


| LWD MEMORY LOG | | | | | | | | | |
|--|--|--|---|--|---|--|-----------------|------------------------|----------------------|
| <div>BAKER HUGHES</div> <div>a GE company</div> <div></div> | | | Gamma Ray | | | | | | |
| Scale: | | | Company: Noble Energy | | | | | | |
| 1:240 MD | | | Well: Wells Ranch State BB09-617 | | | | | | |
| Depth Reference: | | | Field: Wattenberg | | | | | | |
| Driller's Depth | | | County: Weld Country: United States | | | | | | |
| | | | State: Colorado | | | | | | |
| Status: | | | Surface Location: | | | | Other Services: | | |
| Final Print | | | Latitude: 040° 24' 32.976" N | | | | Directional | | |
| API No: 05-123-44948 | | | Longitude: 104° 24' 44.748" W | | | | | | |
| Job ID: 109418303 | | | SEC: 11 | | TWN: 5N | | RGE: 63W | | |
| Permanent Datum (P.D.): | | | Ground Level | | Elevation: | | 4676.00 ft | | Elev. KB: N/A |
| Log Measured From: | | | Rig Floor | | Above P.D. | | 30.00 ft | | Elev. DF: 4706.00 ft |
| | | | | | | | | | Elev. GL: 4676.00 ft |
| Dates | | | | | | | | | |
| Interval Drilled | | | | | Magnetic Field Reference | | | | |
| Date From: 2018-10-08 | | | Top: (ft) 1958.00 | | Azi Reference North: Grid | | | Dip Angle: (deg) 67.02 | |
| Date To: 2018-10-12 | | | Bottom: (ft) 16999.64 | | Total Magnetic Field Strength: (nT) | | | 52197 | |
| Spud Date: 2018-10-07 | | | Mag to Reference North Correction: (deg) 7.20 | | | | | | |
| Borehole Record | | | | | | | | | |
| Casing Record | | | | | | | | | |
| Hole Size (in) | | | From (ft) | | To (ft) | | Size (in) | | Weight (lb/ft) |
| 13.500 | | | 30.00 | | 1958.00 | | 9.625 | | 36.00 |
| 8.500 | | | 1958.00 | | 17000.00 | | | | |
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| | | | | | | | | | |
| Mud Record | | | | | | | | | |
| Deviation Record | | | | | | | | | |
| Type | | | From (ft) | | To (ft) | | Hole Size (in) | | Interval (ft) |
| Oil Based Mud | | | 1958.00 | | 17000.00 | | 8.500 | | 15042.00 |
| | | | | | | | | | 0.42 86.49 |
| | | | | | | | | | 92.15 272.05 |
| | | | | | | | | | |
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| | | | | | | | | | |
| Acquisition System | | | | | | | | | |
| Software Version | | | Other | | | | | | |
| Baker Hughes Cadence | | | RT 4.2 | | Rig: H&P 321 | | | | |
| DeliverableGen | | | 1.0.8107.2 | | Contractor: Helmerich & Payne Drilling Co | | | | |
| | | | | | District: RMD Unit: D&E | | | | |

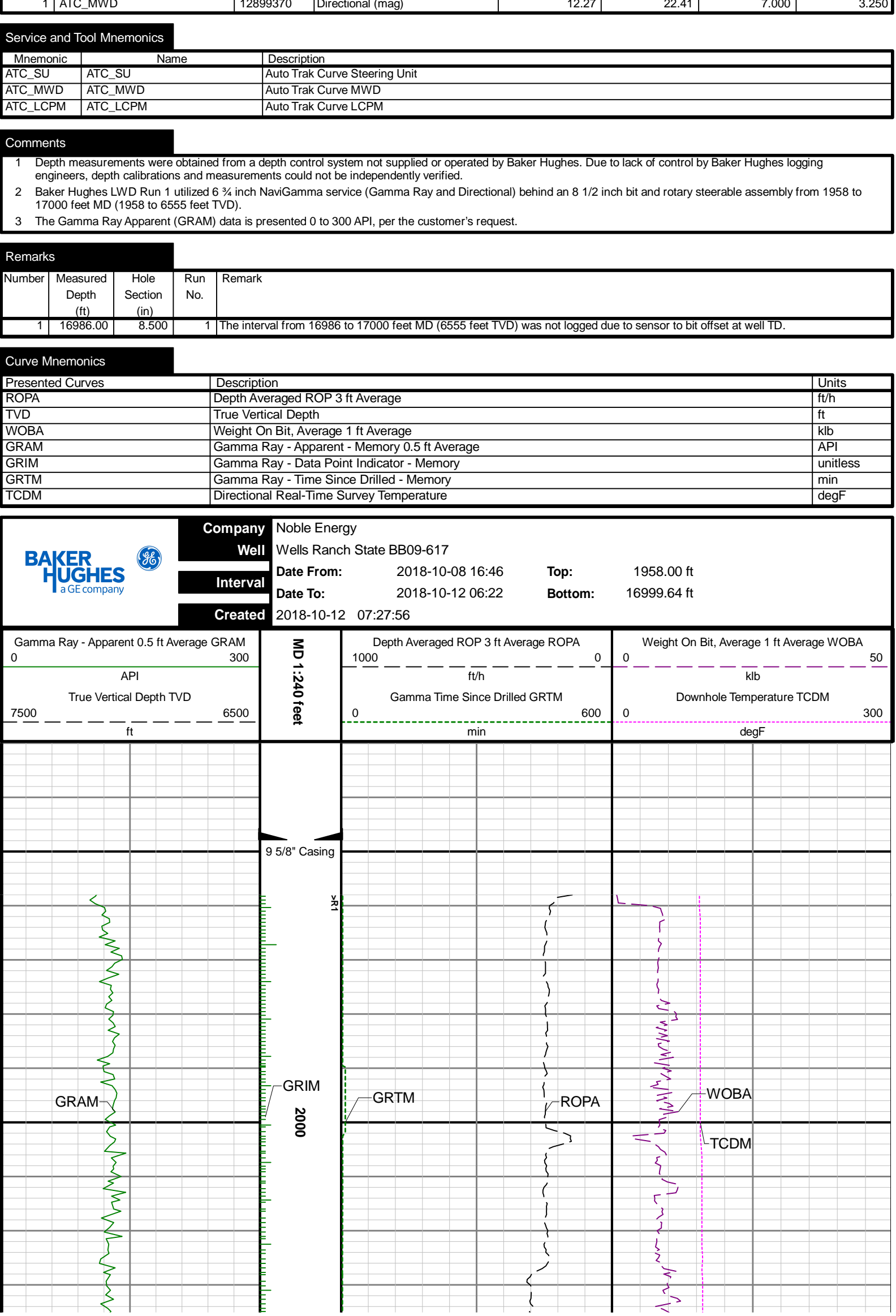
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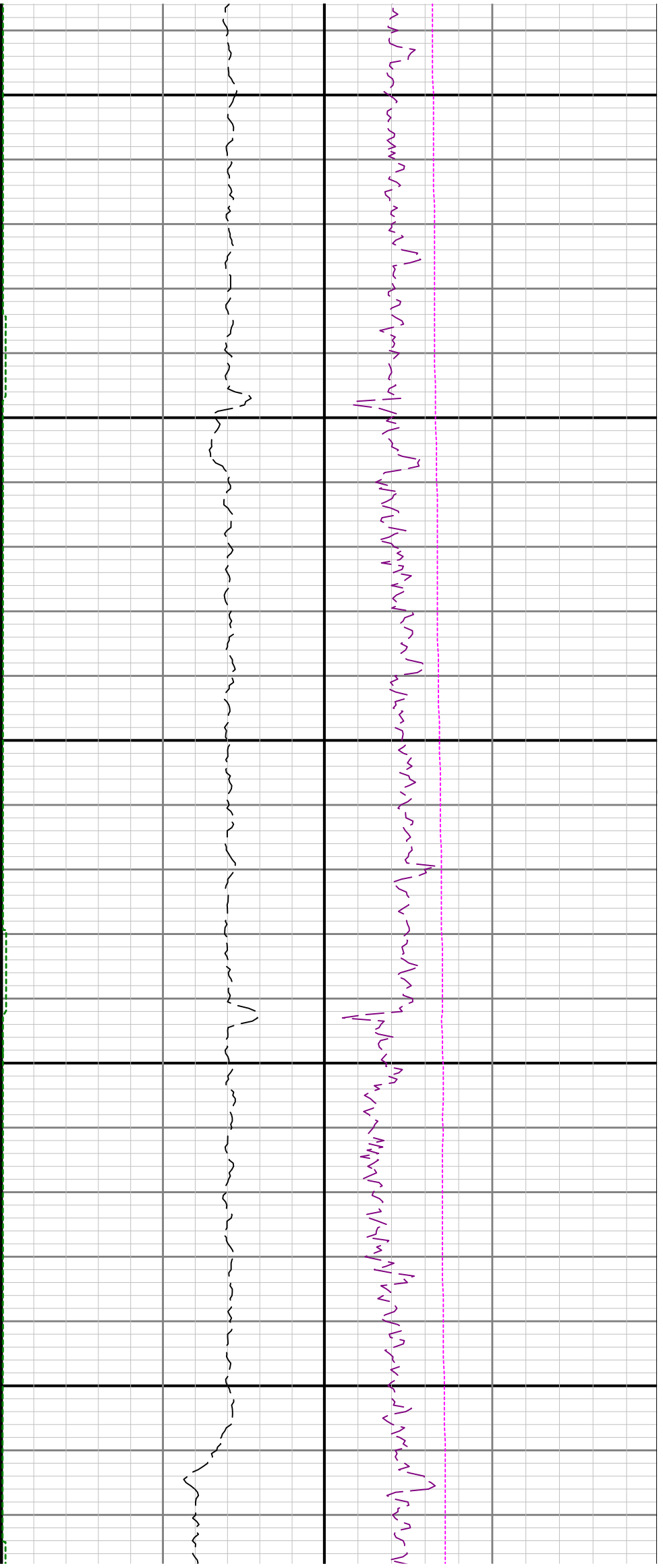
| Log Run Summary | | | | | | | | | | | | |
|-----------------|-------------|---------------|----------|-----------------------|----------------|-----------------|-------------|--------------------|----------|------------------|------------------|-----------------|
| Run No | Bit Run No. | Bit Size (in) | Bit Type | Bit Gauge Length (in) | Assembly Type | Logged Interval | | Bit Depth Interval | | Date / Time | | Circ. Hours (h) |
| | | | | | | Top (ft) | Bottom (ft) | From (ft) | To (ft) | Start Logging | End Logging | |
| 1 | 1 | 8.500 | PDC | 3.50 | AutoTrak Curve | 1958.00 | 16986.00 | 1958.00 | 17000.00 | 2018-10-08 19:14 | 2018-10-11 18:06 | 63.71 |

| Crew | | | | | | | | | |
|----------|--|-----------------|-----------------|------|--|-----------------|-----------------|------|--|
| Name | | Arrive Wellsite | Depart Wellsite | Name | | Arrive Wellsite | Depart Wellsite | Name | |
| Tien Bui | | 2018-10-07 | 2018-10-12 | | | | | | |

| Mud Properties Record | | | | | | | | | | | |
|-----------------------|---------|---------------------|---------------|---------------|----------------|-----|------------------|-------------|------------|-----------------------|--------|
| Date / Time | Run No. | Measured Depth (ft) | Mud Type | Density (ppg) | Viscosity (cP) | pH | Fluid Loss (cm3) | Oil / Water | Source | Total Chlorides (ppm) | K+ (%) |
| 2018-10-08 12:49 | 1 | 1958.00 | Oil Based Mud | 9.3 | 11 | N/A | 10.0 | 81/19 | Active Pit | 25000 | 0.00 |
| 2018-10-09 09:04 | 1 | 5515.00 | Oil Based Mud | 9.3 | 9 | N/A | 18.1 | 83.4/16.6 | Active Pit | 26000 | 0.00 |
| 2018-10-10 08:41 | 1 | 10227.00 | Oil Based Mud | 9.6 | 10 | N/A | 18.3 | 84.3/15.7 | Active Pit | 25500 | 0.00 |
| 2018-10-11 09:04 | 1 | 15104.00 | Oil Based Mud | 9.8 | 16 | N/A | 21.4 | 84.2/15.8 | Active Pit | 24000 | 0.00 |

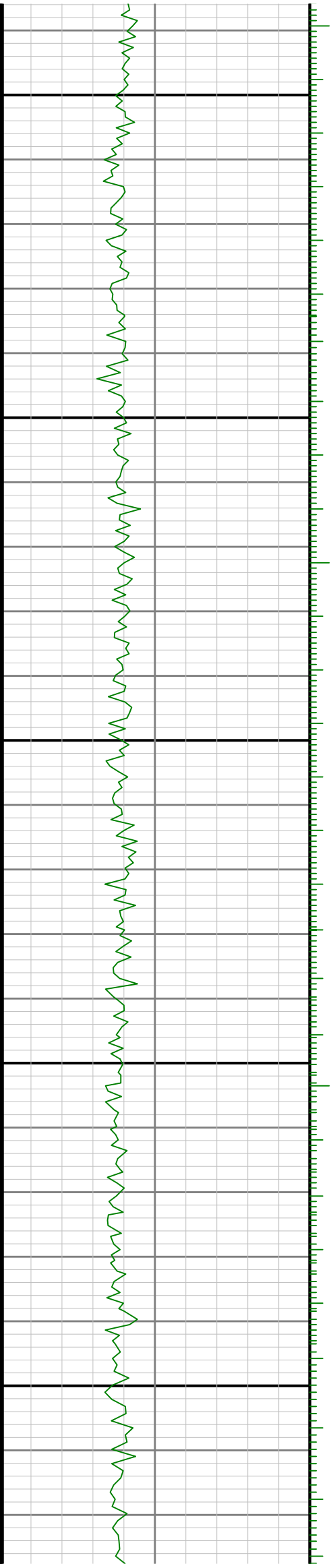
| Equipment and Service Data | | | | | | | |
|----------------------------|---------|--|---------------|----------------------|--------------------|-----------------|---------------|
| Run No. | Tool | | Serial Number | Measurement | Sensor Offset (ft) | Bit Offset (ft) | Max O.D. (in) |
| 1 | ATC_SU | | 14169950 | Near Bit Inclination | 5.93 | 6.72 | 7.000 |
| 1 | ATC_SU | | 14169950 | Near Bit VSS | 5.93 | 6.72 | 7.000 |
| 1 | ATC_MWD | | 12899370 | Gamma (single) | 2.75 | 12.89 | 7.000 |
| 1 | ATC_MWD | | 12899370 | Directional (mag) | 12.37 | 22.44 | 7.000 |

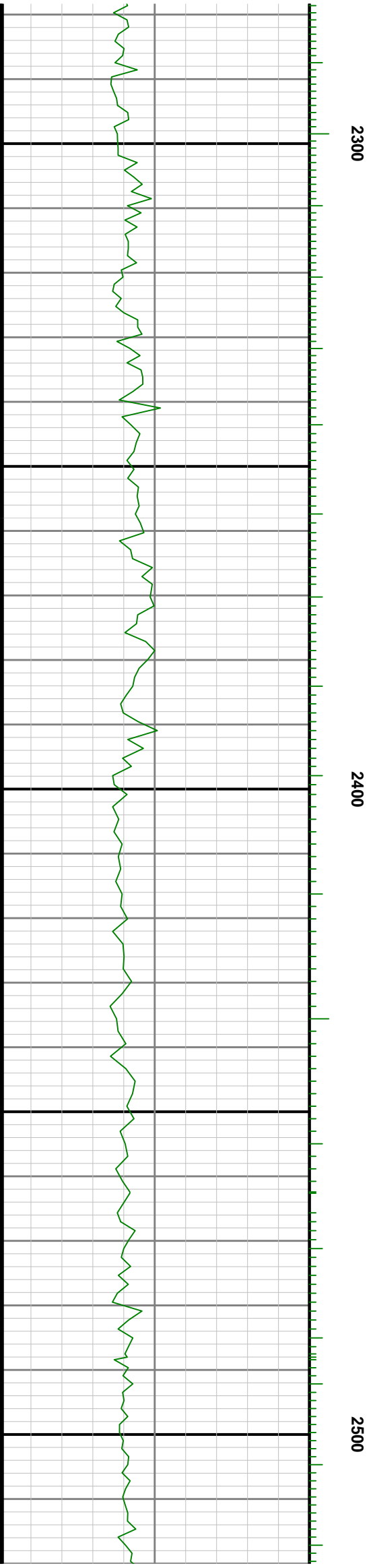
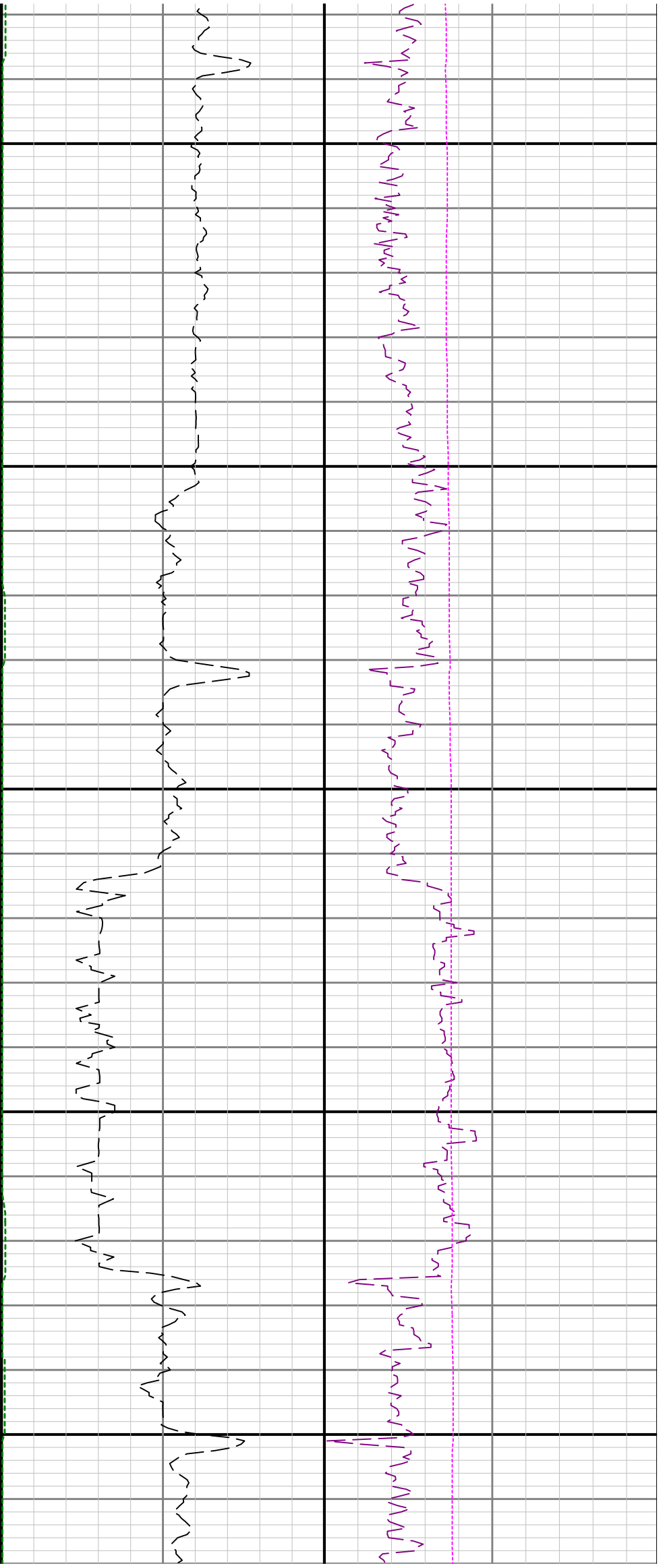


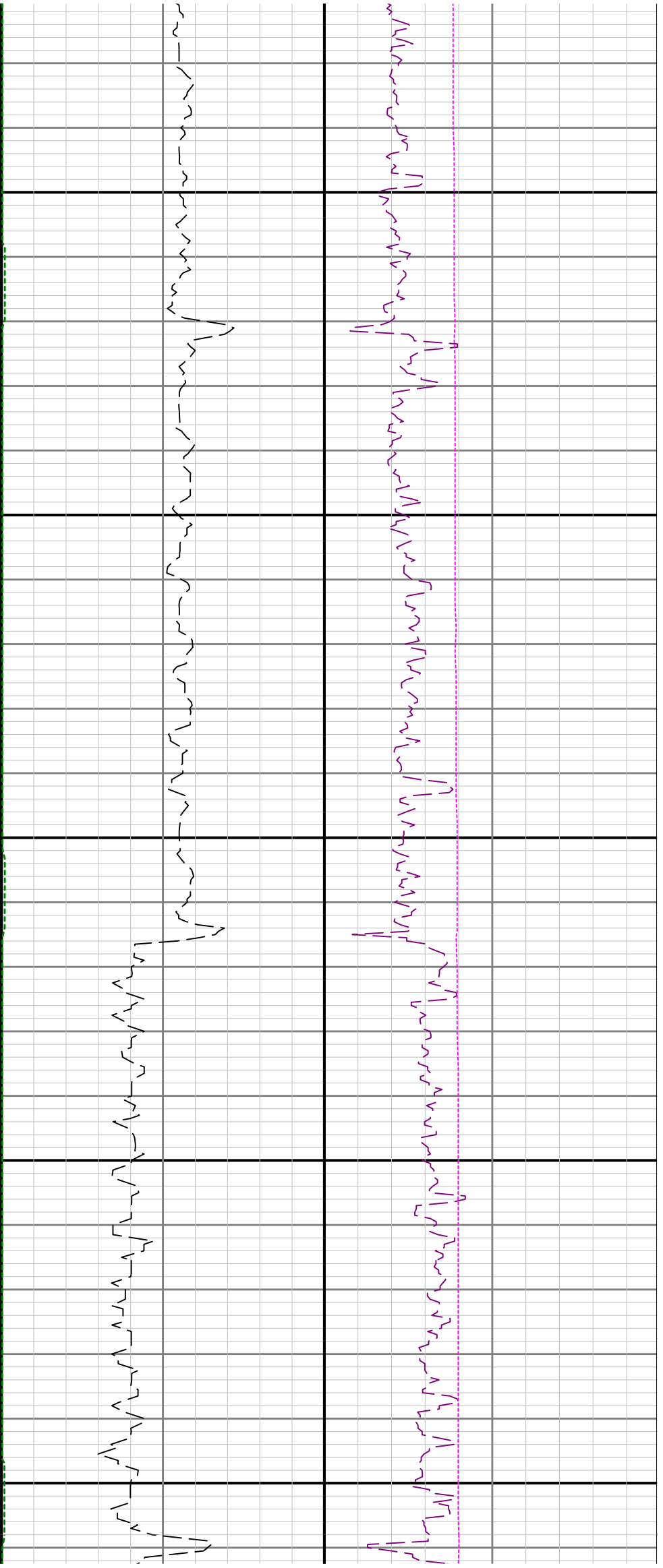


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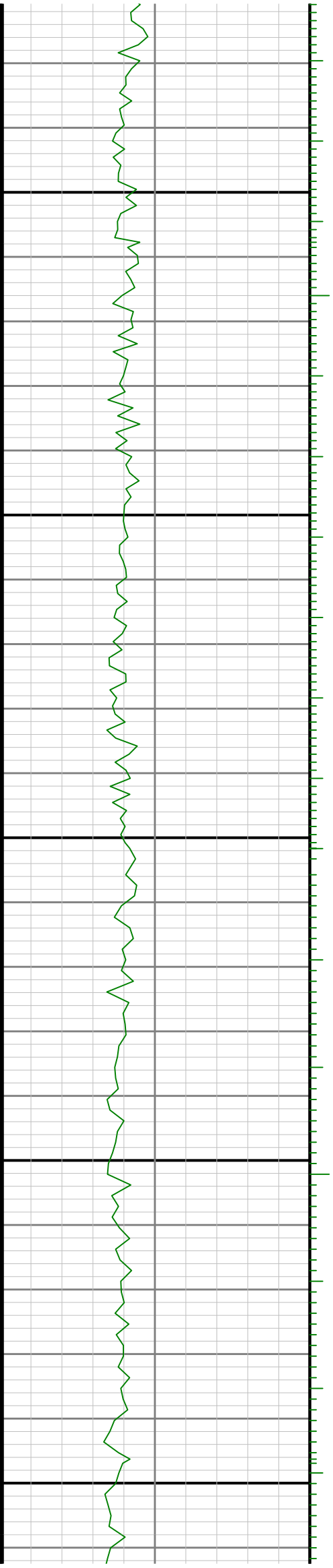


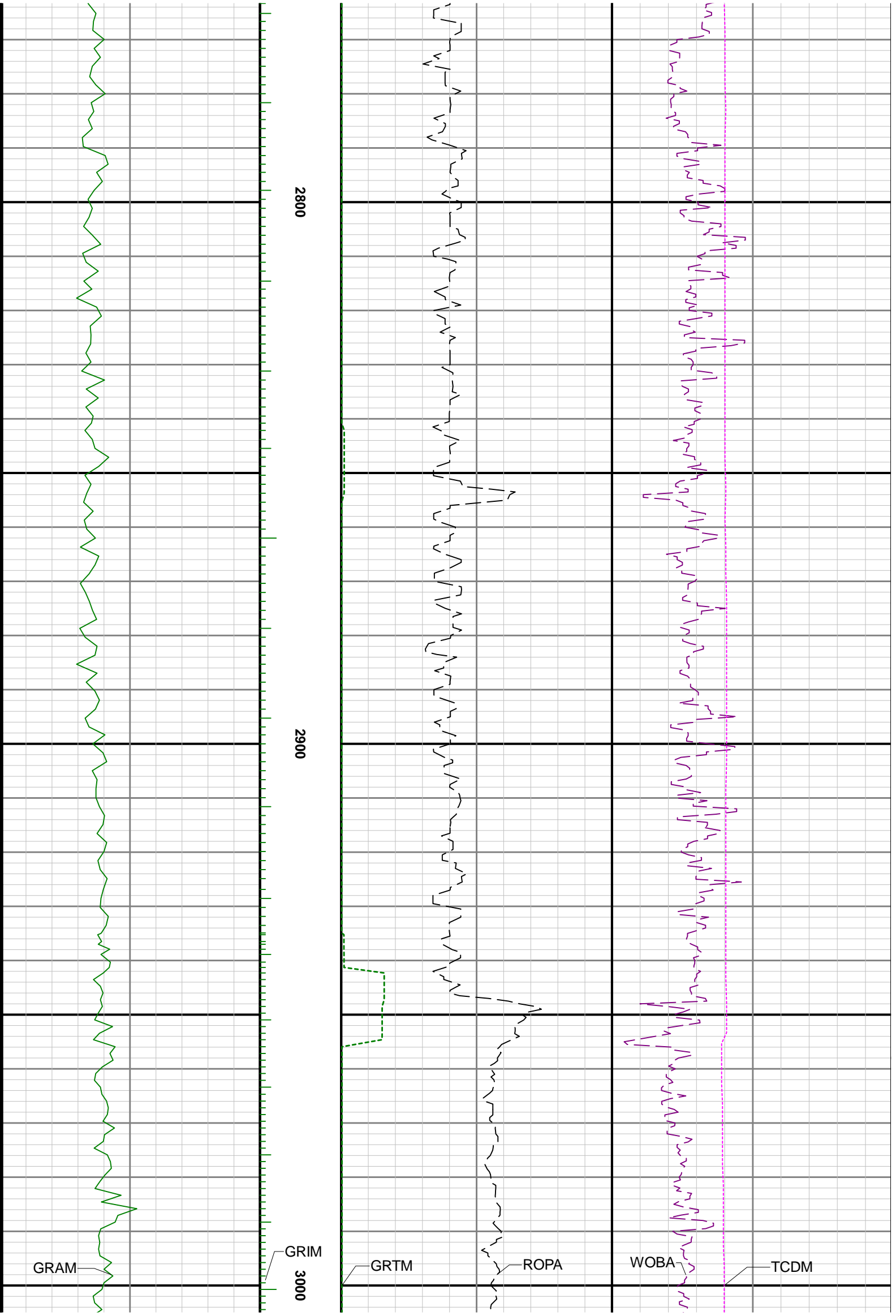


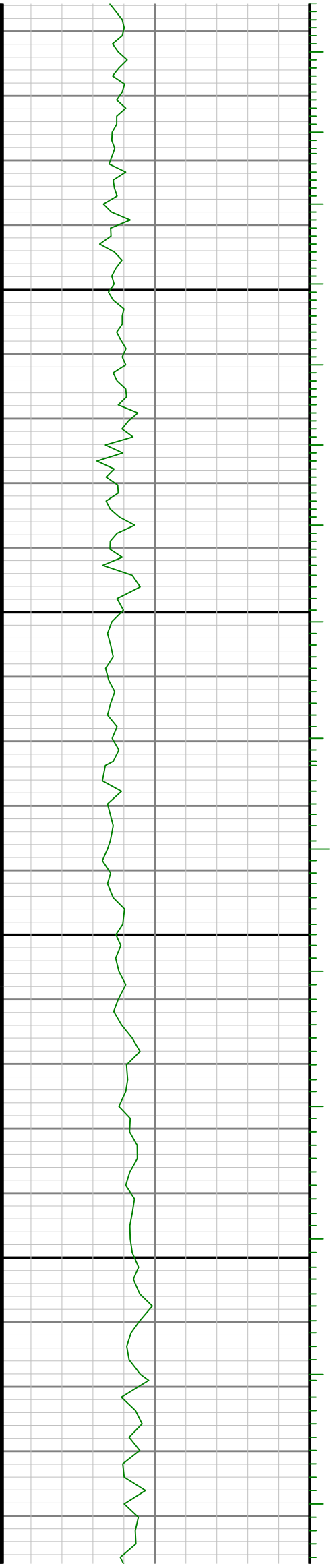
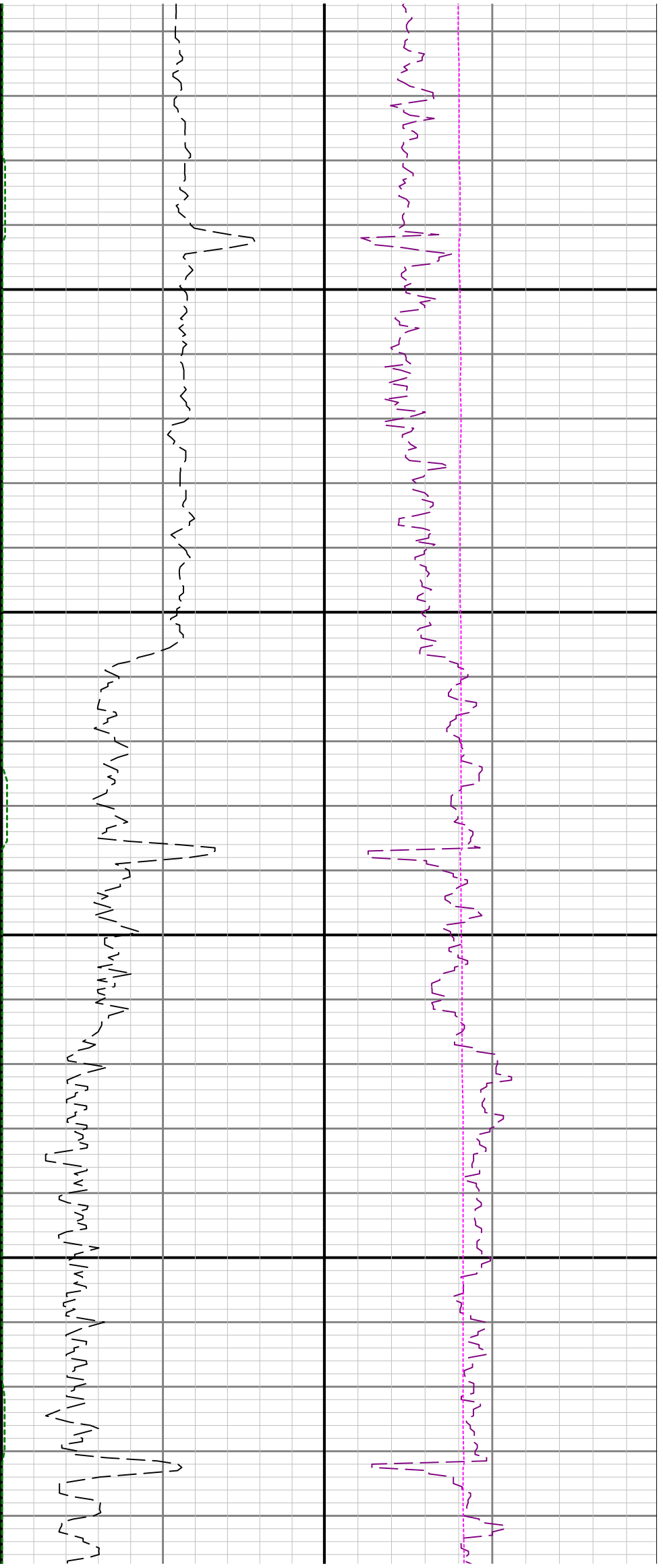


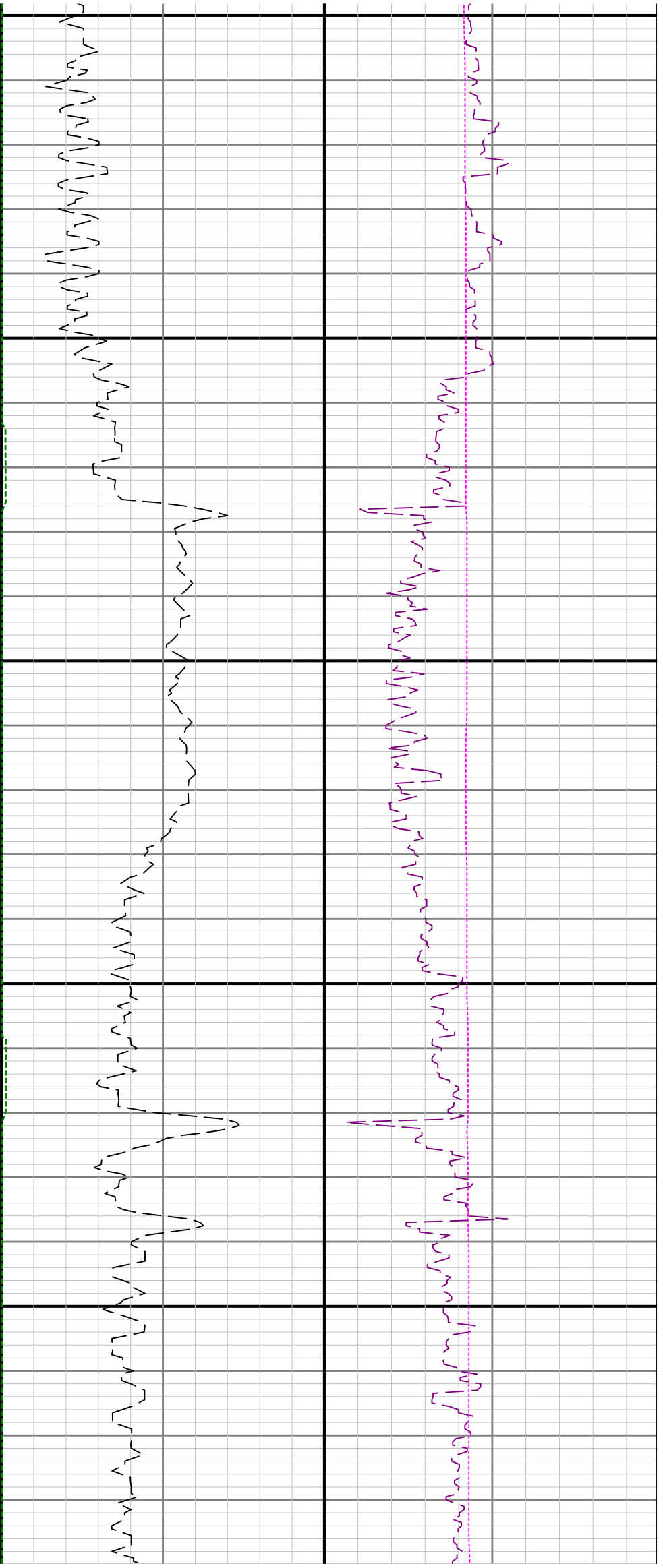
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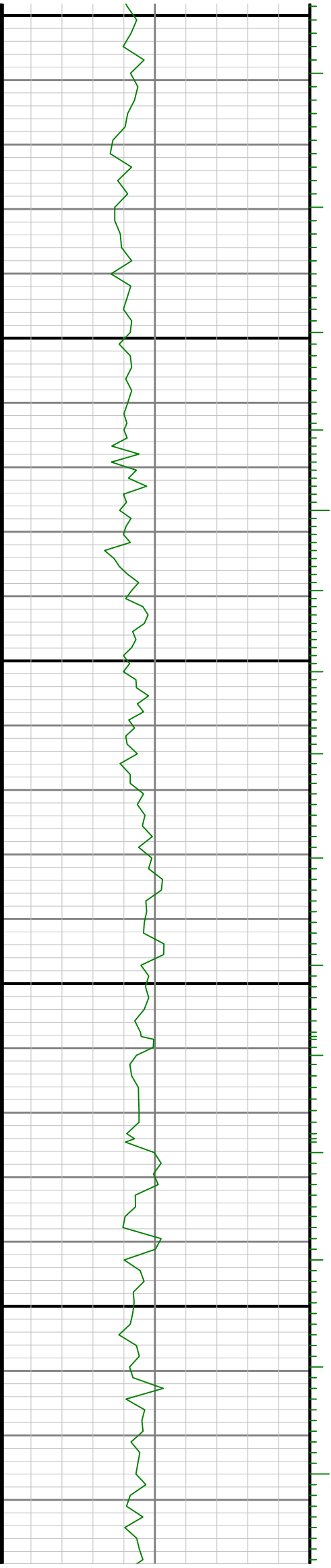


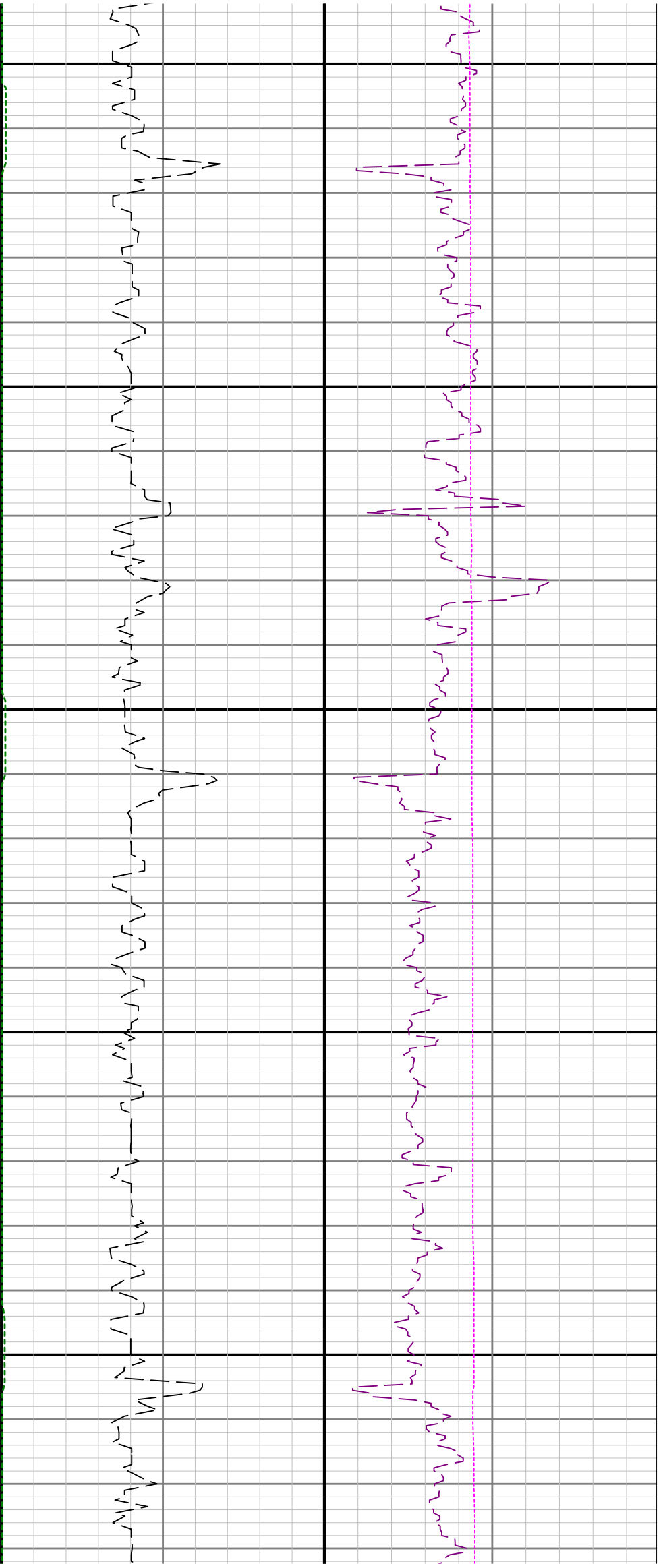




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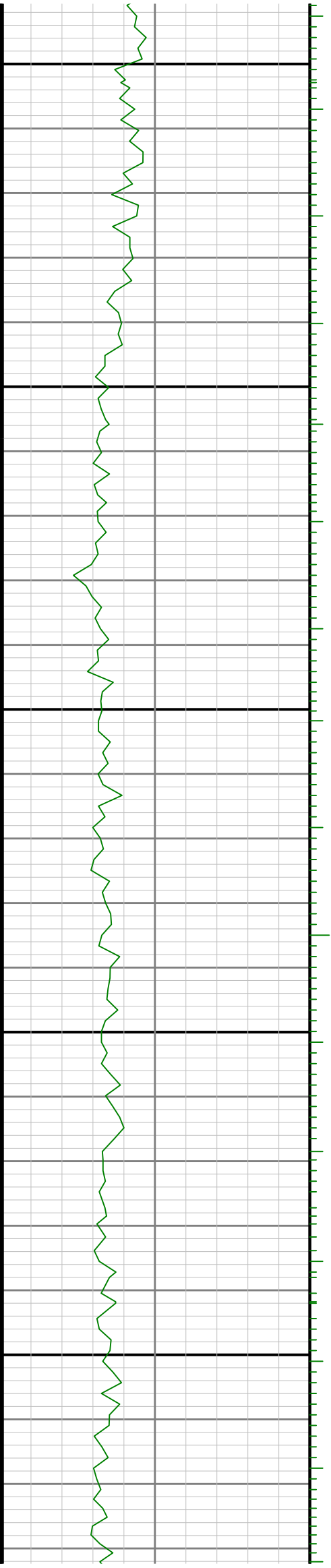


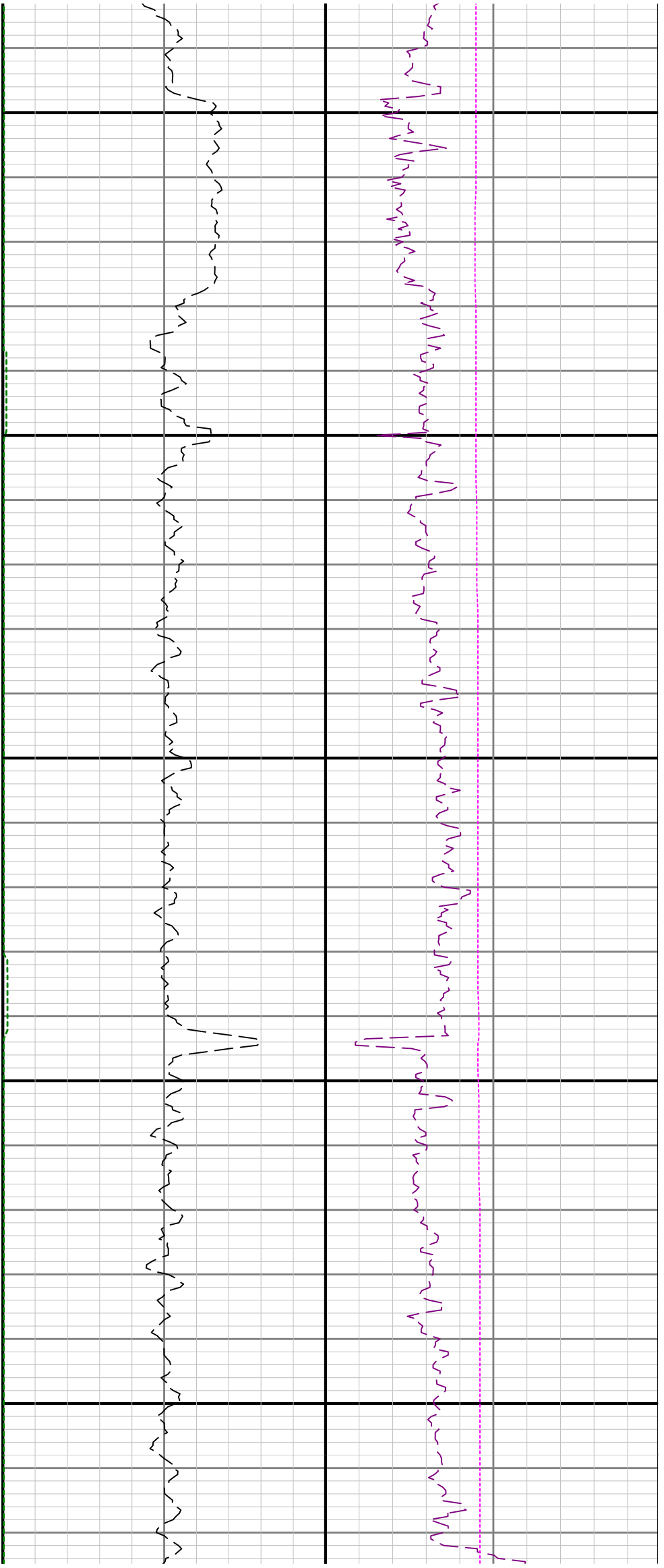


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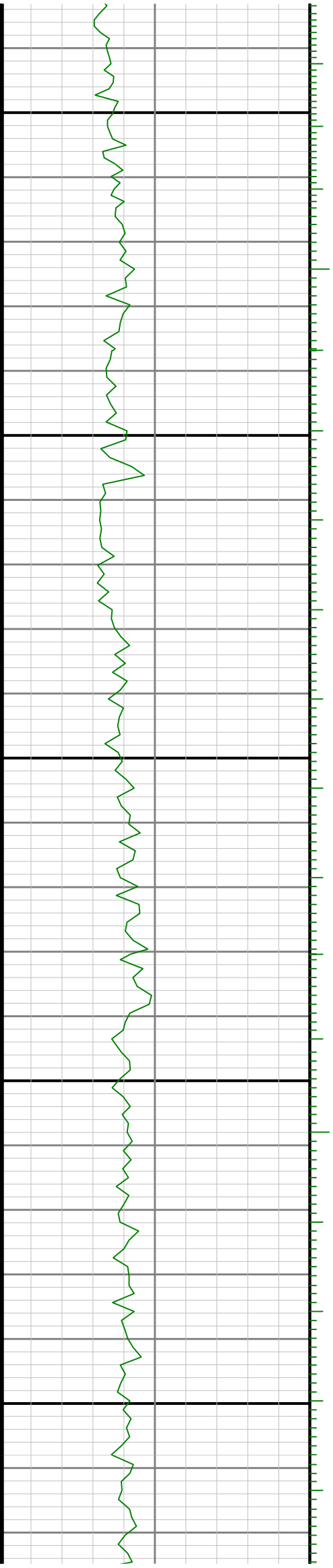
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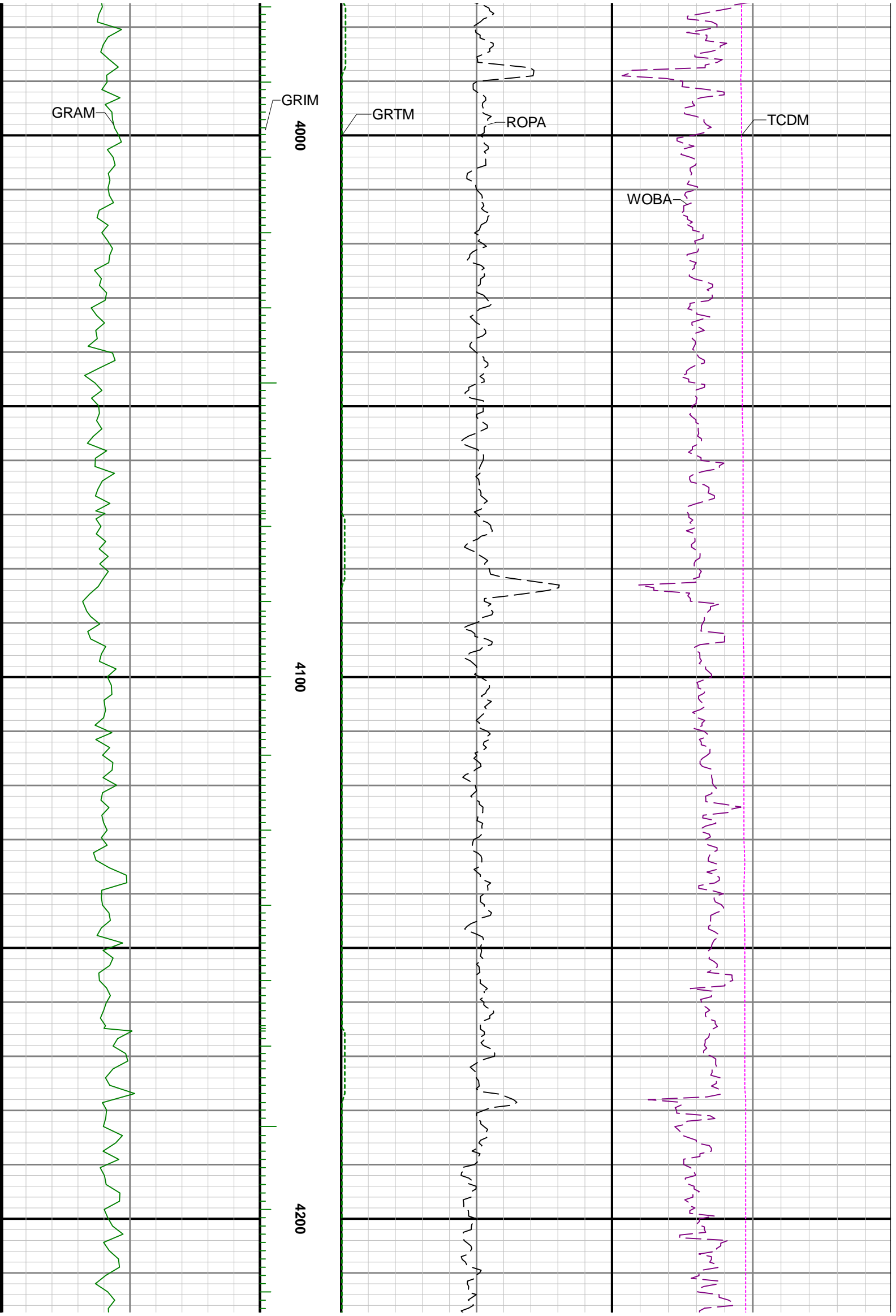


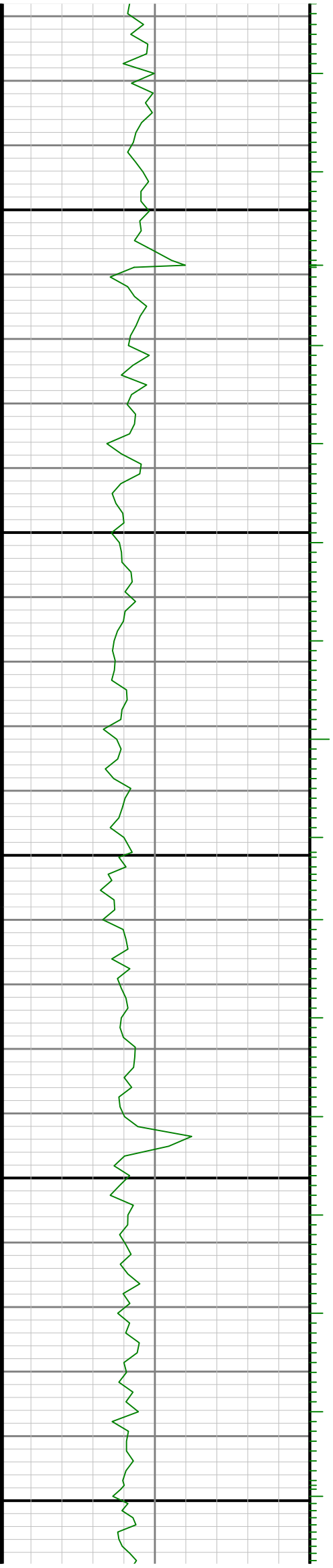
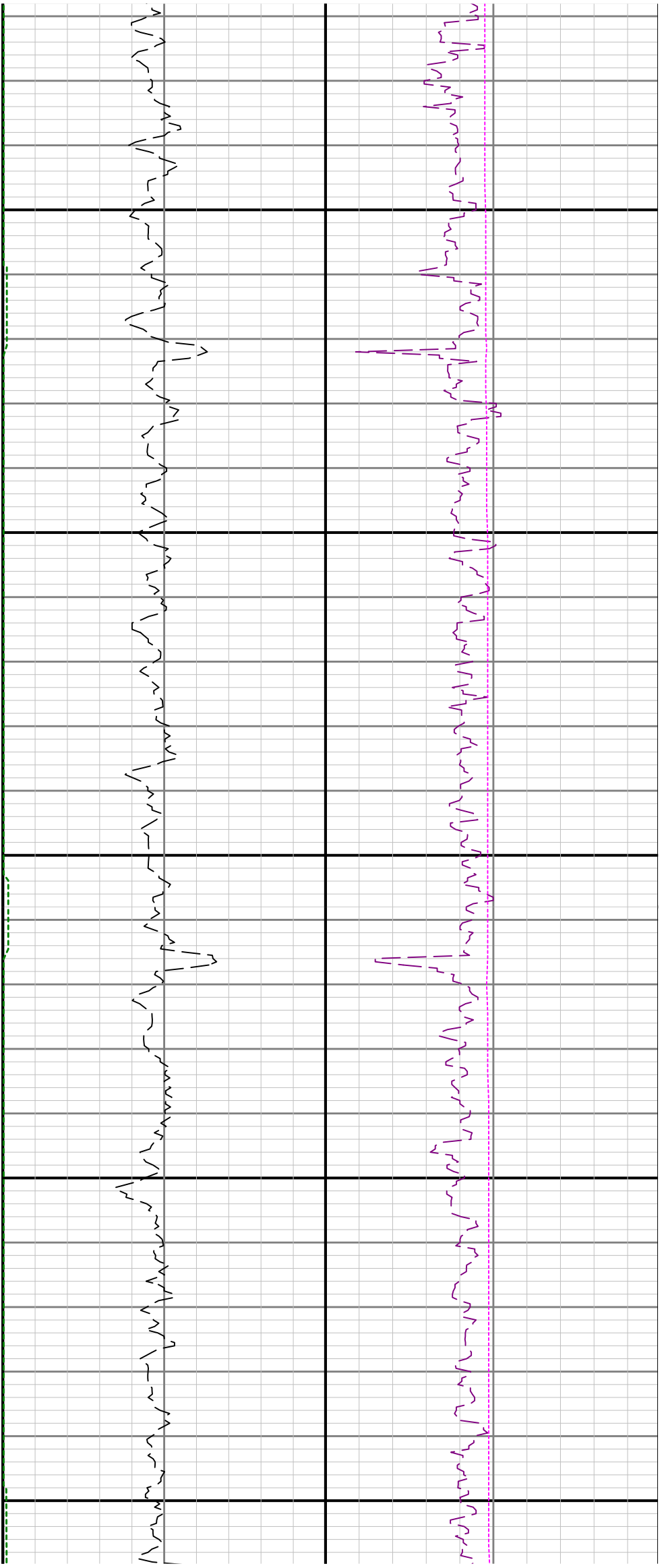


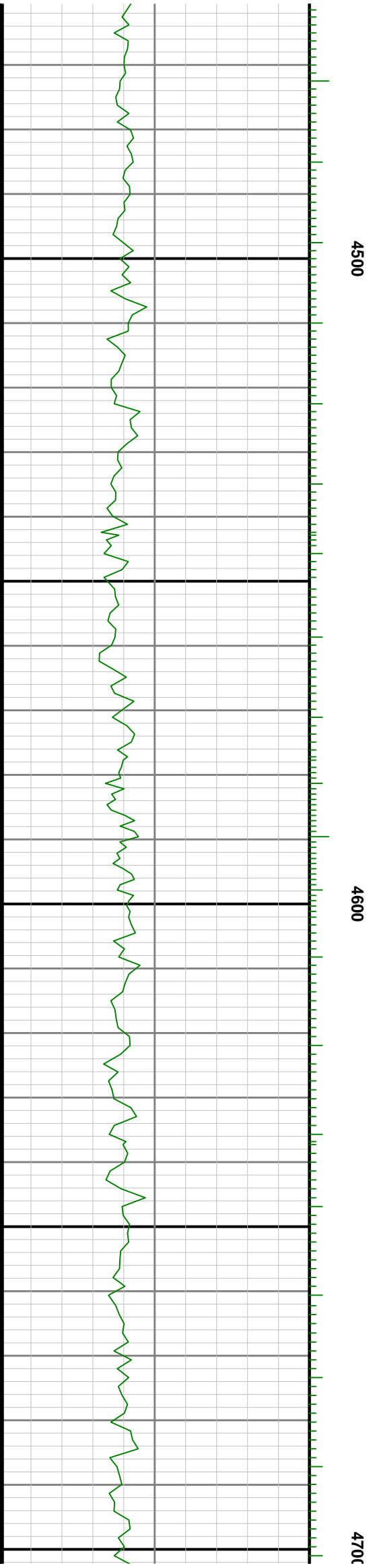
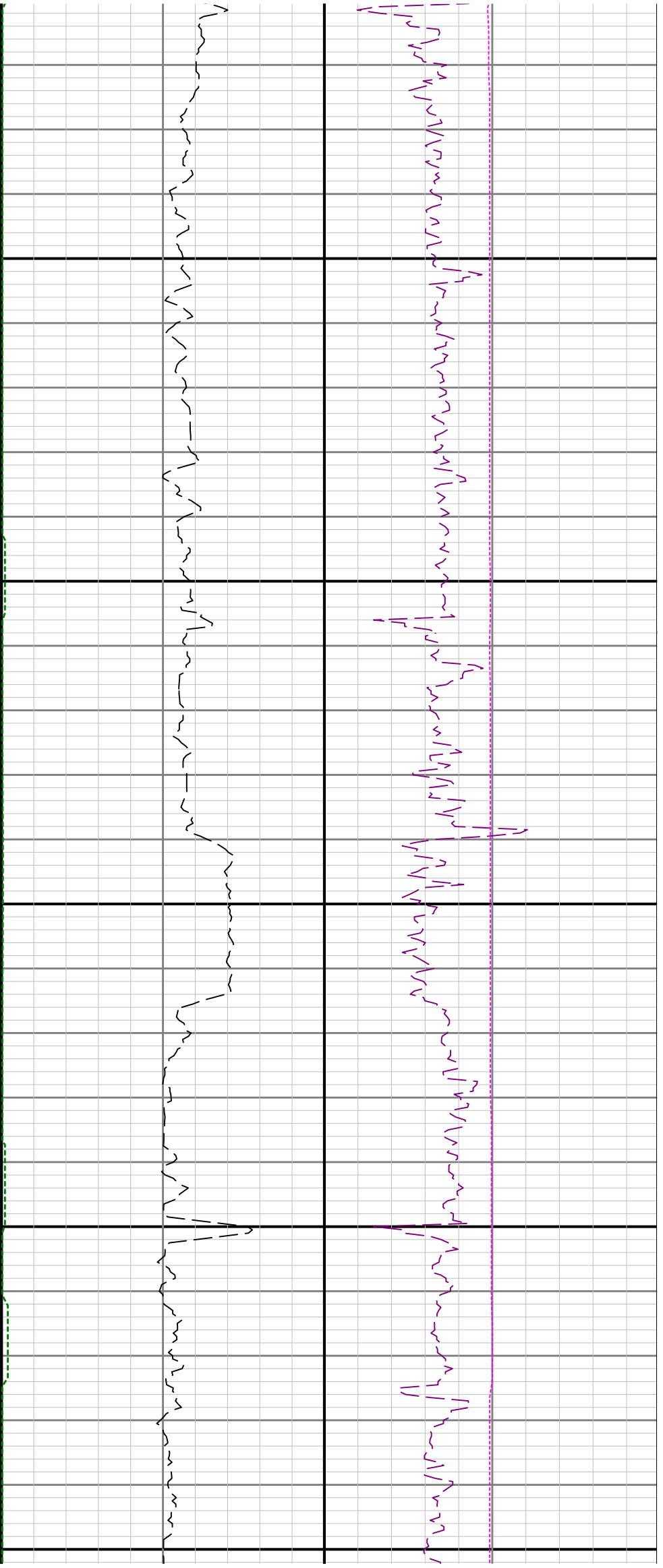
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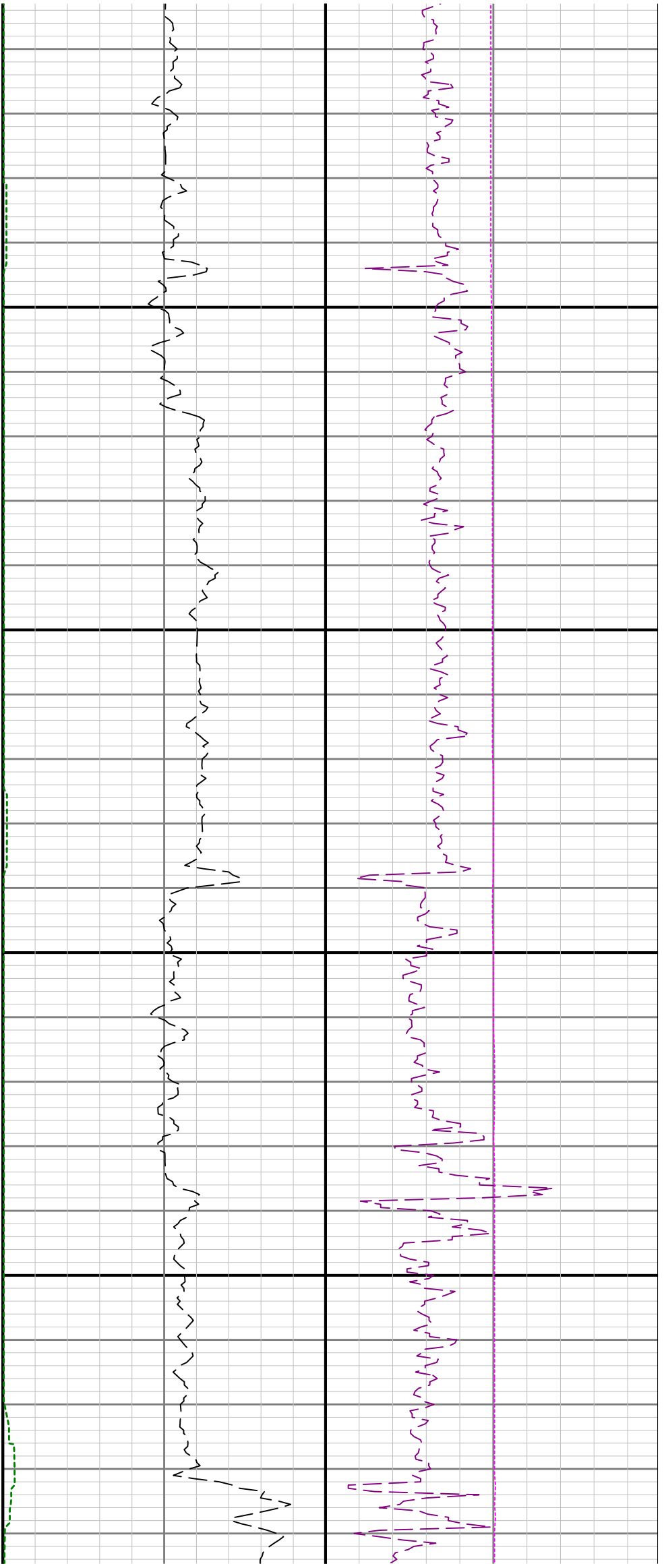
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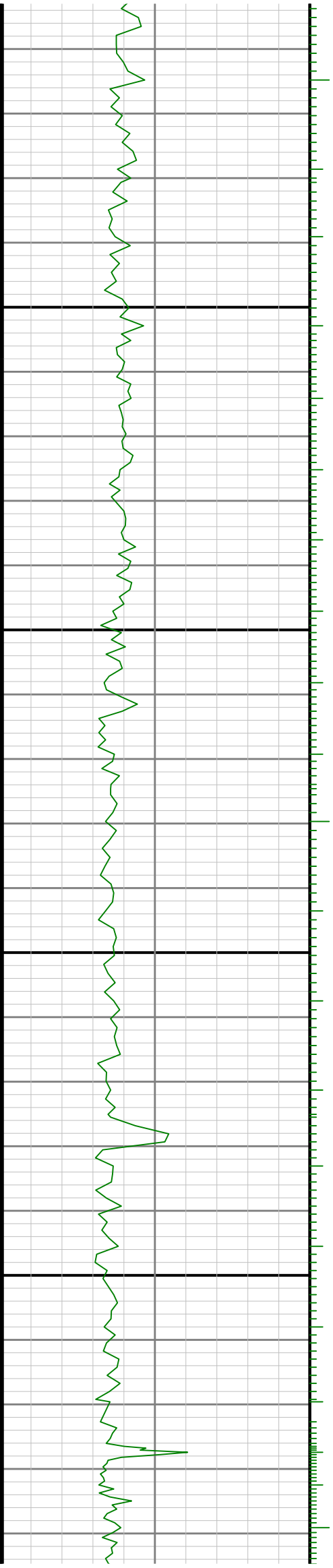


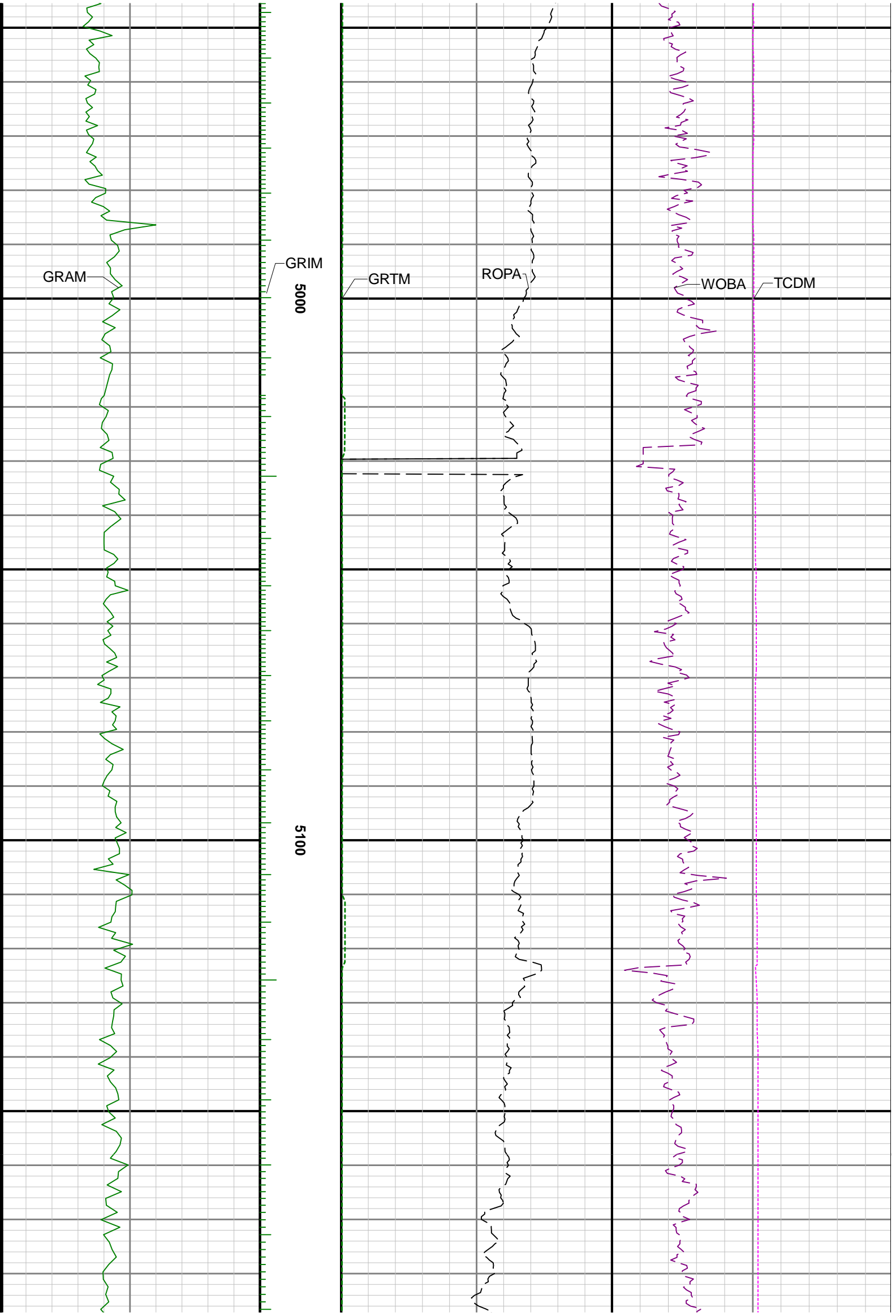


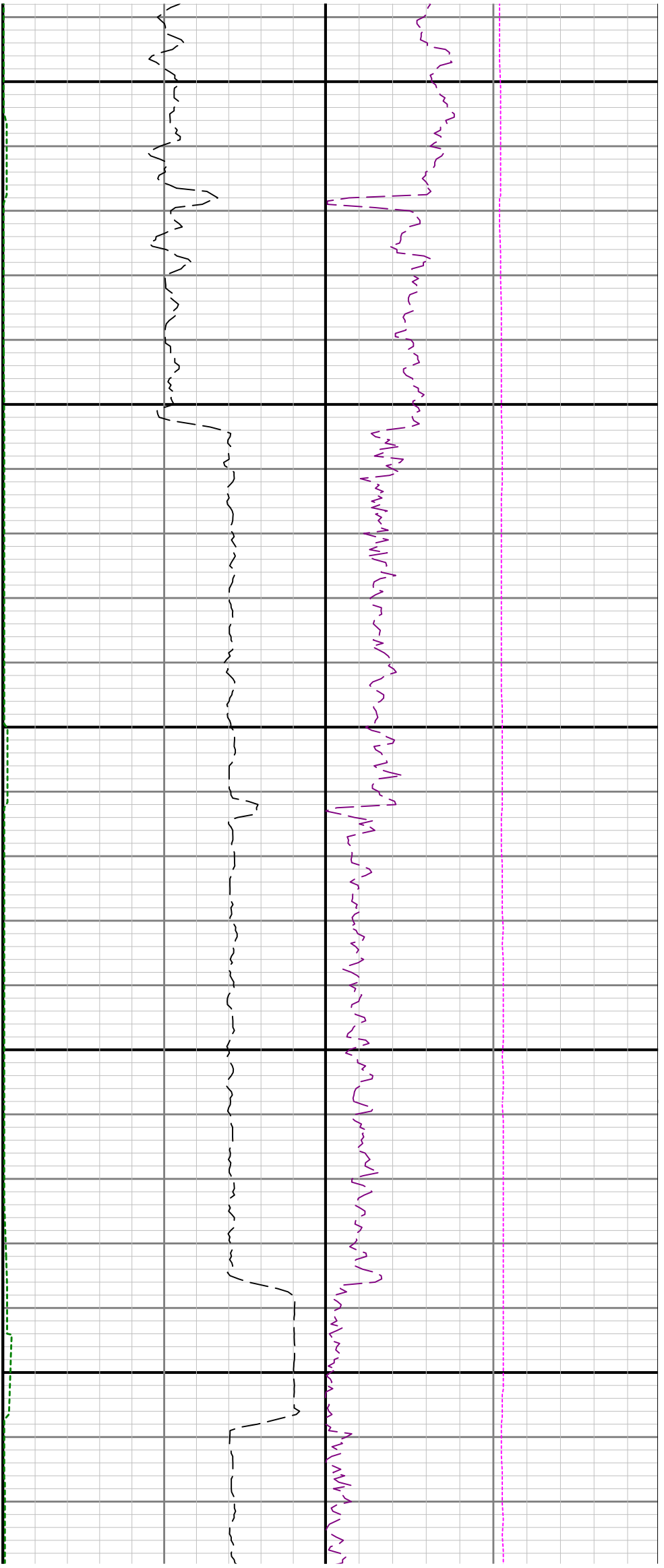


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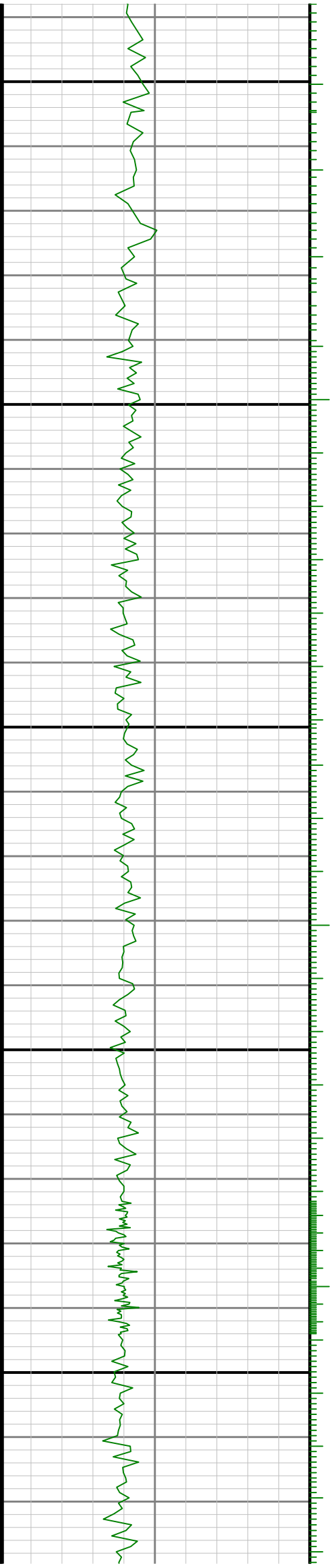


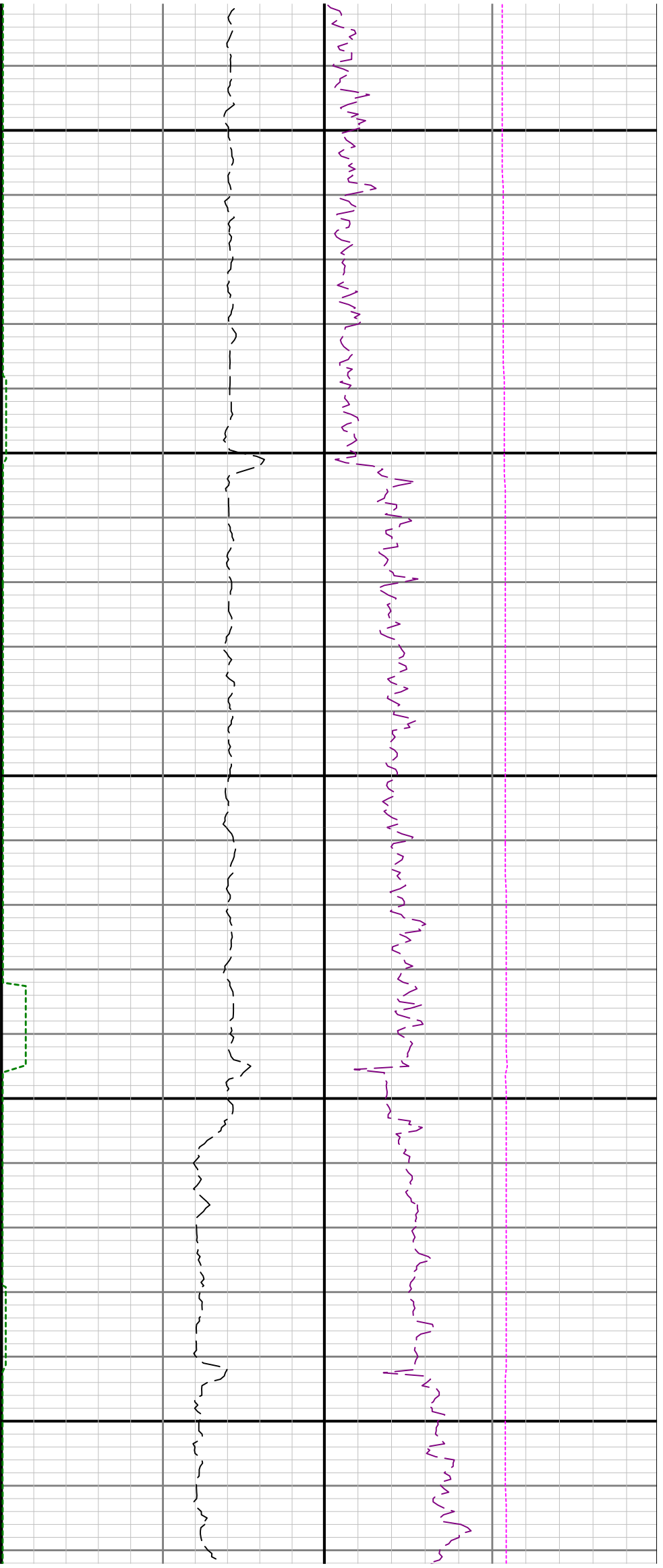


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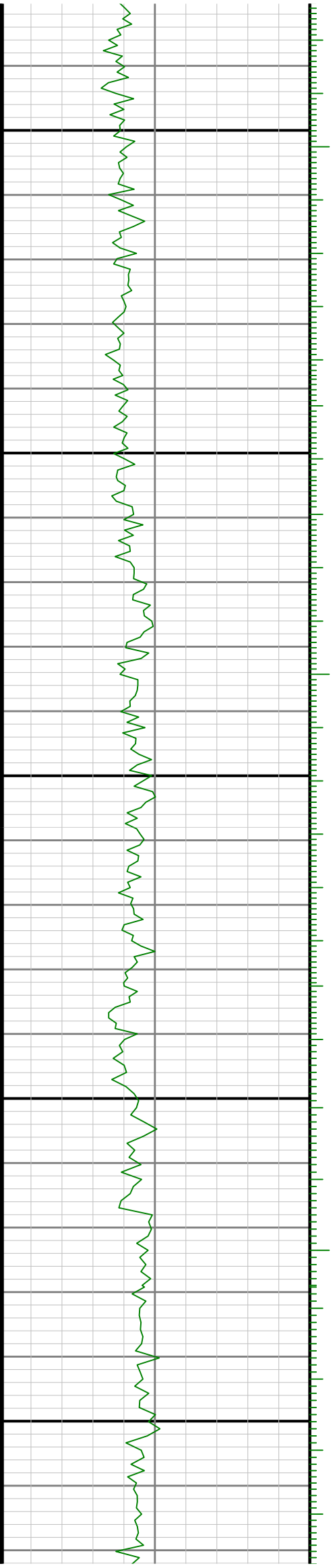
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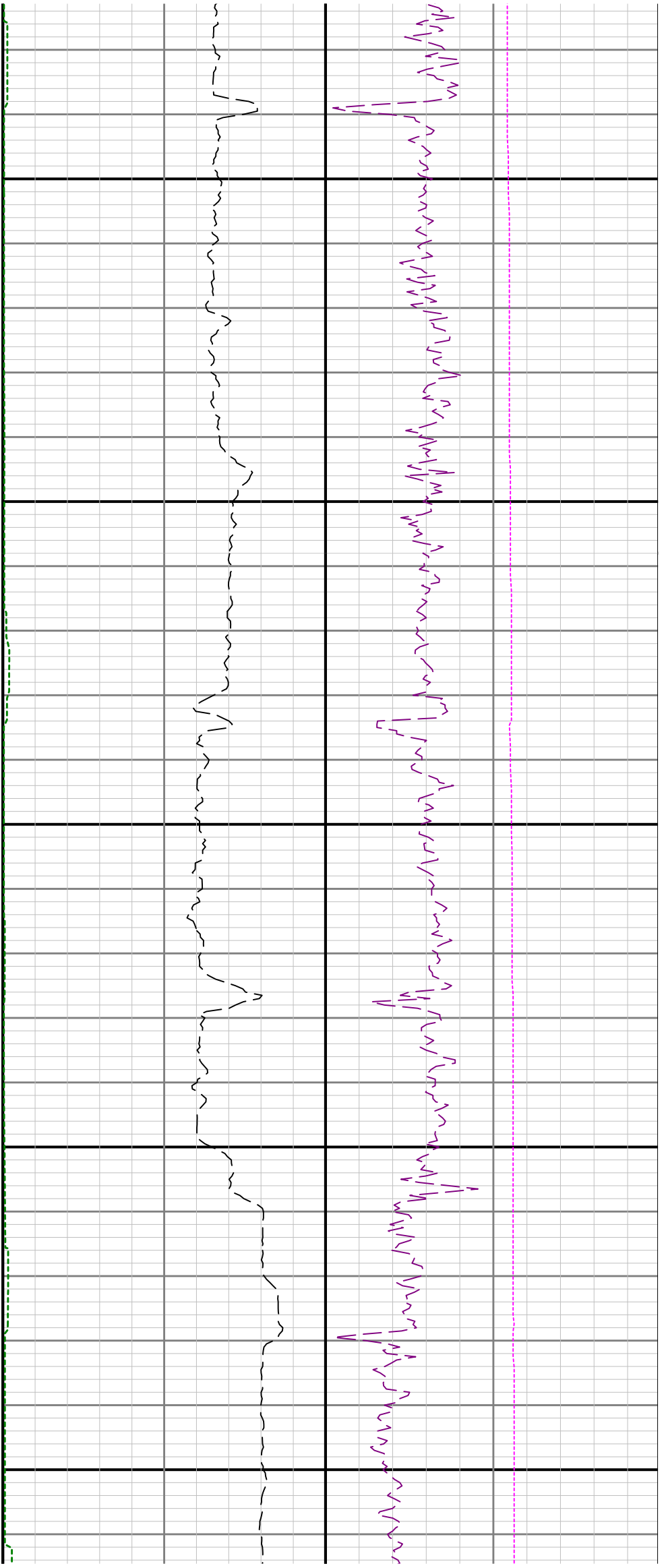




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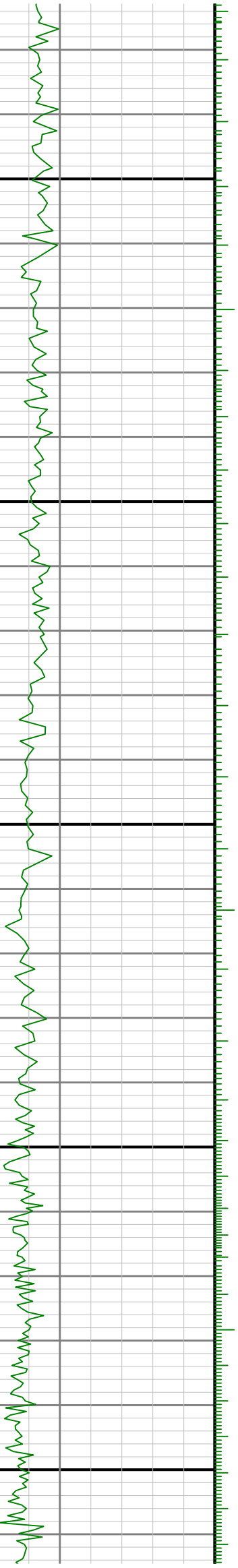


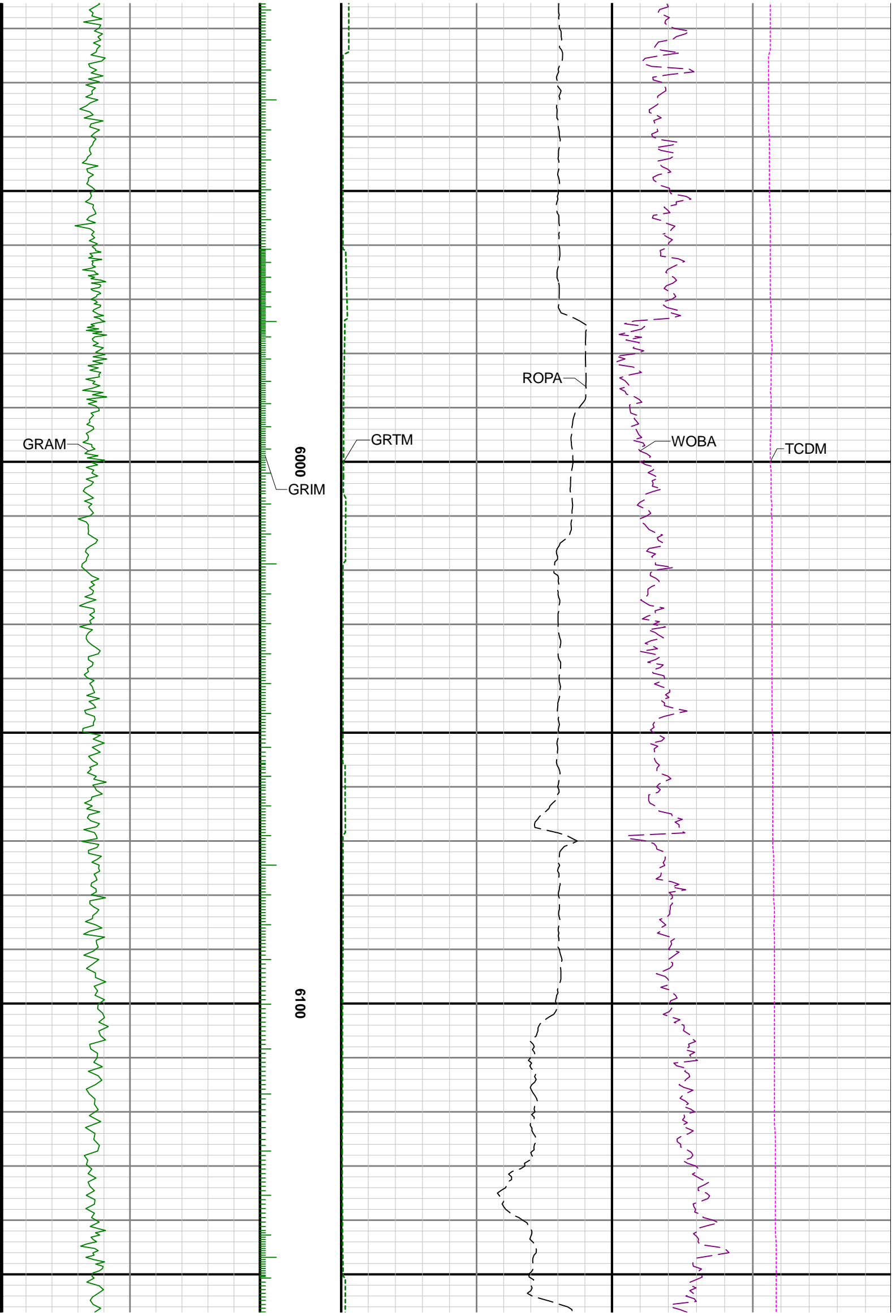


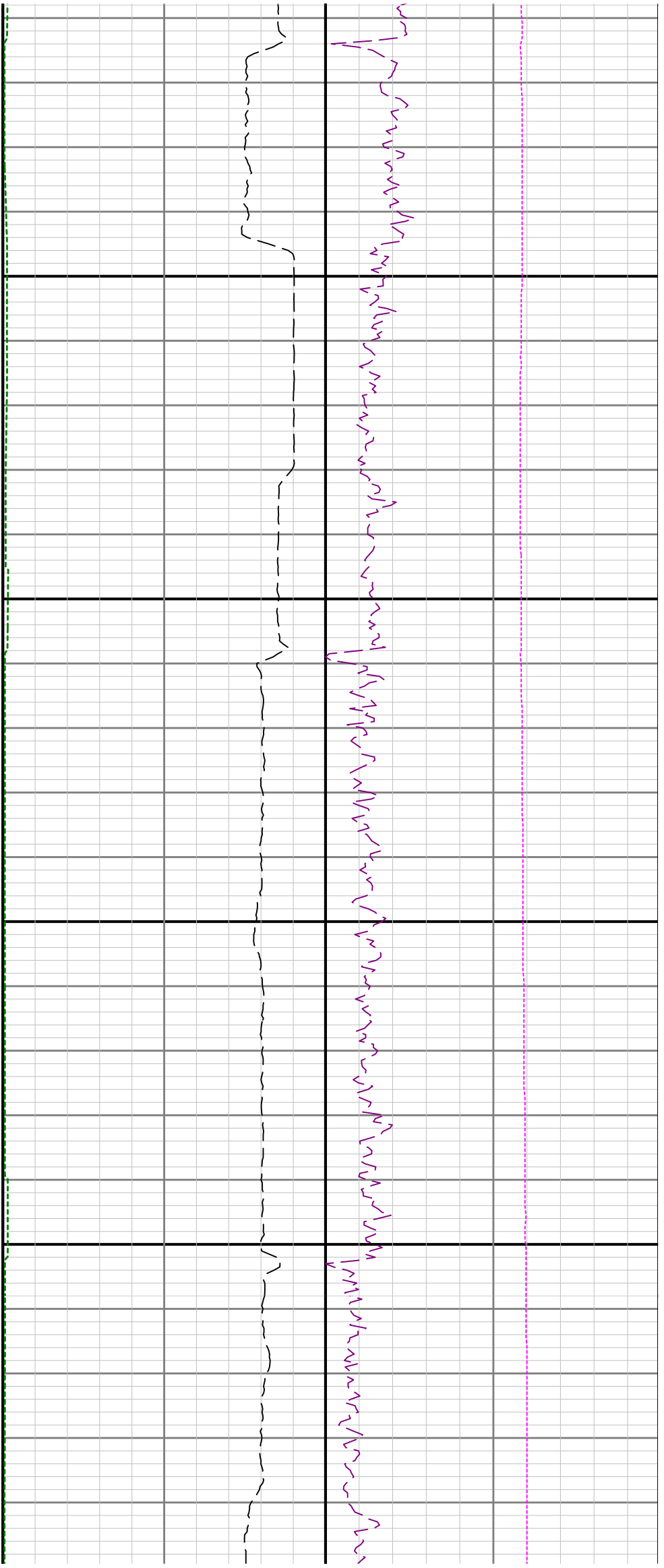
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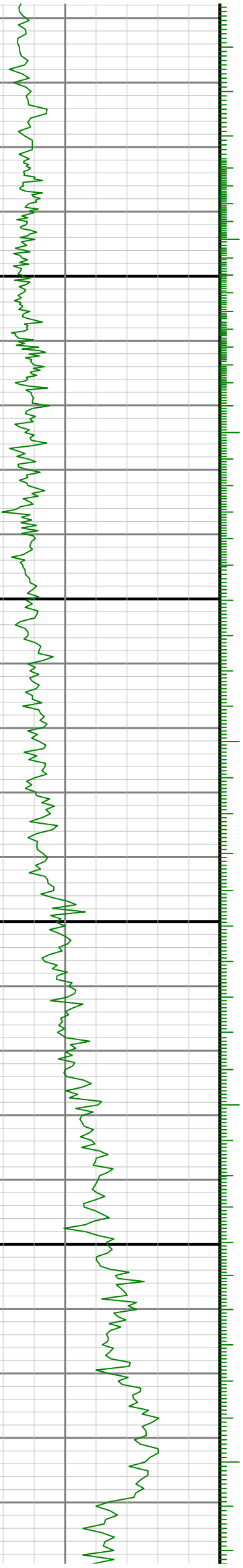


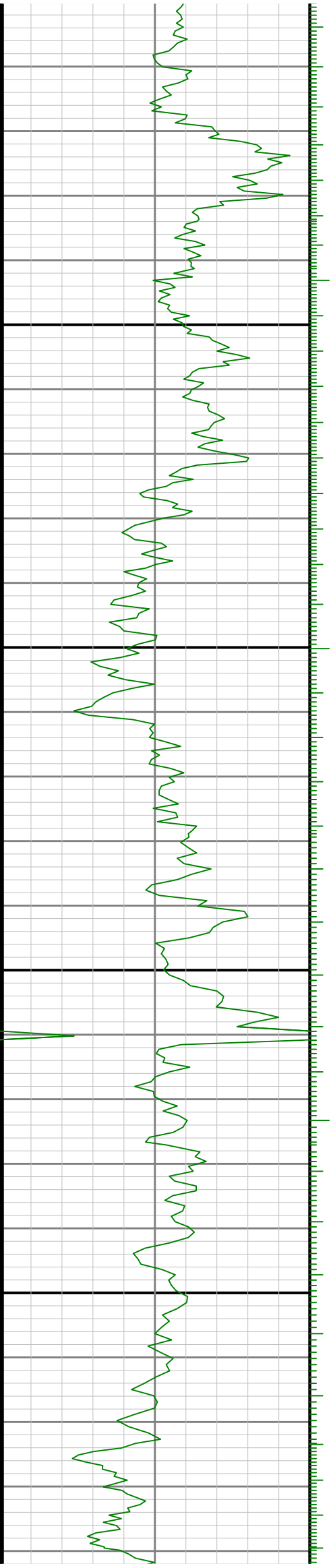


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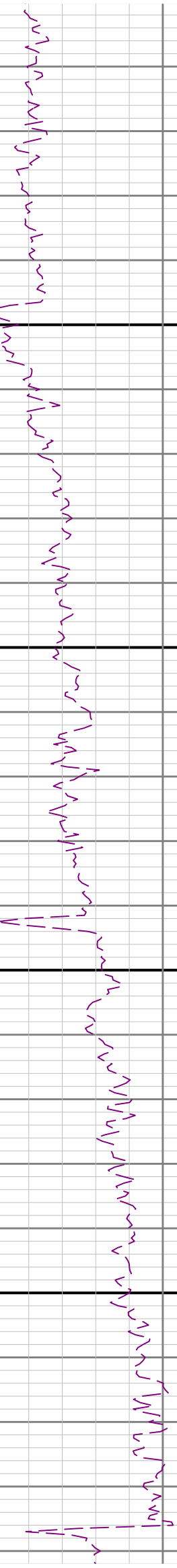
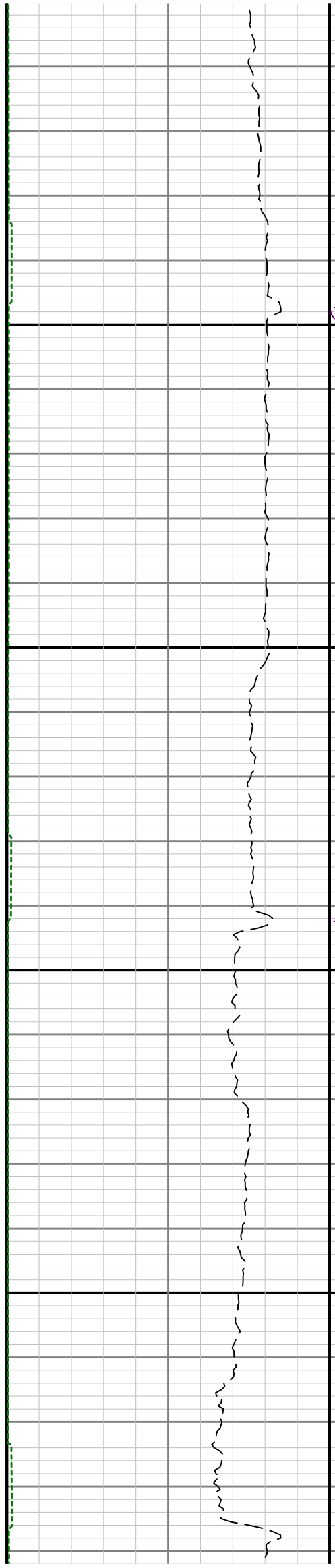


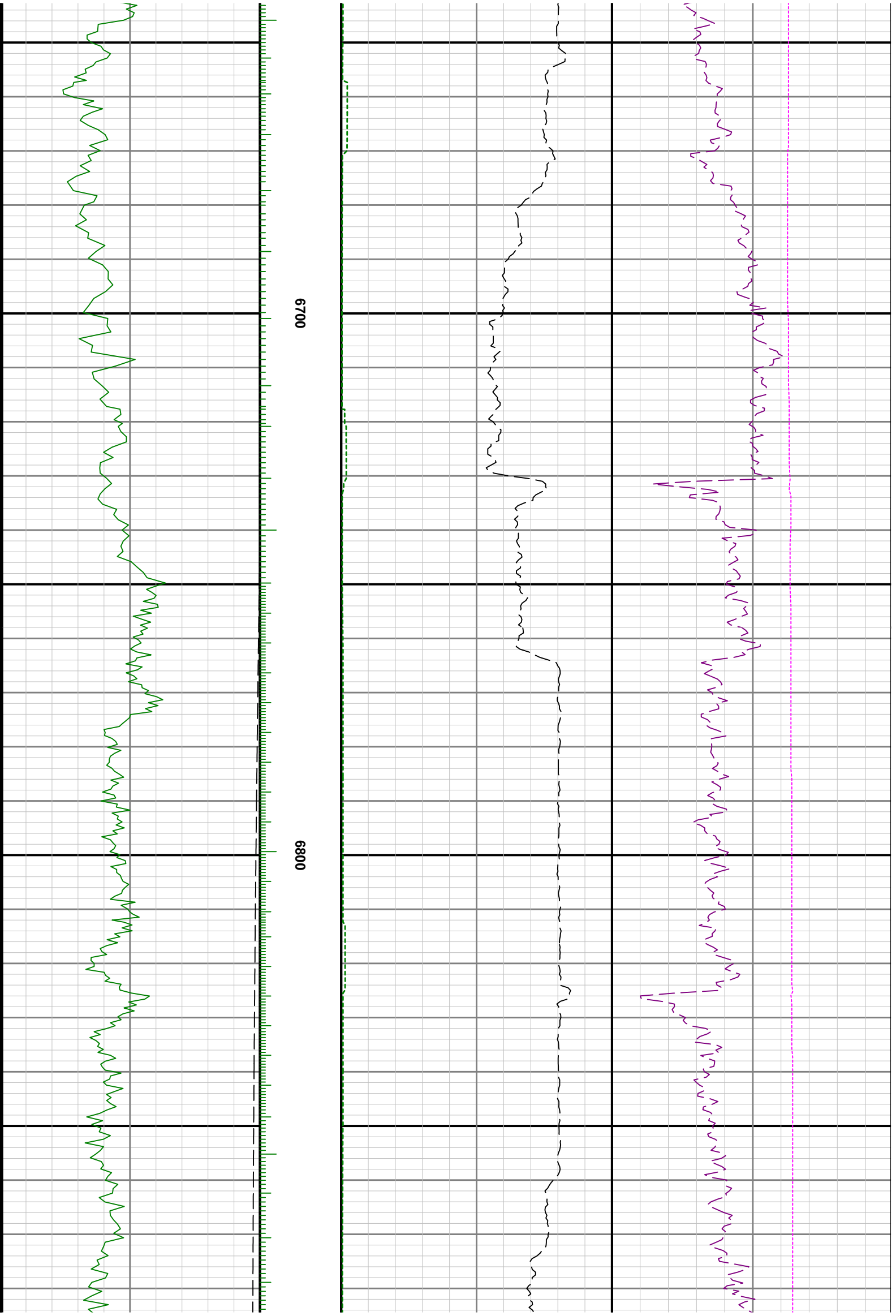


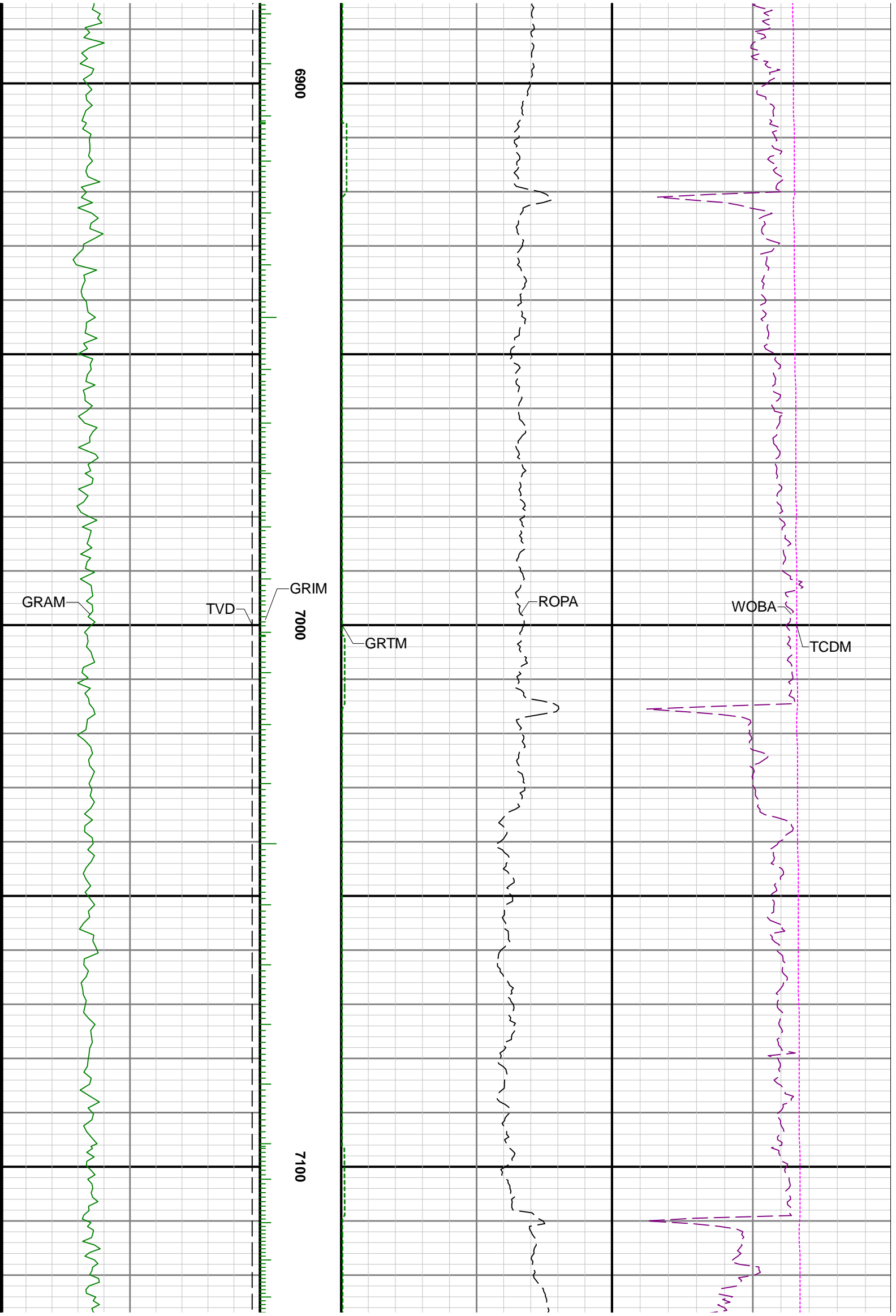
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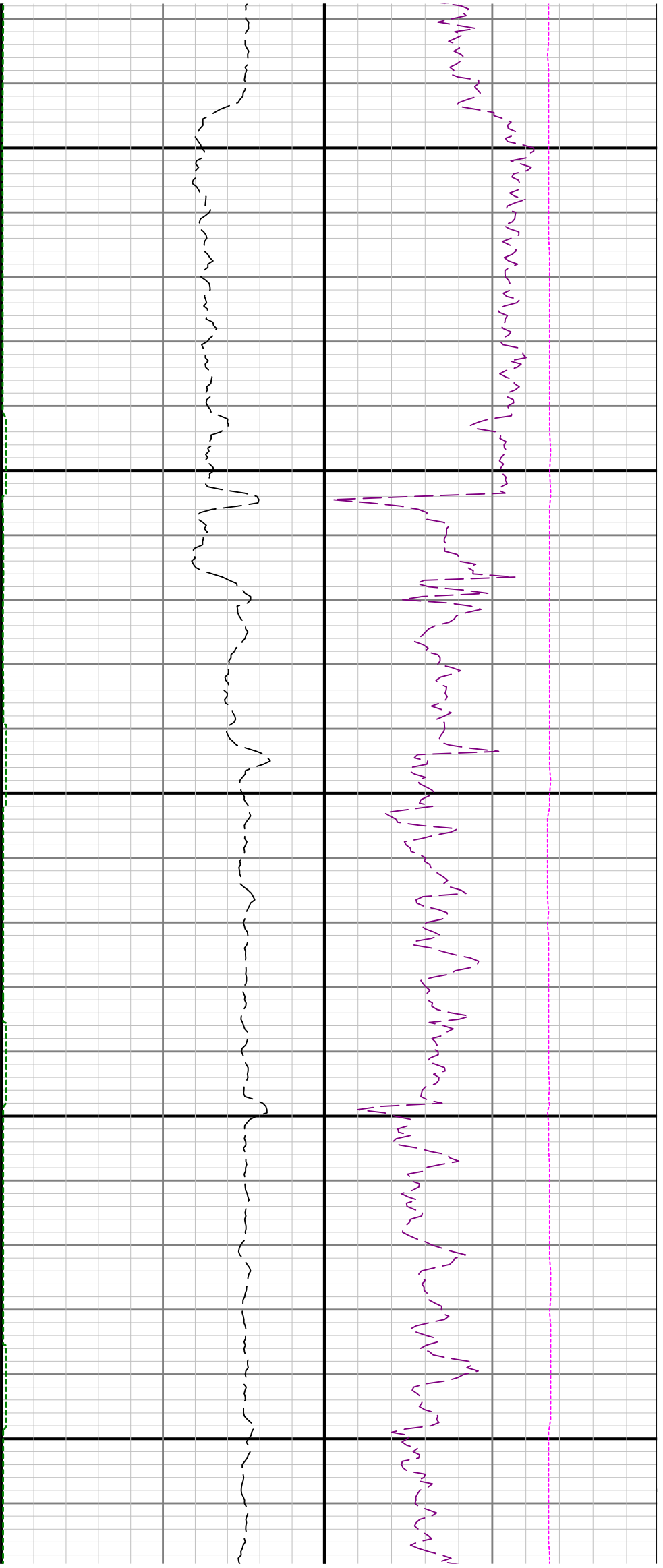
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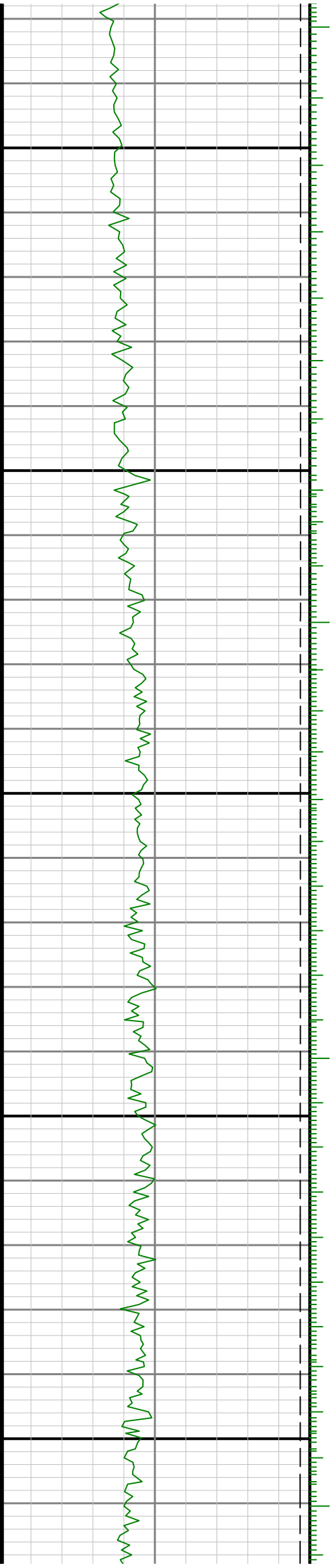


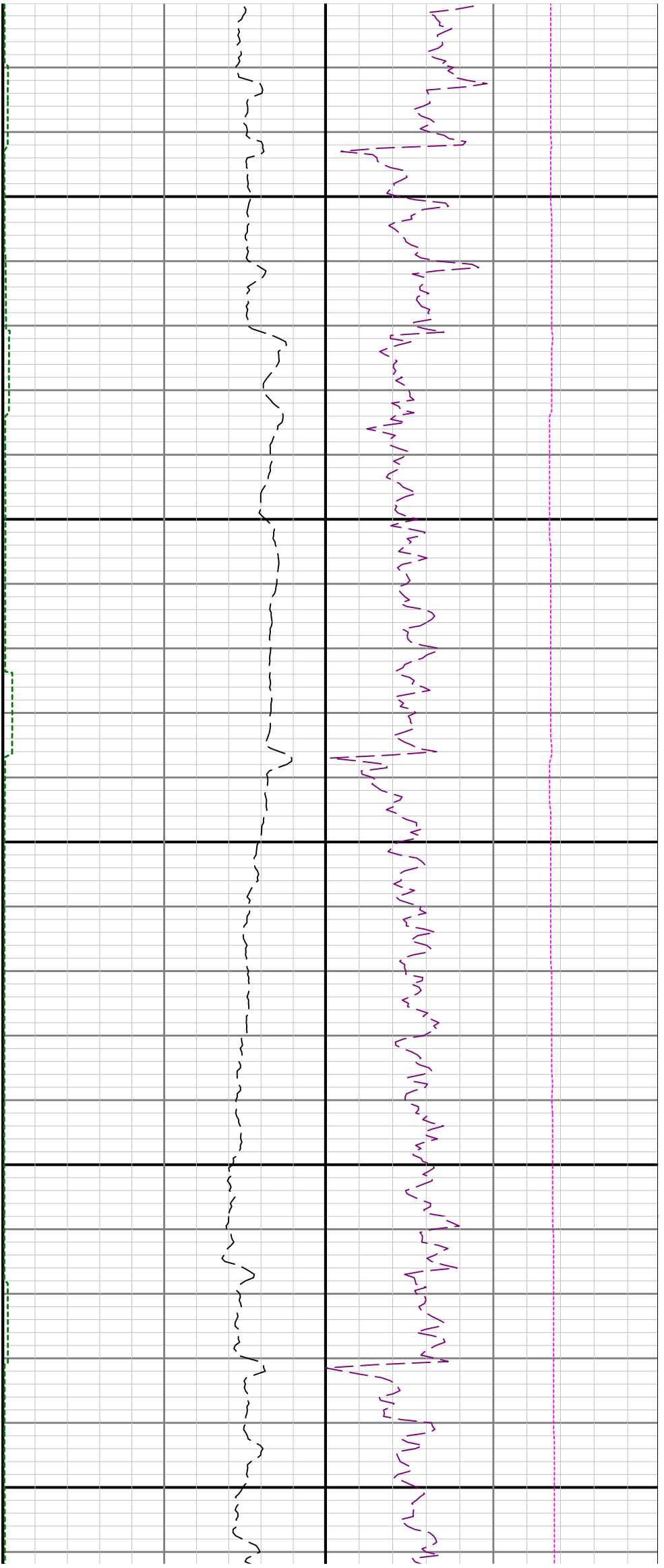




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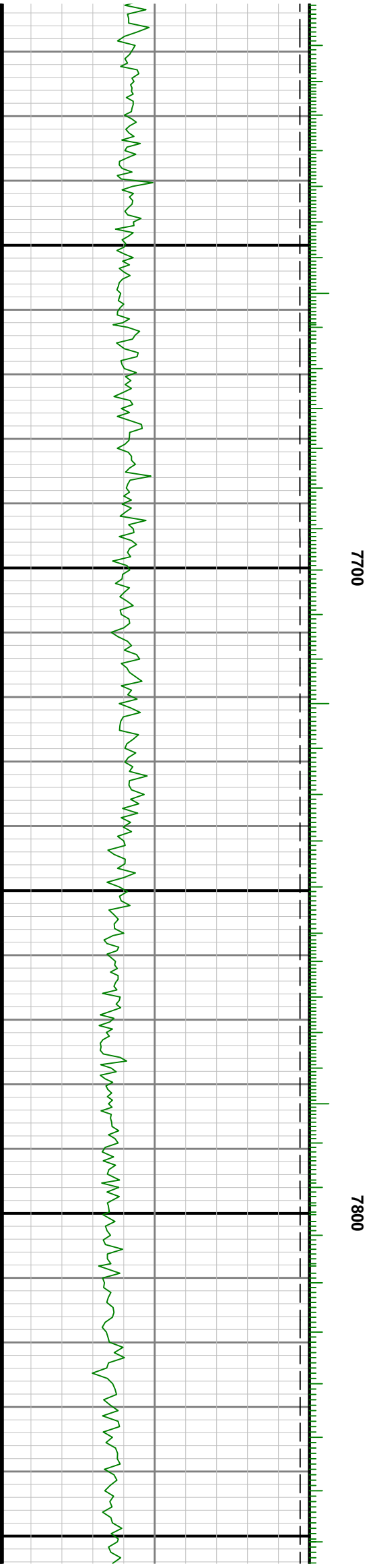
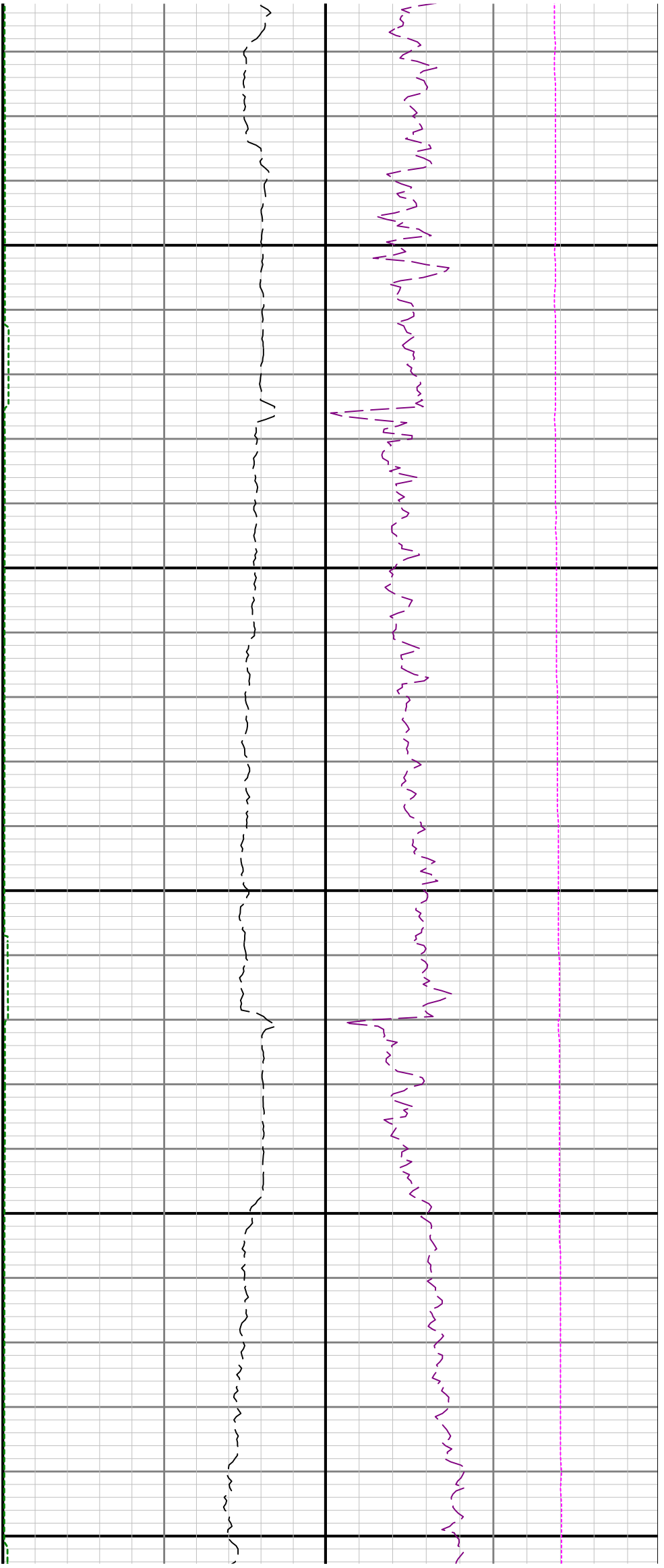


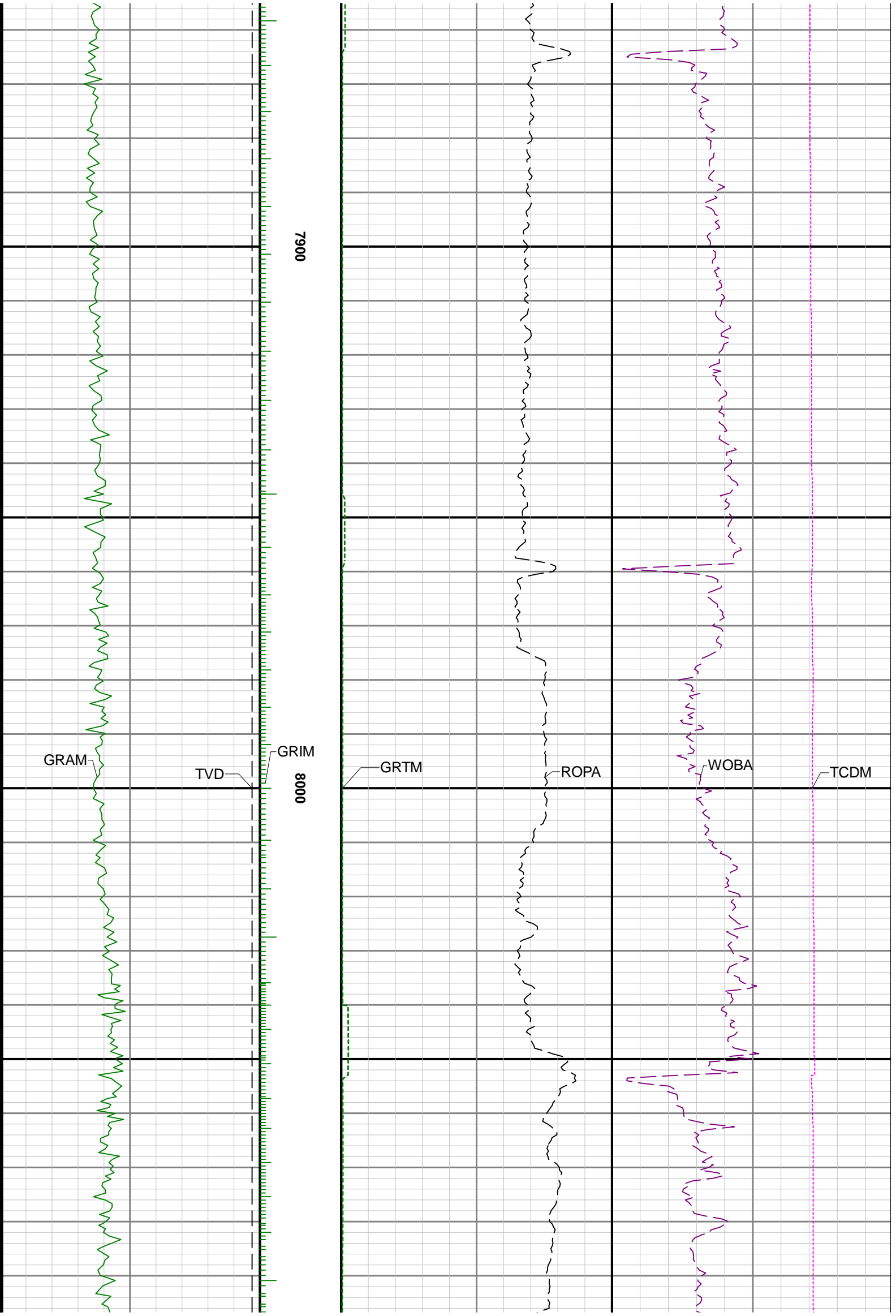


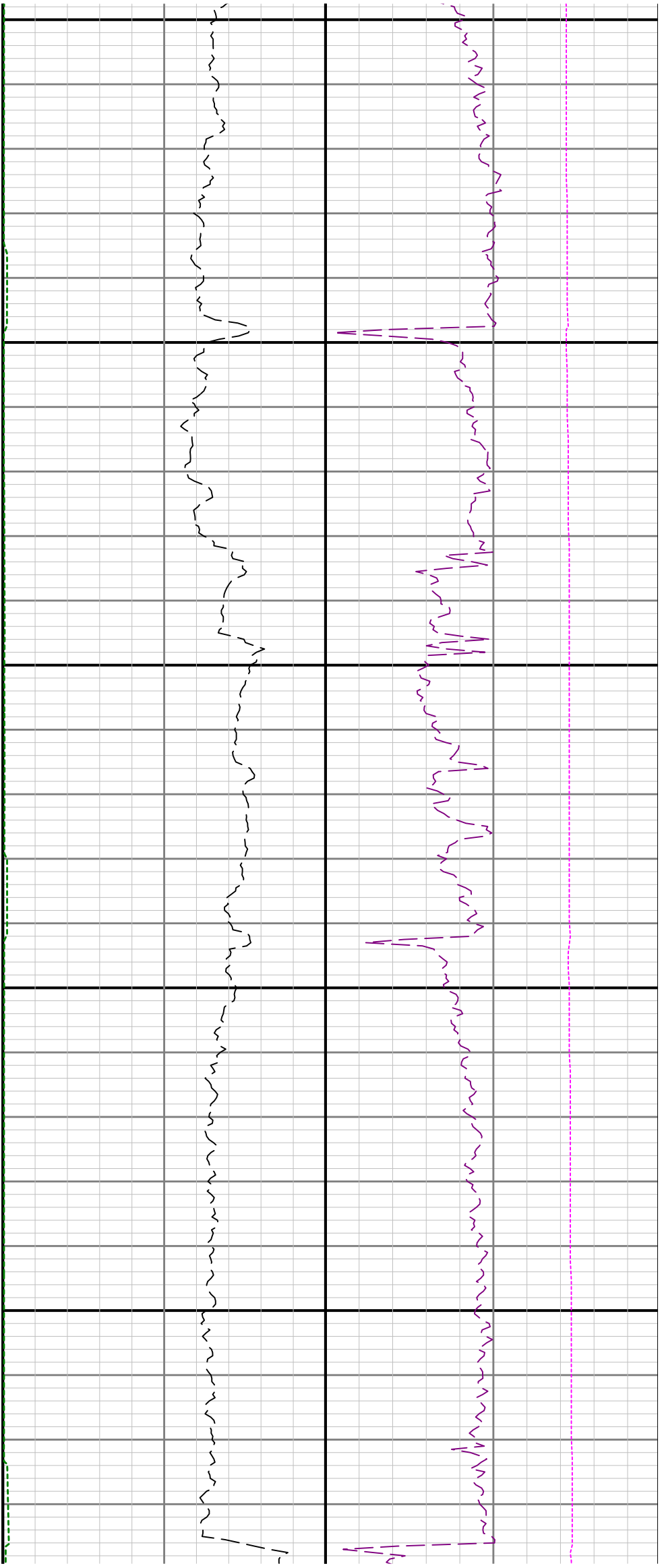
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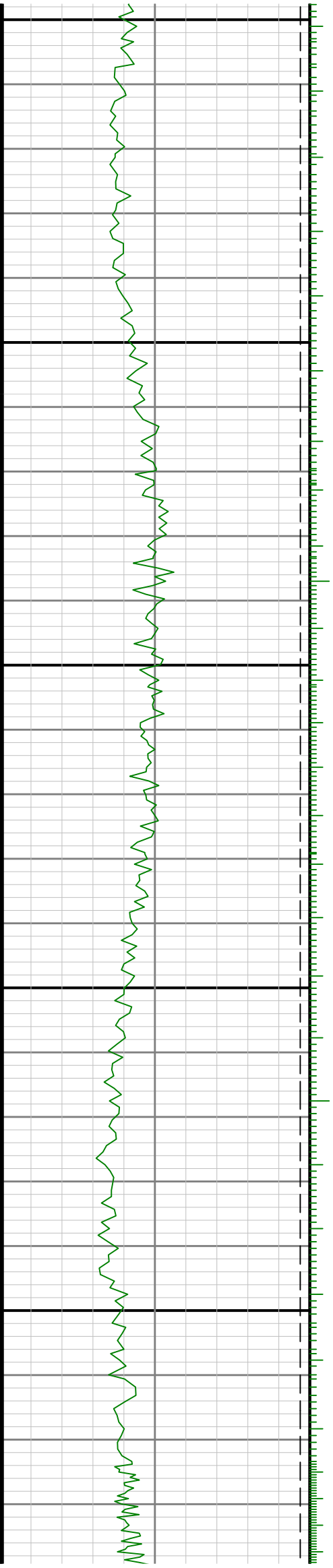


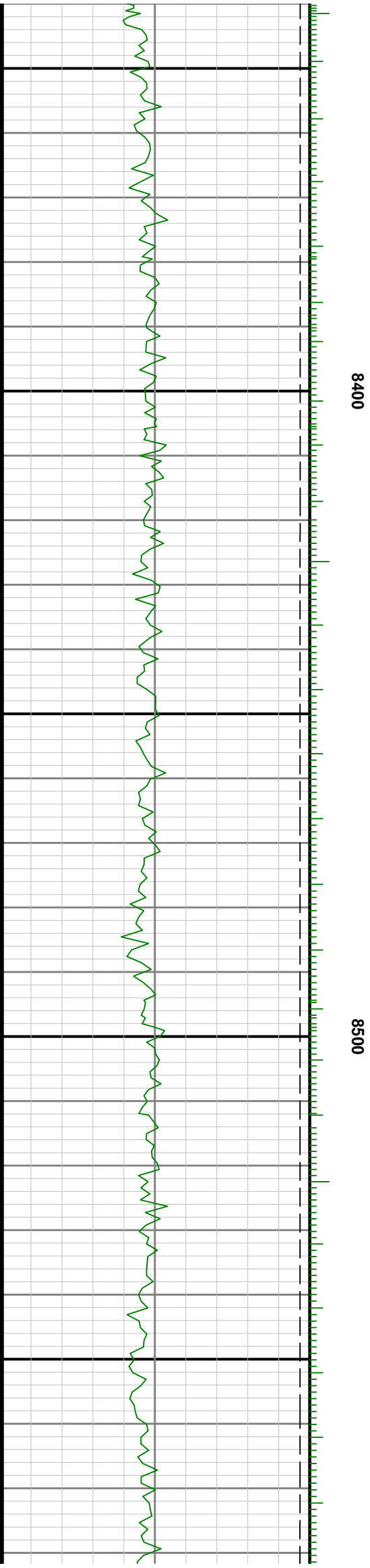
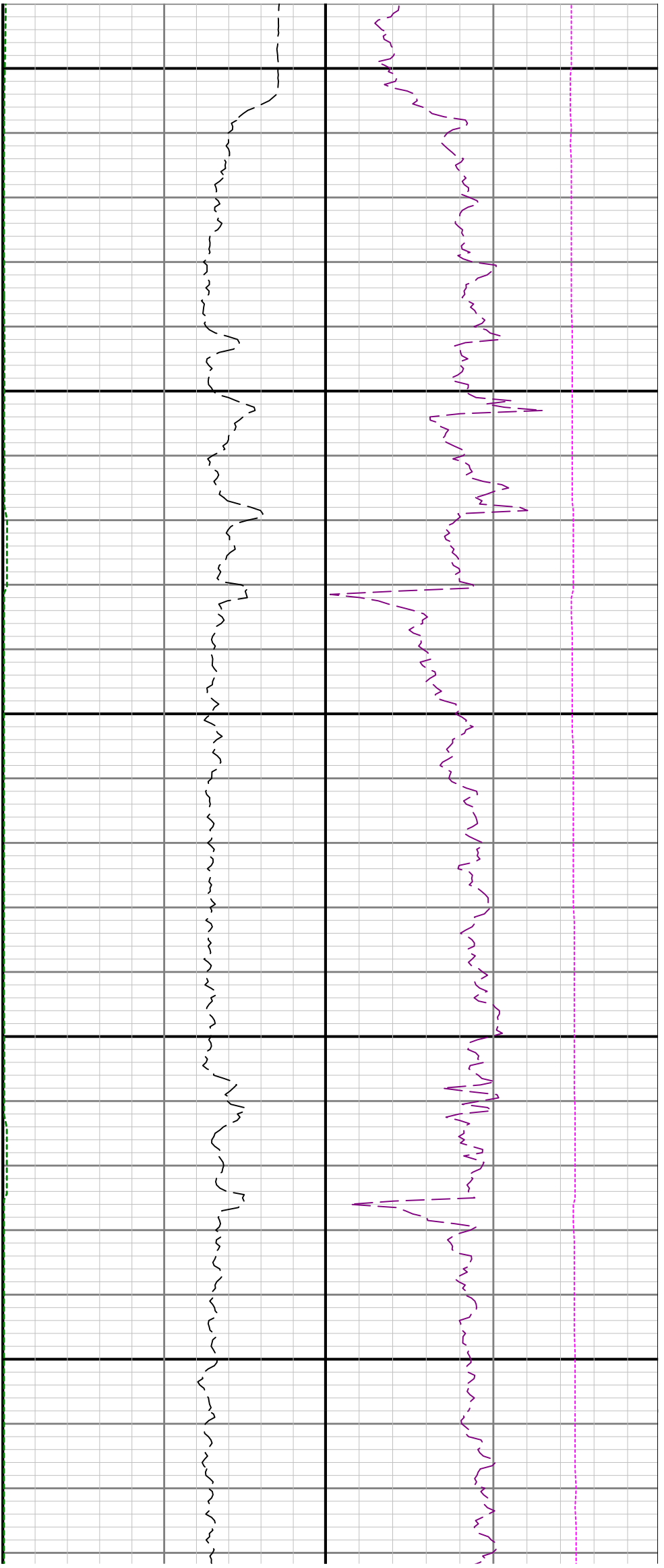


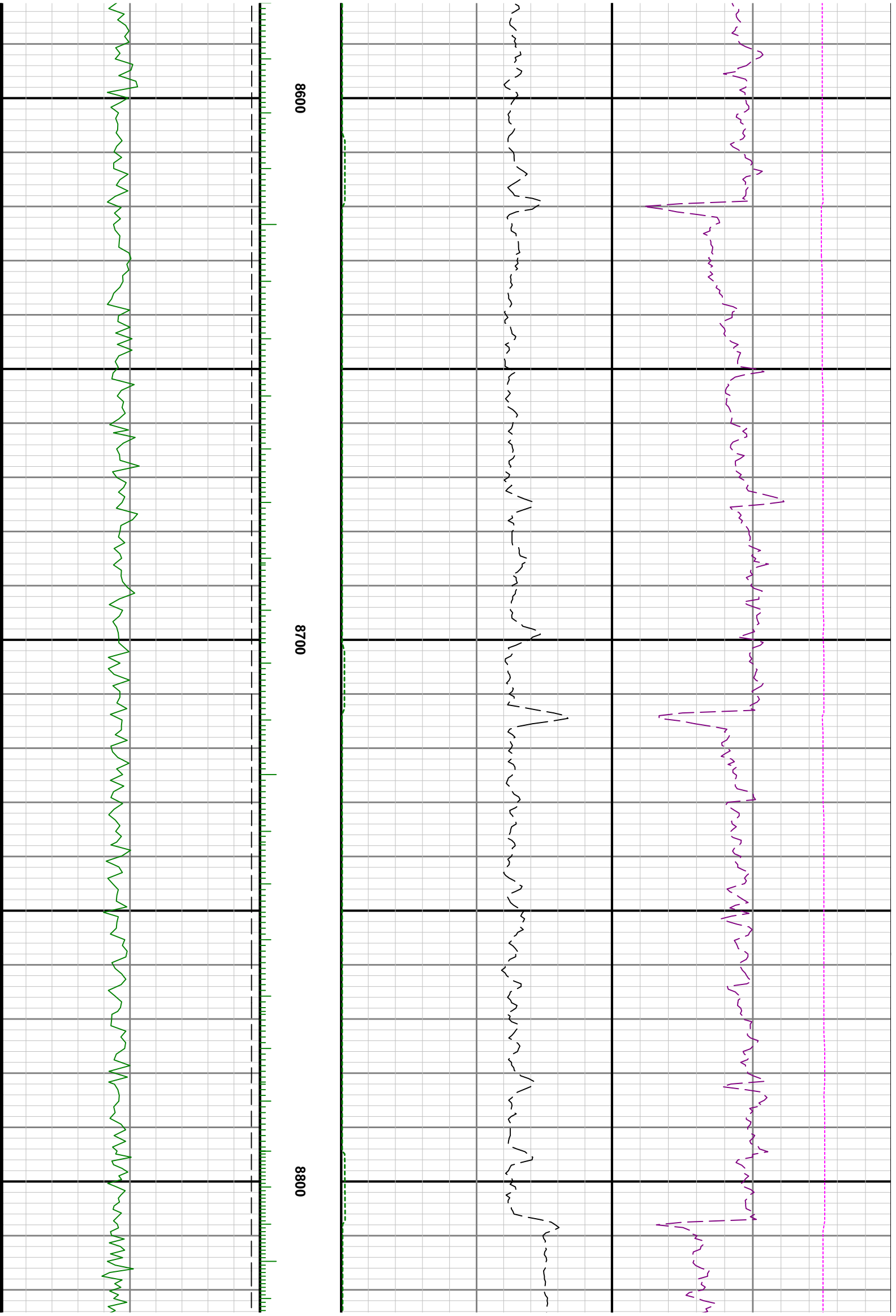
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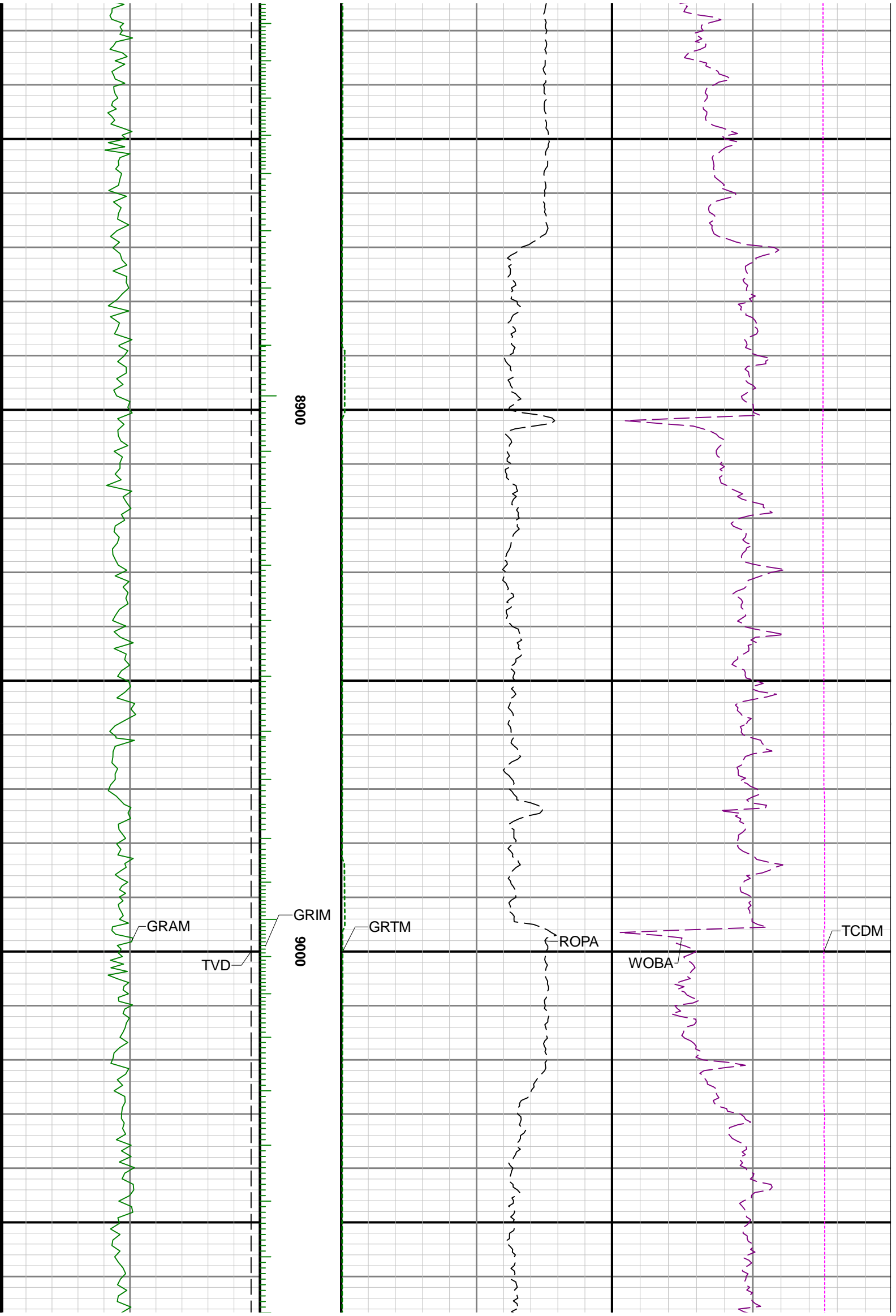
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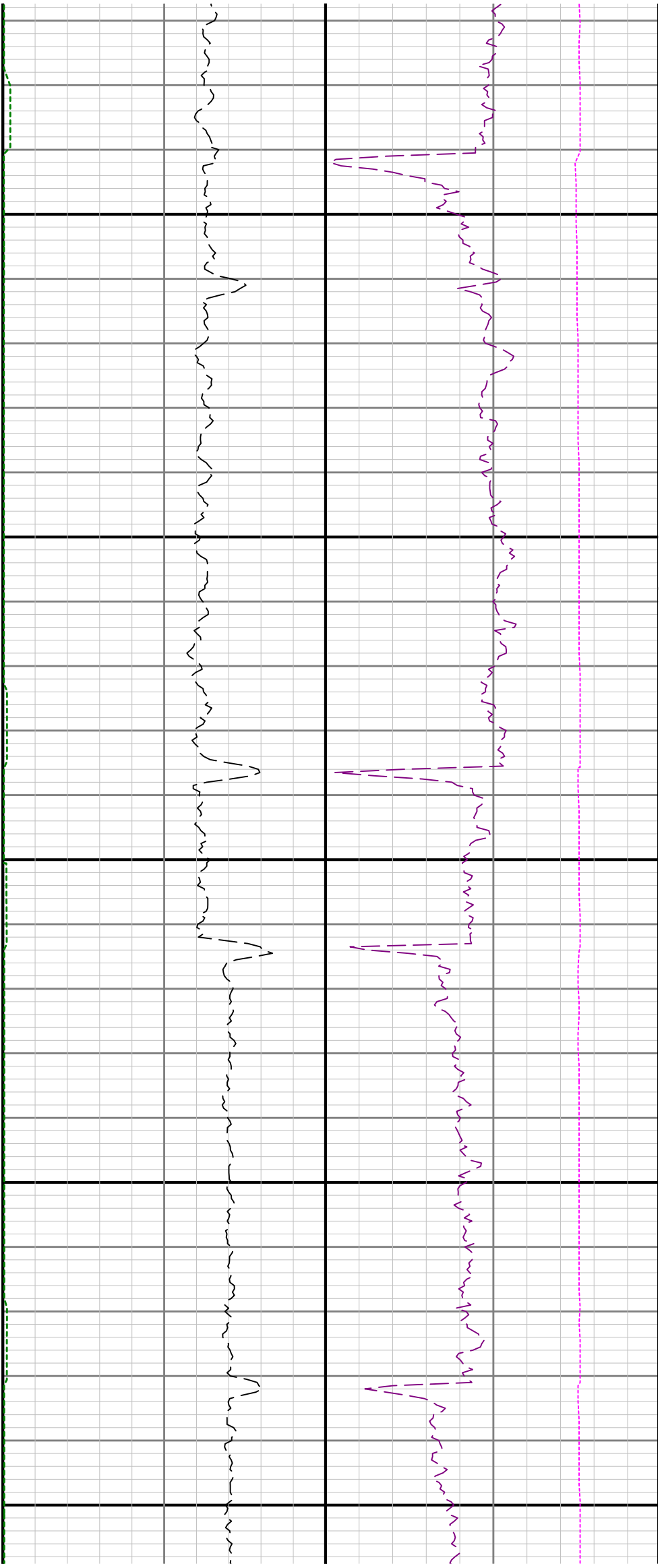
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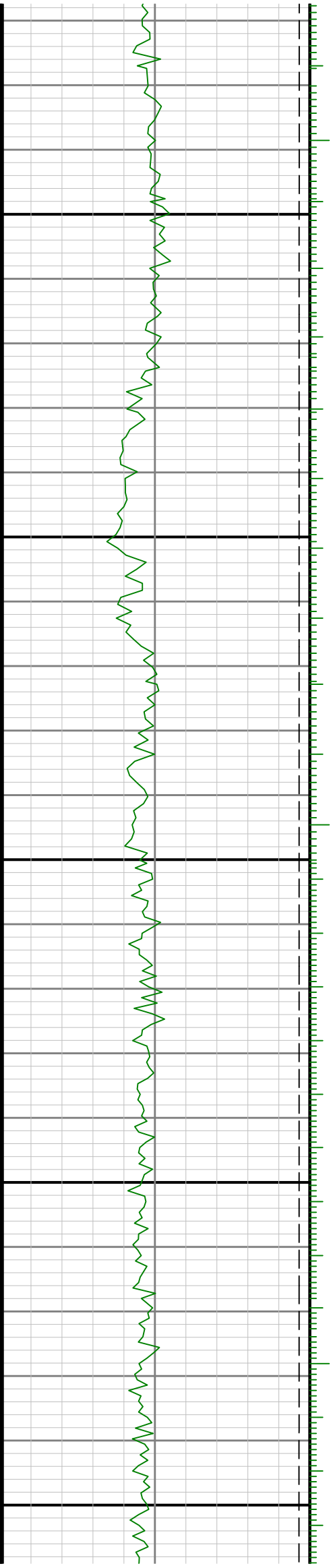


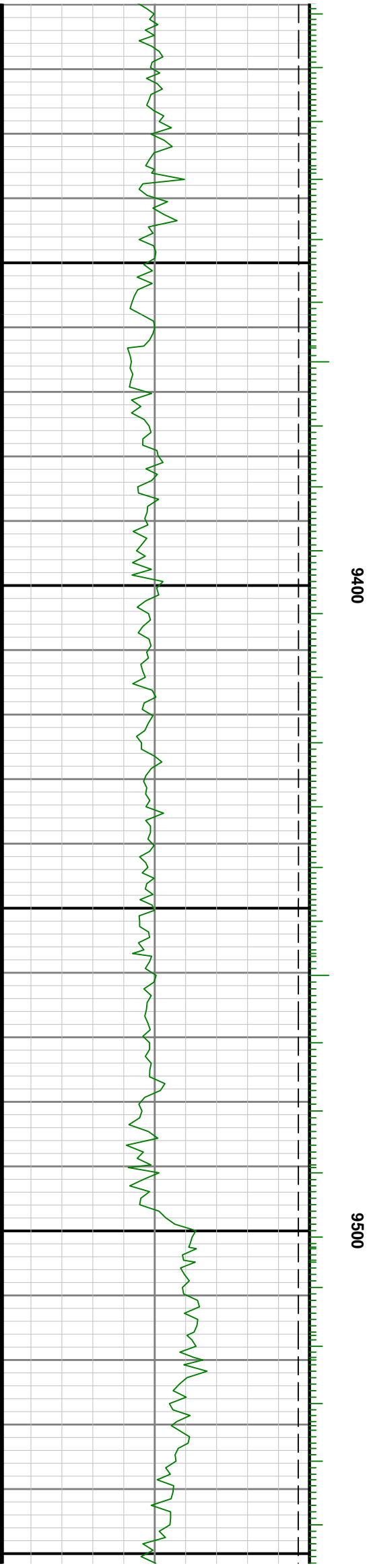
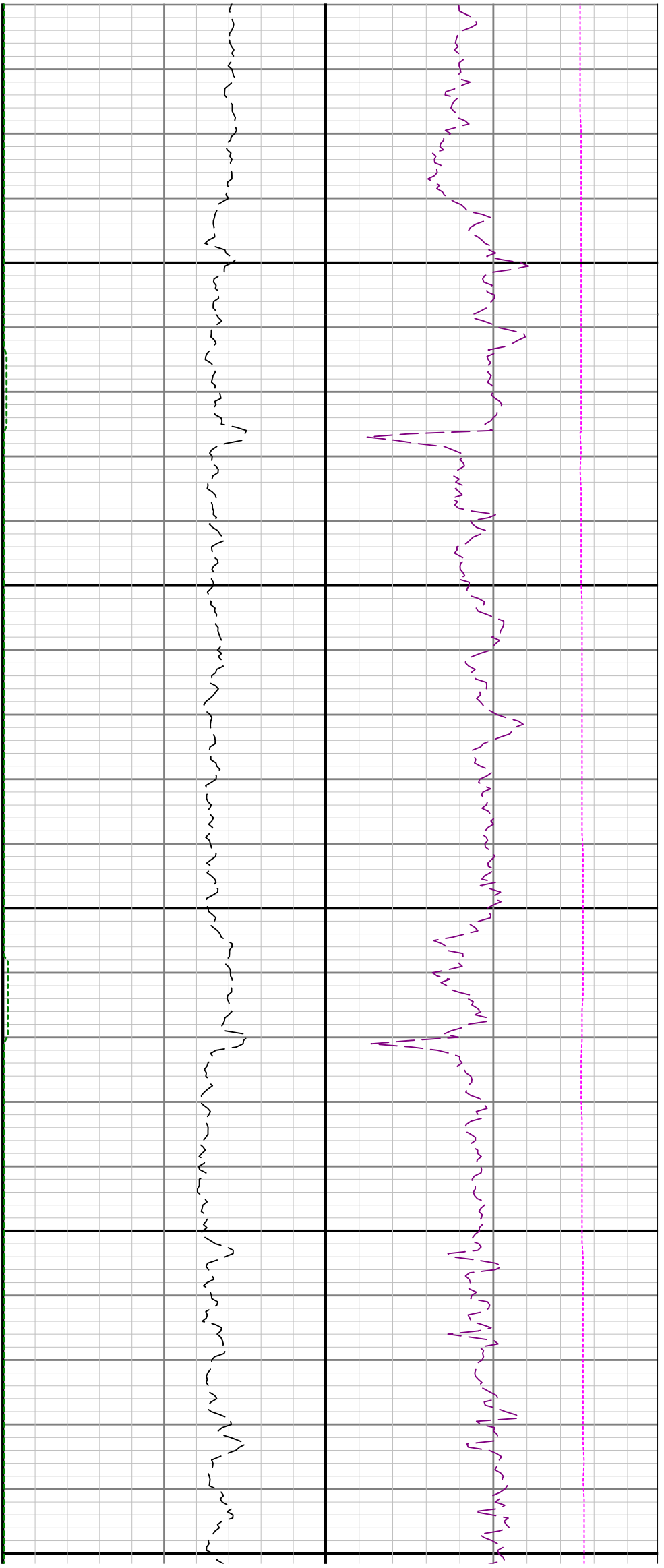


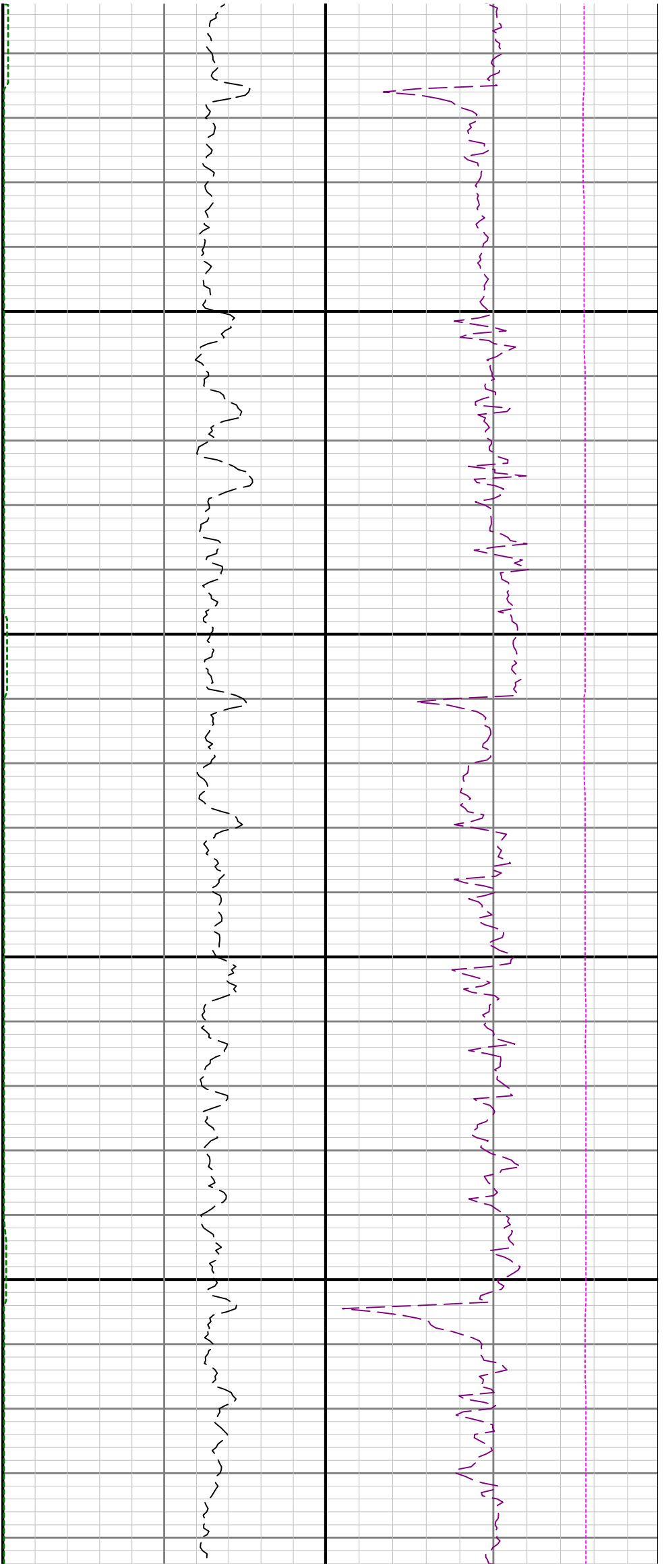
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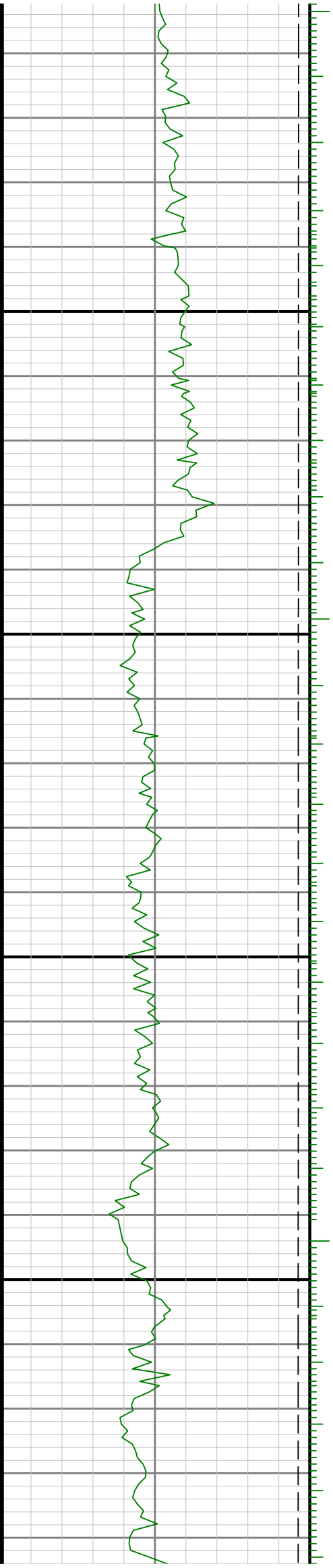


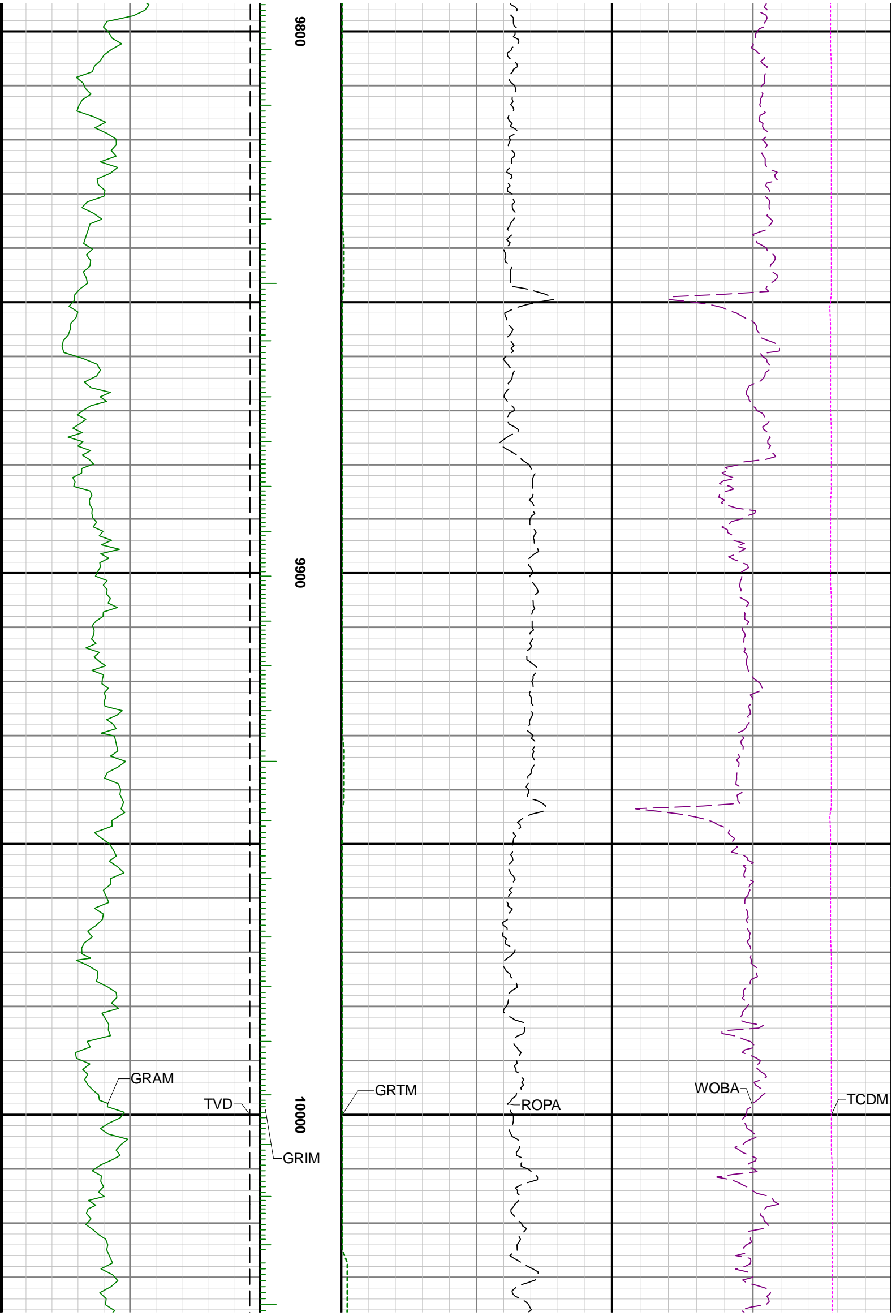


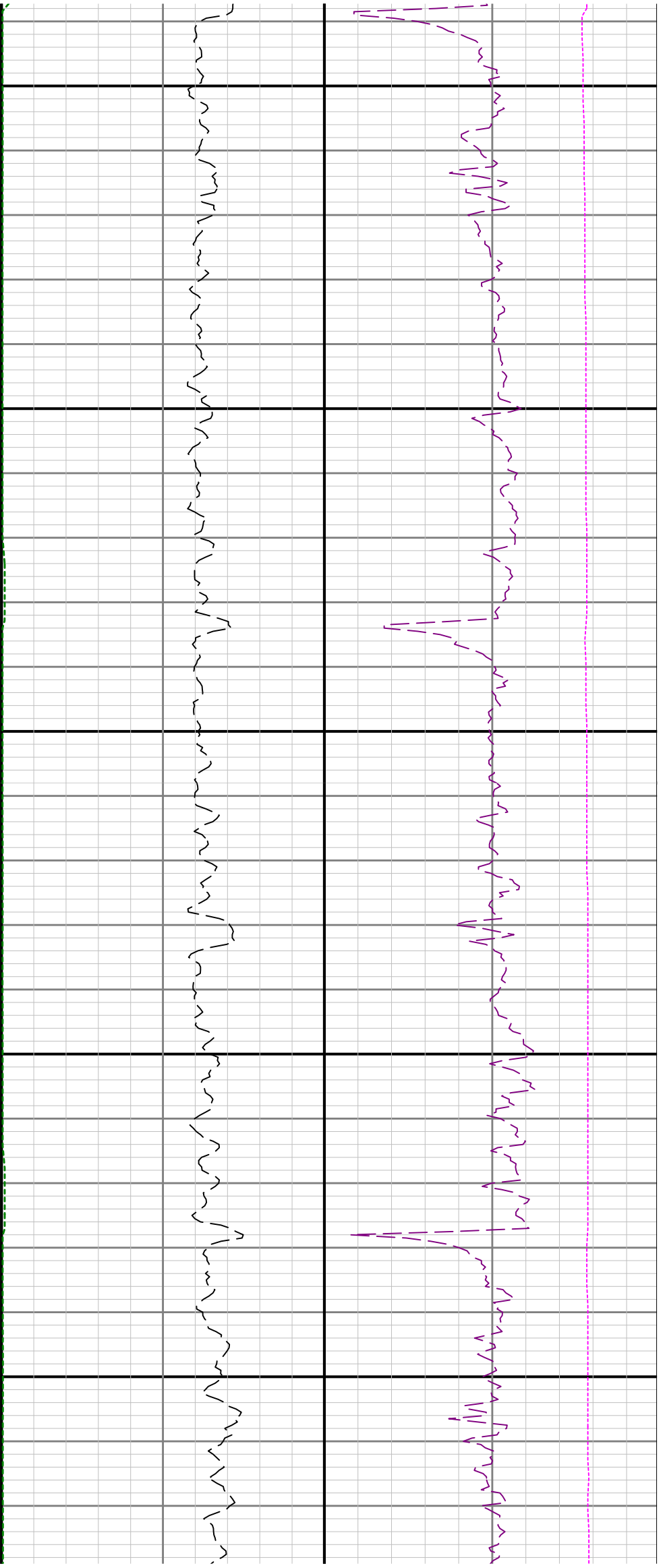


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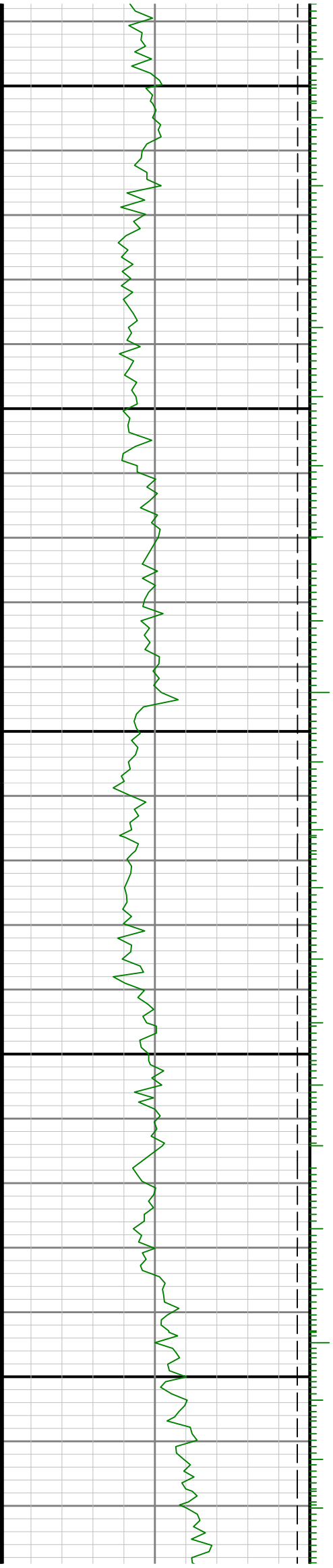


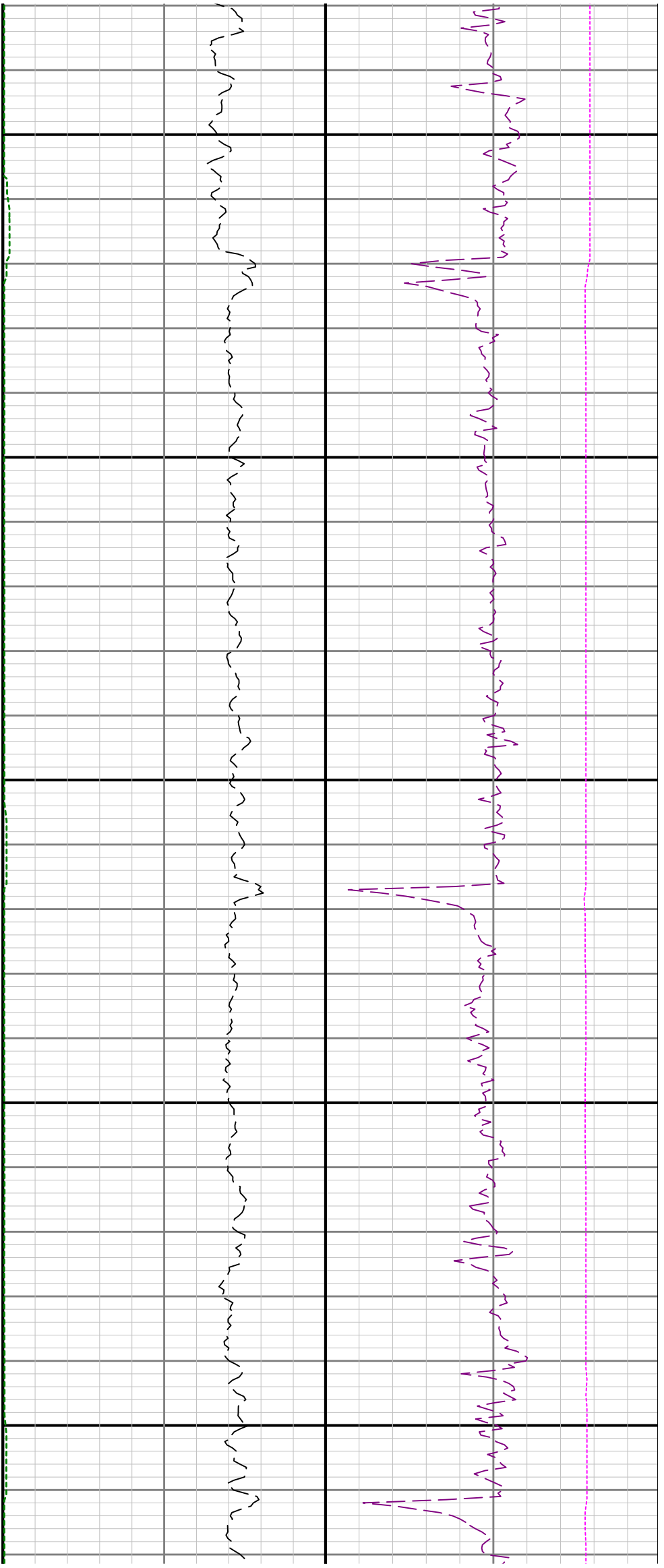




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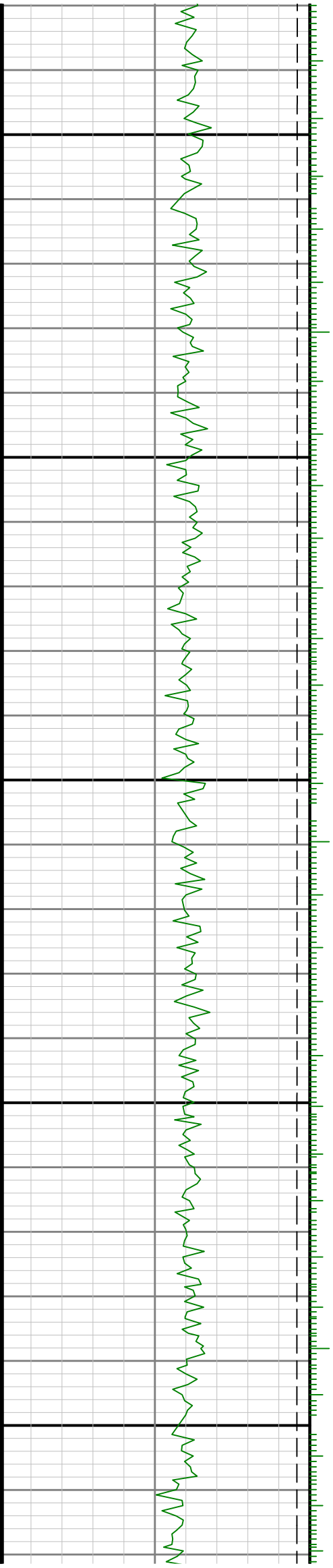


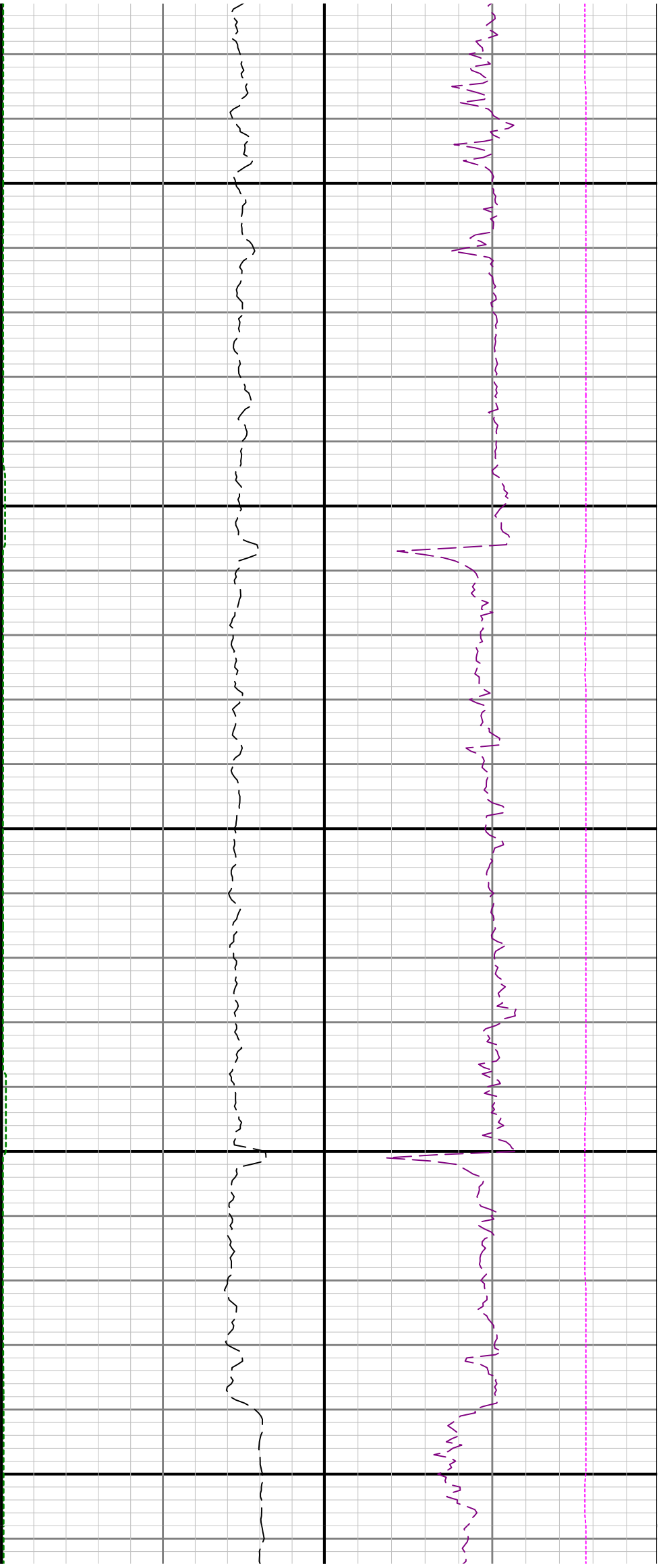


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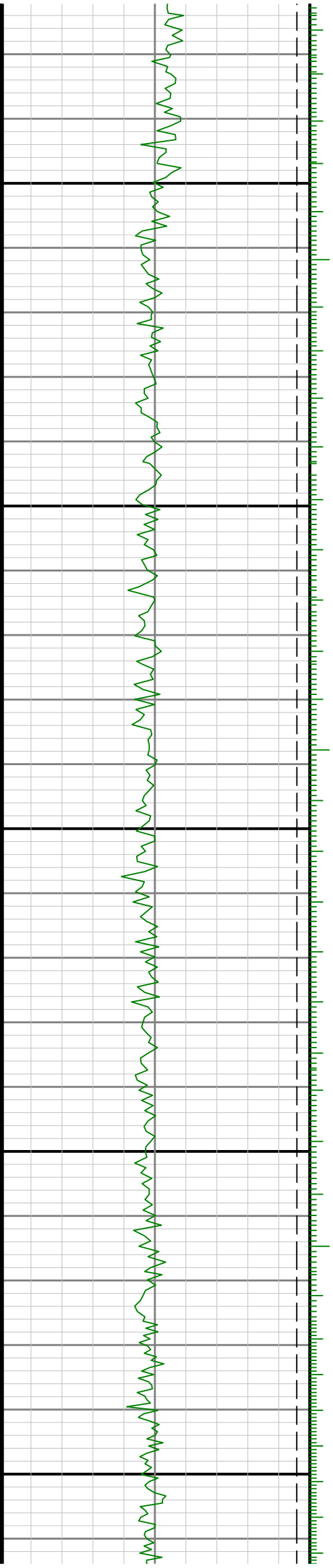
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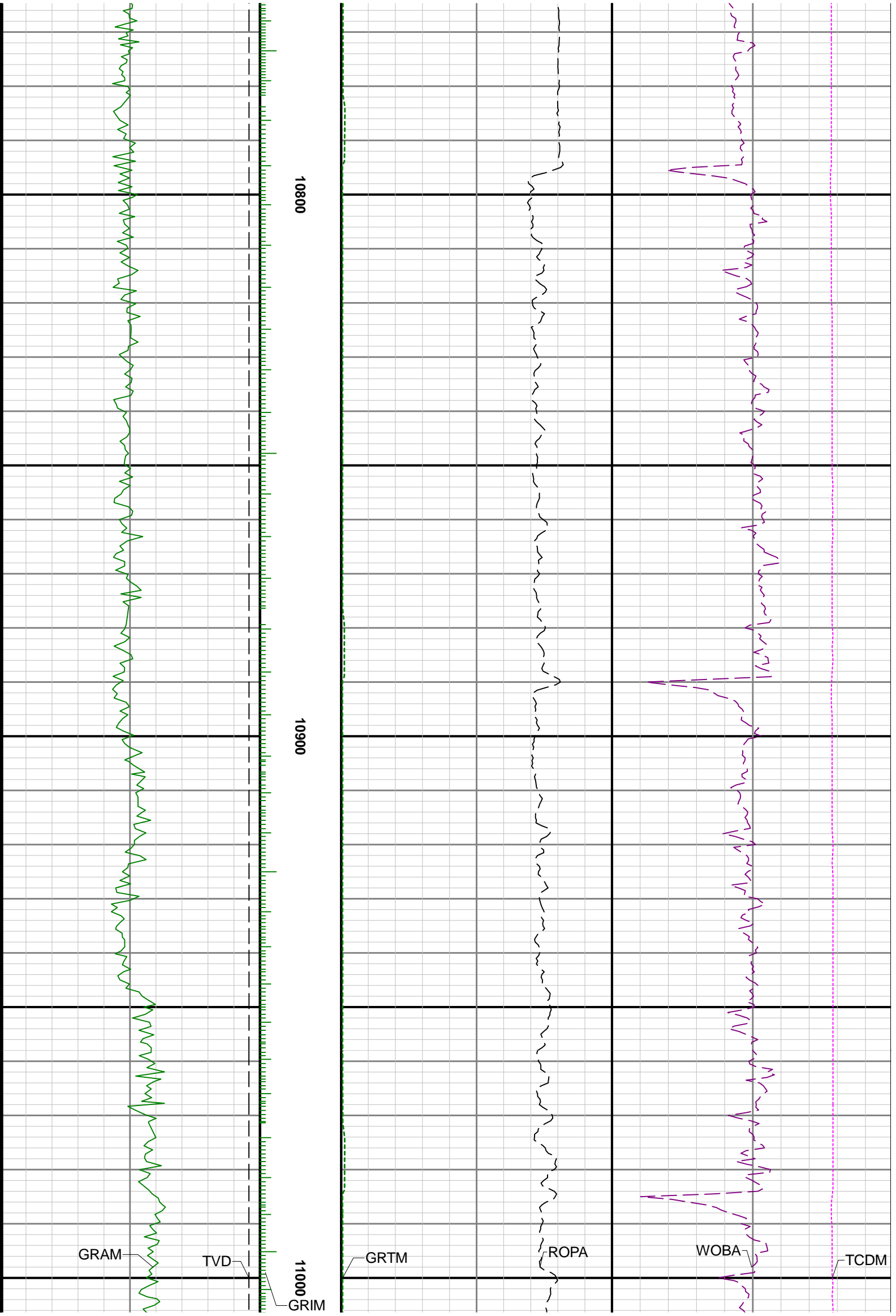


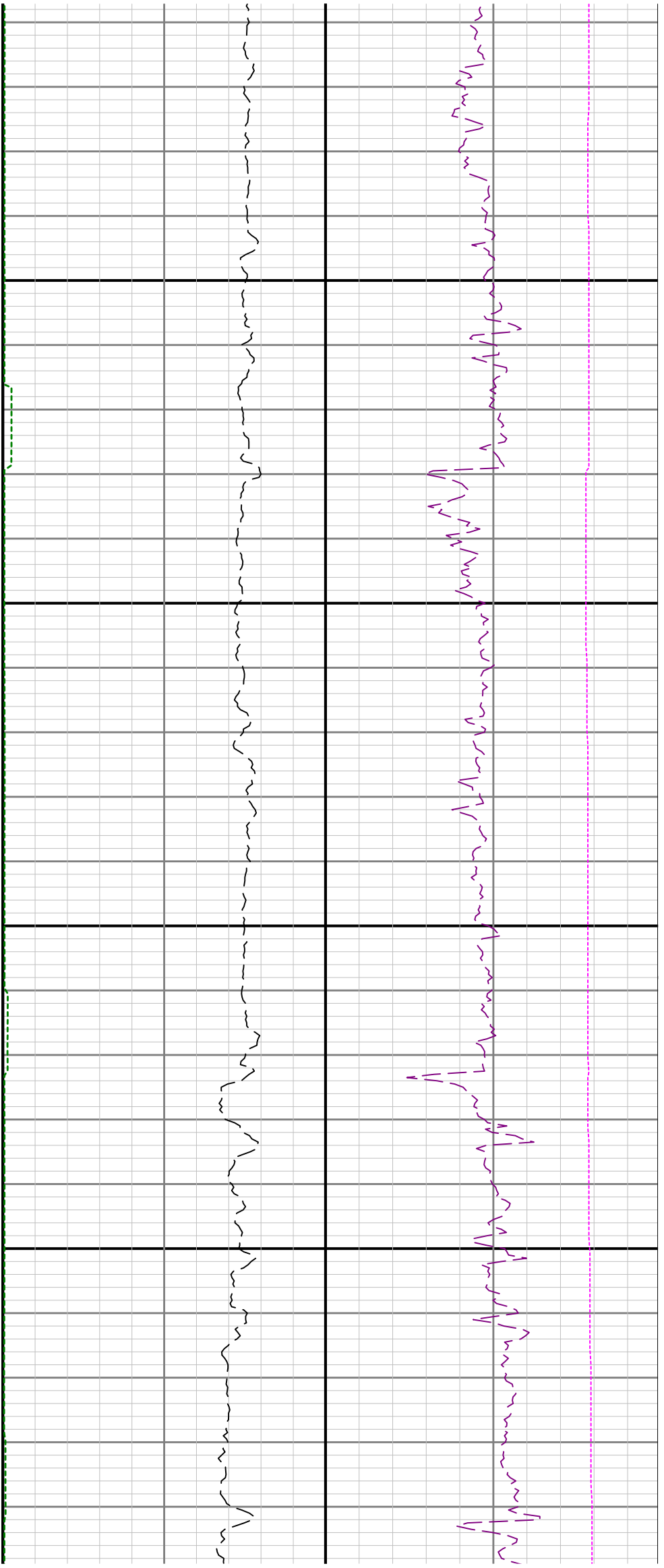


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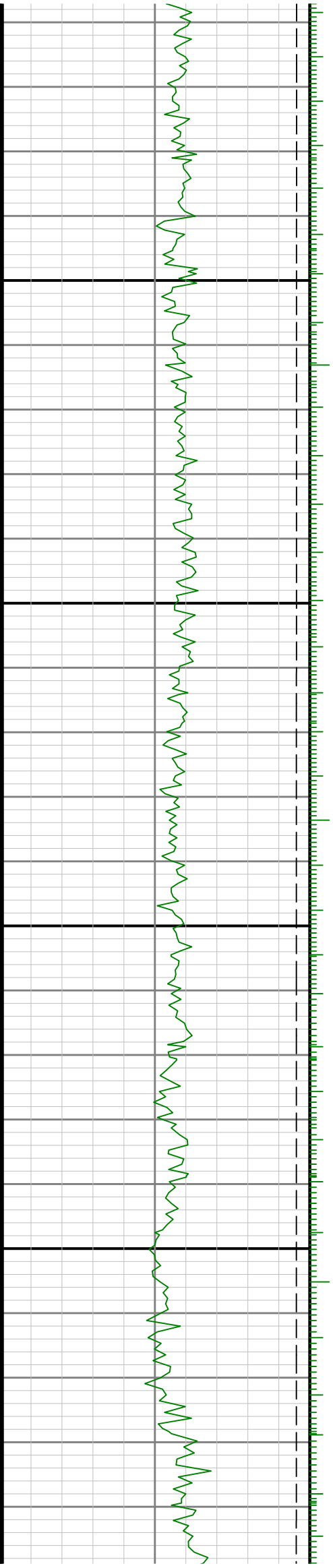


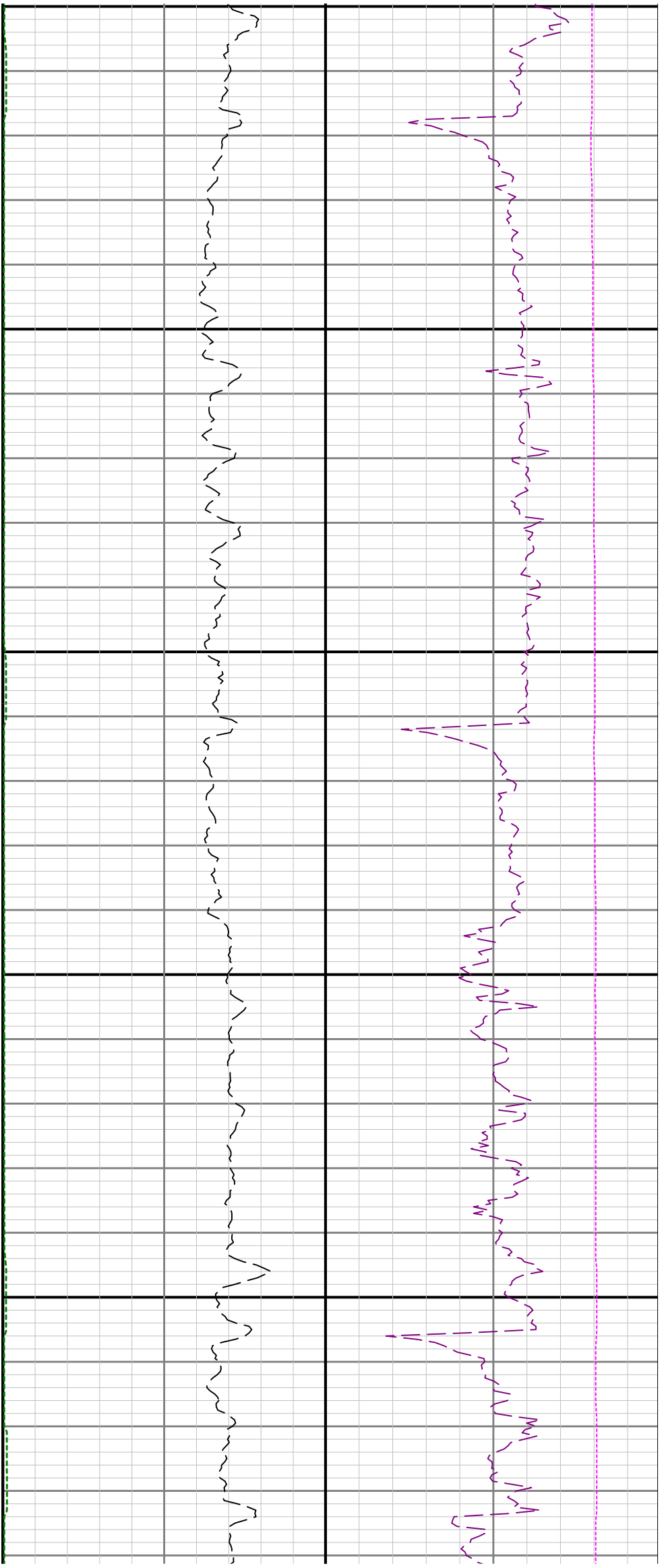




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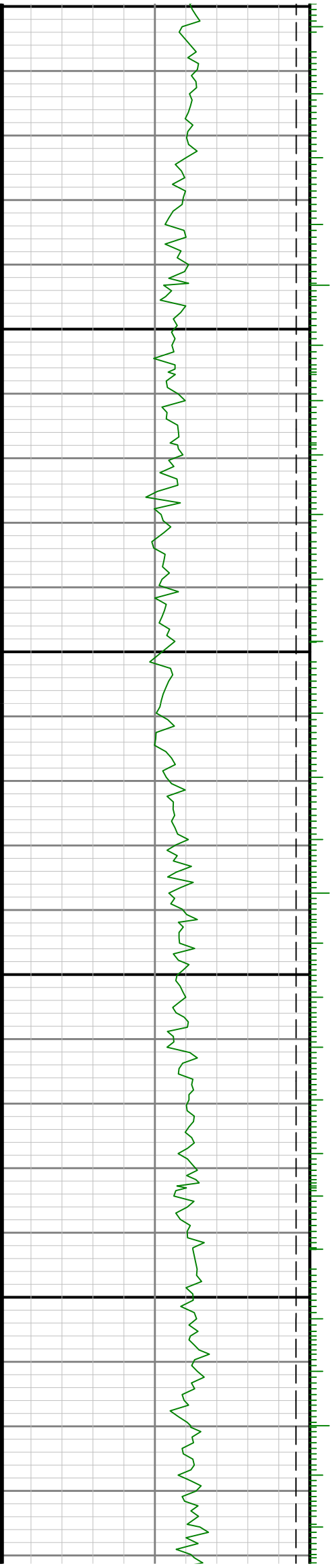
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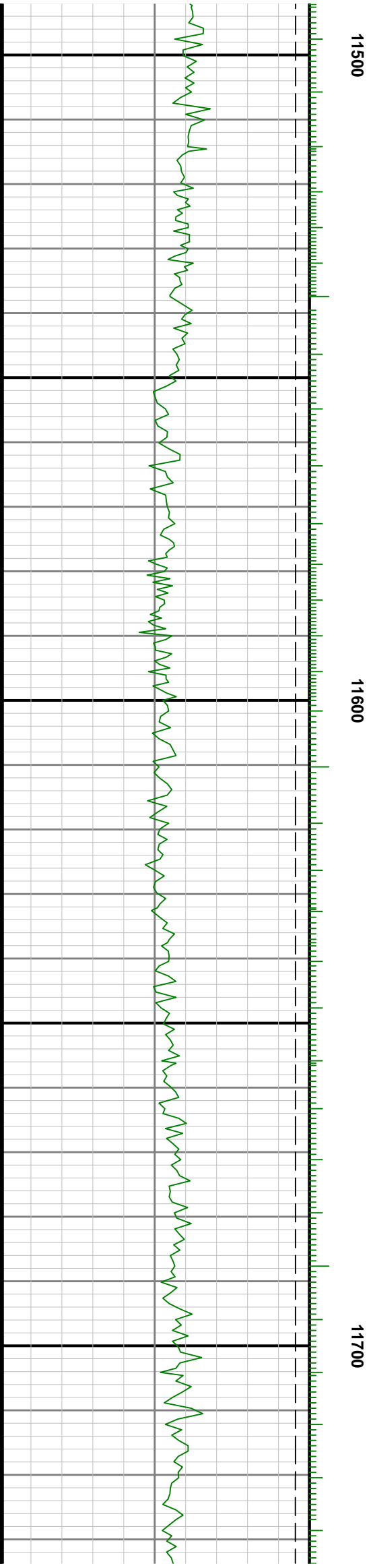
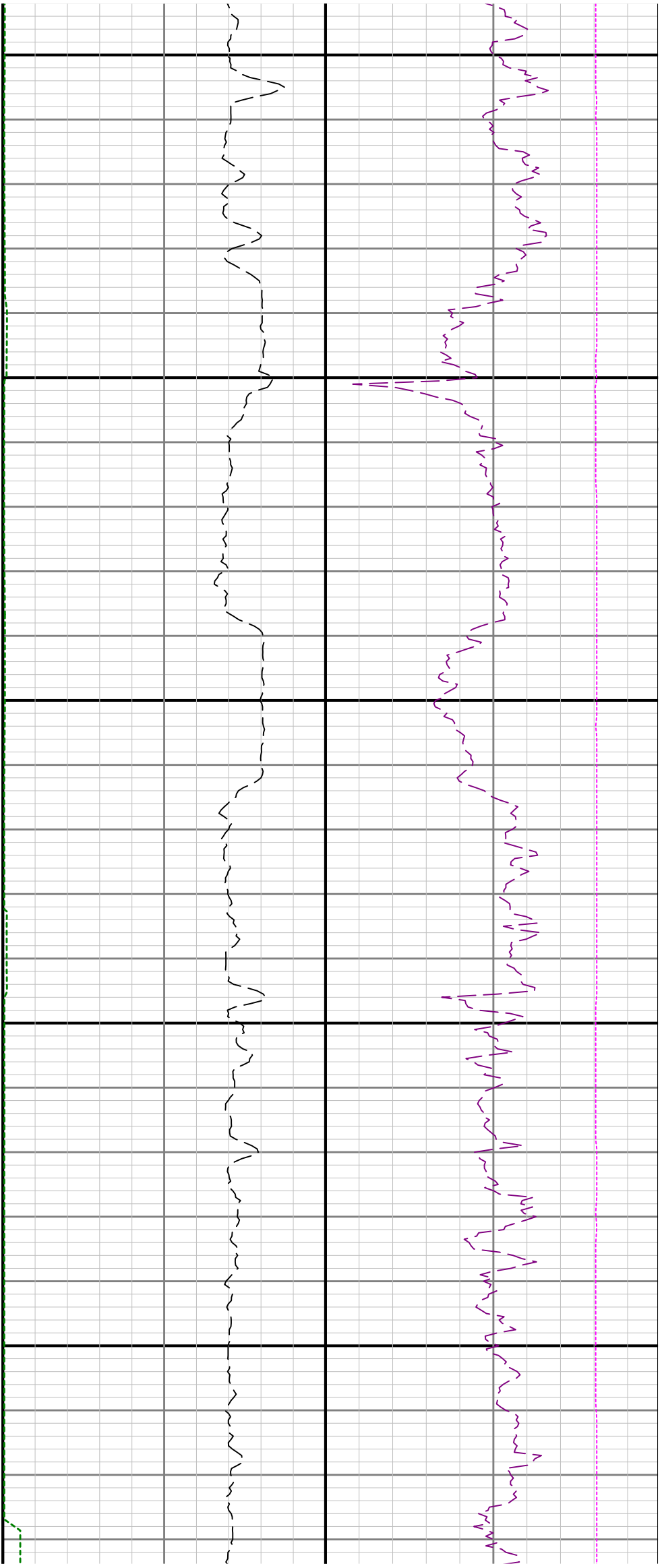


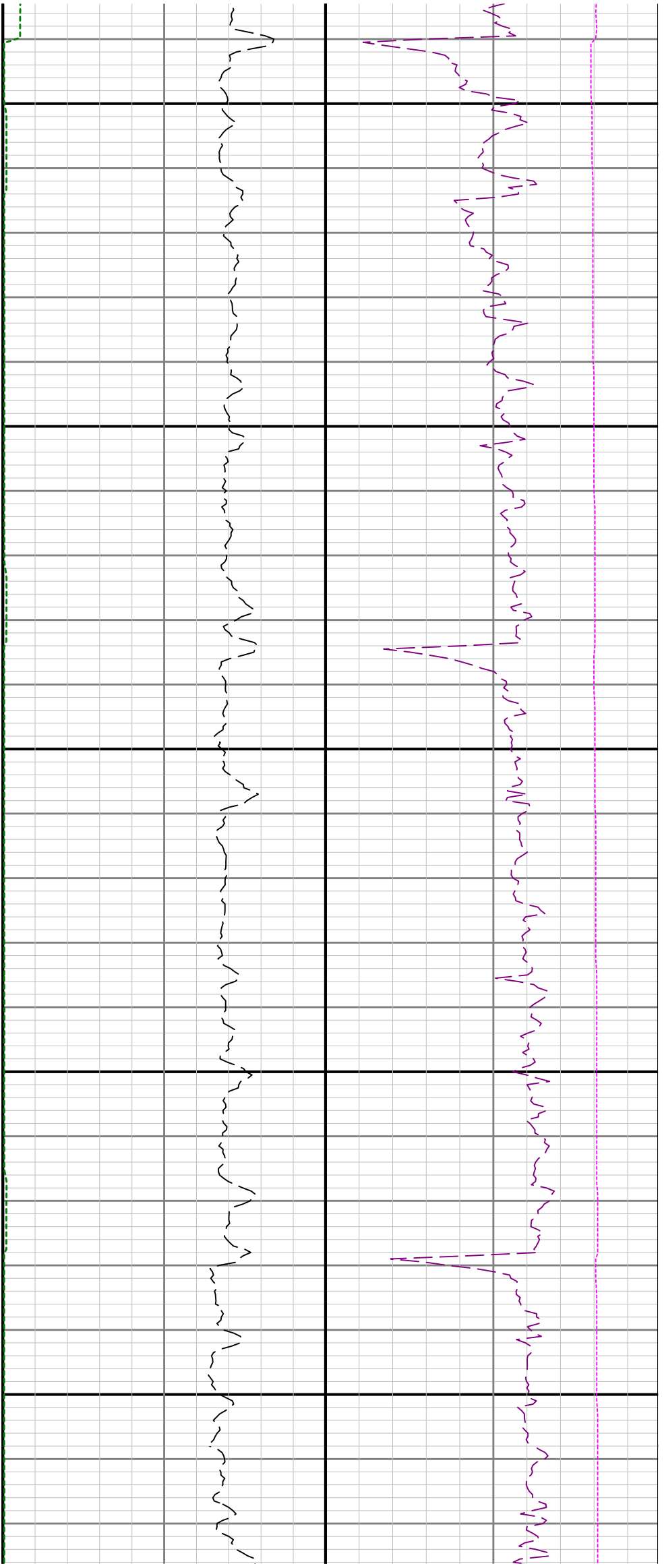


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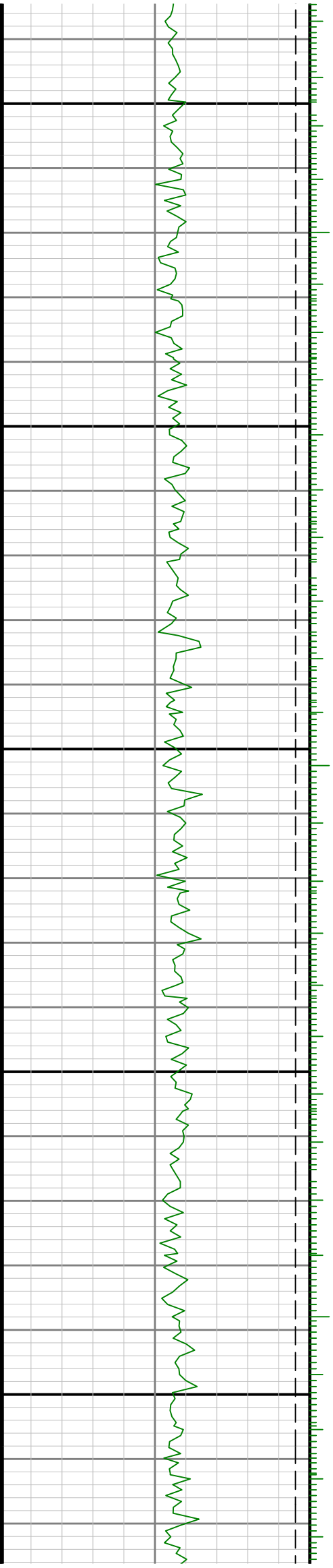


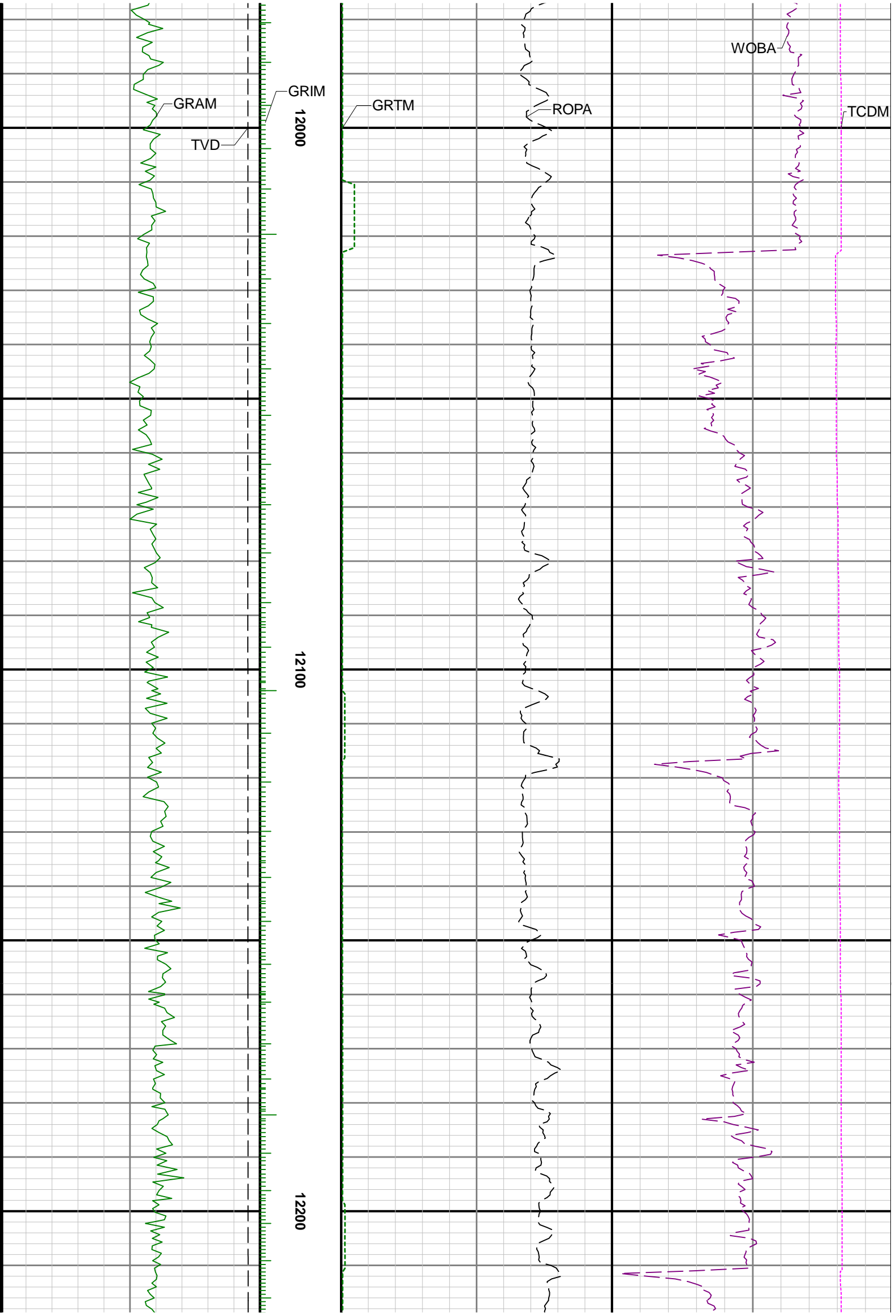


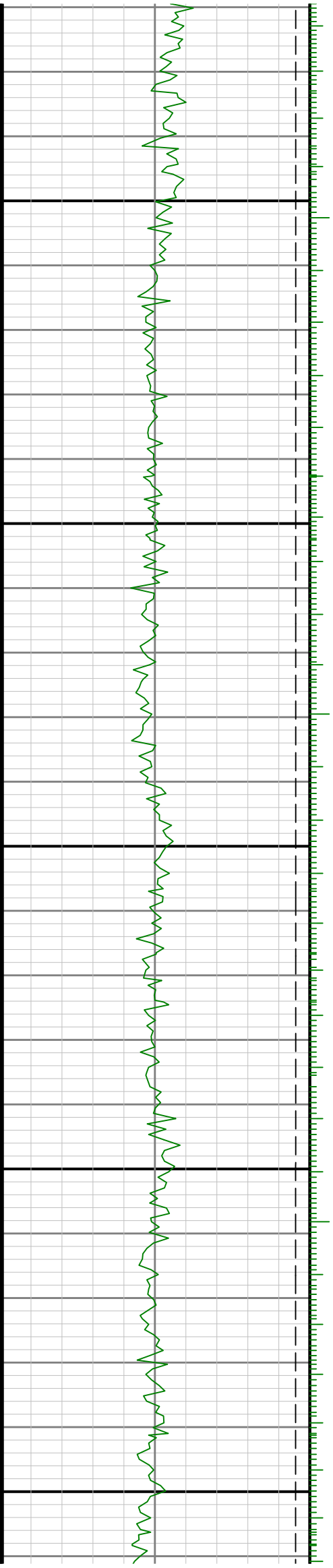
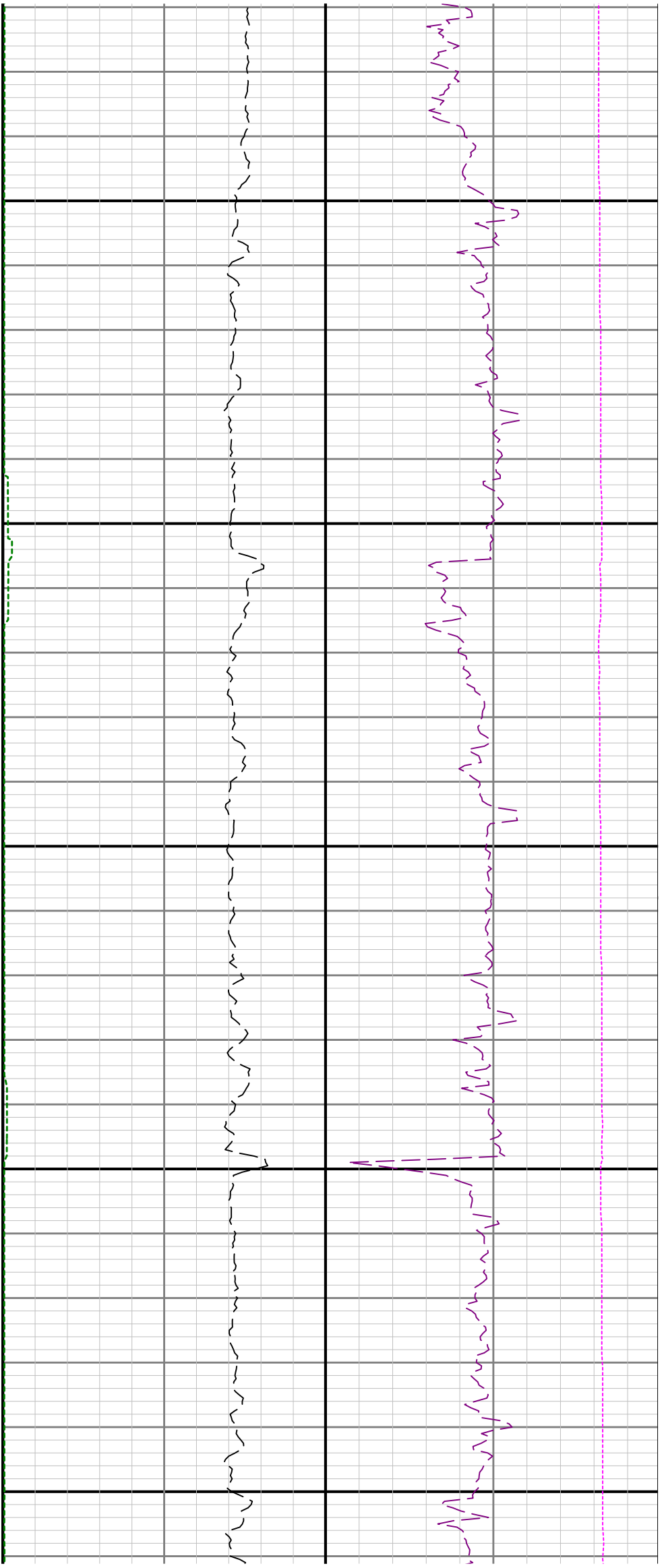


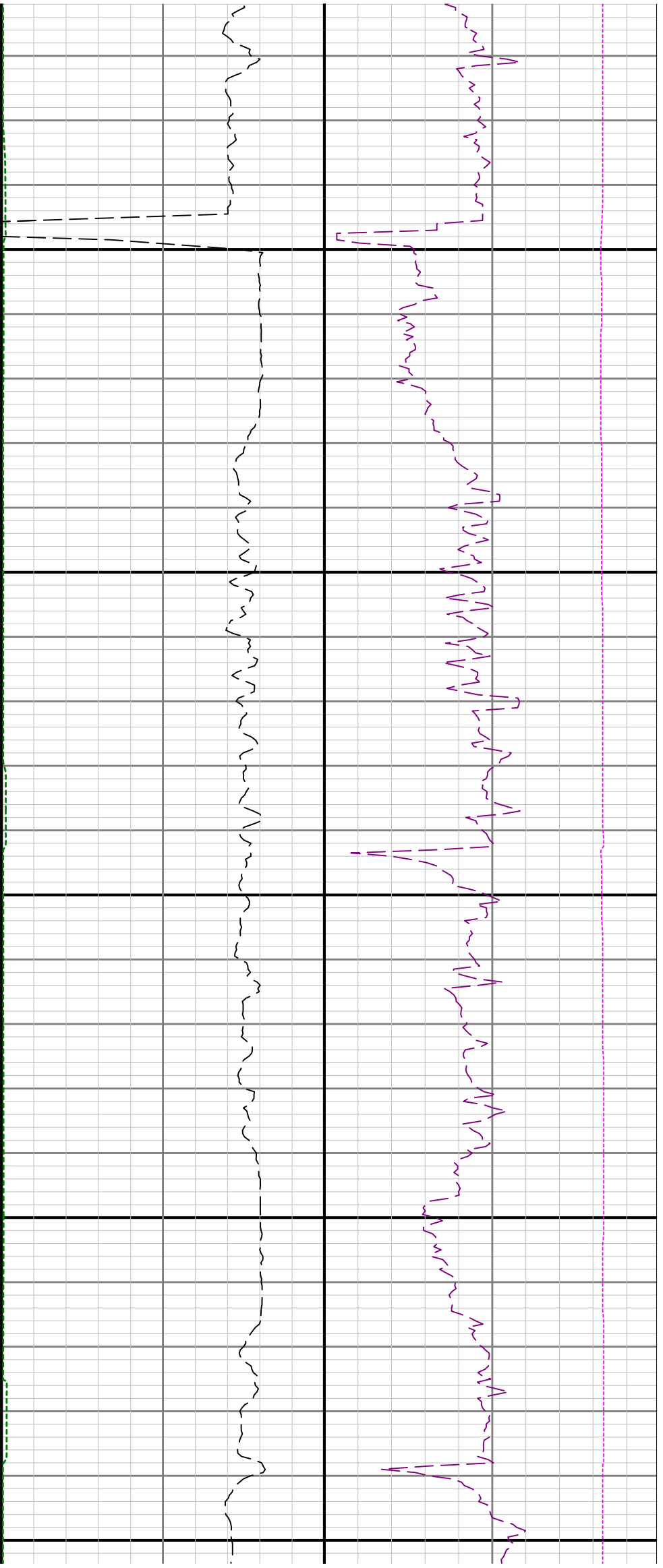
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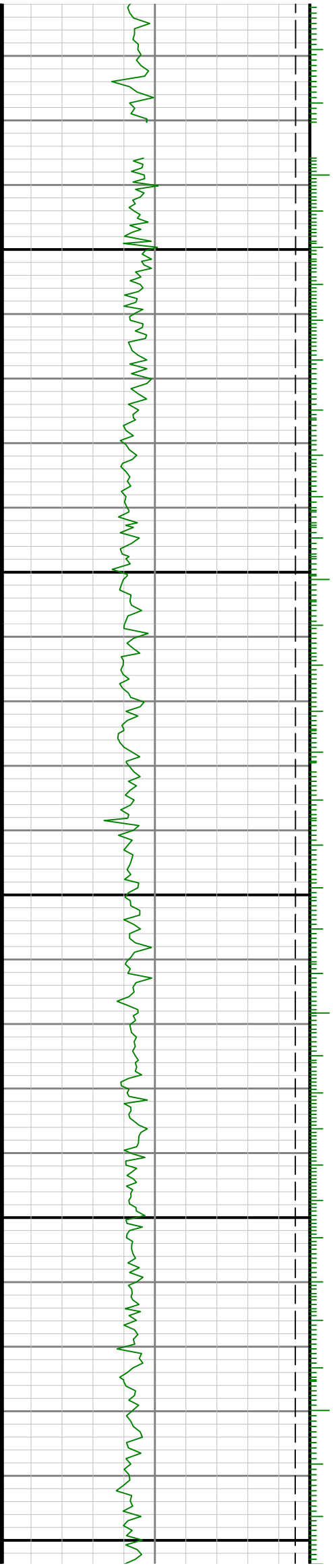


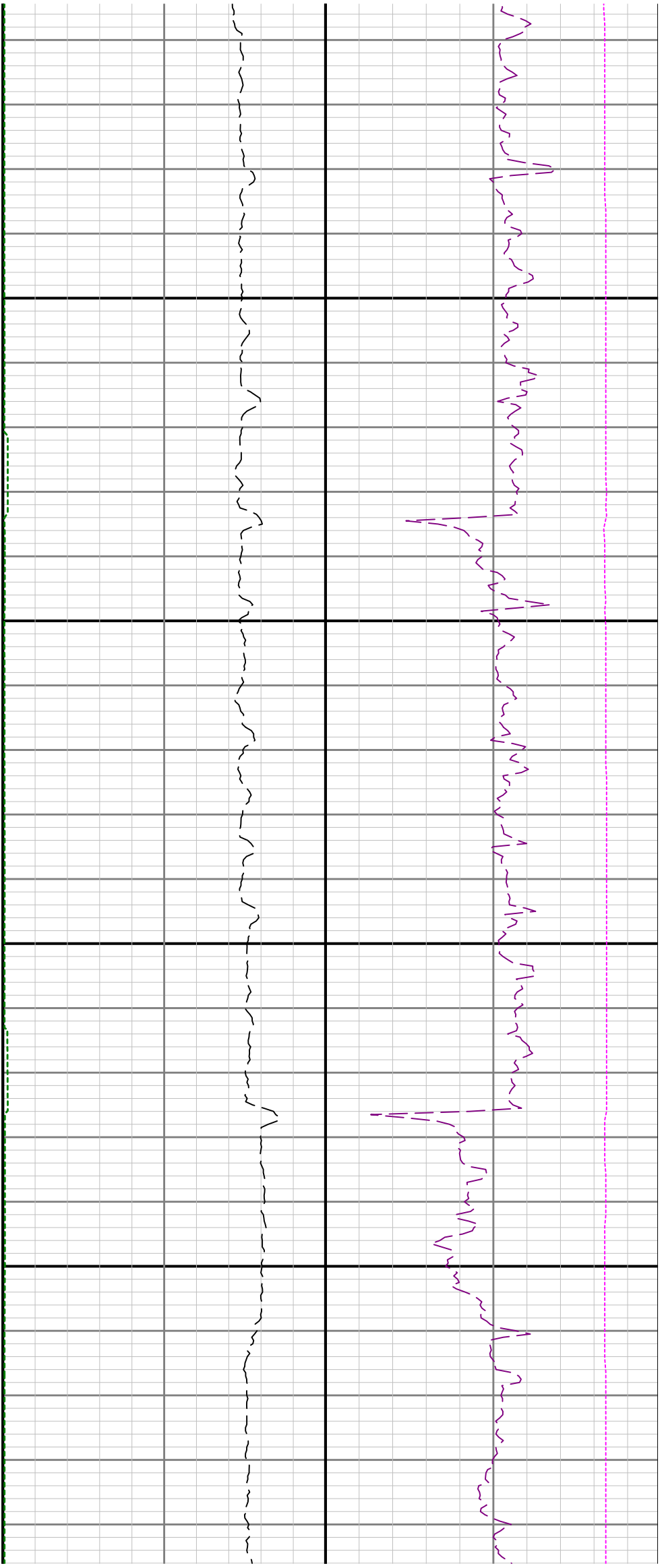


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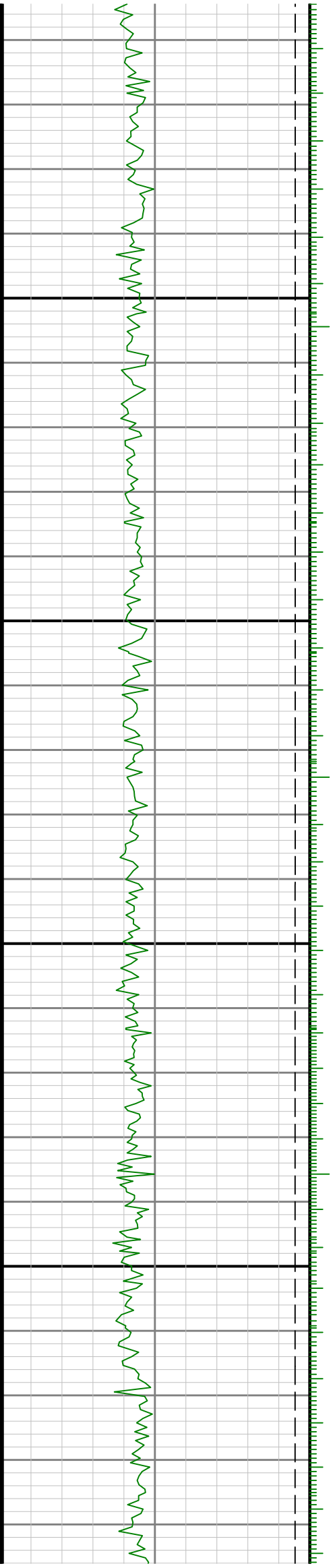
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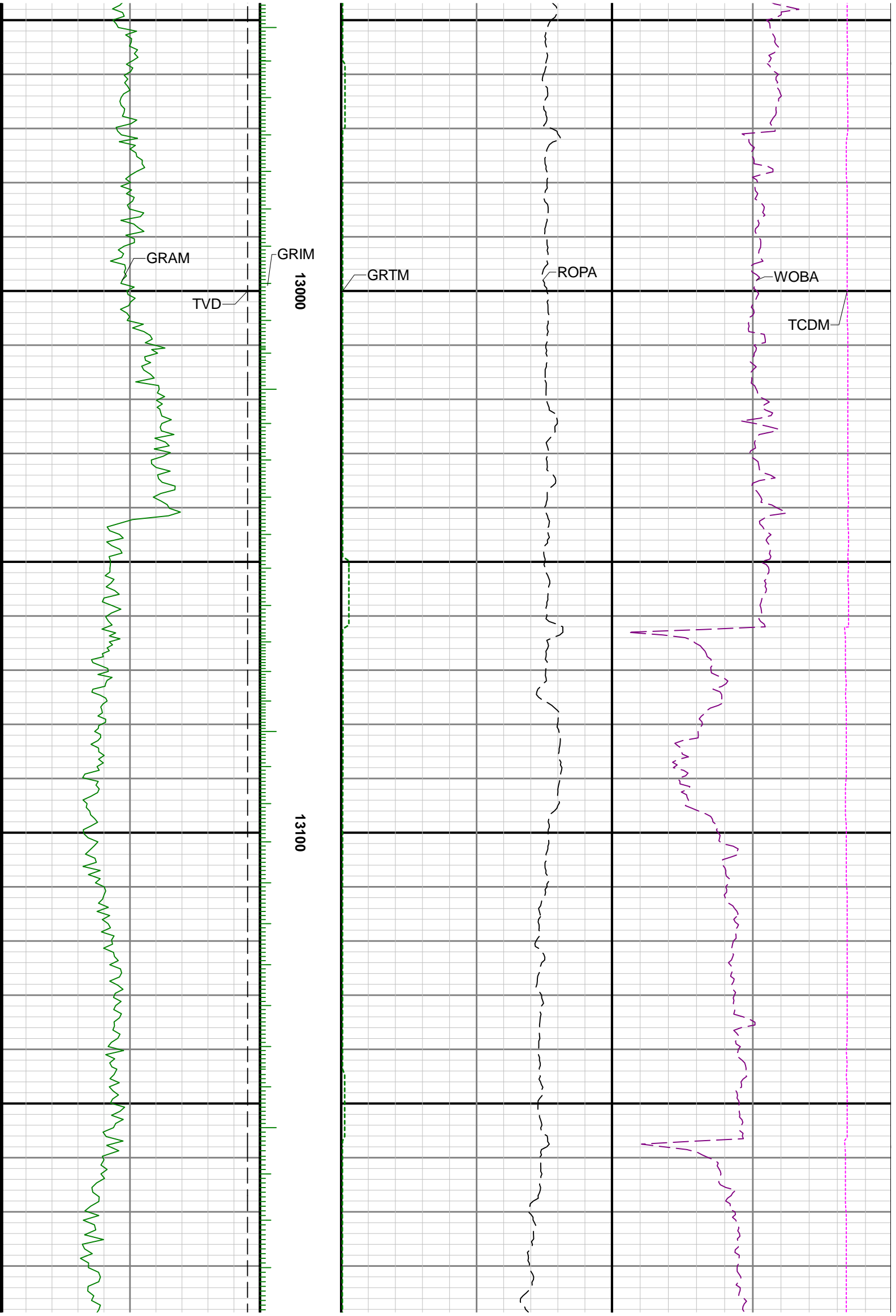


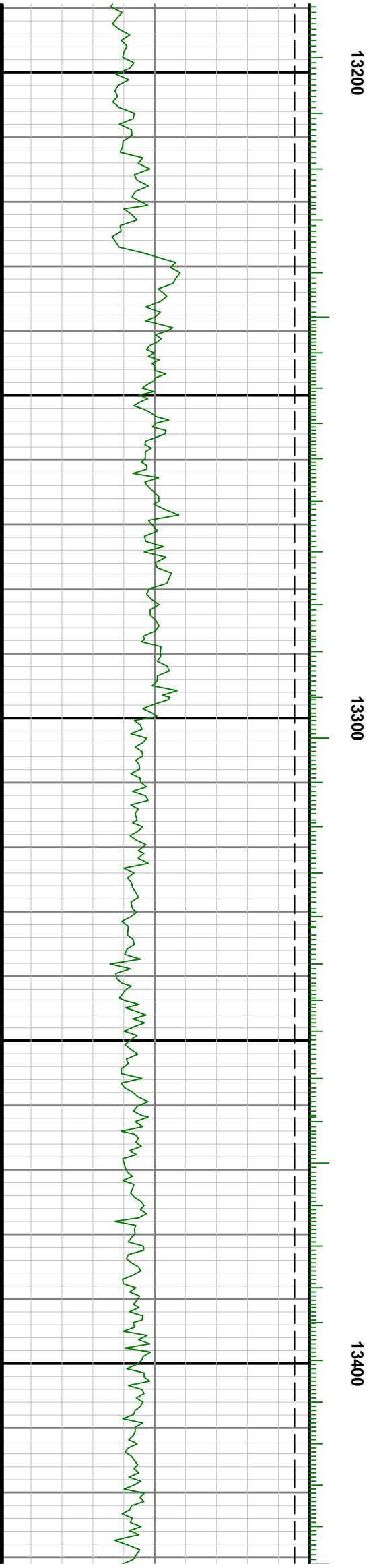
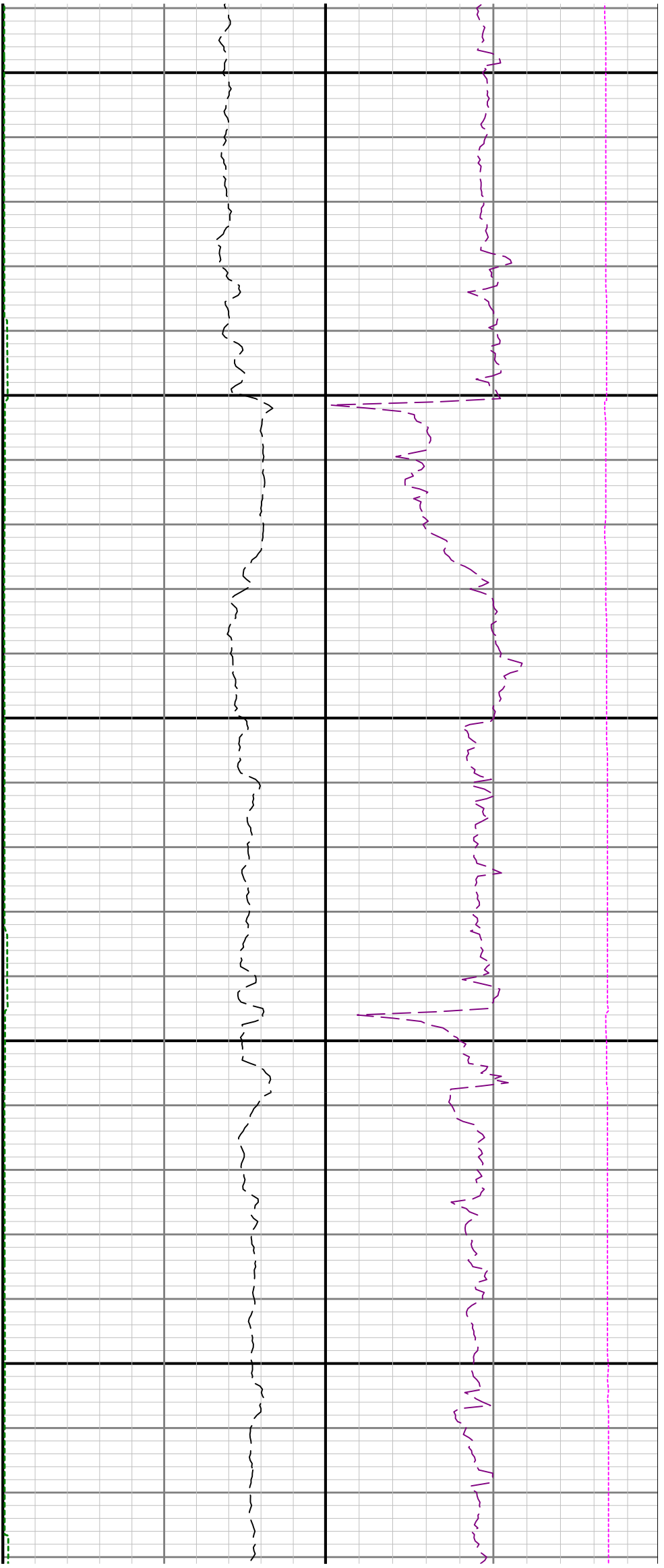


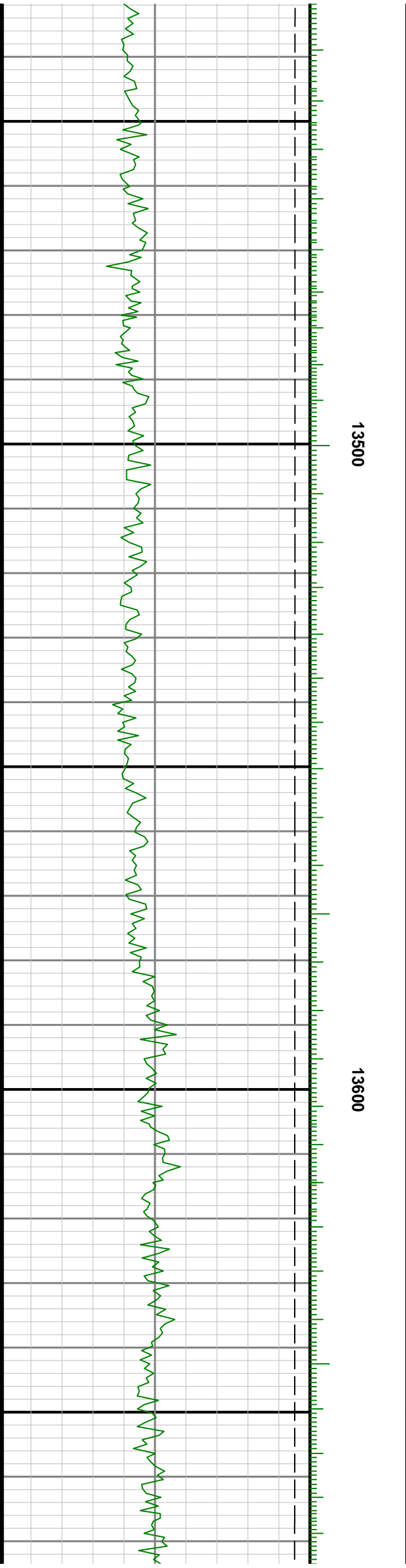
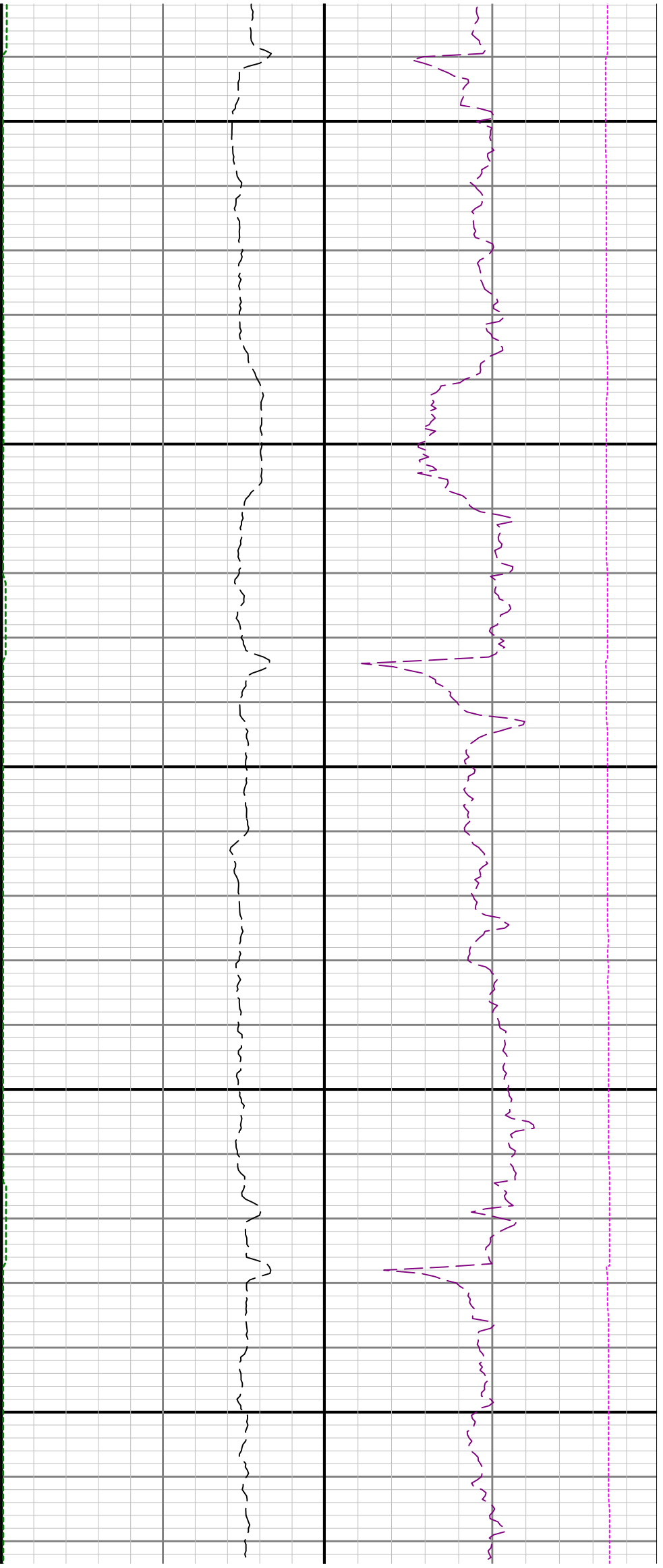
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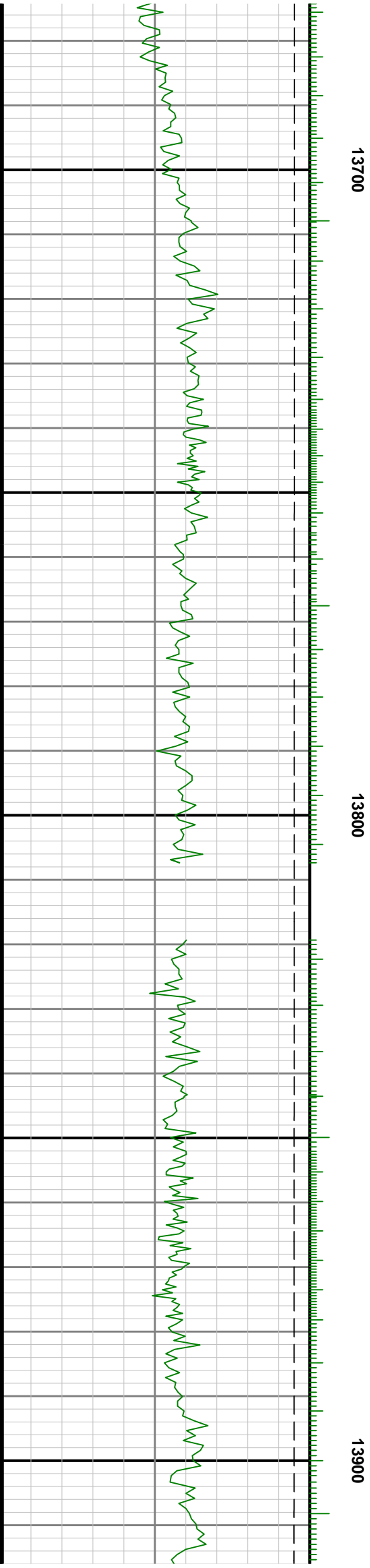
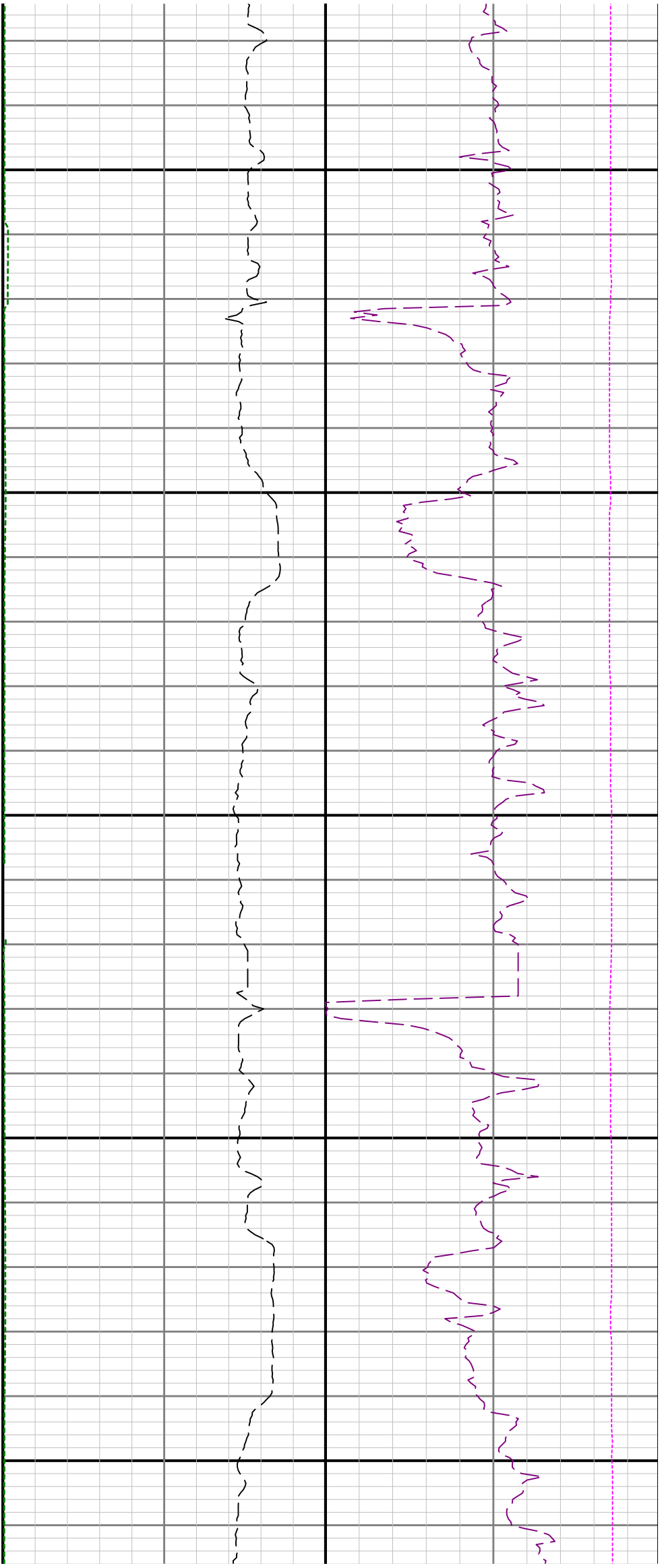
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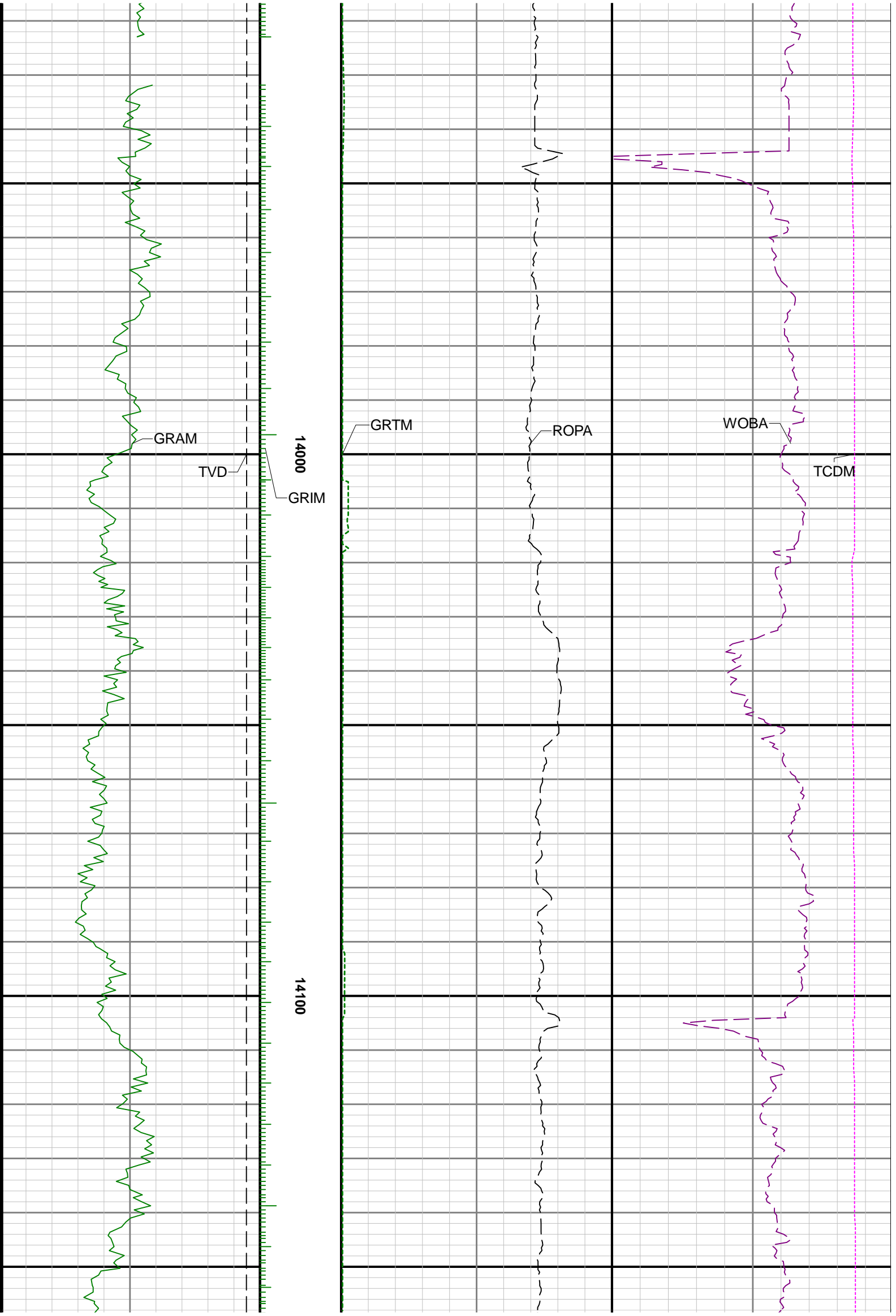


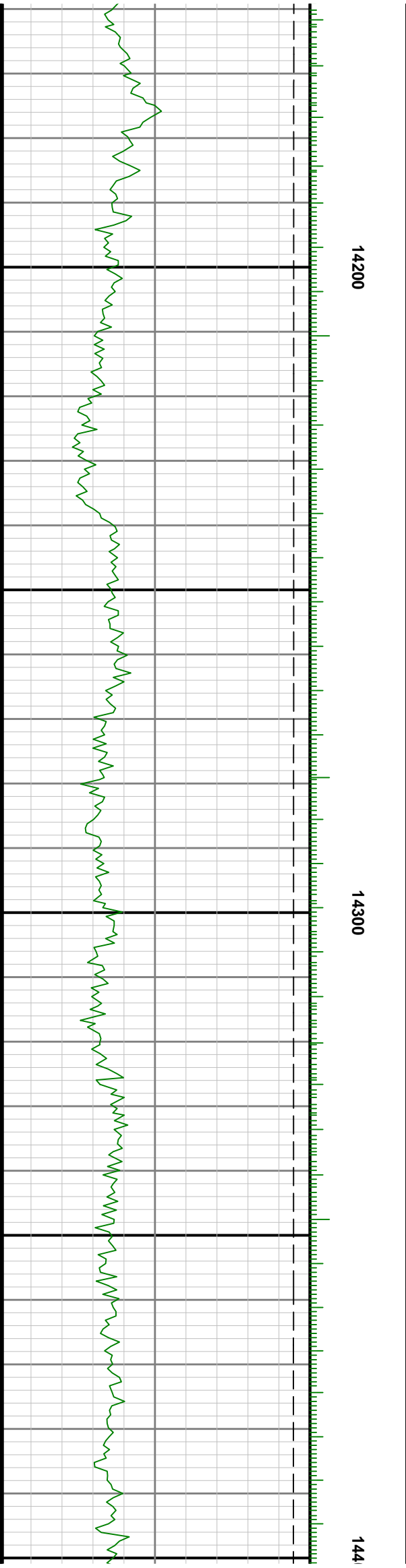
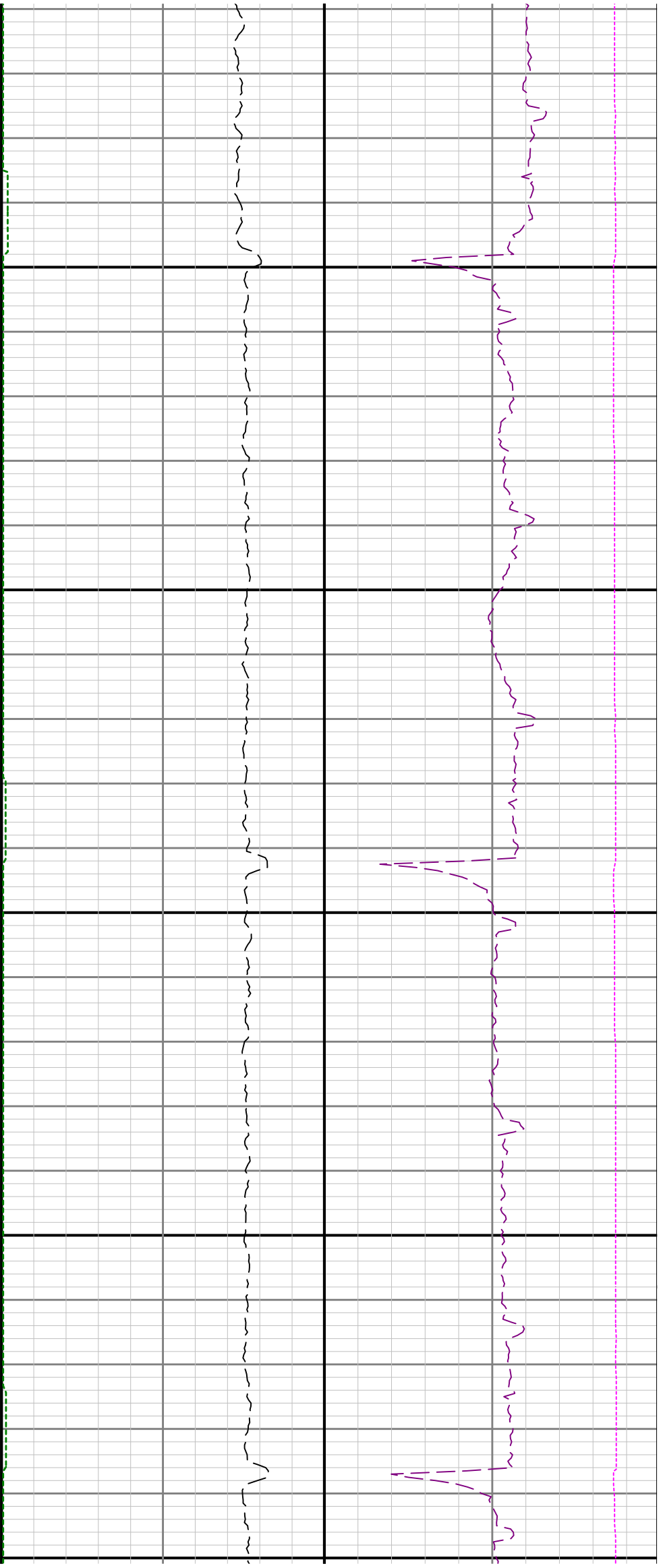


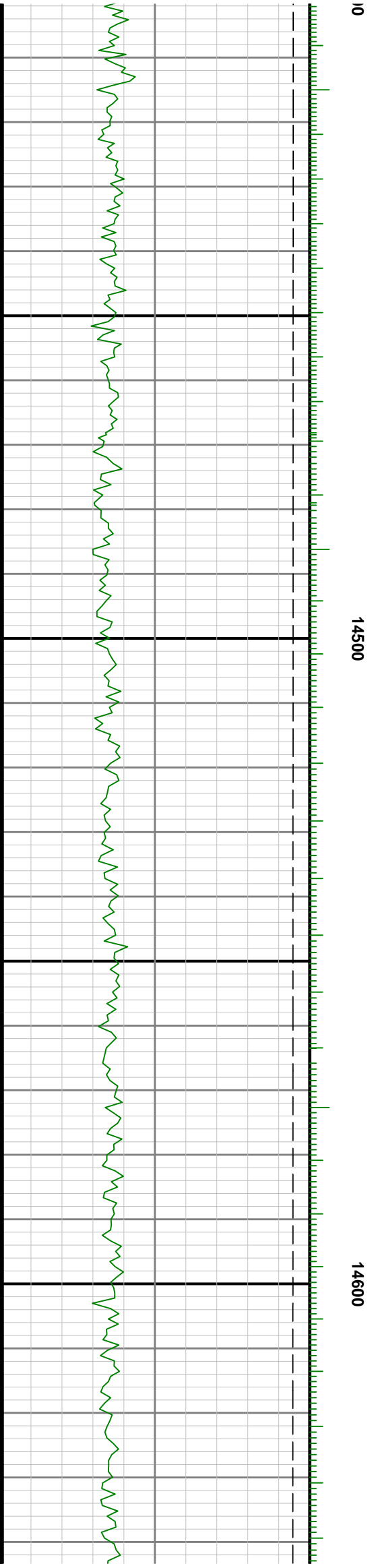
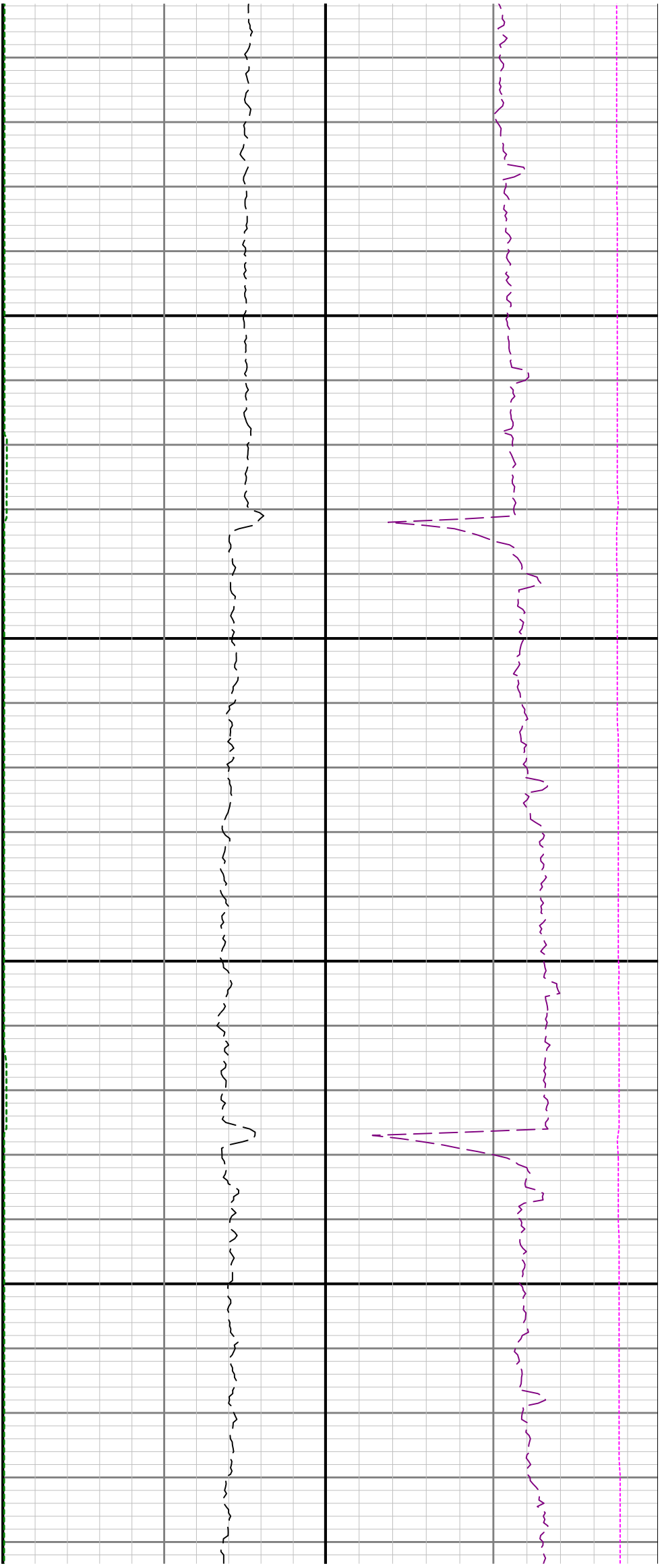


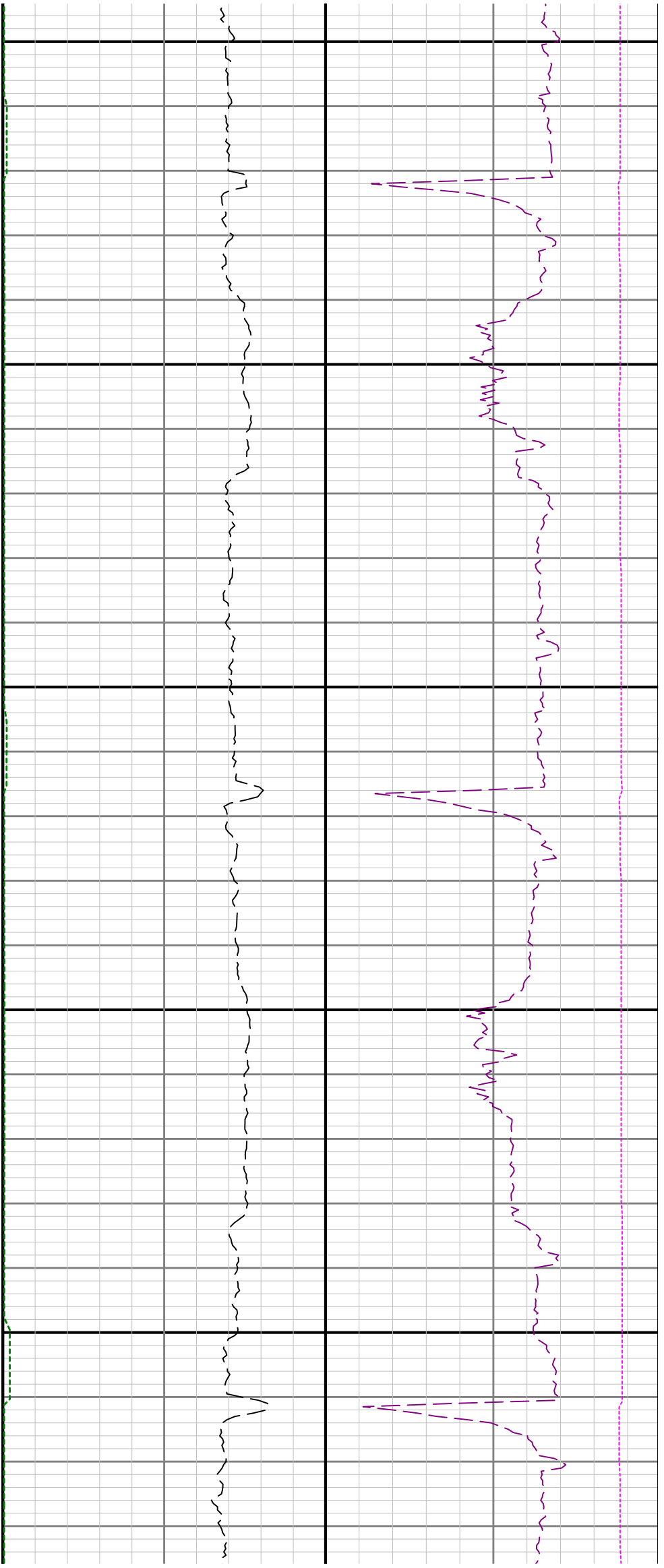












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