Company : **NORTHEAST NATURAL ENERGY LLC**
Well : **BOGGESS 17H ST01**
Field : **MARCELLUS SHALE**

Date : **28-Jun-2019**
Time : **11:40**

GAMMA-RAY

Schlumberger

1" = 100'
FEET MD

COMPANY : NORTHEAST NATURAL ENERGY LLC
WELL : BOGGESS 17H ST01
FIELD : MARCELLUS SHALE
COUNTY : MONONGALIA
STATE : WV
COUNTRY : USA
API No.: 47-061-01812

COMPANY : NORTHEAST NATURAL ENERGY LLC
WELL : BOGGESS 17H ST01
FIELD : MARCELLUS SHALE
COUNTY : MONONGALIA
STATE : WV
COUNTRY : USA
API No.: 47-061-01812

WELL LOCATION

LAT:39°40'13"N LON:80°05'35"W
X:1,801,561' Y:426,810' NAD83

SEC: TWP: RANGE:

OTHER SERVICES

DIRECTIONAL
ROP

DEPTH REF. : ROTARY TABLE
ELEVATION : 25.00 ft (ROTARY TABLE - GROUND LEVEL)
ALTITUDE : 1268.00 ft (GROUND LEVEL - MEAN SEA LEVEL)

BOREHOLE RECORD

HOLE SIZE in	FROM ft	TO ft
8 1/2	5236	19055

CASING RECORD

CASING SIZE in	FROM ft	TO ft
9 5/8	25	2438

DEVIATION RECORD

INCLINATION deg	FROM ft	TO ft
00 - 00	25	5290
00 - 56	5290	6143
56 +/-1	6143	9081
56 - 87	9081	10408
87 +/-4	10408	19055

DRILLING Co.: PATTERSON
RIG : 334
LWD UNIT No.: TRAILER DISTRICT : NEB
SPUD DATE : 21-JUN-19
LWD START DATE : 21-JUN-19 DEPTH : 5213 ft
LWD END DATE : 29-JUN-19 DEPTH : 19032 ft
TOTAL DEPTH : 19055 ft

RUN DATA

RUN NUMBER	1
START DATE	20-JUN-19
START TIME	22:00
END DATE	28-JUN-19
END TIME	09:00
DEPTH IN ft	5236
DEPTH OUT ft	19055
LOG TOP ft	5213
LOG BOTTOM ft	19032
HOLE SIZE in	8 1/2
MUD DATA @ ft	19055
MUD TYPE	OIL BASED
DENSITY lb/gal	12.00
VISCOSITY s/qt	67
pH	
FLUID LOSS cm3/30	12.5
SALINITY ppm	34000
Rm ohmm @ deg F	@
Rmf ohmm @ deg F	@

MAX REC TEMP deg F	231					
Rm @ MAX TEMP ohmm						
LWD ENGINEER #1	M.KHALIL					
LWD ENGINEER #2						
LWD ENGINEER #3						

REMARKS

NORTHEAST NATURAL ENERGY LLC, AFE#: 100430-603

SCHLUMBERGER JOB#: 19NEB1089

ALL LOGGING DATA IS MEMORY UNLESS STATED OTHERWISE.

ALL REFERENCES TO LOG TOP, LOG BOTTOM OR LOGGING TOOL DEPTH REFER TO THE GAMMA-RAY SENSO UNLESS STATED OTHERWISE.

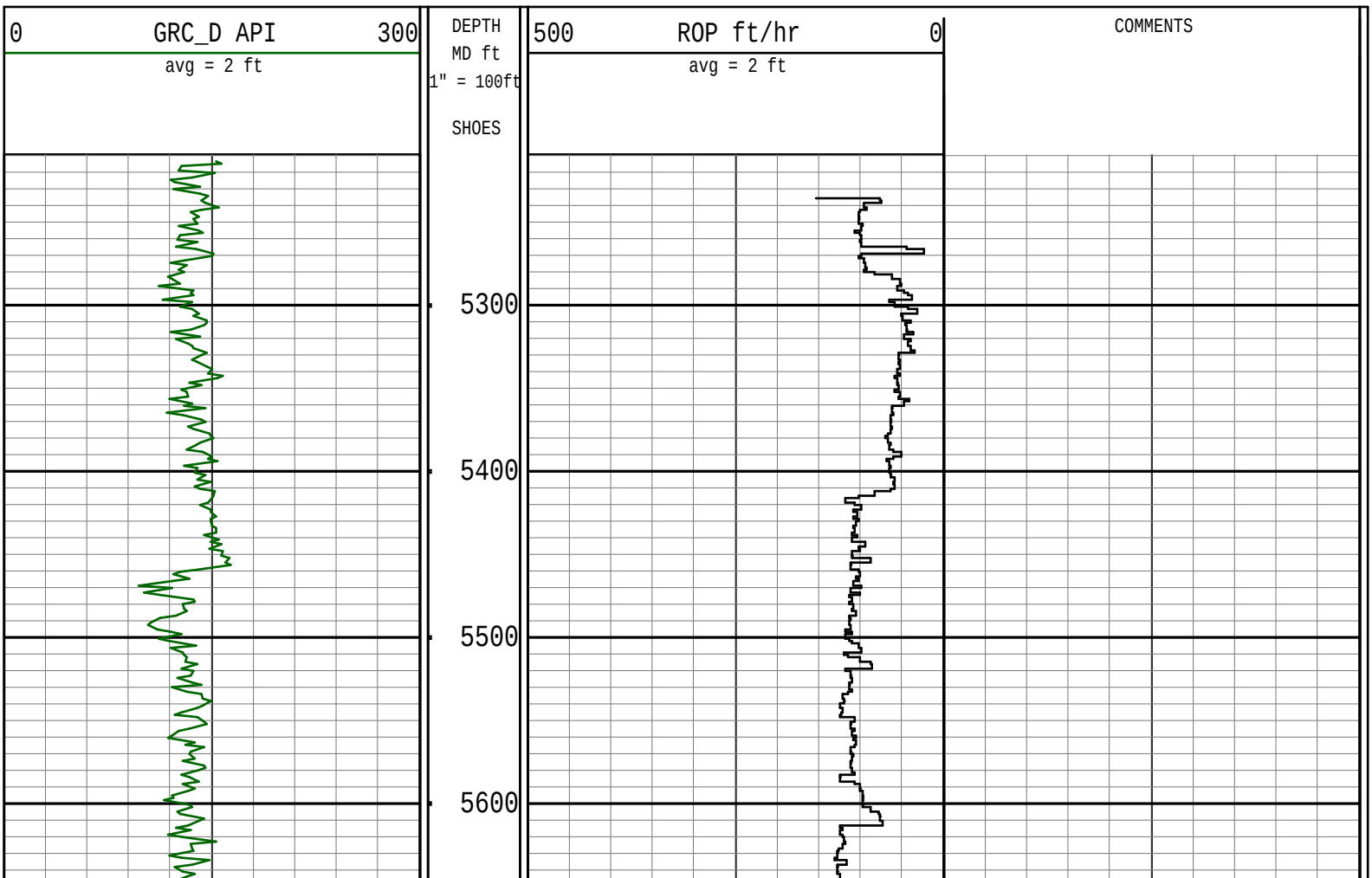
ALL ANNOTATIONS IN THE DEPTH TRACK ARE REFERENCED TO BIT DEPTH.

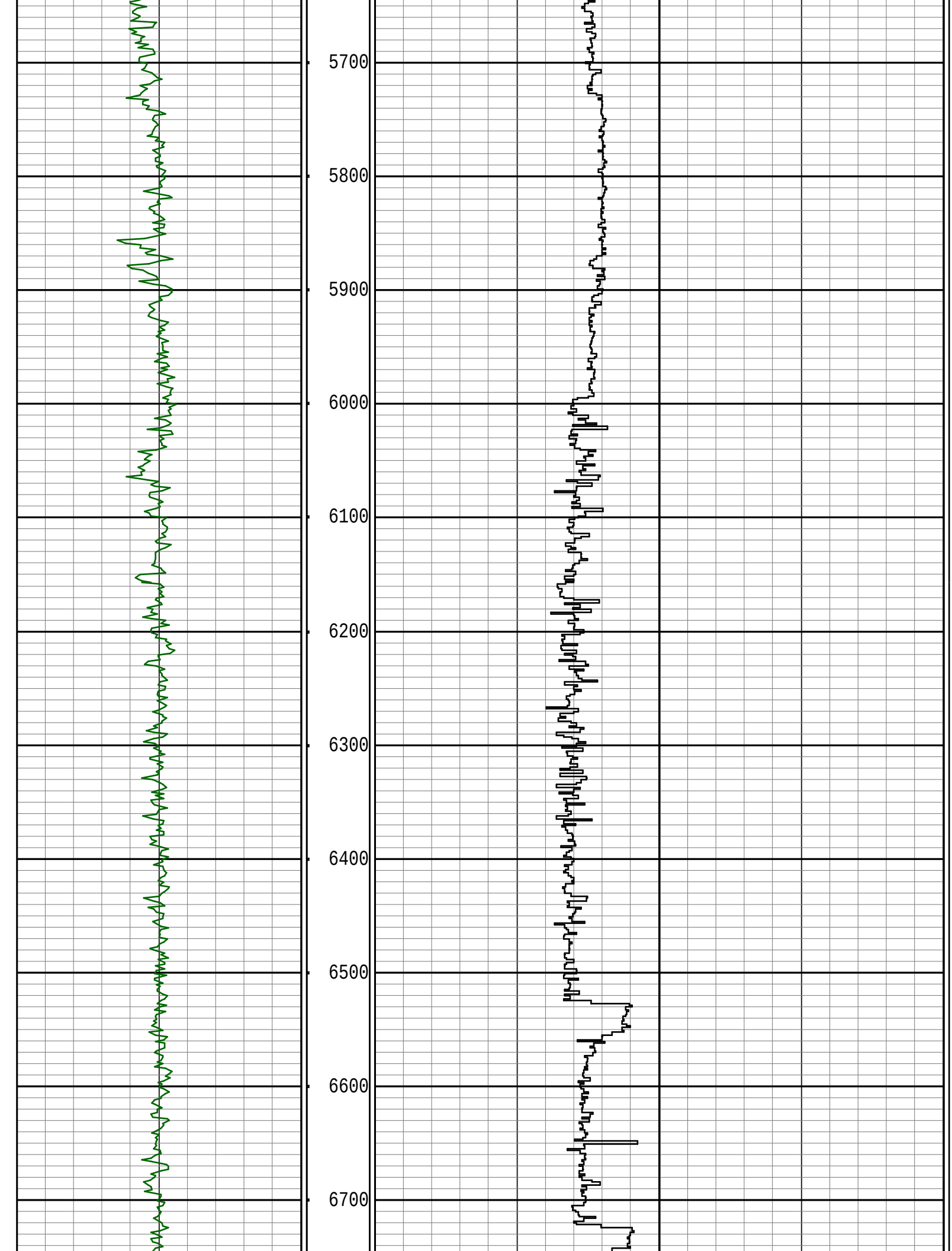
THIRD PARTY DEPTH TRACKING SERVICES PROVIDED BY PASON.

RUN #1: 6 3/4" XBOLT/AGR LOGGING RUN.

Version No : RX6 V7.02B Release 18Sep2017

Plot Time : 28-Jun-2019 11:38

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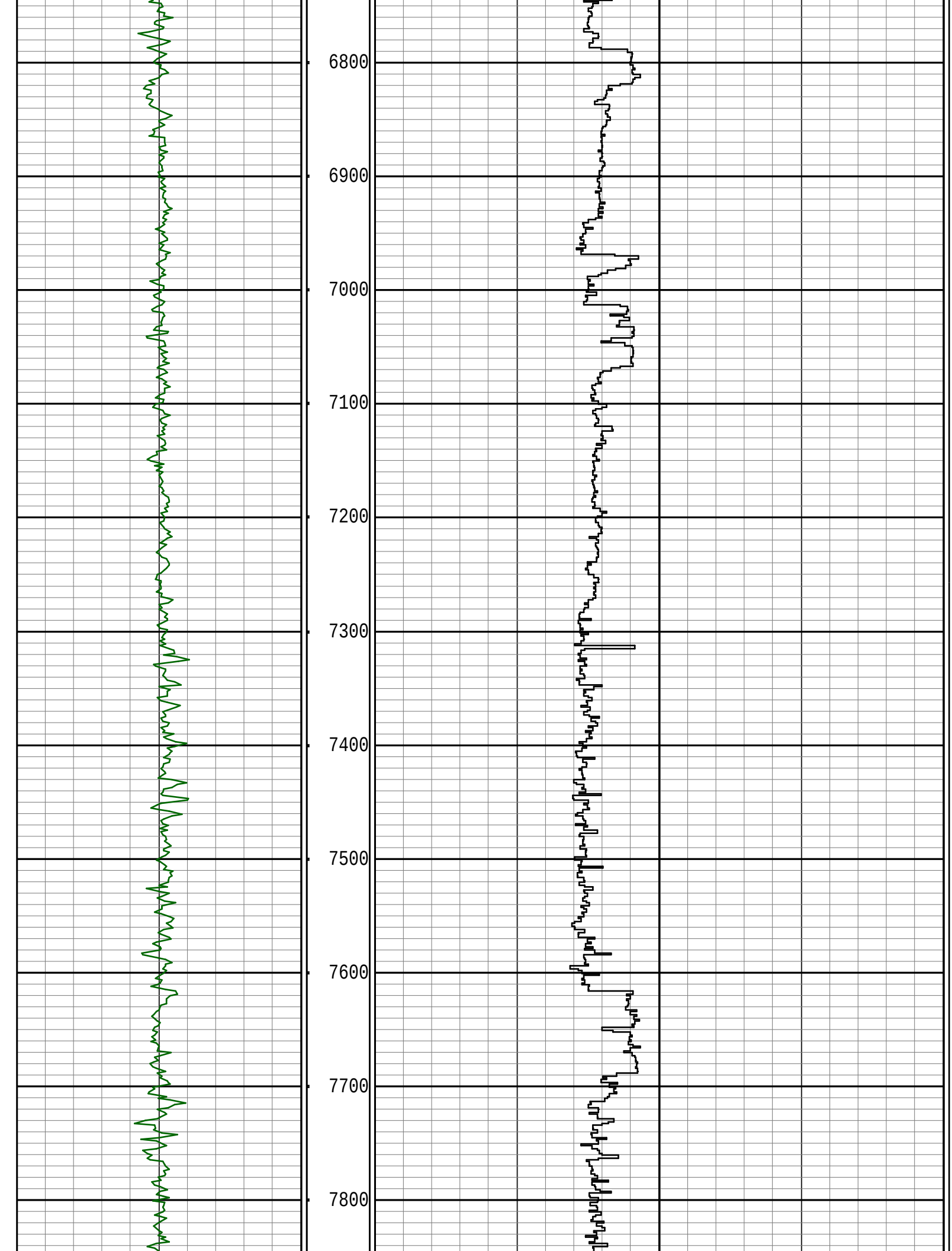
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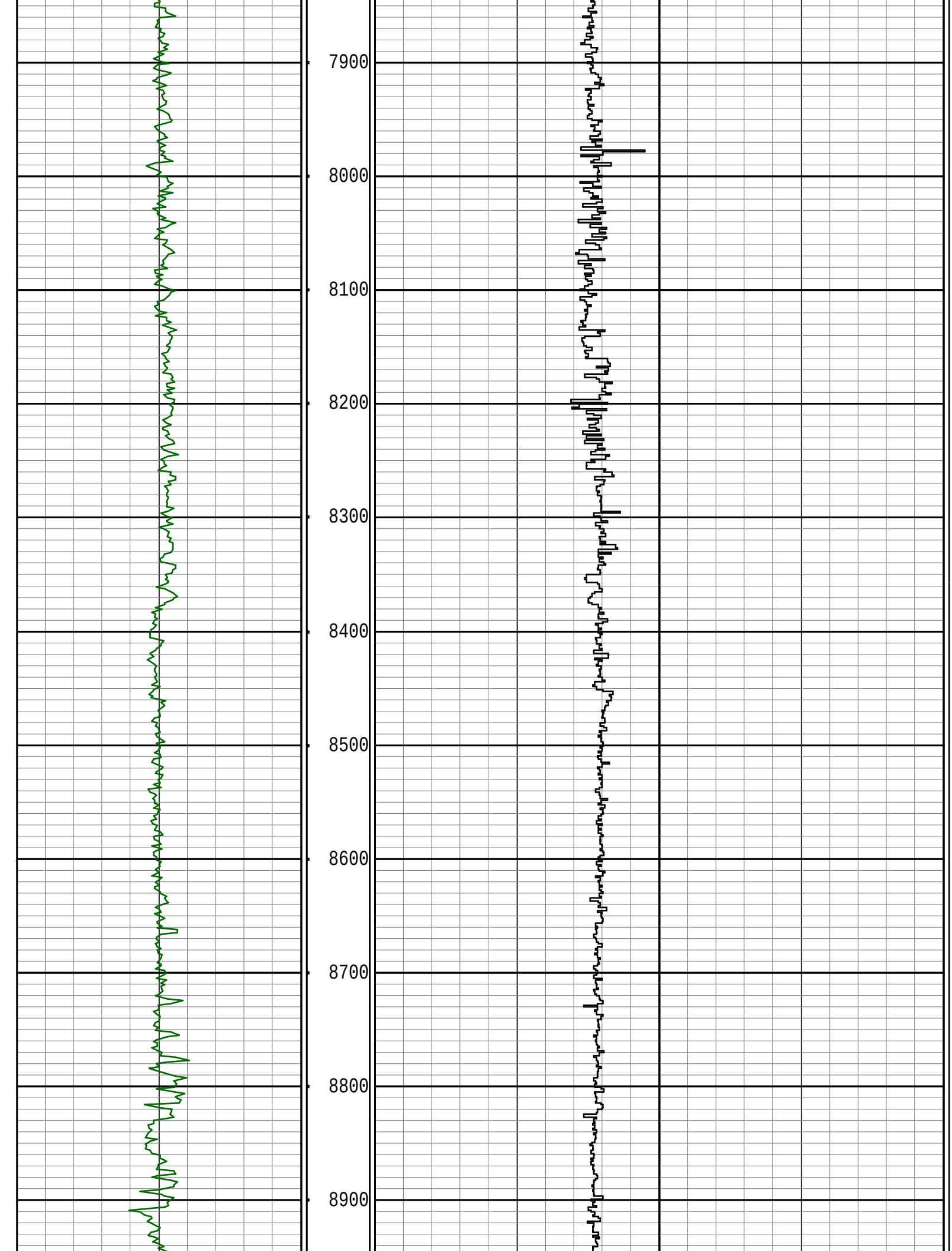
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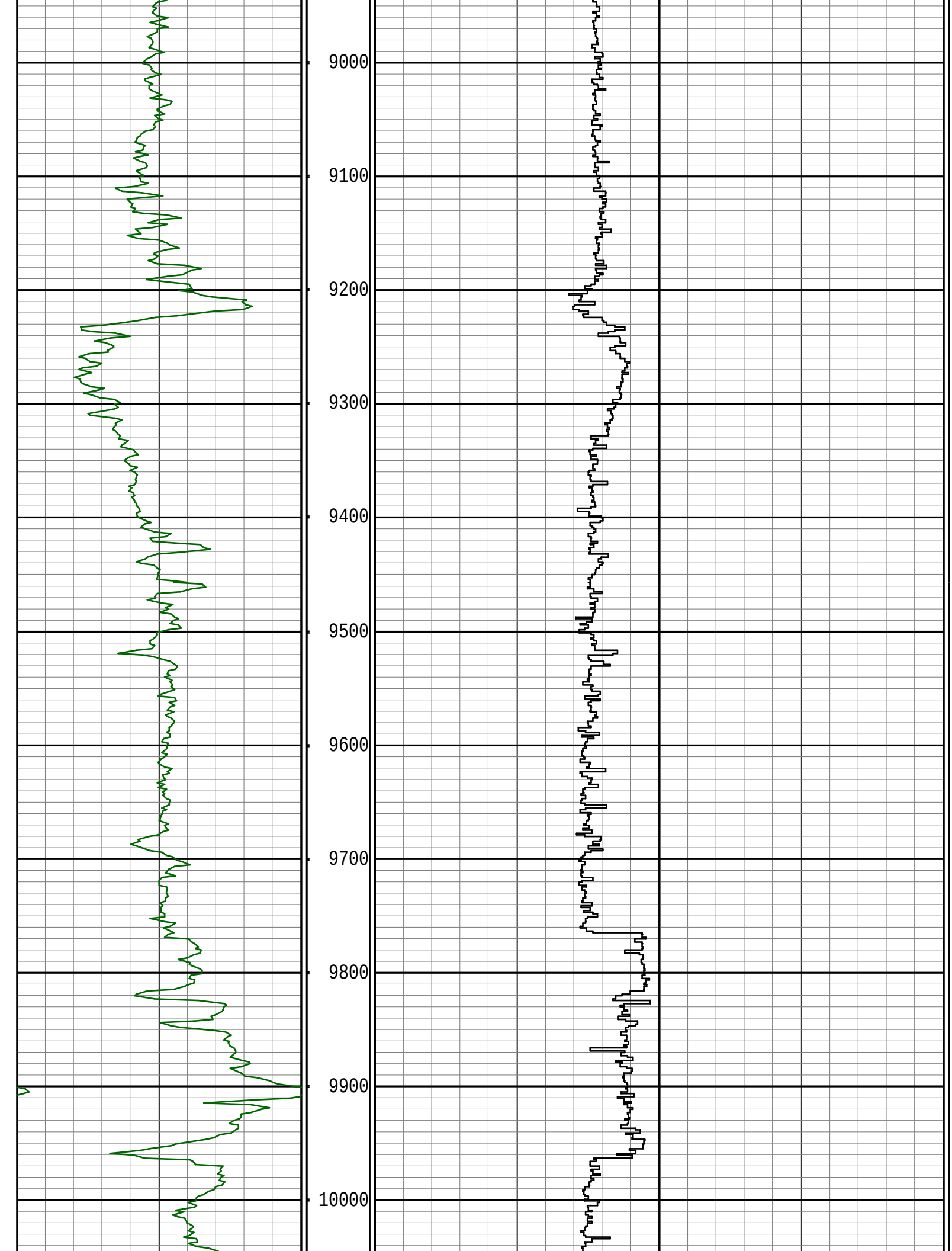
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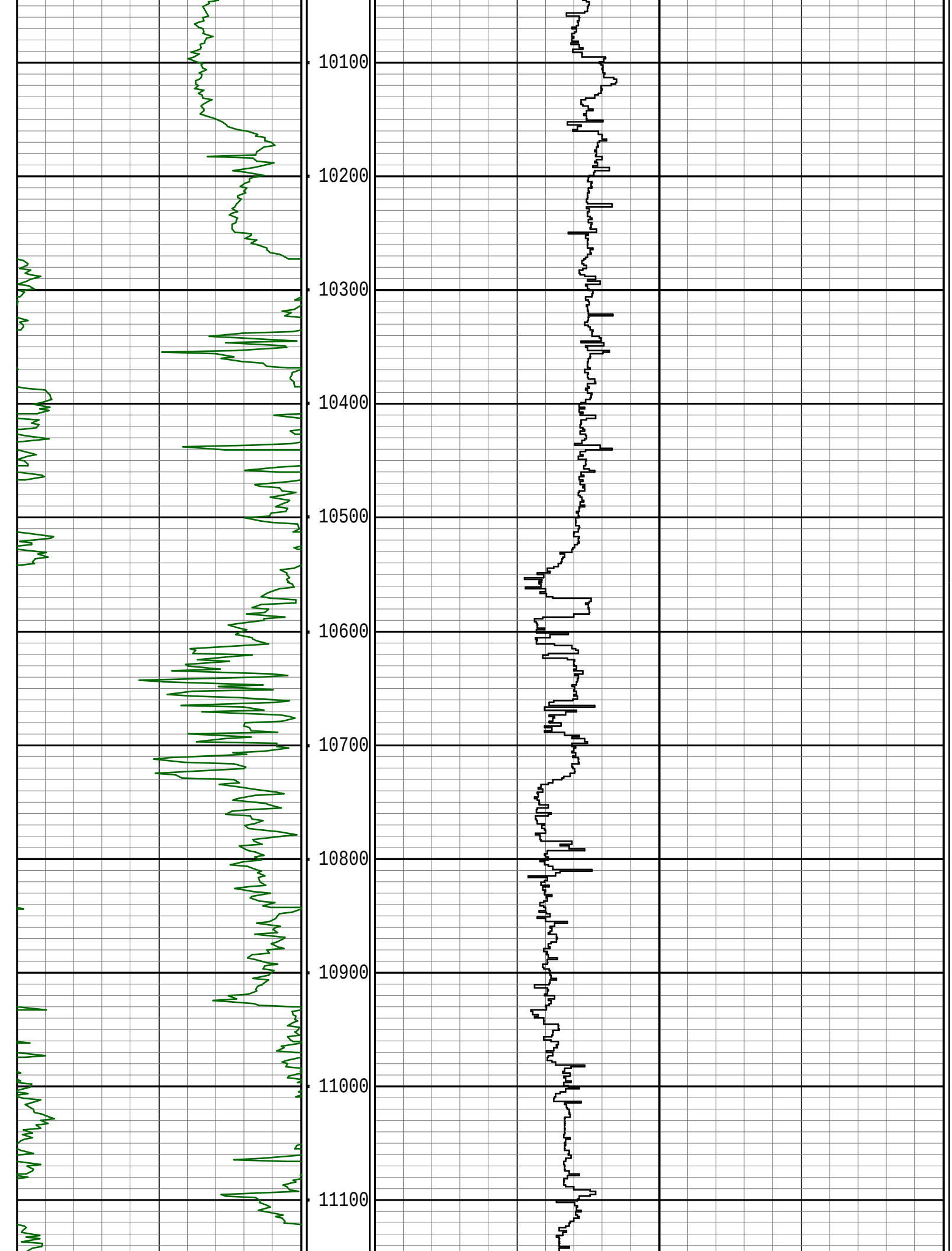
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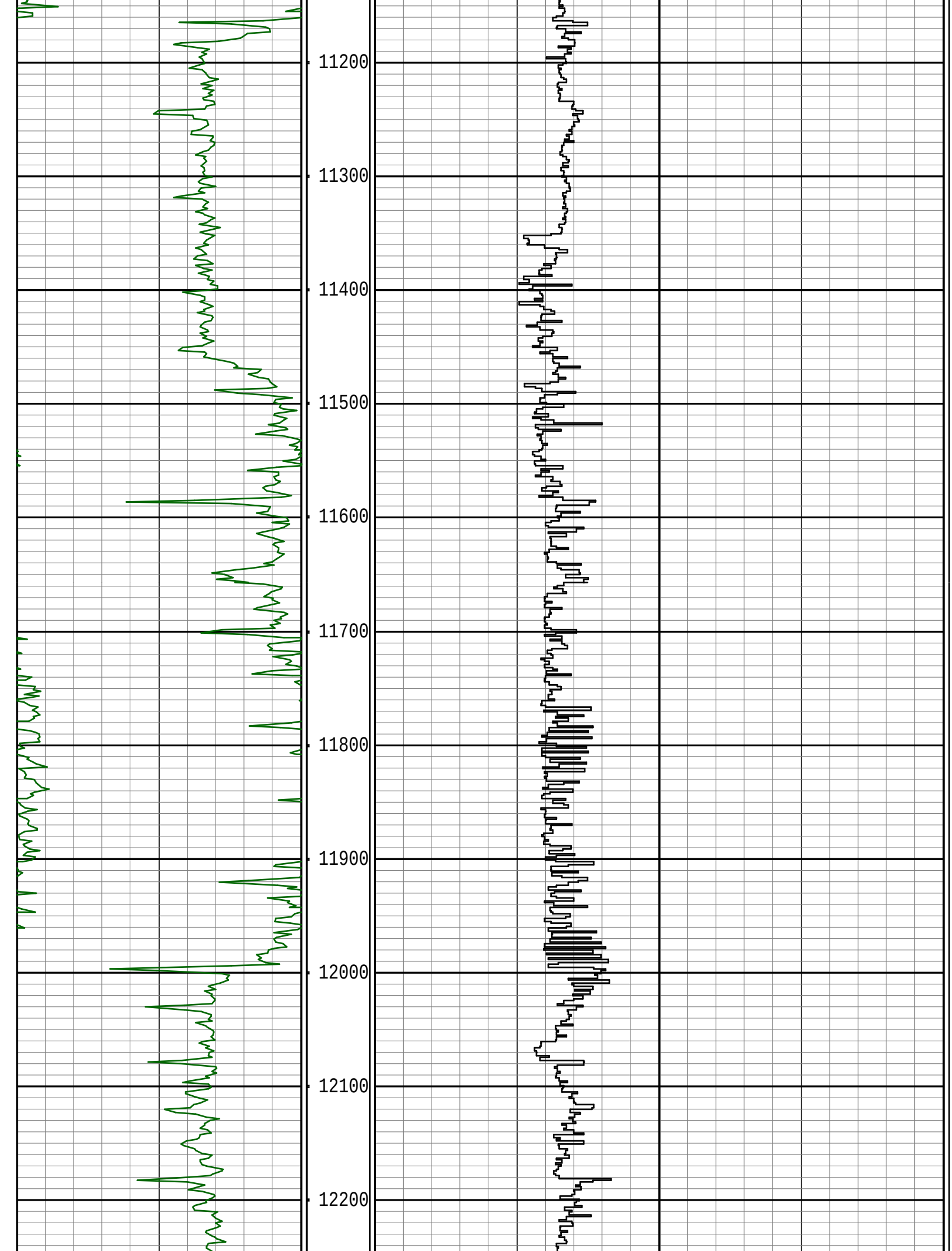
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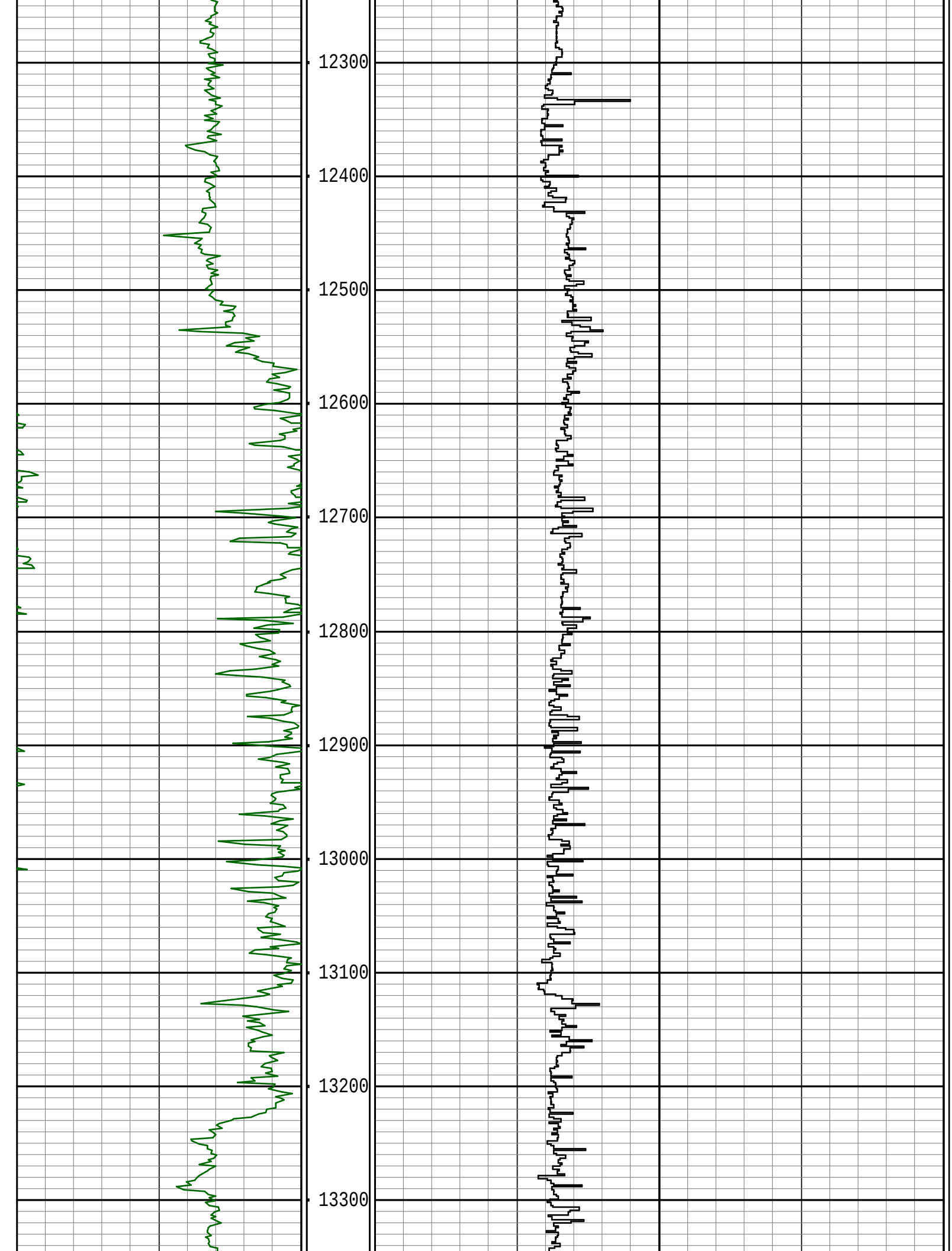
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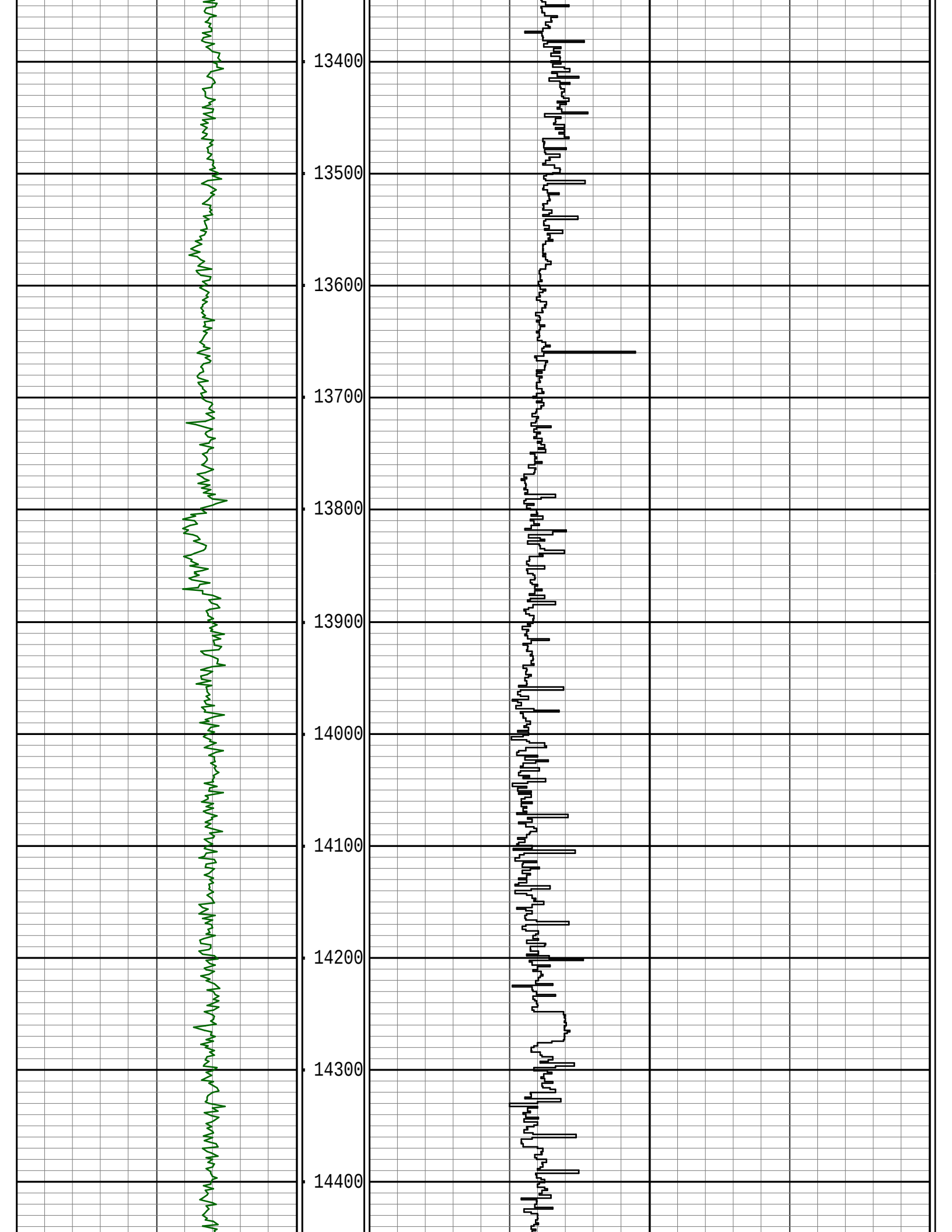
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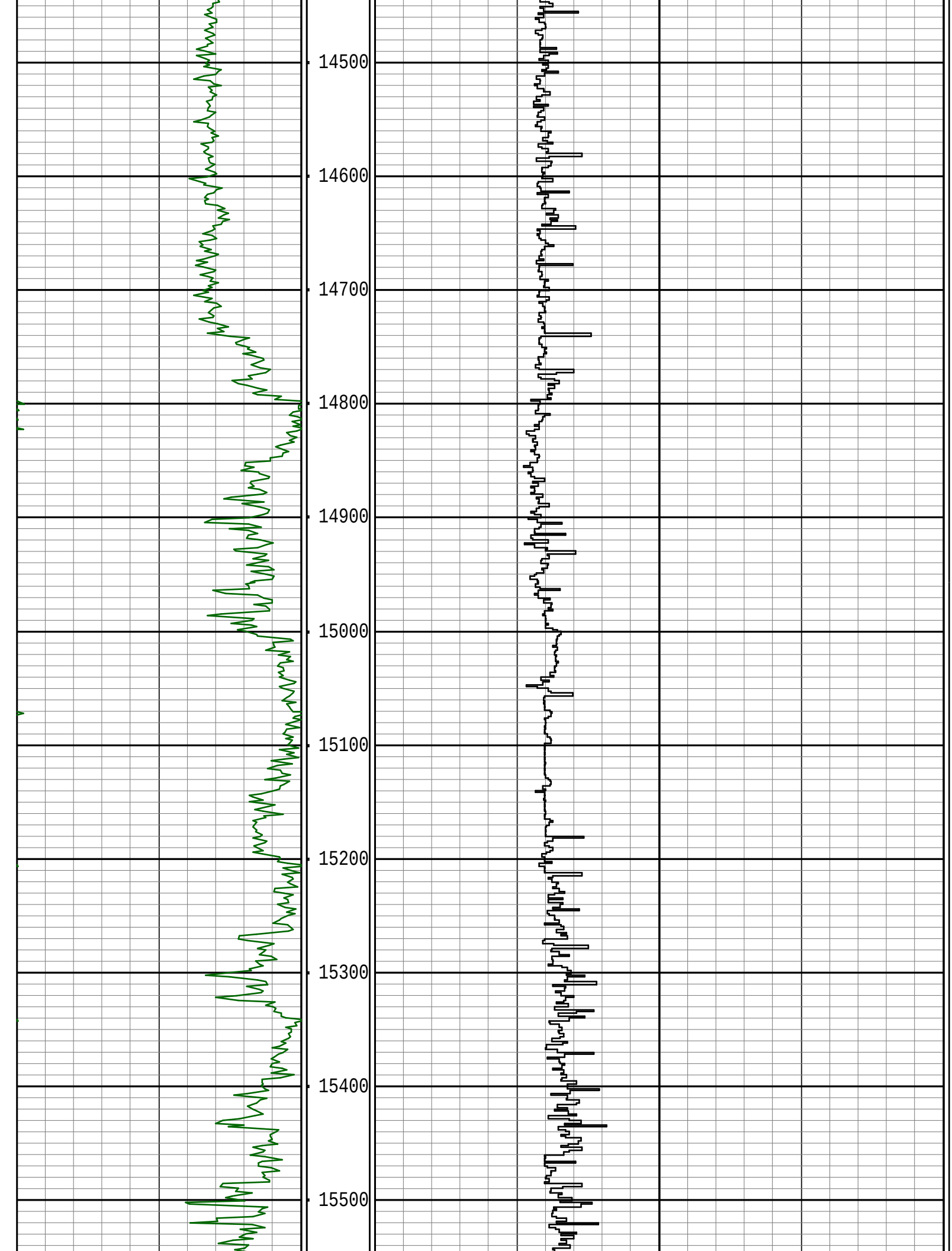
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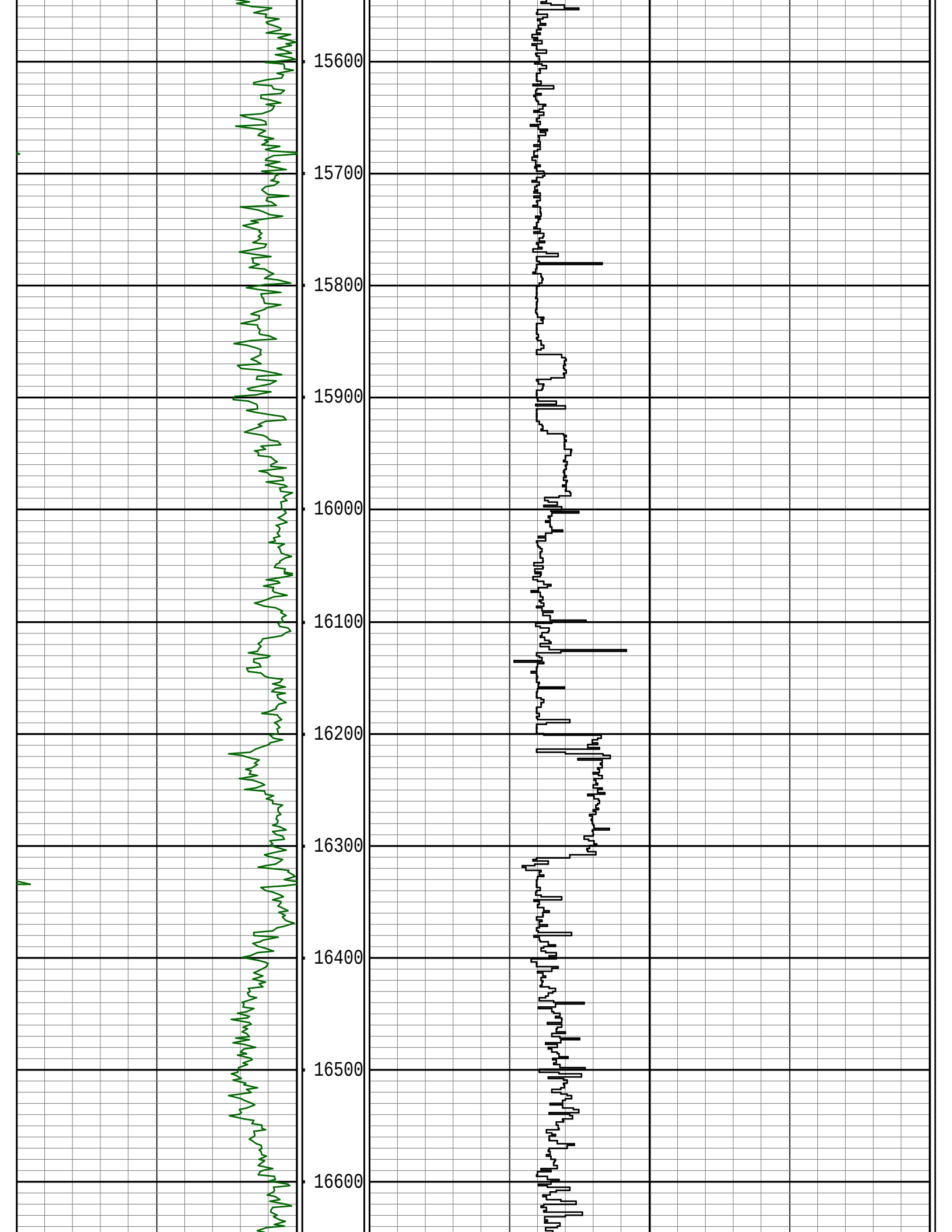
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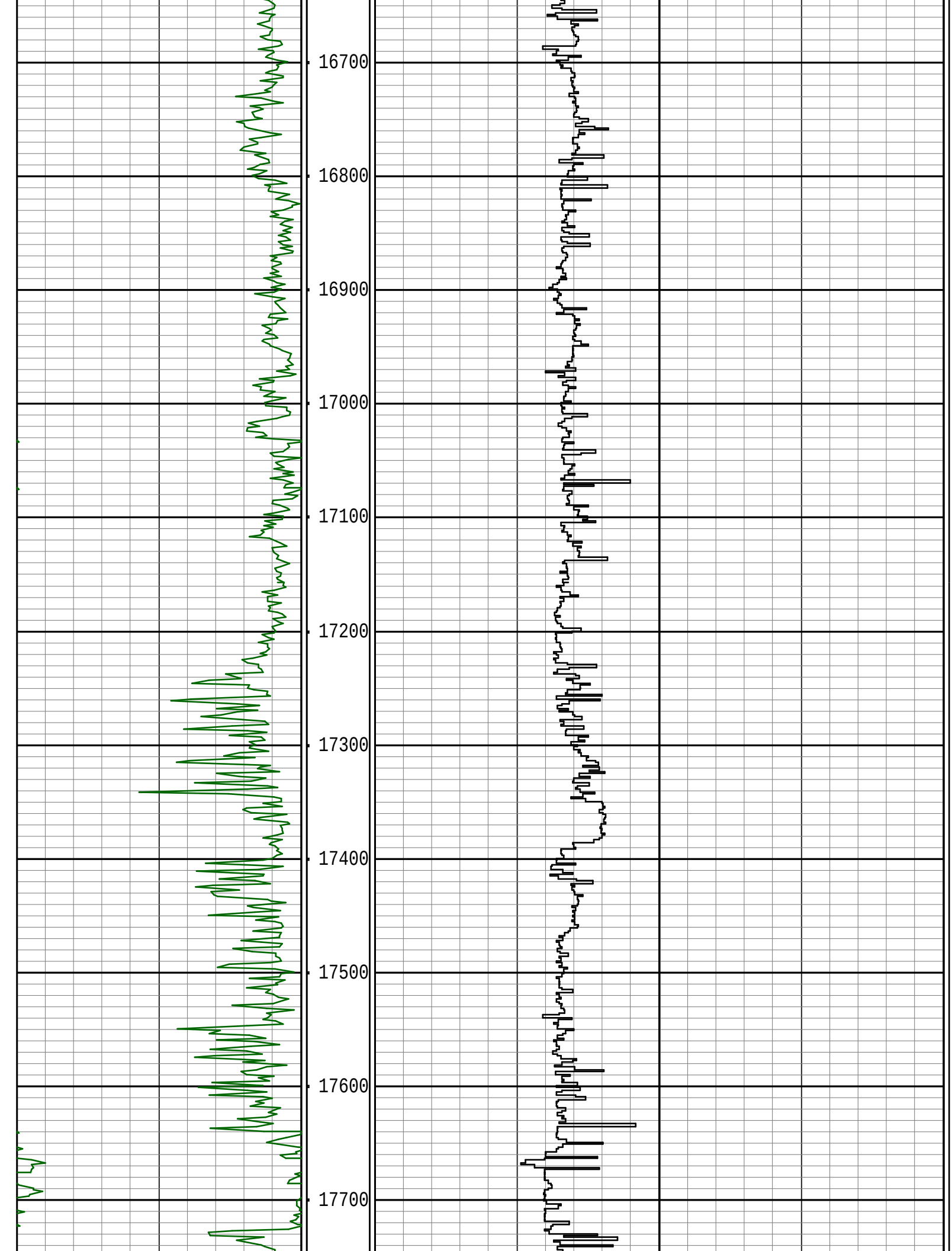
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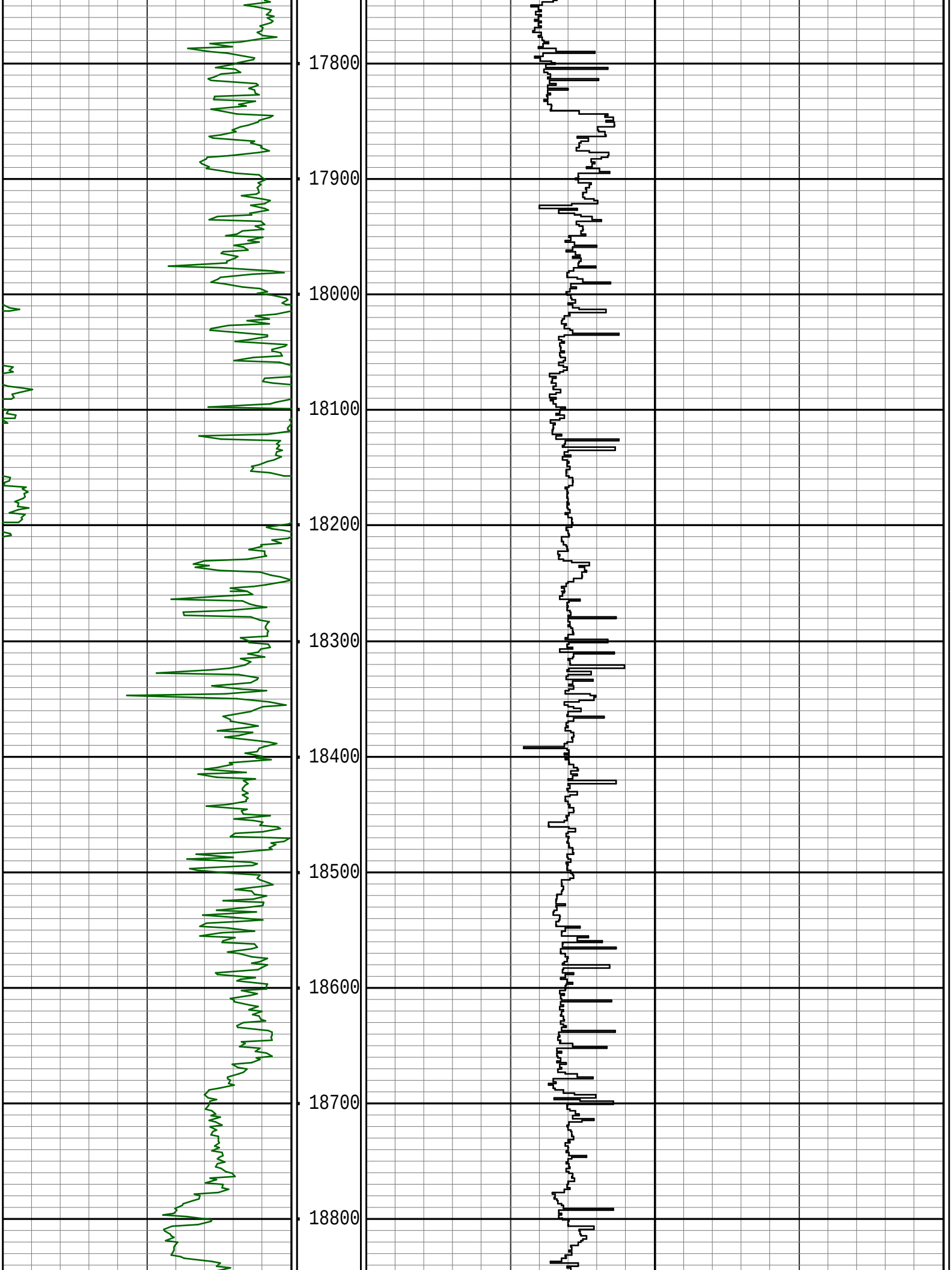
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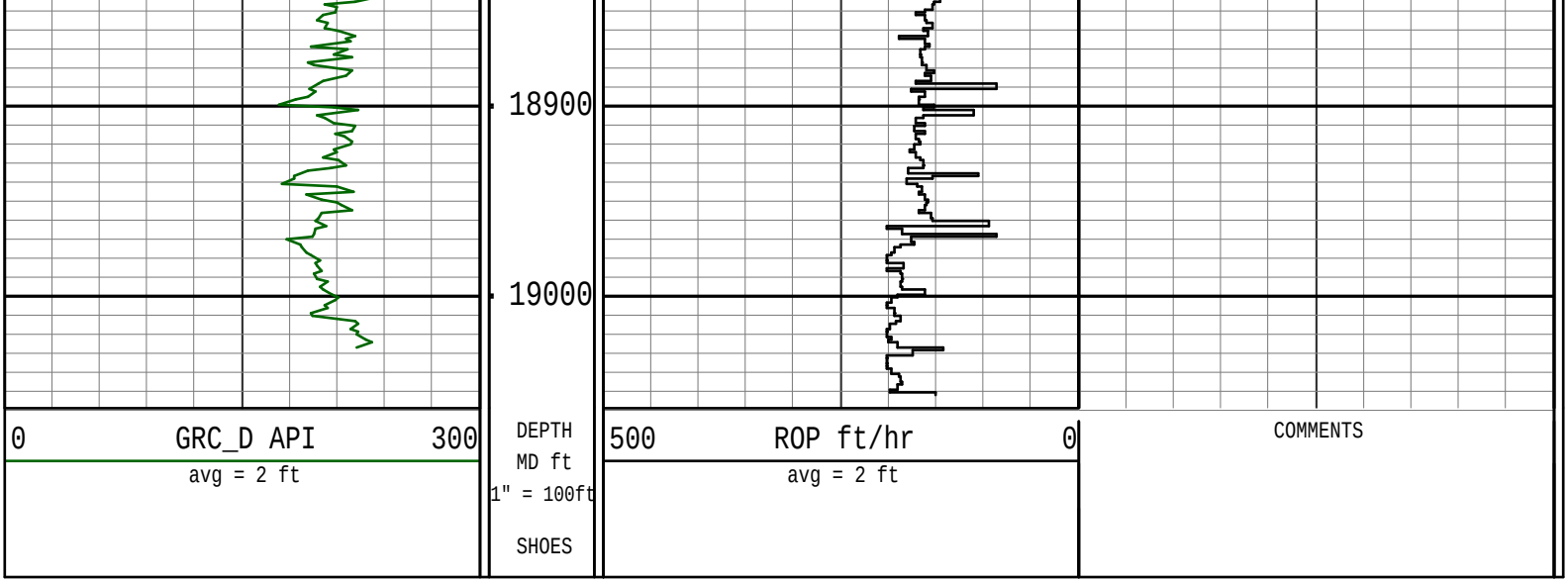

Survey Report

Vertical Section Plane: 329.66°	Total Correction: 9.27° West to True
Calculation Method: Minimum Curvature	Survey Reference: Wellhead
North Aligned to: True North	Well: BOGGESS 17H ST01
RT: 25' ROTARY TABLE TO GROUND LEVEL	FIELD: MARCELLUS SHALE

Measured Depth (ft)	Inclination (deg)	Azimuth (deg)	TVD (ft)	Course Length (ft)	Vertical Section (ft)	Rect Co-ord North (ft)	Rect Co-ord East (ft)	Closure Distance (ft)	Closure Direction (deg)	Dog-leg Severity (dg/hft)	Temp (deg F)
ORIGIN OF WELL AT SURFACE											
0.00	0.00	0.00	0.00		0.00	0.00 N	0.00 E	0.00	0.00		
THE FOLLOWING ARE MULTISHOT SURVEYS											
110.00	0.16	266.21	110.00	110.00	0.07	0.01 S	0.15 W	0.15	266.21	0.14	
210.00	0.15	259.79	210.00	100.00	0.18	0.04 S	0.42 W	0.42	264.23	0.02	
310.00	0.16	259.84	310.00	100.00	0.27	0.09 S	0.69 W	0.69	262.51	0.01	
410.00	0.17	250.98	410.00	100.00	0.35	0.16 S	0.97 W	0.98	260.39	0.03	
510.00	0.16	258.86	510.00	100.00	0.42	0.24 S	1.24 W	1.27	259.13	0.02	
610.00	0.15	93.36	610.00	100.00	0.39	0.27 S	1.25 W	1.28	257.65	0.31	
710.00	0.19	77.78	710.00	100.00	0.27	0.25 S	0.96 W	0.99	255.58	0.06	
810.00	0.16	77.09	810.00	100.00	0.18	0.18 S	0.66 W	0.68	254.73	0.03	
910.00	0.12	56.80	910.00	100.00	0.14	0.09 S	0.43 W	0.44	258.15	0.06	
1010.00	0.22	319.13	1010.00	100.00	0.33	0.11 N	0.47 W	0.49	283.26	0.26	
1110.00	0.22	324.63	1110.00	100.00	0.71	0.41 N	0.71 W	0.82	300.22	0.02	
1210.00	0.17	74.03	1210.00	100.00	0.87	0.61 N	0.68 W	0.91	312.01	0.32	
1310.00	0.36	91.78	1309.99	100.00	0.67	0.64 N	0.22 W	0.68	340.98	0.20	
1410.00	0.36	98.88	1409.99	100.00	0.30	0.58 N	0.40 E	0.71	34.66	0.05	
1510.00	0.38	103.44	1509.99	100.00	-0.13	0.46 N	1.04 E	1.13	66.16	0.03	
1610.00	0.43	111.91	1609.99	100.00	-0.65	0.24 N	1.71 E	1.72	81.97	0.08	
1710.00	0.47	117.31	1709.98	100.00	-1.30	0.09 S	2.42 E	2.42	92.07	0.06	
1810.00	0.48	119.63	1809.98	100.00	-2.01	0.48 S	3.15 E	3.18	98.72	0.02	
1910.00	0.58	128.60	1909.98	100.00	-2.84	1.01 S	3.91 E	4.03	104.43	0.13	
2010.00	0.58	136.87	2009.97	100.00	-3.81	1.69 S	4.65 E	4.95	109.99	0.08	
2110.00	0.57	134.85	2109.97	100.00	-4.78	2.41 S	5.35 E	5.87	114.27	0.02	
2210.00	0.59	134.53	2209.96	100.00	-5.76	3.12 S	6.07 E	6.82	117.23	0.02	
2310.00	0.56	139.11	2309.96	100.00	-6.74	3.85 S	6.75 E	7.78	119.70	0.05	
2410.00	0.46	140.69	2409.95	100.00	-7.61	4.53 S	7.33 E	8.62	121.74	0.10	
2510.00	0.47	137.61	2509.95	100.00	-8.41	5.15 S	7.86 E	9.39	123.22	0.03	
2610.00	0.49	139.22	2609.95	100.00	-9.23	5.77 S	8.42 E	10.21	124.45	0.02	
2710.00	0.54	135.94	2709.94	100.00	-10.11	6.44 S	9.02 E	11.08	125.50	0.06	
2810.00	0.57	134.87	2809.94	100.00	-11.05	7.13 S	9.70 E	12.04	126.29	0.03	
2910.00	0.57	139.68	2909.93	100.00	-12.02	7.86 S	10.38 E	13.02	127.13	0.05	
3010.00	0.56	141.26	3009.93	100.00	-12.99	8.62 S	11.00 E	13.98	128.06	0.02	
3110.00	0.52	146.54	3109.92	100.00	-13.93	9.38 S	11.56 E	14.88	129.04	0.06	
3210.00	0.52	145.87	3209.92	100.00	-14.84	10.13 S	12.07 E	15.75	130.02	0.01	
3310.00	0.55	134.35	3309.91	100.00	-15.75	10.84 S	12.66 E	16.67	130.57	0.11	
3410.00	0.67	125.51	3409.91	100.00	-16.75	11.52 S	13.48 E	17.73	130.50	0.15	
3510.00	0.66	125.35	3509.90	100.00	-17.81	12.19 S	14.43 E	18.89	130.19	0.01	
3610.00	0.62	122.70	3609.90	100.00	-18.81	12.81 S	15.35 E	20.00	129.85	0.05	
3710.00	0.54	116.16	3709.89	100.00	-19.69	13.31 S	16.23 E	20.99	129.36	0.10	
3810.00	0.50	115.15	3809.89	100.00	-20.44	13.71 S	17.05 E	21.88	128.80	0.04	
3910.00	0.51	119.11	3909.88	100.00	-21.19	14.11 S	17.83 E	22.74	128.35	0.04	
4010.00	0.49	138.77	4009.88	100.00	-21.99	14.65 S	18.50 E	23.60	128.37	0.17	
4110.00	0.46	141.40	4109.88	100.00	-22.81	15.28 S	19.04 E	24.41	128.76	0.04	
4210.00	0.45	138.38	4209.87	100.00	-23.59	15.89 S	19.55 E	25.19	129.11	0.03	
4310.00	0.44	145.10	4309.87	100.00	-24.36	16.50 S	20.03 E	25.95	129.48	0.05	
4410.00	0.43	144.34	4409.87	100.00	-25.11	17.12 S	20.47 E	26.68	129.91	0.01	
4510.00	0.38	173.10	4509.86	100.00	-25.79	17.75 S	20.72 E	27.29	130.58	0.21	
4610.00	0.41	173.21	4609.86	100.00	-26.42	18.44 S	20.81 E	27.80	131.54	0.03	
4710.00	0.66	213.04	4709.86	100.00	-27.01	19.28 S	20.54 E	28.16	133.19	0.43	
4810.00	0.71	229.84	4809.85	100.00	-27.37	20.16 S	19.75 E	28.22	135.59	0.21	

4910.00	0.73	240.96	4909.84	100.00	-27.46	20.87 S	18.72 E	28.03	138.11	0.14	
5010.00	0.64	245.75	5009.84	100.00	-27.39	21.41 S	17.65 E	27.74	140.49	0.11	
5110.00	0.49	247.03	5109.83	100.00	-27.28	21.80 S	16.75 E	27.49	142.47	0.15	
THE FOLLOWING ARE SCHLUMBERGER MWD SURVEYS											
5290.00	0.90	295.10	5289.82	180.00	-26.01	21.50 S	14.76 E	26.08	145.53	0.38	129.94
5385.00	12.48	0.89	5384.04	95.00	-16.59	10.88 S	14.24 E	17.92	127.39	12.78	140.78
5480.00	16.24	36.18	5476.23	95.00	-2.48	10.15 N	22.26 E	24.46	65.49	9.83	140.78
5575.00	22.89	44.32	5565.71	95.00	7.71	34.12 N	43.04 E	54.92	51.59	7.55	144.39
5670.00	29.26	33.04	5651.05	95.00	23.02	66.86 N	68.65 E	95.82	45.76	8.47	144.39
5764.00	36.99	28.56	5729.73	94.00	47.97	111.03 N	94.73 E	145.95	40.47	8.62	144.39
5859.00	46.17	29.29	5800.71	95.00	80.12	166.13 N	125.23 E	208.04	37.01	9.68	148.01
5953.00	54.05	32.58	5860.96	94.00	114.65	227.87 N	162.37 E	279.80	35.47	8.80	148.01
6048.00	55.69	33.95	5915.62	95.00	149.17	292.82 N	204.99 E	357.45	34.99	2.09	151.62
6143.00	56.44	35.90	5968.66	95.00	182.15	357.44 N	250.11 E	436.26	34.98	1.88	151.62
6238.00	56.44	38.30	6021.18	95.00	212.51	420.57 N	297.86 E	515.37	35.31	2.10	151.62
6333.00	56.44	38.42	6073.70	95.00	241.27	482.65 N	346.99 E	594.43	35.71	0.10	155.24
6428.00	56.31	38.37	6126.31	95.00	269.96	544.65 N	396.12 E	673.46	36.03	0.14	155.24
6523.00	56.46	38.12	6178.90	95.00	298.85	606.78 N	445.09 E	752.52	36.26	0.27	155.24
6618.00	56.49	40.42	6231.37	95.00	326.44	668.08 N	495.22 E	831.61	36.55	2.02	158.85
6712.00	56.54	40.33	6283.24	94.00	352.33	727.81 N	546.00 E	909.85	36.88	0.10	155.24

Survey Report

Vertical Section Plane: 329.66°	Total Correction: 9.27° West to True
Calculation Method: Minimum Curvature	Survey Reference: Wellhead
North Aligned to: True North	Well: BOGGESS 17H ST01
RT: 25' ROTARY TABLE TO GROUND LEVEL	FIELD: MARCELLUS SHALE

Measured Depth (ft)	Inclination (deg)	Azimuth (deg)	TVD (ft)	Course Length (ft)	Vertical Section (ft)	Rect Co-ord North (ft)	Rect Co-ord East (ft)	Closure Distance (ft)	Closure Direction (deg)	Dog-leg Severity (dg/hft)	Temp (deg F)
6806.00	55.85	40.46	6335.53	94.00	378.10	787.30 N	596.62 E	987.82	37.16	0.74	158.85
6902.00	55.89	40.94	6389.40	96.00	403.92	847.54 N	648.44 E	1067.15	37.42	0.42	158.85
6996.00	56.36	40.73	6441.79	94.00	429.10	906.59 N	699.47 E	1145.06	37.65	0.53	158.85
7091.00	56.44	40.77	6494.36	95.00	454.75	966.53 N	751.12 E	1224.08	37.85	0.09	158.85
7187.00	56.53	39.01	6547.37	96.00	481.82	1027.94 N	802.45 E	1304.07	37.98	1.53	158.85
7282.00	56.60	37.64	6599.72	95.00	510.66	1090.13 N	851.61 E	1383.34	38.00	1.20	162.46
7376.00	56.44	38.27	6651.57	94.00	539.66	1151.95 N	899.83 E	1461.74	37.99	0.59	162.46
7471.00	56.47	38.44	6704.07	95.00	568.42	1214.04 N	948.96 E	1540.92	38.01	0.15	162.46
7566.00	56.48	38.17	6756.54	95.00	597.26	1276.19 N	998.05 E	1620.11	38.03	0.24	162.46
7660.00	55.36	38.11	6809.21	94.00	625.82	1337.42 N	1046.13 E	1697.97	38.03	1.19	162.46
7755.00	55.29	40.94	6863.27	95.00	652.71	1397.68 N	1095.85 E	1776.06	38.10	2.45	166.08
7849.00	55.44	40.80	6916.69	94.00	677.62	1456.16 N	1146.46 E	1853.31	38.21	0.20	166.08
7944.00	55.85	41.03	6970.30	95.00	702.83	1515.43 N	1197.82 E	1931.66	38.32	0.48	166.08
8039.00	56.47	40.56	7023.20	95.00	728.34	1575.17 N	1249.37 E	2010.49	38.42	0.77	166.08
8134.00	56.48	40.63	7075.67	95.00	754.21	1635.30 N	1300.91 E	2089.63	38.50	0.06	169.69
8229.00	56.31	38.55	7128.25	95.00	781.36	1696.27 N	1351.33 E	2168.74	38.54	1.83	166.08
8324.00	56.43	38.16	7180.87	95.00	810.10	1758.30 N	1400.41 E	2247.84	38.54	0.36	169.69
8418.00	56.36	38.42	7232.90	94.00	838.63	1819.75 N	1448.92 E	2326.13	38.53	0.24	169.69
8513.00	56.56	38.25	7285.38	95.00	867.42	1881.86 N	1498.04 E	2405.31	38.52	0.26	169.69
8608.00	56.53	38.13	7337.76	95.00	896.43	1944.15 N	1547.04 E	2484.57	38.51	0.11	169.69
8703.00	56.54	38.24	7390.14	95.00	925.45	2006.45 N	1596.03 E	2563.82	38.50	0.10	173.31
8798.00	56.37	38.06	7442.64	95.00	954.48	2068.71 N	1644.94 E	2642.99	38.49	0.24	169.69
8891.00	56.51	38.25	7494.05	93.00	982.89	2129.65 N	1692.82 E	2720.49	38.48	0.23	173.31
8986.00	56.47	37.85	7546.50	95.00	1012.06	2192.03 N	1741.64 E	2799.70	38.47	0.35	173.31
9081.00	56.48	38.04	7598.97	95.00	1041.36	2254.48 N	1790.34 E	2878.89	38.45	0.17	176.92
9176.00	58.33	28.34	7650.23	95.00	1077.03	2321.37 N	1834.01 E	2958.44	38.31	8.82	176.92
9270.00	61.39	20.30	7697.48	94.00	1124.06	2395.38 N	1867.36 E	3037.25	37.94	8.08	180.54
9365.00	65.00	12.59	7740.36	95.00	1182.11	2476.63 N	1891.25 E	3116.17	37.37	8.18	184.15
9460.00	68.76	6.27	7777.69	95.00	1249.26	2562.76 N	1905.49 E	3193.53	36.63	7.29	180.54
9554.00	71.65	1.46	7809.54	94.00	1322.39	2650.97 N	1911.41 E	3268.20	35.79	5.71	180.54
9649.00	74.18	356.53	7837.46	95.00	1401.53	2741.72 N	1909.79 E	3341.31	34.86	5.63	184.15
9743.00	74.87	350.89	7862.56	94.00	1484.22	2831.72 N	1899.87 E	3410.01	33.86	5.83	184.15
9839.00	75.23	344.94	7887.35	96.00	1572.26	2922.37 N	1880.45 E	3475.11	32.76	6.00	184.15
9933.00	77.76	341.04	7909.30	94.00	1661.18	3009.74 N	1853.71 E	3534.80	31.63	4.85	184.15
10028.00	79.70	339.41	7927.87	95.00	1752.76	3097.41 N	1822.18 E	3593.65	30.47	2.65	187.76
10123.00	83.44	336.56	7941.80	95.00	1845.72	3184.50 N	1786.96 E	3651.61	29.30	4.93	187.76
10218.00	85.35	332.55	7951.08	95.00	1939.89	3269.85 N	1746.34 E	3706.97	28.11	4.66	187.76
10313.00	85.69	331.11	7958.50	95.00	2034.53	3353.34 N	1701.63 E	3760.38	26.91	1.55	187.76
10408.00	87.03	330.30	7964.53	95.00	2129.32	3436.02 N	1655.24 E	3813.93	25.72	1.65	187.76
10502.00	88.71	330.26	7968.03	94.00	2223.25	3517.60 N	1608.68 E	3867.99	24.58	1.79	191.38
10597.00	88.15	328.07	7970.63	95.00	2318.20	3599.13 N	1560.00 E	3922.67	23.43	2.38	194.99
10692.00	87.48	329.46	7974.25	95.00	2413.12	3680.30 N	1510.78 E	3978.32	22.32	1.62	198.61
10787.00	87.65	329.38	7978.29	95.00	2508.03	3762.01 N	1462.49 E	4036.29	21.24	0.20	198.61
10881.00	87.54	329.64	7982.23	94.00	2601.95	3842.94 N	1414.84 E	4095.12	20.21	0.30	198.61
10976.00	87.59	328.94	7986.27	95.00	2696.86	3924.55 N	1366.37 E	4155.60	19.20	0.74	202.22
11071.00	87.65	328.83	7990.21	95.00	2791.77	4005.81 N	1317.32 E	4216.85	18.20	0.13	202.22
11165.00	87.65	329.30	7994.07	94.00	2885.69	4086.37 N	1269.04 E	4278.89	17.25	0.50	198.61
11259.00	87.76	327.70	7997.83	94.00	2979.59	4166.45 N	1219.96 E	4341.38	16.32	1.70	202.22
11354.00	88.32	328.64	8001.08	95.00	3074.50	4247.12 N	1169.89 E	4405.30	15.40	1.15	198.61
11449.00	88.43	329.55	8003.78	95.00	3169.46	4328.59 N	1121.12 E	4471.42	14.52	0.96	202.22
11544.00	88.66	329.68	8006.19	95.00	3264.42	4410.52 N	1073.08 E	4539.18	13.67	0.28	202.22
11639.00	89.10	330.97	8008.05	95.00	3359.40	4493.04 N	1026.06 E	4608.71	12.86	1.43	202.22
11734.00	88.71	328.25	8009.86	95.00	3454.37	4574.97 N	978.01 E	4678.34	12.07	2.89	202.22
11828.00	88.77	330.18	8011.93	94.00	3548.34	4655.70 N	929.91 E	4747.66	11.30	2.05	205.83

11922.00	88.21	328.90	8014.41	94.00	3642.31	4736.69 N	882.28 E	4818.16	10.55	1.49	205.83
12017.00	87.82	330.32	8017.70	95.00	3737.25	4818.59 N	834.25 E	4890.27	9.82	1.55	205.83
12112.00	88.99	329.25	8020.34	95.00	3832.21	4900.65 N	786.46 E	4963.35	9.12	1.67	205.83
12206.00	89.50	331.21	8021.58	94.00	3926.19	4982.23 N	739.80 E	5036.86	8.45	2.16	205.83
12301.00	89.10	327.58	8022.74	95.00	4021.16	5063.98 N	691.44 E	5110.97	7.78	3.84	209.45
12396.00	89.50	329.49	8023.90	95.00	4116.13	5145.00 N	641.86 E	5184.88	7.11	2.05	209.45
12491.00	89.55	329.58	8024.69	95.00	4211.13	5226.88 N	593.70 E	5260.49	6.48	0.11	205.83
12586.00	89.78	329.37	8025.24	95.00	4306.13	5308.71 N	545.45 E	5336.66	5.87	0.33	205.83
12681.00	89.16	328.95	8026.12	95.00	4401.12	5390.28 N	496.75 E	5413.12	5.27	0.79	205.83
12776.00	89.10	330.63	8027.57	95.00	4496.11	5472.36 N	448.95 E	5490.75	4.69	1.77	205.83
12870.00	89.66	331.31	8028.58	94.00	4590.07	5554.55 N	403.34 E	5569.17	4.15	0.94	205.83
12964.00	89.83	330.65	8029.00	94.00	4684.05	5636.74 N	357.74 E	5648.08	3.63	0.72	209.45
13059.00	89.61	330.44	8029.46	95.00	4779.04	5719.46 N	311.03 E	5727.91	3.11	0.32	209.45
13154.00	89.44	330.30	8030.25	95.00	4874.03	5802.04 N	264.06 E	5808.04	2.61	0.23	209.45
13248.00	89.78	328.65	8030.89	94.00	4968.02	5883.00 N	216.32 E	5886.98	2.11	1.79	213.06
13342.00	89.66	329.71	8031.35	94.00	5062.01	5963.73 N	168.16 E	5966.10	1.62	1.14	213.06
13437.00	90.28	330.15	8031.40	95.00	5157.01	6045.94 N	120.56 E	6047.14	1.14	0.80	213.06

Survey Report

Vertical Section Plane: 329.66°	Total Correction: 9.27° West to True
Calculation Method: Minimum Curvature	Survey Reference: Wellhead
North Aligned to: True North	Well: BOGGESS 17H ST01
RT: 25' ROTARY TABLE TO GROUND LEVEL	FIELD: MARCELLUS SHALE

Measured Depth (ft)	Inclination (deg)	Azimuth (deg)	TVD (ft)	Course Length (ft)	Vertical Section (ft)	Rect Co-ord North (ft)	Rect Co-ord East (ft)	Closure Distance (ft)	Closure Direction (deg)	Dog-leg Severity (dg/hft)	Temp (deg F)
13532.00	89.89	330.27	8031.26	95.00	5252.01	6128.39 N	73.36 E	6128.83	0.69	0.43	213.06
13627.00	90.00	329.02	8031.35	95.00	5347.01	6210.36 N	25.35 E	6210.41	0.23	1.32	216.68
13722.00	89.94	328.71	8031.40	95.00	5442.00	6291.68 N	23.77 W	6291.72	359.78	0.33	216.68
13817.00	90.22	330.17	8031.27	95.00	5536.99	6373.48 N	72.07 W	6373.89	359.35	1.56	216.68
13911.00	90.39	330.83	8030.77	94.00	5630.98	6455.29 N	118.35 W	6456.38	358.95	0.72	216.68
14007.00	90.45	329.21	8030.06	96.00	5726.97	6538.44 N	166.32 W	6540.56	358.54	1.69	216.68
14102.00	90.11	330.42	8029.60	95.00	5821.97	6620.56 N	214.09 W	6624.02	358.15	1.32	216.68
14197.00	89.89	328.44	8029.60	95.00	5916.96	6702.35 N	262.40 W	6707.48	357.76	2.10	220.29
14292.00	90.11	329.73	8029.60	95.00	6011.96	6783.85 N	311.21 W	6790.99	357.37	1.38	220.29
14386.00	89.55	327.31	8029.88	94.00	6105.93	6864.01 N	360.29 W	6873.46	357.00	2.64	202.22
14481.00	90.00	329.15	8030.25	95.00	6200.90	6944.77 N	410.30 W	6956.88	356.62	1.99	209.45
14576.00	90.11	329.44	8030.16	95.00	6295.89	7026.45 N	458.81 W	7041.42	356.26	0.33	213.06
14671.00	90.67	329.31	8029.51	95.00	6390.89	7108.20 N	507.21 W	7126.27	355.92	0.61	216.68
14765.00	91.29	331.64	8027.91	94.00	6484.86	7189.98 N	553.52 W	7211.25	355.60	2.57	216.68
14860.00	90.62	328.52	8026.32	95.00	6579.83	7272.29 N	600.89 W	7297.07	355.28	3.36	216.68
14955.00	90.28	329.69	8025.58	95.00	6674.82	7353.81 N	649.67 W	7382.45	354.95	1.28	216.68
15050.00	89.78	329.16	8025.53	95.00	6769.82	7435.60 N	697.99 W	7468.29	354.64	0.77	216.68
15144.00	89.83	331.13	8025.85	94.00	6863.81	7517.12 N	744.78 W	7553.93	354.34	2.10	216.68
15239.00	90.56	328.98	8025.52	95.00	6958.80	7599.43 N	792.20 W	7640.61	354.05	2.39	220.29
15334.00	90.06	329.91	8025.01	95.00	7053.80	7681.24 N	840.49 W	7727.09	353.76	1.11	220.29
15429.00	90.00	330.39	8024.96	95.00	7148.80	7763.63 N	887.78 W	7814.23	353.48	0.51	220.29
15524.00	89.66	328.81	8025.24	95.00	7243.79	7845.57 N	935.85 W	7901.19	353.20	1.70	220.29
15618.00	89.94	330.48	8025.57	94.00	7337.79	7926.68 N	983.35 W	7987.44	352.93	1.80	220.29
15713.00	90.45	330.70	8025.25	95.00	7432.78	8009.44 N	1030.00 W	8075.39	352.67	0.59	220.29
15807.00	90.50	331.56	8024.47	94.00	7526.74	8091.75 N	1075.39 W	8162.90	352.43	0.92	220.29
15903.00	90.95	333.77	8023.25	96.00	7622.60	8177.02 N	1119.46 W	8253.29	352.20	2.35	220.29
15998.00	90.56	329.36	8022.00	95.00	7717.51	8260.53 N	1164.68 W	8342.23	351.97	4.66	220.29
16092.00	90.06	329.42	8021.49	94.00	7811.51	8341.43 N	1212.55 W	8429.10	351.73	0.54	220.29
16186.00	90.00	329.40	8021.44	94.00	7905.51	8422.35 N	1260.38 W	8516.13	351.49	0.07	220.29
16280.00	89.66	328.92	8021.72	94.00	7999.50	8503.06 N	1308.57 W	8603.16	351.25	0.63	220.29
16374.00	89.89	328.81	8022.09	94.00	8093.49	8583.51 N	1357.17 W	8690.14	351.02	0.27	223.91
16469.00	90.56	331.15	8021.72	95.00	8188.48	8665.76 N	1404.70 W	8778.87	350.79	2.56	223.91
16563.00	91.06	331.47	8020.39	94.00	8282.43	8748.21 N	1449.82 W	8867.54	350.59	0.63	223.91
16658.00	89.94	328.61	8019.56	95.00	8377.42	8830.51 N	1497.25 W	8956.54	350.38	3.23	223.91
16753.00	90.34	331.09	8019.33	95.00	8472.41	8912.65 N	1544.96 W	9045.56	350.17	2.64	223.91
16849.00	90.22	328.70	8018.86	96.00	8568.40	8995.69 N	1593.11 W	9135.67	349.96	2.49	223.91
16942.00	90.22	329.73	8018.50	93.00	8661.39	9075.58 N	1640.71 W	9222.70	349.75	1.11	223.91
17037.00	90.00	329.69	8018.32	95.00	8756.39	9157.62 N	1688.63 W	9312.00	349.55	0.24	227.52
17132.00	89.78	328.72	8018.50	95.00	8851.39	9239.22 N	1737.26 W	9401.13	349.35	1.05	223.91
17226.00	89.89	329.14	8018.77	94.00	8945.38	9319.73 N	1785.77 W	9489.28	349.15	0.46	227.52
17321.00	89.78	327.53	8019.04	95.00	9040.35	9400.59 N	1835.64 W	9578.13	348.95	1.70	227.52
17416.00	89.16	329.01	8019.92	95.00	9135.32	9481.38 N	1885.60 W	9667.06	348.75	1.69	33.80
17512.00	89.33	328.33	8021.19	96.00	9231.30	9563.38 N	1935.51 W	9757.27	348.56	0.73	227.52
17606.00	89.50	329.28	8022.15	94.00	9325.28	9643.78 N	1984.20 W	9845.79	348.37	1.03	223.91
17700.00	88.99	328.30	8023.39	94.00	9419.26	9724.17 N	2032.90 W	9934.39	348.19	1.18	223.91
17795.00	89.05	329.00	8025.01	95.00	9514.23	9805.29 N	2082.32 W	10023.96	348.01	0.74	227.52
17890.00	89.38	328.45	8026.31	95.00	9609.21	9886.47 N	2131.63 W	10113.66	347.83	0.68	227.52
17985.00	89.38	328.97	8027.34	95.00	9704.19	9967.65 N	2180.97 W	10203.46	347.66	0.55	227.52
18080.00	89.50	329.05	8028.27	95.00	9799.18	10049.09 N	2229.88 W	10293.52	347.49	0.15	227.52
18174.00	89.22	328.58	8029.32	94.00	9893.16	10129.50 N	2278.55 W	10382.61	347.32	0.58	227.52
18269.00	89.10	328.73	8030.71	95.00	9988.14	10210.62 N	2327.97 W	10472.64	347.16	0.20	231.13
18364.00	89.22	330.25	8032.11	95.00	10083.12	10292.46 N	2376.19 W	10563.19	347.00	1.60	227.52
18459.00	89.66	330.86	8033.03	95.00	10178.11	10375.18 N	2422.89 W	10654.33	346.86	0.79	231.13
18553.00	89.94	328.84	8033.36	94.00	10272.10	10456.46 N	2470.10 W	10744.25	346.71	2.17	231.13
18647.00	89.38	329.95	8033.92	94.00	10366.09	10537.36 N	2517.95 W	10834.03	346.56	1.32	231.13
18741.00	89.22	329.60	8035.07	94.00	10460.09	10618.58 N	2565.27 W	10924.05	346.42	0.41	223.91
18836.00	90.39	332.07	8035.39	95.00	10555.06	10701.53 N	2611.56 W	11015.58	346.29	2.88	227.52
18931.00	90.00	328.88	8035.07	95.00	10650.04	10784.18 N	2658.37 W	11107.00	346.15	3.38	227.52

18931.00	90.00	328.88	8035.07	95.00	10650.04	10784.18 N	2658.37 W	11107.00	346.15	3.38	227.52
19026.00	89.44	328.06	8035.53	95.00	10745.01	10865.15 N	2708.05 W	11197.55	346.00	1.05	231.13
STRAIGHT LINE PROJECTION TO BIT DEPTH AT 19055'MD											
19055.00	89.44	328.06	8035.82	29.00	10774.00	10889.76 N	2723.39 W	11225.14	345.96	0.00	

BOTTOM HOLE ASSEMBLY RECORD

RUN #1	ft
8 1/2" PDC BIT	1.33
PD COPIBANA	12.32
NM HHOP SUB	5.84
XBOLT DIR/GR	23.23
NM X/O SUB	3.57
FRAC ID SUB	2.64
NM FLEX DC	15.14
0° MUD MOTOR	38.62
DIFFUSER SUB	7.33
TOTAL BHA:	110.02
SENSOR OFFSETS:	
GAMMA-RAY	23.16
DIRECTIONAL	26.47

GAMMA-RAY

Schlumberger

1" = 100'
FEET MD