



**Natural Formation Evaluation
Gamma Ray**

Composite Log

Scale:

1:240 TVD

Depth Reference:

Driller's Depth

Status:

Final Print

API No: 0512343322

Job ID: 8132084

Permanent Datum (P.D.): Mean Sea Level

Log Measured From: Rig Floor

Company: Noble Energy

Well: Ellie LD26-625

Field: Noble NAD 83 Grid

County: Weld County State: United States

Surface Location:

Latitude: 040° 43' 5.844" N

Longitude: 103° 51' 37.944" W

Other Services:

Elevation: 0.00 ft

Above P.D. 4856.00 ft

KB: N/A

DF: 4856.00 ft

GL: 4826.00 ft

Interval Logged

Magnetic Field Reference

Dates

Date From: 2016-09-24 Top: (ft) 1928.00
Date To: 2016-09-25 Bottom: (ft) 5764.00
Spud Date: 2016-09-23

Azi Reference North: Grid Dip Angle: (deg) 67.25
Total Magnetic Field Strength: (nT) 52583
Mag to Reference North Correction: (deg) 6.63 E

Borehole Record

Casing Record

Hole Size (in)	From (ft)	To (ft)	Size (in)	Weight (lb/ft)	From (ft)	To (ft)
8.500	1930.00	16000.00	9.620	36.00	0.00	1931.00

Type	From (ft)	To (ft)	Hole Size (in)	Interval (ft)	Inc Az (Start)	Inc Az (End)
Fresh Water	1941.00	2096.32	8.500	14039.00	0.57 206.81	90.55 86.85
Oil Based Mud	2096.32	15980.00				

Mud Record

Deviation Record

Acquisition System

Software Version

Other

Baker Hughes Cadence 3.3.7410.1

Rig: H&P 517
Contractor: Helmerich & Payne Drilling Co
District: RMD Unit: D&E

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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 (ft)	Bottom (ft)	From (ft)	To (ft)	Start Logging	End Logging	
1	1	8.500	PDC	2.00	AutoTrak Curve	1927.79	15973.22	1941.00	15980.00	2016-09-24 19:22	2016-09-27 07:45	56.73

Crew

Name	Arrive Wellsite	Depart Wellsite	Name	Arrive Wellsite	Depart Wellsite	Name	Arrive Wellsite	Depart Wellsite
Alex Osborne	2016-09-23	2016-09-27	Hans Cary	2016-09-23	2016-09-27	Lenn Bennett	2016-09-23	2016-09-27
Scott Sims	2016-09-23	2016-09-27						

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+ (%)
2016-09-24 08:00	1	1941.00	Fresh Water	8.5	27	8.3	0.0	0/1	Active Pit	1000	0.00
2016-09-24 20:00	1	2095.76	Oil Based Mud	9.6	74	0	21.6	0.75/0.25	Active Pit	30000	0.00
2016-09-25 08:00	1	5506.20	Oil Based Mud	9.3	46	0	22.0	0.74/0.26	Active Pit	22500	0.00
2016-09-25 20:00	1	8182.89	Oil Based Mud	9.5	42	0	21.2	0.82/0.18	Active Pit	20000	0.00
2016-09-26 08:00	1	10895.26	Oil Based Mud	9.7	42	0	19.6	0.74/0.26	Active Pit	22500	0.00
2016-09-26 20:00	1	13342.39	Oil Based Mud	9.6	40	0	21.6	0.75/0.25	Active Pit	22500	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	12077516	Near Bit VSS	5.98	6.78	7.000	4.330
1	ATC_SU	12077516	Near Bit Inclination	5.98	6.78	7.000	4.330
1	ATC_MWD	12178891	Gamma (single)	2.74	13.21	7.000	3.250
1	ATC_MWD	12178891	Directional (mag)	12.27	22.74	7.000	3.250

Service and Tool Mnemonics

Mnemonic	Name	Description
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


- Baker Hughes Run 1 utilized a 6.75 inch AutoTrak Curve Rotary Steerable assembly tool behind a 8.50 inch bit from 1931 to 15980 ft MD (1931 to 5679.7 ft TVD).
- Depth measurements 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.

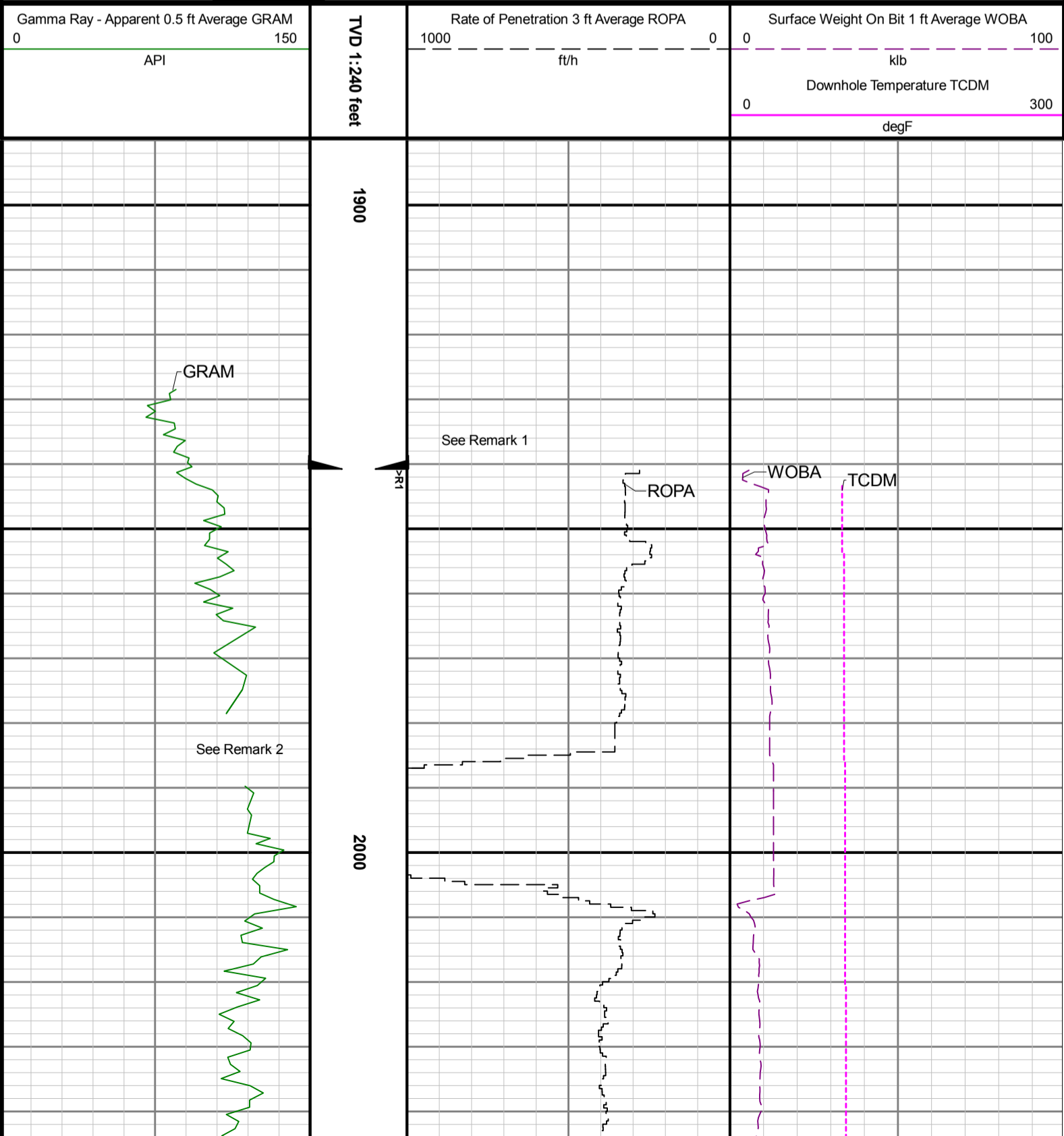
Remarks

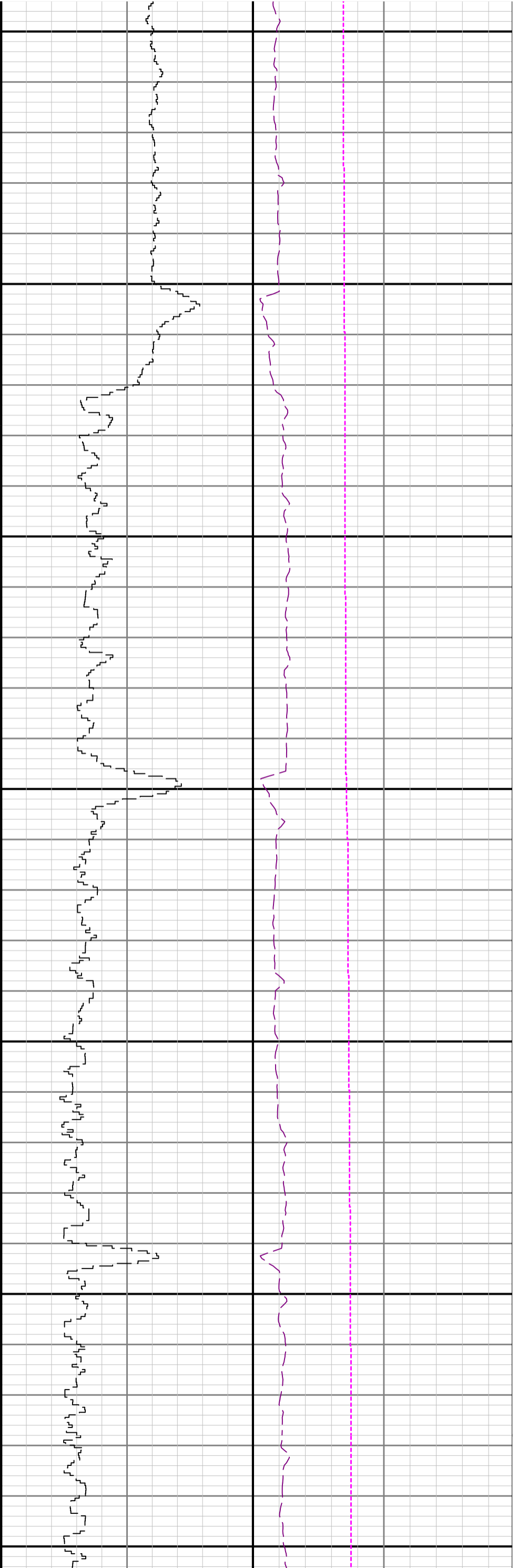
Number	Measured Depth (ft)	Hole Section (in)	Run No.	Remark
1	1930.00	8.500	1	The interval from 1929 to 1941 ft MD (1929 to 1941 ft TVD) has no surface data due to the Gamma Ray sensor to bit offset.
2	1985.00	8.500	1	The interval from 1979 to 1990 ft MD (1979 to 1990 ft TVD) has no gamma data due to a WITS issue.

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	Noble Energy	
	Well	Ellie LD26-625	
	Interval	Date From: 2016-09-24 19:22:55	Top: 1928.00
	Created	Date To: 2016-09-25 11:36:52	Bottom: 5764.00
		Created 2016-09-27 19:01	

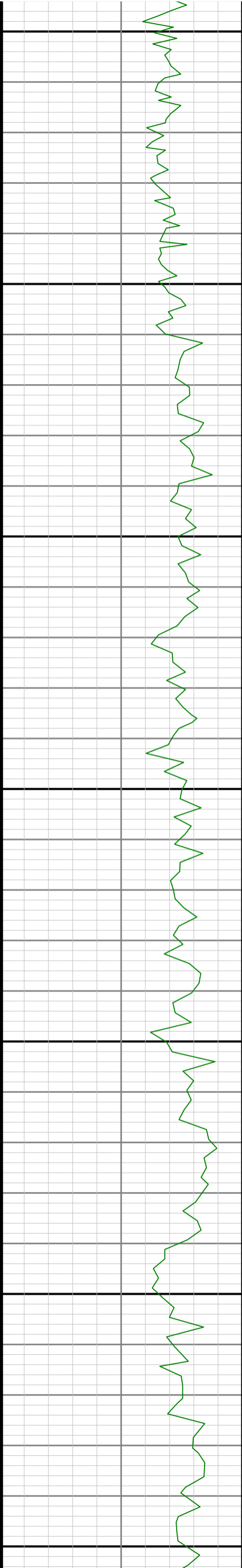


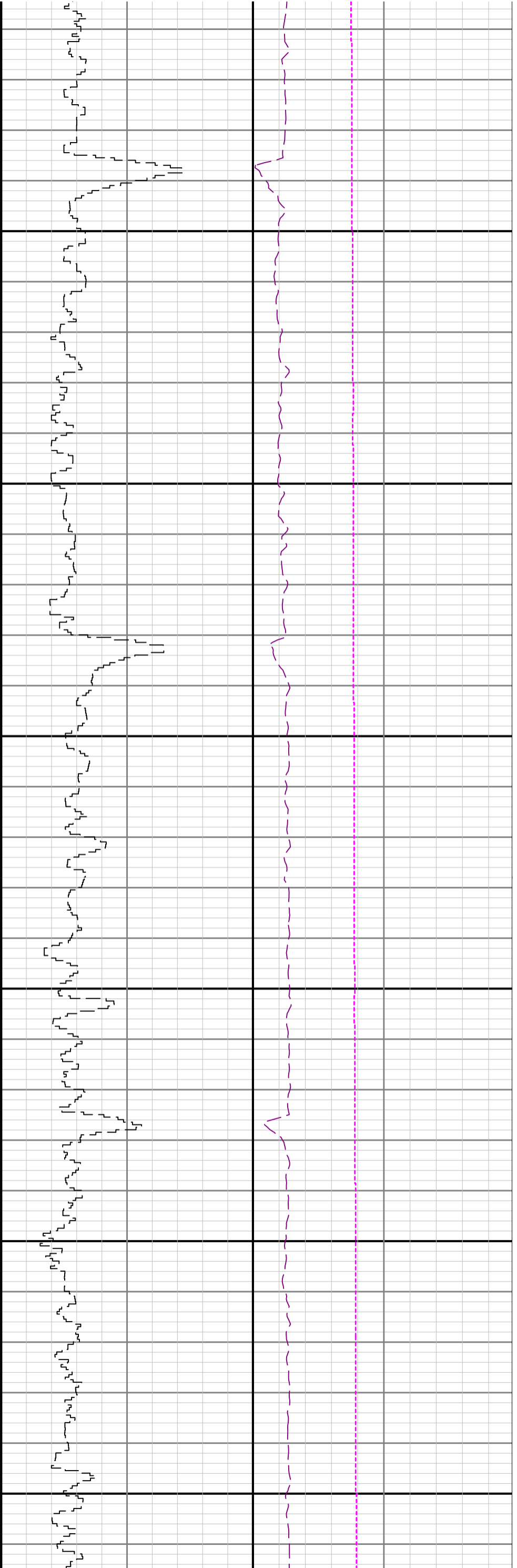


2100

2200

2300

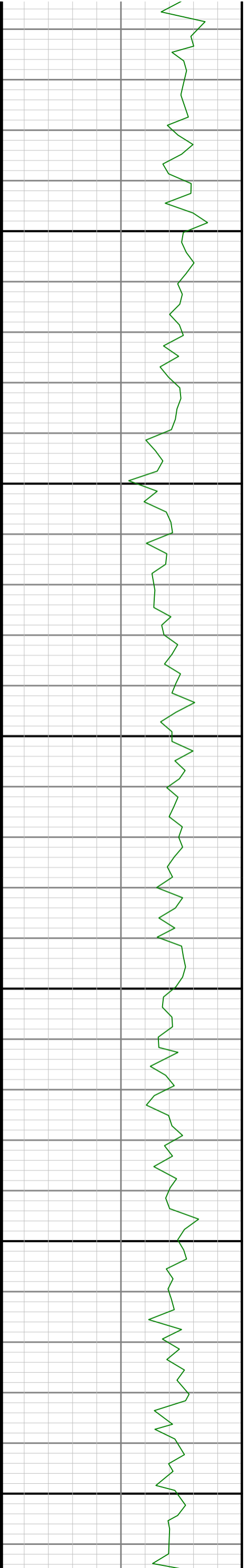


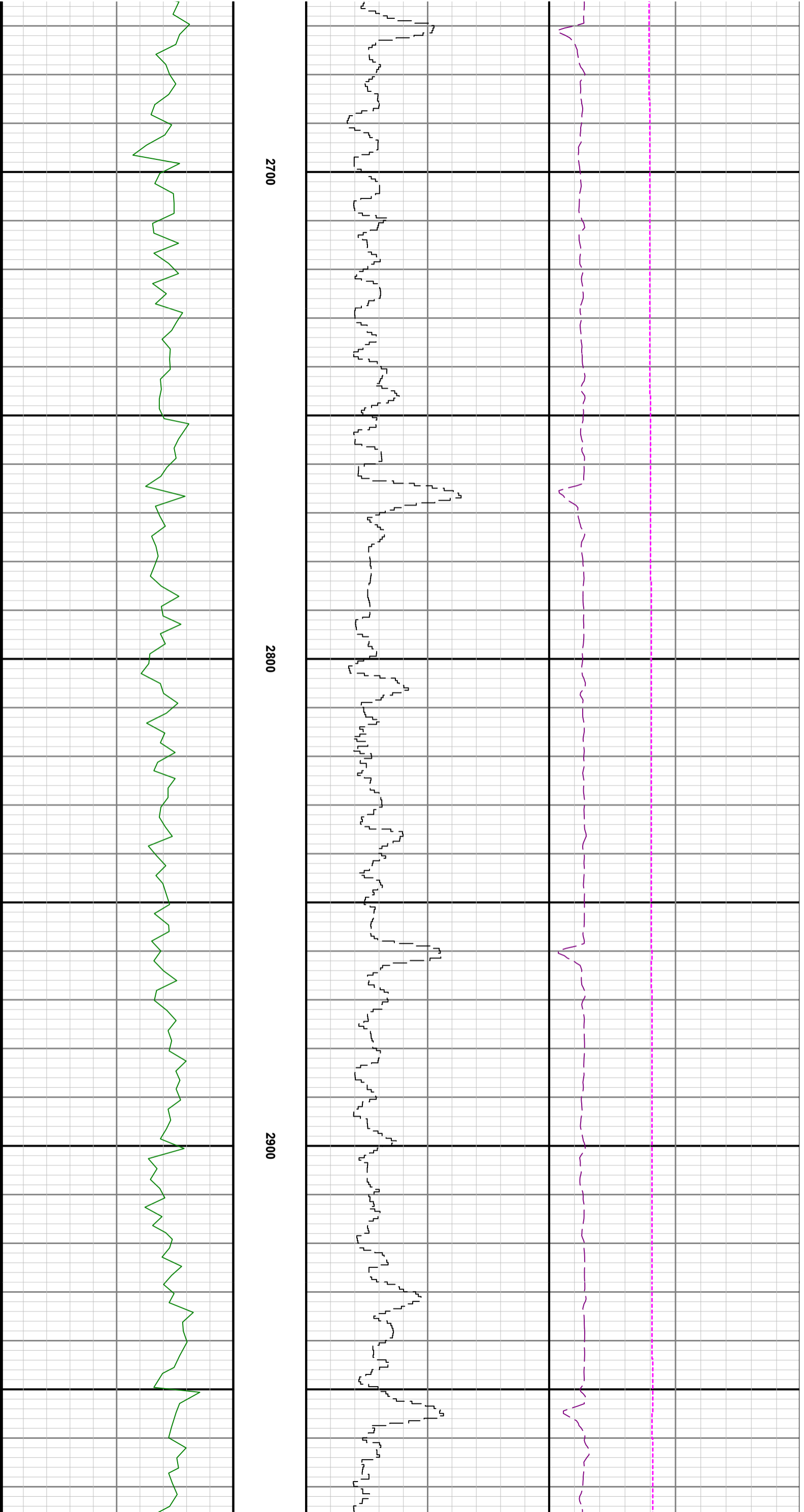


2400

2500

2600





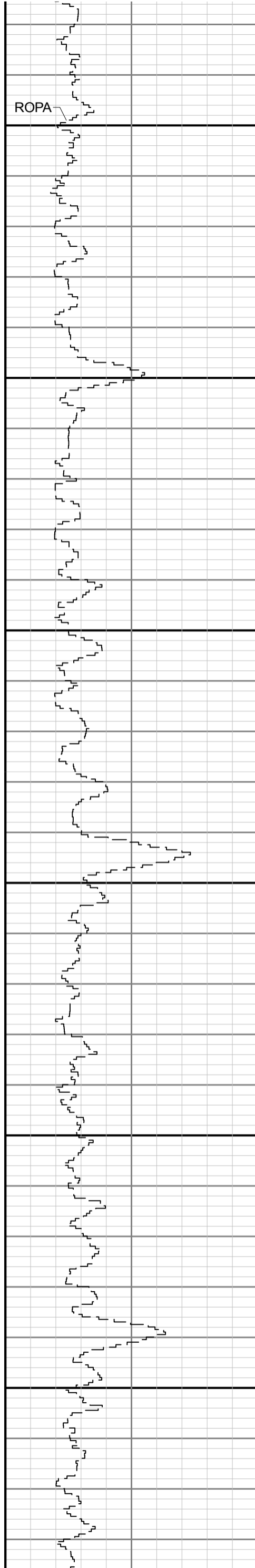


GRAM

3000

3100

3200

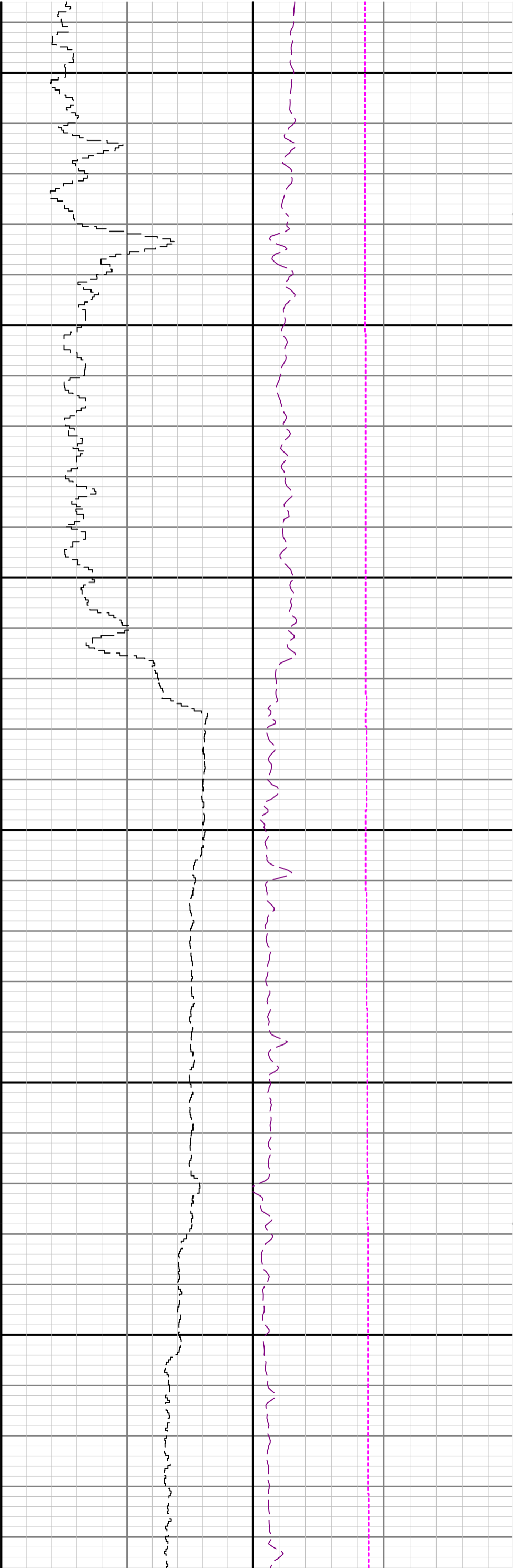


ROPA



WOB

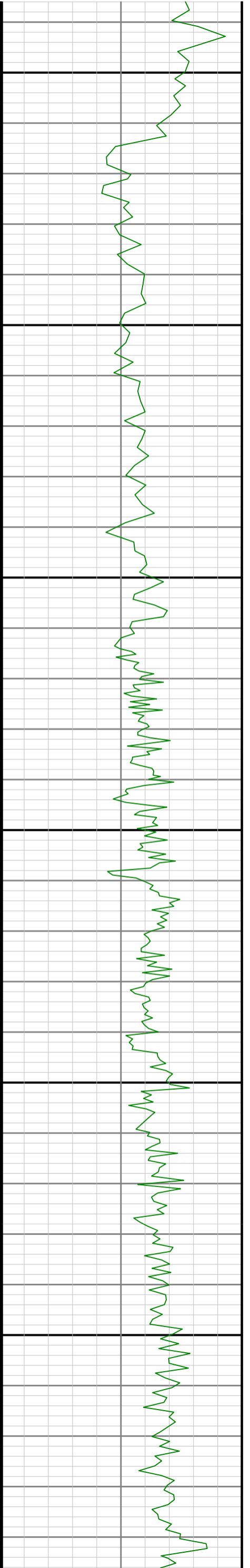
TCDM

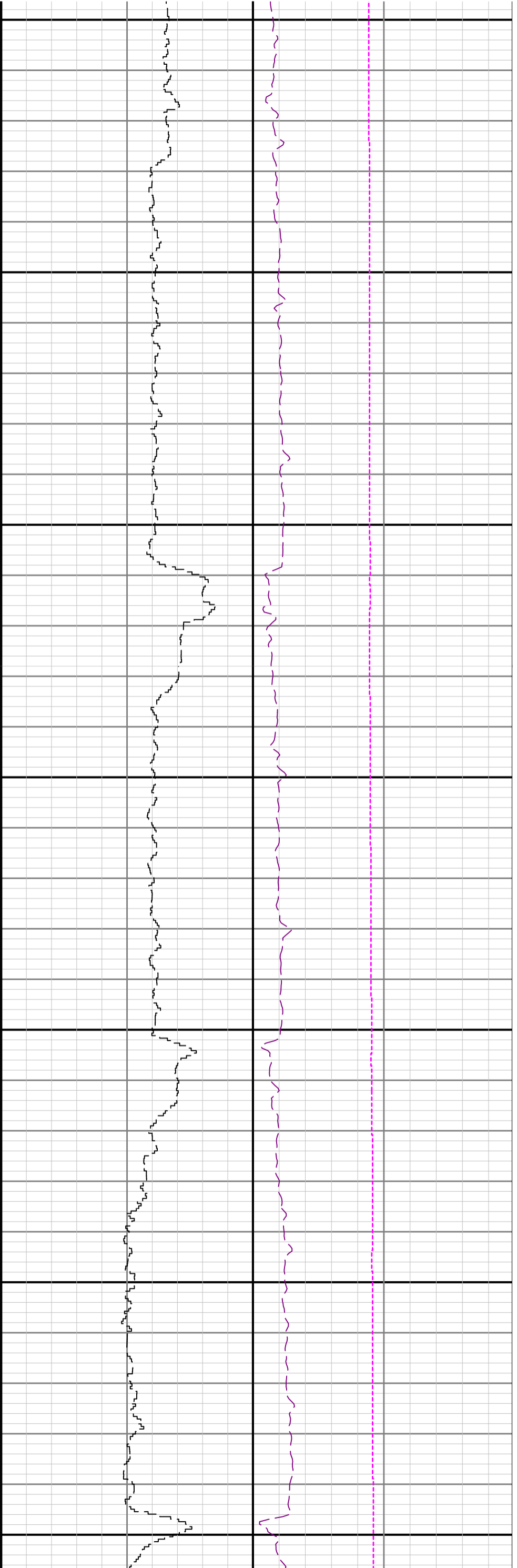


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3400

3500



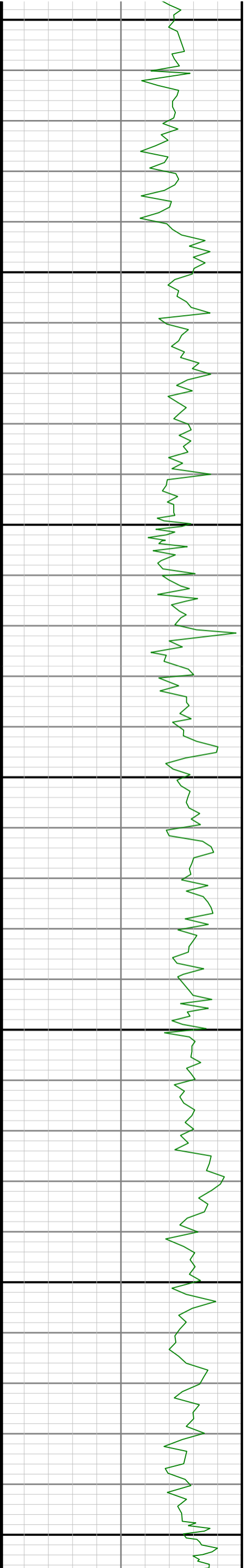


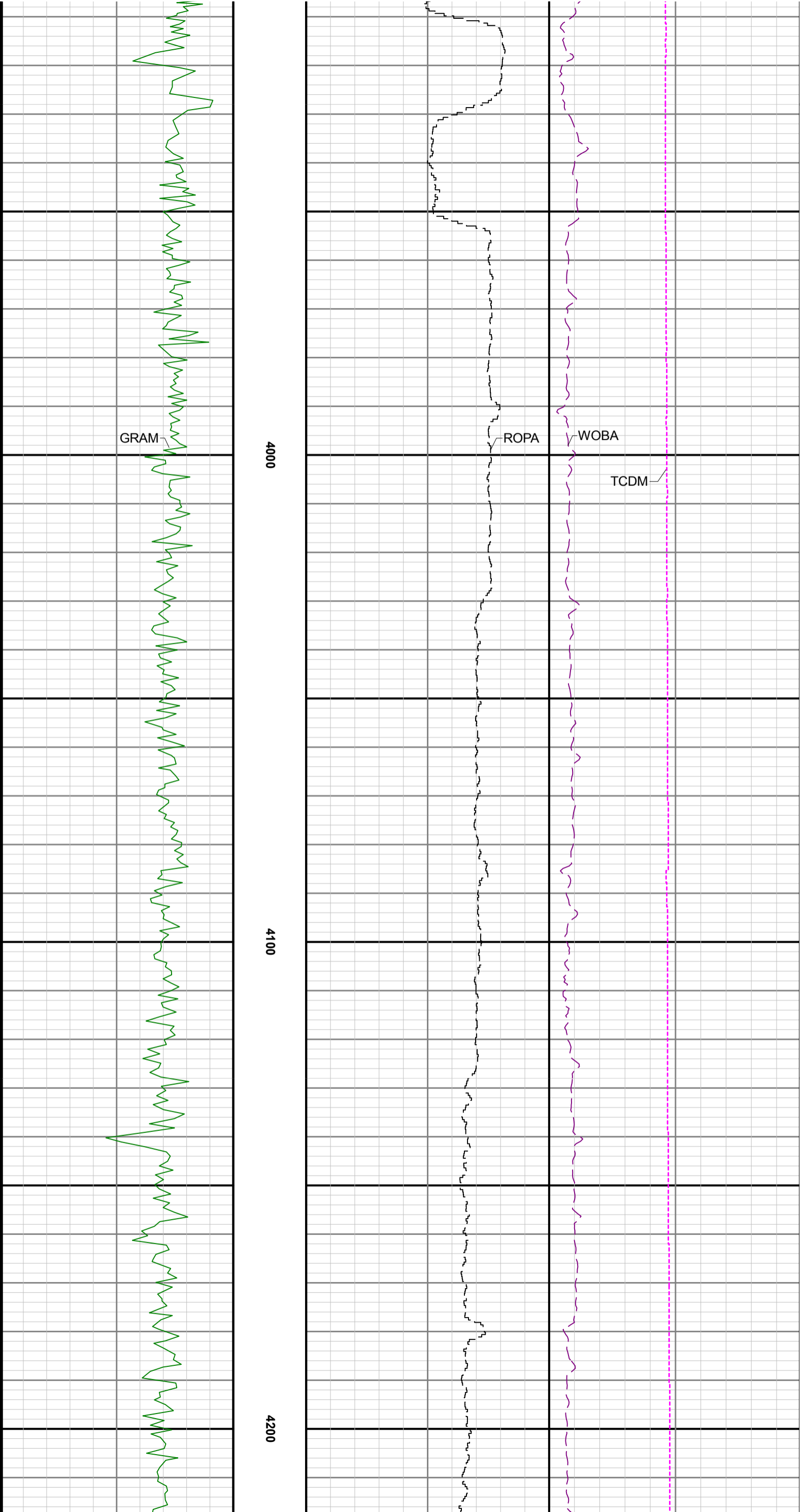
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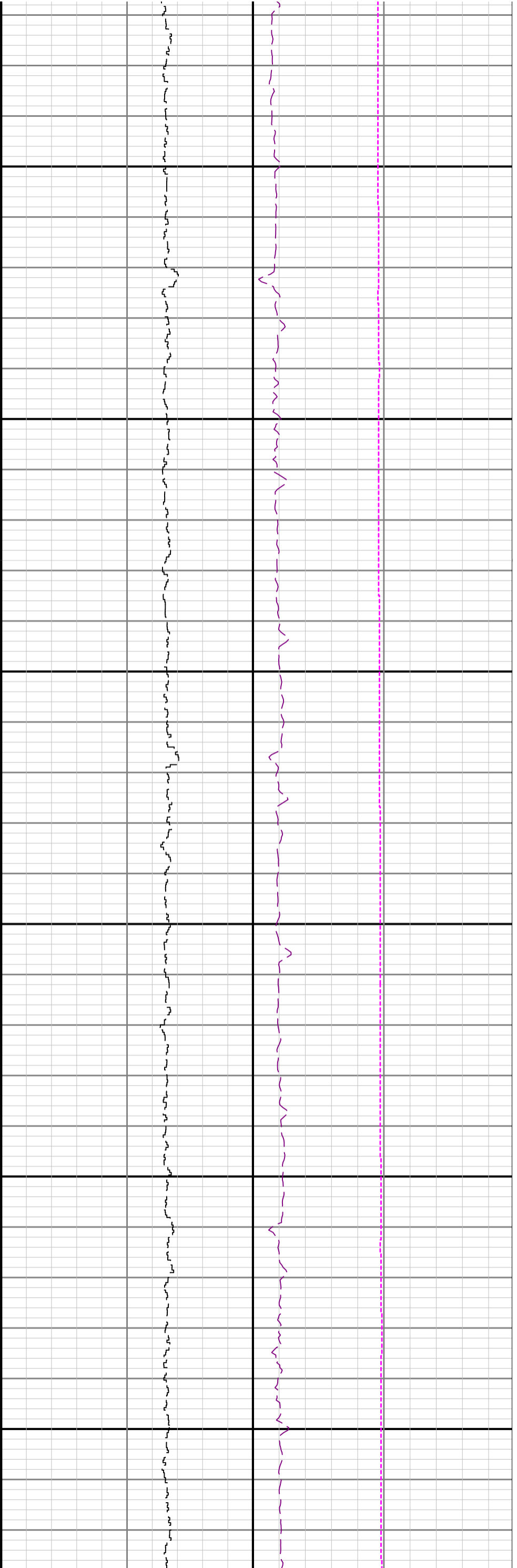
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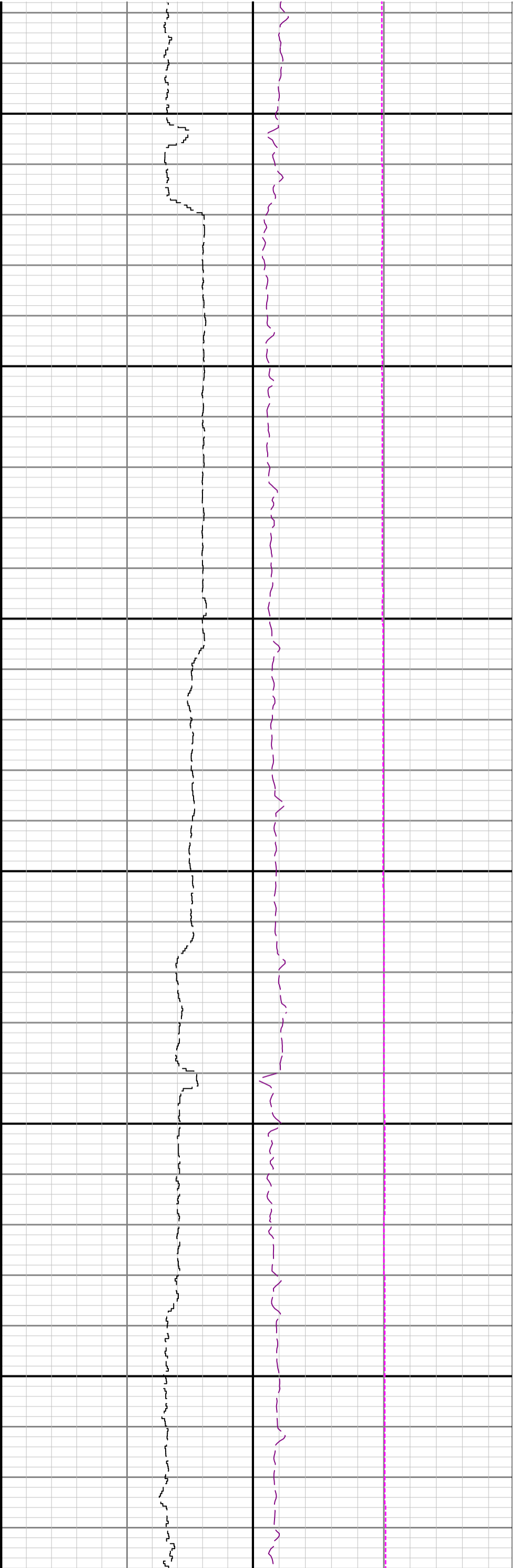


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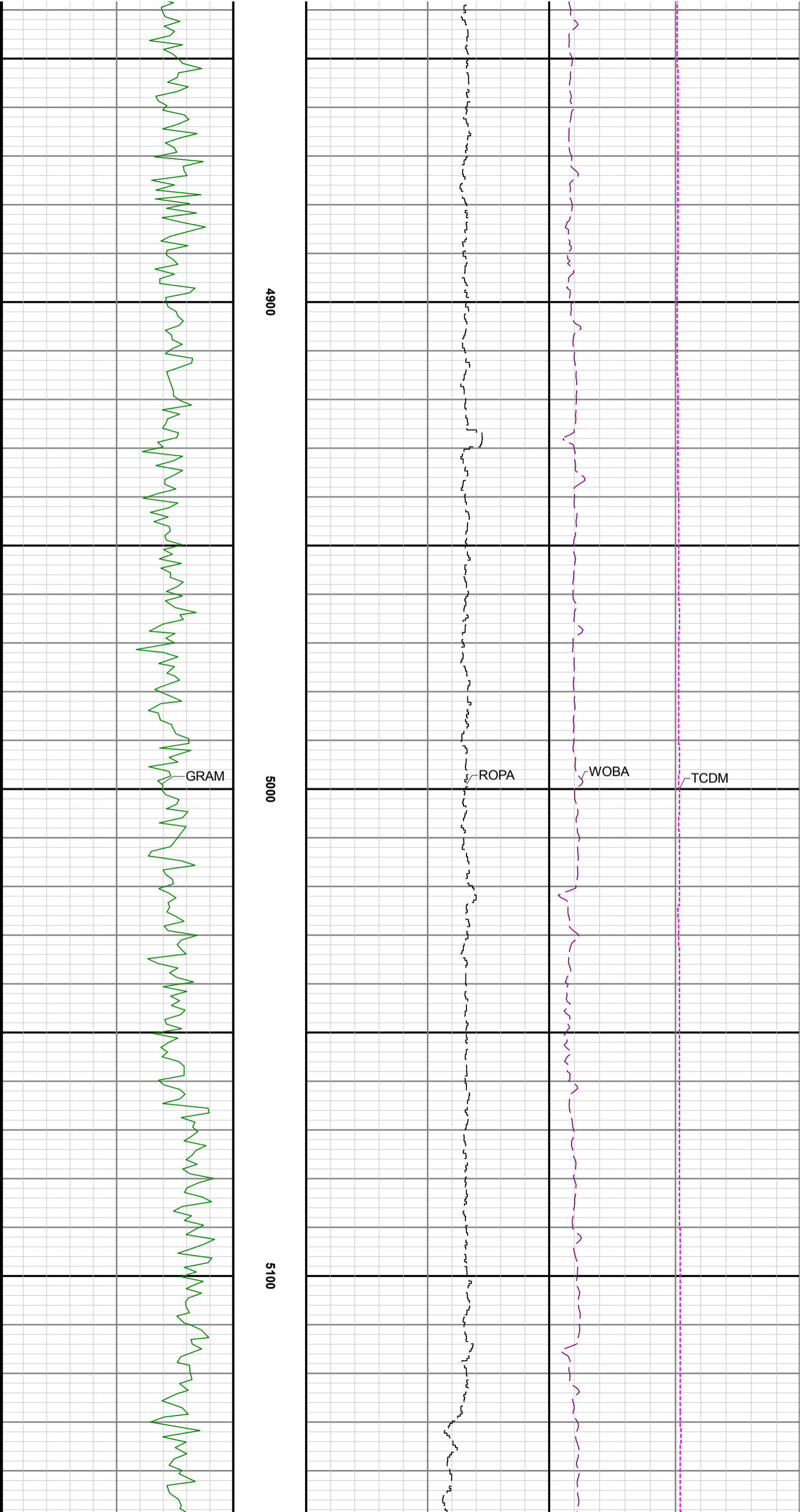


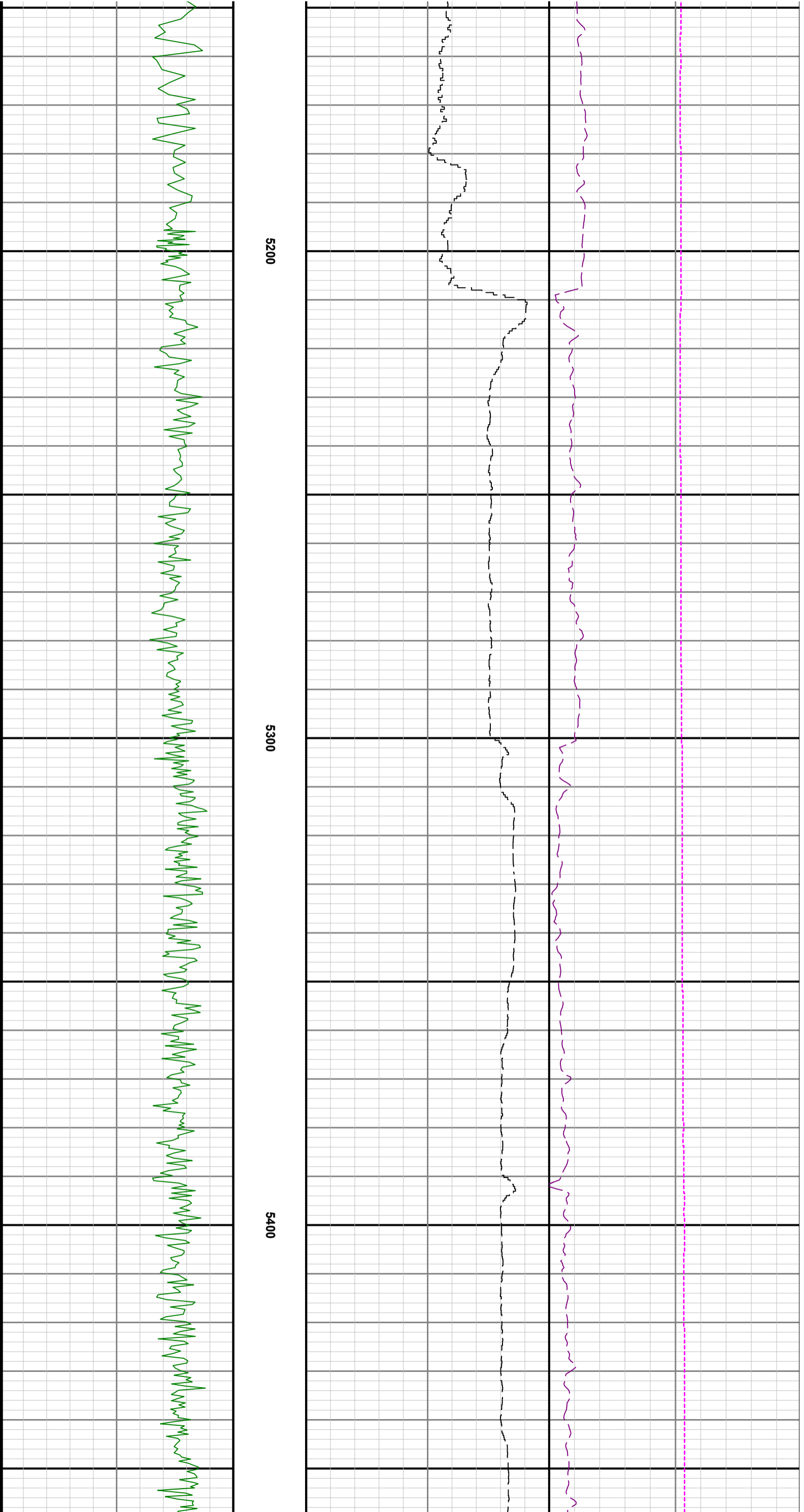


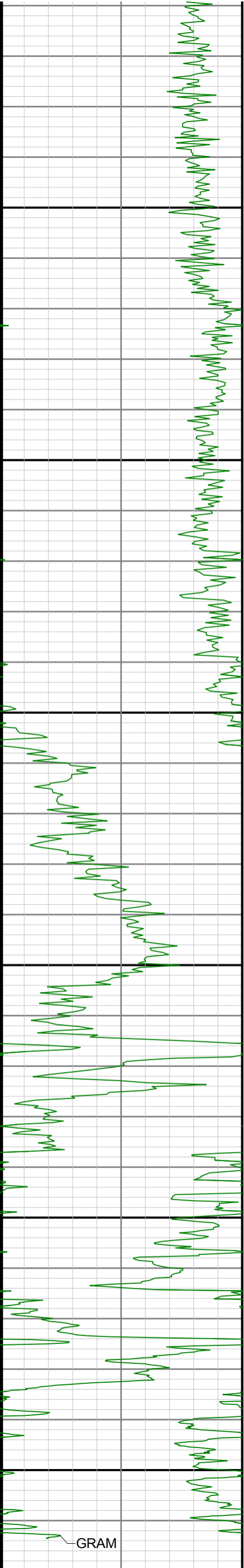
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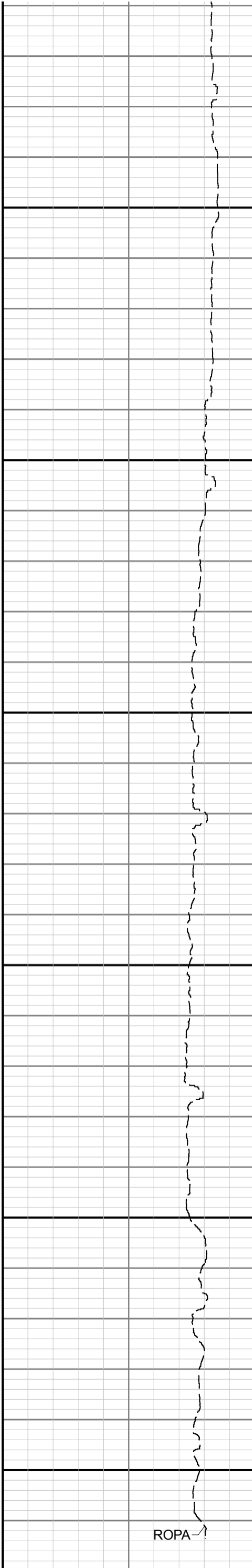


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5600

5700

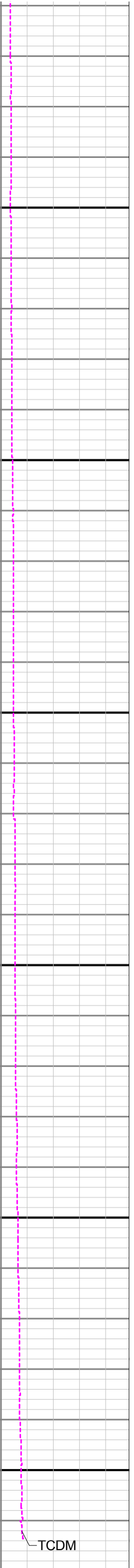
R14



ROPA



WOBA



TCDM

	6995.00	90.52	86.42	N/A	-223.14	1546.13	5756.39	1545.82	95.00	0.41	-0.14	-0.39
	7089.00	90.49	86.79	N/A	-217.58	1639.97	5755.56	1639.66	94.00	0.39	-0.03	0.39
	7184.00	90.52	88.60	N/A	-213.76	1734.88	5754.73	1734.58	95.00	1.91	0.03	1.91
	7278.00	90.49	88.45	N/A	-211.34	1828.85	5753.90	1828.55	94.00	0.16	-0.03	-0.16
	7373.00	90.58	88.55	N/A	-208.85	1923.81	5753.01	1923.52	95.00	0.14	0.09	0.11
	7467.00	90.49	88.42	N/A	-206.37	2017.77	5752.13	2017.48	94.00	0.17	-0.10	-0.14
	7562.00	90.52	87.78	N/A	-203.22	2112.72	5751.30	2112.43	95.00	0.67	0.03	-0.67
	7656.00	90.55	86.79	N/A	-198.76	2206.61	5750.42	2206.33	94.00	1.05	0.03	-1.05
	7751.00	90.46	85.67	N/A	-192.52	2301.39	5749.58	2301.12	95.00	1.18	-0.09	-1.18
	7845.00	90.49	84.61	N/A	-184.55	2395.05	5748.80	2394.79	94.00	1.13	0.03	-1.13
	7940.00	90.46	87.41	N/A	-177.94	2489.81	5748.01	2489.56	95.00	2.95	-0.03	2.95
	8035.00	90.68	90.40	N/A	-176.13	2584.78	5747.07	2584.53	95.00	3.16	0.23	3.15
	8129.00	90.55	88.60	N/A	-175.31	2678.76	5746.06	2678.52	94.00	1.92	-0.14	-1.91
	8224.00	90.58	89.26	N/A	-173.54	2773.74	5745.12	2773.50	95.00	0.70	0.03	0.69
	8318.00	90.55	86.11	N/A	-169.74	2867.65	5744.20	2867.41	94.00	3.35	-0.03	-3.35
	8413.00	90.40	86.51	N/A	-163.63	2962.45	5743.41	2962.22	95.00	0.45	-0.16	0.42
	8507.00	90.34	88.78	N/A	-159.76	3056.36	5742.80	3056.13	94.00	2.42	-0.06	2.41
	8602.00	90.40	91.33	N/A	-159.85	3151.35	5742.19	3151.12	95.00	2.68	0.06	2.68
	8697.00	90.28	92.59	N/A	-163.10	3246.29	5741.62	3246.06	95.00	1.33	-0.13	1.33
	8791.00	90.40	93.19	N/A	-167.84	3340.17	5741.07	3339.93	94.00	0.65	0.13	0.64
	8886.00	90.37	93.17	N/A	-173.11	3435.02	5740.43	3434.78	95.00	0.04	-0.03	-0.02
	8981.00	90.55	93.21	N/A	-178.40	3529.87	5739.67	3529.62	95.00	0.19	0.19	0.04
	9075.00	90.37	89.19	N/A	-180.37	3623.83	5738.91	3623.57	94.00	4.28	-0.19	-4.28
	9170.00	90.37	86.51	N/A	-176.80	3718.75	5738.30	3718.50	95.00	2.82	0.00	-2.82
	9264.00	90.43	87.86	N/A	-172.19	3812.63	5737.64	3812.39	94.00	1.44	0.06	1.44
	9359.00	90.52	88.40	N/A	-169.09	3907.58	5736.85	3907.34	95.00	0.58	0.09	0.57
	9454.00	90.49	87.03	N/A	-165.30	4002.50	5736.02	4002.26	95.00	1.44	-0.03	-1.44
	9548.00	90.65	87.46	N/A	-160.78	4096.38	5735.08	4096.15	94.00	0.49	0.17	0.46
	9643.00	90.62	88.78	N/A	-157.67	4191.32	5734.03	4191.10	95.00	1.39	-0.03	1.39
	9738.00	90.65	90.24	N/A	-156.85	4286.31	5732.97	4286.09	95.00	1.54	0.03	1.54
	9832.00	90.58	90.40	N/A	-157.38	4380.31	5731.97	4380.08	94.00	0.19	-0.07	0.17
	9927.00	90.55	89.41	N/A	-157.22	4475.30	5731.03	4475.08	95.00	1.04	-0.03	-1.04
	10021.00	90.71	91.23	N/A	-157.75	4569.29	5730.00	4569.06	94.00	1.94	0.17	1.94
	10116.00	90.58	88.94	N/A	-157.89	4664.28	5728.93	4664.05	95.00	2.41	-0.14	-2.41
	10210.00	90.49	86.67	N/A	-154.29	4758.20	5728.05	4757.98	94.00	2.42	-0.10	-2.41
	10305.00	90.55	87.70	N/A	-149.62	4853.08	5727.19	4852.86	95.00	1.09	0.06	1.08
	10399.00	90.58	90.28	N/A	-147.96	4947.05	5726.26	4946.84	94.00	2.74	0.03	2.74
	10494.00	90.52	88.51	N/A	-146.96	5042.04	5725.35	5041.83	95.00	1.86	-0.06	-1.86
	10588.00	90.25	88.08	N/A	-144.16	5135.99	5724.72	5135.79	94.00	0.54	-0.29	-0.46
	10683.00	90.28	87.31	N/A	-140.34	5230.91	5724.28	5230.71	95.00	0.81	0.03	-0.81
	10777.00	90.18	85.20	N/A	-134.20	5324.71	5723.90	5324.51	94.00	2.25	-0.11	-2.24
	10872.00	90.52	85.50	N/A	-126.50	5419.39	5723.32	5419.21	95.00	0.48	0.36	0.32
	10967.00	90.55	88.59	N/A	-121.61	5514.25	5722.43	5514.08	95.00	3.25	0.03	3.25
	11061.00	90.55	88.34	N/A	-119.09	5608.21	5721.53	5608.04	94.00	0.27	0.00	-0.27
	11155.00	90.49	86.74	N/A	-115.05	5702.12	5720.68	5701.95	94.00	1.70	-0.06	-1.70
	11250.00	90.55	86.37	N/A	-109.35	5796.94	5719.81	5796.78	95.00	0.39	0.06	-0.39
	11345.00	90.55	86.93	N/A	-103.79	5891.78	5718.90	5891.63	95.00	0.59	0.00	0.59
	11439.00	90.40	88.11	N/A	-99.73	5985.68	5718.12	5985.54	94.00	1.27	-0.16	1.26
	11534.00	90.55	89.31	N/A	-97.59	6080.65	5717.33	6080.51	95.00	1.27	0.16	1.26
	11628.00	90.71	90.65	N/A	-97.56	6174.65	5716.30	6174.50	94.00	1.44	0.17	1.43
	11723.00	90.49	89.45	N/A	-97.64	6269.64	5715.31	6269.50	95.00	1.28	-0.23	-1.26
	11818.00	90.52	88.97	N/A	-96.33	6364.63	5714.47	6364.49	95.00	0.51	0.03	-0.51
	11912.00	90.58	88.16	N/A	-93.98	6458.59	5713.57	6458.45	94.00	0.86	0.06	-0.86
	12101.00	90.52	87.30	N/A	-86.49	6647.43	5711.75	6647.31	189.00	0.46	-0.03	-0.46
	12196.00	90.65	88.06	N/A	-82.64	6742.35	5710.78	6742.23	95.00	0.81	0.14	0.80
	12291.00	90.55	87.40	N/A	-78.88	6837.27	5709.79	6837.15	95.00	0.70	-0.11	-0.69
	12385.00	90.62	87.50	N/A	-74.70	6931.17	5708.83	6931.06	94.00	0.13	0.07	0.11
	12480.00	90.65	86.67	N/A	-69.87	7026.04	5707.77	7025.94	95.00	0.87	0.03	-0.87
	12575.00	90.43	89.16	N/A	-66.41	7120.97	5706.88	7120.87	95.00	2.63	-0.23	2.62
	12669.00	90.52	89.67	N/A	-65.45	7214.96	5706.10	7214.86	94.00	0.55	0.10	0.54
	12763.00	90.68	89.24	N/A	-64.56	7308.95	5705.12	7308.85	94.00	0.49	0.17	-0.46
	12858.00	90.58	88.71	N/A	-62.86	7403.93	5704.07	7403.83	95.00	0.57	-0.11	-0.56
	13047.00	90.52	88.67	N/A	-58.54	7592.87	5702.26	7592.78	189.00	0.04	-0.03	-0.02
	13142.00	90.58	88.28	N/A	-56.01	7687.83	5701.34	7687.74	95.00	0.42	0.06	-0.41
	13236.00	90.55	88.86	N/A	-53.67	7781.80	5700.42	7781.71	94.00	0.62	-0.03	0.62
	13331.00	90.46	88.41	N/A	-51.40	7876.77	5699.58	7876.69	95.00	0.48	-0.09	-0.47
	13425.00	90.55	87.95	N/A	-48.42	7970.71	5698.75	7970.64	94.00	0.50	0.10	-0.49
	13520.00	90.68	90.35	N/A	-47.01	8065.69	5697.73	8065.62	95.00	2.53	0.14	2.53
	13614.00	90.28	93.75	N/A	-50.37	8159.61	5696.94	8159.54	94.00	3.64	-0.43	3.62
	13709.00	90.34	91.02	N/A	-54.32	8254.52	5696.43	8254.44	95.00	2.87	0.06	-2.87
	13804.00	90.28	89.53	N/A	-54.78	8349.52	5695.92	8349.43	95.00	1.57	-0.06	-1.57
	13898.00	90.22	88.60	N/A	-53.25	8443.50	5695.51	8443.42	94.00	0.99	-0.06	-0.99
	13993.00	90.28	86.09	N/A	-48.84	8538.39	5695.09	8538.31	95.00	2.64	0.06	-2.64
	14087.00	90.34	85.86	N/A	-42.25	8632.16	5694.58	8632.09	94.00	0.25	0.06	-0.24
	14182.00	90.25	85.41	N/A	-35.02	8726.88	5694.09	8726.82	95.00	0.48	-0.09	-0.47
	14276.00	90.25	85.33	N/A	-27.43	8820.57	5693.68	8820.53	94.00	0.09	0.00	-0.09
	14371.00	90.22	86.65	N/A	-20.79	8915.34	5693.29	8915.30	95.00	1.39	-0.03	1.39
	14465.00	90.22	88.69	N/A	-16.96	9009.25	5692.93	9009.22	94.00	2.17	0.00	2.17
	14560.00	90.28	89.12	N/A	-15.15	9104.24	5692.52	9104.21	95.00	0.46	0.06	0.45
	14655.00	90.28	88.39	N/A	-13.08	9199.21	5692.05	9199.18	95.00	0.77	0.00	-0.77
	14749.00	90.71	87.32	N/A	-9.57	9293.14	5691.24	9293.12	94.00	1.23	0.46	-1.14
	14844.00	90.55	87.79	N/A	-5.51	9388.05	5690.20	9388.03	95.00	0.52	-0.17	0.49
	14938.00	90.58	88.93	N/A	-2.82	9482.00	5689.27	9481.99	94.00	1.21	0.03	1.21
	15033.00	90.43	90.20	N/A	-2.10	9577.00	5688.43	9576.98	95.00	1.35	-0.16	1.34
	15127.00	90.49	91.52	N/A	-3.51	9670.94	5687.68	9670.97	94.00	1.41	0.06	1.40
	15222.00	90.46	91.76	N/A	-6.23	9765.94	5686.89	9765.92	95.00	0.25	-0.03	0.25
	15316.00	90.55	89.42	N/A	-7.20	9859.92	5686.06	9859.90	94.00	2.49	0.10	-2.49
	15411.00	90.52	86.62	N/A	-3.92	9954.85	5685.18	9954.84	95.00	2.95	-0.03	-2.95
	15506.00	90.52	85.95	N/A	2.24	10049.65	5684.31	10049.64	95.00	0.71	0.00	-0.71
	15600.00	90.52	87.78	N/A	7.38	10143.50	5683.46	10143.50	94.00	1.95	0.00	1.95
	15695.00	90.62	86.64	N/A	12.00	10238.38	5682.51	10238.39	95.00	1.20	0.11	-1.20
	15789.00	90.52	86.63	N/A	17.52	10332.21	5681.58	10332.23	94.00	0.11	-0.11	-0.01
	15884.00	90.68	86.99	N/A	22.80	10427.06	5680.58	10427.08	95.00	0.41	0.17	0.38
	15956.00	90.55	86.85	N/A	26.67	10498.95	5679.81	10498.98	72.00	0.27	-0.18	-0.19
Projection	15980.00	90.55	86.85	N/A	27.99	10522.92	5679.58	10522.94	24.00	0.00		