

BAKER HUGHES				LWD MEMORY LOG											
Gamma Ray															
Scale:				Company: Noble Energy											
1:240 MD				Well: Wells Ranch AF07-666											
Depth Reference:				Field: Weld County(Noble NAD 83 Grid)											
Driller's Depth				County: Weld State: Colorado											
Status:				Surface Location:						Other Services:					
Final Print				Latitude: 040° 24' 54.972" N											
API No: 05-123-44240-00				Longitude: 104° 20' 18.096" W						Directional					
Job ID: 8645477				UTM: N/A						N/A					
				SEC: 8						TNW: 5N RGE: 62W					
Permanent Datum (P.D.): Ground Level				Elevation: 4705.00 ft						KB: N/A					
Log Measured From: Rig Floor				Above P.D. 30.00 ft						DF: 4735.00 ft					
				GL: 4705.00 ft											
Dates				Interval Logged						Magnetic Field Reference					
Date From: 2017-07-21				Top: (ft) 1946.00		Azi Reference North: Grid		Dip Angle: (deg)		67.14					
Date To: 2017-07-24				Bottom: (ft) 16540.00		Total Magnetic Field Strength: (mT)				52284					
Spud Date: 2017-07-21						Mag to Reference North Correction: (deg)				7.13 E					
Borehole Record				Casing Record											
Hole Size (in)				From (ft)		To (ft)		Size (in)		Weight (lb/ft)		From (ft)		To (ft)	
13.500				0.00		1946.00		9.625		36.00		30.00		1936.00	
8.500				1946.00		16540.00									

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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	3.00	AutoTrak Curve	1933.10	16527.10	1946.00	16540.00	2017-07-22 04:05	2017-07-24 13:23	52.42

Crew

Name	Arrive Wellsite	Depart Wellsite	Name	Arrive Wellsite	Depart Wellsite	Name	Arrive Wellsite	Depart Wellsite
Adam Schlenz	2017-07-21	2017-07-25	Alexis Bejarano	2017-07-21	2017-07-24	Emi Iyalla	2017-07-21	2017-07-25

Mud Properties Record

Date / Time	Run	Measured	Mud	Density	Viscosity	pH	Fluid	Oil /	Source	Total	K+
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	No.	Depth (ft)	Type	(ppg)	(cP)		Loss (cm3)	Water		Chlorides (ppm)	(%)
2017-07-22 03:00	1	1946.00	Oil Based Mud	9.3	9	N/A	16.0	84/16	Active Pit	21500	0.00
2017-07-22 13:00	1	4520.00	Oil Based Mud	9.1	12	N/A	15.2	82/18	Active Pit	20000	0.00
2017-07-23 03:00	1	7684.00	Oil Based Mud	9.1	9	N/A	16.4	85/15	Active Pit	25000	0.00
2017-07-23 13:00	1	10228.00	Oil Based Mud	9.2	9	N/A	16.0	84/16	Active Pit	21000	0.00
2017-07-24 03:00	1	13817.00	Oil Based Mud	9.4	11	N/A	18.0	86/14	Active Pit	20000	0.00
2017-07-24 14:00	1	16540.00	Oil Based Mud	9.4	10	N/A	21.2	86/14	Active Pit	21000	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	14178991	Near Bit VSS	5.93	6.73	7.000	4.330
1	ATC_SU	14178991	Near Bit Inclination	5.93	6.73	7.000	4.330
1	ATC_MWD	12211066	Gamma (single)	2.76	12.90	7.000	3.250
1	ATC_MWD	12211066	Directional (mag)	12.28	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 1946 to 16540 feet MD (1946 to 6469 feet TVD).

Remarks

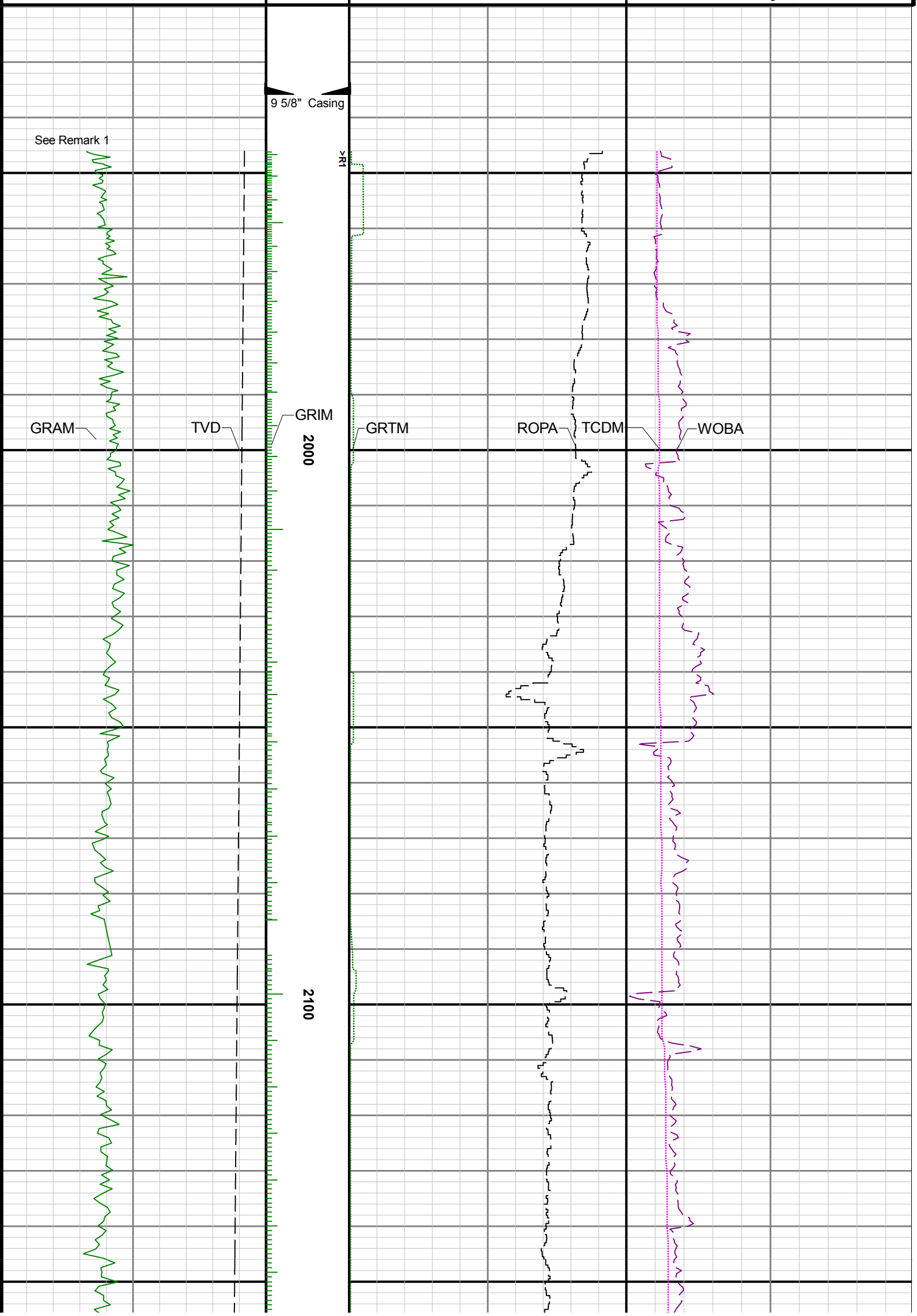
Number	Measured Depth (ft)	Hole Section (in)	Run No.	Remark
1	1946.00	8.500	1	Gamma Ray logging operations began at 1946 feet MD (1946 feet TVD) per customer request.
2	16527.00	8.500	1	The interval from 16527 to 16540 feet MD (6469 feet TVD) was not logged after being drilled due to sensor to bit offset at well TD.

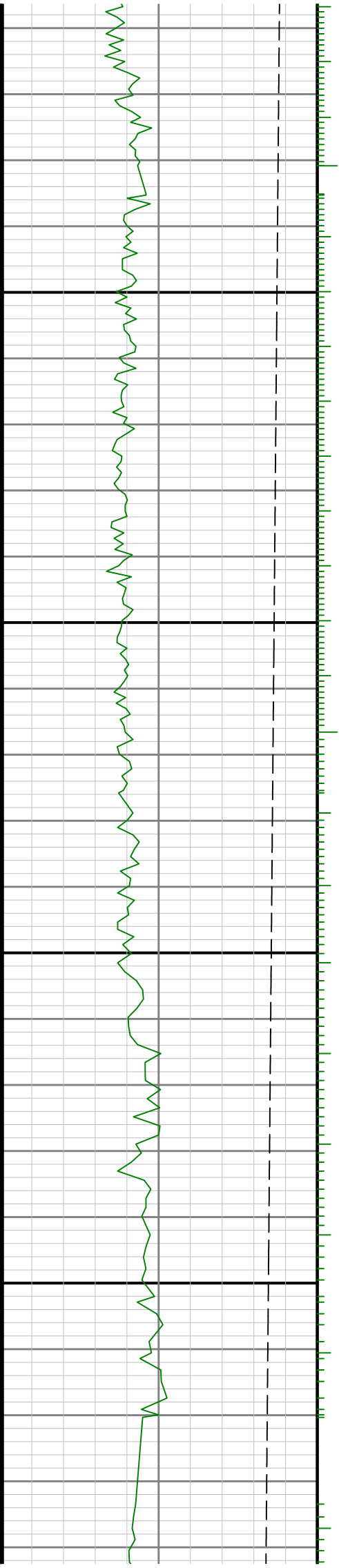
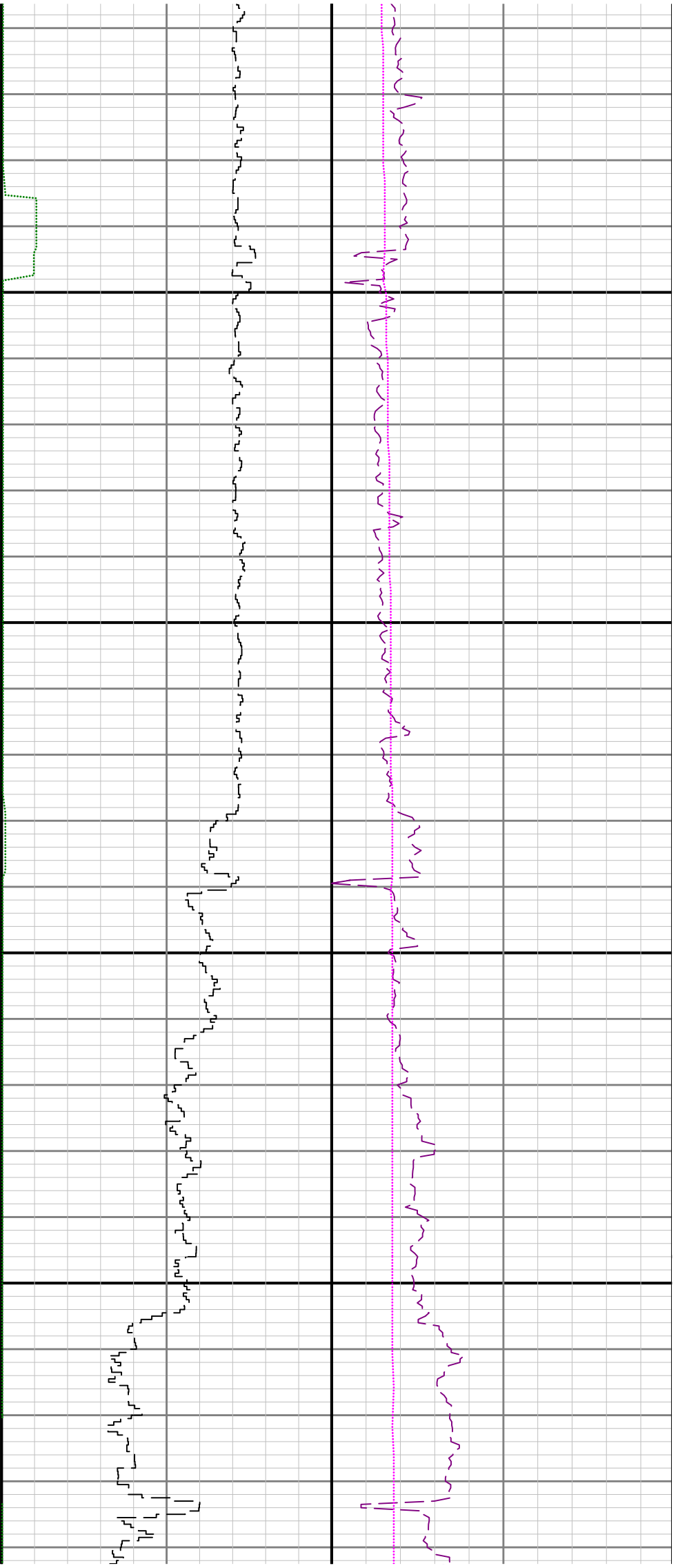
Curve Mnemonics

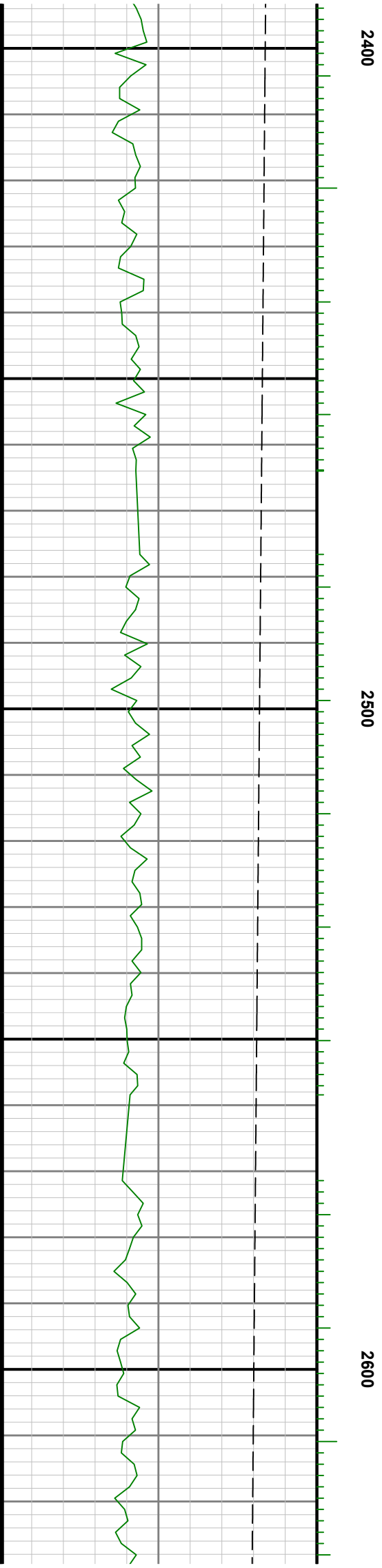
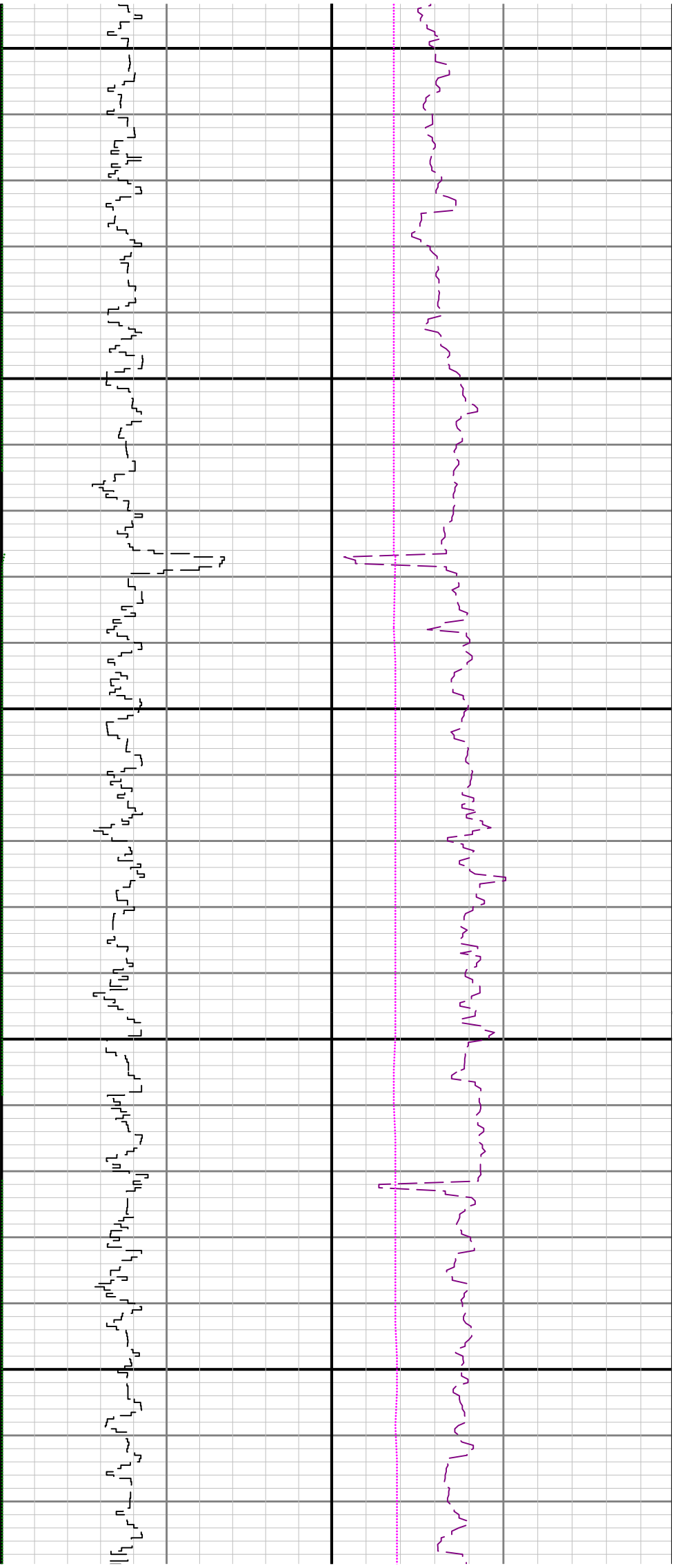
Presented Curves	Description	Units
ROPA	Depth Averaged ROP 3 ft Average	ft/h
TVD	True Vertical Depth	ft
WOBA	Weight On Bit, Average 1 ft Average	klb
GRAM	OnTrak - Gamma Ray - Apparent - Memory 0.5 ft Average	API
GRIM	OnTrak - Gamma Ray - Data Point Indicator - Memory	unitless
GRTM	OnTrak - Gamma Ray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

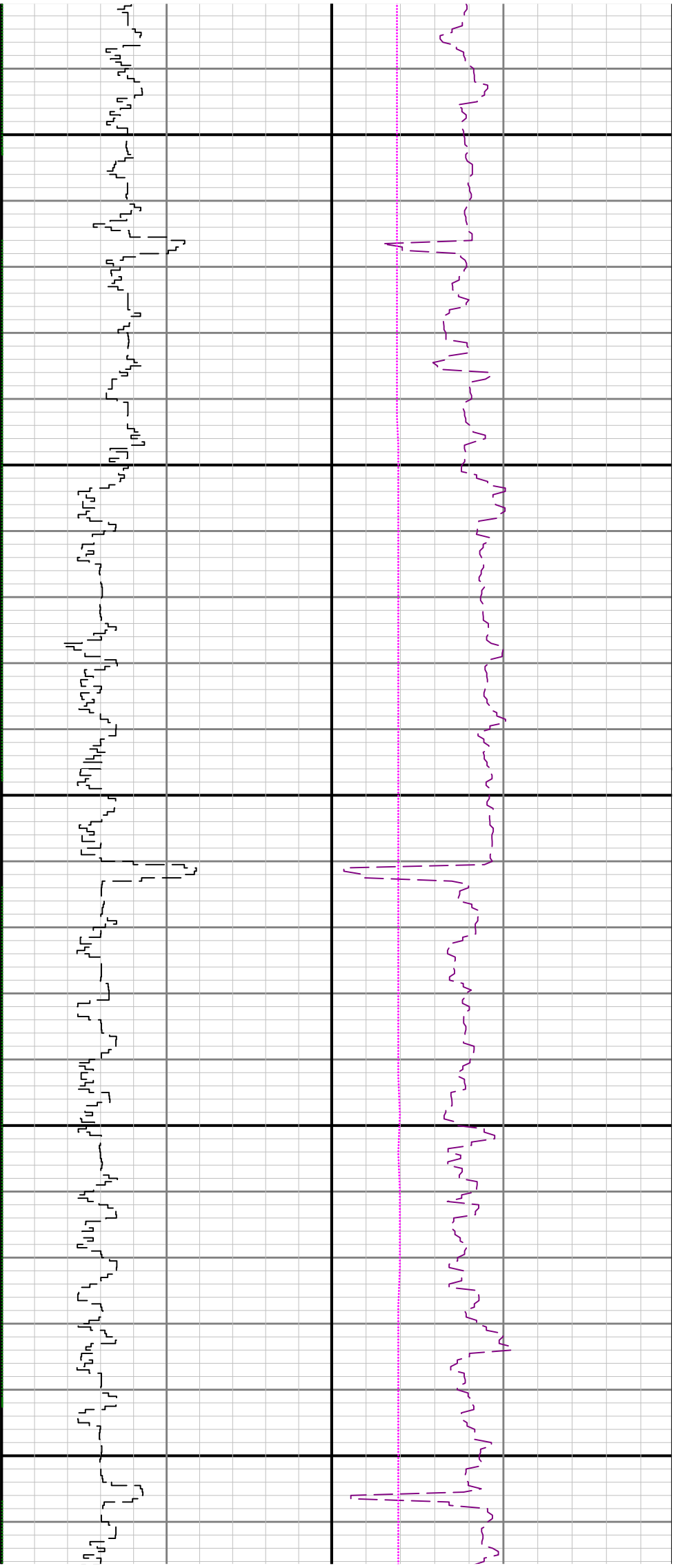
	Company	Noble Energy		
	Well	Wells Ranch AF07-666		
	Interval	Date From: 2017-07-21 22:05:14 Date To: 2017-07-24 07:23:34	Top: 1946.00 Bottom: 16540.00	
	Created	2017-07-25 03:09:38		

Gamma Ray - Apparent 0.5 ft Average GRAM	MD 1:240 feet	Depth Averaged ROP 3 ft Average ROPA	Weight On Bit, Average 1 ft Average WOBA
0 300		1000 _____ 0	0 _____ 50
API		ft/h	klb
True Vertical Depth TVD		Gamma Time Since Drilled GRTM	Downhole Temperature TCDM
7000 _____ 1500		0 _____ 600	100 _____ 300
ft		min	degF



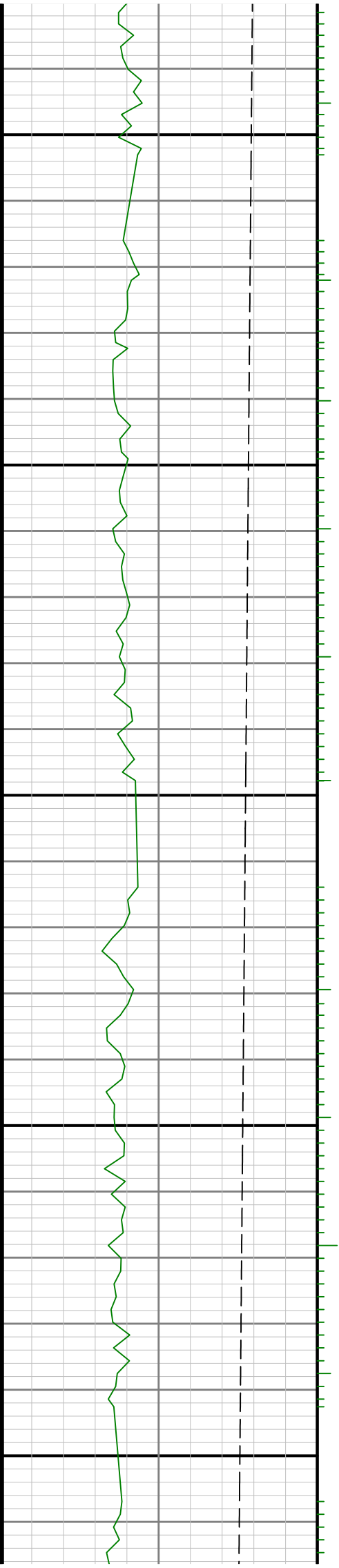


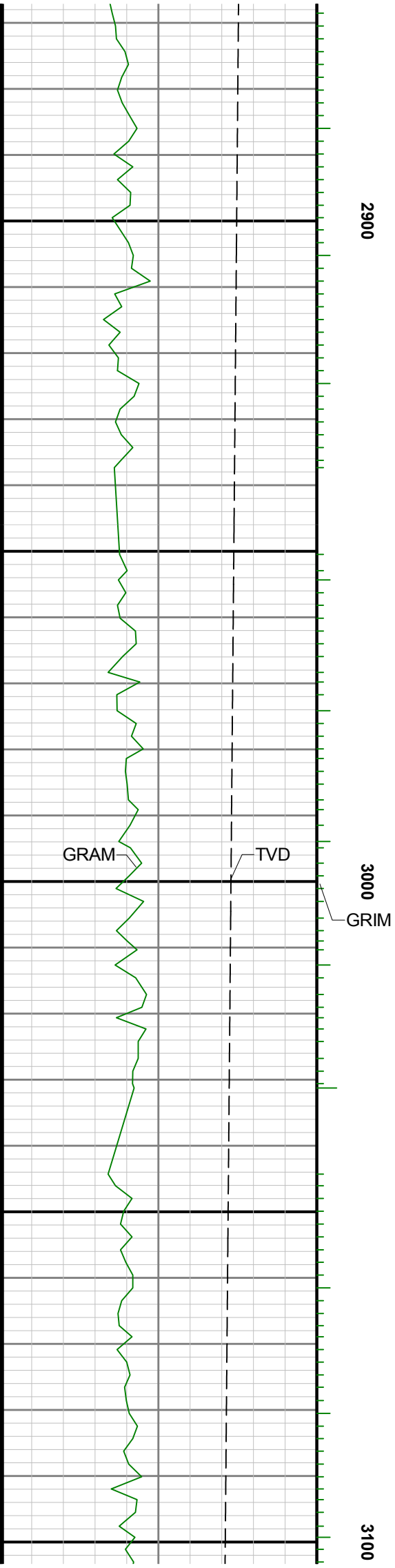
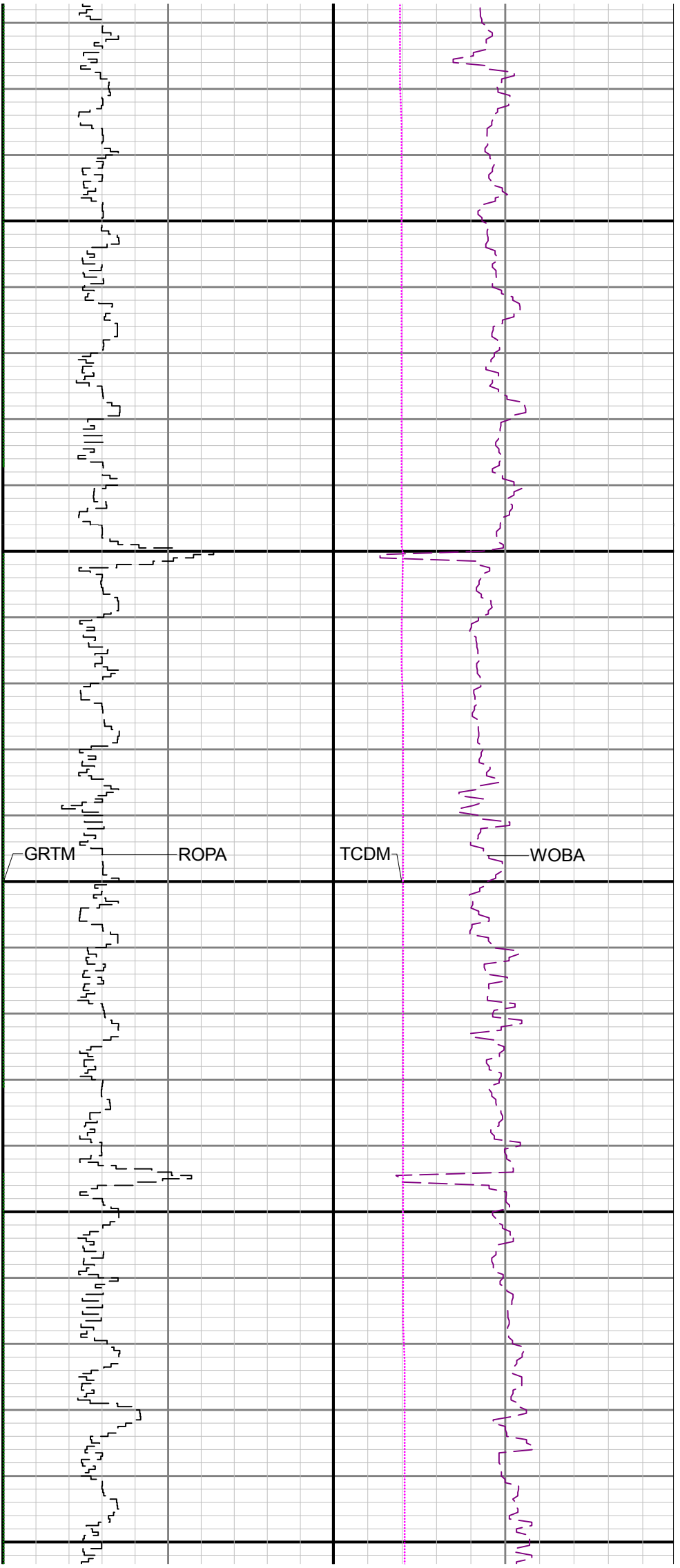


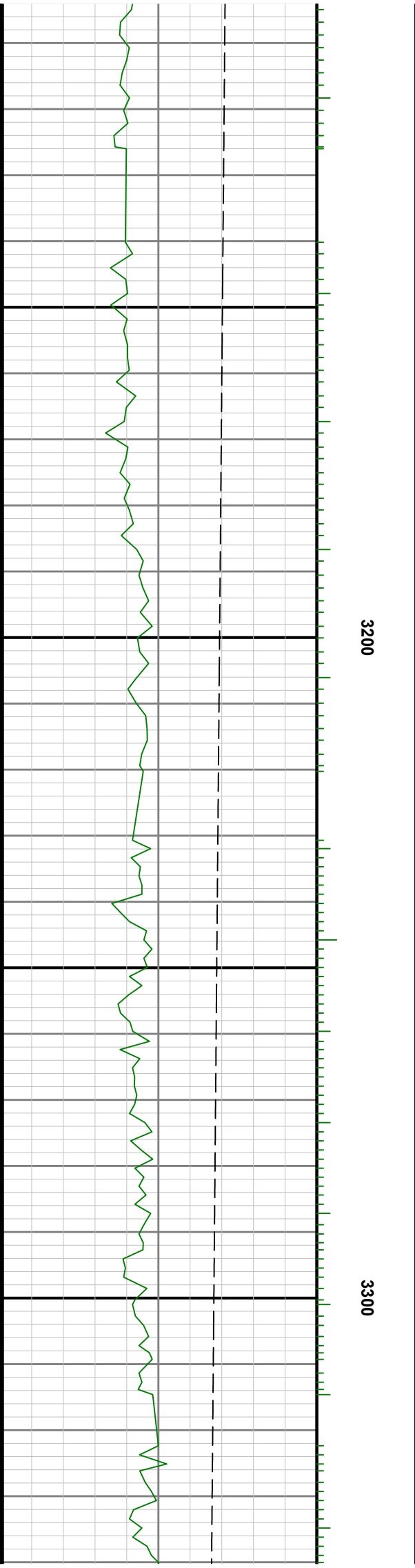
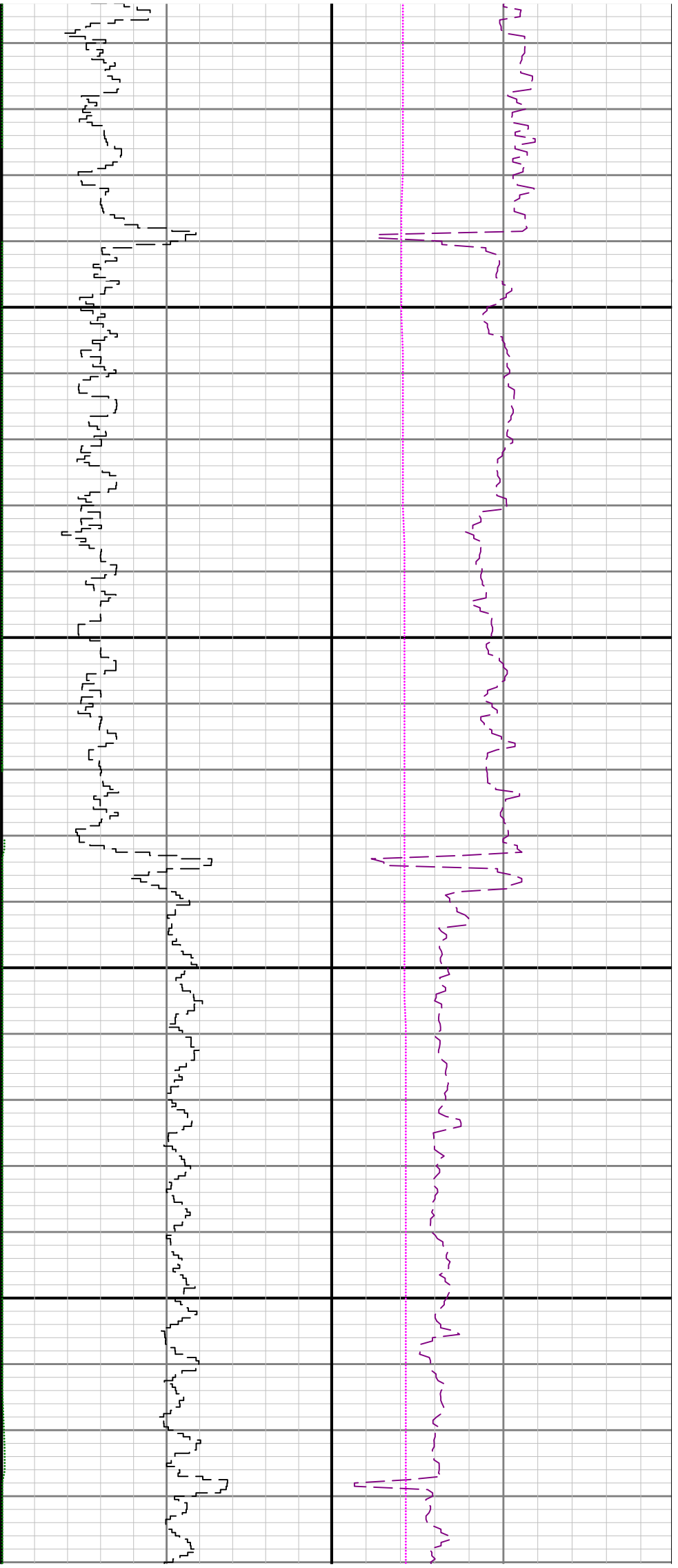


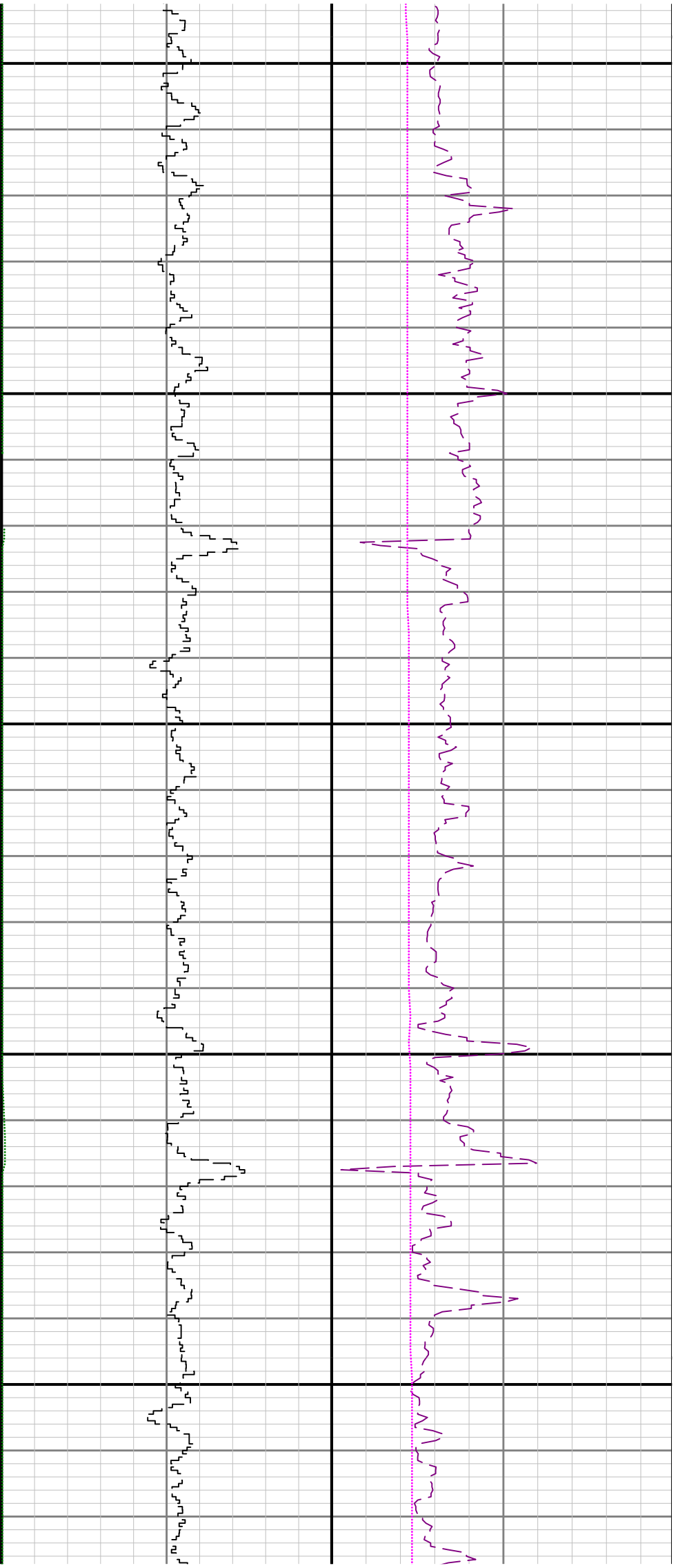
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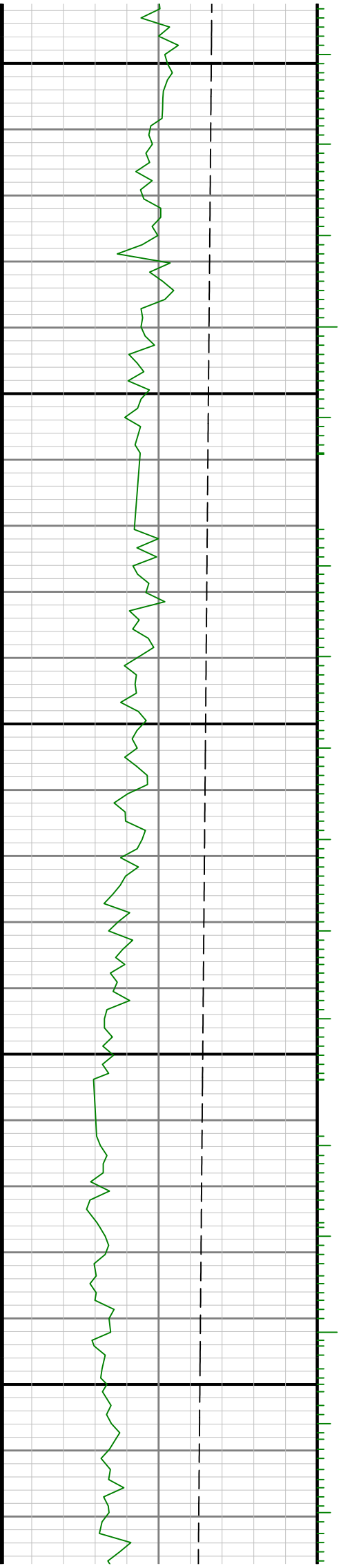


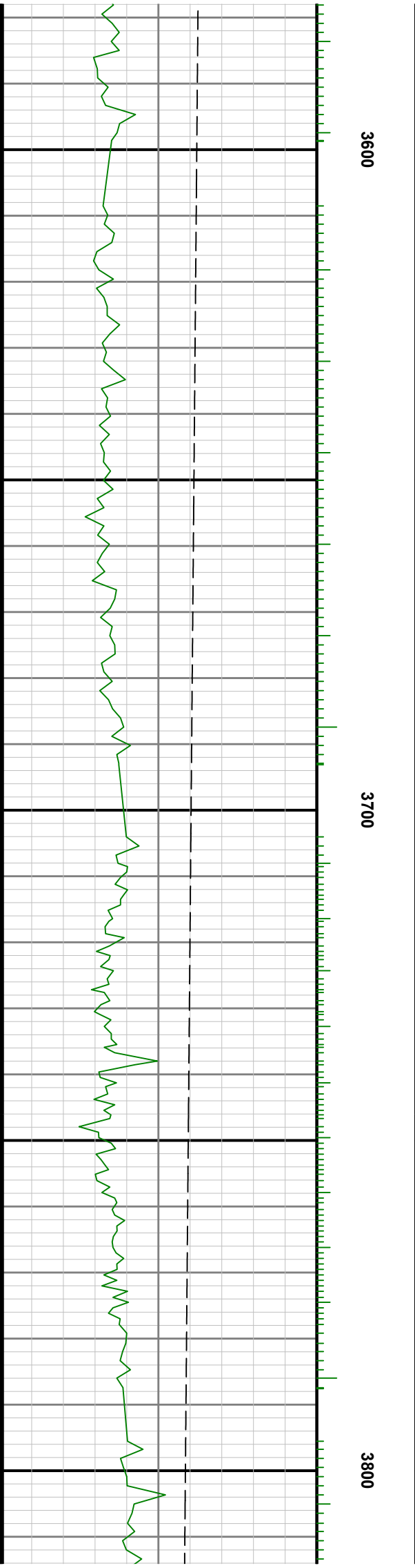
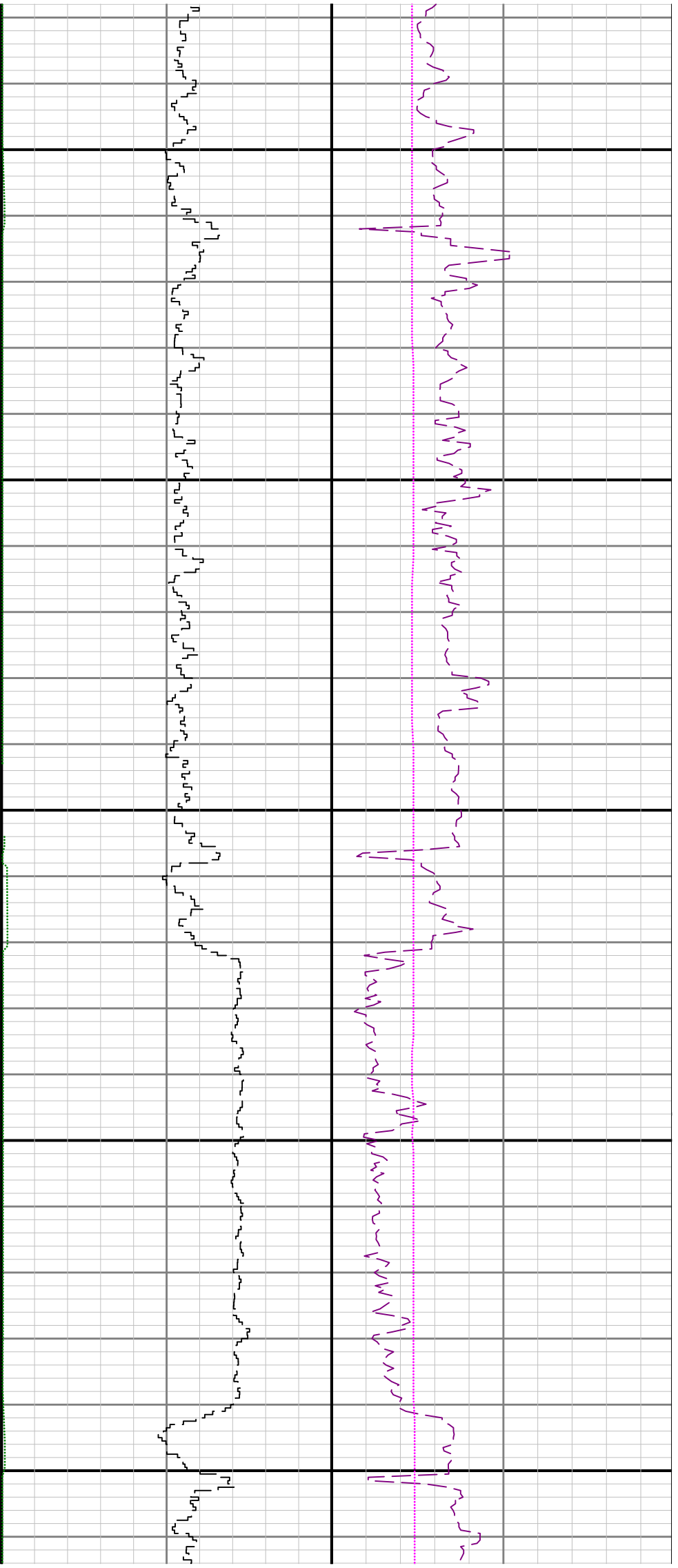


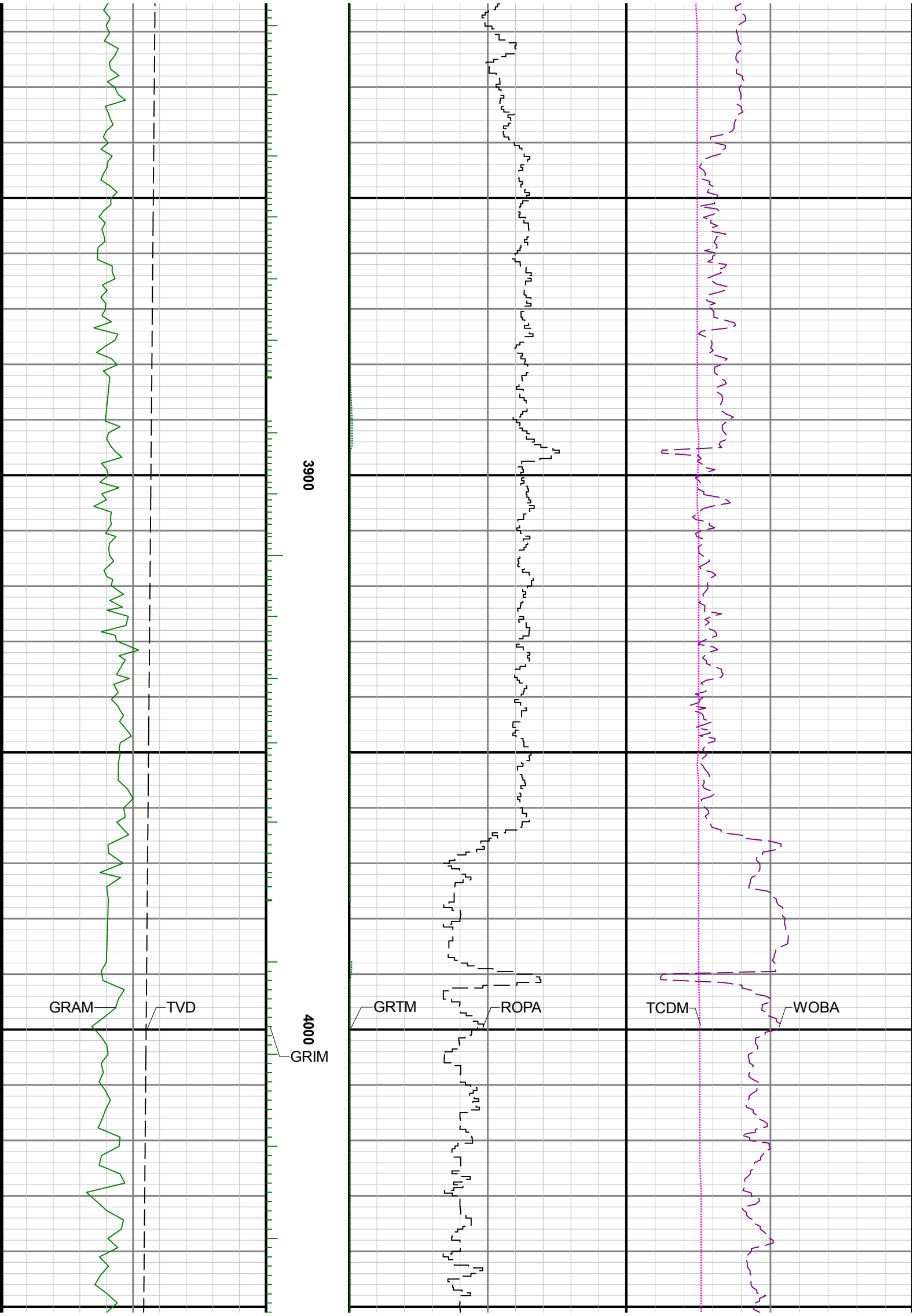


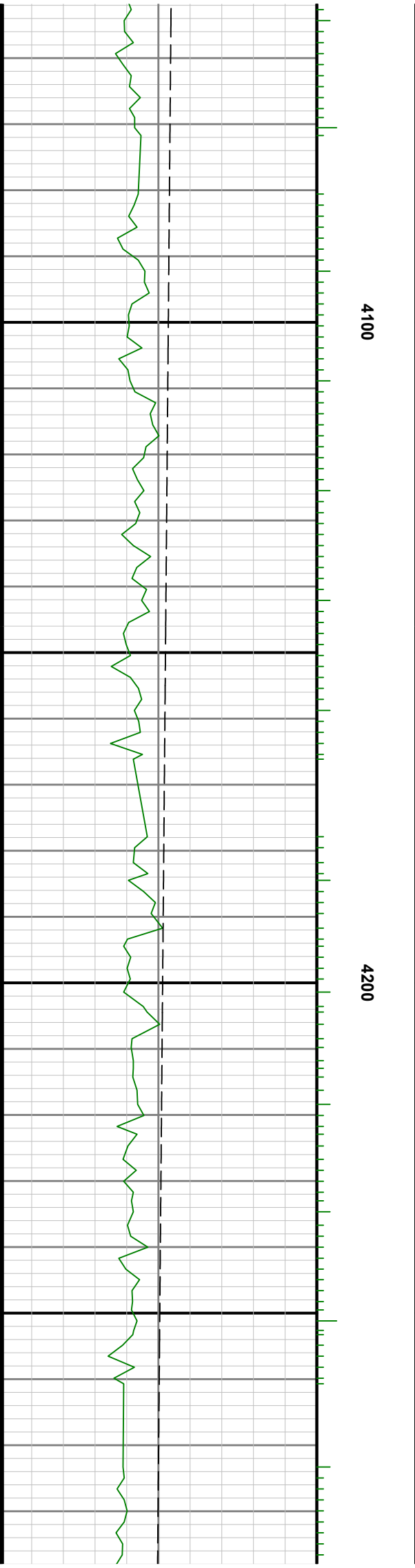
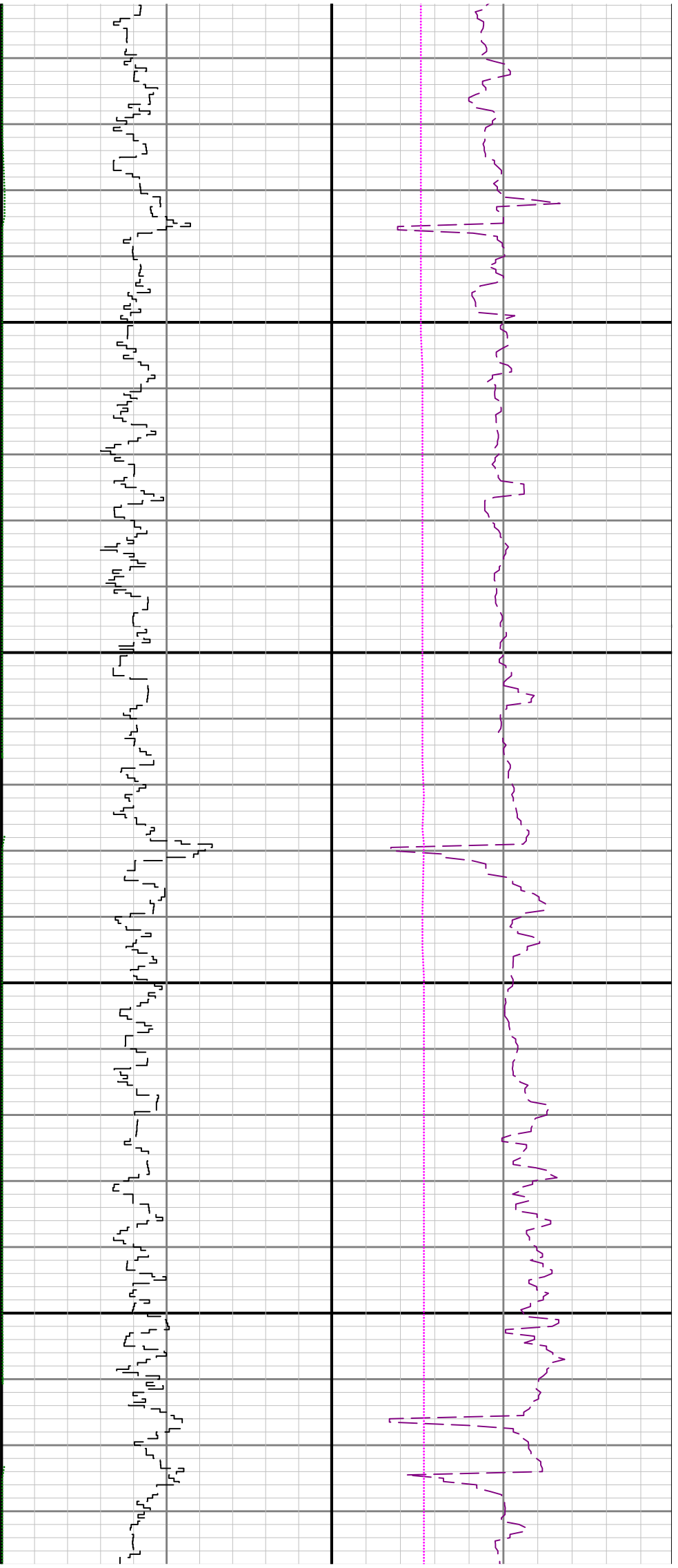
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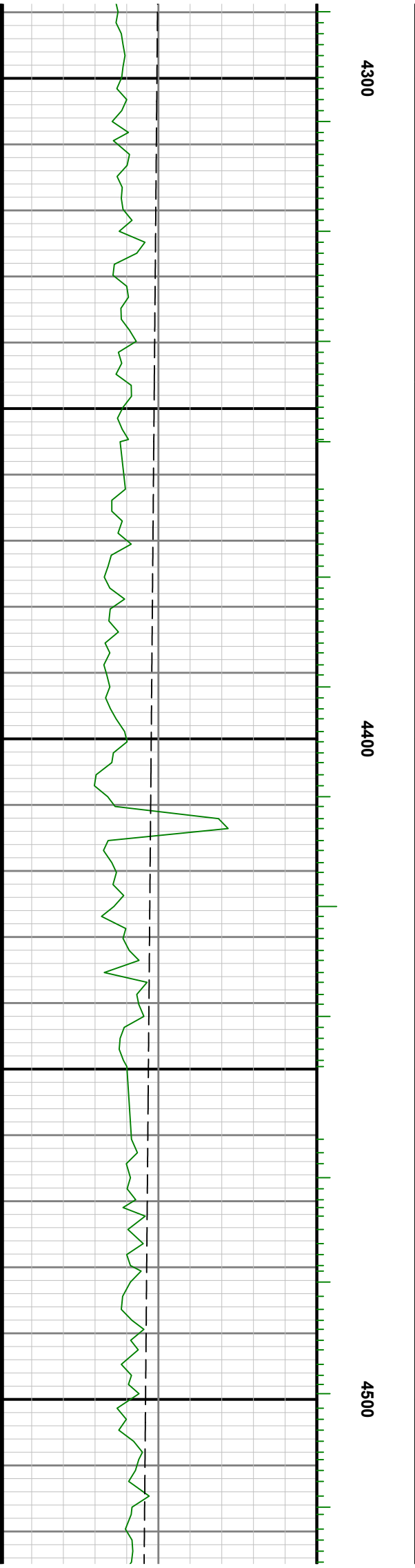
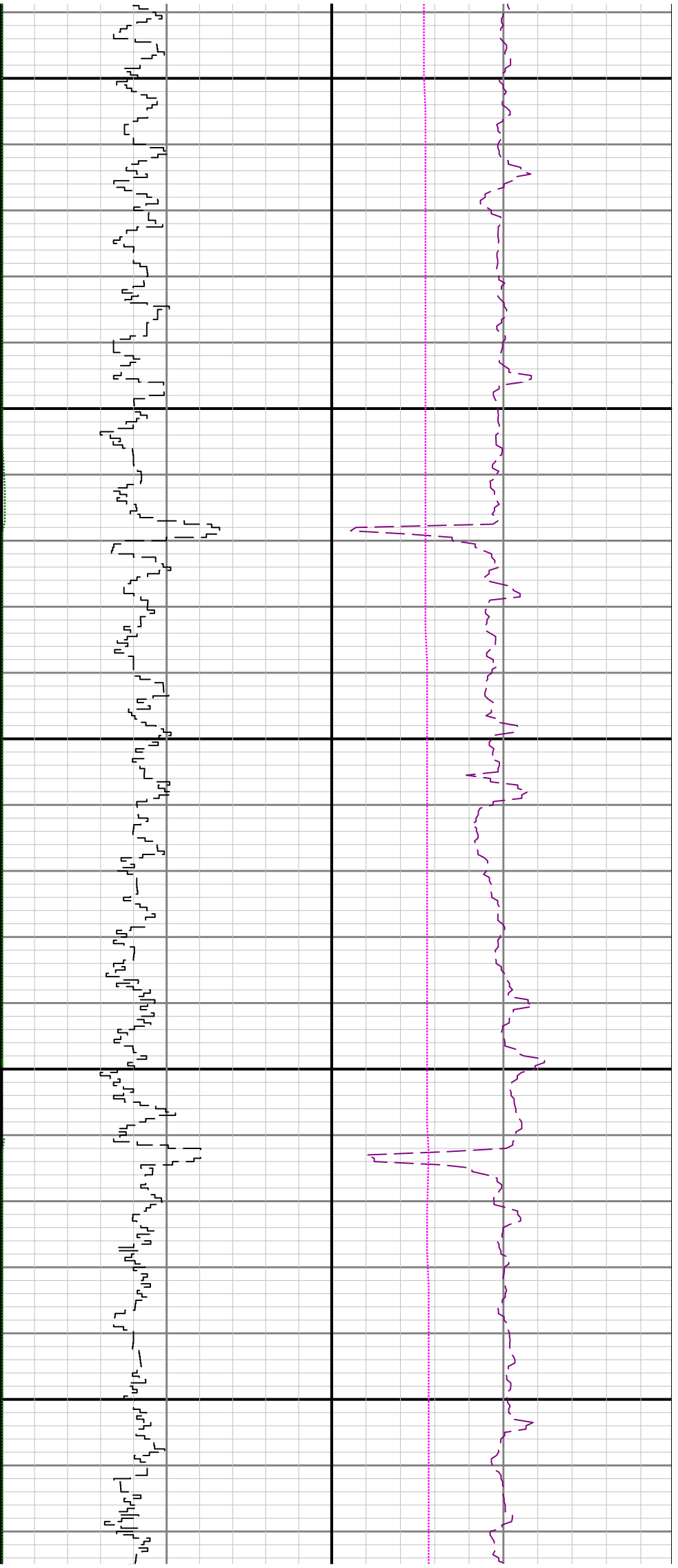
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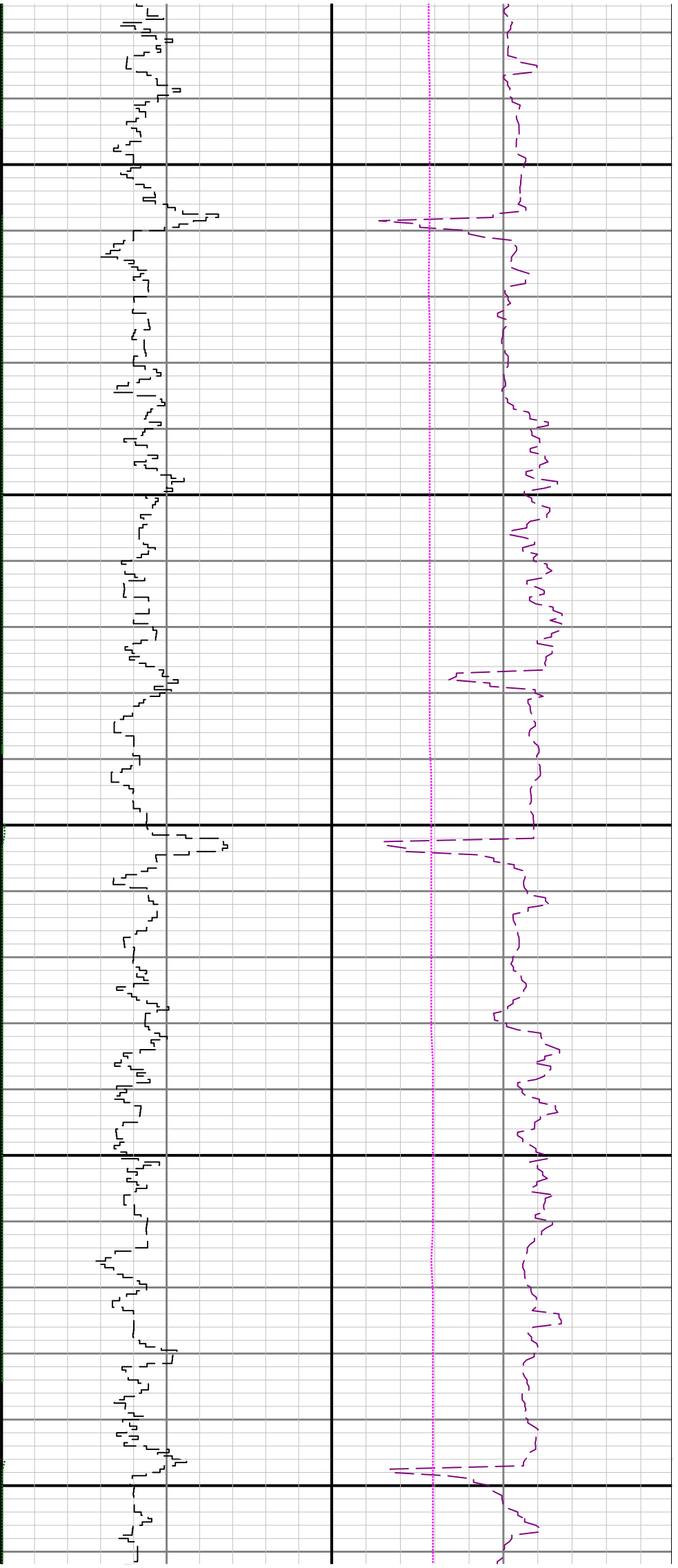






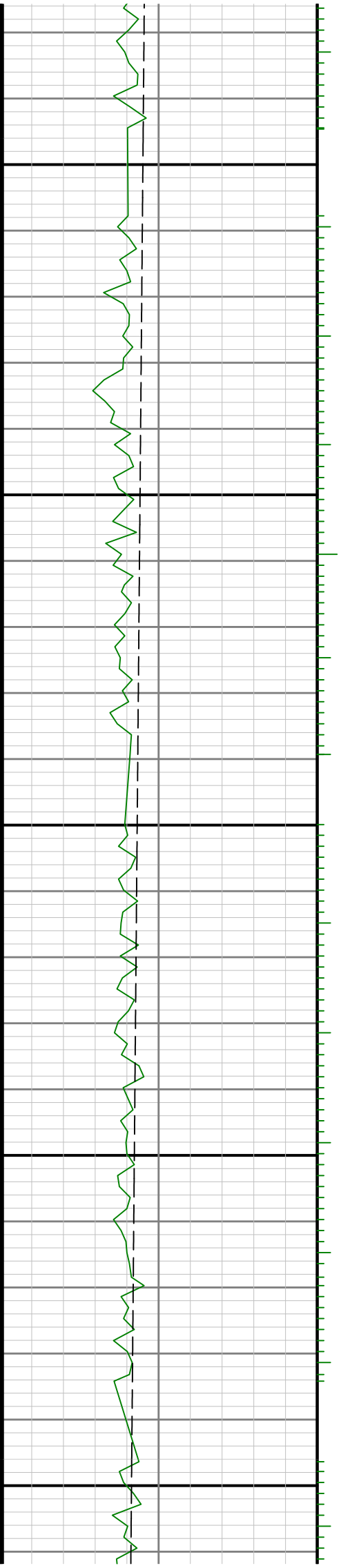


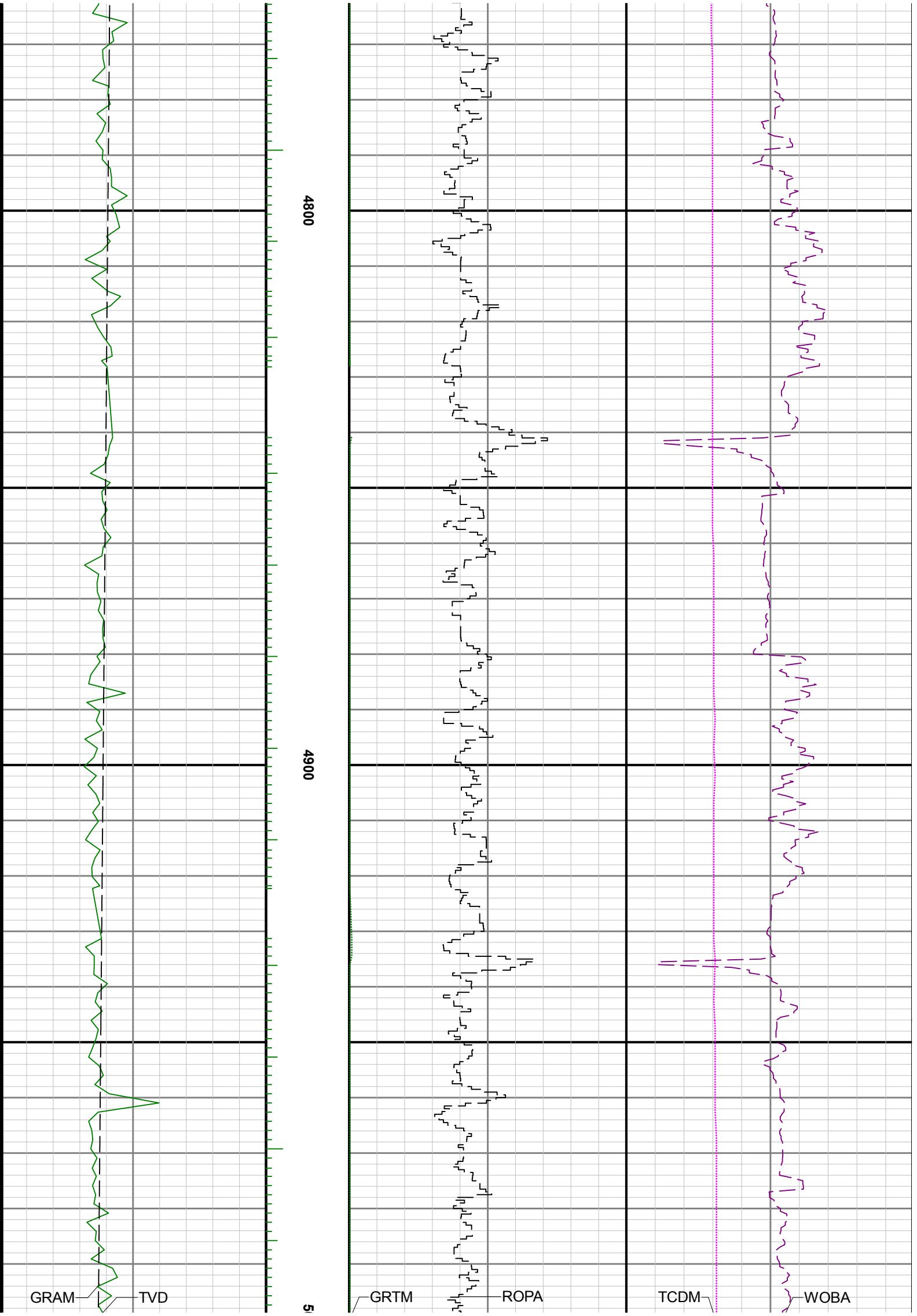


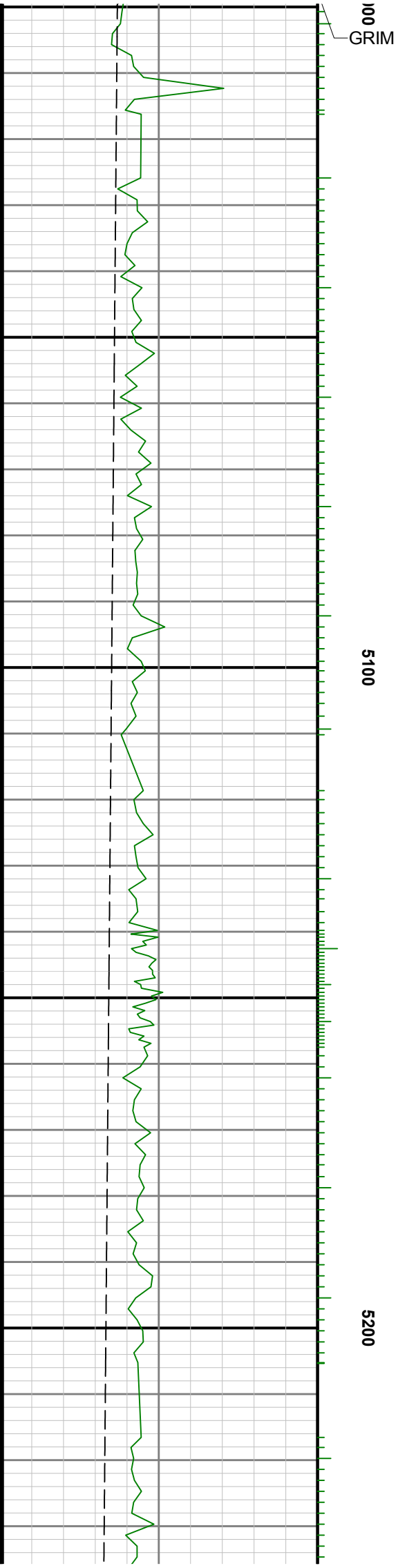
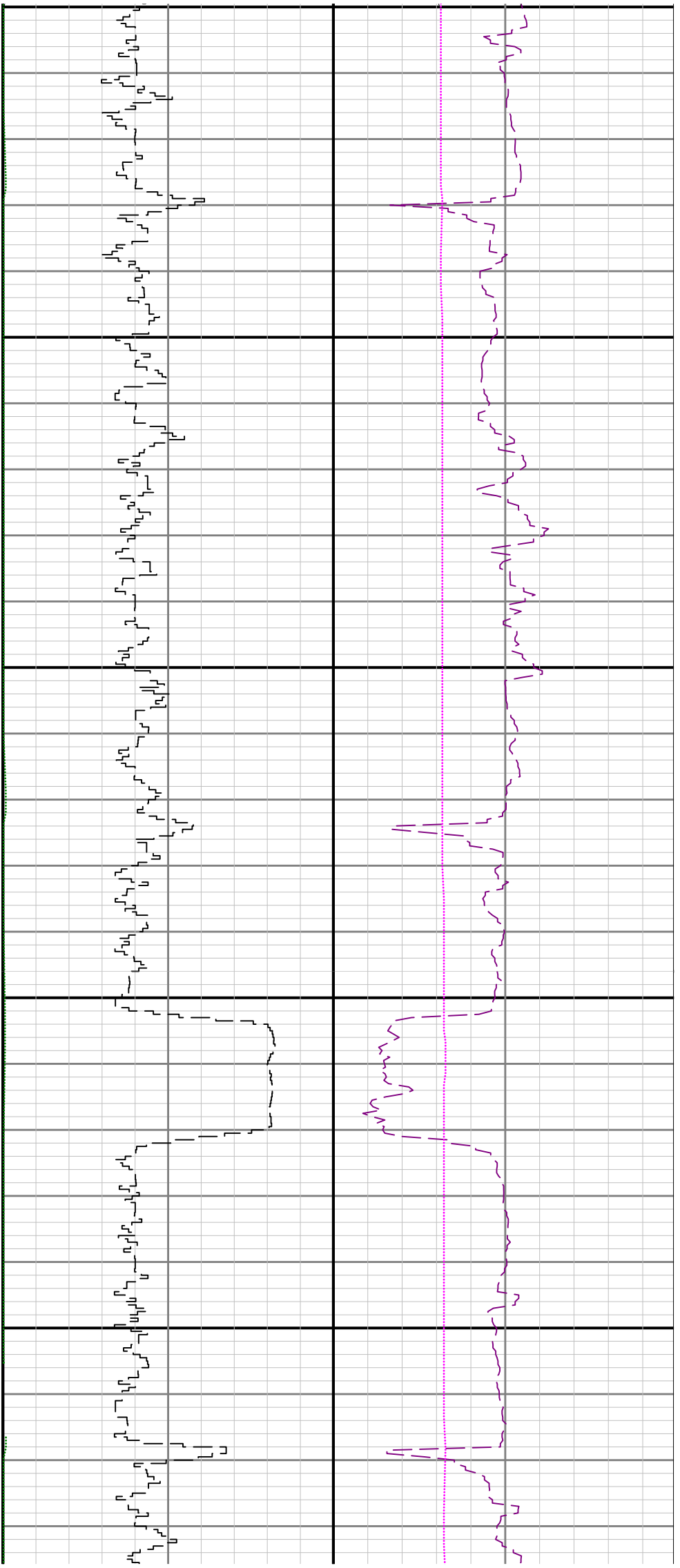


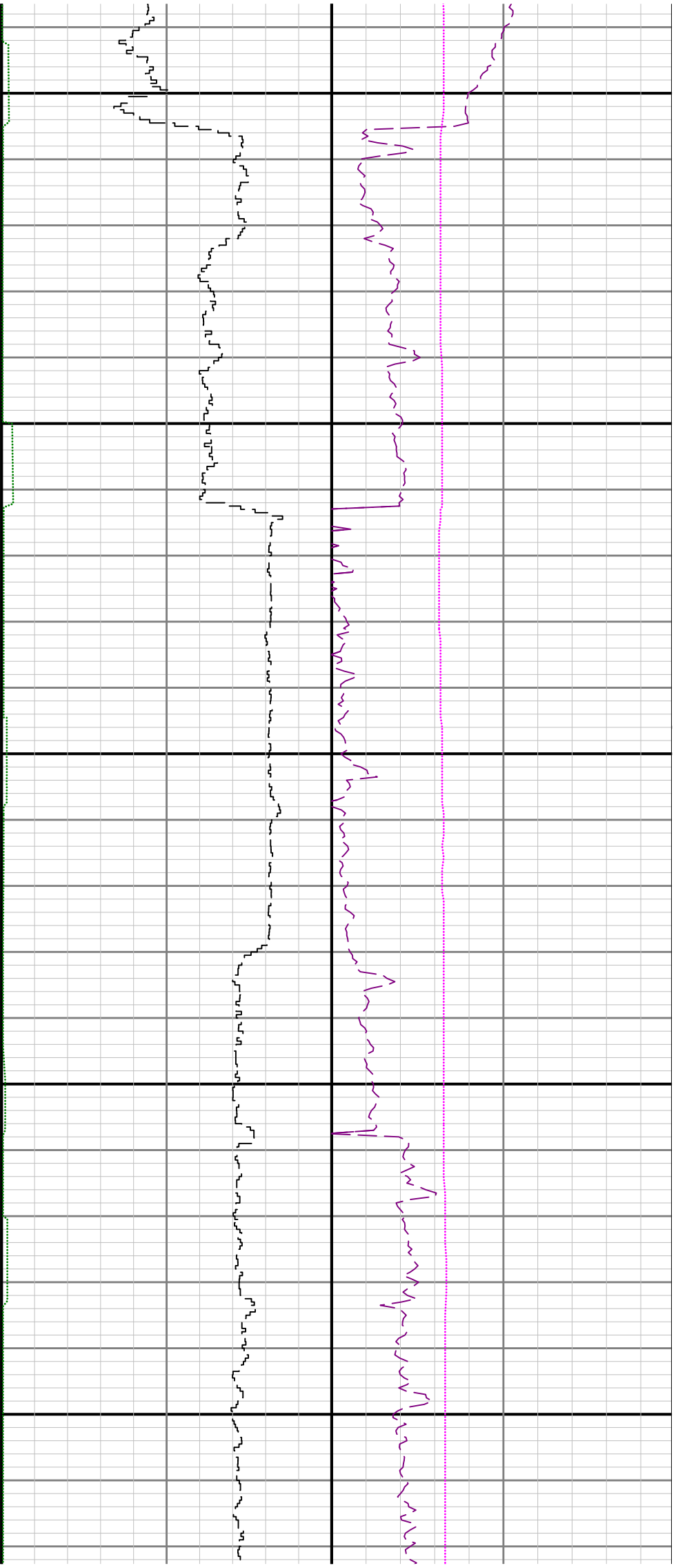
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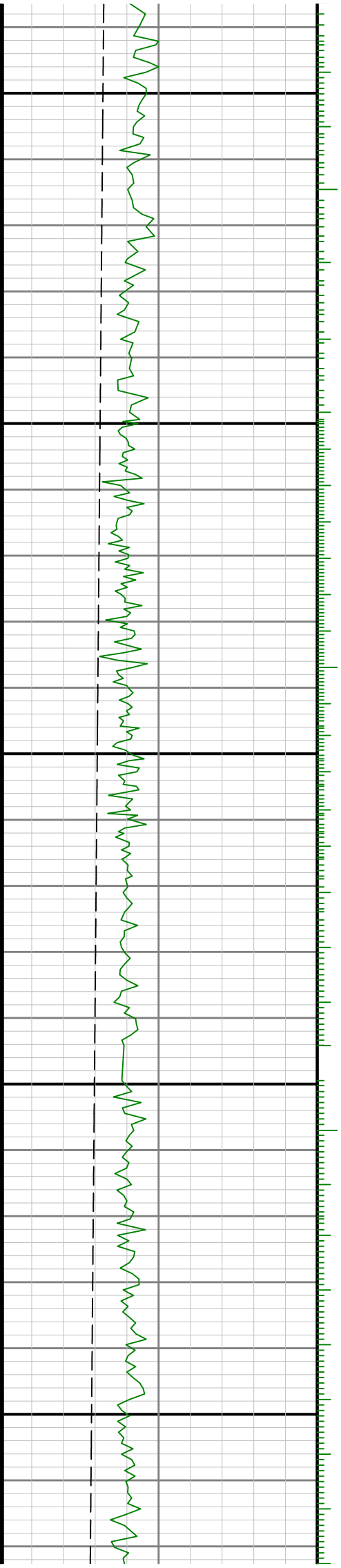


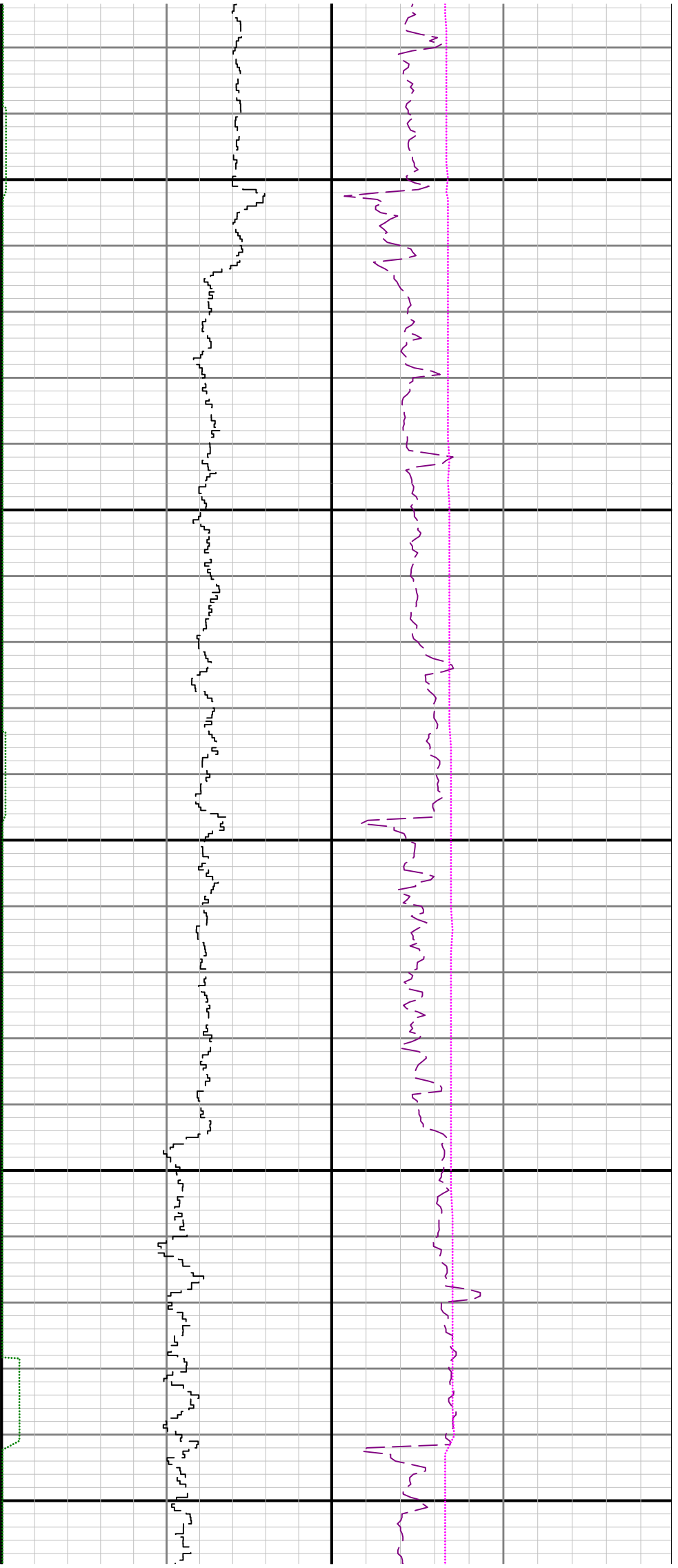




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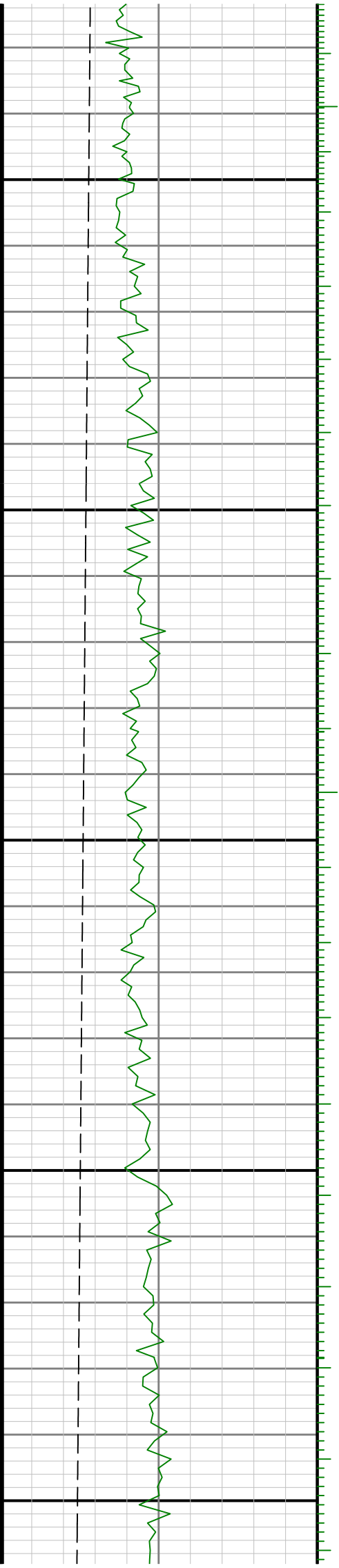


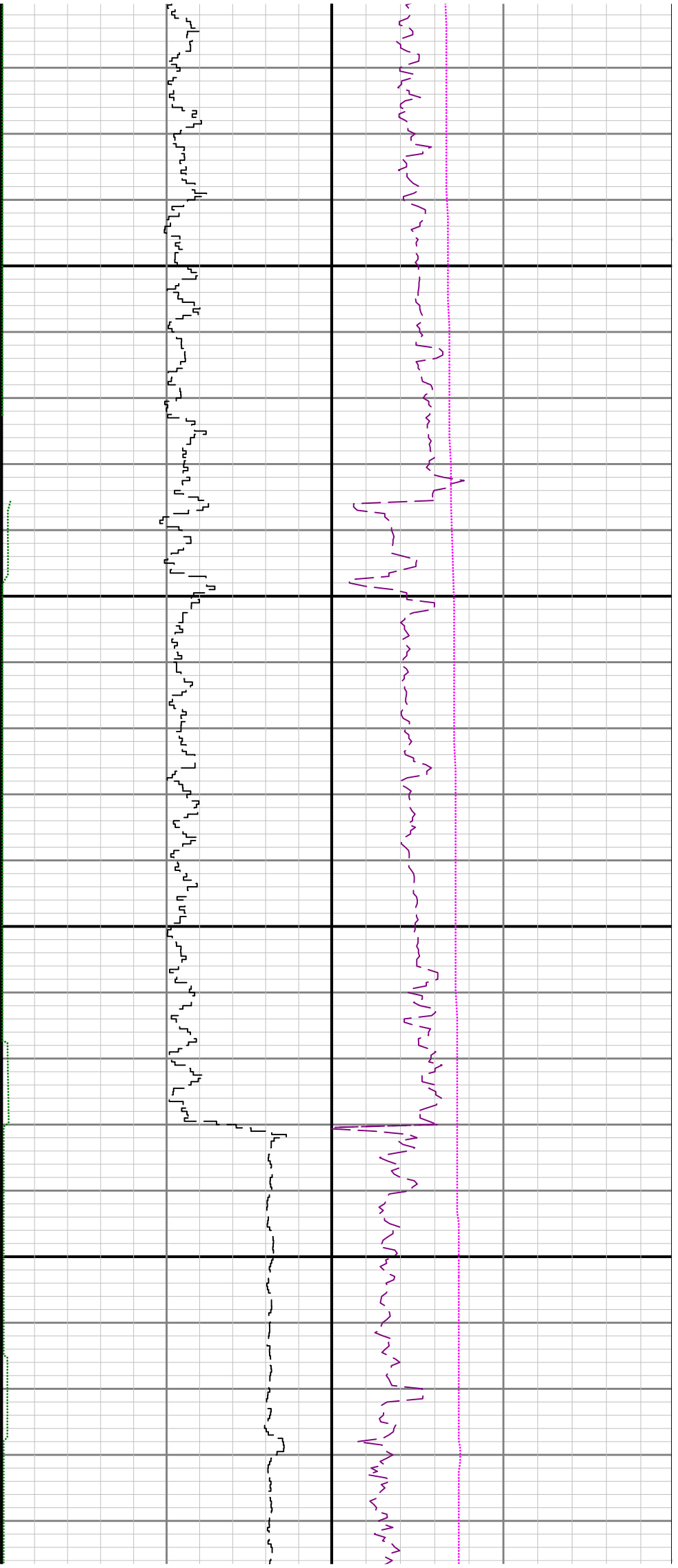


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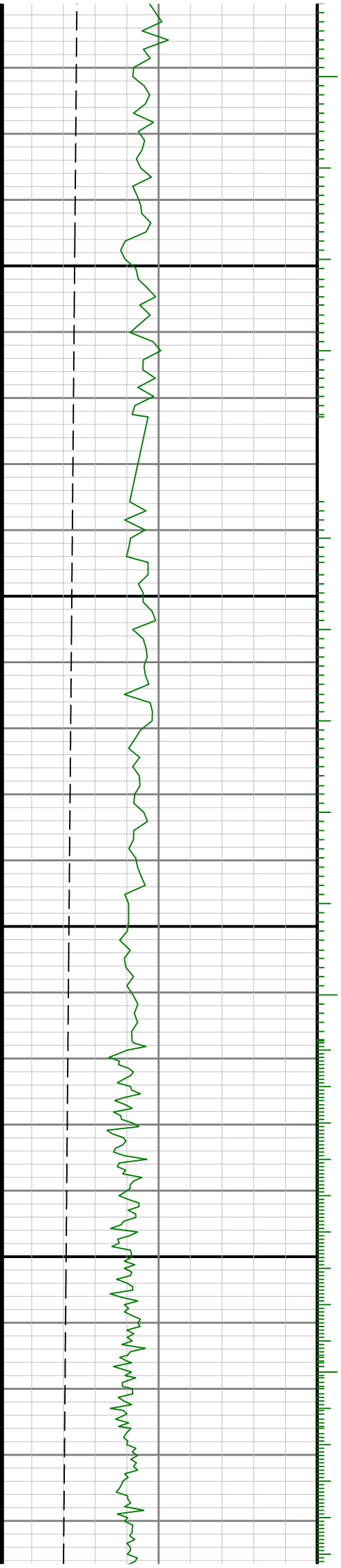
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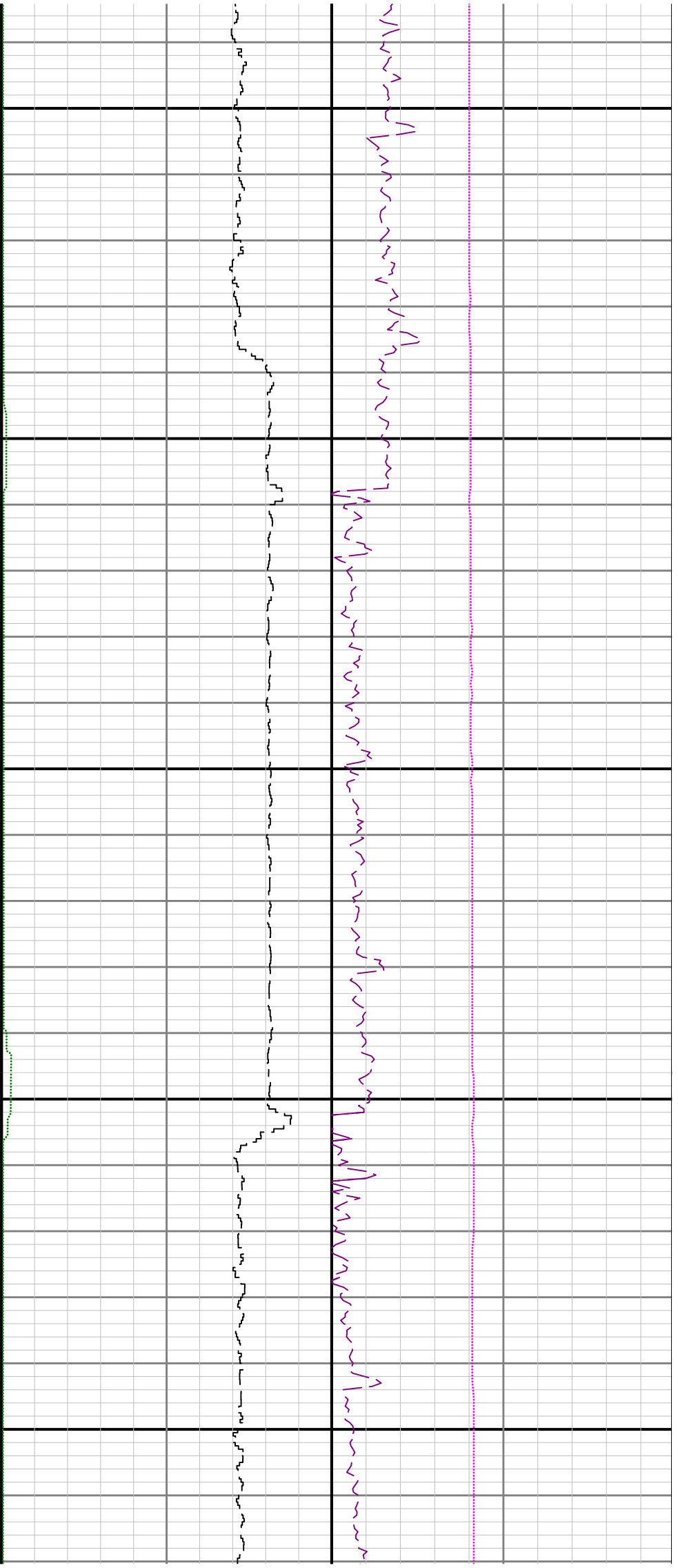




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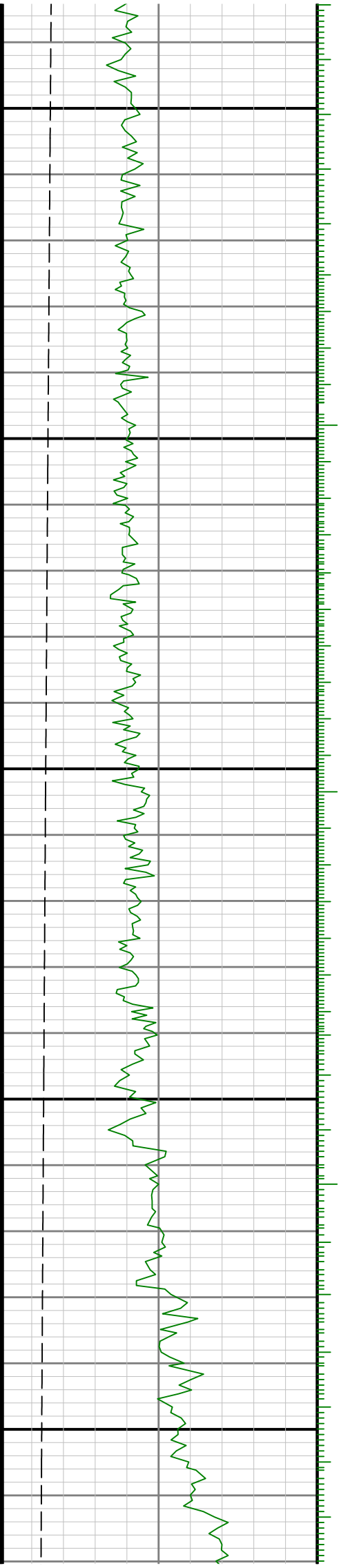


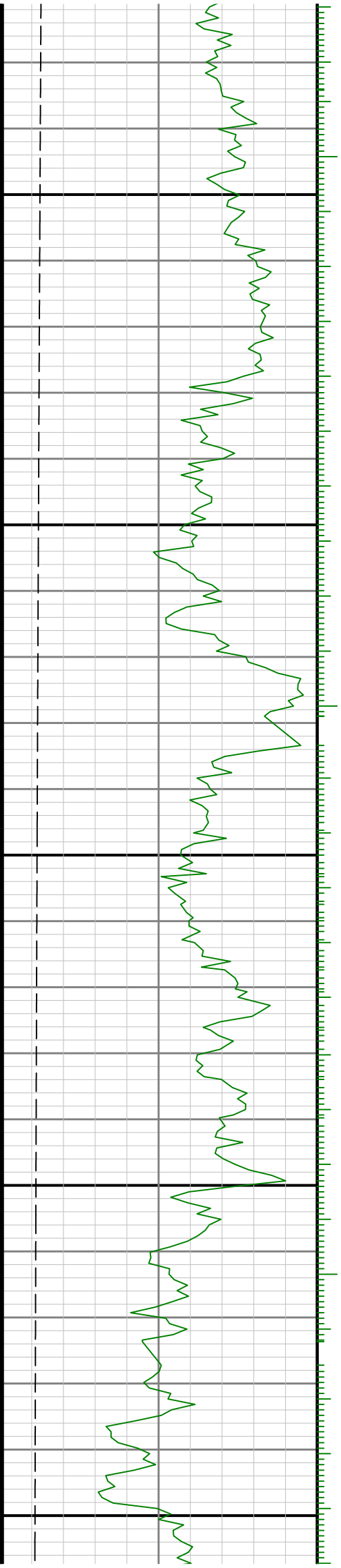


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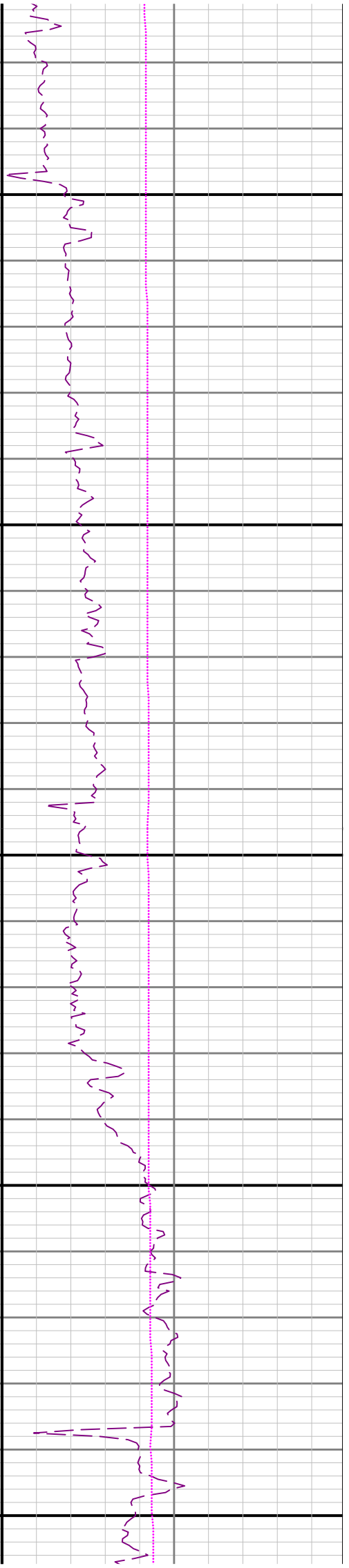
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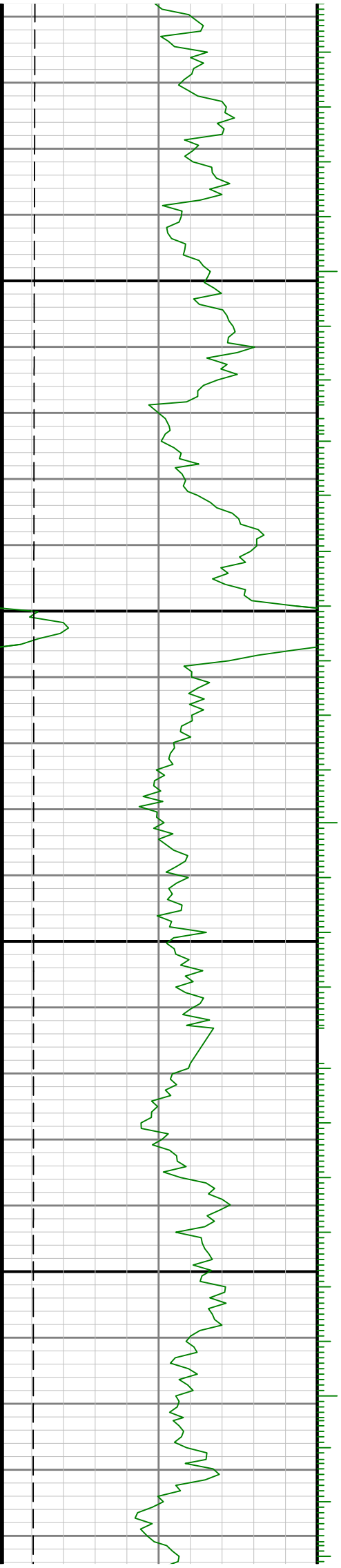




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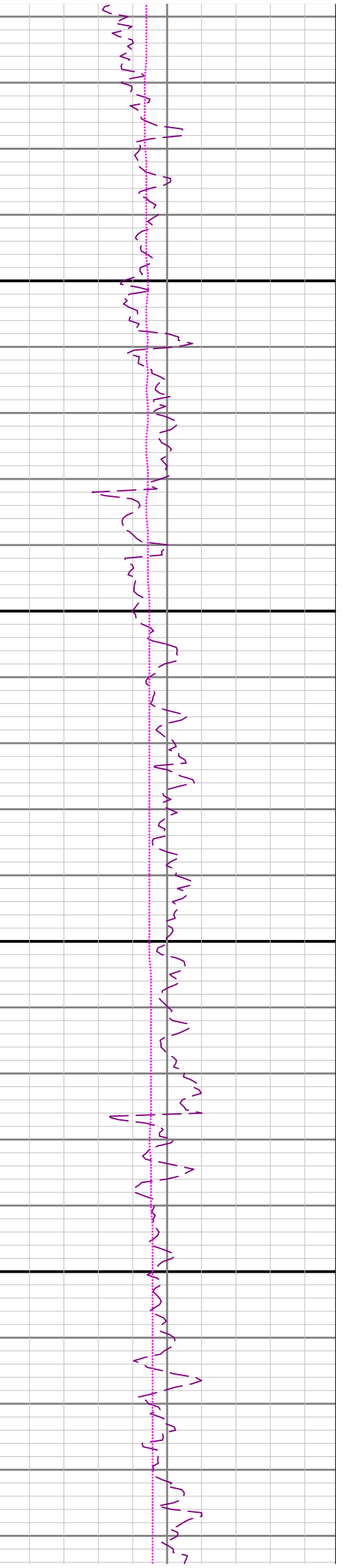
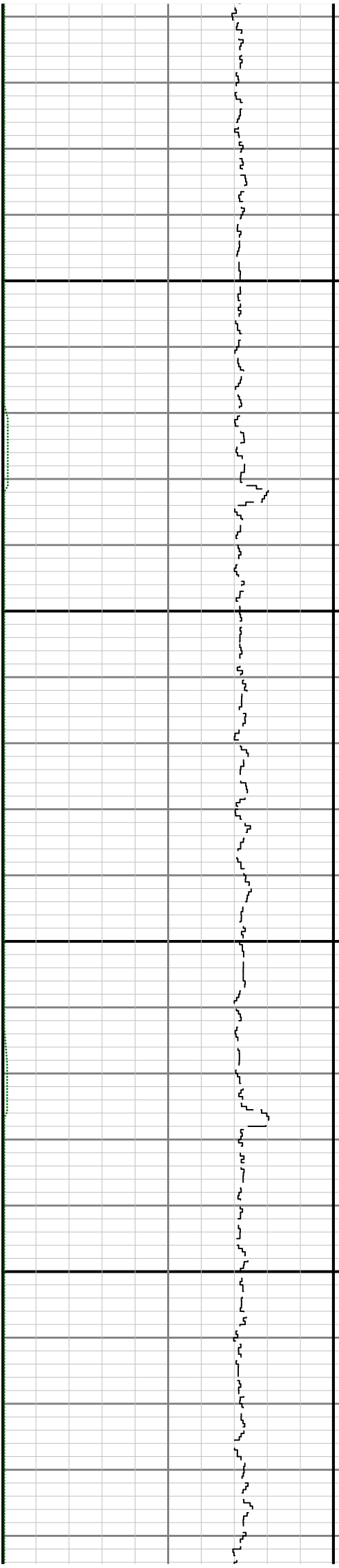
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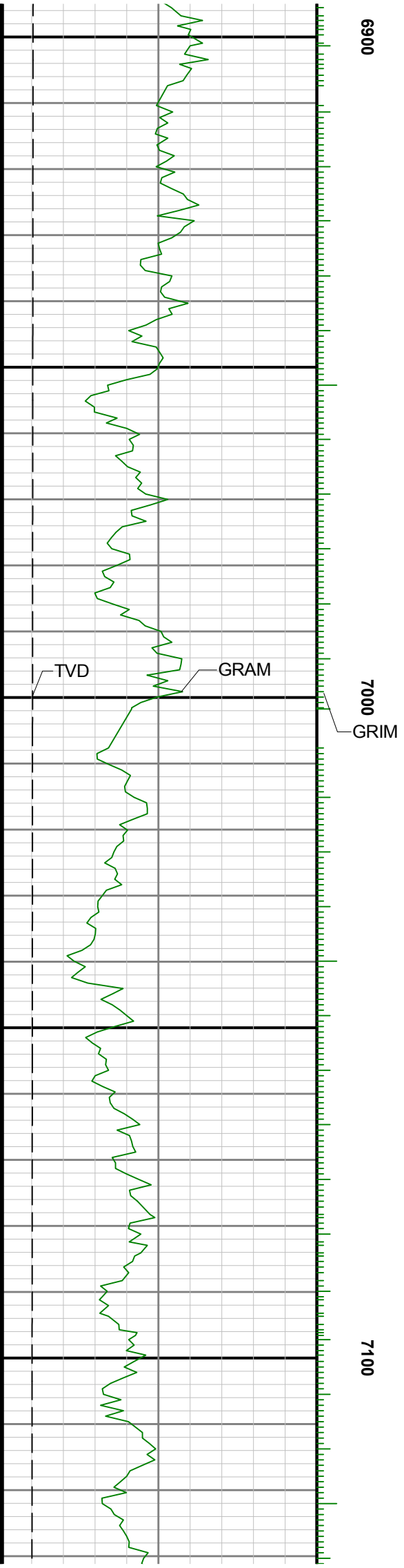
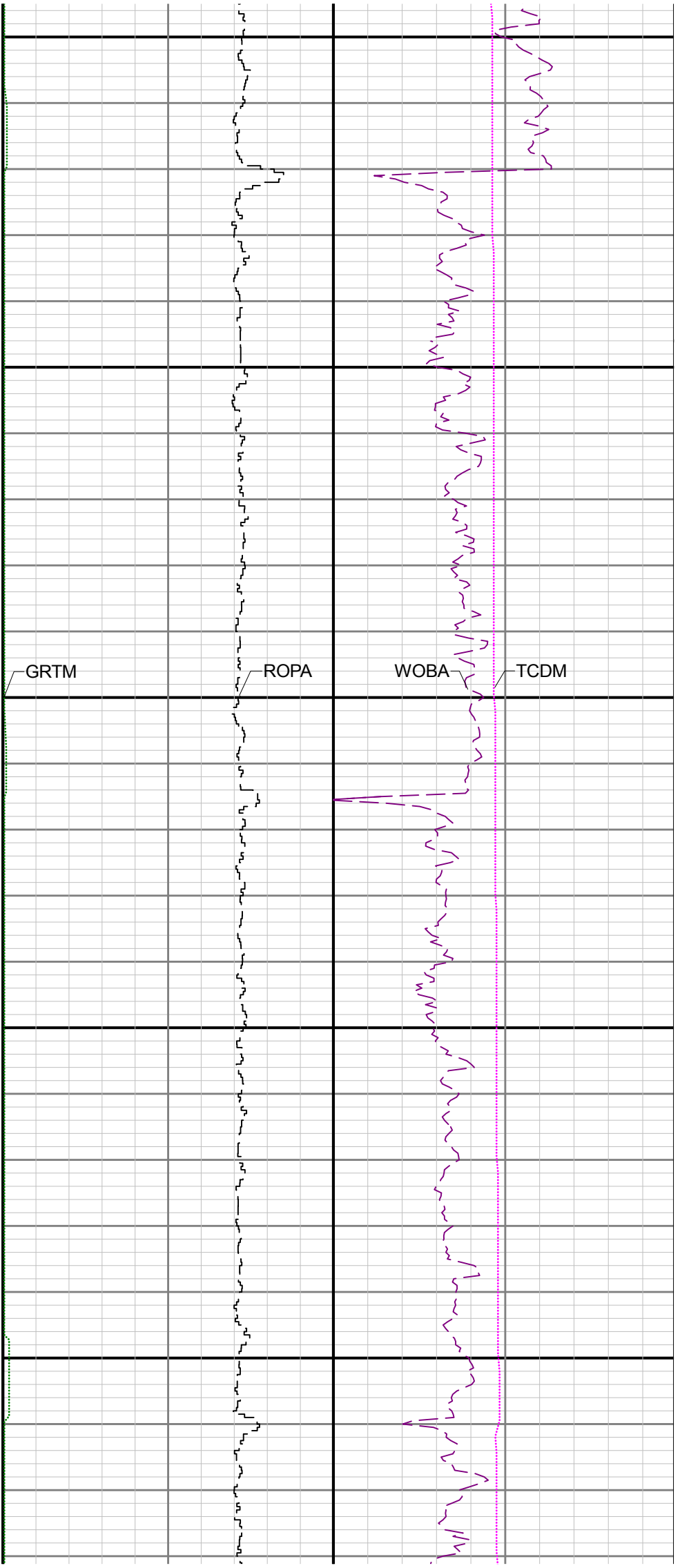


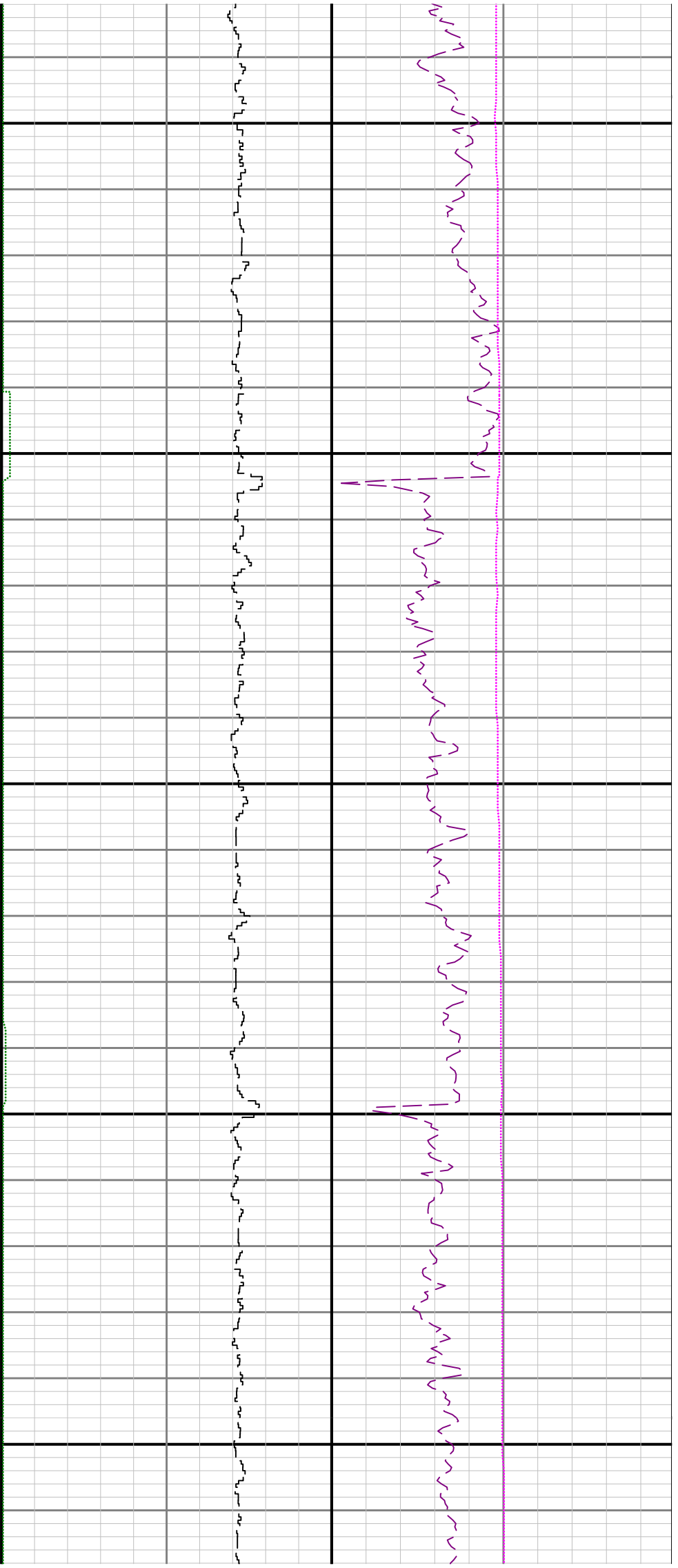


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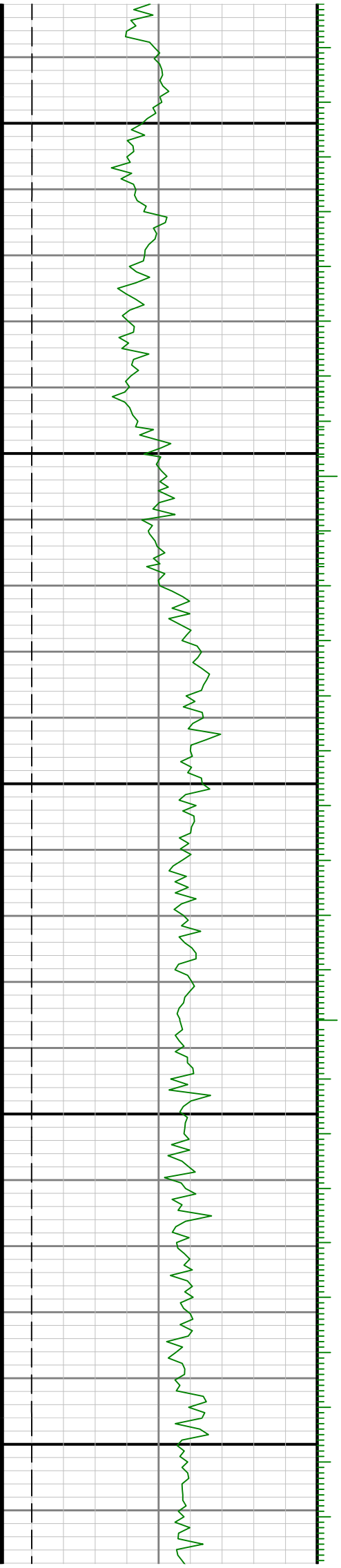


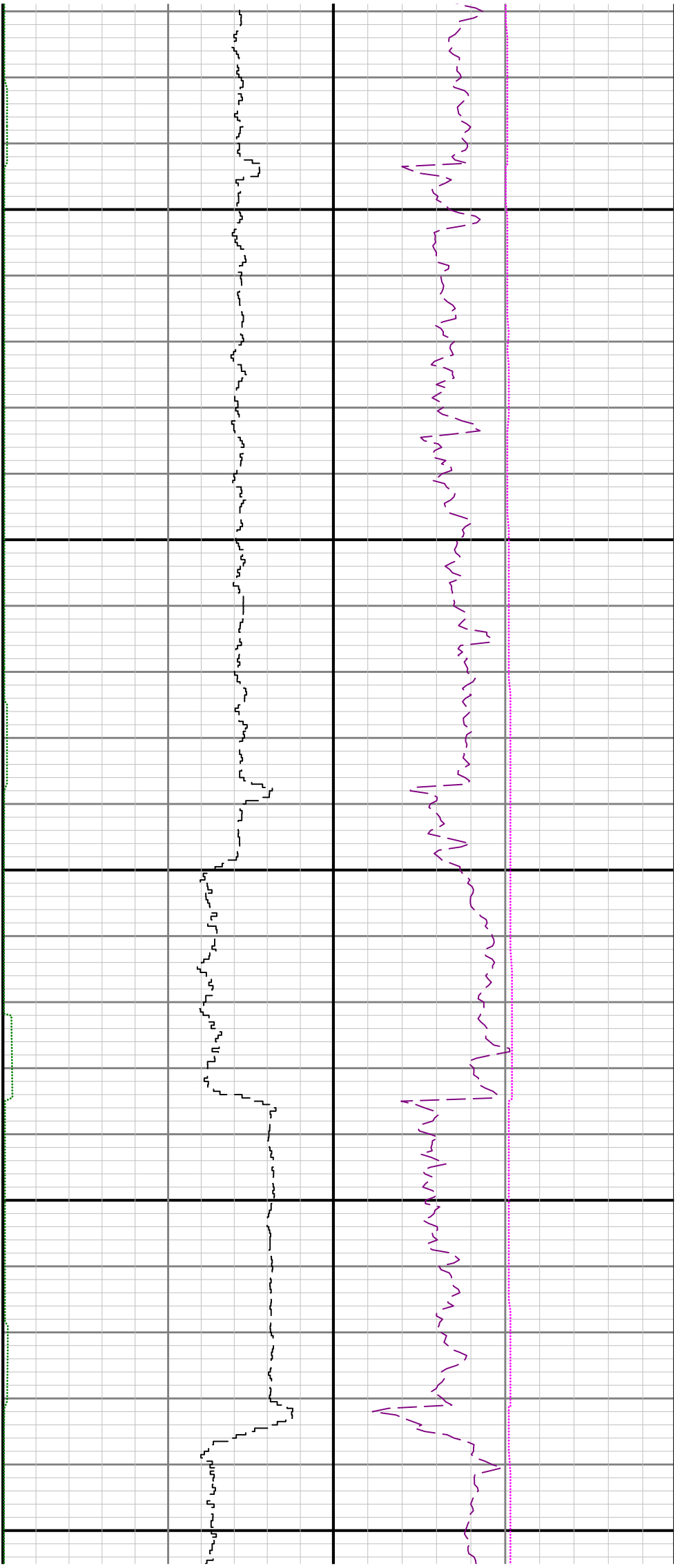




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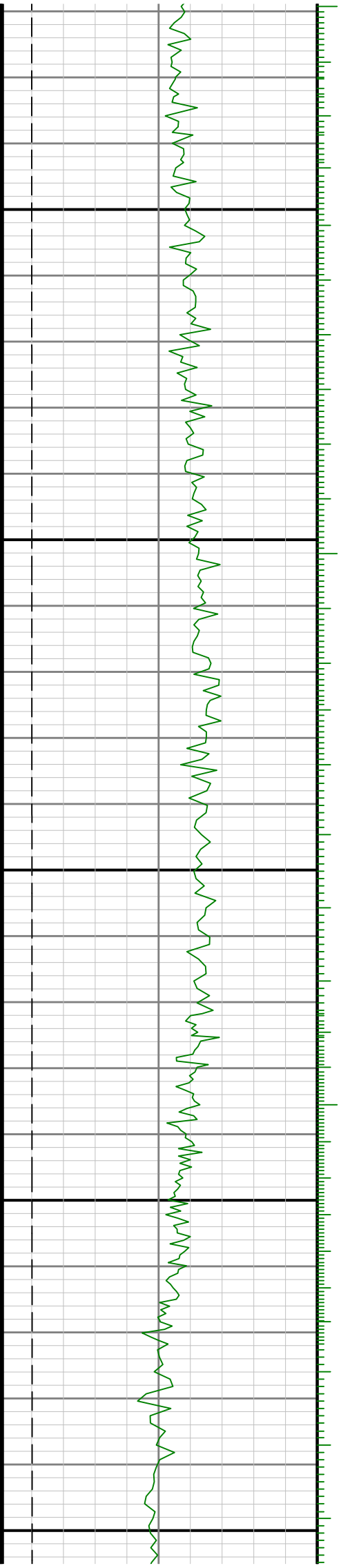


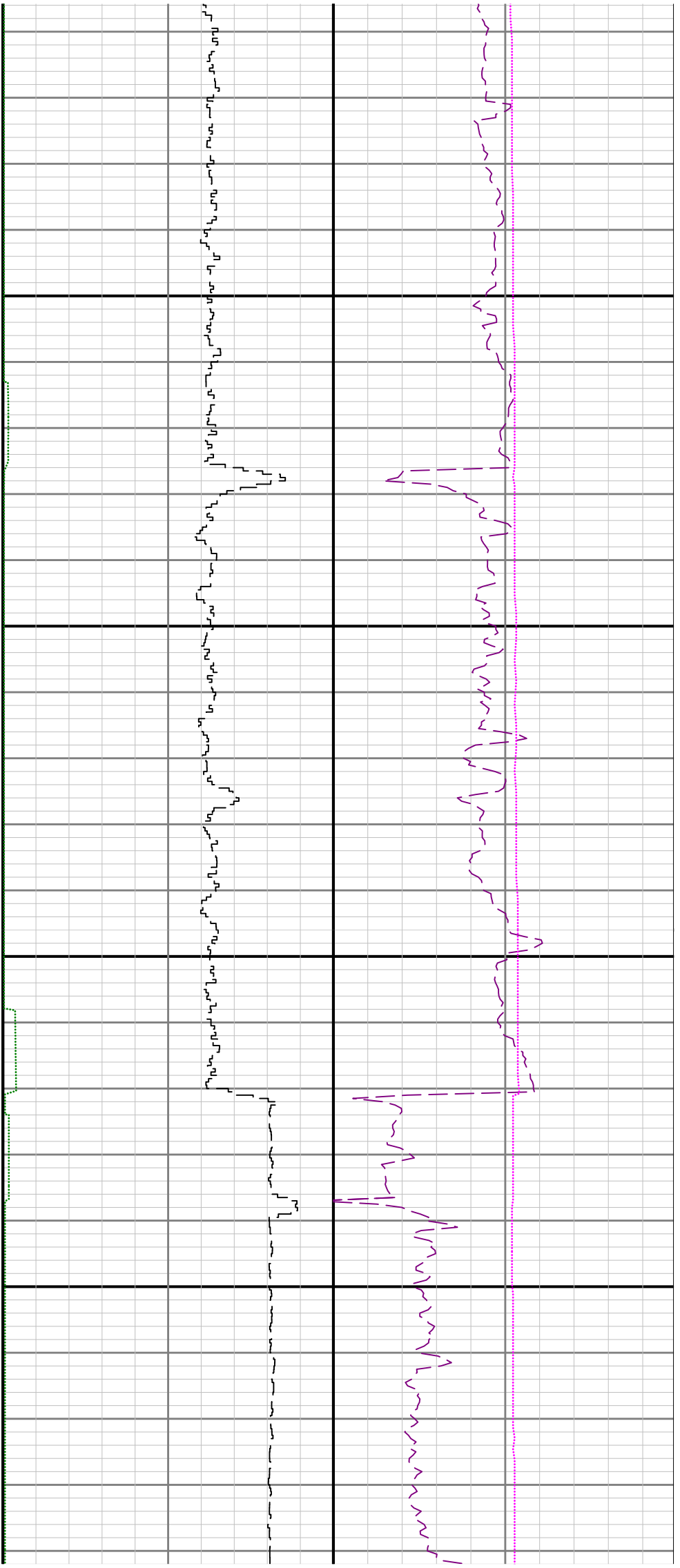


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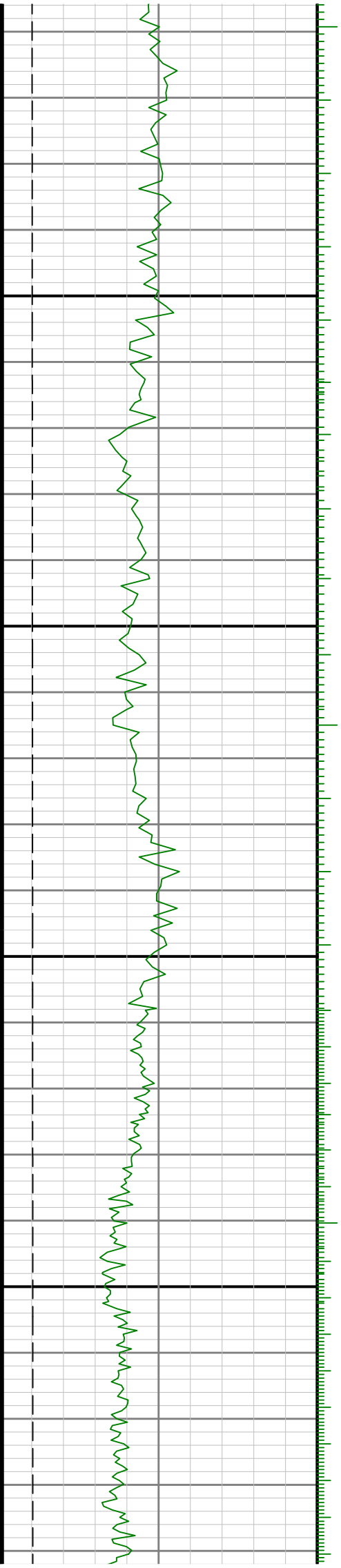
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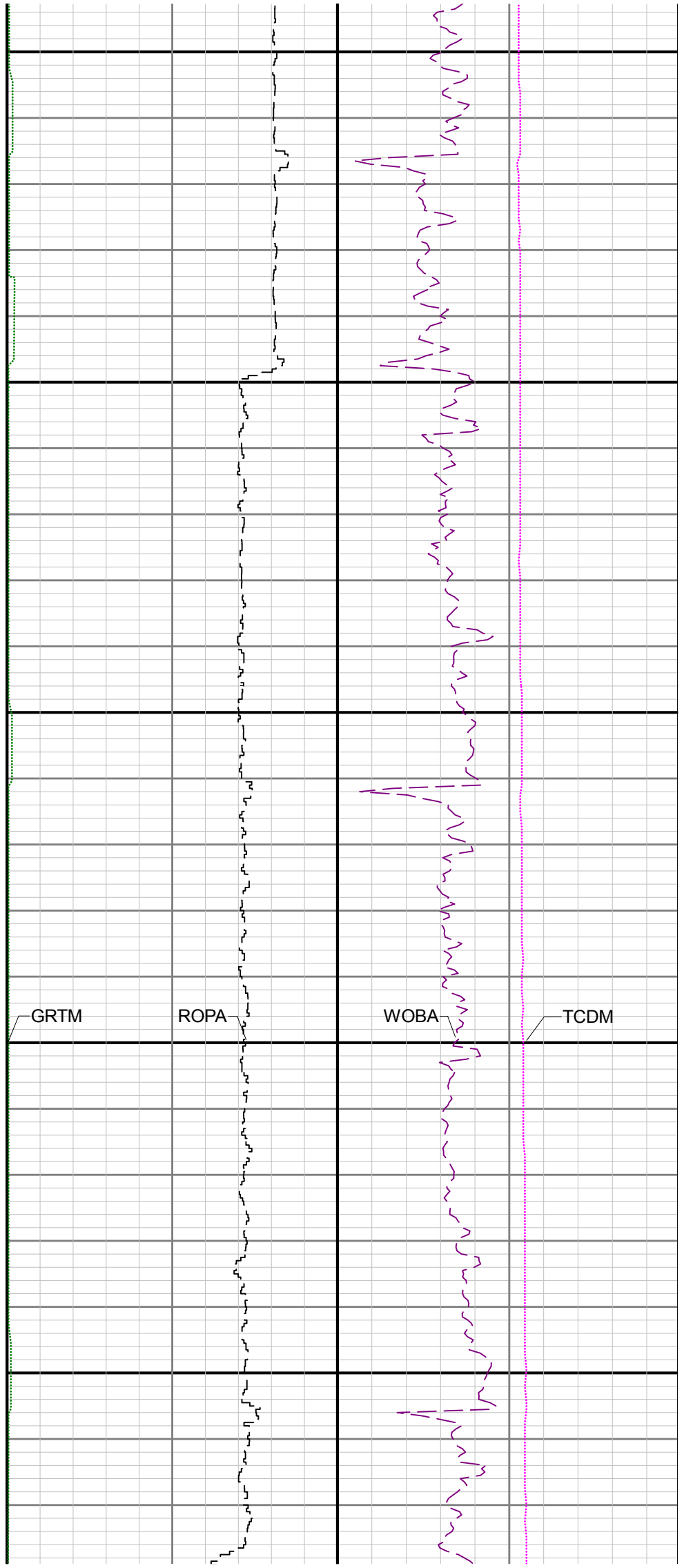
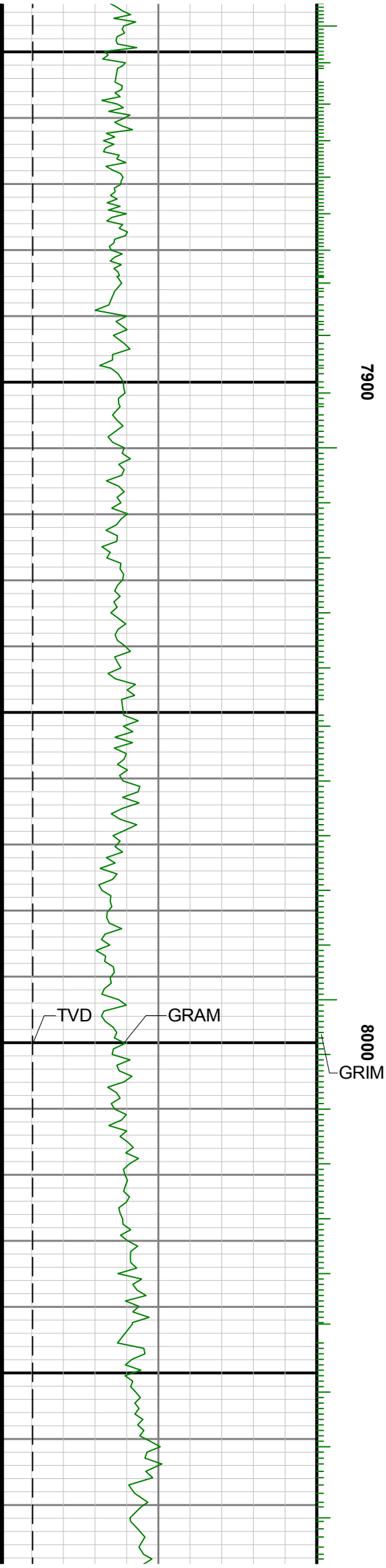


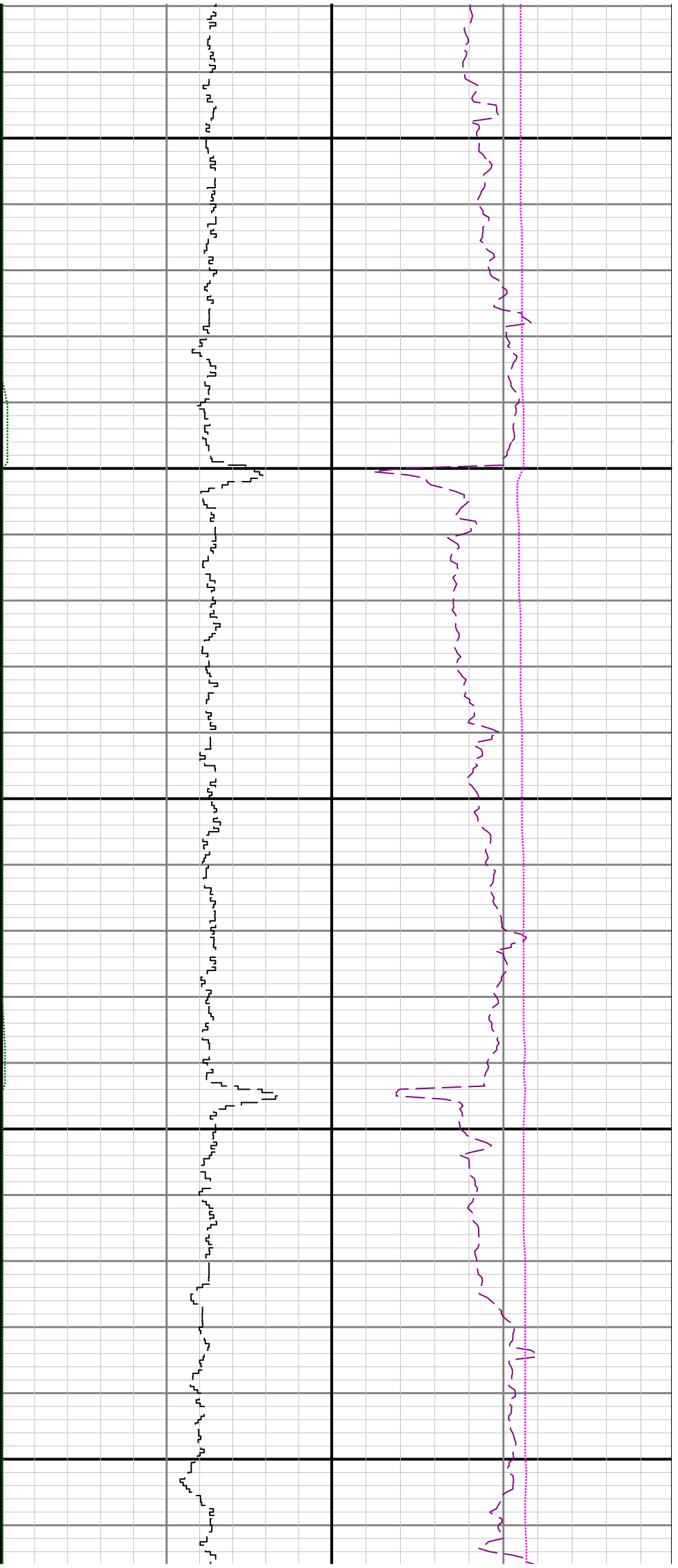


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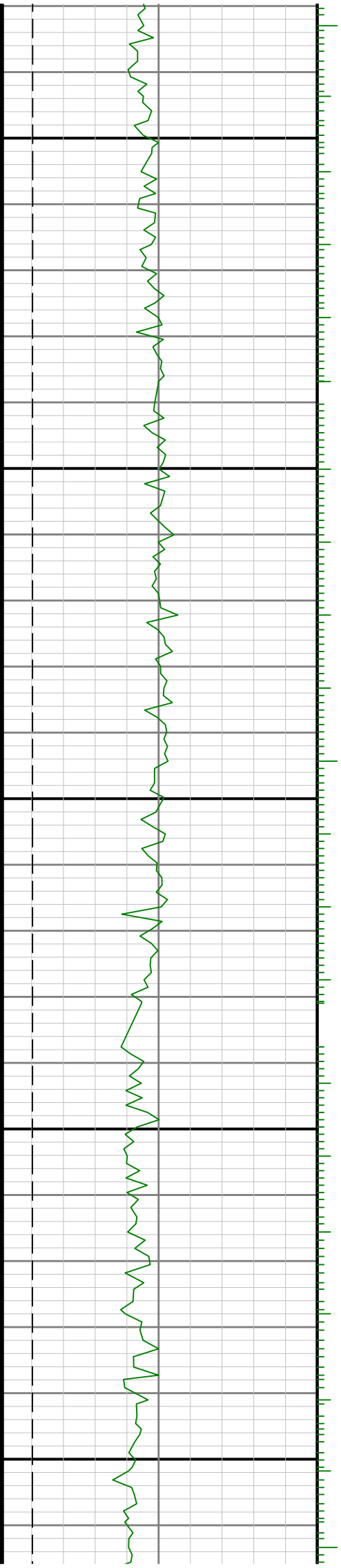


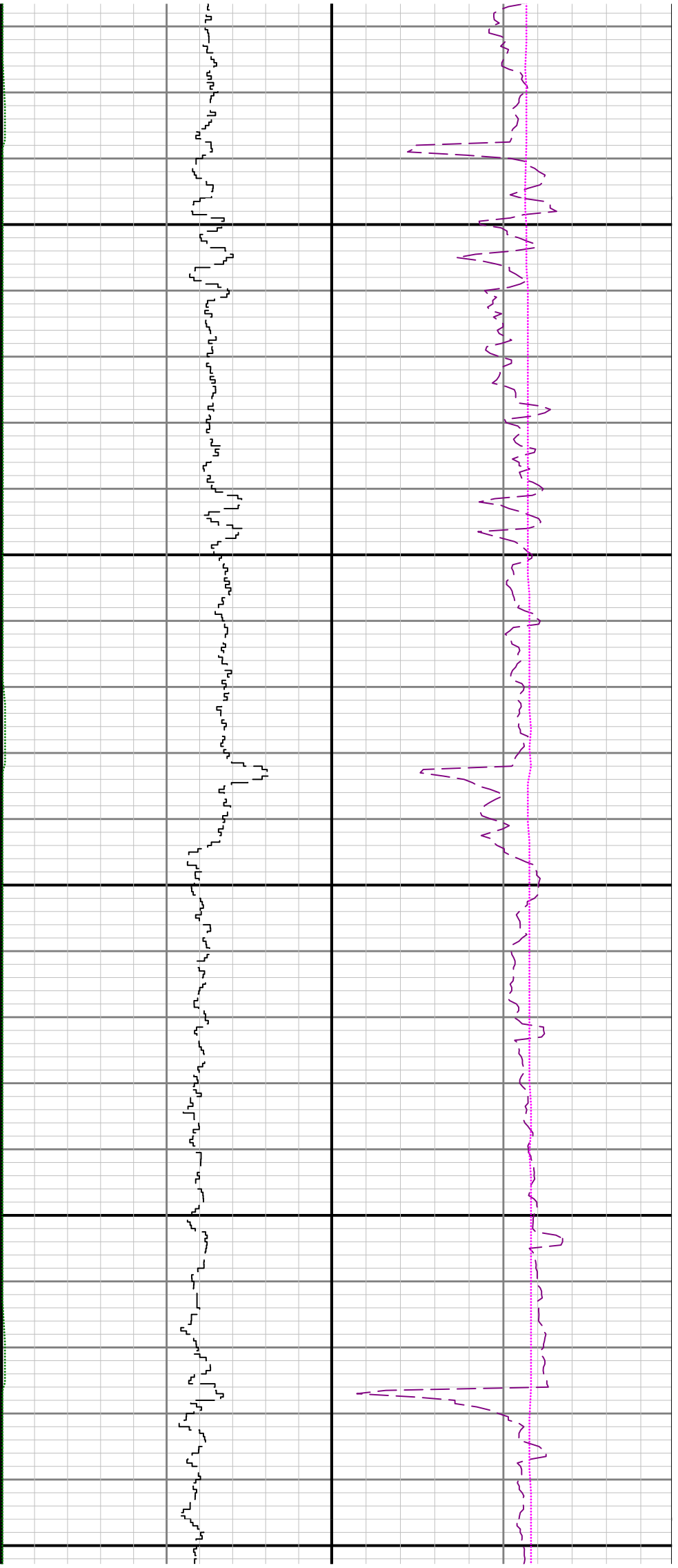


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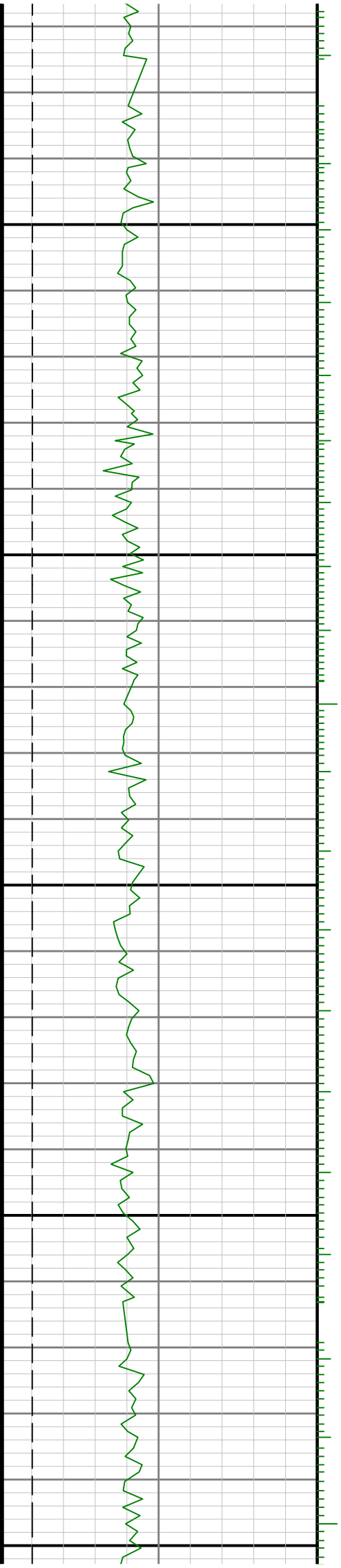
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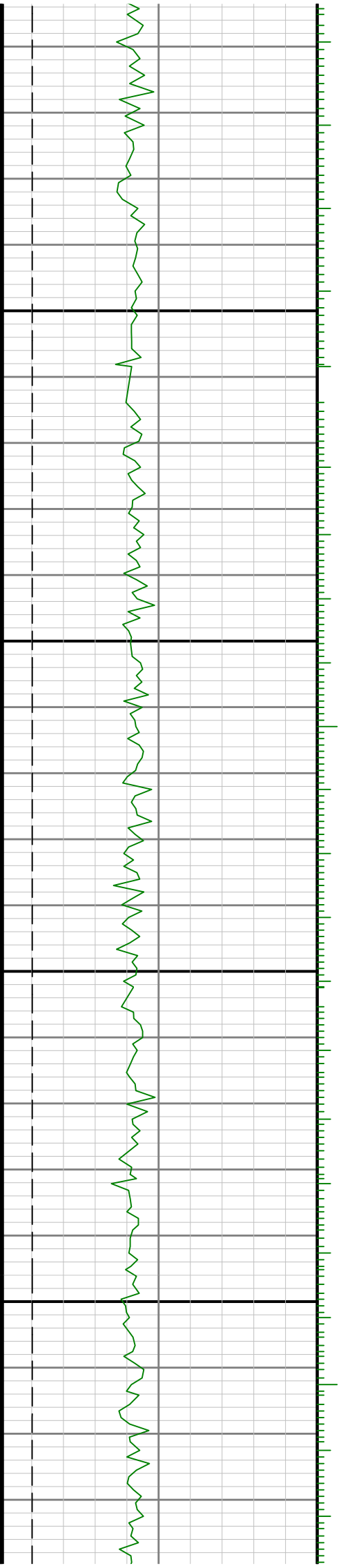




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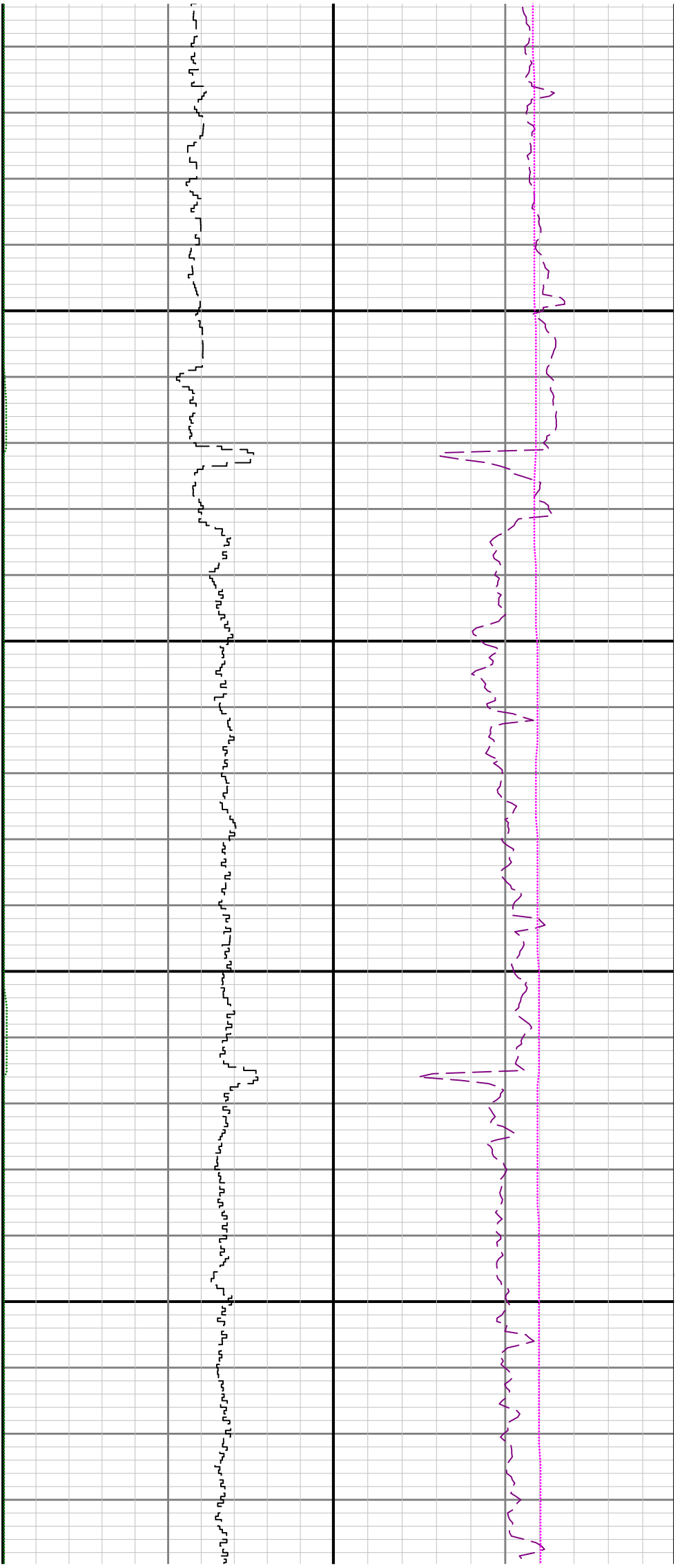
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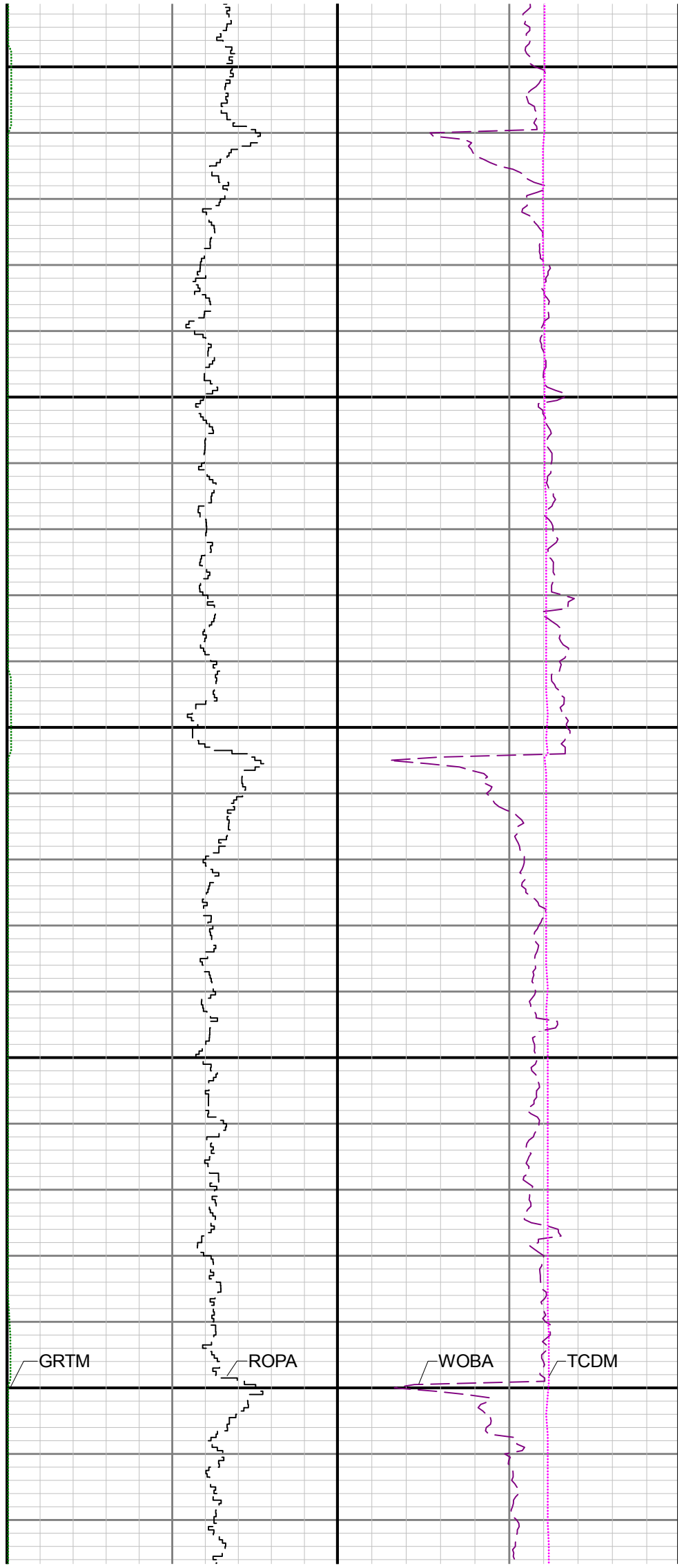
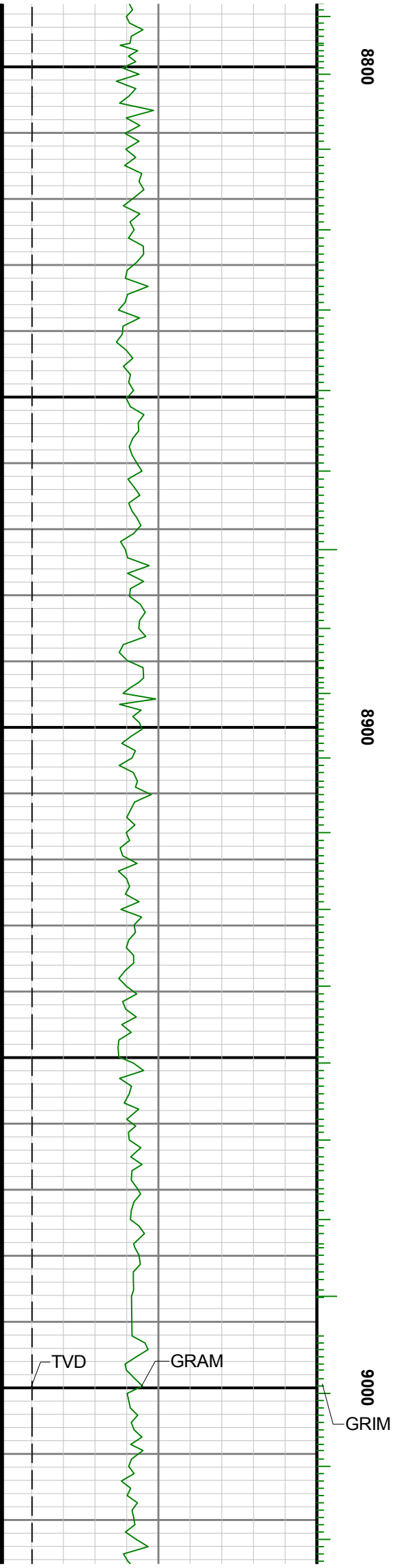


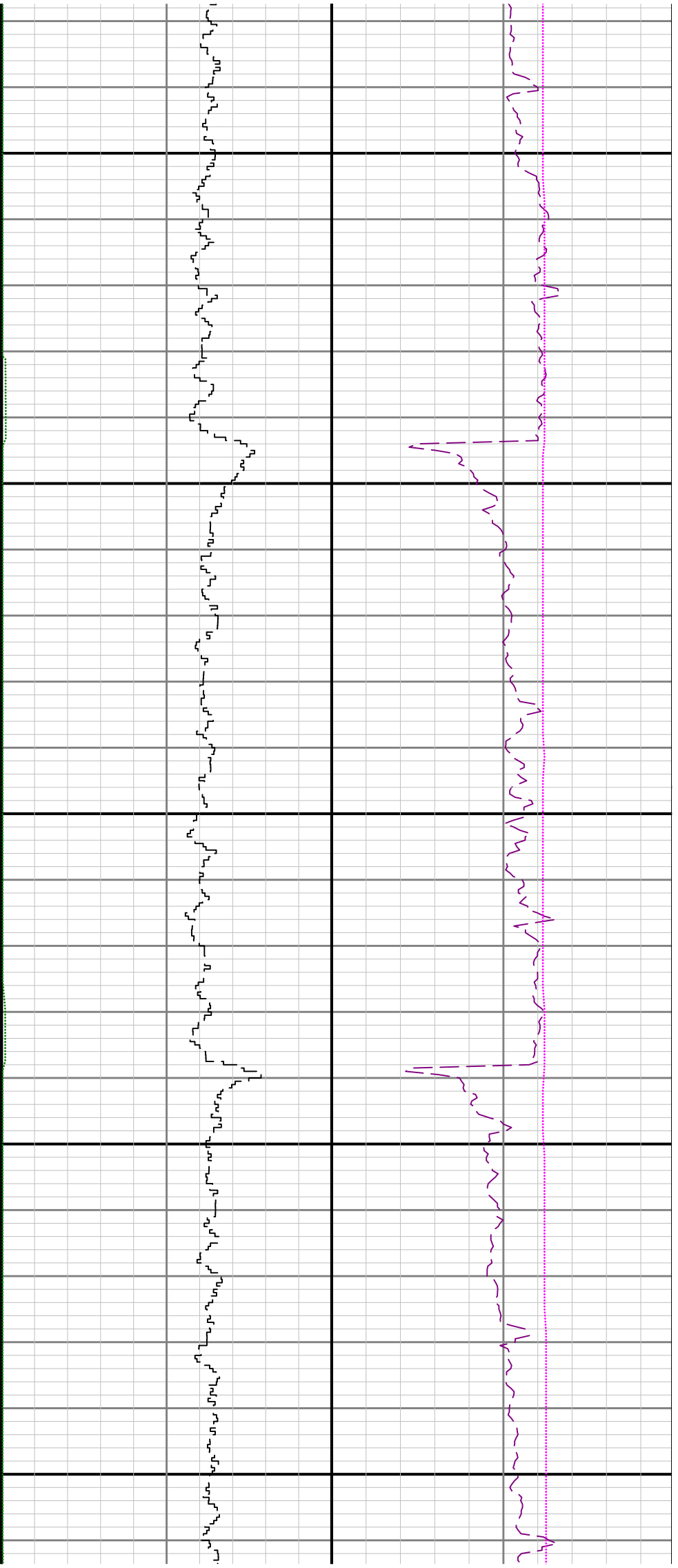


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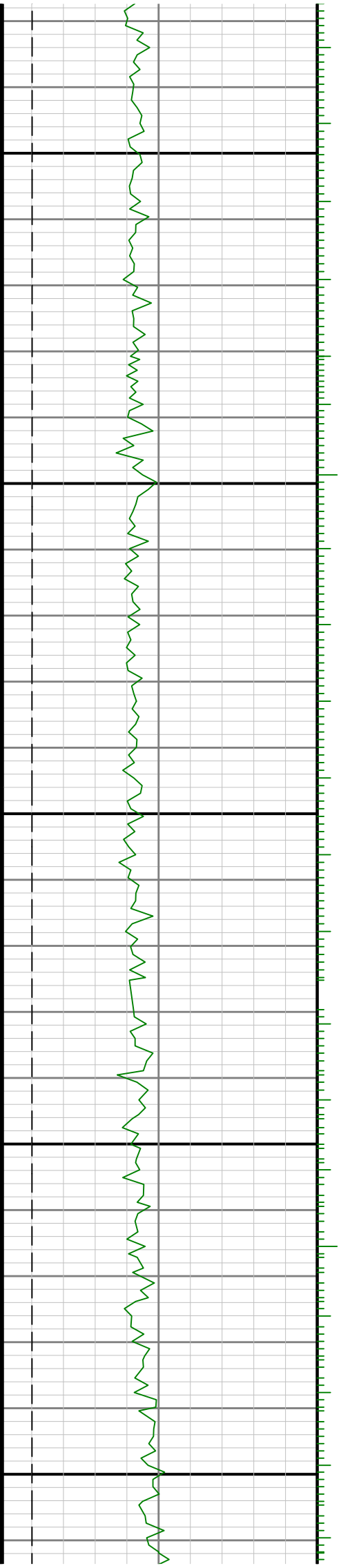


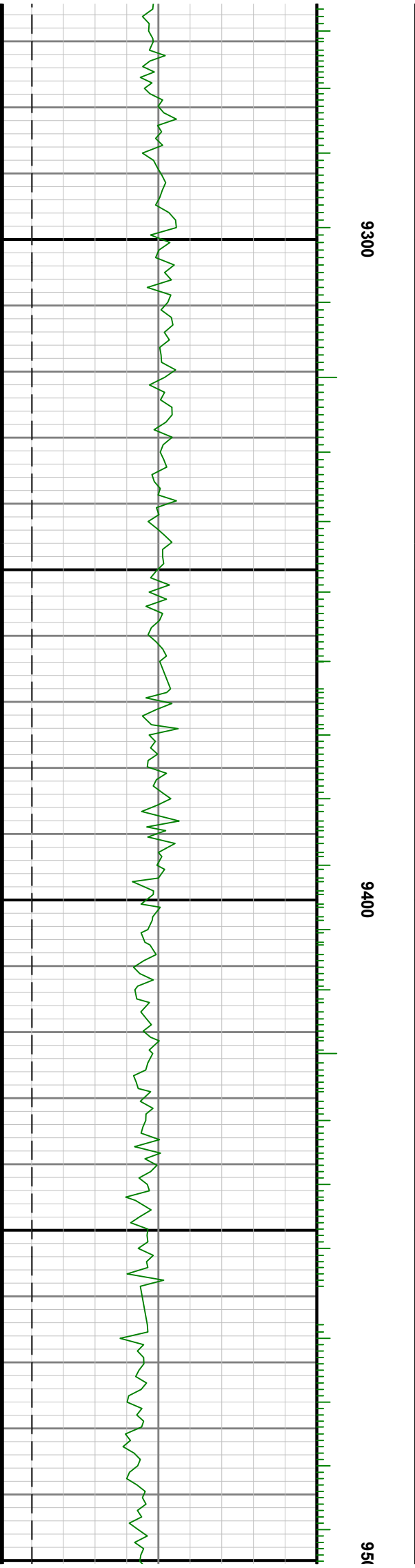
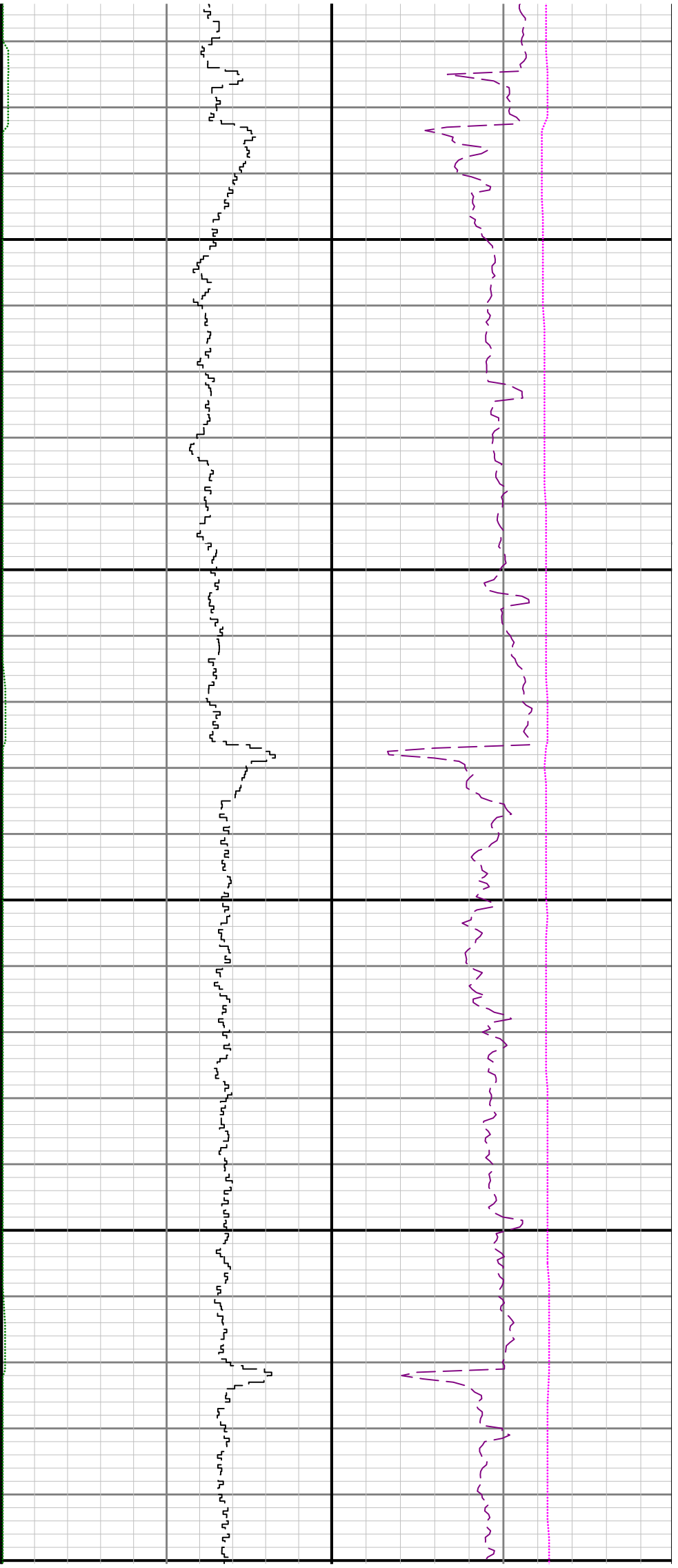


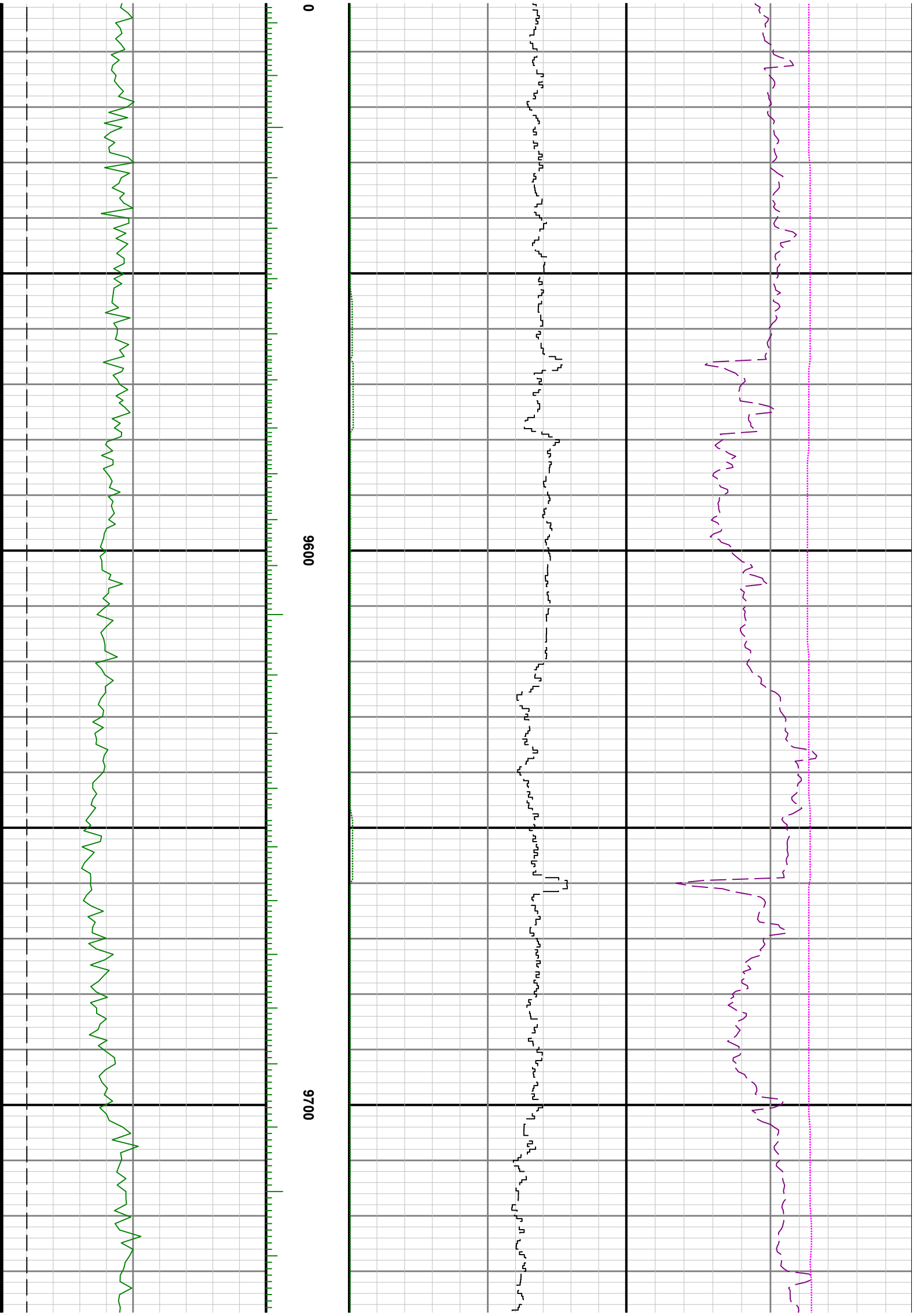


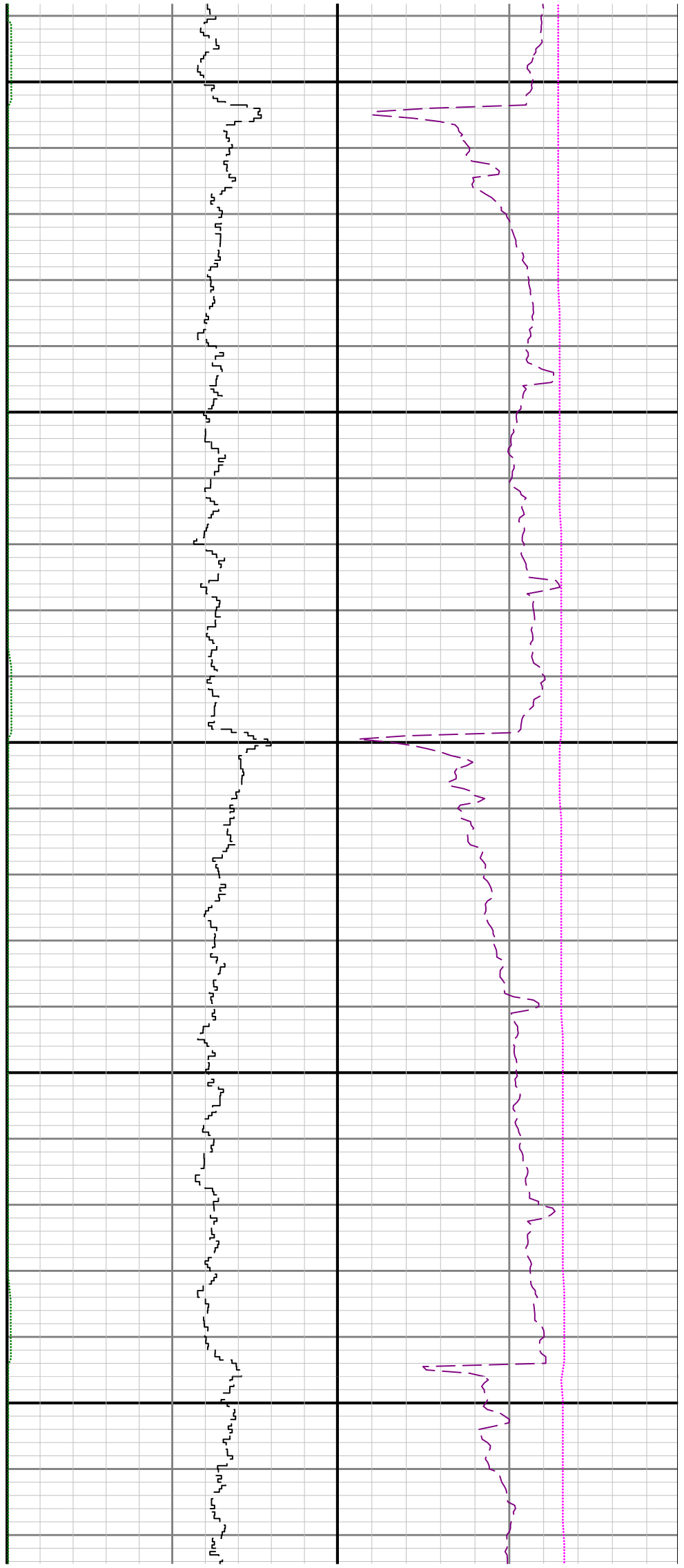
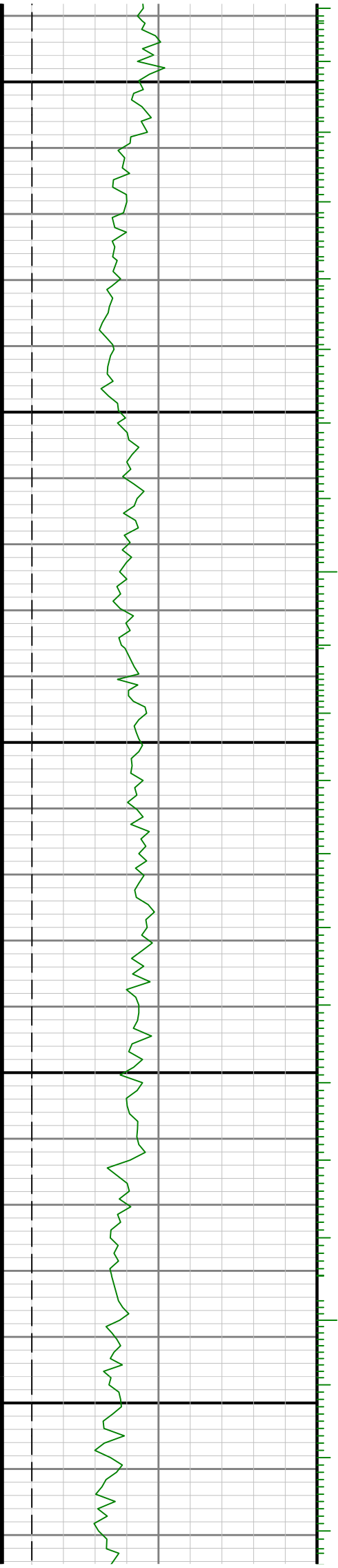
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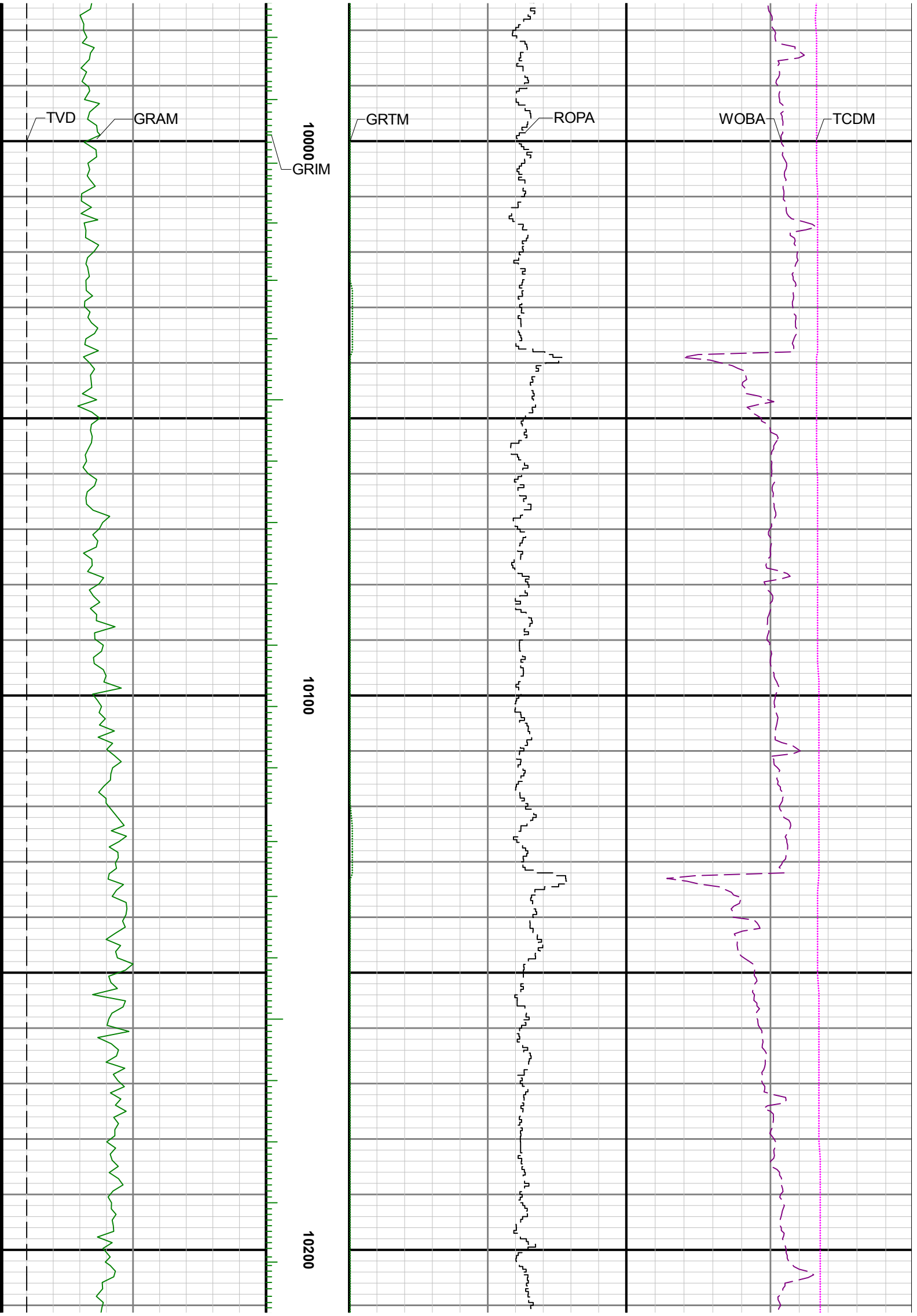
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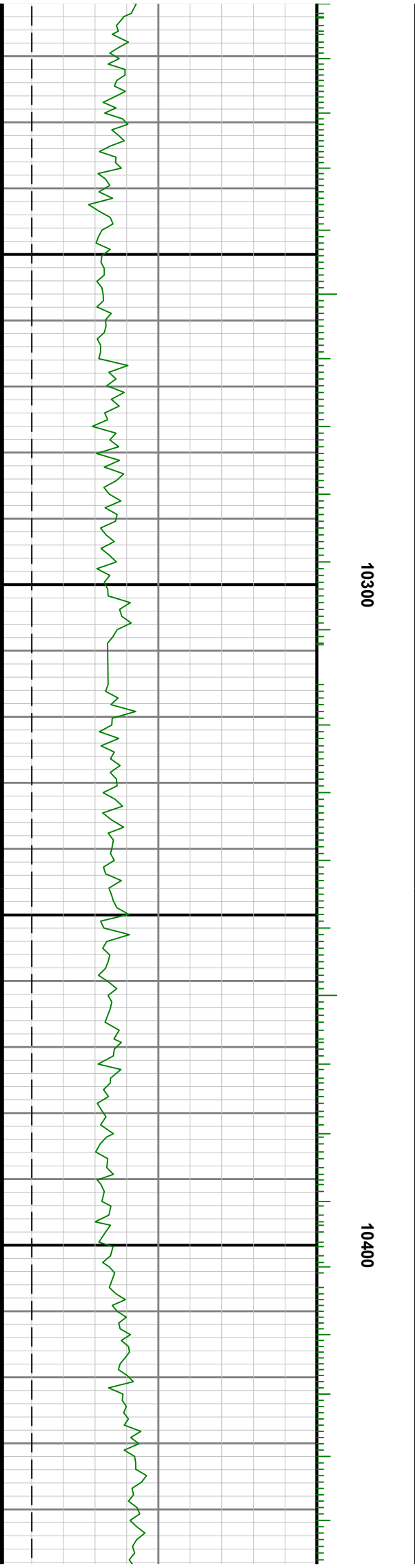


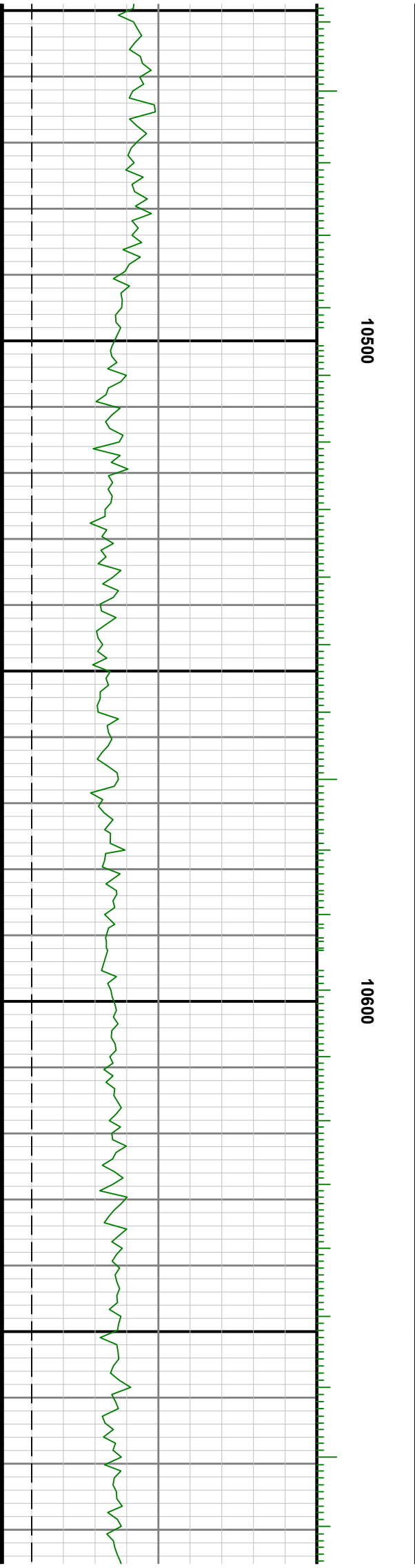
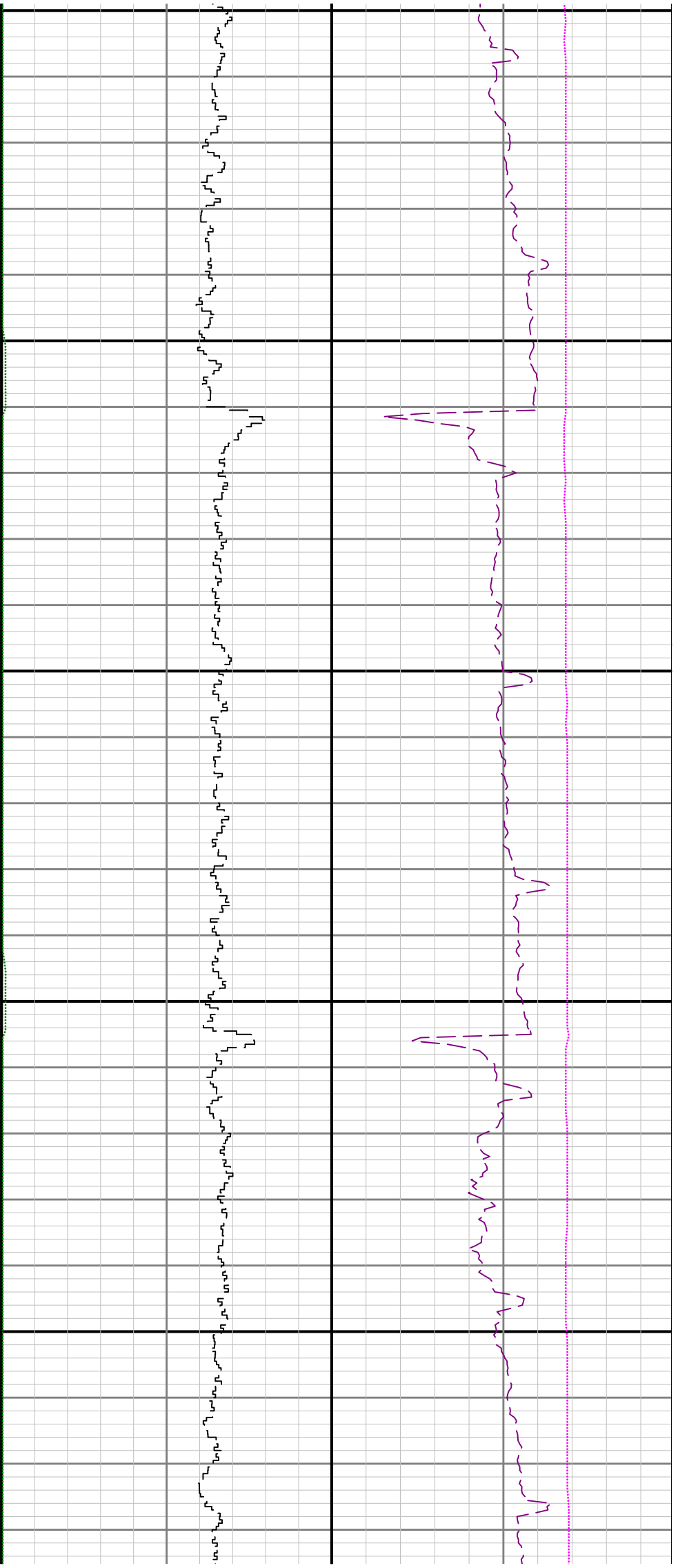


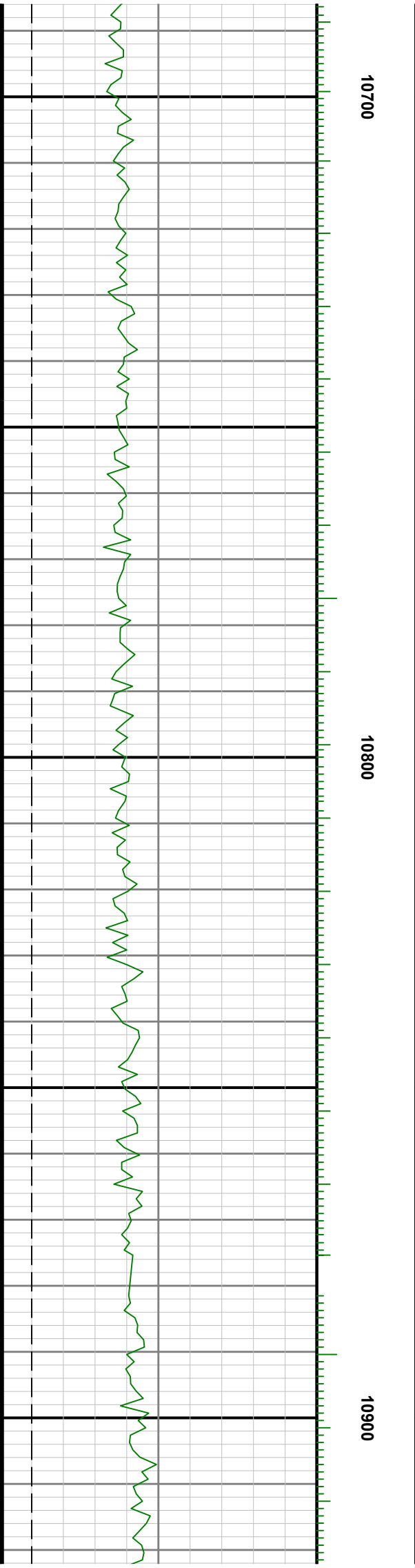


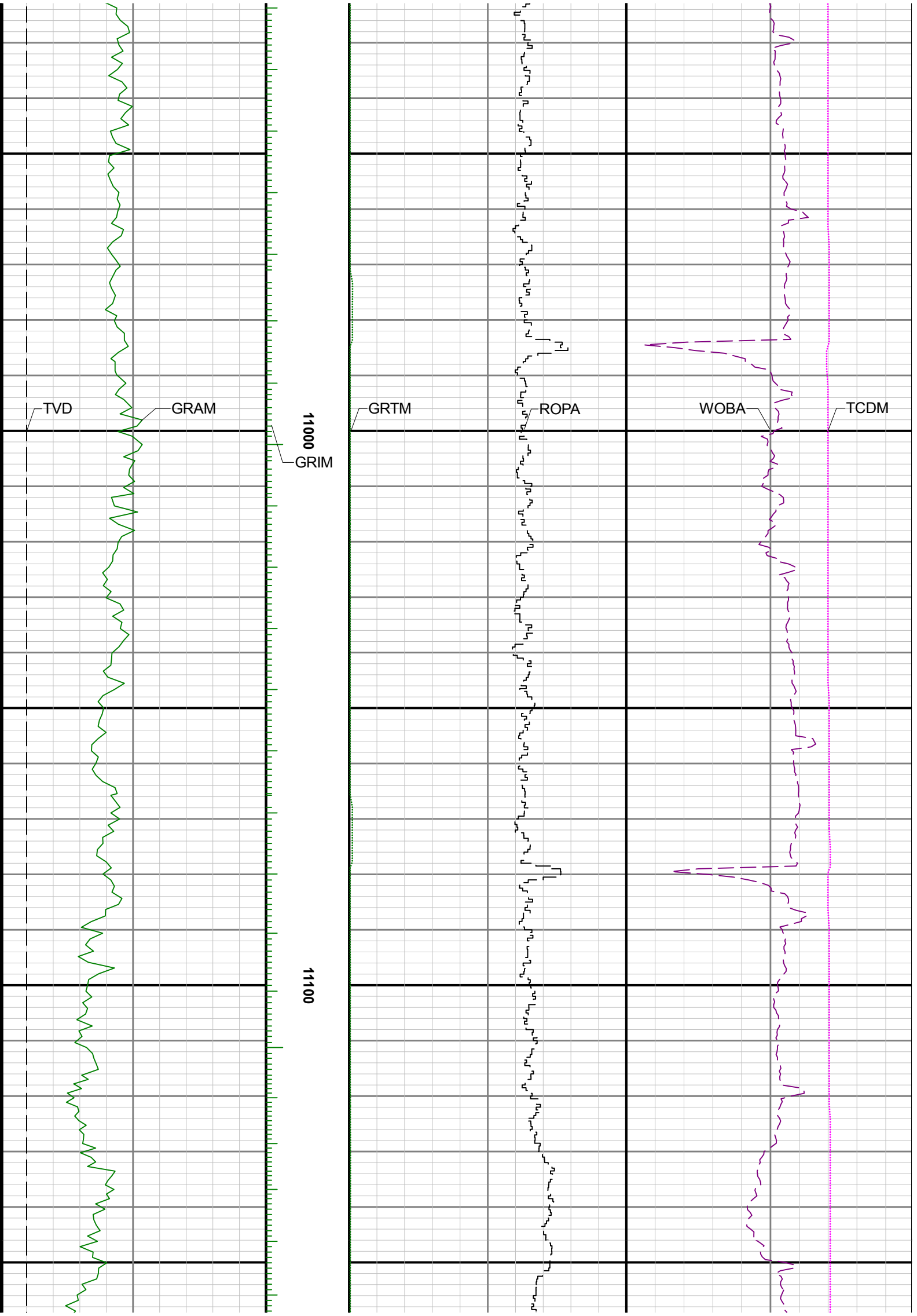


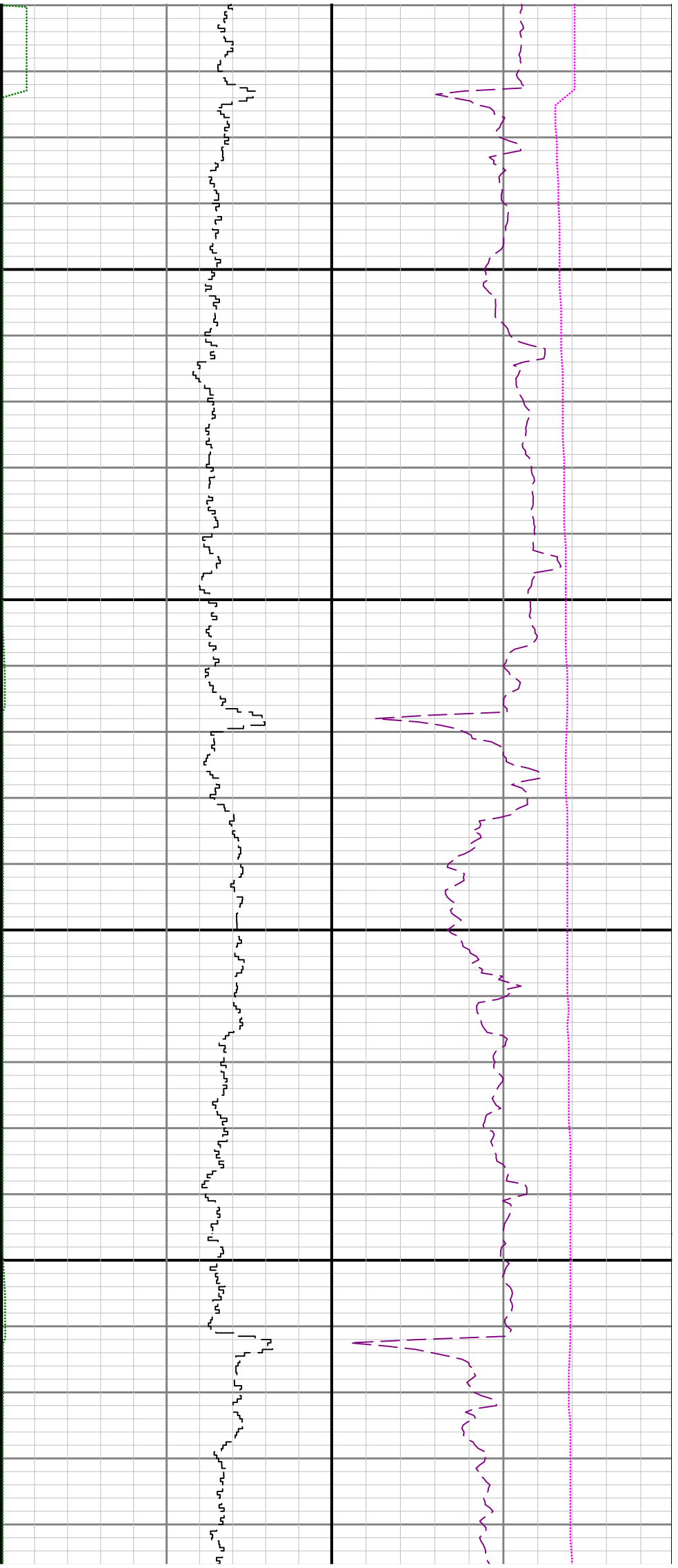






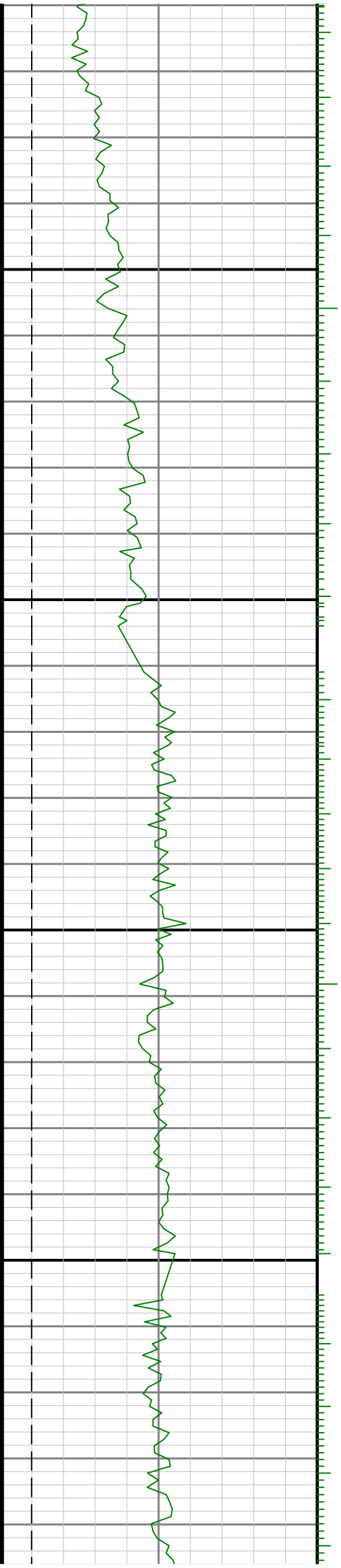


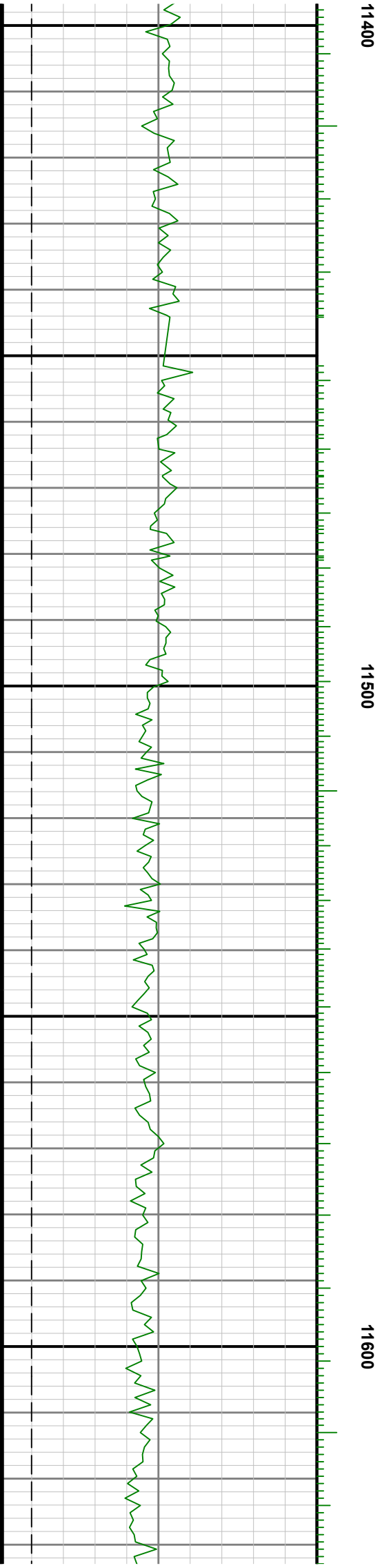
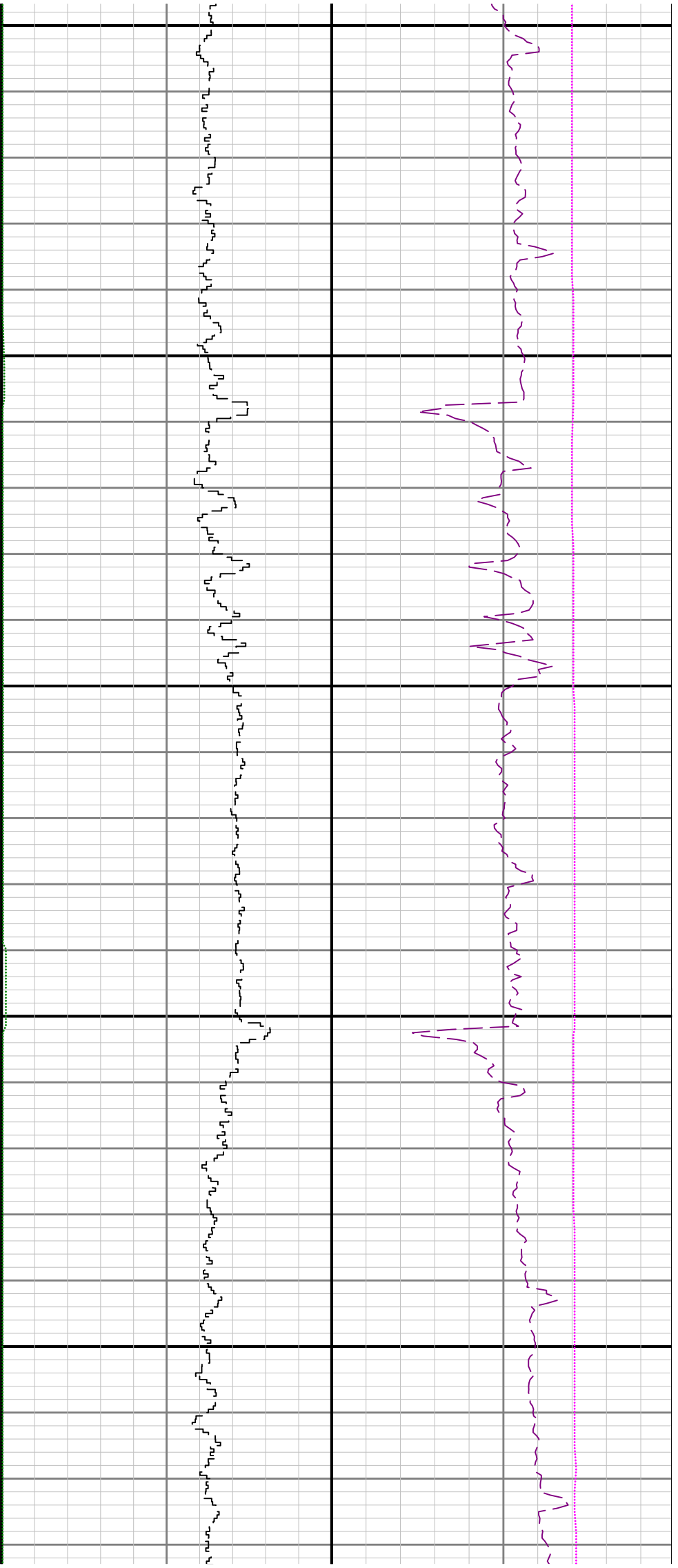


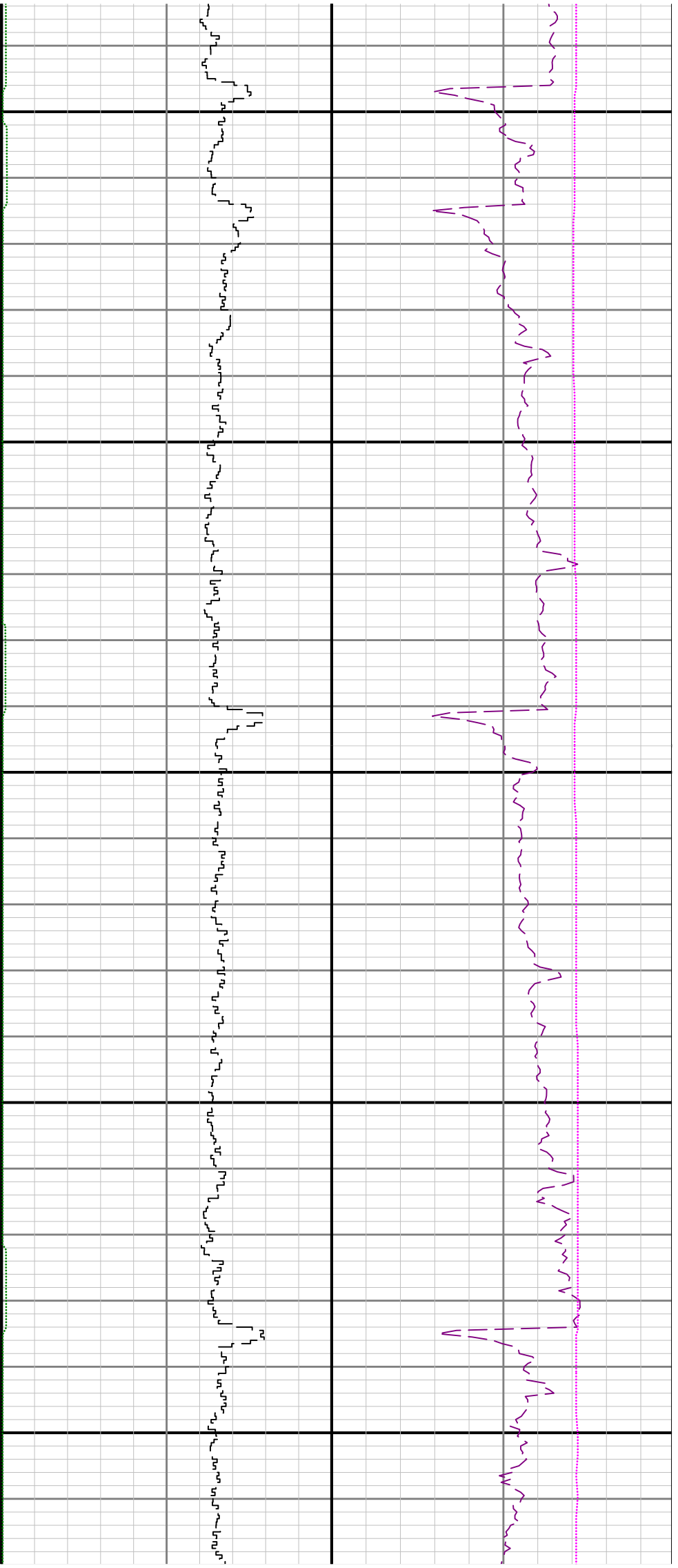


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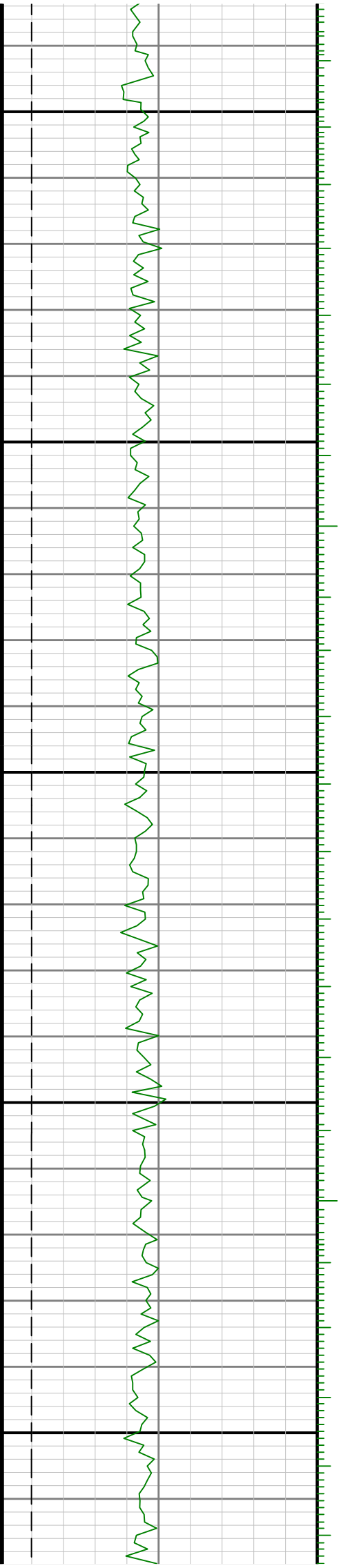


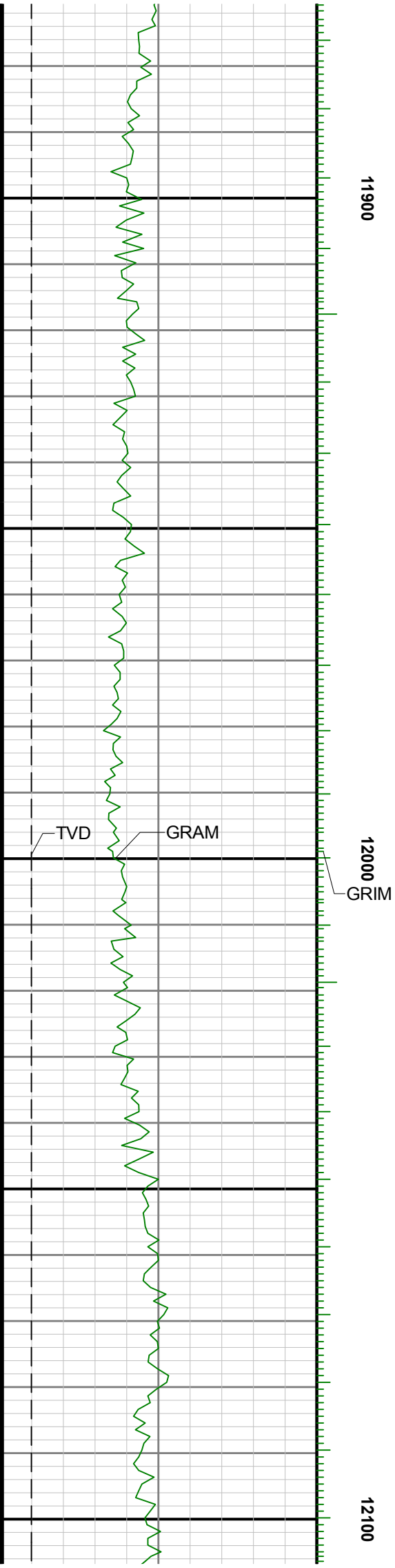
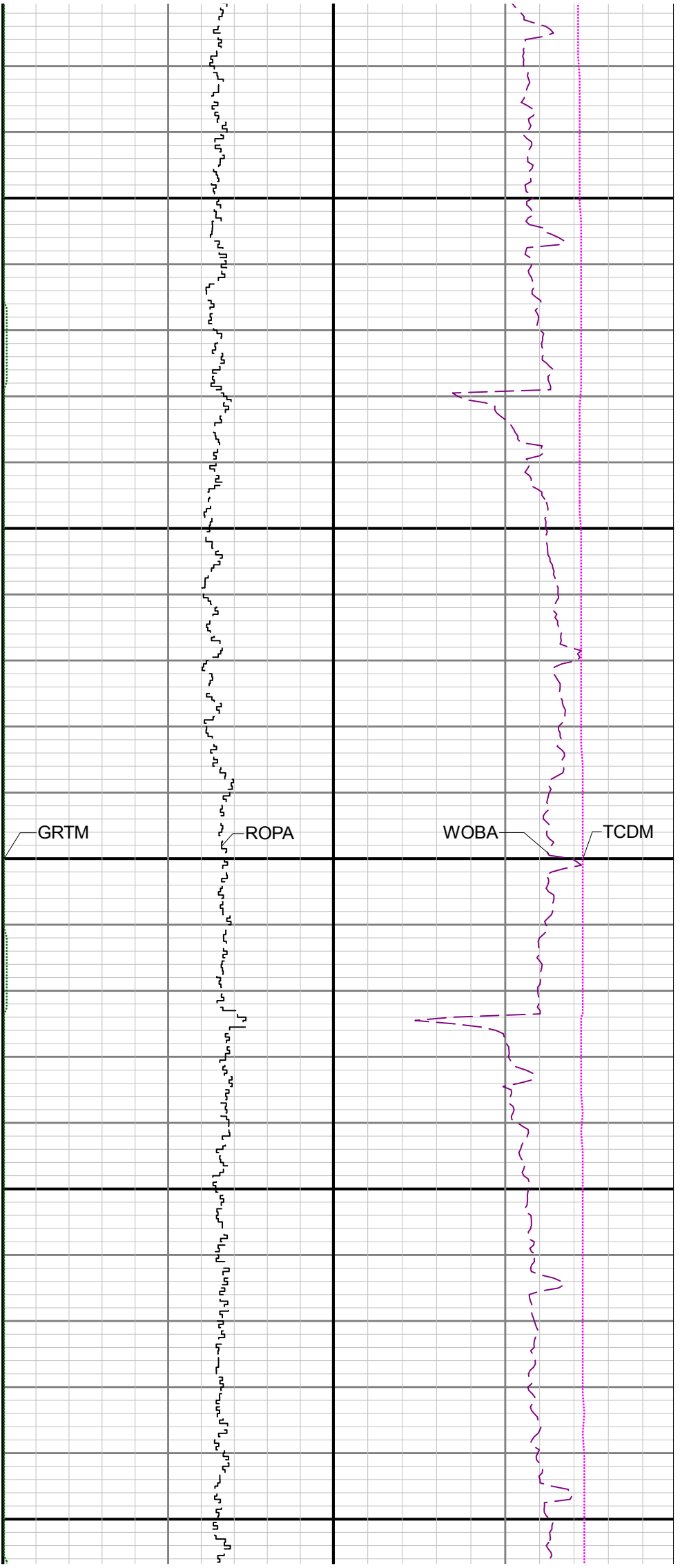


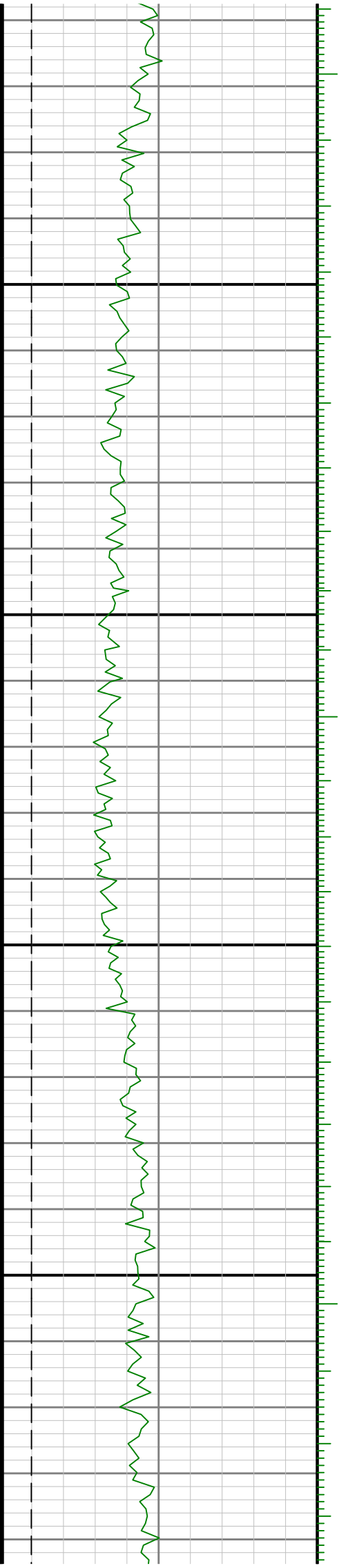
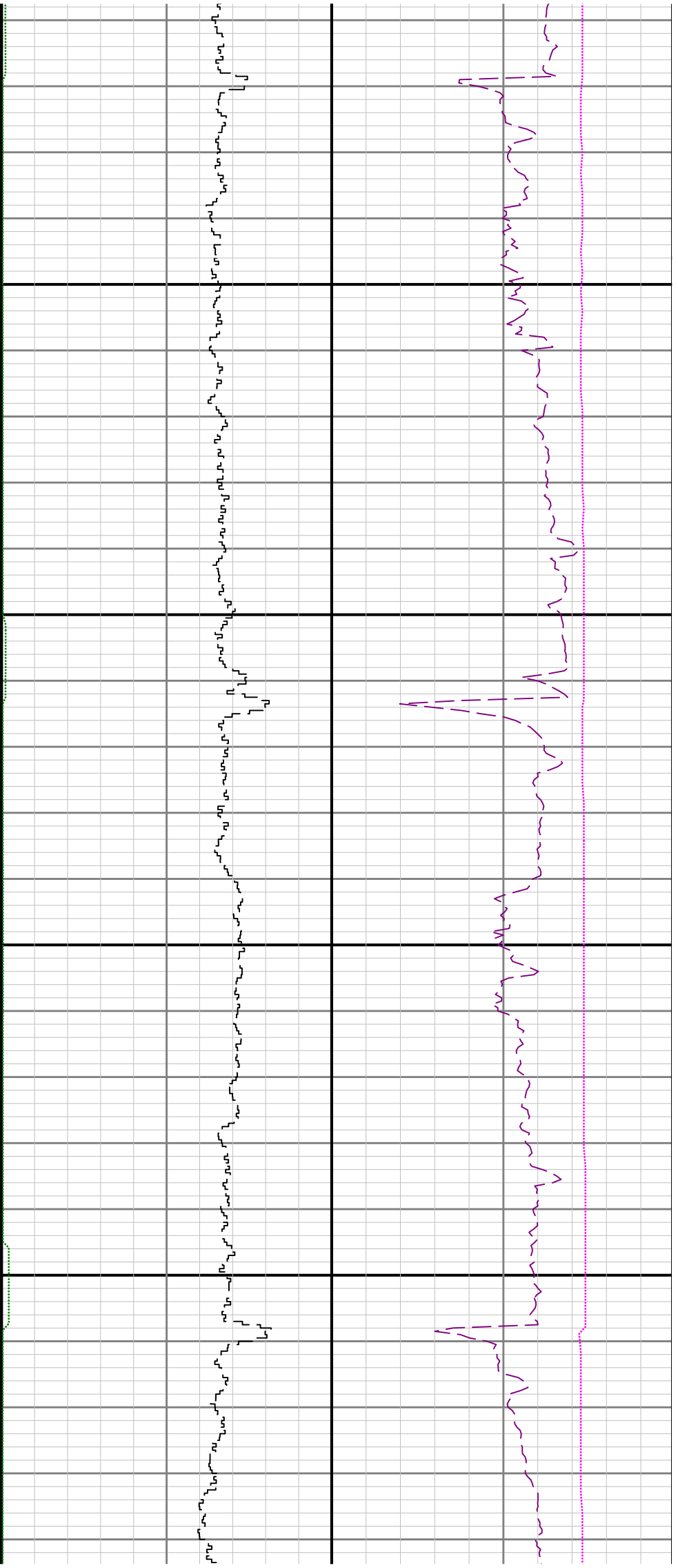


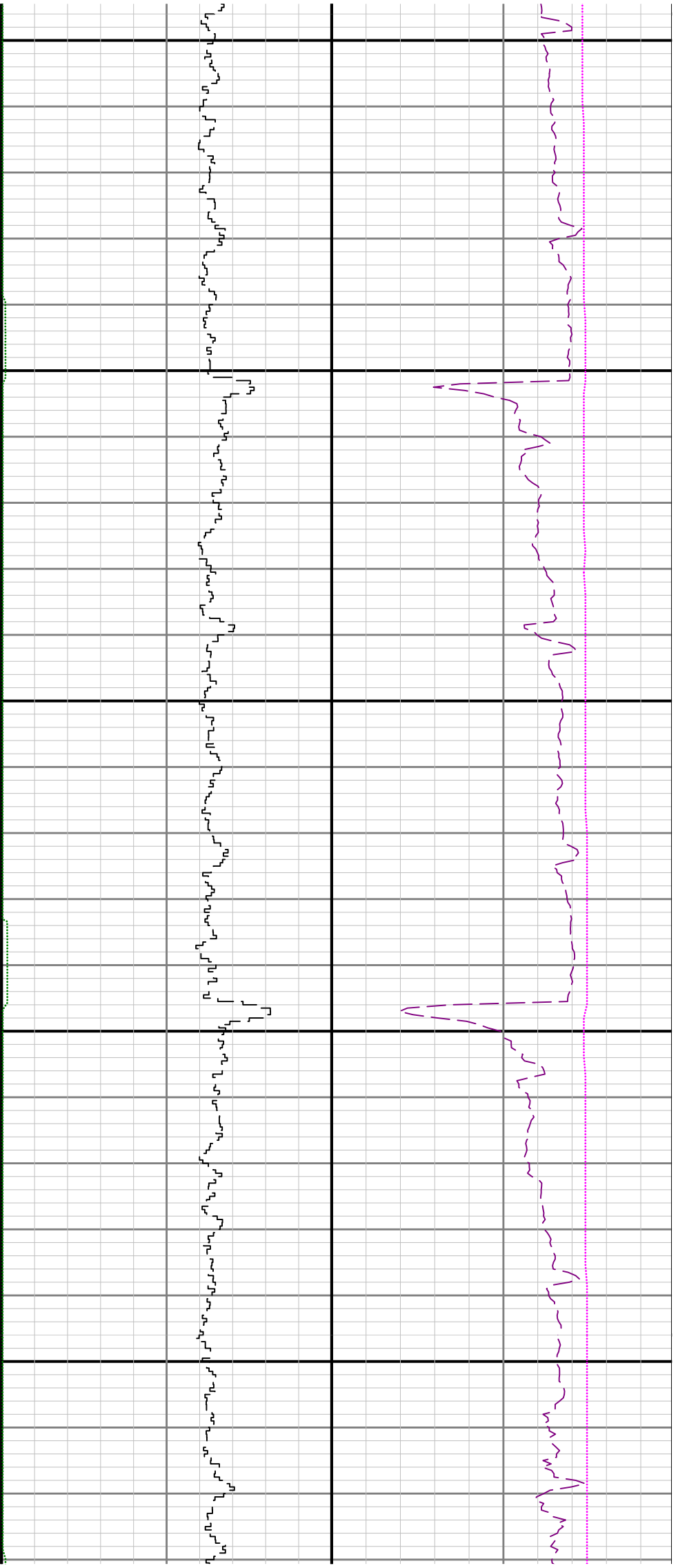
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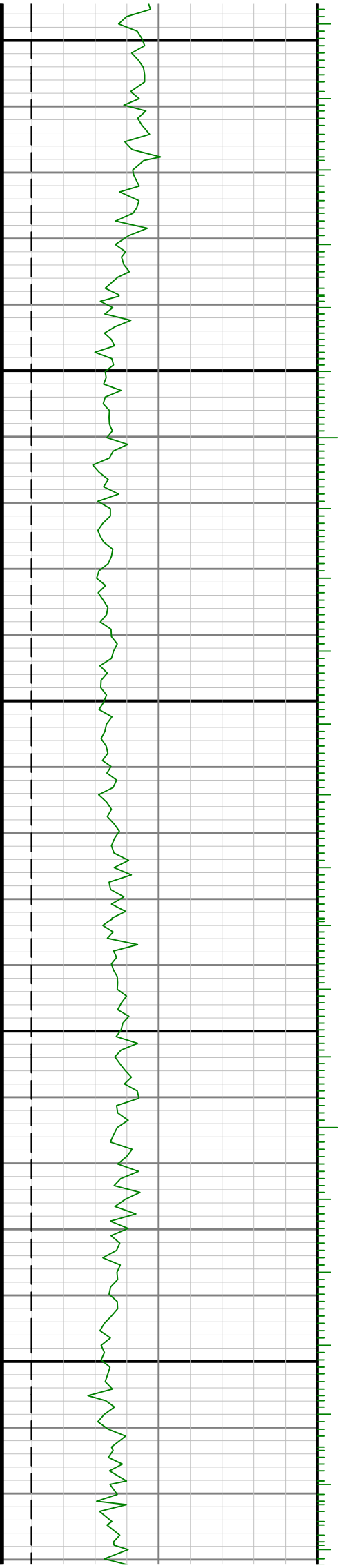


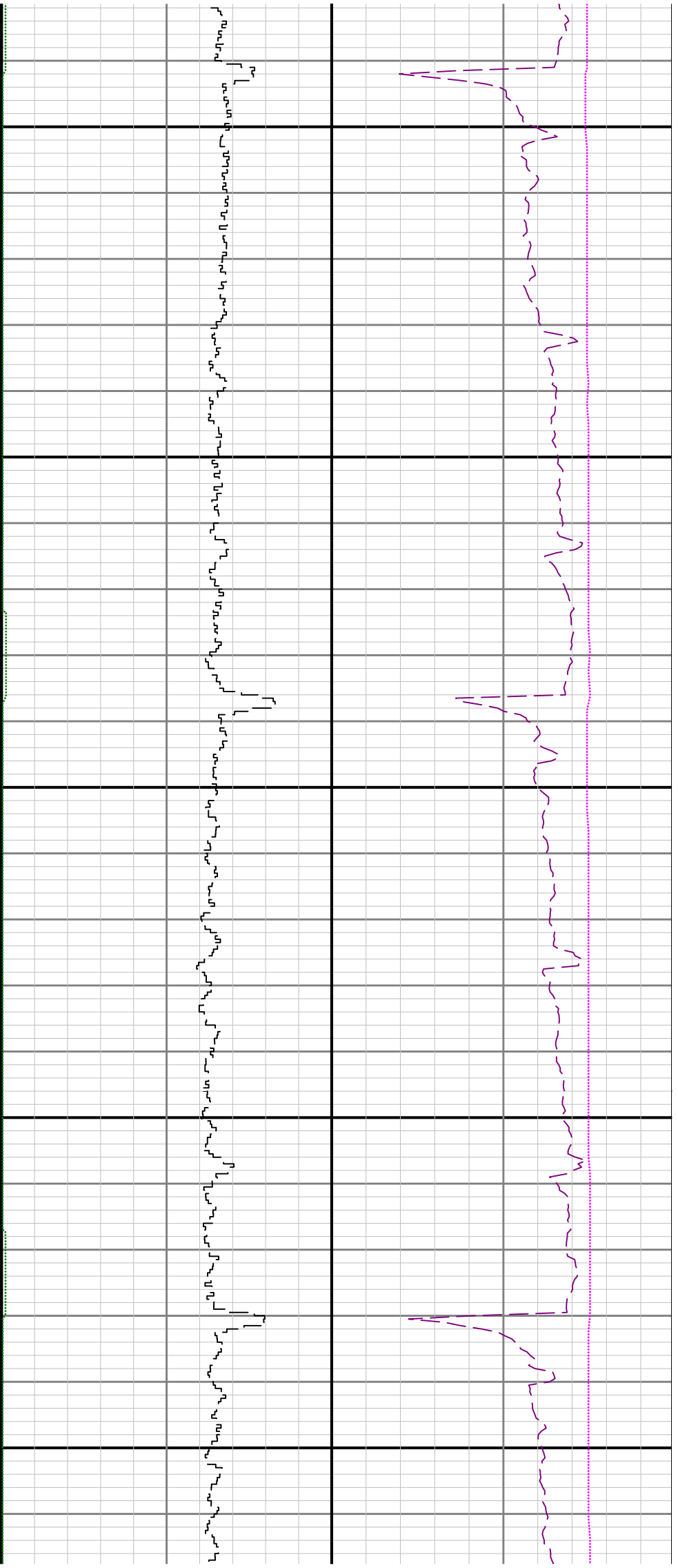




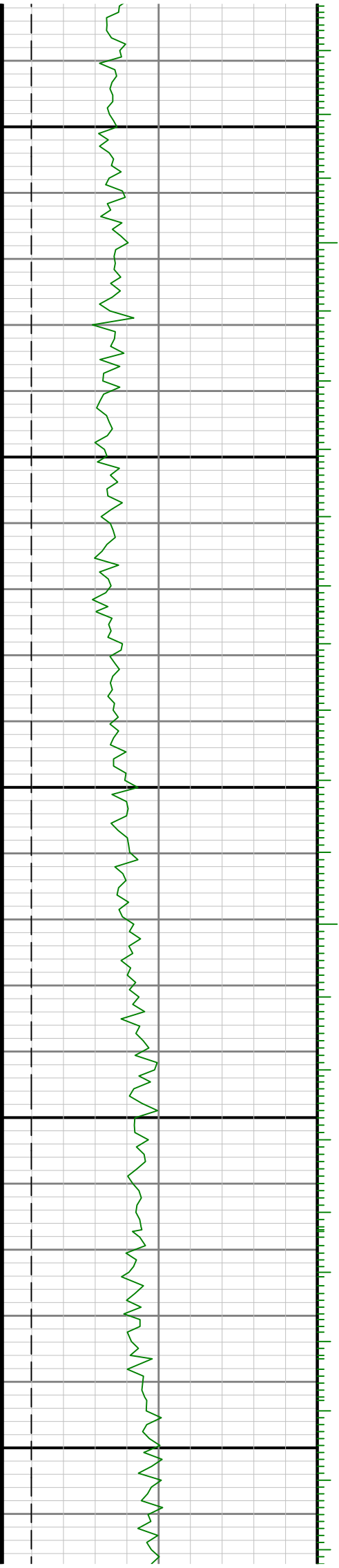
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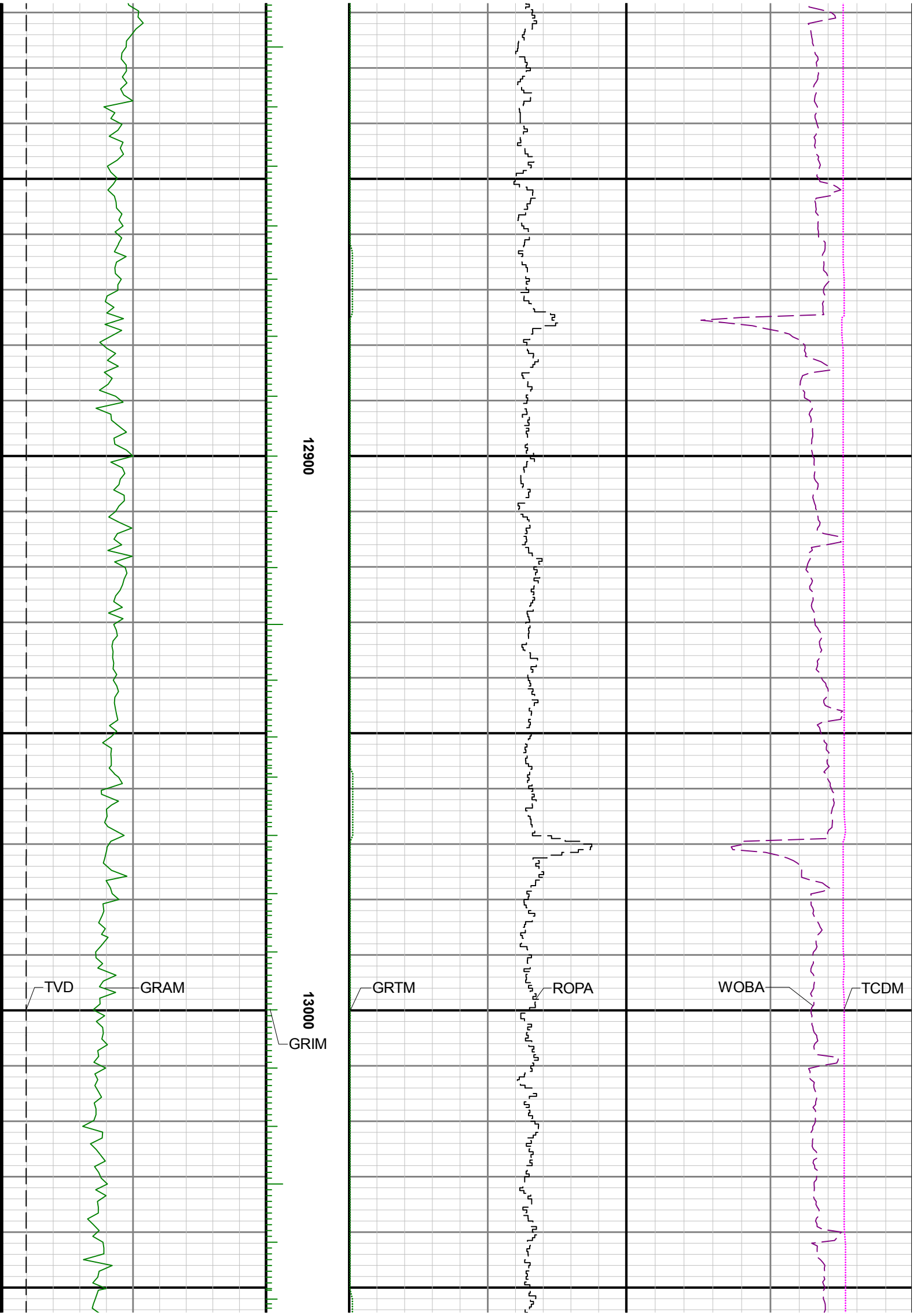
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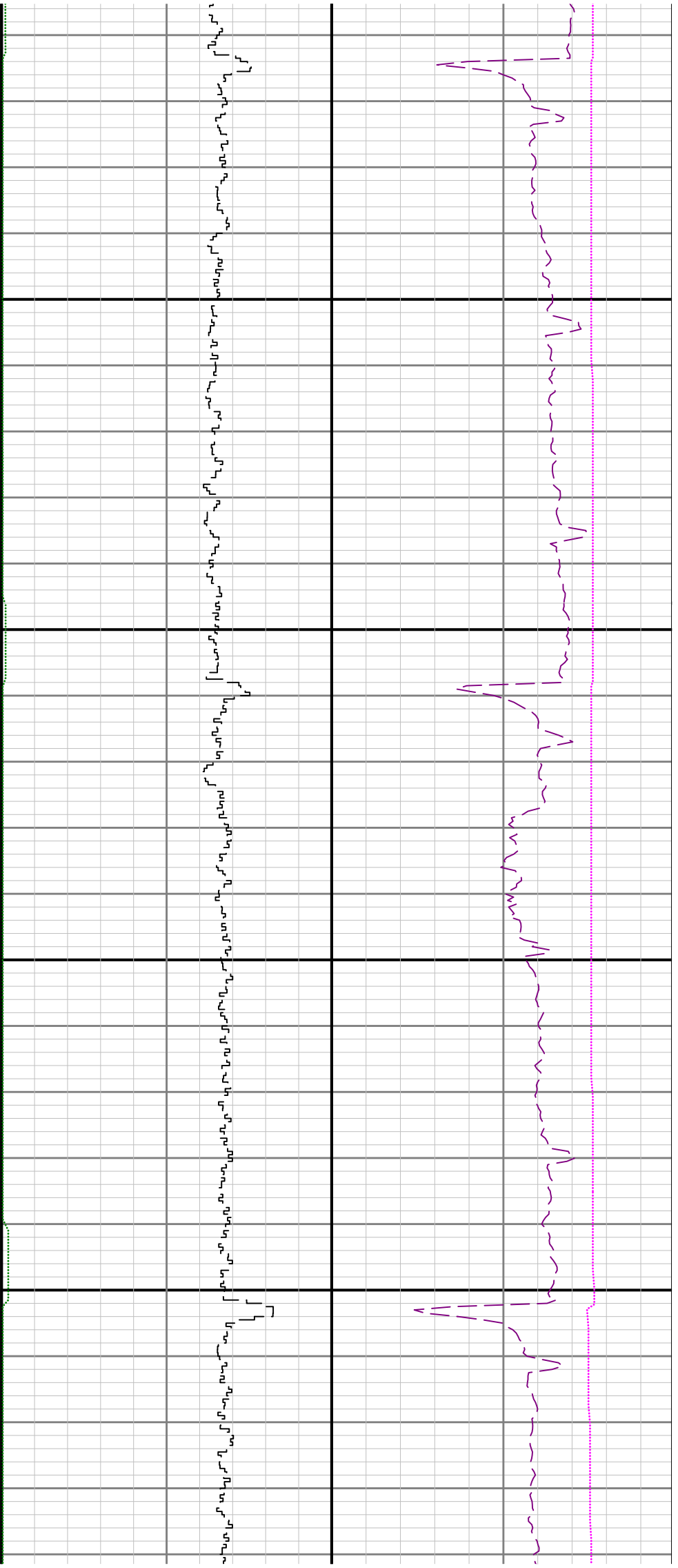




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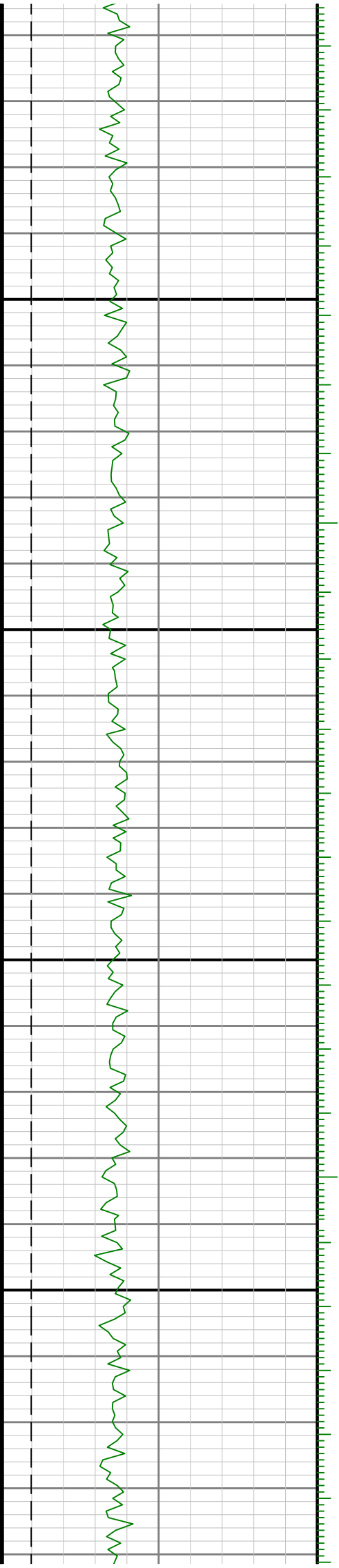


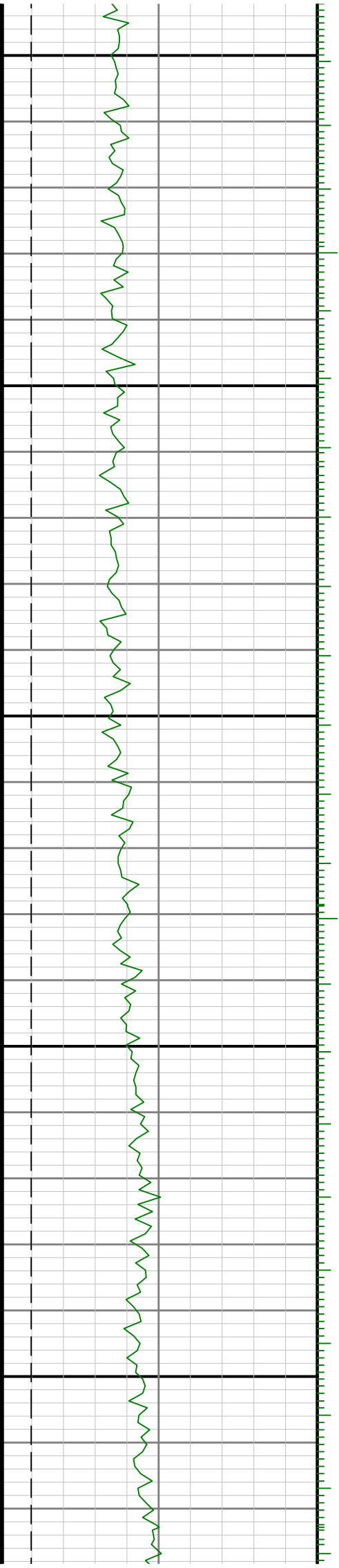
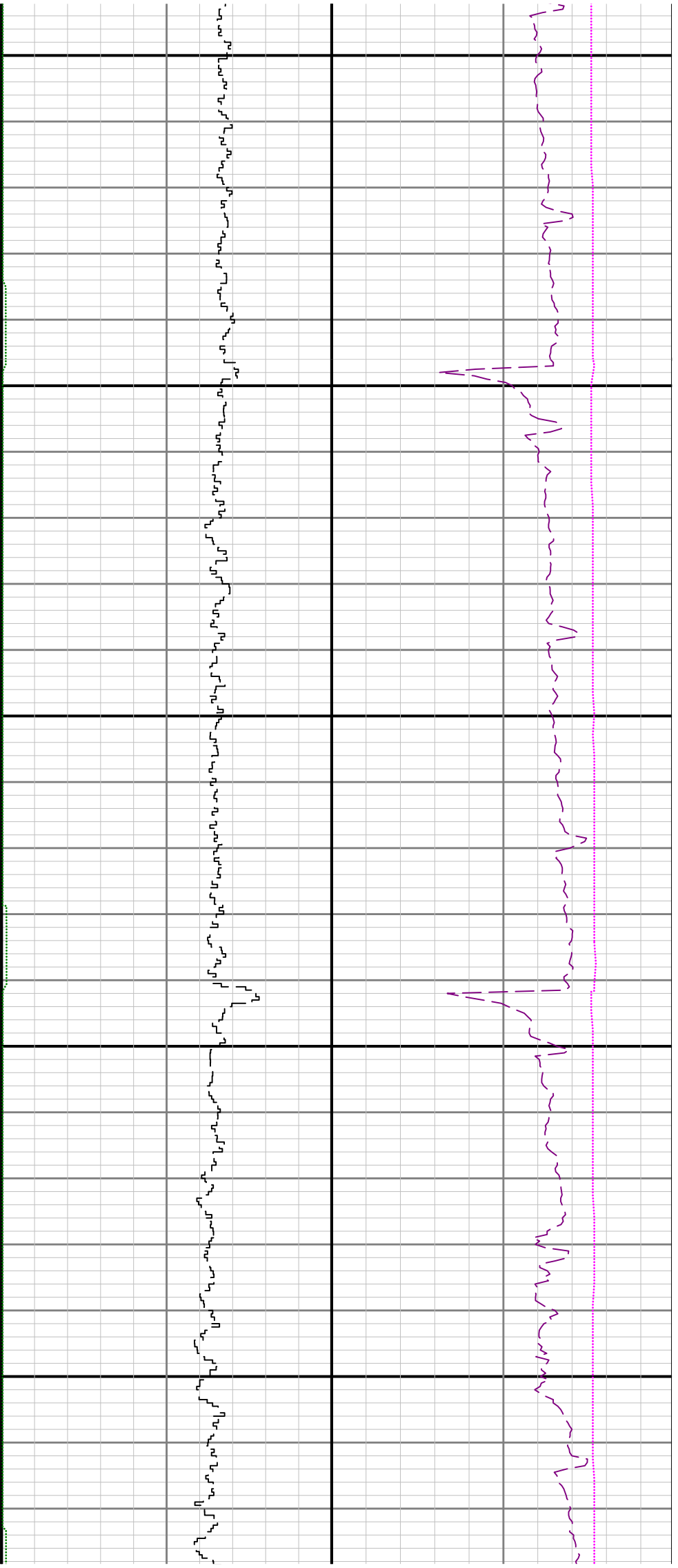


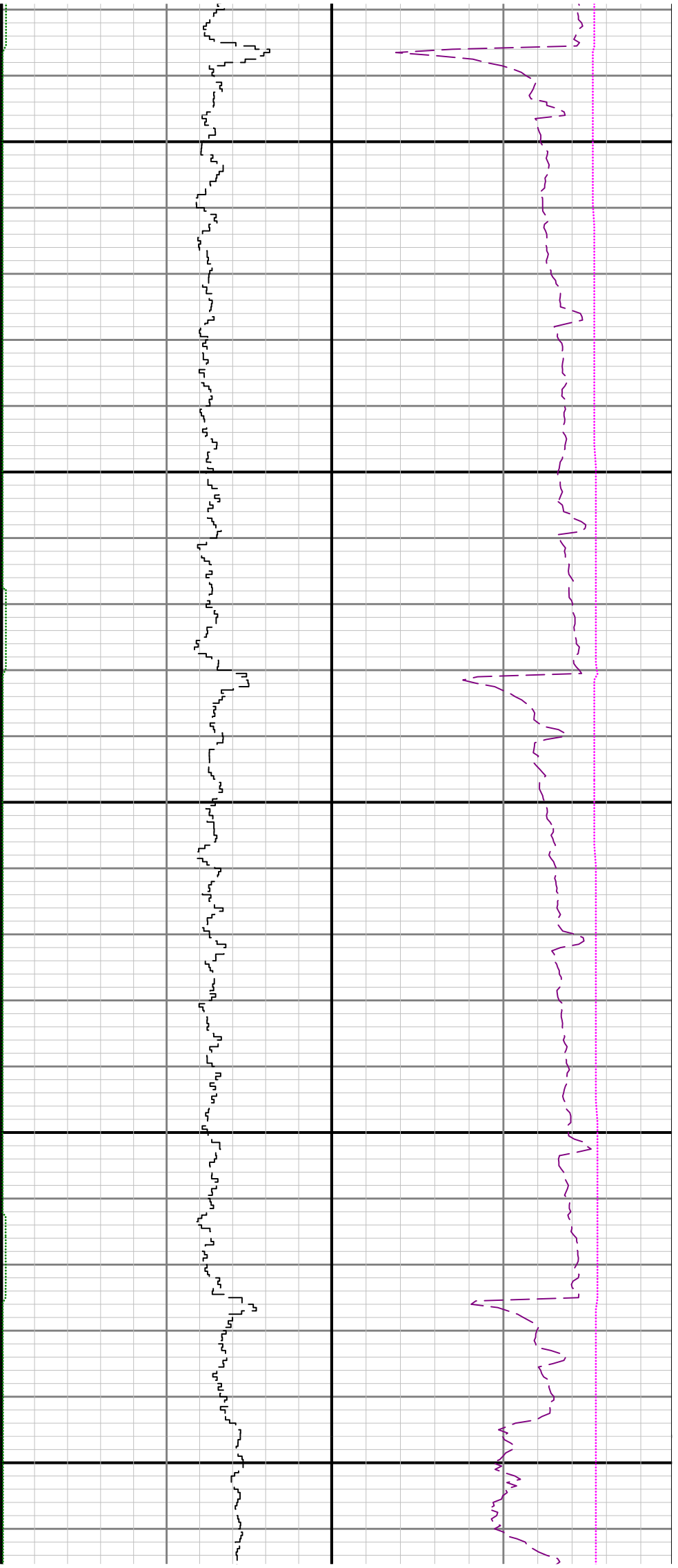


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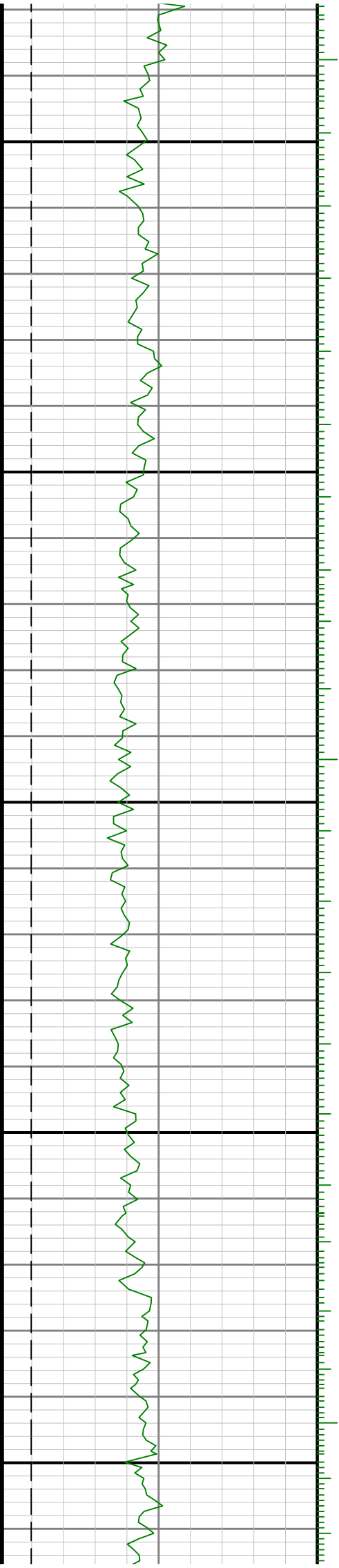


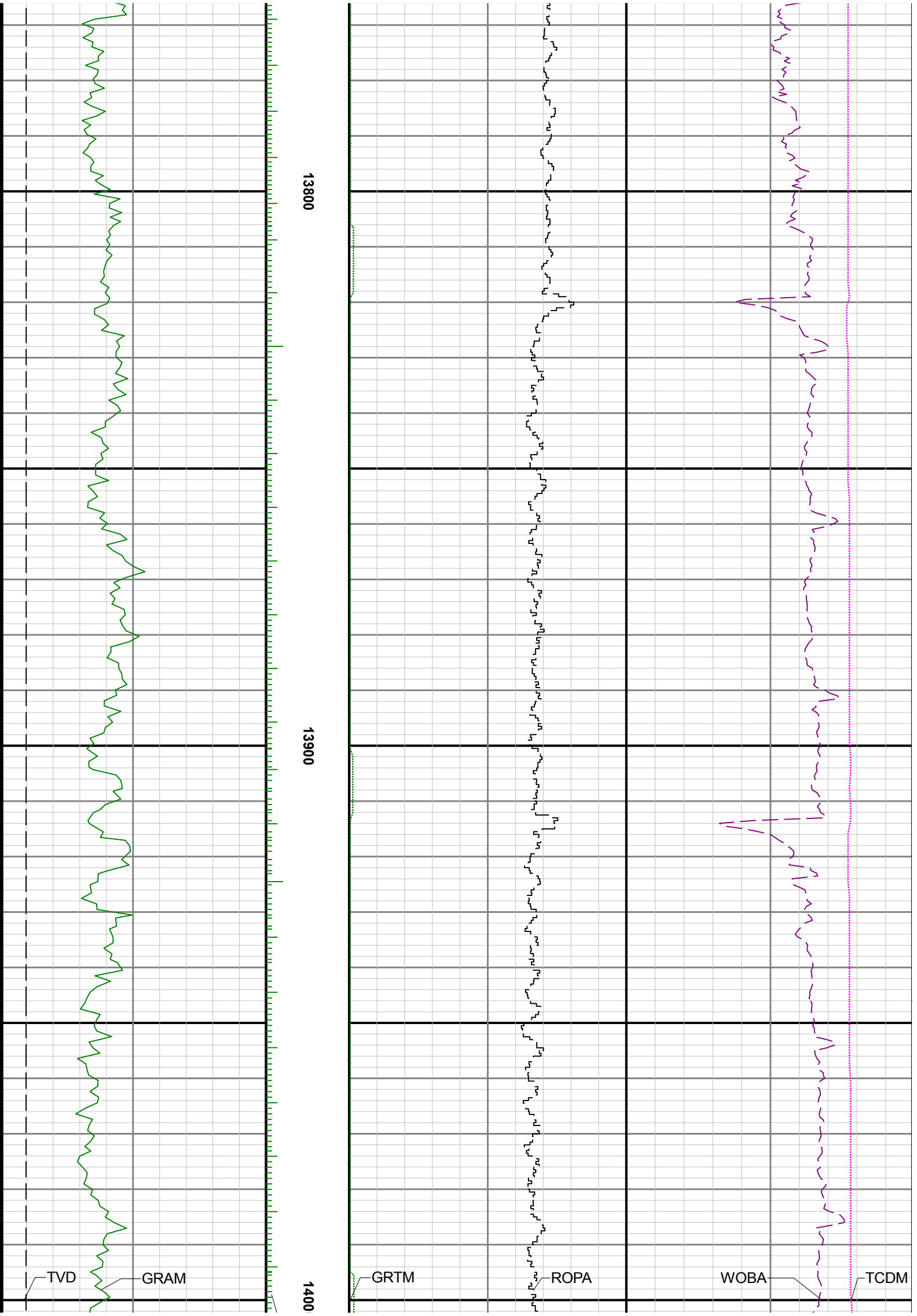


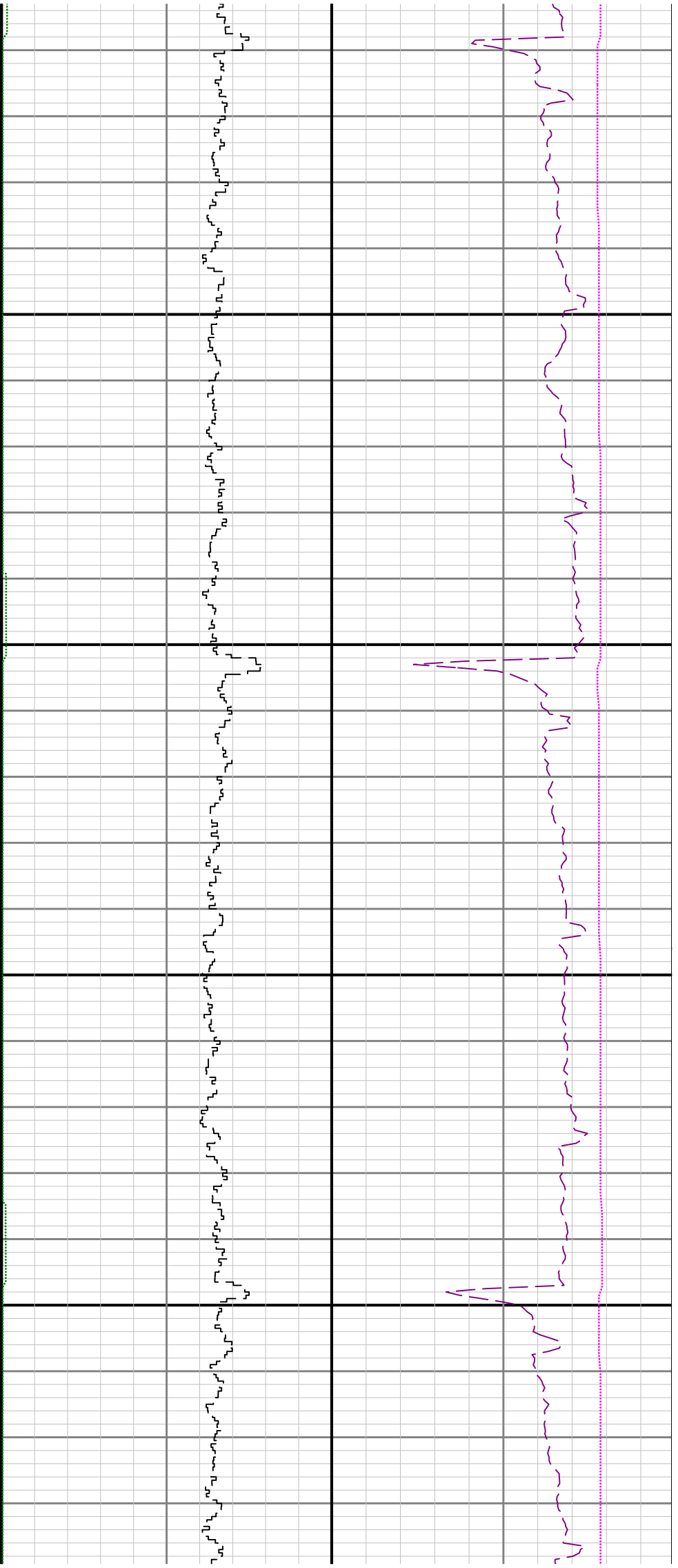


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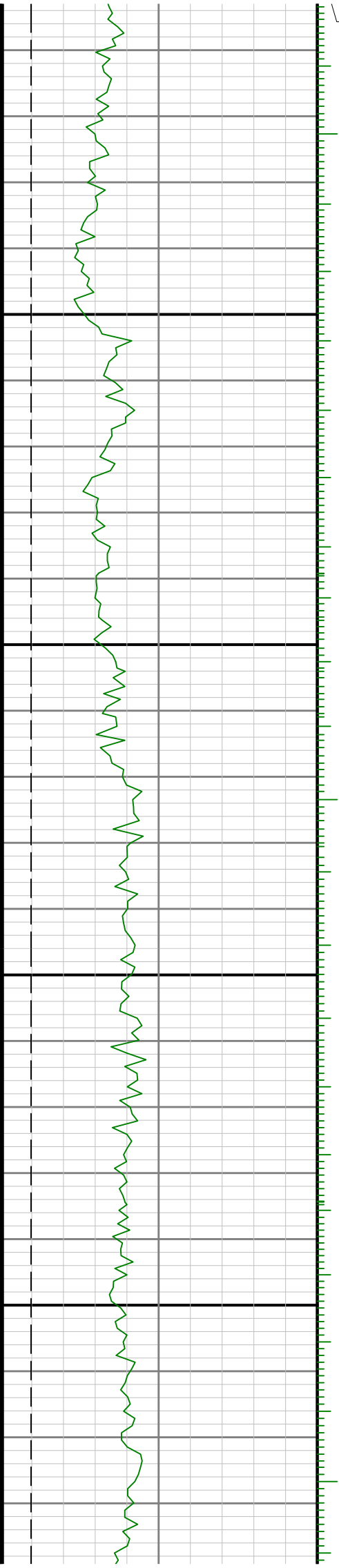


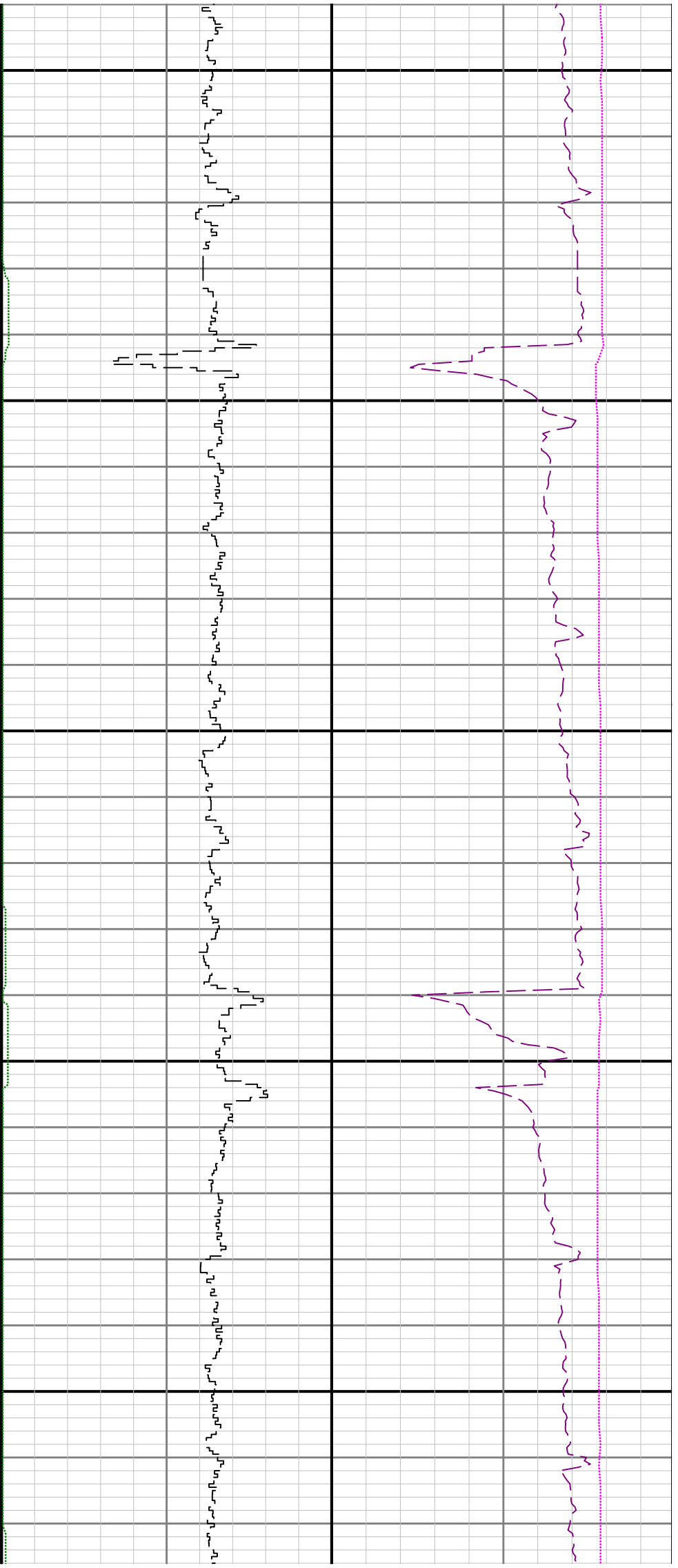


GRIM

14100

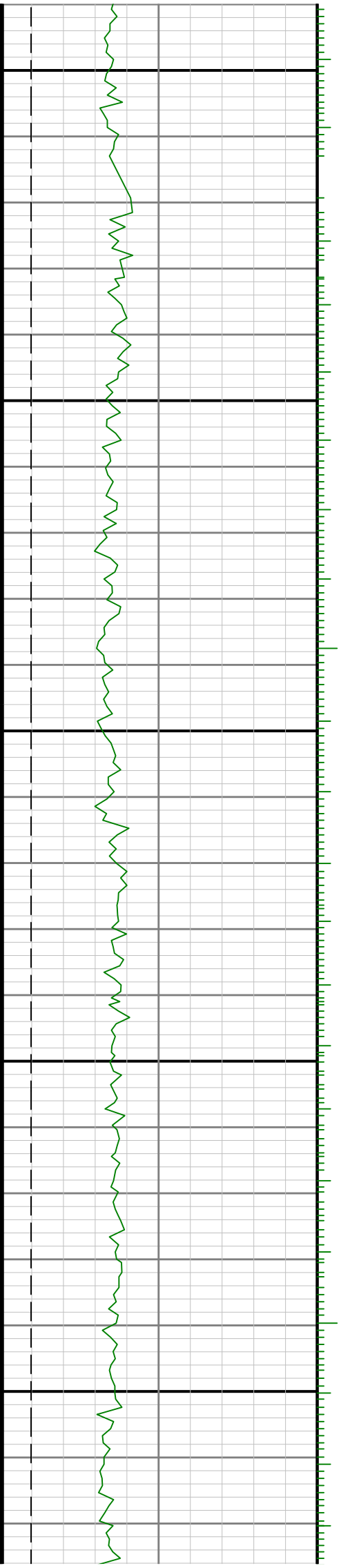
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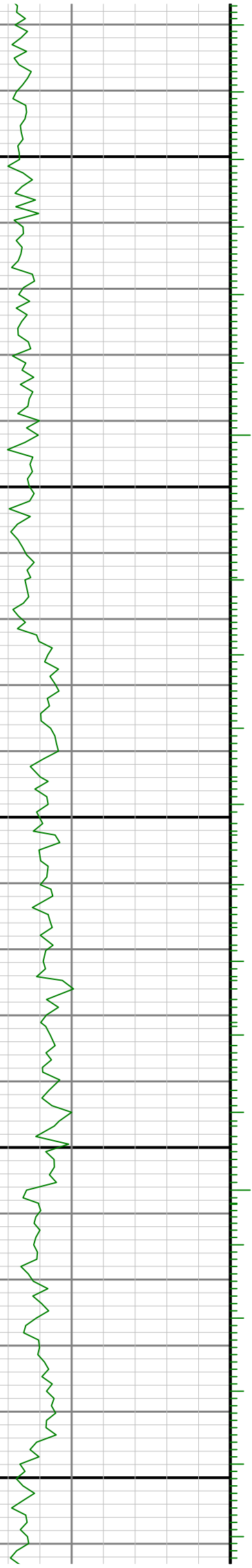
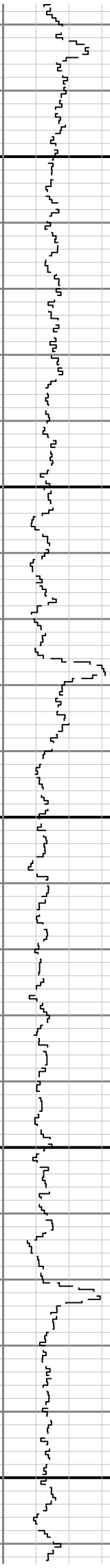


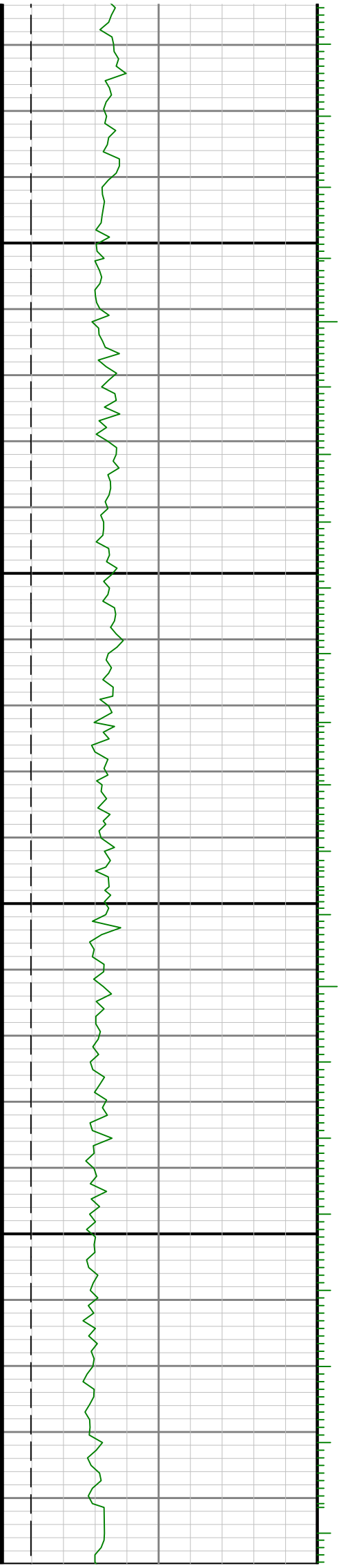
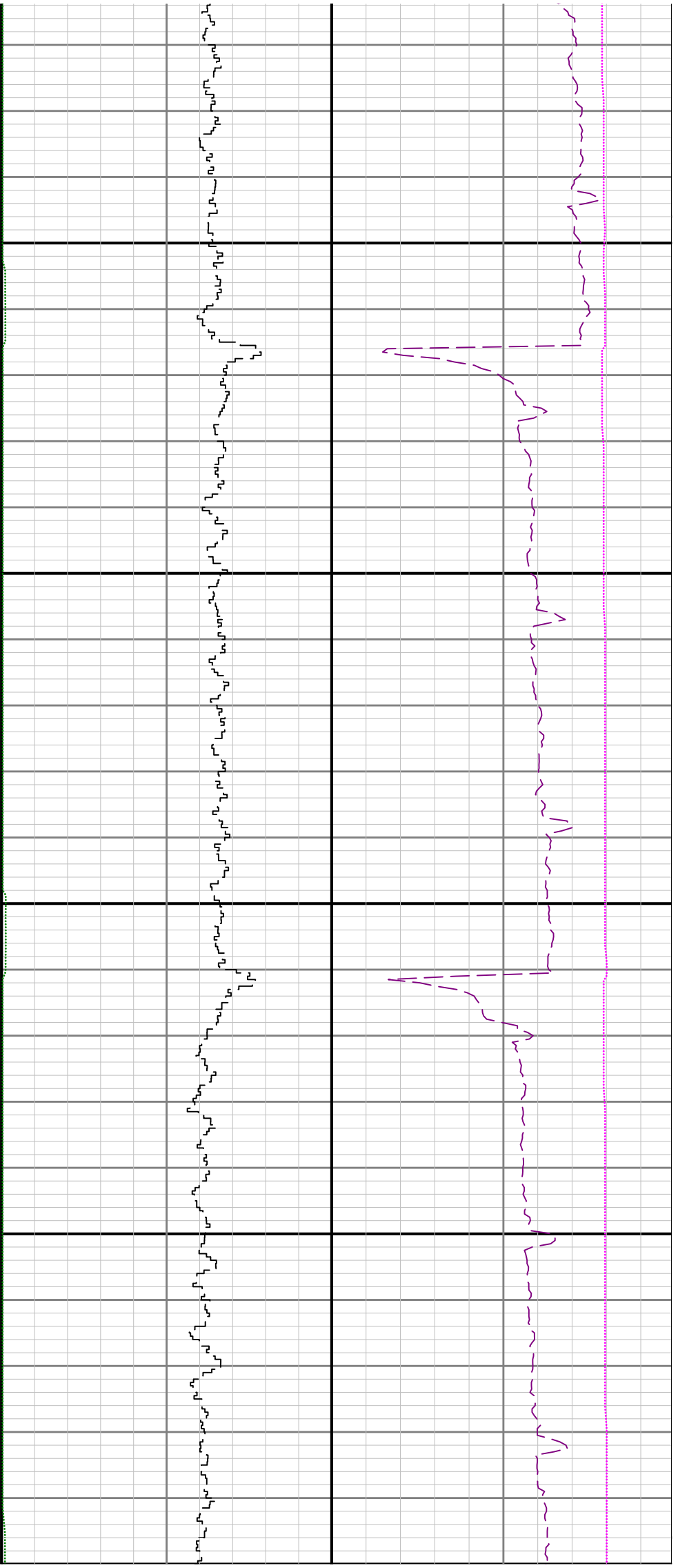


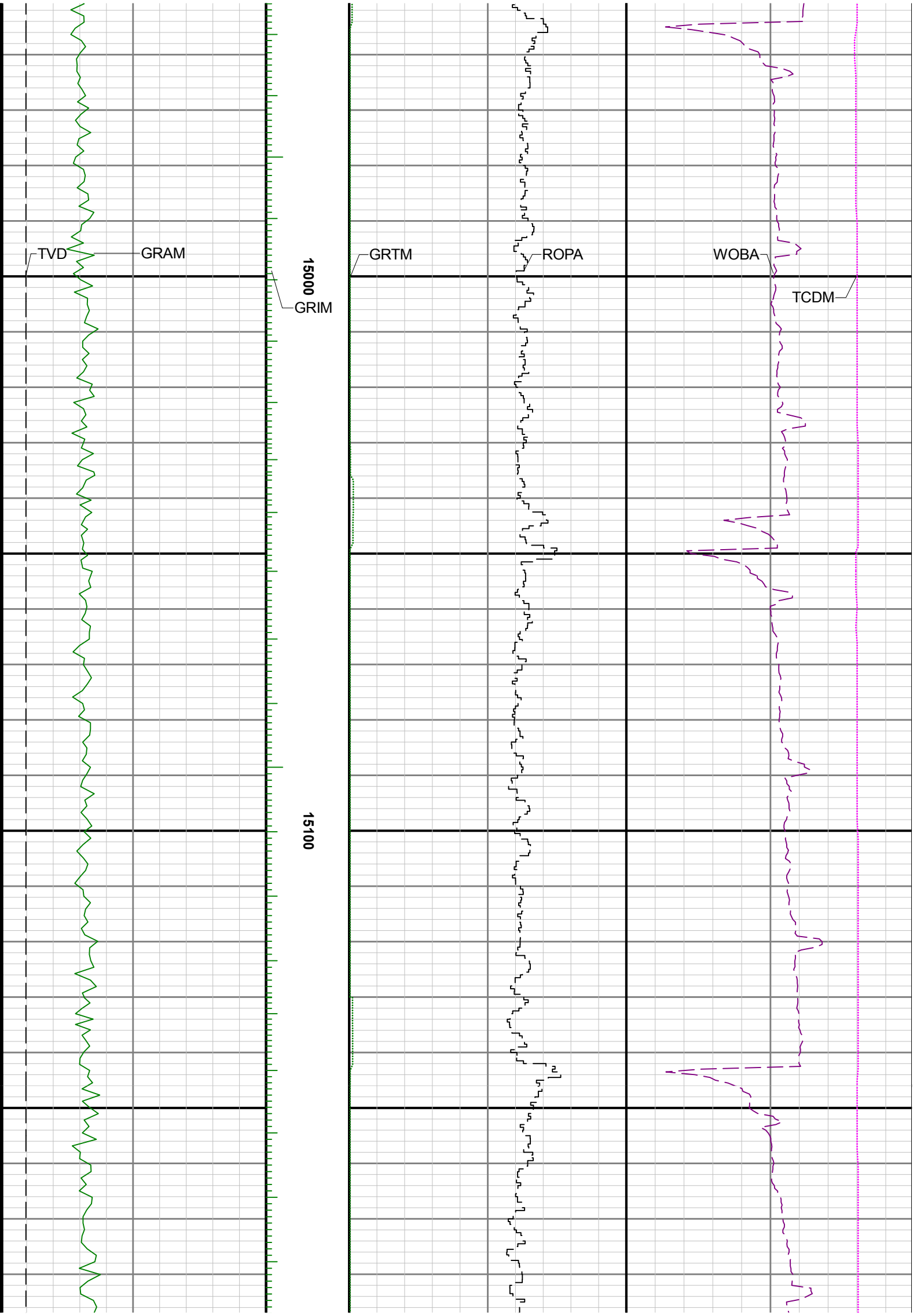
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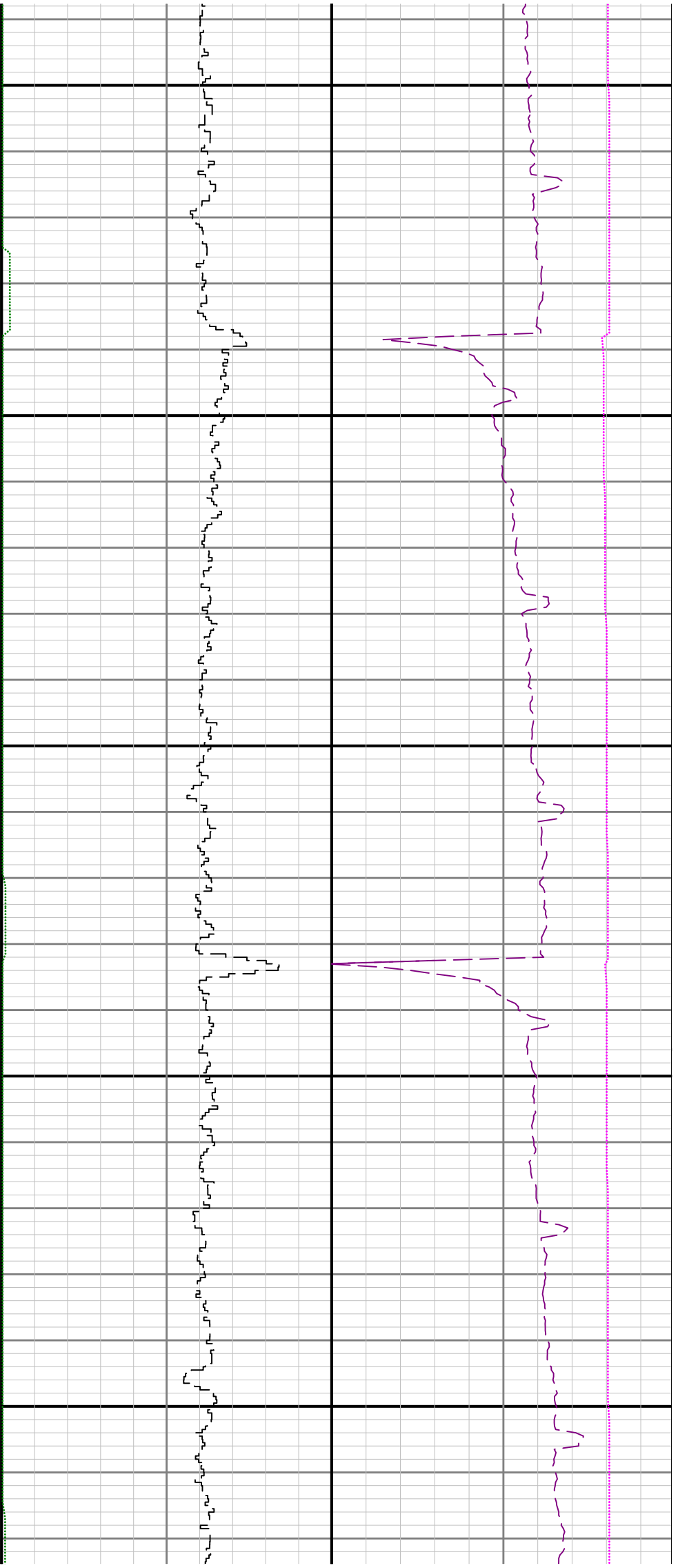
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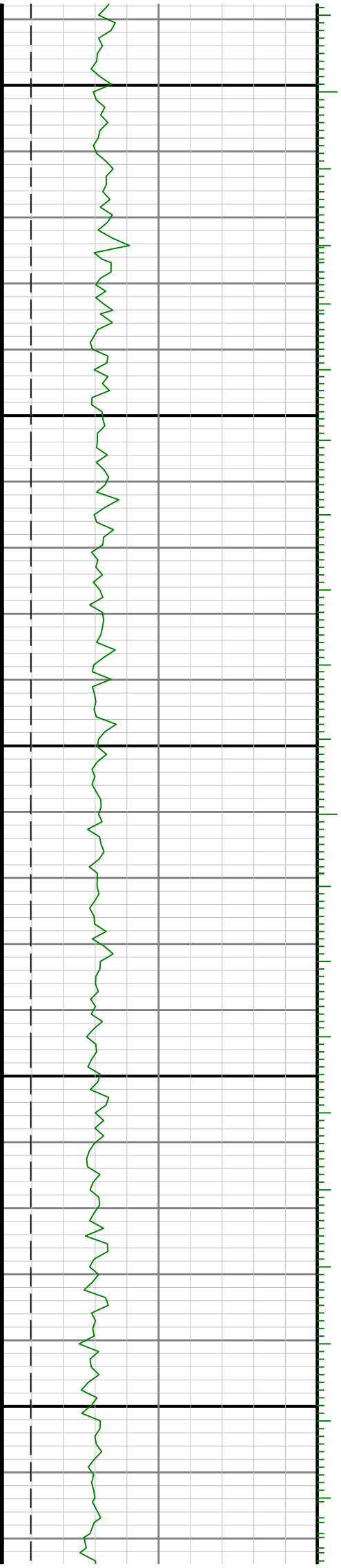


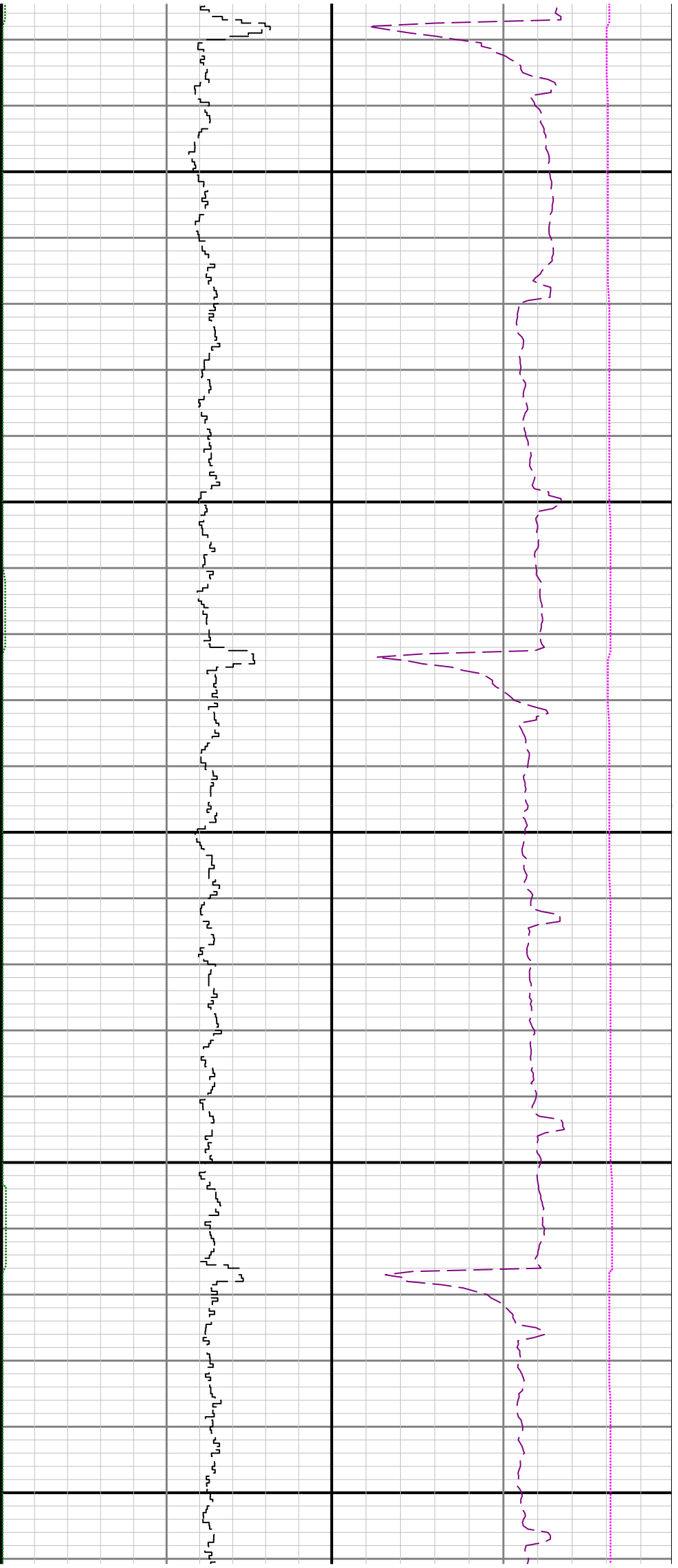


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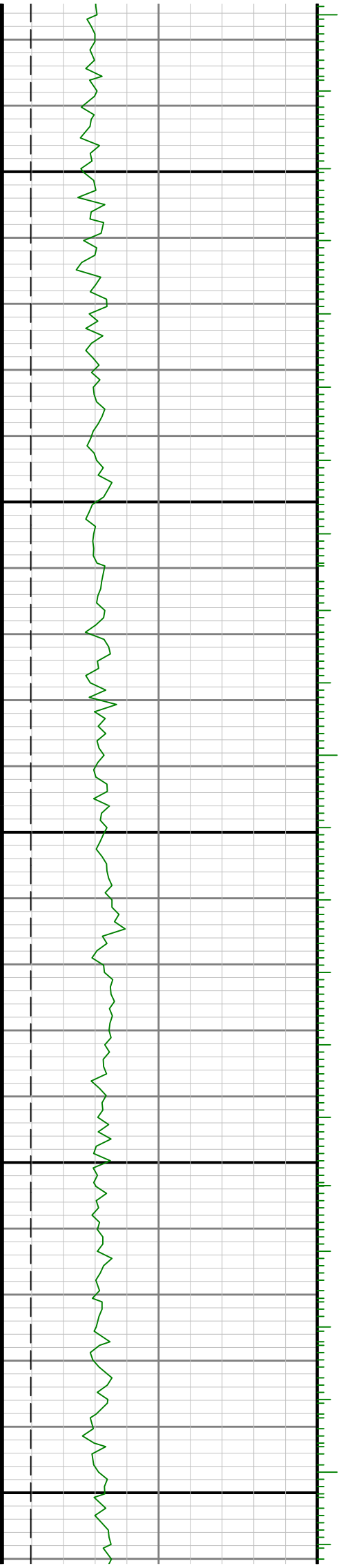
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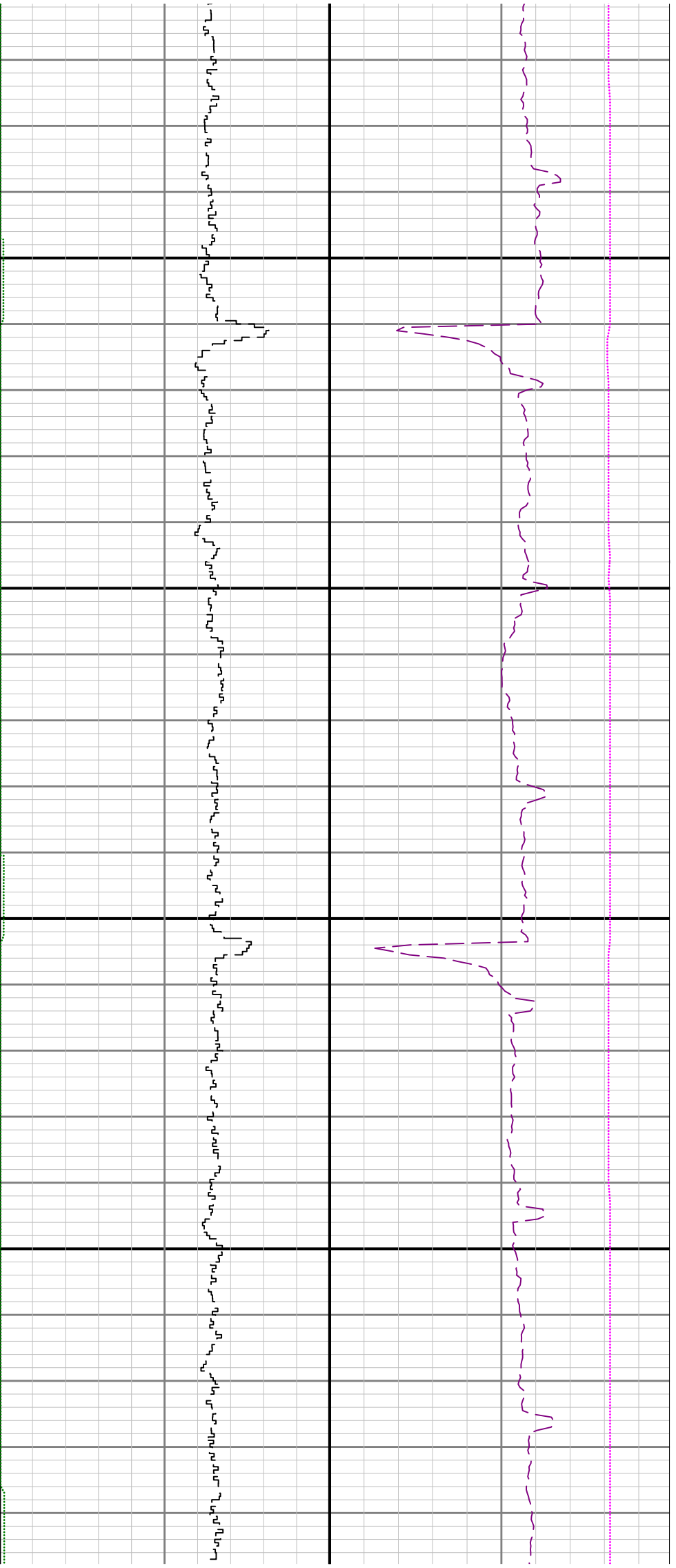




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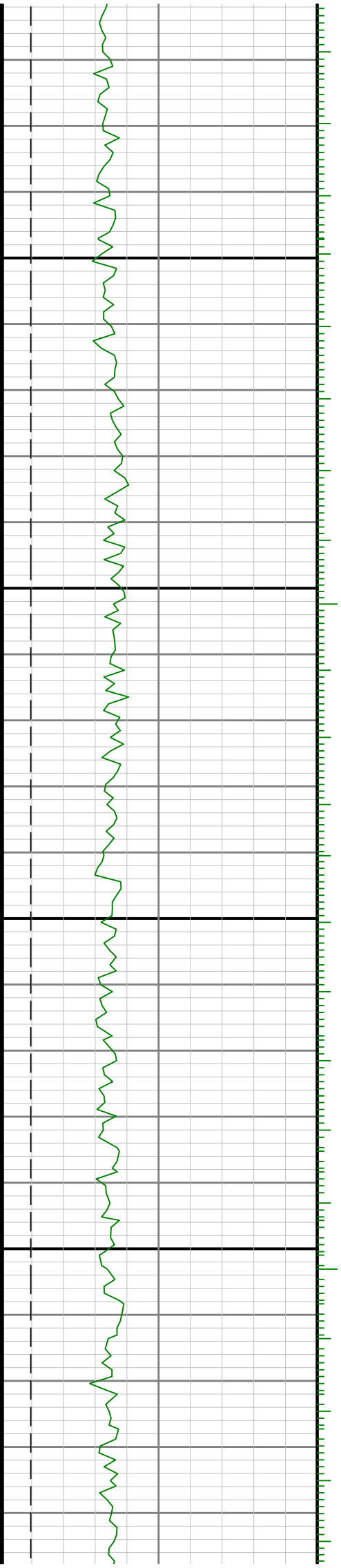


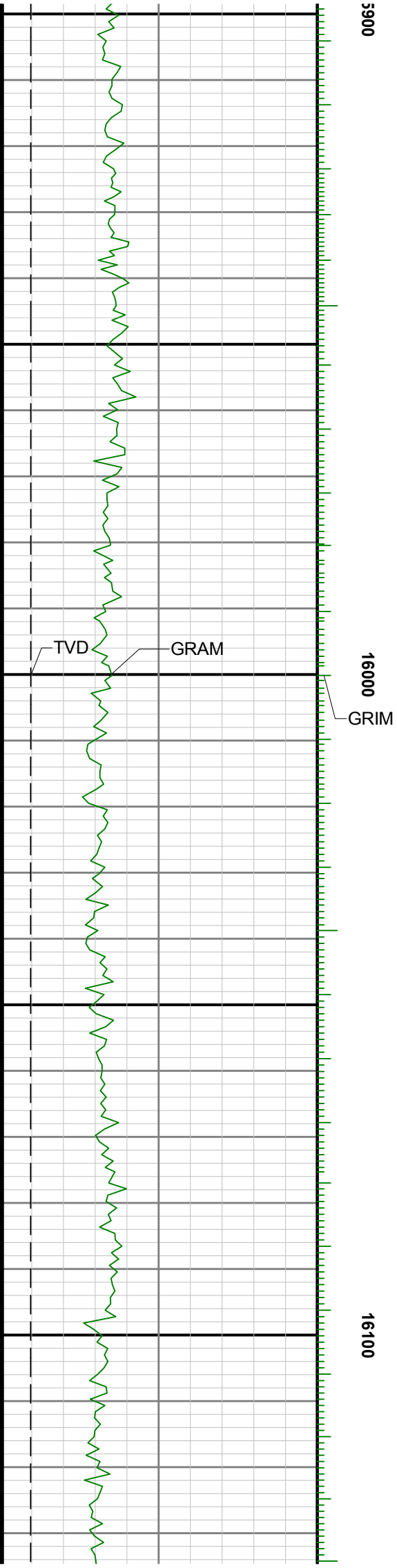
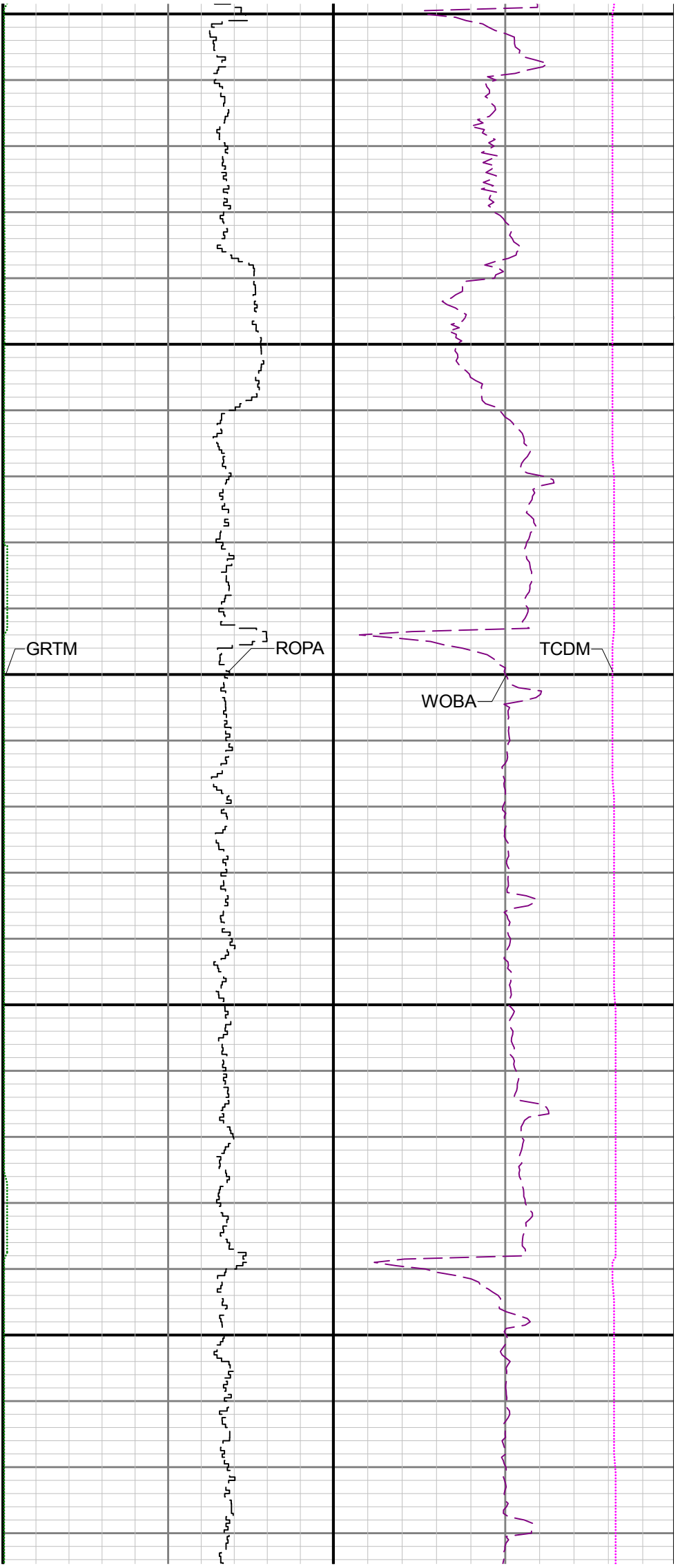


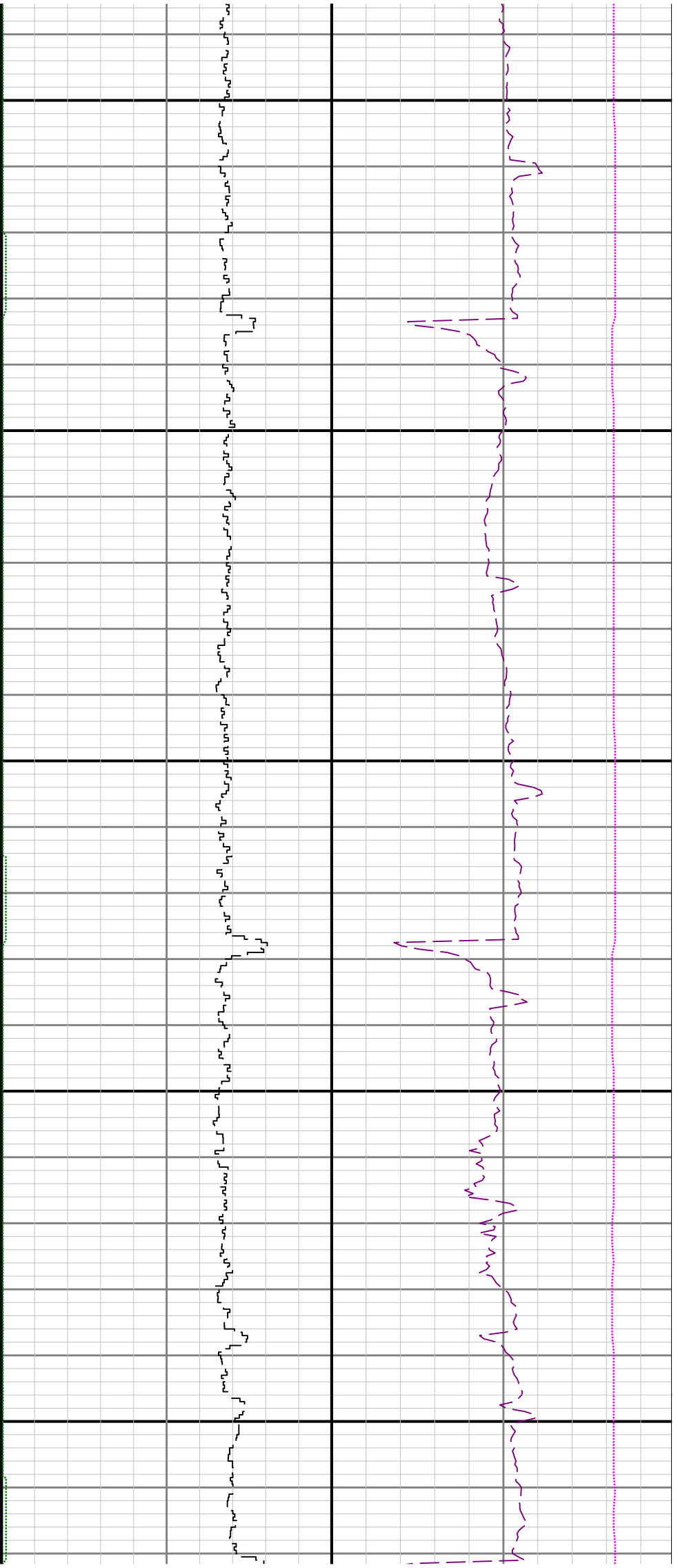
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16200

16300

