

SlimPulse - Gamma Ray

1 in / 100 ft & 5 in / 100 ft True Vertical Depth

Recorded Mode, Composite Log**Schlumberger**

Company: Noble Energy Inc.

Well: Heartland G25-73-1HN

Field: Wattenberg

Country: Weld

State: Colorado

Country: USA

Section: 25 APIN: 05-123-39551

Township: 04 N Rig Name: PD 829

Range: 65 W Rig Type: Top Drive

FL: NAD83 Colorado State Plane, Northern Zone, US Feet

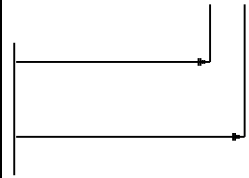
FL1: Latitude: N 40° 16' 36.22790", Northing: 1344914.310 ftUS

FL2: Longitude: W 104° 36' 17.96401", Easting: 3249718.560 ftUS

Log Measured From: - Drill Floor: 4851.00 ft

Ground Level: 4835.00 ft

Permanent Datum: - Mean Sea Level



Acquisition Dates: 26-Sep-2014 -- 02-Oct-2014

Other Services:

Log Interval: 599.98(ft)TVD -- 6997.77(ft)TVD

Directional Drilling

Index Types: True Vertical Depth

Surveys / Continuous D&I

Index Scales: 1:1200 1" / 100', 1:240 5" / 100'

Downhole Temperature

Depth Source: Driller's Depth

Downhole Shocks

Depth Sensor: 3rd Party Depth

Print Type: Final

Spud Date: 22-Sep-2014

**Disclaimer**

THE USE OF AND RELIANCE UPON THIS RECORDED-DATA BY THE HEREIN NAMED COMPANY (AND ANY OF ITS AFFILIATES, PARTNERS, REPRESENTATIVES, AGENTS, CONSULTANTS AND EMPLOYEES) IS SUBJECT TO THE TERMS AND CONDITIONS AGREED UPON BETWEEN SCHLUMBERGER AND THE COMPANY, INCLUDING: (a) RESTRICTIONS ON USE OF THE RECORDED-DATA; (b) DISCLAIMERS AND WAIVERS OF WARRANTIES AND REPRESENTATIONS REGARDING COMPANY'S USE AND RELIANCE UPON THE RECORDED-DATA; AND (c) CUSTOMER'S FULL AND SOLE RESPONSIBILITY FOR ANY INFERENCE DRAWN OR DECISION MADE IN CONNECTION WITH THE USE OF THIS RECORDED-DATA.

Contents

1. Header
2. Disclaimer
3. Contents
4. Borehole Size/Casing/Tubing Record
5. Operational Run Summary
6. Borehole Fluids
7. Remarks and Equipment Summary
8. UDComposite 1 1 in / 100 ft True Vertical Depth
 - 8.1 Integration Summary
 - 8.2 Composite Summary
 - 8.3 Log (SlimPulse Gamma Ray Final TVD)
 - 8.4 Parameter Listing
9. UDComposite 1 5 in / 100 ft True Vertical Depth
 - 9.1 Integration Summary
 - 9.2 Composite Summary
 - 9.3 Log (SlimPulse Gamma Ray Final TVD)
 - 9.4 Parameter Listing

- 10. Survey Record
- 11. Calibration Report
- 12. Tail

Borehole Size/Casing Record

Bit						
Bit Size (in)	8.75	6.125				
Top Driller (ft)	0	7382				
Bottom Driller (ft)	7382	16867				
Casing						
Size (in)	7					
Weight (lbm/ft)	26					
Inner Diameter (in)	6.276					
Grade	P110					
Top Driller (ft)	0					
Bottom Driller (ft)	7382					

Operational Run Summary

Parameter (unit)	Lateral1					
Date Log Started	26-Sep-2014					
Time Log Started	00:34:25					
Date Log Finished	02-Oct-2014					
Time Log Finished	07:18:00					
Bit Size (in)	6.125					
Bit Start Depth (ft)	7382.00					
Bit Stop Depth (ft)	16867.00					
Top Log Interval (ft)	7337.00					
Bottom Log Interval (ft)	16822.00					
Max Hole Deviation (deg)	91.79					
Azimuth of Max Deviation (deg)	359.27					
Logging Unit Number	Command Center					
Logging Unit Location	Zone 2					
Recorded By	ZachBrunson					
Witnessed By	Ty Briggs					
Service Order Number	14CCO0649					

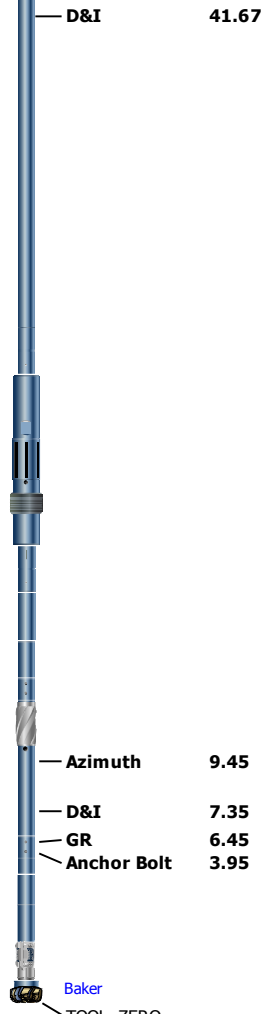
Borehole Fluids

Parameter(unit)	Lateral1					
Fluid Type	Water					
Fluid Name	Fresh Water					
Max Recorded Temperatures (degF)	276					
Source of Sample	Active Tank					

Salinity (ppm)	34972.17				
Density (lbm/gal)	10.1				
Funnel Viscosity (s)	39				
Fluid Loss (cm3)	0				
PH	9.2				
Source RMF					
RMC	Pressed				
RM @ Meas Temp (ohm.m@degF)	0.2 @ 68				
RMF @ Meas Temp (ohm.m@degF)	0.15 @ 68				
RMC @ Meas Temp (ohm.m@degF)					
RM @ BHT (ohm.m@degF)	0.07 @ 212				
RMF @ BHT (ohm.m@degF)	0.05 @ 212				
RMC @ BHT (ohm.m@degF)	NaN @ 212				
Total Solid (%)	9.4				
High Gravity Solids (%)	3.2				

Remarks and Equipment Summary

Lateral1: Toolstring				Lateral1: Remarks	
Equip name	Length	MP name	Offset	<p>Data presented is from tool memory and acquired while drilling from 7382.0 ft MD to 16867.0 ft MD</p> <p>Depth Reference: Driller's Depth</p> <p>Environmental Corrections: Gamma Ray is corrected for bit size, mud weight, and tool collar thickness. Barite and Potassium in the mud affect Gamma Ray readings.</p> <p>Run Objective: Drill Lateral Section to TD</p> <p>Bit to GR: 44.70 ft Bit to DNI: 41.67 ft</p> <p>Drilled from 7382.0 ft MD to 16867.0 ft MD Logged from 7337.0 ft MD to 16822.0 ft MD</p> <p>SlimPulse Version Software: Version 11 SlimPulse GR Calibrated: 27-Aug-2014 SlimPulse D&I Calibrated: 15-Jul-2014</p> <p>PathFinder, a Schlumberger Co Personnel: DD: Cotton Walker, Tony Butler MWD: Zach Brunson, Ty M. Briggs</p> <p>Reason for POOH: Well TD</p>	
X/O: 4 3/4"[2]:D R21913	106.1				
Stab: 4 3/4"[2]: DR27109	102.76				
Motor:106	97.86	Hunting Motor			
X/O: 4 3/4"[1]:D R4475	67.33				
Filtr Sub: 4 3/4": DR18577	66.21	Filter			
Stab: 4 3/4"[1]: DR27111	62.68				
SPULSE-GEN:DR 28001	57.78	SlimDrive			
FLOWSUB:DR2251					
5					
SPCOLLAR:DR2800					
1					
SPMA:623					
SPEC:930					
SPBA:01869					
		GR	44.7		



CLNKL675:CC40 24.9
11
 CL.K6D:CC4011
 CL.K6C:022
 CL.KP6E:022

UBHO: 4 3/4":47 18.15
SU125
PDX5_475 15.39
 Crossover
 PD475CC
 Impeller Set
 PDCU
 PDSC Sleeve
 PDX5GP
 PD475BU

Azimuth 9.45
D&I 7.35
GR 6.45
Anchor Bolt 3.95

Bit: 6":7042732 0.59 Baker
 TOOL_ZERO
 Lengths are in ft
 Maximum Outer Diameter = 6.125 in
 Line: Sensor Location, Value: Gating Offset
 All measurements are relative to TOOL_ZERO

UDComposite 1

1 in / 100 ft True Vertical Depth

Composite Summary

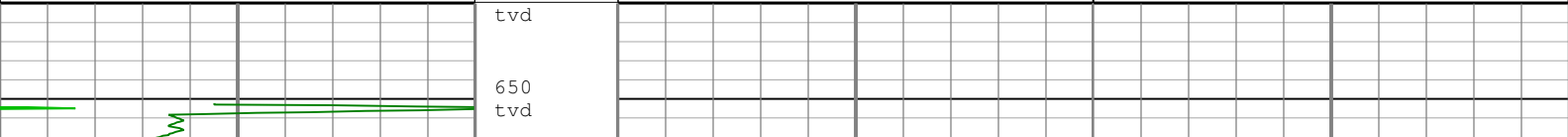
Run Name	Pass Objective	Direction	Top	Bottom	Start	Stop	Include Parallel Data
Lateral1	Drilling	Down	7300.17 ft	16868.25 ft	26-Sep-2014 9:43:50 AM	02-Oct-2014 7:18:00 AM	No

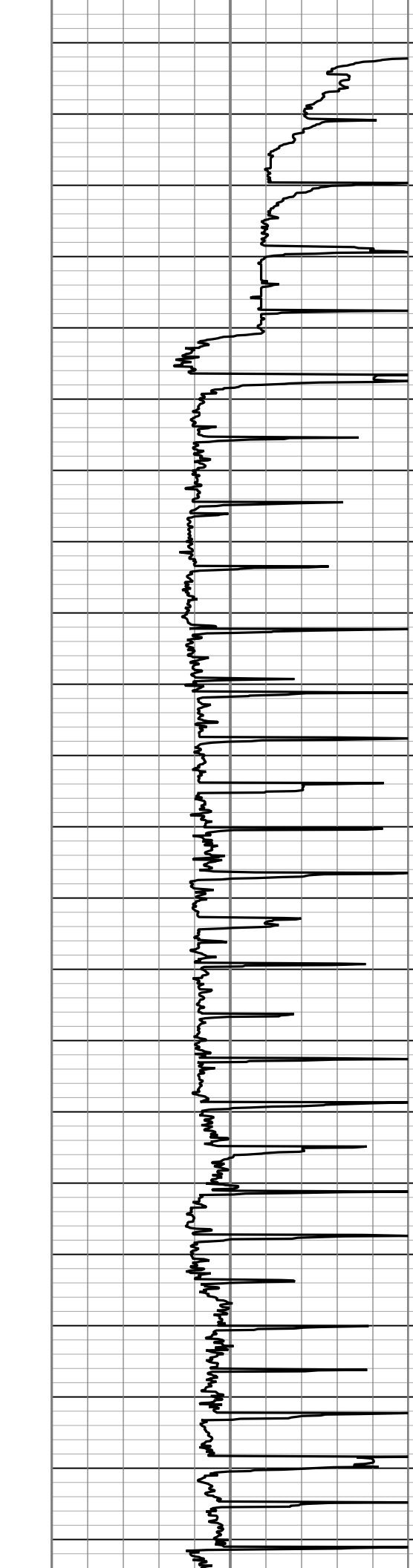
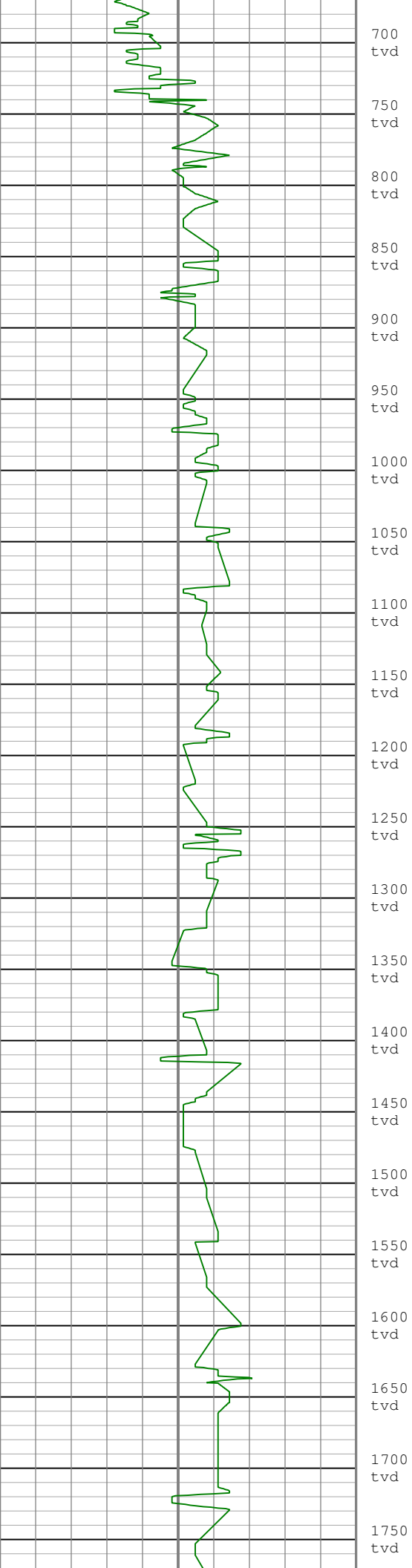
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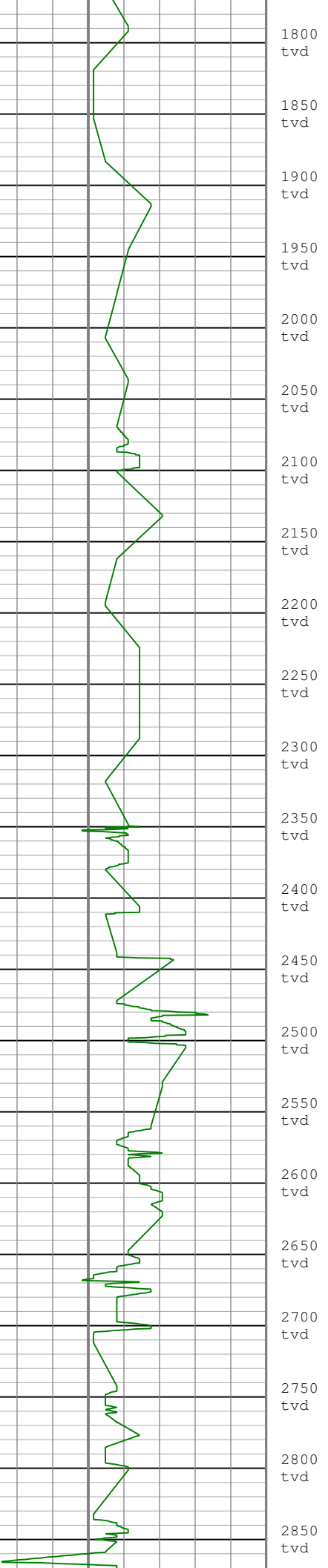
Log	Company: Noble Energy Inc. Well: Heartland G25-73-1HN
	UDComposite 1:S528

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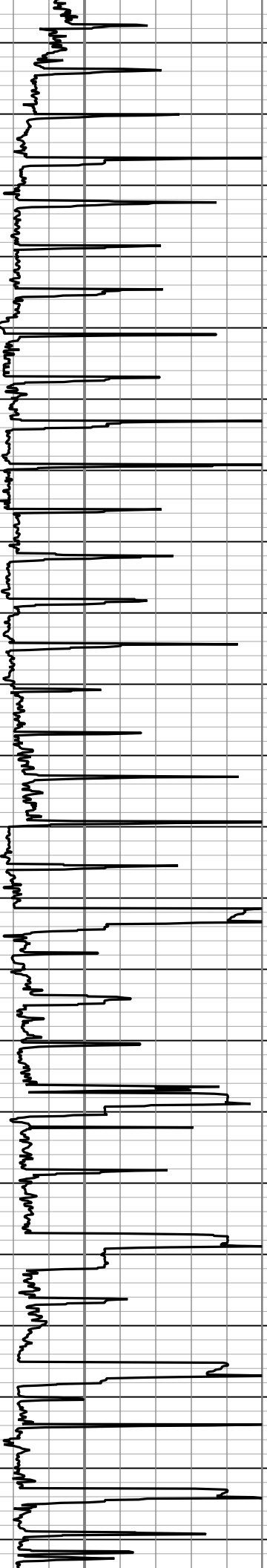
Gamma Ray (GR) SlimPulse[1] RM		Shock Risk (SHKRSK) SlimPulse[1] RT
0 gAPI 150		3 0
Gamma Ray (GR) SlimPulse[1] RM		Direction and Inclination Sensor Temperature (TEMP_DNI) SlimPulse[1] RT
150 gAPI 300		100 degF 300
Gamma Ray (GR) SlimPulse[1] RM	Rate of Penetration (ROP) RT	
300 gAPI 450	1000 ft/h 0	



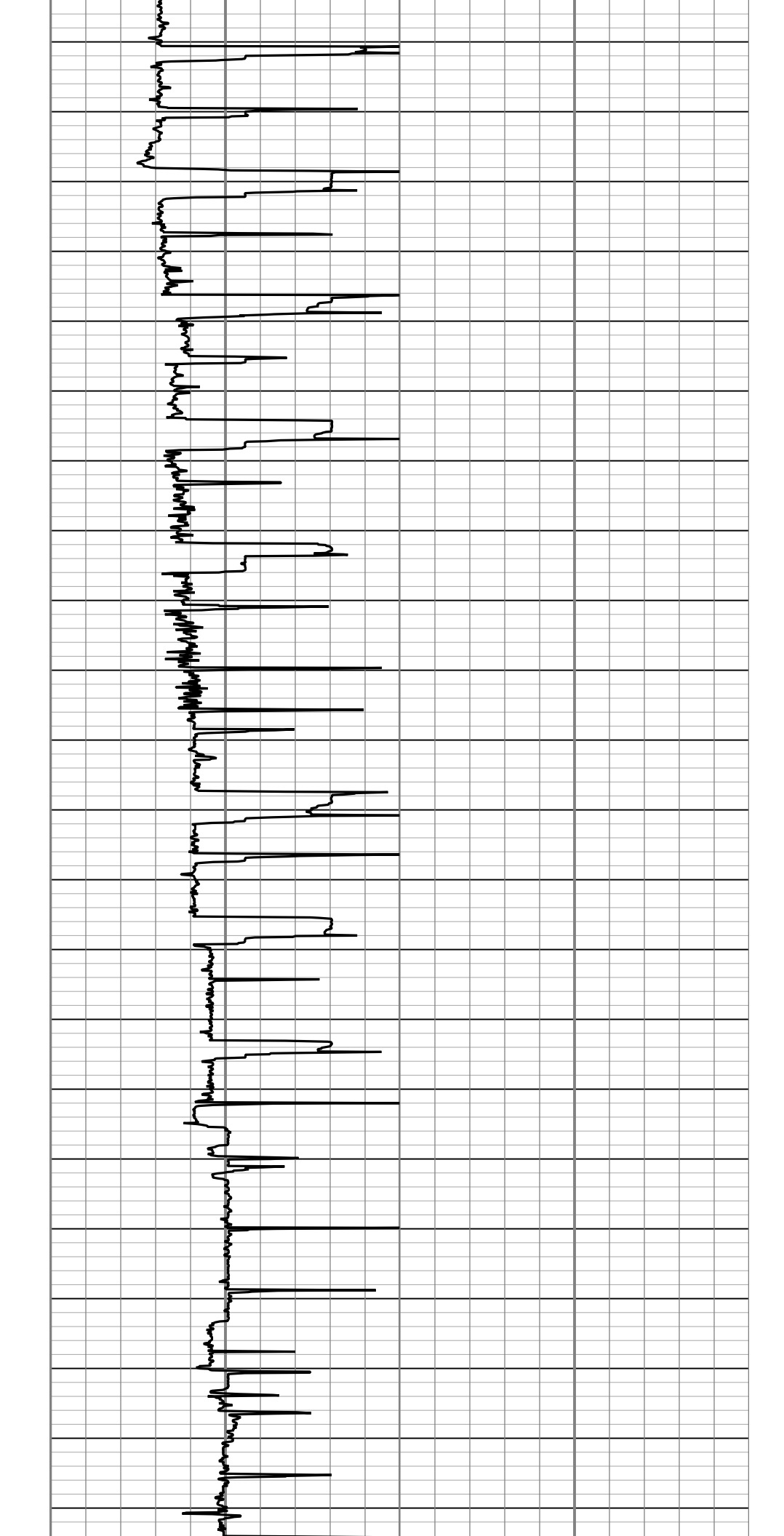
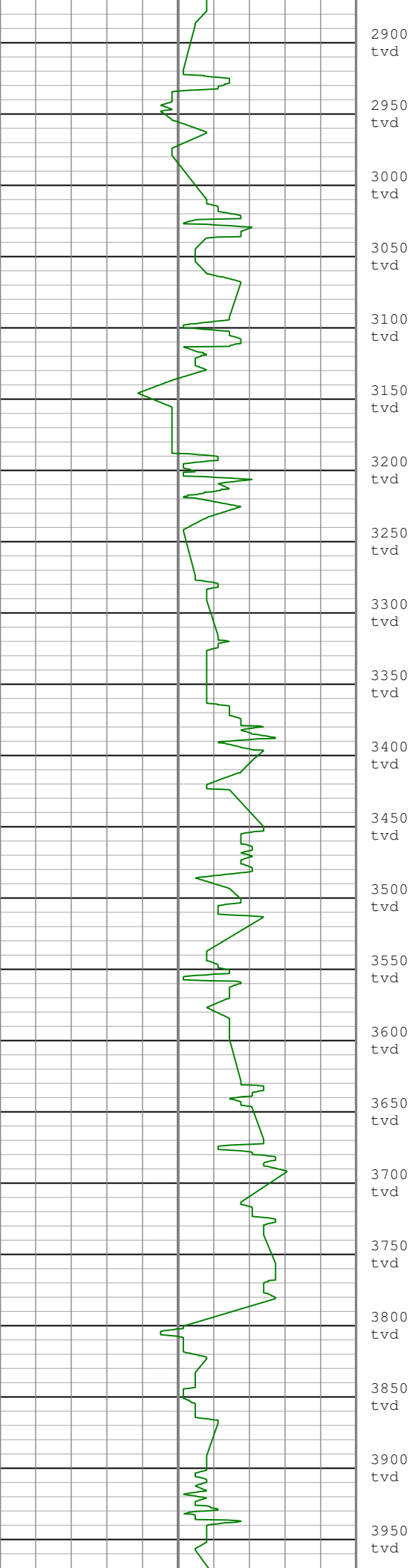


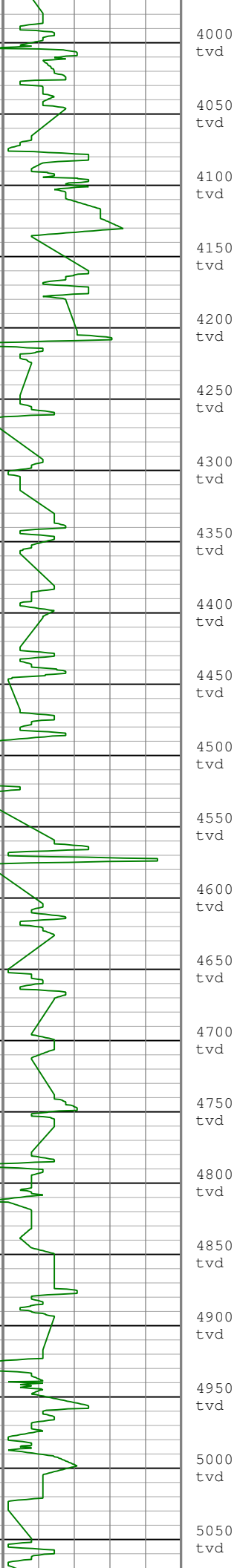


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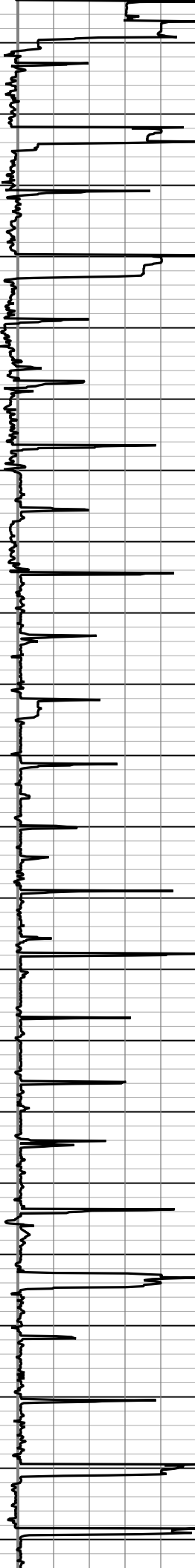


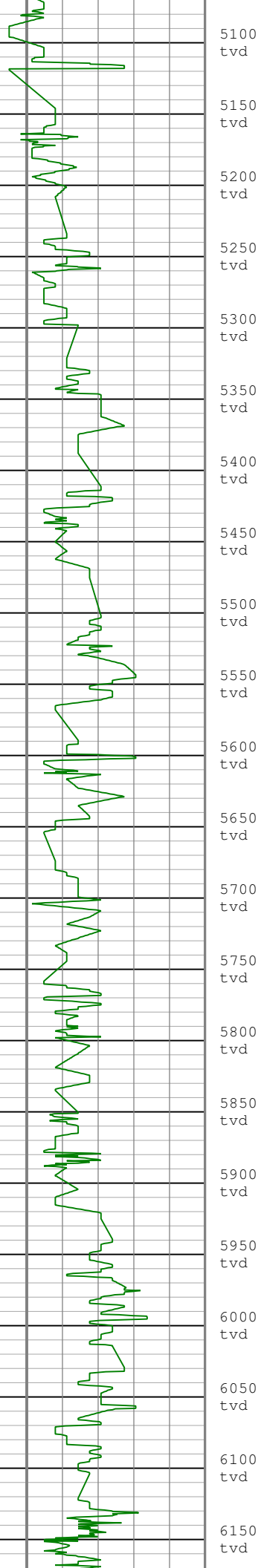
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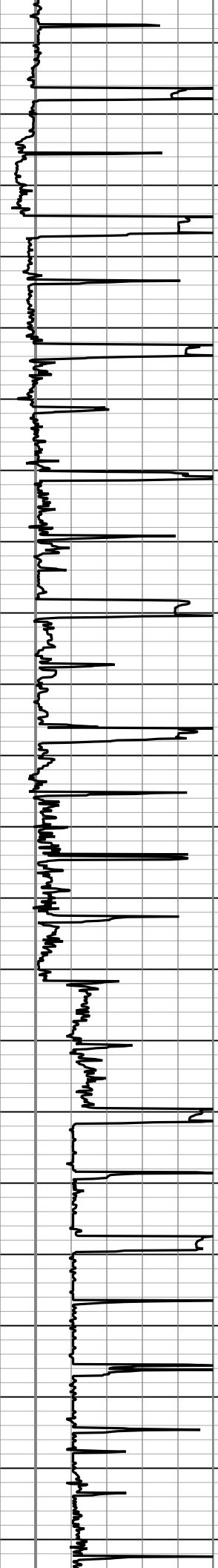


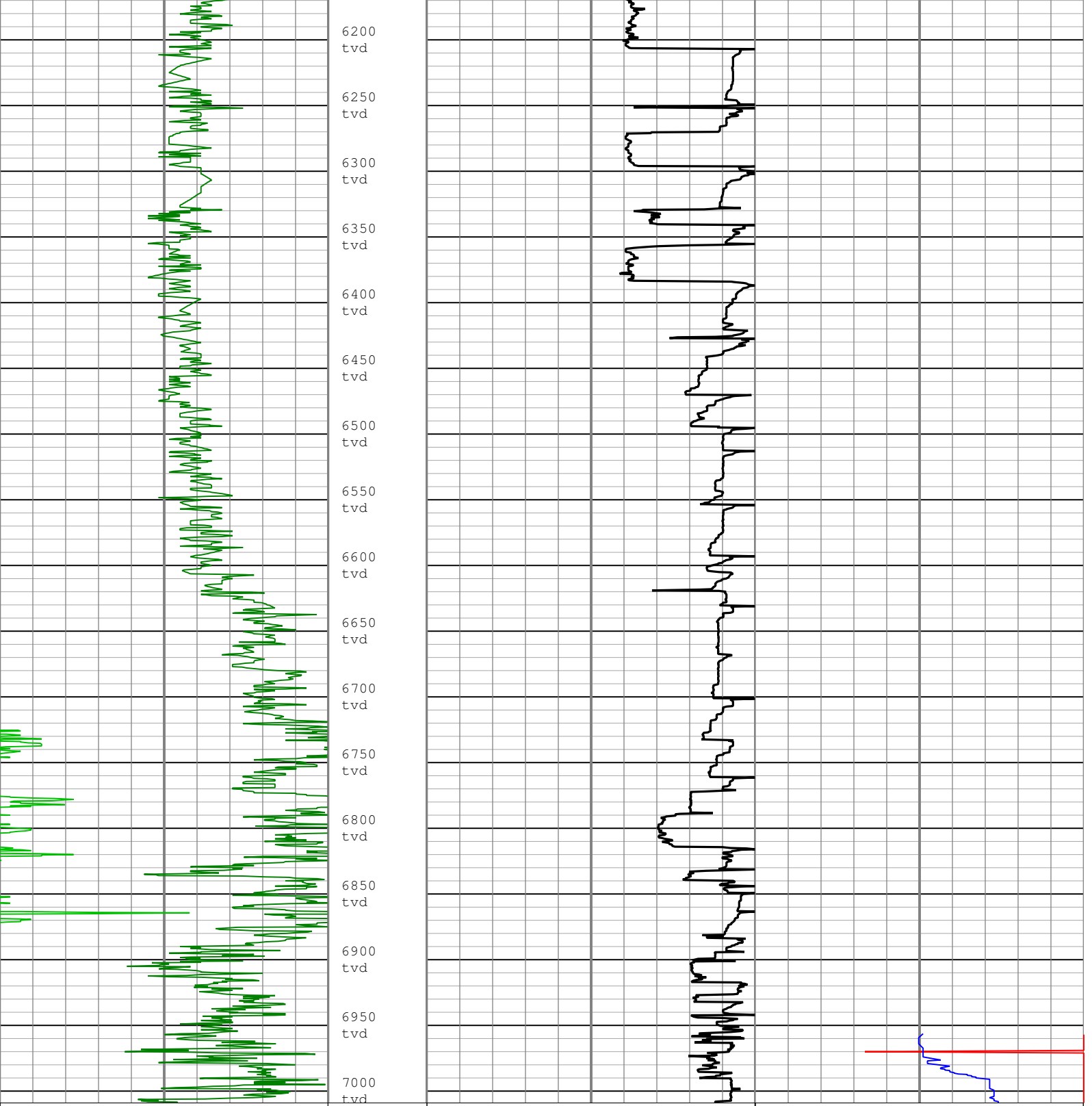
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Gamma Ray (GR) SlimPulse[1] RM	0	150
gAPI	150	300
Gamma Ray (GR) SlimPulse[1] RM	300	450
gAPI	300	450

Rate of Penetration (ROP) RT	1000	0
ft/h		

Shock Risk (SHKRSK) SlimPulse[1] RT	3	0
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Direction and Inclination Sensor Temperature (TEMP_DNI) SlimPulse[1] RT	100	300
degF		

Description: SlimPulse Gamma Ray 1 Format: Log (SlimPulse Gamma Ray Final TVD) Index Scale: 1 in per 100 ft Index Unit: ft Index Type: TVD
 Creation Date: 03-Oct-2014 12:35:12

Channel Processing Parameters

Lateral1: Parameters

Parameter	Description	Tool	Value	Unit
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BS	Bit Size	DNMSESSION	Depth Zoned	in
DFD	Drilling Fluid Density	Borehole	10.1	lbm/gal
GR_SRC	GR Source Selection	SPULSE-GEN	GAMMA_EXT	

Lateral1Depth Zoned Parameters

Parameter	Value	Start (ft)	Stop (ft)
BS	8.75	6927.77	6962.92
BS	6.125	6962.92	7009.22

All depth are actual.

Tool Control Parameters

UDComposite 1

5 in / 100 ft True Vertical Depth

Composite Summary

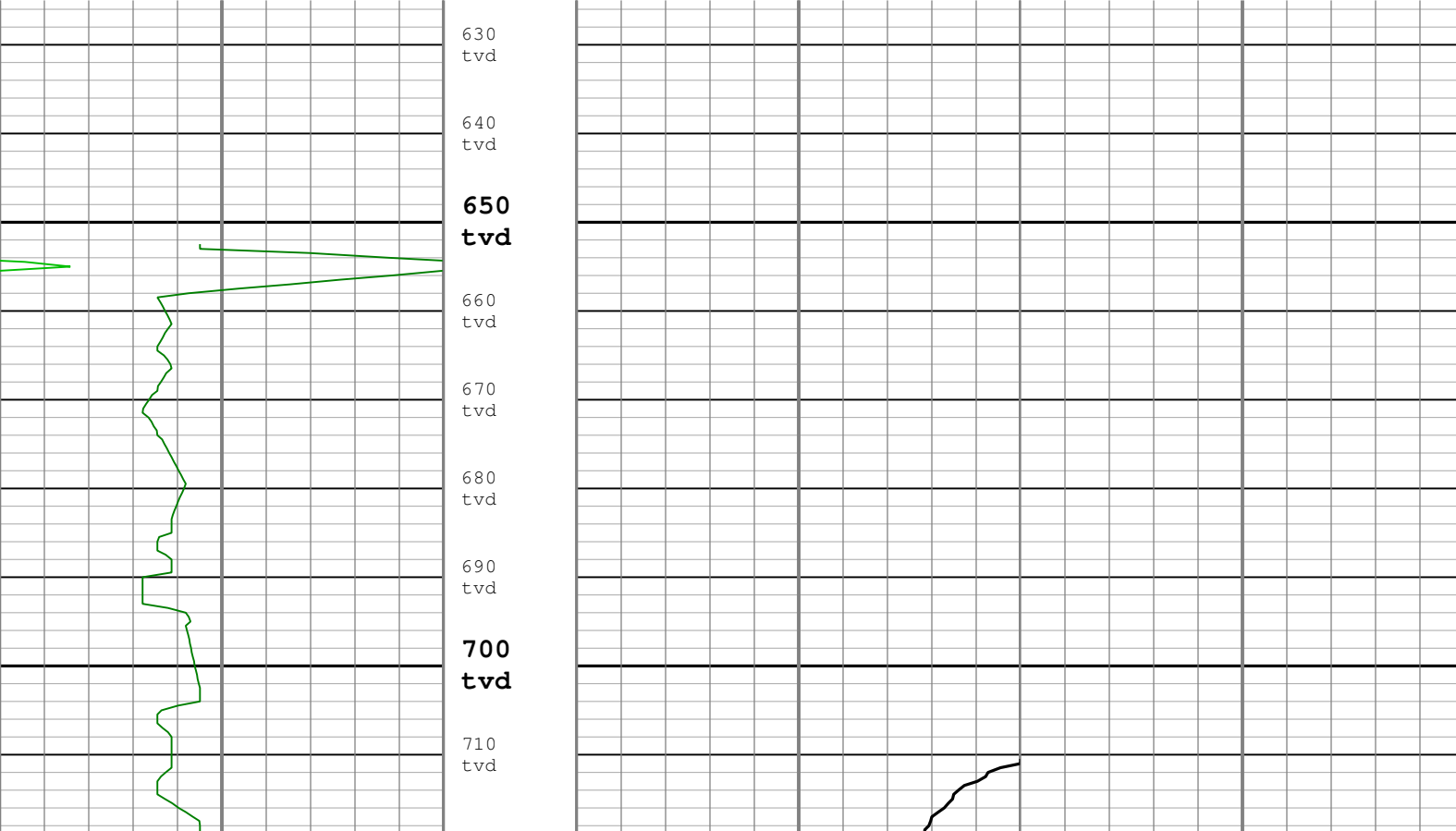
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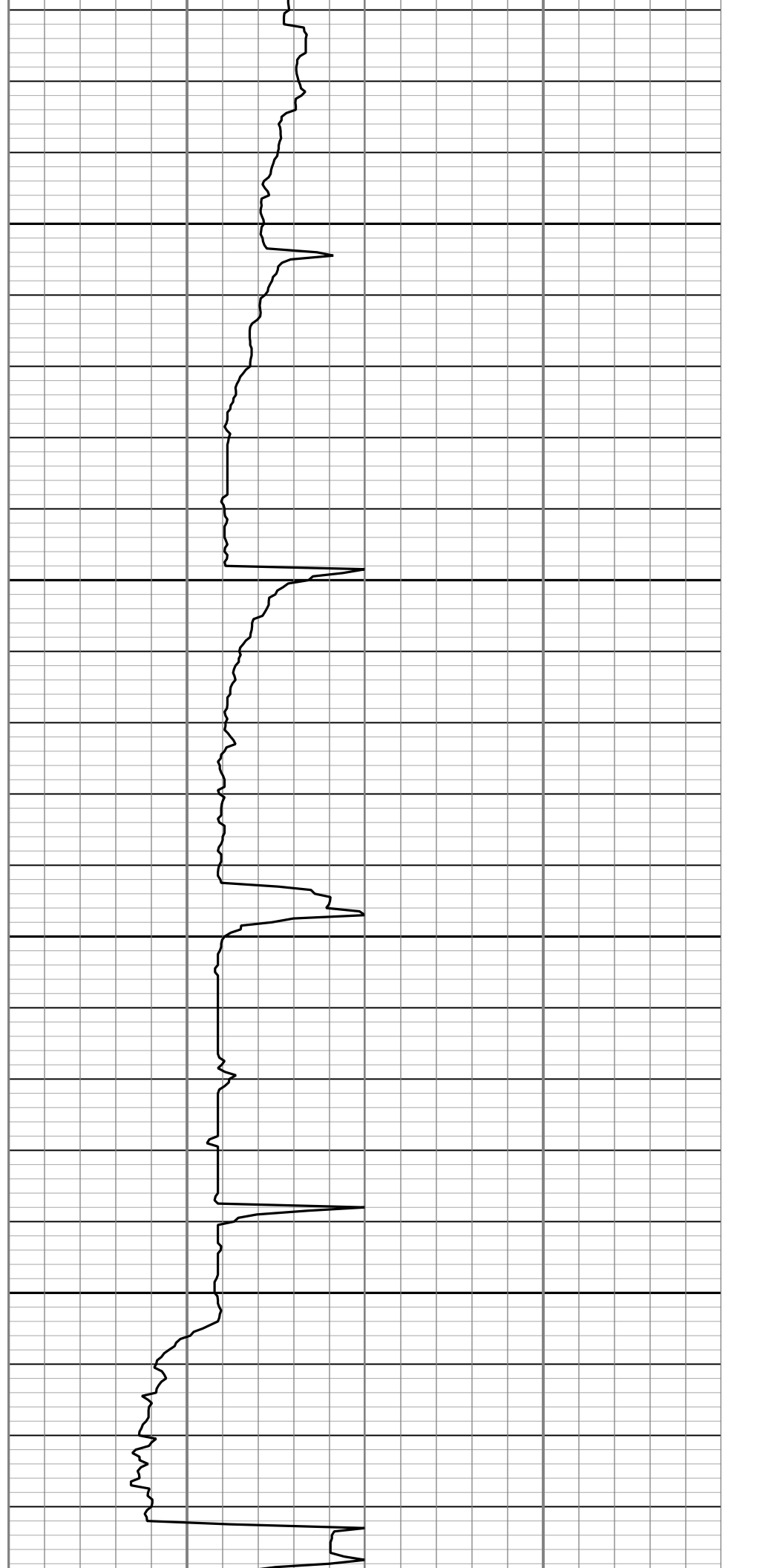
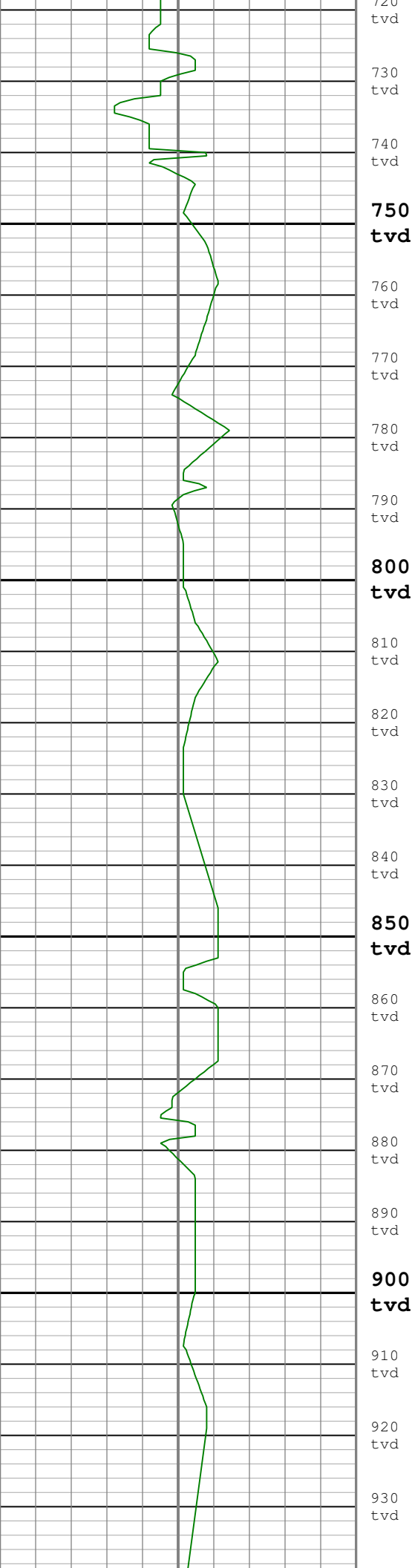
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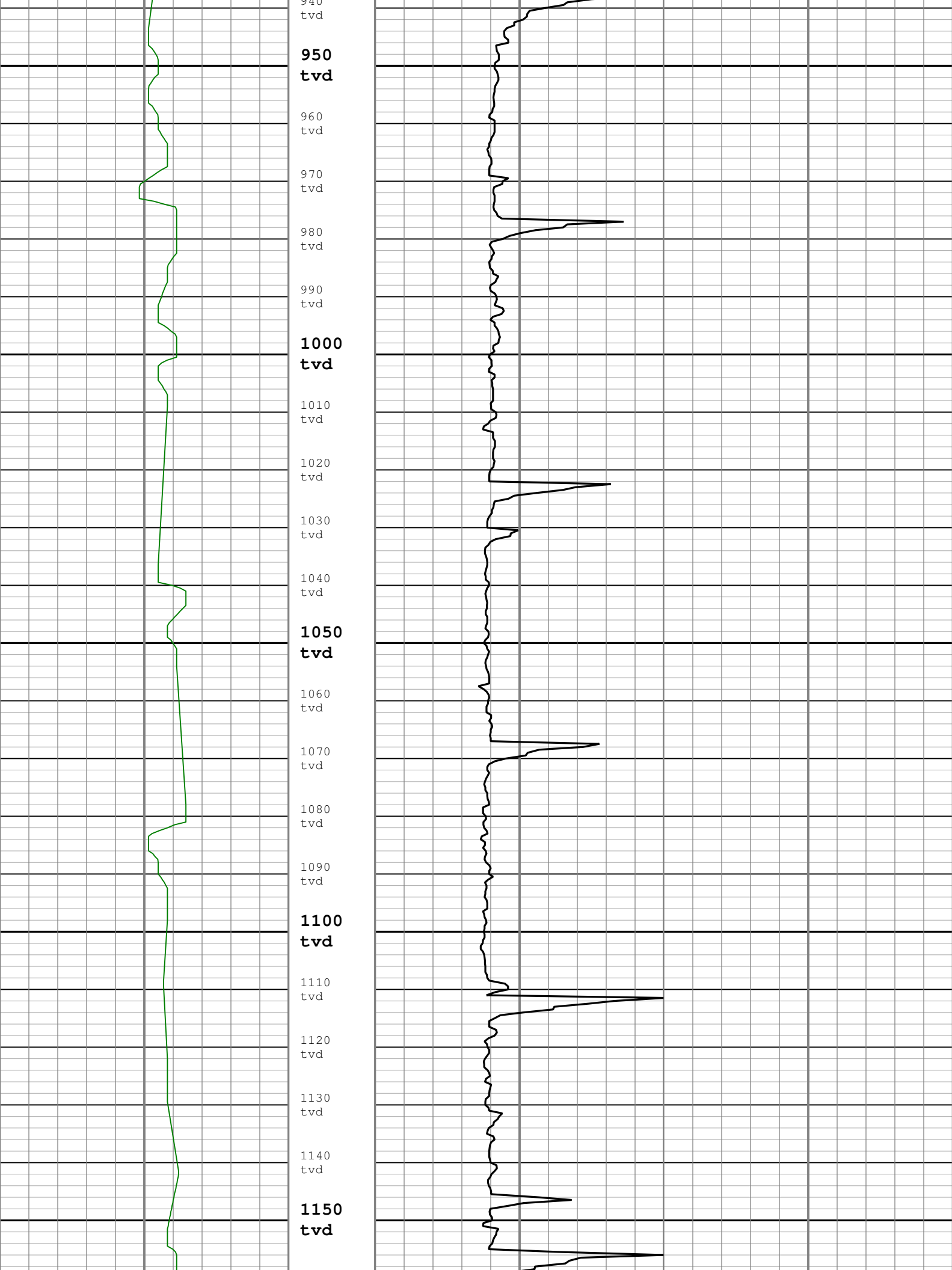
Log	Company:Noble Energy Inc.	Well:Heartland G25-73-1HN
	UDComposite 1:S528	

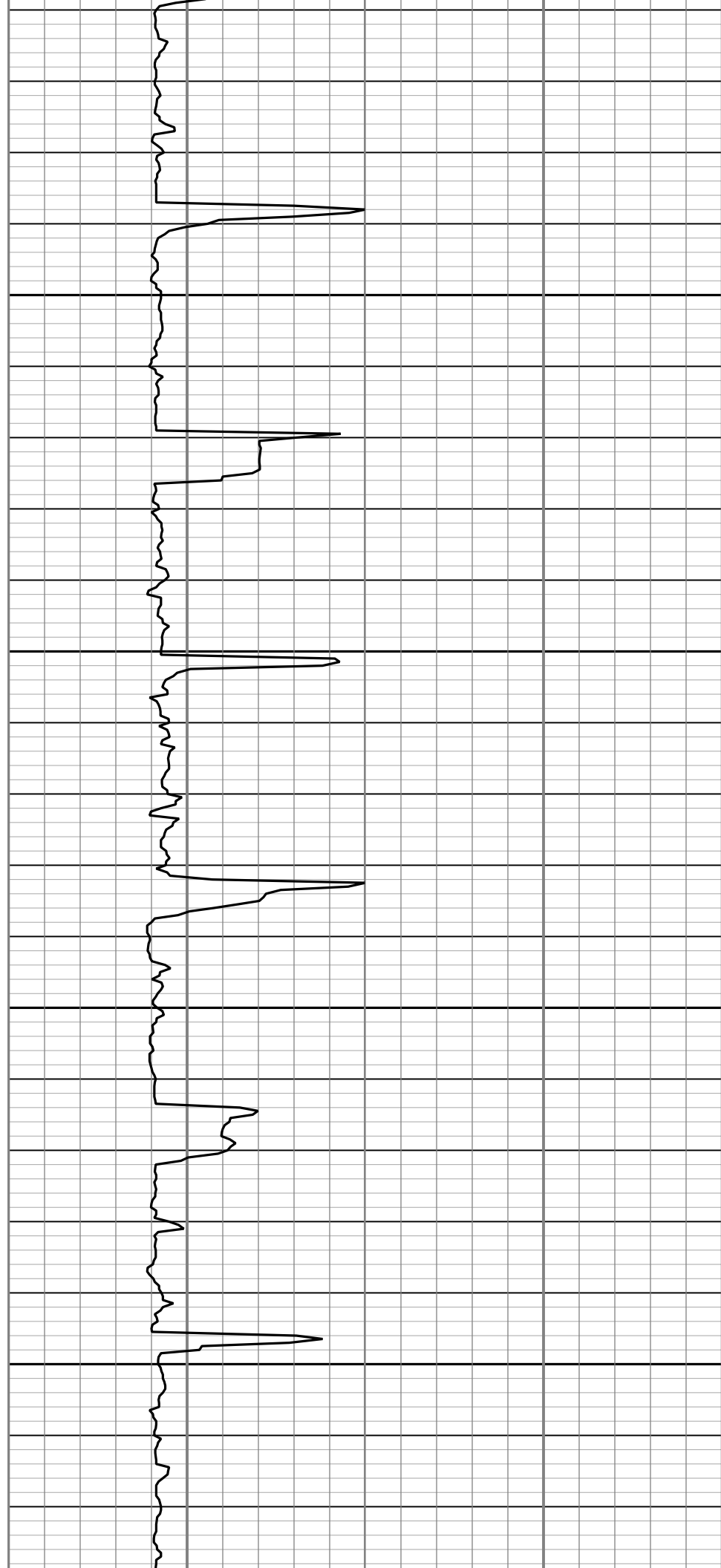
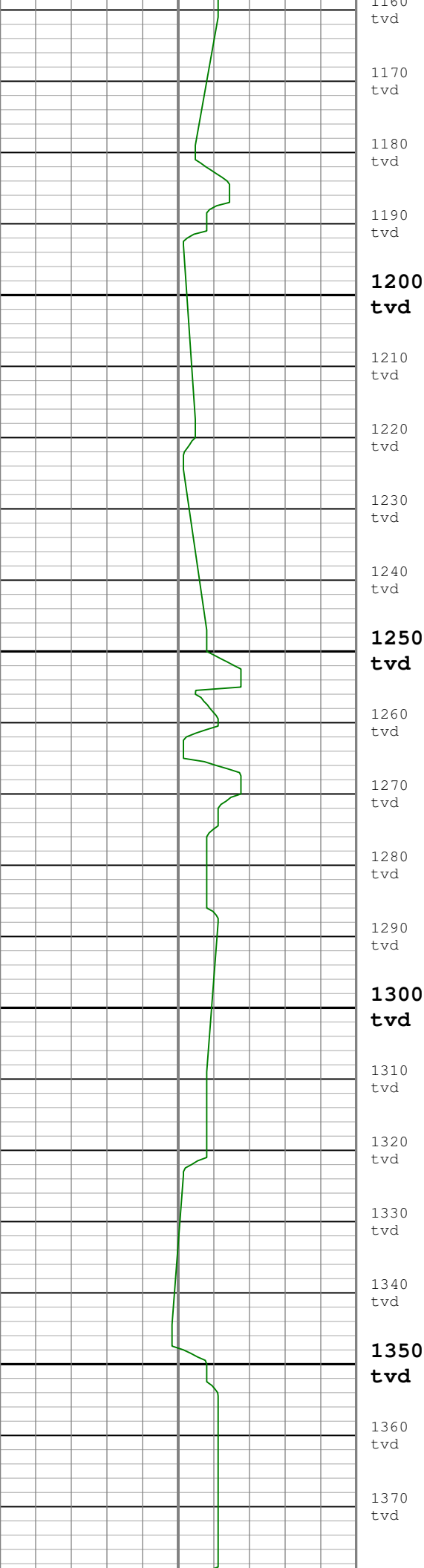
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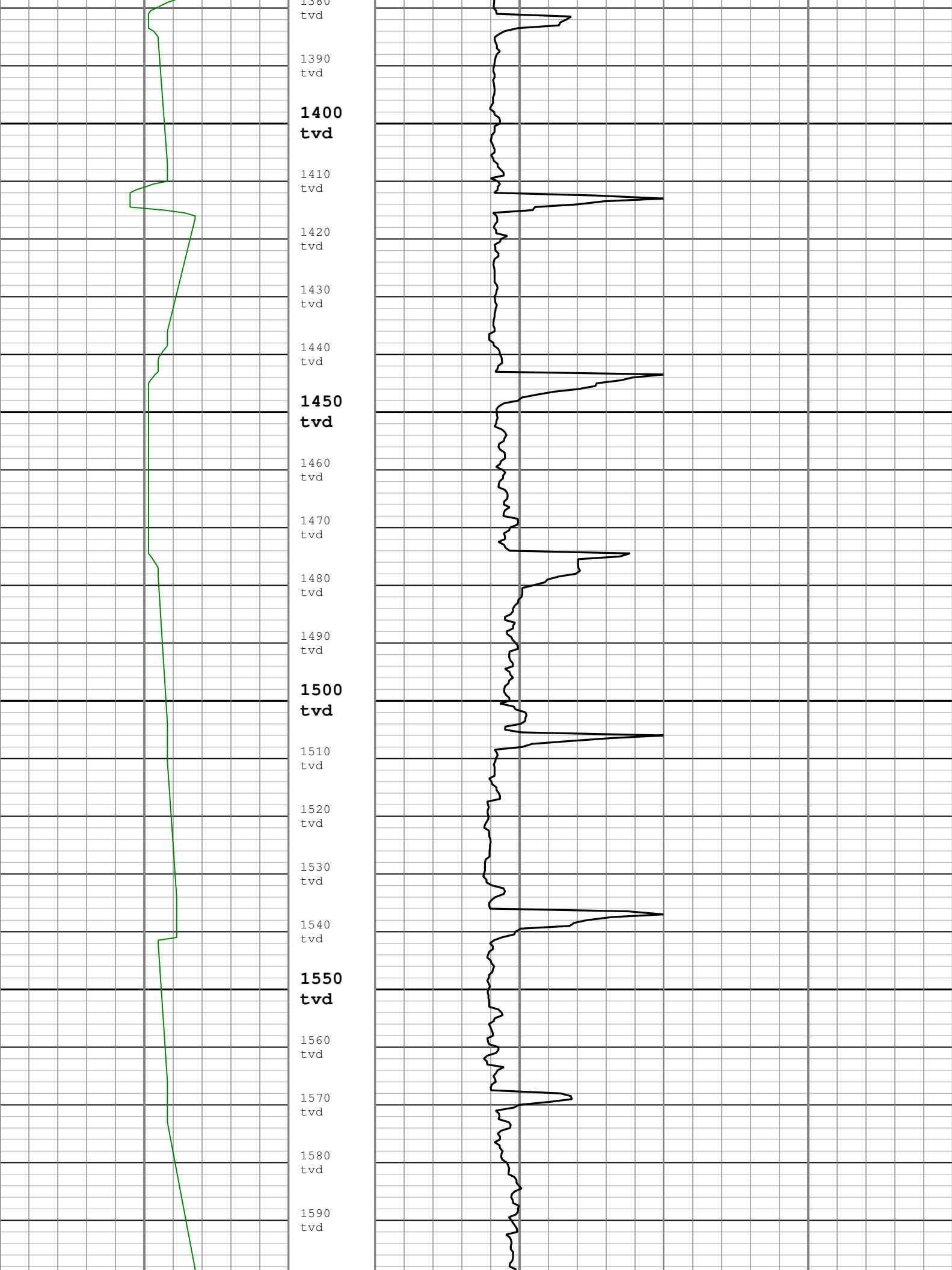
Gamma Ray (GR) SlimPulse[1] RM			Shock Risk (SHKRSK) SlimPulse[1] RT		
0	gAPI	150	3 0		
Gamma Ray (GR) SlimPulse[1] RM			Direction and Inclination Sensor Temperature (TEMP_DNI) SlimPulse[1] RT		
150	gAPI	300	100 degF 300		
Gamma Ray (GR) SlimPulse[1] RM			Rate of Penetration (ROP) RT		
300	gAPI	450	1000 ft/h	0	

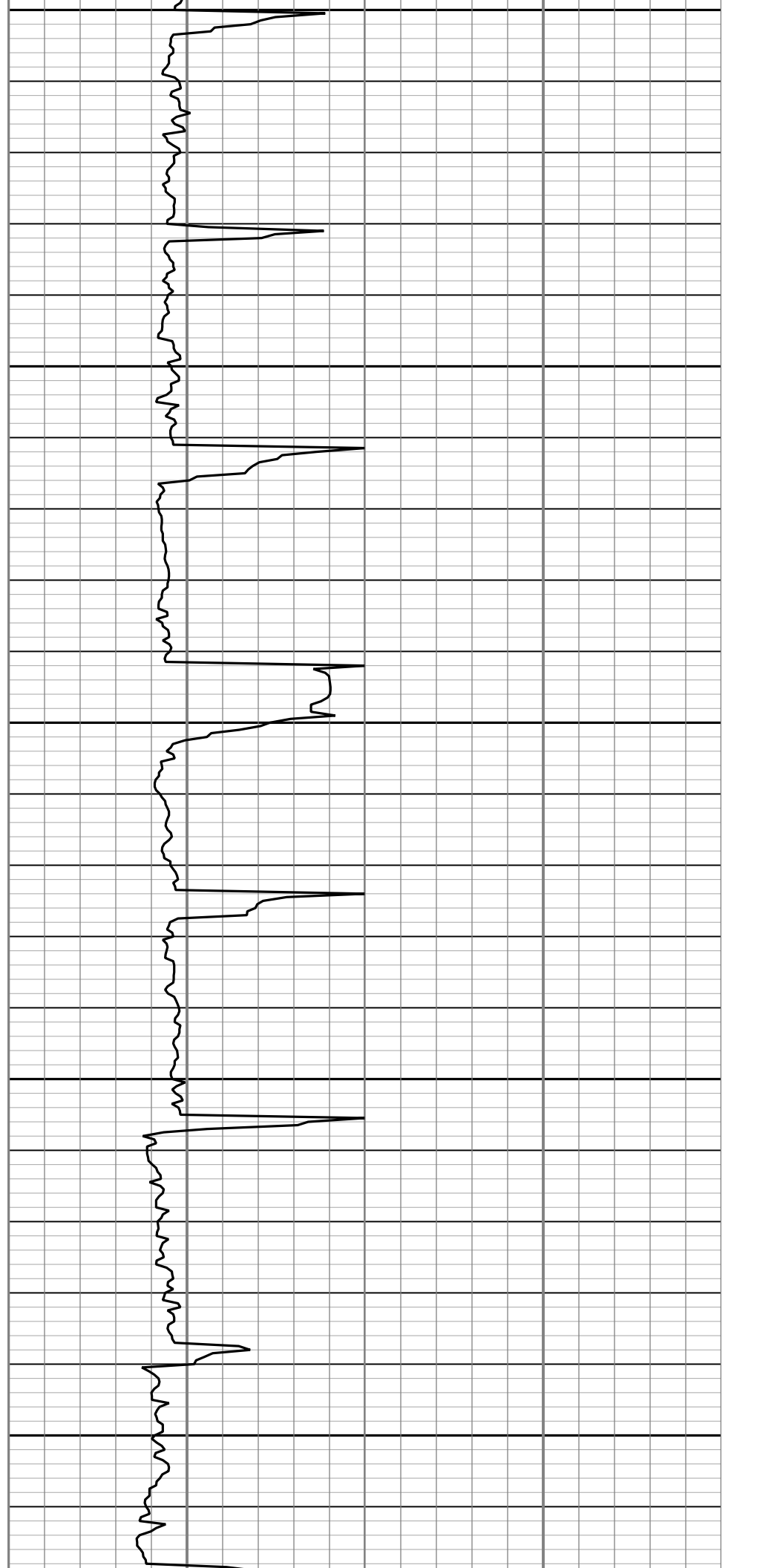
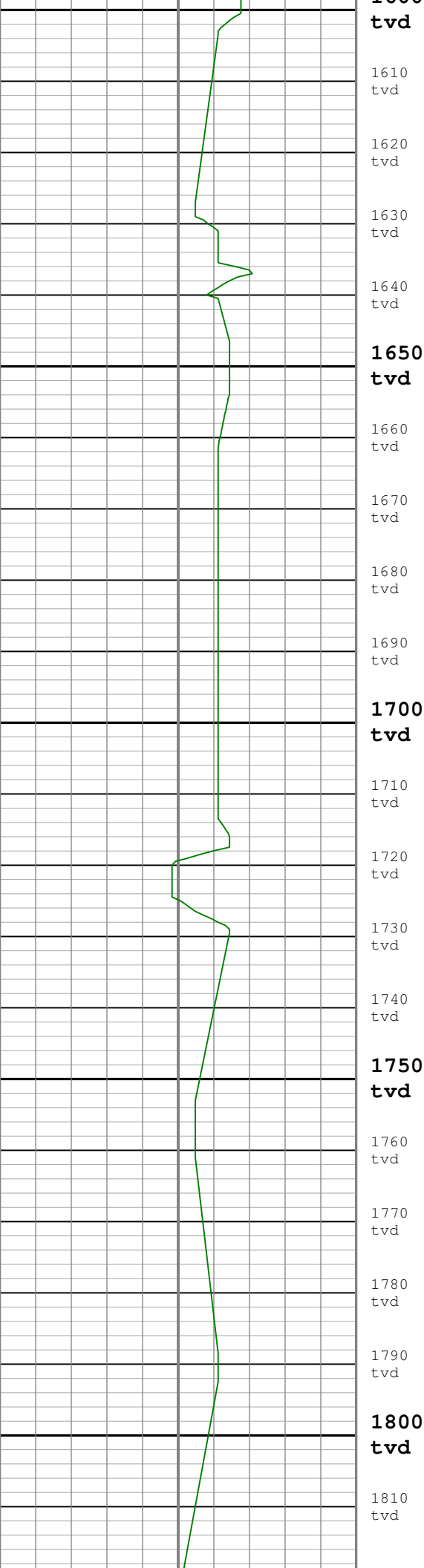


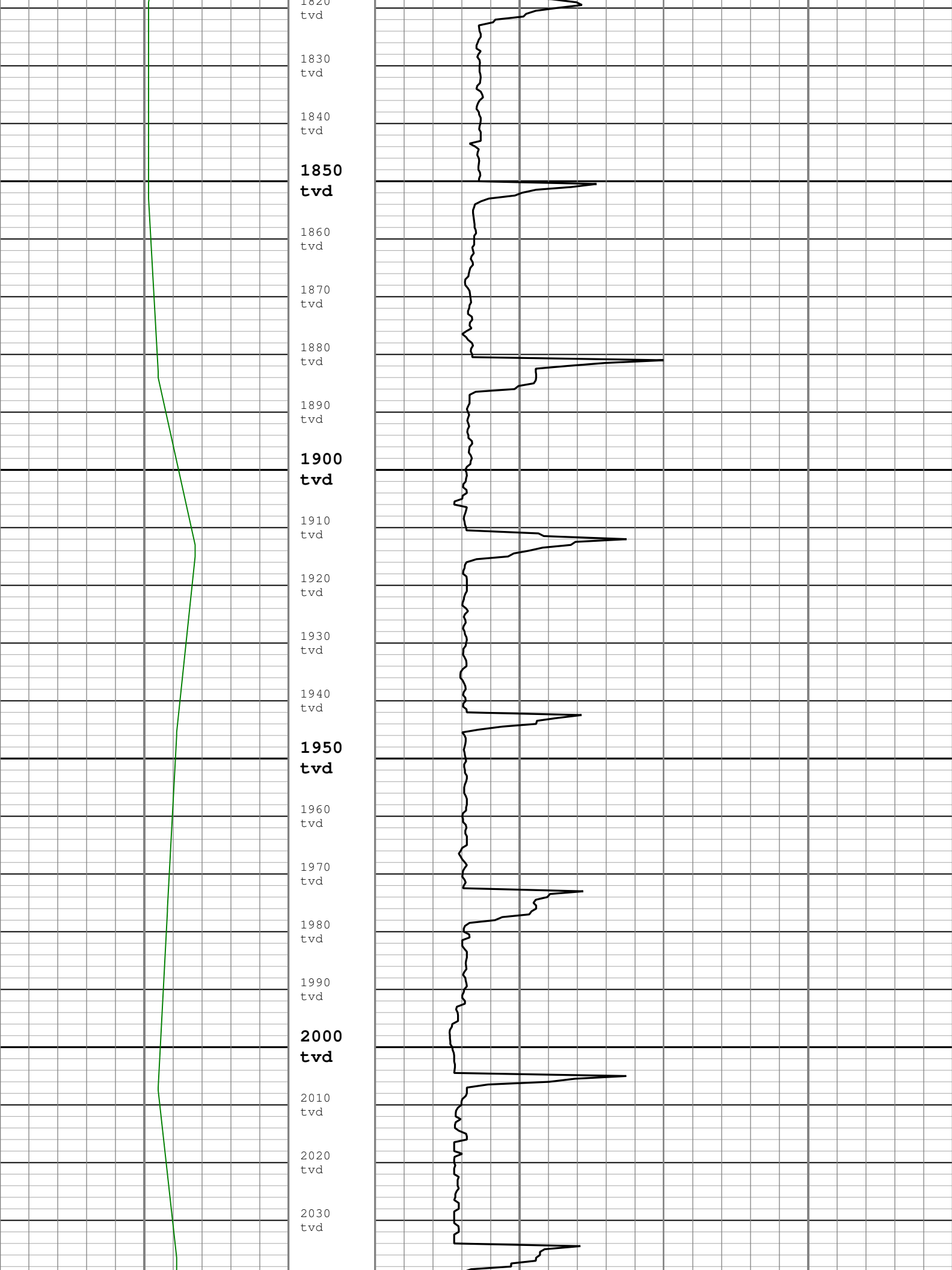


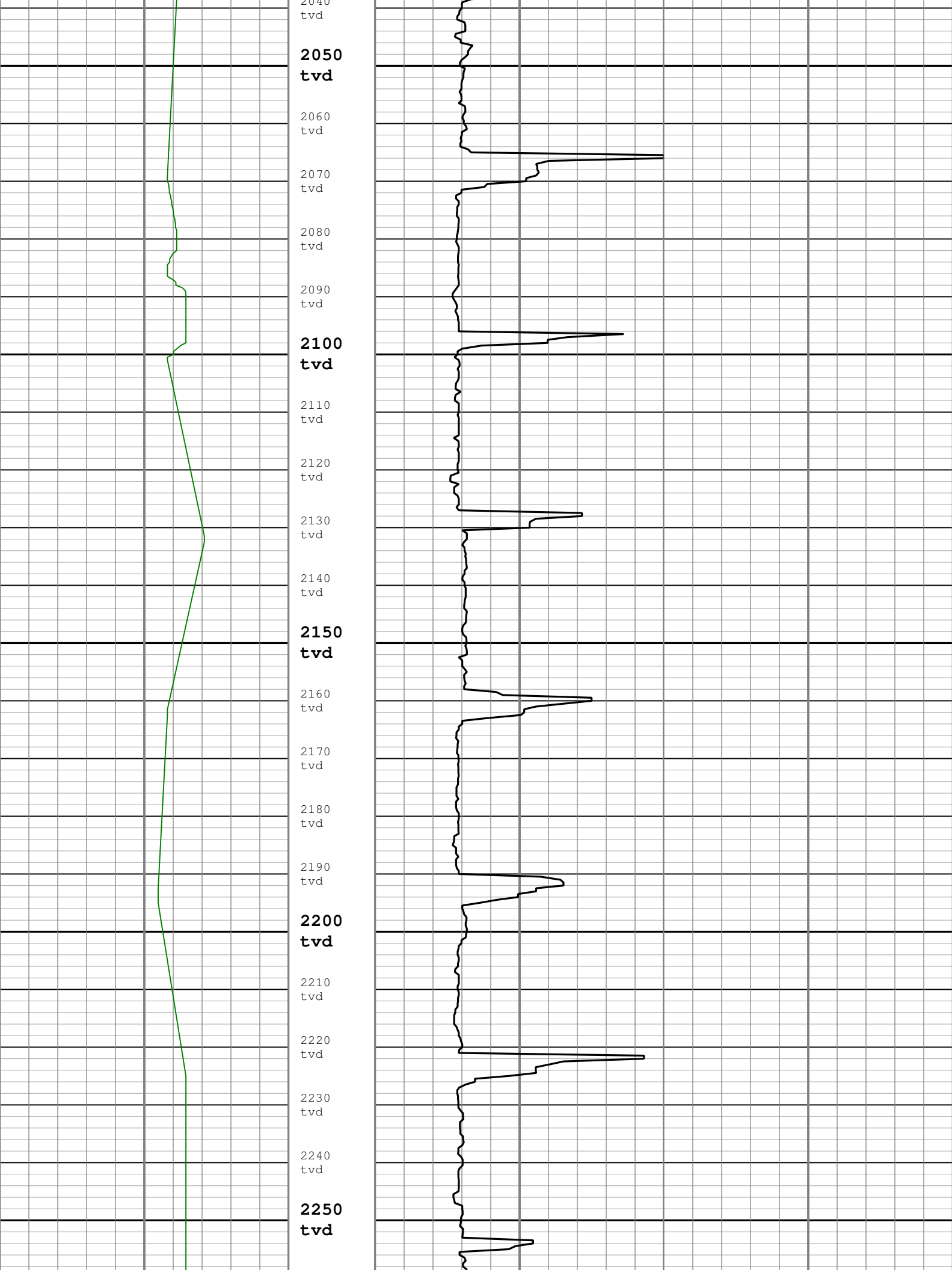


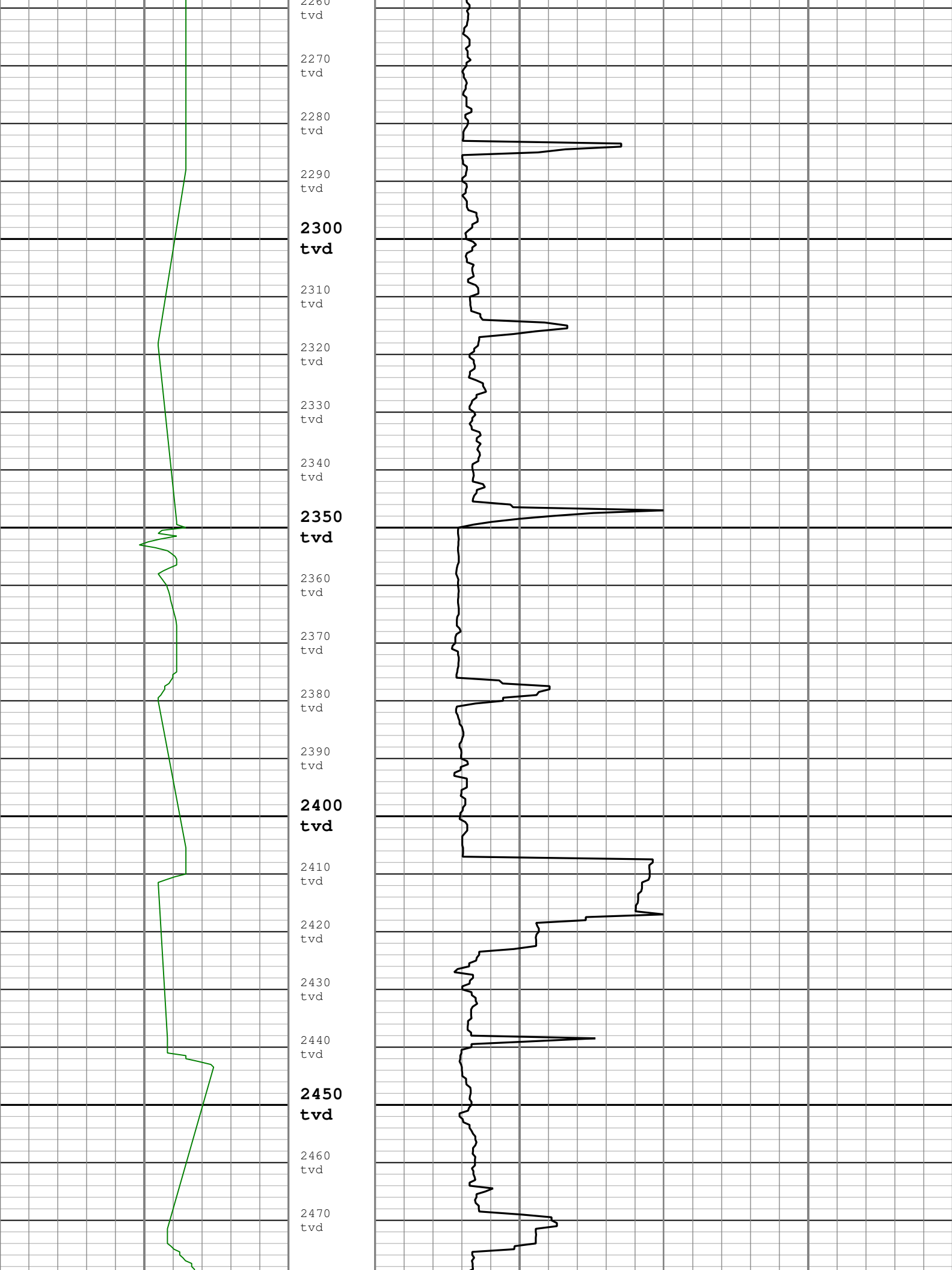


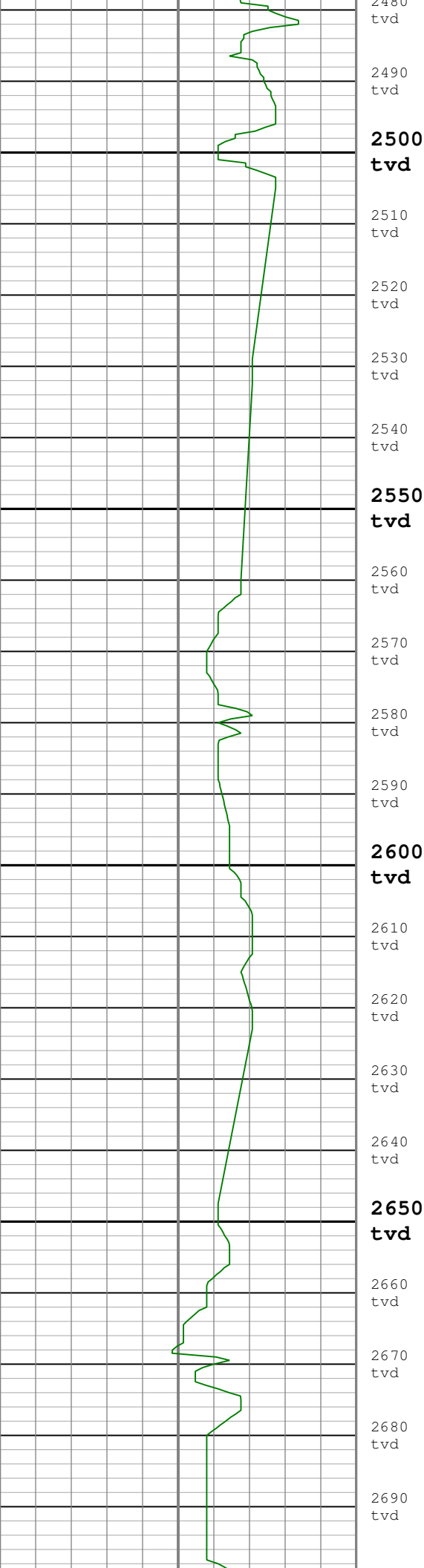




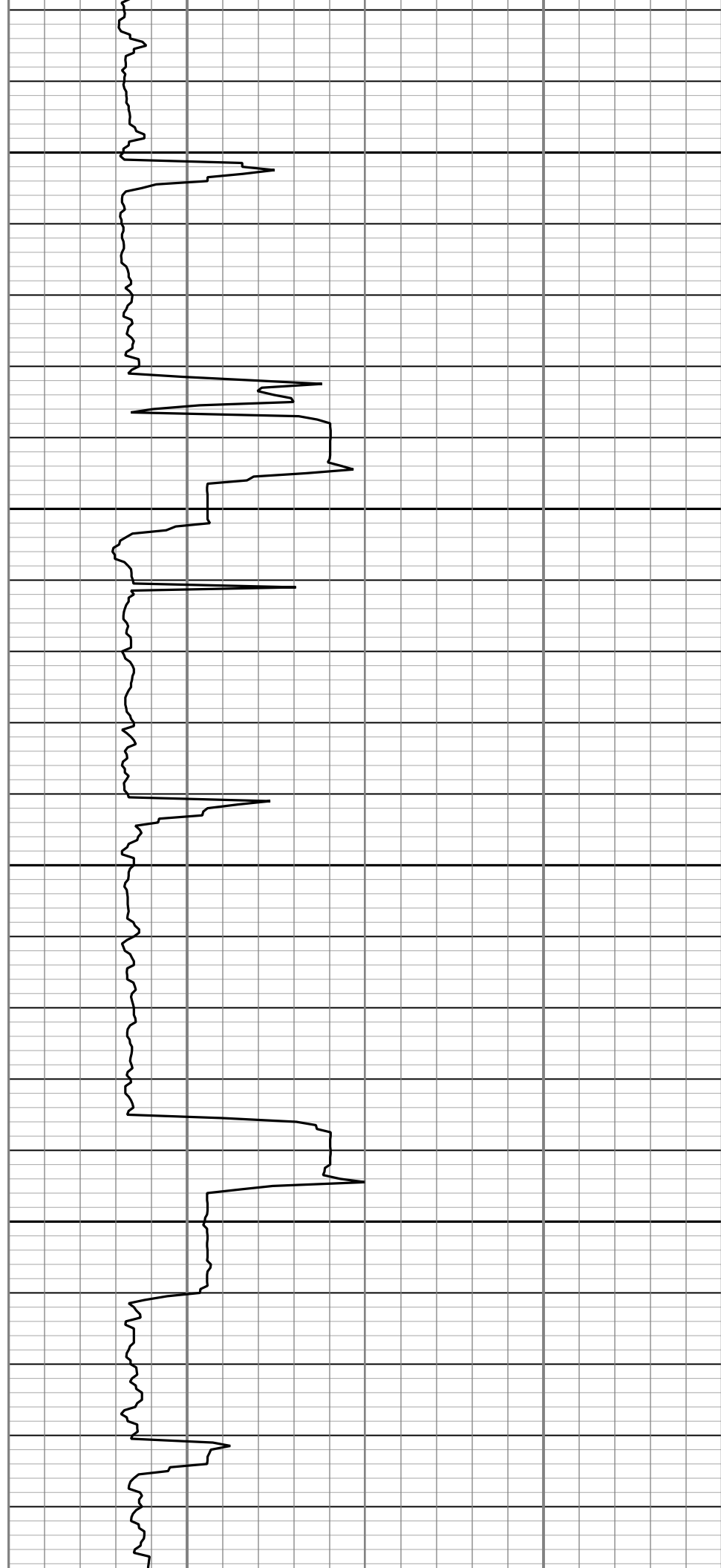


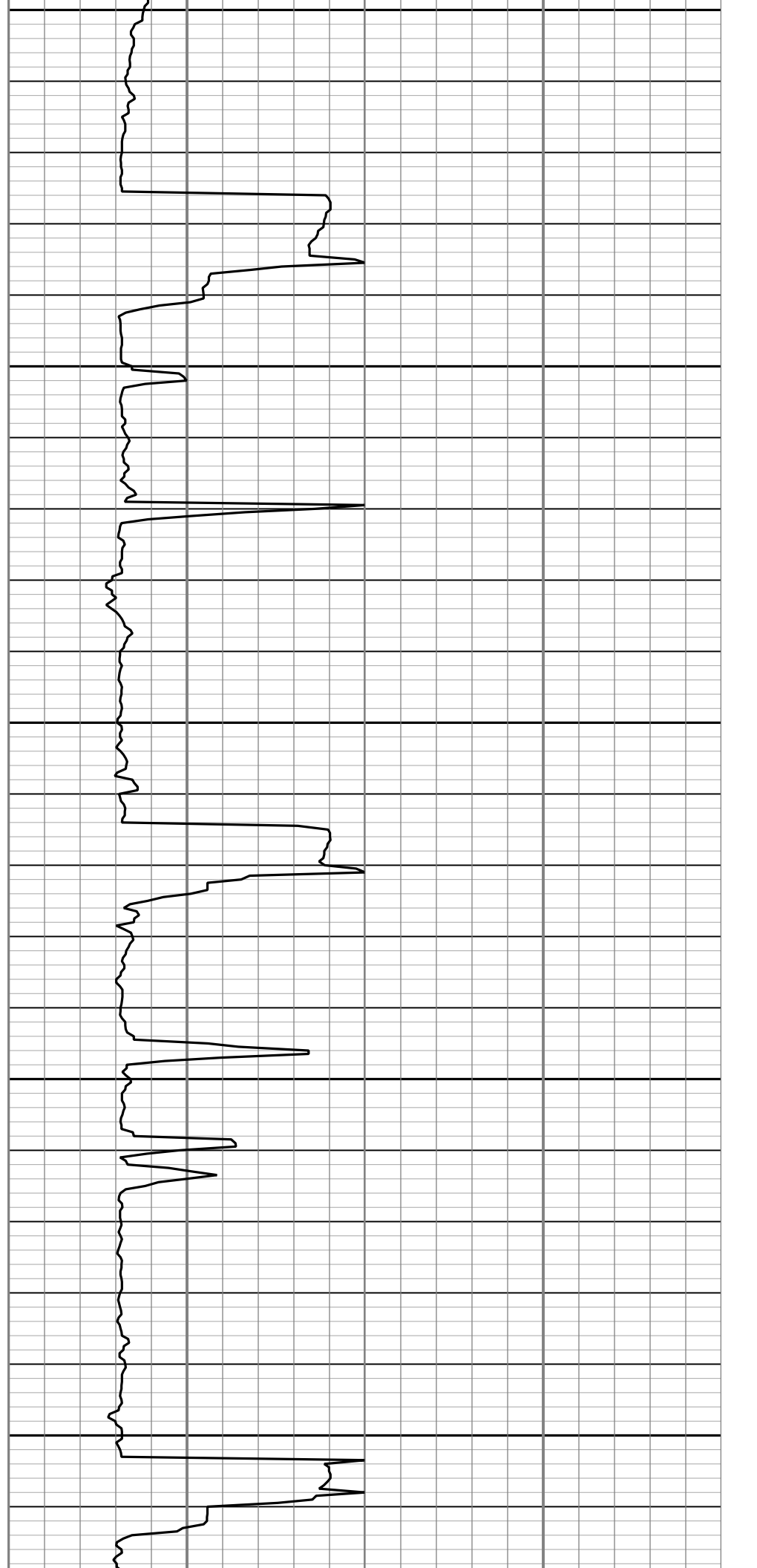
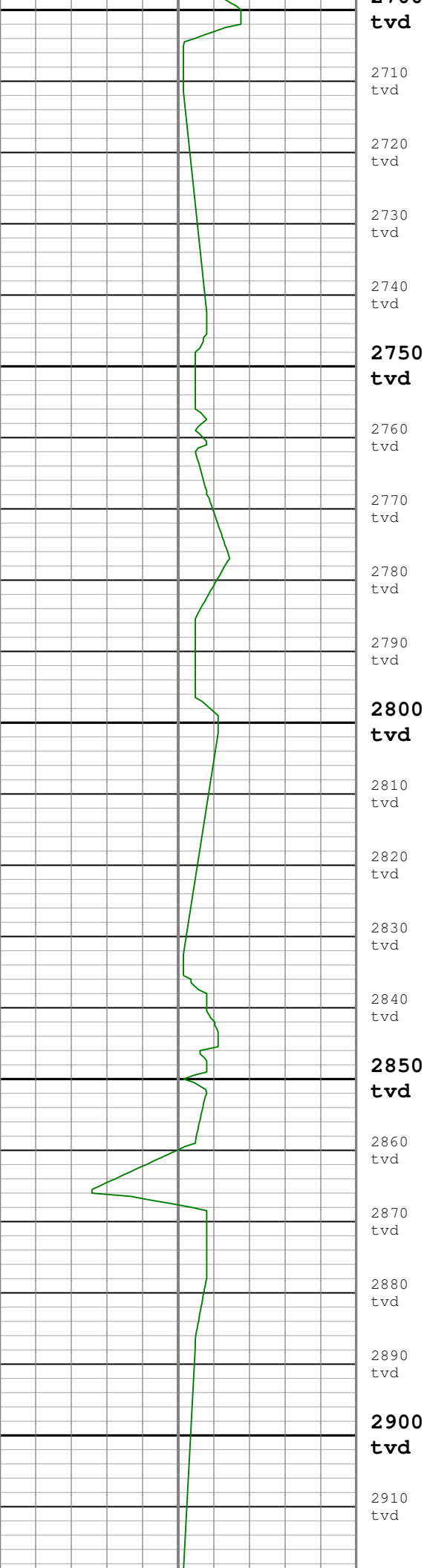


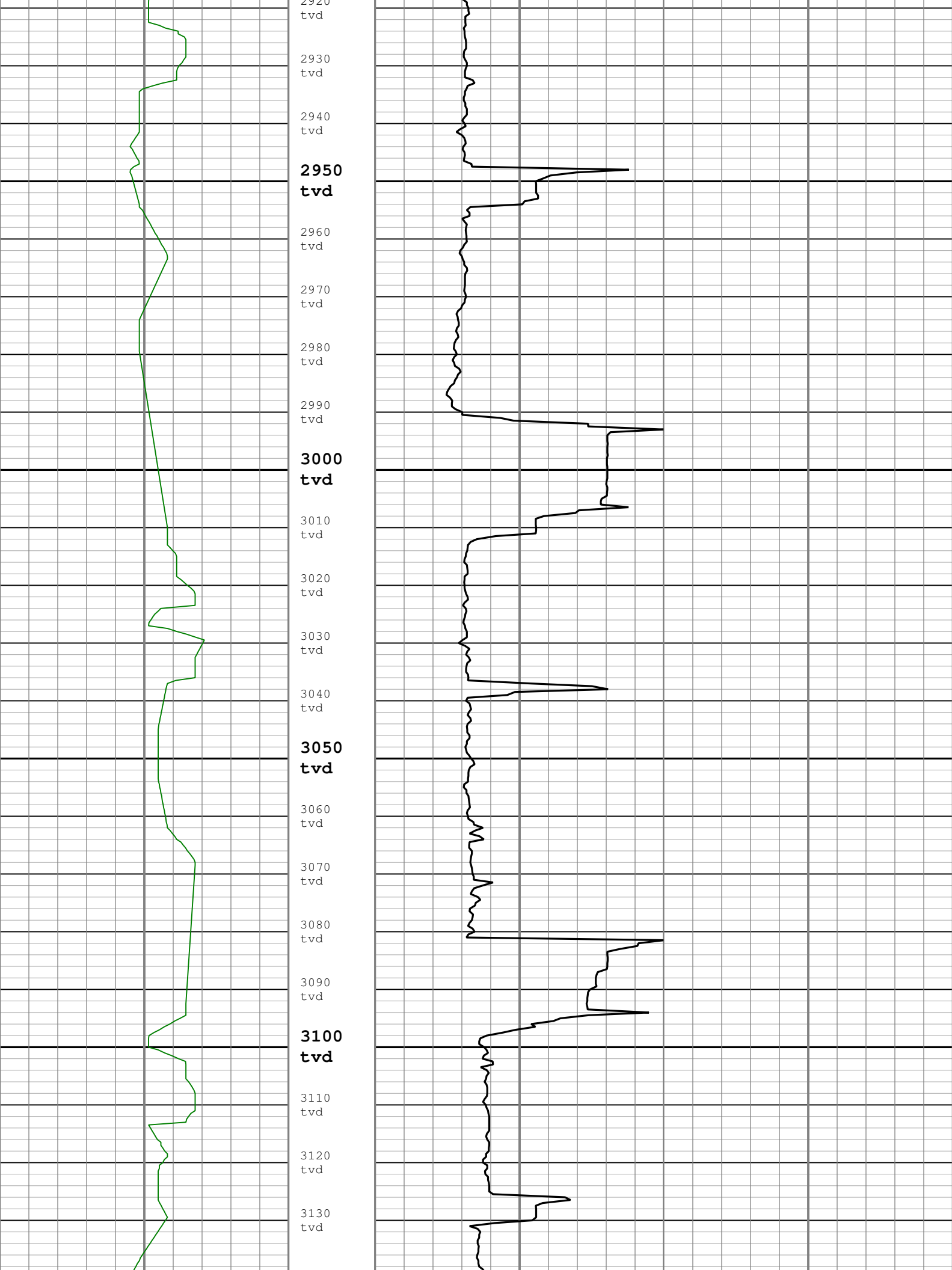


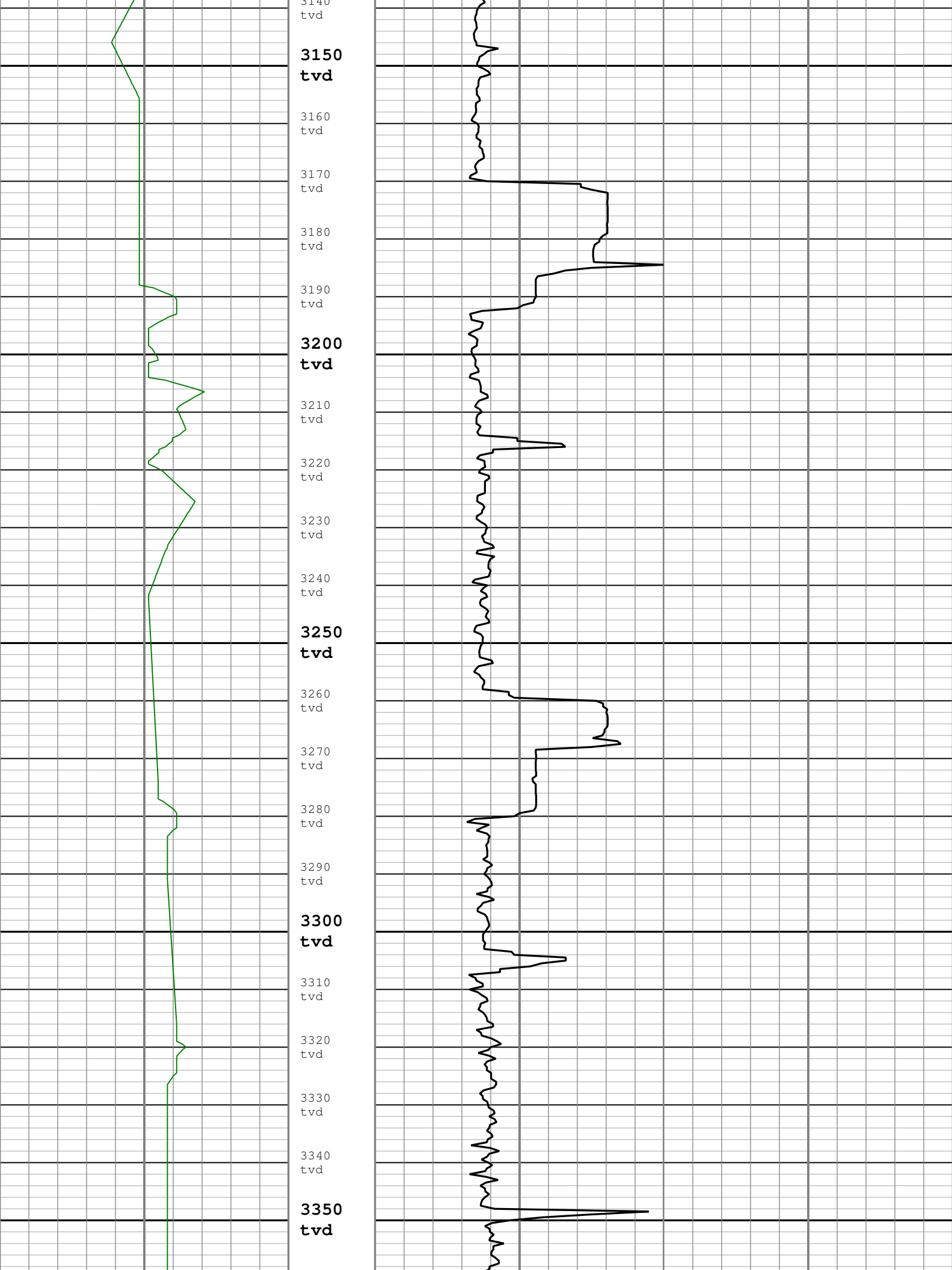


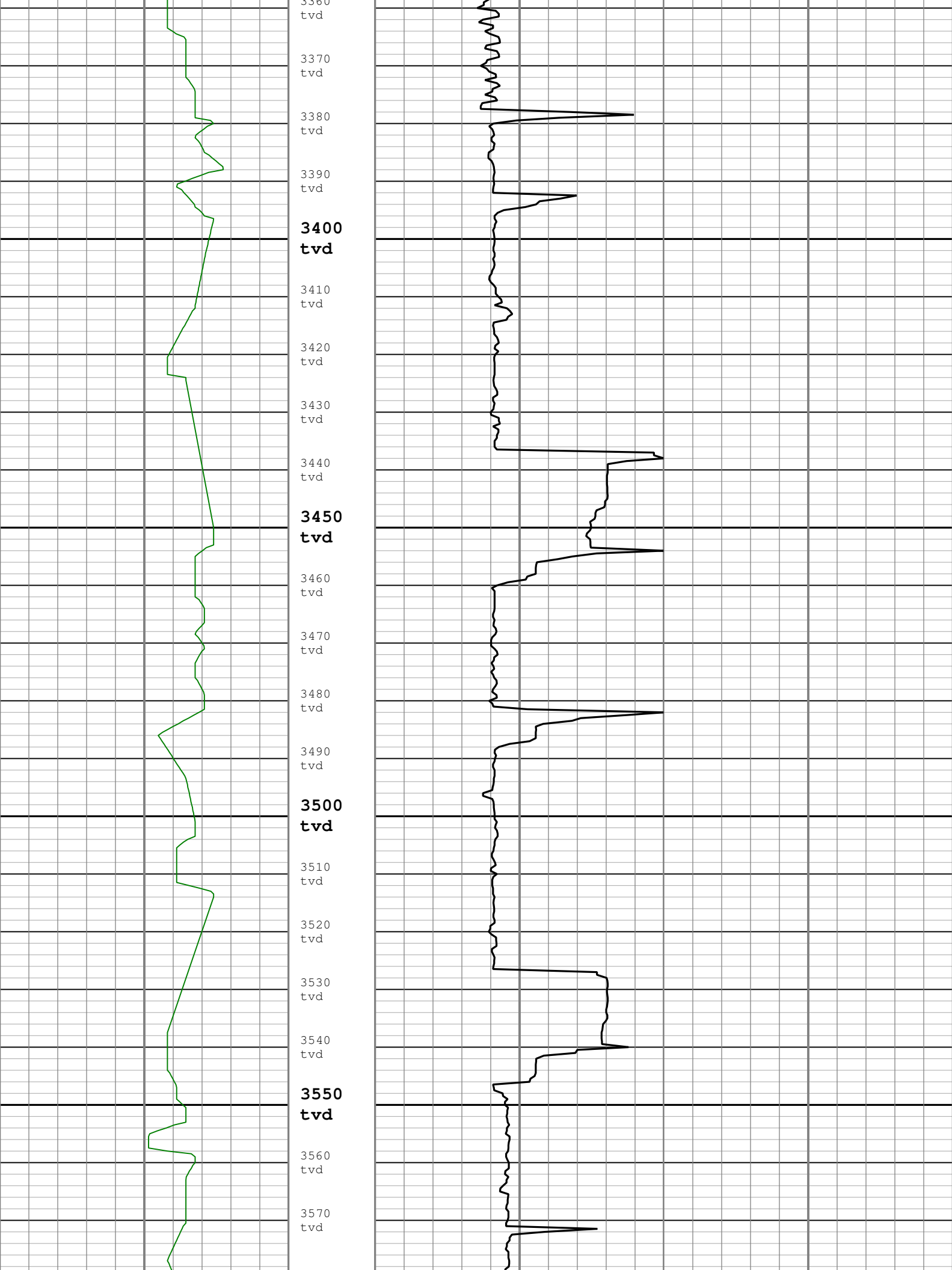
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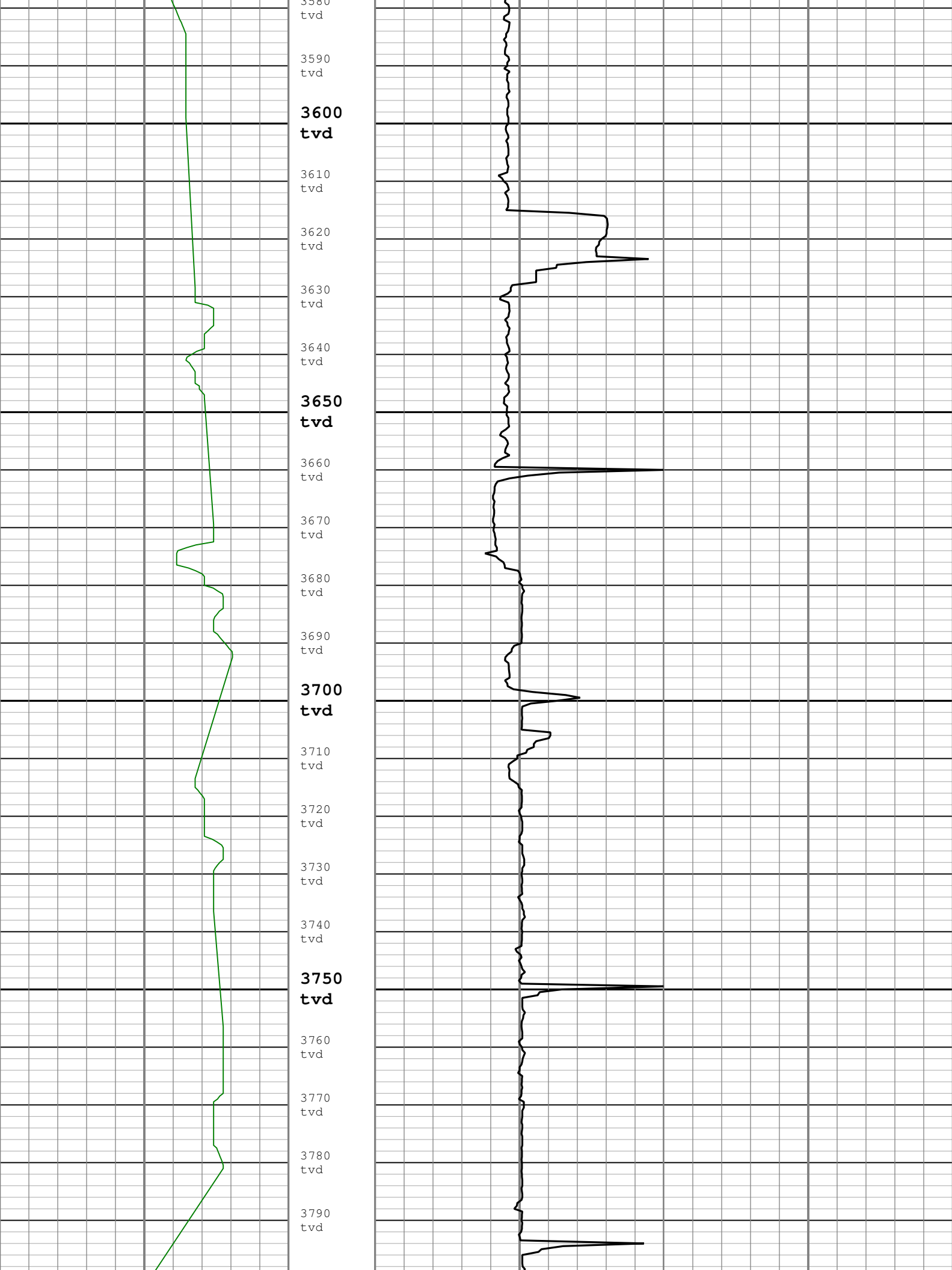


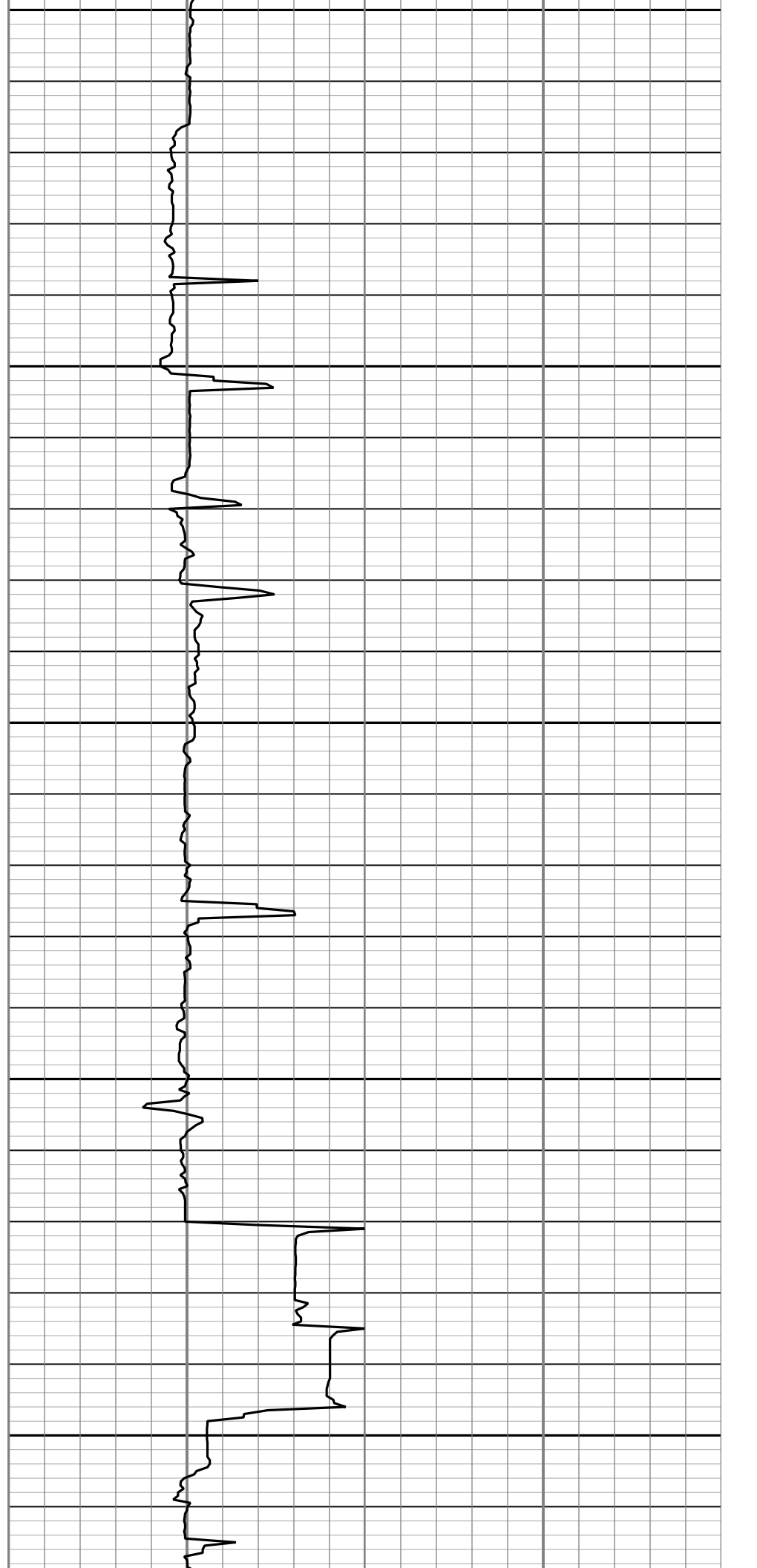
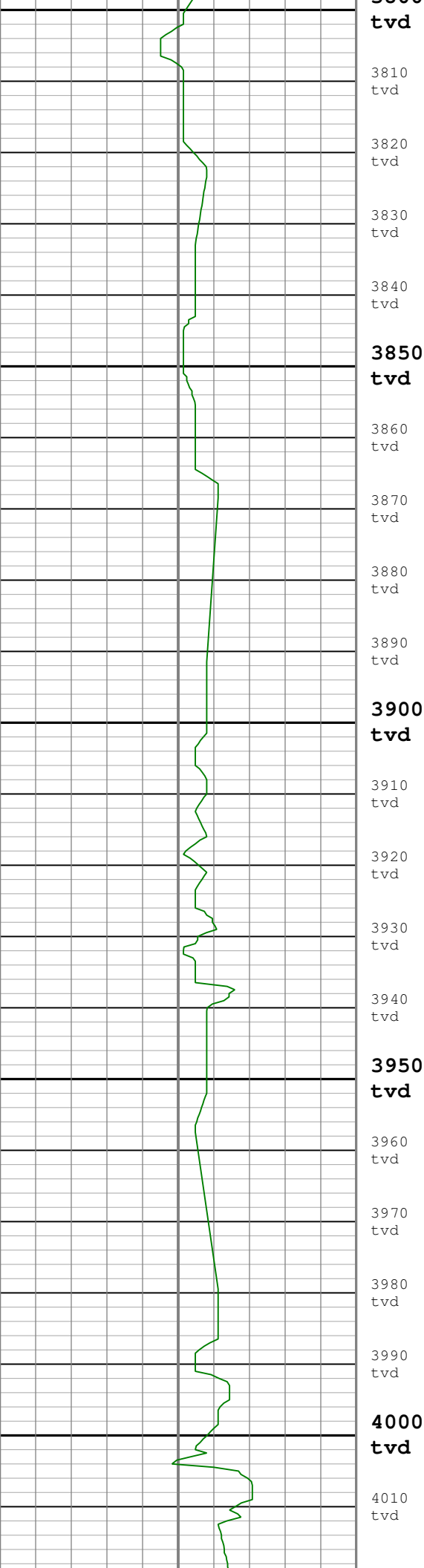


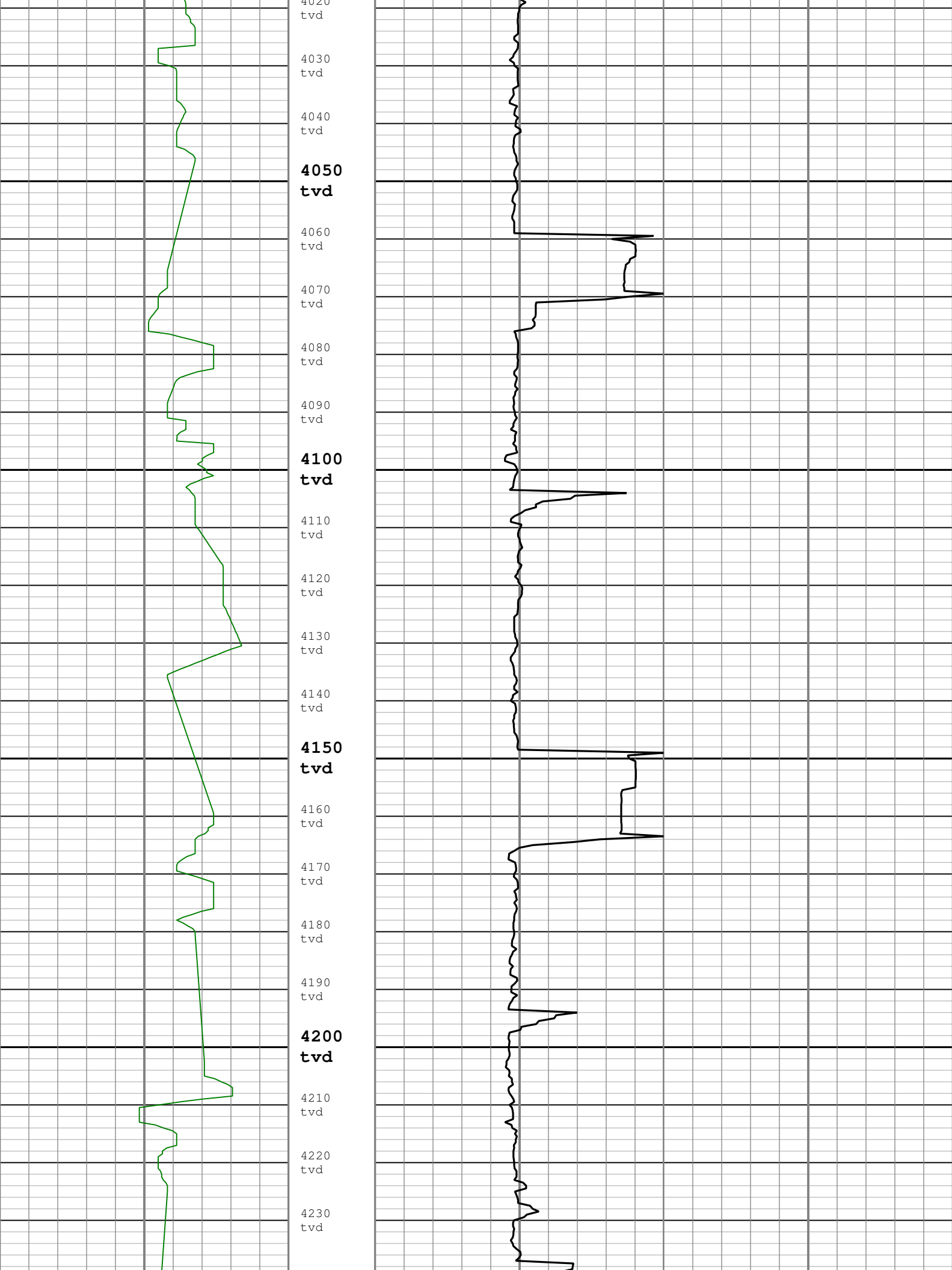


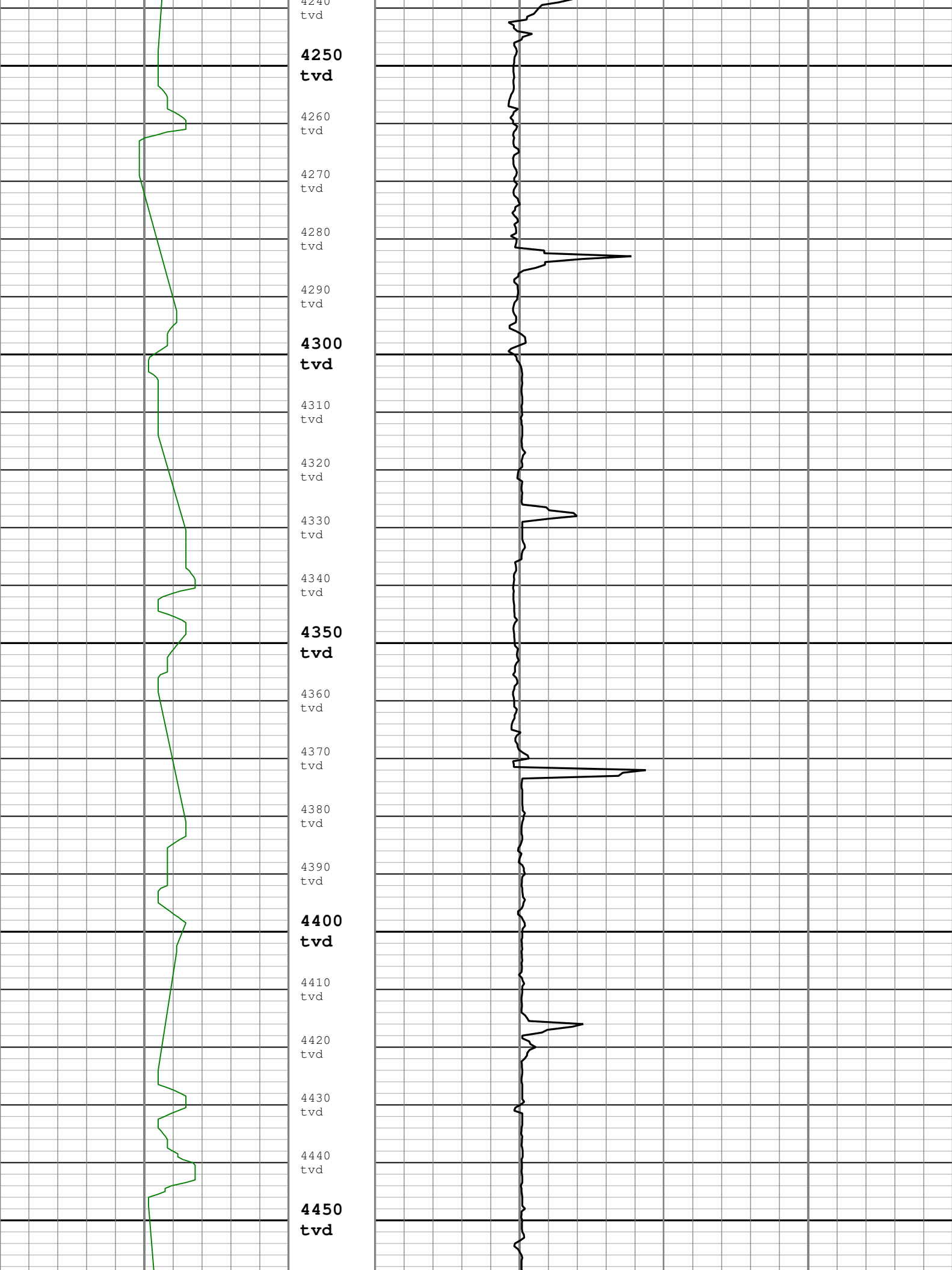


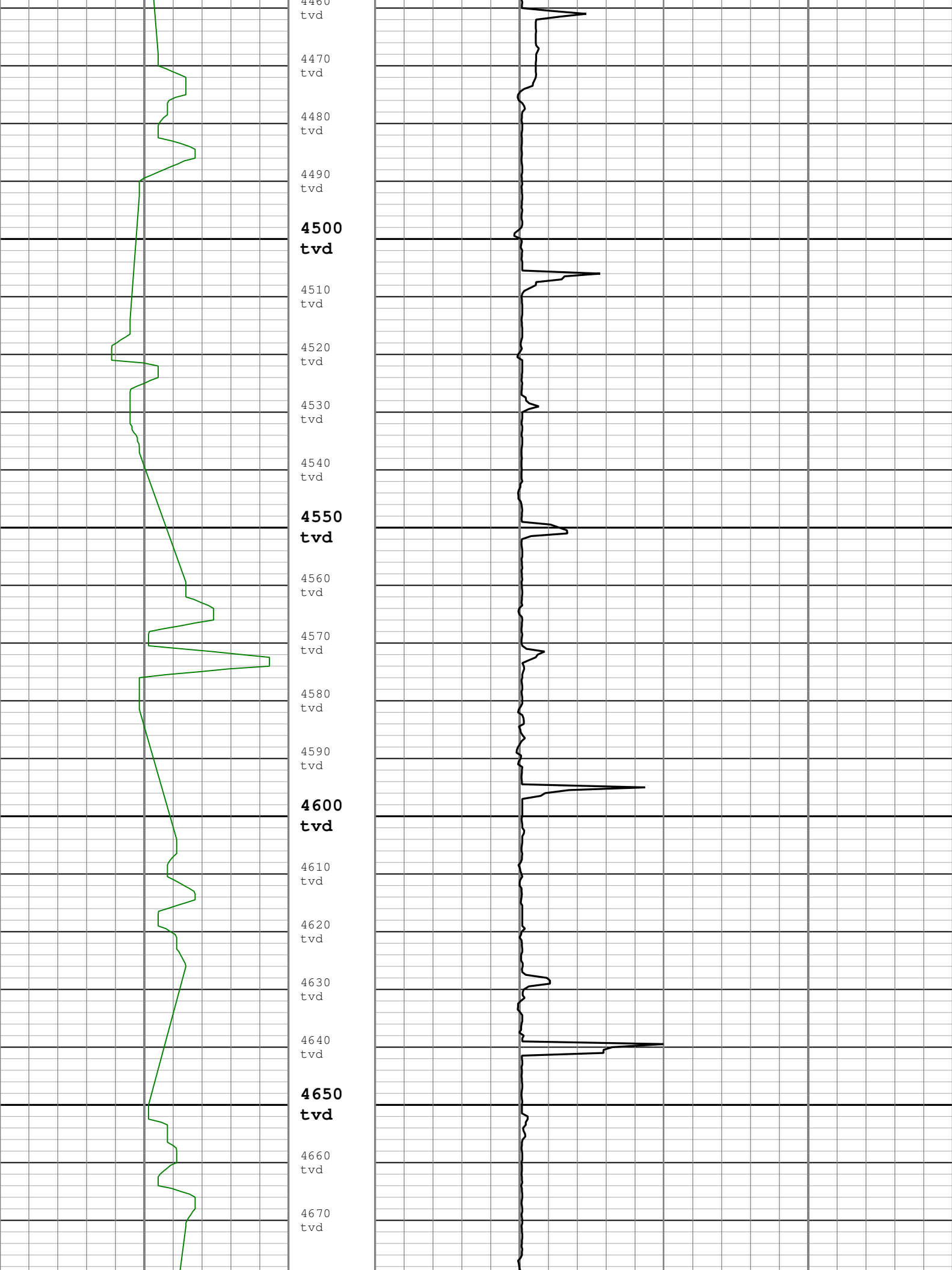


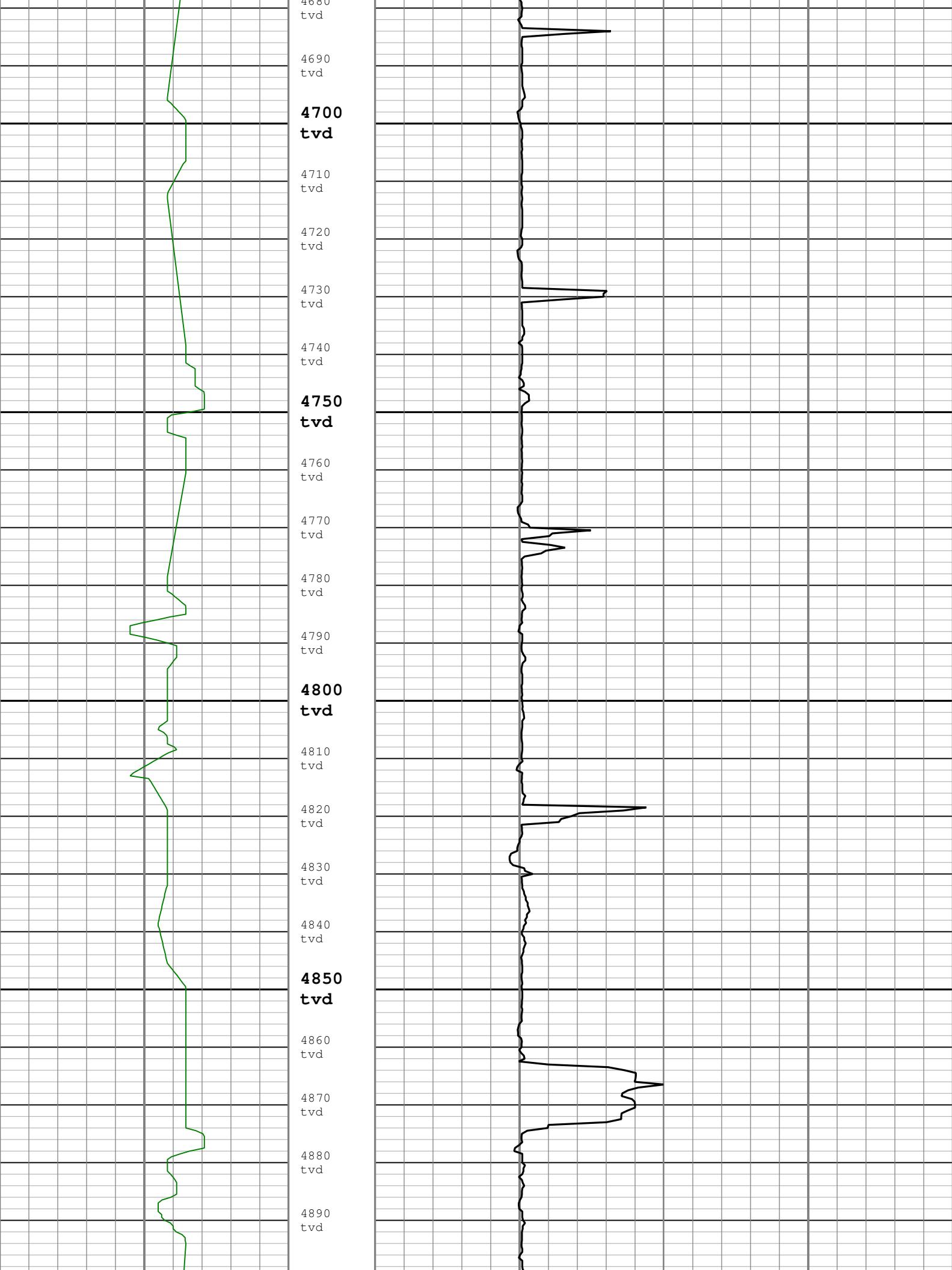


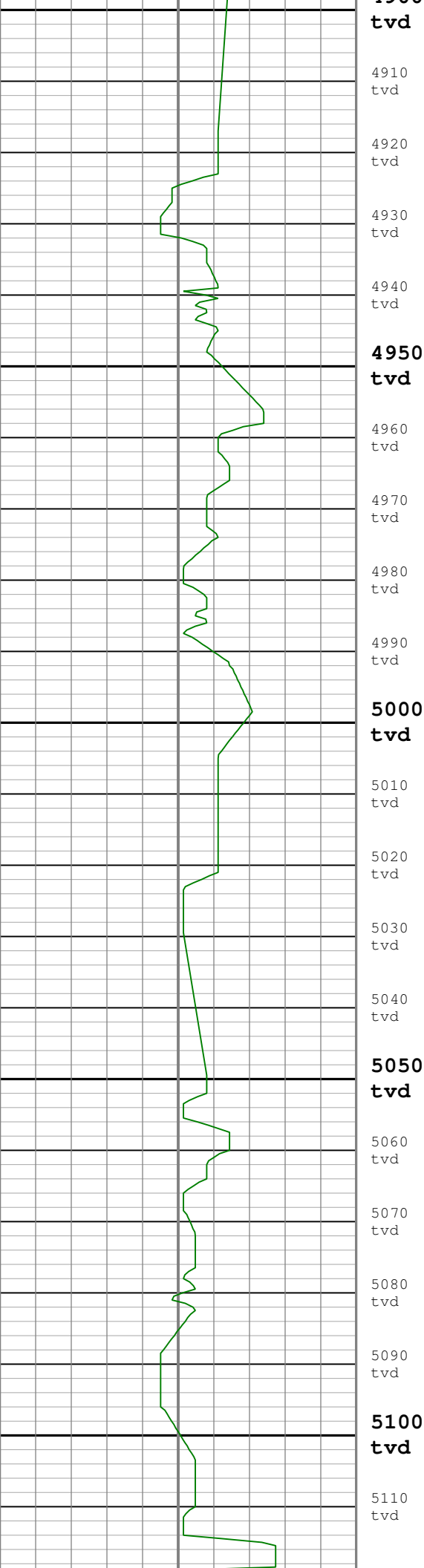












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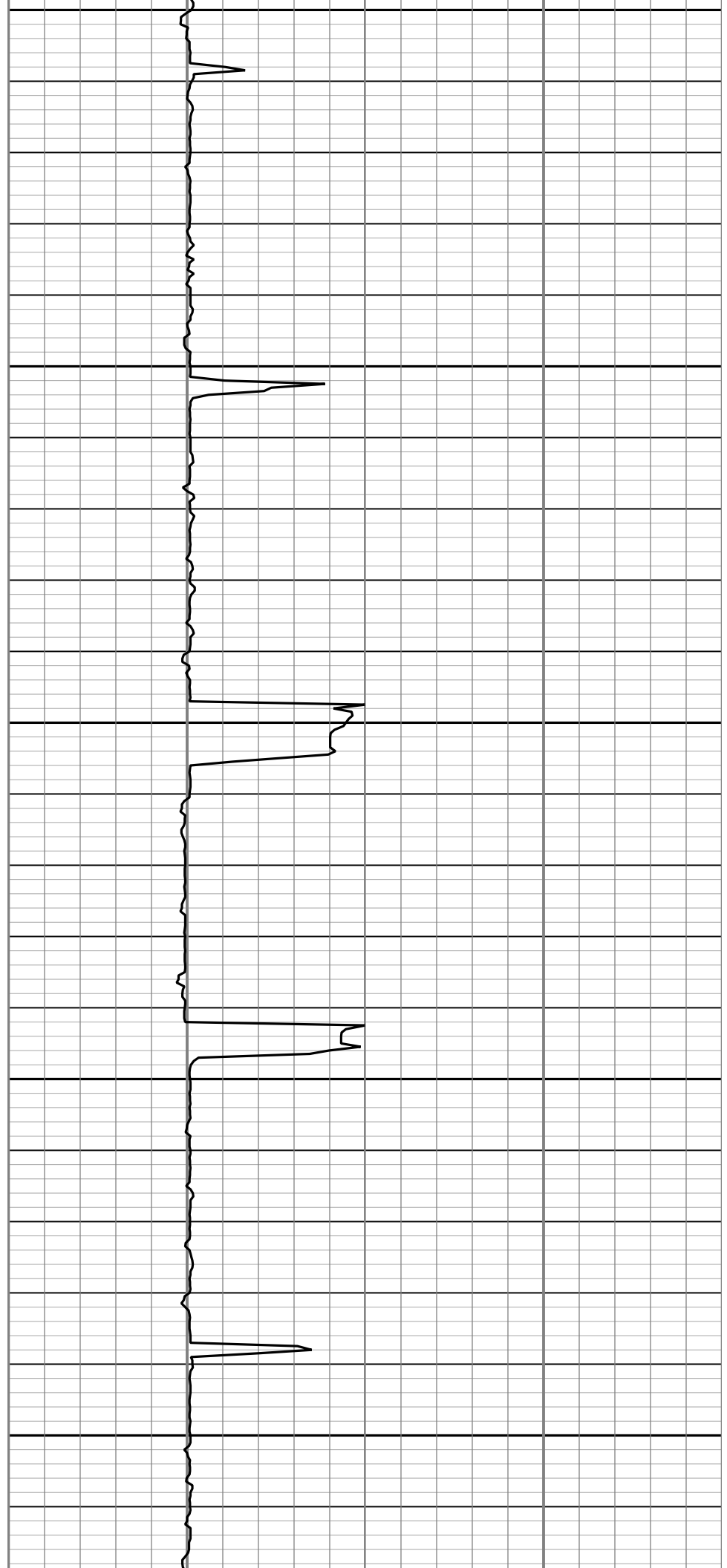
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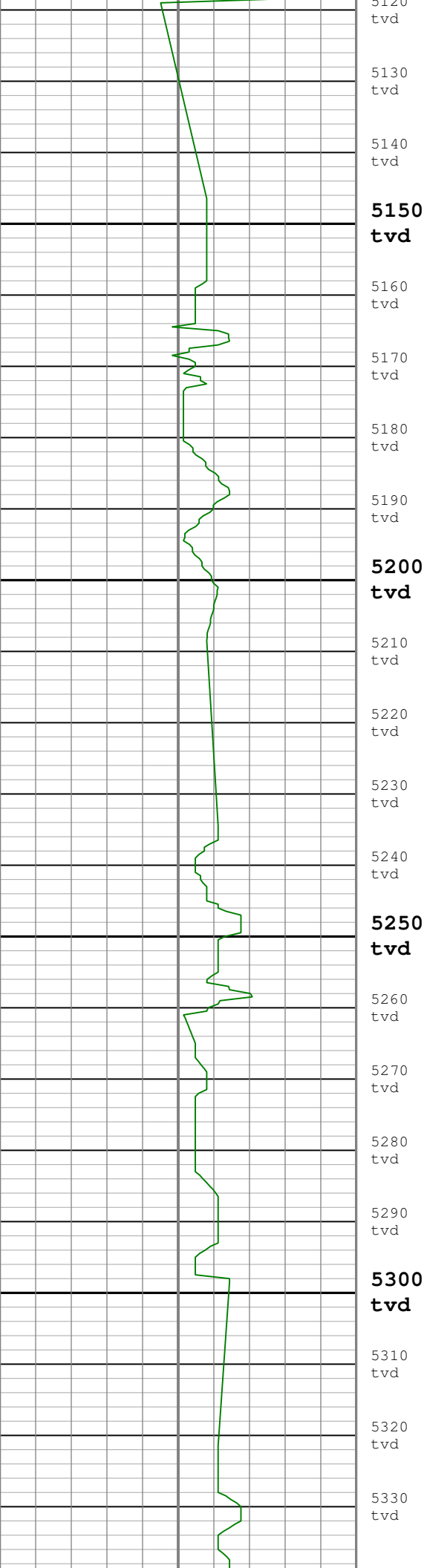
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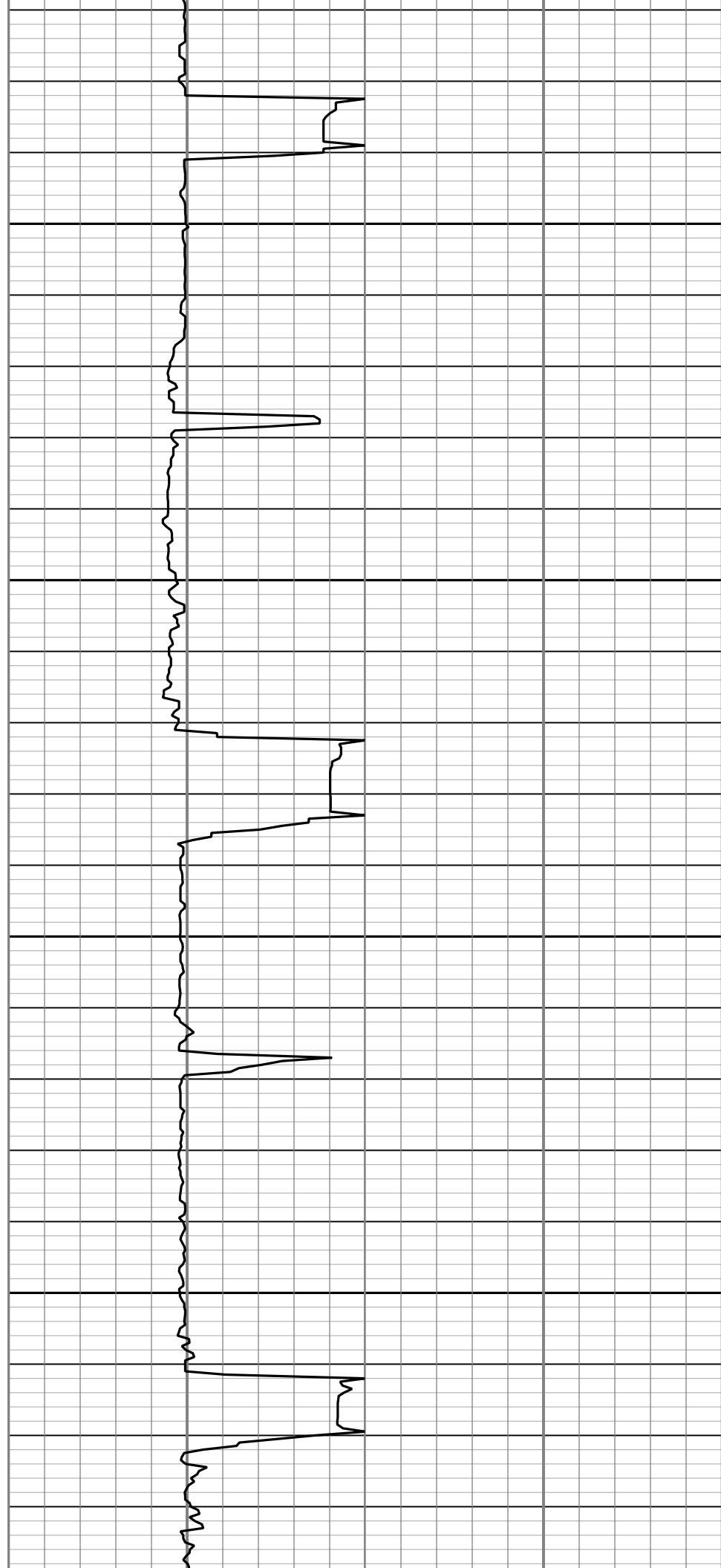
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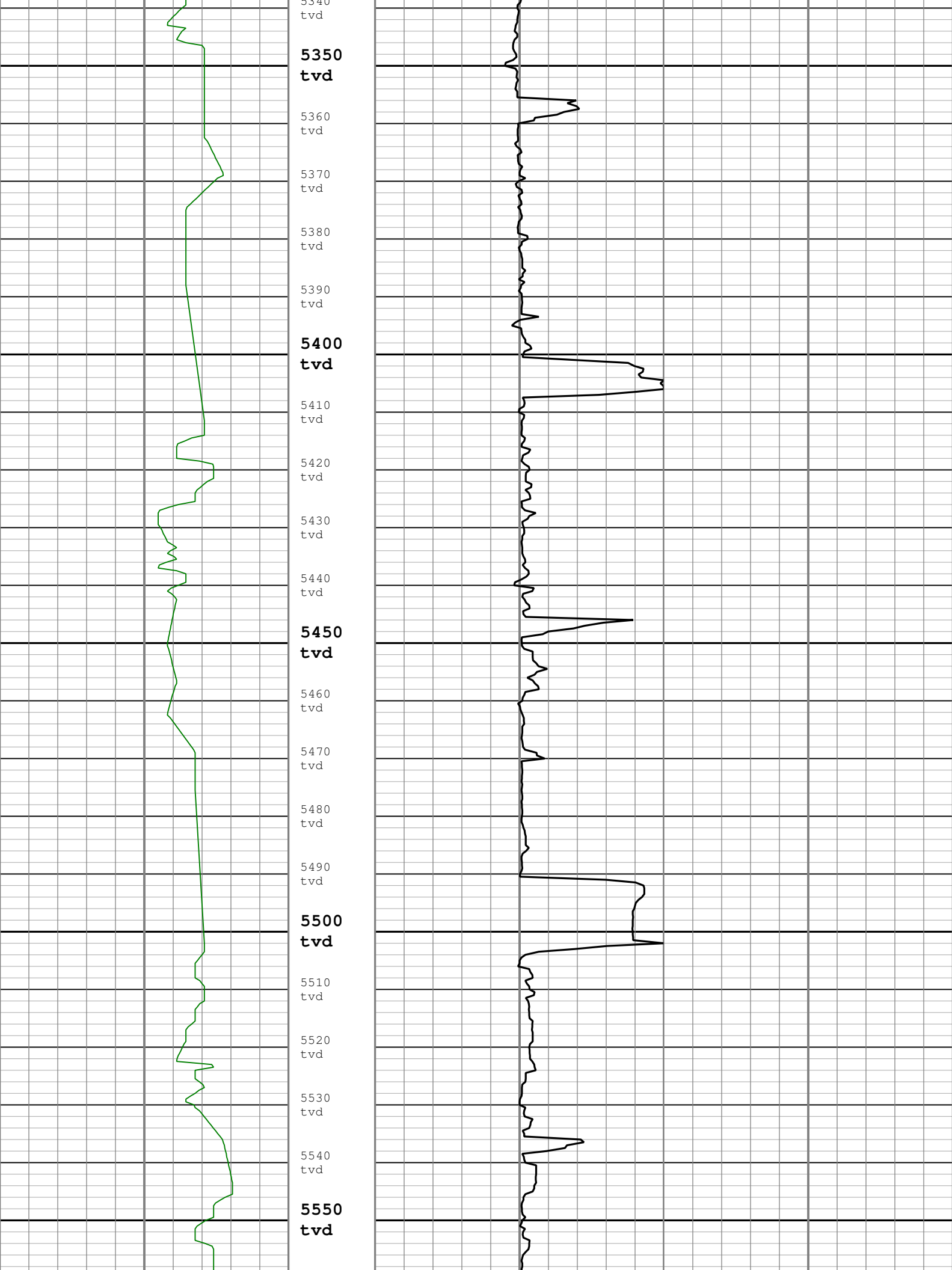
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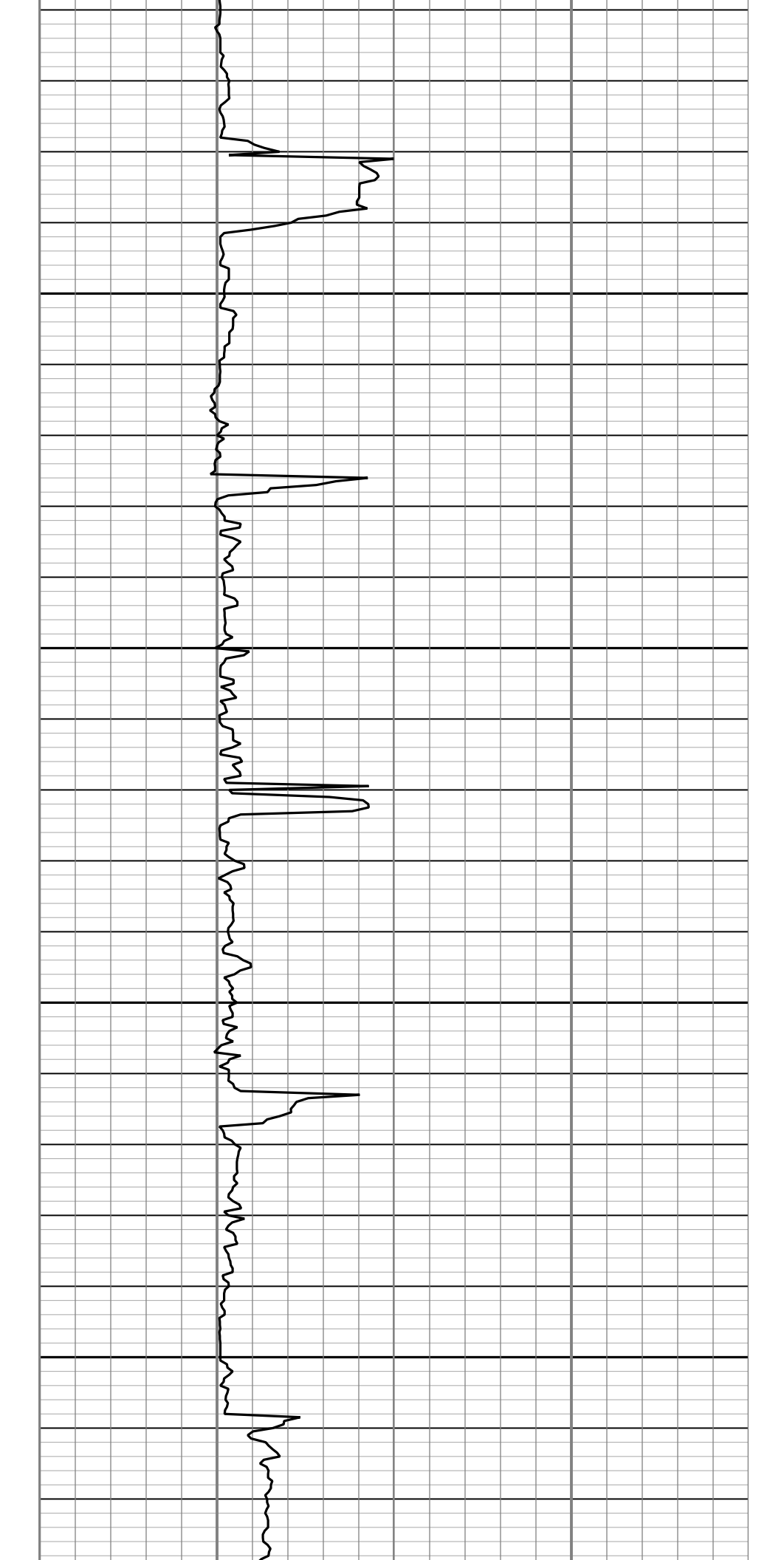
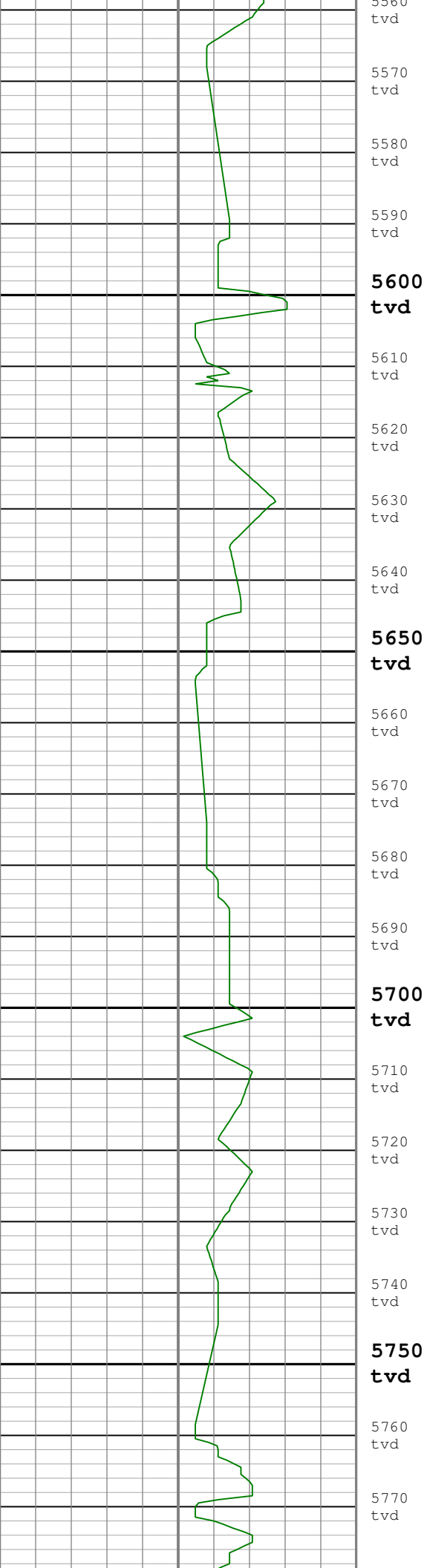
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tvd

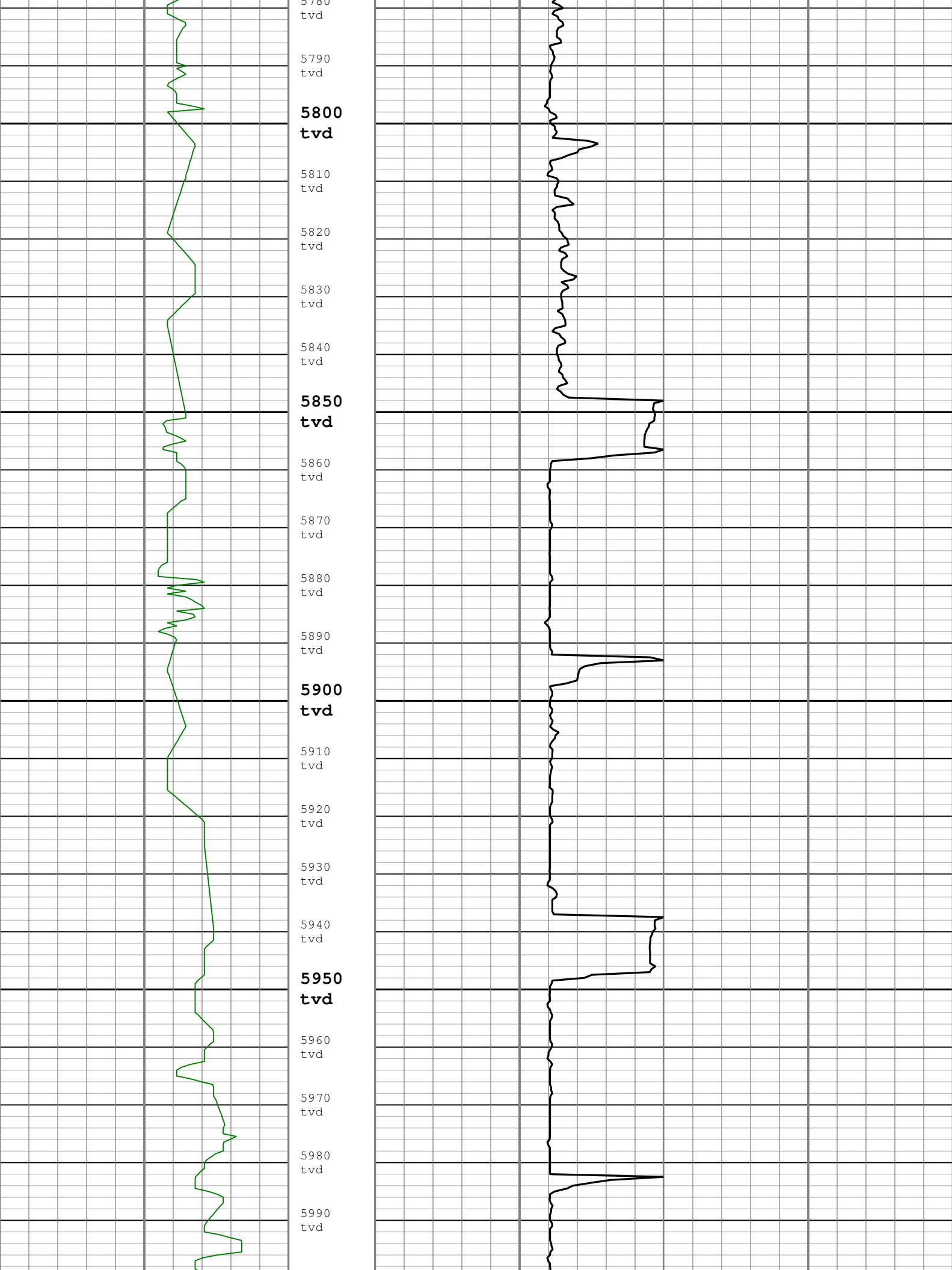
5320
tvd

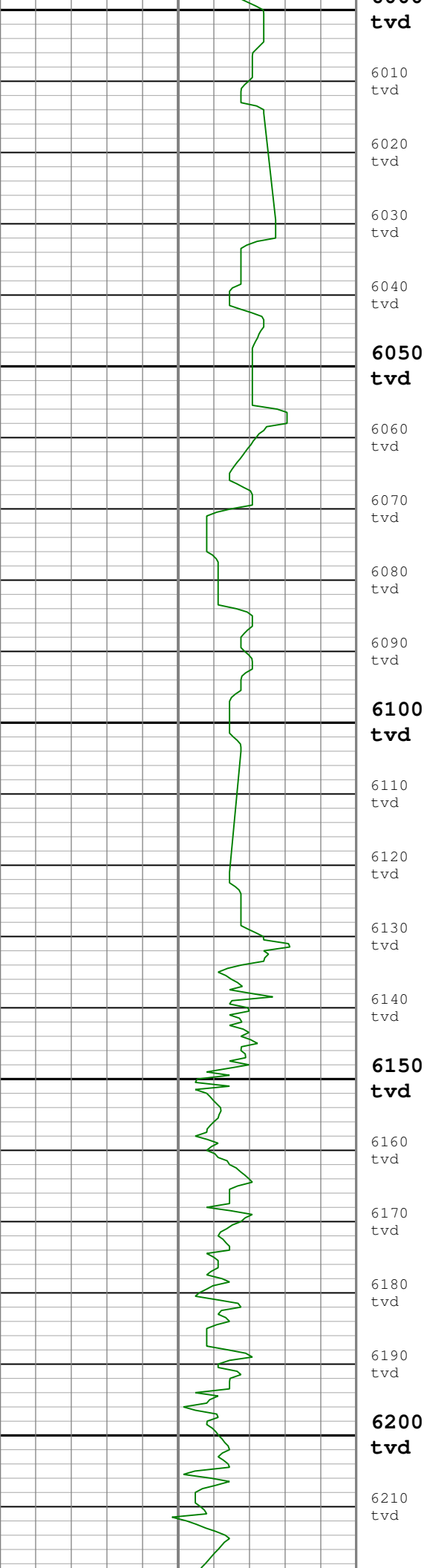
5330
tvd



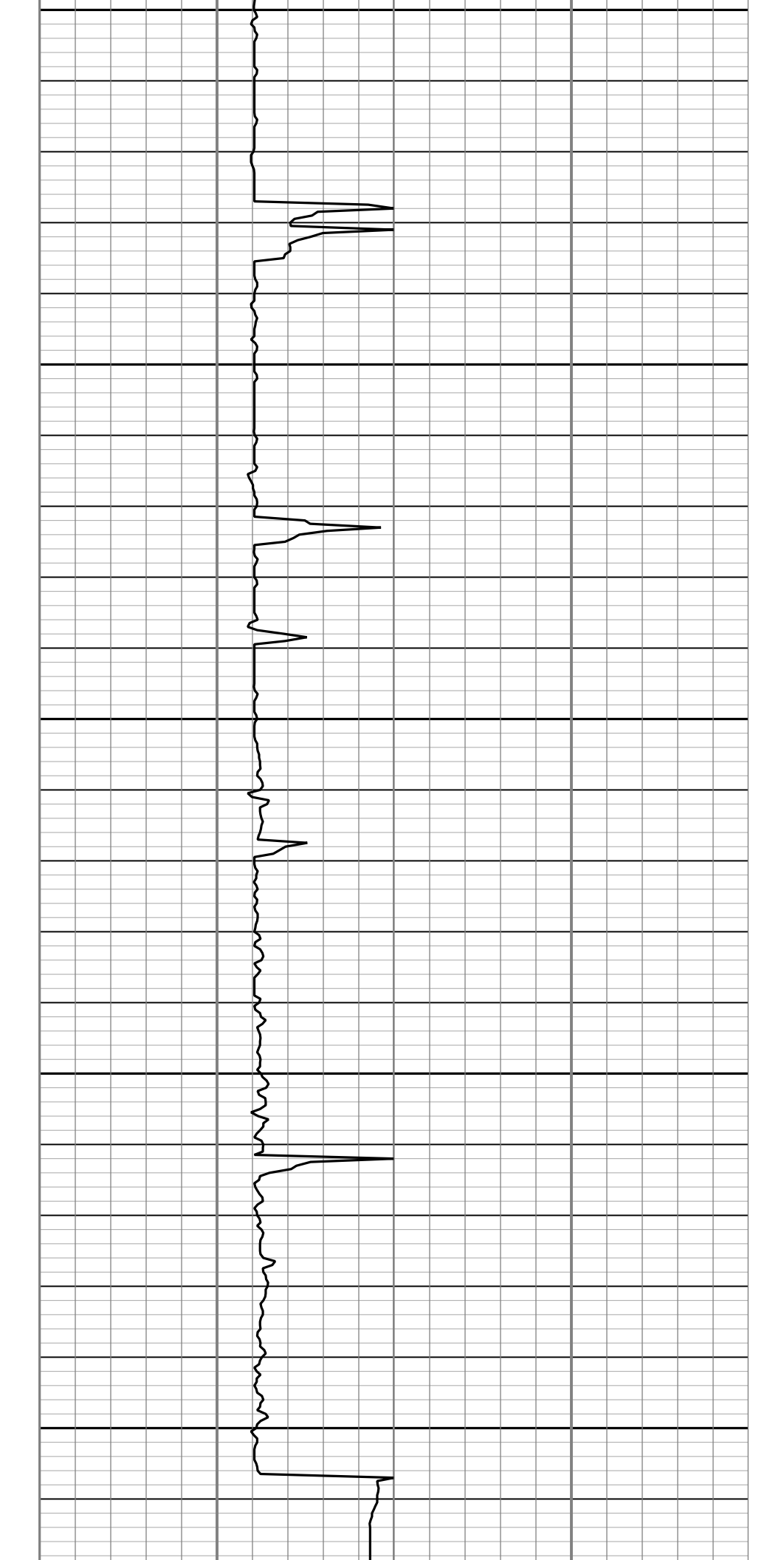


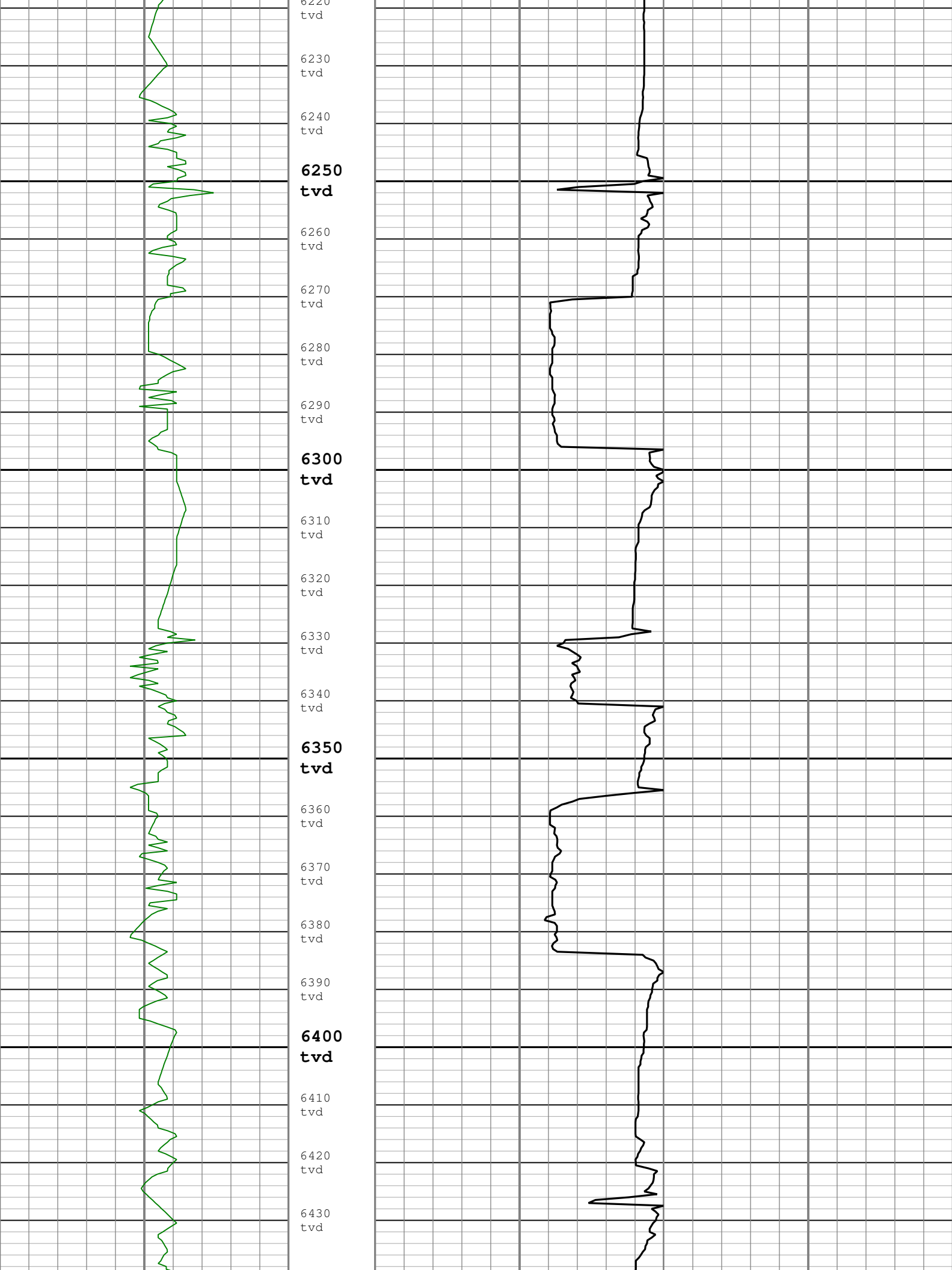


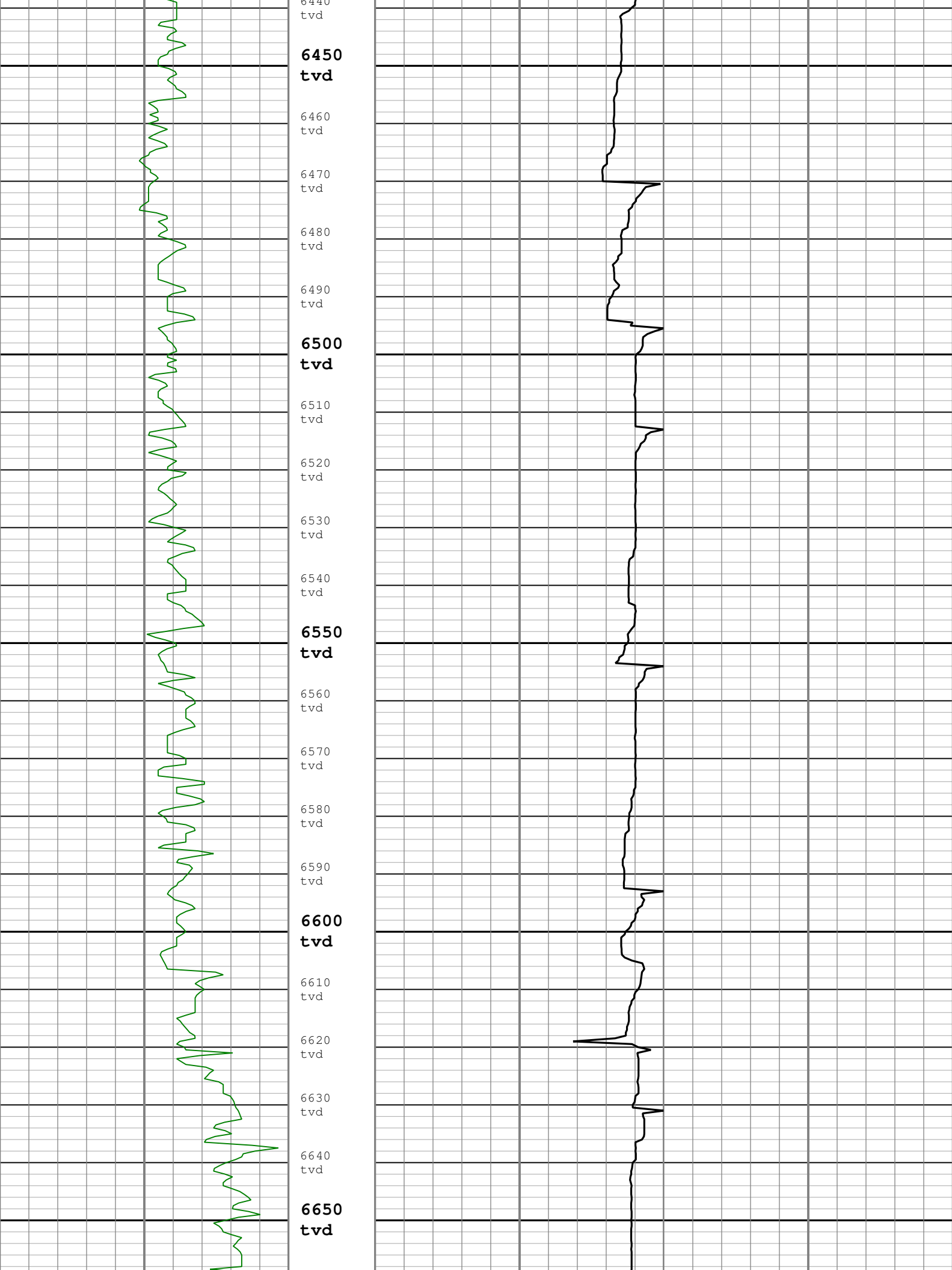


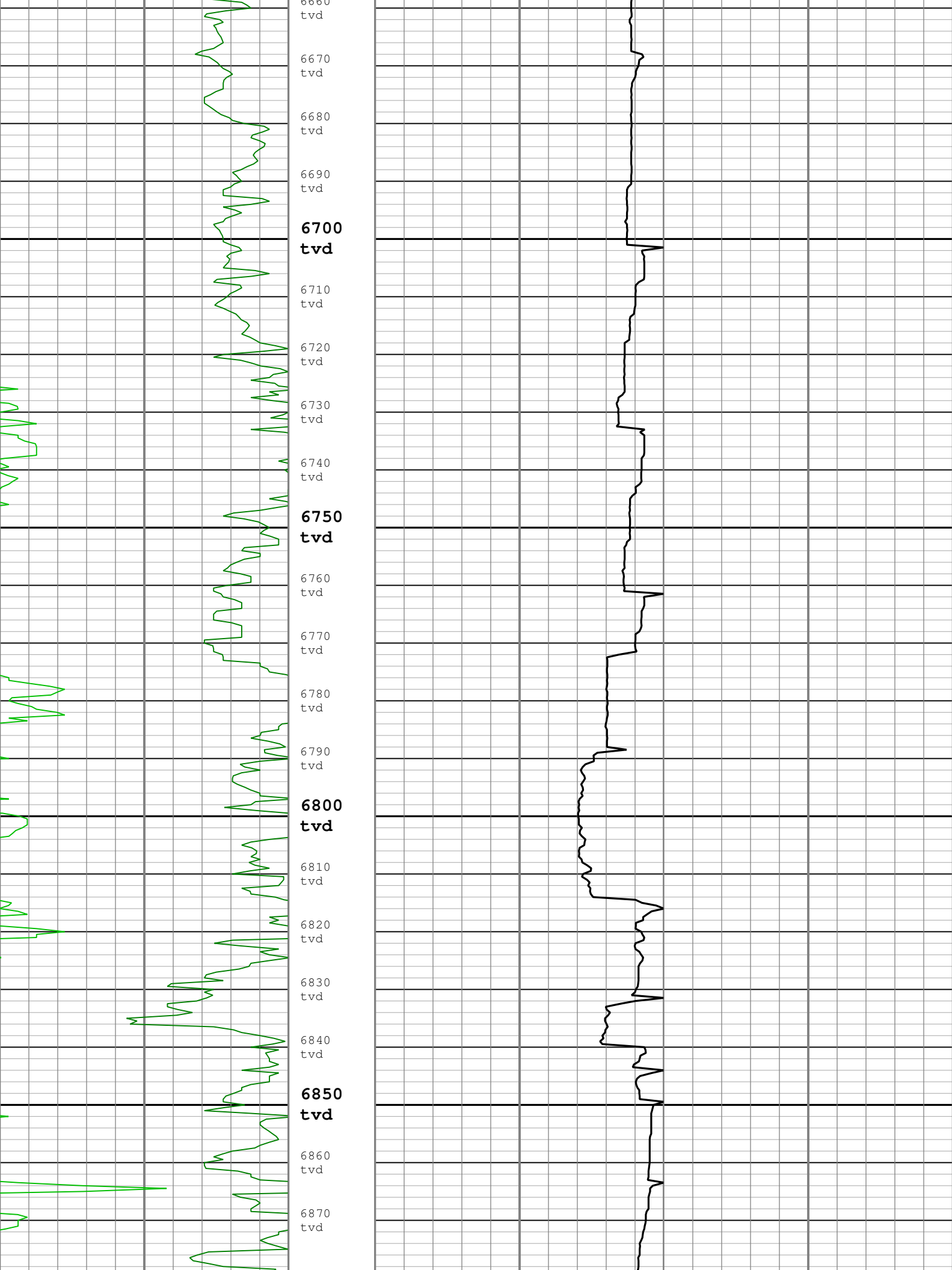


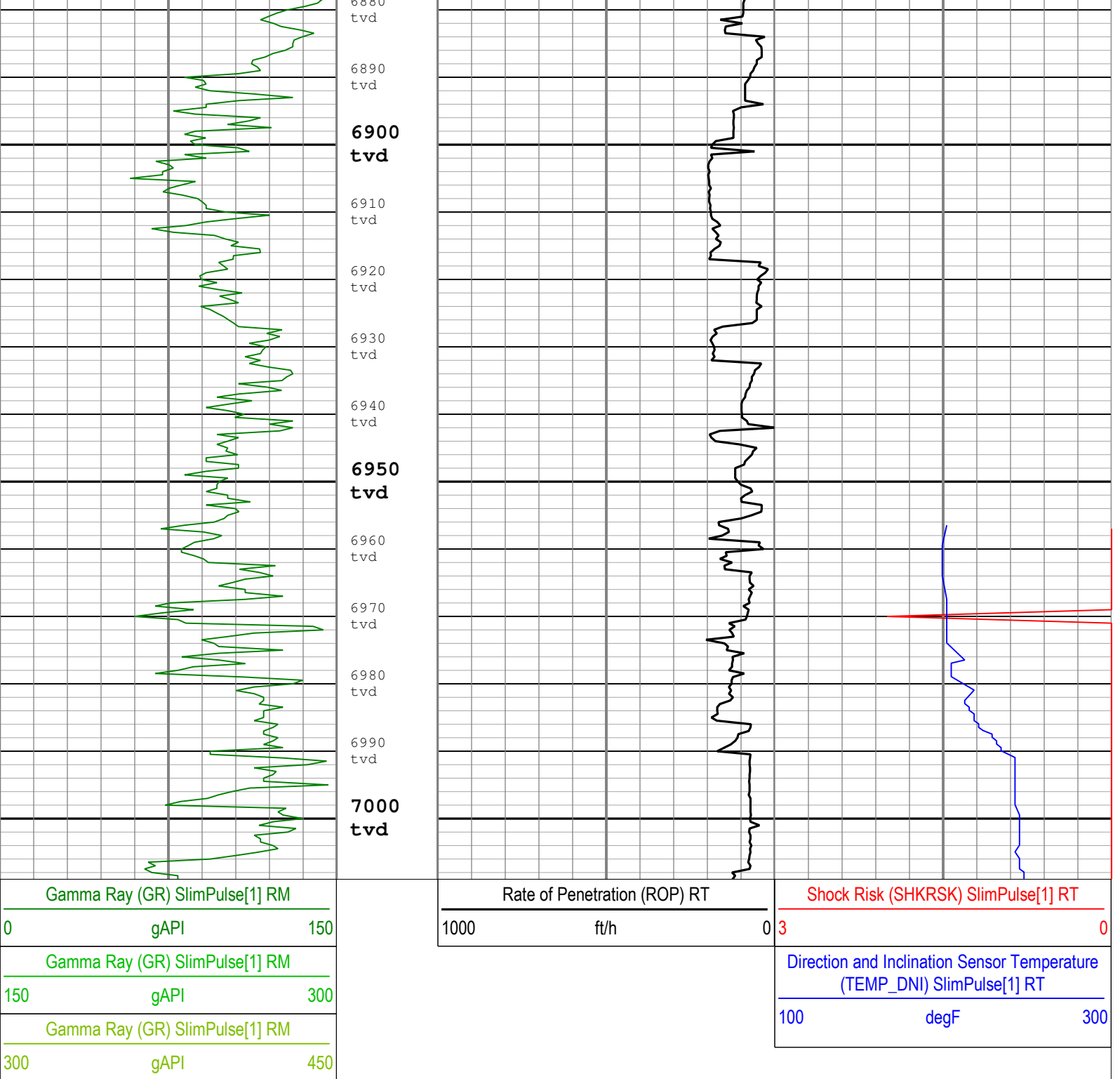
6000
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tvd











Description: SlimPulse Gamma Ray 1 Format: Log (SlimPulse Gamma Ray Final TVD) Index Scale: 5 in per 100 ft Index Unit: ft Index Type: TVD
 Creation Date: 03-Oct-2014 12:35:15

Channel Processing Parameters

Lateral1: Parameters

Parameter	Description	Tool	Value	Unit
BS	Bit Size	DNMSESSION	Depth Zoned	in
DFD	Drilling Fluid Density	Borehole	10.1	lbm/gal
GR_SRC	GR Source Selection	SPULSE-GEN	GAMMA_EXT	

Lateral1Depth Zoned Parameters

Parameter	Value	Start (ft)	Stop (ft)
BS	8.75	6927.77	6962.92
BS	6.125	6962.92	7009.22

All depth are actual

Tool Control Parameters

Survey Record

Survey Calculation			
Method :	Minimum Radius of Curvature	DLS Method :	Lubinski
North Reference :	Grid North	Total Correction Formula :	Magnetic Dec - Grid Convergence
Grid Convergence :	0.58 deg		

Rig Location			
Latitude :	40° 16' 36.228" N	Longitude :	104° 36' 17.964" W

Tie In Point					
Measured Depth:	0.00 ft	Inclination:	0.00 deg	Azimuth:	0.00 deg
True Vertical Depth:	0.00 ft	North Displacement:	0.00 ft	East Displacement:	0.00 ft
N/-S VSec Origin:	0.00 ft	E/-W VSec Origin:	0.00 ft	Vertical Section Azimuth:	358.35 deg

D&I Inits Computed and Values Used - Lateral1			
Geomagnetic Model :	BGGM 2014	Geomagnetic Date :	25-Sep-2014
Computed Location B :	52631.80 nT +/- 300.00nT	Used Location B :	52631.80 nT +/- 300.00nT
Computed Location G :	999.53 mgn +/- 2.50mgn	Used Location G :	999.53 mgn +/- 2.50mgn
Computed Magnetic Dip :	66.86 deg +/- 0.45deg	Used Magnetic Dip :	66.86 deg +/- 0.45deg
Computed Magnetic Dec :	8.42 deg	Used Magnetic Dec :	8.42 deg
Computed Total Correction :	7.84 deg	Used Total Correction :	7.84 deg

Survey Quality Index	
9 : Manual	28 : Tie-In Point

Survey Correction Index	
0 : No correction	

Survey Description Index	
0 : Not Flagged Survey	7 : Projection to Bit

Seq	MD (ft)	Incl (deg)	Azim (deg)	Course (ft)	TVD (ft)	V Sec (ft)	N/ -S (ft)	E/ -W (ft)	Closure (ft)	at Azim (deg)	DLS deg/100ft	Tool Type	QI	CI	DI
1	0.00	0.00	0.00	----	0.00	0.00	0.00	0.00	0.00	90.00	0.00	TIP	28	0	0
2	351.00	0.60	205.80	351.00	350.99	-1.63	-1.65	-0.80	1.84	205.80	0.17	Other	9	0	0
3	691.00	0.70	189.20	340.00	690.97	-5.25	-5.31	-1.91	5.64	199.76	0.06	Other	9	0	0
4	788.00	0.80	198.30	97.00	787.96	-6.47	-6.54	-2.21	6.89	198.72	0.16	Other	9	0	0
5	877.00	1.10	154.30	89.00	876.95	-7.83	-7.90	-2.04	8.17	194.48	0.86	Other	9	0	0
6	967.00	0.70	87.50	90.00	966.94	-8.61	-8.65	-1.11	8.73	187.34	1.16	Other	9	0	0
7	1056.00	0.70	63.00	89.00	1055.94	-8.37	-8.38	-0.09	8.37	180.60	0.33	Other	9	0	0
8	1164.00	1.00	57.60	108.00	1163.92	-7.61	-7.57	1.30	7.68	170.29	0.29	Other	9	0	0
9	1259.00	1.00	48.00	95.00	1258.91	-6.65	-6.58	2.61	7.09	158.33	0.18	Other	9	0	0
10	1358.00	1.00	36.70	99.00	1357.90	-5.41	-5.30	3.77	6.50	144.60	0.20	Other	9	0	0
11	1450.00	1.10	13.20	92.00	1449.88	-3.93	-3.80	4.45	5.84	130.49	0.48	Other	9	0	0
12	1545.00	1.30	22.40	95.00	1544.86	-2.06	-1.92	5.07	5.41	110.71	0.29	Other	9	0	0
13	1637.00	1.10	45.10	92.00	1636.84	-0.50	-0.33	6.09	6.10	93.09	0.56	Other	9	0	0
14	1731.00	1.30	298.20	94.00	1730.83	0.64	0.81	5.79	5.84	82.02	2.05	Other	9	0	0
15	1823.00	1.50	296.00	92.00	1822.80	1.72	1.83	3.79	4.20	64.20	0.23	Other	9	0	0
16	1917.00	1.70	308.60	94.00	1916.76	3.19	3.24	1.60	3.61	26.21	0.43	Other	9	0	0
17	2009.00	1.60	296.00	92.00	2008.73	4.67	4.66	-0.62	4.69	352.36	0.41	Other	9	0	0
18	2103.00	1.20	283.60	94.00	2102.70	5.54	5.46	-2.76	6.14	333.19	0.53	Other	9	0	0
19	2196.00	0.50	233.60	93.00	2195.69	5.57	5.45	-4.03	6.79	323.50	1.03	Other	9	0	0
20	2289.00	0.20	267.70	93.00	2288.69	5.33	5.20	-4.52	6.89	319.00	0.38	Other	9	0	0
21	2380.00	0.40	327.20	91.00	2379.69	5.60	5.46	-4.85	7.32	318.39	0.38	Other	9	0	0
22	2474.00	1.90	305.30	94.00	2473.66	6.82	6.64	-6.30	9.15	316.49	1.63	Other	9	0	0
23	2580.00	3.00	303.00	106.00	2579.57	9.45	9.17	-10.06	13.62	312.33	1.04	Other	9	0	0
24	2670.00	3.90	301.90	90.00	2669.40	12.48	12.07	-14.64	18.96	309.50	1.00	Other	9	0	0
25	2759.00	5.30	303.20	89.00	2758.11	16.51	15.92	-20.65	26.08	307.63	1.58	Other	9	0	0
26	2849.00	6.20	296.00	90.00	2847.66	21.14	20.32	-28.49	35.01	305.50	1.28	Other	9	0	0
27	2938.00	6.60	289.60	89.00	2936.11	25.22	24.15	-37.63	44.72	302.69	0.92	Other	9	0	0
28	3028.00	7.20	289.80	89.00	3025.46	28.21	26.94	-48.04	55.00	299.28	1.25	Other	9	0	0

28	3028.00	7.20	280.80	90.00	3025.46	28.31	26.94	-48.04	55.09	299.28	1.35	Other	9	0	0
29	3118.00	7.30	283.10	90.00	3114.74	30.98	29.29	-59.15	66.01	296.34	0.34	Other	9	0	0
30	3207.00	8.90	287.20	89.00	3202.85	34.65	32.61	-71.24	78.35	294.60	1.91	Other	9	0	0
31	3297.00	8.50	282.80	90.00	3291.81	38.56	36.14	-84.38	91.80	293.19	0.86	Other	9	0	0
32	3386.00	6.60	277.00	89.00	3380.04	40.97	38.22	-95.87	103.22	291.74	2.30	Other	9	0	0
33	3476.00	5.80	284.40	90.00	3469.51	43.01	39.98	-105.41	112.73	290.77	1.25	Other	9	0	0
34	3566.00	7.10	289.00	90.00	3558.94	46.23	42.93	-115.07	122.80	290.46	1.55	Other	9	0	0
35	3656.00	7.80	291.20	90.00	3648.18	50.56	46.95	-126.02	134.48	290.43	0.84	Other	9	0	0
36	3745.00	7.00	284.80	89.00	3736.44	54.44	50.51	-136.90	145.93	290.25	1.29	Other	9	0	0
37	3835.00	6.40	280.00	90.00	3825.83	57.01	52.79	-147.14	156.33	289.74	0.91	Other	9	0	0
38	3924.00	6.20	279.30	89.00	3914.29	58.92	54.42	-156.77	165.94	289.15	0.24	Other	9	0	0
39	4014.00	6.00	290.40	90.00	4003.78	61.61	56.85	-165.97	175.43	288.91	1.33	Other	9	0	0
40	4104.00	7.00	290.00	90.00	4093.20	65.40	60.37	-175.54	185.63	288.98	1.11	Other	9	0	0
41	4194.00	7.40	291.20	90.00	4182.49	69.67	64.34	-186.09	196.92	289.07	0.47	Other	9	0	0
42	4283.00	7.00	289.20	89.00	4270.79	73.83	68.19	-196.56	208.04	289.13	0.53	Other	9	0	0
43	4373.00	6.30	287.80	90.00	4360.19	77.43	71.51	-206.44	218.47	289.11	0.80	Other	9	0	0
44	4463.00	6.10	282.60	90.00	4449.66	80.25	74.06	-215.81	228.15	288.94	0.66	Other	9	0	0
45	4552.00	5.80	282.50	89.00	4538.18	82.51	76.06	-224.81	237.34	288.69	0.34	Other	9	0	0
46	4642.00	5.70	281.40	90.00	4627.73	84.63	77.93	-233.63	246.29	288.45	0.17	Other	9	0	0
47	4732.00	5.30	275.40	90.00	4717.31	86.15	79.21	-242.15	254.79	288.11	0.78	Other	9	0	0
48	4821.00	4.60	265.30	89.00	4805.98	86.47	79.30	-249.80	262.07	287.61	1.25	Other	9	0	0
49	4911.00	4.60	259.50	90.00	4895.69	85.72	78.35	-256.95	268.64	286.96	0.52	Other	9	0	0
50	5001.00	4.00	264.00	90.00	4985.44	84.93	77.36	-263.62	274.74	286.35	0.76	Other	9	0	0
51	5090.00	3.00	263.90	89.00	5074.27	84.51	76.79	-269.02	279.76	285.93	1.12	Other	9	0	0
52	5180.00	2.30	284.70	90.00	5164.18	84.84	77.00	-273.11	283.76	285.74	1.31	Other	9	0	0
53	5270.00	1.10	227.60	90.00	5254.14	84.78	76.87	-275.49	286.02	285.59	2.15	Other	9	0	0
54	5359.00	1.50	162.40	89.00	5343.12	83.11	75.19	-275.77	285.83	285.25	1.62	Other	9	0	0
55	5449.00	2.10	153.90	90.00	5433.08	80.47	72.58	-274.69	284.12	284.80	0.73	Other	9	0	0
56	5538.00	1.50	106.10	89.00	5522.04	78.63	70.80	-272.85	281.89	284.55	1.75	Other	9	0	0
57	5628.00	1.80	118.70	90.00	5612.00	77.56	69.79	-270.48	279.33	284.47	0.52	Other	9	0	0
58	5718.00	1.10	136.60	90.00	5701.97	76.20	68.48	-268.65	277.23	284.30	0.92	Other	9	0	0
59	5807.00	0.50	140.60	89.00	5790.96	75.26	67.56	-267.82	276.21	284.16	0.68	Other	9	0	0
60	5897.00	0.90	172.30	90.00	5880.96	74.24	66.56	-267.47	275.62	283.97	0.60	Other	9	0	0
61	5987.00	1.50	121.90	90.00	5970.94	72.89	65.24	-266.38	274.25	283.76	1.29	Other	9	0	0
62	6076.00	0.90	125.00	89.00	6059.92	71.83	64.22	-264.82	272.51	283.63	0.68	Other	9	0	0
63	6166.00	0.30	57.00	90.00	6149.91	71.53	63.94	-264.04	271.69	283.61	0.93	Other	9	0	0
64	6211.00	0.50	19.90	45.00	6194.91	71.77	64.19	-263.87	271.56	283.67	0.71	Other	9	0	0
65	6256.00	5.00	23.70	45.00	6239.85	73.73	66.17	-263.02	271.23	284.12	10.00	Other	9	0	0
66	6301.00	7.90	19.80	45.00	6284.56	78.38	70.88	-261.18	270.64	285.18	6.51	Other	9	0	0
67	6346.00	10.00	24.20	45.00	6329.01	84.77	77.35	-258.53	269.85	286.66	4.90	Other	9	0	0
68	6390.00	11.50	21.10	44.00	6372.24	92.26	84.93	-255.39	269.13	288.39	3.65	Other	9	0	0
69	6435.00	14.80	15.00	45.00	6416.05	101.90	94.67	-252.28	269.46	290.57	7.95	Other	9	0	0
70	6480.00	18.20	17.00	45.00	6459.20	114.07	106.95	-248.74	270.77	293.27	7.66	Other	9	0	0
71	6525.00	20.40	19.80	45.00	6501.66	128.03	121.05	-244.03	272.41	296.38	5.30	Other	9	0	0
72	6570.00	24.40	19.40	45.00	6543.26	144.01	137.20	-238.28	274.97	299.93	8.90	Other	9	0	0
73	6615.00	29.10	20.90	45.00	6583.43	162.80	156.20	-231.29	279.10	304.03	10.55	Other	9	0	0
74	6659.00	33.00	20.40	44.00	6621.12	183.80	177.43	-223.29	285.20	308.47	8.88	Other	9	0	0
75	6704.00	37.10	14.20	45.00	6657.97	208.23	202.10	-215.68	295.57	313.14	12.06	Other	9	0	0
76	6749.00	41.70	9.20	45.00	6692.74	236.01	230.05	-209.96	311.45	317.61	12.41	Other	9	0	0
77	6794.00	47.10	5.40	45.00	6724.88	267.09	261.26	-206.01	332.71	321.74	13.37	Other	9	0	0
78	6839.00	52.00	359.80	45.00	6754.08	301.21	295.44	-204.52	359.32	325.31	14.42	Other	9	0	0
79	6883.00	54.30	356.80	44.00	6780.47	336.41	330.62	-205.58	389.34	328.13	7.56	Other	9	0	0
80	6928.00	53.80	356.80	45.00	6806.89	372.83	367.00	-207.61	421.65	330.50	1.11	Other	9	0	0
81	6973.00	55.40	356.50	45.00	6832.96	409.49	403.61	-209.75	454.86	332.54	3.60	Other	9	0	0

	7017.00	58.30	357.10	44.00	6857.02	446.31	440.39	-211.81	488.68	334.31	6.69	Other	9	0	0
83	7062.00	64.60	359.00	45.00	6878.51	485.82	479.87	-213.13	525.07	336.05	14.48	Other	9	0	0
84	7107.00	68.10	0.20	45.00	6896.56	527.02	521.09	-213.41	563.09	337.73	8.15	Other	9	0	0
85	7152.00	68.70	0.60	45.00	6913.13	568.83	562.92	-213.12	601.90	339.26	1.57	Other	9	0	0
86	7197.00	70.70	359.70	45.00	6928.74	611.02	605.13	-213.01	641.54	340.61	4.82	Other	9	0	0
87	7242.00	75.10	358.30	45.00	6941.97	654.01	648.12	-213.77	682.45	341.75	10.22	Other	9	0	0
88	7286.00	80.40	357.90	44.00	6951.30	696.99	691.08	-215.20	723.82	342.70	12.08	Other	9	0	0
89	7327.00	83.30	358.00	41.00	6957.11	737.57	731.63	-216.65	763.02	343.51	7.08	Other	9	0	0
90	7430.00	85.74	357.99	103.00	6966.95	840.09	834.09	-220.24	862.66	345.21	2.37	SlimPulse	9	0	0
91	7520.00	86.15	356.72	90.00	6973.31	929.85	923.77	-224.38	950.62	346.35	1.48	SlimPulse	9	0	0
92	7609.00	87.28	354.73	89.00	6978.41	1018.61	1012.37	-231.00	1038.39	347.15	2.57	SlimPulse	9	0	0
93	7699.00	88.21	352.66	90.00	6981.96	1108.24	1101.75	-240.88	1127.79	347.67	2.52	SlimPulse	9	0	0
94	7789.00	91.10	354.01	90.00	6982.50	1197.88	1191.13	-251.32	1217.36	348.09	3.54	SlimPulse	9	0	0
95	7878.00	91.03	355.00	89.00	6980.84	1286.66	1279.70	-259.84	1305.81	348.52	1.11	SlimPulse	9	0	0
96	7968.00	90.10	357.66	90.00	6979.96	1376.59	1369.50	-265.60	1395.01	349.02	3.13	SlimPulse	9	0	0
97	8058.00	89.73	1.65	90.00	6980.09	1466.55	1459.48	-266.14	1483.56	349.67	4.45	SlimPulse	9	0	0
98	8147.00	90.21	5.18	89.00	6980.14	1555.19	1548.31	-260.84	1570.14	350.44	4.00	SlimPulse	9	0	0
99	8237.00	89.86	7.15	90.00	6980.08	1644.35	1637.79	-251.18	1656.92	351.28	2.22	SlimPulse	9	0	0
100	8327.00	89.21	6.63	90.00	6980.81	1733.35	1727.13	-240.38	1743.77	352.08	0.92	SlimPulse	9	0	0
101	8416.00	88.83	5.62	89.00	6982.33	1821.51	1815.61	-230.89	1830.25	352.75	1.21	SlimPulse	9	0	0
102	8506.00	89.35	4.19	90.00	6983.76	1910.91	1905.27	-223.19	1918.31	353.32	1.69	SlimPulse	9	0	0
103	8596.00	89.28	3.67	90.00	6984.84	2000.48	1995.05	-217.03	2006.82	353.79	0.58	SlimPulse	9	0	0
104	8685.00	89.52	2.93	89.00	6985.77	2089.14	2083.90	-211.90	2094.65	354.19	0.87	SlimPulse	9	0	0
105	8775.00	90.41	4.14	90.00	6985.83	2178.77	2173.72	-206.35	2183.50	354.58	1.67	SlimPulse	9	0	0
106	8865.00	90.07	4.91	90.00	6985.45	2268.24	2263.44	-199.25	2272.18	354.97	0.94	SlimPulse	9	0	0
107	8954.00	89.97	3.56	89.00	6985.42	2356.77	2352.20	-192.68	2360.07	355.32	1.52	SlimPulse	9	0	0
108	9044.00	89.76	1.47	90.00	6985.63	2446.53	2442.10	-188.73	2449.38	355.58	2.33	SlimPulse	9	0	0
109	9134.00	89.76	359.35	90.00	6986.01	2536.46	2532.09	-188.09	2539.07	355.75	2.36	SlimPulse	9	0	0
110	9223.00	89.69	357.46	89.00	6986.43	2625.46	2621.06	-190.57	2627.99	355.84	2.13	SlimPulse	9	0	0
111	9313.00	89.66	355.25	90.00	6986.94	2715.40	2710.87	-196.29	2717.98	355.86	2.46	SlimPulse	9	0	0
112	9403.00	89.66	356.38	90.00	6987.48	2805.31	2800.62	-202.85	2807.97	355.86	1.26	SlimPulse	9	0	0
113	9493.00	89.86	358.04	90.00	6987.86	2895.29	2890.51	-207.24	2897.93	355.90	1.86	SlimPulse	9	0	0
114	9582.00	89.90	359.58	89.00	6988.04	2984.28	2979.49	-209.08	2986.81	355.99	1.73	SlimPulse	9	0	0
115	9672.00	89.90	359.77	90.00	6988.20	3074.26	3069.49	-209.59	3076.64	356.09	0.21	SlimPulse	9	0	0
116	9761.00	89.38	359.50	89.00	6988.76	3163.23	3158.49	-210.16	3165.49	356.19	0.66	SlimPulse	9	0	0
117	9851.00	89.59	359.53	90.00	6989.57	3253.21	3248.48	-210.92	3255.31	356.29	0.24	SlimPulse	9	0	0
118	9941.00	89.86	359.57	90.00	6990.00	3343.19	3338.47	-211.63	3345.18	356.37	0.30	SlimPulse	9	0	0
119	10030.00	90.65	359.23	89.00	6989.60	3432.17	3427.47	-212.56	3434.06	356.45	0.97	SlimPulse	9	0	0
120	10120.00	90.96	358.27	90.00	6988.34	3522.16	3517.44	-214.52	3523.98	356.51	1.12	SlimPulse	9	0	0
121	10210.00	90.93	357.14	90.00	6986.85	3612.14	3607.35	-218.13	3613.94	356.54	1.26	SlimPulse	9	0	0
122	10299.00	88.56	354.09	89.00	6987.25	3701.02	3696.07	-224.93	3702.92	356.52	4.34	SlimPulse	9	0	0
123	10389.00	89.59	352.50	90.00	6988.70	3790.65	3785.44	-235.44	3792.75	356.44	2.10	SlimPulse	9	0	0
124	10479.00	89.97	351.19	90.00	6989.05	3880.07	3874.53	-248.20	3882.48	356.33	1.52	SlimPulse	9	0	0
125	10568.00	90.07	350.22	89.00	6989.02	3968.28	3962.36	-262.58	3971.06	356.21	1.10	SlimPulse	9	0	0
126	10658.00	90.31	351.07	90.00	6988.72	4057.47	4051.16	-277.21	4060.63	356.09	0.98	SlimPulse	9	0	0
127	10748.00	90.03	352.30	90.00	6988.45	4146.86	4140.21	-290.22	4150.36	355.99	1.40	SlimPulse	9	0	0
128	10838.00	90.89	353.96	90.00	6987.73	4236.48	4229.56	-300.99	4240.26	355.93	2.08	SlimPulse	9	0	0
129	10927.00	89.45	355.05	89.00	6987.47	4325.27	4318.15	-309.51	4329.23	355.90	2.03	SlimPulse	9	0	0
130	11019.00	87.97	356.08	92.00	6989.54	4417.14	4409.84	-316.62	4421.19	355.89	1.96	SlimPulse	9	0	0
131	11113.00	86.43	358.56	94.00	6994.13	4511.00	4503.62	-321.01	4515.06	355.92	3.10	SlimPulse	9	0	0
132	11206.00	87.46	0.80	93.00	6999.09	4603.84	4596.48	-321.53	4607.71	356.00	2.65	SlimPulse	9	0	0
133	11298.00	88.08	2.31	92.00	7002.67	4695.62	4688.37	-319.04	4699.21	356.11	1.77	SlimPulse	9	0	0
134	11391.00	87.87	3.97	93.00	7005.95	4788.23	4781.17	-313.95	4791.47	356.24	1.80	SlimPulse	9	0	0
135	11485.00	88.90	4.27	94.00	7008.60	4881.72	4874.89	-307.20	4884.55	356.39	1.14	SlimPulse	9	0	0

136	11577.00	90.48	3.20	92.00	7009.10	4973.31	4966.69	-301.20	4975.82	356.53	2.07	SlimPulse	9	0	0
137	11670.00	90.82	2.00	93.00	7008.05	5066.04	5059.58	-296.98	5068.31	356.64	1.34	SlimPulse	9	0	0
138	11762.00	90.27	2.27	92.00	7007.17	5157.84	5151.51	-293.56	5159.88	356.74	0.67	SlimPulse	9	0	0
139	11855.00	90.41	1.91	93.00	7006.62	5250.64	5244.45	-290.17	5252.46	356.83	0.42	SlimPulse	9	0	0
140	11949.00	91.44	2.89	94.00	7005.10	5344.39	5338.35	-286.23	5346.03	356.93	1.51	SlimPulse	9	0	0
141	12042.00	90.76	2.06	93.00	7003.32	5437.13	5431.25	-282.21	5438.58	357.03	1.15	SlimPulse	9	0	0
142	12134.00	91.55	2.14	92.00	7001.46	5528.91	5523.17	-278.84	5530.22	357.11	0.86	SlimPulse	9	0	0
143	12227.00	90.10	2.04	93.00	7000.12	5621.70	5616.09	-275.45	5622.83	357.19	1.56	SlimPulse	9	0	0
144	12321.00	90.27	0.14	94.00	6999.82	5715.59	5710.07	-273.66	5716.63	357.26	2.03	SlimPulse	9	0	0
145	12415.00	89.59	358.97	94.00	6999.93	5809.56	5804.07	-274.39	5810.56	357.29	1.44	SlimPulse	9	0	0
146	12510.00	89.04	359.31	95.00	7001.07	5904.55	5899.05	-275.82	5905.48	357.32	0.68	SlimPulse	9	0	0
147	12604.00	89.52	0.94	94.00	7002.25	5998.49	5993.04	-275.62	5999.38	357.37	1.81	SlimPulse	9	0	0
148	12698.00	89.04	359.64	94.00	7003.43	6092.43	6087.03	-275.14	6093.24	357.41	1.47	SlimPulse	9	0	0
149	12792.00	89.42	359.99	94.00	7004.69	6186.39	6181.02	-275.44	6187.14	357.45	0.55	SlimPulse	9	0	0
150	12882.00	89.45	0.00	90.00	7005.58	6276.35	6271.01	-275.45	6277.07	357.48	0.04	SlimPulse	9	0	0
151	12971.00	89.76	359.70	89.00	7006.20	6365.31	6360.01	-275.68	6365.98	357.52	0.48	SlimPulse	9	0	0
152	13061.00	89.93	359.48	90.00	7006.44	6455.29	6450.01	-276.33	6455.94	357.55	0.31	SlimPulse	9	0	0
153	13150.00	90.10	359.59	89.00	7006.42	6544.27	6539.00	-277.05	6544.88	357.57	0.23	SlimPulse	9	0	0
154	13240.00	89.97	359.20	90.00	7006.36	6634.26	6629.00	-278.00	6634.84	357.60	0.46	SlimPulse	9	0	0
155	13330.00	89.86	359.20	90.00	7006.49	6724.25	6718.99	-279.26	6724.80	357.62	0.12	SlimPulse	9	0	0
156	13419.00	89.97	358.90	89.00	7006.63	6813.24	6807.98	-280.73	6813.78	357.64	0.36	SlimPulse	9	0	0
157	13509.00	89.93	359.13	90.00	7006.70	6903.24	6897.96	-282.28	6903.74	357.66	0.26	SlimPulse	9	0	0
158	13599.00	89.86	359.83	90.00	7006.87	6993.22	6987.96	-283.10	6993.70	357.68	0.78	SlimPulse	9	0	0
159	13688.00	89.86	359.55	89.00	7007.09	7082.19	7076.96	-283.58	7082.64	357.71	0.31	SlimPulse	9	0	0
160	13778.00	91.41	359.78	90.00	7006.09	7172.16	7166.95	-284.10	7172.57	357.73	1.74	SlimPulse	9	0	0
161	13868.00	91.34	0.73	90.00	7003.93	7262.08	7256.92	-283.70	7262.47	357.76	1.06	SlimPulse	9	0	0
162	13957.00	90.17	1.33	89.00	7002.76	7350.98	7345.90	-282.10	7351.31	357.80	1.48	SlimPulse	9	0	0
163	14047.00	89.76	0.18	90.00	7002.81	7440.90	7435.89	-280.92	7441.21	357.84	1.36	SlimPulse	9	0	0
164	14136.00	90.03	359.74	89.00	7002.98	7529.86	7524.89	-280.98	7530.12	357.86	0.58	SlimPulse	9	0	0
165	14226.00	90.17	359.65	90.00	7002.82	7619.83	7614.89	-281.46	7620.08	357.88	0.18	SlimPulse	9	0	0
166	14316.00	90.41	0.57	90.00	7002.36	7709.79	7704.88	-281.29	7710.01	357.91	1.06	SlimPulse	9	0	0
167	14405.00	90.21	359.86	89.00	7001.88	7798.74	7793.88	-280.95	7798.95	357.94	0.83	SlimPulse	9	0	0
168	14495.00	90.17	359.82	90.00	7001.58	7888.71	7883.88	-281.20	7888.88	357.96	0.06	SlimPulse	9	0	0
169	14584.00	89.48	0.00	89.00	7001.85	7977.68	7972.88	-281.34	7977.85	357.98	0.80	SlimPulse	9	0	0
170	14674.00	89.66	357.51	90.00	7002.53	8067.66	8062.85	-283.30	8067.81	357.99	2.77	SlimPulse	9	0	0
171	14764.00	89.35	359.91	90.00	7003.31	8157.65	8152.81	-285.33	8157.81	358.00	2.69	SlimPulse	9	0	0
172	14853.00	89.35	359.37	89.00	7004.32	8246.62	8241.81	-285.88	8246.75	358.01	0.61	SlimPulse	9	0	0
173	14943.00	89.28	359.12	90.00	7005.39	8336.61	8331.79	-287.07	8336.75	358.03	0.29	SlimPulse	9	0	0
174	15032.00	89.73	0.07	89.00	7006.16	8425.58	8420.79	-287.70	8425.69	358.04	1.18	SlimPulse	9	0	0
175	15122.00	89.90	359.32	90.00	7006.45	8515.55	8510.78	-288.18	8515.65	358.06	0.85	SlimPulse	9	0	0
176	15212.00	89.97	359.02	90.00	7006.56	8605.54	8600.77	-289.48	8605.64	358.07	0.34	SlimPulse	9	0	0
177	15301.00	89.79	359.55	89.00	7006.74	8694.53	8689.77	-290.59	8694.62	358.08	0.63	SlimPulse	9	0	0
178	15391.00	89.69	359.56	90.00	7007.15	8784.51	8779.76	-291.29	8784.58	358.10	0.11	SlimPulse	9	0	0
179	15480.00	89.73	359.75	89.00	7007.60	8873.49	8868.76	-291.83	8873.56	358.12	0.22	SlimPulse	9	0	0
180	15570.00	90.00	359.25	90.00	7007.81	8963.47	8958.76	-292.61	8963.55	358.13	0.63	SlimPulse	9	0	0
181	15659.00	90.10	359.53	89.00	7007.73	9052.45	9047.75	-293.56	9052.53	358.14	0.33	SlimPulse	9	0	0
182	15749.00	90.31	359.35	90.00	7007.41	9142.44	9137.75	-294.44	9142.49	358.15	0.31	SlimPulse	9	0	0
183	15838.00	90.34	359.20	89.00	7006.91	9231.42	9226.74	-295.57	9231.46	358.17	0.17	SlimPulse	9	0	0
184	15928.00	90.79	359.14	90.00	7006.02	9321.41	9316.72	-296.87	9321.46	358.17	0.50	SlimPulse	9	0	0
185	16017.00	90.48	359.32	89.00	7005.03	9410.39	9405.71	-298.07	9410.43	358.18	0.40	SlimPulse	9	0	0
186	16107.00	91.79	359.27	90.00	7003.25	9500.36	9495.68	-299.17	9500.39	358.20	1.46	SlimPulse	9	0	0
187	16196.00	90.82	359.69	89.00	7001.22	9589.32	9584.66	-299.98	9589.34	358.21	1.19	SlimPulse	9	0	0
188	16286.00	90.55	358.54	90.00	7000.15	9679.30	9674.64	-301.37	9679.33	358.22	1.31	SlimPulse	9	0	0
189	16375.00	90.41	358.56	89.00	6999.40	9768.30	9763.60	-303.62	9768.34	358.22	0.16	SlimPulse	9	0	0

190	16465.00	90.27	358.07	90.00	6998.87	9858.30	9853.56	-306.27	9858.33	358.22	0.57	SlimPulse	9	0	0
191	16555.00	90.10	357.41	90.00	6998.58	9948.29	9943.49	-309.82	9948.33	358.22	0.76	SlimPulse	9	0	0
192	16644.00	90.27	356.98	89.00	6998.29	10037.27	10032.39	-314.17	10037.30	358.21	0.52	SlimPulse	9	0	0
193	16734.00	90.10	357.81	90.00	6998.00	10127.26	10122.29	-318.26	10127.30	358.20	0.94	SlimPulse	9	0	0
194	16823.00	90.10	357.79	89.00	6997.84	10216.26	10211.23	-321.68	10216.31	358.20	0.02	SlimPulse	9	0	0
195	16867.00	90.10	357.79	44.00	6997.77	10260.25	10255.19	-323.38	10260.30	358.19	0.00	Other	9	0	7

Calibration Report

SPULSE-GEN (SlimPulse with Generic Collar) Calibration - Run Lateral1

Primary Equipment :

Elec. cartridge, 150C max with GR

SPEC

930

GRGain - Gamma Ray: Blanket

Master (Time Frame File): 12:00:00 27-Jun-2014

Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit		
Gamma Ray Calibration Gain		Master	1.0000	0.9000	1.0774	1.1000		

Company: Noble Energy Inc.
Well: Heartland G25-73-1HN
Field: Wattenberg
County: Weld
State: Colorado
Country: USA



Schlumberger

SlimPulse - Gamma Ray

1 in / 100 ft & 5 in / 100 ft True Vertical Depth

Recorded Mode, Composite Log