



## LWD MEMORY LOG

# Gamma Ray

Scale: **Company: Confluence Resources**

Well: /O Ranch 10-15-3L

Measured Depth	Field:	Well:
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County: Wein County: United States

**Driller's Depth** **State:** **Colorado**

Status:	Surface Location:	Other Services:
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Latitude:	040° 20' 05.136" N
Longitude:	104° 25' 45.876" W
<b>Final Print</b>	

API No:	05123475940000	Directional
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Job ID: 109836754

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SEC: 3    TWN: 4N    RGE: 63W

Permanent Datum (P.D.):	Mean Sea Level	Elevation:	0.00 ft	Elev. KB:	4617.50 ft
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Log Measured From:	Kelly Bushing	Above P.D.:	461 / .50 ft	Elev. GL:	4594.50 ft
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From: 2019-06-30	Drilled (ft)	Logged (ft)	Azi Reference North:	True	Dip Angle: (deg)	66.7
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Spud: 2019-05-28	Bottom: 16462.00	Bottom: 16449.00	Mag to Reference North Correction: (deg) 7.9
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## Borehole Record

Hole Size (in)	From (ft)	To (ft)	Size (in)	Weight (lb/ft)	From (ft)	To (ft)
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13.500	23.00	1550.00	9.625	36.00	23.00	15

8.300	1330.00	10462.00			

[illegible][illegible]



Mud Record	Deviation Record

Type	From (ft)	To (ft)	Hole Size (in)	Interval (ft)	Inc   Az (Start)	Inc   Az (End)

Water Based Mud	0.00	1553.99	13.500	1527.00	0.87	95.58	0.19
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U= Dasein Mund	1000.00	10702.00	0.000	17012.00	0.19	301.74	00.01
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Acquisition System	Software Version	Other
...	...	...

Cadence	R 15.2	Rig:	Ensign 140
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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
						Top	Bottom	From	To	Start Logging	End Logging	
						(ft)	(ft)	(ft)	(ft)			
1	1	13.500	PDC	6.00	Steerable	0.00	0.00	20.00	1550.00	N/A	N/A	7.02
2	2	8.500	PDC	3.00	AutoTrak Curve	1537.00	7076.00	1550.00	7088.00	2019-06-30 04:12	2019-07-01 13:03	28.68
3	2	8.500	PDC	3.00	AutoTrak Curve	0.00	0.00	7088.00	7180.00	2019-07-02 01:24	2019-07-02 01:53	2.58
4	2	8.500	PDC	3.00	AutoTrak Curve	7076.00	16449.00	7180.00	16462.00	2019-07-02 14:39	2019-07-04 23:21	52.78

## Crew

Name	Arrive Wellsite	Depart Wellsite	Name	Arrive Wellsite	Depart Wellsite	Name	Arrive Wellsite	Depart Wellsite
Shawn McCaffrey	2019-06-30	2019-07-01	Will Roth	2019-07-01	2019-07-05			

## 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+ (%)
2019-05-28 10:02	1	102.00	Water Based Mud	8.5	1	7	N/A	N/A	Active Pit	380	0.00
2019-06-30 02:00	2	1550.00	Oil Based Mud	9.3	13	N/A	N/A	80/20	Active Pit	36500	0.00
2019-07-01 20:10	3	7088.00	Oil Based Mud	9.3	13	N/A	N/A	80/20	Active Pit	36500	0.00
2019-07-02 10:17	4	7180.00	Oil Based Mud	9.7	13	N/A	0.0	71/17	Active Pit	34000	0.00
2019-07-03 03:00	4	9230.00	Oil Based Mud	9.6	14	N/A	0.0	70/18	Active Pit	32000	0.00
2019-07-03 15:00	4	11165.00	Oil Based Mud	9.8	16	N/A	0.0	69/17.5	Active Pit	33000	0.00
2019-07-04 03:00	4	13000.00	Oil Based Mud	9.8	15	N/A	0.0	70/17	Active Pit	33000	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	NaviTrak	13249128	VSS	16.47	52.54	8.000	3.250
1	NaviTrak	13249128	Directional (mag)	16.47	52.54	8.000	3.250
2	AutoTrak Curve Steering Unit	14514942	Near Bit VSS	5.93	6.73	7.000	4.330
2	AutoTrak Curve Steering Unit	14514942	Near Bit Inclination	5.93	6.73	7.000	4.330
2	AutoTrak Curve MWD	14452413	Gamma (single)	2.74	12.89	7.000	3.250
2	AutoTrak Curve MWD	14452413	Directional (mag)	12.26	22.41	7.000	3.250
3	AutoTrak Curve Steering Unit	14452345	Near Bit Inclination	5.93	6.73	7.000	4.330
3	AutoTrak Curve Steering Unit	14452345	Near Bit VSS	5.93	6.73	7.000	4.330
3	AutoTrak Curve MWD	14381973	Gamma (single)	2.20	12.36	7.000	3.250
3	AutoTrak Curve MWD	14381973	Directional (mag)	12.27	22.43	7.000	3.250
4	AutoTrak Curve Steering Unit	12480148	Near Bit Inclination	5.93	6.73	7.000	4.330
4	AutoTrak Curve Steering Unit	12480148	Near Bit VSS	5.93	6.73	7.000	4.330
4	AutoTrak Curve MWD	12441474	Gamma (single)	2.20	12.34	7.000	3.250
4	AutoTrak Curve MWD	12441474	Directional (mag)	12.27	22.41	7.000	3.250

### Service and Tool Mnemonics

Mnemonic	Name	Description
NTK	NaviTrak	Probe Based Directional Module, NaviTrak Platform
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

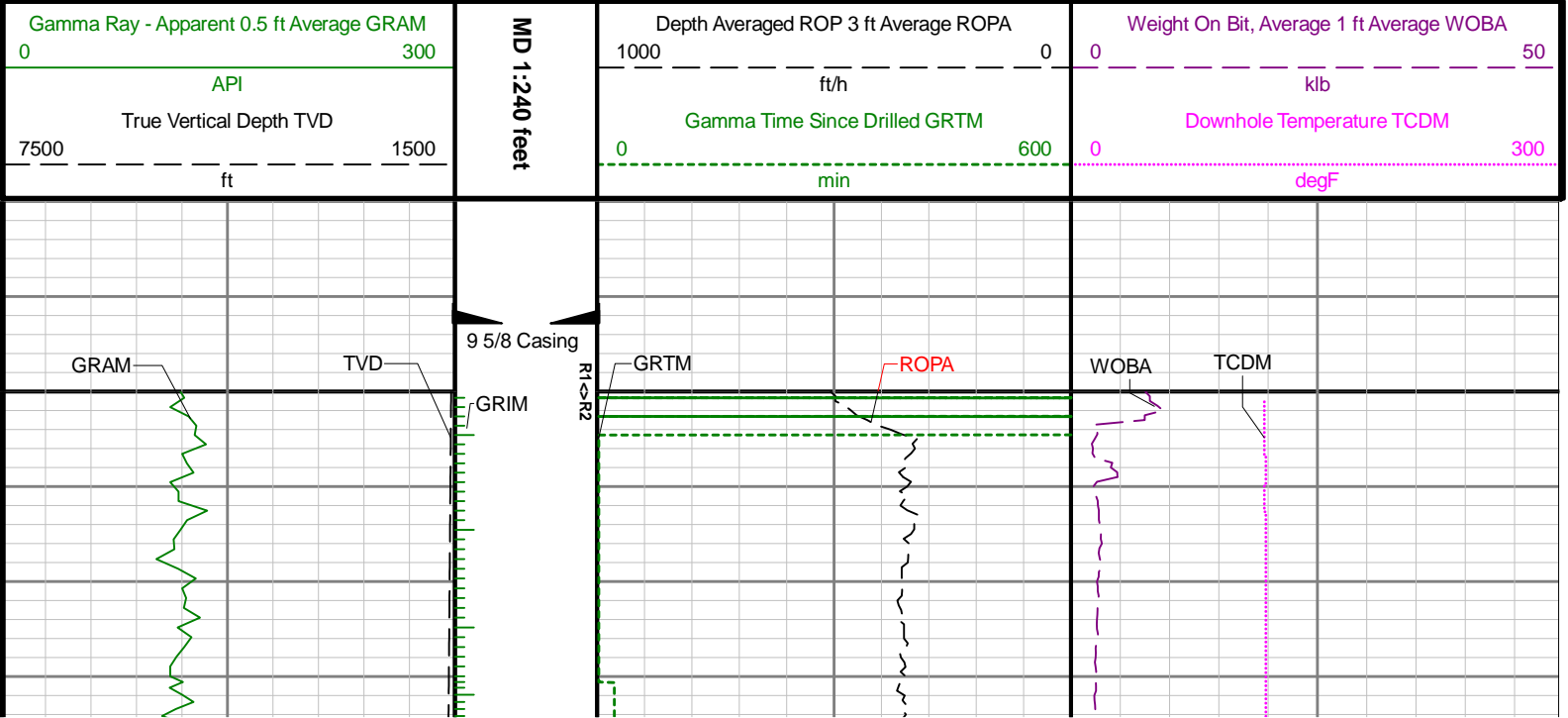
1	Depth measurements were obtained from a depth control system not supplied or operated by Baker Hughes, a GE company. Due to a lack of control by Baker Hughes, a GE company logging engineers, depth calibrations and measurements could not be independently verified and the unverified depths as supplied to Baker Hughes, a GE company are being used to present logging data.
2	Baker Hughes, a GE company run 1 utilized 8 inch Directionalonly with NaviTrak service behind a 13 ½ inch bit an 8 inch steerable assembly from 23 to 1550 feet MD (23 to 1550 feet TVD) therefore, no logging data was acquired for this run.
3	Baker Hughes, a GE company run 2 and 3 utilized 6 ¾ inch NaviGamma services (Gamma Ray and Directional) behind 8 ½ inch bit and rotary steerable assembly from 1550 to 16462 feet MD (1550 to 6418 feet TVD).
4	Gamma Ray Apparent (GRAM) is presented 0 to 300 API per customer request.

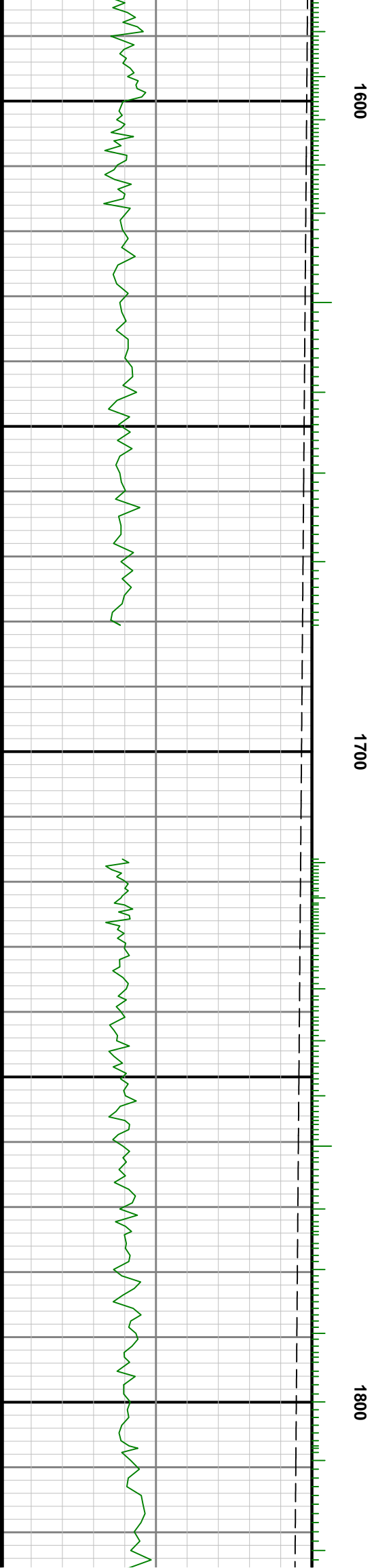
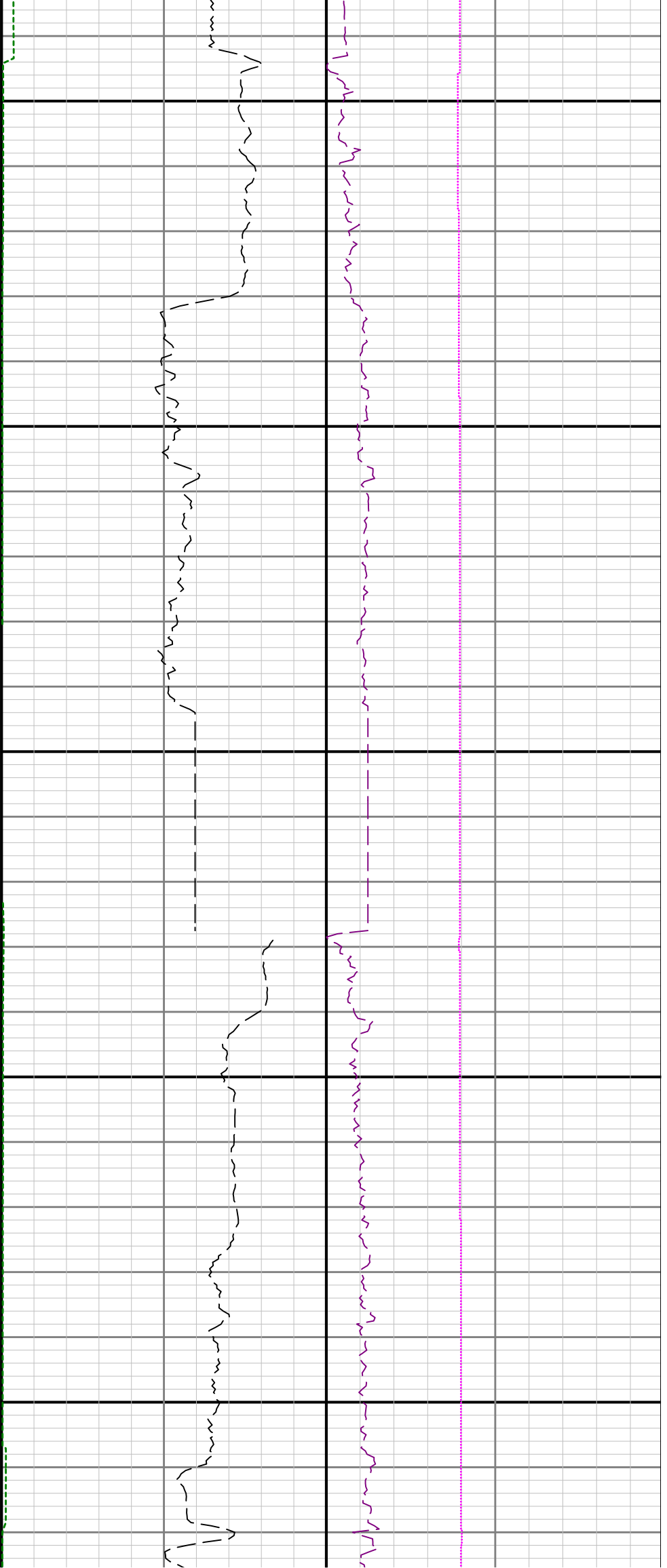
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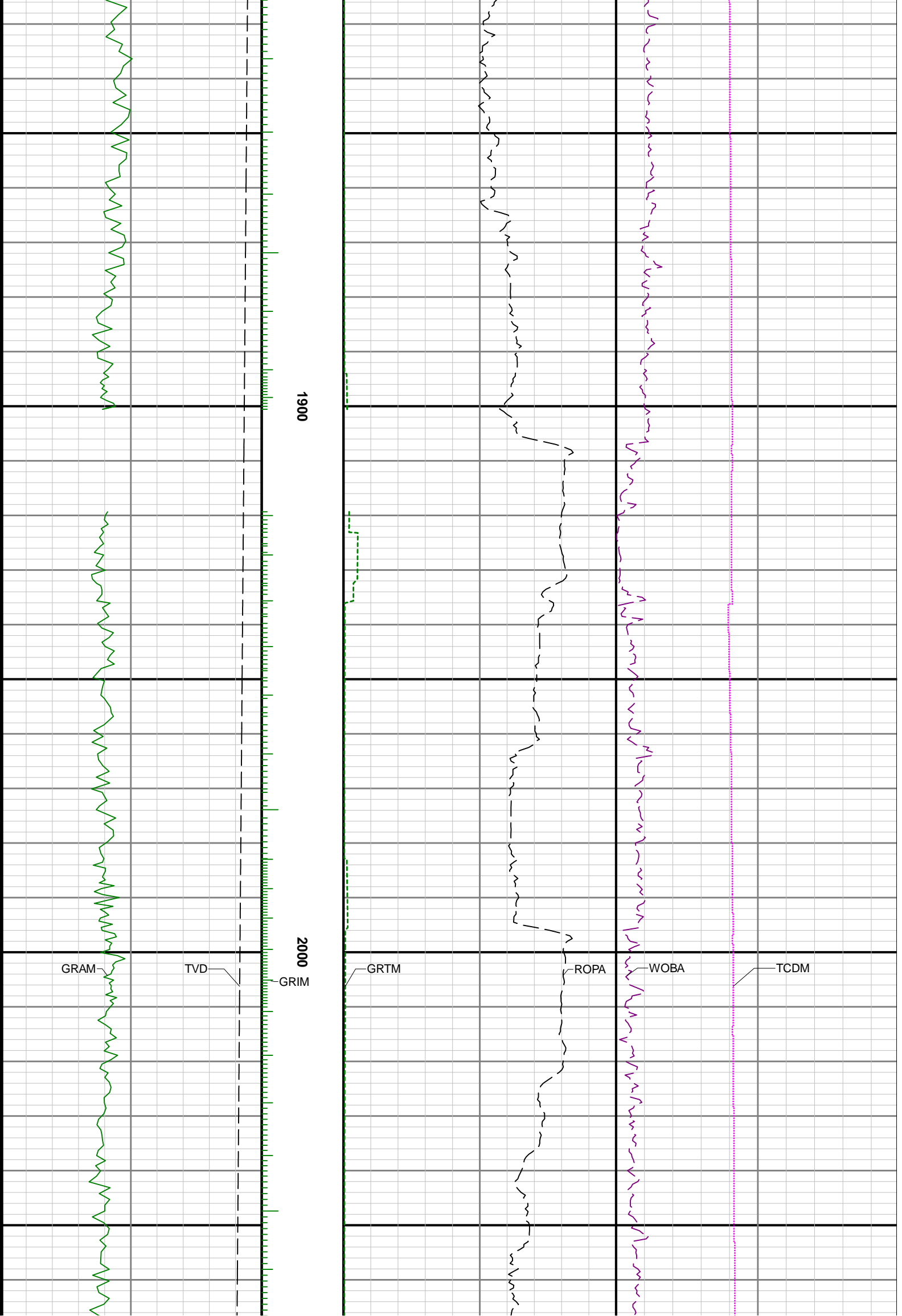
Number	Depth (ft)	Hole Section (in)	Run No.	Remark
1	7088.00	8.500	4	The GRTM isn't present from 7076 to 7180 feet MD (6443 feet TVD) due to no logging data being acquired for 25 hours due to trip out of hole for a new motor and then for a new ATC.
2	16462.00	8.500	4	The interval from 16449 to 16462 feet MD (6418 feet TVD) was not logged due to sensor to bit offset at well TD.

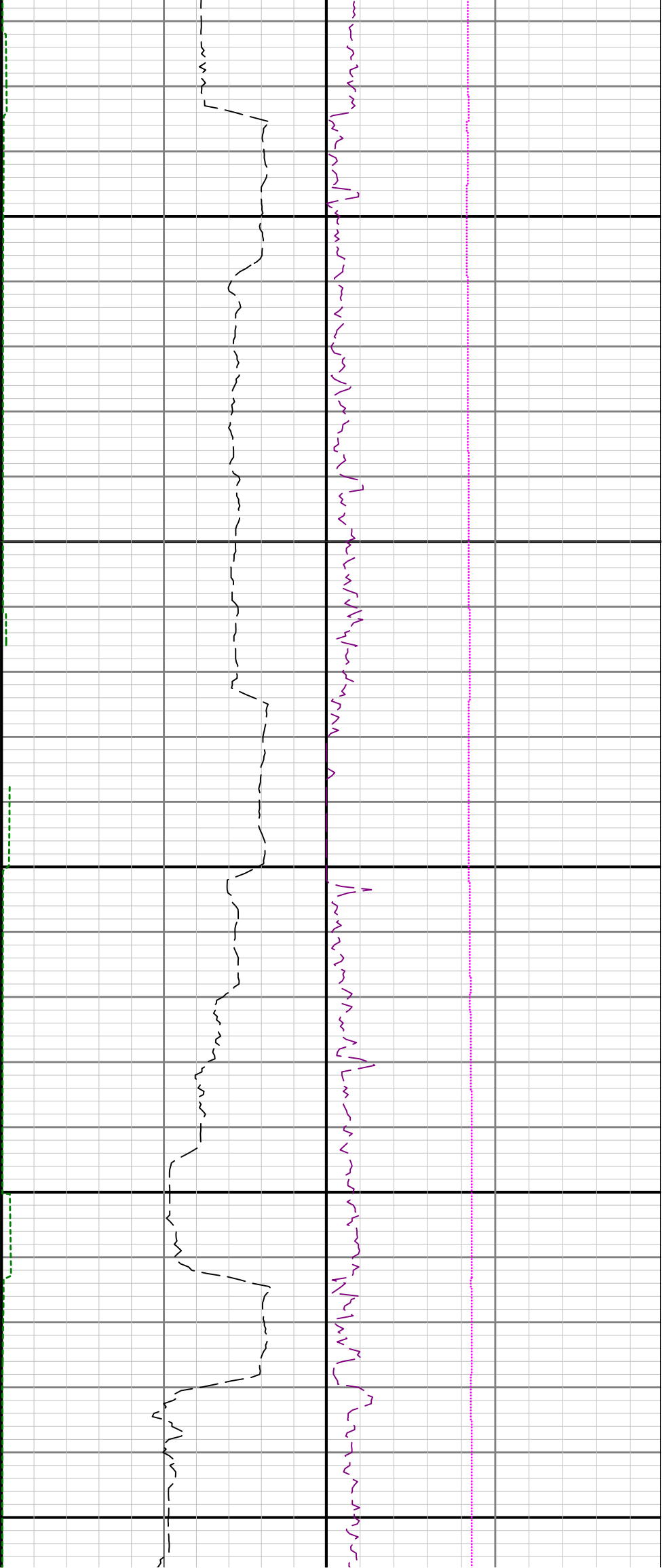
### Curve Mnemonics

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 - 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





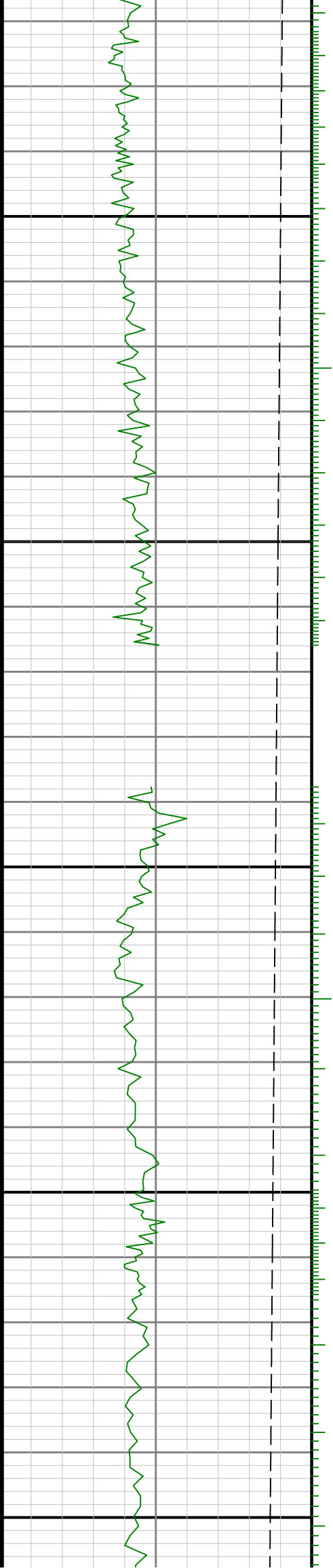


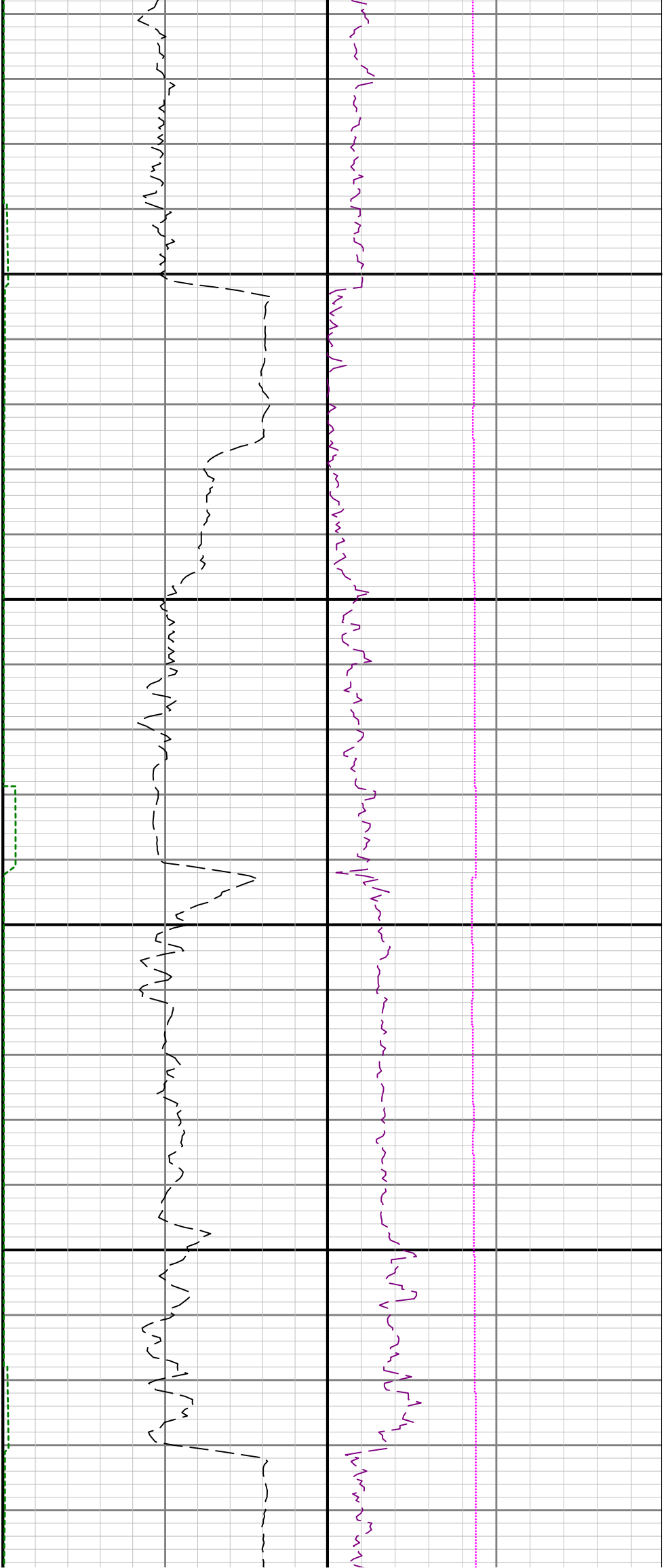


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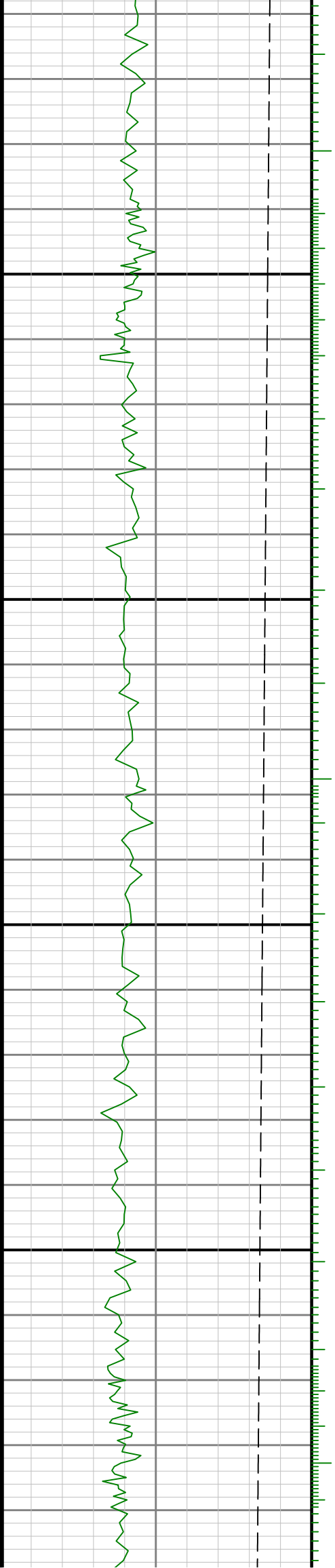
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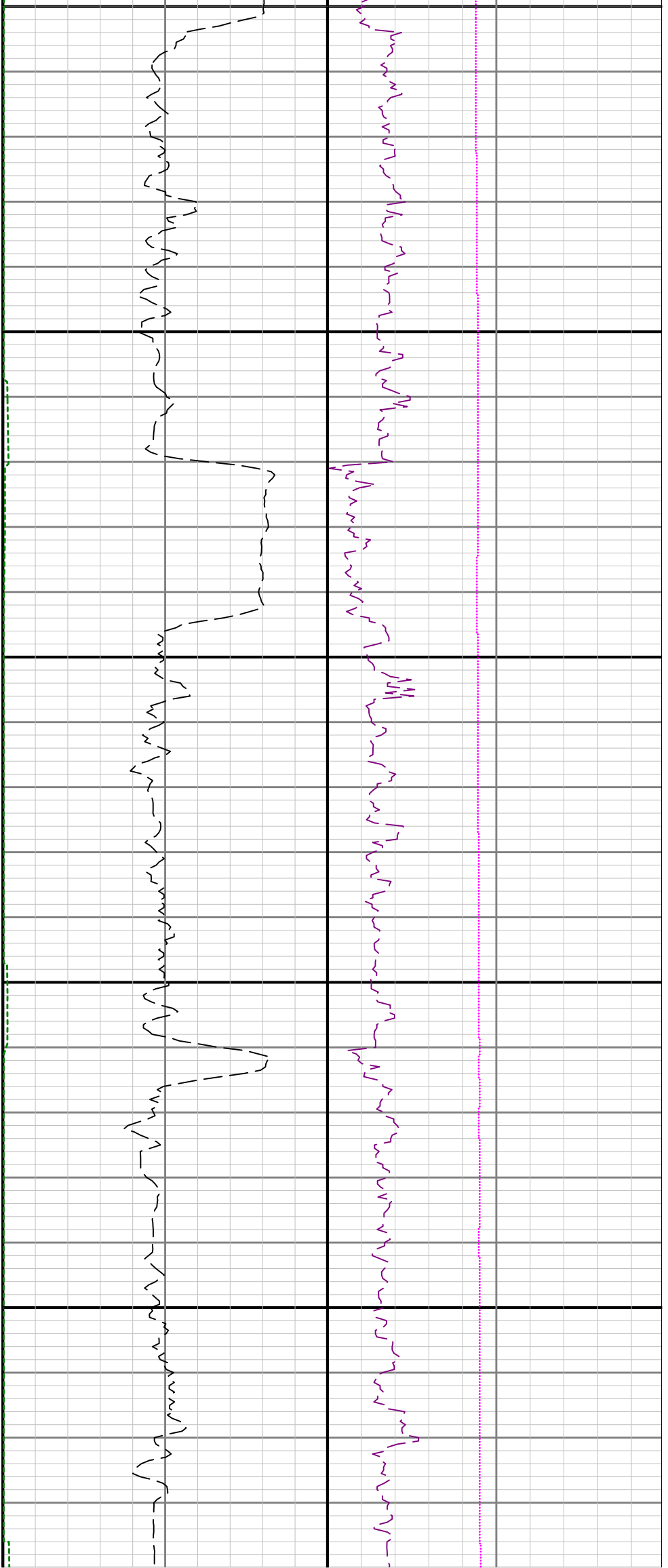




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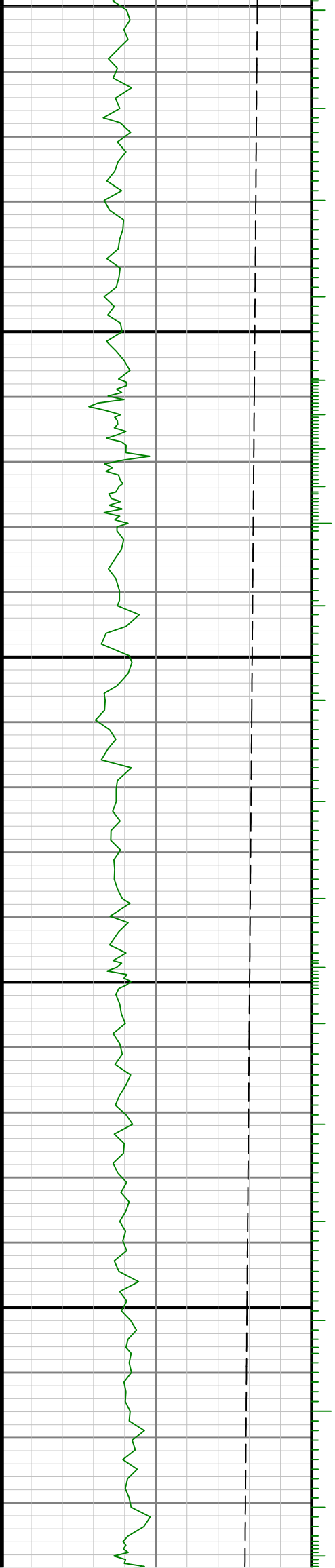
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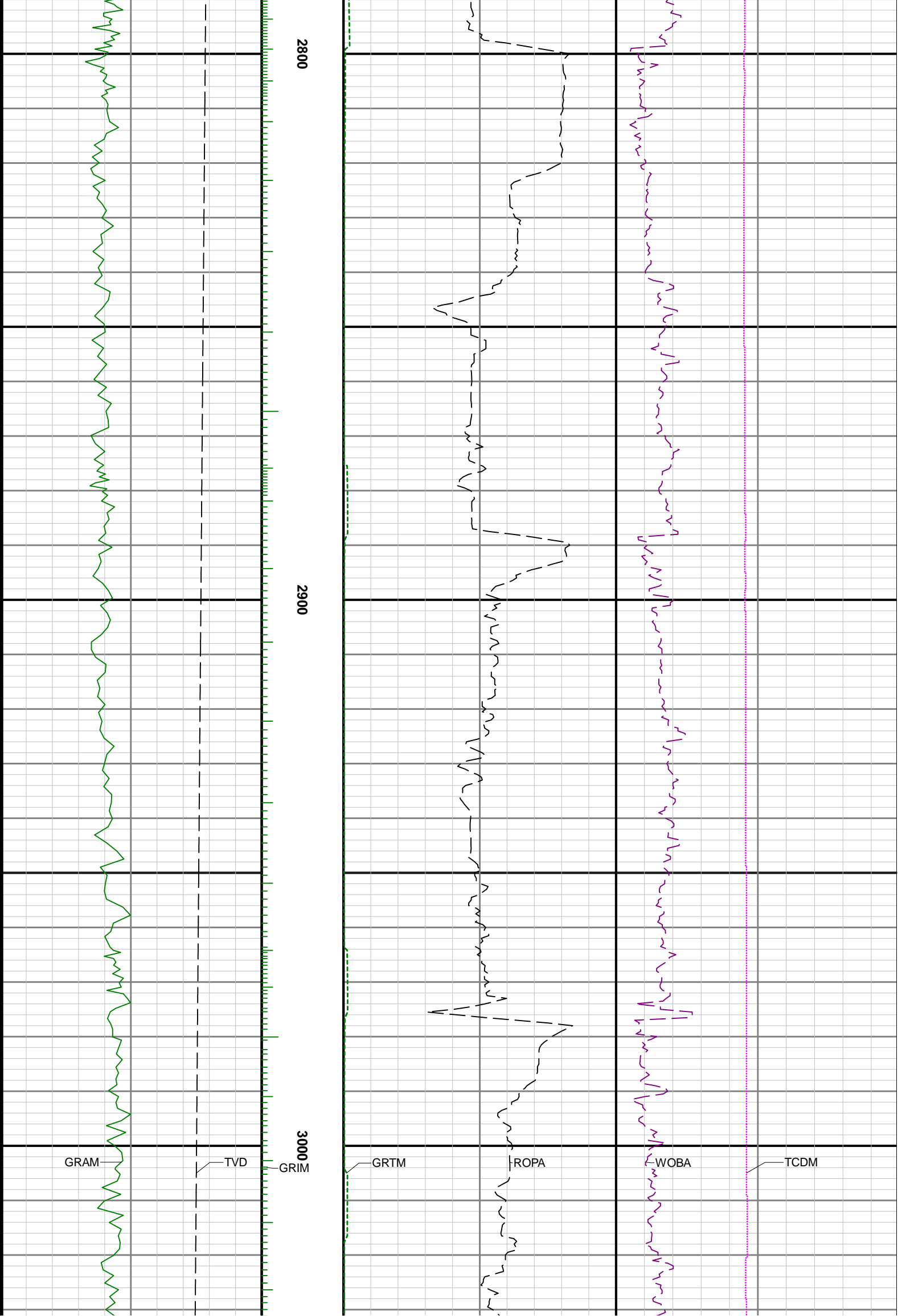




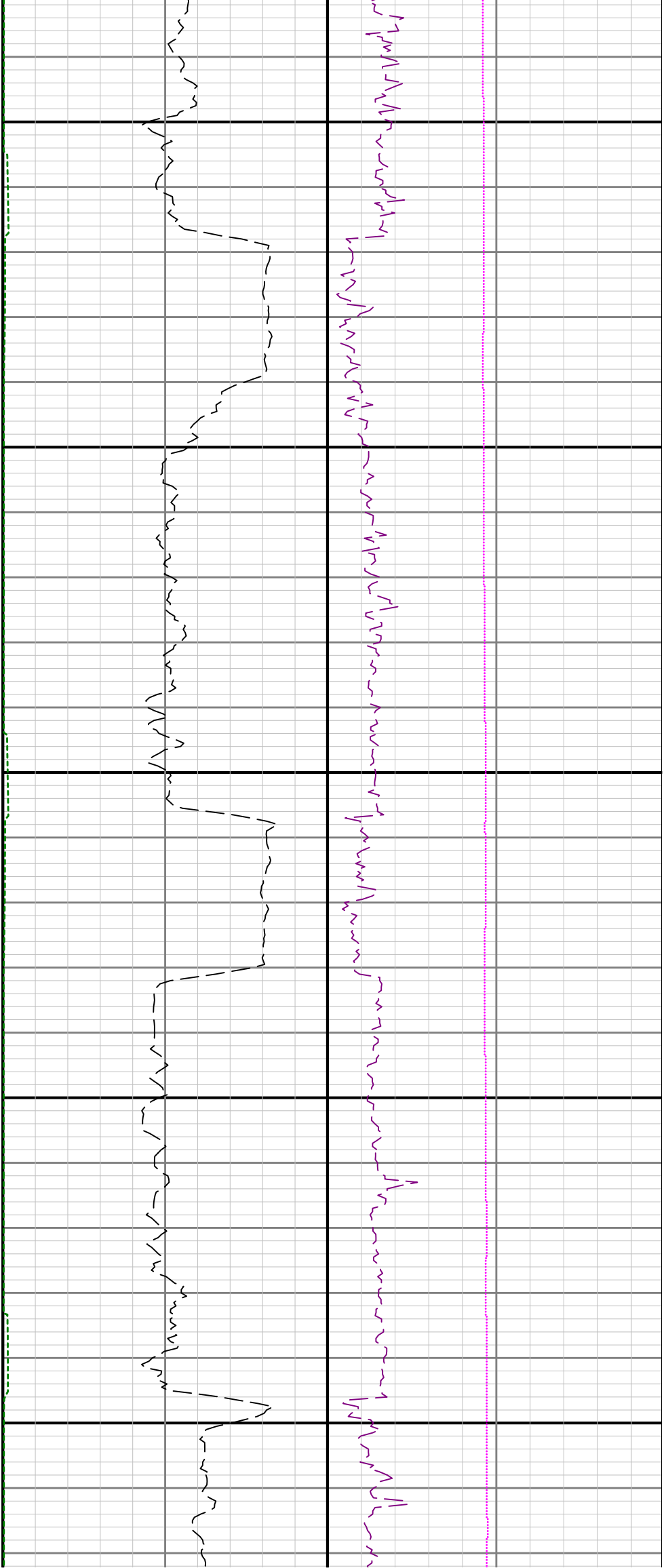
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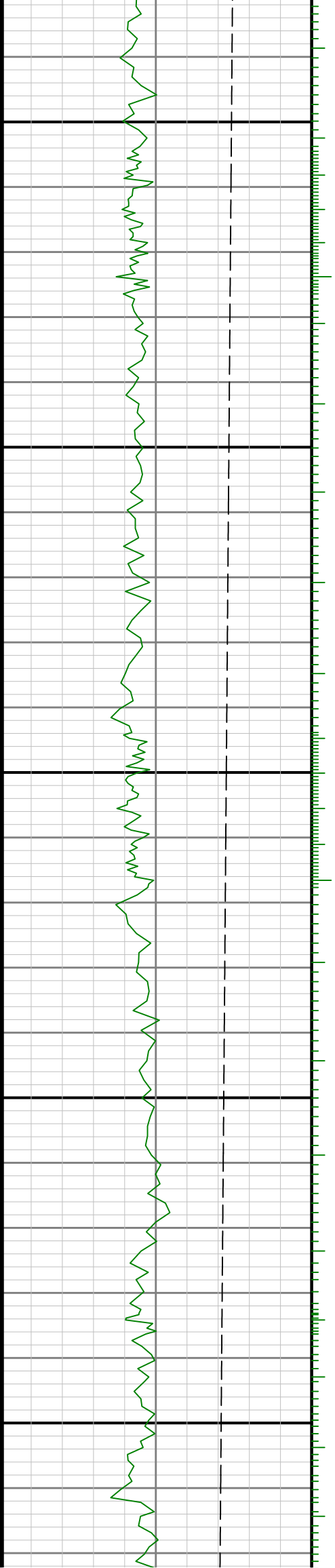






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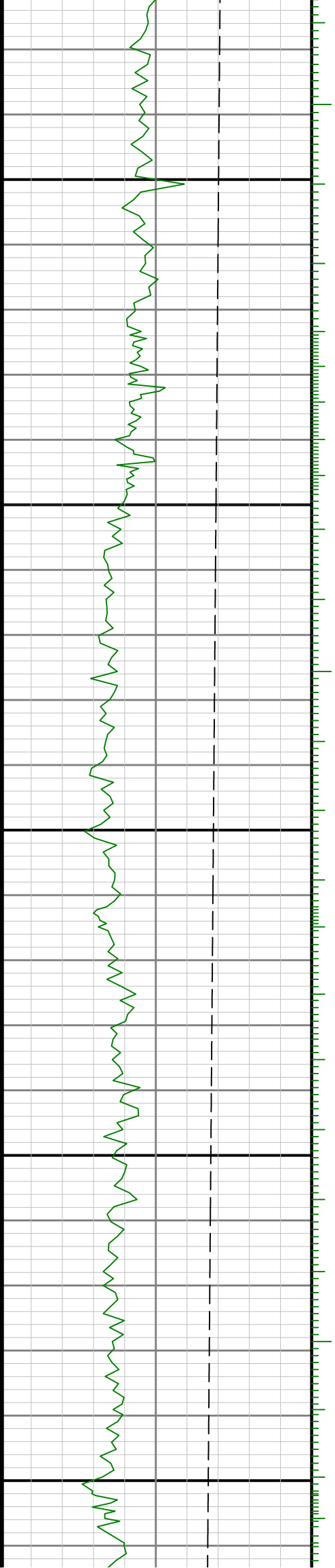




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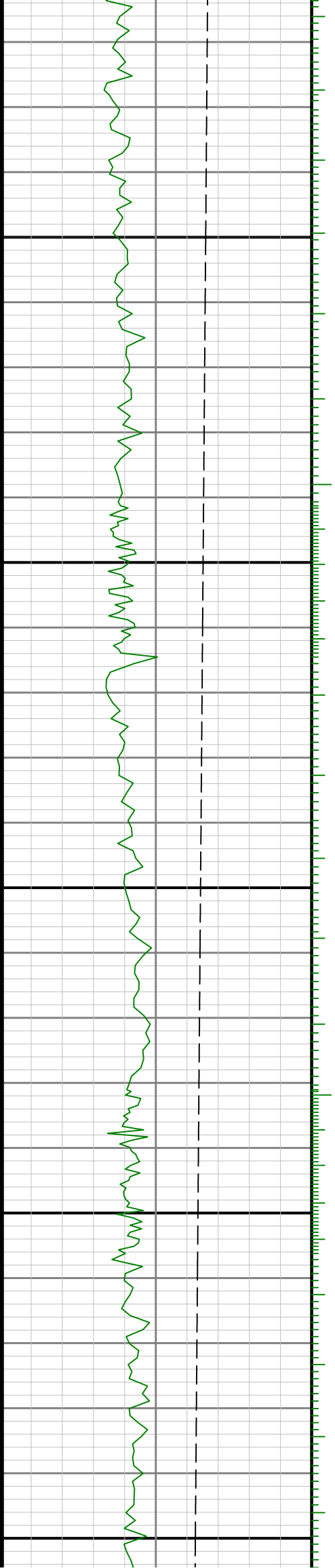
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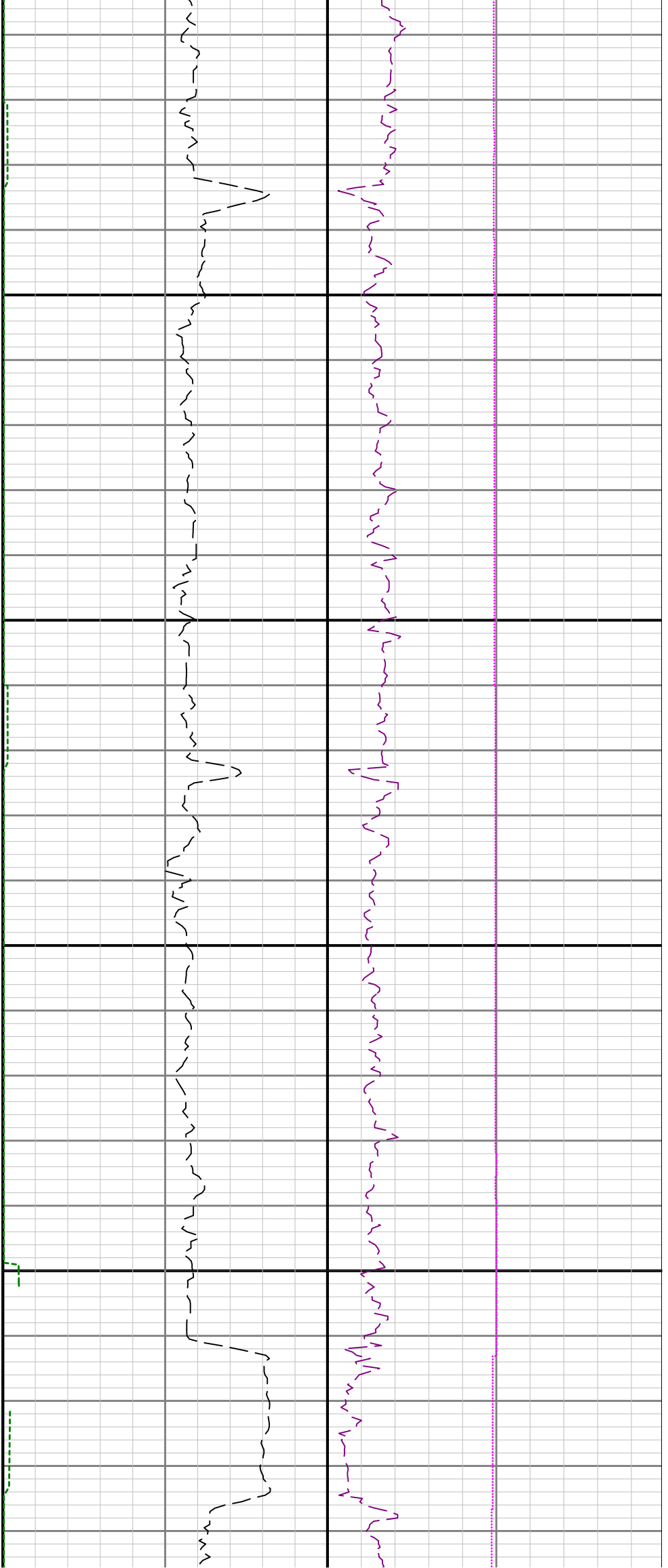




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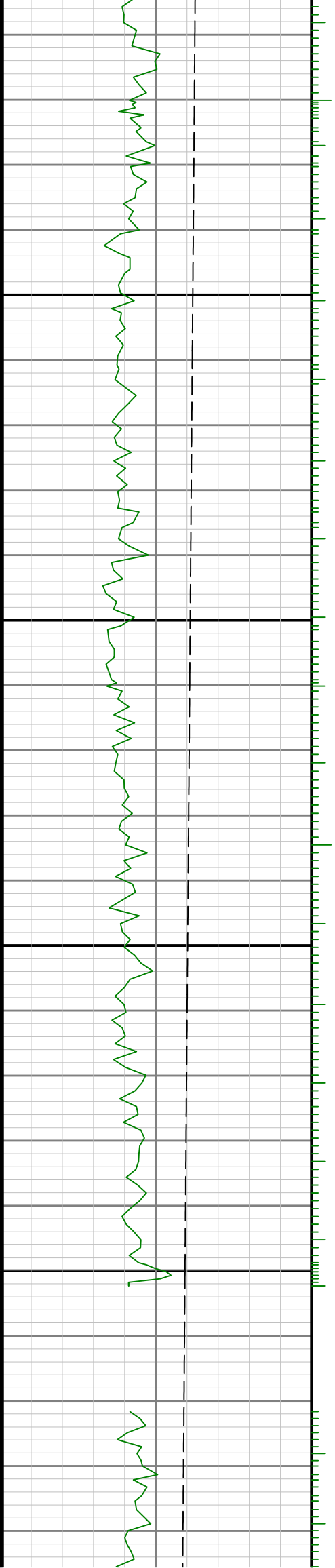
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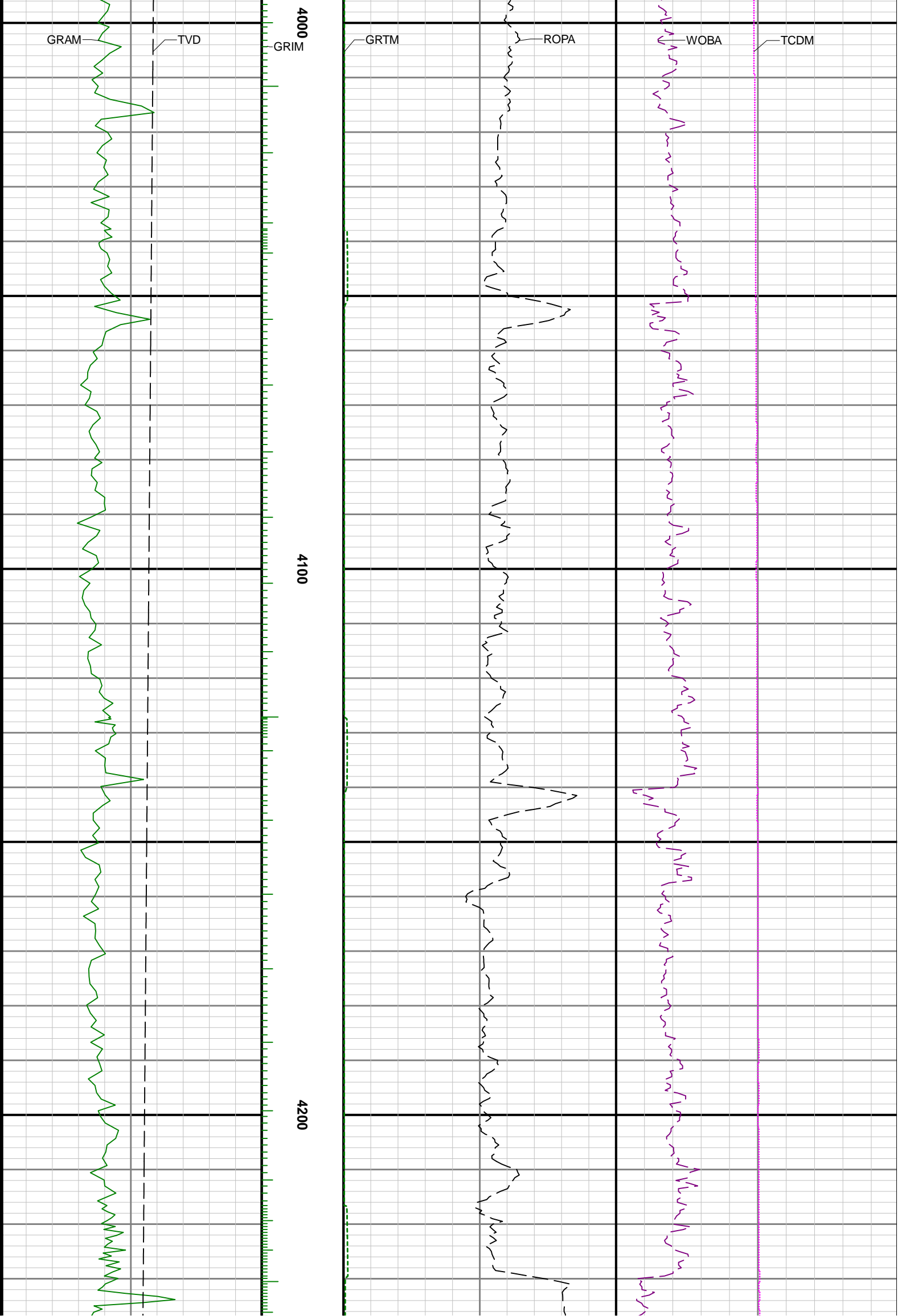


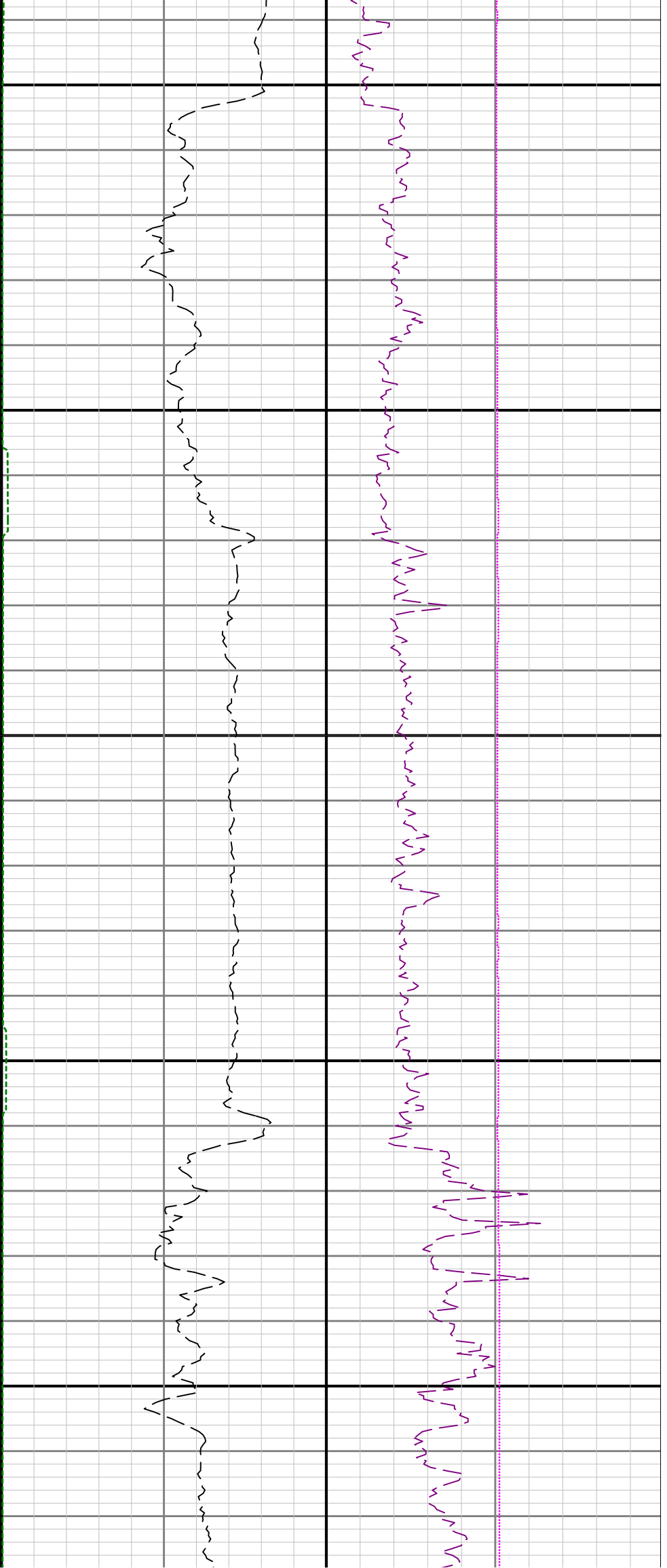


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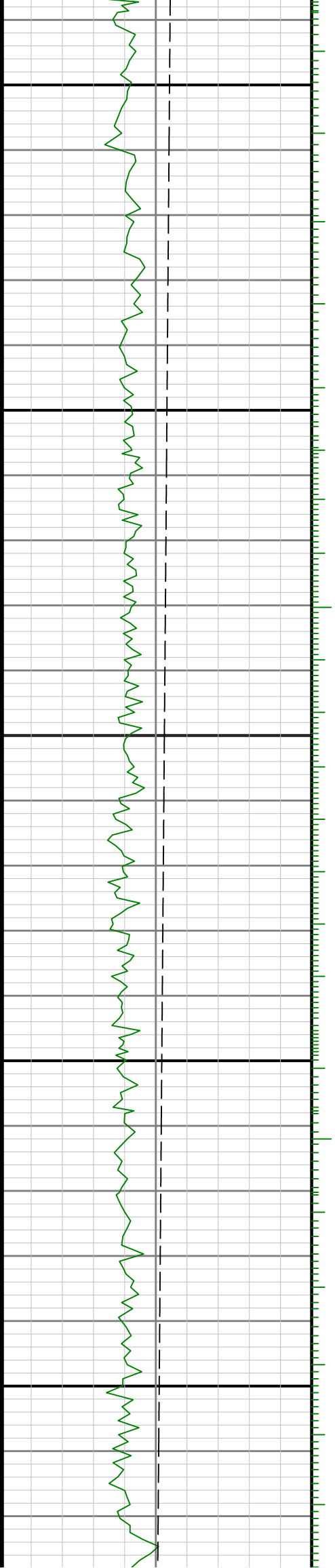


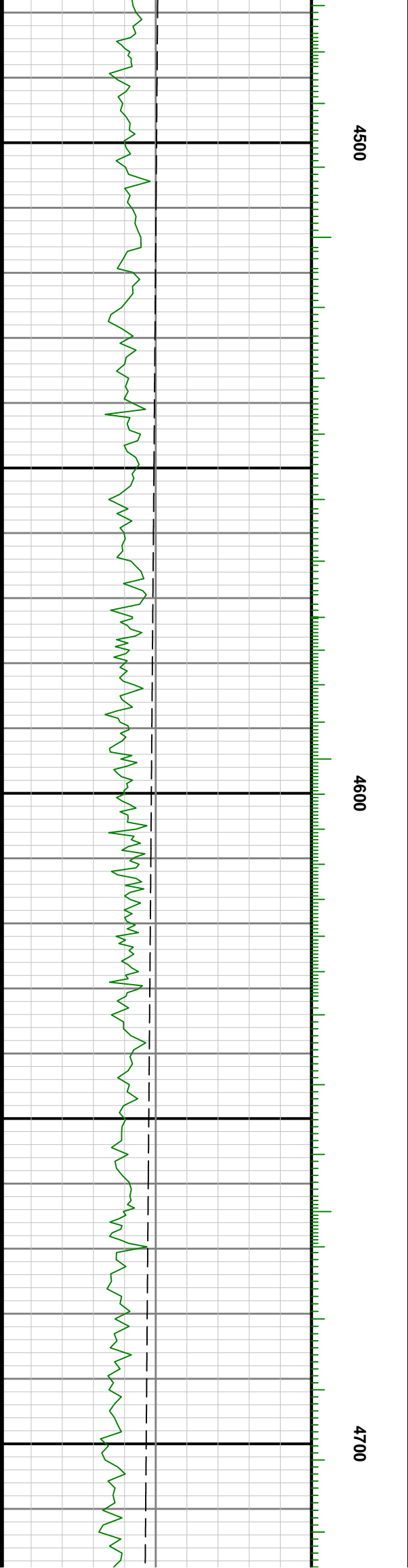
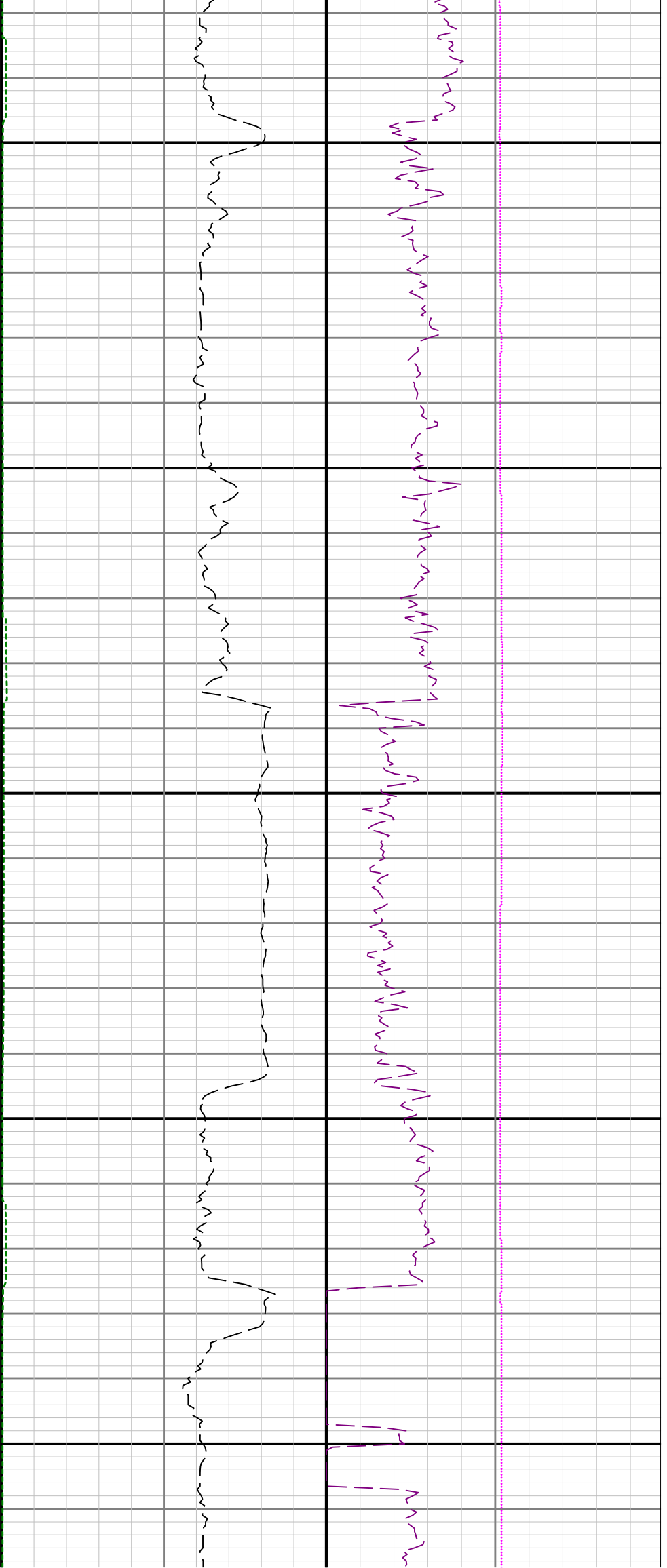


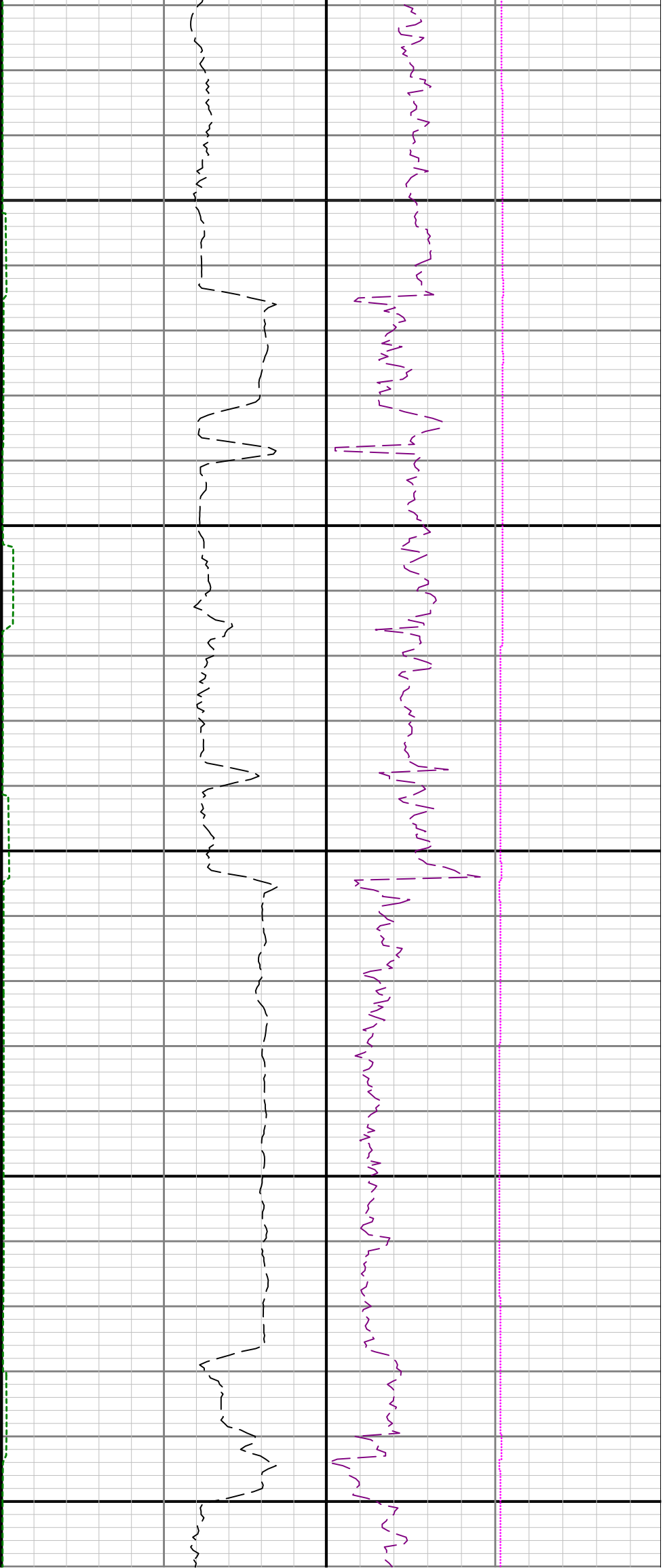


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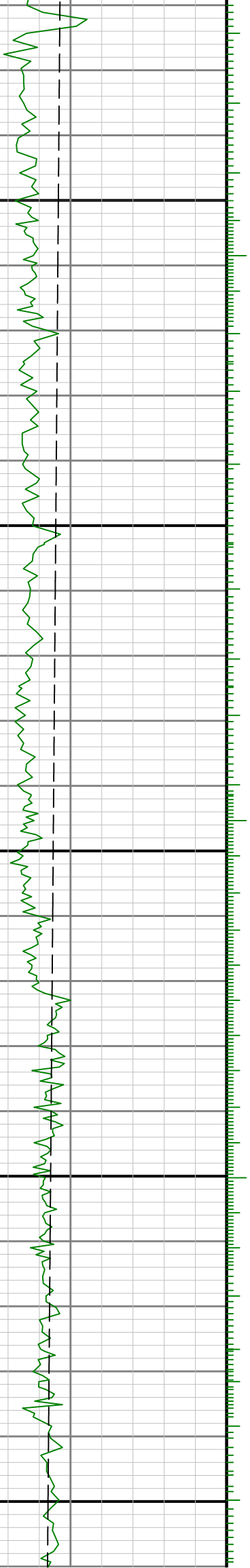




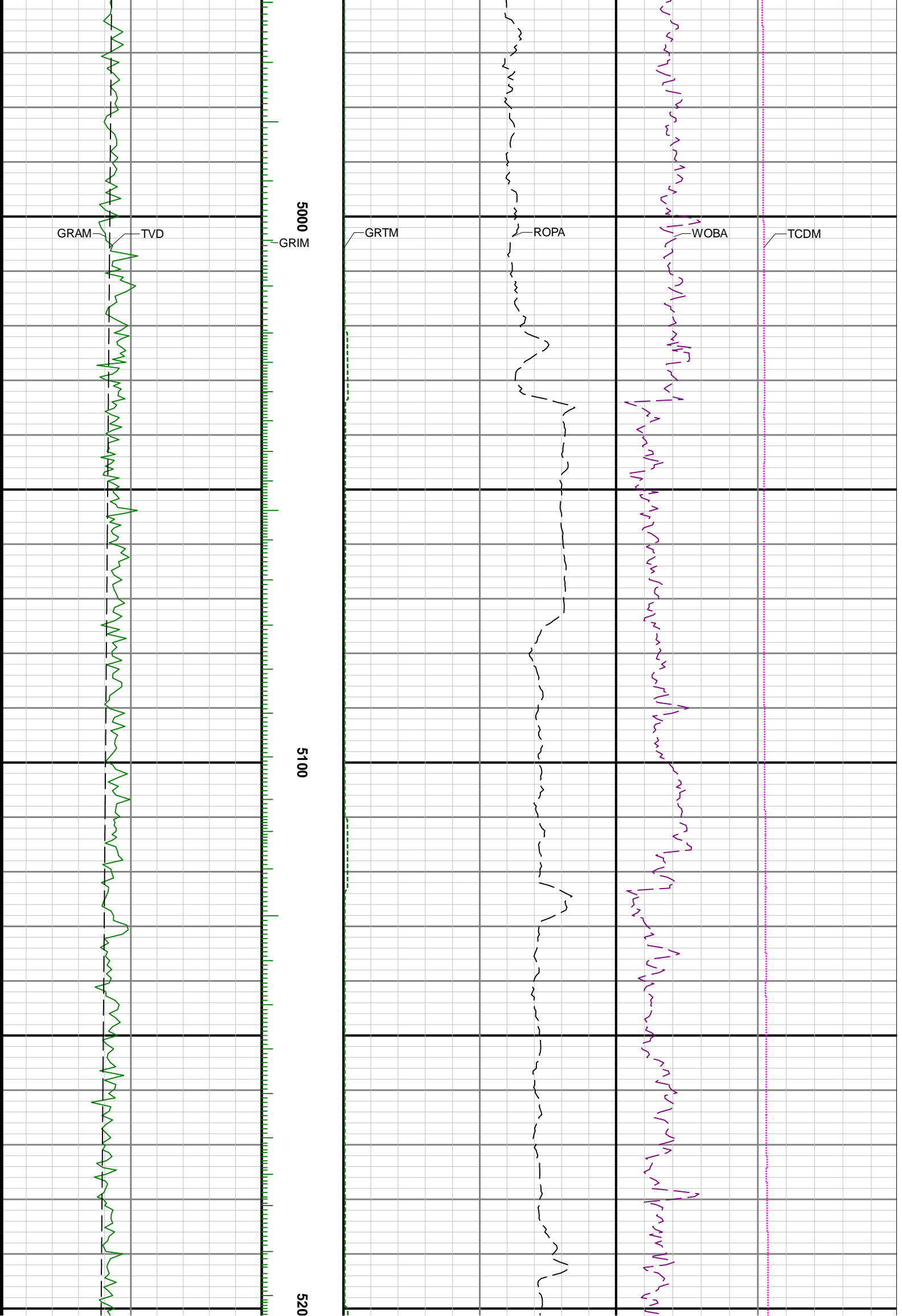


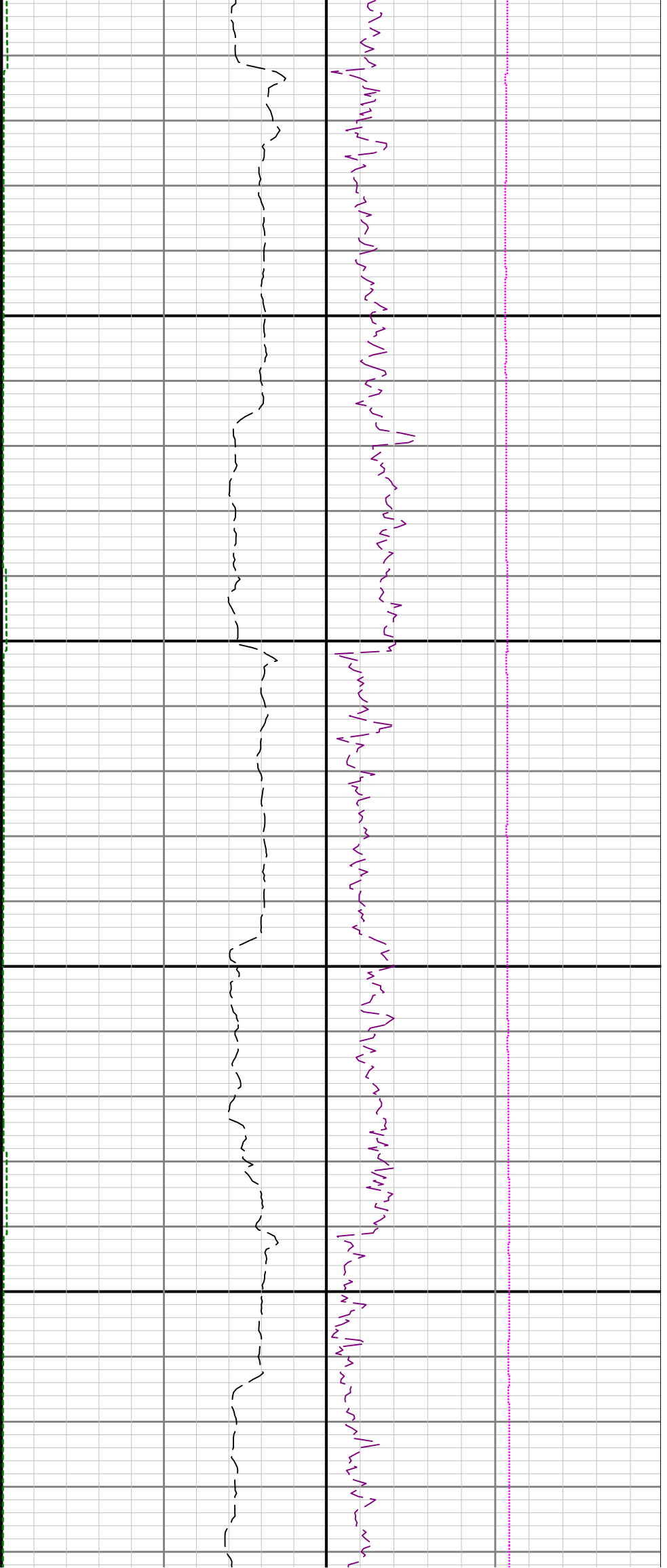
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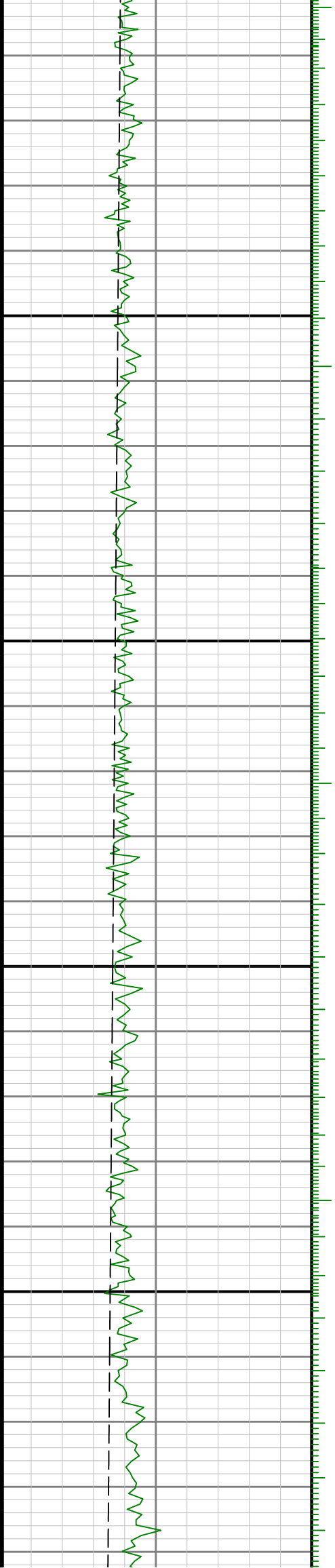


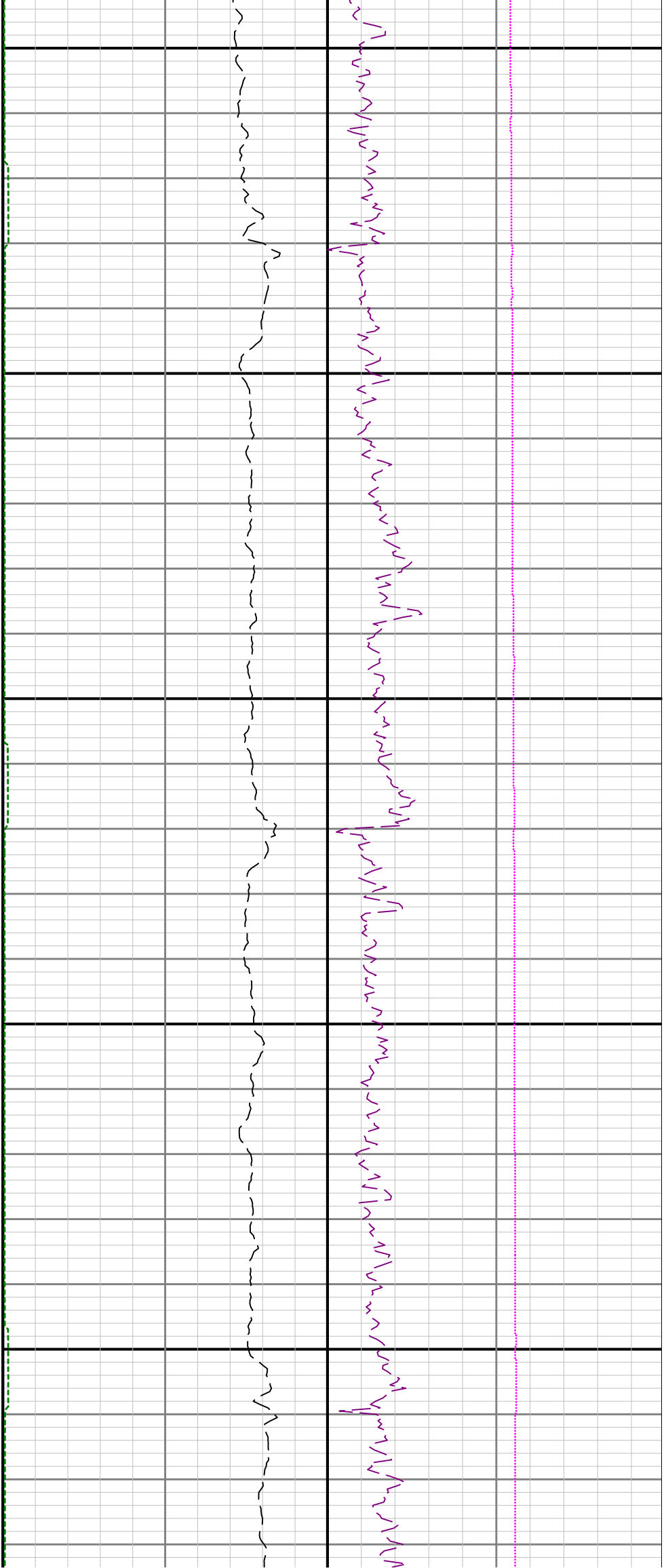




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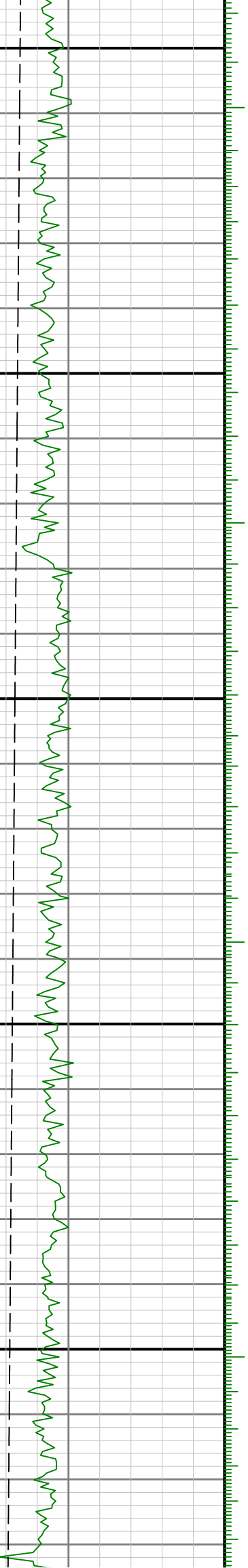
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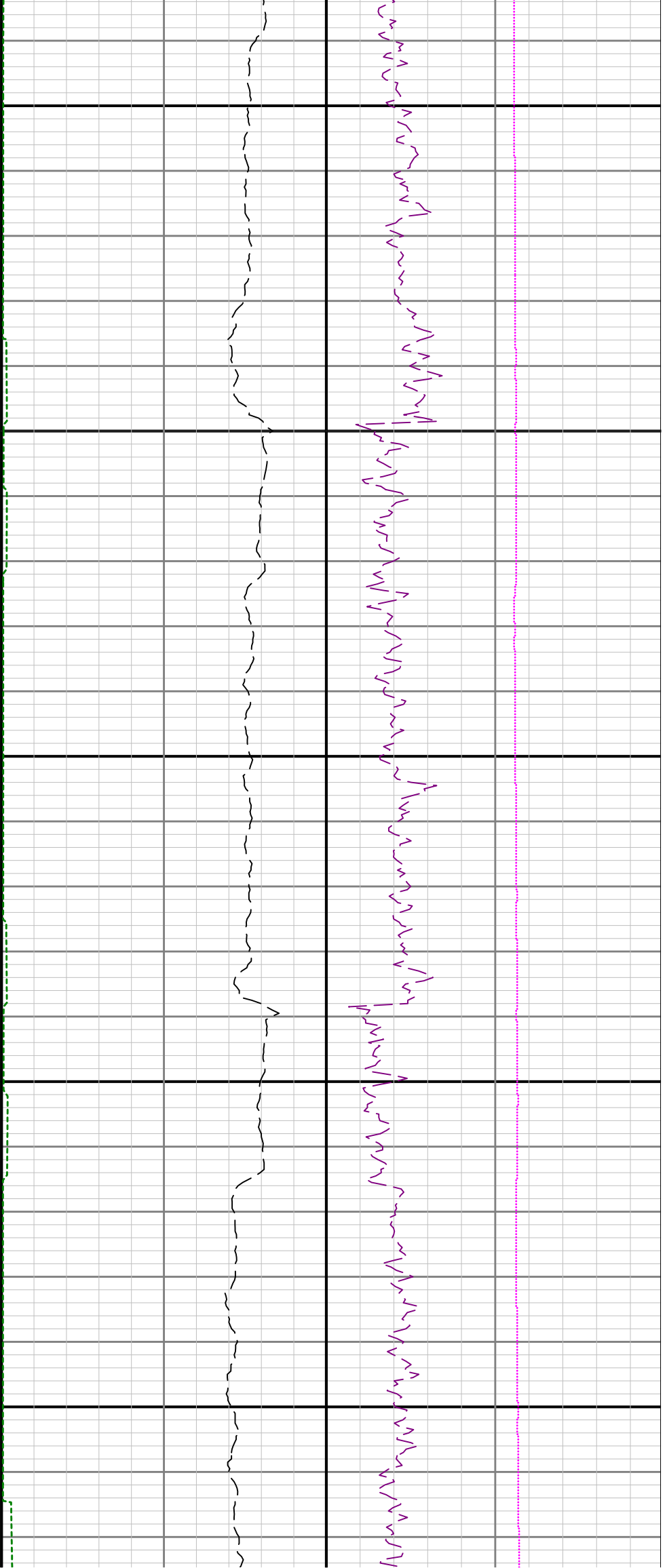




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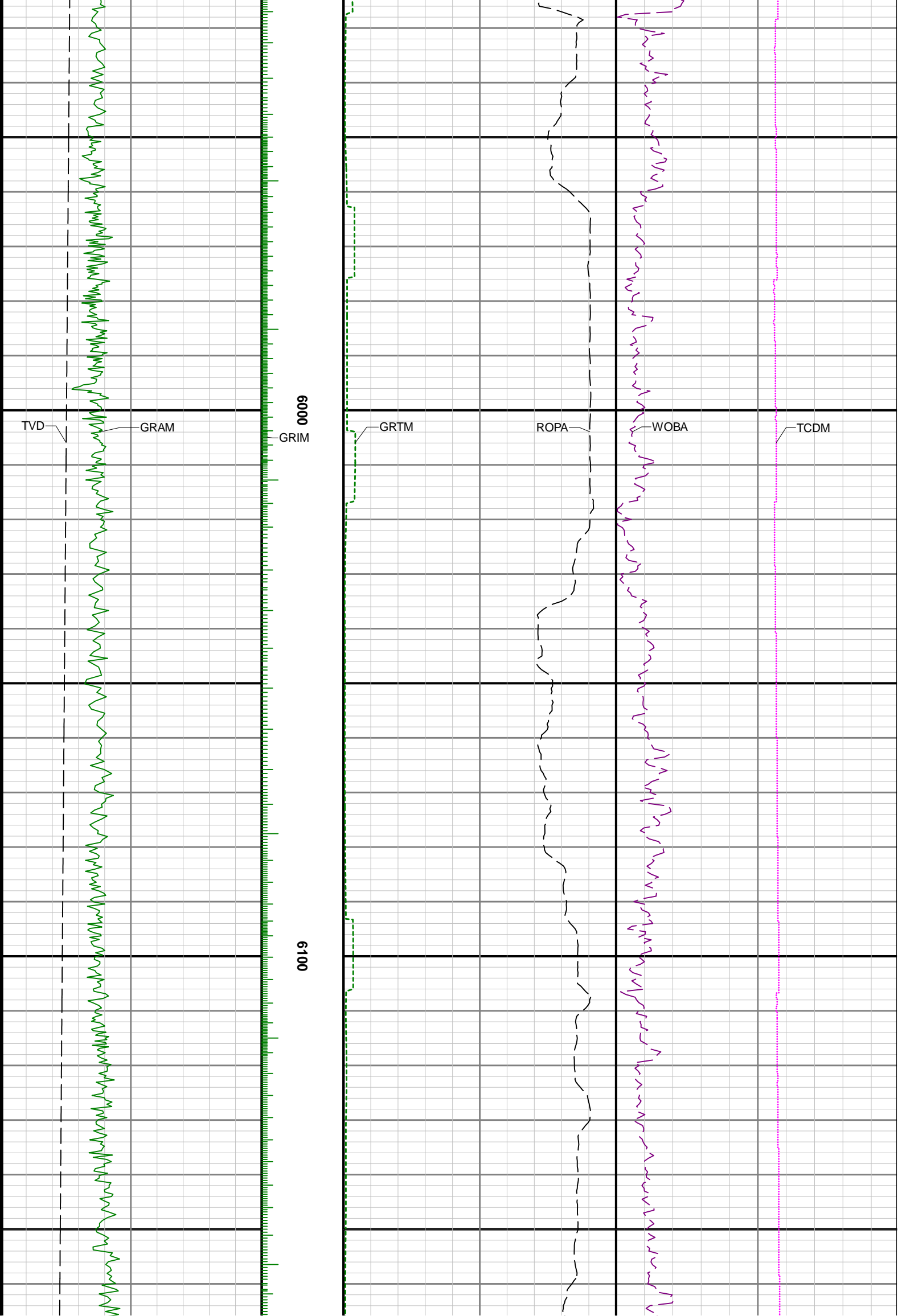




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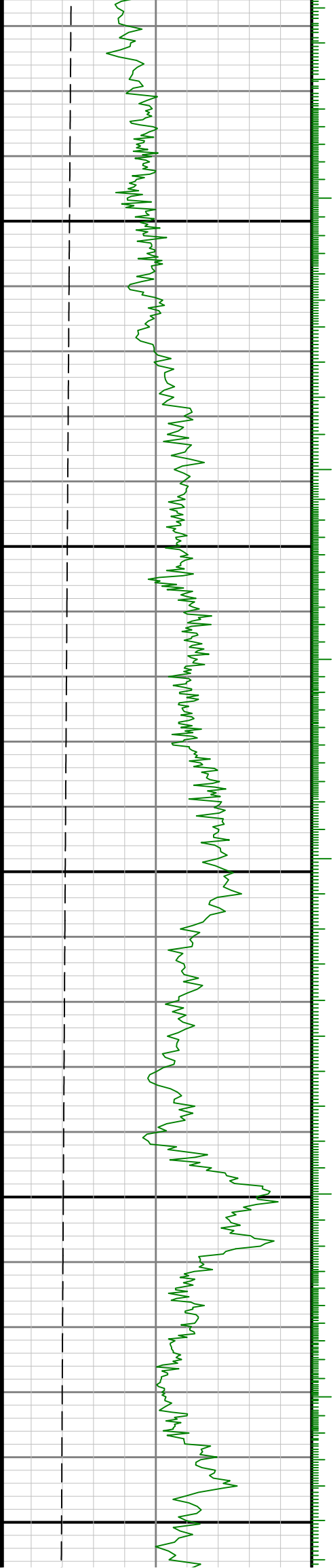


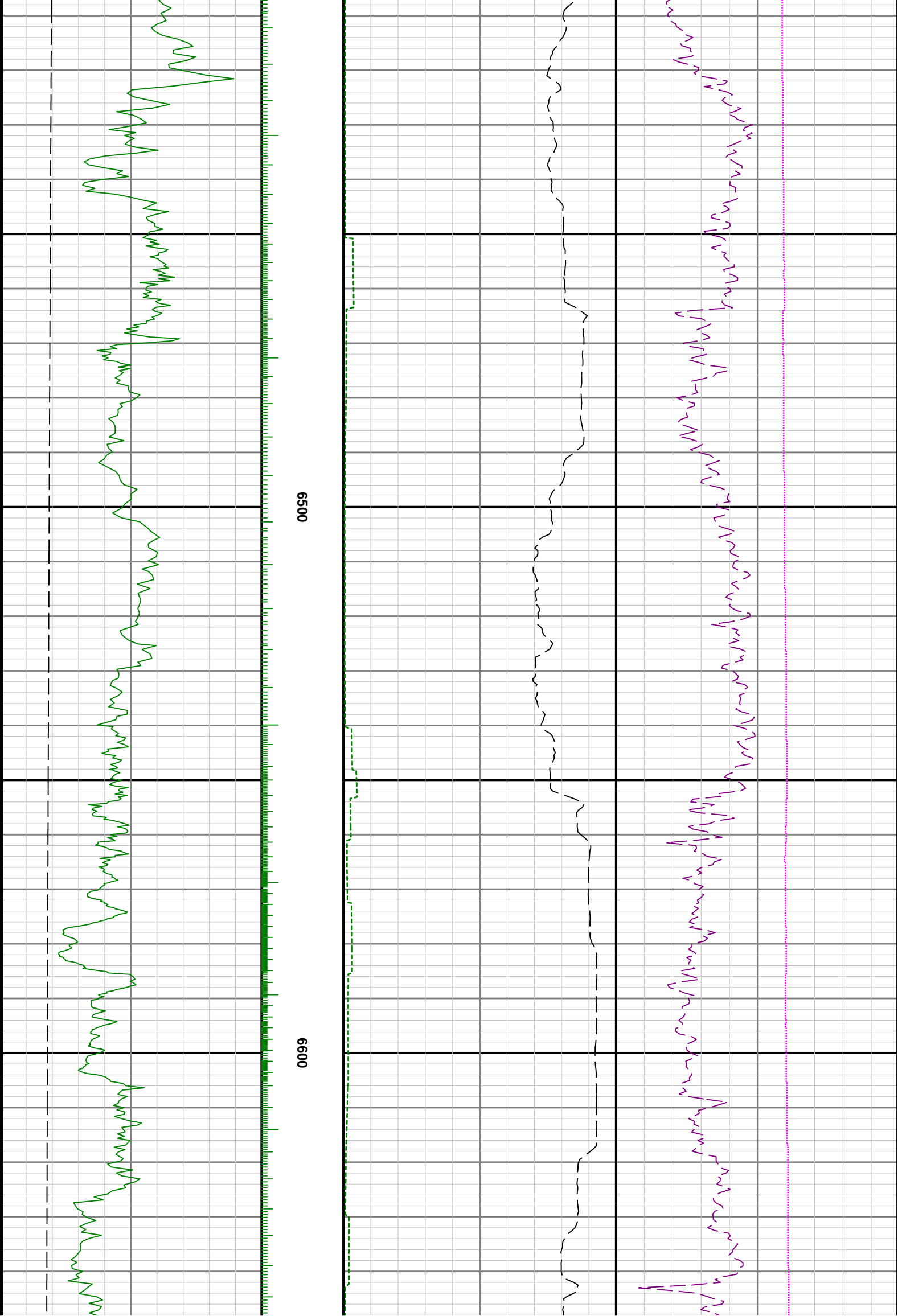


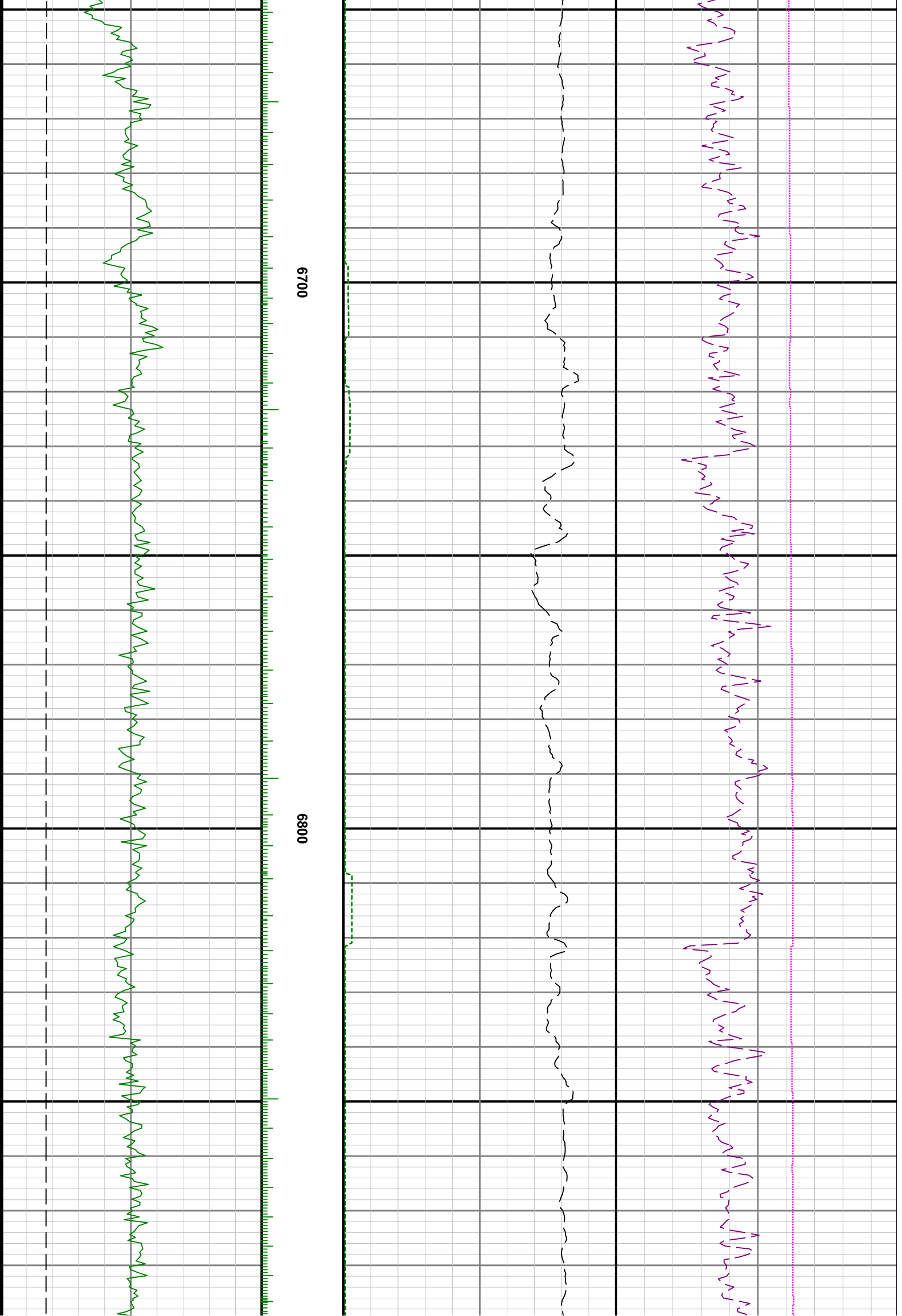
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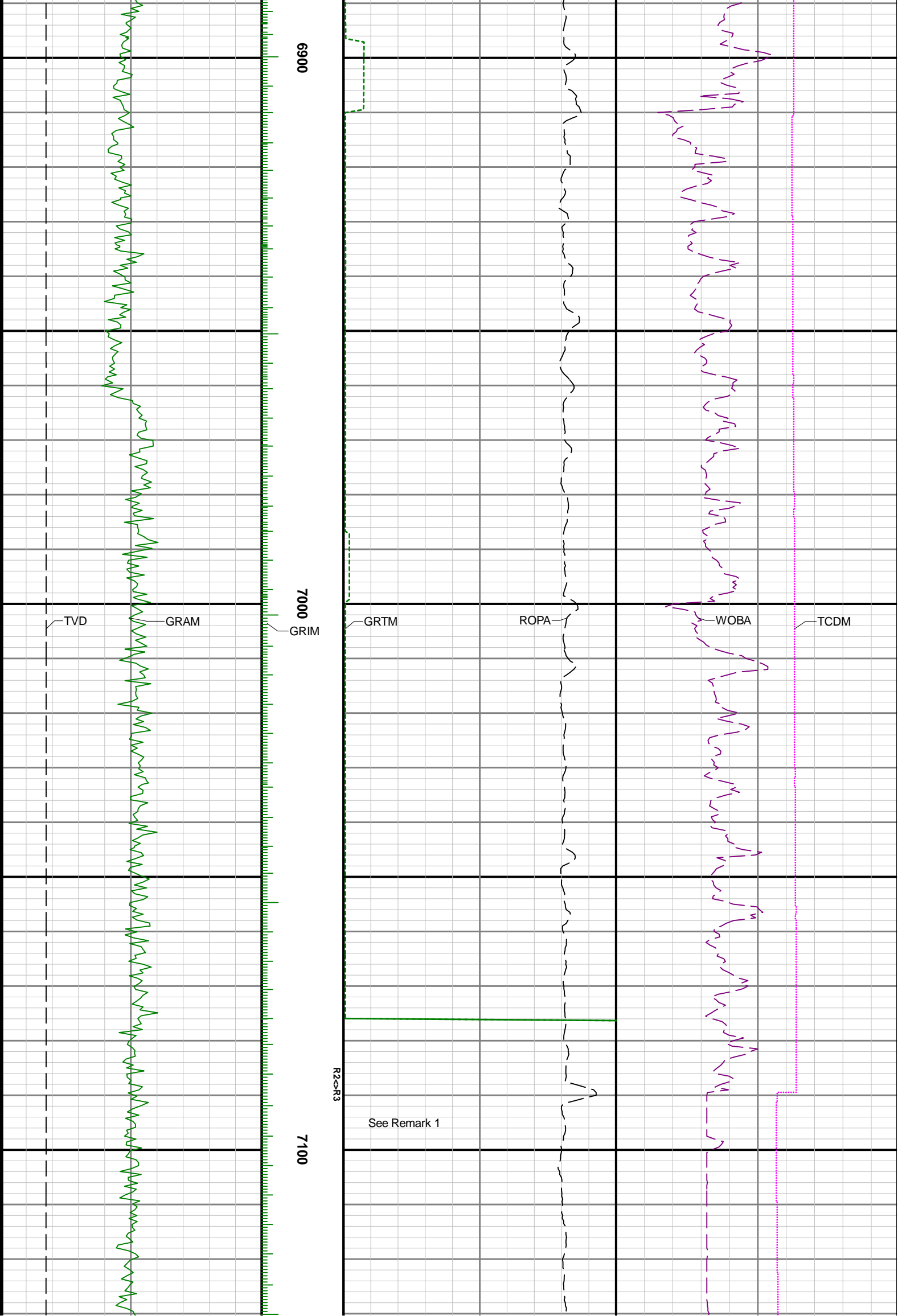
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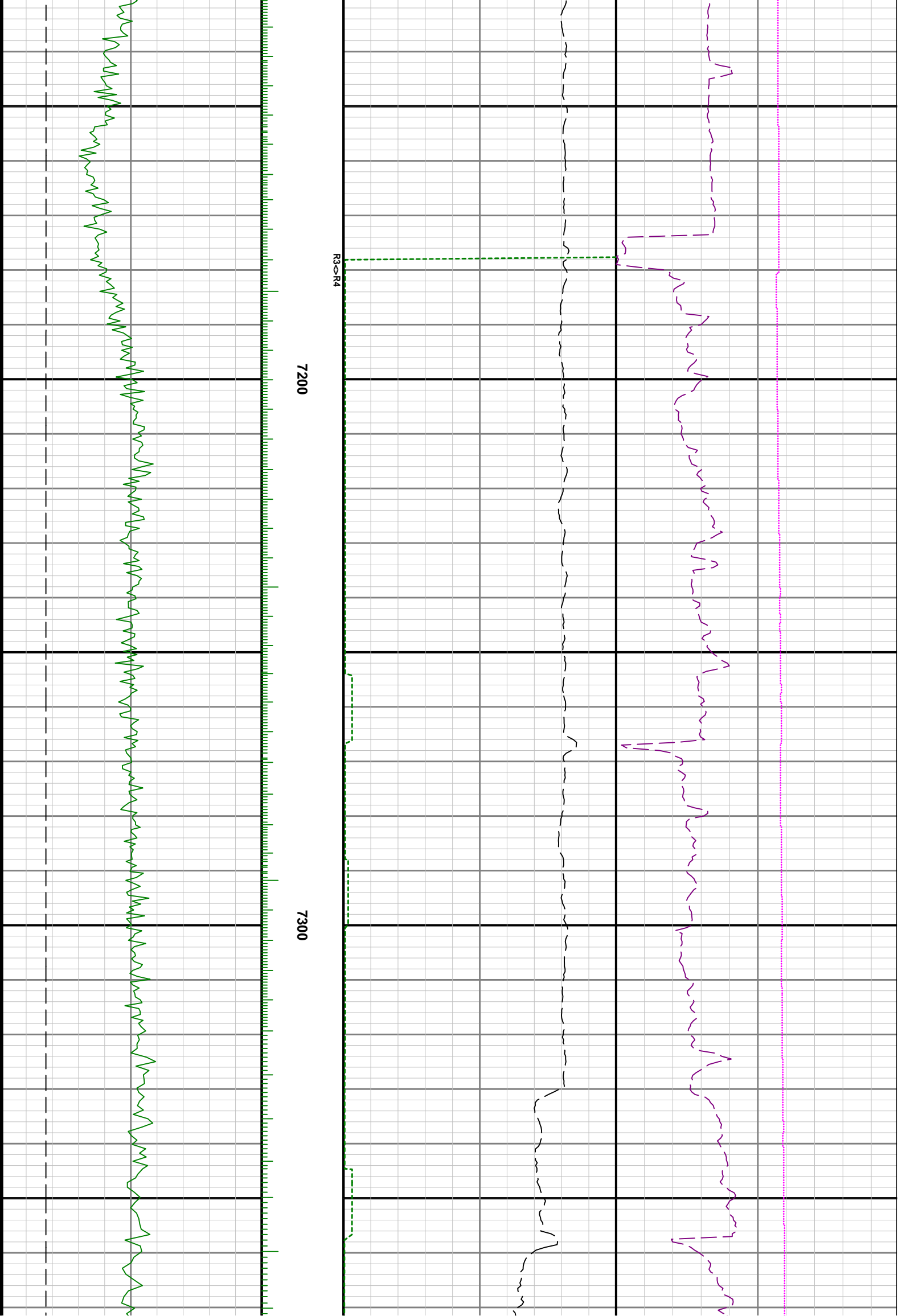


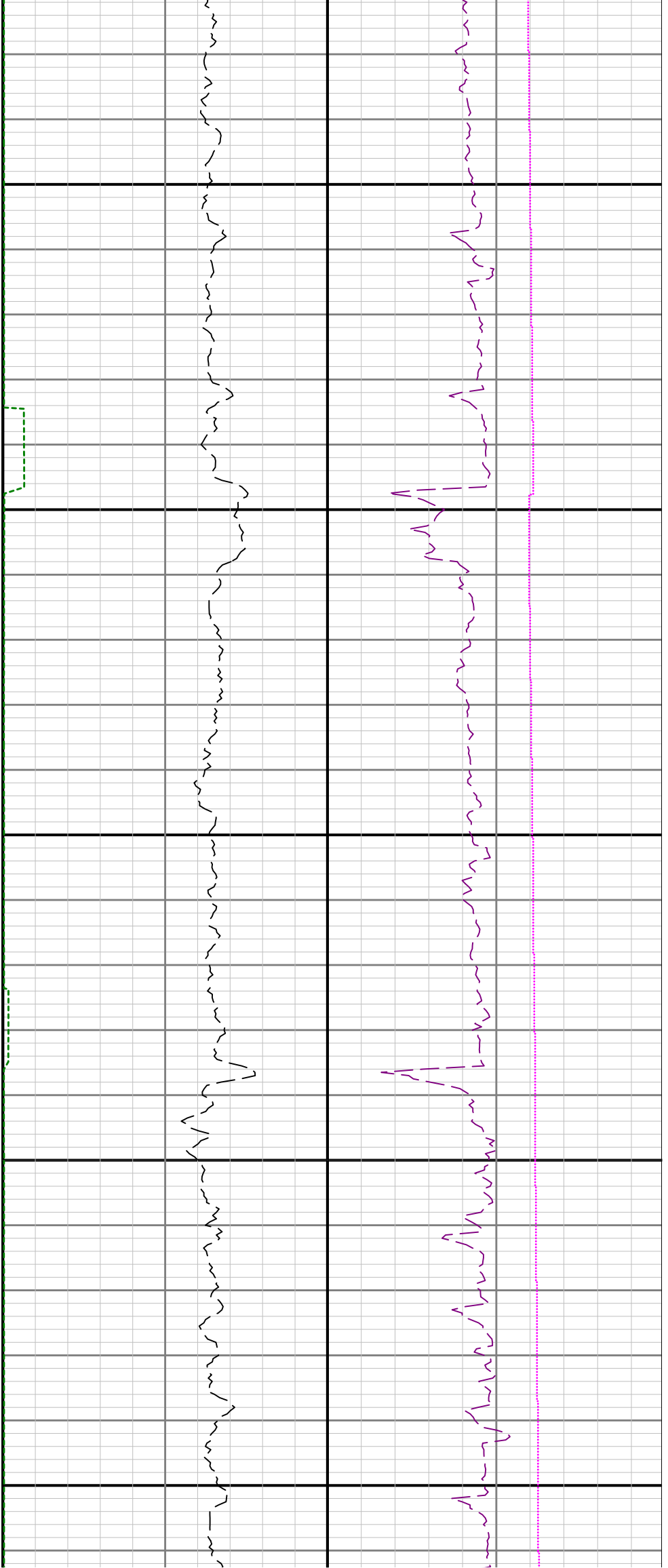








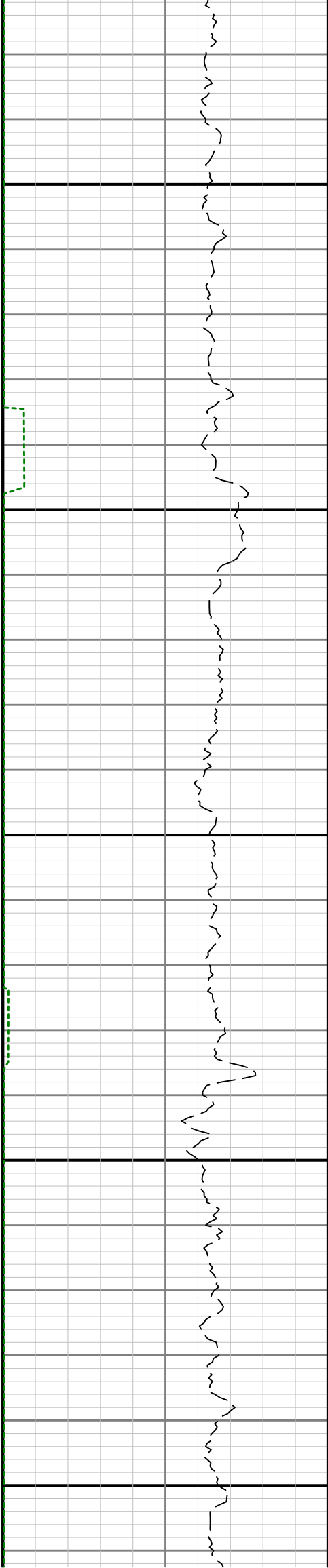


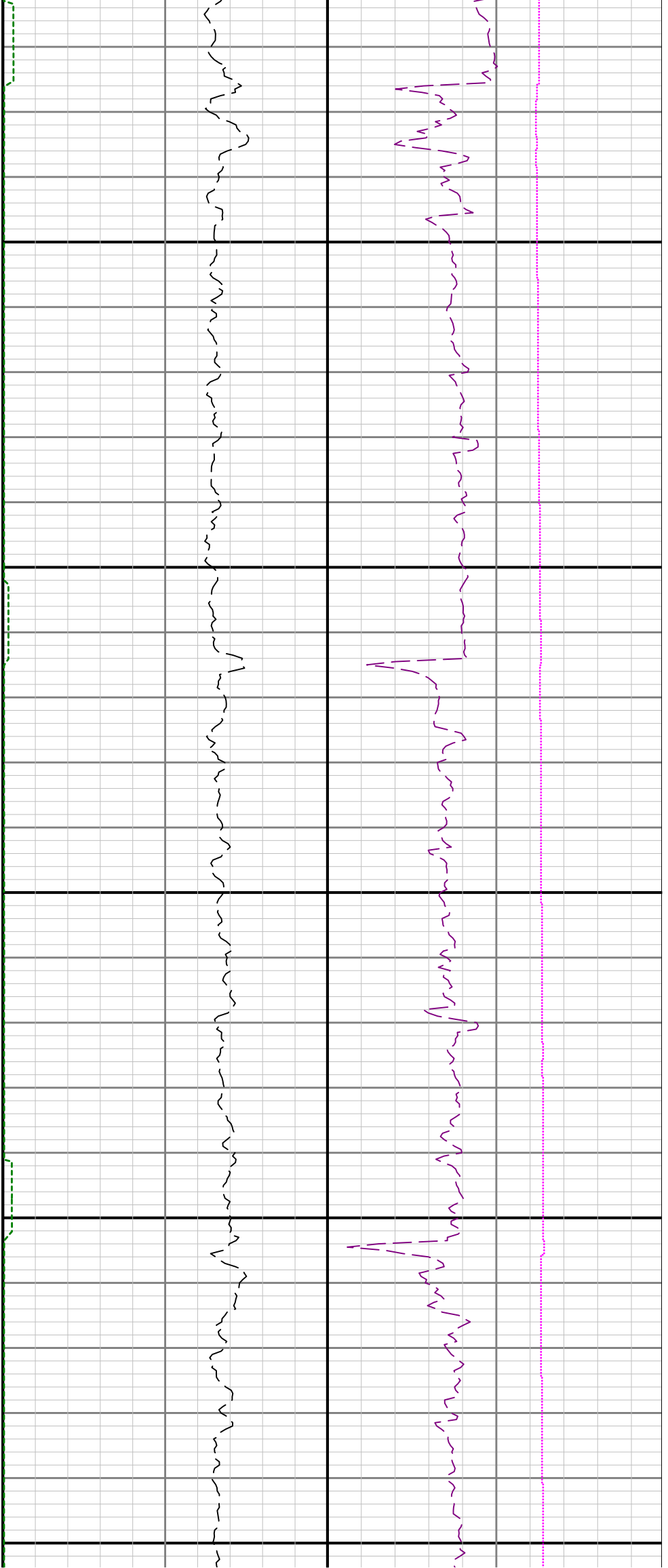


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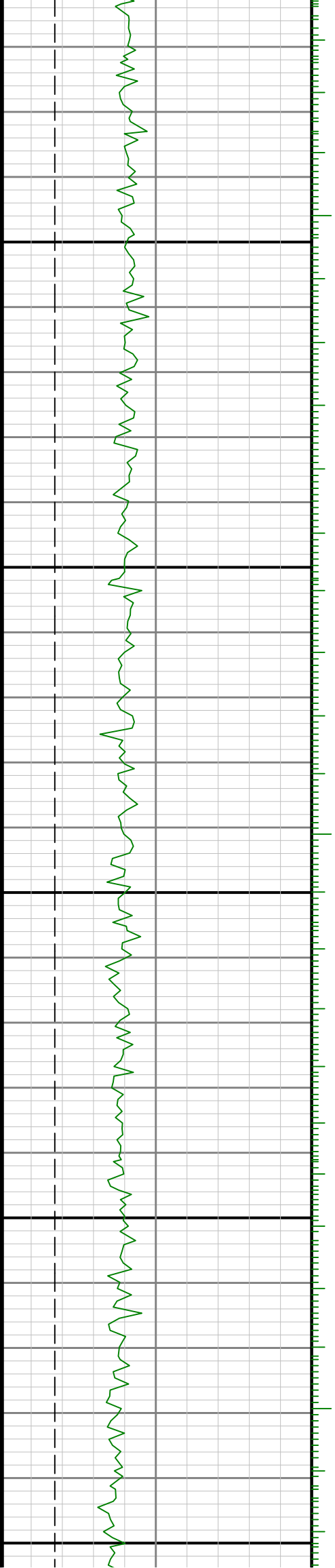
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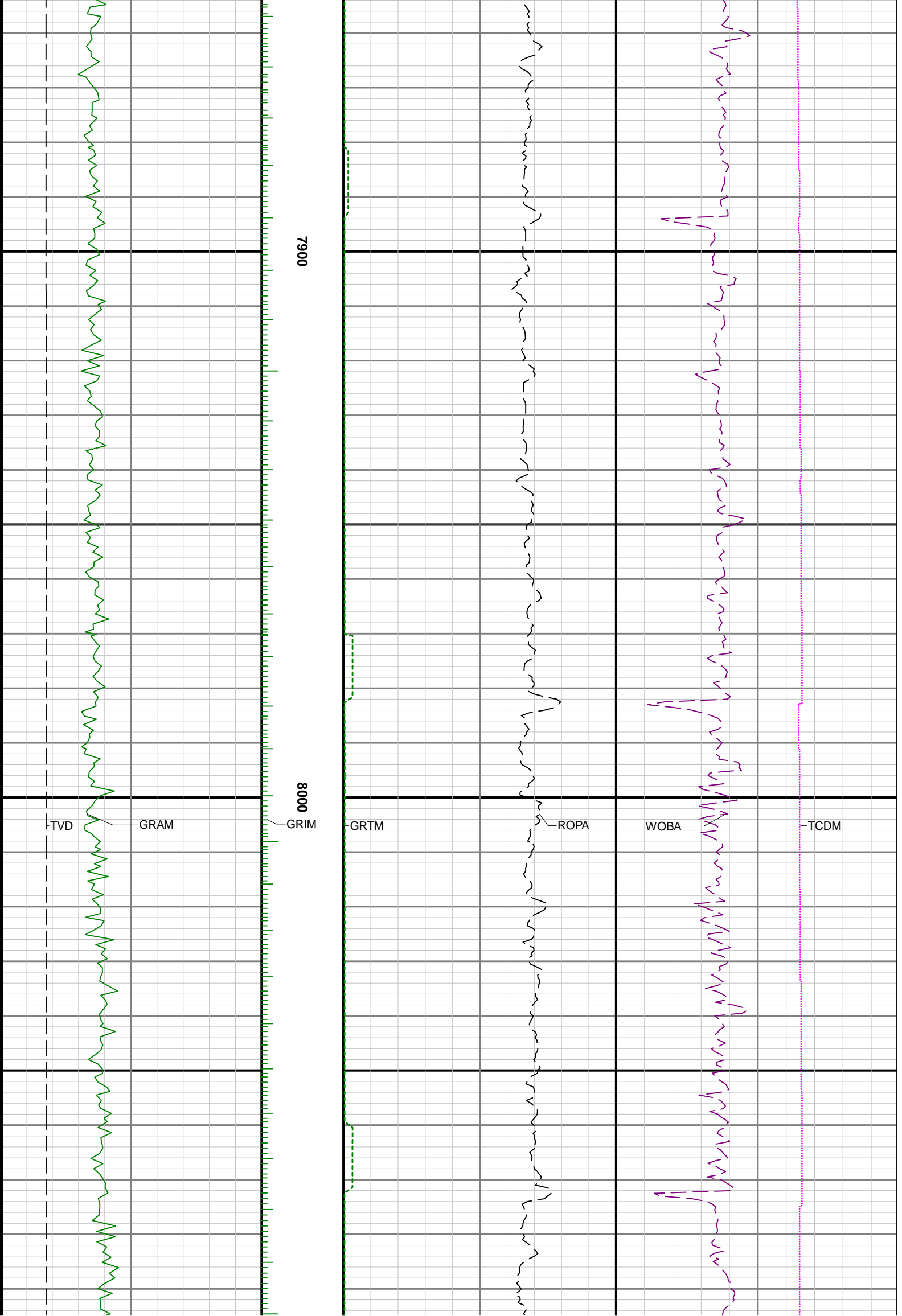


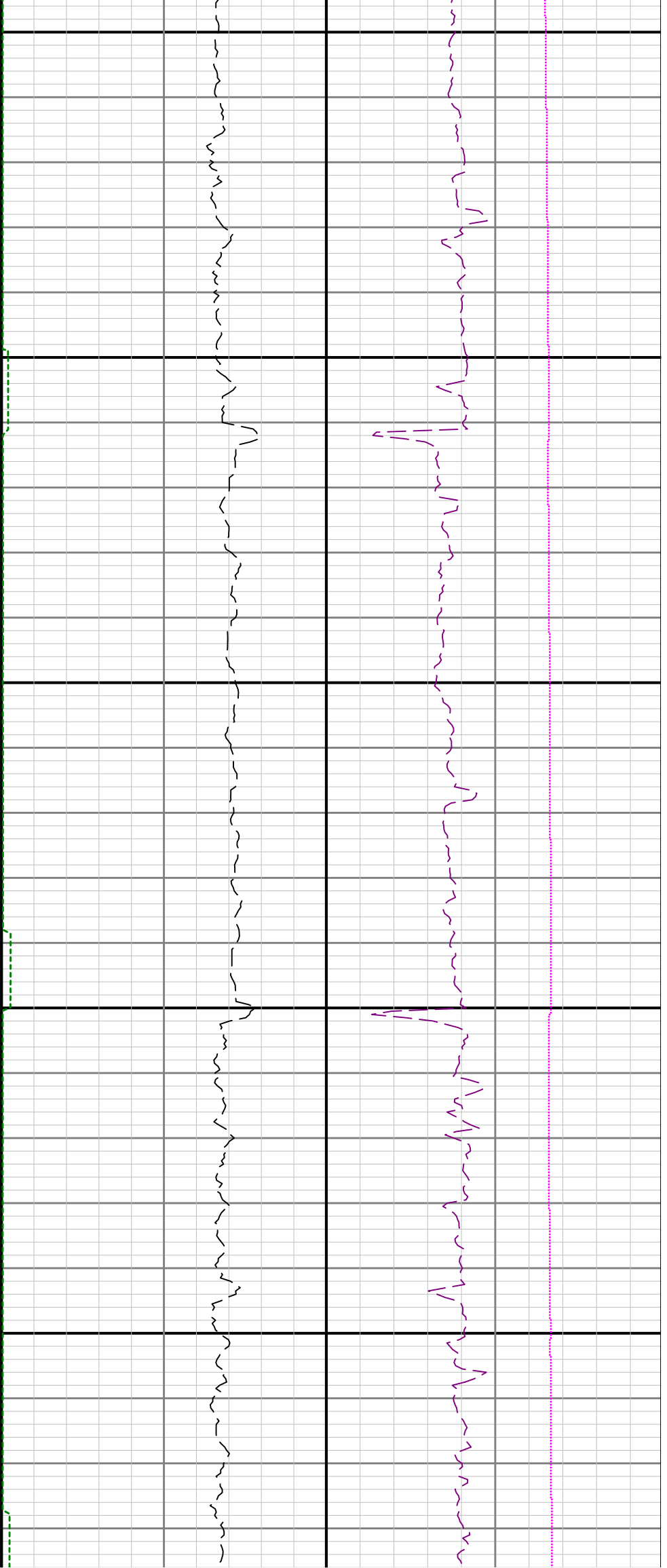


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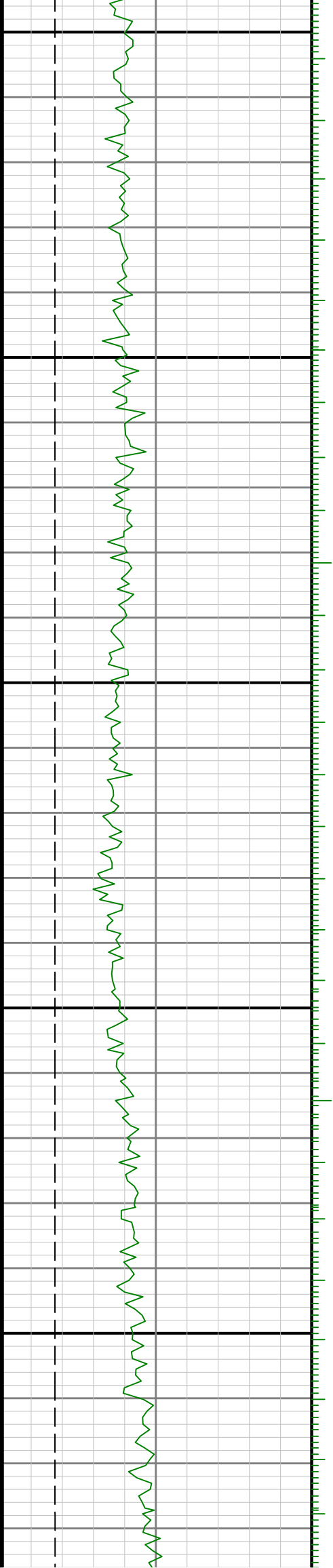


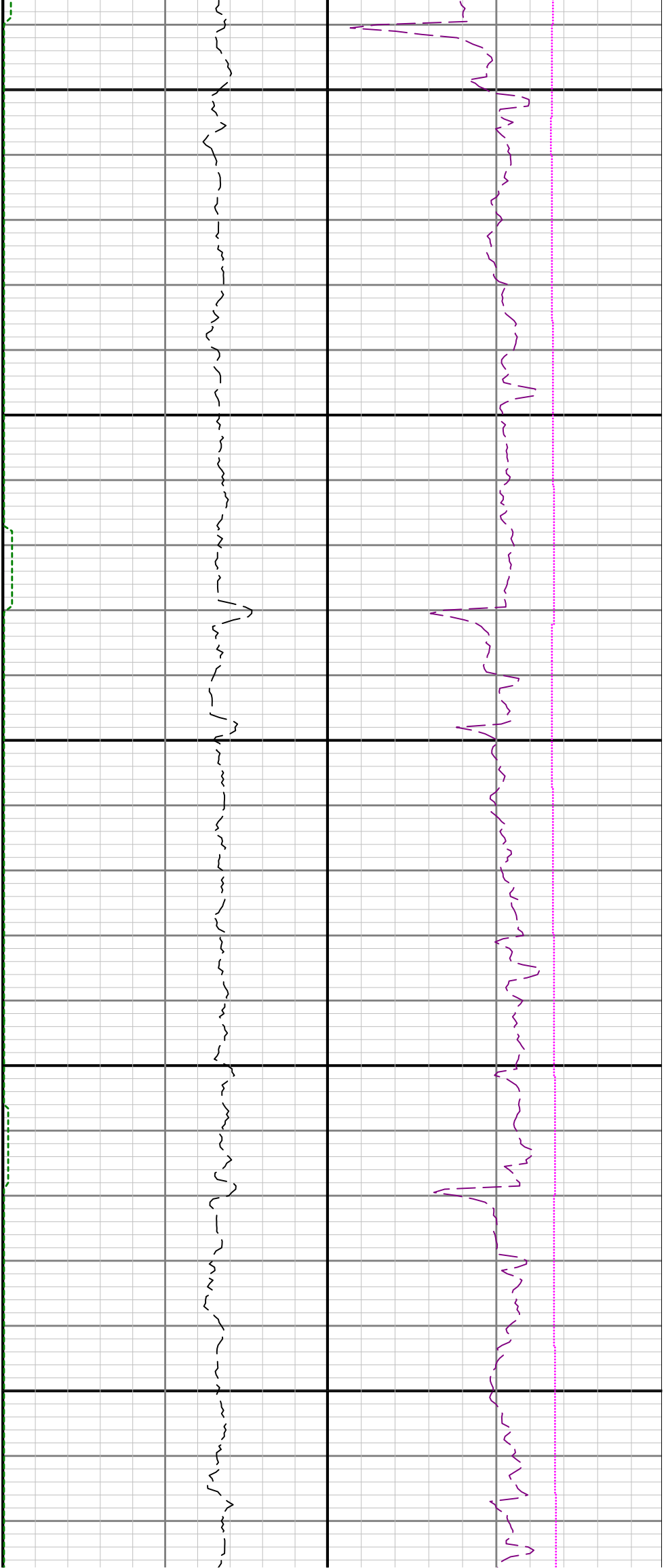


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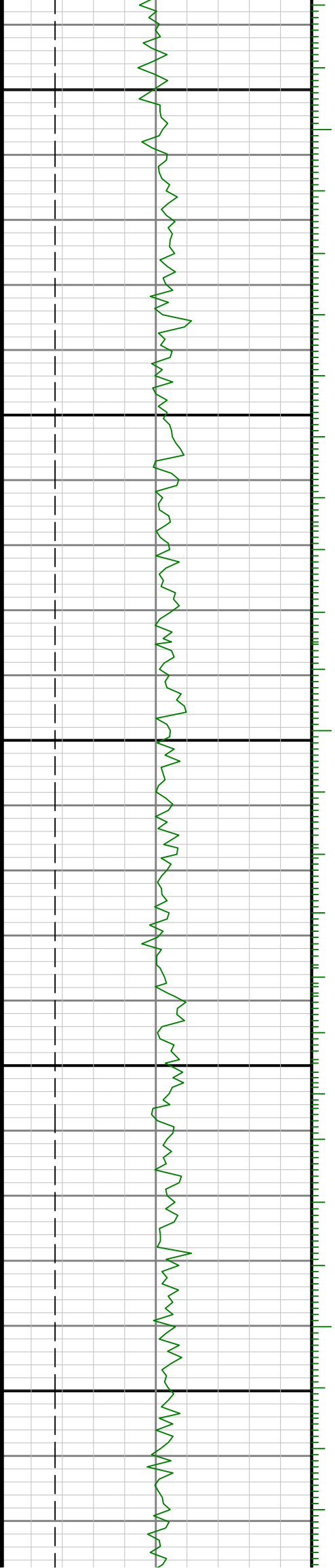
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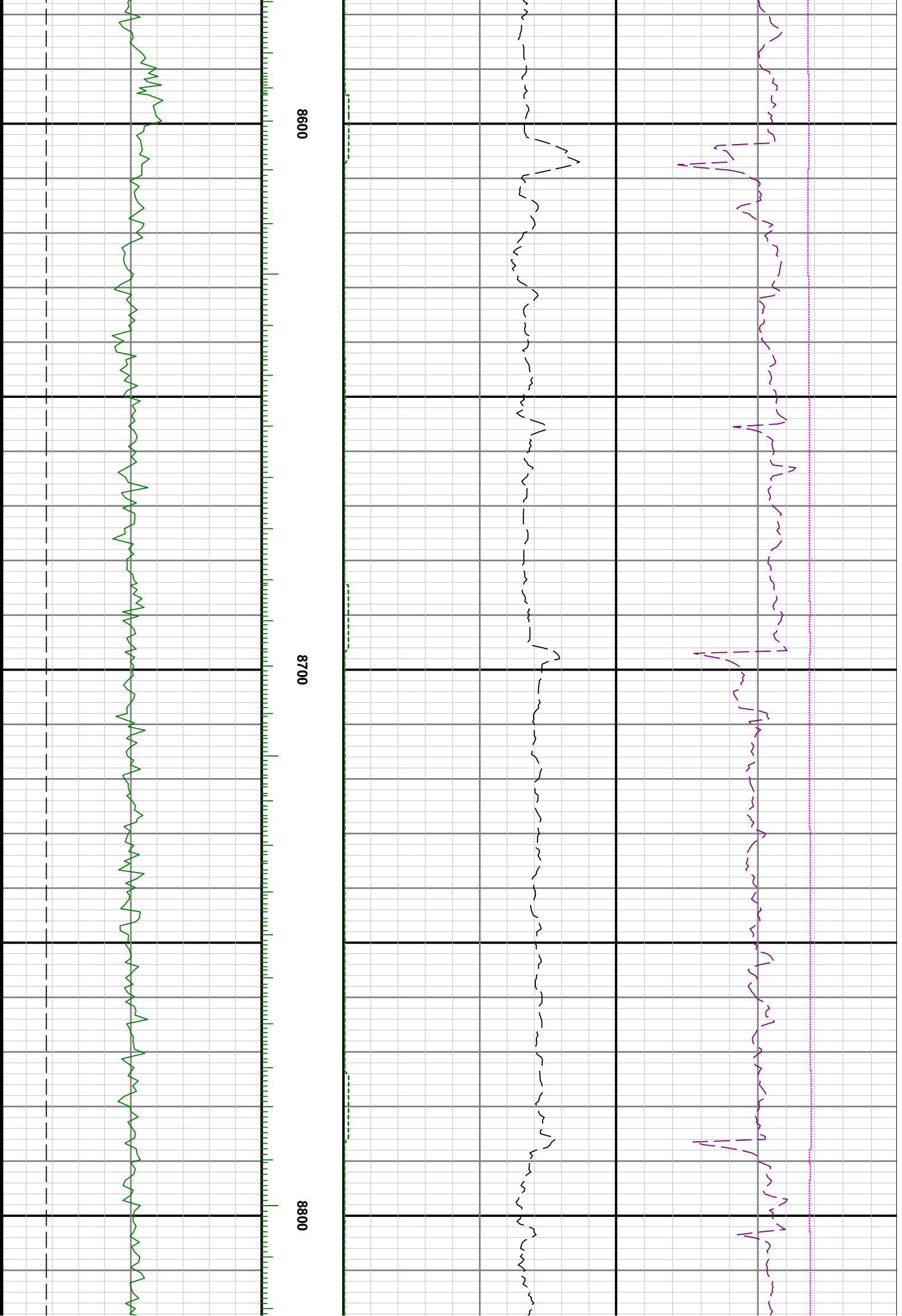




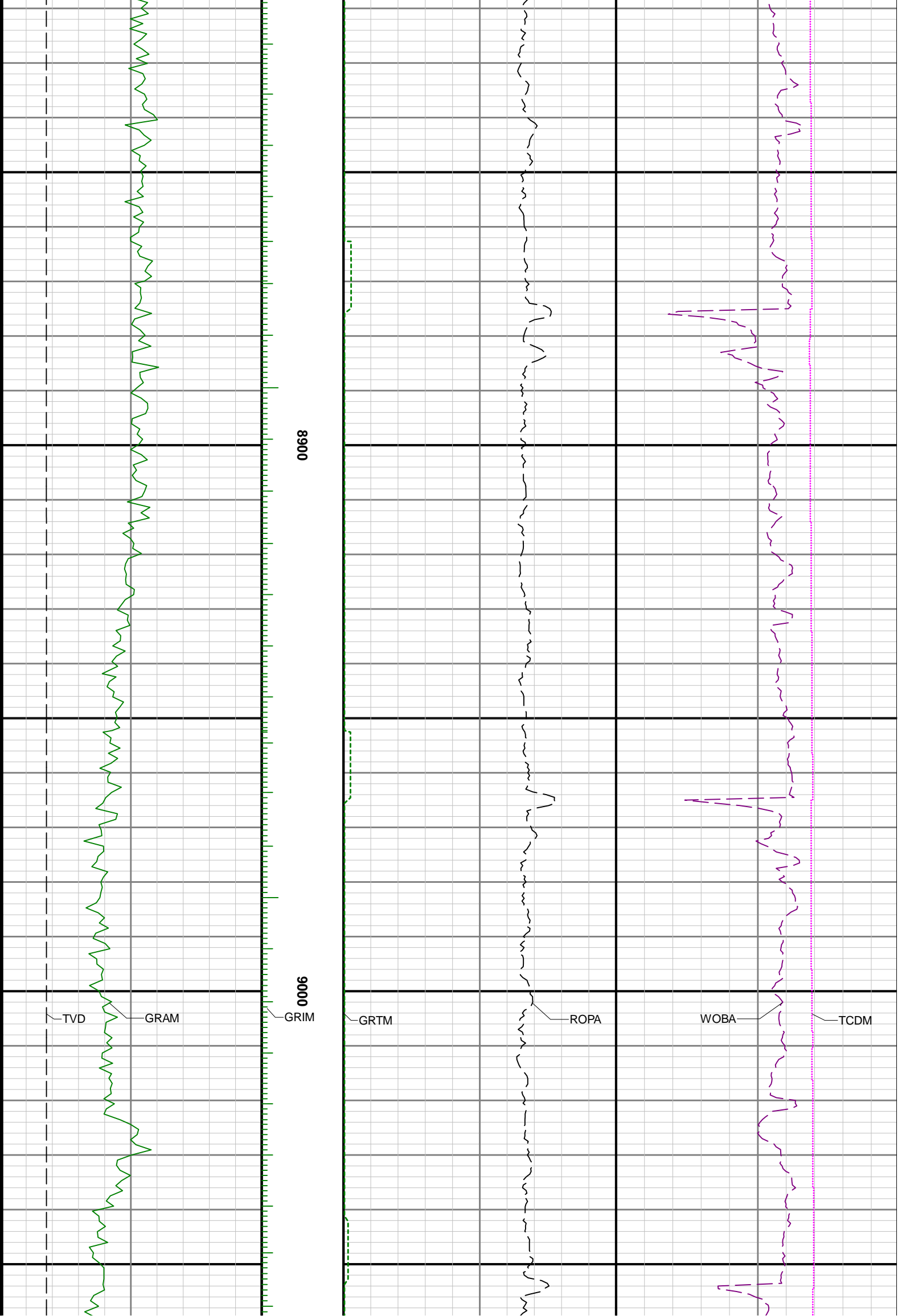
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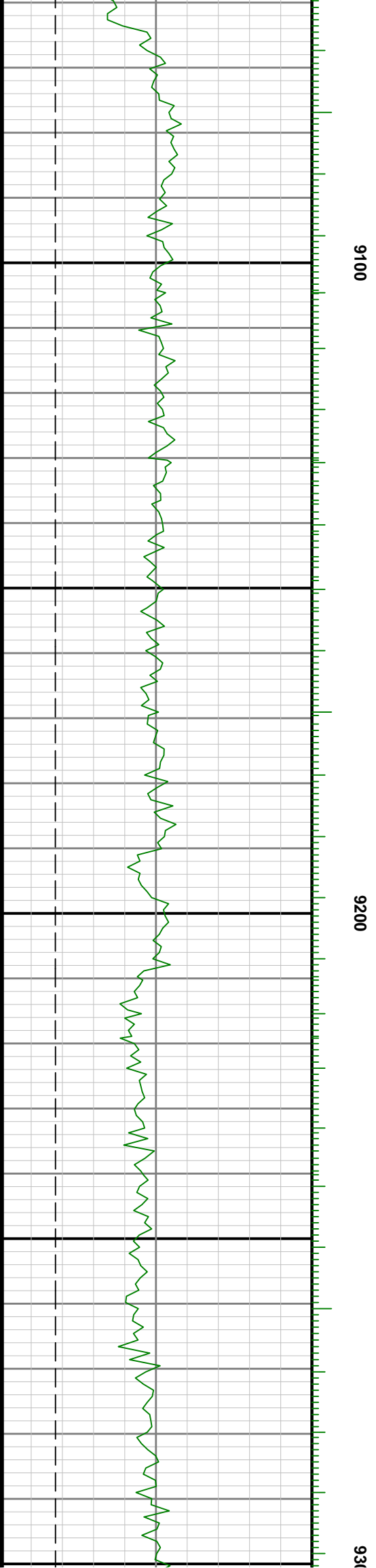
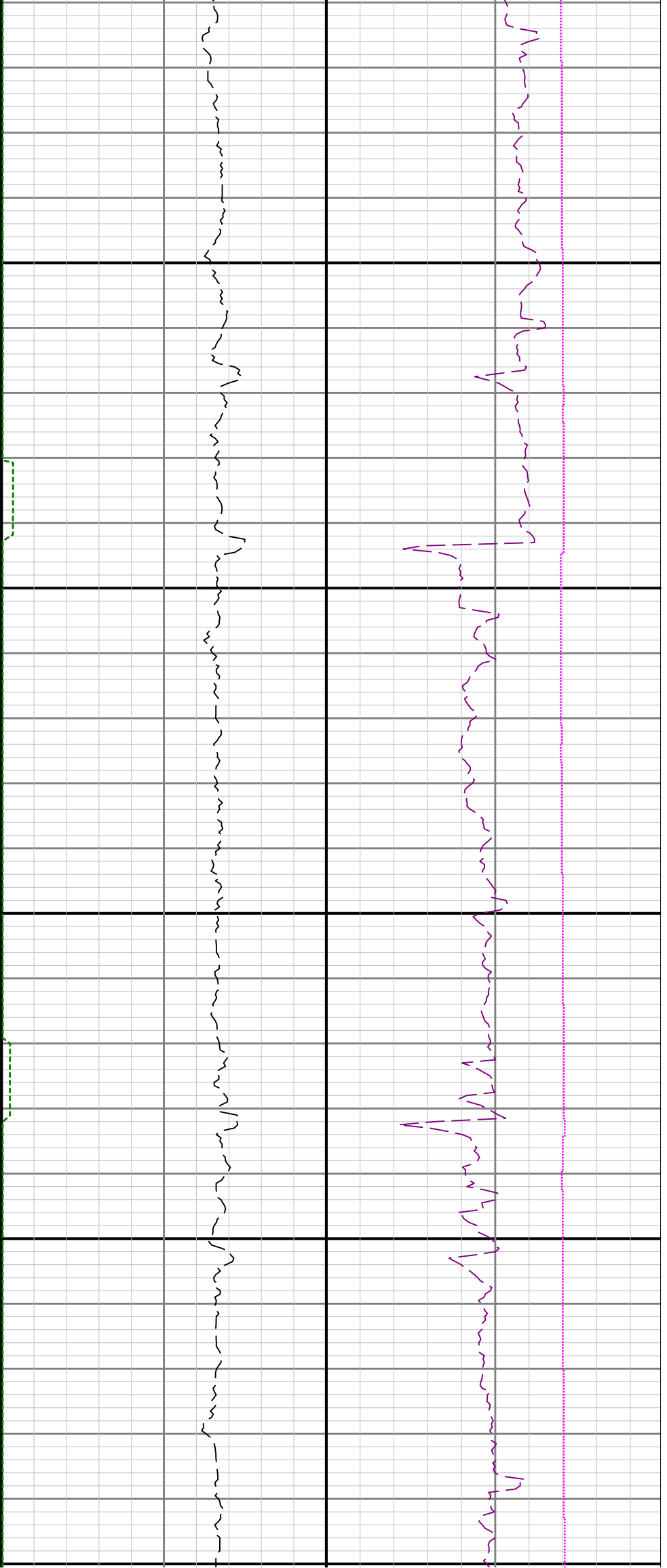
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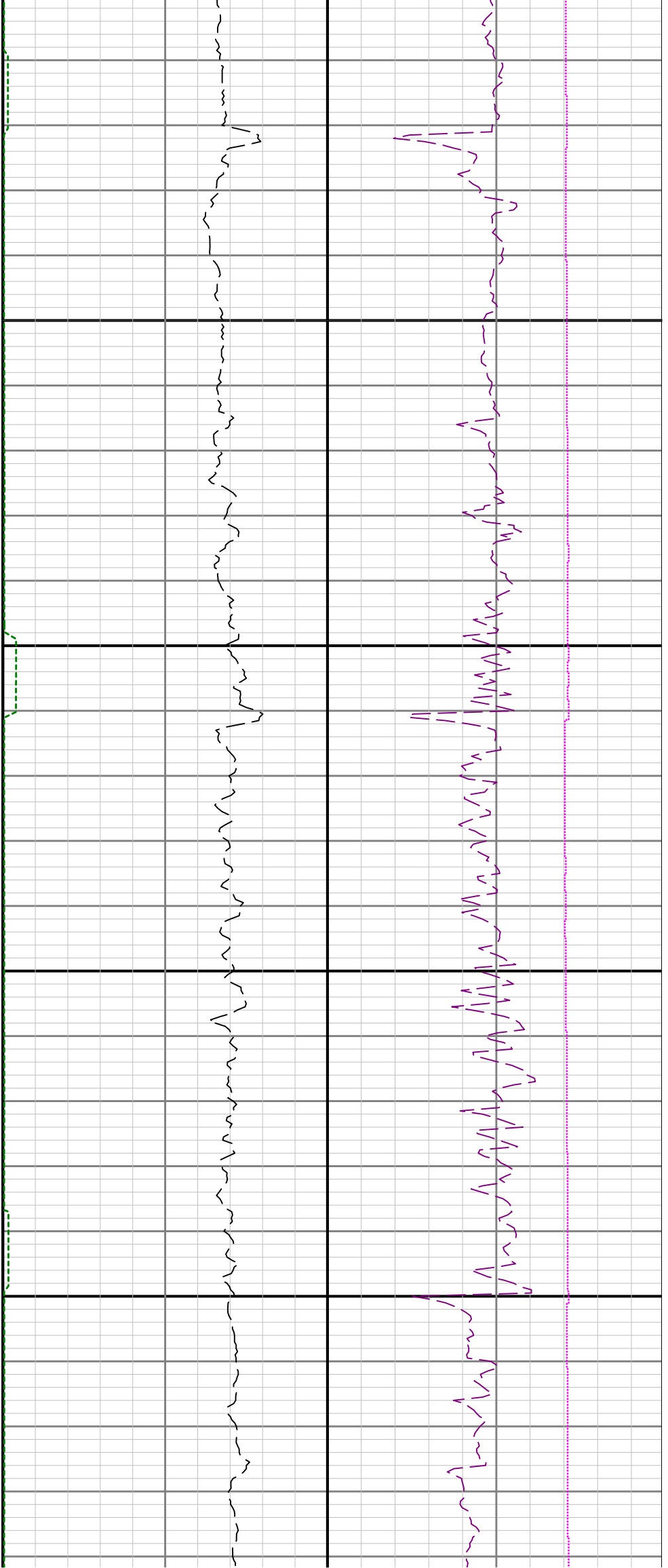








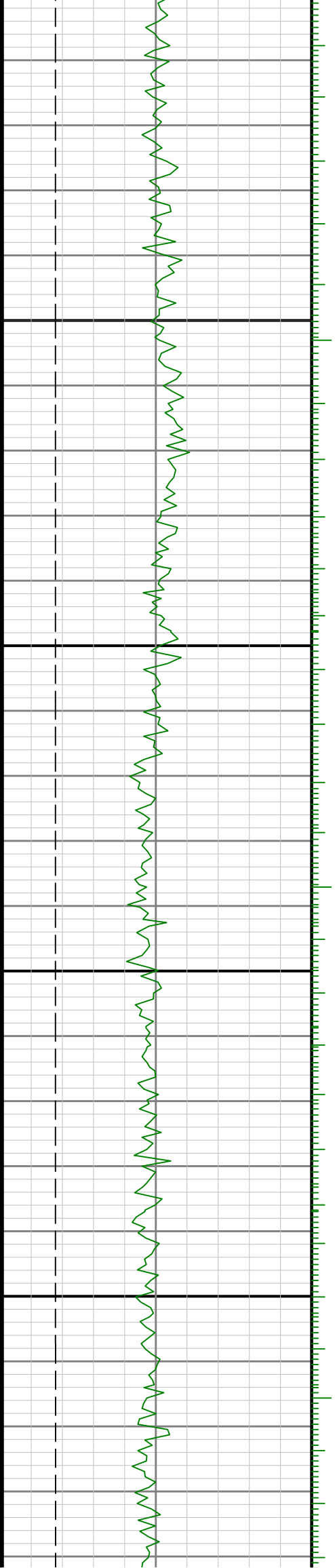


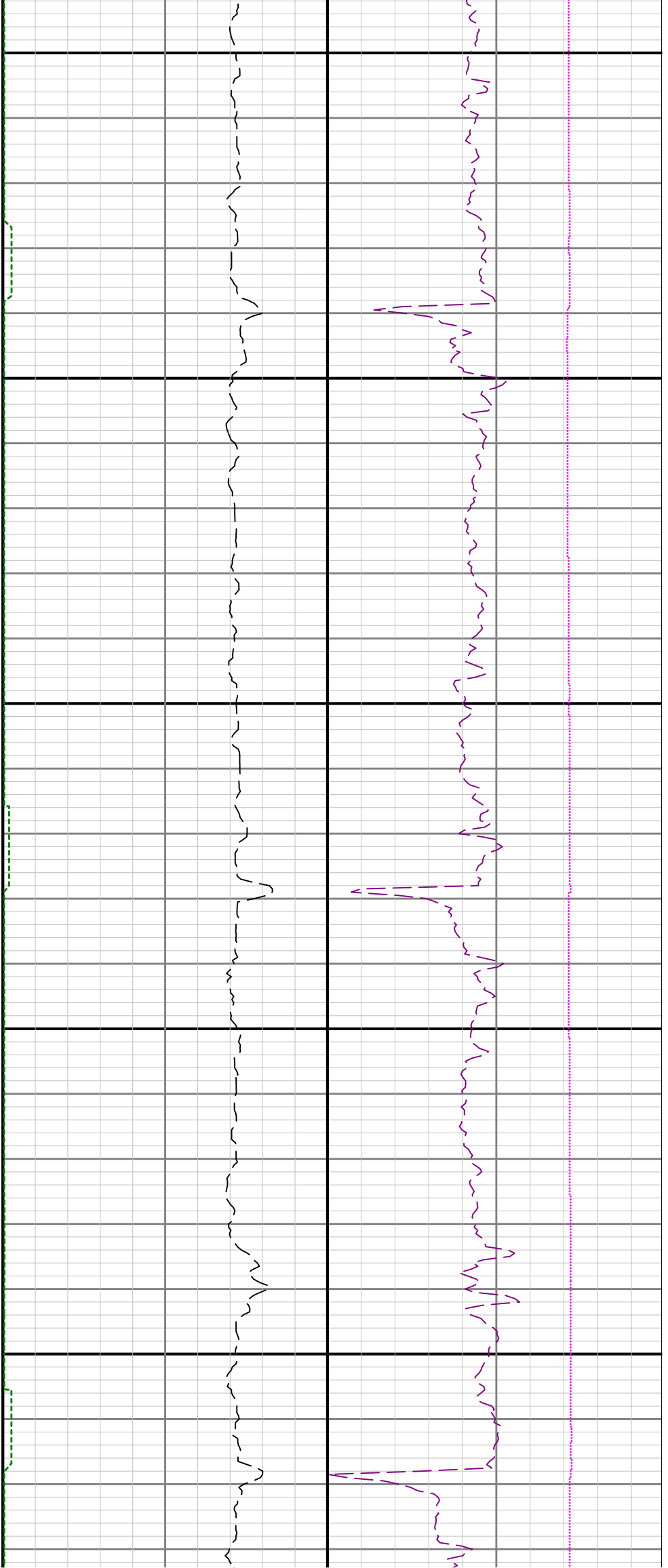


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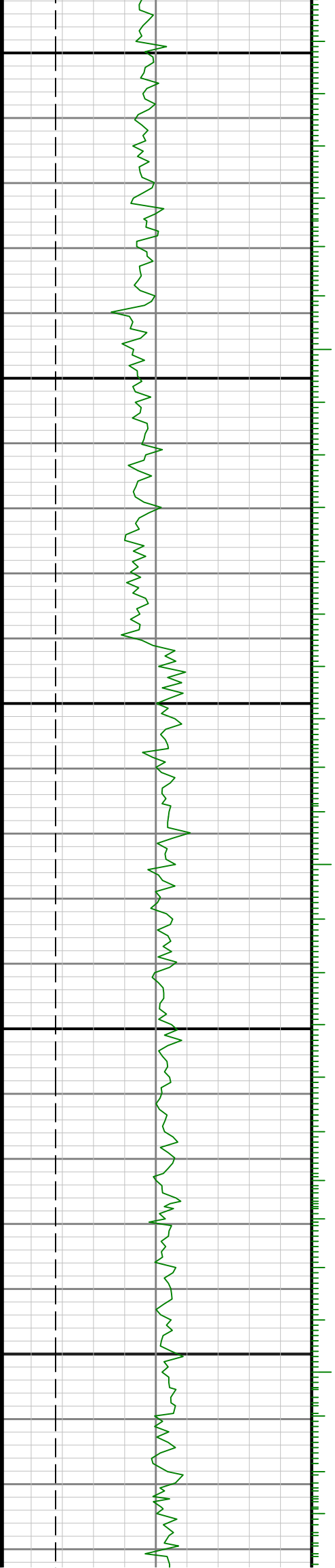
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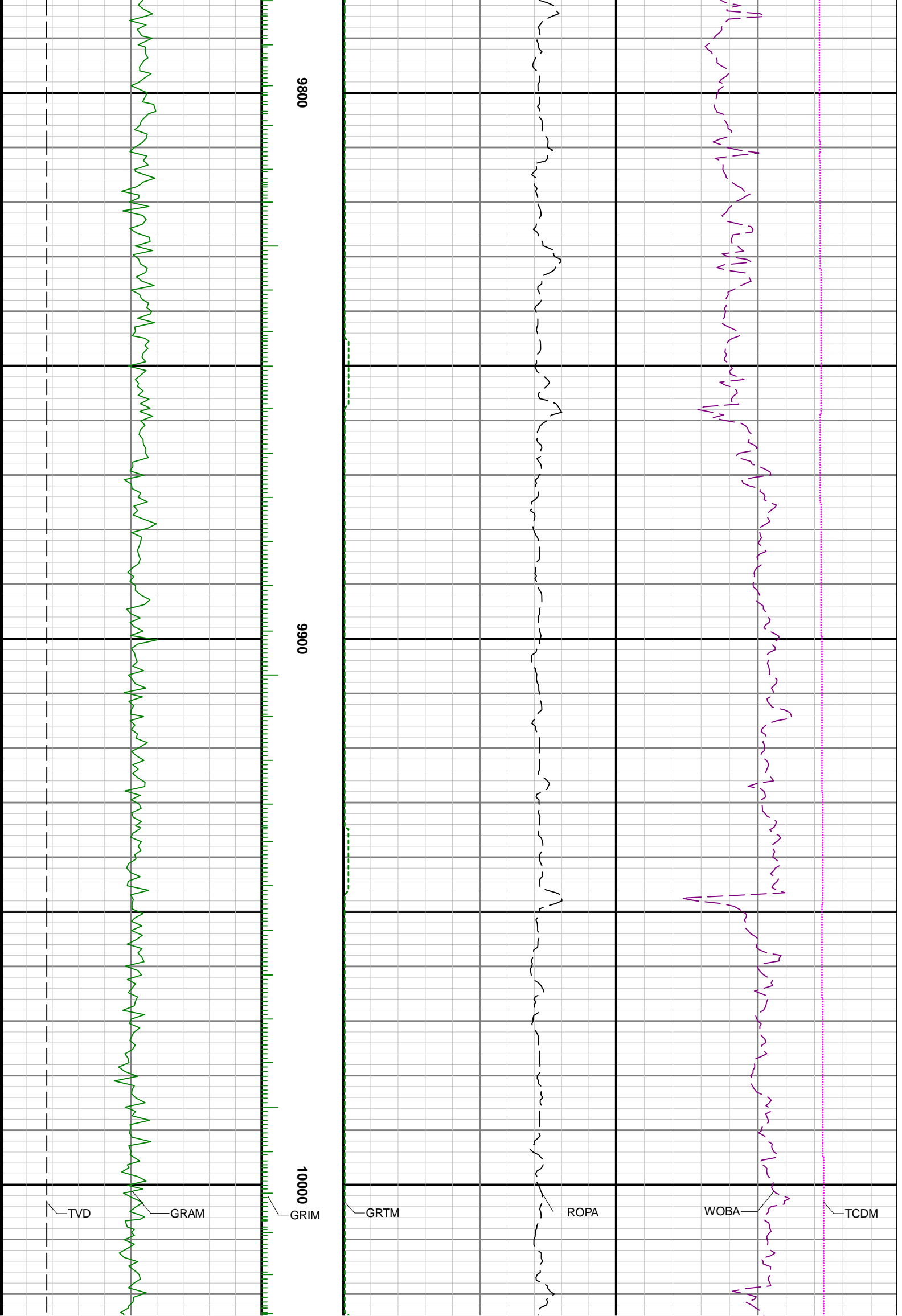


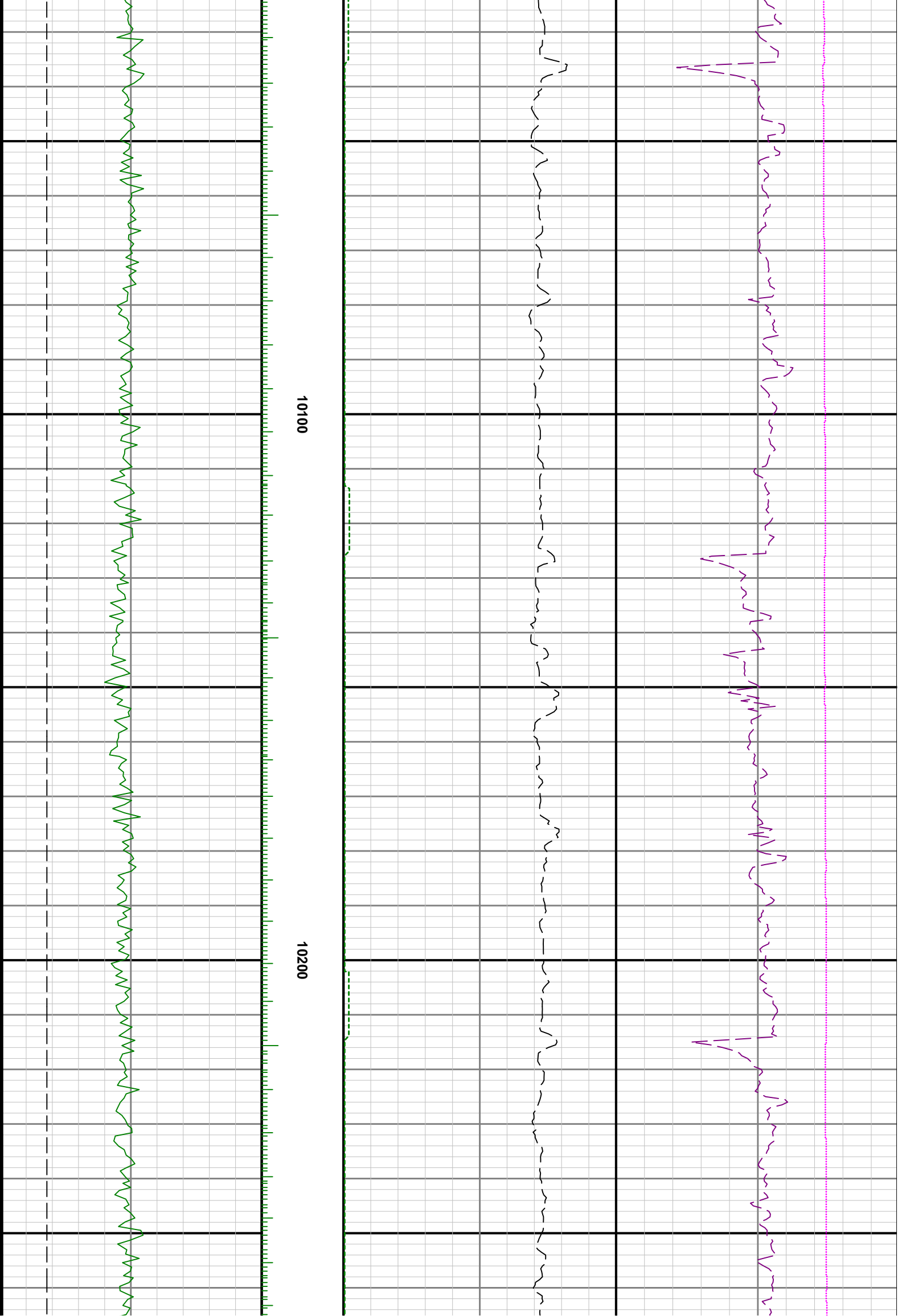


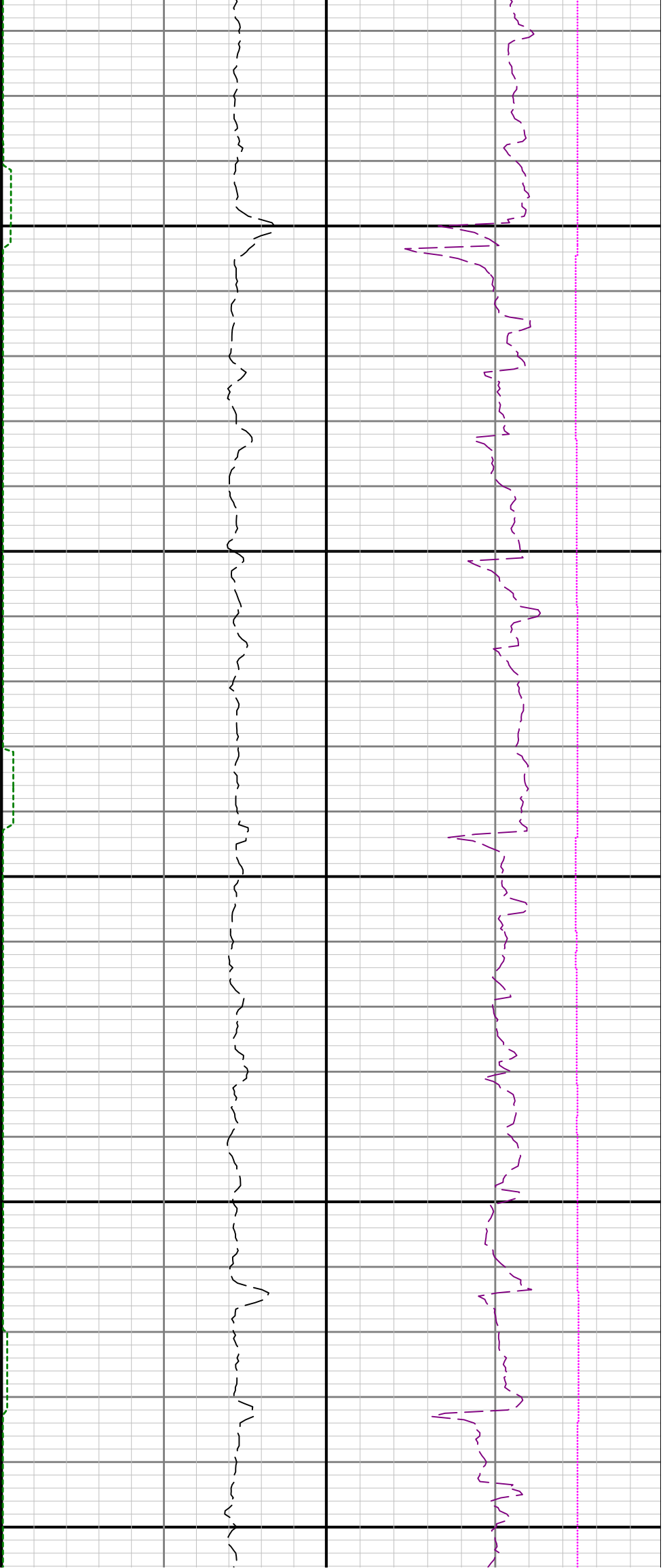
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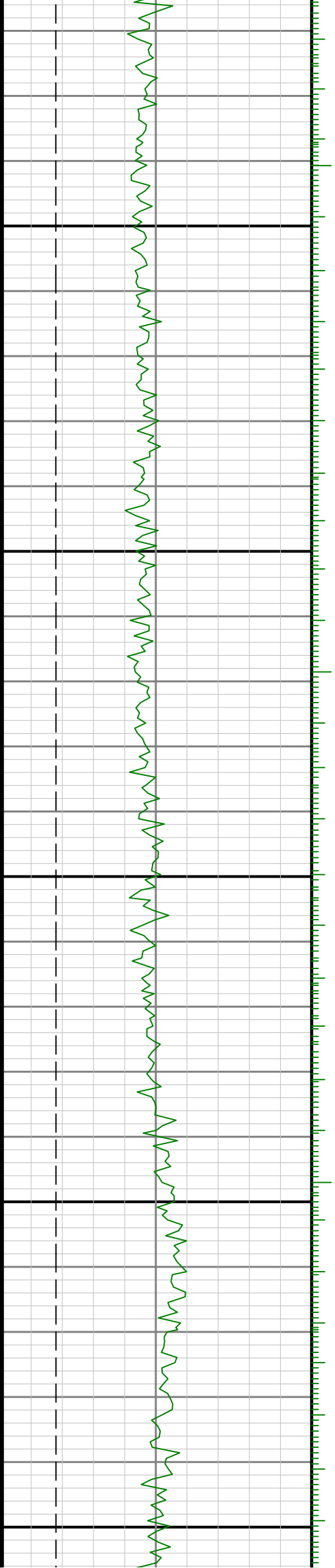


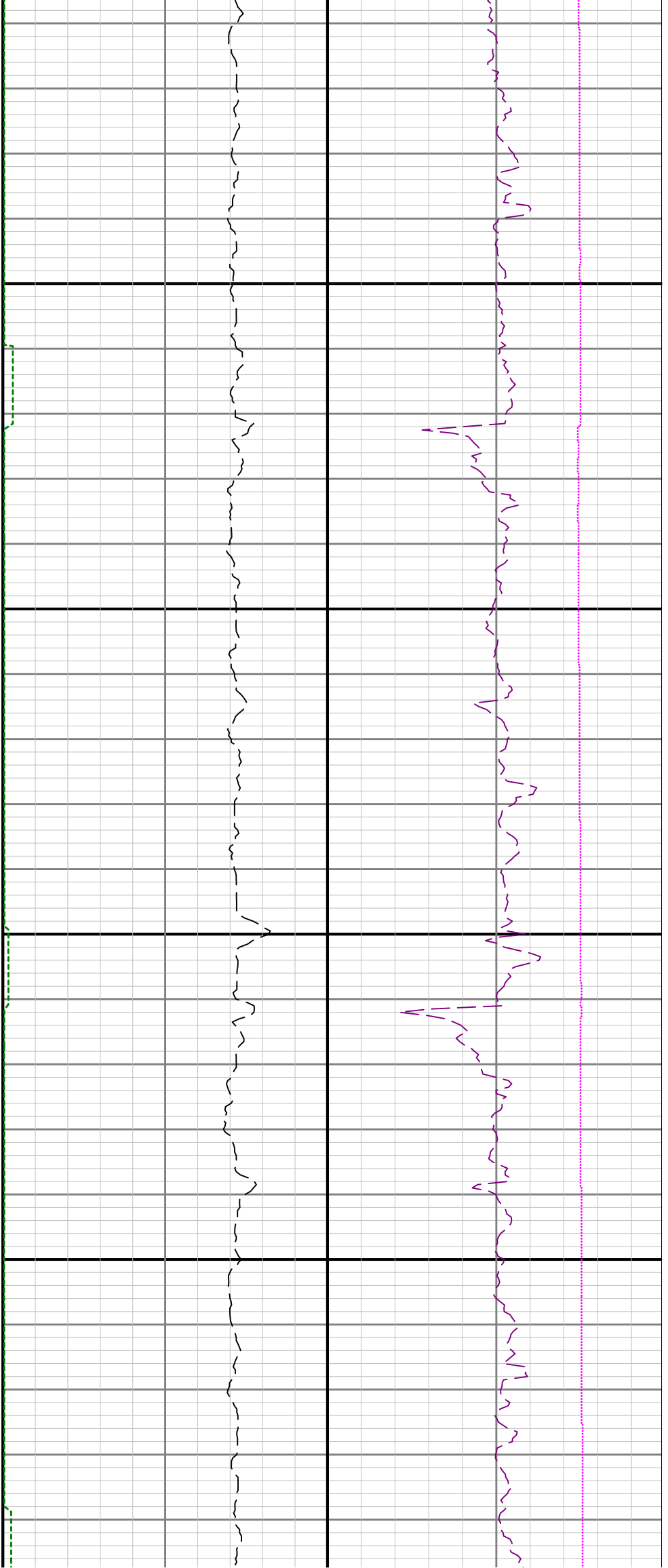


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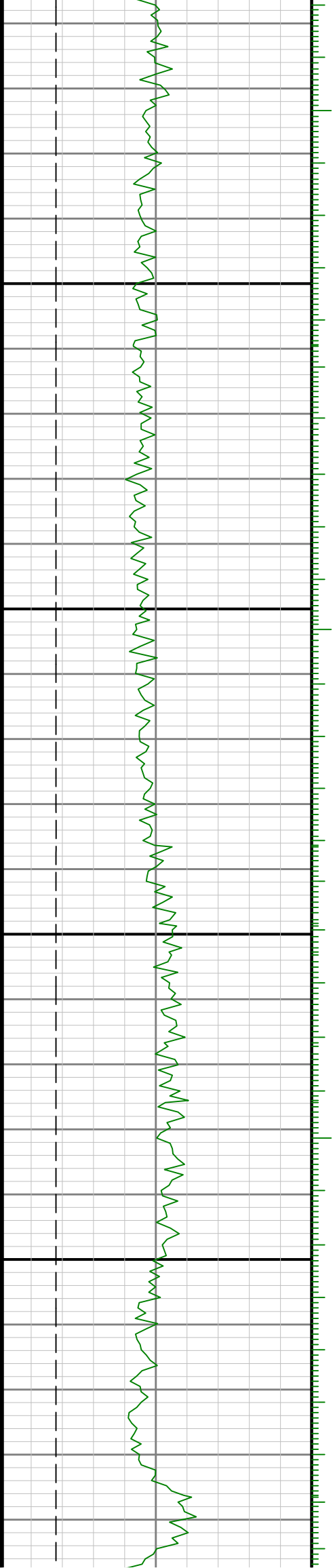
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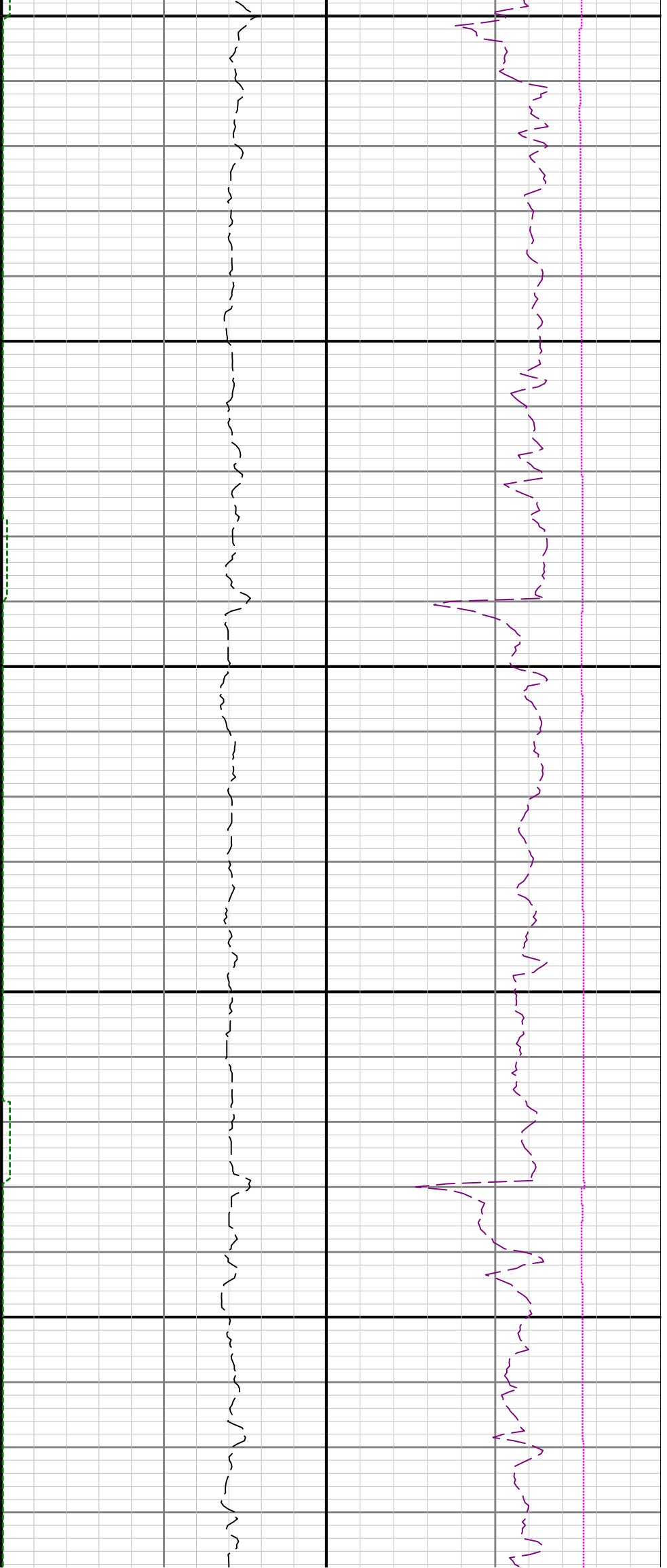


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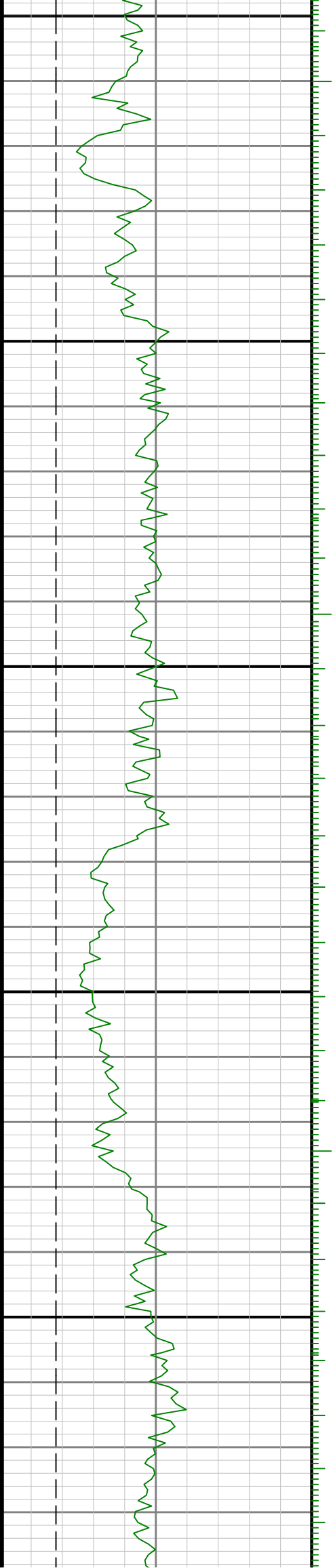


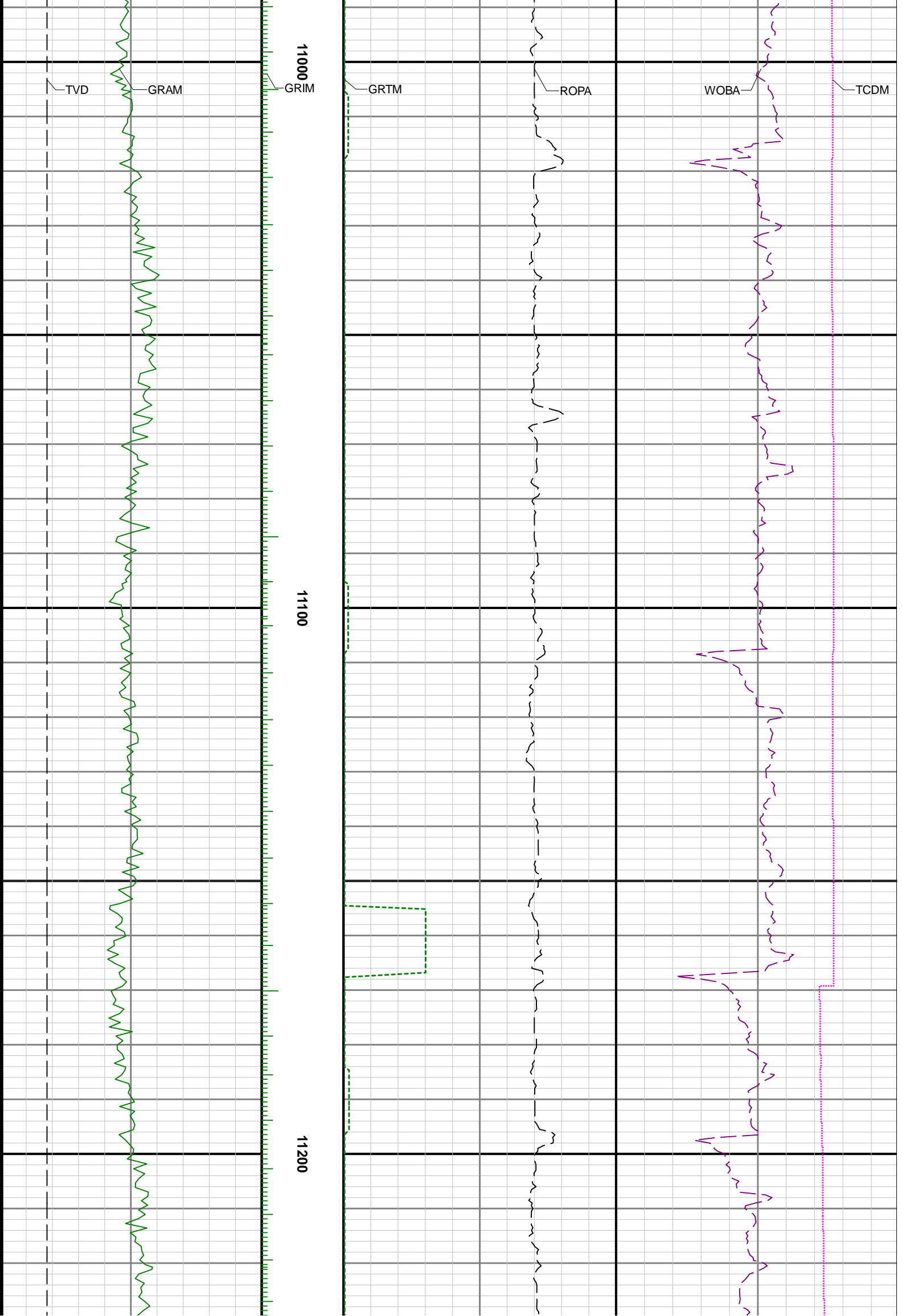


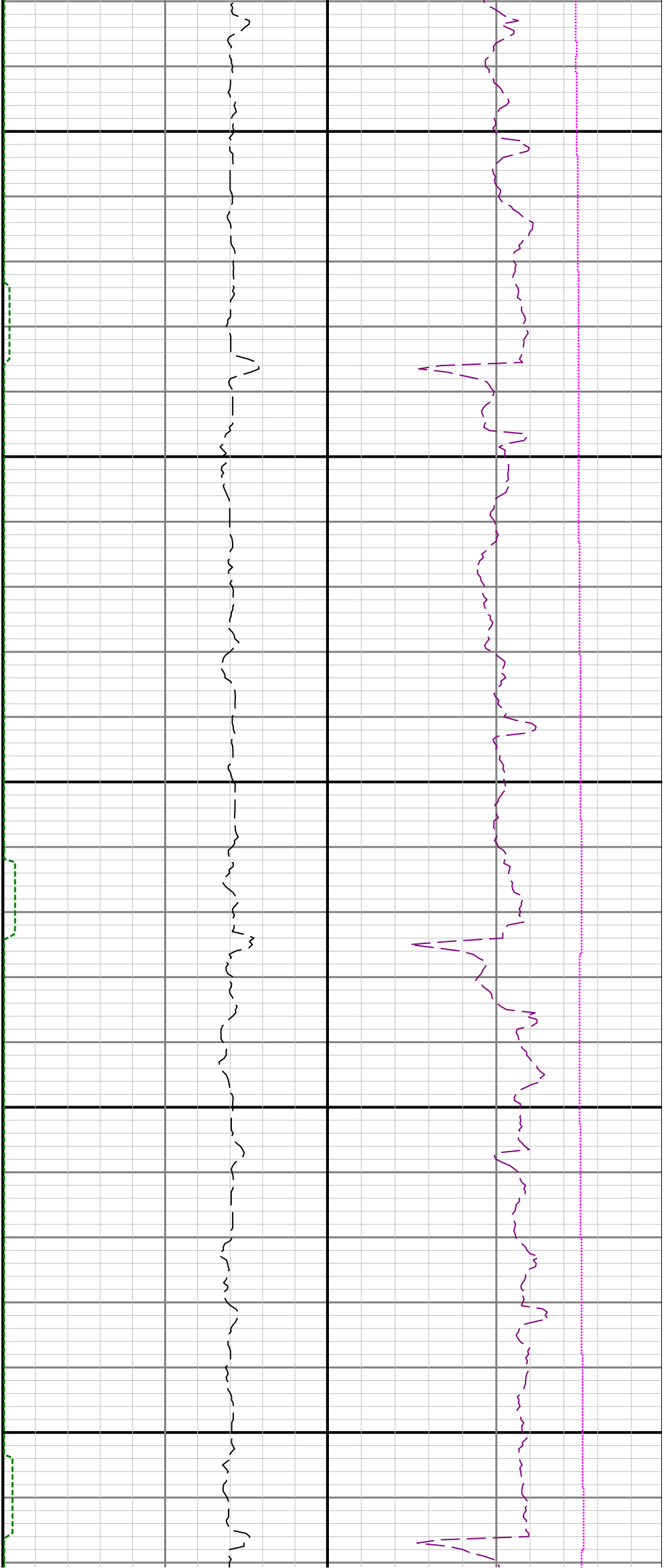


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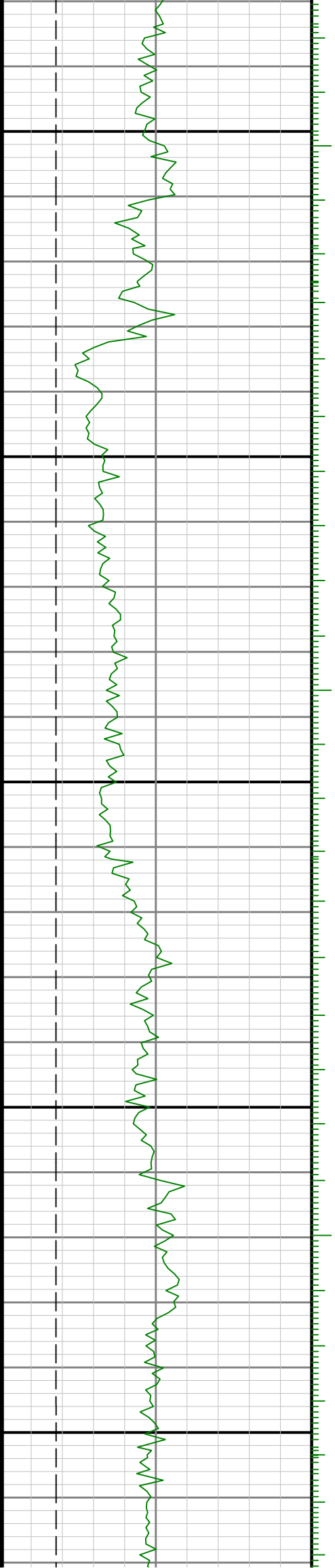


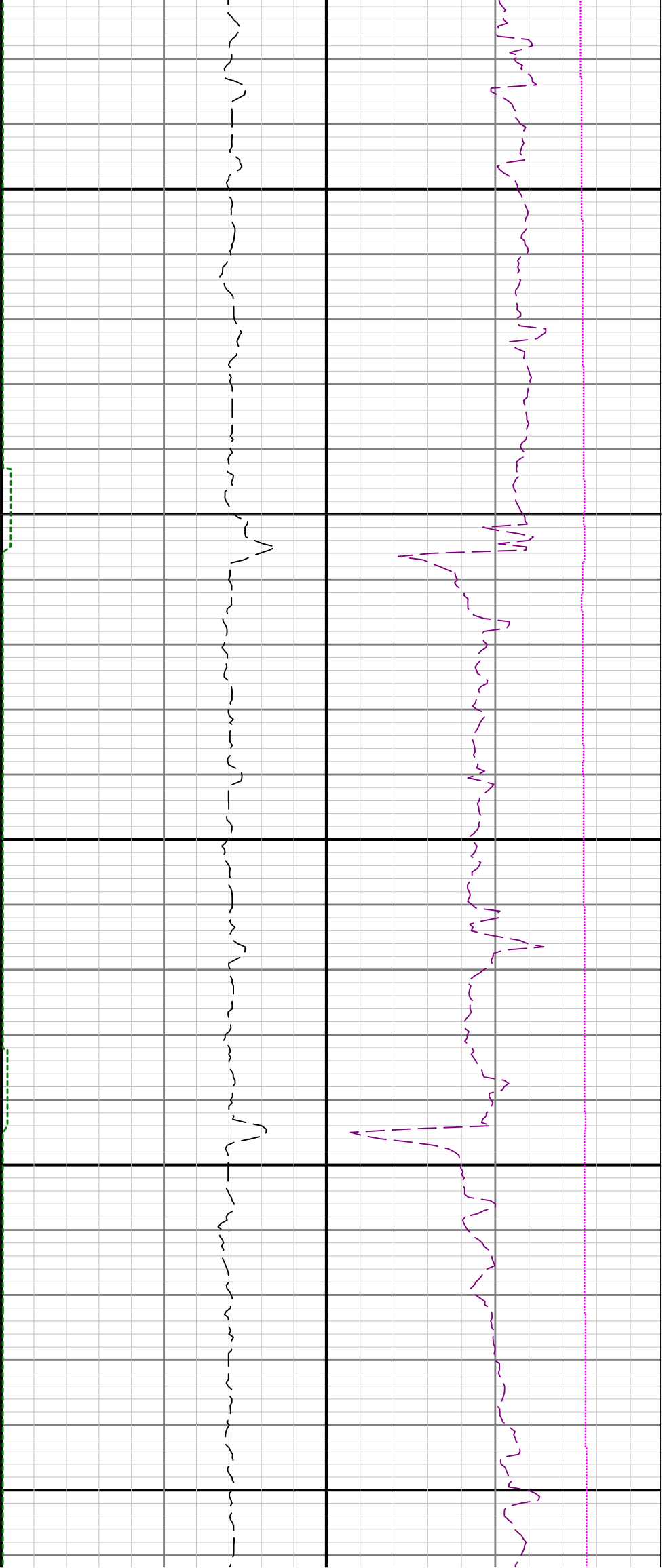




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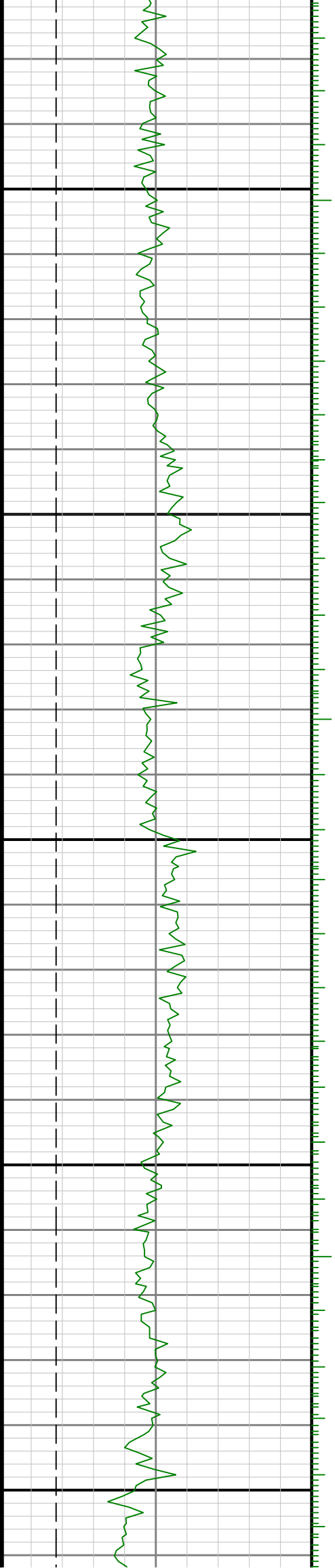


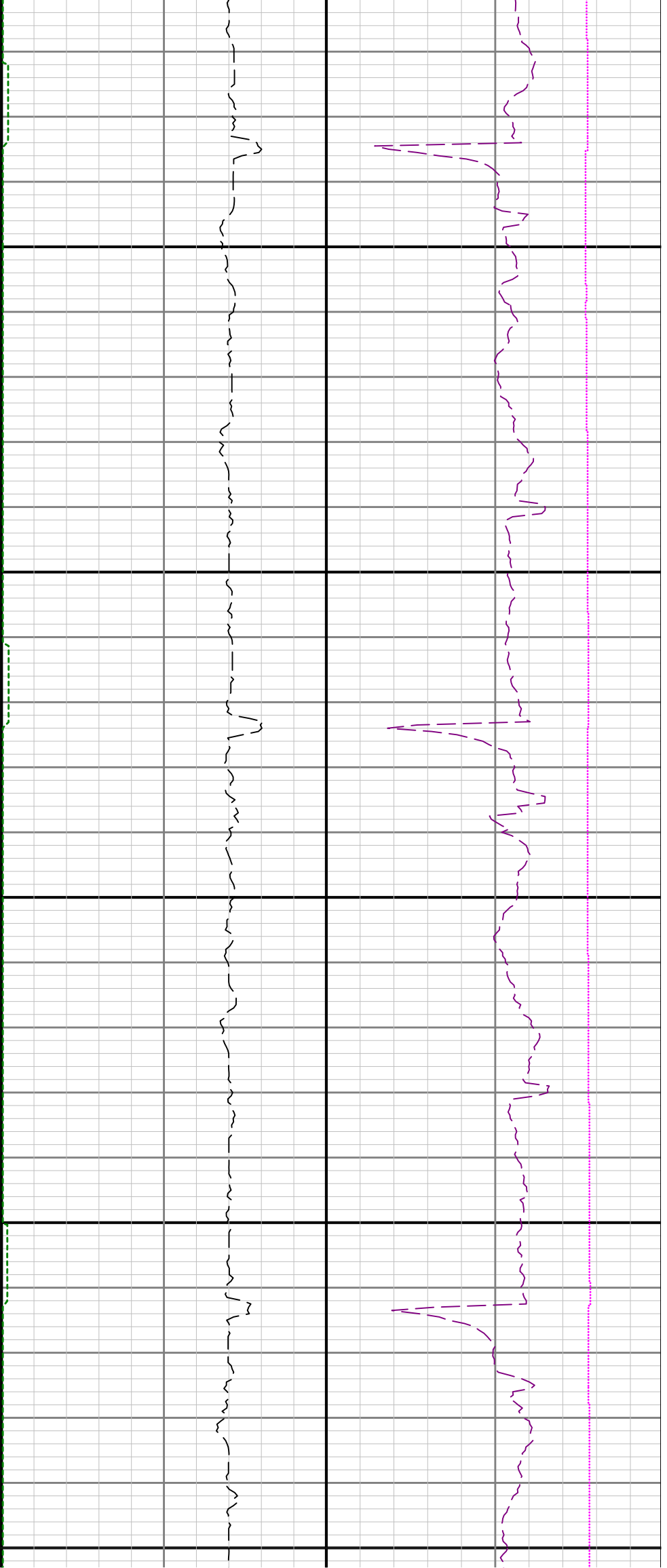


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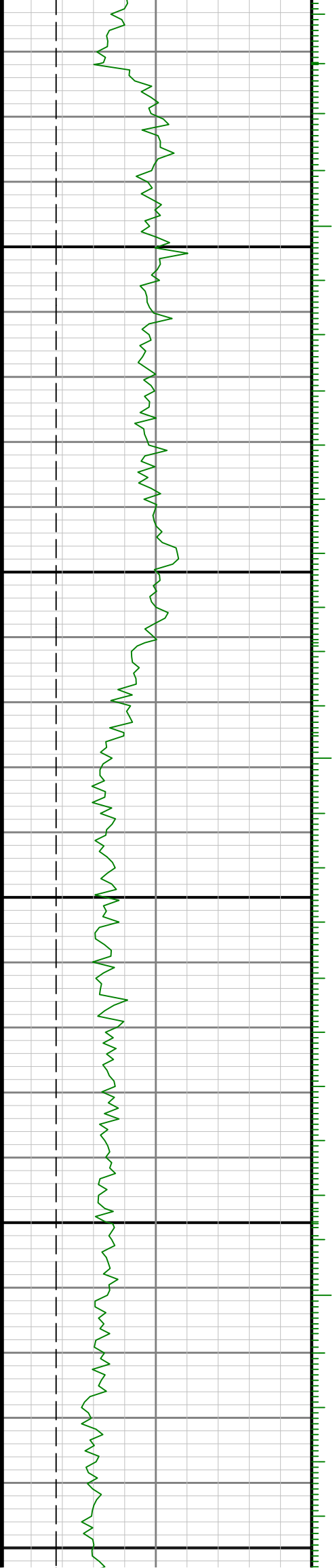
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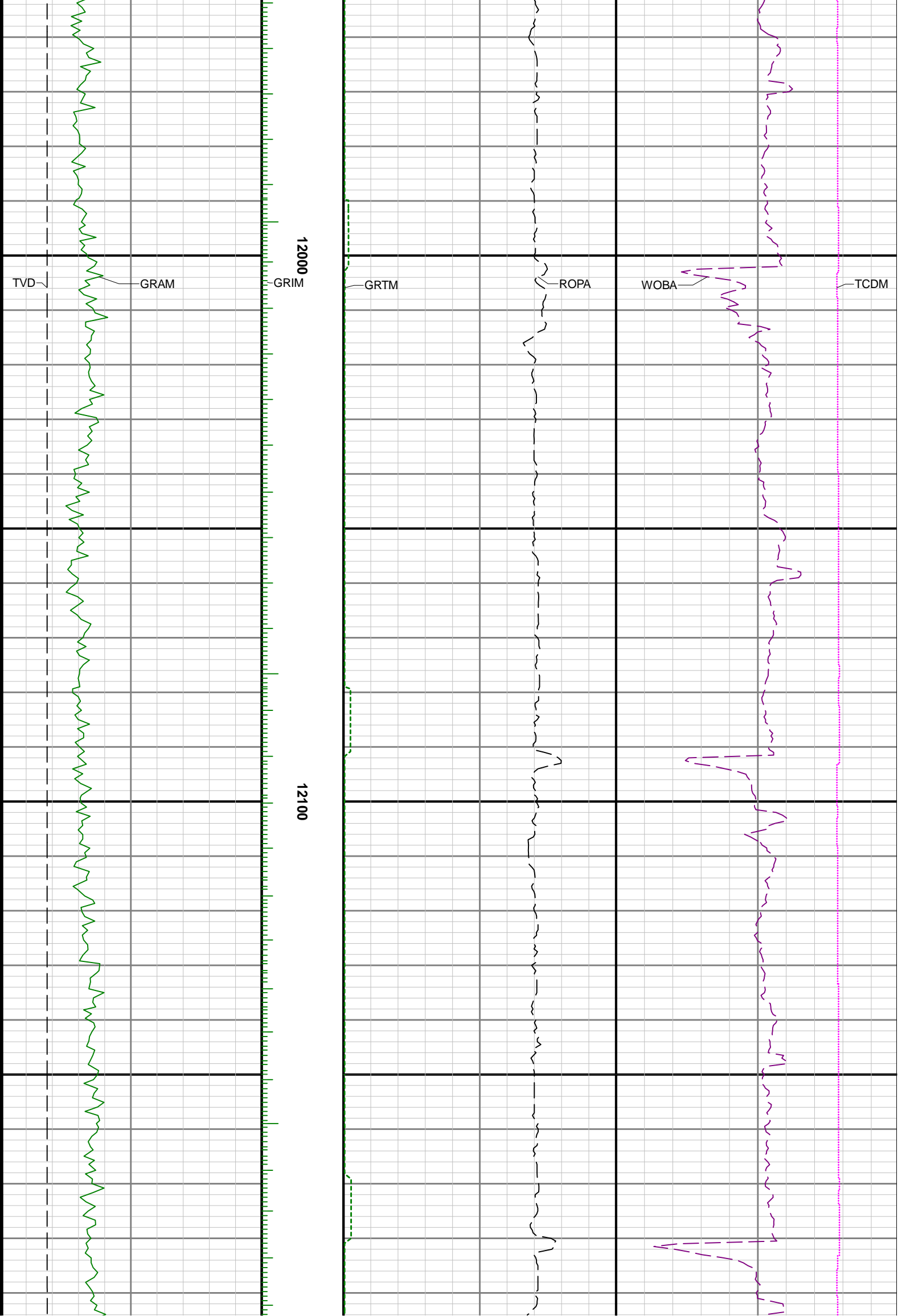


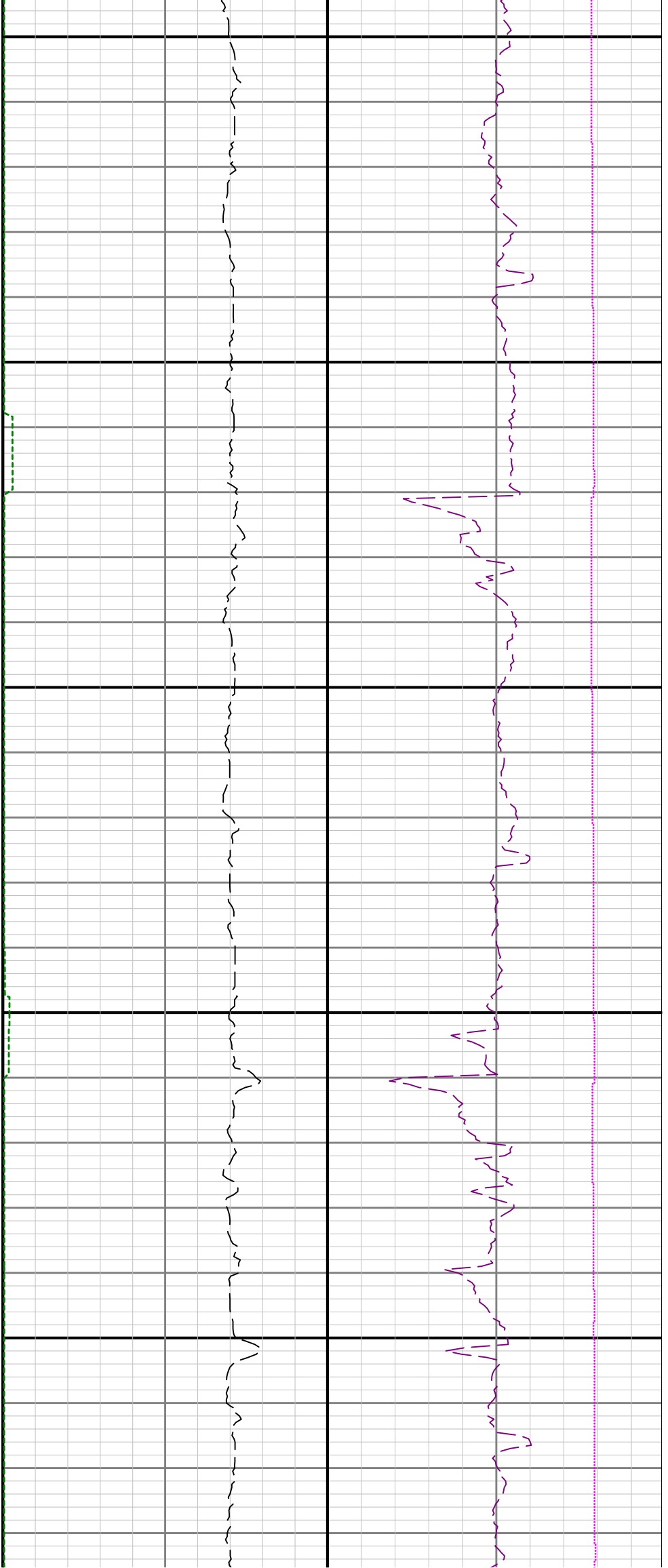


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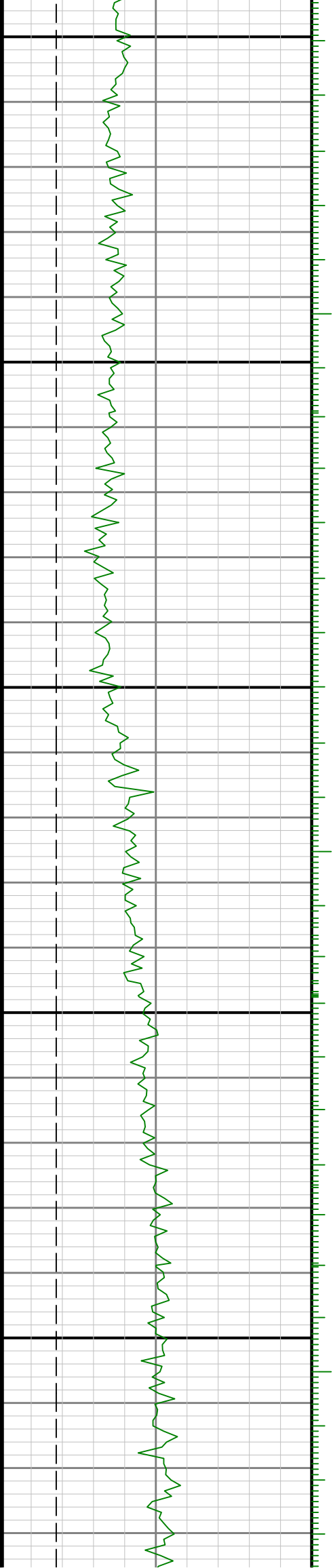




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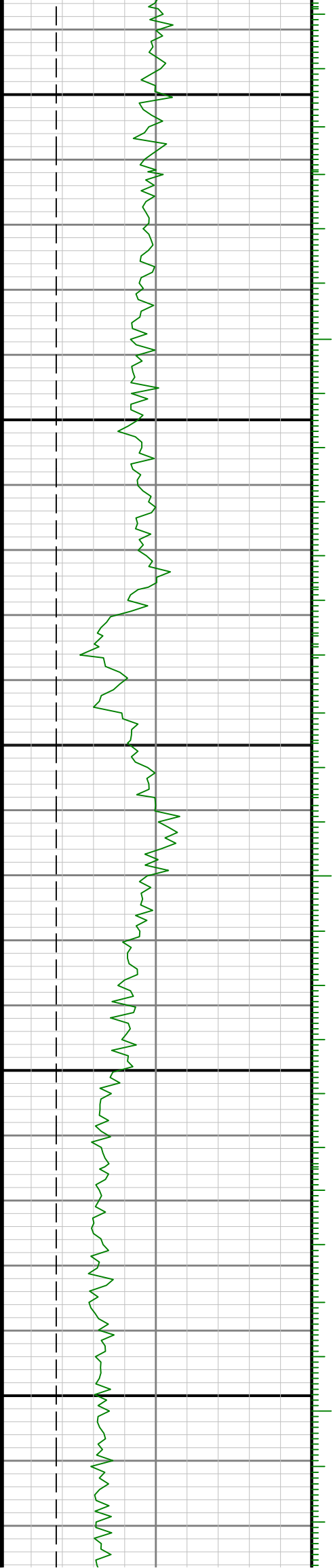
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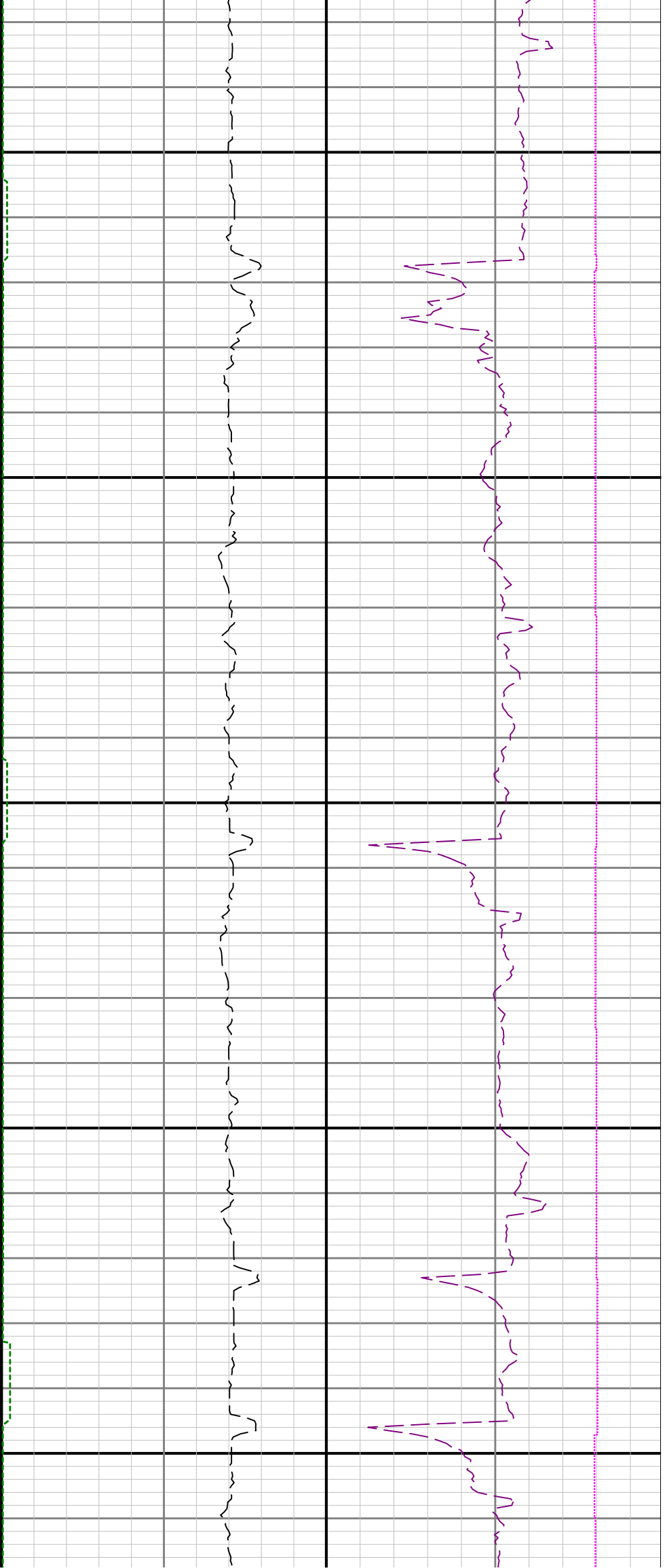


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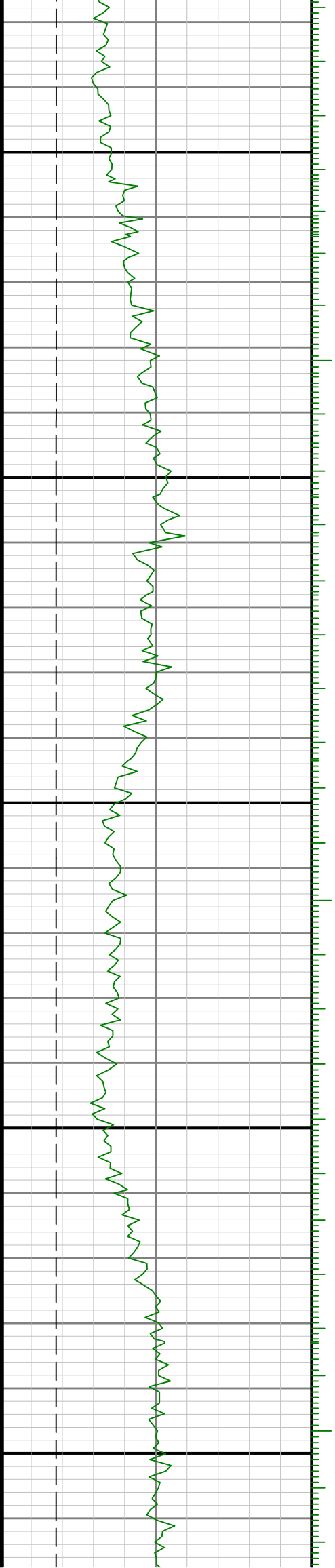


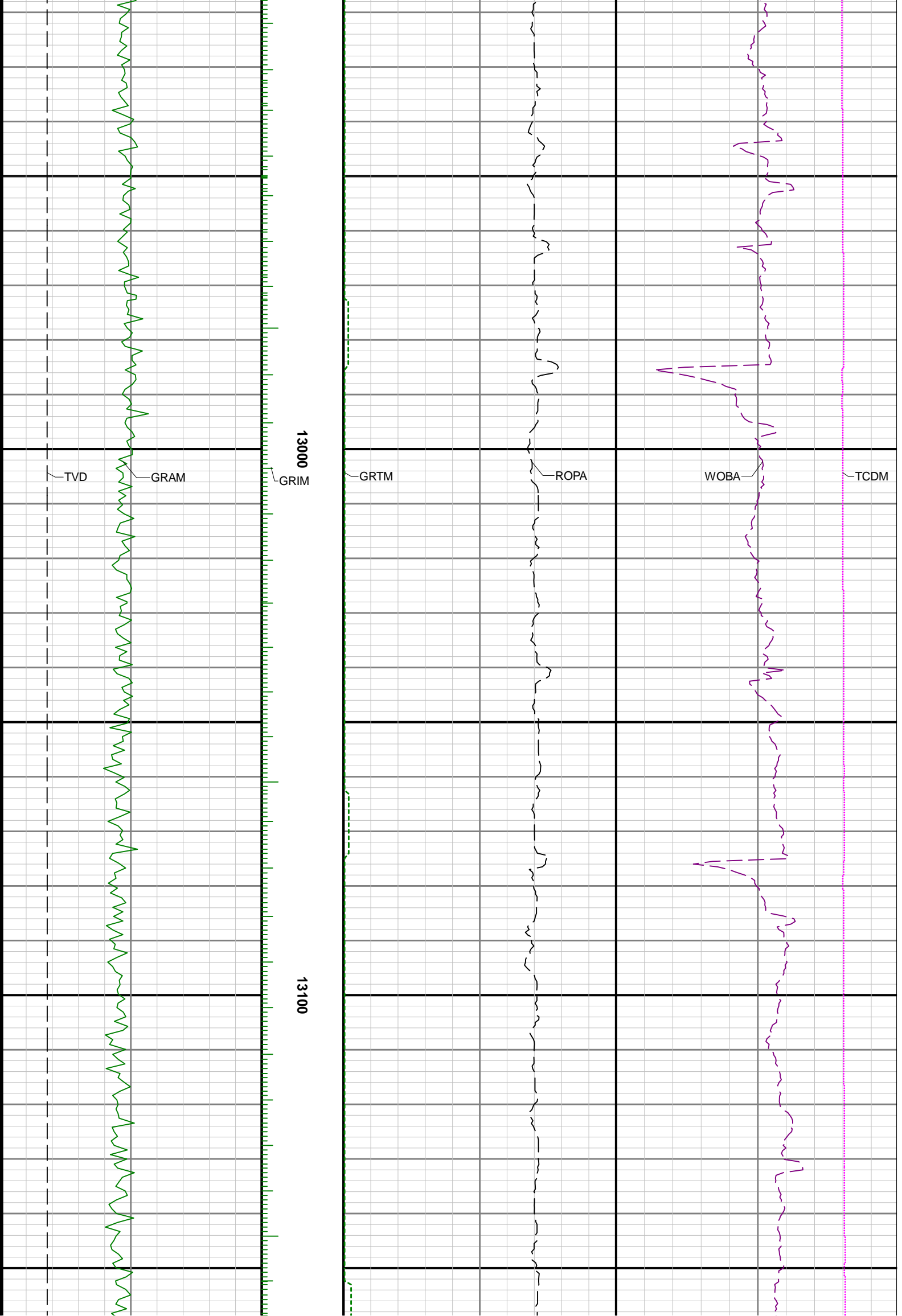


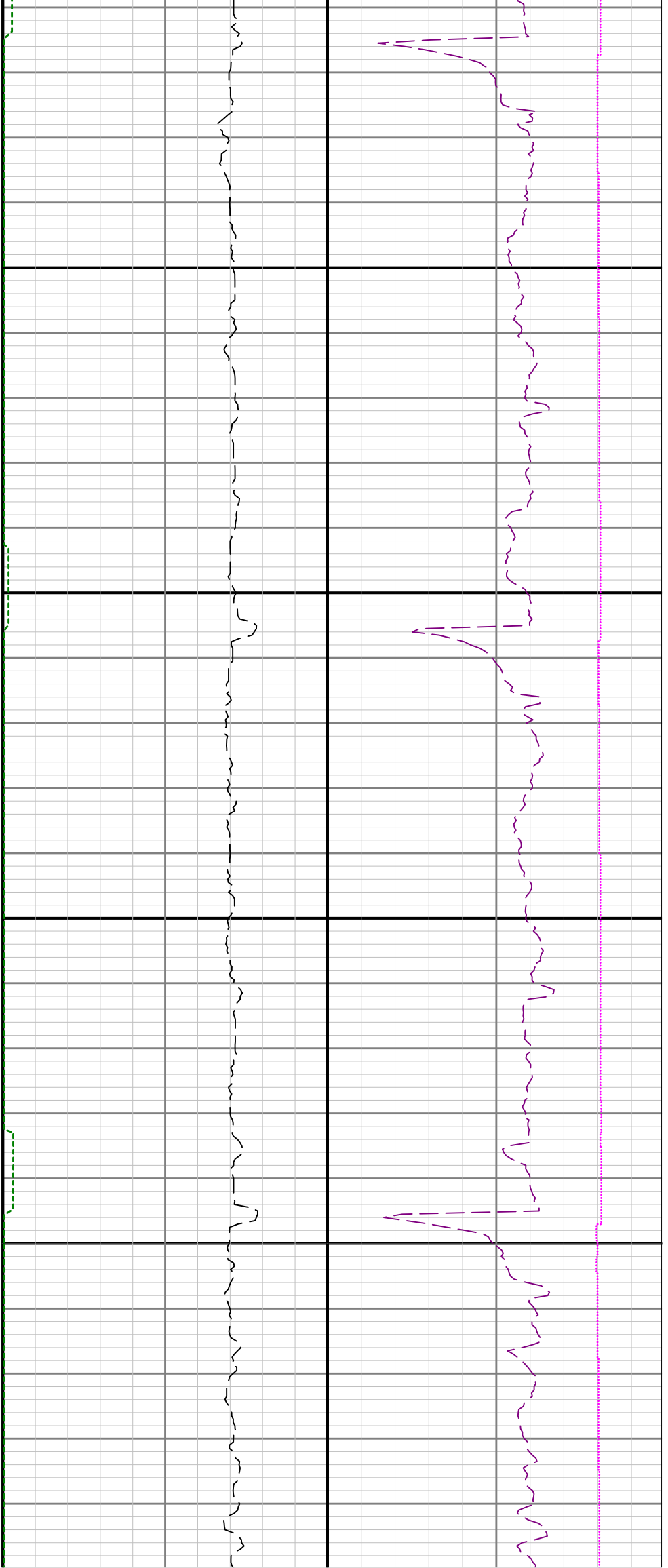
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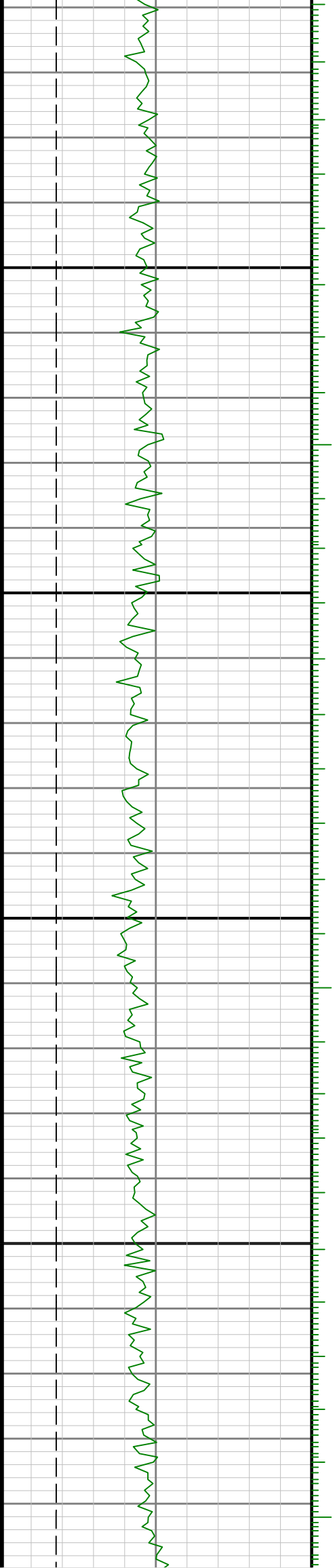


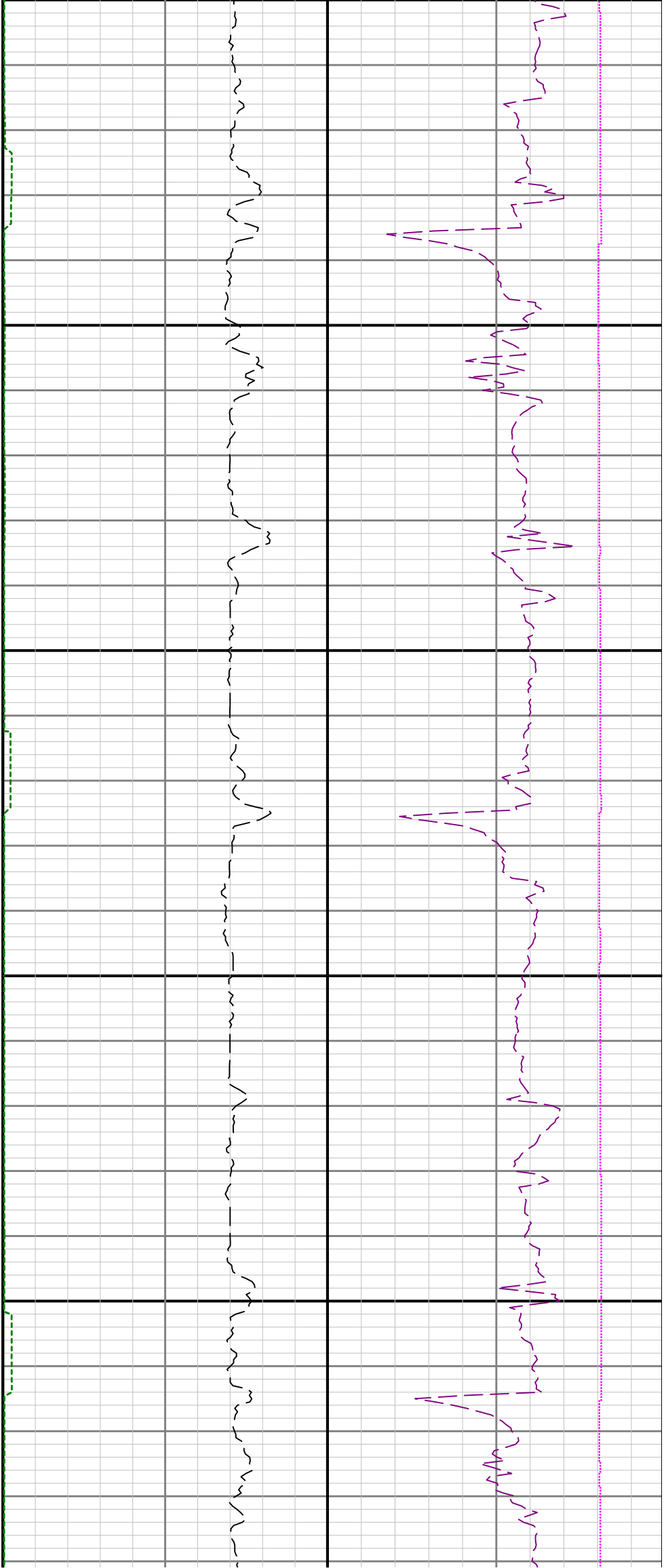


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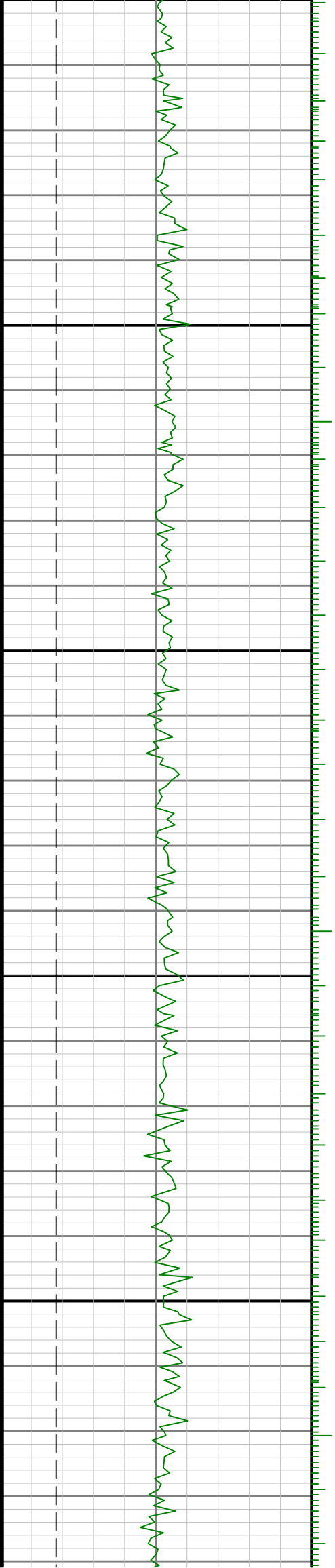


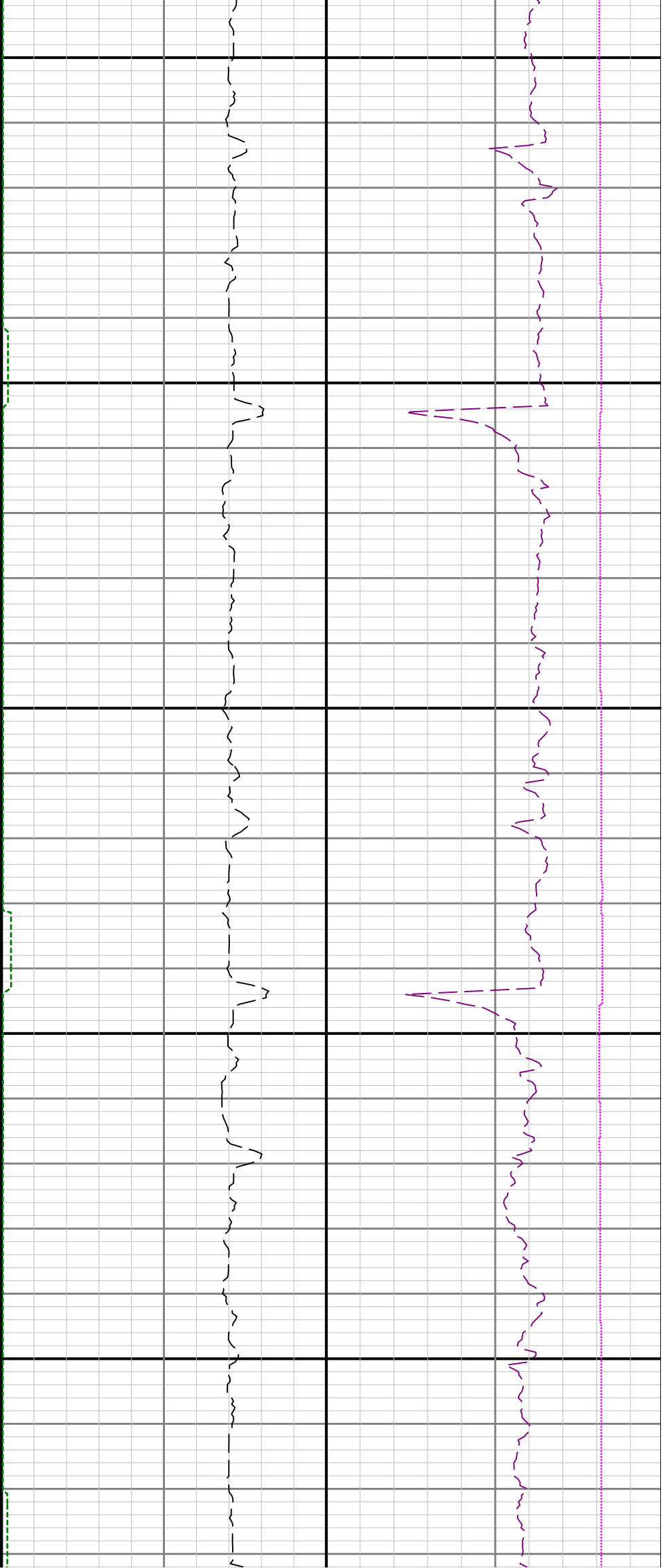


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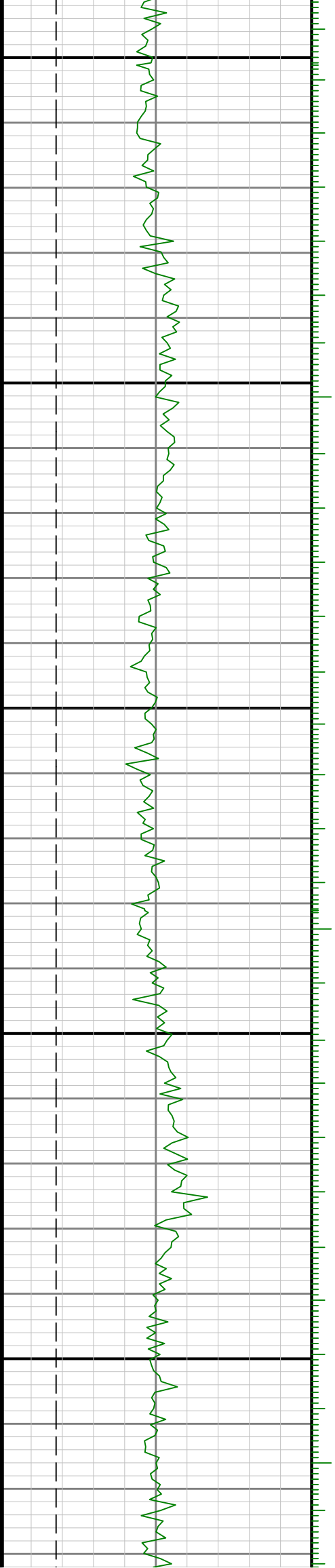
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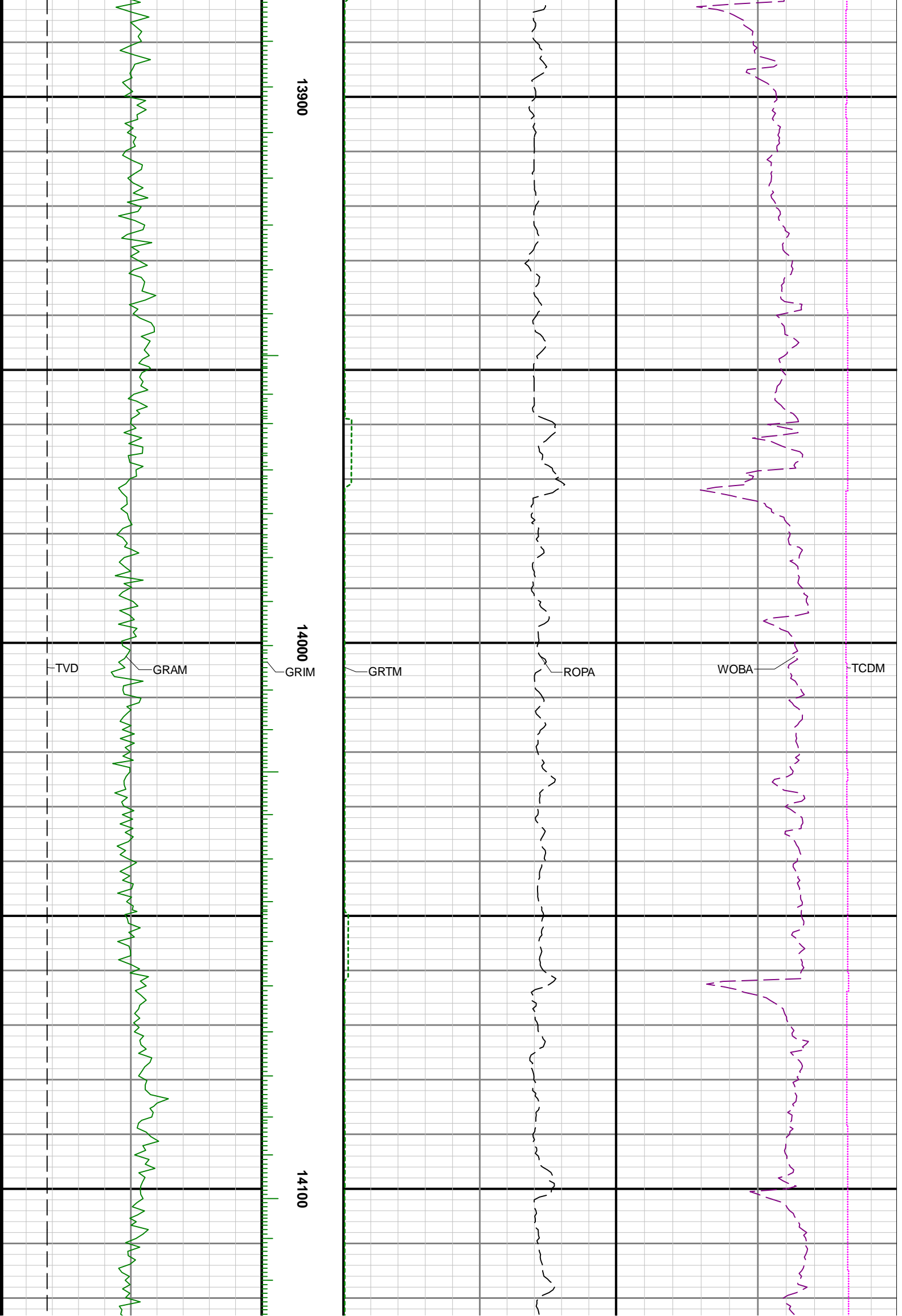


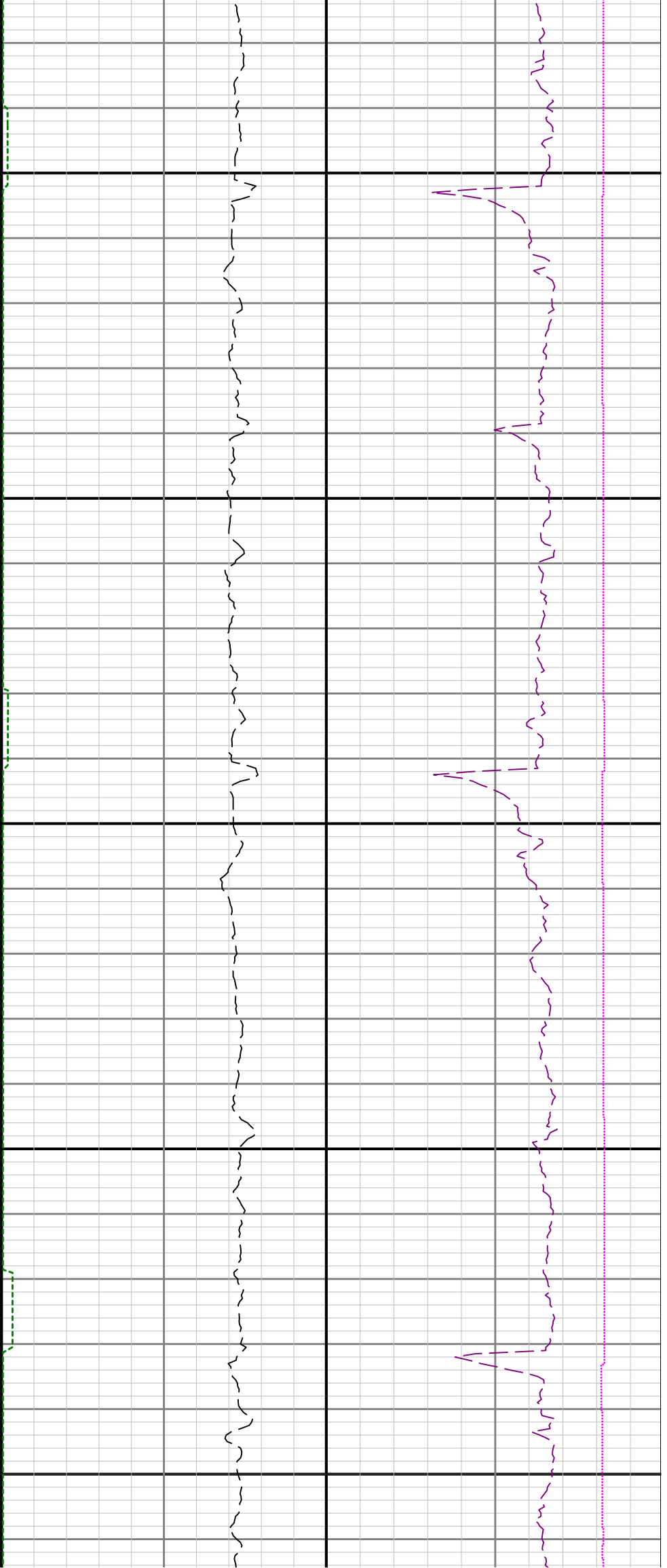


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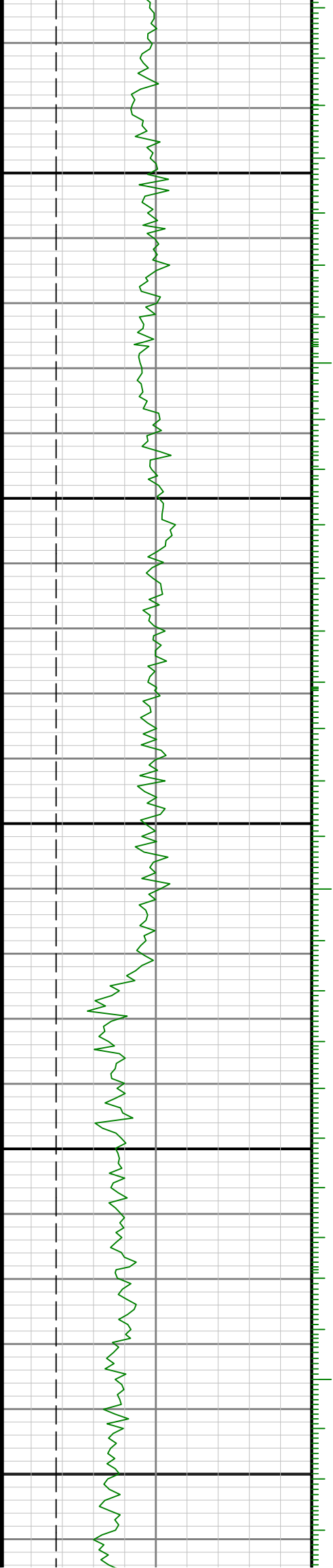


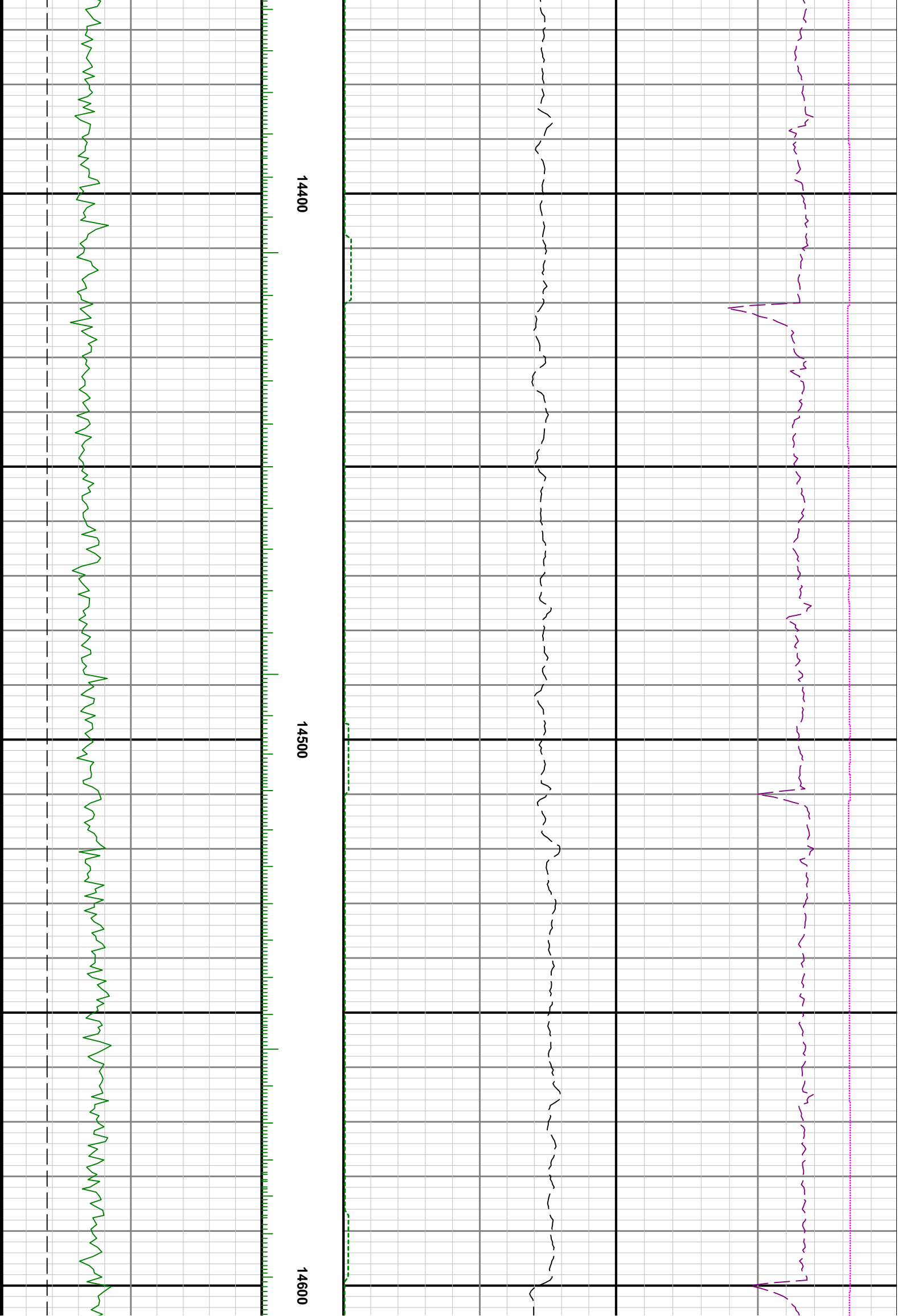




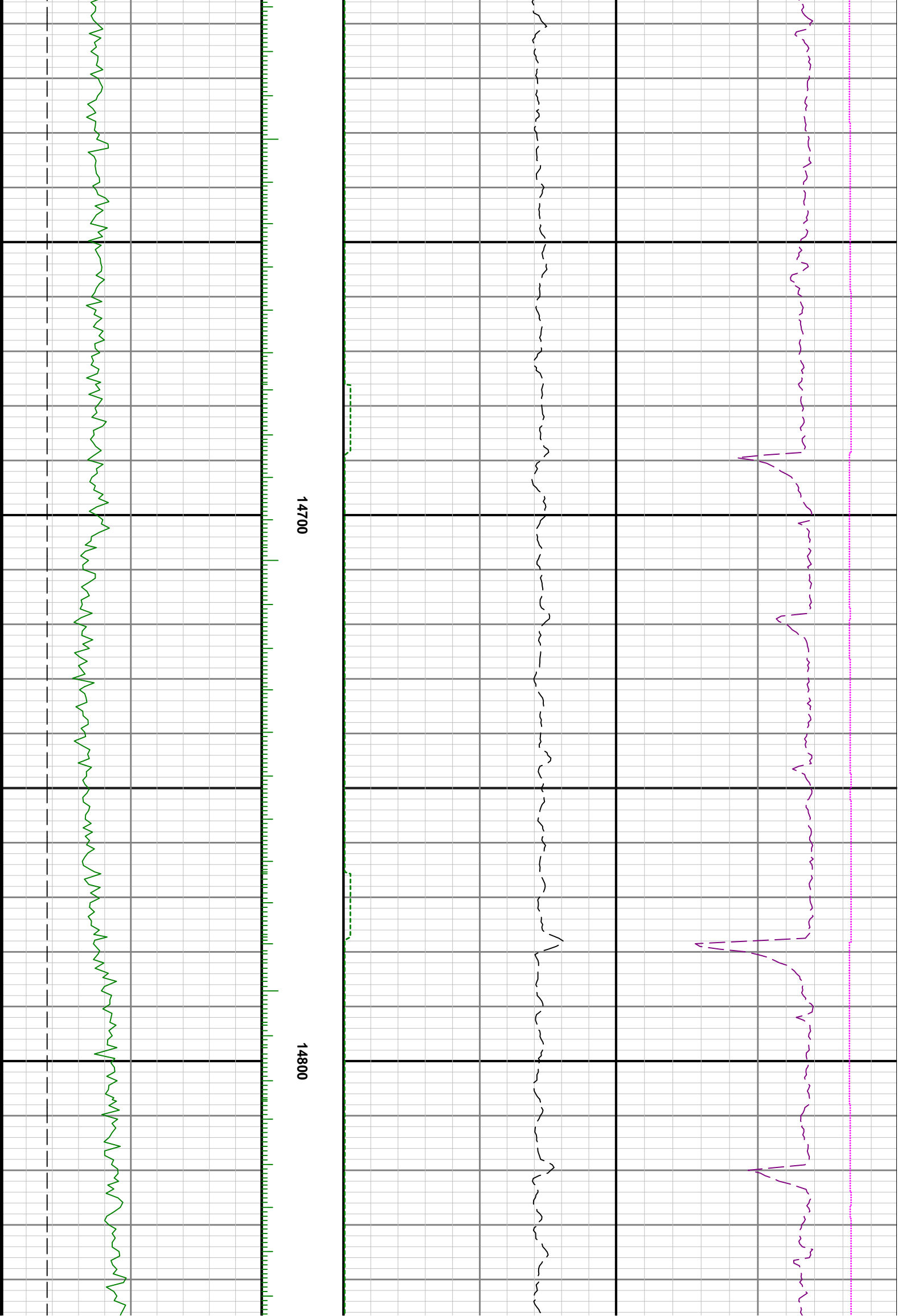
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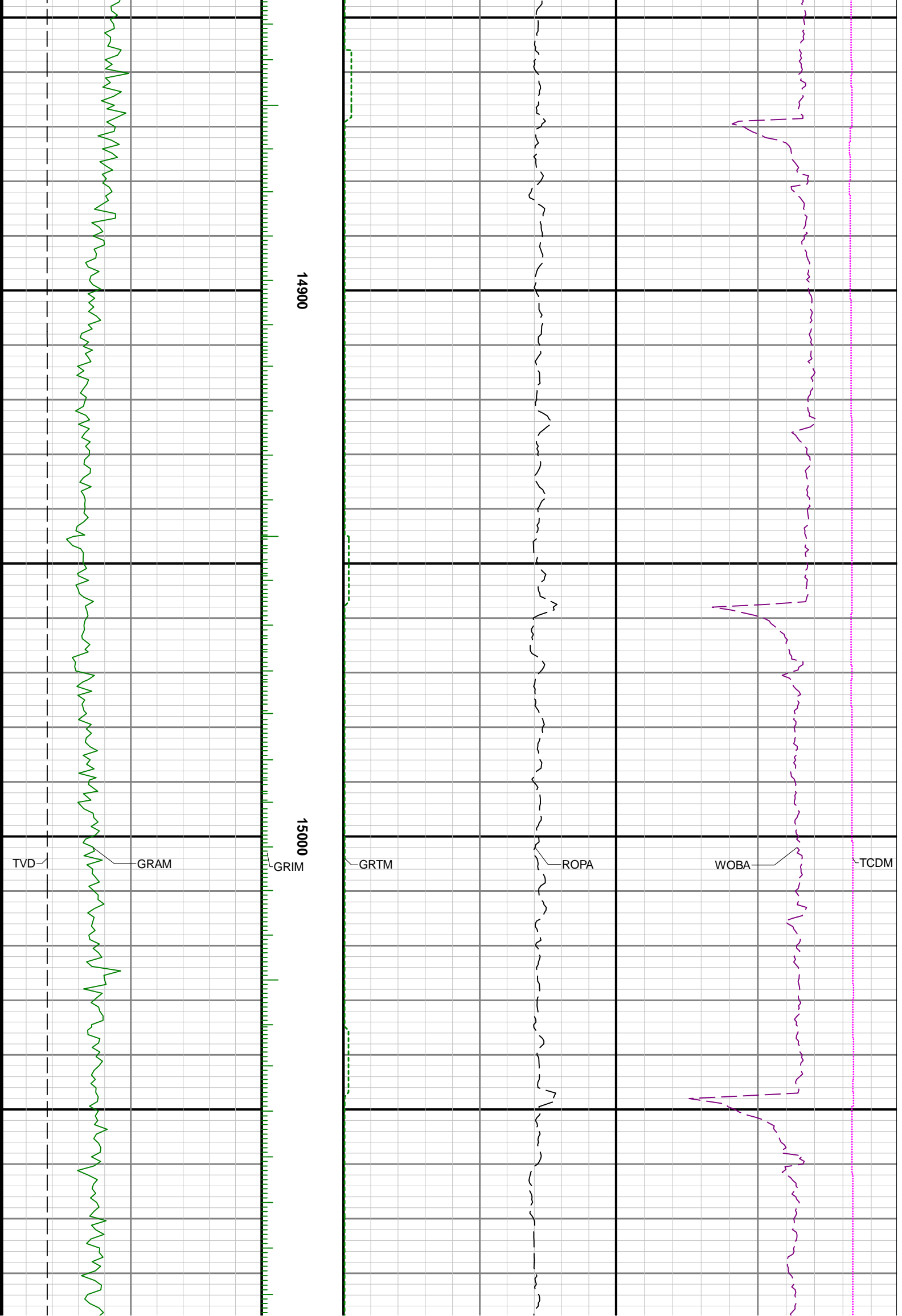
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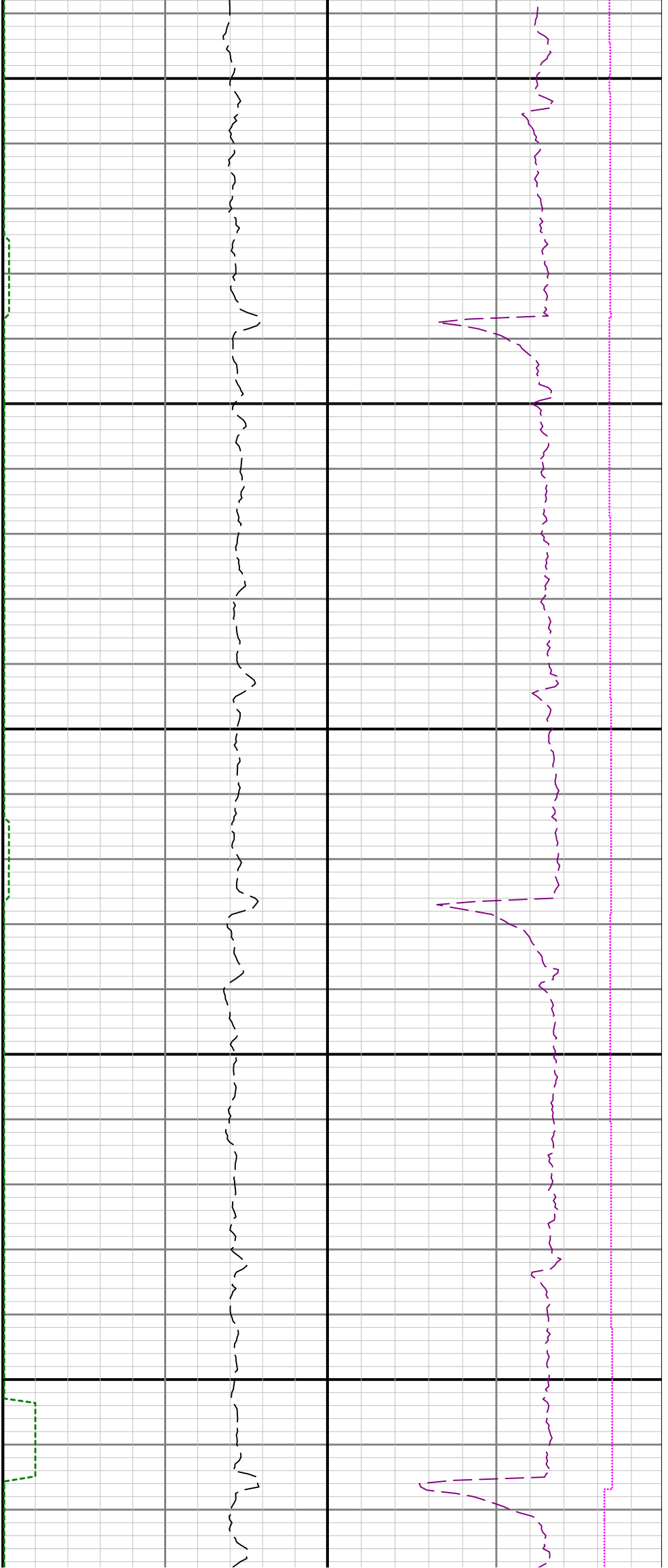








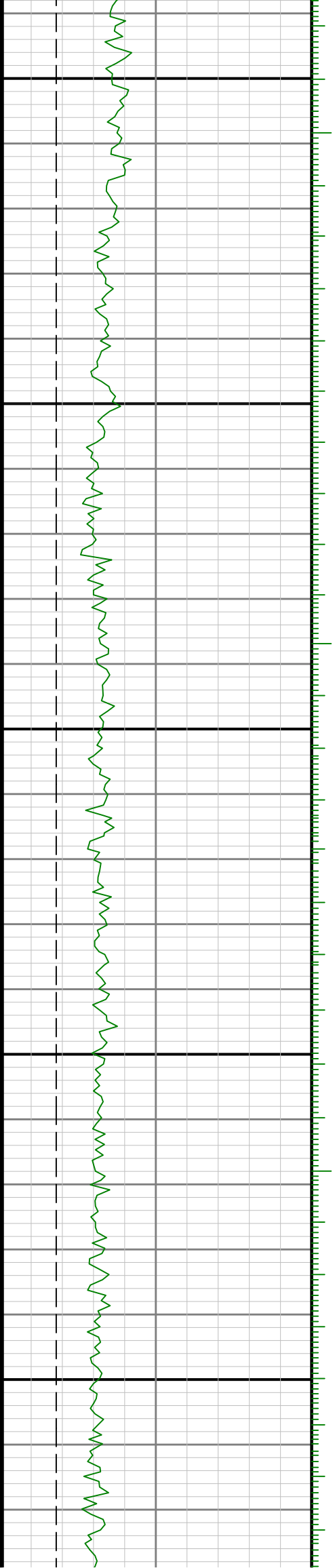


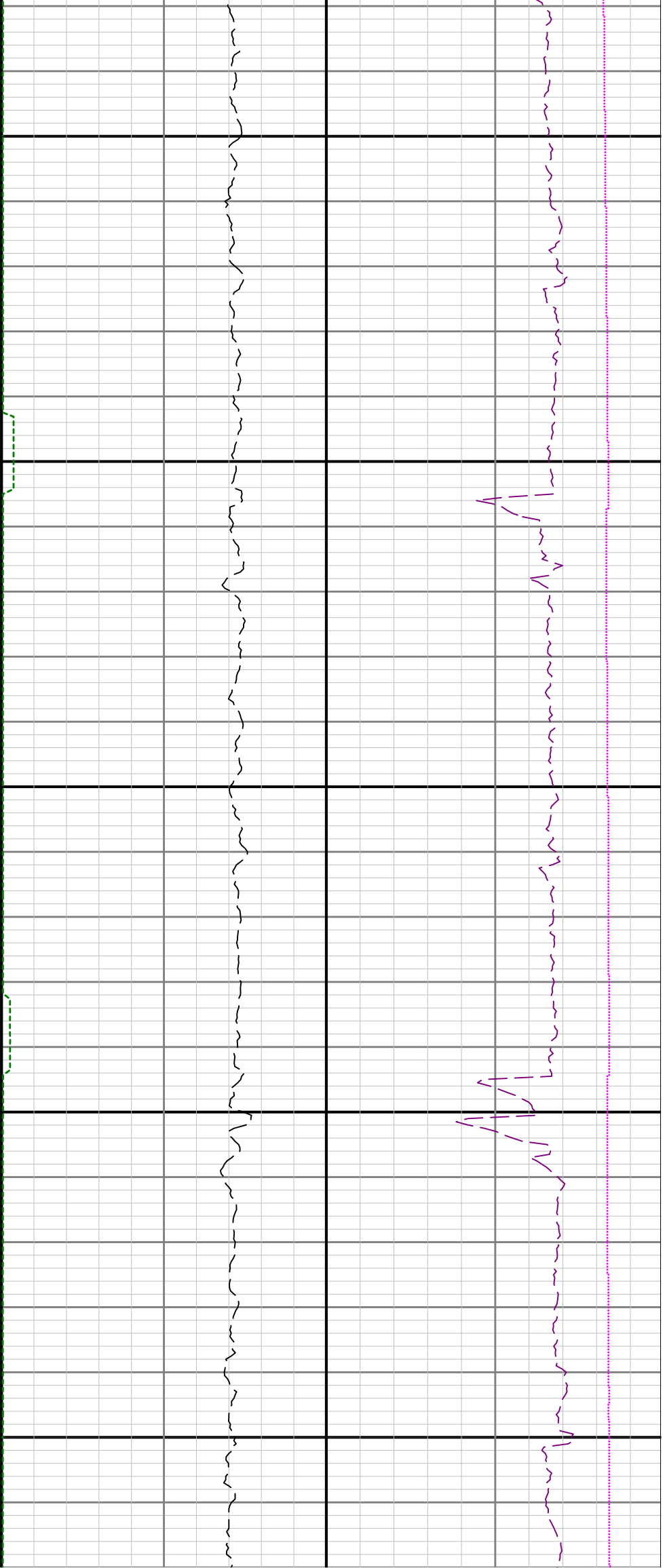


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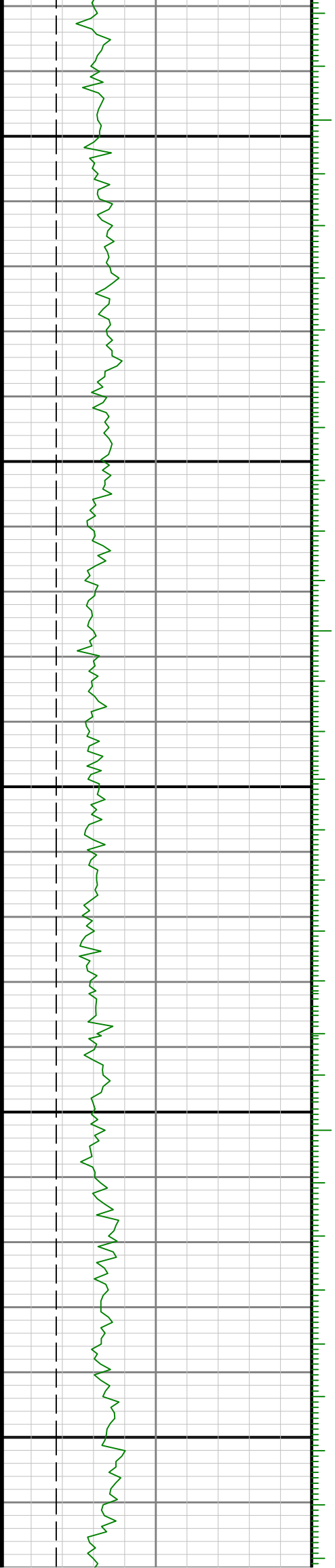
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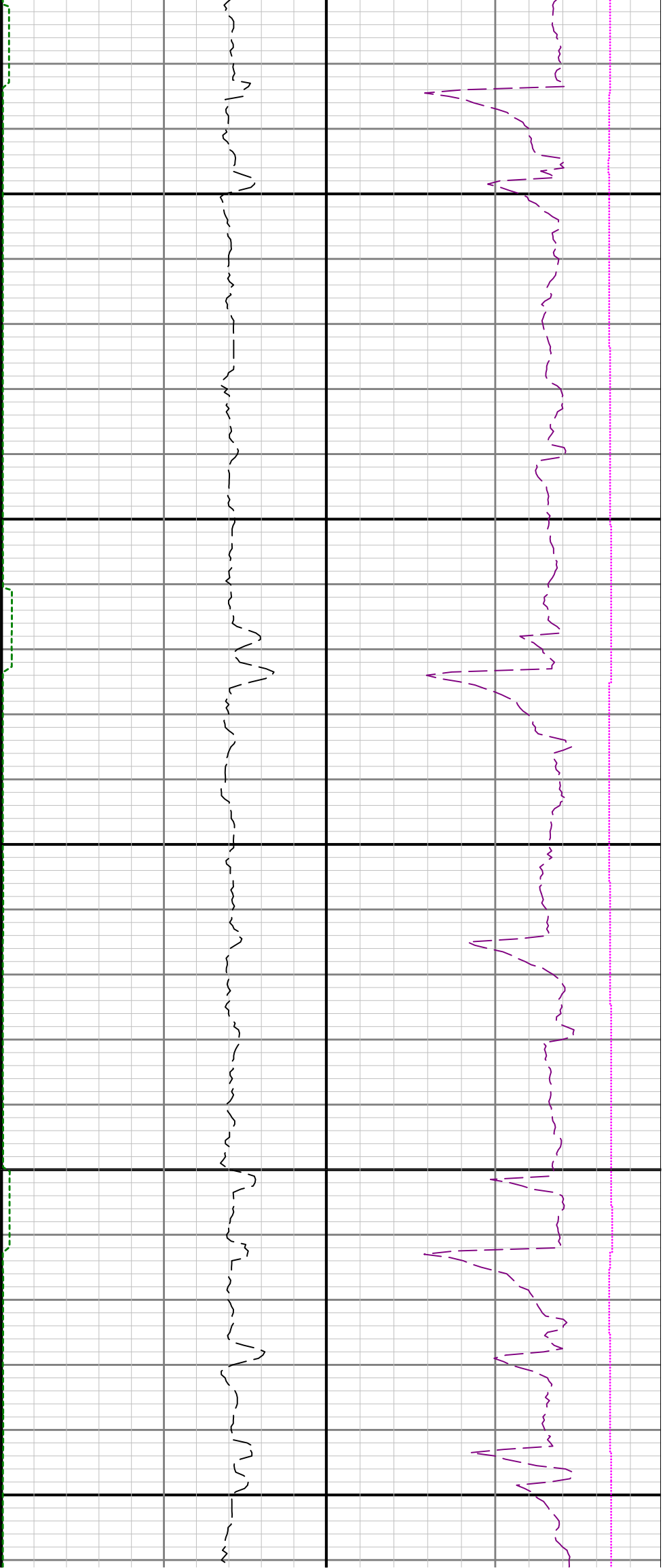




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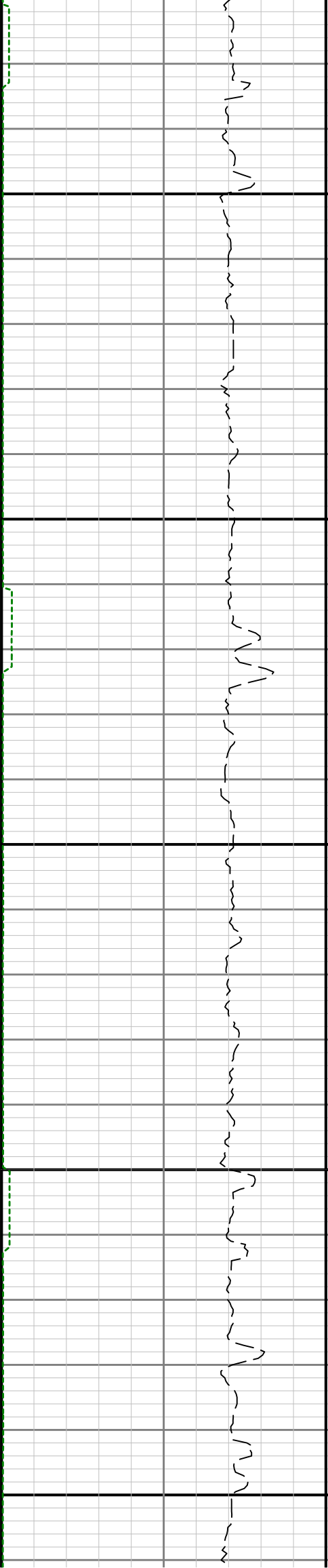


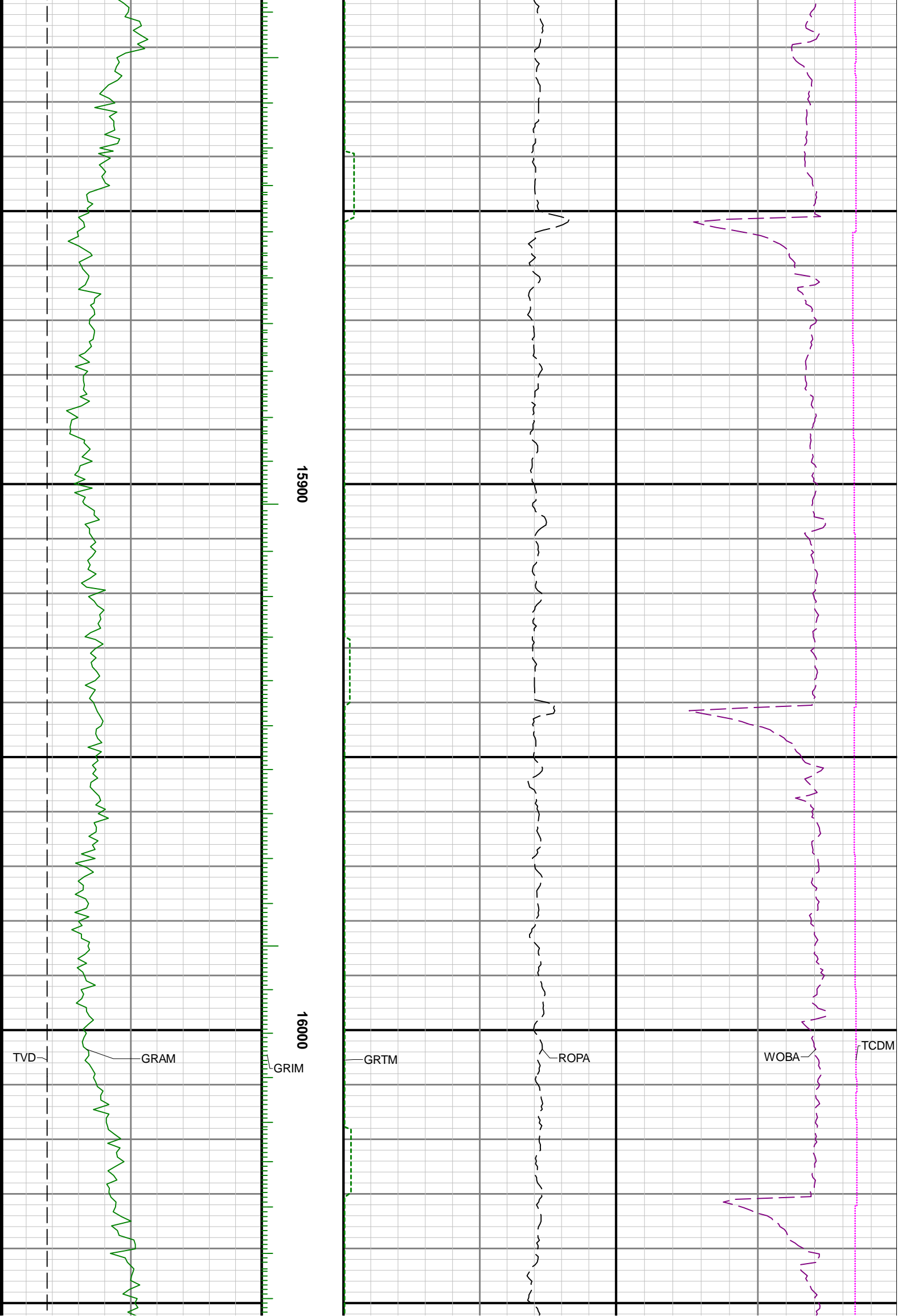


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