



ThruBit
A Schlumberger Company

**ARRAY INDUCTION
GAMMA RAY
MEMORY LOG**

Company	SANDRIDGE ENERGY	Company	SANDRIDGE ENERGY
Well	LuAnn 2925 2-36H	Well	LuAnn 2925 2-36H
Field	MINNEOLA	Field	MINNEOLA
County	FORD	County	FORD
State	KANSAS	State	KANSAS
Location:	API # : 15-057-208740000 240' FNL & 660' FWL	Other Services THRUBIT PORTAL BIT	
Permanent Datum	SEC 36 TWP 29S RGE 25W	Elevation	
Log Measured From	G.L. K.B. 20' ABOVE PERM DATUM	K.B. 2607' D.F. 2607' G.L. 2587'	
Drilling Measured From	K.B.		
Date	15 APR 2013		
Run Number	ONE		
Depth Driller	8422'		
Depth Logger	8373'		
Bottom Logged Interval	8363'		
Top Log Interval	4300'		
Casing Driller	9.625" @ 1048'		
Casing Logger	NA		
Bit Size	8.75"		
Type Fluid in Hole	WBM		
Density / Viscosity	9.2 / 40		
pH / Fluid Loss	10.1 / 8.0		
Source of Sample	MUD SENSOR		
Rm @ Meas. Temp	0.17 OHM@65DEGF		
Rmf @ Meas. Temp	0.13 OHM@65DEGF		
Rmc @ Meas. Temp	0.21 OHM@65DEGF		
Source of Rmf / Rmc	CALCULATED		
Rm @ BHT	0.10 OHM@131DEGF		
Time Circulation Stopped	05:00 15 APR 2013		
Time Logger on Bottom	07:05 15 APR 2013		
Maximum Recorded Temperature	114 DEGF		
Equipment Number	T005		
Location	OKC, OK		
Recorded By	S.JARSKI		
Witnessed By	JESSIE NEW		

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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

SERVICE: HORIZONTAL PUMP DOWN MEMORY BIT DEPTH: 8322' LOGGED TO: 4300'
ALL SCALES AND PRESENTATIONS PER CLIENT REQUEST
LIMESTONE MATRIX, 2.71 g/cc. USED FOR POROSITY MEASUREMENTS
TOOLSTING RAN WITH SWIVEL AND SMALL DE-CENTRALIZER
TBHV REPRESENTS TOTAL BOREHOLE VOLUME, ft³
ABHV REPRESENTS ANNULAR HOLE VOLUME, CALCULATED FOR 5.5" CSG., ft³
RIGMINDER USED TO ACQUIRE LOG DEPTH
LOG CORRELATED TO MWD GR
RIG: Lariat #3

CREW: S.JARSKI R.WILSON R.CRESTWELL

Service Ticket No.	1848	API No.	15-057-208740000	PGM Ver	WARRIOR 7.0
The Well Name, Location, Borehole Description, and / or Cementing Data Furnished by Client					
EQUIPMENT DATA					
GAMMA	NEUTRON	DENSITY	INDUCTION		

Run No.	ONE	Run No.	ONE	Run No.	ONE	Run No.	ONE
Serial No.	PS27T	Serial No.	PS14N	Serial No.	PS01D	Serial No.	PS38R
Model No.	PS	Model No.	PS	Model No.	PS	Model No.	PS
Diameter	2.125"	Diameter	2.125"	Diameter	2.125"	Diameter	2.125"

LOGGING DATA

General Data

Pass	Depths		Well Head	Speed	Logging Run Comments
No.	From	To	Pressure	Ft/Min	
ONE	8363'	4300'	0 PSI	30 FPM	

	GAMMA		NEUTRON		DENSITY		INDUCTION	
Pass	Scale		Scale		Scale		Scale	
No.	L	R	L	R	L	R	L	R
ONE	0 API	150 API	30%	-10%	30%	-10%	0.2 OHMM	2000 OHMM

DIRECTIONAL INFORMATION

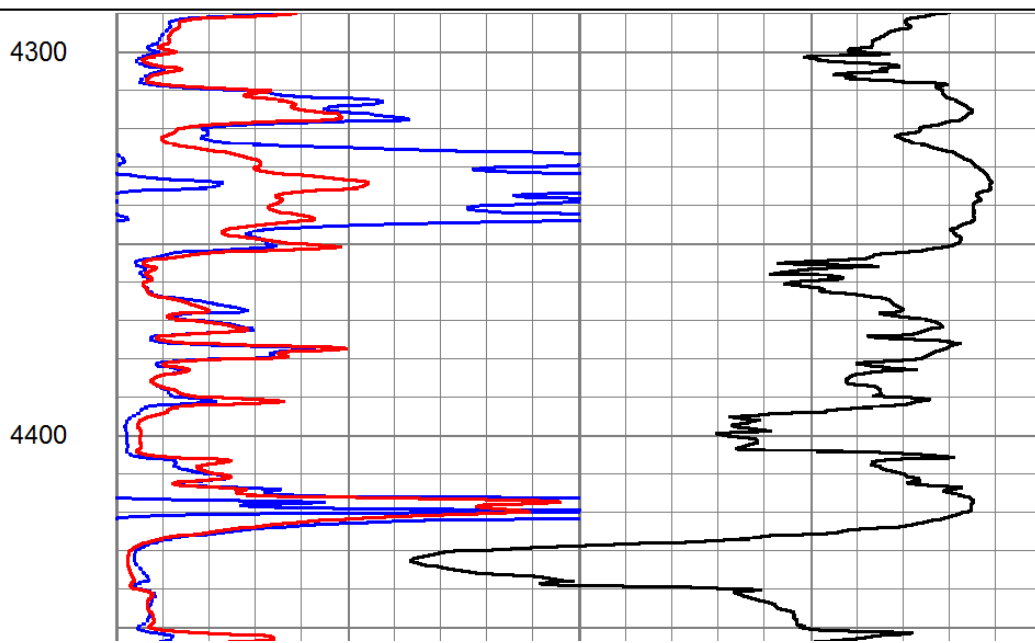
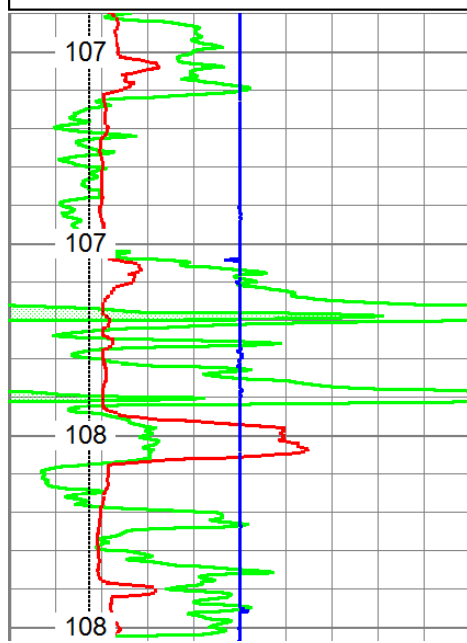
Maximum Deviation	92.7	deg. @	5819'	KOP	4672'	

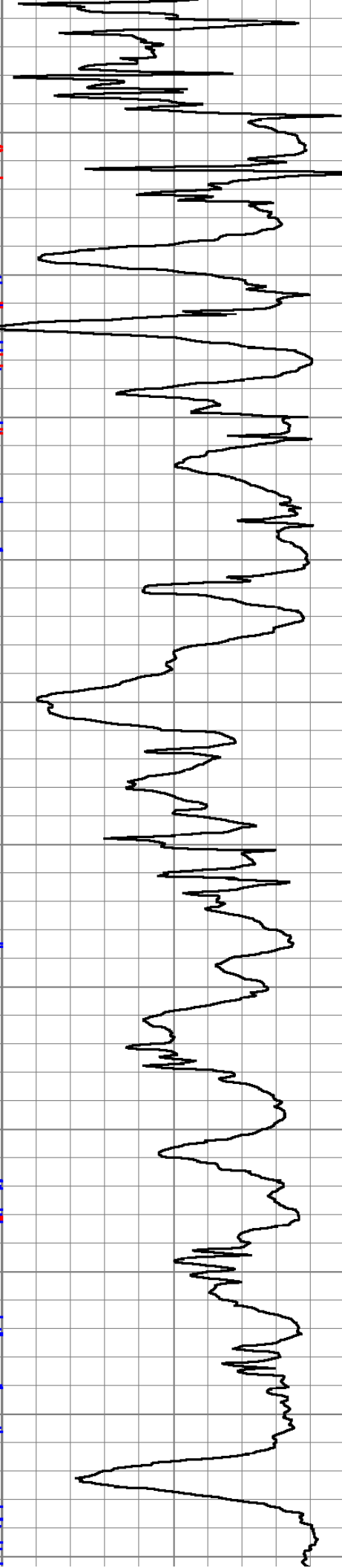
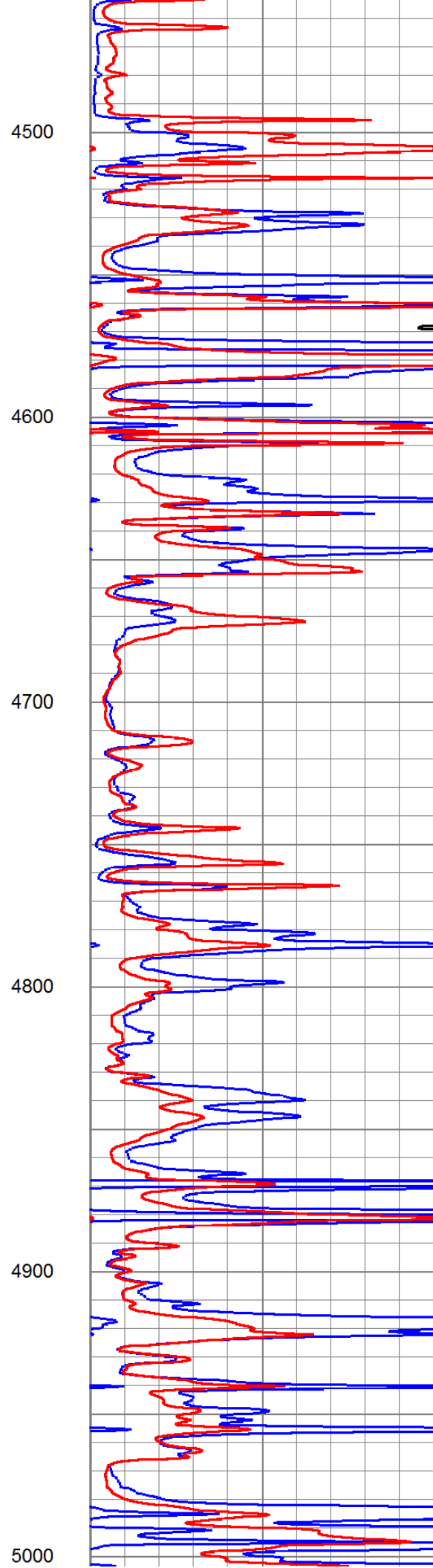
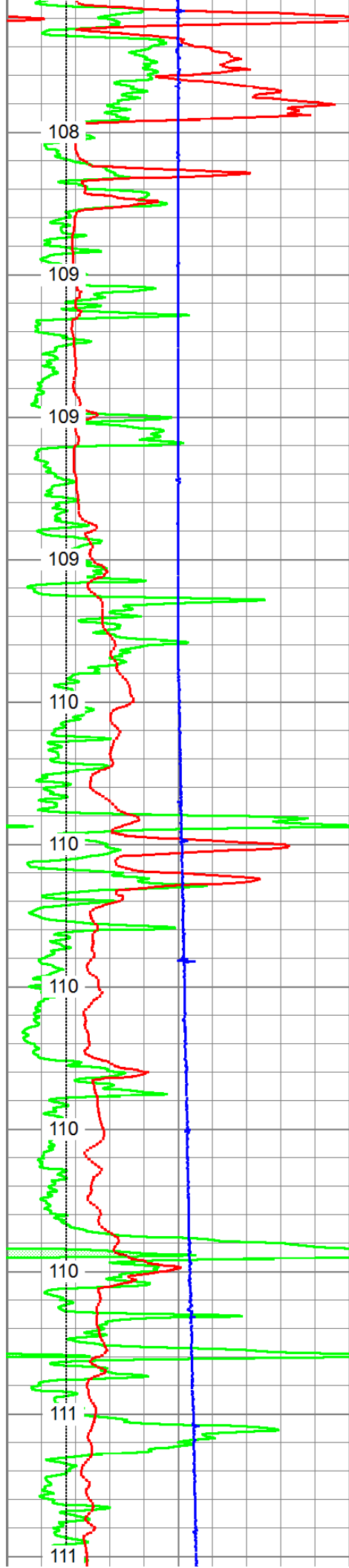


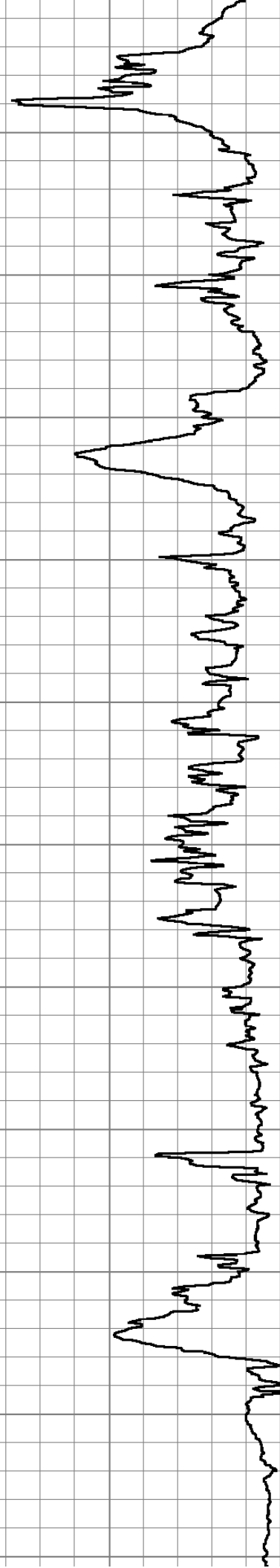
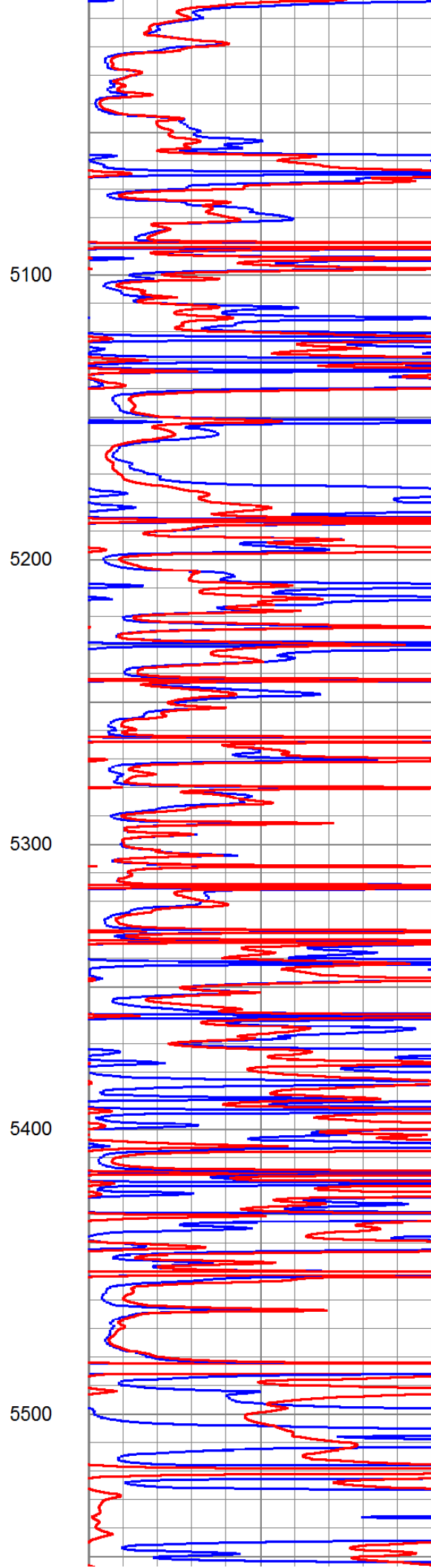
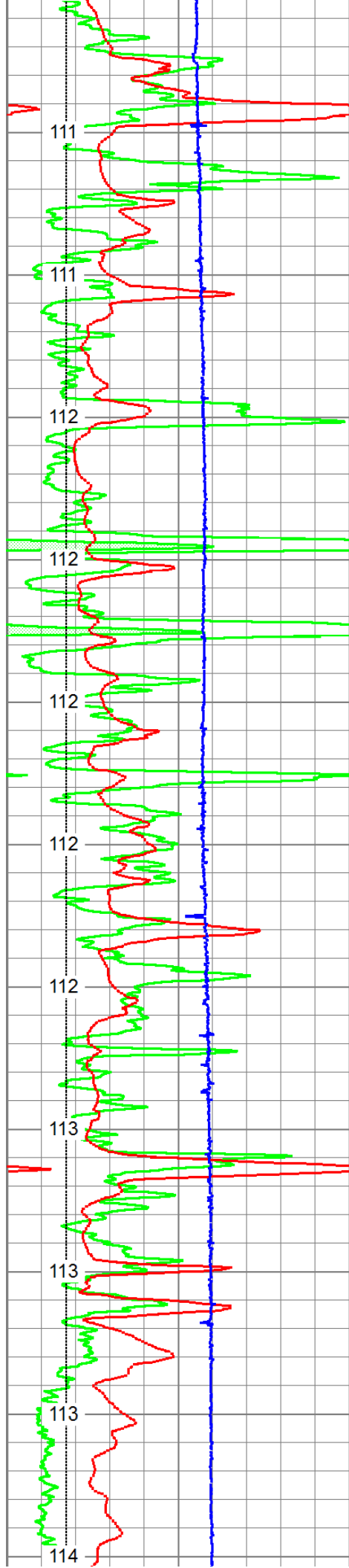
MAIN PASS

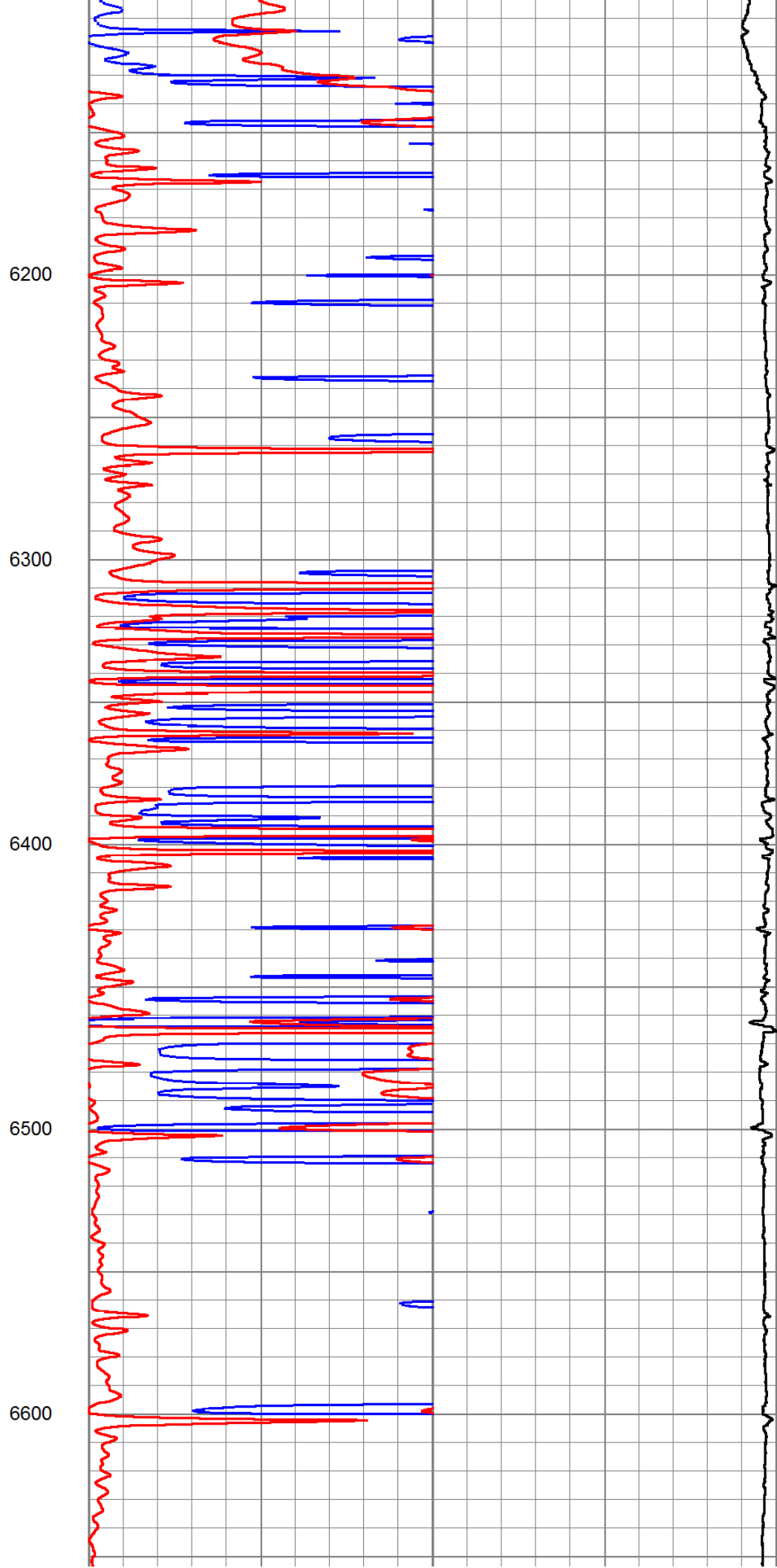
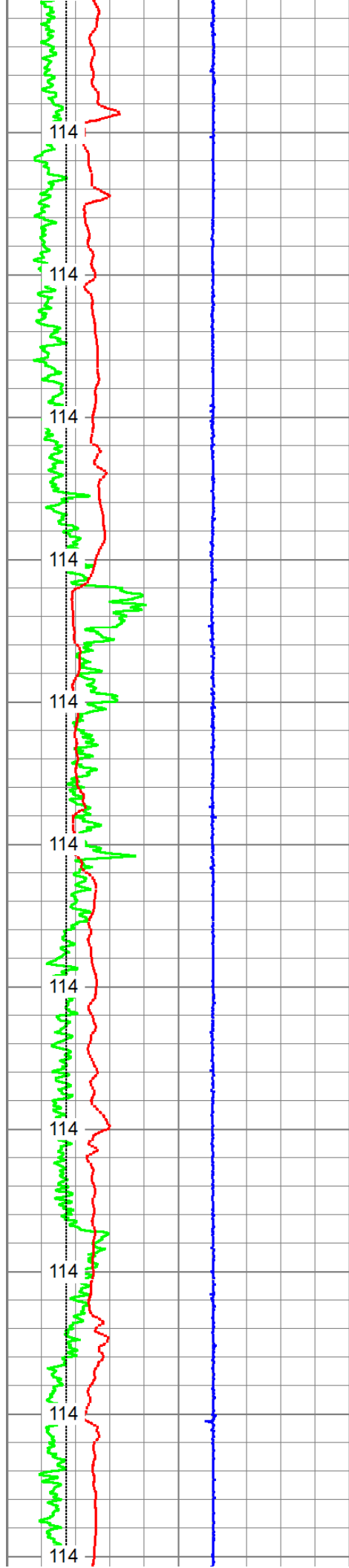
Database File: luann_mem.db
 Dataset Pathname: proc1/pass1.4
 Presentation Format: 8_2r_chk
 Dataset Creation: Mon Apr 15 14:07:12 2013
 Charted by: Depth in Feet scaled 1:600

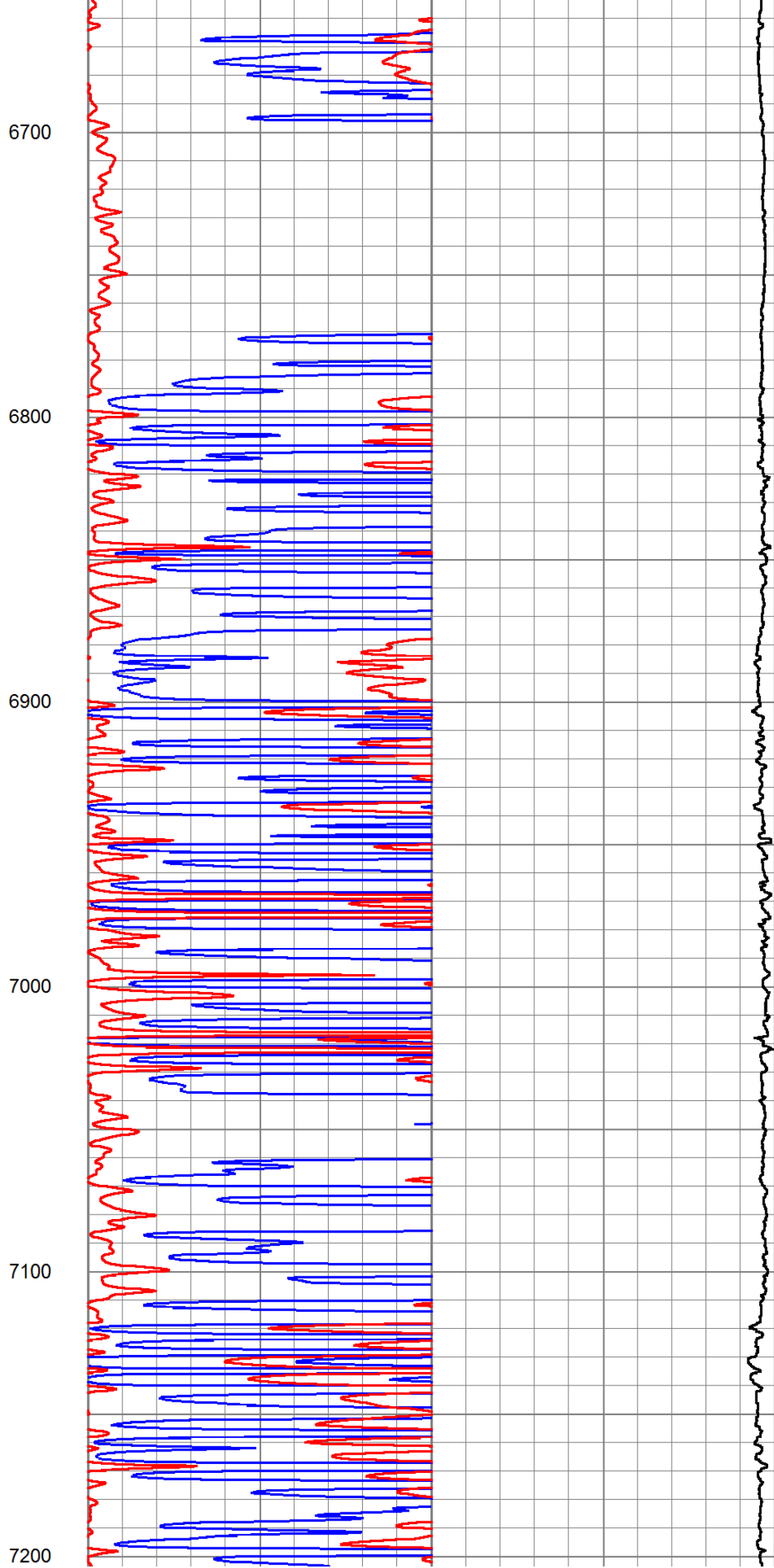
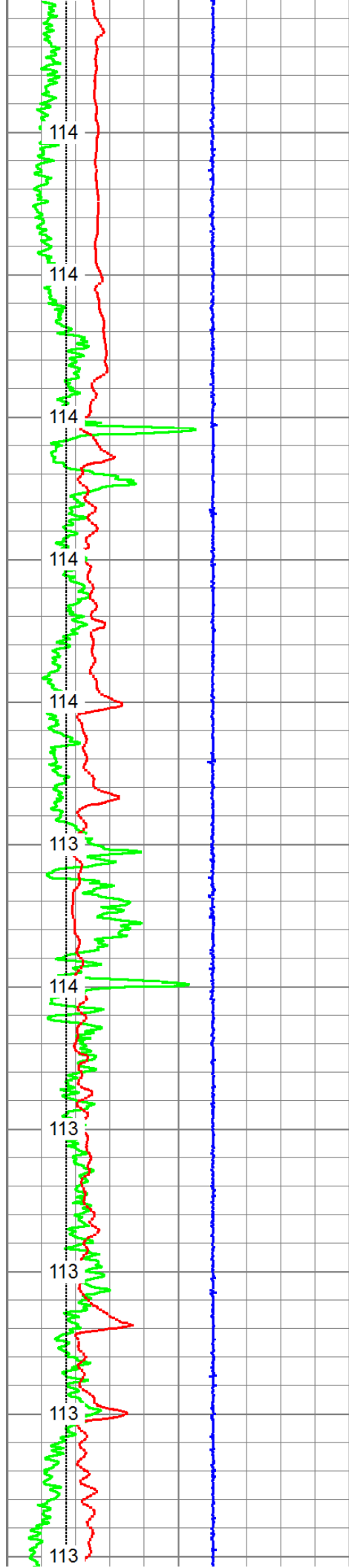
0	GR (GAPI)	150	50	20in 2ft Res (Ohm-m)	500	
7	DCAL (in)	17	50	90in 2ft Res (Ohm-m)	500	
-5	ACCY	5	1000	DEEP COND (mmho/m)		0
7	BOREID (in)	17	0	20in 2ft Res (Ohm-m)	50	
GRTEMP (degF)			0	90in 2ft Res (Ohm-m)	50	

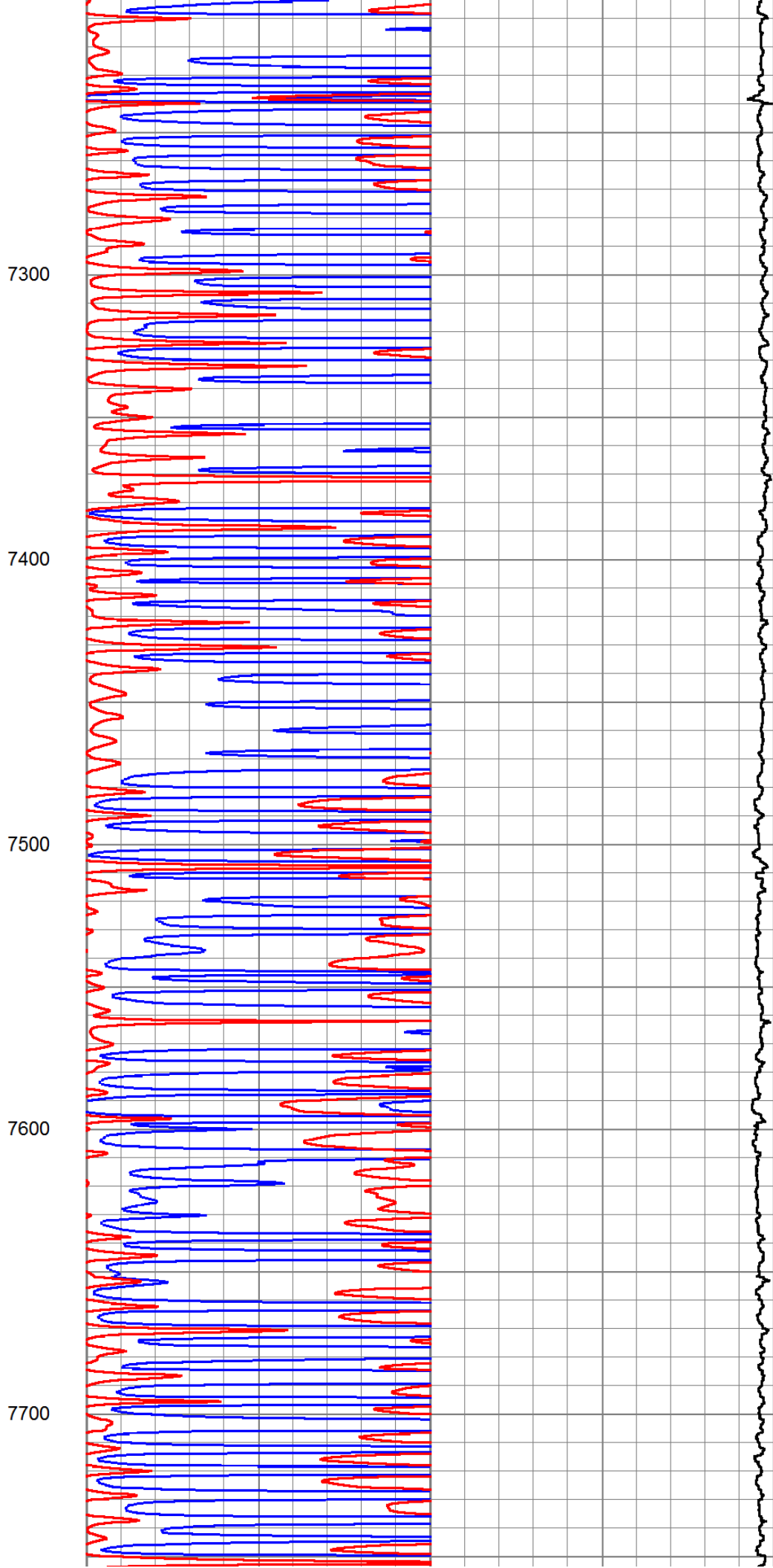
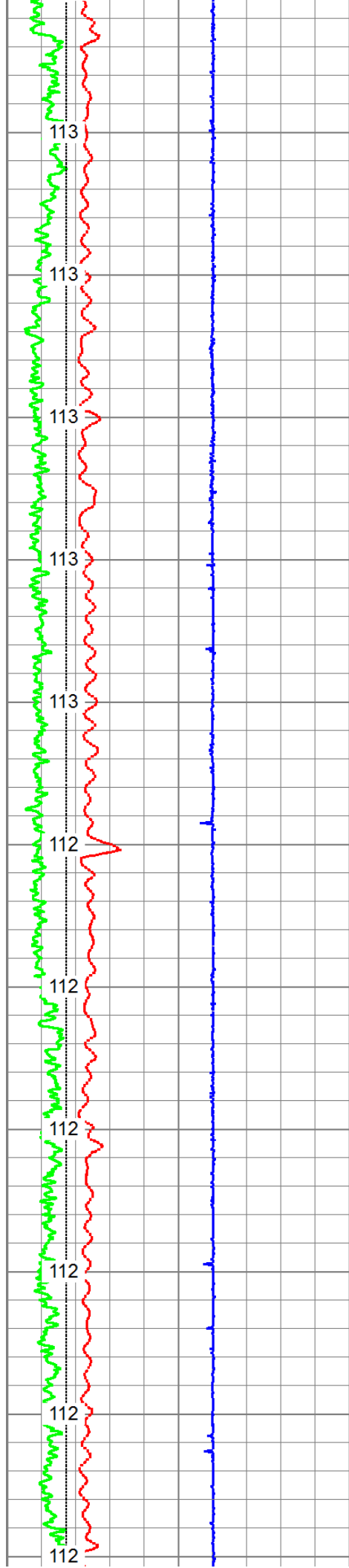


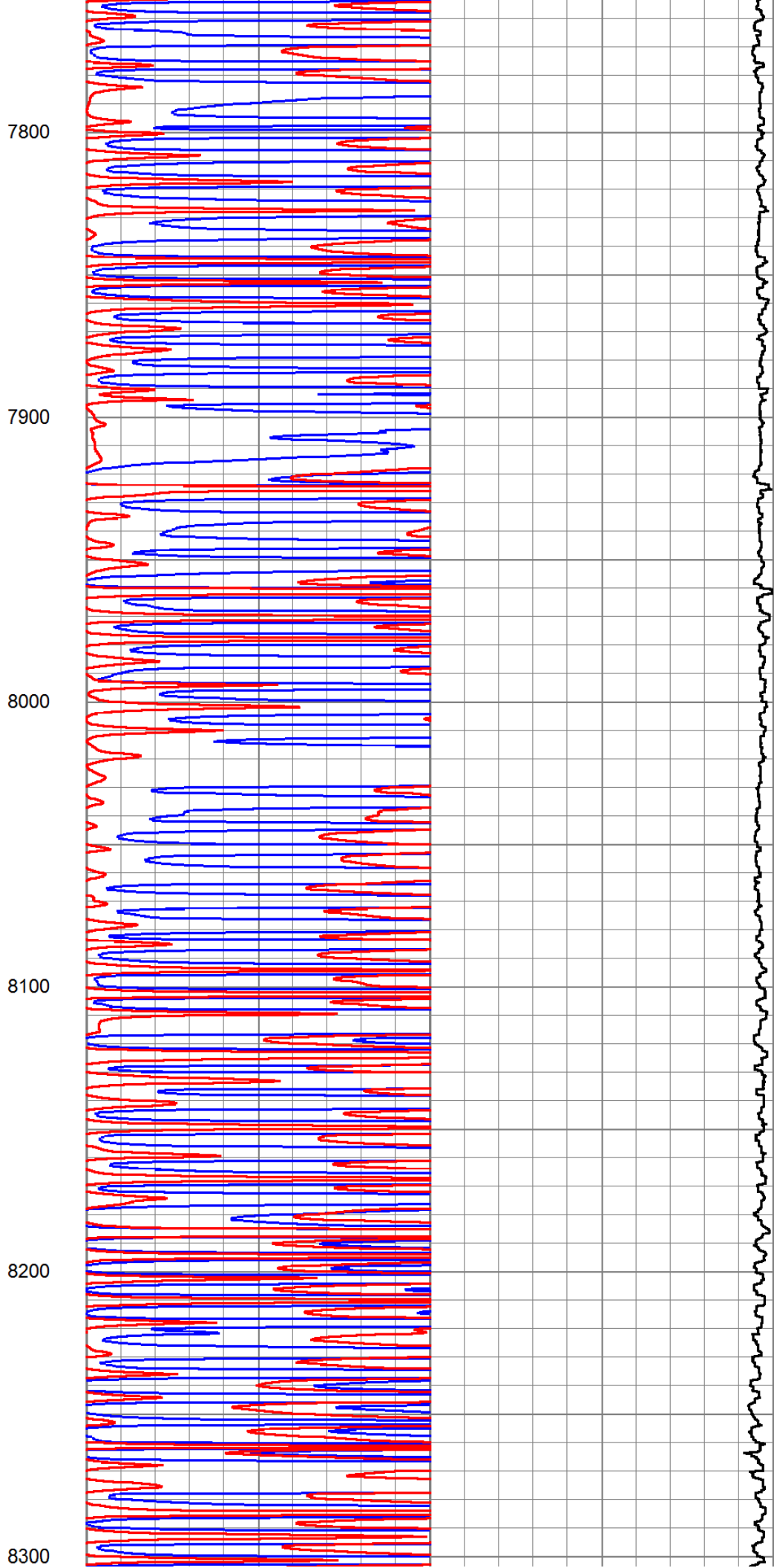
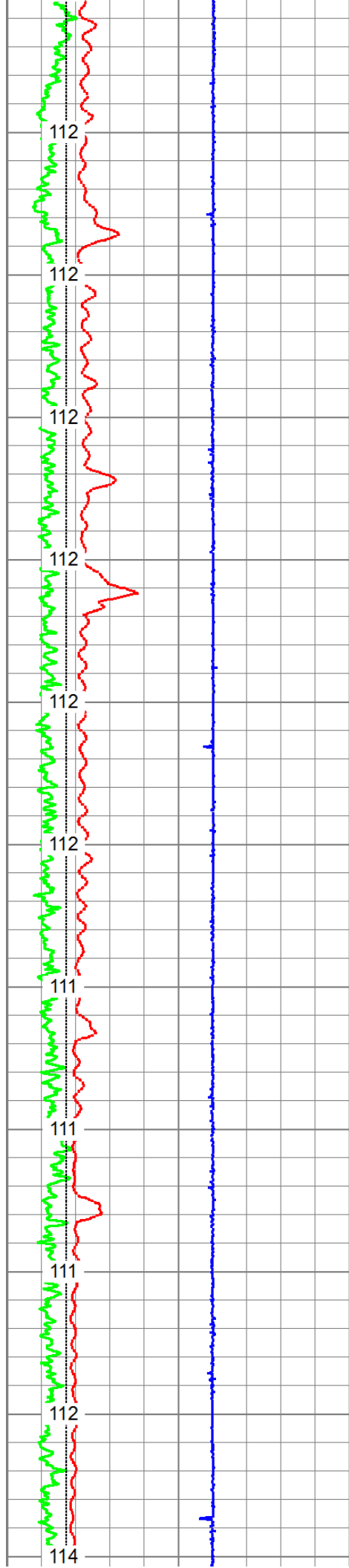


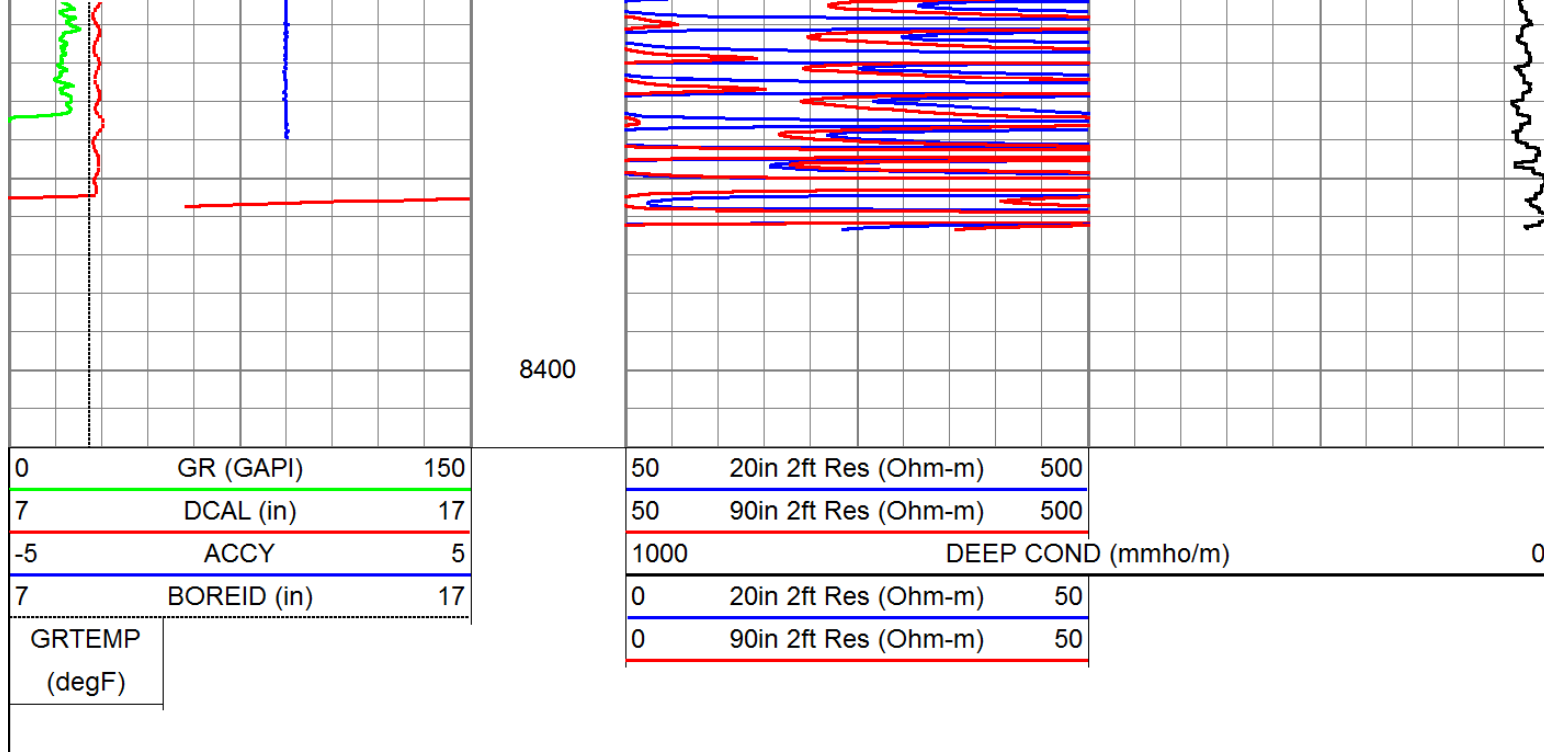






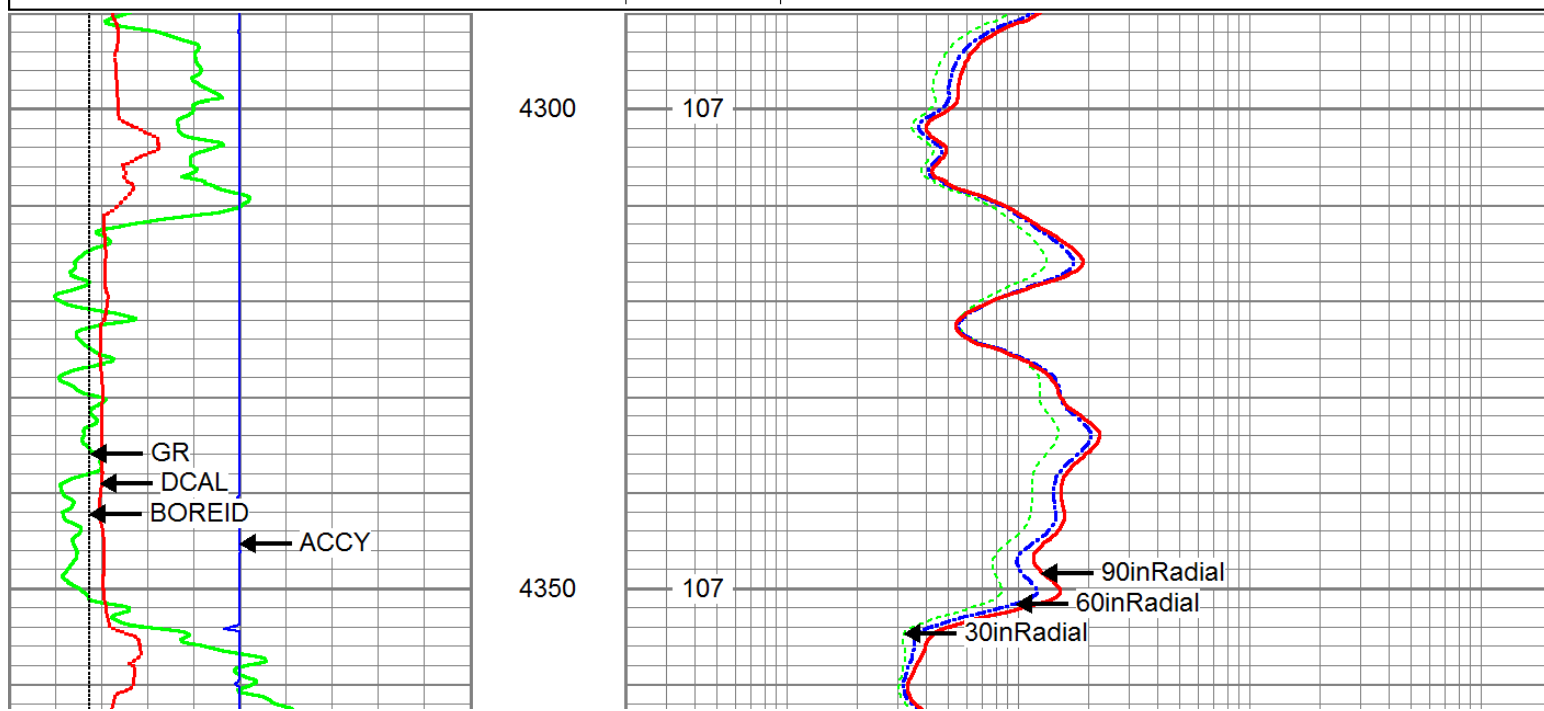
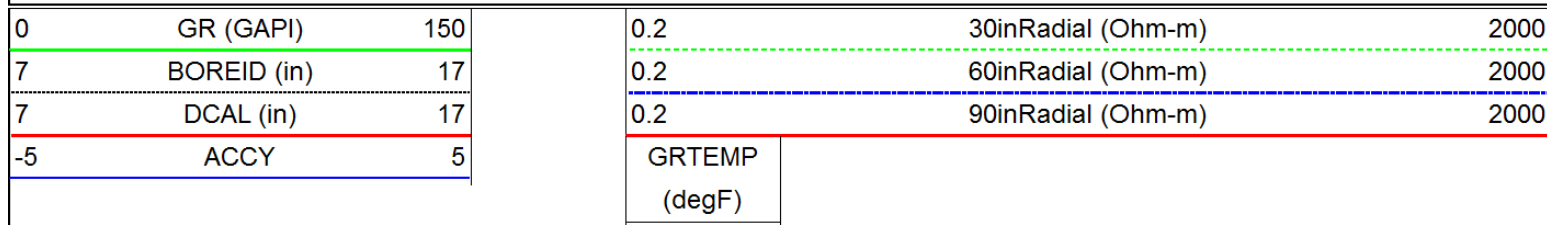


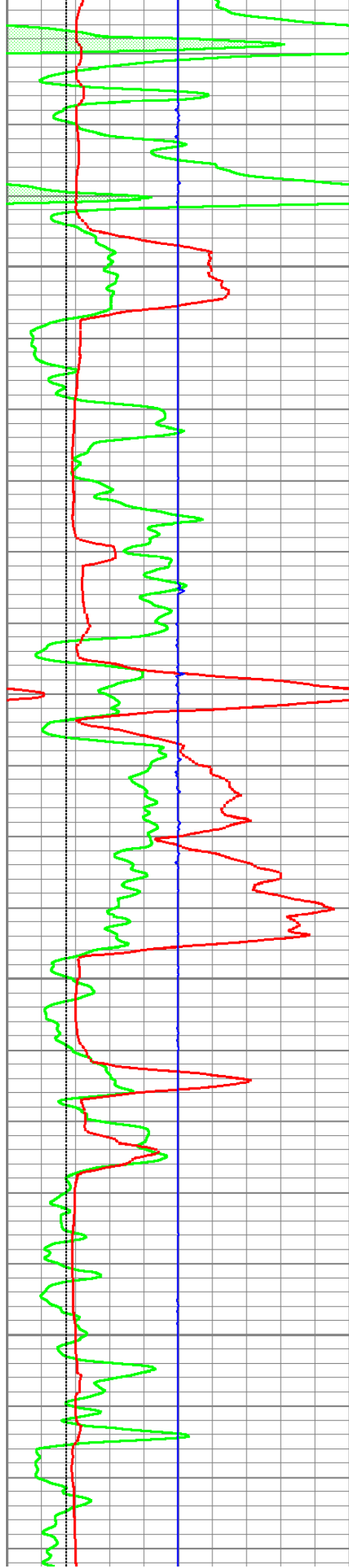




MAIN PASS

Database File: luann_mem.db
Dataset Pathname: proc1/pass1.4
Presentation Format: res4
Dataset Creation: Mon Apr 15 14:07:12 2013
Charted by: Depth in Feet scaled 1:240





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4450

4500

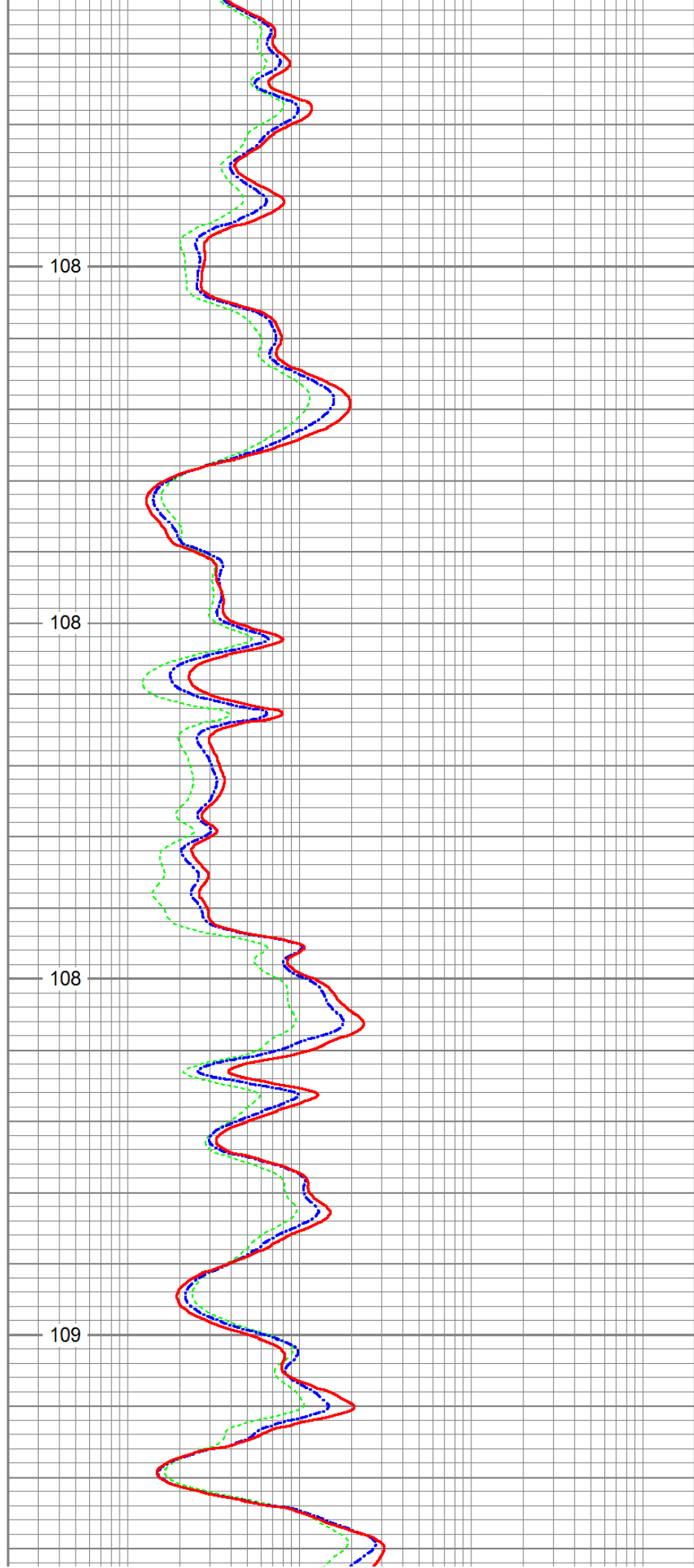
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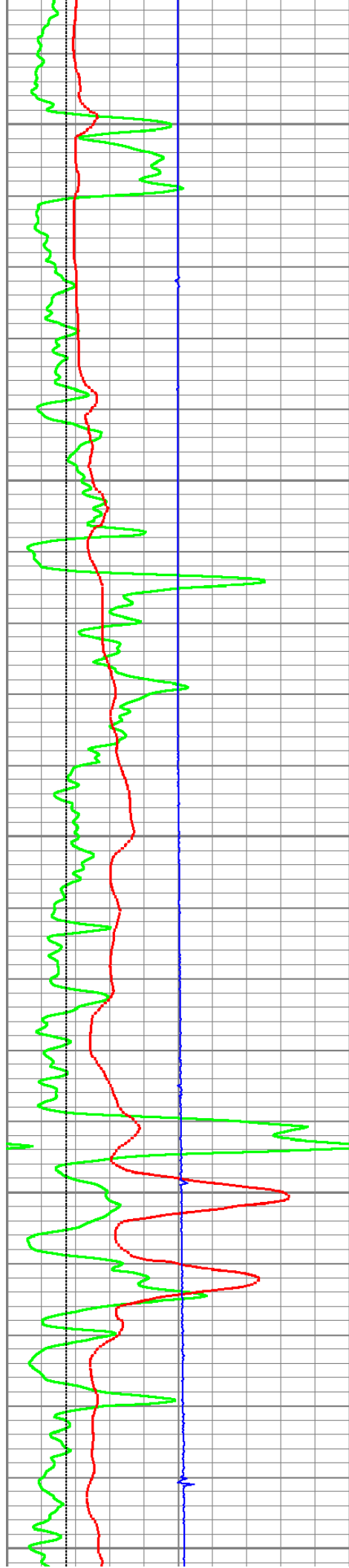
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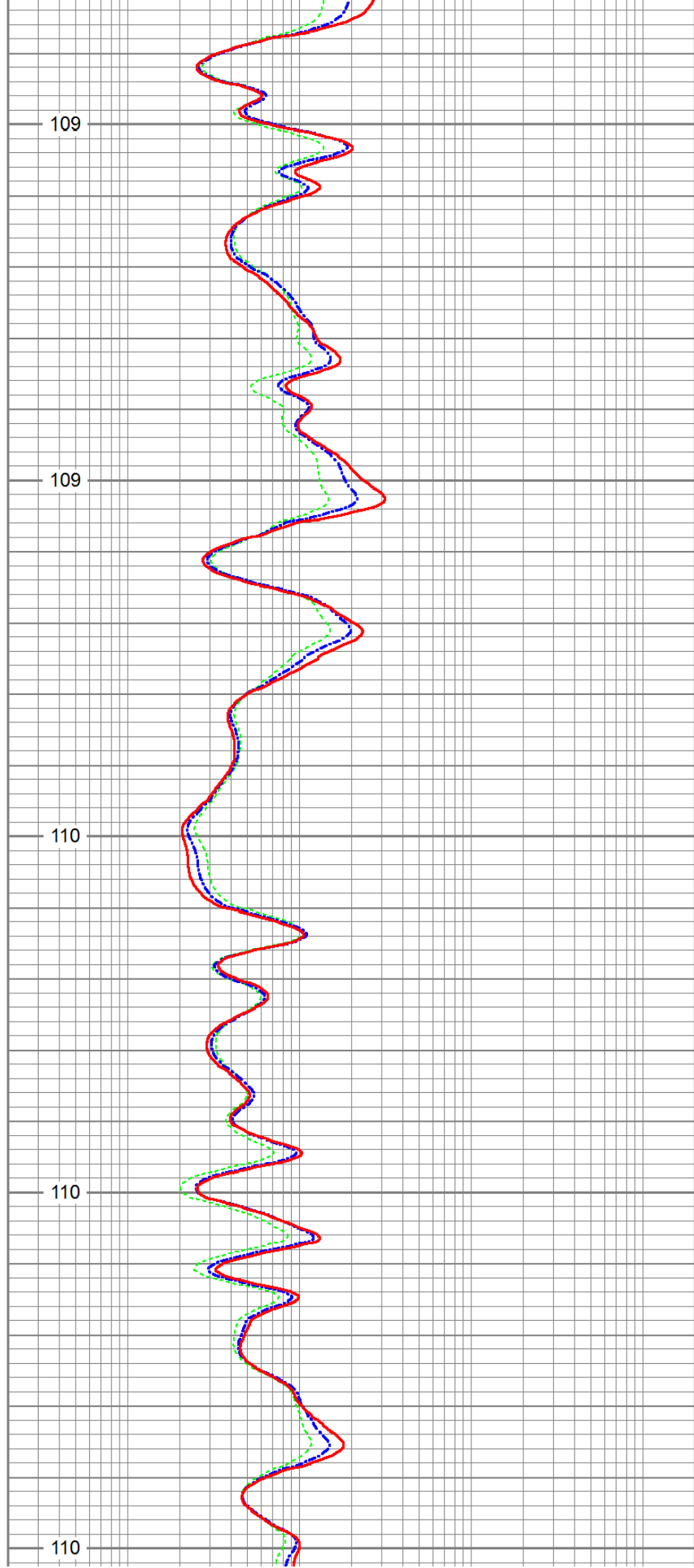
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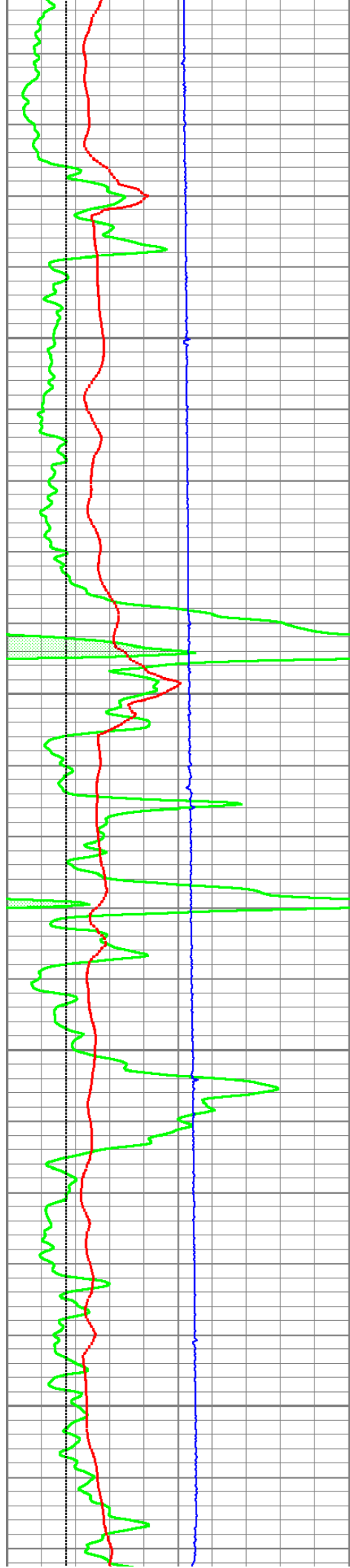
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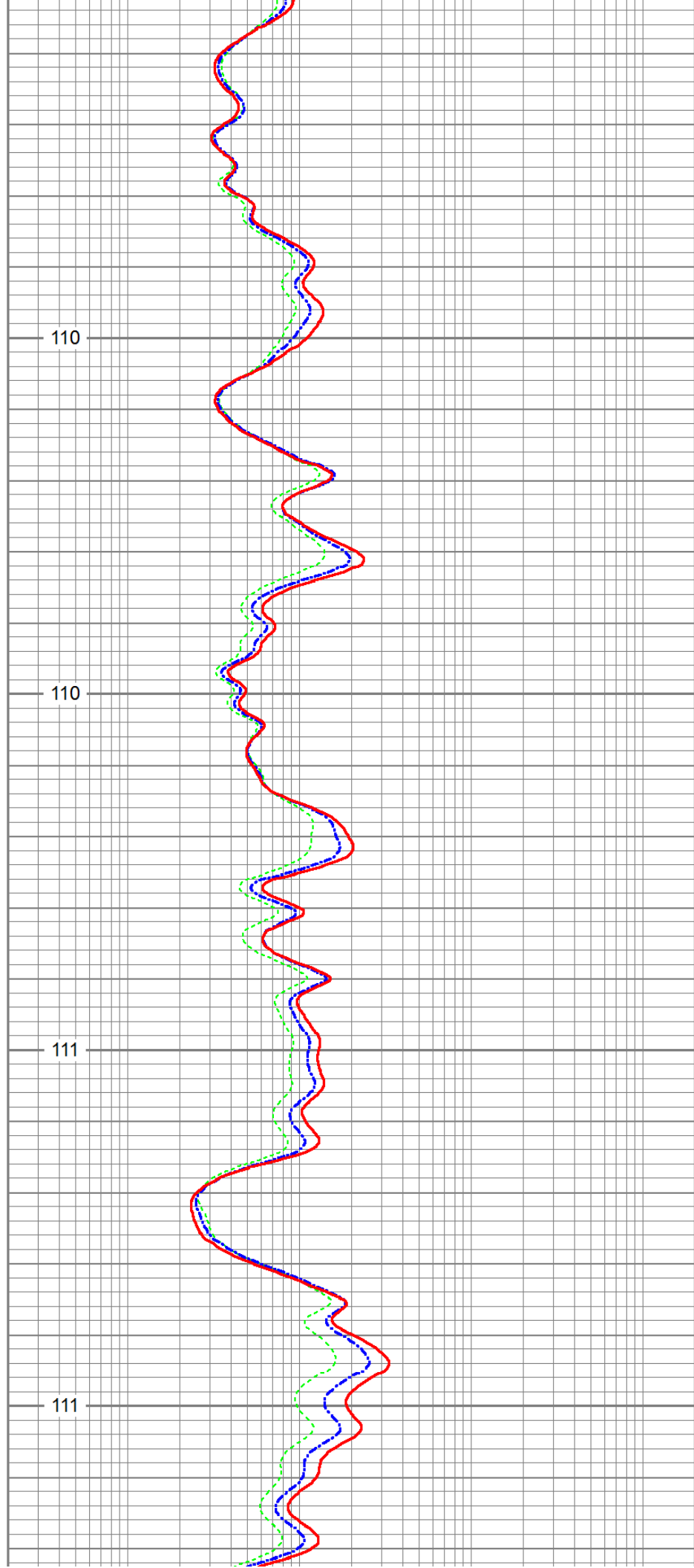


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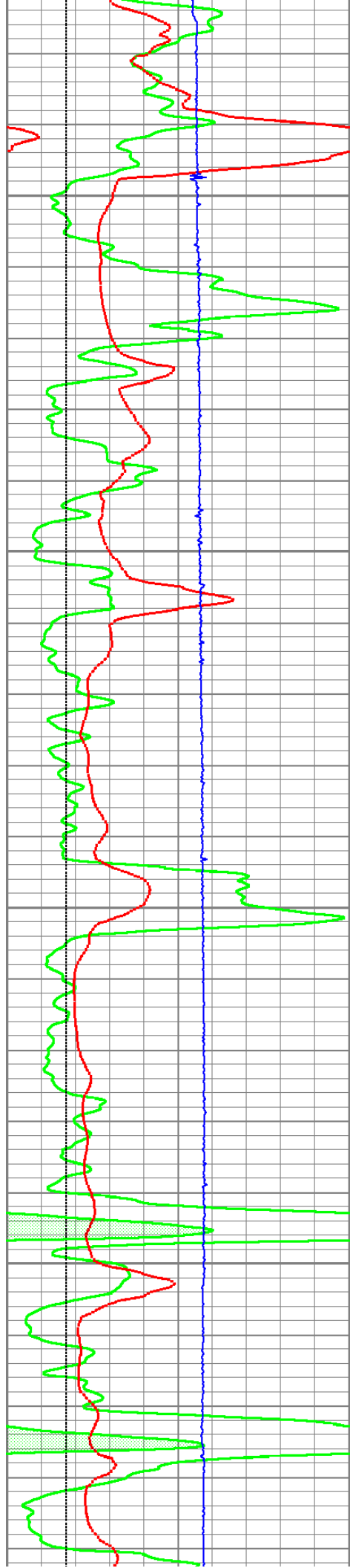


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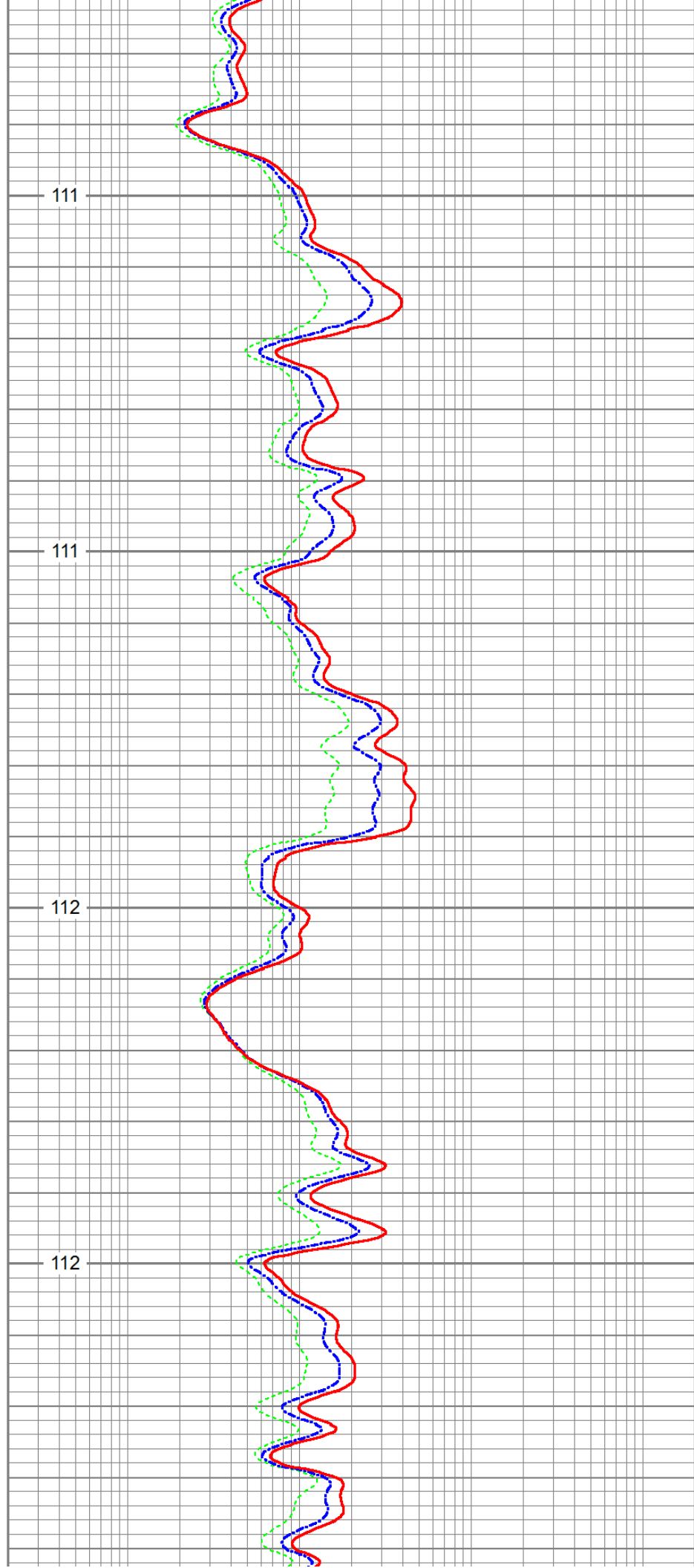


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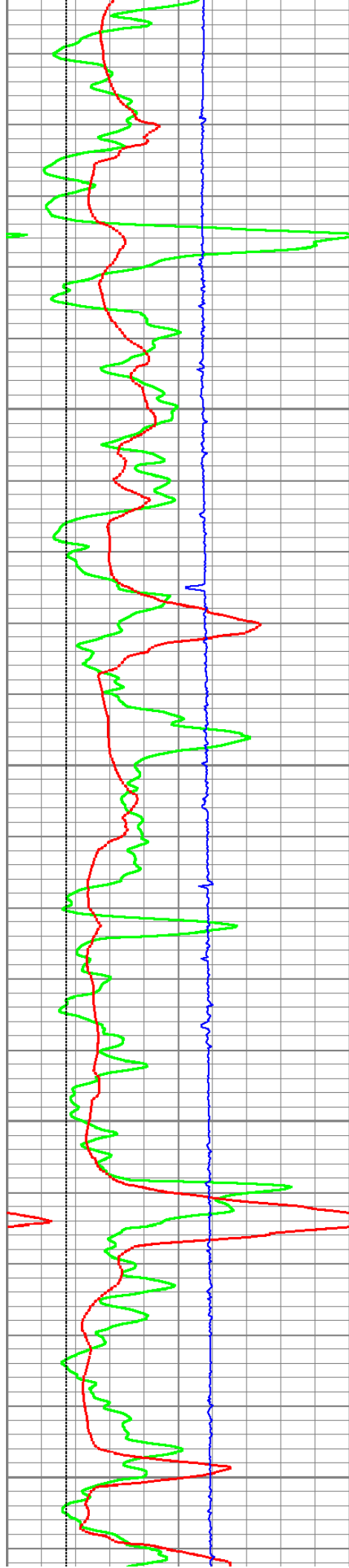


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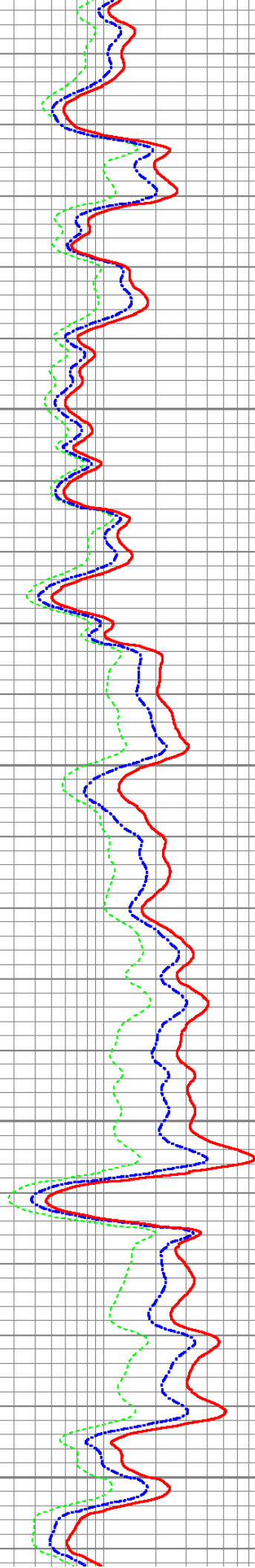
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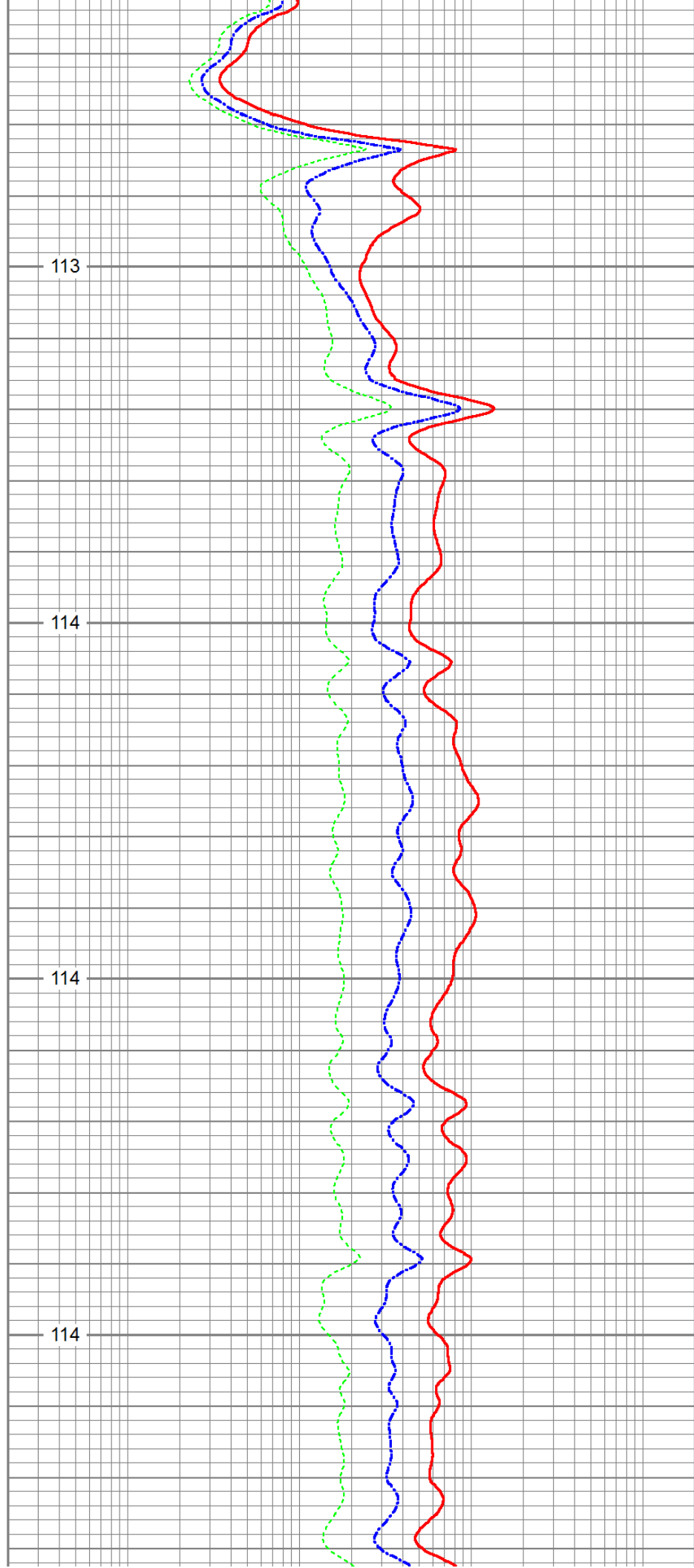
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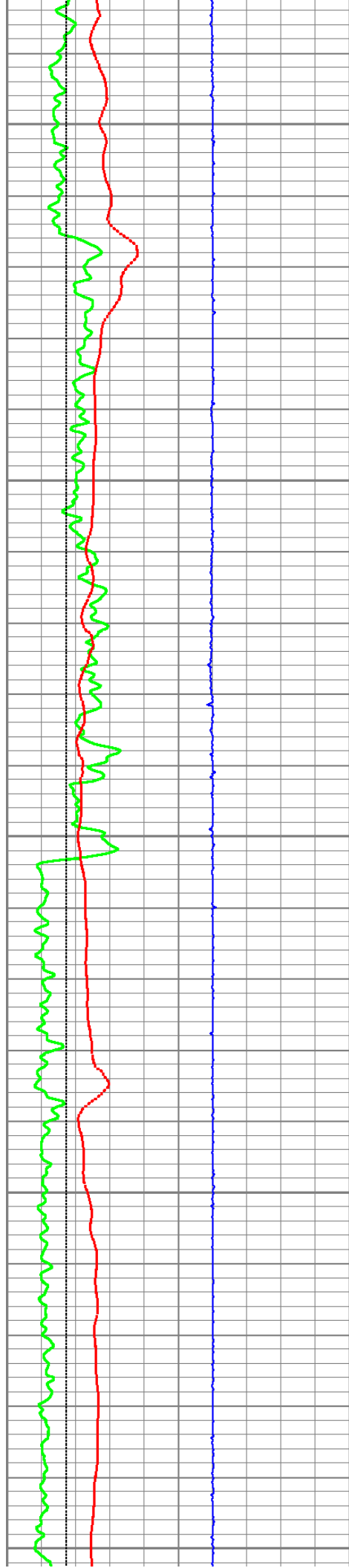
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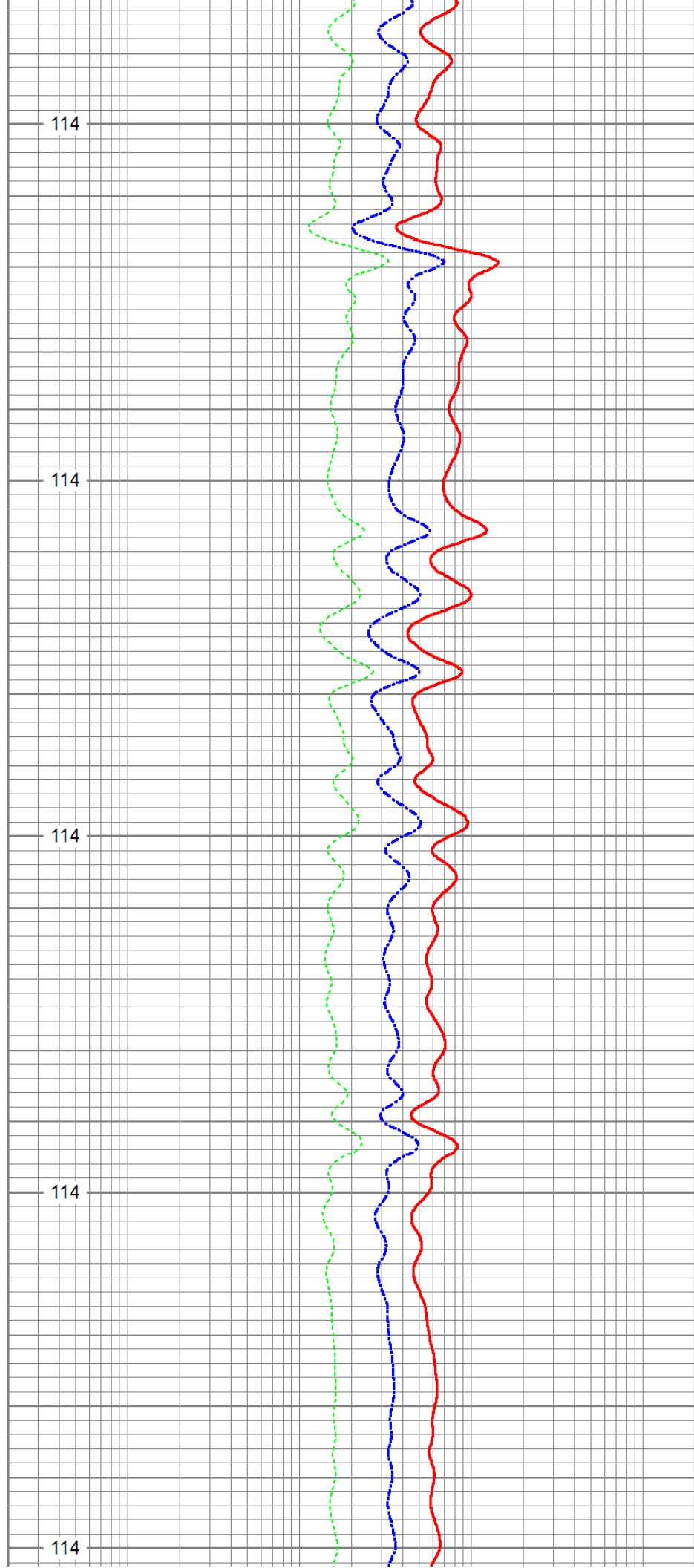
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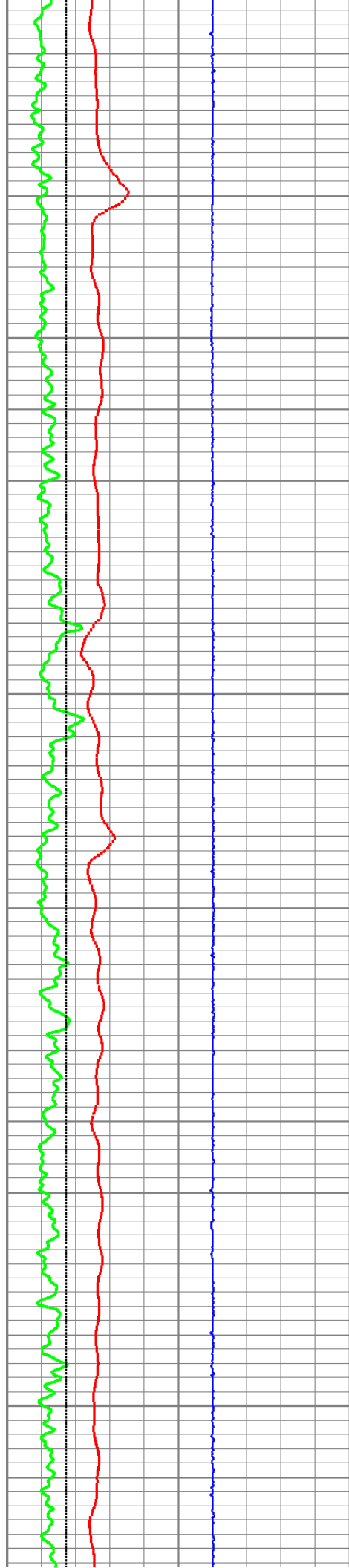
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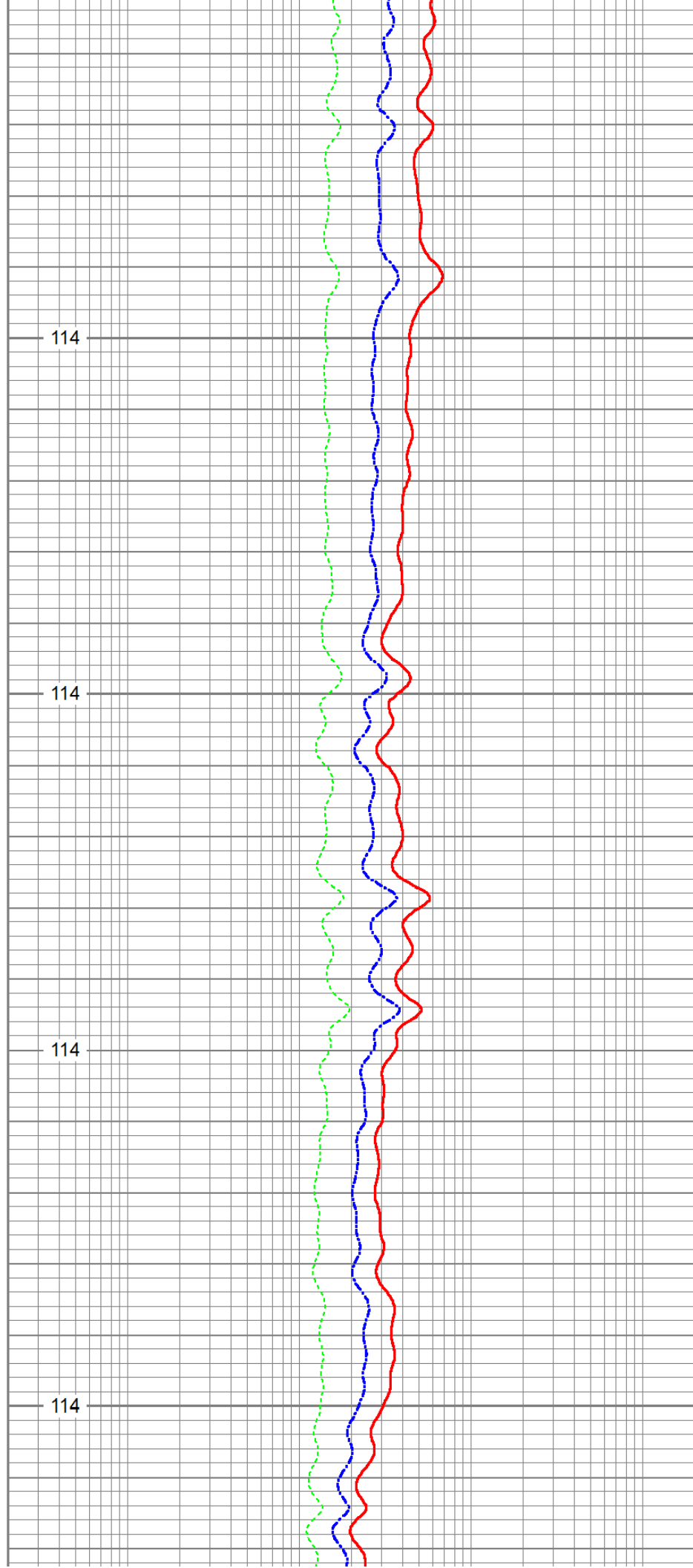
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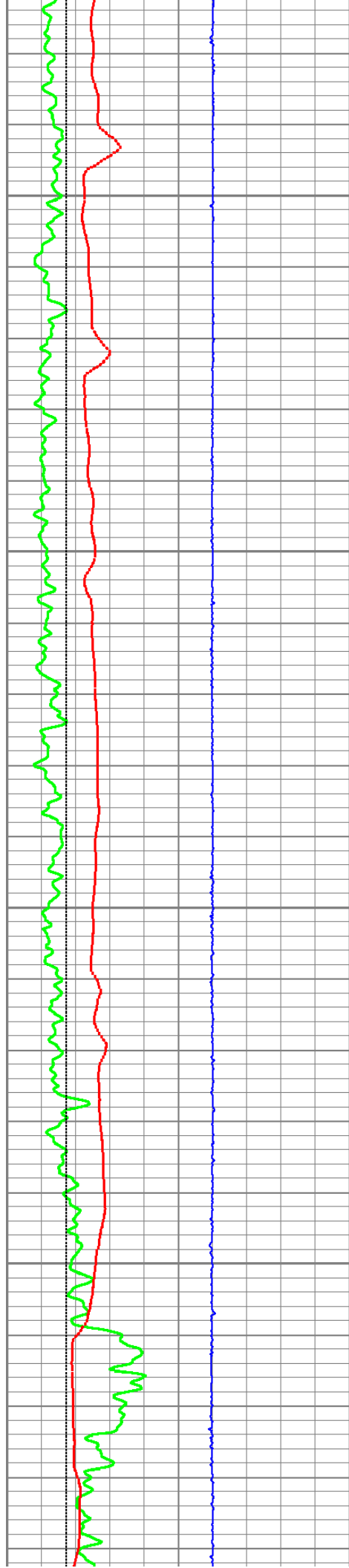
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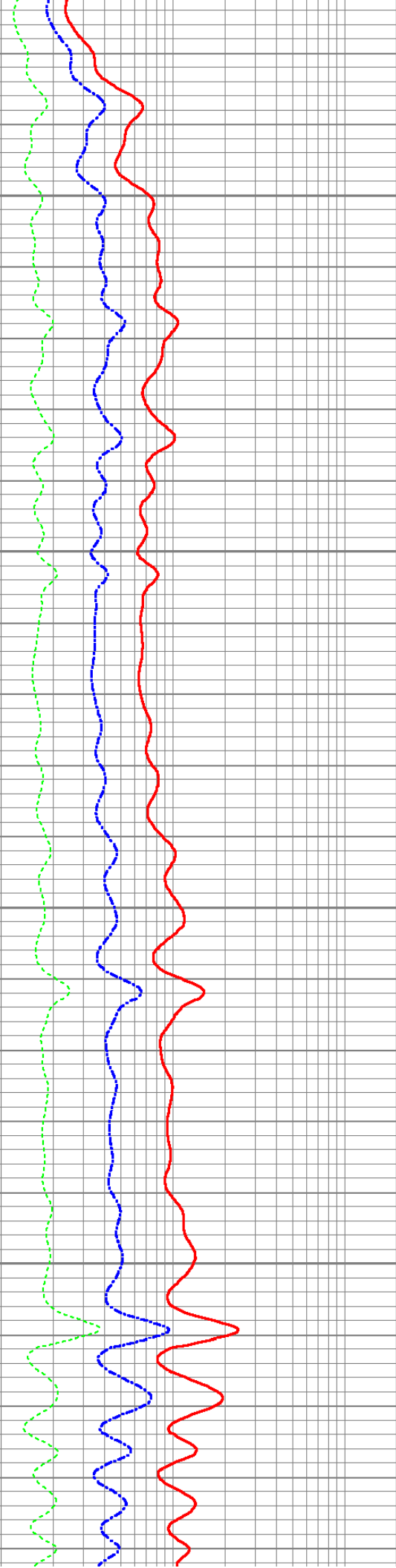
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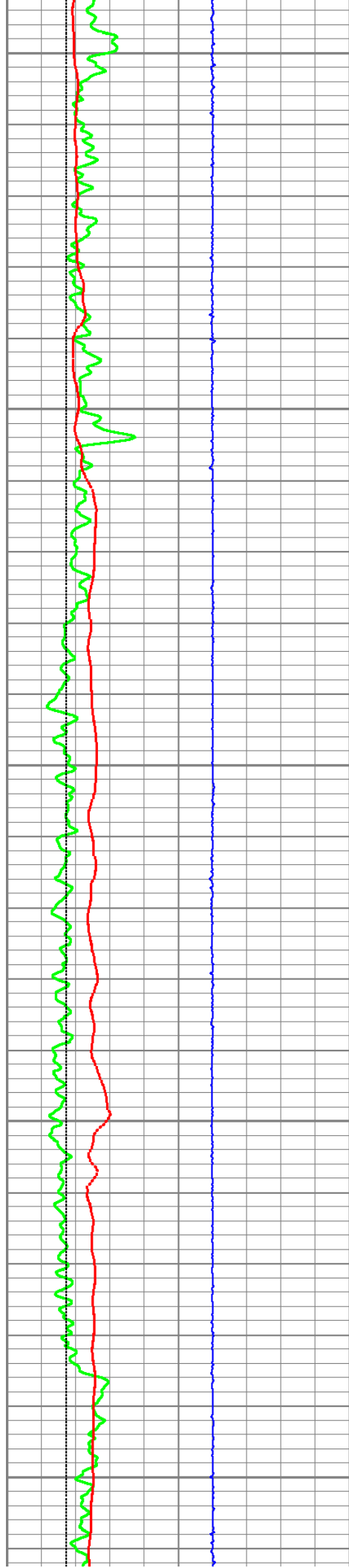
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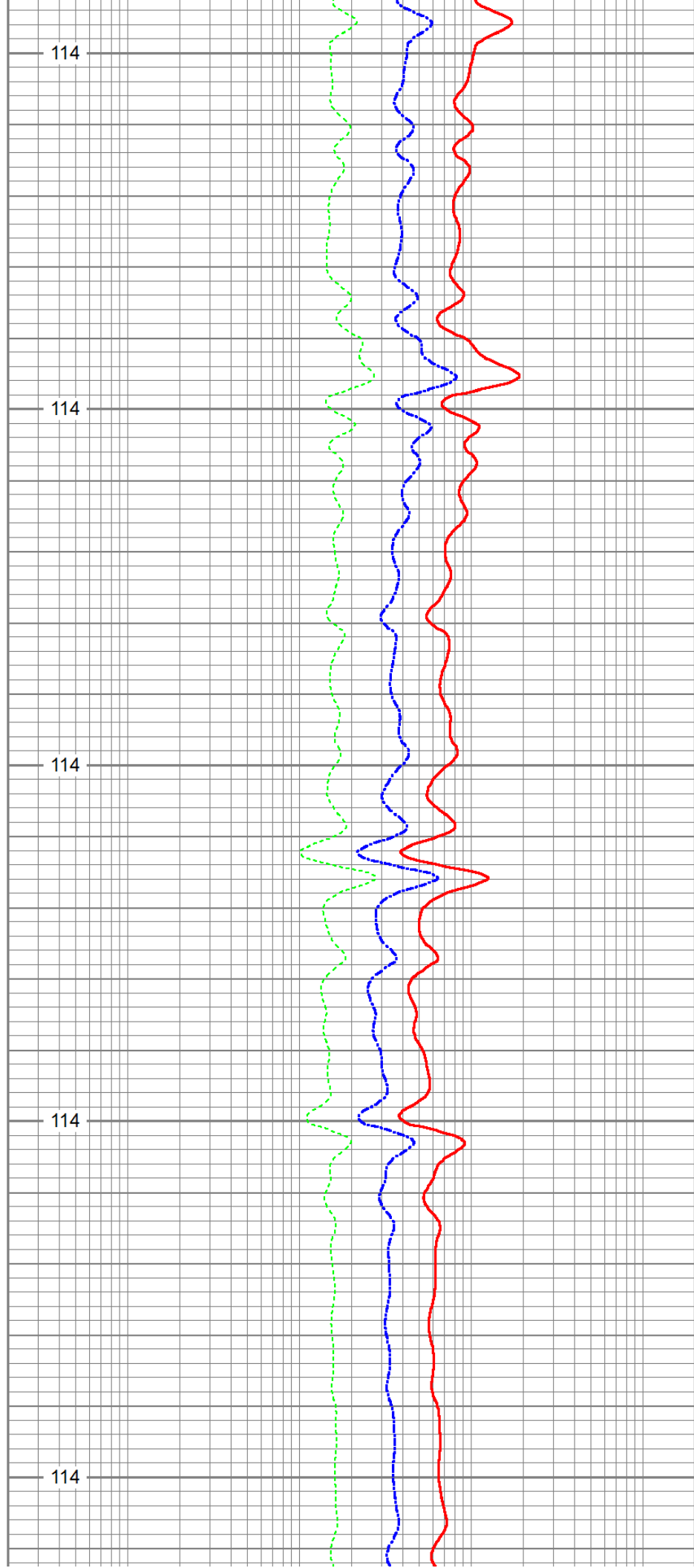
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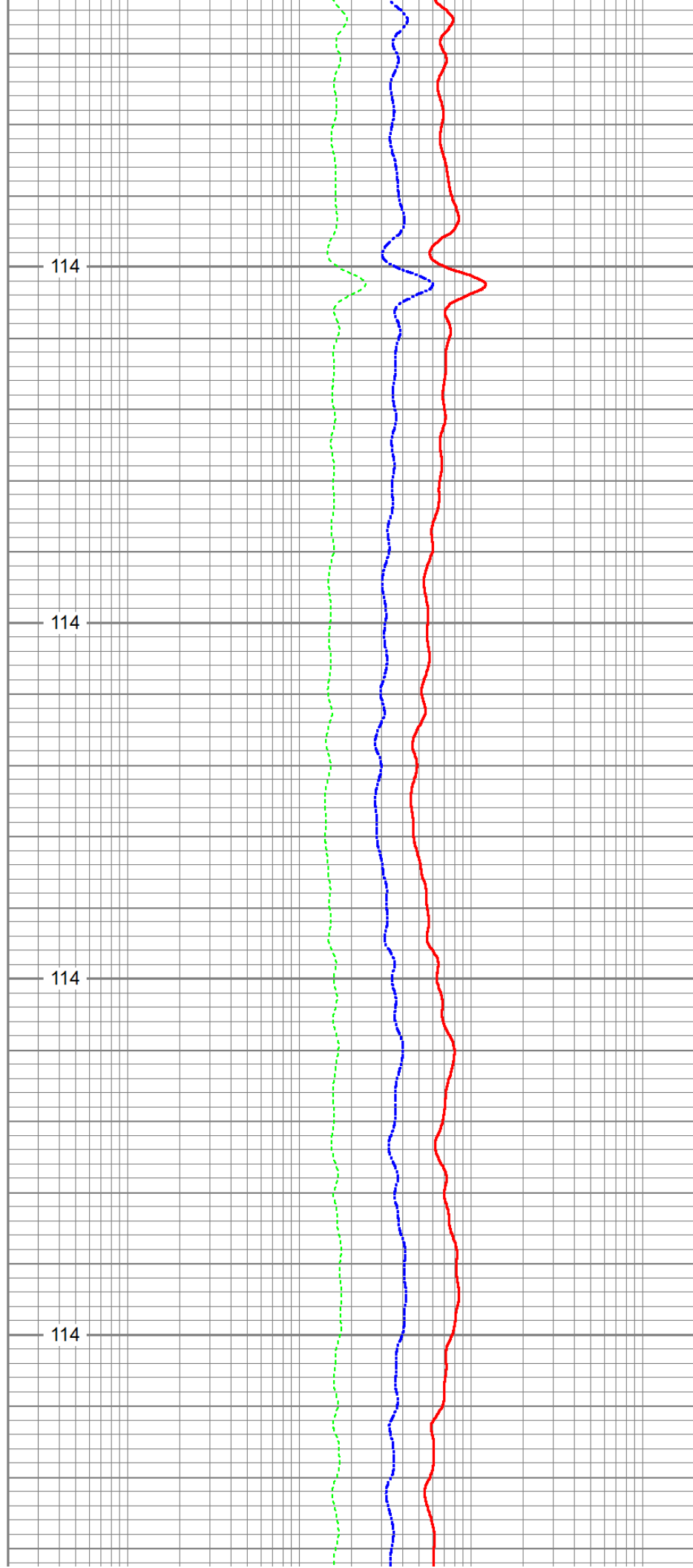
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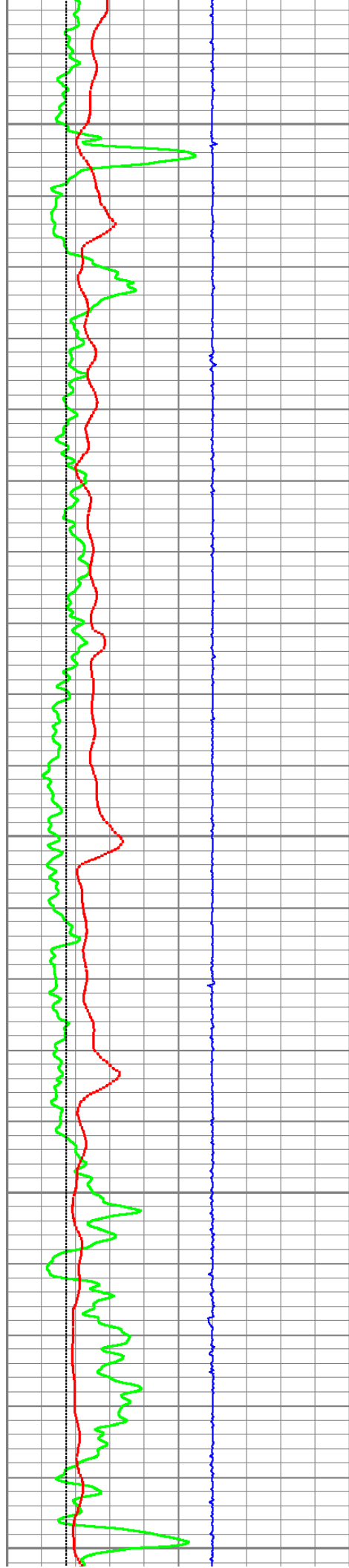
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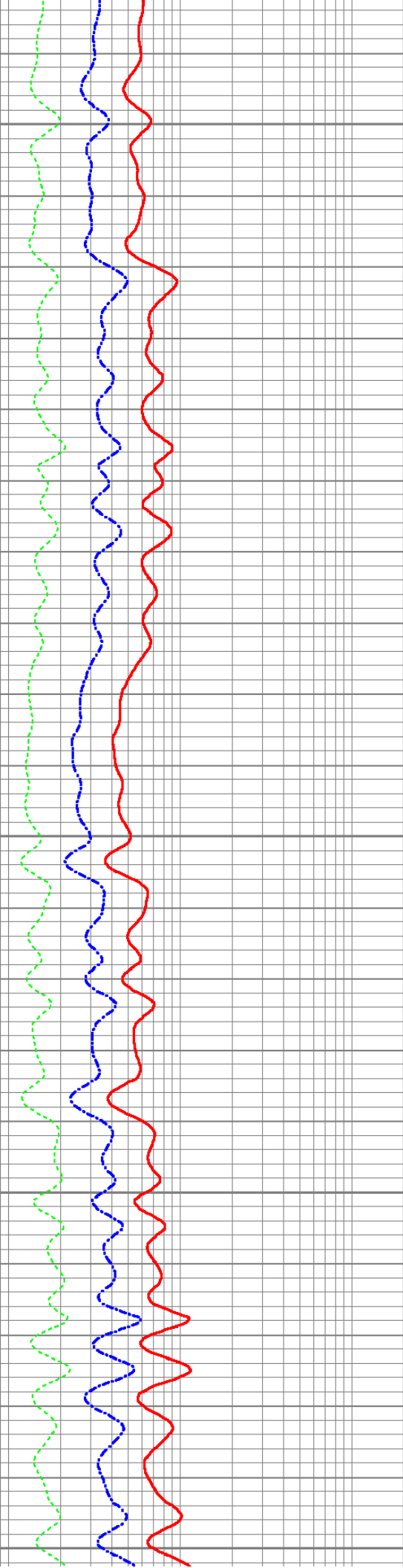
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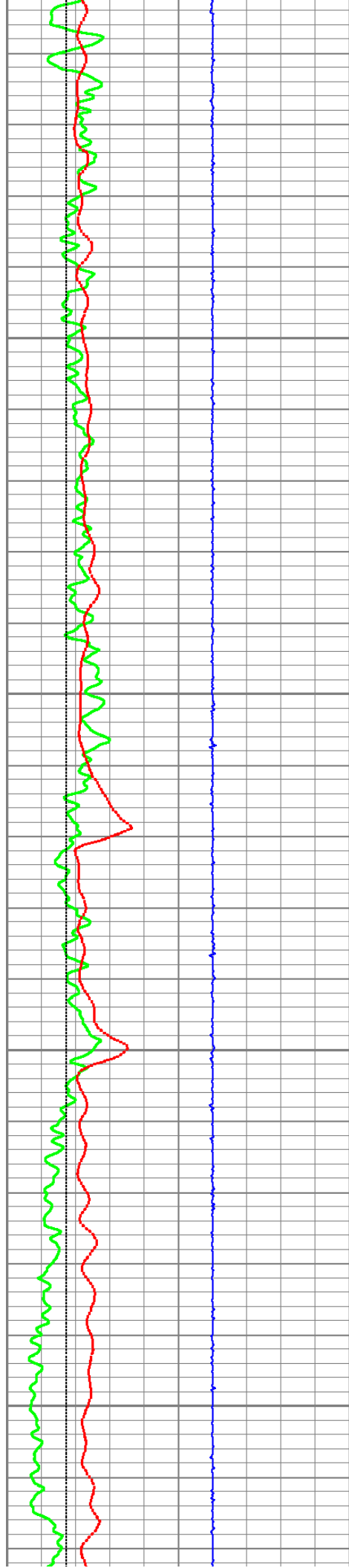
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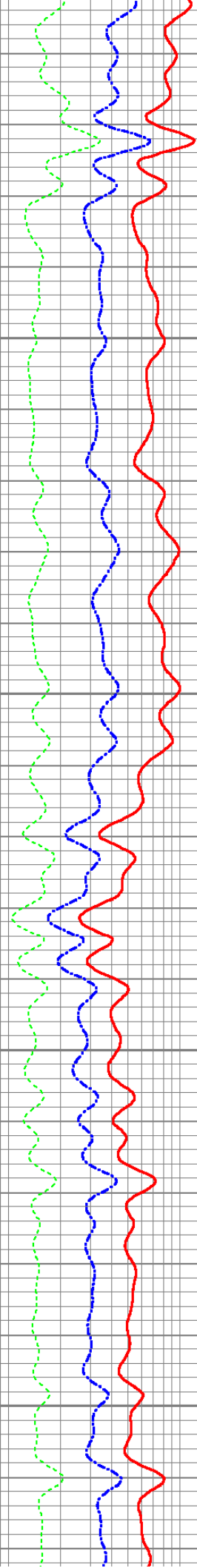
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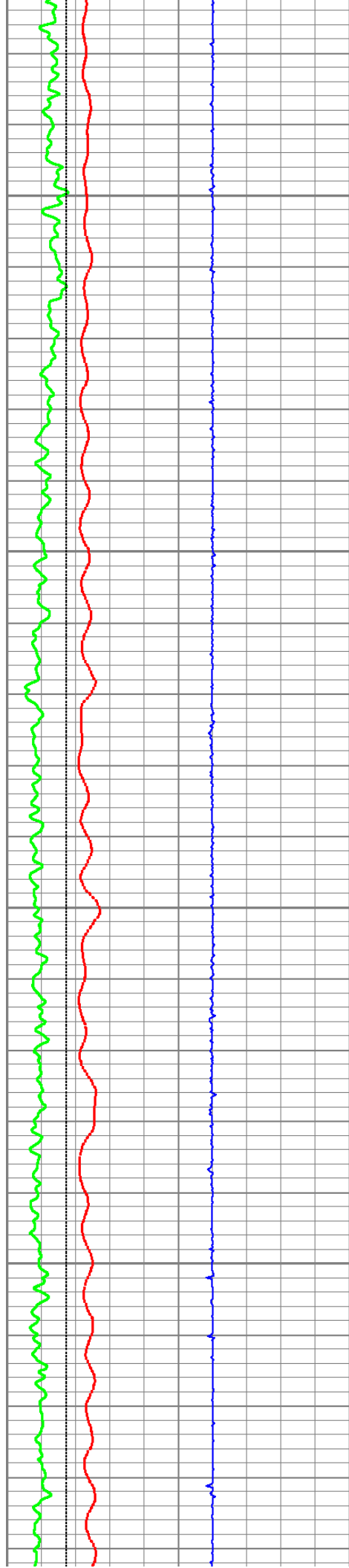
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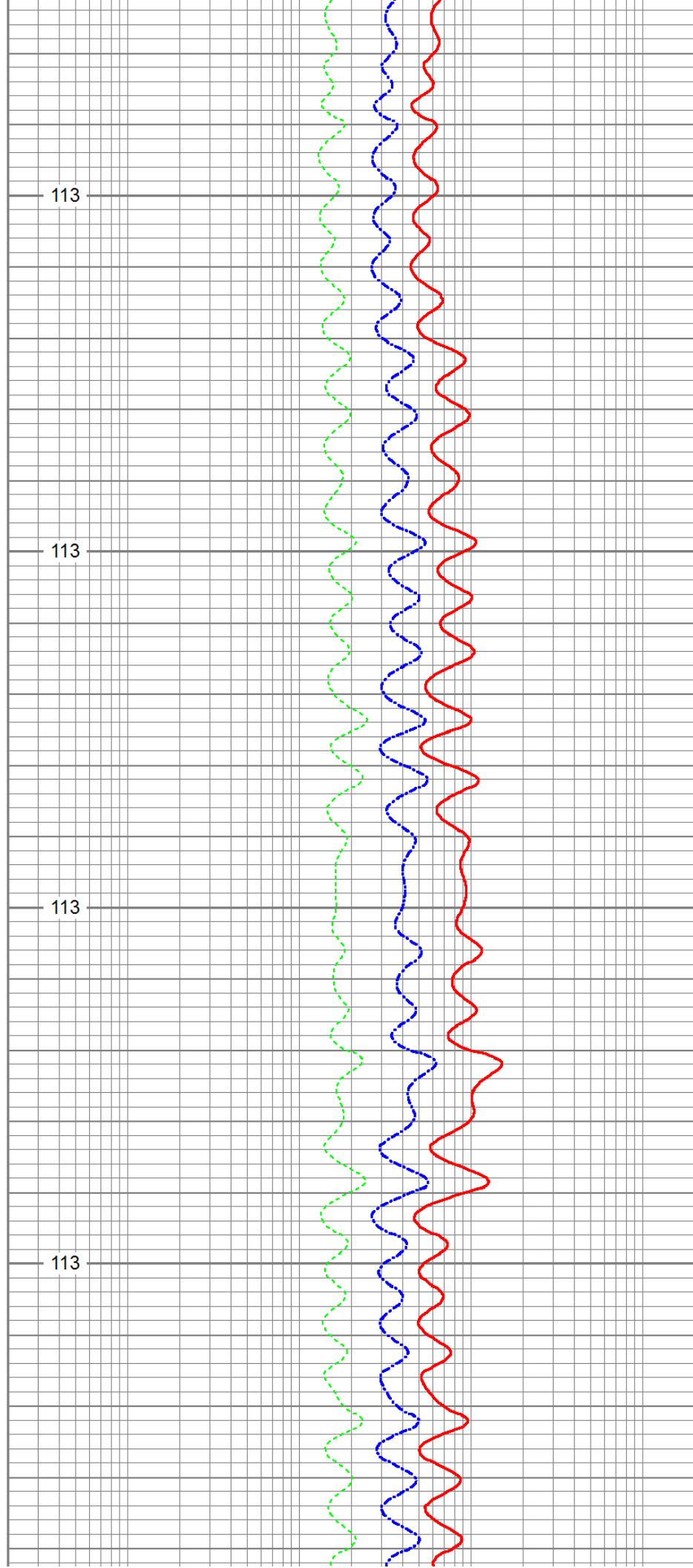
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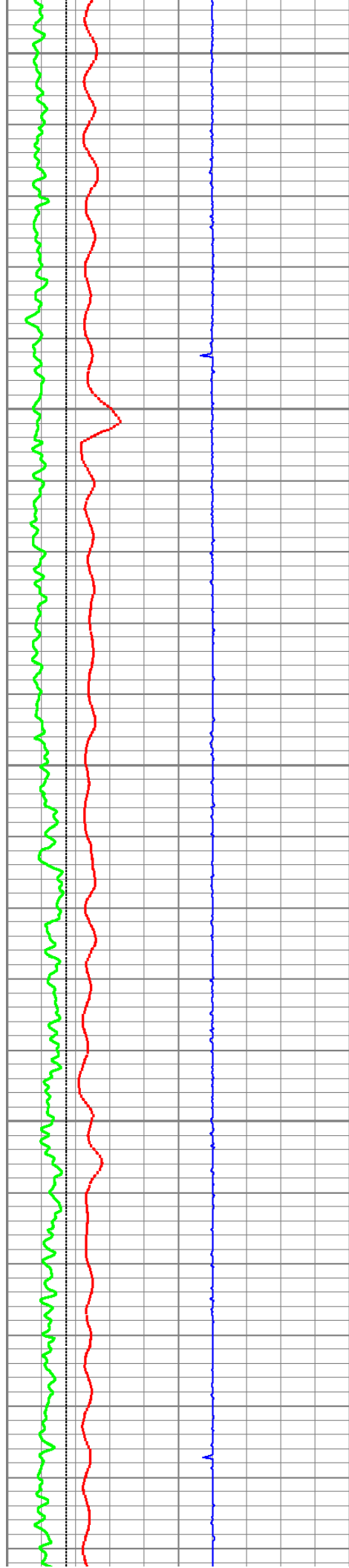
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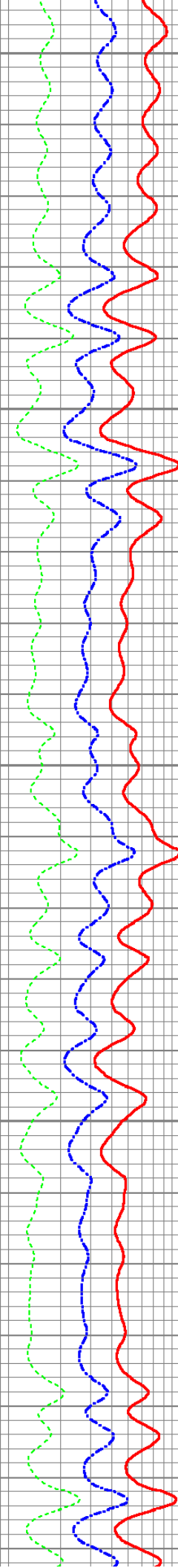
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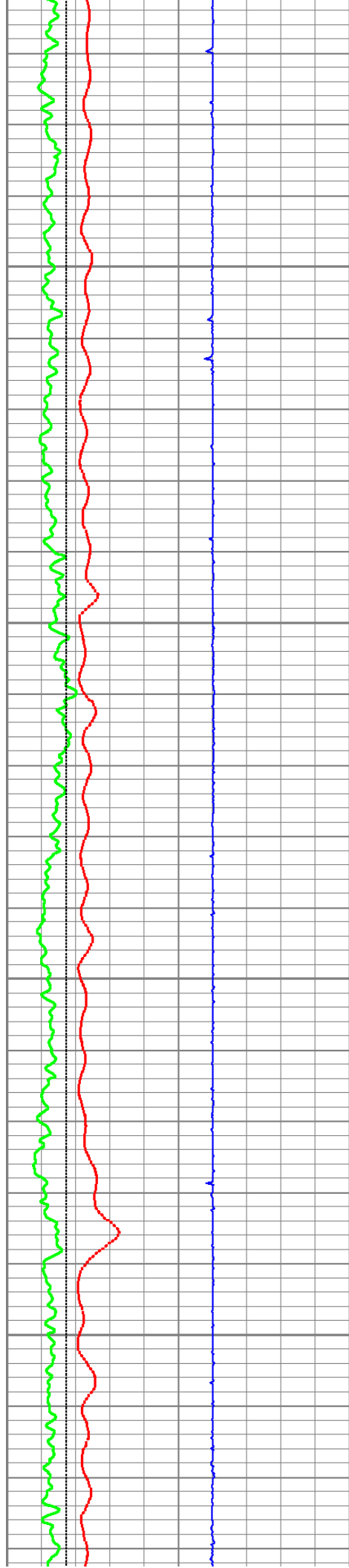
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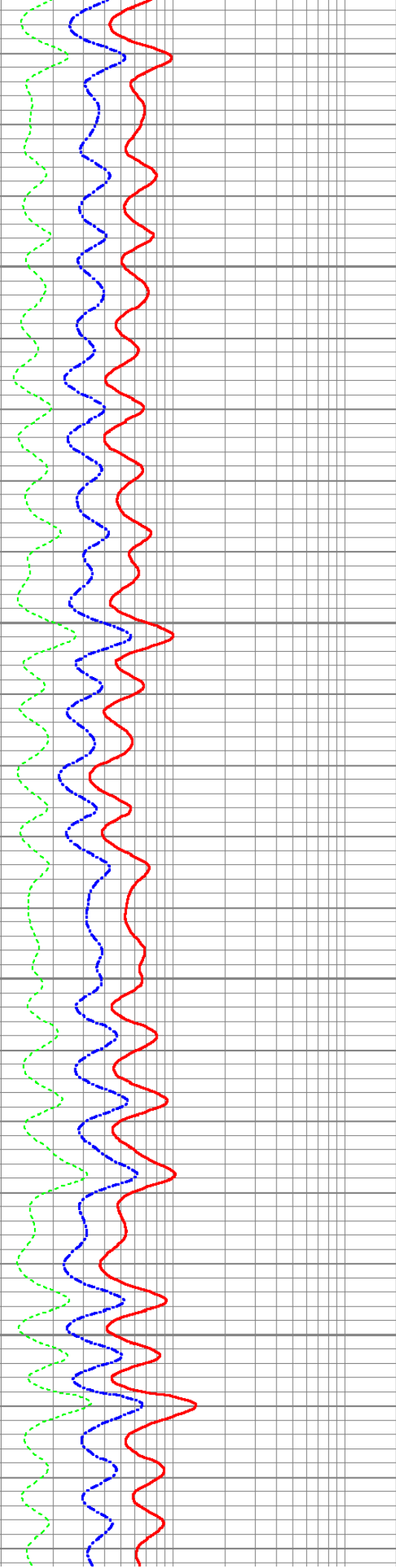
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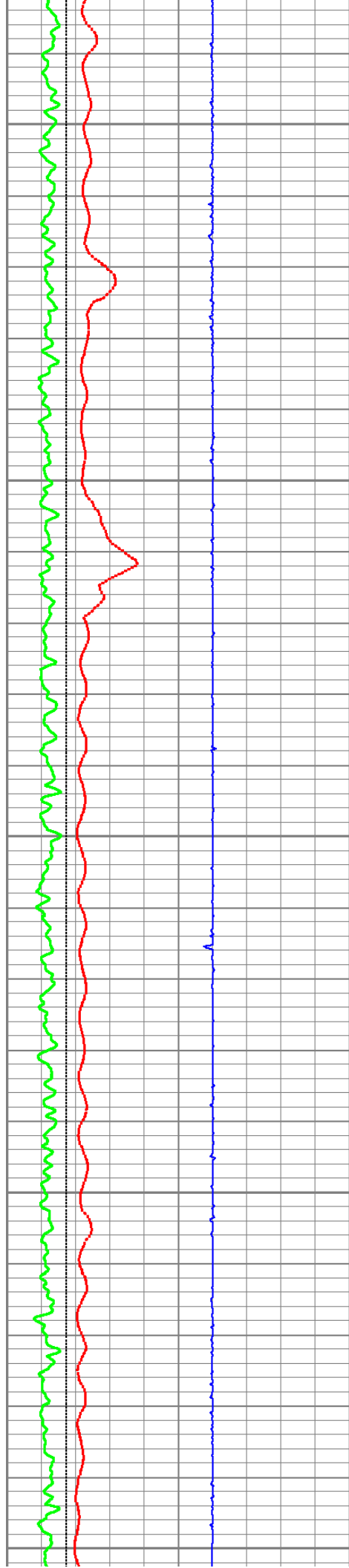
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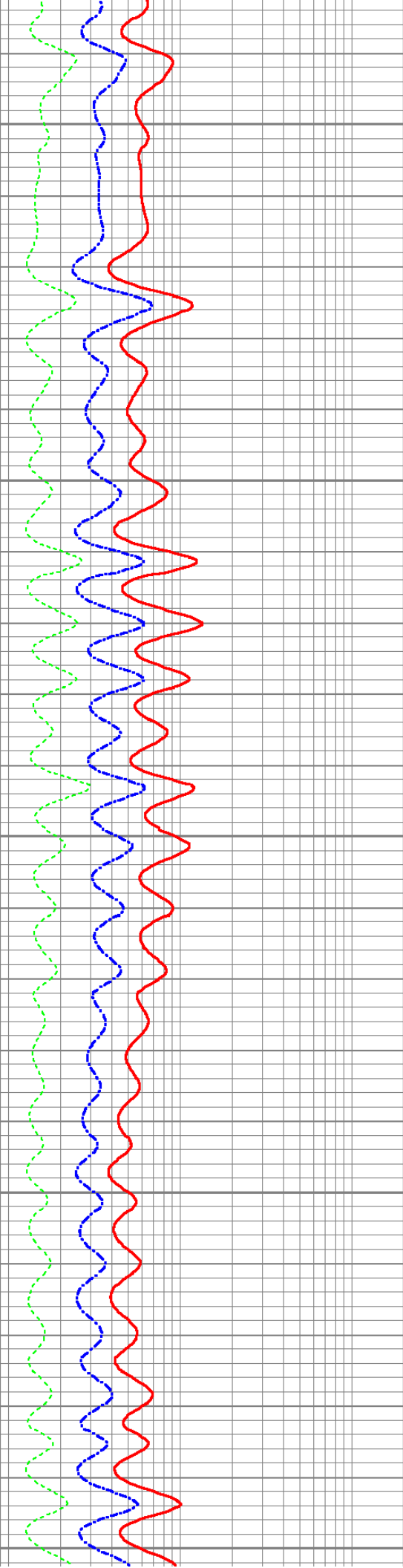
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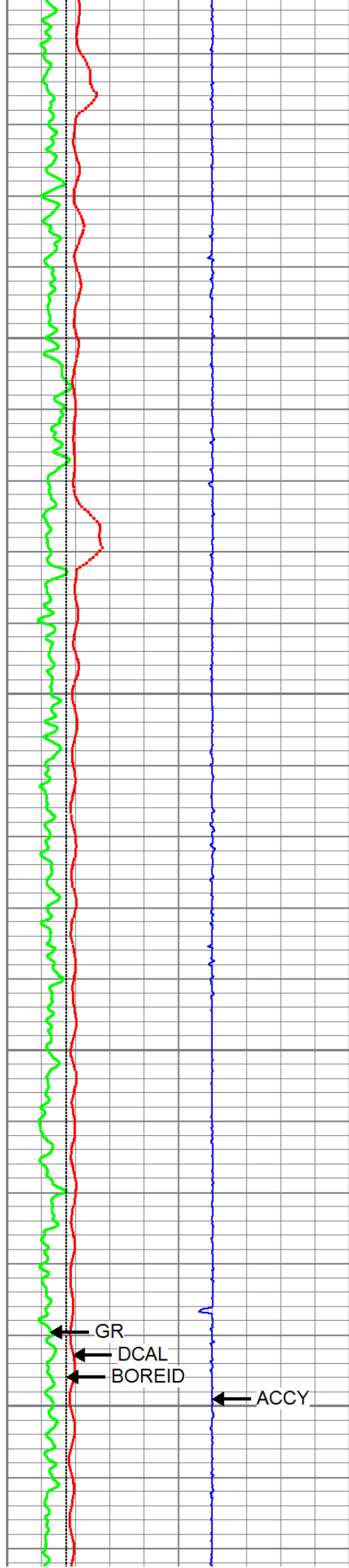
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8150

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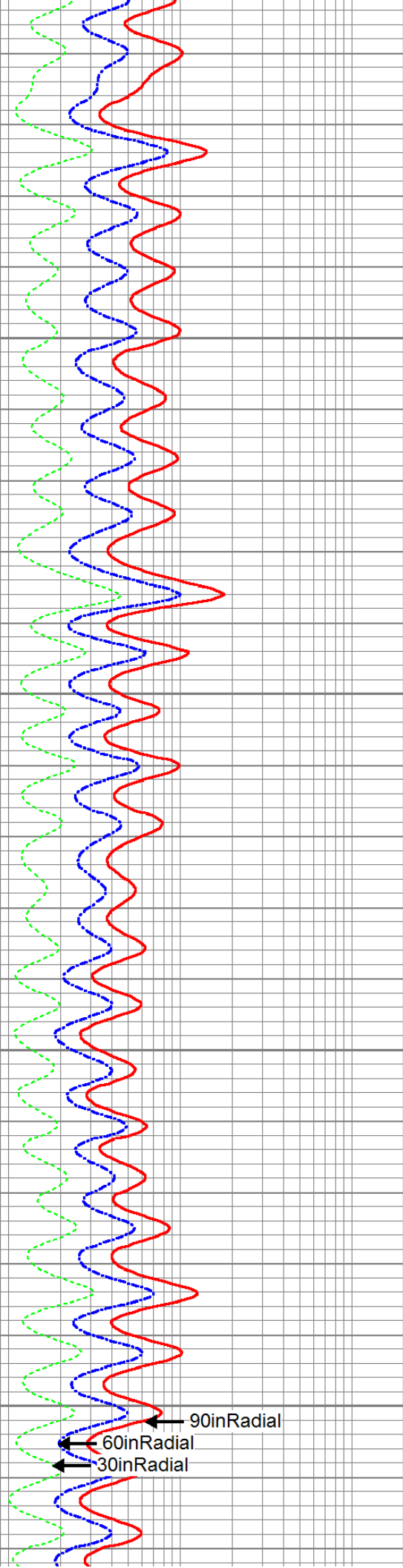
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GR

DCAL

BOREID

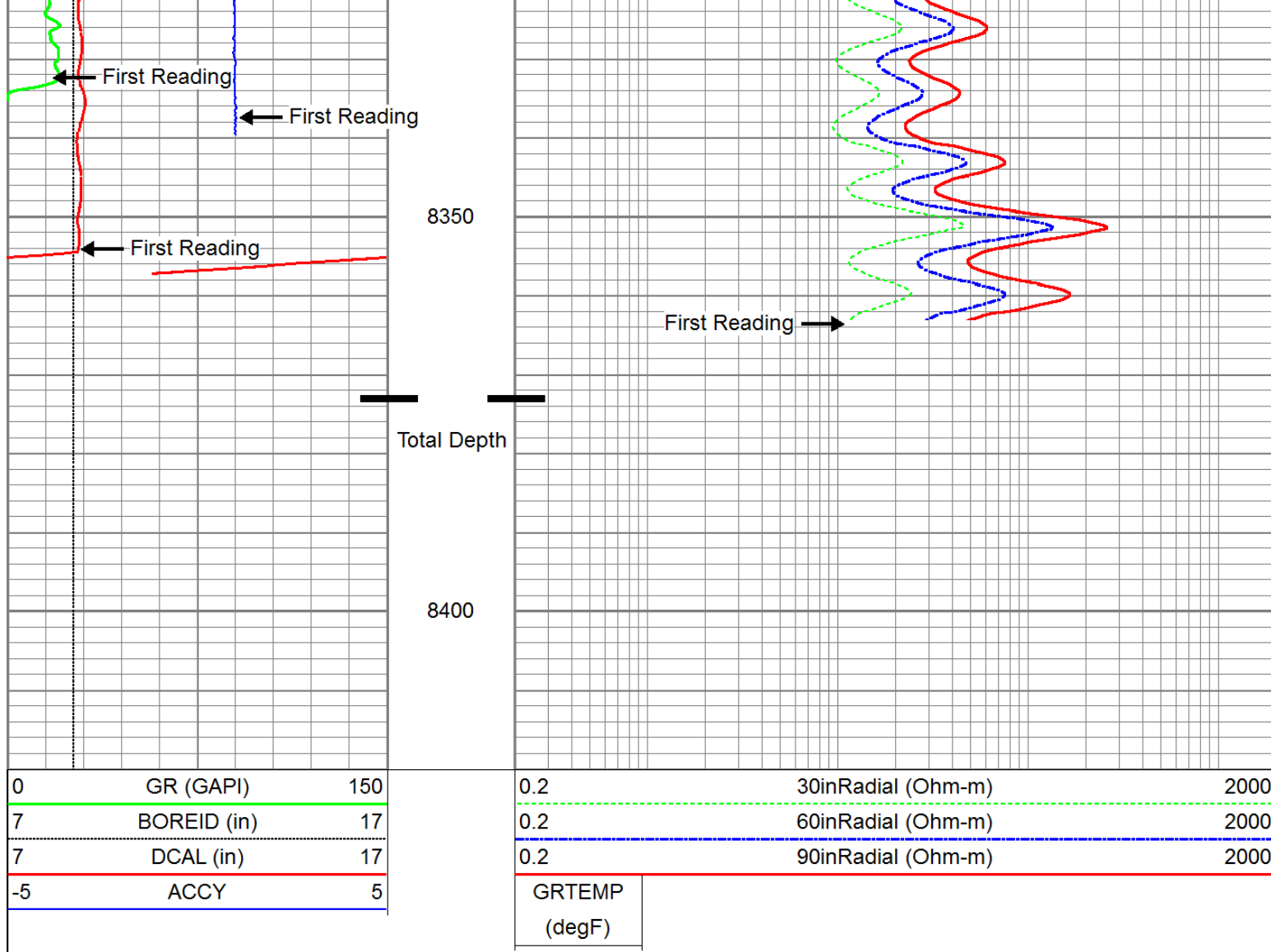
ACCY



90inRadial

60inRadial

30inRadial



Log Variables

Database: C:\Warrior\Data\luann_mem.db
Dataset: field/well/proc1/pass1.4

Top - Bottom

A 1	BHCOR On	BHFL_TYPE WBM	BHFLRES Ohm-m 1	BHFLRESSRC MUDCELL	BHIDSRC CURVE	BOREID in 8.75
BOTTEMP degF 114	CASED? No	CASEOD in 5.5	CASETHCK in 0	CEMWATERSA kppm 0	CMNTTHCK in 0	DNBHC? NO
DPORSEL RHOB	FLUIDDEN g/cc 1	FRMSALIN kppm 0	LATNOR Off	M 2	MATRXDEN g/cc 2.71	MUDSALIN kppm 34
MudWgt lb/gal 9.2	NPORSEL Limestone	PEBHC? YES	PERFS 0	RESTMP SRC INTERNAL	SO in 0.5	SRFTEMP degF 65
SZCOR On	TDEPTH ft 8422	TMPCOR On	TOOLPOS Ec-centered			

ThruBit Induction Calibration Report

Tool Model-Serial Number: PS-PS38R
 Shop Calibration Performed: Fri Mar 01 12:30:29 2013

BASELINE

	R	Expected	X	Expected
Freq 1				
A1	-478.4900	[-500.00, -400.00]	175.3190	[-500.00, 500.00]
A2	-135.7360	[-180.00, -100.00]	302.3650	[-500.00, 500.00]
A3	-26.2781	[-50.00, -10.00]	-65.5454	[-500.00, 500.00]
A4	-16.7549	[-30.00, -10.00]	254.1780	[-500.00, 500.00]
A5	-14.3211	[-30.00, -10.00]	151.4720	[-500.00, 500.00]
Freq 2				
A1	-252.3300	[-280.00, -180.00]	90.6894	[-500.00, 500.00]
A2	-86.4805	[-130.00, -50.00]	170.3340	[-500.00, 500.00]
A3	-19.2593	[-50.00, -10.00]	-94.3423	[-500.00, 500.00]
A4	-19.7630	[-30.00, -10.00]	78.5474	[-500.00, 500.00]
A5	-19.2330	[-30.00, -10.00]	2.2441	[-500.00, 500.00]
Freq 3				
A1	-162.5760	[-180.00, -80.00]	-2.4436	[-500.00, 500.00]
A2	-65.8174	[-130.00, -30.00]	84.6667	[-500.00, 500.00]
A3	-15.1583	[-50.00, -10.00]	-126.5820	[-500.00, 500.00]
A4	-21.2009	[-30.00, -10.00]	-38.0339	[-500.00, 500.00]
A5	-21.8735	[-30.00, -10.00]	-105.2590	[-500.00, 500.00]
Freq 4				
A1	-89.4241	[-120.00, -40.00]	-152.8680	[-500.00, 500.00]
A2	-46.8994	[-110.00, -10.00]	-29.1757	[-500.00, 500.00]
A3	-12.3098	[-50.00, -10.00]	-189.9740	[-500.00, 500.00]
A4	-23.7794	[-30.00, -10.00]	-211.1800	[-500.00, 500.00]
A5	-26.9272	[-30.00, -10.00]	-283.6760	[-500.00, 500.00]

CALIBRATION COEFFICIENTS

	R	Expected	X	Expected
Freq 1				
A1	0.9910	[0.95, 1.05]	0.0019	[-0.05, 0.05]
A2	0.9910	[0.95, 1.05]	0.0018	[-0.05, 0.05]
A3	1.0009	[0.95, 1.05]	-0.0054	[-0.05, 0.05]
A4	0.9885	[0.95, 1.05]	0.0047	[-0.05, 0.05]
A5	0.9939	[0.95, 1.05]	0.0015	[-0.05, 0.05]
Freq 2				
A1	0.9860	[0.95, 1.05]	-0.0059	[-0.05, 0.05]
A2	0.9858	[0.95, 1.05]	-0.0055	[-0.05, 0.05]
A3	0.9901	[0.95, 1.05]	-0.0051	[-0.05, 0.05]
A4	0.9836	[0.95, 1.05]	-0.0030	[-0.05, 0.05]
A5	0.9887	[0.95, 1.05]	-0.0069	[-0.05, 0.05]
Freq 3				
A1	0.9930	[0.95, 1.05]	-0.0045	[-0.05, 0.05]
A2	0.9931	[0.95, 1.05]	-0.0041	[-0.05, 0.05]
A3	0.9966	[0.95, 1.05]	-0.0041	[-0.05, 0.05]
A4	0.9891	[0.95, 1.05]	-0.0015	[-0.05, 0.05]
A5	0.9978	[0.95, 1.05]	-0.0052	[-0.05, 0.05]

Freq 4				
A1	0.9848	[0.95, 1.05]	-0.0070	[-0.05, 0.05]
A2	0.9844	[0.95, 1.05]	-0.0066	[-0.05, 0.05]
A3	0.9901	[0.95, 1.05]	-0.0084	[-0.05, 0.05]
A4	0.9809	[0.95, 1.05]	-0.0036	[-0.05, 0.05]
A5	0.9965	[0.95, 1.05]	-0.0100	[-0.05, 0.05]
Temperature	34.5229 degC			

ThruBit Density Calibration Report

Tool Model-Serial Number: PS-PS01D

Source Number:

Shop Calibration Performed: Fri Mar 15 09:23:41 2013

REFERENCE

	Density	Units
Aluminium	2.607	g/cc
Magnesium	1.752	g/cc

READINGS

Outputs	Counts	Units	Expected
SS1 Background	134.66	cps	[130.00, 170.00]
LS1 Background	144.00	cps	[130.00, 170.00]
LS4 Background	30.55	cps	[27.00, 35.00]
SS1 Aluminium	4854.37	cps	[4500.00, 5500.00]
LS1 Aluminium	895.24	cps	[750.00, 950.00]
LS4 Aluminium	1054.10	cps	[843.00, 1068.00]
SS1 Magnesium	7975.27	cps	[7000.00, 9000.00]
LS1 Magnesium	5799.57	cps	[5250.00, 6250.00]
LS1 Al + Fe	766.72	cps	[650.00, 800.00]
LS4 Al + Fe	476.15	cps	[382.00, 471.00]

RESULTS

SS Slope	1.68	[1.52, 1.77]
LS Slope	0.42	[0.38, 0.45]
PEF K Factor	5.227	[3.510, 6.170]
PEF B Factor	-0.582	[-0.700, -0.410]

Caliper Shop Calibration performed: Fri Mar 15 09:23:41 2013

RESULTS

Reference	Reading	Units
12.00	1841.19	in
9.00	2001.59	in
6.00	2158.21	in

DENSITY PRE-SURVEY CHECK Performed: Mon Apr 08 09:30:56 2013

Outputs	Counts	Units	Expected
SS1 Background	134.25	cps	[130.62, 138.70]
LS1 Background	143.04	cps	[139.68, 148.32]
LS4 Background	31.47	cps	[28.71, 32.38]

CALIPER PRE-SURVEY CHECK Performed:		Thu Apr 04 15:27:52 2013	
Reference	Readings	Units	Expected
6.00	5.99	in	[5.80, 6.20]

Compensated Neutron Calibration Report
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Tool Model-Serial Number:	PS-PS14N
Source Number:	
Calibration Tank Temperature:	63.7 degF
Shop Calibration Performed:	Mon Mar 18 10:54:09 2013

BACKGROUND MEASUREMENT			
Outputs	Measured	Units	Expected
SS Counts	0.1	cps	<10
LS Counts	0.1	cps	<4

WATER TANK REFERENCE			
Outputs	Measured	Units	Expected
SS Counts	786.5	cps	
LS Counts	26.1	cps	
Tank Ratio Ref	30.9580	SS/LS	
Tank Ratio	30.1063	SS/LS	
Tank Ratio Gain	1.0283		[0.85, 1.15]

ALUMINUM SLEEVE REFERENCE			
Outputs	Measured	Units	Expected
SS Counts	8812.9	cps	
LS Counts	832.9	cps	
Al Ratio Ref	10.797	SS/LS	
Al Ratio	10.880	SS/LS	
Al Ratio Gain	0.99		[0.90, 1.10]
Sleeve Porosity	14.46	pu	

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PRE-SURVEY BACKGROUND CHECK Performed:		Mon Apr 08 09:25:20 2013	
Outputs	Measured	Units	Expected
SS Counts	0.1	cps	<10
LS Counts	0.1	cps	<4

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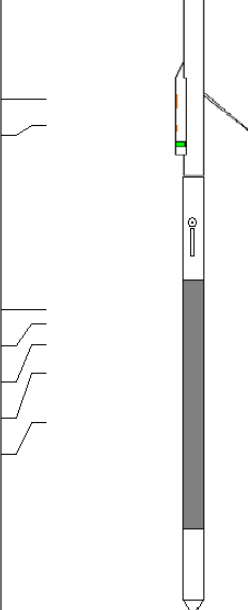
Gamma Ray Calibration Report

Tool Model-Serial Number:	PS-PS27T
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Performed:	Mon Apr 08 09:54:28 2013	
Calibrator Value:	165.0	GAPI
Background Reading:	47.8	cps
Calibrator Reading:	359.6	cps
Sensitivity:	0.3750	GAPI/cps

Inclinometer Calibration Report					
Performed:	Sun Jun 13 14:33:21 1993				
	Low Read.	High Read.	Low Ref.	High Ref.	
X Accelerometer	0.00	1.00	0.00	1.00	gee
Y Accelerometer	0.00	1.00	0.00	1.00	gee
Z Accelerometer	0.00	1.00	0.00	1.00	gee

Sensor	Offset (ft)	Schematic	Description	Len (ft)	OD (in)	Wt (lb)
Thrubit	66.92		Cablehead-S	2.31	2.13	5.00
Thrubit	64.61		Solid Weakpoint			
			PSBDOT	3.87	2.25	35.00
Thrubit	60.75		HangOff_Tool	5.00	2.38	60.00
Thrubit	55.75		10-1	0.88	2.13	3.95
Thrubit	54.87		Universal Joint	1.46	2.06	15.00
TBBAT	53.41		TBBAT-A (PS13B) Thrubit Battery	6.13	2.13	38.20
TBBAT2	47.29		TBBAT2-A (PS33B) Thrubit Battery	6.13	2.13	40.00
TMG	41.16		TMG-PS (PS27T) ThruBit Telemetry Gamma Ray	6.13	2.13	45.00
GR	41.04					
GRTEMP	40.20					
Thrubit	35.04		Decentralizer Decentralizer (Small)	4.50	2.13	70.00
CNLSC	28.60		TBN-PS (PS14N) ThruBit Neutron	4.77	2.13	63.00

LSW1	18.04		TBD-PS (PS01D) ThruBit Density	10.48	2.13	91.00
DCAL	17.13					
A1_P	10.60					
A2_P	10.10					
A3_P	9.35					
A4_P	8.35					
A5_P	6.60		TBI-PS (PS38R) ThruBit Induction	15.29	2.13	94.00
Dataset: luann_mem.db: field/well/proc1/pass1.4 Total Length: 66.92 ft Total Weight: 560.15 lb O.D.: 2.38 in						

 ThruBit A Schlumberger Company	Company	SANDRIDGE ENERGY
	Well	LuAnn 2925 2-36H
	Field	MINNEOLA
	County	HARPER
	State	KANSAS

