

part of Baker Hughes. Unless other contract terms have been agreed to by the parties, each party's liabilities and obligations shall be governed by Baker Hughes Incorporated's Worldwide Terms and Conditions."

Log Run Summary

Run No	Bit Run No.	Bit Size (in)	Bit Type	Bit Gauge Length (in)	Assembly Type	Logged Interval		Bit Depth Interval		Date / Time		Circ. Hours (h)
						Top	Bottom	From	To	Start Logging	End Logging	
						(ft)	(ft)	(ft)	(ft)			
1	1	8.500	PDC	2.00	AutoTrak Curve	1862.00	4949.00	1875.00	4949.00	2015-12-06 05:58	2015-12-06 21:51	14.51
2	2	8.500	PDC	2.00	AutoTrak Curve	4936.00	12430.00	4949.00	12430.00	2015-12-07 04:36	2015-12-08 19:03	35.30

Crew

Name		Arrive Wellsite	Depart Wellsite	Name		Arrive Wellsite	Depart Wellsite	Name		Arrive Wellsite	Depart Wellsite
David Browning		2015-12-05	2015-12-09	Dusty Zink		2015-12-05	2015-12-09	Matthew Delmore		2015-12-05	2015-12-09
Mike Gurnsey		2015-12-05	2015-12-09	Chad Hough		2015-12-08	2015-12-08				

Mud Properties Record

Date / Time		Run No.	Measured Depth (ft)	Mud Type	Density (ppg)	Viscosity (cP)	pH	Fluid Loss (cm3)	Oil / Water	Source	Total Chlorides (ppm)	K+ (%)
2015-12-06 13:20		1	3491.00	Diesel-Oil Based Mud	9.8	27	N/A	11.4	57.8/30.8	Active Pit	45000	0.00
2015-12-07 01:45		2	4949.00	Diesel-Oil Based Mud	9.7	22	N/A	10.8	59.0/29.5	Active Pit	42000	0.00
2015-12-07 13:20		2	6742.00	Diesel-Oil Based Mud	9.8	23	N/A	9.2	59.2/28.6	Active Pit	43000	0.00
2015-12-08 02:00		2	9428.00	Diesel-Oil Based Mud	10.1	23	N/A	9.6	60.0/26.4	Active Pit	44000	0.00
2015-12-08 13:15		2	11450.00	Diesel-Oil Based Mud	10.4	28	N/A	10.4	59.1/25.7	Active Pit	45000	0.00

Equipment and Service Data

Run No.	Tool	Serial Number	Measurement	Sensor Offset (ft)	Bit Offset (ft)	Max O.D. (in)	Min I.D. (in)
1	ATC_SU	102053886	Near Bit Inclination	5.93	6.56	7.000	4.330
1	ATC_MWD	12141354	Gamma (single)	2.75	12.73	7.000	3.250
1	ATC_MWD	12141354	Directional (mag)	12.27	22.25	7.000	3.250
2	ATC_SU	12653420	Near Bit Inclination	5.93	6.56	7.000	4.330
2	ATC_MWD	12252765	Gamma (single)	2.25	12.18	7.000	3.250
2	ATC_MWD	12252765	Directional (mag)	12.32	22.25	7.000	3.250

Service and Tool Mnemonics

Mnemonic	Name	Description
ATC_SU	ATC_SU	Auto Tool Open Service Unit

ATC_SU	ATC_SU	Auto Trak Curve Steering Unit
ATC_MWD	ATC_MWD	Auto Trak Curve MWD
ATC_LCPM	ATC_LCPM	Auto Trak Curve LCPM

Comments


- 1 Baker Hughes Runs 1 and 2 utilized a 6 3/4 inch AutoTrak Curve (Directional and Gamma Ray) tool behind an 8 1/2 inch bit and rotary steerable assembly from 1875 feet MD (1872.58 feet TVD) to 12430 feet MD (7038.99 feet TVD).
- 2 Depth measurements were obtained from a depth control system not supplied or operated by Baker Hughes. Due to lack of control by Baker Hughes logging engineers, depth calibrations and measurements could not be independently verified and the unverified depths as supplied to Baker Hughes are being used to represent logging data.

Remarks

Number	Measured Depth (ft)	Hole Section (in)	Run No.	Remark
1	4655.00	8.500	1	The interval between 4629 feet MD (4597.31 feet TVD) to 4676 feet MD (4643.75 feet TVD) does not contain Gamma memory logging data due to the MWD losing power. This power lose was caused by poor and erratic drilling conditions.
2	4745.00	8.500	1	The interval between 4726 feet MD (4693.17 feet TVD) to 4761 feet MD (4727.25 feet TVD) does not contain Gamma memory logging data due to the MWD losing power. This power lose was caused by poor and erratic drilling conditions.
3	4965.00	8.500	2	The interval between 4928 feet MD (4892.68 feet TVD) to 5004 feet MD (4967.78 feet TVD) does not contain Gamma memory and surface logging data due to a surface logging equipment depth jump.

Curve Mnemonics

Presented Curves	Description	Units
ROPA	Depth Averaged ROP 3 ft Average	ft/h
GRAM	Gamma Ray - Apparent 0.5 ft Average	API
TCDM	Downhole Temperature	degF
WOBA	Weight On Bit, Average 1 ft Average	klb



Company

Well

Interval

Created

Noble Energy

Moser H22-745

Date From:2015-12-06 12:00

Date To:2015-12-09 12:00

2015-12-09 15:40

Top:1862.00

Bottom:12430.00

Gamma Ray - Apparent 0.5 ft Average GRAM

0150

API

TVD 1:240 feet

Rate of Penetration 3 ft Average ROPA

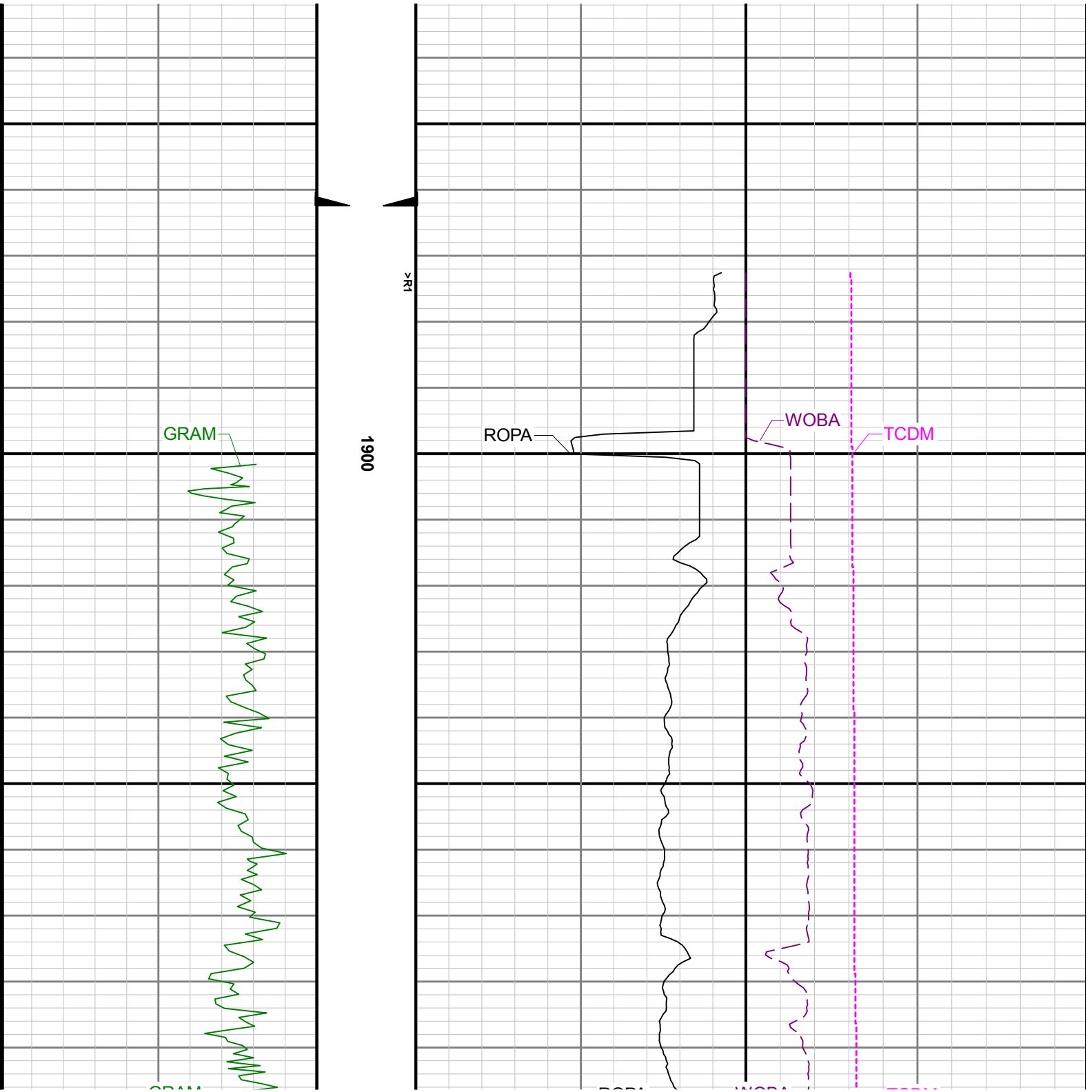
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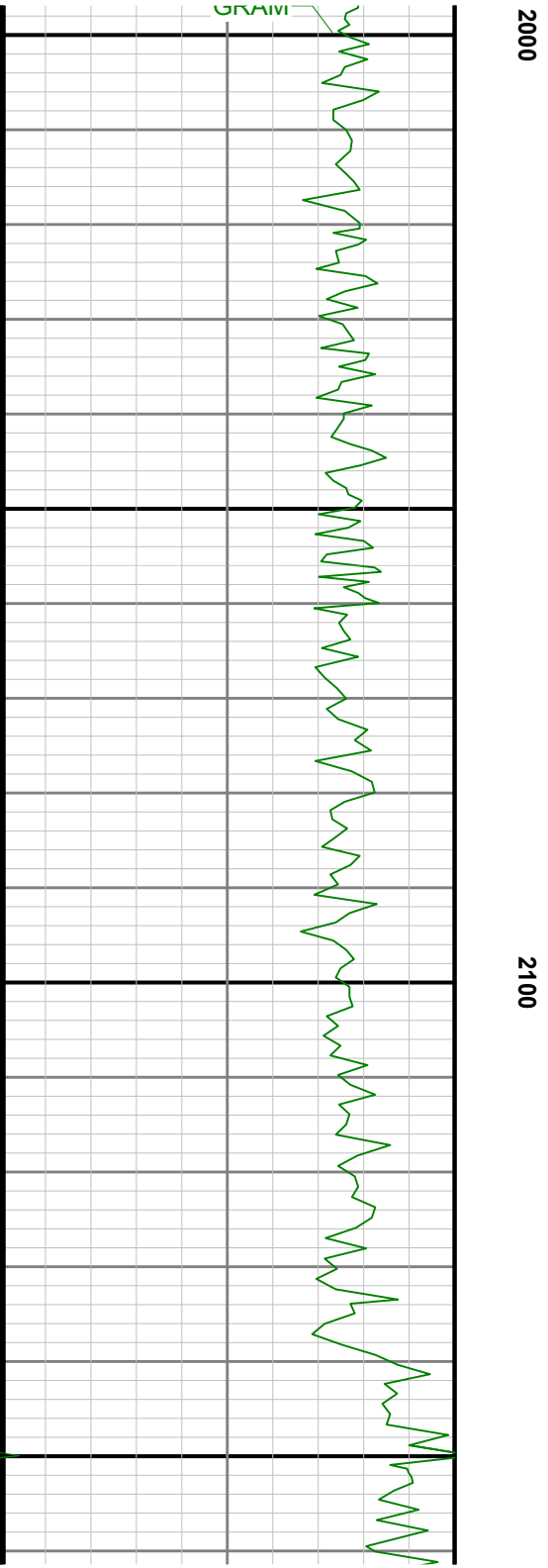
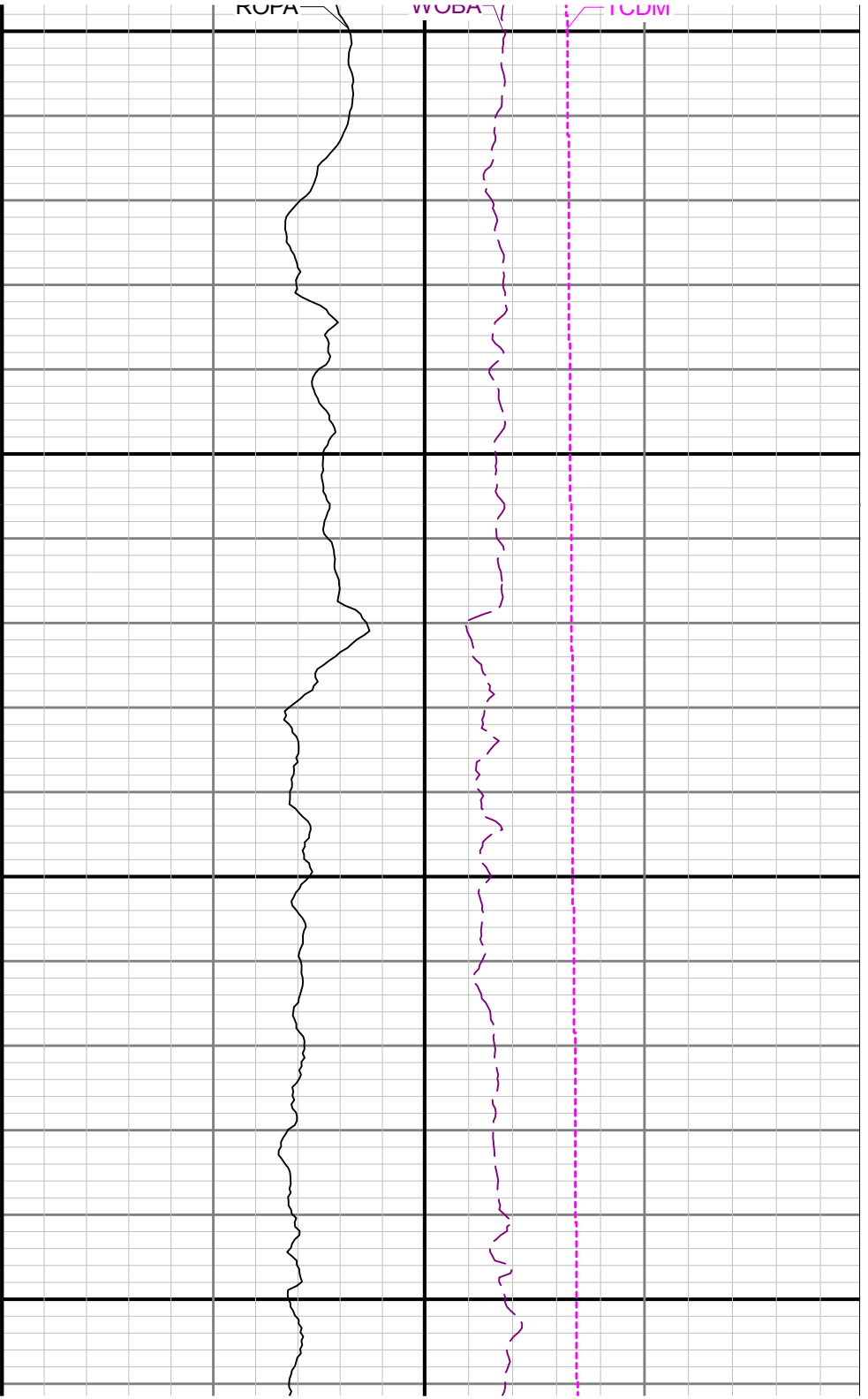
Surface Weight On Bit 1 ft Average WOBA

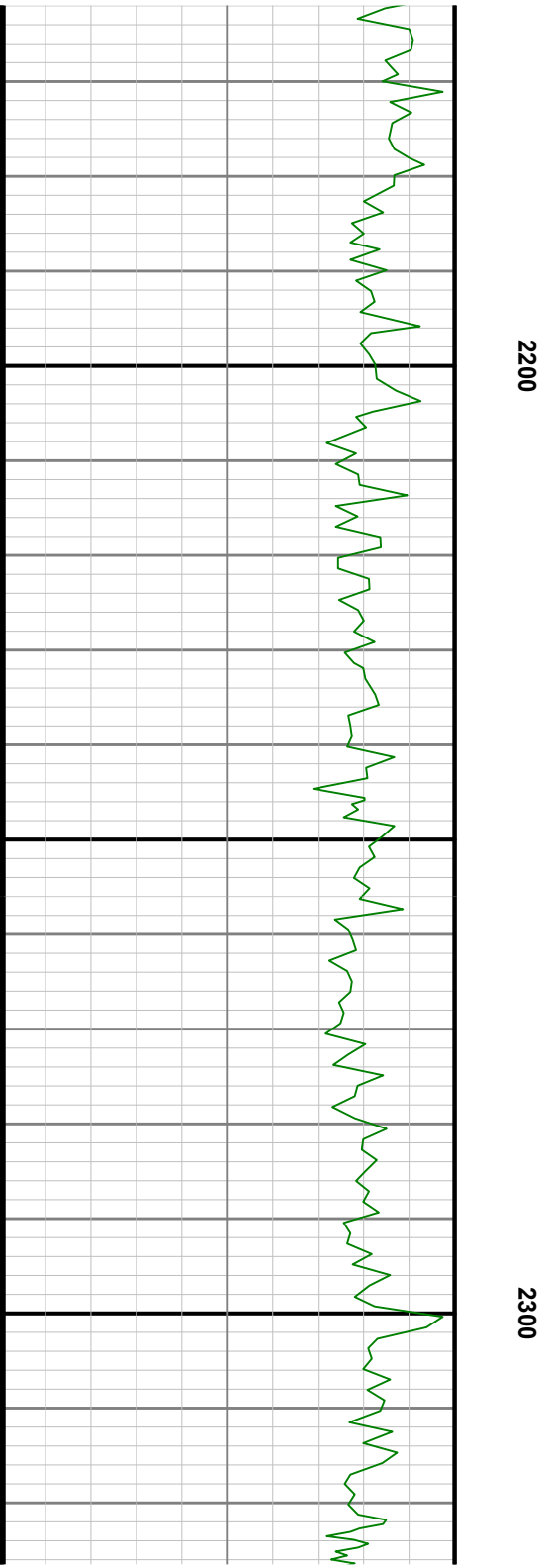
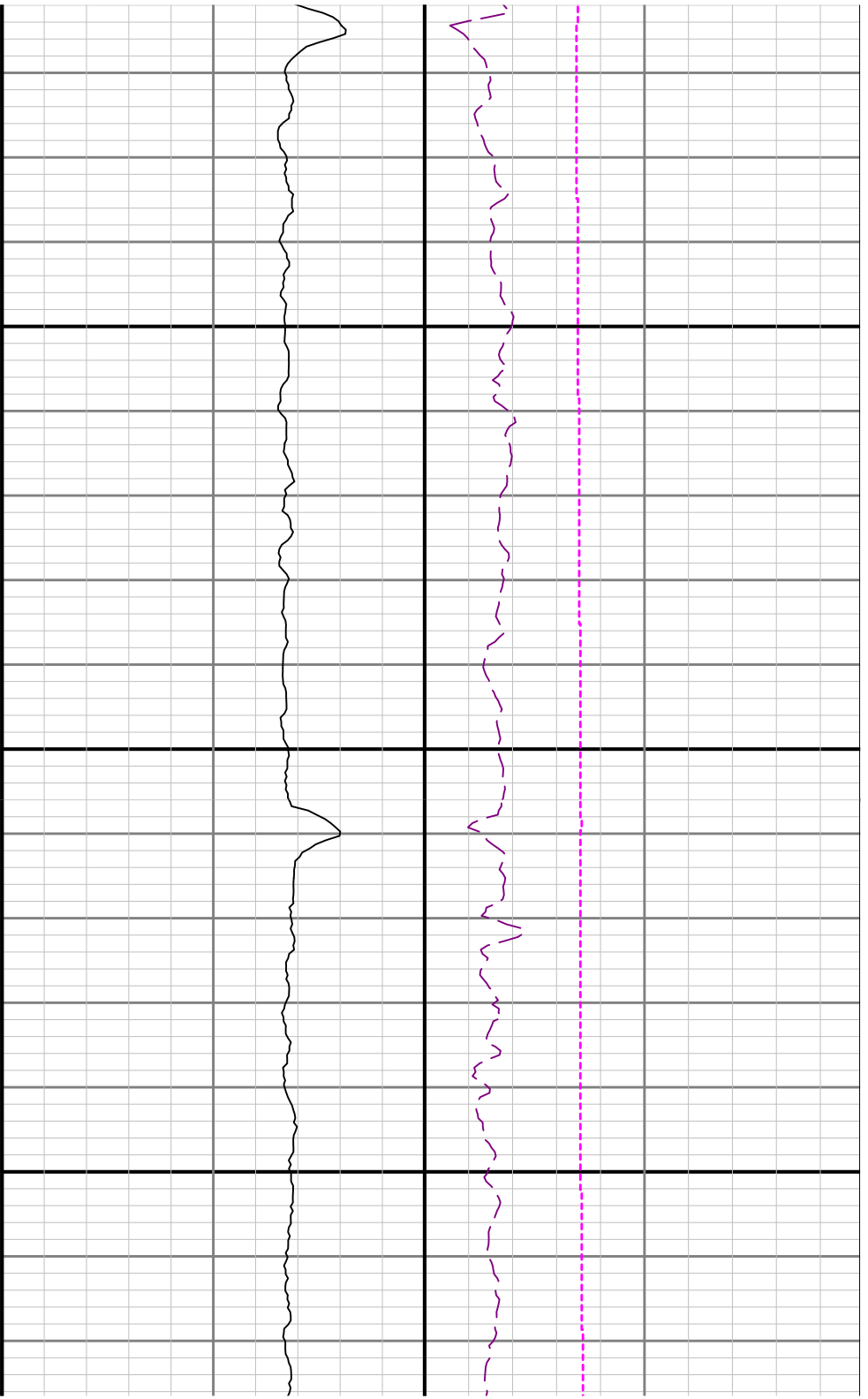
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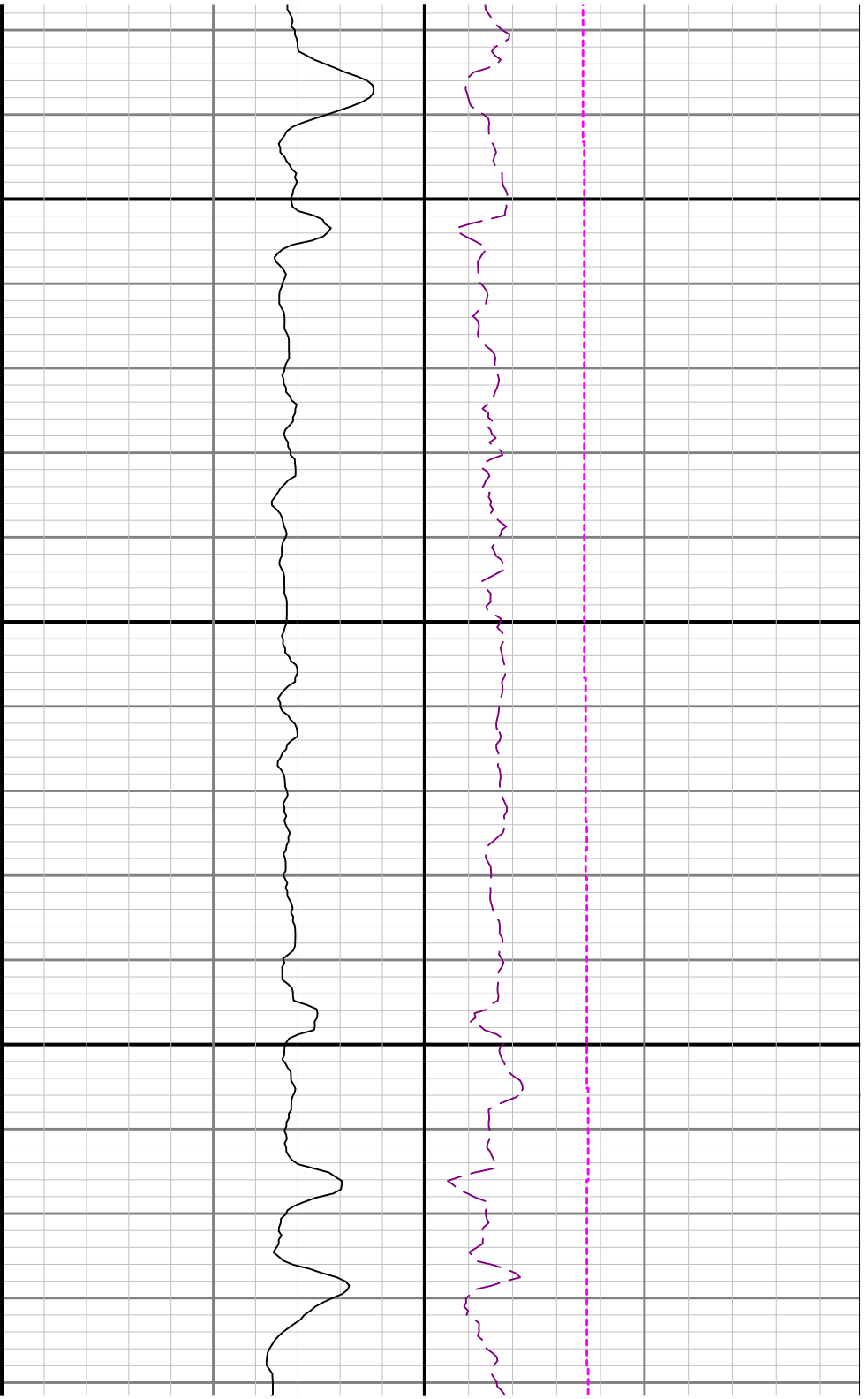
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0degF300

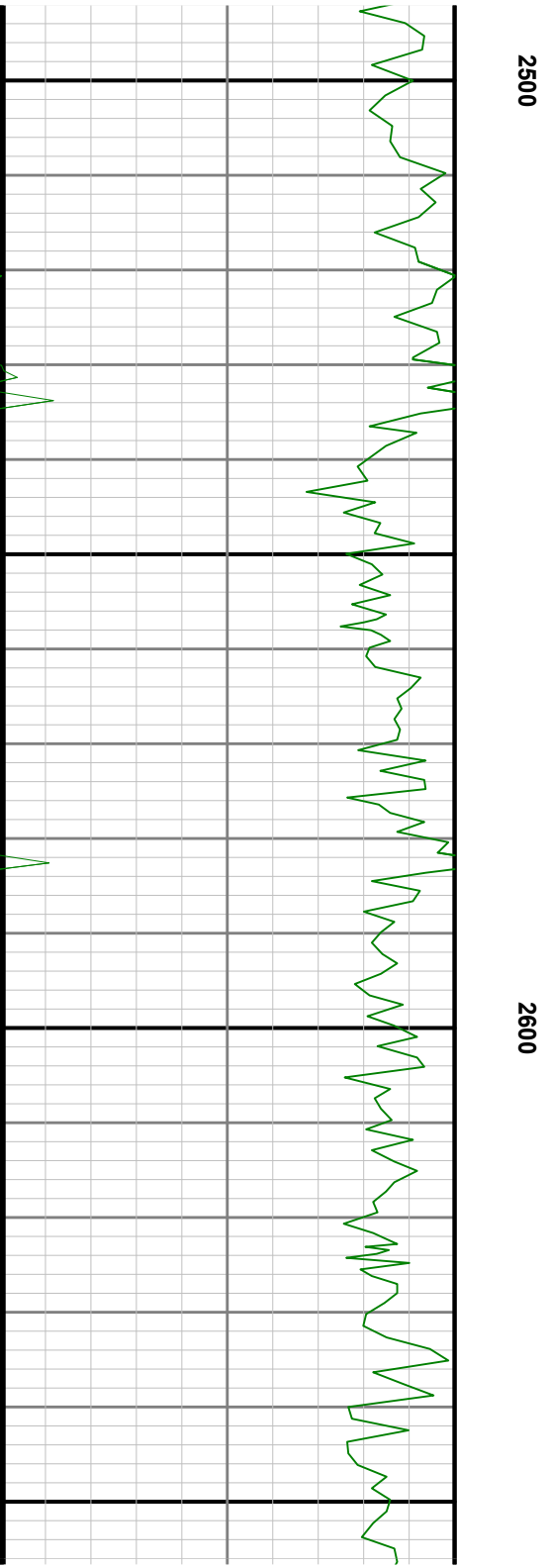


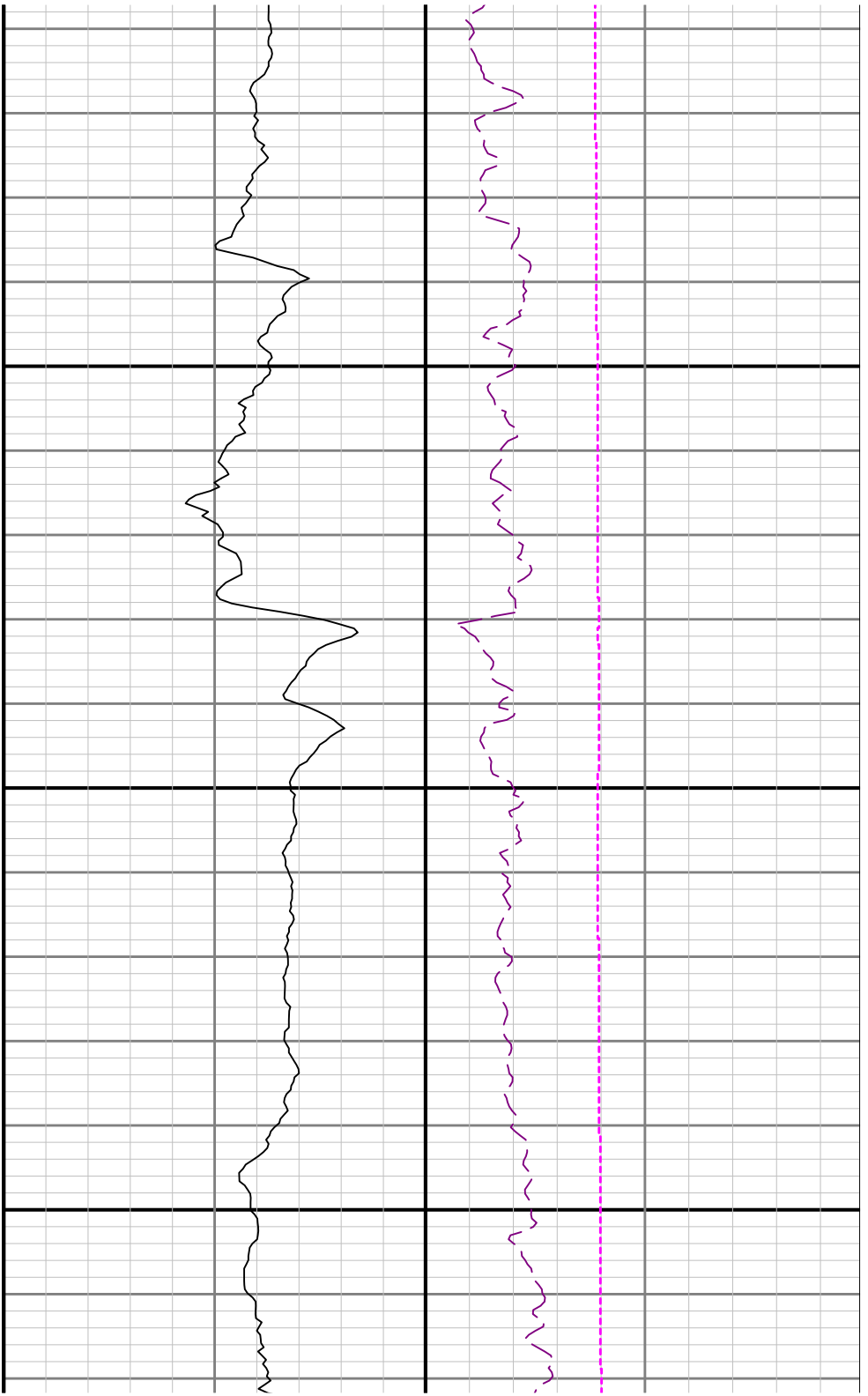






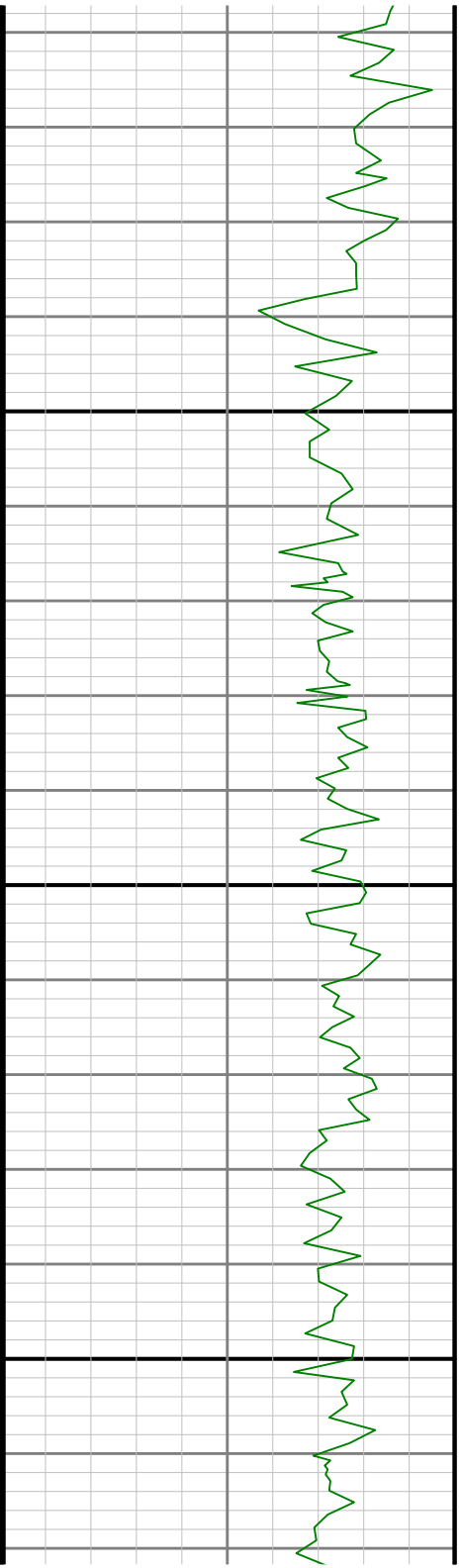
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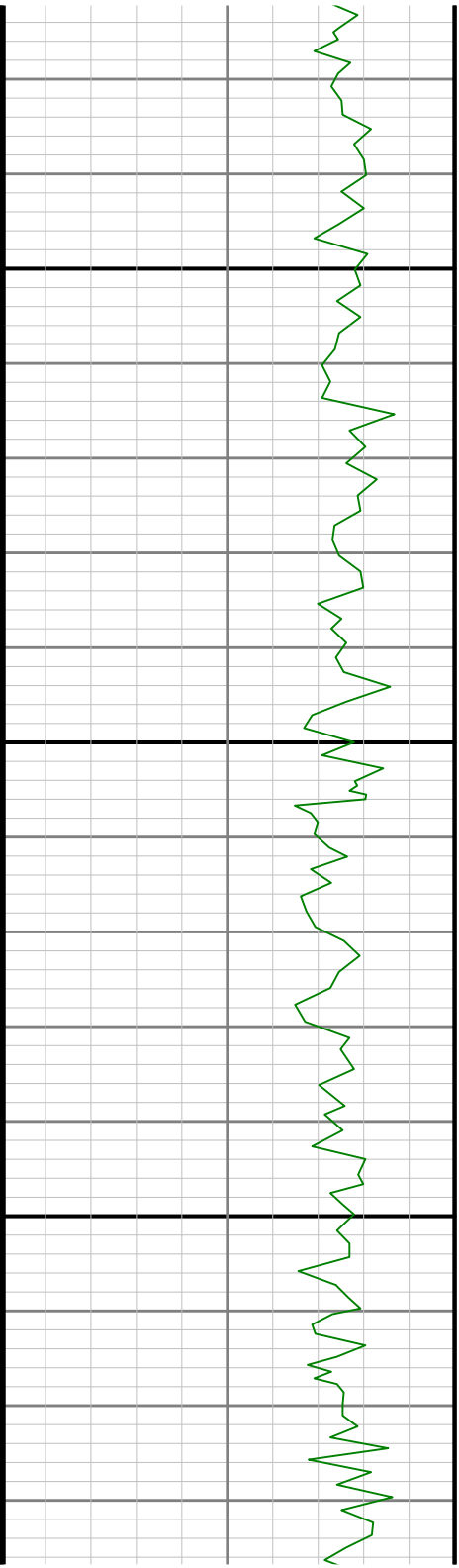




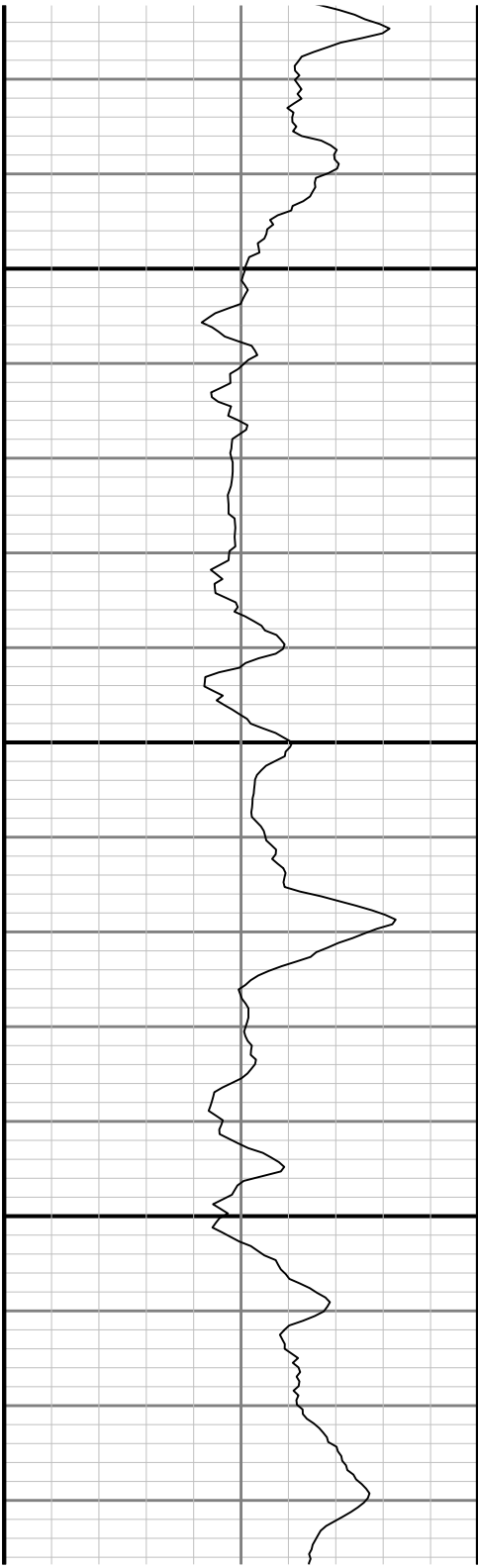
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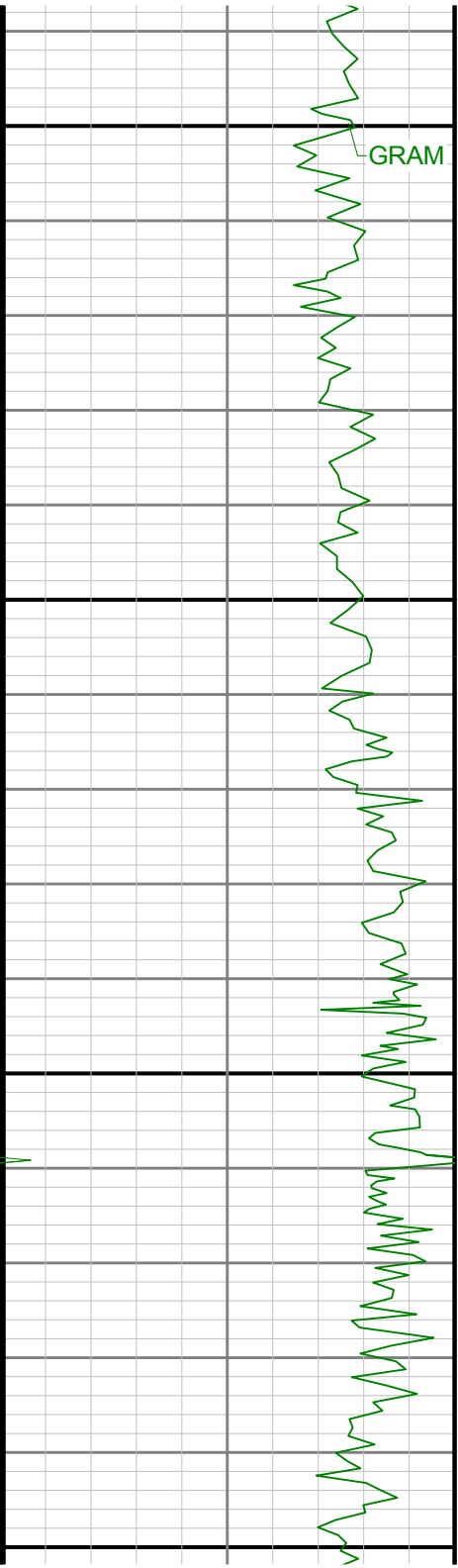
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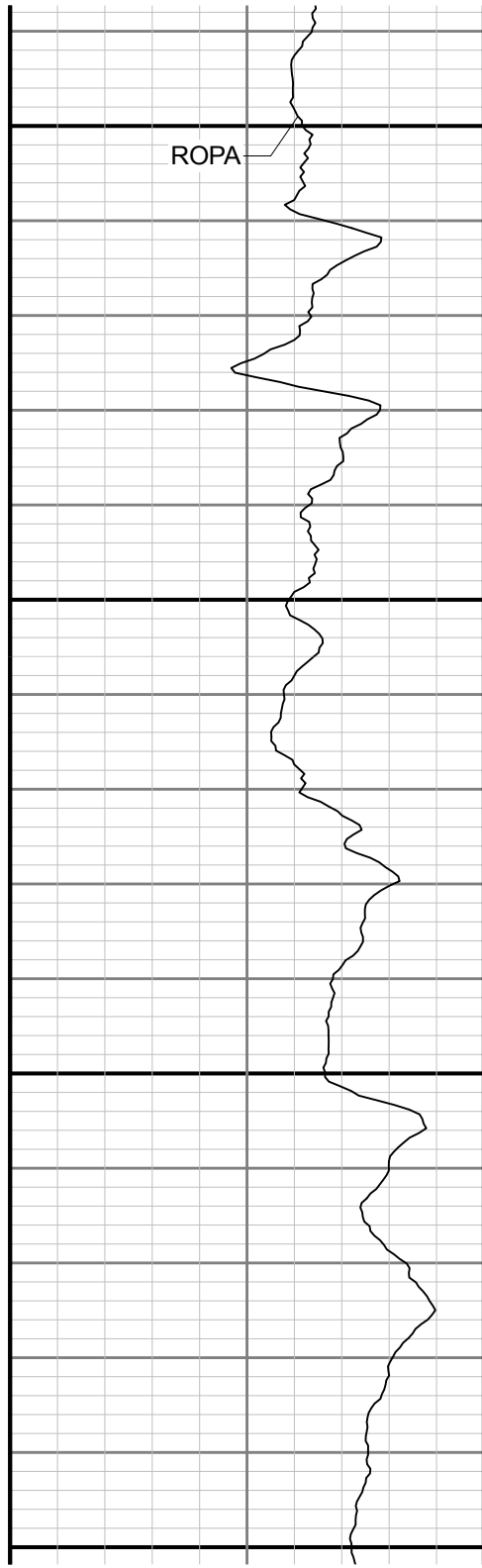




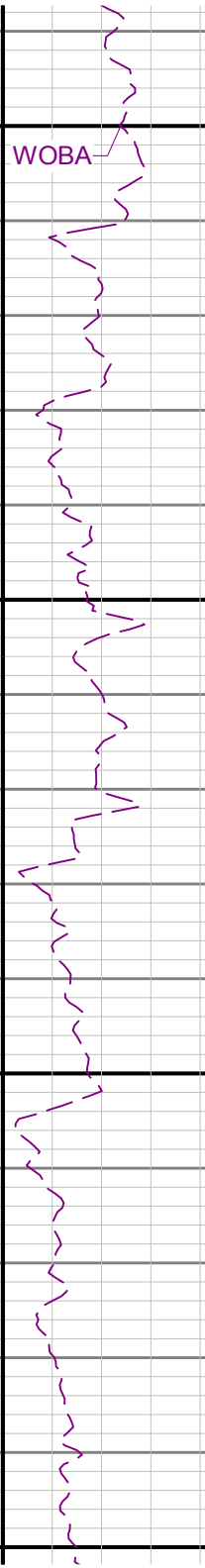
GRAM

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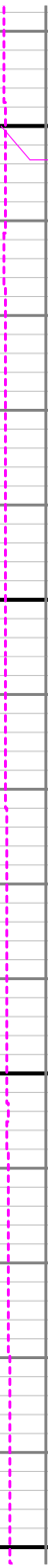
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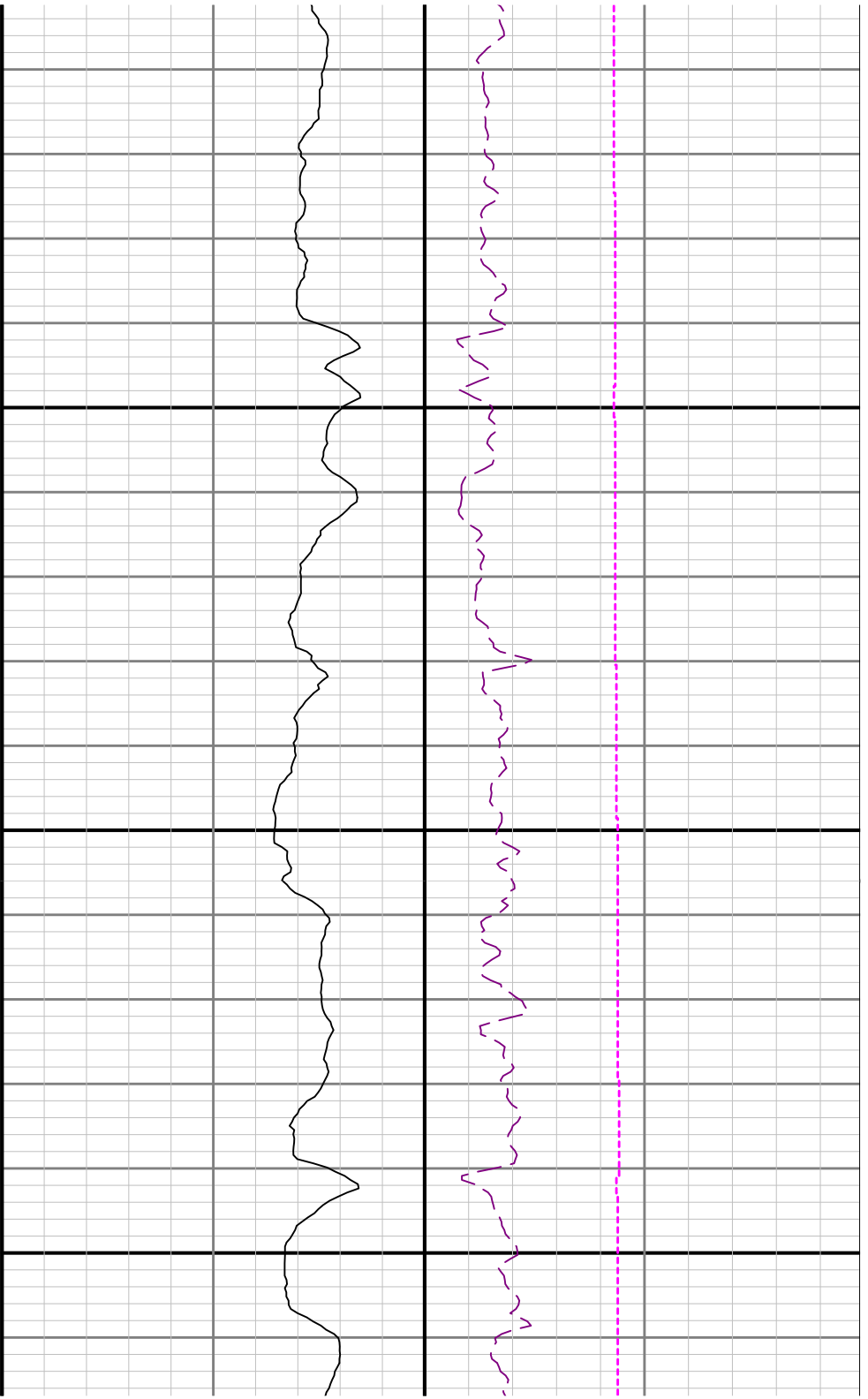
ROPA



WOBA

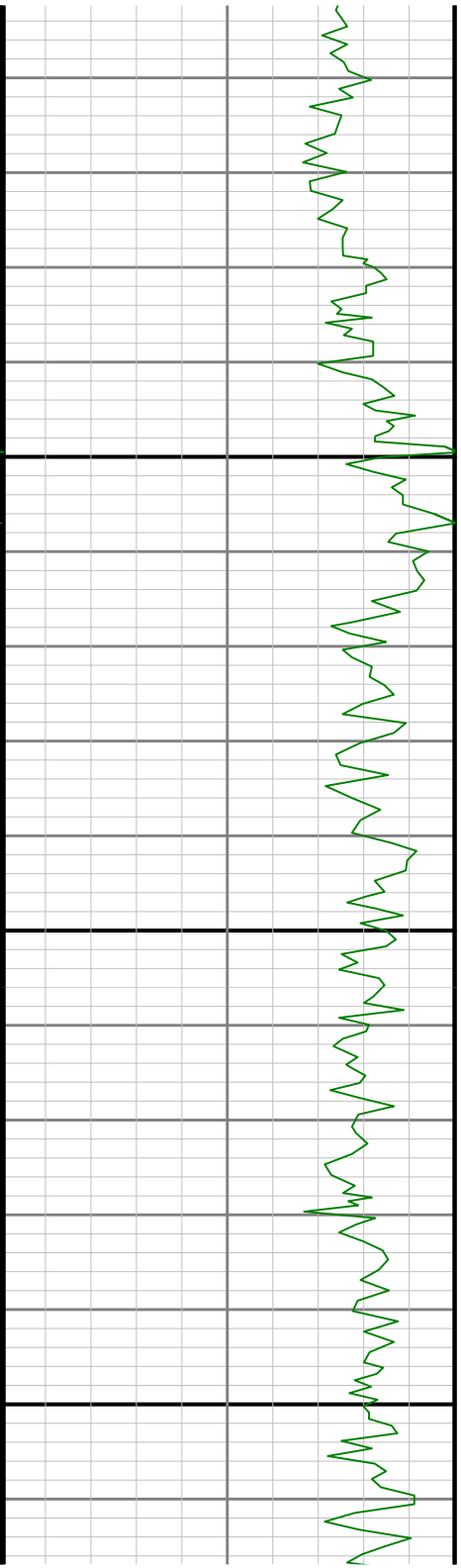


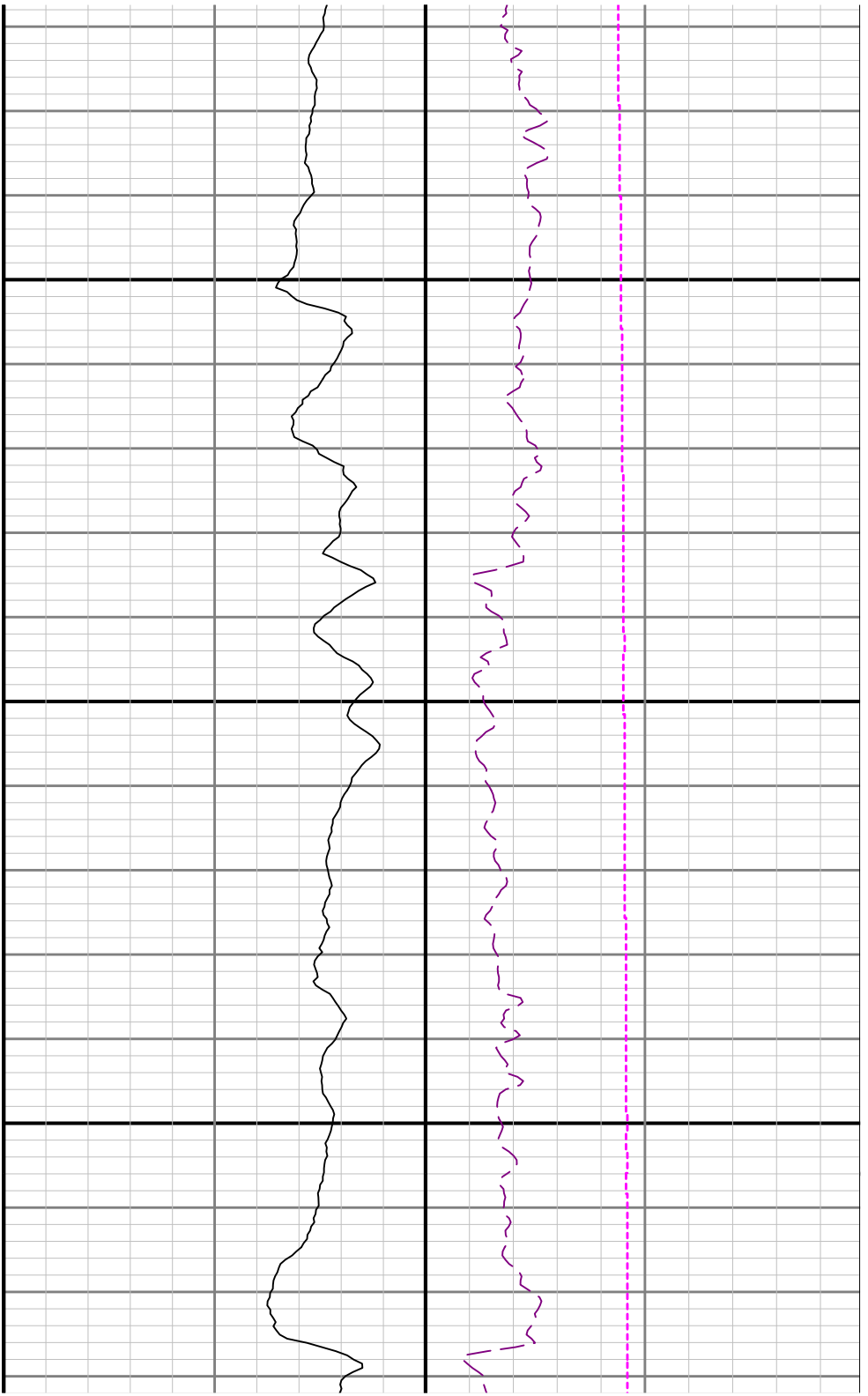
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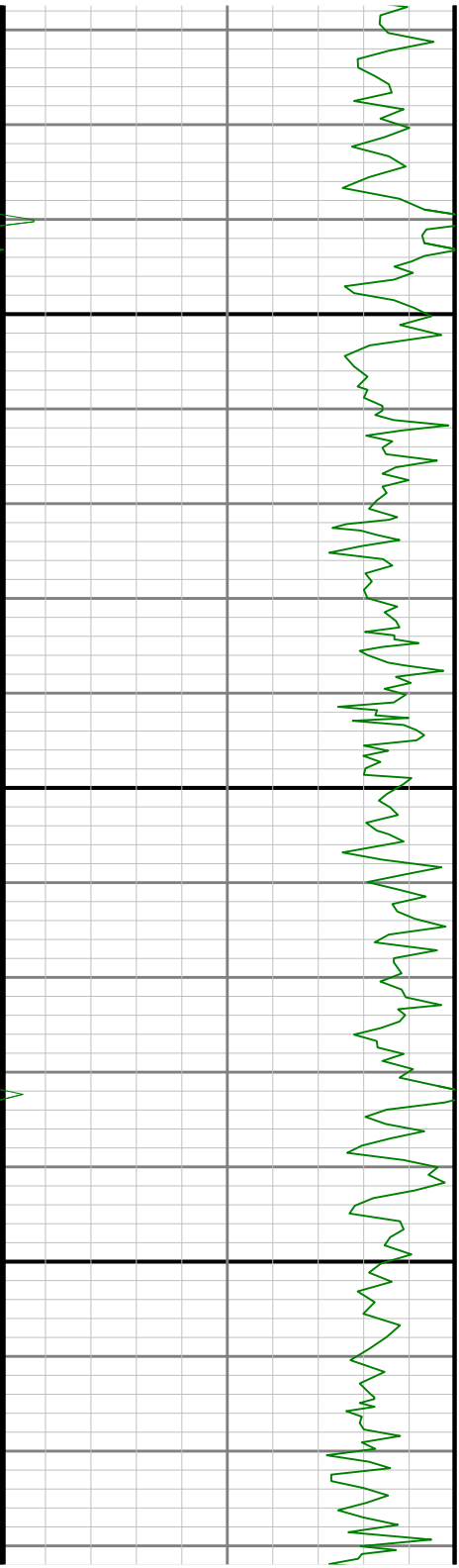
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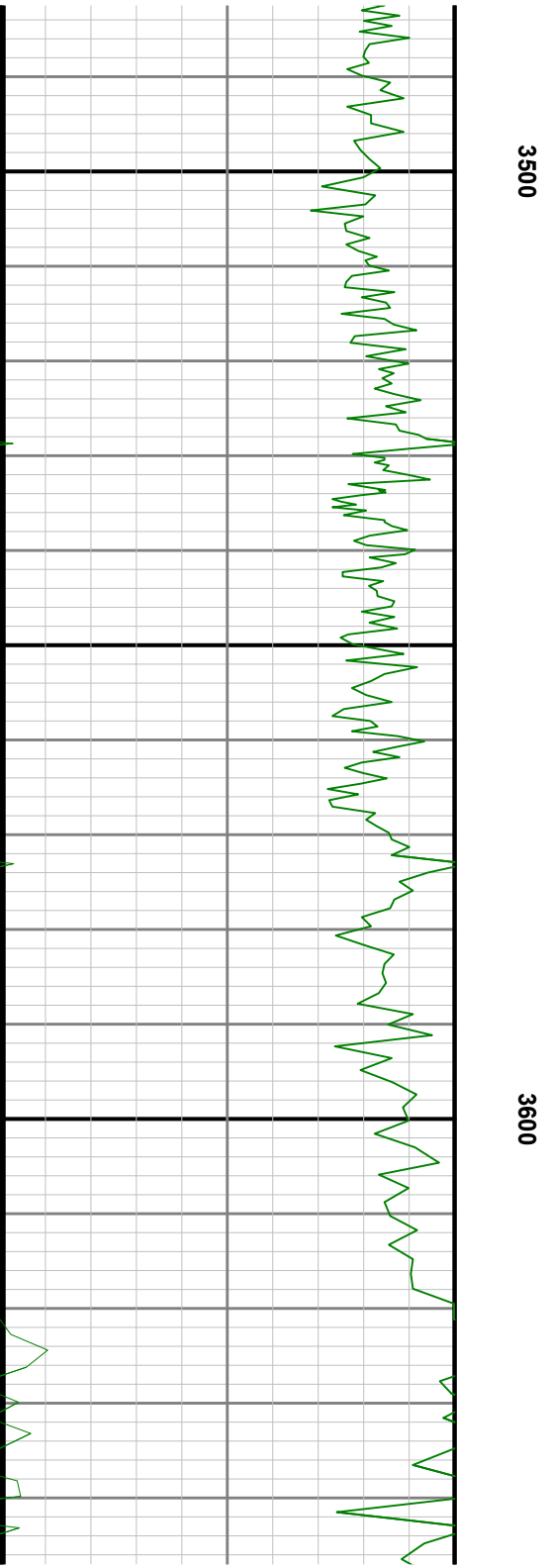
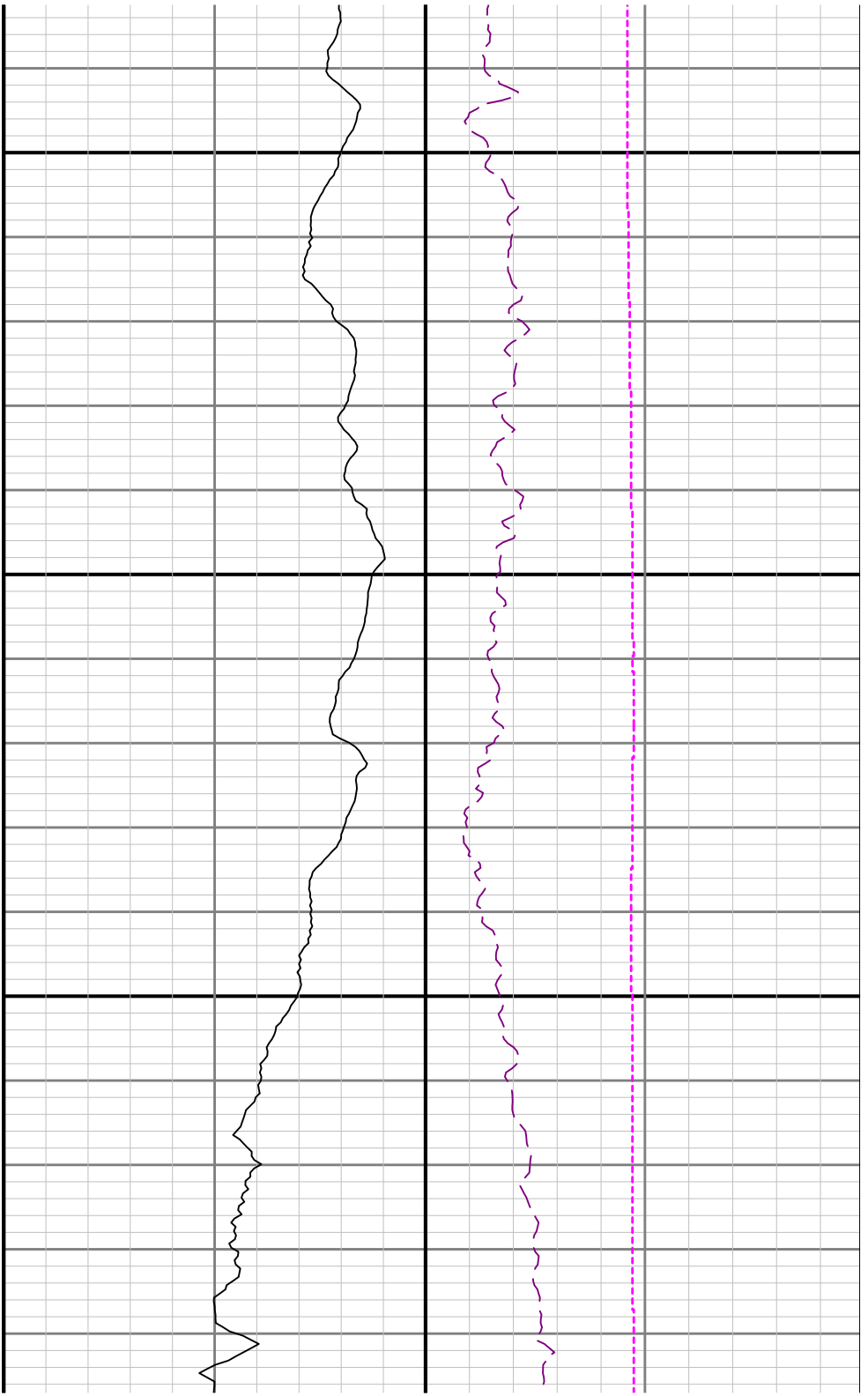
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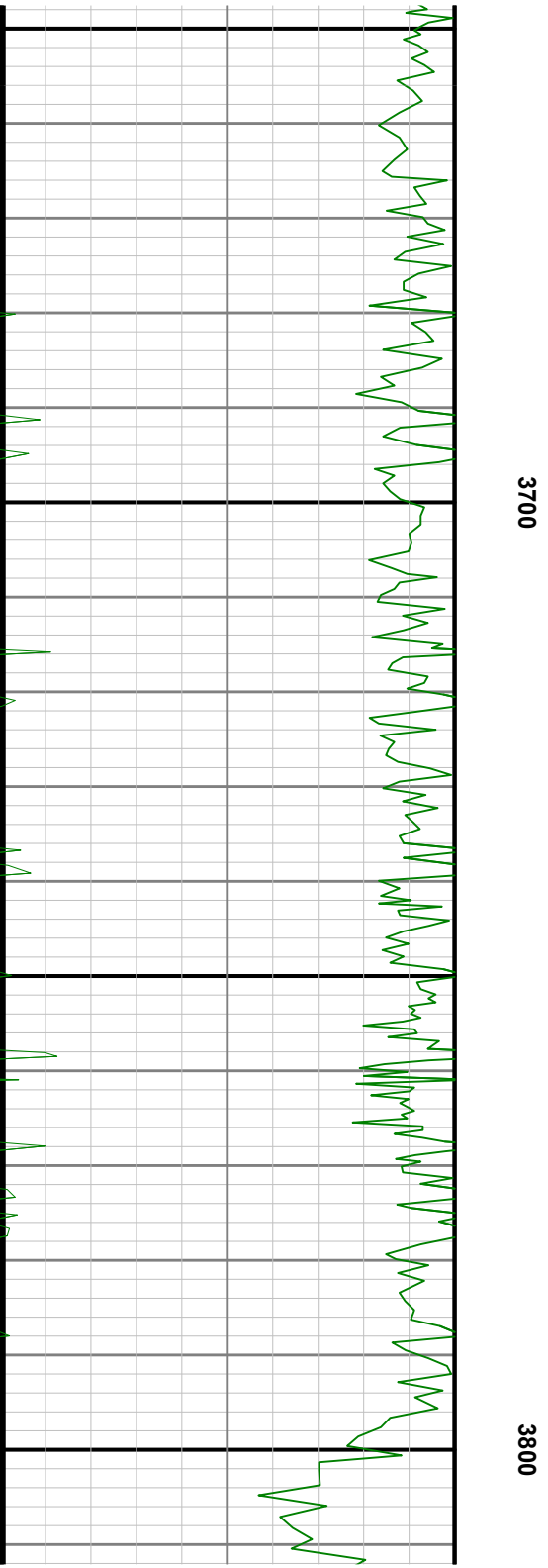
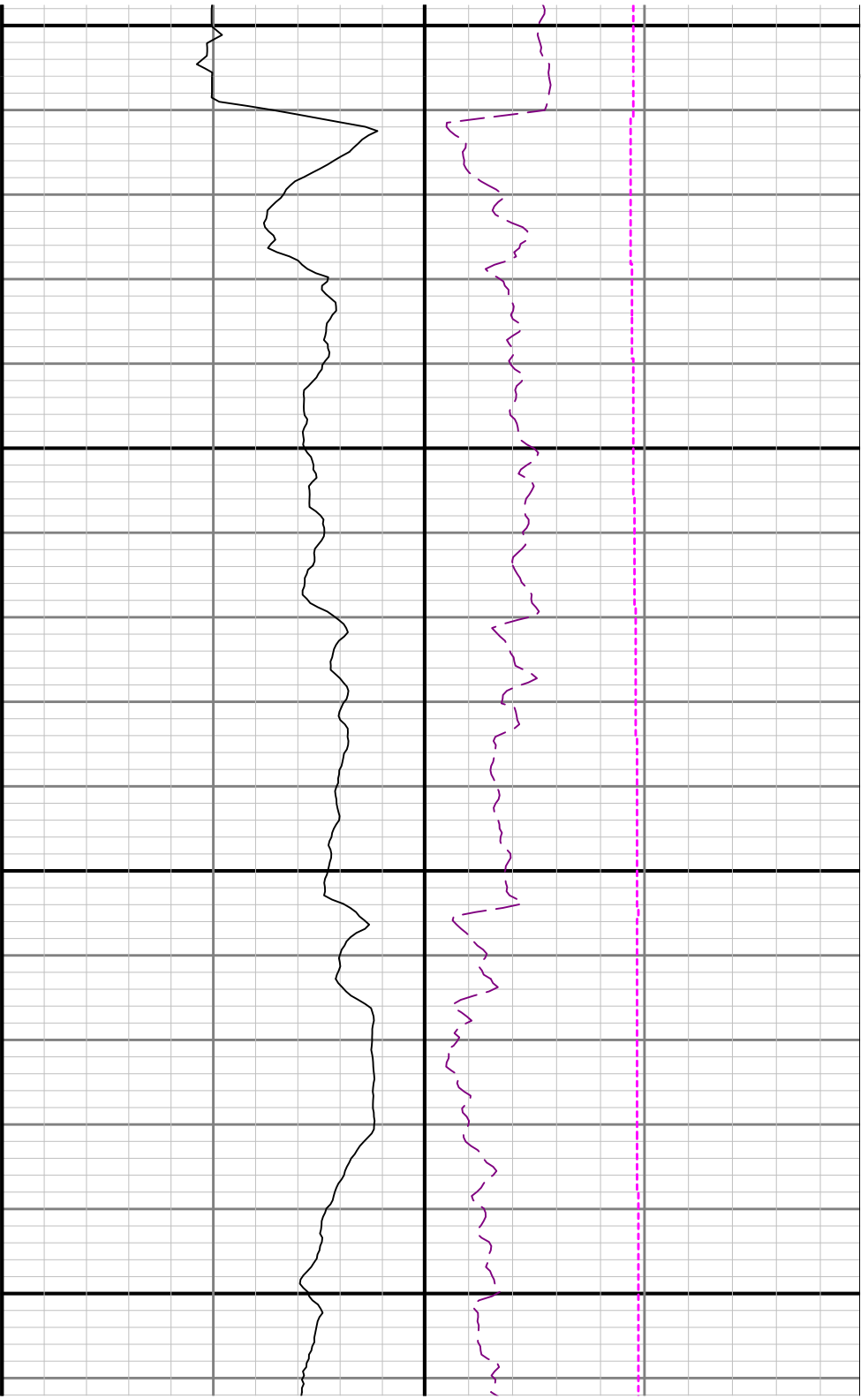


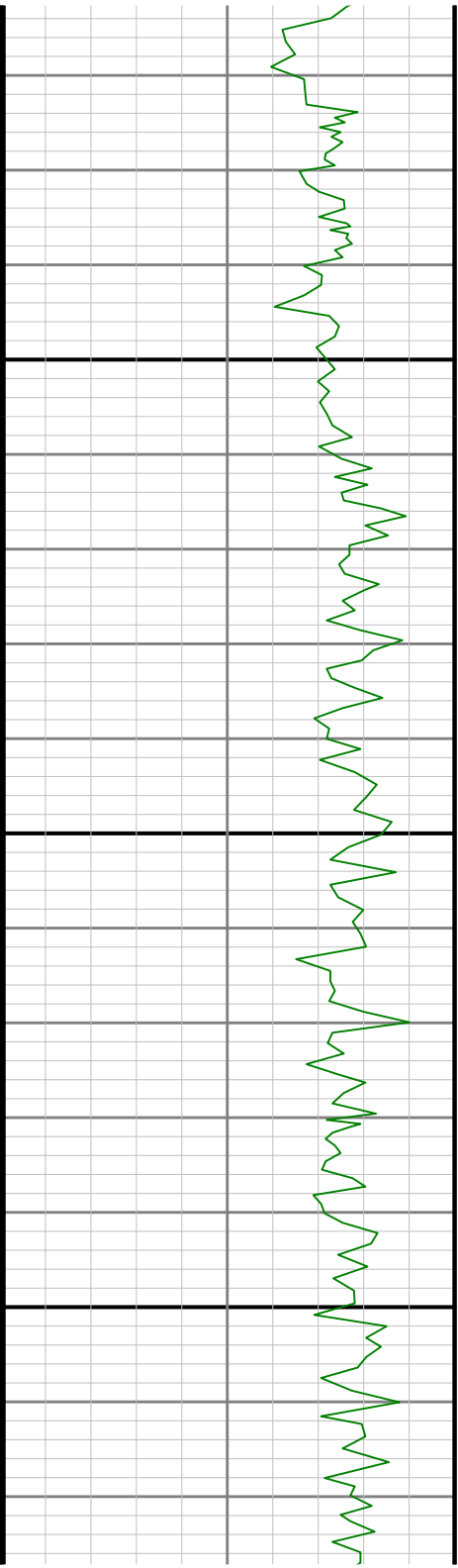


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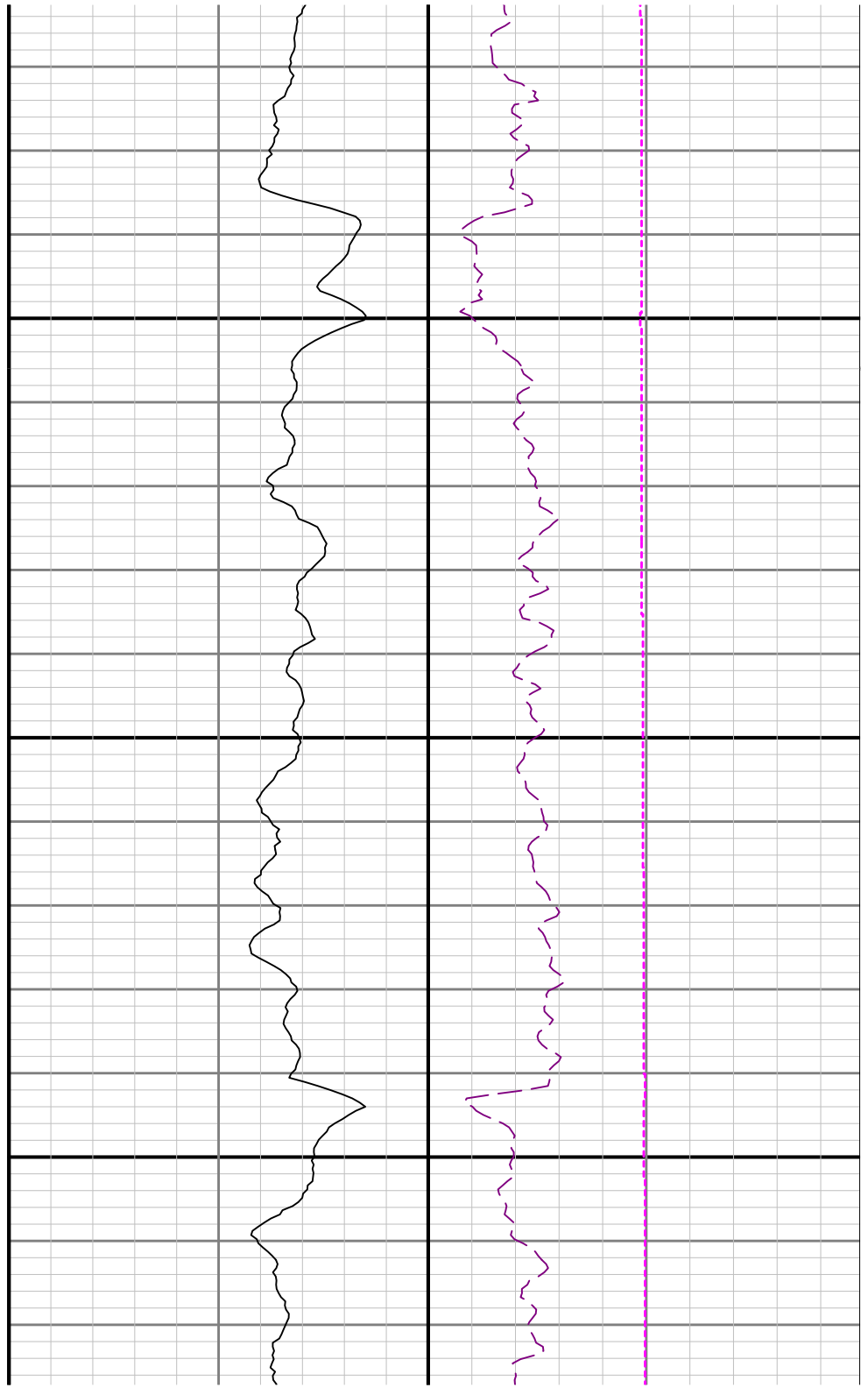


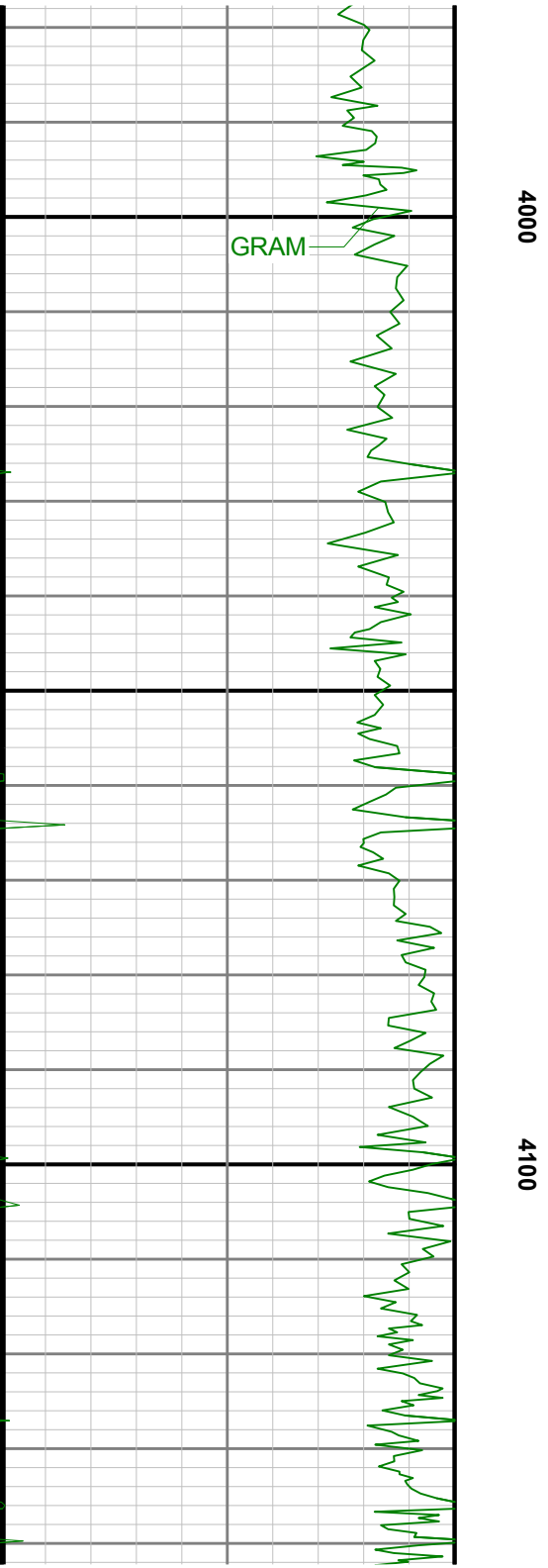
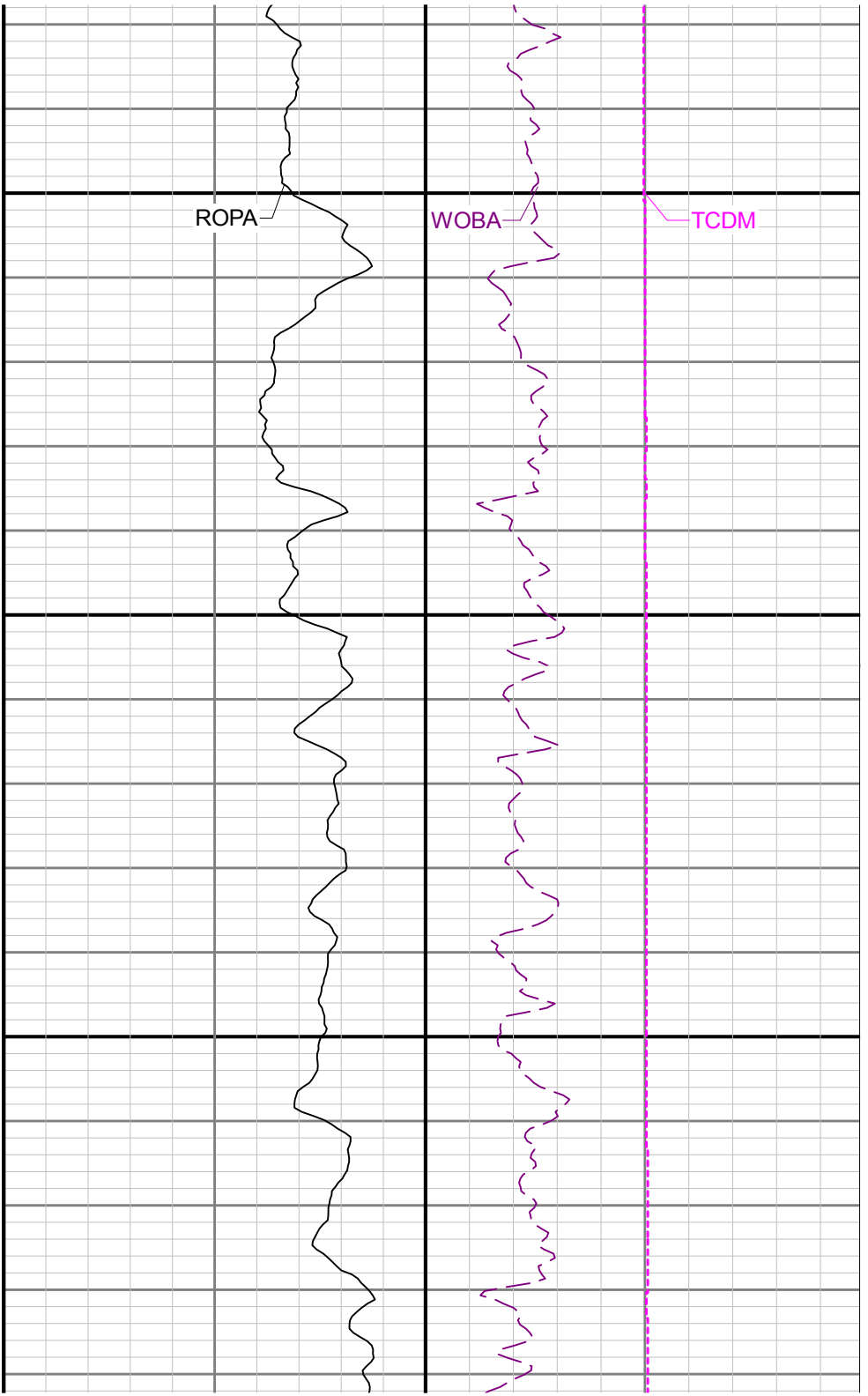


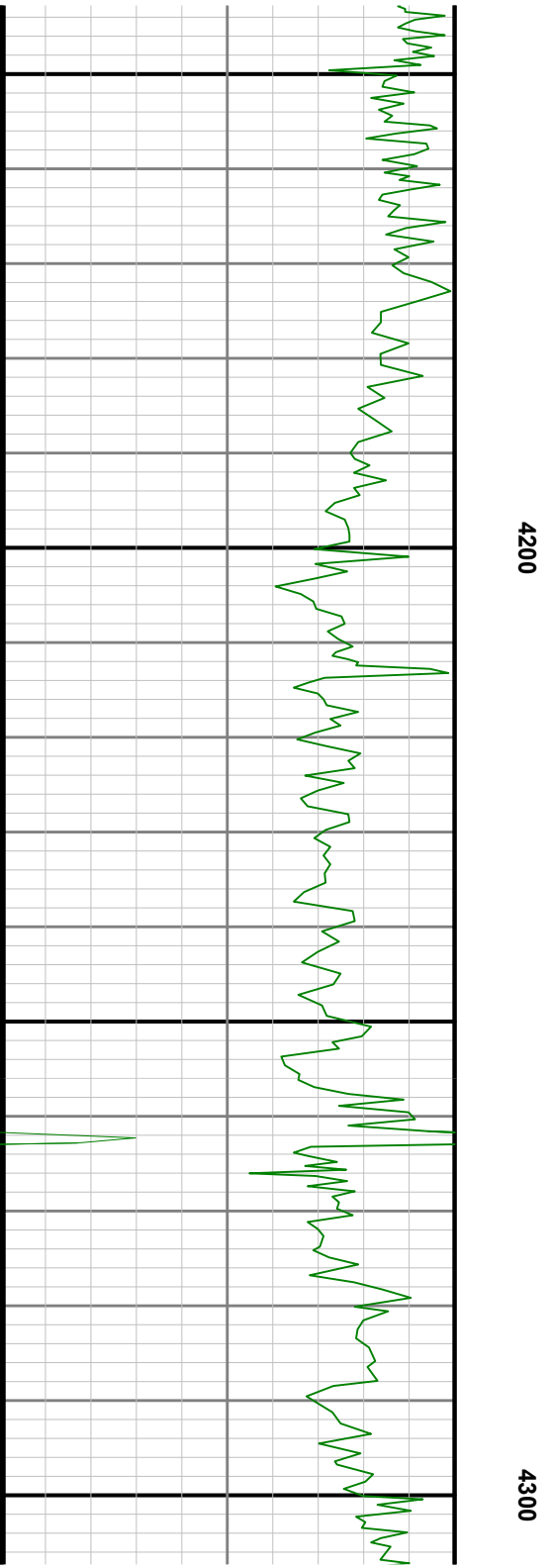
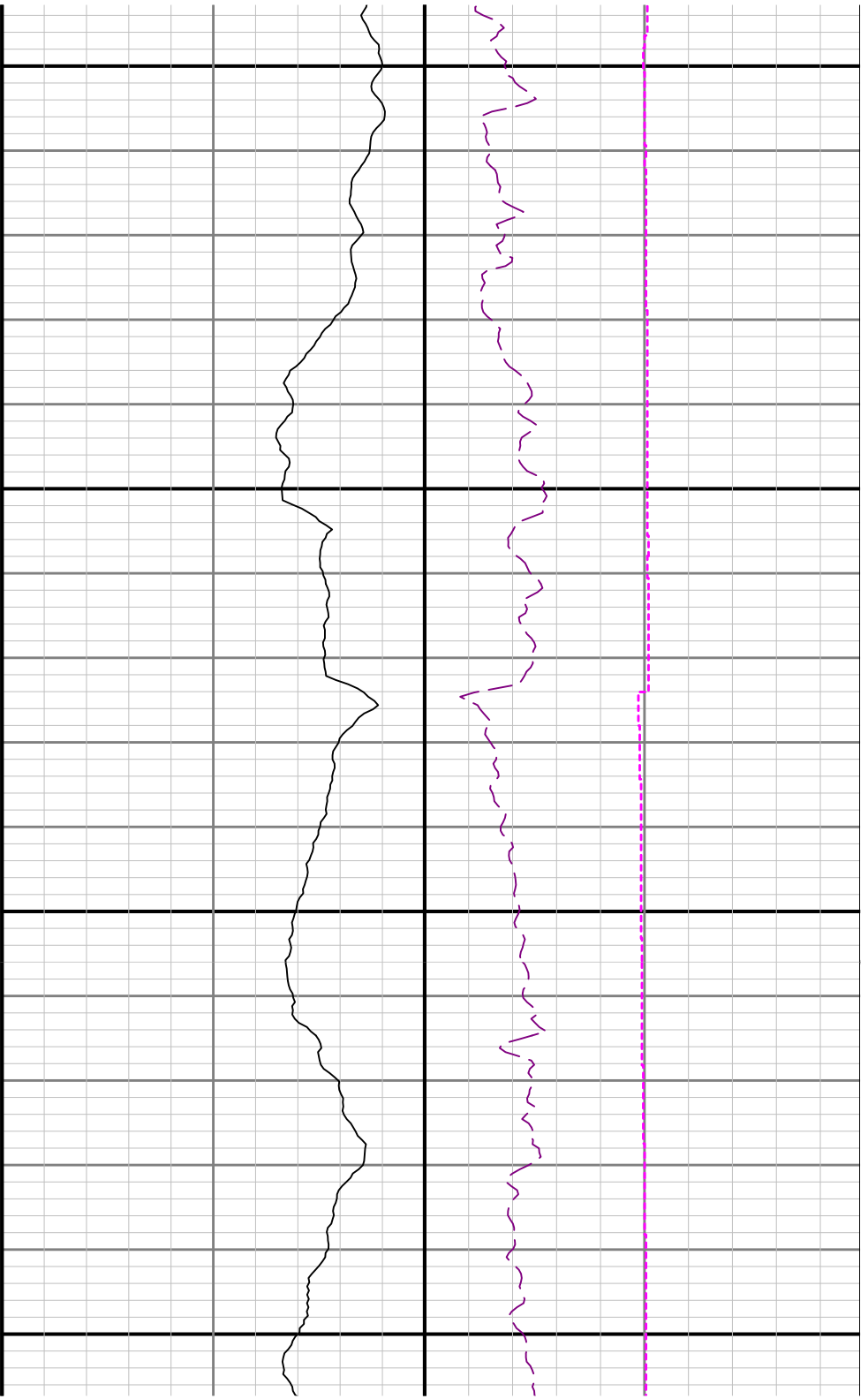


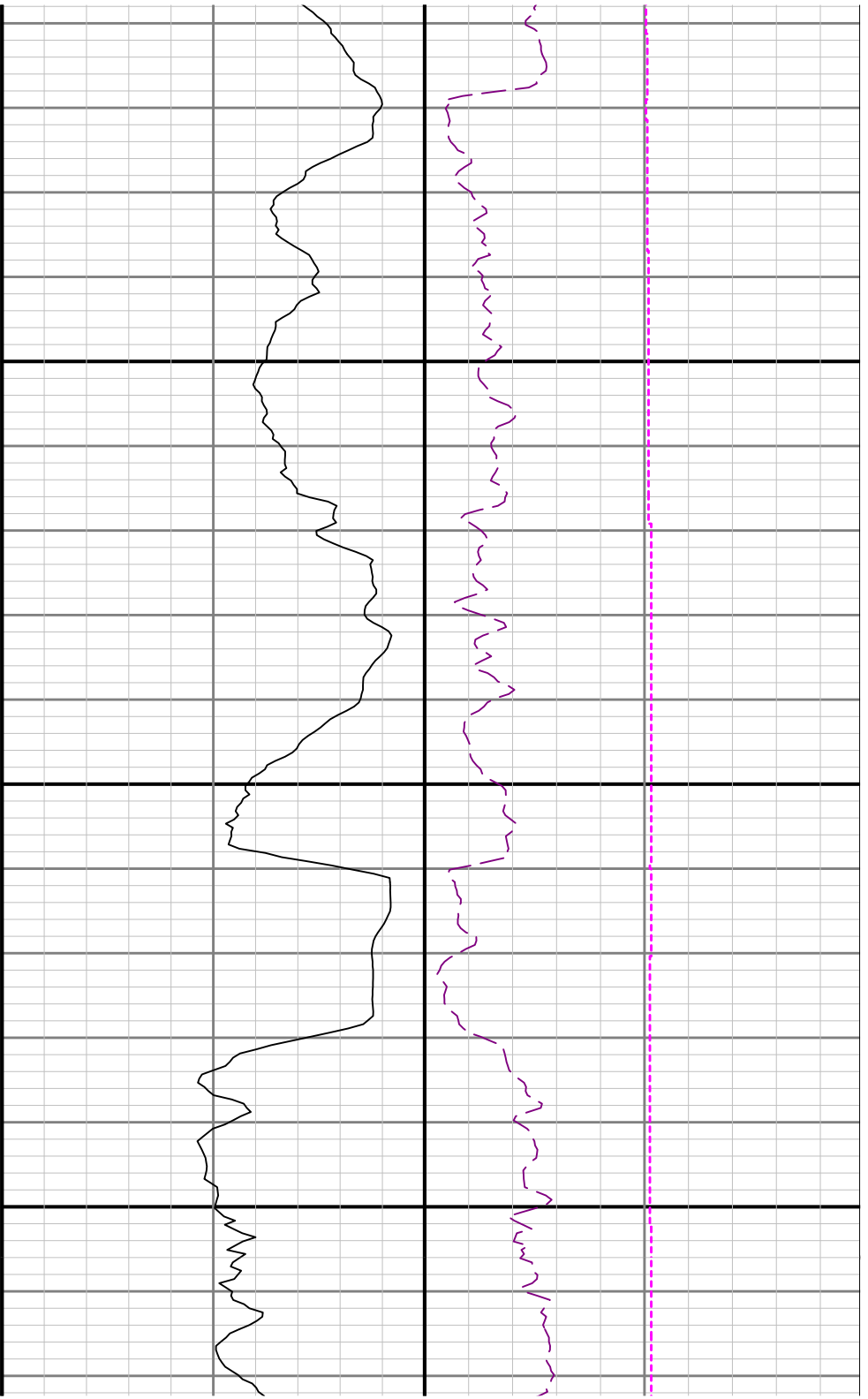


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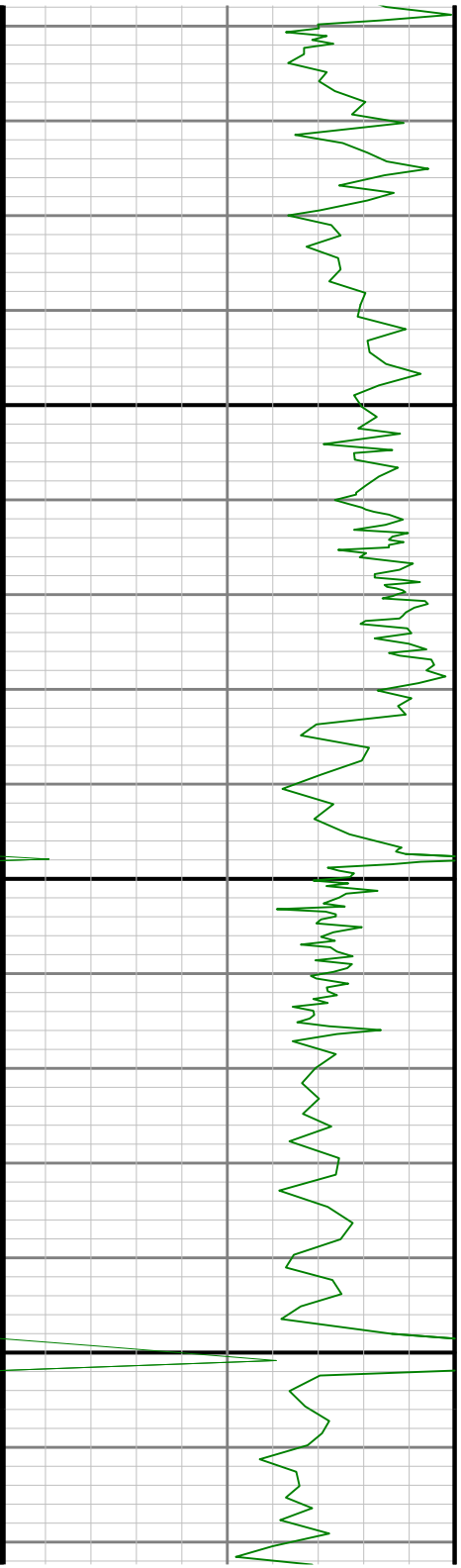


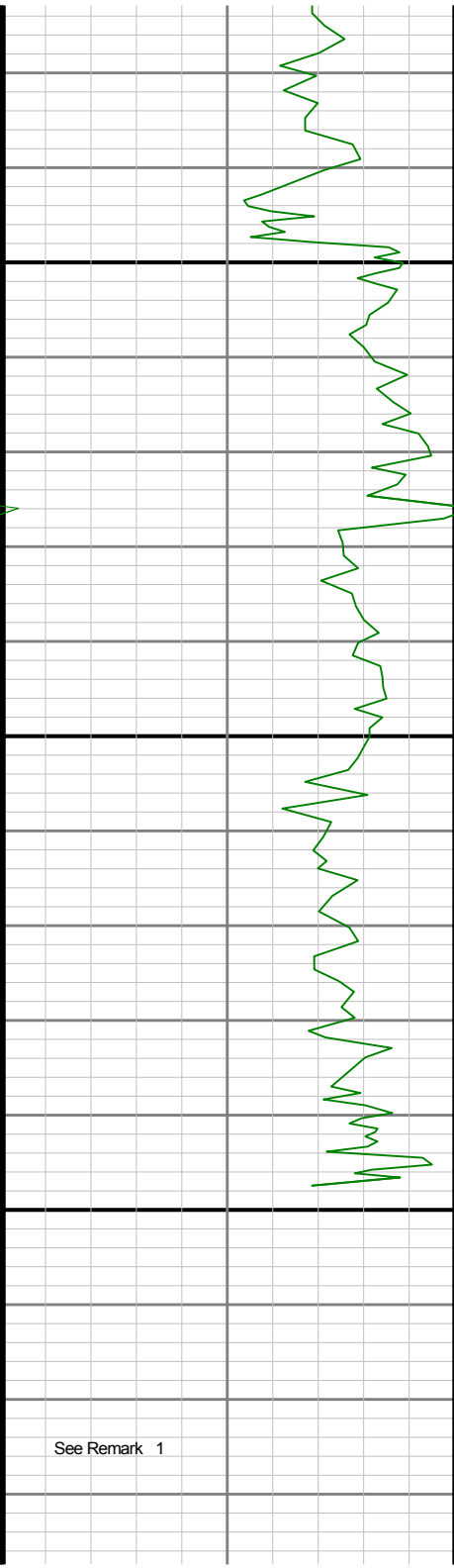






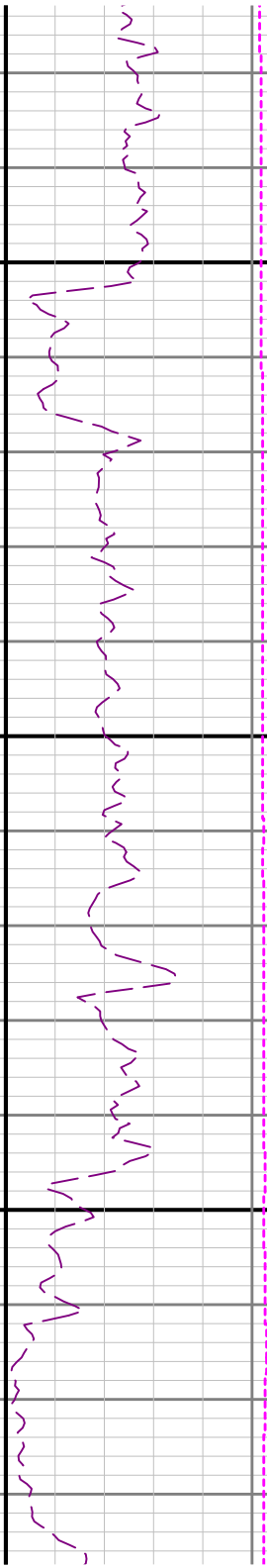
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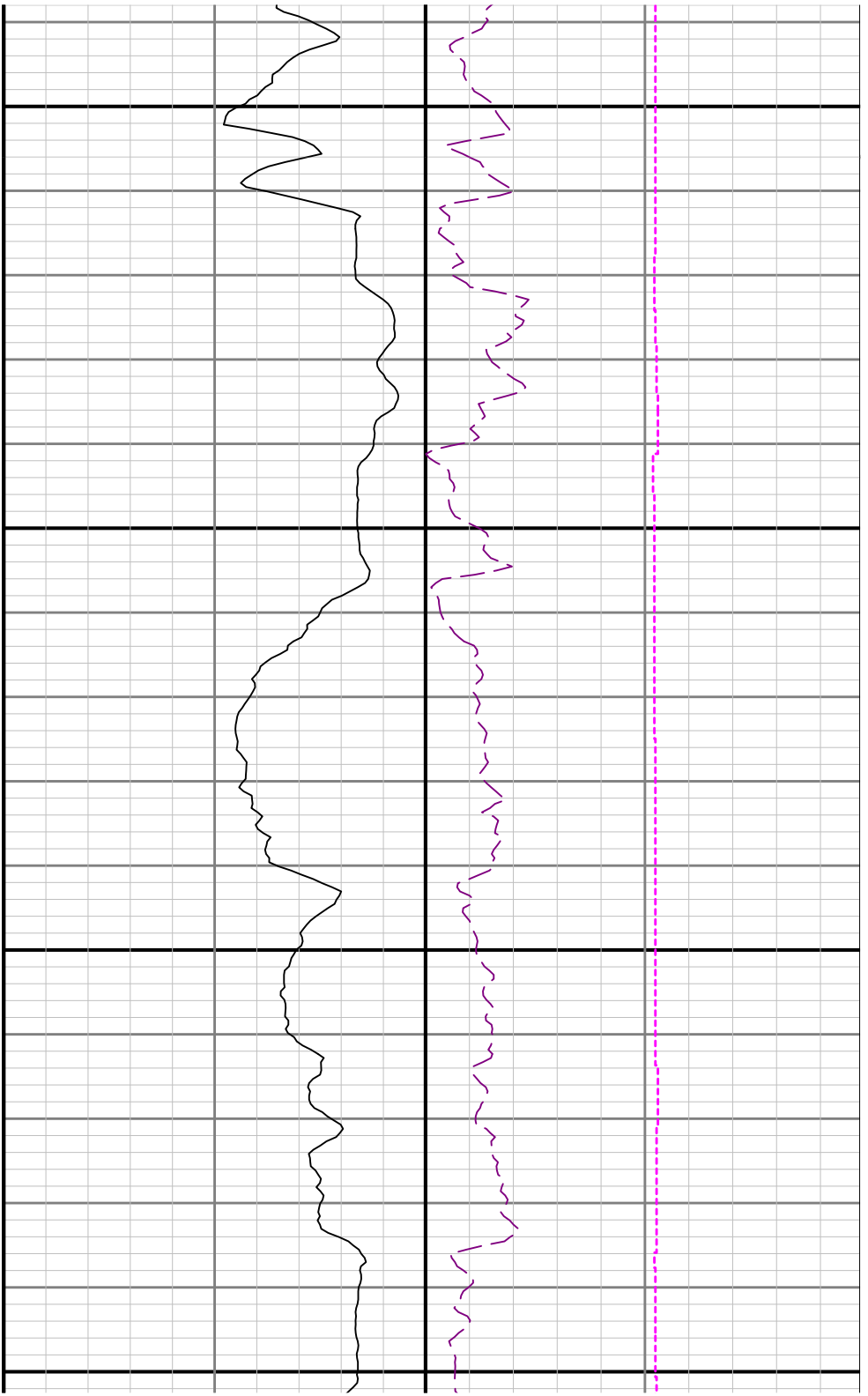


4500

4600



See Remark 1



4700

4800

See Remark 2

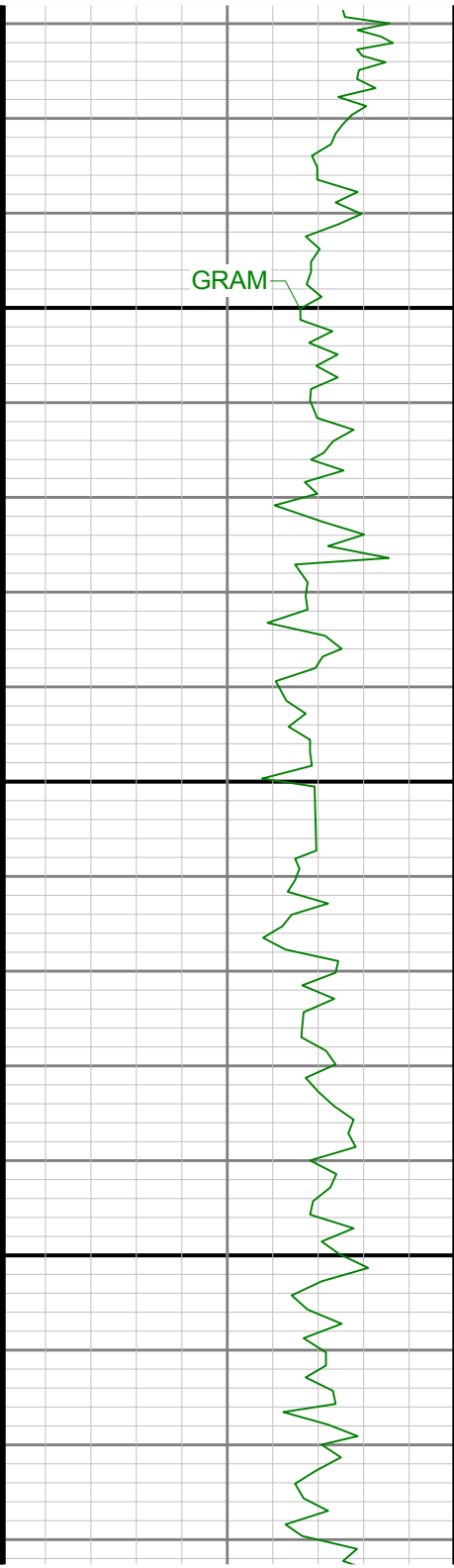


R1<R2

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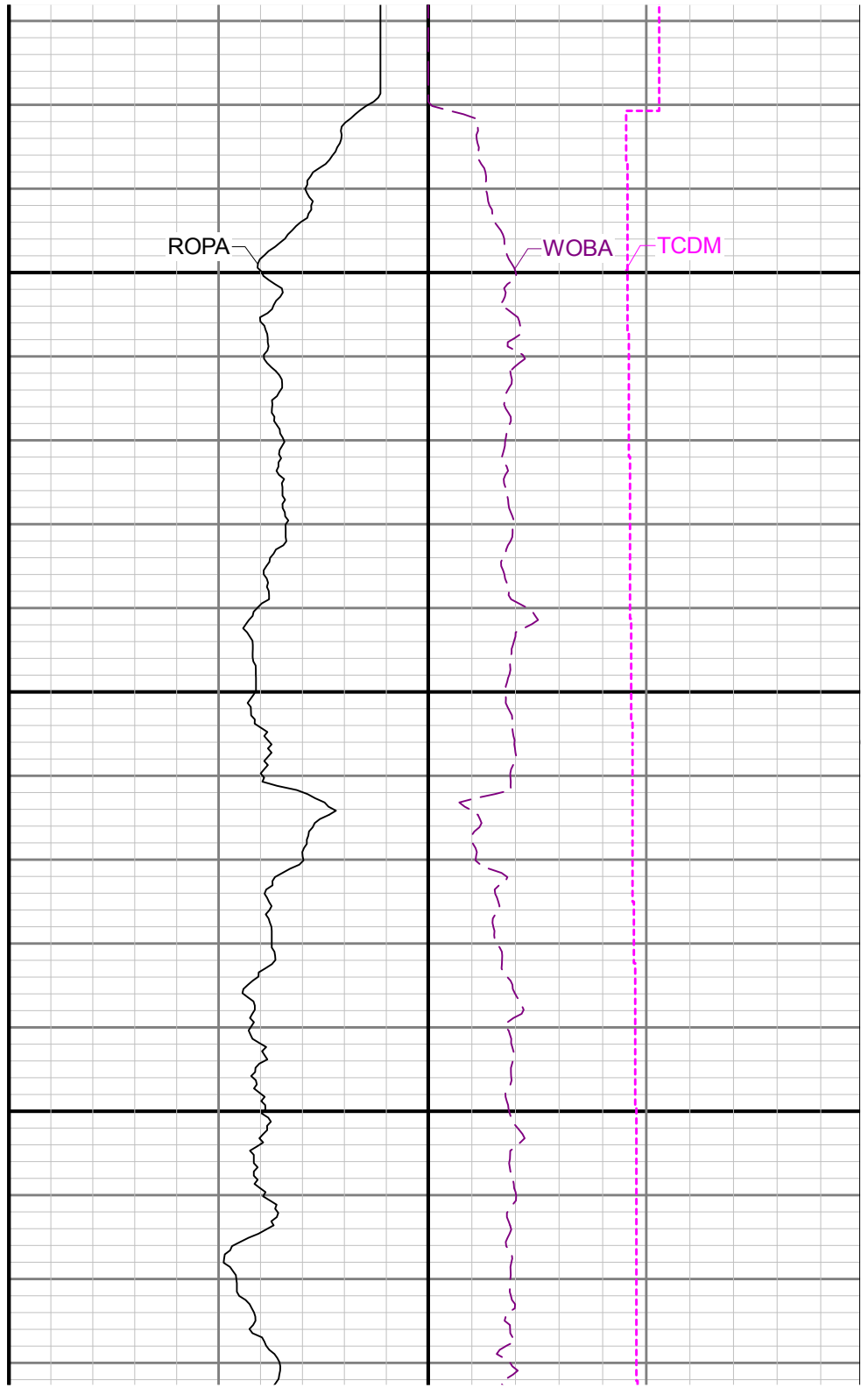
See Remark 3



GRAM

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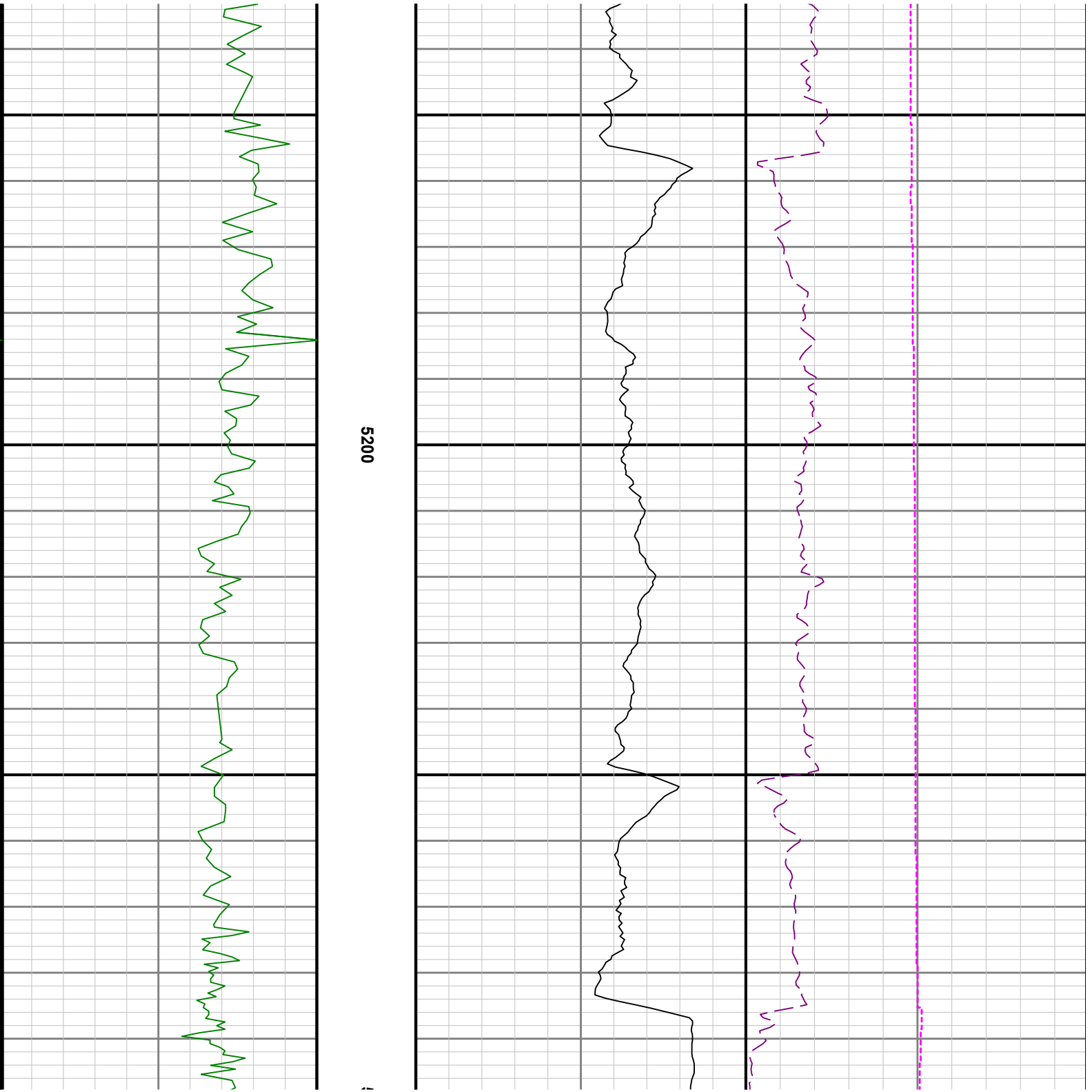
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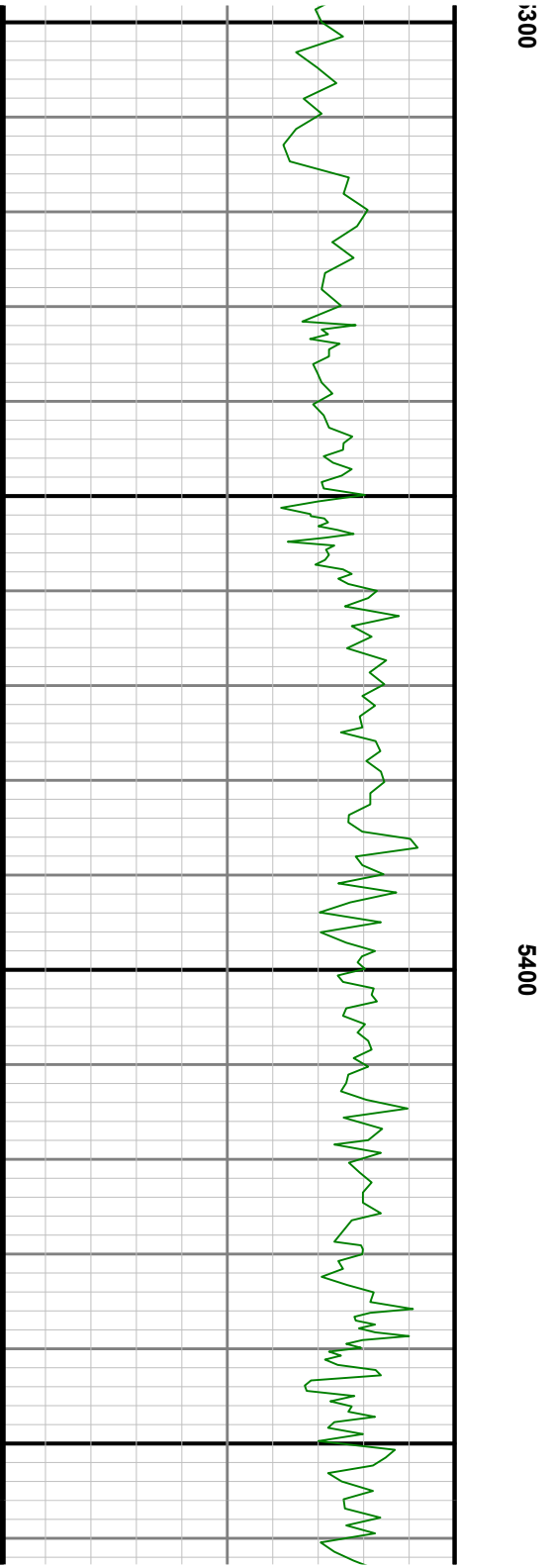
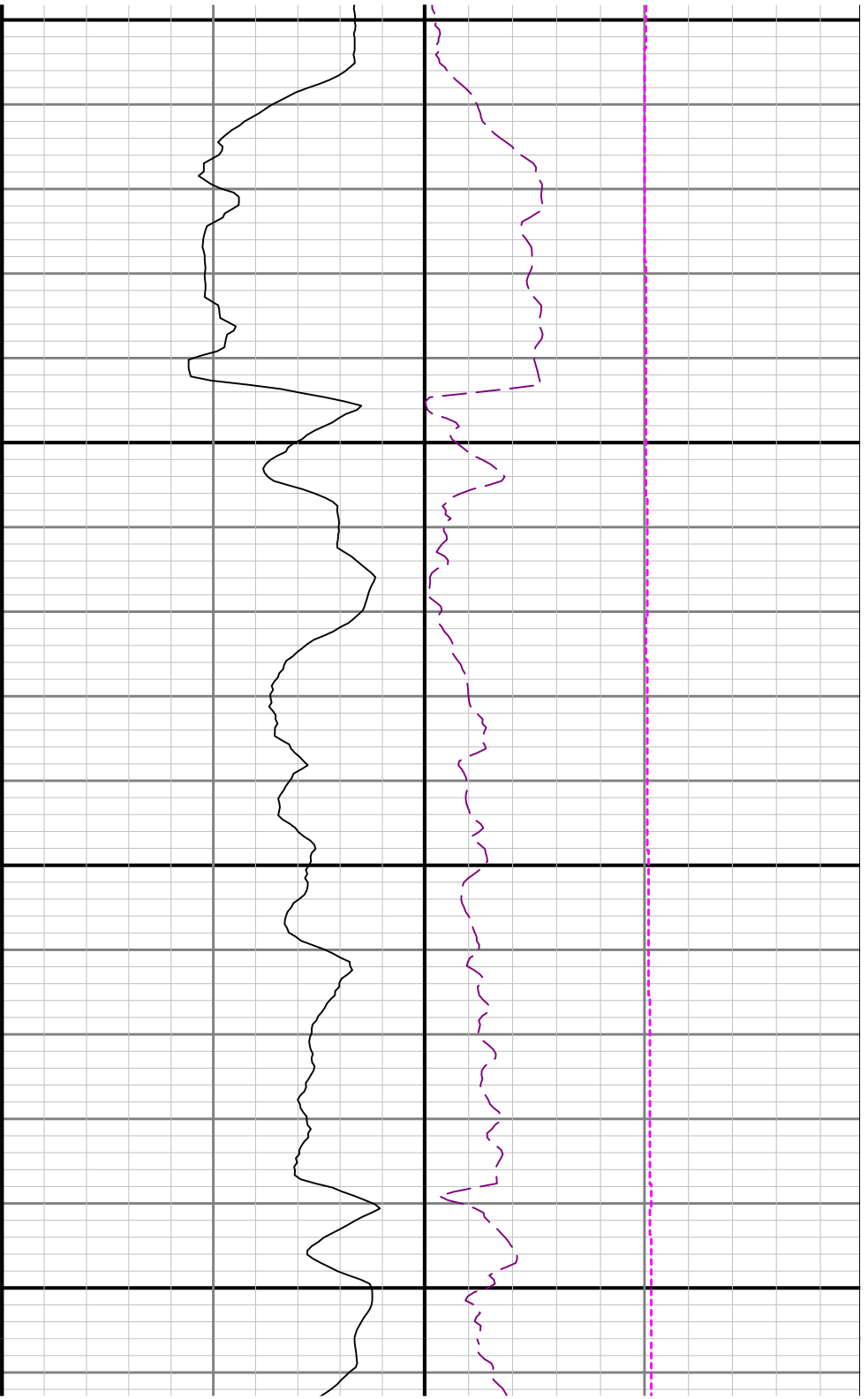


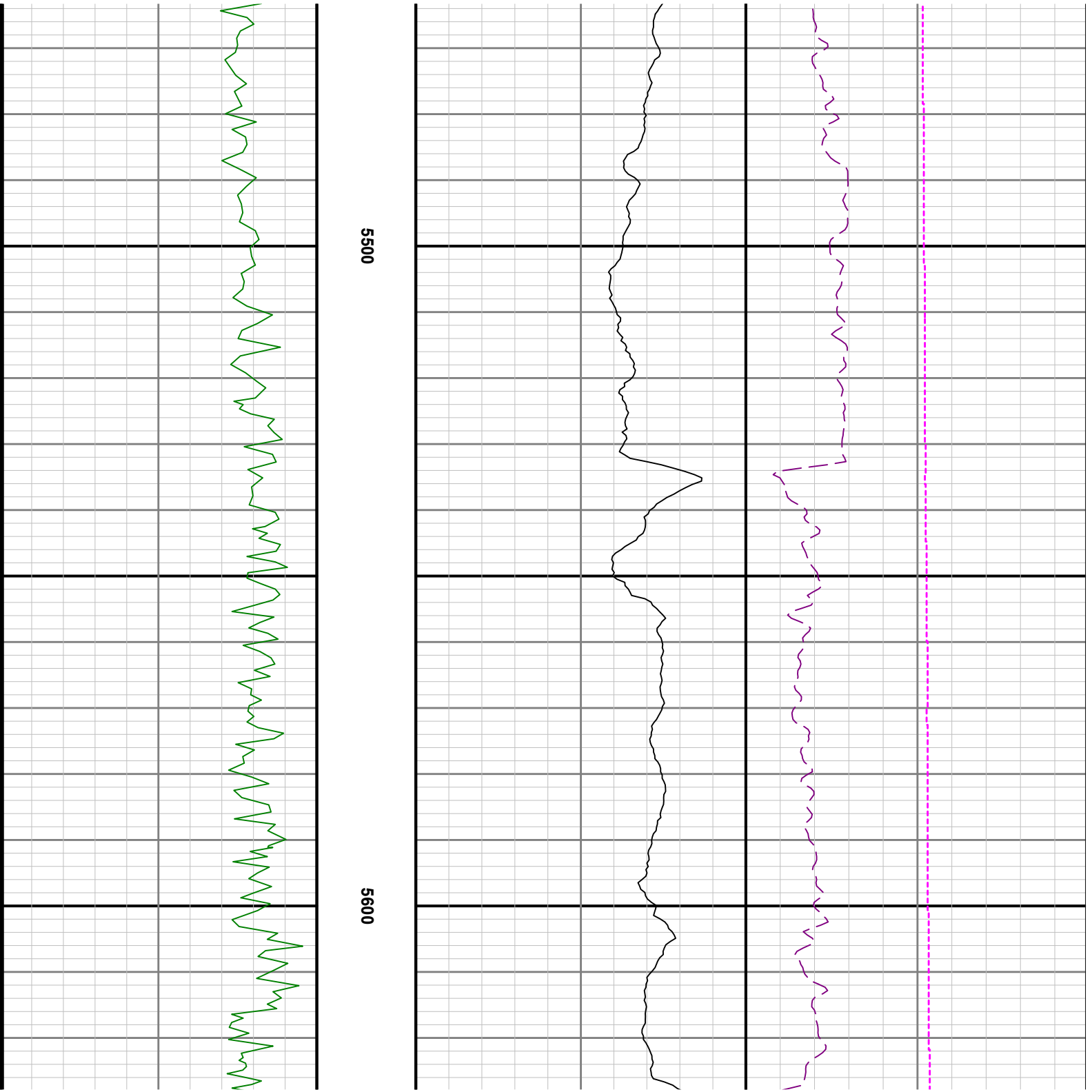
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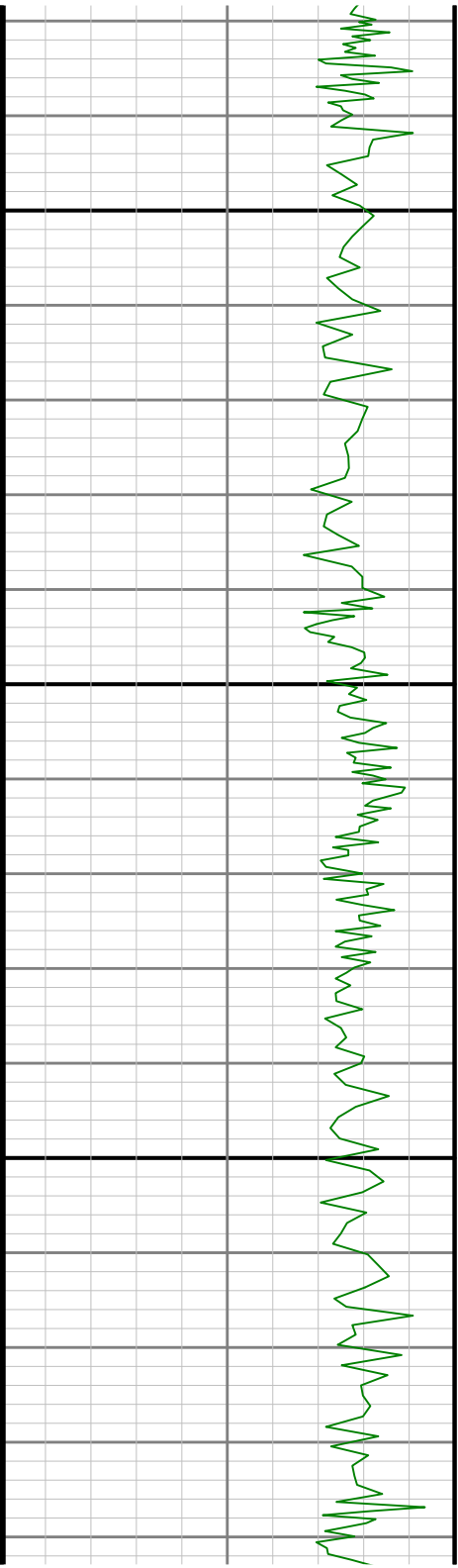
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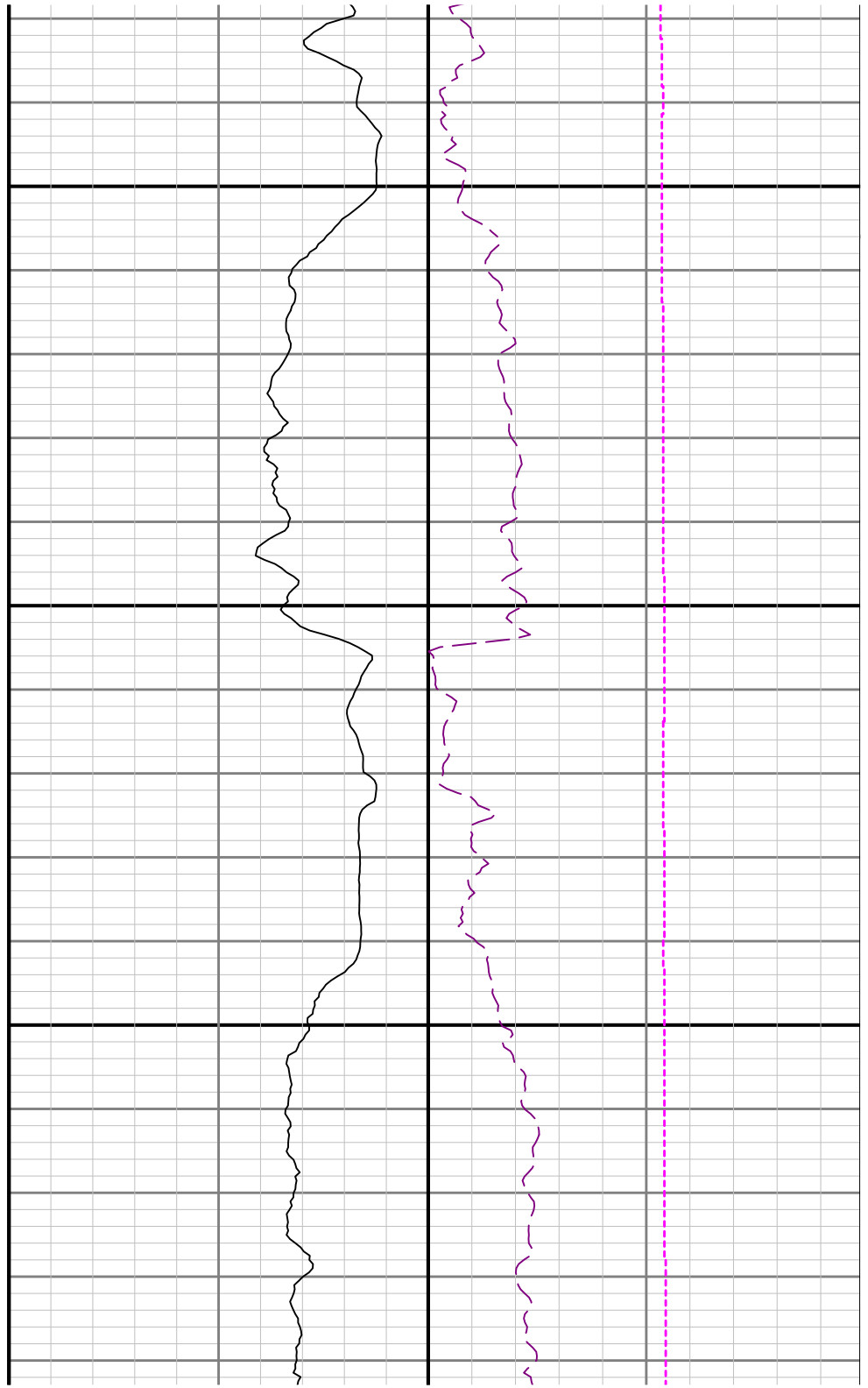


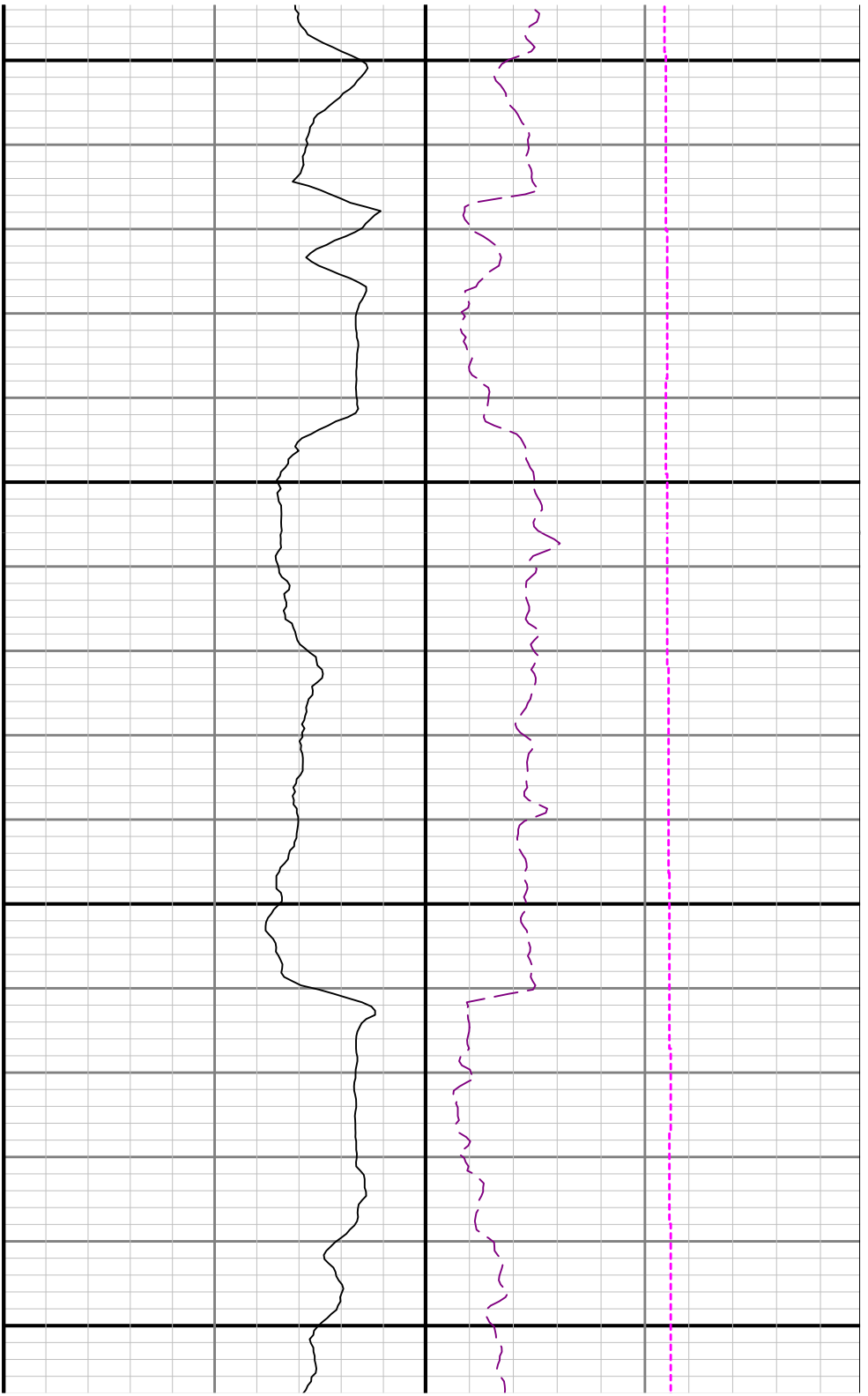






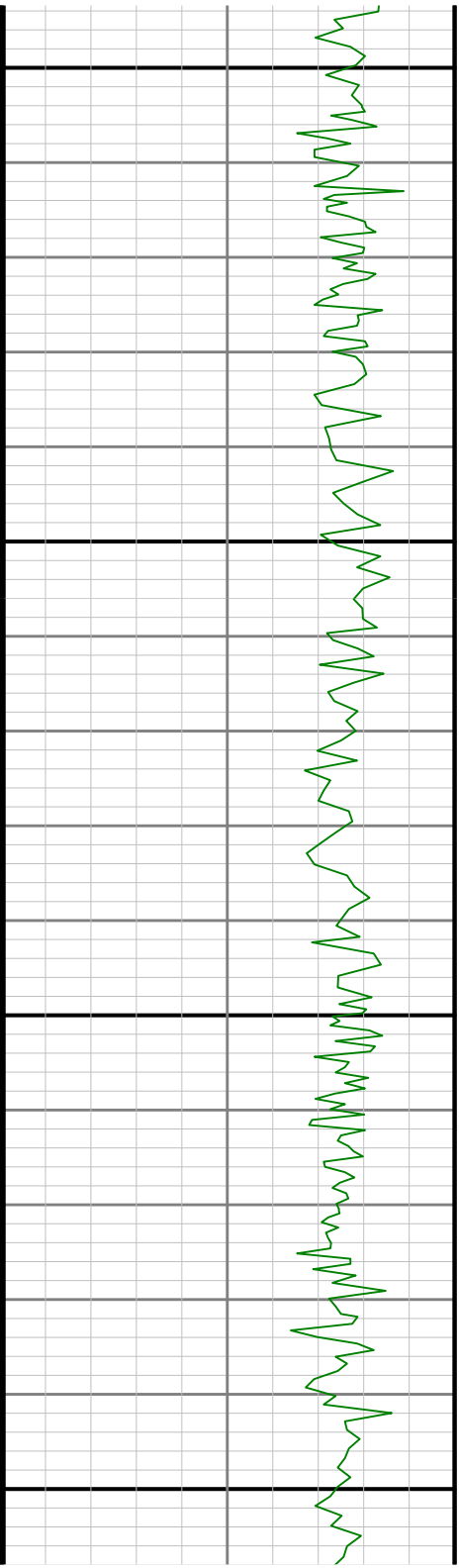
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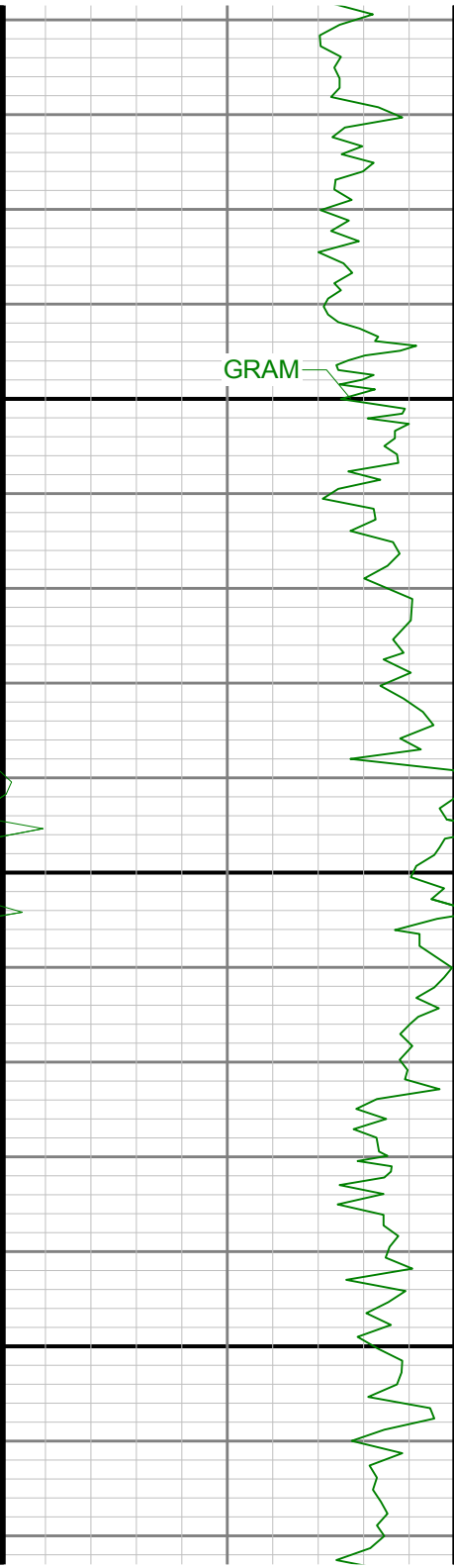




5800

5900





GRAM

6000

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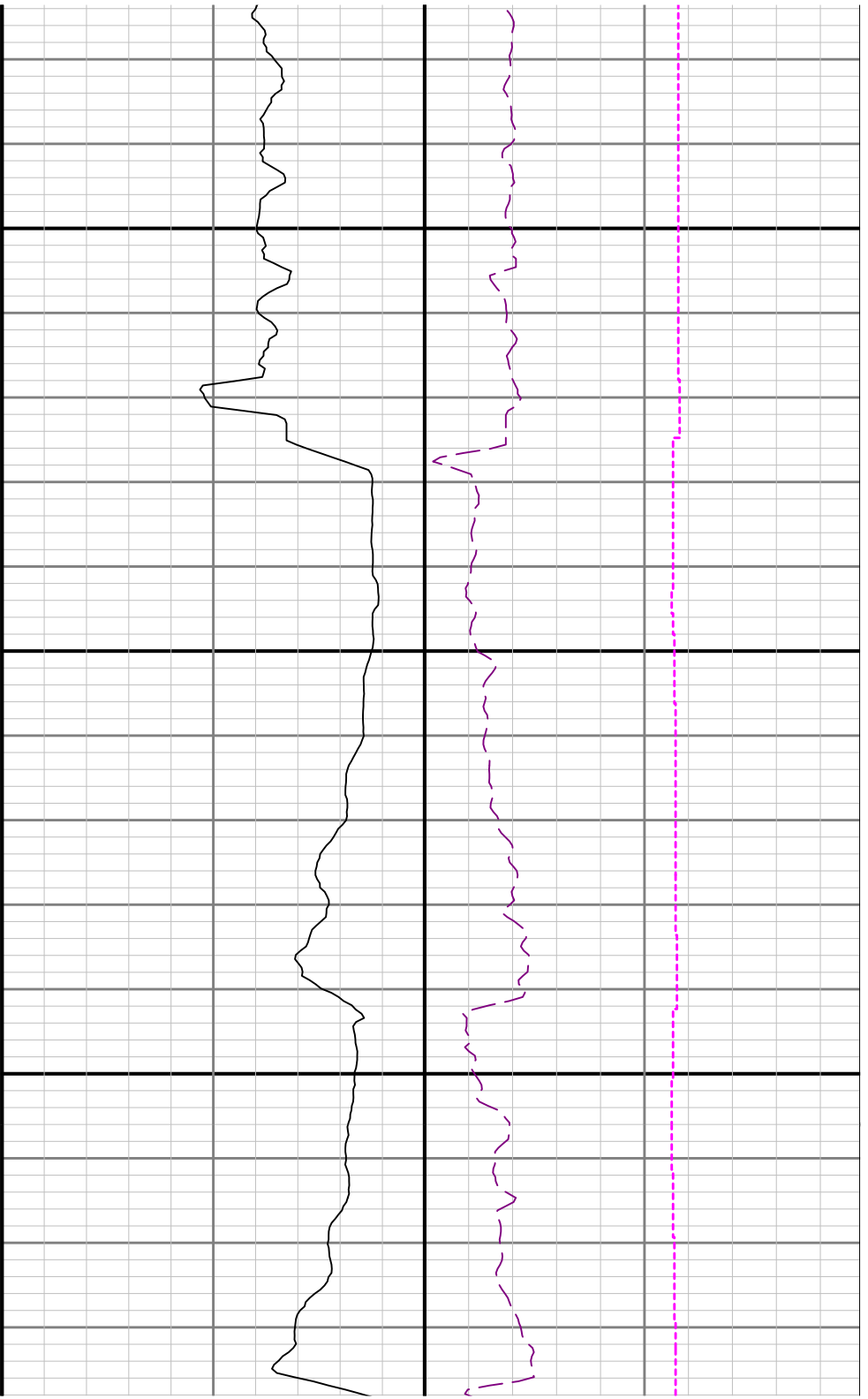


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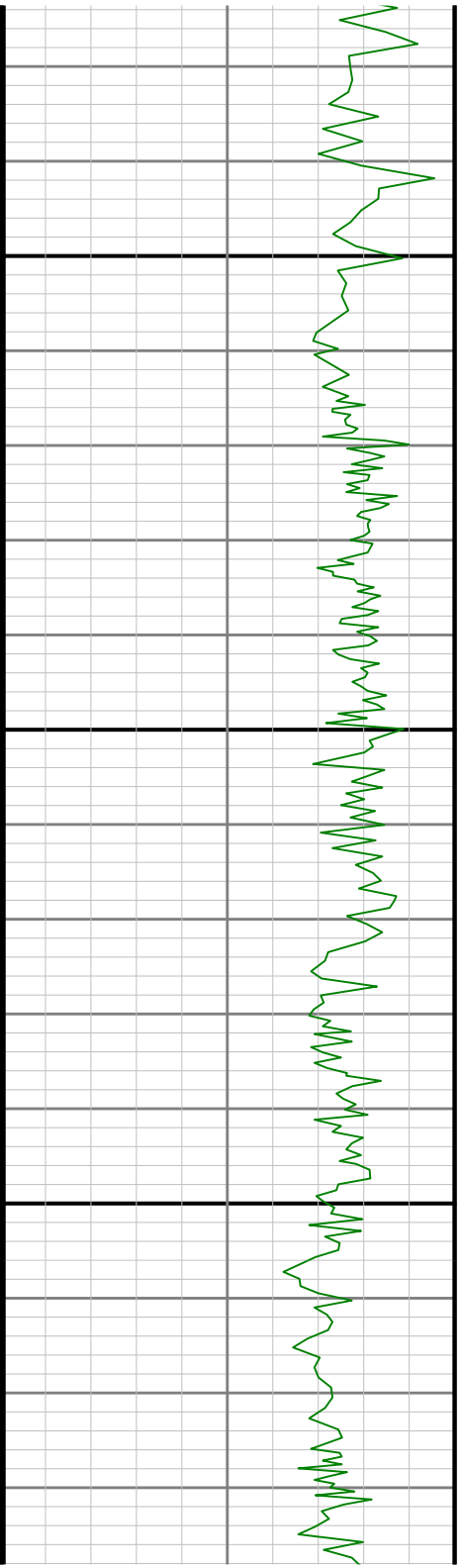


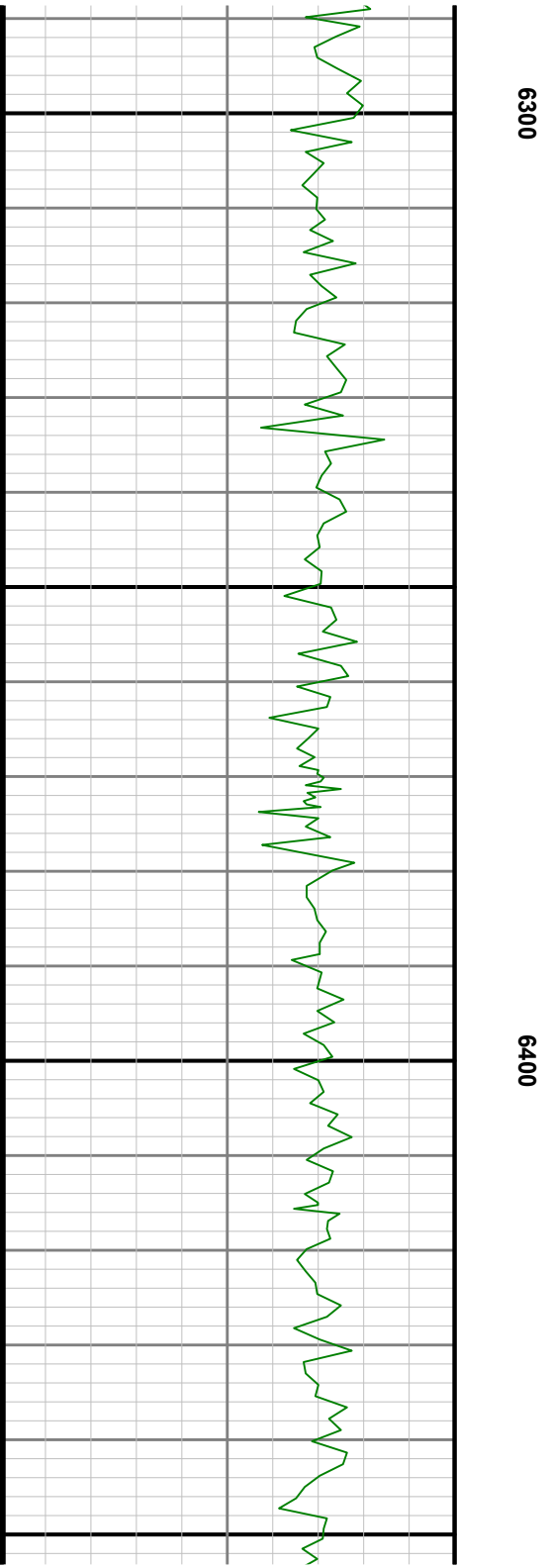
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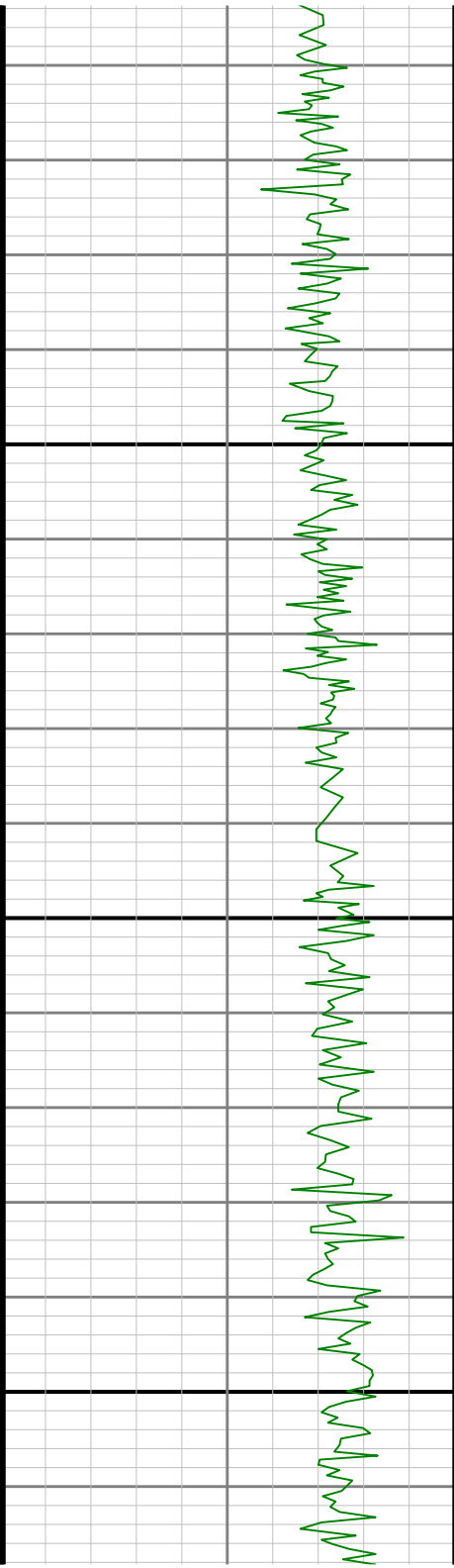
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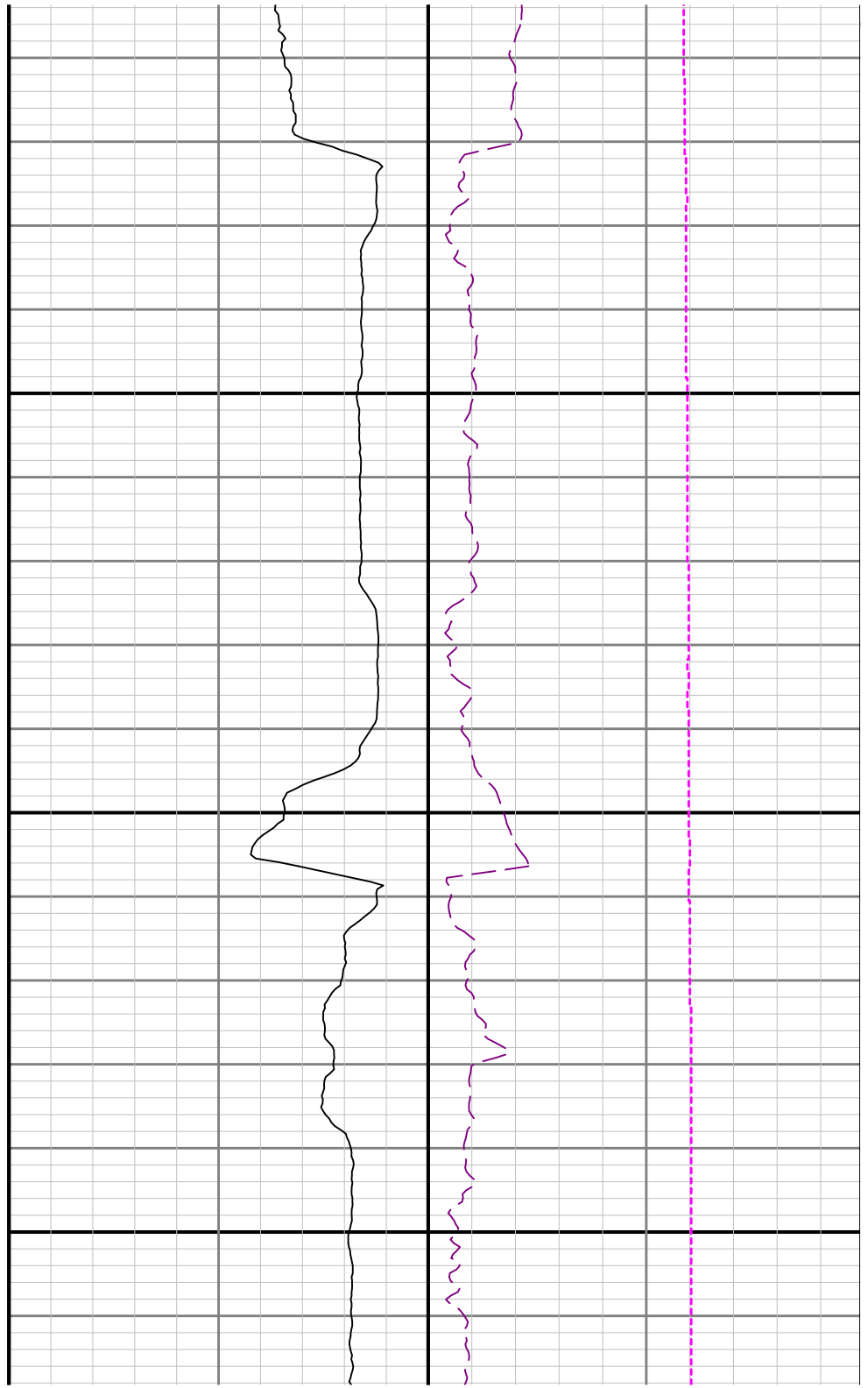


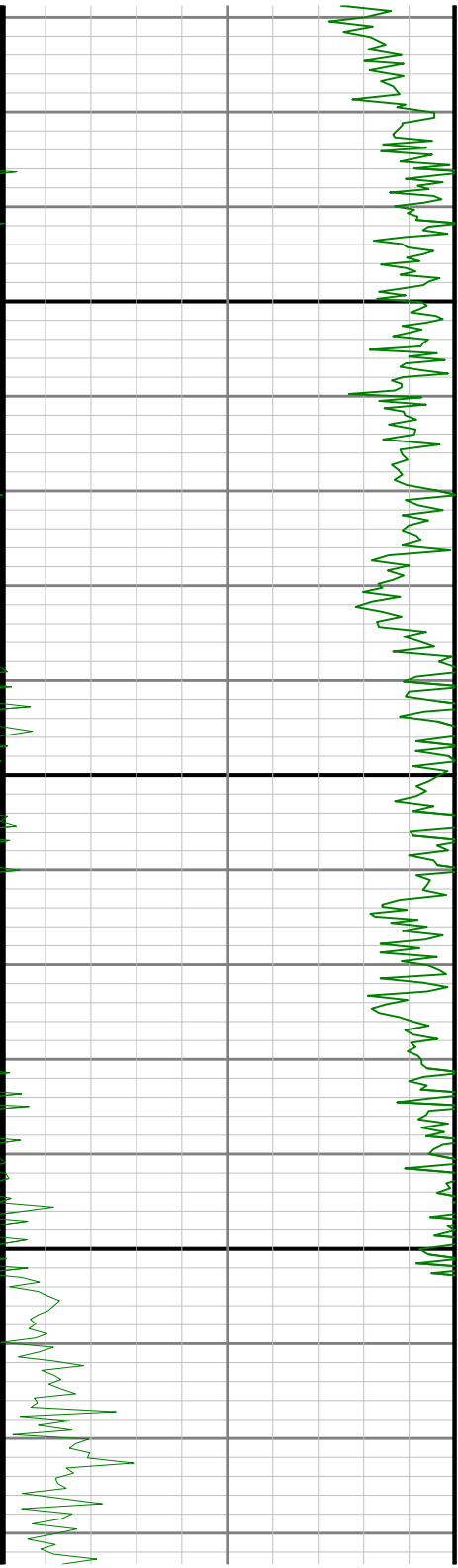




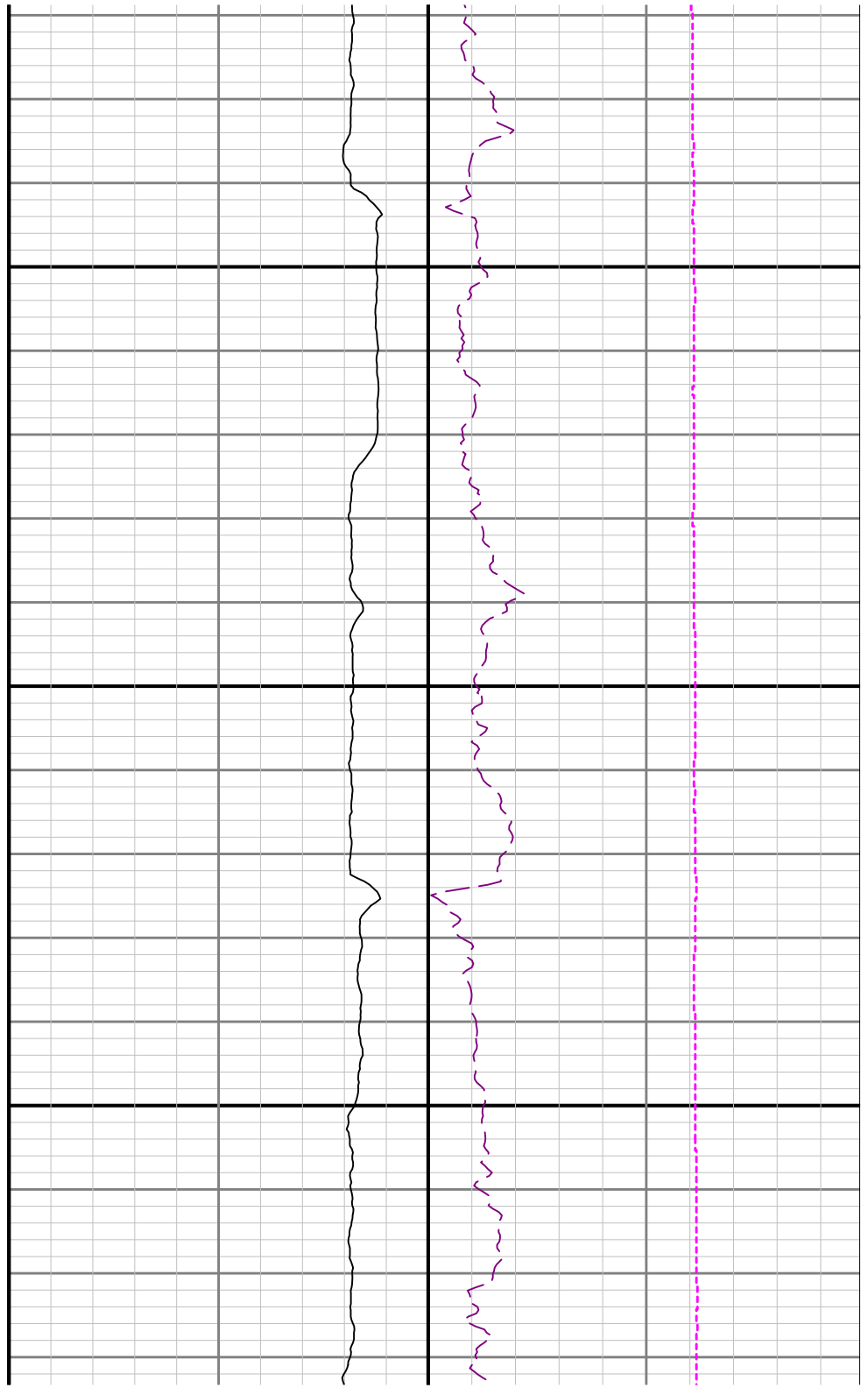
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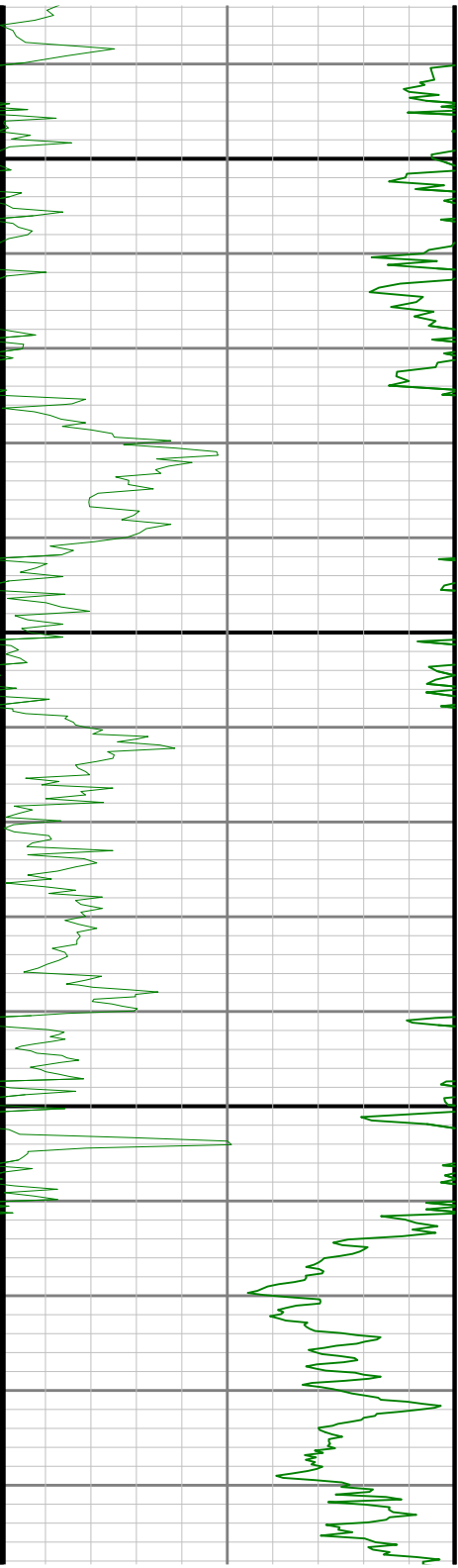
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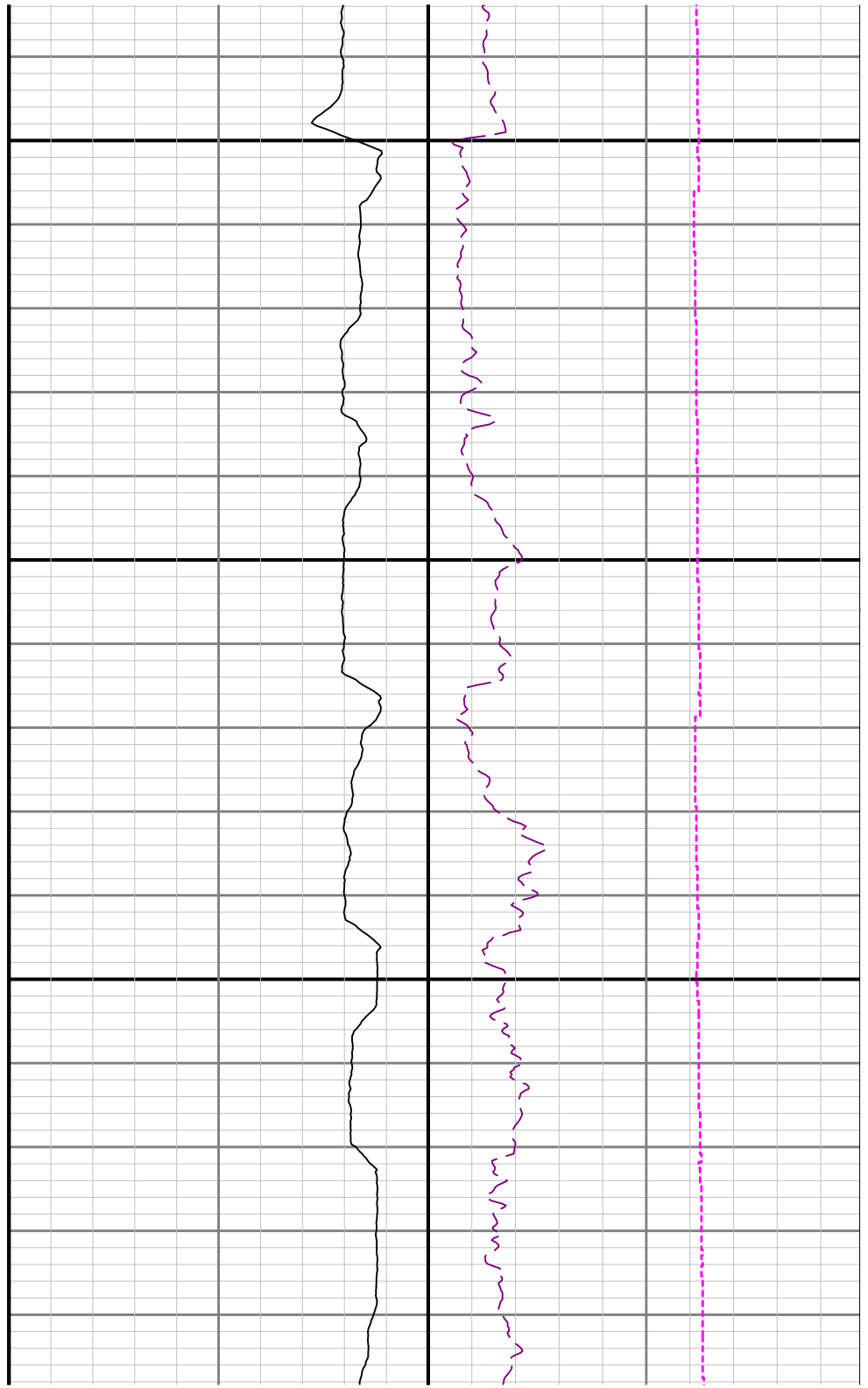
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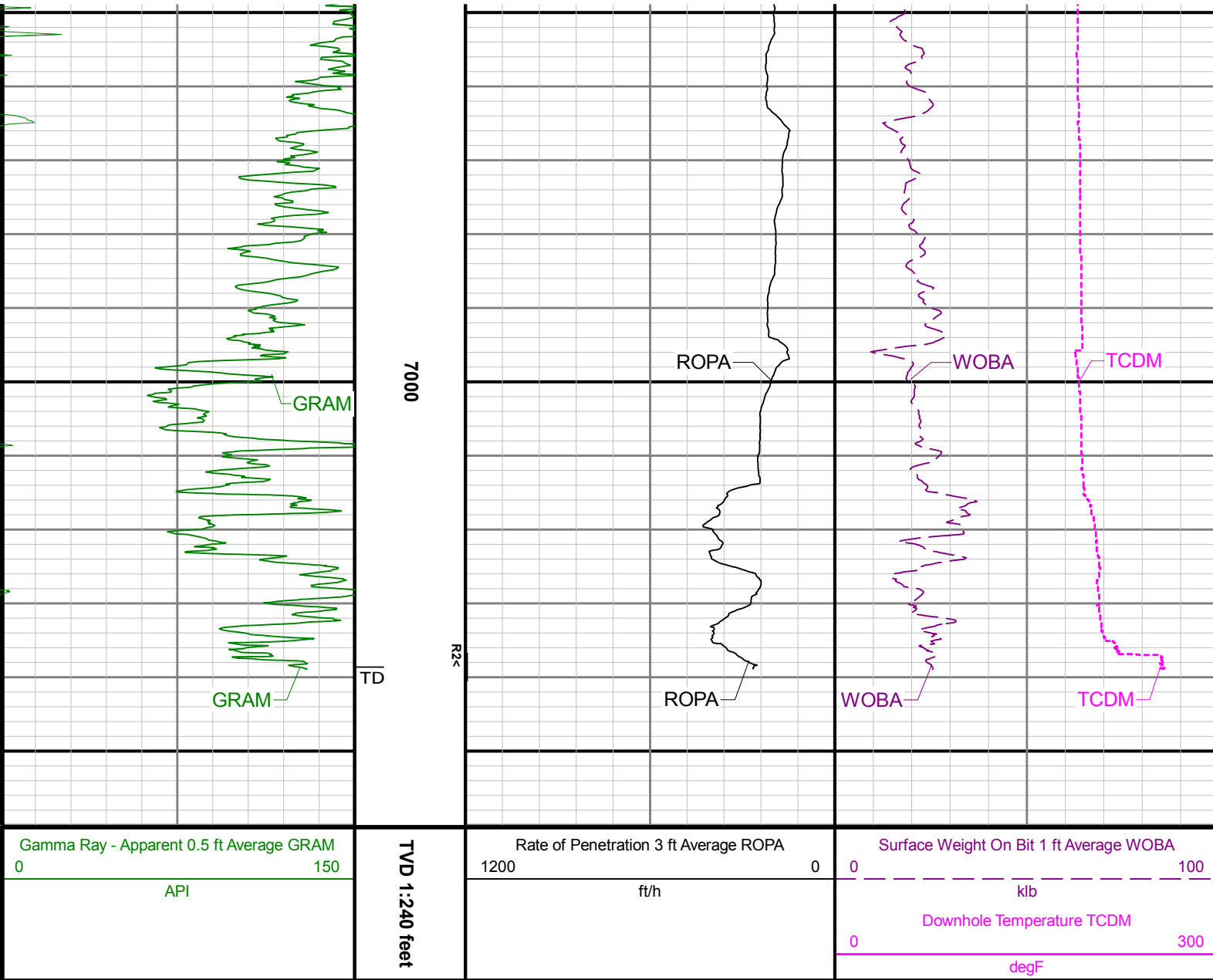




0069

0089





Directional Survey Summary

Latitude:	040° 12' 9.720" N	Longitude:	104° 38' 49.812" W
North Reference:	Grid	Drill Depth Zero:	Rig Floor
Vertical Datum is:	Ground Level	Vertical Datum to DDZ: (ft)	30.00
Vertical Section North: (m)	0.00	Vertical Section East: (m)	0.00
Vertical Section Azimuth: (deg)	356.13		
Grid Convergence: (deg)	-0.55	Magnetic Declination: (deg)	8.36
Total Correction: (deg)	7.81	TVD Calculation Method:	Minimum Curvature
Magnetic Correction:	On	Local Magnetic Field: (nT)	52442
Local Magnetic Dip Angle: (deg)	66.85	Local Gravity Field: (m/s ²)	9.801

Local Magnetic Dip Angle: (deg) 66.85				Local Gravity Field: (m/s2) 9.801								
Tie-In / Projection	Measured Depth (ft)	Inclination (deg)	Azimuth (deg)	Temperature (degF)	North (ft)	East (ft)	True Vertical Depth (ft)	Vertical Section (ft)	Course Length (ft)	Dog Leg Severity (deg/100ft)	Build Rate (deg/100ft)	Turn Rate (deg/100ft)
Tie-In	0.00	0.00	274.69	N/A	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	1858.00	3.60	73.04	N/A	45.87	51.63	1855.62	42.28	1858.00	0.64	0.27	9.62
	1896.00	2.99	69.30	93.2	46.57	53.69	1893.55	42.83	38.00	1.70	-1.61	-9.84
	1955.00	2.32	68.05	96.0	47.56	56.24	1952.49	43.65	59.00	1.14	-1.14	-2.12
	2050.00	1.21	33.65	98.7	49.11	58.58	2047.44	45.04	95.00	1.57	-1.17	-36.21
	2144.00	1.98	327.03	104.1	51.30	58.25	2141.41	47.25	94.00	1.99	0.82	-70.87
	2239.00	3.48	323.79	104.1	55.00	55.65	2236.30	51.12	95.00	1.59	1.58	-3.41
	2334.00	5.36	320.26	106.8	60.74	51.11	2331.02	57.15	95.00	2.00	1.98	-3.72
	2428.00	6.96	311.56	98.7	67.90	44.04	2424.47	64.77	94.00	1.97	1.70	-9.26
	2523.00	8.19	312.52	112.2	76.29	34.75	2518.64	73.77	95.00	1.30	1.29	1.01
	2618.00	9.06	314.02	125.7	86.06	24.38	2612.57	84.22	95.00	0.95	0.92	1.58
	2712.00	9.04	301.62	114.9	95.07	12.77	2705.41	94.00	94.00	2.07	-0.02	-13.19
	2807.00	10.16	297.60	120.3	102.87	-1.01	2799.08	102.70	95.00	1.37	1.18	-4.23
	2901.00	10.03	295.93	120.3	110.29	-15.72	2891.62	111.10	94.00	0.34	-0.14	-1.78
	2996.00	10.05	304.90	125.7	118.65	-29.96	2985.17	120.40	95.00	1.64	0.02	9.44
	3090.00	10.07	309.83	125.7	128.61	-43.00	3077.73	131.22	94.00	0.92	0.02	5.24
	3185.00	10.10	303.50	131.1	138.52	-56.32	3171.26	142.01	95.00	1.17	0.03	-6.66
	3279.00	10.15	295.66	131.1	146.66	-70.66	3263.80	151.10	94.00	1.47	0.05	-8.34
	3374.00	9.99	293.71	133.8	153.60	-85.75	3357.34	159.04	95.00	0.40	-0.17	-2.05
	3469.00	9.96	297.26	136.5	160.68	-100.60	3450.91	167.10	95.00	0.65	-0.03	3.74
	3563.00	8.19	293.67	141.9	167.09	-113.96	3543.73	174.40	94.00	1.98	-1.88	-3.82
	3658.00	8.43	318.81	141.9	175.05	-124.75	3637.76	183.07	95.00	3.80	0.25	26.46
	3752.00	9.00	331.68	144.6	186.71	-132.77	3730.68	195.24	94.00	2.16	0.61	13.69
	3847.00	9.04	318.01	144.6	198.80	-141.29	3824.52	207.88	95.00	2.25	0.04	-14.39
	3942.00	9.16	309.50	147.3	209.15	-152.12	3918.33	218.94	95.00	1.42	0.13	-8.96
	4037.00	9.10	306.49	150.0	218.43	-164.00	4012.12	229.00	95.00	0.51	-0.06	-3.17
	4131.00	8.89	304.80	150.0	227.00	-175.94	4104.97	238.35	94.00	0.36	-0.22	-1.80
	4226.00	8.44	304.23	152.7	235.11	-187.73	4198.88	247.24	95.00	0.48	-0.47	-0.60
	4321.00	8.32	306.01	150.0	243.07	-199.05	4292.87	255.95	95.00	0.30	-0.13	1.87
	4415.00	8.36	315.38	152.7	251.93	-209.35	4385.88	265.49	94.00	1.44	0.04	9.97
	4510.00	9.04	318.80	152.7	262.46	-219.12	4479.79	276.65	95.00	0.90	0.72	3.60
	4605.00	9.04	322.78	158.1	274.02	-228.55	4573.61	288.82	95.00	0.66	0.00	4.19
	4699.00	8.70	320.48	155.4	285.39	-237.54	4666.48	300.77	94.00	0.52	-0.36	-2.45
	4794.00	9.10	320.25	158.1	296.71	-246.92	4760.34	312.70	95.00	0.42	0.42	-0.24
	4889.00	9.02	313.67	158.1	307.62	-257.11	4854.16	324.28	95.00	1.09	-0.08	-6.93
	4985.00	8.77	308.19	133.8	317.35	-268.31	4949.00	334.73	96.00	0.92	-0.26	-5.71
	5080.00	8.65	310.40	141.9	326.45	-279.44	5042.91	344.57	95.00	0.37	-0.13	2.33
	5174.00	8.51	312.64	144.6	335.75	-289.94	5135.86	354.55	94.00	0.39	-0.15	2.38
	5269.00	9.99	320.80	147.3	346.89	-300.32	5229.62	366.37	95.00	2.08	1.56	8.59
	5363.00	8.54	317.79	150.0	358.38	-310.16	5322.39	378.50	94.00	1.63	-1.54	-3.20
	5458.00	8.38	321.40	152.7	369.02	-319.22	5416.36	389.72	95.00	0.58	-0.17	3.80
	5553.00	8.10	321.39	158.1	379.66	-327.71	5510.38	400.91	95.00	0.29	-0.29	-0.01
	5648.00	8.38	321.11	160.8	390.28	-336.24	5604.40	412.08	95.00	0.30	0.29	-0.29
	5742.00	7.42	314.04	160.8	399.83	-344.90	5697.51	422.19	94.00	1.45	-1.02	-7.52
	5837.00	4.95	295.46	N/A	405.86	-353.01	5791.96	428.76	95.00	3.31	-2.60	-19.56
	5932.00	3.56	304.19	166.2	409.27	-359.15	5886.69	432.58	95.00	1.61	-1.46	9.19
	6026.00	1.78	321.85	N/A	412.06	-362.47	5980.59	435.59	94.00	2.06	-1.89	18.79
	6121.00	0.08	196.54	N/A	413.16	-363.40	6075.58	436.74	95.00	1.92	-1.79	-131.91
	6199.00	0.00	357.20	N/A	413.11	-363.41	6153.58	436.69	78.00	0.10	-0.10	205.97
	6216.00	0.14	333.73	N/A	413.13	-363.42	6170.58	436.71	17.00	0.82	0.82	-138.06
	6311.00	9.01	359.68	N/A	420.68	-363.52	6265.18	444.26	95.00	9.35	9.34	27.32

	6405.00	13.71	3.47	N/A	439.17	-362.88	6357.31	462.67	94.00	5.06	5.00	4.03
	6500.00	16.32	357.02	N/A	463.75	-362.90	6449.07	487.18	95.00	3.26	2.75	-6.79
	6594.00	21.78	355.20	N/A	494.34	-365.04	6537.89	517.85	94.00	5.84	5.81	-1.94
	6689.00	28.04	358.11	N/A	534.26	-367.26	6624.01	557.83	95.00	6.71	6.59	3.06
	6784.00	33.01	2.26	N/A	582.47	-366.97	6705.83	605.91	95.00	5.68	5.23	4.37
	6878.00	40.05	5.79	N/A	638.22	-362.91	6781.32	661.26	94.00	7.81	7.49	3.76
	6973.00	49.21	3.82	N/A	704.65	-357.42	6848.86	727.17	95.00	9.75	9.64	-2.07
	7068.00	54.77	358.49	N/A	779.42	-356.04	6907.36	801.67	95.00	7.33	5.85	-5.61
	7163.00	63.97	357.41	N/A	861.02	-359.00	6955.71	883.28	95.00	9.73	9.68	-1.14
	7258.00	73.63	358.11	N/A	949.42	-362.44	6990.03	971.71	95.00	10.19	10.17	0.74
	7352.00	83.14	359.95	N/A	1041.37	-363.97	7008.93	1063.56	94.00	10.30	10.12	1.96
	7447.00	89.26	0.81	N/A	1136.11	-363.34	7015.23	1158.04	95.00	6.51	6.44	0.91
	7542.00	89.32	0.79	N/A	1231.09	-362.01	7016.40	1252.72	95.00	0.07	0.06	-0.02
	7636.00	88.76	359.50	N/A	1325.08	-361.77	7017.98	1346.47	94.00	1.50	-0.60	-1.37
	7731.00	88.05	357.31	N/A	1420.00	-364.42	7020.62	1441.36	95.00	2.42	-0.75	-2.31
	7826.00	88.15	356.75	N/A	1514.82	-369.34	7023.77	1536.29	95.00	0.60	0.11	-0.59
	7921.00	88.43	356.51	N/A	1609.61	-374.92	7026.61	1631.25	95.00	0.39	0.29	-0.25
	8016.00	88.24	356.76	N/A	1704.41	-380.49	7029.37	1726.20	95.00	0.33	-0.20	0.26
	8110.00	88.12	356.50	N/A	1798.20	-386.02	7032.35	1820.15	94.00	0.30	-0.13	-0.28
	8205.00	89.38	356.81	N/A	1893.01	-391.56	7034.43	1915.12	95.00	1.37	1.33	0.33
	8300.00	89.90	358.13	N/A	1987.91	-395.75	7035.02	2010.09	95.00	1.49	0.55	1.39
	8395.00	90.12	2.44	N/A	2082.89	-395.28	7035.01	2104.82	95.00	4.54	0.23	4.54
	8489.00	90.02	4.01	N/A	2176.74	-389.99	7034.89	2198.10	94.00	1.67	-0.11	1.67
	8584.00	89.65	2.20	N/A	2271.60	-384.84	7035.17	2292.39	95.00	1.94	-0.39	-1.91
	8679.00	89.62	0.21	N/A	2366.57	-382.85	7035.77	2387.01	95.00	2.09	-0.03	-2.09
	8774.00	89.72	359.74	N/A	2461.57	-382.89	7036.32	2481.79	95.00	0.51	0.11	-0.49
	8868.00	89.75	359.55	N/A	2555.56	-383.47	7036.75	2575.62	94.00	0.20	0.03	-0.20
	8963.00	90.24	359.36	N/A	2650.56	-384.37	7036.76	2670.46	95.00	0.55	0.52	-0.20
	9058.00	90.24	359.31	N/A	2745.55	-385.48	7036.36	2765.31	95.00	0.05	0.00	-0.05
	9153.00	90.39	358.95	N/A	2840.54	-386.92	7035.84	2860.18	95.00	0.41	0.16	-0.38
	9248.00	90.17	0.13	N/A	2935.53	-387.68	7035.38	2955.00	95.00	1.26	-0.23	1.24
	9342.00	89.65	0.62	N/A	3029.53	-387.07	7035.52	3048.75	94.00	0.76	-0.55	0.52
	9437.00	89.81	1.44	N/A	3124.51	-385.36	7035.97	3143.40	95.00	0.88	0.17	0.86
	9531.00	89.93	0.12	N/A	3218.50	-384.08	7036.19	3237.08	94.00	1.41	0.13	-1.40
	9626.00	89.87	358.77	N/A	3313.49	-385.00	7036.35	3331.92	95.00	1.42	-0.06	-1.42
	9721.00	90.42	357.35	N/A	3408.44	-388.22	7036.11	3426.87	95.00	1.60	0.58	-1.49
	9815.00	90.05	356.59	N/A	3502.30	-393.18	7035.73	3520.85	94.00	0.90	-0.39	-0.81
	9910.00	89.90	357.21	N/A	3597.16	-398.32	7035.77	3615.85	95.00	0.67	-0.16	0.65
	10005.00	89.78	357.45	N/A	3692.06	-402.75	7036.03	3710.82	95.00	0.28	-0.13	0.25
	10099.00	89.90	357.75	N/A	3785.98	-406.68	7036.29	3804.79	94.00	0.34	0.13	0.32
	10194.00	89.96	358.53	N/A	3880.93	-409.77	7036.41	3899.73	95.00	0.82	0.06	0.82
	10289.00	90.02	358.36	N/A	3975.89	-412.34	7036.43	3994.66	95.00	0.19	0.06	-0.18
	10384.00	89.75	358.93	N/A	4070.86	-414.59	7036.62	4089.56	95.00	0.66	-0.28	0.60
	10478.00	90.02	0.61	N/A	4164.86	-414.97	7036.81	4183.37	94.00	1.81	0.29	1.79
	10573.00	89.90	2.04	N/A	4259.83	-412.77	7036.87	4277.98	95.00	1.51	-0.13	1.51
	10668.00	89.99	2.19	N/A	4354.77	-409.27	7036.96	4372.46	95.00	0.18	0.09	0.16
	10762.00	90.46	359.70	N/A	4448.75	-407.72	7036.59	4466.12	94.00	2.70	0.50	-2.65
	10857.00	91.96	359.03	N/A	4543.72	-408.77	7034.59	4560.94	95.00	1.73	1.58	-0.71
	10951.00	90.36	0.70	N/A	4637.69	-408.99	7032.69	4654.72	94.00	2.46	-1.70	1.78
	11046.00	90.14	2.00	N/A	4732.66	-406.75	7032.27	4749.32	95.00	1.39	-0.23	1.37
	11141.00	89.74	2.26	N/A	4827.59	-403.22	7032.37	4843.80	95.00	0.50	-0.42	0.27
	11235.00	89.78	2.51	N/A	4921.51	-399.31	7032.76	4937.24	94.00	0.27	0.04	0.27
	11330.00	89.87	1.50	N/A	5016.45	-395.98	7033.05	5031.74	95.00	1.07	0.09	-1.06
	11425.00	89.78	0.59	N/A	5111.44	-394.25	7033.34	5126.39	95.00	0.96	-0.09	-0.96
	11519.00	89.81	359.90	N/A	5205.43	-393.85	7033.68	5220.15	94.00	0.73	0.03	-0.73

	11614.00	89.78	359.23	N/A	5300.43	-394.57	7034.02	5314.97	95.00	0.71	-0.03	-0.71
	11708.00	89.68	359.60	N/A	5394.42	-395.53	7034.46	5408.82	94.00	0.41	-0.11	0.39
	11803.00	89.62	359.86	N/A	5489.42	-395.98	7035.04	5503.63	95.00	0.28	-0.06	0.27
	11898.00	89.75	359.52	N/A	5584.42	-396.49	7035.57	5598.44	95.00	0.38	0.14	-0.36
	11993.00	89.65	359.49	N/A	5679.41	-397.31	7036.06	5693.28	95.00	0.11	-0.11	-0.03
	12087.00	89.71	359.24	N/A	5773.41	-398.36	7036.59	5787.13	94.00	0.27	0.06	-0.27
	12182.00	89.56	358.83	N/A	5868.39	-399.96	7037.19	5882.00	95.00	0.46	-0.16	-0.43
	12277.00	89.59	358.04	N/A	5963.35	-402.55	7037.90	5976.92	95.00	0.83	0.03	-0.83
	12406.00	89.59	355.84	N/A	6092.16	-409.44	7038.82	6105.90	129.00	1.71	0.00	-1.71
Projection	12430.00	89.59	355.84	N/A	6116.09	-411.18	7038.99	6129.90	24.00	0.00	0.00	0.00