



Gamma Ray

LWD MEMORY LOG

<div><div><div>Baker Hughes</div></div></div>				<div>LWD MEMORY LOG</div>			
				<div>Gamma Ray</div>			
Scale: 1:240		Measured Depth		Company: Noble Energy			
				Well: Reveille A34-714			
				Field: Wattenberg			
Depth Reference:		County:		Weld		Country: United States	
Driller's Depth		State:		Colorado			
Status: Final Print		Surface Location:		Latitude: 40° 26' 10.788" N		Other Services:	
API No: 05-123-50800-00		Longitude:		104° 31' 32.016" W		Directional	
Job ID: 110697723		SEC: 35		TWN: 6N		RGE: 64W	
Permanent Datum (P.D.): Mean Sea Level		Elevation: Above P.D.:		0.00 ft		Elev. KB: 4679.00 ft	
Log Measured From: Rig Floor				4679.00 ft		Elev. DF: 4649.00 ft	
Dates		Interval		Magnetic Field Reference			
From: 2021-01-10		Drilled (ft)		Logged (ft)		Azi Reference North: Grid Dip Angle: (deg)	
To: 2021-01-13		Top: 1944.00		Top: 1944.00		Total Magnetic Field Strength: (nT)	
Spud: 2021-01-10		Bottom: 17015.00		Bottom: 17002.00		Mag to Reference North Correction: (deg)	
Borehole Record				Casing Record			
Hole Size (in)		From (ft)		To (ft)		Size (in)	
13.500		30.00		1944.00		9.625	
8.500		1944.00		17015.00		36.00	
						30.00	
						1934.00	
Mud Record				Deviation Record			
Type		From (ft)		To (ft)		Hole Size (in)	
Oil Based Mud		1944.00		17015.00		8.500	
						15071.00	
						1.42 182.99	
						90.18 1.08	

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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	2.50	Rotary Steerable	1944.00	10708.00	1944.00	10721.00	2021-01-10 12:51	2021-01-11 22:42	30.09
2	2	8.500	PDC	2.50	Rotary Steerable	10708.00	17002.00	10721.00	17015.00	2021-01-12 07:50	2021-01-13 05:45	21.51

Crew

Name	Arrive Wellsite	Depart Wellsite	Name	Arrive Wellsite	Depart Wellsite	Name	Arrive Wellsite	Depart Wellsite
Adam Schlenz	2021-01-10	2021-01-13						

Mud Properties Record

Date / Time	Run No.	Depth (ft)	Mud Type	Density (ppg)	Viscosity (cP)	pH	Fluid Loss (cm3)	Oil / Water	Source	Total Chlorides (ppm)	K+ (%)
2021-01-10 08:36	1	1944.00	Oil Based Mud	9.7	14	N/A	16.4	70/18	Active Pit	25267	0.00
2021-01-10 16:00	1	3183.00	Oil Based Mud	9.5	12	N/A	15.8	71/17	Active Pit	26239	0.00
2021-01-11 04:00	1	6990.00	Oil Based Mud	9.8	16	N/A	16.8	69/19	Active Pit	27211	0.00
2021-01-11 16:00	1	10102.00	Oil Based Mud	9.7	14	N/A	16.8	68/19	Active Pit	27211	0.00
2021-01-12 04:42	2	10721.00	Oil Based Mud	9.7	14	N/A	16.8	68/19	Active Pit	27211	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	AutoTrak Curve Steering Unit	14907524	Near Bit VSS	5.93	6.78	7.000	4.330
1	AutoTrak Curve Steering Unit	14907524	Near Bit Inclination	5.93	6.78	7.000	4.330

1	AutoTrak Curve MWD	14334114	Gamma (single)	2.75	12.94	7.000	3.250
1	AutoTrak Curve MWD	14334114	Directional (mag)	12.27	22.46	7.000	3.250
2	AutoTrak Curve Steering Unit	12187651	Near Bit Inclination	5.93	6.78	7.000	4.330
2	AutoTrak Curve Steering Unit	12187651	Near Bit VSS	5.93	6.78	7.000	4.330
2	AutoTrak Curve MWD	12316739	Gamma (single)	2.75	12.93	7.000	3.250
2	AutoTrak Curve MWD	12316739	Directional (mag)	12.27	22.45	7.000	3.250

Service and Tool Mnemonics

Mnemonic	Name	Description
ATC SU	AutoTrak Curve SU	Auto Trak Curve Steering Unit
ATC MWD	AutoTrak Curve MWD	Auto Trak Curve MWD
ATC LCPM	AutoTrak Curve LCPM	Auto Trak Curve LCPM

Comments

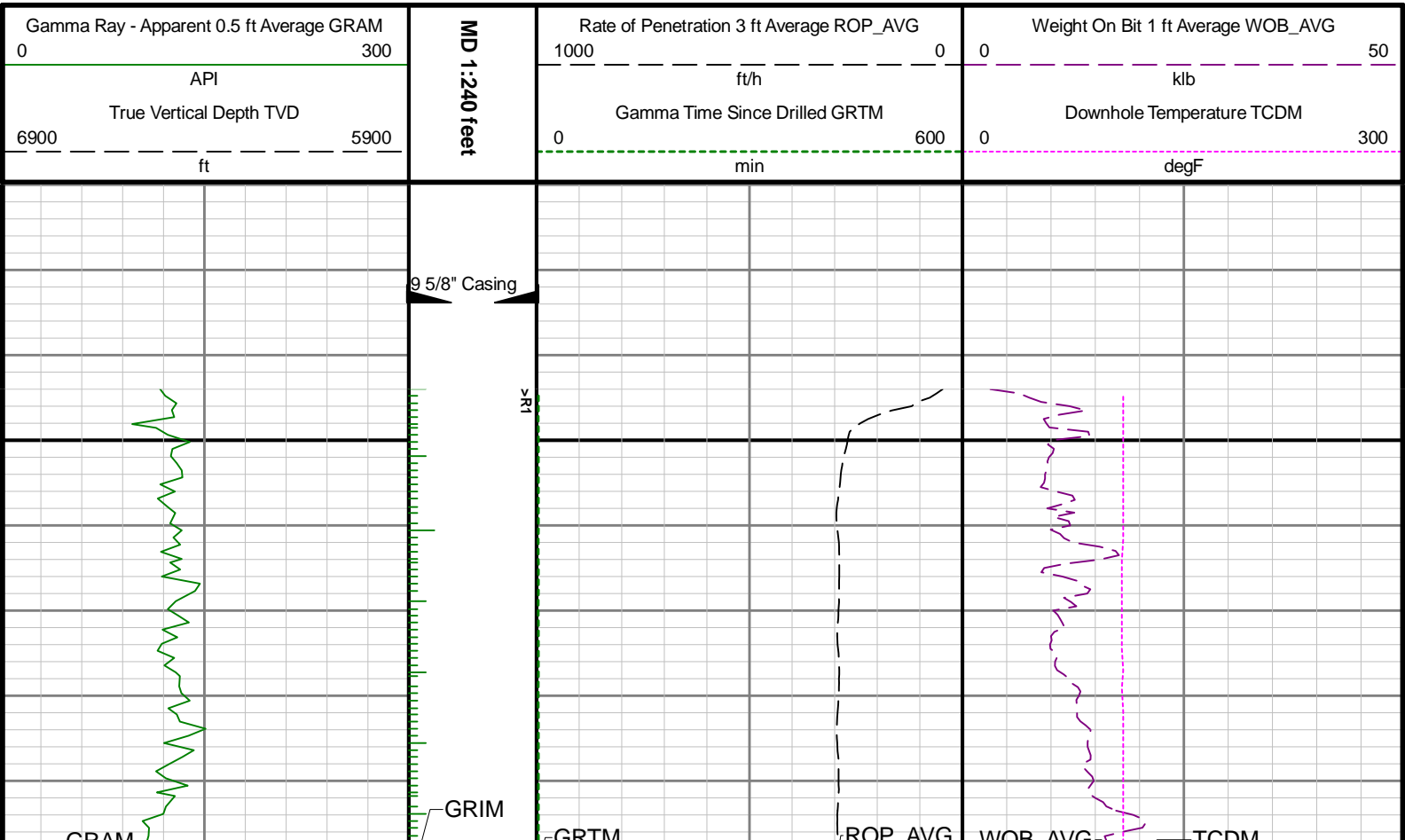
1	Depth measurements were obtained from a depth control system not supplied or operated by Baker Hughes. Due to the lack of control by Baker Hughes, depth calibrations and measurements could not be independently verified.
2	Baker Hughes LWD run 1 and 2 utilized a 6.75 inch NaviGamma service (Directional and Gamma Ray) behind a 8.5 inch bit and rotary steerable assembly from 1944 to 17015 feet MD (1944 to 6686 feet TVD).
3	The Gamma Ray Apparent (GRAM) data is presented 0 to 300 API, per the customer's request.

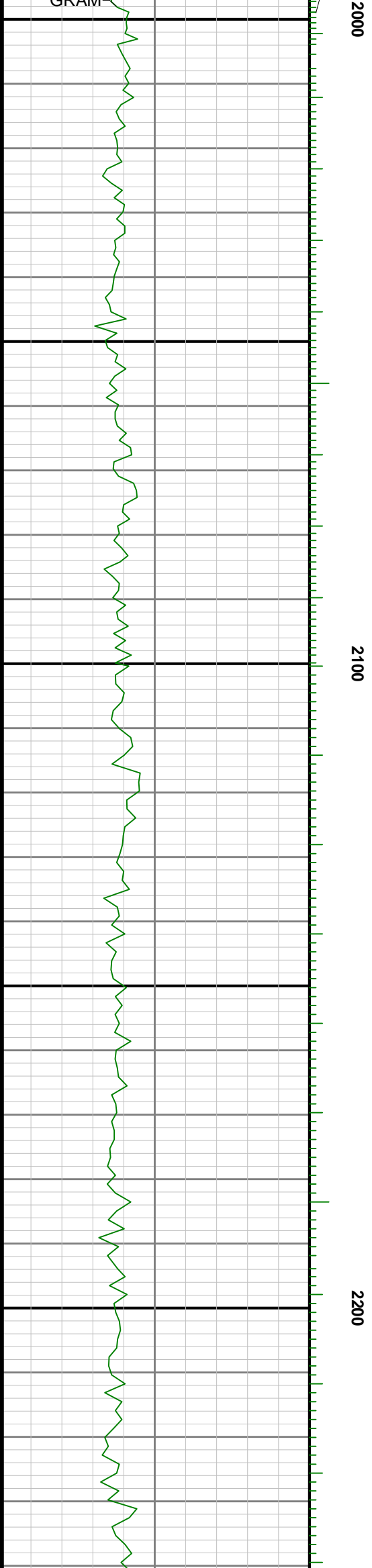
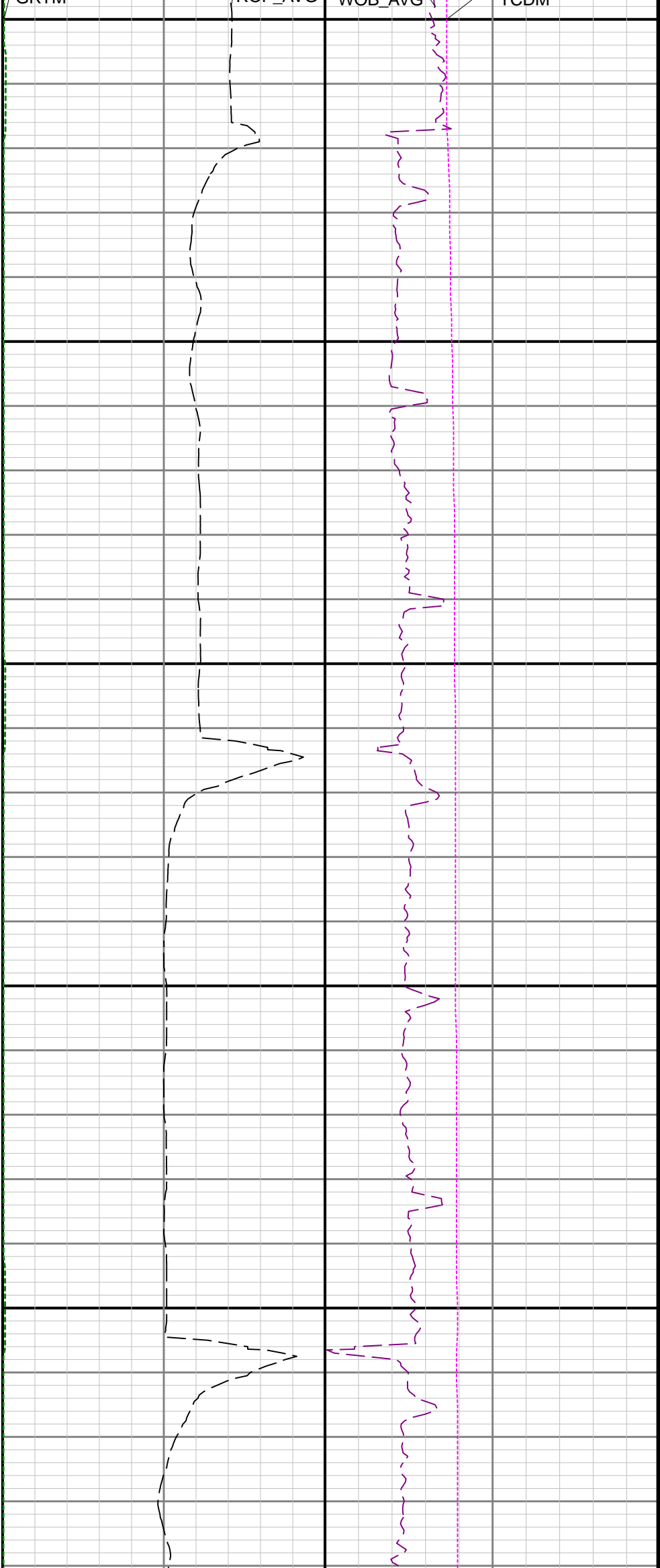
Remarks

Number	Depth (ft)	Hole Section (in)	Run No.	Remark
1	6059.00	8.500	1	The interval from 6024 to 6045 feet MD (5986 to 5989 feet TVD) has a gap in gamma ray data, due to the loss of power to the logging assembly.
2	7936.00	8.500	1	The interval from 7889 to 7923 feet MD (6708 feet TVD) has a gap in gamma ray data, due to the loss of power to the logging assembly.
3	10721.00	8.500	2	The interval from 10708 to 10721 feet MD (6695 feet TVD) was logged 9 hours after being drilled, due to a trip out of the hole to pick up a new bottom hole assembly.
4	17015.00	8.500	2	The interval from 17002 to 17015 feet MD (6686 feet TVD) was not logged after being drilled due to sensor to bit offset at well TD.

Curve Mnemonics

Presented Curves	Description	Units
ROP_AVG	Rate of Penetration 3 ft Average	ft/h
TVD	TVD	ft
WOB_AVG	Weight On Bit 1 ft Average	klb
GRAM	Gamma Ray - Apparent - Memory 0.5 ft Average	API
GRIM	Gamma Ray - Data Point Indicator - Memory	unitless
GRTM	Gamma Ray - Time Since Drilled - Memory	min
TCDM	Directional Real-Time Survey Temperature	degF

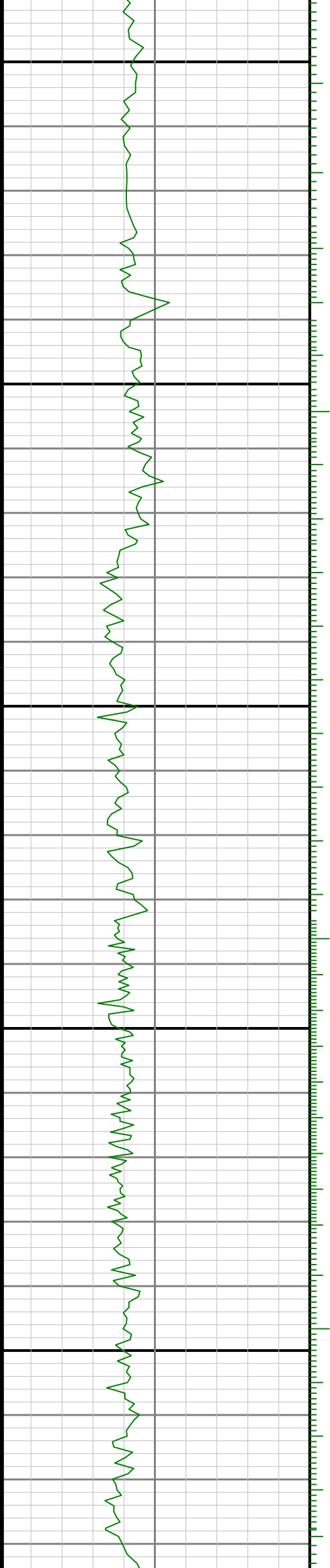


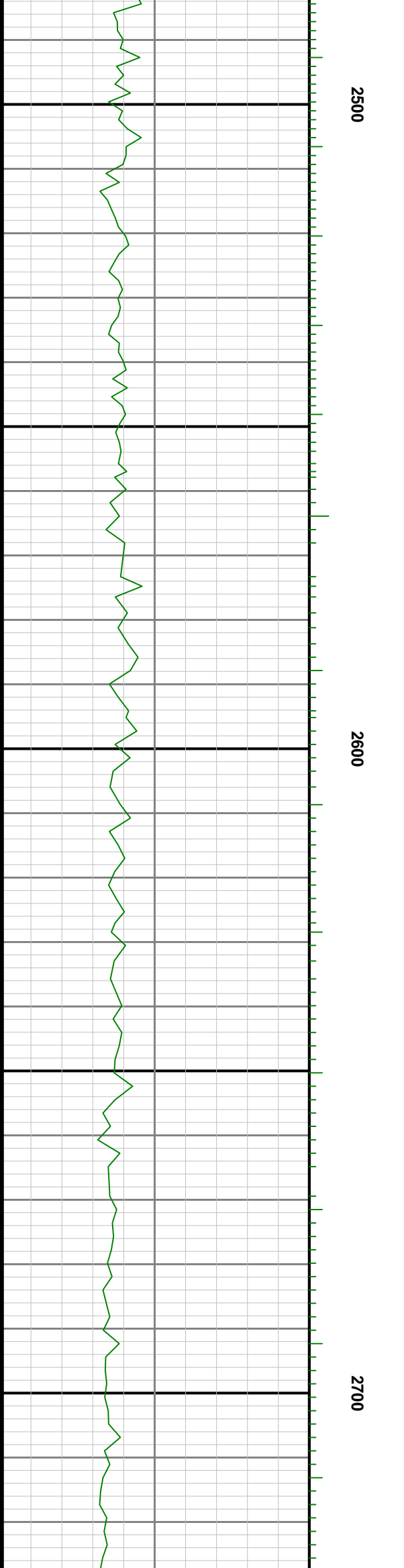
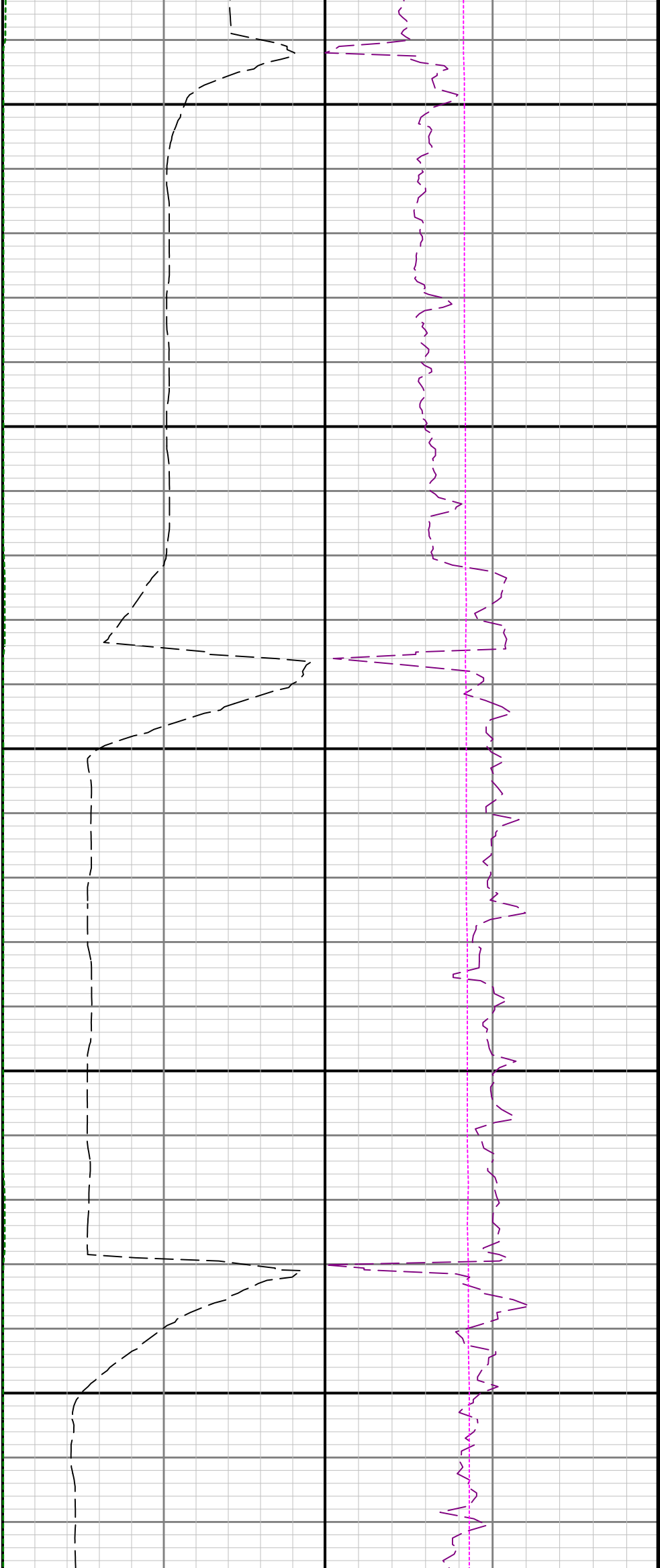


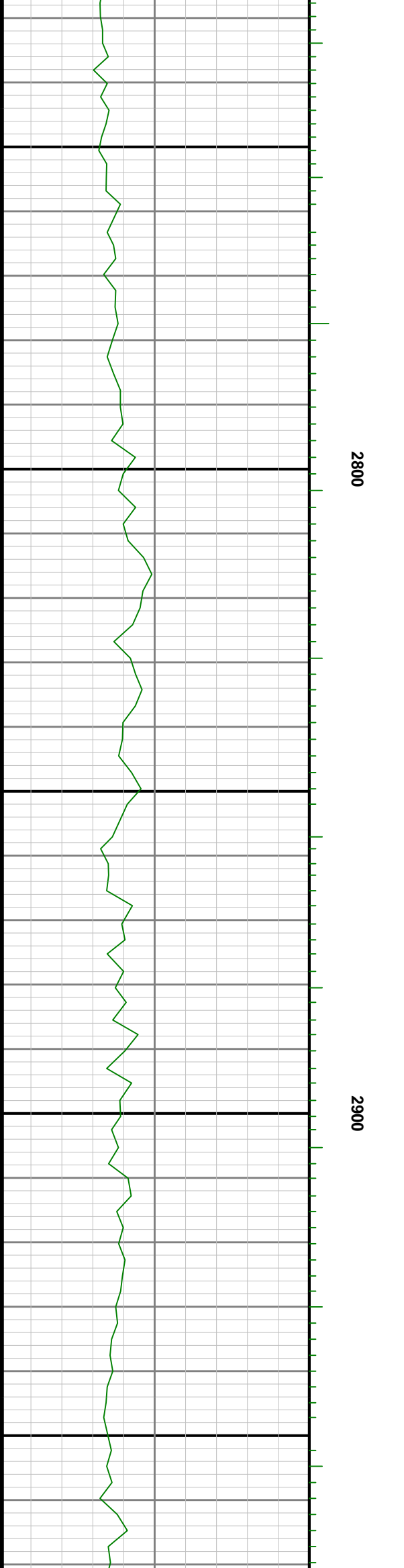
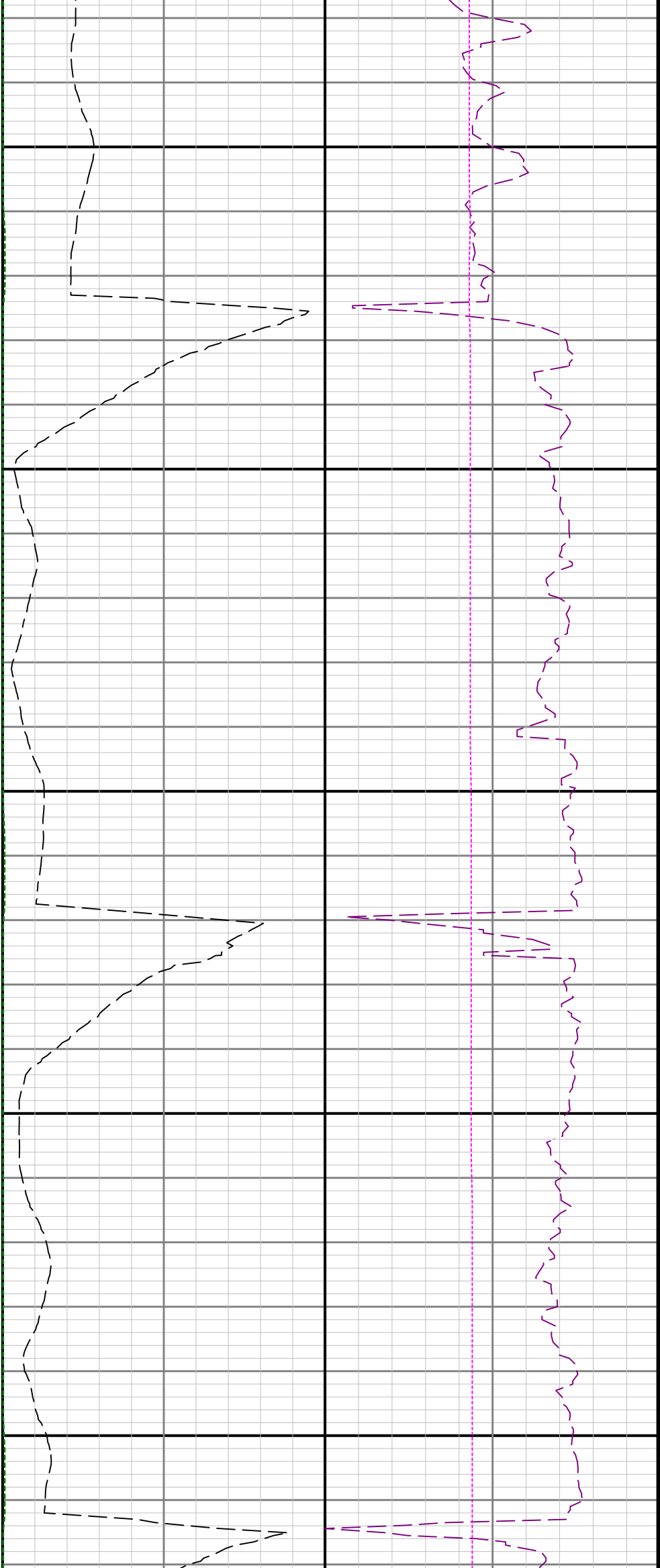


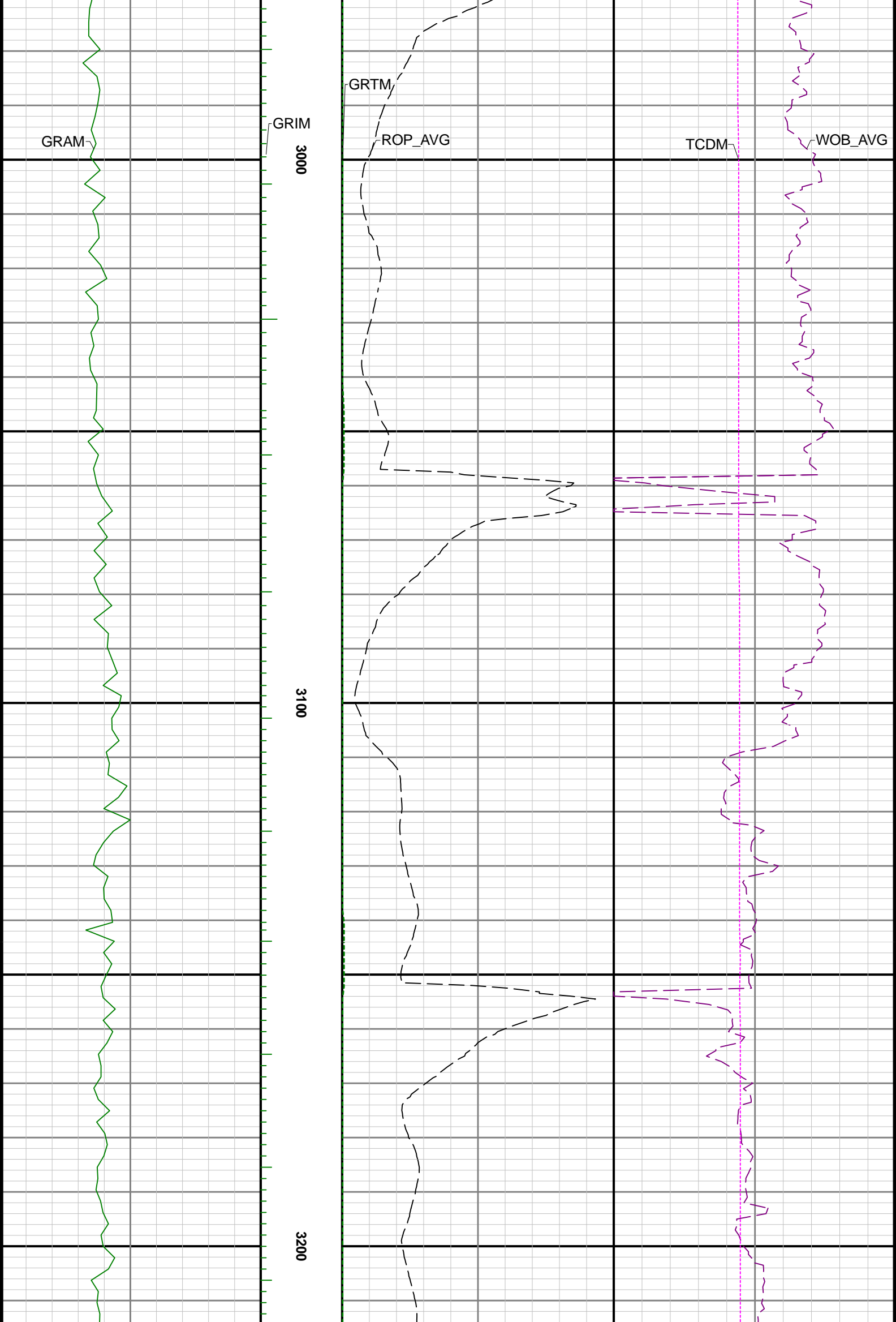
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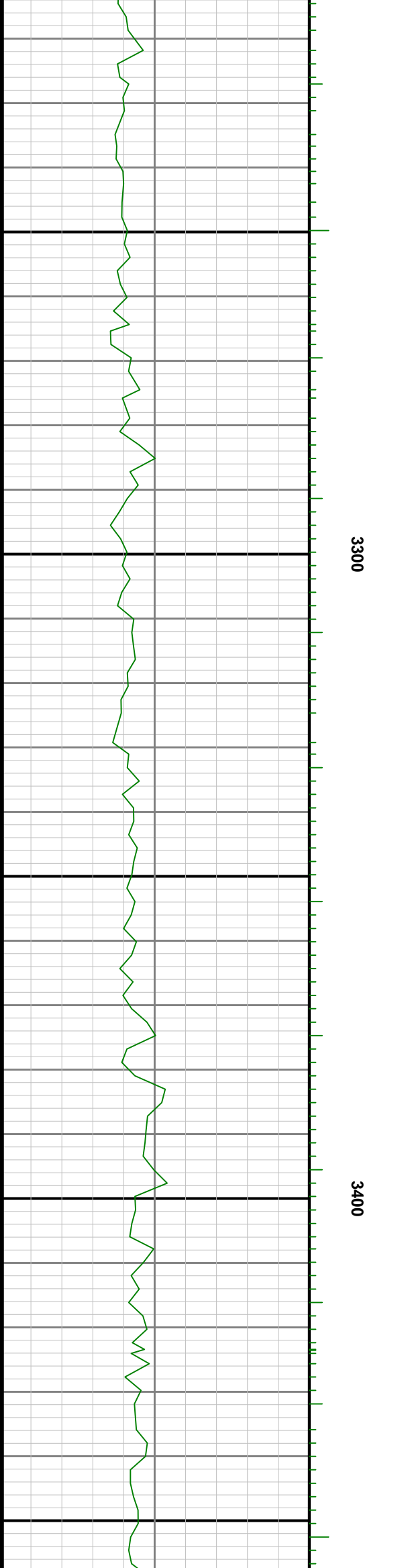
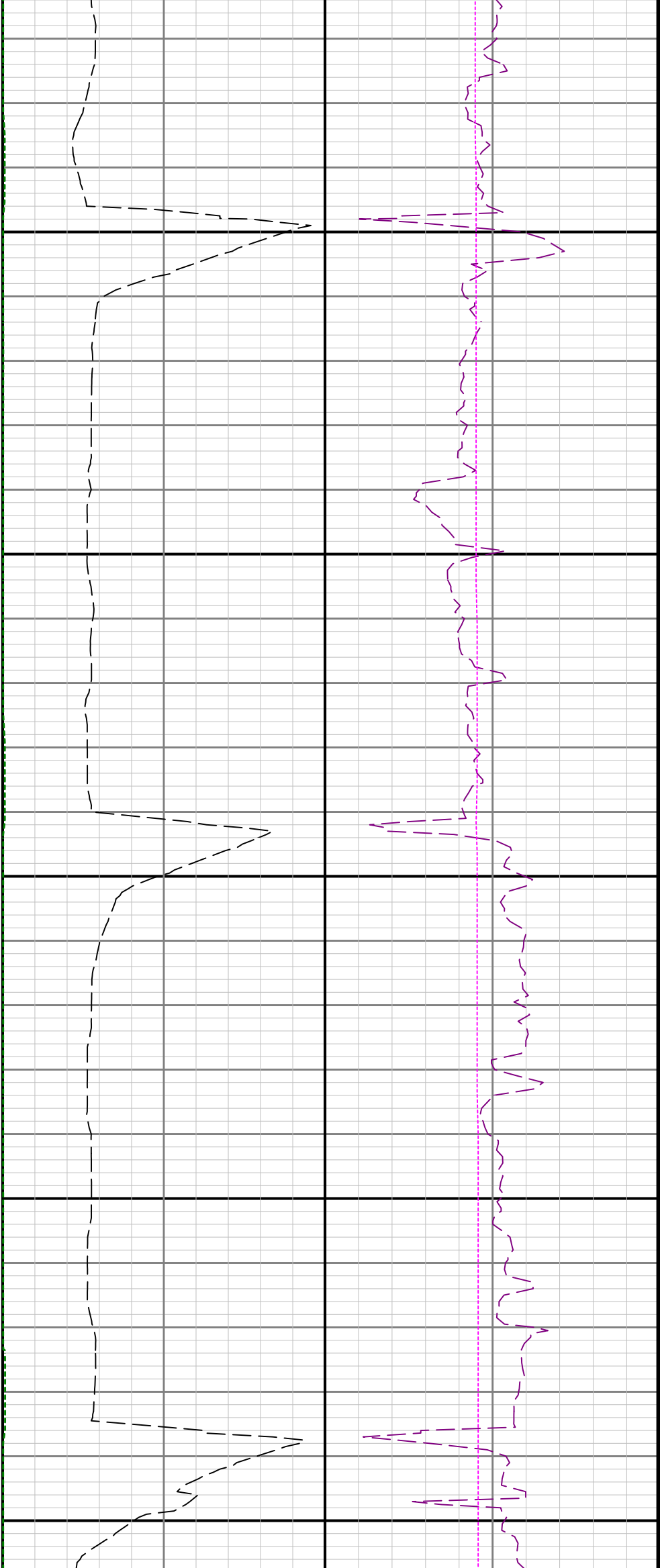
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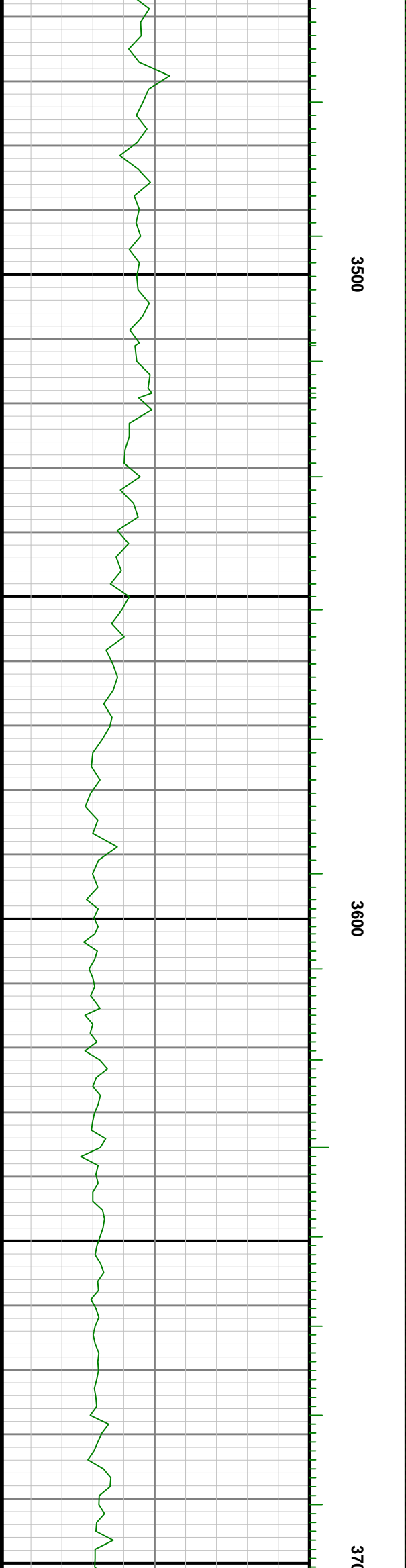
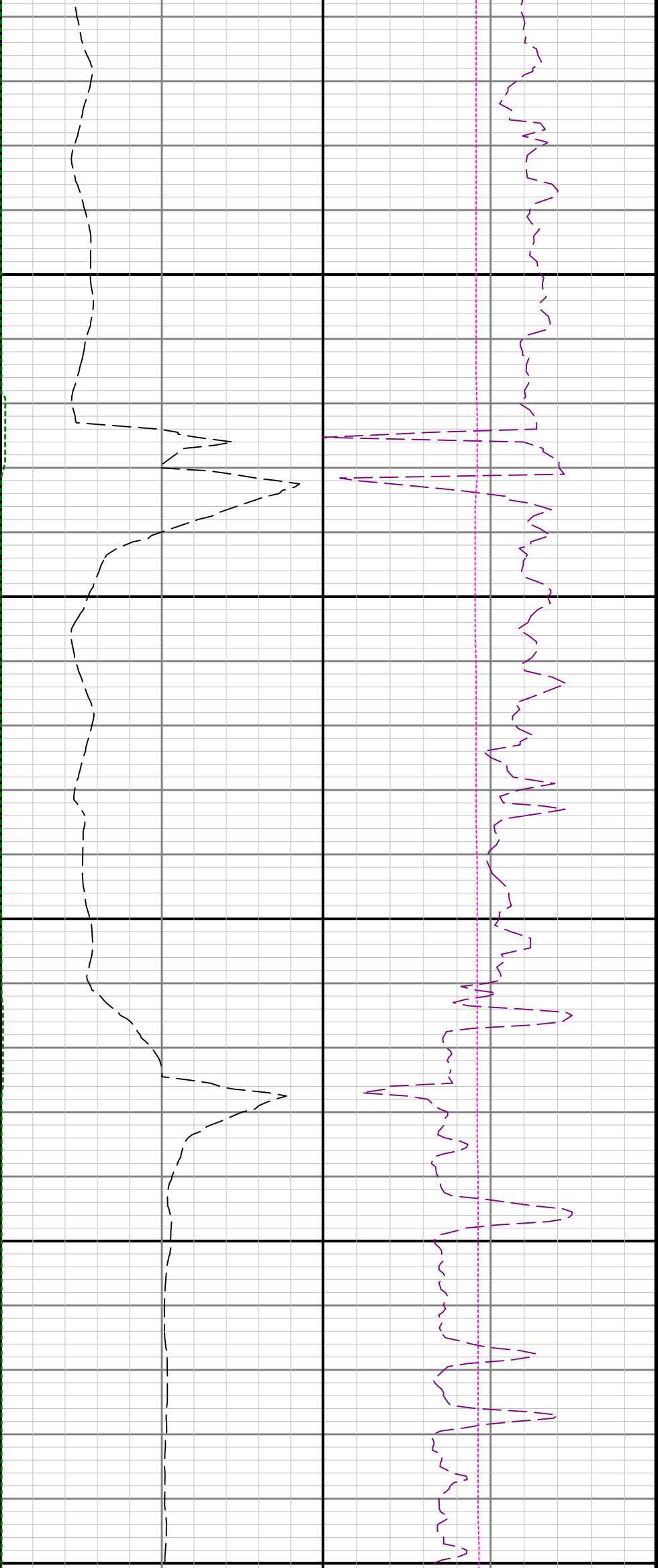






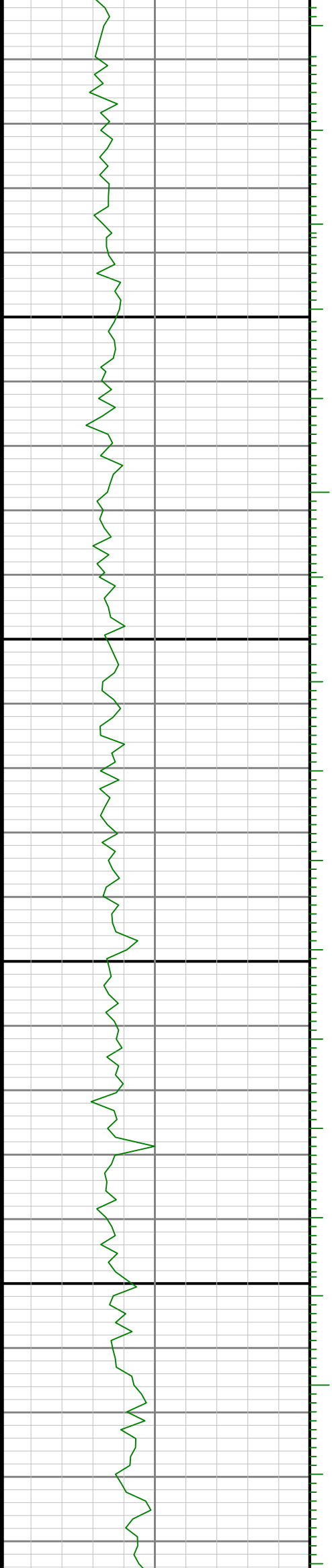


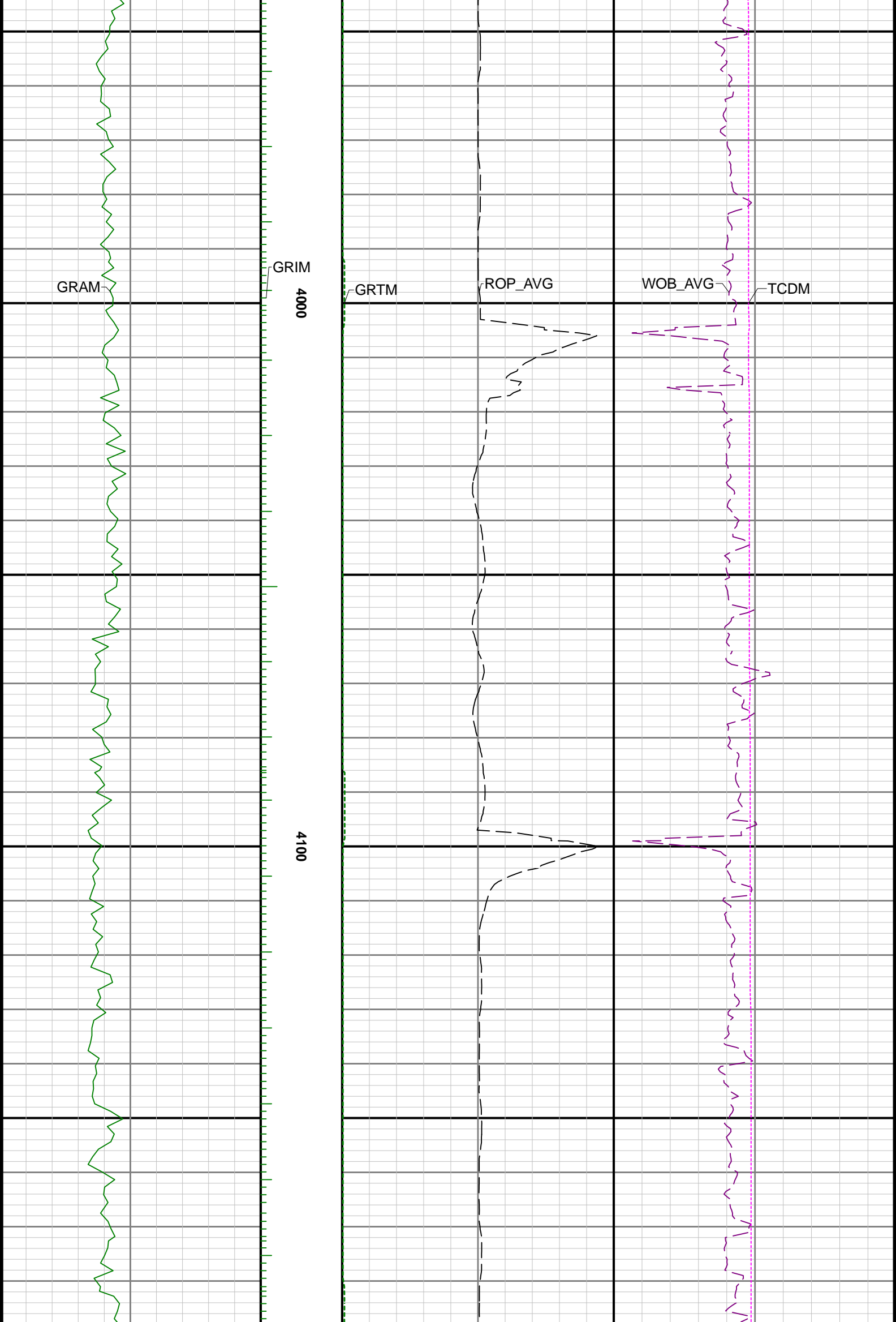


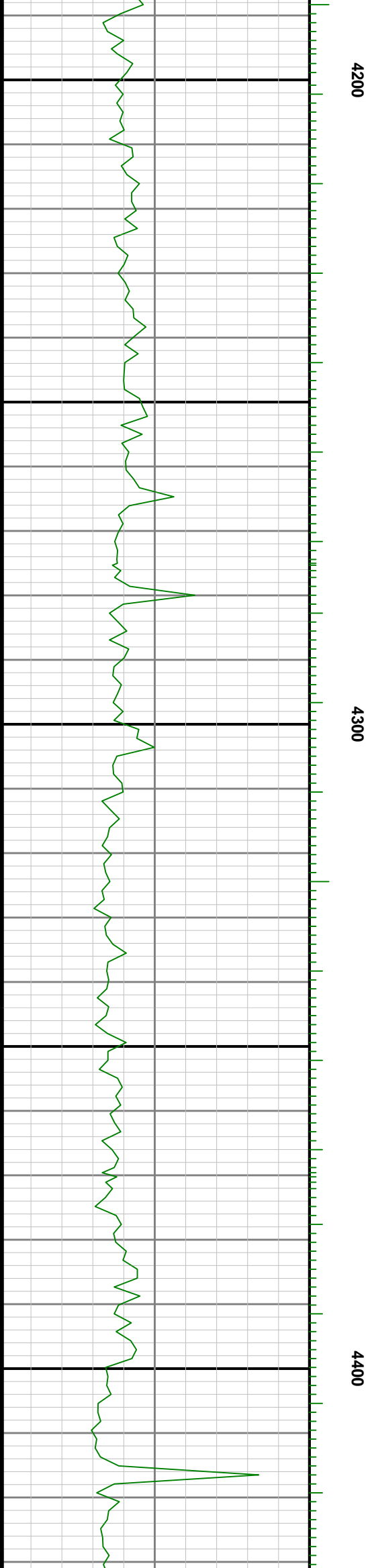
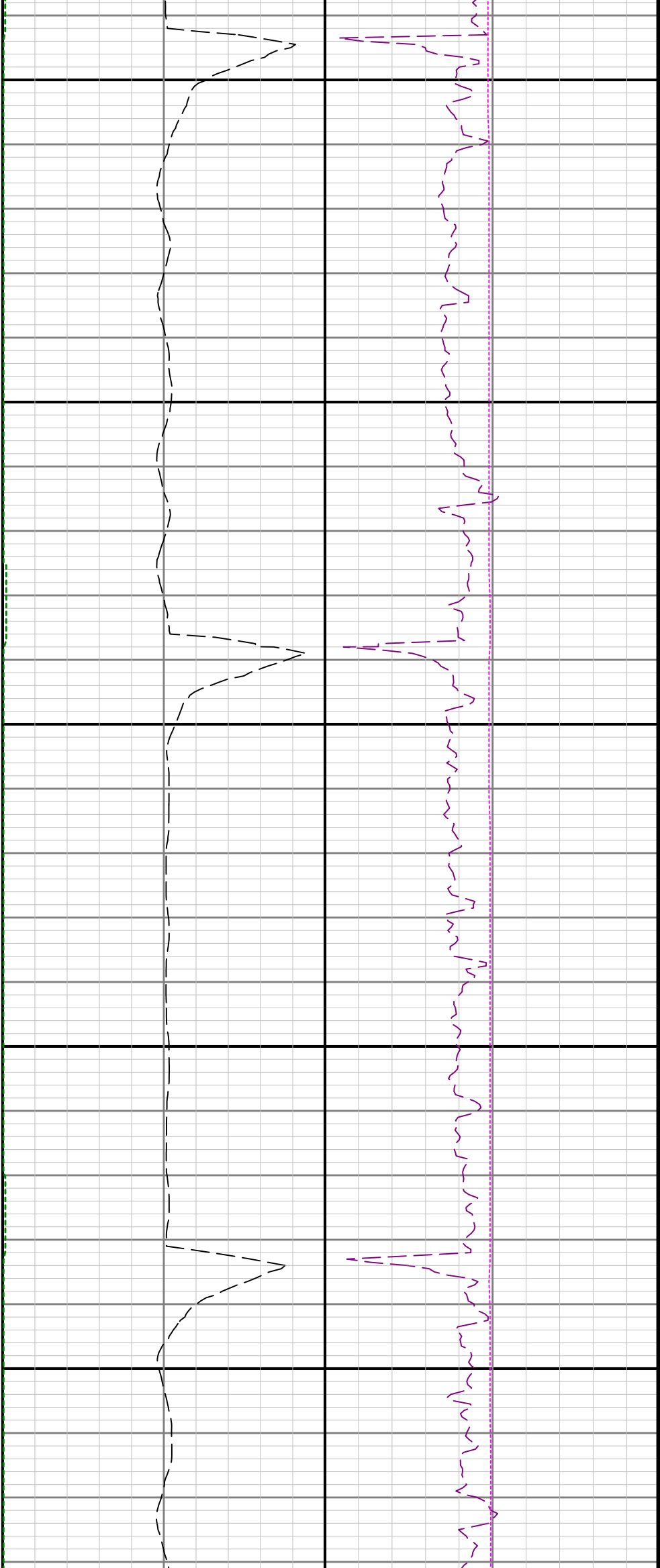


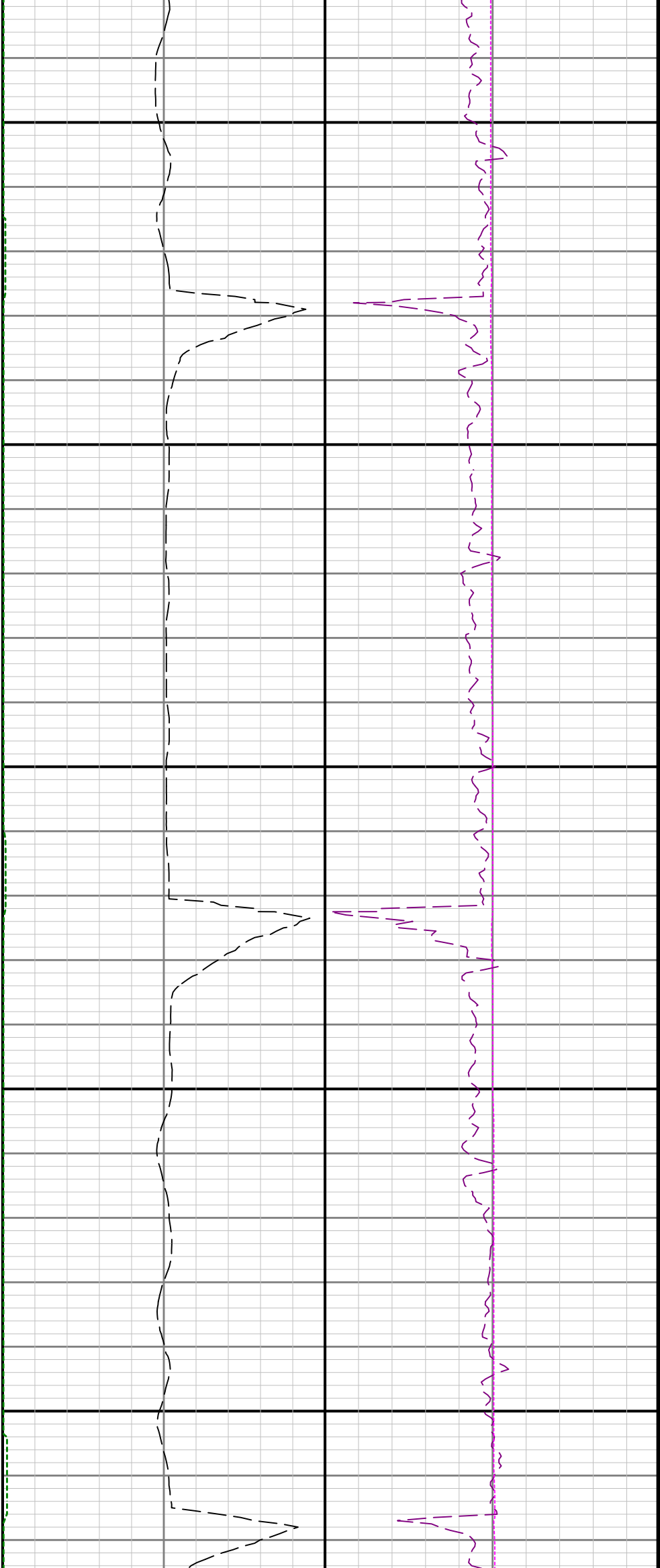


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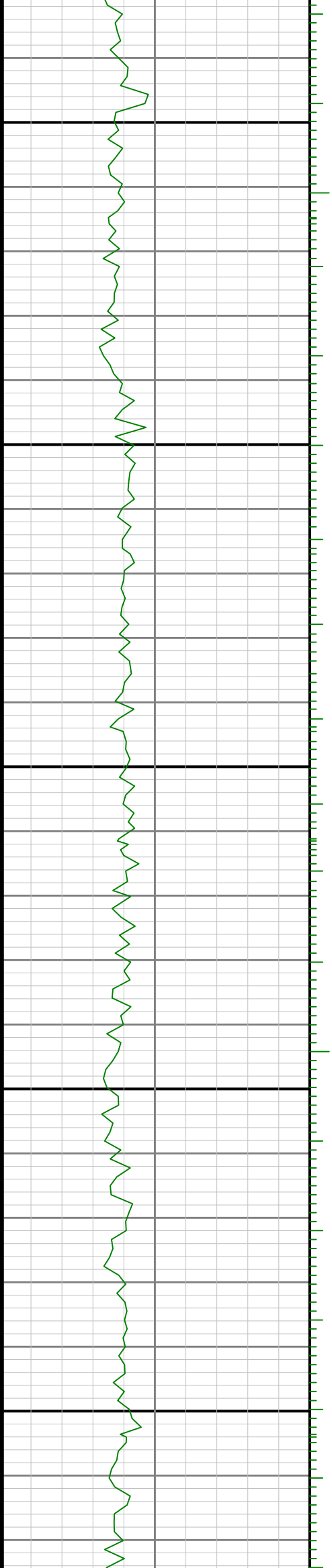


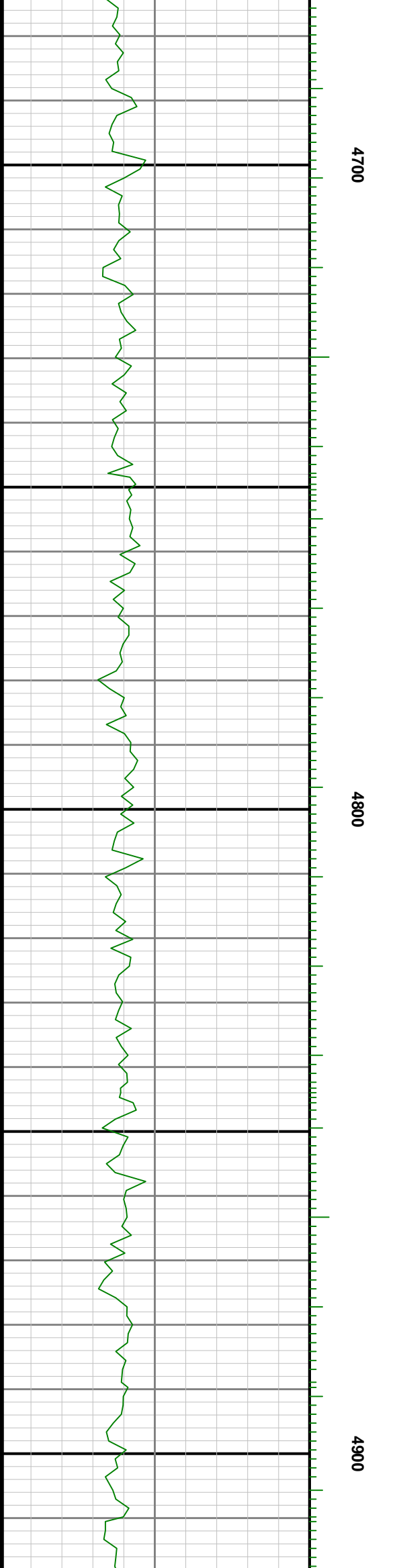
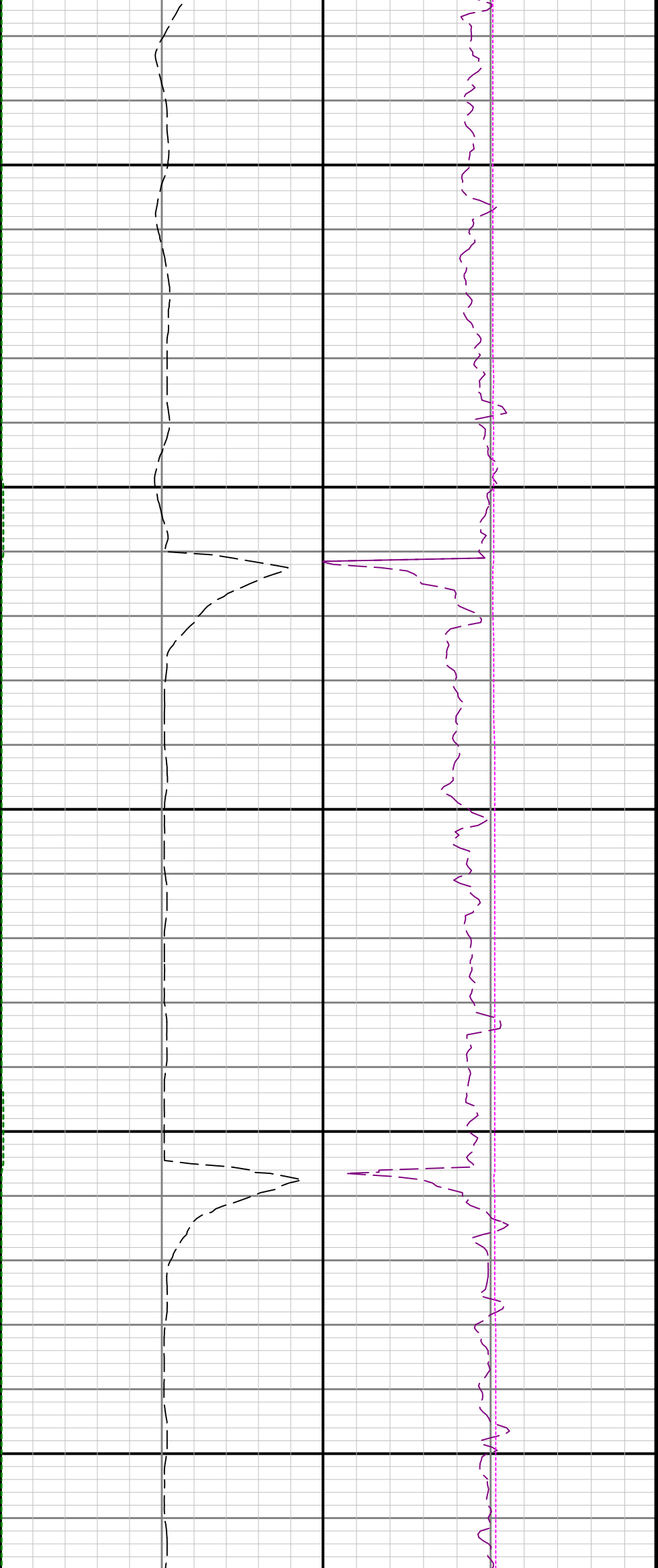


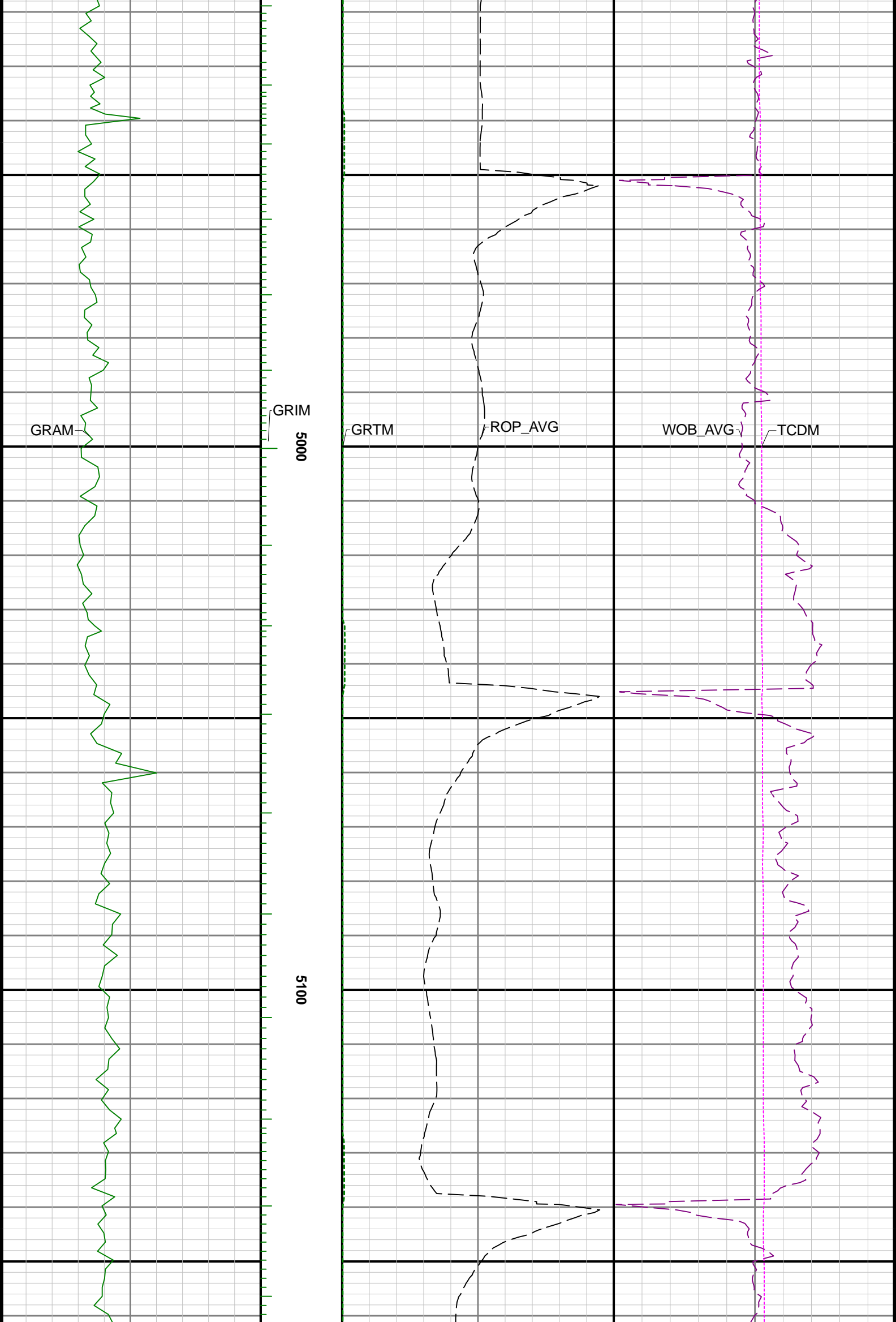


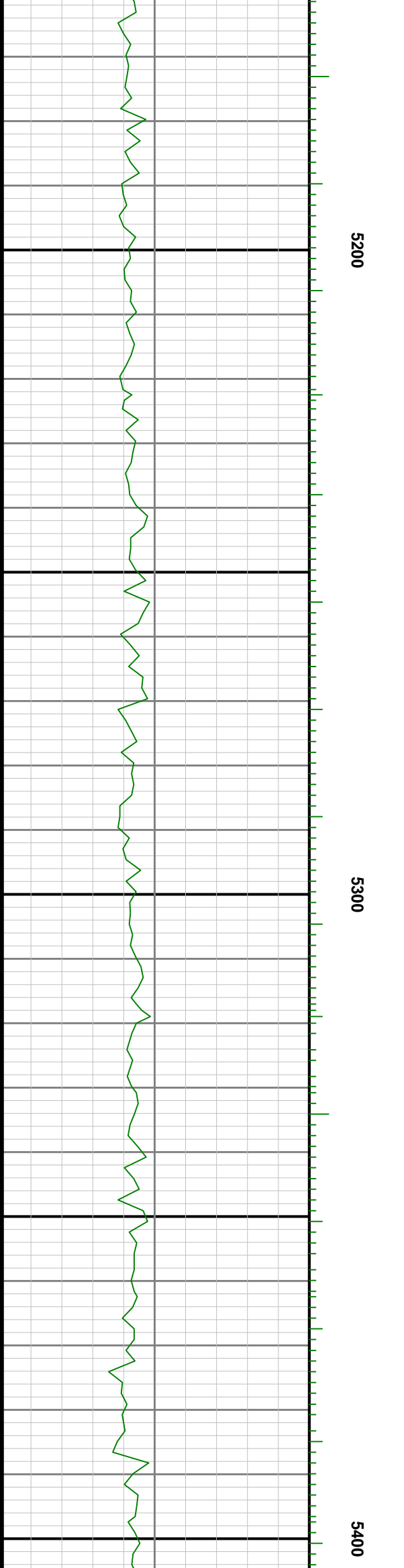
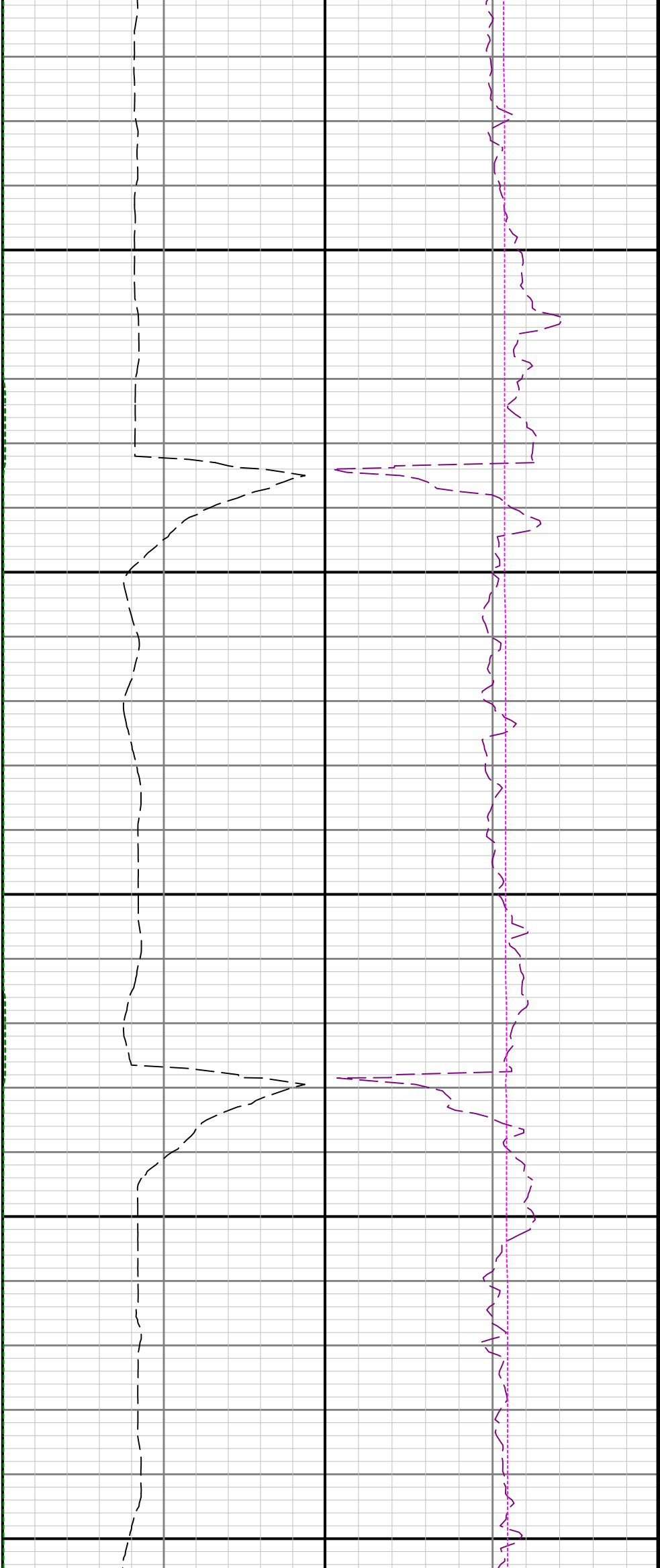
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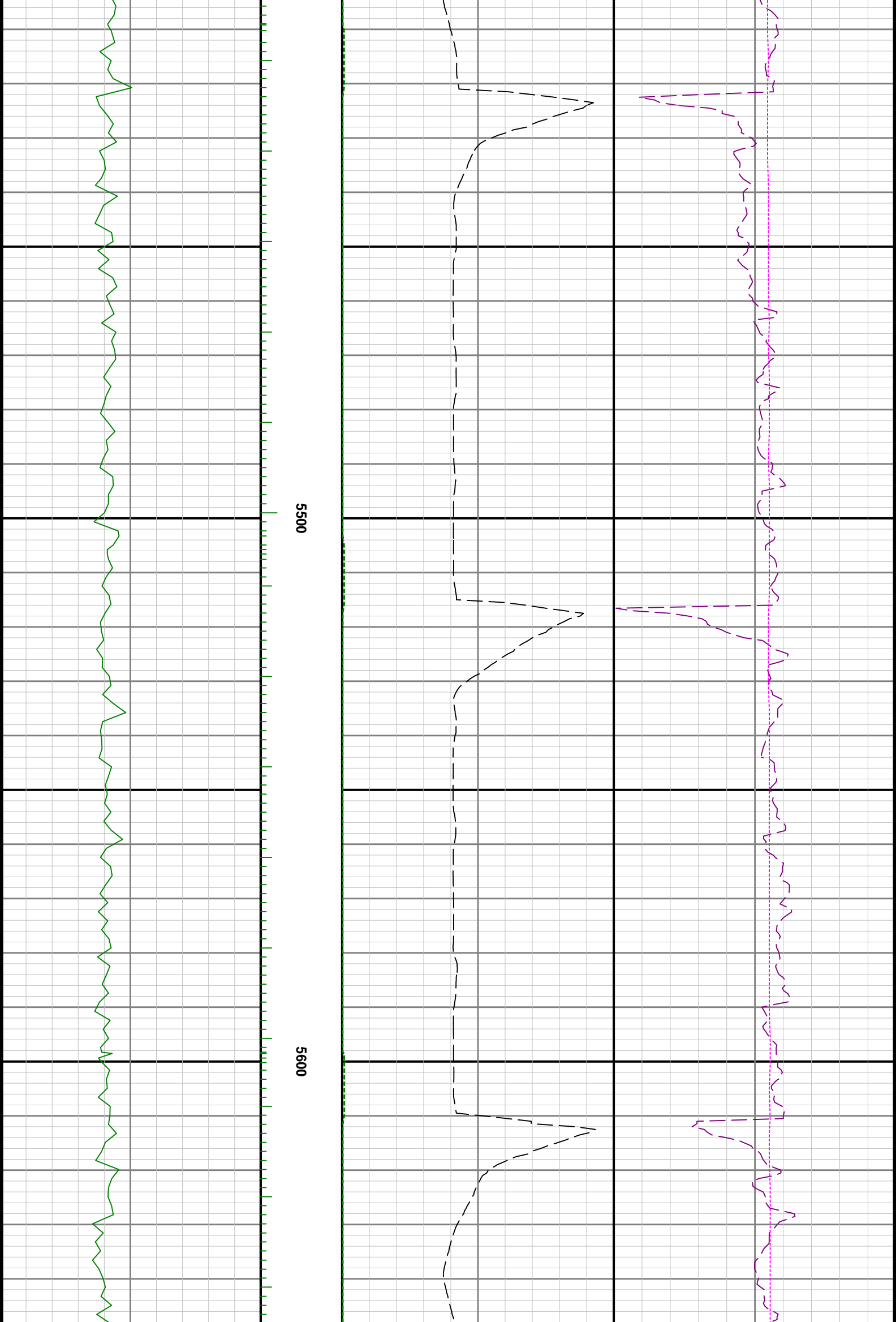
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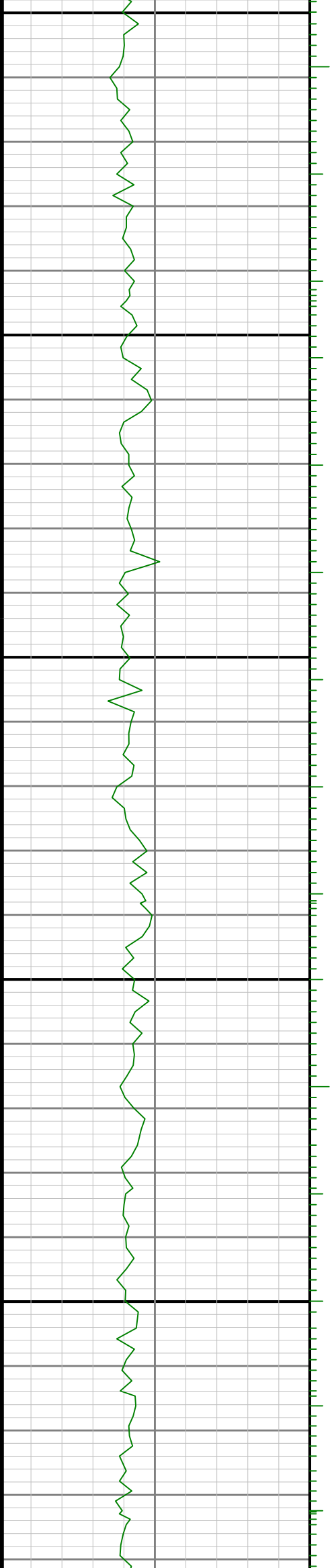


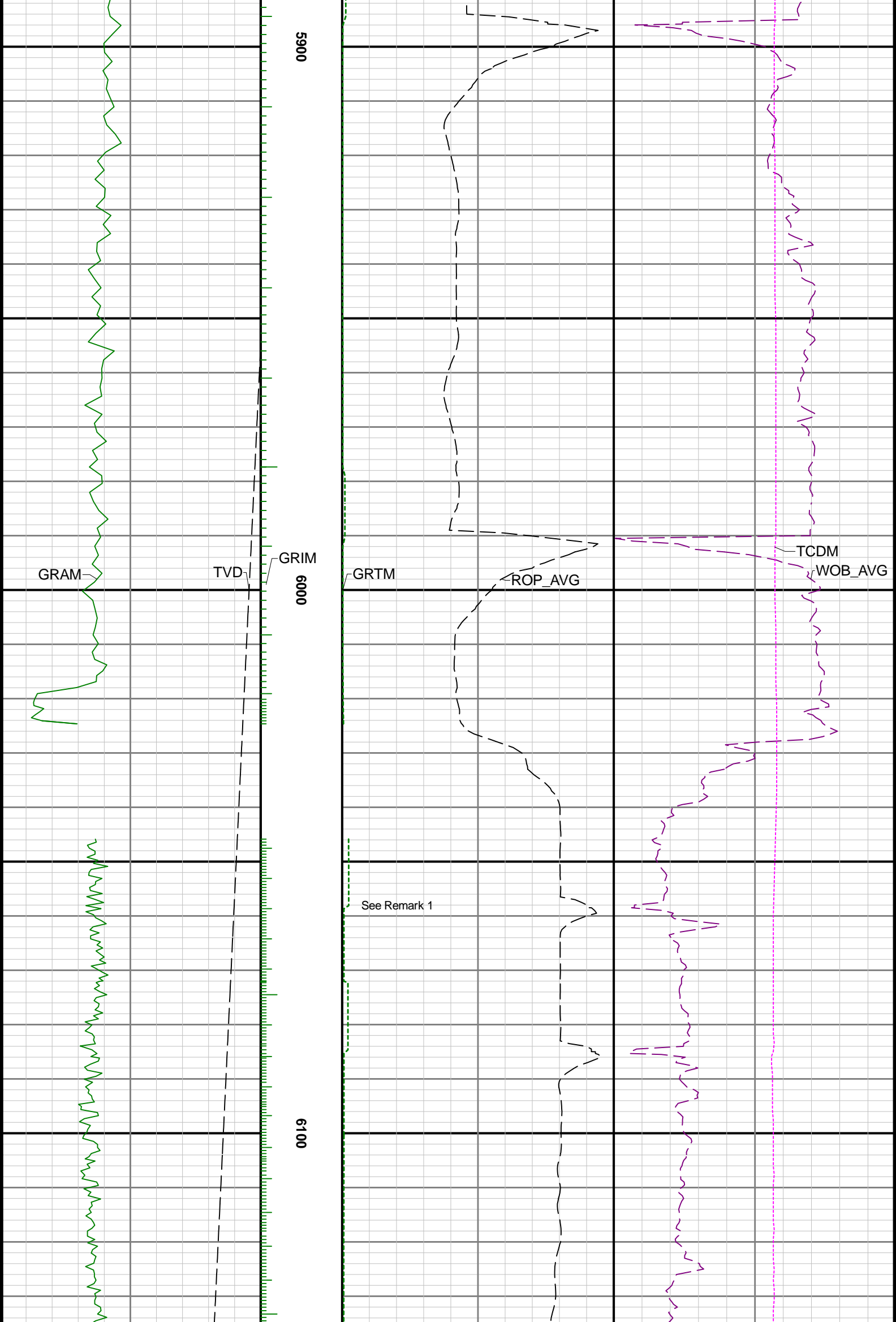


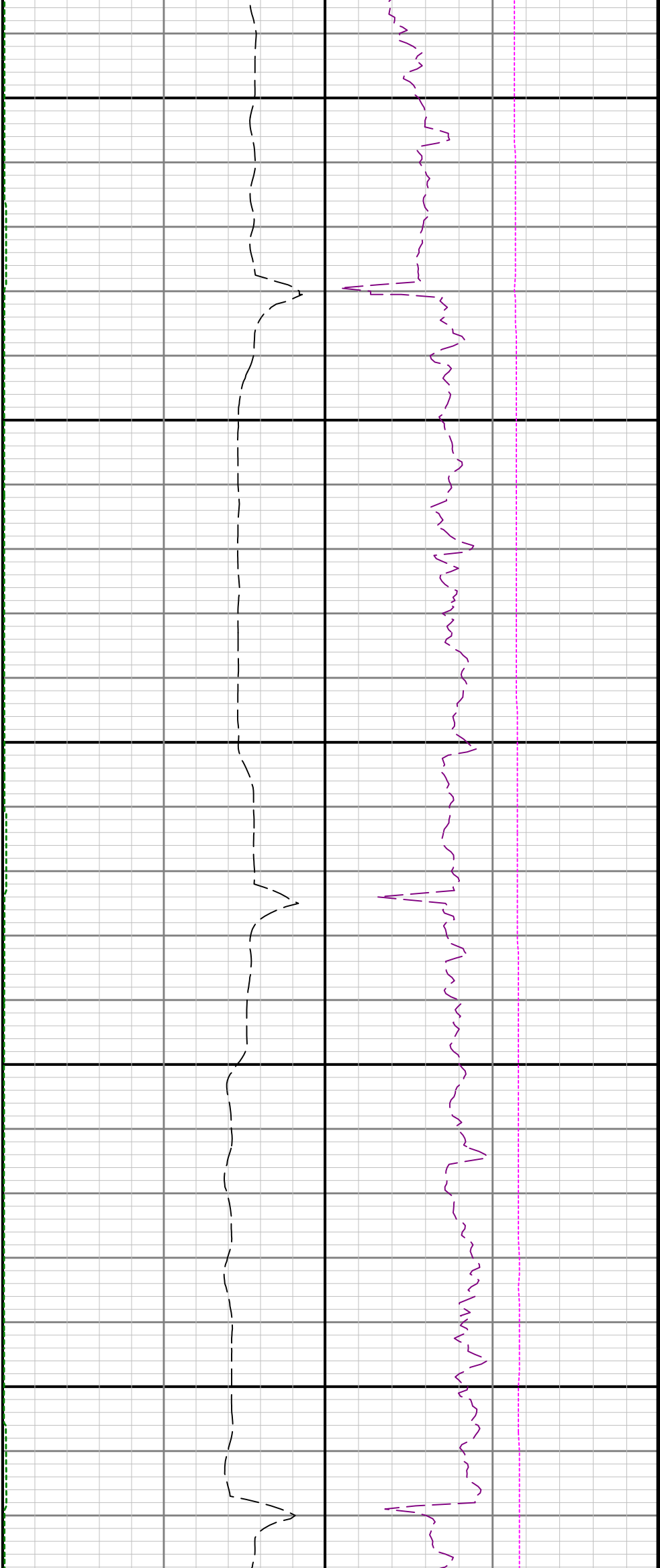


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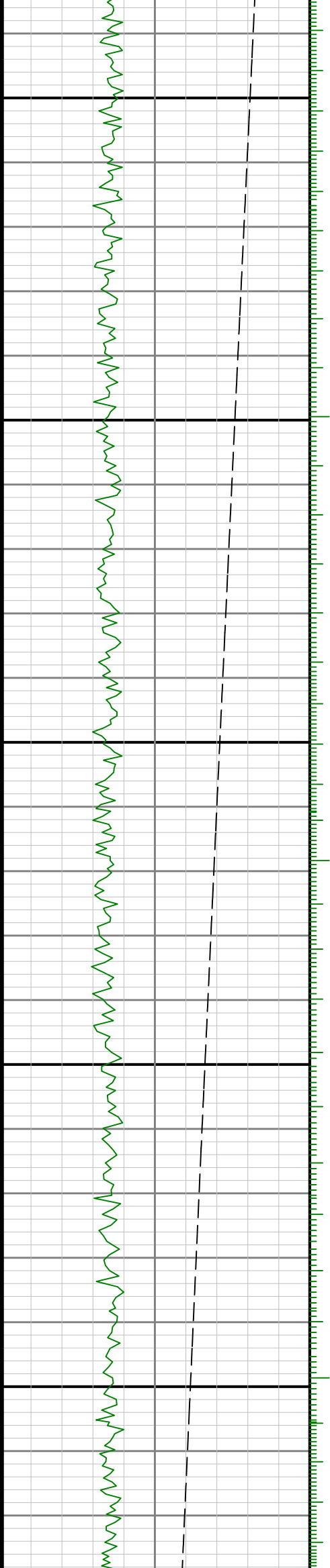


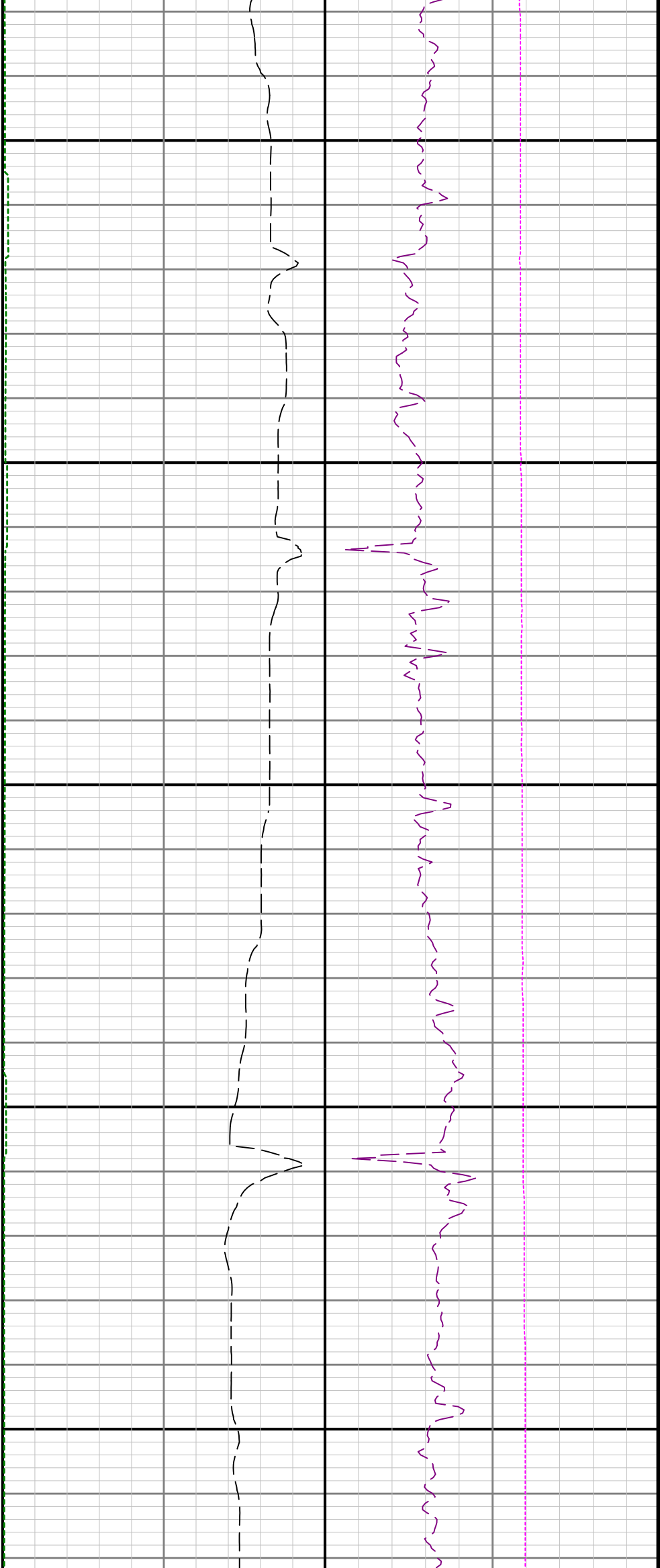




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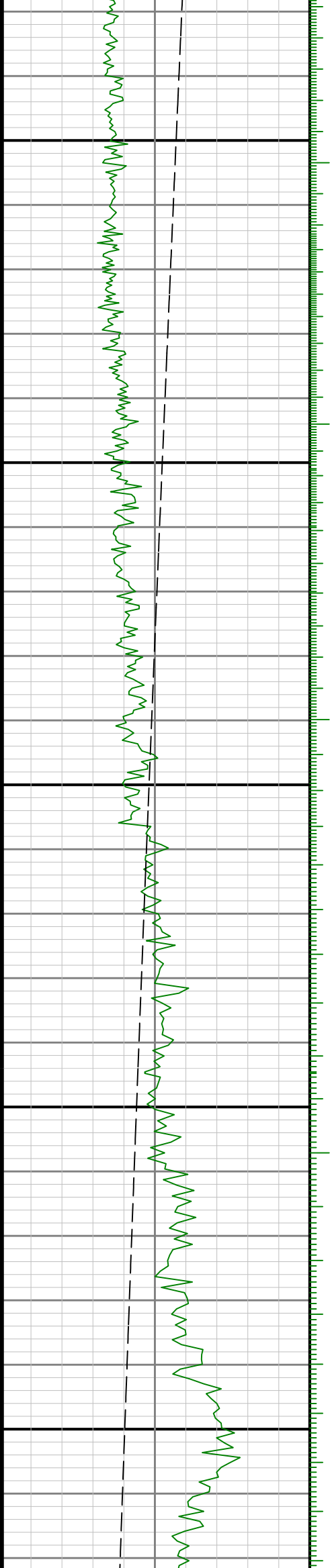


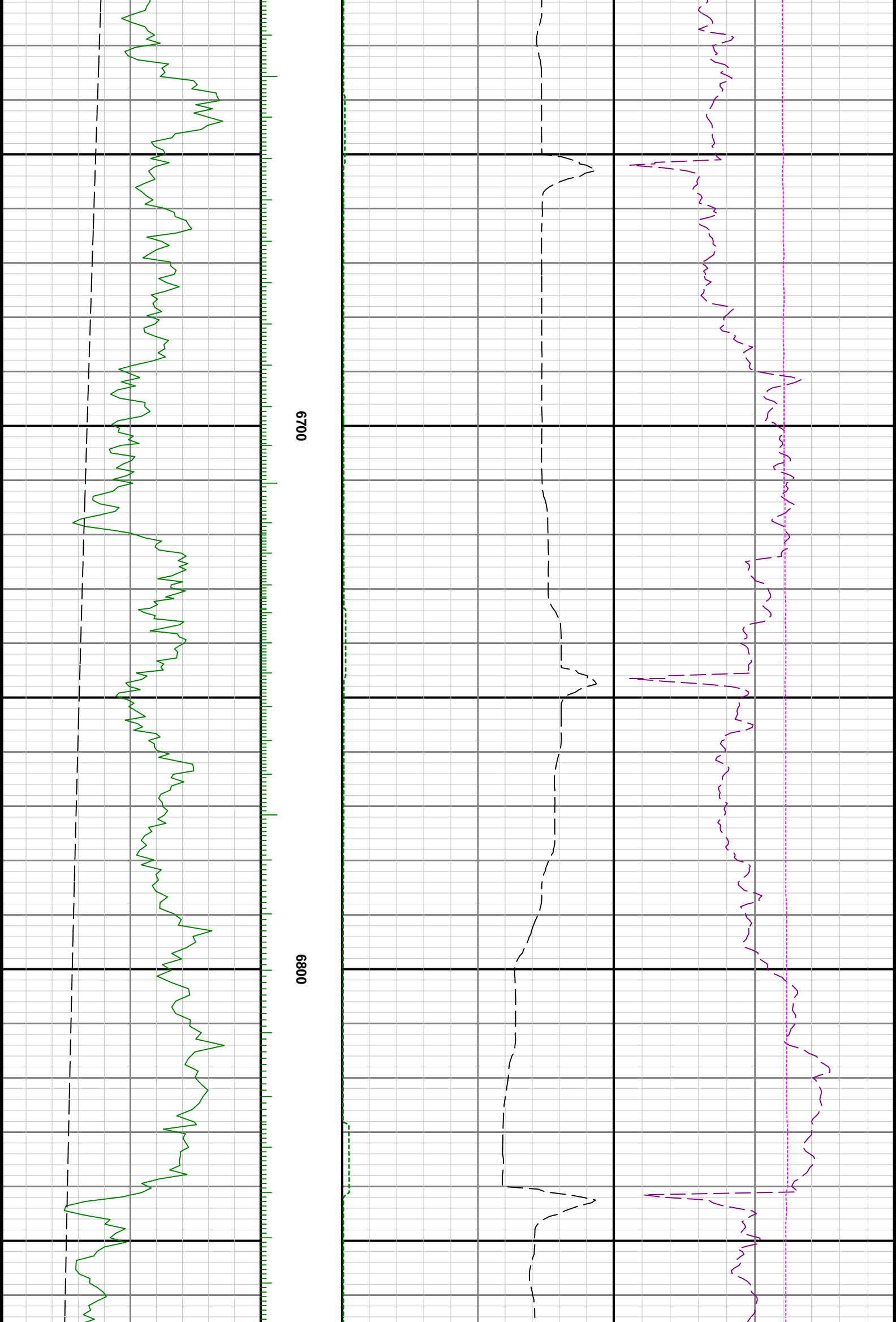


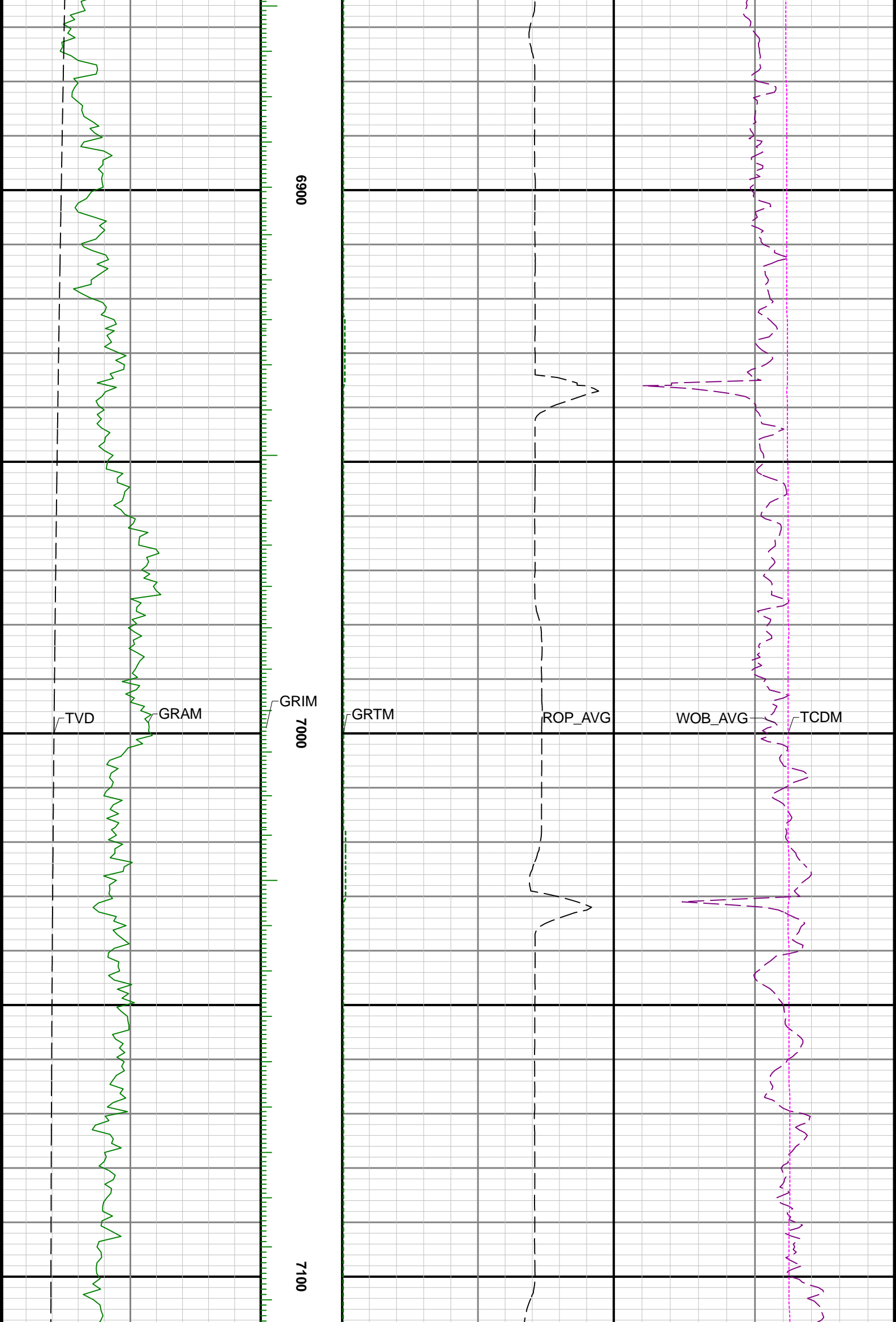
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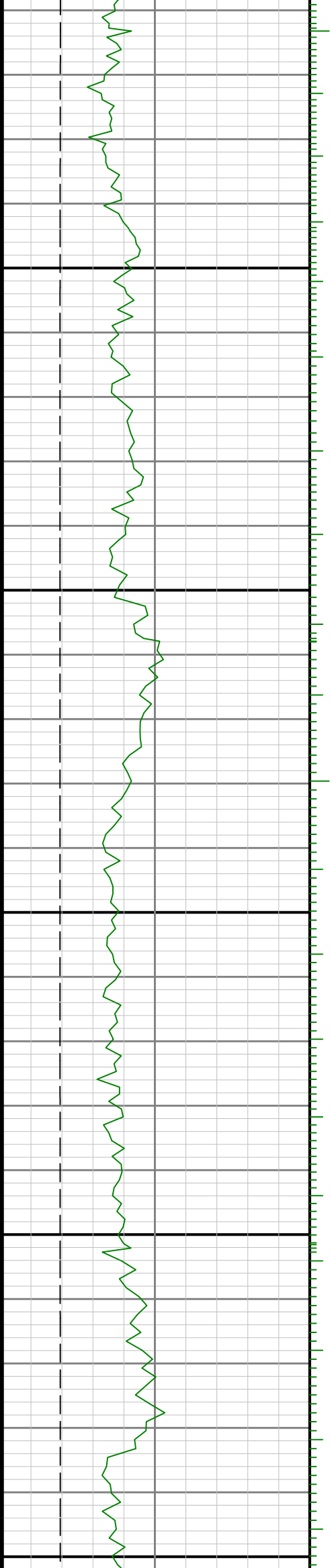


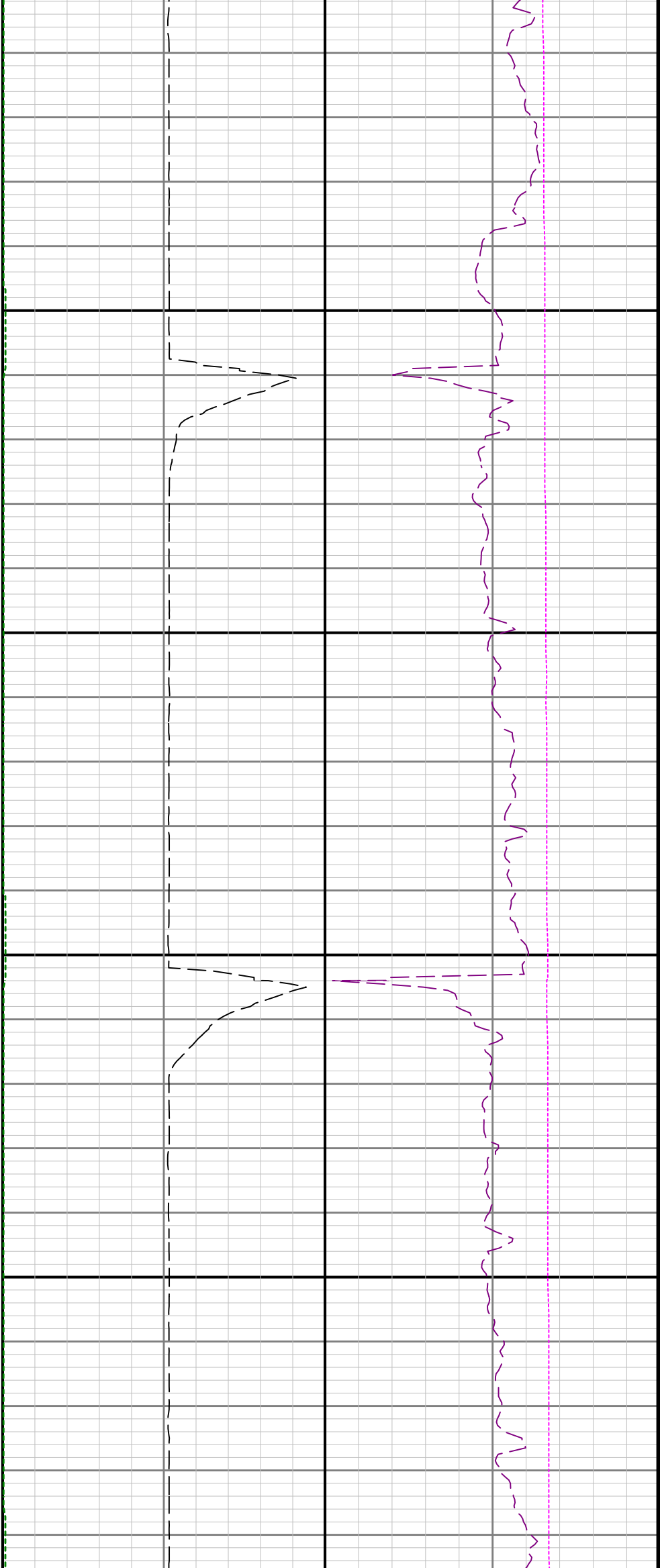




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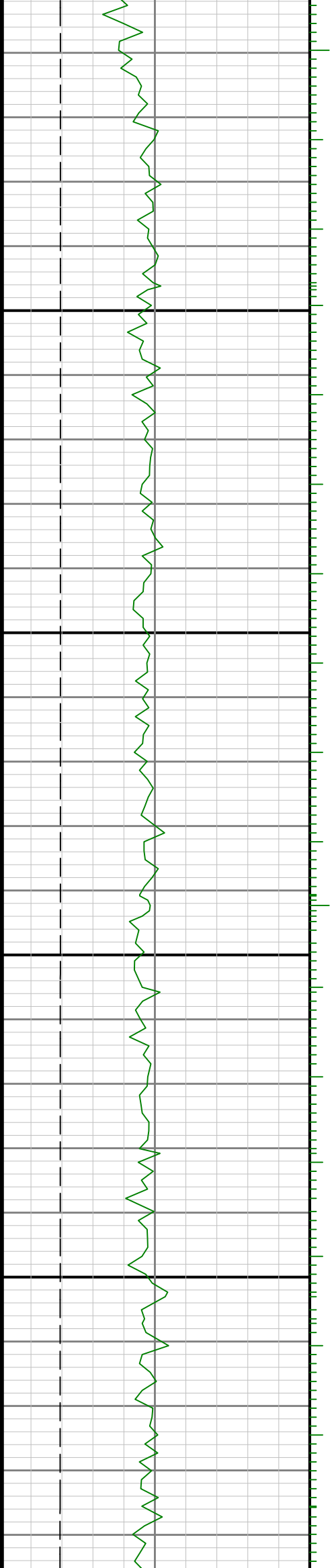
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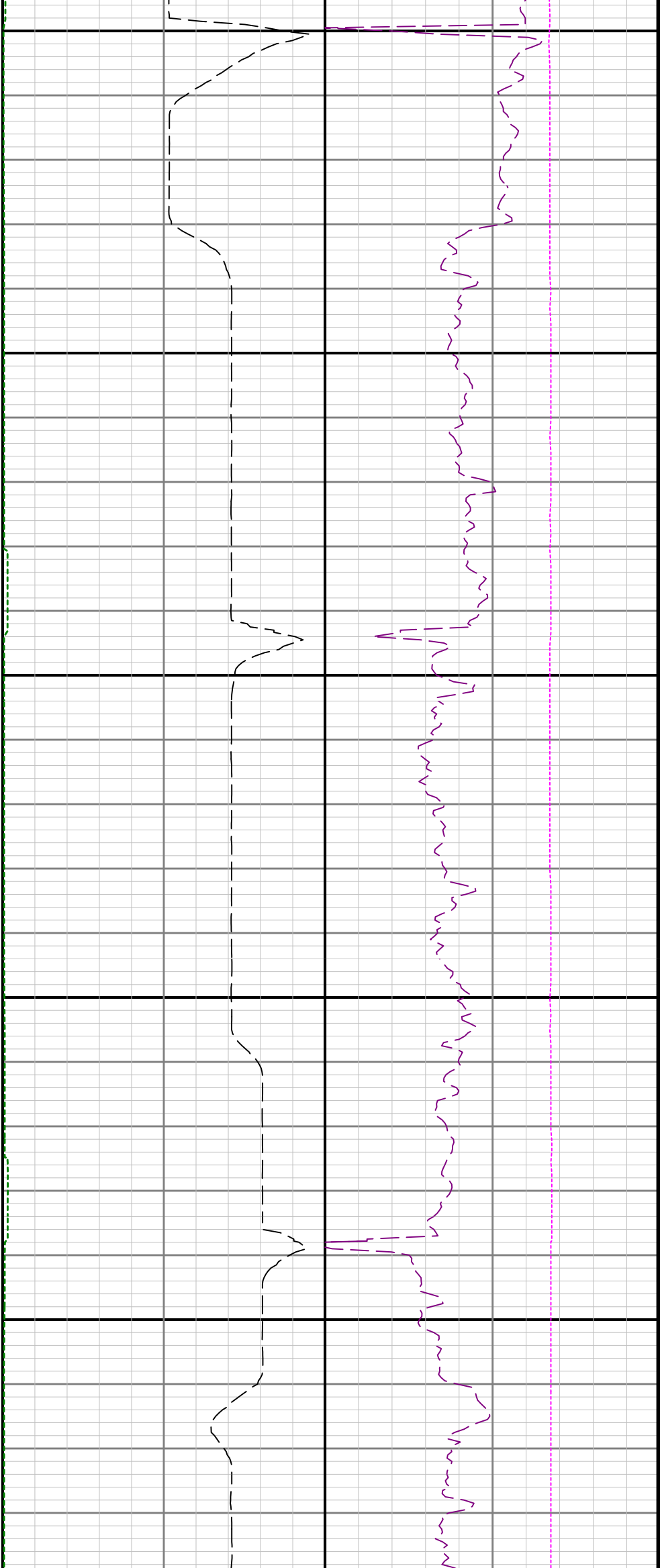




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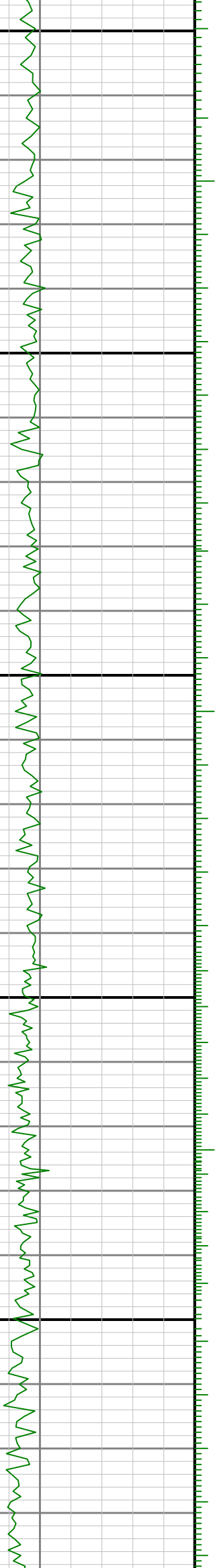


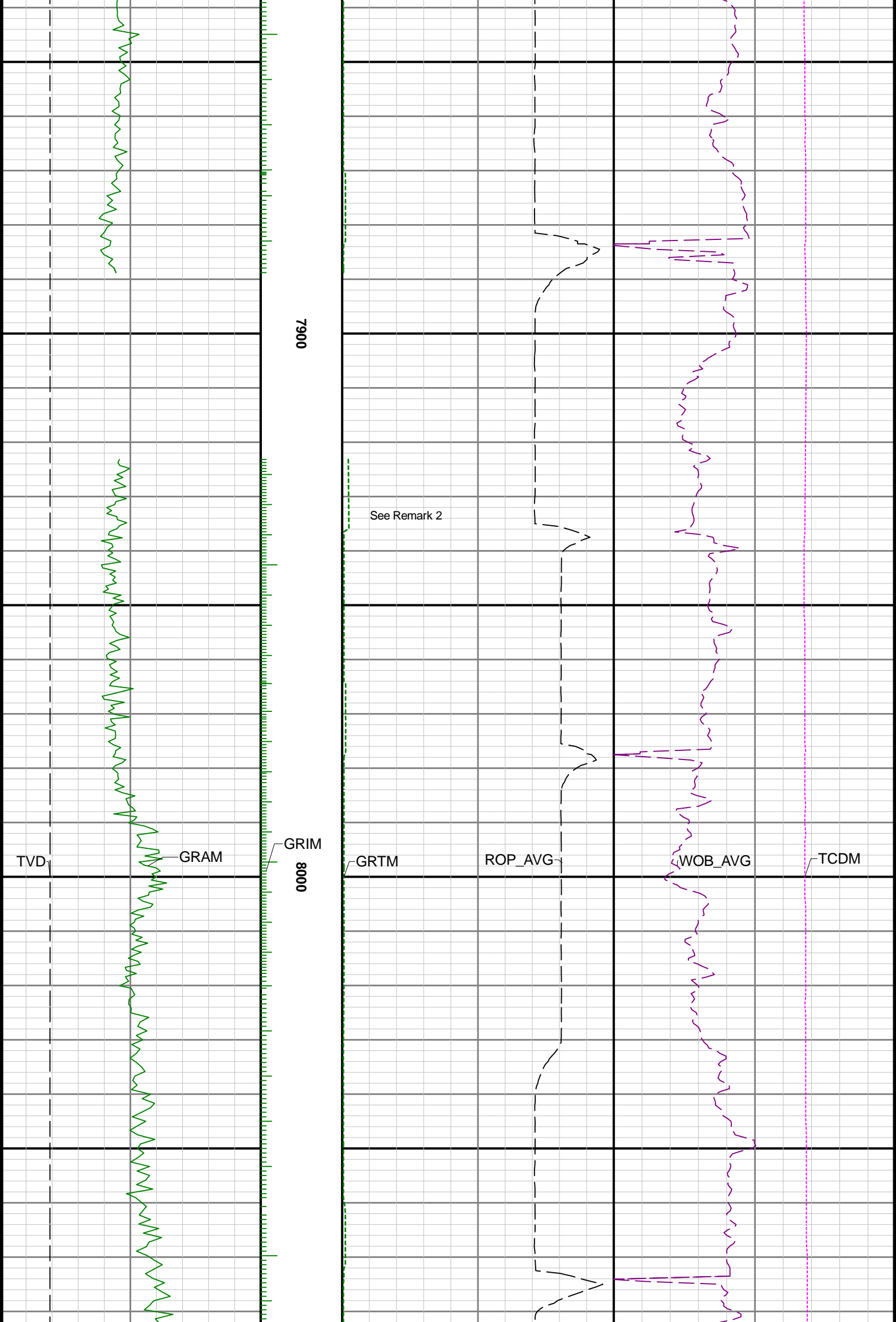


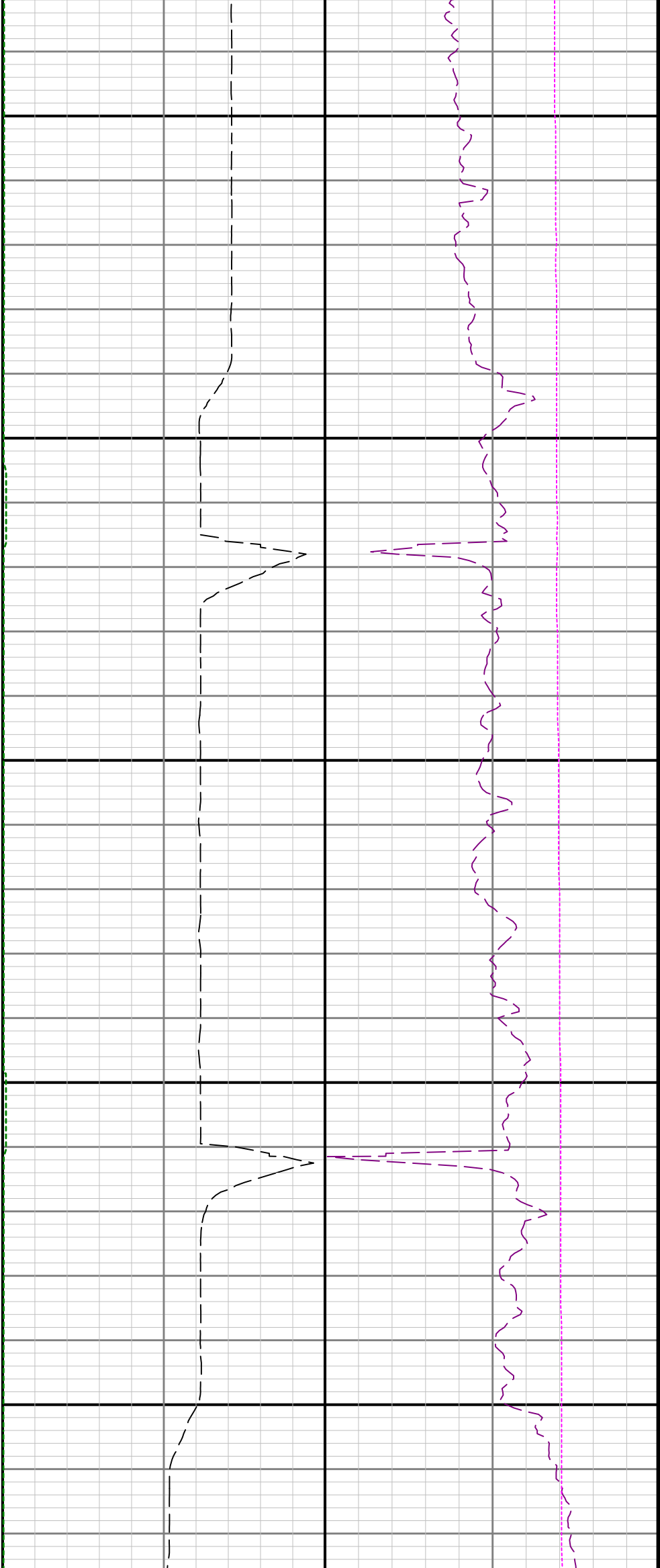
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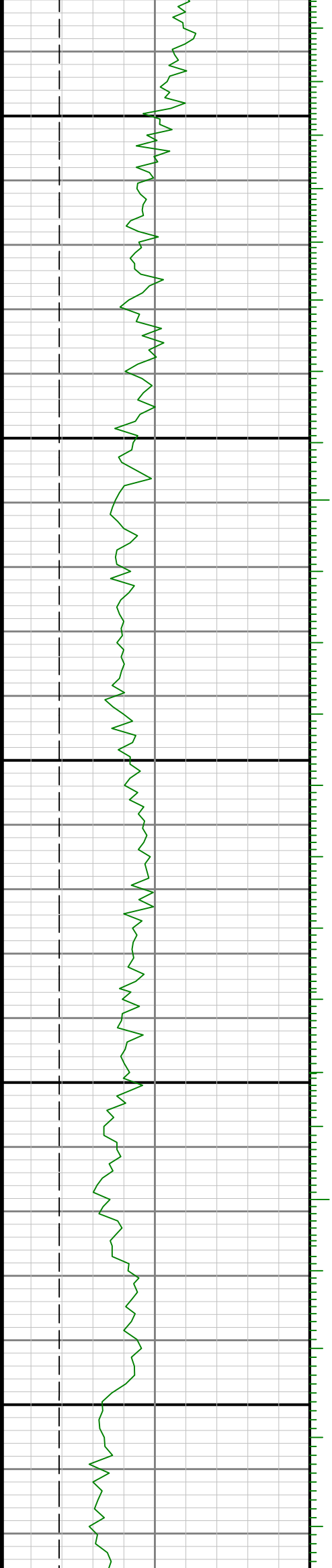




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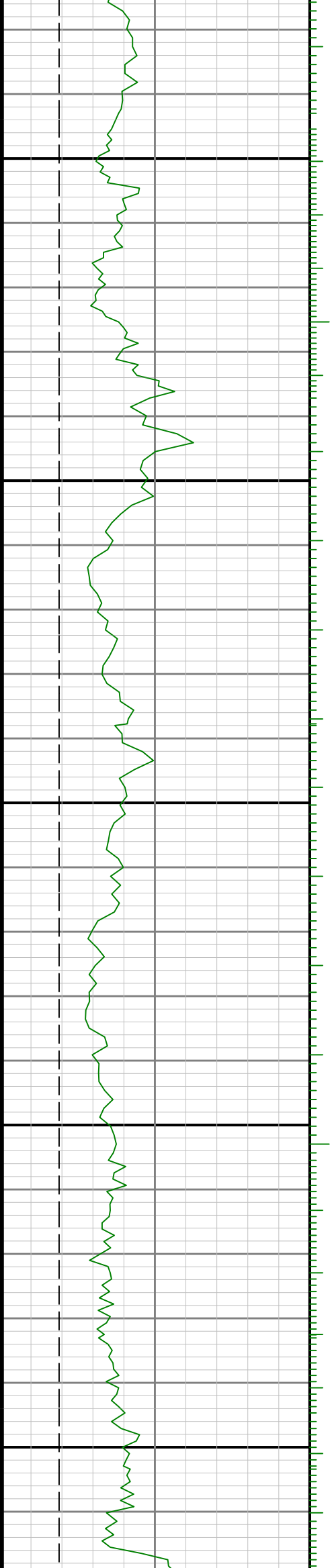
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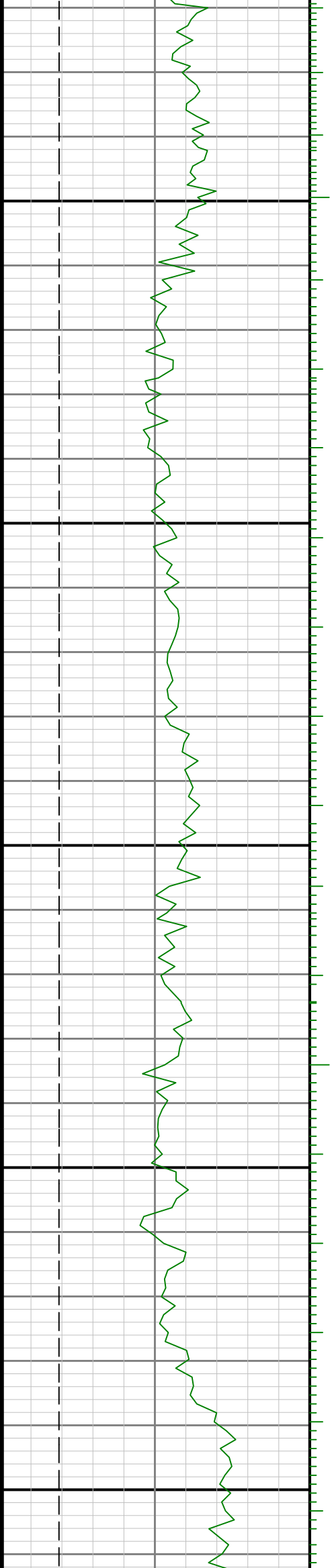




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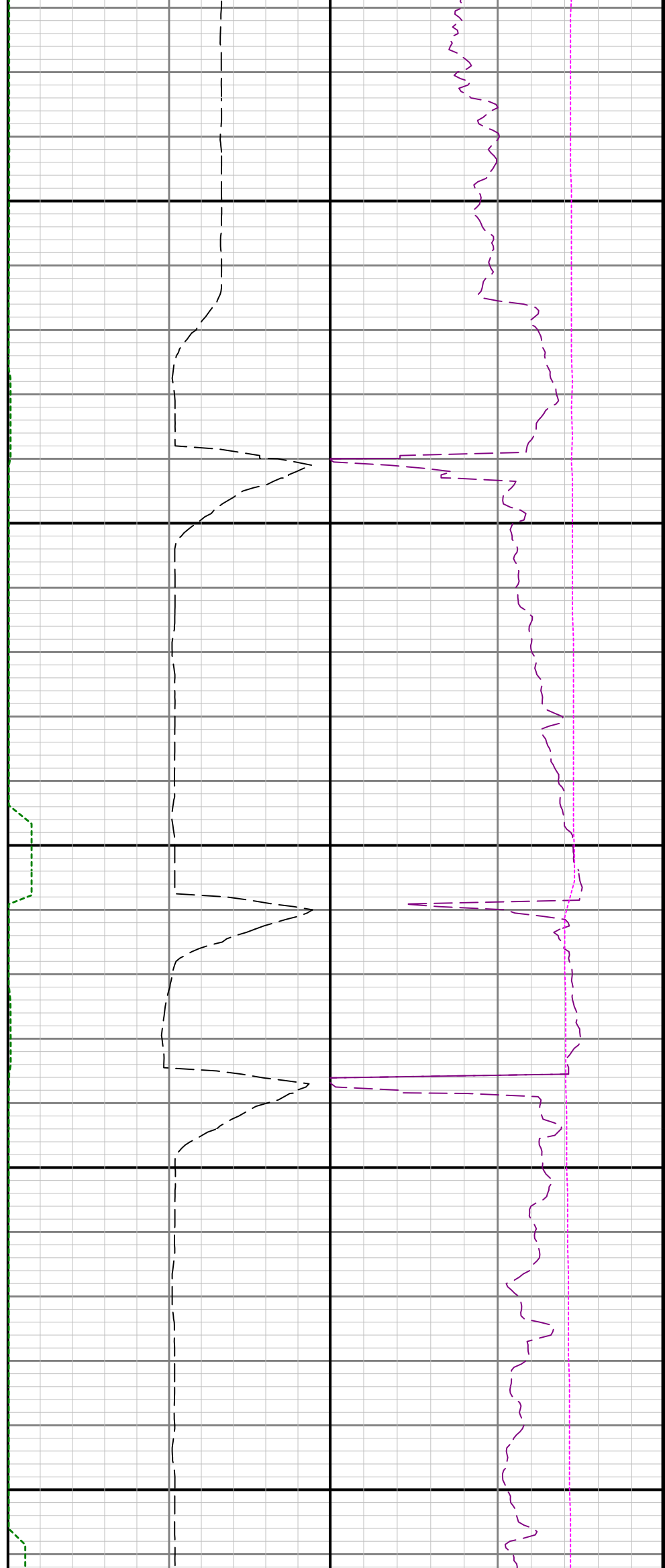


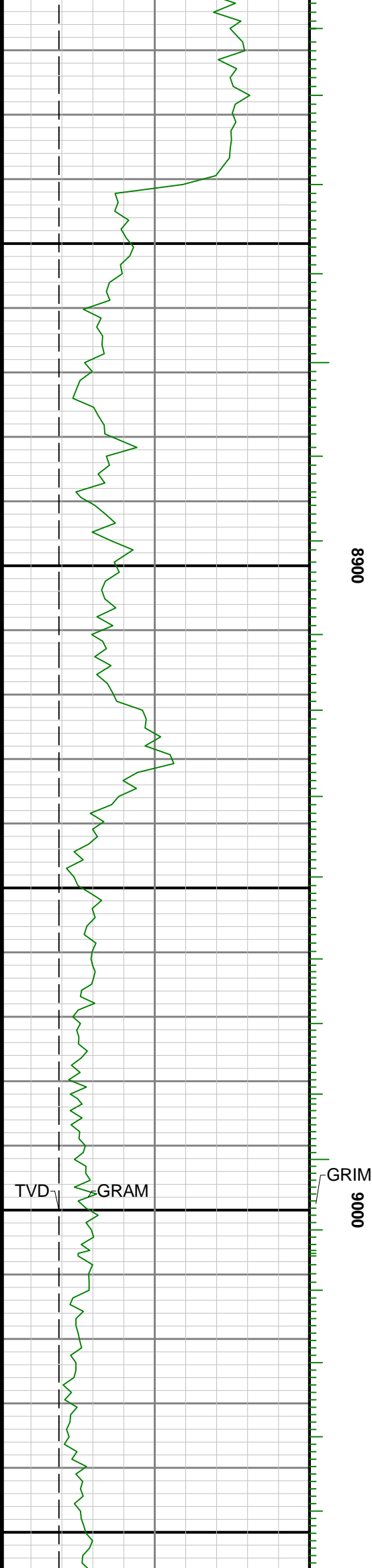


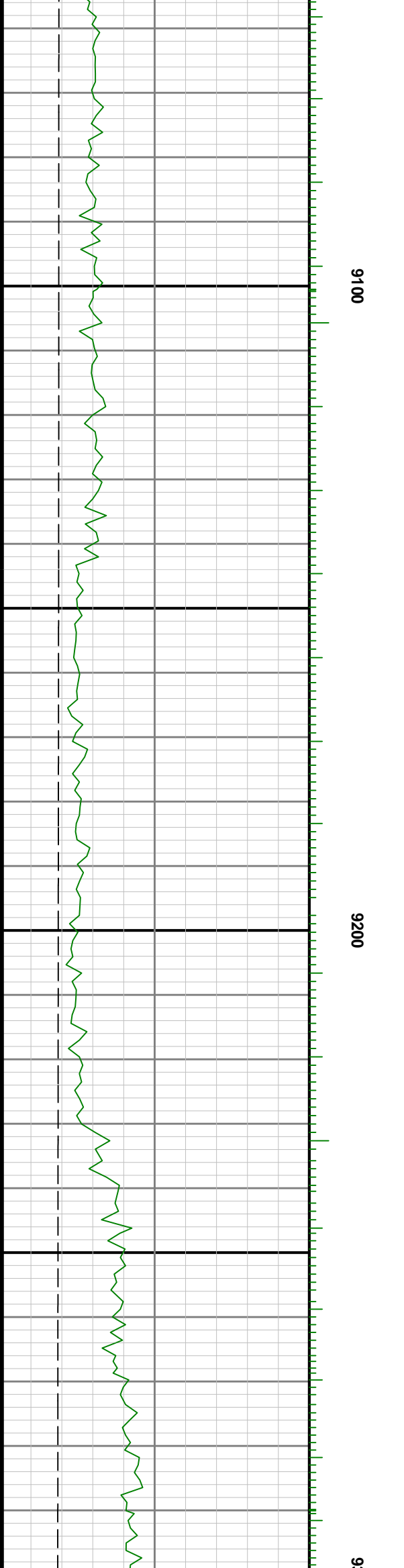
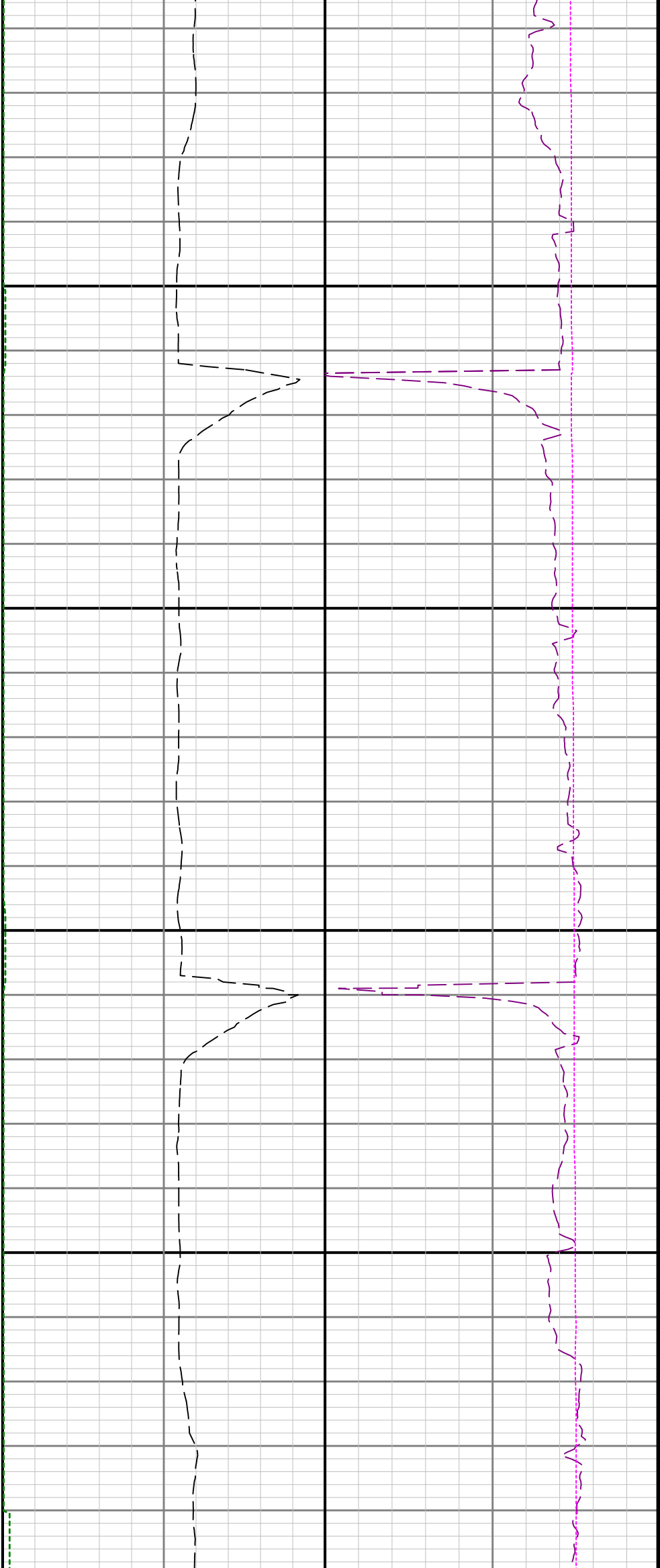
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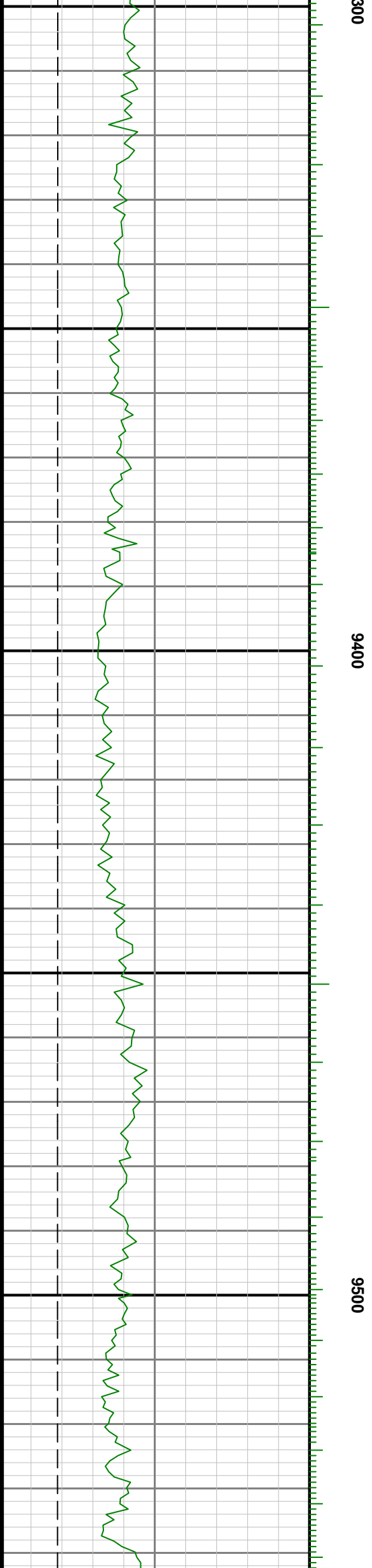
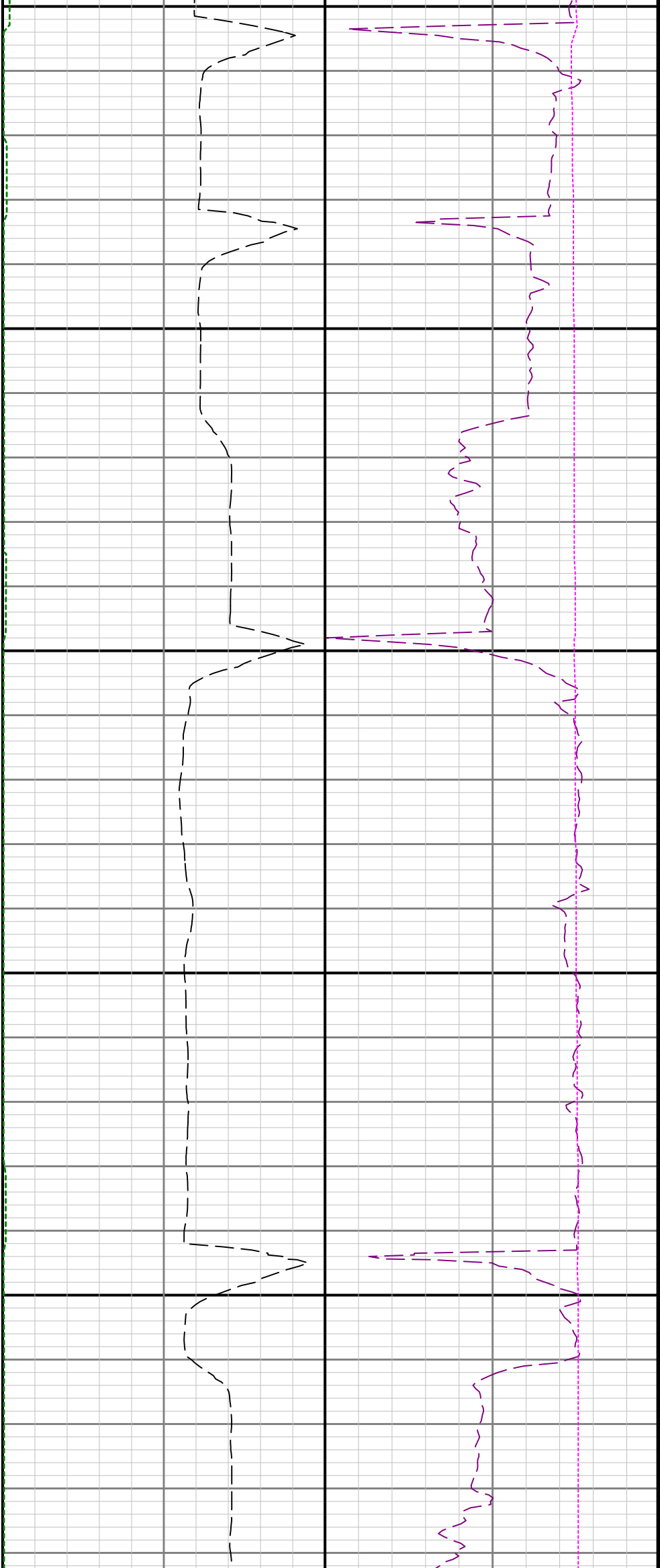
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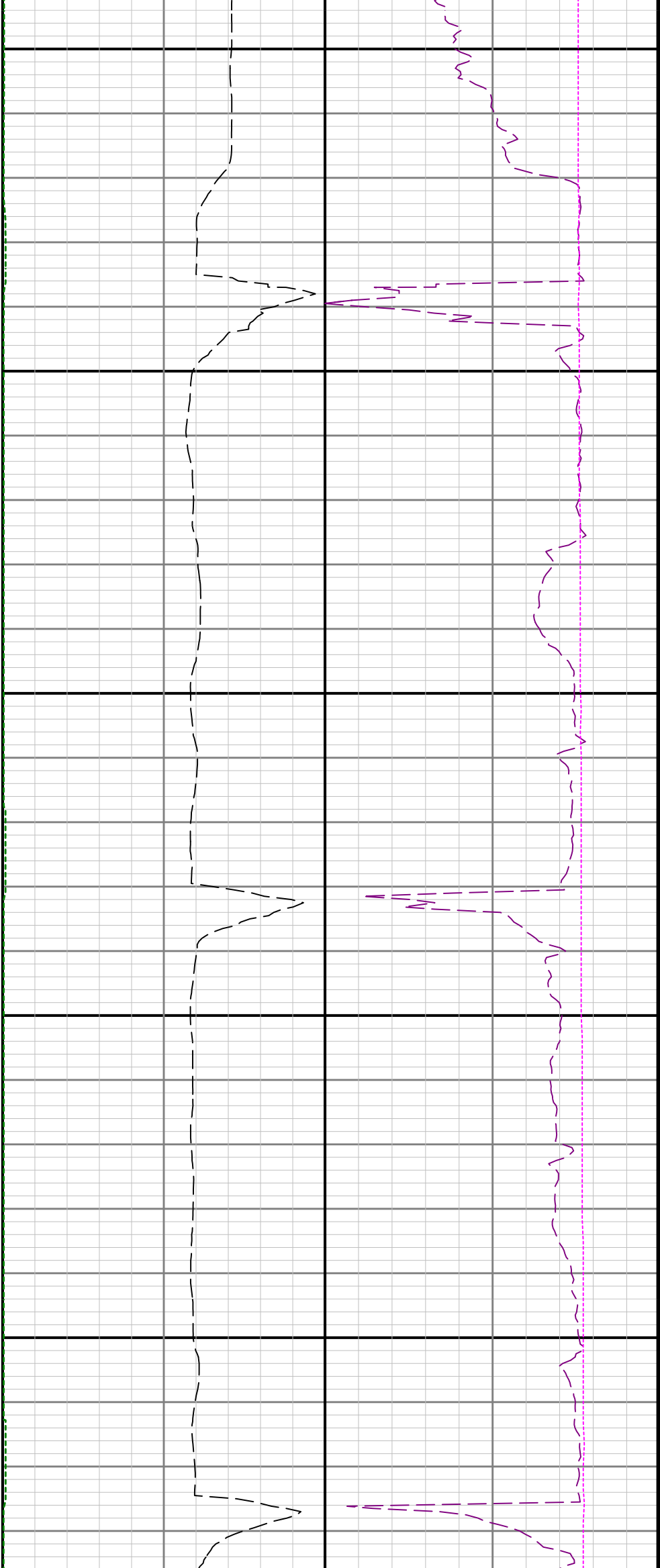
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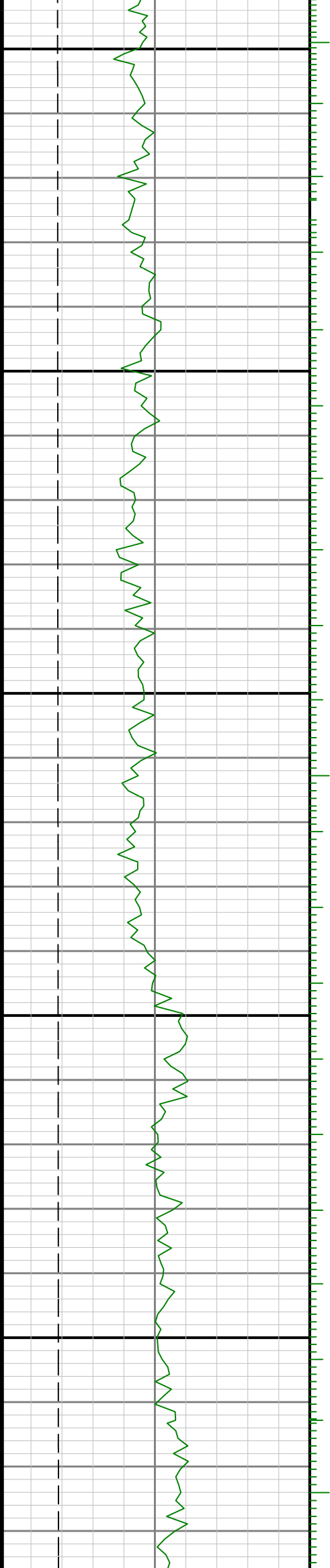


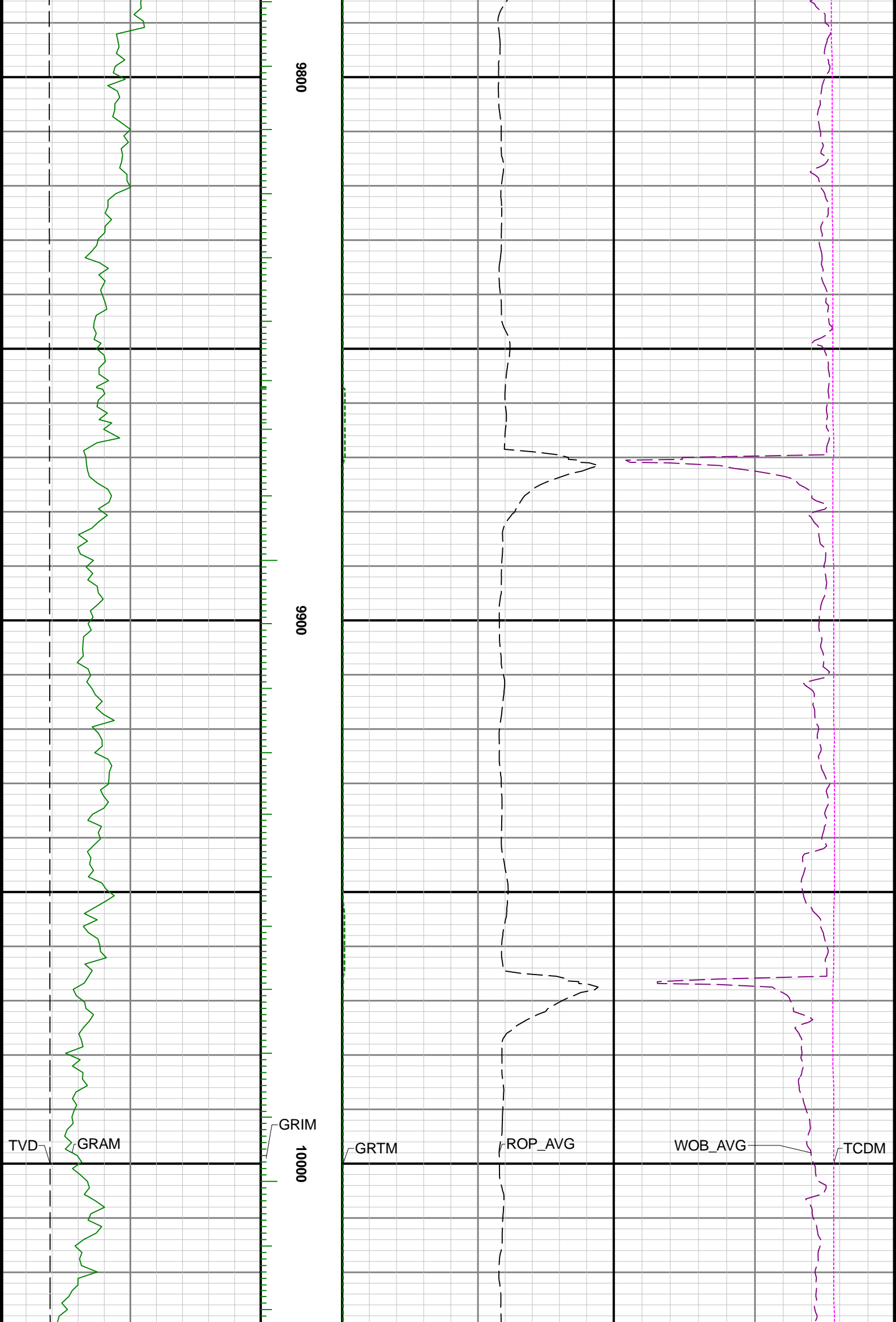


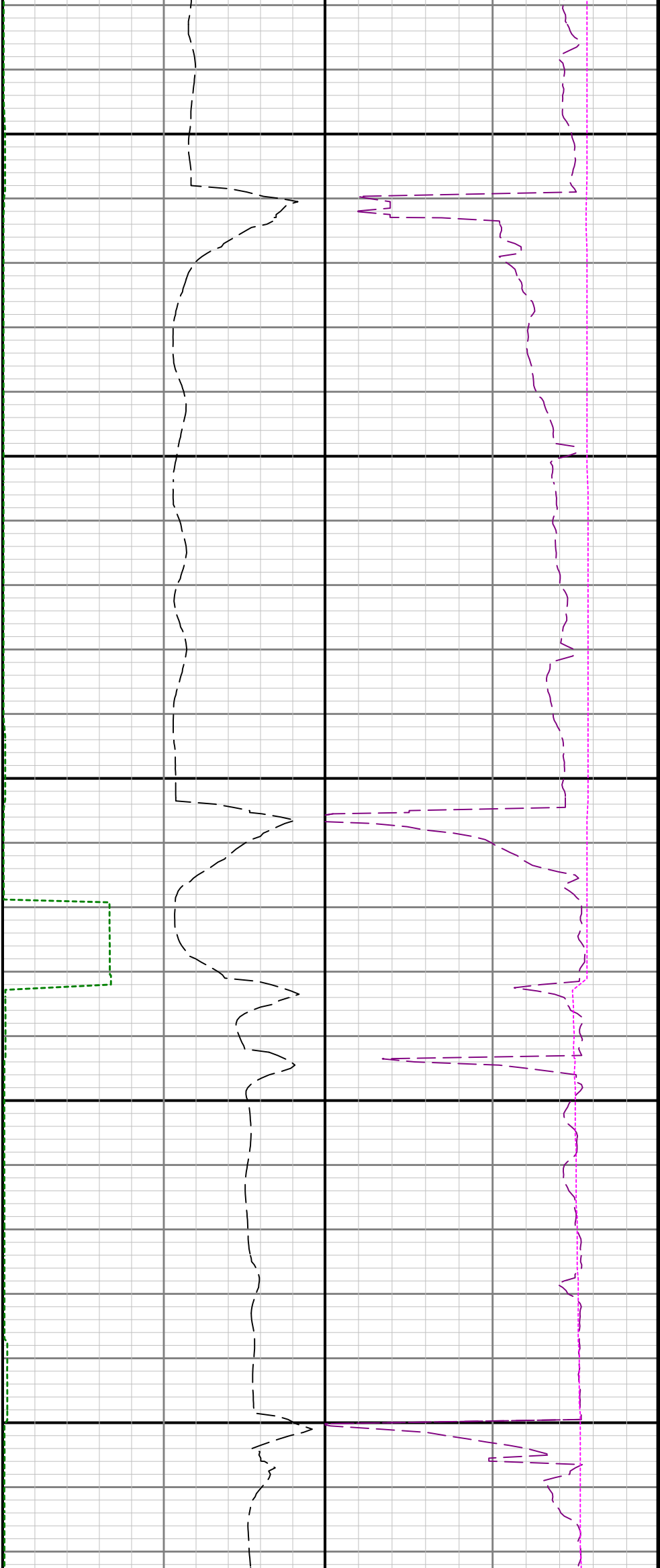


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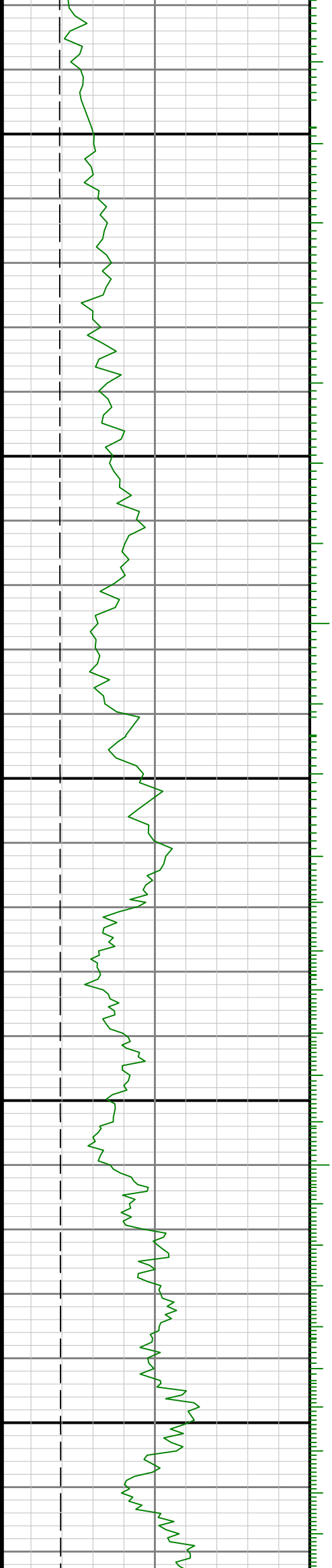


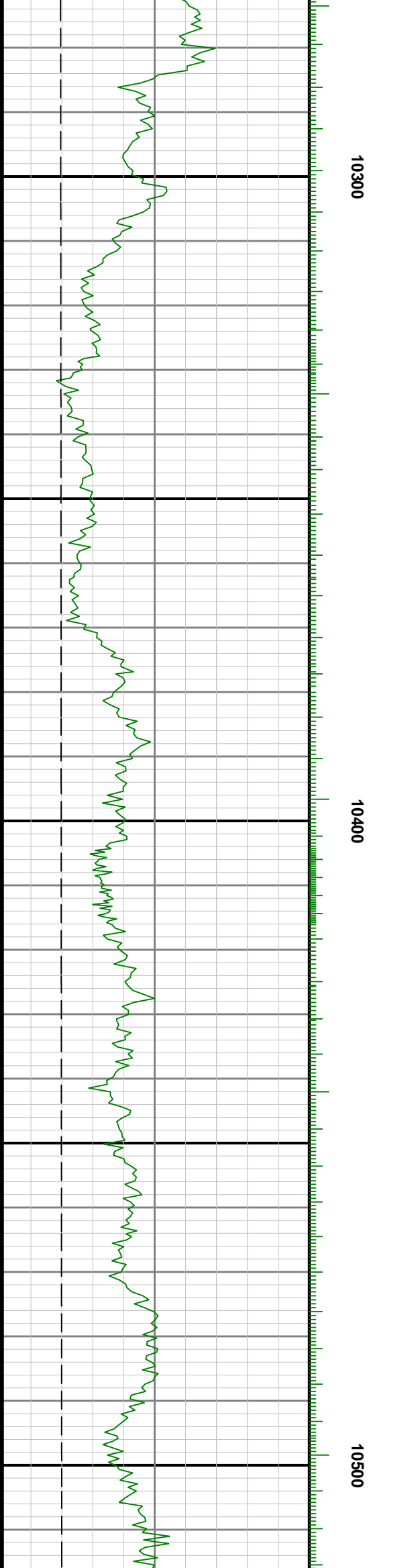
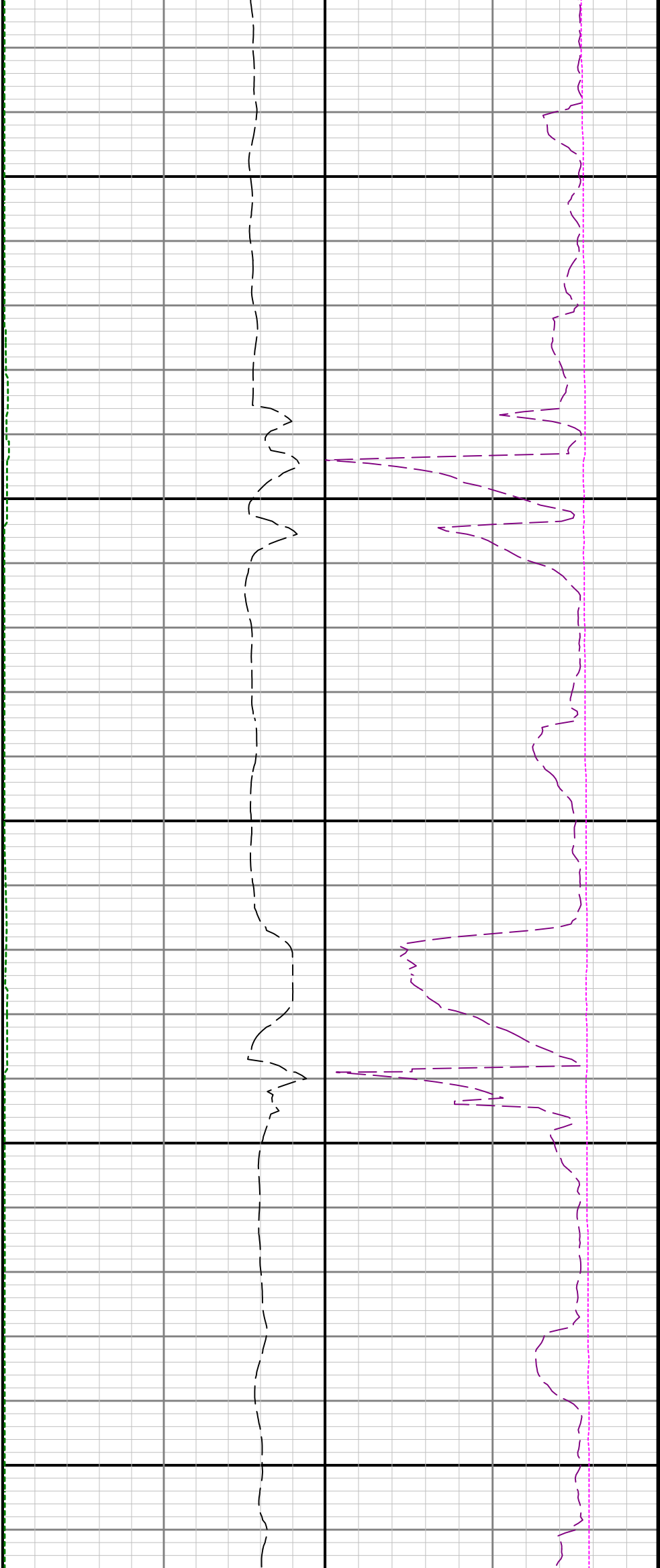


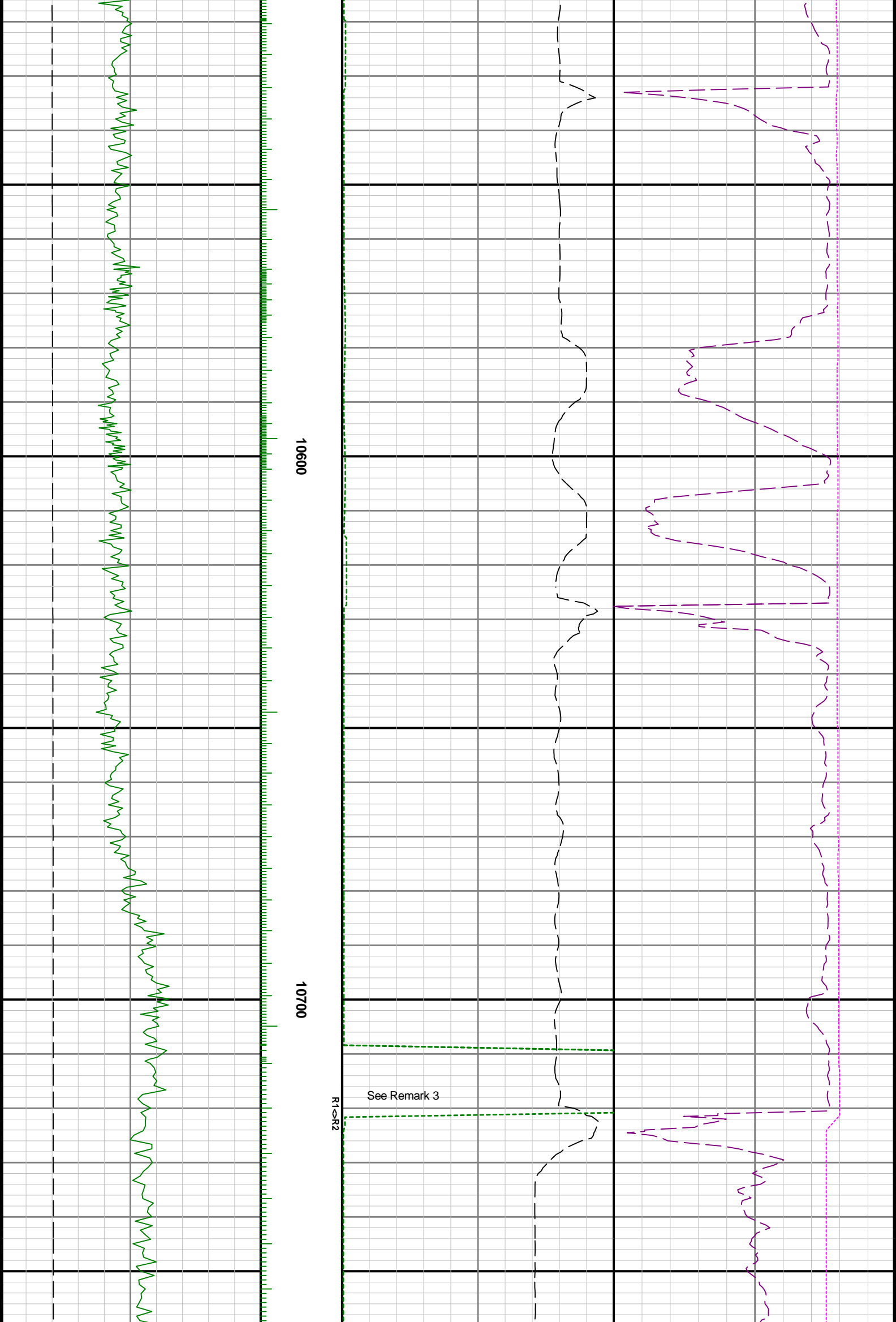


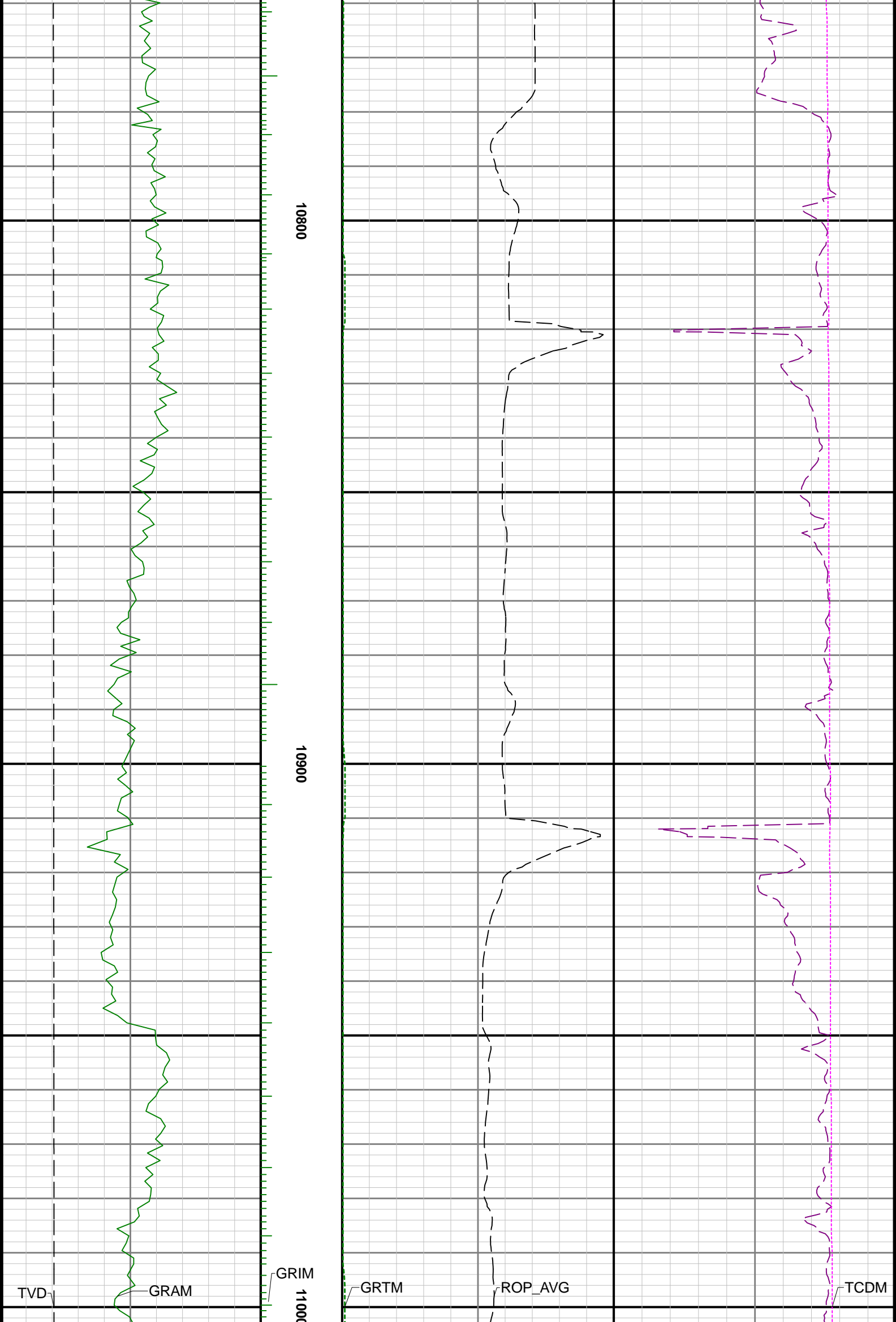
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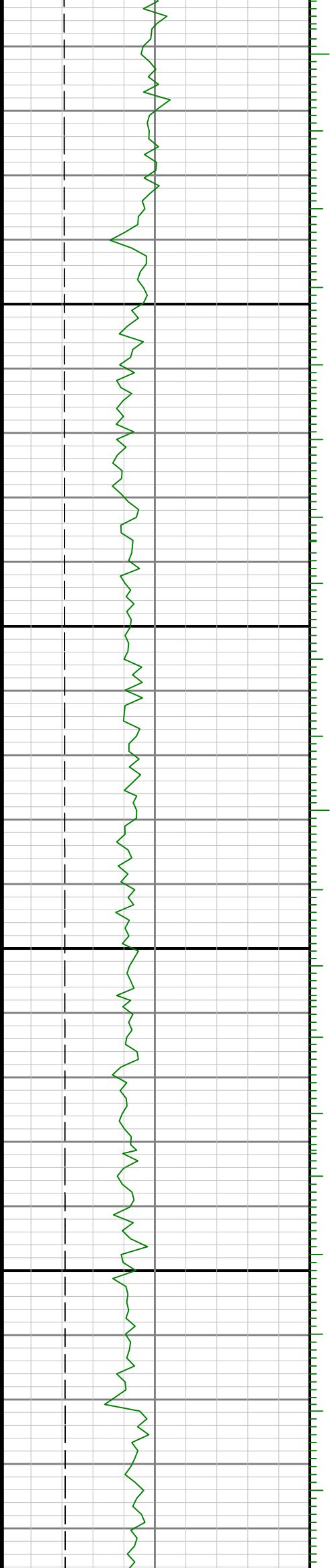


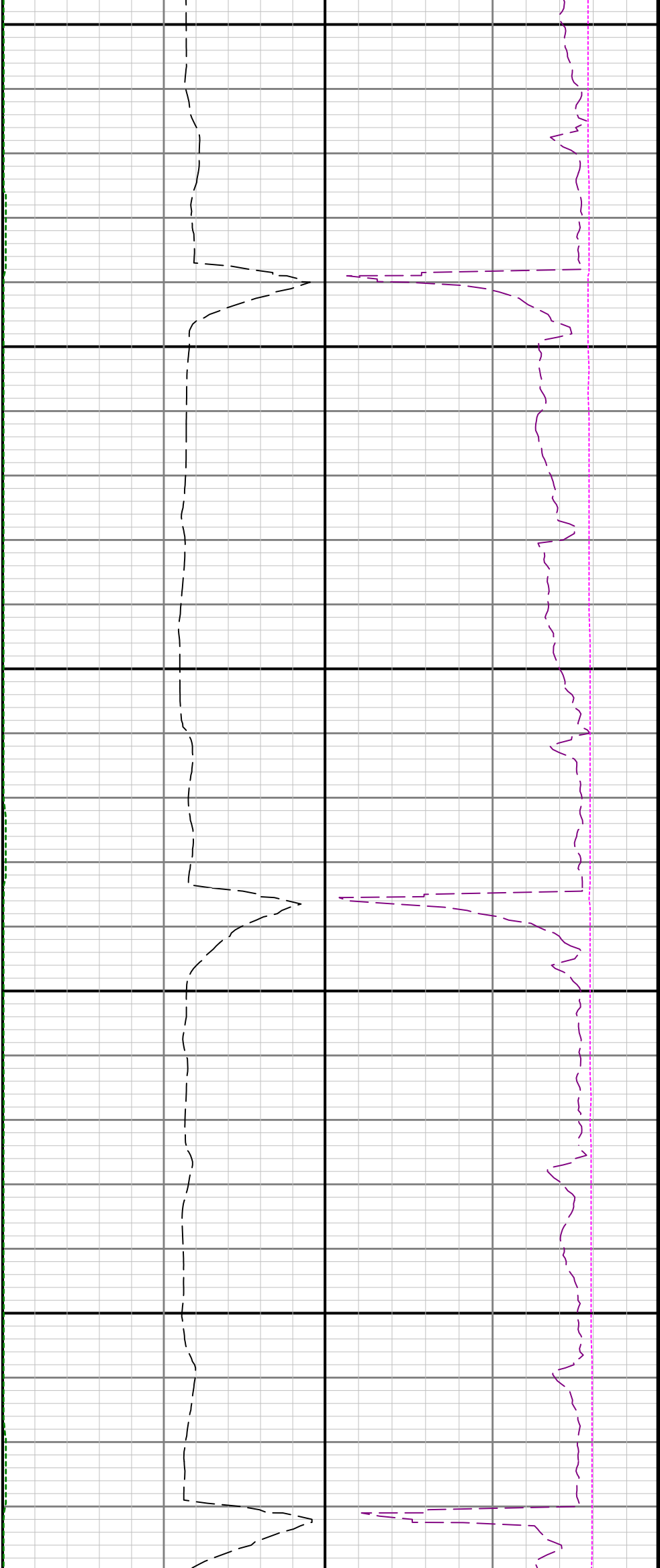


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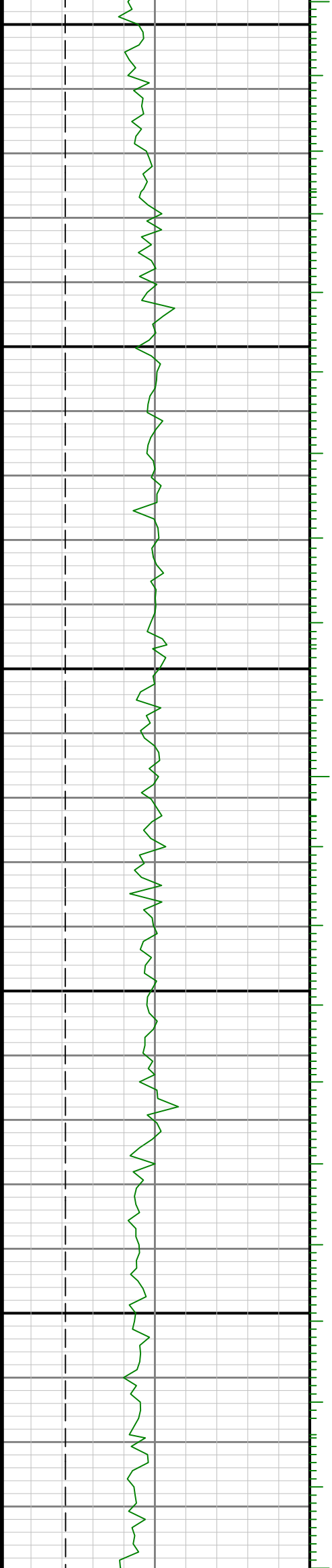
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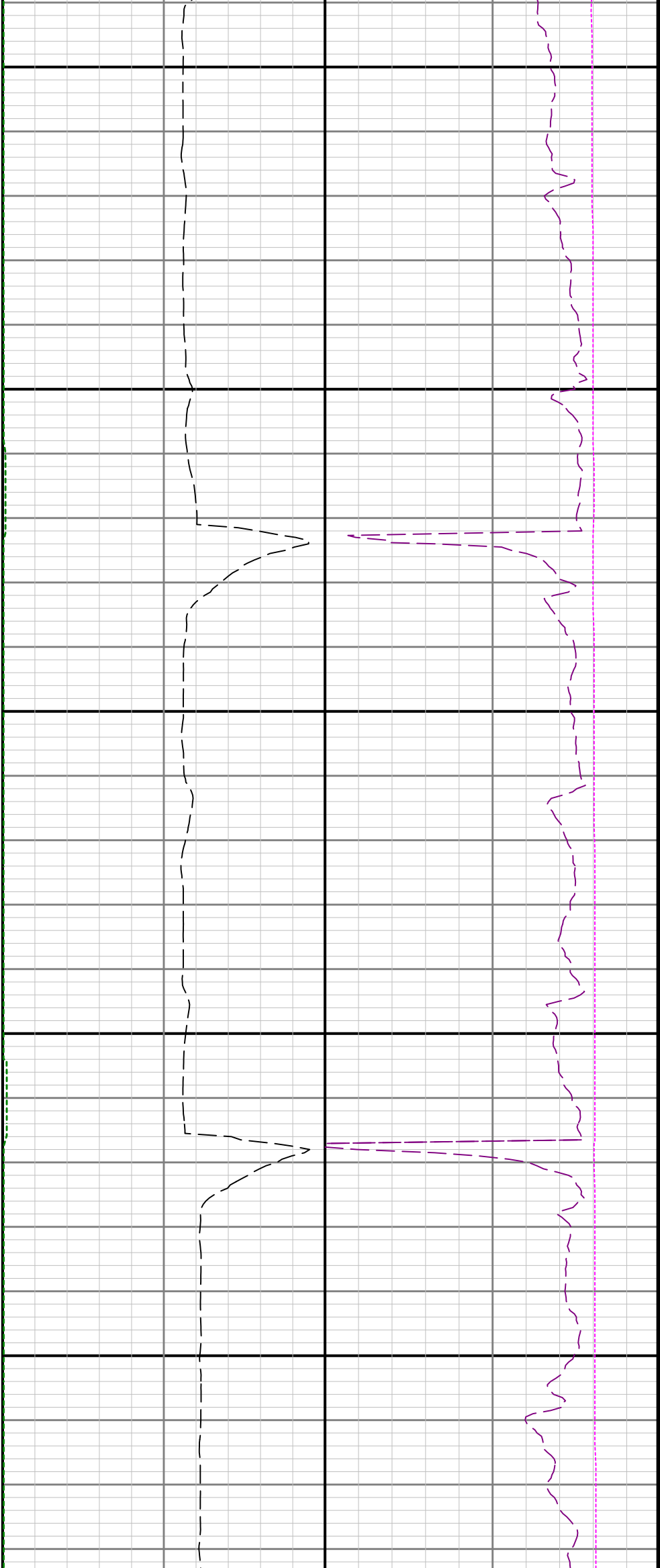




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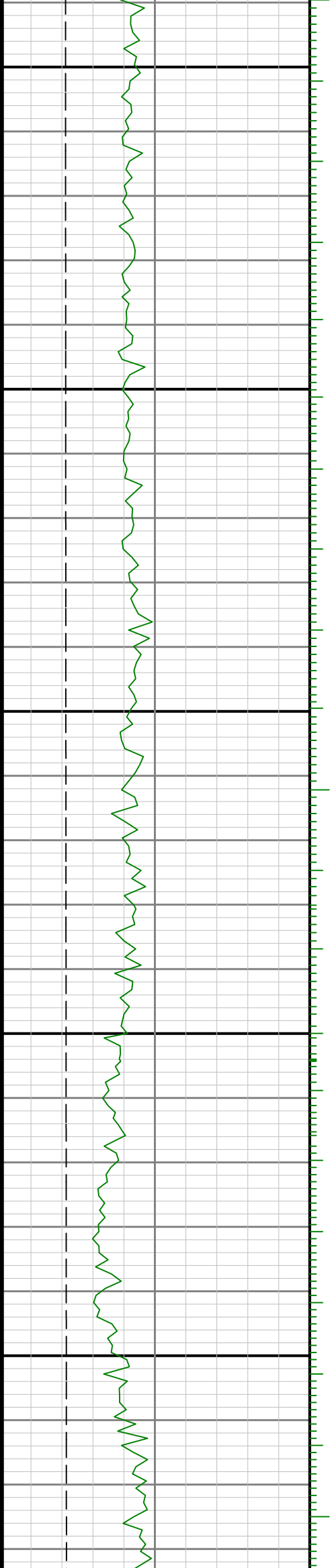


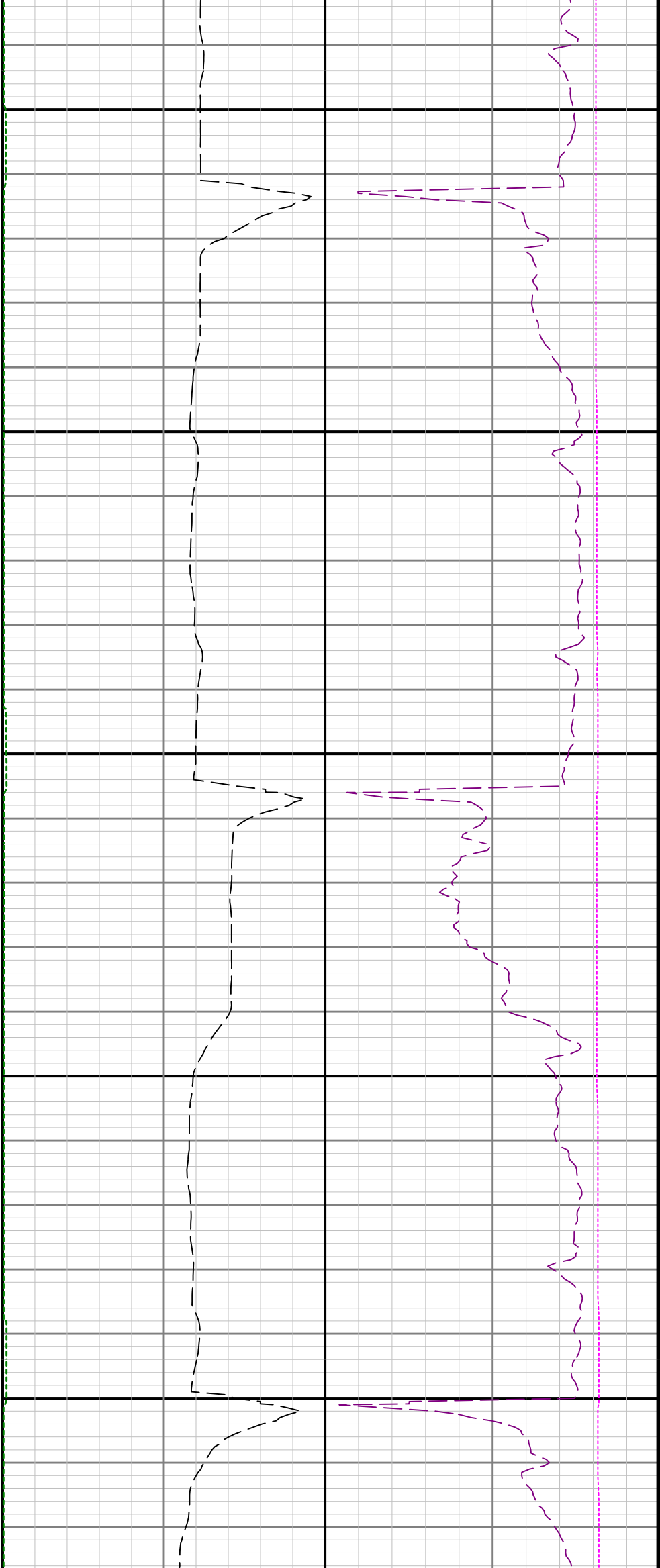


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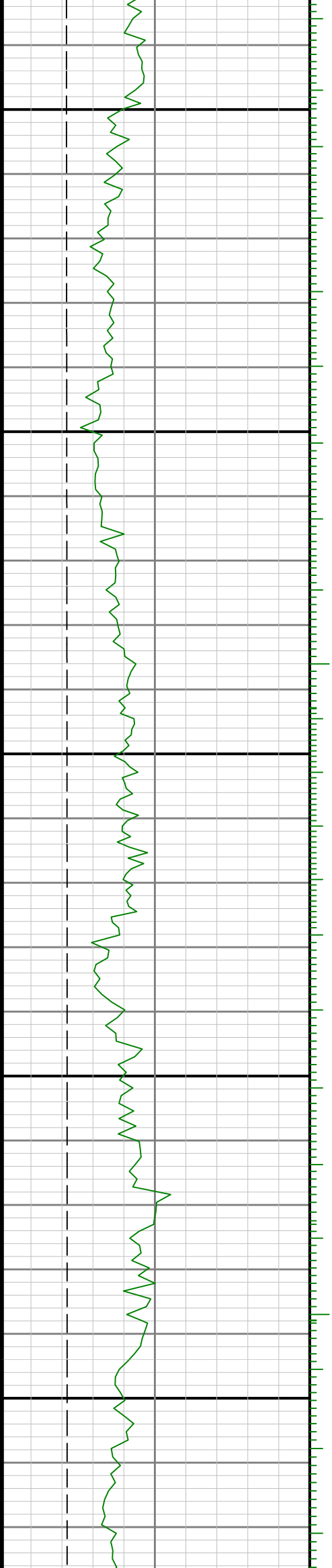
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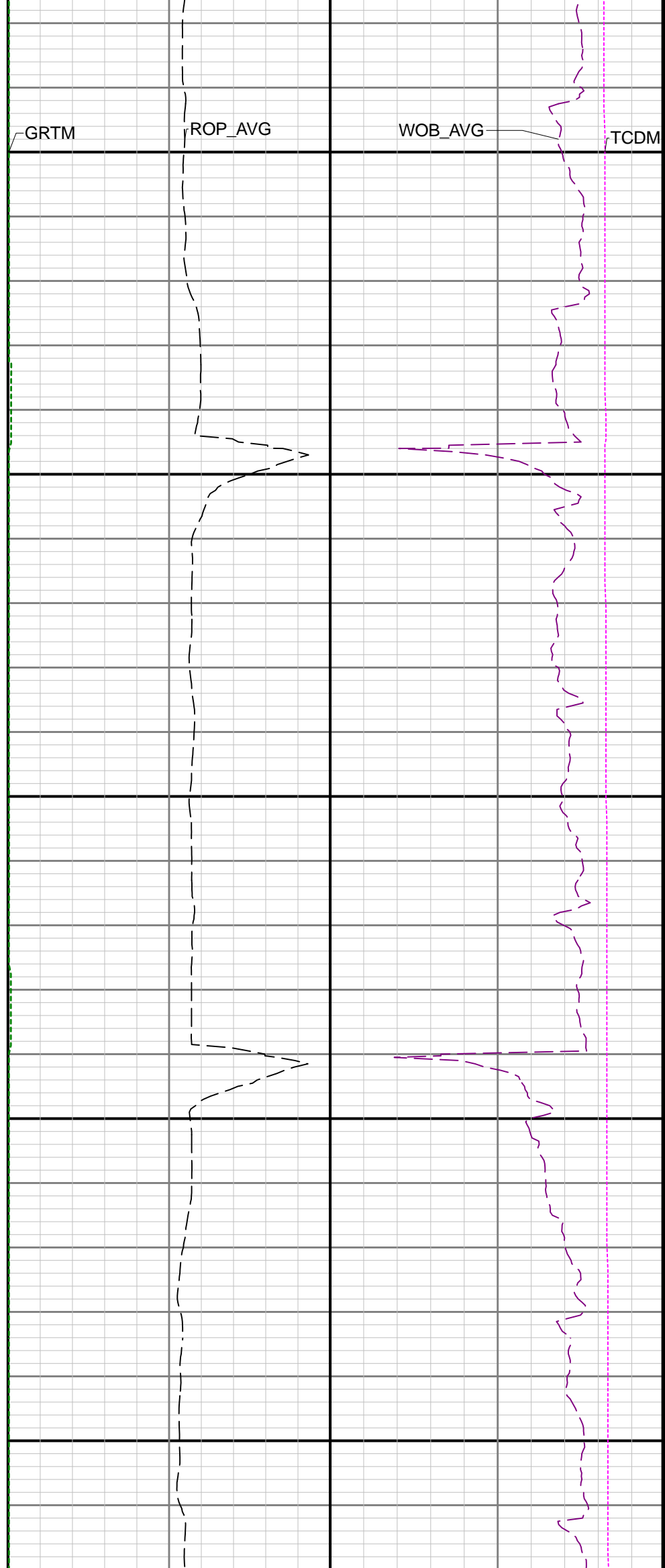
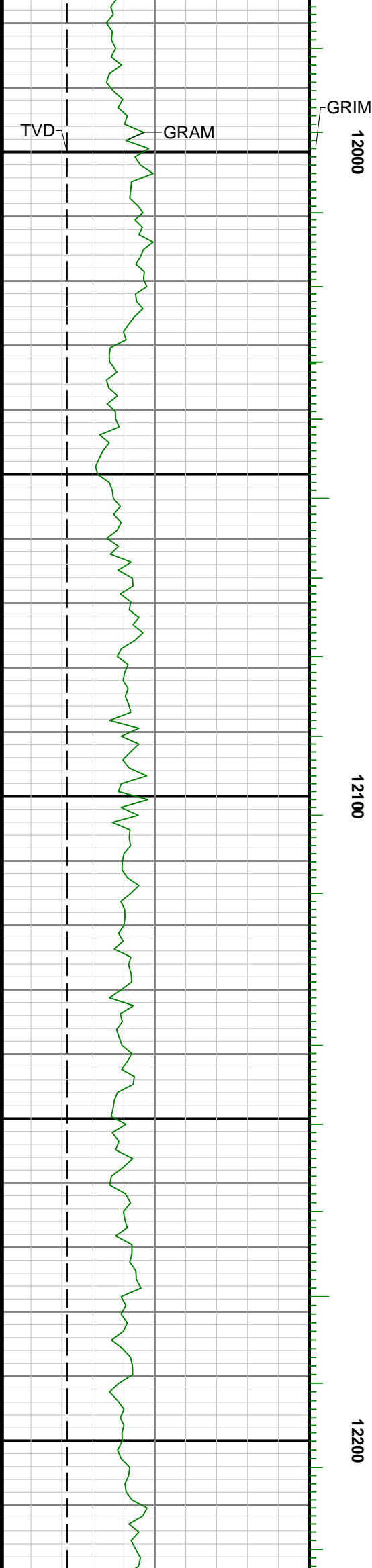




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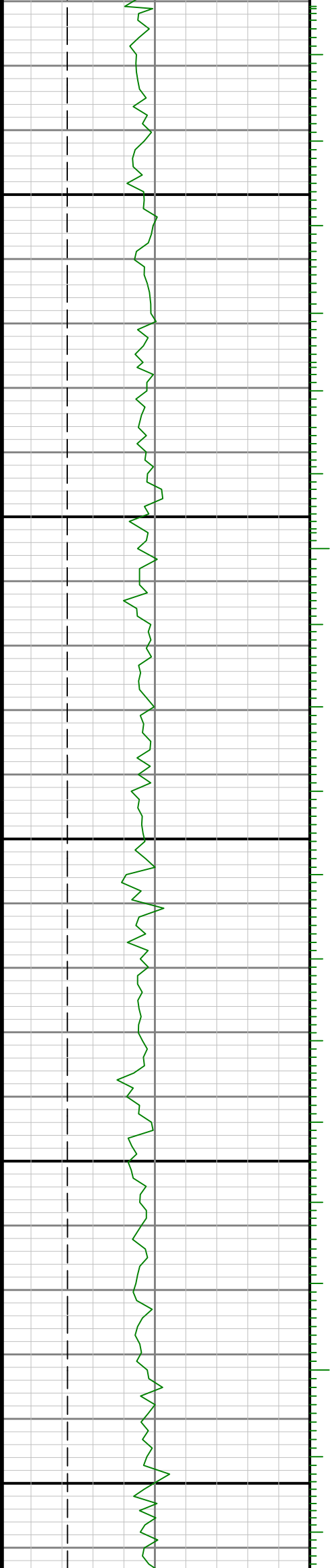






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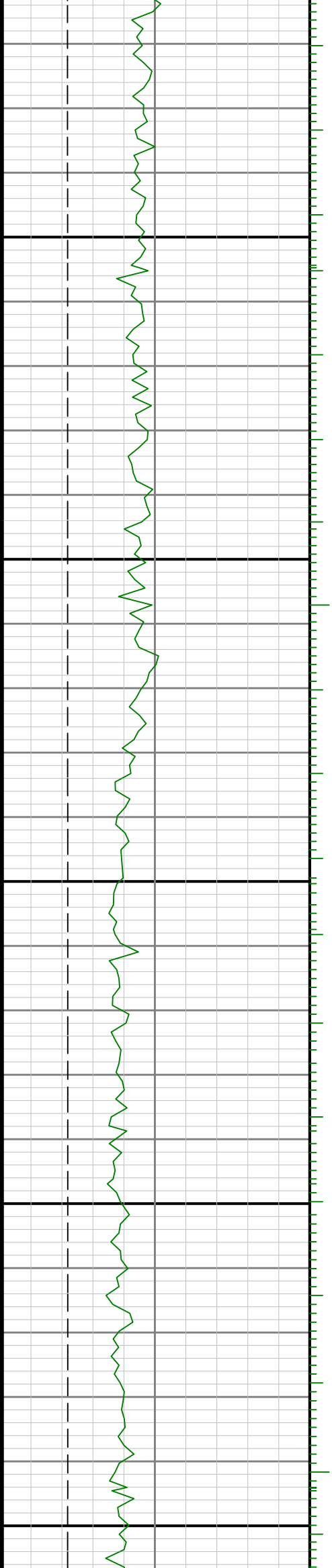


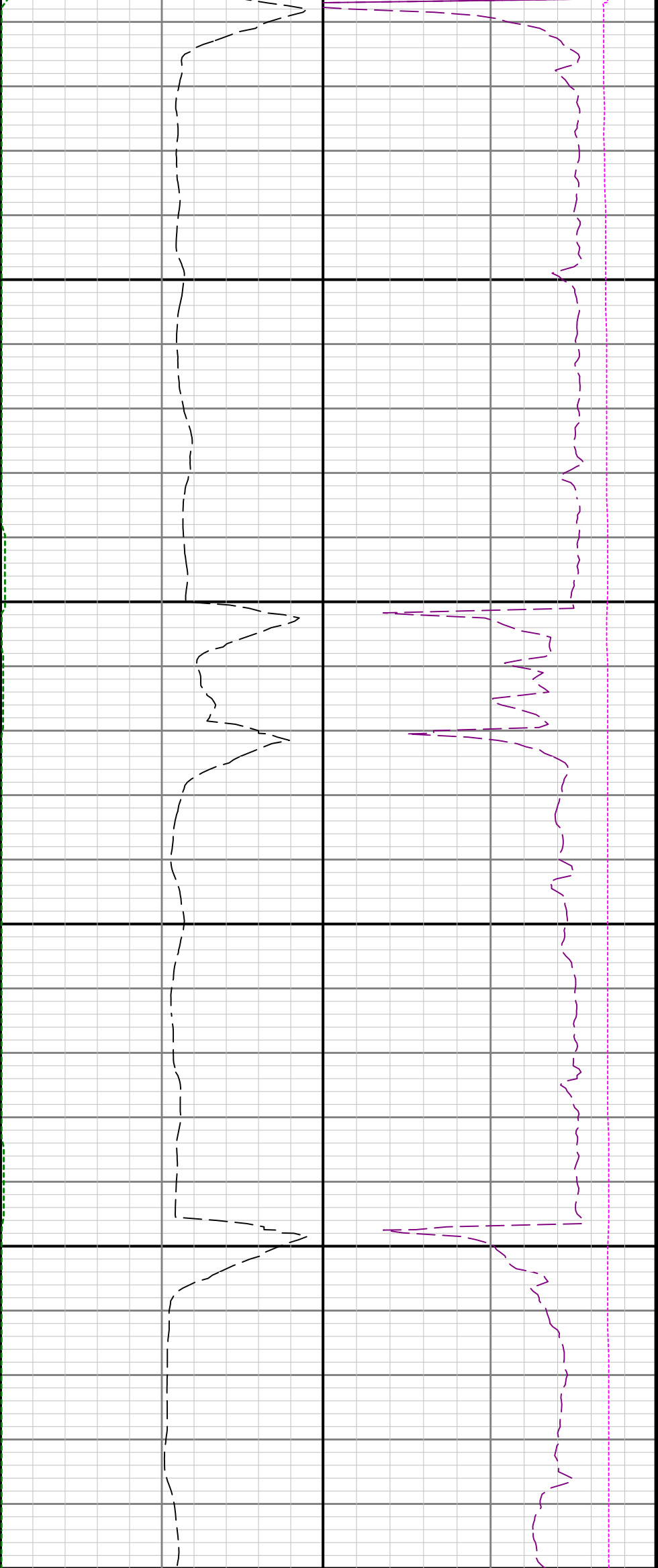


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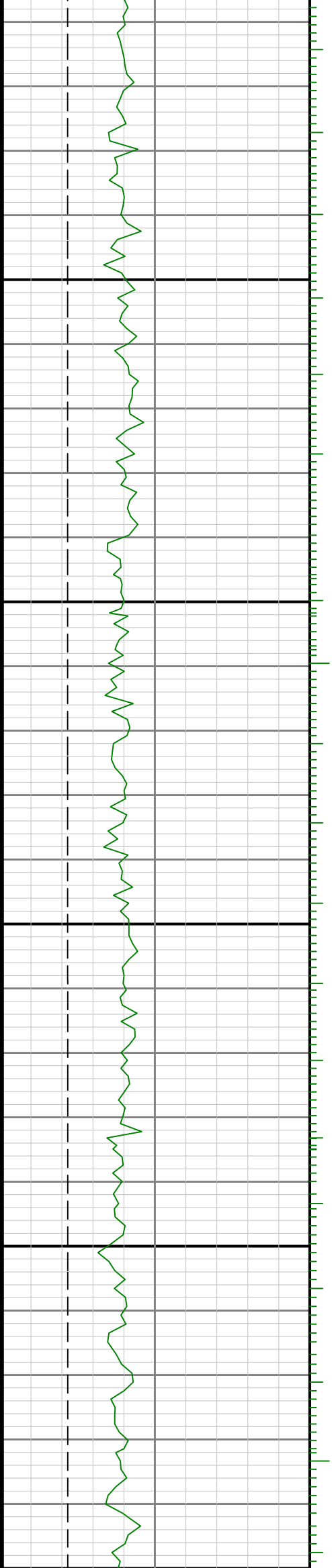
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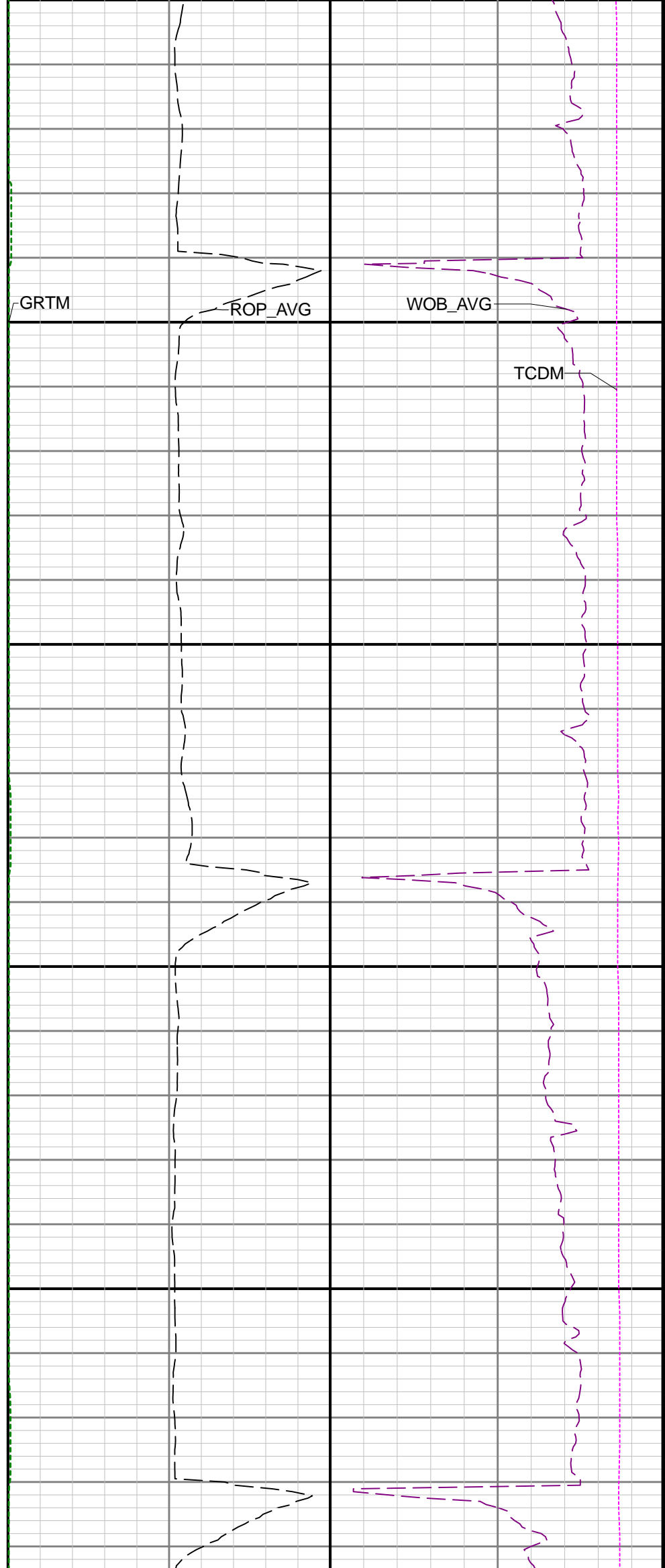
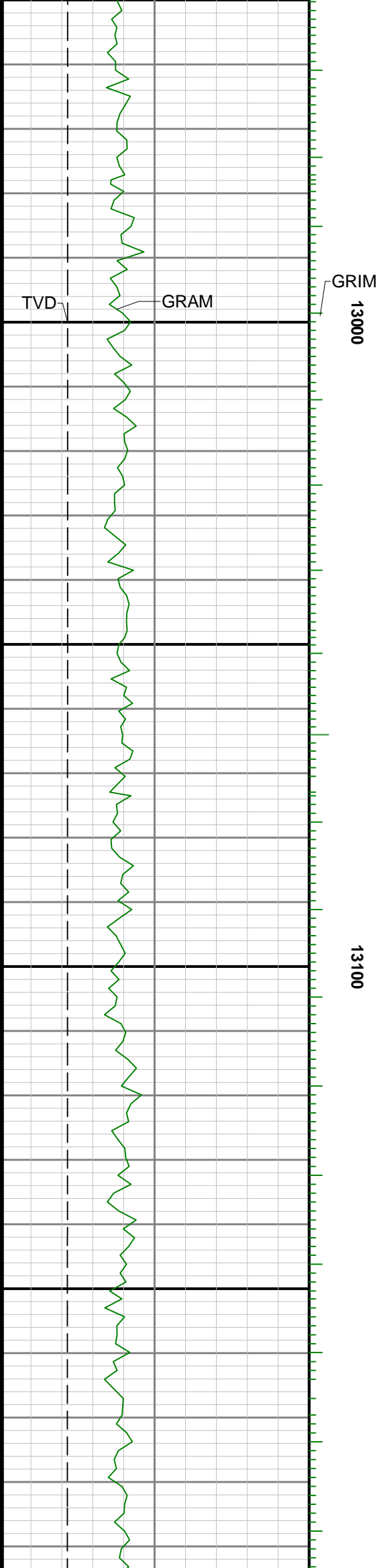


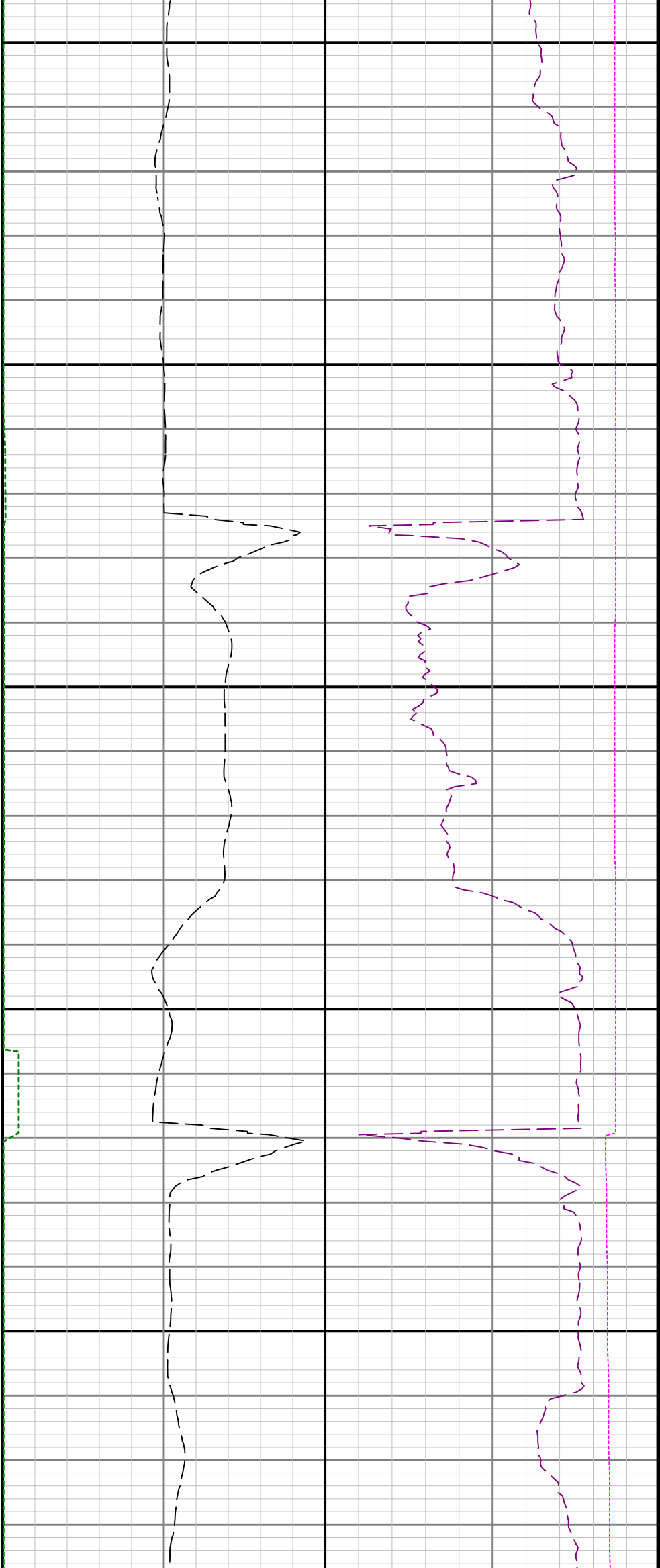


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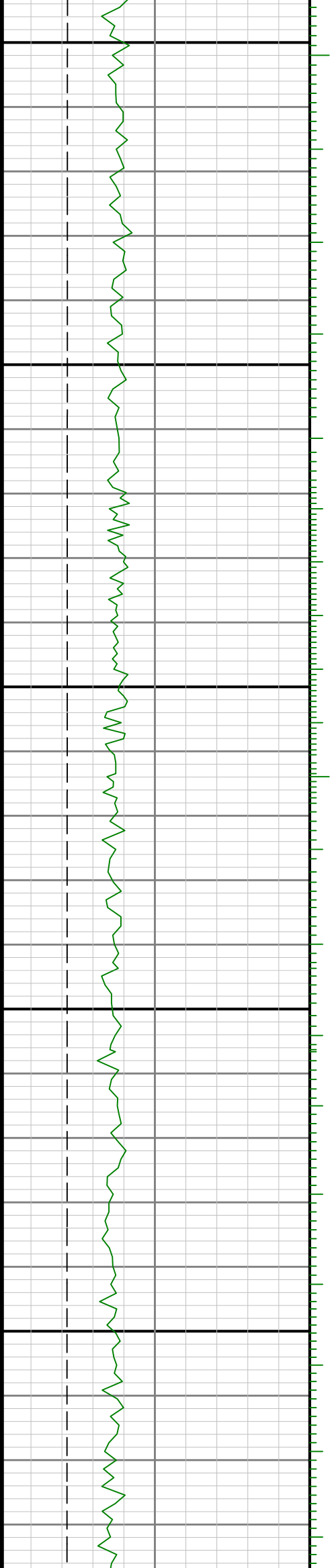




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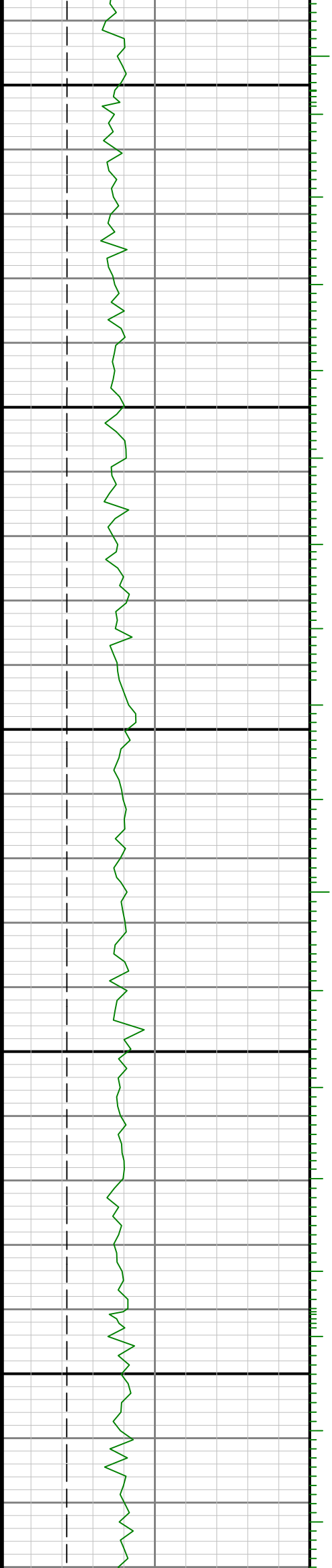
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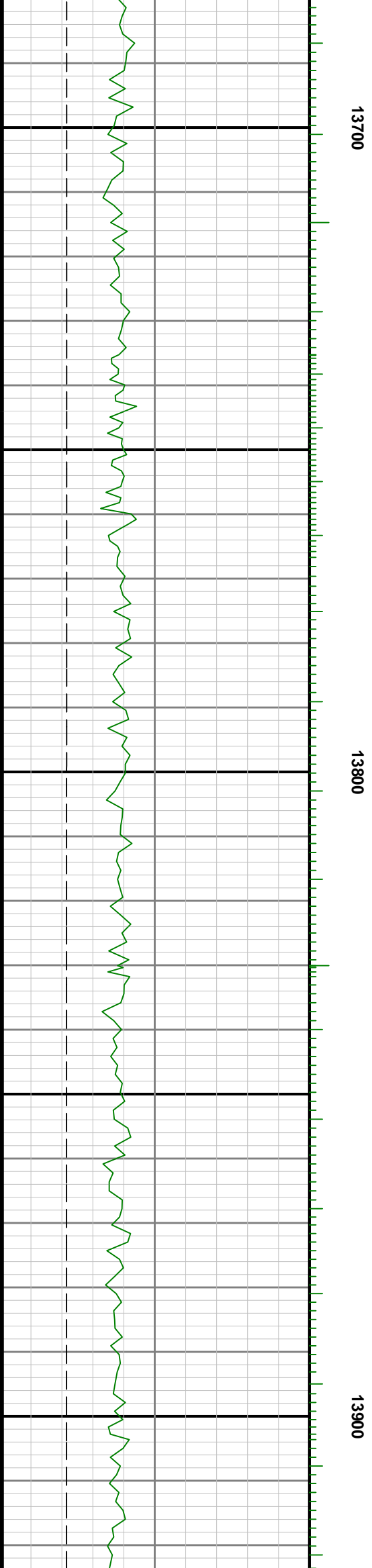


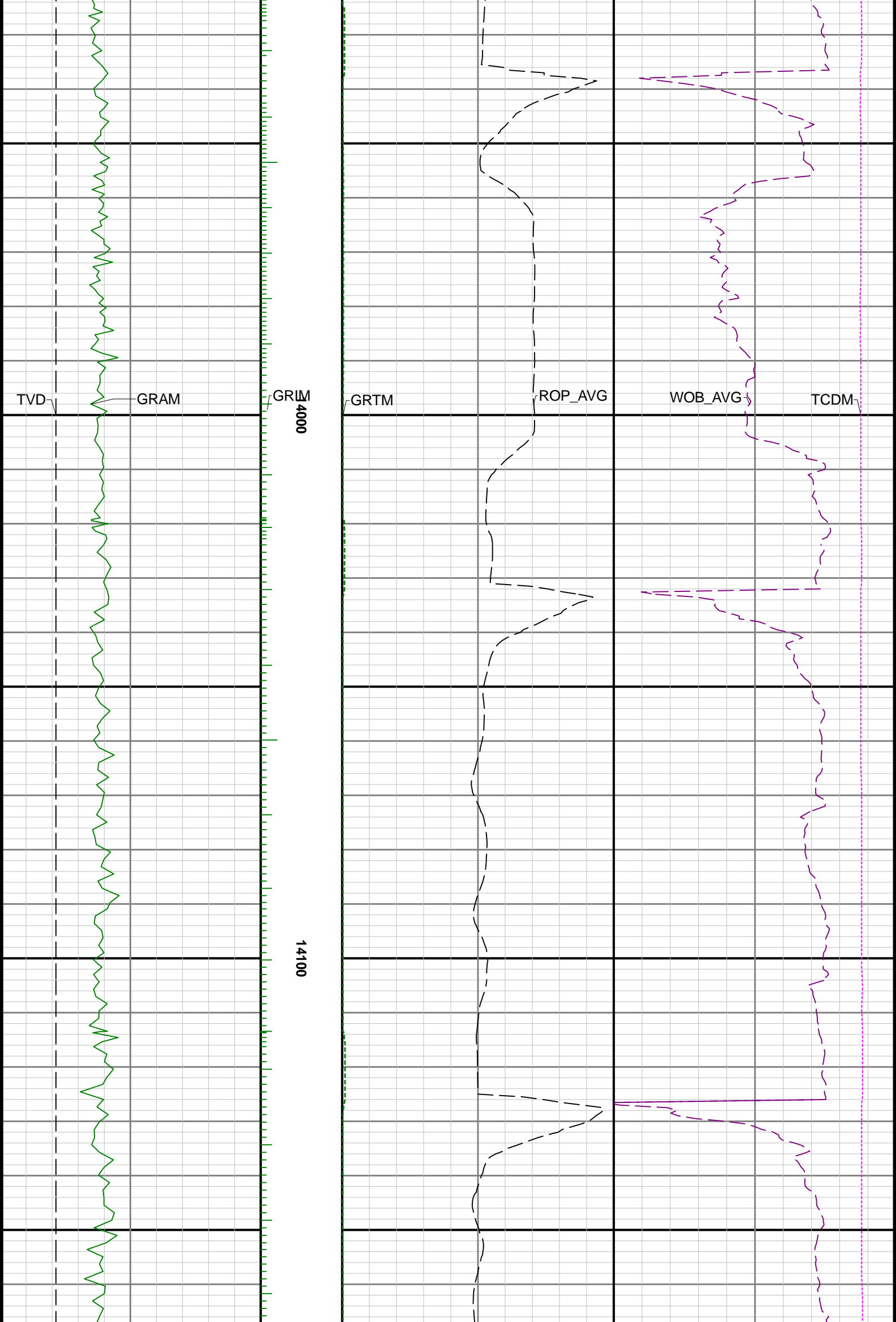


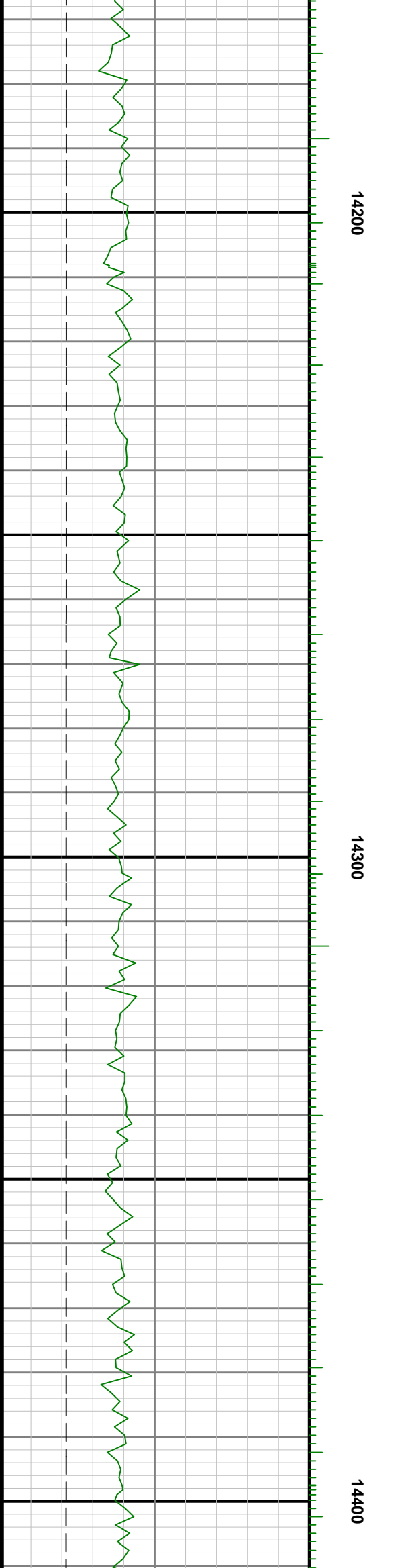
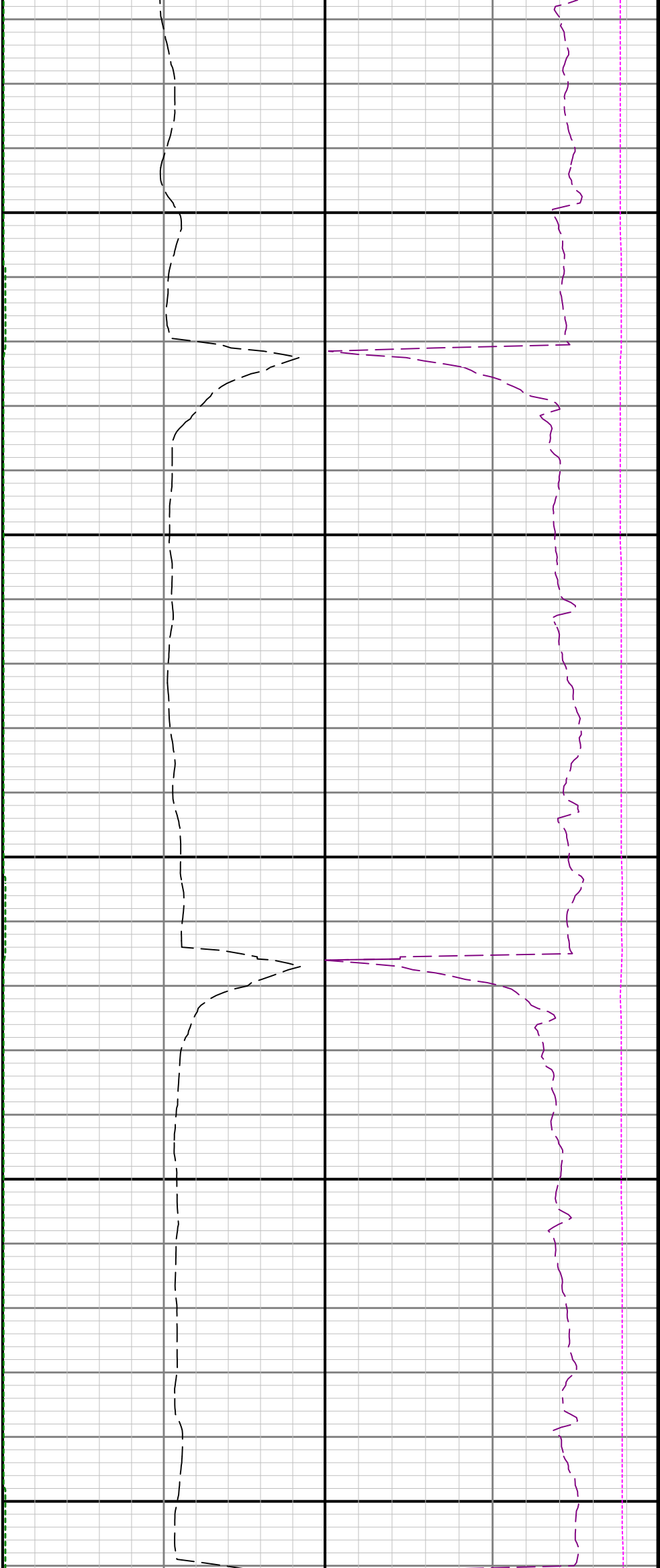
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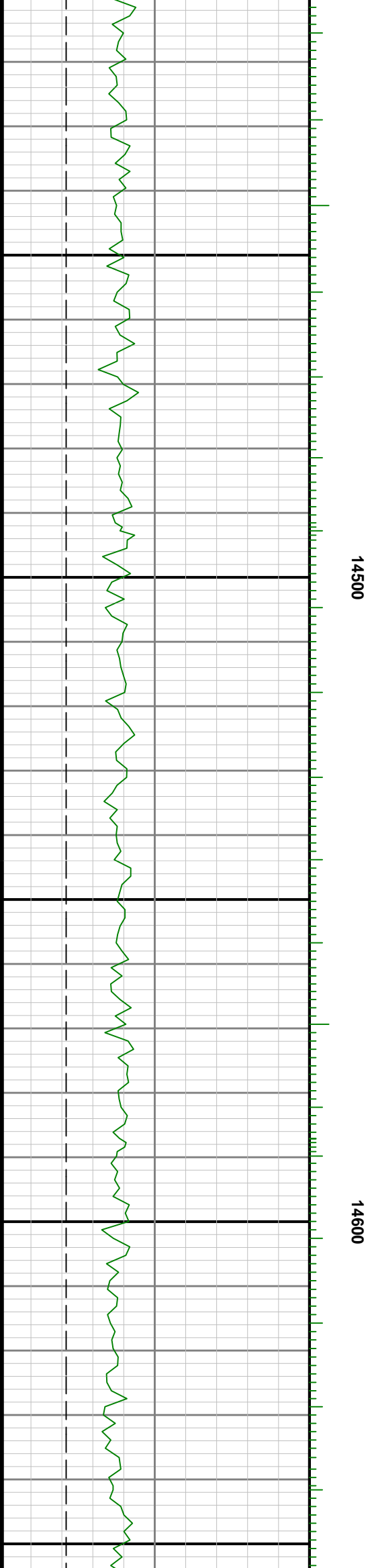
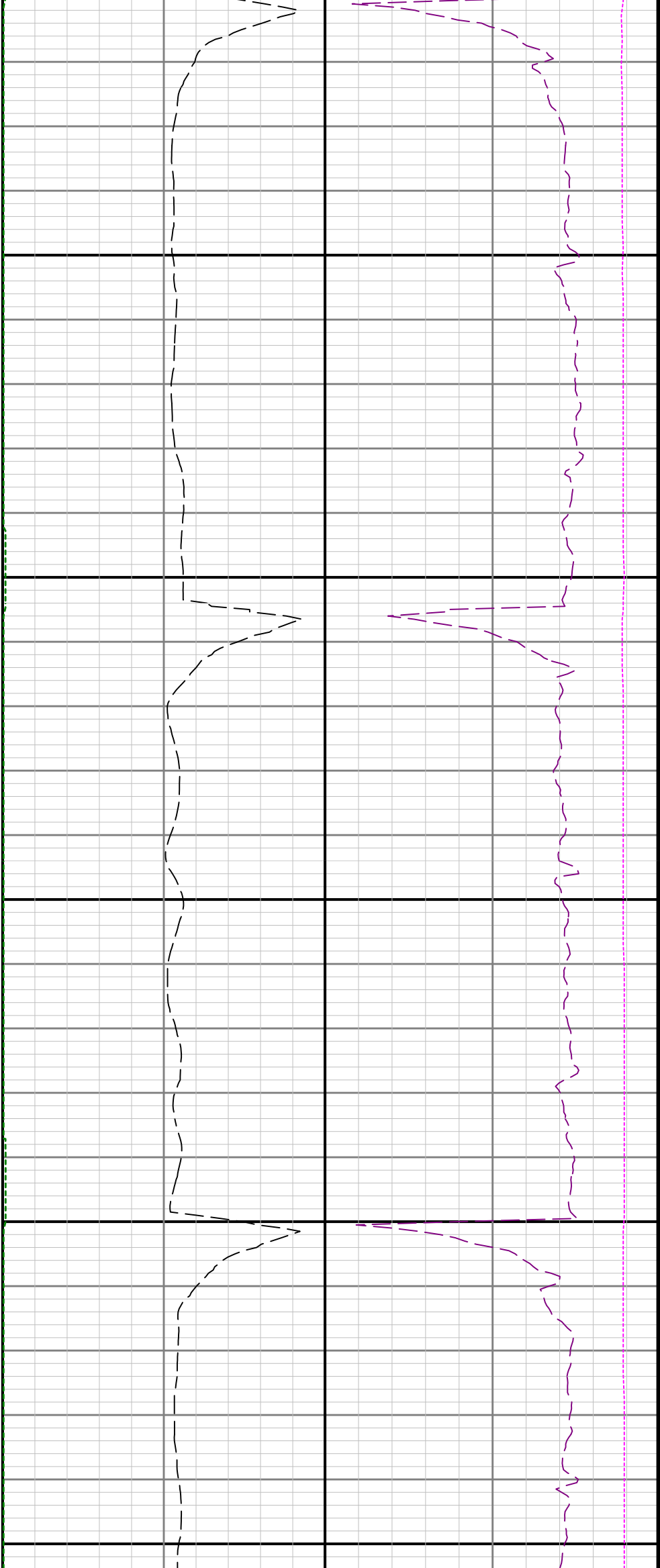
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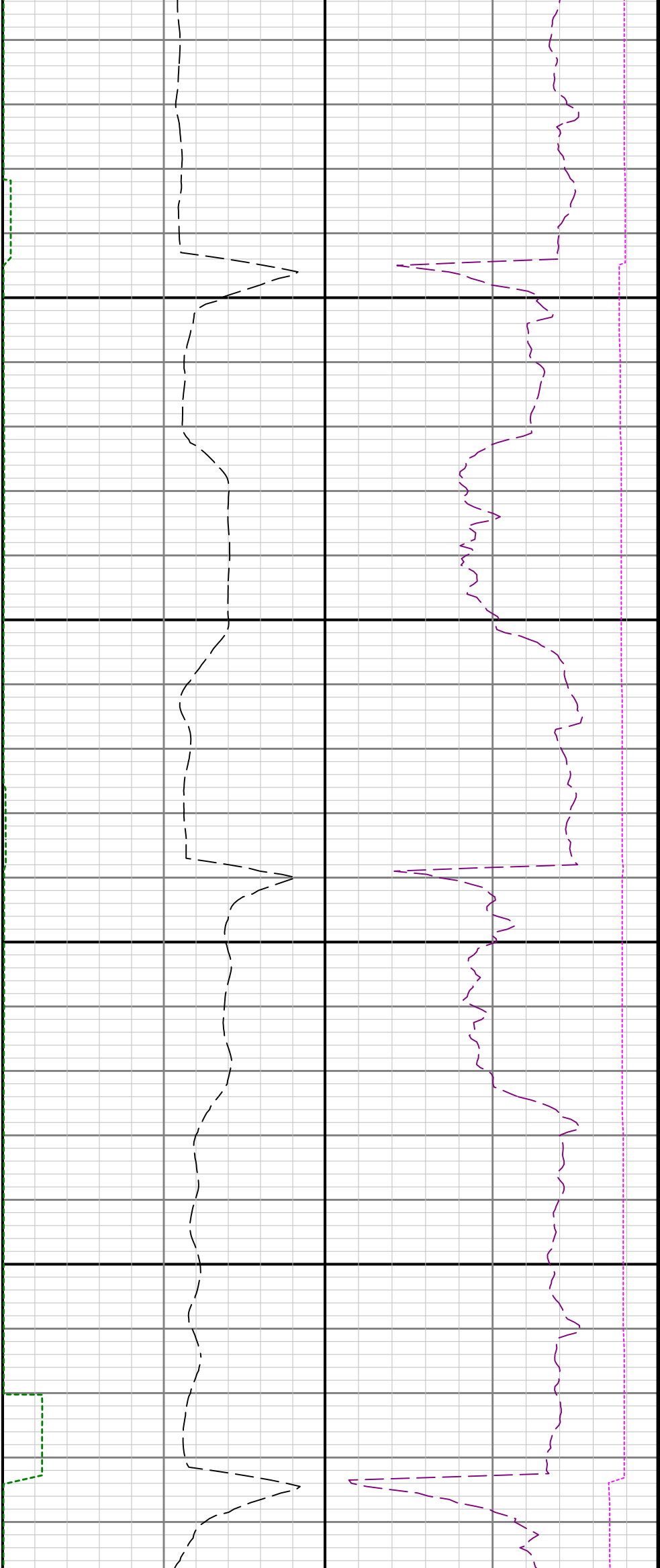






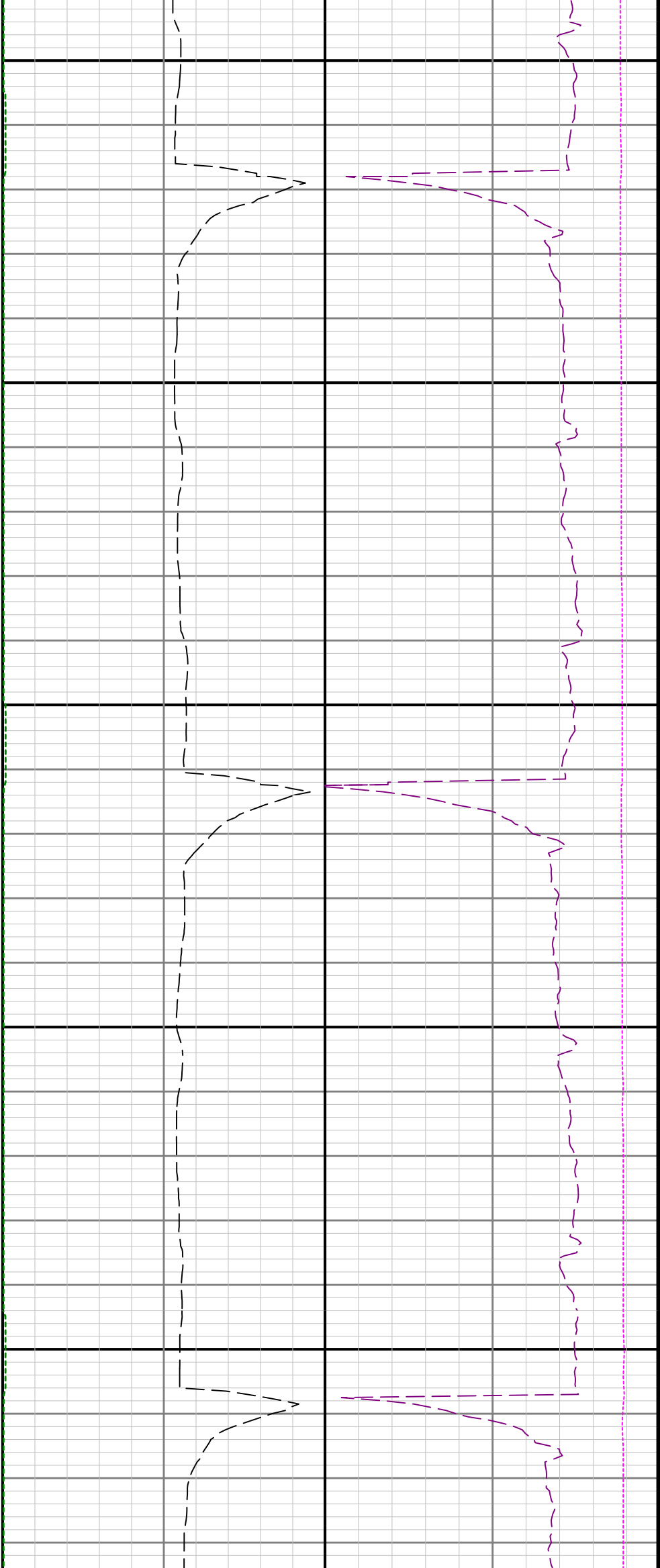






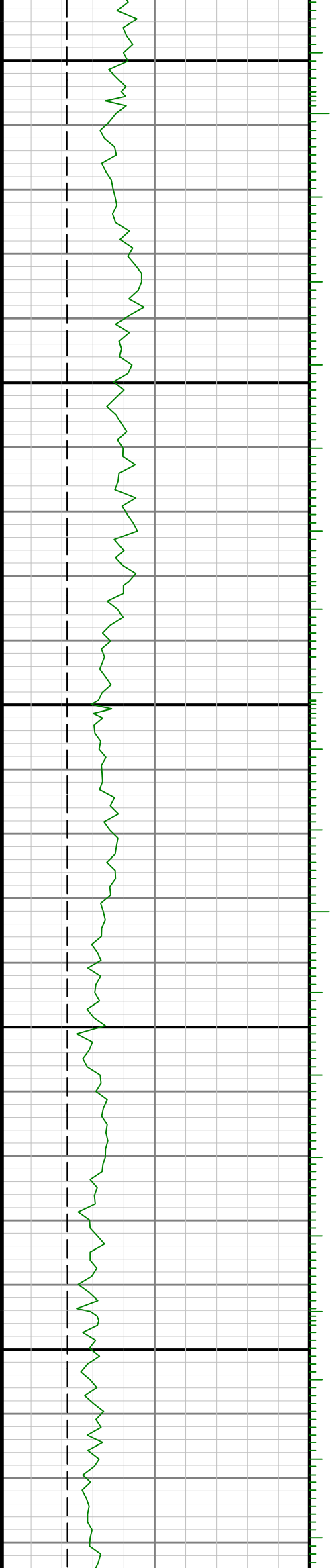
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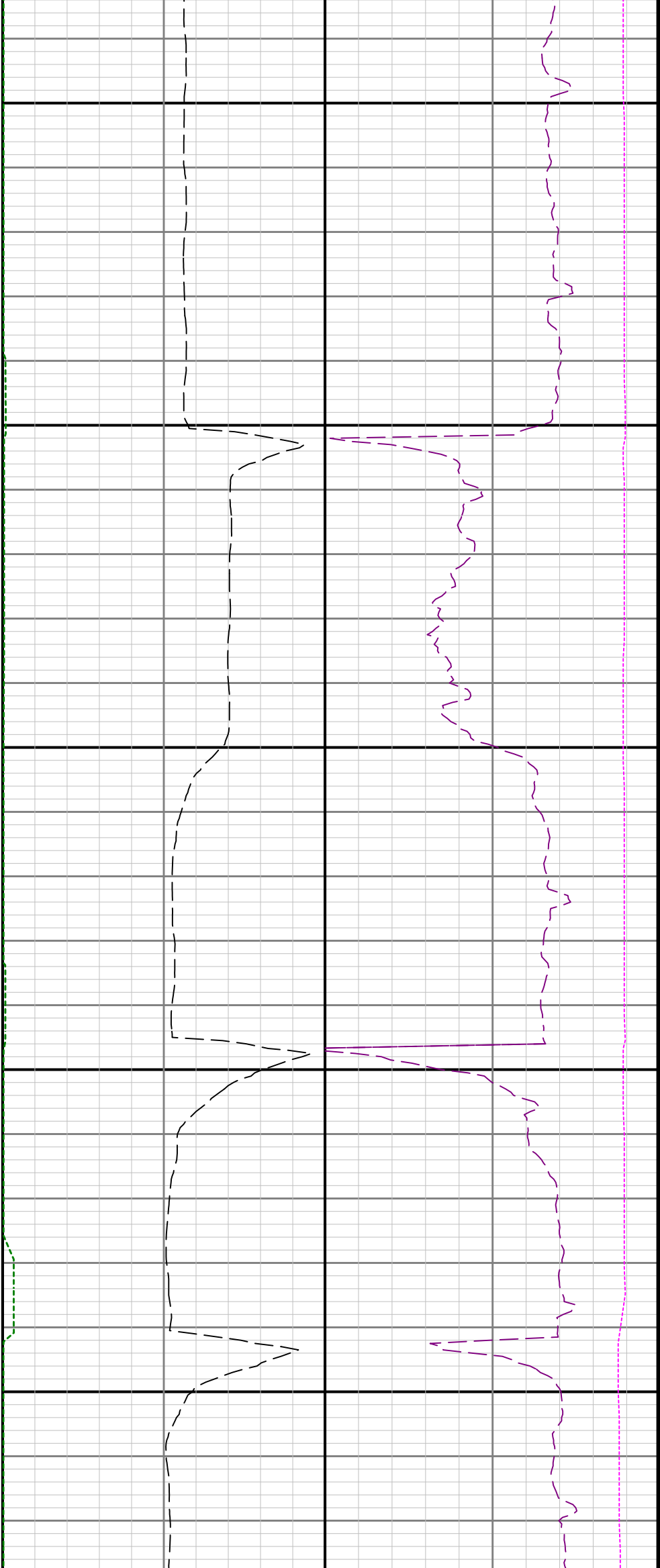
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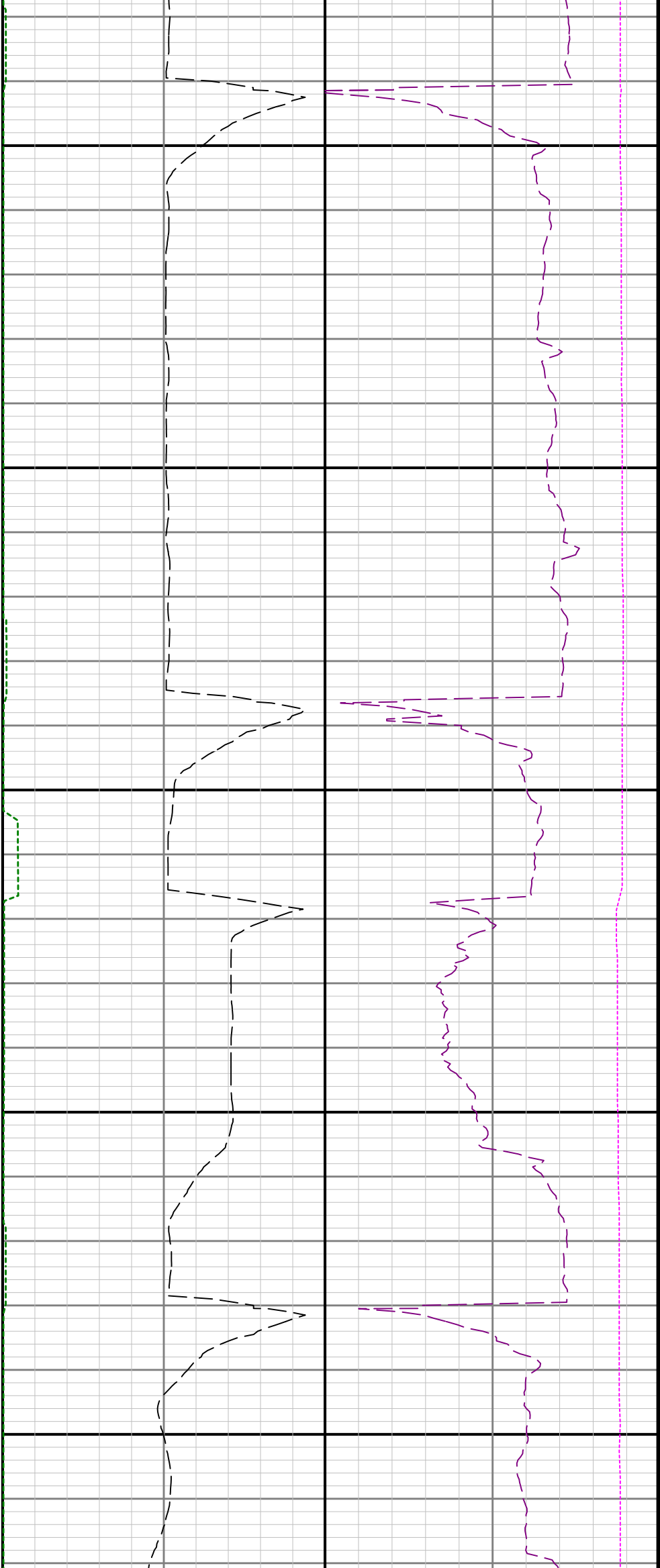




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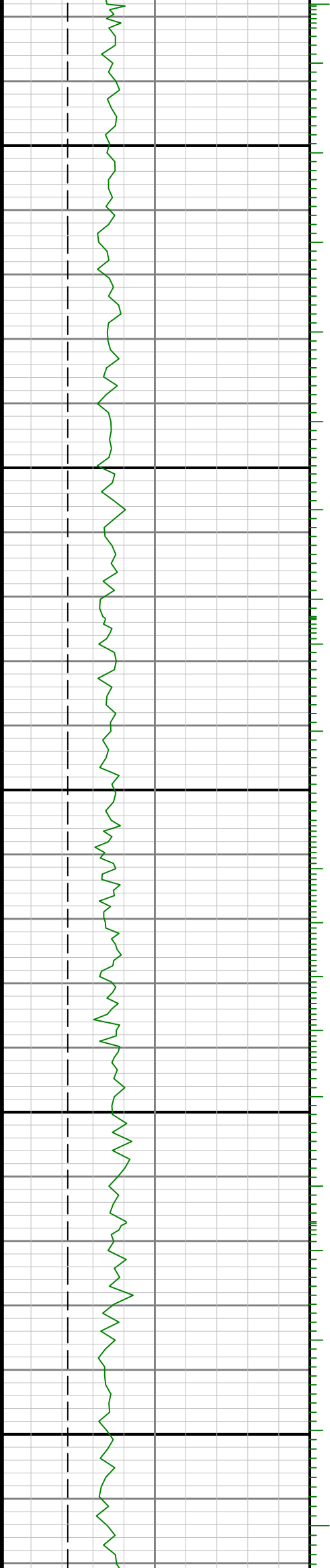
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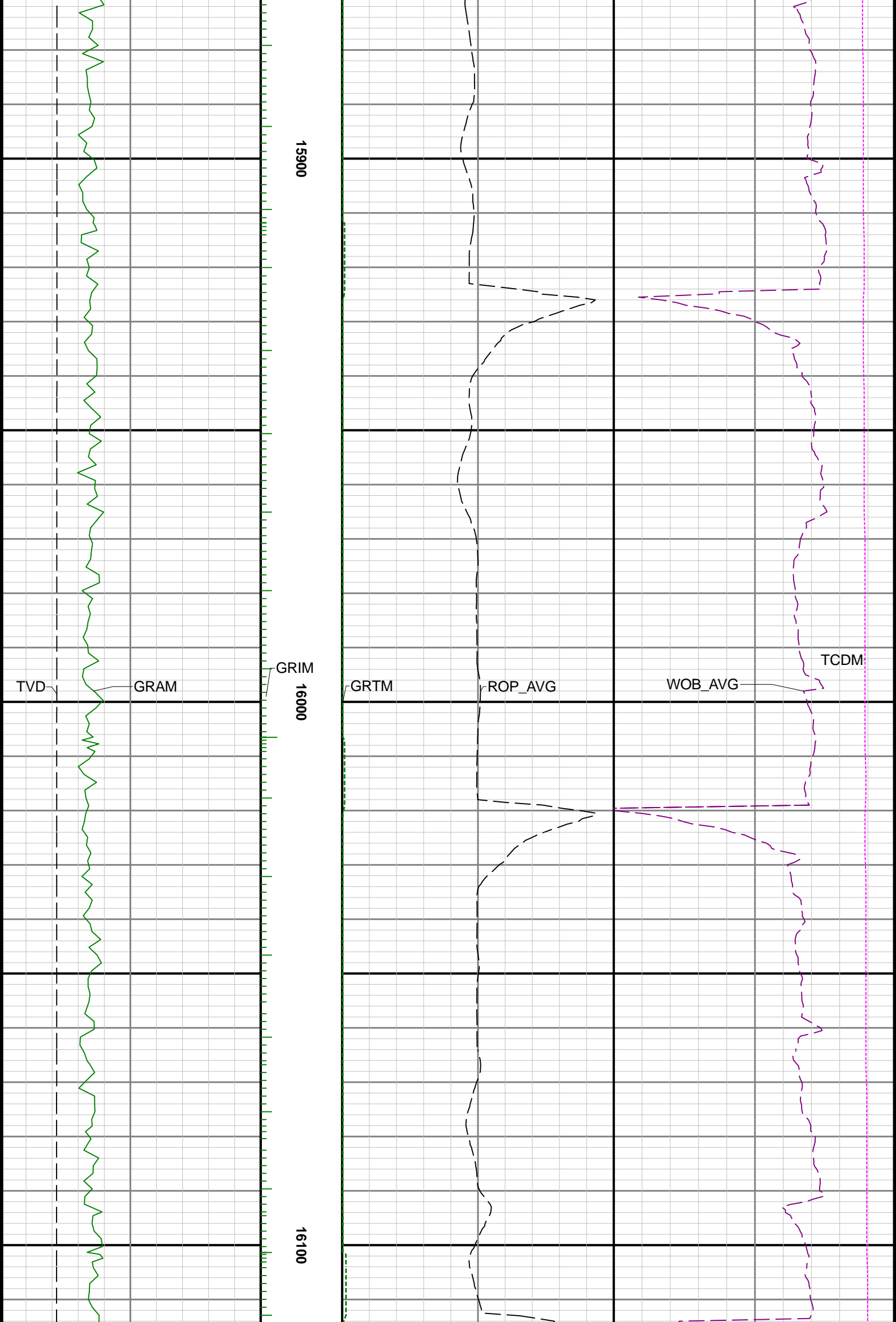
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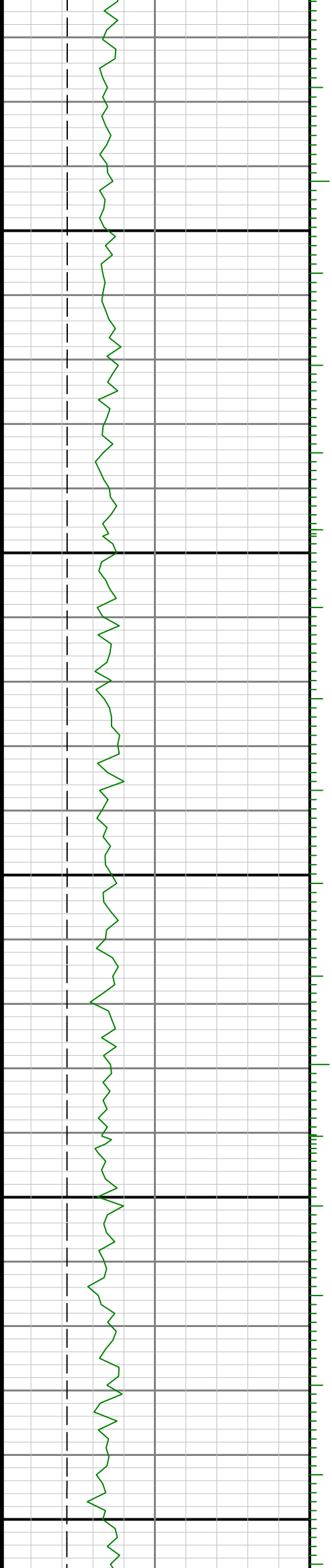


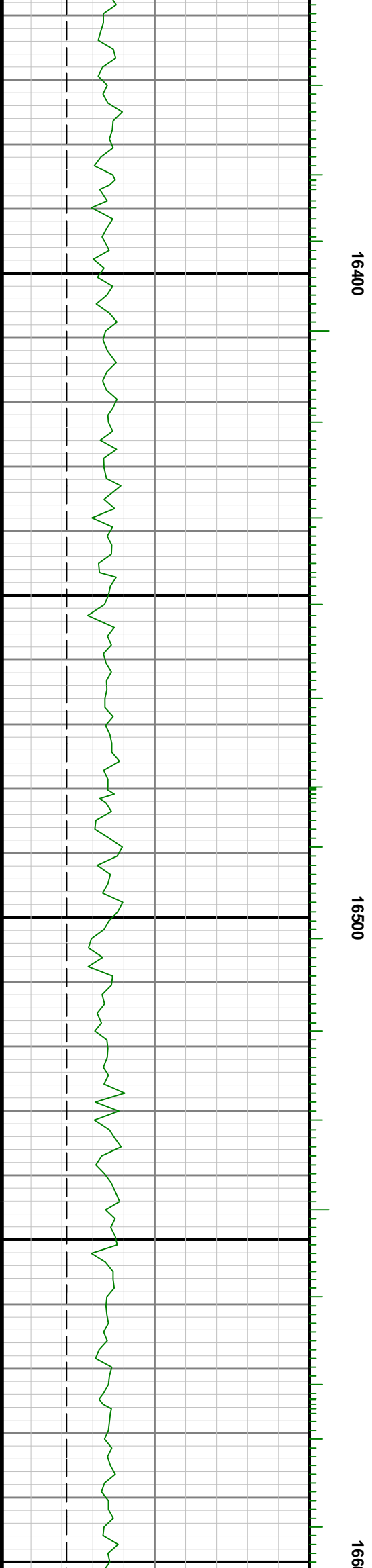
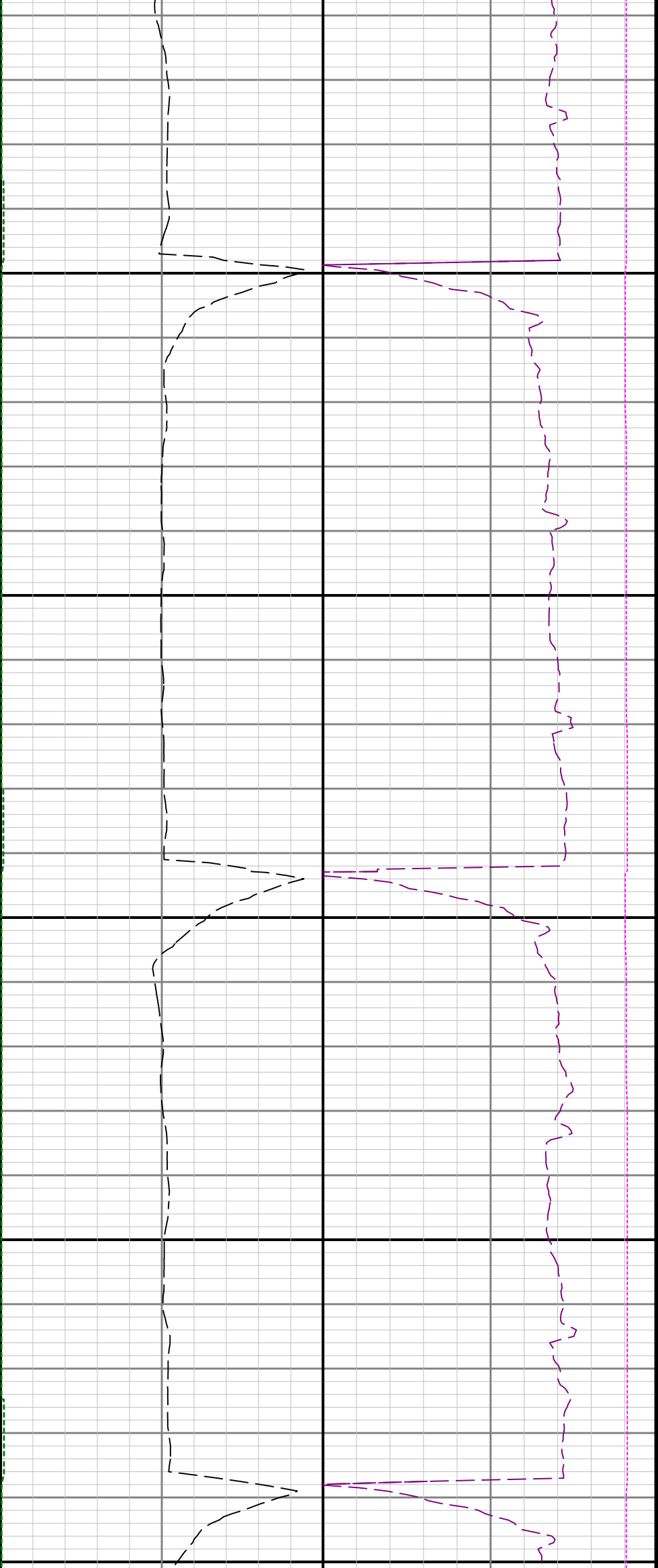


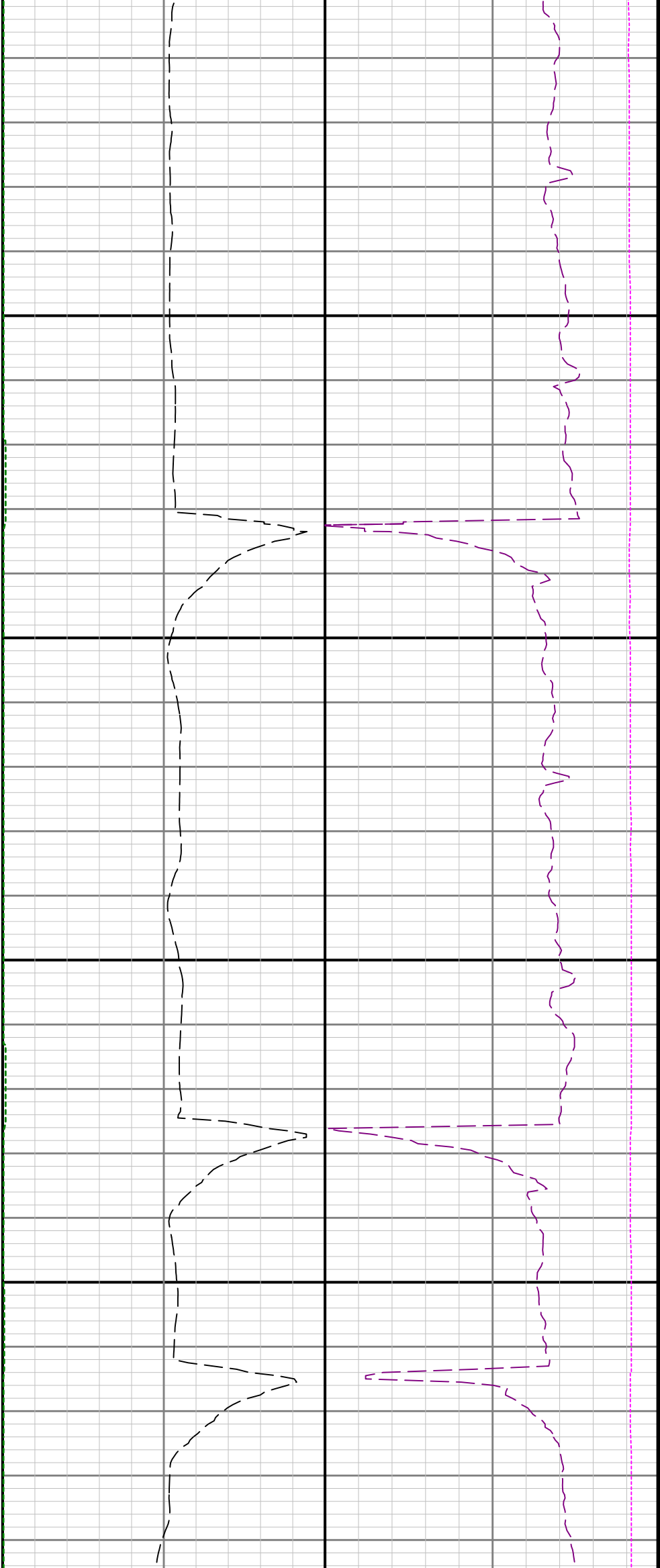


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16300







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