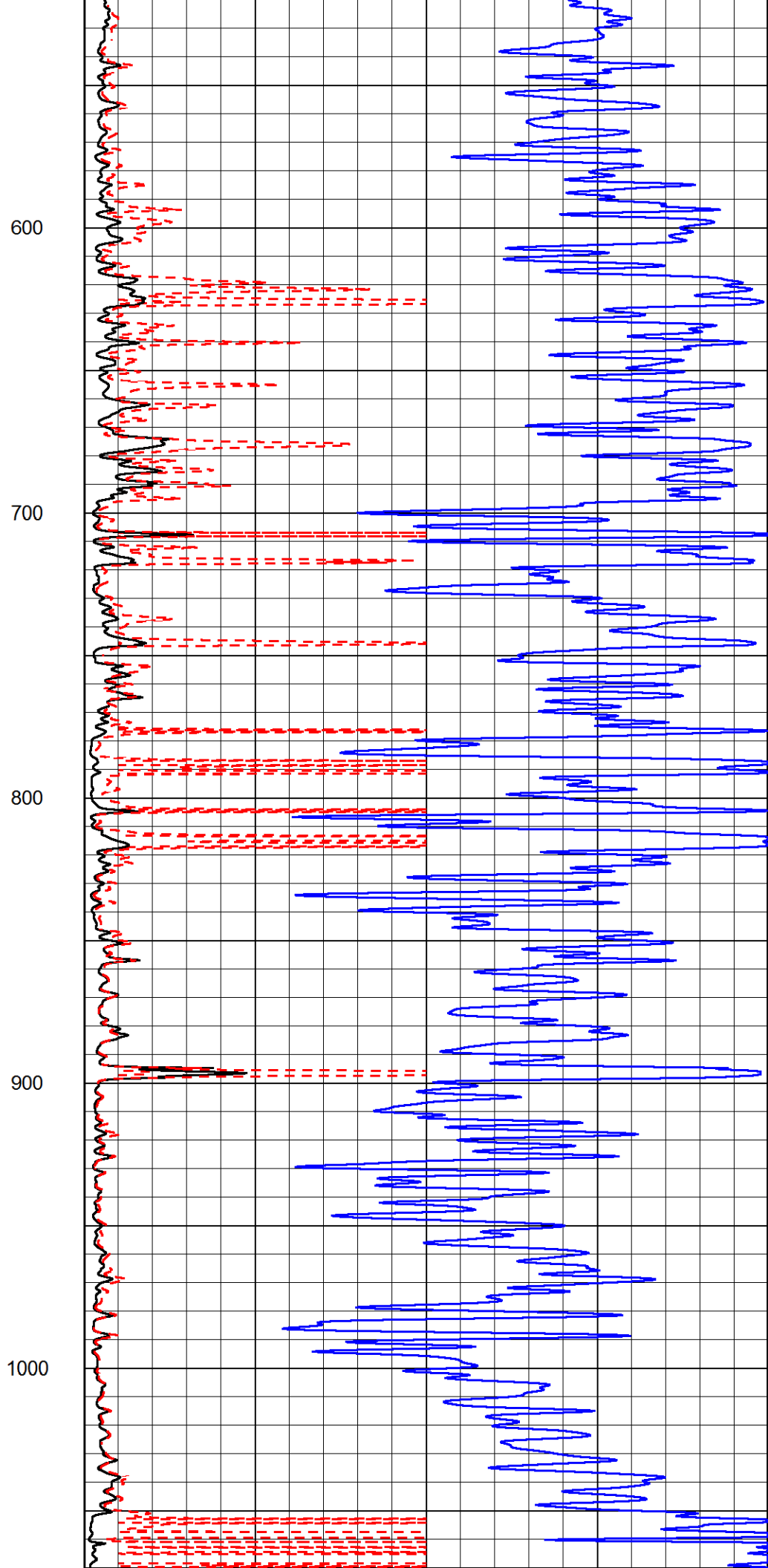
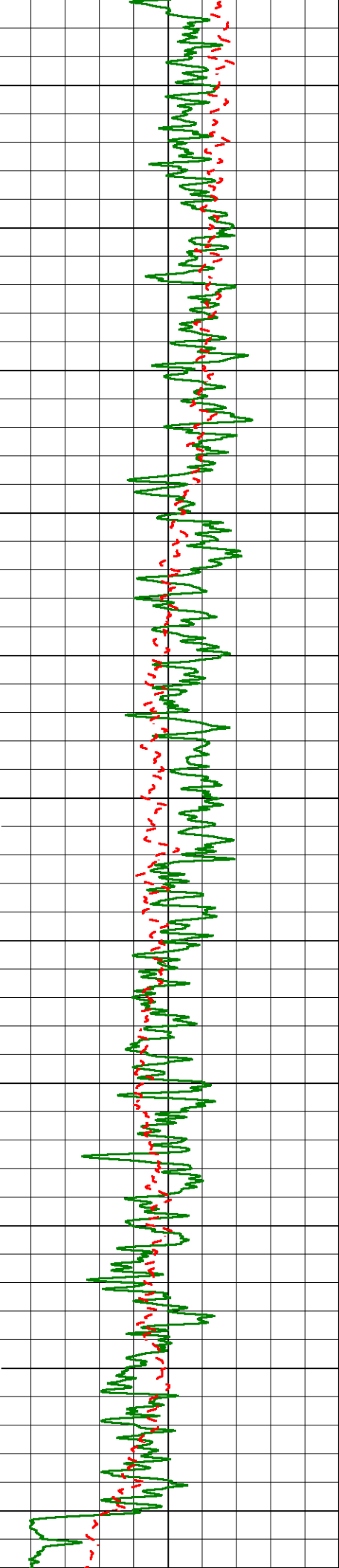


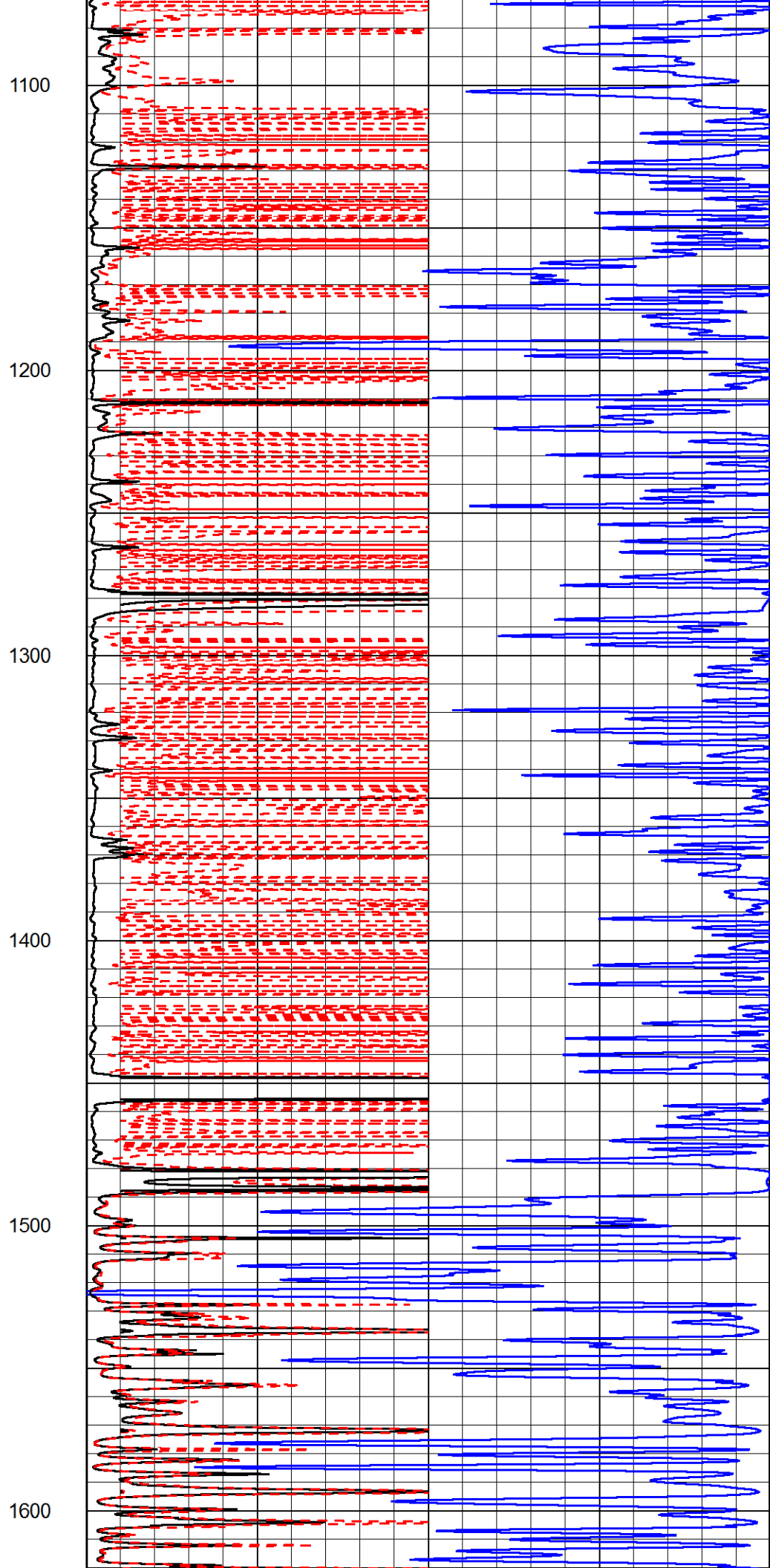
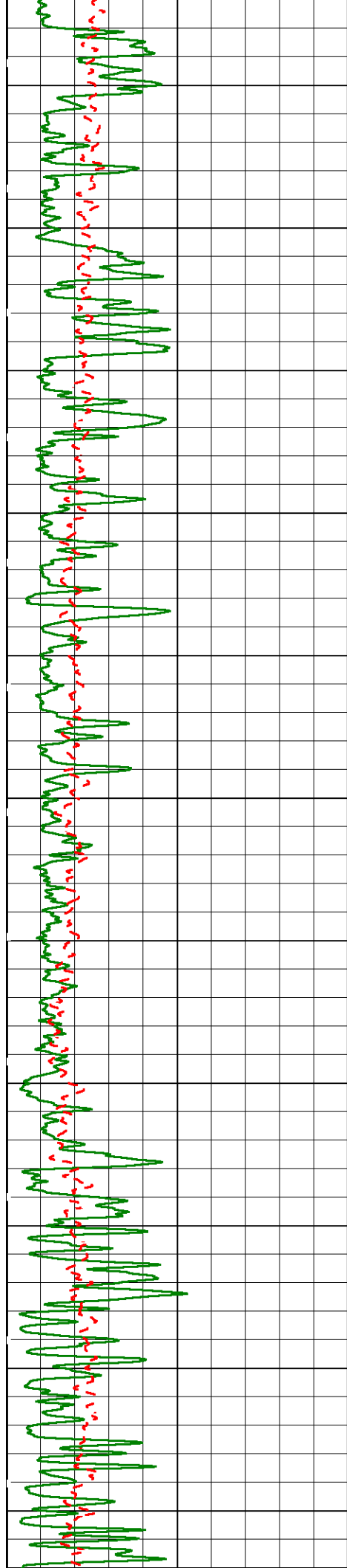
Main Pass

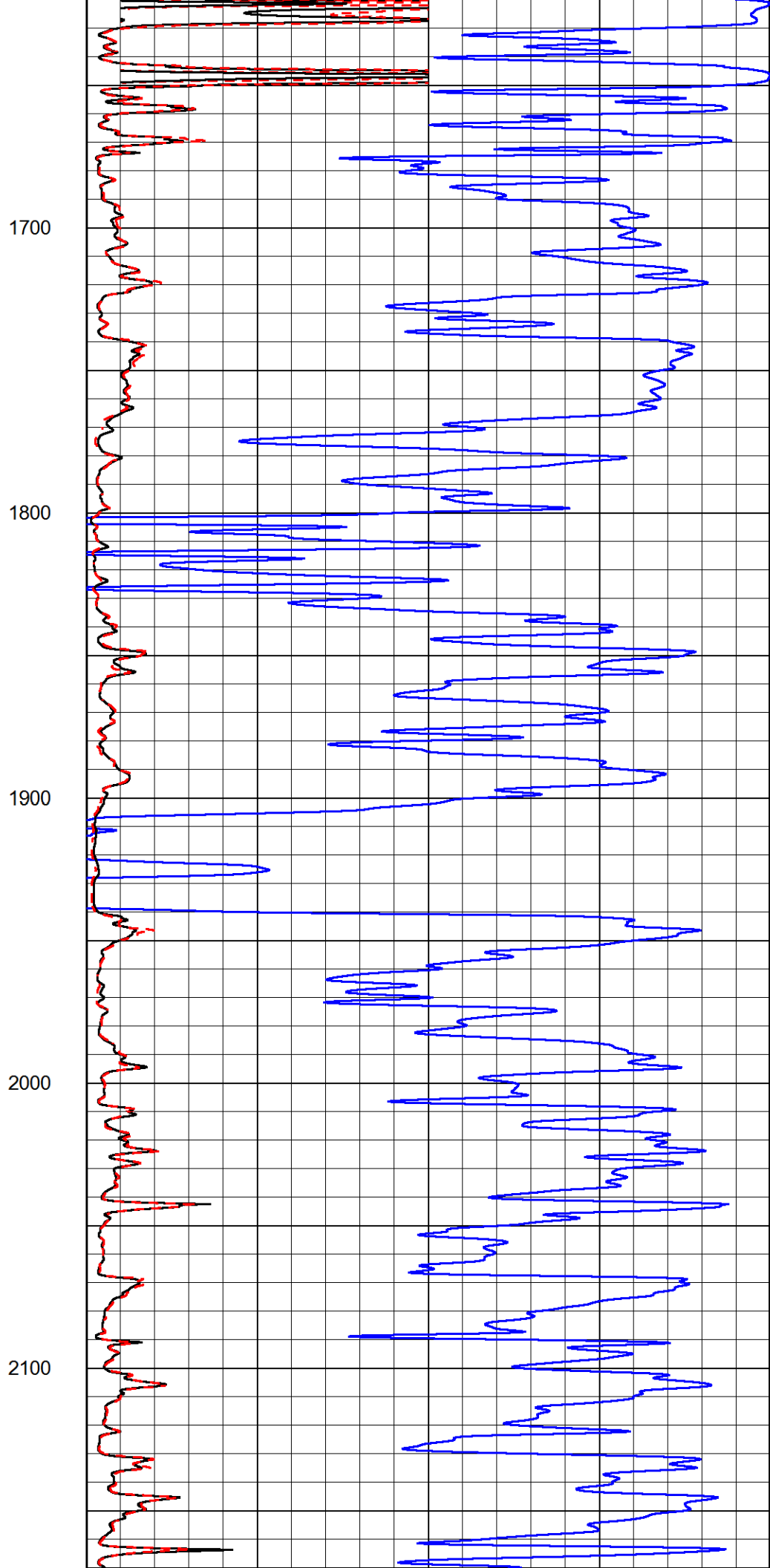
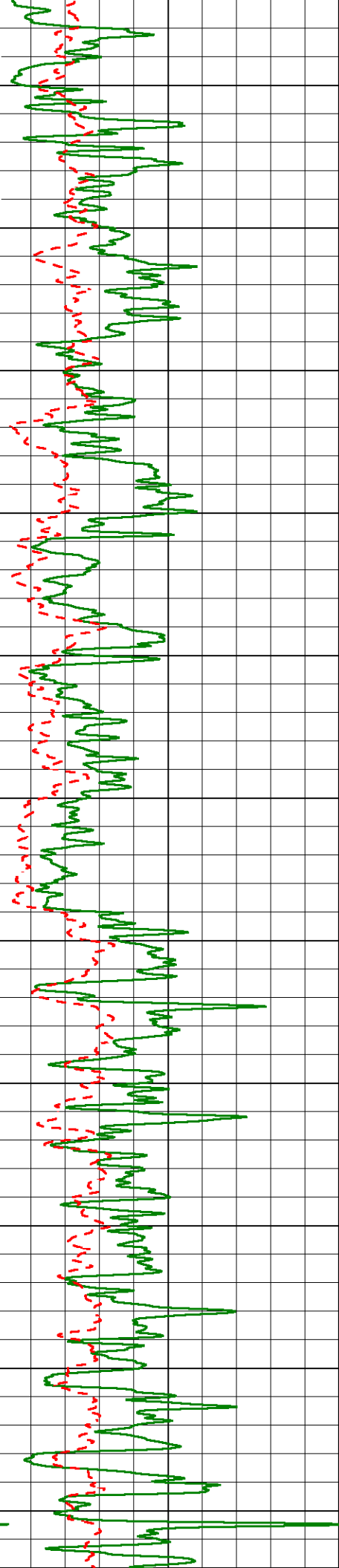
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Dataset Pathname pass4
Presentation Format OKC-AC~1
Dataset Creation Tue Sep 13 18:34:32 2016 by Log Sondex
Charted by Depth in Feet scaled 1:600

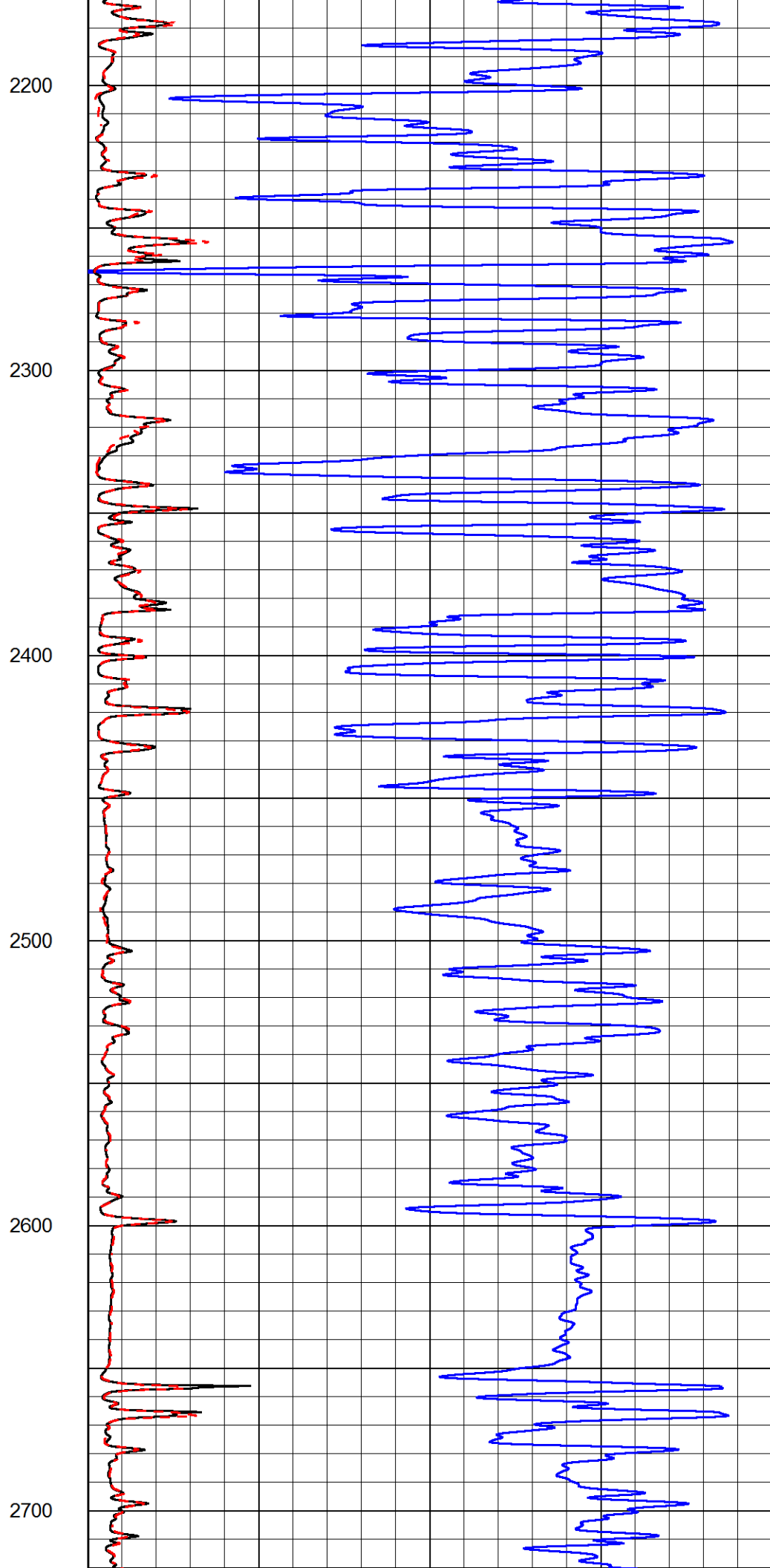
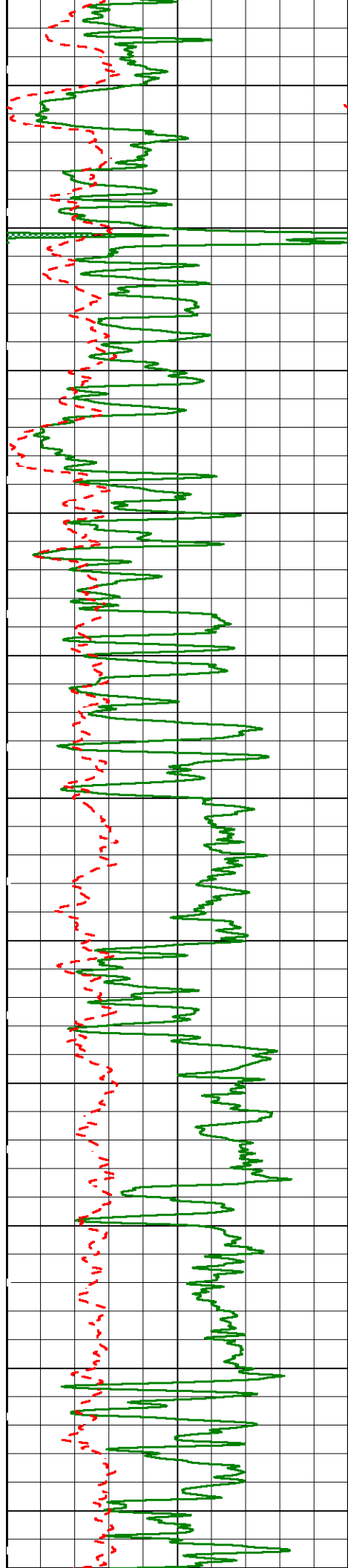
0	Gamma Ray (GAPI)	150	1000	90" Conductivity (mmho/m)	0
	SP (mV)		0 Shallow Resistivity (Ohm-m) 50		
			0 Deep Resistivity (Ohm-m) 50		

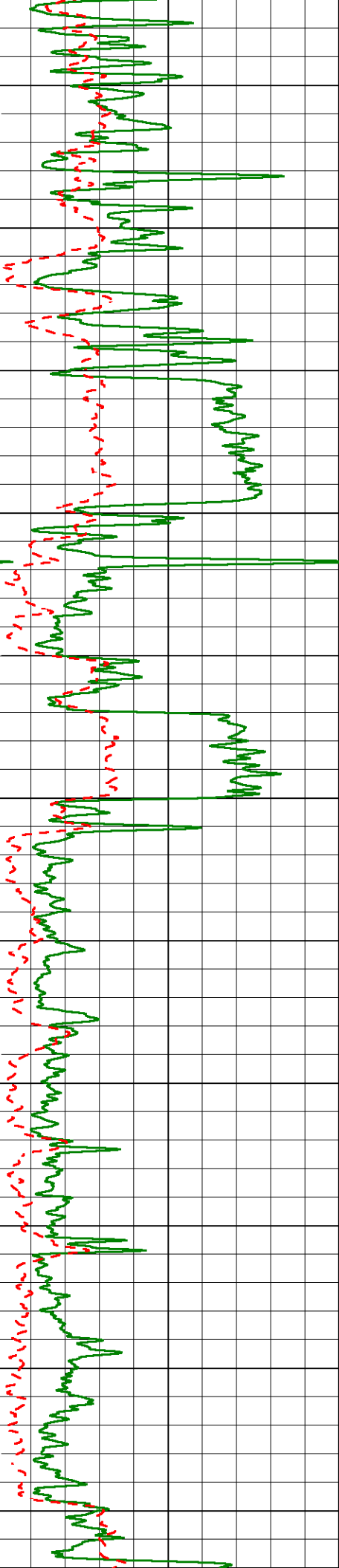












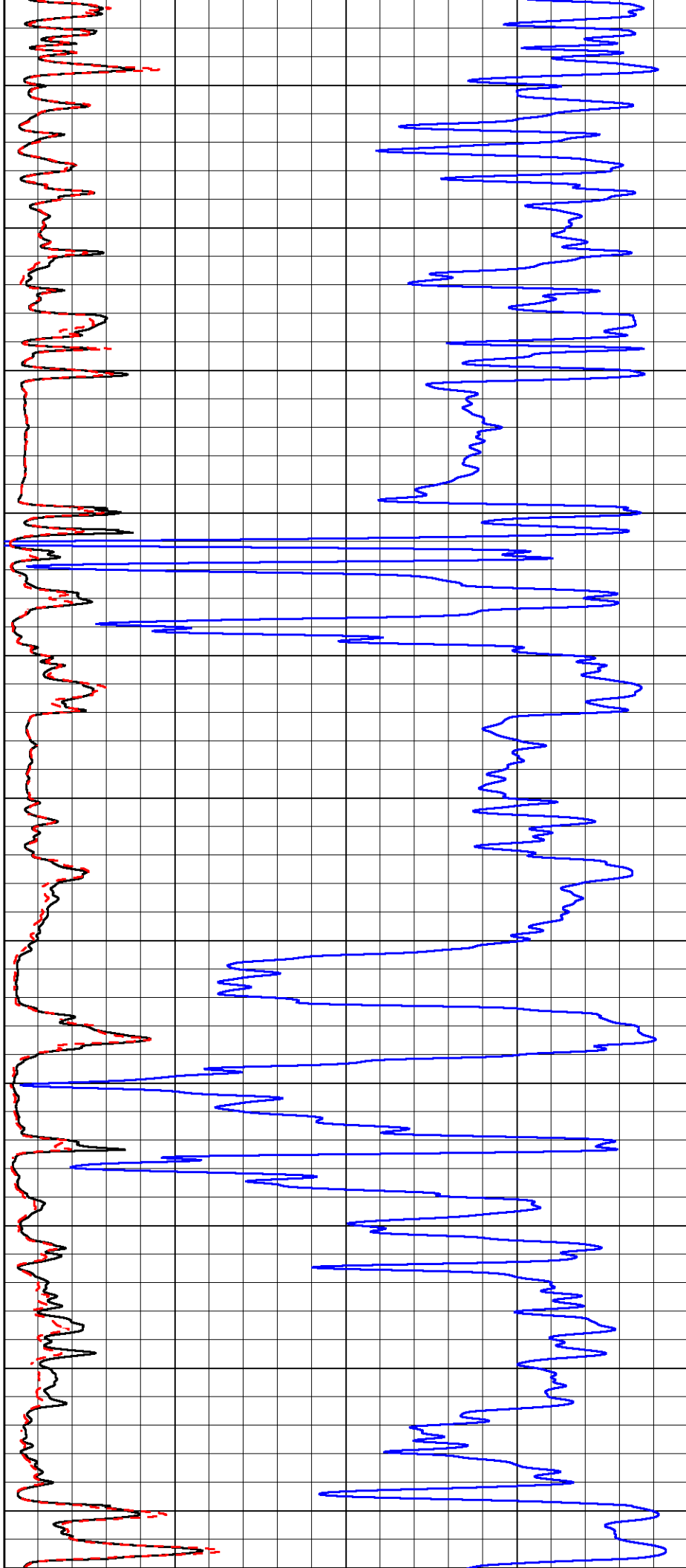
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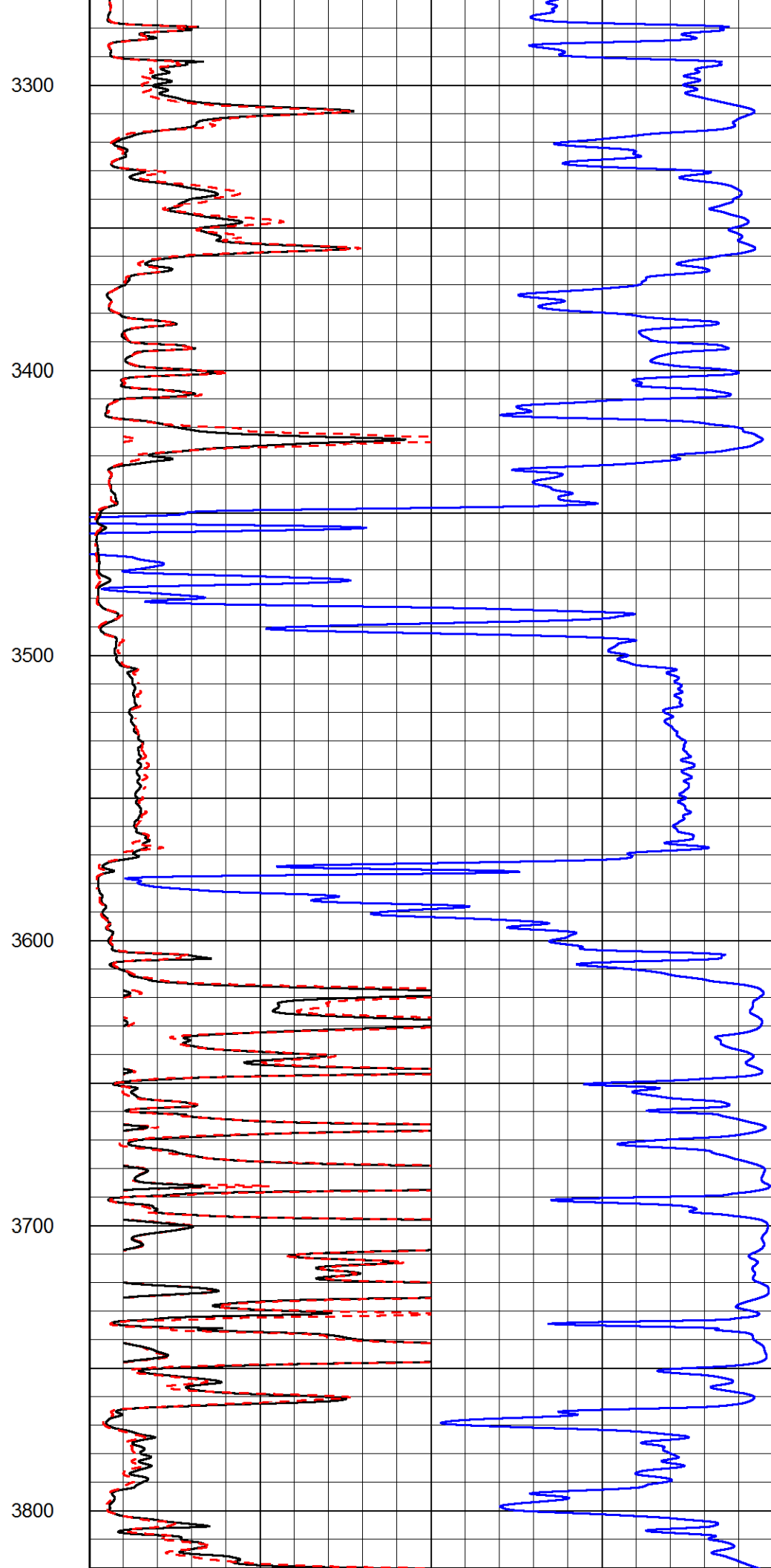
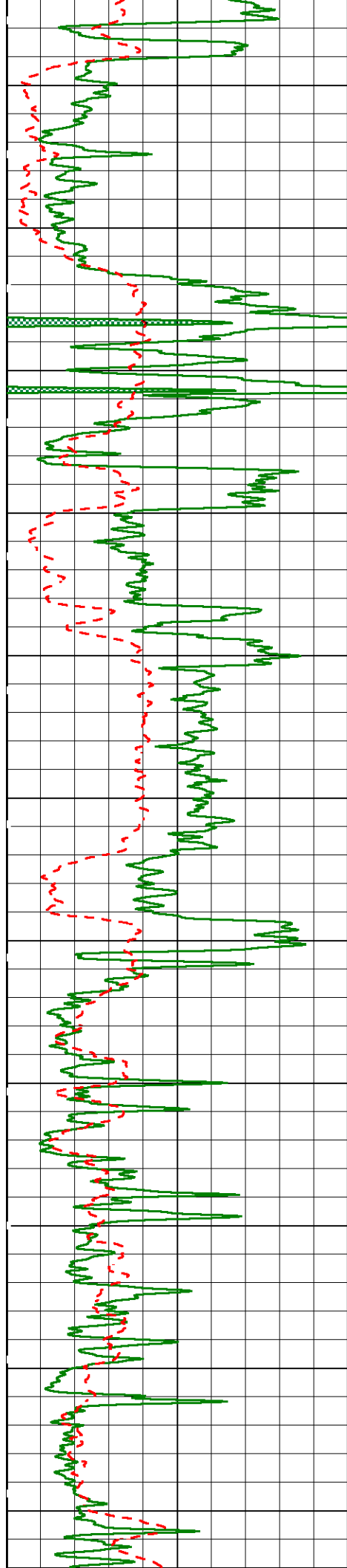
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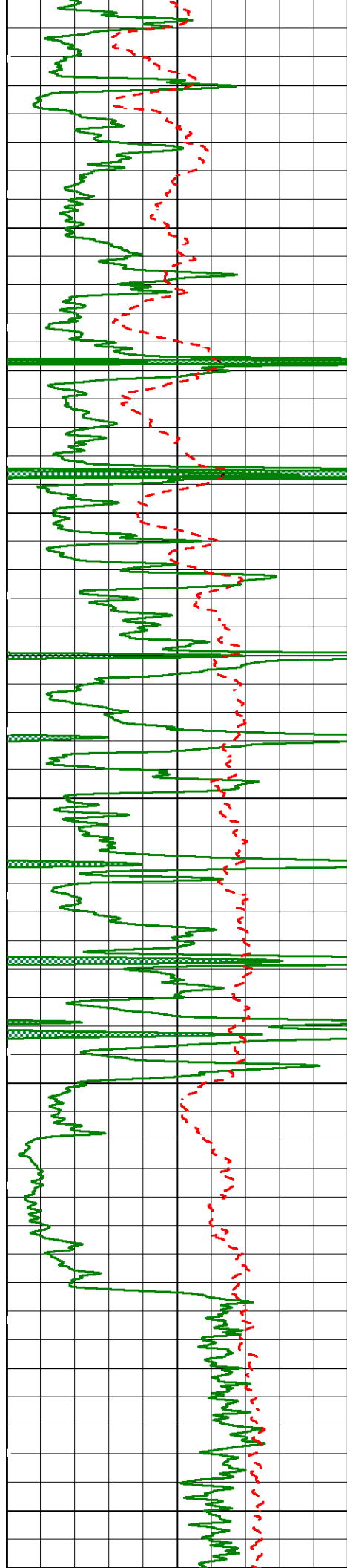
3000

3100

3200







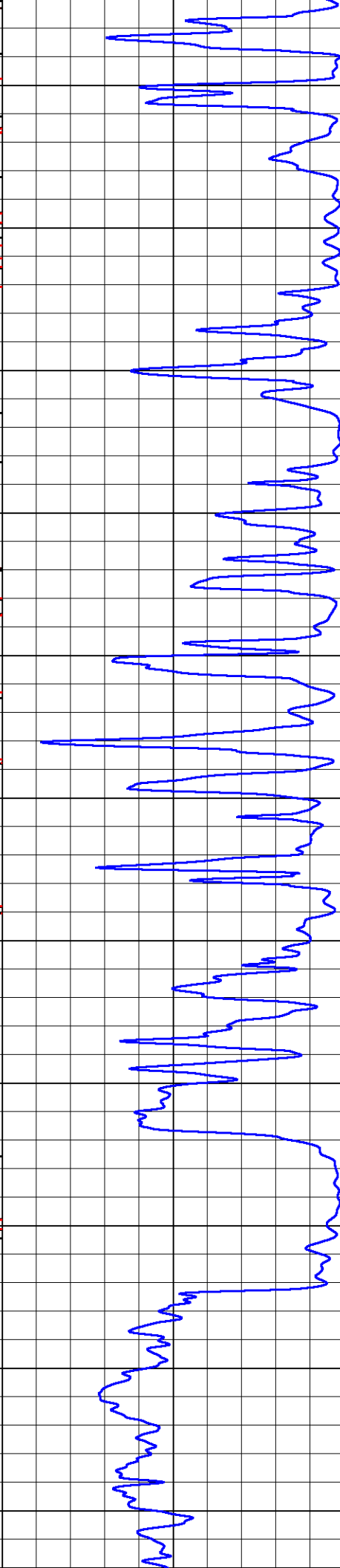
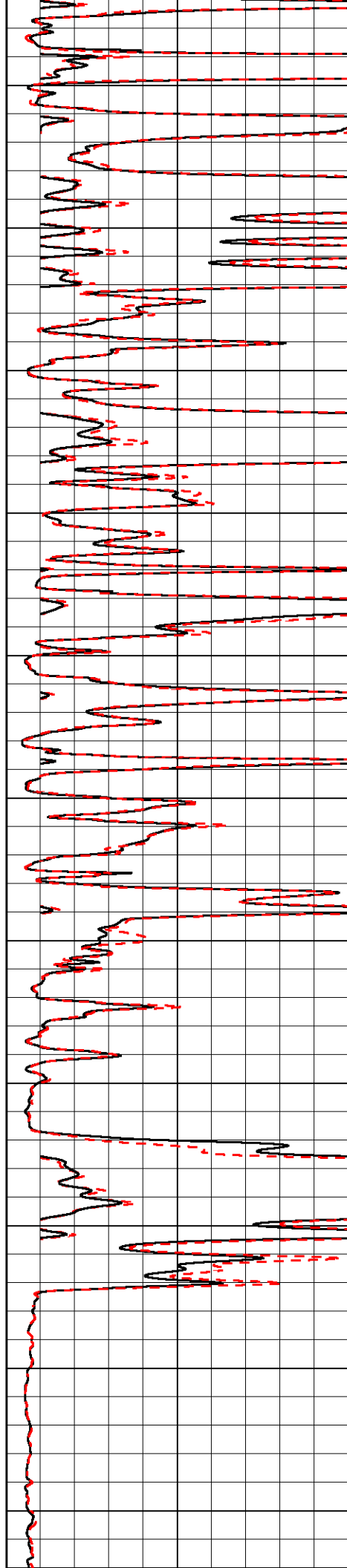
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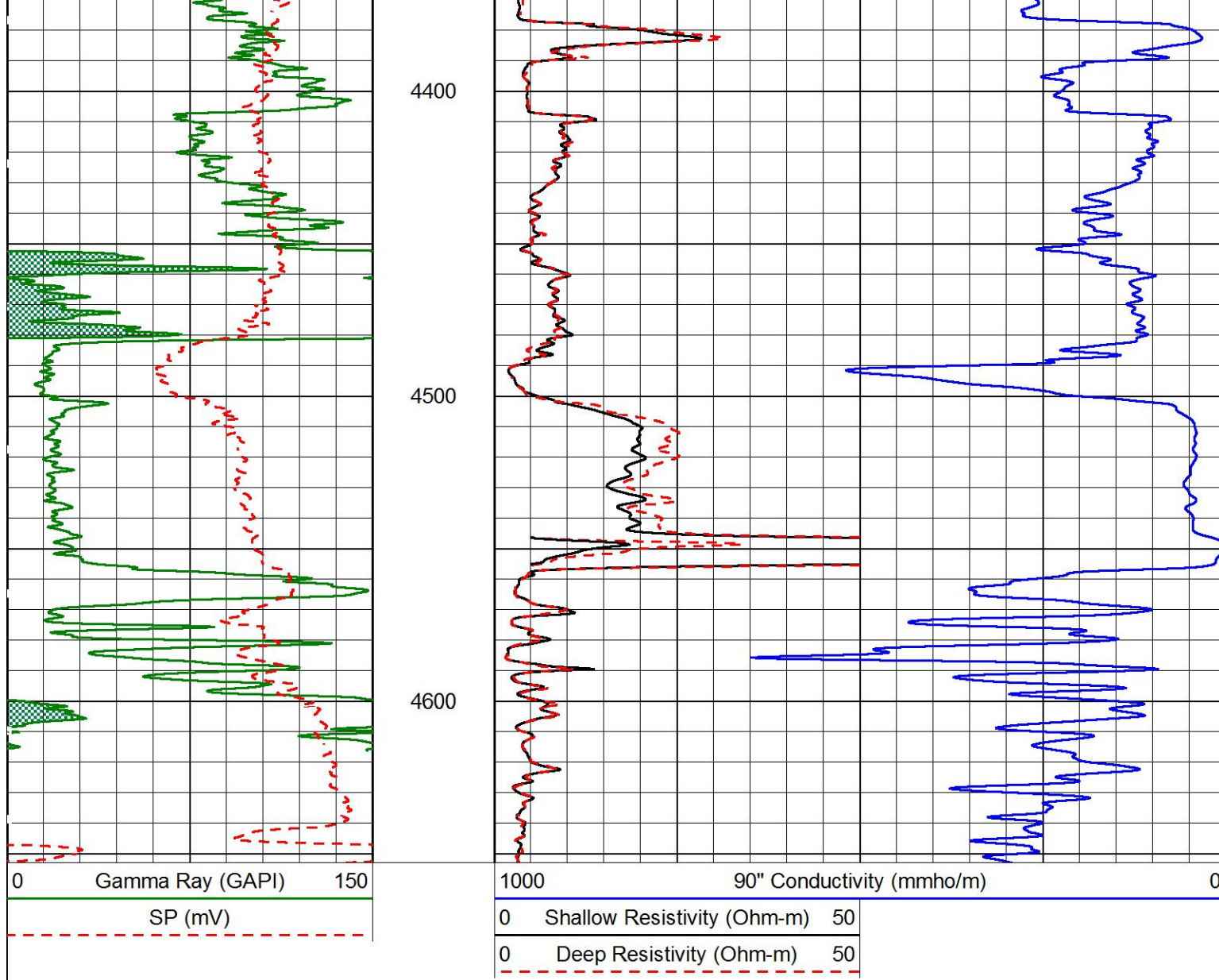
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4100

4200

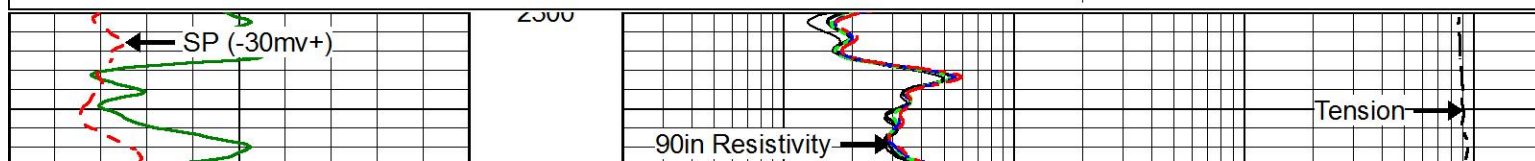
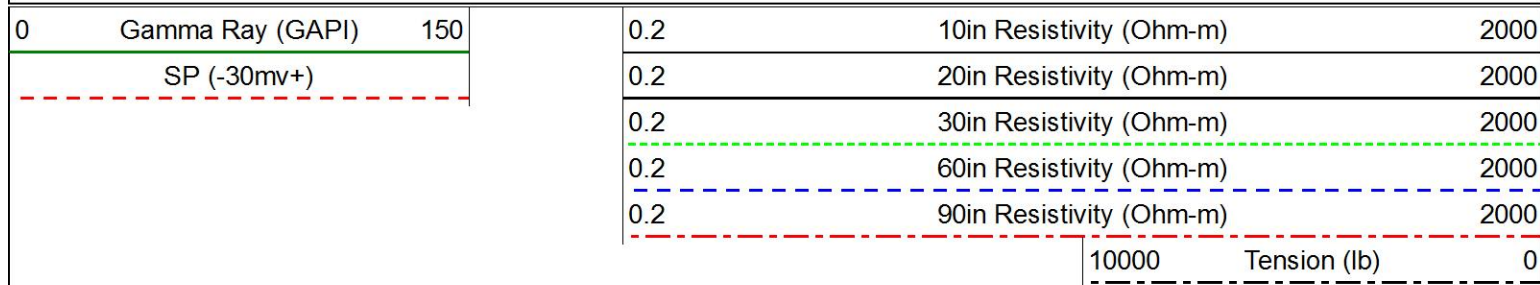
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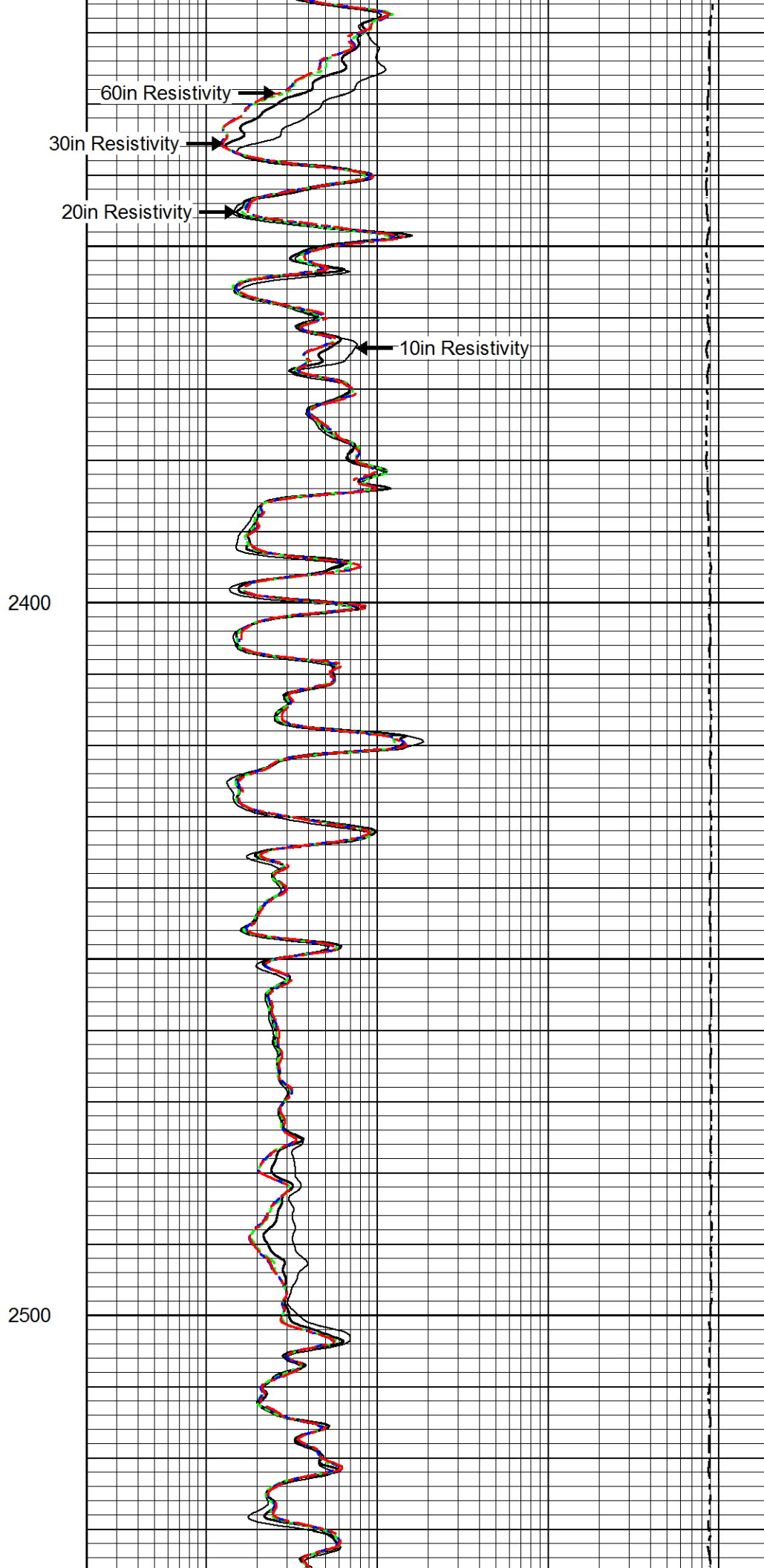
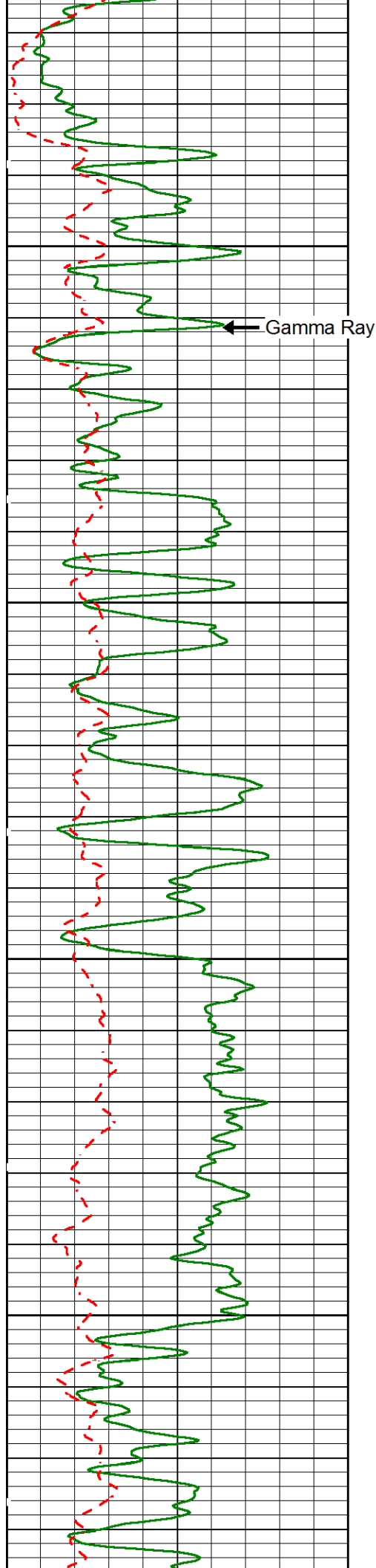


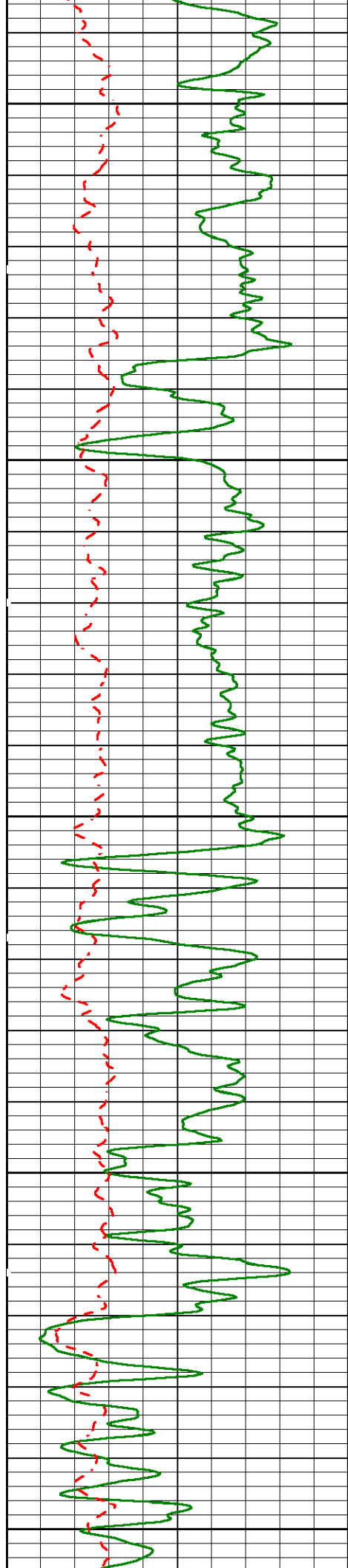


Main Pass

Database File okland_liberty_1-8.db
 Dataset Pathname pass4
 Presentation Format OKC-AI~1
 Dataset Creation Tue Sep 13 18:34:32 2016 by Log Sondex
 Charted by Depth in Feet scaled 1:240

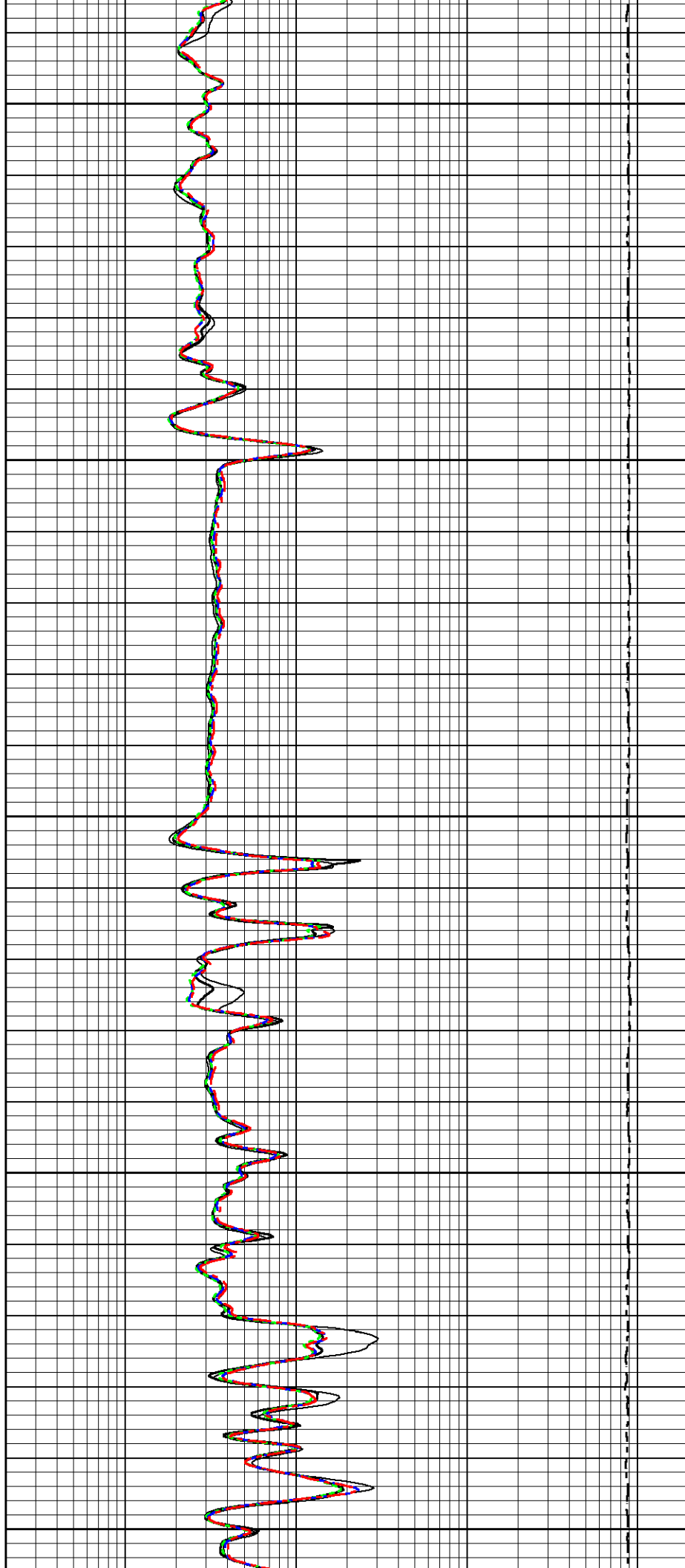


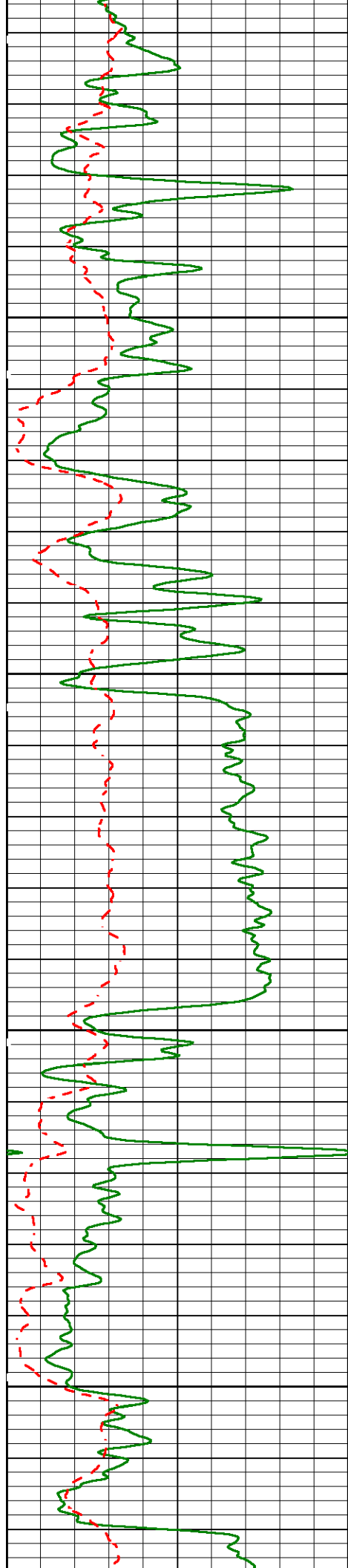




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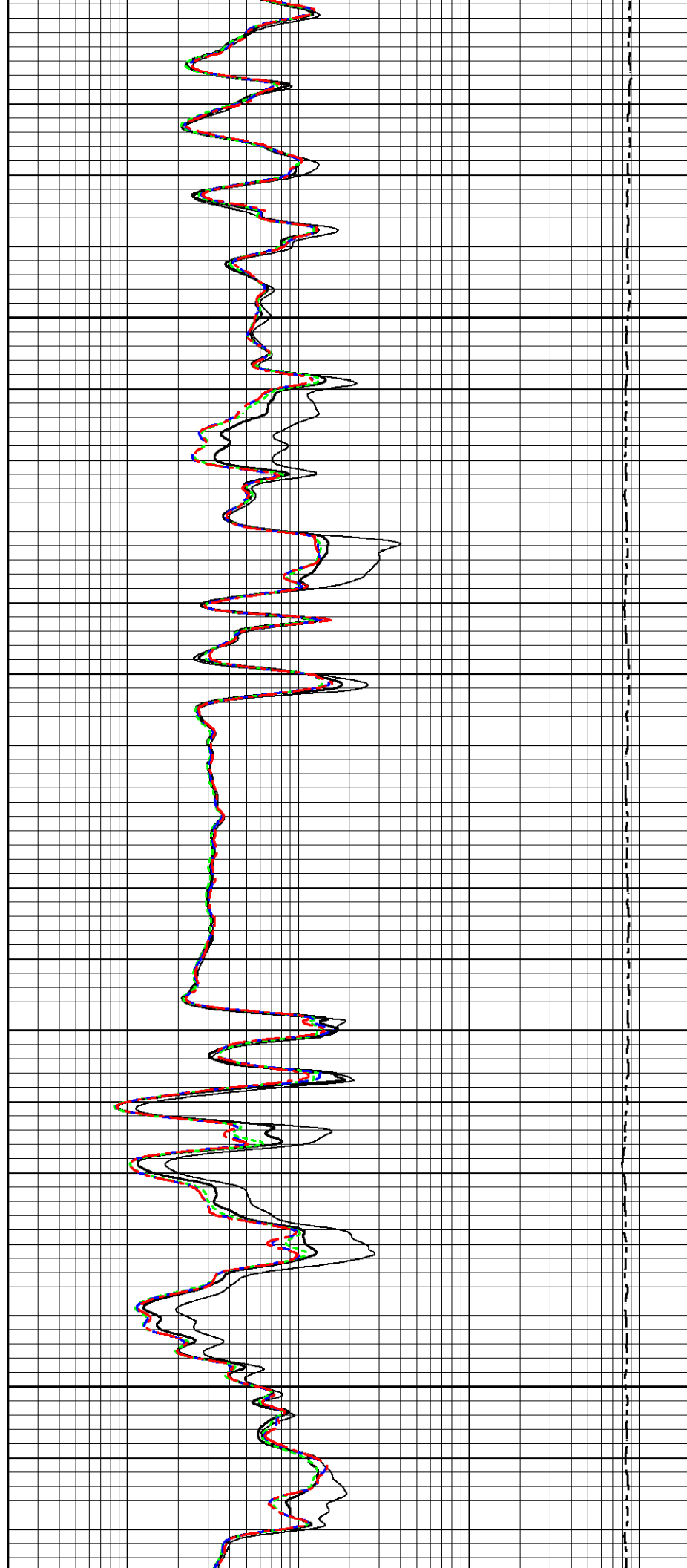
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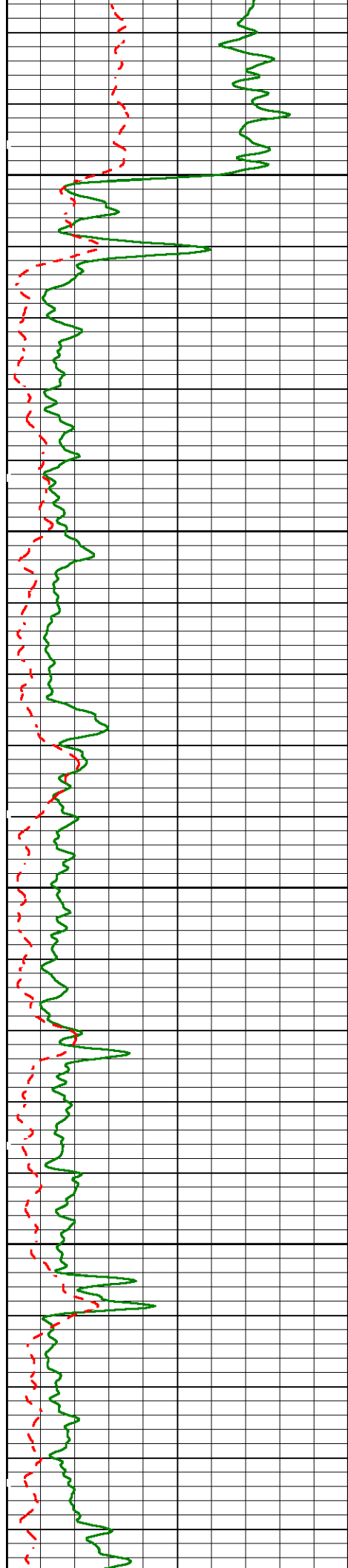




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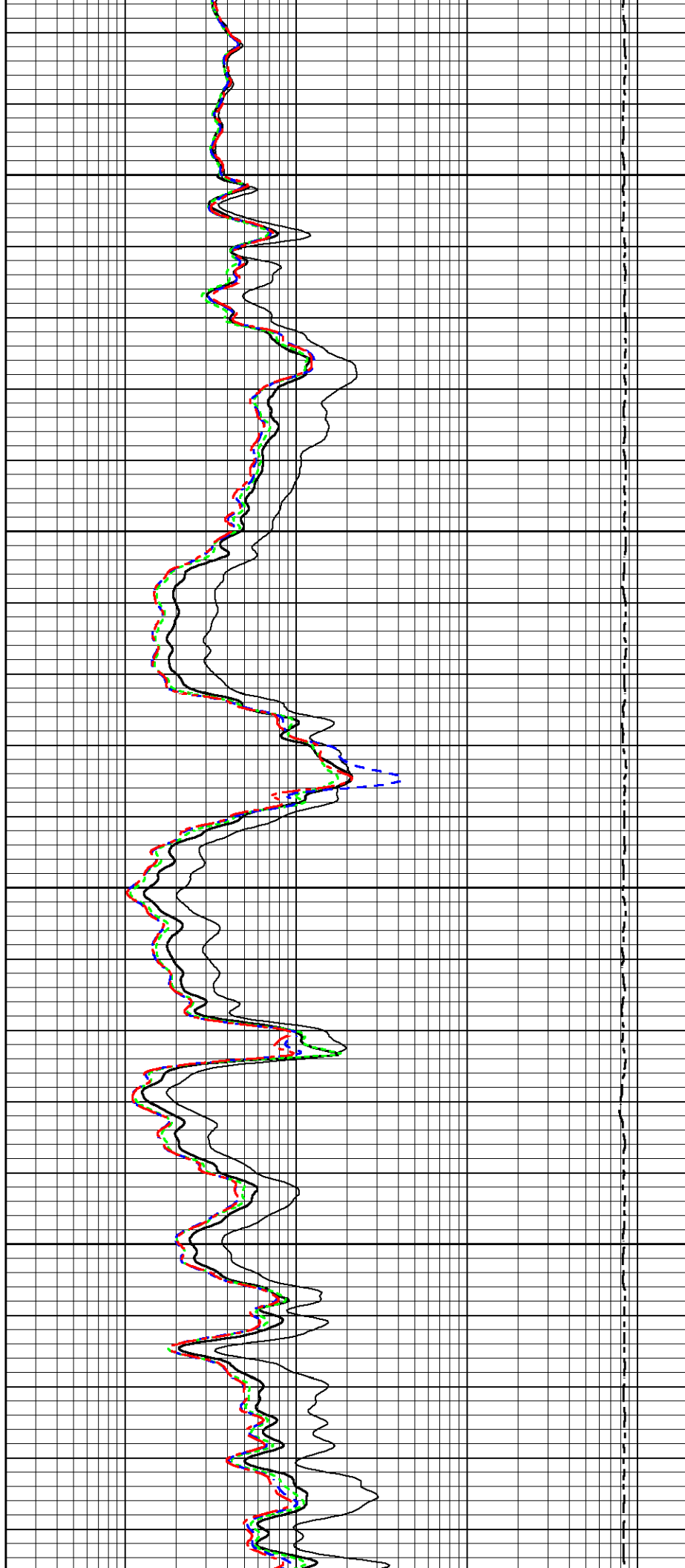
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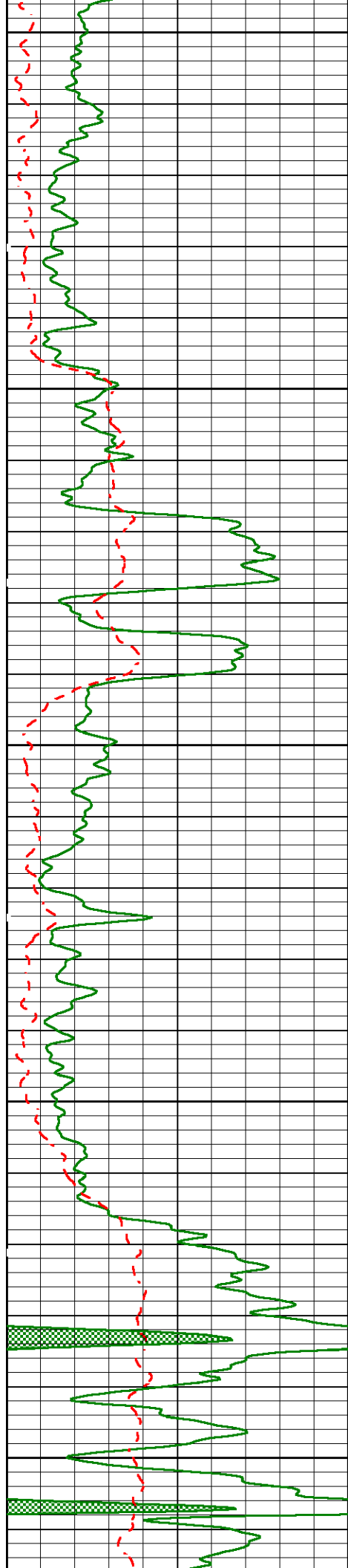




3000

3100

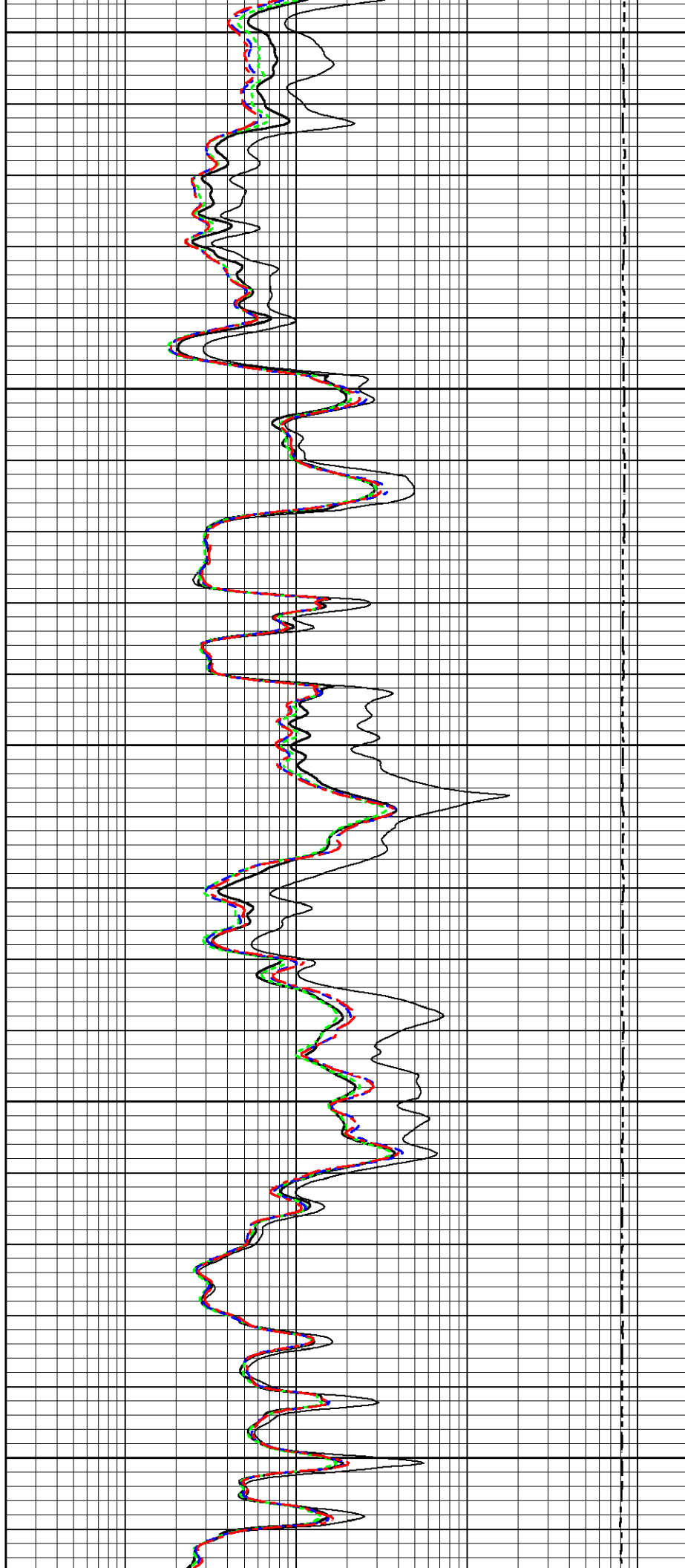


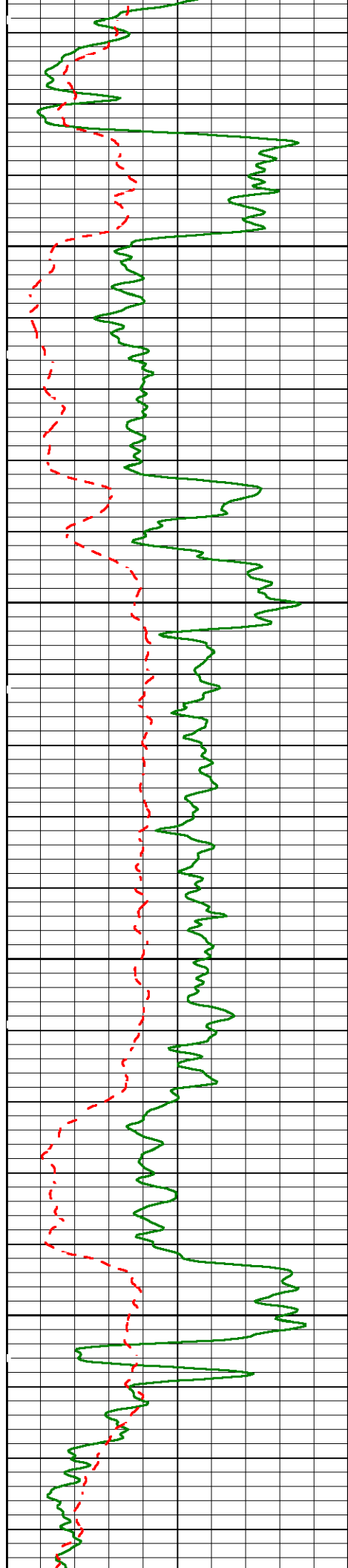


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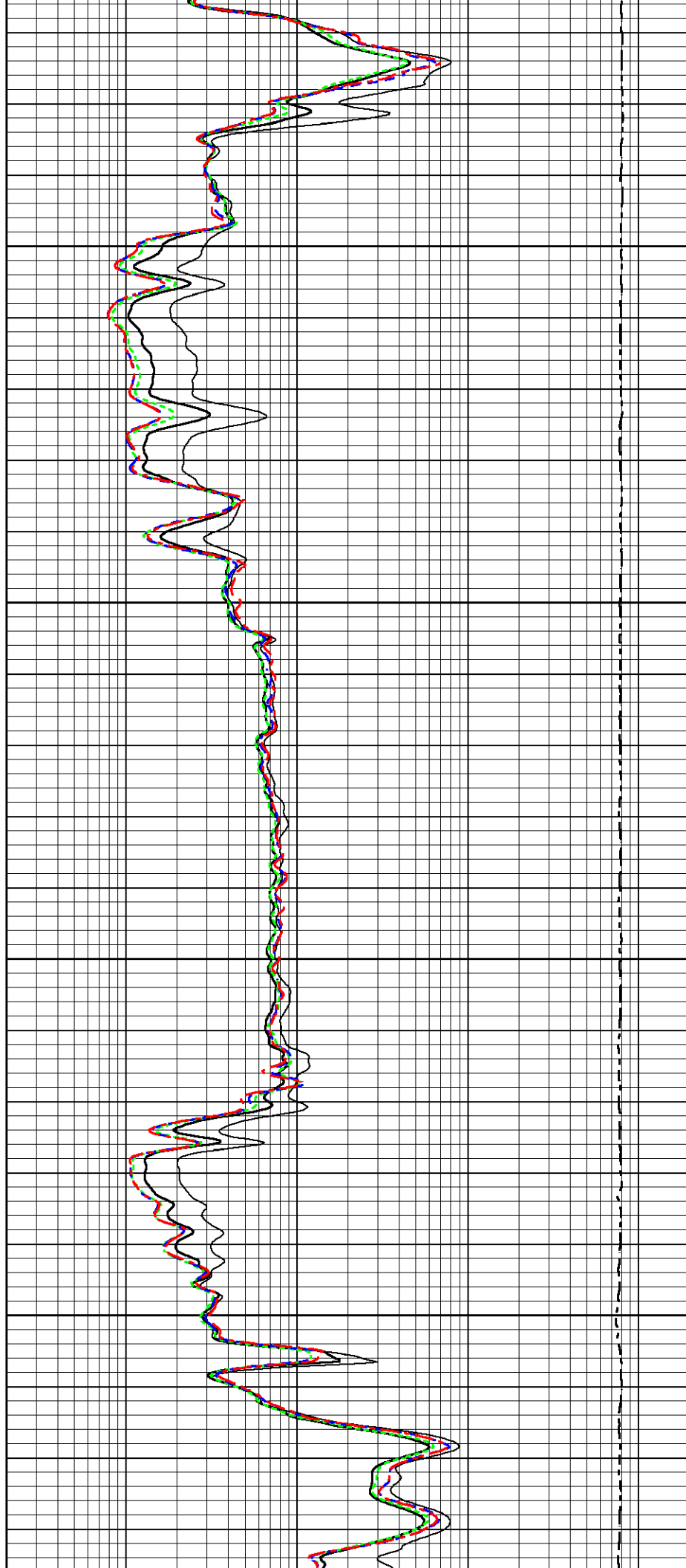
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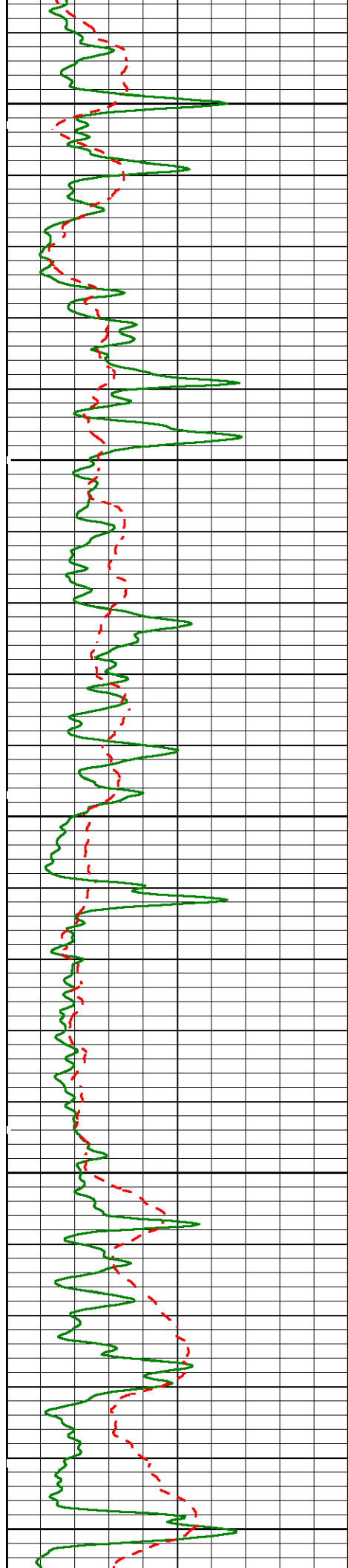




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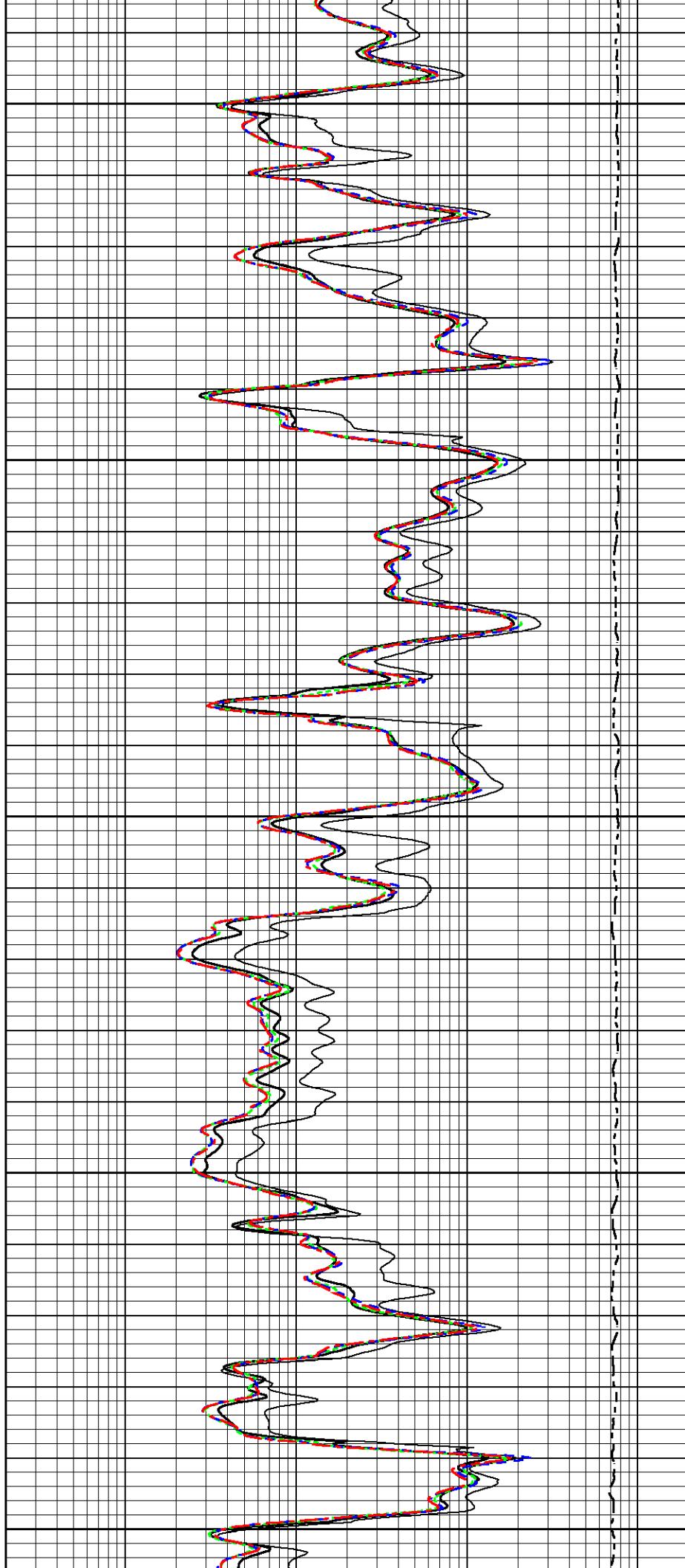
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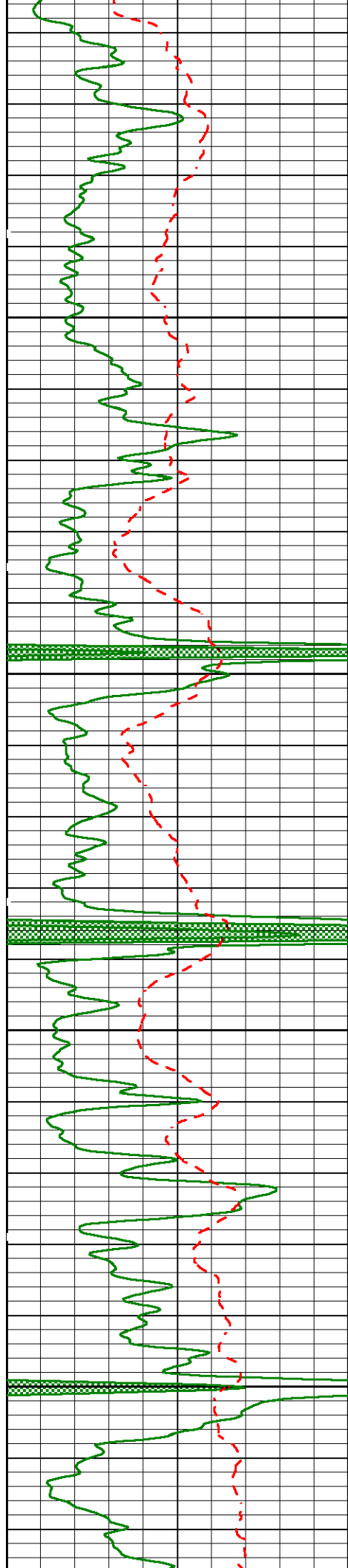




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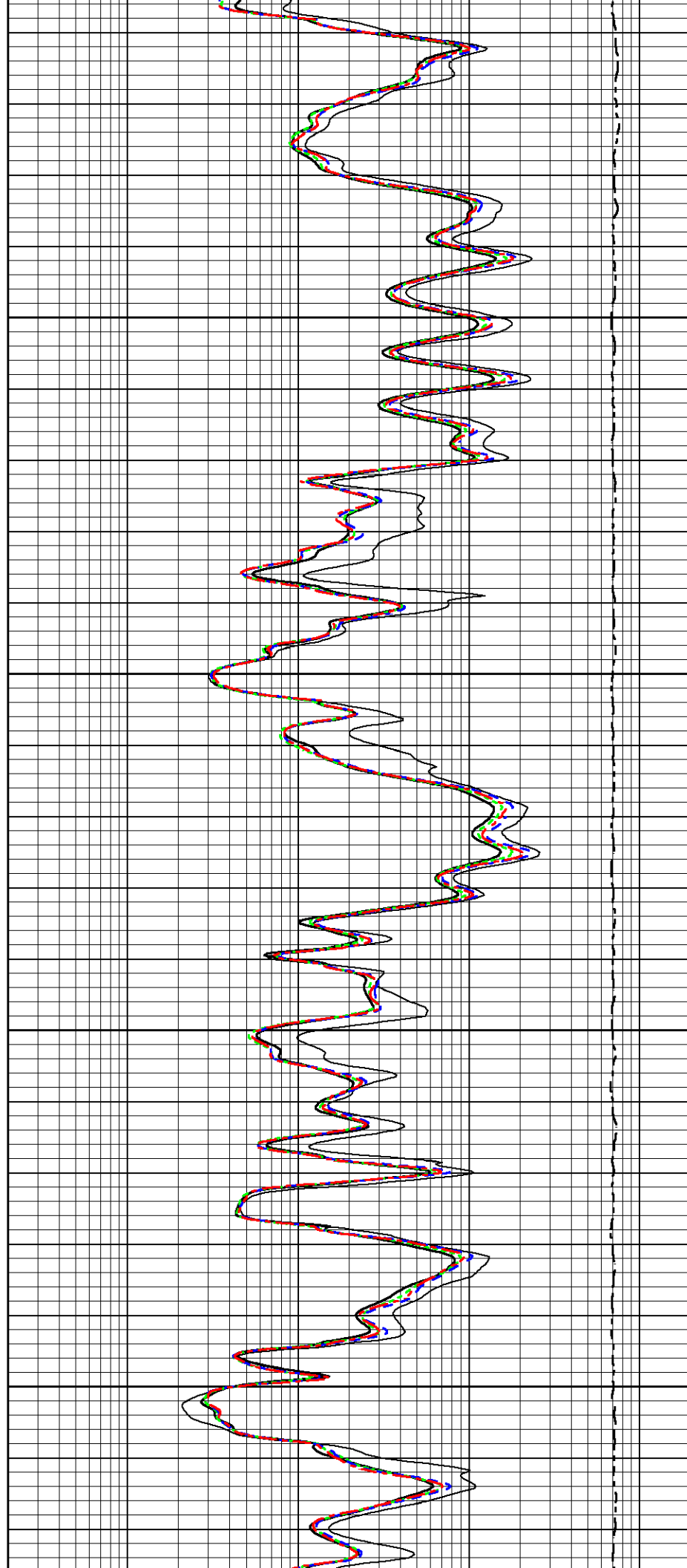
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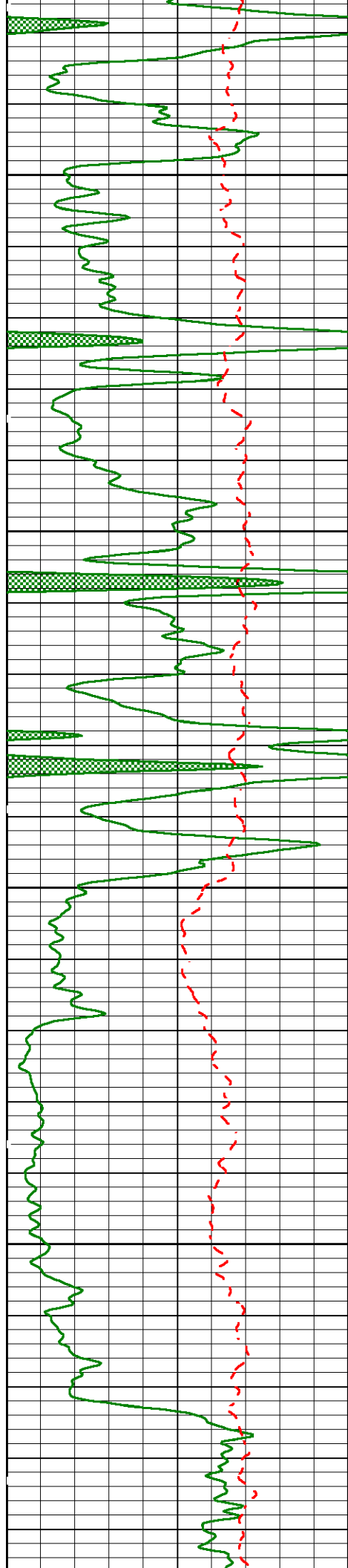




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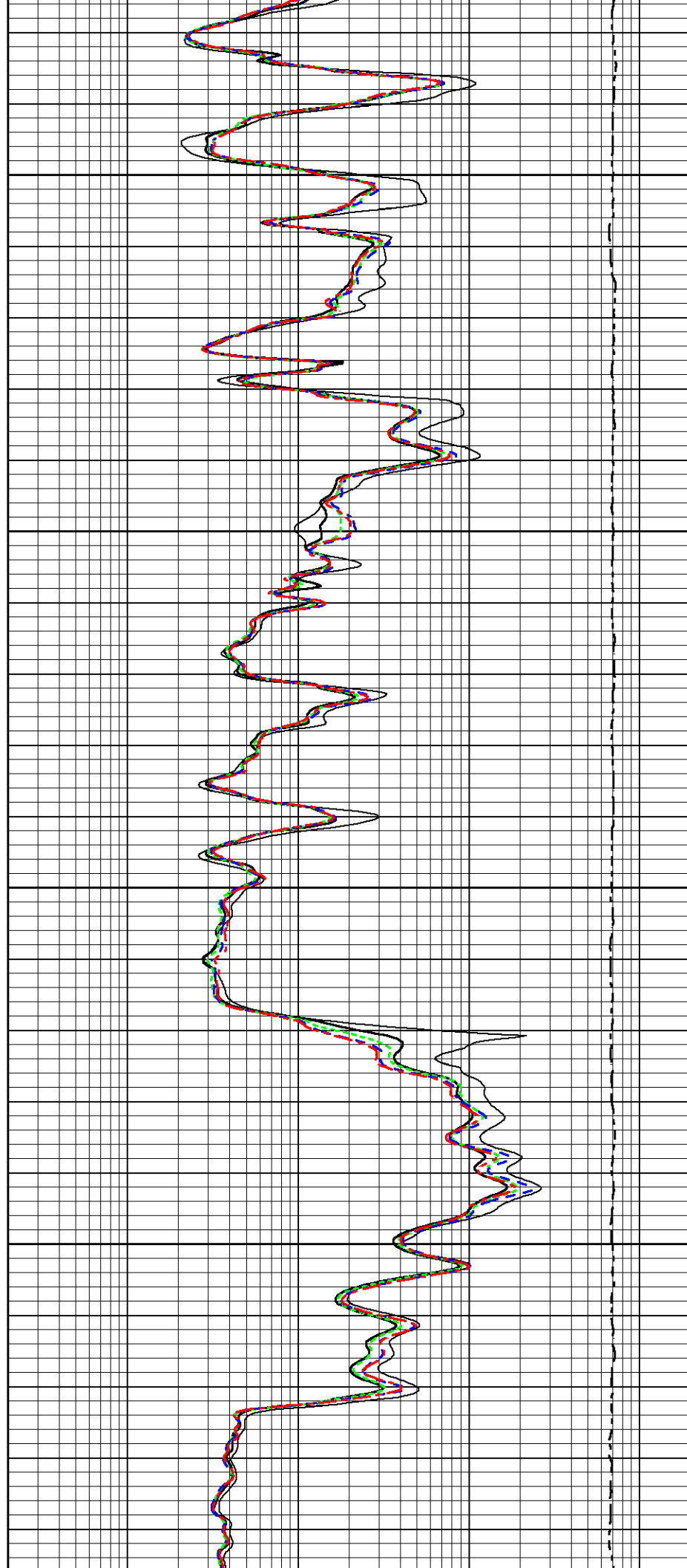
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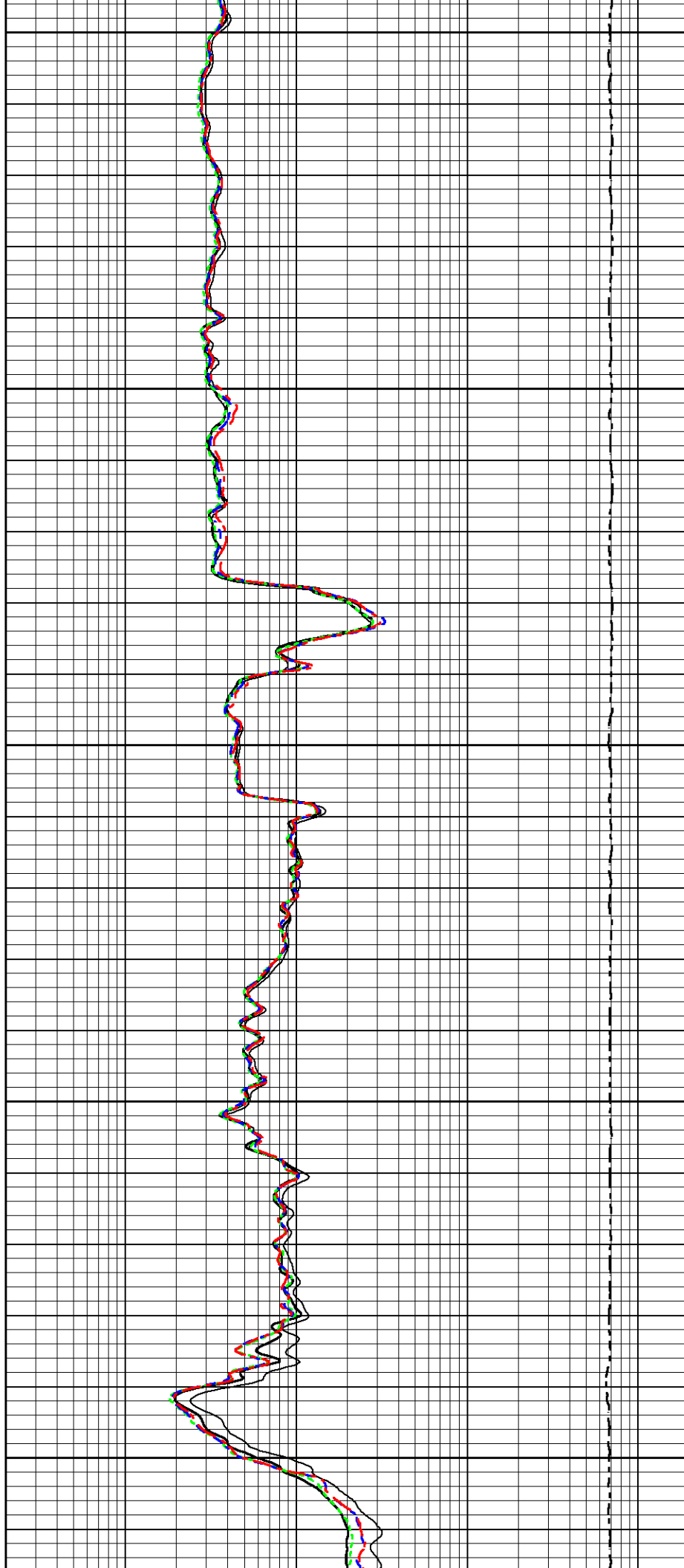
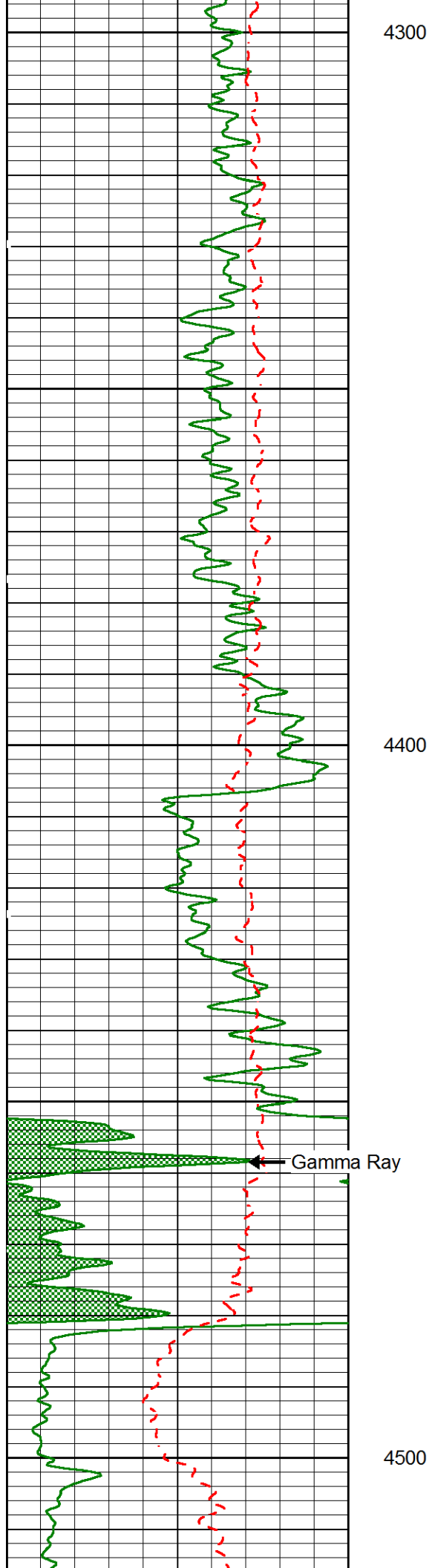


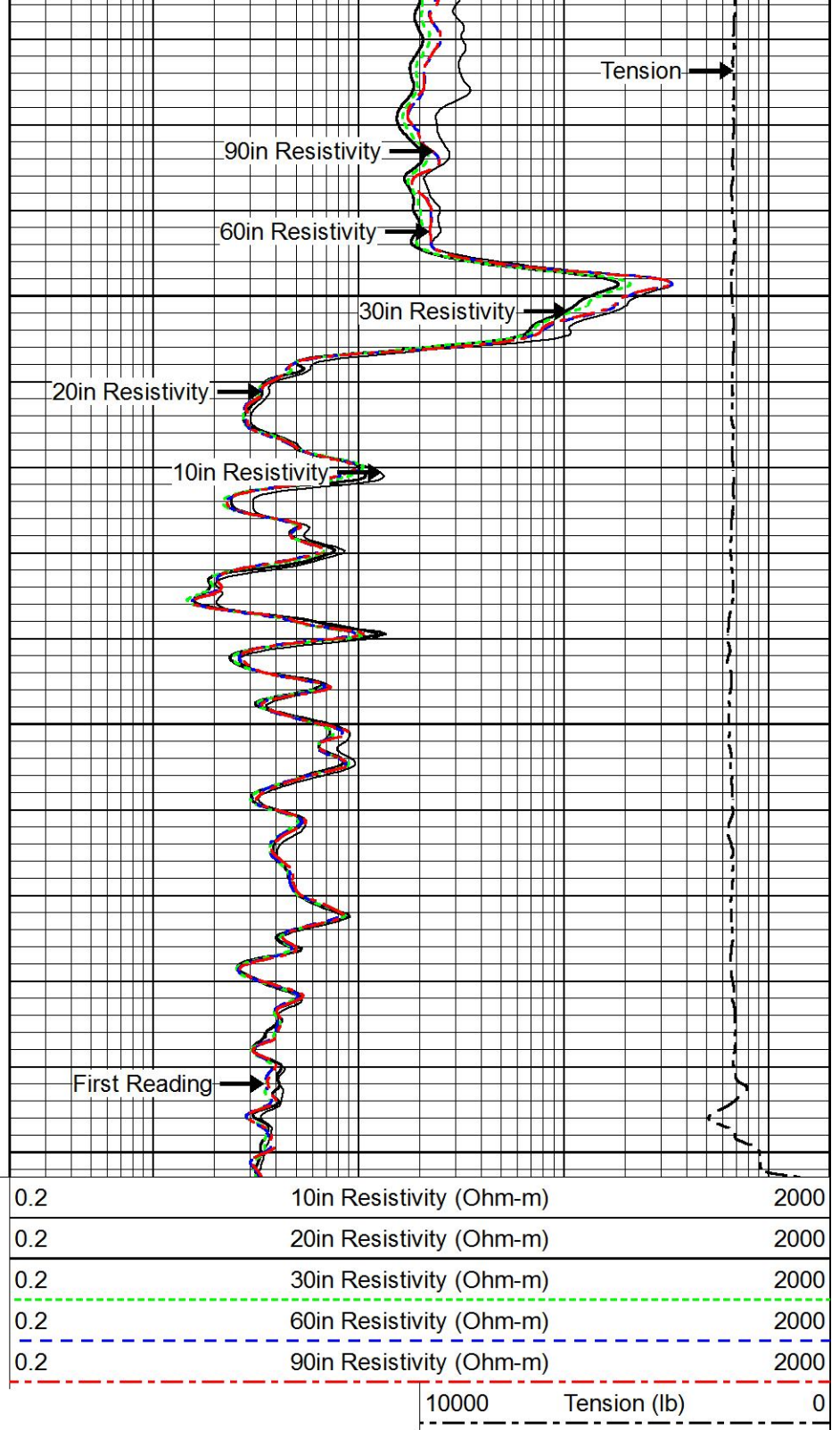
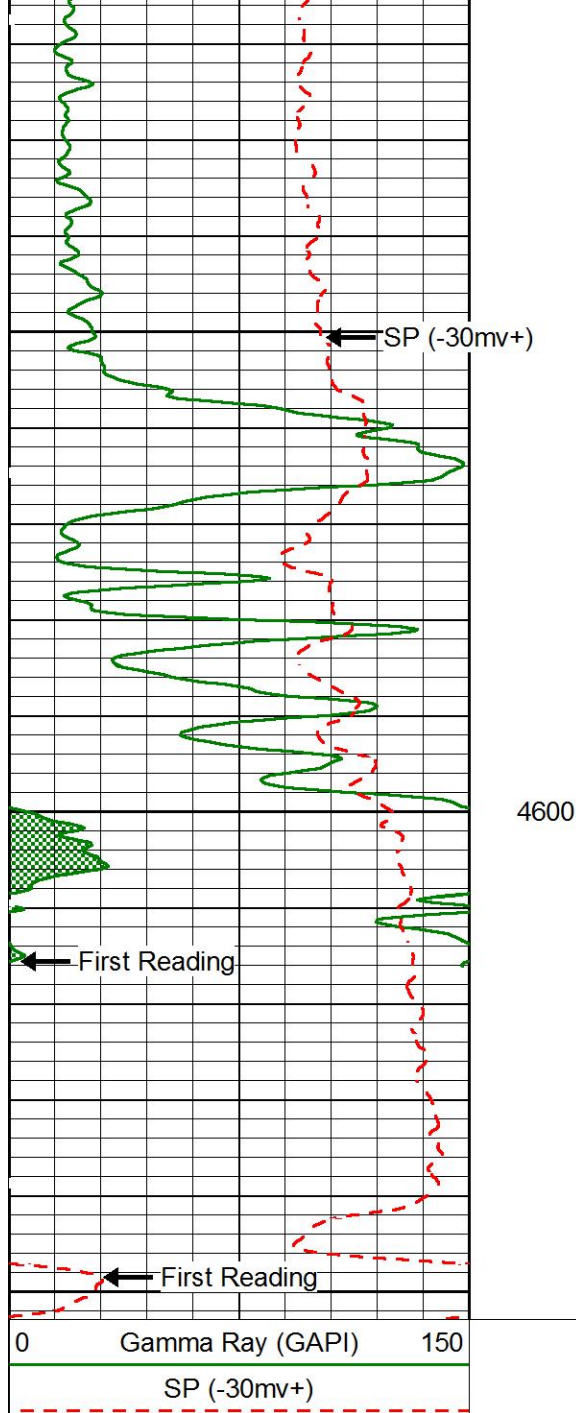


4100

4200







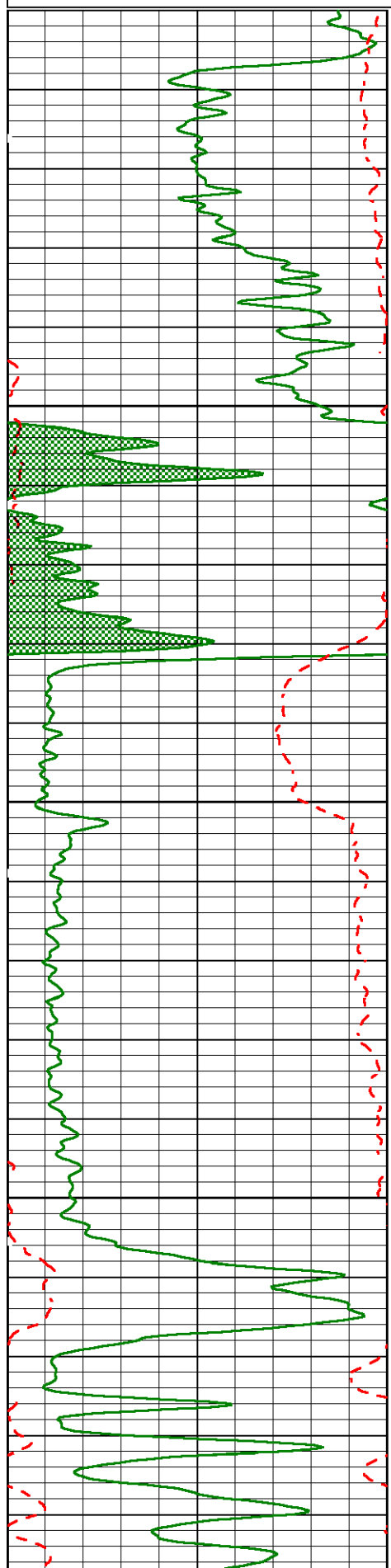
Repeat Pass

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 Dataset Pathname pass3
 Presentation Format OKC-AI~1
 Dataset Creation Tue Sep 13 18:23:39 2016 by Log Sondex
 Charted by Depth in Feet scaled 1:240

0	Gamma Ray (GAPI)	150	0.2	10in Resistivity (Ohm-m)	2000
	SP (-30mv+)		0.2	20in Resistivity (Ohm-m)	2000

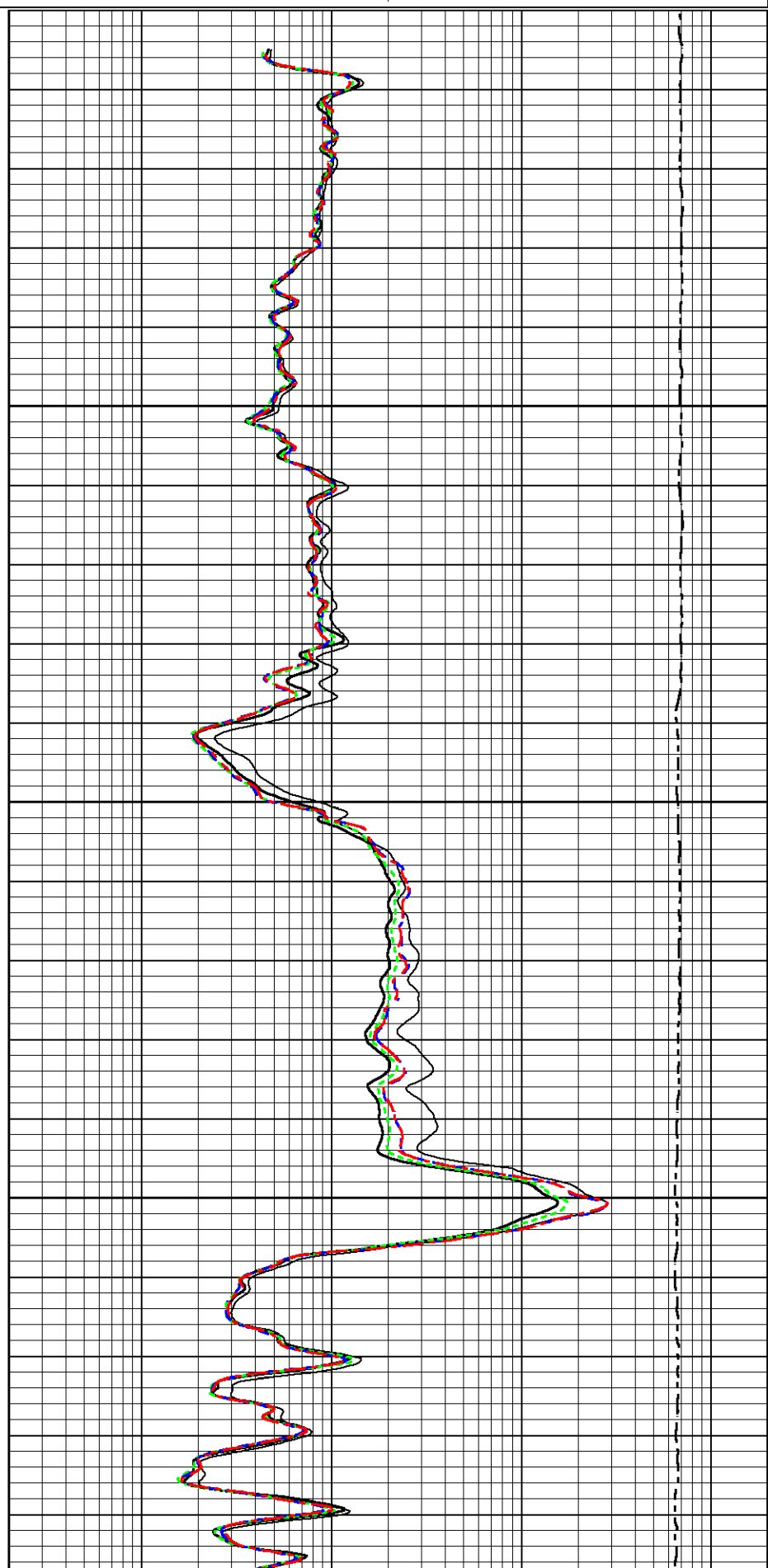
SI (-50mV)

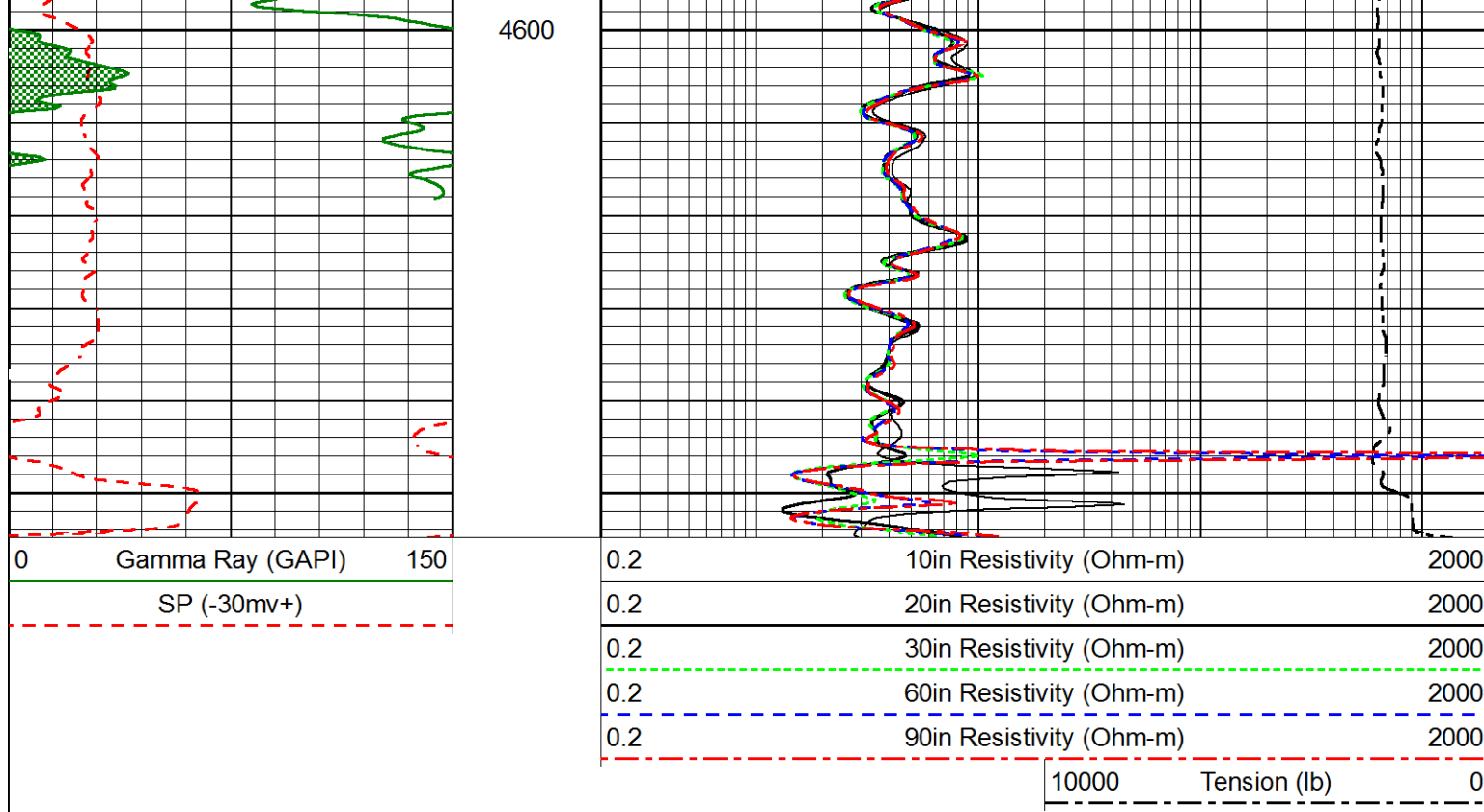
0.2	20in Resistivity (Ohm-m)	2000
0.2	30in Resistivity (Ohm-m)	2000
0.2	60in Resistivity (Ohm-m)	2000
0.2	90in Resistivity (Ohm-m)	2000
	10000	Tension (lb)
		0



4400

4500





Log Variables

DatabaseC:\Sondex\Sondex Warrior\Data\okland_liberty_1-8.db

Dataset field/well/run1/pass4/_vars_

Top - 223.00 ft

MAXAMPL mV 0	MINAMPL mV 1	MINATTN db/ft 0.8	COMPACT 1	SVFLUID usec/ft 189	SVMATRIX usec/ft 47.6	FRMSALIN kppm 0	MUDSALIN kppm 0
DEVI deg 0	SRFTEMP degF 68	SO in 0.25	DE-CENT Yes	CASED? Yes	CASEWGHT lb/ft 11.5	NPORSEL Limestone	AIR_HOLE? No
MudWgt lb/gal 9.3	FLUIDDEN g/cc 1	MATRXDEN g/cc 2.71	SPSHIFT mV 0	CASETHCK in 0	CASEOD in 8.625	PERFS 0	TDEPTH ft 4650
BOTTEMP degF 114	BOREID in 7.875						

223.00 ft - Bottom

MAXAMPL mV 0	MINAMPL mV 1	MINATTN db/ft 0.8	COMPACT 1	SVFLUID usec/ft 189	SVMATRIX usec/ft 47.6	FRMSALIN kppm 0	MUDSALIN kppm 0
DEVI deg 0	SRFTEMP degF 68	SO in 0.25	DE-CENT Yes	CASED? No	CASEWGHT lb/ft 11.5	NPORSEL Limestone	AIR_HOLE? No
MudWgt lb/gal 9.3	FLUIDDEN g/cc 1	MATRXDEN g/cc 2.71	SPSHIFT mV 0	CASETHCK in 0	CASEOD in 5.5	PERFS 0	TDEPTH ft 4650
BOTTEMP	BOREID						

BOTTOM TEMP degF 114	BOREID in 7.875
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Calibration Report	
Database File	okland_liberty_1-8.db
Dataset Pathname	pass4
Dataset Creation	Tue Sep 13 18:34:32 2016 by Log Sondex

Induction Array Tool Calibration Report

Serial Number:	B10106
Tool Model:	002

Master Calibration Performed:				Mon Apr 06 13:13:38 2015				
Temperature:				74.2 degF				
Sonde Error:								
Array	1	2	3	4	5	6	7	
Real	192.9	-12.8	-40.1	-14.0	-2.6	0.9	4.6	mmho/m
Imaginary	-66.9	-110.0	-26.2	3.8	-5.1	-20.7	-1.6	mmho/m
Loop Gain:								
Array	1	2	3	4	5	6	7	
Loop (real)	537.7	678.5	1295.3	1394.1	1144.8	712.8	404.8	mmho/m
Loop (imaginary)	73.3	92.5	389.8	419.5	344.5	214.5	121.8	mmho/m
Real	751.5	712.0	1266.4	1380.9	1167.8	742.6	429.0	mmho/m
Imaginary	5.5	-16.7	355.5	417.2	343.1	201.0	126.6	mmho/m
Gain (real)	0.963	0.936	0.991	0.999	0.978	0.961	0.954	
Gain (imaginary)	1.012	0.992	1.021	1.015	0.989	0.967	0.950	

Before Survey Verification Performed:		Tue Aug 04 09:42:06 2015						
Sonde 1 Temperature:		83.1 degF						
Sonde 2 Temperature:		79.2 degF						
Array 1 Temperature:		81.6 degF						
Array	1	2	3	4	5	6	7	
TxIR	-0.0	-0.0	0.1	0.1	0.1	0.1	0.1	
TxIX	-0.0	-0.0	-0.2	-0.2	-0.2	-0.2	-0.2	
Tx Magnitude	0.0	0.0	0.2	0.2	0.2	0.2	0.2	
Gain	50.5	64.5	54.5	66.5	80.2	108.5	158.9	
RxCR	-0.0	-0.0	-0.0	-0.0	-0.0	-0.0	-0.0	
RxCX	0.1	0.1	0.1	0.1	0.2	0.1	0.1	
RxC Magnitude	0.1	0.1	0.1	0.1	0.2	0.1	0.1	

Tool Module Parameters	
Software Version:	8.0.0.4
Borehole Size Source:	BOREID
Mud Resistivity Source:	MUDRES
Mud Resistivity At Surface:	N/A
Mud Resistivity Surface Temperature:	N/A
Borehole Corrections:	Centralized Lookup Table
Minimum Standoff:	N/A

Multi Array Sonic Calibration Report

Serial Number:	C10038SS
Tool Model:	001SS

Tool Module Parameters	
Software Version:	8.0.0.2
Integrated Transit Time Source:	DT57
Density Source:	DT57

Porosity Source: D157
 Porosity Method: Wyllie
 Raymer Hunt Constant: N/A

Gamma Ray Calibration Report

Serial Number: C10047
 Tool Model: 001

Performed: Tue Jul 19 11:02:37 2016

Calibrator Value: 156.0 GAPI

Background Reading: 78.5 cps
 Calibrator Reading: 529.3 cps

Sensitivity: 0.3460 GAPI/cps

Borehole Fluid Resistivity Calibration Report

Serial Number: P004
 Tool Model: 002

Master Calibration Performed: Mon Dec 05 18:05:39 2011

Resistivity Polynomial Equation:

$$0.1429x^3 - 0.4495x^2 + 1.2097x - 0.2854$$

Temperature Calibration:

Reference		Reading	
71.60	degF	559.80	bits
167.00	degF	659.50	bits

Head Tension Unit Calibration Report

Serial Number: 00001
 Tool Model: 011

Performed: Mon Dec 15 11:20:16 2014

Point #	Reference		Reading	
1	-19894.000	lb	8957.860	cps
2	-15010.000	lb	13965.100	cps
3	-9998.000	lb	19076.100	cps
4	-5007.000	lb	24133.000	cps
5	-1009.000	lb	28232.100	cps
6	1017.000	lb	30185.400	cps
7	5040.000	lb	34439.700	cps
8	9970.000	lb	39346.900	cps
9	14955.000	lb	44466.000	cps
10	19770.000	lb	49397.800	cps

Sensor	Offset (ft)	Schematic	Description	Length (ft)	O.D. (in)	Weight (lb)
HTEN	41.18		CHD-001 (000004) Cable Head	2.19	3.38	35.00
			XTU-008 (C10067) Crossover Ultrawire Toolbus to Ultralink	2.08	3.38	47.00
			Centralizer-Overbody Overbody Centralizer	2.00	6.88	5.00
			HTU-011 (00001) Head Tension Unit	2.18	3.38	55.00
BFR	37.53		BFR-002 (P004) Borehole Fluid Resistivity	4.39	3.38	94.00

		Borehole Fluid Resistivity						
GR	34.78		GRT-001 (C10047) Gamma Ray Tool	3.22	3.38	69.00		
WVFUTRF	25.95			MAS-001SS (C10038SS) Multi Array Sonic Tool (SS)	14.28	3.38	242.00	
WVFLTRF	24.95				WVFUTRN	24.95		
WVFLTRN	23.95							
IAT	8.44							
SP	0.43							
								
								
								
								
								
								
								
								
								
								
								
								
								
								
								
								
								
								
								
								
								
								
								
								
								
								
								
								
								
								
								
								
								
								
								
								
								
								
								
								
								