

Baker Hughes										LWD MEMORY LOG									
<div> <div>Scale: 1:240</div> <div>Measured Depth</div> <div>Depth Reference:</div> <div>Driller's Depth</div> <div>Status: Final Print</div> <div>API No: 05-123-48552-00</div> <div>Job ID: 110311140</div> <div>Permanent Datum (P.D.): Mean Sea Level</div> <div>Log Measured From: Rig Floor</div> </div>										<div> <div>Company: Noble Energy</div> <div>Well: Gutteresen D34-759</div> <div>Field: Wattenberg</div> <div>County: Weld</div> <div>State: Colorado</div> <div>Country: United States</div> <div>Surface Location: Latitude: 40° 12' 23.058" N Longitude: 104° 32' 29.317" W</div> <div>Other Services: Directional</div> <div>Elevation: 0.00 ft</div> <div>Above P.D.: 4855.00 ft</div> <div>Elev. KB: 4855.00 ft</div> <div>Elev. D.F.: 4825.00 ft</div> <div>Elev. GL: 4825.00 ft</div> </div>									
<div> <div>Dates</div> <div>From: 2020-03-18 To: 2020-03-22 Spud: 2020-03-06</div> <div>Interval</div> <div>Drilled (ft) 1965.00 Top: 1965.00 Bottom: 17492.00</div> <div>Logged (ft) 1965.00 Top: 1965.00 Bottom: 17479.00</div> <div>Magnetic Field Reference</div> <div>Azi Reference North: Total Magnetic Field Strength: (nT) Mag to Reference North Correction: (deg)</div> </div>										<div> <div>Borehole Record</div> <div>Casing Record</div> <div>Hole Size (in) From (ft) To (ft) Size (in) Weight (lb/ft) From (ft) To (ft)</div> <div>13.500 30.00 1965.00 9.625 36.00 30.00 1955.00</div> <div>8.500 1965.00 17492.00 30.00 1965.00 17492.00</div> </div>									
<div> <div>Mud Record</div> <div>Deviation Record</div> <div>Type From (ft) To (ft) Hole Size (in) Interval (ft) Inc   Az (Start) Inc   Az (End)</div> <div>Oil Based Mud 1965.00 17492.00 8.500 15527.00 0.55   114.60 90.49   179.48</div> </div>										<div> <div>Acquisition System</div> <div>Software Version</div> <div>Other</div> <div>Cadence RT 5.5 5.5.8716.2</div> <div>Rig: H&amp;P 321</div> <div>Contractor: Helmerich &amp; Payne Drilling Co</div> <div>District: RMA</div> <div>Unit: D&amp;E</div> </div>									

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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	
						(ft)	(ft)	(ft)	(ft)			
1	1	8.500	PDC	3.00	AutoTrak Curve	1965.00	5595.00	1965.00	5608.00	2020-03-18 21:55	2020-03-19 11:42	12.78
2	1	8.500	PDC	3.00	AutoTrak Curve	5595.00	17479.00	5608.00	17492.00	2020-03-19 23:35	2020-03-22 03:10	45.51

### Crew

Name	Arrive Wellsite	Depart Wellsite	Name	Arrive Wellsite	Depart Wellsite	Name	Arrive Wellsite	Depart Wellsite
Andrew Hays	2020-03-18	2020-03-22						

### 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+ (%)
2020-03-19 05:00	1	3815.00	Oil Based Mud	9.1	10	N/A	18.3	73.4/17.2	Active Pit	26500	0.00
2020-03-19 19:47	2	5608.00	Oil Based Mud	9.4	11	N/A	18.2	71.6/18	Active Pit	27000	0.00
2020-03-20 16:00	2	8784.00	Oil Based Mud	9.8	13	N/A	18.5	70.2/17.2	Active Pit	27000	0.00
2020-03-21 16:00	2	15112.00	Oil Based Mud	9.8	14	N/A	20.3	70.6/16	Active Pit	23500	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	14381997	Near Bit VSS	5.93	6.90	7.500	4.330
1	AutoTrak Curve Steering Unit	14381997	Near Bit Inclination	5.93	6.90	7.500	4.330
1	AutoTrak Curve MWD	12118955	Gamma (single)	2.77	13.07	7.000	3.250
1	AutoTrak Curve MWD	12118955	Directional (mag)	12.27	22.57	7.000	3.250
2	AutoTrak Curve Steering Unit	14299702	Near Bit VSS	5.93	6.90	7.500	4.330

2	AutoTrak Curve Steering Unit	14299702	Near Bit Inclination	5.93	6.90	7.500	4.330
2	AutoTrak Curve MWD	12049472	Gamma (single)	2.76	13.07	7.000	3.250
2	AutoTrak Curve MWD	12049472	Directional (mag)	12.27	22.58	7.000	3.250

Service and Tool Mnemonics

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

Comments

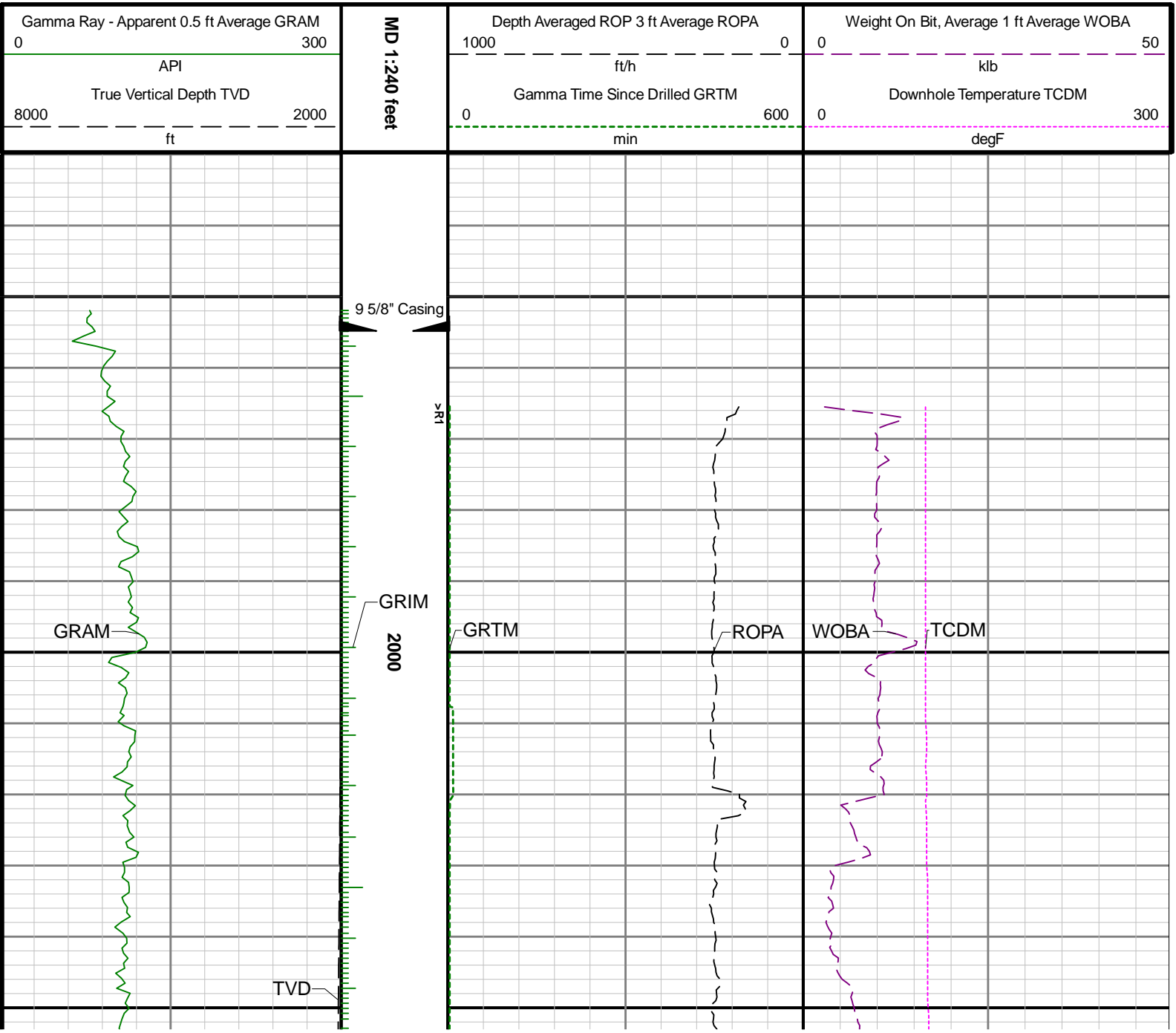
1	Depth measurements were obtained from a depth control system not supplied or operated by Baker Hughes. Due to lack of control by Baker Hughes logging engineers, depth calibrations and measurements could not be independently verified.
2	Baker Hughes LWD Runs 1 and 2 utilized 6 ¾ inch NaviGamma service (Gamma Ray and Directional) behind an 8 1/2 inch bit and rotary steerable assembly from 1965 to 17492 feet MD (1965 to 6858 feet TVD).
3	The Gamma Ray Apparent (GRAM) data is presented 0 to 300 API, per the customer's request.
4	Several gaps appear in the log due to drilling ahead before the assembly had time to properly power on.

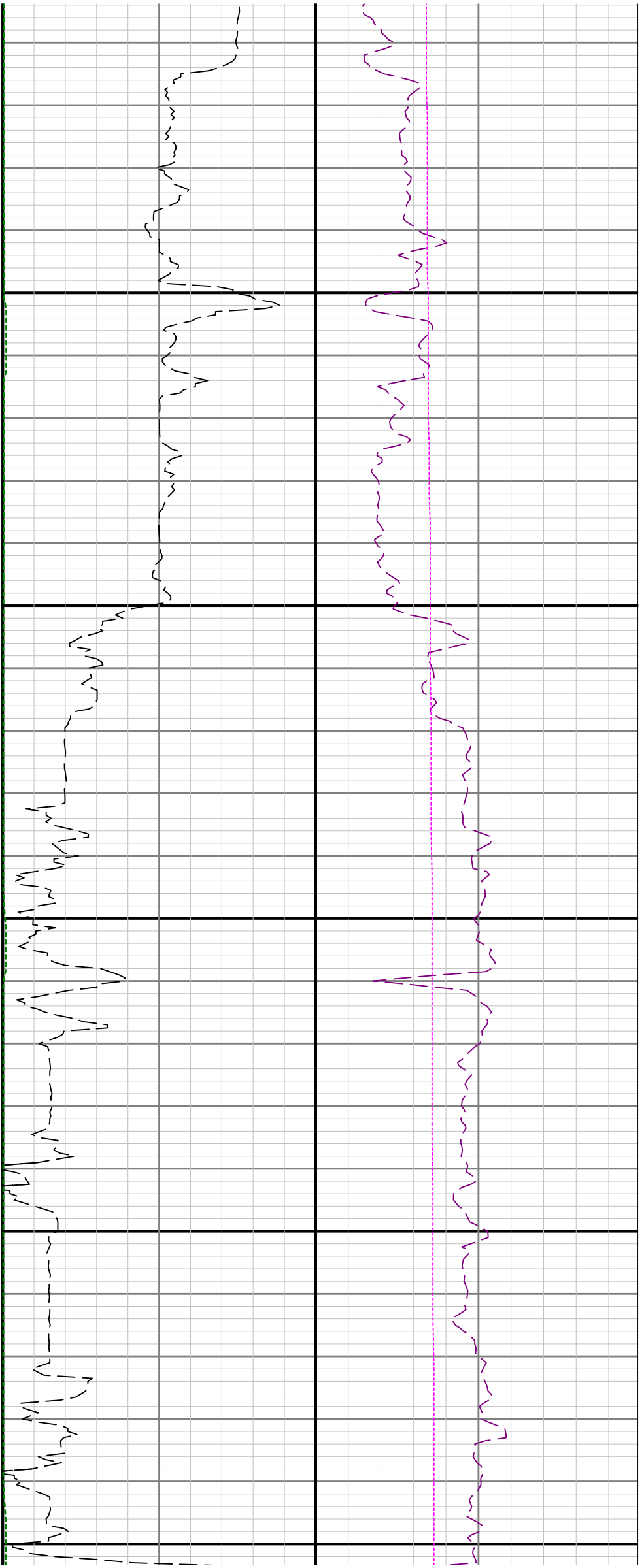
Remarks

Number	Depth (ft)	Hole Section (in)	Run No.	Remark
1	17479.00	8.500	2	The interval from 17479 to 17492 feet MD (6858 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 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

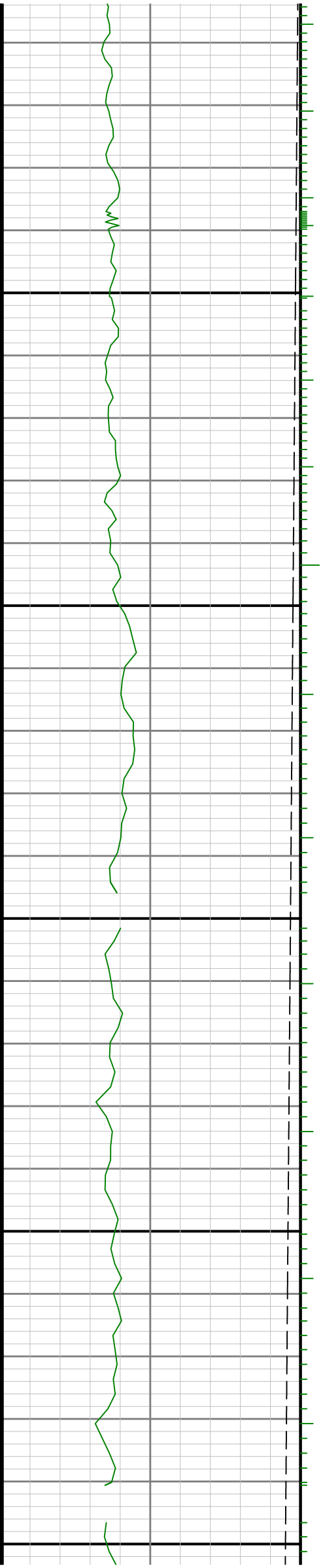


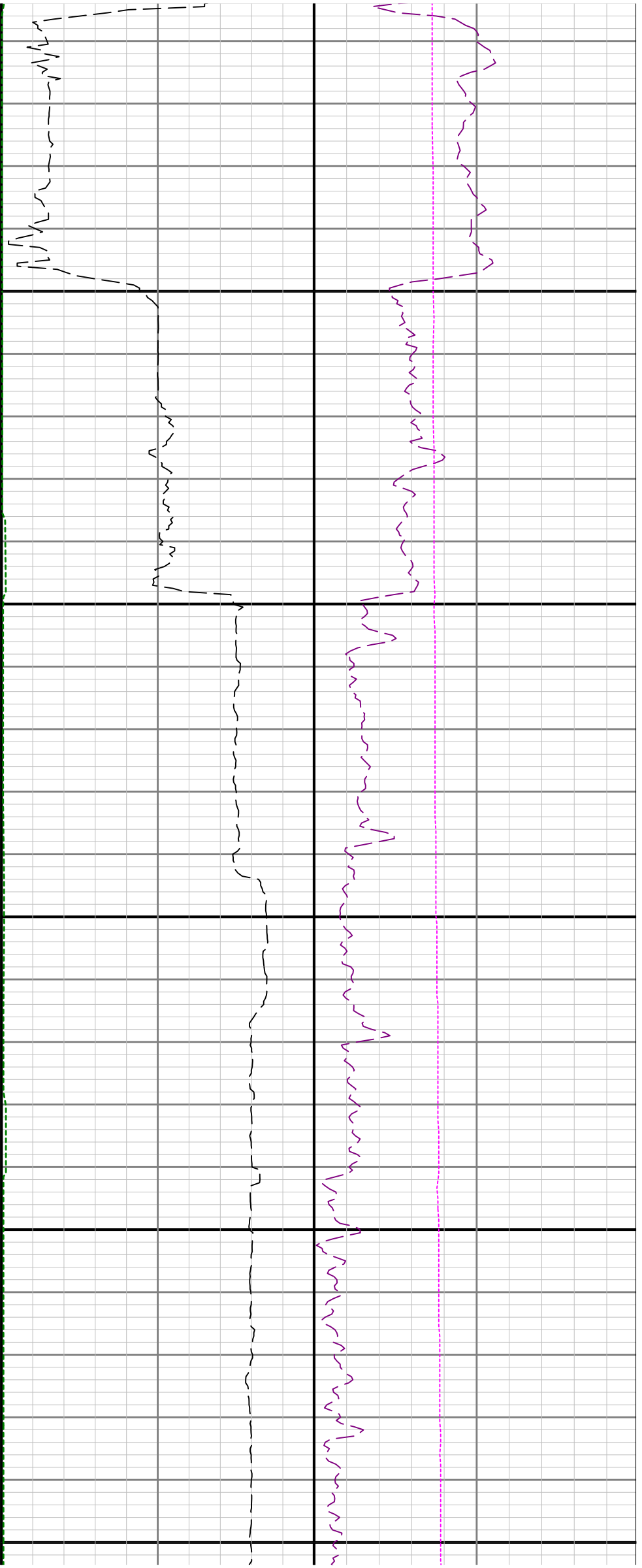


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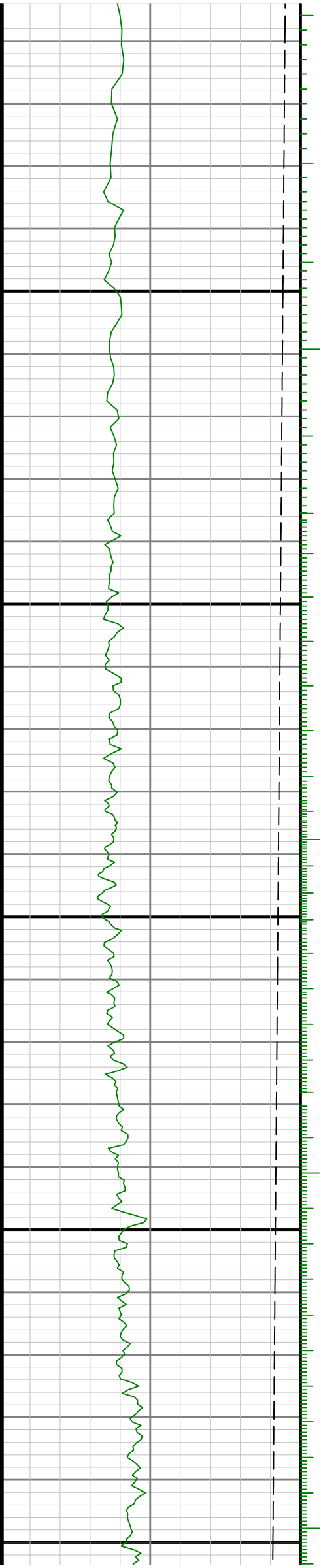
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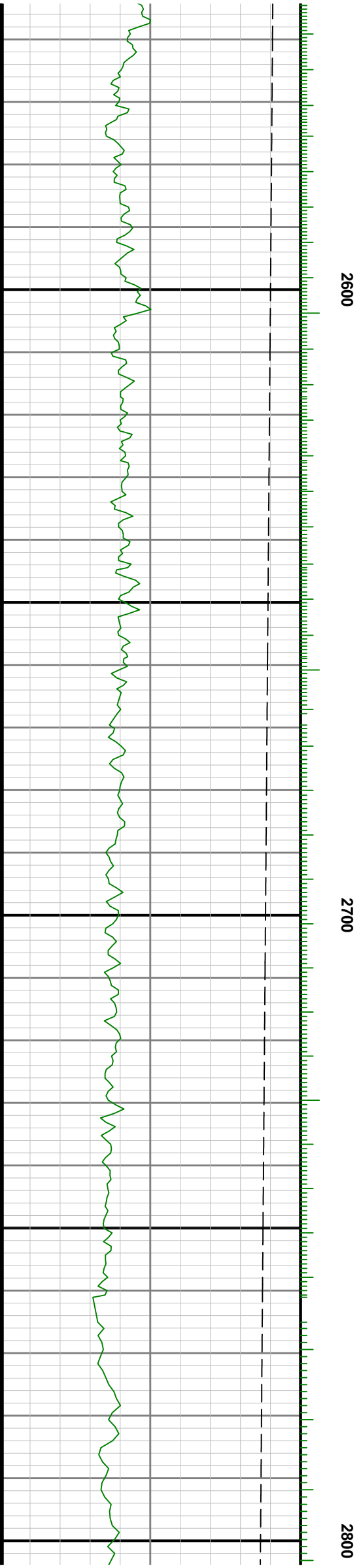
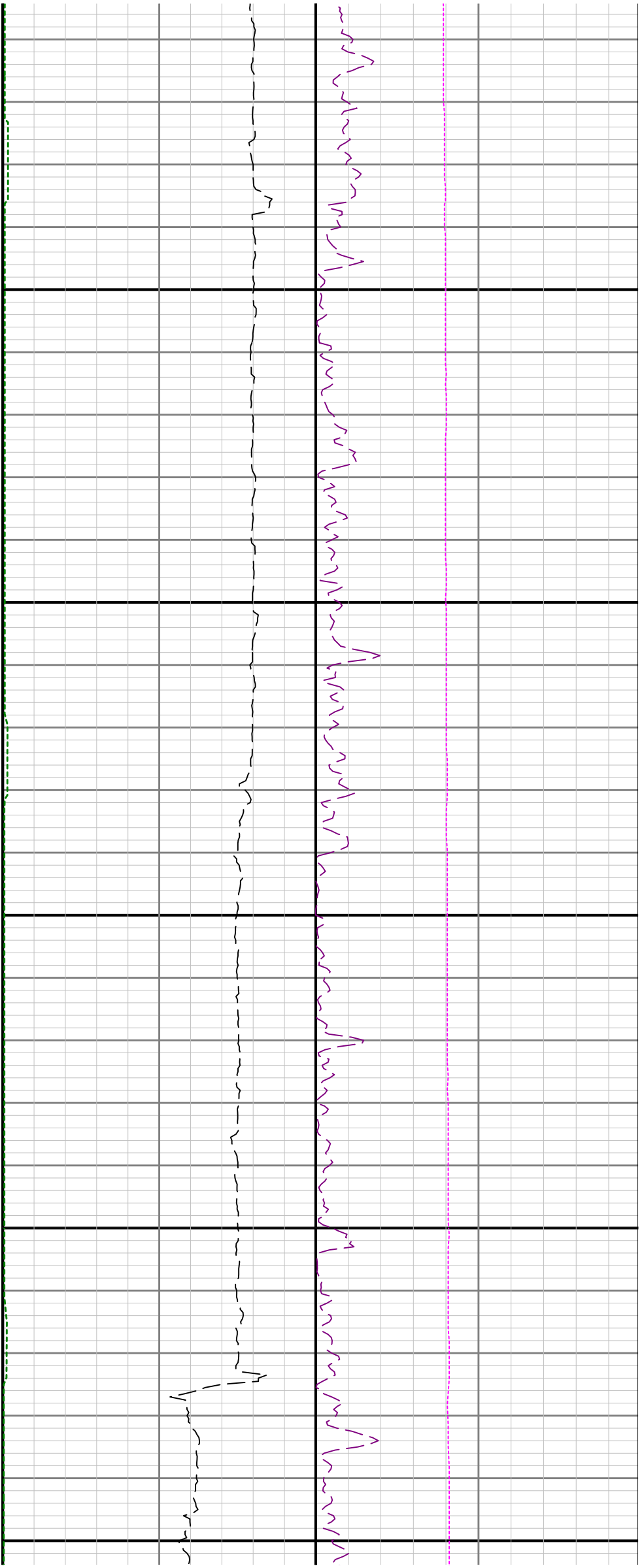


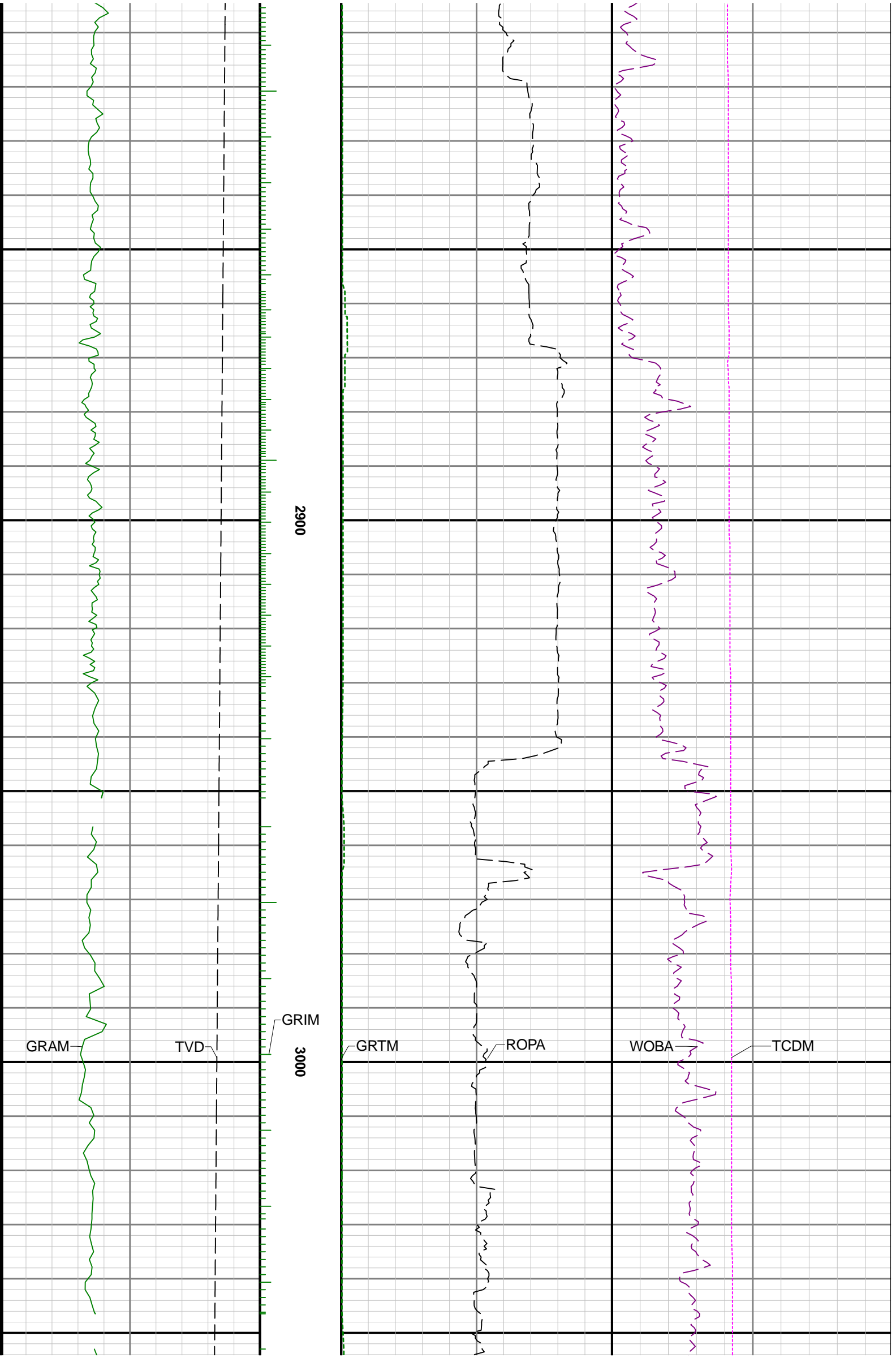


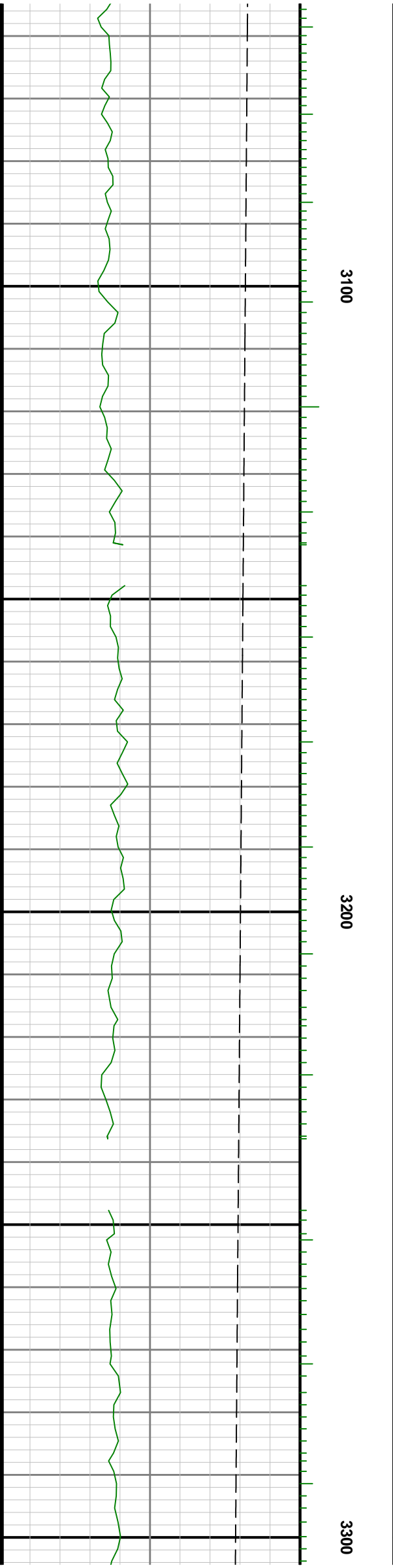
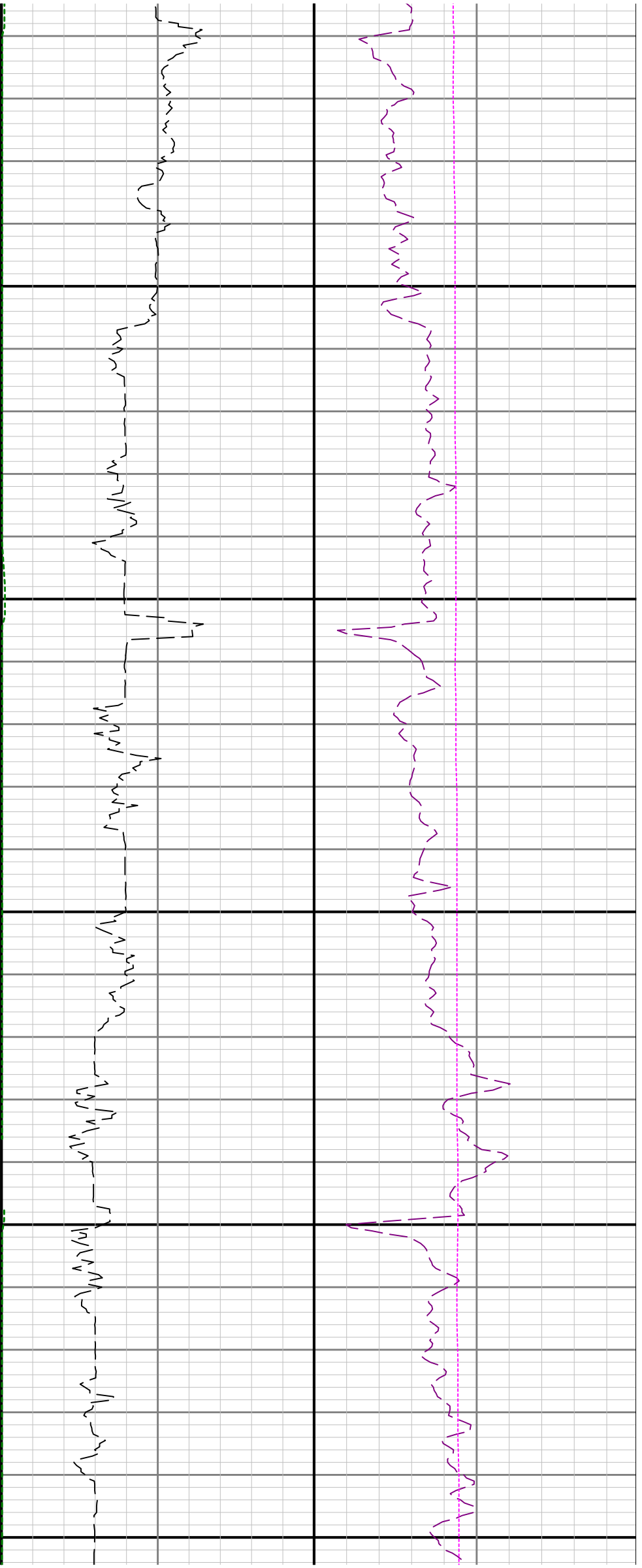
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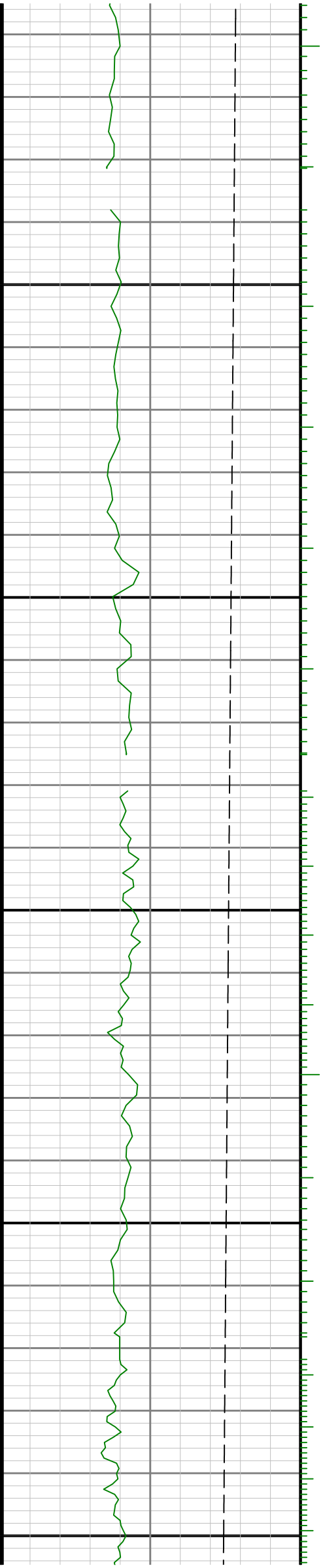
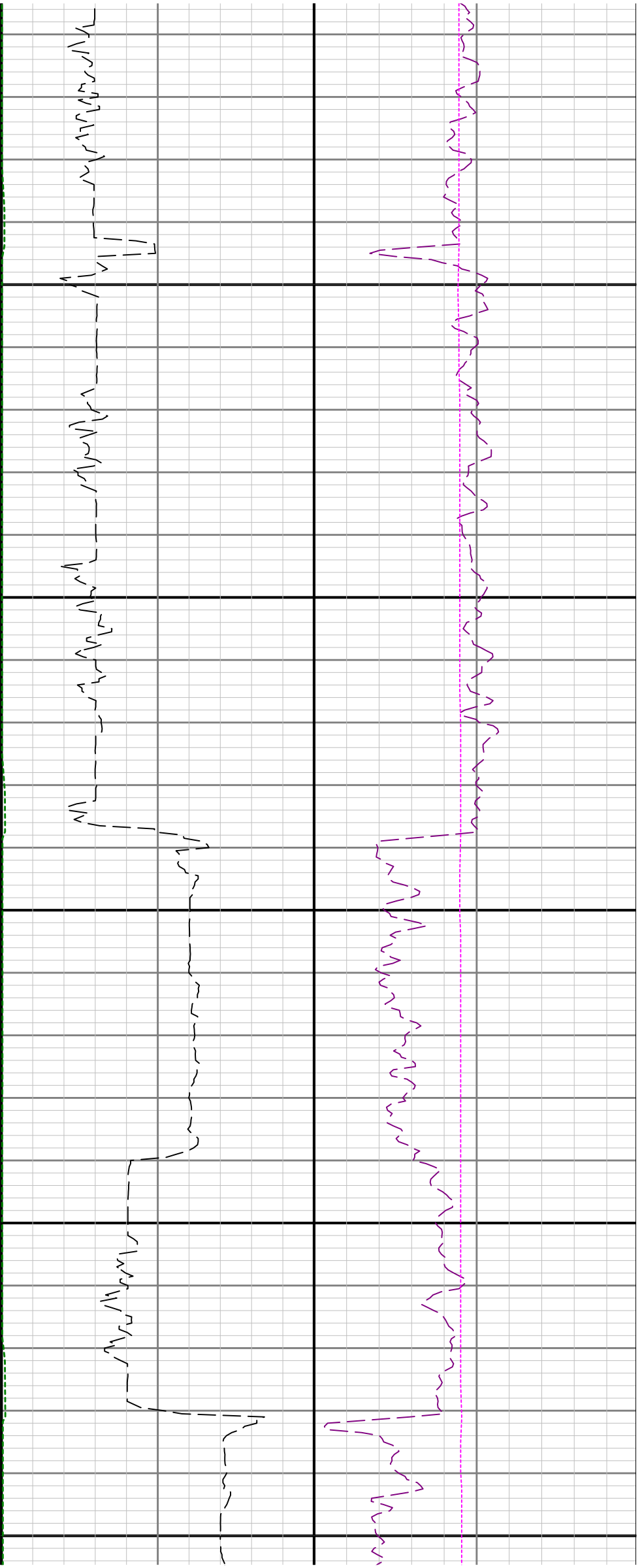
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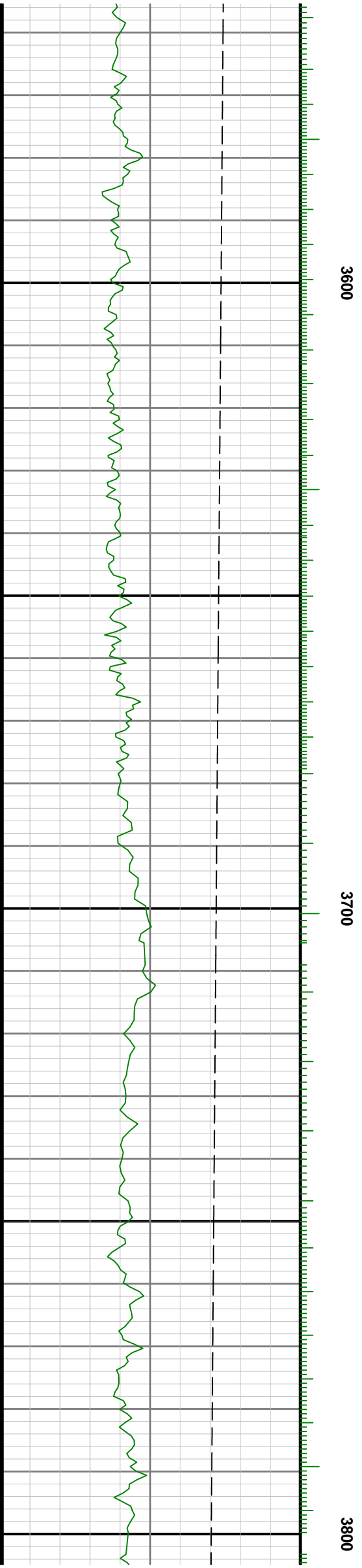
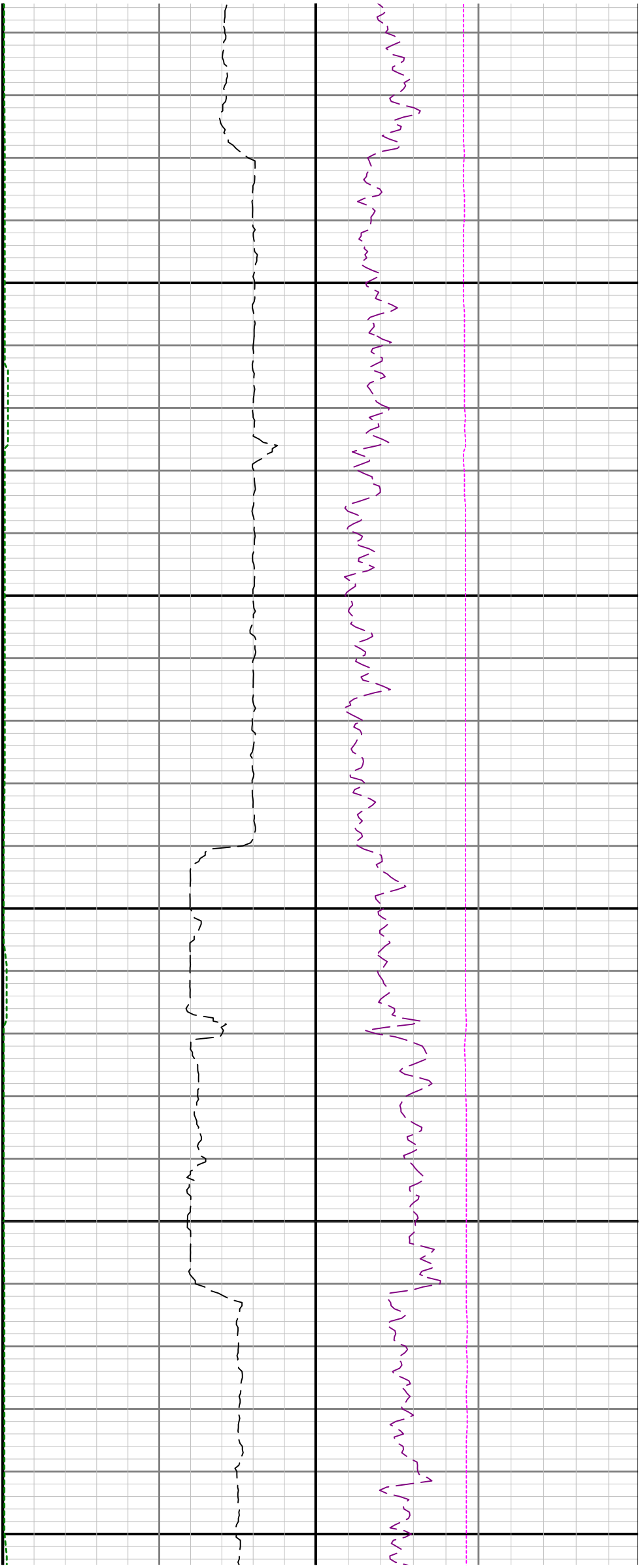


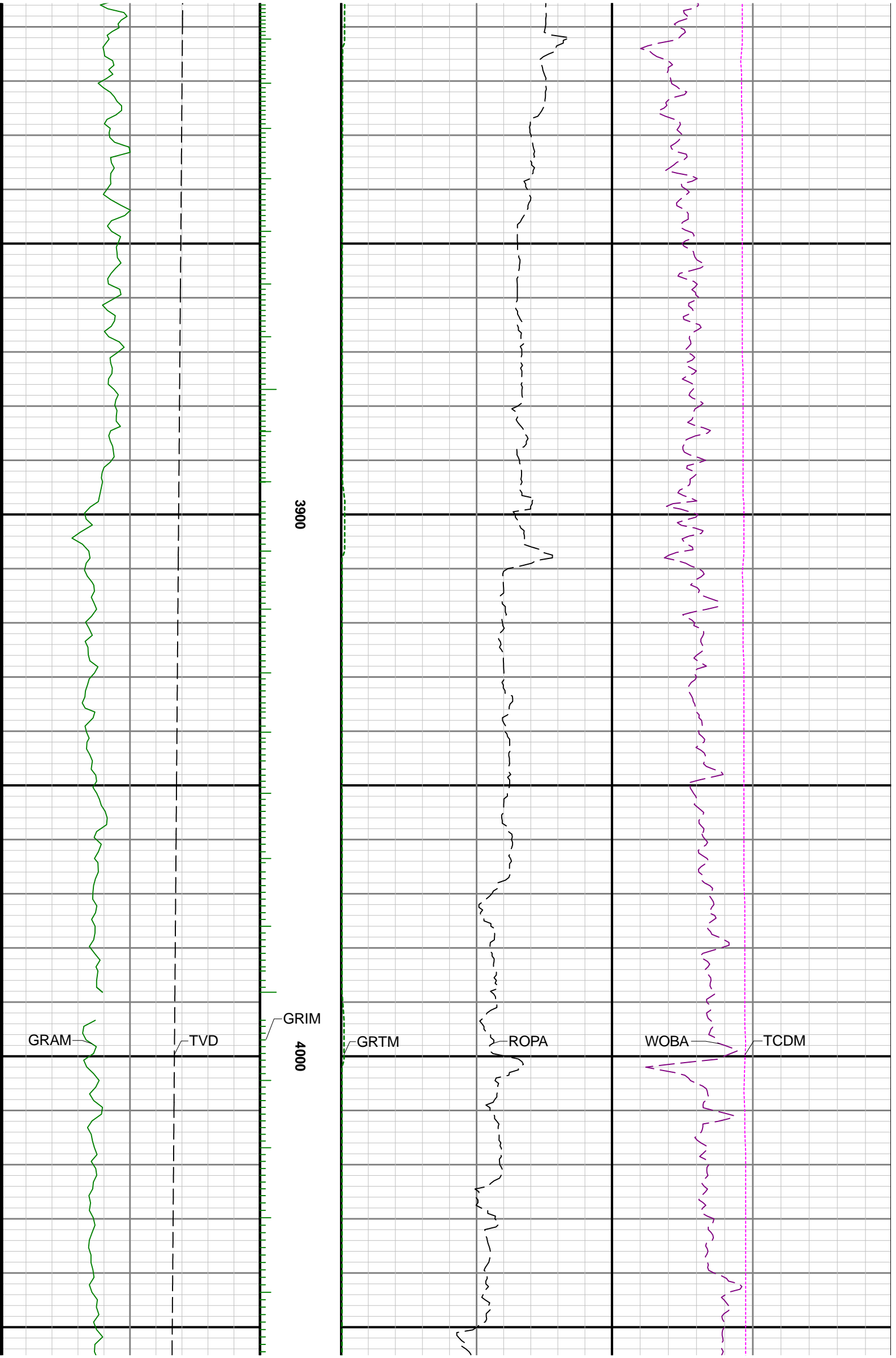


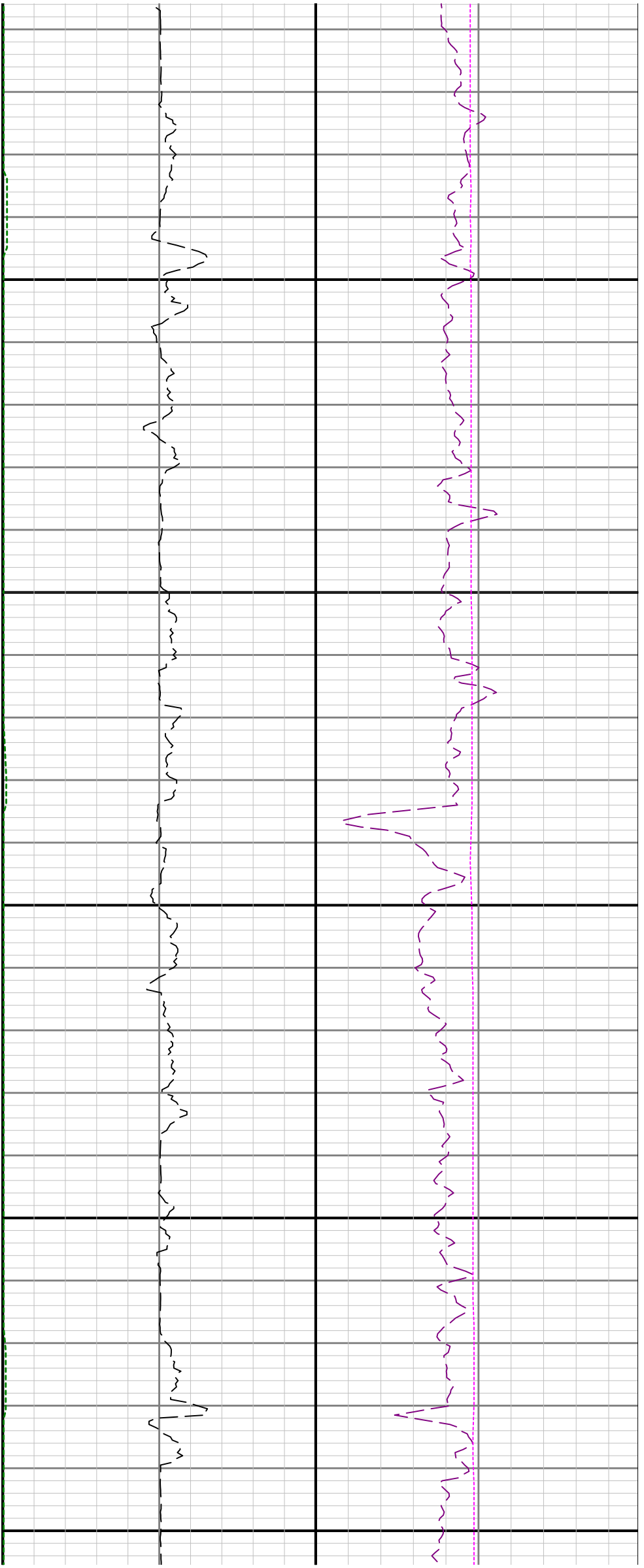








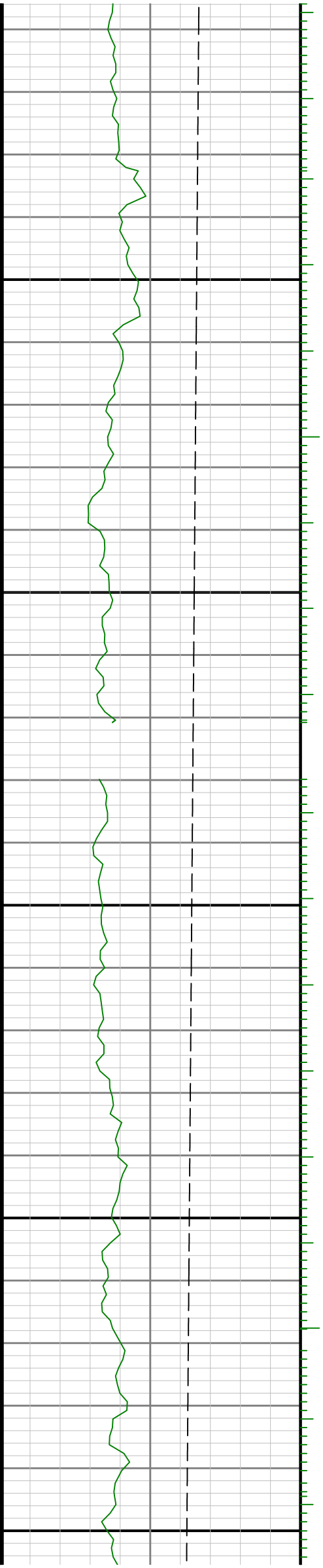


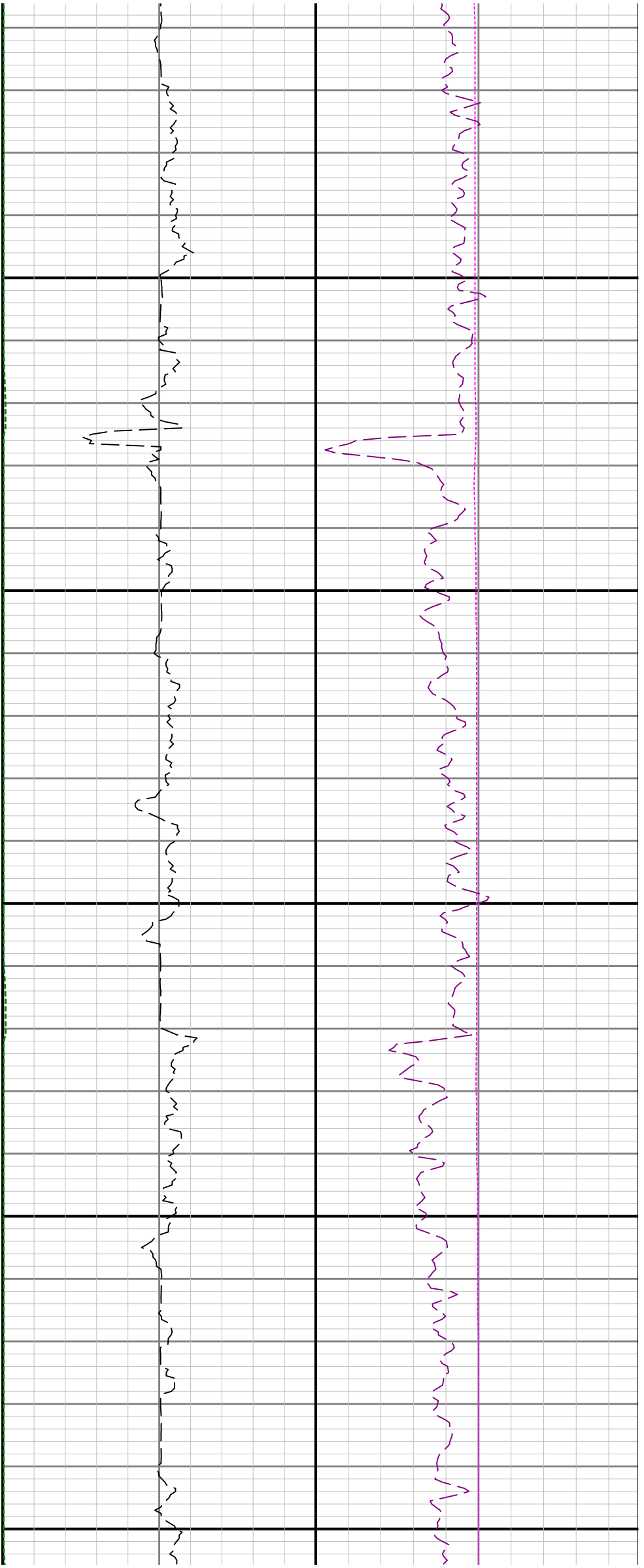


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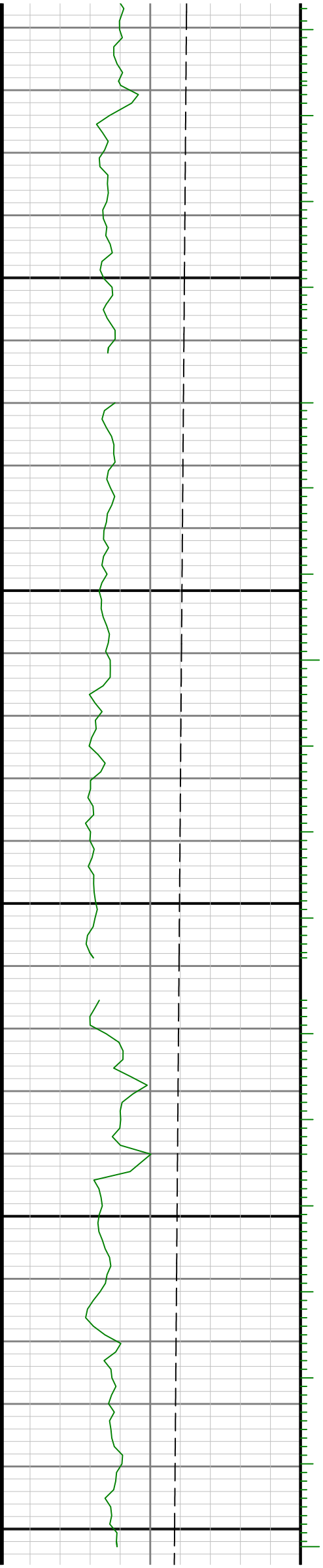
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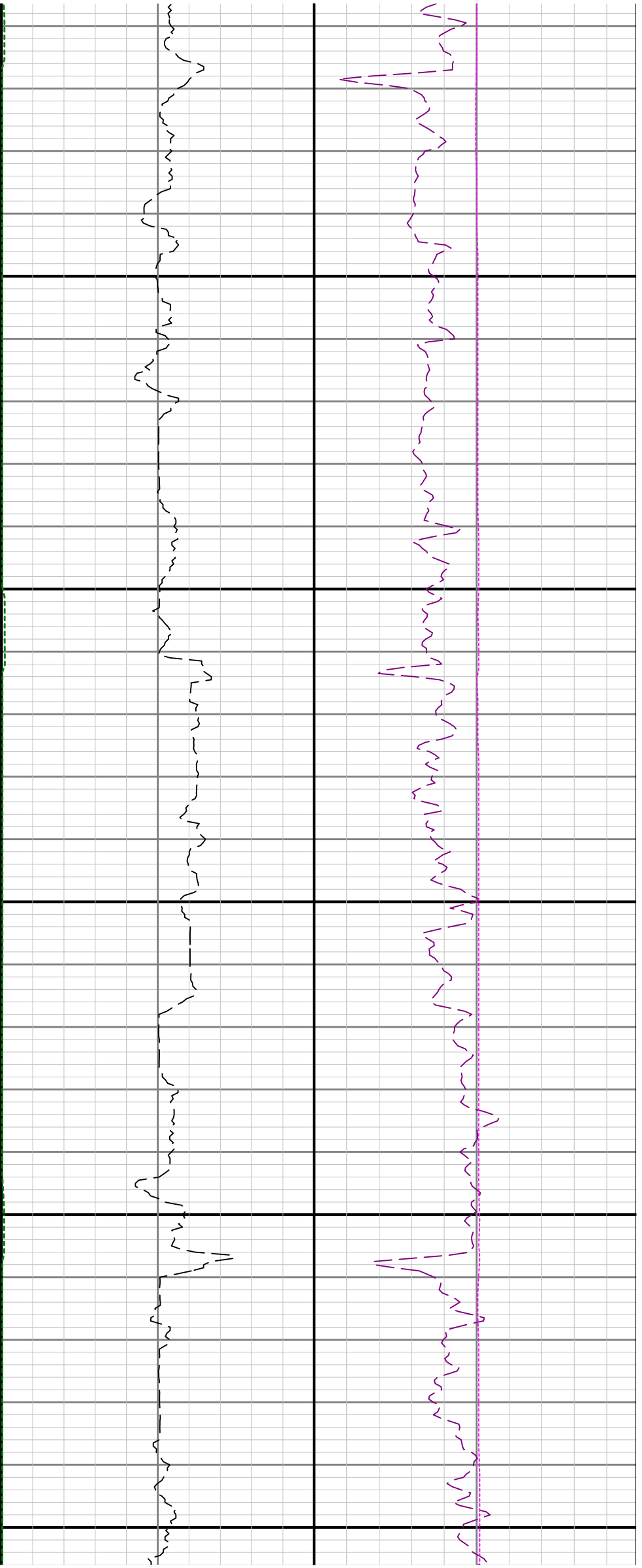




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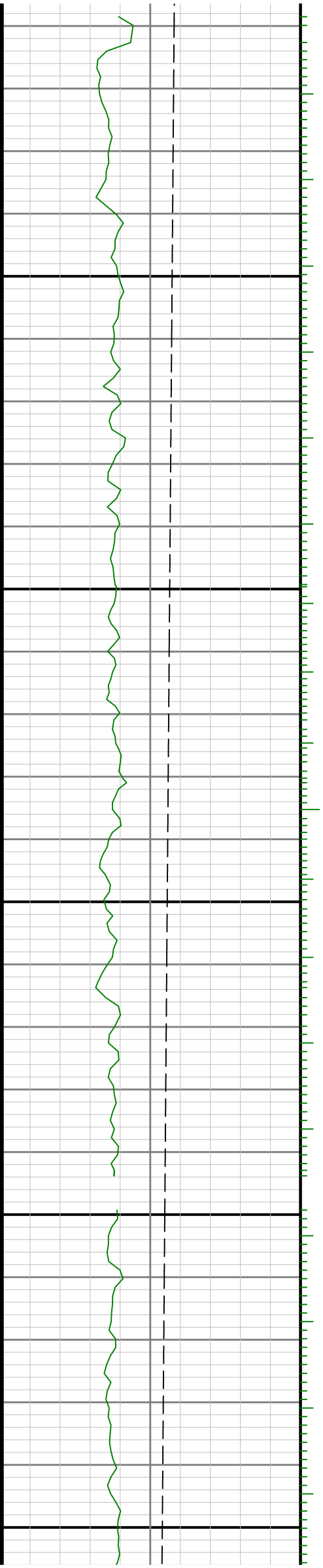


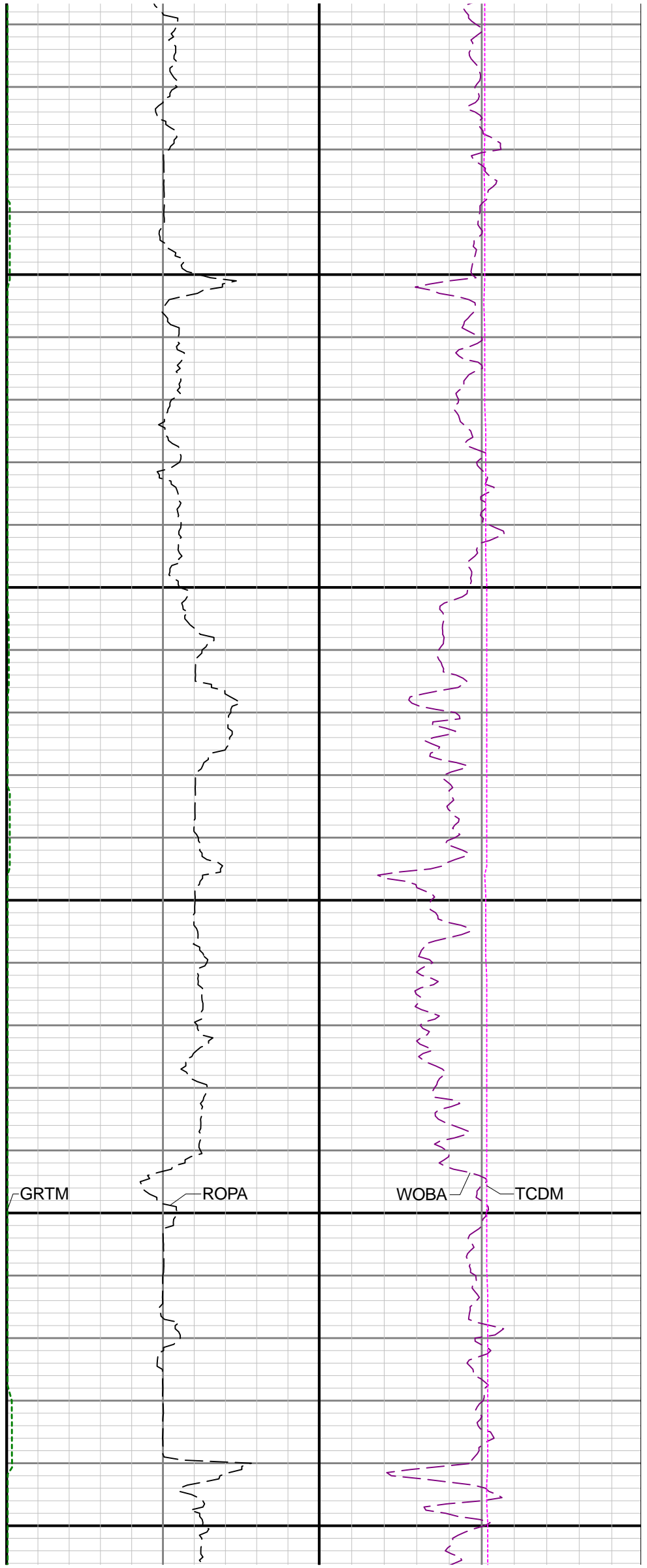
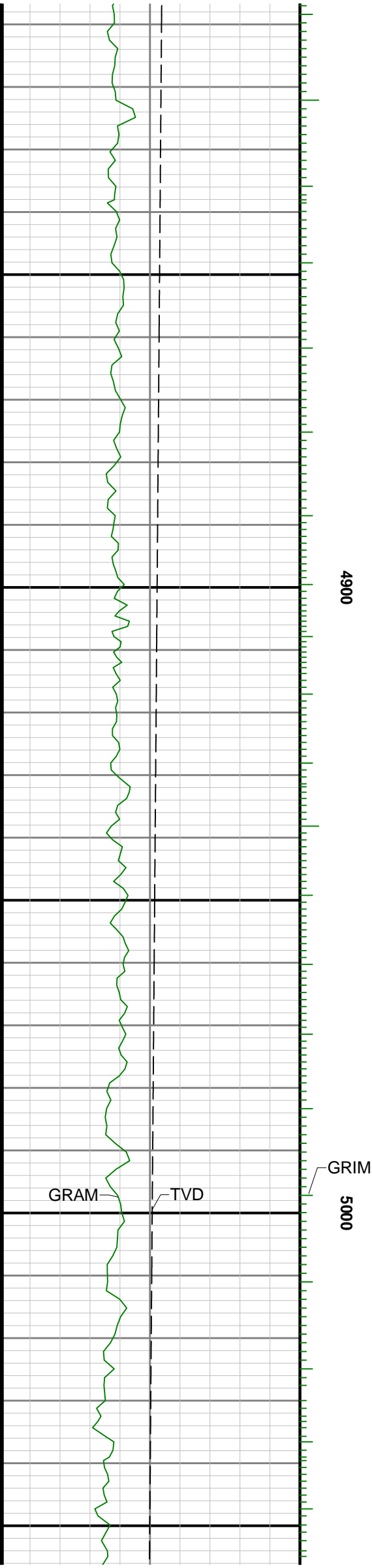


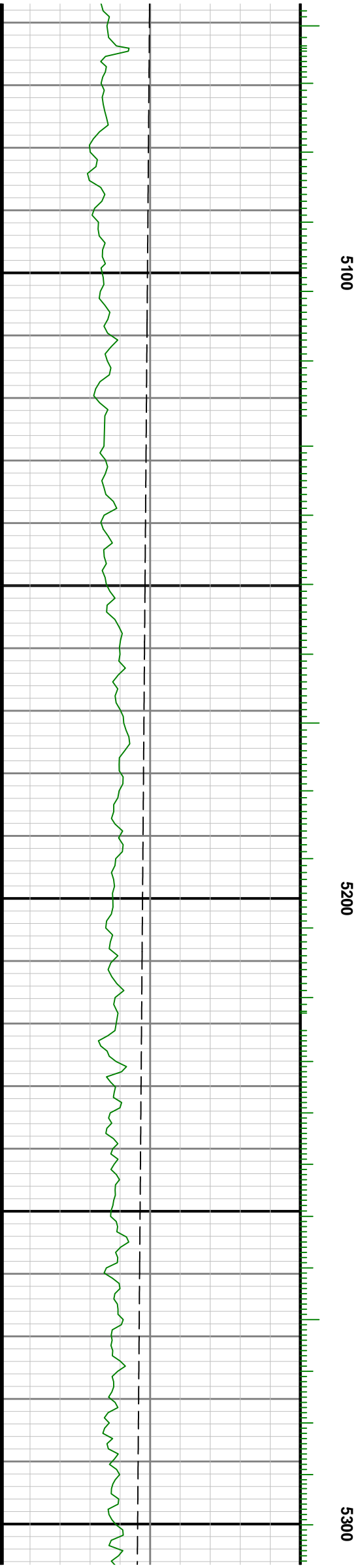
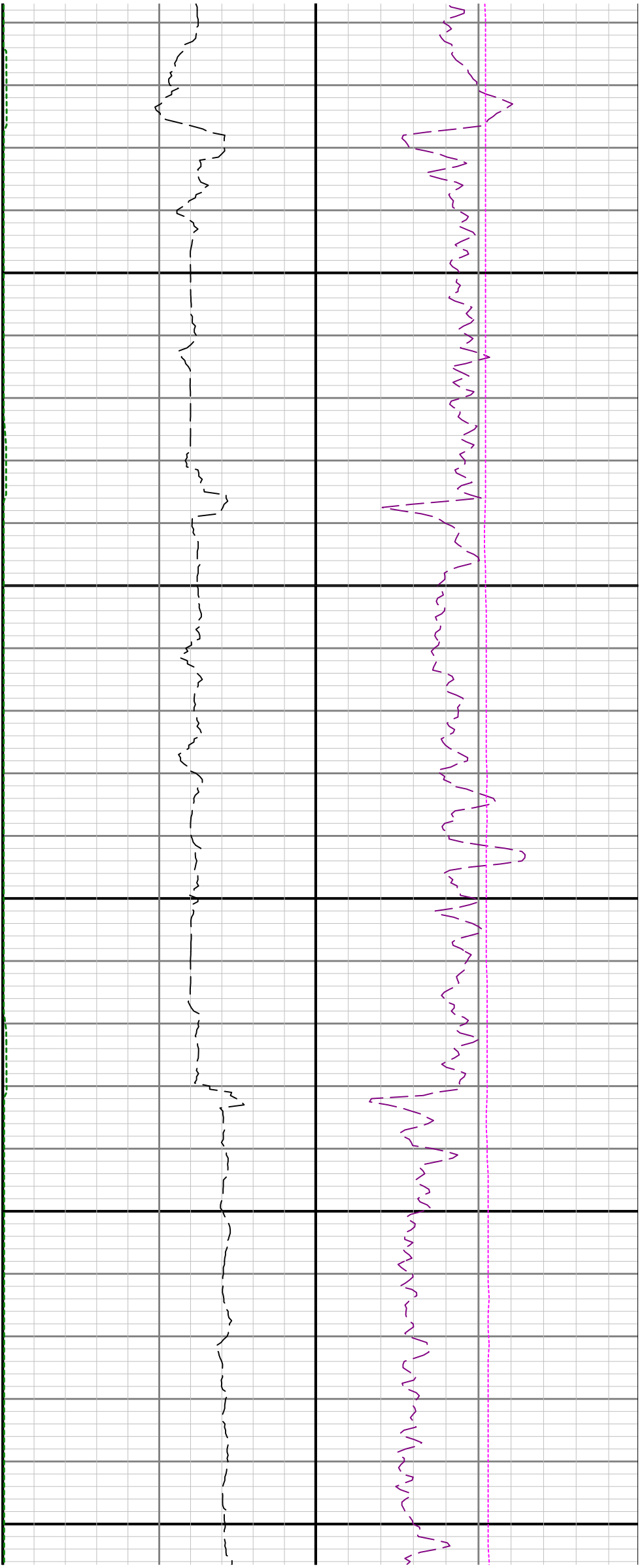
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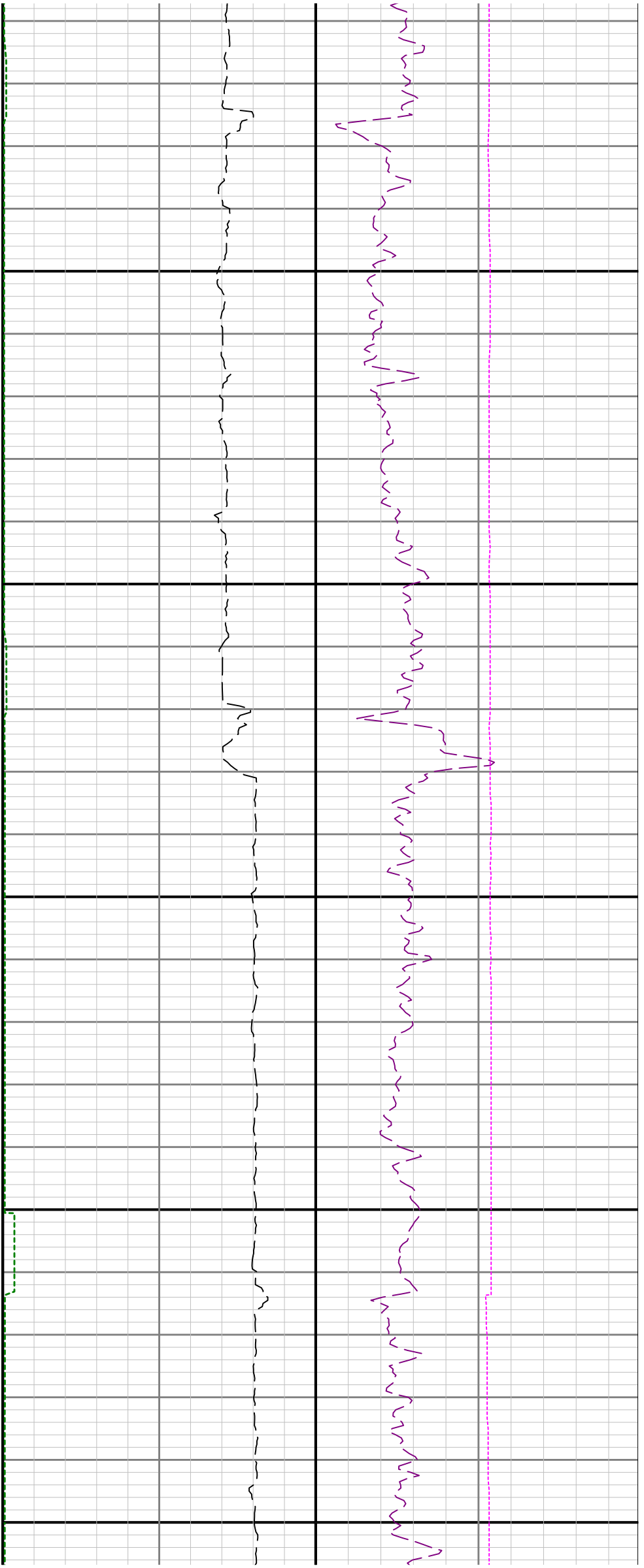
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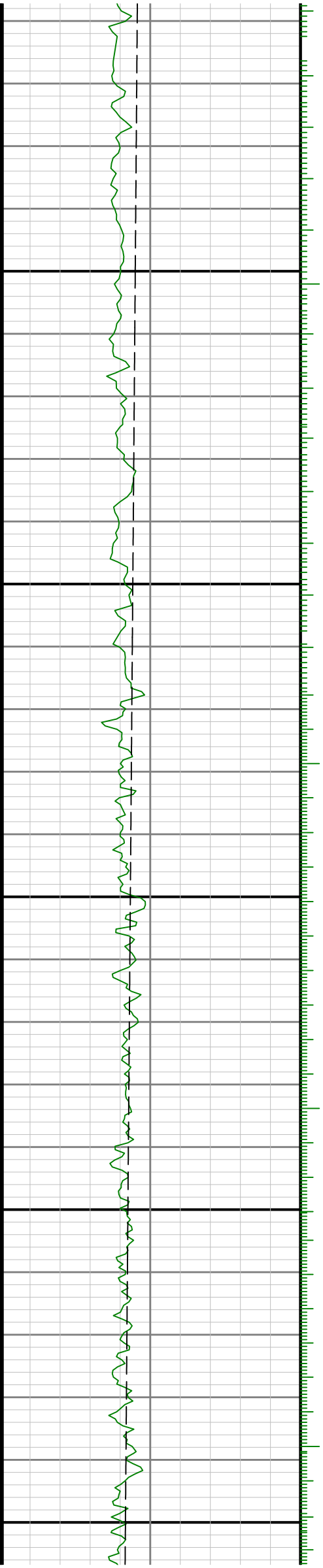




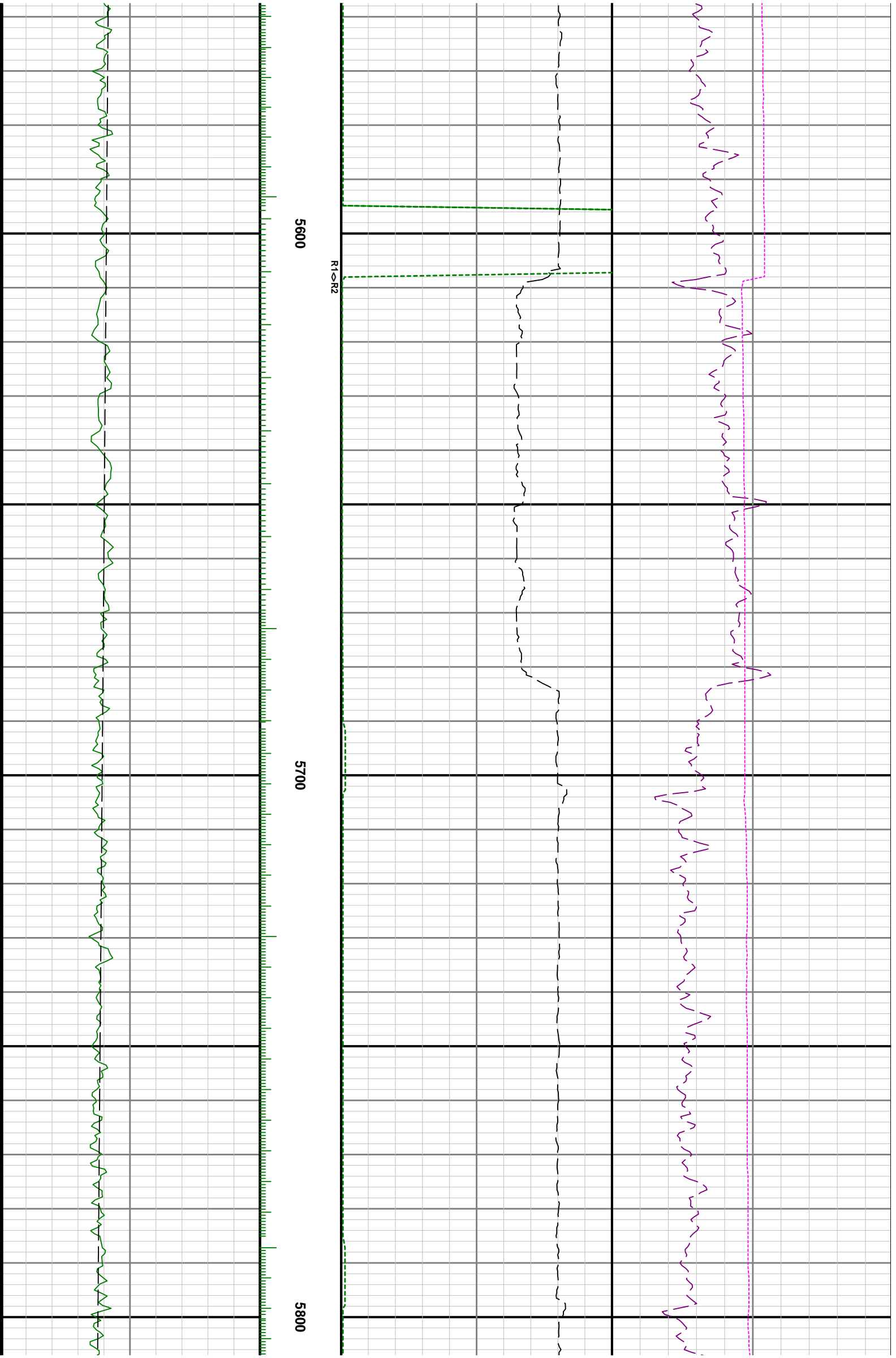


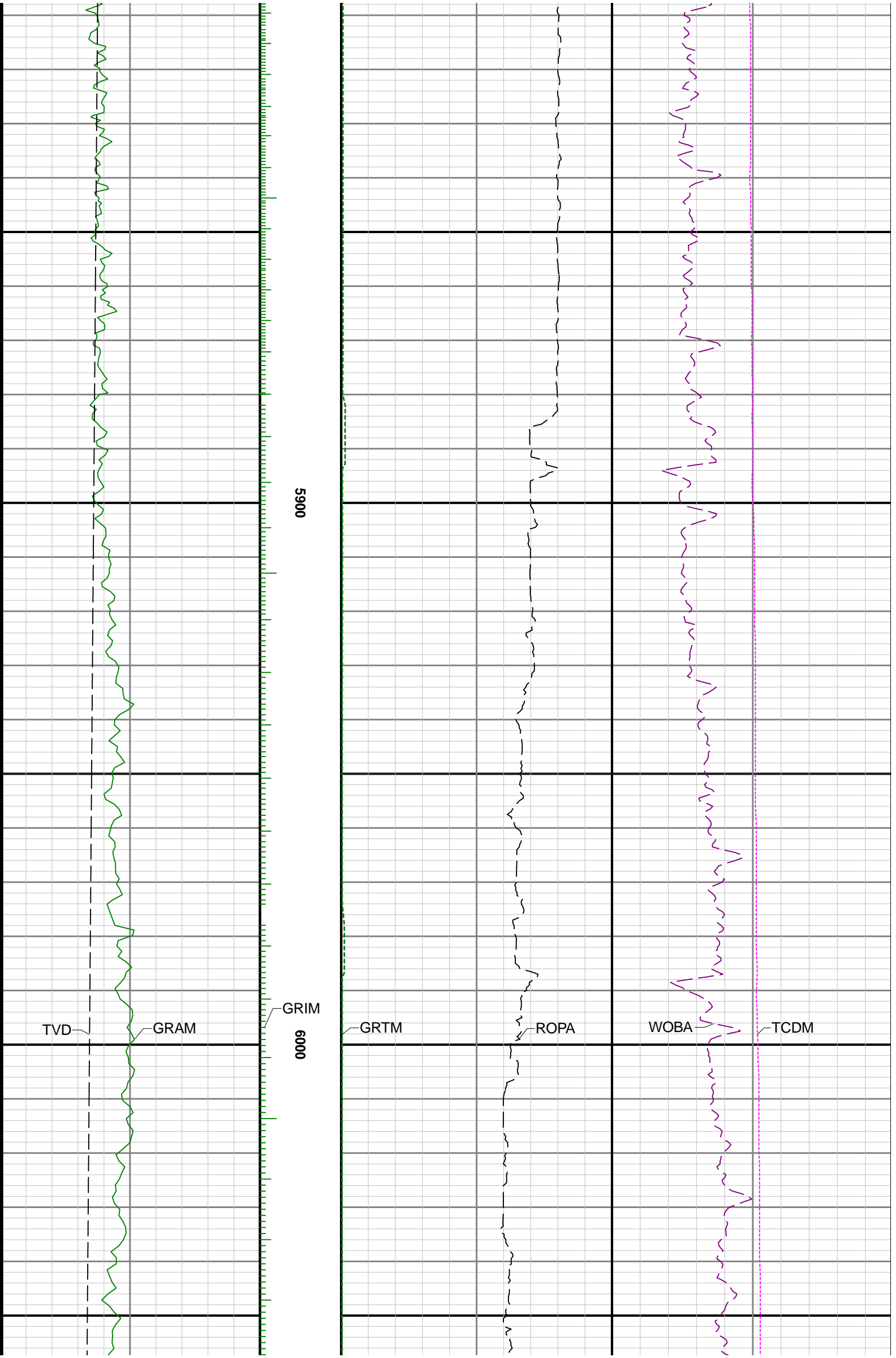
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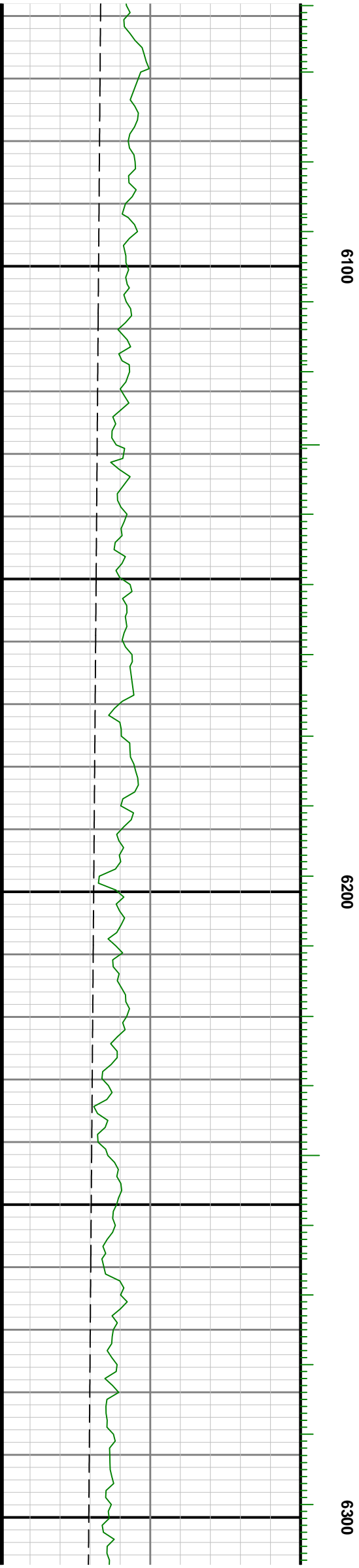
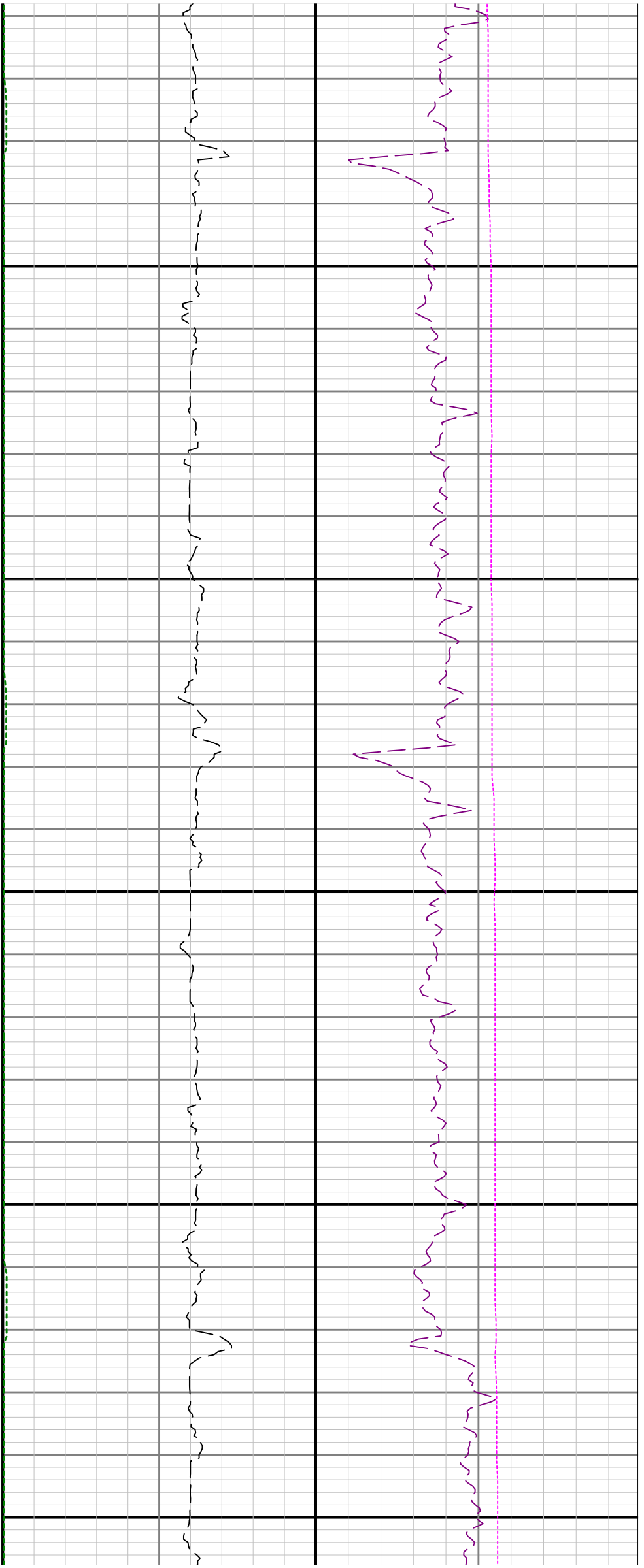
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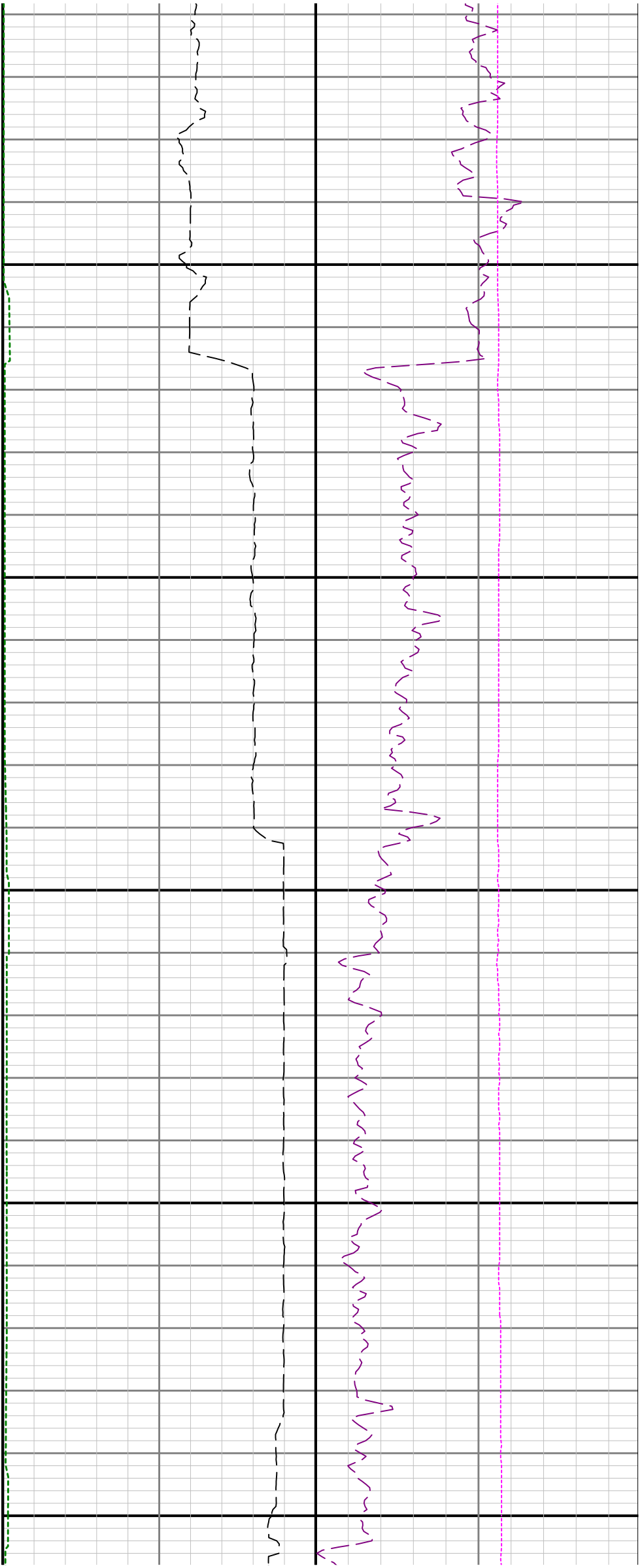






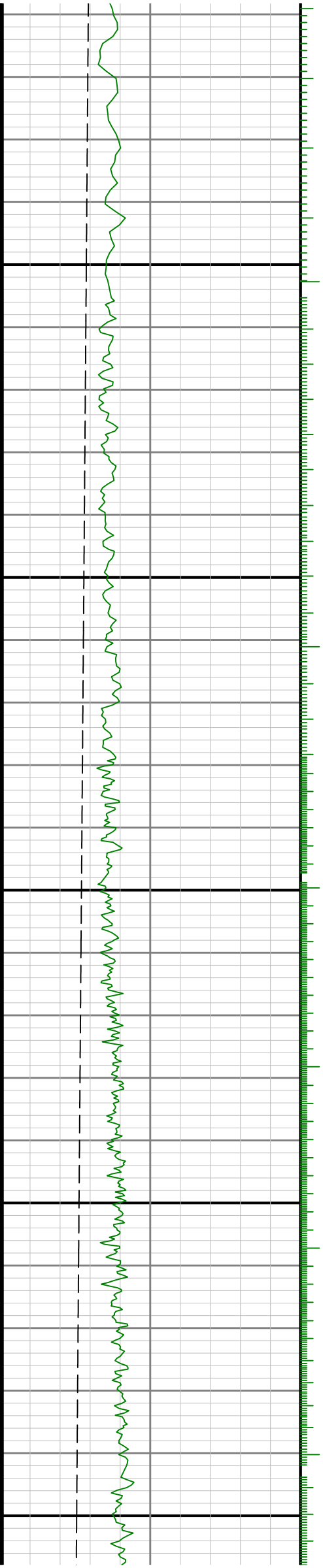


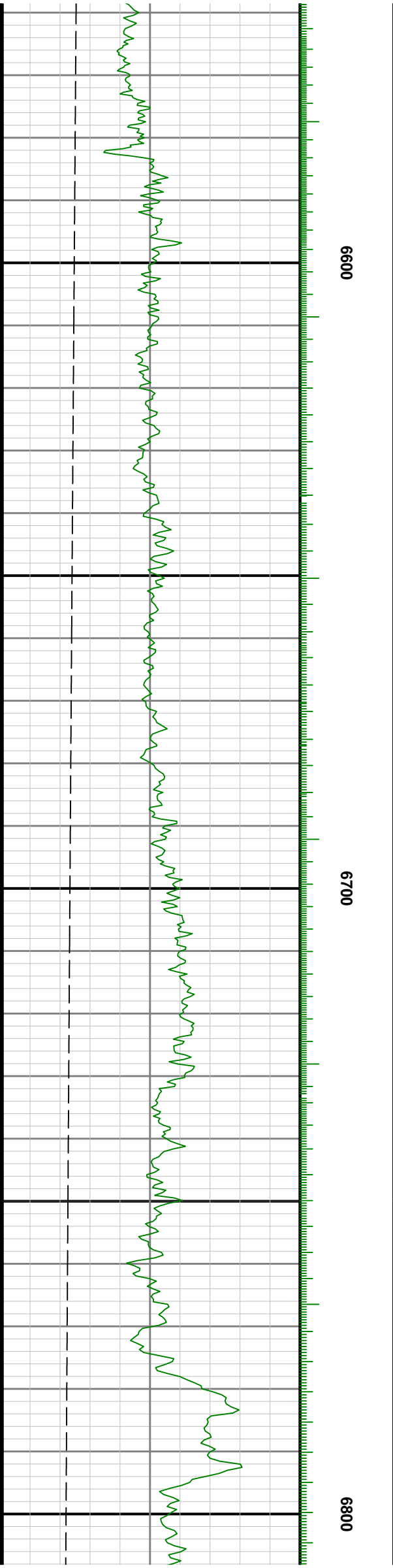
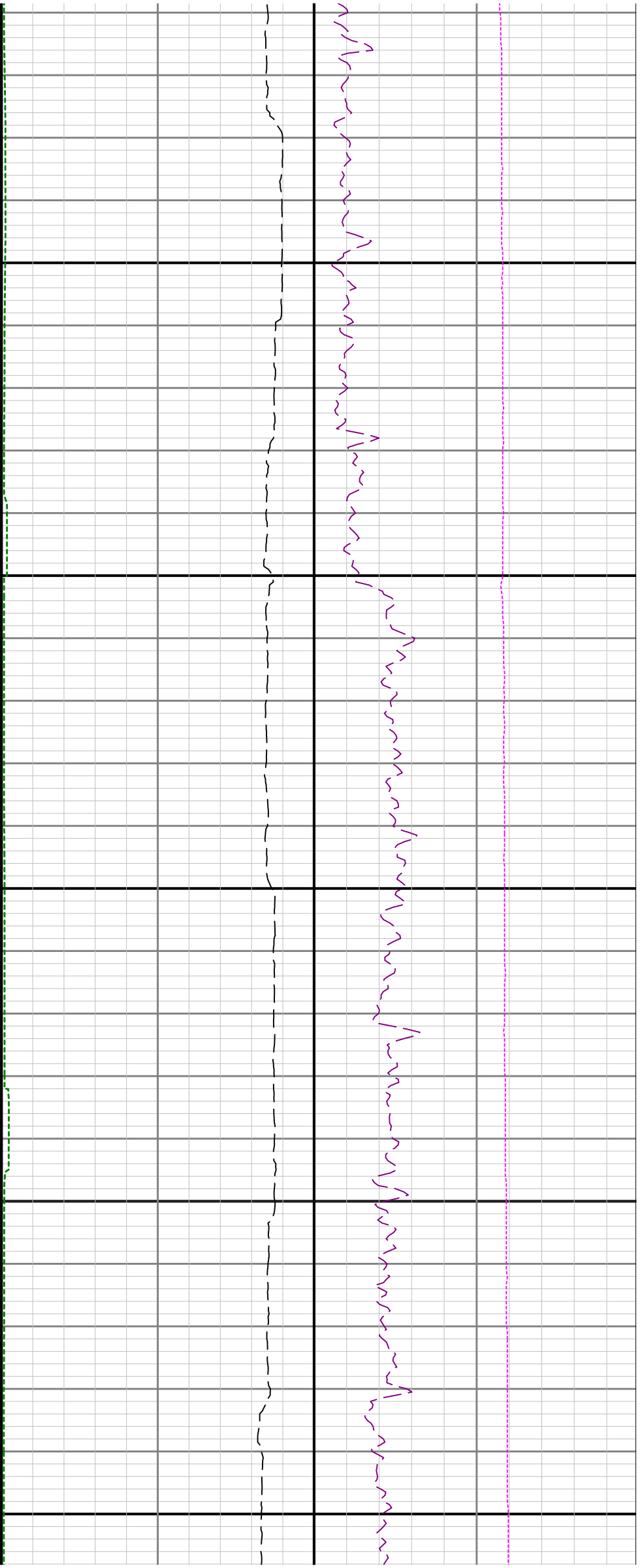


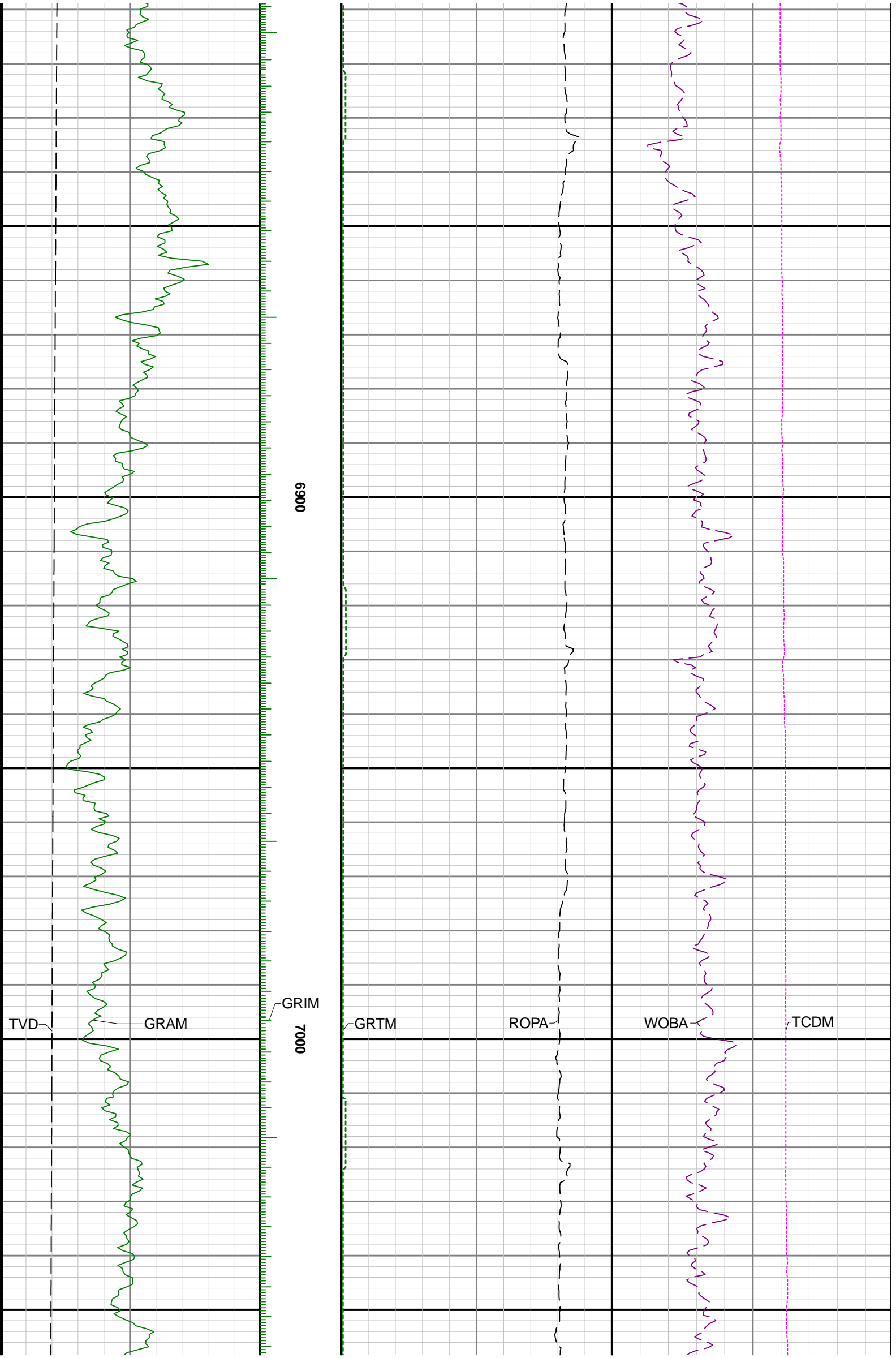


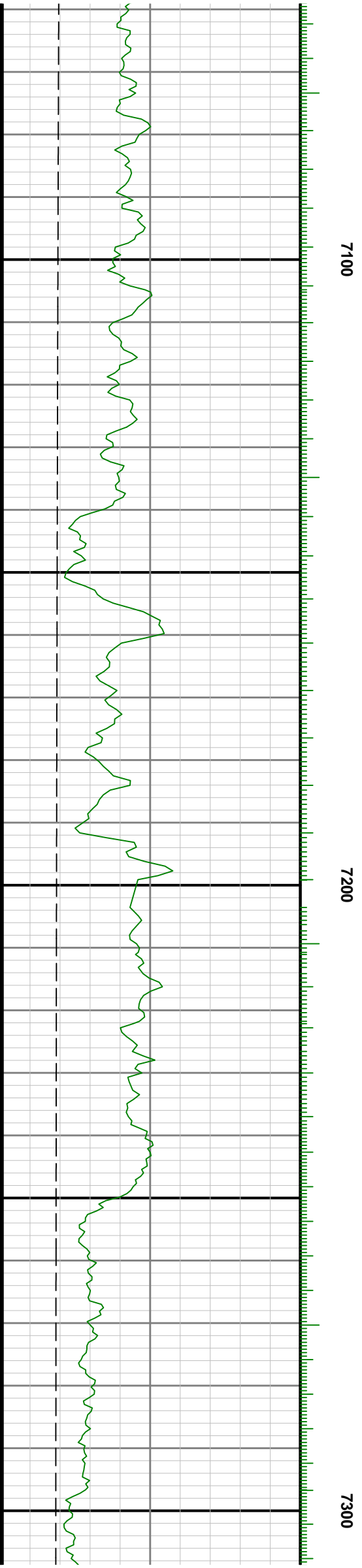
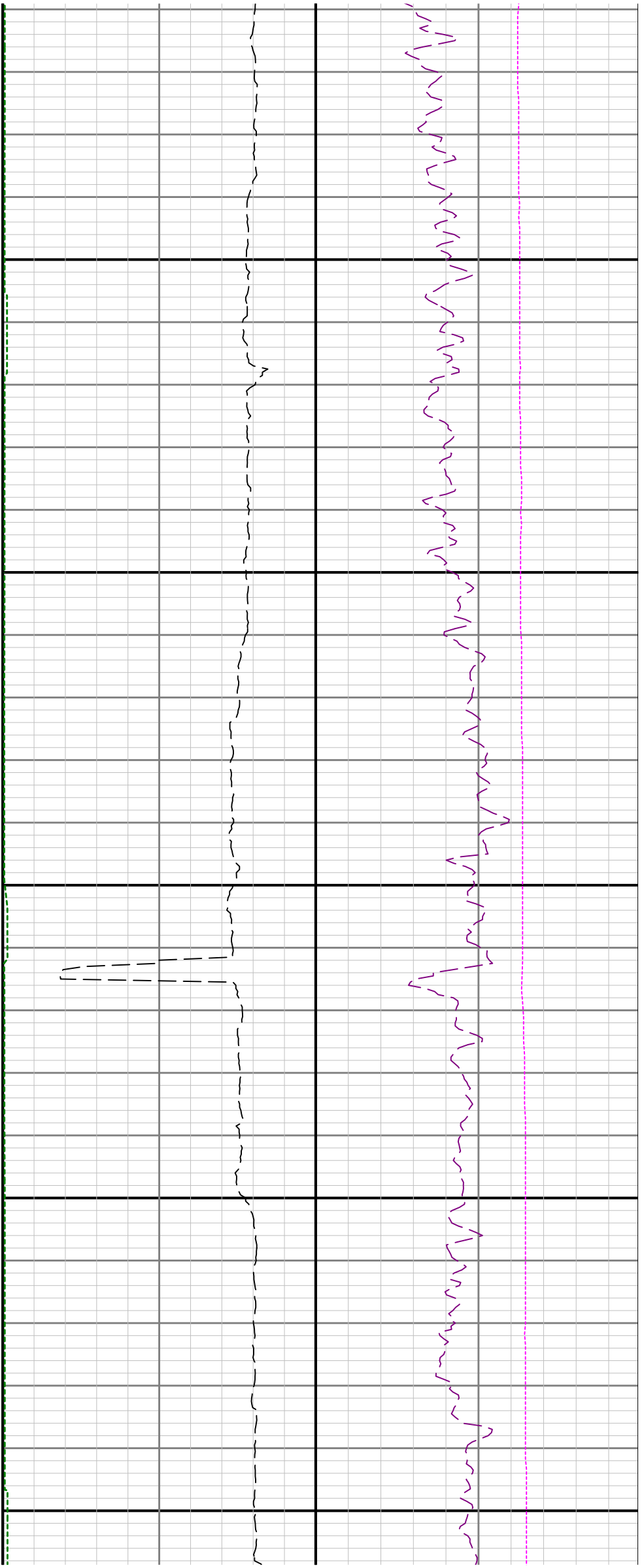
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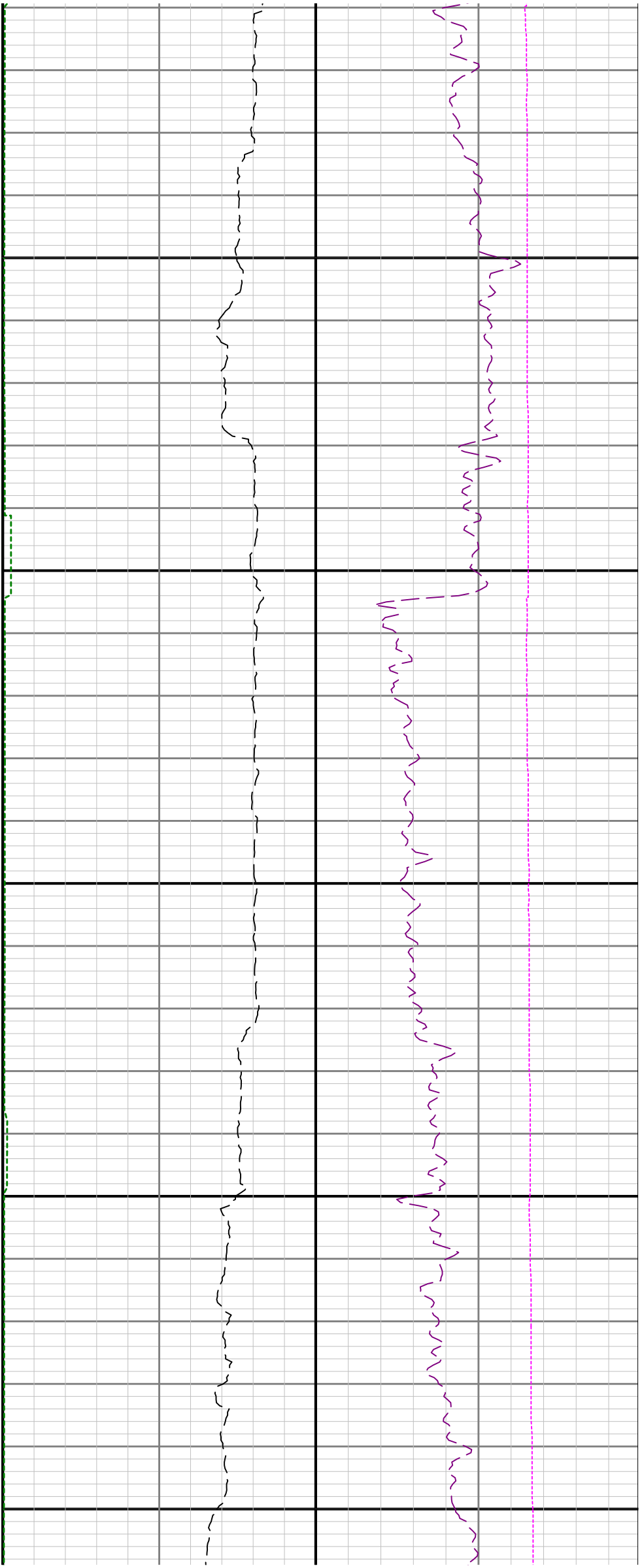
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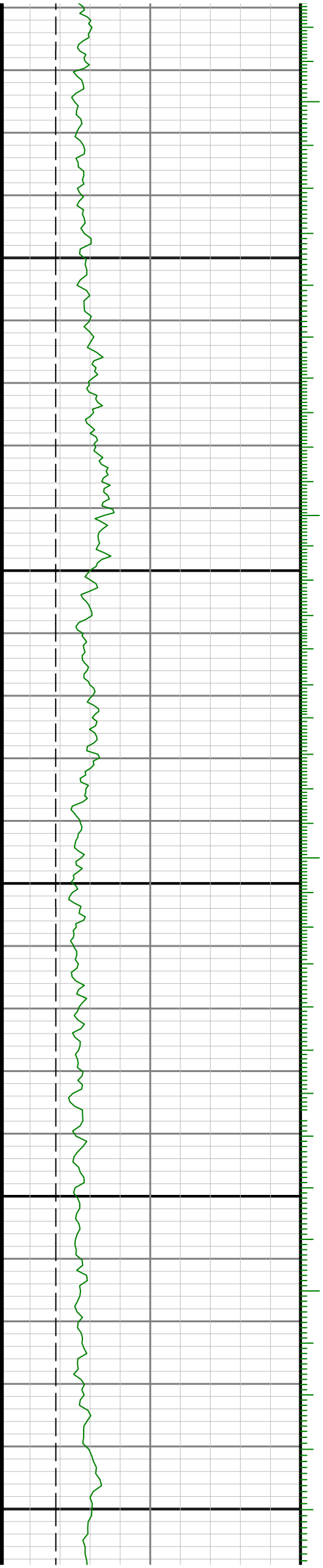




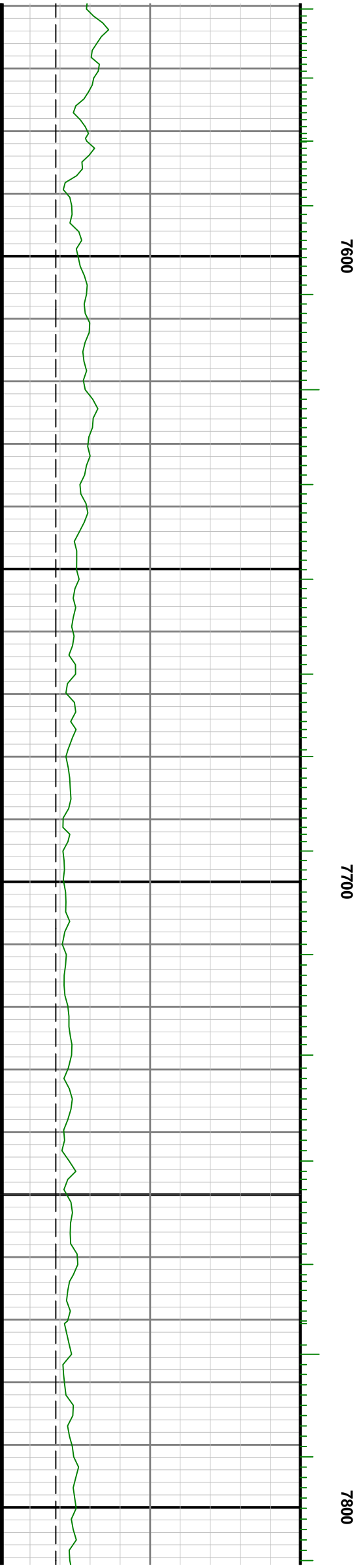
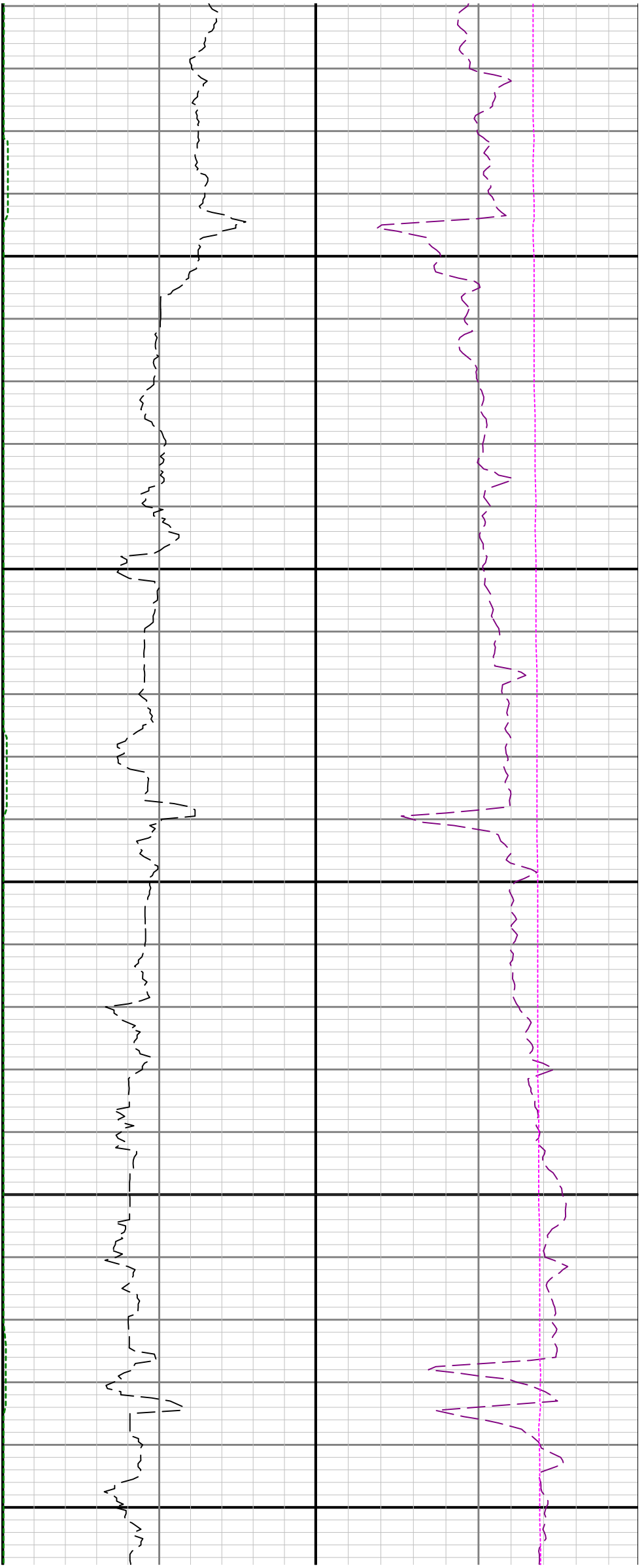


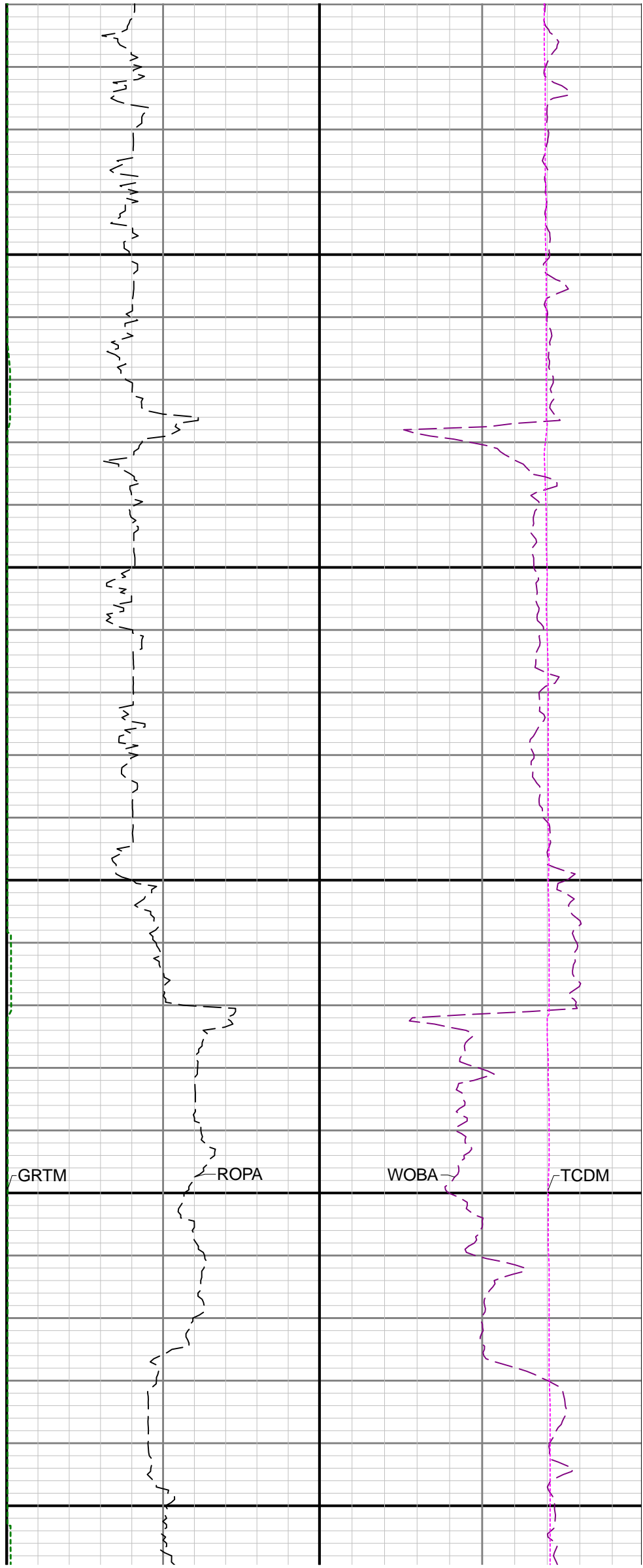
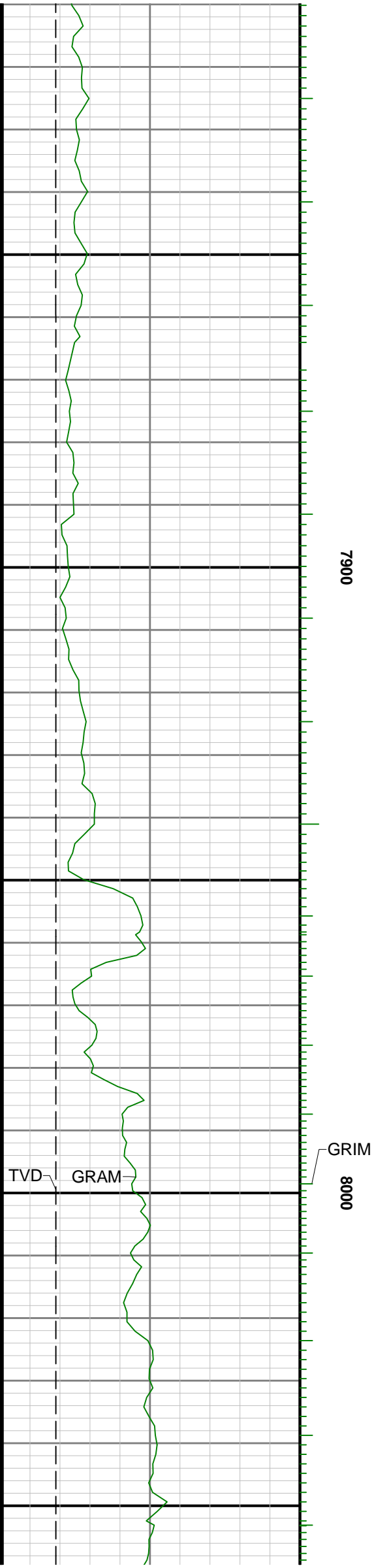
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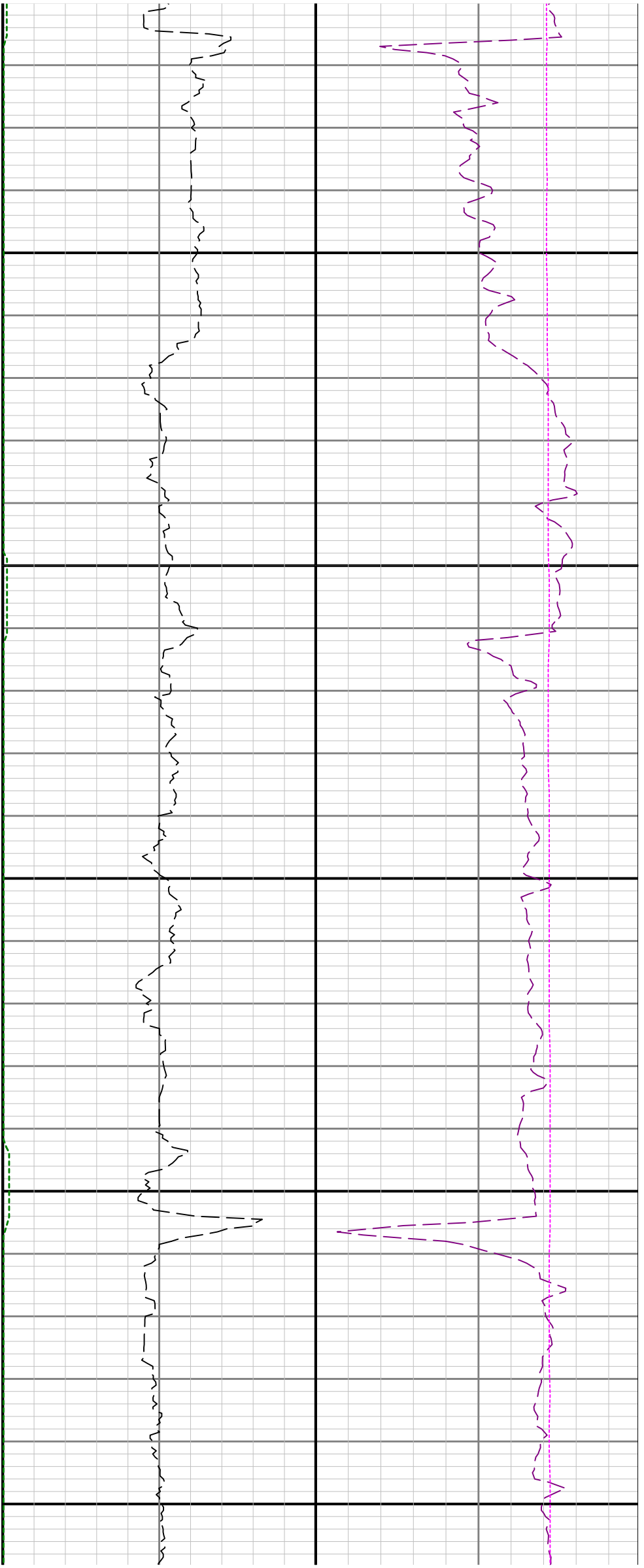
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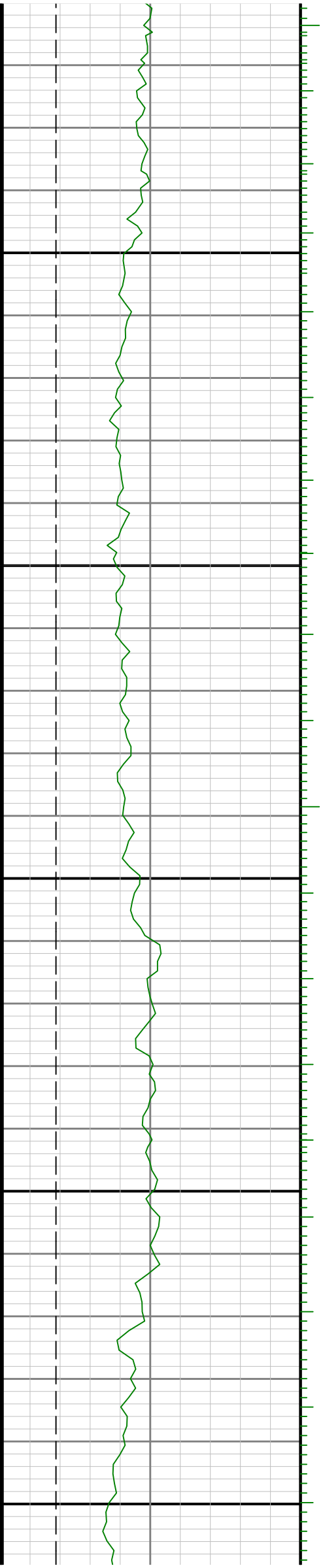


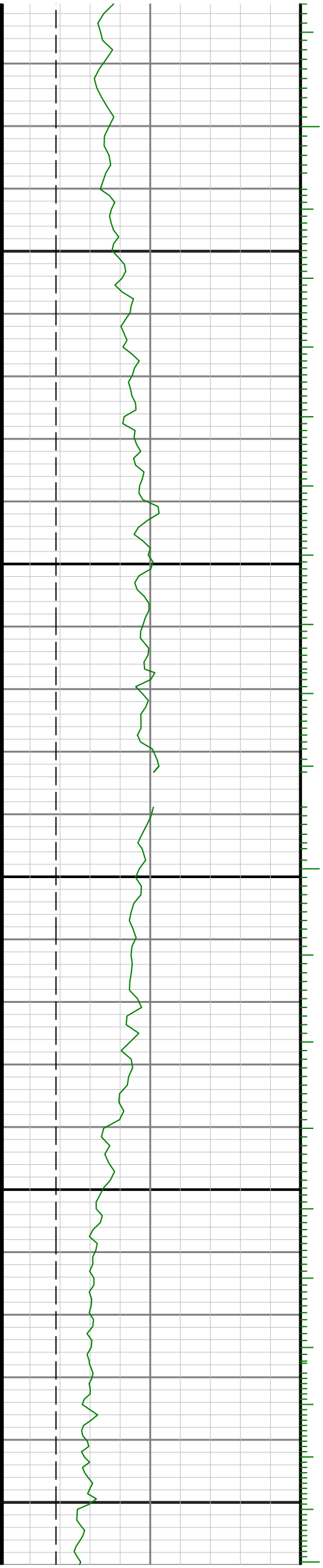


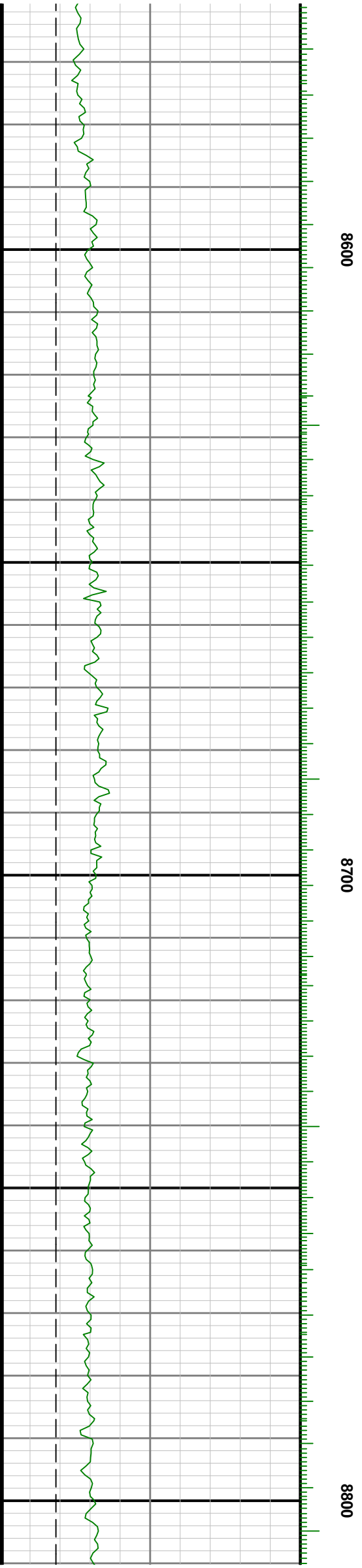
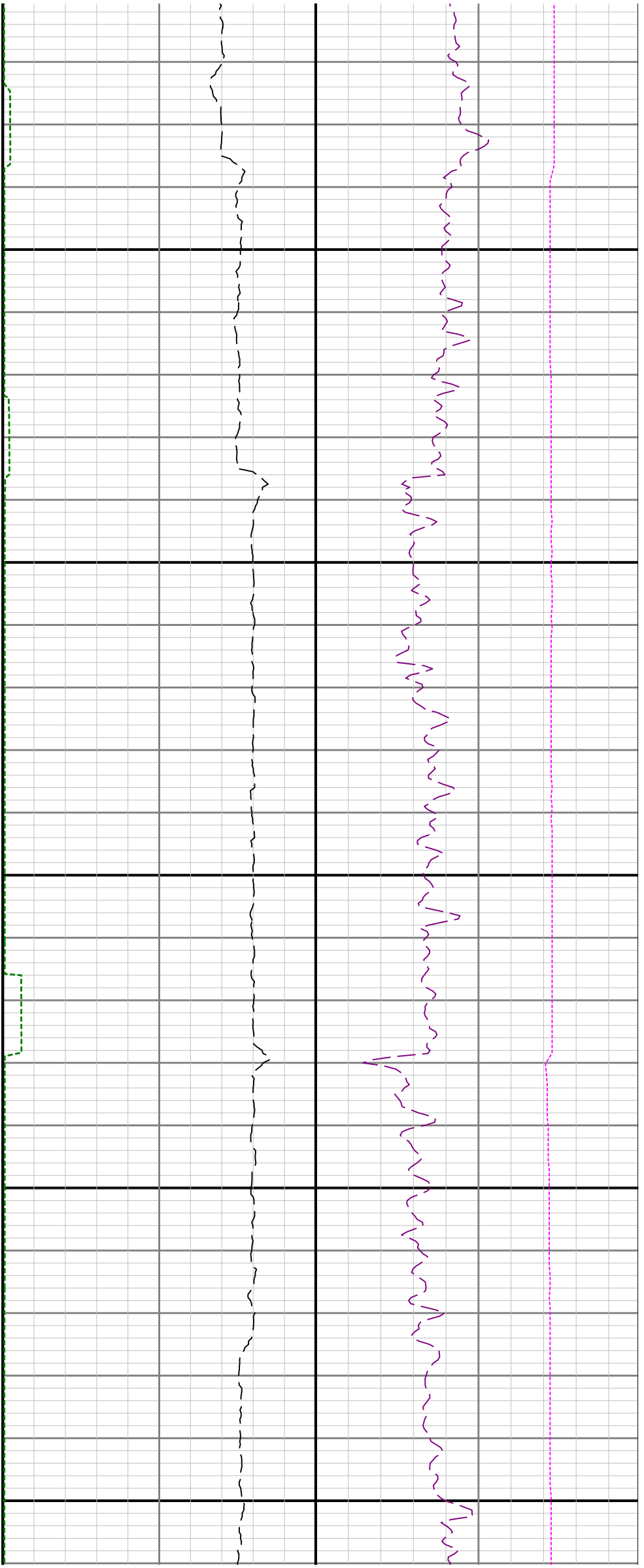
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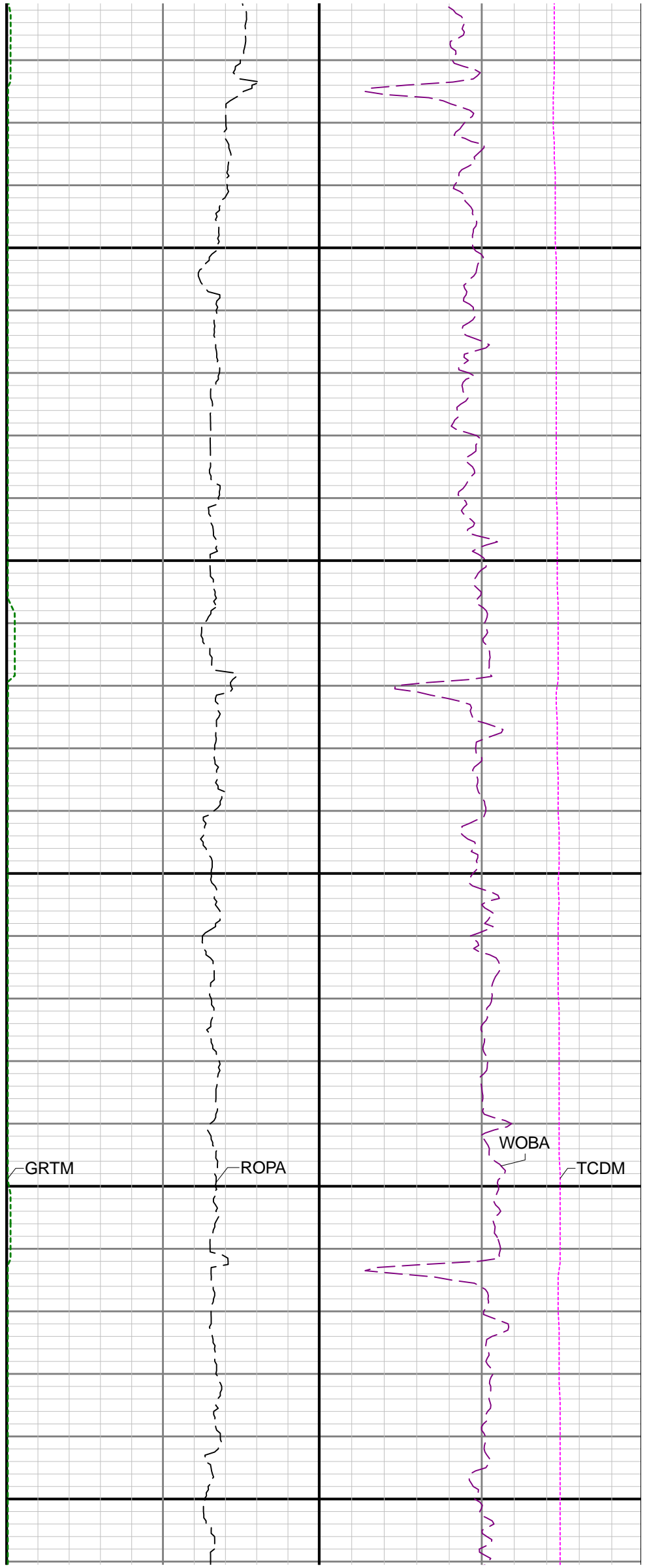
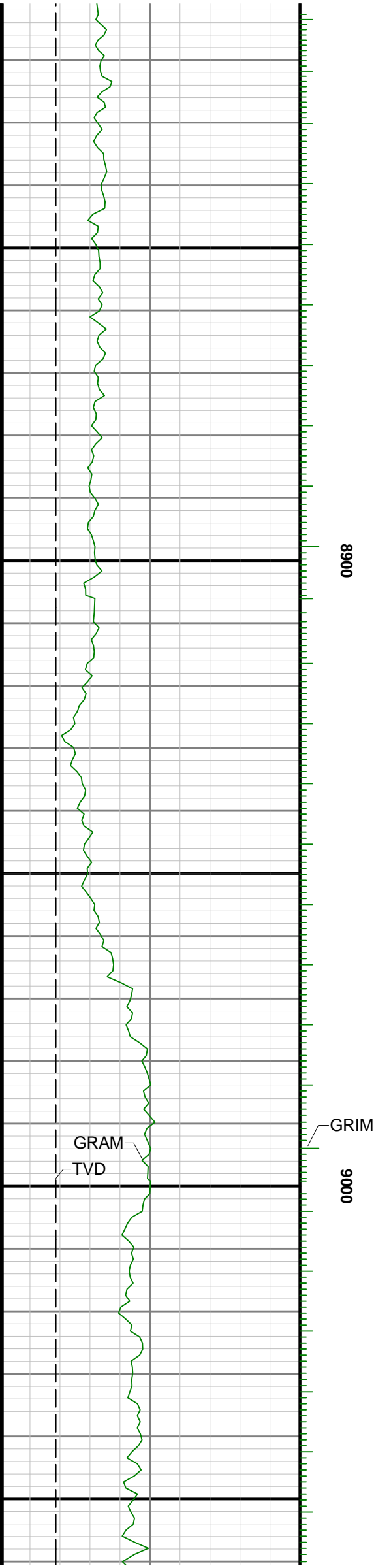
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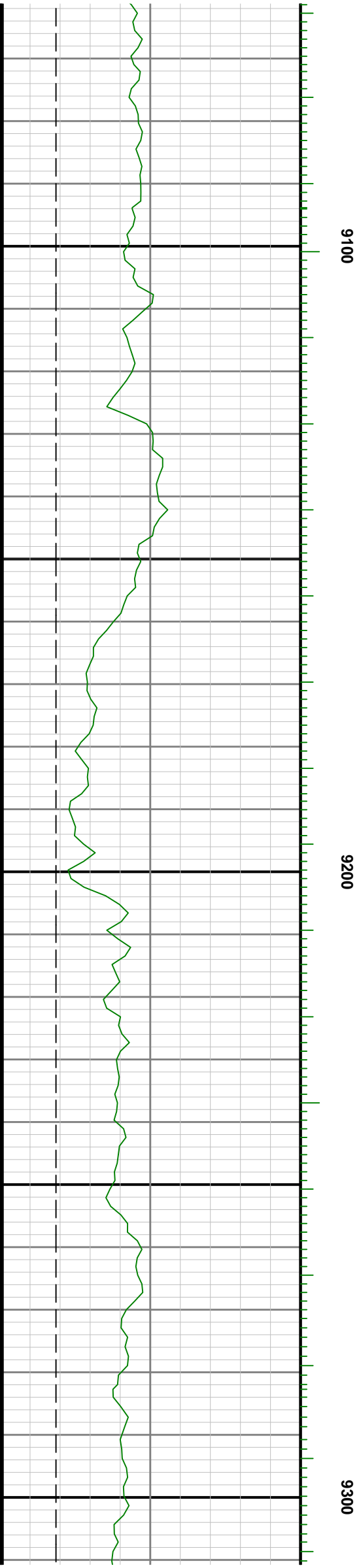
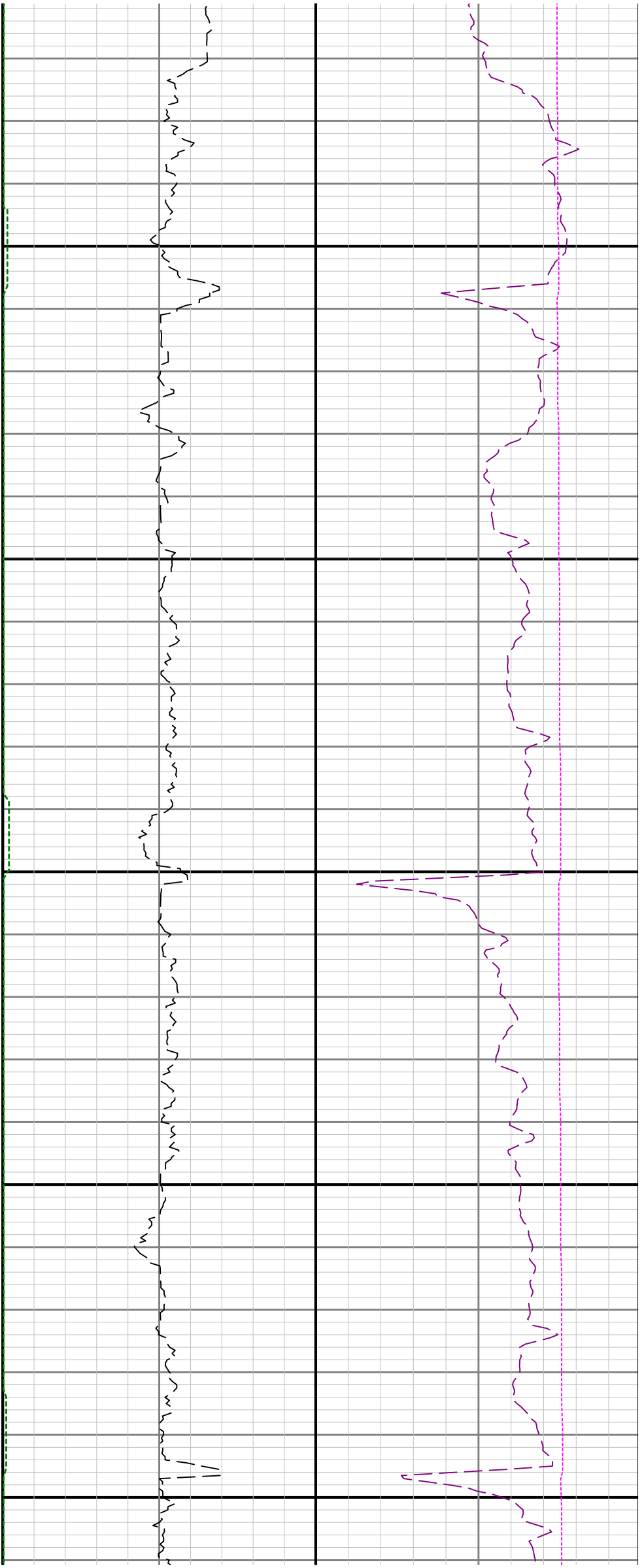
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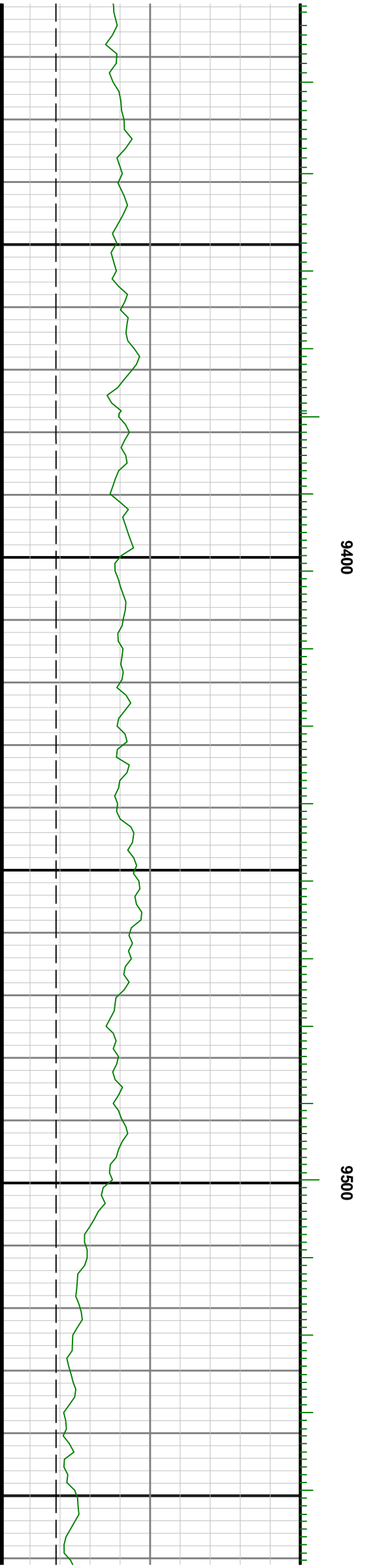
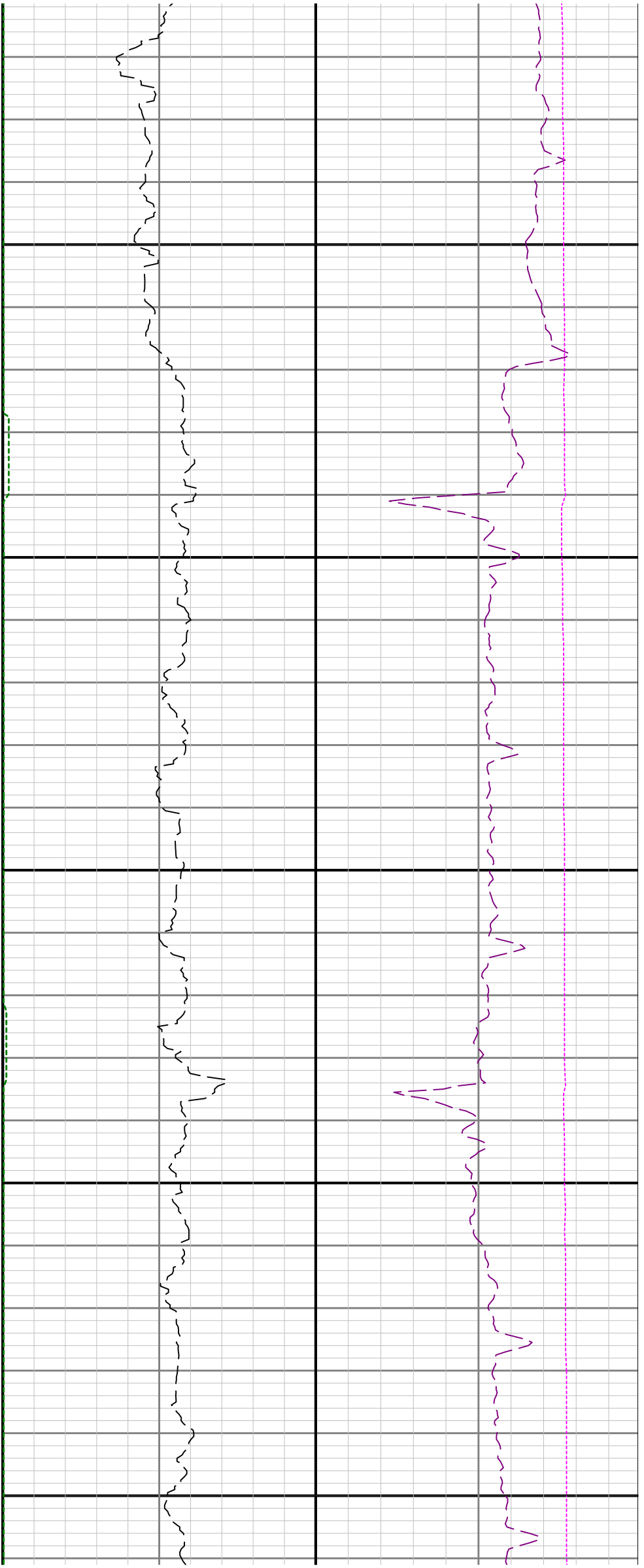




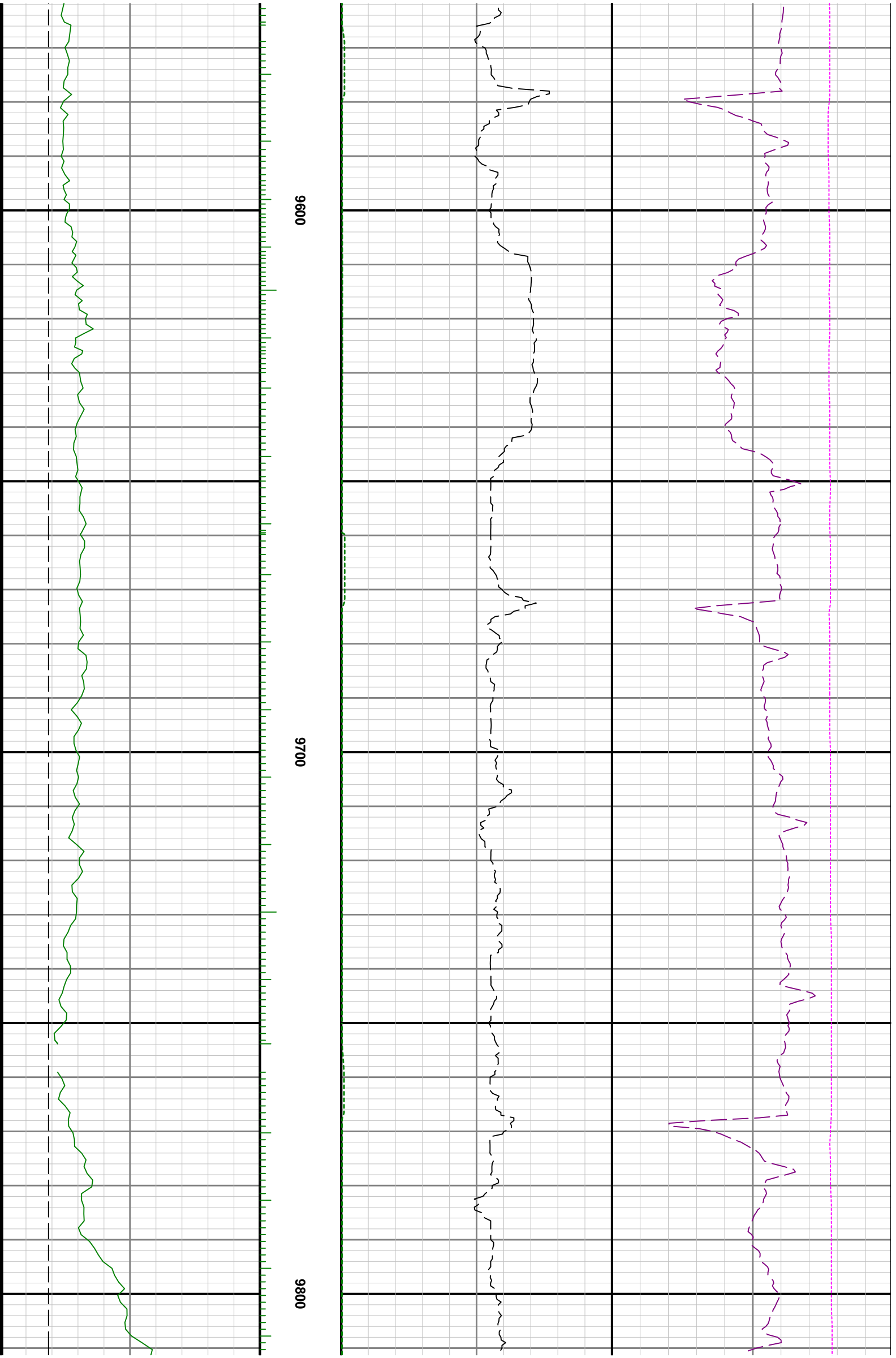


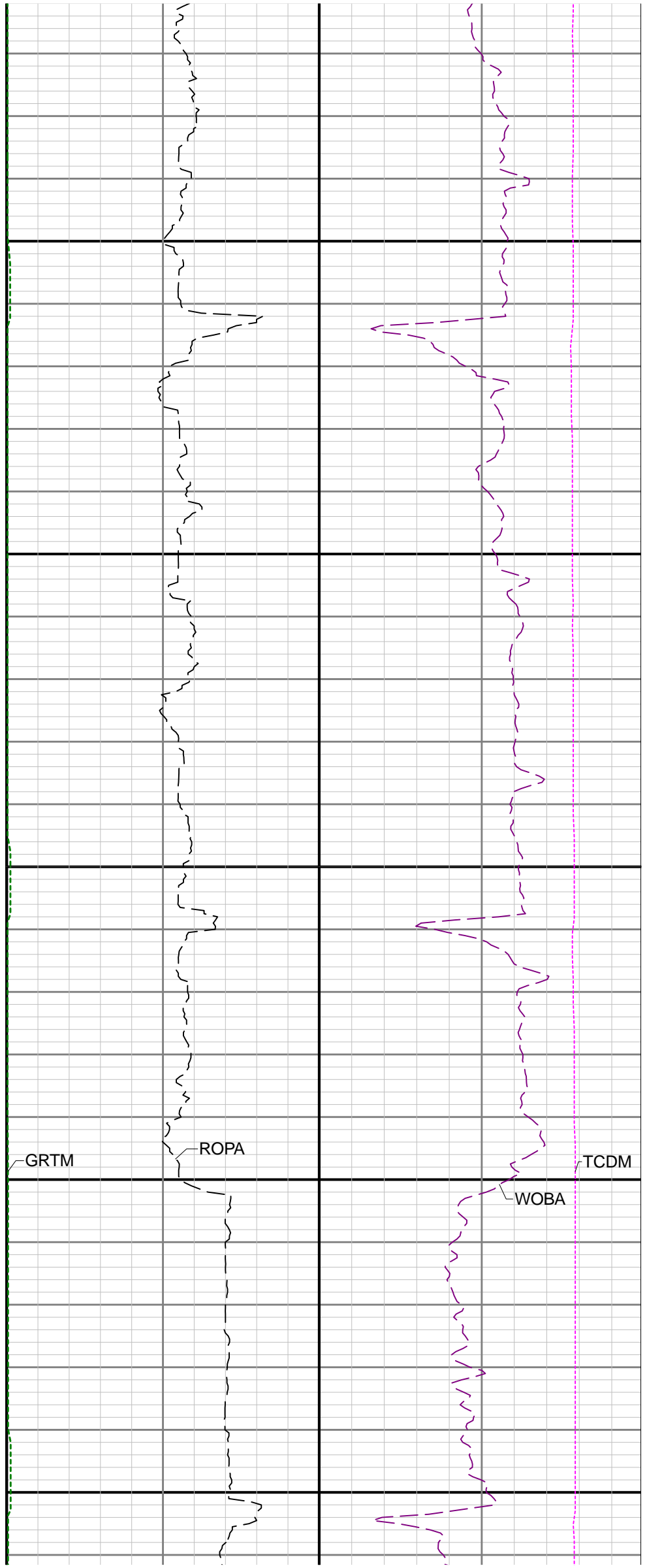
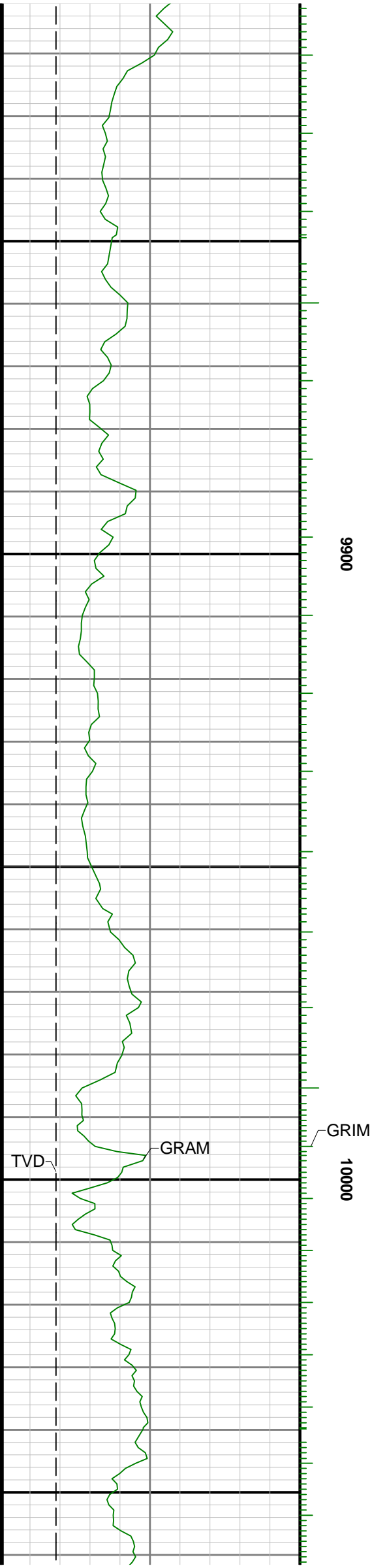


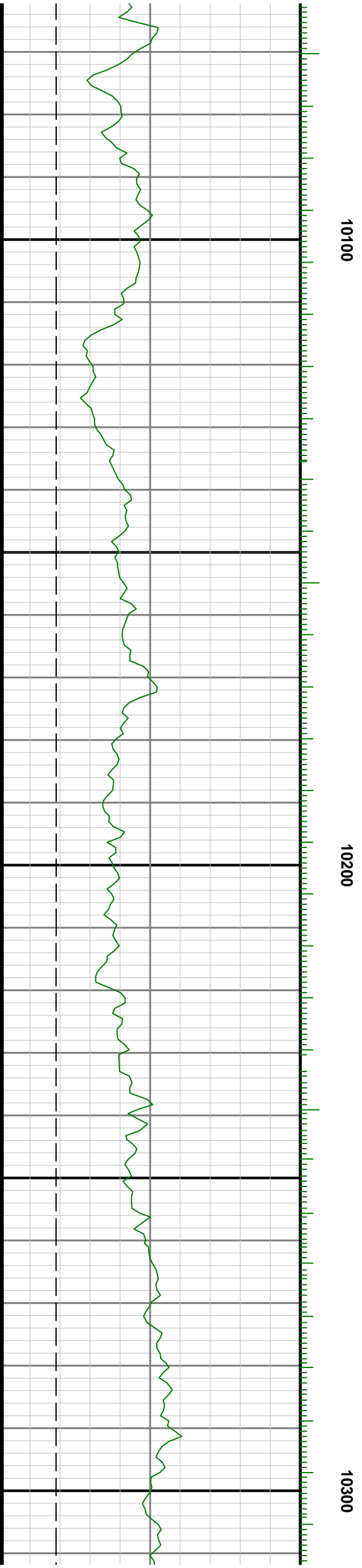
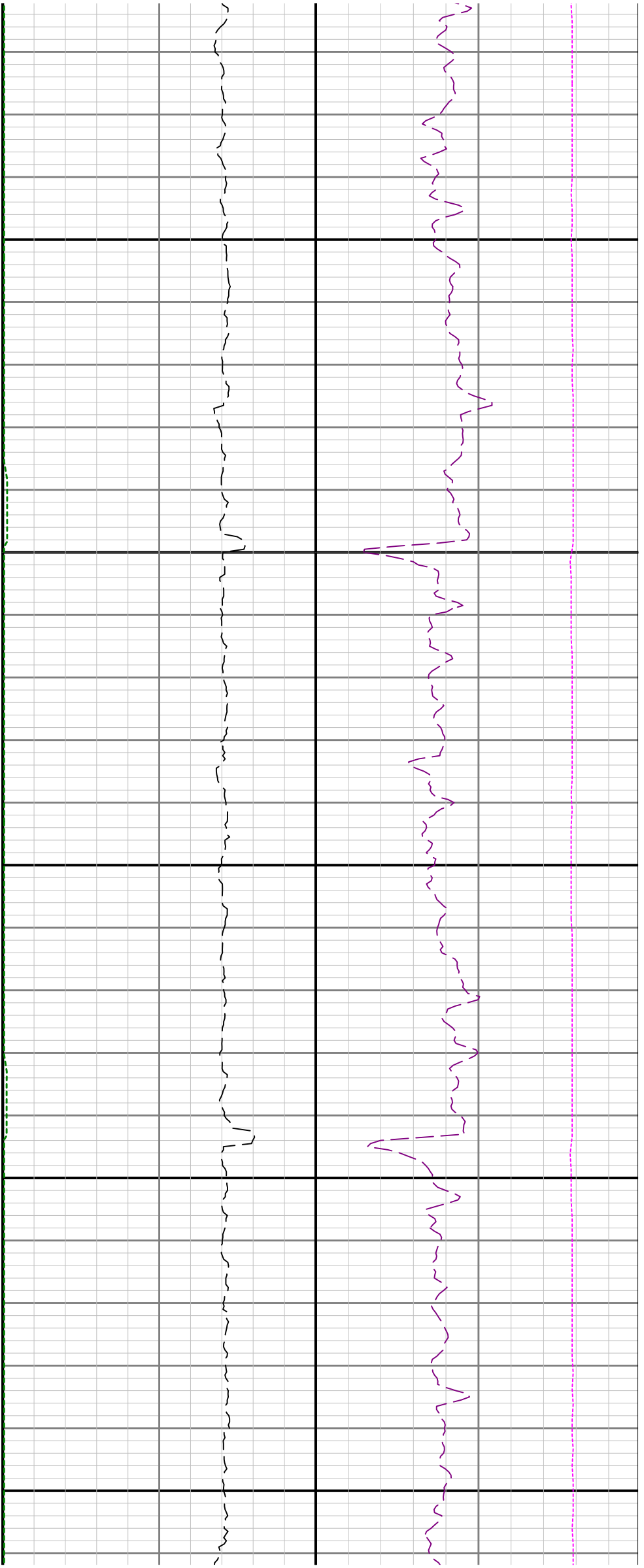


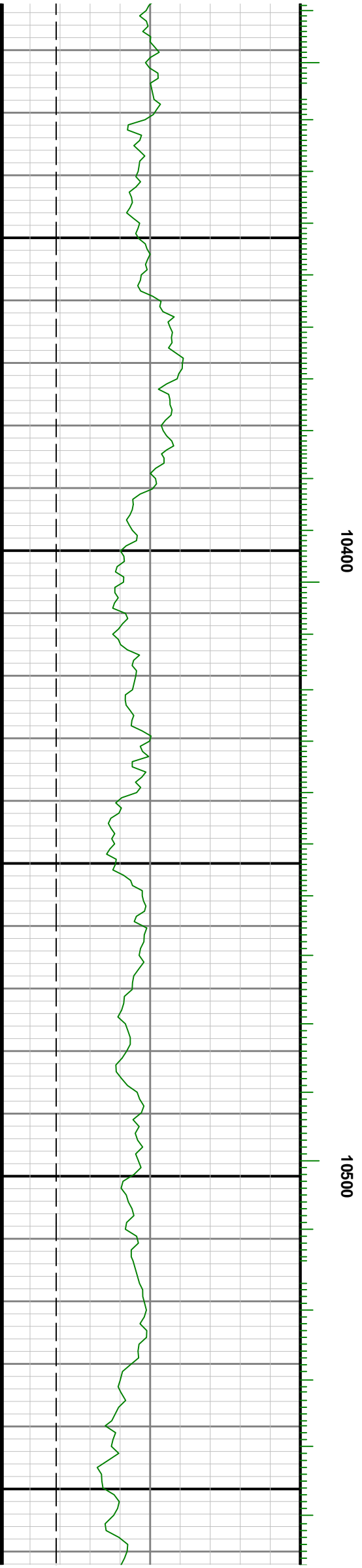
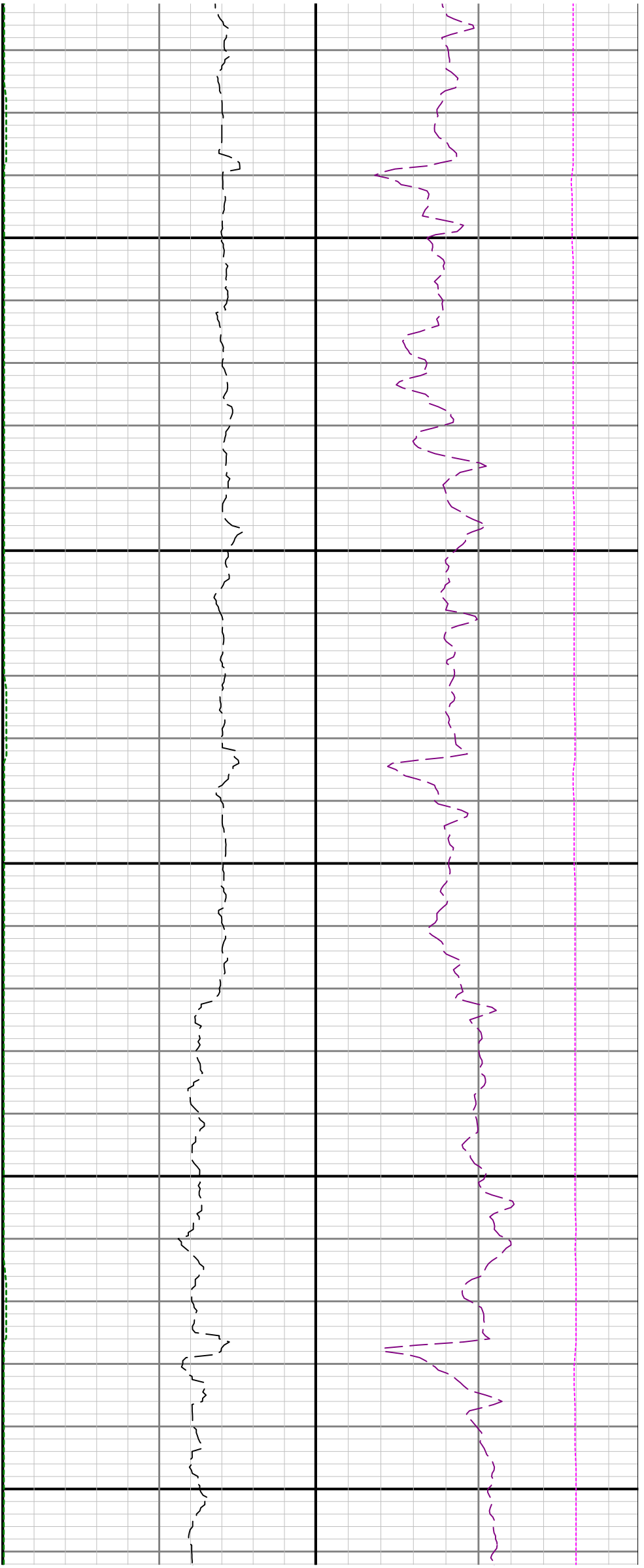


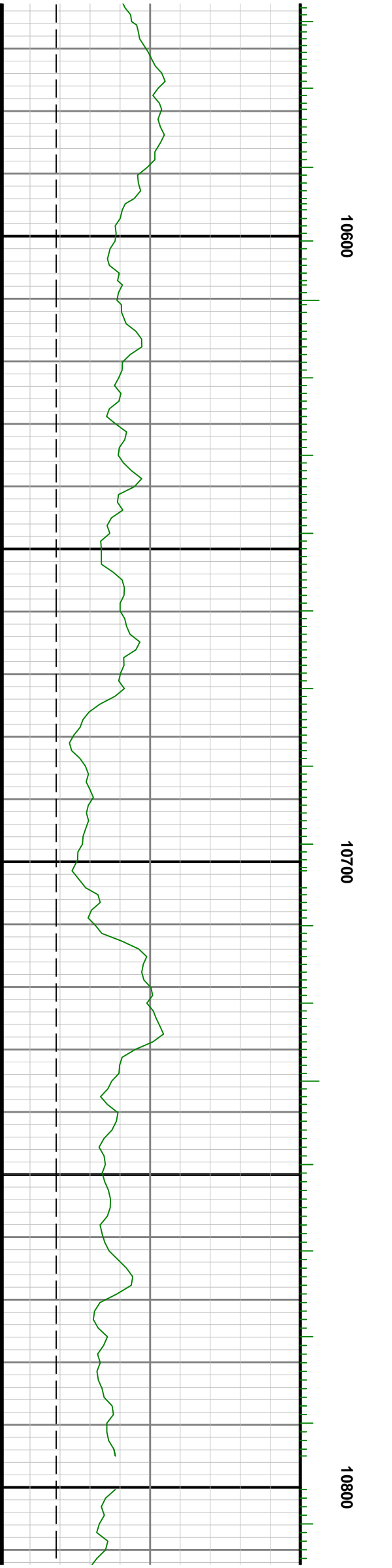
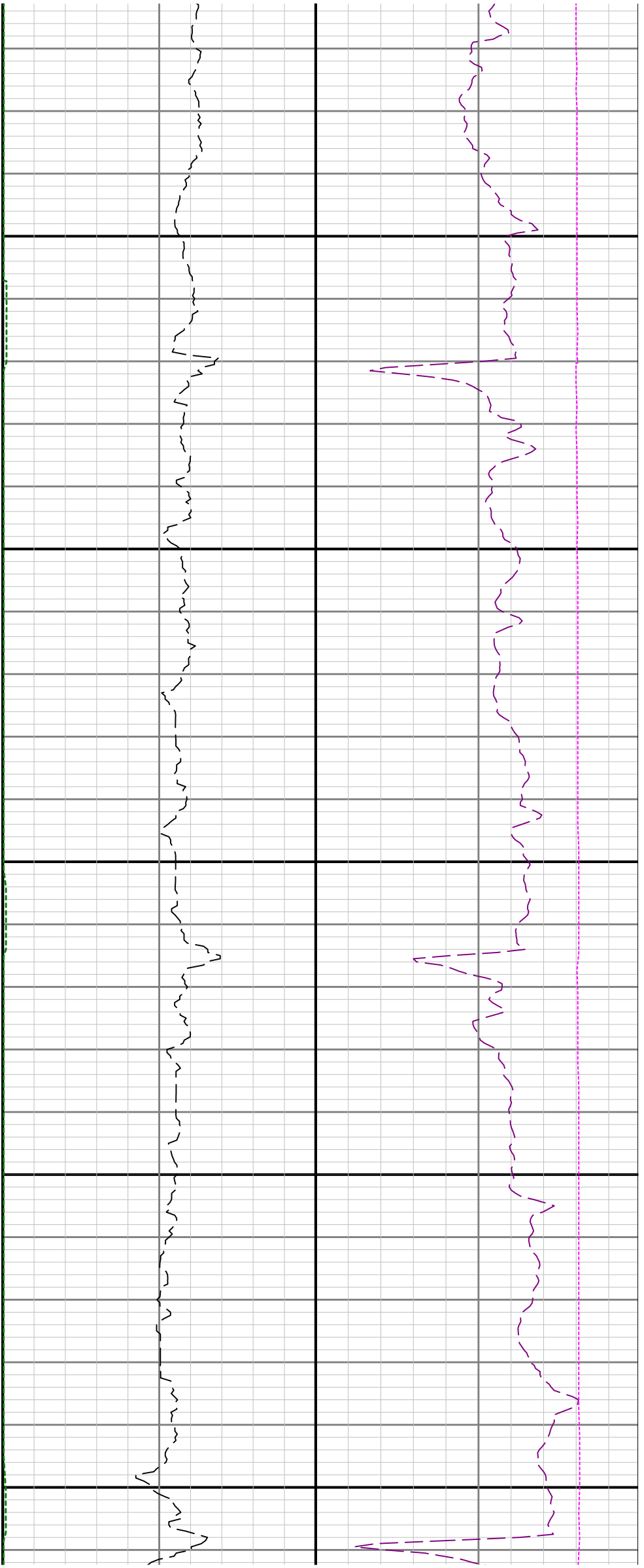


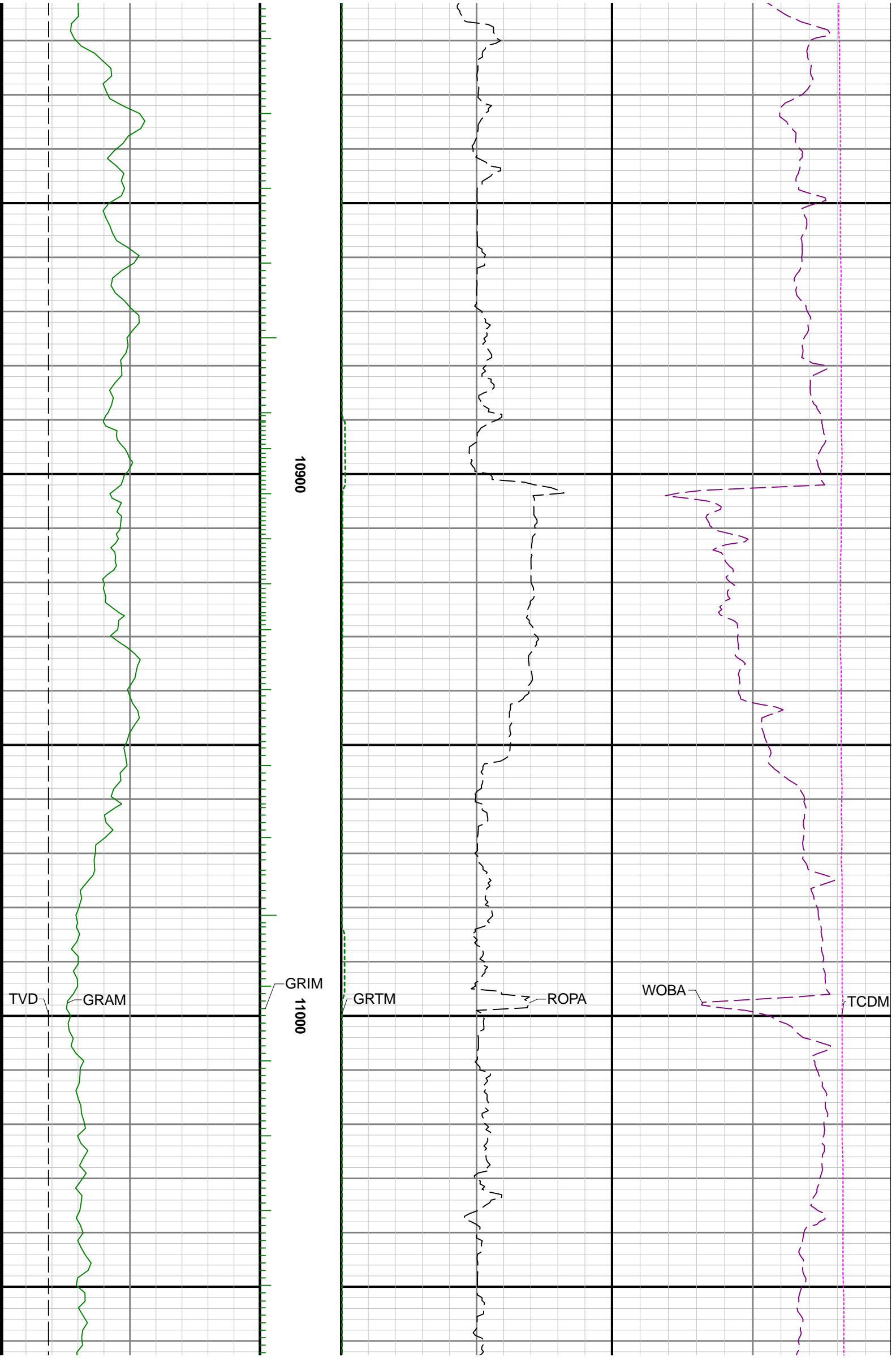


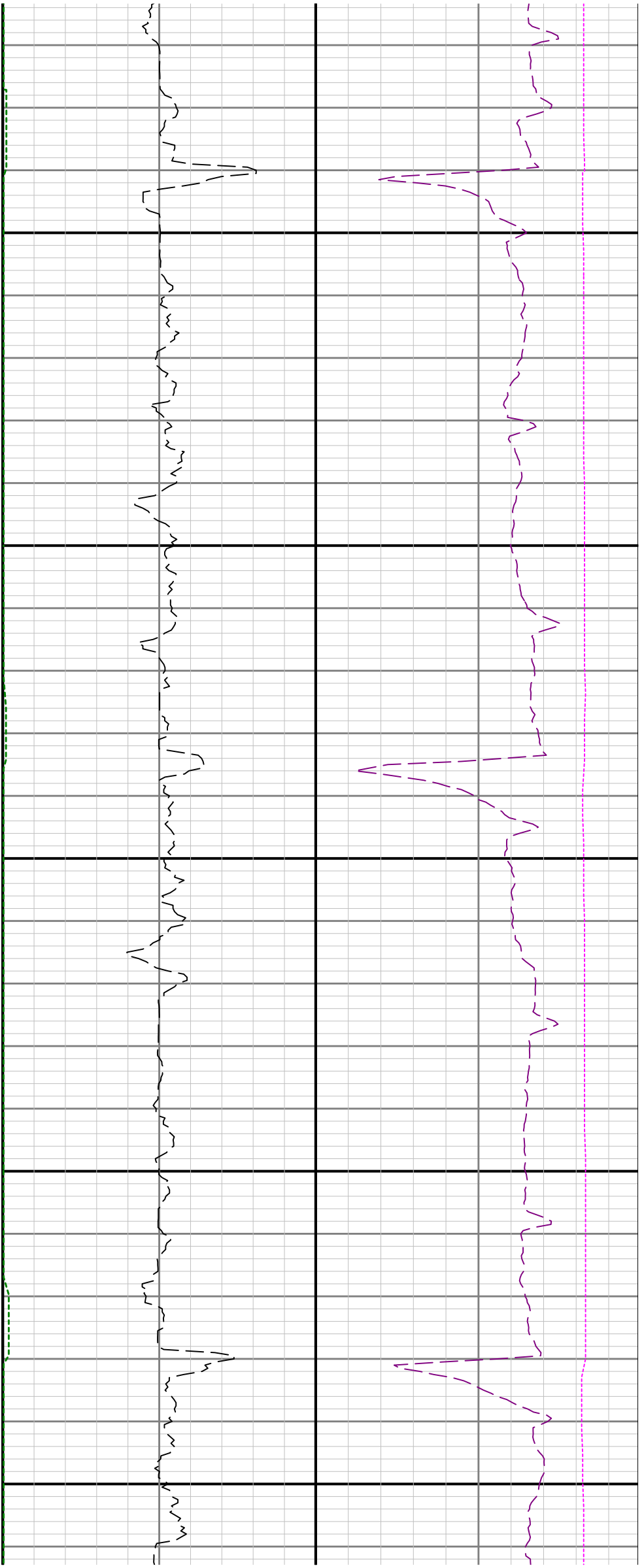








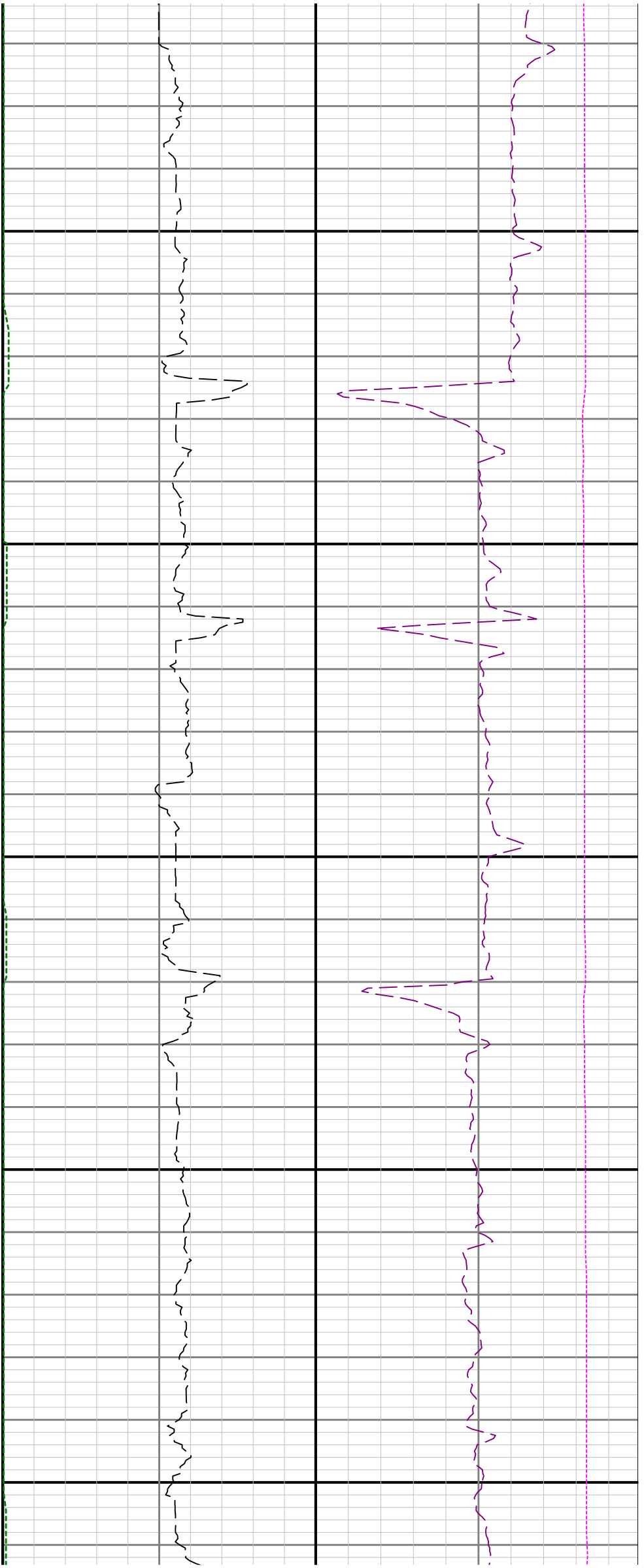




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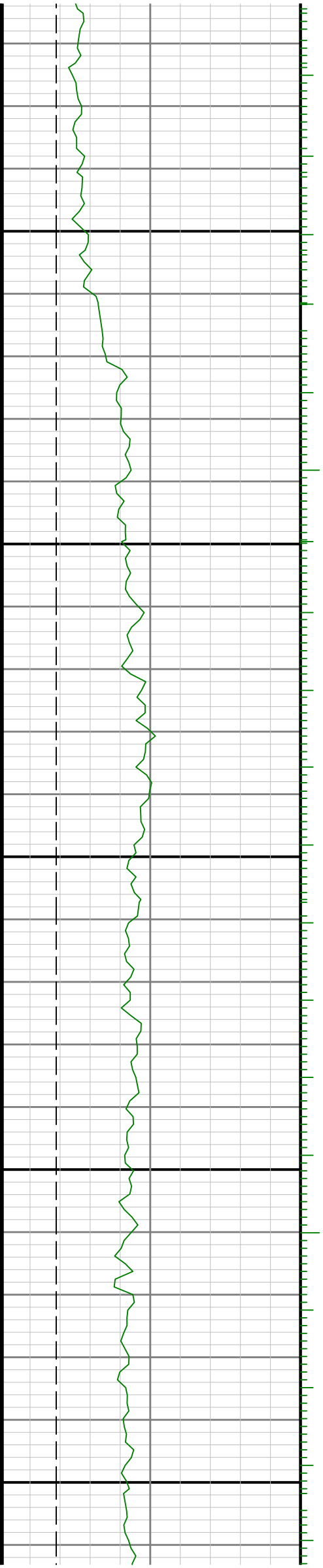
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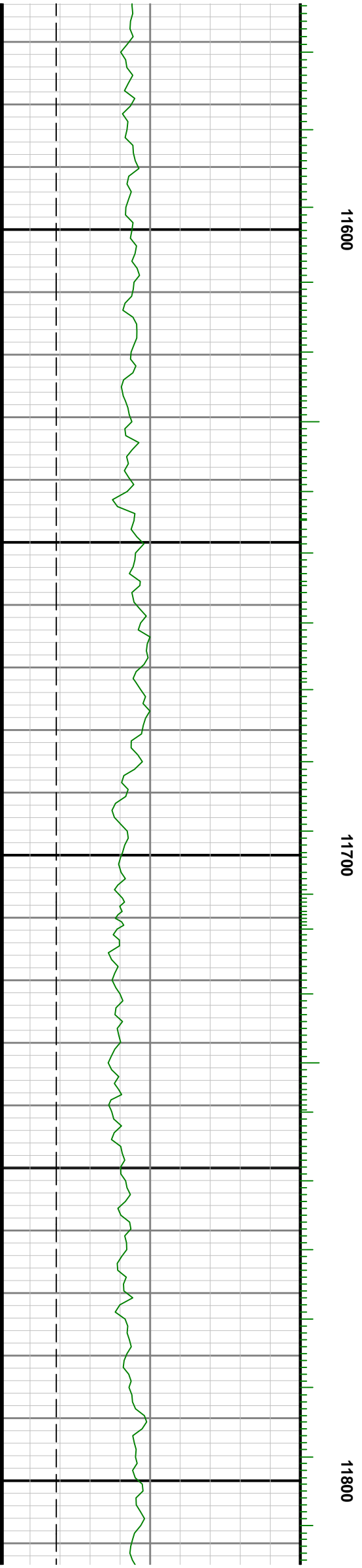
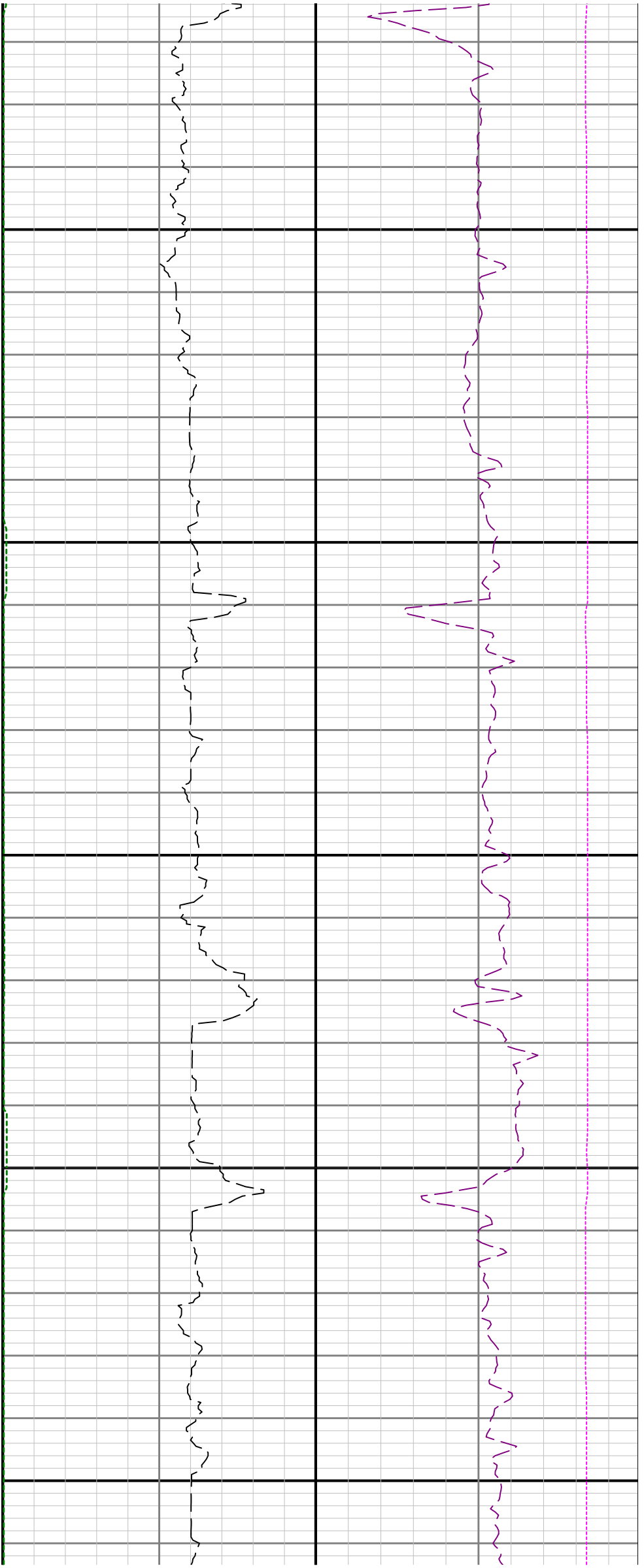


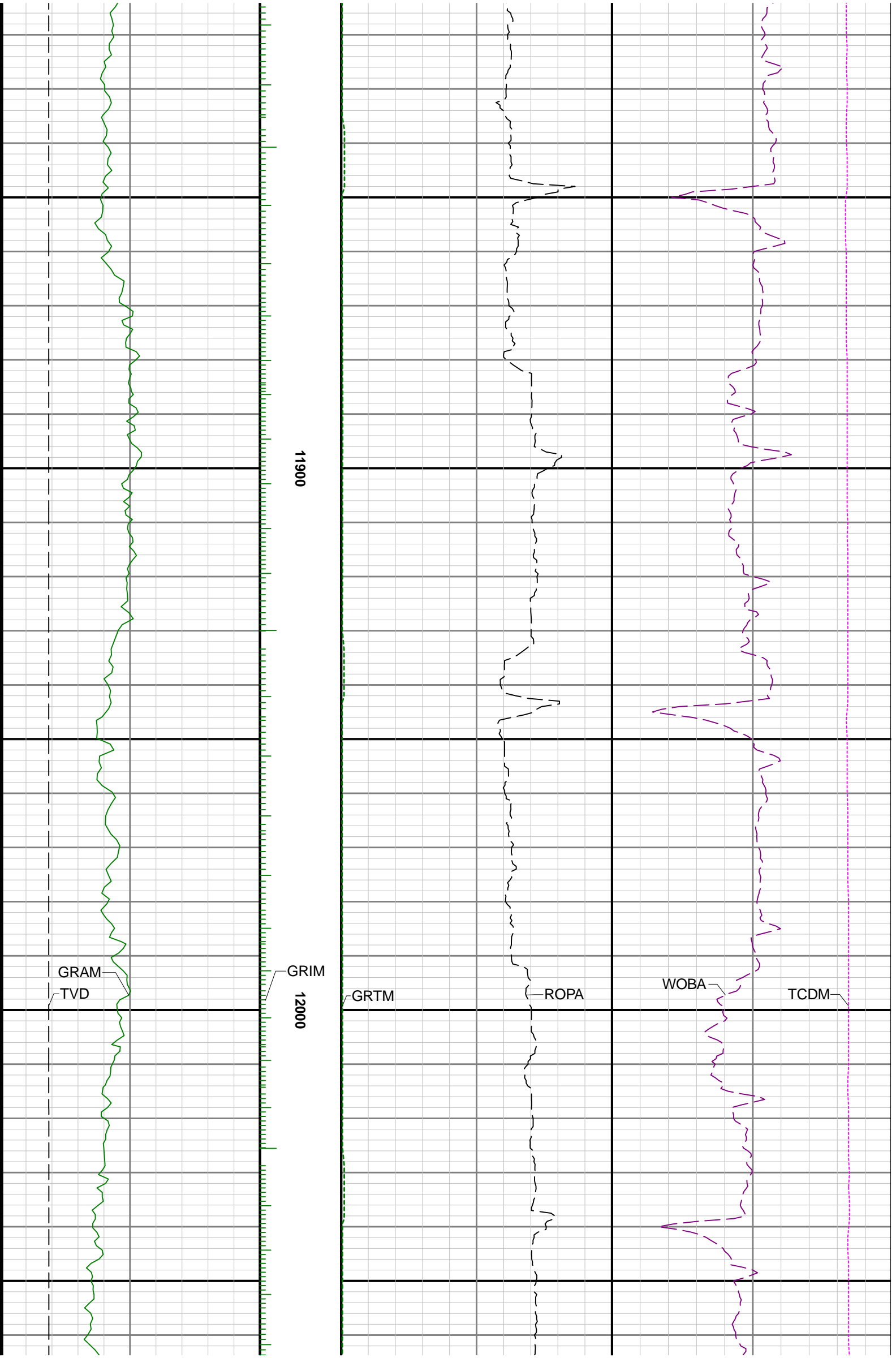
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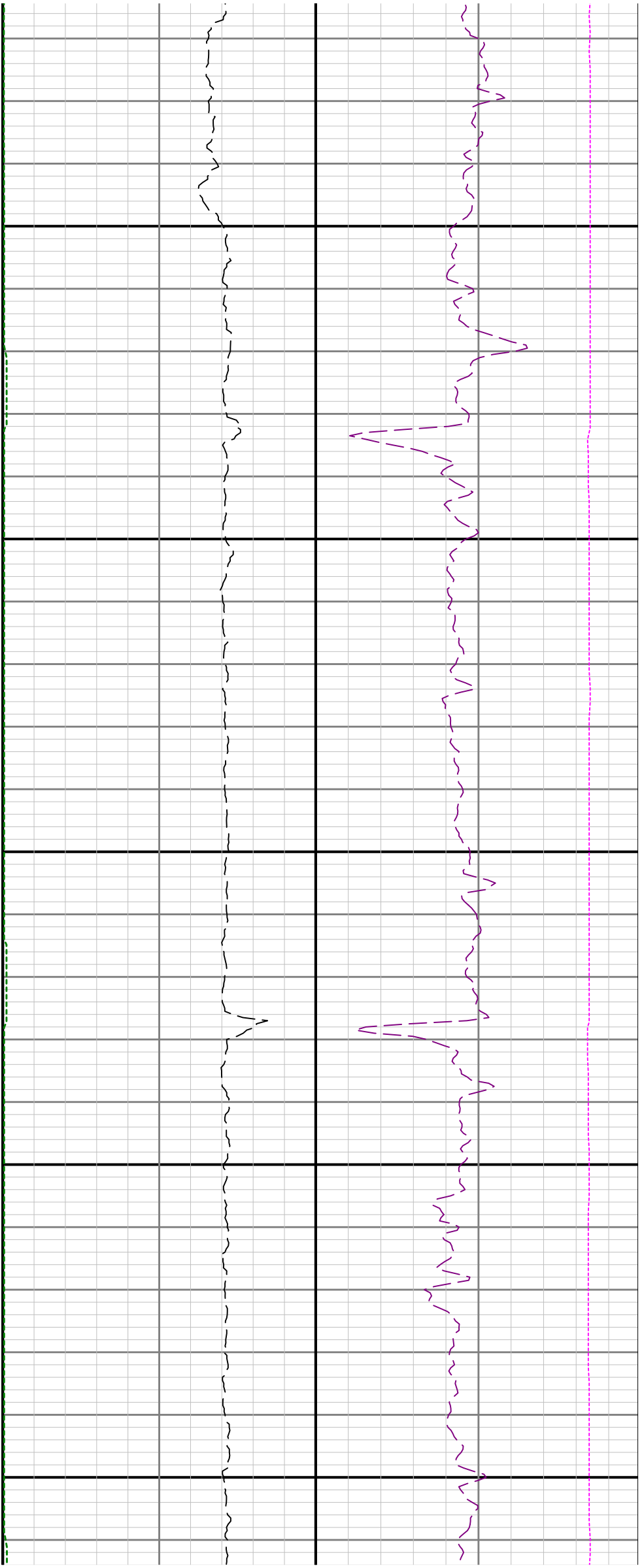
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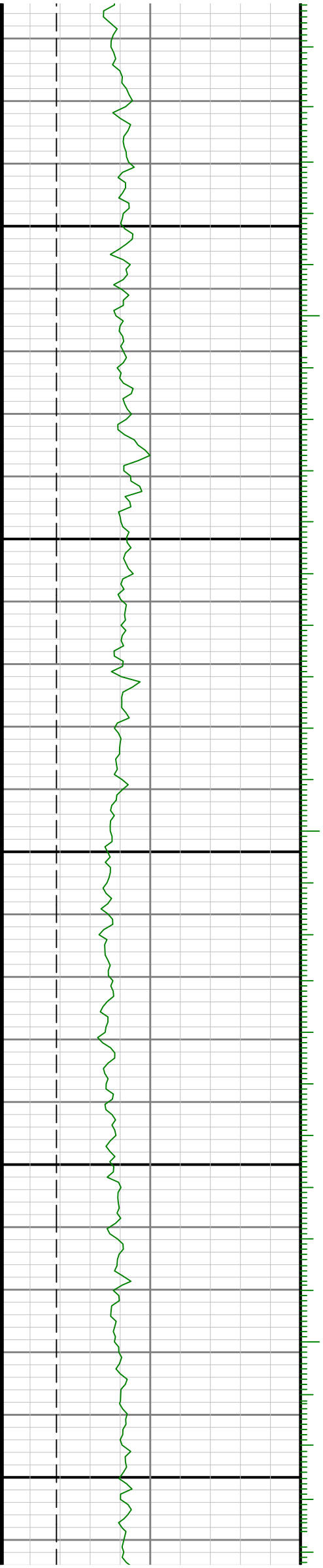


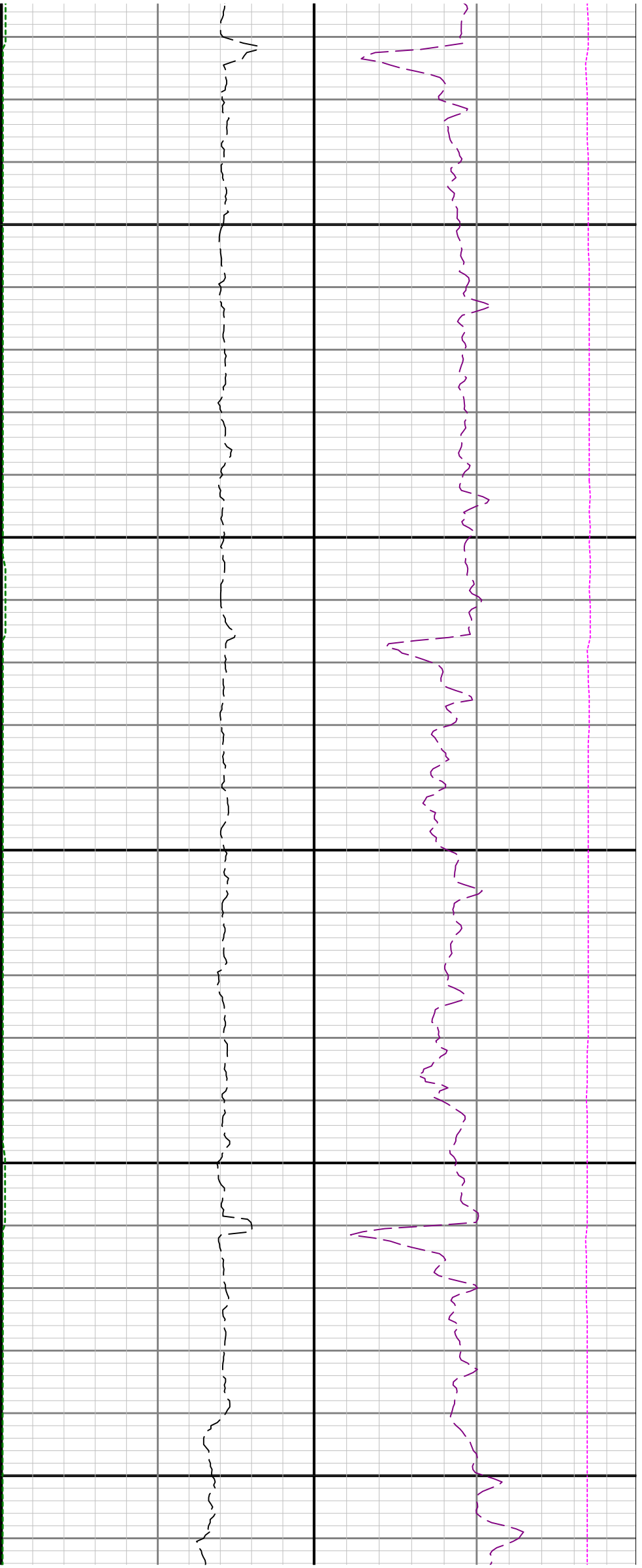


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12200

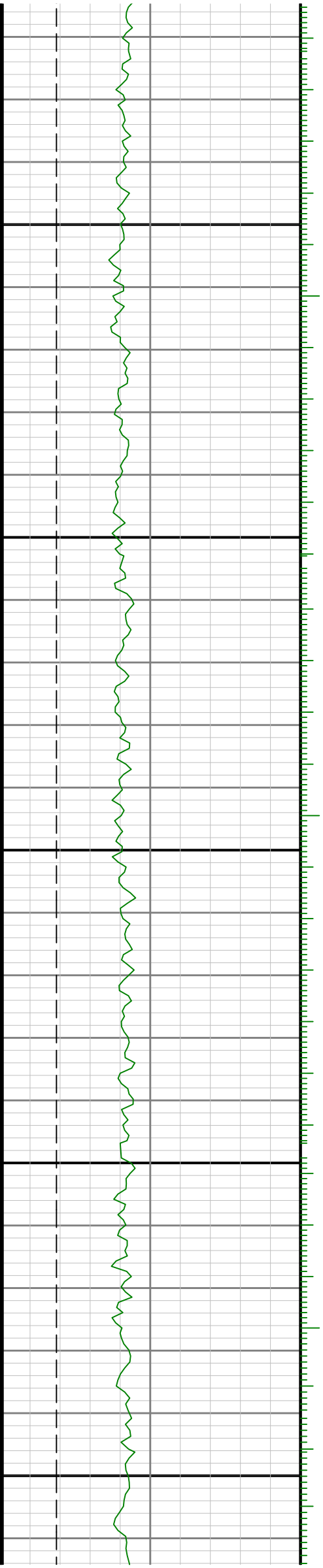
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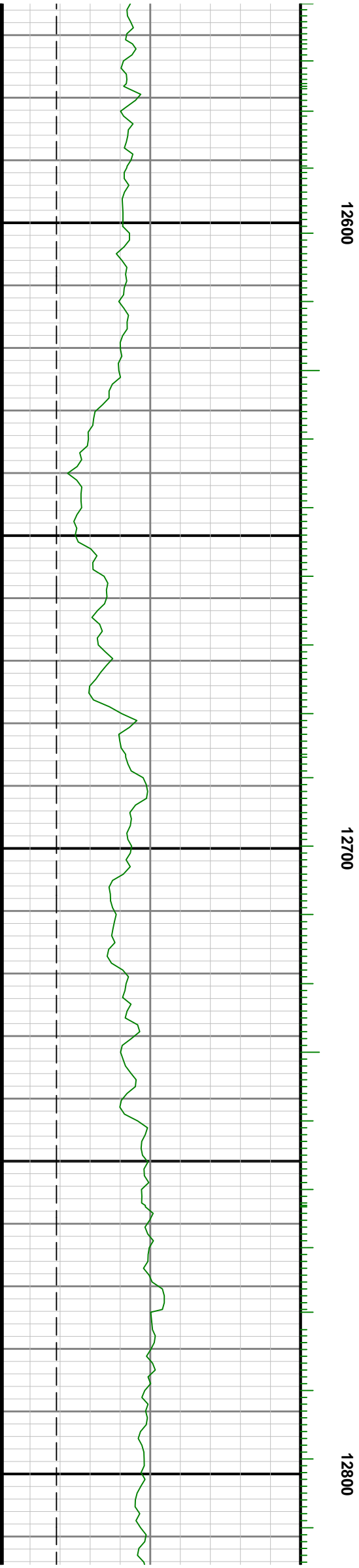
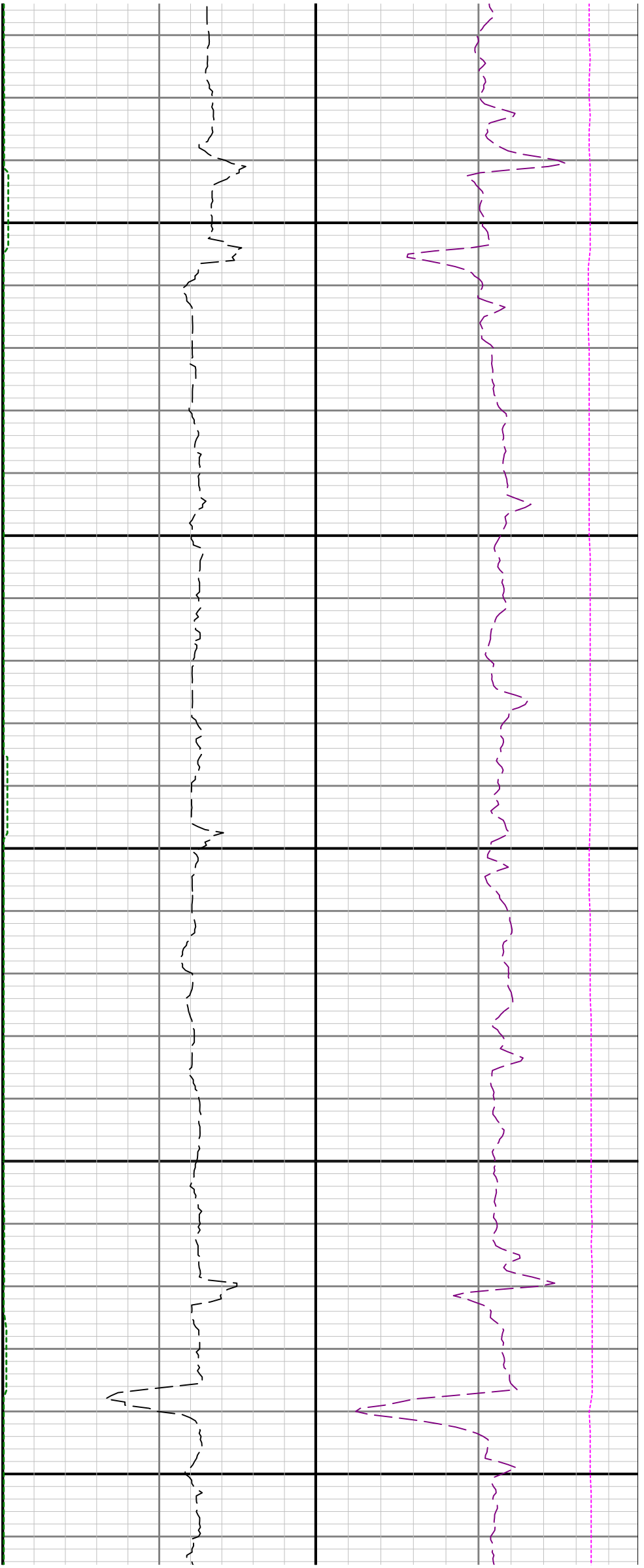


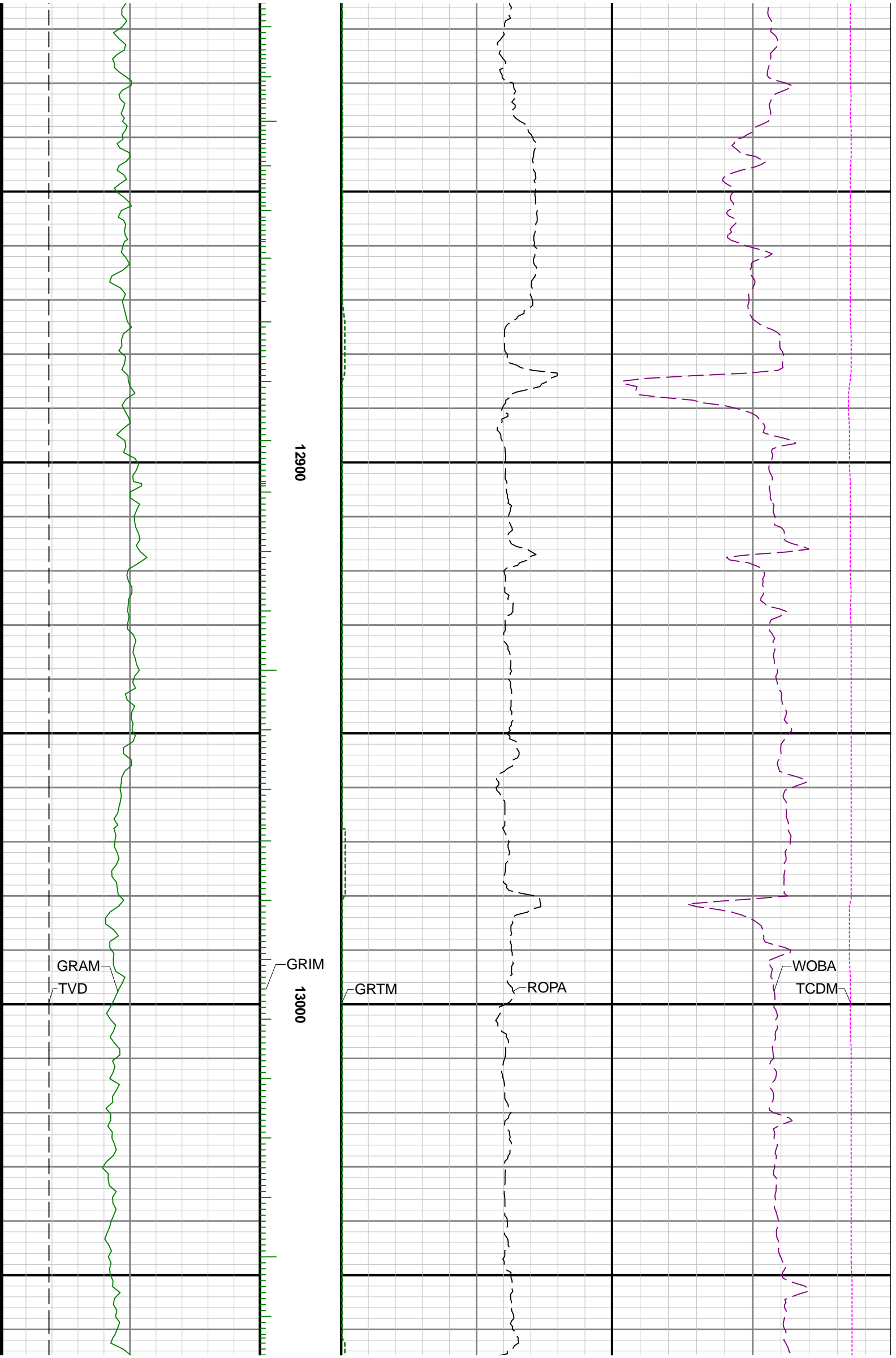


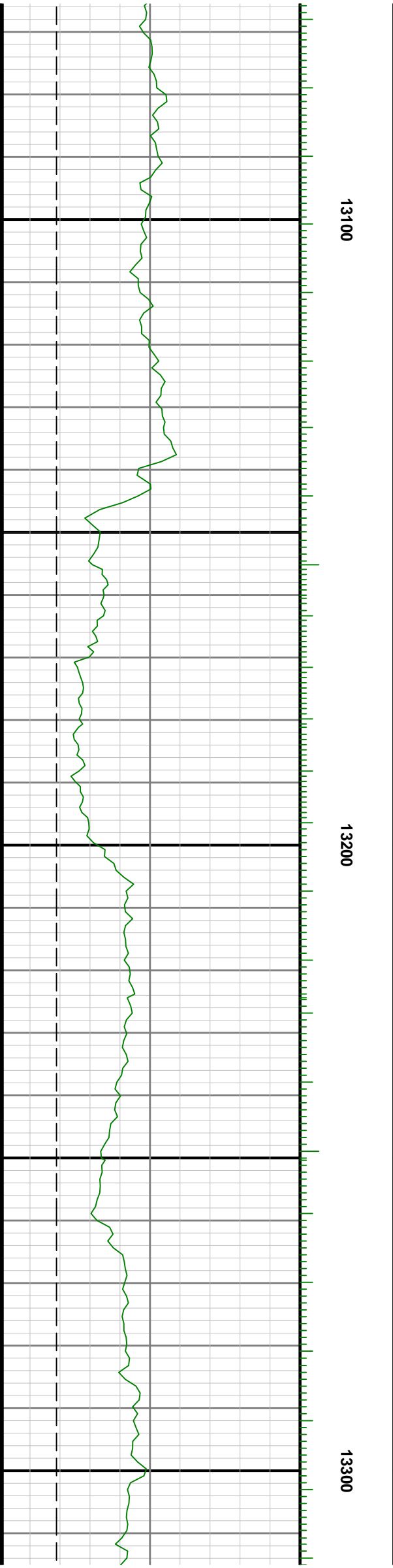
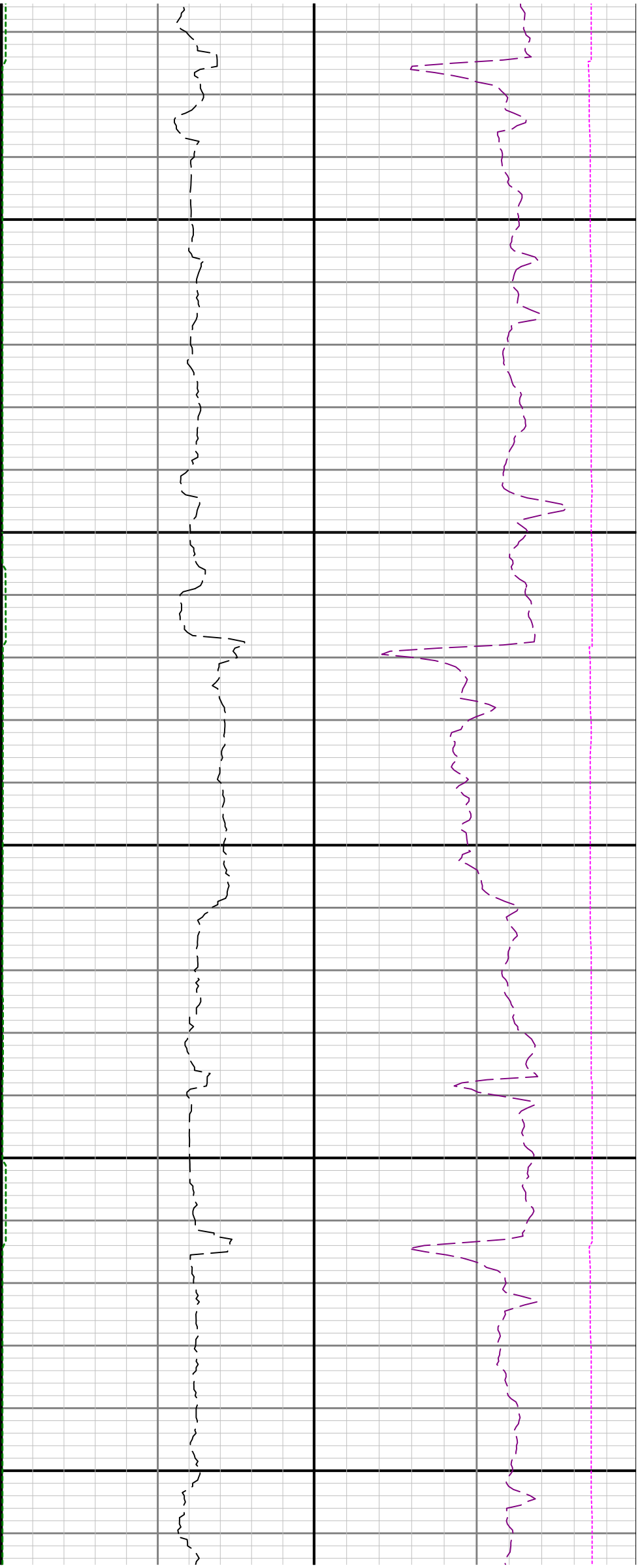
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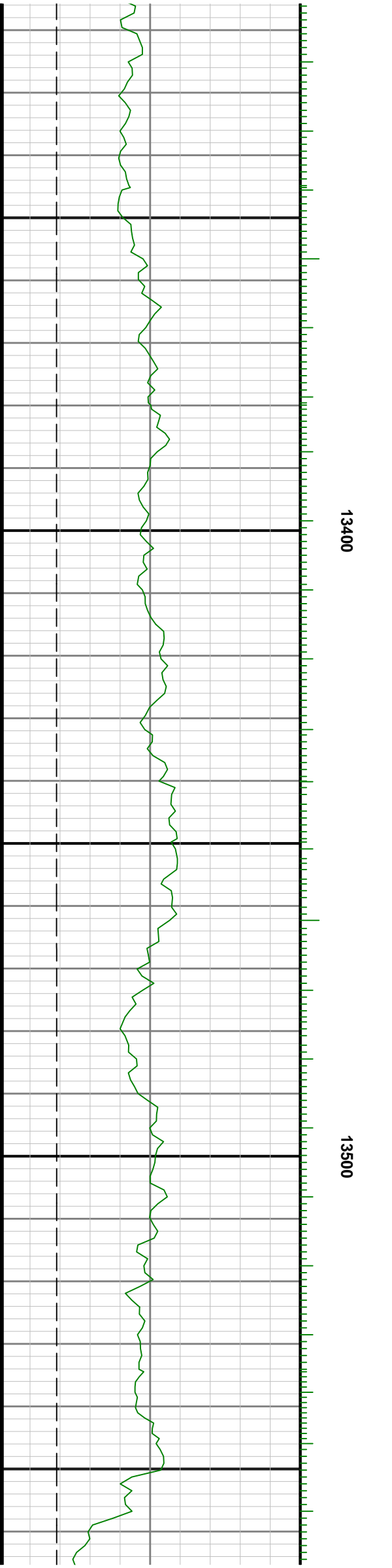
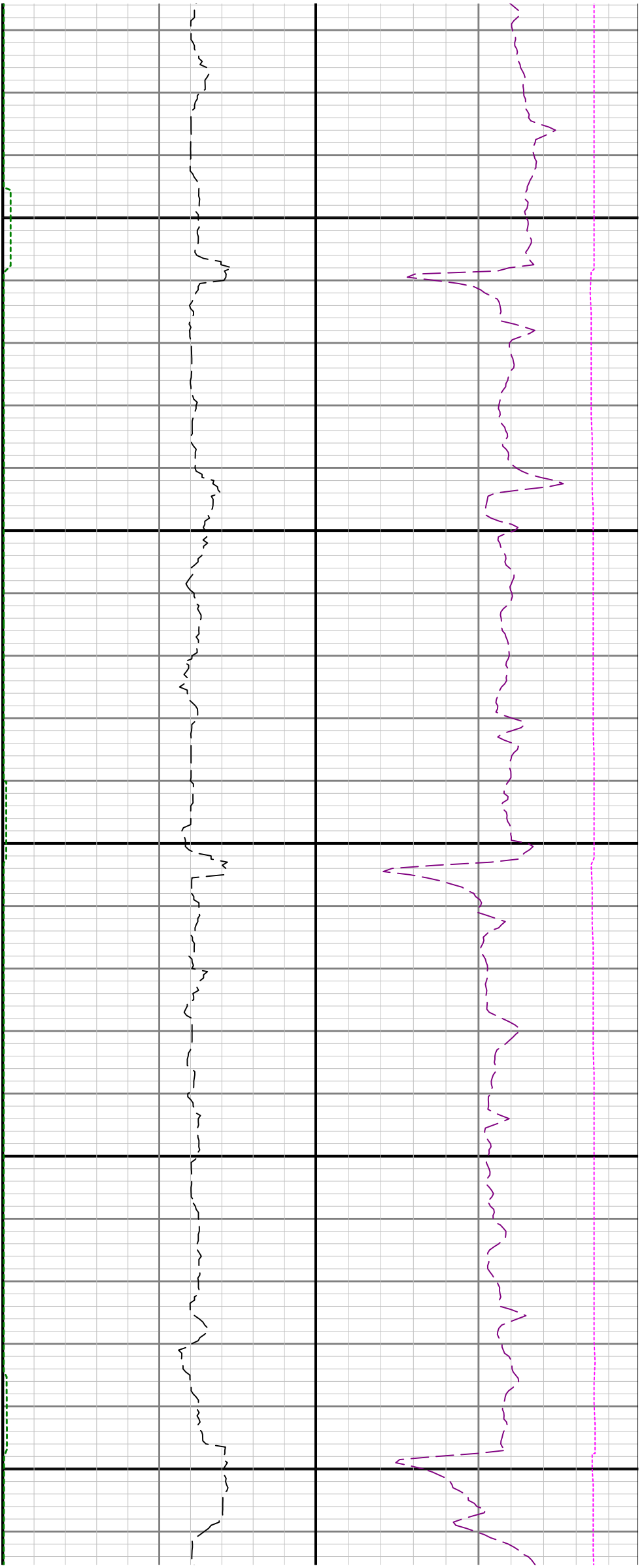
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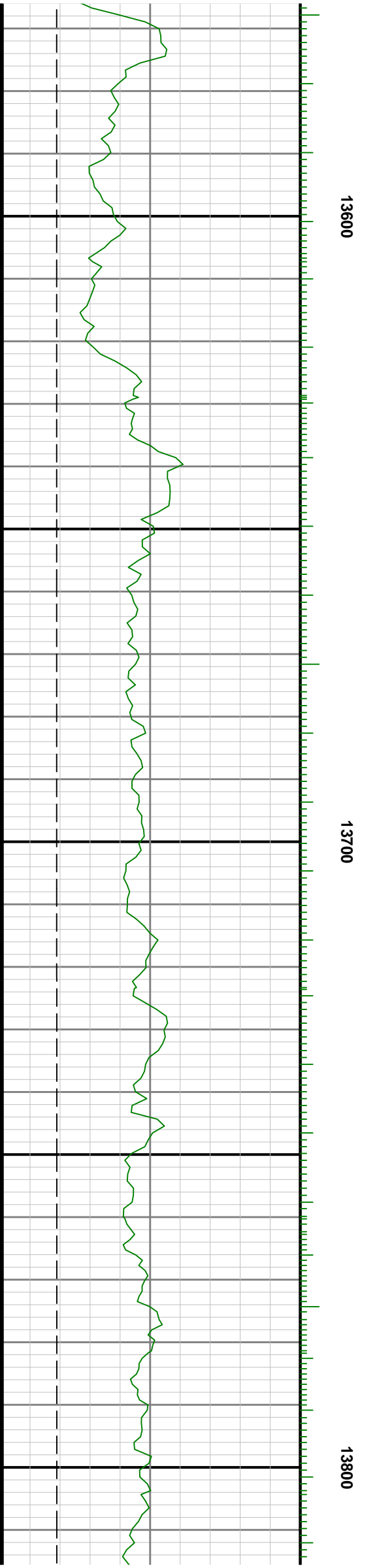
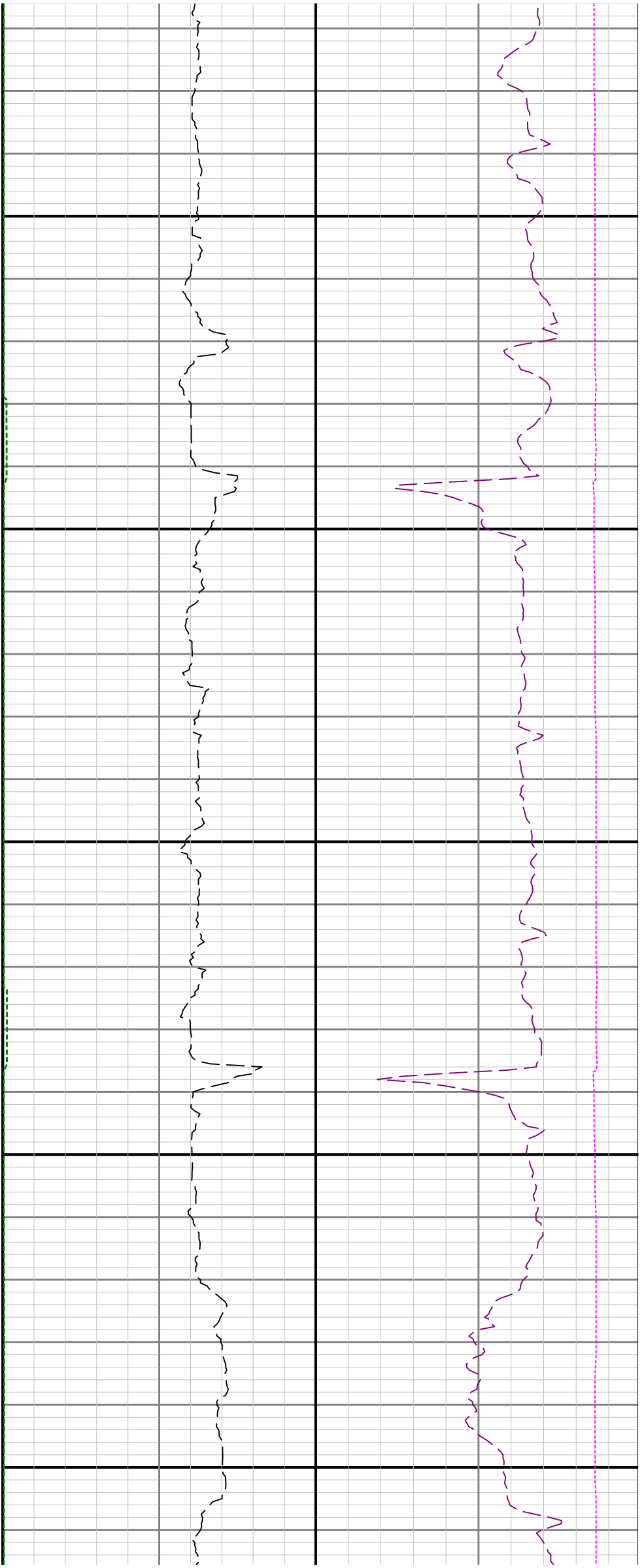


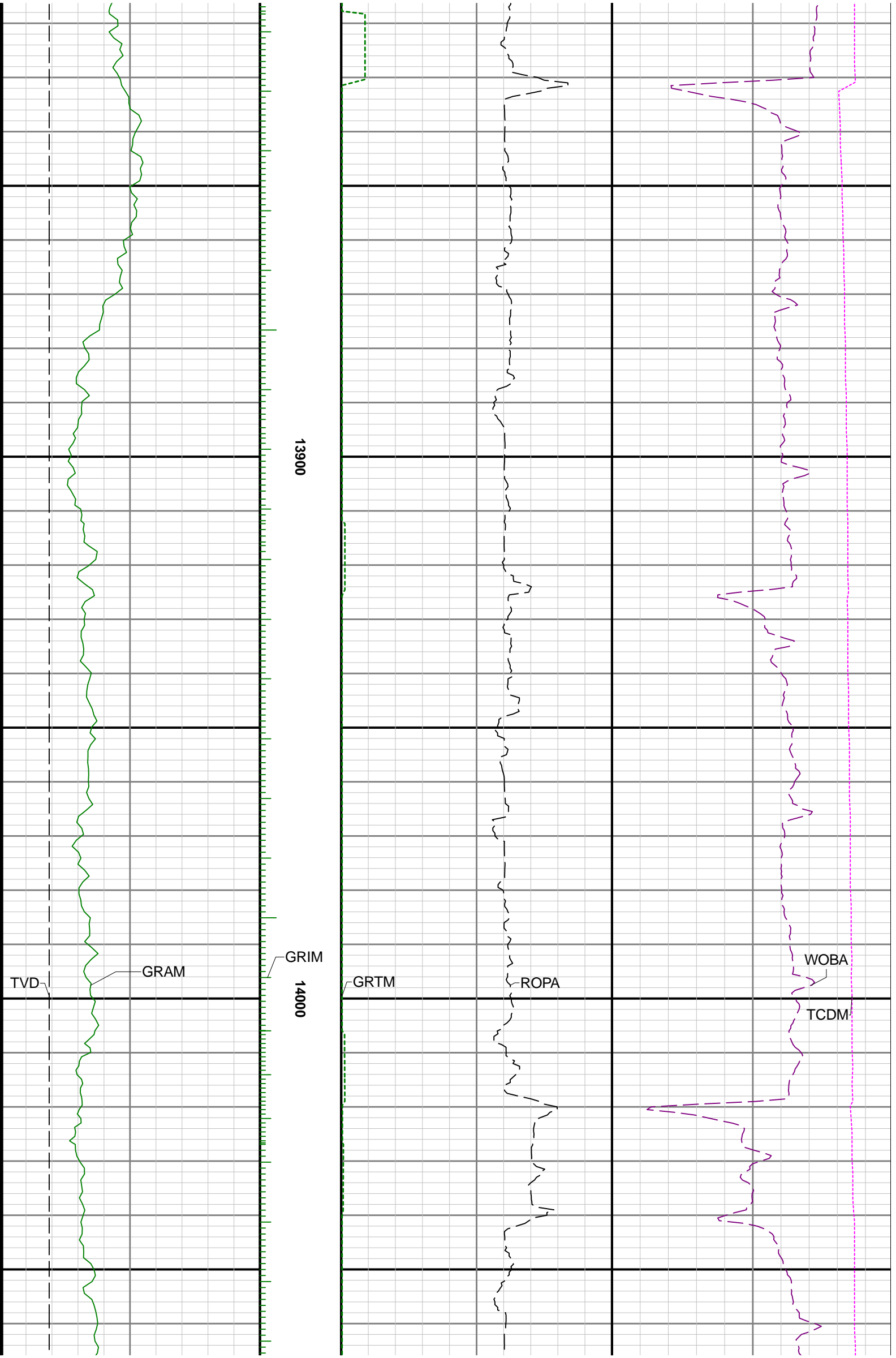


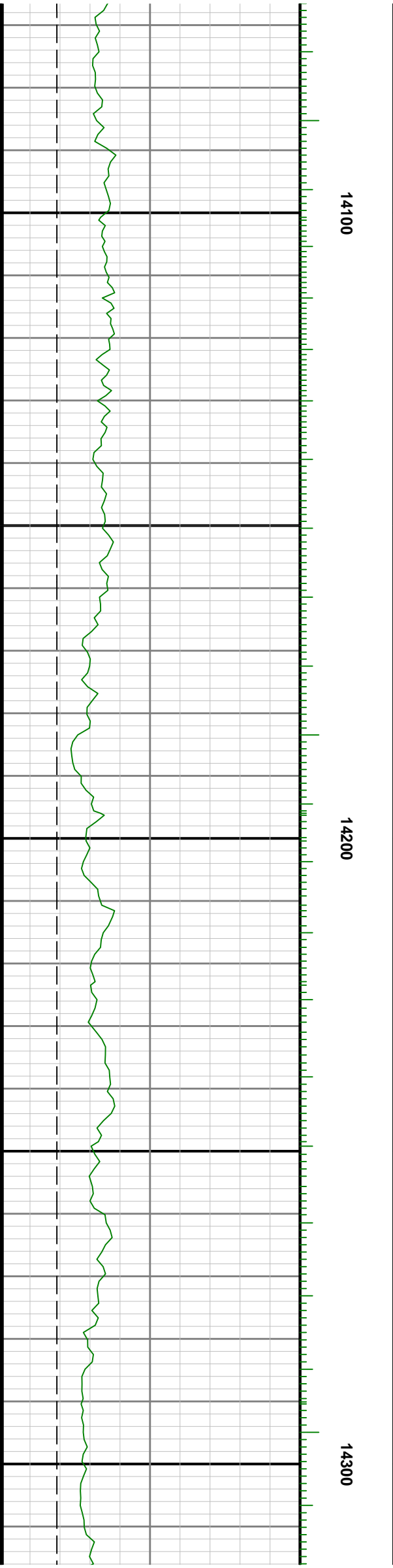
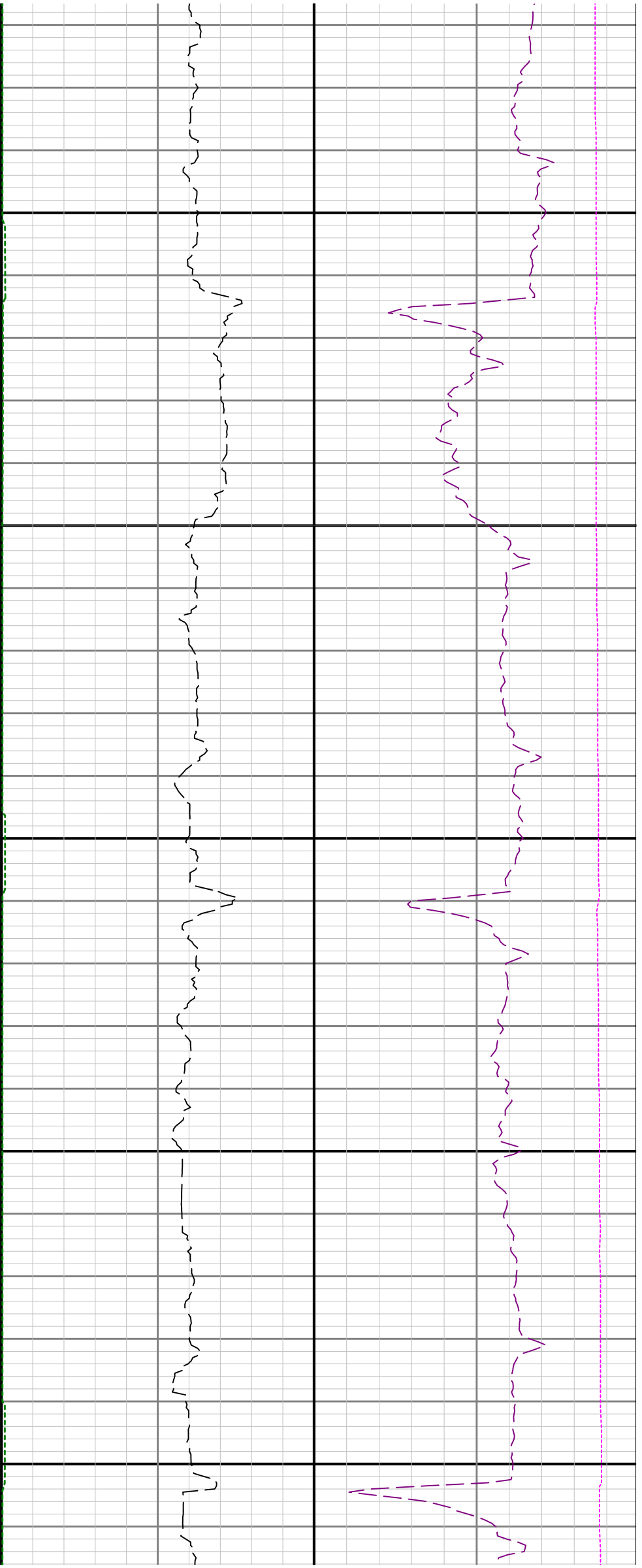


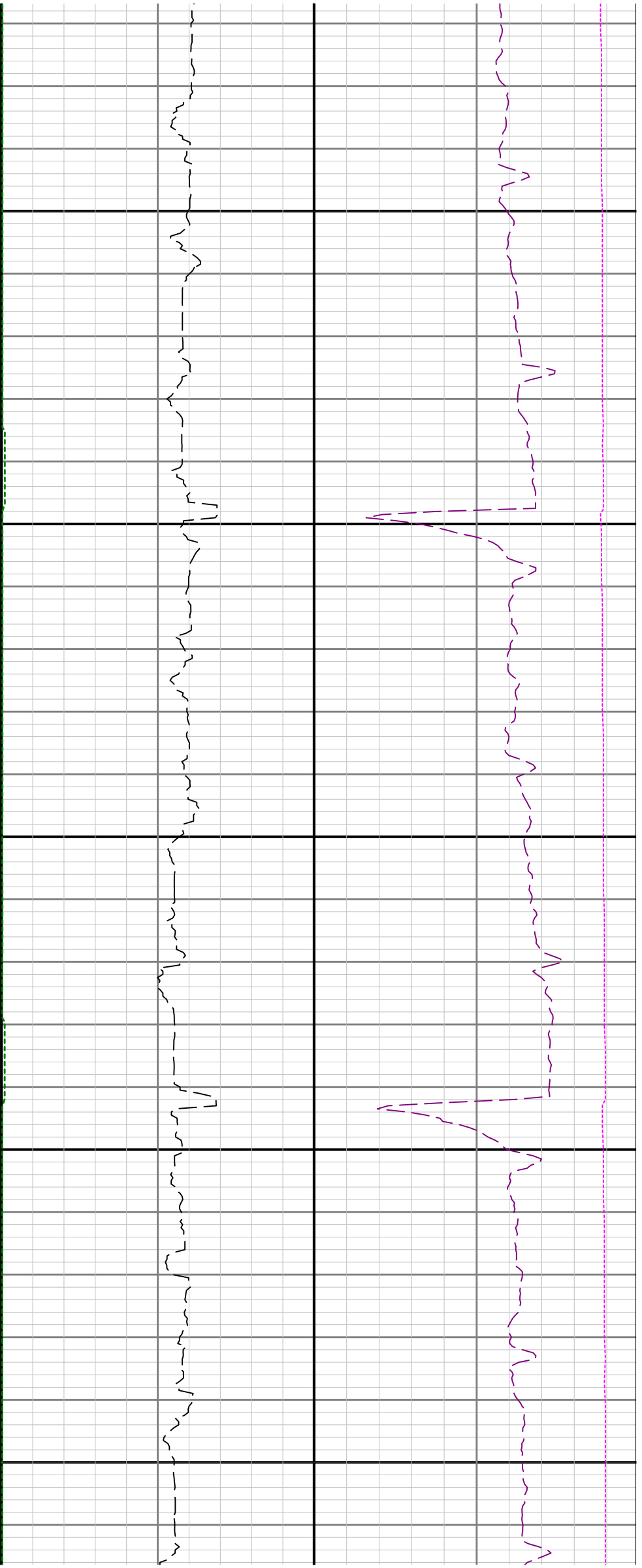






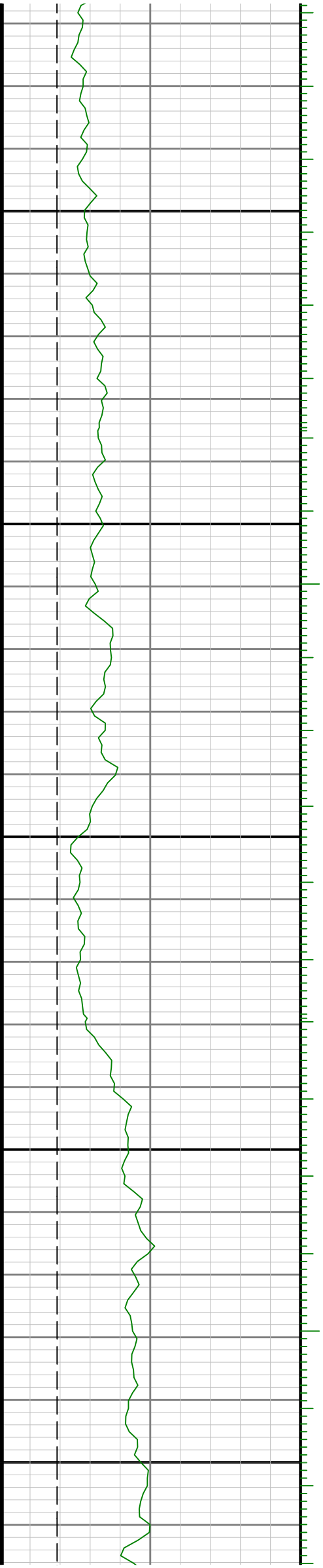


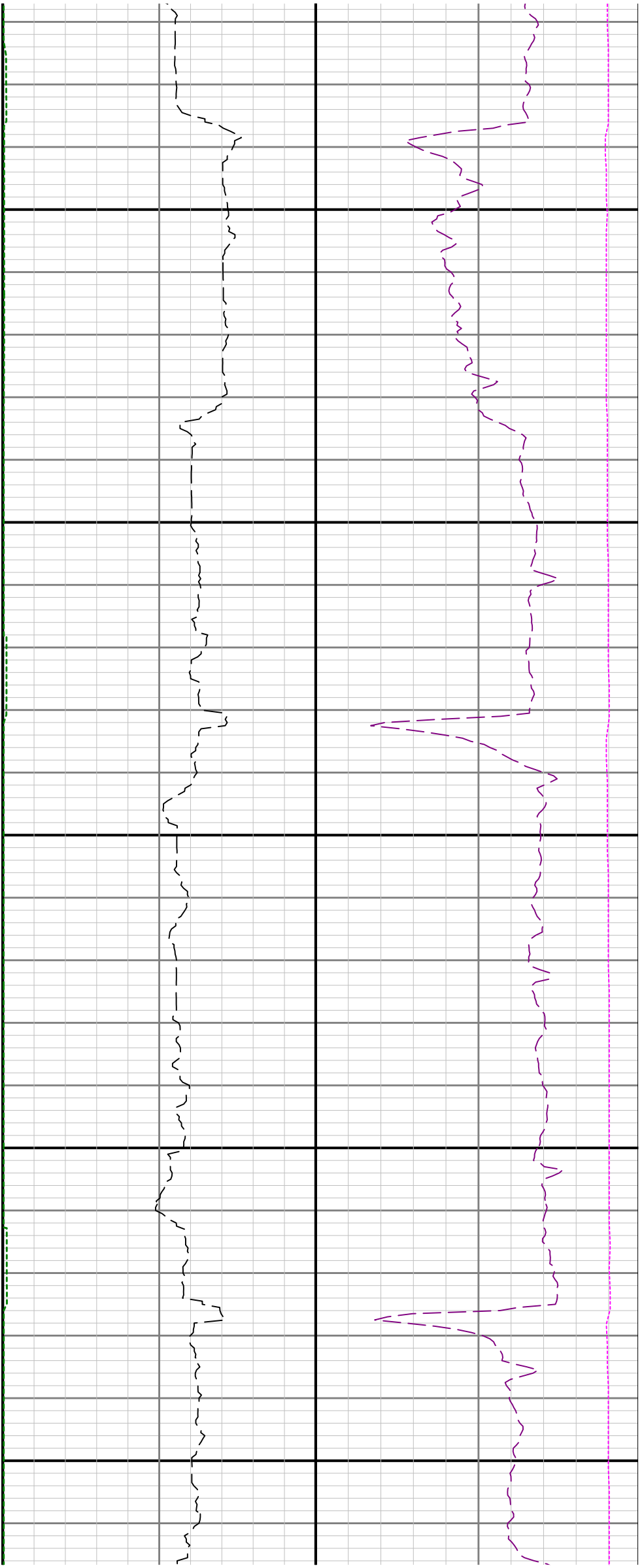




14400

14500

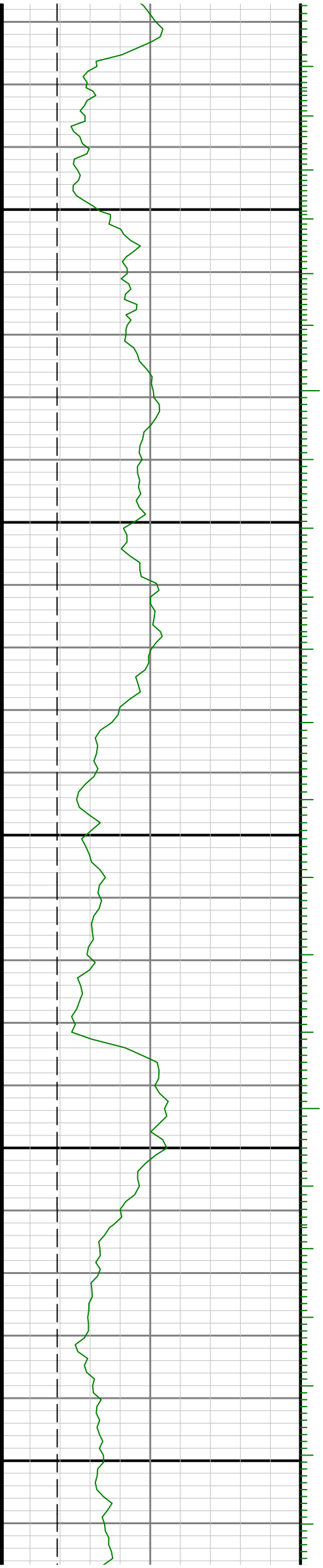


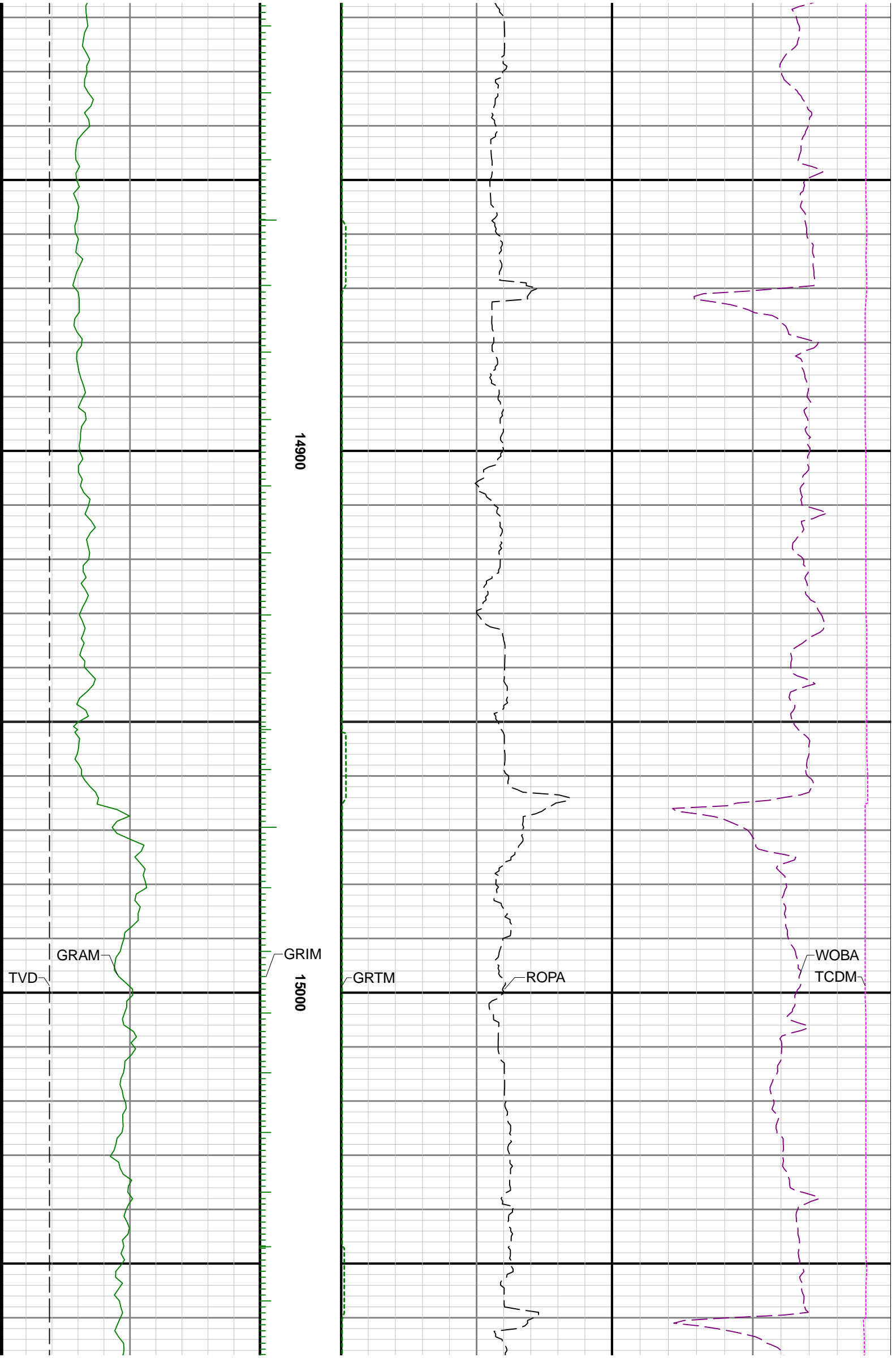


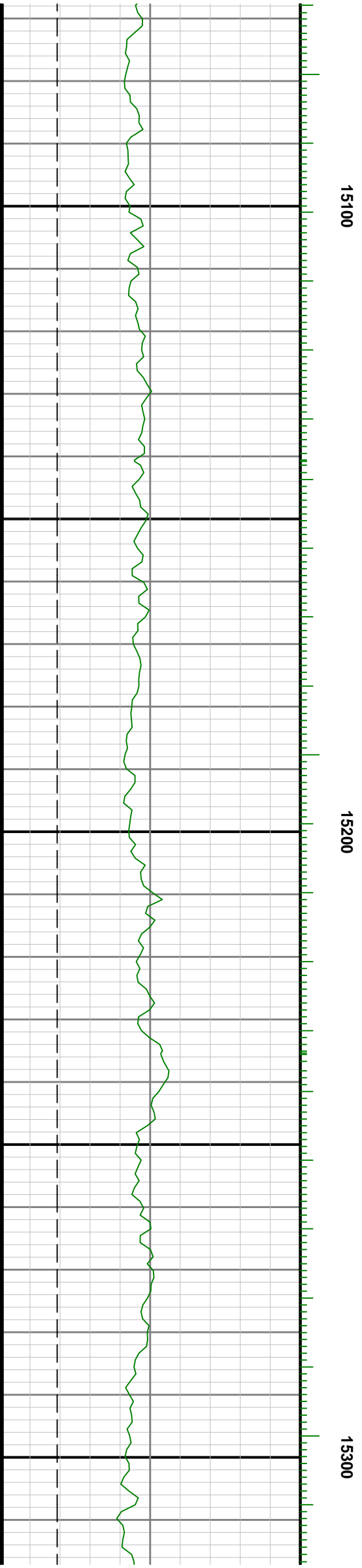
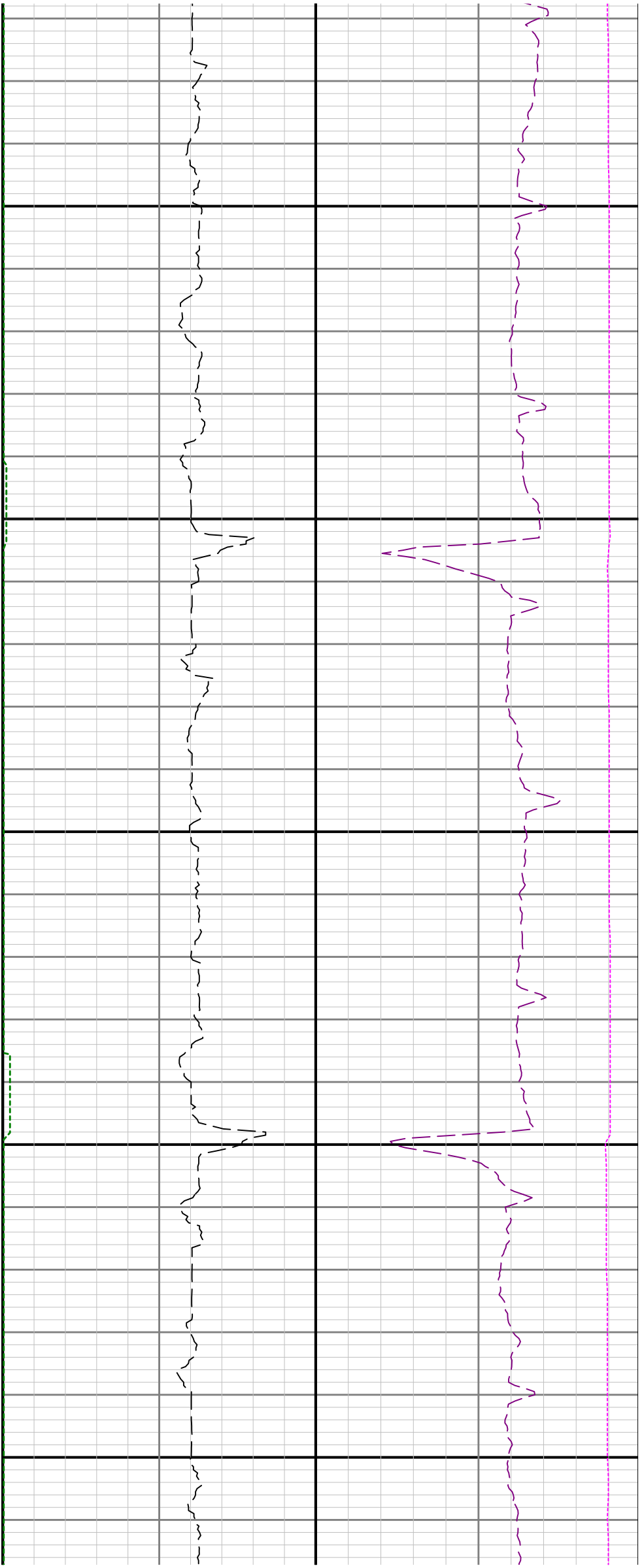
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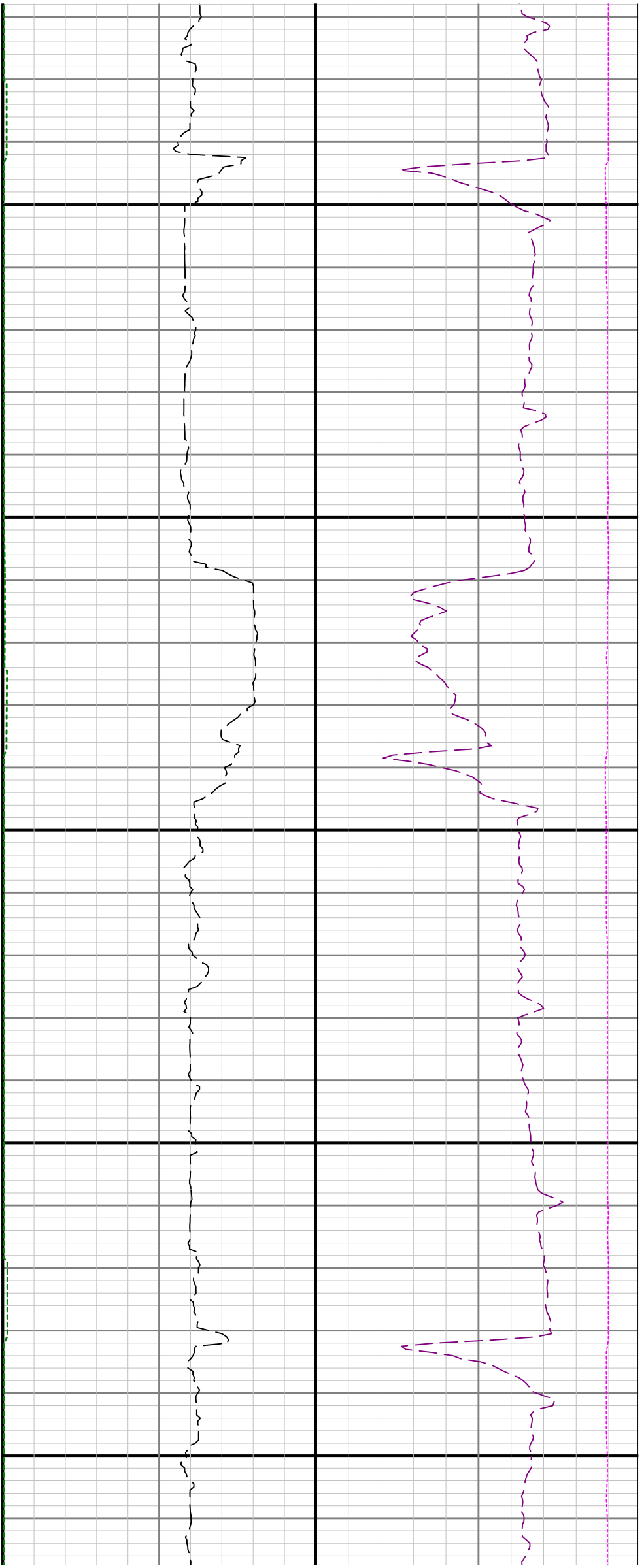
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14800



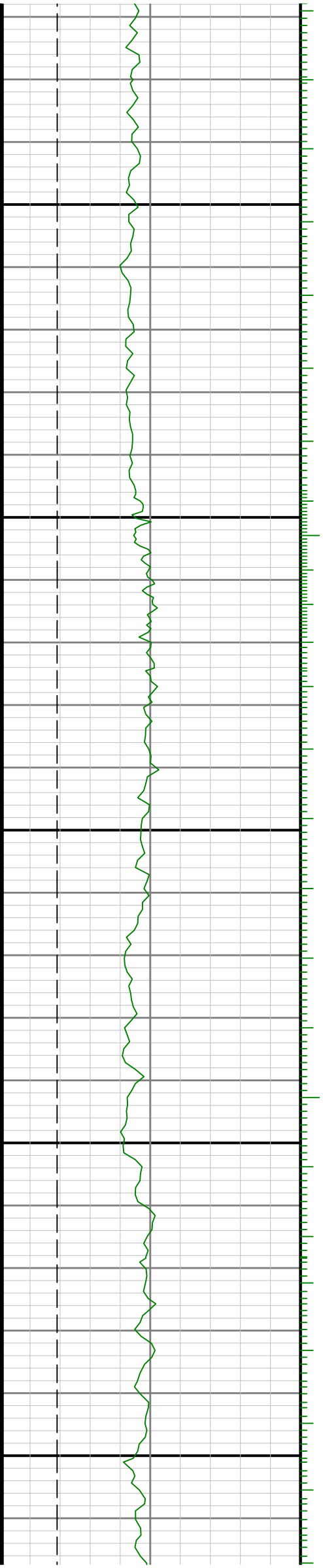




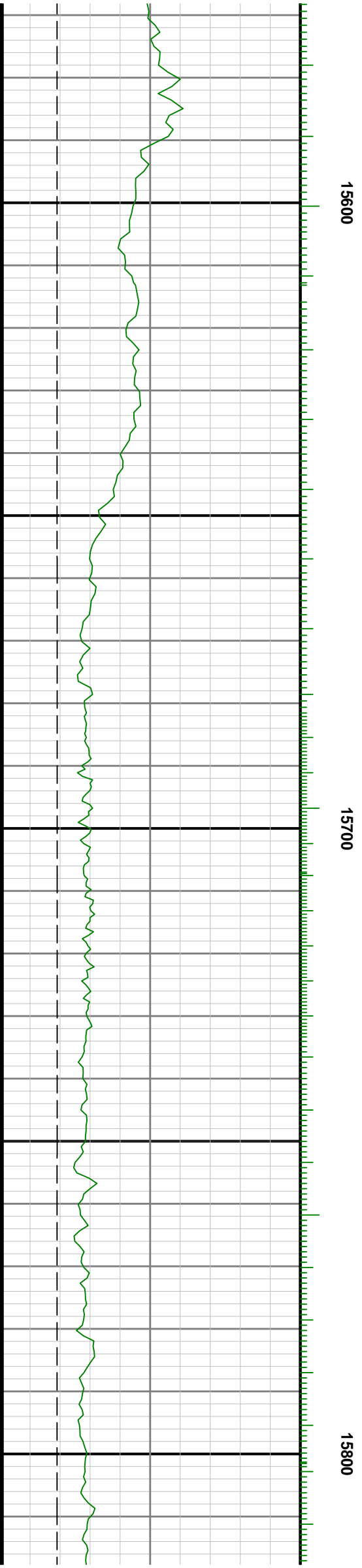
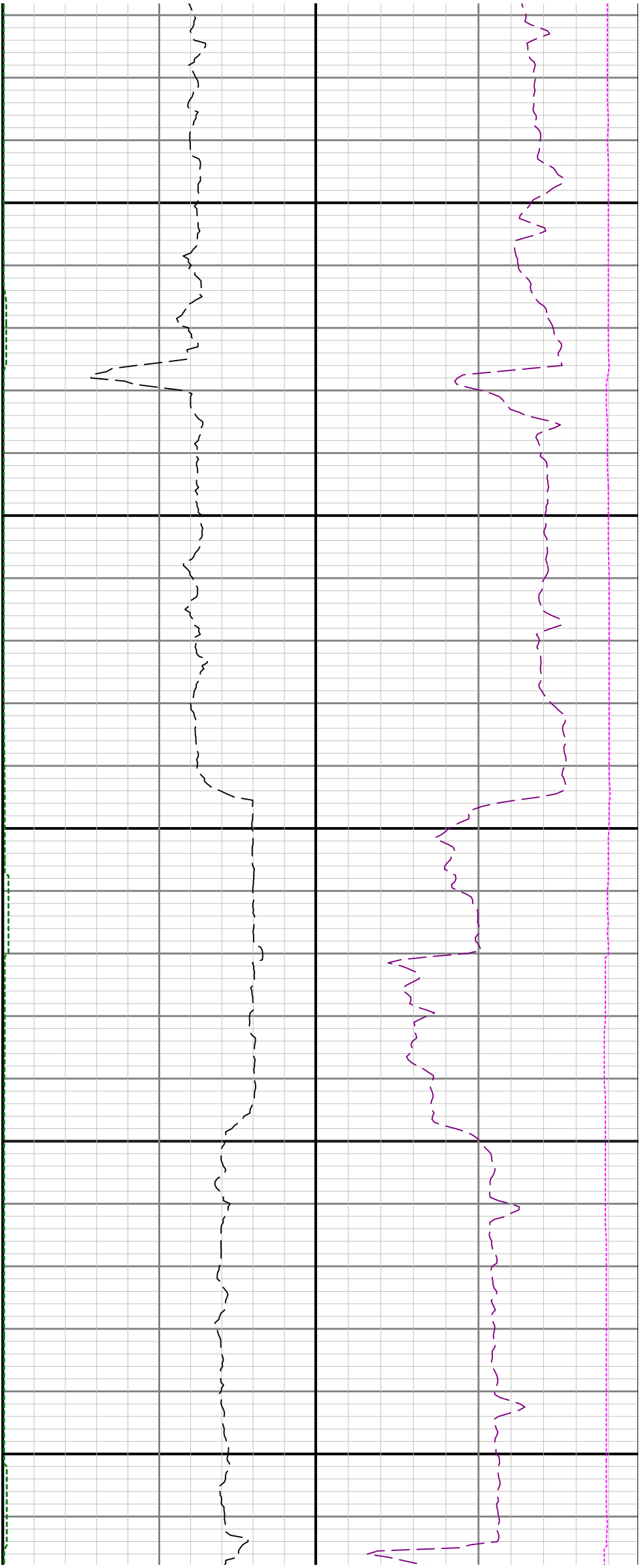


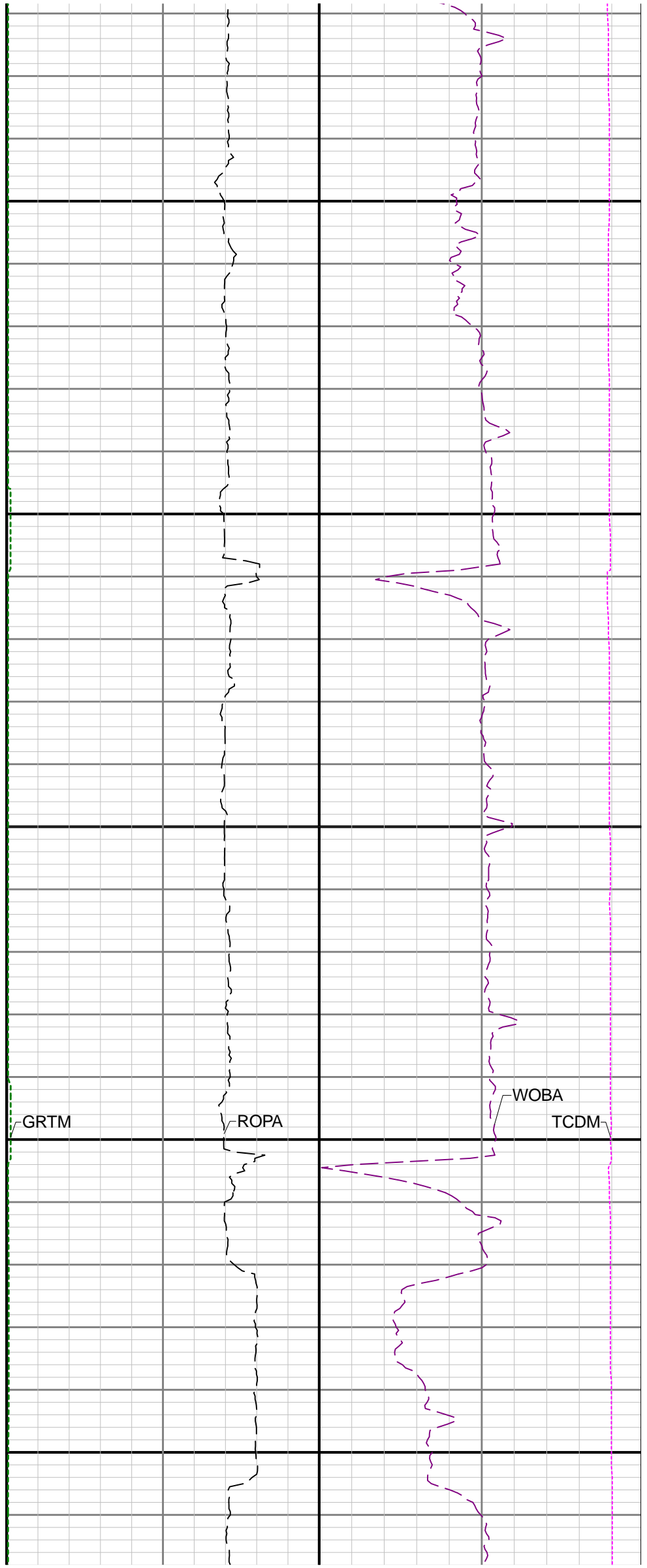
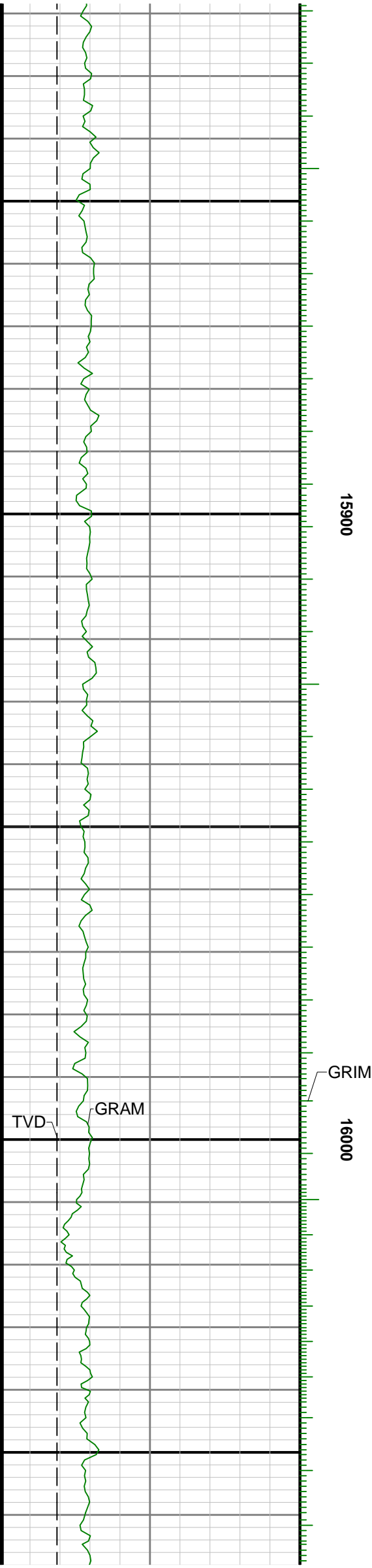
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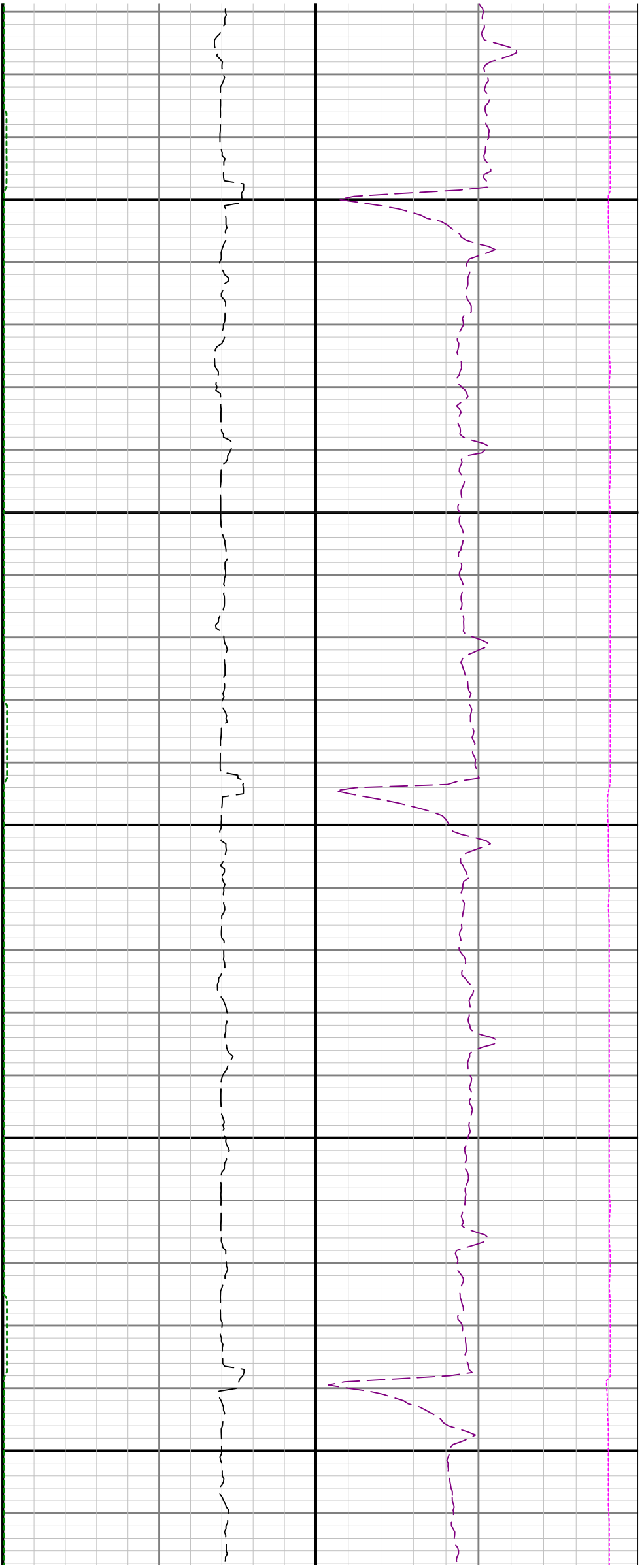
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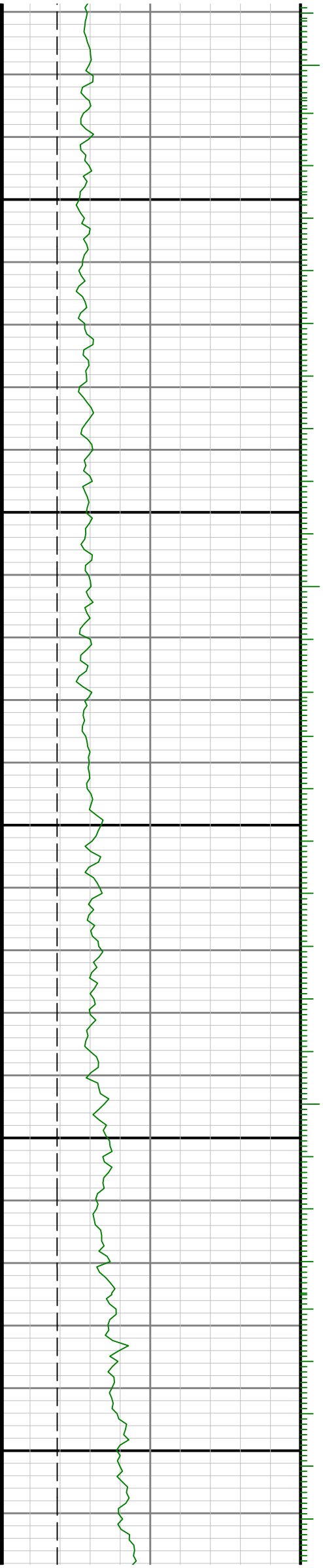


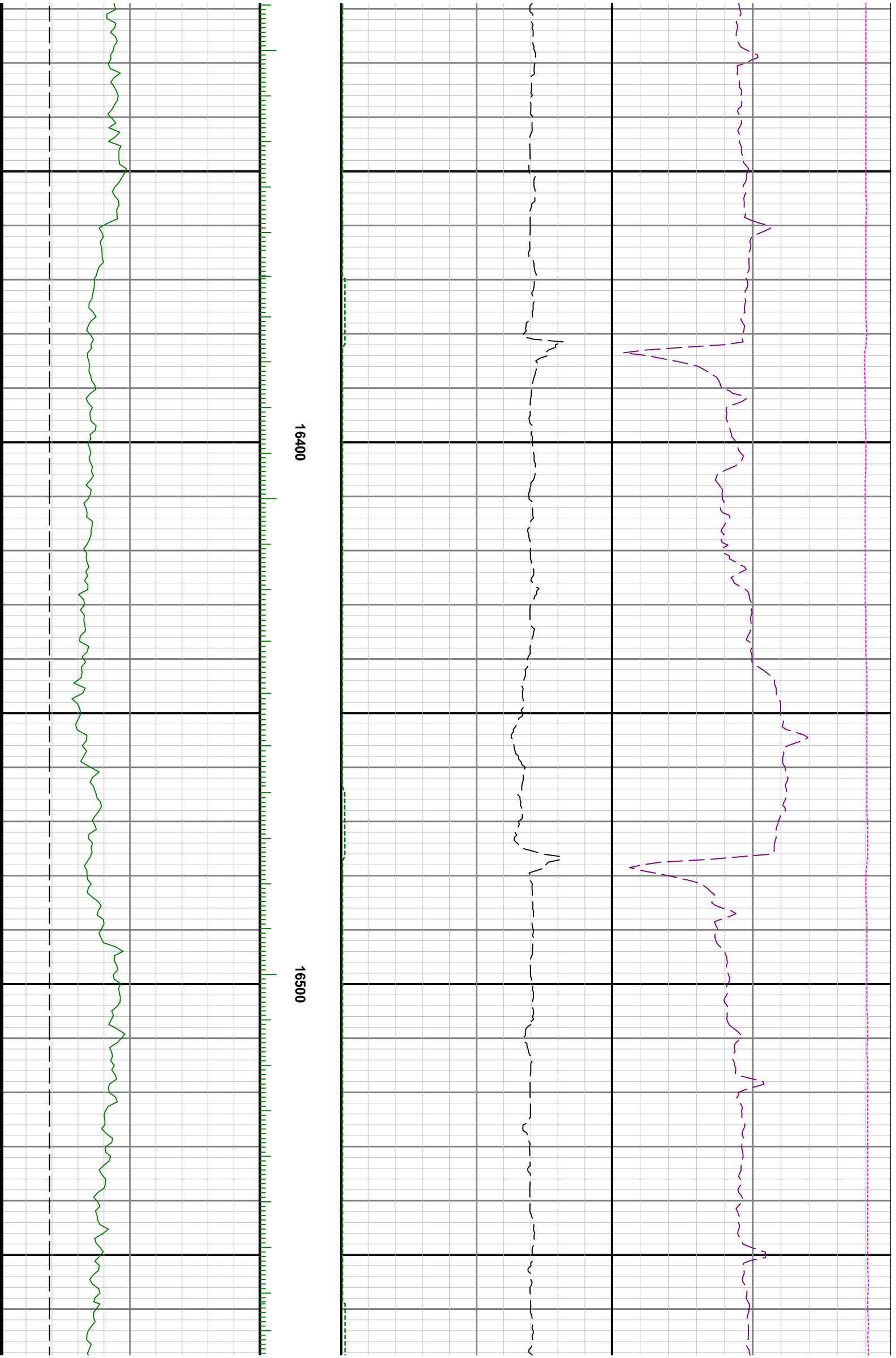


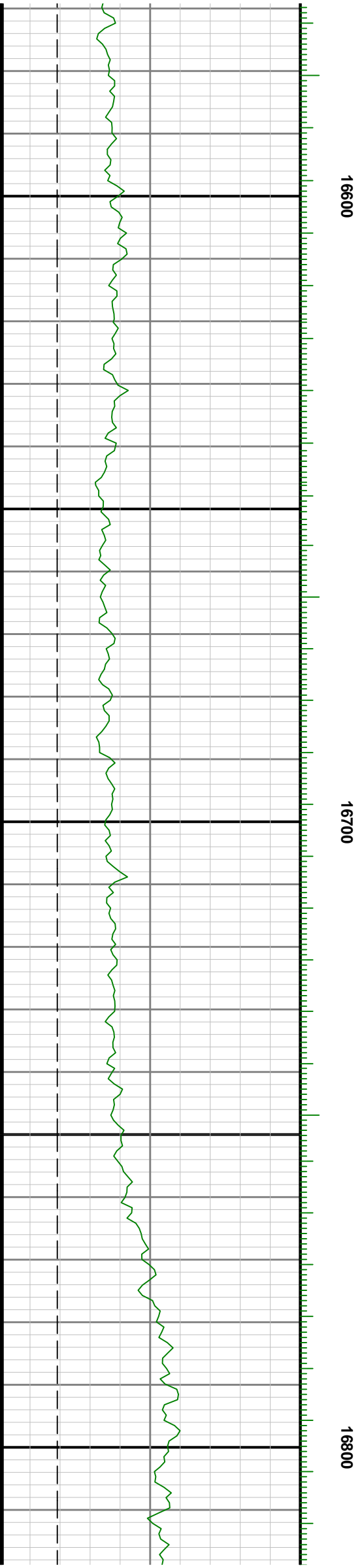
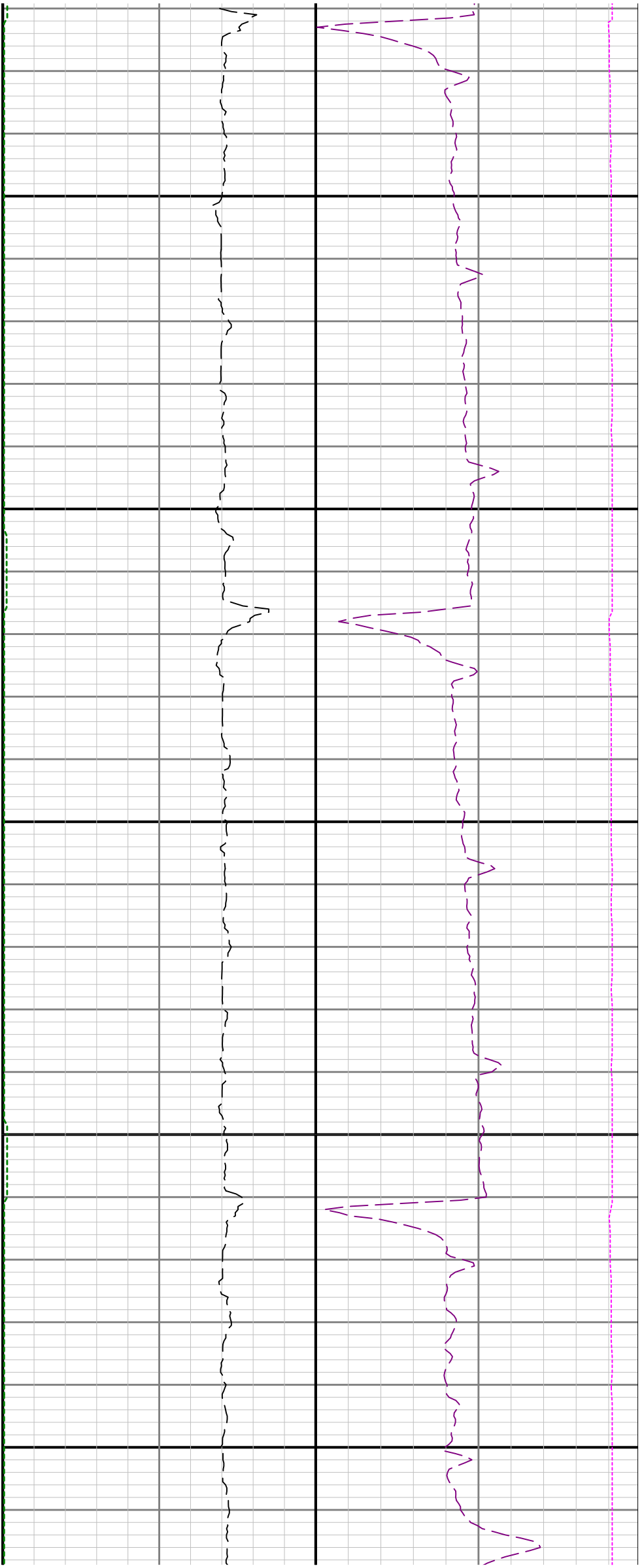
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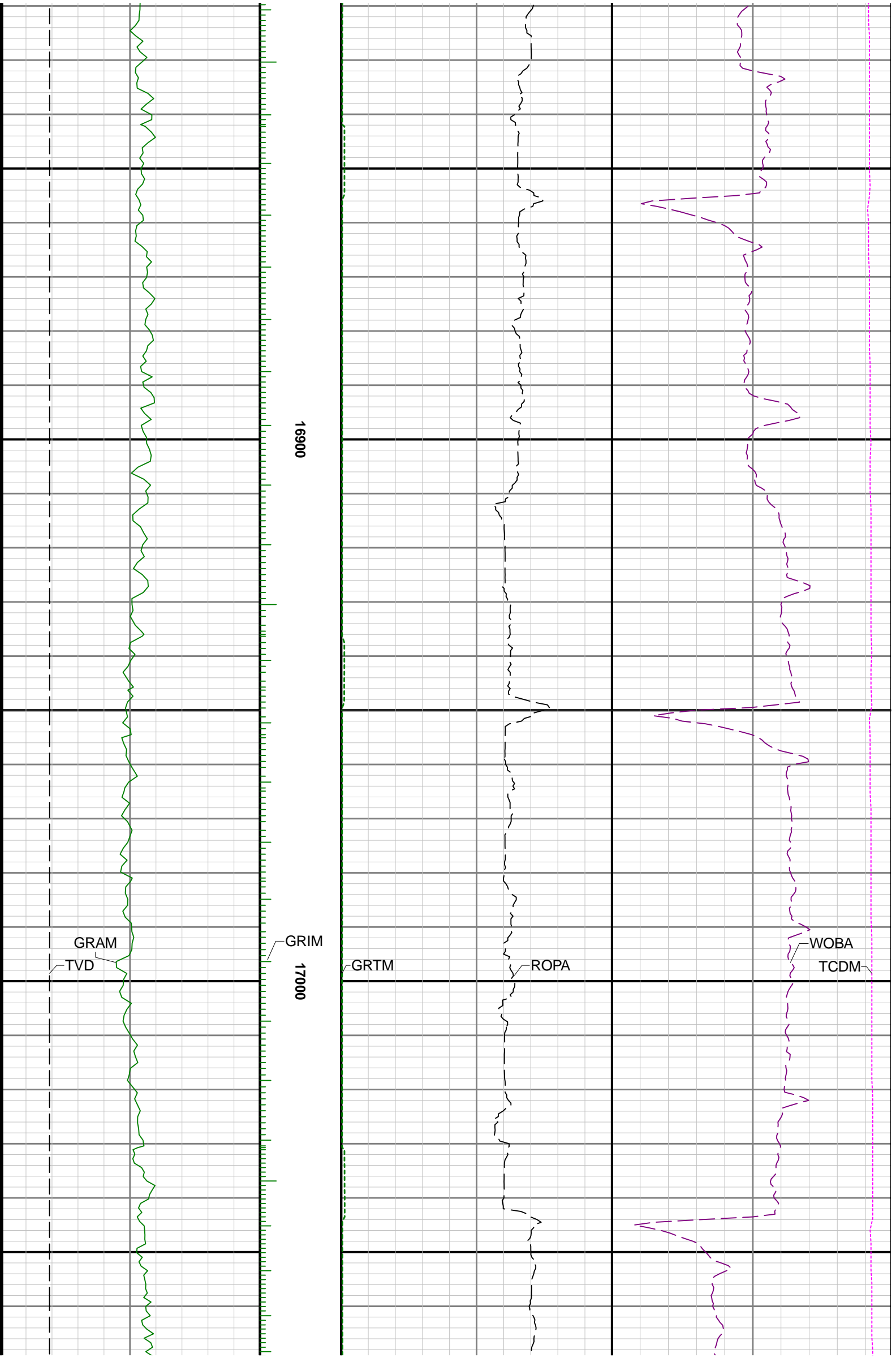
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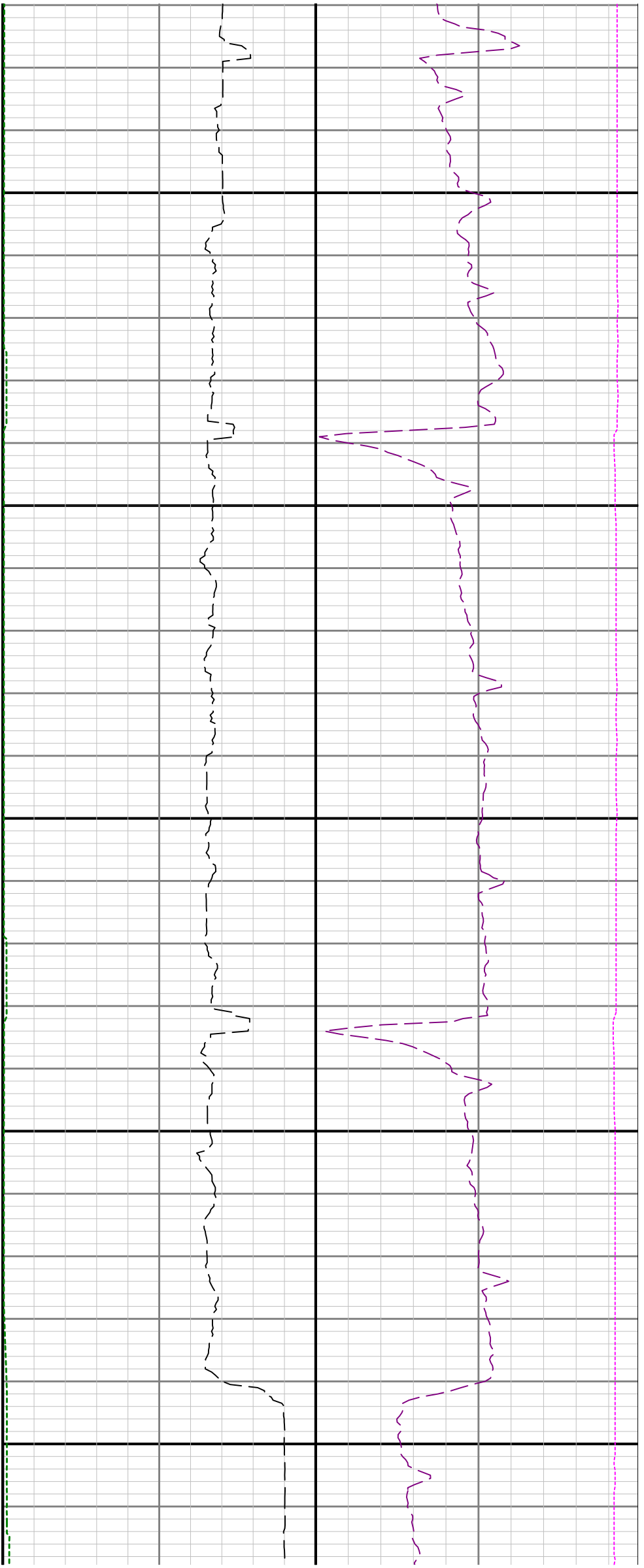
16300











17100

17200

17300

