

LWD MEMORY LOG									
<div>BAKER HUGHES</div>			Gamma Ray						
Scale:			Company: Noble Energy						
1:240 MD			Well: Wells Ranch State AA33-744						
Depth Reference:			Field: Weld County(Noble NAD 83 Grid)						
Driller's Depth			County: Weld		State: Colorado				
Status:			Surface Location:				Other Services:		
Final Print			Latitude:				Directional		
API No: 05-123-43878-00			Longitude:						
Job ID: 8391773			UTM: N/A						
Permanent Datum (P.D.): Ground Level			Elevation:		4720.00 ft		KB: N/A		
Log Measured From: Rig Floor			Above P.D.		30.00 ft		DF: 4750.00 ft		
							GL: 4720.00 ft		
Dates			Interval Logged			Magnetic Field Reference			
Date From: 2017-03-21			Top: (ft) 1936.00		Azi Reference North:		Grid		Dip Angle: (deg) 67.12
Date To: 2017-03-23			Bottom: (ft) 16456.00		Total Magnetic Field Strength: (nT)				52326
Spud Date: 2017-03-20					Mag to Reference North Correction: (deg)				7.24 E
Borehole Record									
Casing Record									
Hole Size (in)			From (ft)		To (ft)		Size (in)		Weight (lb/ft)
13.500			30.00		1936.00		9.625		36.00
8.500			1936.00		16456.00				
Mud Record									
Deviation Record									
Type			From (ft)		To (ft)		Hole Size (in)		Interval (ft)
Oil Based Mud			1936.00		16456.00		8.500		14520.00
									1.03   289.30
									90.15   178.36

Date/Time	Run No.	Measured Depth (ft)	Mud Type	Density (ppg)	Viscosity (cP)	pH	Fluid Loss (cm3)	Clay Water	Coarse Solids	Total Solids (ppm)	Chlorides (%)
2017-03-21 05:00	1	2086.00	Oil Based Mud	8.8	10	N/A	157.0	84.6/15.4	Active Pit	20000	0.00
2017-03-21 16:00	1	6400.00	Oil Based Mud	8.9	9	N/A	324.0	85.7/14.3	Active Pit	22500	0.00
2017-03-22 05:00	1	9562.00	Oil Based Mud	9.2	10	N/A	144.8	84.3/15.7	Active Pit	22000	0.00
2017-03-22 16:00	1	12317.00	Oil Based Mud	9.2	11	N/A	313.0	85.2/14.8	Active Pit	22000	0.00
2017-03-23 05:00	1	15437.00	Oil Based Mud	9.3	42	N/A	145.0	85.2/14.8	Active Pit	2000	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	12406997	Near Bit Inclination	5.93	6.73	7.000	4.330
1	ATC_SU	12406997	Near Bit VSS	5.93	6.73	7.000	4.330
1	ATC_MWD	12200472	Gamma (single)	2.78	12.90	7.000	3.250
1	ATC_MWD	12200472	Directional (mag)	12.30	22.42	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

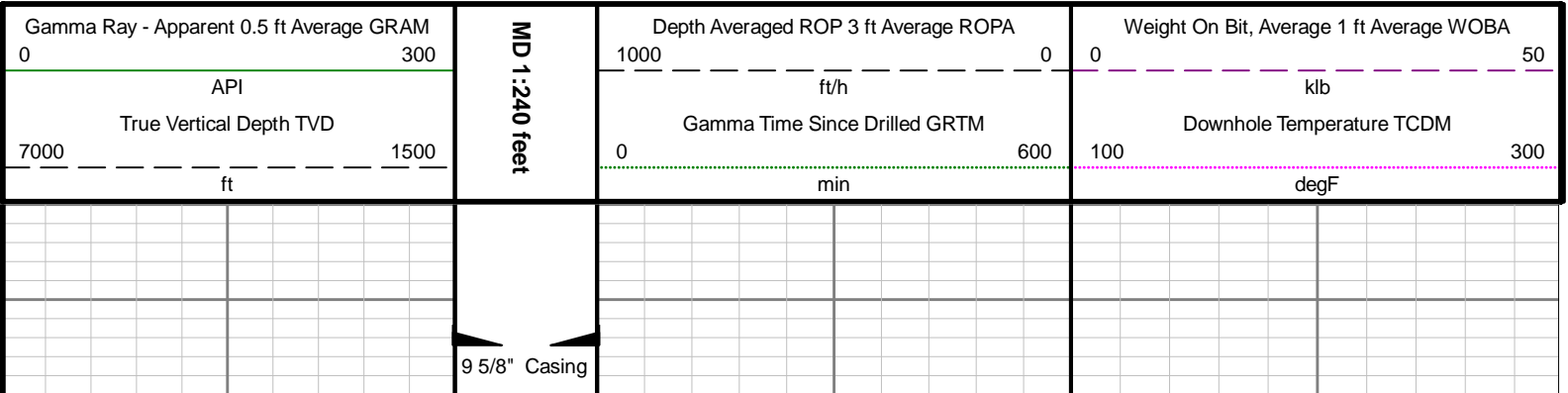
1	Depth measurements were obtained from a depth control system not supplied or operated by Baker Hughes. Due to the lack of control by Baker Hughes, depth calibrations and measurements could not be independently verified.
2	Baker Hughes LWD run 1 utilized a 6.75 inch NaviGamma (Directional and Gamma Ray) services behind a 8.5 inch bit and rotary steerable assembly from 1936 to 16456 feet MD (1936 to 6672 feet TVD).

Remarks

Number	Measured Depth (ft)	Hole Section (in)	Run No.	Remark
1	1936.00	8.500	1	Gamma Ray logging operations began at 1936 feet MD (1936 feet TVD).
2	16443.00	8.500	1	The interval from 16443 to 16456 feet MD (6672 feet TVD) was not logged after being drilled due to sensor to bit offset at well TD.

Curve Mnemonics

Presented Curves	Description	Units
ROPA	Depth Averaged ROP 3 ft Average	ft/h
TVD	True Vertical Depth	ft
WOBA	Weight On Bit, Average 1 ft Average	klb
GRAM	Gamma Ray - Apparent 0.5 ft Average	API
GRIM	Gamma Ray Data Point Indicator	unitless
GRTM	Gamma Time Since Drilled	min
TCDM	Downhole Temperature	degF



See Remark 1

GRAM

TVD

2000

GRIM

2100

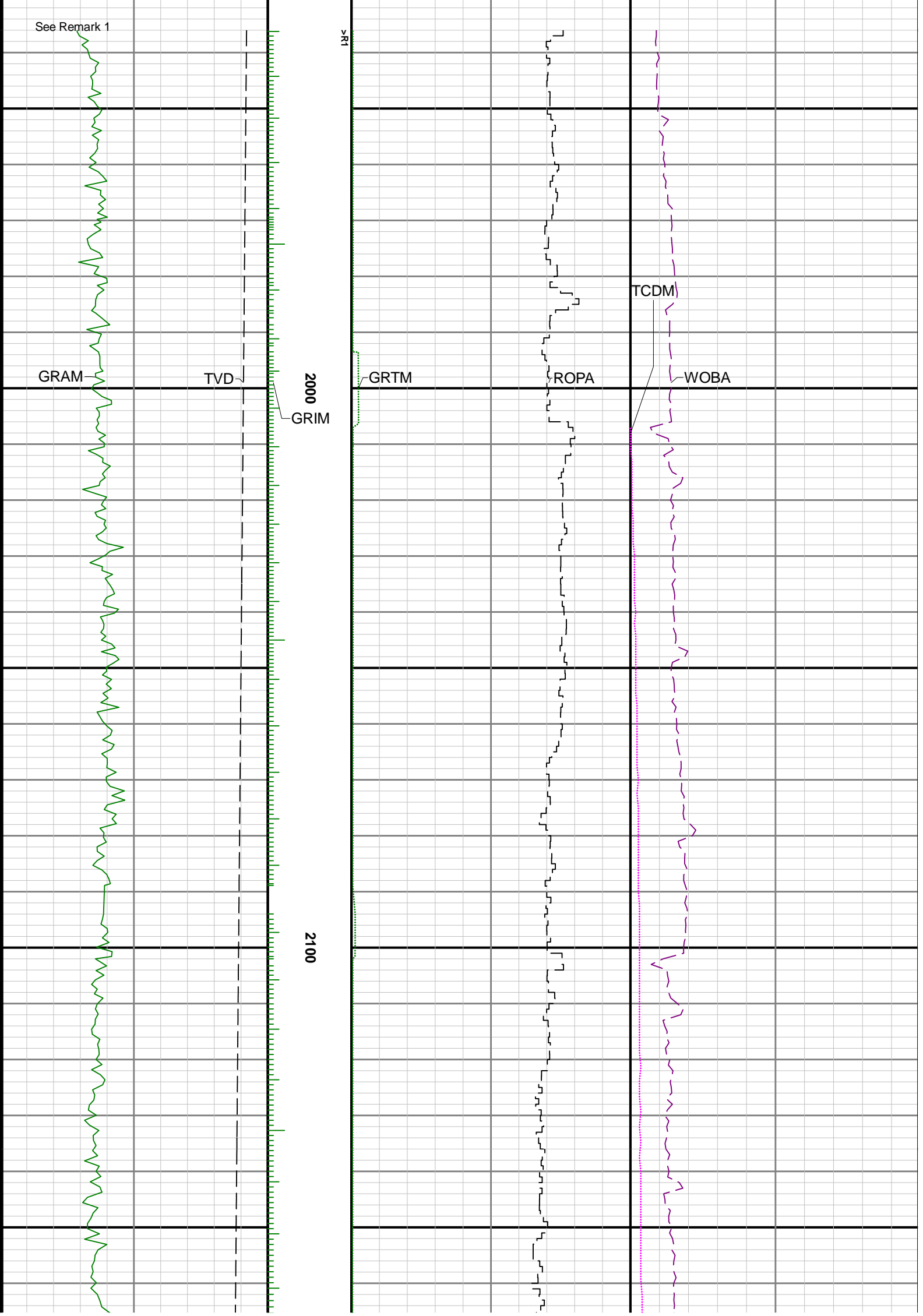
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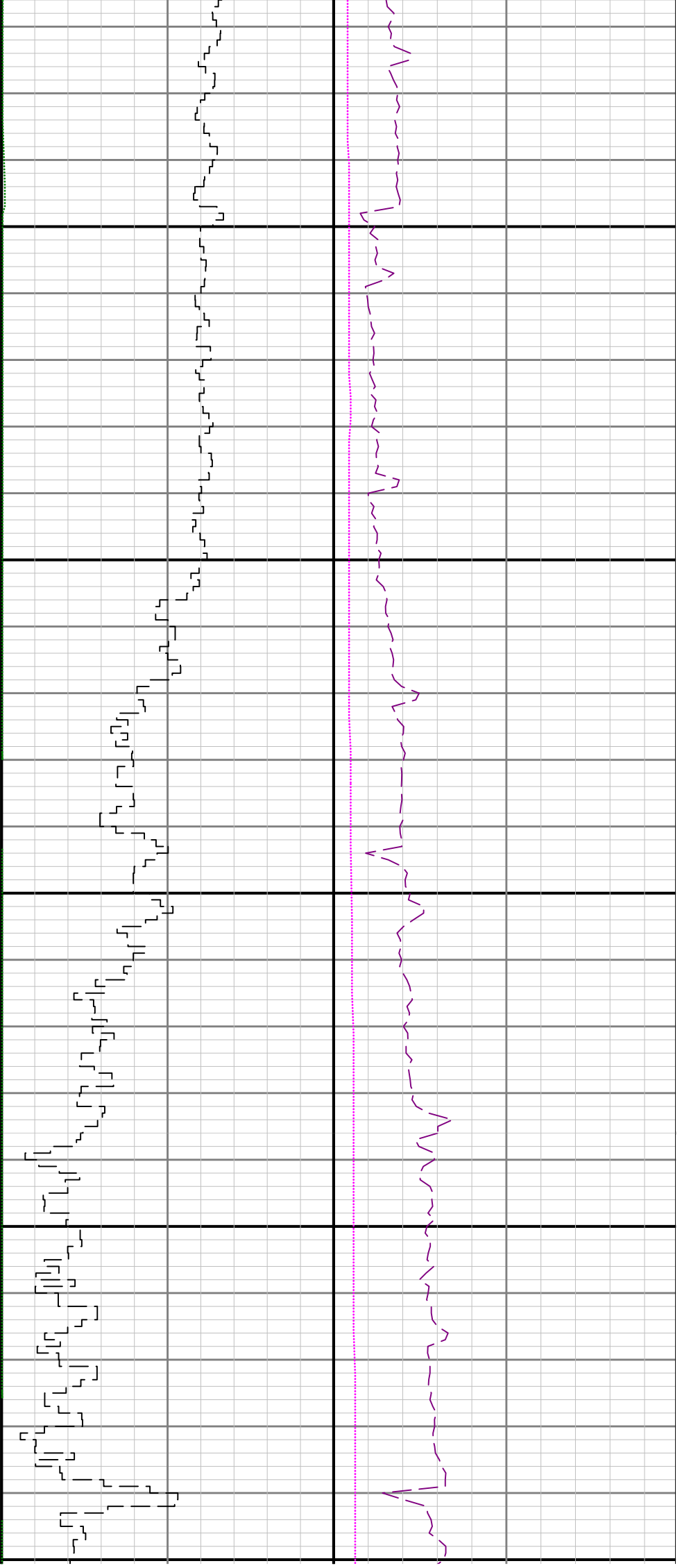
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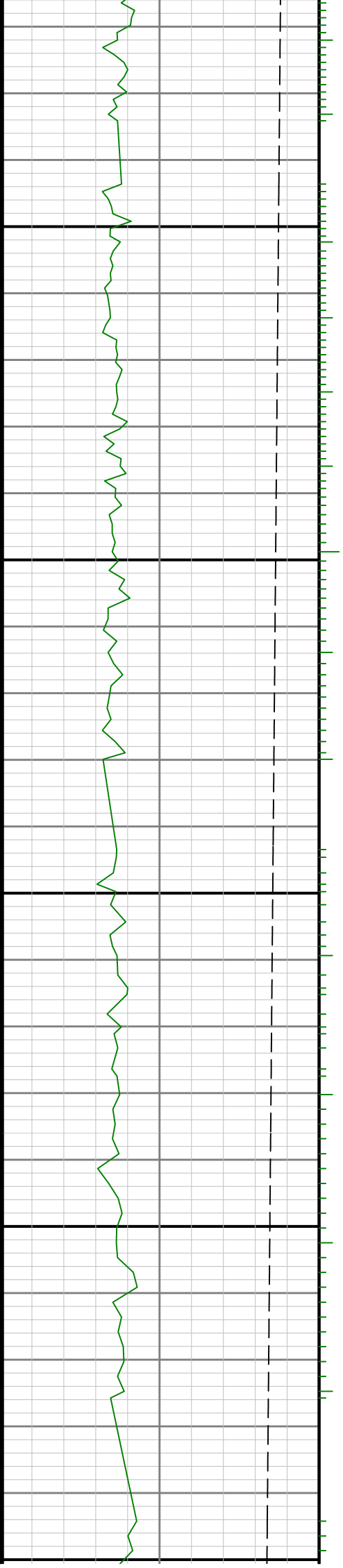


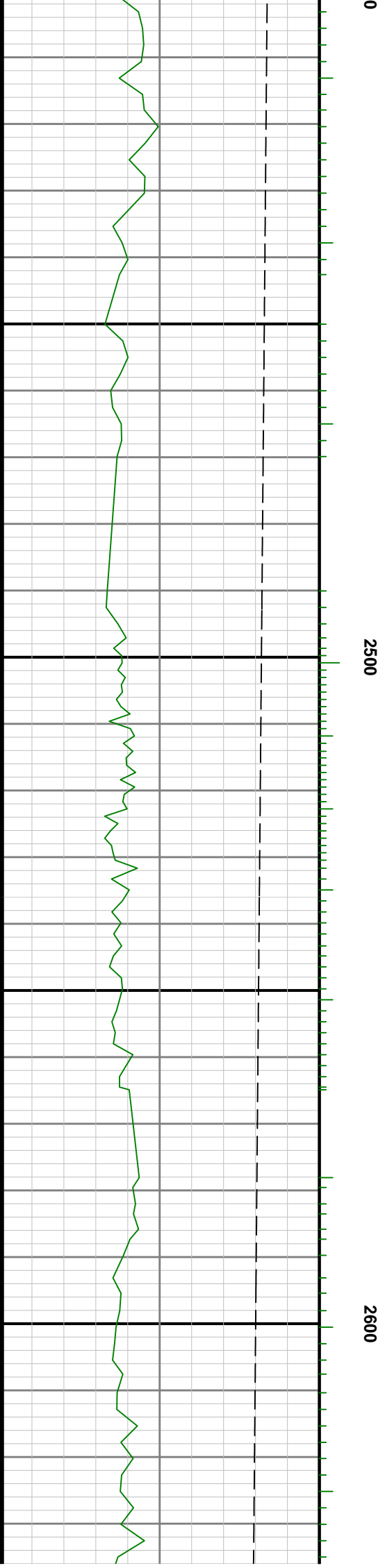
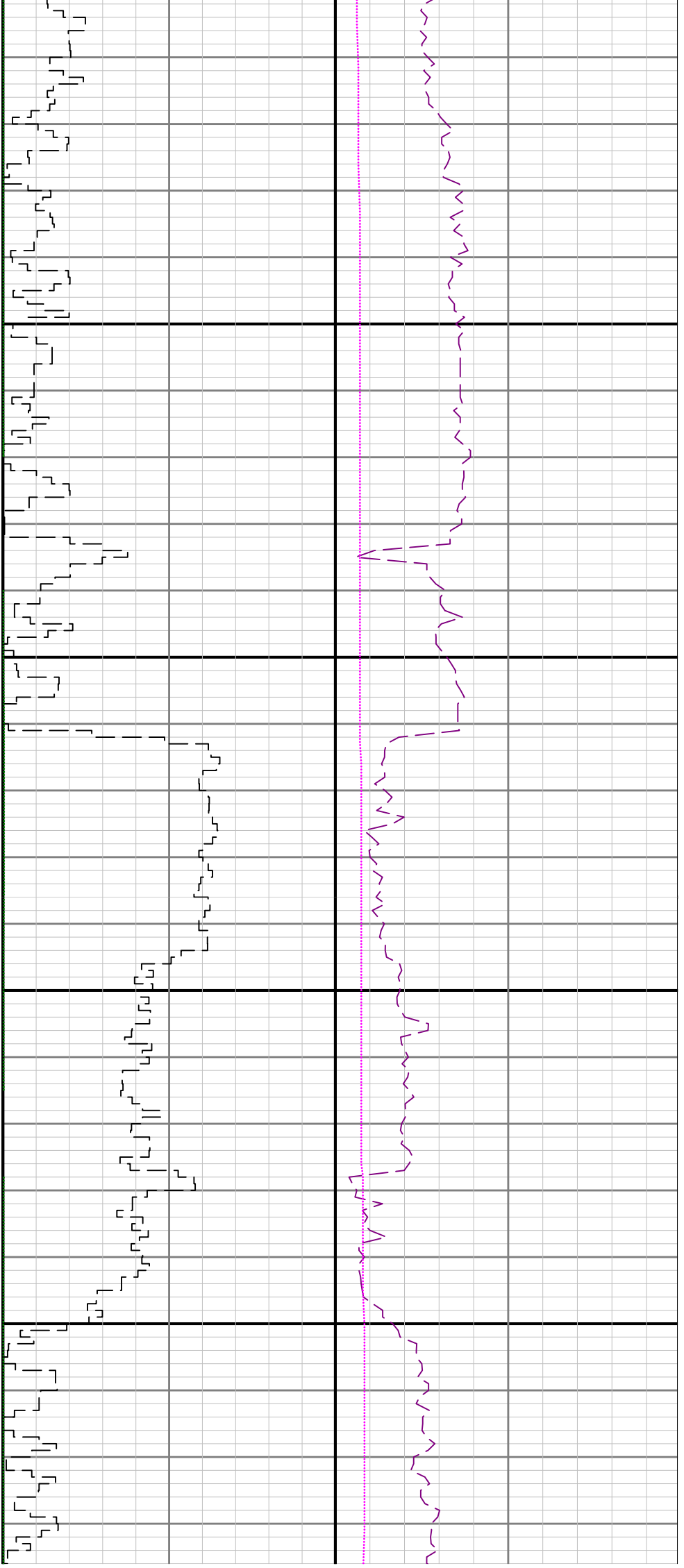


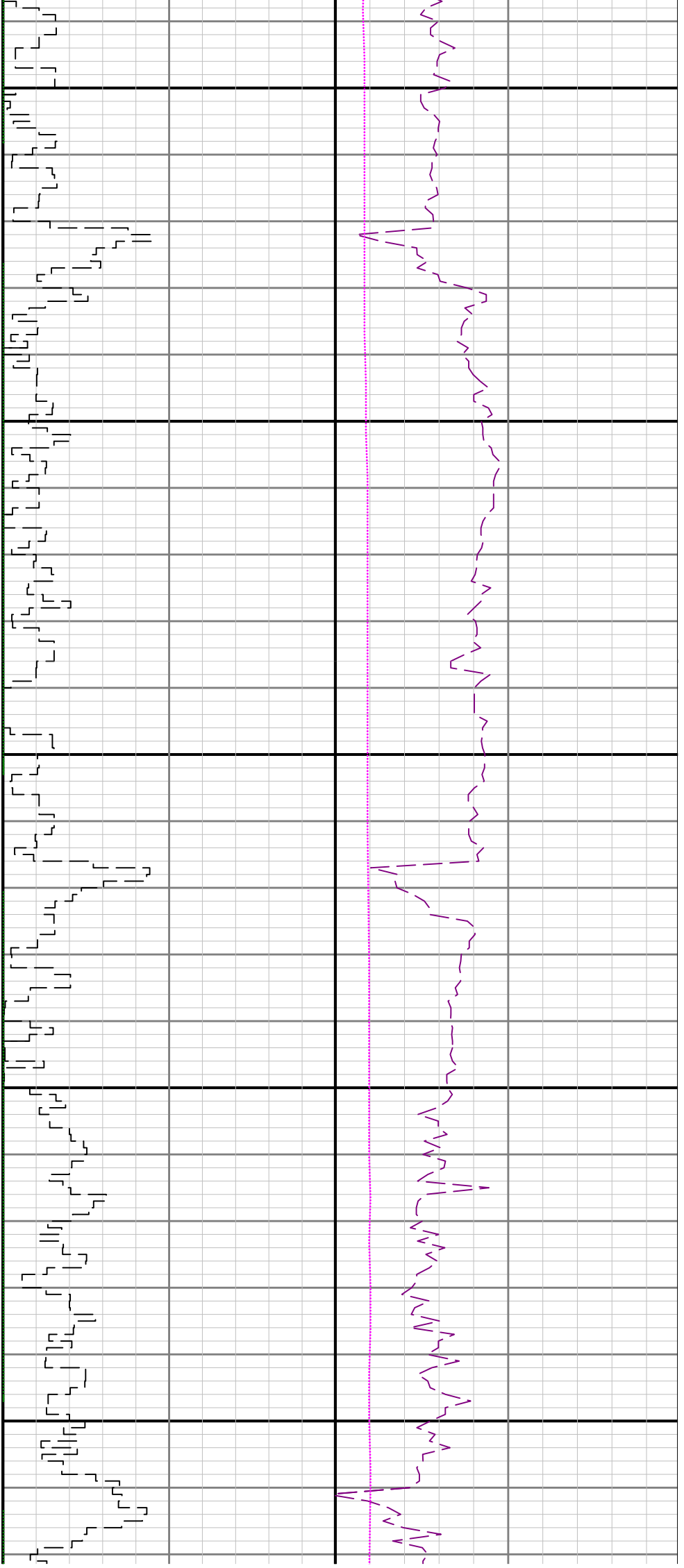
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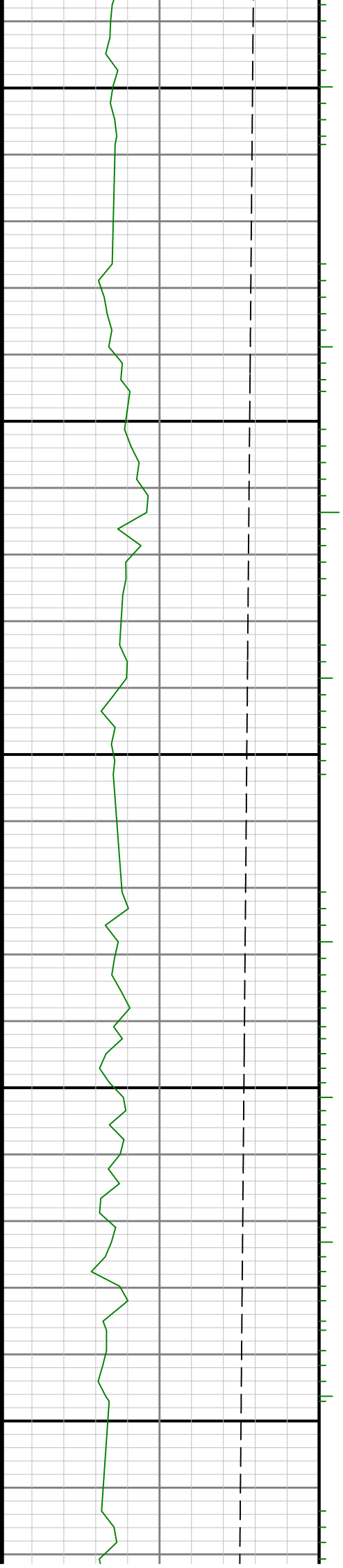


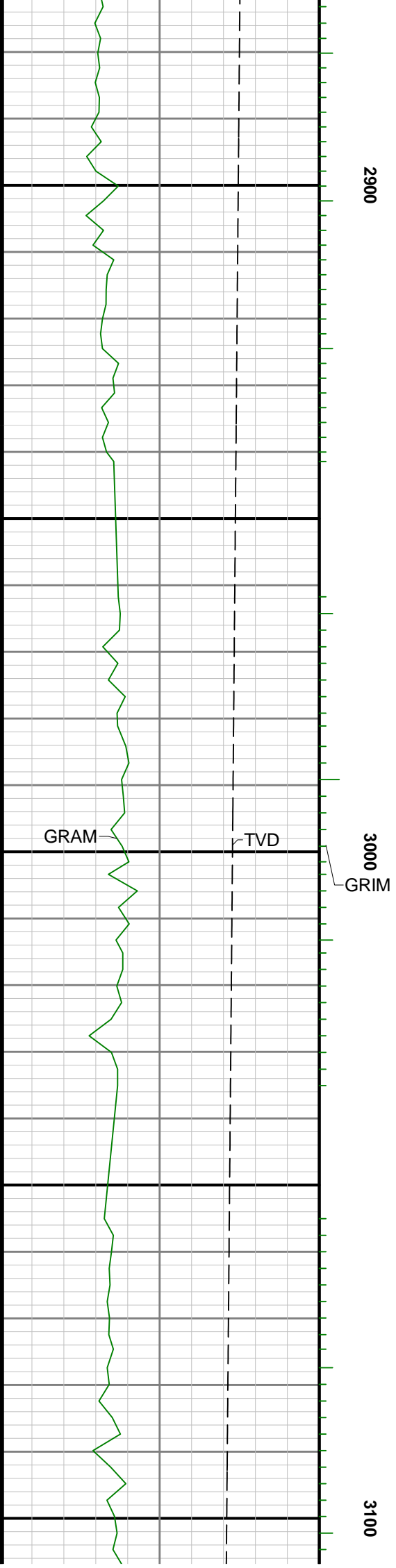
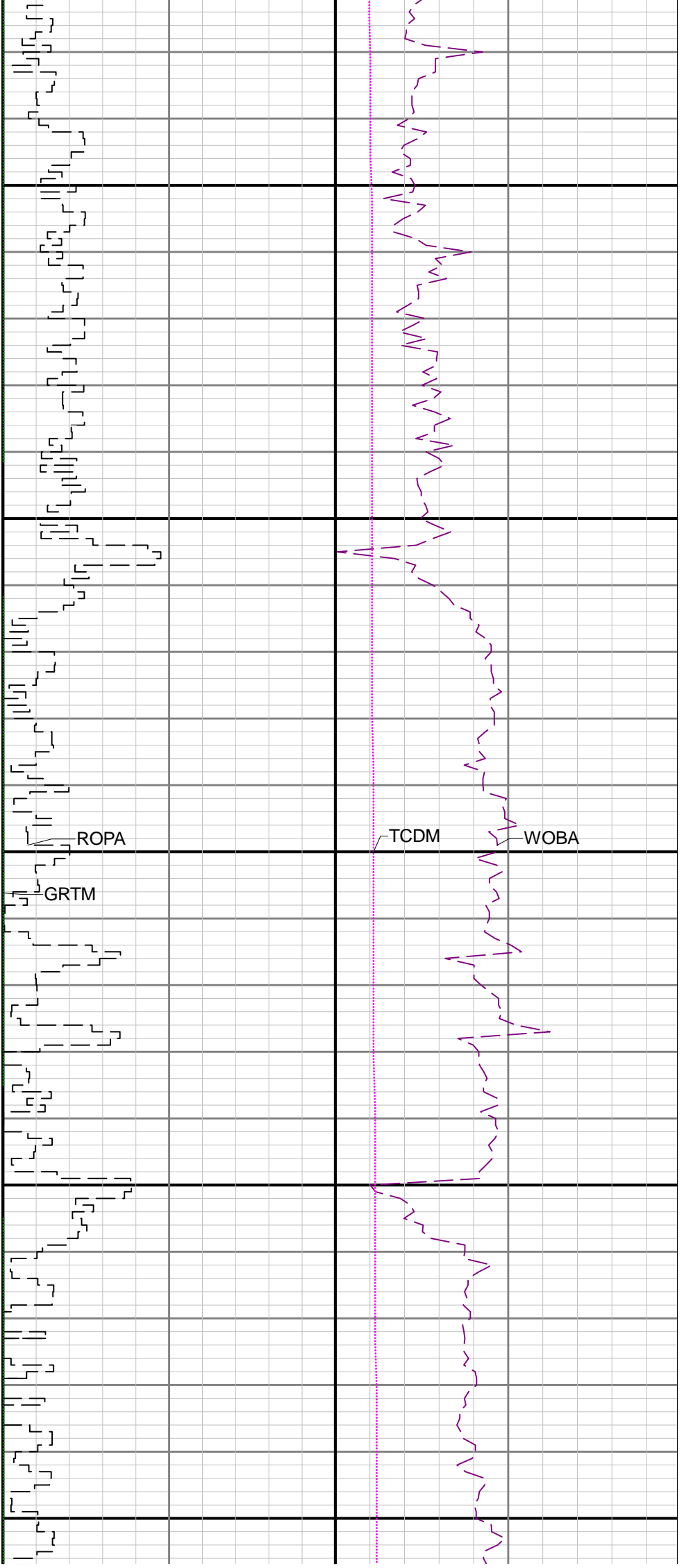


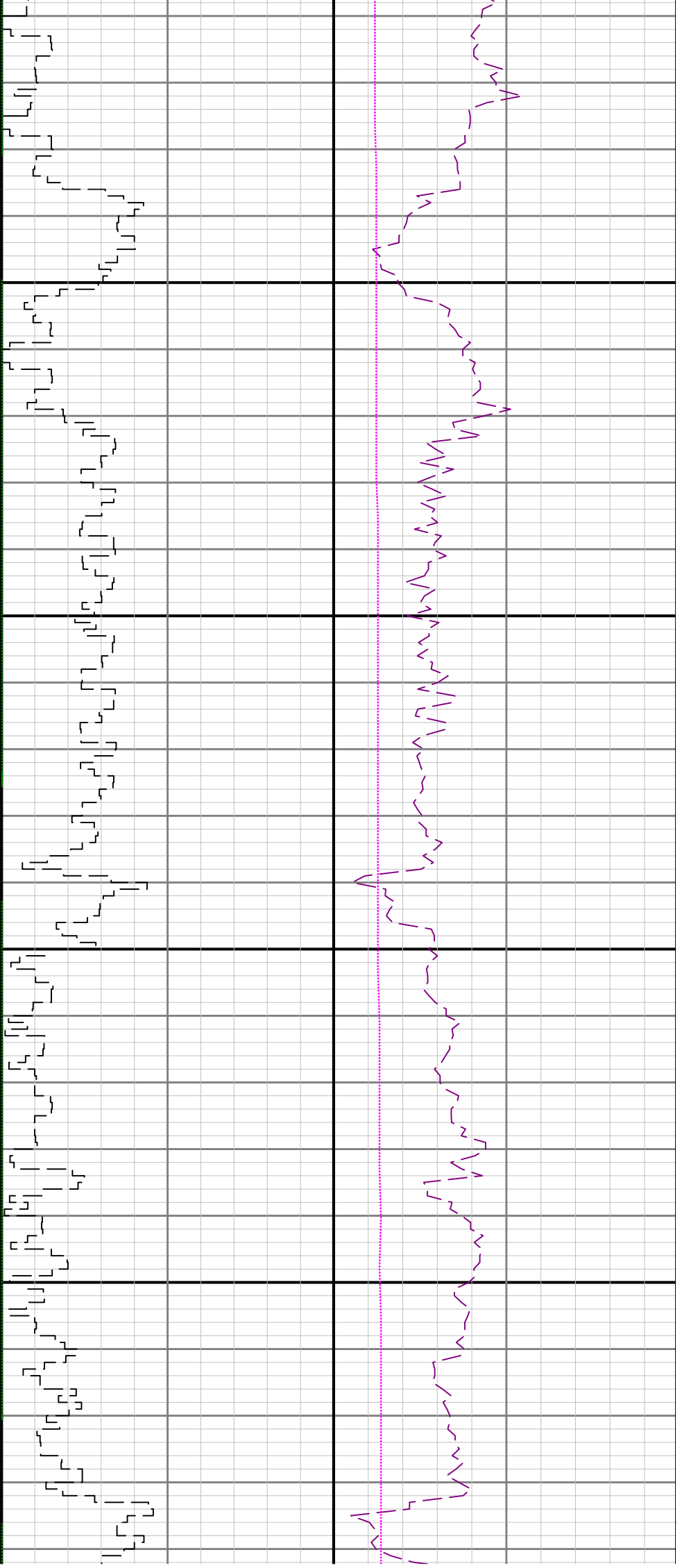


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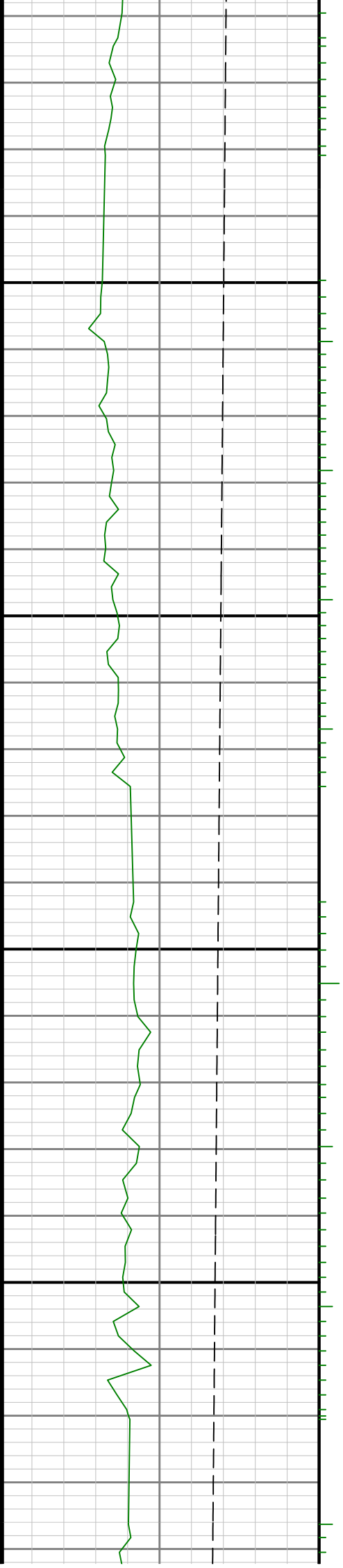




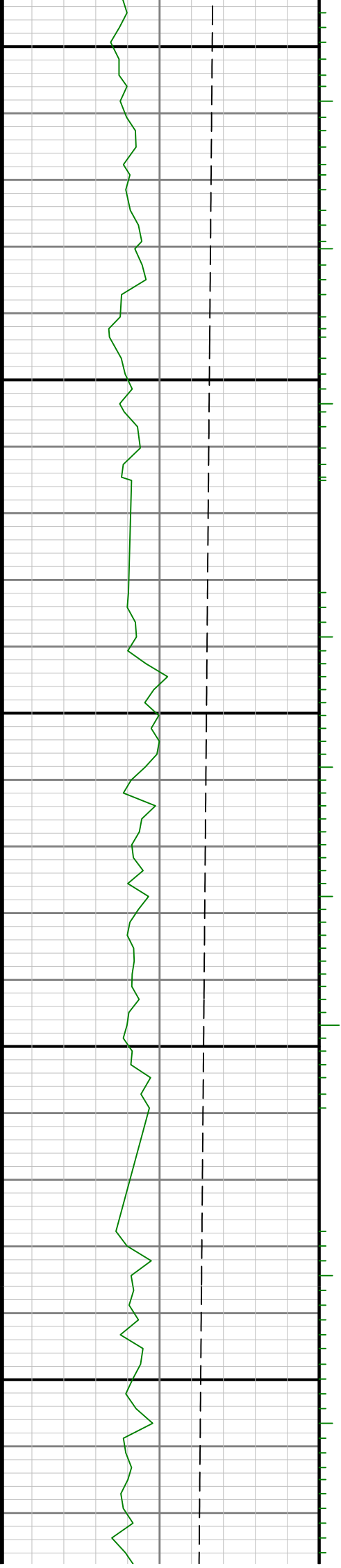
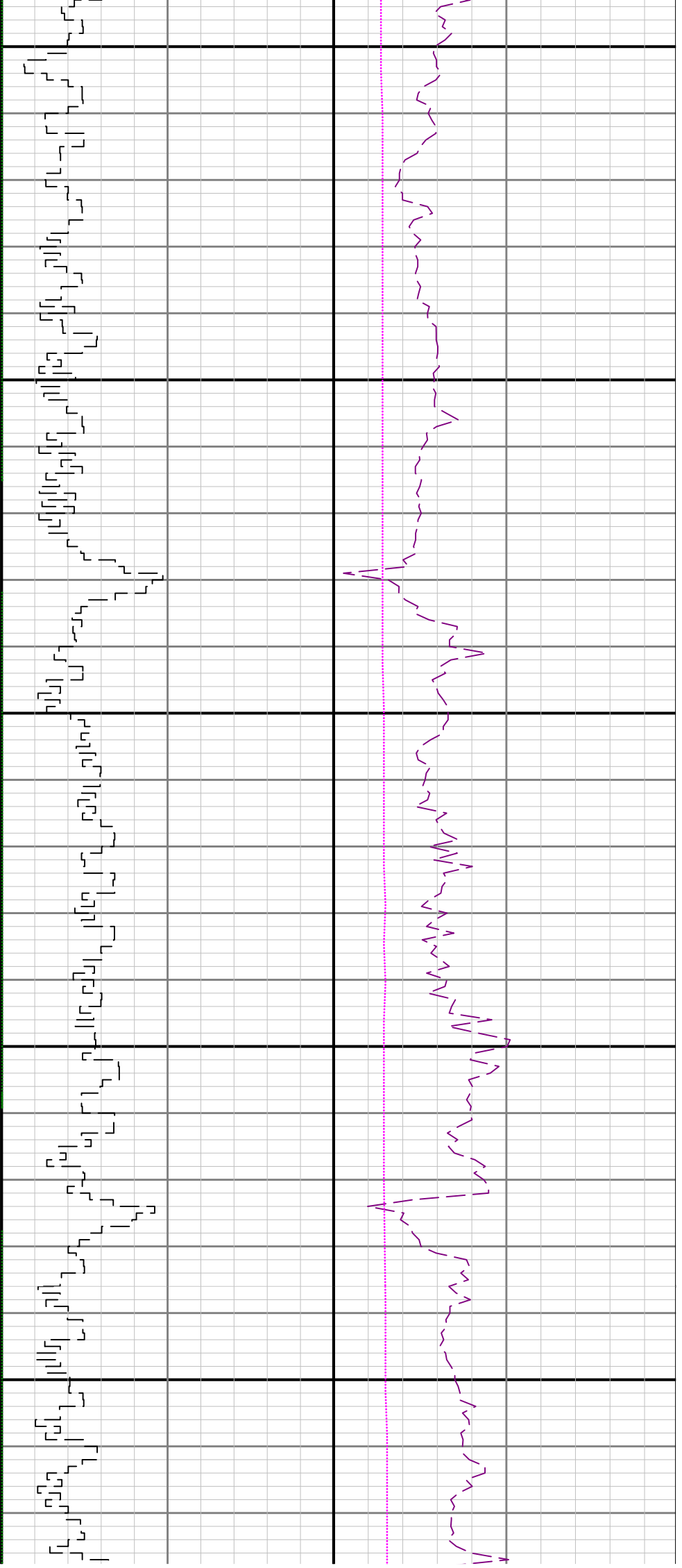


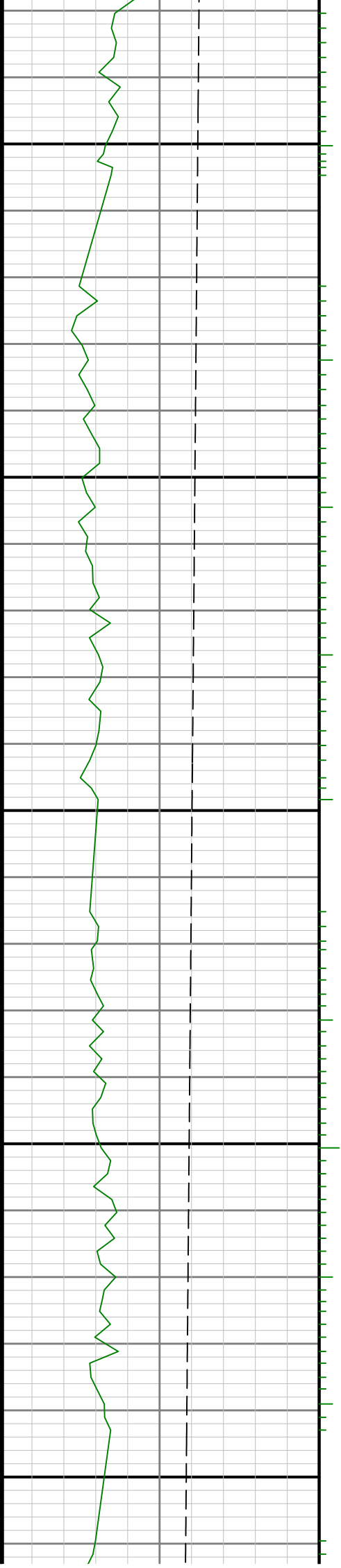
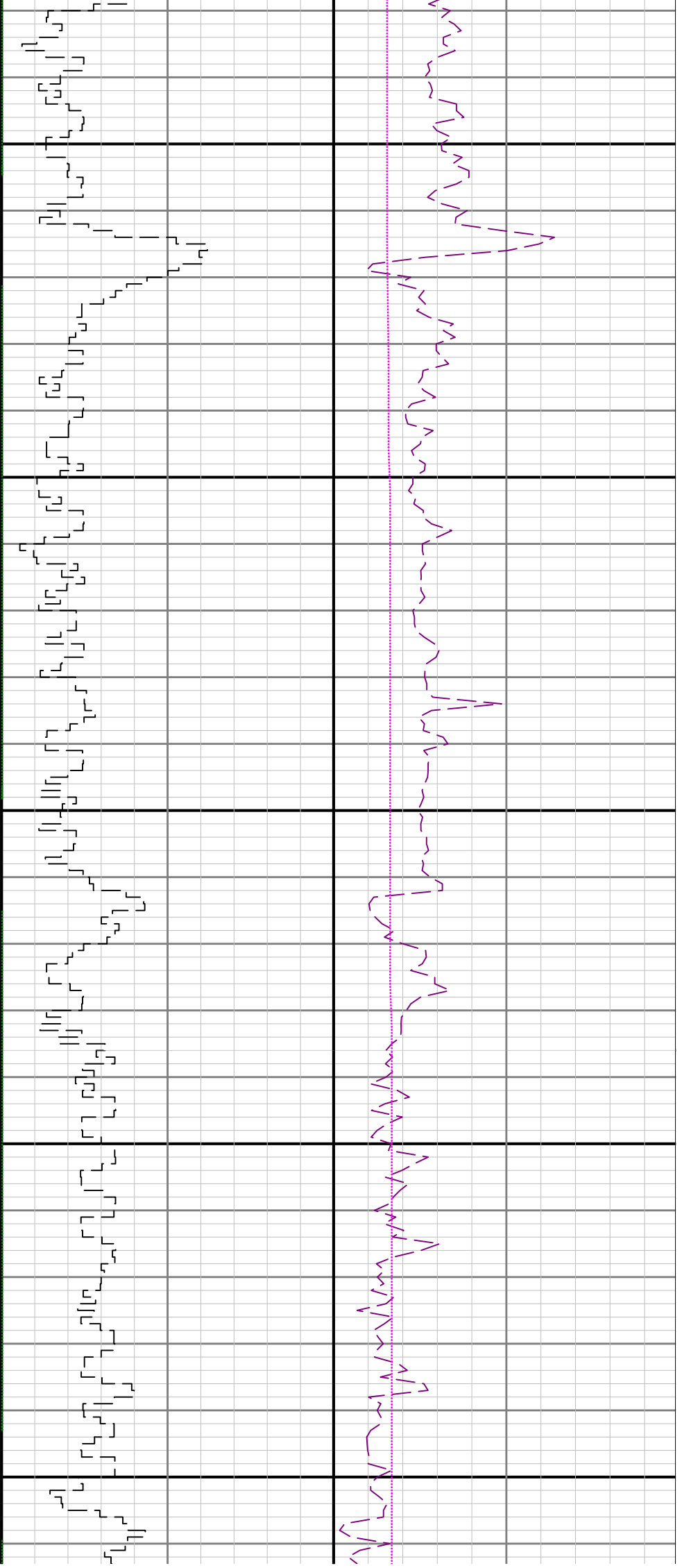
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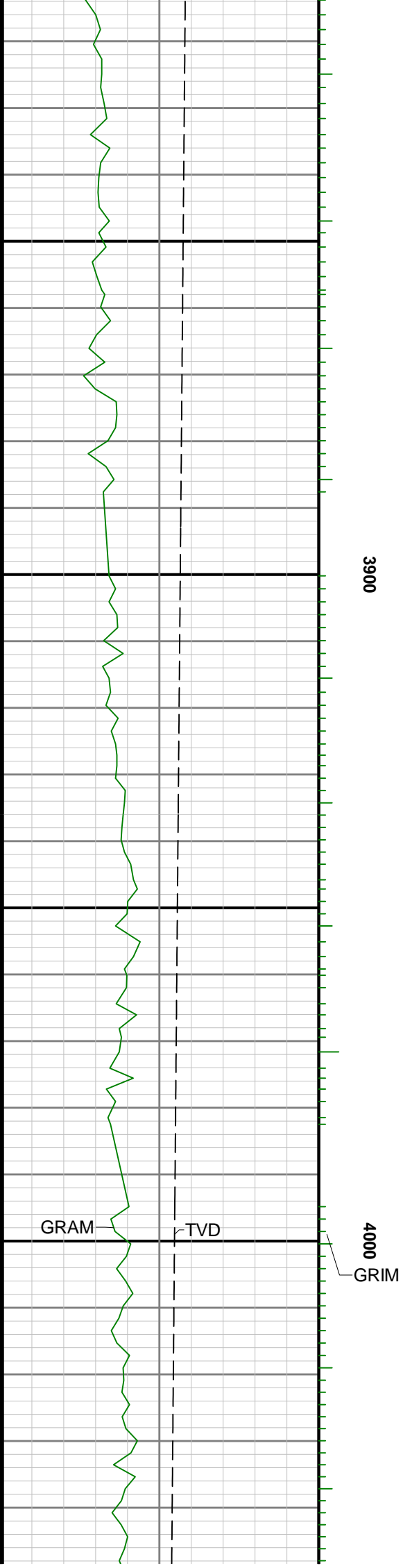
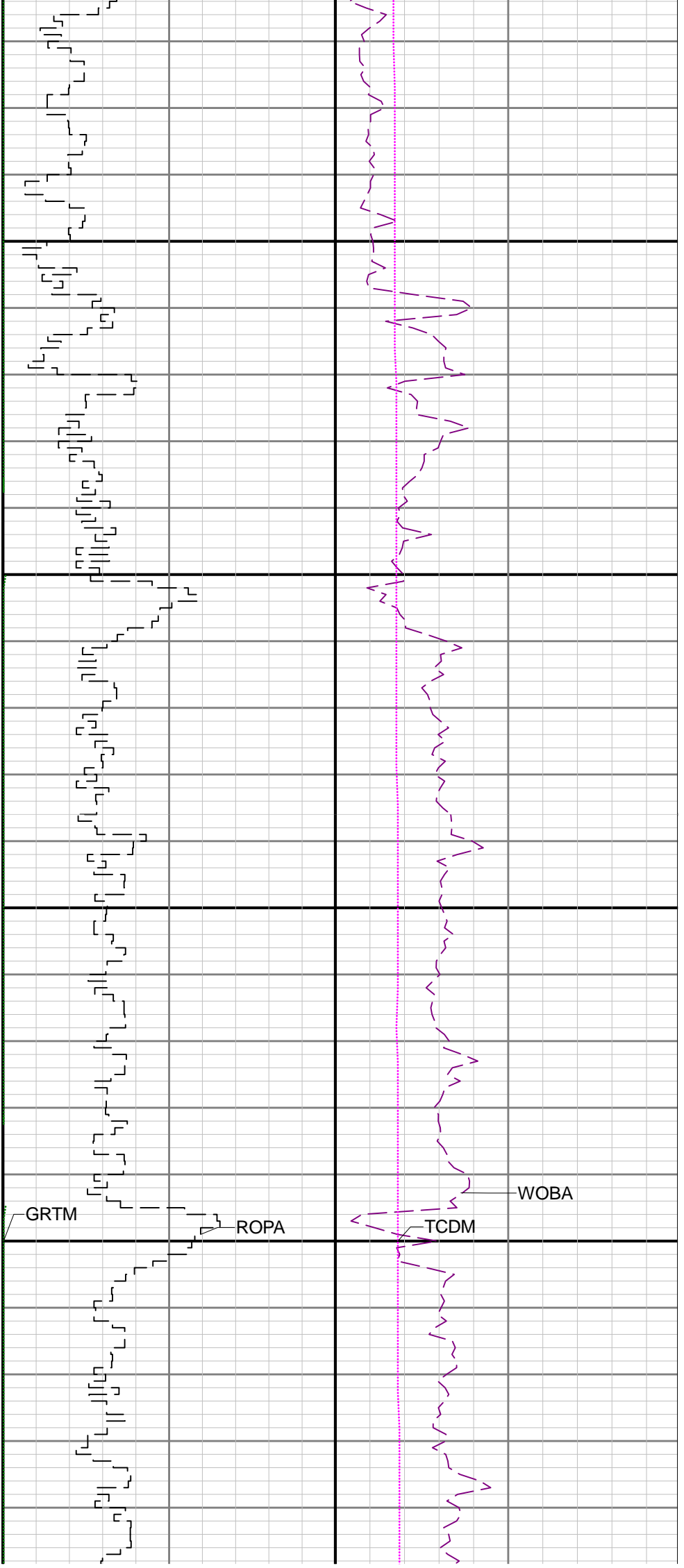
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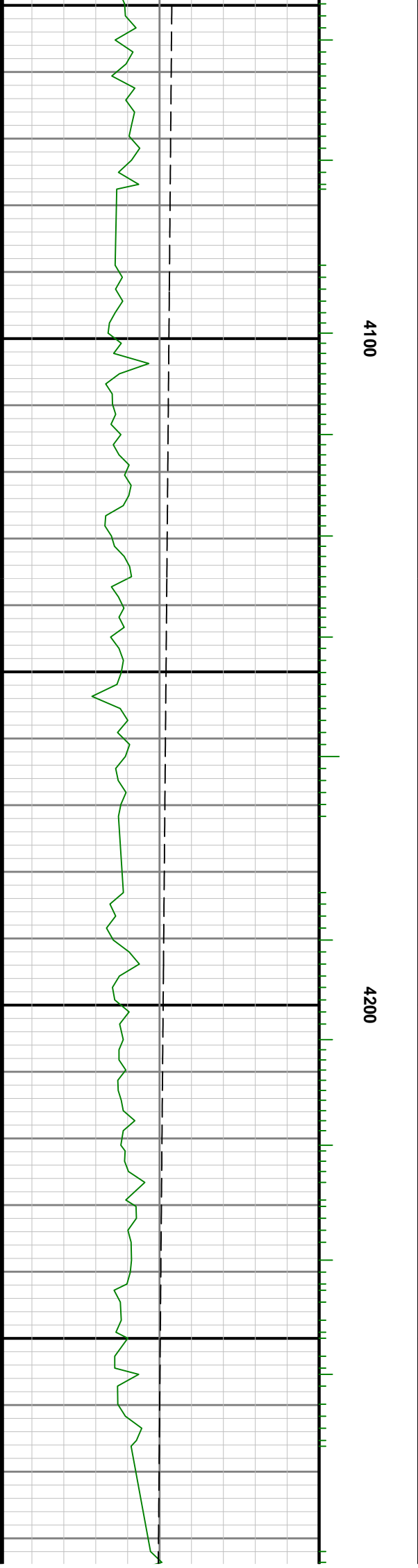
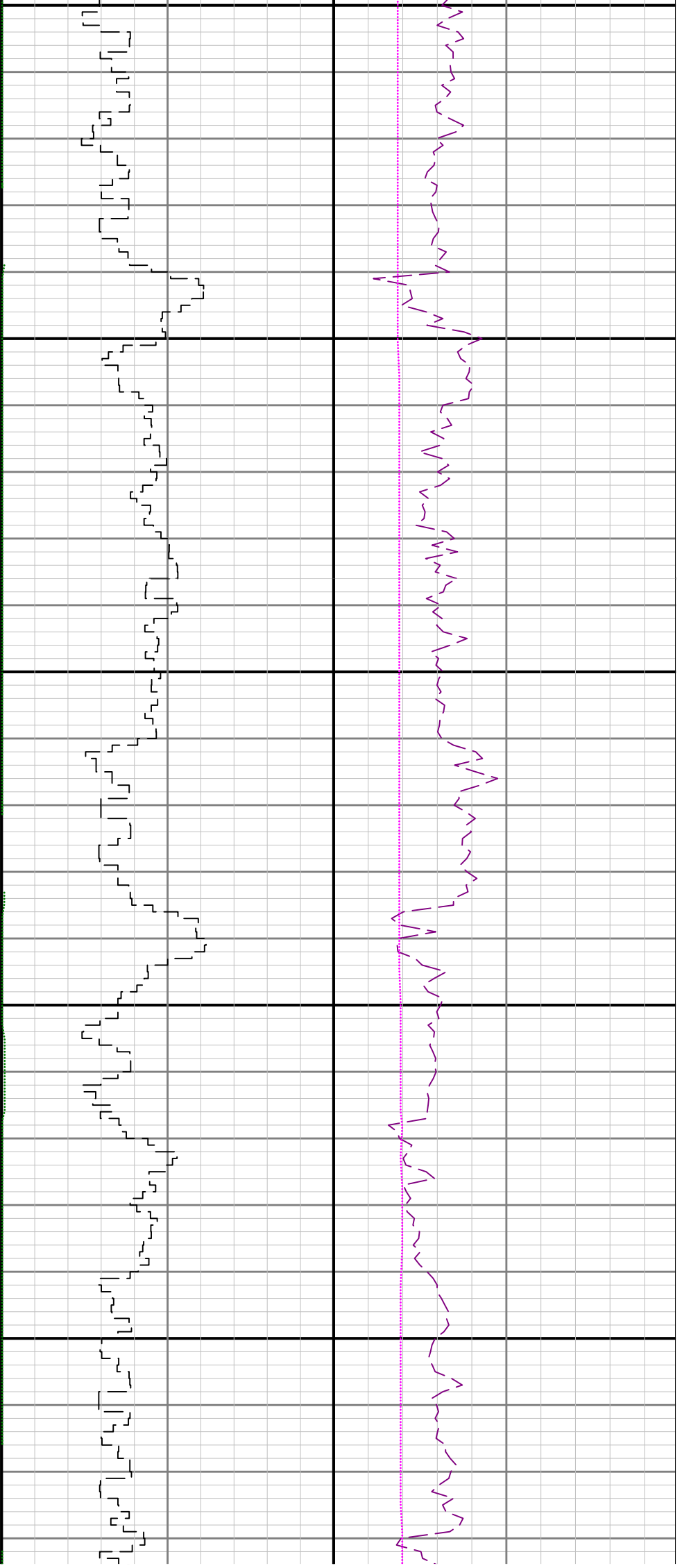


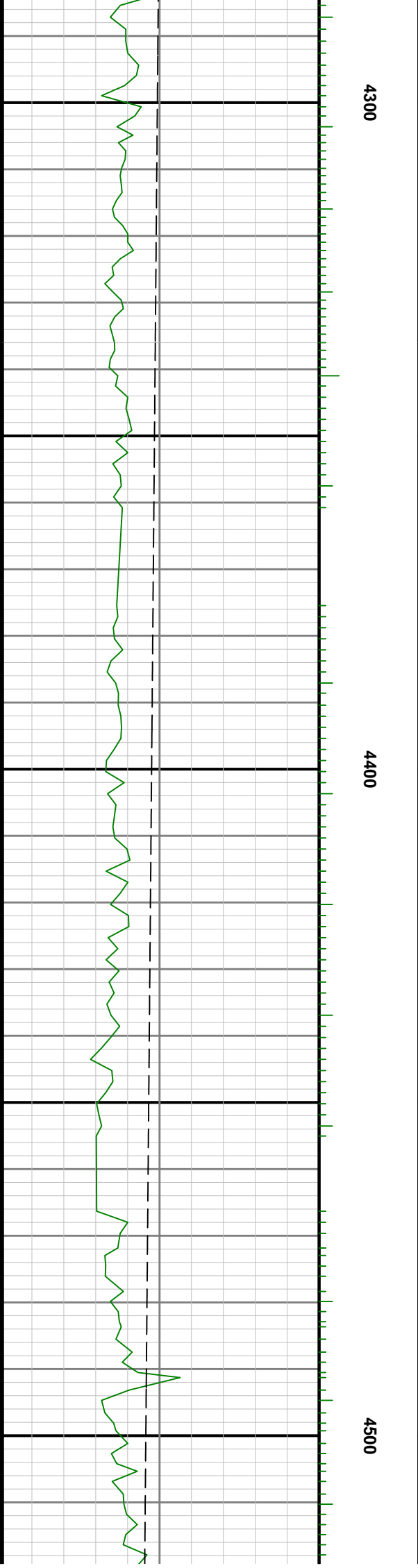
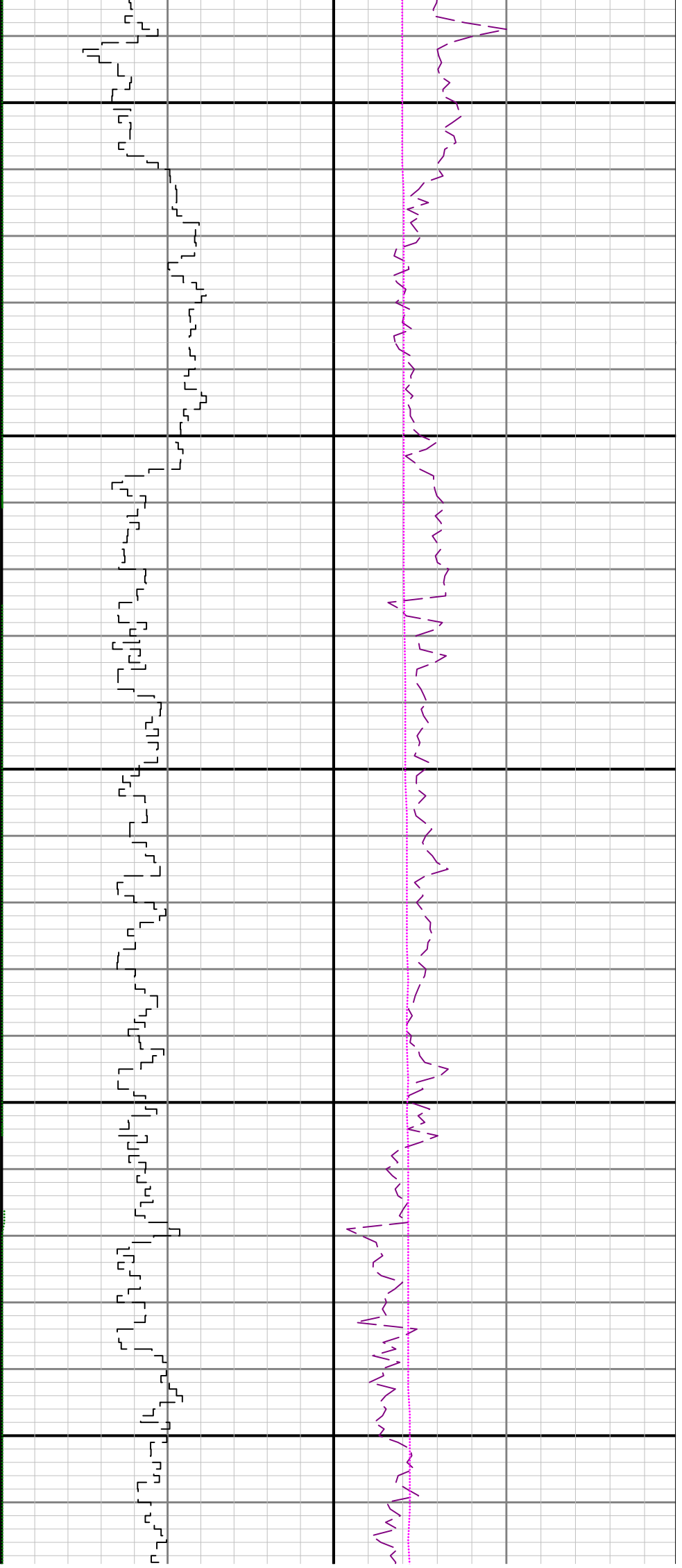


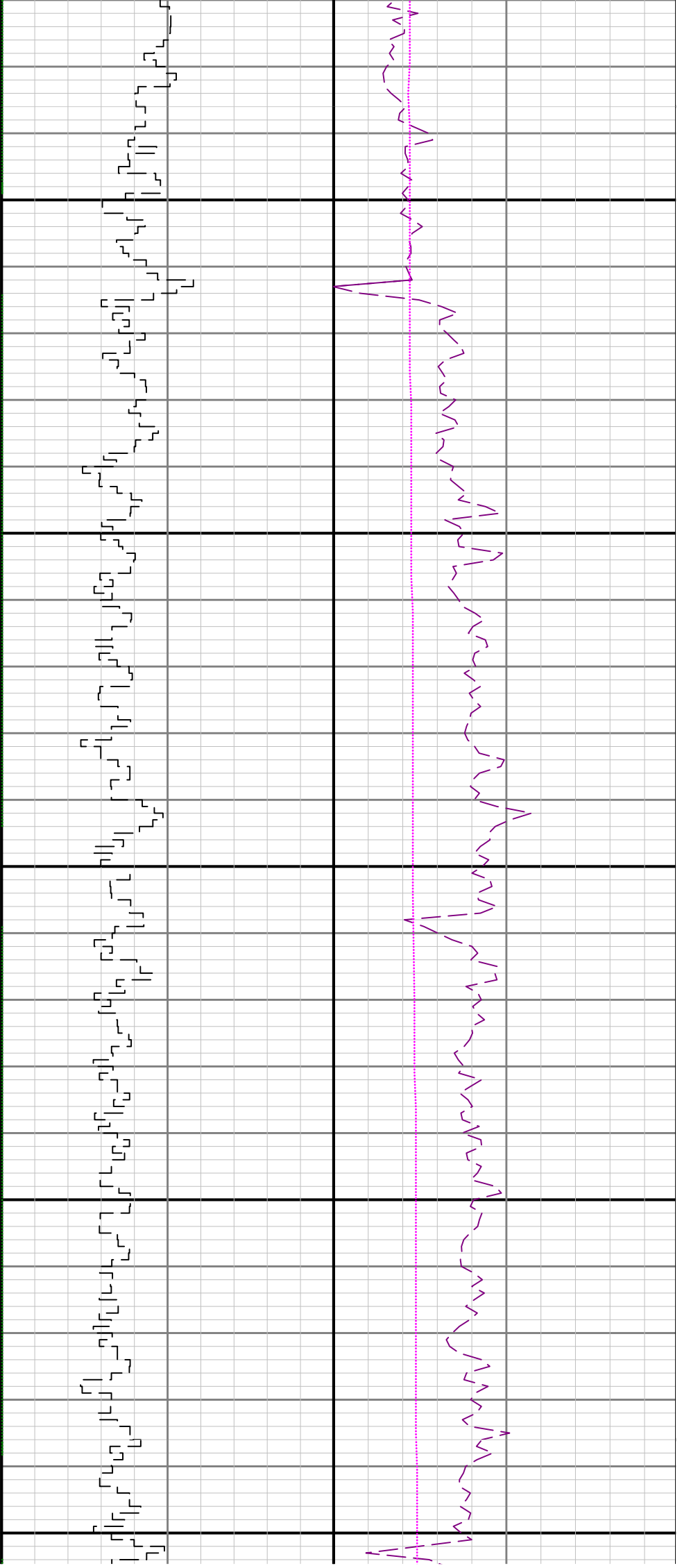






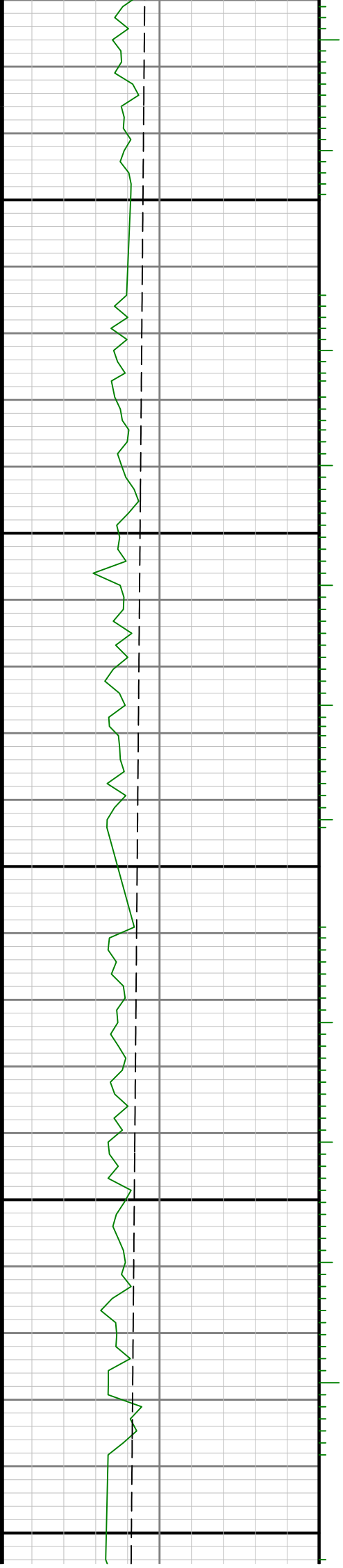


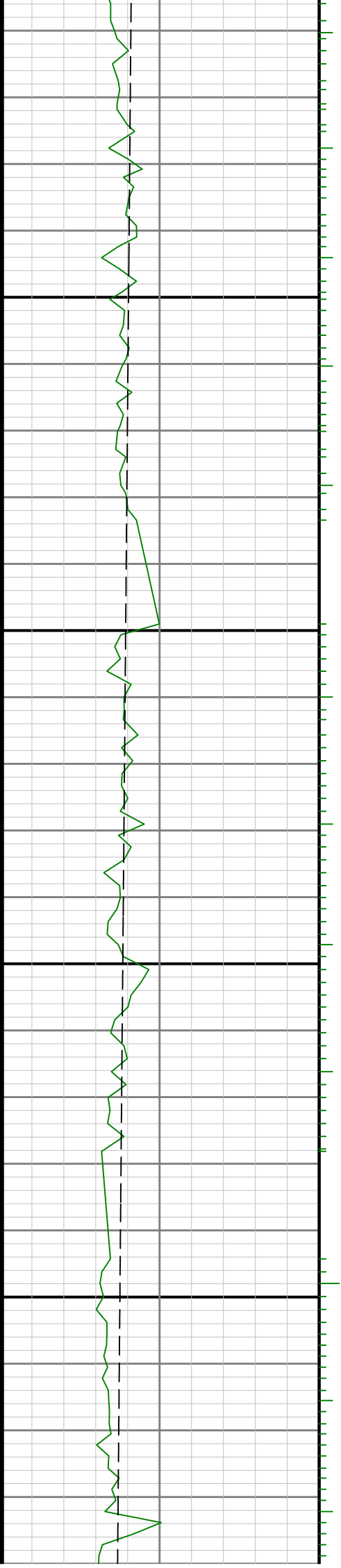
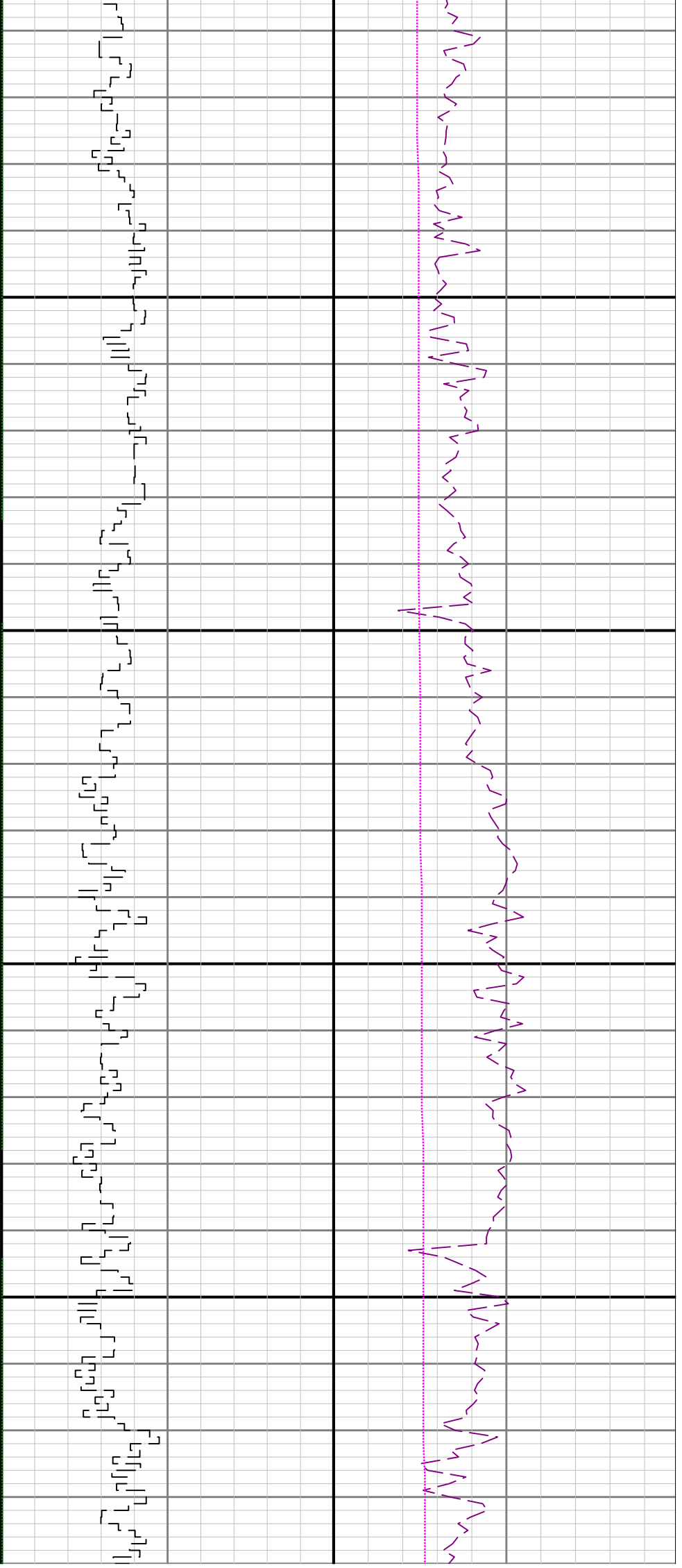


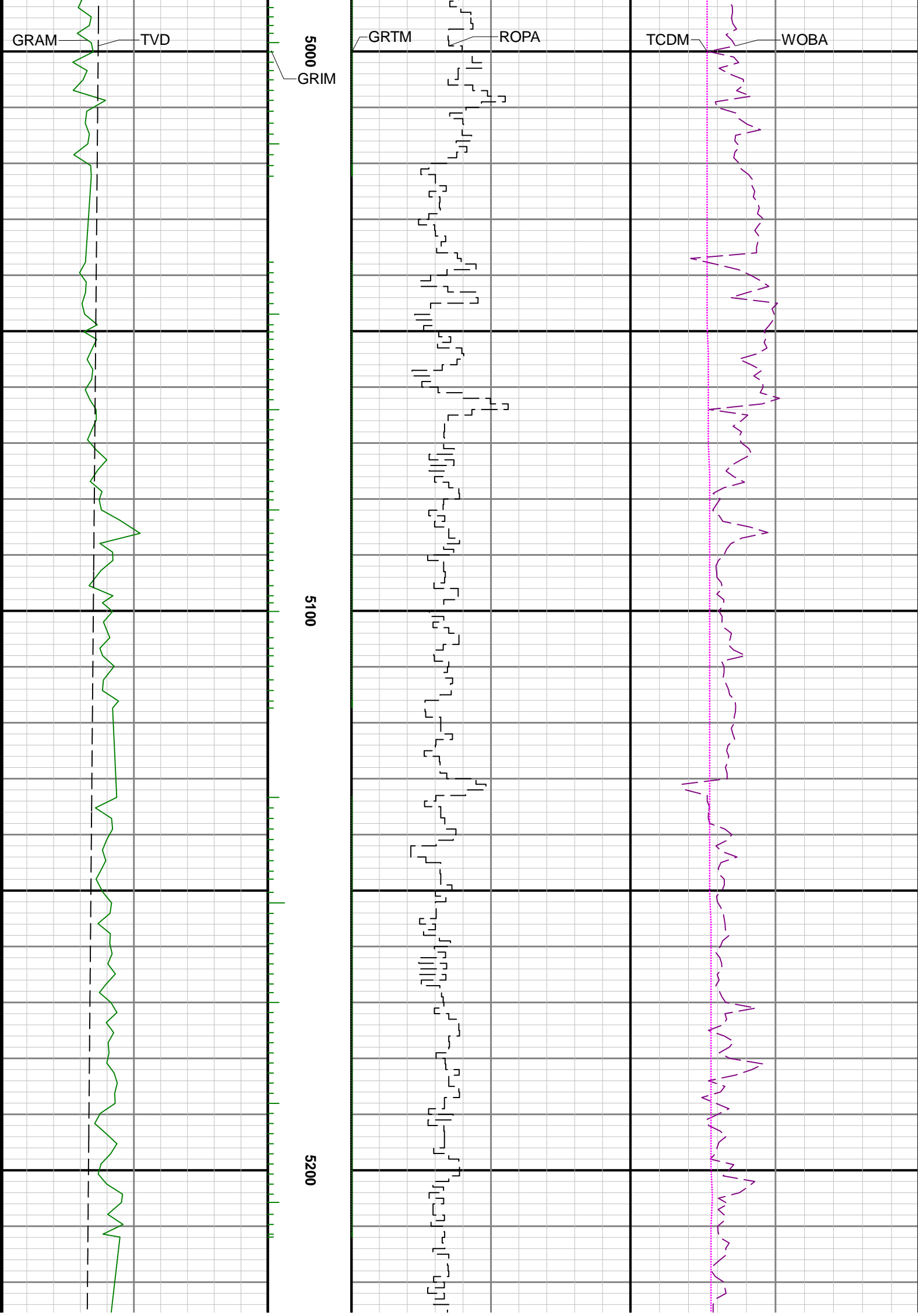


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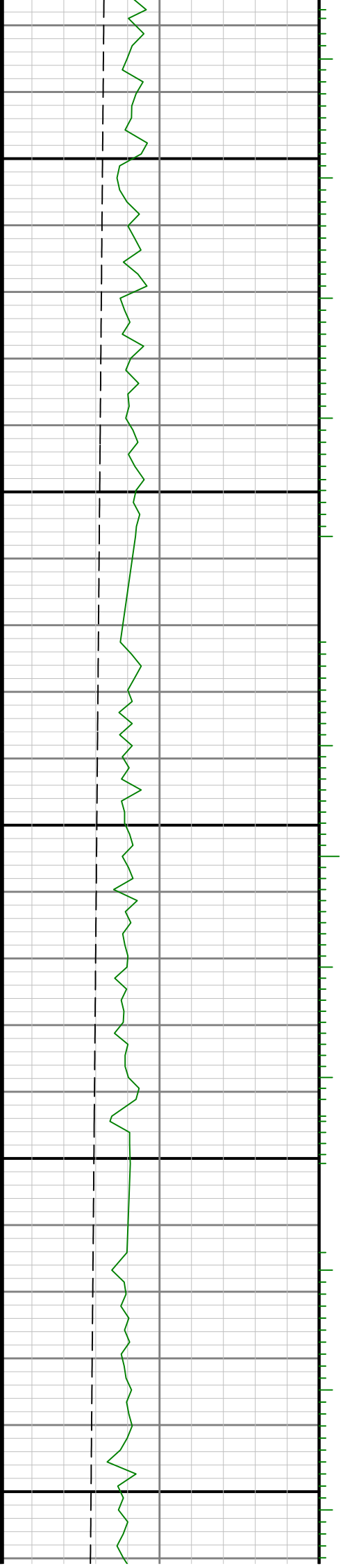
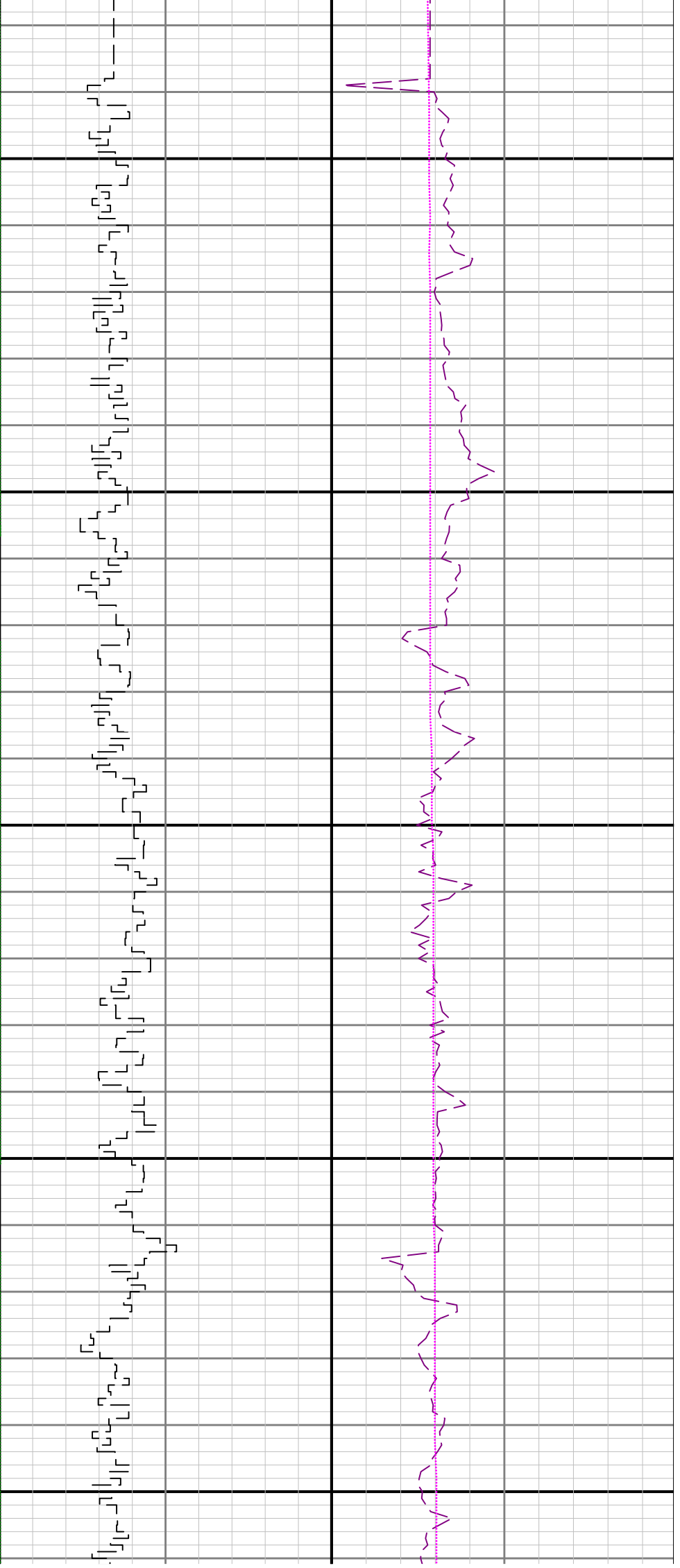
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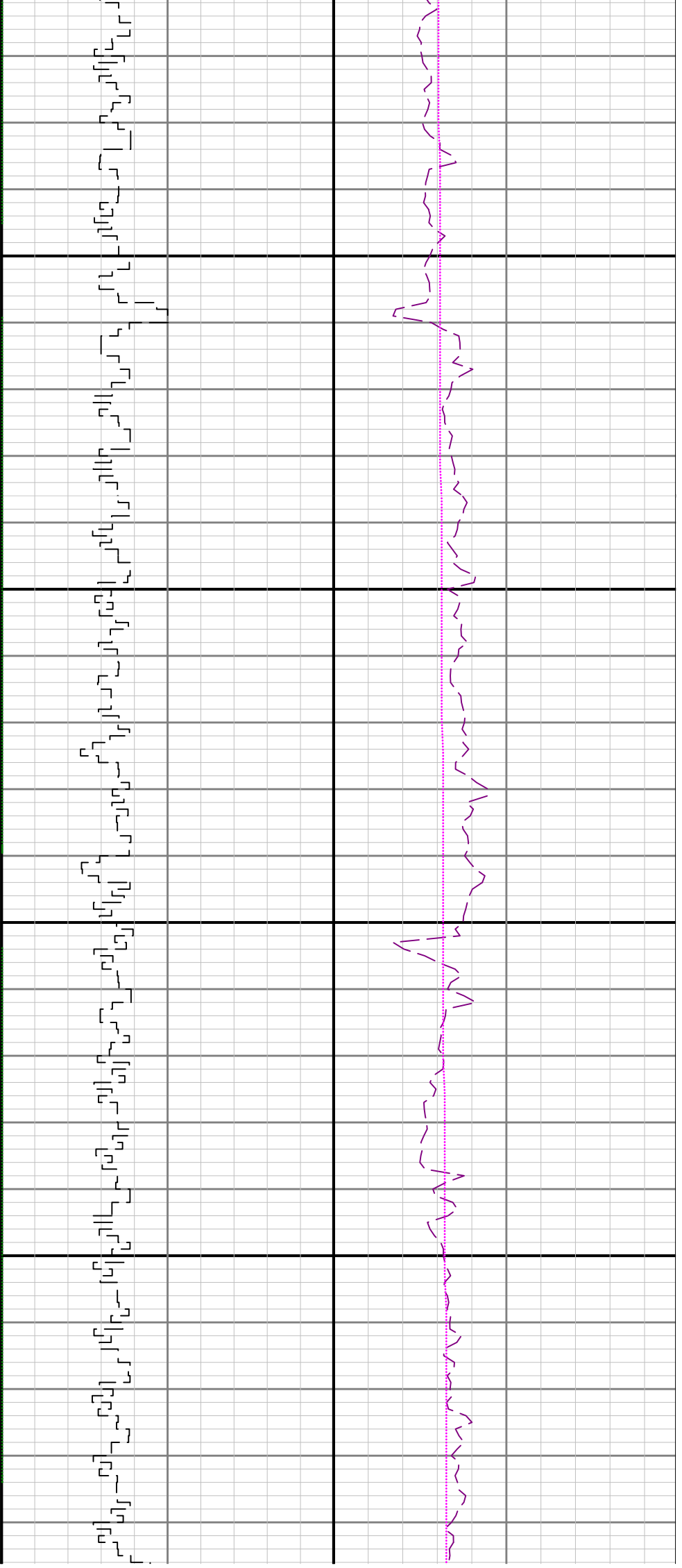






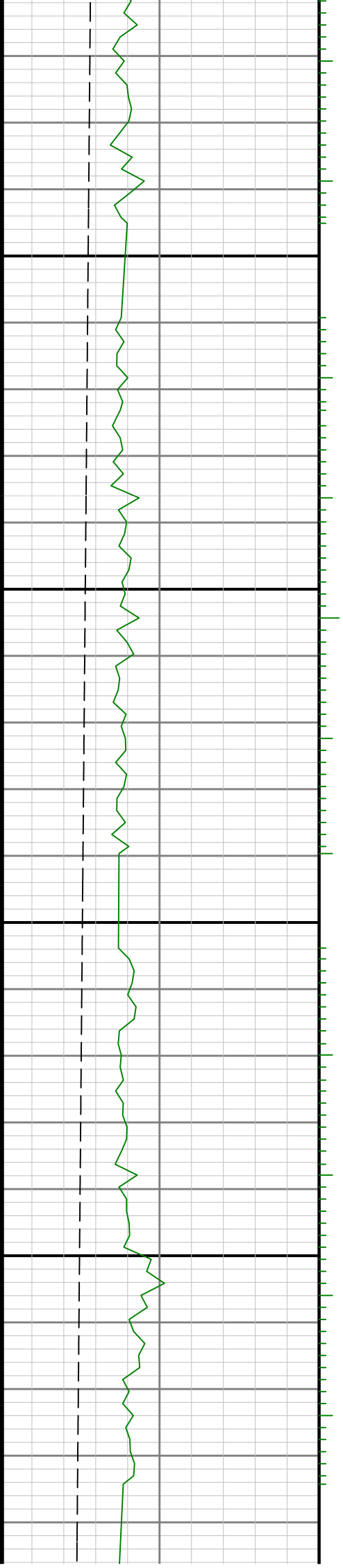


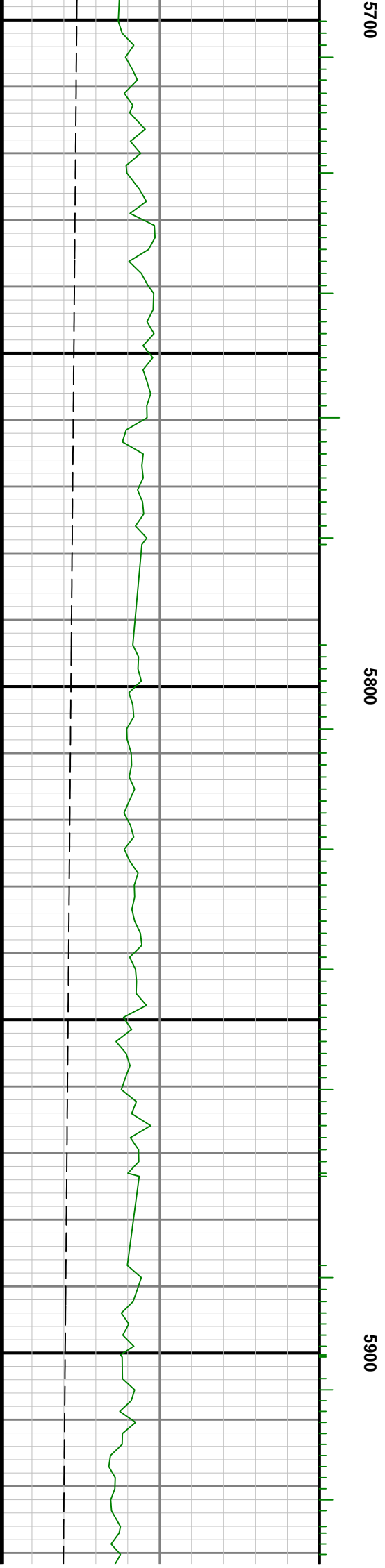


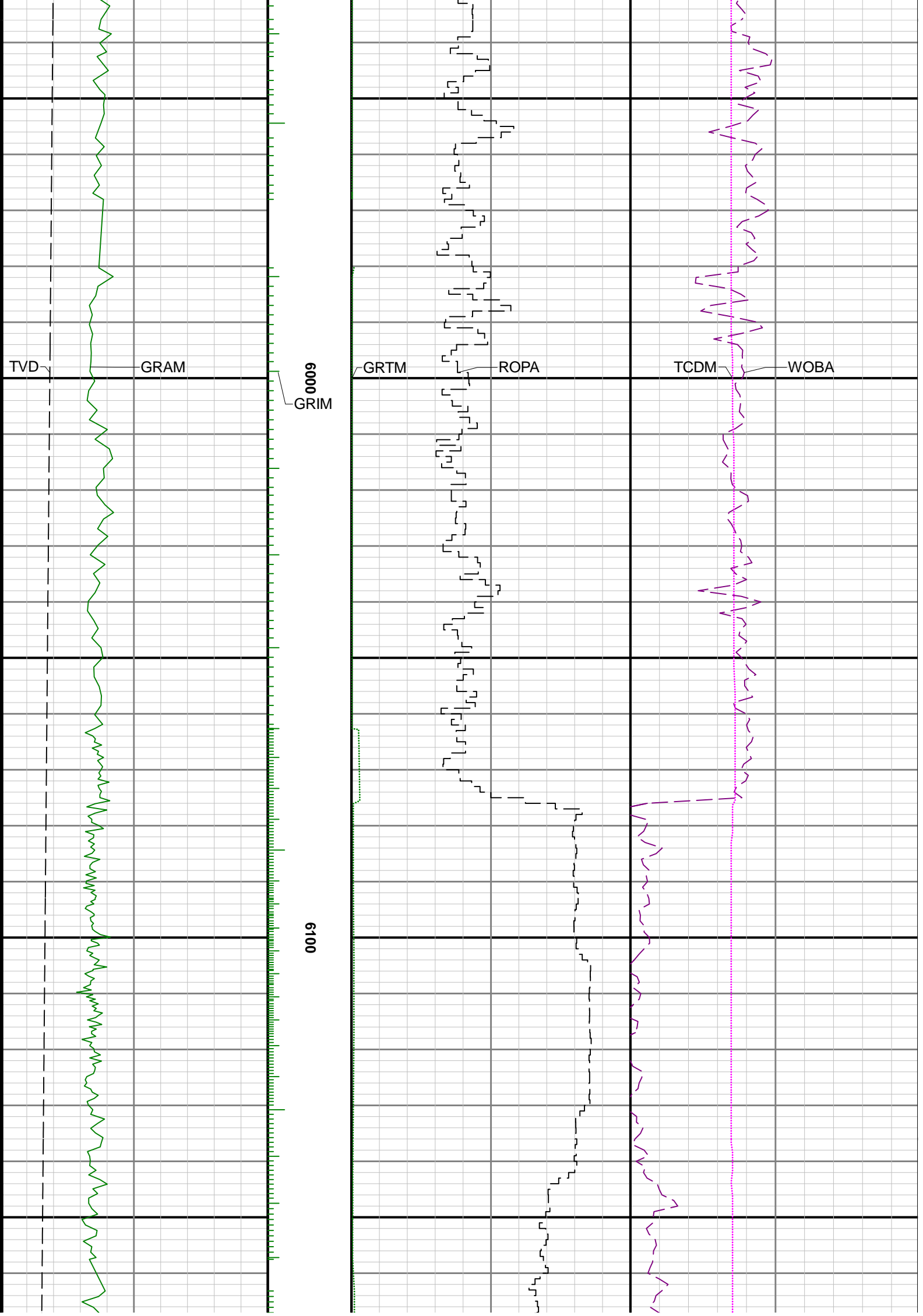


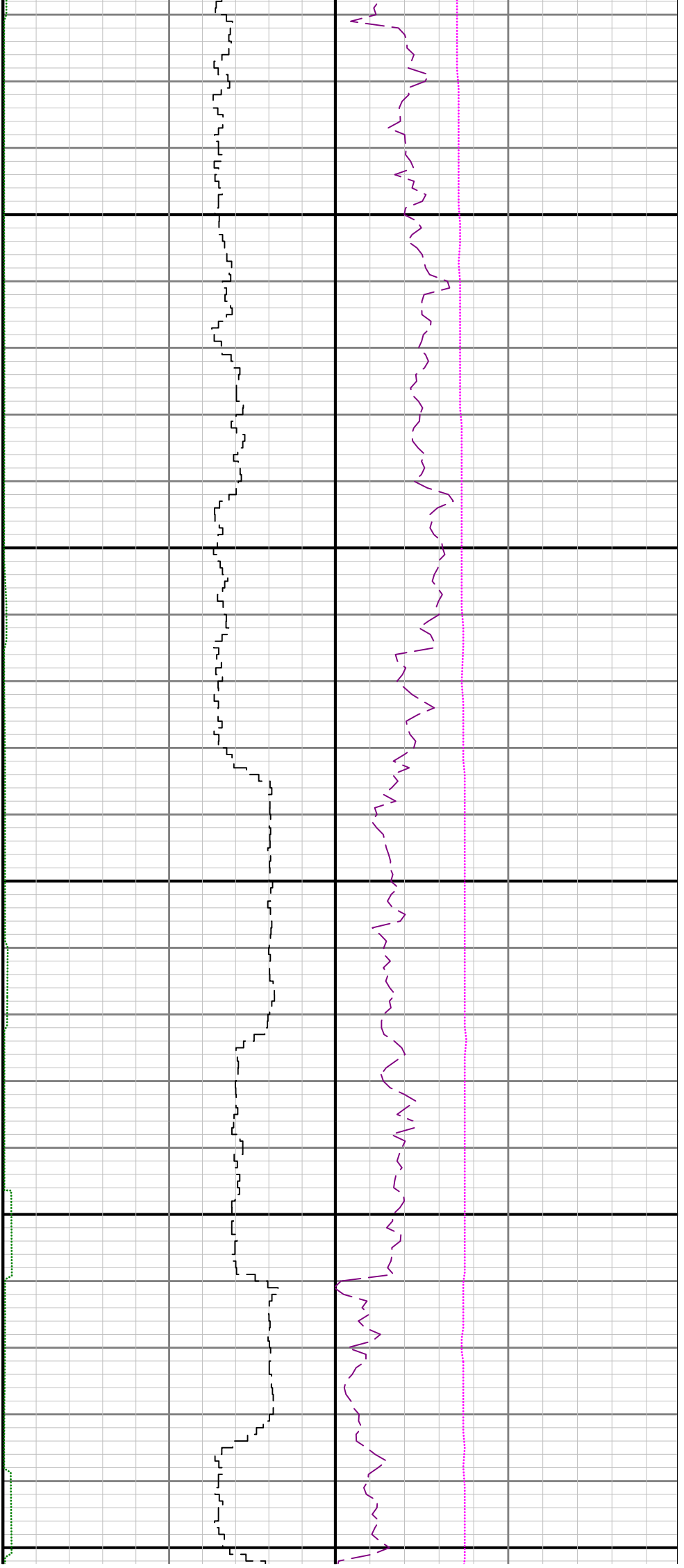
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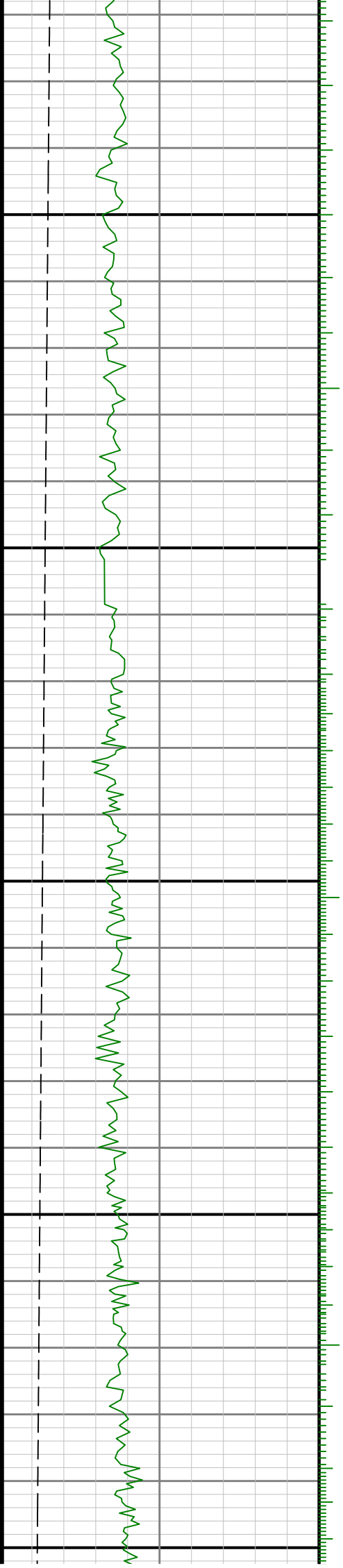


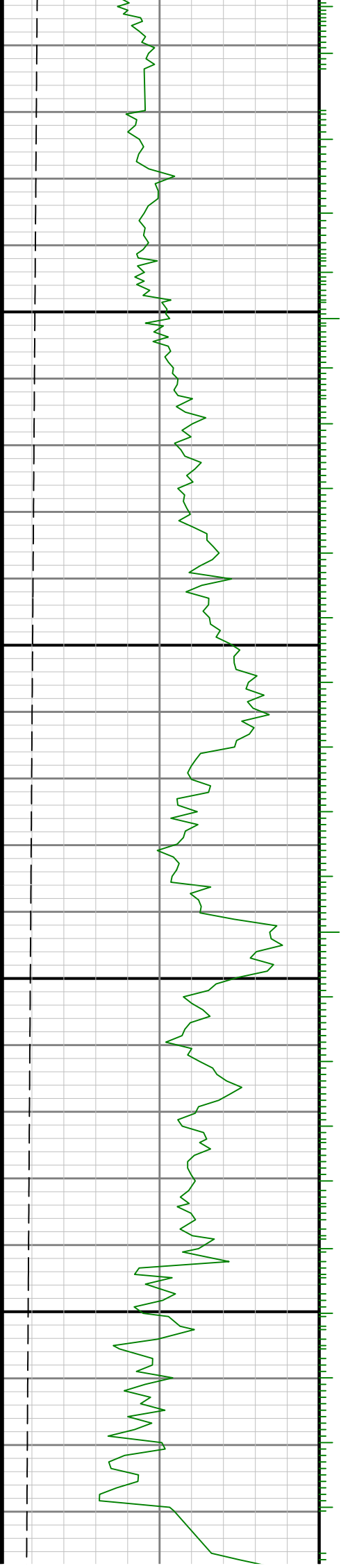


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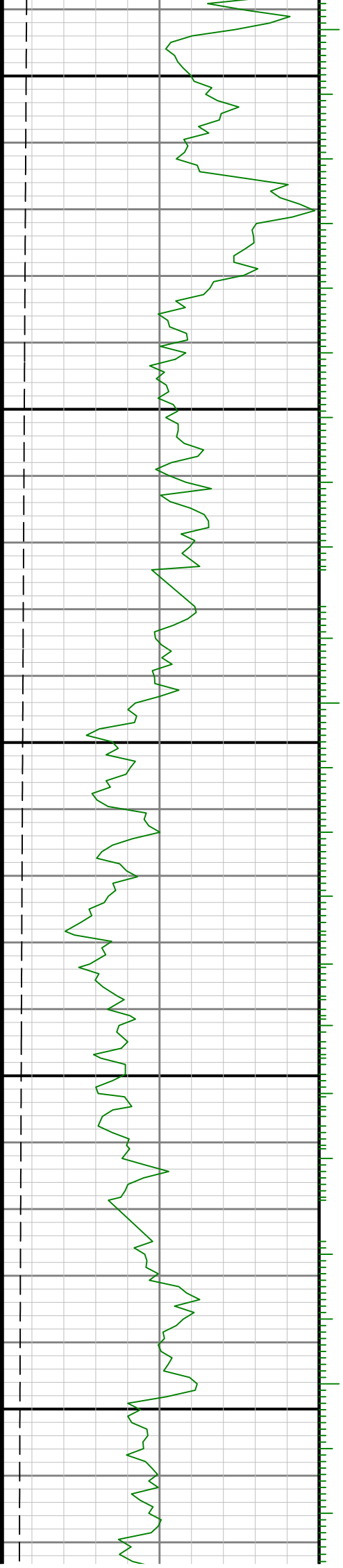




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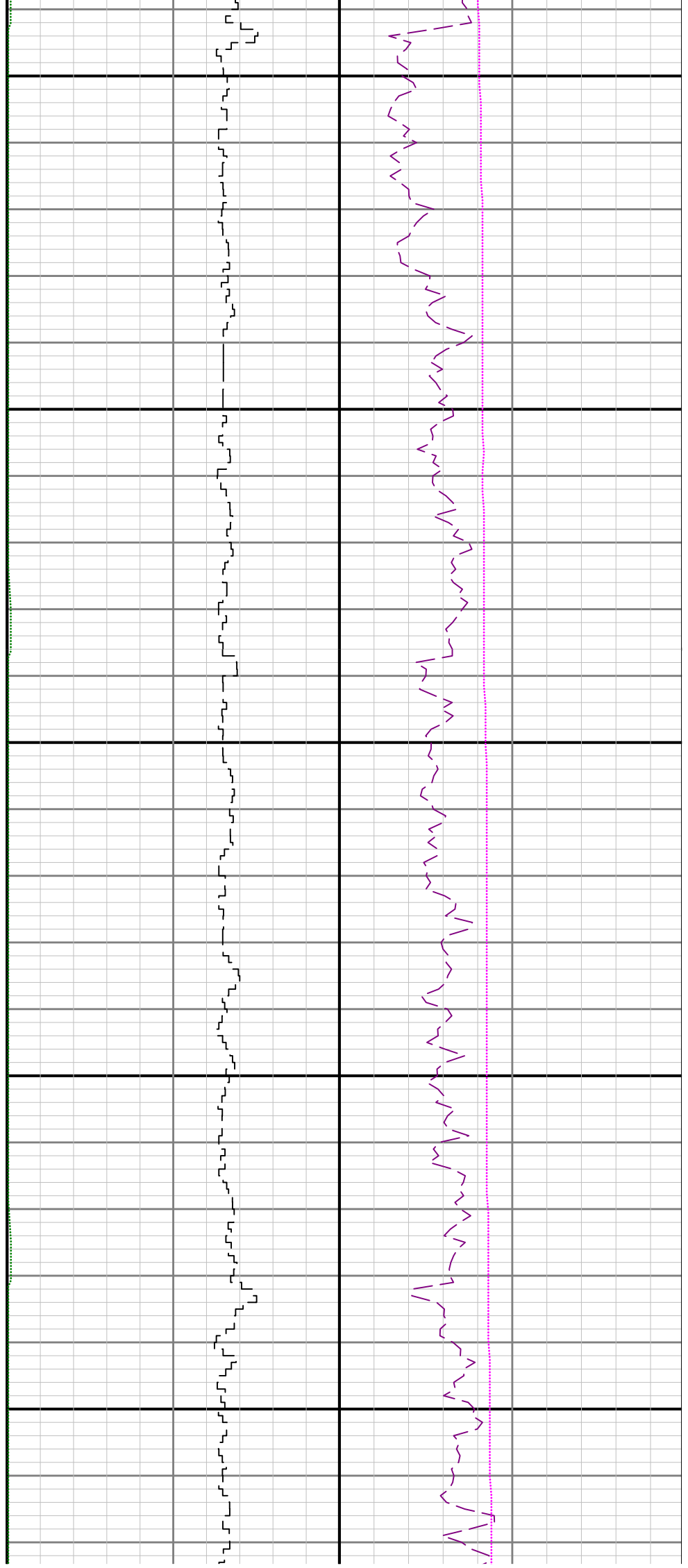
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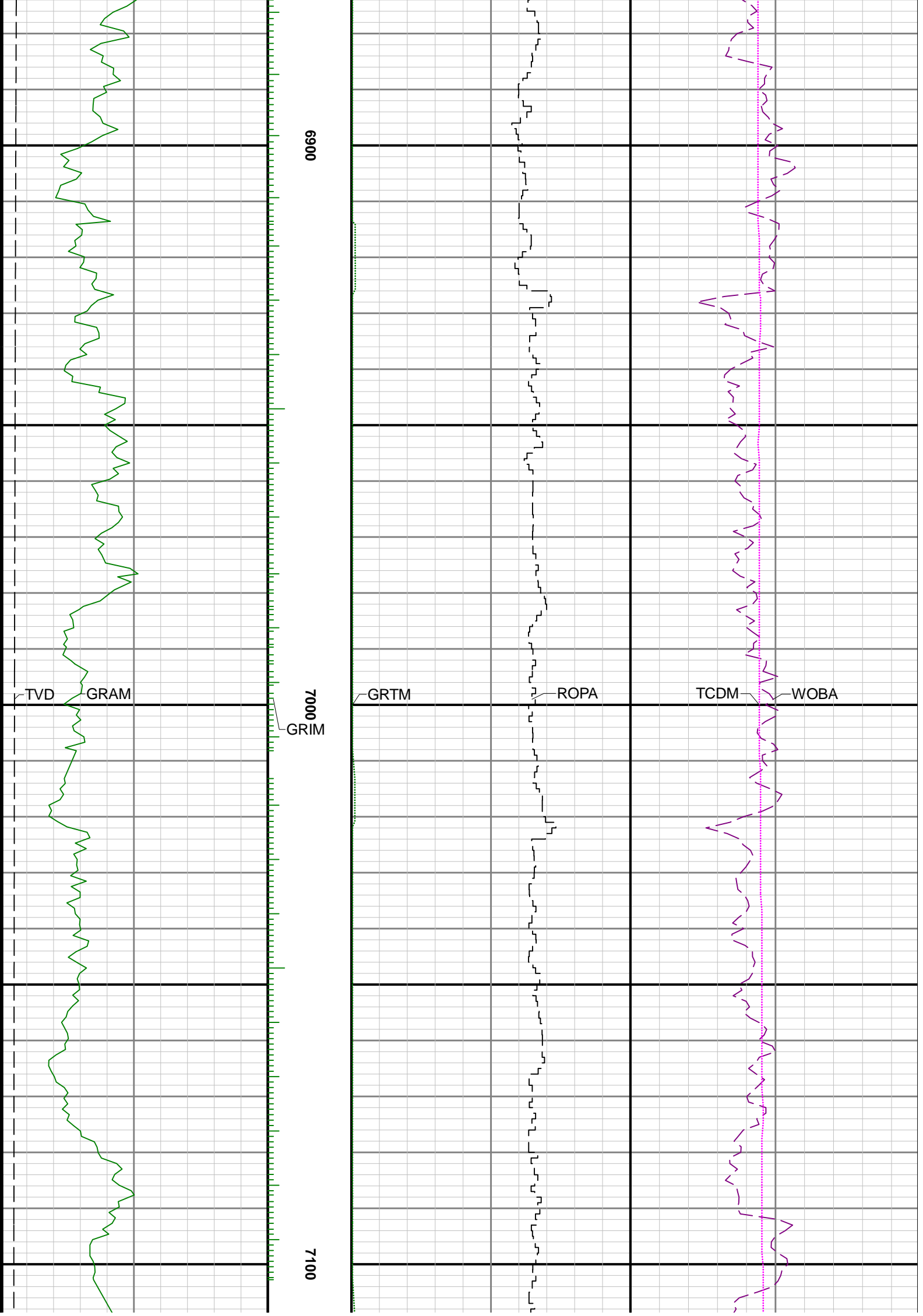




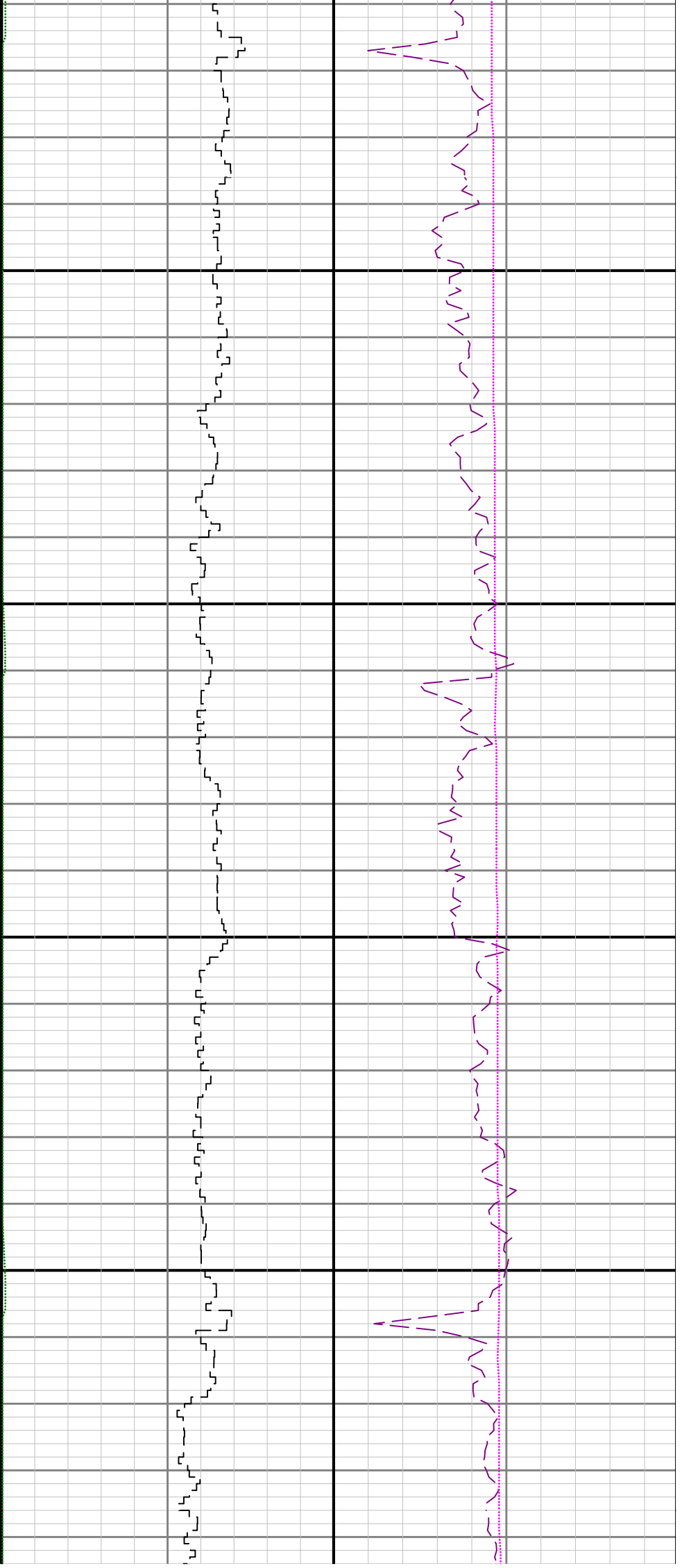
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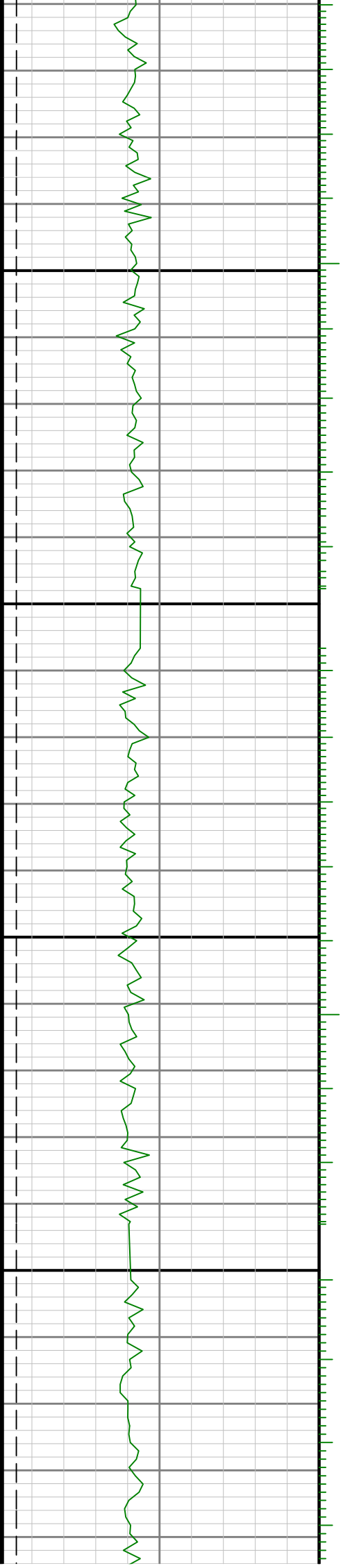


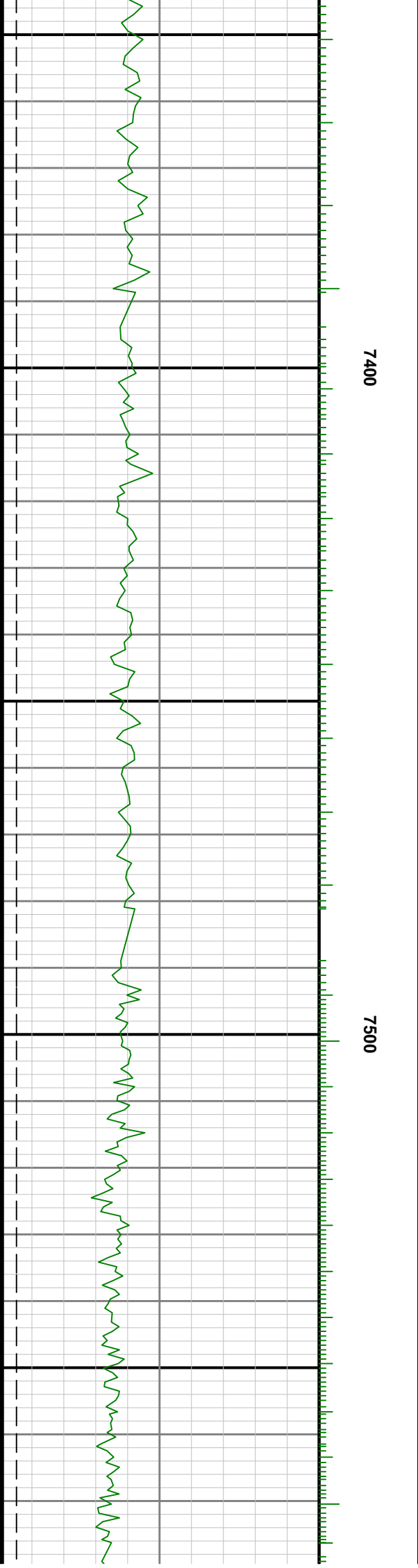
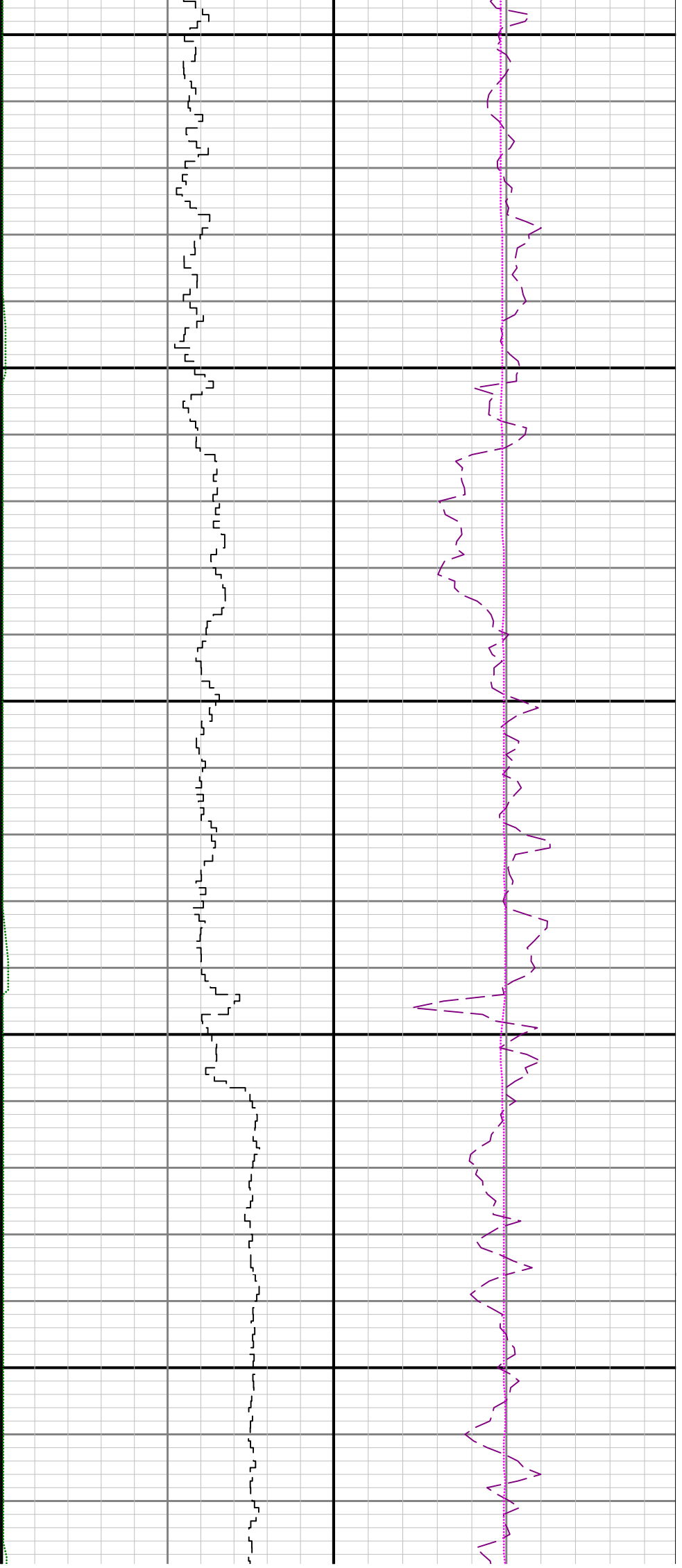


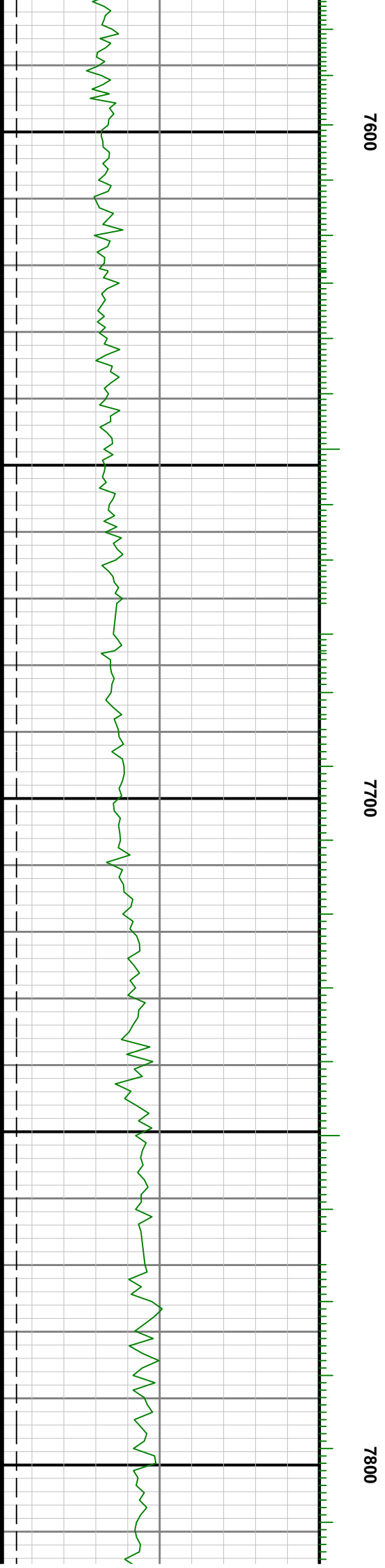
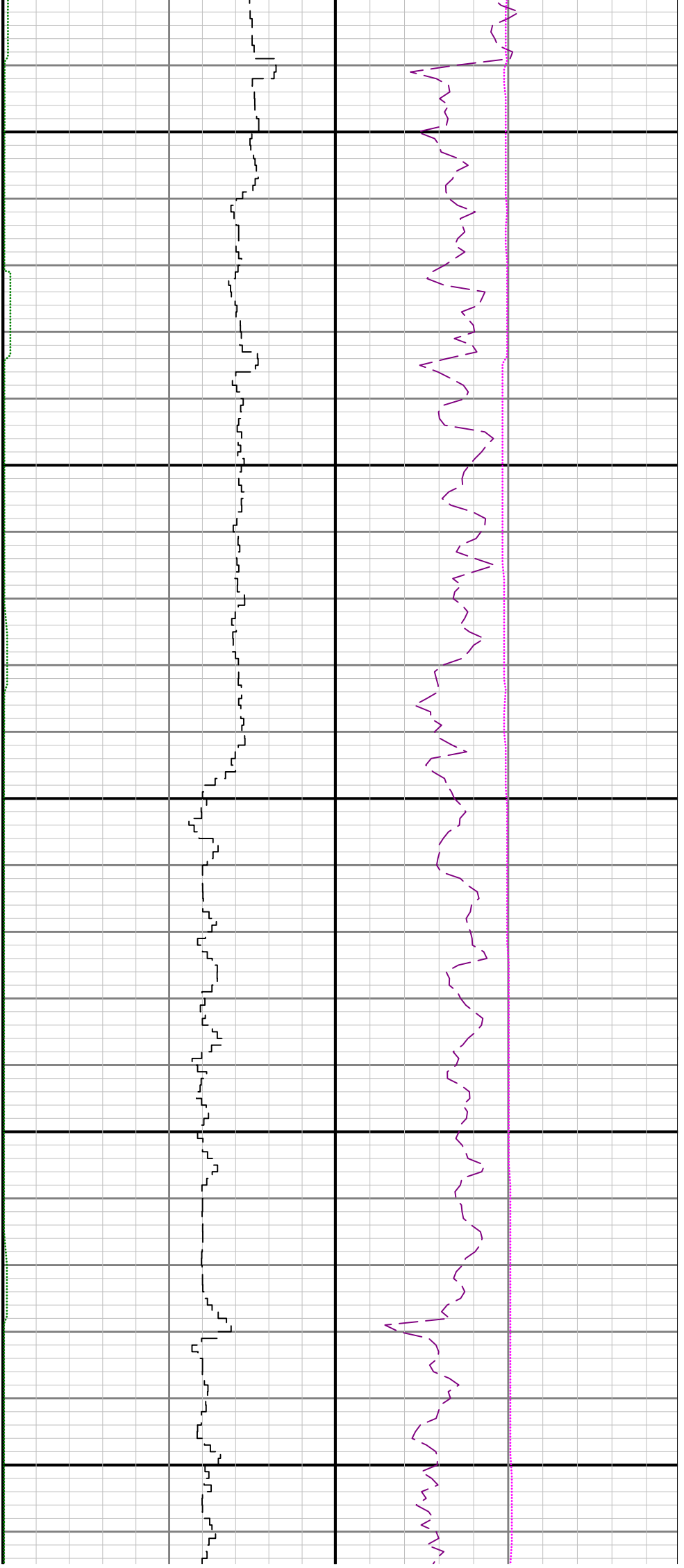


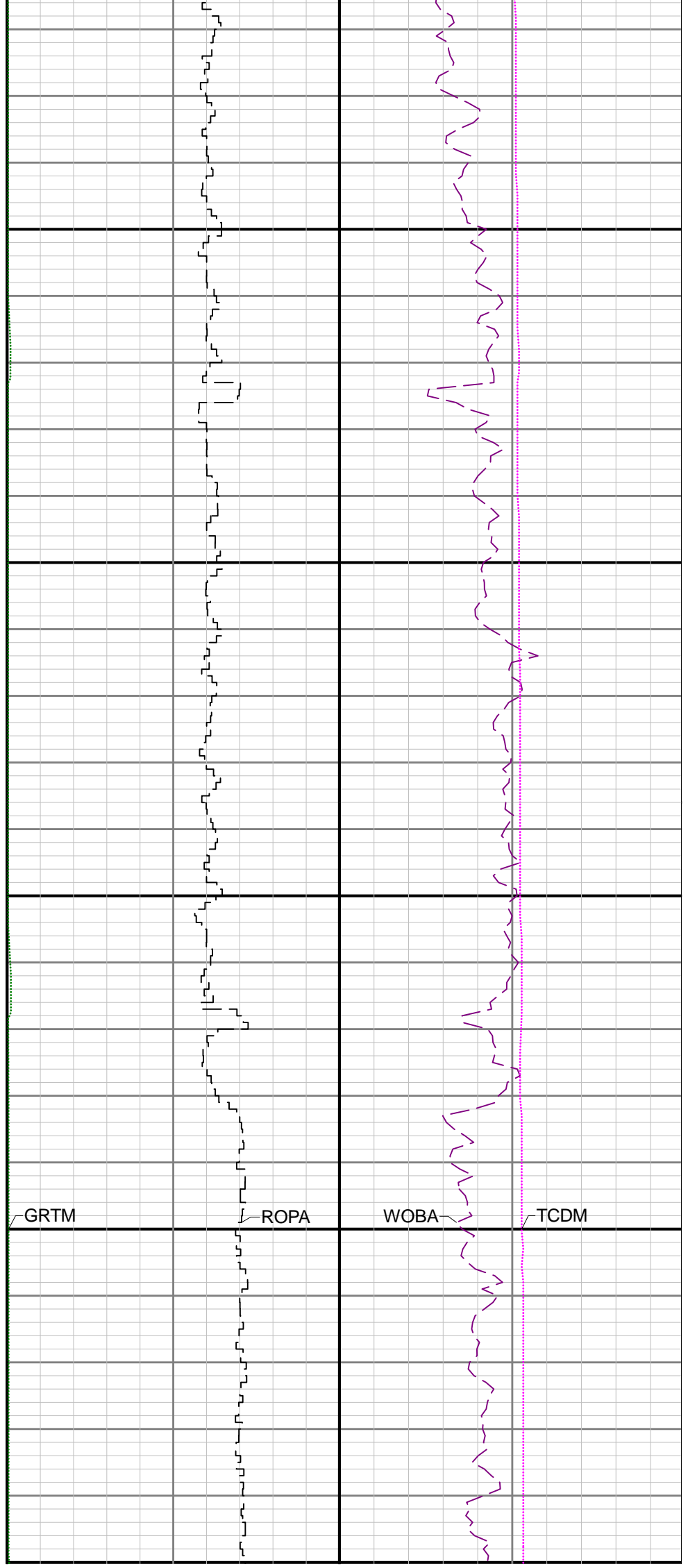
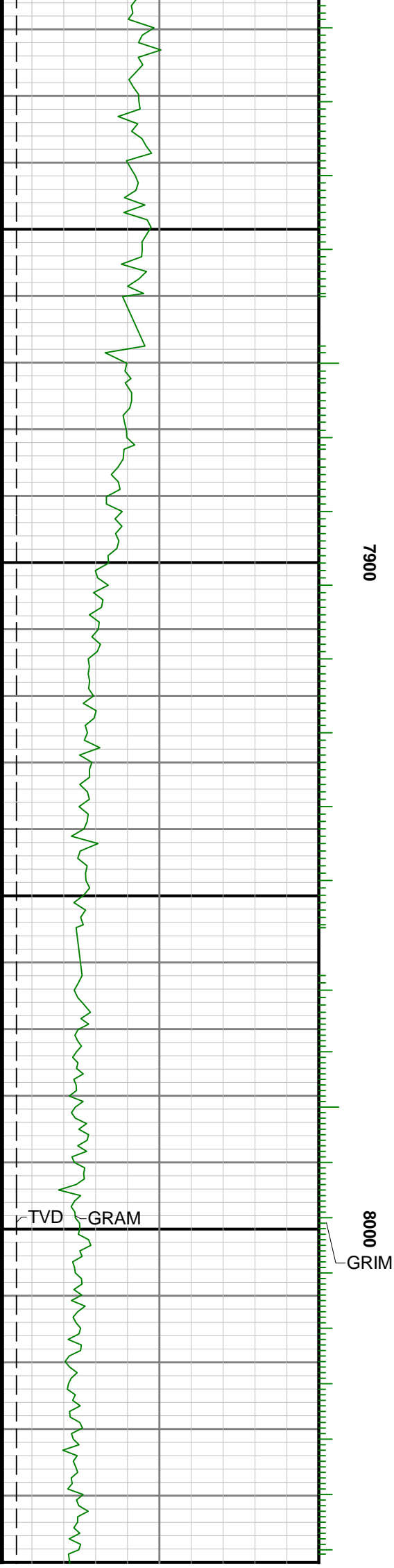
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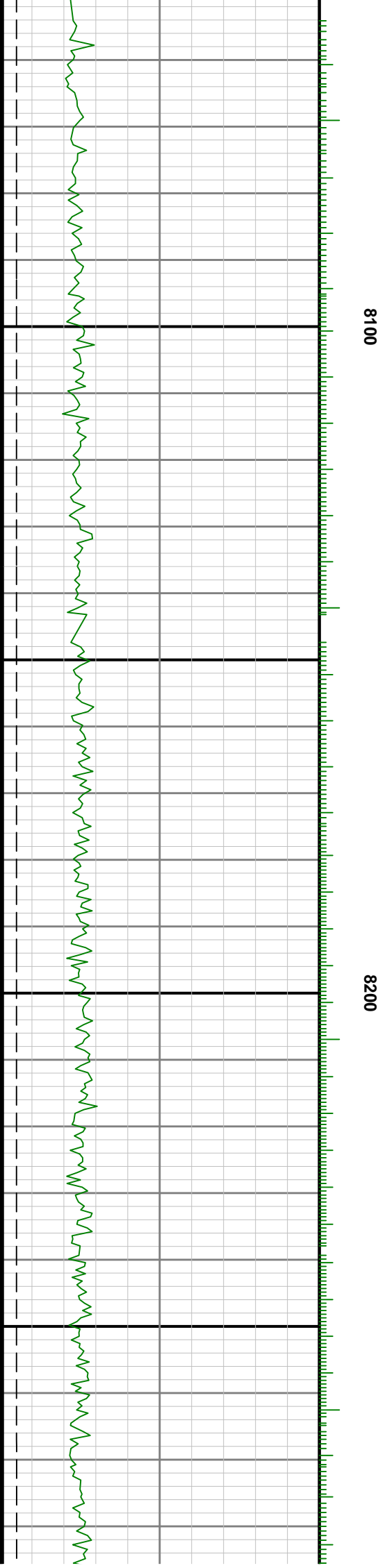
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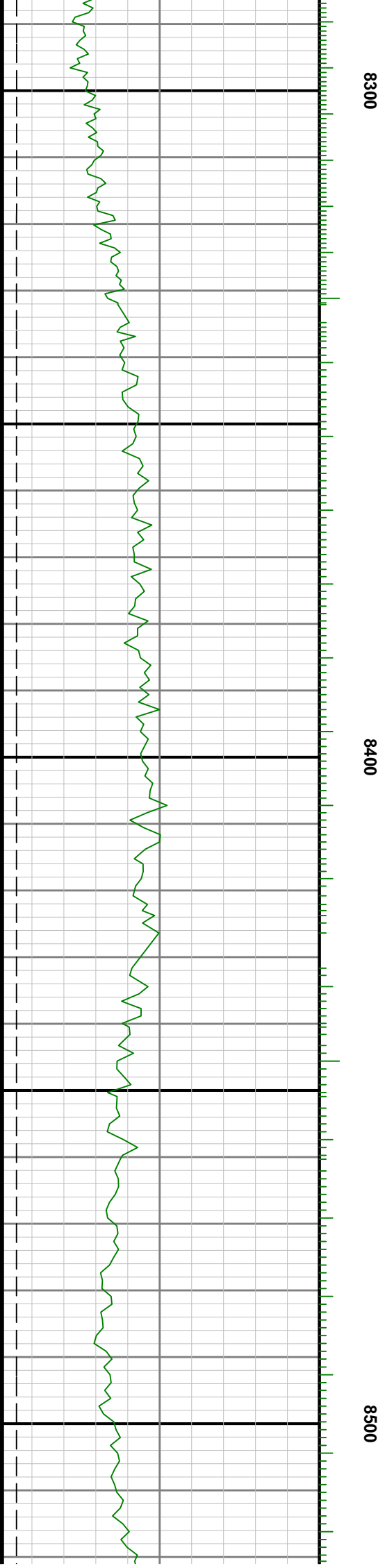
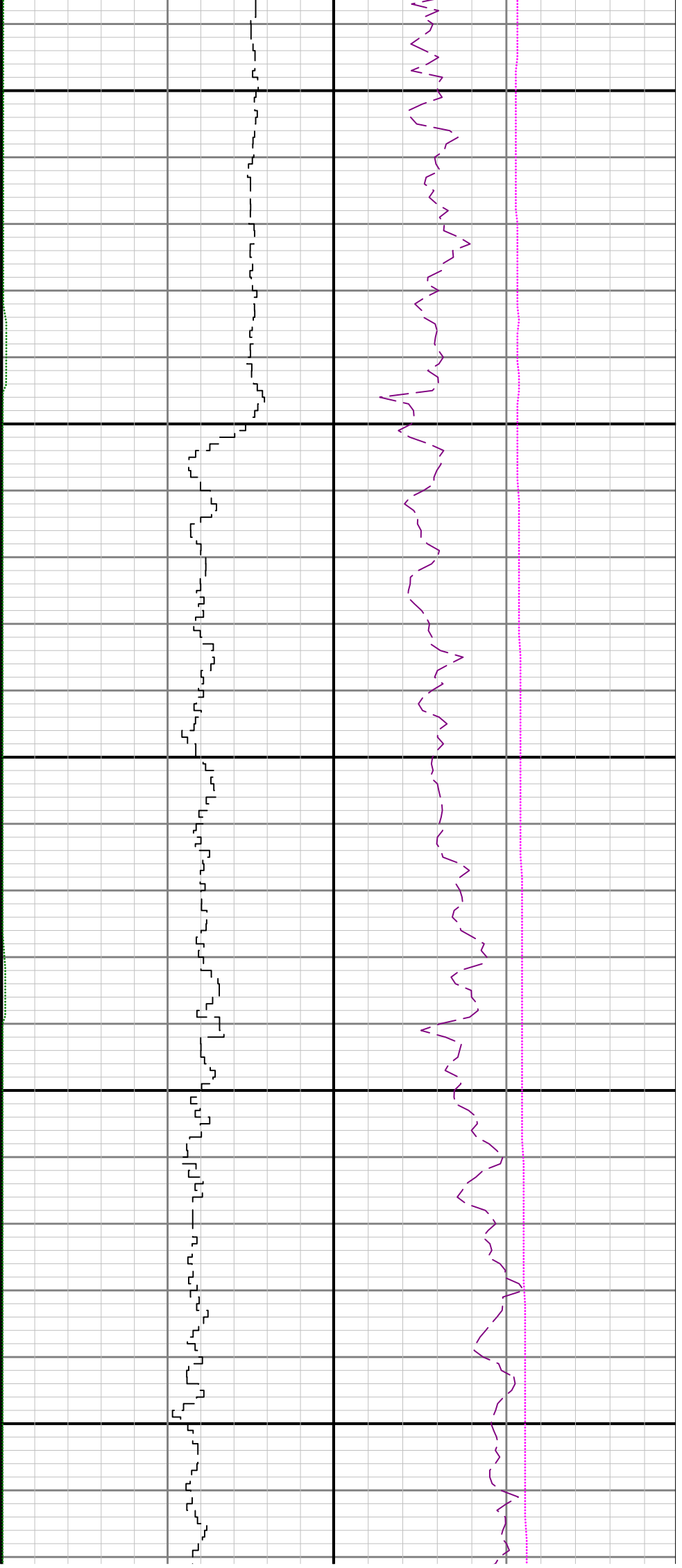


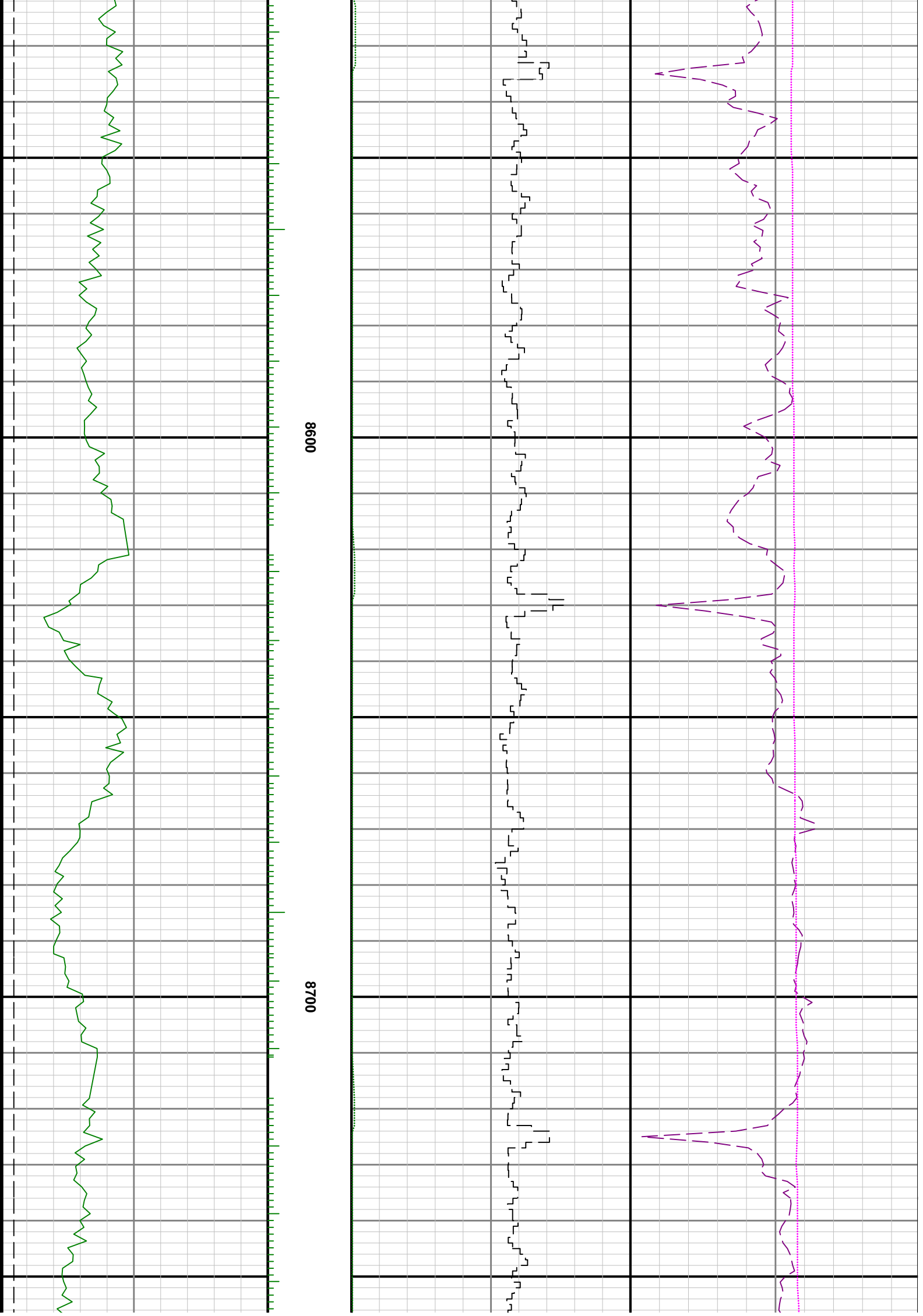


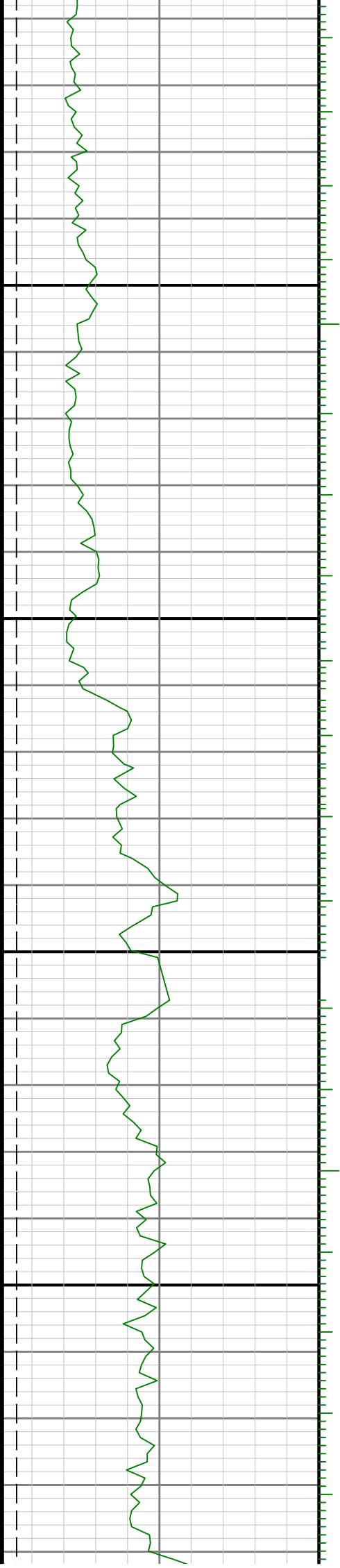






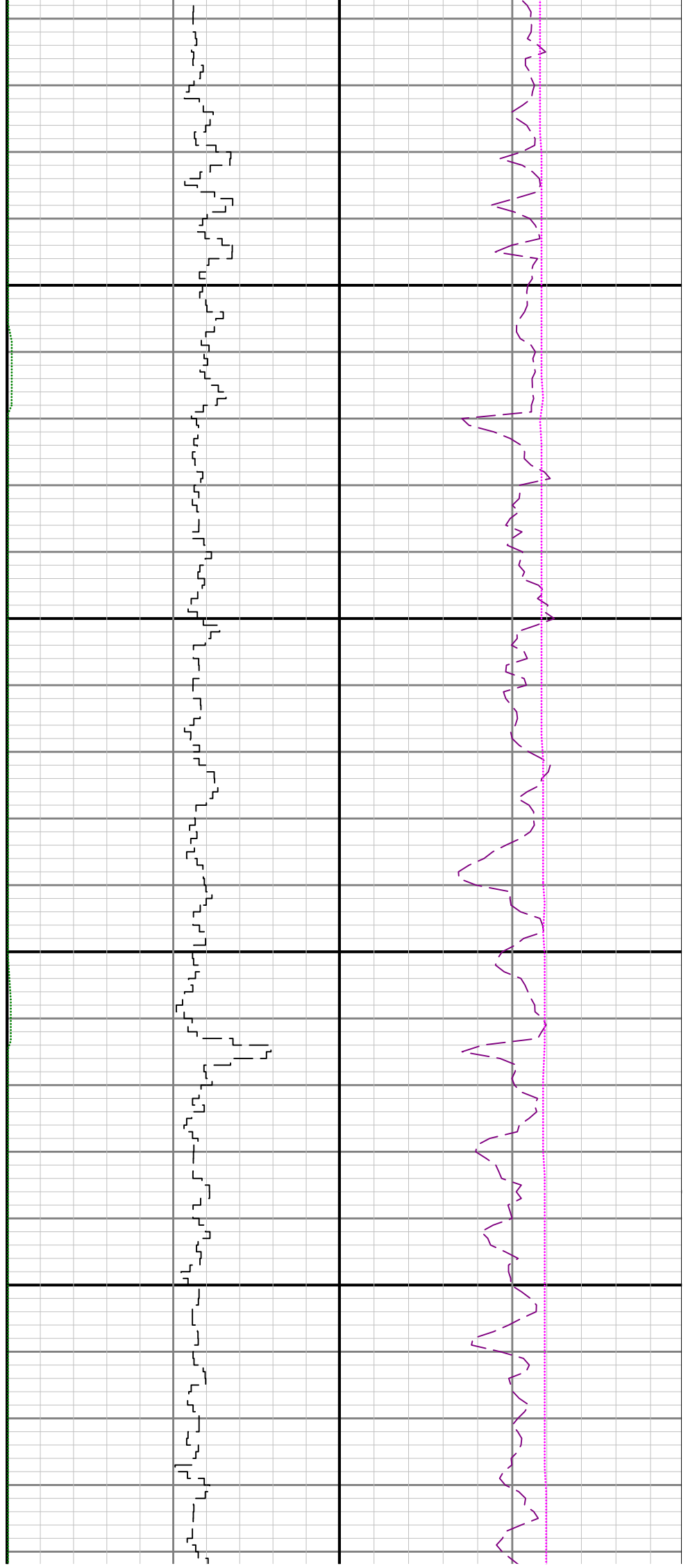




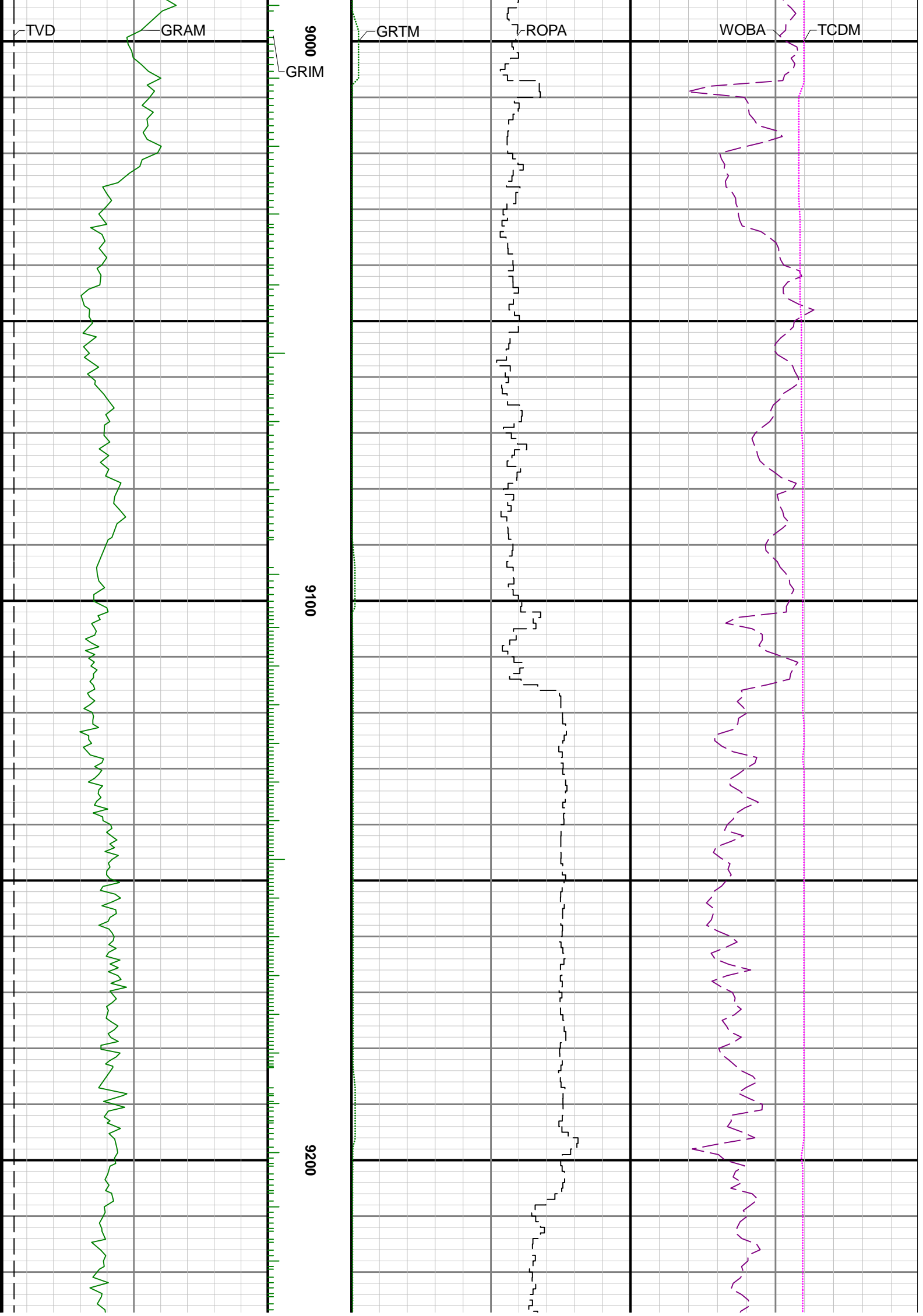


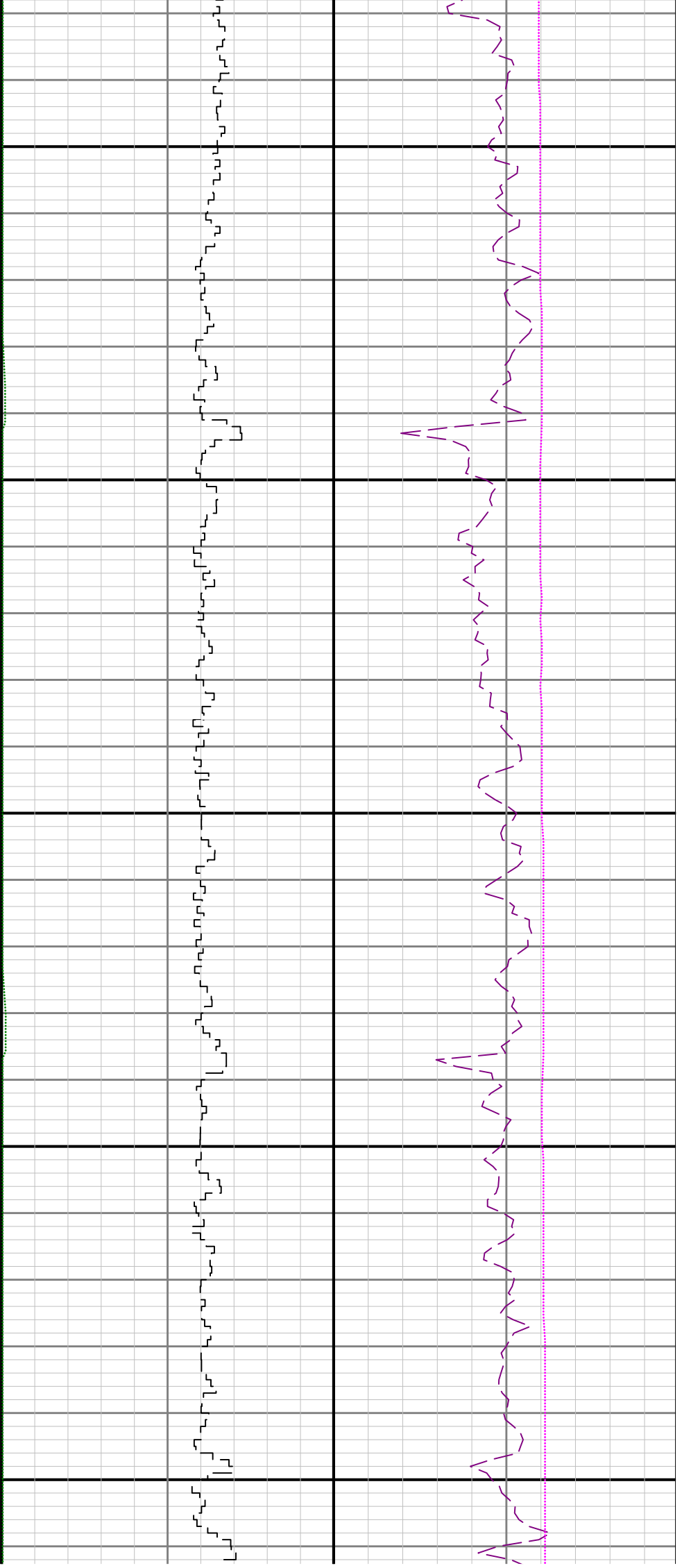
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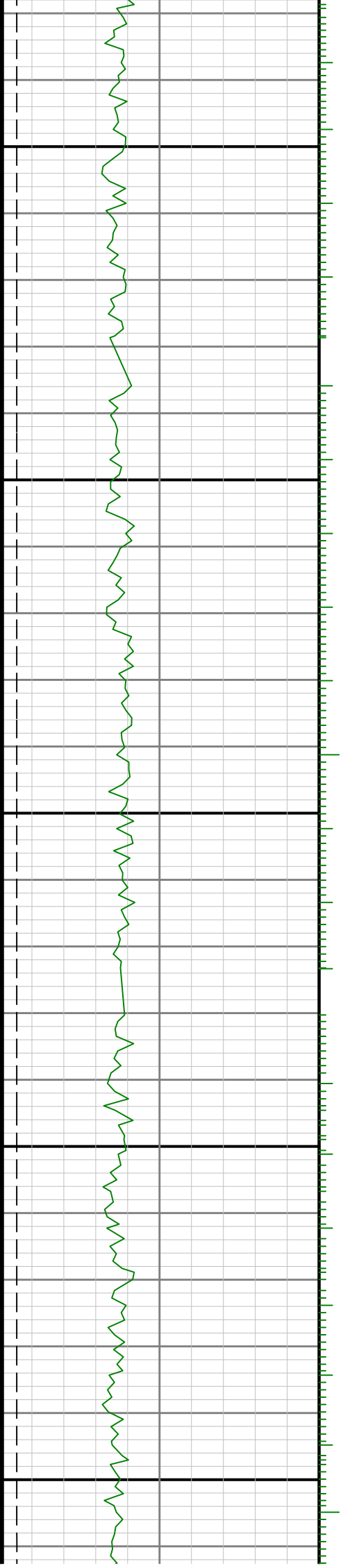


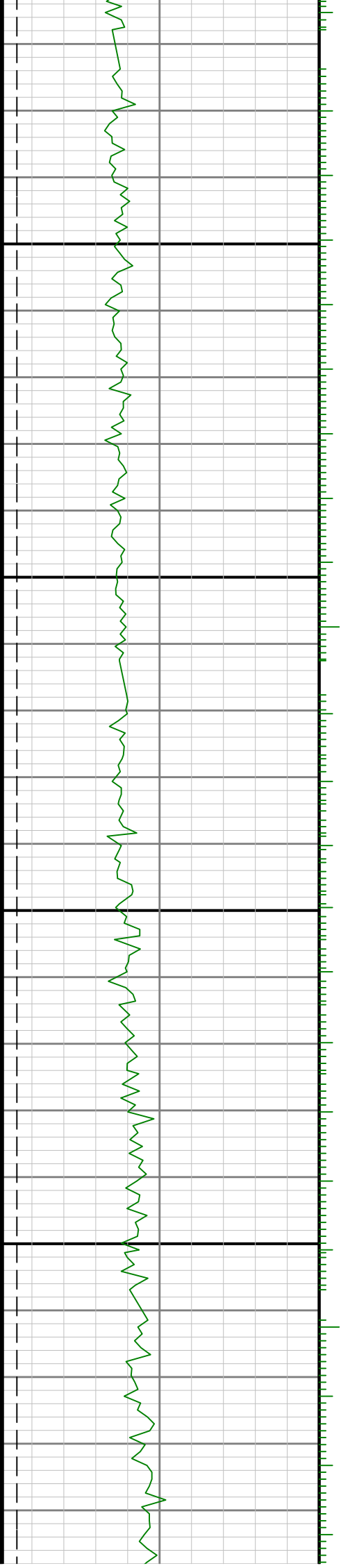




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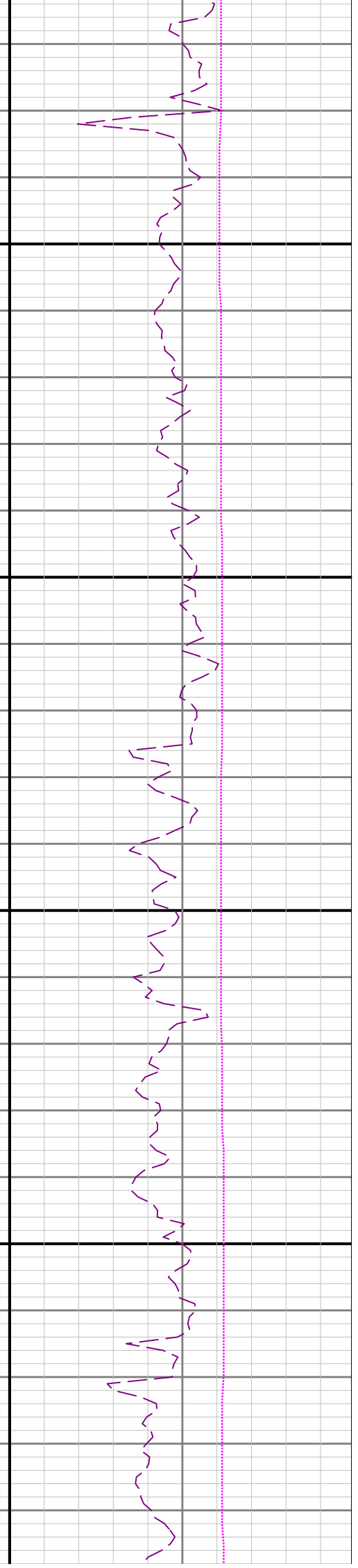
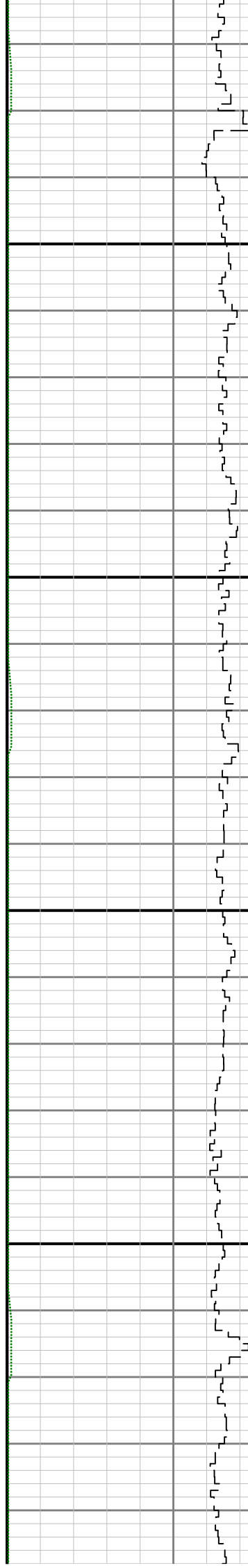
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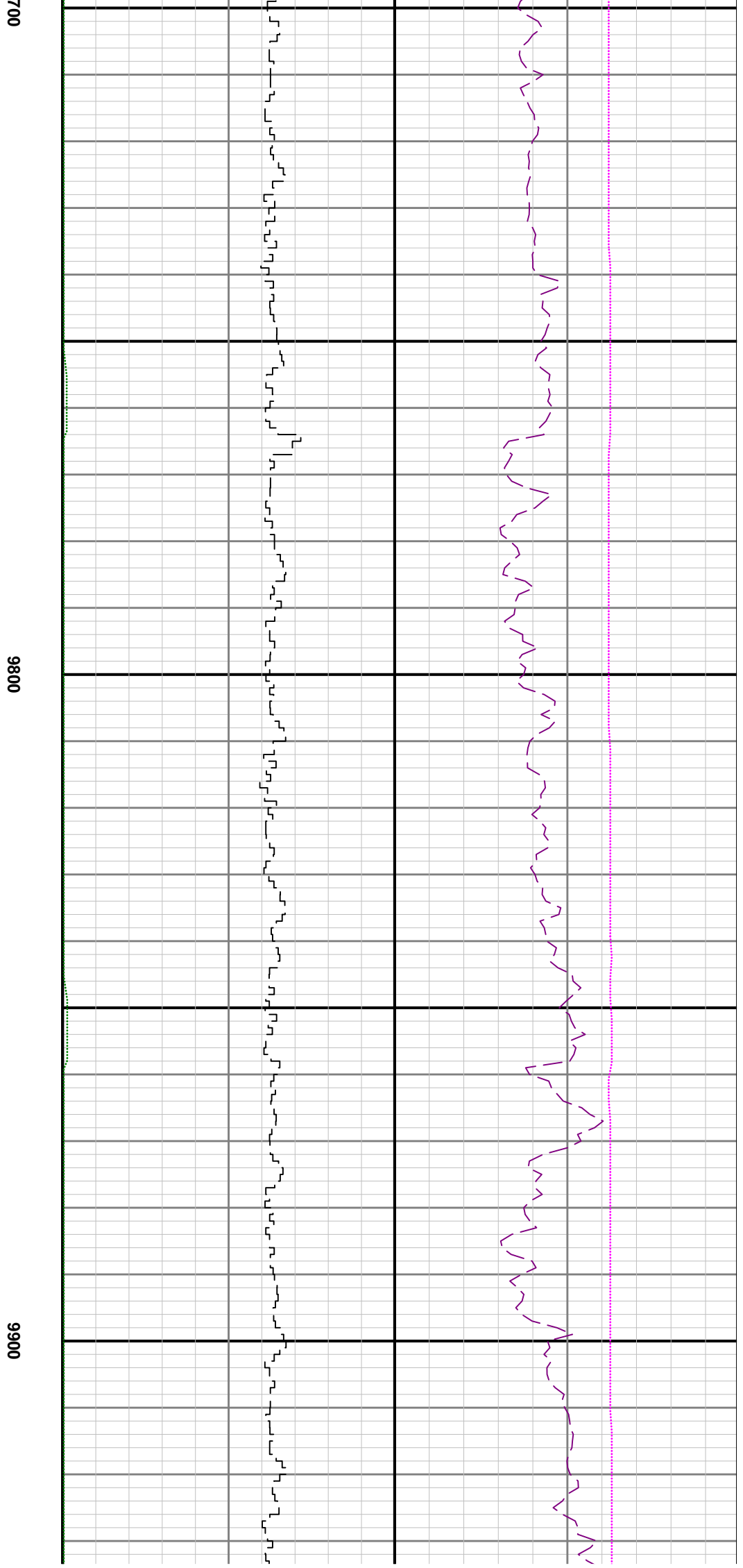
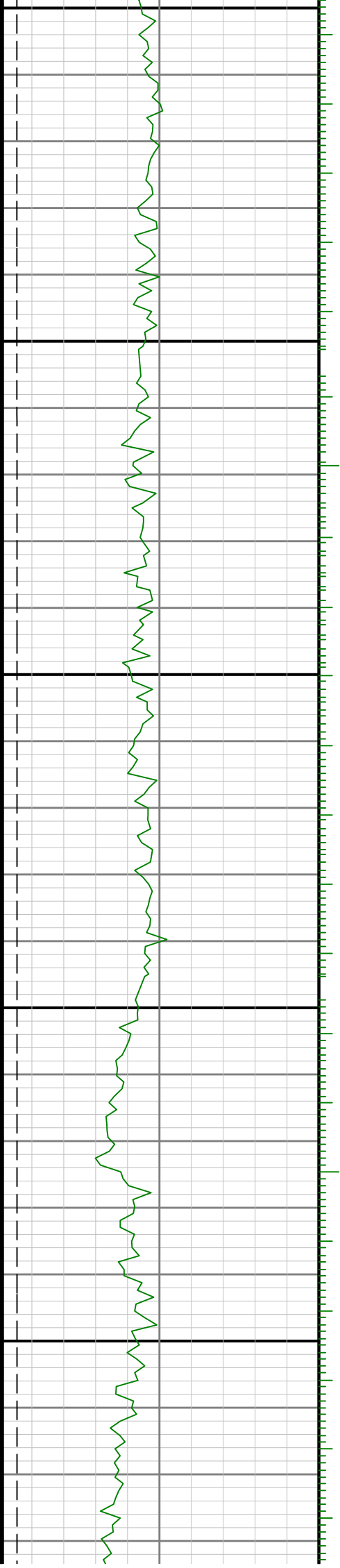


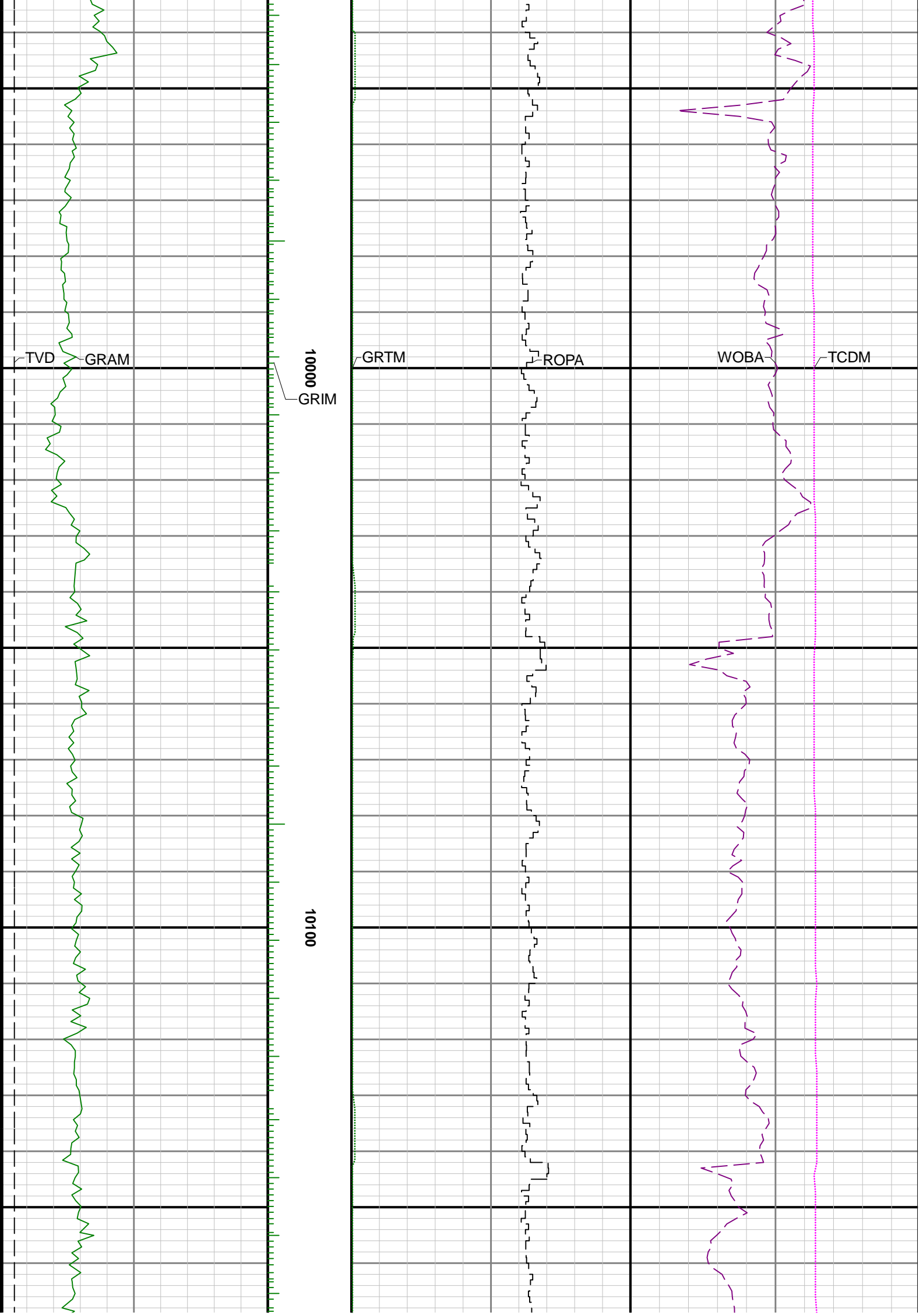


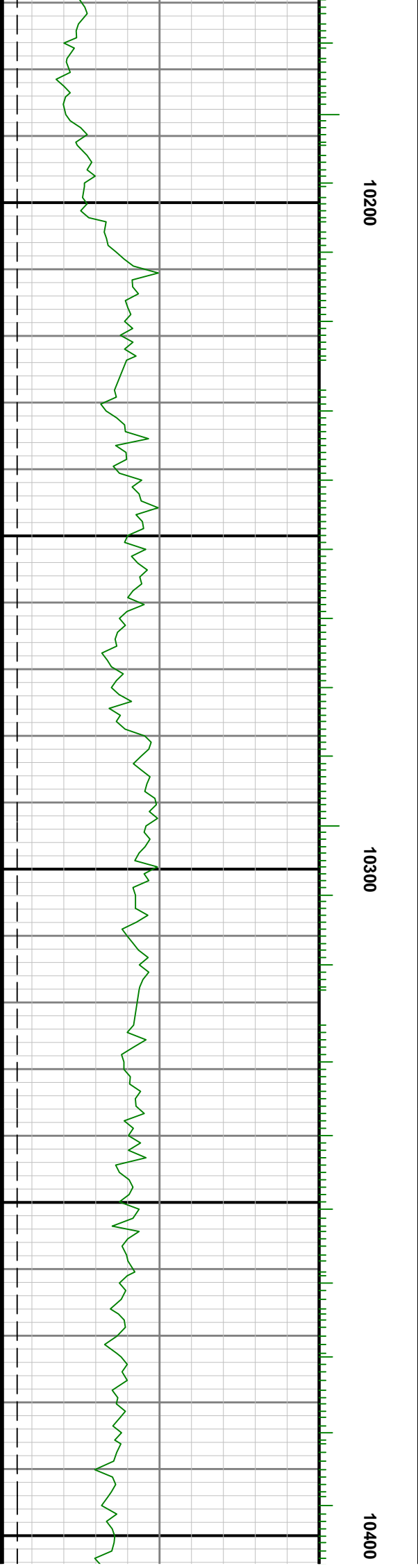
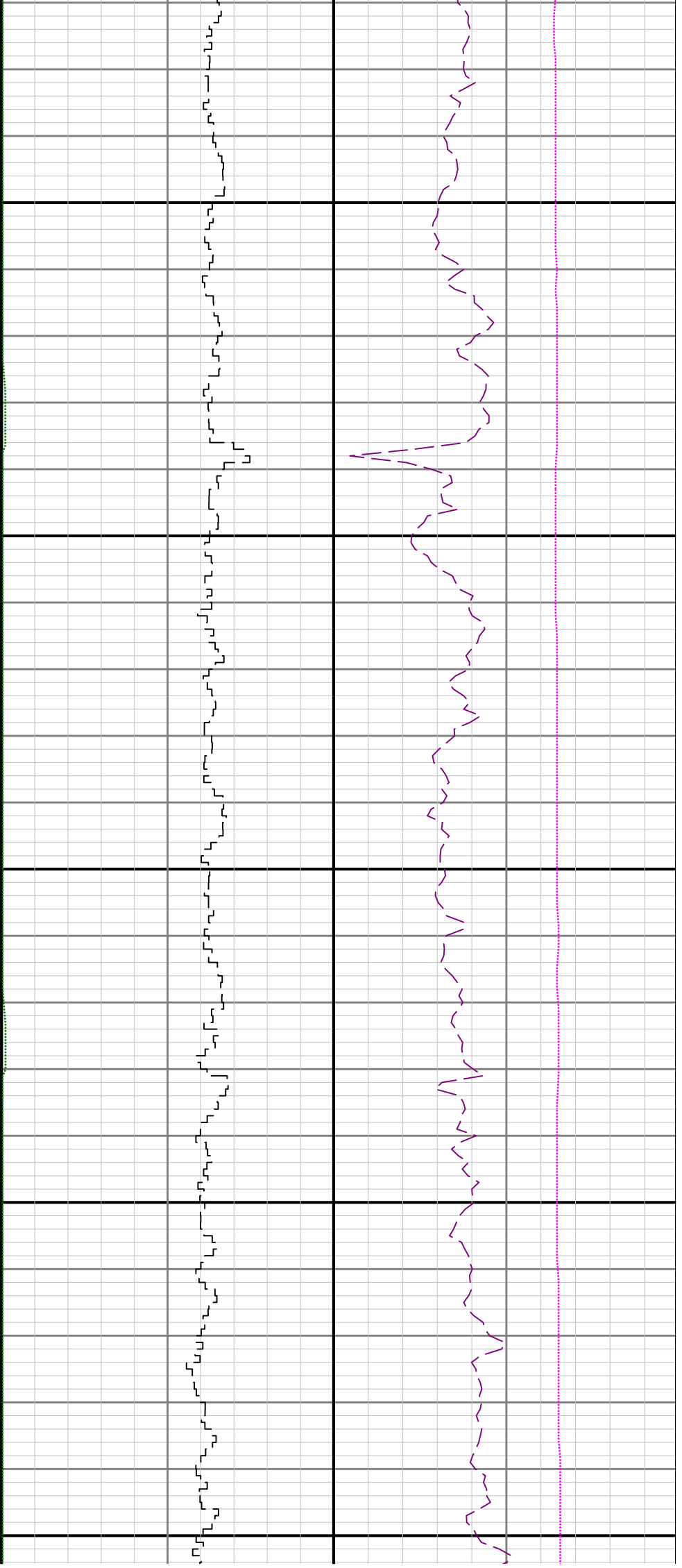
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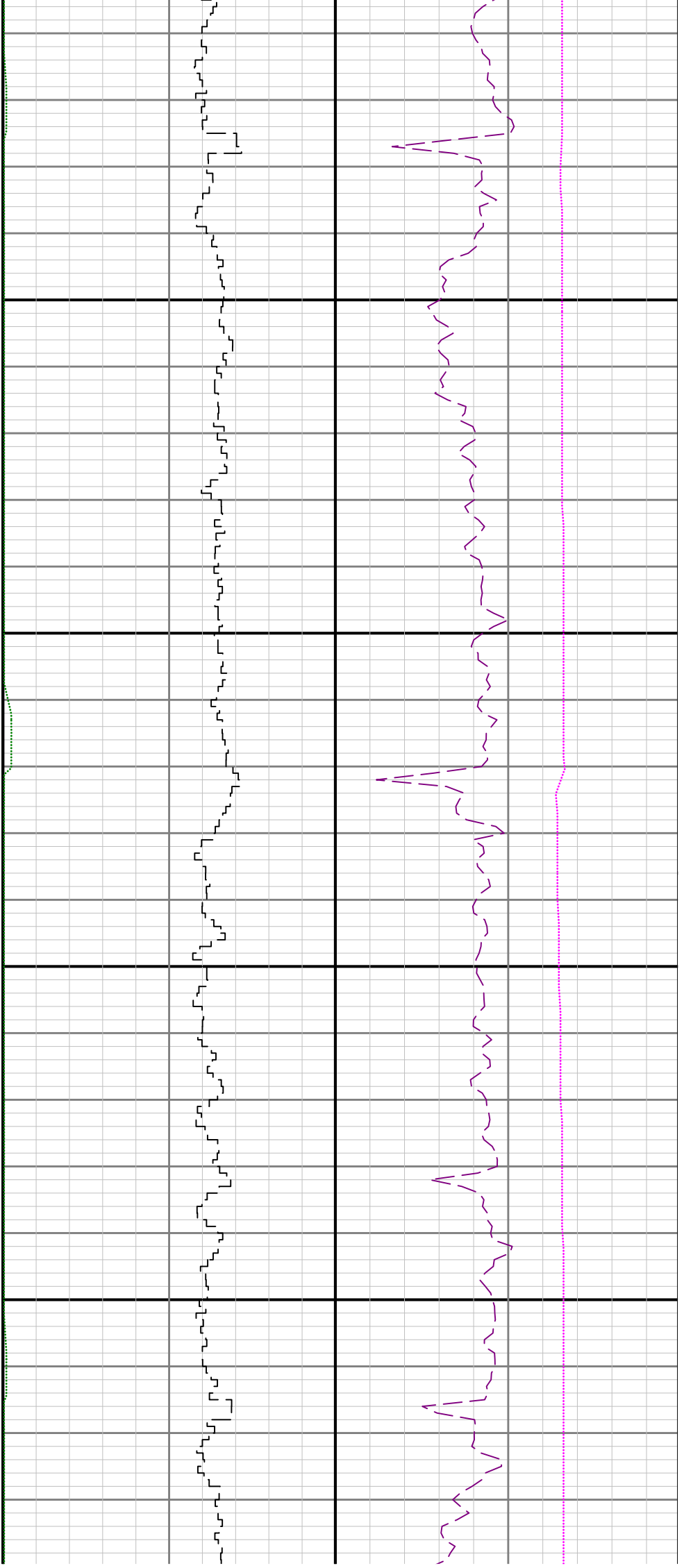
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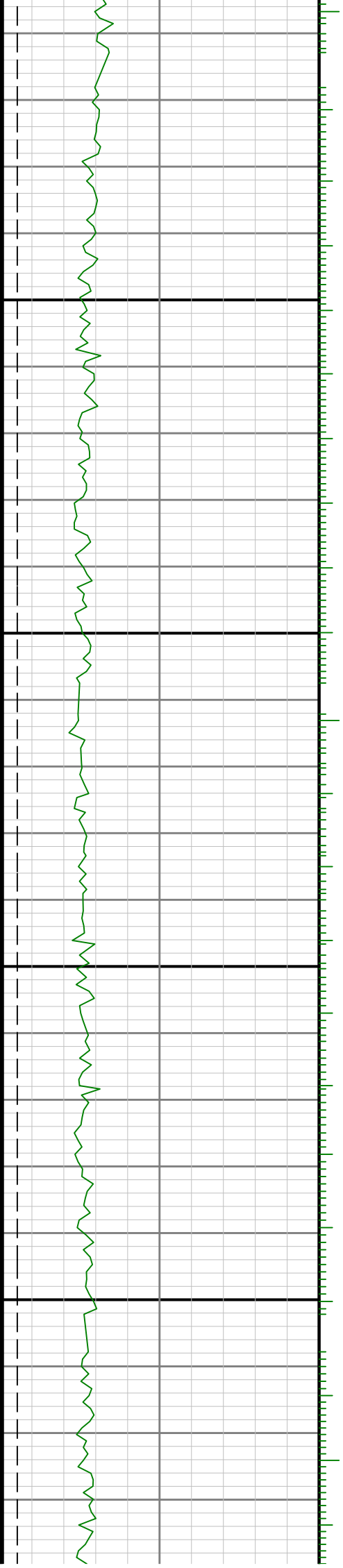


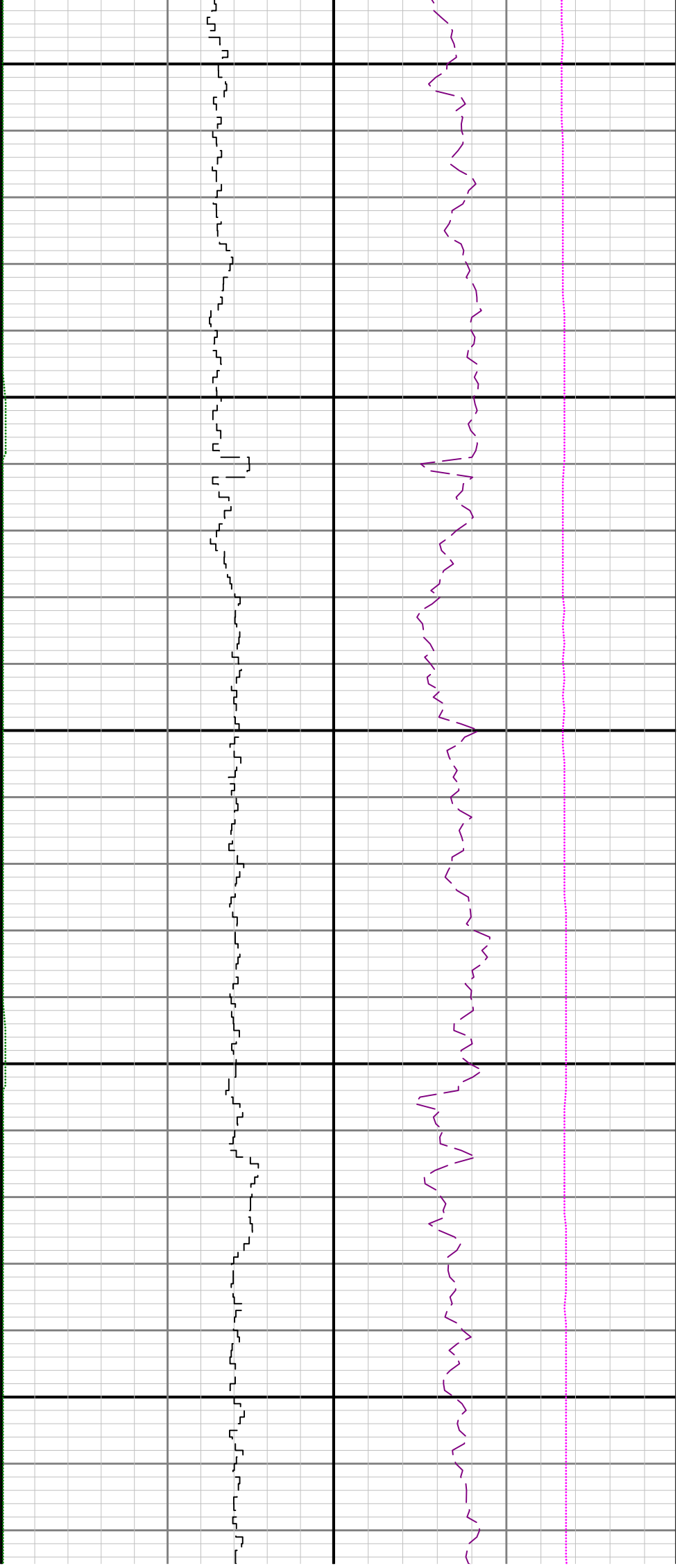




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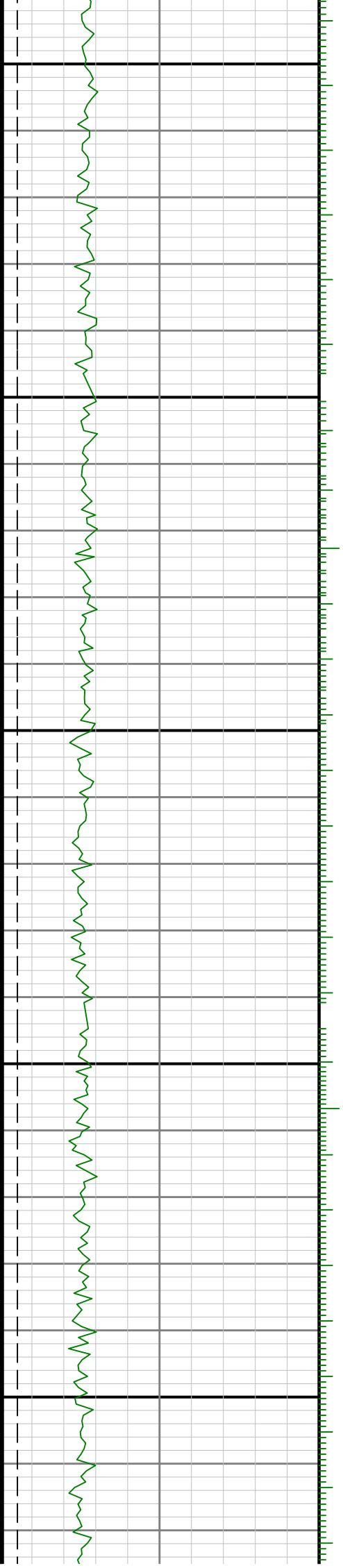
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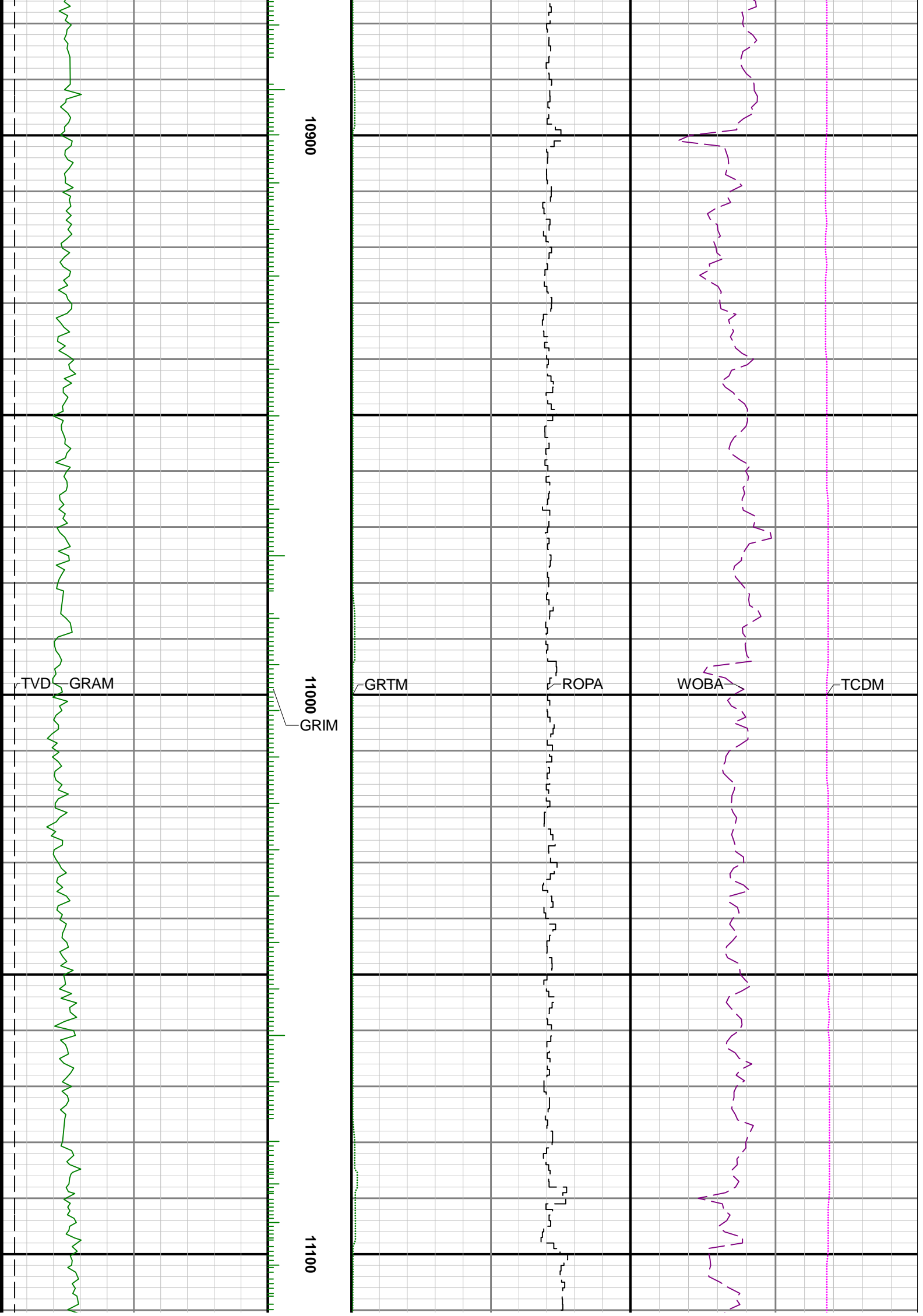


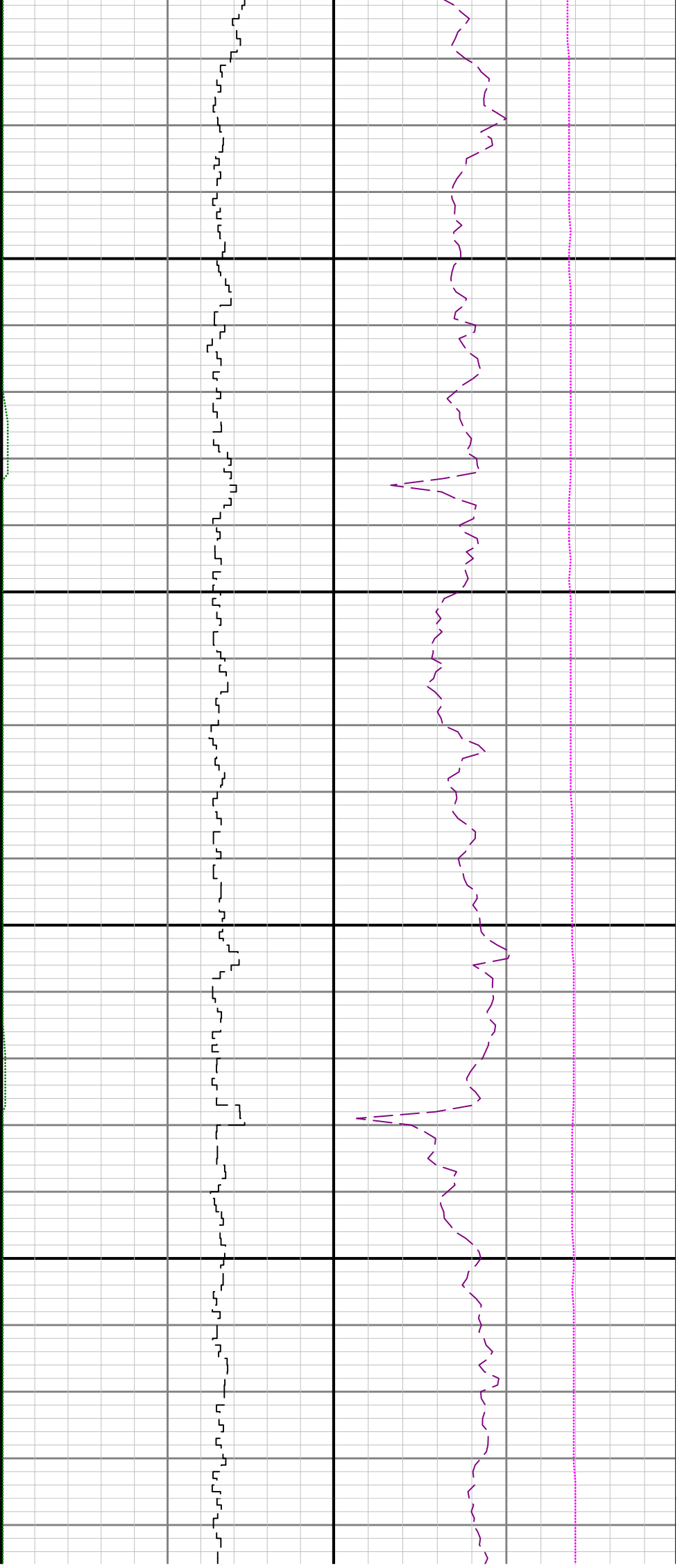
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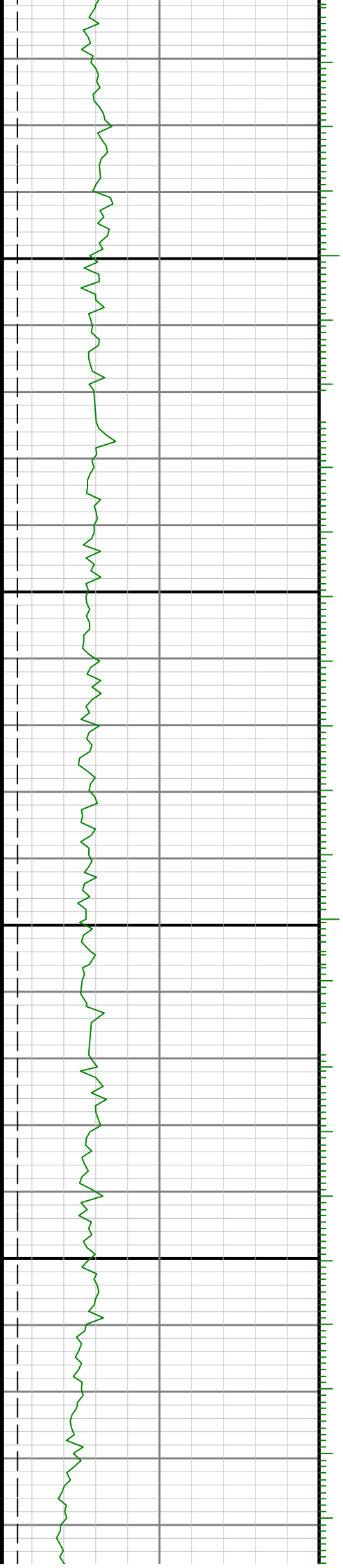


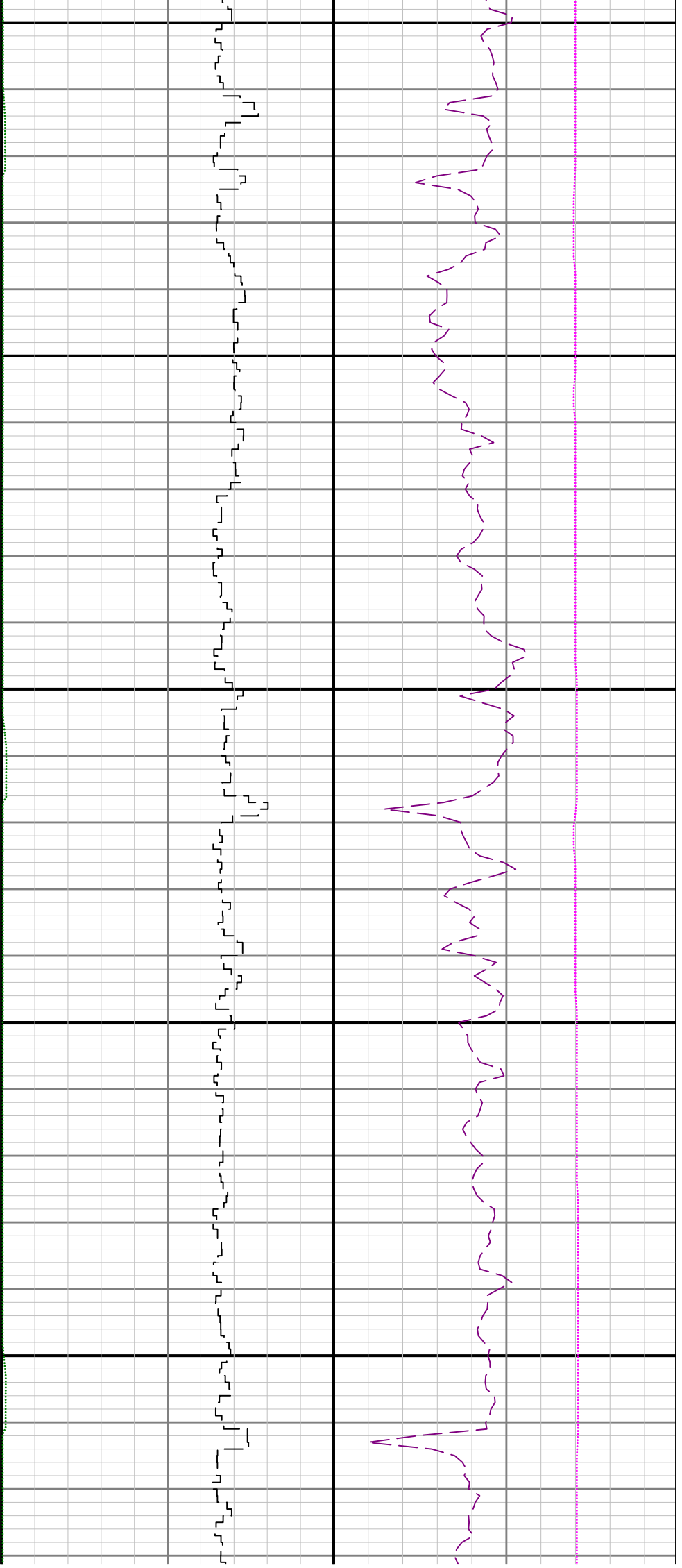




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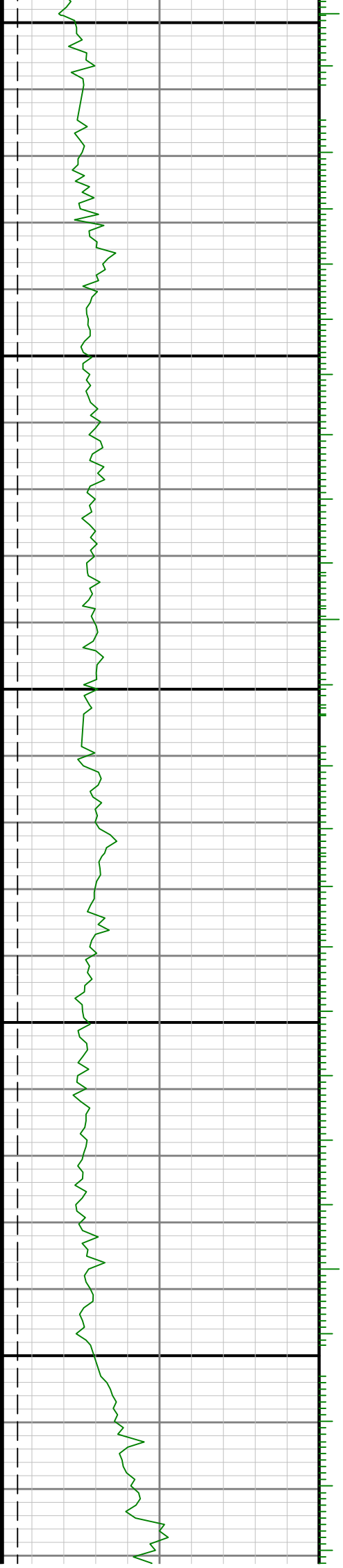
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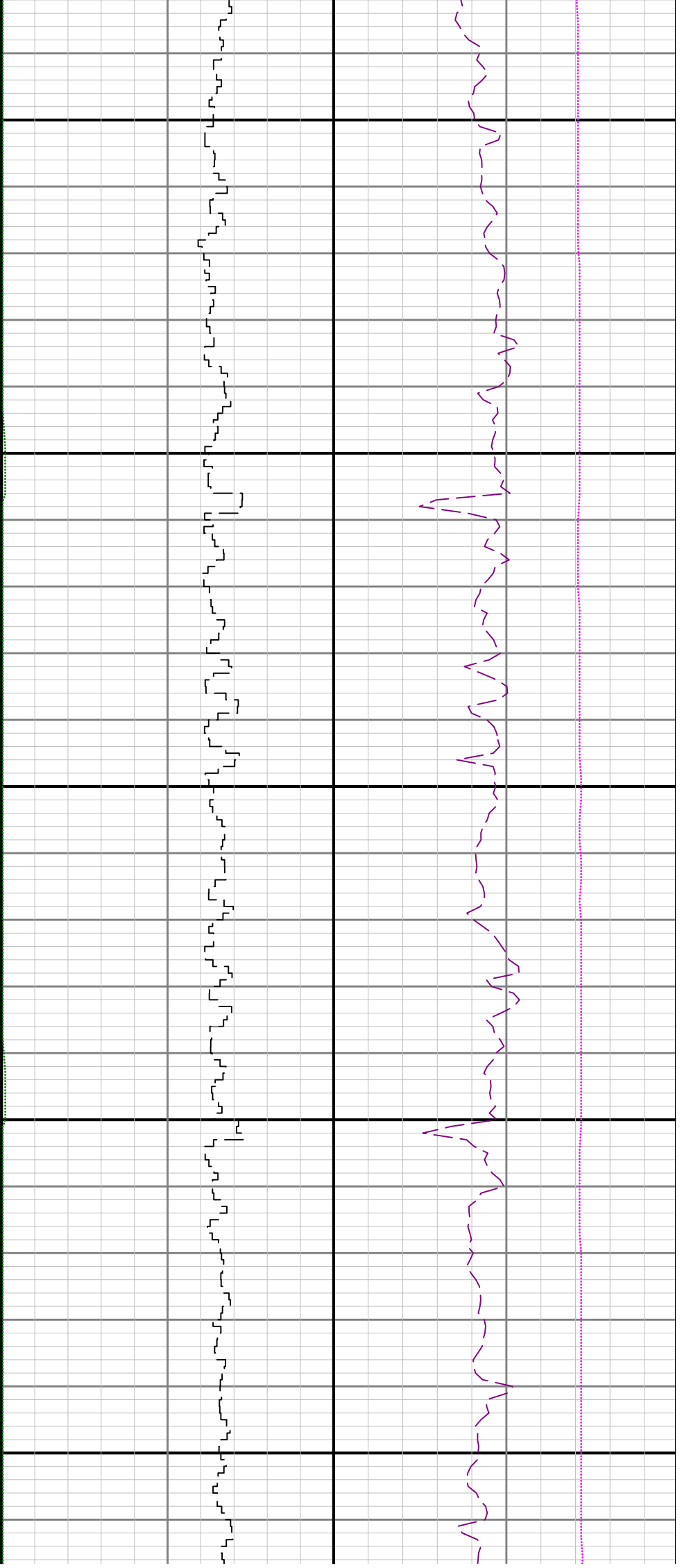




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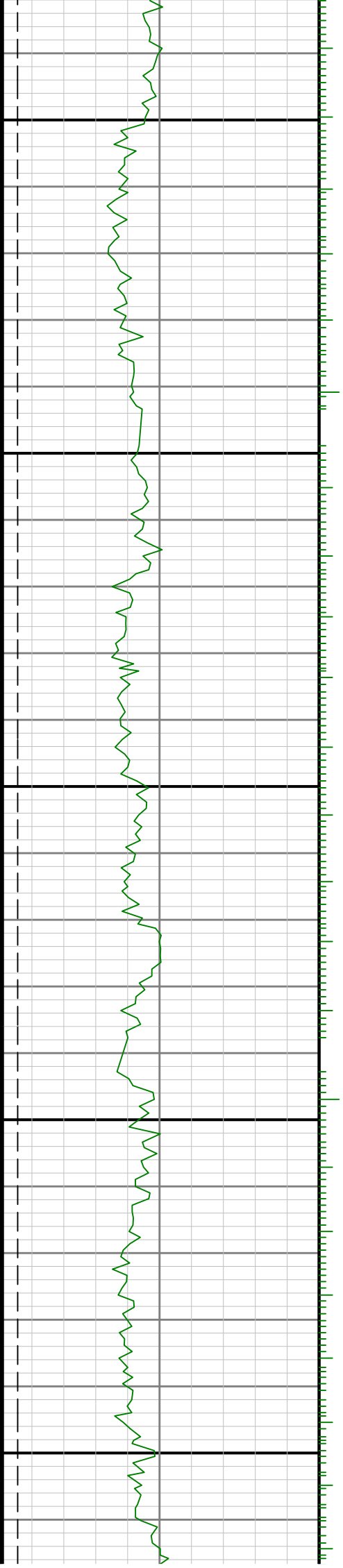


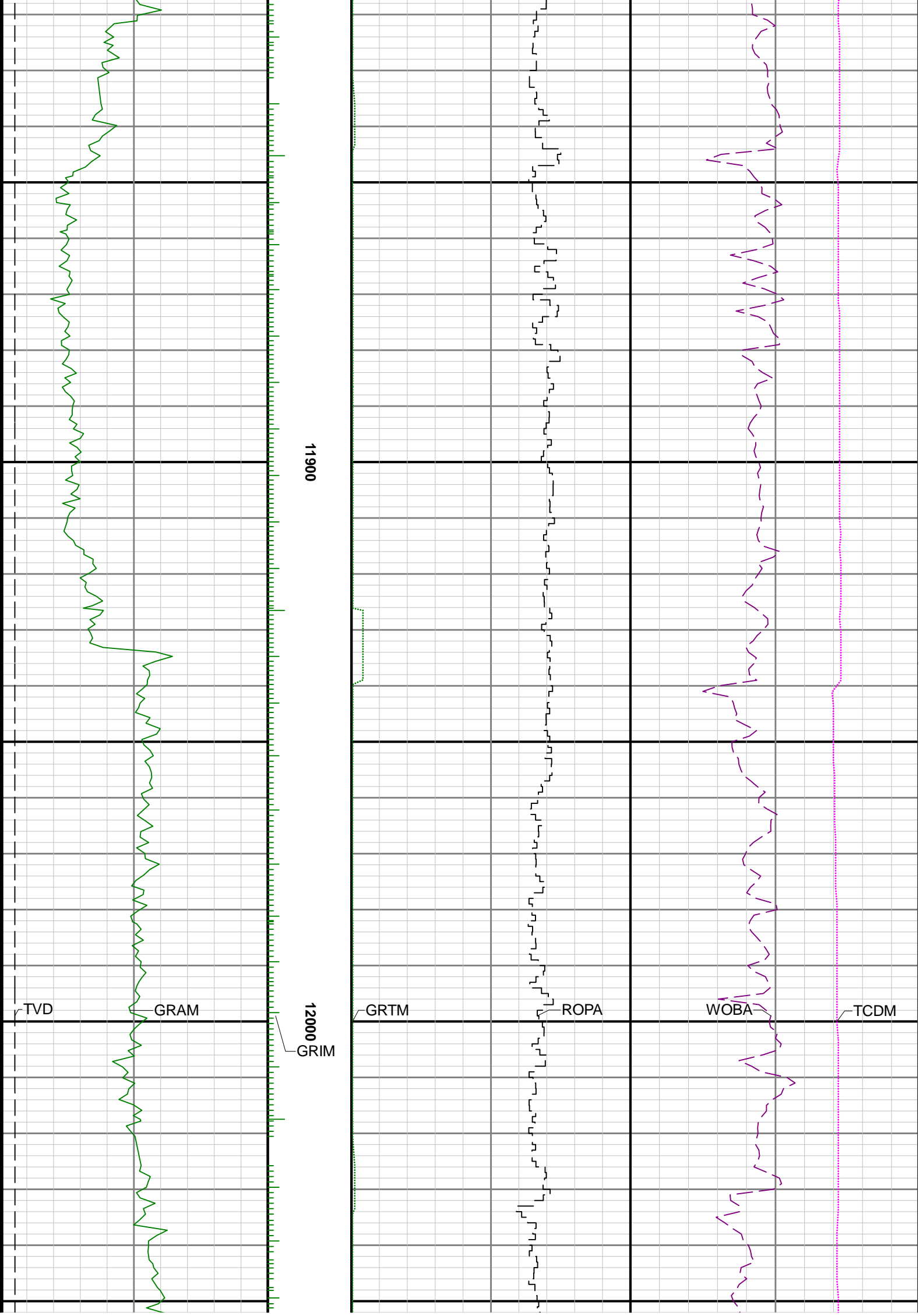


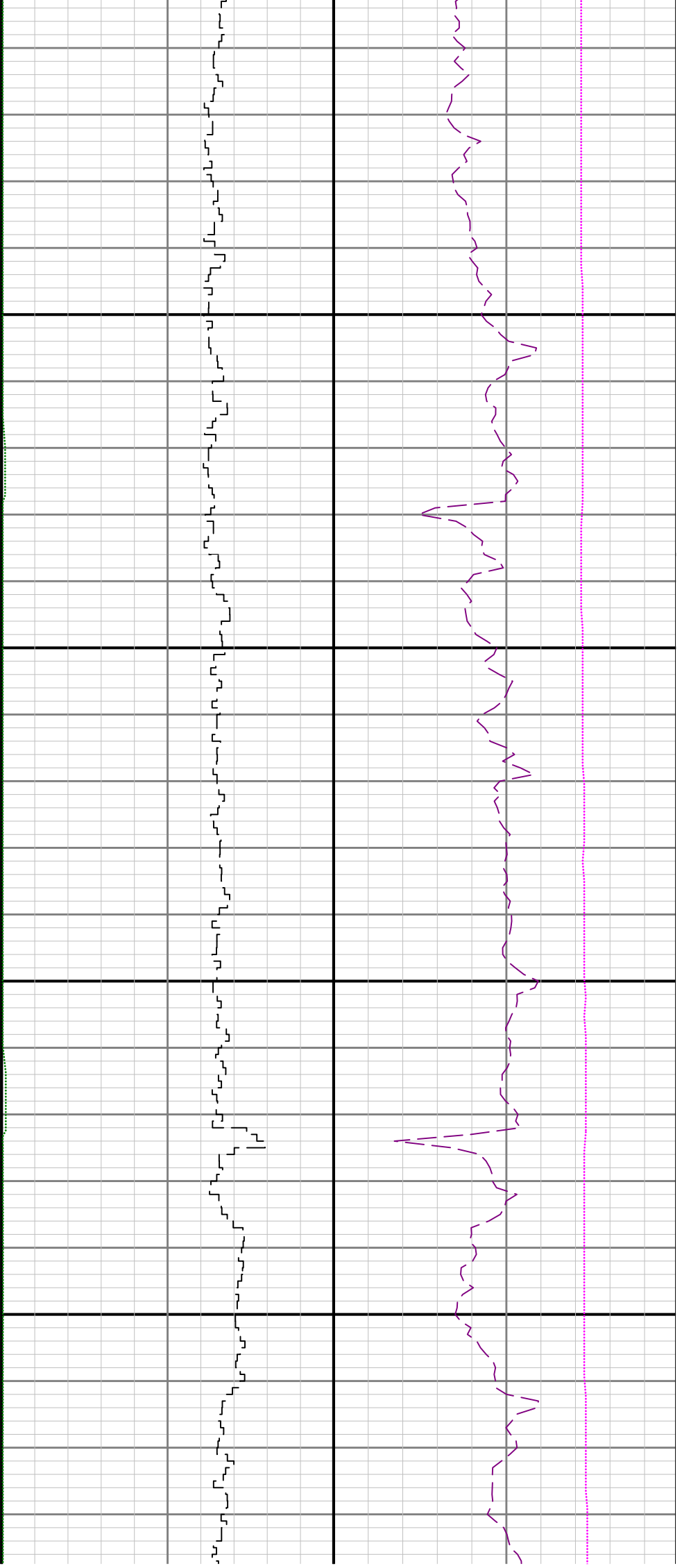
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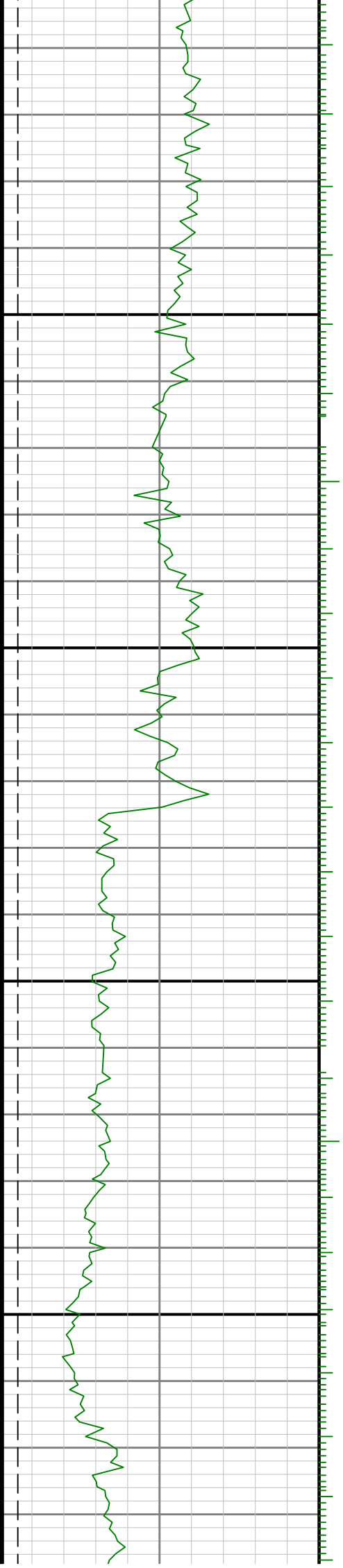


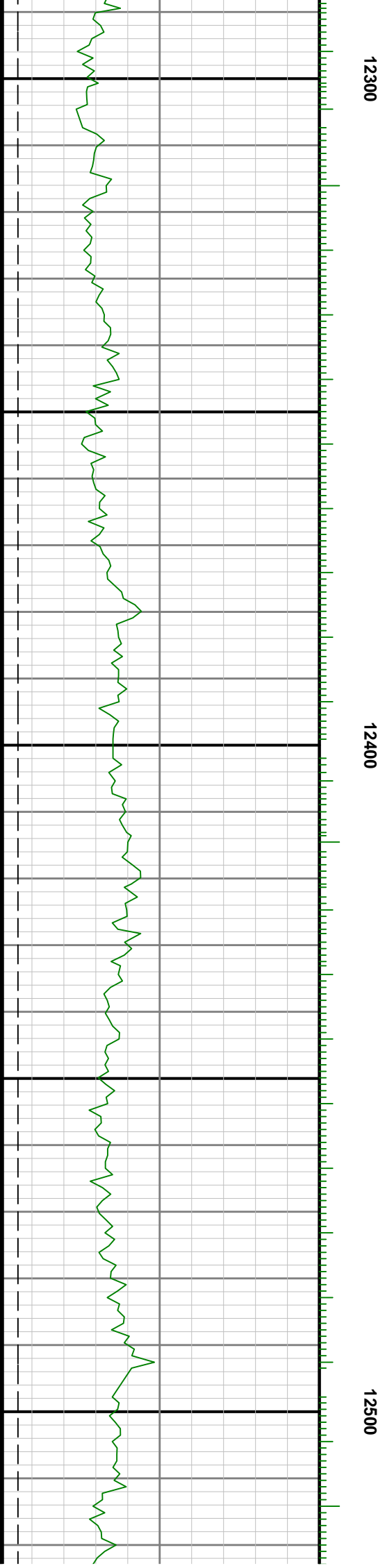
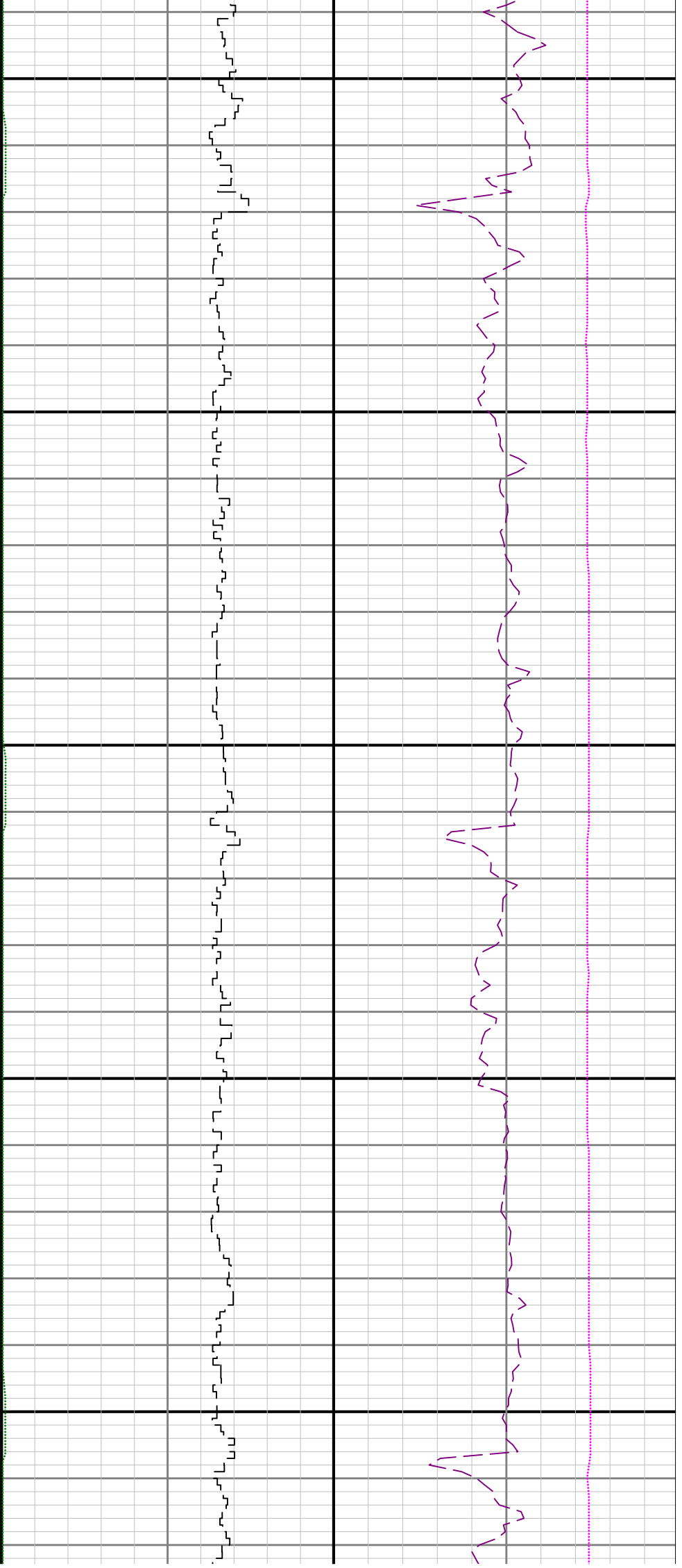


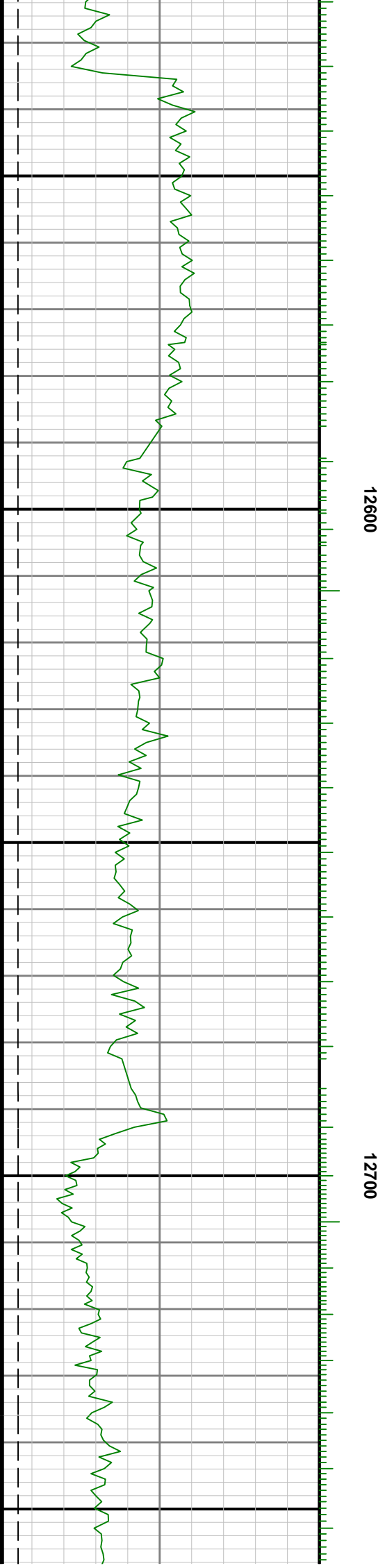
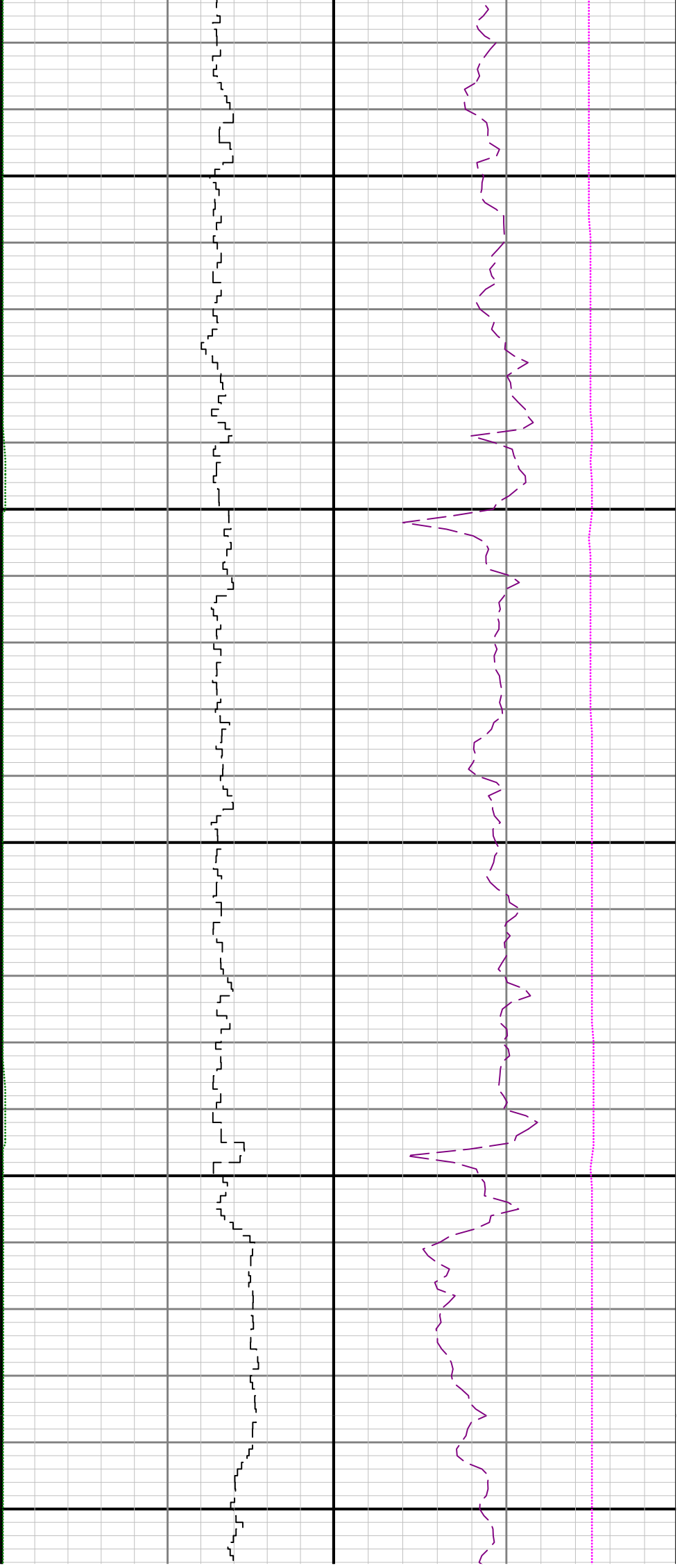


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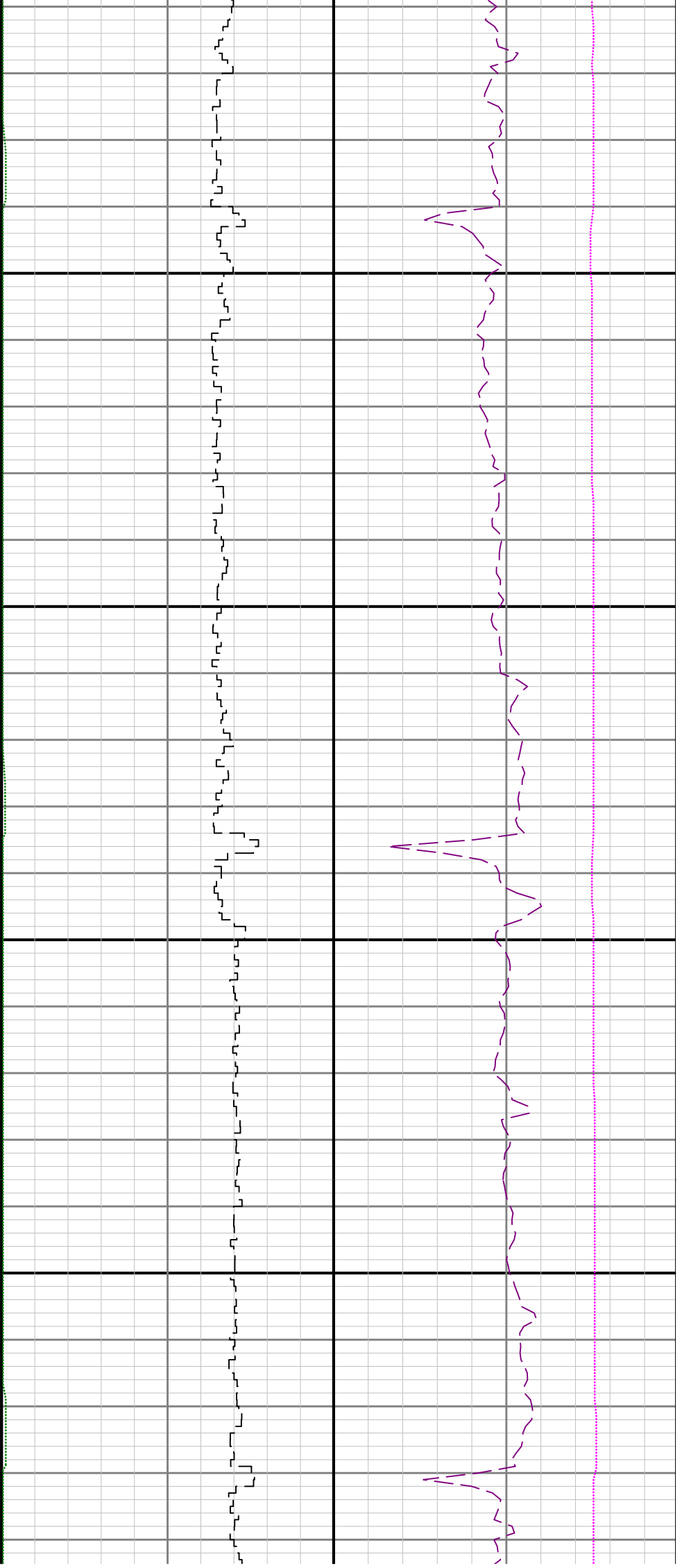
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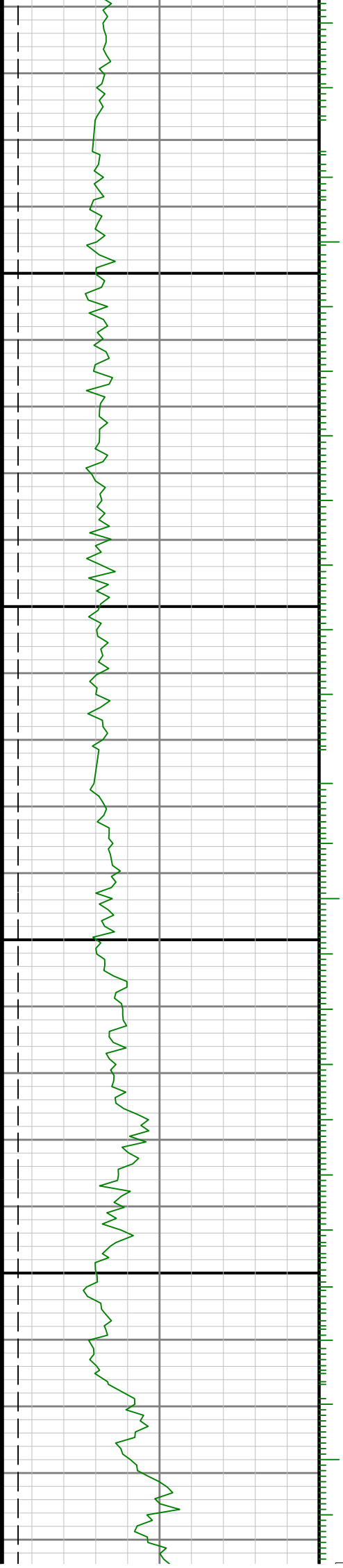




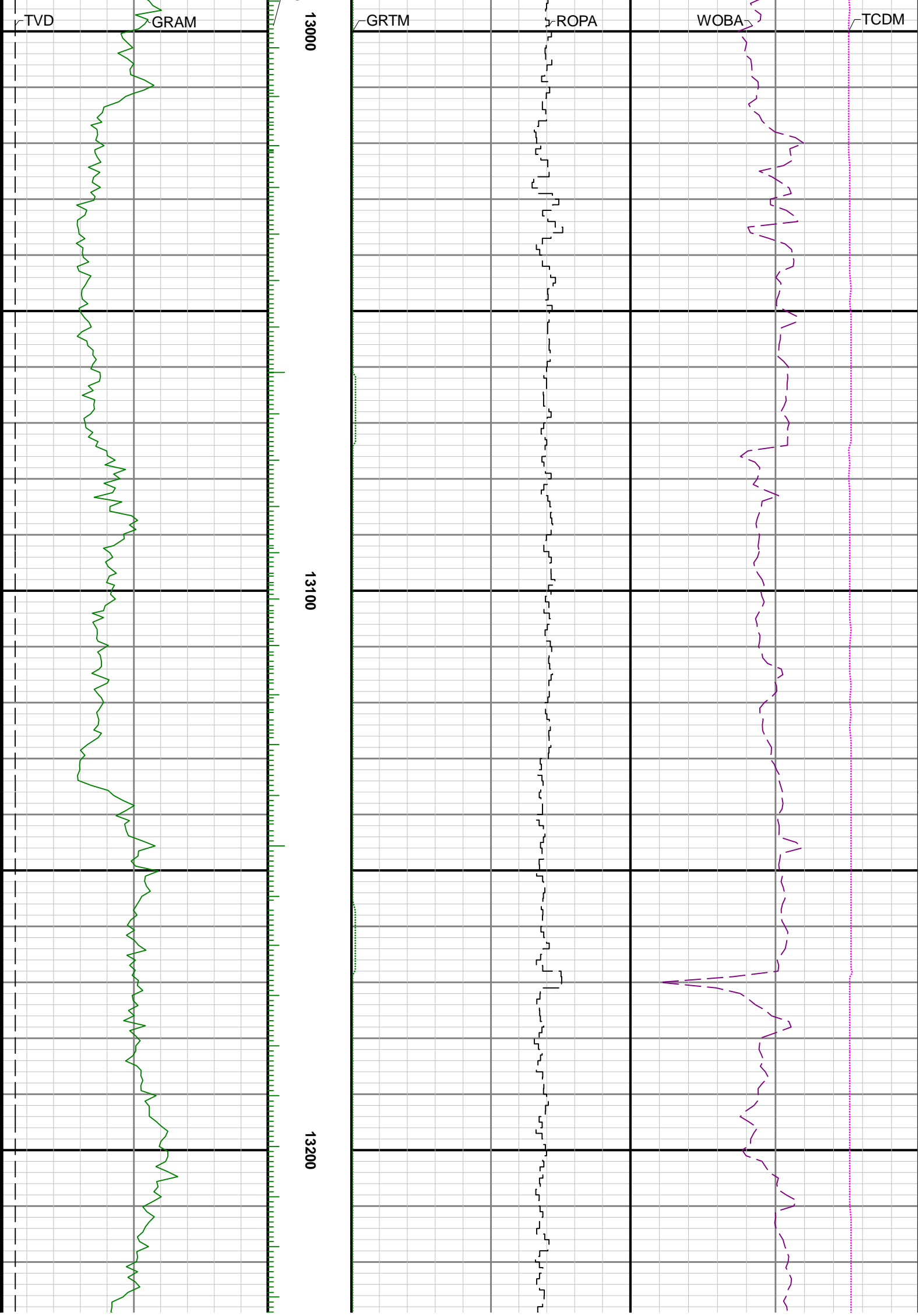


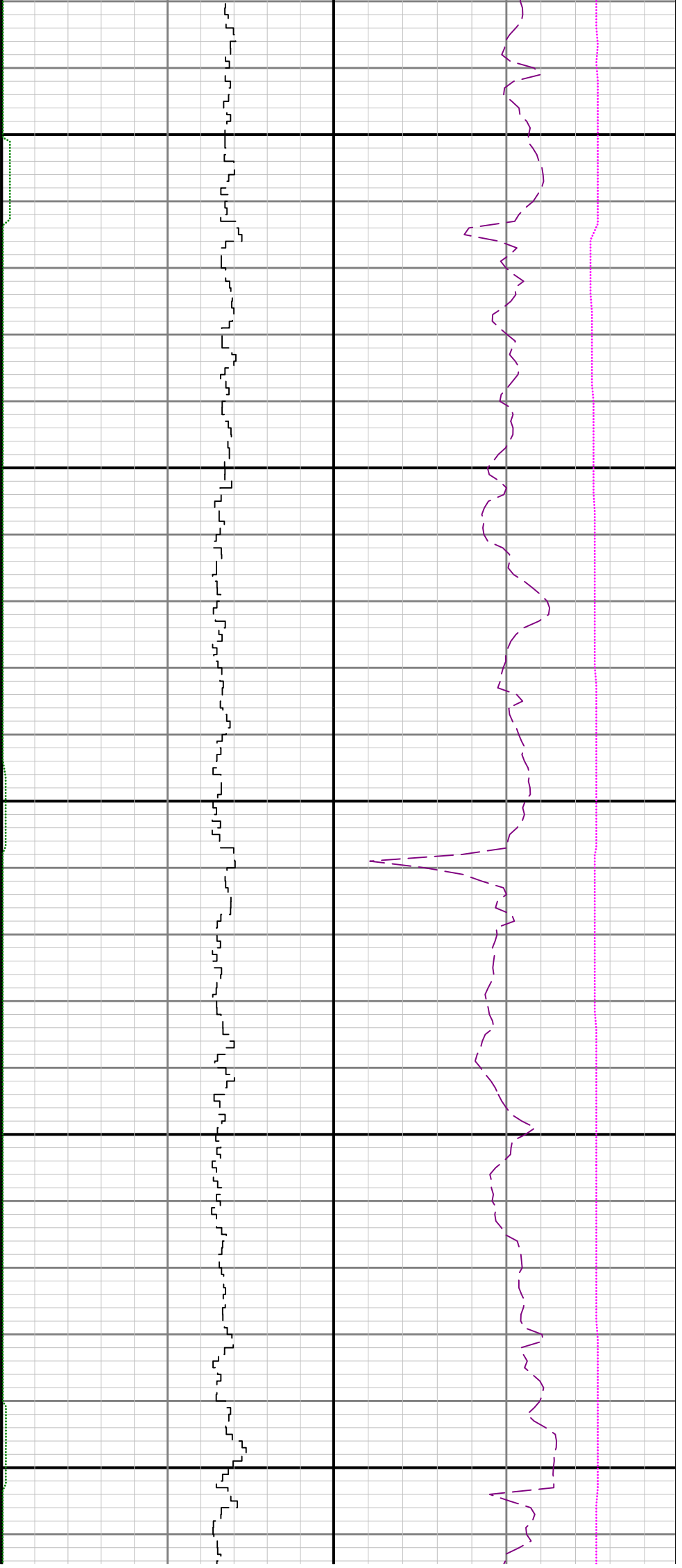
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12900



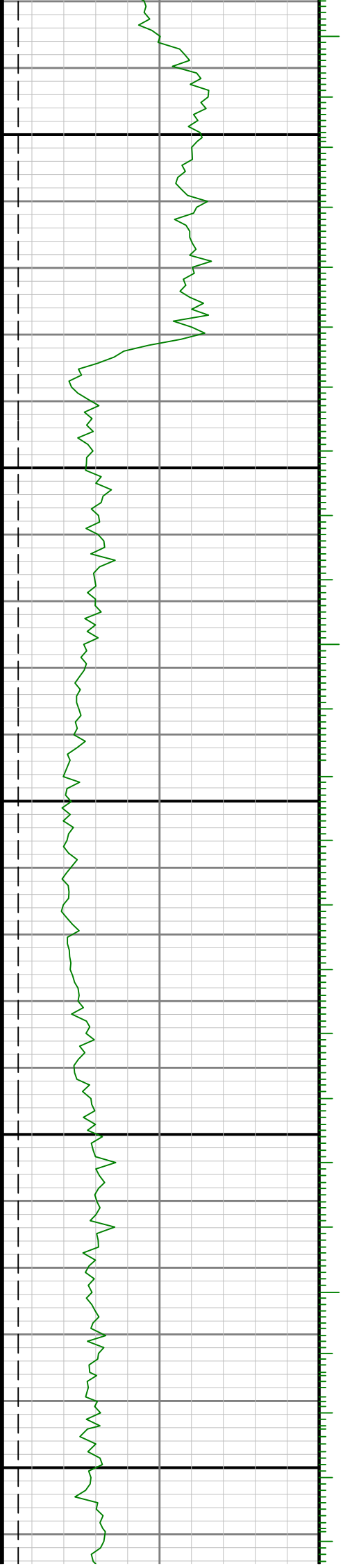
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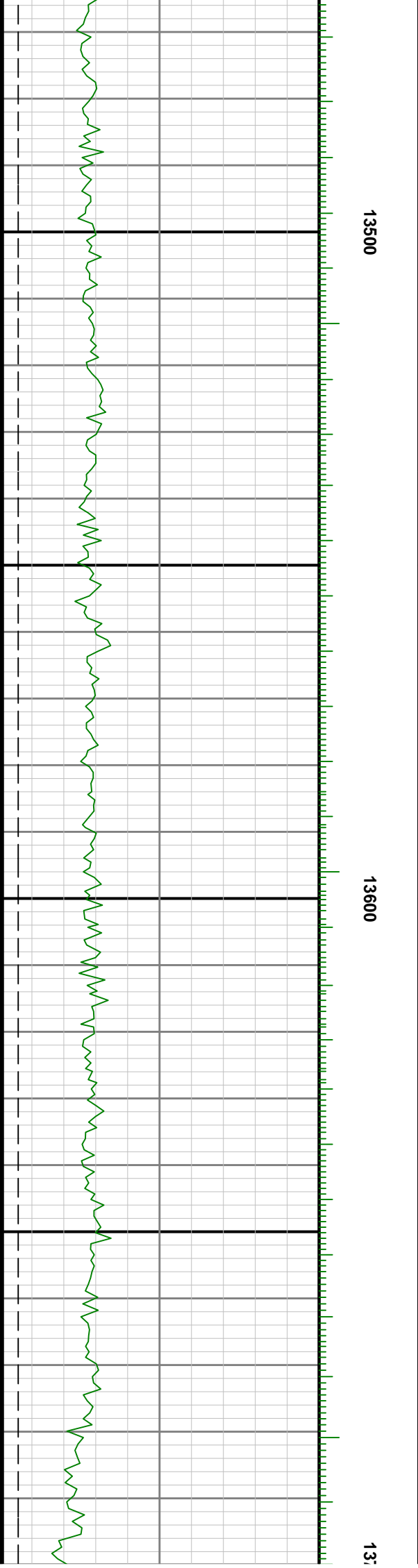
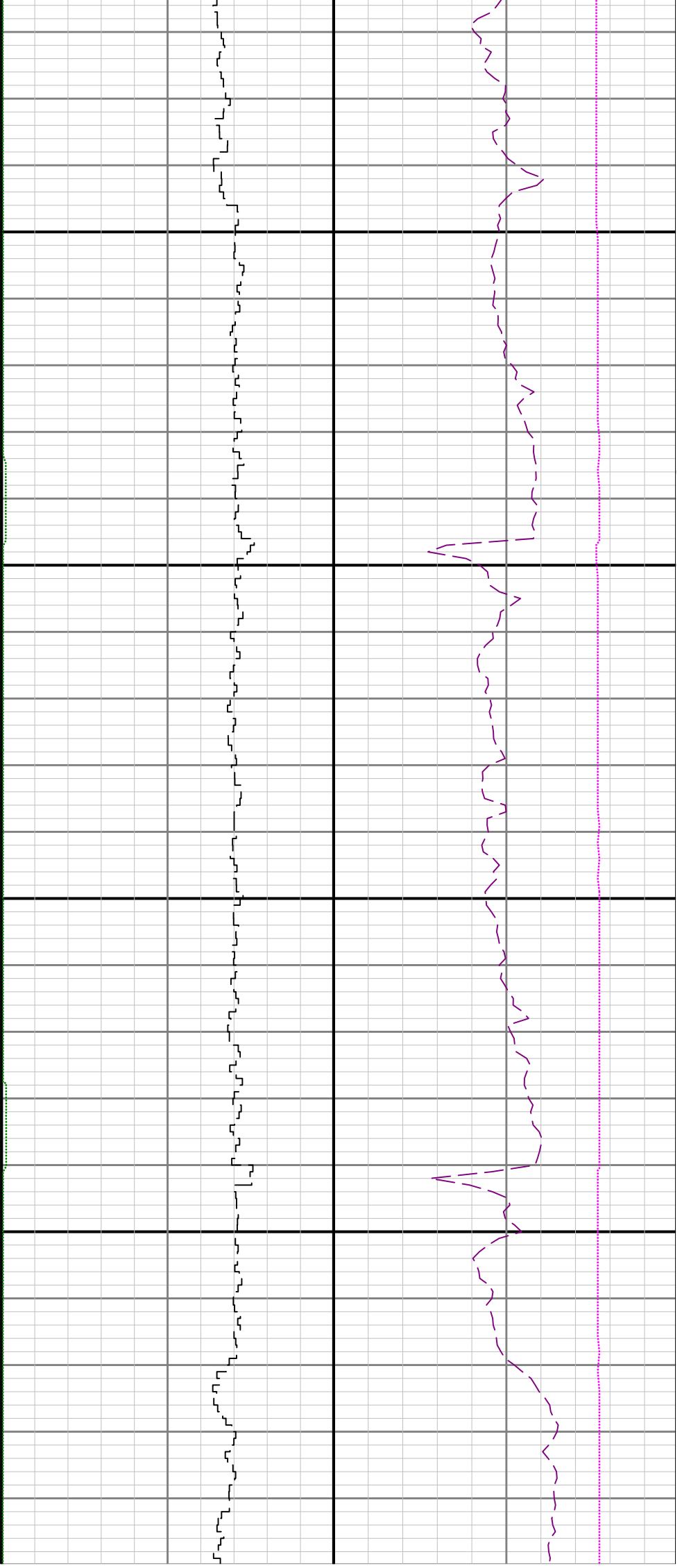


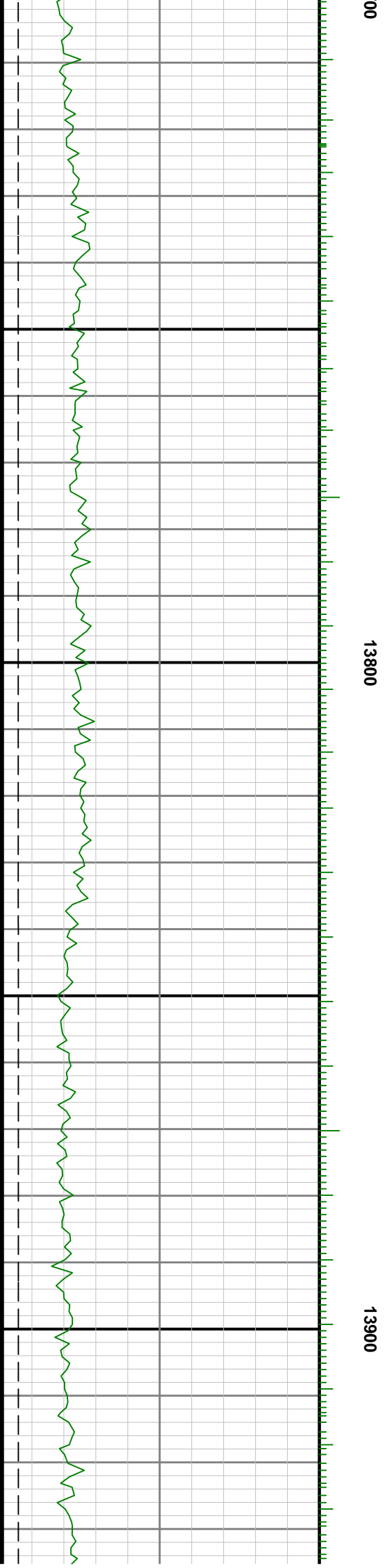
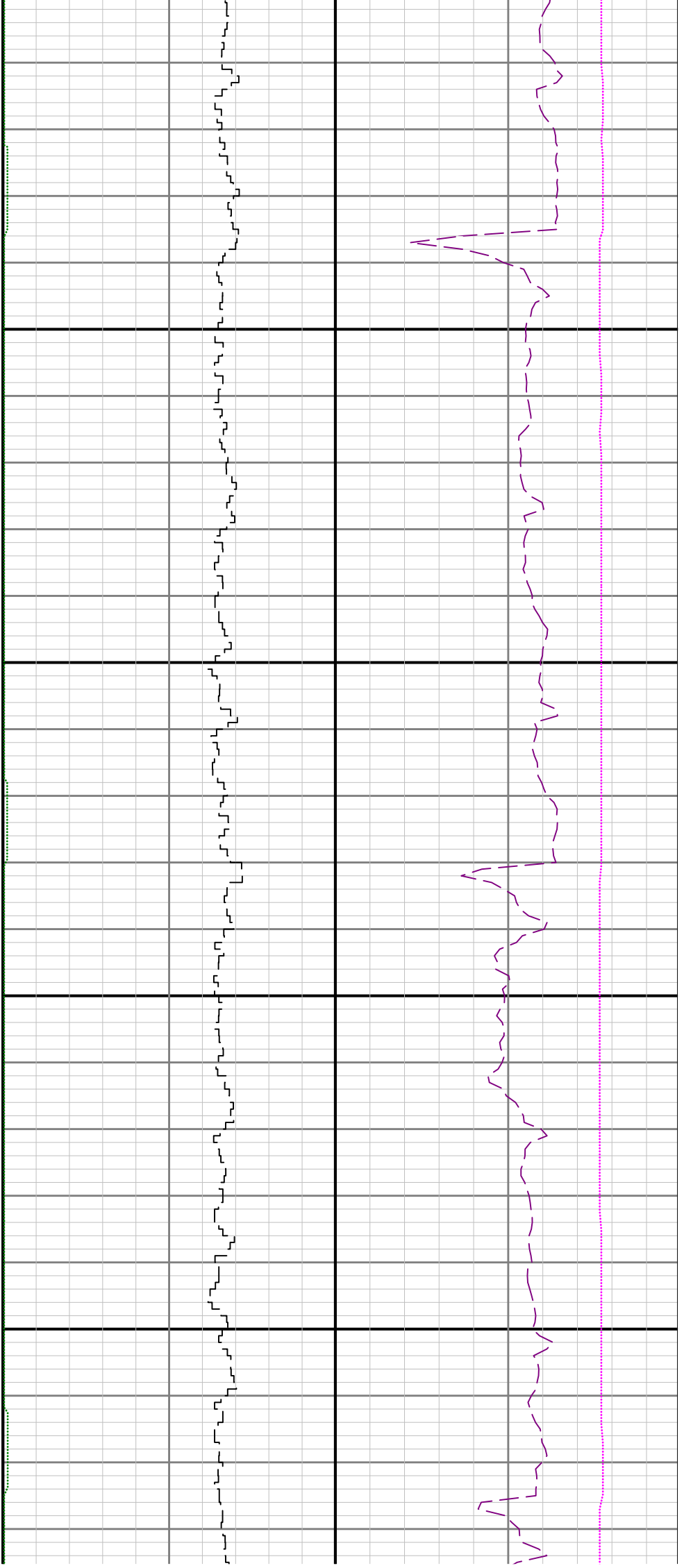


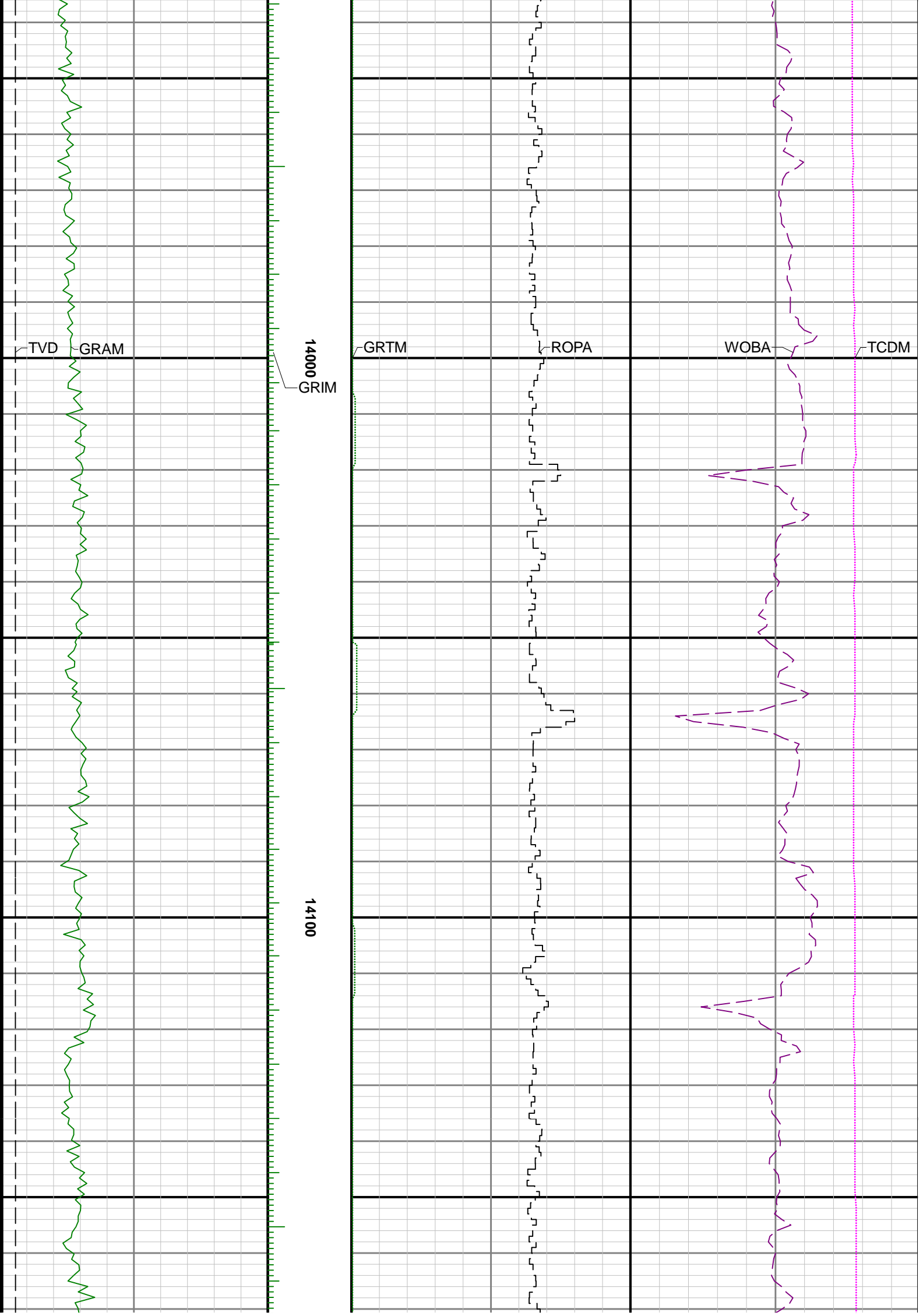
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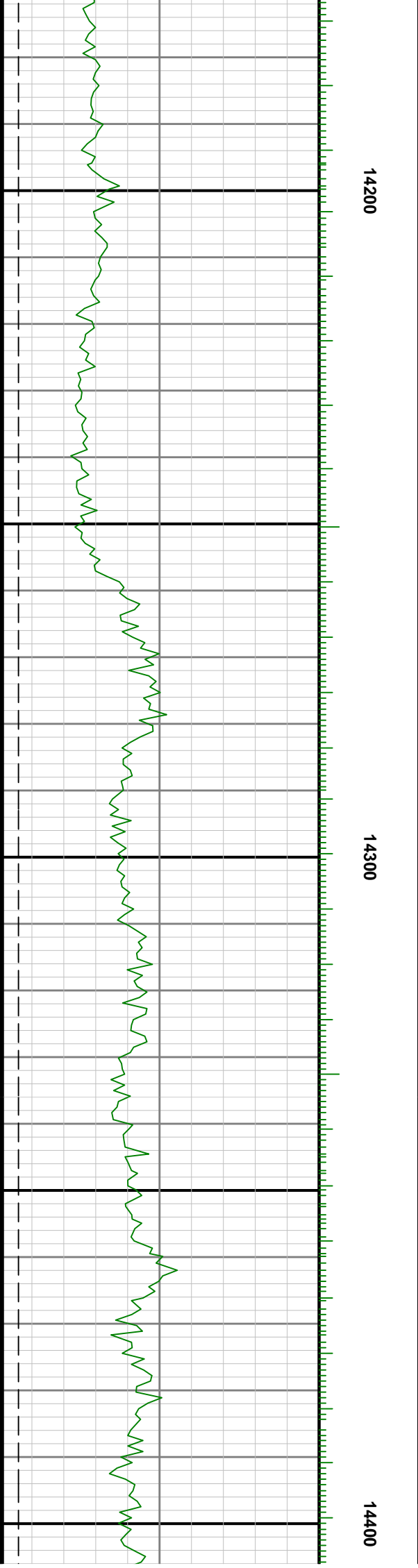
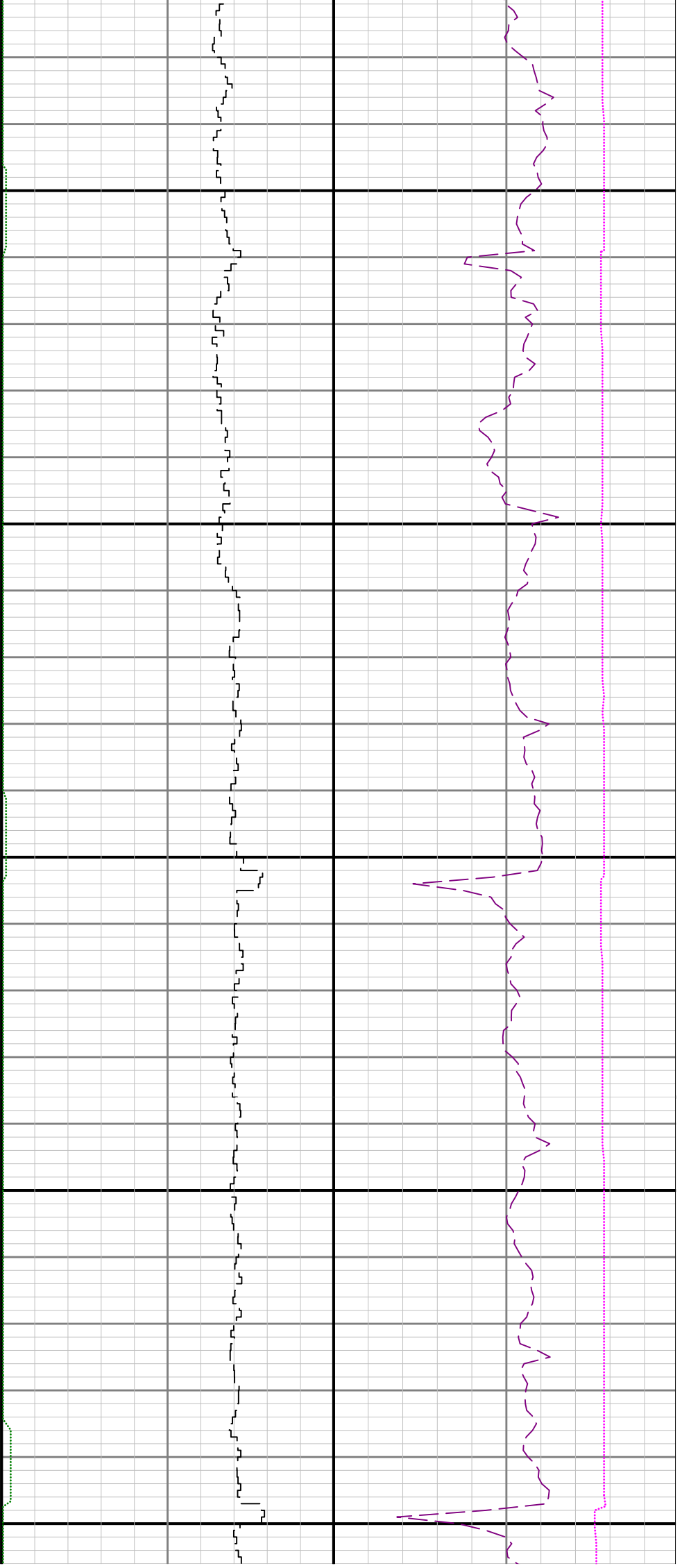
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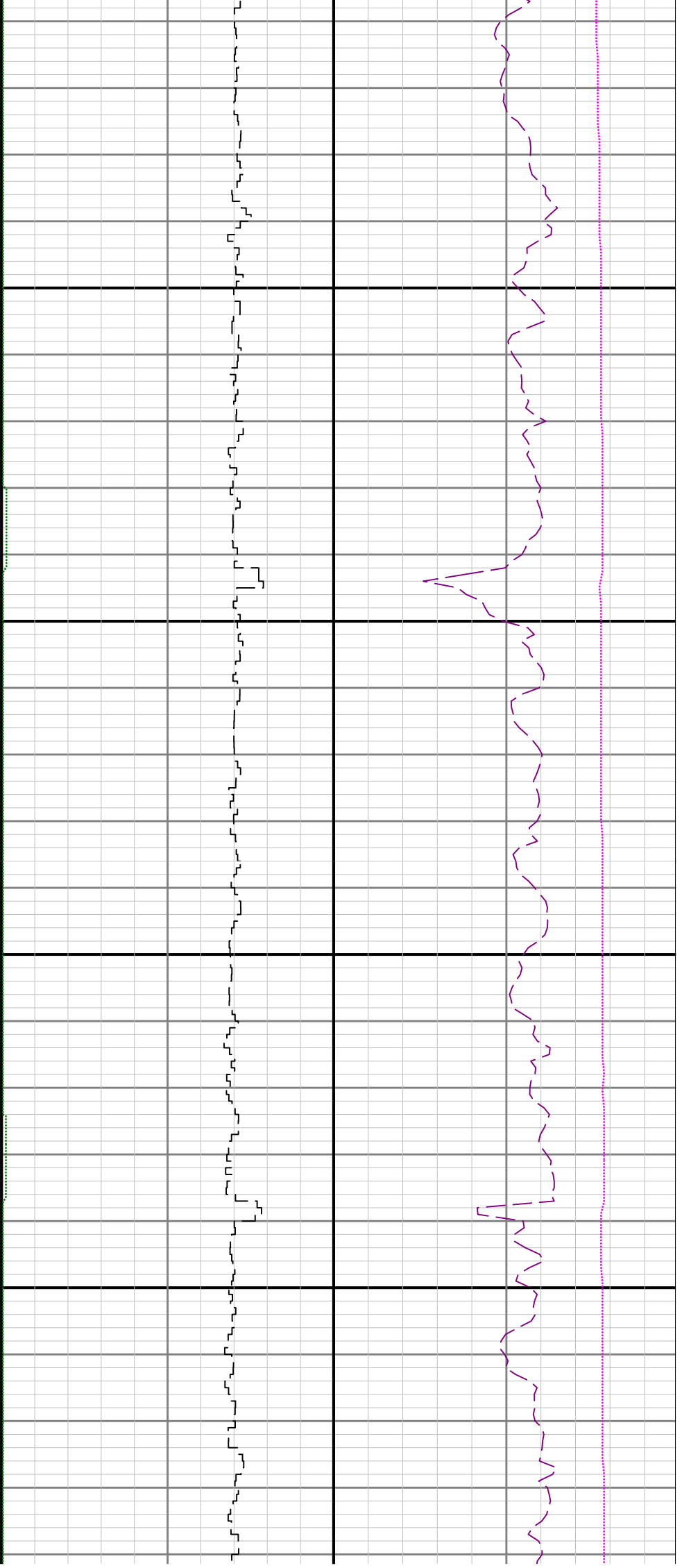






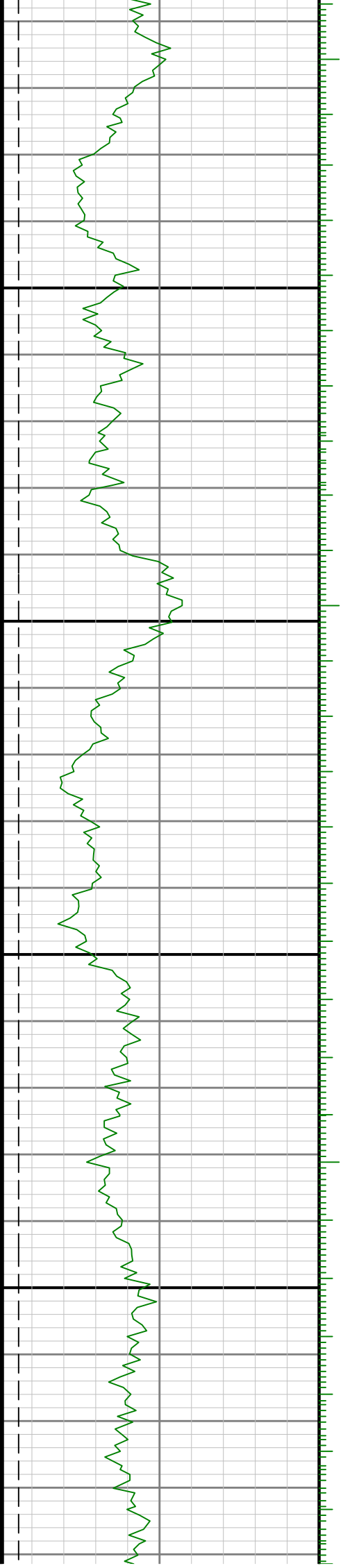




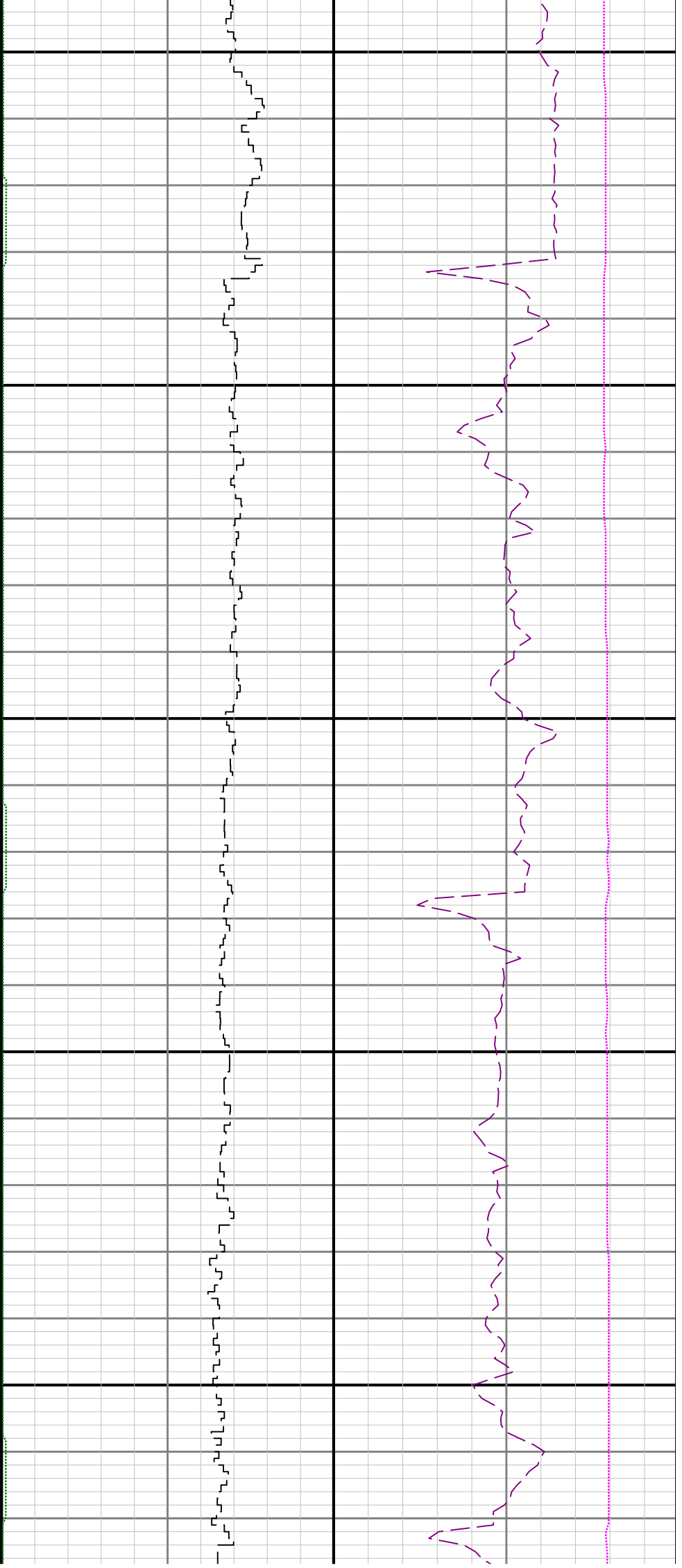


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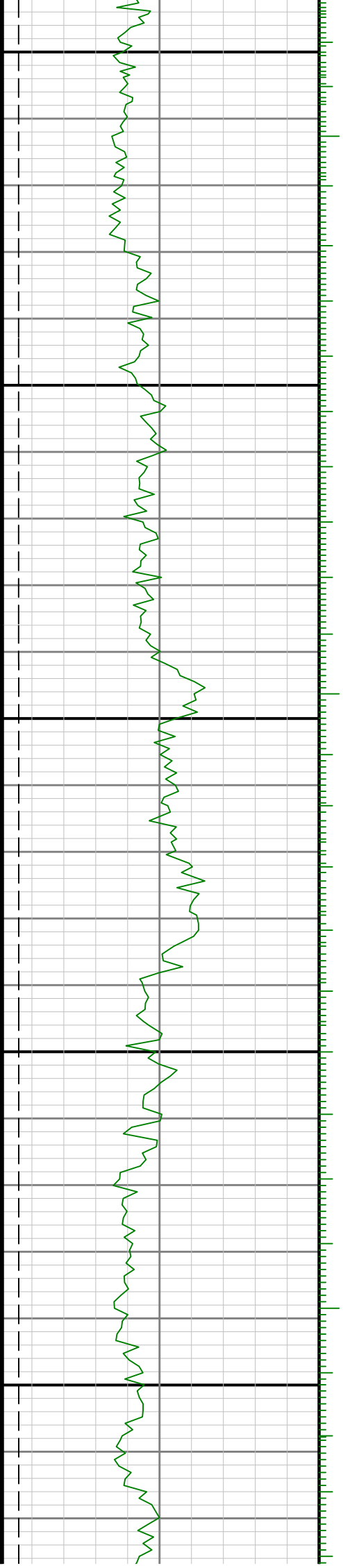


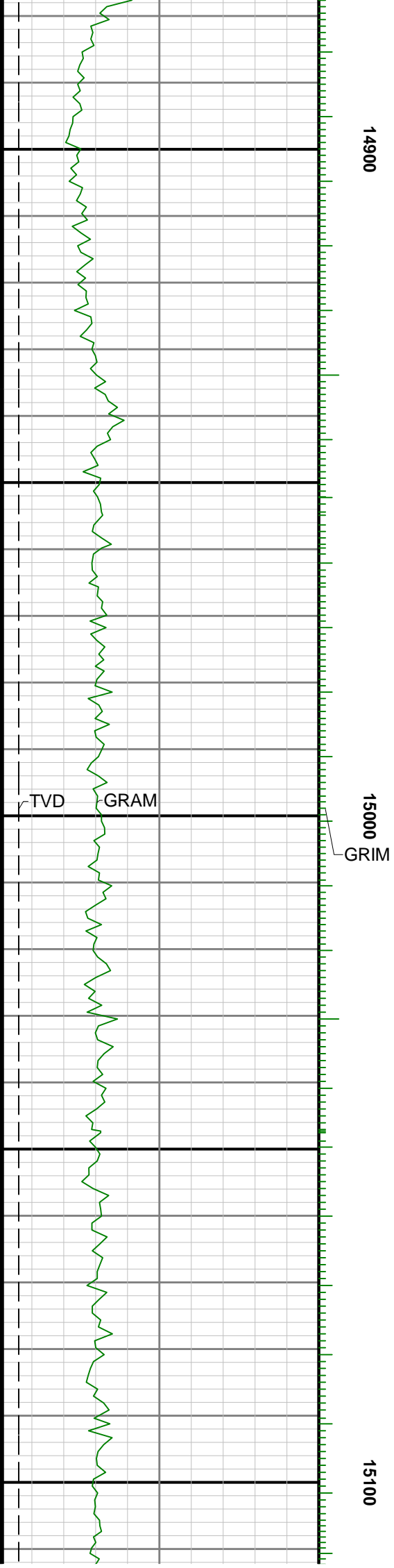
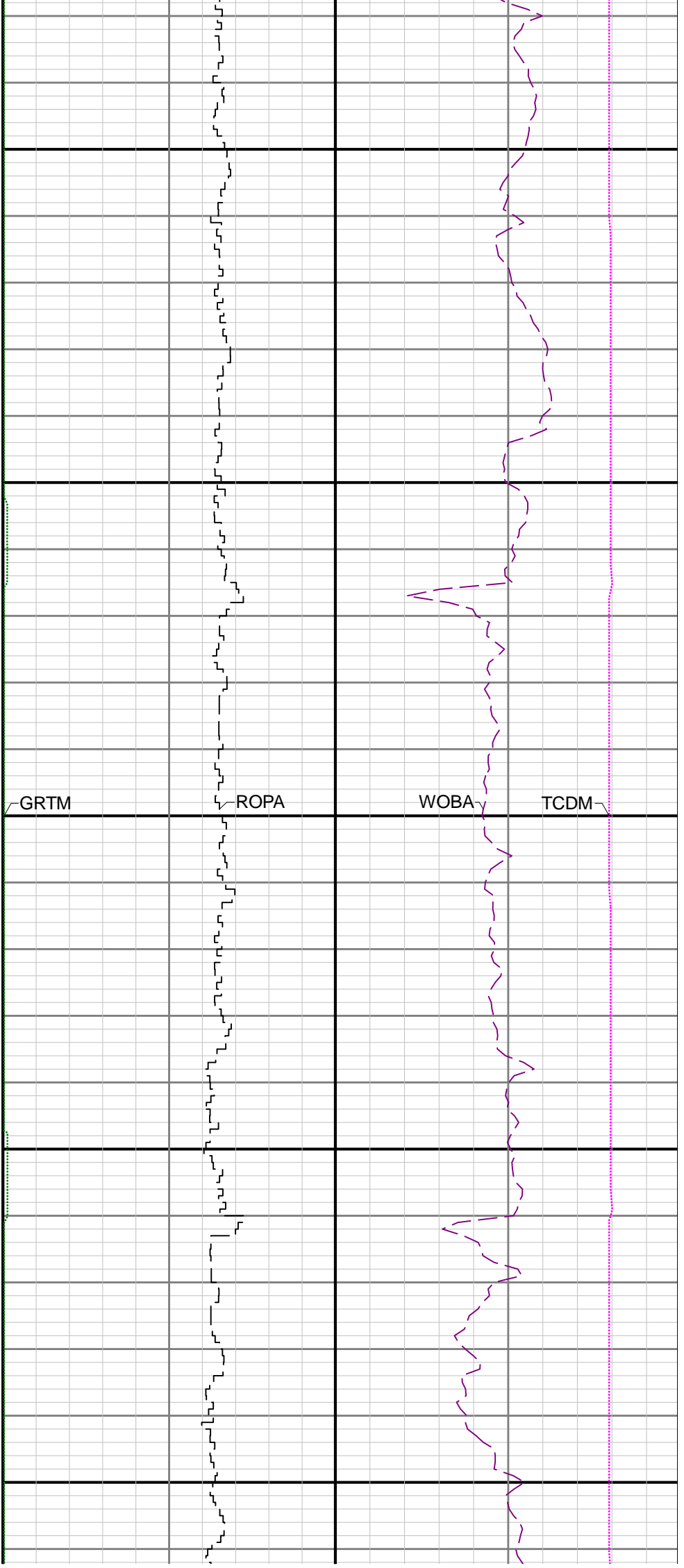


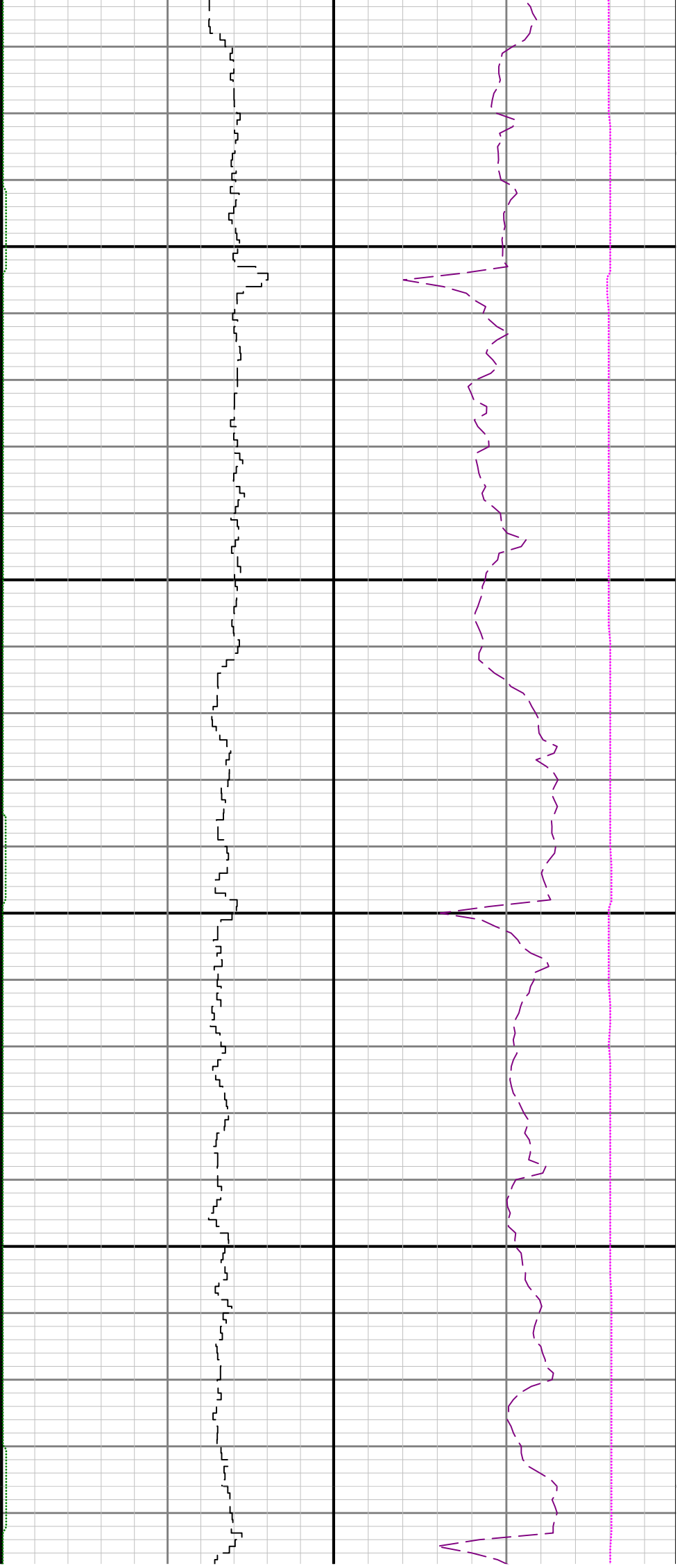


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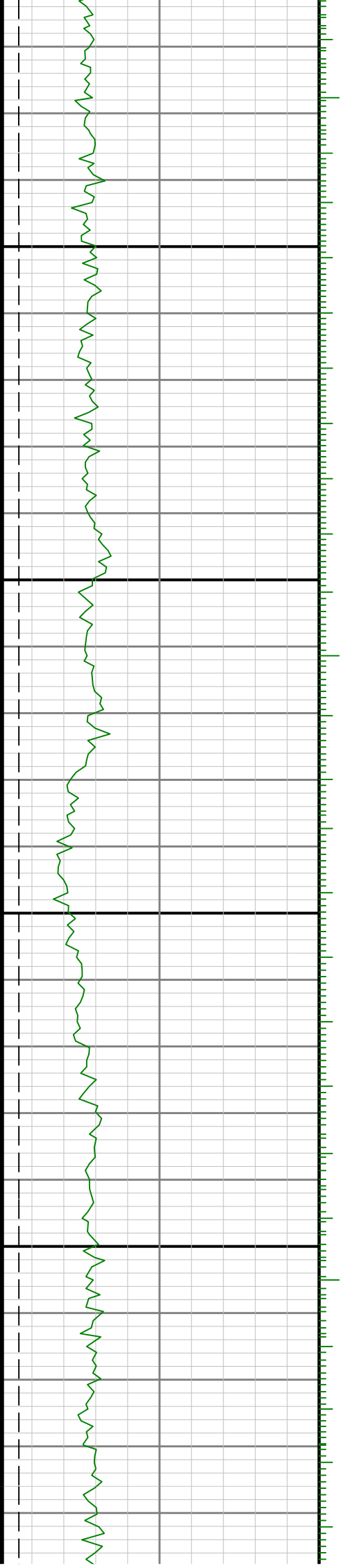


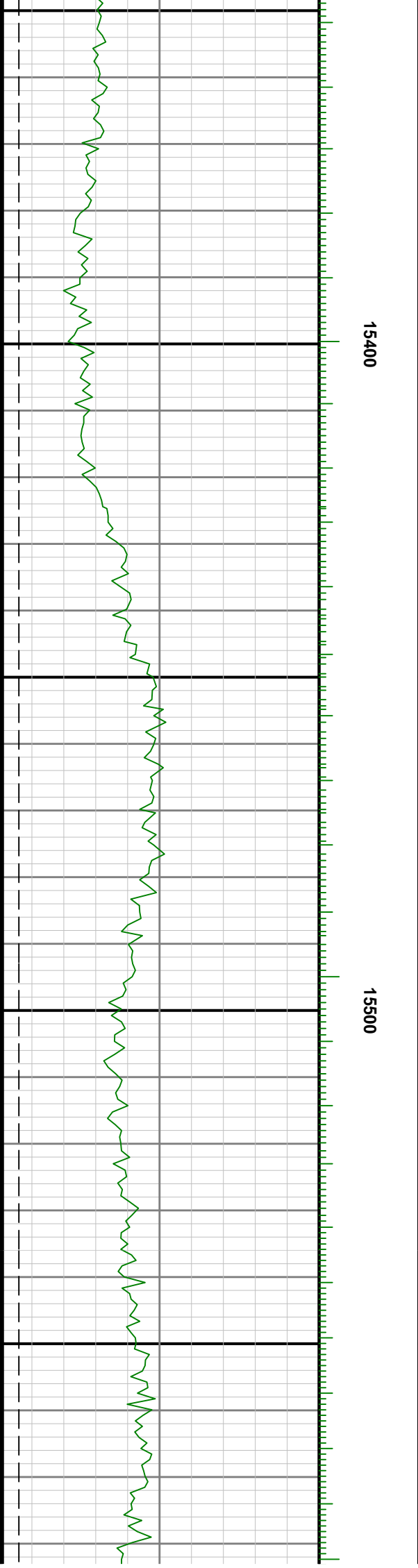


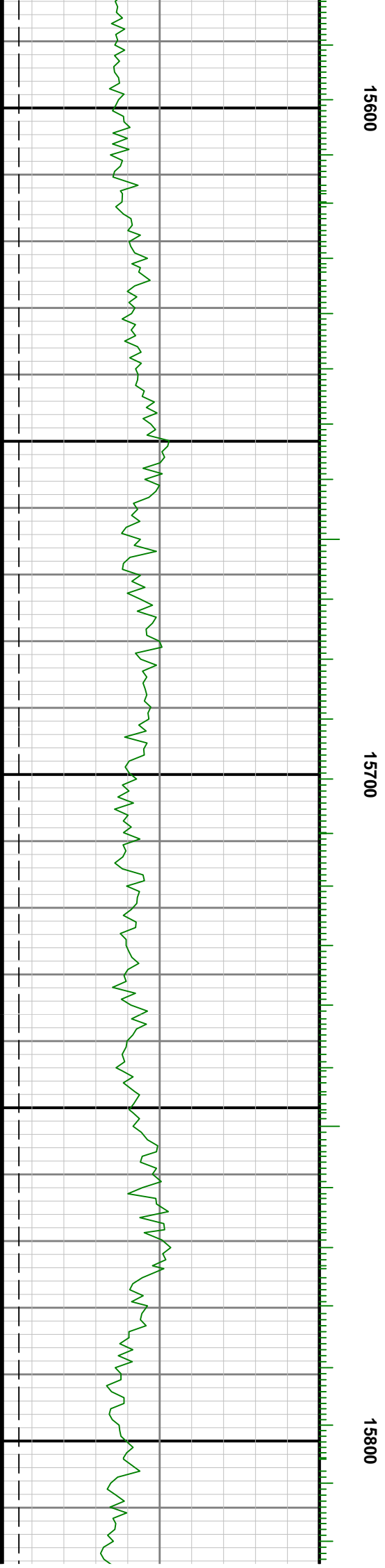
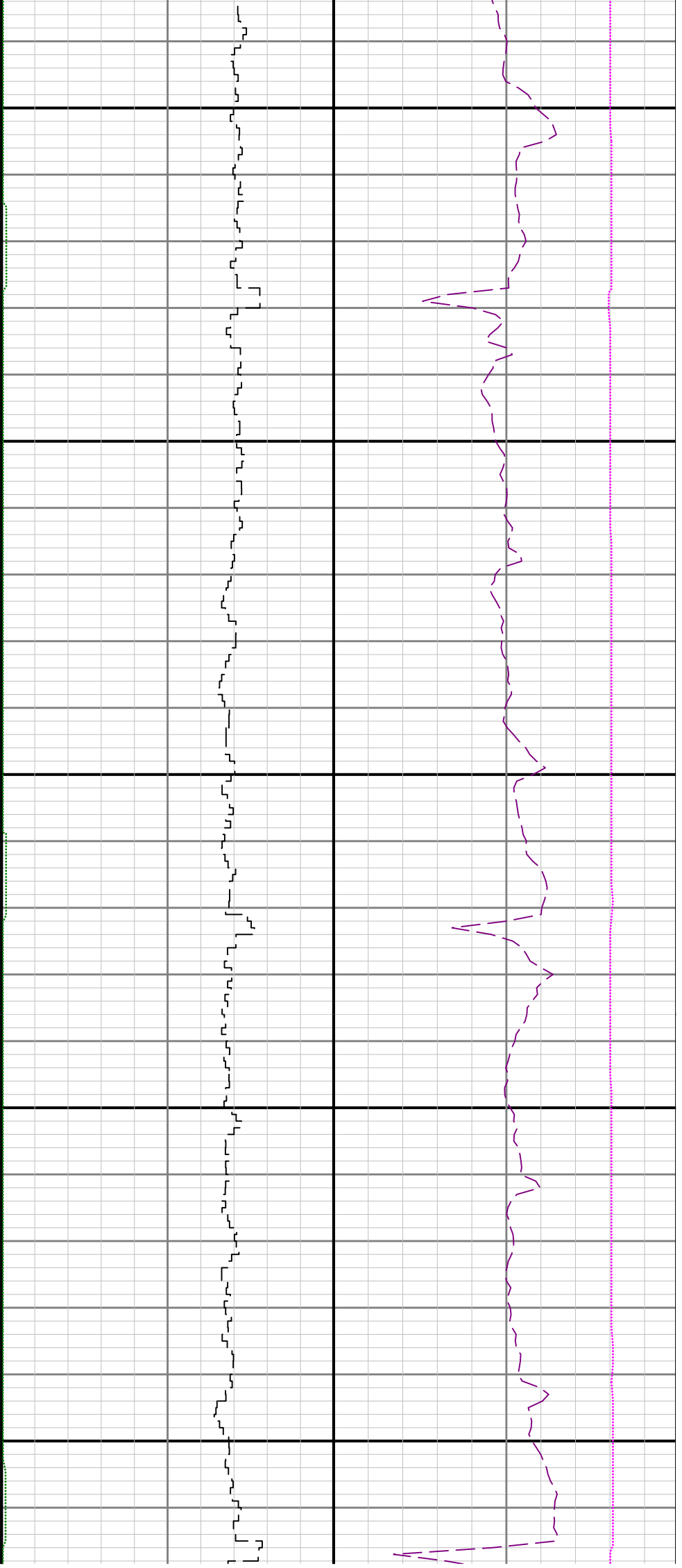


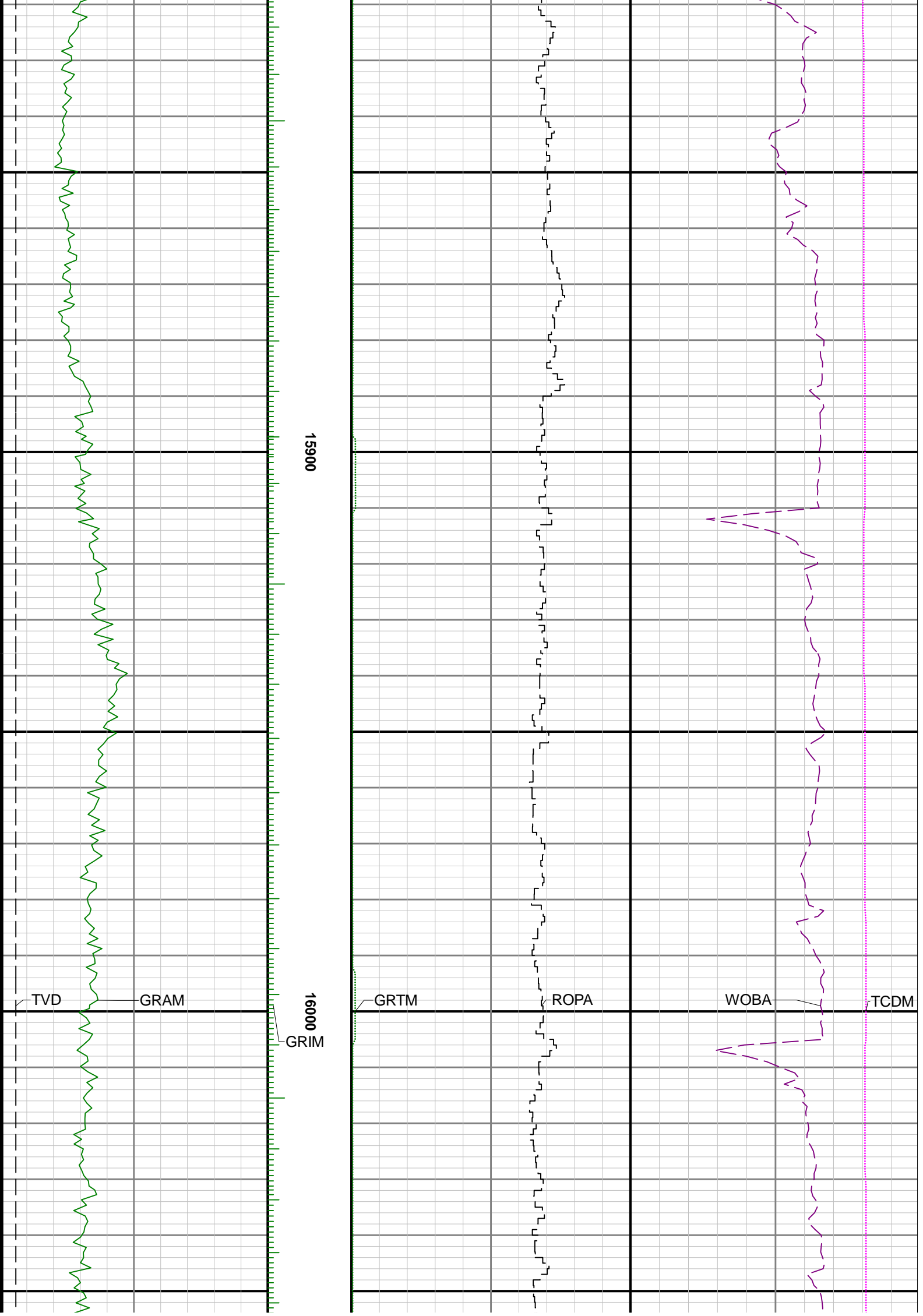
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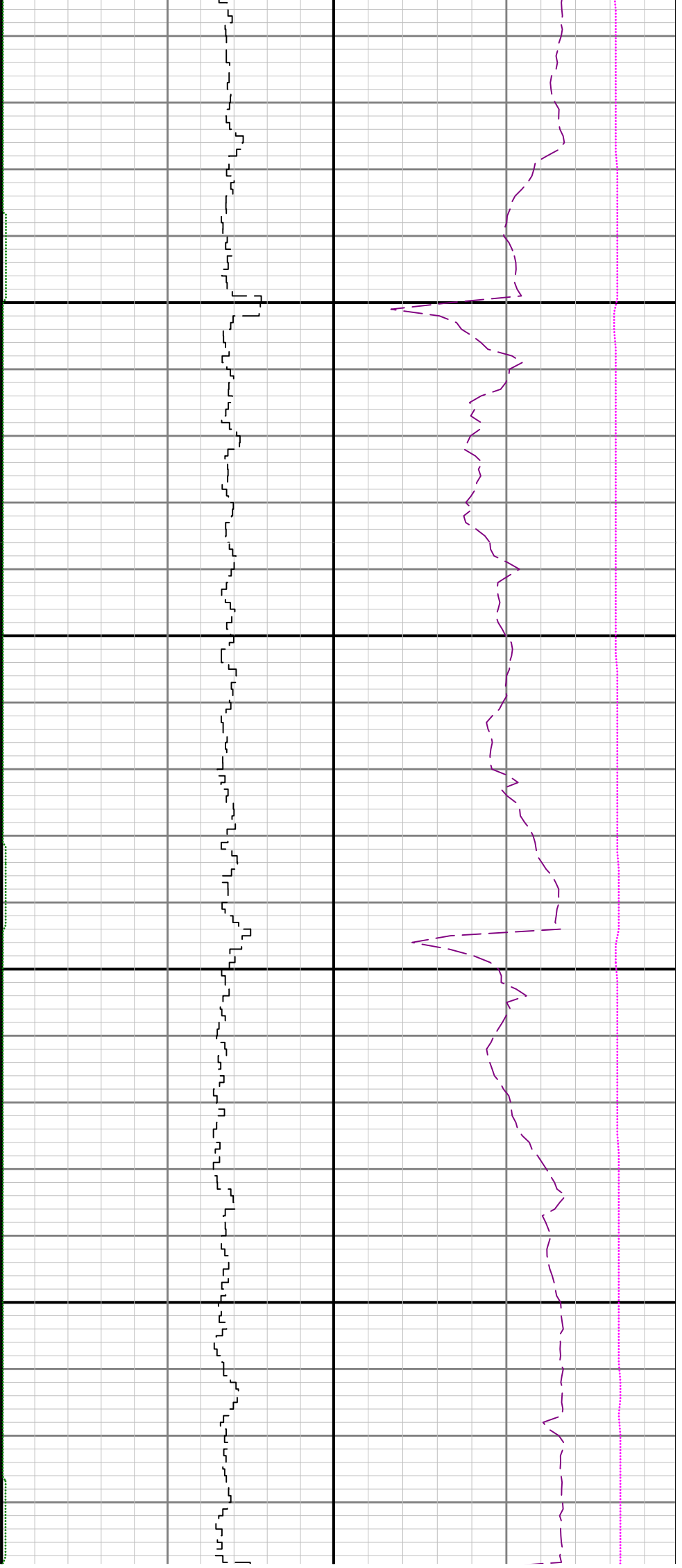
15300











16100

16200

