



PHOENIX  
TECHNOLOGY SERVICES

TVD  
1:240  
Feet

MWD Gamma / ROP (5")

Client: Whiting Petroleum Corp

Well Name: Razor Federal #12F-1308B

API/UWID: 051233871200

County: Weld Field: Wildcat

Permit #: 15-0360

State: Colorado Country: USA

Longitude: 103° 49' 3.23731 W  
Latitude: 40° 51' 16.04828 N

Personnel

Company Representative  
Kenny Wilkerson

Geologist

Directional Driller(s)  
Derrick Gracie  
Brandon Davis

MWD Operator(s)  
Justin Amari  
Larry Seebeck

Reference Data

North Reference: True North  
Magnetic Declination: 7.44  
Grid Convergence: 0.00  
Total Mag Correction: 7.44

Comments:

Main Leg

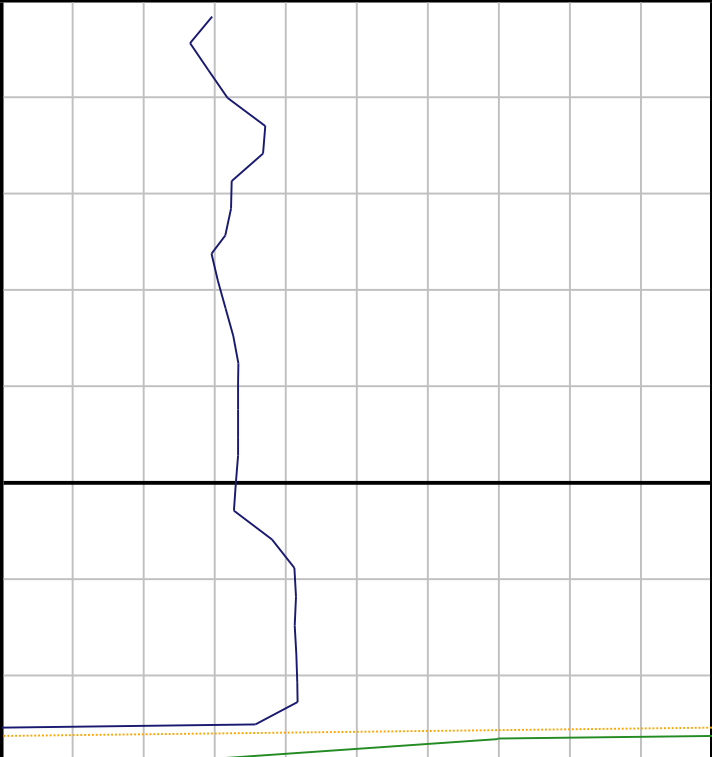
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1:240

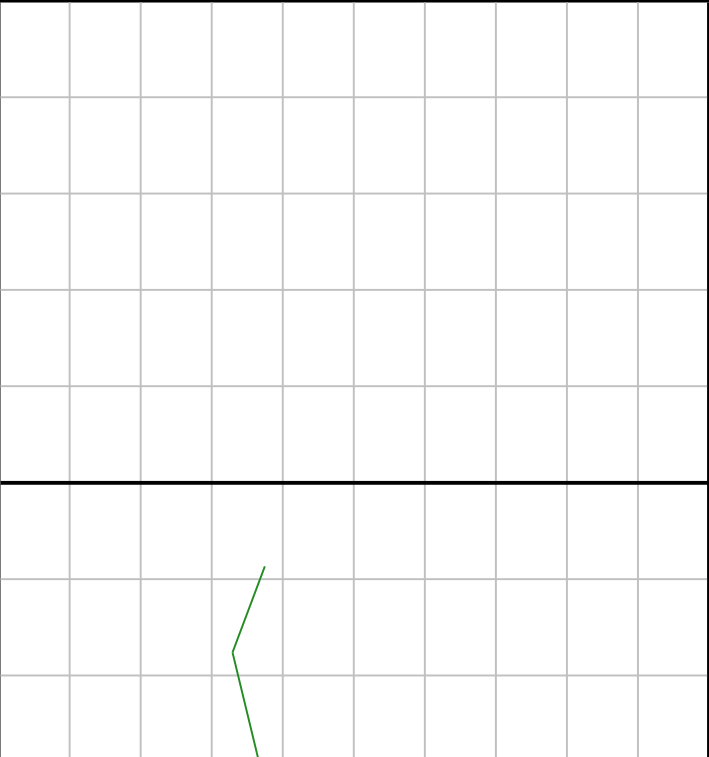
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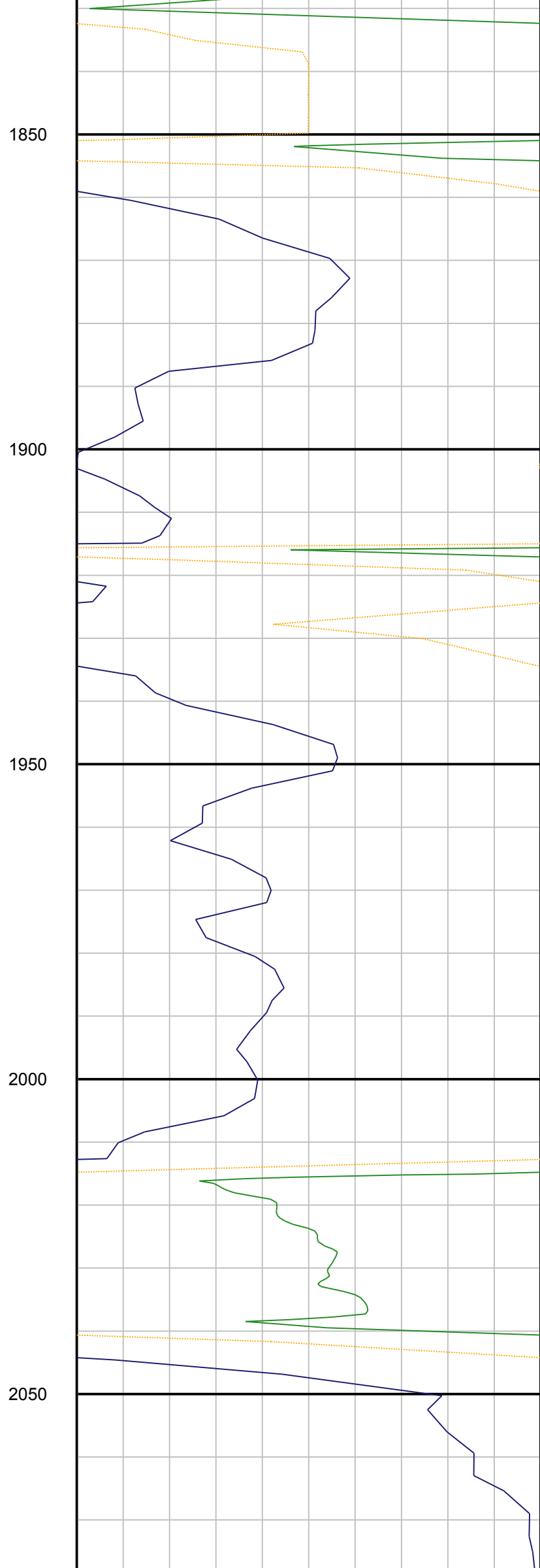
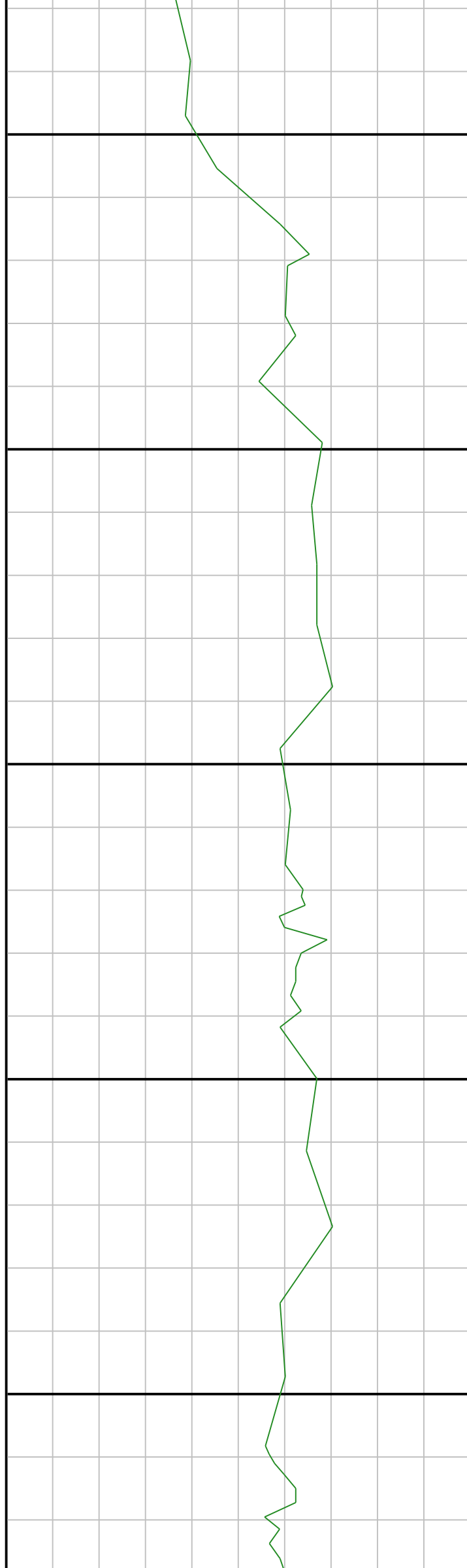
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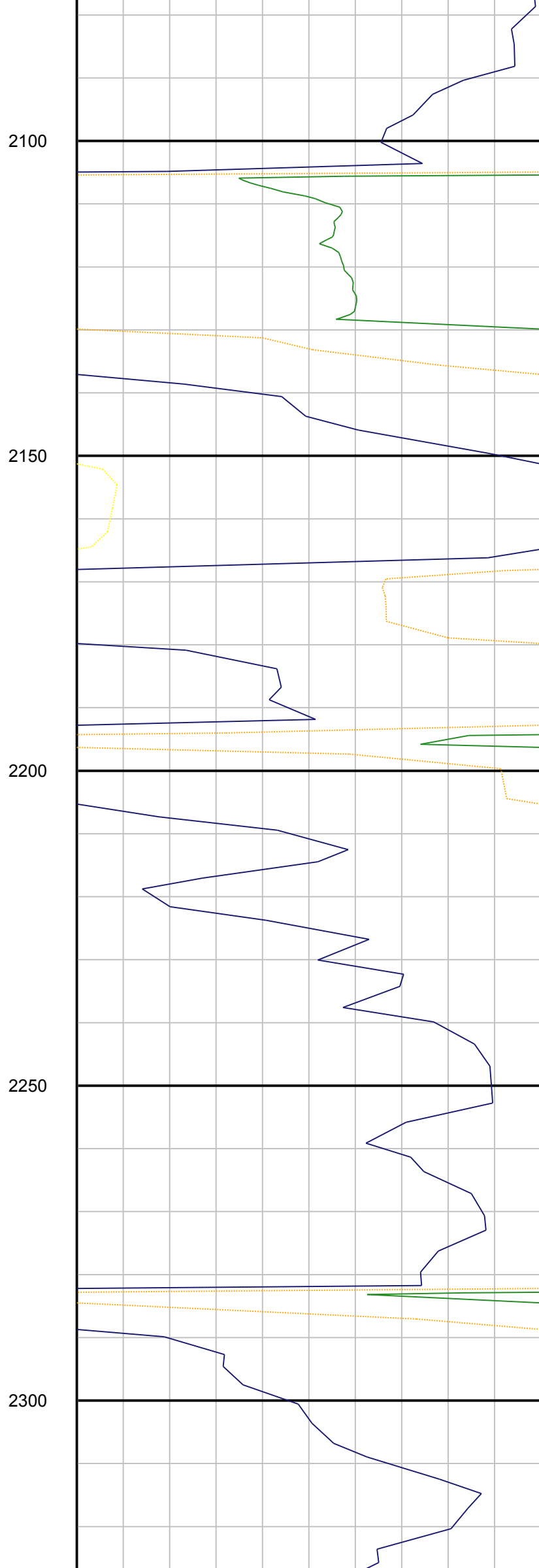
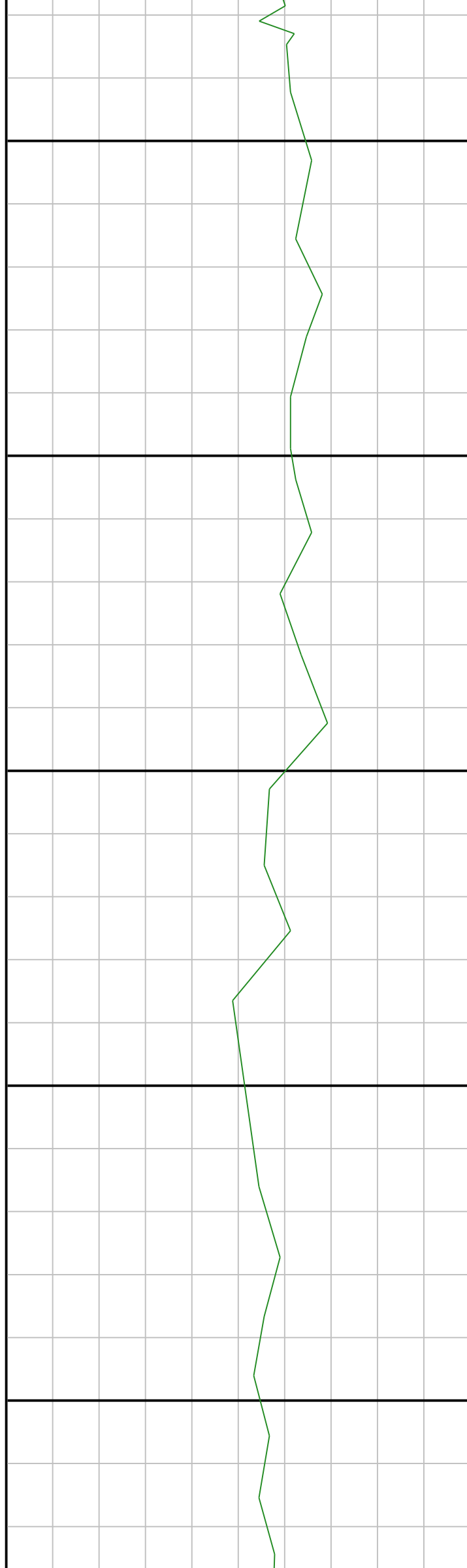
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900	1200

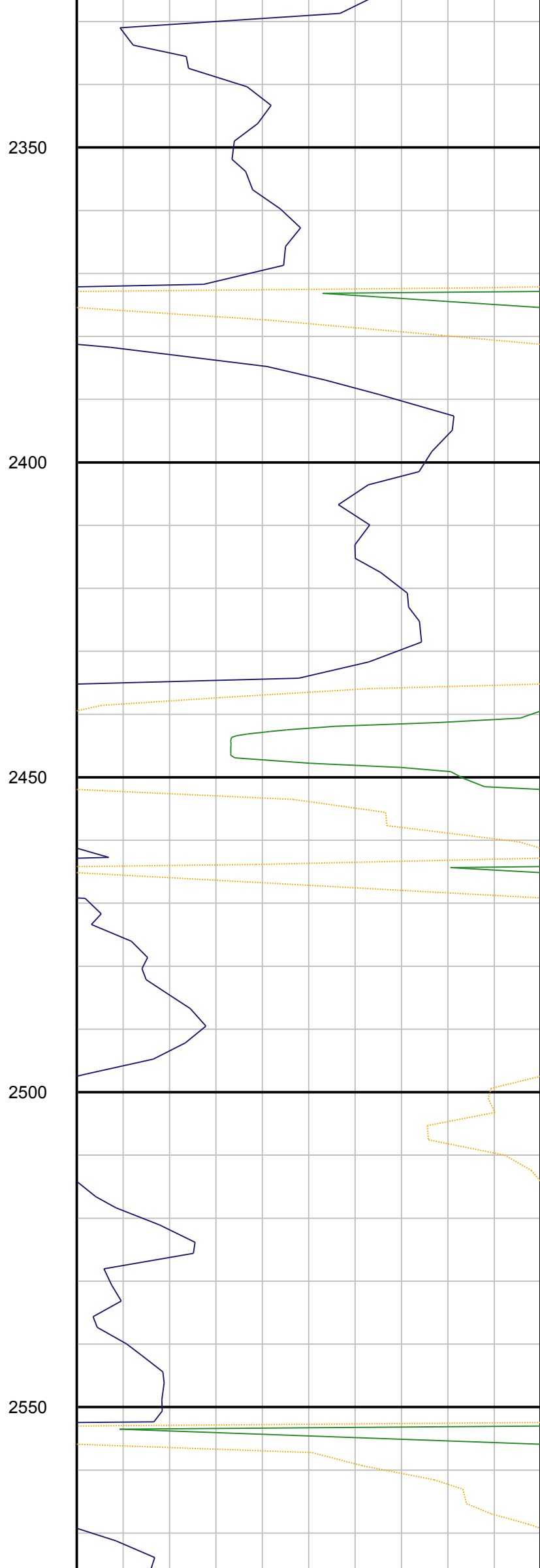
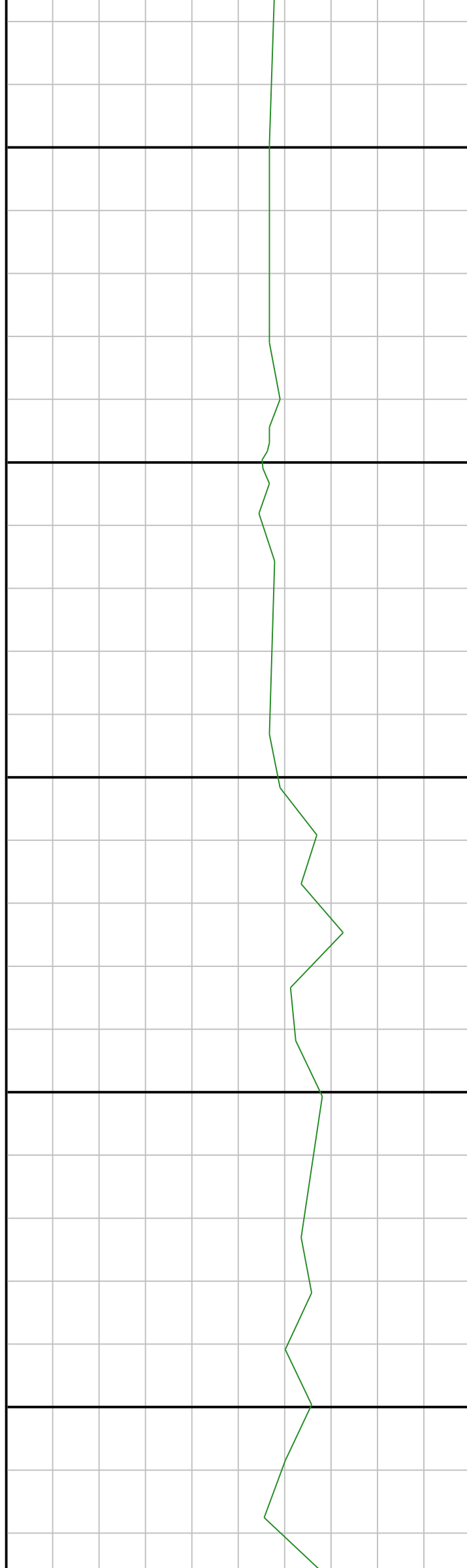


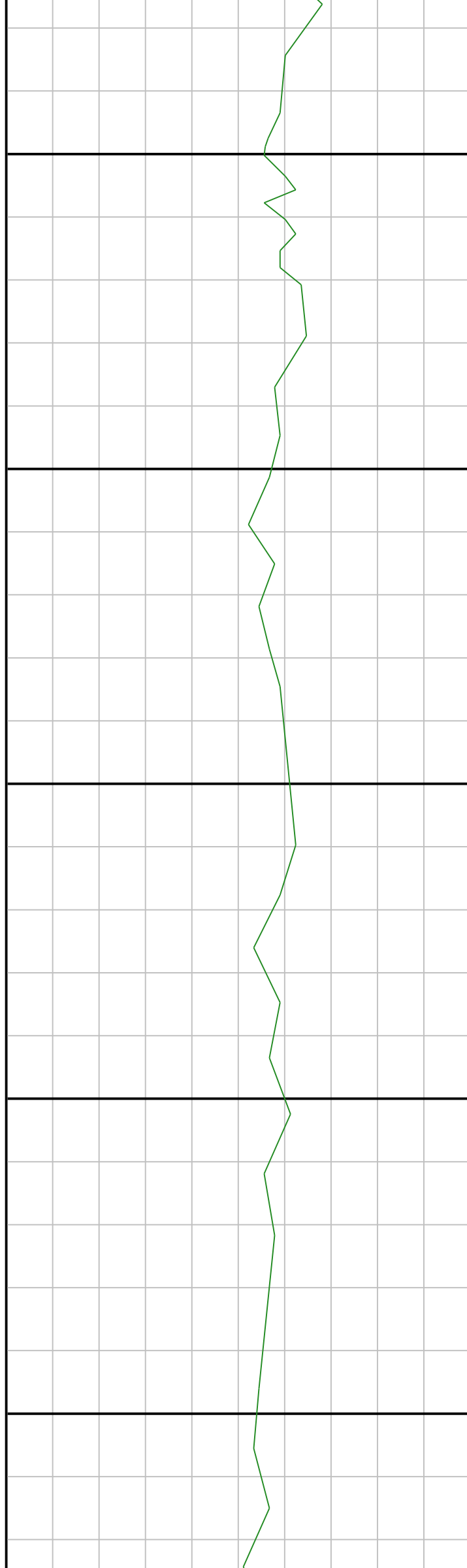
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Gamma	Gama
Gamma	Gama
200	400
Gamma	Gama
Gamma	Gama
400	600
Gamma	Gama
Gamma	Gama
600	800











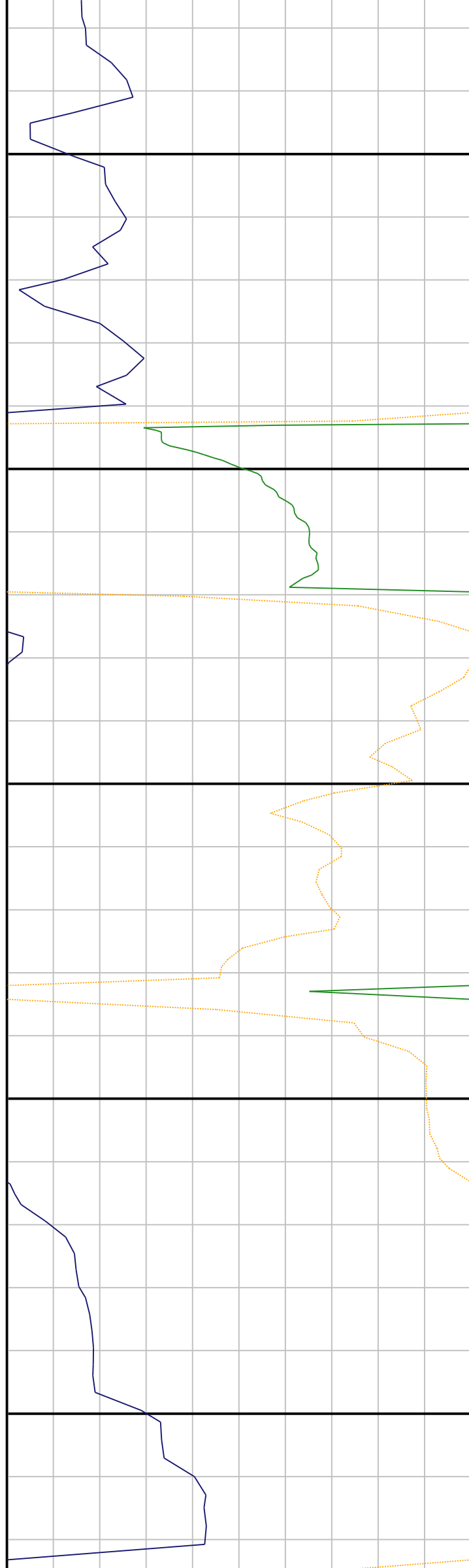
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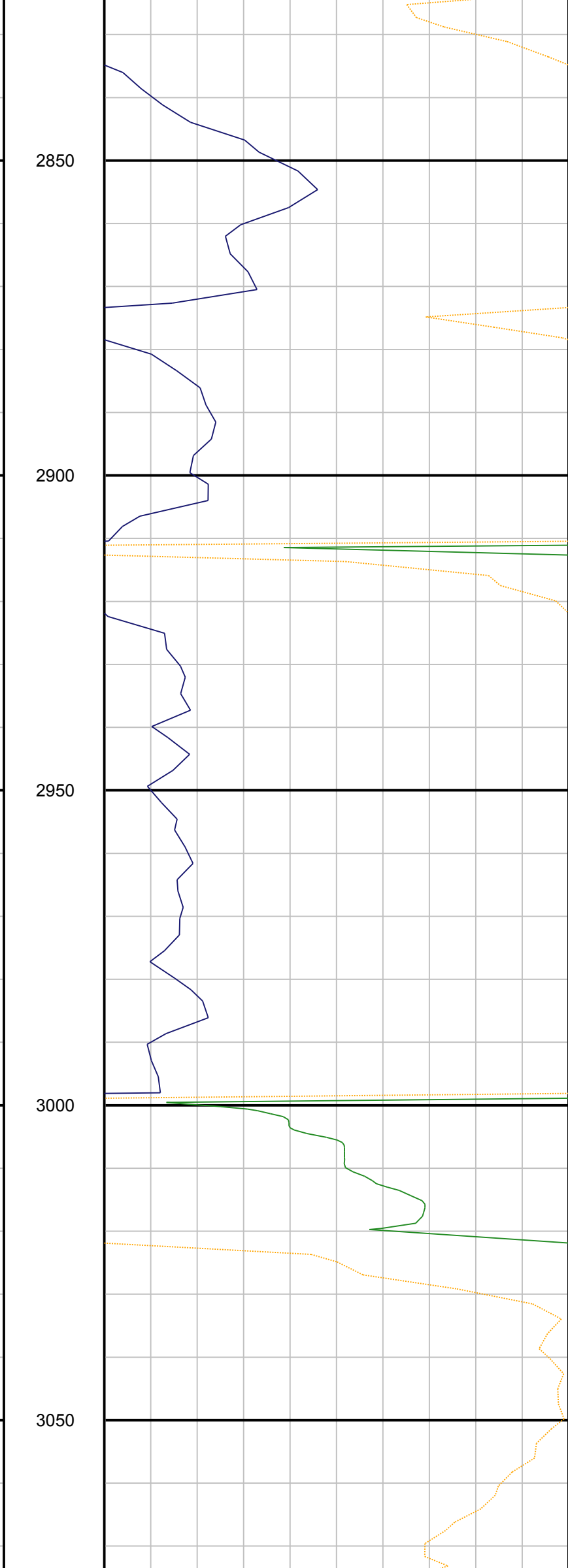
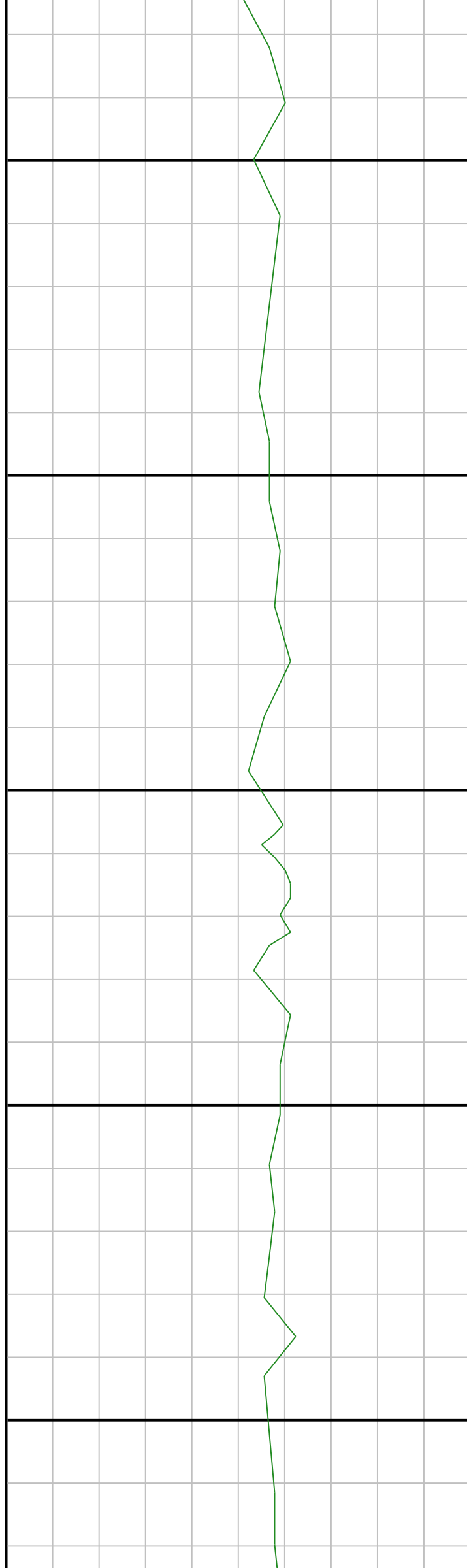
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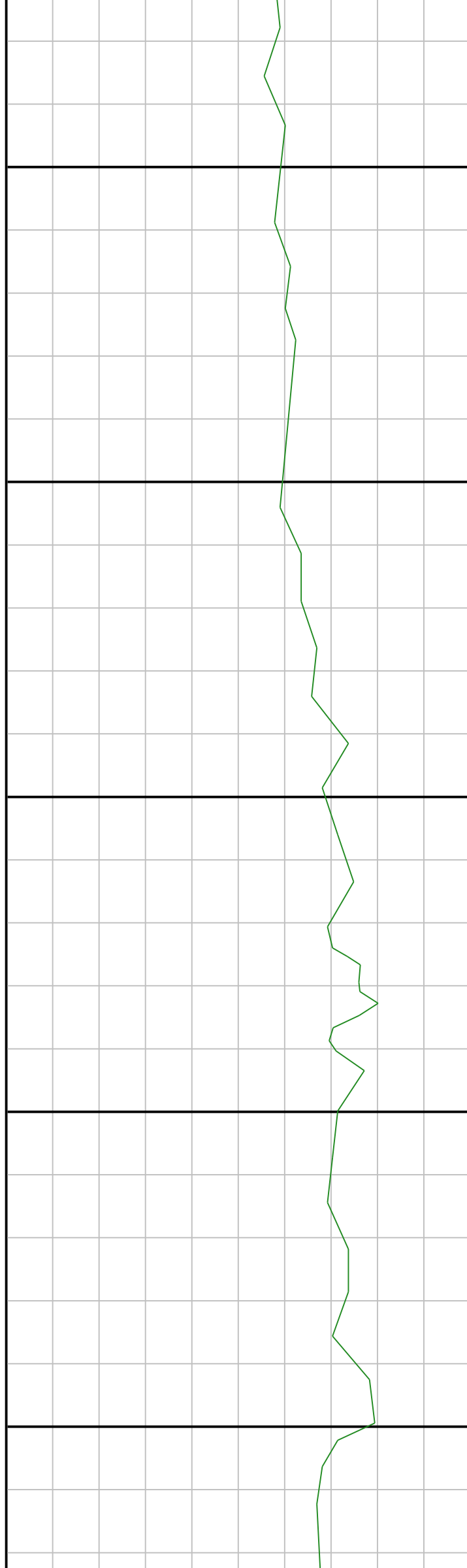
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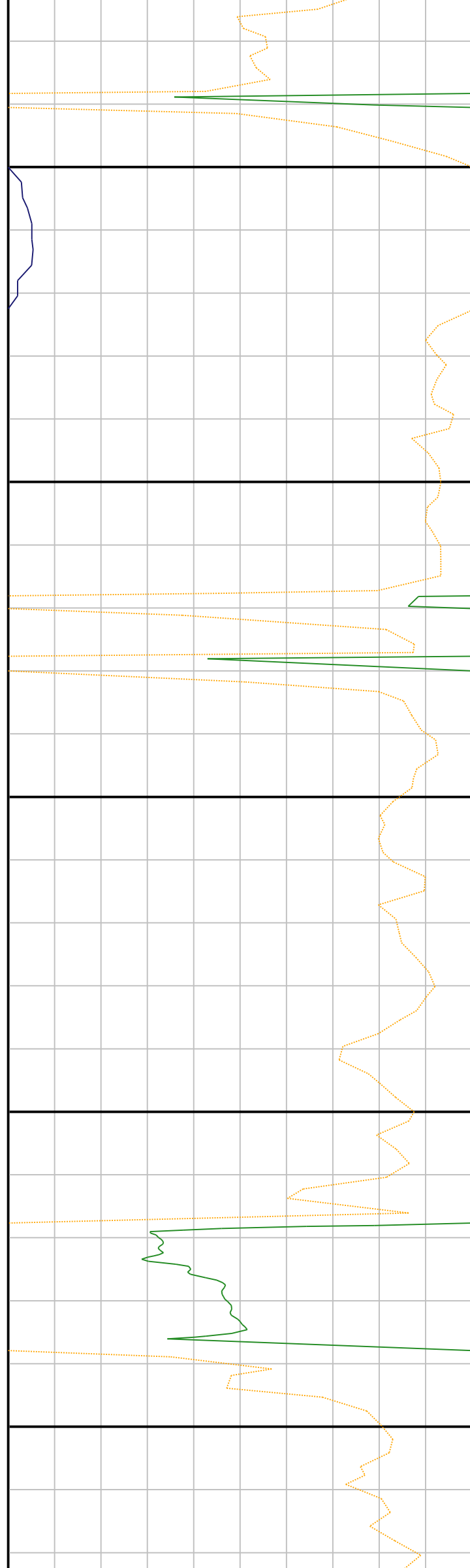
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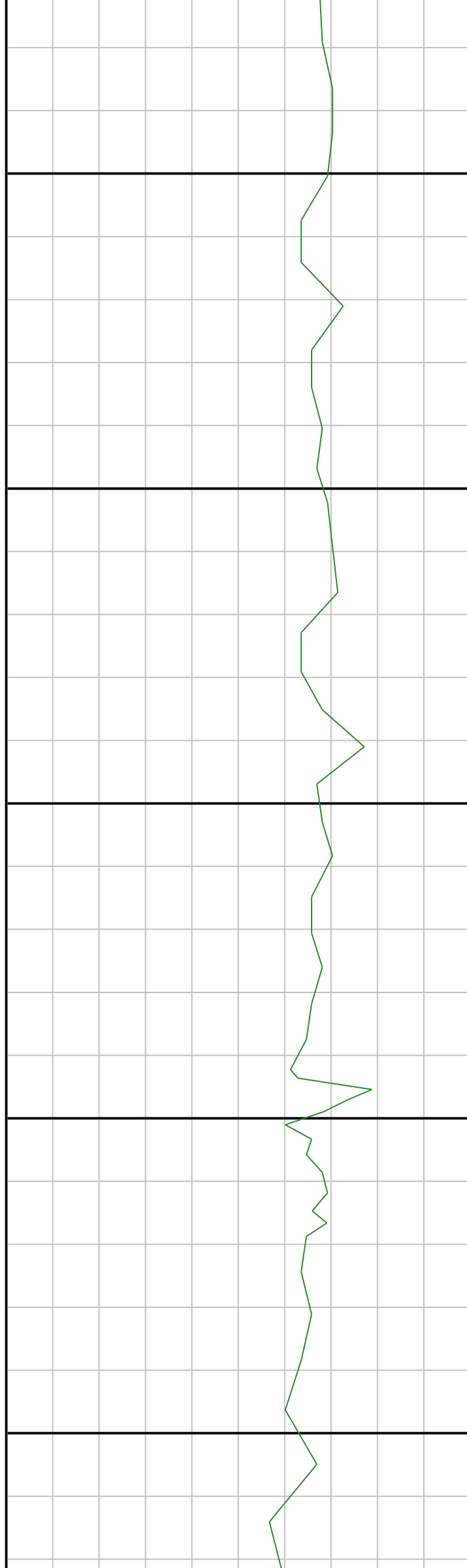
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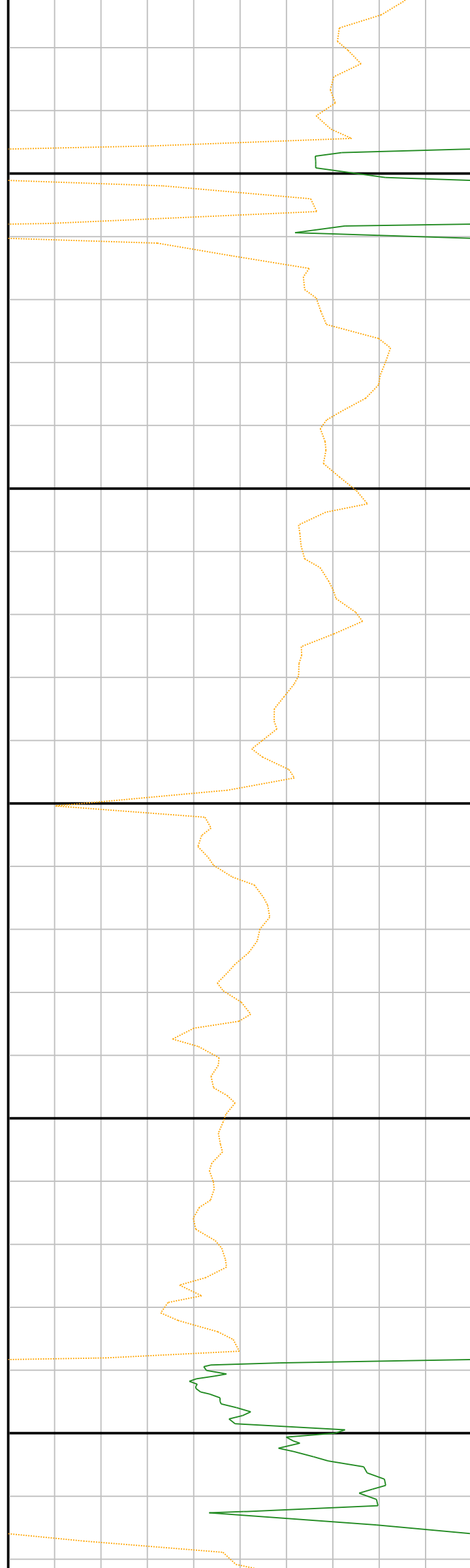
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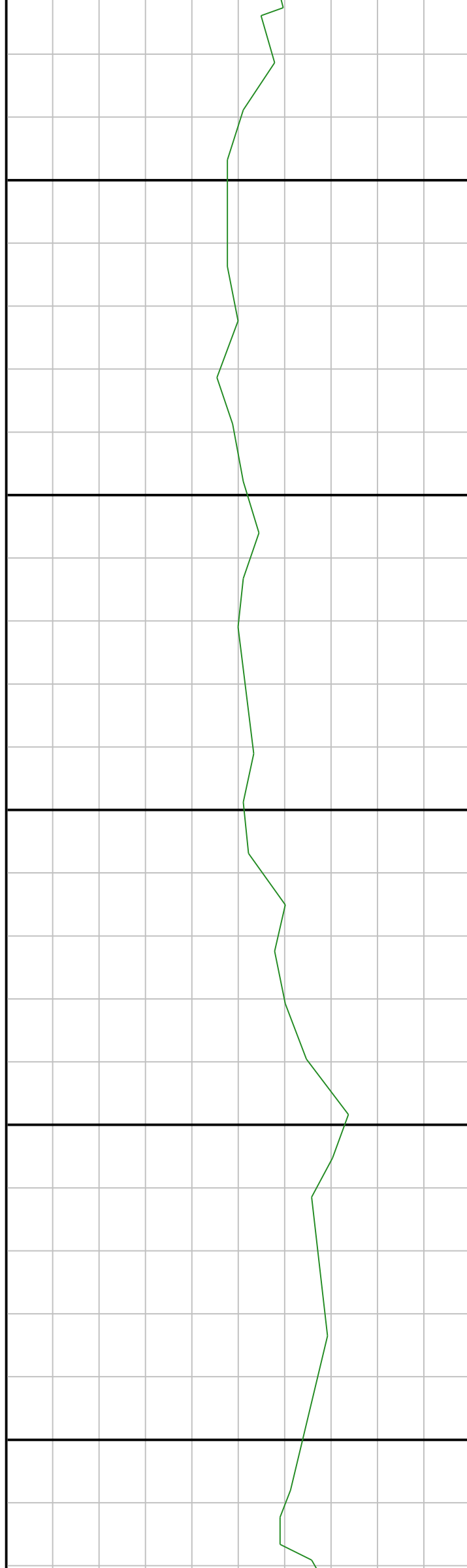
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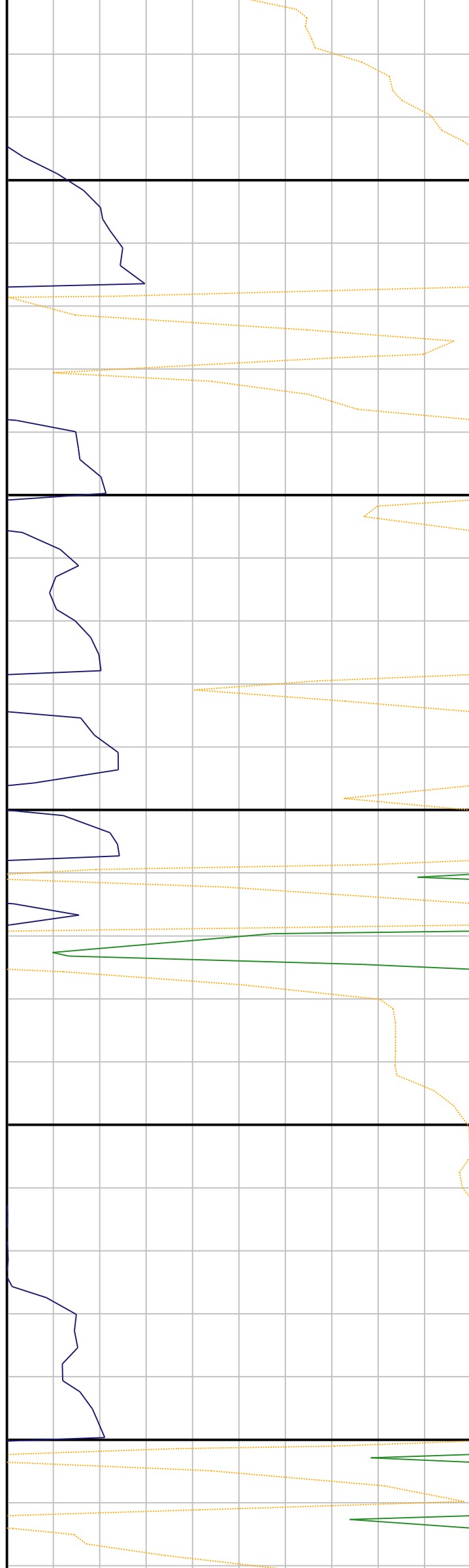
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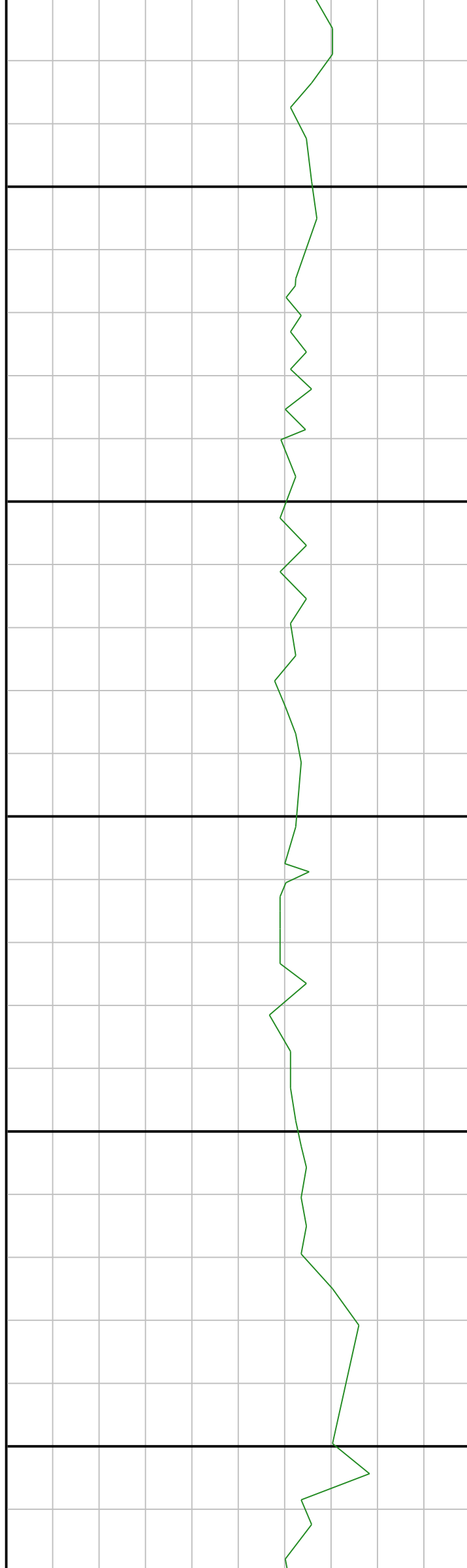
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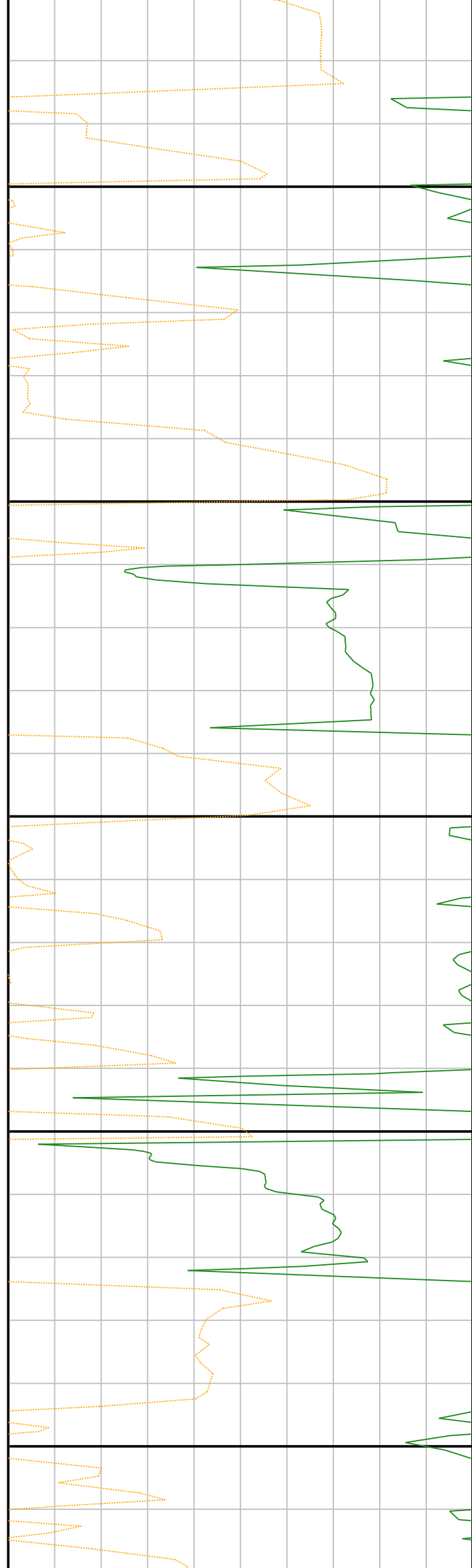
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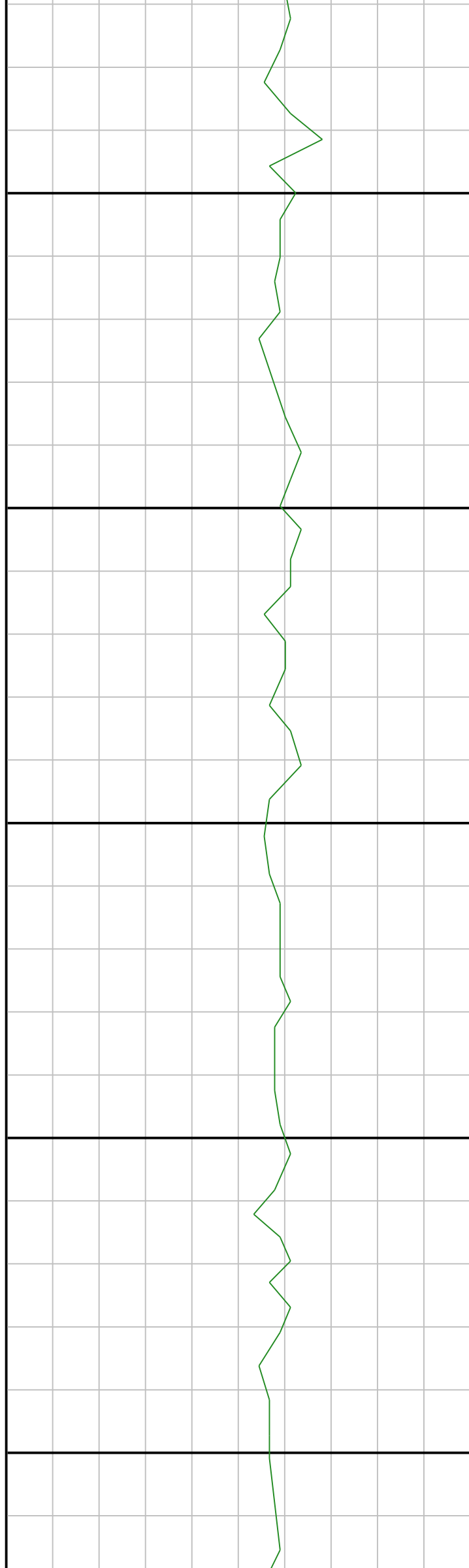
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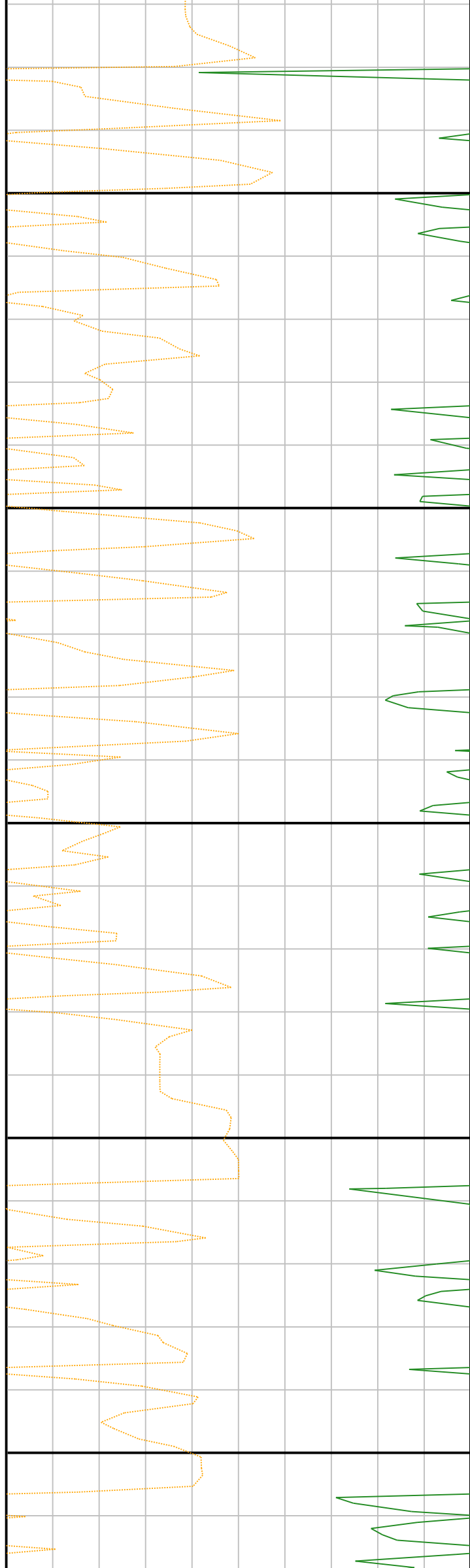
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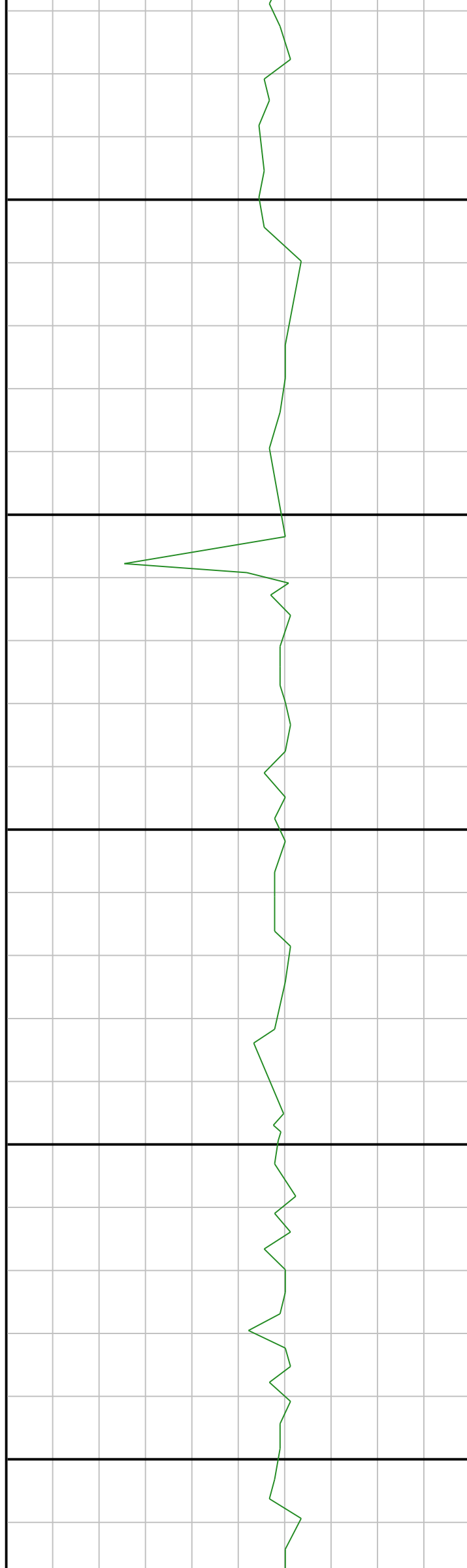
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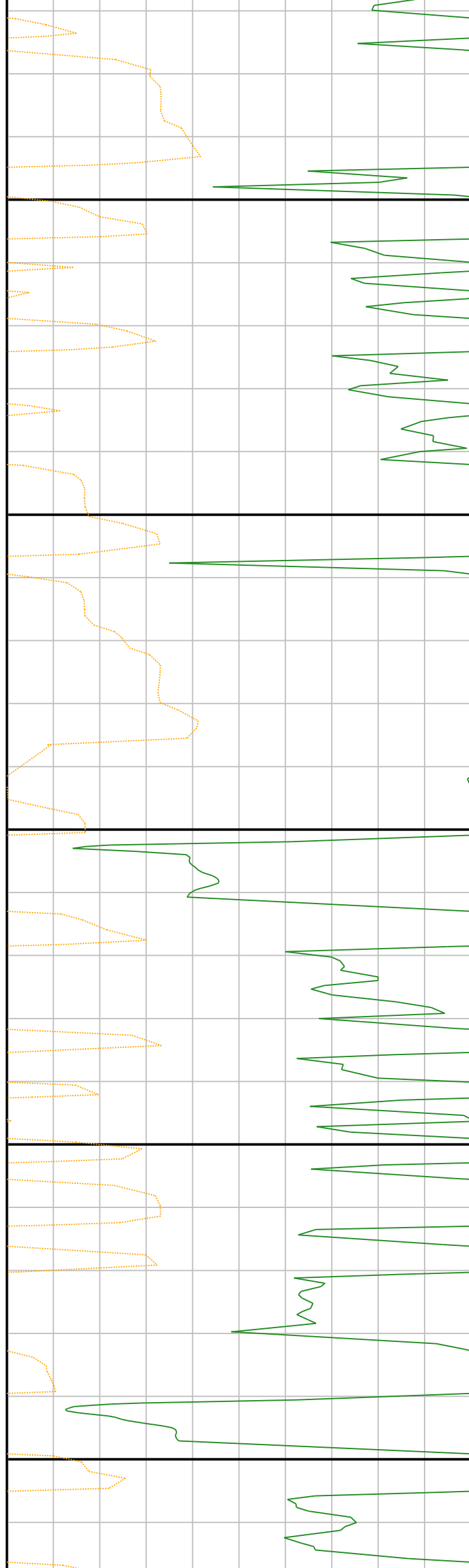
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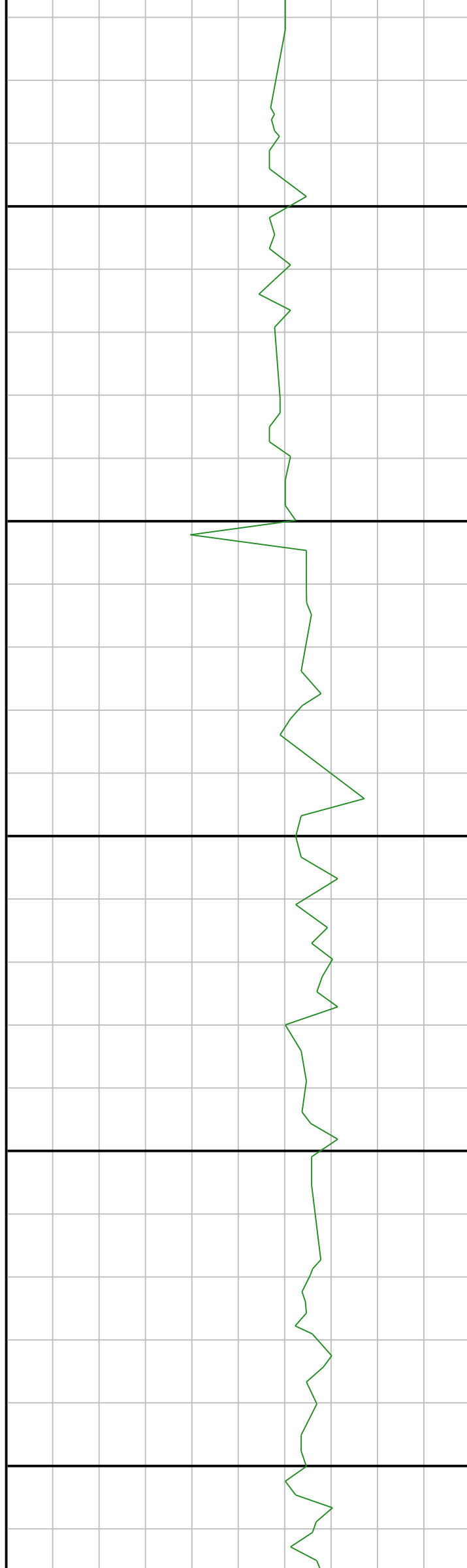
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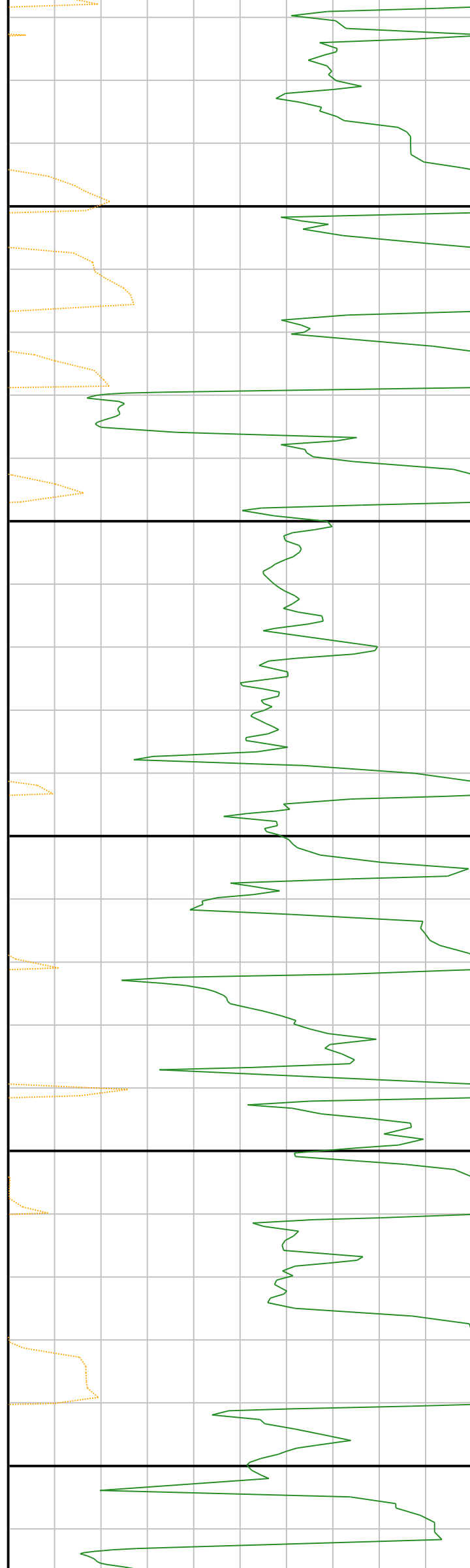
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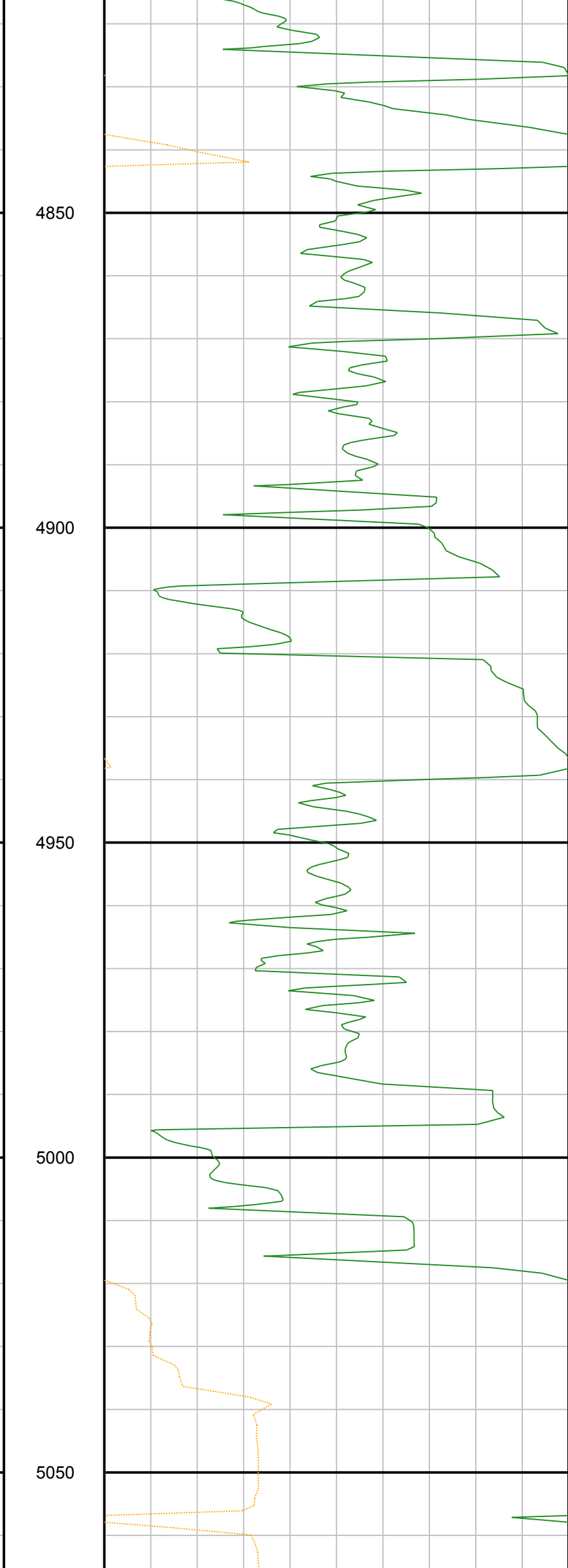
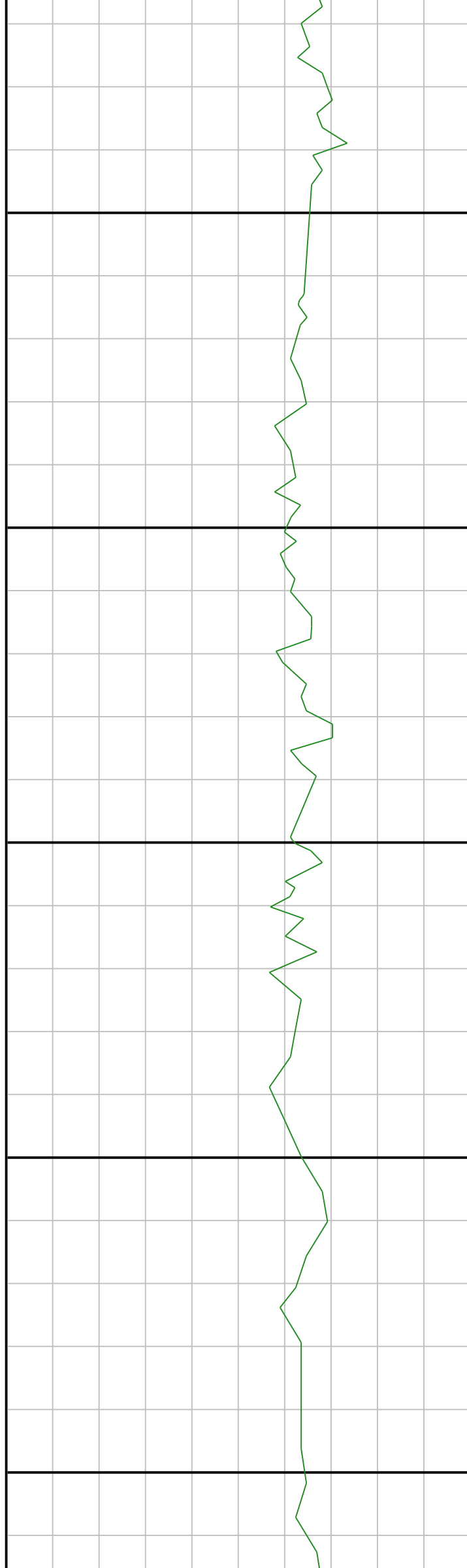
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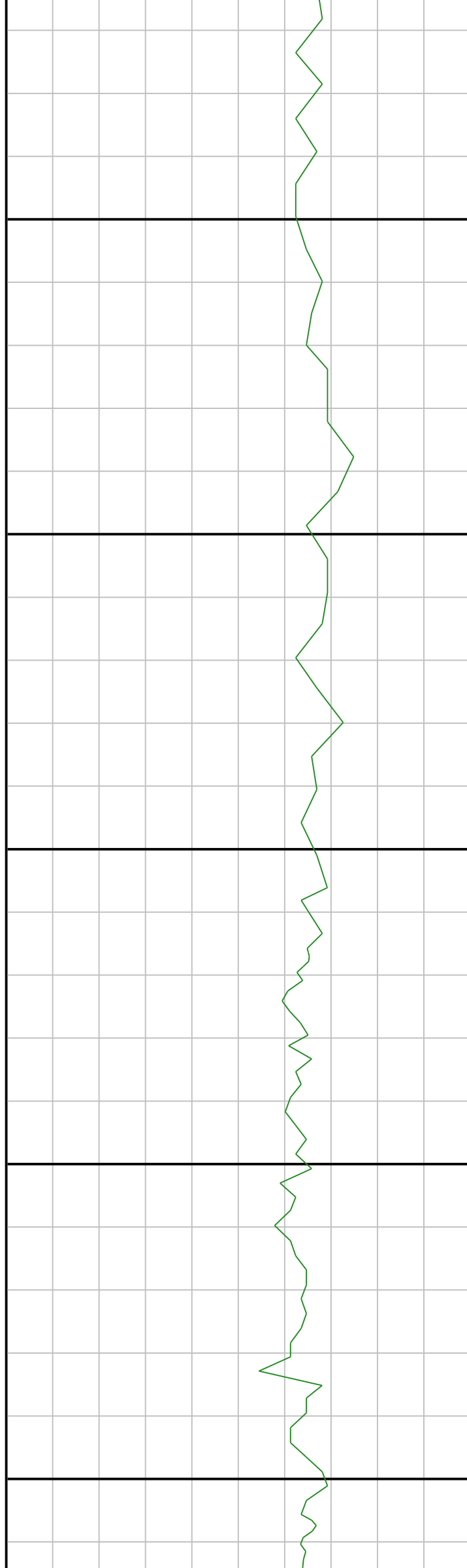
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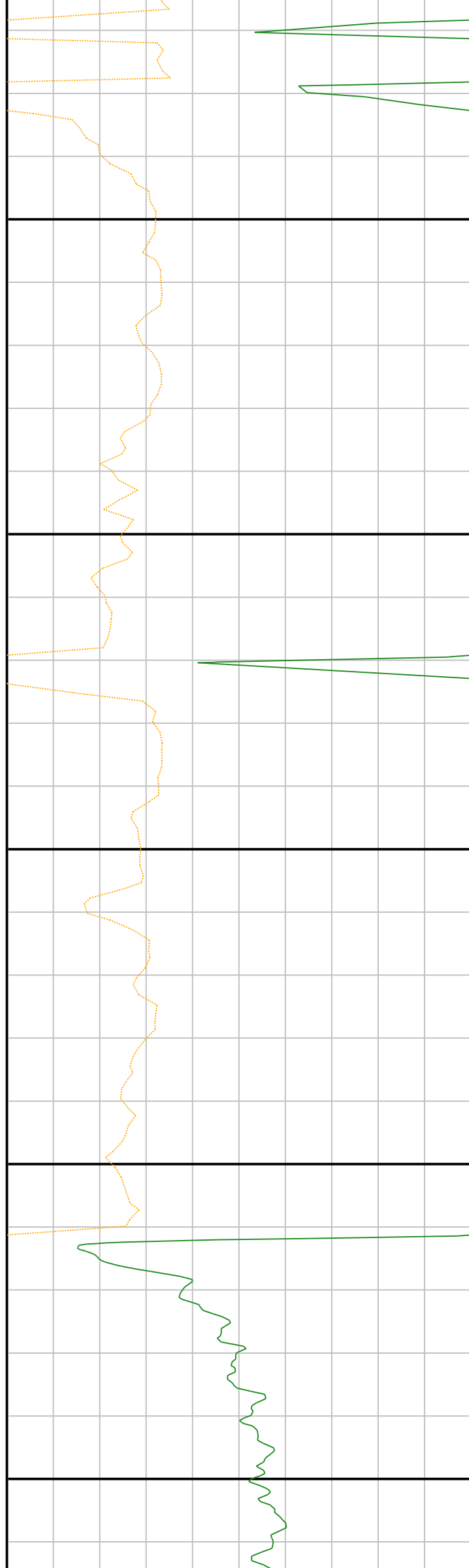
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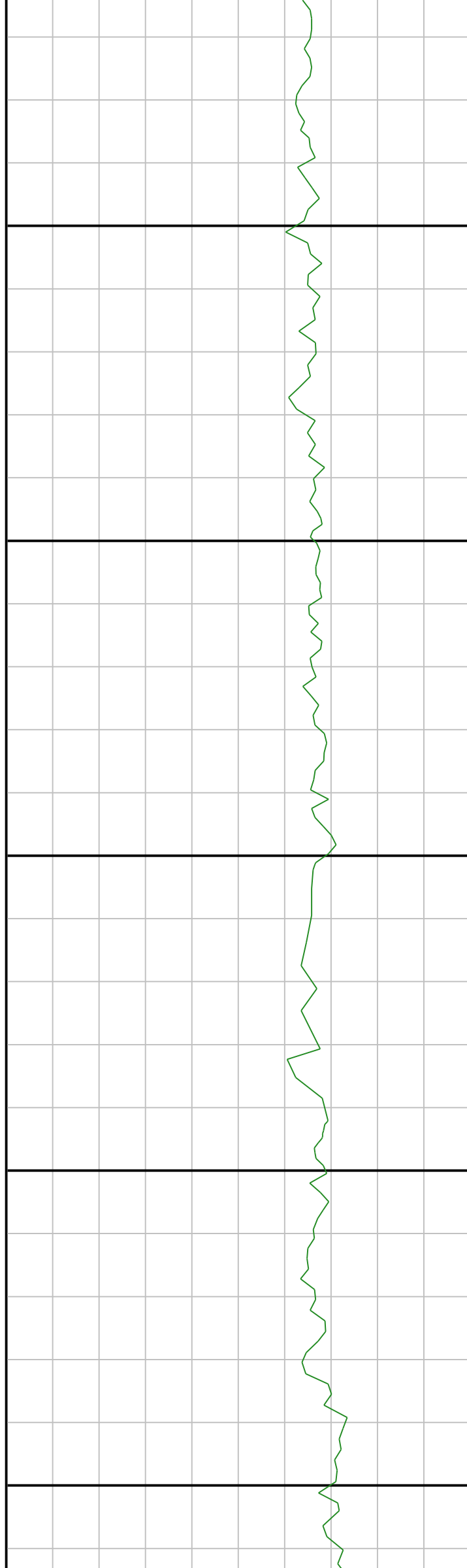
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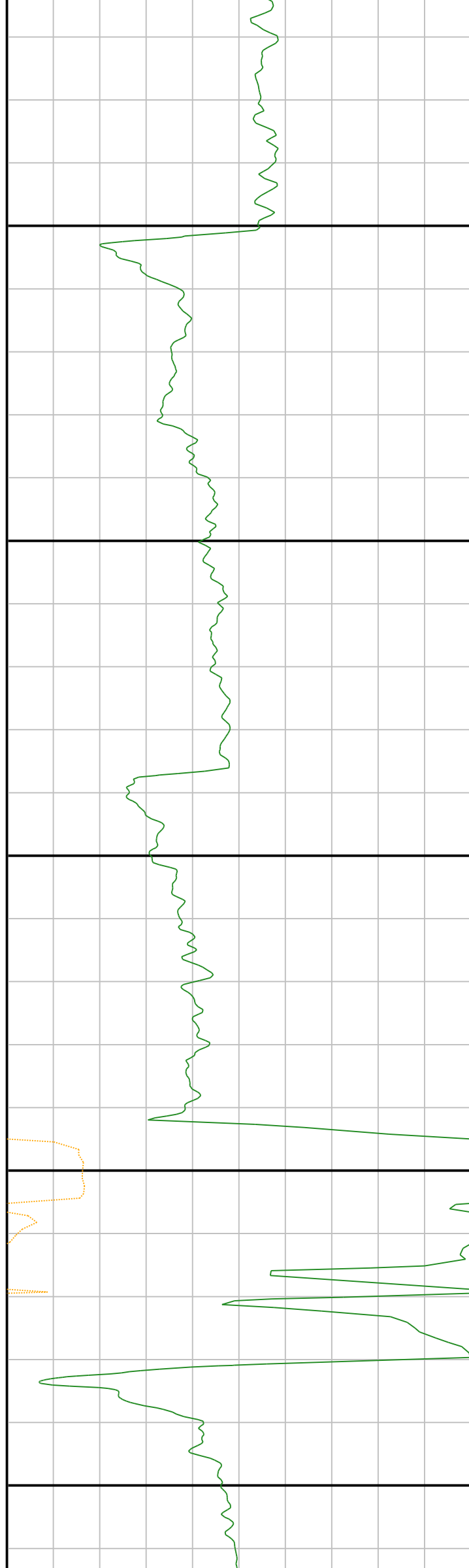
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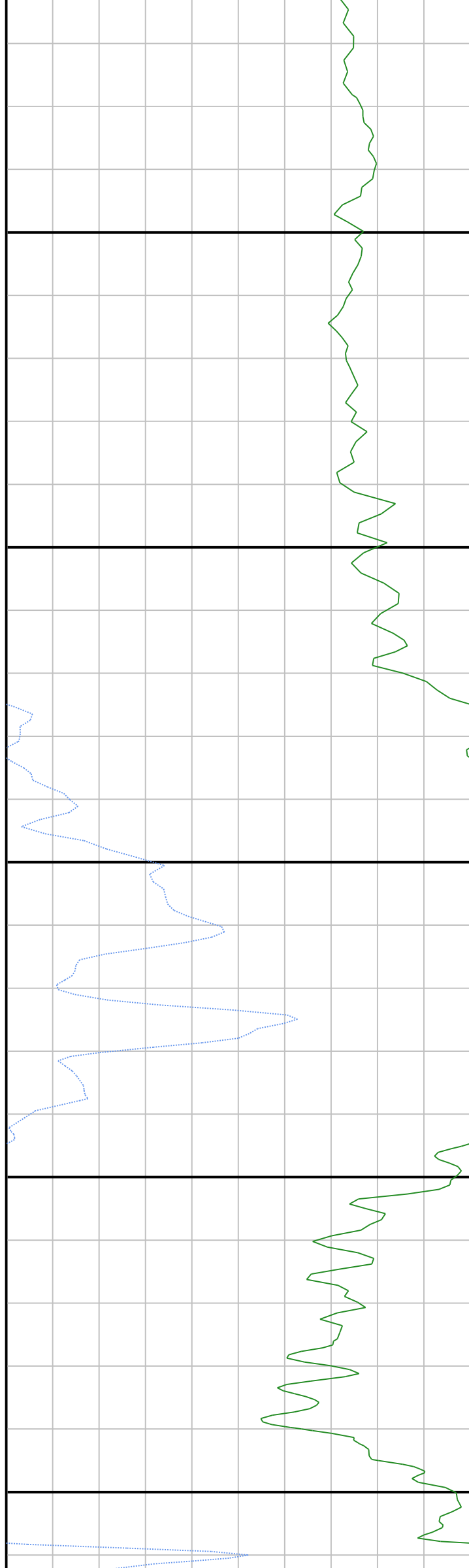
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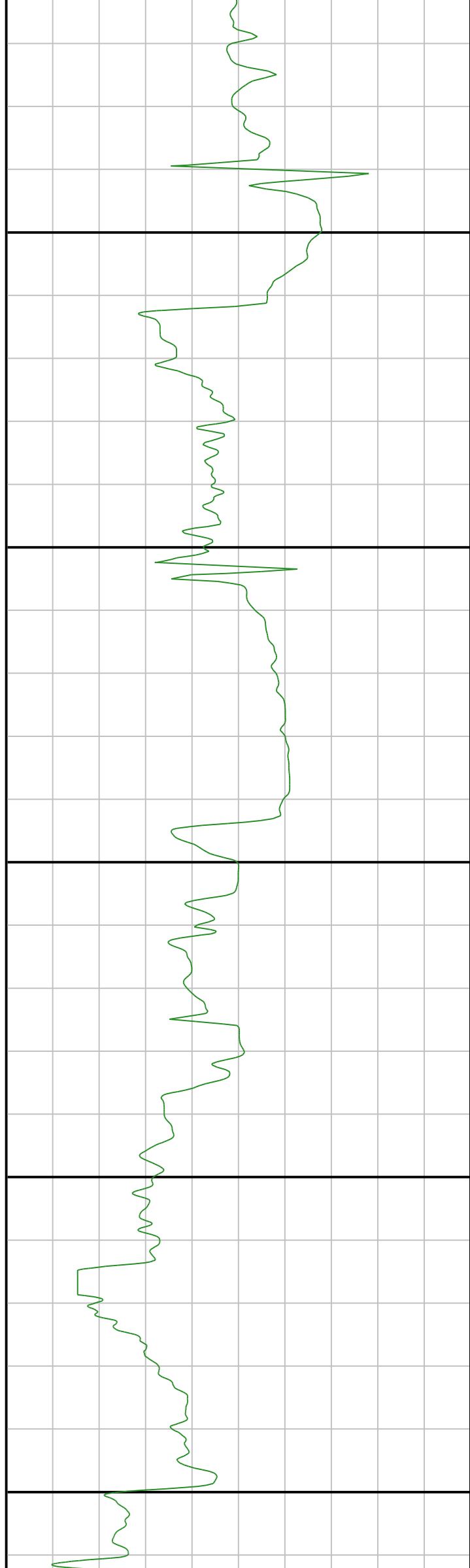
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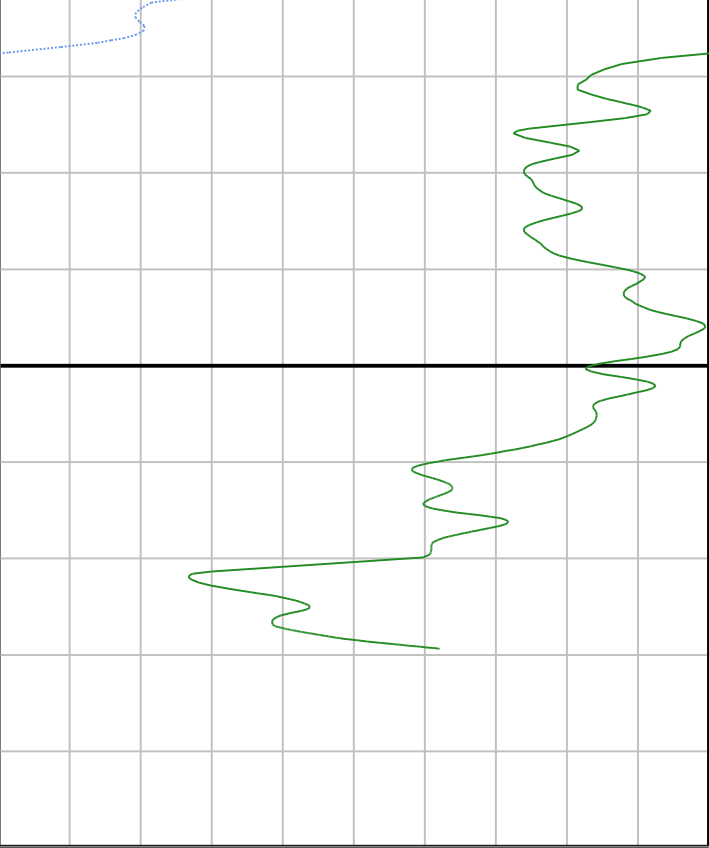
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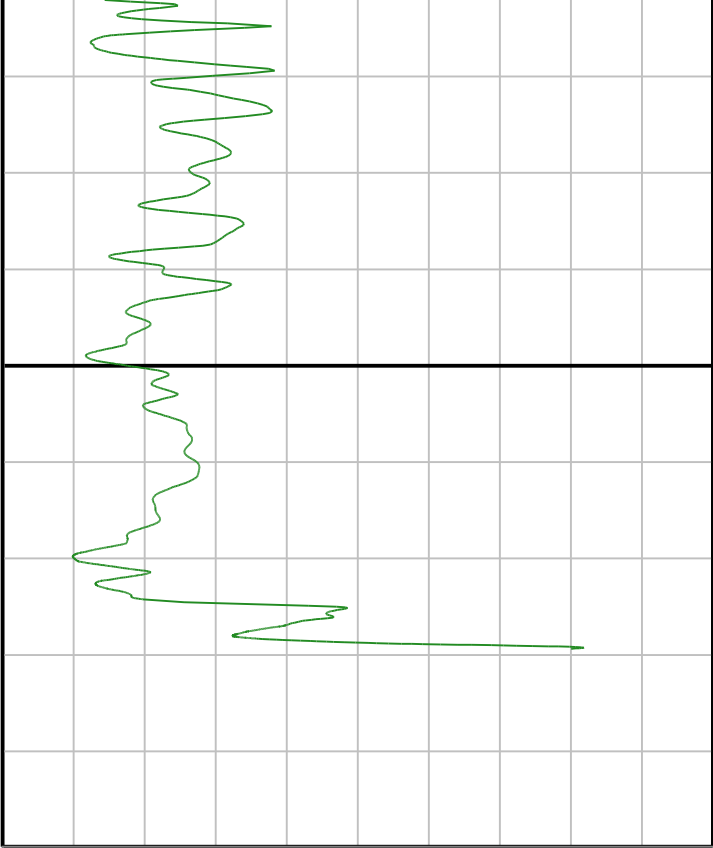
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Gamma		Gama
0	AAP1	200
Gamma		Gama
200	AAP1	400
Gamma		Gama
400	AAP1	600
Gamma		Gama
600	AAP1	800

5850



ROP		ROP
0	ft/hr	300
ROP		ROP
300	ft/hr	600
ROP		ROP
600	ft/hr	900
ROP		ROP
900	ft/hr	1200

5900

# Survey Information

Seq	MD (ft)	Inc (°)	Azm (°)	TVD (ft)	V Sec (ft)	N/-S (ft)	E/-W (ft)	DLS (°/100ft)	Bld Rate (°/ft)
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	324.00	0.34	111.54	324.00	0.46	-0.35	0.89	0.10	0.00
3	417.00	0.78	101.57	416.99	0.79	-0.58	1.77	0.48	0.00
4	509.00	1.73	96.90	508.97	1.31	-0.87	3.76	1.04	0.01
5	601.00	3.13	97.50	600.89	2.26	-1.37	7.63	1.52	0.02
6	694.00	4.15	91.98	693.70	3.39	-1.82	13.51	1.16	0.01
7	786.00	6.36	91.05	785.30	4.59	-2.02	21.94	2.40	0.02
8	879.00	8.17	94.18	877.55	6.54	-2.60	33.68	1.99	0.02
9	971.00	9.45	93.93	968.47	9.18	-3.59	47.73	1.39	0.01
10	1064.00	11.09	92.30	1059.97	12.00	-4.48	64.29	1.79	0.02
11	1156.00	13.65	89.10	1149.83	14.50	-4.66	83.99	2.88	0.03
12	1248.00	13.17	89.76	1239.32	16.80	-4.45	105.32	0.55	-0.01
13	1340.00	12.83	89.96	1328.97	19.18	-4.40	126.02	0.37	0.00
14	1432.00	12.79	92.00	1418.68	21.92	-4.74	146.41	0.49	0.00
15	1524.00	12.80	93.05	1508.39	25.20	-5.64	166.76	0.25	0.00
16	1616.00	12.64	94.37	1598.13	28.88	-6.95	186.98	0.36	0.00
17	1709.00	12.07	95.72	1688.98	32.94	-8.70	206.80	0.69	-0.01
18	1801.00	11.14	93.37	1779.10	36.58	-10.18	225.24	1.13	-0.01
19	1824.00	10.96	92.71	1801.67	37.33	-10.41	229.64	0.96	-0.01
20	1982.00	8.64	79.56	1957.38	39.04	-8.97	256.32	2.03	-0.01
21	2074.00	11.59	81.58	2047.94	38.32	-6.36	272.27	3.23	0.03
22	2167.00	14.50	88.27	2138.53	39.07	-4.64	293.15	3.52	0.03
23	2259.00	13.64	85.85	2227.77	40.57	-3.51	315.48	1.13	-0.01
24	2350.00	13.41	85.86	2316.25	41.54	-1.97	336.71	0.25	0.00
25	2442.00	12.77	85.03	2405.86	42.34	-0.32	357.48	0.73	-0.01
26	2534.00	12.29	81.06	2495.67	42.28	2.08	377.28	1.07	-0.01
27	2626.00	11.64	78.42	2585.67	41.12	5.47	396.05	0.92	-0.01
28	2718.00	14.79	86.25	2675.23	40.96	8.10	416.86	3.93	0.03
29	2810.00	14.17	86.51	2764.30	42.21	9.55	439.82	0.68	-0.01
30	2902.00	13.81	84.44	2853.58	43.08	11.30	461.99	0.67	0.00
31	2994.00	13.12	82.63	2943.05	43.19	13.70	483.27	0.88	-0.01
32	3086.00	15.31	85.52	3032.23	43.56	15.99	505.74	2.50	0.02
33	3178.00	14.39	84.30	3121.15	44.25	18.08	529.23	1.06	-0.01

• Tie-in Point

34	3270.00	12.65	81.52	3210.60	44.16	20.70	550.57	2.02	-0.02
35	3362.00	12.26	92.28	3300.45	45.39	21.79	570.29	2.55	0.00
36	3454.00	10.69	88.32	3390.61	47.68	21.66	588.58	1.91	-0.02
37	3546.00	9.38	85.17	3481.20	48.68	22.54	604.58	1.54	-0.01
38	3730.00	10.97	92.86	3662.31	52.11	22.93	637.01	1.13	0.01
39	3822.00	10.15	90.92	3752.75	54.65	22.36	653.86	0.97	-0.01
40	3914.00	9.61	90.72	3843.38	56.73	22.13	669.65	0.59	-0.01
41	4006.00	11.19	92.89	3933.87	59.22	21.59	686.24	1.77	0.02
42	4098.00	13.77	92.63	4023.69	62.50	20.63	706.10	2.81	0.03
43	4190.00	13.62	90.69	4113.07	65.69	20.00	727.87	0.53	0.00
44	4281.00	13.18	90.52	4201.60	68.39	19.78	748.96	0.49	0.00
45	4373.00	13.54	88.35	4291.11	70.67	19.99	770.21	0.67	0.00
46	4465.00	12.80	88.72	4380.69	72.60	20.53	791.16	0.81	-0.01
47	4557.00	10.84	92.11	4470.73	74.91	20.44	810.00	2.26	-0.02
48	4649.00	8.69	96.75	4561.40	77.86	19.30	825.55	2.49	-0.02
49	4741.00	7.03	91.66	4652.53	80.31	18.32	838.08	1.95	-0.02
50	4833.00	7.36	96.33	4743.81	82.47	17.51	849.56	0.73	0.00
51	4925.00	4.76	86.39	4835.29	84.01	17.10	859.23	3.04	-0.03
52	5017.00	3.63	86.55	4927.04	84.39	17.52	865.95	1.23	-0.01
53	5109.00	1.23	116.82	5018.95	85.10	17.25	869.74	2.87	-0.03
54	5201.00	1.29	126.48	5110.93	86.36	16.19	871.45	0.24	0.00
55	5293.00	1.71	127.30	5202.90	88.02	14.74	873.38	0.46	0.00
56	5338.00	2.33	128.58	5247.87	89.14	13.76	874.63	1.38	0.01
57	5385.00	6.36	164.60	5294.73	92.39	10.65	876.06	9.96	0.09
58	5430.00	13.70	174.52	5339.02	100.19	2.93	877.24	16.70	0.16
59	5477.00	18.85	178.36	5384.12	113.33	-10.20	877.99	11.19	0.11
60	5522.00	25.84	182.07	5425.72	130.28	-27.29	877.84	15.84	0.16
61	5569.00	30.84	179.30	5467.07	152.40	-49.59	877.62	11.00	0.11
62	5614.00	33.60	178.32	5505.14	176.28	-73.58	878.12	6.24	0.06
63	5661.00	35.51	177.45	5543.85	202.85	-100.21	879.11	4.20	0.04
64	5706.00	42.43	177.73	5578.81	231.05	-128.47	880.30	15.38	0.15
65	5753.00	44.00	176.77	5613.06	263.15	-160.62	881.84	3.62	0.03
66	5798.00	50.20	175.72	5643.68	296.06	-193.49	884.02	13.88	0.14
67	5845.00	50.72	175.53	5673.60	332.27	-229.63	886.78	1.15	0.01
68	5890.00	51.07	175.41	5701.98	367.16	-264.44	889.54	0.80	0.01
69	5937.00	54.10	175.14	5730.54	404.47	-301.64	892.62	6.46	0.06
70	5982.00	53.95	174.96	5756.97	440.86	-337.92	895.76	0.46	0.00
71	6029.00	58.46	172.30	5783.11	479.91	-376.72	900.11	10.69	0.10
72	6074.00	63.13	172.64	5805.06	519.17	-415.65	905.26	10.40	0.10
73	6122.00	67.67	171.74	5825.04	562.80	-458.88	911.19	9.61	0.09
74	6166.00	74.10	172.52	5839.44	604.34	-500.04	916.88	14.71	0.15
75	6215.00	77.77	171.17	5851.35	651.85	-547.08	923.62	7.95	0.07
76	6260.00	79.48	171.05	5860.22	695.93	-590.66	930.44	3.81	0.04
77	6307.00	80.59	170.77	5868.35	742.18	-636.37	937.75	2.43	0.02
78	6392.00	87.93	169.73	5876.85	826.58	-719.67	952.07	8.72	0.09
79	6485.00	90.28	170.61	5878.30	919.43	-811.28	967.94	2.70	0.03
80	6578.00	92.04	171.32	5876.42	1012.33	-903.10	982.55	2.04	0.02
81	6671.00	92.80	173.77	5872.49	1105.23	-995.23	994.60	2.76	0.01
82	6765.00	93.50	177.66	5867.33	1198.99	-1088.81	1001.61	4.20	0.01
83	6858.00	90.20	179.45	5864.32	1291.52	-1181.71	1003.96	4.04	-0.04
84	6951.00	88.29	181.18	5865.55	1383.80	-1274.69	1003.45	2.77	-0.02
85	7044.00	88.38	181.03	5868.25	1475.89	-1367.64	1001.65	0.19	0.00
86	7137.00	88.01	179.92	5871.18	1568.10	-1460.59	1000.88	1.26	0.00
87	7230.00	89.78	181.59	5872.97	1660.28	-1553.55	999.66	2.62	0.02
88	7323.00	90.50	181.36	5872.75	1752.32	-1646.52	997.26	0.81	0.01
89	7417.00	91.15	180.83	5871.39	1845.43	-1740.49	995.47	0.89	0.01
90	7509.00	89.80	180.06	5870.63	1936.70	-1832.48	994.75	1.69	-0.01
91	7602.00	90.06	180.06	5870.74	2029.05	-1925.48	994.65	0.28	0.00
92	7696.00	89.27	178.63	5871.29	2122.51	-2019.47	995.73	1.74	-0.01
93	7789.00	88.77	178.88	5872.88	2215.07	-2112.44	997.75	0.60	-0.01
94	7882.00	88.32	178.89	5875.25	2307.59	-2205.39	999.56	0.48	0.00
95	7975.00	87.71	178.80	5878.47	2400.09	-2298.31	1001.43	0.66	-0.01
96	8068.00	89.08	179.27	5881.07	2492.58	-2391.26	1003.00	1.56	0.01
97	8160.00	91.12	180.05	5880.91	2584.00	-2483.26	1003.54	2.37	0.02
98	8253.00	90.95	179.09	5879.23	2676.42	-2576.24	1004.24	1.05	0.00
99	8346.00	90.90	179.09	5877.73	2768.92	-2669.21	1005.72	0.05	0.00
100	8439.00	90.70	178.80	5876.43	2861.45	-2762.19	1007.43	0.38	0.00
101	8532.00	90.11	178.80	5875.77	2954.01	-2855.16	1009.38	0.63	-0.01
102	8625.00	89.78	181.48	5875.86	3046.33	-2948.16	1009.15	2.90	0.00
103	8718.00	88.64	181.44	5876.63	3138.44	-3041.46	1007.86	2.83	-0.01
104	8811.00	87.71	181.44	5877.07	3230.34	-3134.46	1006.57	2.76	-0.01
105	8904.00	86.77	181.44	5877.26	3322.03	-3227.46	1005.28	2.69	-0.01
106	9000.00	85.84	181.44	5877.21	3413.51	-3320.46	1004.00	2.62	-0.01
107	9096.00	84.91	181.44	5877.01	3504.79	-3413.46	1002.71	2.55	-0.01
108	9192.00	83.98	181.44	5876.66	3595.87	-3506.46	1001.43	2.48	-0.01
109	9288.00	83.05	181.44	5876.16	3686.75	-3600.46	1000.14	2.41	-0.01
110	9384.00	82.12	181.44	5875.51	3777.43	-3694.46	998.85	2.34	-0.01
111	9480.00	81.19	181.44	5874.71	3867.91	-3788.46	997.56	2.27	-0.01
112	9576.00	80.26	181.44	5873.76	3958.19	-3882.46	996.27	2.20	-0.01
113	9672.00	79.33	181.44	5872.66	4048.27	-3976.46	994.98	2.13	-0.01
114	9768.00	78.40	181.44	5871.41	4138.15	-4070.46	993.69	2.06	-0.01
115	9864.00	77.47	181.44	5870.01	4227.83	-4164.46	992.40	1.99	-0.01
116	9960.00	76.54	181.44	5868.46	4317.31	-4258.46	991.11	1.92	-0.01
117	10056.00	75.61	181.44	5866.76	4406.59	-4352.46	989.82	1.85	-0.01
118	10152.00	74.68	181.44	5864.91	4495.67	-4446.46	988.53	1.78	-0.01
119	10248.00	73.75	181.44	5862.91	4584.55	-4540.46	987.24	1.71	-0.01
120	10344.00	72.82	181.44	5860.76	4673.23	-4634.46	985.95	1.64	-0.01
121	10440.00	71.89	181.44	5858.46	4761.71	-4728.46	984.66	1.57	-0.01
122	10536.00	70.96	181.44	5856.01	4850.19	-4822.46	983.37	1.50	-0.01
123	10632.00	70.03	181.44	5853.41	4938.47	-4916.46	982.08	1.43	-0.01
124	10728.00	69.10	181.44	5850.66	5026.55	-5010.46	980.79	1.36	-0.01
125	10824.00	68.17	181.44	5847.76	5114.43	-5104.46	979.50	1.29	-0.01
126	10920.00	67.24	181.44	5844.71	5202.11	-5198.46	978.21	1.22	-0.01
127	11016.00	66.31	181.44	5841.51	5289.59	-5292.46	976.92	1.15	-0.01
128	11112.00	65.38	181.44	5838.16	5376.87	-5386.46	975.63	1.08	-0.01
129	11208.00	64.45	181.44	5834.66	5463.95	-5480.46	974.34	1.01	-0.01
130	11304.00	63.52	181.44	5831.01	5550.83	-5574.46	973.05	0.94	-0.01
131	11400.00	62.59	181.44	5827.21	5637.51	-5668.46	971.76	0.87	-0.01
132	11496.00	61.66	181.44	5823.26	5723.99	-5762.46	970.47	0.80	-0.01
133	11592.00	60.73	181.44	5819.16	5810.27	-5856.46	969.18	0.73	-0.01
134	11688.00	59.80	181.44	5814.91	5896.35	-5950.46	967.89	0.66	-0.01
135	11784.00	58.87	181.44	5810.51	5982.23	-6044.46	966.60	0.59	-0.01
136	11880.00	57.94	181.44	5805.96	6067.91	-6138.46	965.31	0.52	-0.01
137	11976.00	57.01	181.44	5801.26	6153.39	-6232.46	964.02	0.45	-0.01
138	12072.00	56.08	181.44	5796.41	6238.67	-6326.46	962.73	0.38	-0.01
139	12168.00	55.15	181.44	5791.41	6323.75	-6420.46	961.44	0.31	-0.01
140	12264.00	54.22	181.44	5786.26	6408.63	-6514.46	960.15	0.24	-0.01
141	12360.00	53.29	181.44	5780.96	6493.31	-6608.46	958.86	0.17	-0.01
142	12456.00	52.36	181.44	5775.51	6577.79	-6702.46	957.57	0.10	-0.01
143	12552.00	51.43	181.44	5769.91	6662.07	-6796.46	956.28	0.03	-0.01
144	12648.00	50.50	181.44	5764.16	6746.15	-6890.46	954.99	-0.04	-0.01
145	12744.00	49.57	181.44	5758.26	6830.03	-6984.46	953.70	-0.11	-0.01
146	12840.00	48.64	181.44	5752.21	6913.71	-7078.46	952.41	-0.18	-0.01
147	12936.00	47.71	181.44	5746.01	6997.19	-7172.46	951.12	-0.25	-0.01

103	8718.00	88.91	181.14	5876.93	3138.41	-3041.12	1007.02	1.00	-0.01
104	8810.00	88.94	180.83	5878.65	3229.55	-3133.09	1005.44	0.34	0.00
105	8902.00	88.15	180.02	5880.99	3320.80	-3225.06	1004.76	1.23	-0.01
106	8995.00	87.20	179.52	5884.76	3413.12	-3317.98	1005.13	1.15	-0.01
107	9087.00	88.01	180.04	5888.61	3504.45	-3409.90	1005.49	1.05	0.01
108	9179.00	91.23	181.32	5889.22	3595.66	-3501.88	1004.39	3.77	0.04
109	9271.00	90.34	178.75	5887.96	3687.00	-3593.86	1004.34	2.96	-0.01
110	9364.00	91.62	180.59	5886.37	3779.39	-3686.84	1004.87	2.41	0.01
111	9456.00	91.34	180.38	5883.99	3870.63	-3778.80	1004.10	0.38	0.00
112	9549.00	90.20	180.79	5882.74	3962.86	-3871.79	1003.15	1.30	-0.01
113	9641.00	89.66	180.95	5882.85	4054.05	-3963.78	1001.75	0.61	-0.01
114	9734.00	89.30	181.00	5883.70	4146.20	-4056.76	1000.17	0.39	0.00
115	9826.00	89.78	181.48	5884.43	4237.30	-4148.74	998.18	0.74	0.01
116	9918.00	91.20	181.73	5883.65	4328.32	-4240.69	995.60	1.57	0.02
117	10010.00	92.24	181.60	5880.89	4419.29	-4332.61	992.93	1.14	0.01
118	10102.00	91.60	181.73	5877.80	4510.25	-4424.52	990.26	0.71	-0.01
119	10194.00	92.74	181.70	5874.32	4601.18	-4516.41	987.50	1.24	0.01
120	10287.00	92.60	181.55	5869.99	4693.08	-4609.27	984.87	0.22	0.00
121	10379.00	90.00	181.56	5867.90	4784.09	-4701.21	982.37	2.83	-0.03
122	10472.00	90.31	181.97	5867.65	4876.06	-4794.16	979.51	0.55	0.00
123	10564.00	88.49	181.93	5868.61	4967.00	-4886.10	976.38	1.98	-0.02
124	10656.00	89.10	182.28	5870.55	5057.88	-4978.02	973.00	0.76	0.01
125	10748.00	89.72	181.82	5871.49	5148.79	-5069.96	969.71	0.84	0.01
126	10840.00	90.36	181.31	5871.43	5239.82	-5161.92	967.20	0.89	0.01
127	10932.00	91.48	180.95	5869.95	5330.94	-5253.89	965.38	1.28	0.01
128	11024.00	90.28	180.69	5868.54	5422.13	-5345.87	964.07	1.33	-0.01
129	11116.00	89.75	181.66	5868.52	5513.25	-5437.85	962.18	1.20	-0.01
130	11208.00	89.86	180.33	5868.83	5604.40	-5529.83	960.58	1.45	0.00
131	11300.00	91.03	181.35	5868.11	5695.59	-5621.81	959.23	1.69	0.01
132	11392.00	89.75	179.51	5867.49	5786.86	-5713.80	958.54	2.44	-0.01
133	11484.00	89.50	179.14	5868.09	5878.34	-5805.79	959.63	0.49	0.00
134	11576.00	89.64	179.17	5868.78	5969.85	-5897.78	960.99	0.16	0.00
135	11668.00	90.50	178.63	5868.67	6061.40	-5989.76	962.75	1.10	0.01
136	11759.00	89.41	178.34	5868.74	6152.02	-6080.73	965.16	1.24	-0.01
137	11851.00	89.72	178.27	5869.44	6243.66	-6172.69	967.88	0.35	0.00
138	11943.00	89.83	177.94	5869.80	6335.33	-6264.64	970.92	0.38	0.00
139	12036.00	89.13	178.45	5870.64	6427.98	-6357.59	973.85	0.93	-0.01
140	12128.00	89.94	178.67	5871.39	6519.58	-6449.55	976.16	0.91	0.01
141	12220.00	90.73	178.48	5870.85	6611.18	-6541.52	978.45	0.88	0.01
142	12312.00	89.24	177.89	5870.88	6702.84	-6633.47	981.36	1.74	-0.02
143	12404.00	89.66	177.87	5871.76	6794.53	-6725.41	984.77	0.46	0.00
144	12496.00	90.20	178.27	5871.87	6886.21	-6817.35	987.86	0.73	0.01
145	12587.00	89.72	178.27	5871.94	6976.86	-6908.31	990.61	0.53	-0.01
146	12679.00	90.36	178.13	5871.87	7068.52	-7000.26	993.50	0.71	0.01
147	12771.00	90.34	177.23	5871.31	7160.24	-7092.19	997.23	0.98	0.00
148	12863.00	90.39	177.04	5870.72	7252.02	-7184.07	1001.82	0.21	0.00
149	12955.00	90.50	176.56	5870.01	7343.85	-7275.92	1006.96	0.54	0.00
150	13047.00	88.60	178.09	5870.73	7435.60	-7367.81	1011.25	2.65	-0.02
151	13139.00	88.43	178.18	5873.12	7527.24	-7459.73	1014.25	0.21	0.00
152	13231.00	88.80	177.83	5875.34	7618.89	-7551.65	1017.45	0.55	0.00
153	13323.00	89.30	177.48	5876.86	7710.61	-7643.56	1021.21	0.66	0.01
154	13415.00	89.05	177.73	5878.19	7802.33	-7735.47	1025.06	0.38	0.00
155	13507.00	88.88	179.28	5879.85	7893.93	-7827.42	1027.46	1.69	0.00
156	13599.00	89.92	181.00	5880.82	7985.26	-7919.41	1027.23	2.18	0.01
157	13691.00	90.81	180.84	5880.23	8076.43	-8011.40	1025.75	0.98	0.01
158	13783.00	90.28	179.68	5879.35	8167.74	-8103.39	1025.34	1.39	-0.01