



Gamma Ray

LWD MEMORY LOG

Scale:

Company: Noble Energy

1:240

Well: Rampart A33-750

Measured Depth

Field: Wattenberg

Depth Reference:

County:

Weld

Country: United States

Driller's Depth

State: Colorado

Status:

Final Print

Surface Location:

Latitude:

Longitude:

Other Services:

API No: 05-123-50927-00

Job ID: 110958224

SEC:

21

TWN:

6N

RGE:

64W

Permanent Datum (P.D.):

Log Measured From:

Mean Sea Level

Rig Floor

Elevation:

Above P.D.:

0.00 ft

4757.00 ft

Elev. KB:

Elev. DF:

N/A

4727.00 ft

Dates

Interval

Magnetic Field Reference

From: 2021-08-08

To: 2021-08-12

Spud: 2021-07-28

Drilled (ft)

Top: 1959.00

Bottom: 17110.00

Logged (ft)

Top: 1959.00

Bottom: 17097.00

Azi Reference North:

Total Magnetic Field Strength: (nT)

Mag to Reference North Correction: (deg)

Grid Dip Angle: (deg)

51905

7.00

Borehole Record

Casing Record

Hole Size (in)	From (ft)	To (ft)	Size (in)	Weight (lb/ft)	From (ft)	To (ft)
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13.500	30.00	1959.00	9.625	36.00	30.00	1949.00
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8.500	1959.00	17110.00				
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Mud Record

Deviation Record

Type	From (ft)	To (ft)	Hole Size (in)	Interval (ft)	Inc Az (Start)	Inc Az (End)
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Oil Based Mud	1959.00	17110.00	8.500	15151.00	1.87 50.52	89.38 178.64
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Acquisition System

Software Version

Other

Cadence

RT 6.1

6.1.9214.1

Rig:

H&P 517

Contractor:

Helmerich & Payne Drilling Co

Unit: D&E

DeliverableGen

6.1.9214.1

District:

RMA

Unit: D&E

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Log Run Summary

Run No	Bit Run No.	Bit Size (in)	Bit Type	Bit Gauge Length (in)	Assembly Type	Logged Interval		Bit Depth Interval		Date / Time		Circ. Hours
						Top (ft)	Bottom (ft)	From (ft)	To (ft)	Start Logging	End Logging	
1	1	8.500	PDC	3.00	AutoTrak Curve	1959.00	17097.00	1959.00	17110.00	2021-08-08 16:43	2021-08-12 09:07	78.36

Crew

Name		Arrive Wellsite	Depart Wellsite	Name		Arrive Wellsite	Depart Wellsite	Name		Arrive Wellsite	Depart Wellsite
Alix Cain		2021-08-08	2021-08-11	Jeremiah Samson		2021-08-08	2021-08-13	Michael Gurnsey		2021-08-08	2021-08-13
Tien Bui		2021-08-08	2021-08-13	Tyler Bench		2021-08-08	2021-08-11	Dallata Dinh		2021-08-12	2021-08-13
Rizwan Khan		2021-08-12	2021-08-13								

Witness

Name		Run
Dave Nielson		1

Mud Properties Record

Date / Time		Run No.	Depth (ft)	Mud Type	Density (ppg)	Viscosity (cP)	pH	Fluid Loss (cm3)	Oil / Water	Source	Total Chlorides (ppm)	K+ (%)
2021-08-07 17:47		1	1959.00	Oil Based Mud	9.2	10	N/A	20.0	79.5/20.5	Active Pit	25500	0.00
2021-08-08 16:00		1	1959.00	Oil Based Mud	9.3	11	N/A	2.0	81/19	Active Pit	28475	0.00
2021-08-09 05:00		1	5871.00	Oil Based Mud	9.1	11	N/A	2.0	80/20	Active Pit	28000	0.00
2021-08-09 16:00		1	7730.00	Oil Based Mud	9.5	12	N/A	3.0	80.9/19.1	Active Pit	24781	0.00
2021-08-10 16:00		1	9048.00	Oil Based Mud	10.8	15	N/A	3.0	79.7/20.3	Active Pit	23810	0.00
2021-08-11 05:00		1	11403.00	Oil Based Mud	11.1	14	N/A	3.0	71.85/28.15	Active Pit	23324	0.00
2021-08-11 16:00		1	13816.00	Oil Based Mud	11.2	16	N/A	3.0	81.1/18.9	Active Pit	24295	0.00

Equipment and Service Data

Run No.	Tool	Serial Number	Measurement	Sensor Offset (ft)	Bit Offset (ft)	Max O.D. (in)	Min I.D. (in)
1	AutoTrak Curve Steering Unit	15322209	Near Bit VSS	5.93	6.75	7.000	4.330
1	AutoTrak Curve Steering Unit	15322209	Near Bit Inclination	5.93	6.75	7.000	4.330
1	AutoTrak Curve MWD	14256861	Gamma (single)	2.82	12.92	7.000	3.250
1	AutoTrak Curve MWD	14256861	Directional (mag)	12.27	22.37	7.000	3.250

Service and Tool Mnemonics

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

Comments

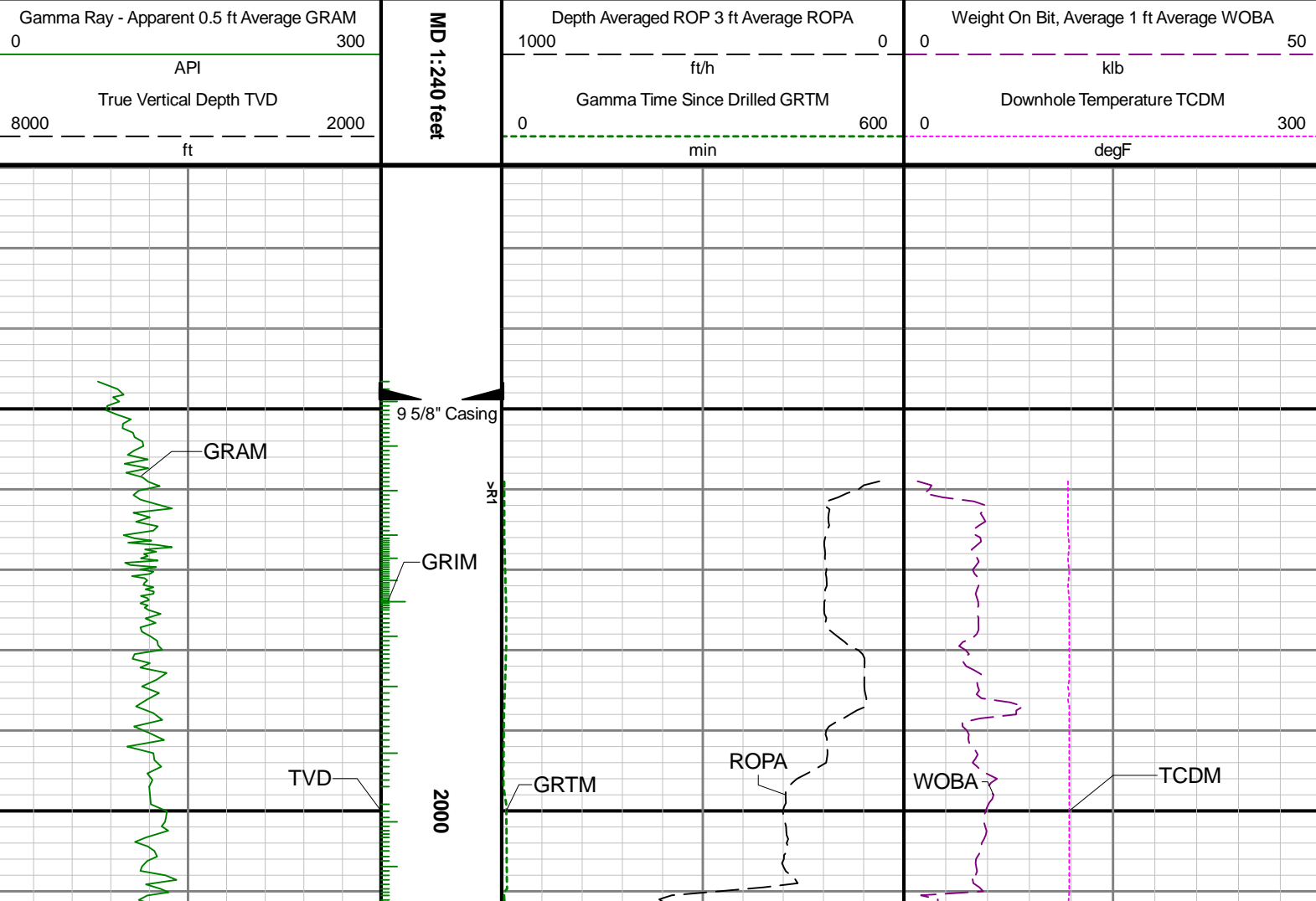
- 1 Baker Hughes LWD Run 1 utilized 6 ¾ inch NaviGamma service (Gamma Ray and Directional) behind a 8 1/2 inch bit and rotary steerable assembly from 1959 to 17110 feet MD (1959 to 6885 feet TVD).
- 2 Depth measurements were obtained from a depth control system not supplied or operated by Baker Hughes. Due to lack of control by Baker Hughes logging engineers, depth calibrations and measurements could not be independently verified.
- 3 The Gamma Ray Apparent (GRAM) data is presented 0 to 300 API, per the customer's request.

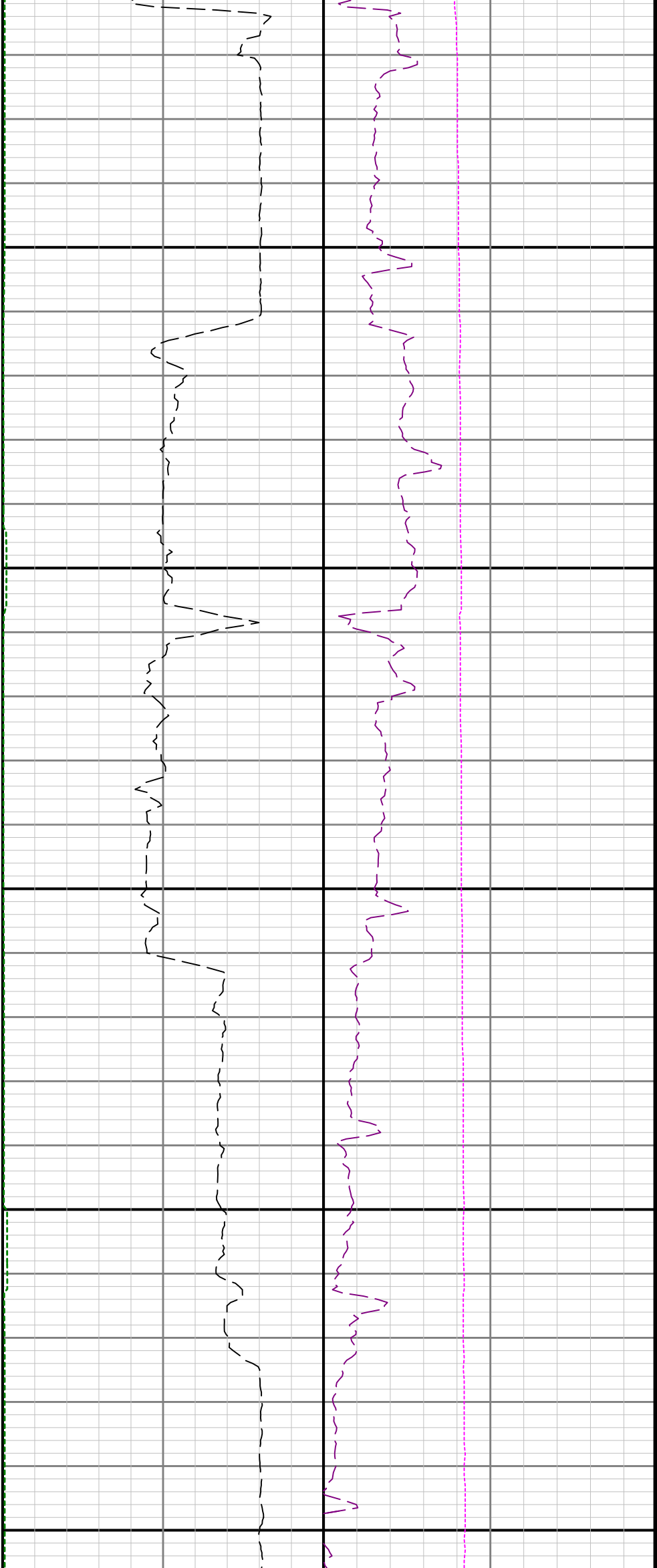
Remarks

Number	Depth (ft)	Hole Section (in)	Run No.	Remark
1	6650.00	8.500	1	The interval from 6650 to 6674 feet MD (6373 to 6395 feet TVD) was not logged due to a temporary failure of third party depth tracking system.
2	13806.00	8.500	1	The interval from 13806 to 13866 feet MD (6880 to 6880 feet TVD) was not logged due to a temporary failure of third party depth tracking system.
3	17097.00	8.500	1	The interval from 17097 to 17110 feet MD (6885 to 6885 feet TVD) was not logged due to sensor to bit offset at well TD

Curve Mnemonics

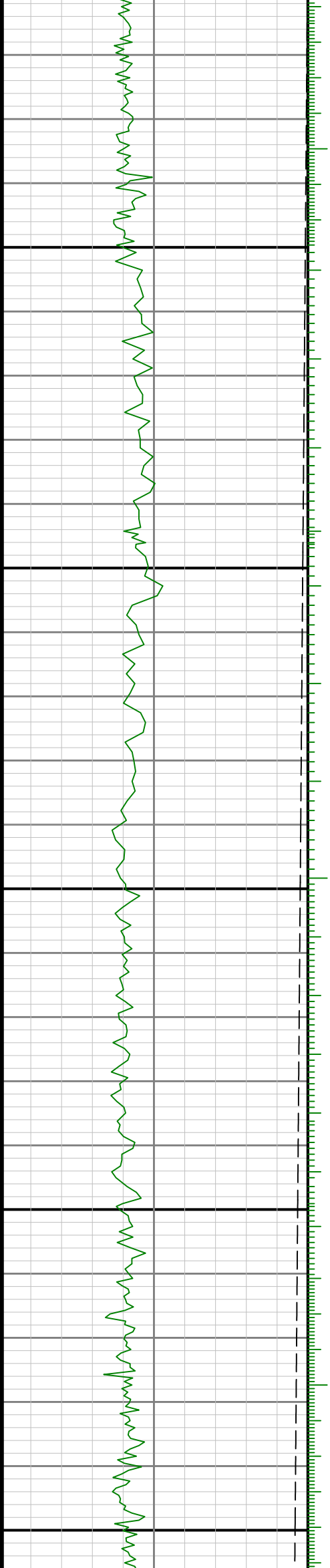
Presented Curves	Description	Units
ROPA	Depth Averaged ROP 3 ft Average	ft/h
TVD	True Vertical Depth	ft
WOBA	Weight on Bit - Average 1 ft Average	klb
GRAM	Gamma Ray - Apparent - Memory 0.5 ft Average	API
GRIM	Gamma Ray - Data Point Indicator - Memory	unitless
GRTM	Gamma Ray - Time Since Drilled - Memory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

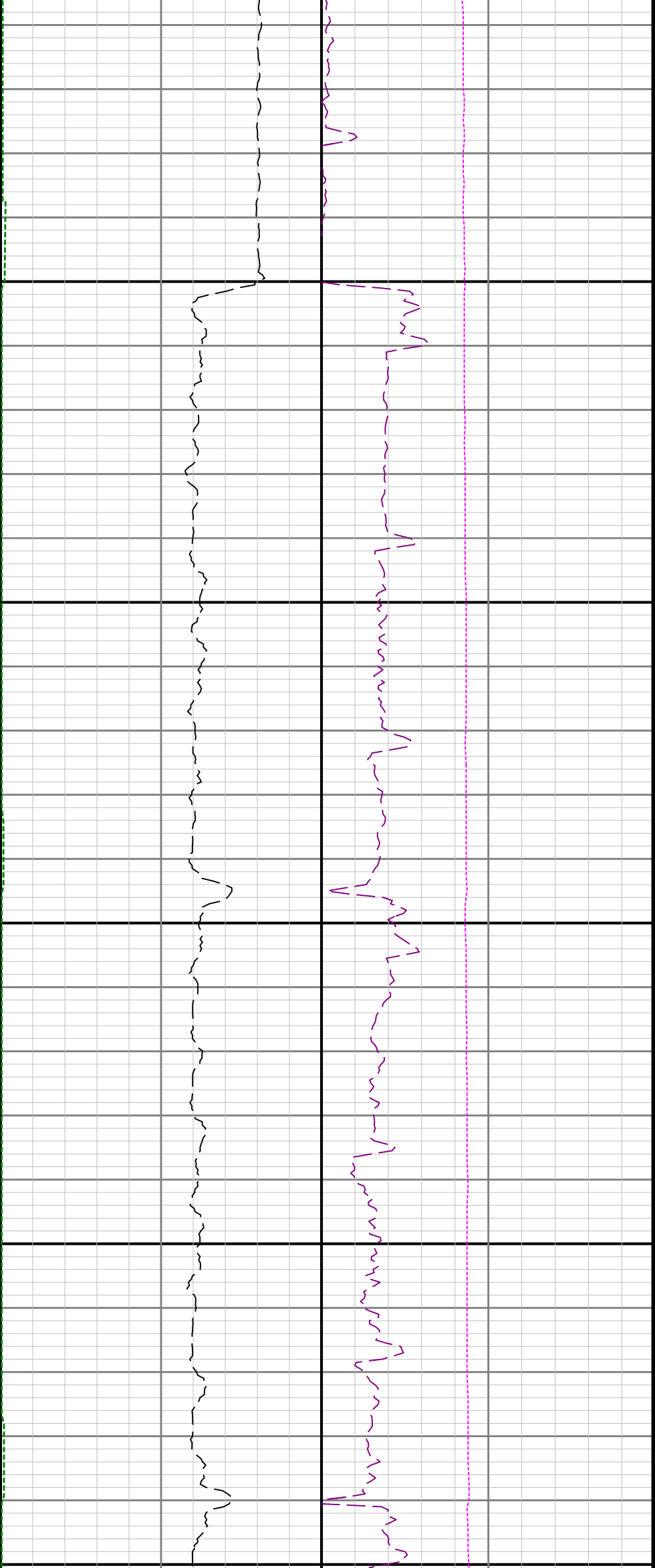




2100

2200

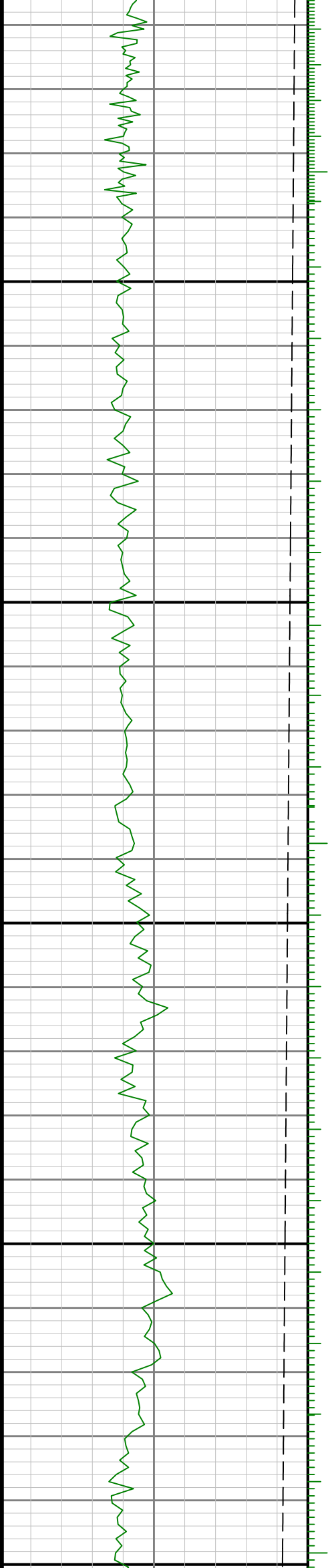


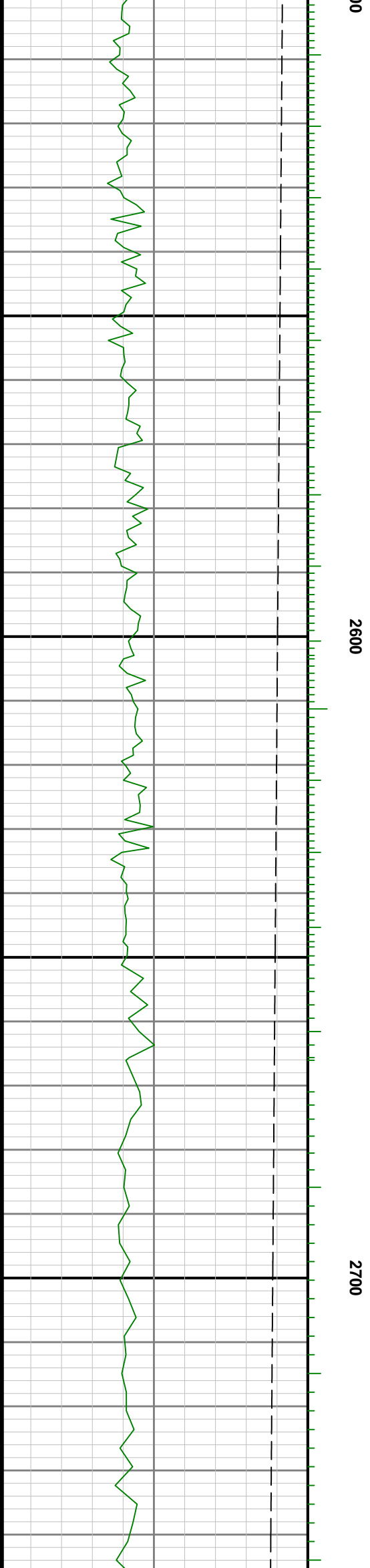
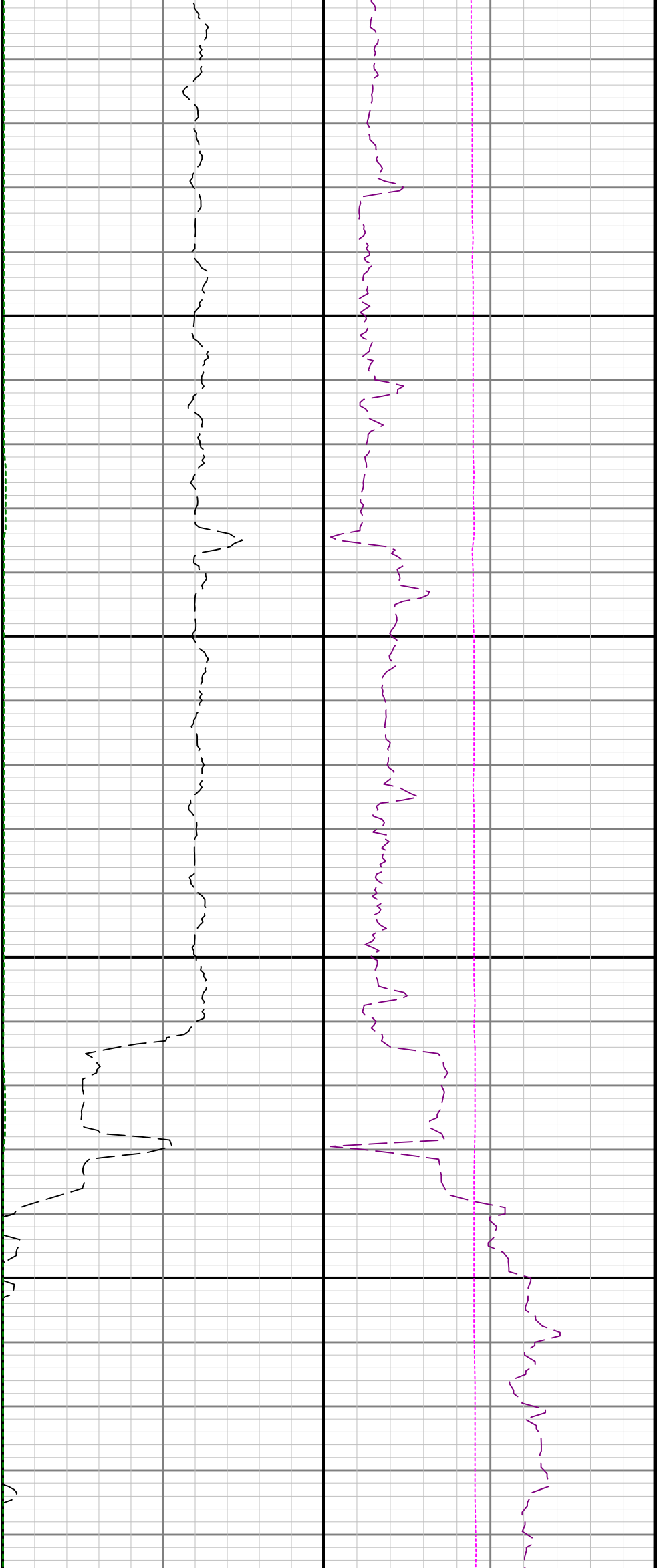


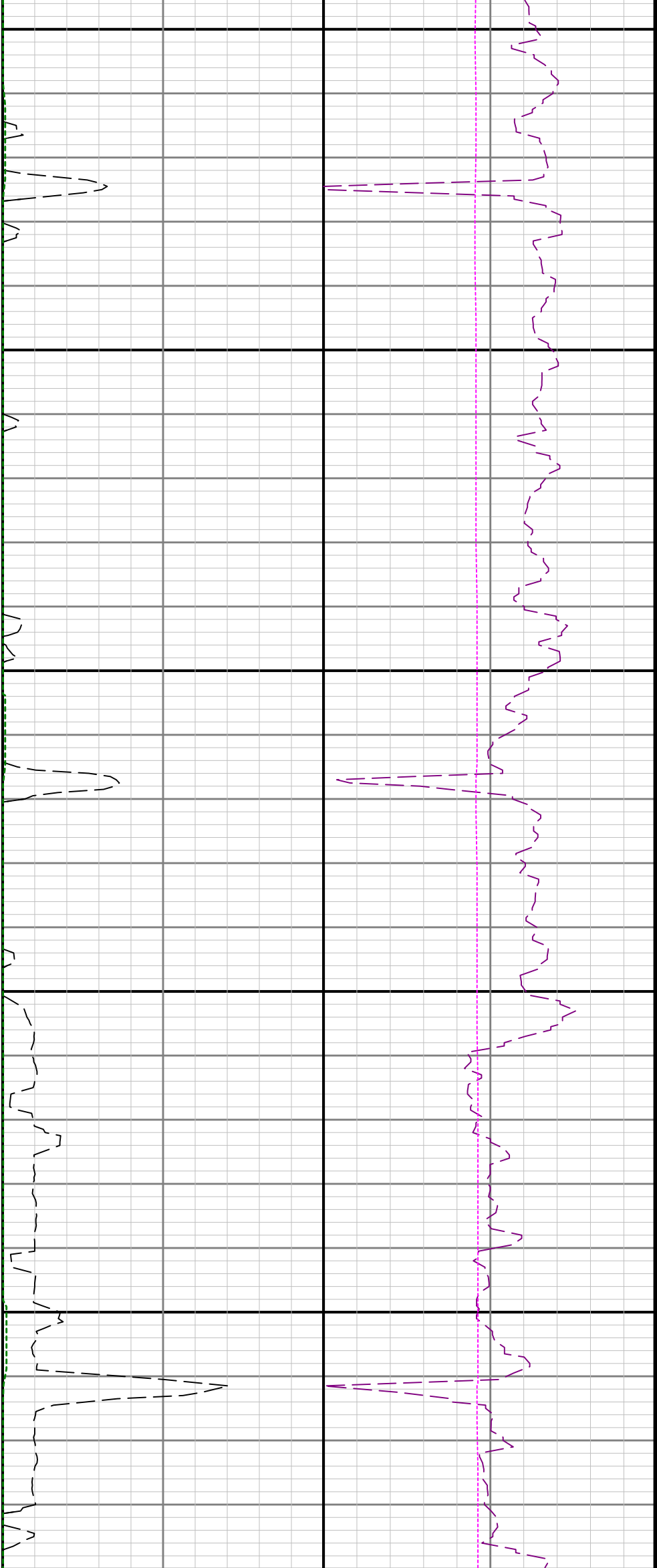
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2400

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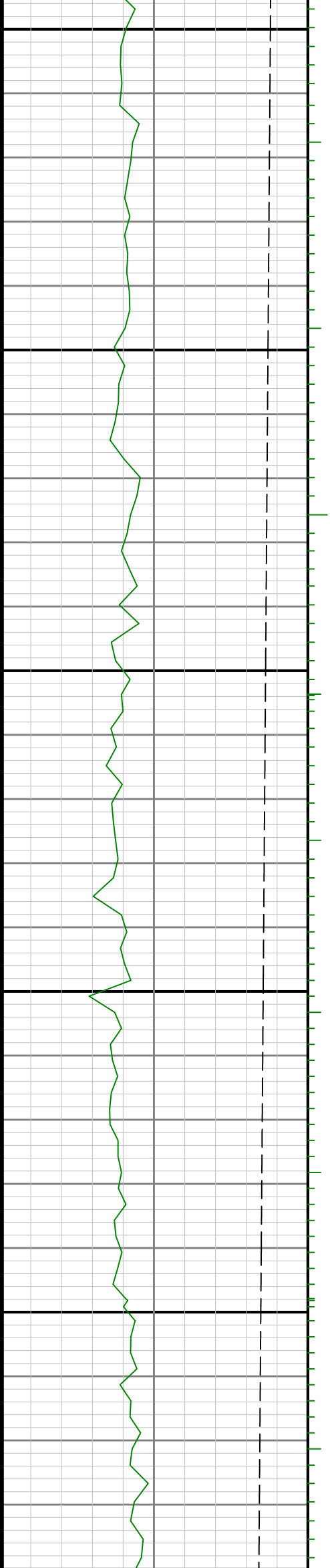


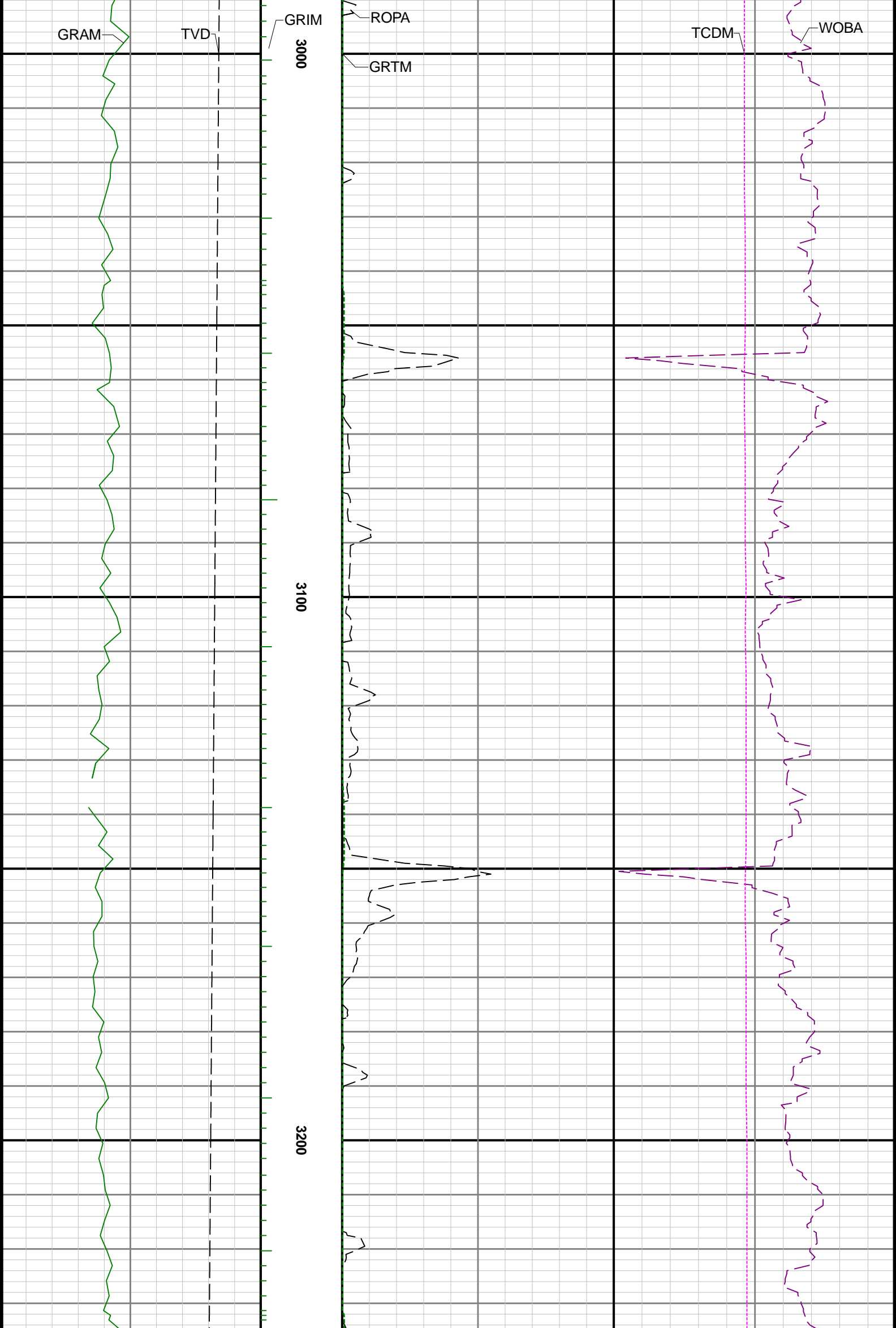


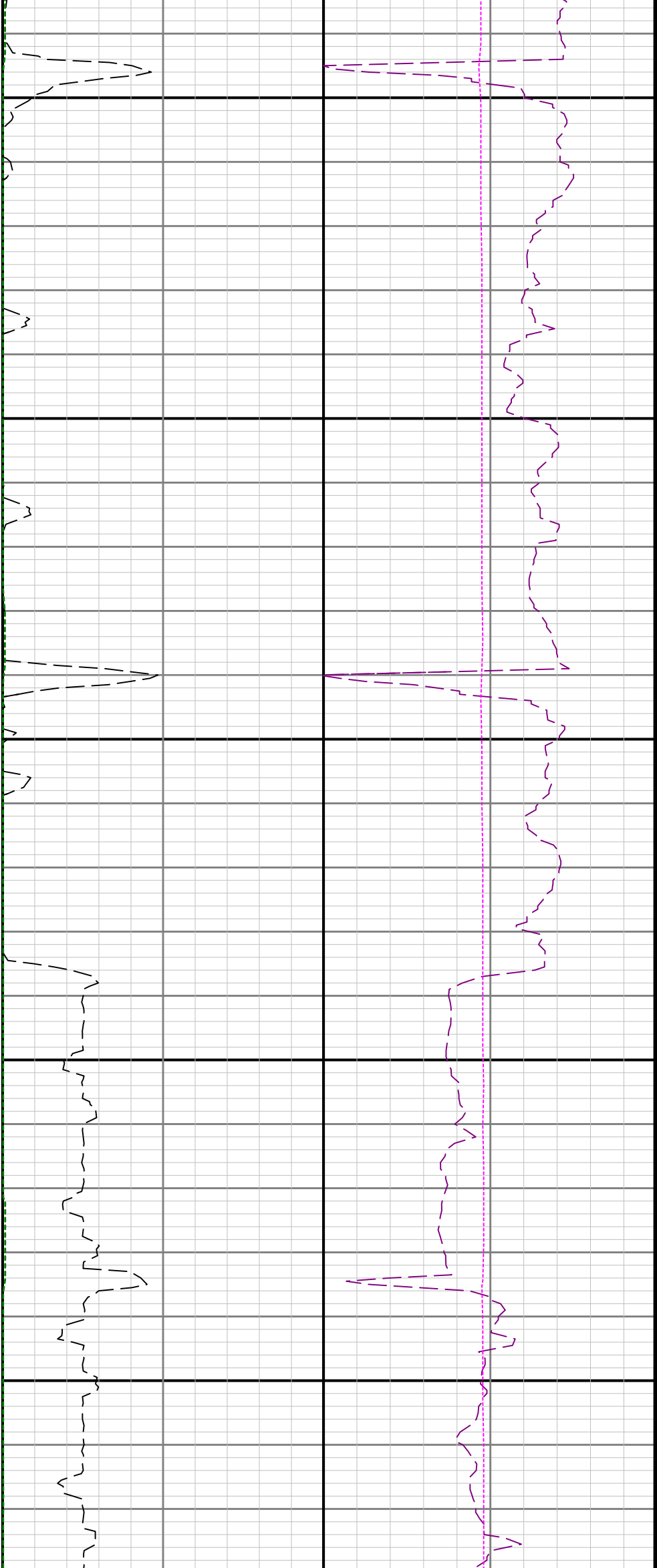


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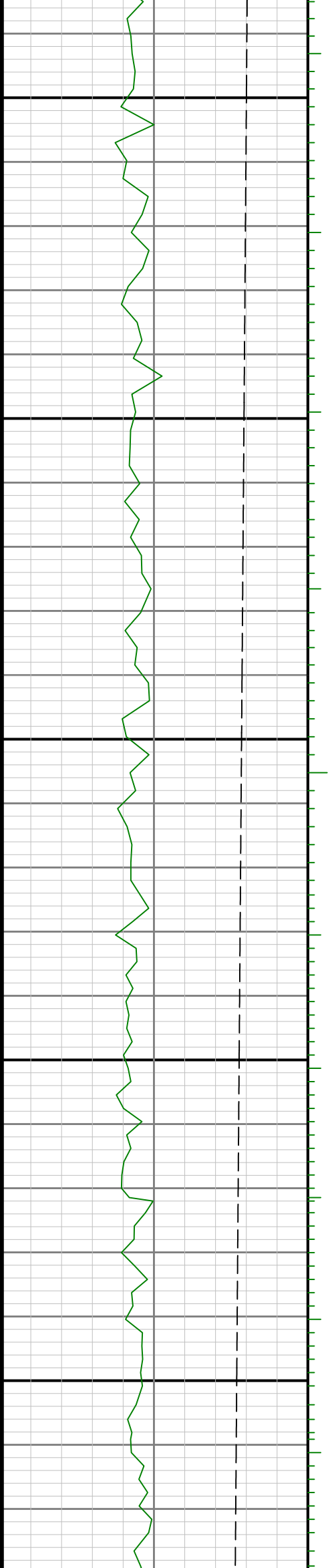


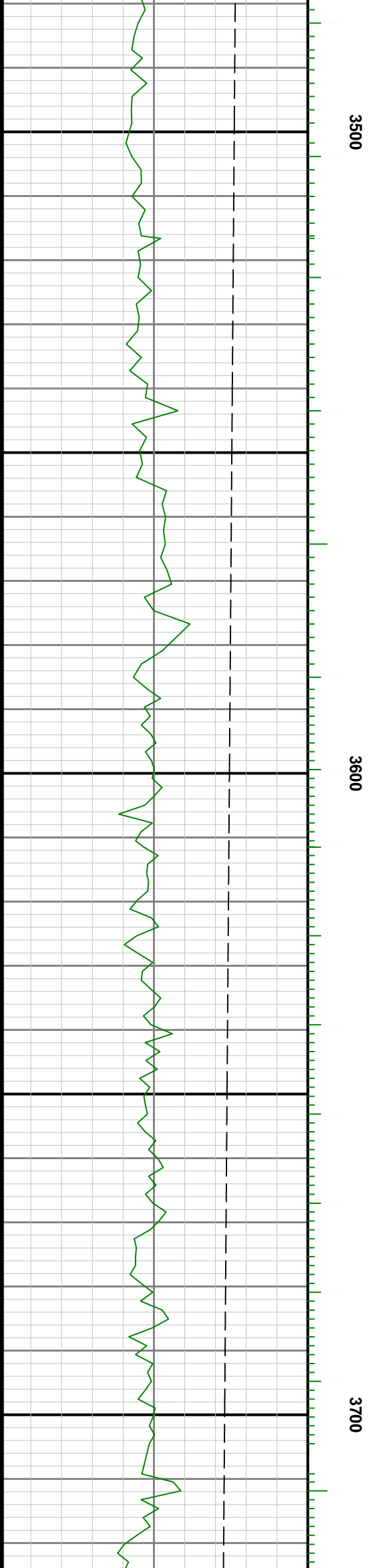
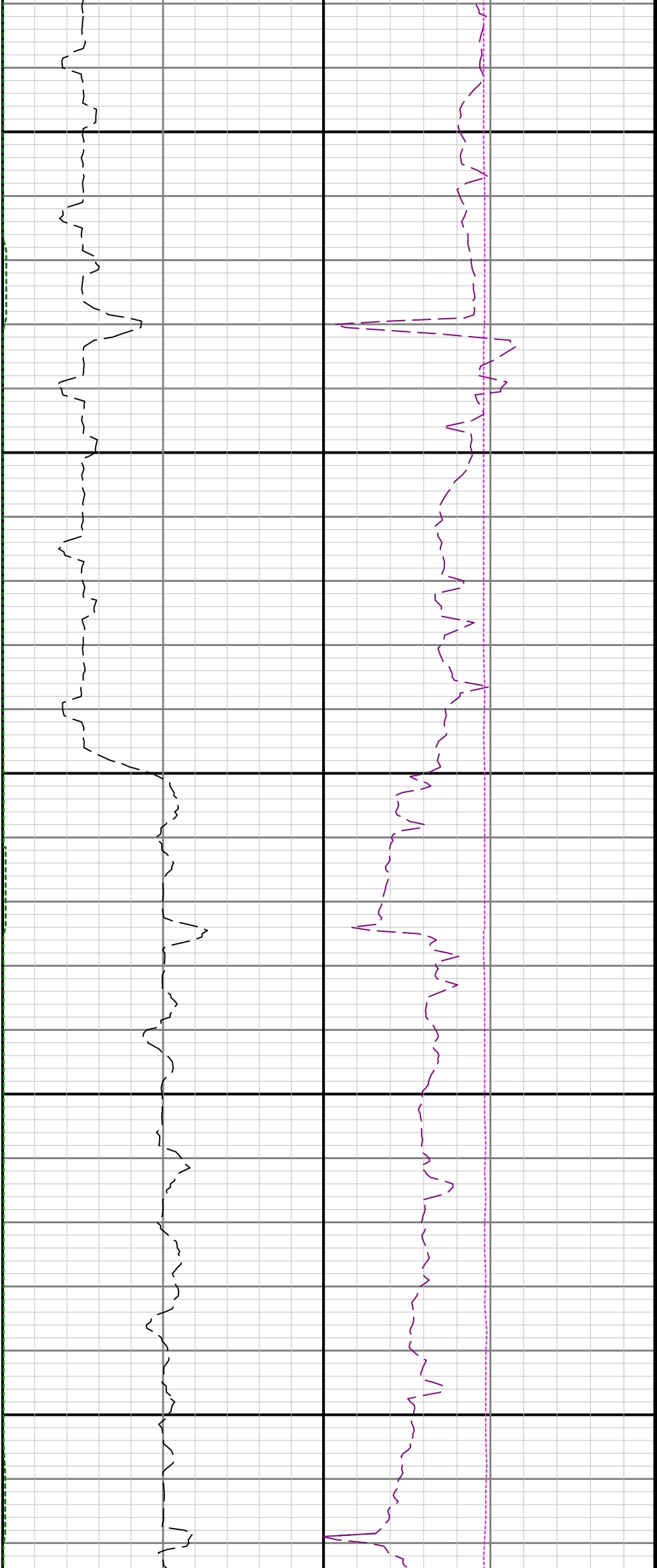


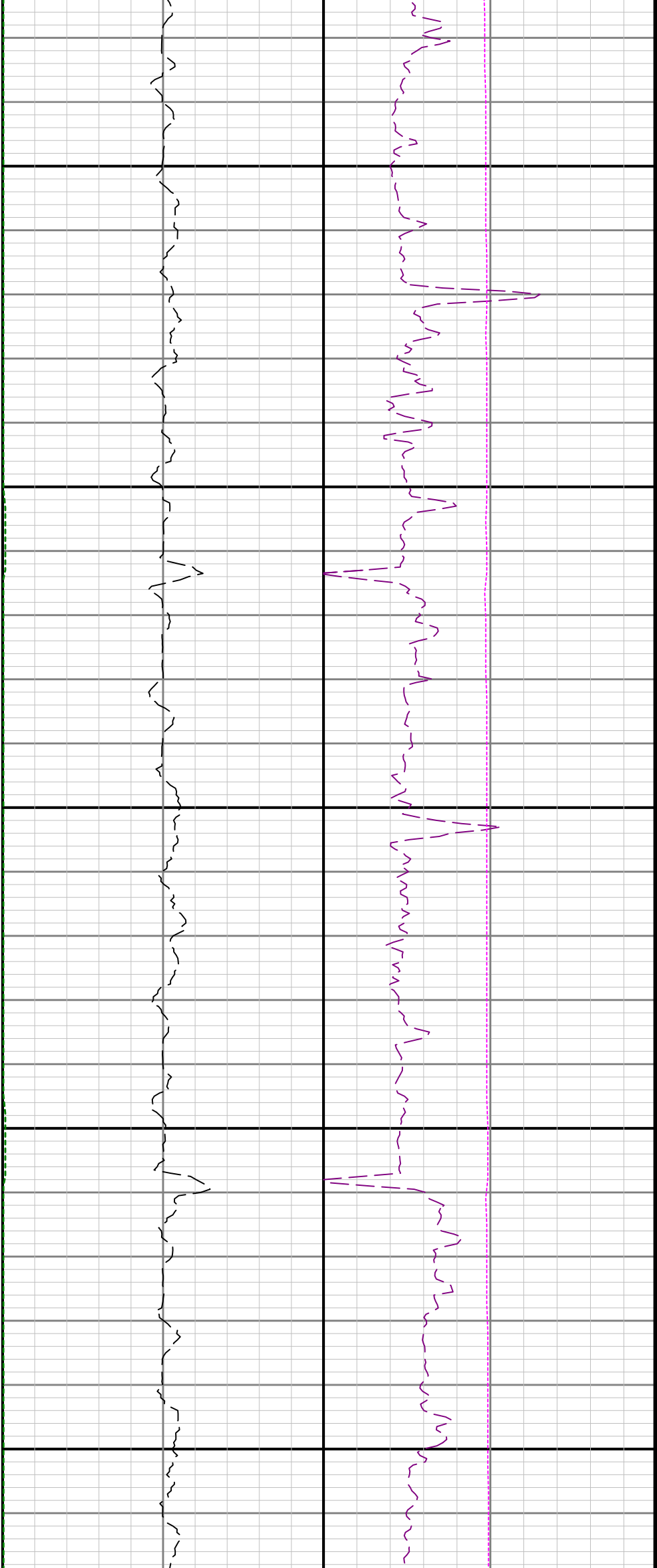


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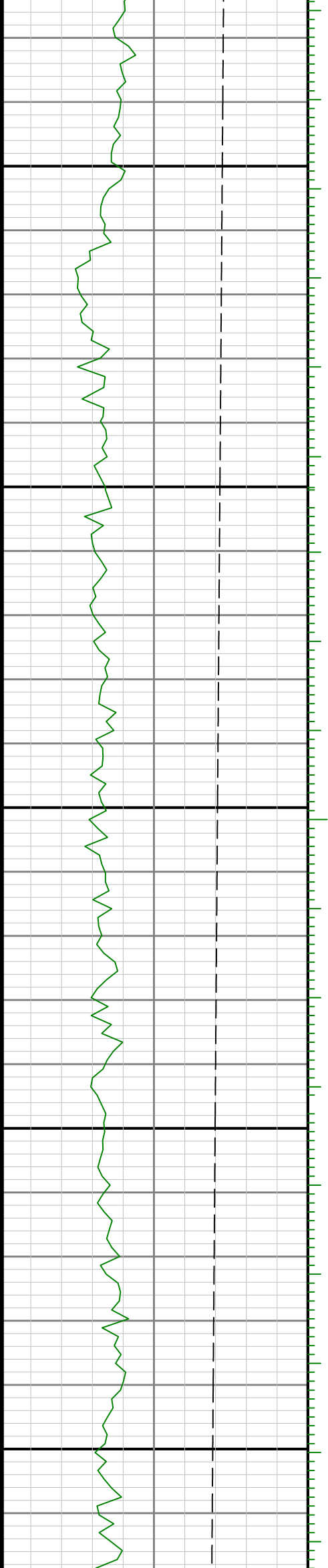


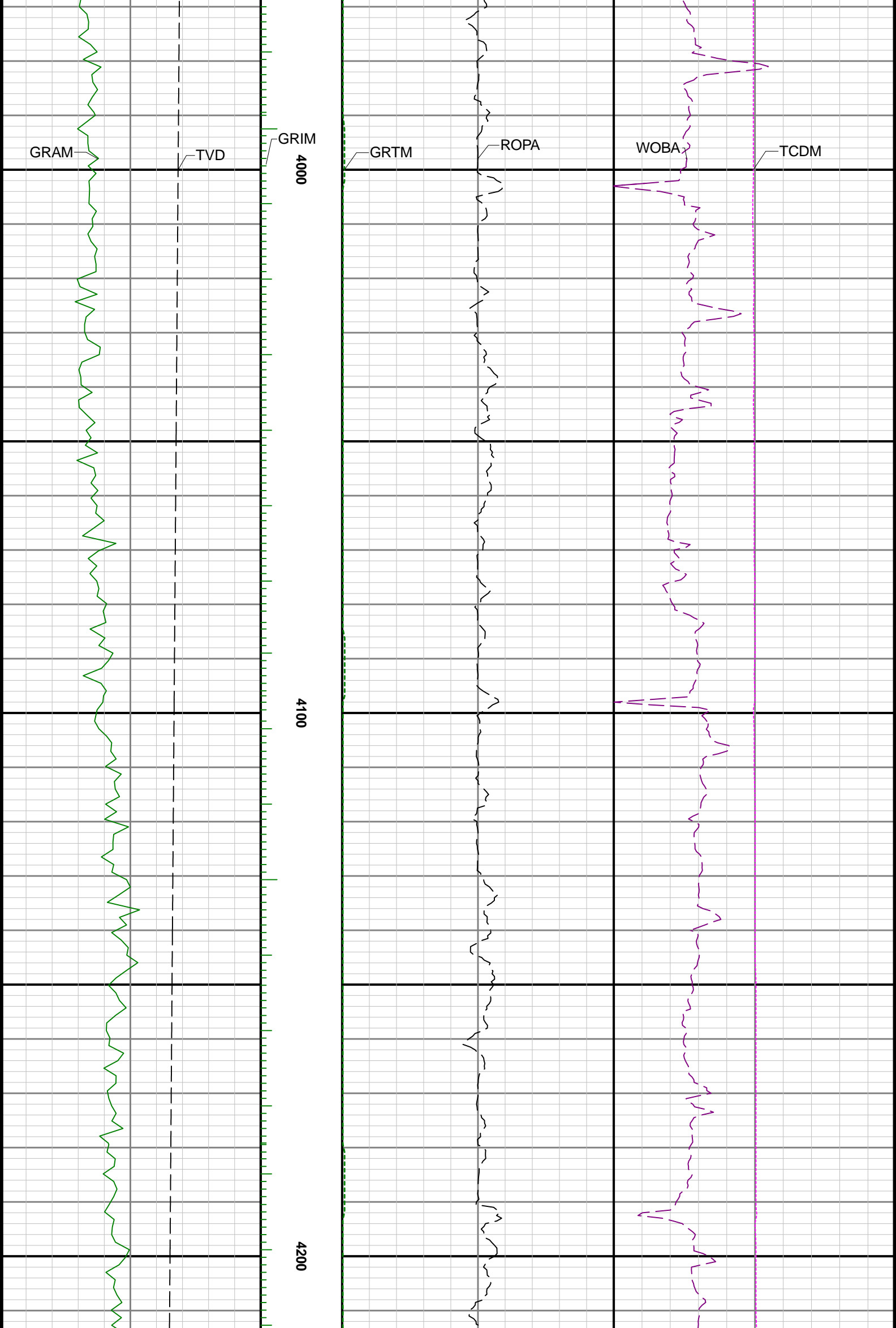


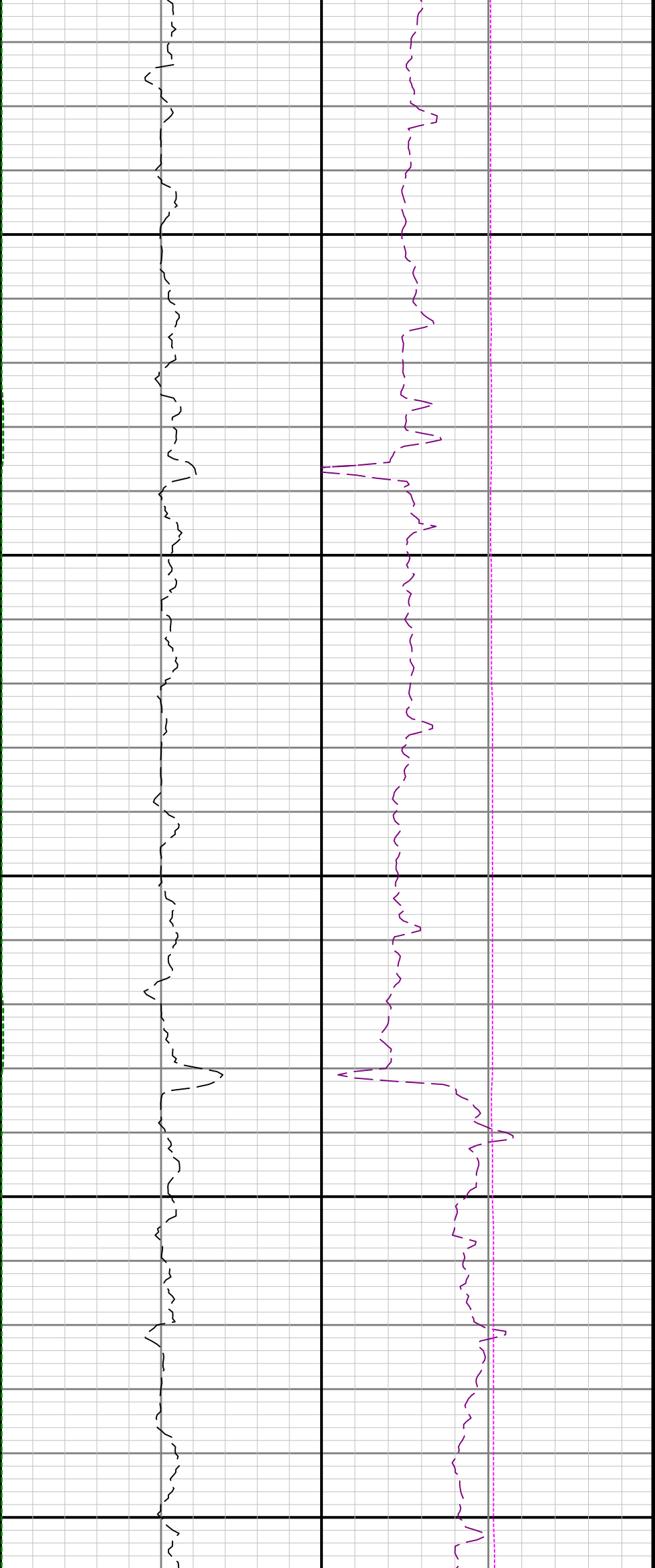


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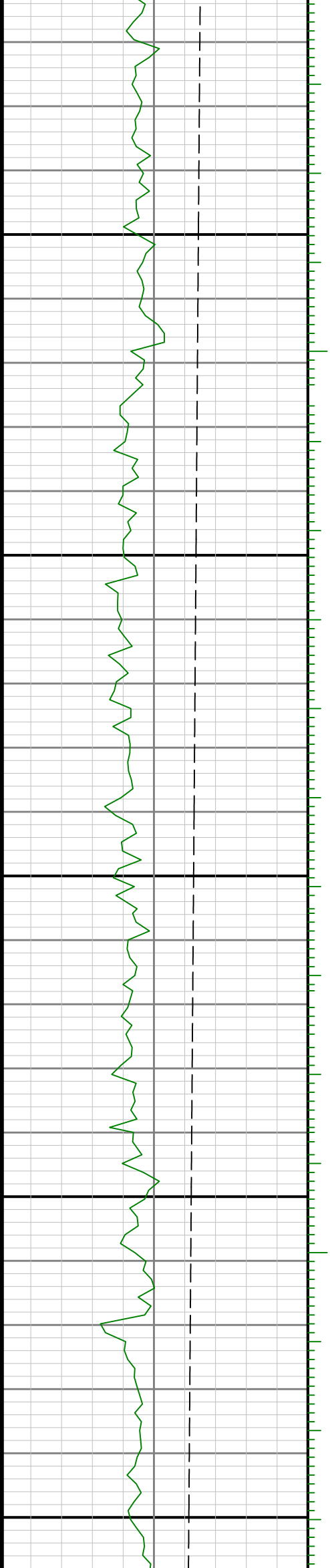


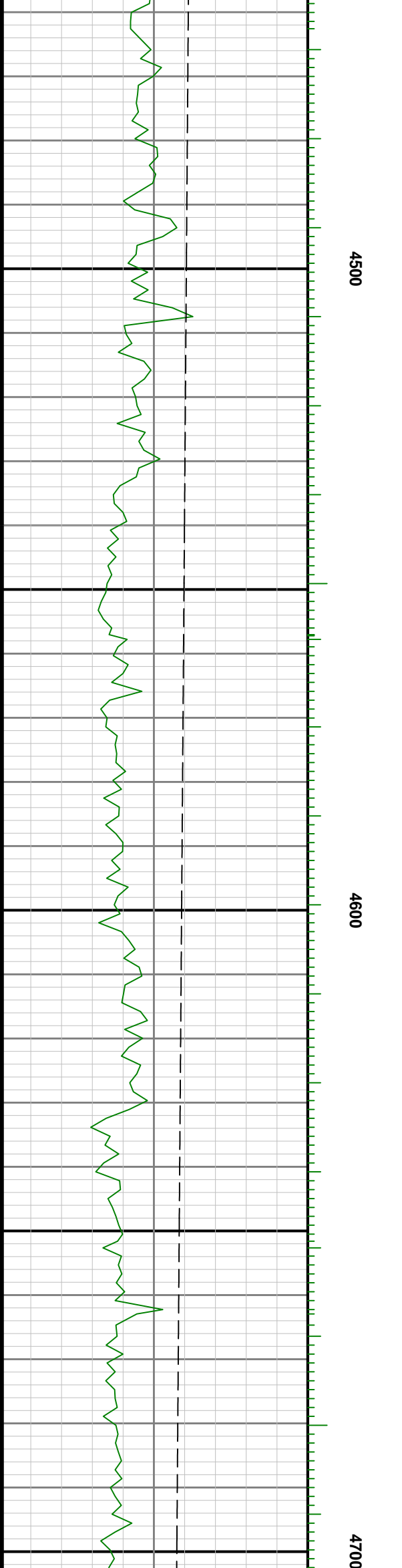
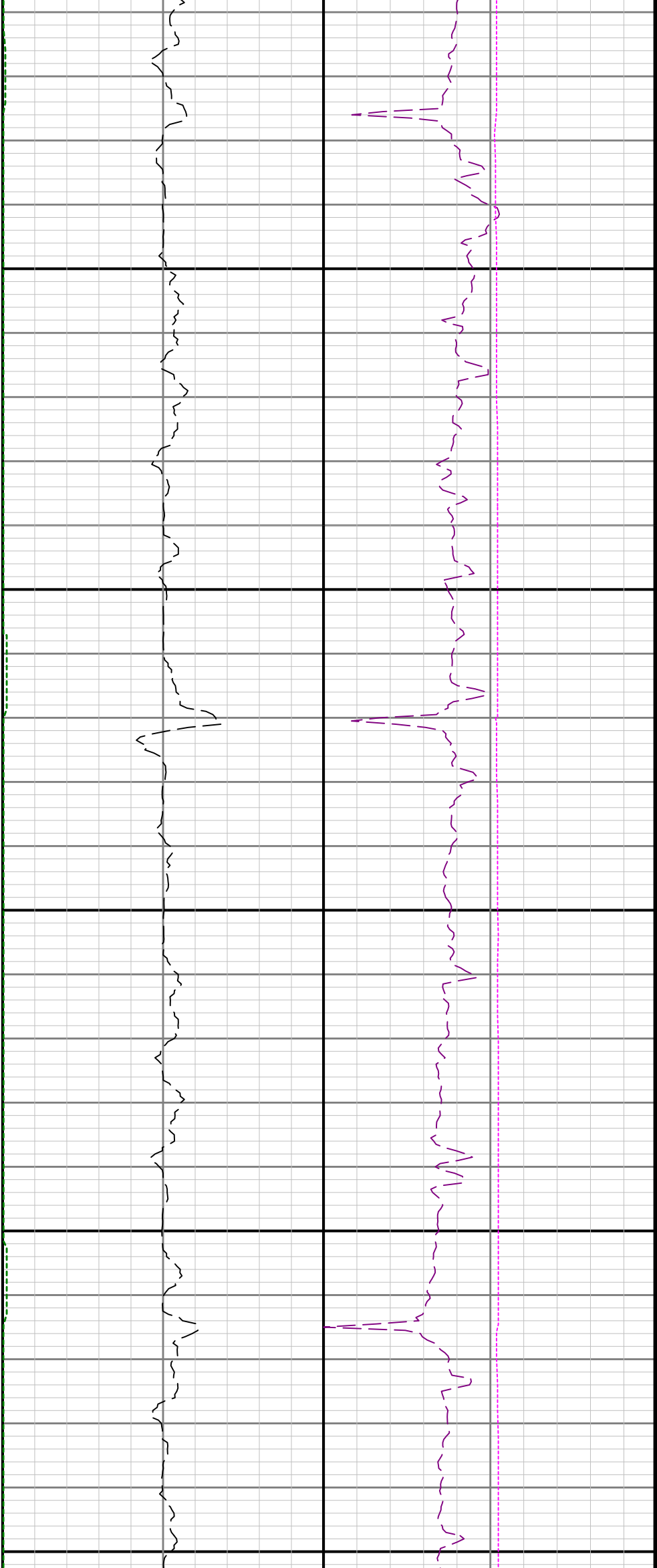


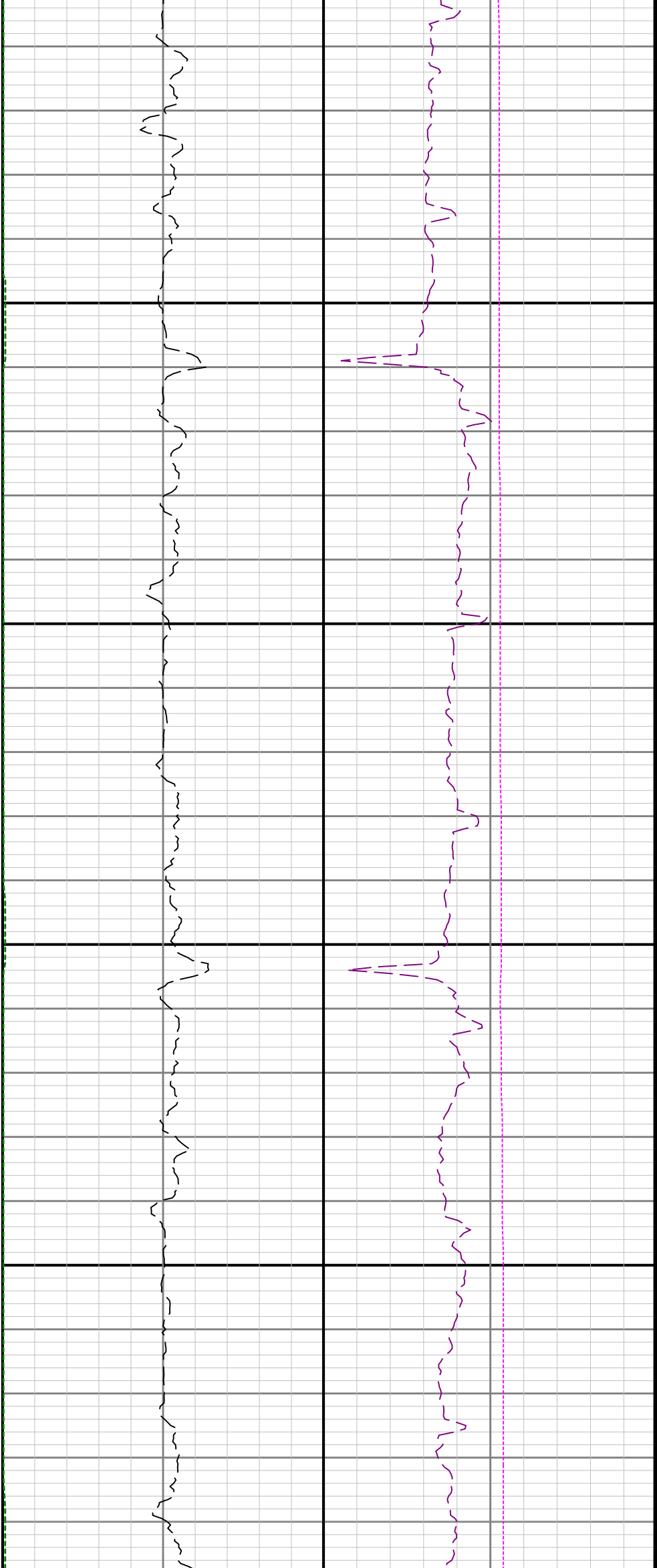


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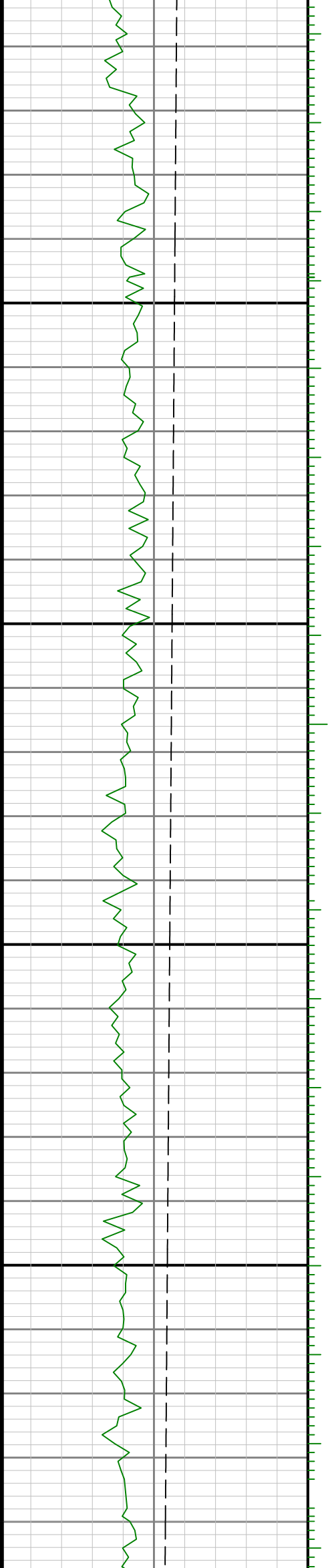


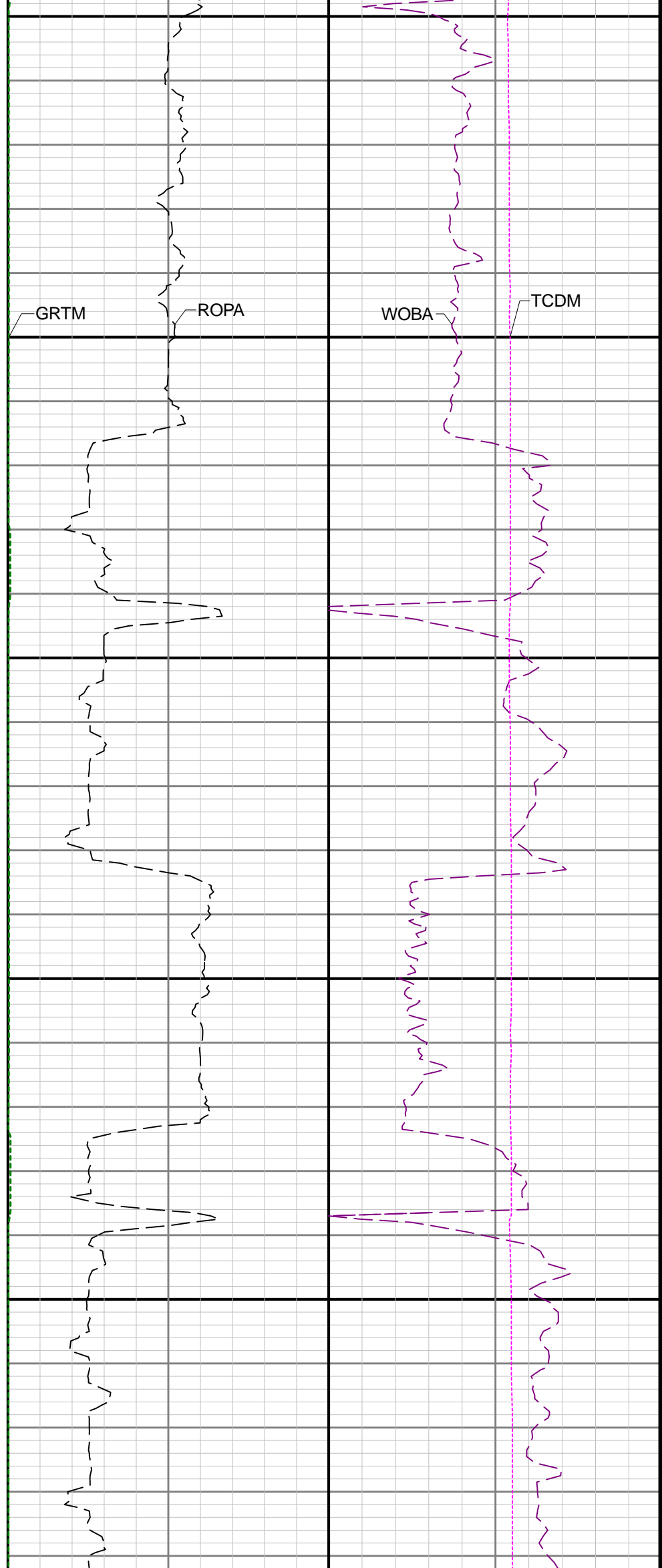
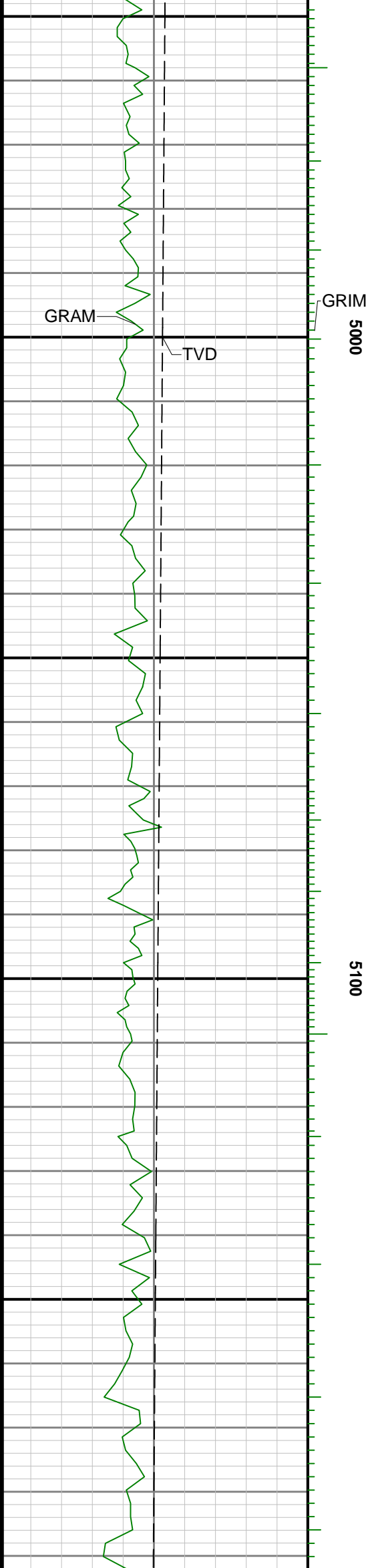


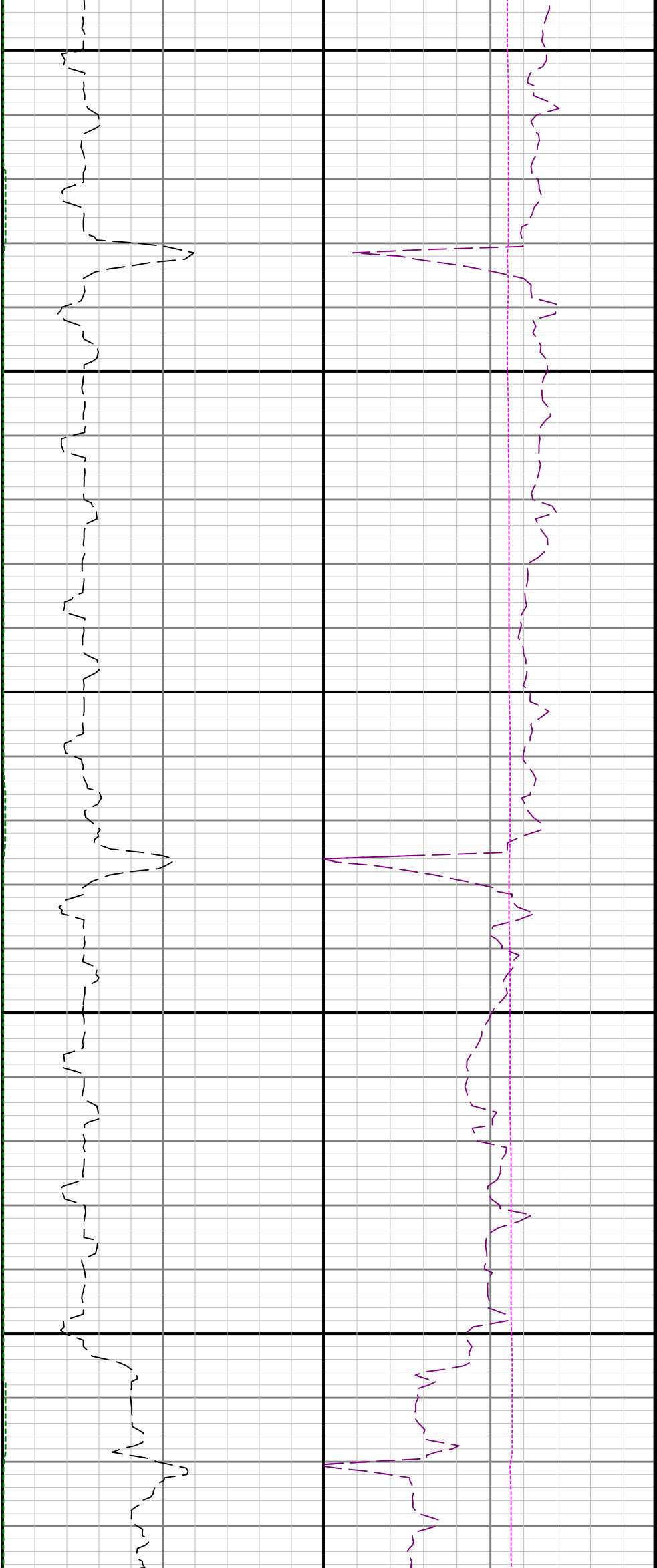


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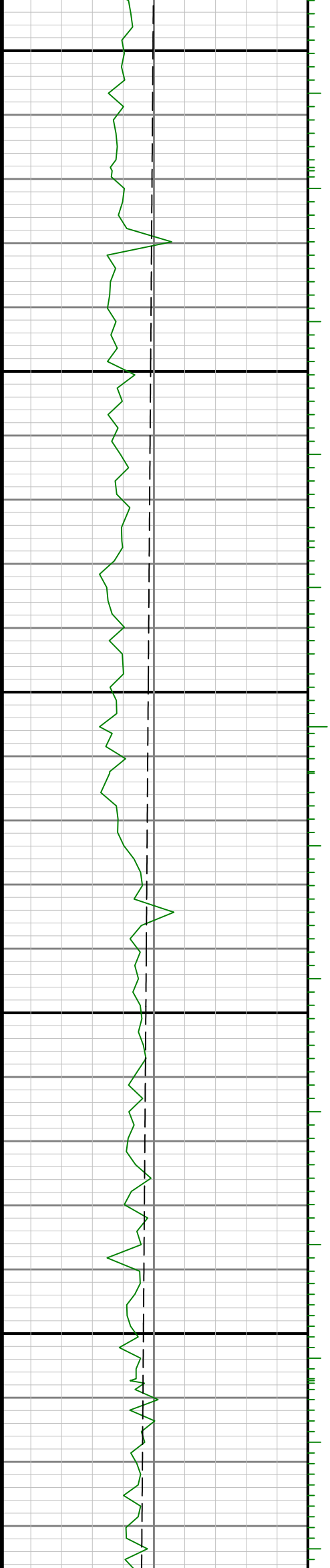


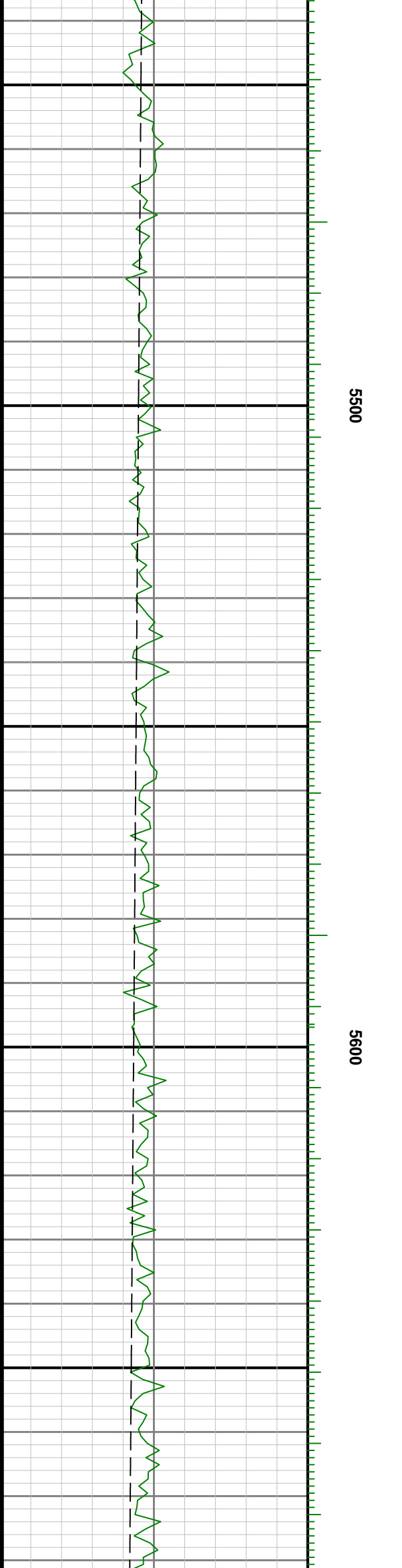
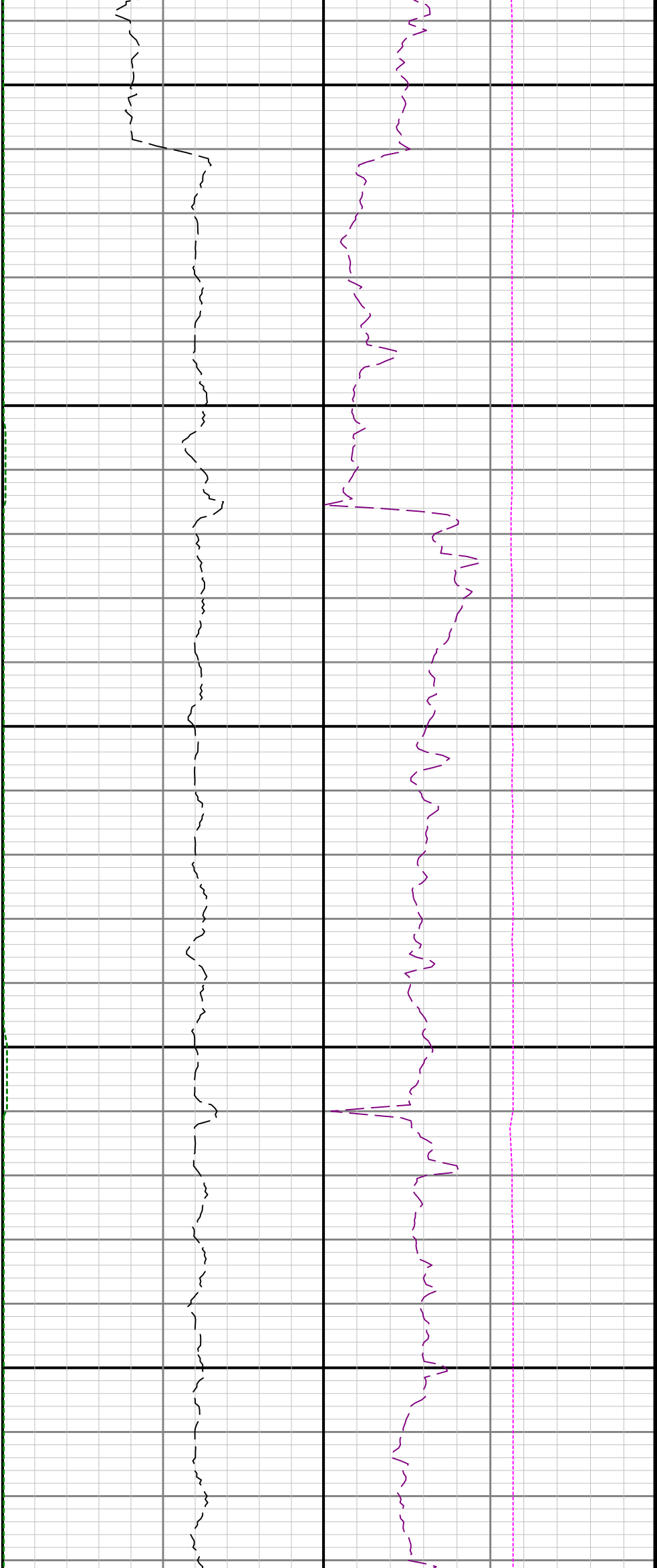


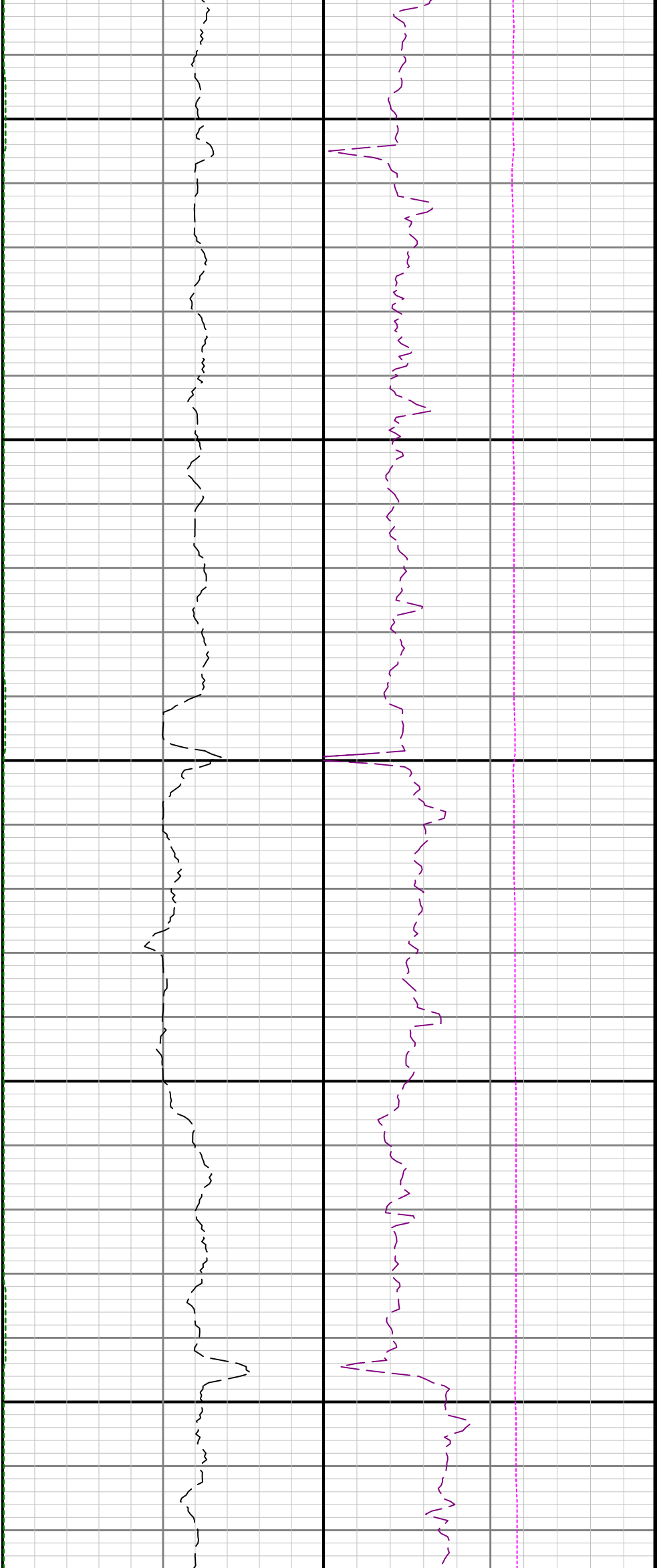
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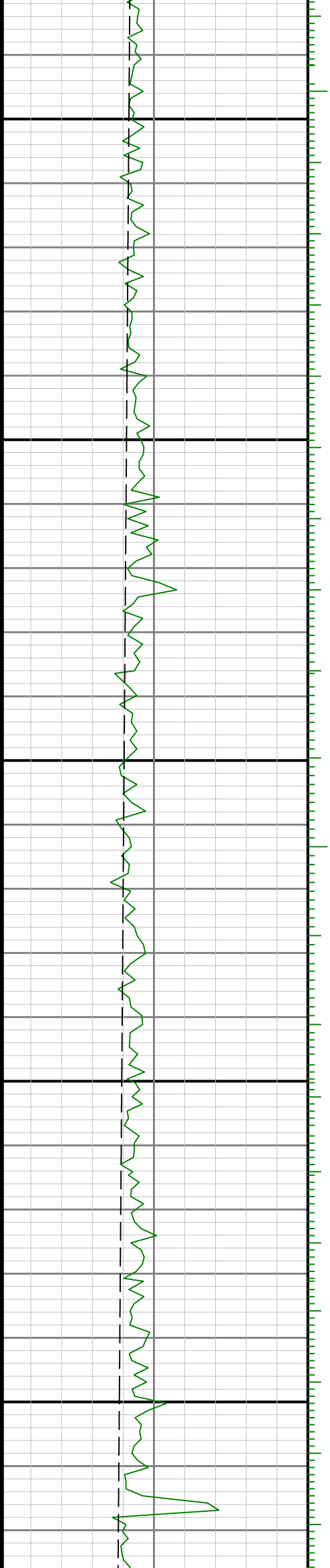


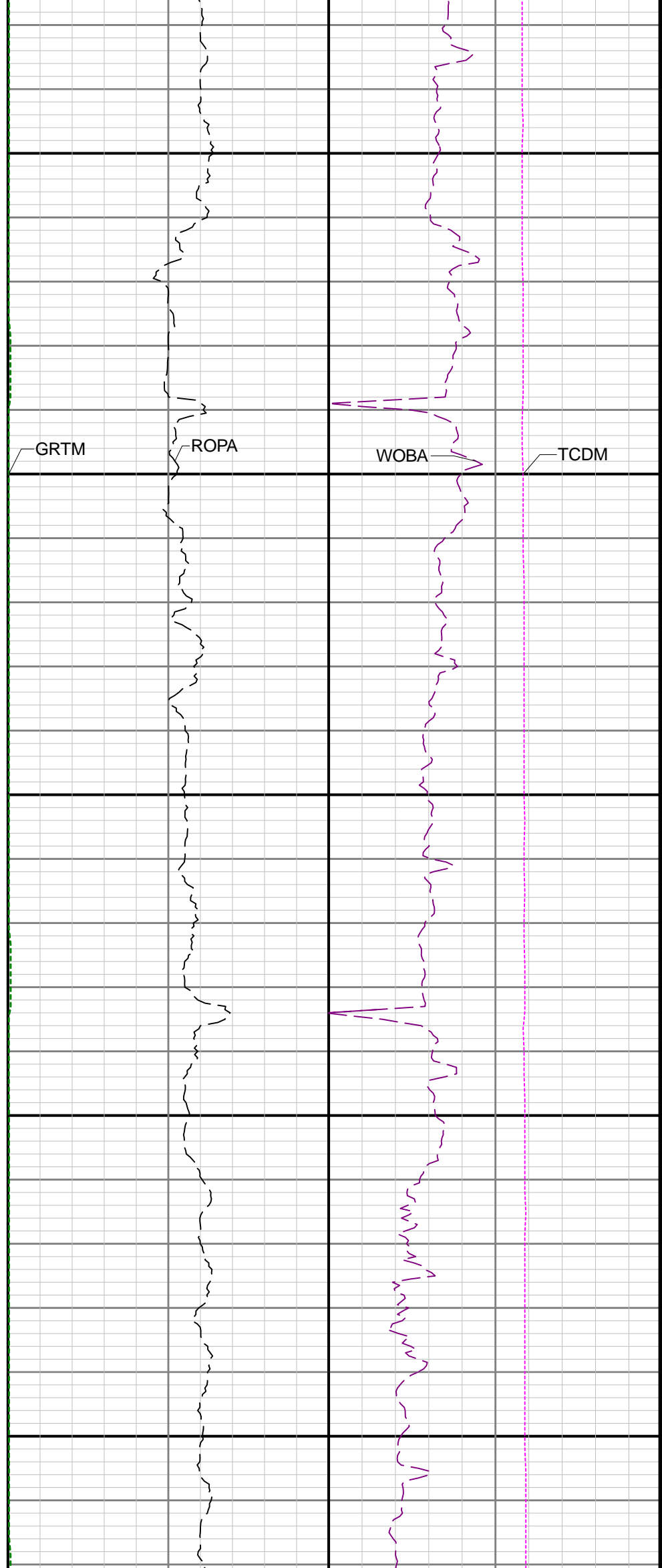
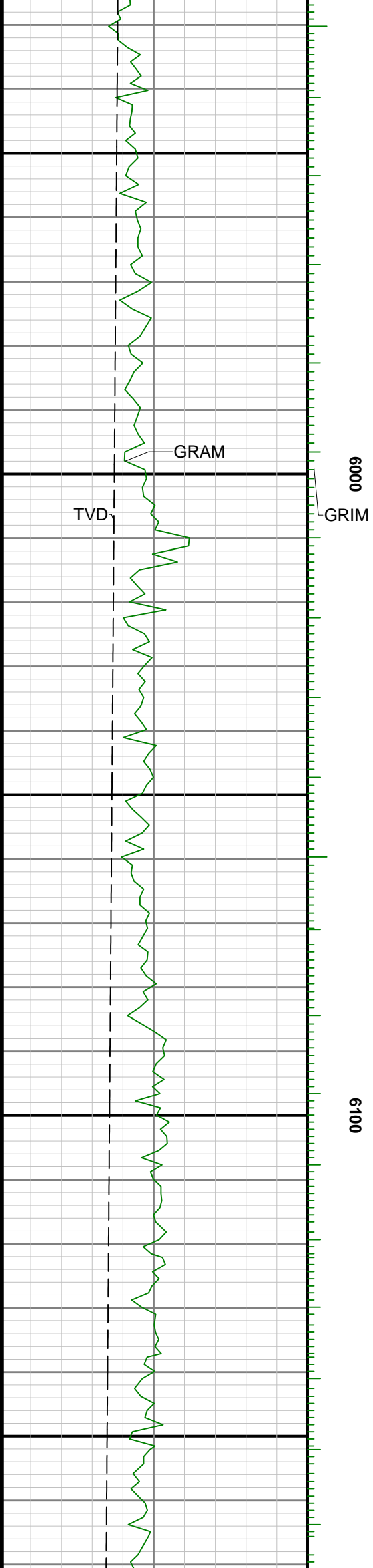


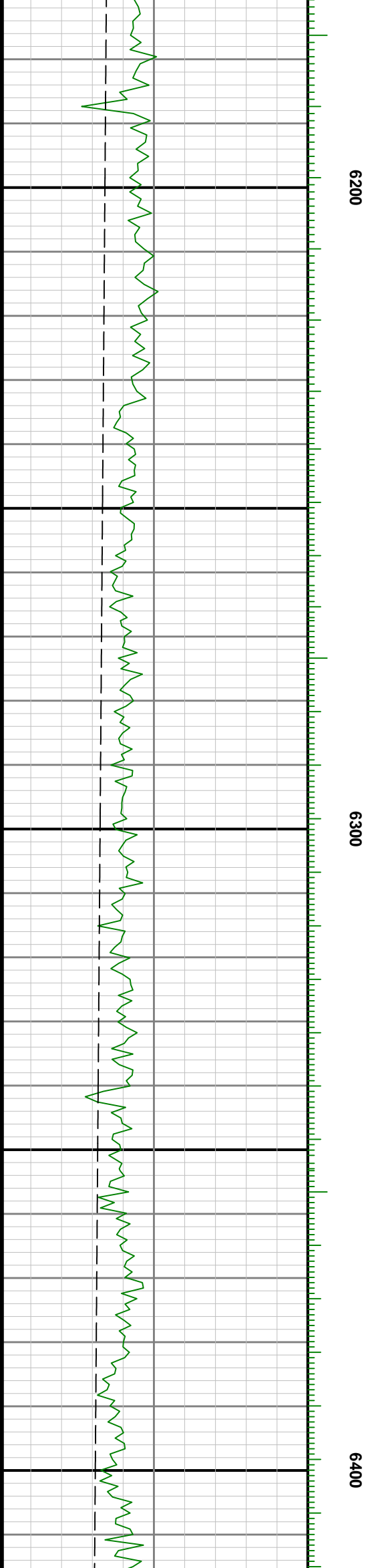
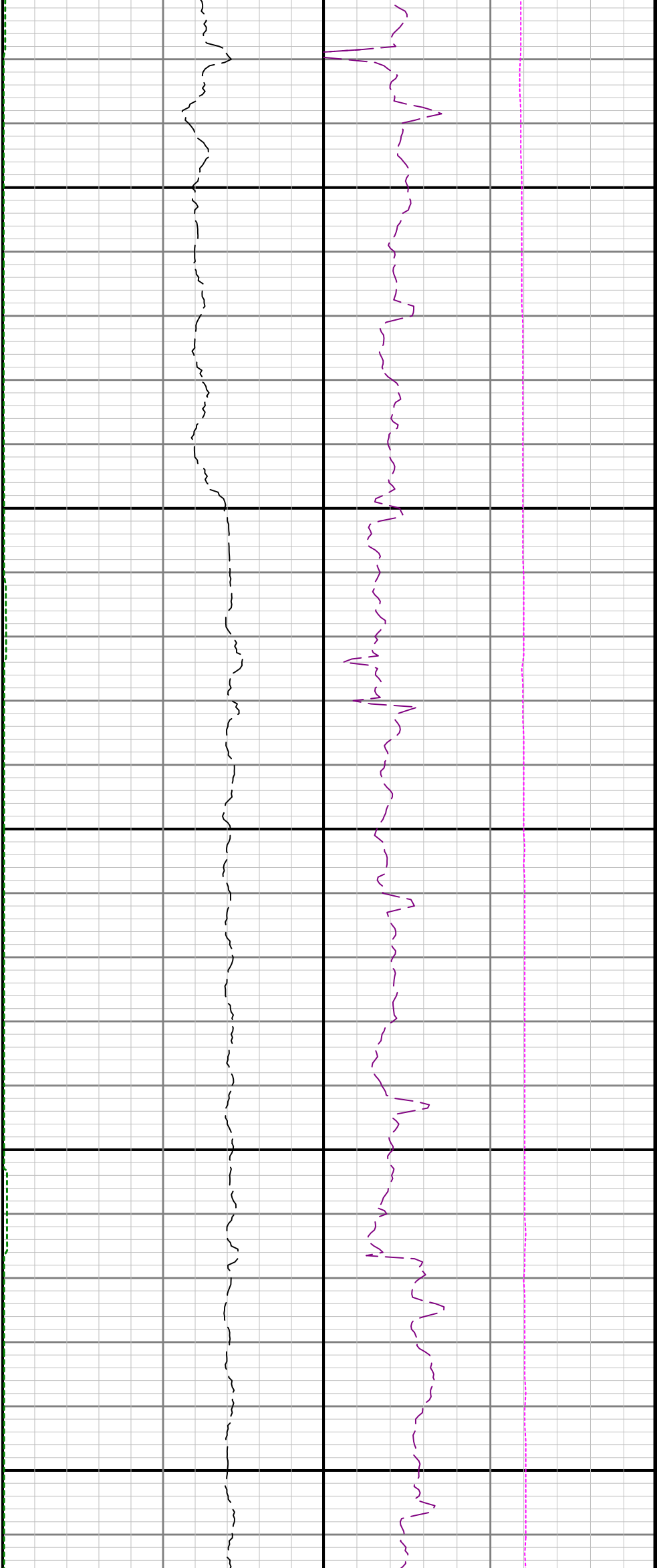
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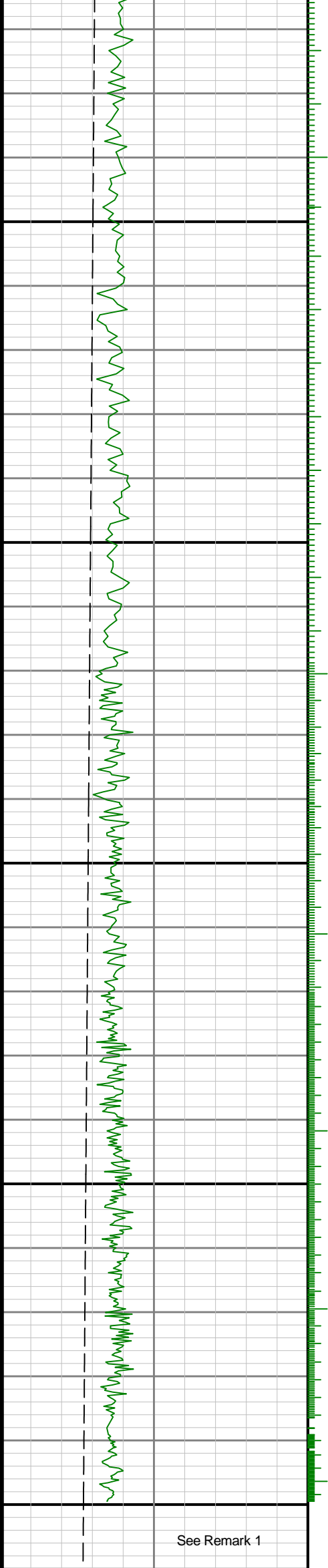
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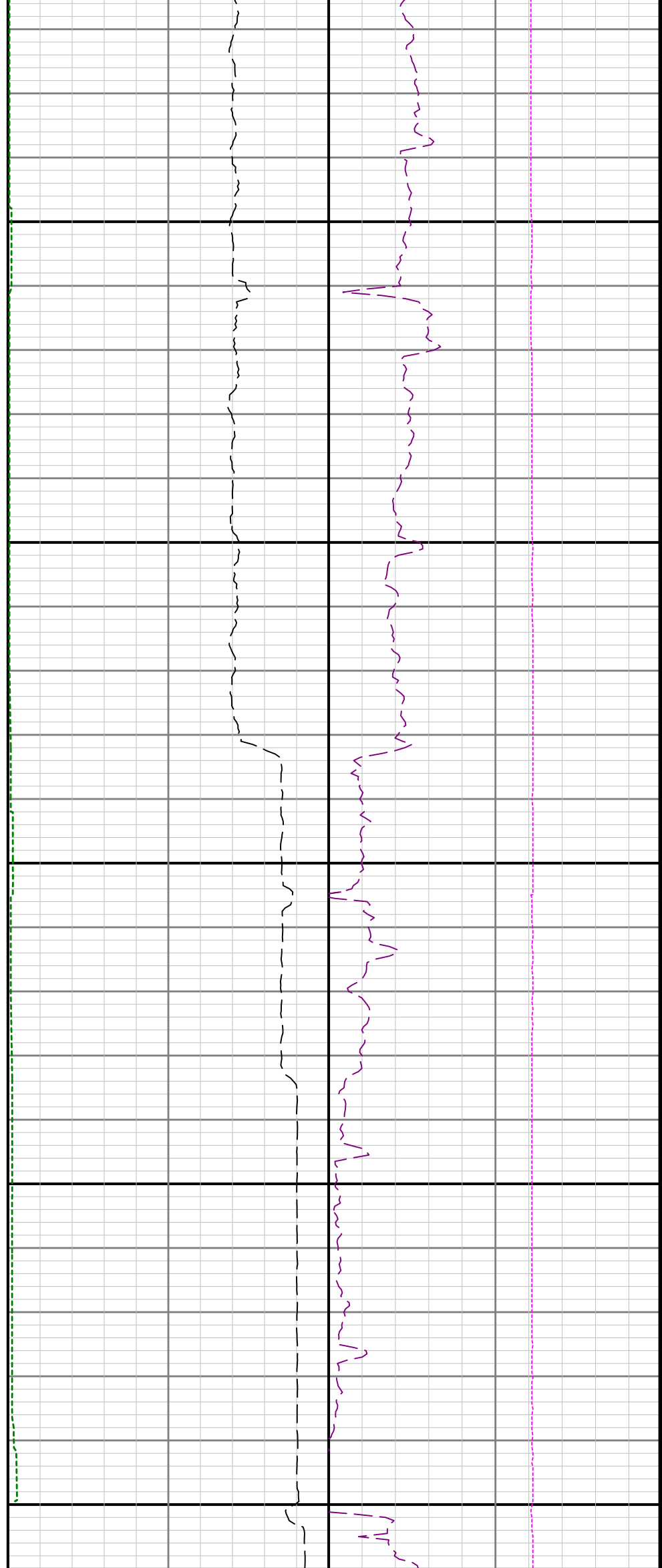


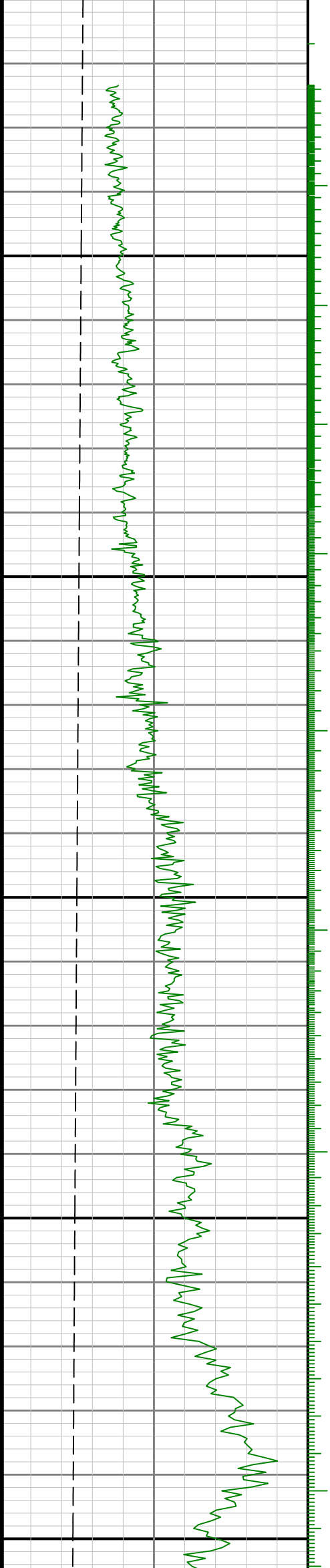


See Remark 1

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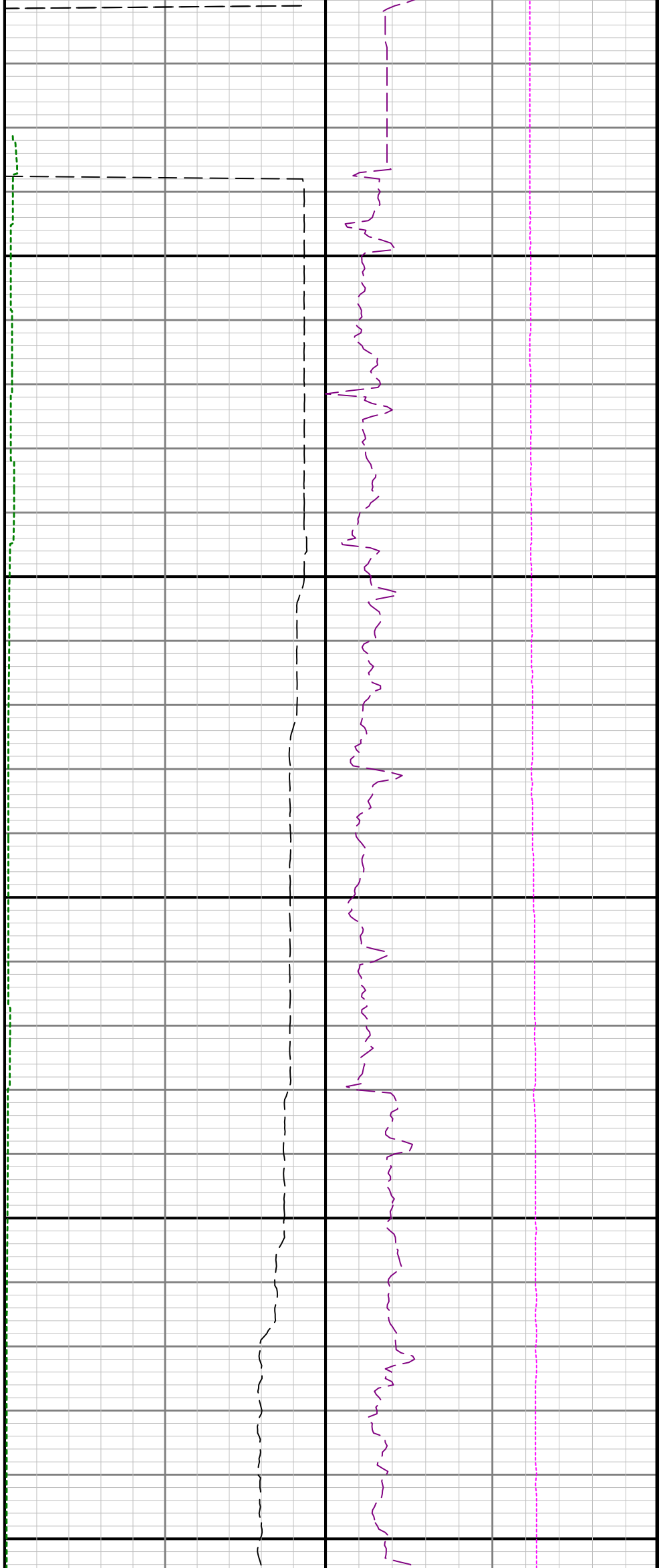


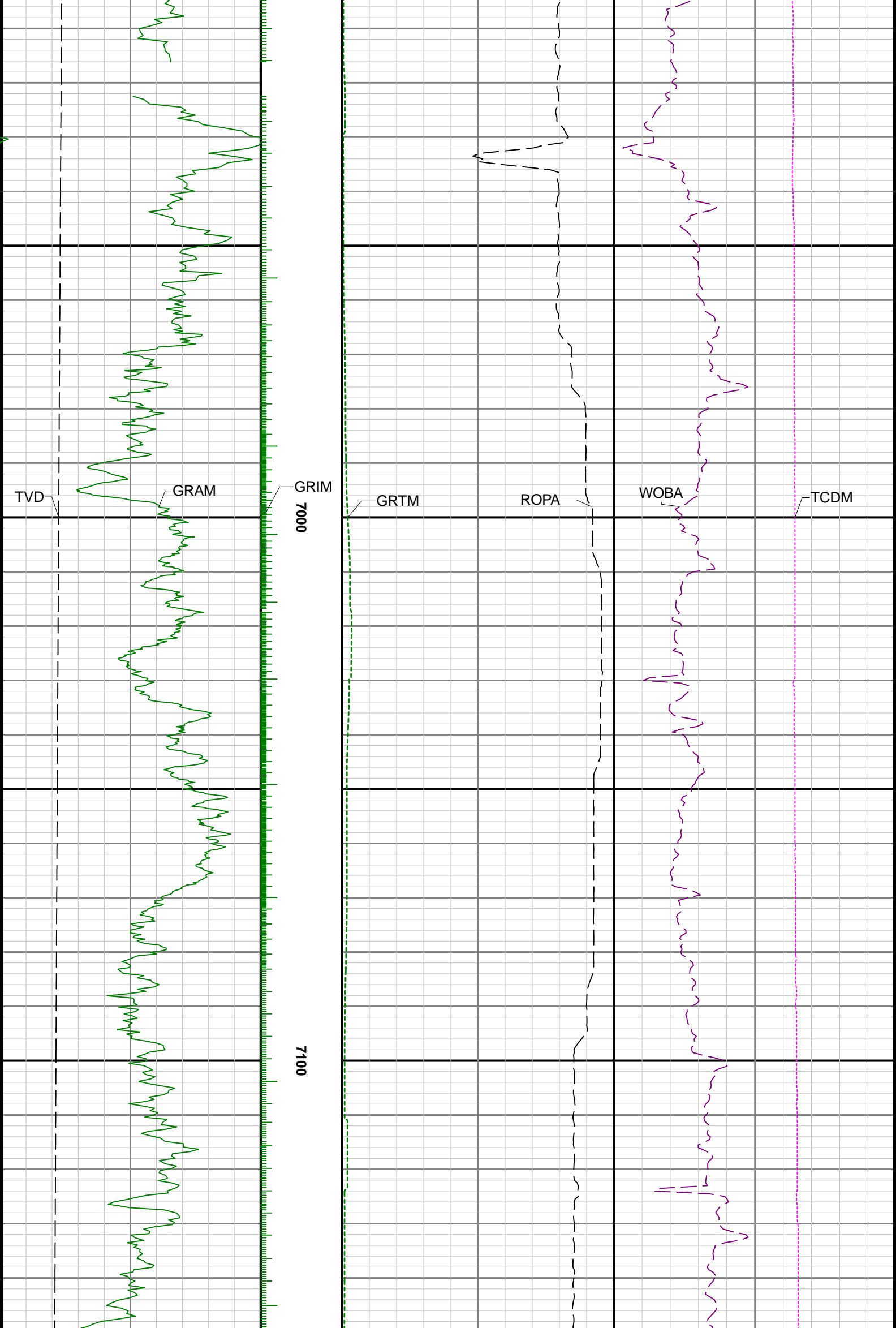


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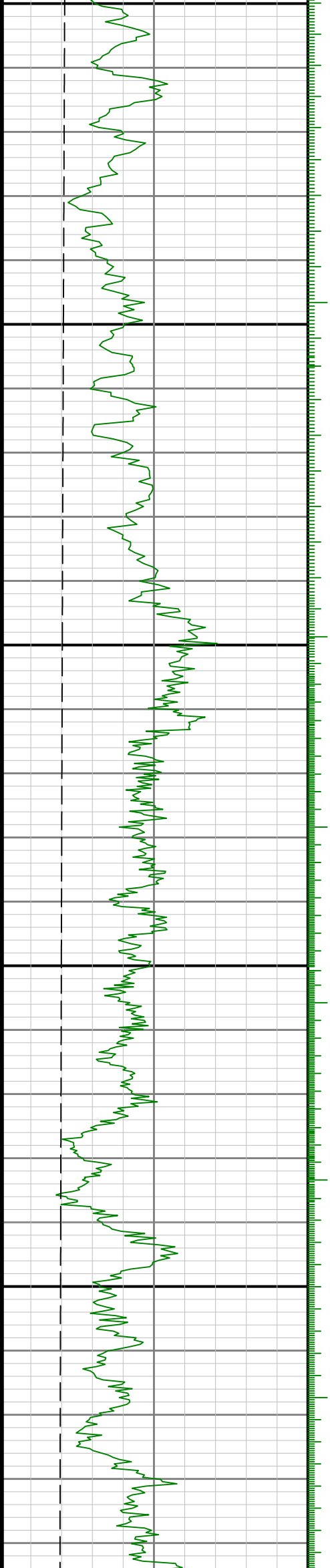


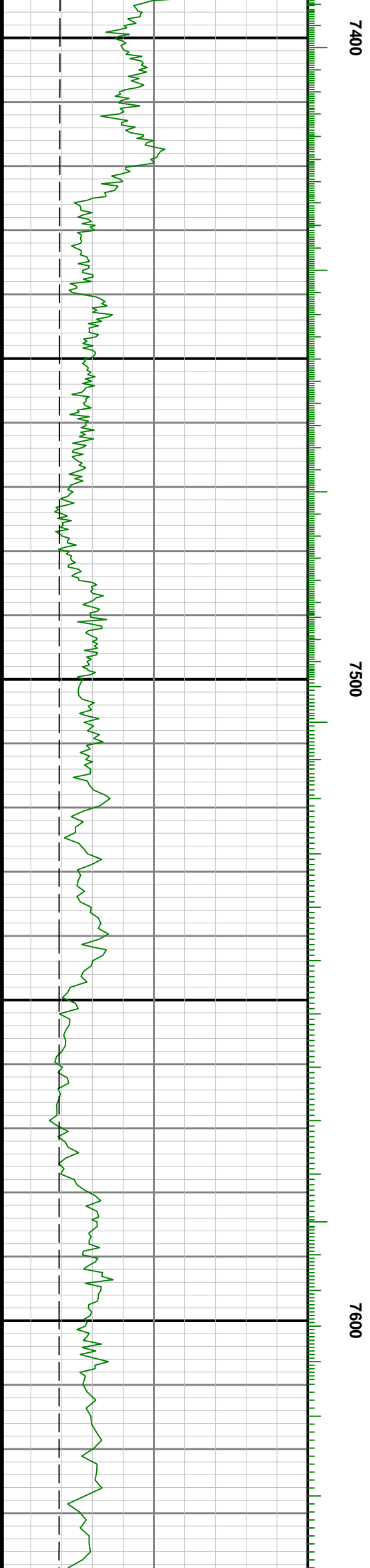
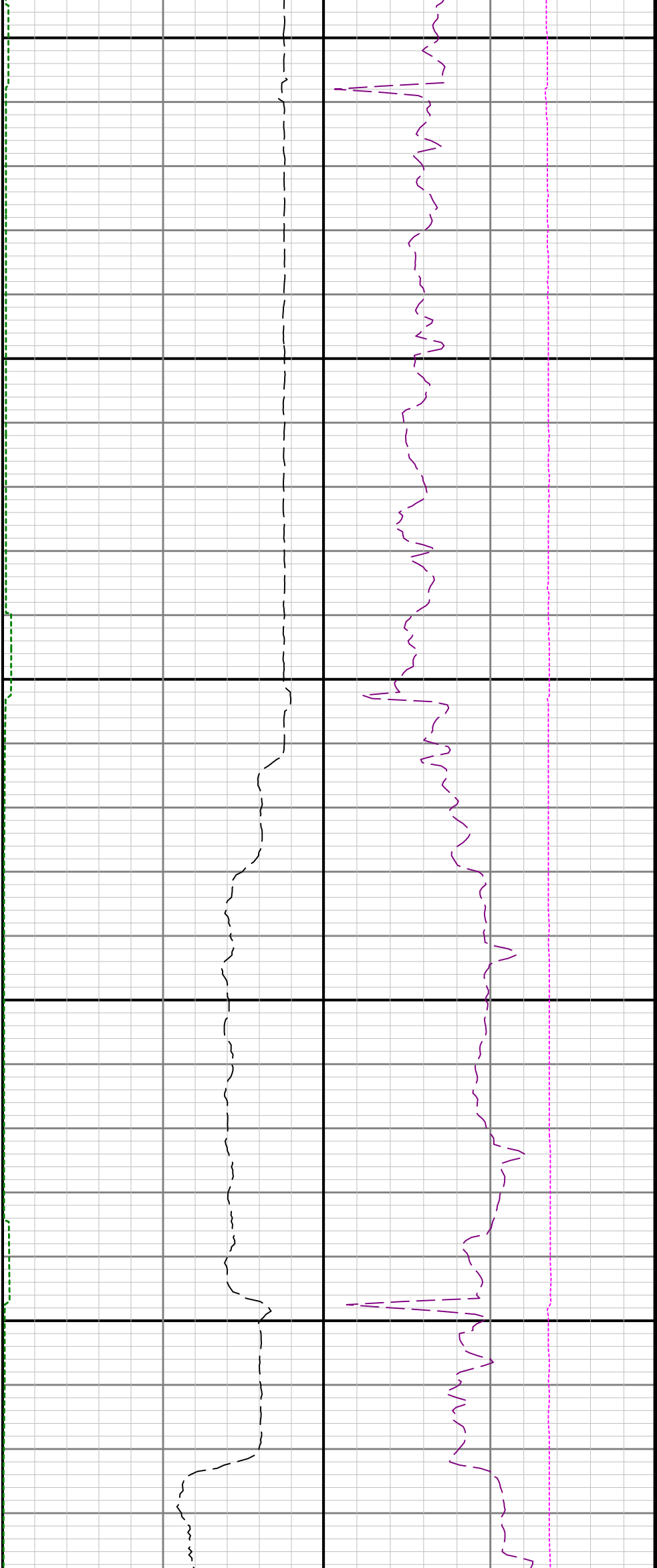


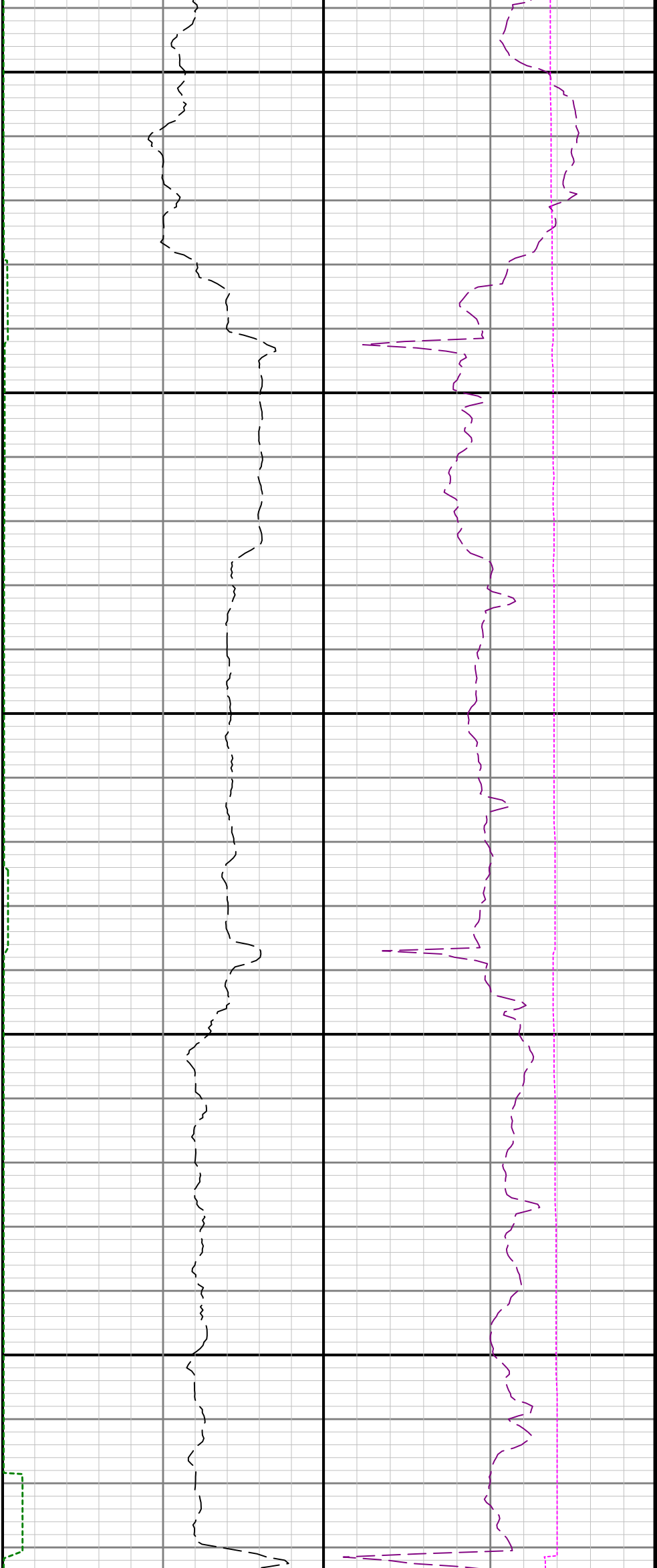


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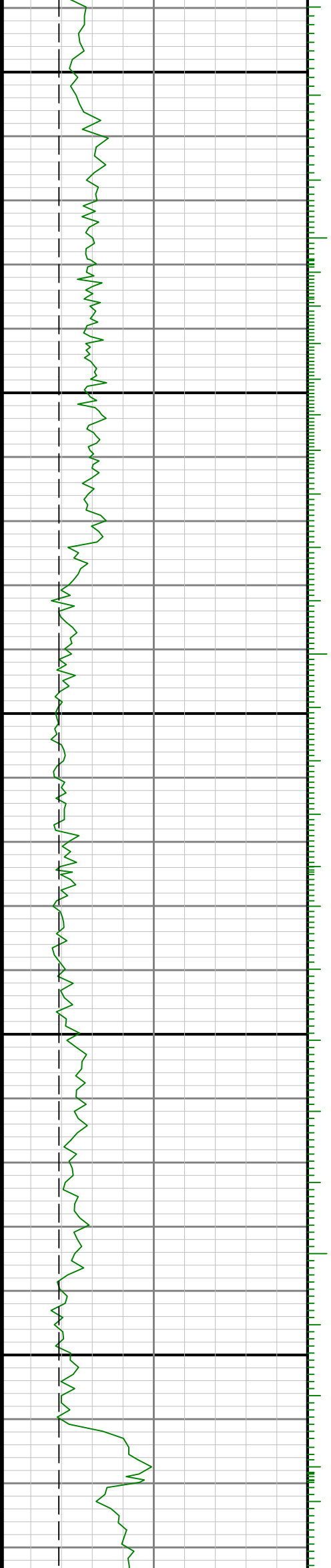


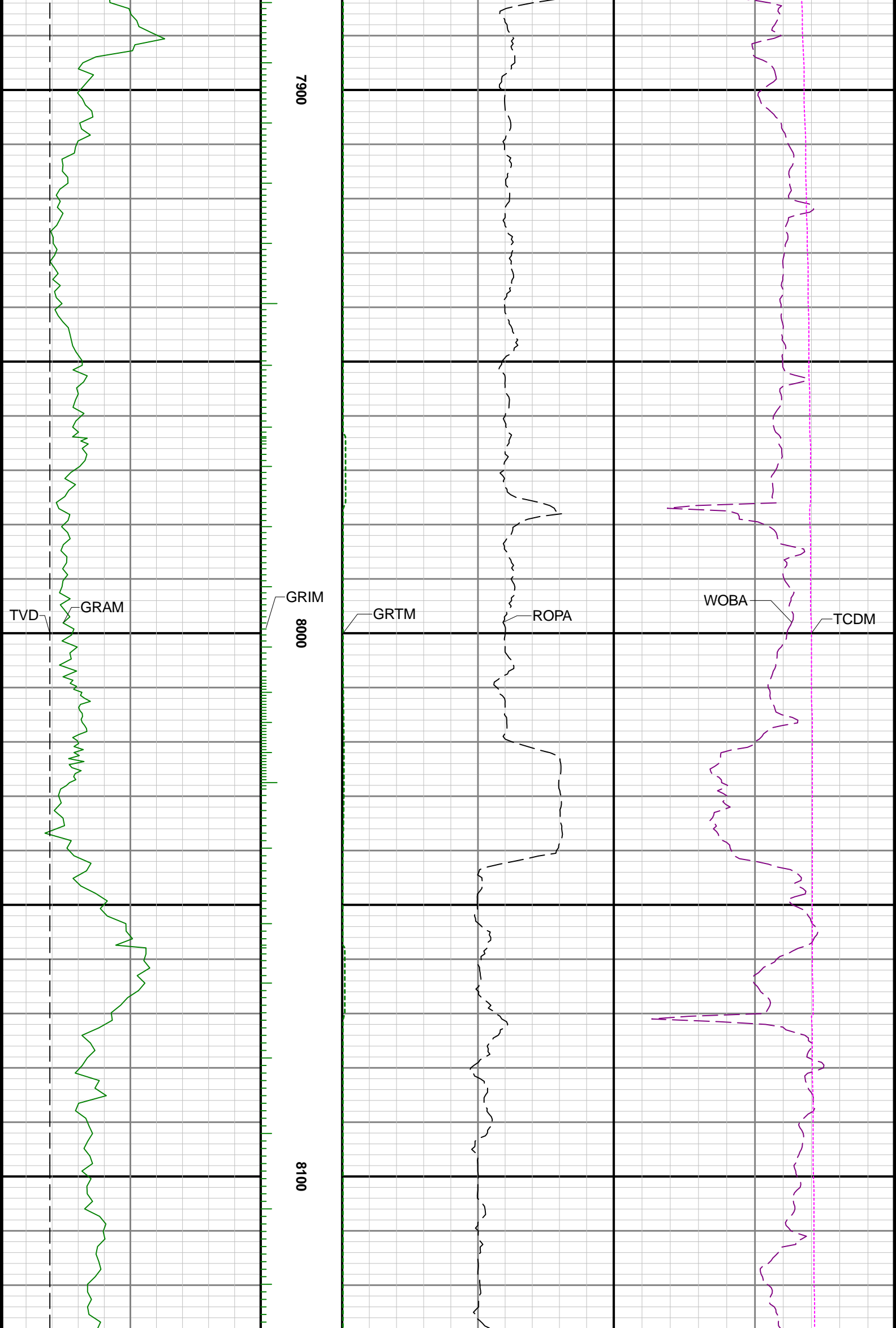


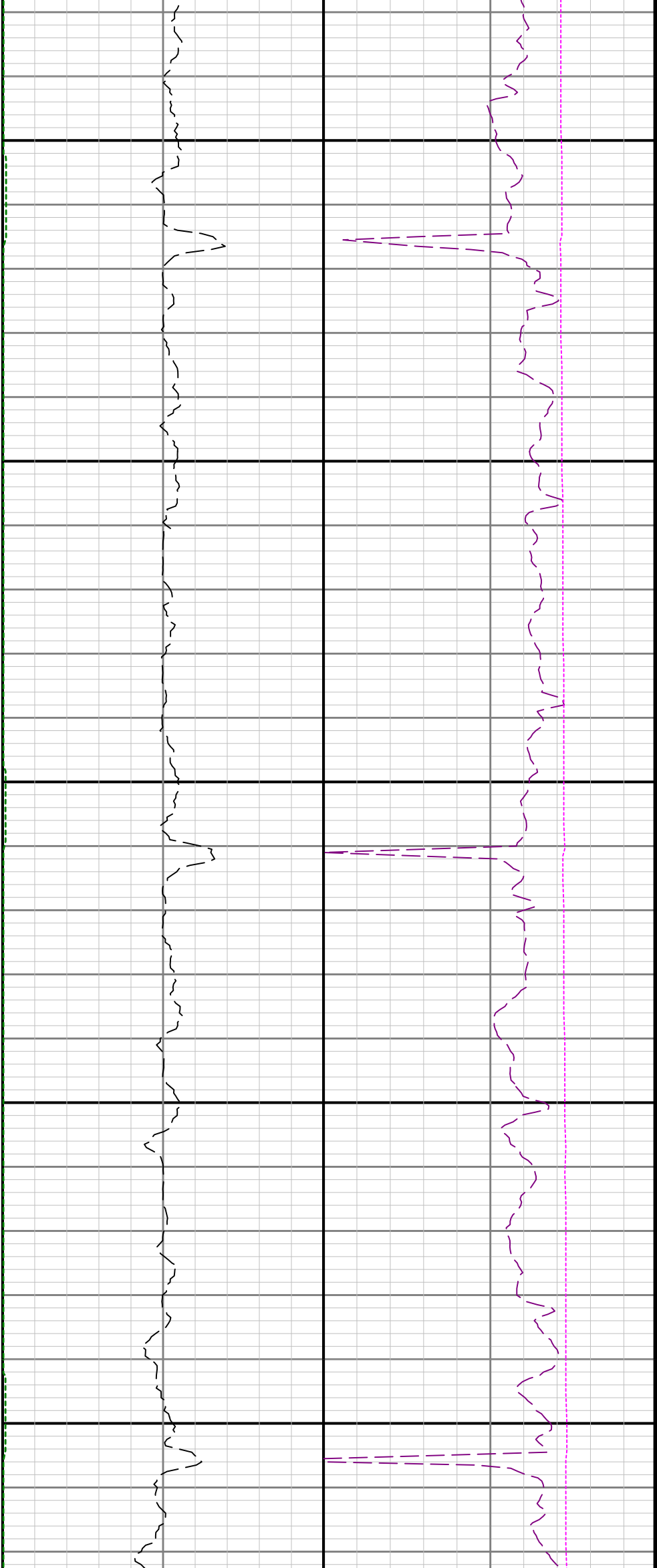


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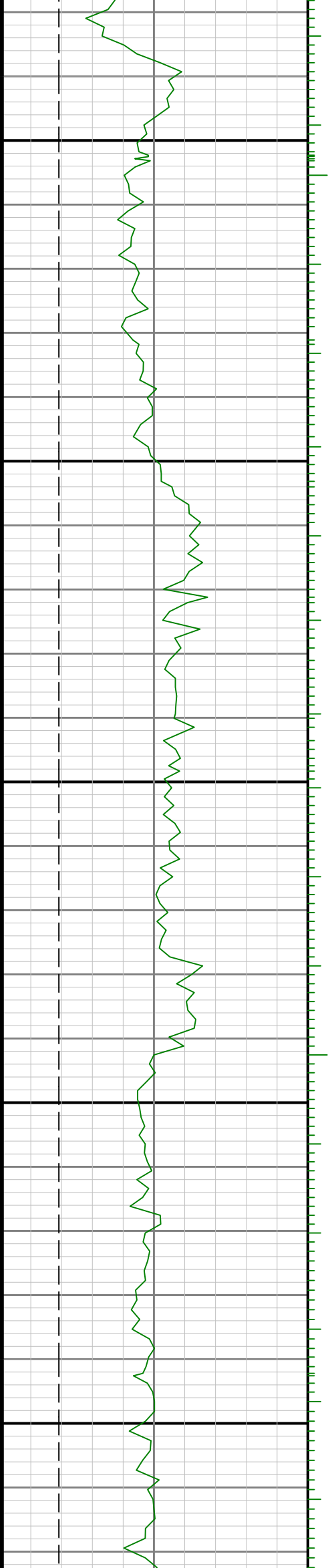


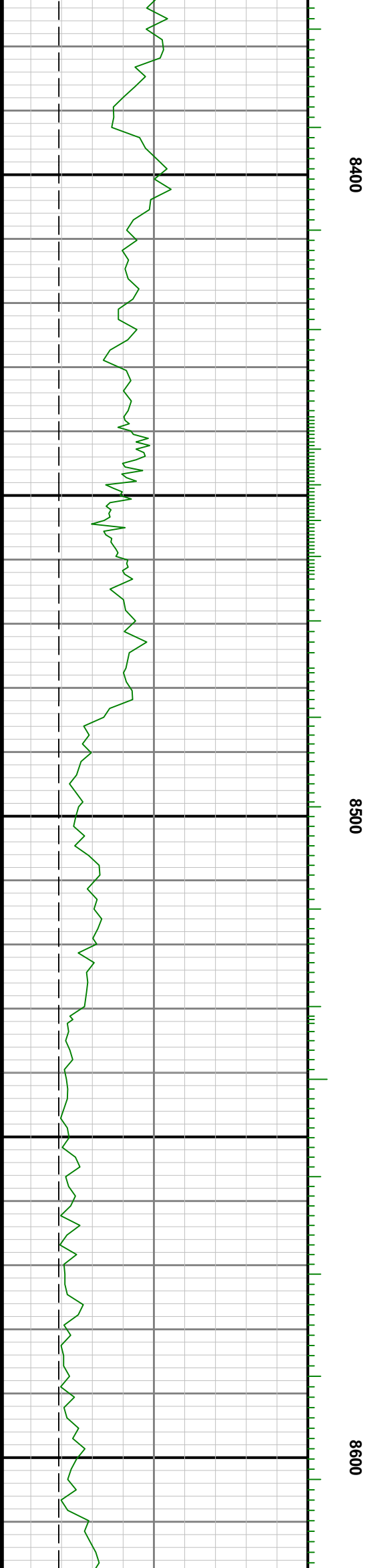
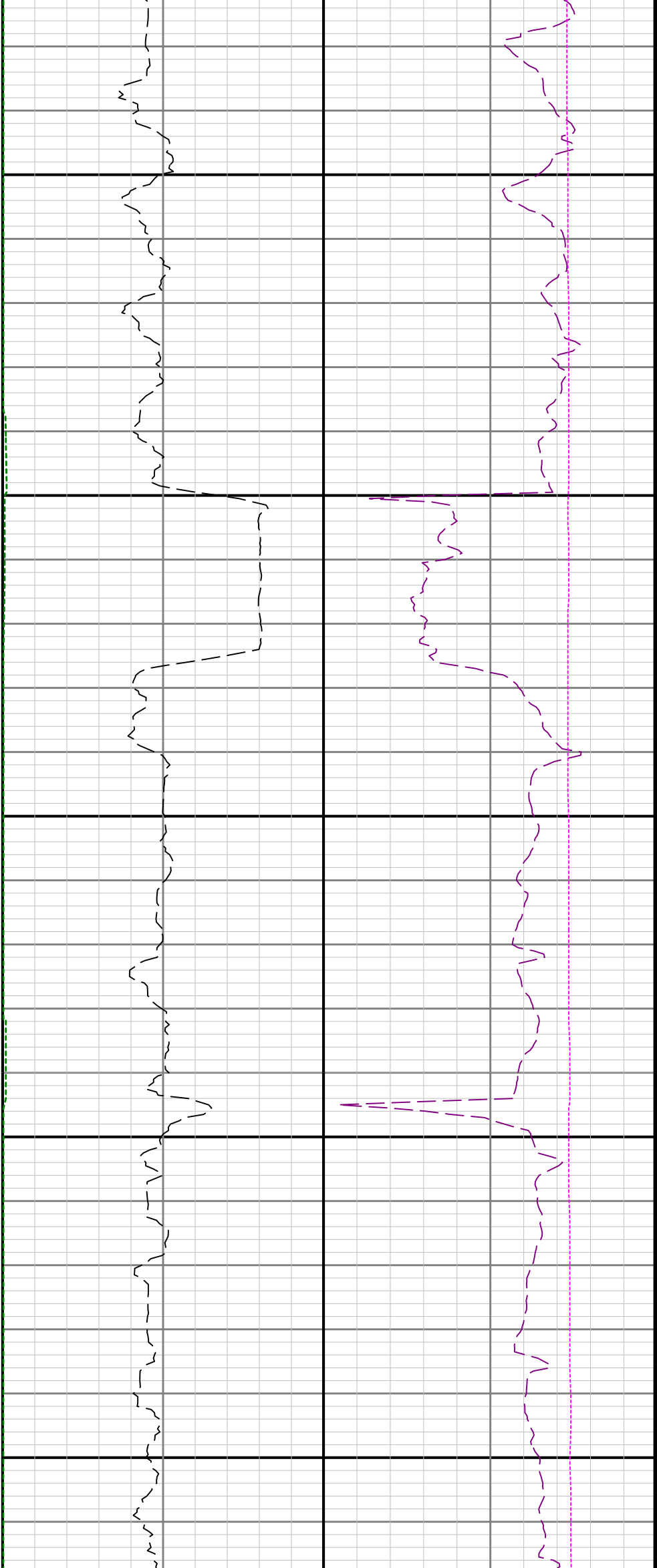


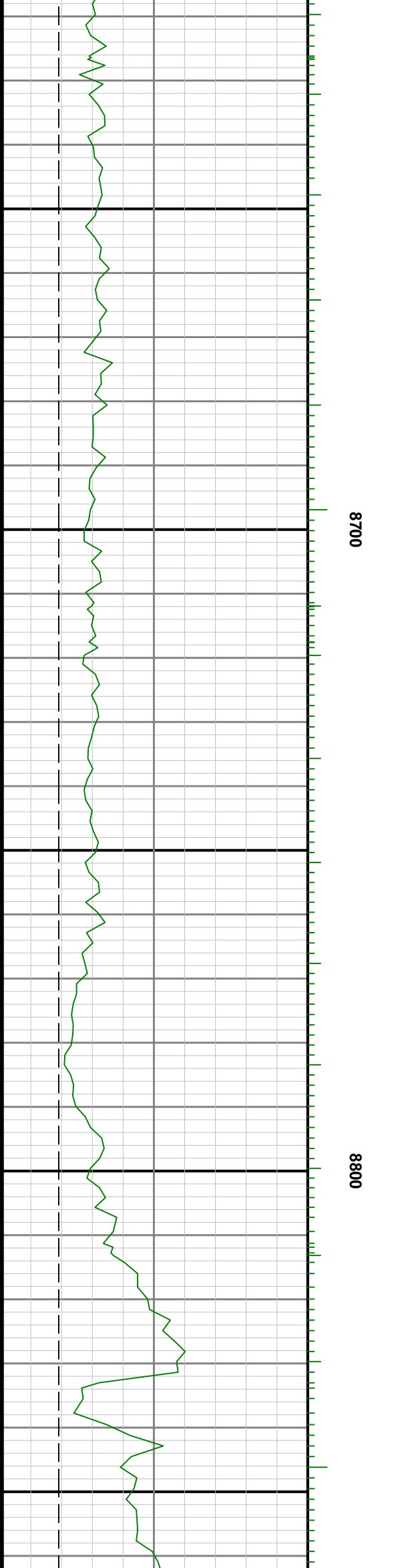
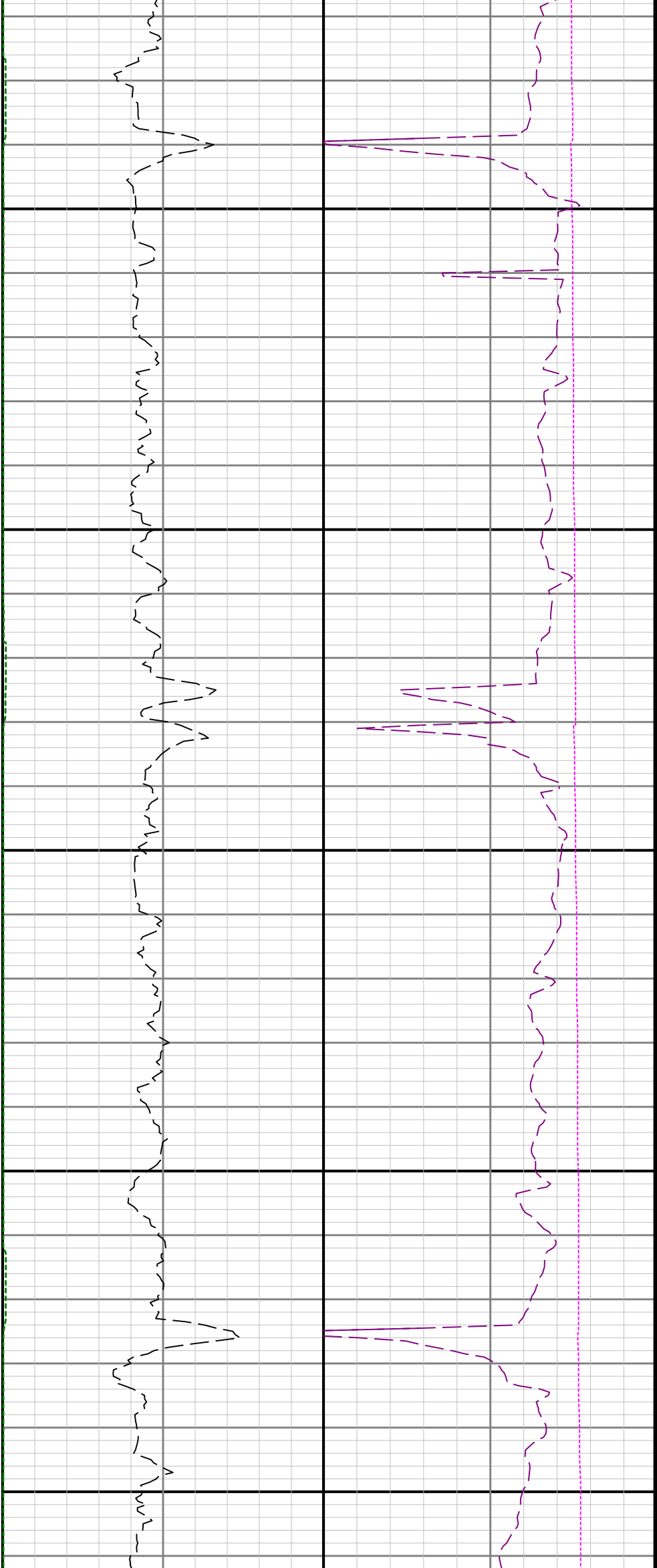


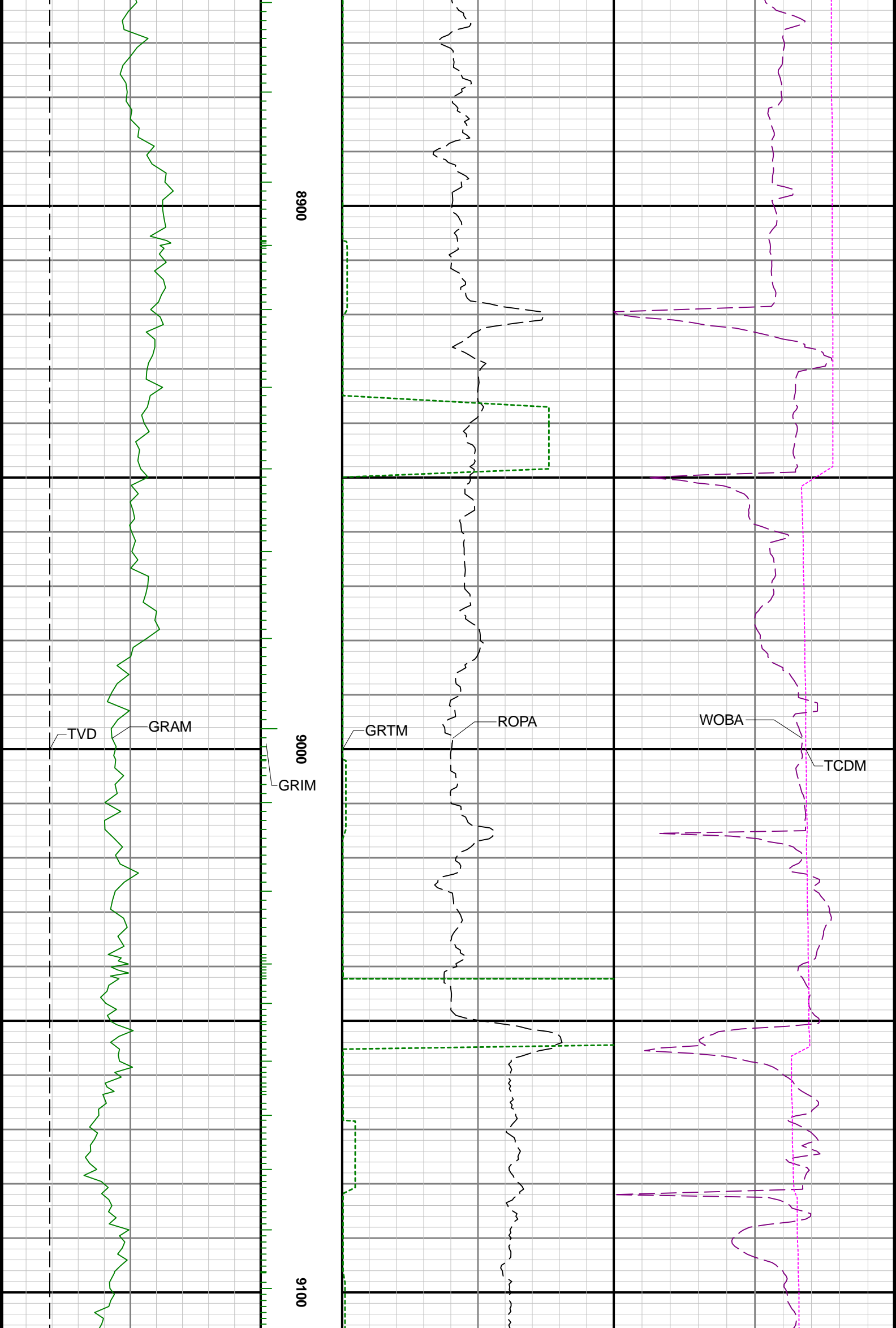
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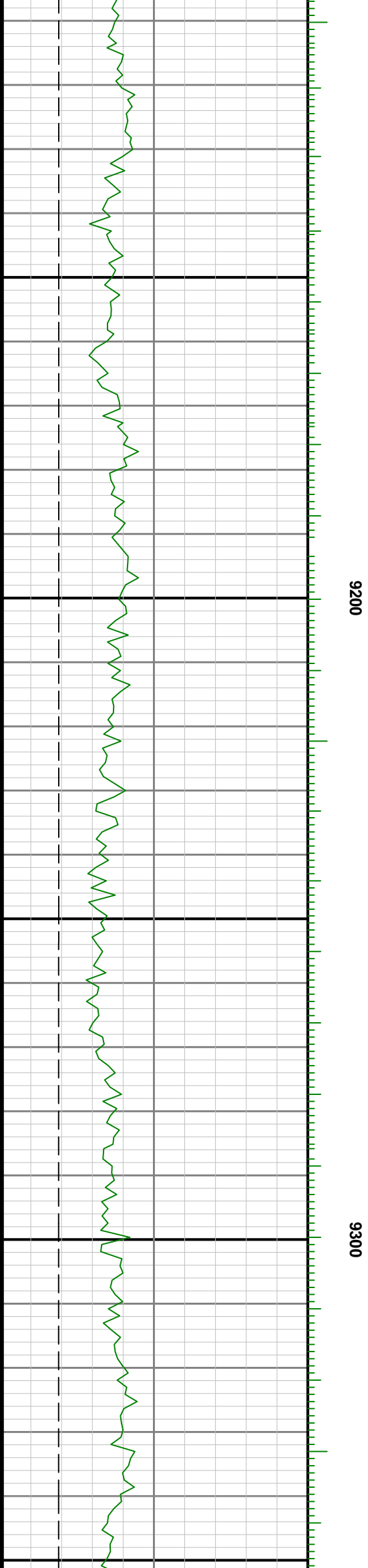
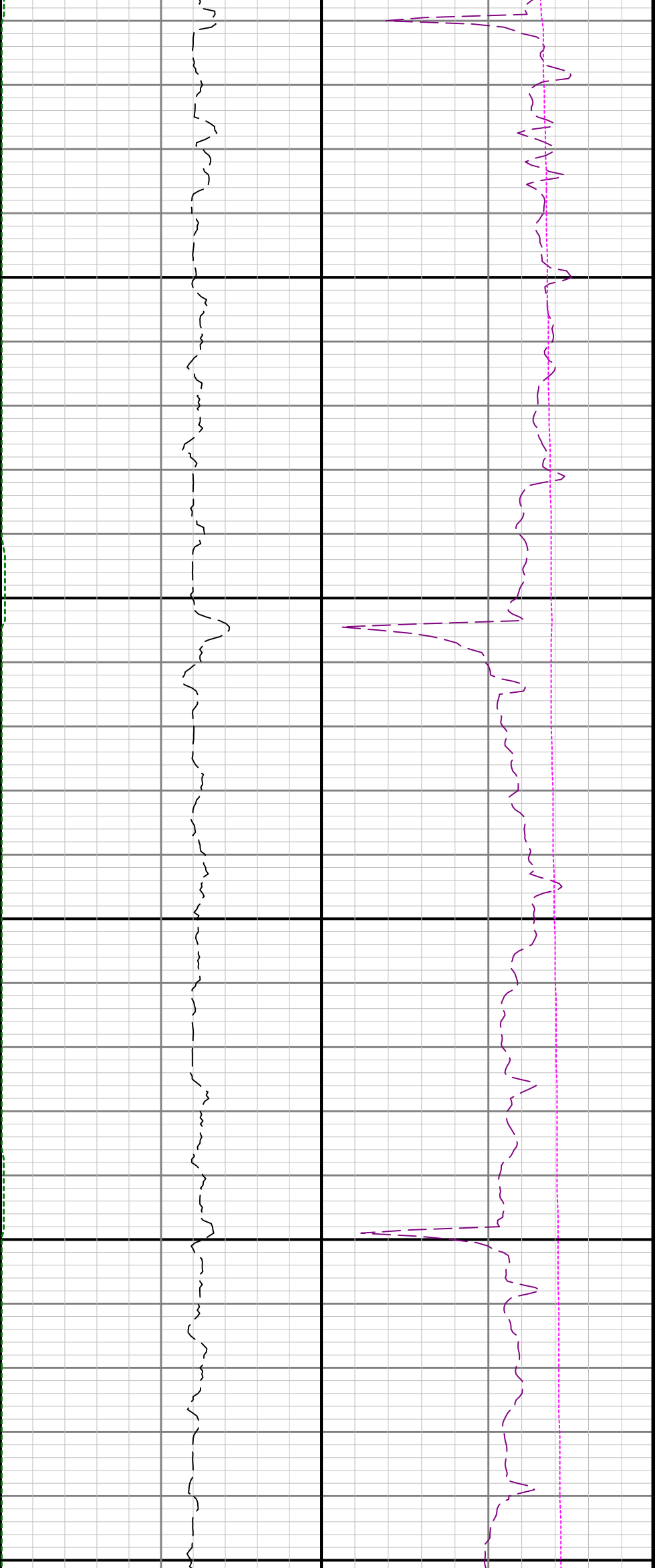
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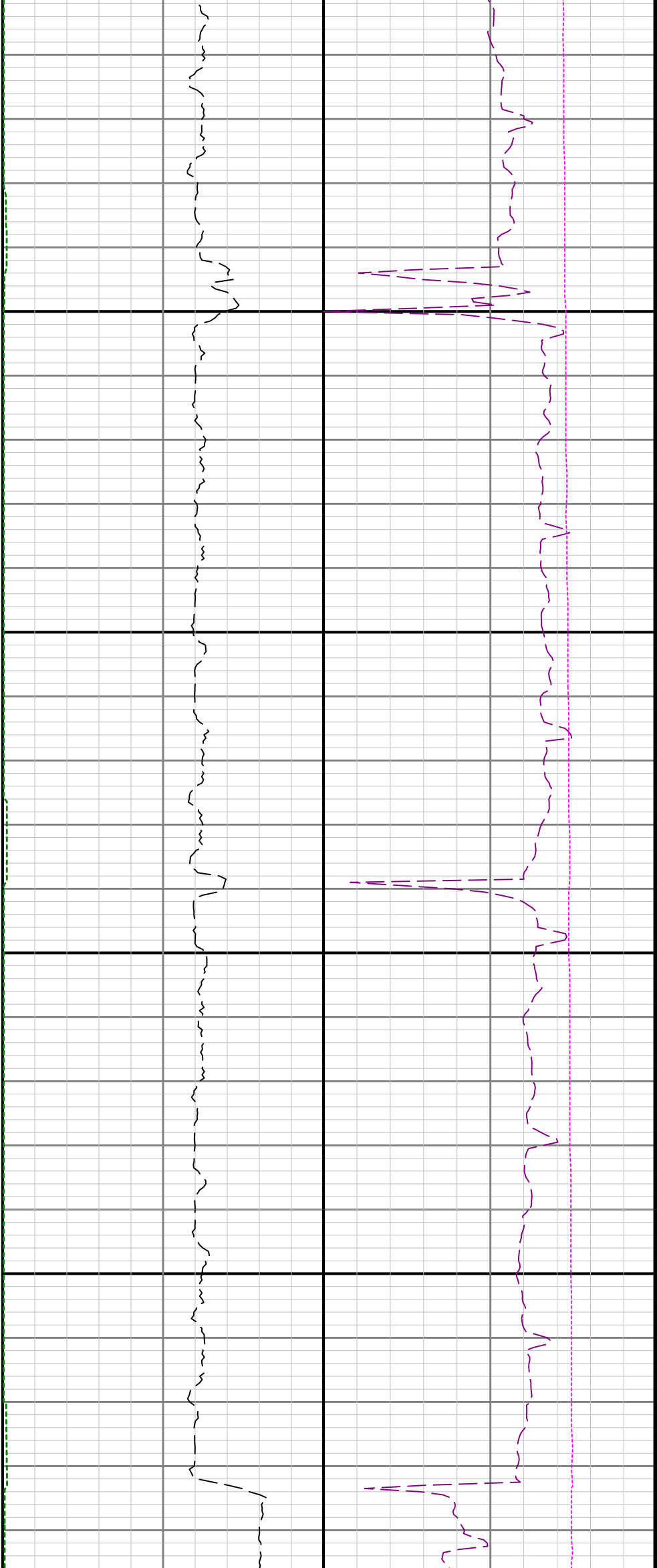






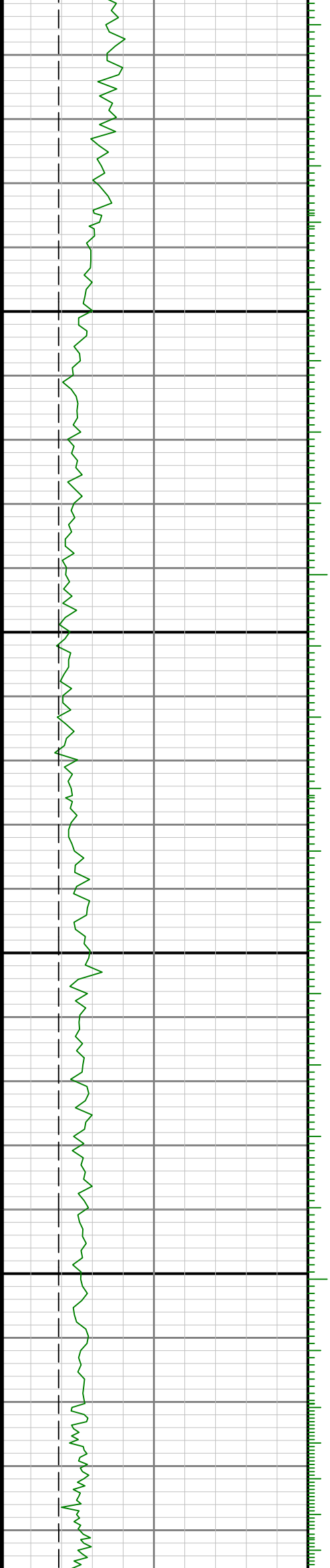


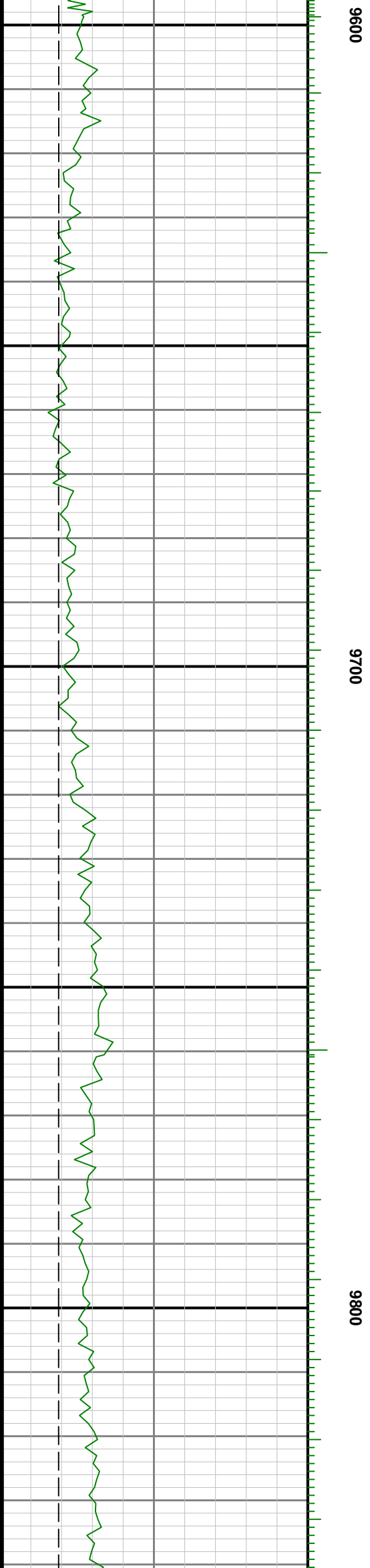
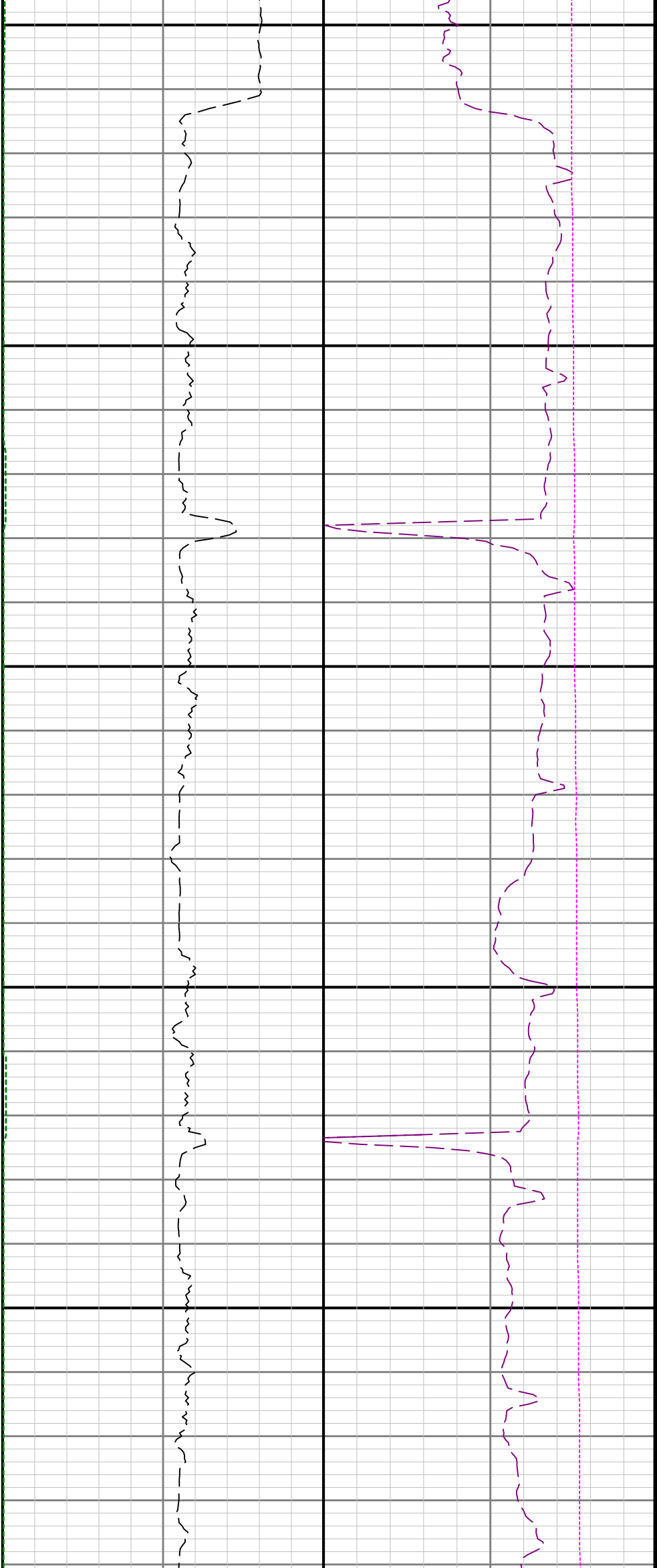


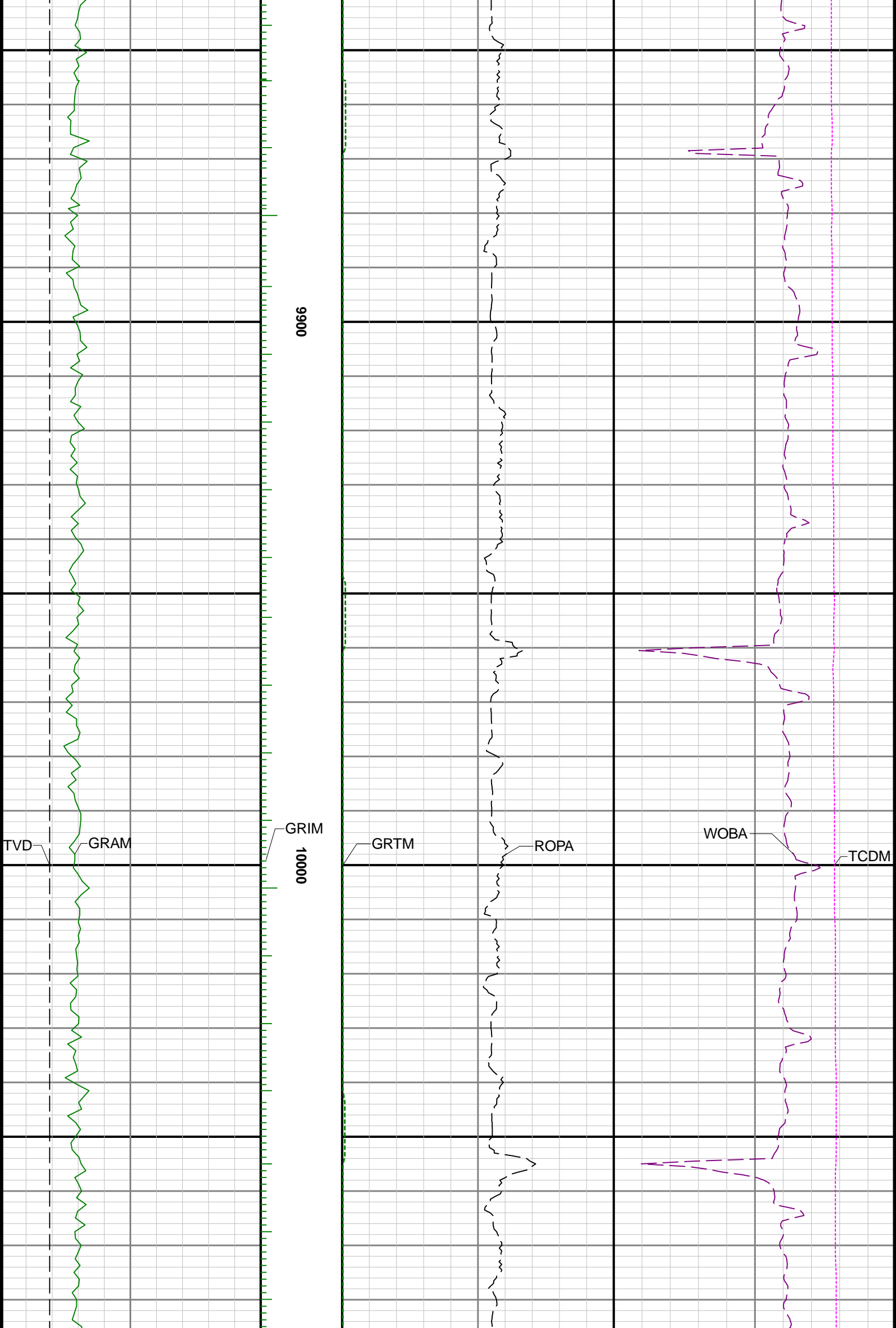


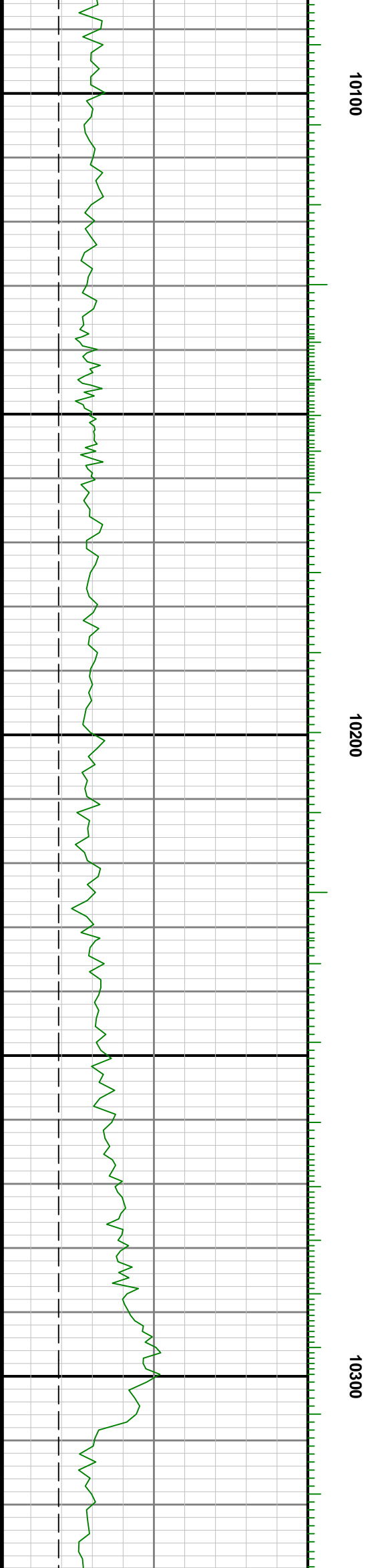
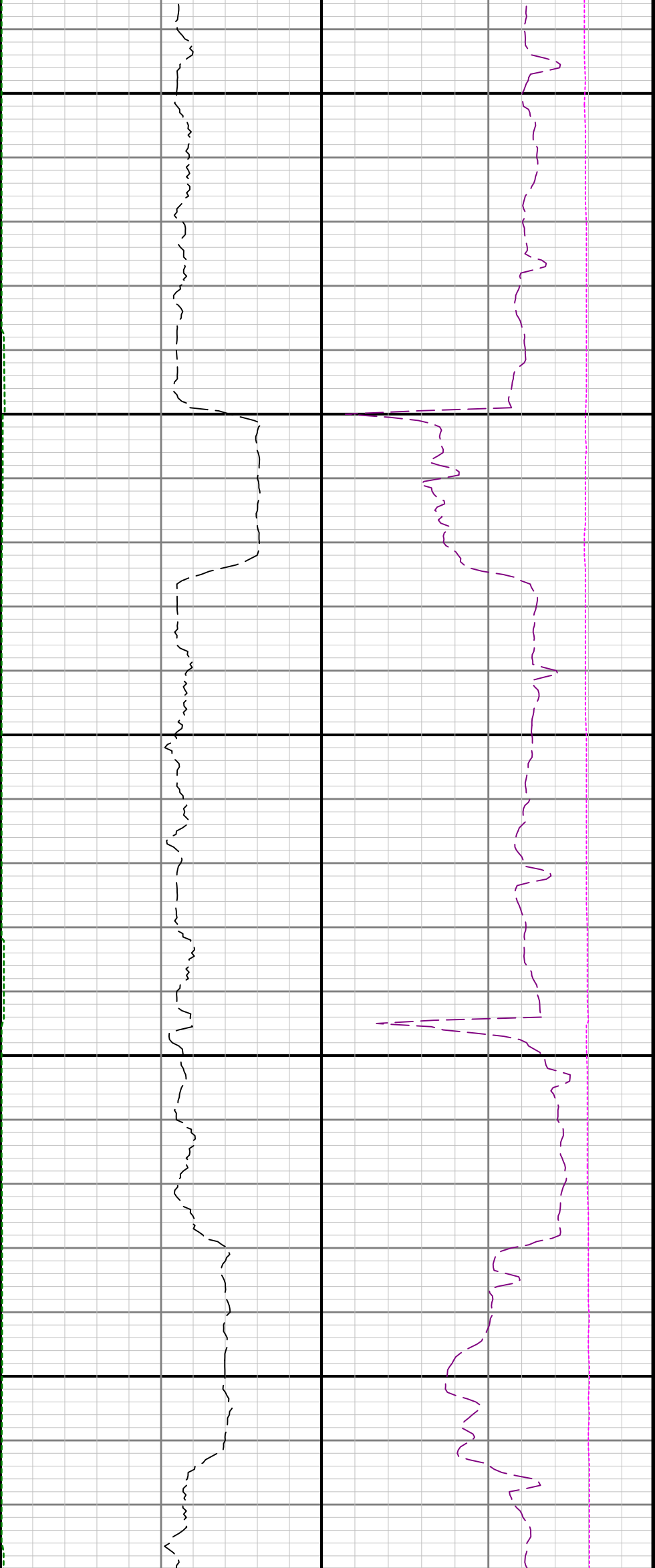
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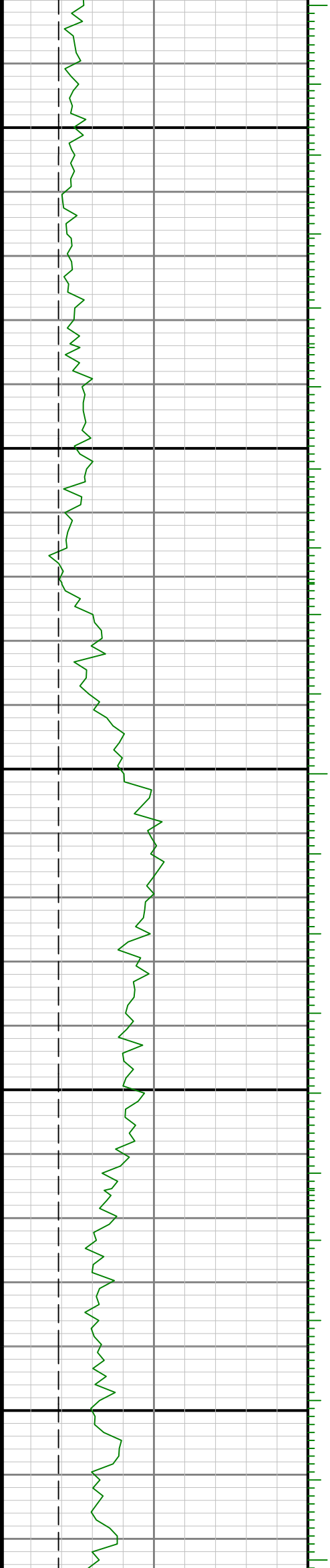


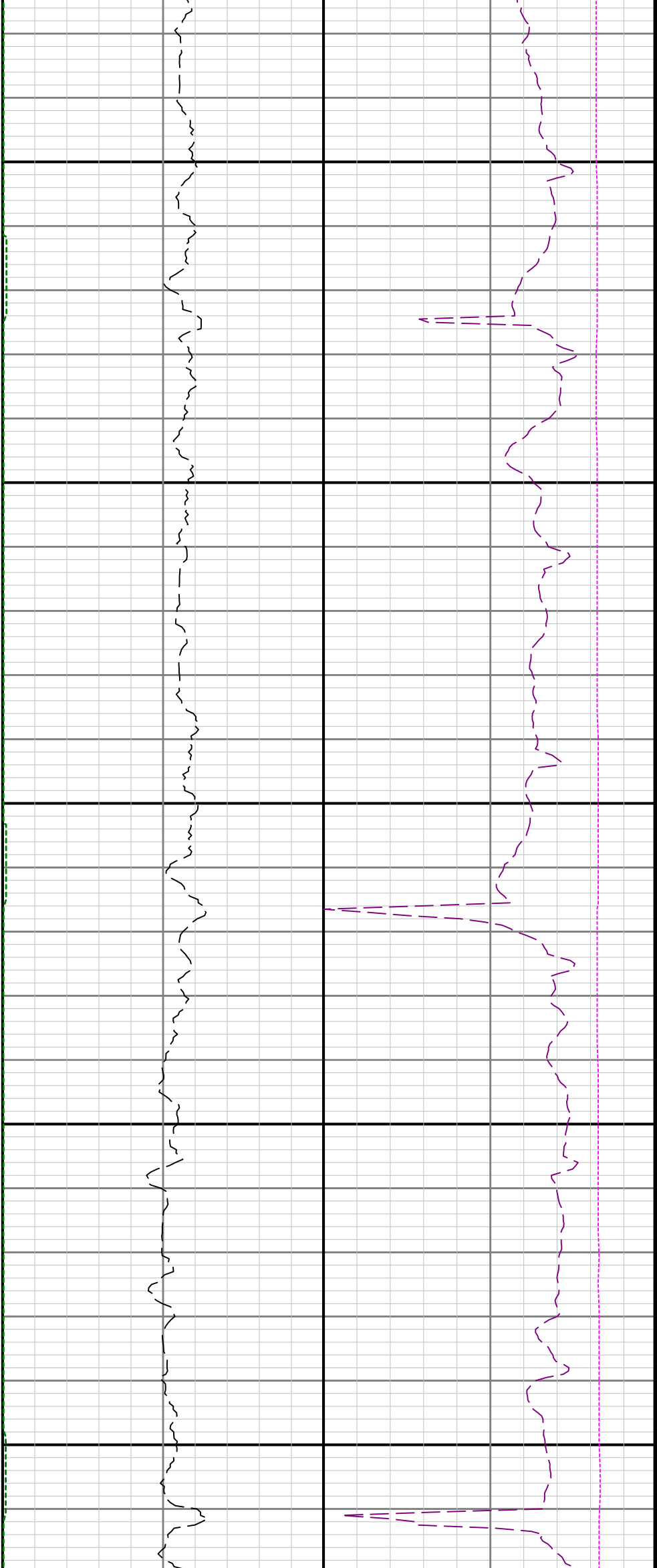




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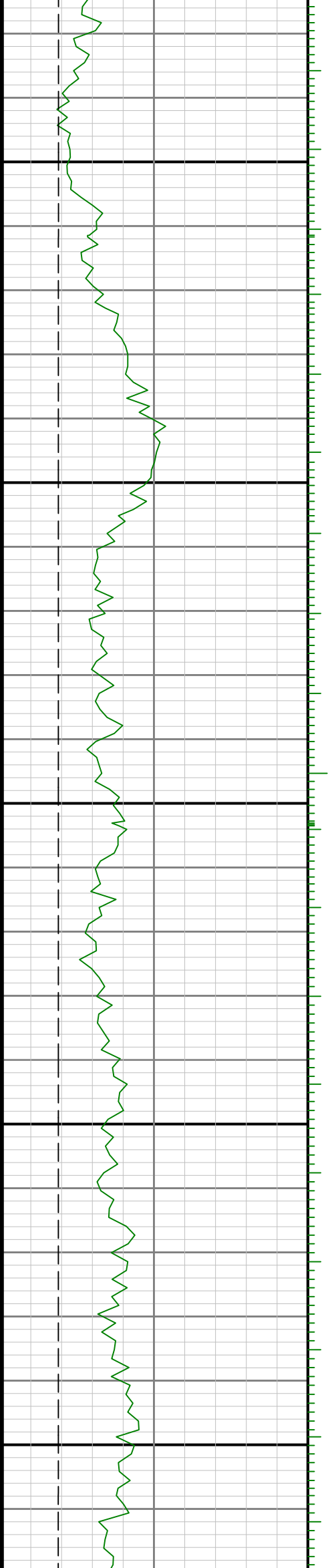


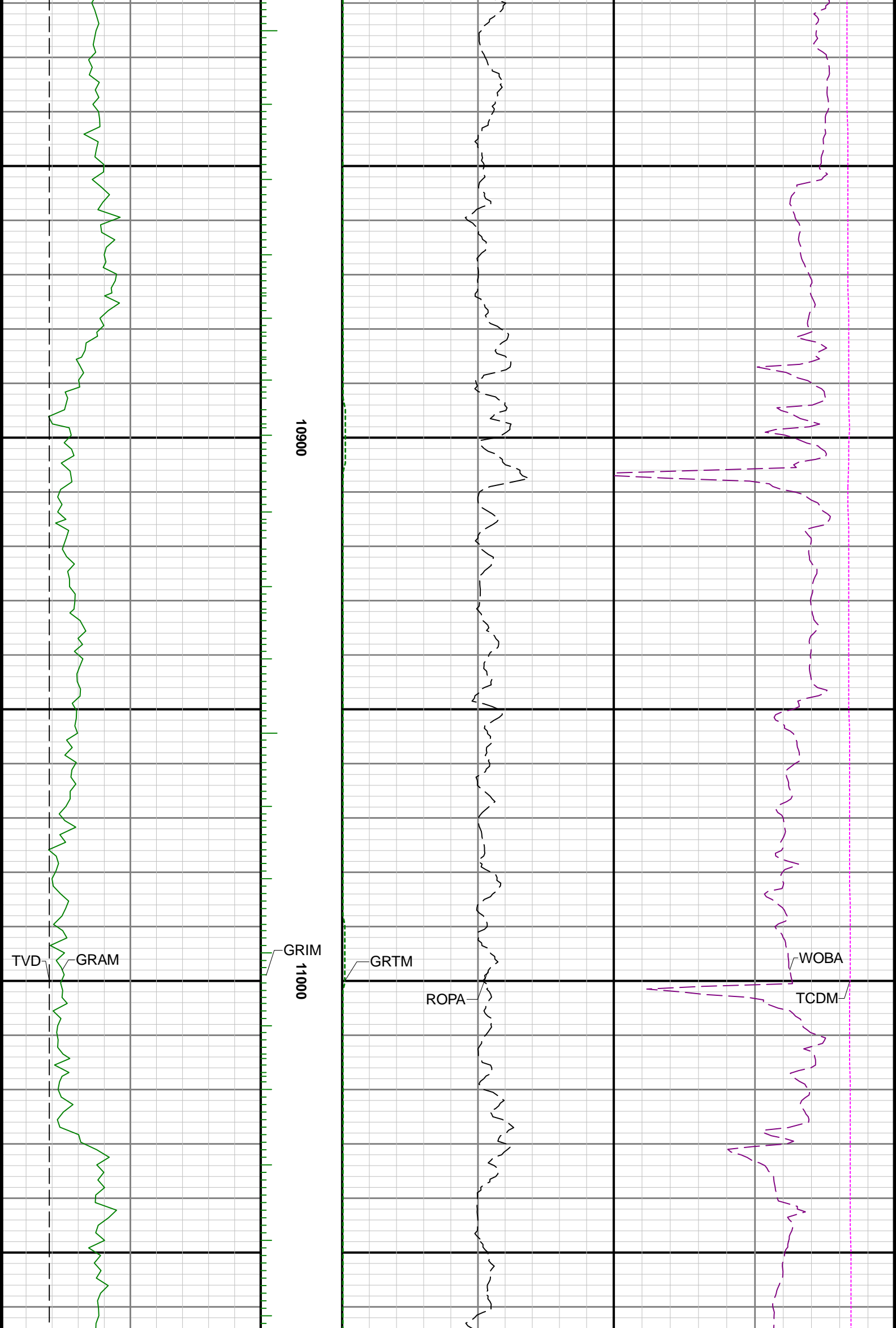


10600

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10800



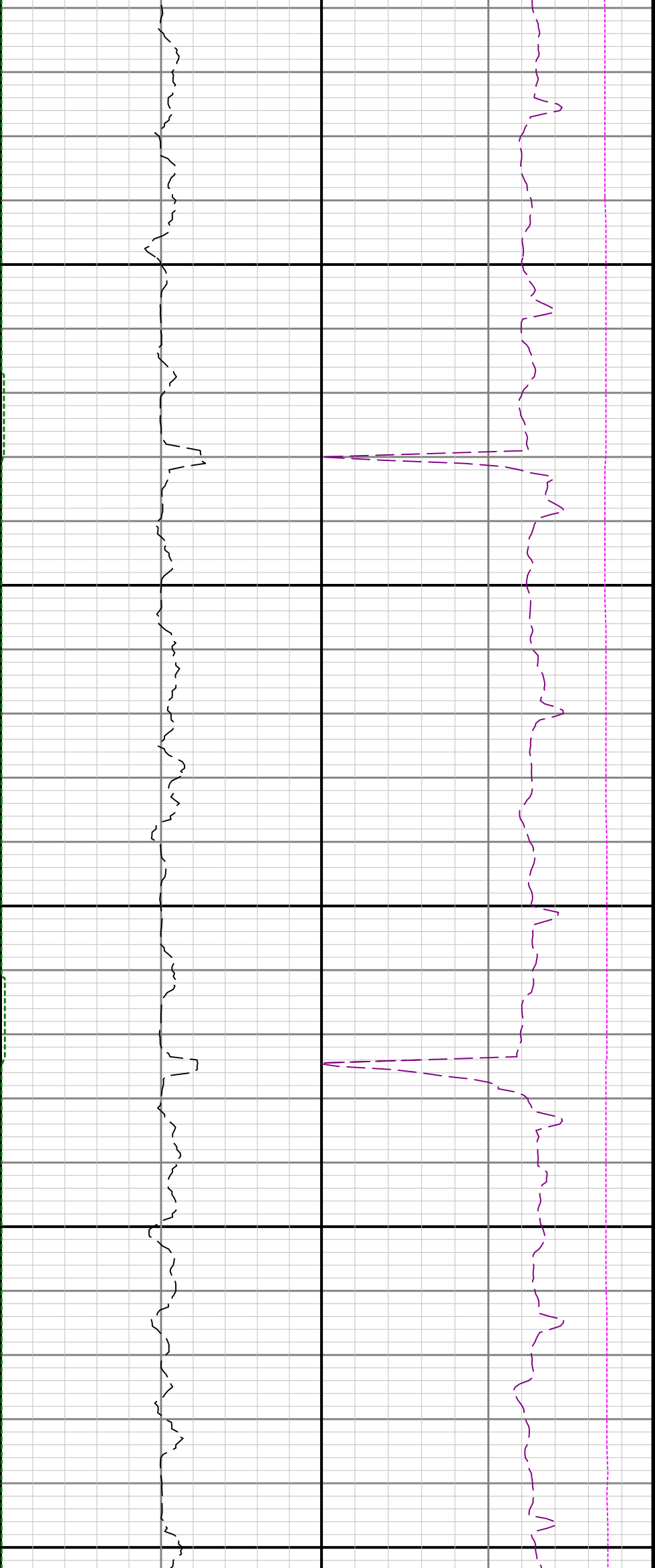




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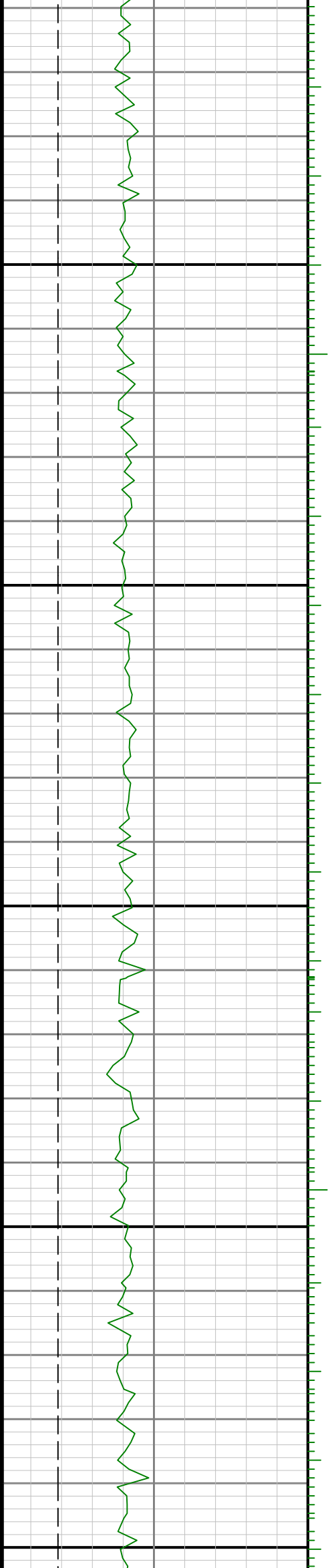
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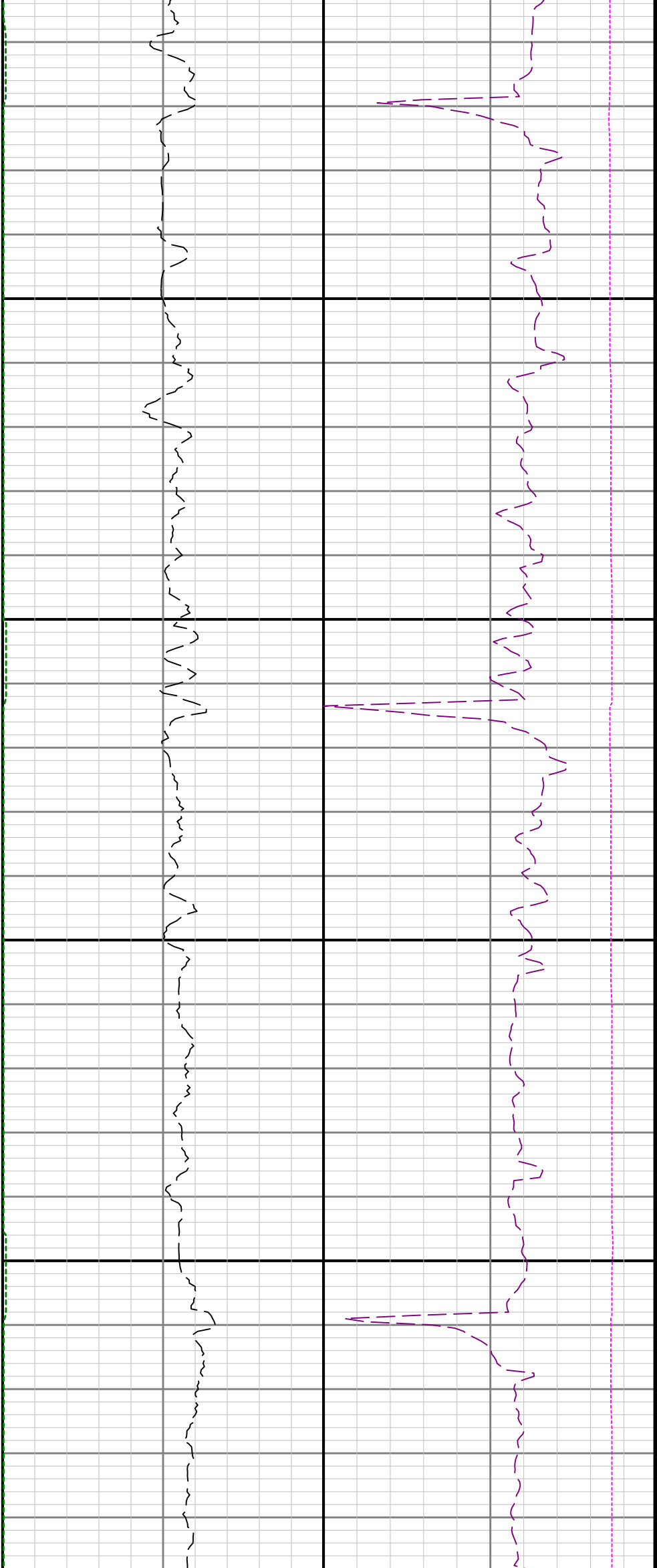
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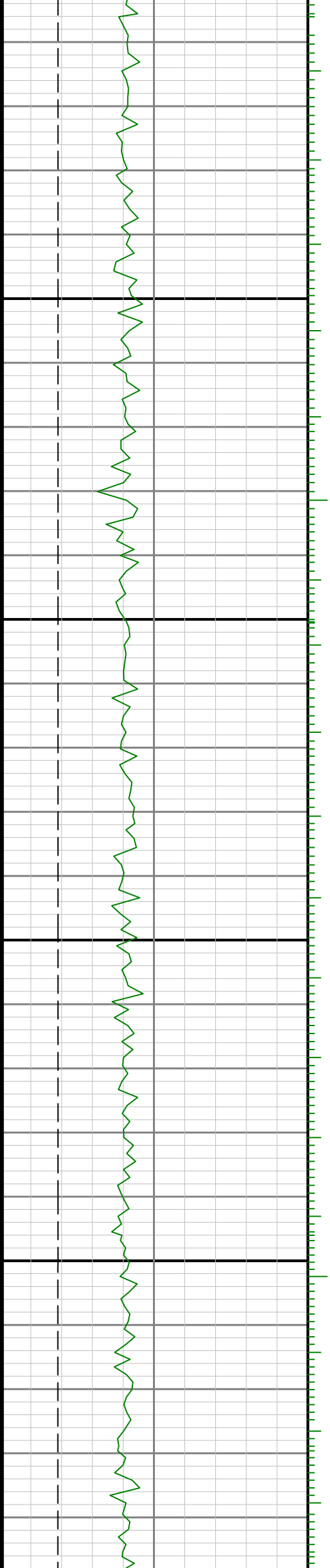


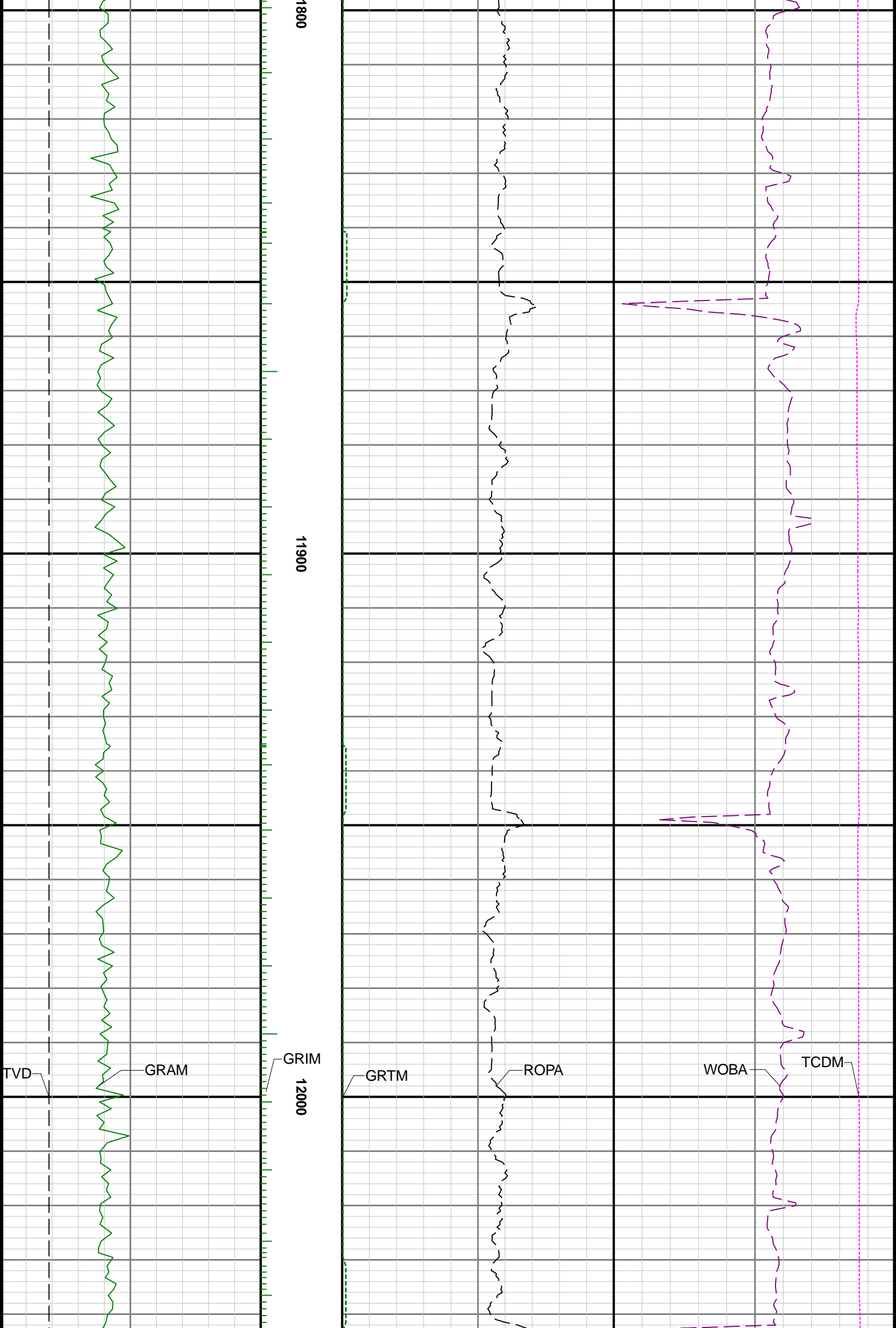


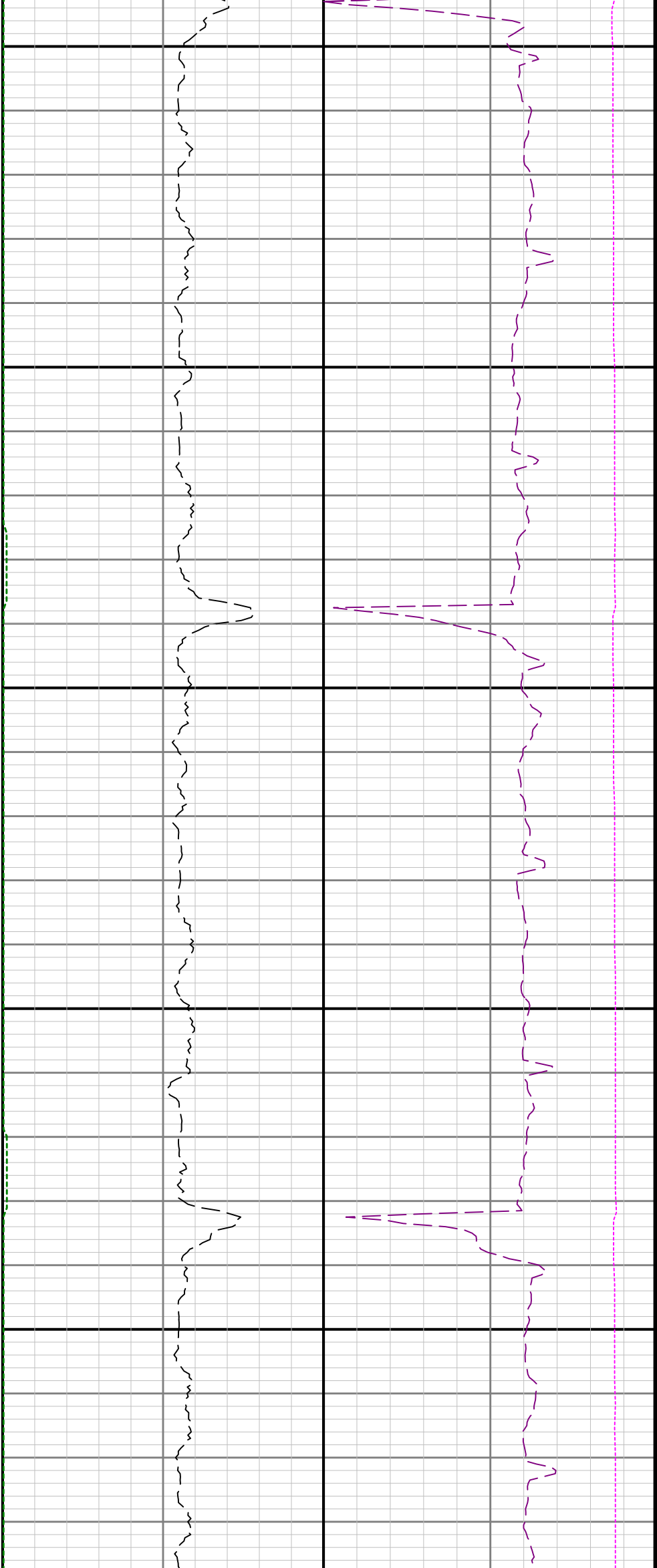
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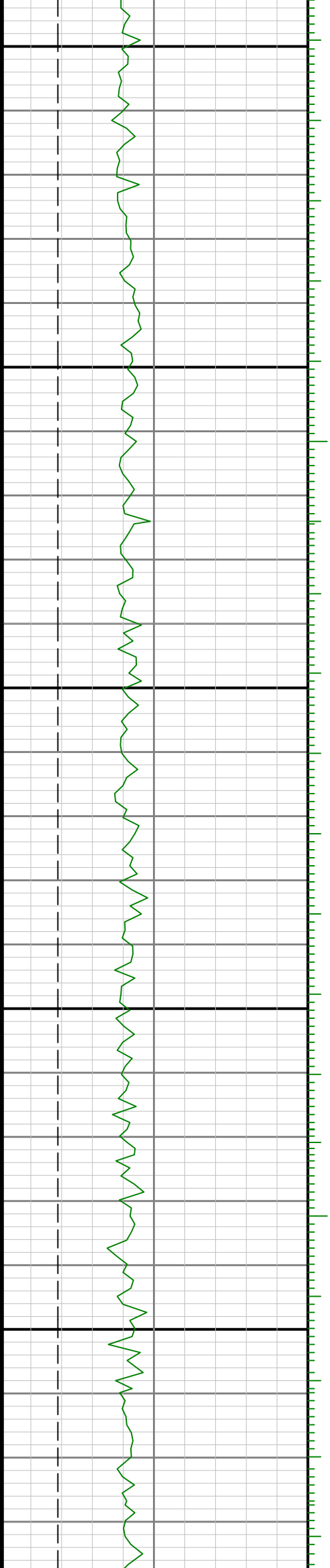


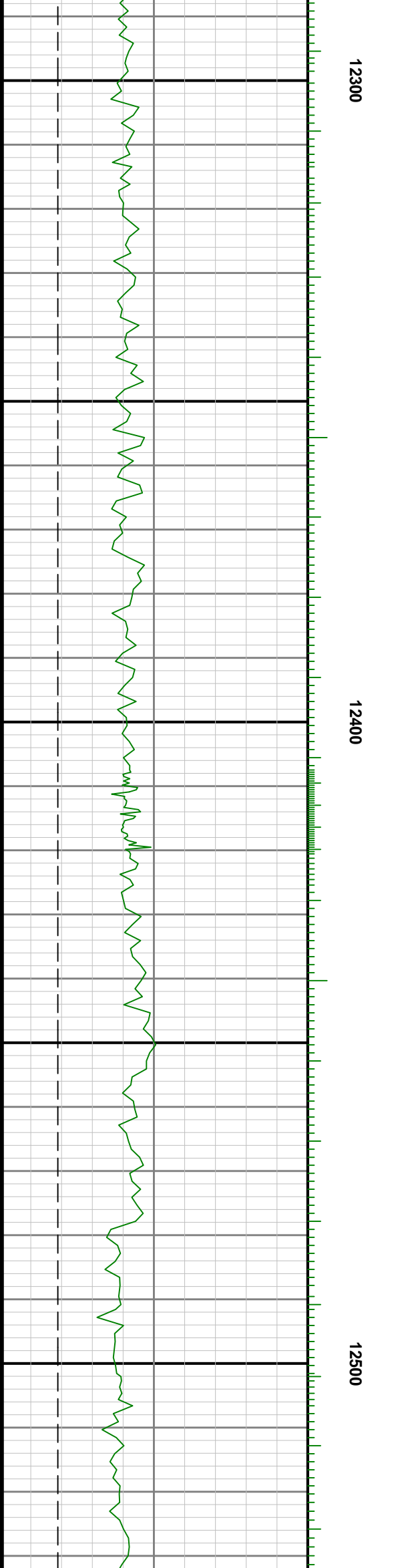
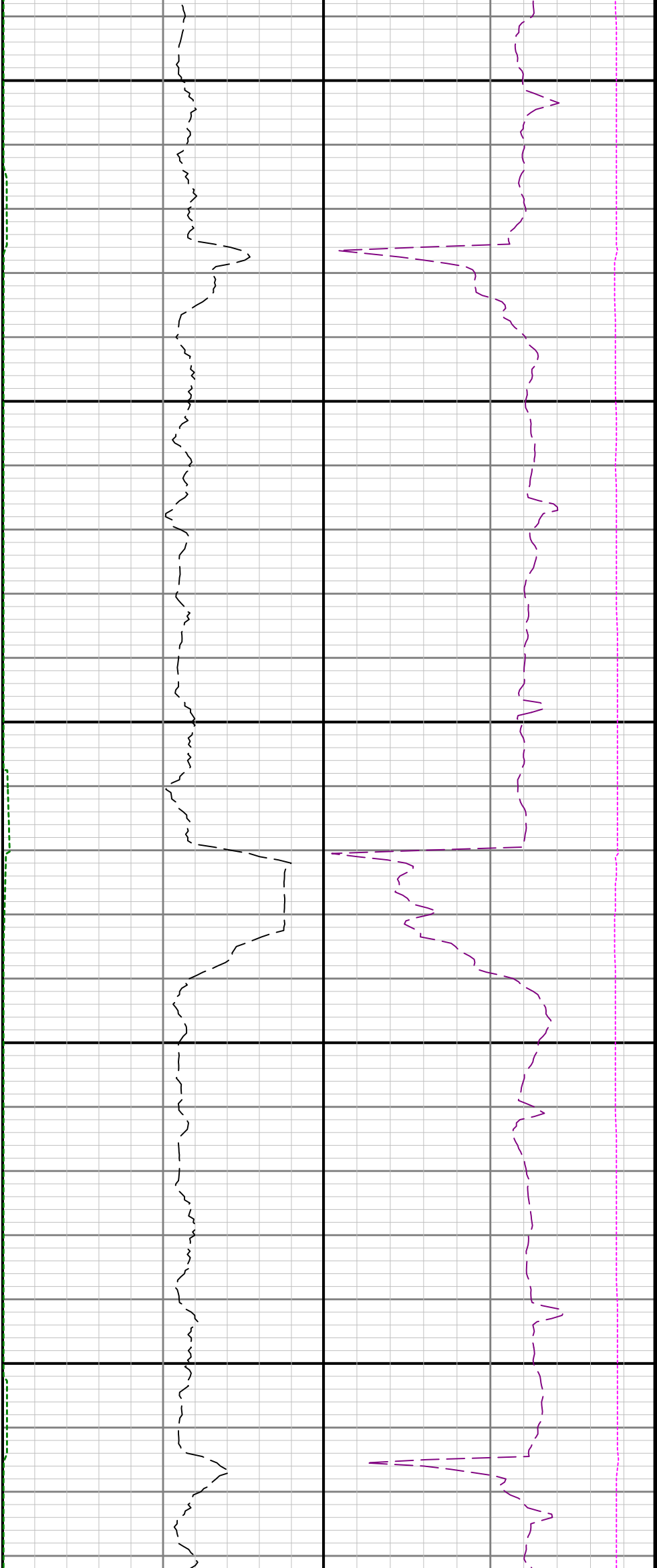




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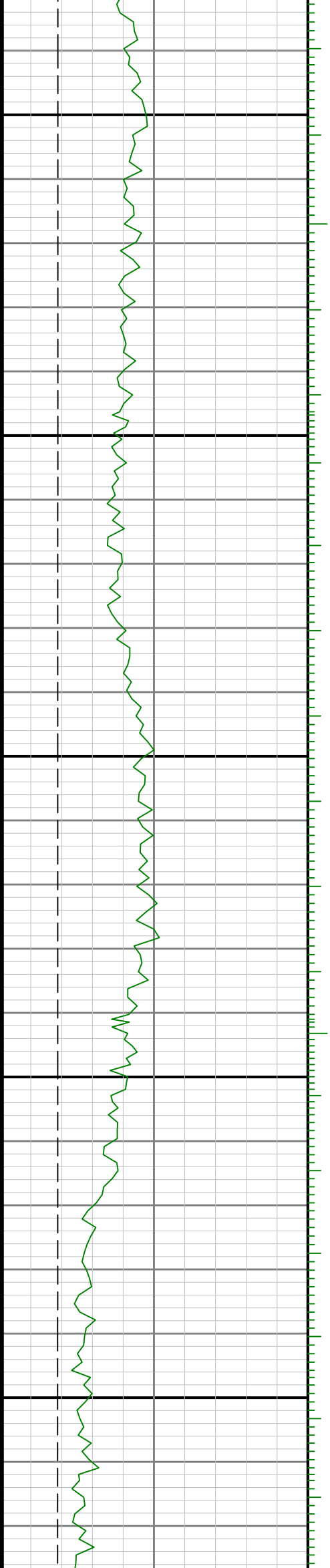




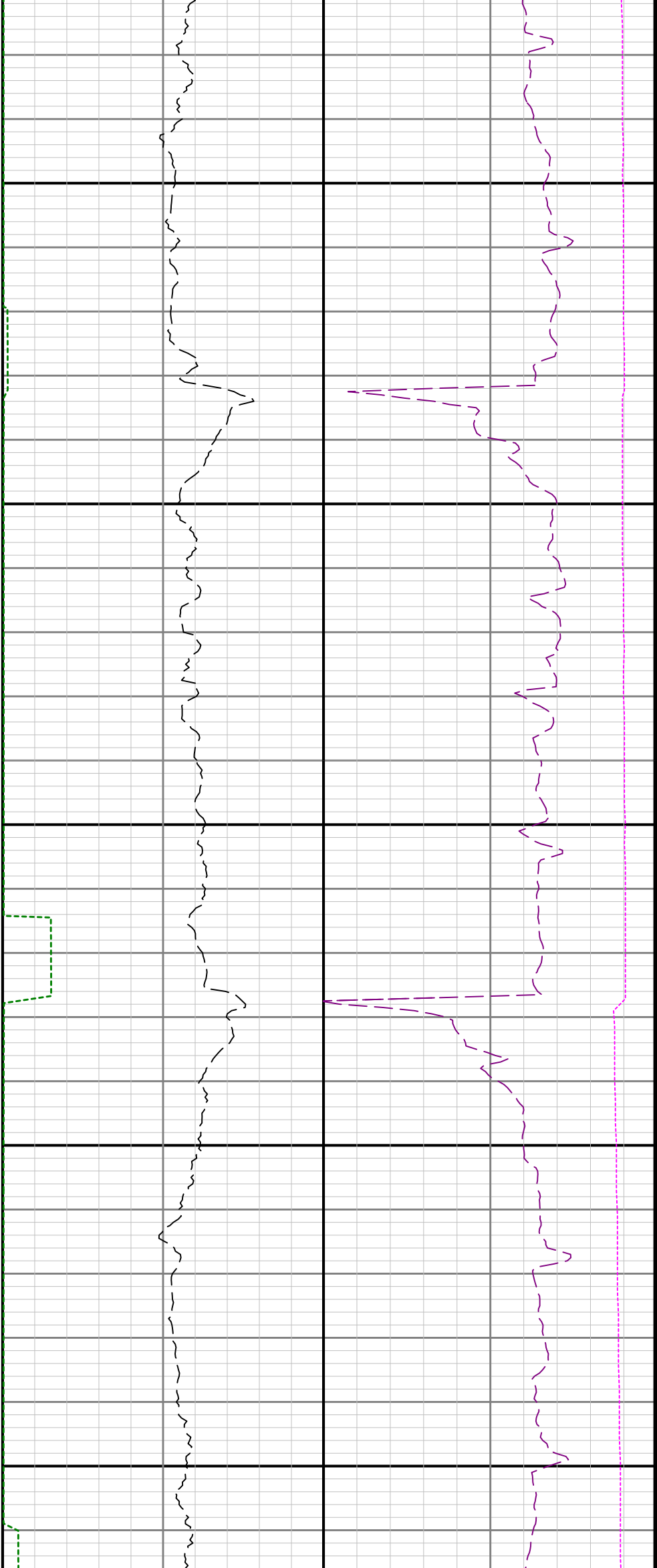


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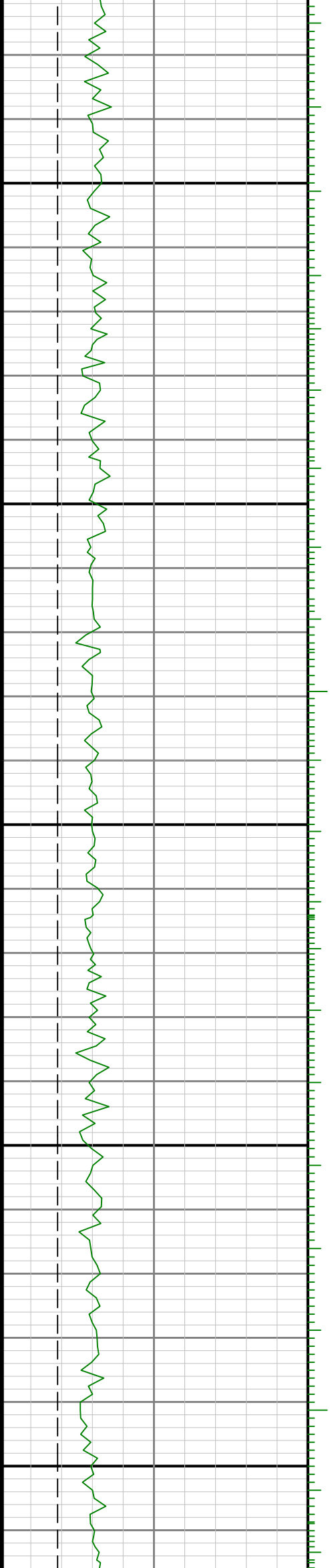


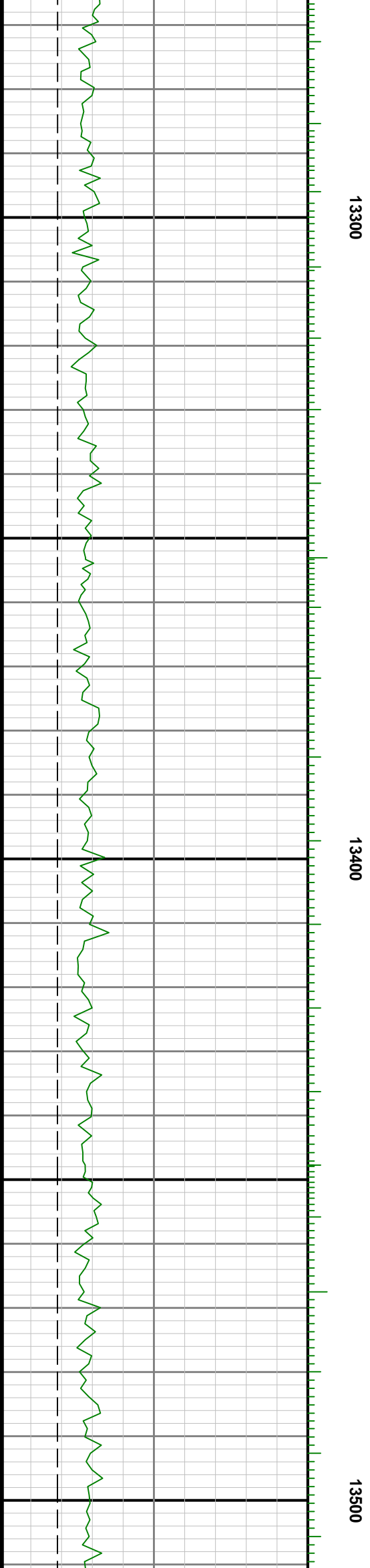
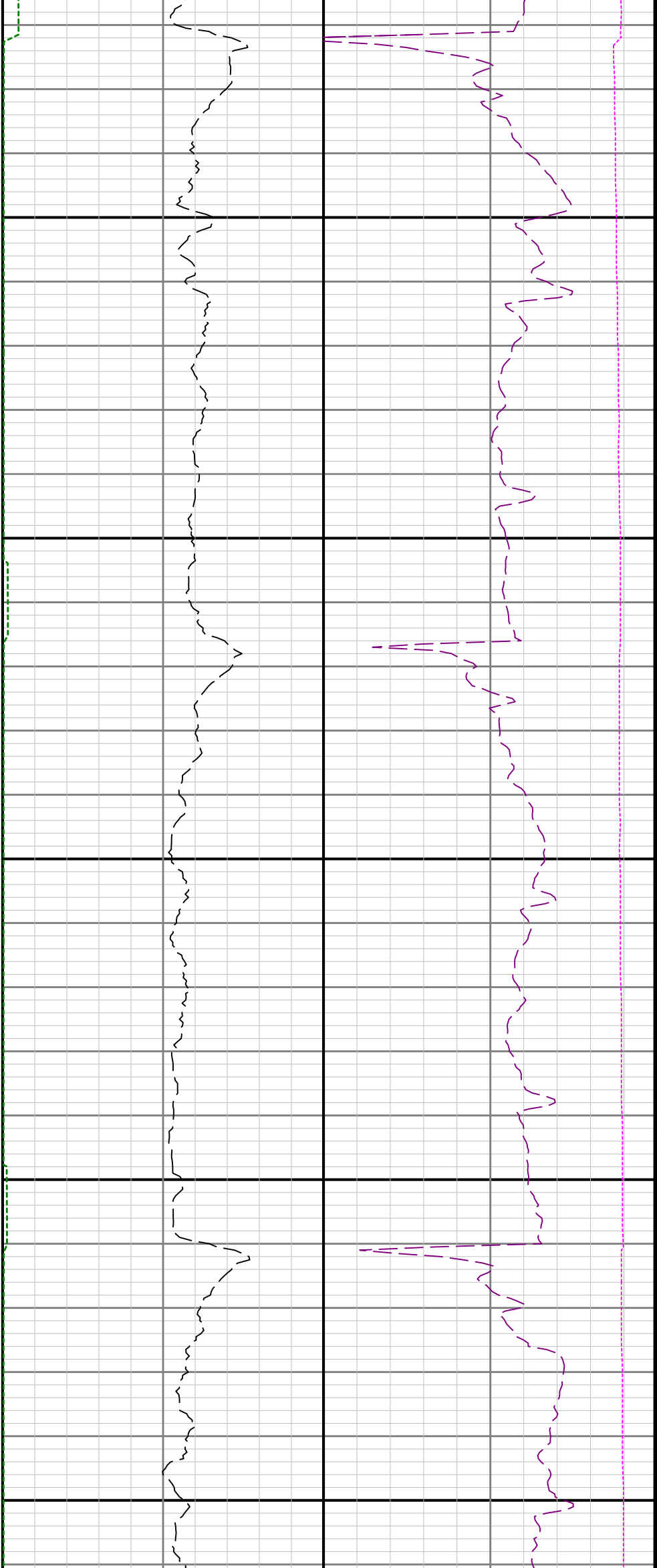


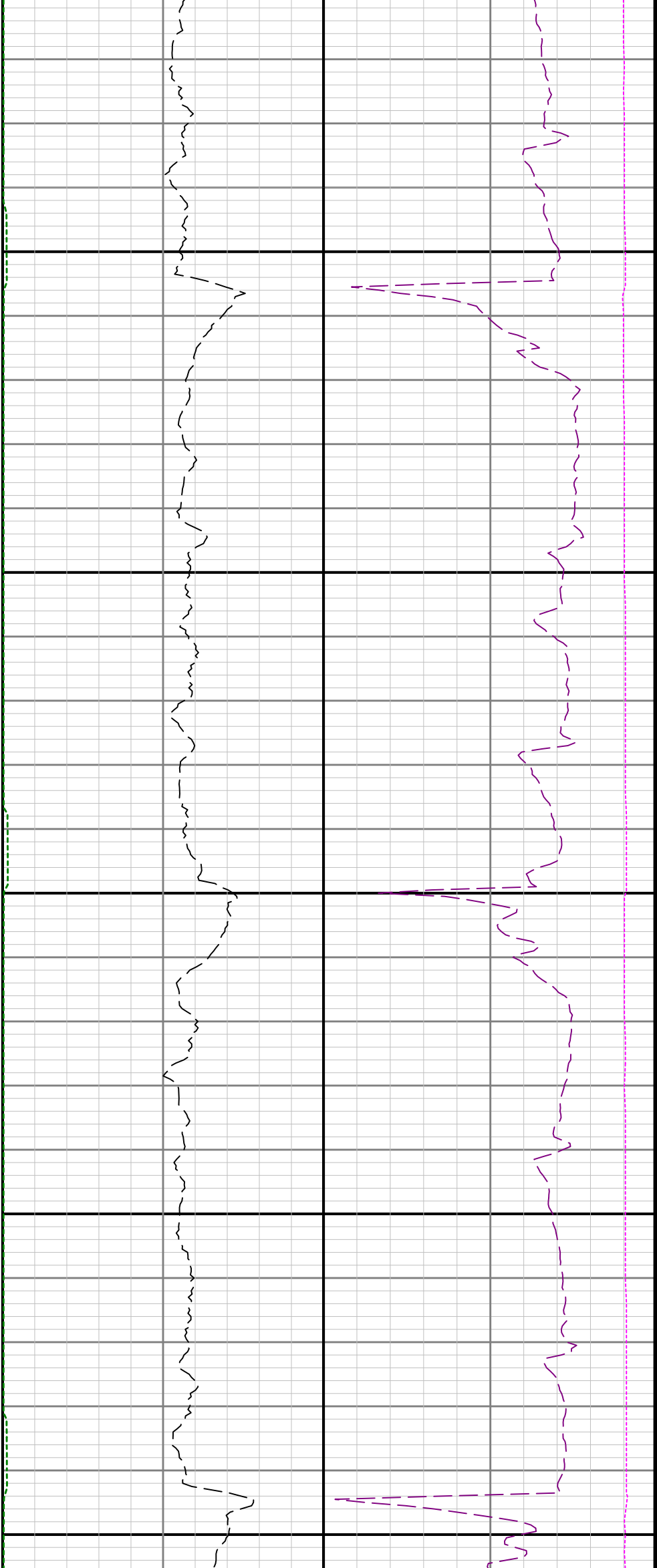


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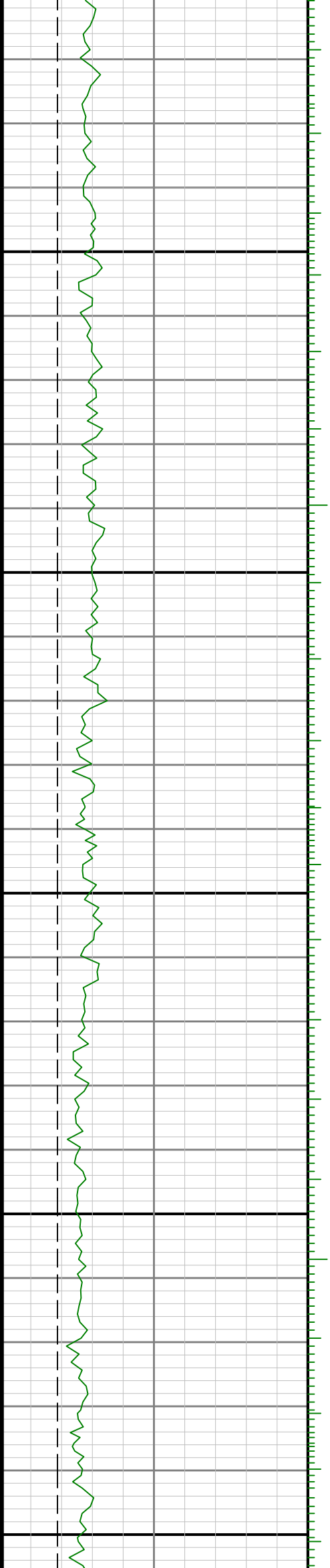


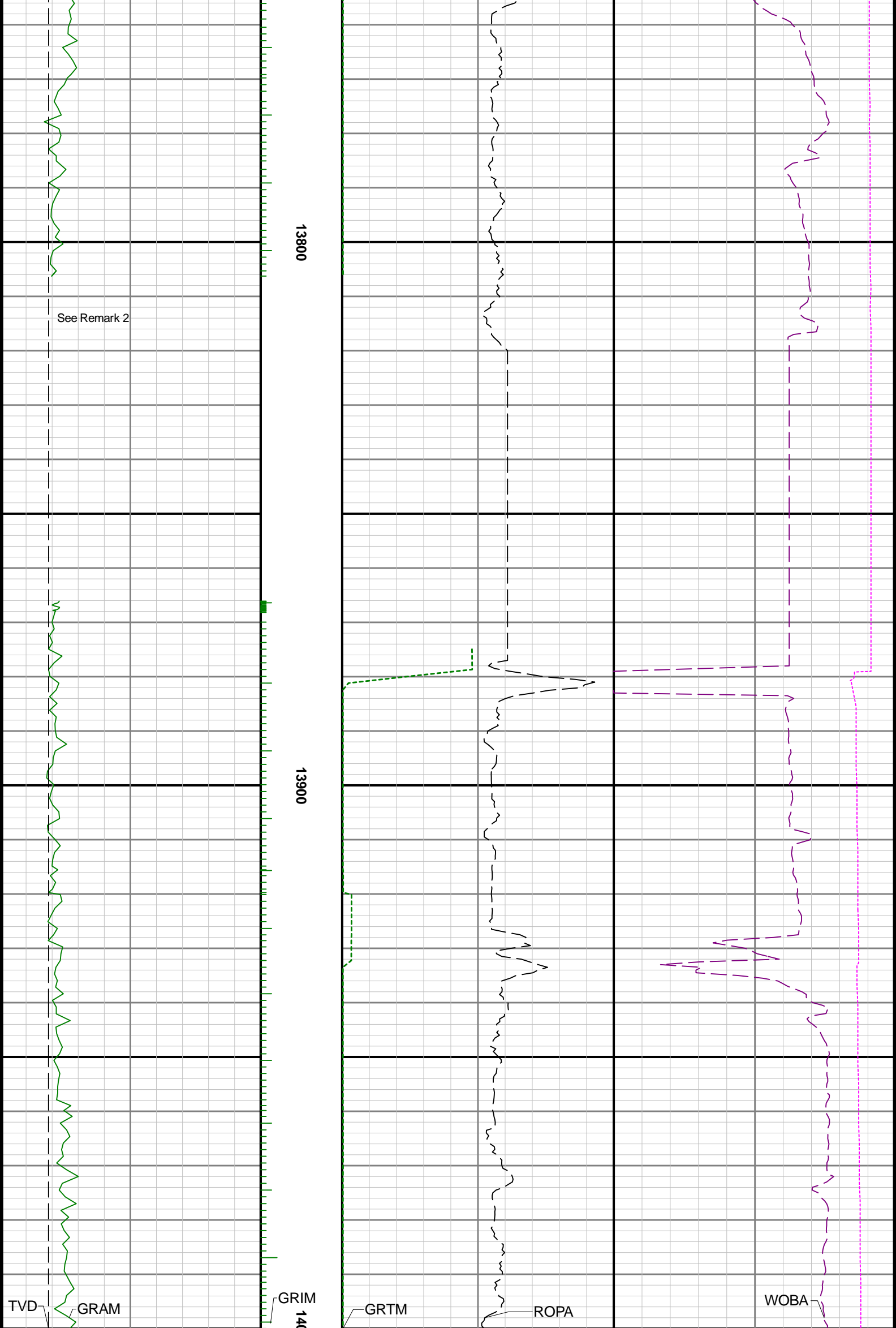


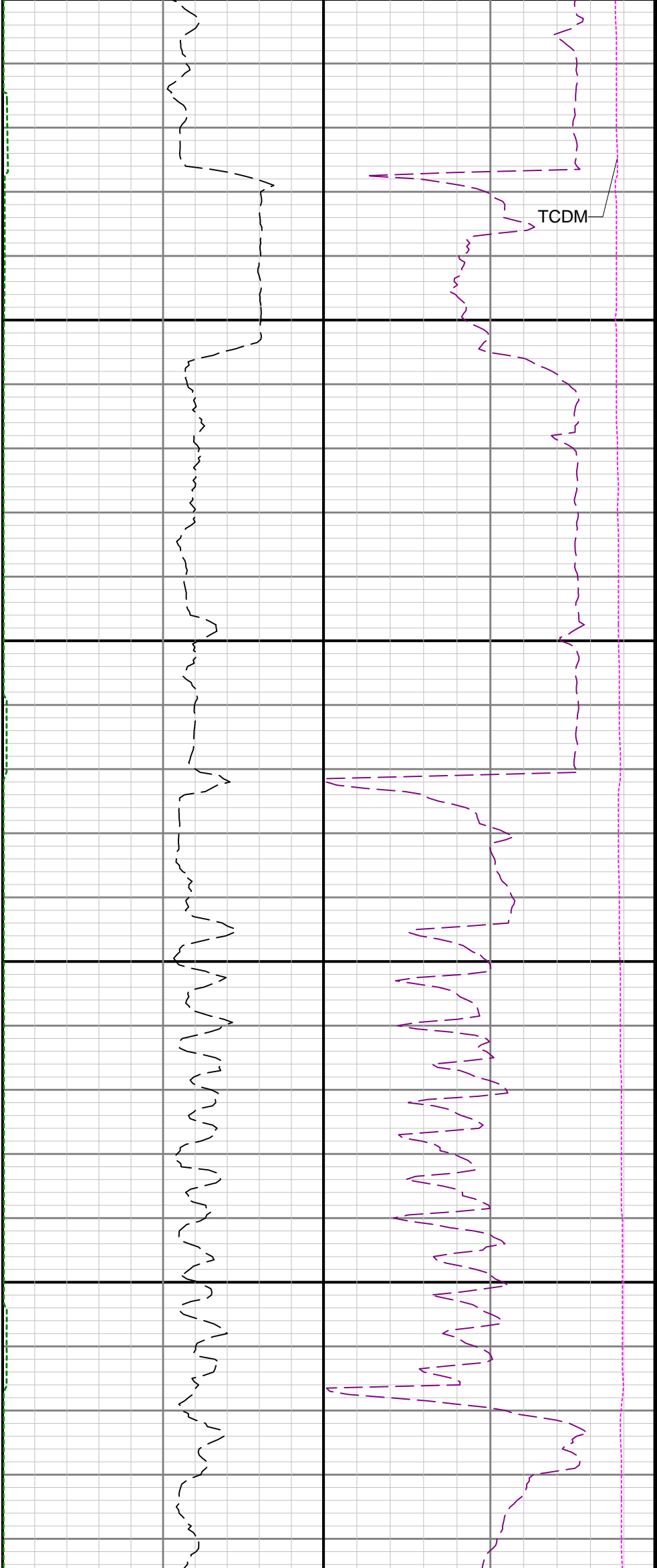


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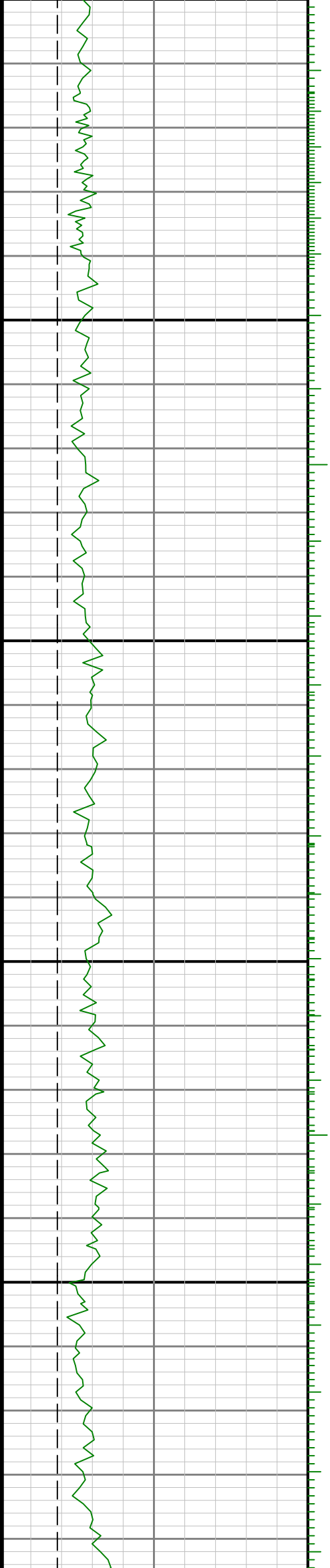


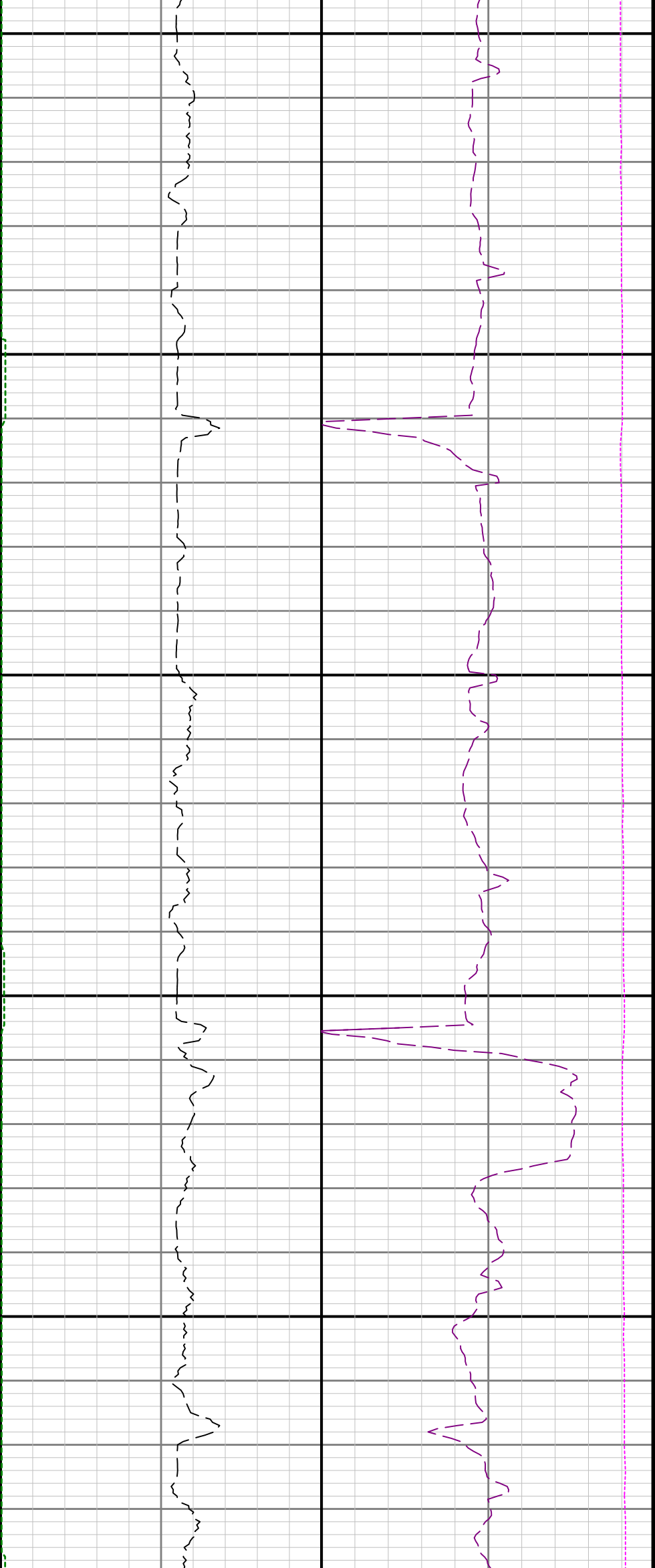


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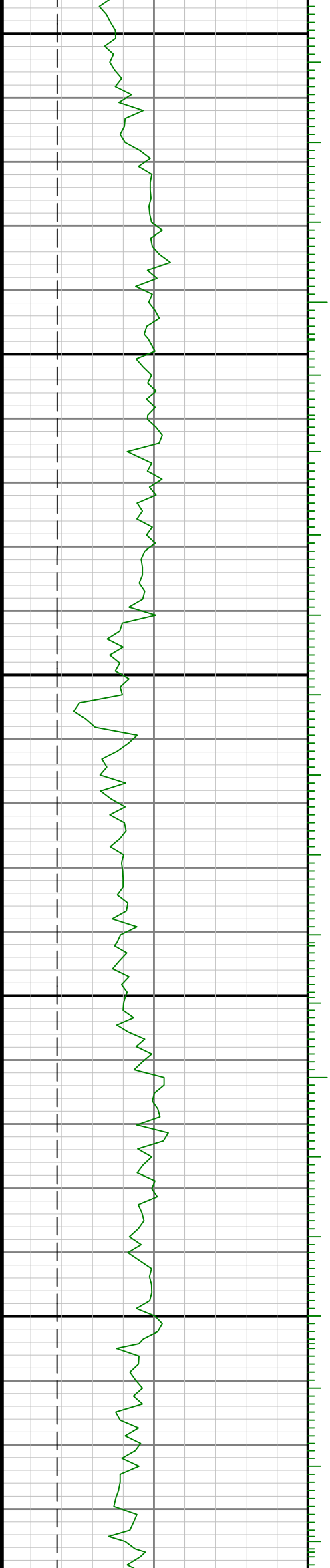
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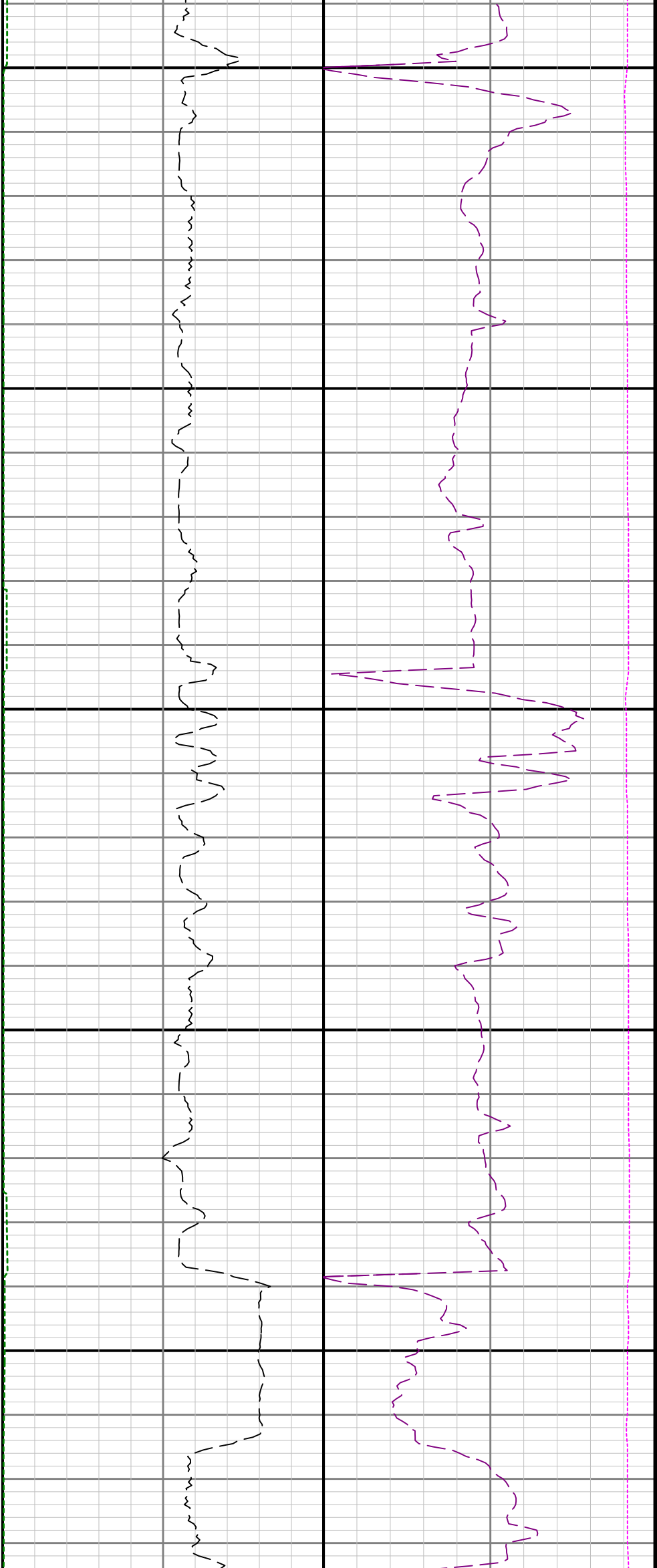




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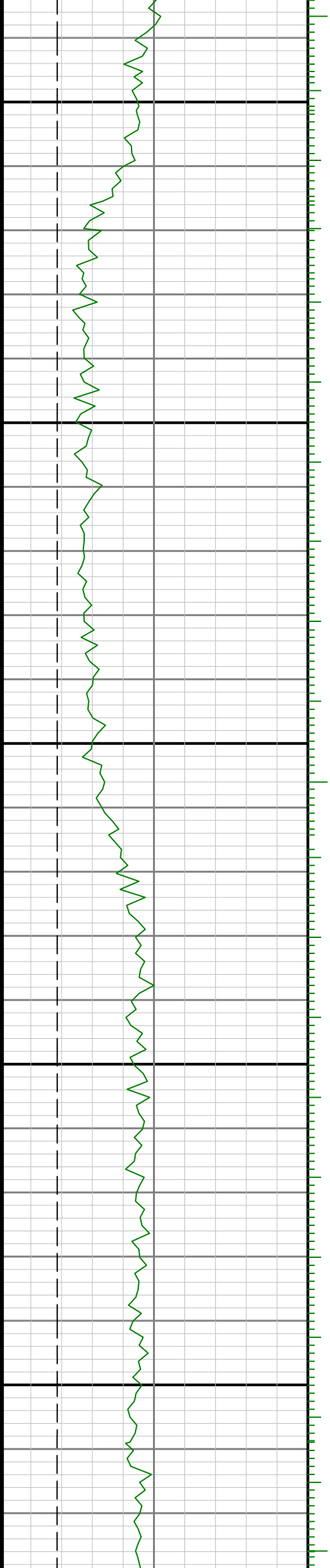
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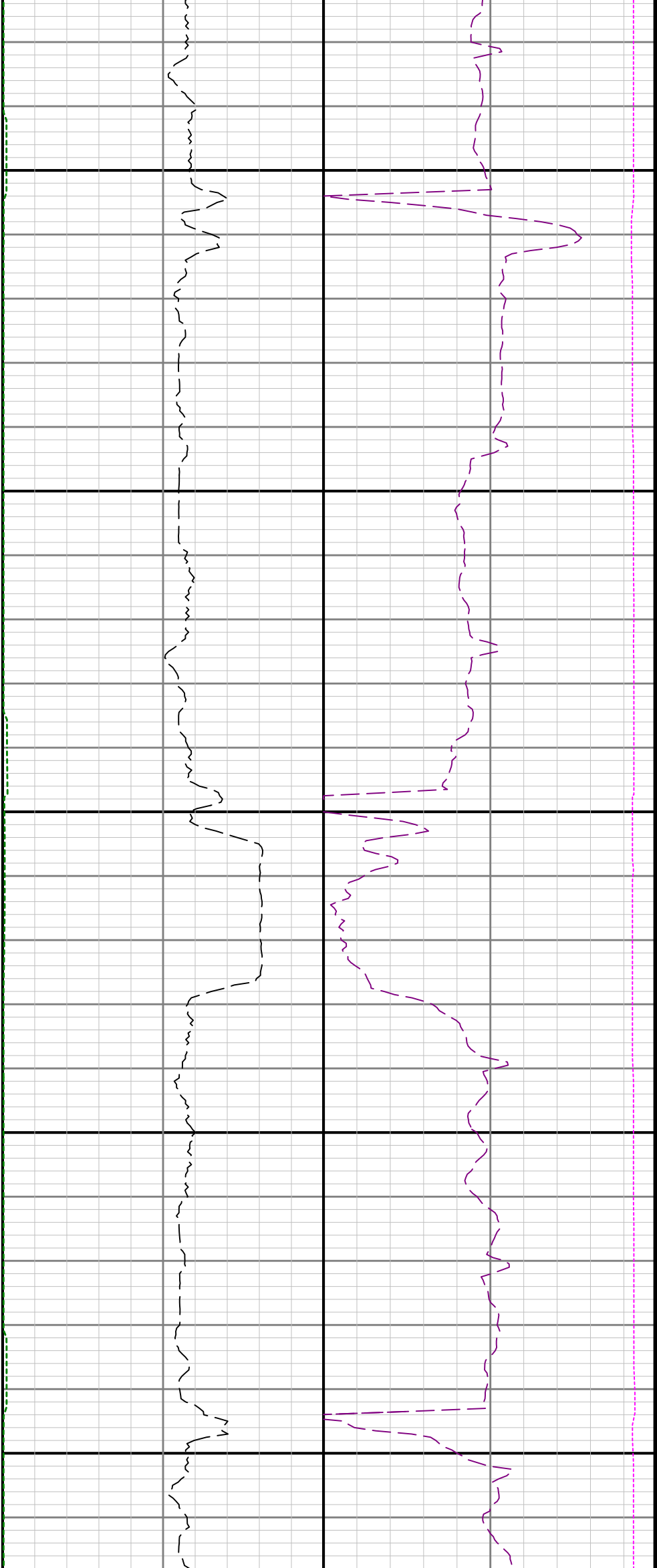


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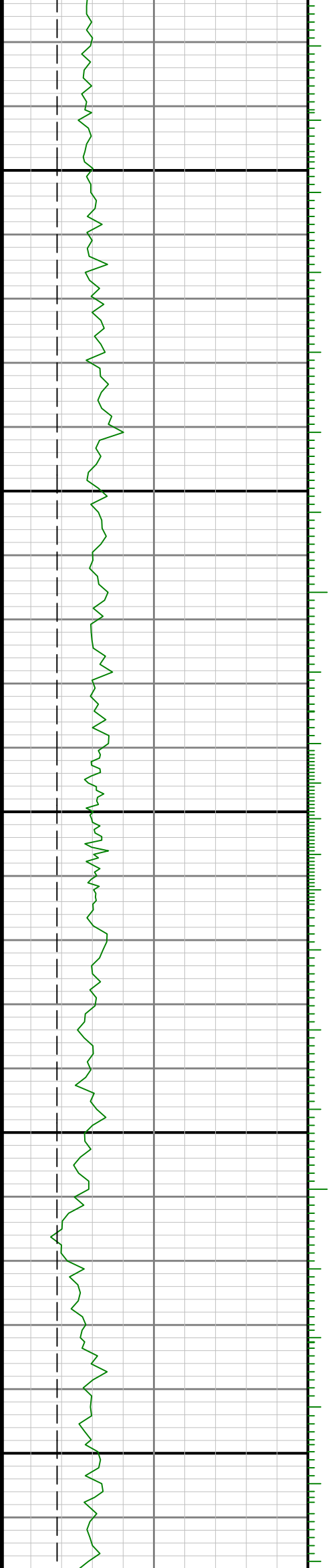


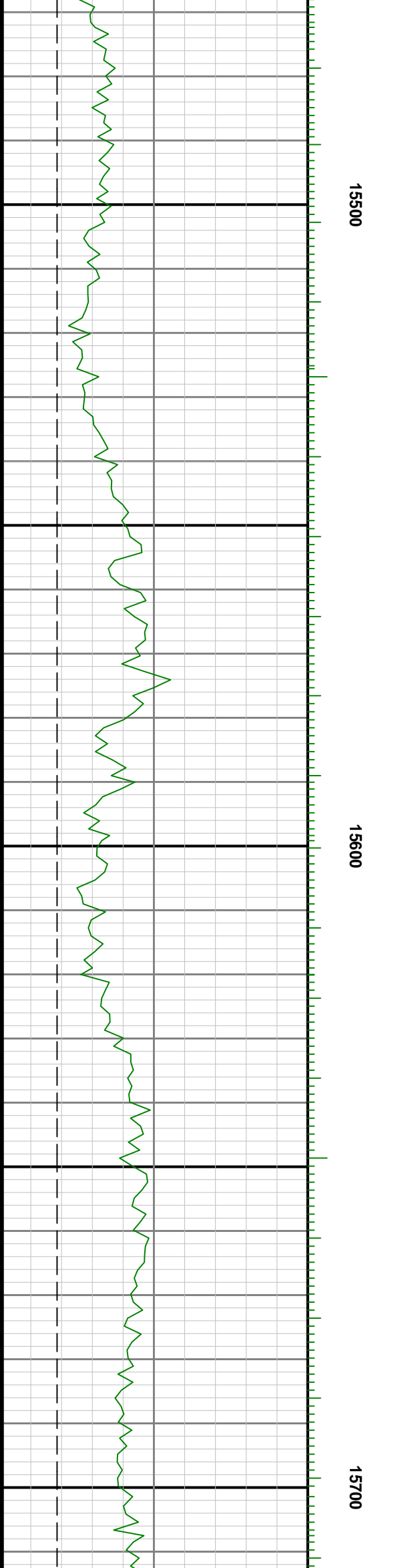


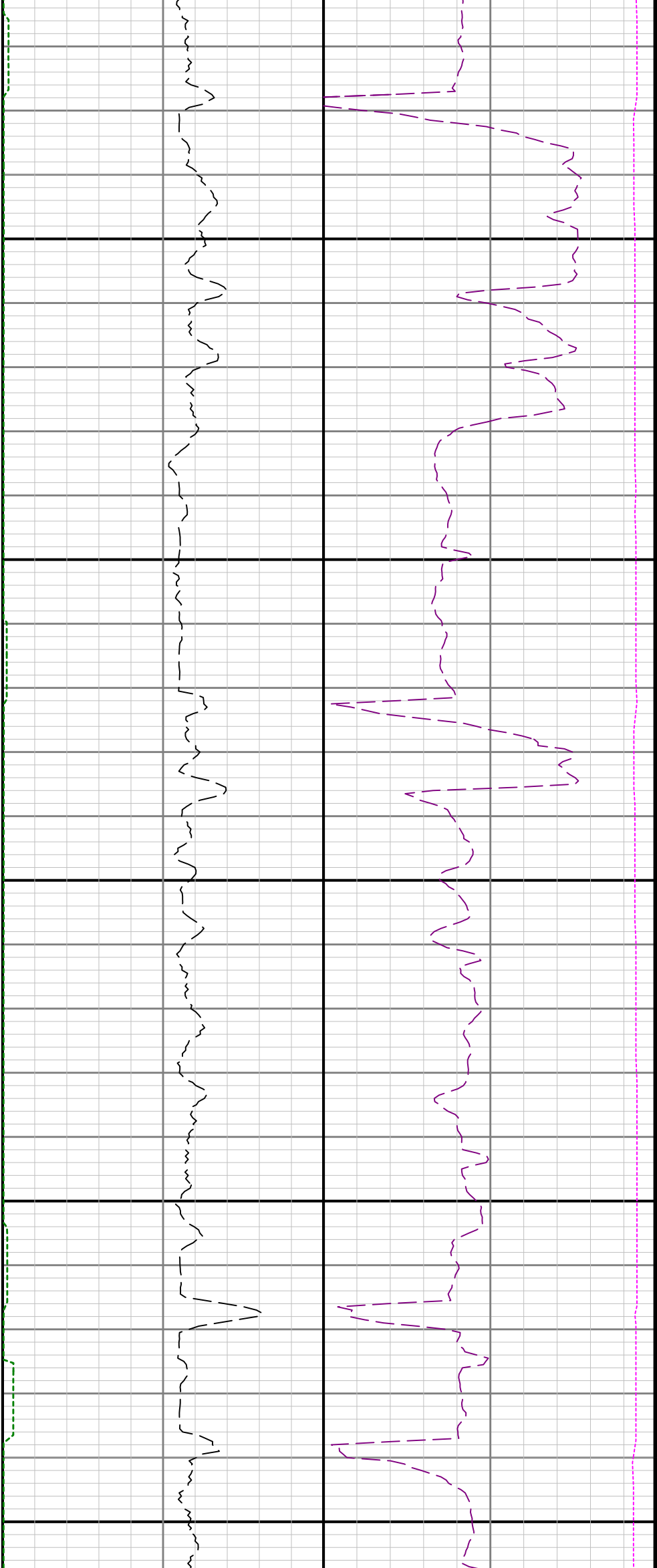


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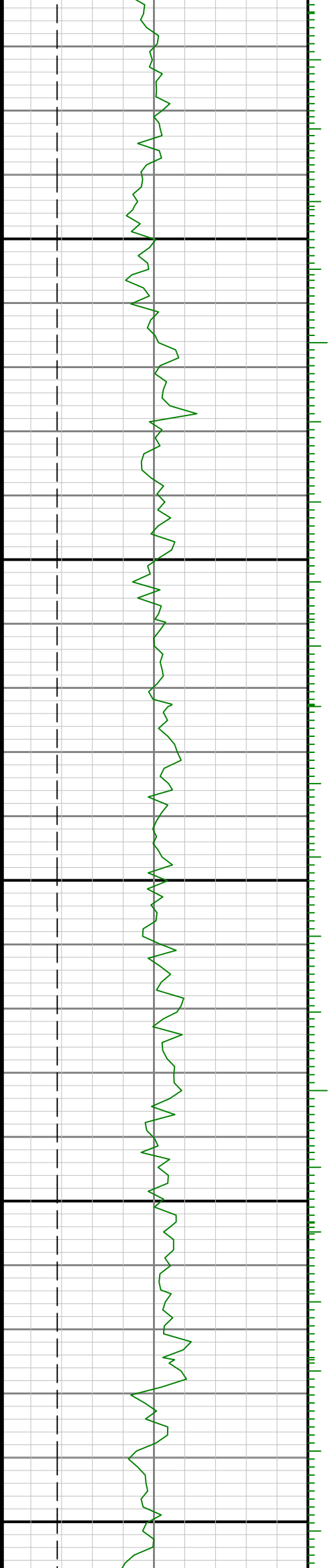


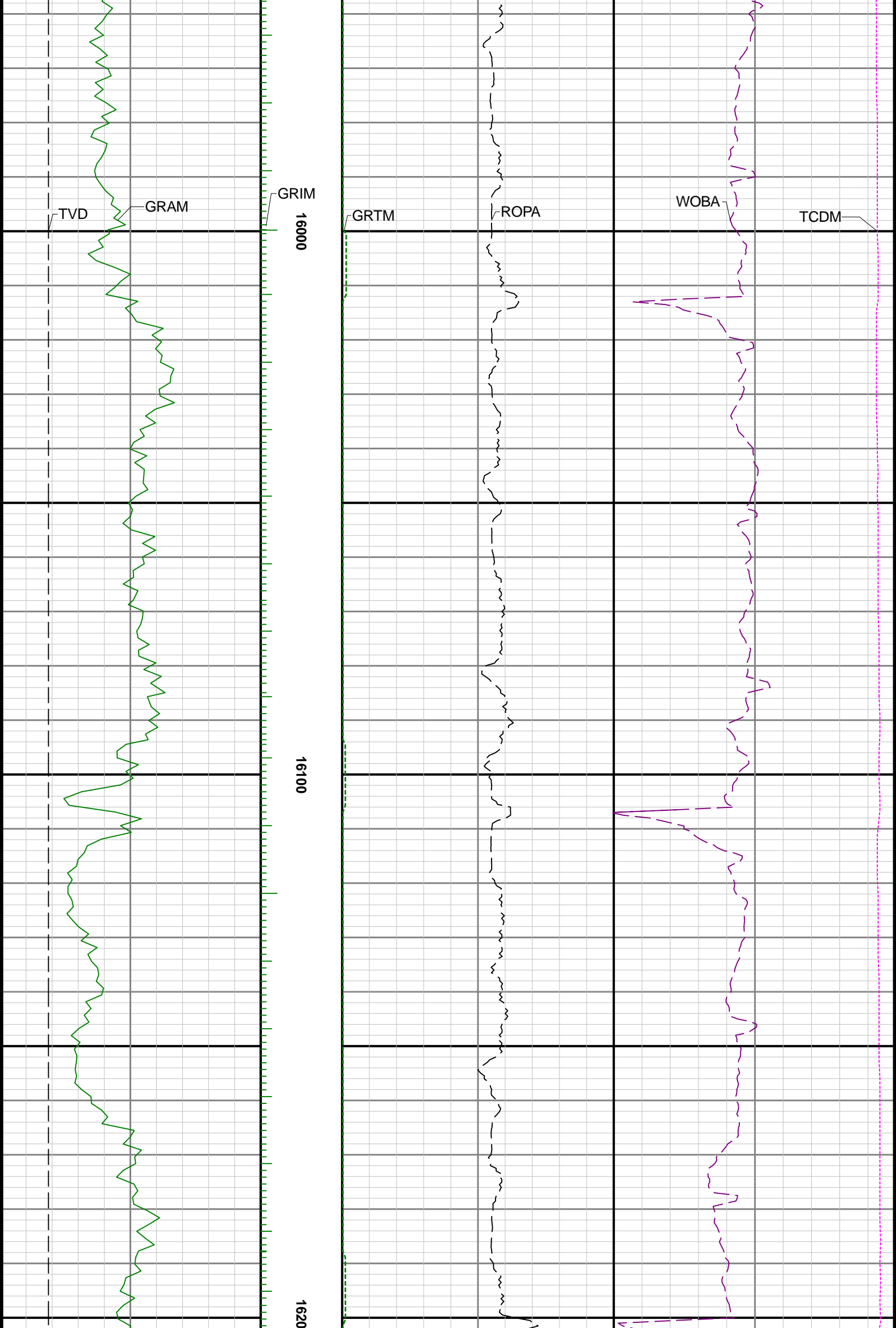


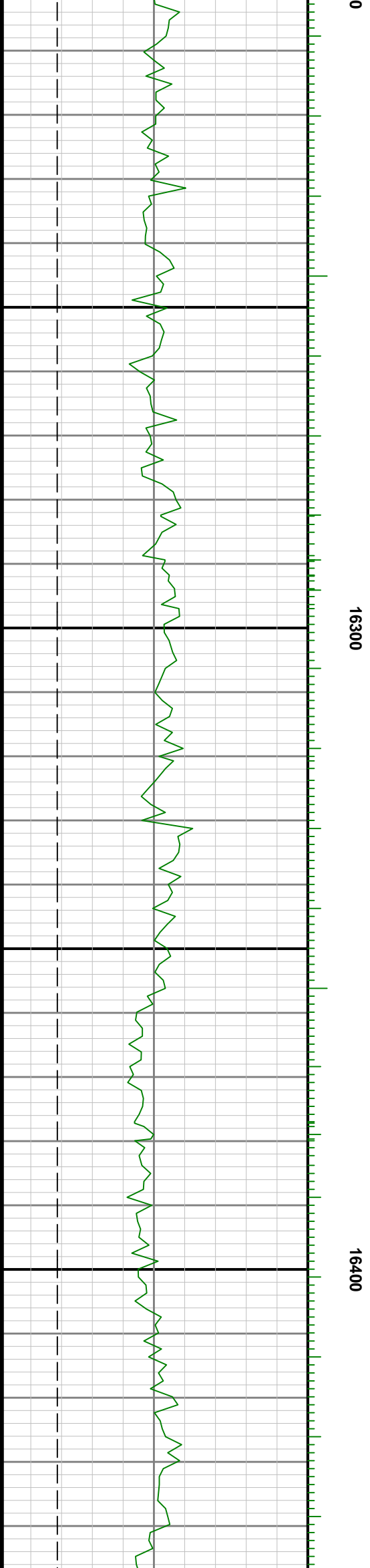
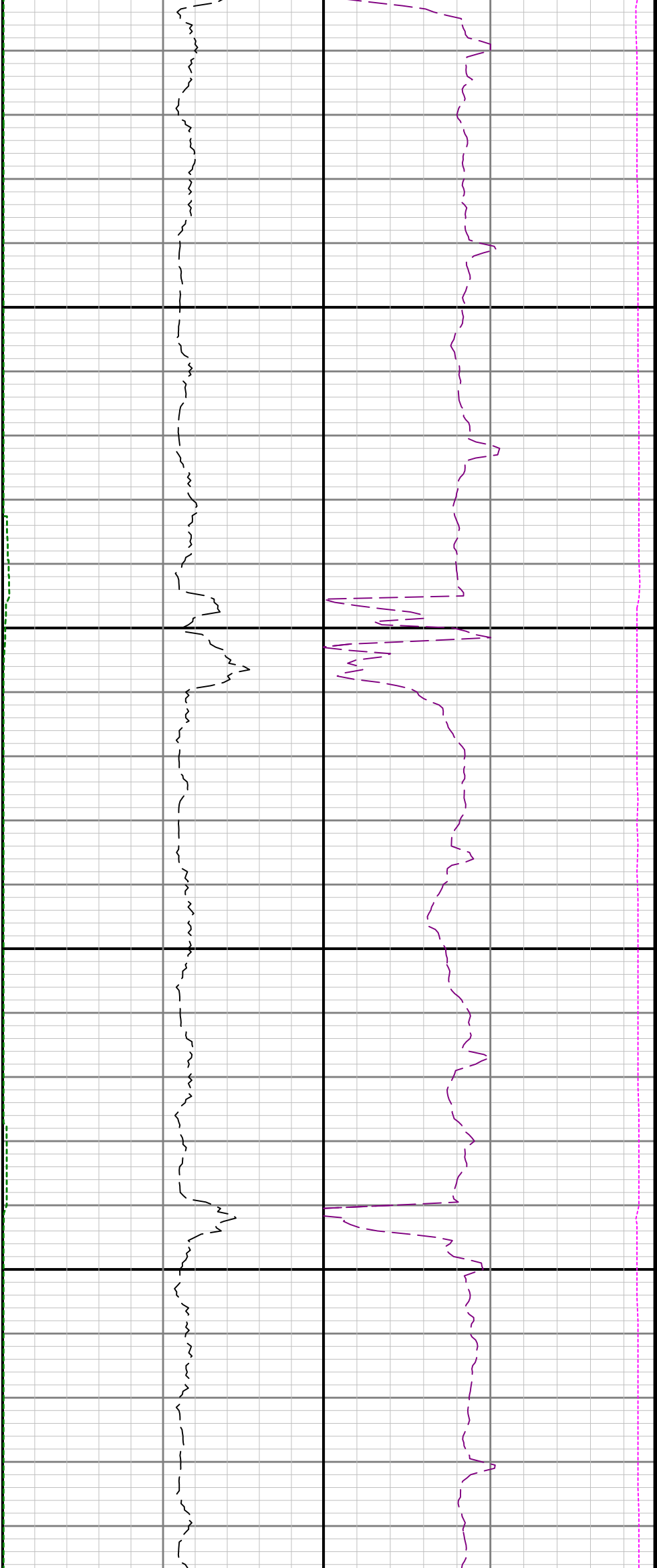


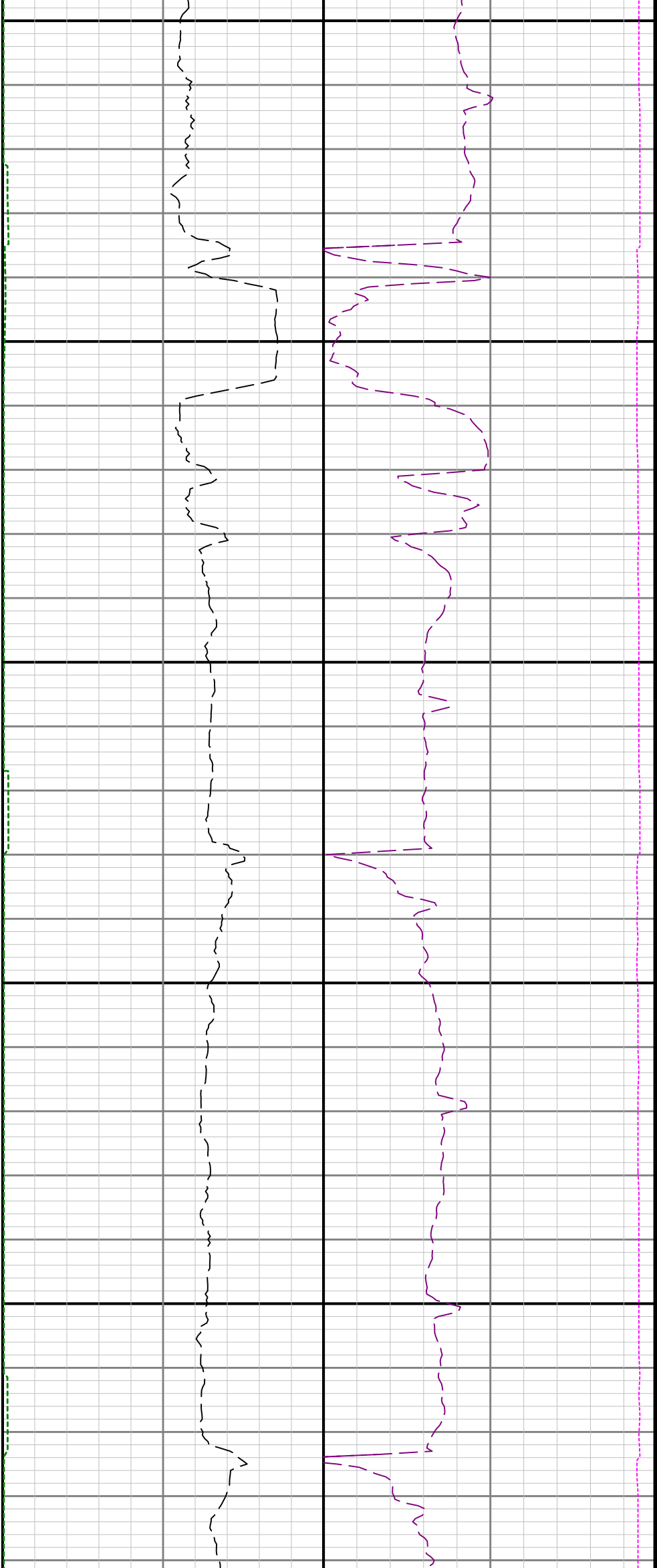
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