



ThruBit
A Schlumberger Company

**SPECTRAL DENSITY
DUAL SPACED NEUTRON
GAMMA RAY
MEMORY LOG**

Company	SANDRIDGE ENERGY, INC.	Company	SANDRIDGE ENERGY, INC.
Well	JONES 3506 1-13H	Well	JONES 3506 1-13H
Field	WAKITA	Field	WAKITA
County	HARPER	County	HARPER
State	KANSAS	State	KANSAS
Location:	API #: 15-077-21946-00-00	Other Services	THRUBIT PORTAL BIT
	SURF LOC: 200' FSL + 1320' FEL	Elevation	K.B. 1255' D.F. 1255' G.L. 1240'
	SEC 13 TWP 35S RGE 6W		
Permanent Datum	G.L.	Elevation	1240'
Log Measured From	D.F. 15' ABOVE PERM DATUM		
Drilling Measured From	D.F.		

Date	19 JUL 2013
Run Number	ONE
Depth Driller	9906'
Depth Logger	9871'
Bottom Logged Interval	9854'
Top Log Interval	2500'
Casing Driller	7" @ 5858'
Casing Logger	7" @ 5853'
Bit Size	6.125"
Type Fluid in Hole	WATER
Density / Viscosity	8.4 / 27
pH / Fluid Loss	8.5 / 60
Source of Sample	SENSOR
Rim @ Meas. Temp	0.10 OHMS@65 DEGF
Rmf @ Meas. Temp	0.08 OHMS@65 DEGF
Rmc @ Meas. Temp	0.12 OHMS@65 DEGF
Source of Rmf / Rmc	CALCULATED
Rim @ BHT	0.05OHMS@142 DEGF
Time Circulation Stopped	13:15 19 JUL 2013
Time Logger on Bottom	14:45 19 JUL 2013
Maximum Recorded Temperature	142 DEGF
Equipment Number	T004
Location	OKC, OK
Recorded By	B. FRANTOM
Witnessed By	M. KULCHISKY

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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: LEVEL 4, HORIZONTAL MEMORY PUMPDOWN, BIT DEPTH: 9814' LOG TO: 2500'
ALL SCALES AND PRESENTATIONS PER CLIENT REQUEST
LIMESTONE MATRIX, 2.71 G/CC, USED TO MEASURE POROSITIES
TOOL STRING RAN WITH S. DECENTRALIZER, SWIVEL, NO STANDOFFS
TBHV = TOTAL BOREHOLE VOLUME, FT3
ABHV = ANNULAR BOREHOLE VOLUME, FT3, CALCULATED FOR 4.50" CSG
RIGMINDER LITE AND PASON USED TO CREATE LOG DEPTH
LOG DEPTH CORRELATED MWD GAMMA AT CUSTOMERS REQUEST

CREW: B. FRANTOM/J. DOTY/J.HIRST
RIG: UNIT #310

Service Ticket No.	2038	API No.	15-077-21946-00-00	PGM Ver	WARRIOR 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.	PS21T	Serial No.	PS6N	Serial No.	PS32D	Serial No.	PS10R
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	9860'	2500'		30	

	GAMMA RAY		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 OHM-M	2000 OHM-M

DIRECTIONAL INFORMATION

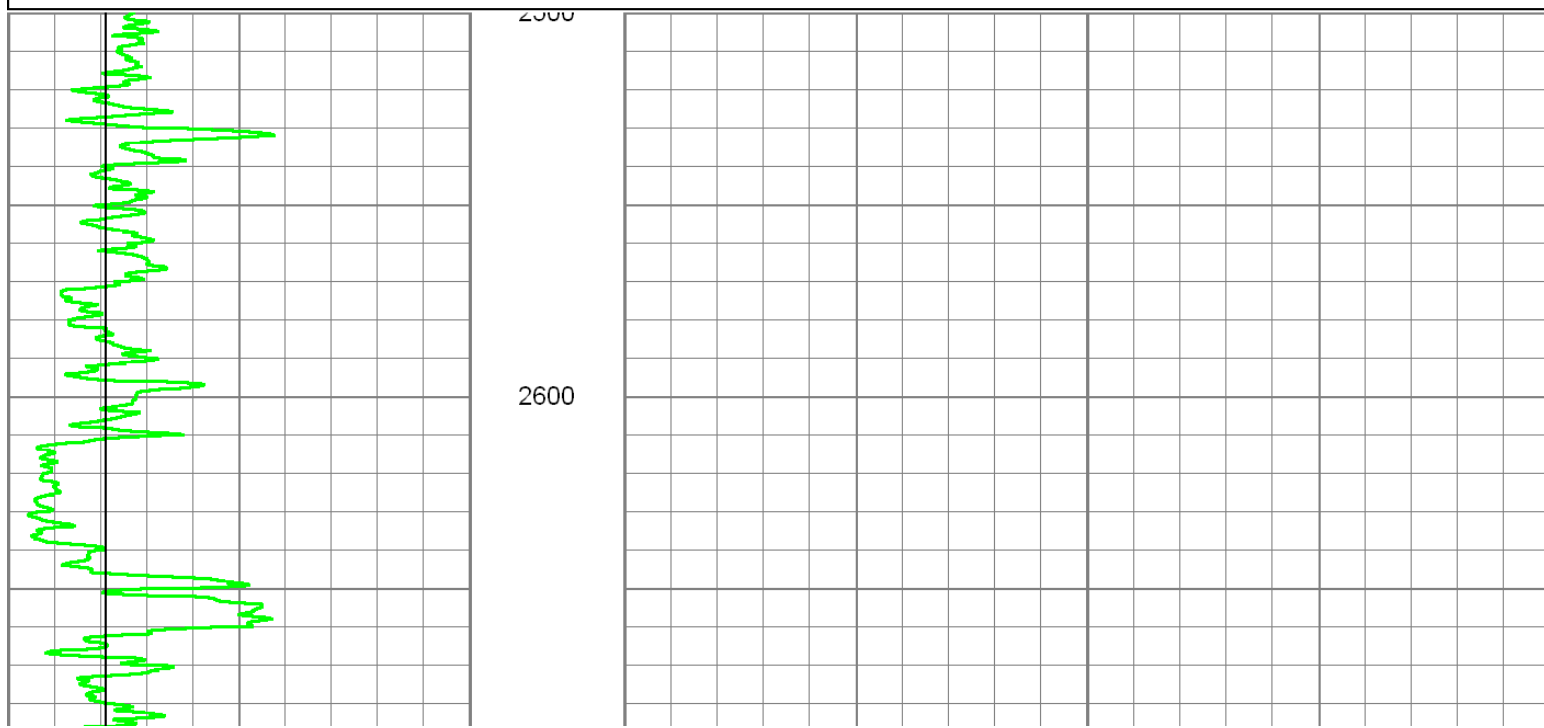
Maximum Deviation	92.74	deg. @	9699'	KOP	4293'
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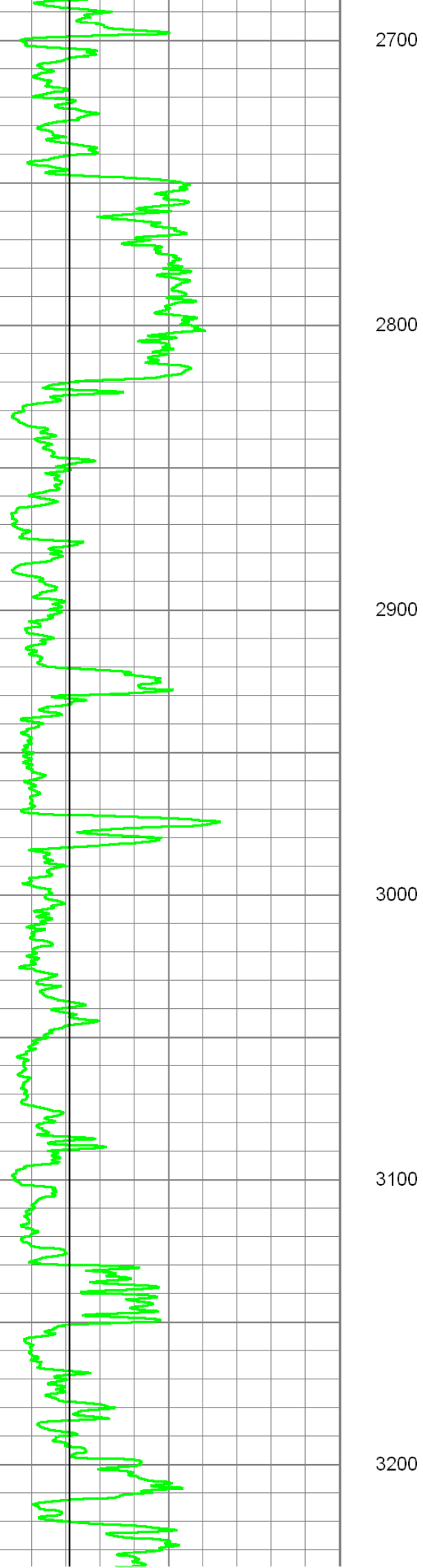


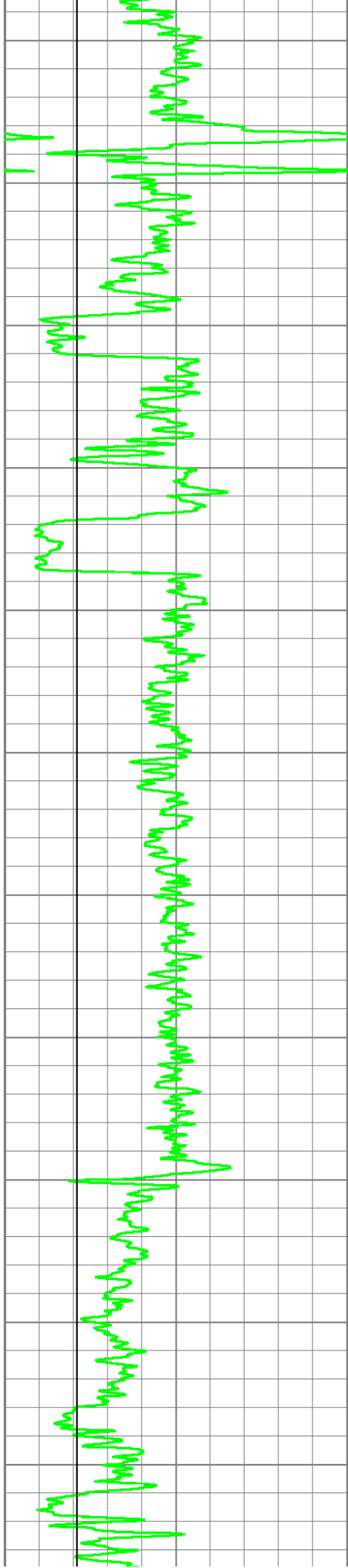
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 Dataset Pathname: proc1/pass1.4
 Presentation Format: 6_2n_chk
 Dataset Creation: Fri Jul 19 23:30:45 2013
 Charted by: Depth in Feet scaled 1:600

0	GR (GAPI)	150	0	PEF (barn)	10	-0.5	DRHO (g/cc)	0.5
4	DCAL (in)	14	2	RHOB (g/cc)				3
4	BOREID (in)	14						
-5	ACCY	5						







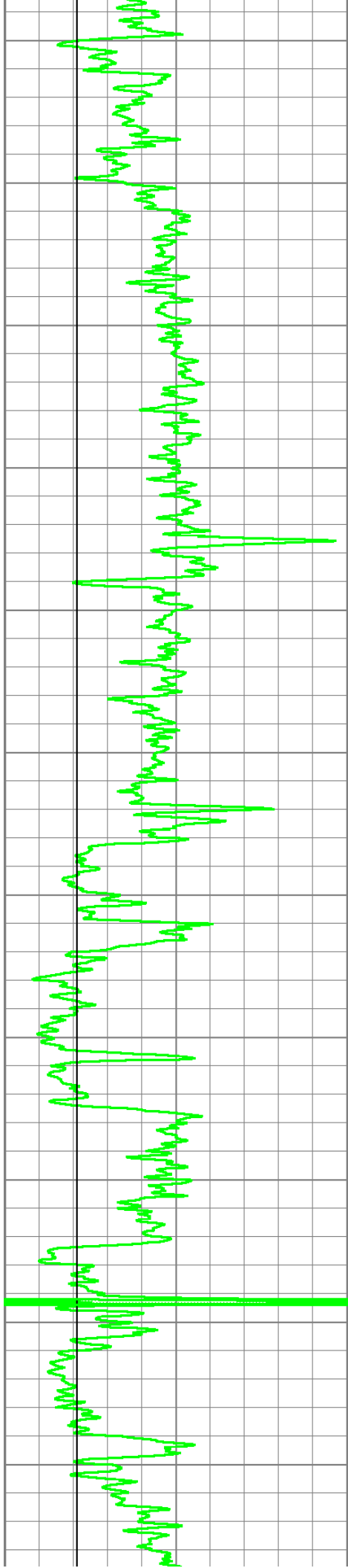
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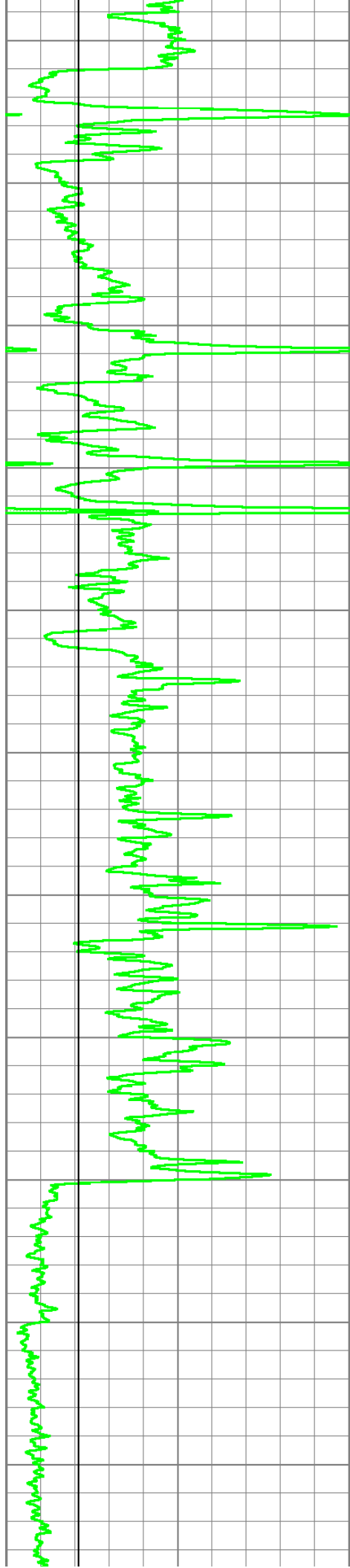
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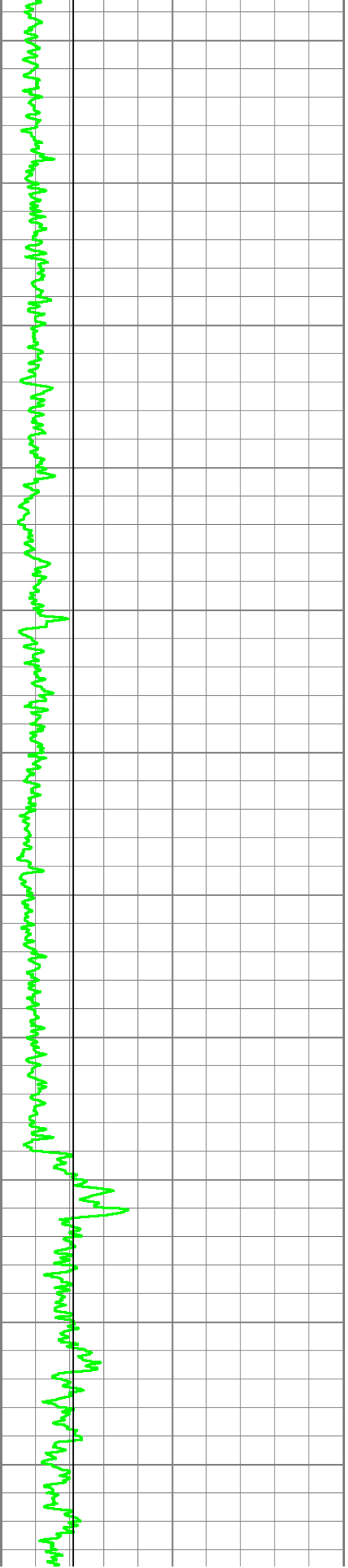
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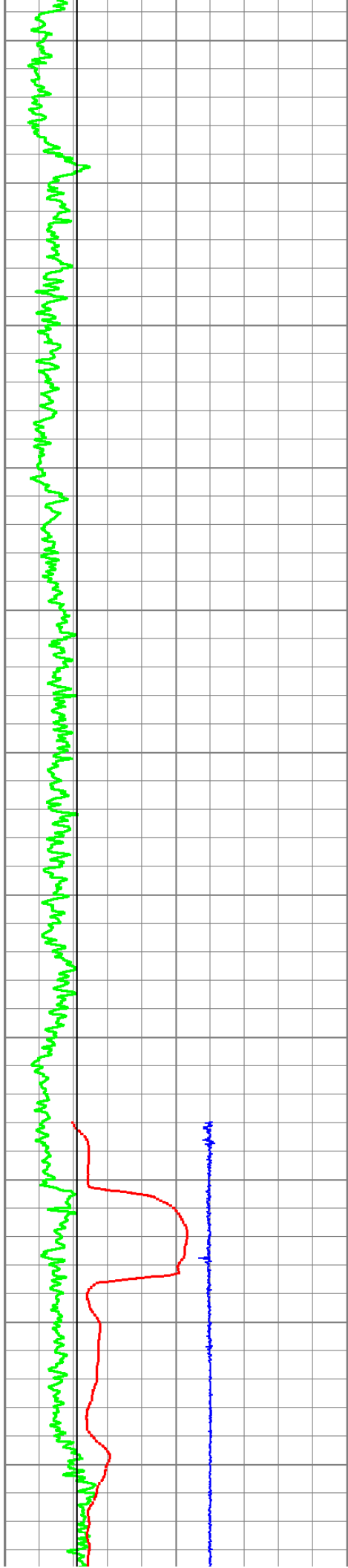
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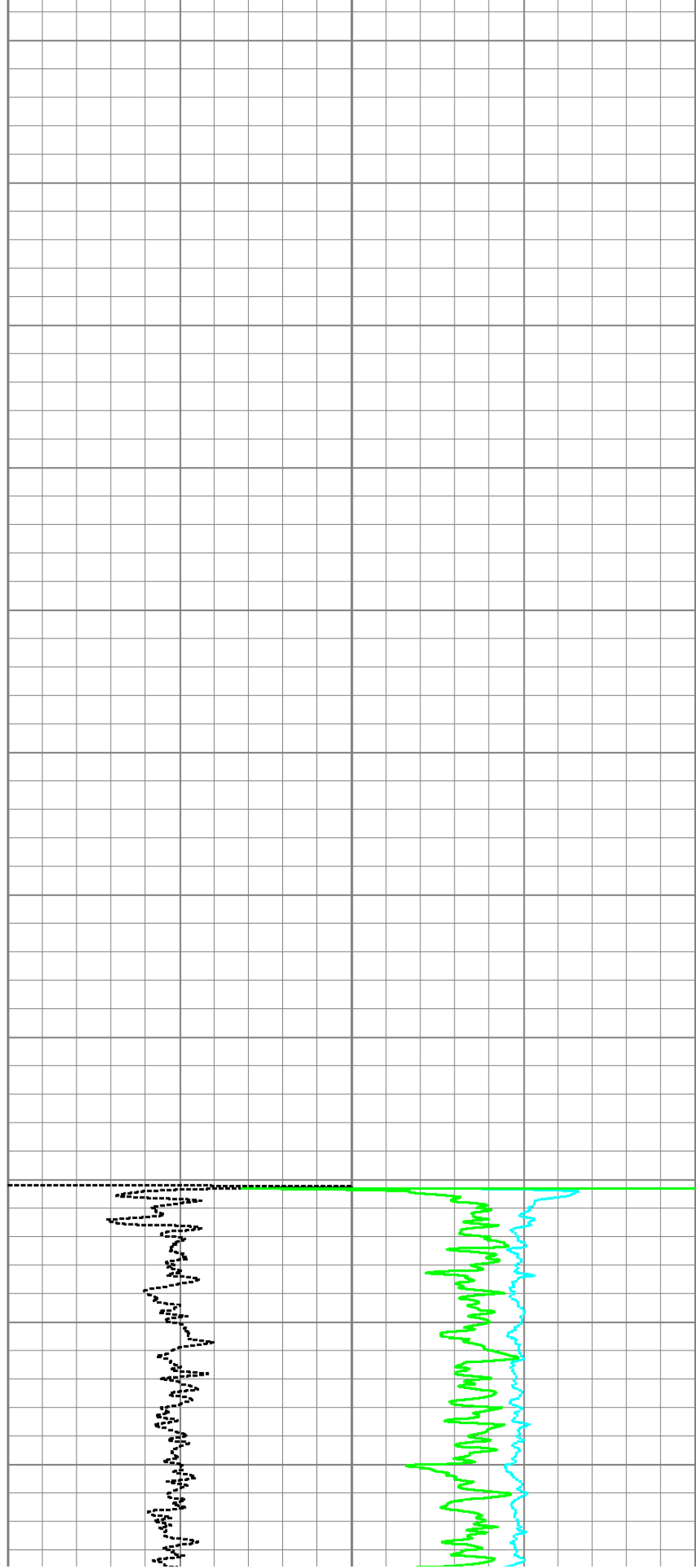
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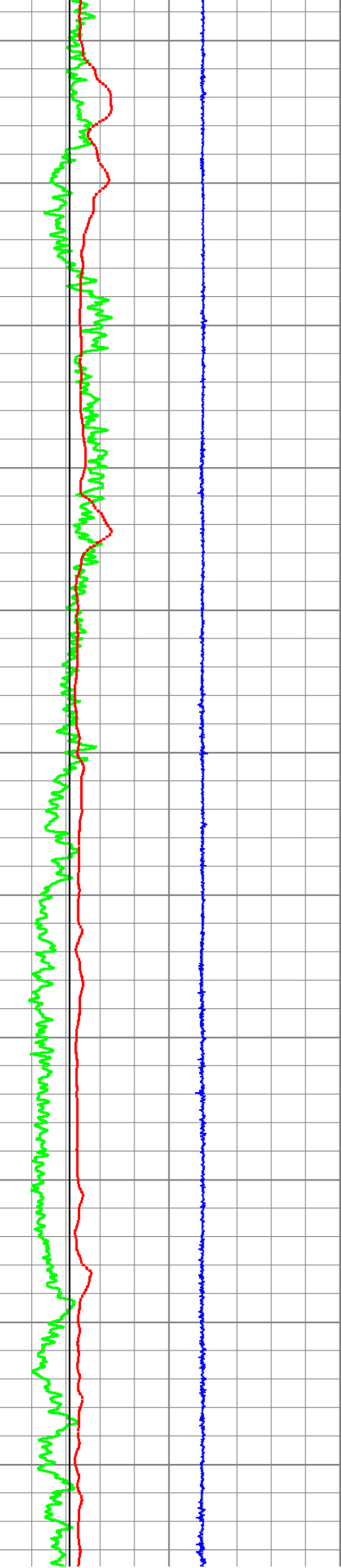
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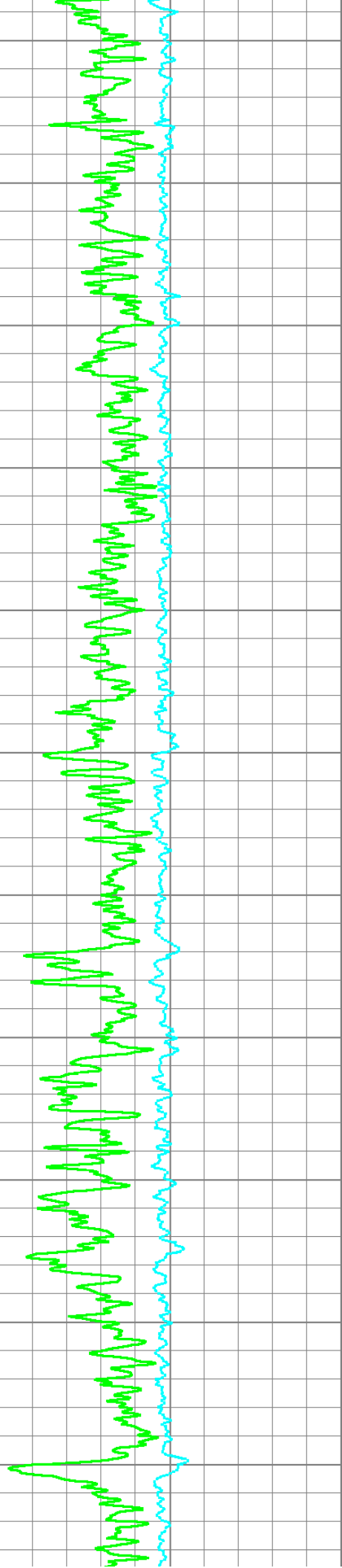
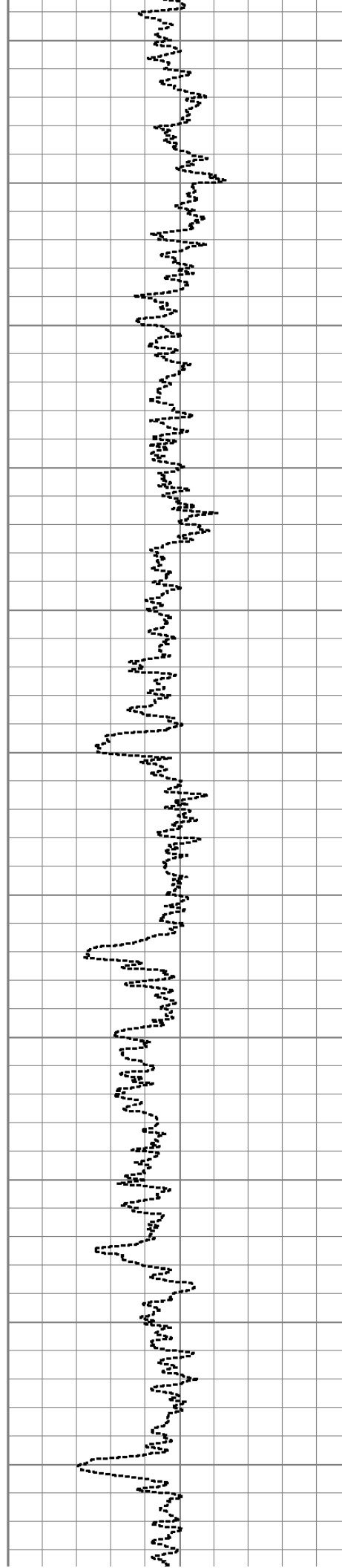
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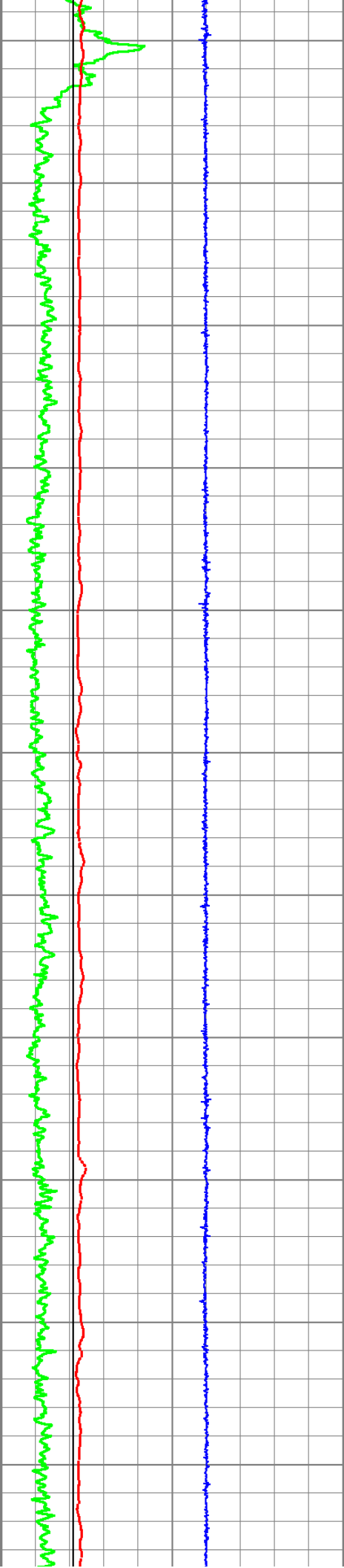
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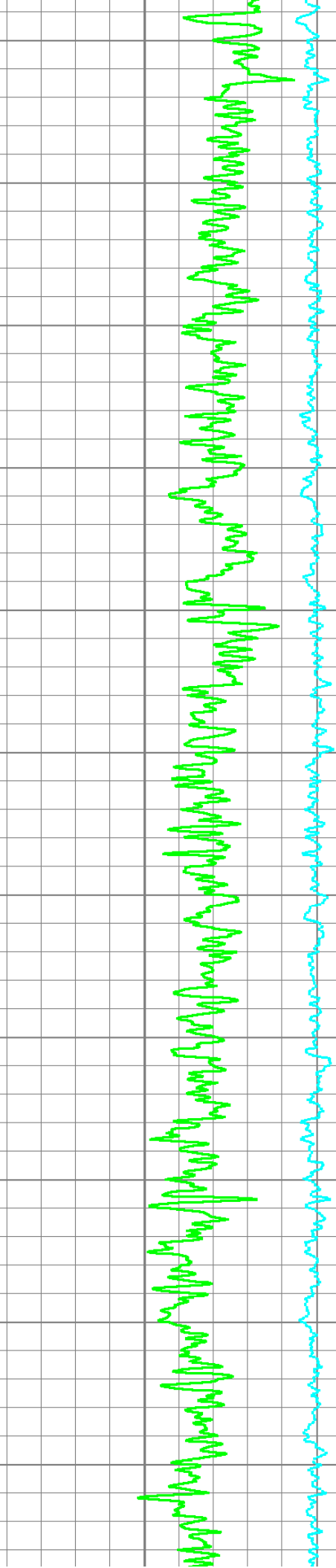
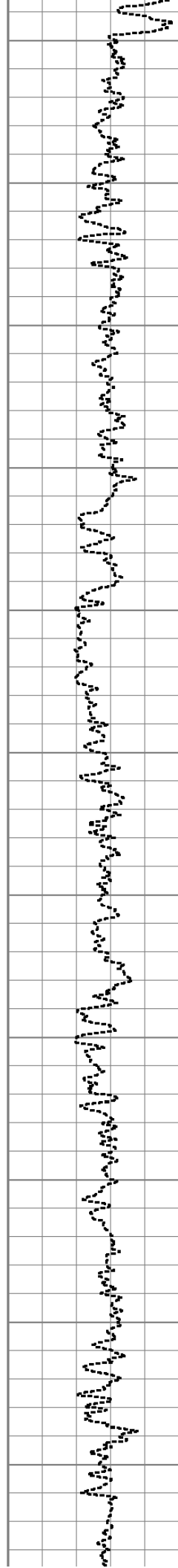
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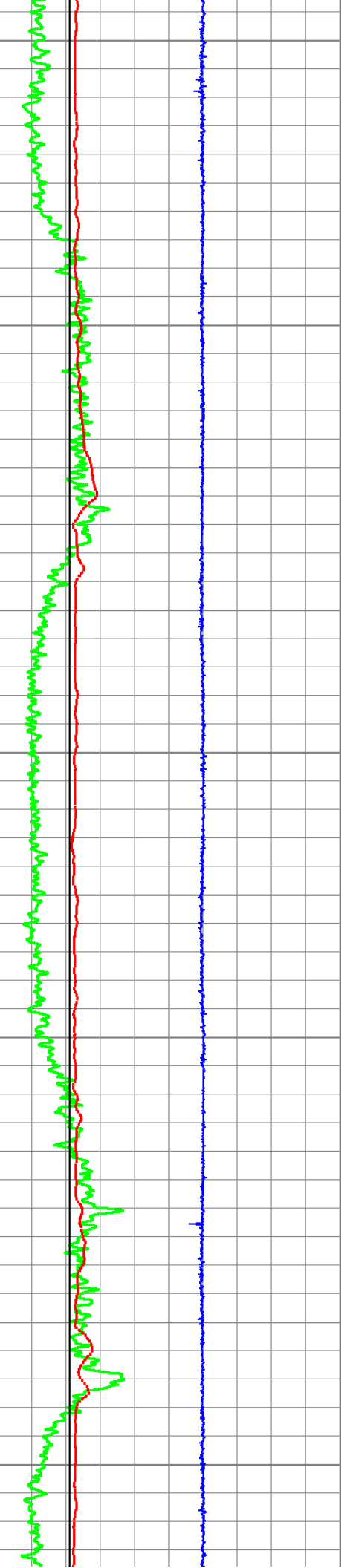
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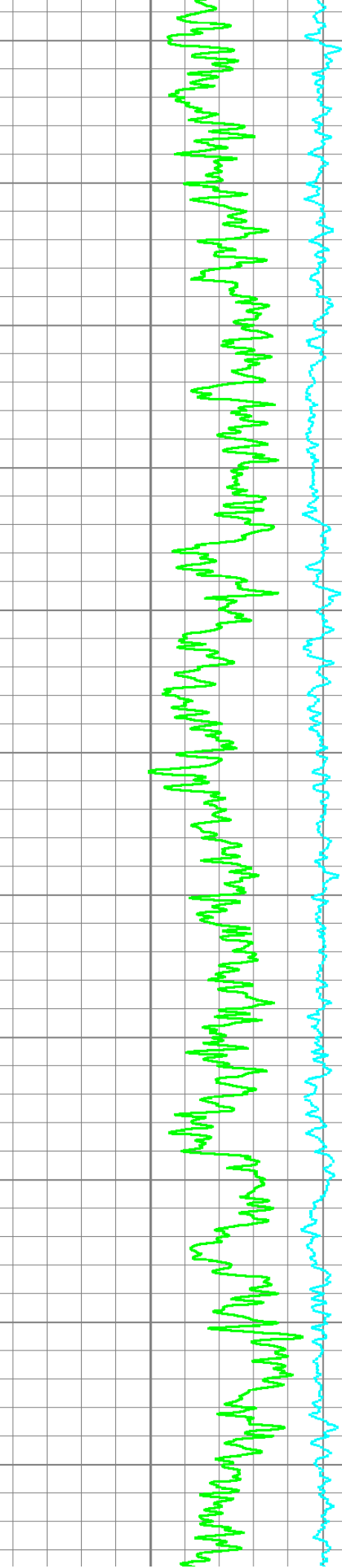
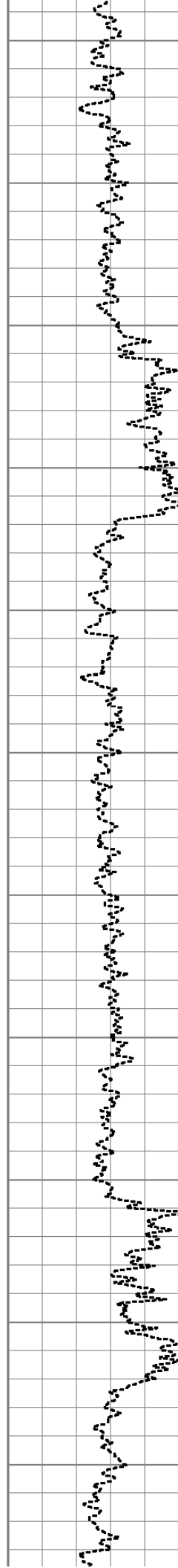
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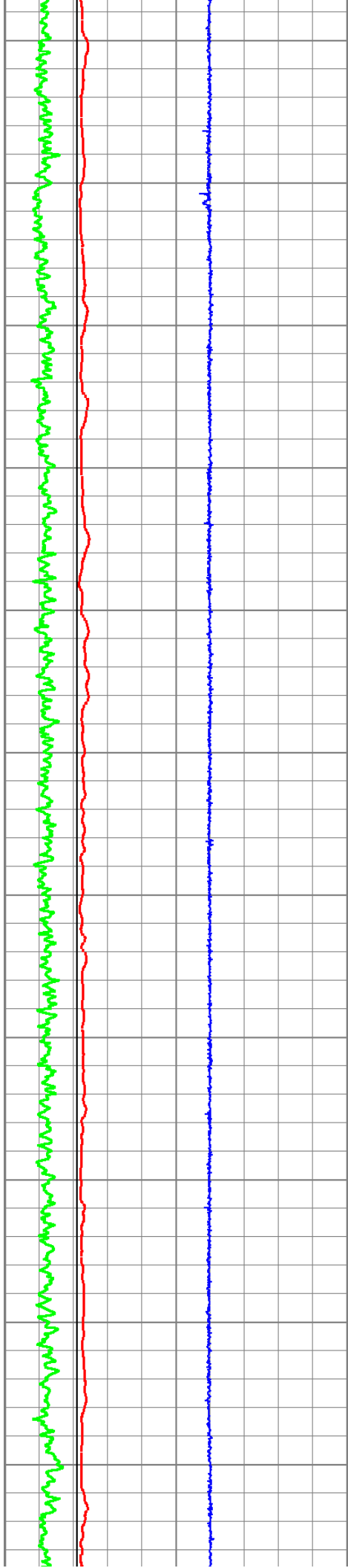
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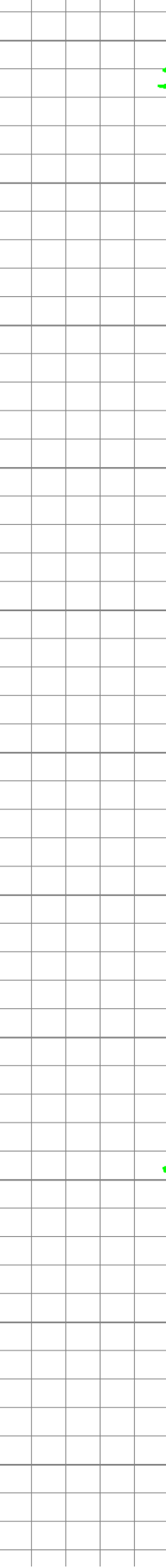
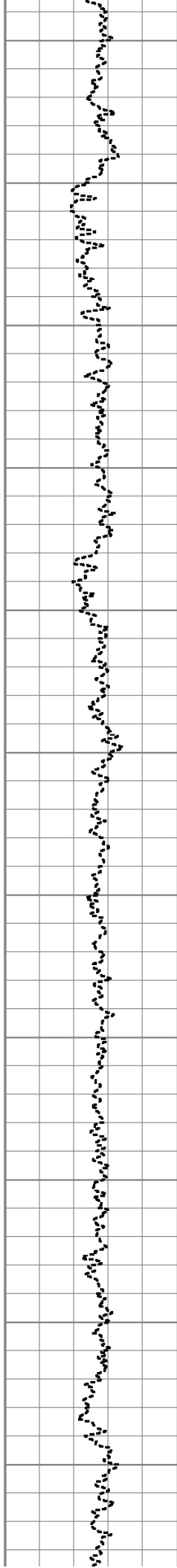
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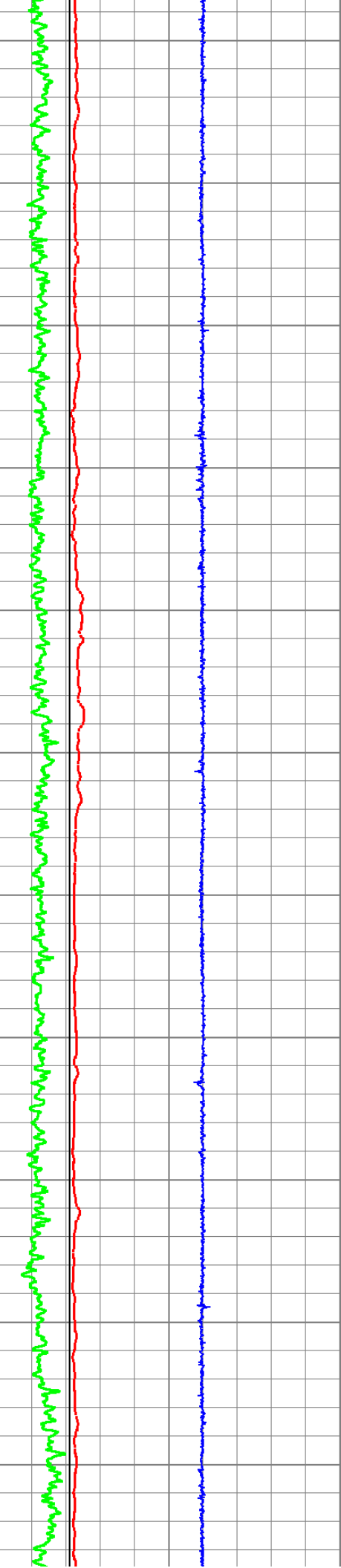
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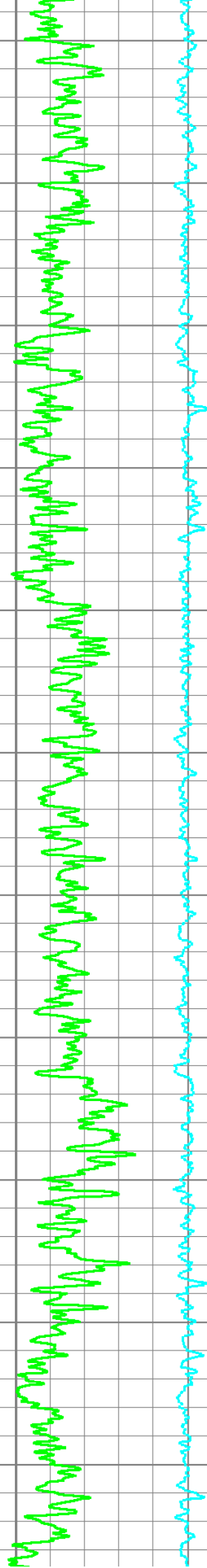
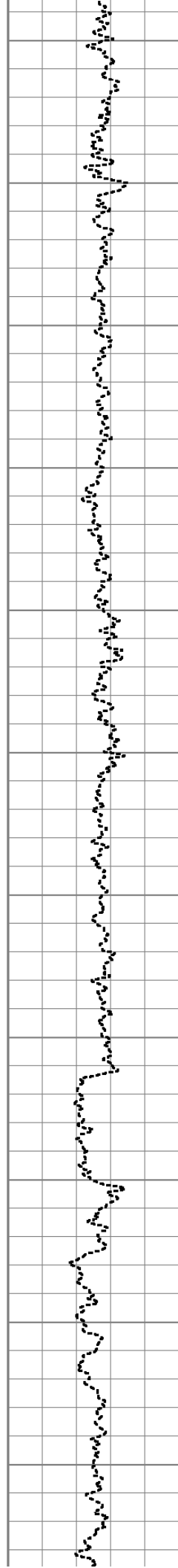
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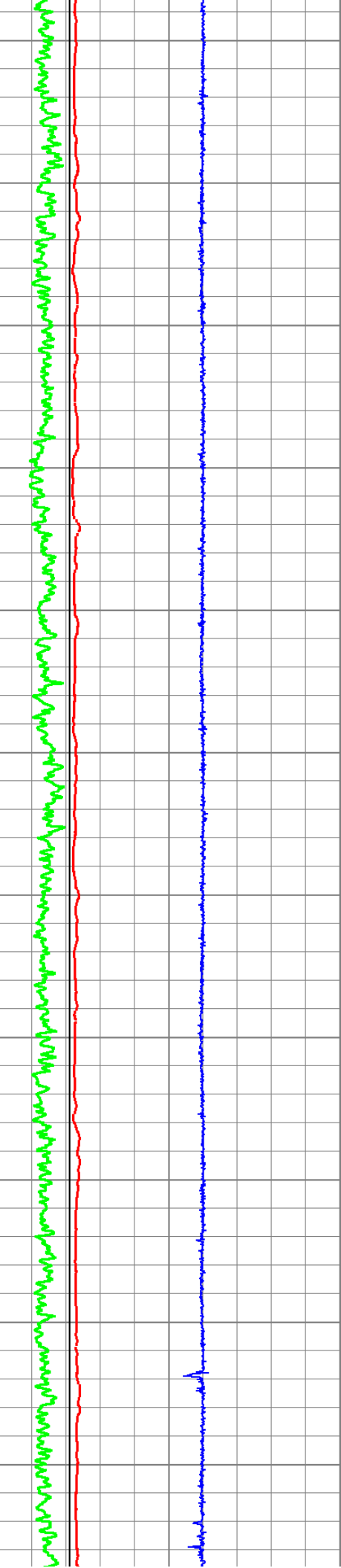
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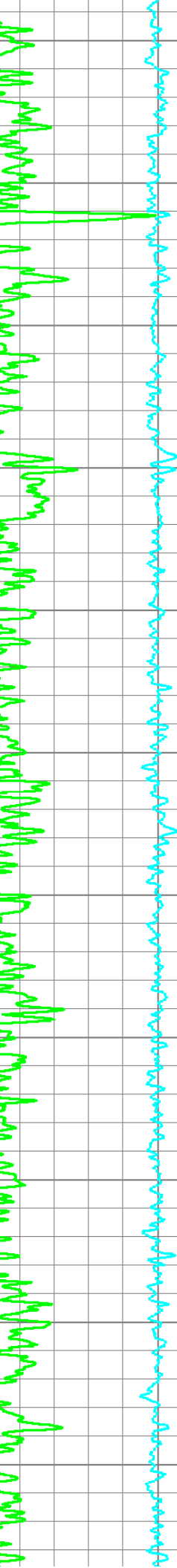
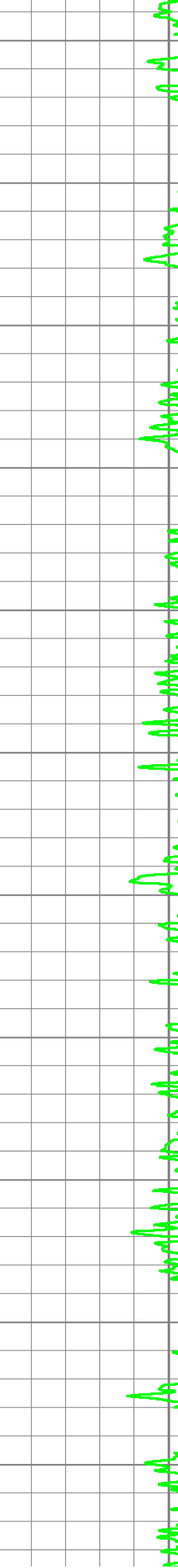
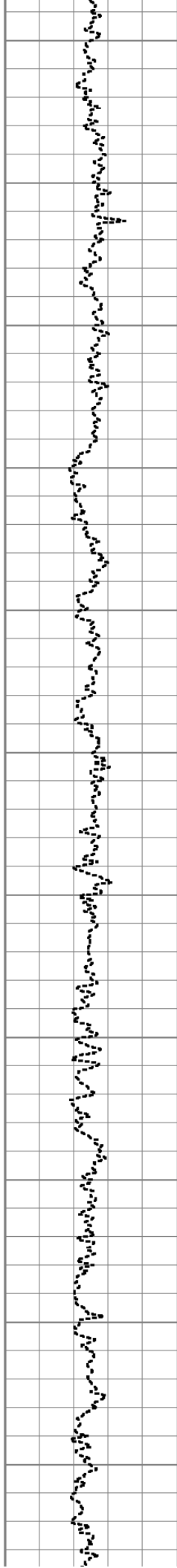
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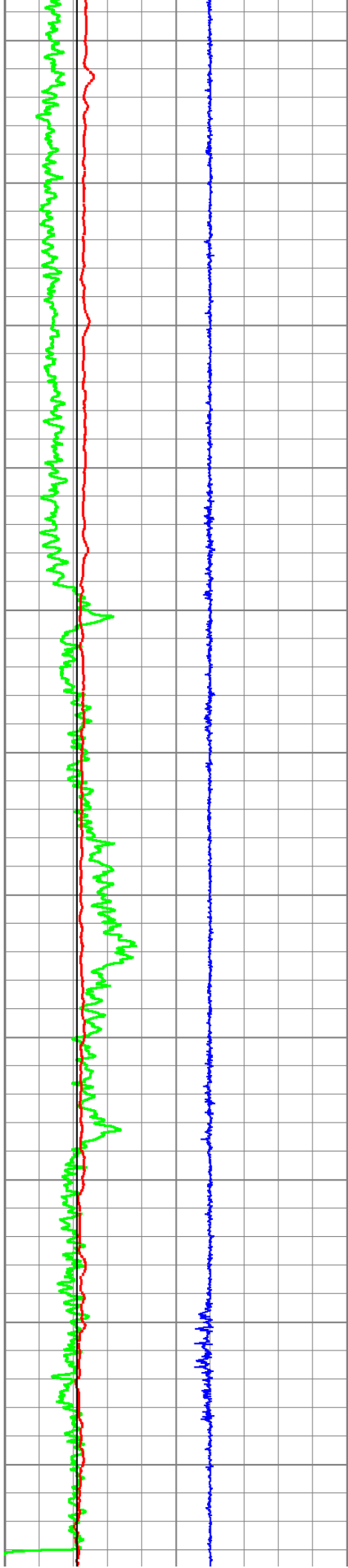
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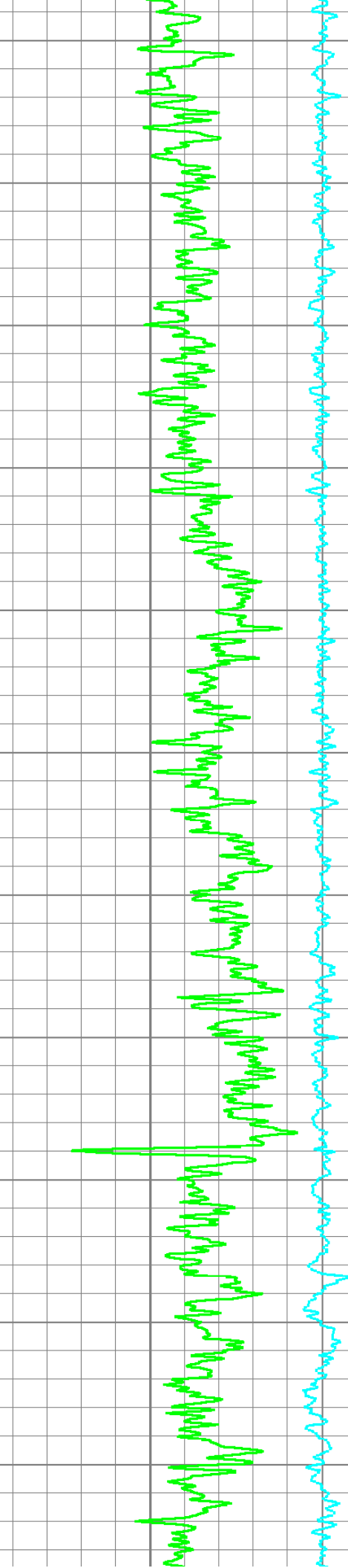
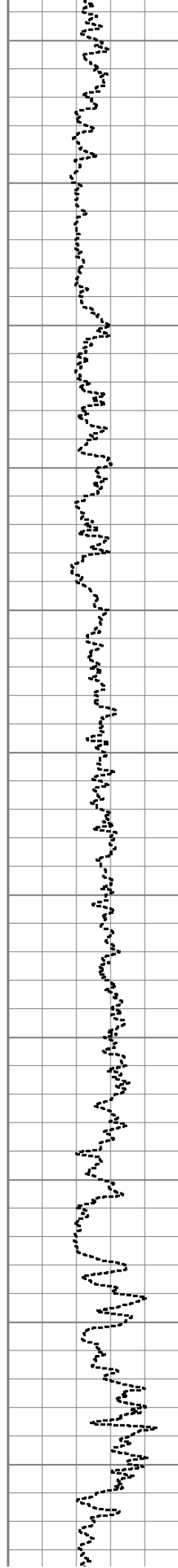
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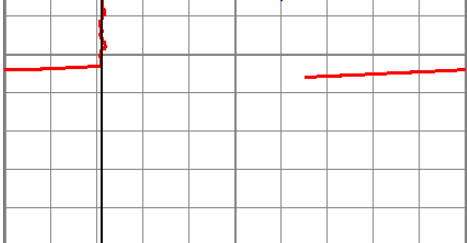
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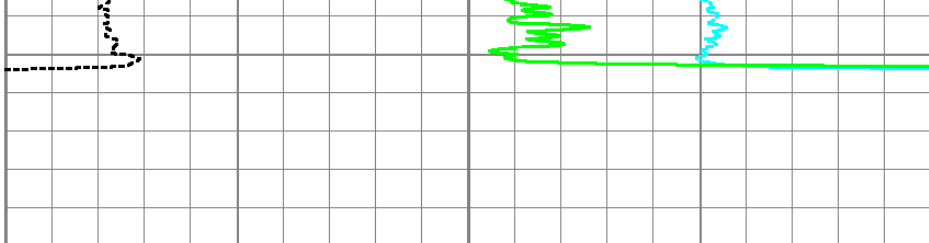
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0	GR (GAPI)	150
4	DCAL (in)	14
4	BOREID (in)	14
-5	ACCY	5

9900



0	PEF (barn)	10	-0.5	DRHO (g/cc)	0.5
2	RHOB (g/cc)		3		

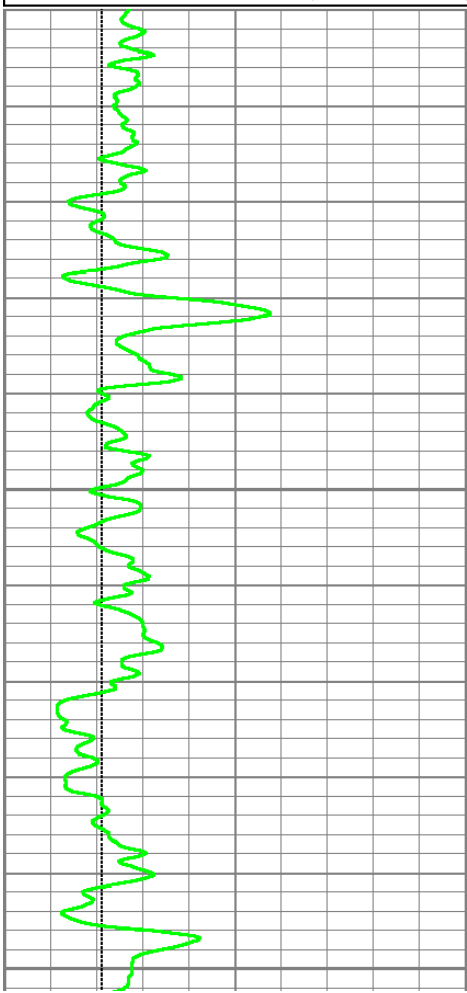


MAIN PASS

Database File: jones_mem.db
 Dataset Pathname: proc1/pass1.4
 Presentation Format: 6_5n_chk
 Dataset Creation: Fri Jul 19 23:30:45 2013
 Charted by: Depth in Feet scaled 1:240

4	DCAL (in)	14
4	BOREID (in)	14
0	GR (GAPI)	150
-5	ACCY	5
	TBHV (ft3)	

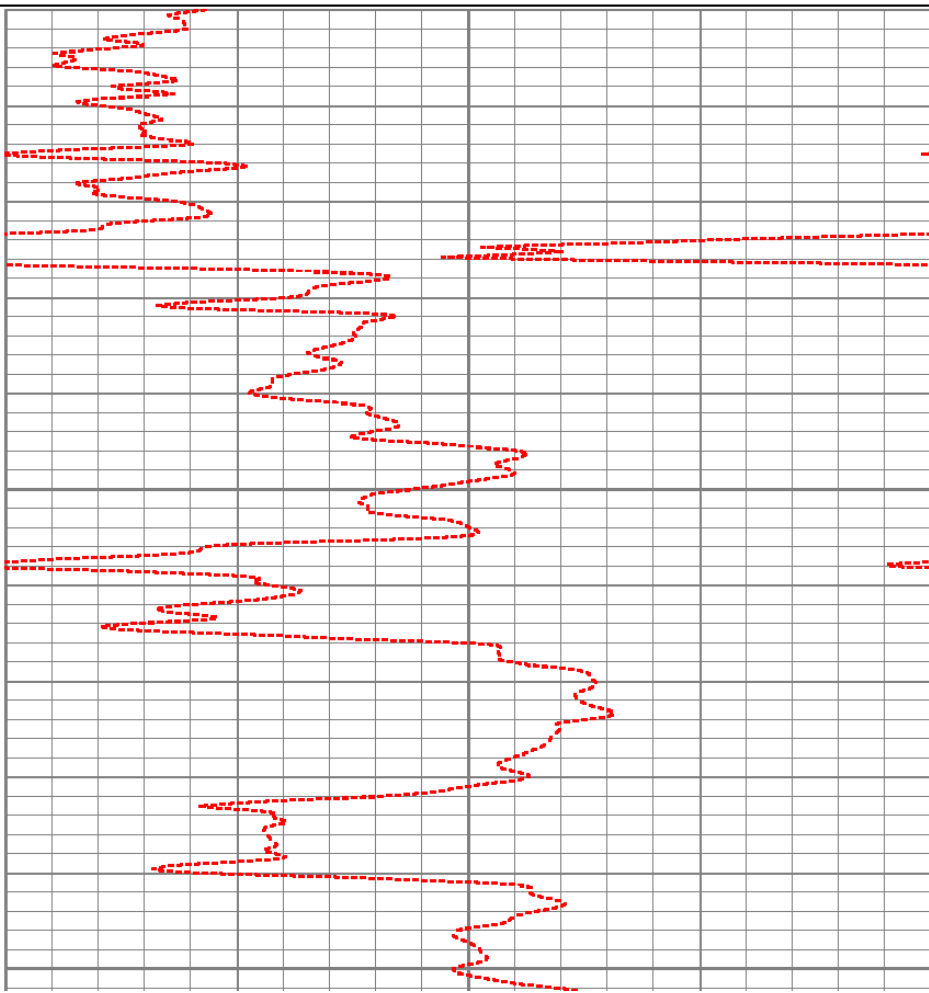
30	CNPOR (pu)		-10		
30	DPHI (pu)		-10		
0	PEF (barn)	10	-0.5	DRHO (g/cc)	0.5
	ABHV (ft3)				

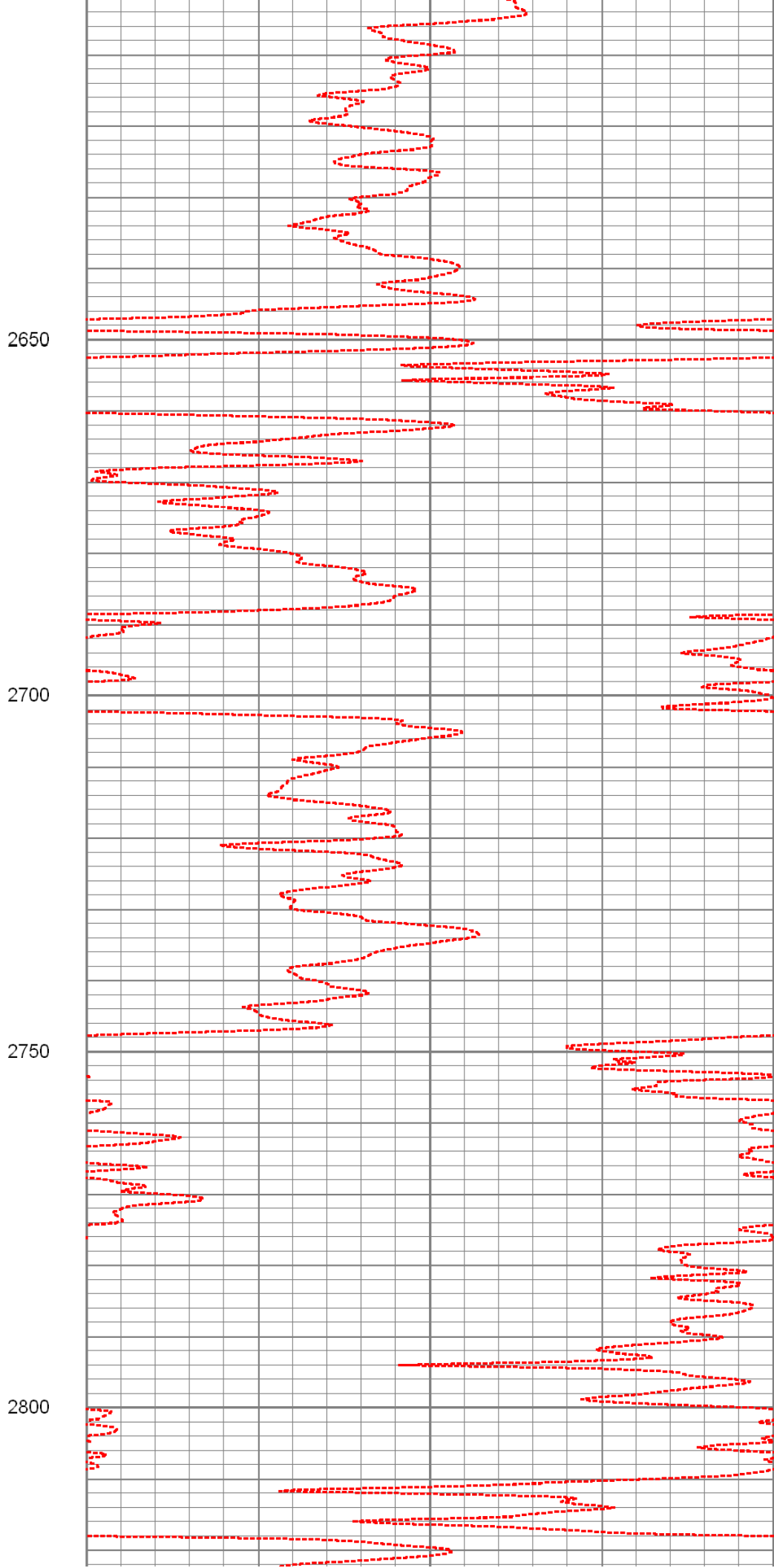
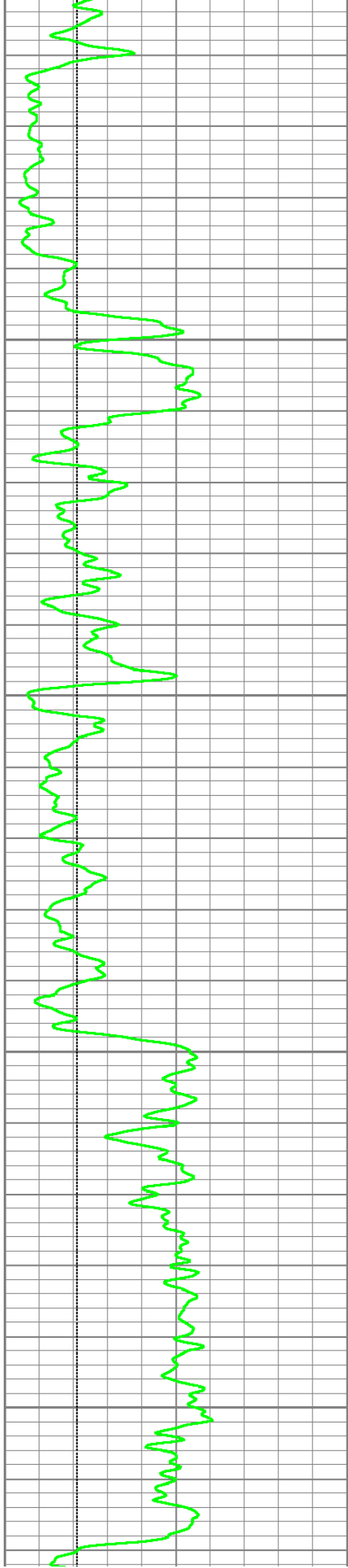


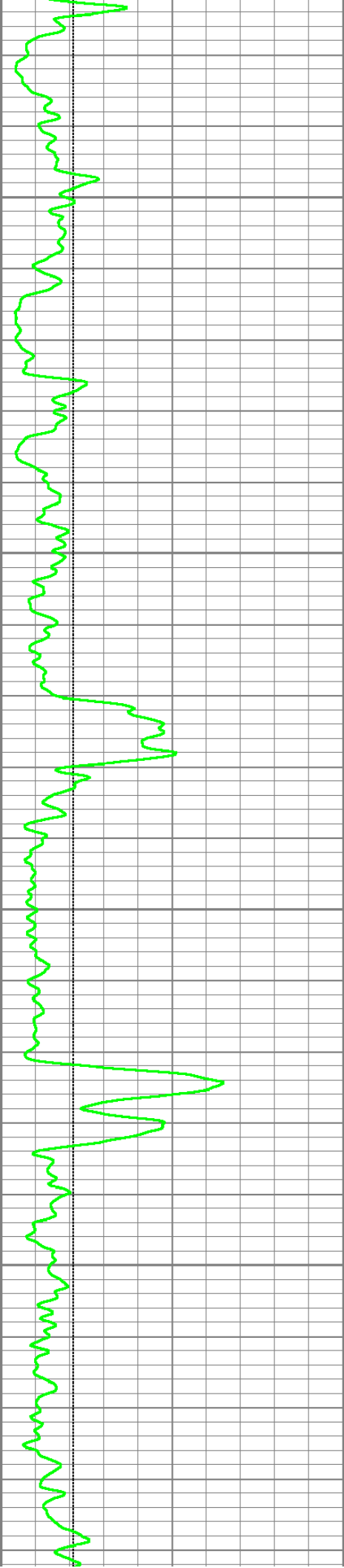
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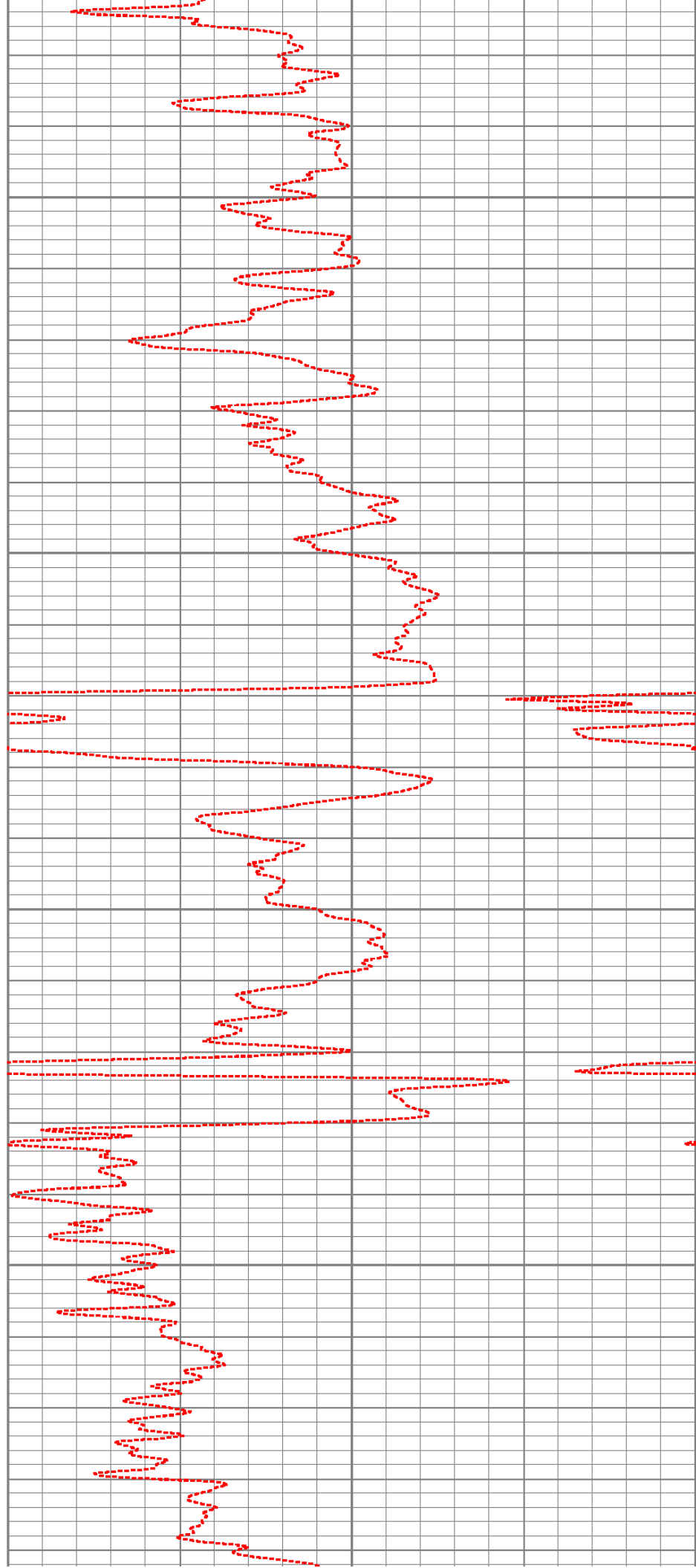


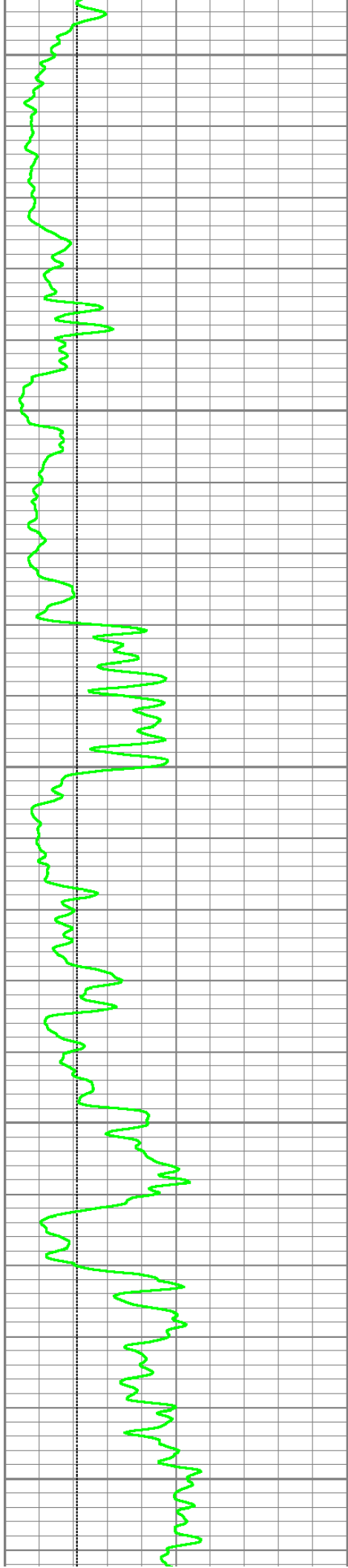
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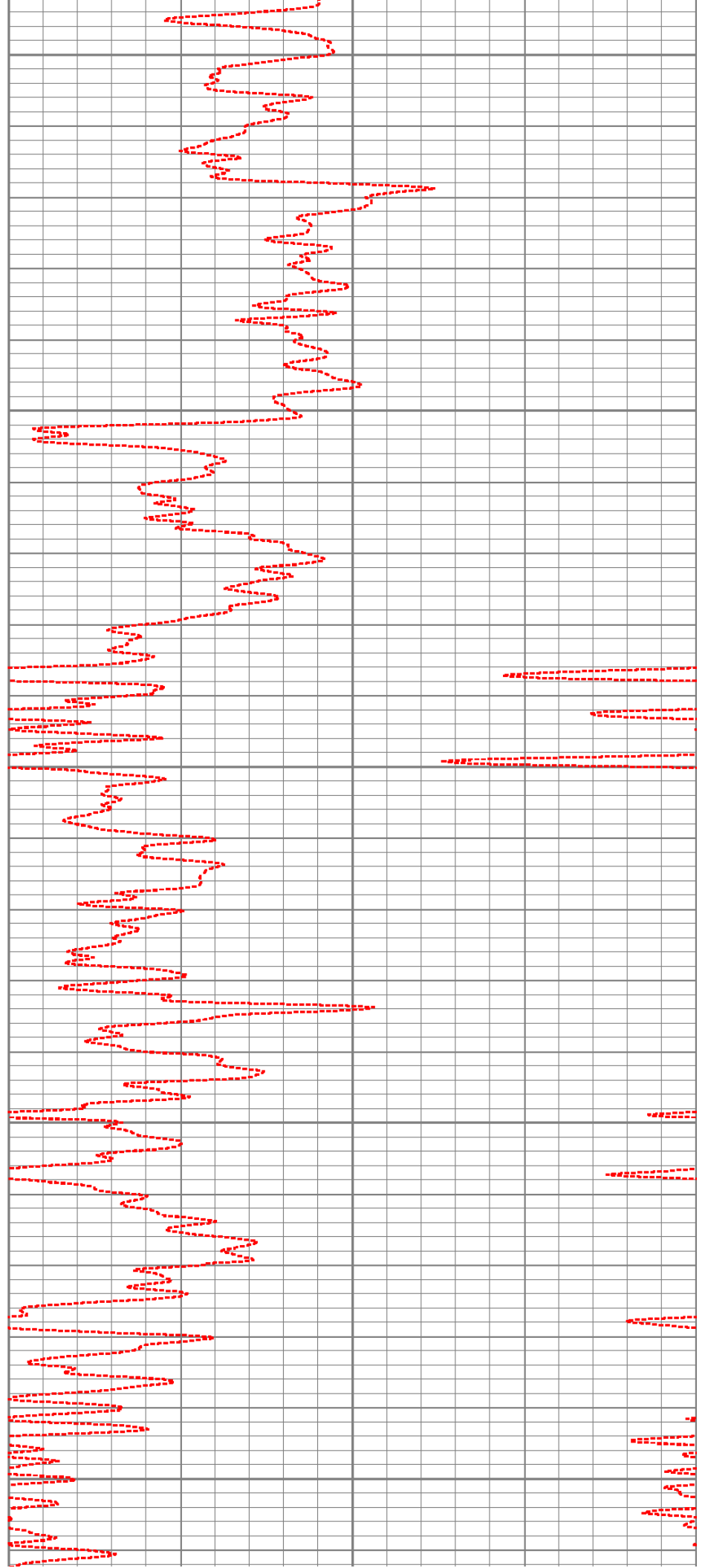
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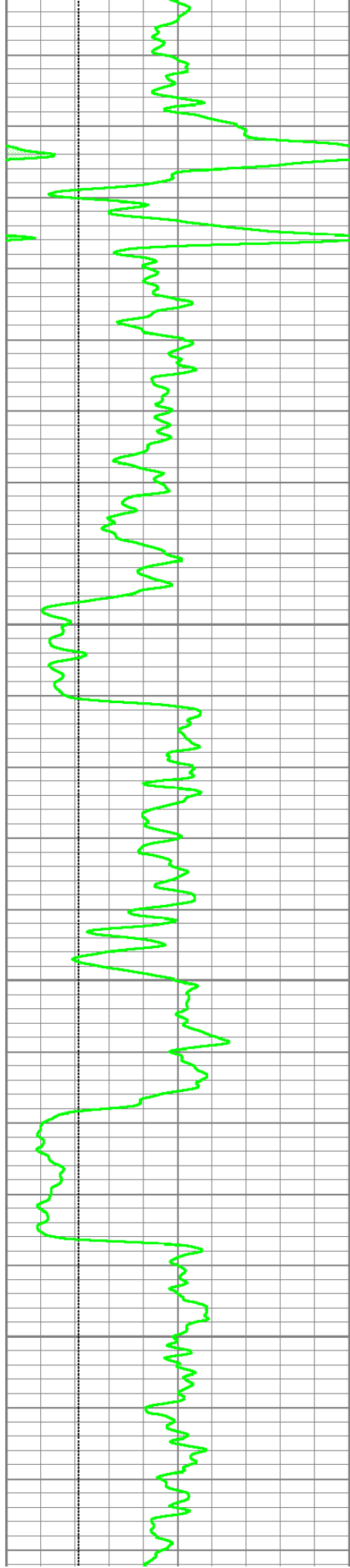
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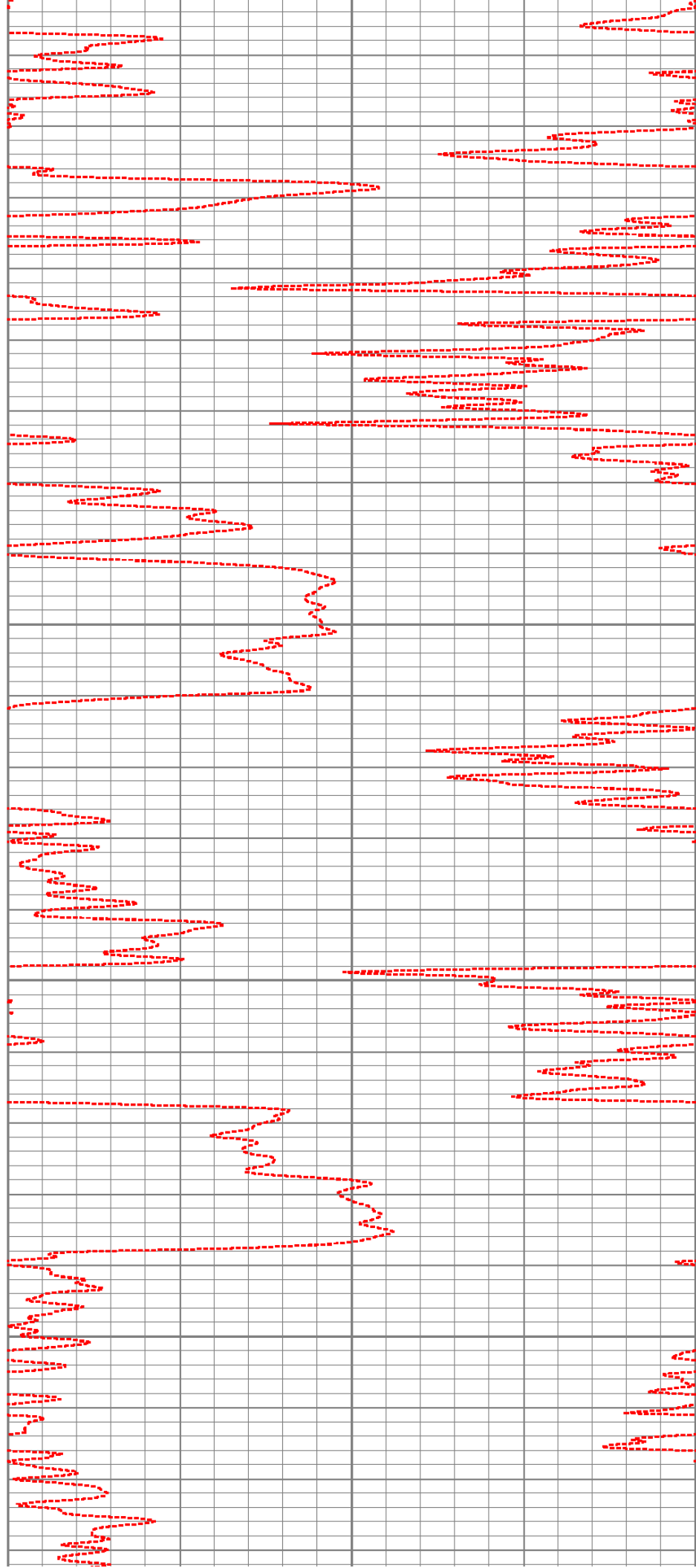


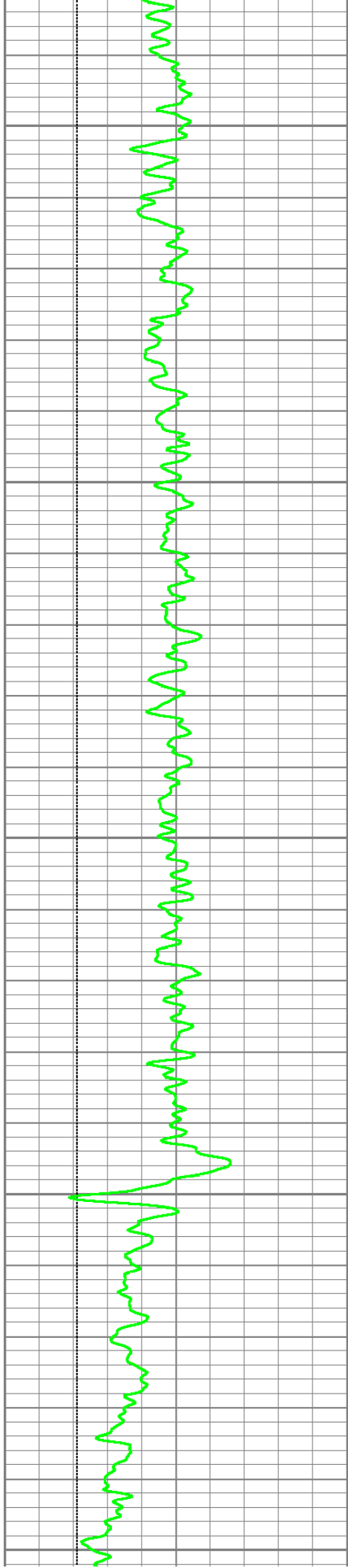
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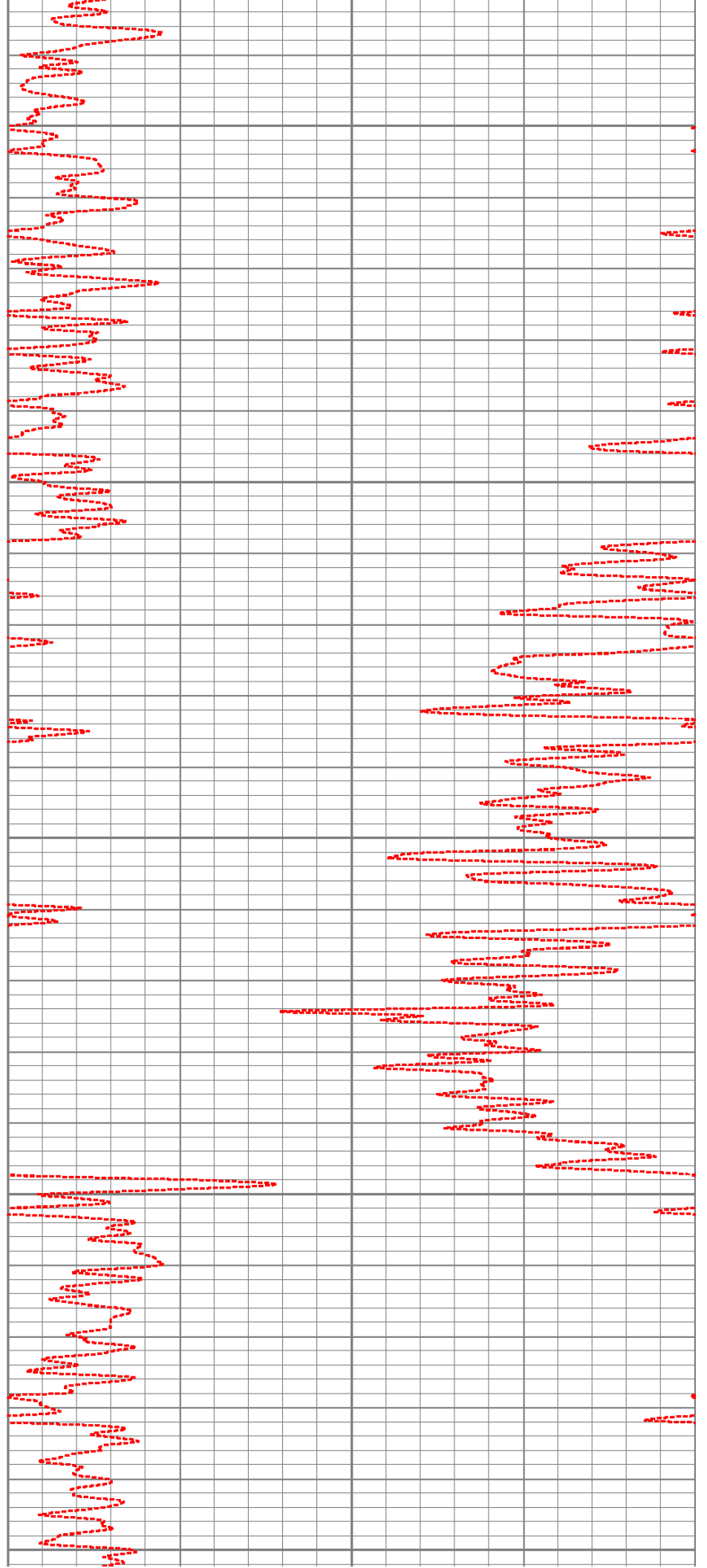
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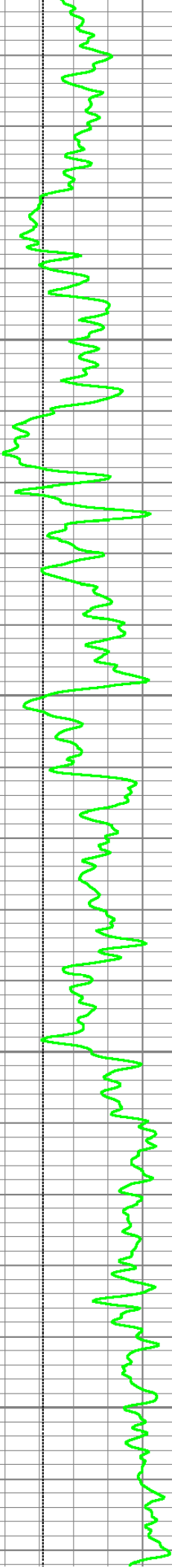
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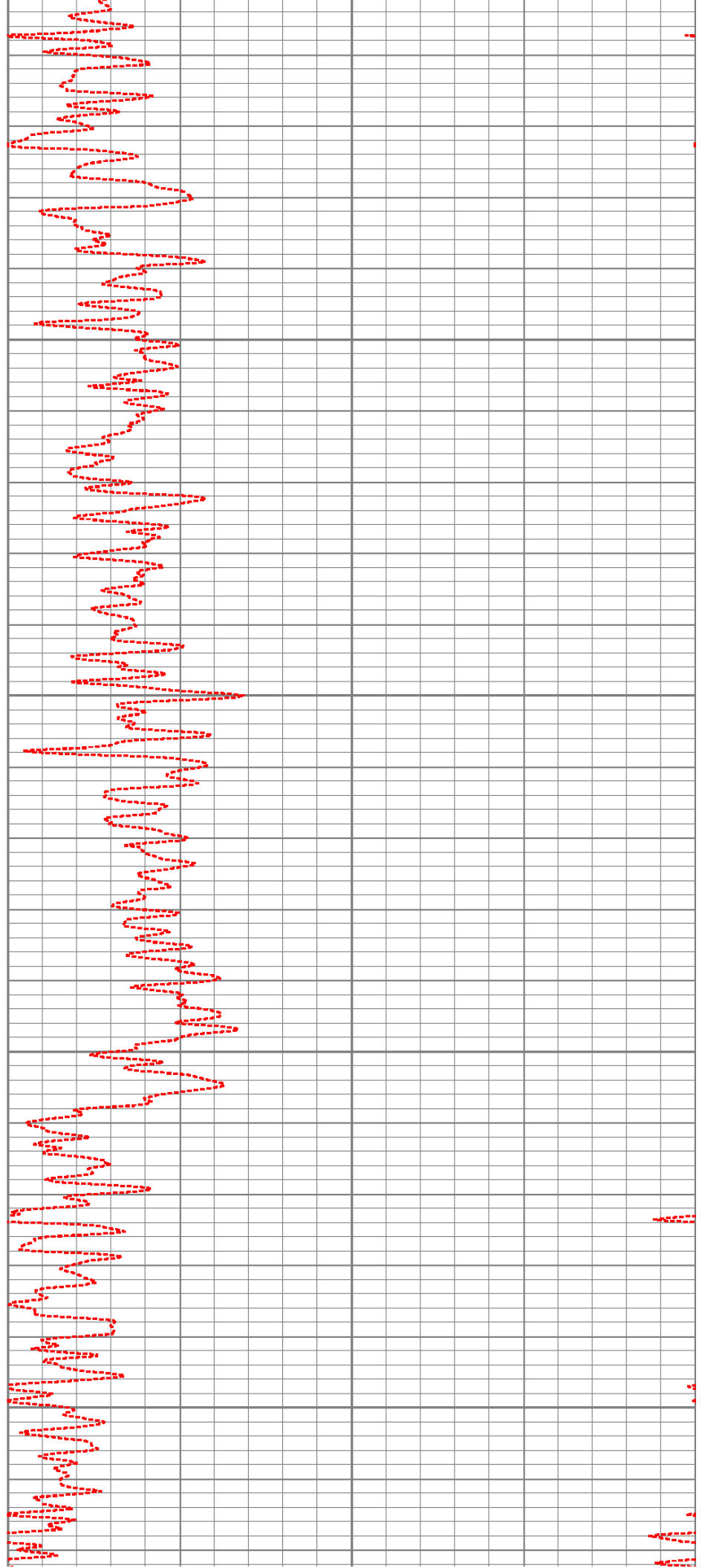


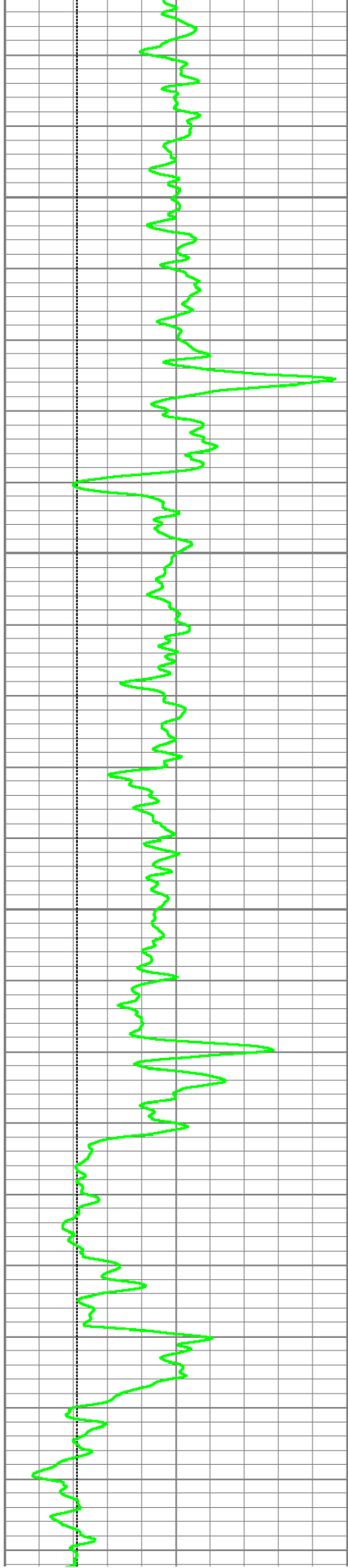
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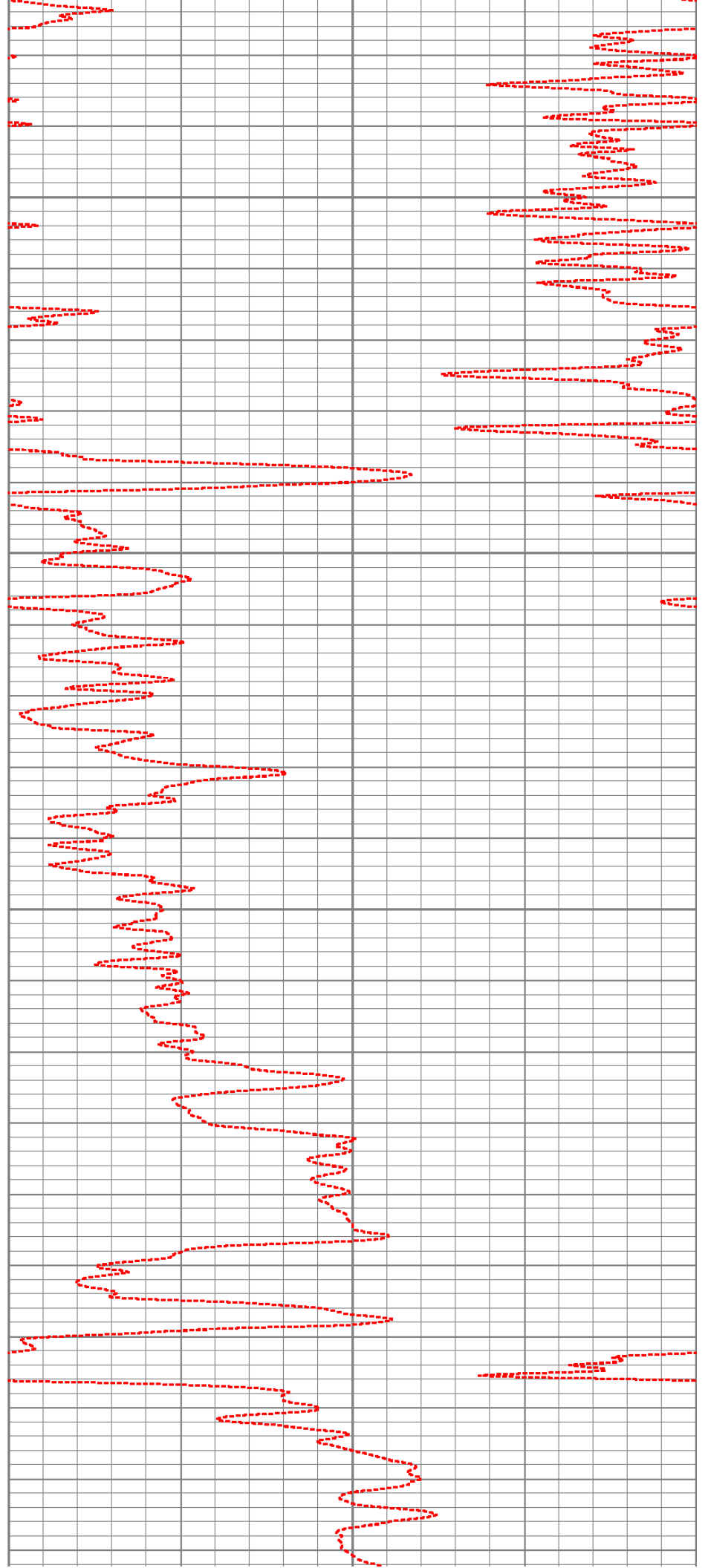


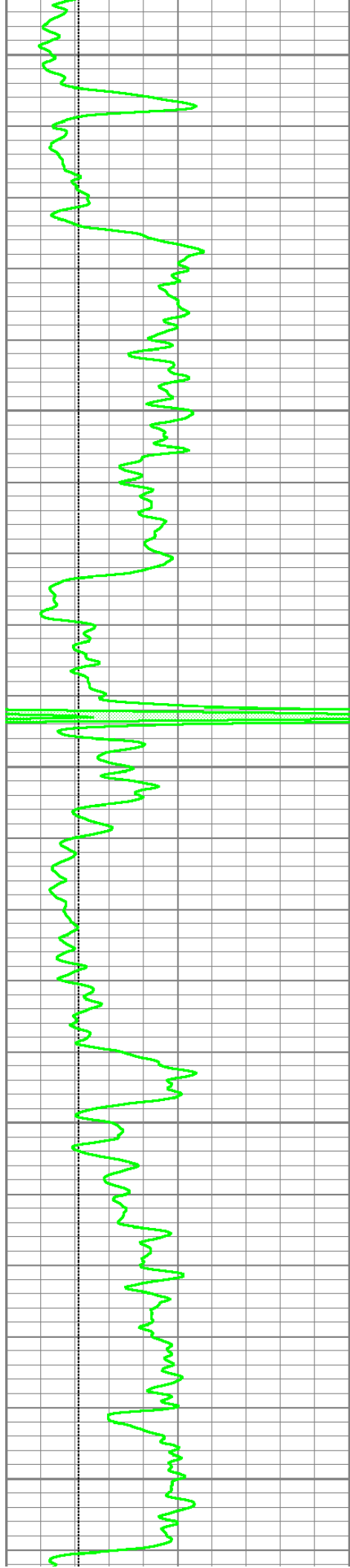
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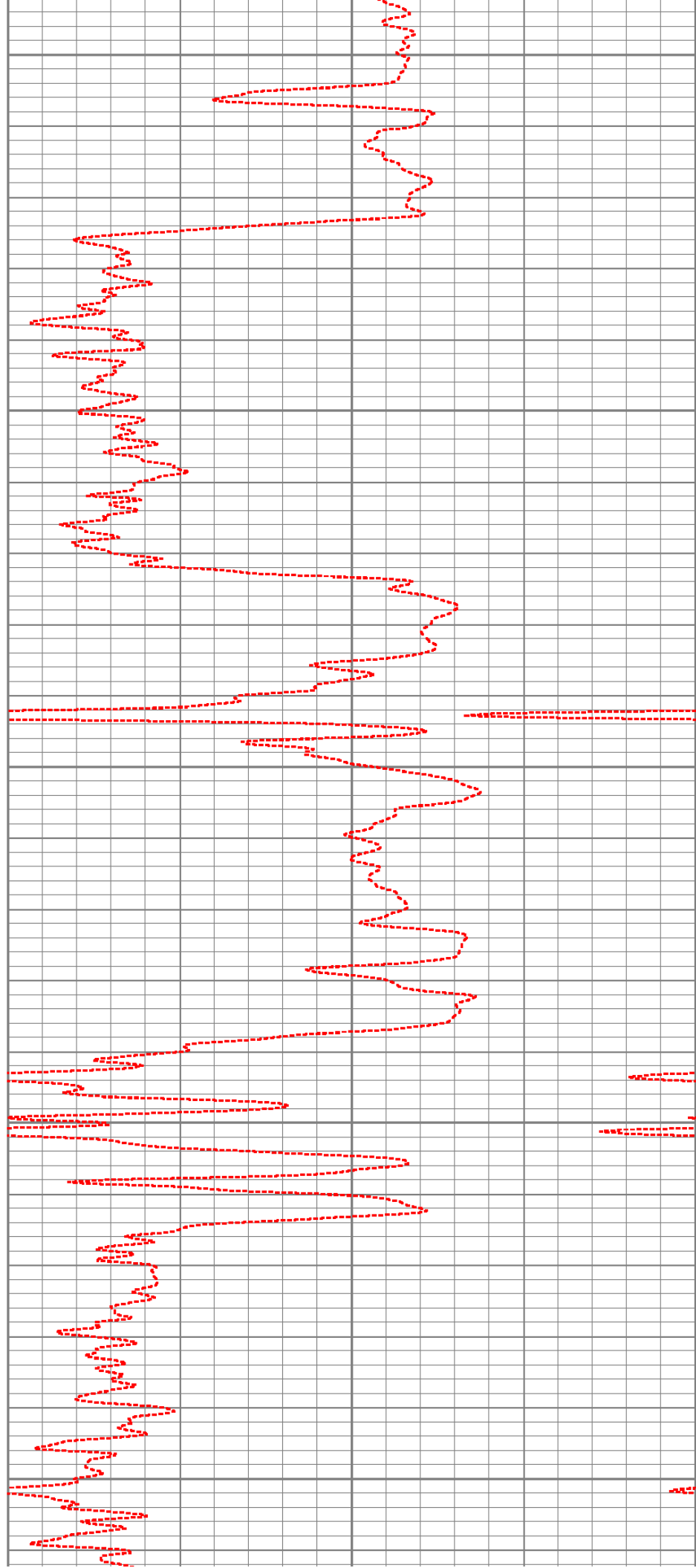
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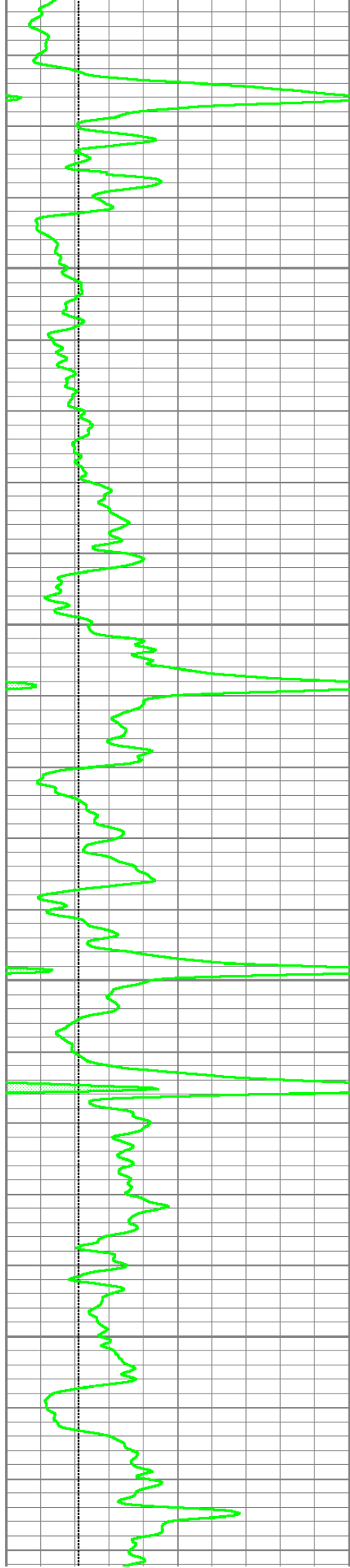
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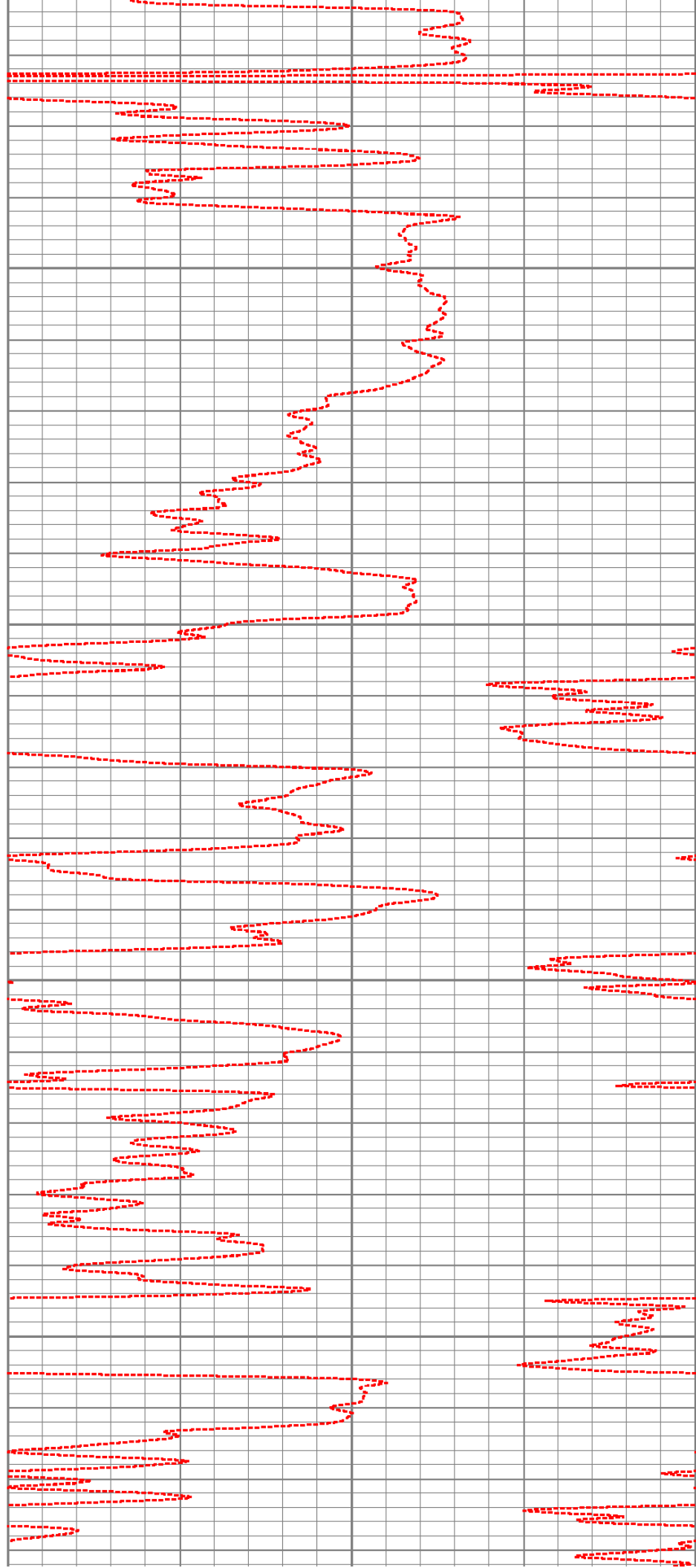


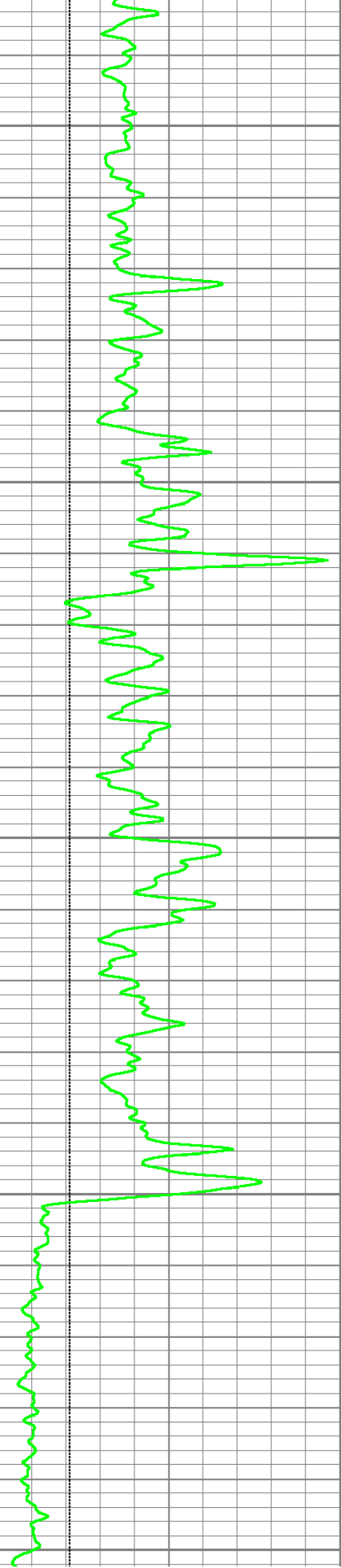
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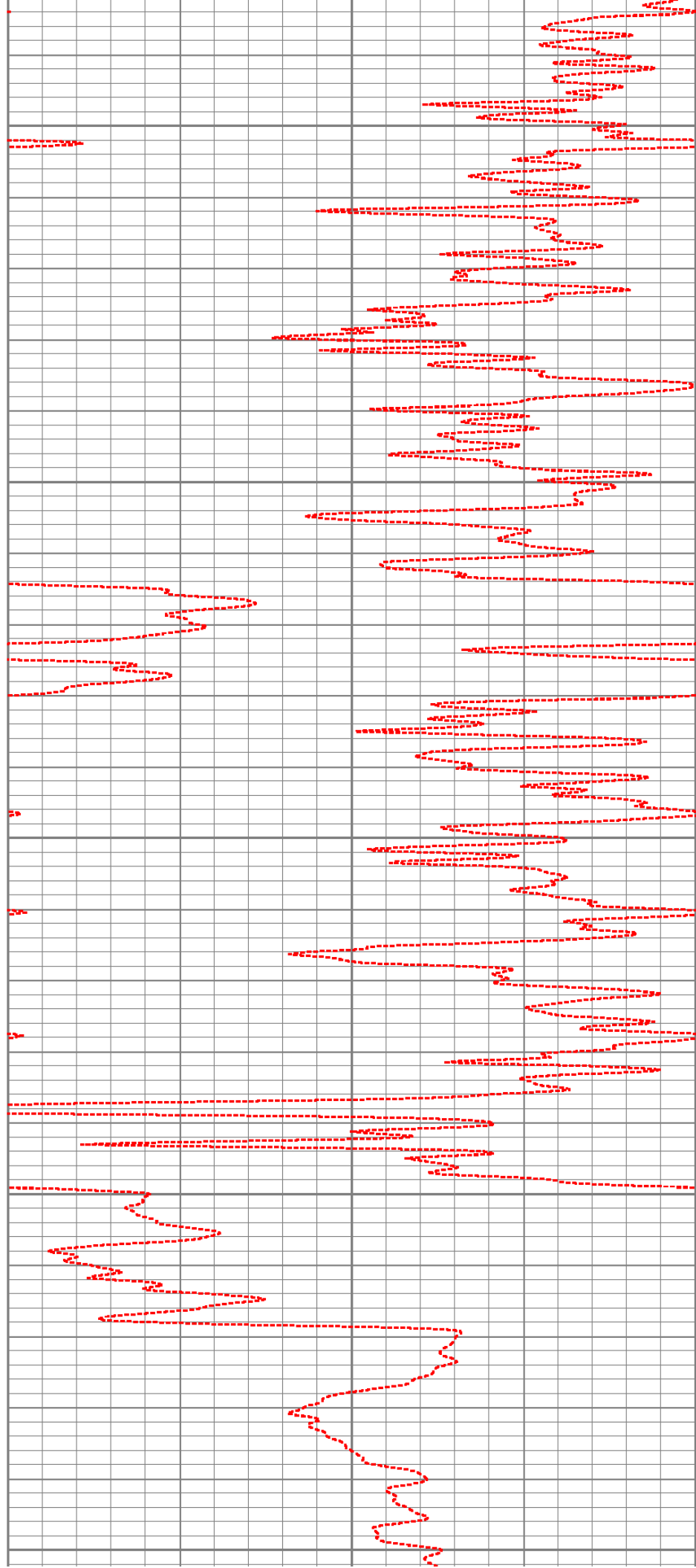
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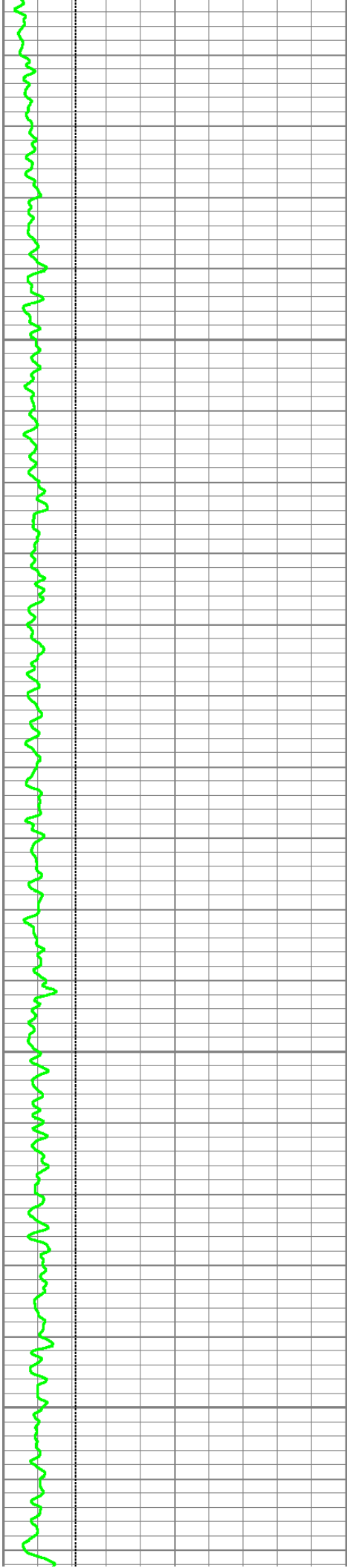
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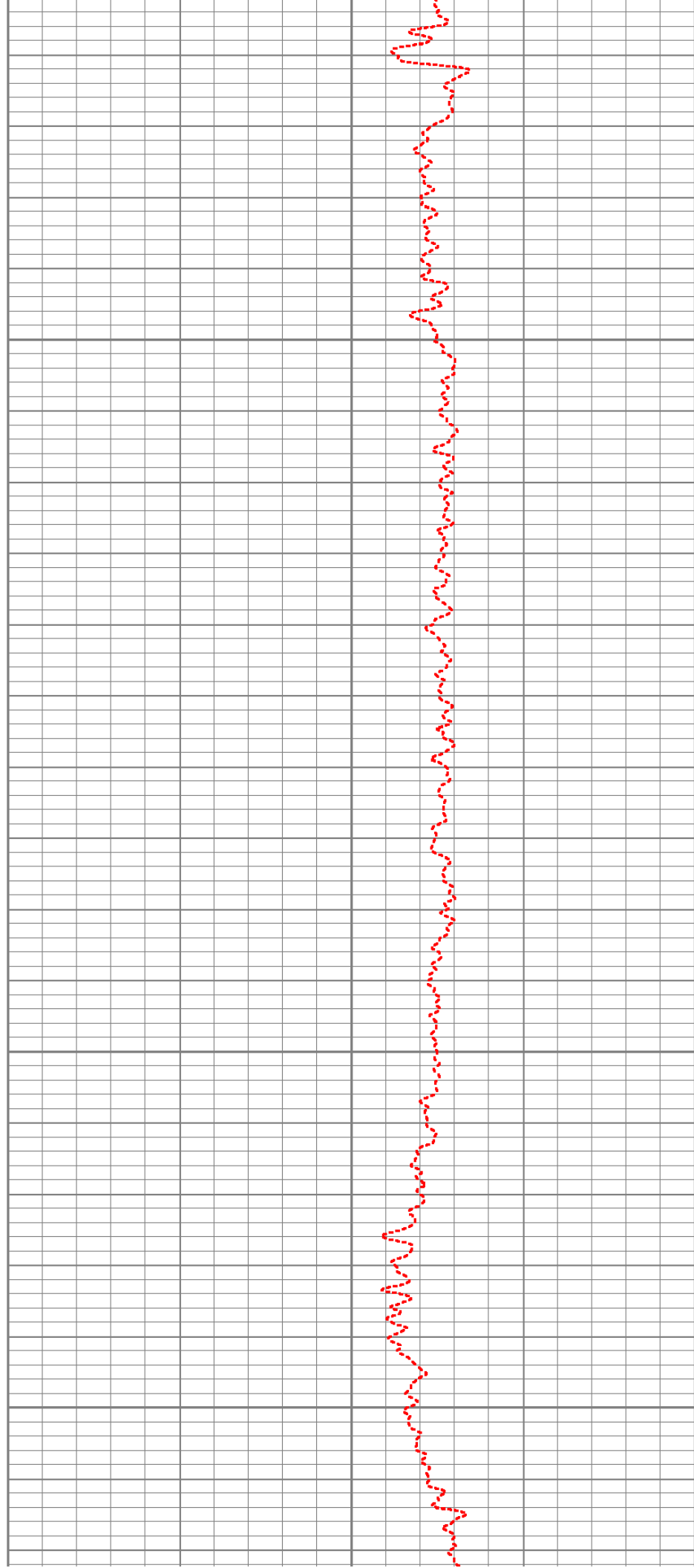


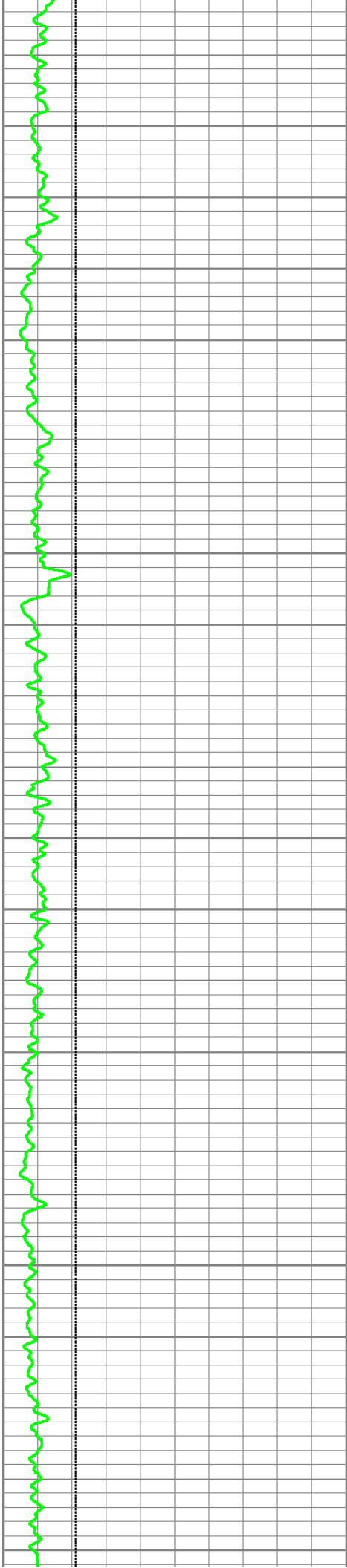
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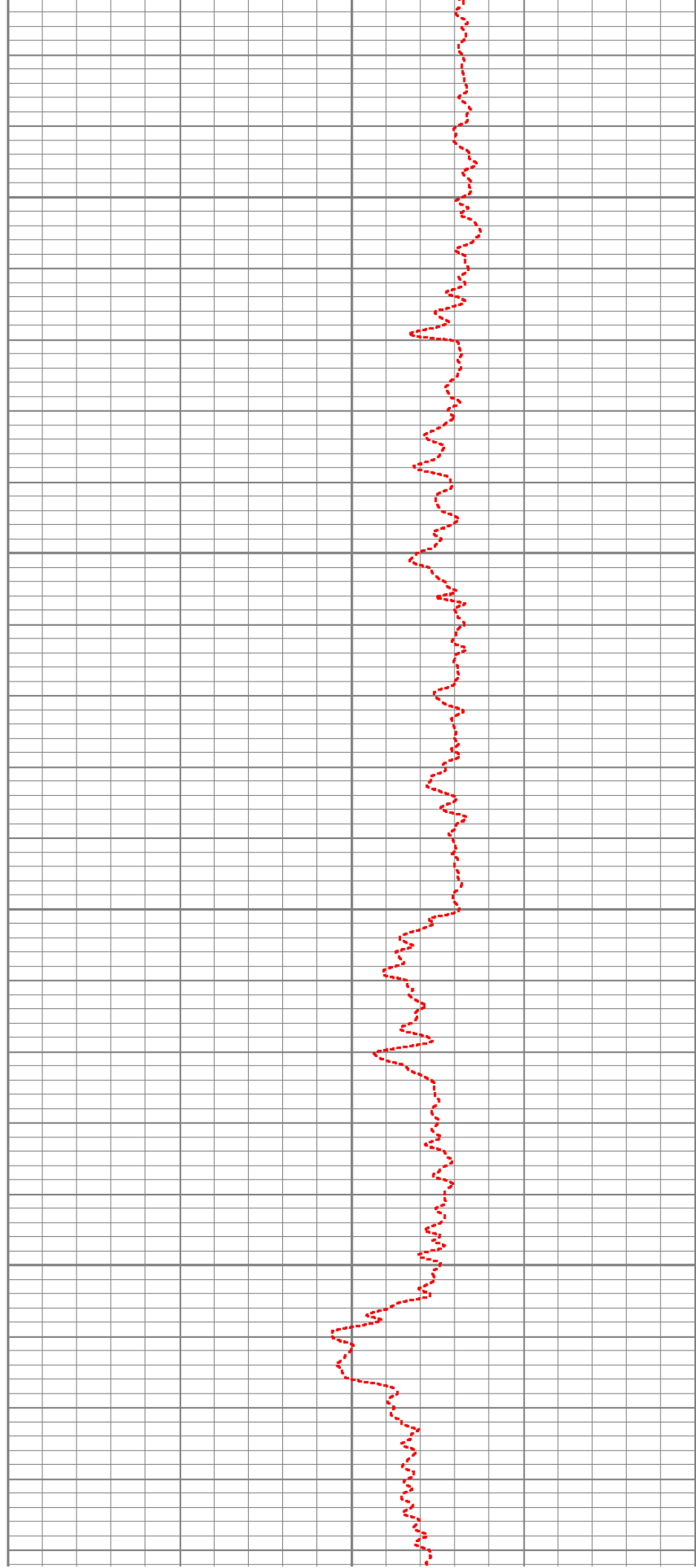


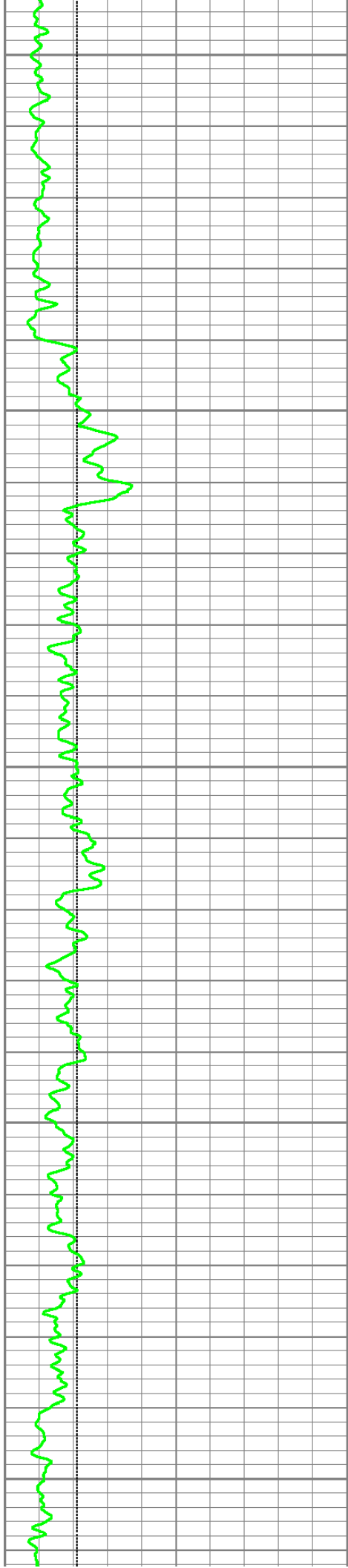
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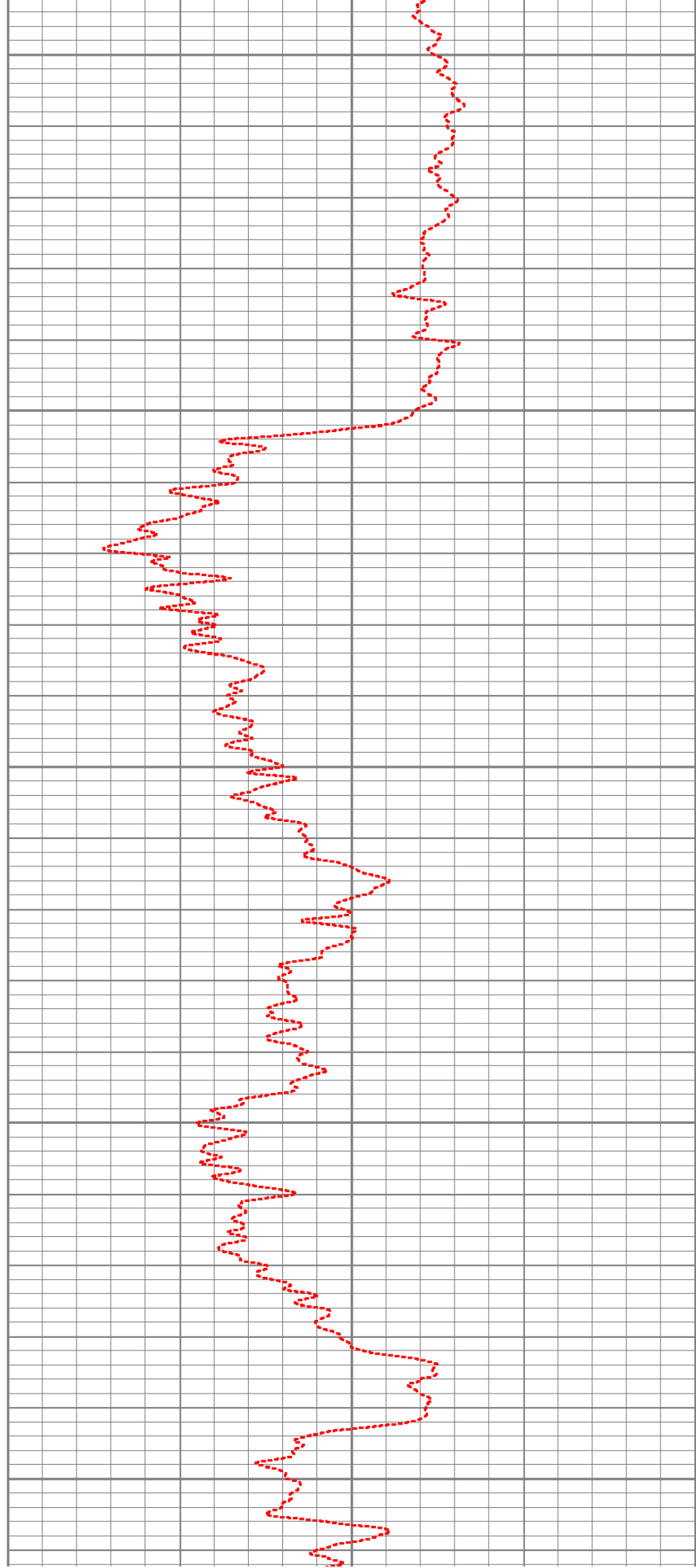
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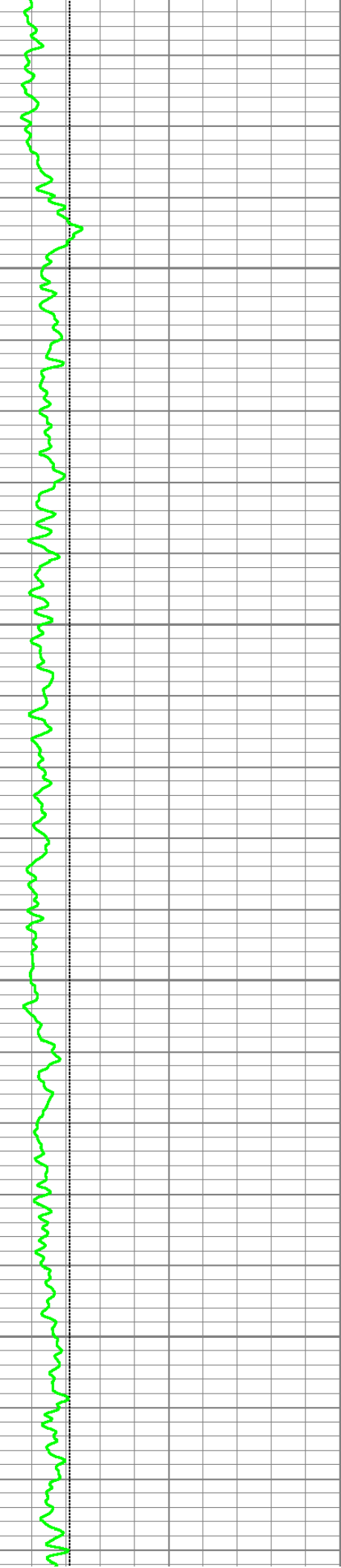
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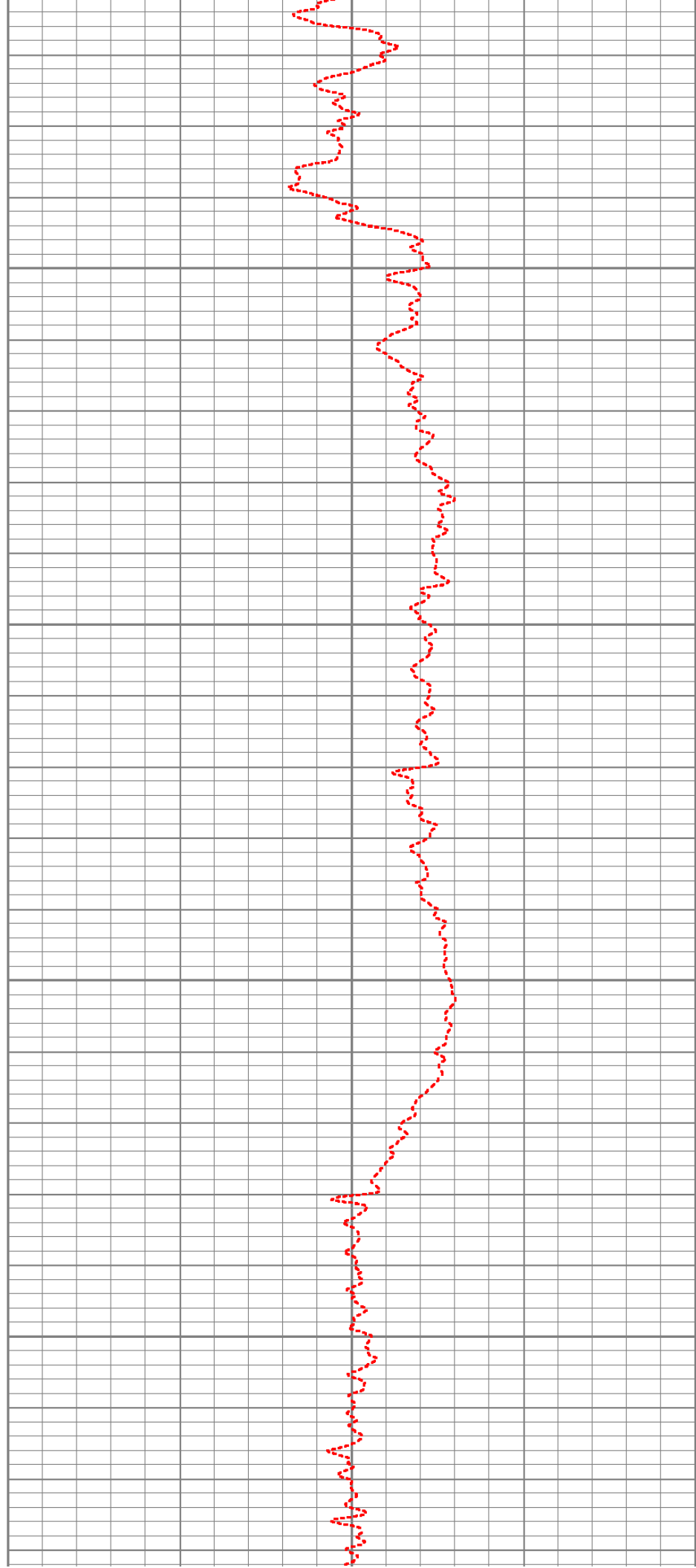


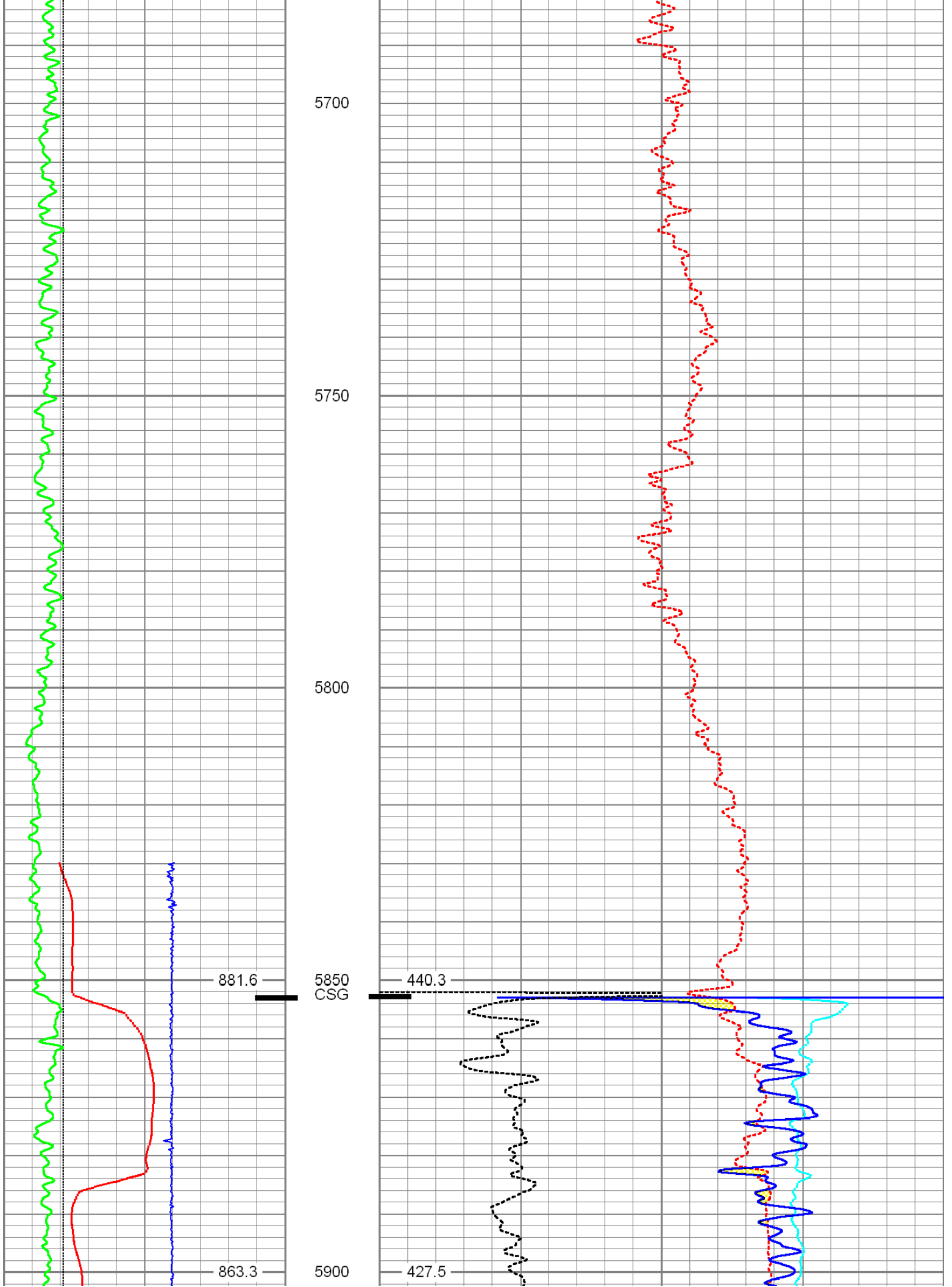
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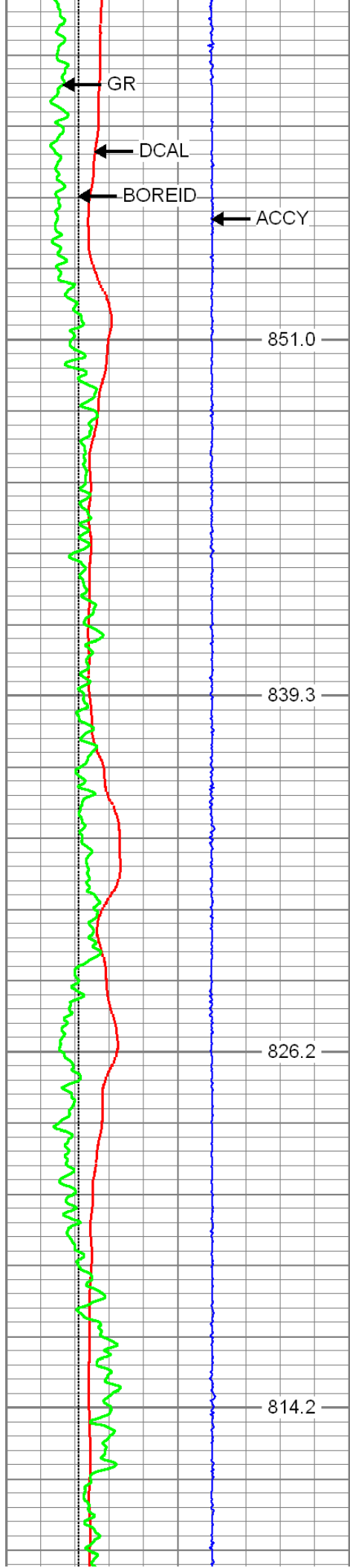
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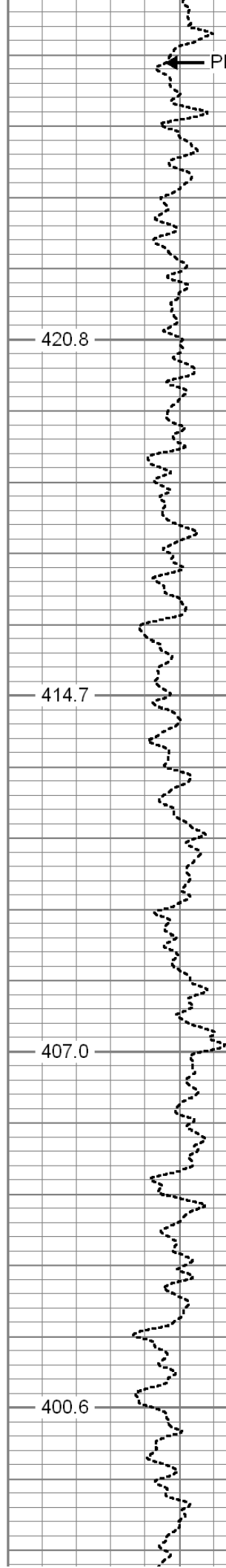


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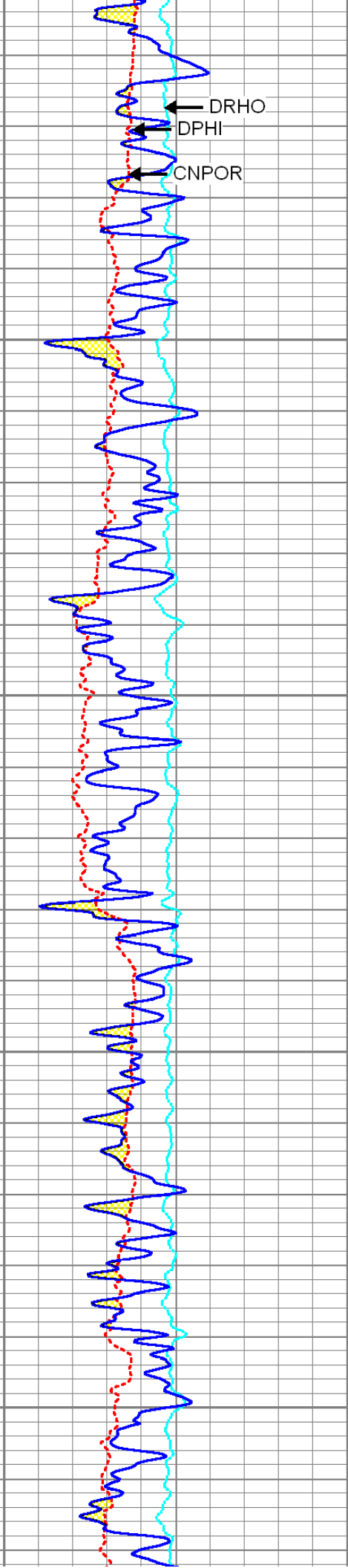
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PEF

DRHO

DPHI

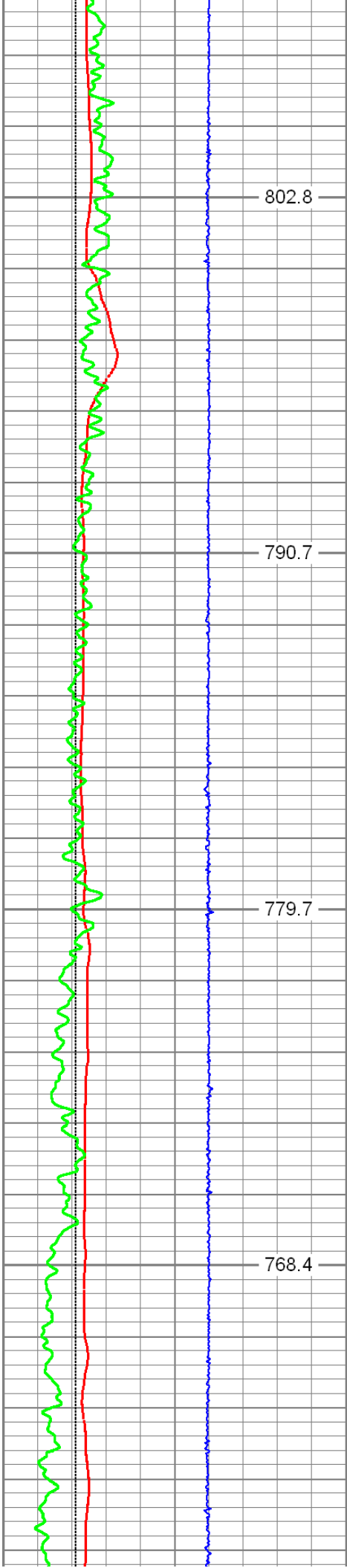
CNPOR

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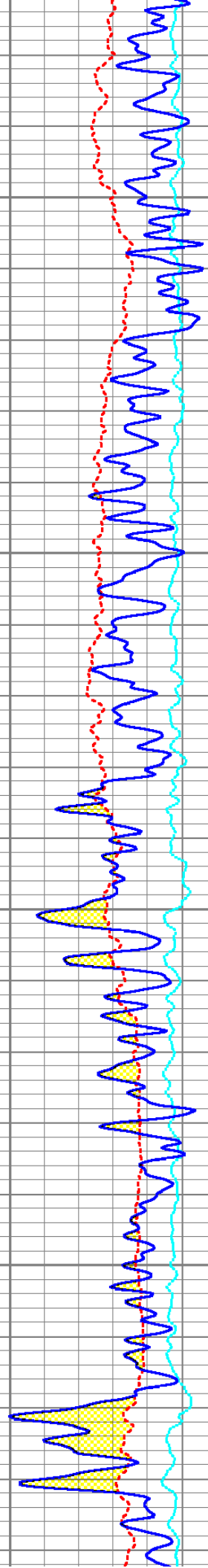
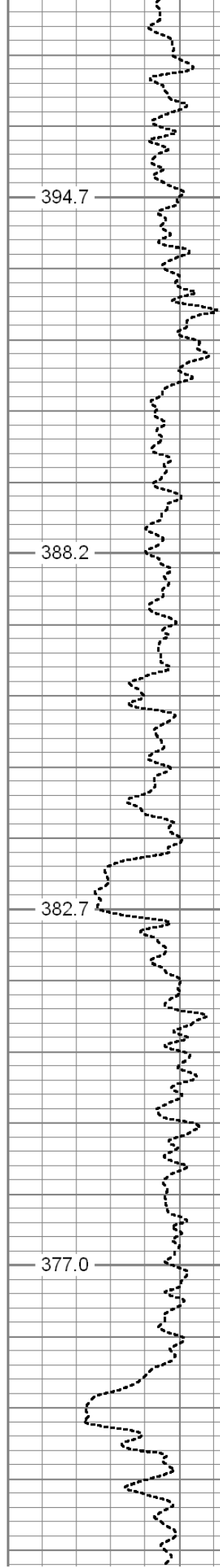
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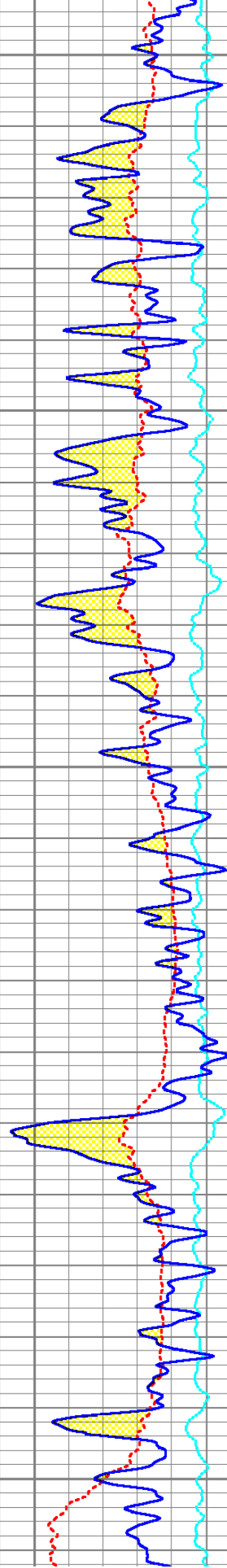
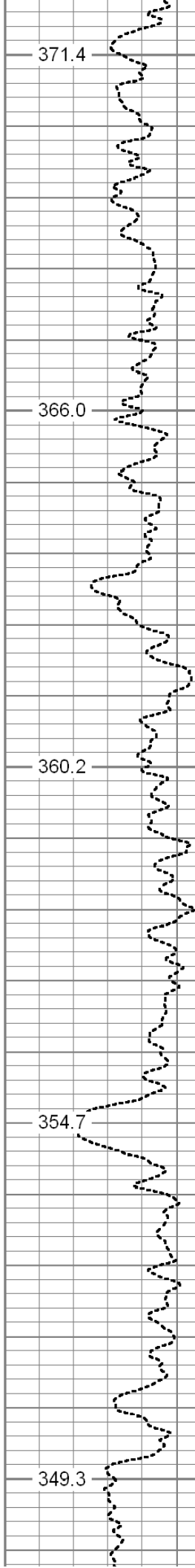
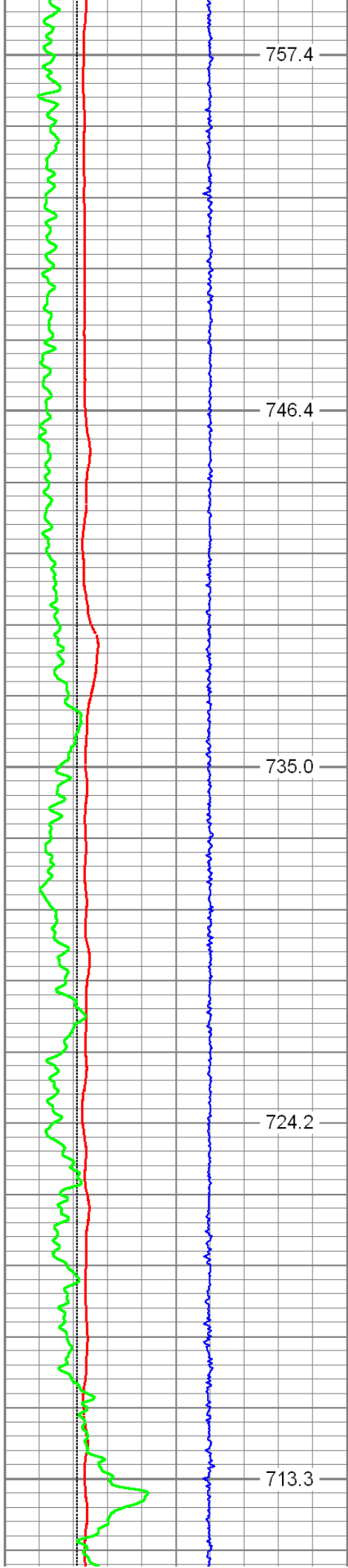
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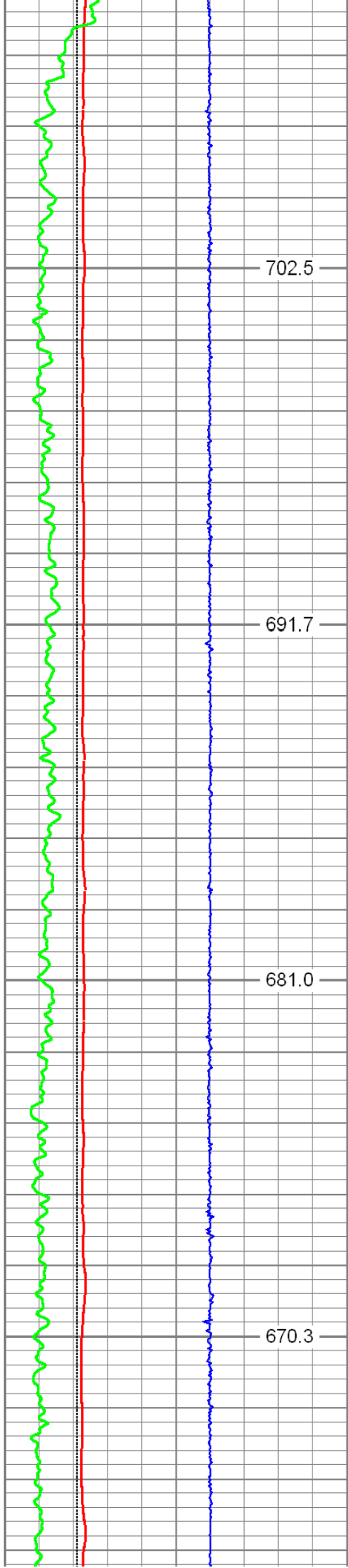
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6150
6200
6250
6300





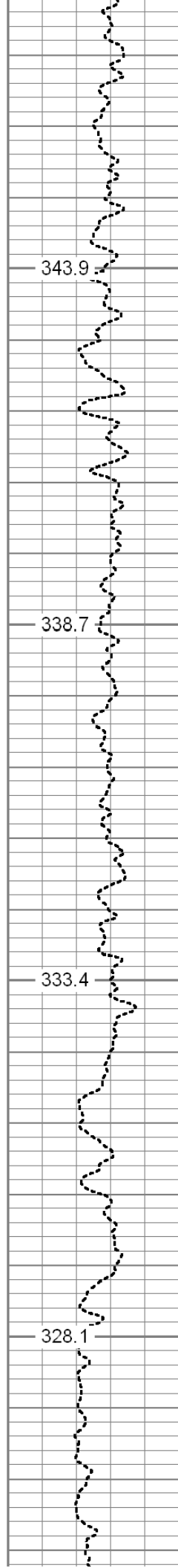


6600

6650

6700

6750

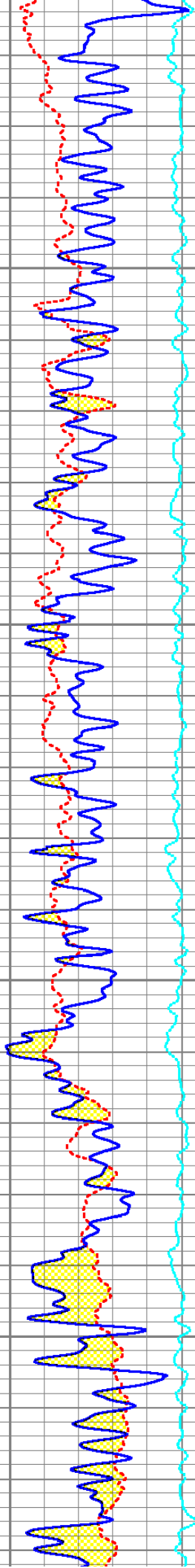


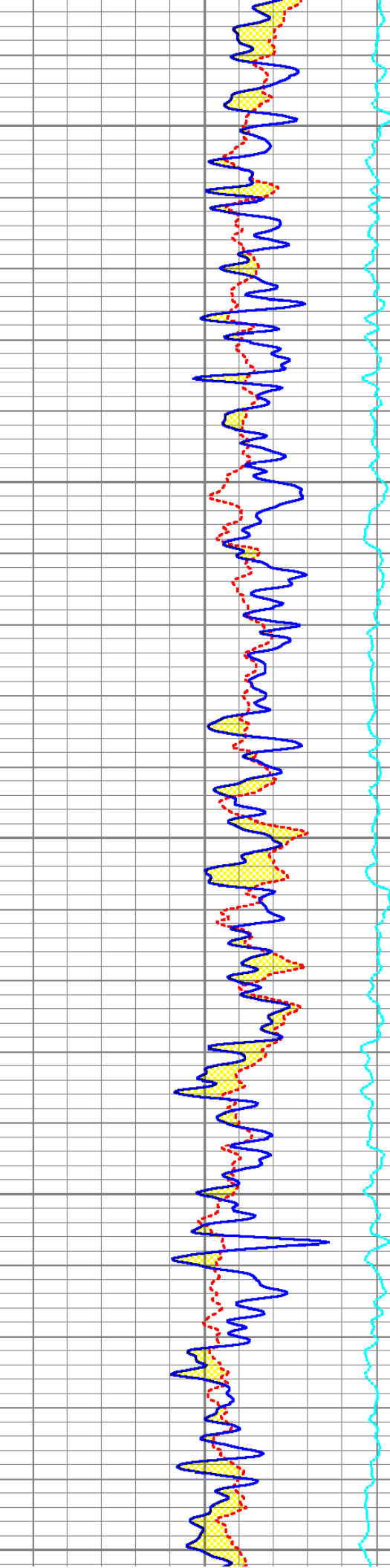
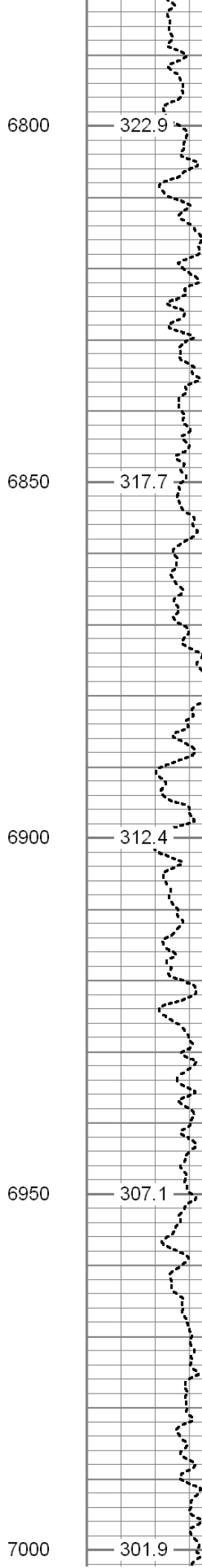
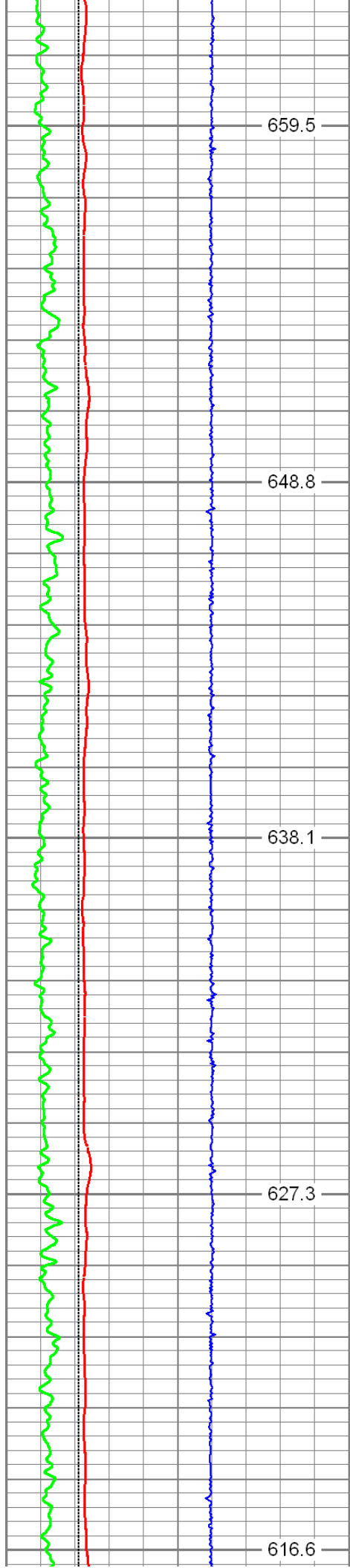
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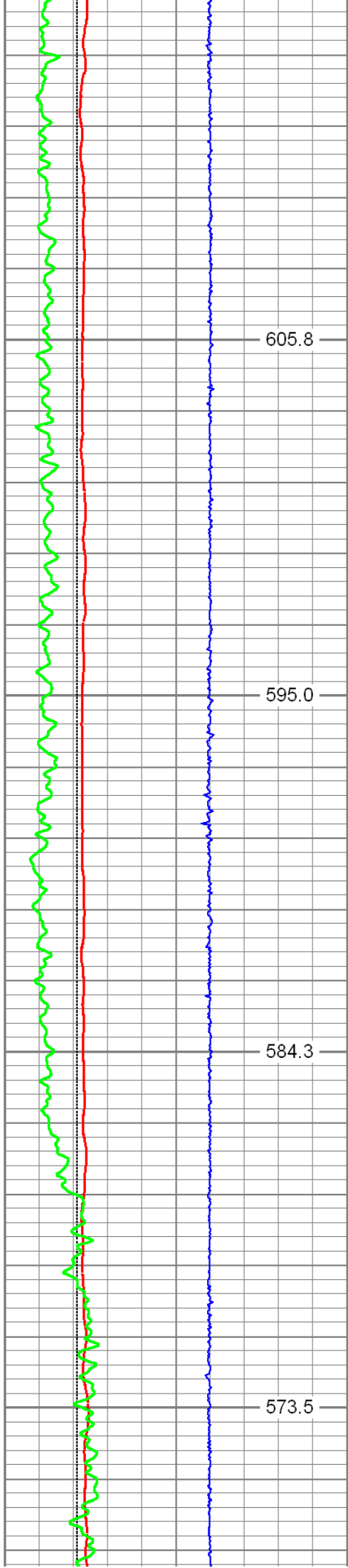
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333.4

328.1





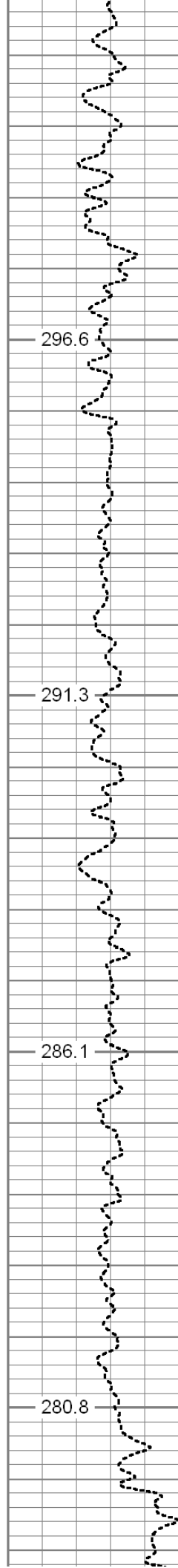


7050

7100

7150

7200

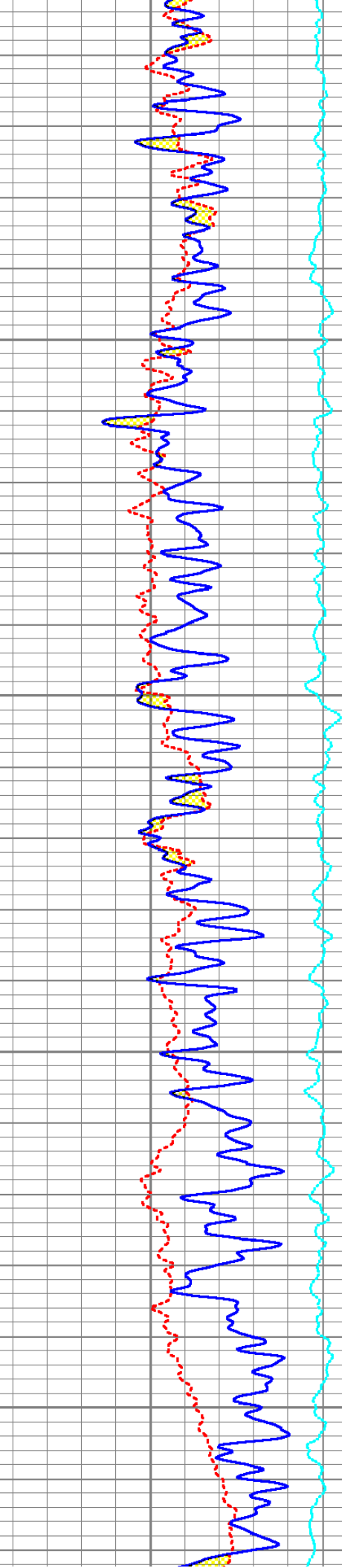


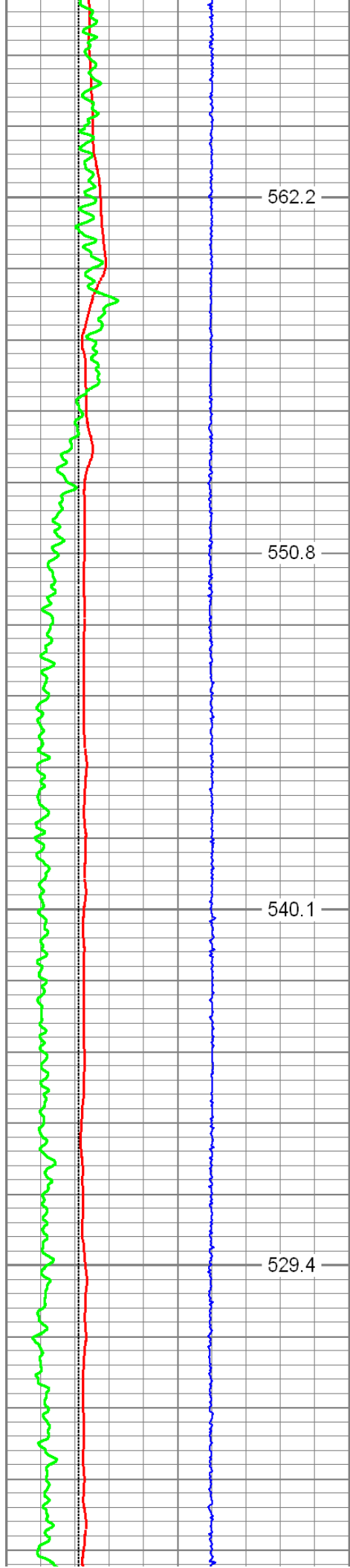
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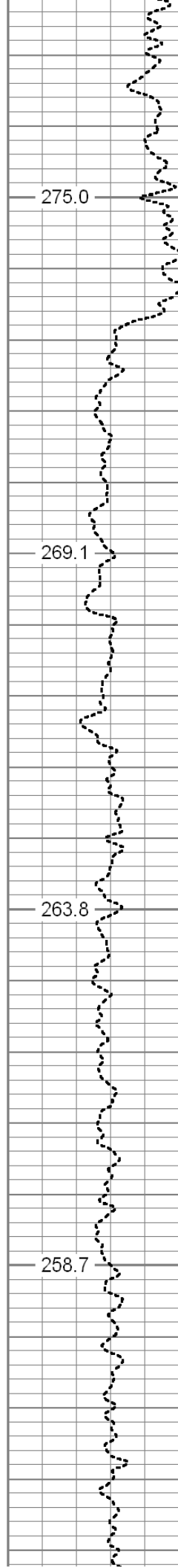
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280.8

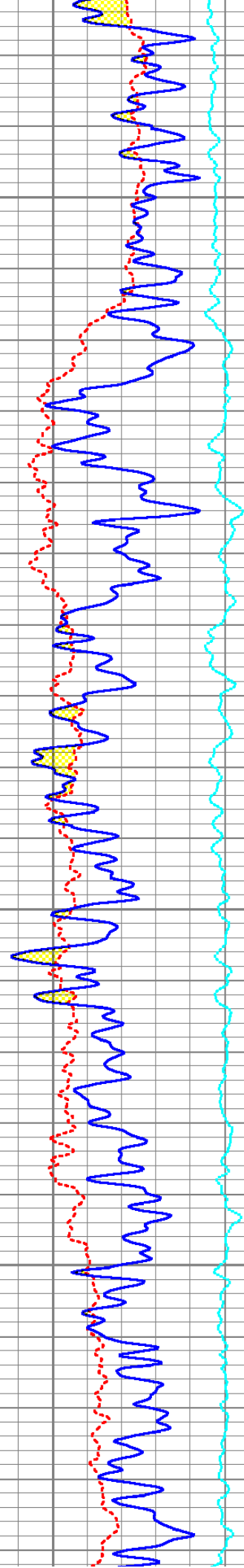


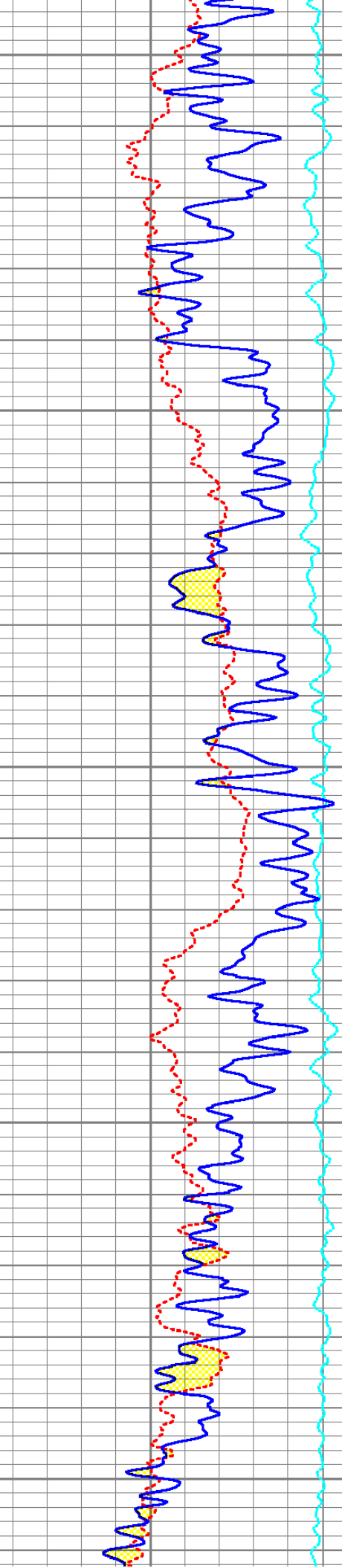
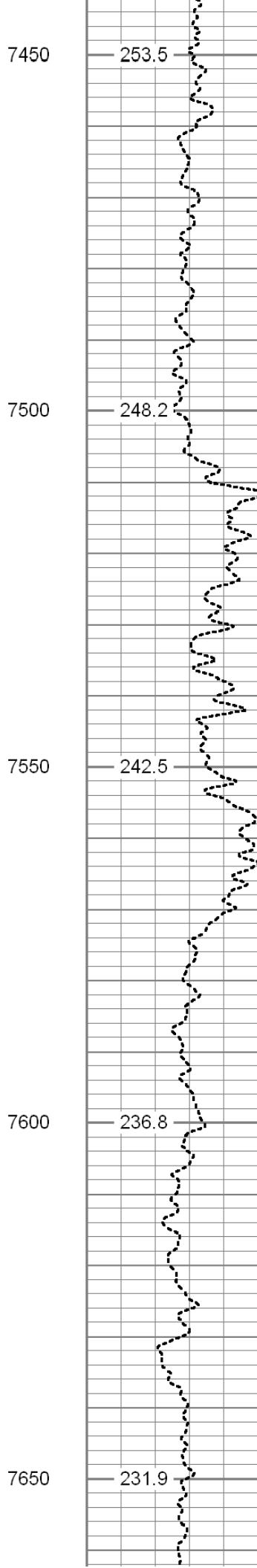
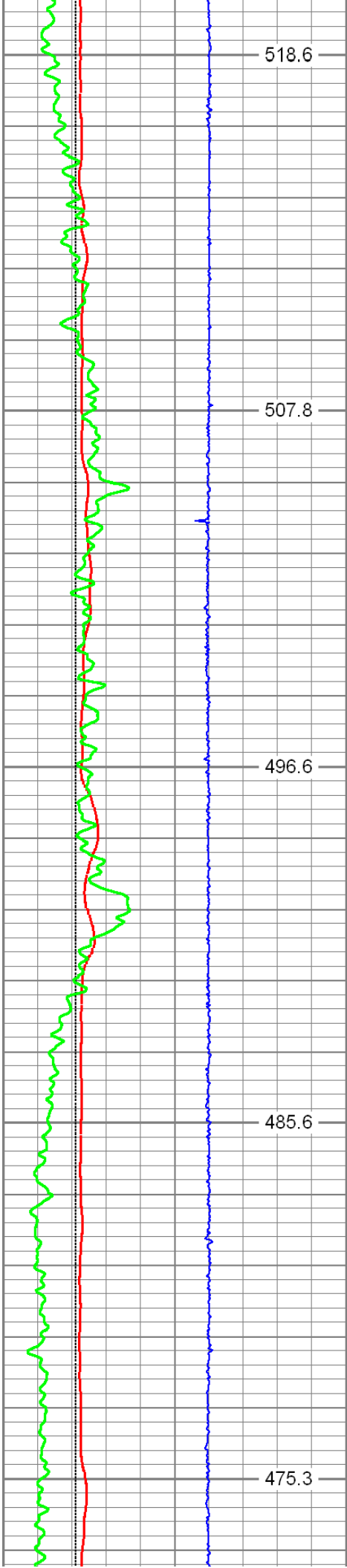


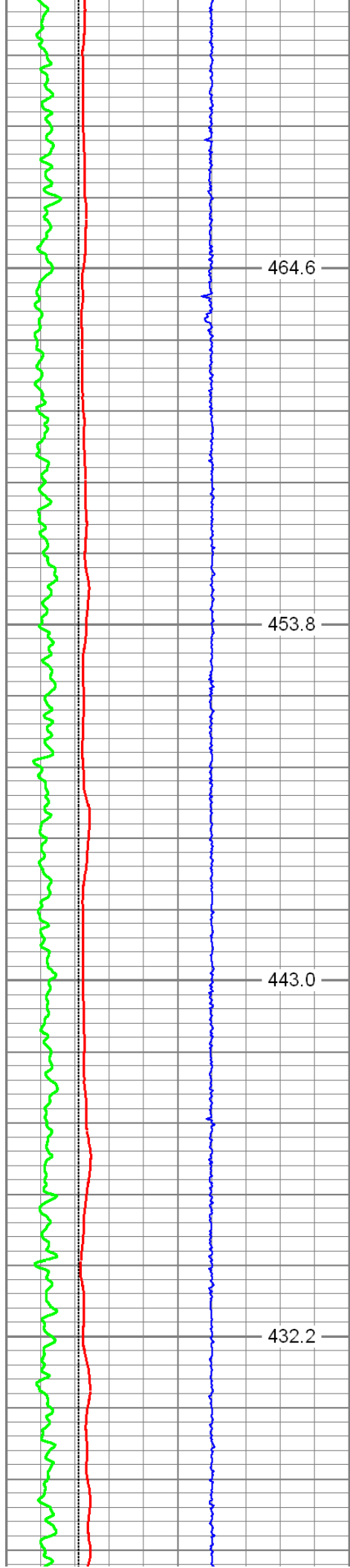
7250
7300
7350
7400



275.0
269.1
263.8
258.7





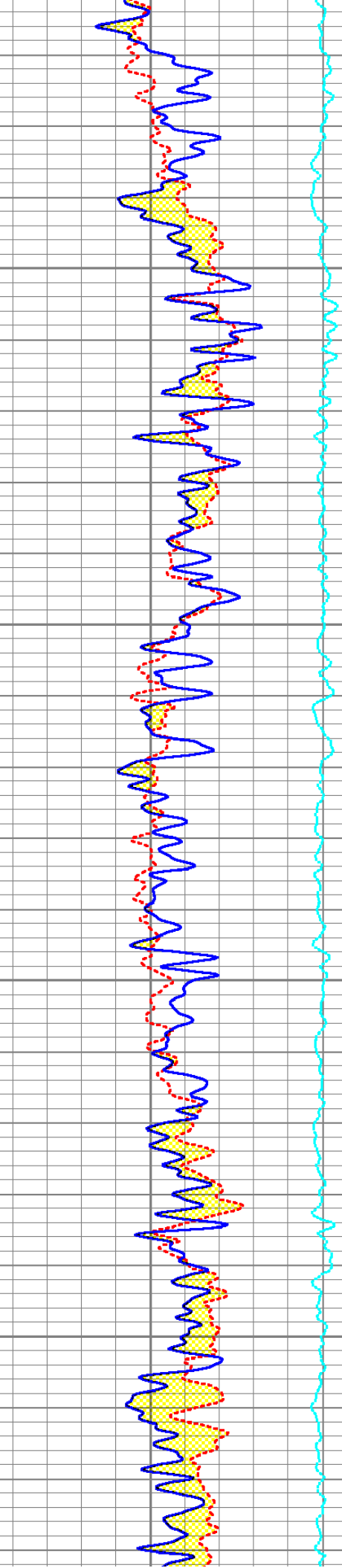
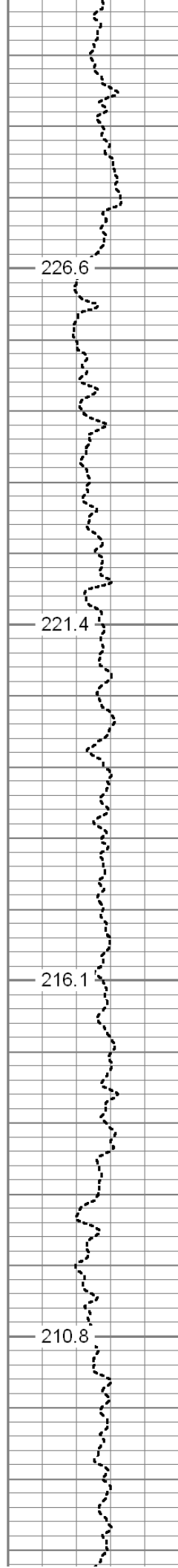


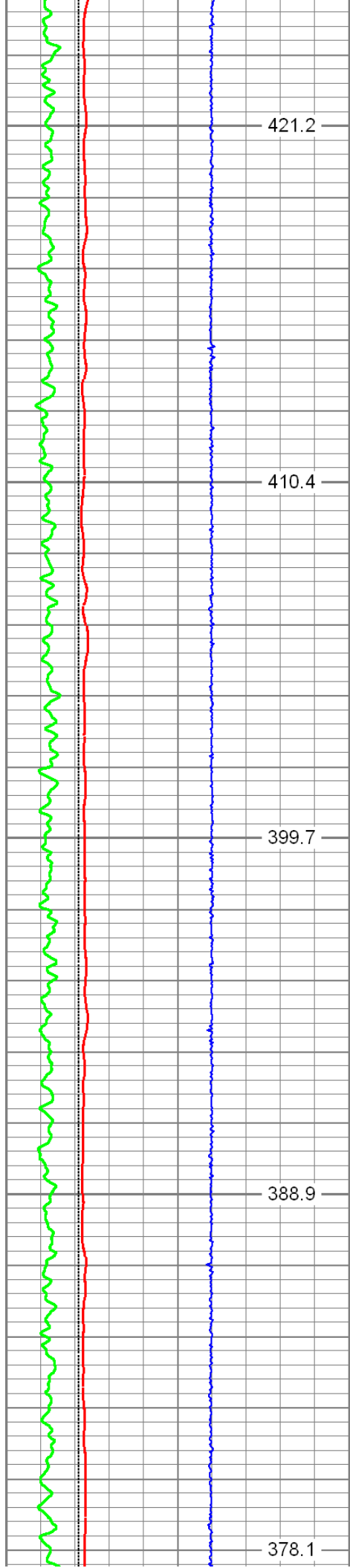
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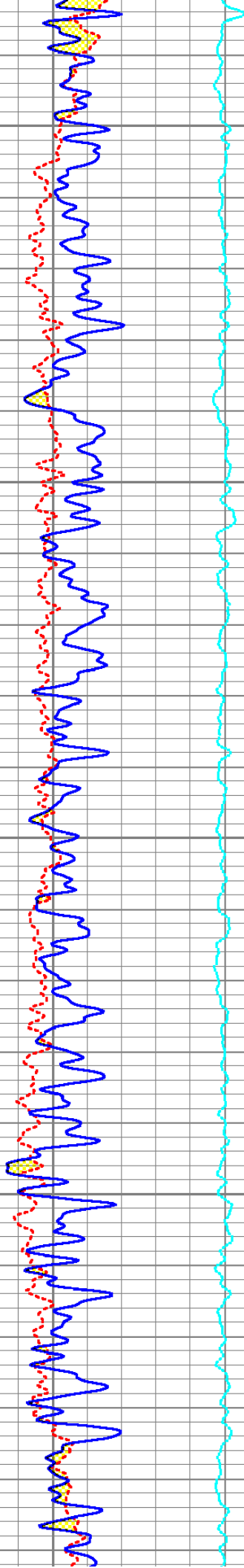
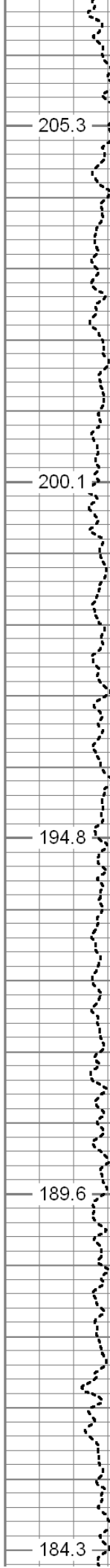
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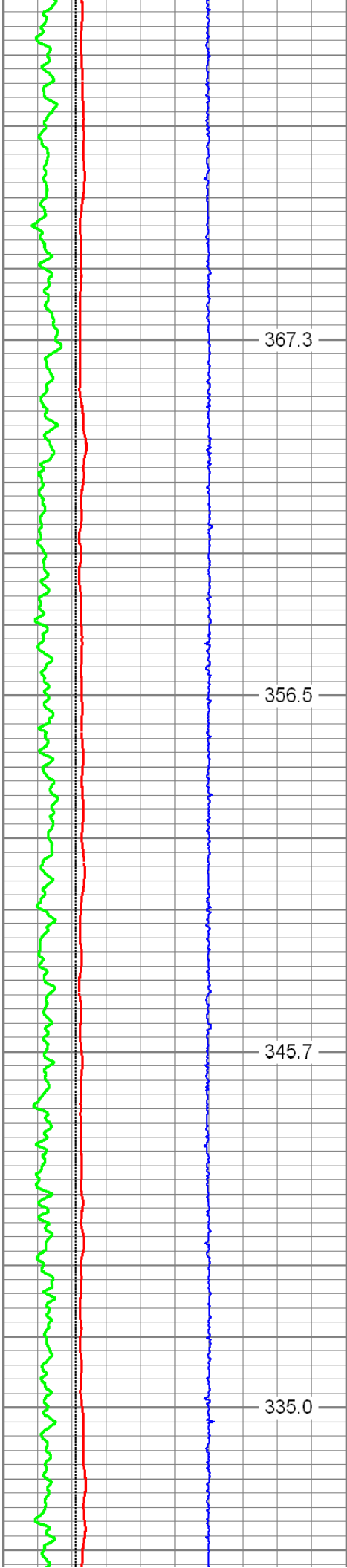
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7900
7950
8000
8050
8100





8150

367.3

8200

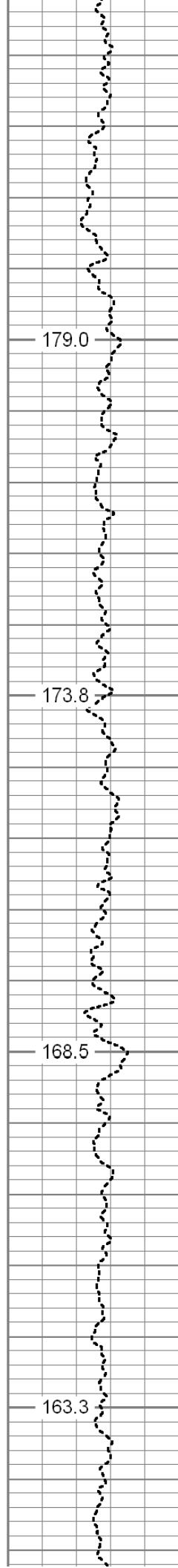
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8250

345.7

8300

335.0

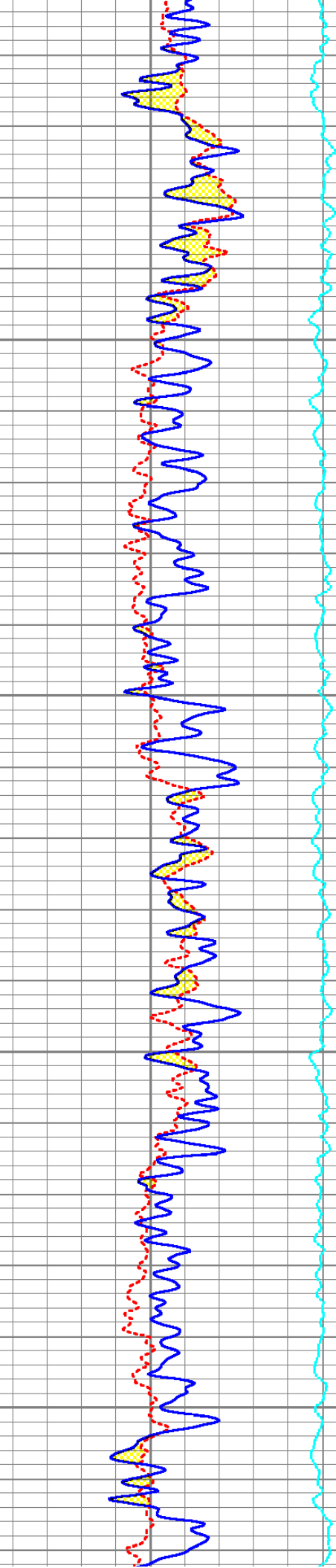


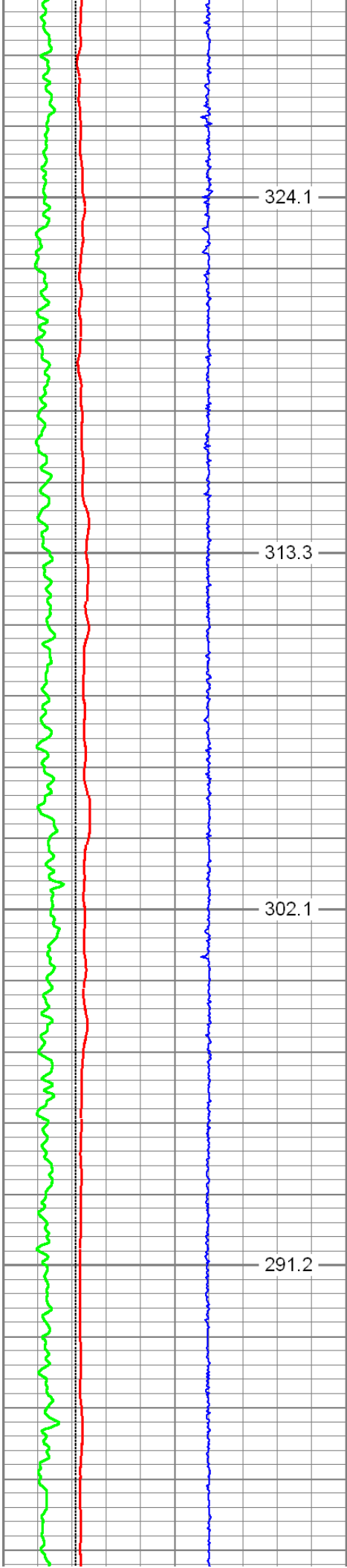
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173.8

168.5

163.3



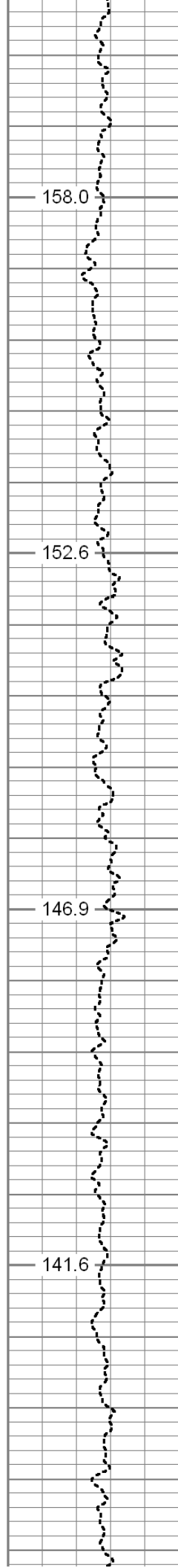


8350

8400

8450

8500

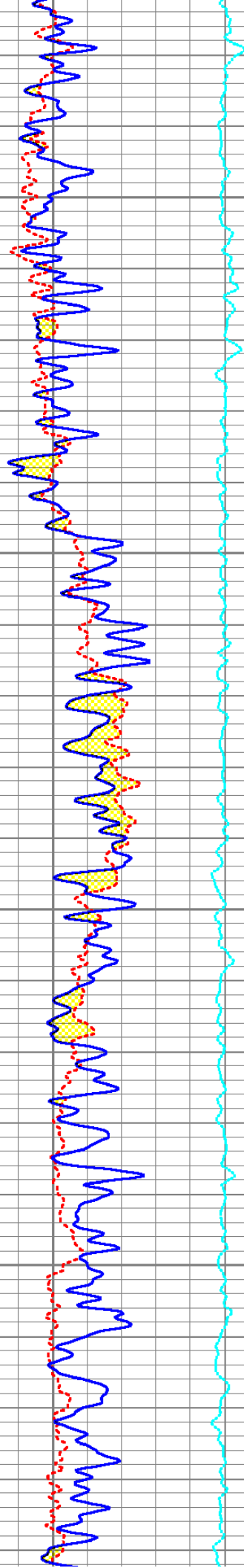


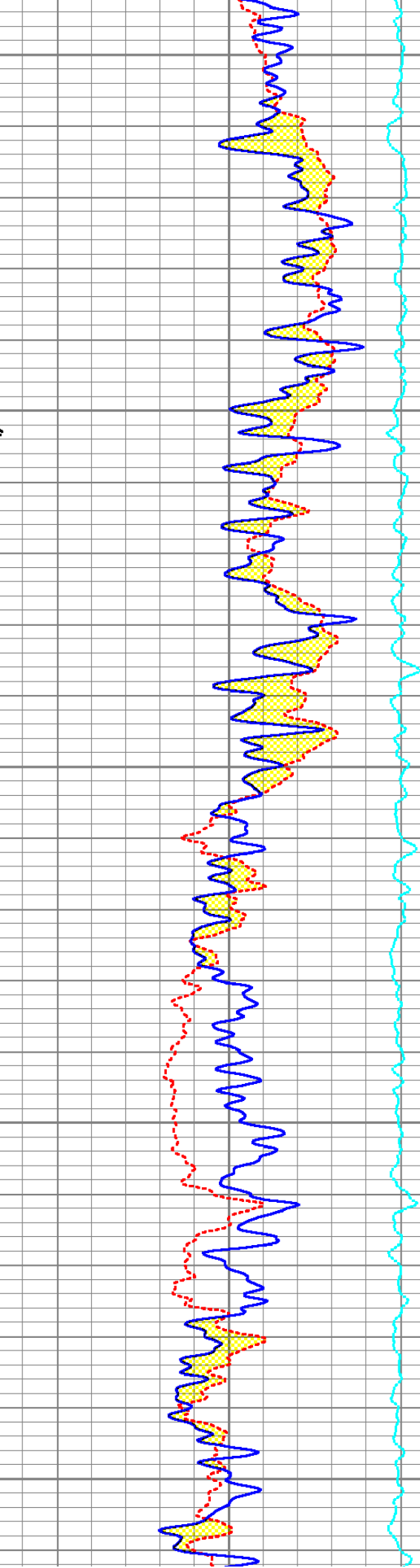
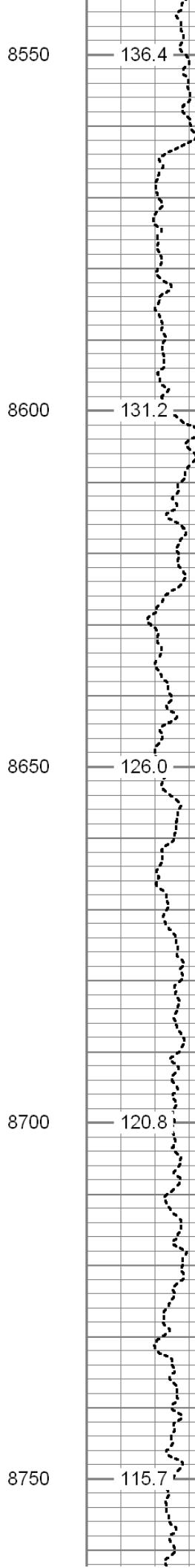
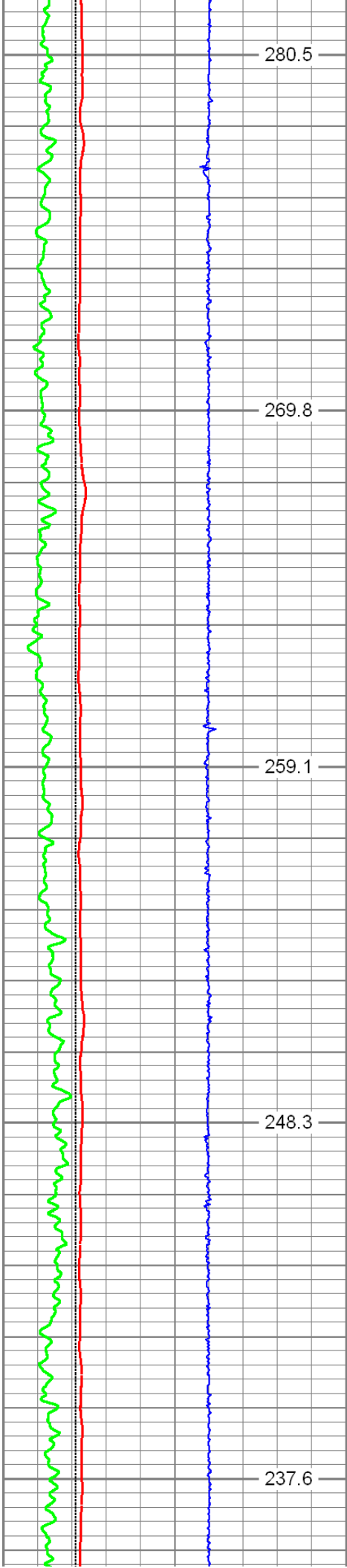
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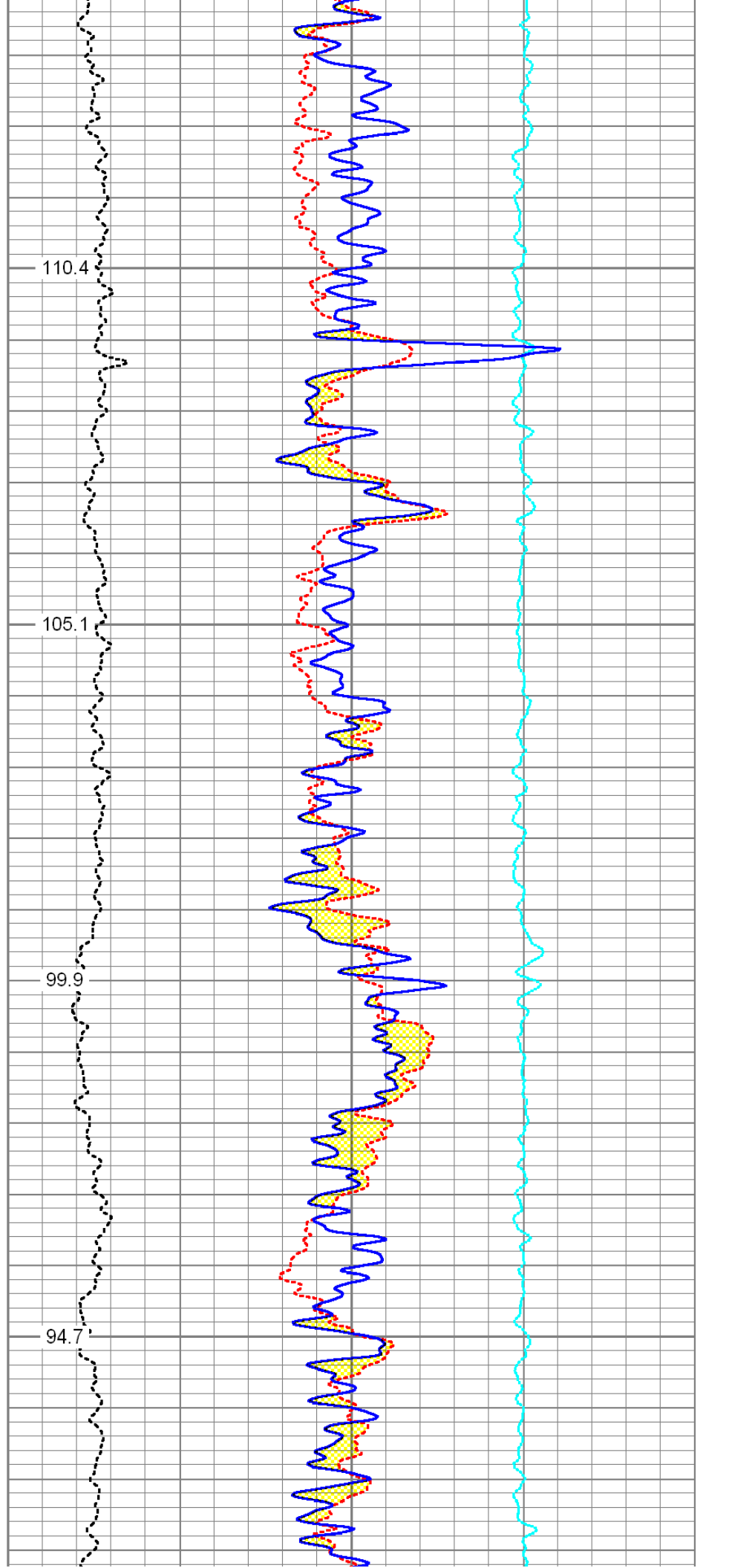
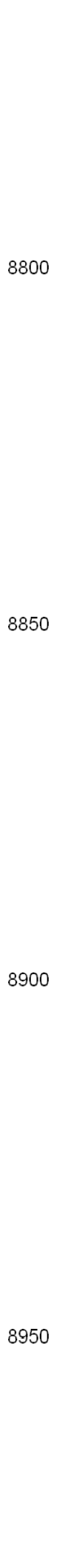
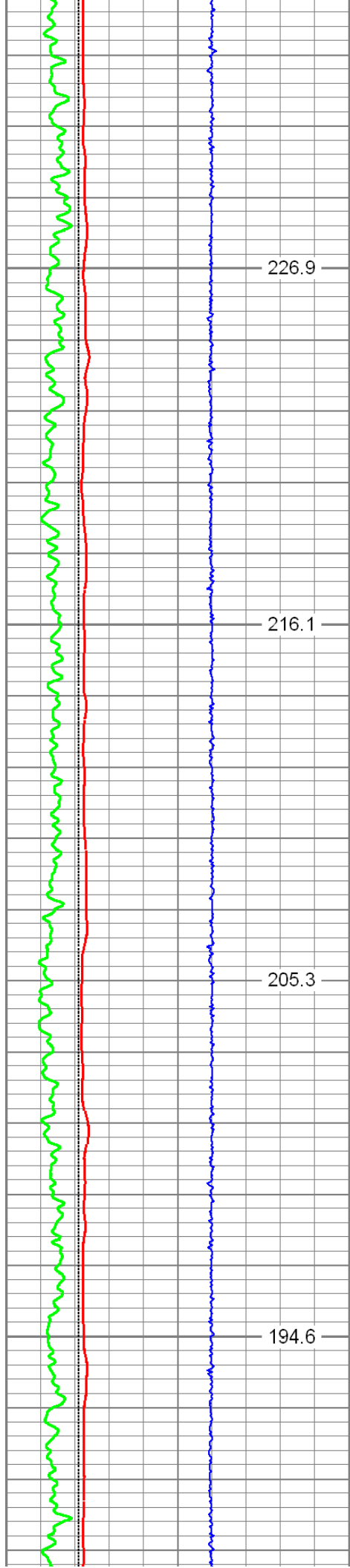
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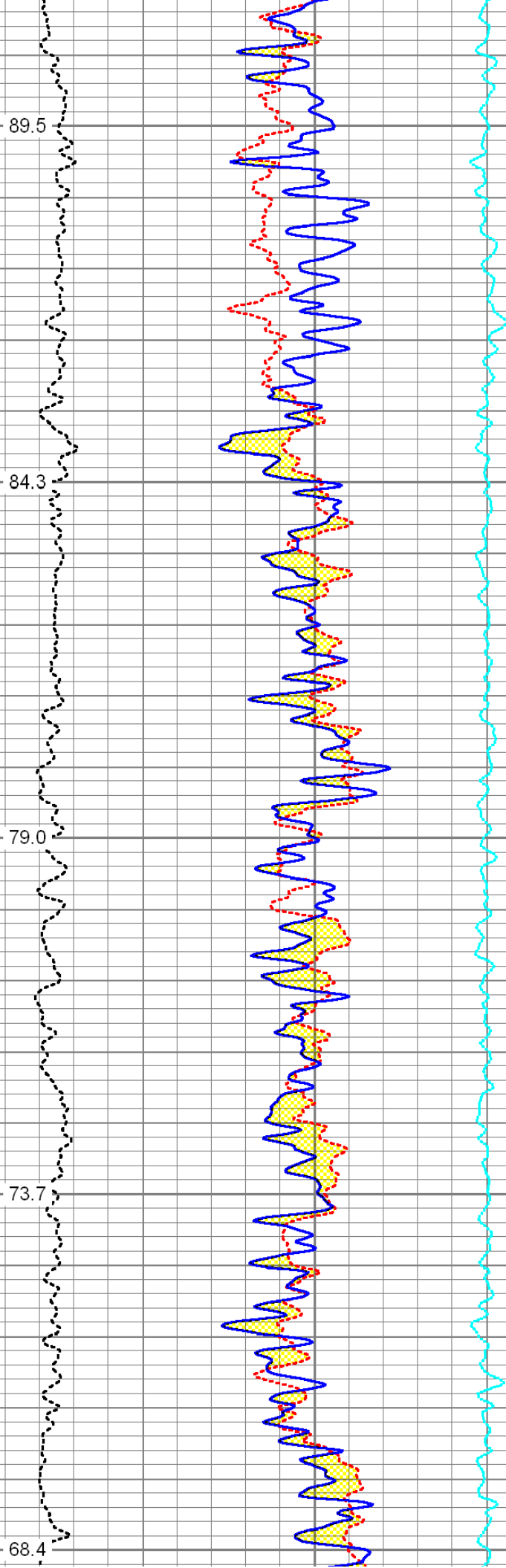
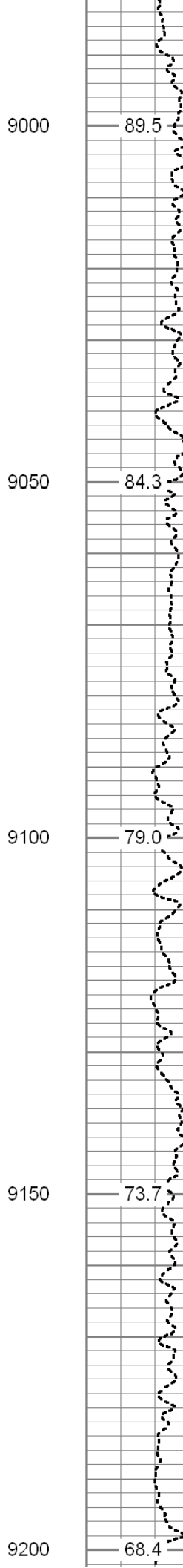
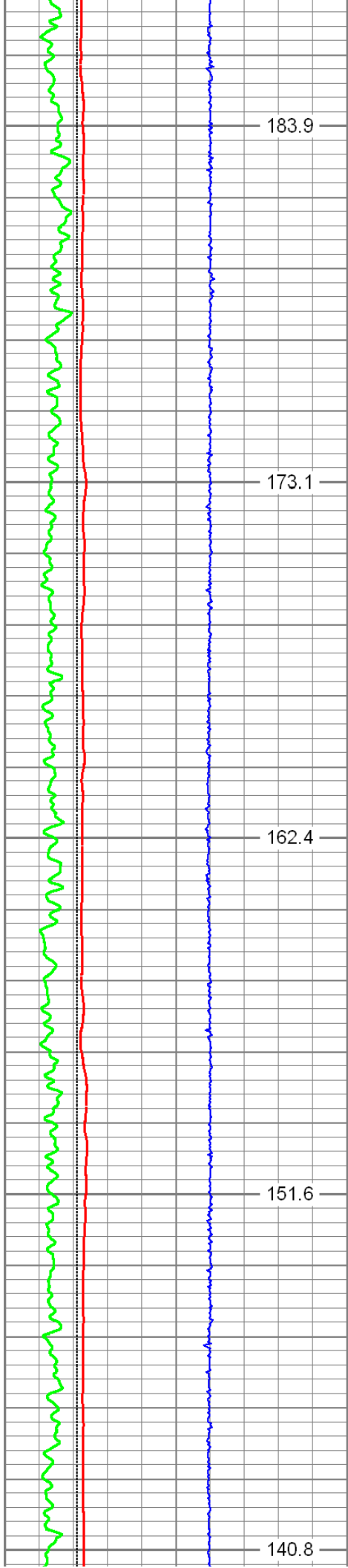
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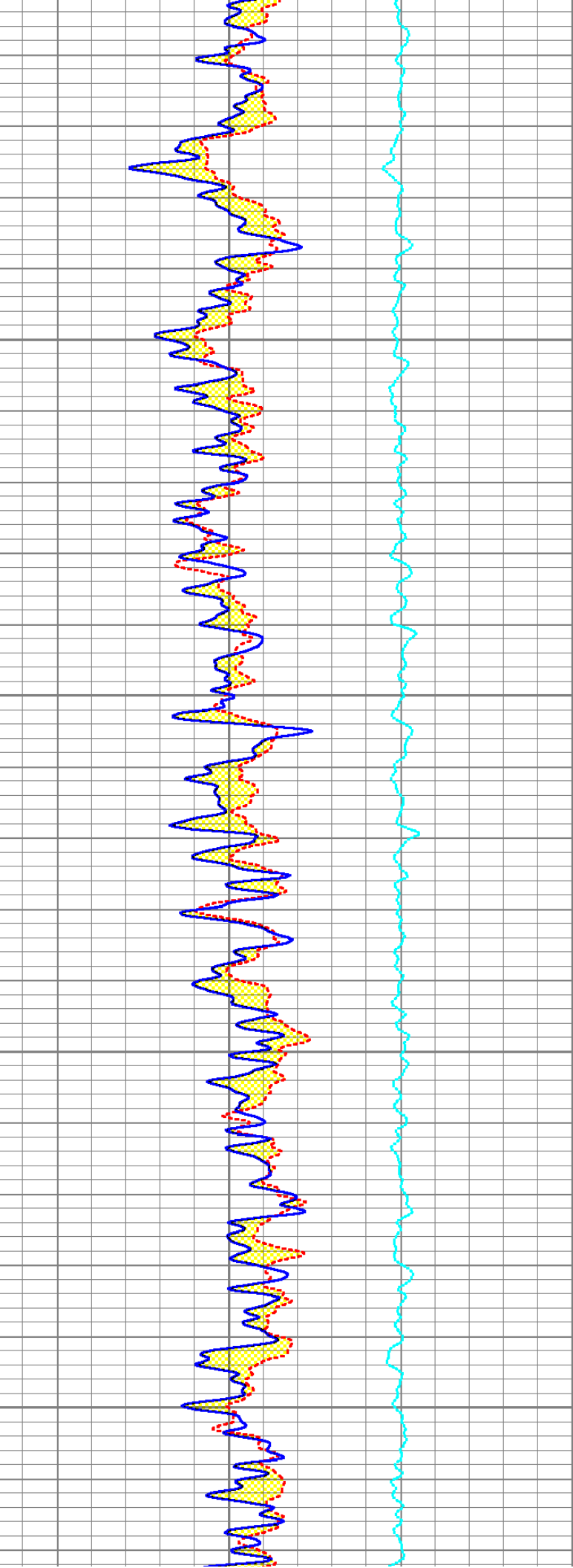
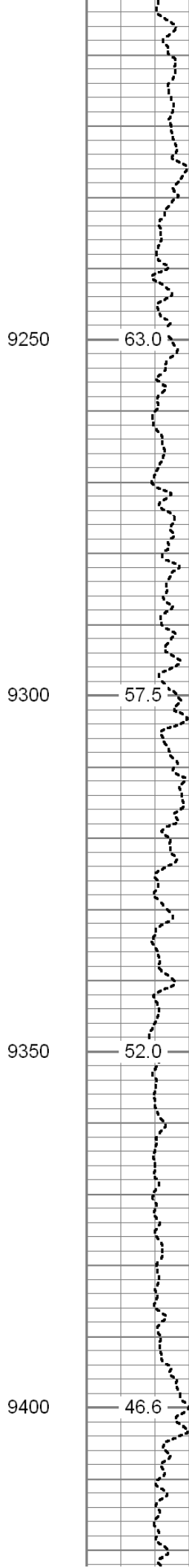
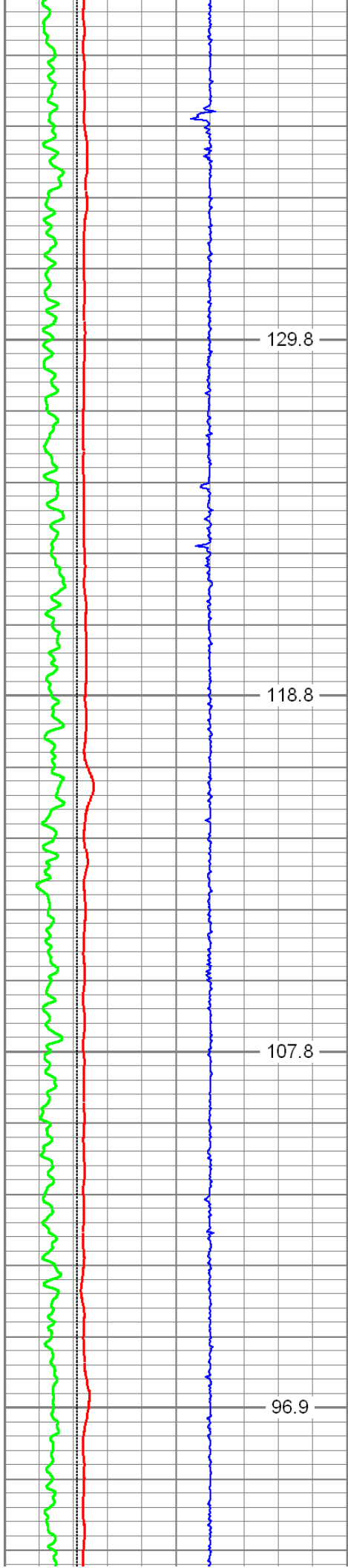
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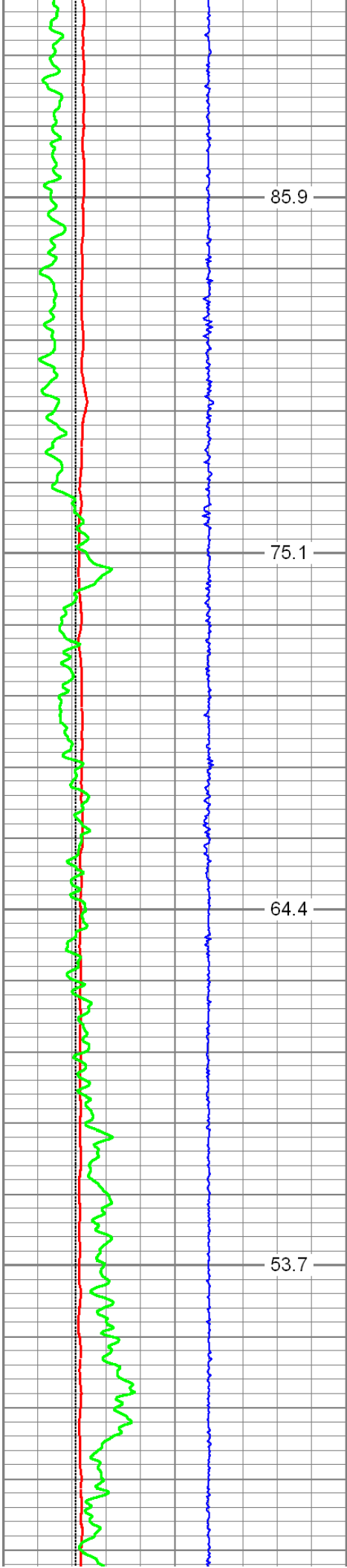










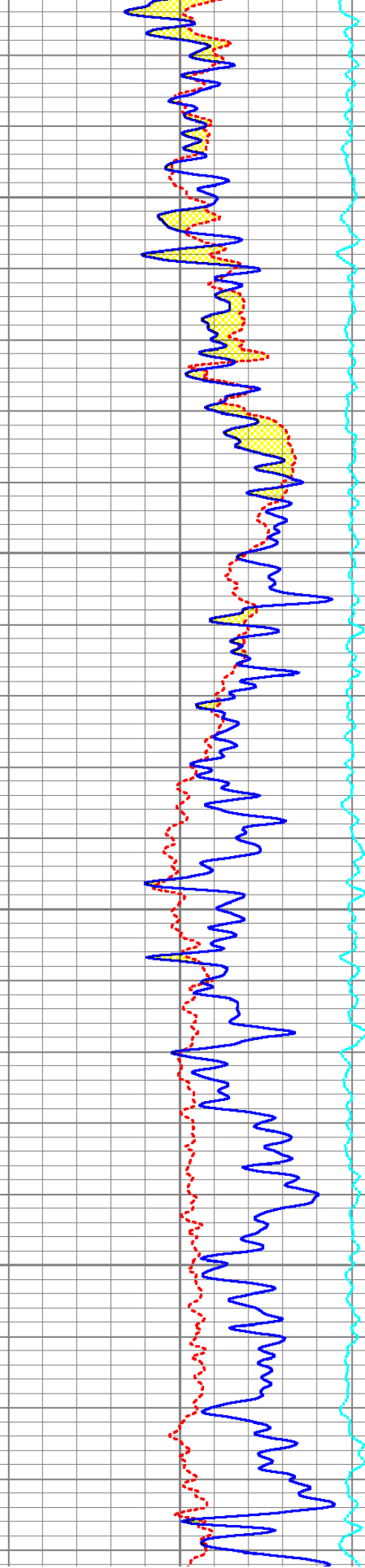
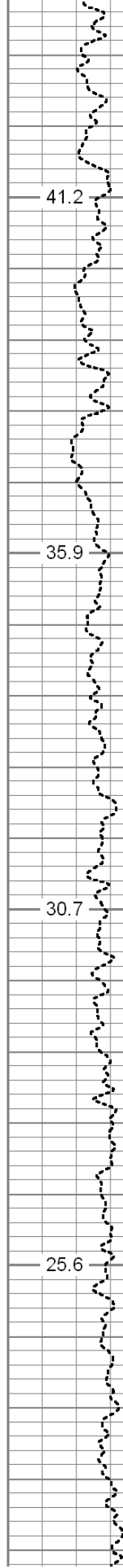


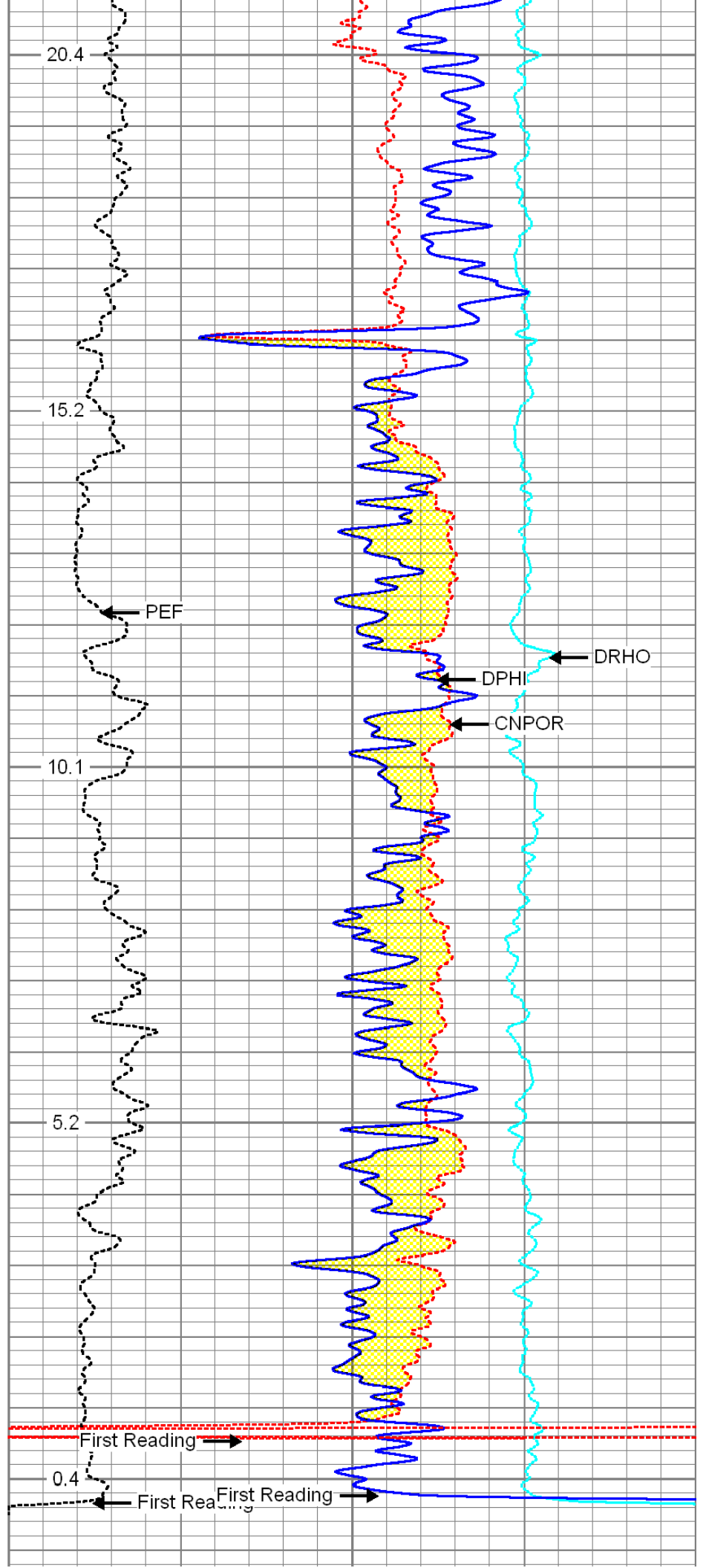
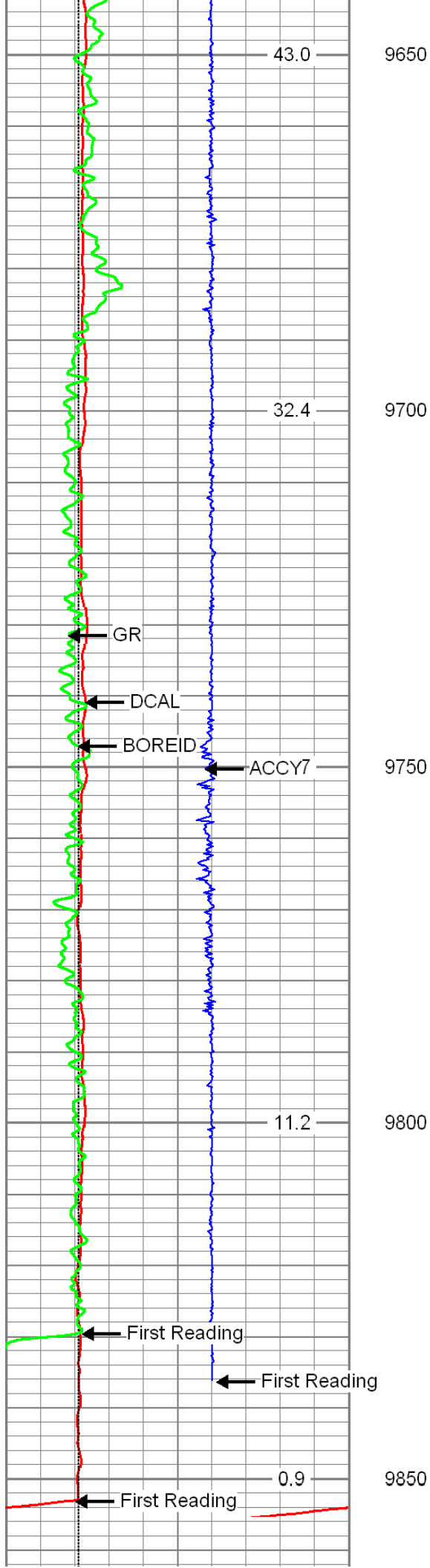
9450

9500

9550

9600





A4	-15.9512	[-30.00, -10.00]	228.7500	[-500.00, 500.00]
A5	-13.6283	[-30.00, -10.00]	83.3784	[-500.00, 500.00]
Freq 2				
A1	-239.4930	[-280.00, -180.00]	7.6437	[-500.00, 500.00]
A2	-101.9710	[-130.00, -50.00]	-15.3668	[-500.00, 500.00]
A3	-20.6605	[-50.00, -10.00]	-67.3545	[-500.00, 500.00]
A4	-19.2090	[-30.00, -10.00]	62.8732	[-500.00, 500.00]
A5	-18.5613	[-30.00, -10.00]	-43.4806	[-500.00, 500.00]
Freq 3				
A1	-151.7520	[-180.00, -80.00]	-66.7762	[-500.00, 500.00]
A2	-76.9346	[-130.00, -30.00]	-52.4590	[-500.00, 500.00]
A3	-16.9558	[-50.00, -10.00]	-107.3930	[-500.00, 500.00]
A4	-20.8968	[-30.00, -10.00]	-48.5169	[-500.00, 500.00]
A5	-21.4073	[-30.00, -10.00]	-139.7200	[-500.00, 500.00]
Freq 4				
A1	-80.6134	[-120.00, -40.00]	-200.7310	[-500.00, 500.00]
A2	-54.2909	[-110.00, -10.00]	-119.7920	[-500.00, 500.00]
A3	-13.3738	[-50.00, -10.00]	-179.0530	[-500.00, 500.00]
A4	-23.8747	[-30.00, -10.00]	-214.8970	[-500.00, 500.00]
A5	-26.8928	[-30.00, -10.00]	-307.2270	[-500.00, 500.00]

CALIBRATION COEFFICIENTS

	R	Expected	X	Expected
Freq 1				
A1	0.9951	[0.95, 1.05]	0.0030	[-0.05, 0.05]
A2	0.9924	[0.95, 1.05]	0.0036	[-0.05, 0.05]
A3	0.9990	[0.95, 1.05]	-0.0033	[-0.05, 0.05]
A4	0.9957	[0.95, 1.05]	0.0066	[-0.05, 0.05]
A5	1.0014	[0.95, 1.05]	0.0027	[-0.05, 0.05]
Freq 2				
A1	0.9898	[0.95, 1.05]	-0.0059	[-0.05, 0.05]
A2	0.9868	[0.95, 1.05]	-0.0051	[-0.05, 0.05]
A3	0.9875	[0.95, 1.05]	-0.0049	[-0.05, 0.05]
A4	0.9911	[0.95, 1.05]	-0.0022	[-0.05, 0.05]
A5	0.9959	[0.95, 1.05]	-0.0072	[-0.05, 0.05]
Freq 3				
A1	0.9938	[0.95, 1.05]	-0.0053	[-0.05, 0.05]
A2	0.9913	[0.95, 1.05]	-0.0045	[-0.05, 0.05]
A3	0.9912	[0.95, 1.05]	-0.0047	[-0.05, 0.05]
A4	0.9951	[0.95, 1.05]	-0.0017	[-0.05, 0.05]
A5	1.0000	[0.95, 1.05]	-0.0069	[-0.05, 0.05]
Freq 4				
A1	1.0004	[0.95, 1.05]	0.0002	[-0.05, 0.05]
A2	0.9973	[0.95, 1.05]	0.0007	[-0.05, 0.05]
A3	0.9995	[0.95, 1.05]	-0.0014	[-0.05, 0.05]
A4	1.0021	[0.95, 1.05]	0.0035	[-0.05, 0.05]
A5	1.0136	[0.95, 1.05]	-0.0023	[-0.05, 0.05]
Temperature	32.8123 degC			

ThruBit Density Calibration Report

Tool Model-Serial Number: PS-PS32D

Source Number:

Shop Calibration Performed: Mon Jul 08 12:27:03 2013

REFERENCE

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

READINGS

Outputs	Counts	Units	Expected
SS1 Background	140.98	cps	[130.00, 170.00]
LS1 Background	142.39	cps	[130.00, 170.00]
LS4 Background	29.26	cps	[27.00, 35.00]
SS1 Aluminium	4478.43	cps	[4500.00, 5500.00]
LS1 Aluminium	808.62	cps	[750.00, 950.00]
LS4 Aluminium	912.65	cps	[843.00, 1068.00]
SS1 Magnesium	7369.04	cps	[7000.00, 9000.00]
LS1 Magnesium	5165.24	cps	[5250.00, 6250.00]
LS1 Al + Fe	709.22	cps	[650.00, 800.00]
LS4 Al + Fe	432.19	cps	[382.00, 471.00]

RESULTS

SS Slope	1.67	[1.52, 1.77]
LS Slope	0.42	[0.38, 0.45]
PEF K Factor	4.901	[3.510, 6.170]
PEF B Factor	-0.609	[-0.700, -0.410]

Caliper Shop Calibration performed:

Mon Jul 08 12:27:03 2013

RESULTS

Reference	Reading	Units
12.00	1845.37	in
9.00	2013.25	in
6.00	2180.38	in

DENSITY PRE-SURVEY CHECK Performed:

Tue Jul 16 10:22:53 2013

Outputs	Counts	Units	Expected
SS1 Background	142.18	cps	[136.75, 145.21]
LS1 Background	141.01	cps	[138.12, 146.66]
LS4 Background	29.32	cps	[27.51, 31.02]

CALIPER PRE-SURVEY CHECK Performed:

Tue Jul 16 10:23:28 2013

Reference	Readings	Units	Expected
9.00	9.10	in	[8.80, 9.20]

Compensated Neutron Calibration Report

Tool Model-Serial Number: PS-PS06N
 Source Number:

Calibration Tank Temperature: 85.5 degF
 Shop Calibration Performed: Mon Jul 08 13:55:27 2013

BACKGROUND MEASUREMENT

Outputs	Measured	Units	Expected
SS Counts	0.0	cps	<10
LS Counts	0.1	cps	<4

WATER TANK REFERENCE

Outputs	Measured	Units	Expected
SS Counts	2679.6	cps	
LS Counts	90.3	cps	
Tank Ratio Ref	30.9580	SS/LS	
Tank Ratio	29.6590	SS/LS	
Tank Ratio Gain	1.0438		[0.85, 1.15]

ALUMINUM SLEEVE REFERENCE

Outputs	Measured	Units	Expected
SS Counts	29793.6	cps	
LS Counts	2858.7	cps	
Al Ratio Ref	10.797	SS/LS	
Al Ratio	10.878	SS/LS	
Al Ratio Gain	0.99		[0.90, 1.10]
Sleeve Porosity	14.46	pu	

PRE-SURVEY BACKGROUND CHECK Performed: Fri Jul 05 16:13:04 2013

Outputs	Measured	Units	Expected
SS Counts	0.0	cps	<10
LS Counts	0.1	cps	<4

Gamma Ray Calibration Report

Tool Model-Serial Number:	PS-PS21T	
Performed:	Mon Jul 08 14:18:30 2013	
Calibrator Value:	176.8	GAPI
Background Reading:	66.2	cps
Calibrator Reading:	457.2	cps
Sensitivity:	0.3850	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

Sensor	Offset (ft)	Schematic	Description	Len (ft)	OD (in)	Wt (lb)
Thrubit	67.59		Cablehead-S Solid Weakpoint	2.31	2.13	5.00
Thrubit	65.28		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 (PS07B) ThruBit Battery	6.13	2.13	38.20
TBBAT2	47.29		TBBAT2-A (PS40B) ThruBit Battery	6.13	2.13	40.00
TMG GR GRTEMP	41.16 41.04 40.20		TMG-PS (PS21T) ThruBit Telemetry Gamma Ray	6.13	2.13	45.00
Thrubit	35.04		Decentralizer Decentralizer (Small)	4.50	2.13	70.00
CNLSC	28.60		TBN-PS (PS06N) ThruBit Neutron	4.77	2.13	63.00
LSW1 DCAL	18.04 17.13		TBD-PS (PS32D) ThruBit Density	10.48	2.13	91.00
A1_P A2_P A3_P A4_P A5_P	10.60 10.10 9.35 8.35 6.60		TBI-PS (PS10R) ThruBit Induction	15.29	2.13	94.00

Dataset: jones_mern.db: field/well/proc 1/pass 1.4
Total Length: 67.59 ft
Total Weight: 570.15 lb
O.D.: 2.38 in



ThruBit

A Schlumberger Company

Company	SANDRIDGE ENERGY, INC.
Well	JONES 3506 1-13H
Field	WAKITA
County	HARPER
State	KANSAS