



ThruBit
A Schlumberger Company

**ARRAY INDUCTION
GAMMA RAY
MEMORY LOG**

Company	SANDRIDGE ENERGY, INC.	Location:	API #: 15077218570000	Other Services
Well	STARKS 1-35H	SURF LOC: 200' FSL & 660' FWL OF SW/4		THRUBIT
Field	KANSAS / WALDRON WEST	SEC 35 TWP 34S RGE 8W		PORTAL BIT
County	HARPER	Permanent Datum	G.L. Elevation 1272'	Elevation K.B. 1288' D.F. 1288' G.L. 1272'
State	KANSAS	Log Measured From	D.F. 16' ABOVE PERM DATUM	
		Drilling Measured From	D.F.	

Date	10 JULY 2012
Run Number	ONE
Depth Driller	11304'
Depth Logger	11288'
Bottom Logged Interval	11278'
Top Log Interval	3290'
Casing Driller	7" @ 5372'
Casing Logger	7" @ 5390'
Bit Size	6.125"
Type Fluid in Hole	WATER
Density / Viscosity	8.4 / 28
pH / Fluid Loss	10.5 / 100
Source of Sample	SUCTION PIT
Rim @ Meas. Temp	1.1 OHMS @ 81 DEGF
Rinf @ Meas. Temp	0.8 OHMS @ 81 DEGF
Rimc @ Meas. Temp	1.4 OHMS @ 81 DEGF
Source of Rinf / Rimc	SUCTION PIT
Rim @ BHT	0.6 OHMS @ 145 DEGF
Time Circulation Stopped	04:45 10JULY2012
Time Logger on Bottom	06:20 10JULY2012
Maximum Recorded Temperature	145 DEGF
Equipment Number	T004
Location	OKC, OK
Recorded By	D. THOMAS
Witnessed By	ANTONIO LEJIA JR

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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 MEMORY PUMP DOWN - LEVEL 4, BIT DEPTH:11226' LOG TO: 3300'
ALL SCALES AND PRESENTATIONS PER CLIENT REQUEST
LIMESTONE MATRIX, 2.71 G/CC, USED TO MEASURE POROSITIES
TOOL STRING RAN WITH SWIVEL, S. DECENTRALIZER, NO STANDOFFS
TBHV = TOTAL BOREHOLE VOLUME, FT3
ABHV = ANNULAR BOREHOLE VOLUME, FT3, CALCULATED FOR 4.50" CSG
RIG MINDER LITE AND PASON USED TO CREATE LOG DEPTH
LOG DEPTH CORRELATED TO MWD GAMMA AT CUSTOMERS REQUEST

CREW: D. THOMAS/K. REED/R. WILSON
RIG: UNIT #310

Service Ticket No.	1270	API No.	15077218570000	PGM Ver	WARRIO 7.0
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The Well Name, Location, Borehole Description, and / or Cementing Data Furnished by Client

EQUIPMENT DATA

GAMMA RAY	NEUTRON	DENSITY	INDUCTION
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Run No.	ONE	Run No.	ONE	Run No.	ONE	Run No.	ONE
Serial No.	PS5T	Serial No.	PS5N	Serial No.	PS41D	Serial No.	ENP6R
Model No.	PS	Model No.	PS	Model No.	PS	Model No.	ENP
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	11288'	3300'		30	

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

DIRECTIONAL INFORMATION

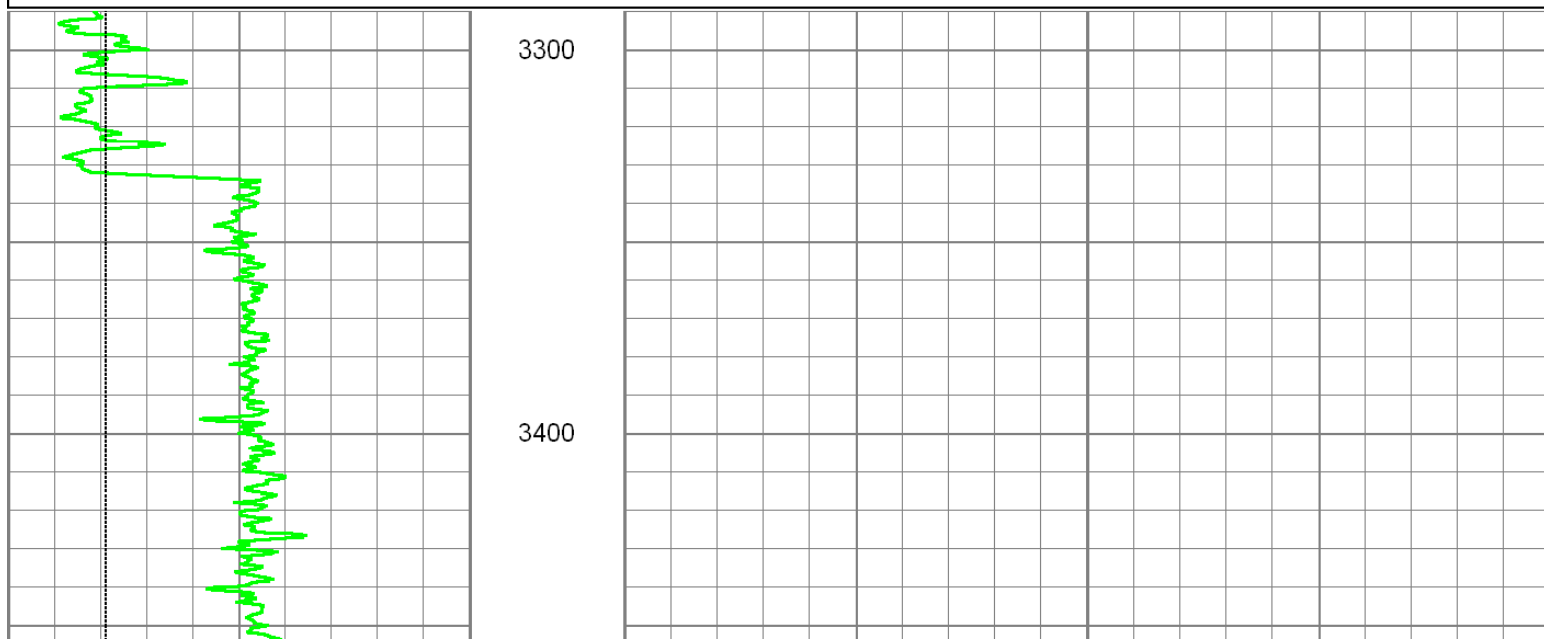
Maximum Deviation	93.13	deg. @	6087'	KOP	3877'
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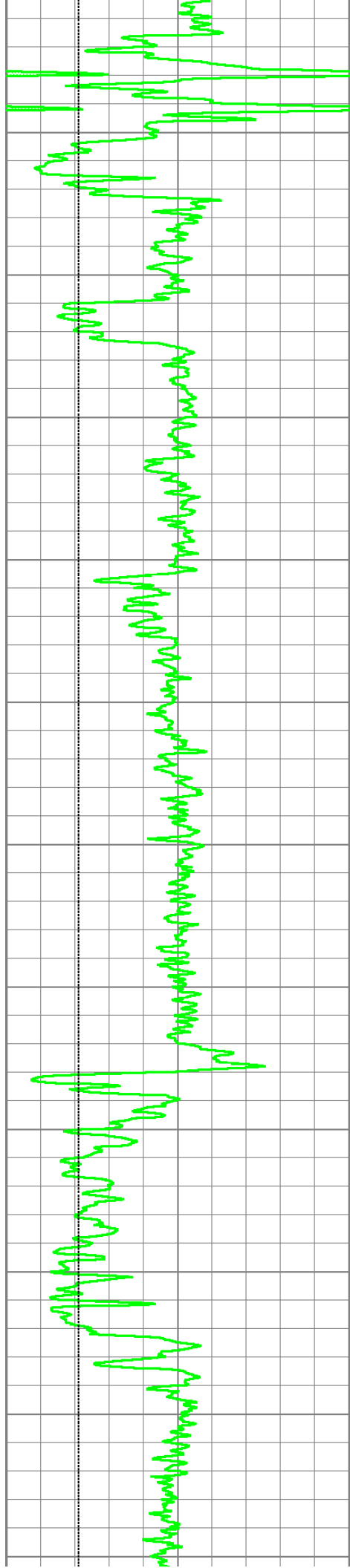


MAIN PASS

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 Dataset Pathname: proc1/pass1.4
 Presentation Format: 6_2r_chk
 Dataset Creation: Tue Jul 10 18:09:01 2012
 Charted by: Depth in Feet scaled 1:600

0	GR (GAPI)	150	50	20in 2ft Res (Ohm-m)	500
4	DCAL (in)	14	50	90in 2ft Res (Ohm-m)	500
-5	ACCY	5	1000	DEEP COND (mmho/m) 0	
4	BOREID (in)	14	0	20in 2ft Res (Ohm-m)	50
	GRTEMP (degF)		0	90in 2ft Res (Ohm-m)	50





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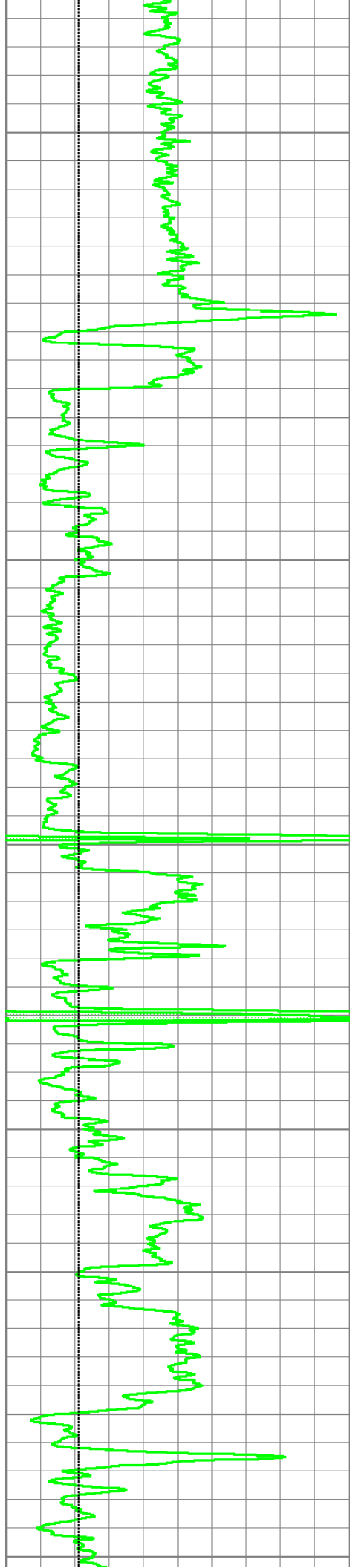
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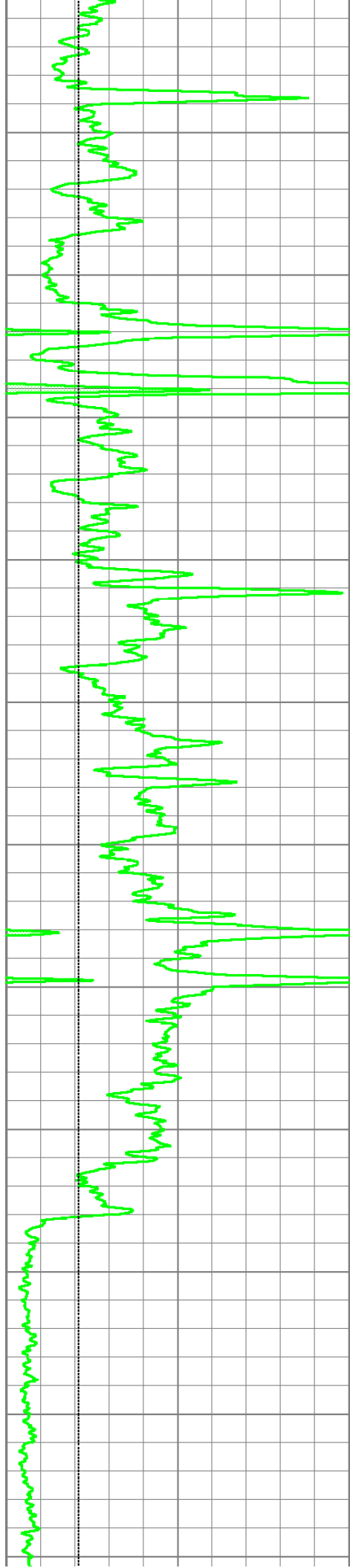
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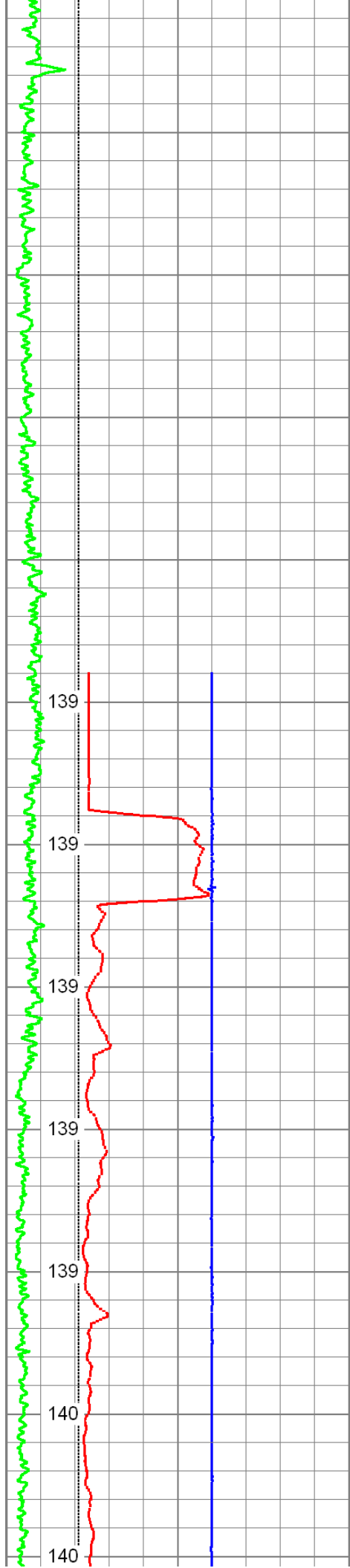
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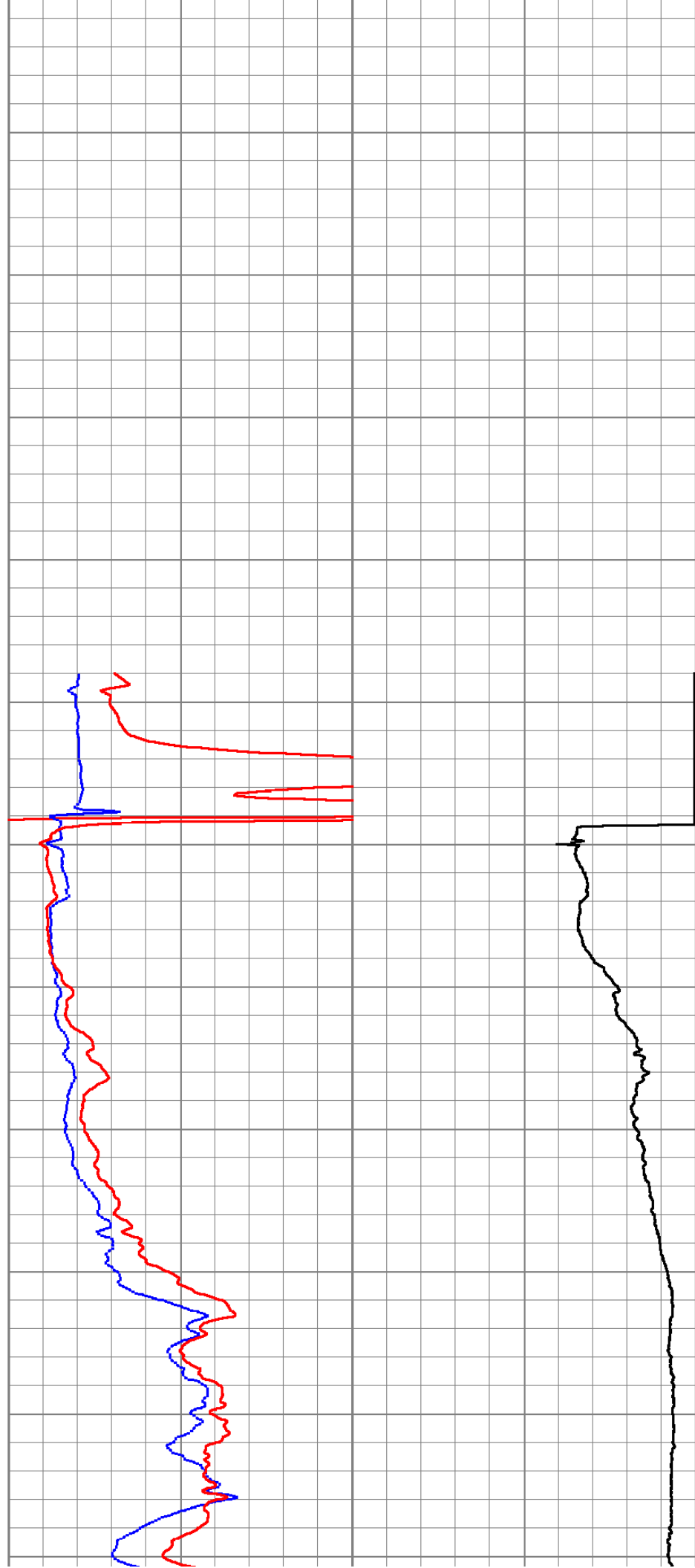
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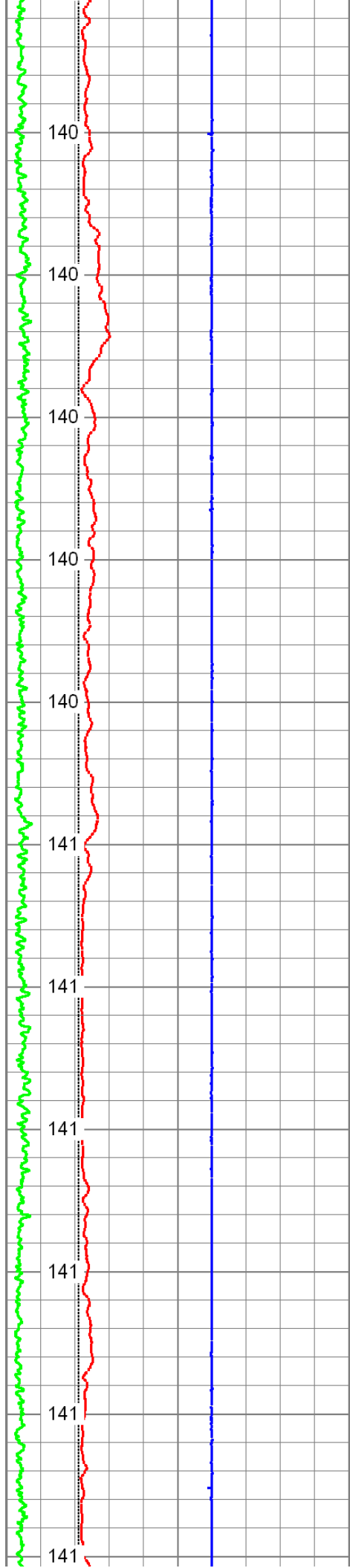
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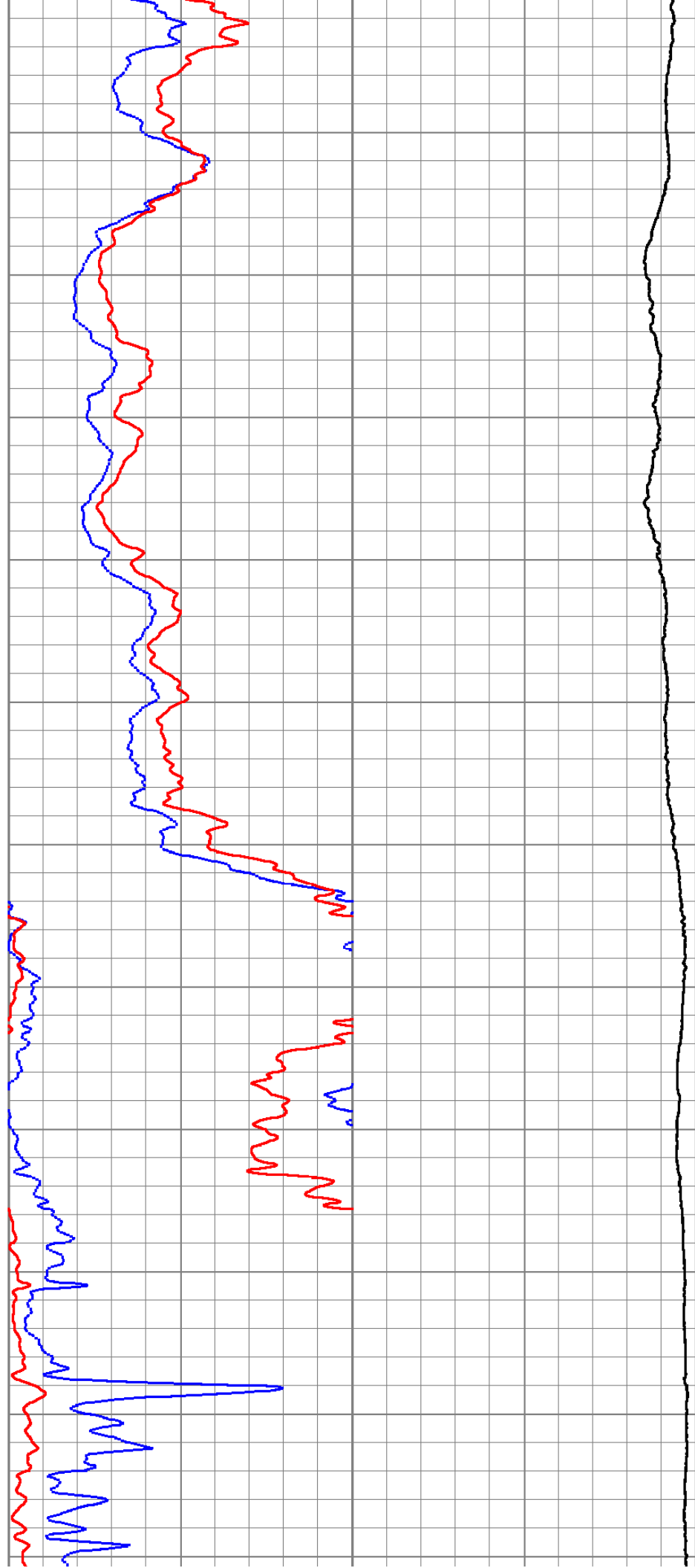
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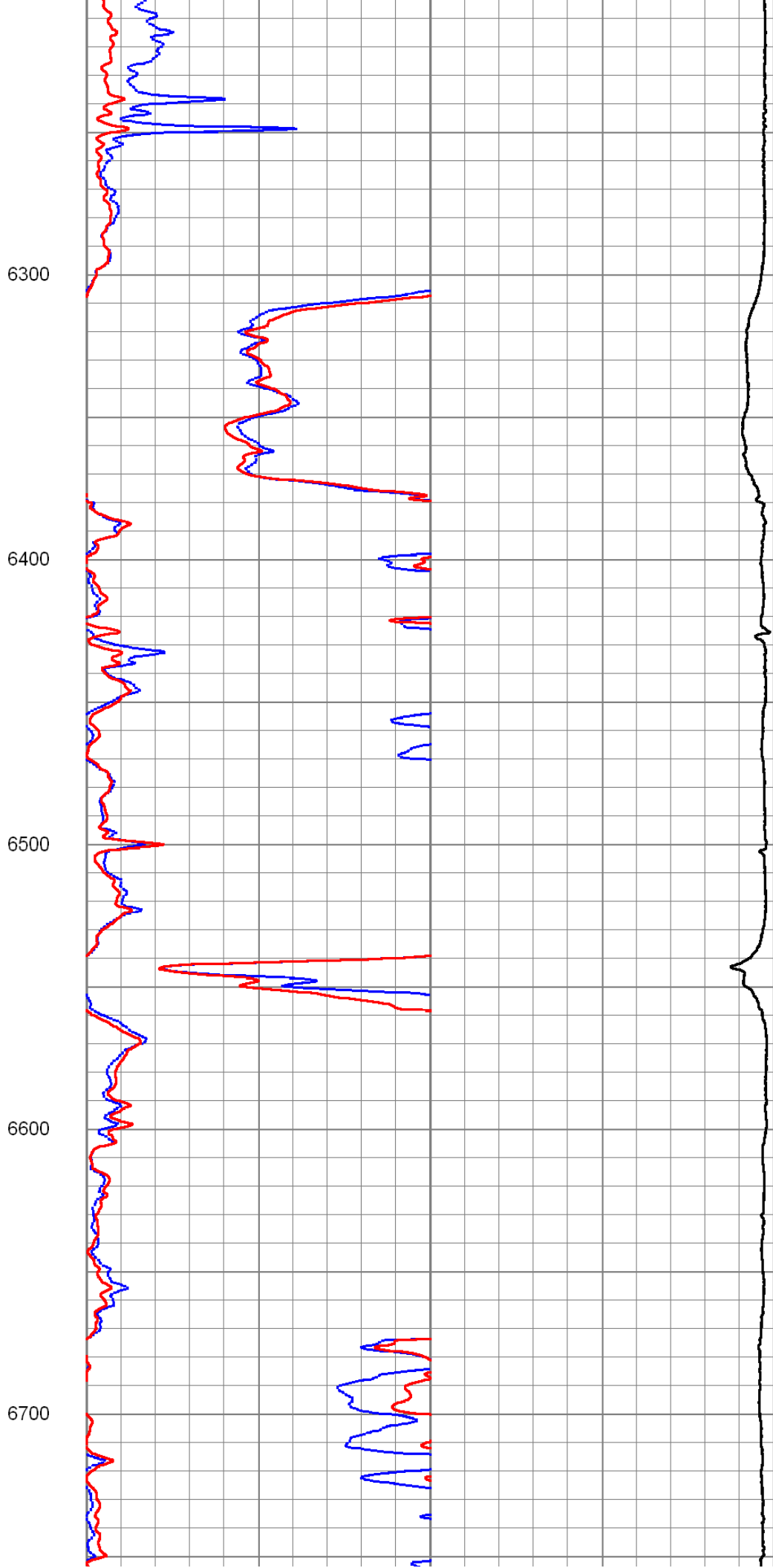
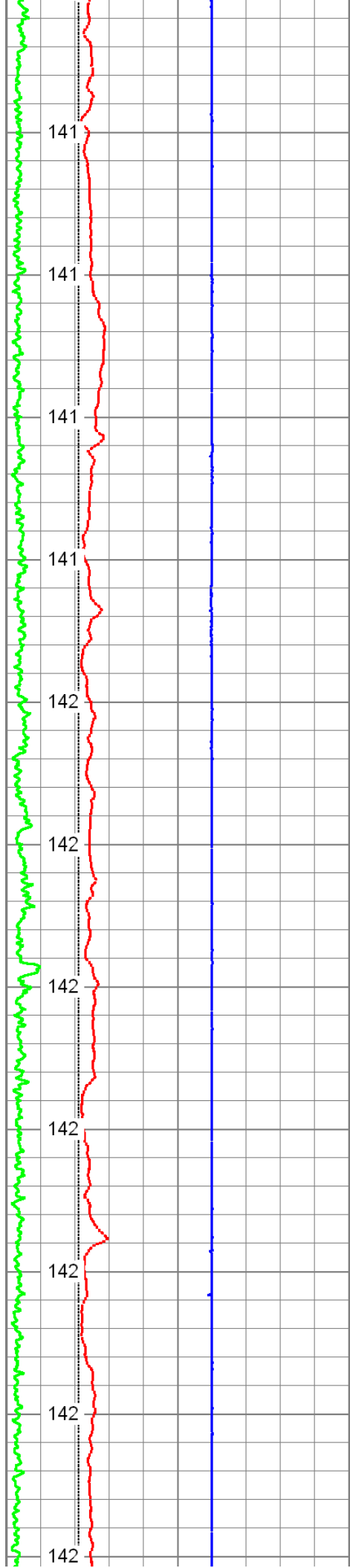
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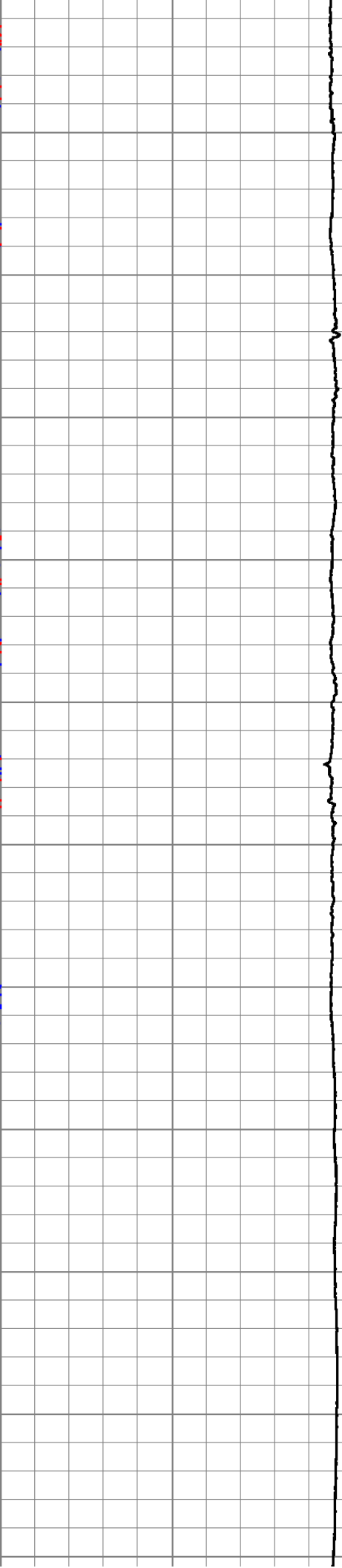
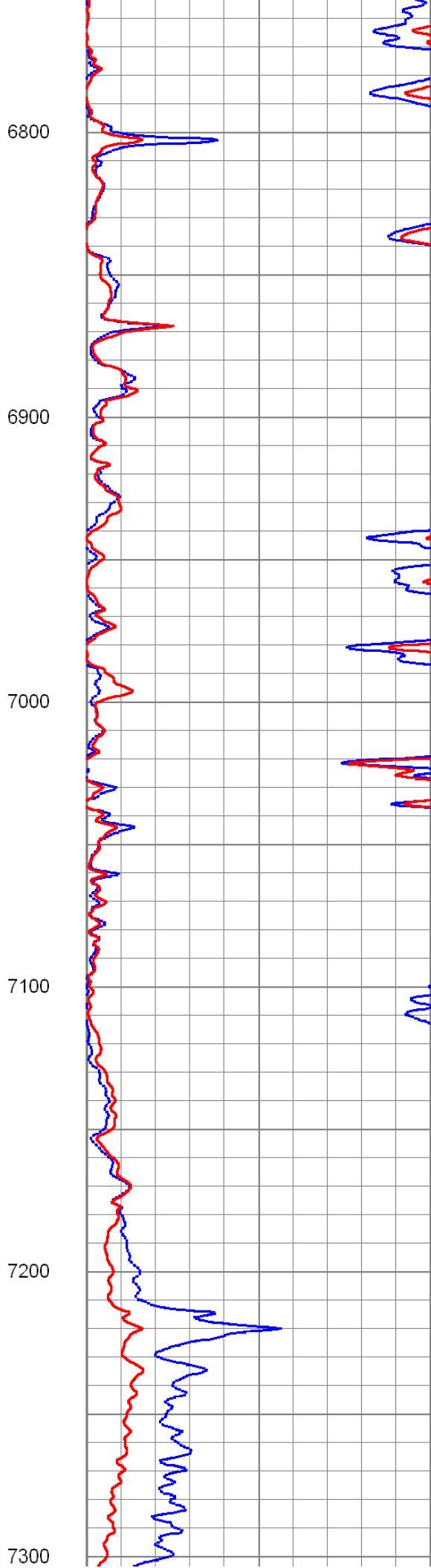
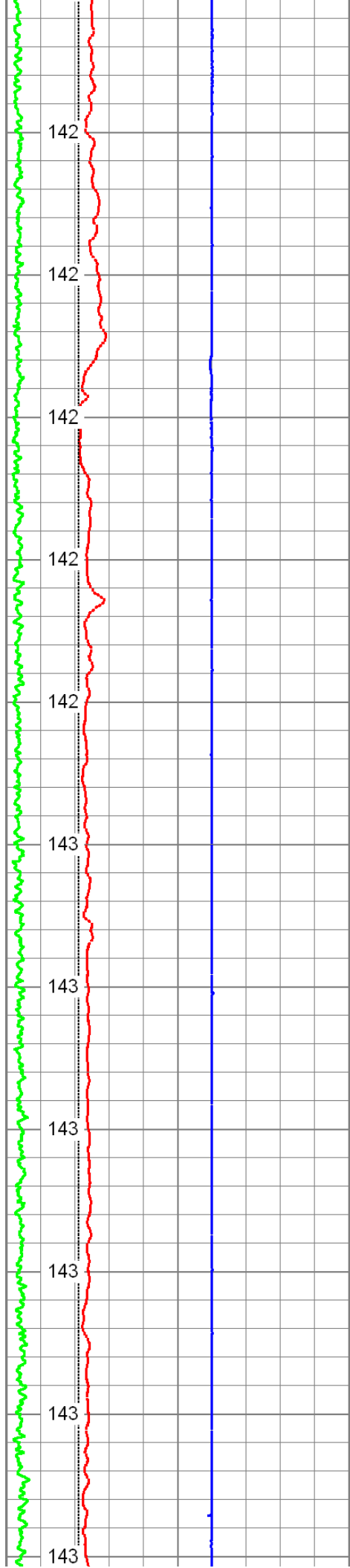
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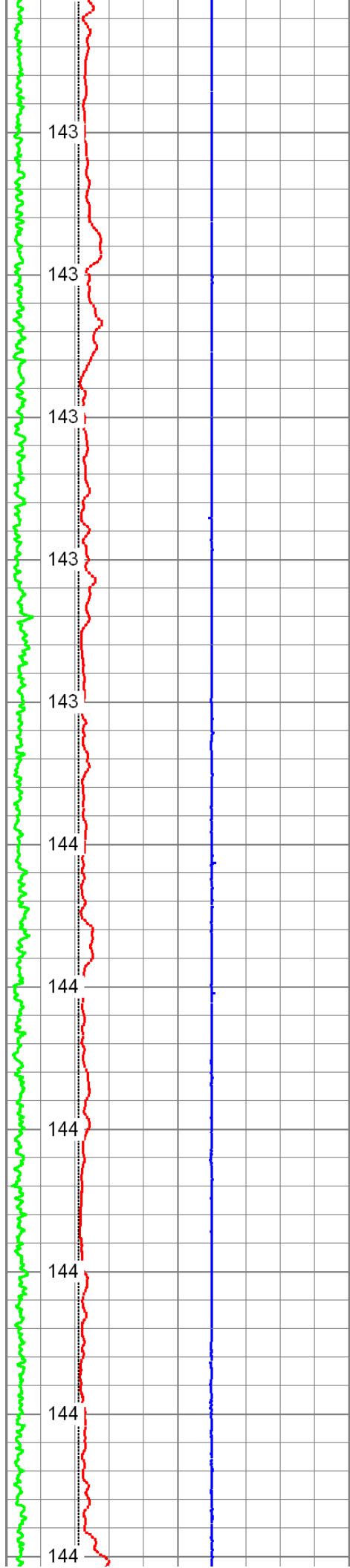
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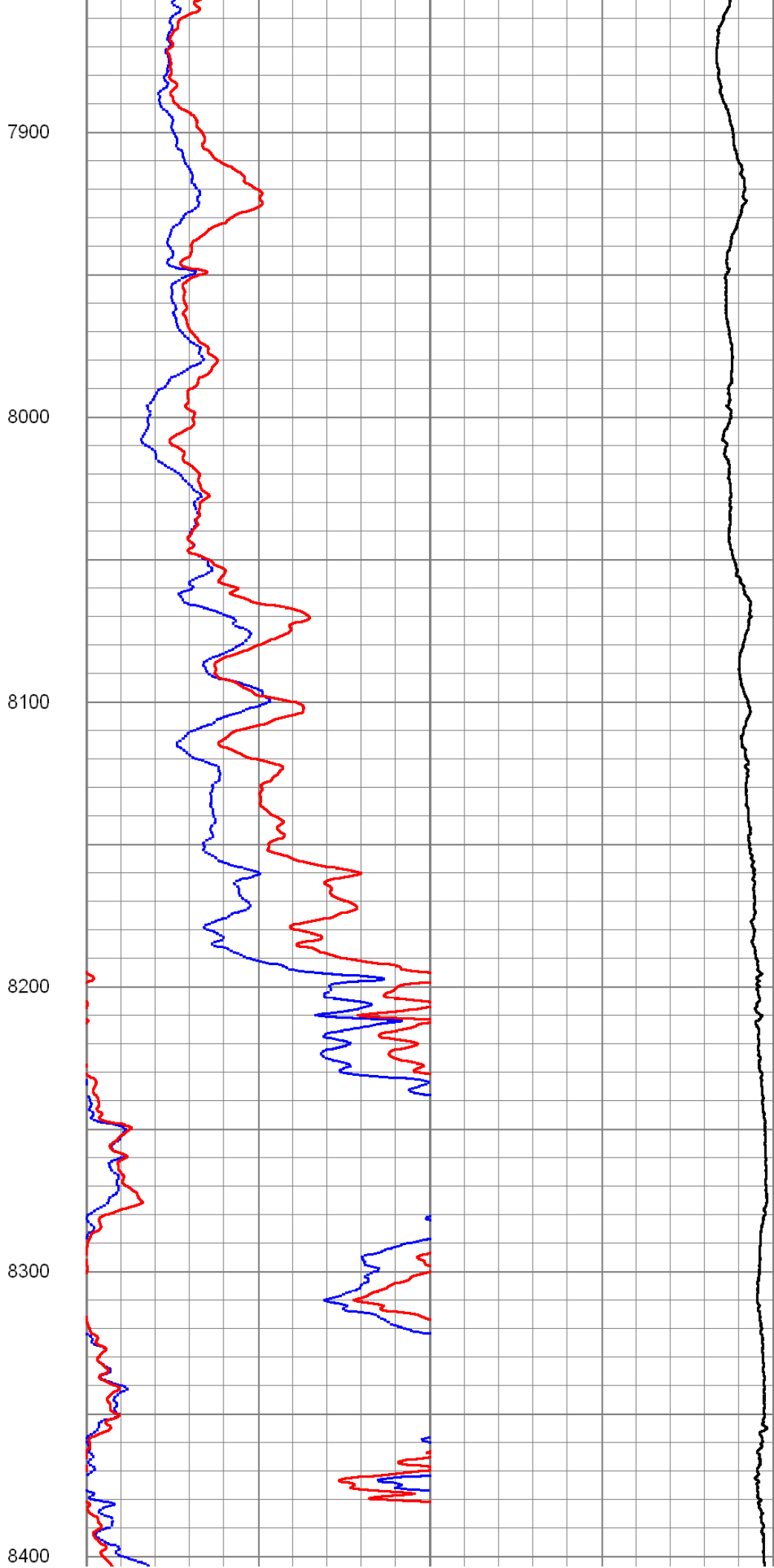
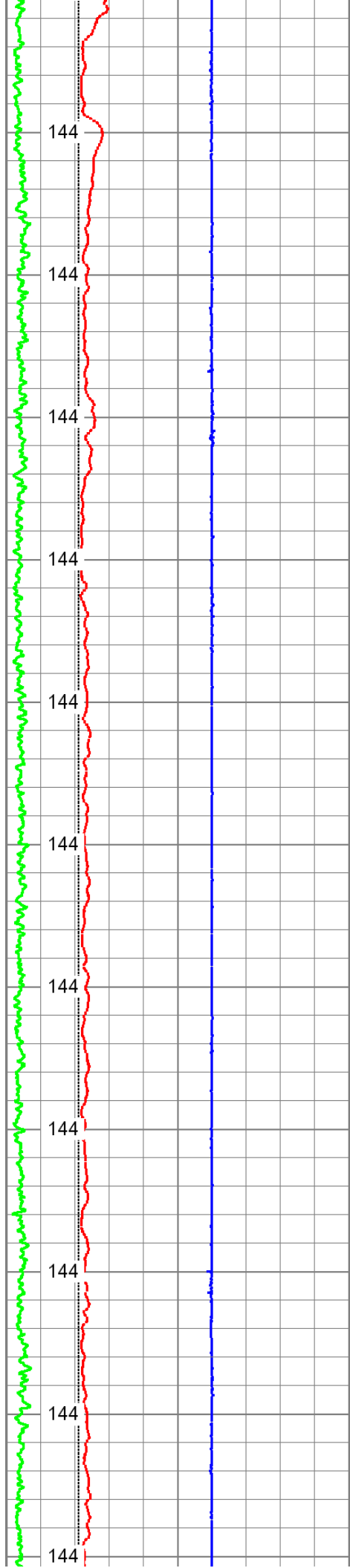
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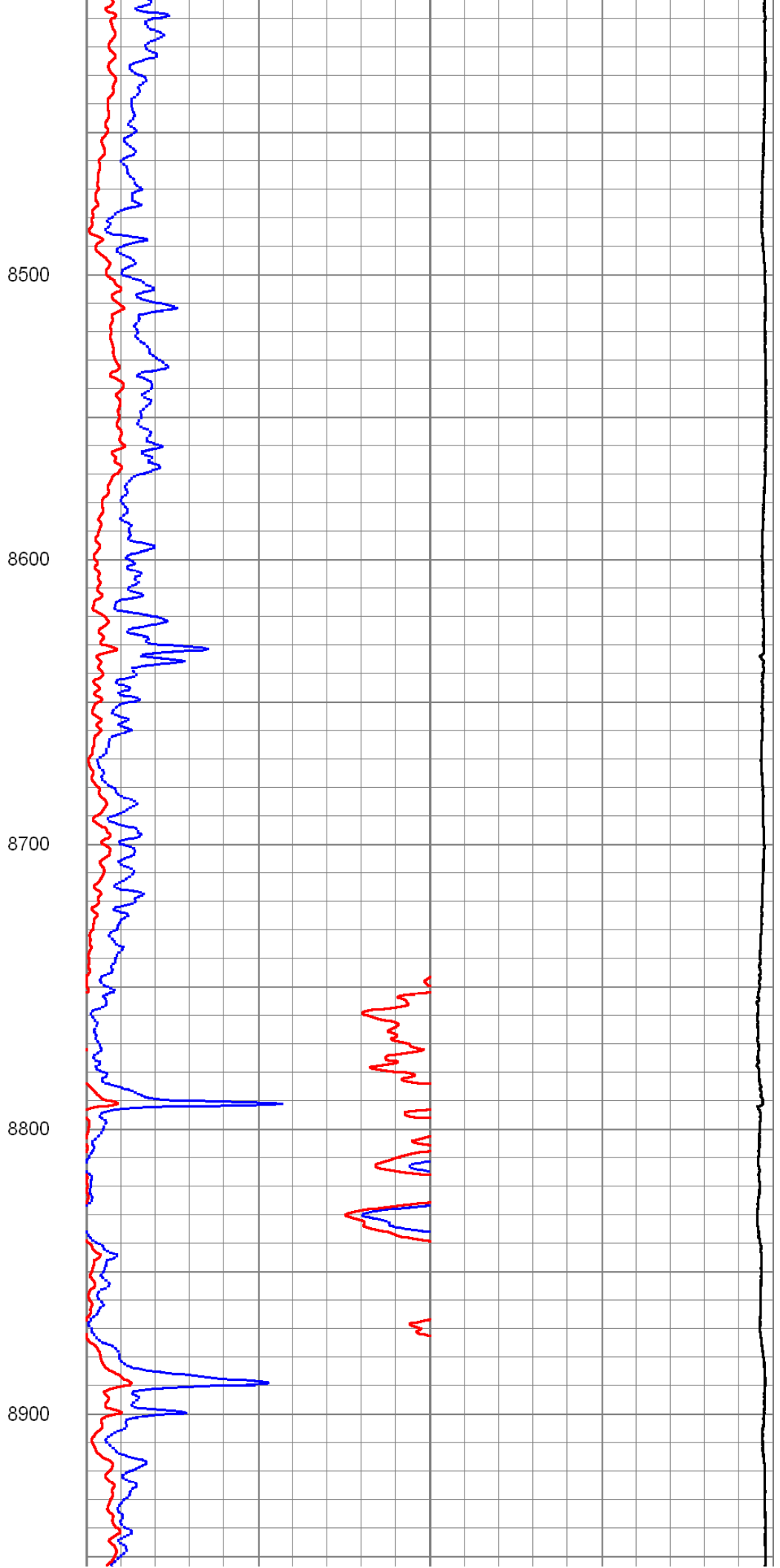
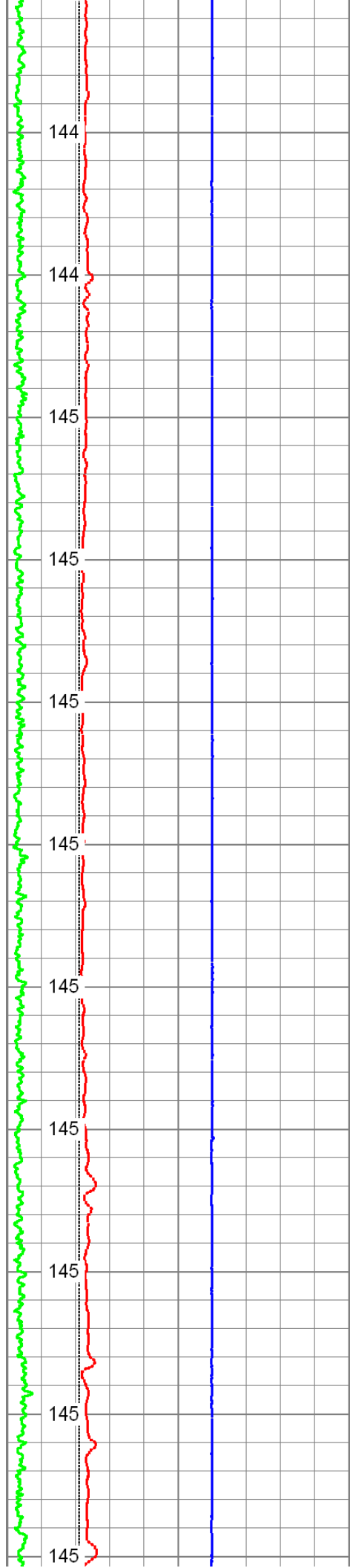


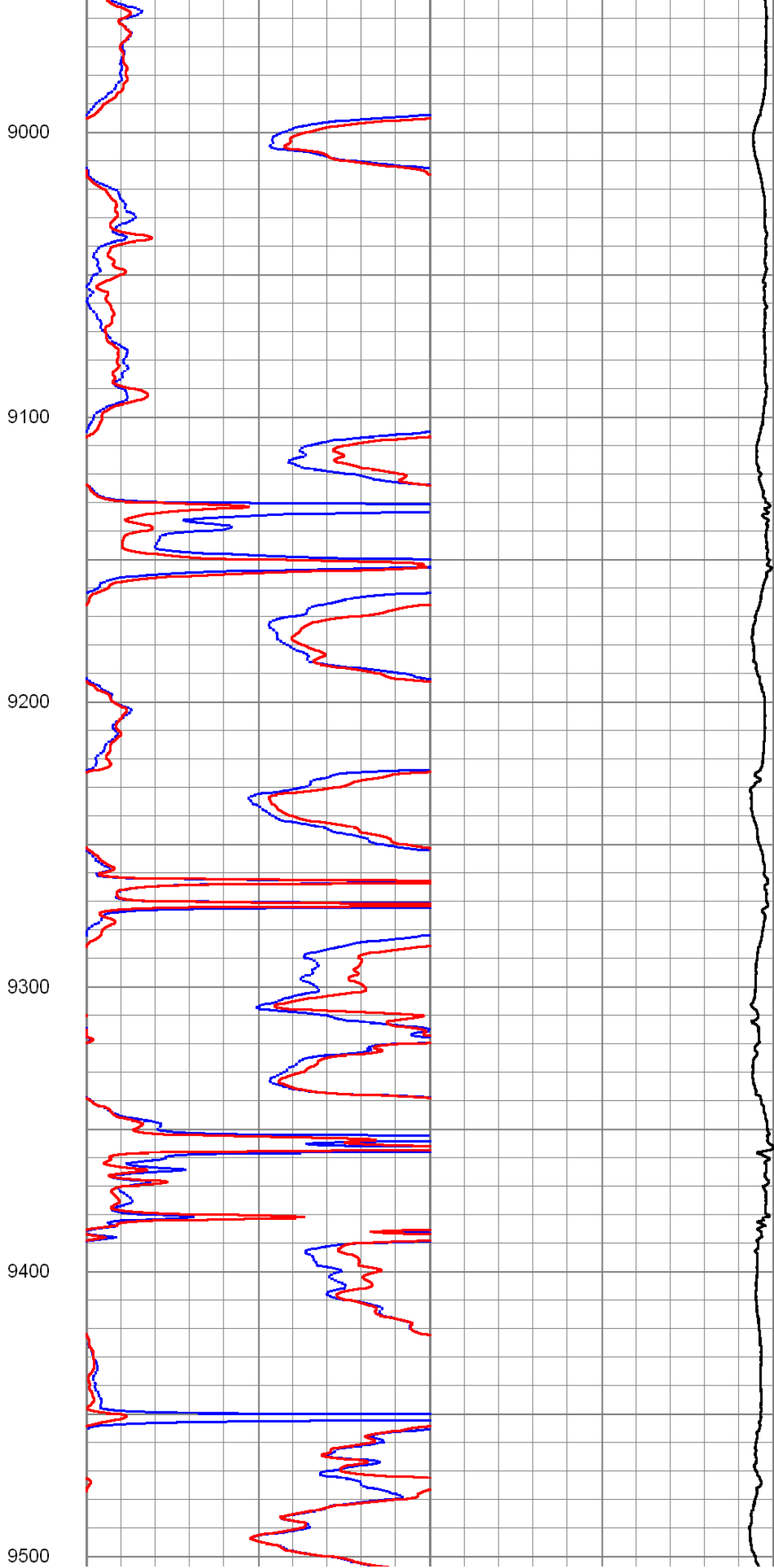
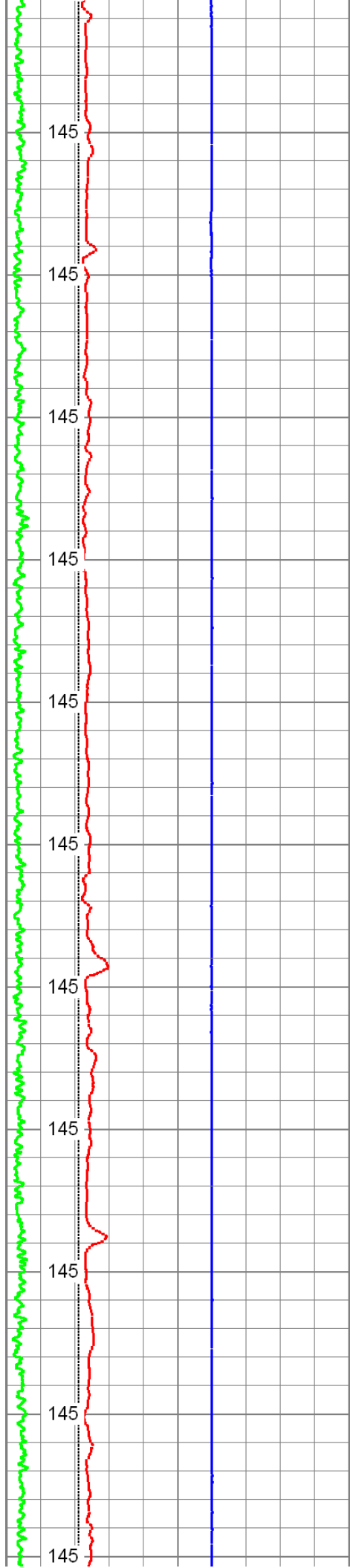


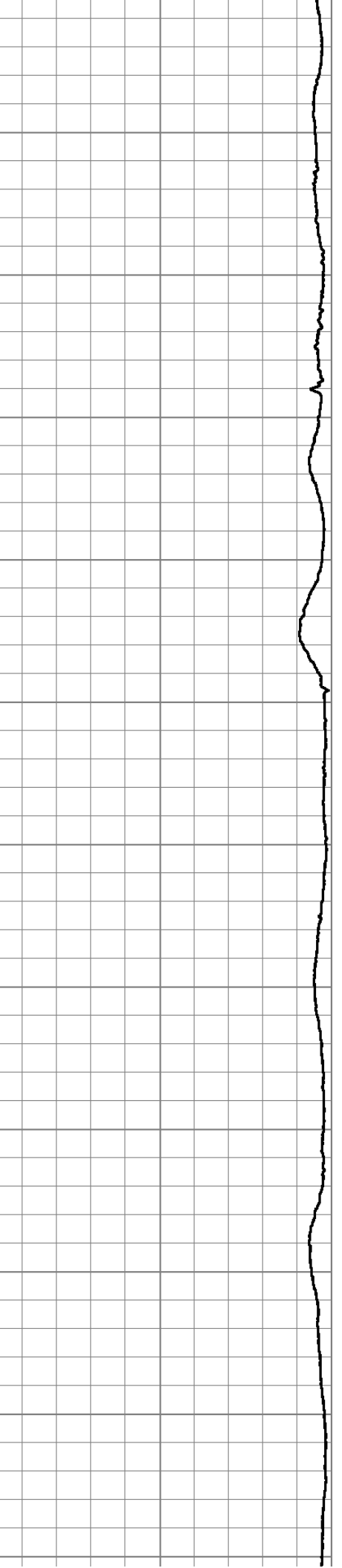
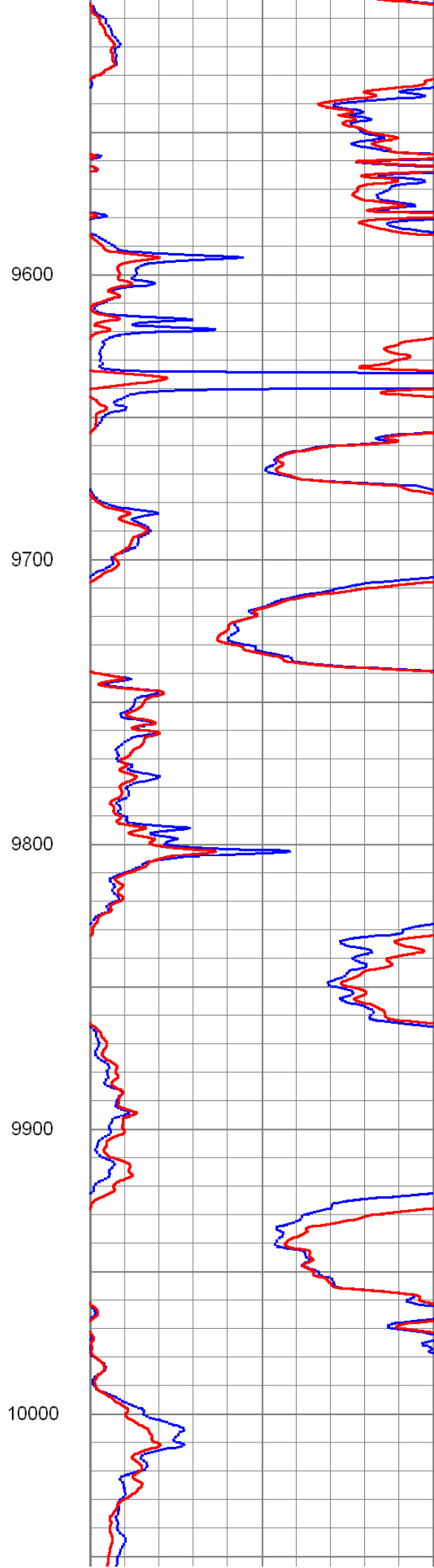
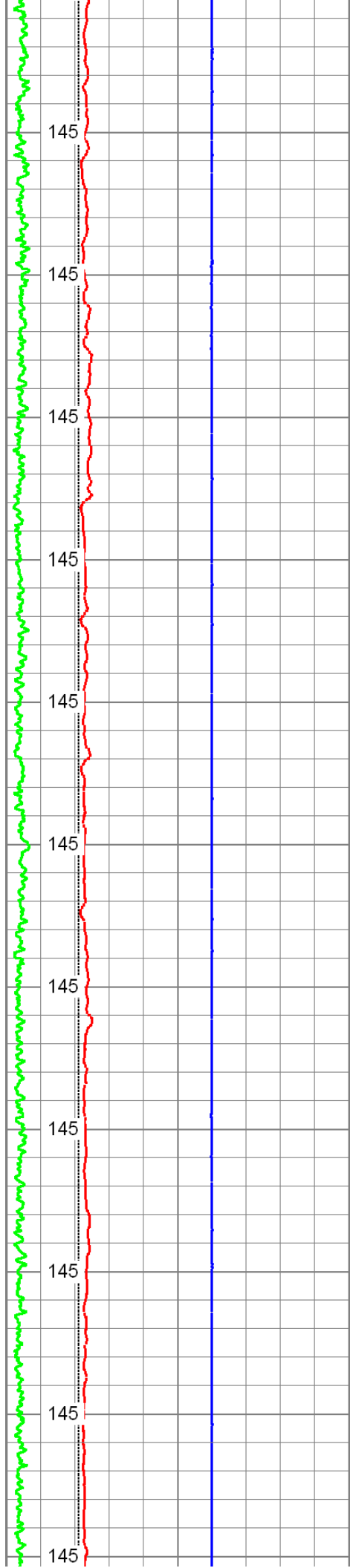


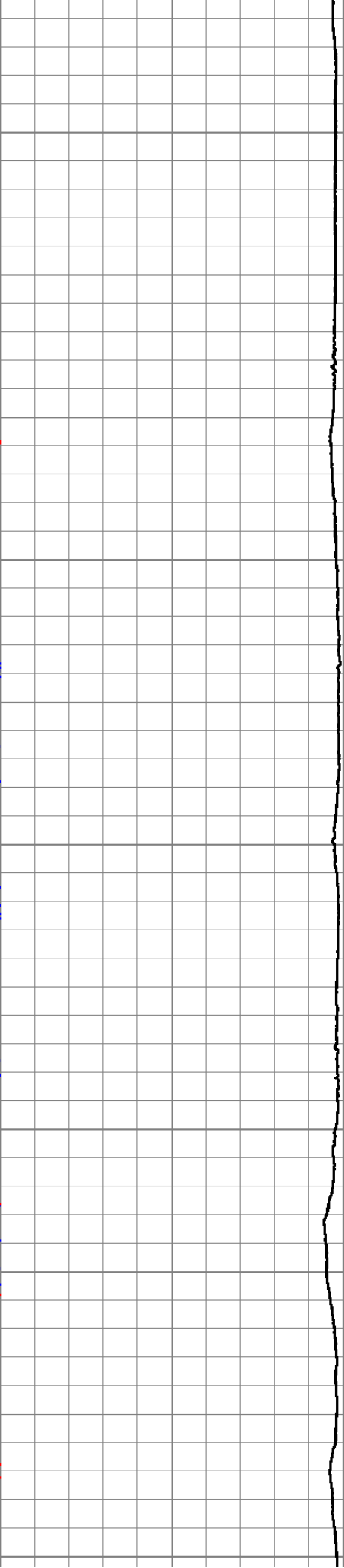
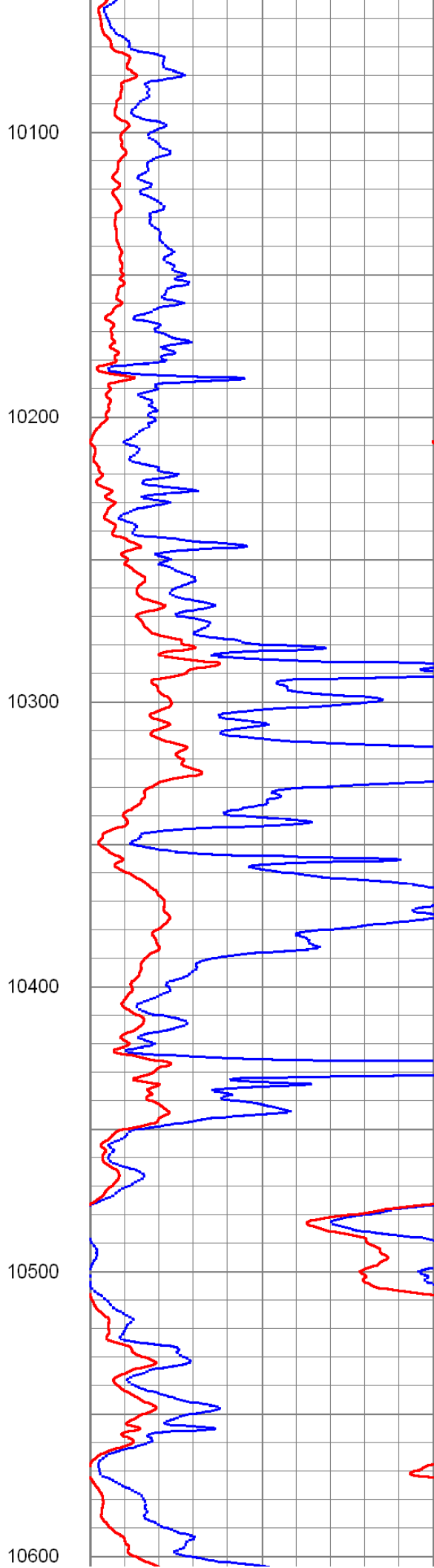
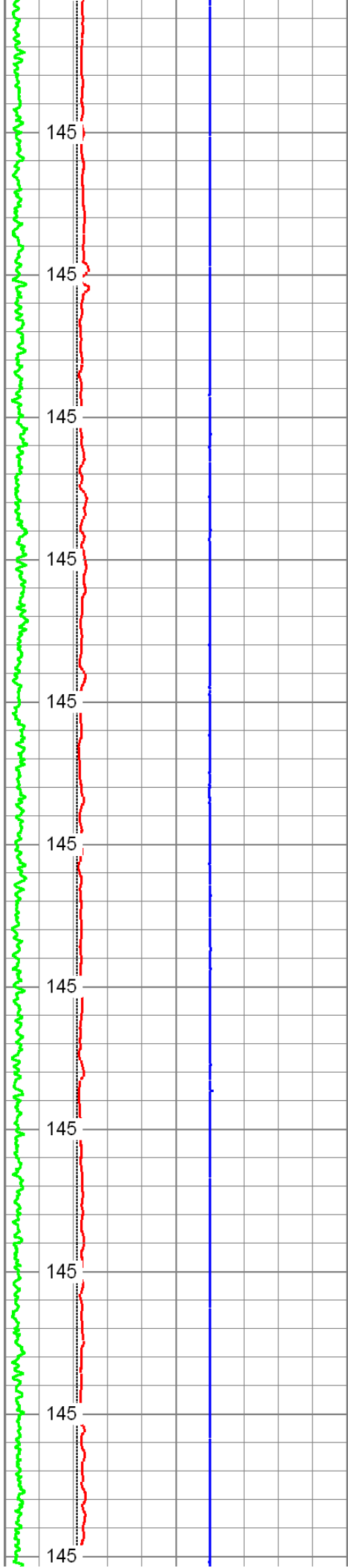


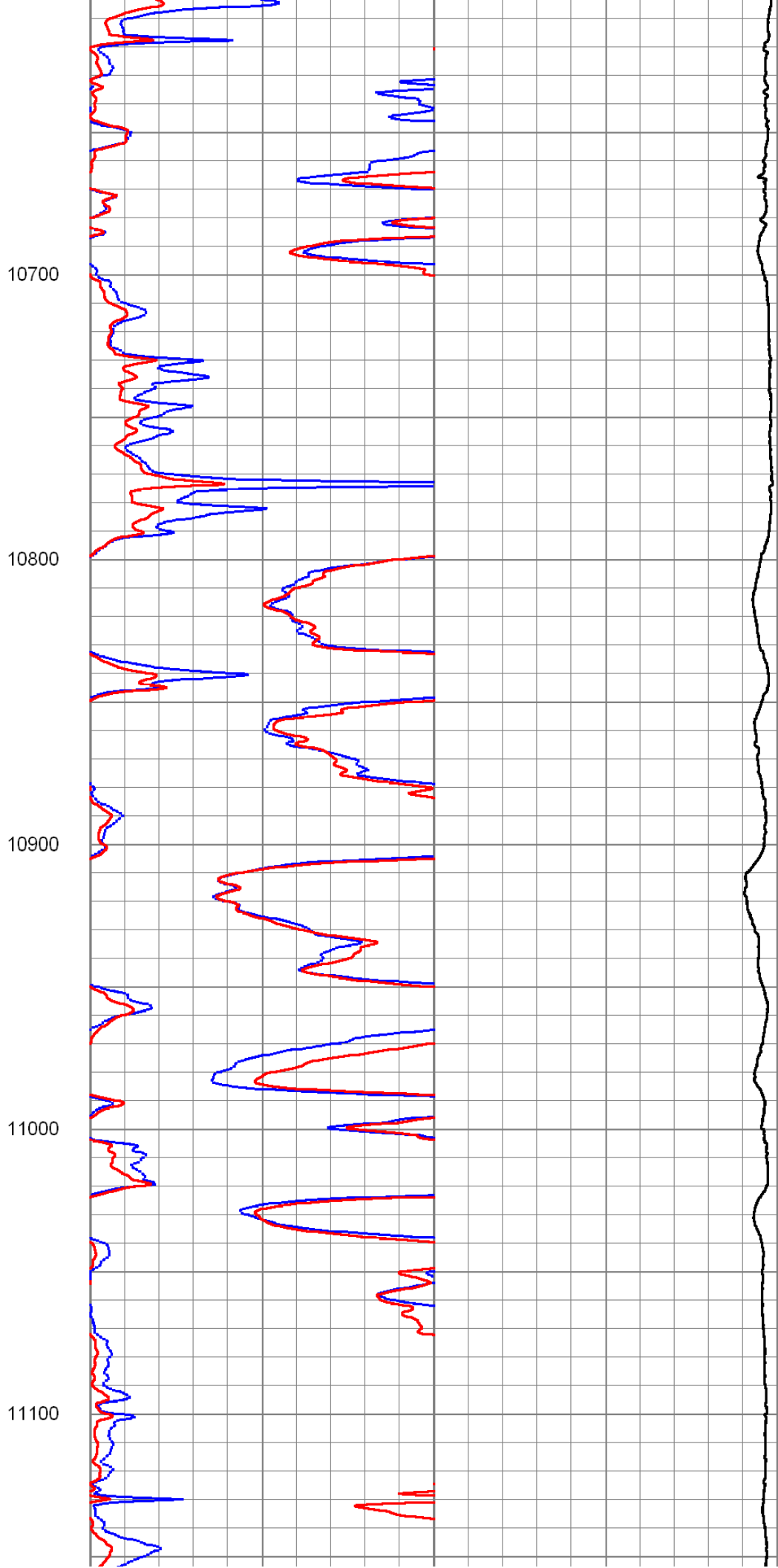
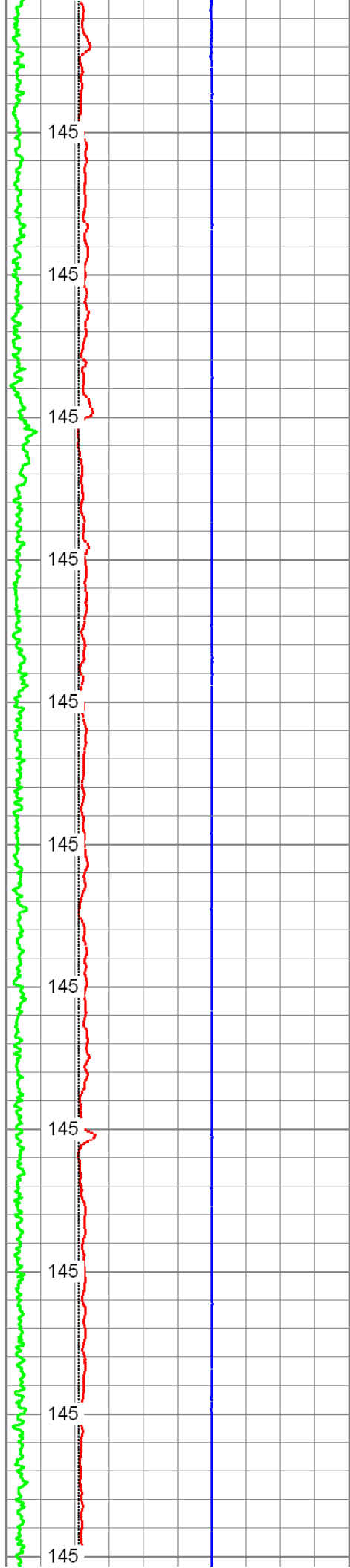


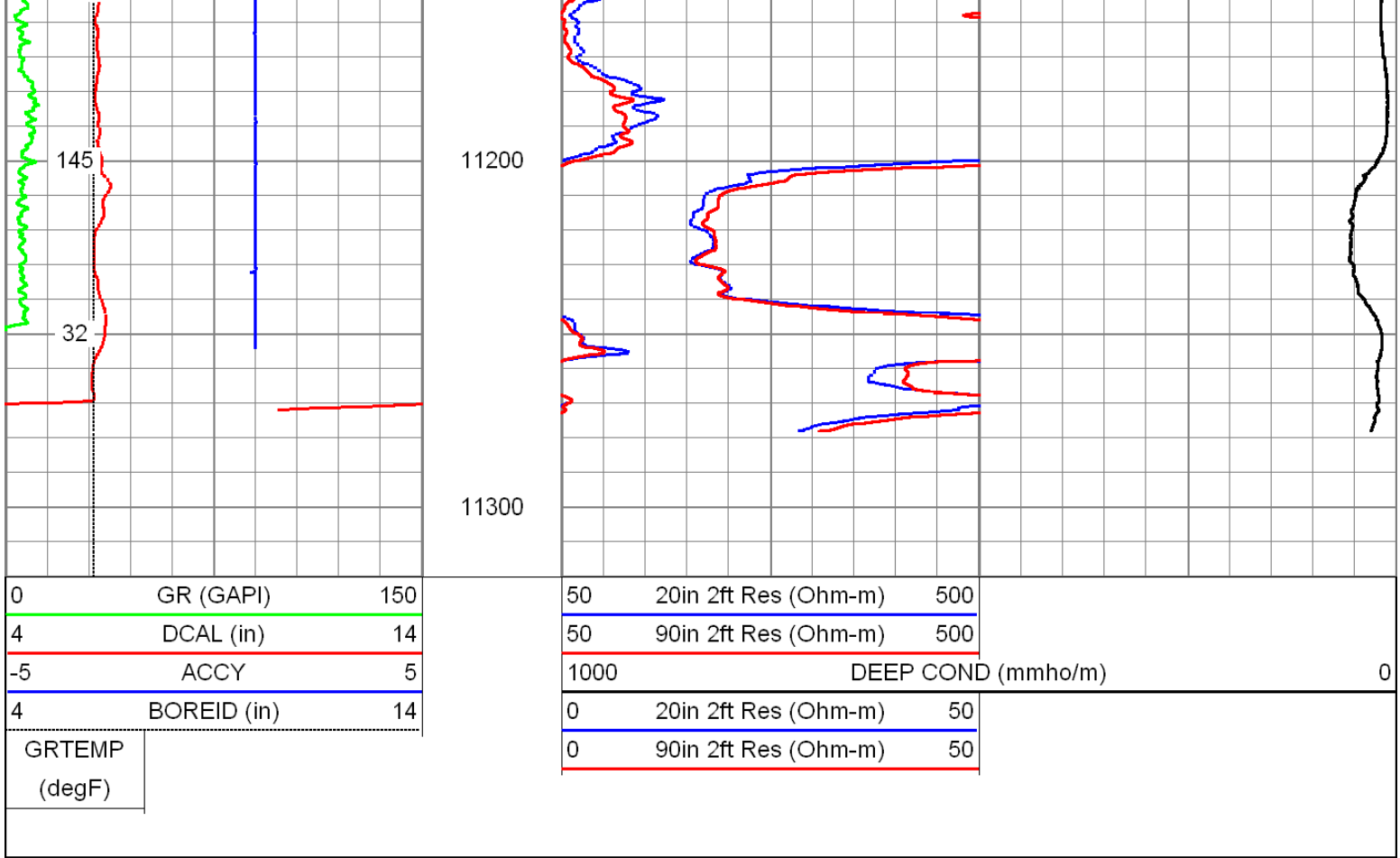








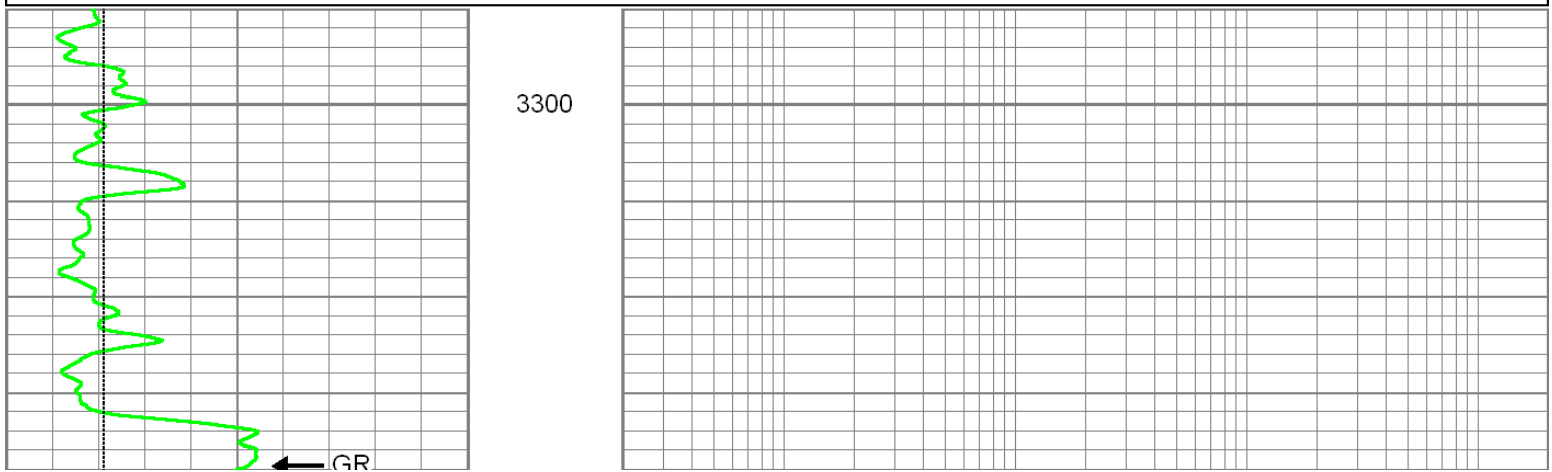


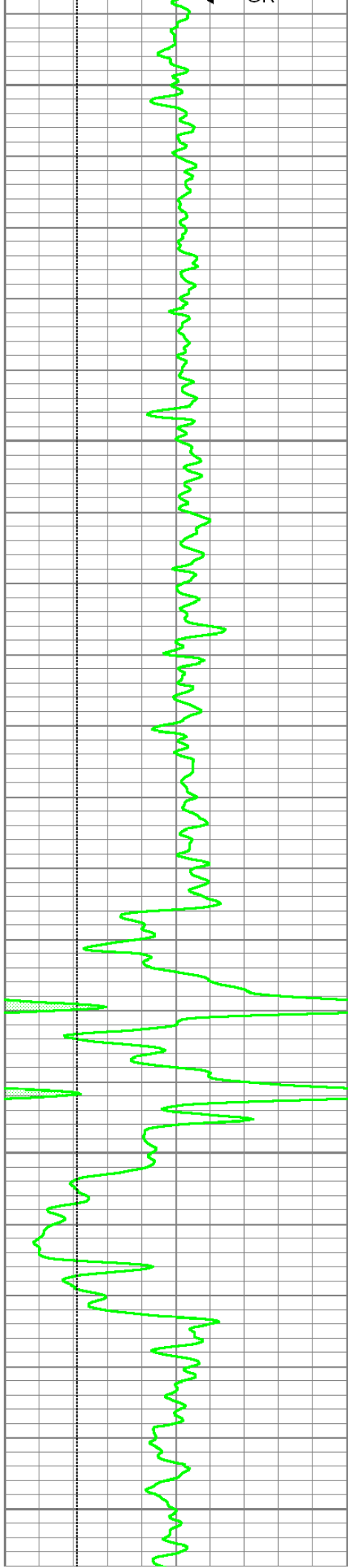


MAIN PASS

Database File: starks_mem.db
 Dataset Pathname: proc1/pass1.4
 Presentation Format: 6_5r_chk
 Dataset Creation: Tue Jul 10 18:09:01 2012
 Charted by: Depth in Feet scaled 1:240

0	GR (GAPI)	150	0.2	20inRadial (Ohm-m)	2000
4	BOREID (in)	14	0.2	30inRadial (Ohm-m)	2000
4	DCAL (in)	14	0.2	60inRadial (Ohm-m)	2000
-5	ACCY	5	0.2	90inRadial (Ohm-m)	2000
	GRTEMP (degF)				





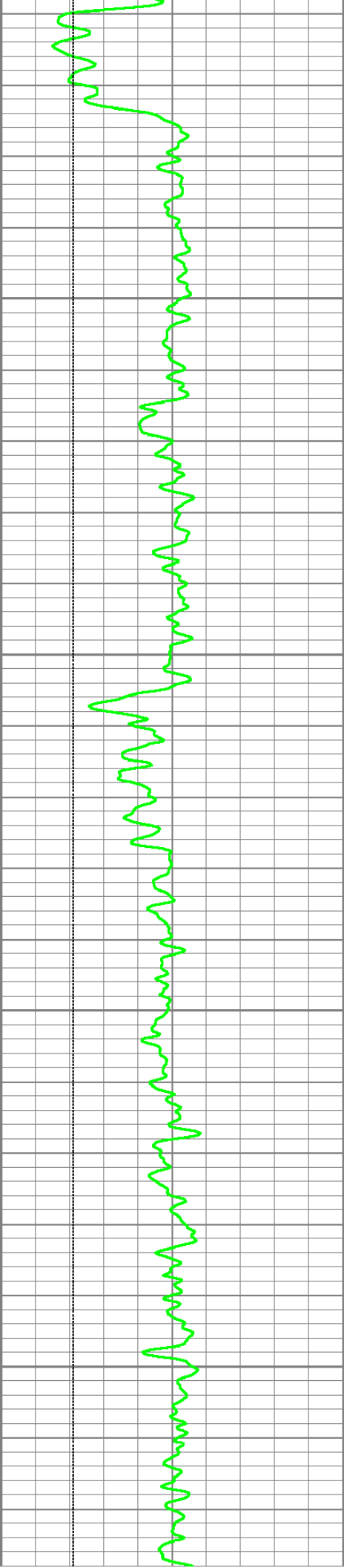
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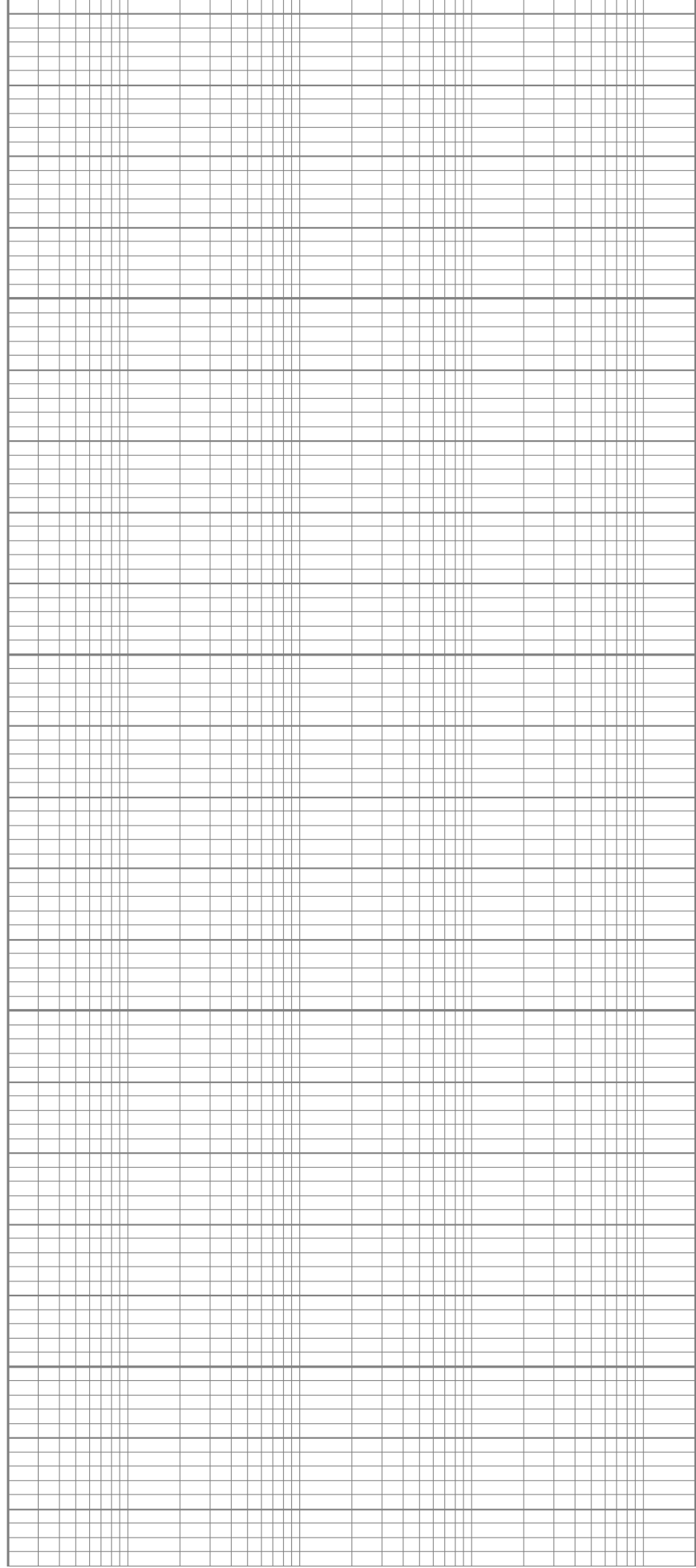


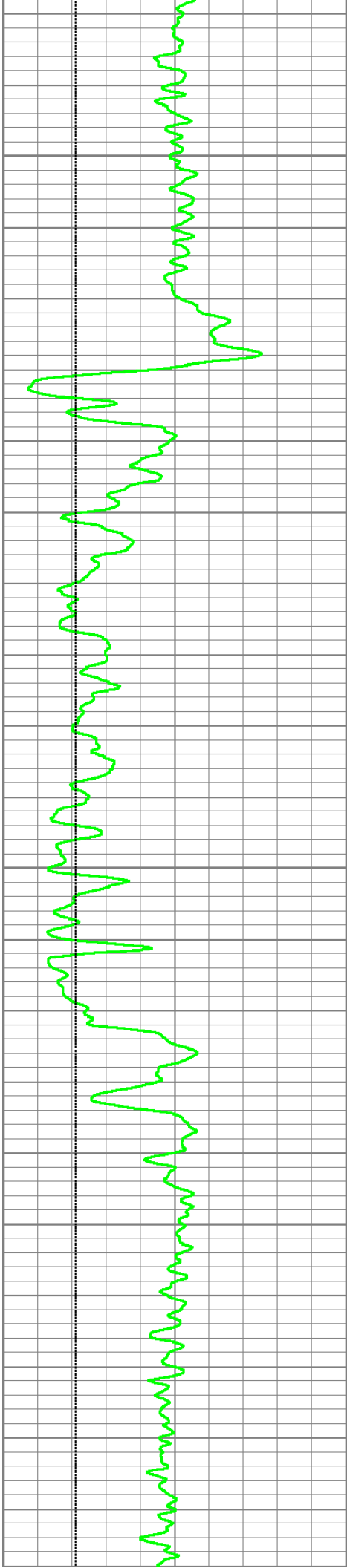
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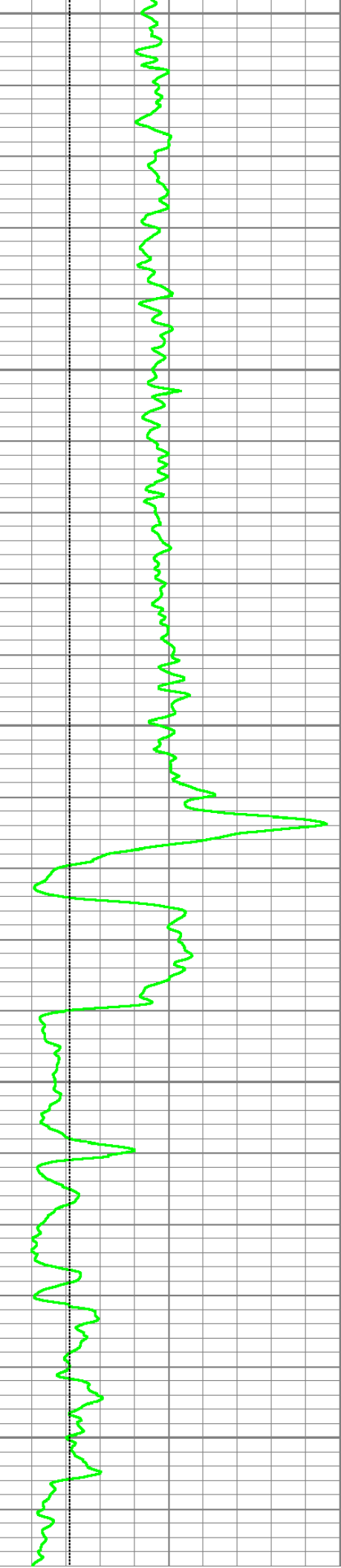


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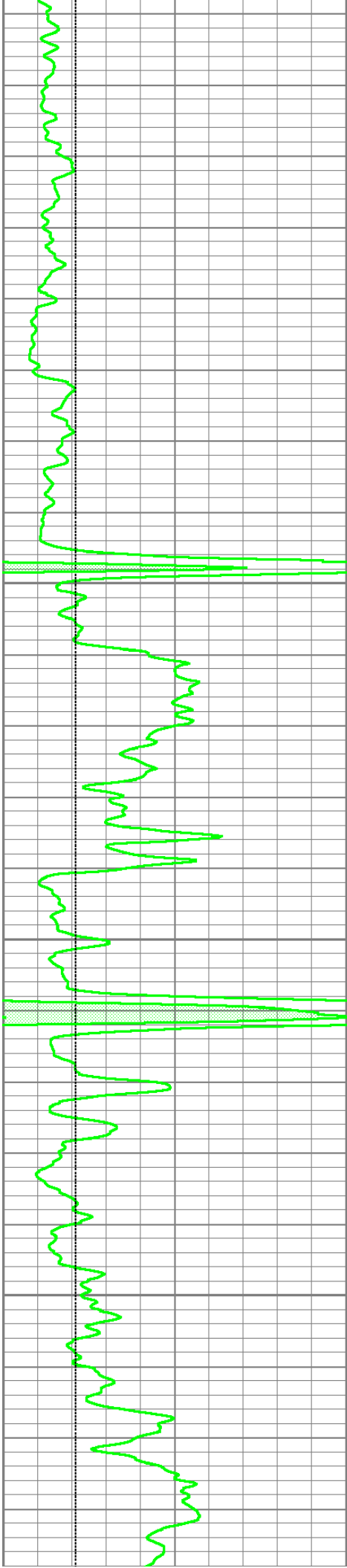
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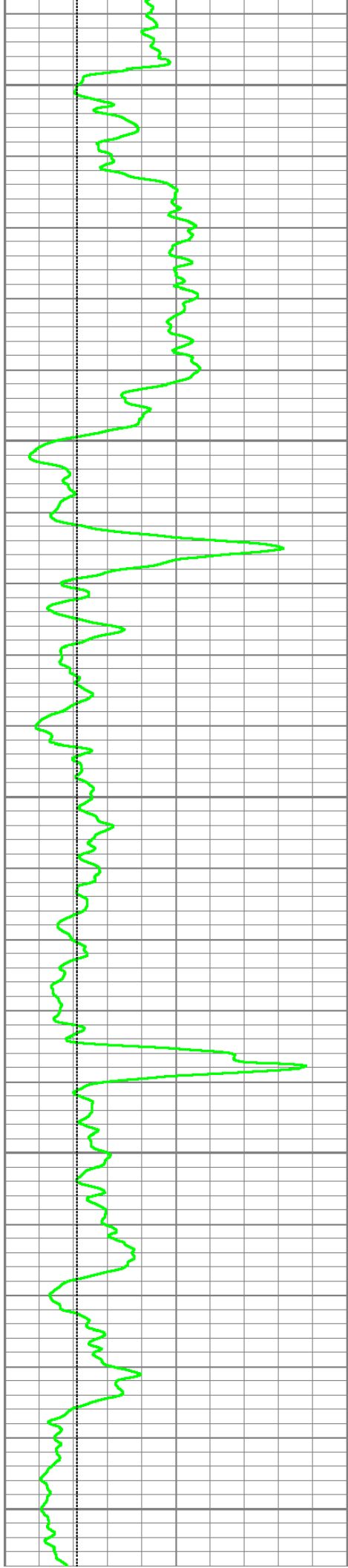


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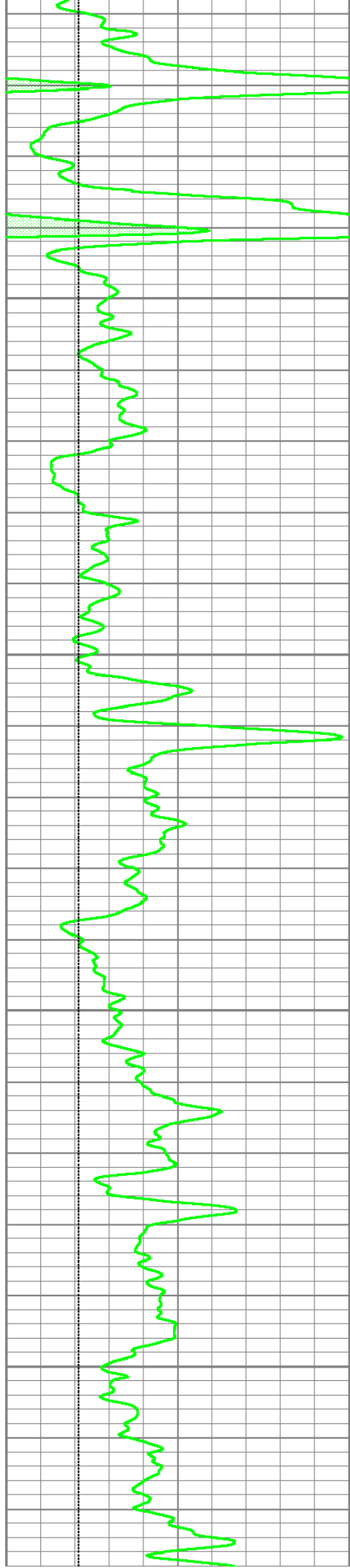
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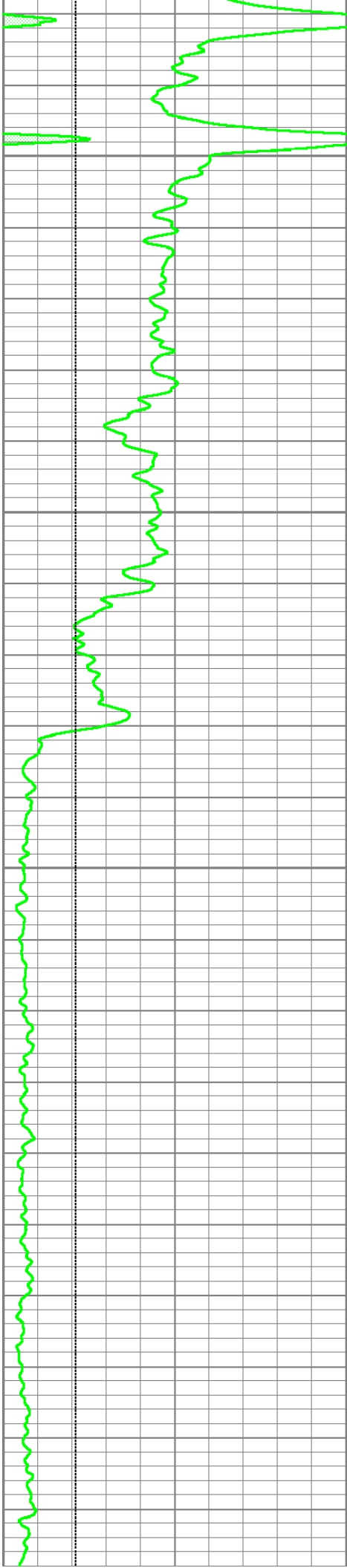


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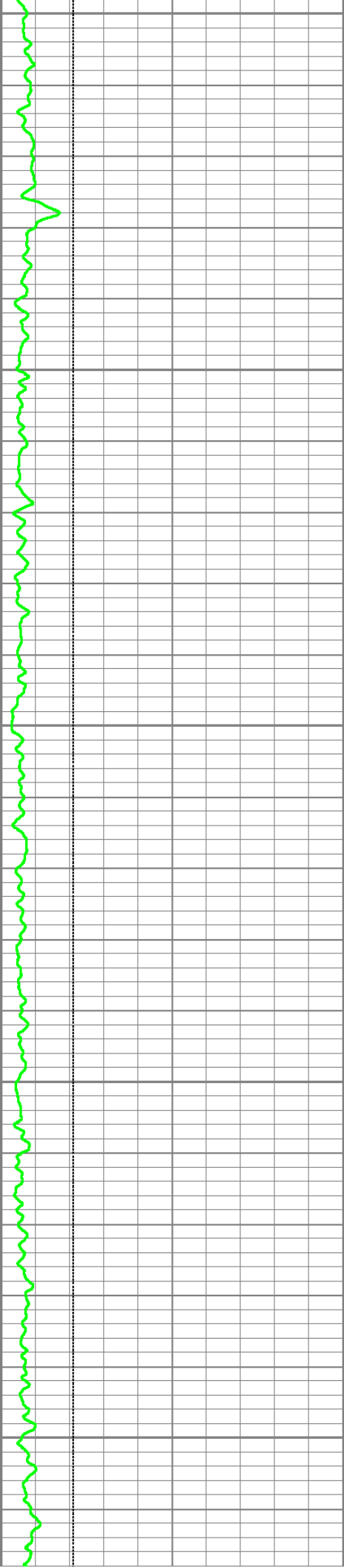
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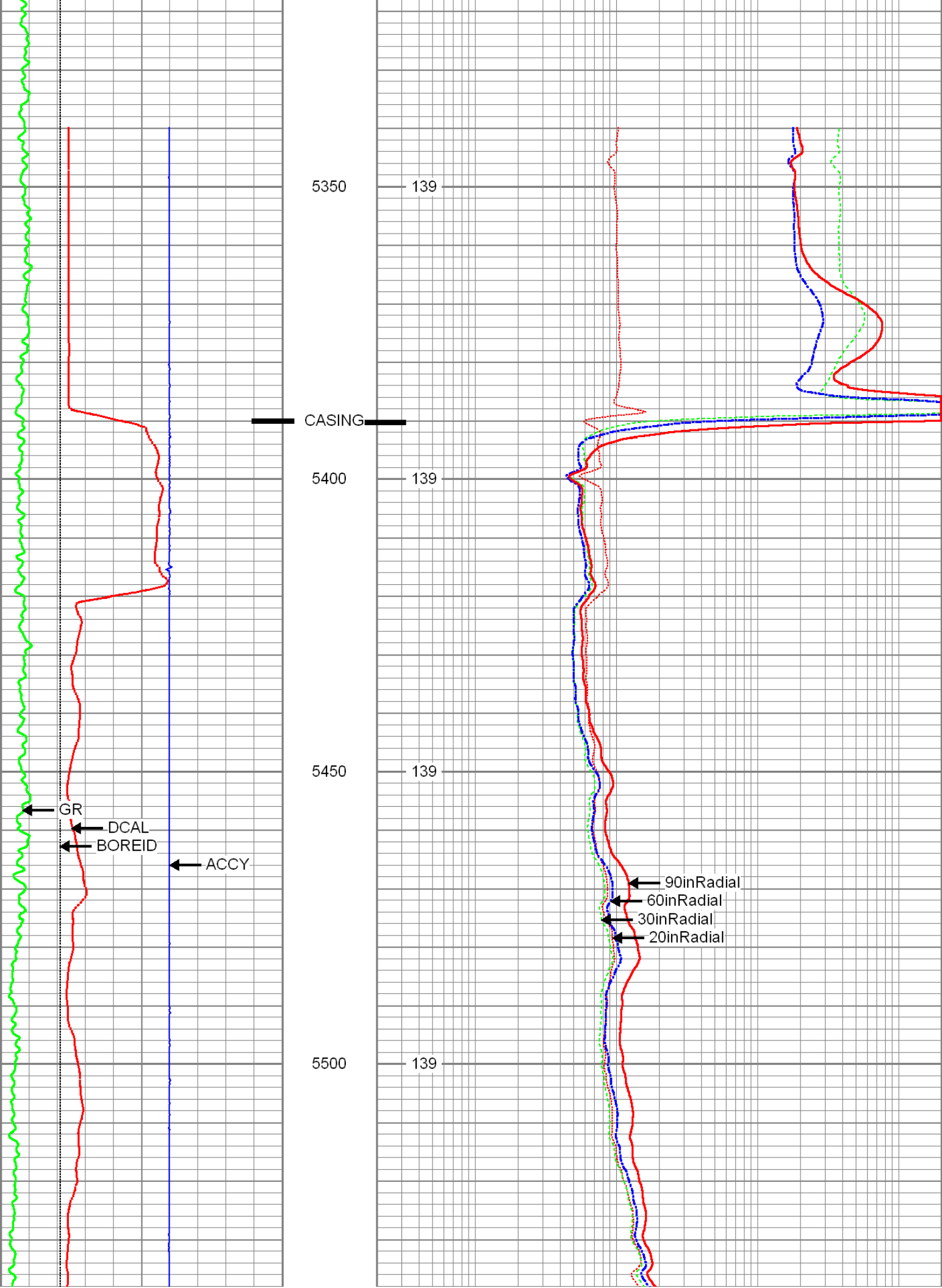
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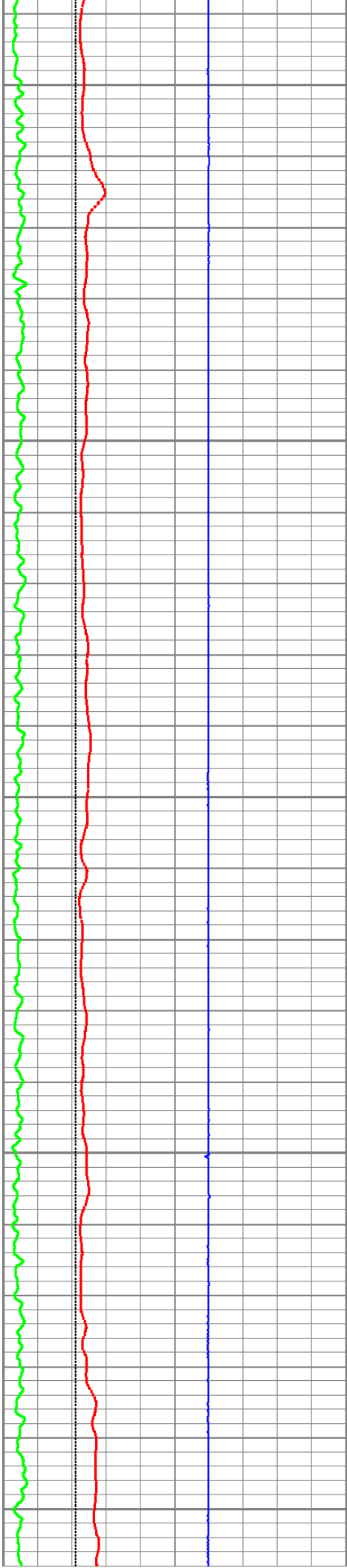
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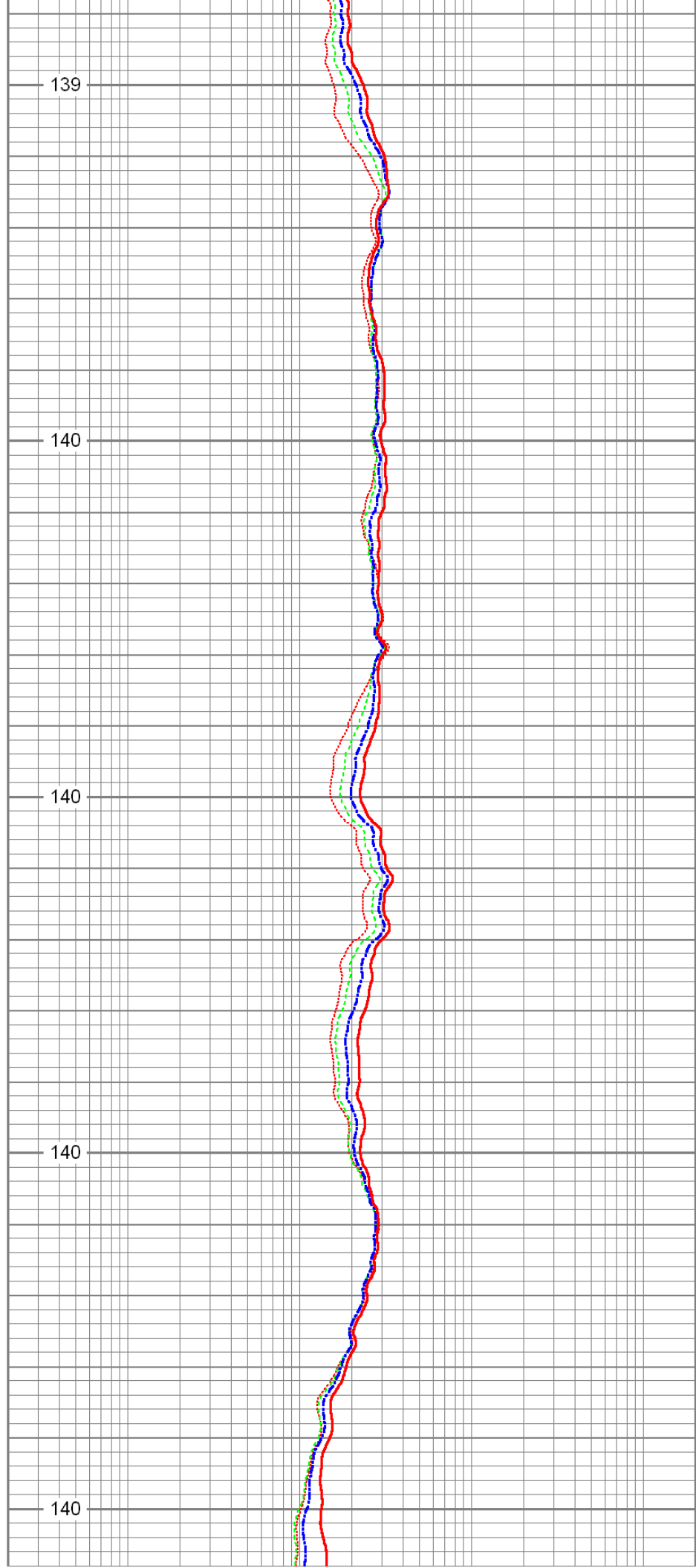
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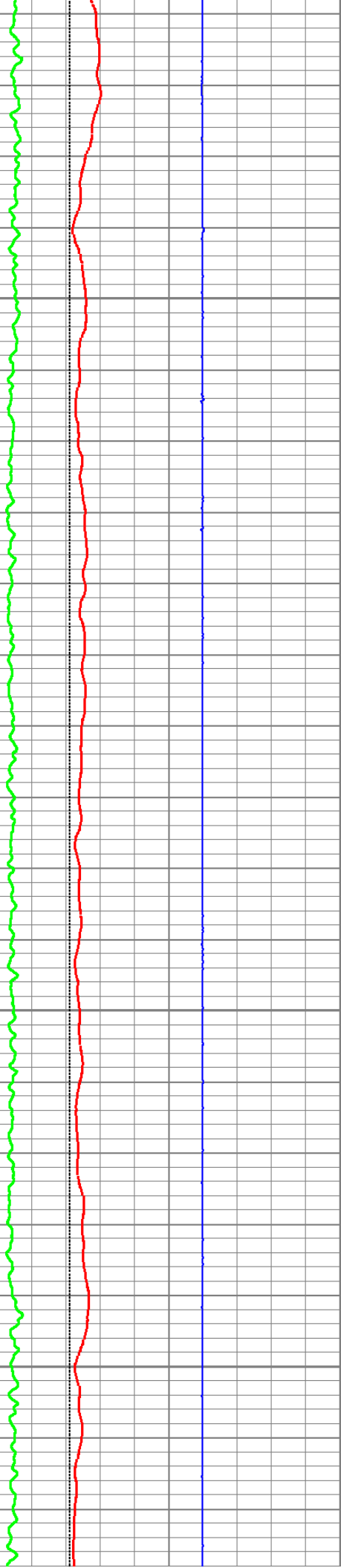
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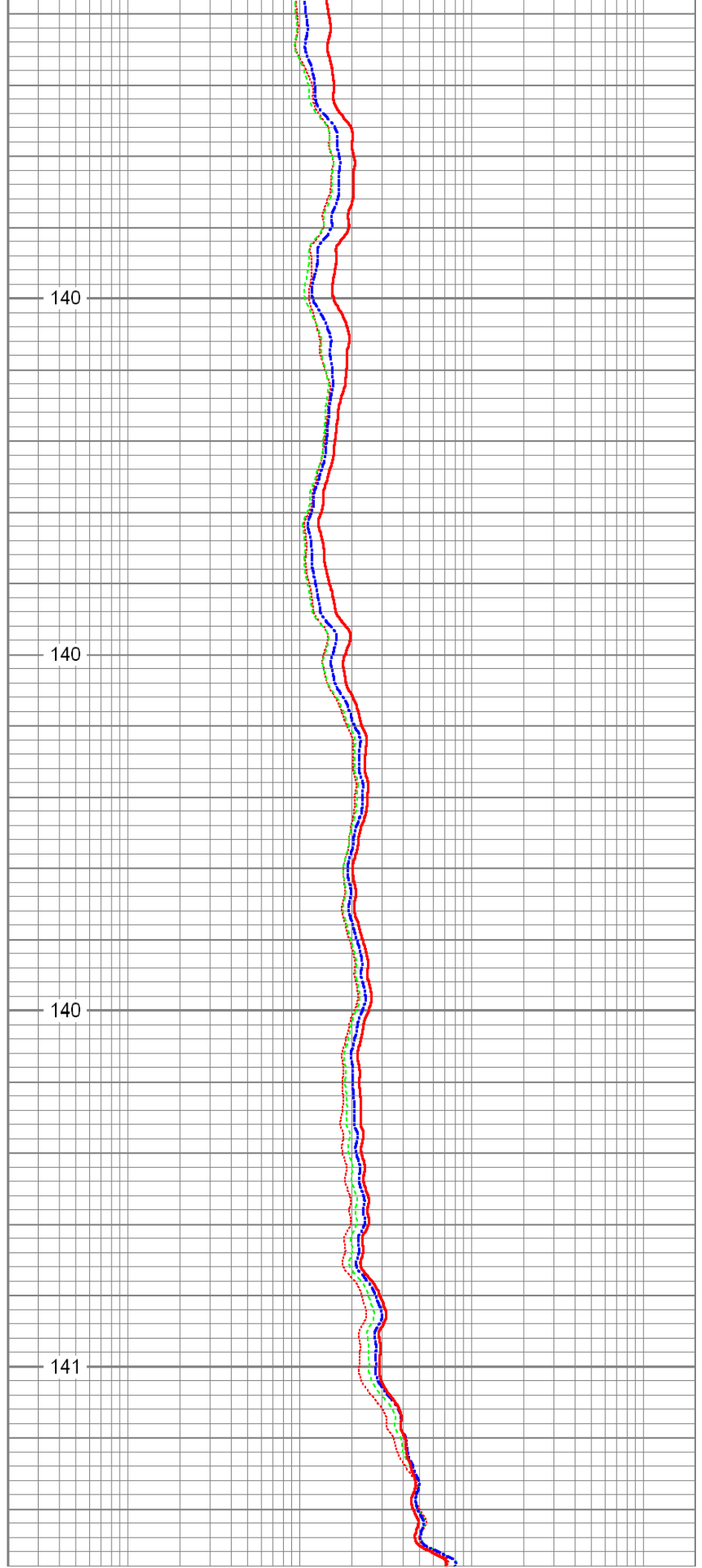
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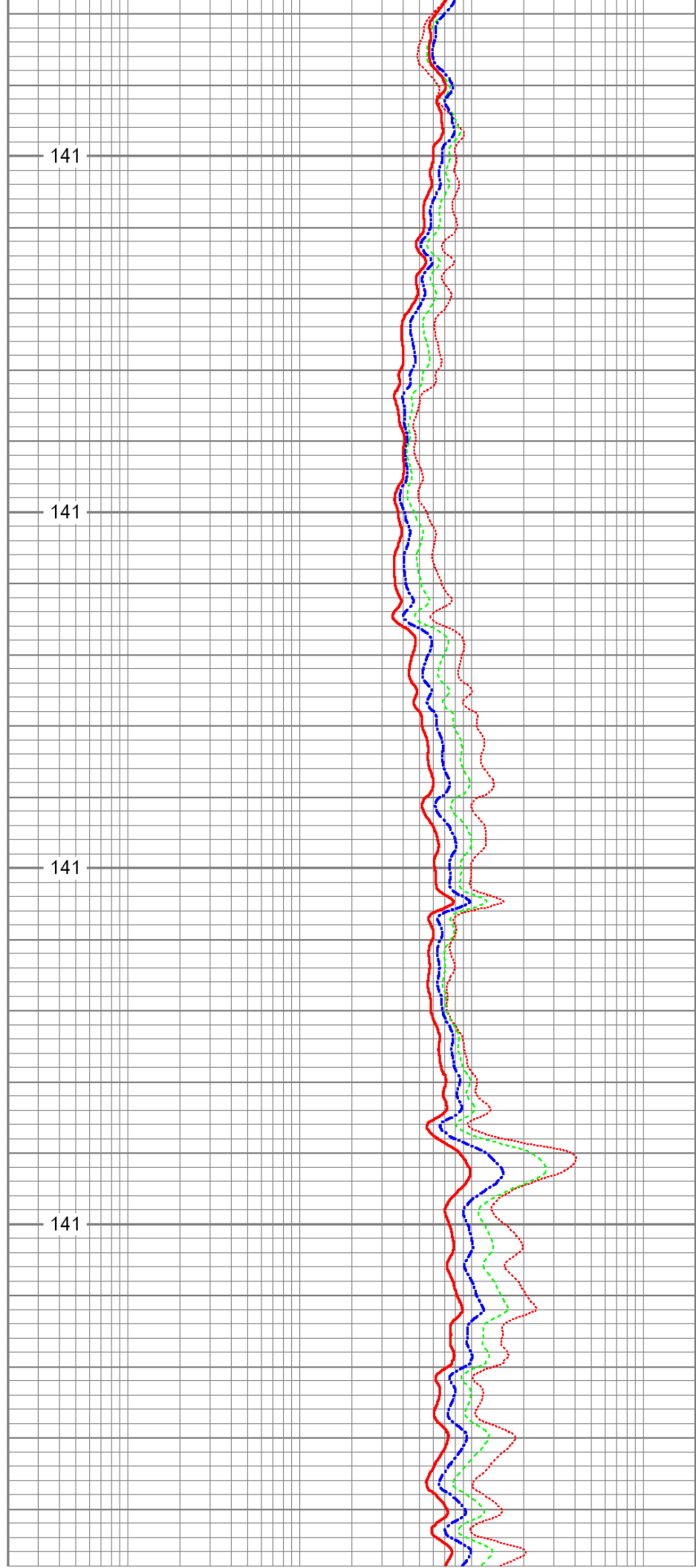
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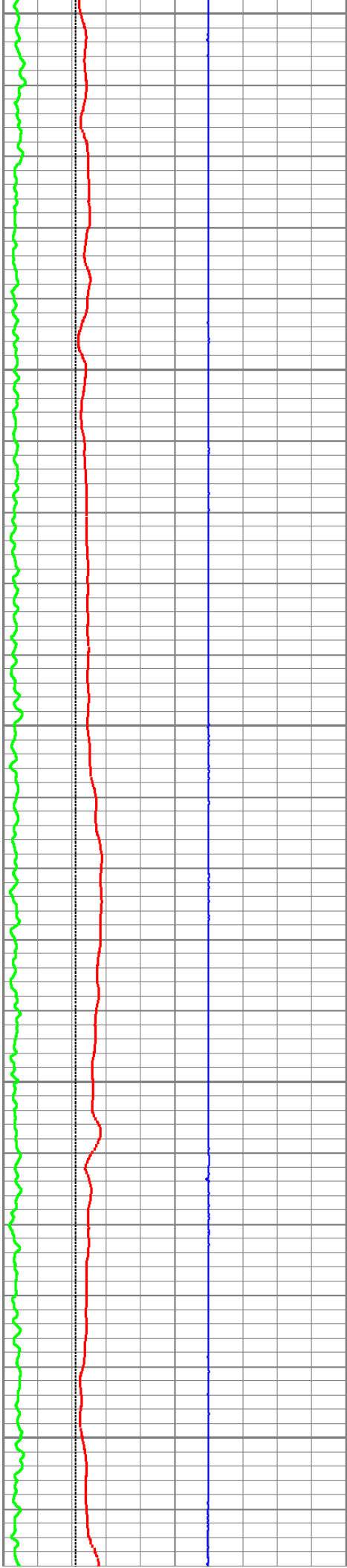
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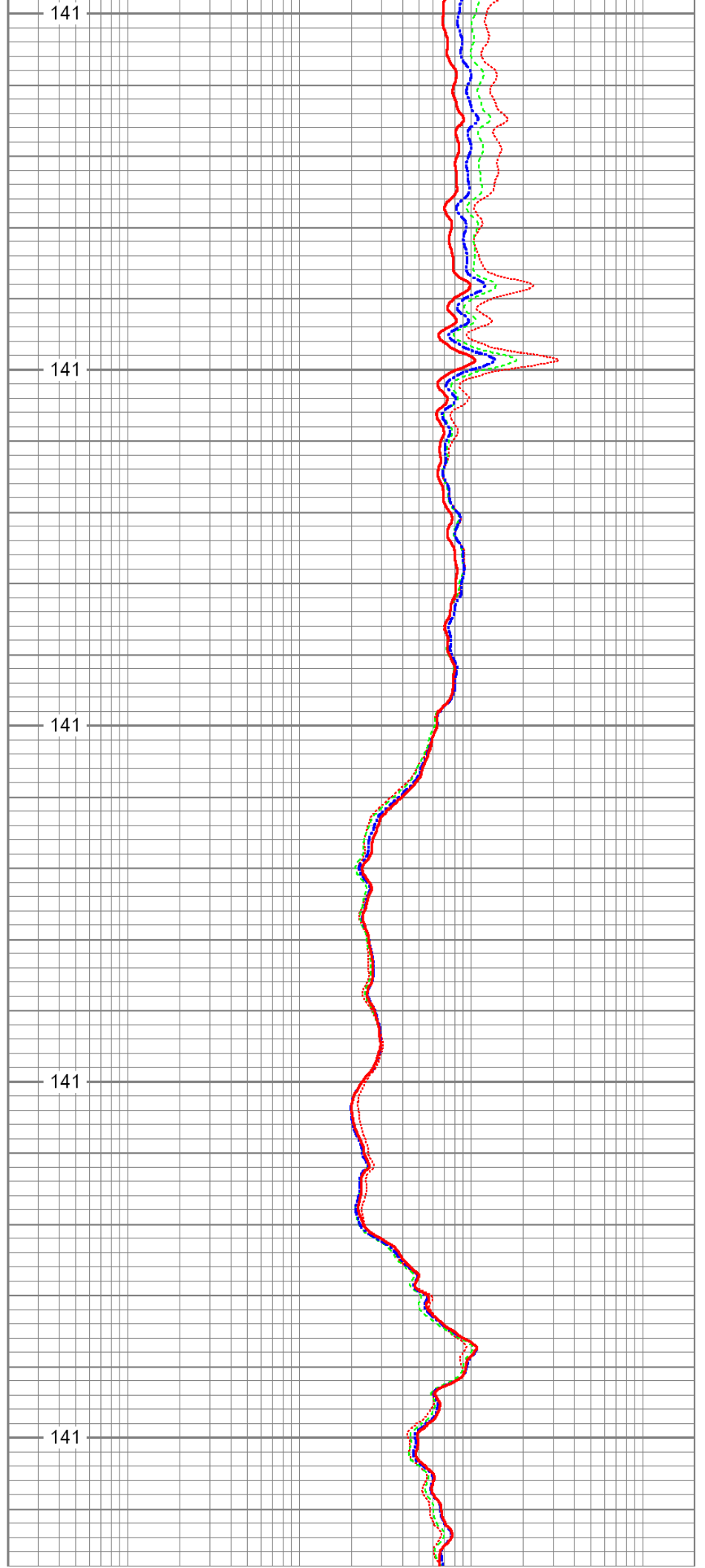
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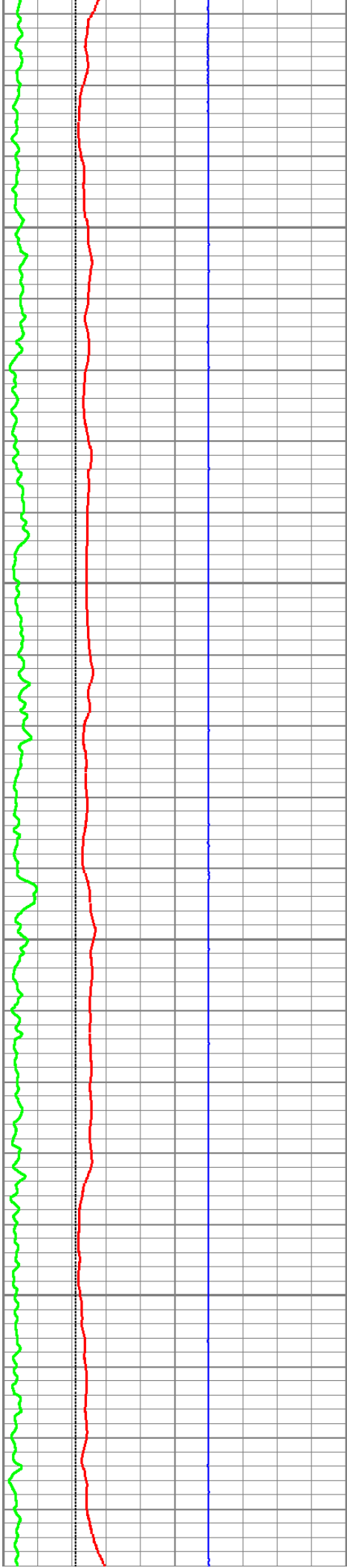
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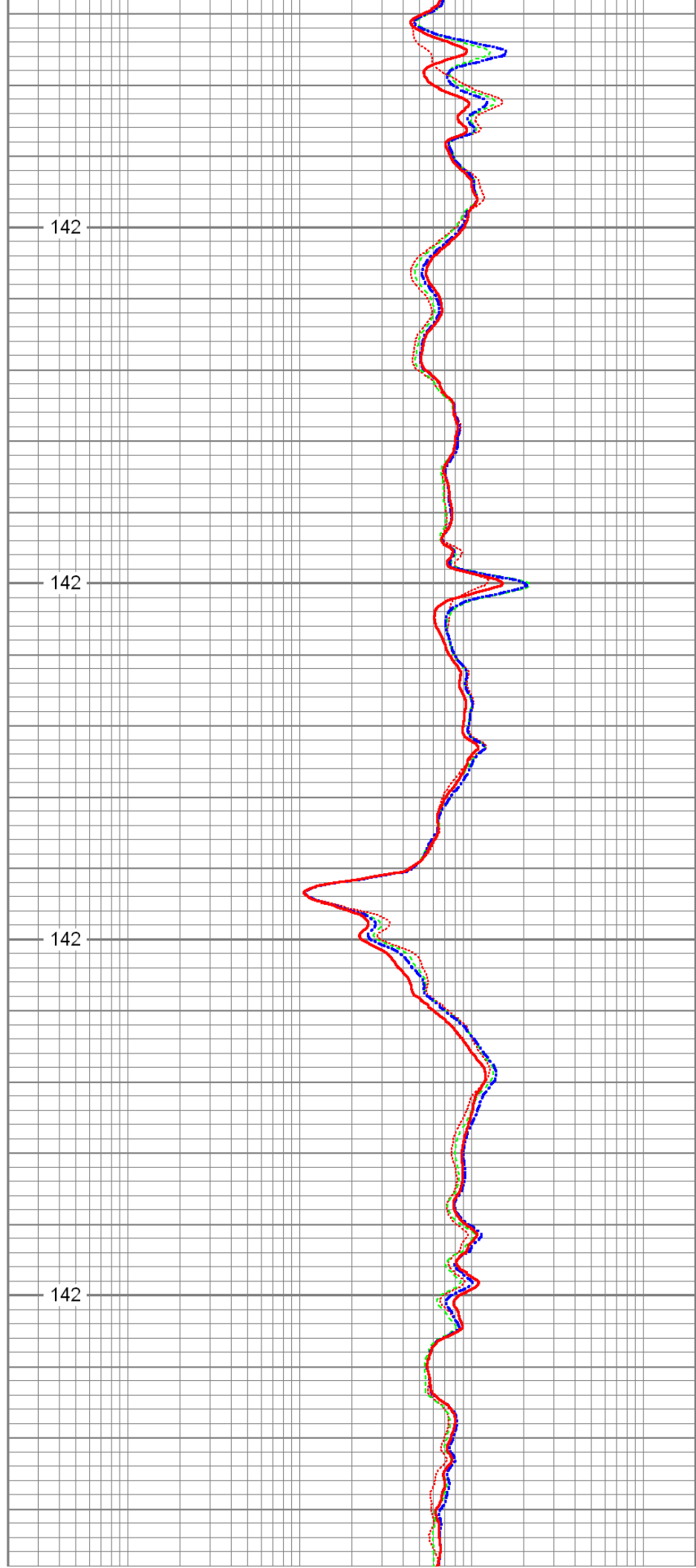
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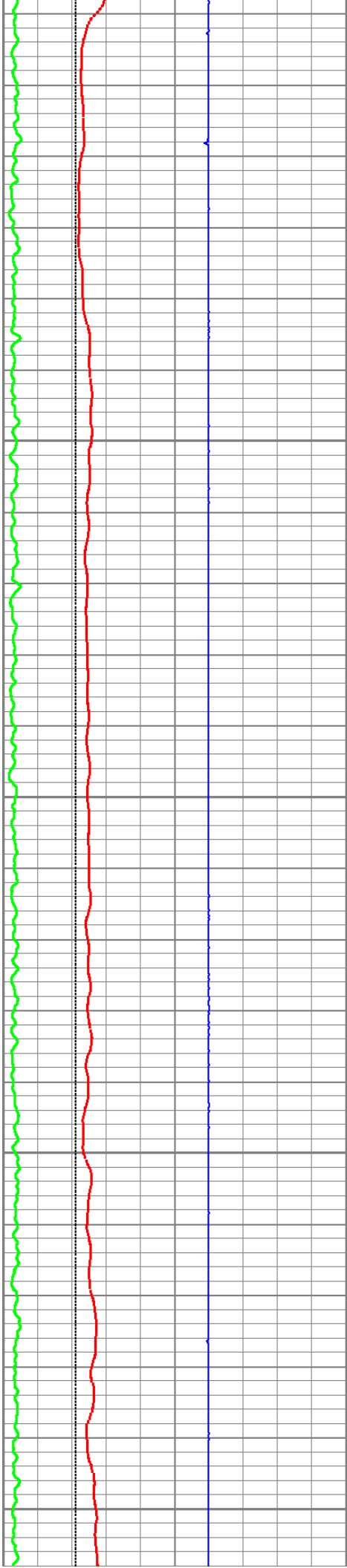
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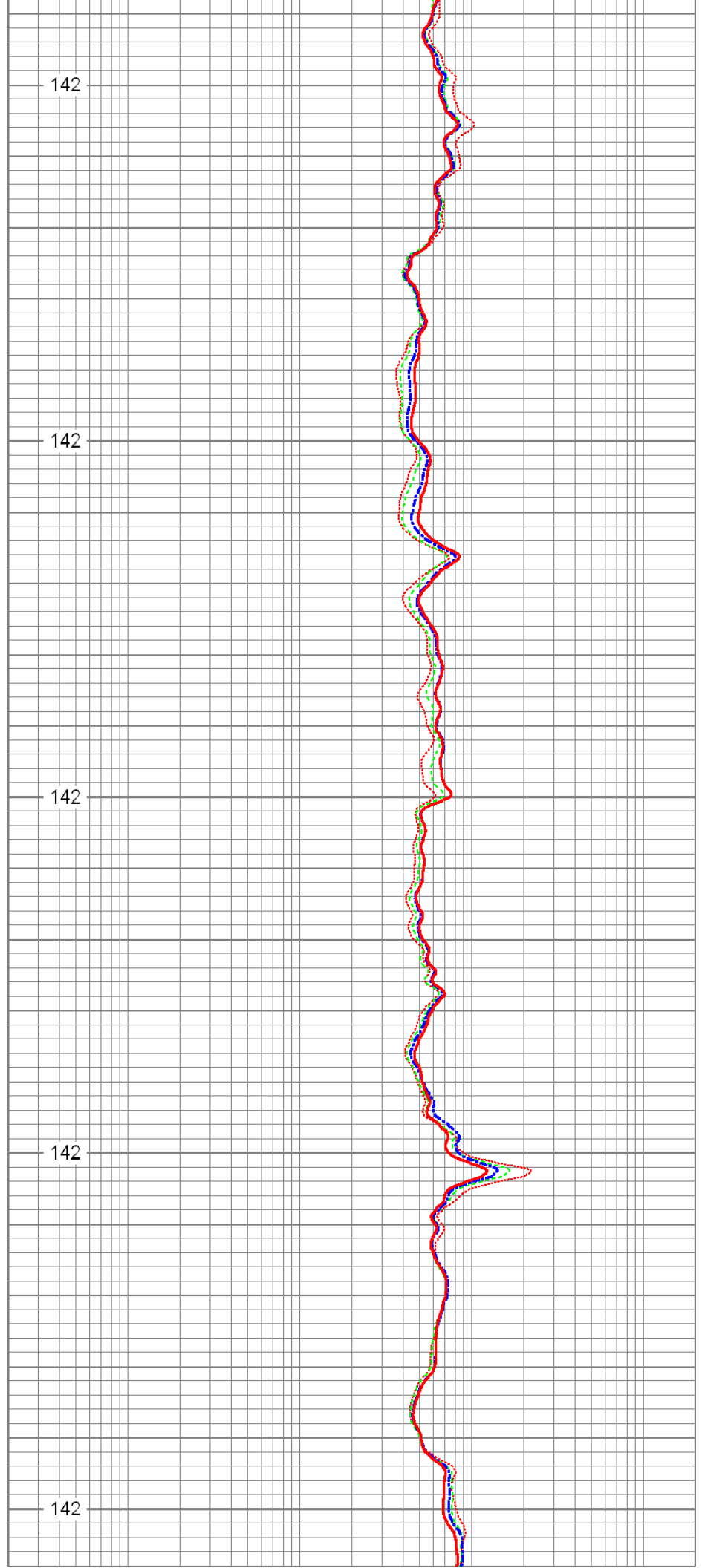
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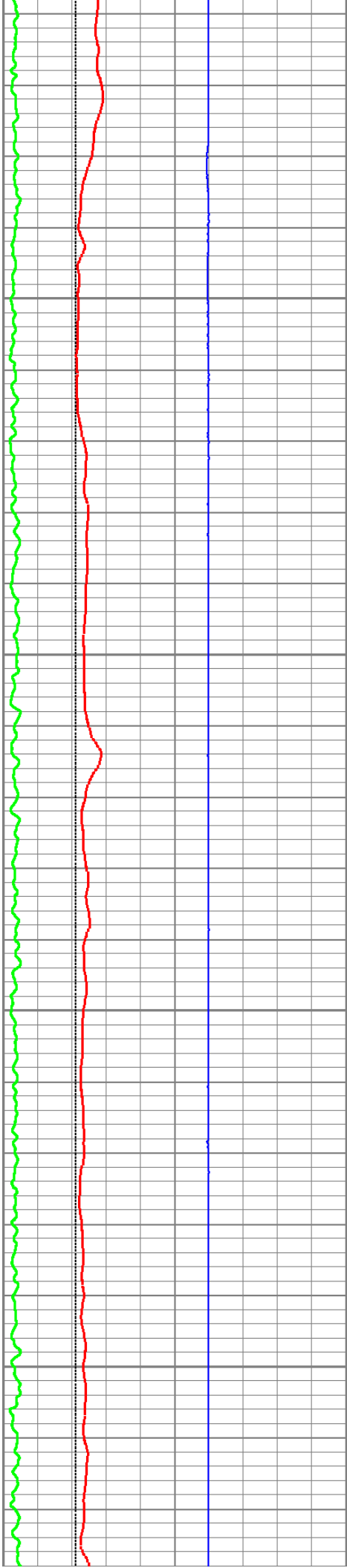
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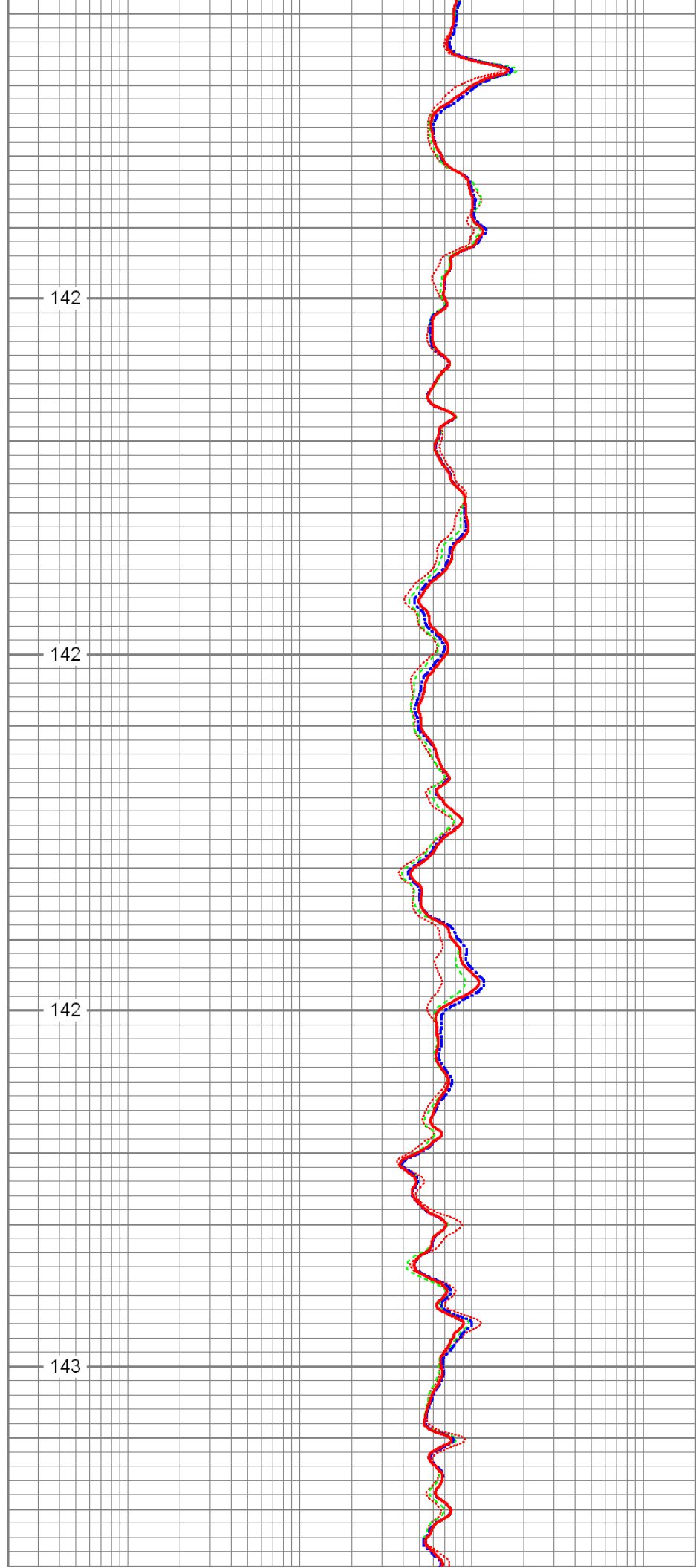
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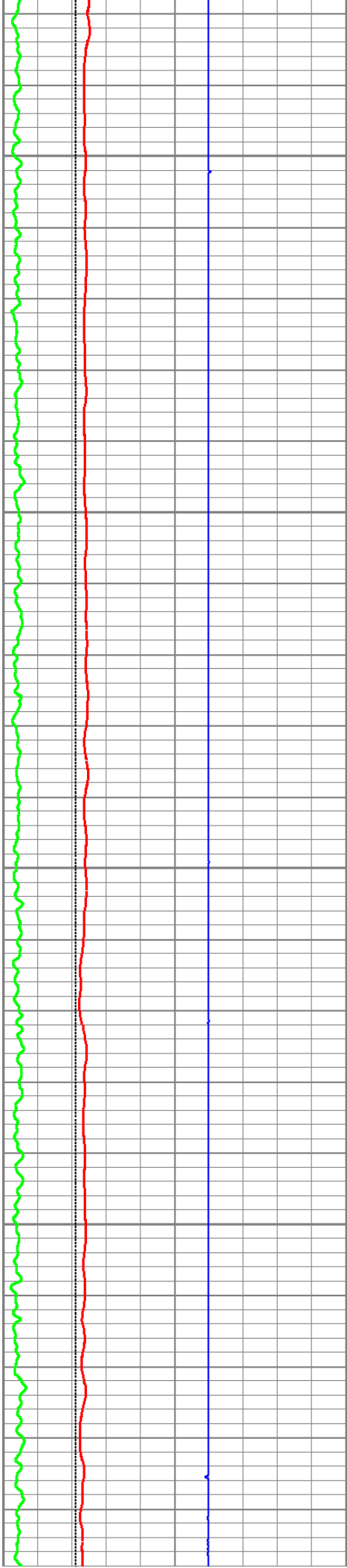
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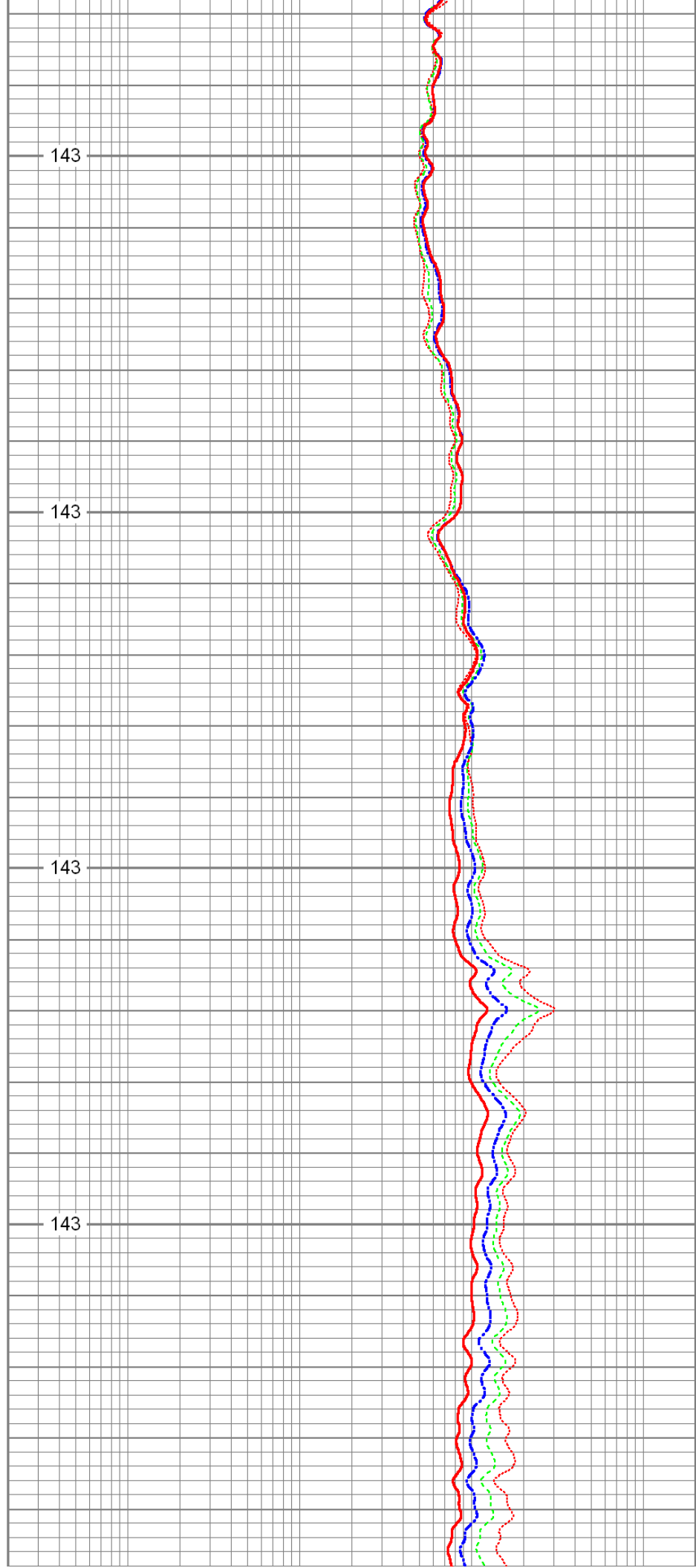
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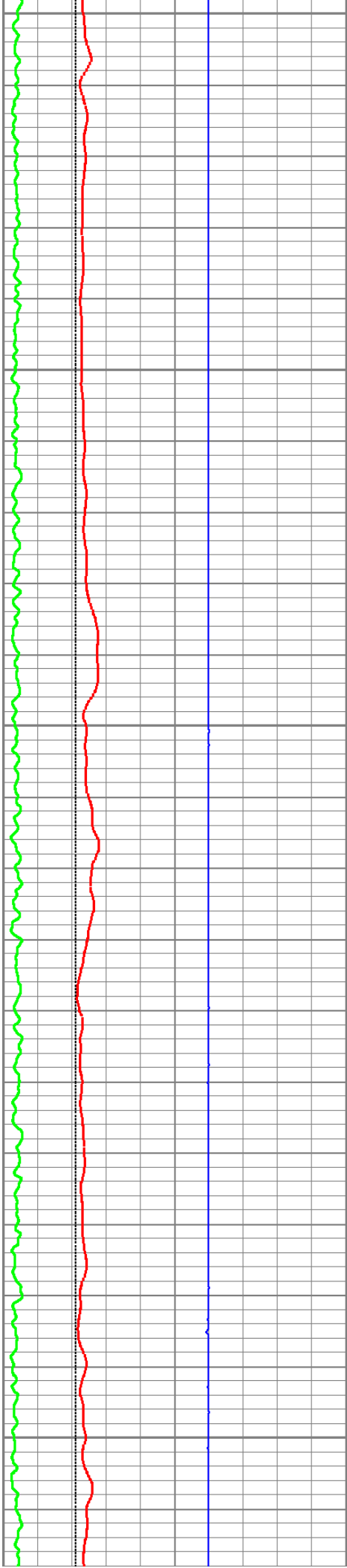
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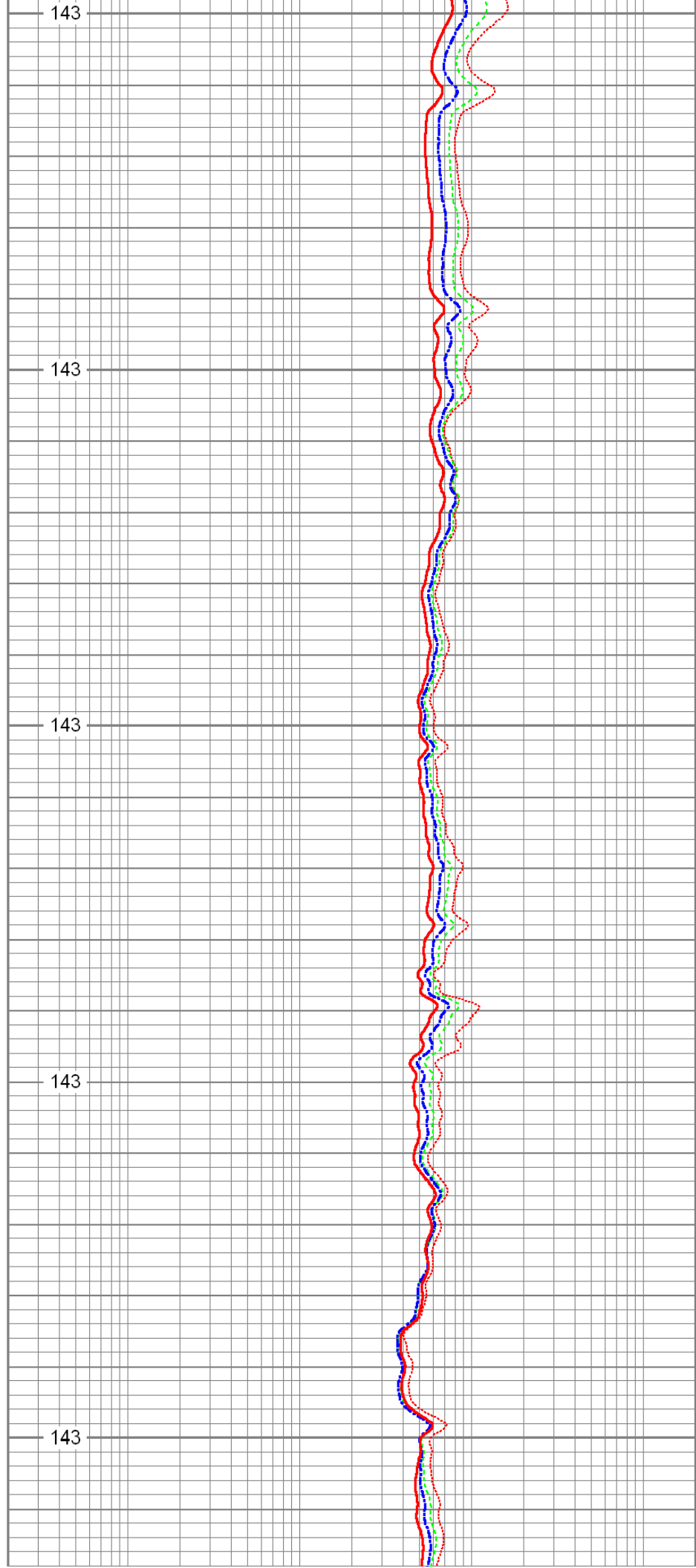
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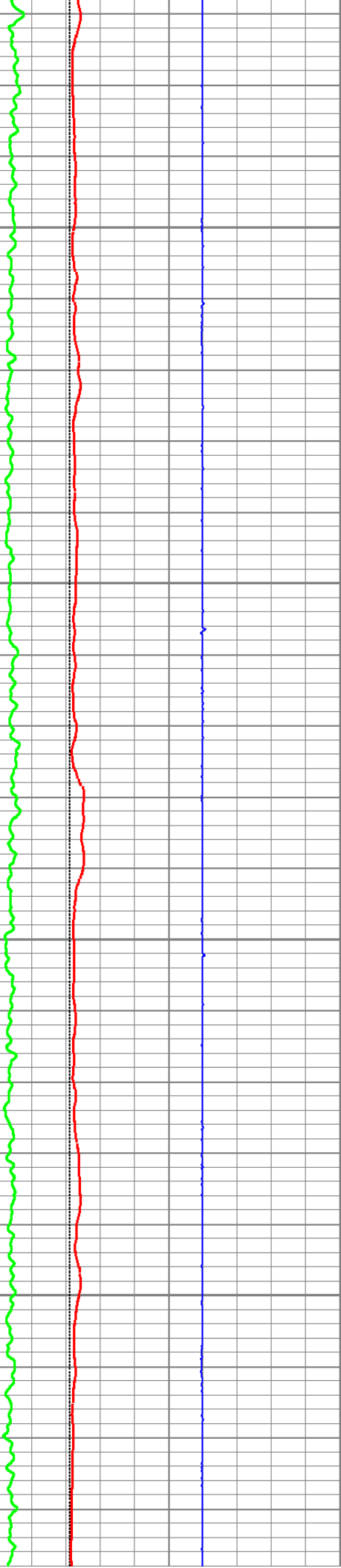
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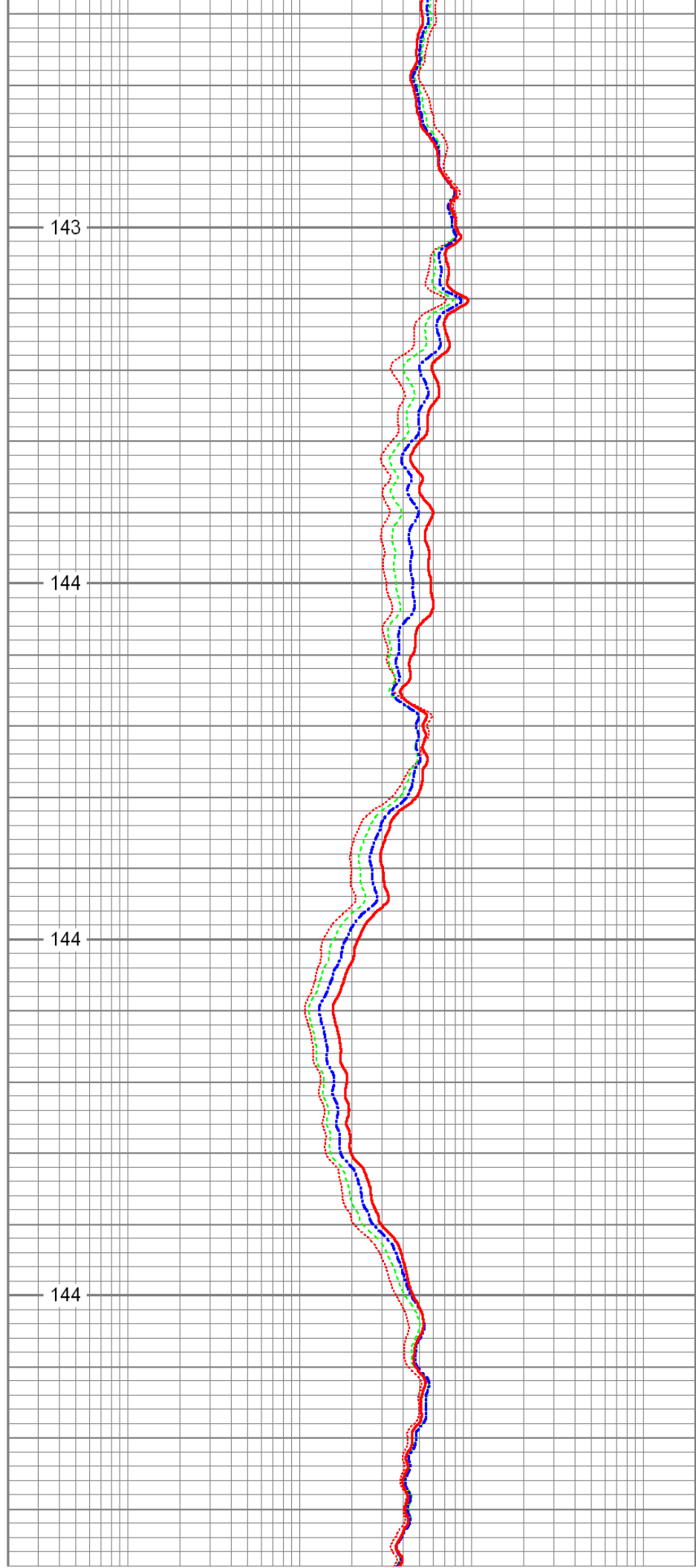
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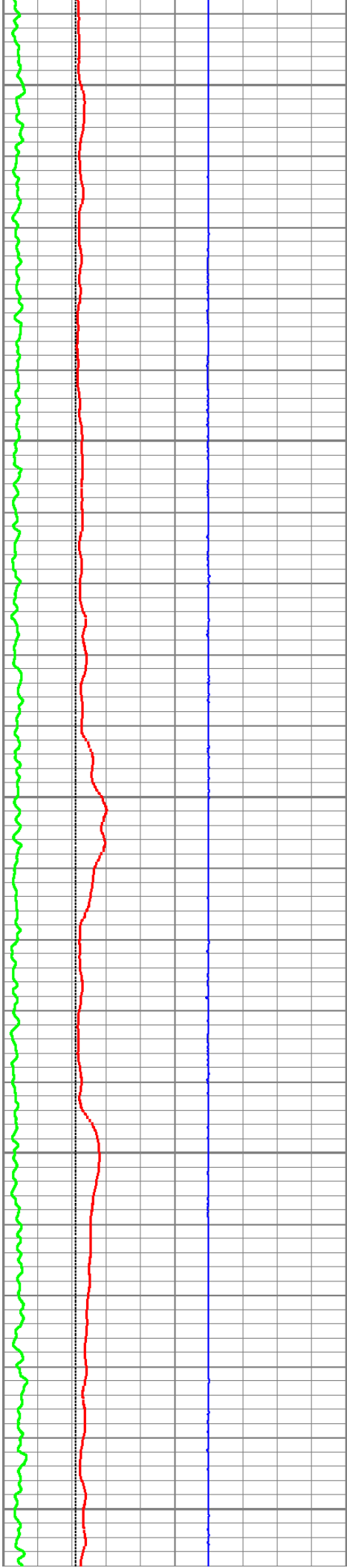
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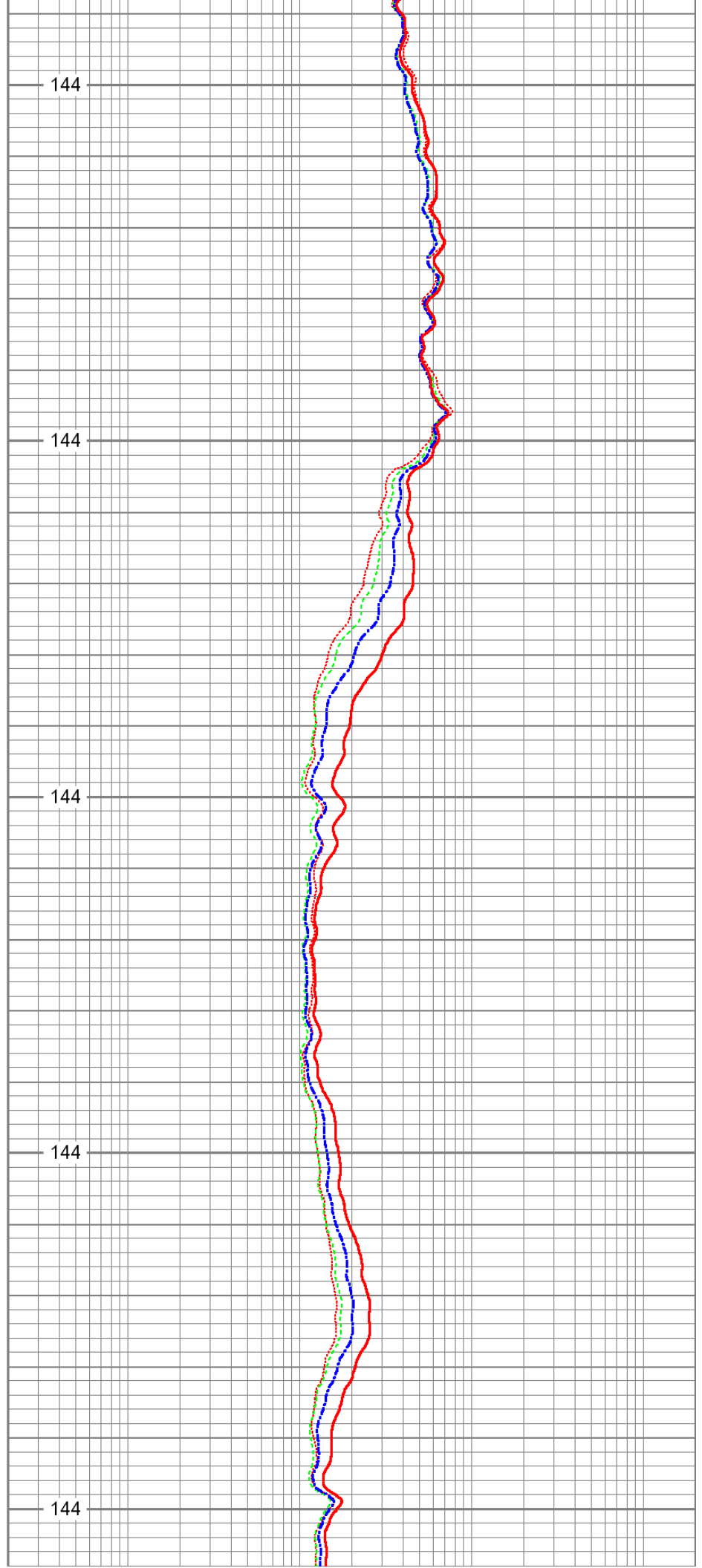
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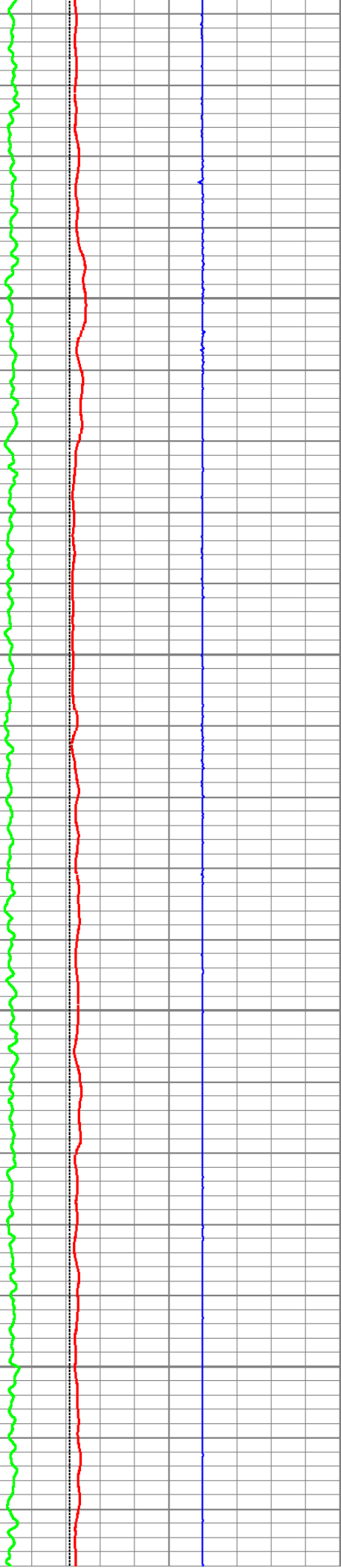
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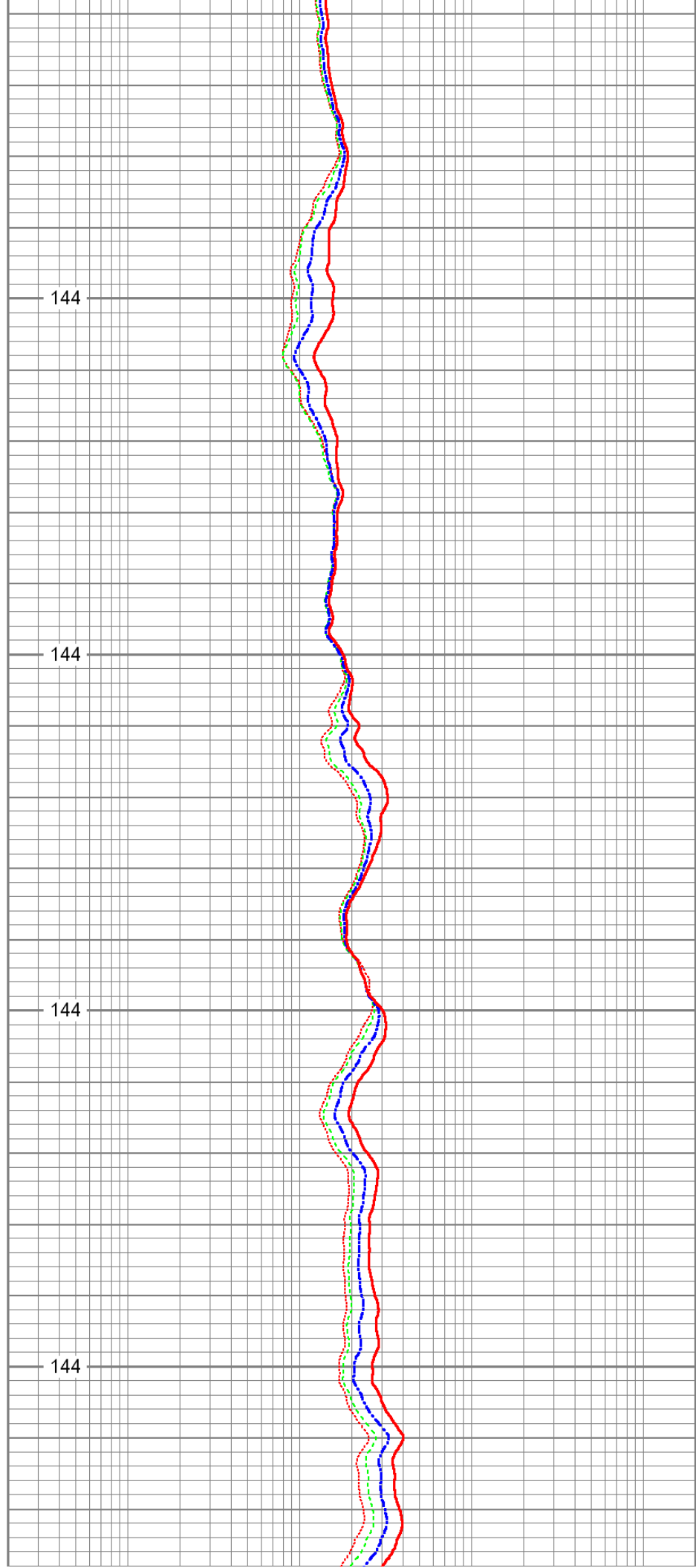
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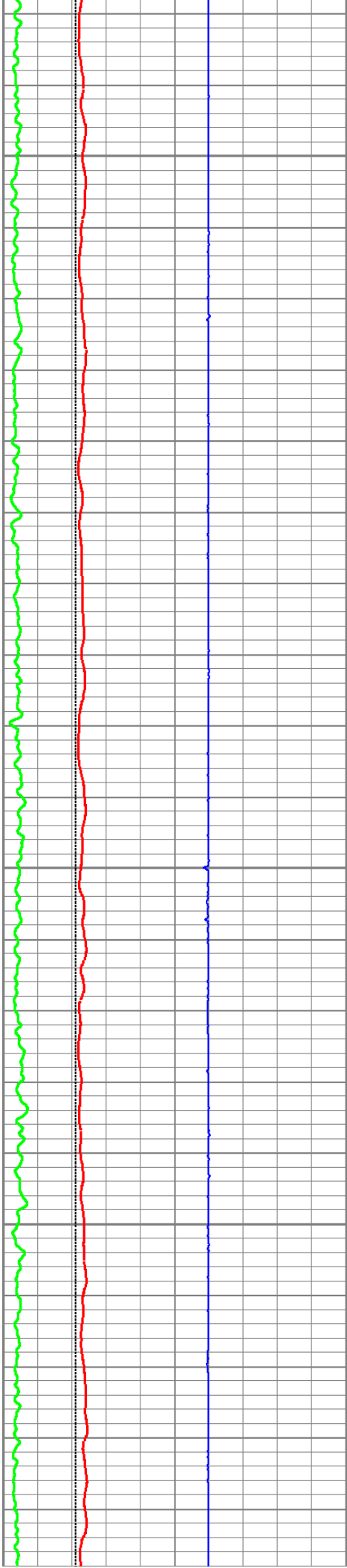
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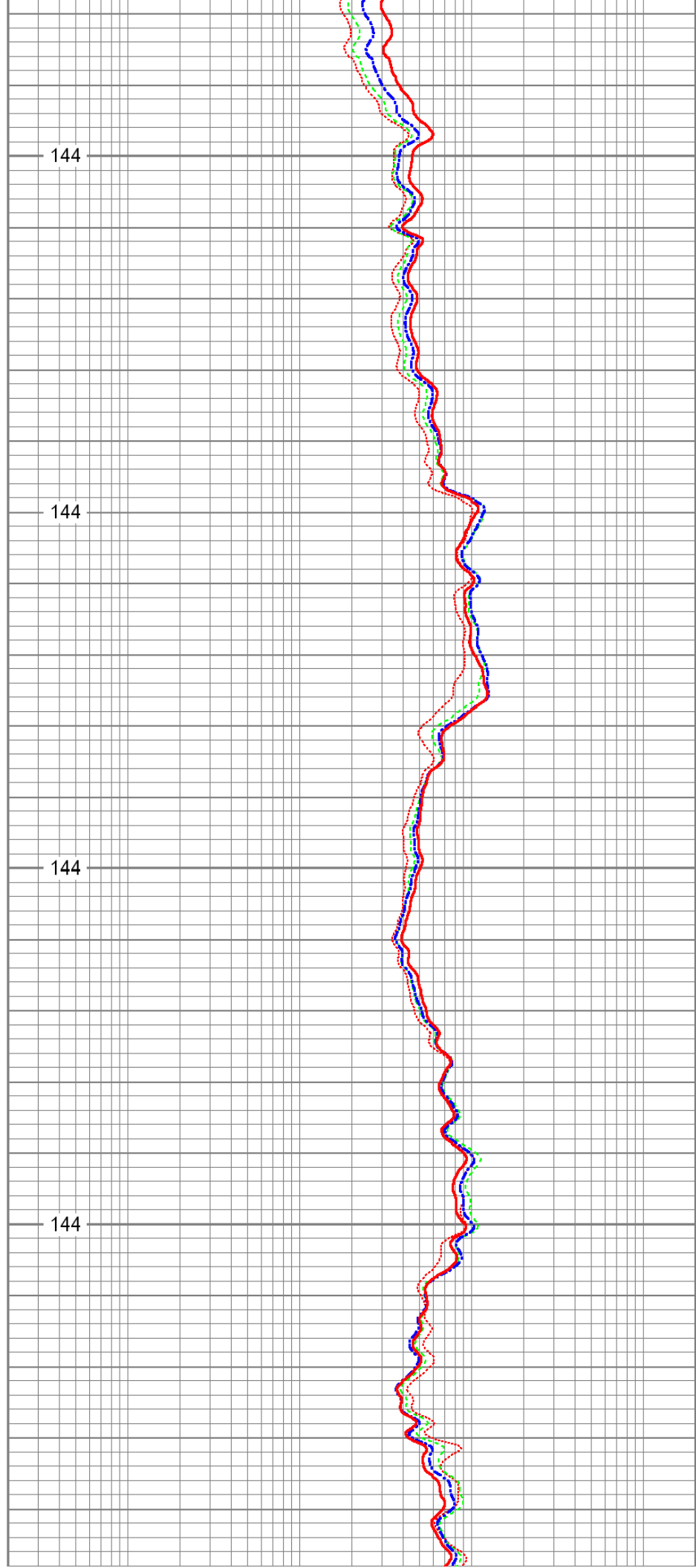
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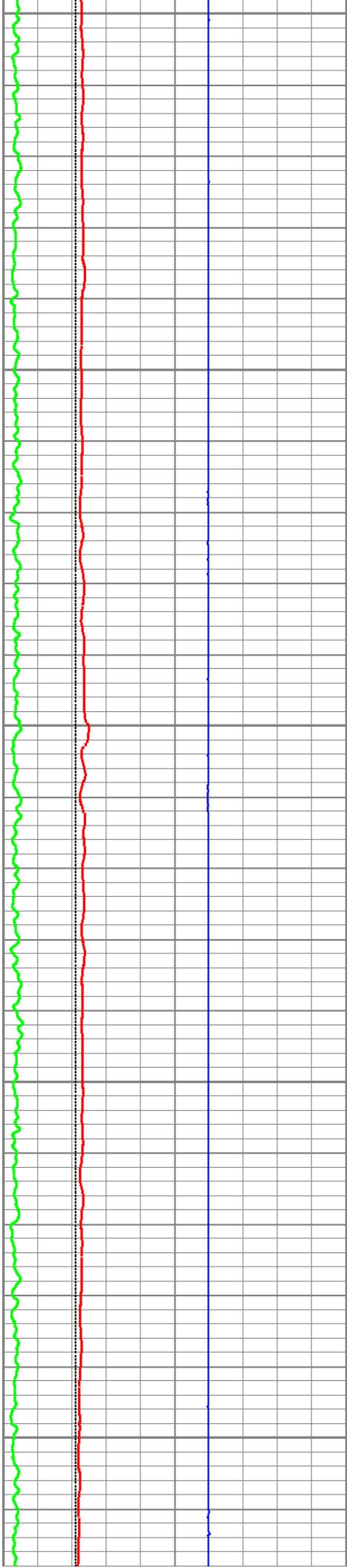
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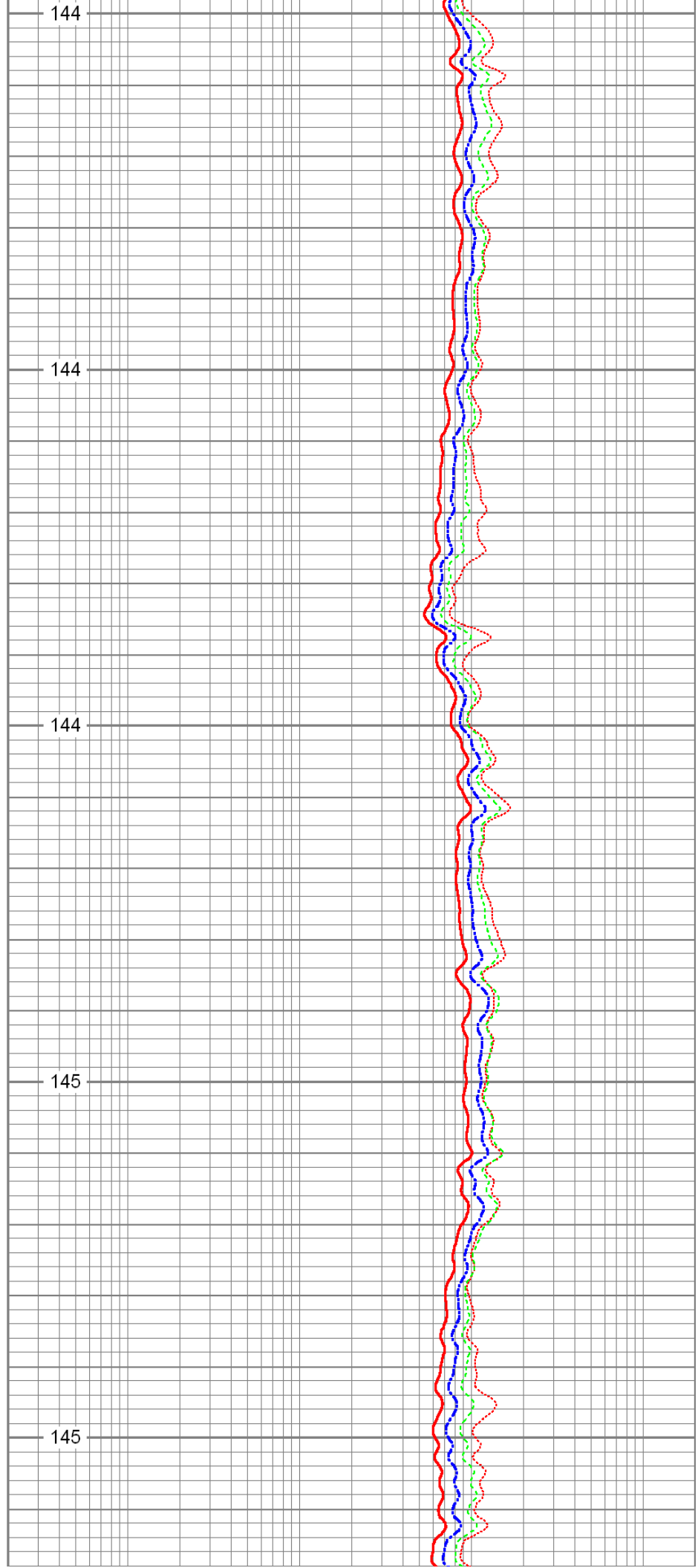
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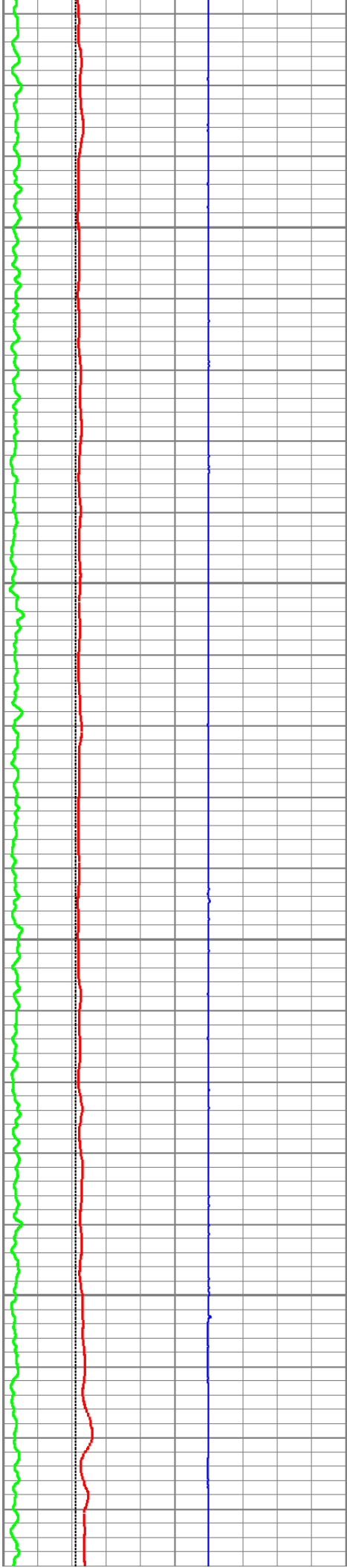
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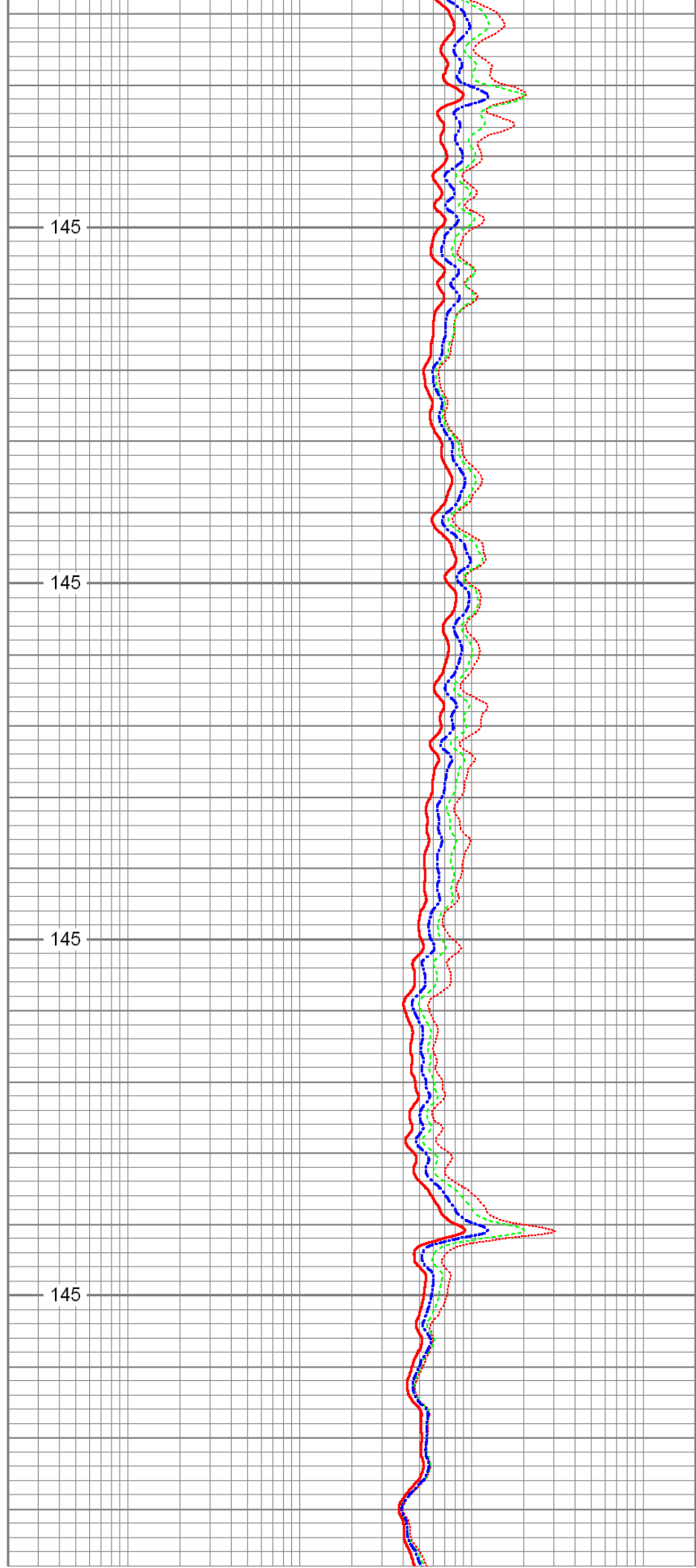
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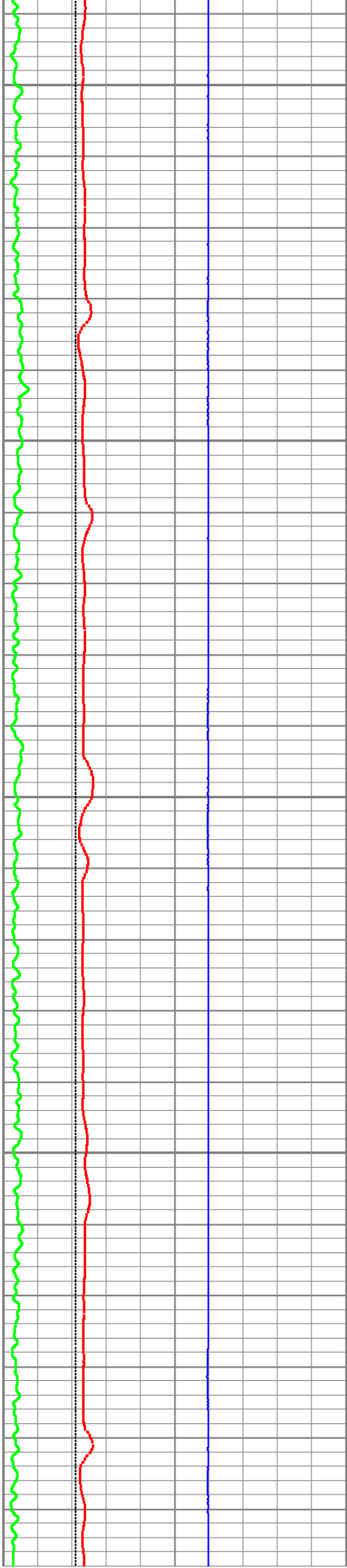
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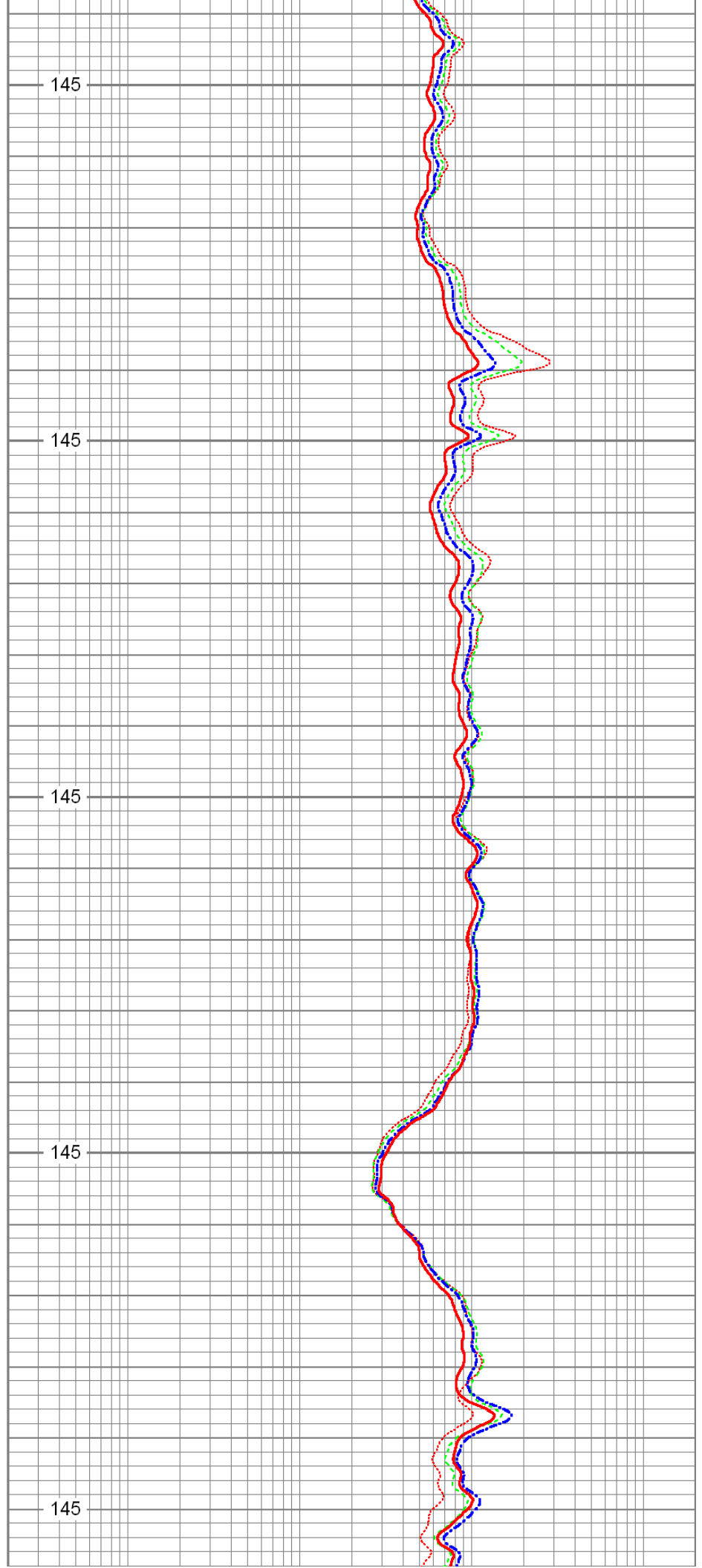
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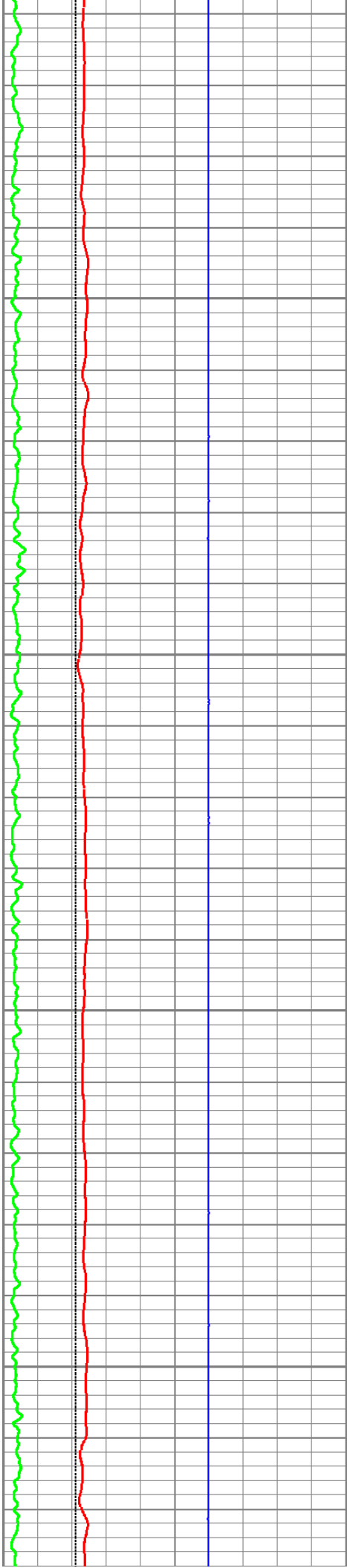
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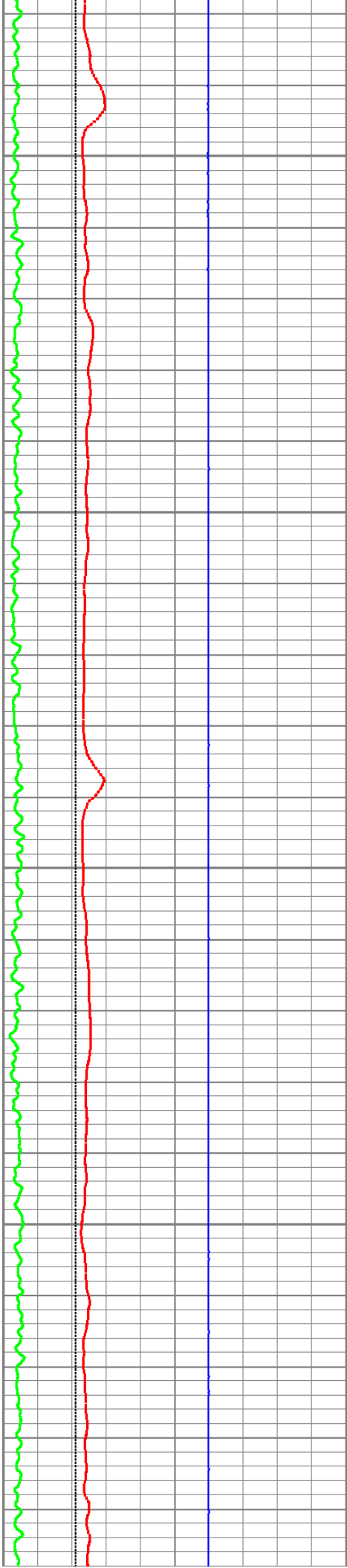
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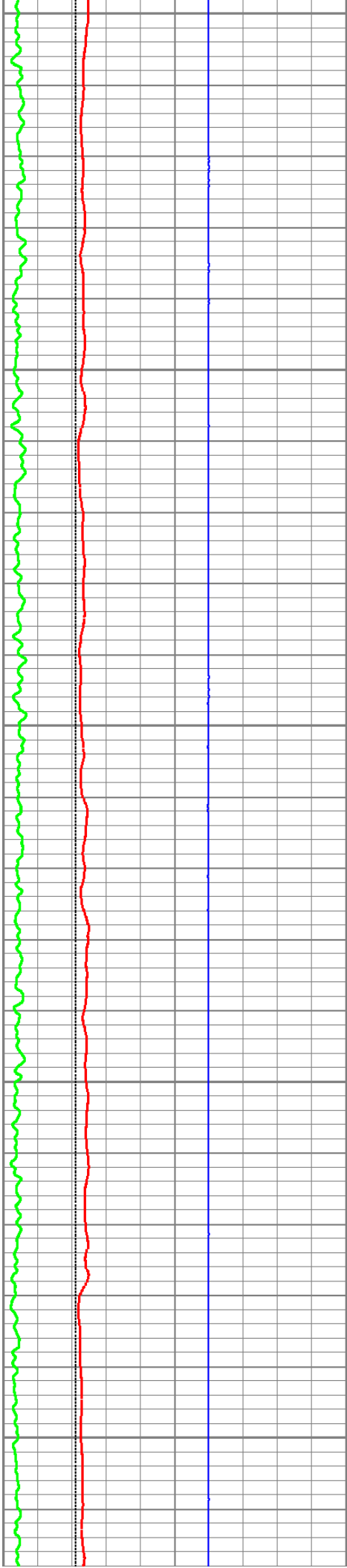
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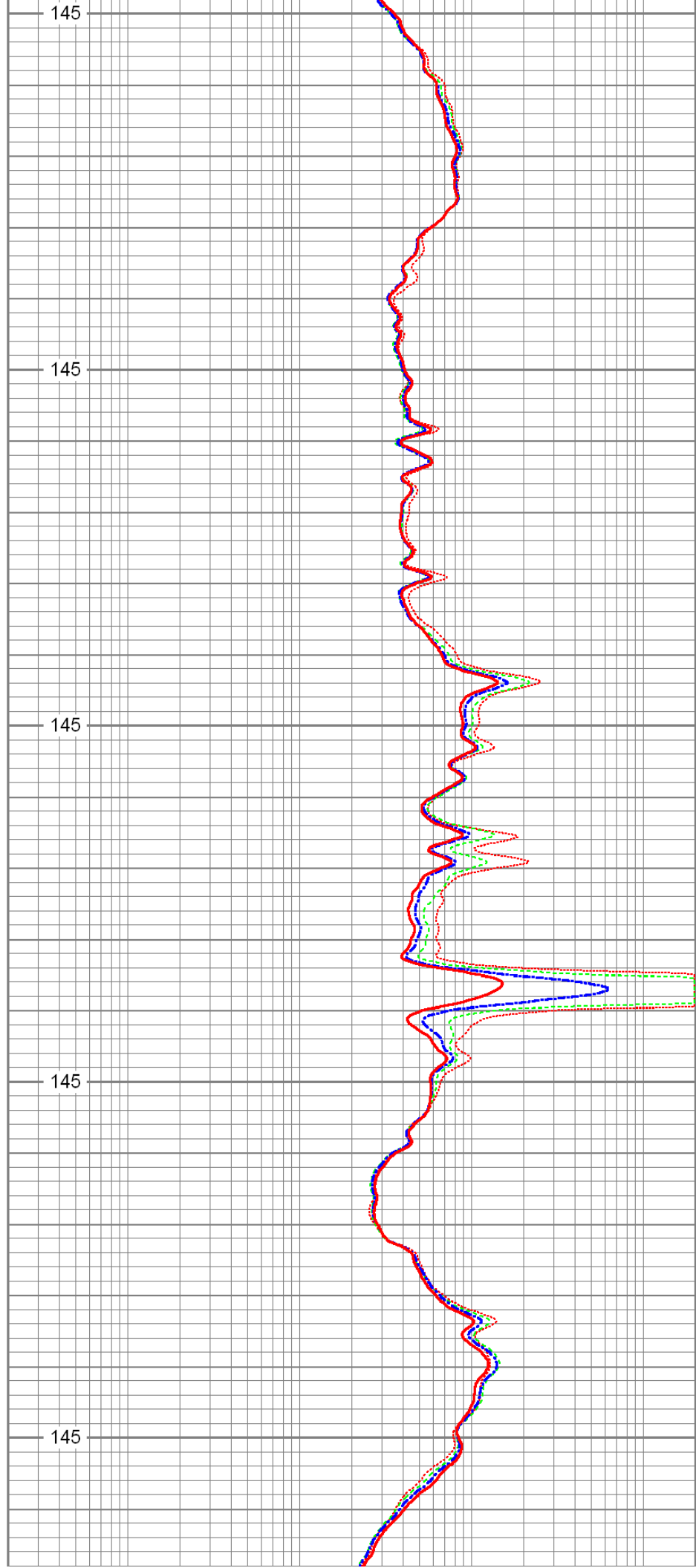
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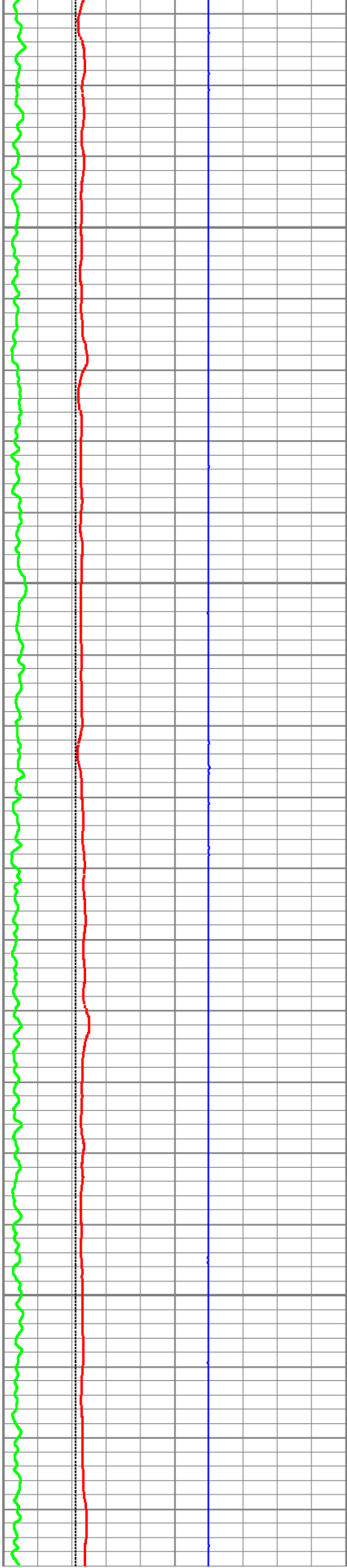
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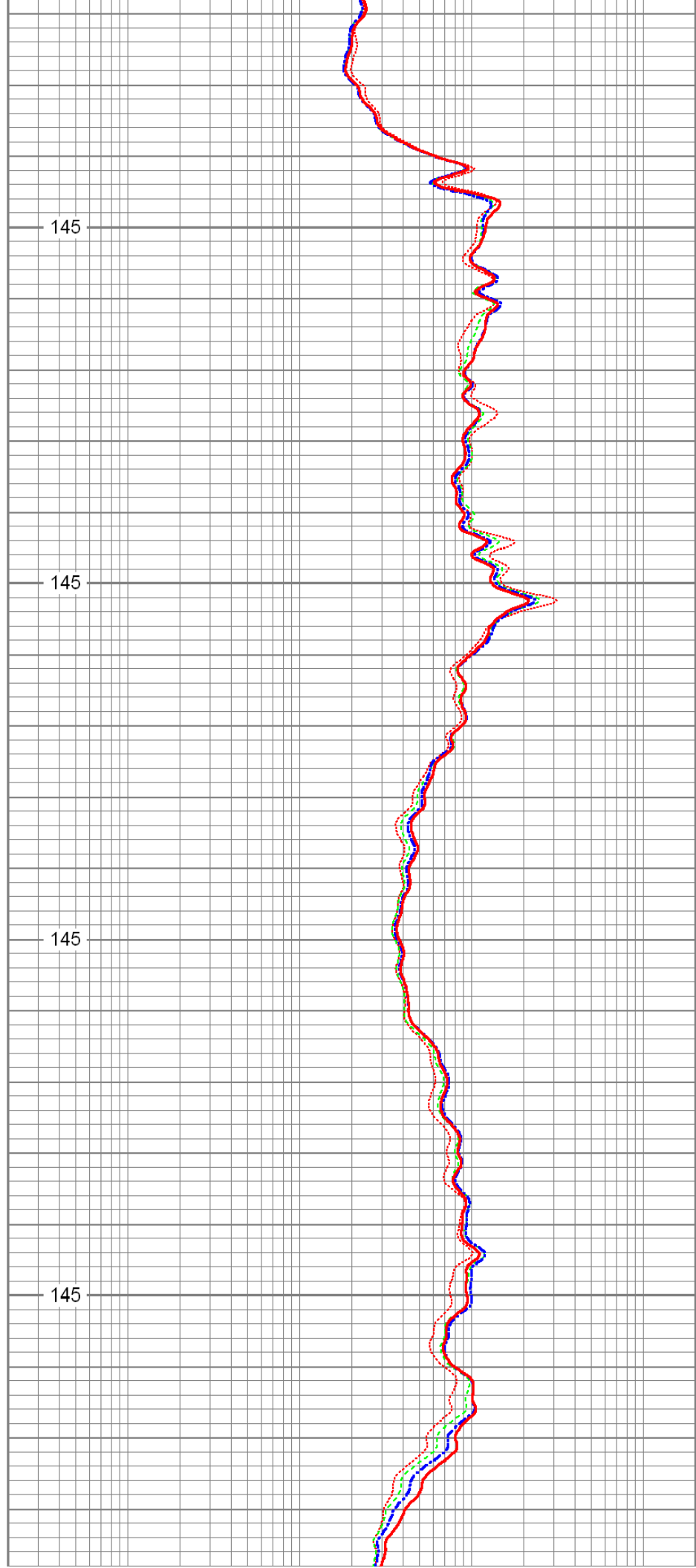
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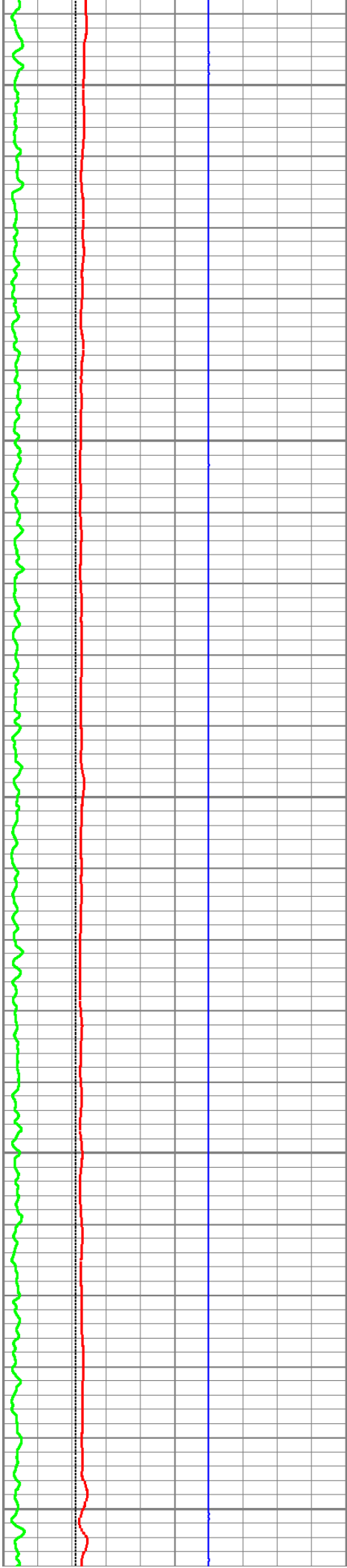
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9950

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10050

10100

10150

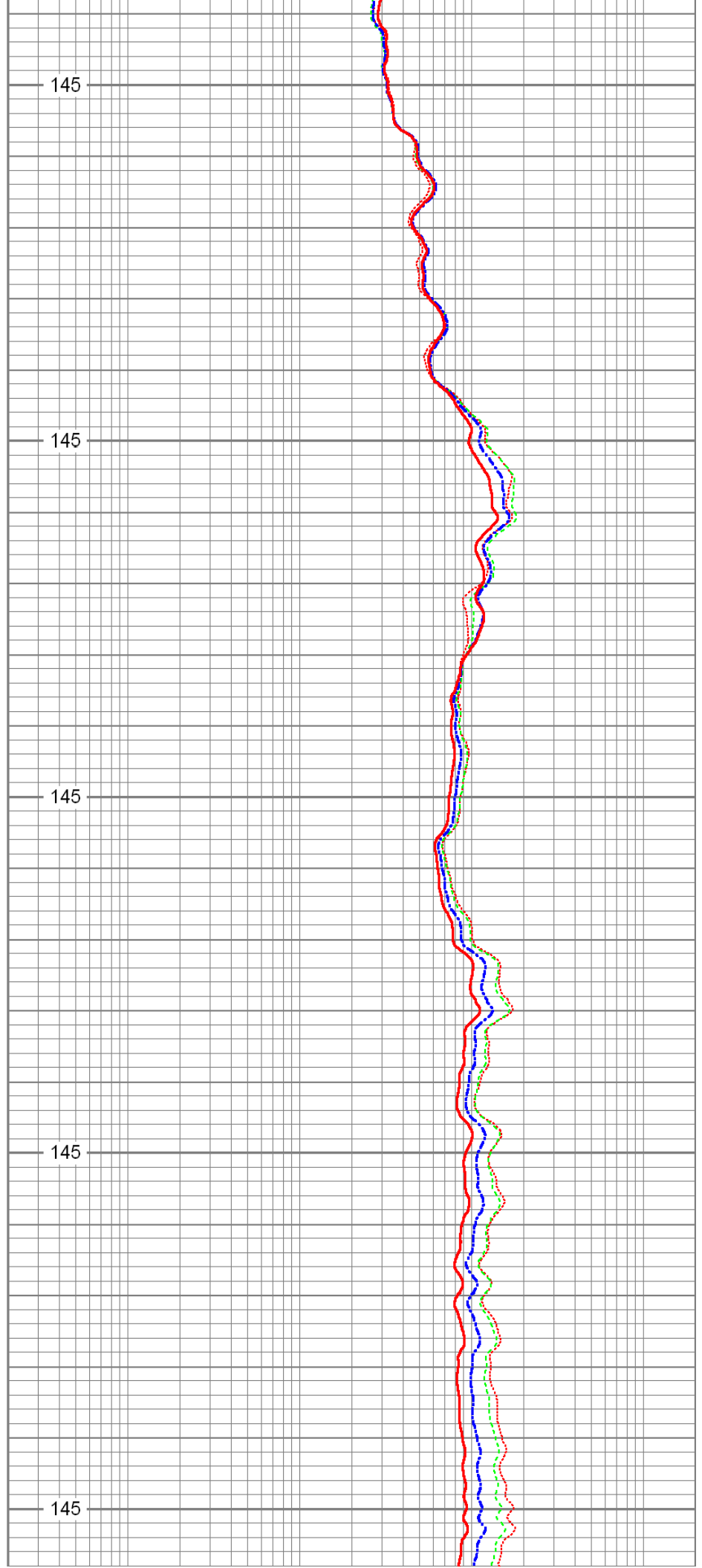
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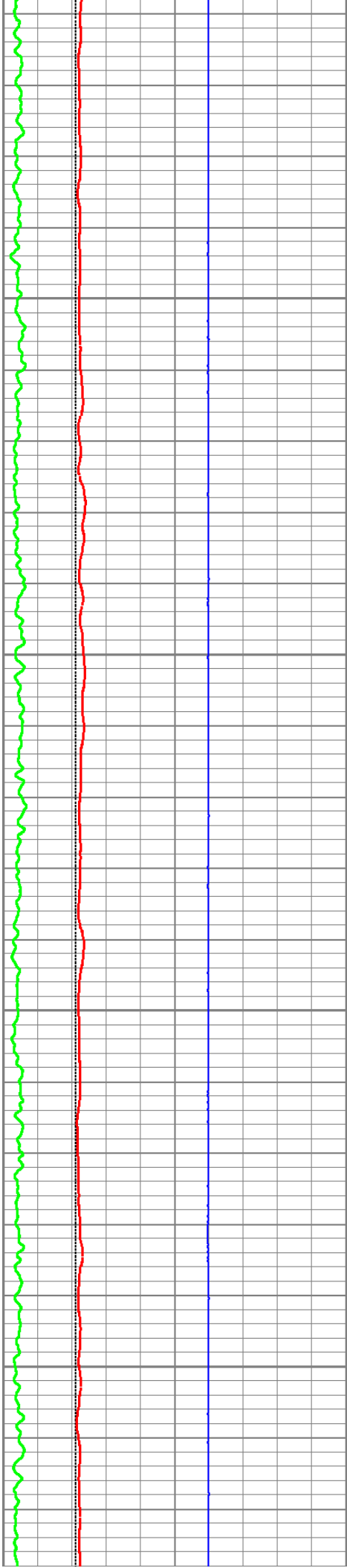
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10250

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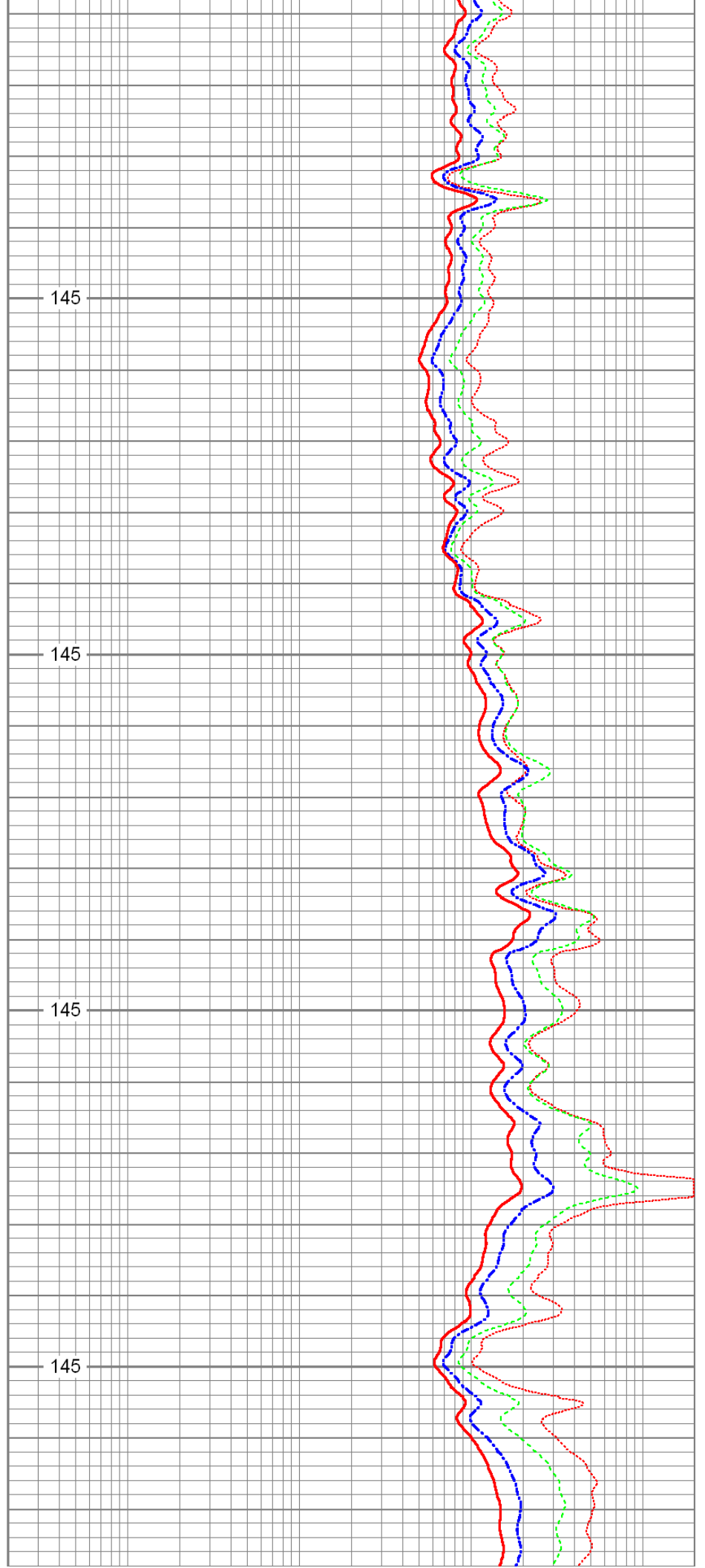
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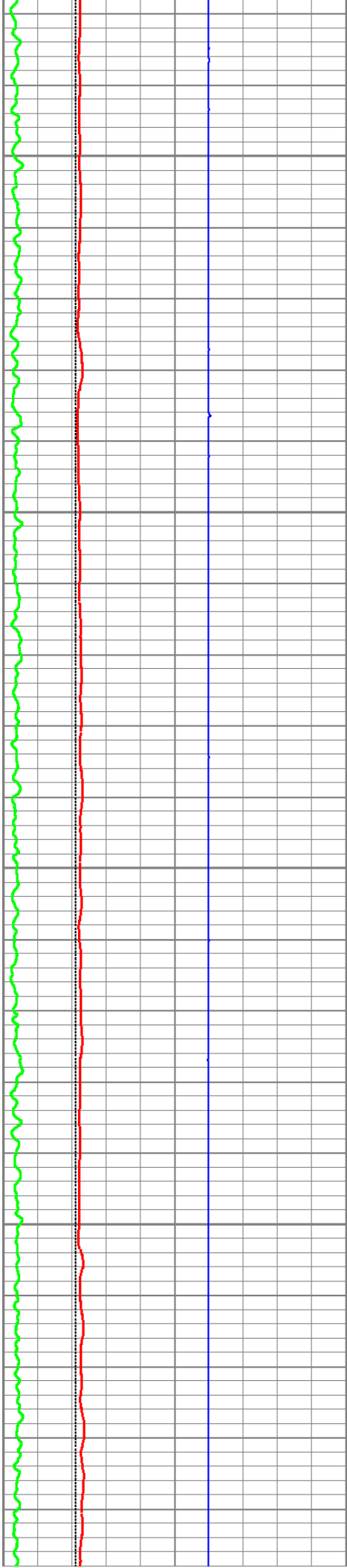
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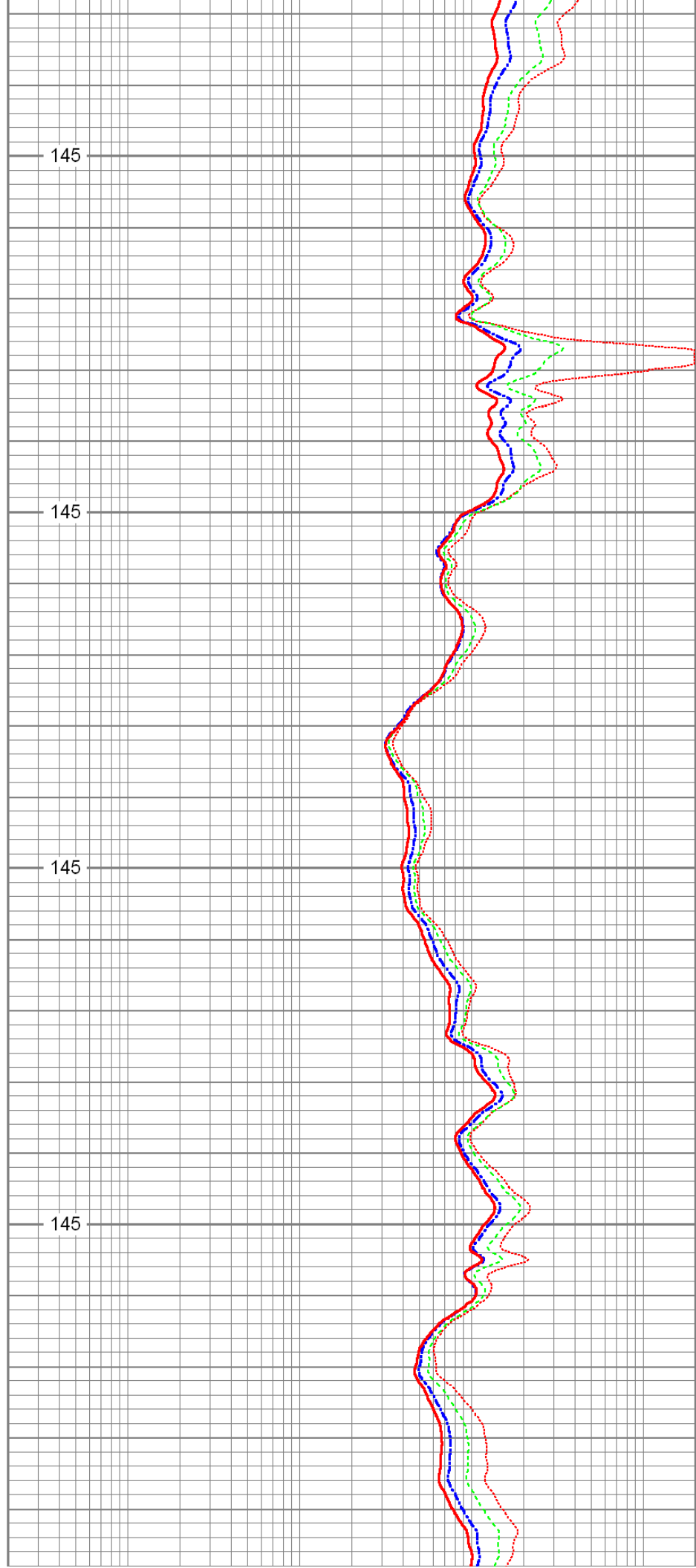
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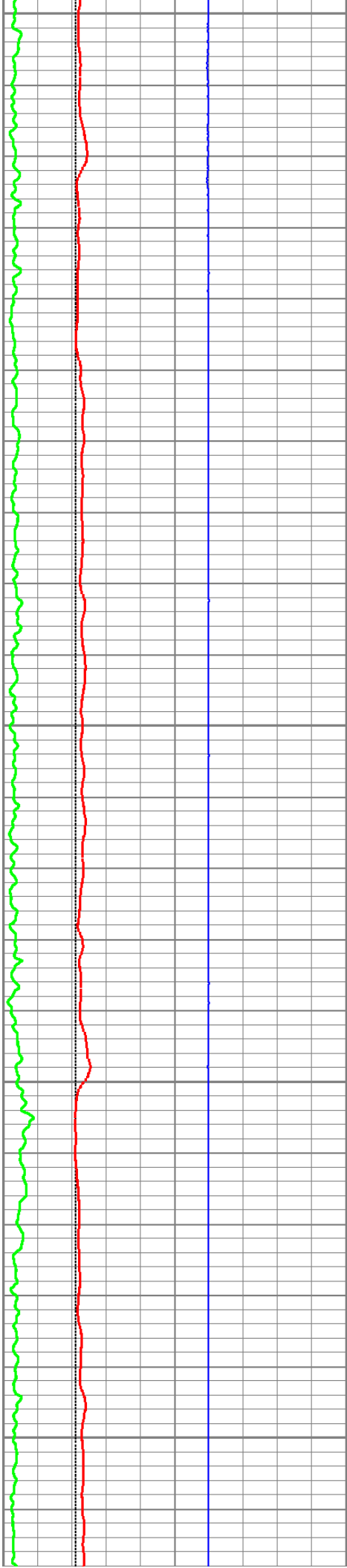
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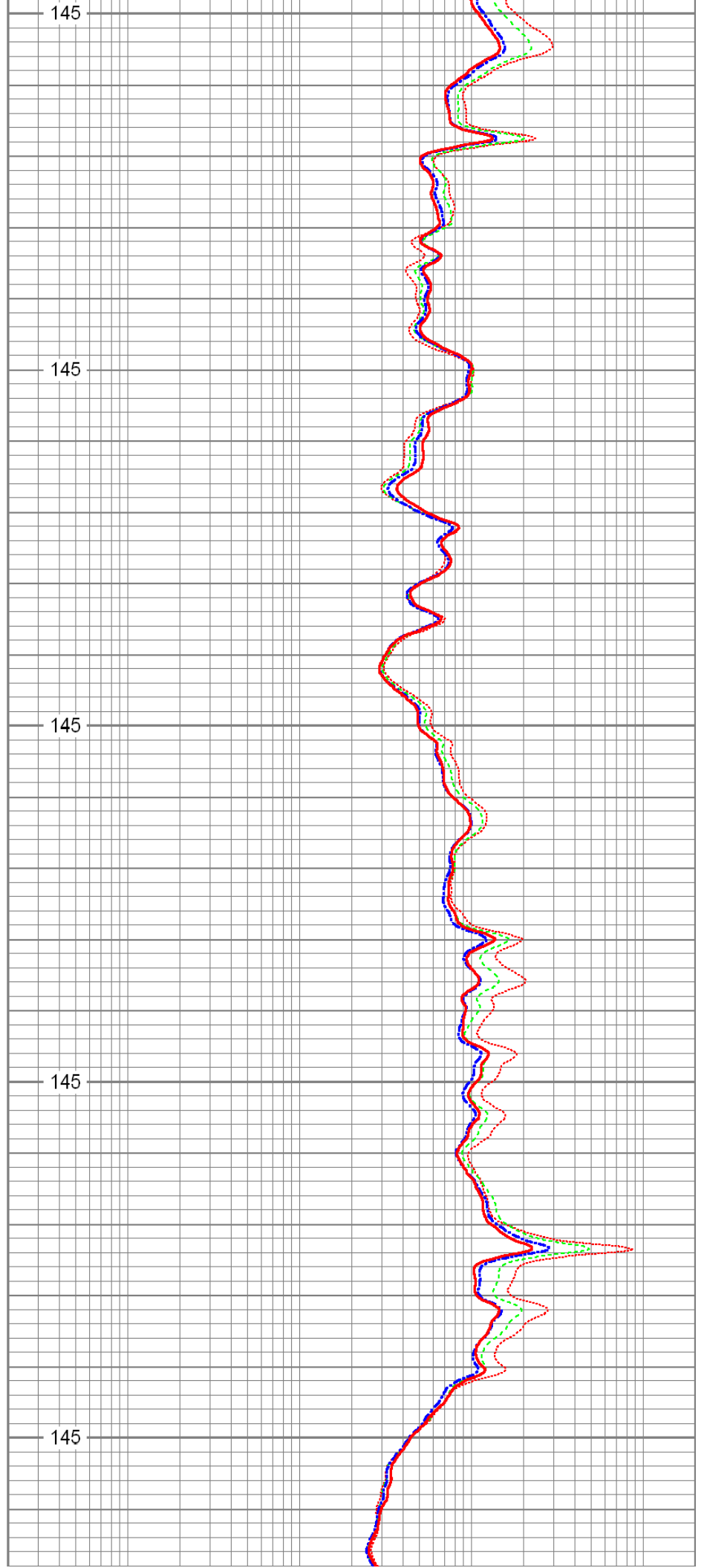
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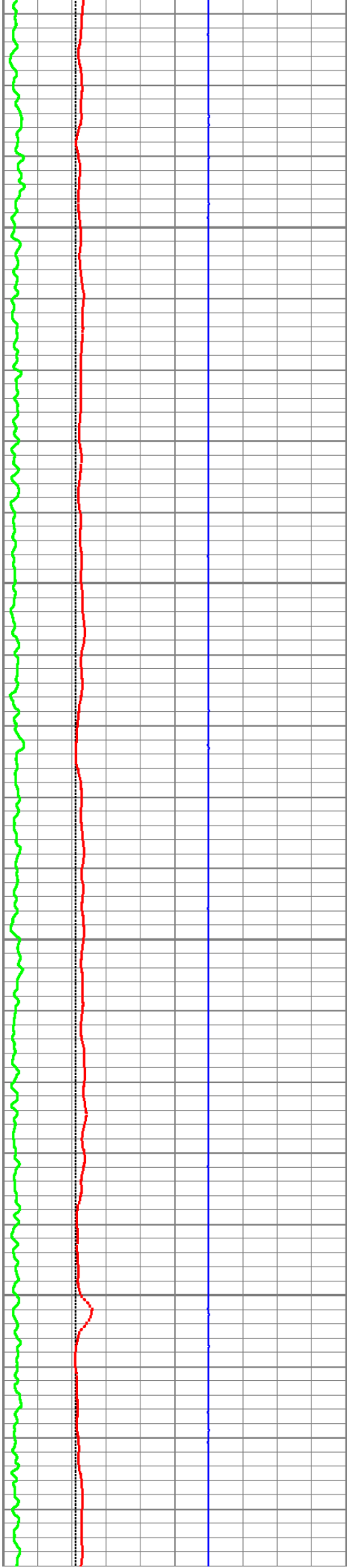
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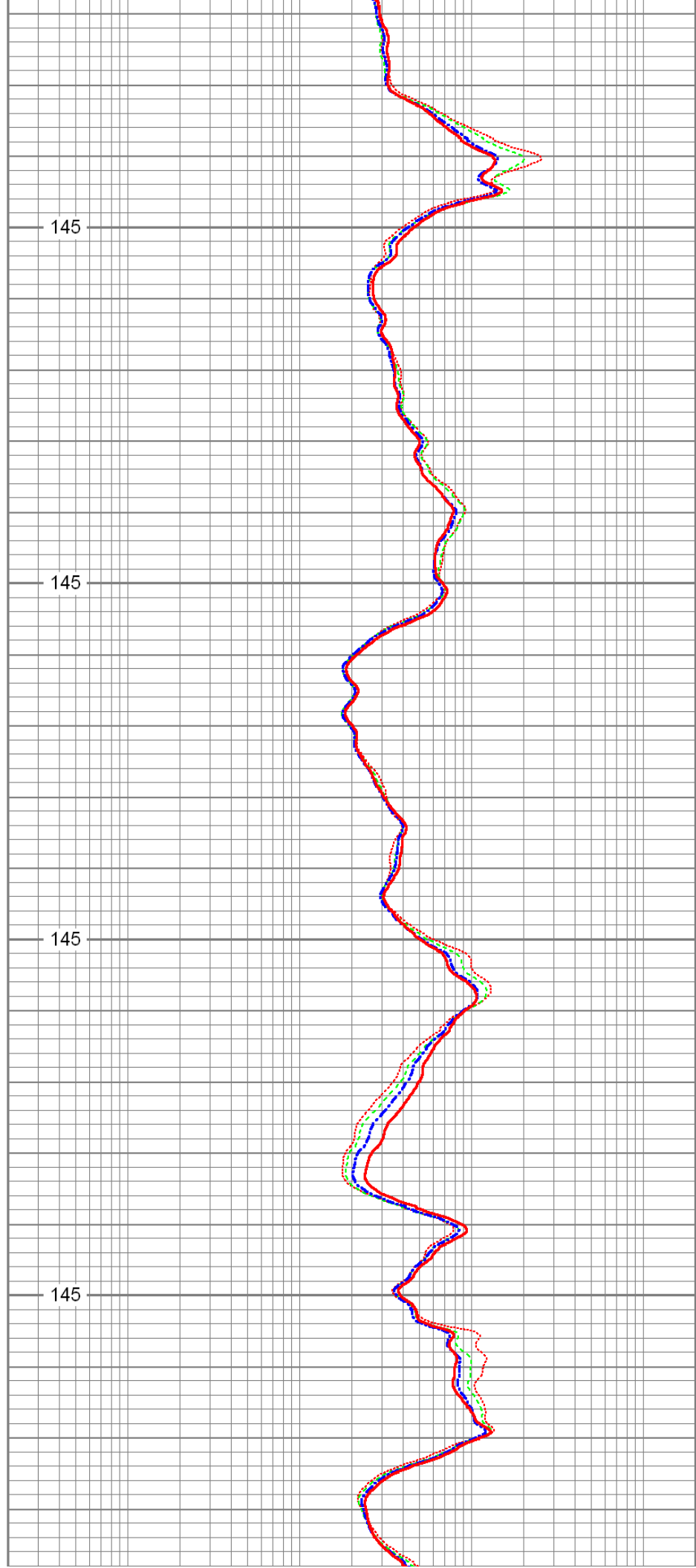
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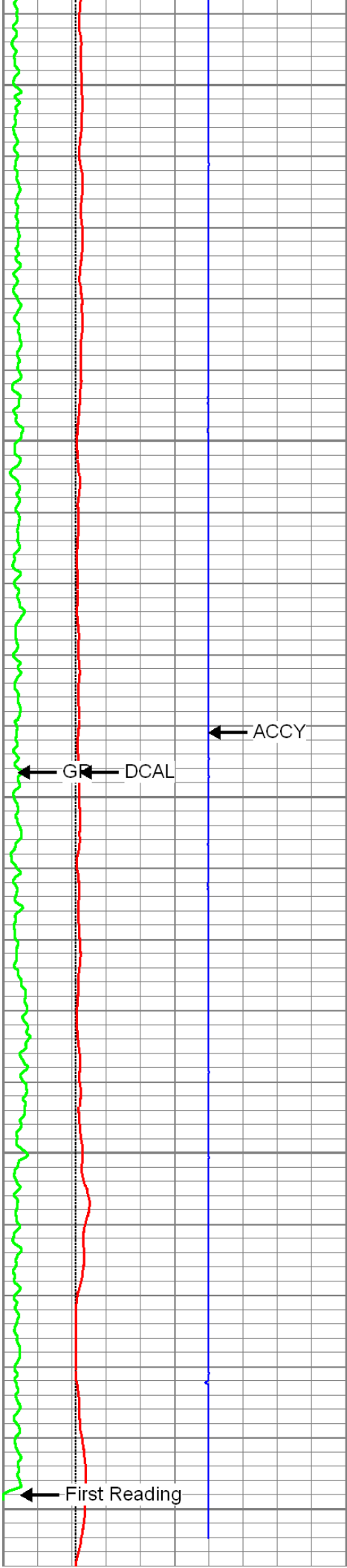
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11150

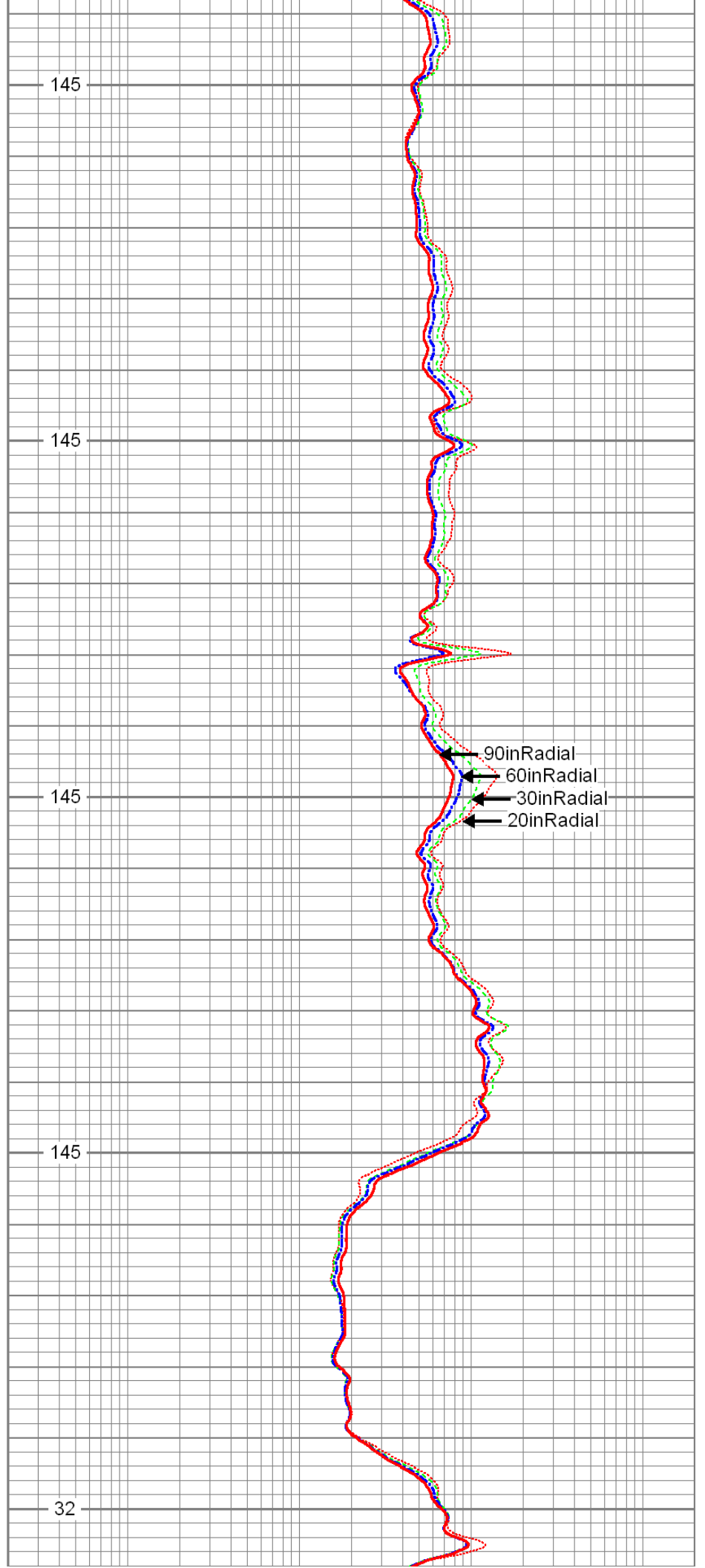
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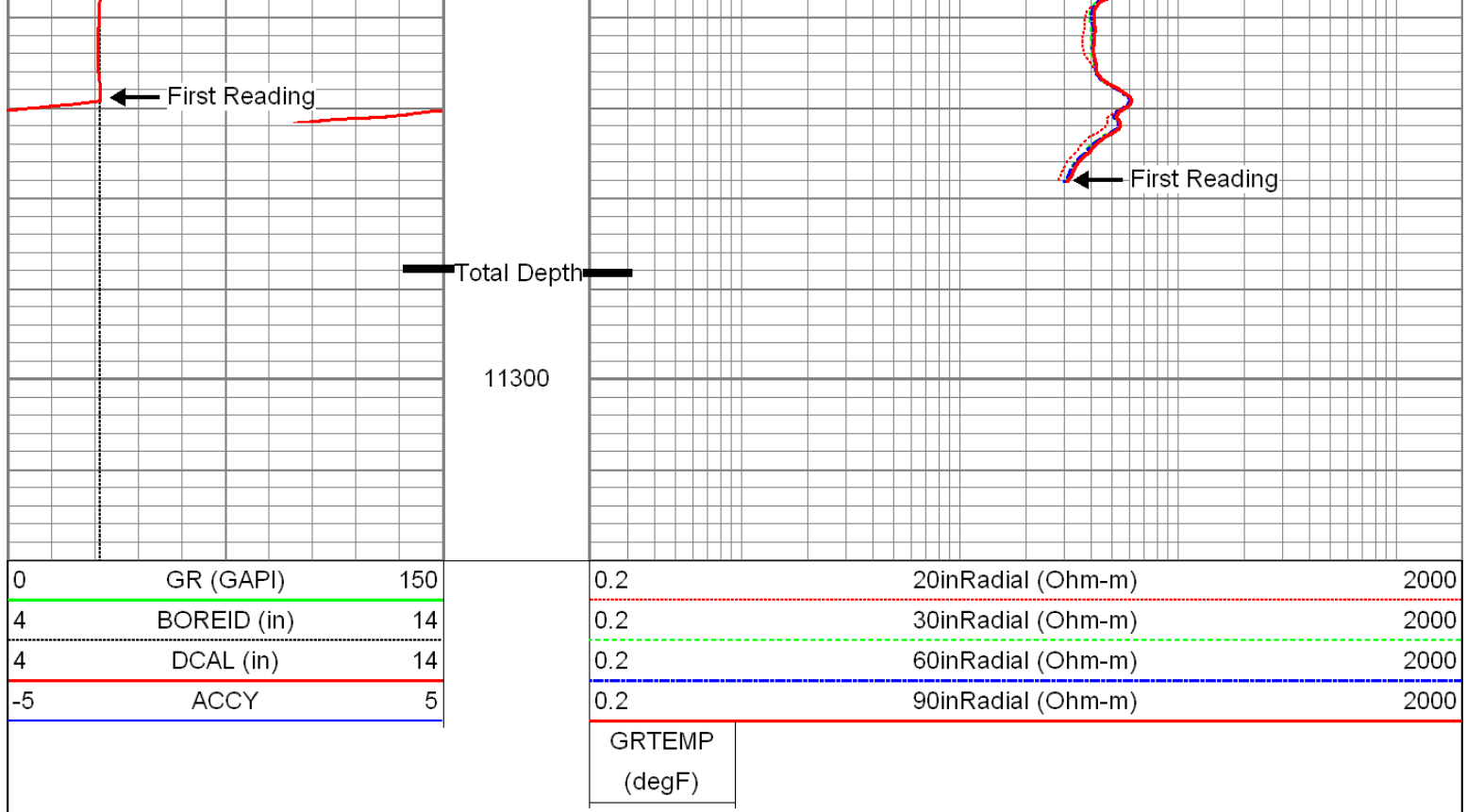
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32





Log Variables

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

Top - Bottom

A	BHCOR	BHFL_TYPE	BHFLRES Ohm-m	BHFLRESSRC	BHIDSRC	BOREID in
1	On	WBM	1	MUDCELL	CURVE	6.125
BOTTEMP degF	CASED?	CASEOD in	CASETHCK in	CEMWATERSA kppm	CMNTTHCK in	DNBHC?
145	No	4.5	0	0	0	NO
DPORSEL	FLUIDDEN g/cc	FRMSALIN kppm	LATNOR	M	MATRXDEN g/cc	MUDSALIN kppm
RHOB	1	0	Off	2	2.71	0.9
MudWgt lb/gal	NPORSEL	PEBHC?	PERFS	RESTMP SRC	SO in	SRFTEMP degF
8.4	Limestone	YES	0	INTERNAL	2.5	65
SZCOR	TDEPTH ft	TMPCOR	TOOLPOS			
On	11304	On	Ec-centered			

Calibration Report

Database File: starks_mem.db
 Dataset Pathname: proc1/pass1.4
 Dataset Creation: Tue Jul 10 18:09:01 2012

ThruBit Induction Calibration Report

Tool Model-Serial Number: ENP-ENP6R
 Shop Calibration Performed: Wed Apr 18 09:22:47 2012

BASELINE

	R	Expected	X	Expected
Freq 1				
A1	-467.0380	[-500.00, -400.00]	232.4220	[-500.00, 500.00]
A2	-138.8400	[-180.00, -100.00]	285.6810	[-500.00, 500.00]
A3	-28.8967	[-50.00, -10.00]	113.8010	[-500.00, 500.00]
A4	-15.4044	[-30.00, -10.00]	267.4970	[-500.00, 500.00]
A5	-13.0840	[-30.00, -10.00]	135.5770	[-500.00, 500.00]
Freq 2				
A1	-244.4280	[-280.00, -180.00]	124.4130	[-500.00, 500.00]
A2	-88.8609	[-130.00, -50.00]	156.6850	[-500.00, 500.00]
A3	-21.5772	[-50.00, -10.00]	24.1077	[-500.00, 500.00]
A4	-18.5383	[-30.00, -10.00]	94.2783	[-500.00, 500.00]
A5	-17.6156	[-30.00, -10.00]	0.5805	[-500.00, 500.00]
Freq 3				
A1	-158.0540	[-180.00, -80.00]	20.1496	[-500.00, 500.00]
A2	-67.8115	[-130.00, -30.00]	72.1157	[-500.00, 500.00]
A3	-17.8249	[-50.00, -10.00]	-38.9634	[-500.00, 500.00]
A4	-20.0103	[-30.00, -10.00]	-18.7511	[-500.00, 500.00]
A5	-20.0769	[-30.00, -10.00]	-96.5371	[-500.00, 500.00]
Freq 4				
A1	-88.4004	[-120.00, -40.00]	-143.0110	[-500.00, 500.00]
A2	-49.2908	[-110.00, -10.00]	-41.6048	[-500.00, 500.00]
A3	-13.8024	[-50.00, -10.00]	-132.8410	[-500.00, 500.00]
A4	-22.1237	[-30.00, -10.00]	-183.0270	[-500.00, 500.00]
A5	-24.0794	[-30.00, -10.00]	-255.8540	[-500.00, 500.00]

CALIBRATION COEFFICIENTS

	R	Expected	X	Expected
Freq 1				
A1	0.9865	[0.95, 1.05]	0.0100	[-0.05, 0.05]
A2	0.9892	[0.95, 1.05]	0.0028	[-0.05, 0.05]
A3	0.9899	[0.95, 1.05]	-0.0043	[-0.05, 0.05]
A4	0.9896	[0.95, 1.05]	0.0042	[-0.05, 0.05]
A5	0.9923	[0.95, 1.05]	0.0022	[-0.05, 0.05]
Freq 2				
A1	0.9807	[0.95, 1.05]	-0.0006	[-0.05, 0.05]
A2	0.9829	[0.95, 1.05]	-0.0052	[-0.05, 0.05]
A3	0.9777	[0.95, 1.05]	-0.0051	[-0.05, 0.05]
A4	0.9849	[0.95, 1.05]	-0.0047	[-0.05, 0.05]
A5	0.9885	[0.95, 1.05]	-0.0072	[-0.05, 0.05]
Freq 3				
A1	0.9888	[0.95, 1.05]	-0.0030	[-0.05, 0.05]
A2	0.9915	[0.95, 1.05]	-0.0064	[-0.05, 0.05]
A3	0.9859	[0.95, 1.05]	-0.0066	[-0.05, 0.05]
A4	0.9929	[0.95, 1.05]	-0.0069	[-0.05, 0.05]
A5	0.9991	[0.95, 1.05]	-0.0092	[-0.05, 0.05]
Freq 4				
A1	0.9867	[0.95, 1.05]	-0.0013	[-0.05, 0.05]
A2	0.9893	[0.95, 1.05]	-0.0035	[-0.05, 0.05]
A3	0.9860	[0.95, 1.05]	-0.0059	[-0.05, 0.05]
A4	0.9932	[0.95, 1.05]	-0.0053	[-0.05, 0.05]
A5	1.0086	[0.95, 1.05]	-0.0094	[-0.05, 0.05]
Temperature	23.0942 degC			

ThruBit Density Calibration Report

Tool Model-Serial Number: PS-PS41D
 Source Number:
 Shop Calibration Performed: Wed Jun 20 10:37:37 2012

REFERENCE

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

READINGS

Outputs	Counts	Units	Expected
SS1 Background	144.69	cps	[130.00, 170.00]
LS1 Background	160.66	cps	[130.00, 170.00]
LS4 Background	33.67	cps	[27.00, 35.00]
SS1 Aluminium	4754.62	cps	[4500.00, 5500.00]
LS1 Aluminium	867.21	cps	[750.00, 950.00]
LS4 Aluminium	958.17	cps	[843.00, 1068.00]
SS1 Magnesium	7820.39	cps	[7000.00, 9000.00]
LS1 Magnesium	5501.35	cps	[5250.00, 6250.00]
LS1 Al + Fe	751.35	cps	[650.00, 800.00]
LS4 Al + Fe	430.49	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	5.104	[3.510, 6.170]
PEF B Factor	-0.510	[-0.700, -0.410]

Caliper Shop Calibration performed: Wed Jun 20 10:37:37 2012

RESULTS

Reference	Reading	Units
12.00	1866.94	in
9.00	2034.01	in
6.00	2196.09	in

DENSITY PRE-SURVEY CHECK Performed: Sun Jul 08 14:16:22 2012

Outputs	Counts	Units	Expected
SS1 Background	143.39	cps	[140.35, 149.03]
LS1 Background	161.97	cps	[155.84, 165.48]
LS4 Background	33.56	cps	[31.65, 35.69]

CALIPER PRE-SURVEY CHECK Performed: Sun Jul 08 14:14:03 2012

Reference	Readings	Units	Expected
9.00	8.99	in	[8.80, 9.20]

Compensated Neutron Calibration Report

Tool Model-Serial Number:	PS-PS05N
Source Number:	
Calibration Tank Temperature:	77.1 degF
Shop Calibration Performed:	Fri Jun 22 15:43:32 2012

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	889.4	cps	
LS Counts	29.4	cps	
Tank Ratio Ref	30.9580	SS/LS	
Tank Ratio	30.2687	SS/LS	
Tank Ratio Gain	1.0228		[0.85, 1.15]

ALUMINUM SLEEVE REFERENCE

Outputs	Measured	Units	Expected
SS Counts	9730.1	cps	
LS Counts	940.9	cps	
Al Ratio Ref	10.797	SS/LS	
Al Ratio	10.576	SS/LS	
Al Ratio Gain	1.02		[0.90, 1.10]
Sleeve Porosity	14.46	pu	

PRE-SURVEY BACKGROUND CHECK Performed: Sun Jul 08 14:21:26 2012

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

Gamma Ray Calibration Report

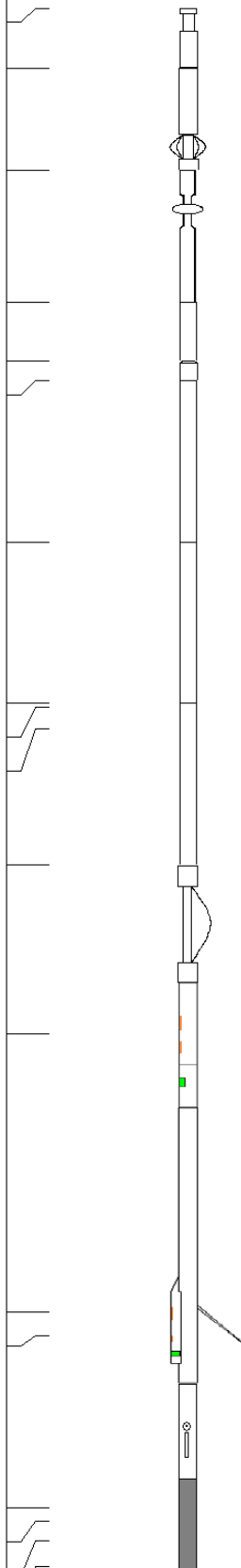
Tool Model-Serial Number:	PS-PS05T
Performed:	Mon Jun 25 14:39:11 2012
Calibrator Value:	160.7 GAPI
Background Reading:	60.5 cps
Calibrator Reading:	461.2 cps
Sensitivity:	0.3900 GAPI/cps

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	67.59		Cablehead-S	2.31	2.13	5.00
ThruBit	65.28		Solid Weakpoint			
			PSBDOT	3.87	2.25	35.00
ThruBit	61.41		HangOff_Tool	5.00	2.38	60.00
ThruBit	56.41		Swivel	2.25	2.06	25.00
ThruBit	54.16		10-1	0.75	2.13	3.95
TBBAT	53.41		TBBAT-A (PS01B) ThruBit Battery	6.13	2.13	38.20
TBBAT2	47.29		TBBAT2-A (PS13B) ThruBit Battery	6.13	2.13	40.00
TMG	41.16		TMG-PS (PS05T) ThruBit Telemetry Gamma Ray			
GR	41.04					
GRTEMP	40.20					
ThruBit	35.04		Decentralizer Decentralizer (Small)	4.50	2.13	70.00
CNLSC	28.60		TBN-PS (PS05N) ThruBit Neutron	4.77	2.13	63.00
			TBD-PS (PS41D) ThruBit Density	10.48	2.13	91.00
LSW1	18.04					
DCAL	17.13					
A1_P	10.60					
A2_P	10.10					
A3_P	9.35					

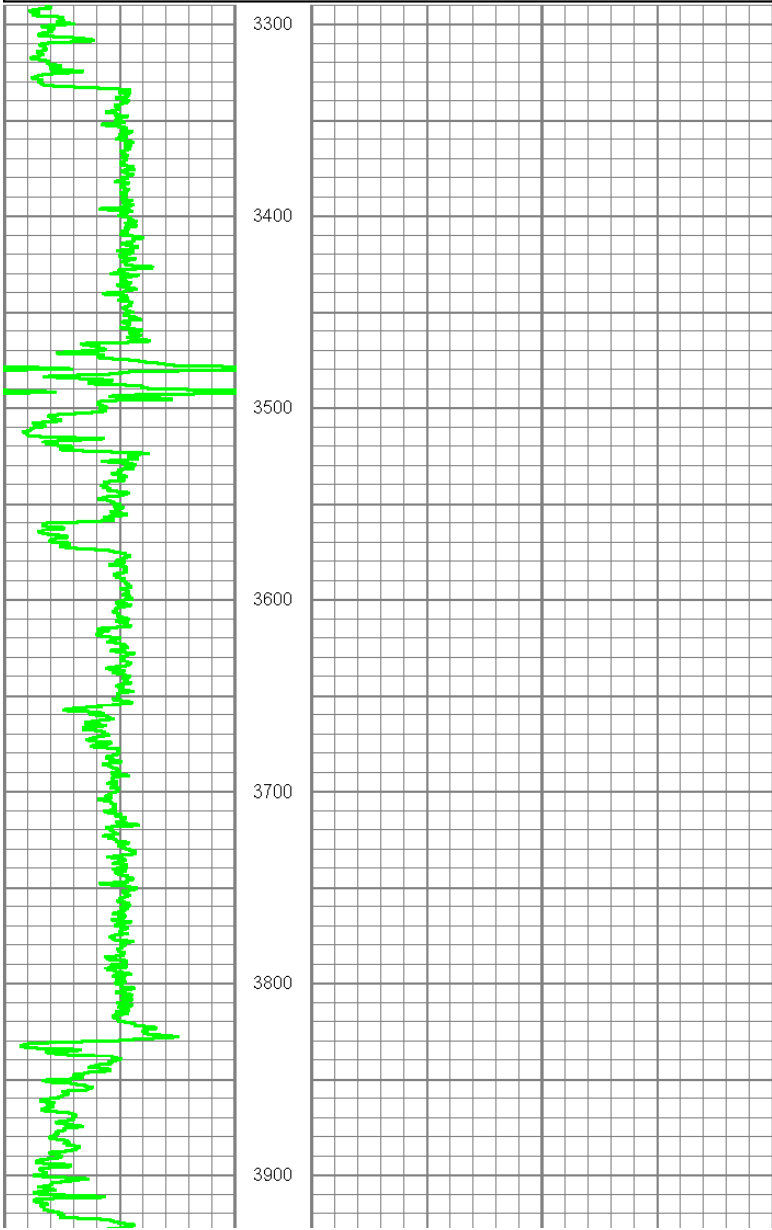
A3_P	5.55		TBI-ENP (ENP6R)	15.29	2.13	94.00
A4_P	8.35		ThruBit Induction			
A5_P	6.60					

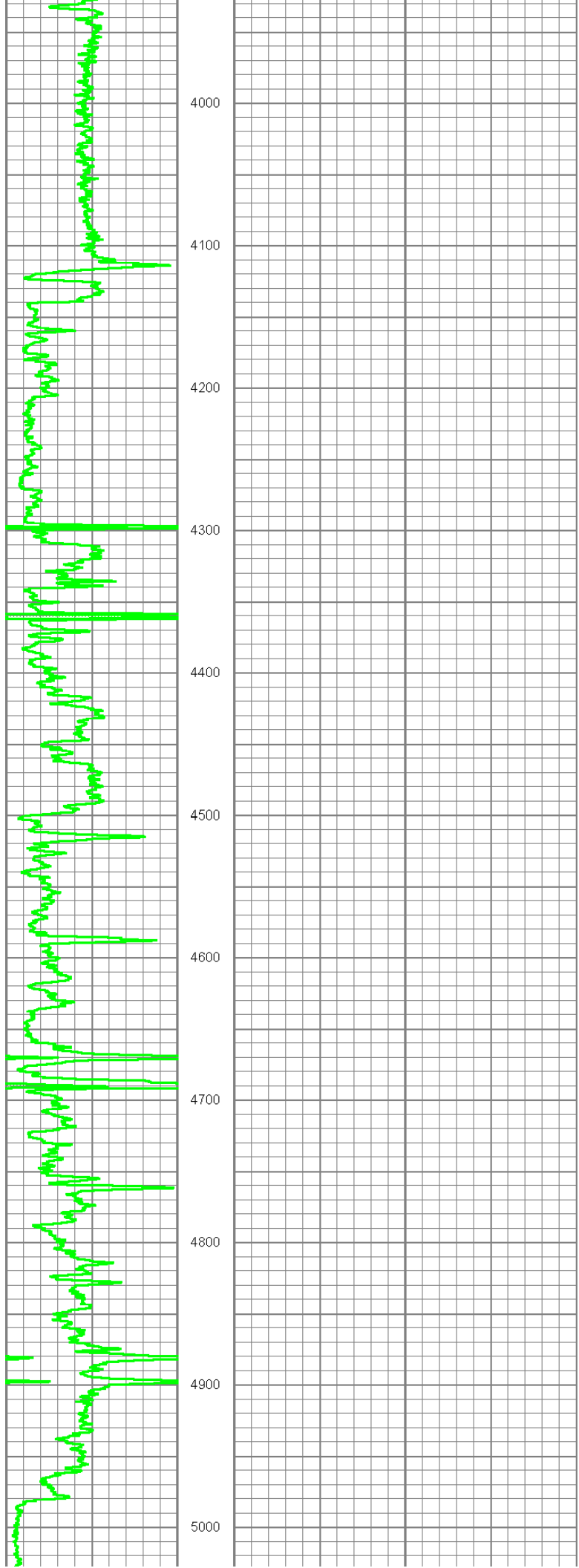
Dataset: starks_mem.db: field/well/proc1/pass1.4
 Total Length: 67.59 ft
 Total Weight: 570.15 lb
 O.D.: 2.38 in

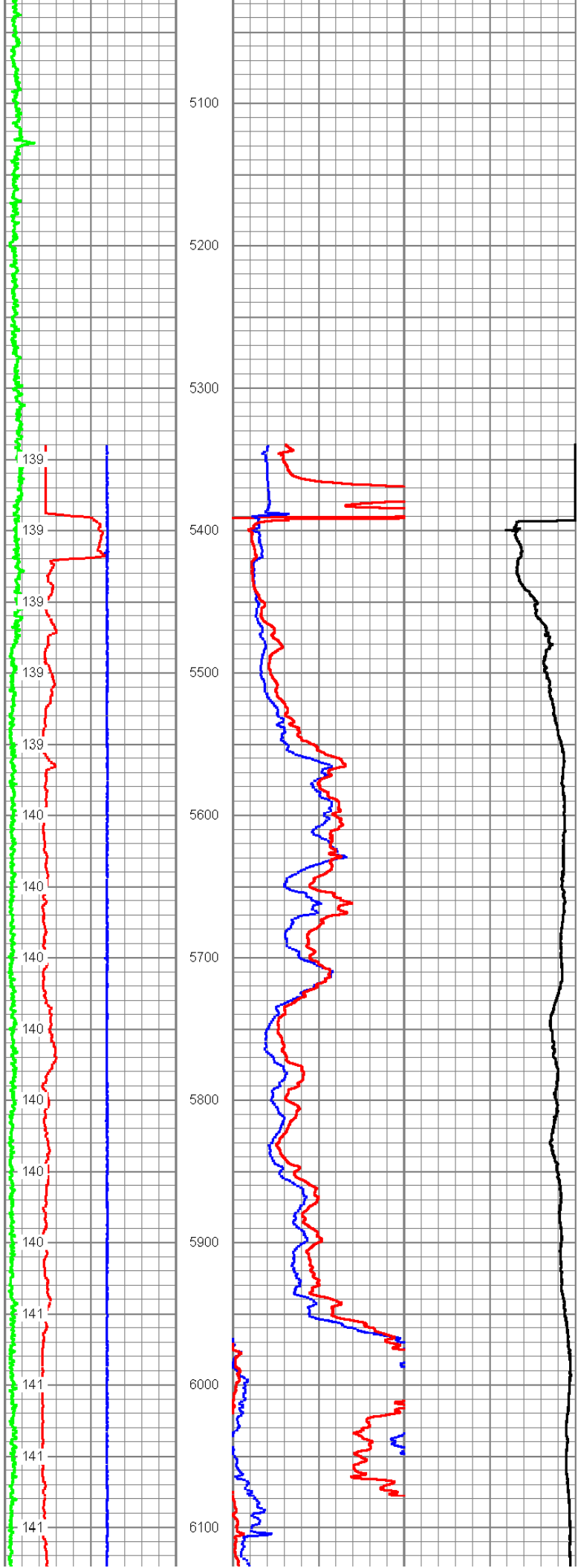
MAIN PASS

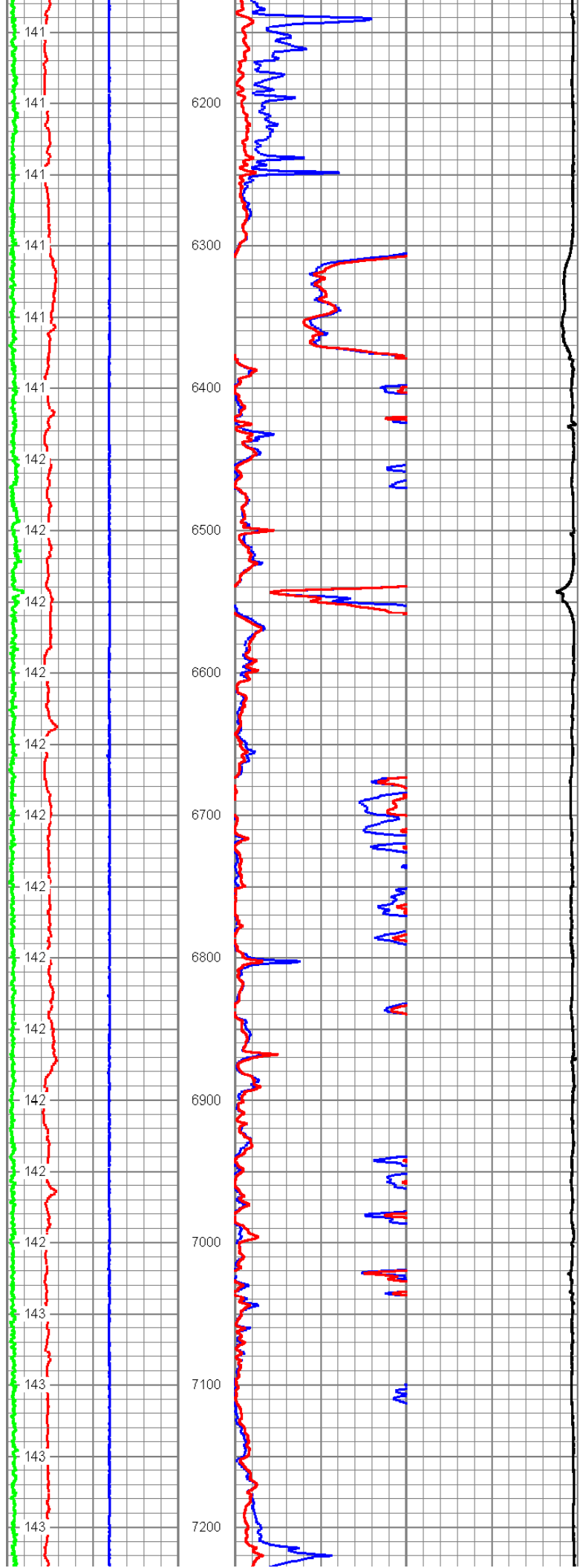
Database File: starks_mem.db
 Dataset Pathname: proc1/pass1.4
 Presentation Format: 6_1r_chk
 Dataset Creation: Tue Jul 10 18:09:01 2012
 Charted by: Depth in Feet scaled 1:1200

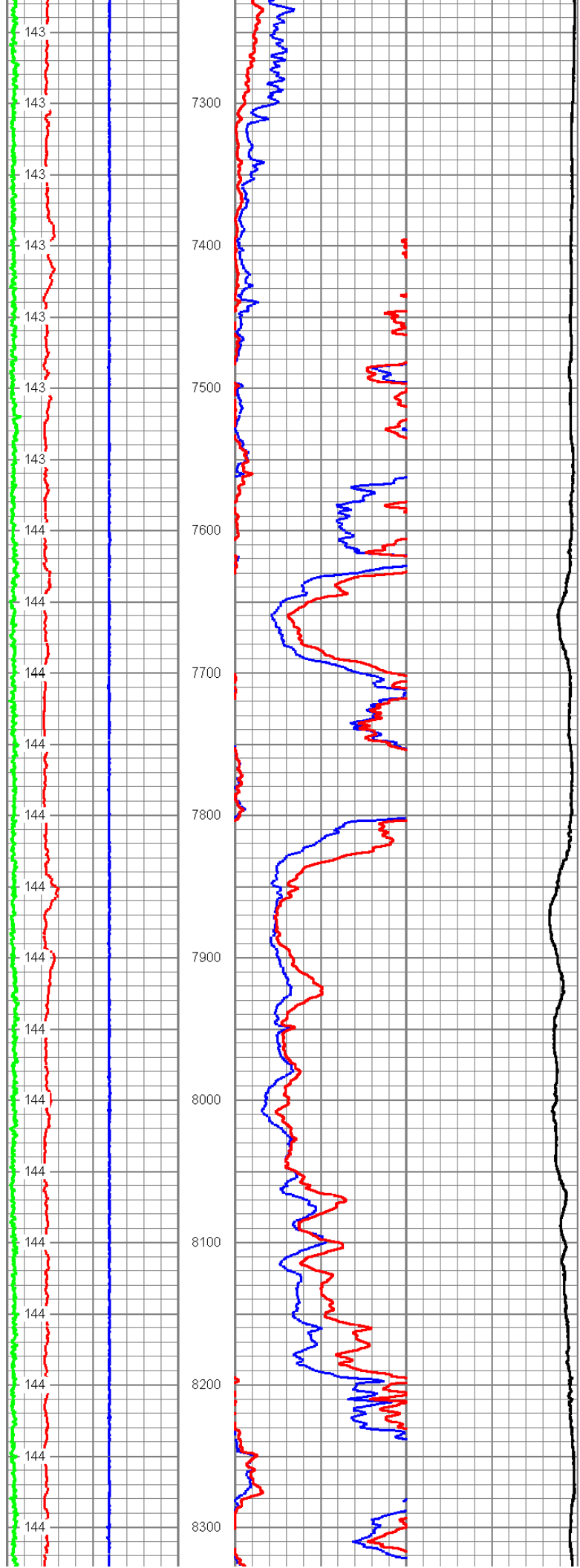
0	GR (GAPI)	150	20in 2ft Res	
4	DCAL (in)	14	(Ohm-m)	500
-5	ACCY	5	90in 2ft Res	
GRTEMP			(Ohm-m)	500
(degF)			1000	DEEP COND (mmho/m) 0
			0	20in 2ft Res (Ohm-m) 50
			0	90in 2ft Res (Ohm-m) 50

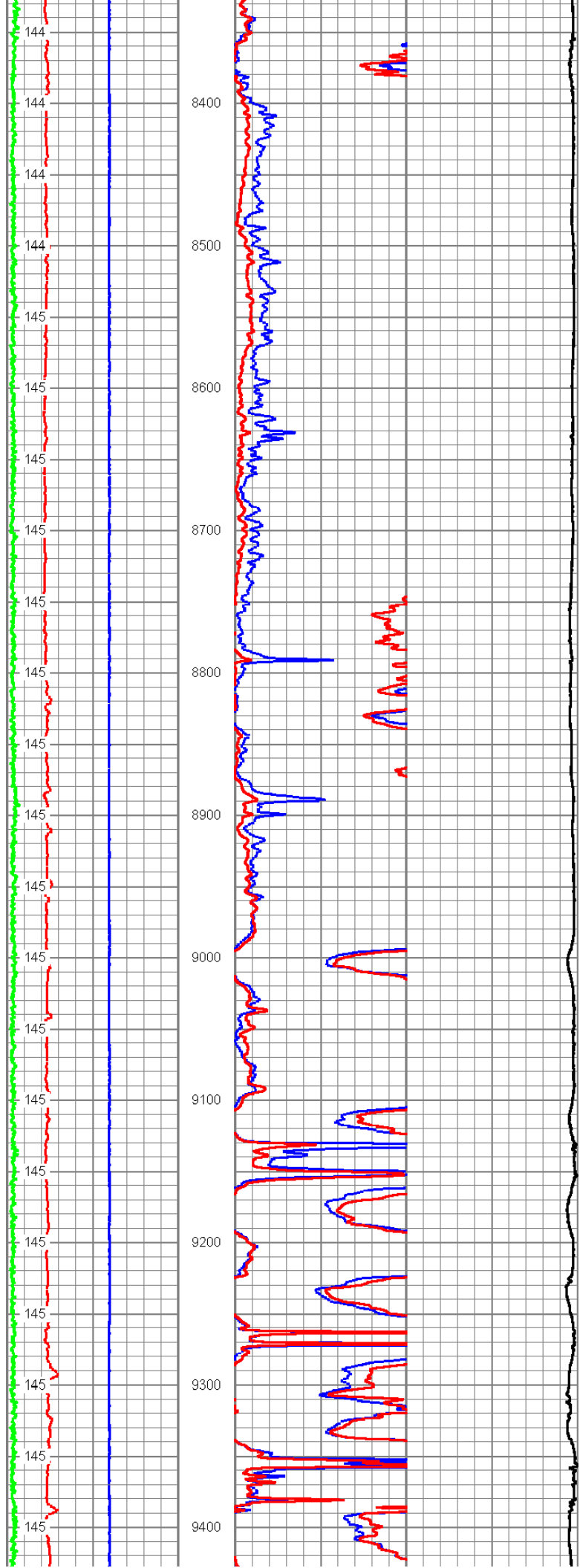


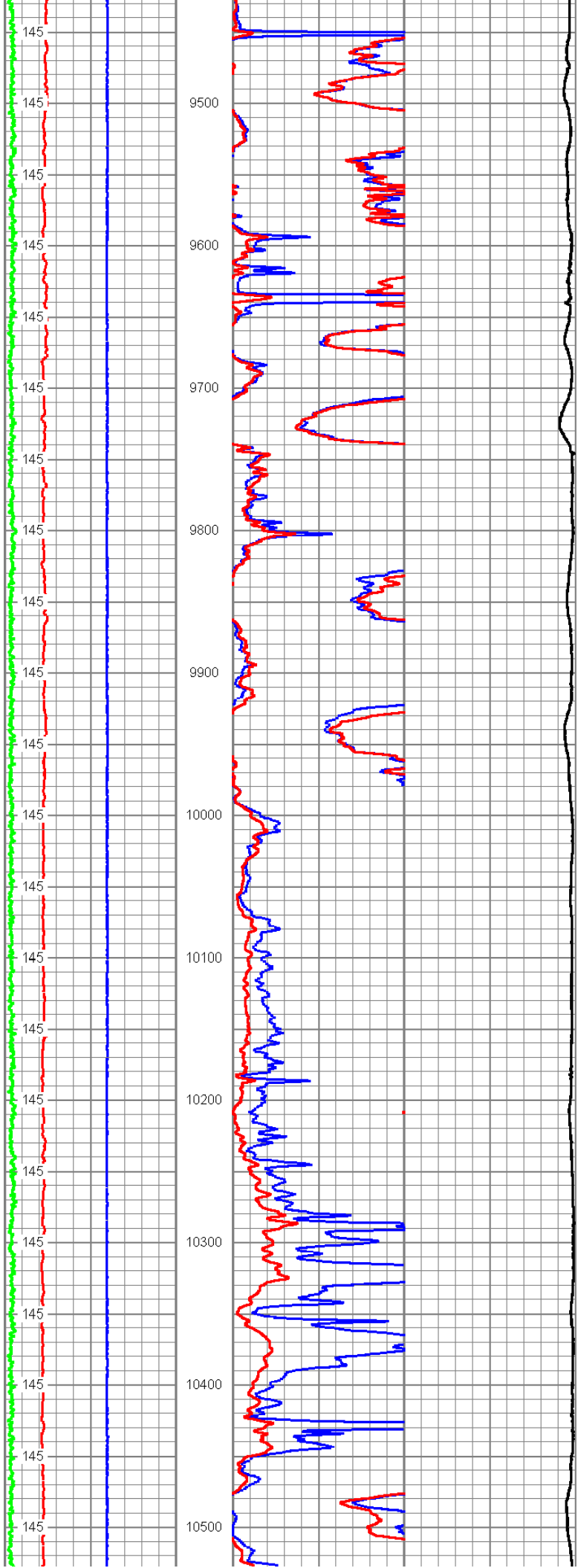


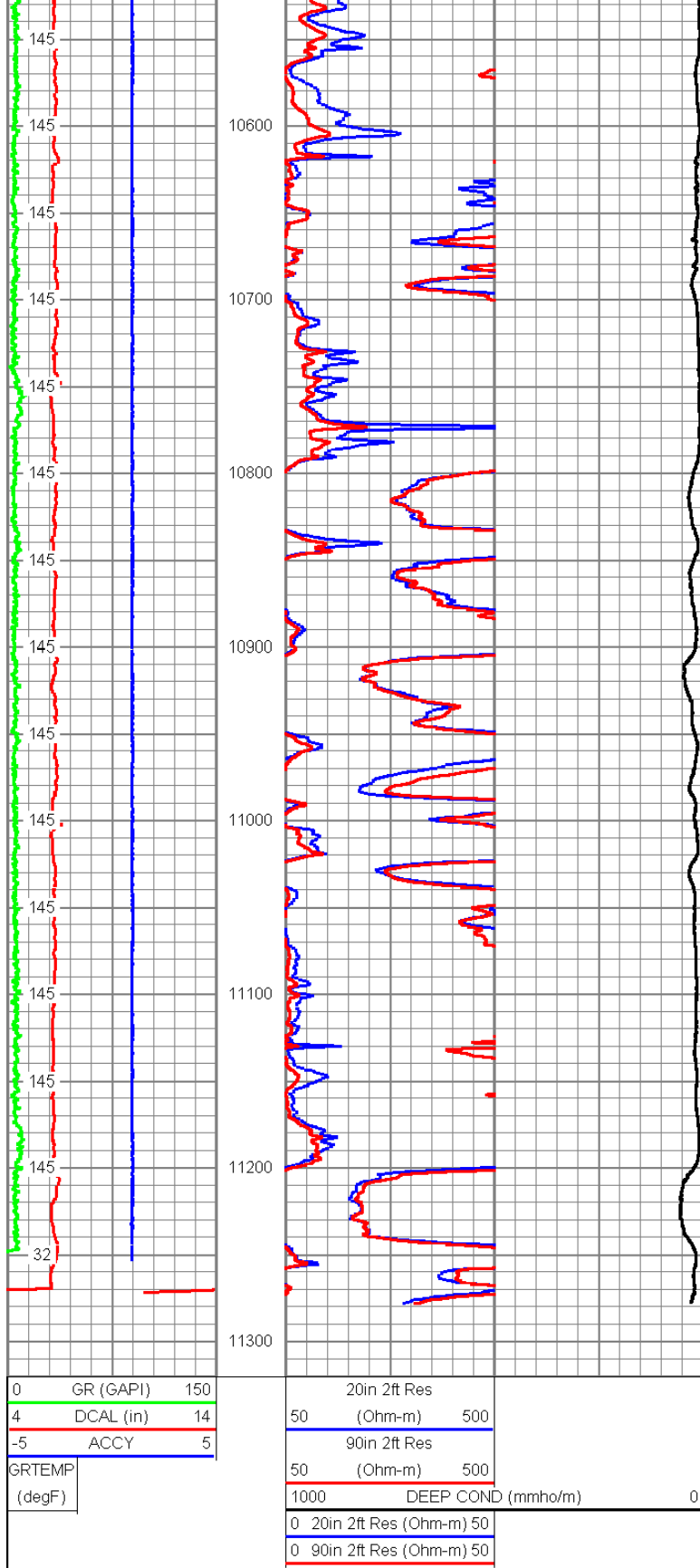












ThruBit
A Schlumberger Company

Company	SANDRIDGE ENERGY, INC.
Well	STARKS 1-35H
Field	KANSAS / WALDRON WEST
County	HARPER
State	KANSAS