



Realtime Log

Natural Formation Evaluation
Gamma Ray

Scale:

Company: Kerr-McGee Oil & Gas Onshore LP

Well: Howard 26N-28HZ

Field: Weld County (Kerr-McGee)

Region: RMD Country: United States

Surface Location:

Latitude: 40° 1' 43.100" N

Longitude: 104° 53' 24.112" W

Other Services:

Directional
VSS

Status:

Final Print

API Number:

051233693400

Section 28

TWN: 1N

Range 67W

Permanent Datum (P.D.): Ground Level

Elevation: 4999.00 ft.

Elevations: N/A

Log Measured From:

Drill Floor

13.00 ft.

Above P.D.

KB:

DF:

GL:

Depth Reference:

Driller's Depth

4999.00 ft.

4986.00 ft.

Interval Logged

Dates

Magnetic Field Reference

Top: 6882 ft.

Date From: 01/Oct/13

Dip Angle: 66.36°

Azi Reference North: True

Bottom: 12017 ft.

Date To: 05/Oct/14

Total

Mag to Reference

Spud Date:

27/Sep/13

Field Strength: 52797.0 nT

North Correction: 8.45°

Borehole Record

Casing Record

Hole Size	From	To	Size	Weight	From	To
13.500 in.	Surface	1003 ft.	9.625 in.	36.00 lb/ft	Surface	1023 ft.
8.750 in.	1003 ft.	8006 ft.	7.000 in.	26.00 lb/ft	Surface	7909 ft.
6.125 in.	8006 ft.	12071 ft.				

Mud Record

Deviation Record

Type	From	To	Hole Size	Interval	Inc / Az (Start)	Inc / Az (End)
Water Based - Fresh	2500 ft.	11367 ft.	13.500 in.	1023 ft.	0.9° / 245.4°	0.4° / 282.4°
			8.750 in.	6983 ft.	0.5° / 298.2°	84.7° / 179.8°
			6.125 in.	5088 ft.	90.7° / 180.7°	90.5° / 180.6°
					/	/
					/	/
					/	/
					/	/

Acquisition System

Software Version

Other

Advantage

2.2004

Rig / Contractor: Xtreme 20

/ Ensign Drilling

PATS

6.4.1.34

Job No: 5769725

District / Unit: RMD

/ D&E

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Log Run Summary

LWD Run No.	BHA Run No.	Bit Run No.	Bit Size (in.)	Bit Type	Bit Gauge Length (in.)	Assembly Type	Logged Interval		Bit Depth Interval		Date / Time		Circ. Time (hrs.)
							Top (ft.)	Bottom (ft.)	From (ft.)	To (ft.)	Start	End	
1	2	2	8.750	PDC	2.500	Steerable	6882	7952	1033	8006	01/Oct/2013 02:31	01/Oct/2013 16:33	49.6
2	2	3	6.125	PDC	3.000	Steerable	7952	12017	8006	12071	04/Oct/2013 05:54	05/Oct/2013 13:14	32.88

Crew

Name	Arrive	Depart	Name	Arrive	Depart	Name	Arrive	Depart
	Wellsite	Wellsite		Wellsite	Wellsite		Wellsite	Wellsite
David Campbell	Sept 26 2013	Oct 6 2013	Greg Dore	Sept 26 2013	Oct 6 2013	Adam Merha	Sept 26 2013	Oct 1 2013
Travis Wilcox	Sept 26 2013	Oct 6 2013	Barry Combs	Oct 1 2013	Oct 6 2013			

Mud Properties Record

Date / Time		LWD Run No.	Measured Depth (ft.)	Mud Type	Density (sg)	Viscosity (cp)	pH	Fluid Loss (cc)	Oil / Water	Source	Total Chlorides (ppm)	K+ (%)
30/Sep/2013	16:26	1	2500	Water Based - Fresh	8.7	27	7.5	0.0	0 / 98	Active Mud Pit	1000	0.0
30/Sep/2013	16:26	1	5400	Water Based - Fresh	8.4	29	7.1	0.0	0 / 99	Active Mud Pit	900	0.0
01/Oct/2013	06:41	1	7260	Water Based - Fresh	8.7	27	7.5	0.0	0 / 98	Active Mud Pit	1000	0.0
04/Oct/2013	14:37	2	9137	Water Based - Fresh	9.7	35	7.9	3.8	4 / 88	Active Mud Pit	1000	0.0
05/Oct/2013	06:13	2	11314	Water Based - Fresh	9.2	42	7.9	3.9	5 / 90	Active Mud Pit	900	0.0

Mnemonics

Curve	Description	Units
GRAX	Gamma Ray Apparent, 0.5 ft. Avg.	API
GRIX	Gamma Ray Data Density	point
GRSI	Gamma Ray Sliding Indicator	unitless
GRTX	Gamma Ray Time Since Drilled	min
ROPA	Rate of Penetration, 3.0 ft. Avg.	ft/hr
TCDX	Downhole Temperature	degF
TVD	True Vertical Depth	ft
WOBA	Surface Weight on Bit, 1.0 ft. Avg.	klbs

Equipment and Service Data

LWD Run No.	Tool	Serial Number	Measurement	Bit Offset (m.)	Max O.D. (in.)	Min I.D. (in.)
1	DIR	12546334	Directional	56.42	6.750	0.000
1	SRIG	10658452	Gamma	53.04	6.750	0.000
2	DIR	12546374	Directional	54.13	4.750	0.000
2	SRIG	12606956	Gamma	50.75	4.750	0.000

Service and Tool Mnemonics

Mnemonic	Name	Description
DIR	Directional	Wellbore directional survey
SRIG	Inclination and Gamma	Probe based gamma ray and inclination module

Comments

1.) Depth measurements obtained from a depth control system not supplied or operated by Baker Hughes. Due to the lack of control by Baker Hughes logging engineers, depth calibrations and measurements could not be independently verified.
2.) Baker Hughes run 1 utilized 6 3/4 inch NaviGamma services (Gamma Ray and Directional) behind an 8 3/4 inch bit and steerable assembly from 1003 to 8006 feet MD (1003 to 7476 feet TVD).
3.) Baker Hughes run 2 utilized 4 3/4 inch NaviGamma services (Gamma Ray and Directional) behind an 6 1/8 inch bit and steerable assembly from 8006 to 12071 feet MD (7476 to 7495 feet TVD).
5.) The interval from 1003 to 6882 feet MD (1003 to 6759 feet TVD) was not logged due to directional only services being provided through the straight-hole and nudge section for Baker Hughes run 1.

Remarks

Number	Measured Depth (m.)	Hole Section (in.)	LWD Run No.	Remark
1	6882	8.750	1	Begin logging due to directional only service provided thru vertical section.
2	12018	6.125	2	No sensor data logged from 12018 ft to 12071 ft MD (7497 ft to 7496 ft TVD) due to sensor to bit offset.

Curve Mnemonics

Curve	Description	Units
GRAX	Gamma Ray - Apparent	API
GRIX	Gamma Ray - Data Point Indicator	unitless
GRSI	Gamma Slide Ind.	unitless
GRTX	Gamma Time Since Drilled GRTX	min
ROPA	AVERAGE Instantaneous ROP - 5 second ROP	ft/hr
TCDX	Downhole Temperature	degF
TVD	True Vertical Depth TVD	ft
WOBA	AVERAGE Weight On Bit	klbf

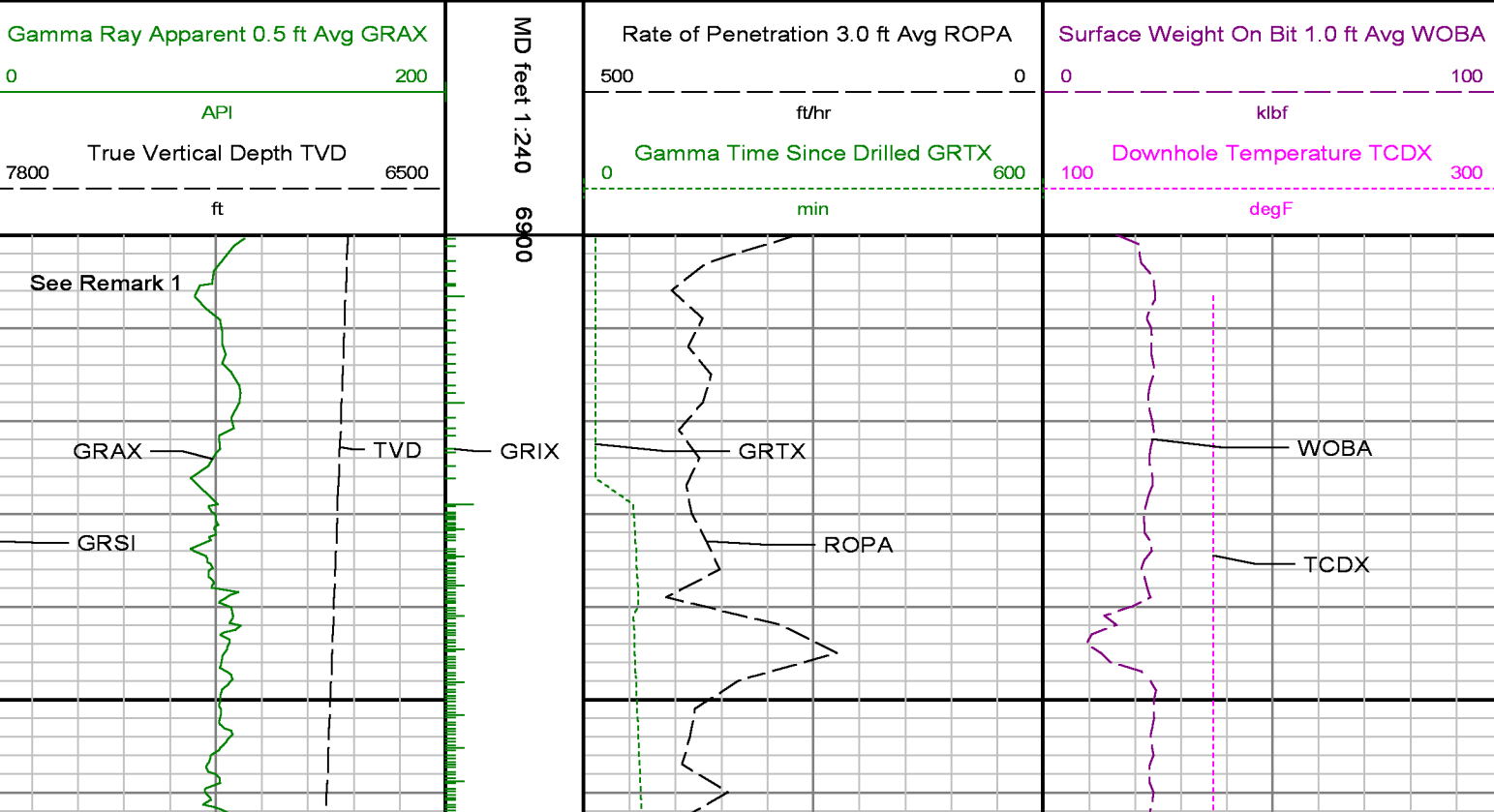


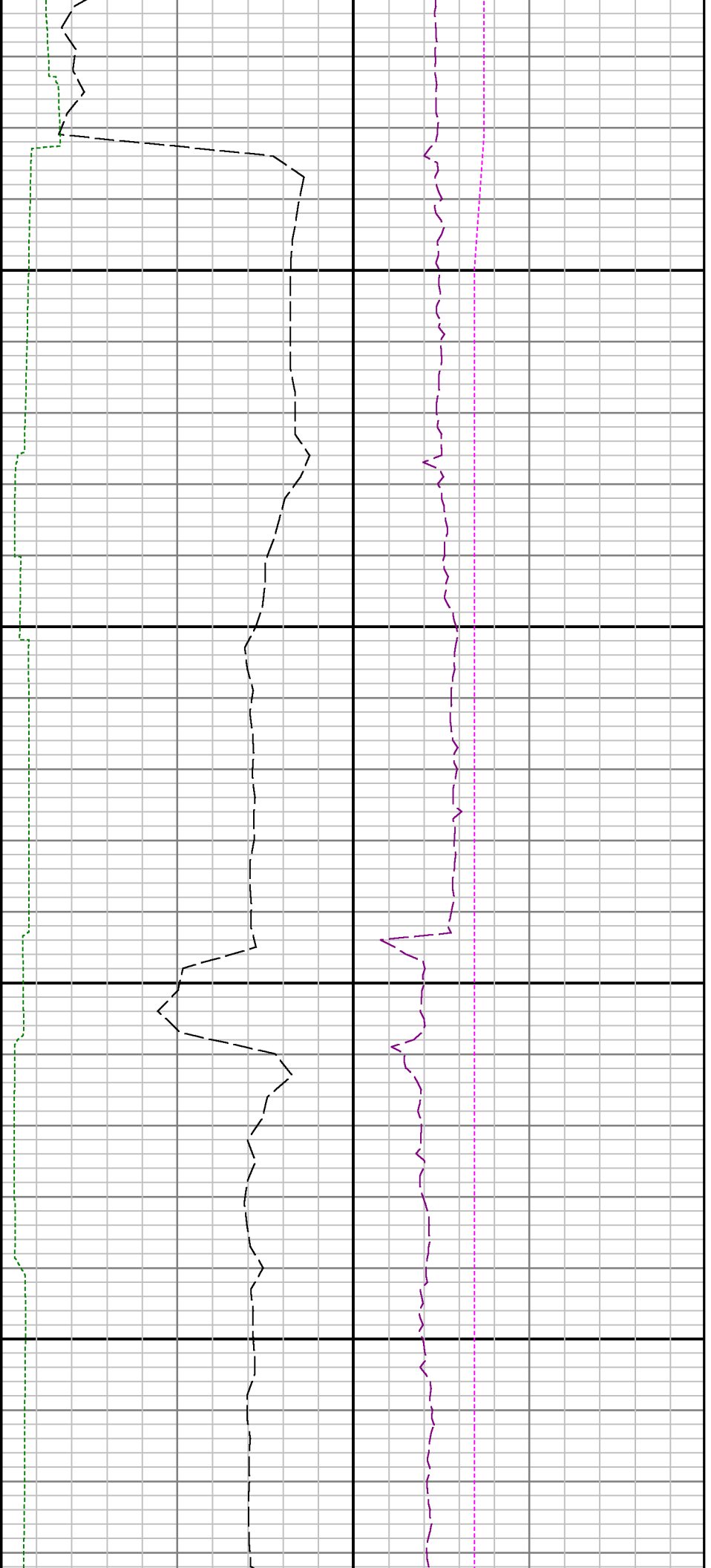
Company : Kerr-McGee Oil & Gas Onshore LP

Well : Howard 26N-28HZ

Interval : 6900.00 - 12100.00 feet

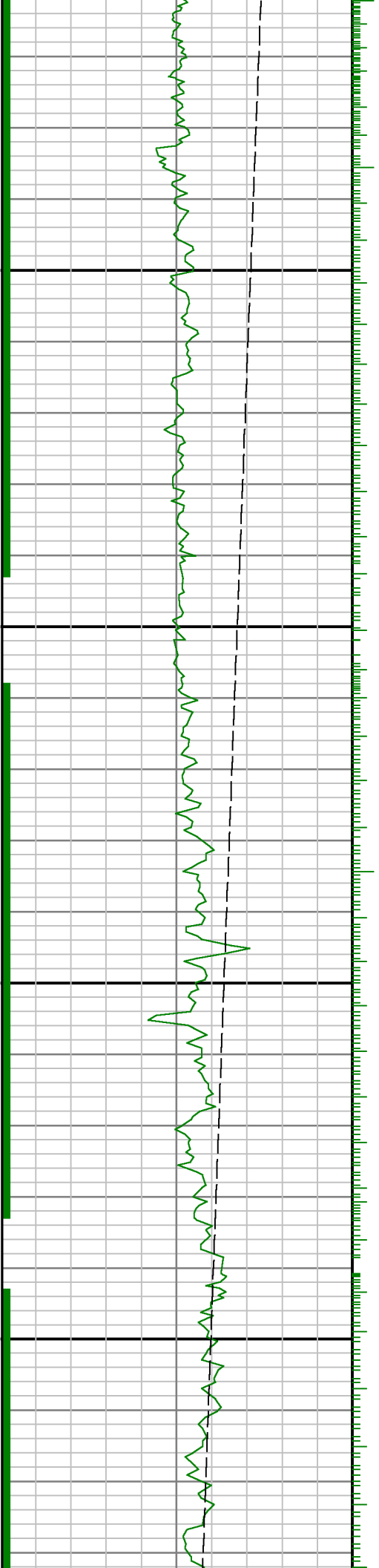
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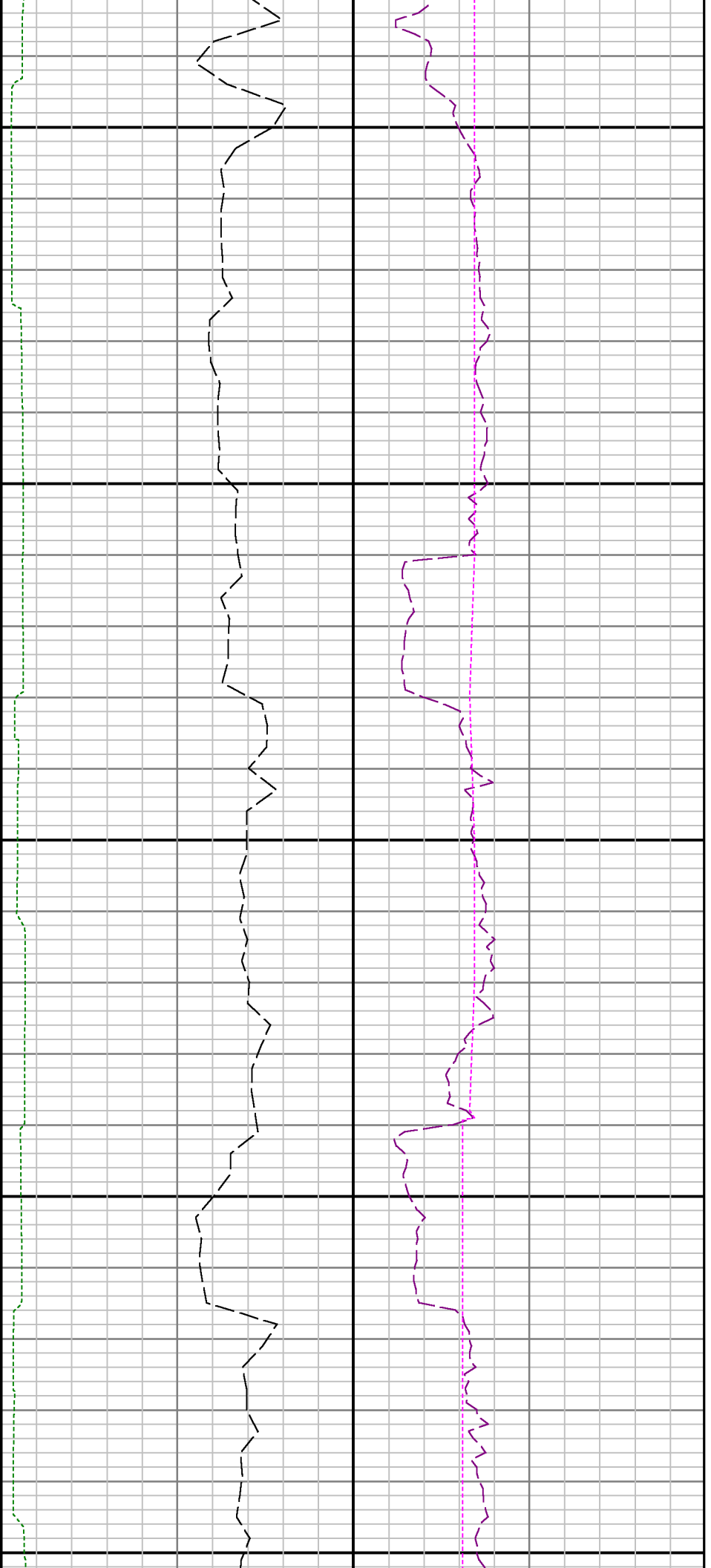




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7100

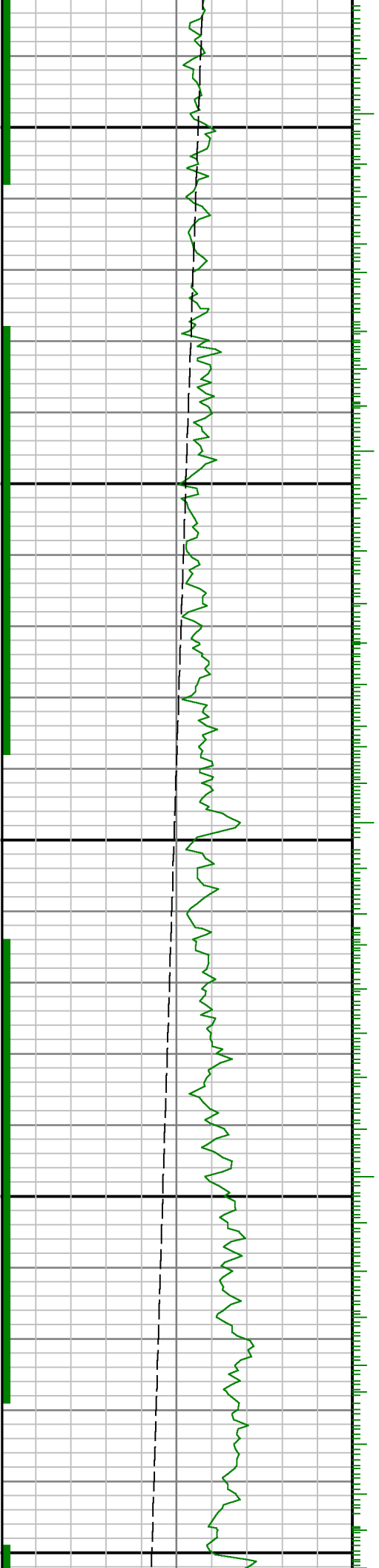


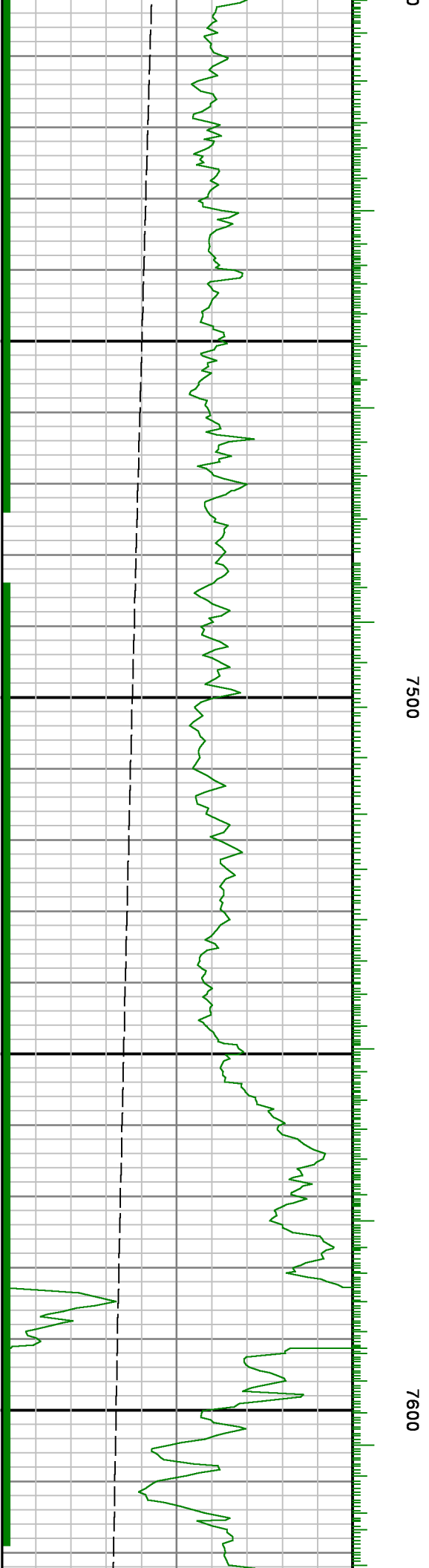
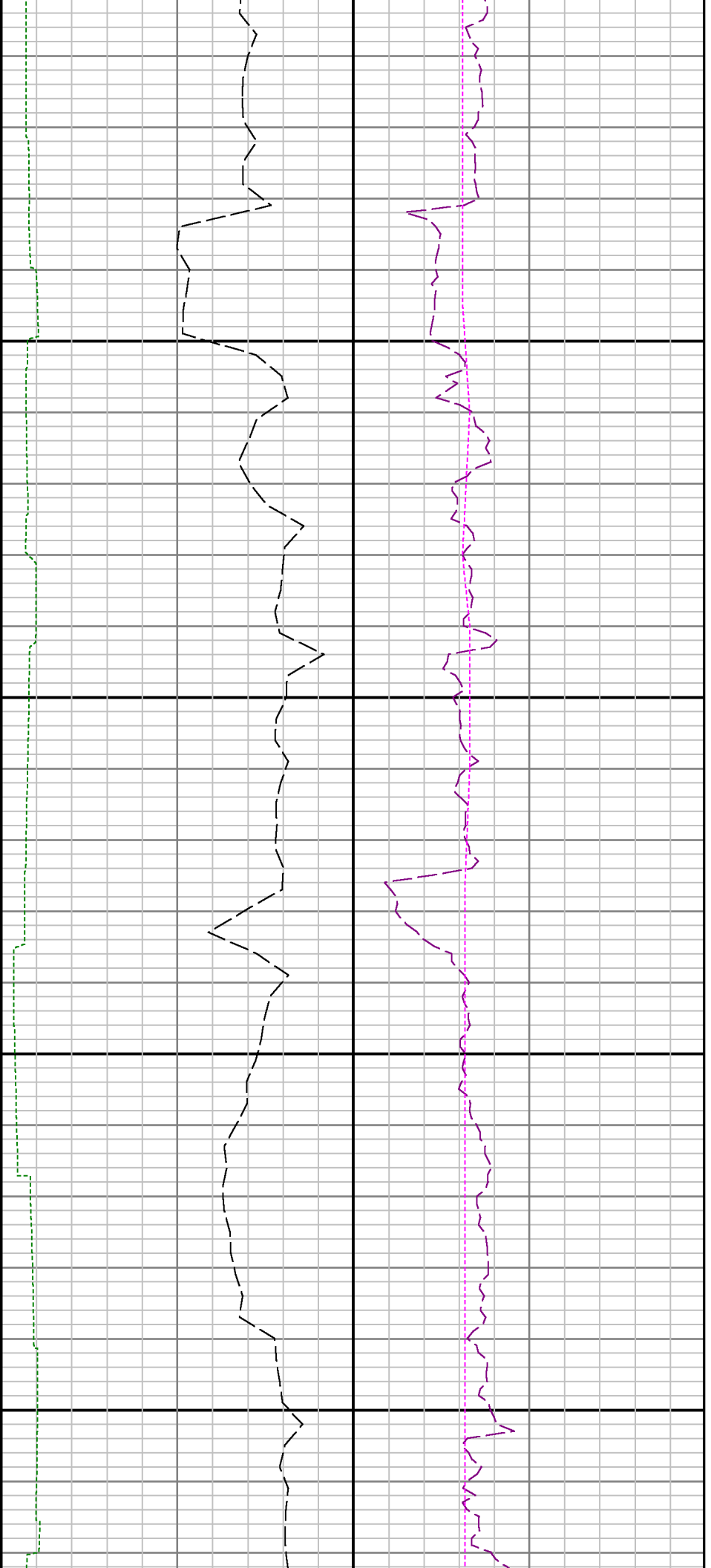


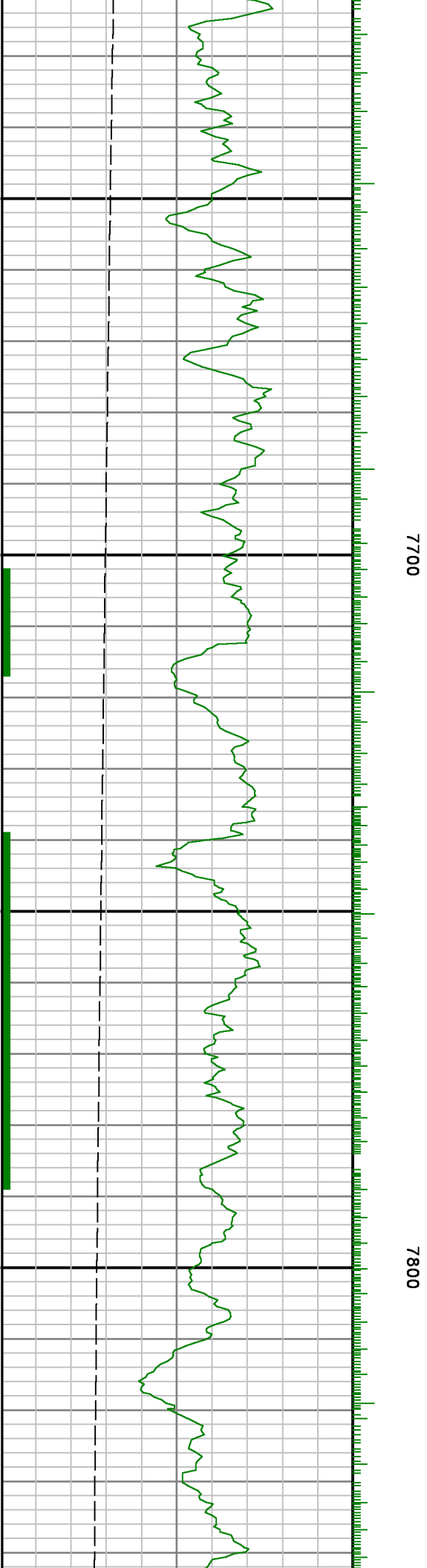
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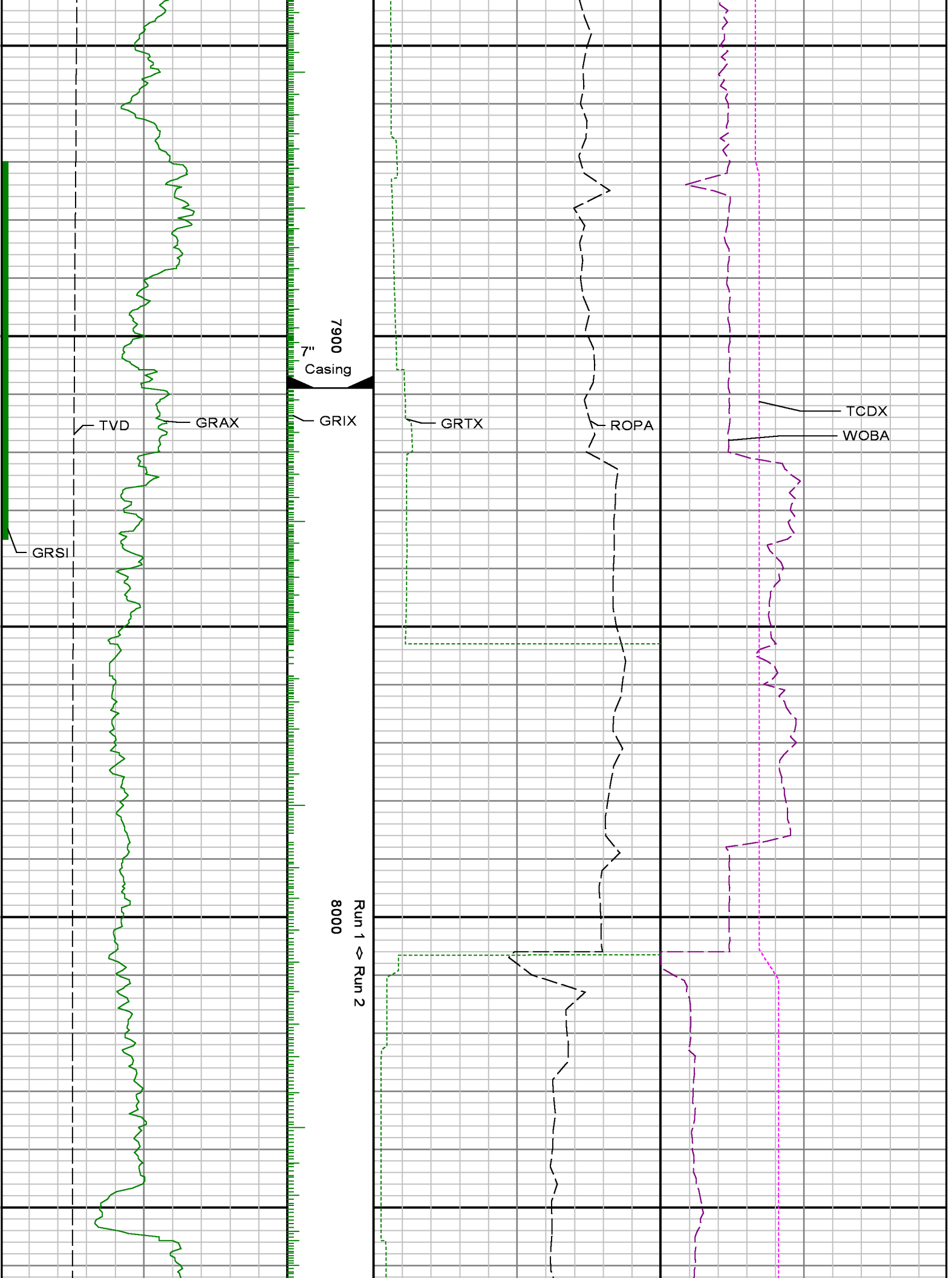
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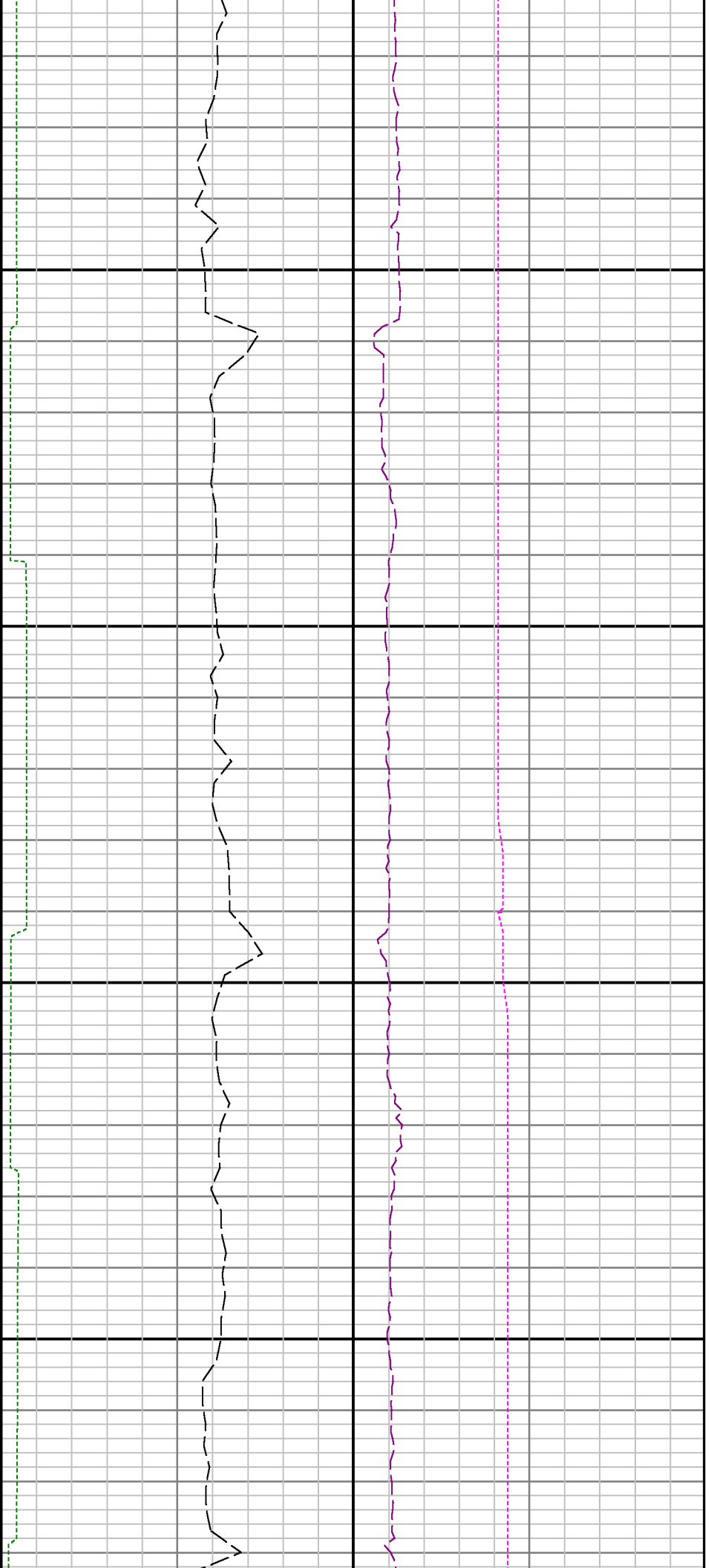
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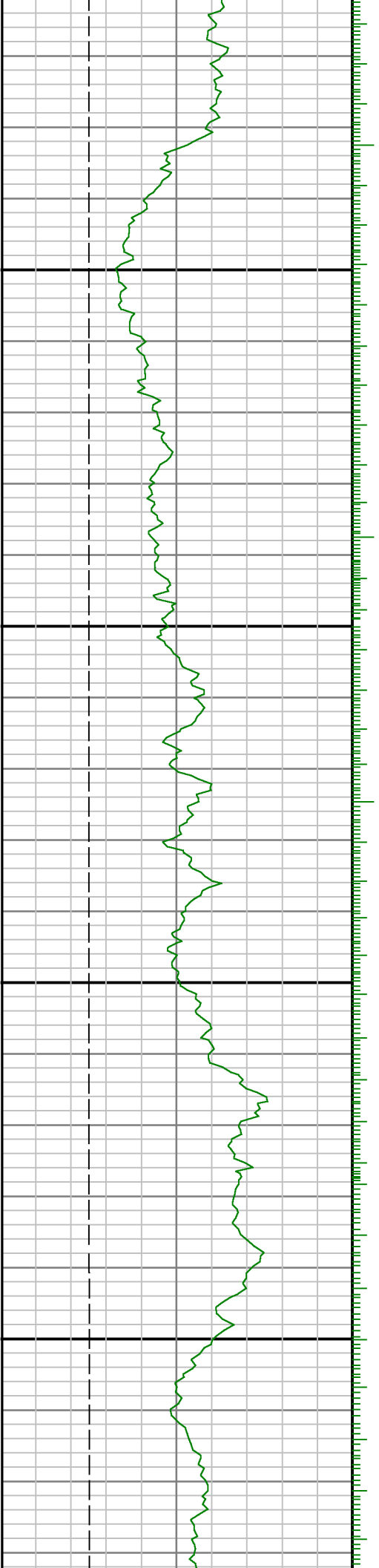


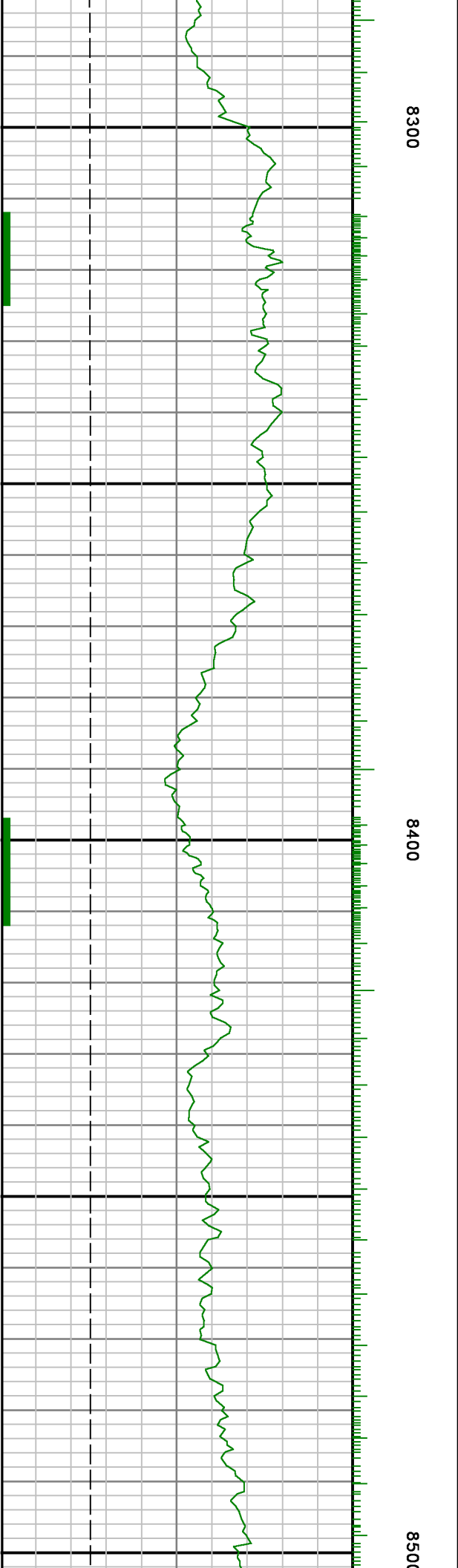
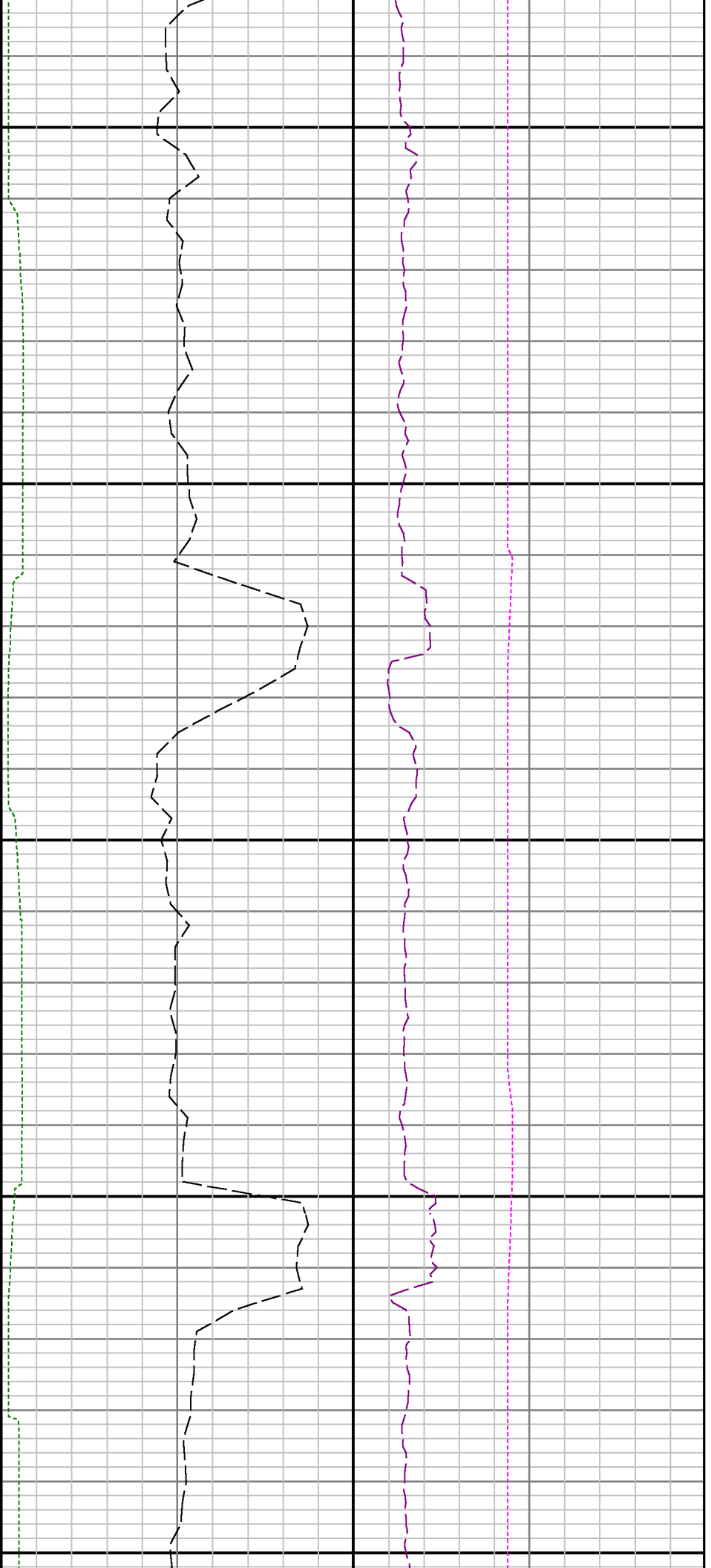


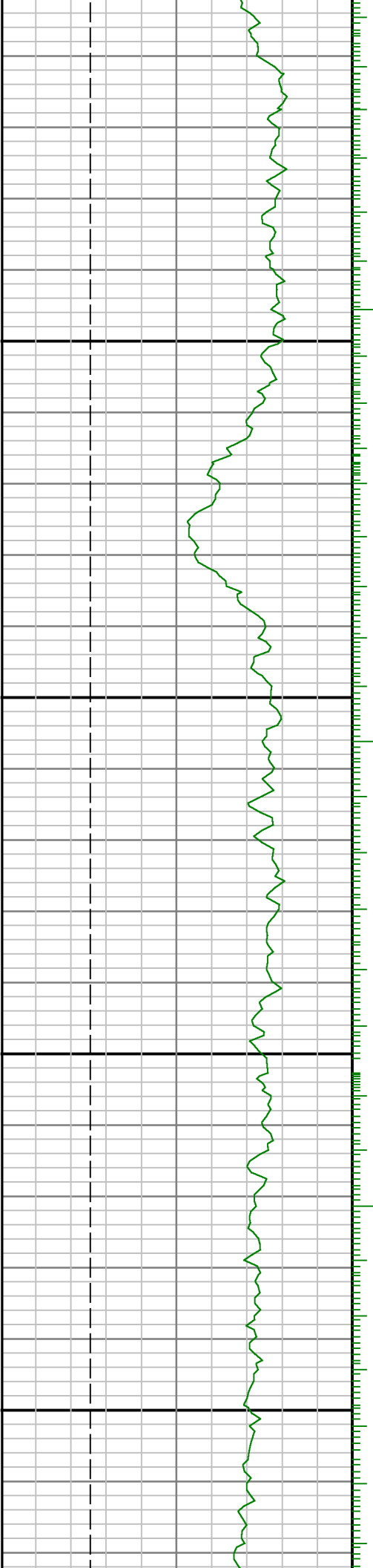


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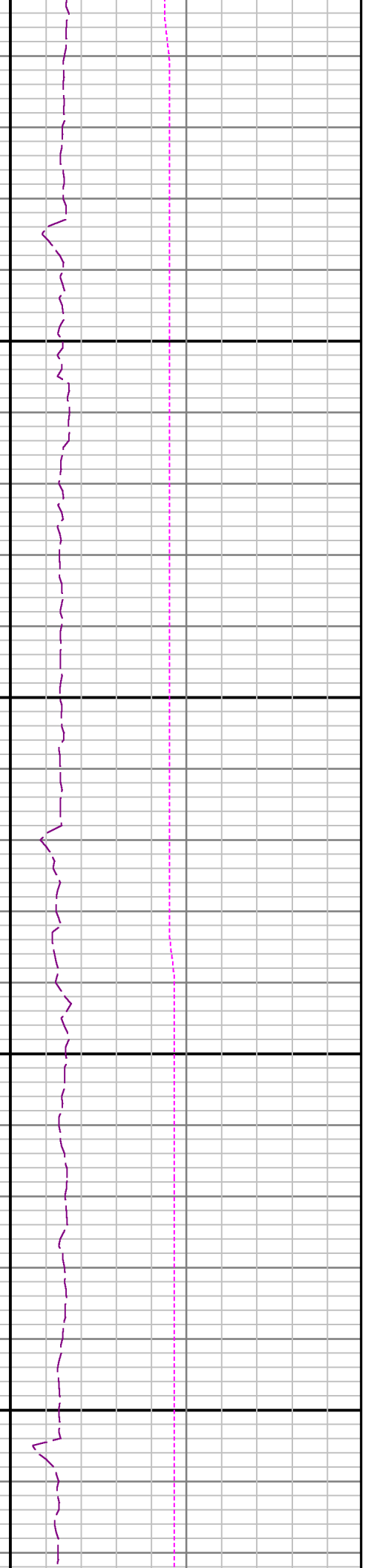
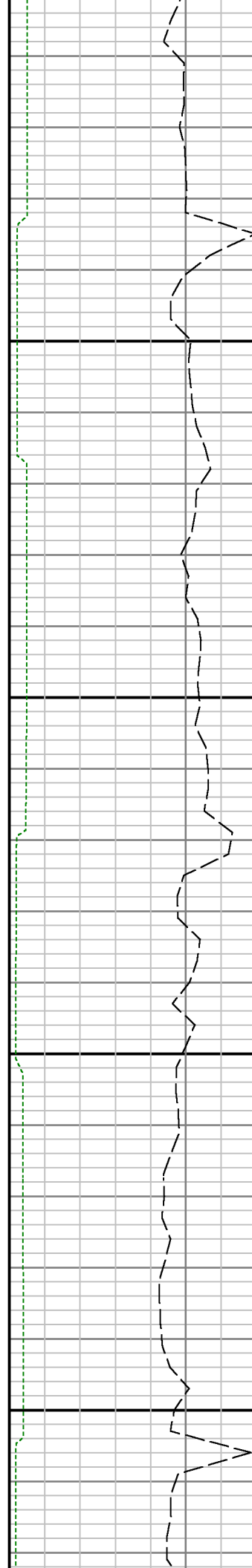


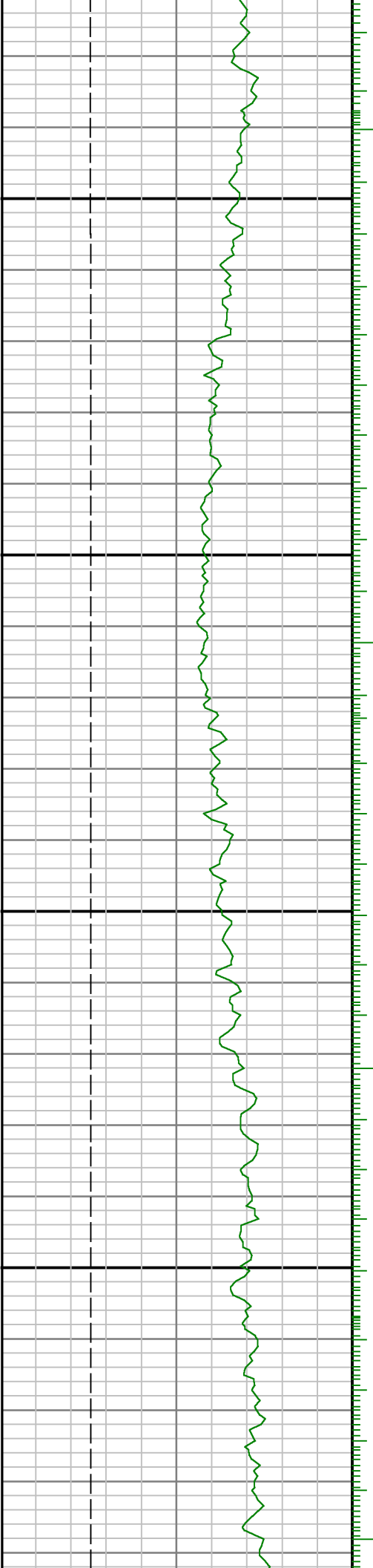




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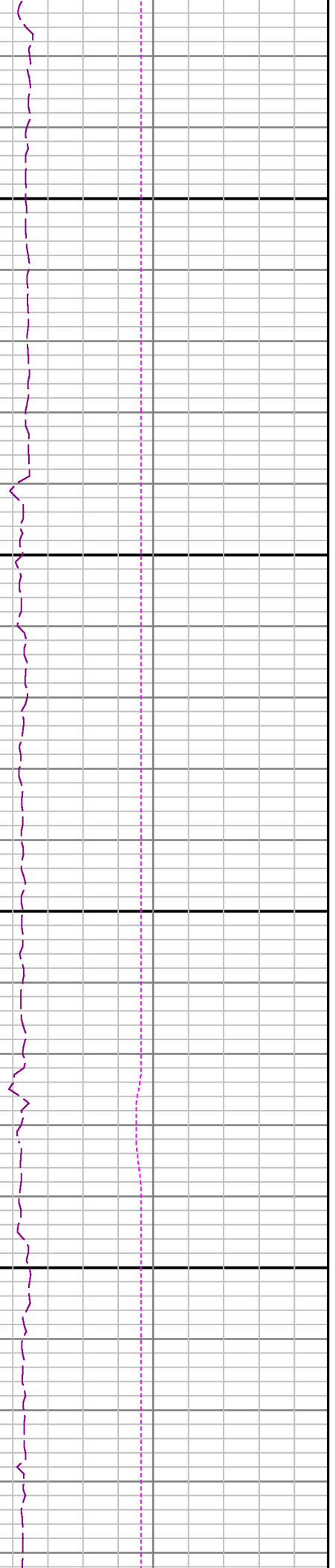
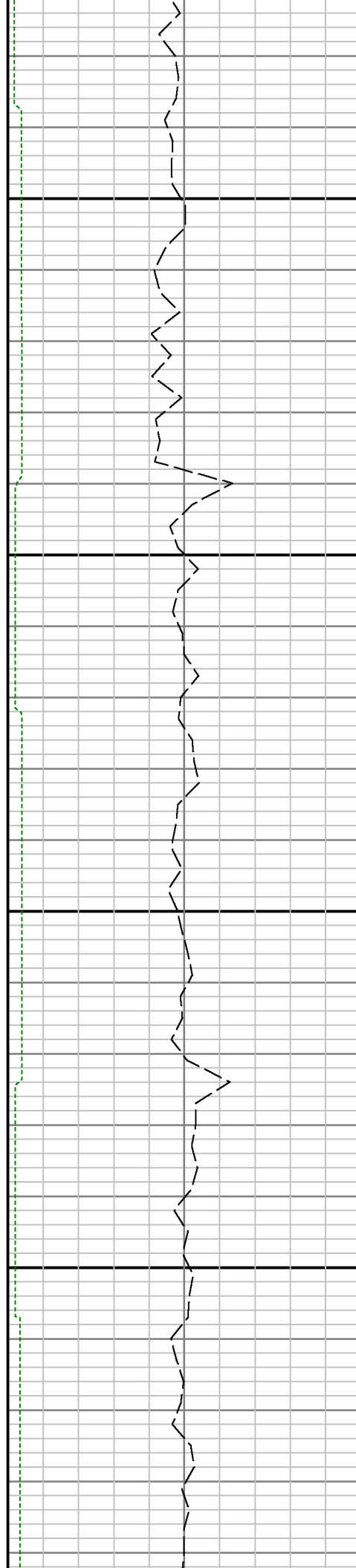
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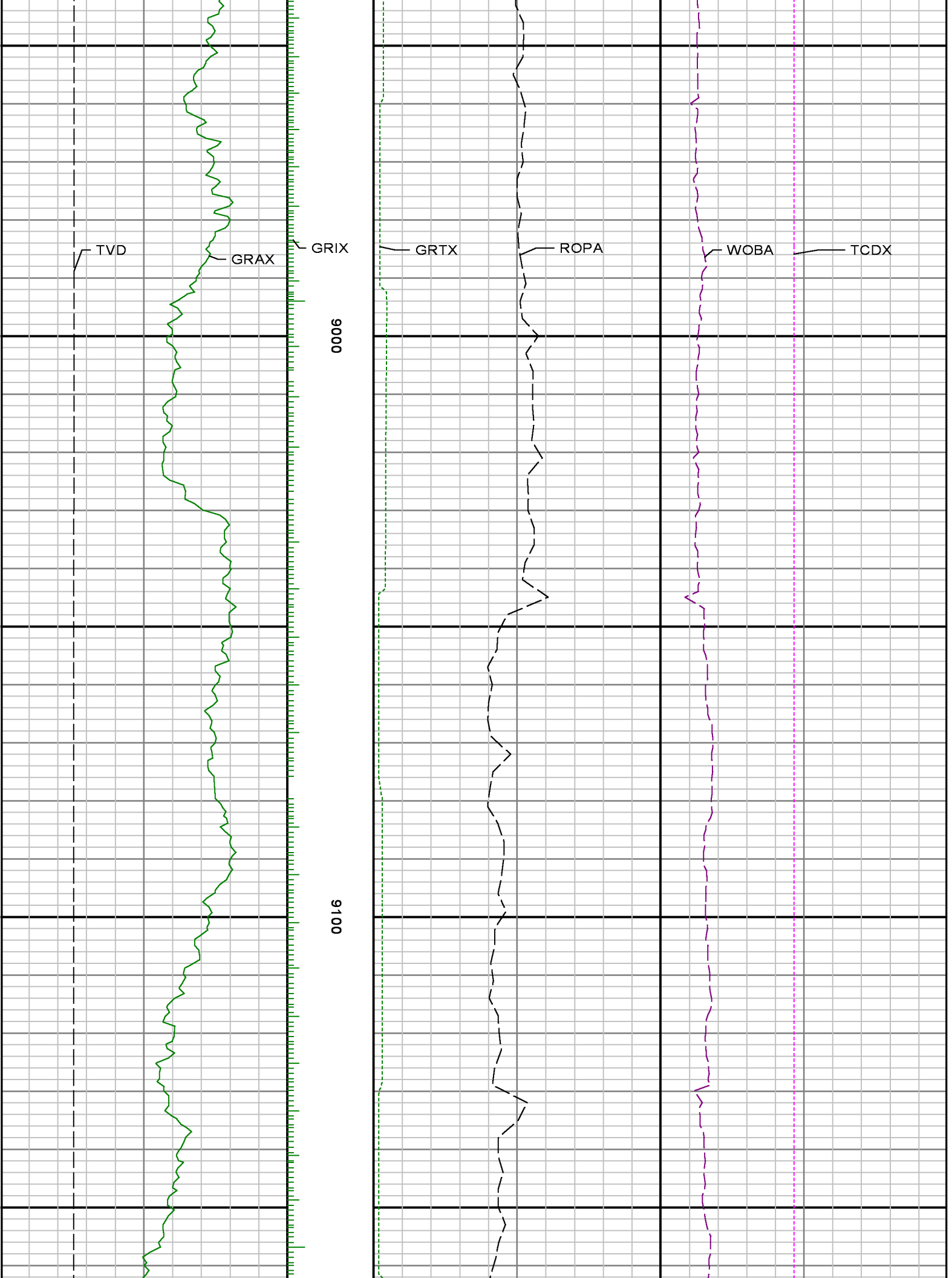


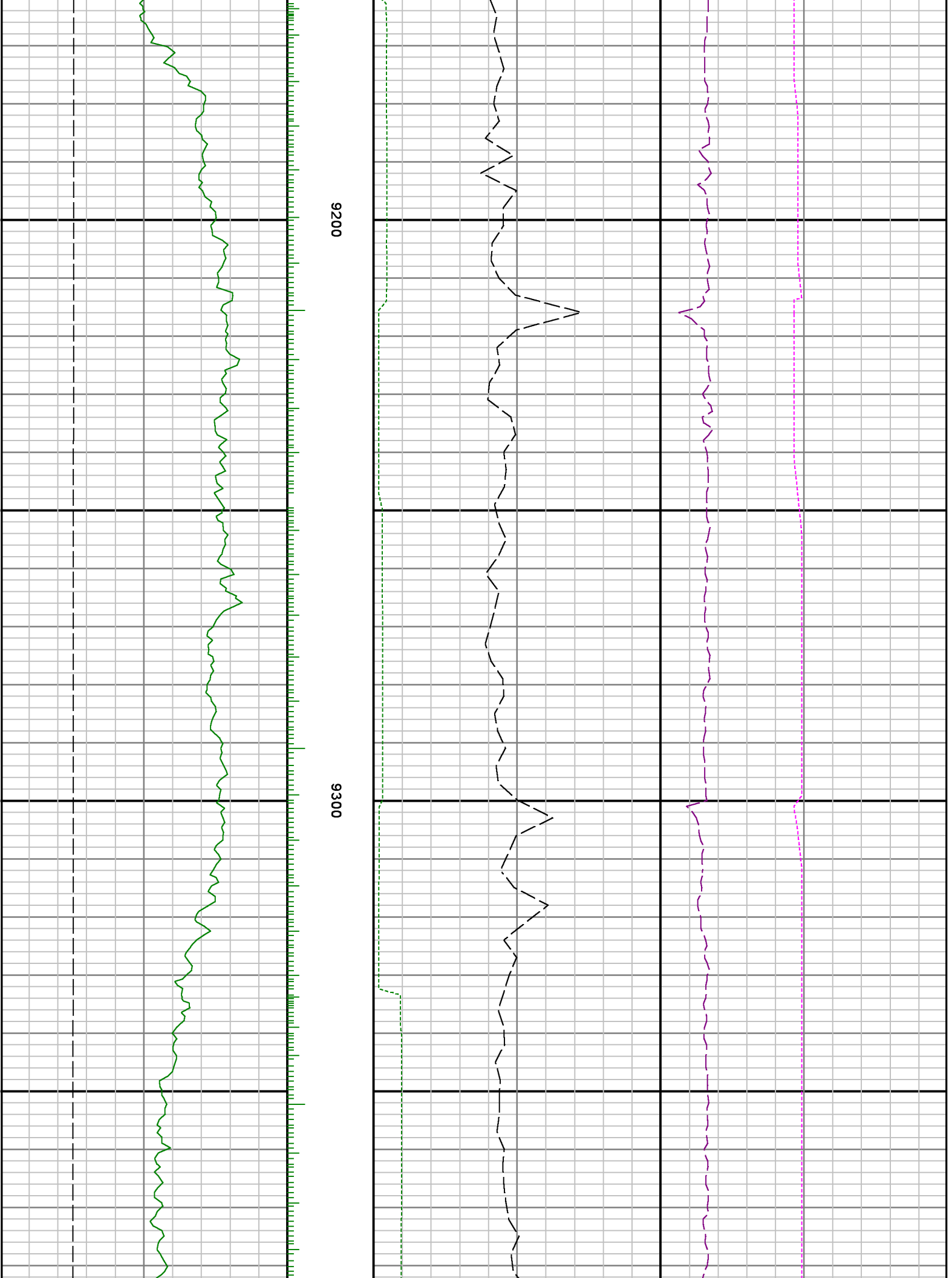


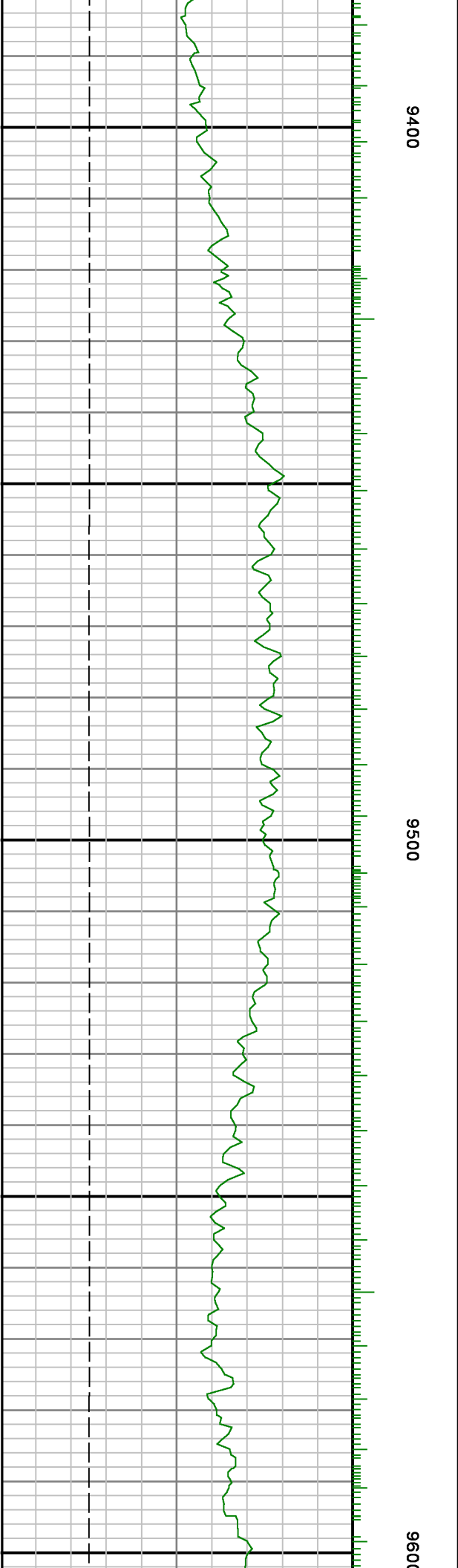
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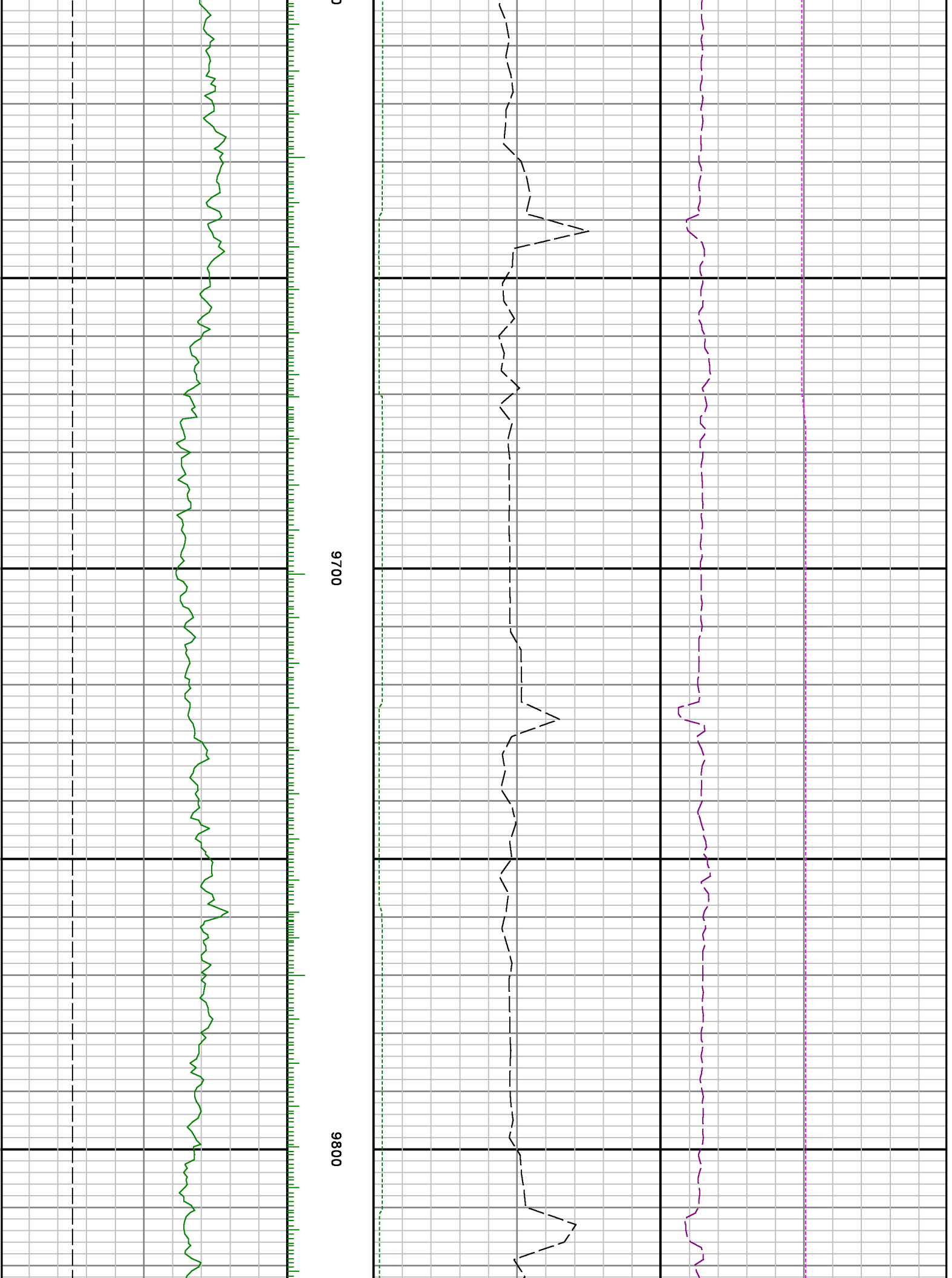
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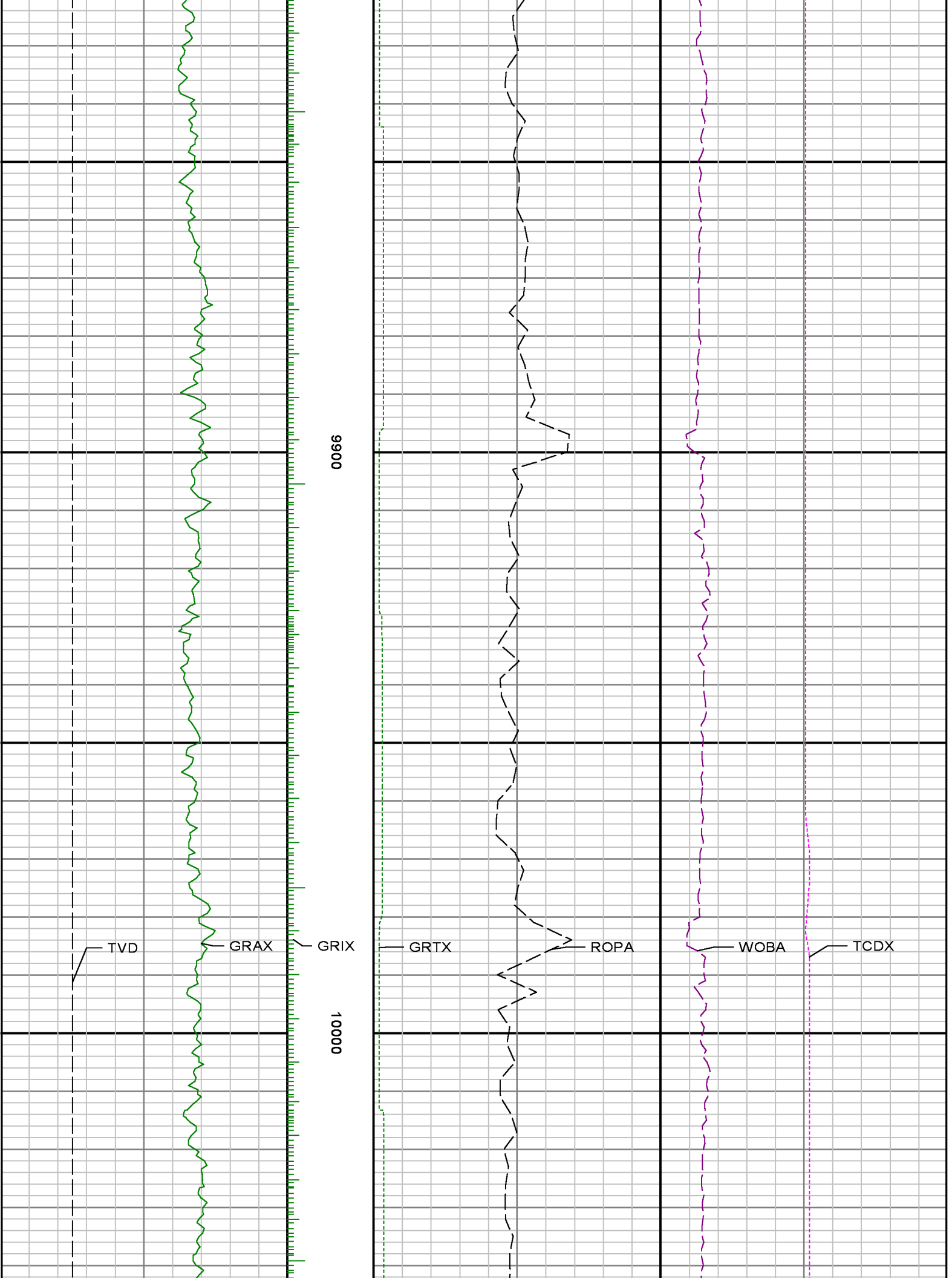








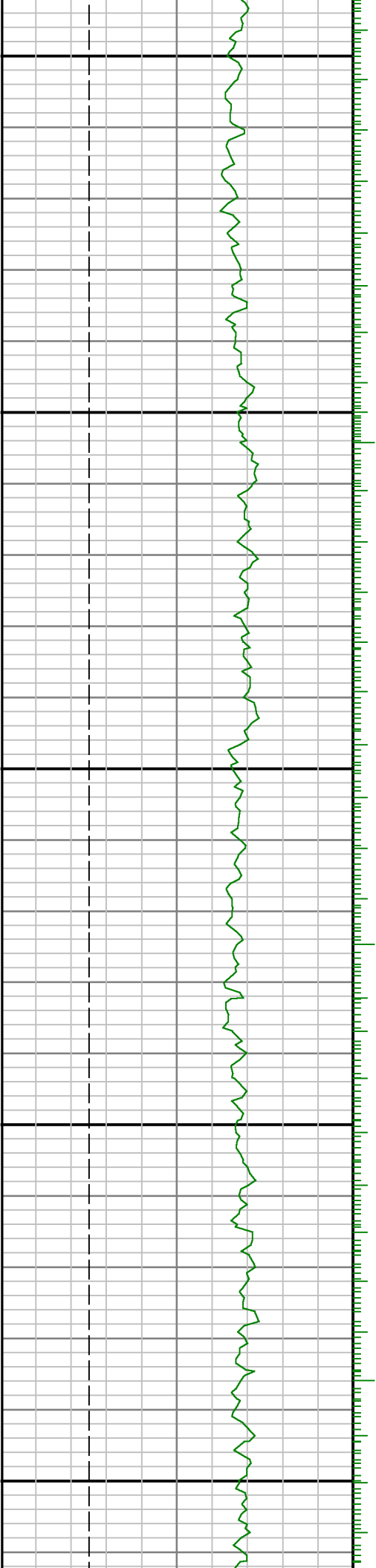


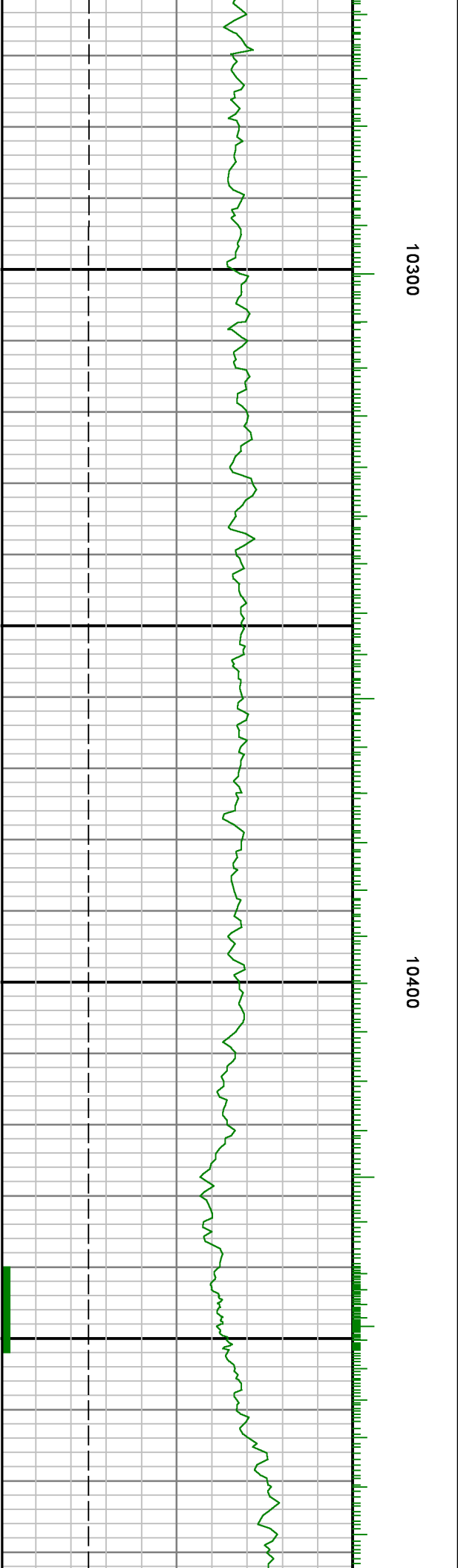
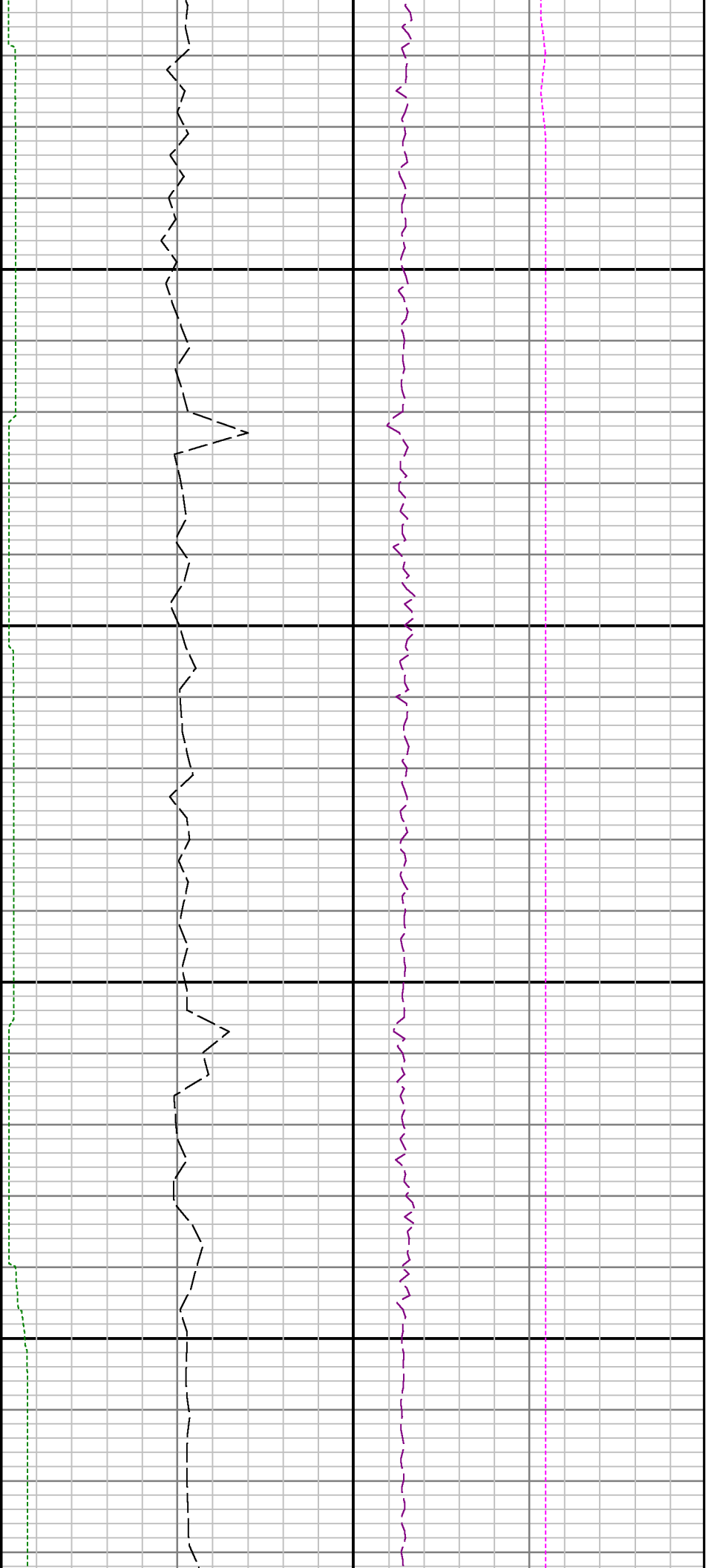




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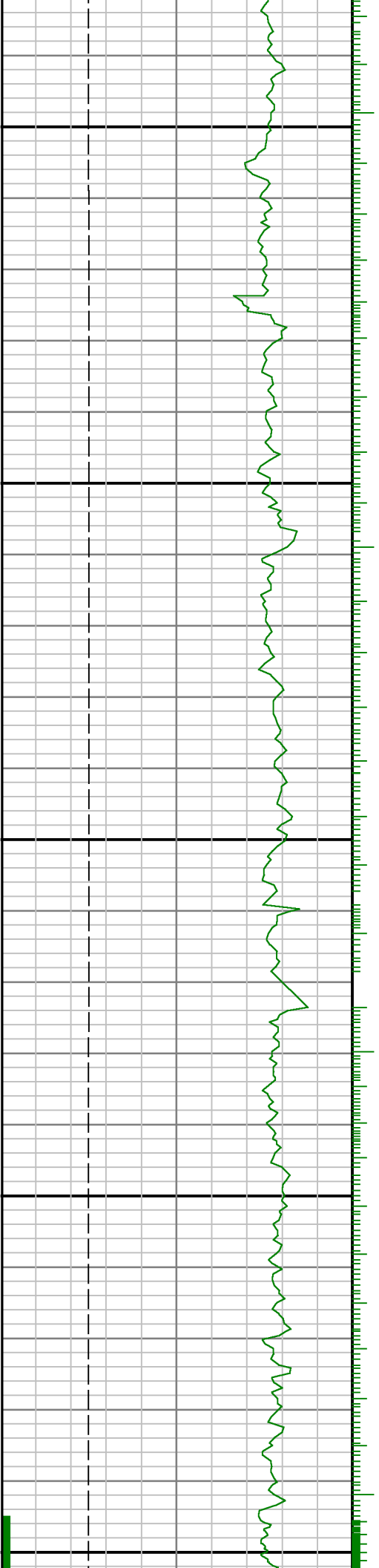


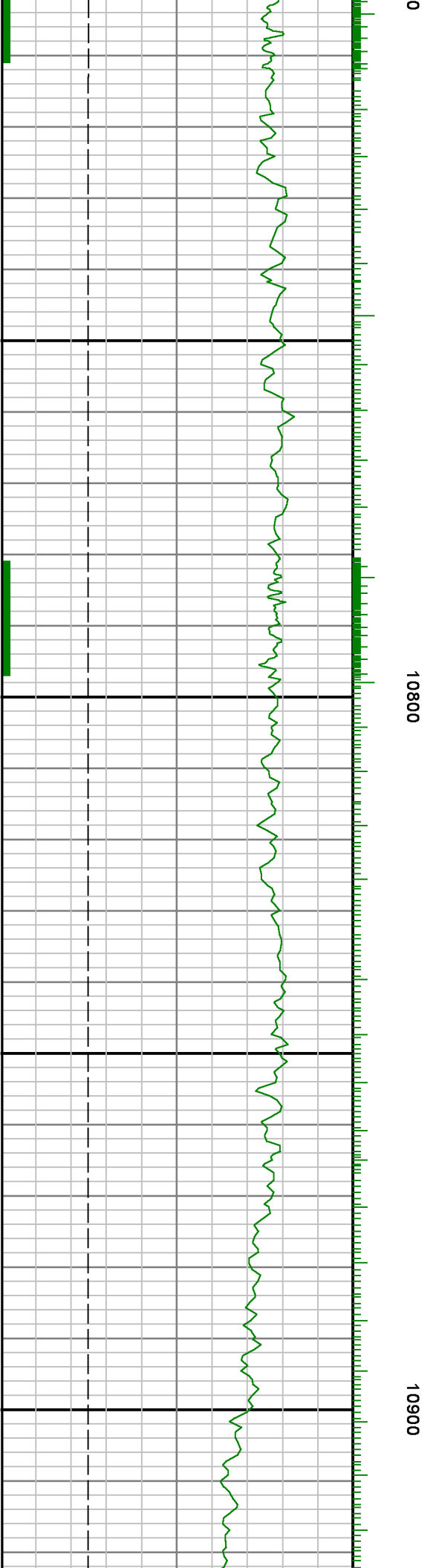


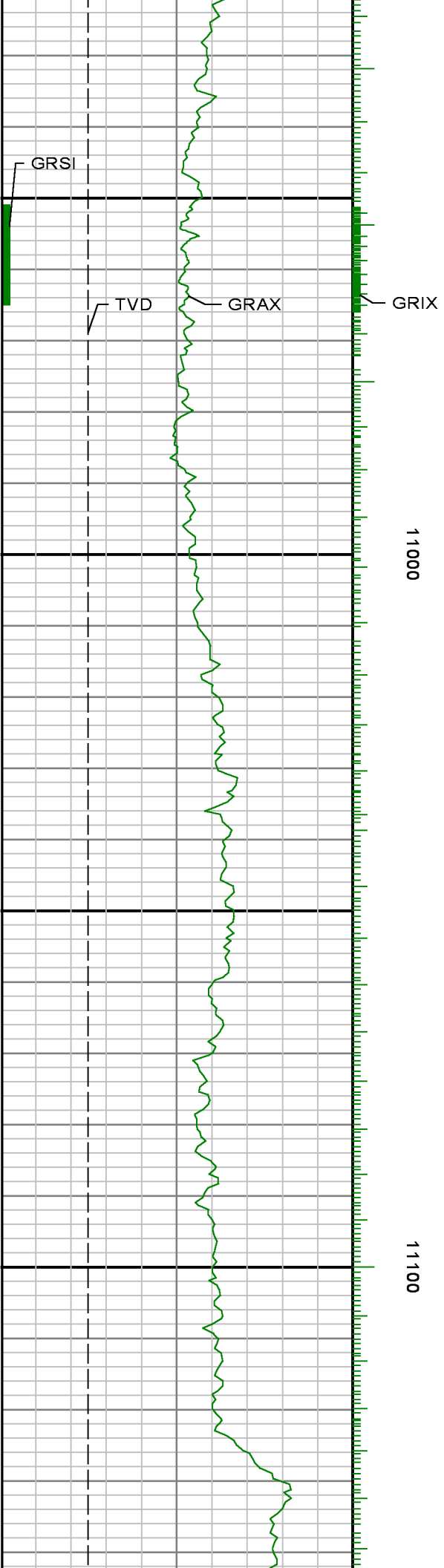
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10600

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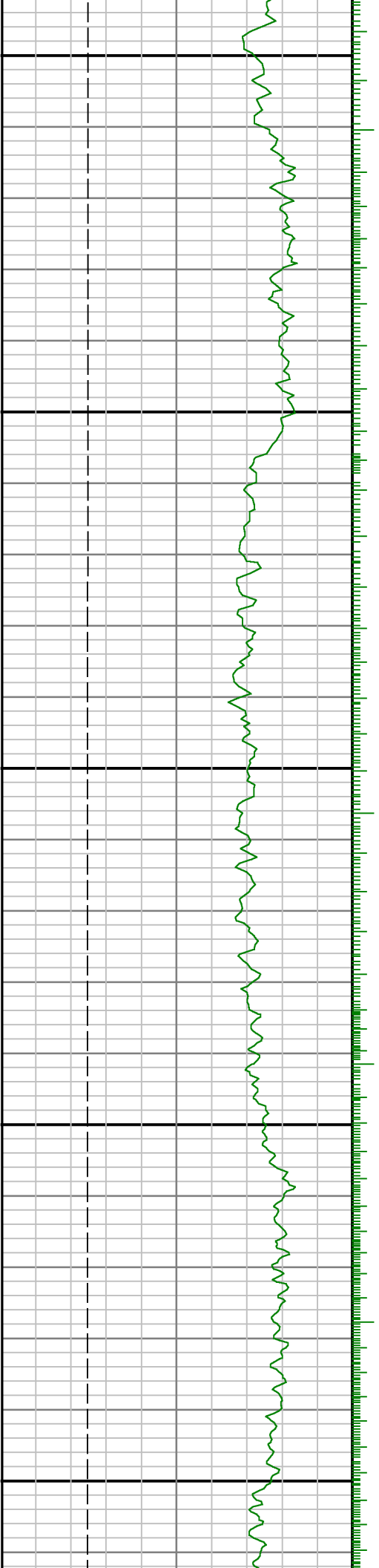


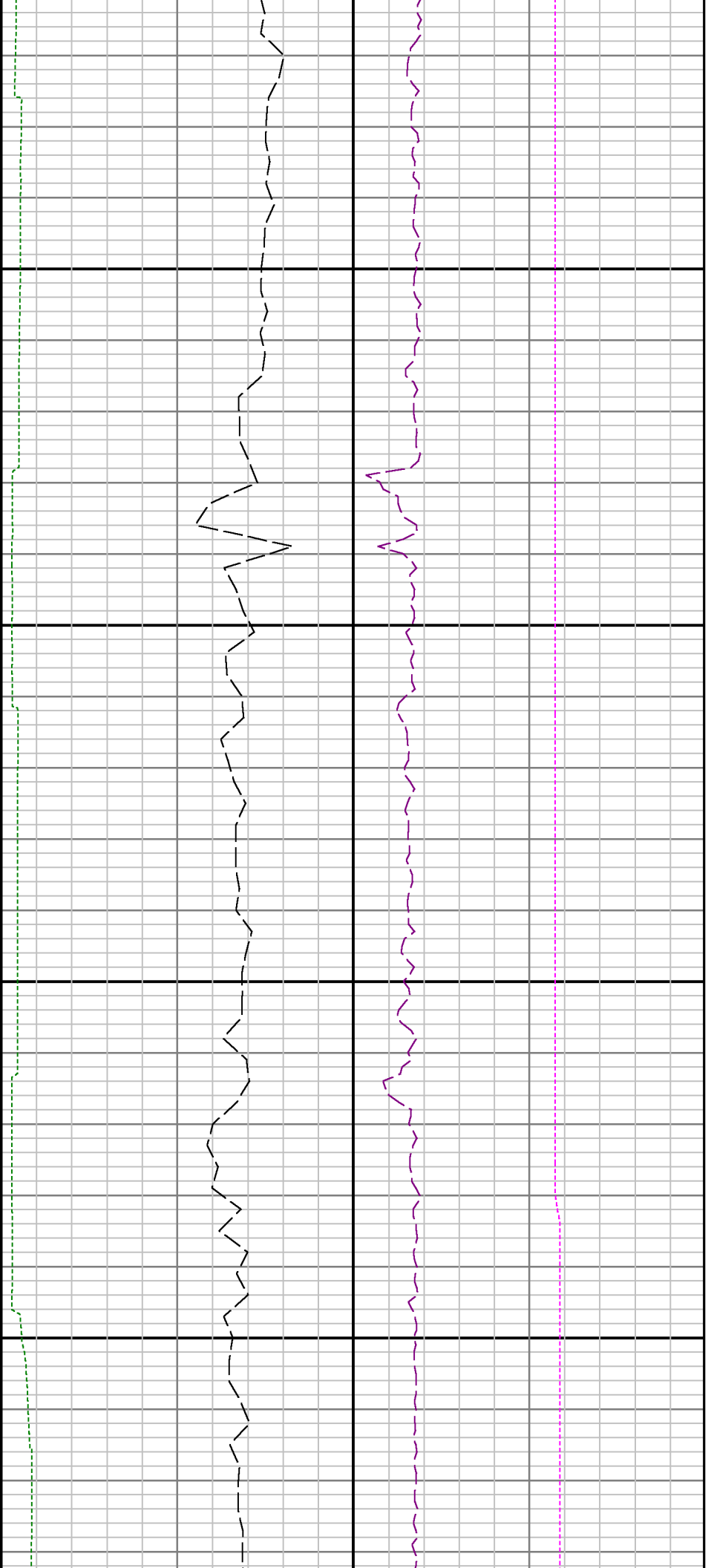




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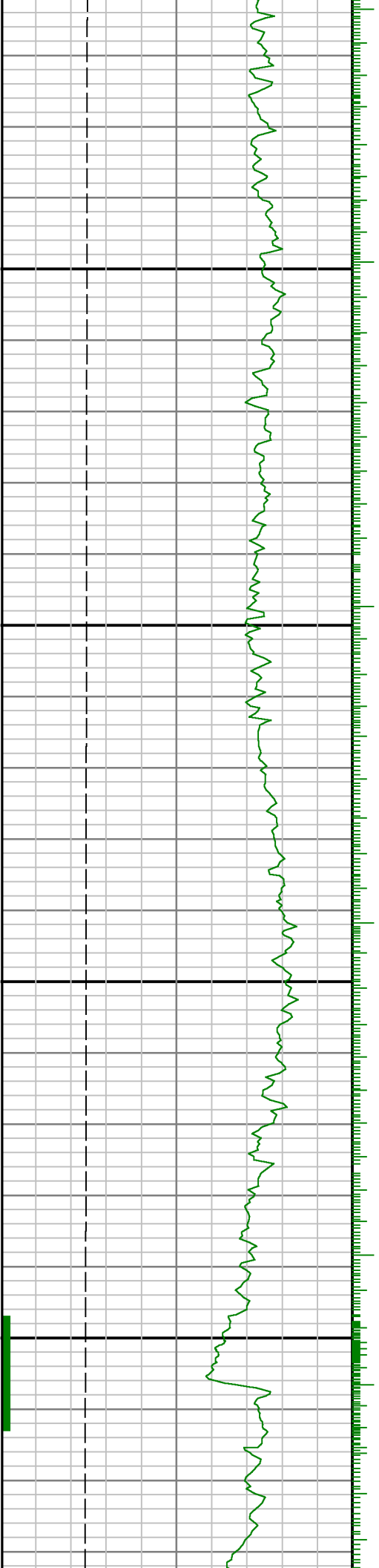
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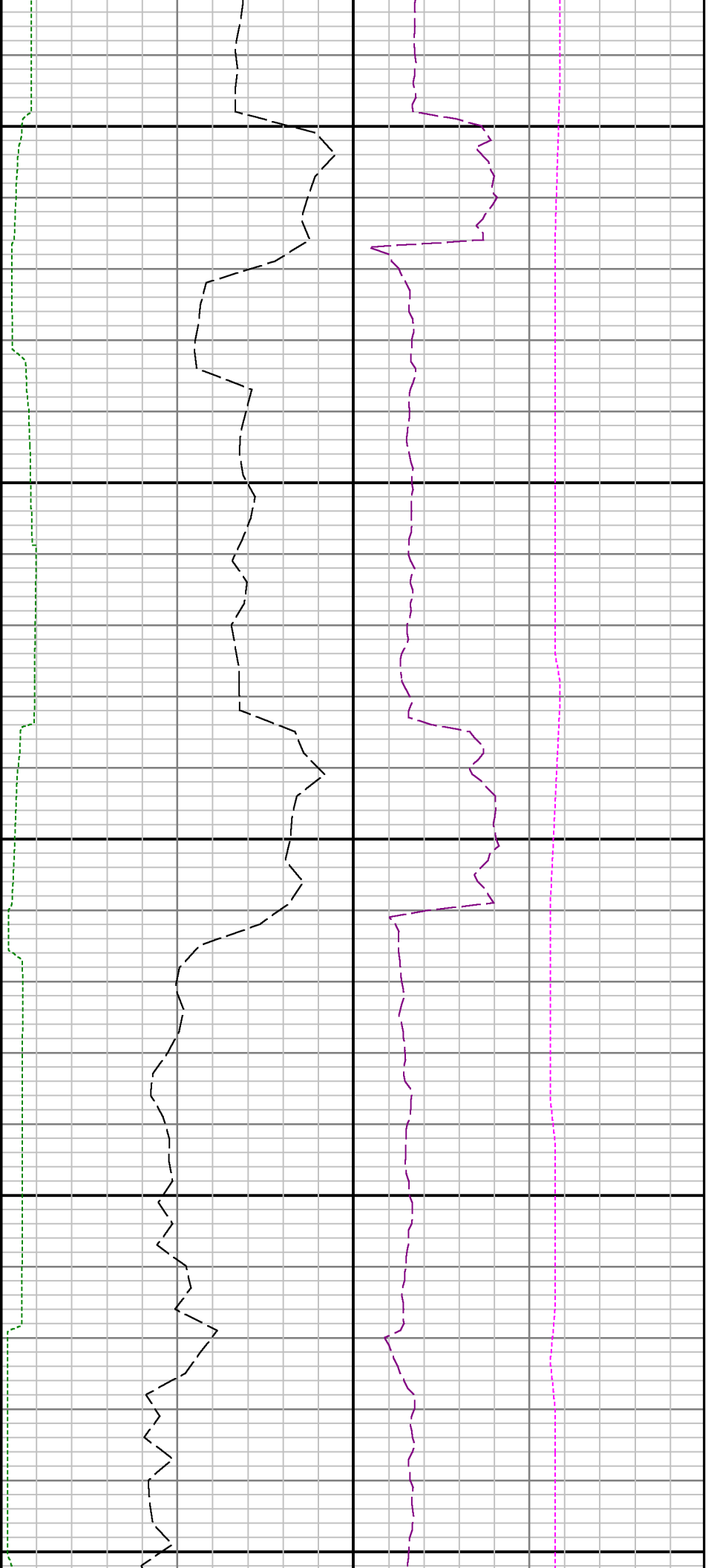




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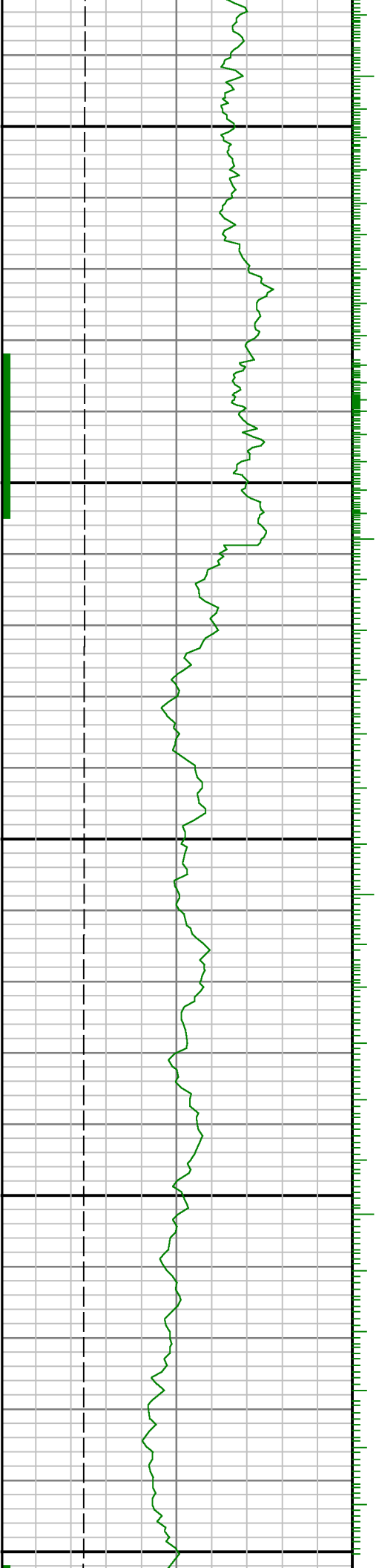




11600

11700

11800





See Remark 2	Run 2 < 12:00 D feet 1:240			
Gamma Ray Apparent 0.5 ft Avg GRAX 0 200 API True Vertical Depth TVD 7800 6500 ft		Rate of Penetration 3.0 ft Avg ROPA 500 0 ft/hr Gamma Time Since Drilled GRTX 0 600 min	Surface Weight On Bit 1.0 ft Avg WOBA 0 100 klbf Downhole Temperature TCDX 100 300 degF	