



Real Time Log

Natural Formation Evaluation  
Gamma Ray

Scale:

Company: Anadarko

Well: Howard 28N-28HZ

Field: Weld County (Kerr McGee)

Region: Rocky Mountains Country: United States

Surface Location:

Latitude: 40° 0' 55.800" N

Longitude: 104° 53' 52.951" W

Other Services:

Directional

Status:

Final Print

API Number:  
051233767800

SEC: 28 TWN: 1N RNG: 67W

Permanent Datum (P.D.): Ground Level

Elevation:

5020.00 ft.

Elevations:

N/A

Log Measured From:

Rig Floor

16.00 ft.

Above P.D.

KB:

DF:

GL:

5036.00 ft.

Depth Reference:

Driller's Depth

GL:

5020.00 ft.

Interval Logged

Dates

Magnetic Field Reference

Top: 6945 ft. Date From: 10/Sep/13 Dip Angle: 66.37° Azi Reference North: True

Bottom: 12515 ft. Date To: 14/Sep/13 Total Mag to Reference

Spud Date: 09/Sep/13 Field Strength: 52820.0 nT North Correction: 8.46°

Borehole Record

Casing Record

Hole Size	From	To	Size	Weight	From	To
8.750 in.	1031 ft.	7960 ft.	9.625 in.	36.00 lb/ft	Surface	1023 ft.
6.125 in.	7960 ft.	12567 ft.	7.000 in.	26.00 lb/ft	Surface	7950 ft.

Mud Record

Deviation Record

Type	From	To	Hole Size	Interval	Inc / Az (Start)	Inc / Az (End)
Water Based	Surface	7960 ft.	8.750 in.	85 ft.	0.4° / 315.0°	1.2° / 147.4°
LSND	7960 ft.	12567 ft.	8.750 in.	43 ft.	1.2° / 147.4°	84.6° / 357.2°
			6.125 in.	85 ft.	84.6° / 357.2°	91.8° / 359.0°
					/	/
					/	/
					/	/
					/	/
					/	/

Acquisition System Software Version

Other

Advantage 2.20U4 Rig / Contractor: Xtreme 24 / Advance Drilling

PATS 6.4.1.34 Job No: 5740519 / D & E

District / Unit: RMD

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Log Run Summary

LWD	BHA	Bit	Bit	Bit	Bit	Assembly	Logged Interval		Bit Depth Interval		Date / Time		Circ.
Run	Run	Run	Size	Type	Gauge	Type	Top	Bottom	From	To	Start	End	Time
No.	No.	No.	(in.)		(in.)		(ft.)	(ft.)	(ft.)	(ft.)			(hrs.)
1	1	1	8.750	PDC	2.000	Steerable	6945	7906	6999	7960	10/Sep/2013 21:30	11/Sep/2014 16:00	32.7
2	2	2	6.125	PDC	6.000	Steerable	7911	12515	7960	12567	12/Sep/2013 14:00	14/Sep/2013 07:00	35.2

Crew

Name	Arrive	Depart	Name	Arrive	Depart	Name	Arrive	Depart
	Wellsite	Wellsite		Wellsite	Wellsite		Wellsite	Wellsite
Osagie Otoikhine	08/Sep/2013	15/Sep/2013	Marcus Boucher	08/Sep/2013	10/Sep/2013	Aaron Burton	10/Sep/2013	13/Sep/2013
Austin Small	13/Sep/2013	15/Sep/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+ (%)
12/Sep/2013	18:00	1	7961	LSND	9.7	11	8.8	N/A	1.4/91.0	Active Pit	1200	N/A
13/Sep/2013	06:00	2	8903	LSND	9.2	10	8.6	N/A	2.4/92.0	Active Pit	1100	N/A
13/Sep/2013	08:00	2	10514	LSND	9.2	10	8.5	N/A	2.0/92.5	Active Pit	1200	N/A

Mnemonics

Curve	Description	Units
GRAX	Gamma Ray Apparent 0.5 ft. Avg.	API
GRIX	Gamma Ray Density	Points
GRSI	Gamma Ray Slide Indicator	Unitless
GRTX	Gamma Ray Time Since Drilled	min
ROPA	Rate of Penetration 3.0 ft. Avg.	ft/hr
TCDX	Downhole Temperature	deg F
TVD	True Vertical Depth	ft
WOBA	Surface Weight on Bit 1.0 ft Avg.	klbf

Equipment and Service Data

LWD Run No.	Tool	Serial Number	Measurement	Bit Offset (ft.)	Max O.D. (in.)	Min I.D. (in.)
1	DIR	12566669	Directional	56.36	6.750	2.165
1	SRIG	12722372	Gamma	53.62	6.750	2.165
2	DIR	12592568	Directional	51.67	4.750	2.875
2	SRIG	12673191	Gamma	48.26	4.750	2.875

Service and Tool Mnemonics

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

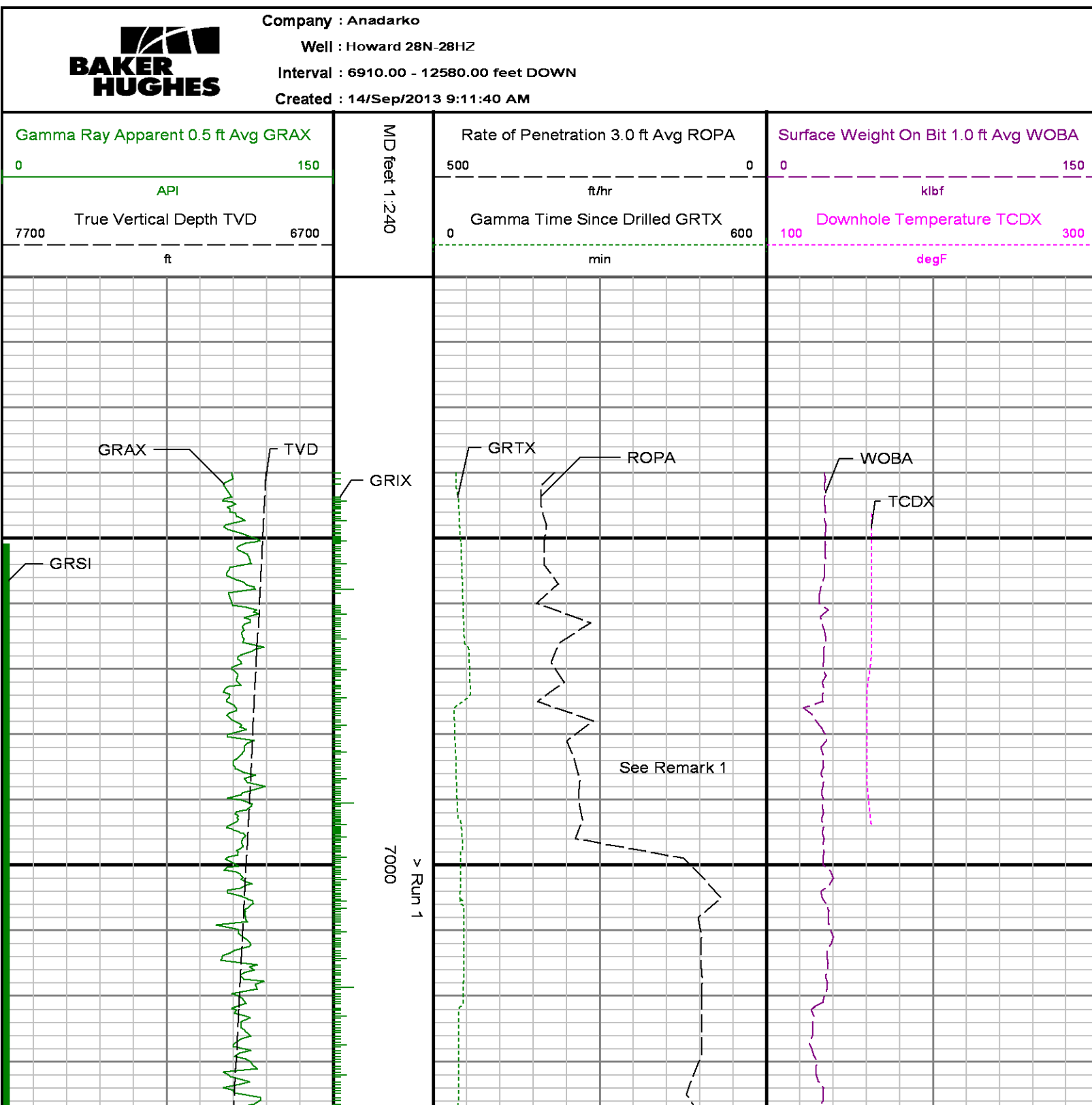
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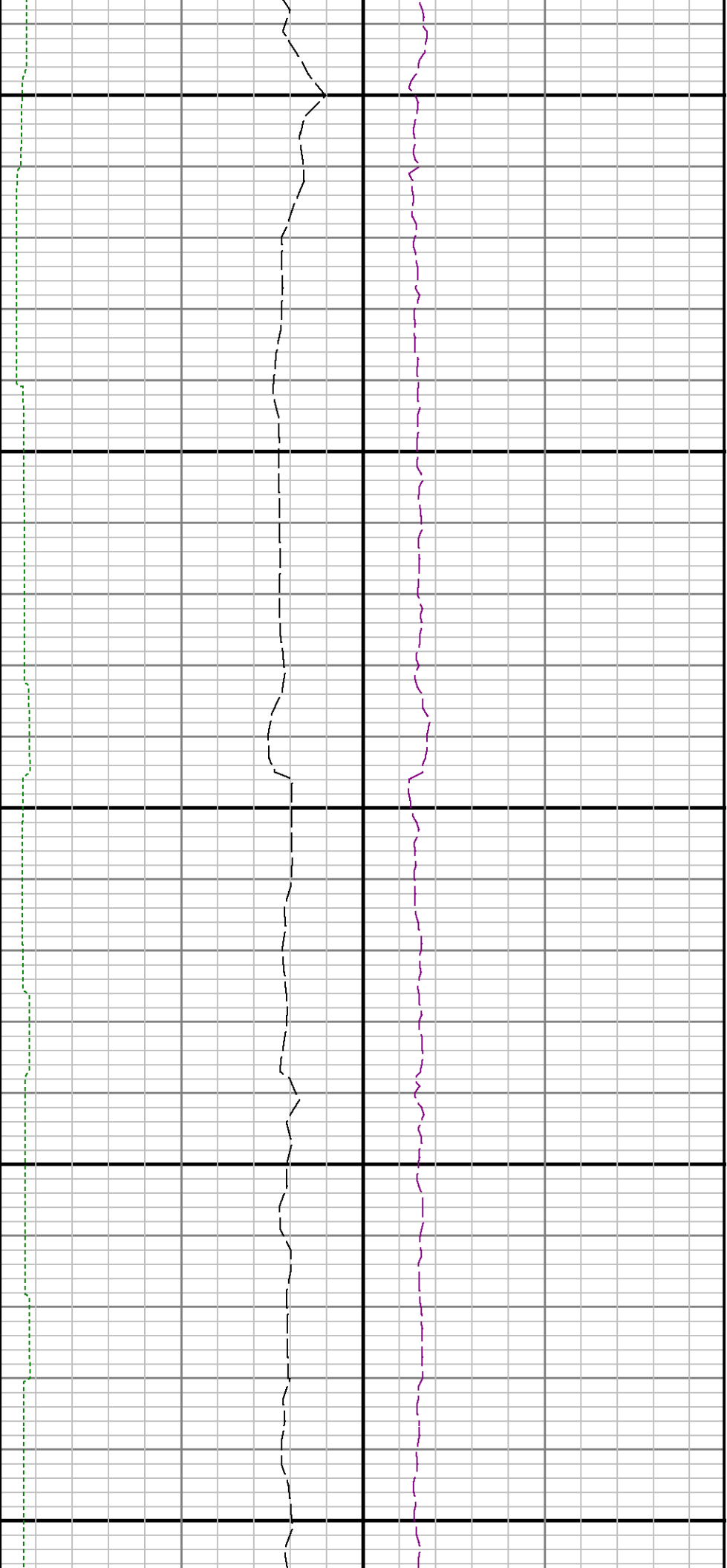
1) Baker Hughes INTEQ run 1 utilized 6 1/2 inch NaviGamma (Gamma Ray and Directional) behind a 8 3/4 inch bit and steerable assembly from 6999 feet to 7960 feet MD (6961 feet to 7575 feet TVD).
2) Baker Hughes INTEQ run 2 utilized 4 3/4 inch NaviGamma (Gamma Ray and Directional) behind a 6 1/8 inch bit and steerable assembly from 7960 feet to 12567 feet MD (7575 feet to 7573 feet TVD).
3) A sliding indicator is shown to the left edge of track 1 as a heavy line. The indicator has been depth-shifted to the gamma sensor offset to correspond with gamma data acquired while sliding.

Remarks

Number	Measured Depth (ft.)	Hole Section (in.)	LWD Run No.	Remark
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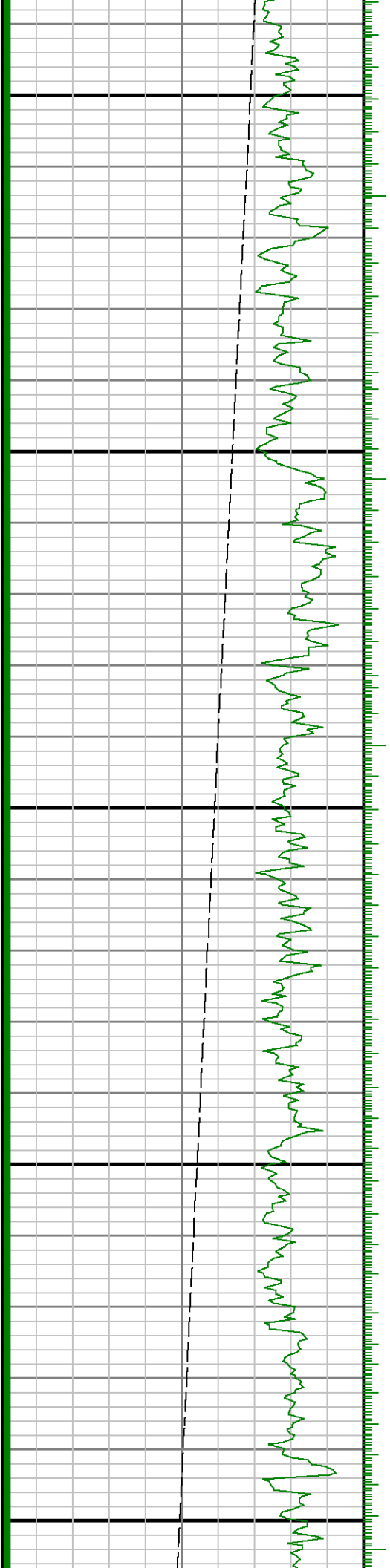
1	6999	8.750	1	The interval from surface to 6945 feet MD( 6907 feet TVD) was not logged since logging services began at kick off point.
2	7960	8.750	2	Interval from 7907 feet to 7960 feet MD (7570 feet to 7575 feet TVD) was logged more than 22 hours after drilling due to tripping for a new BHA.
3	12515	6.125	2	Interval from 12515 feet to 12567 feet MD (7575 feet to 7573 feet TVD) was not logged due to gamma ray sensor offset at well TD.

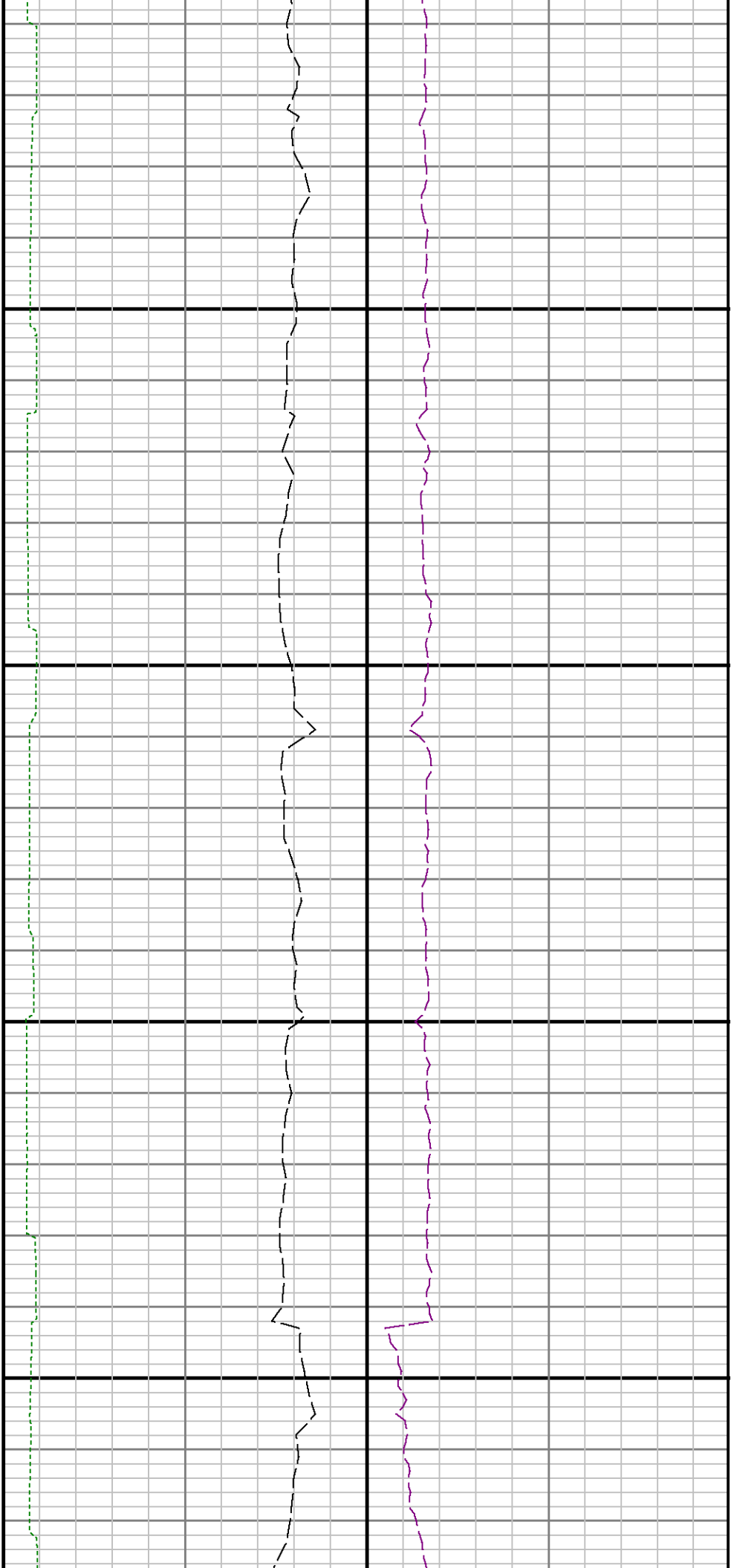




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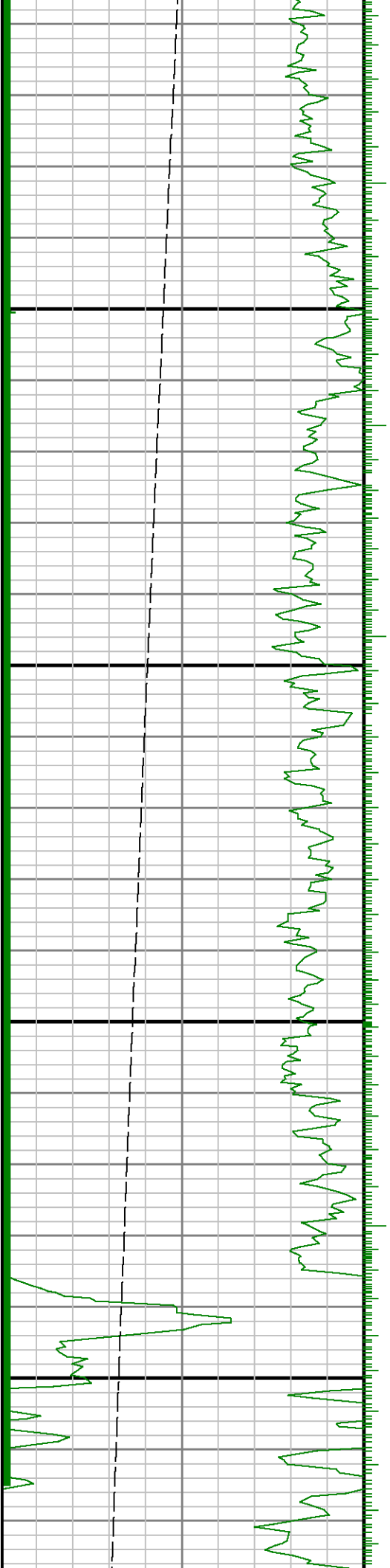
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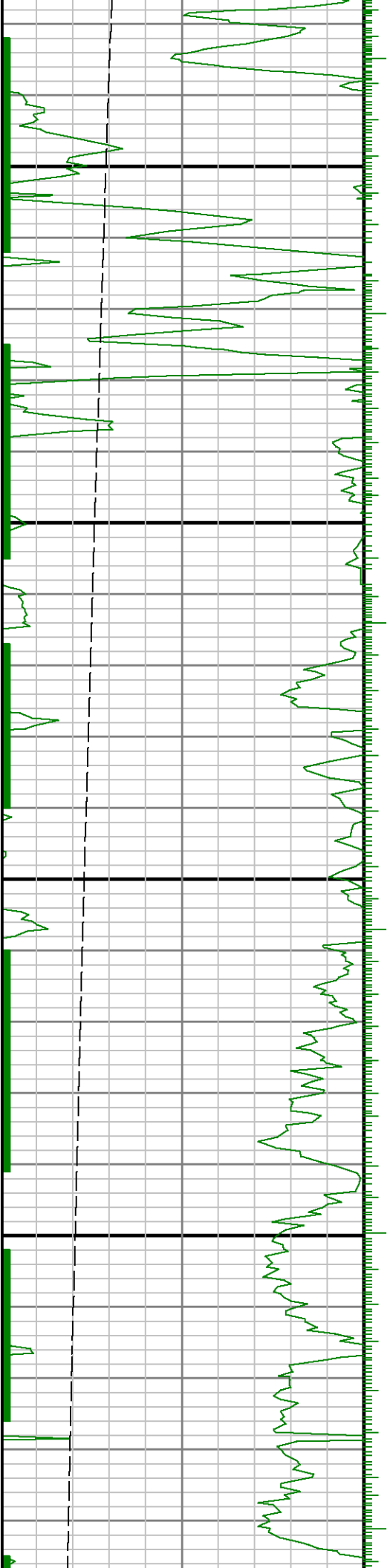




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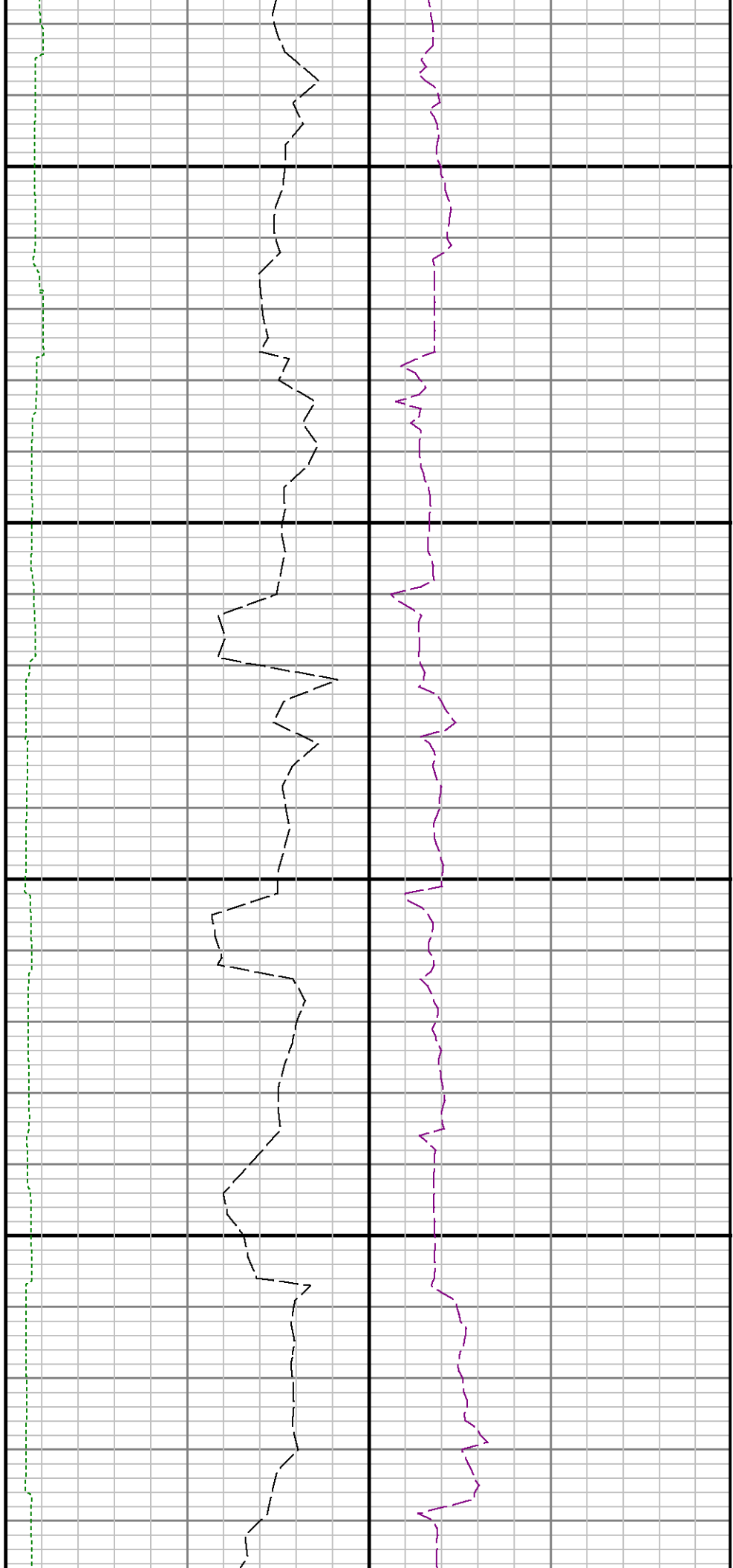
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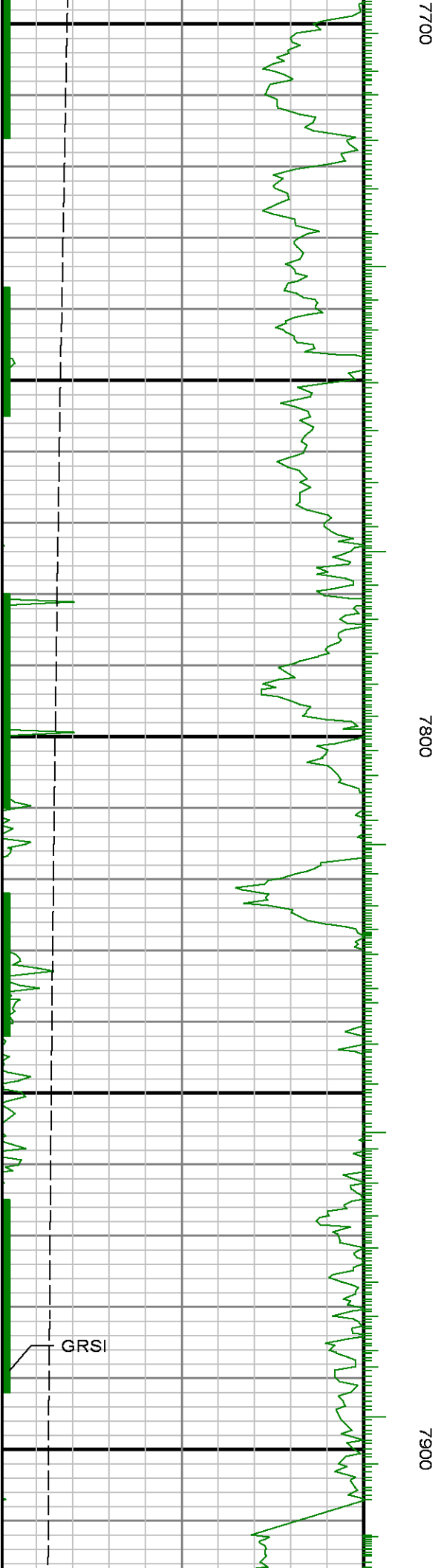
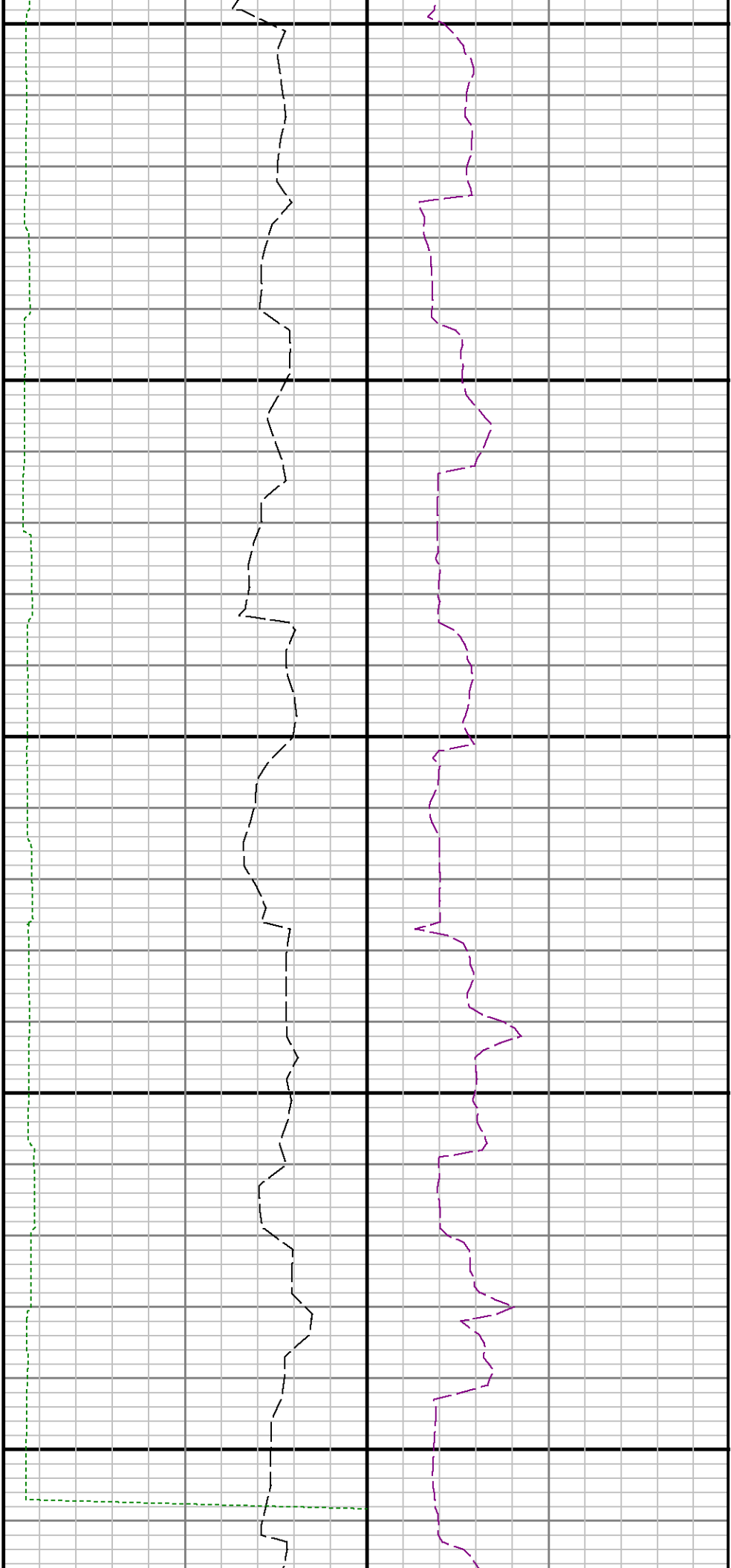


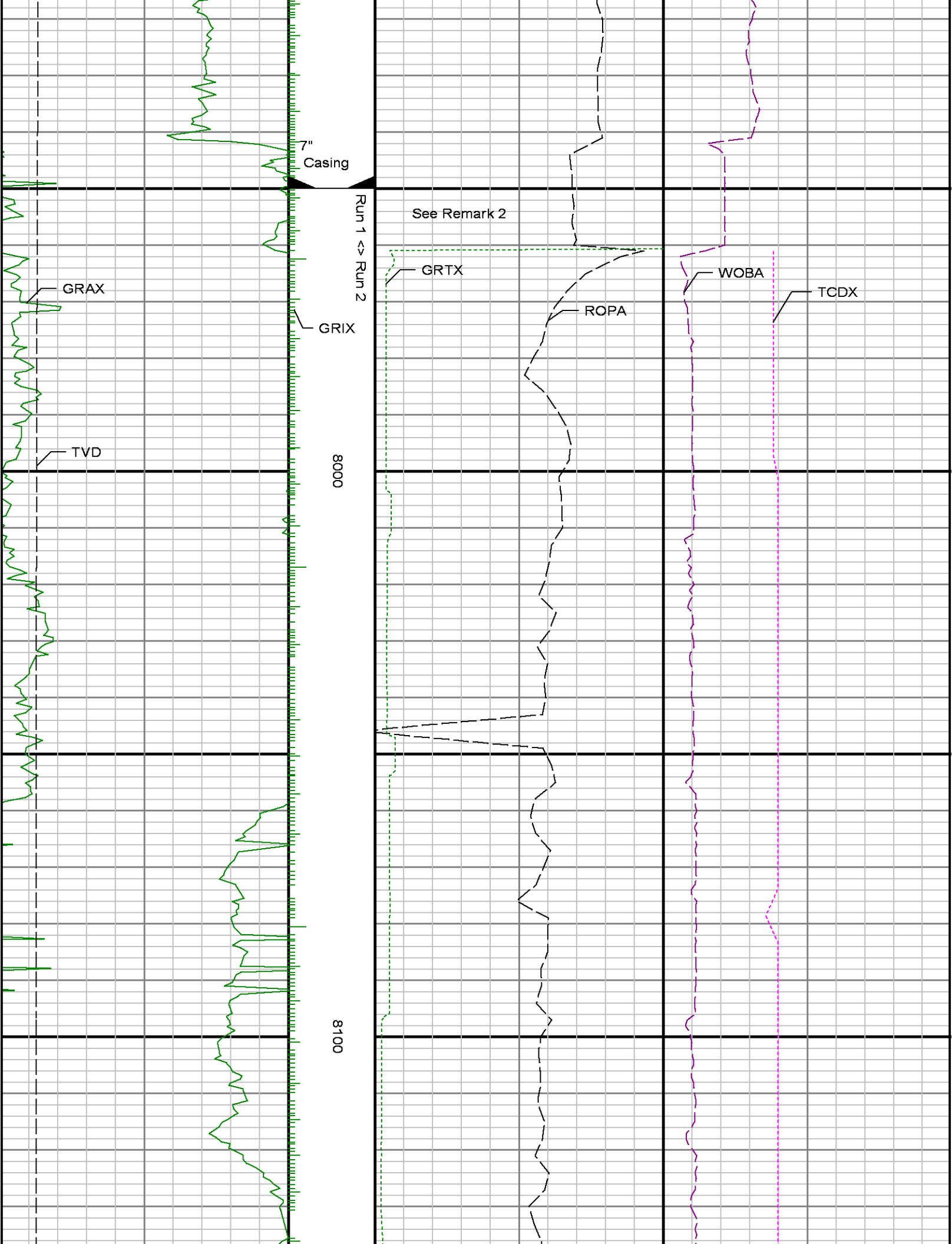


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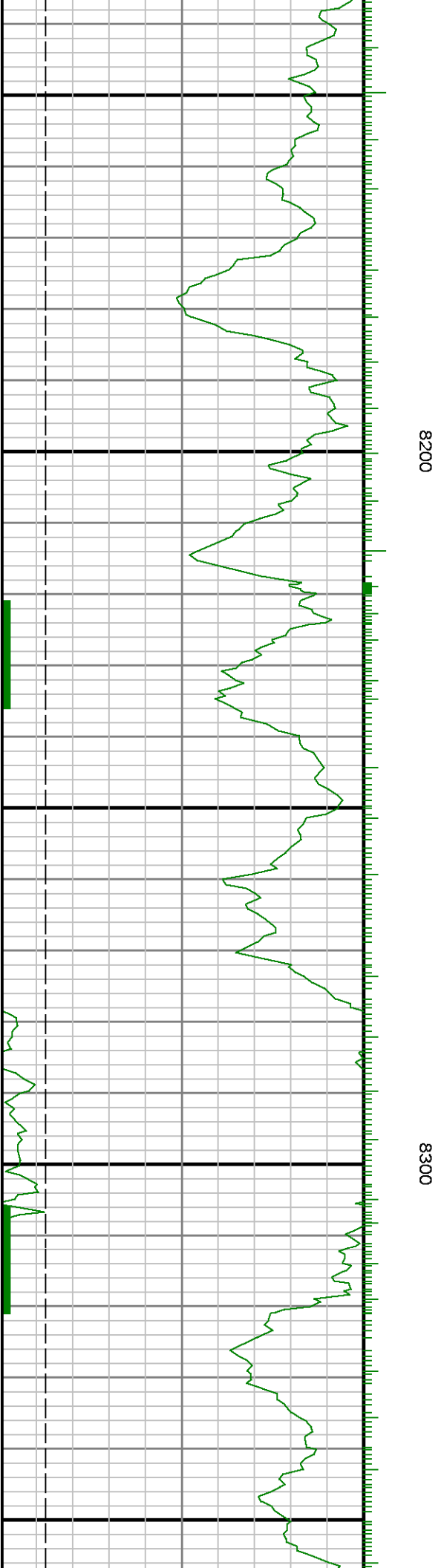
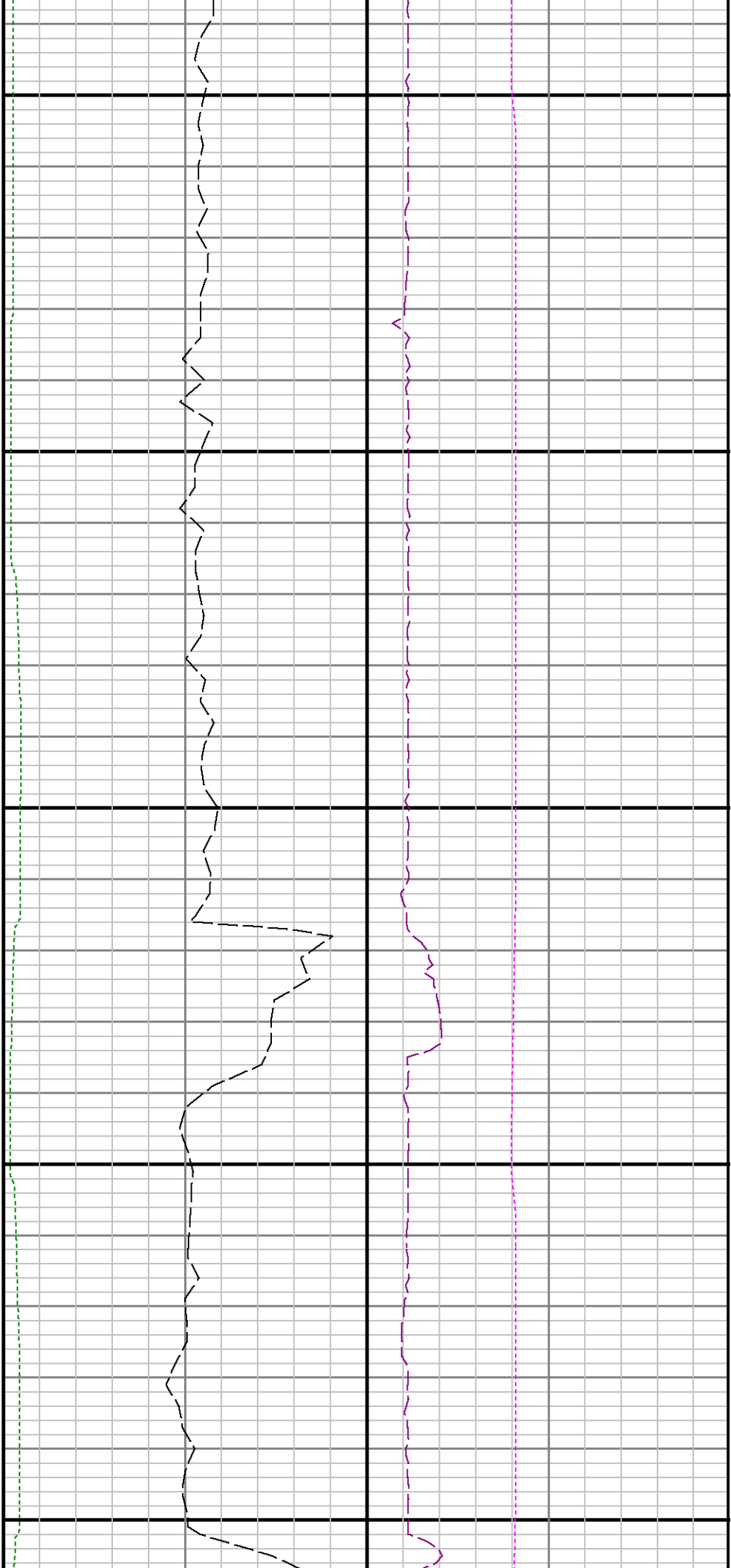
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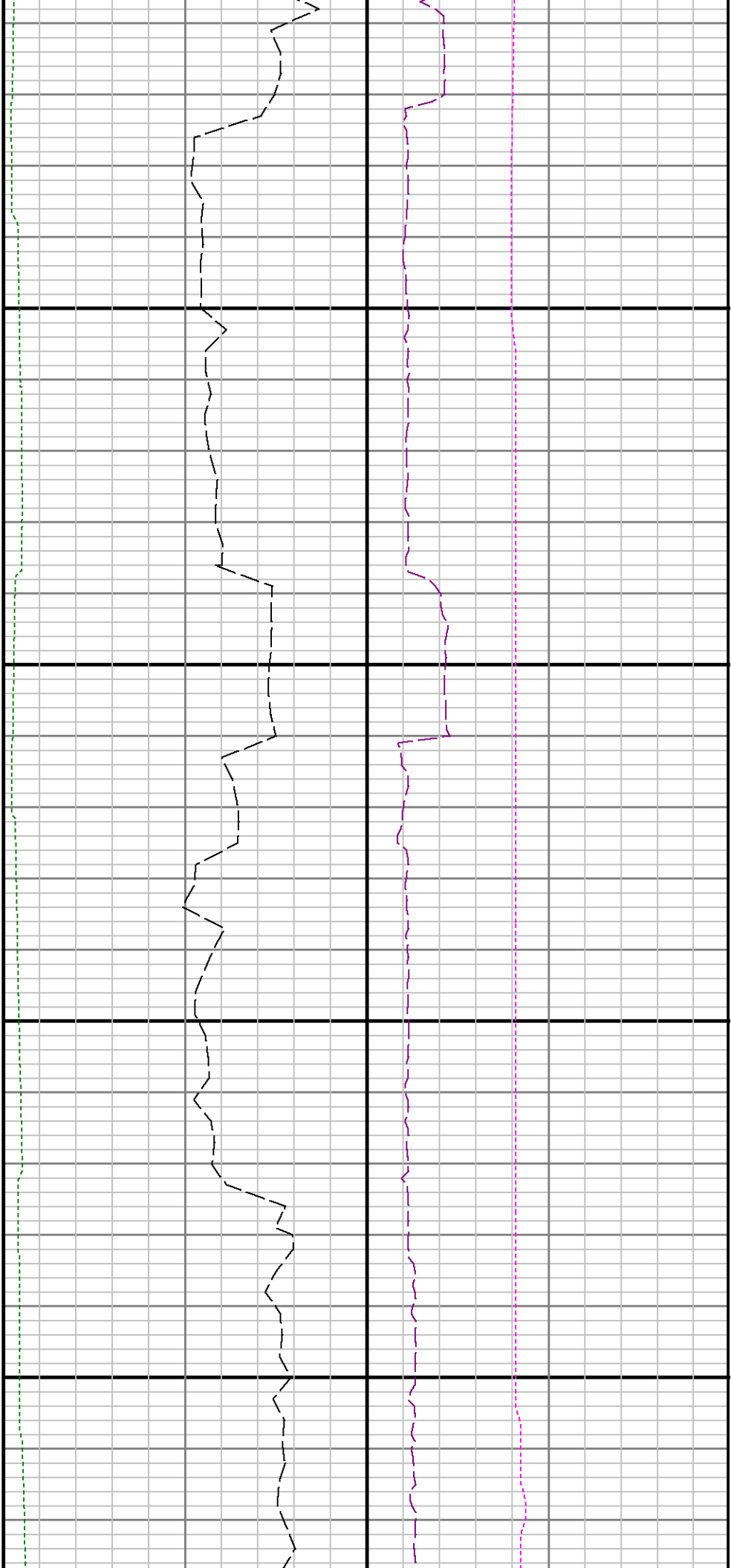






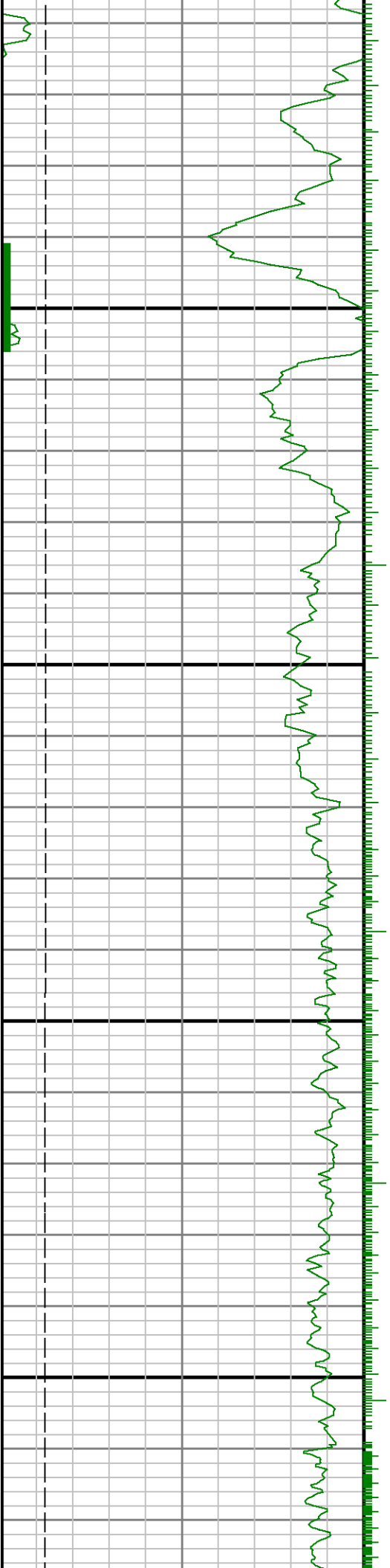


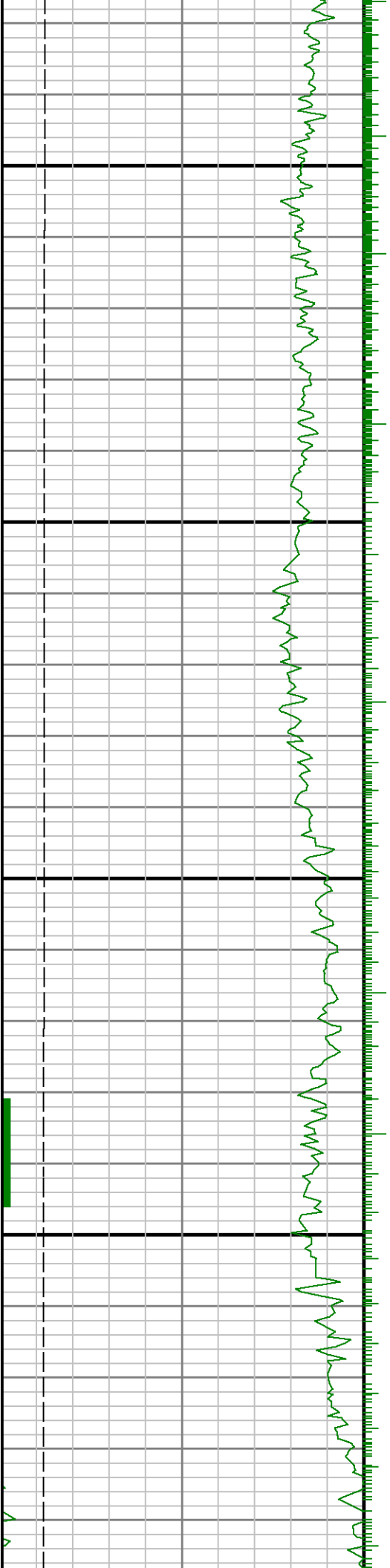




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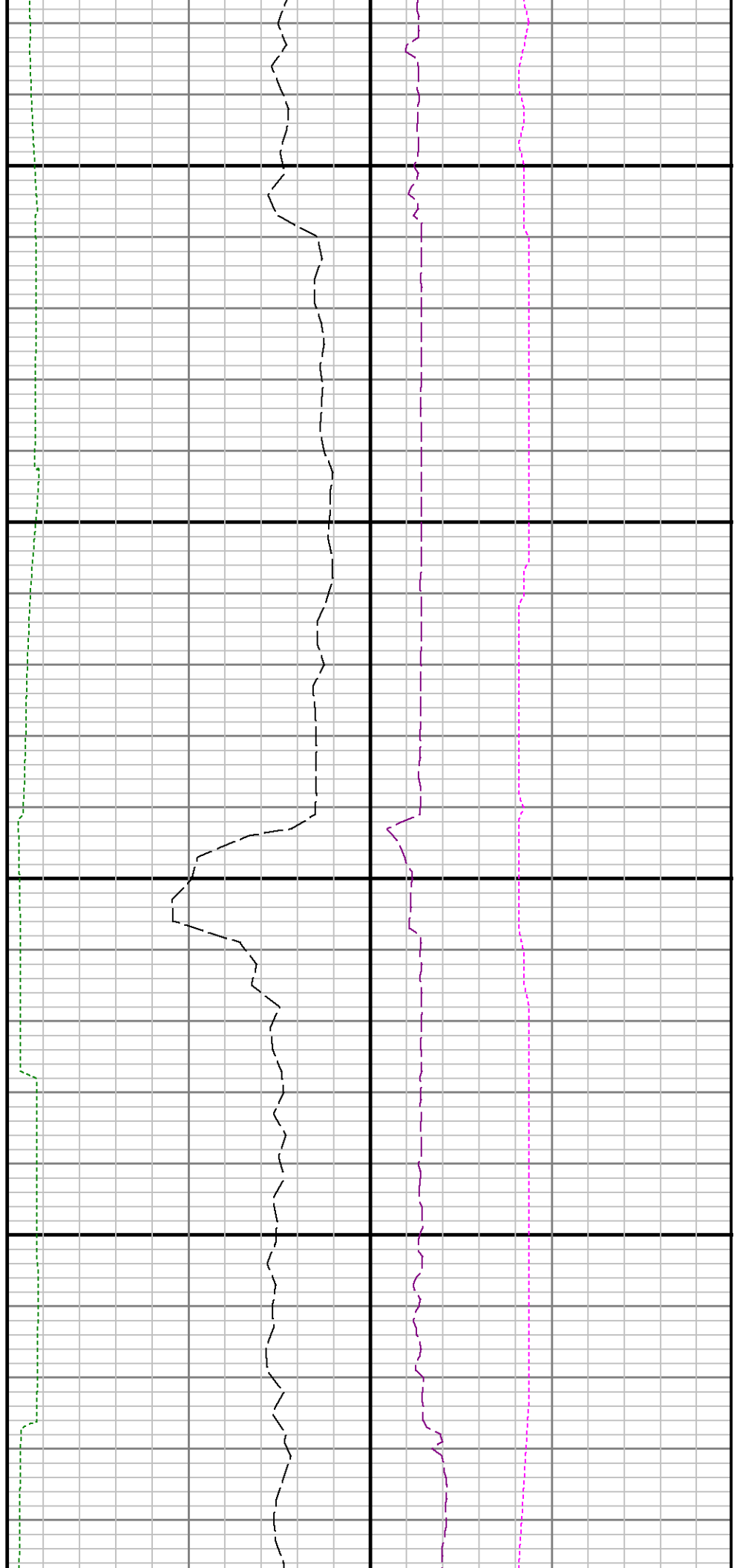
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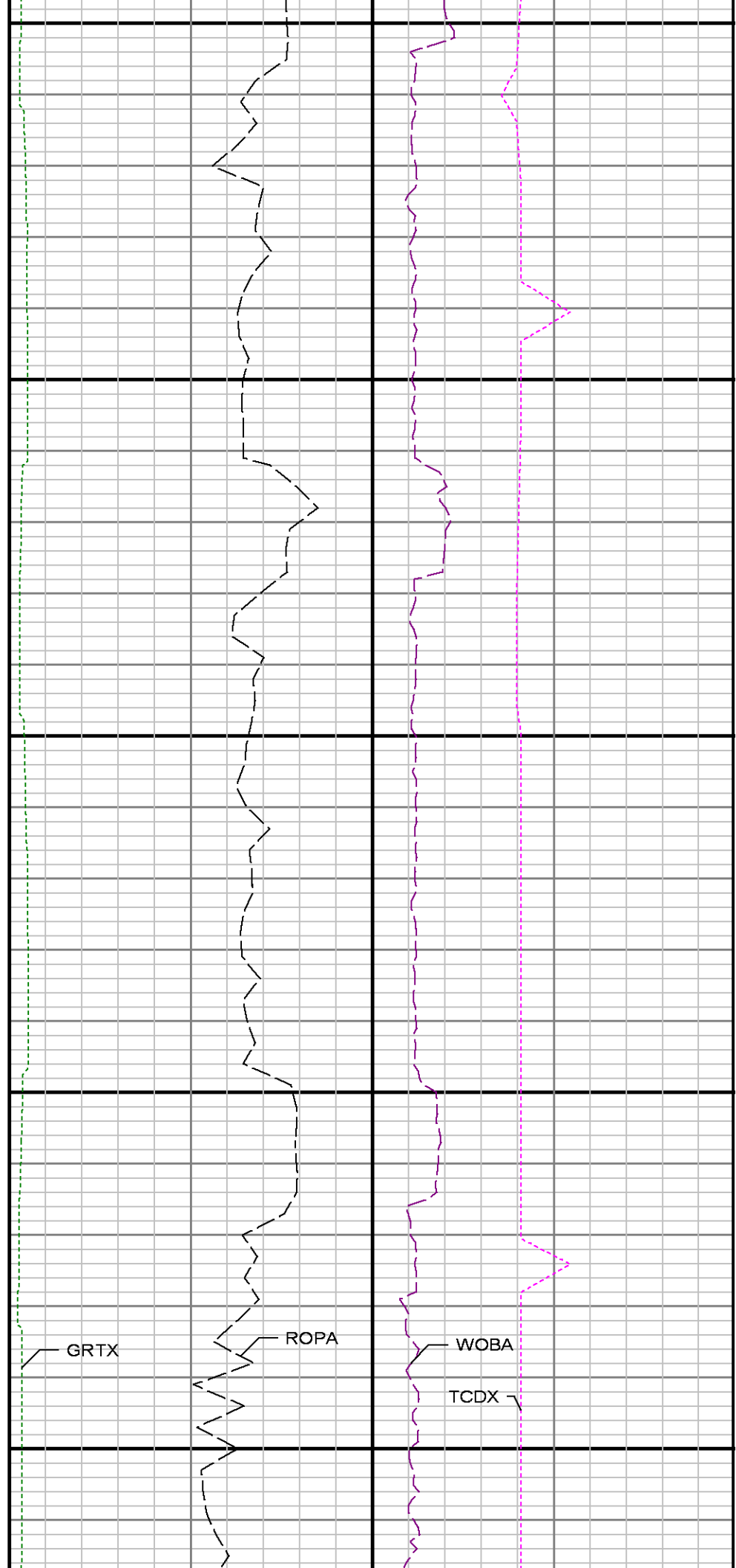
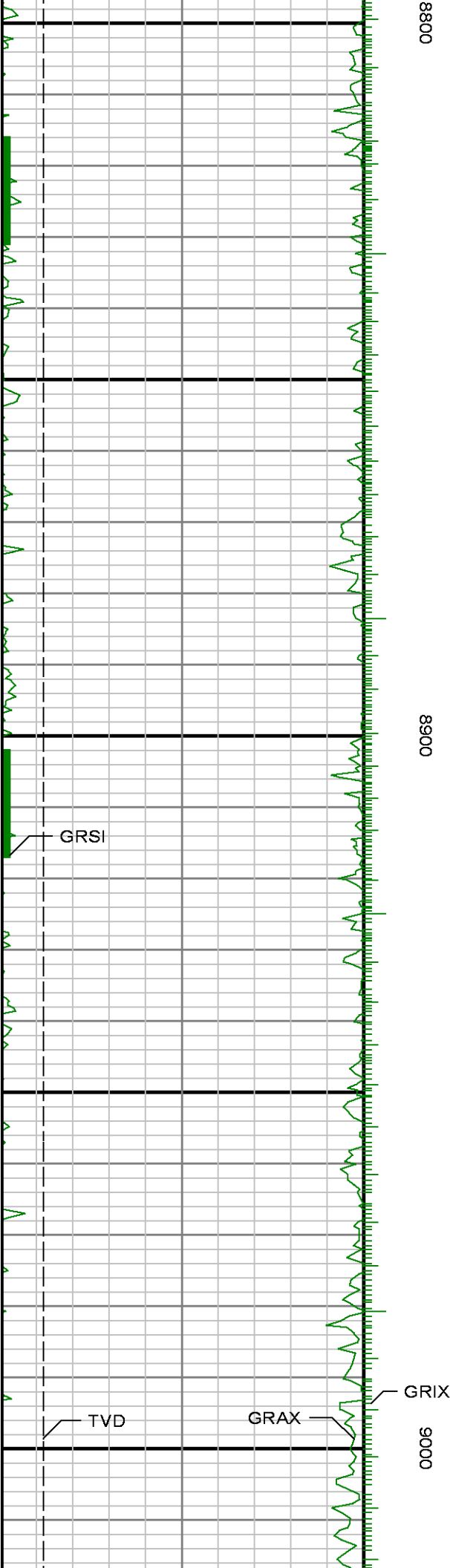


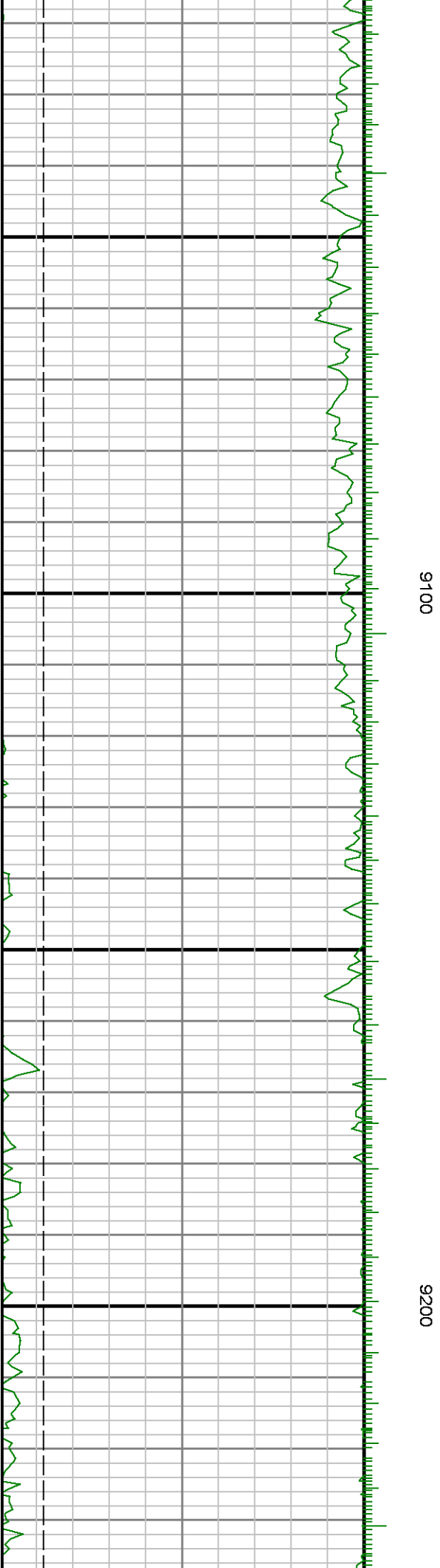
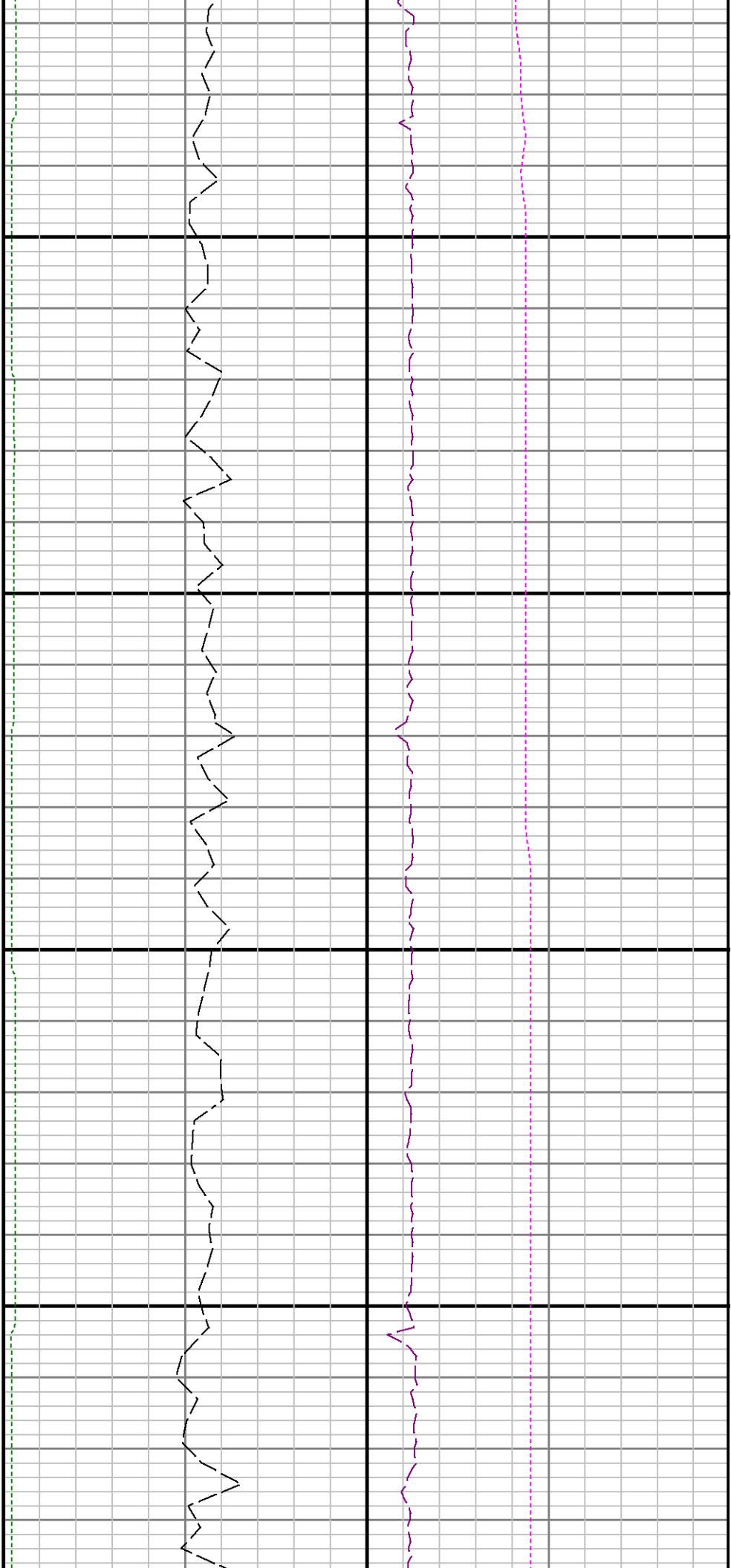


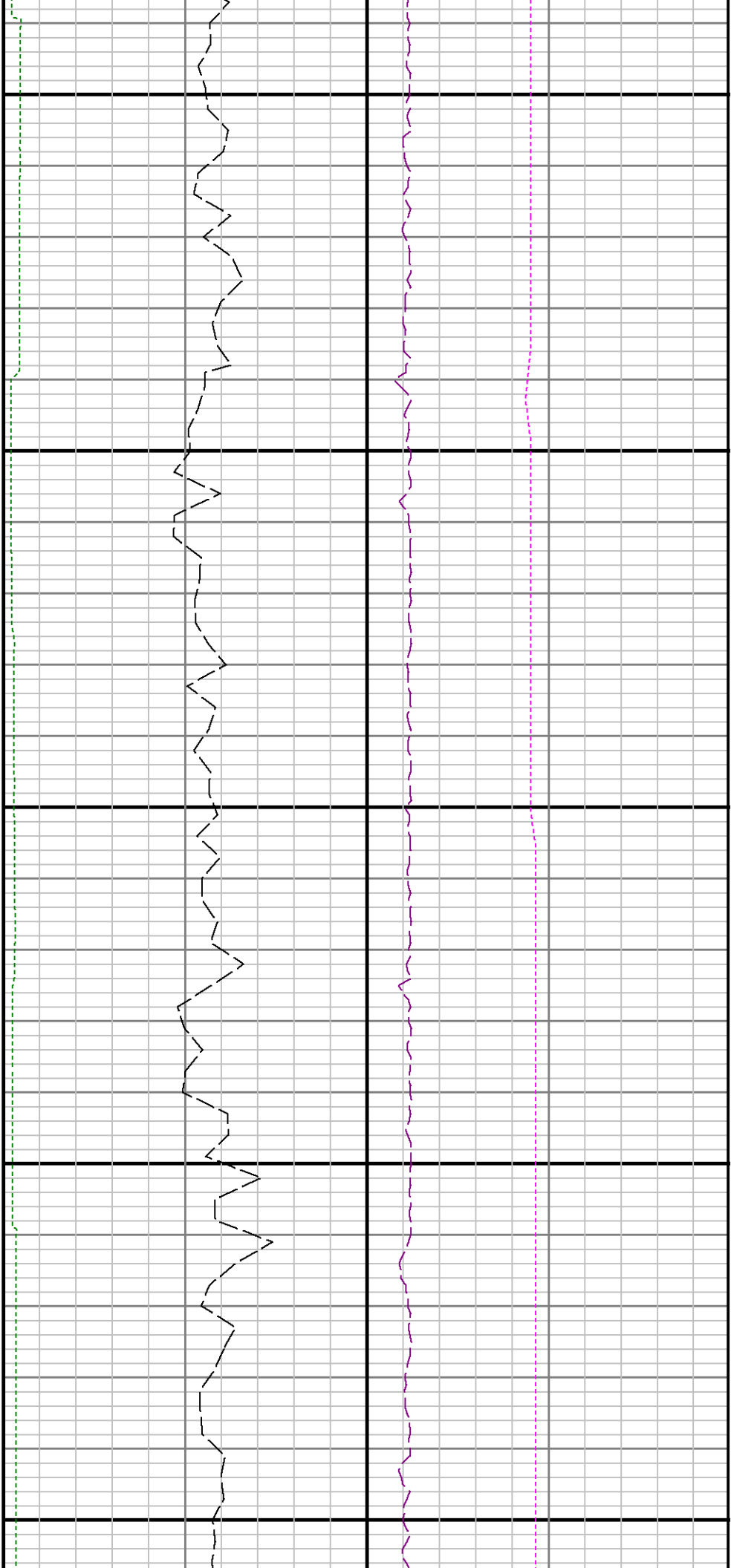
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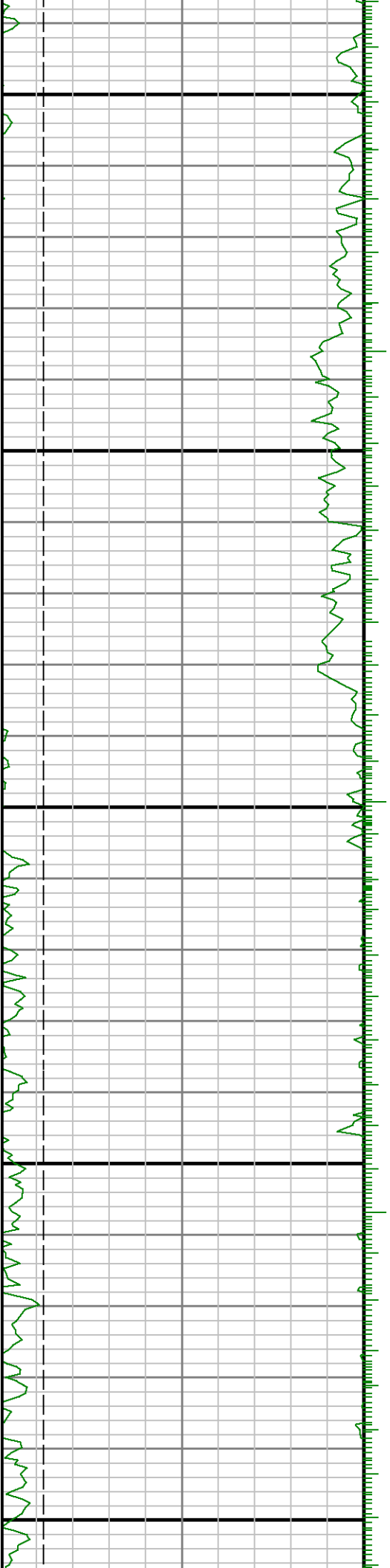


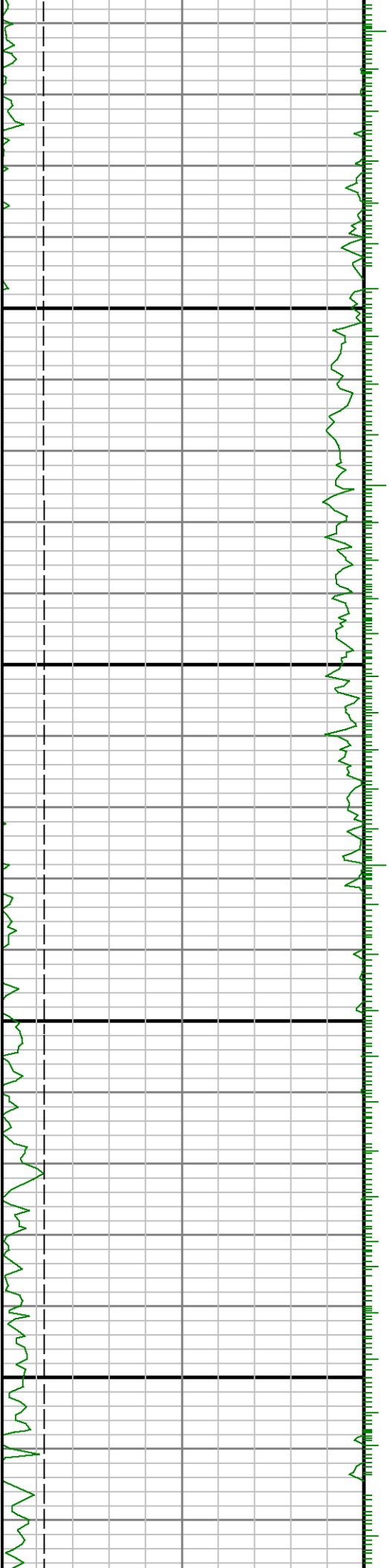




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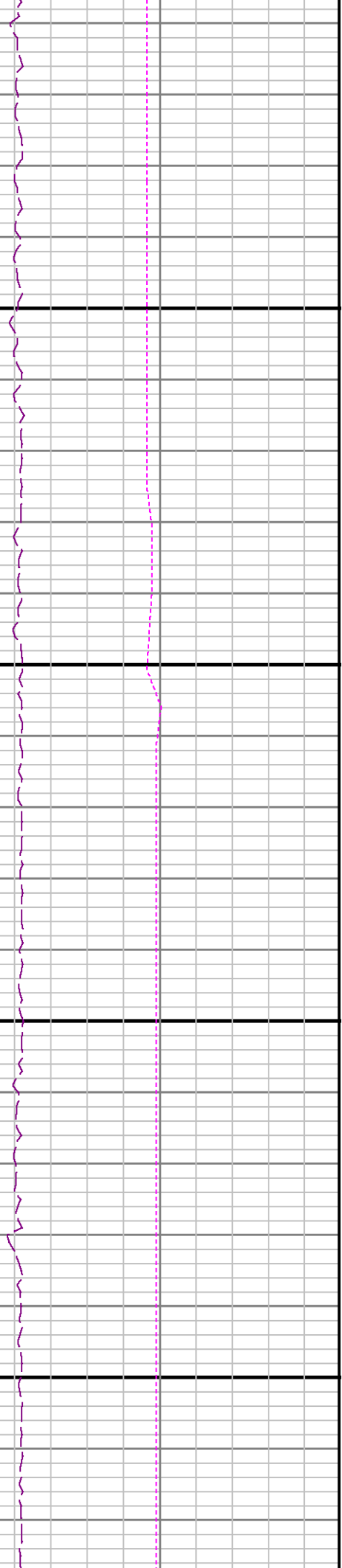
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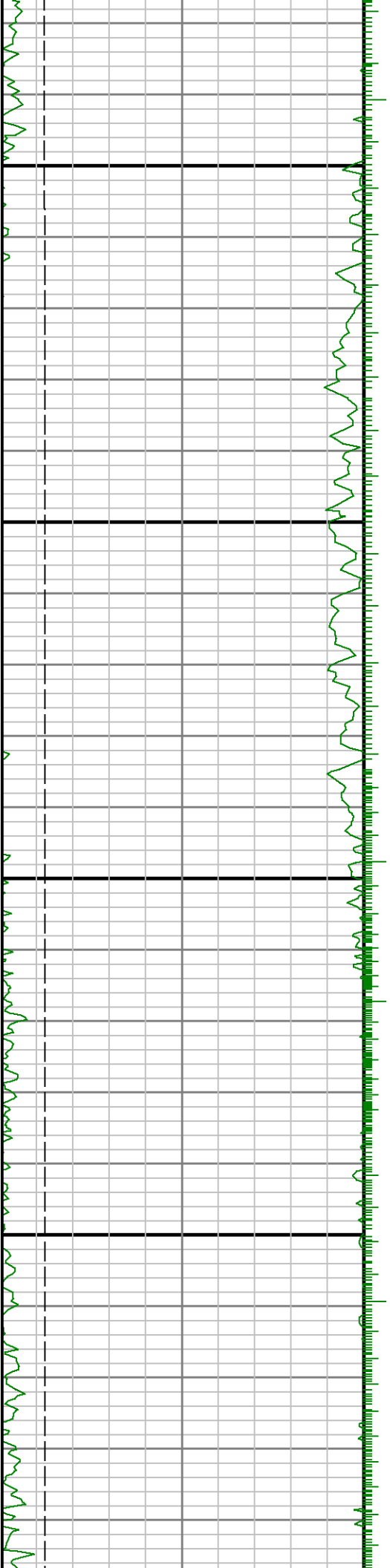




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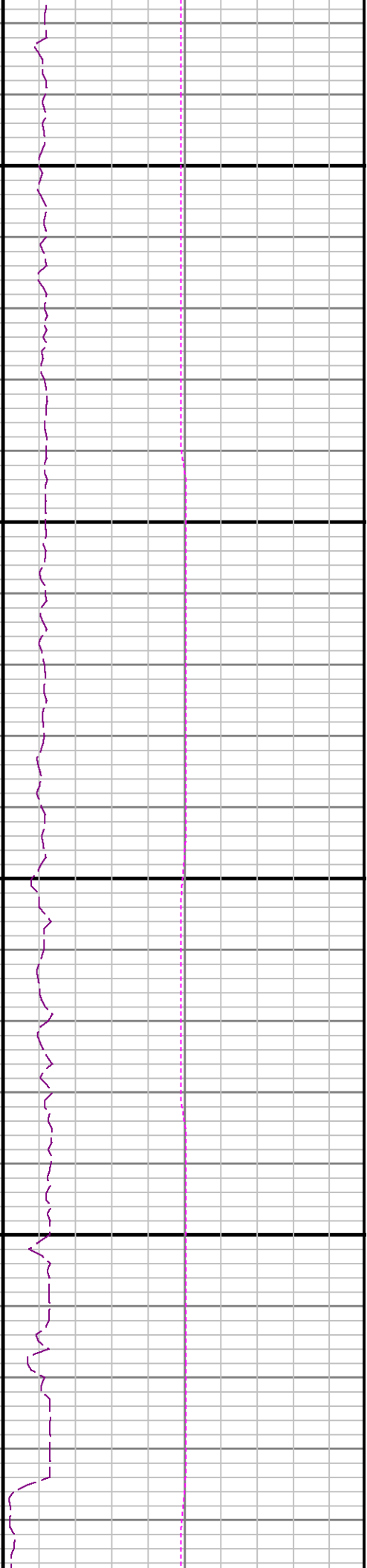
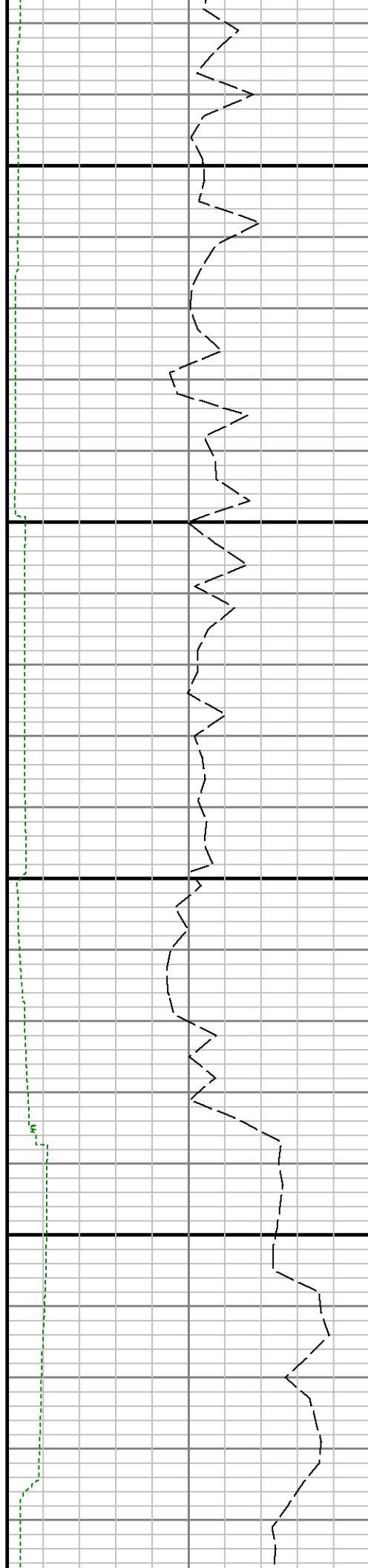
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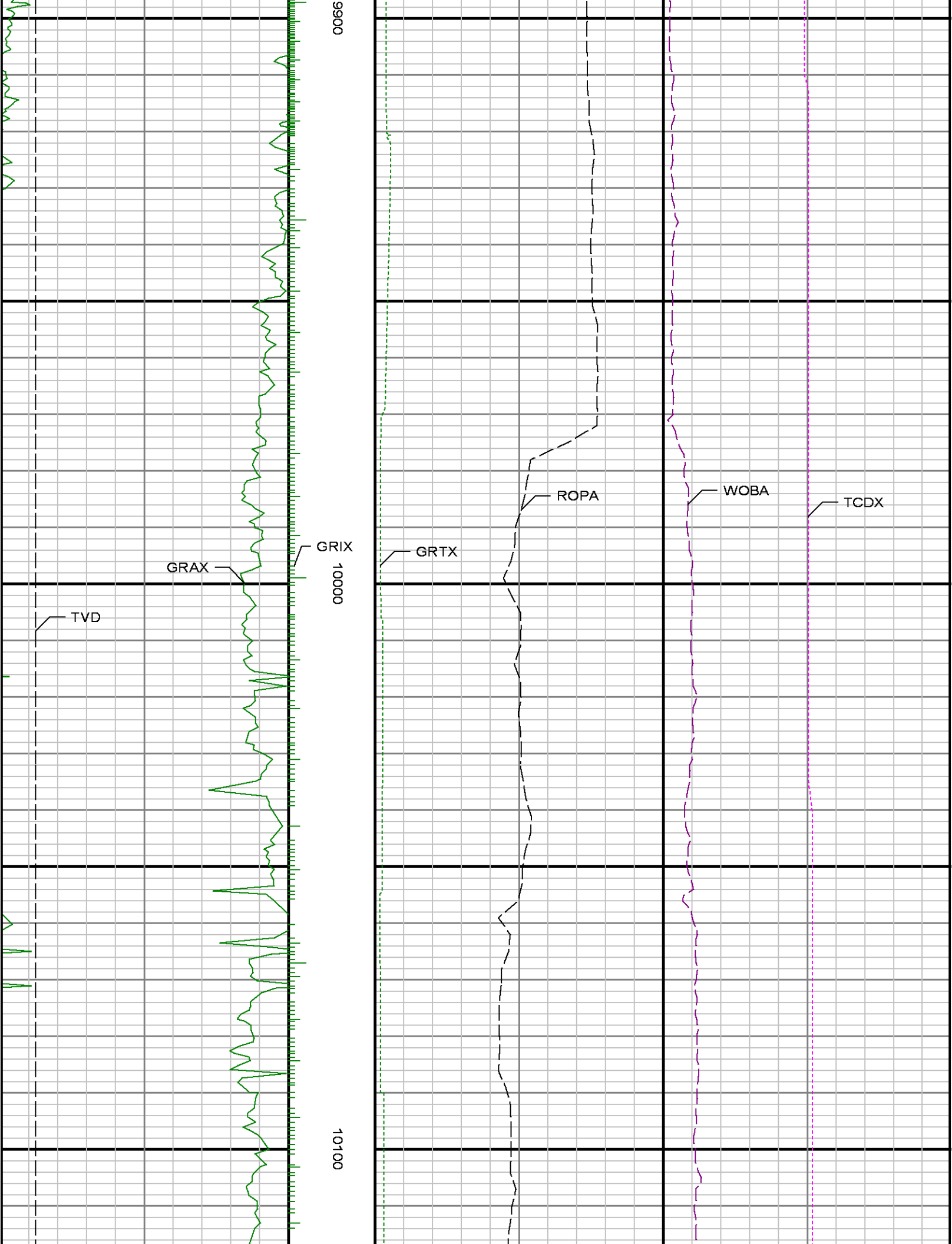


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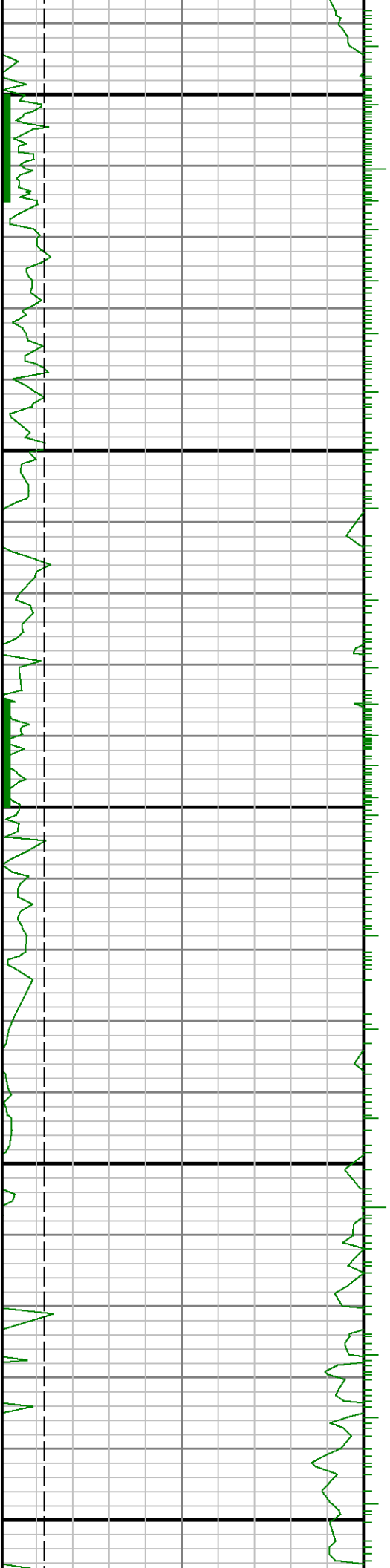


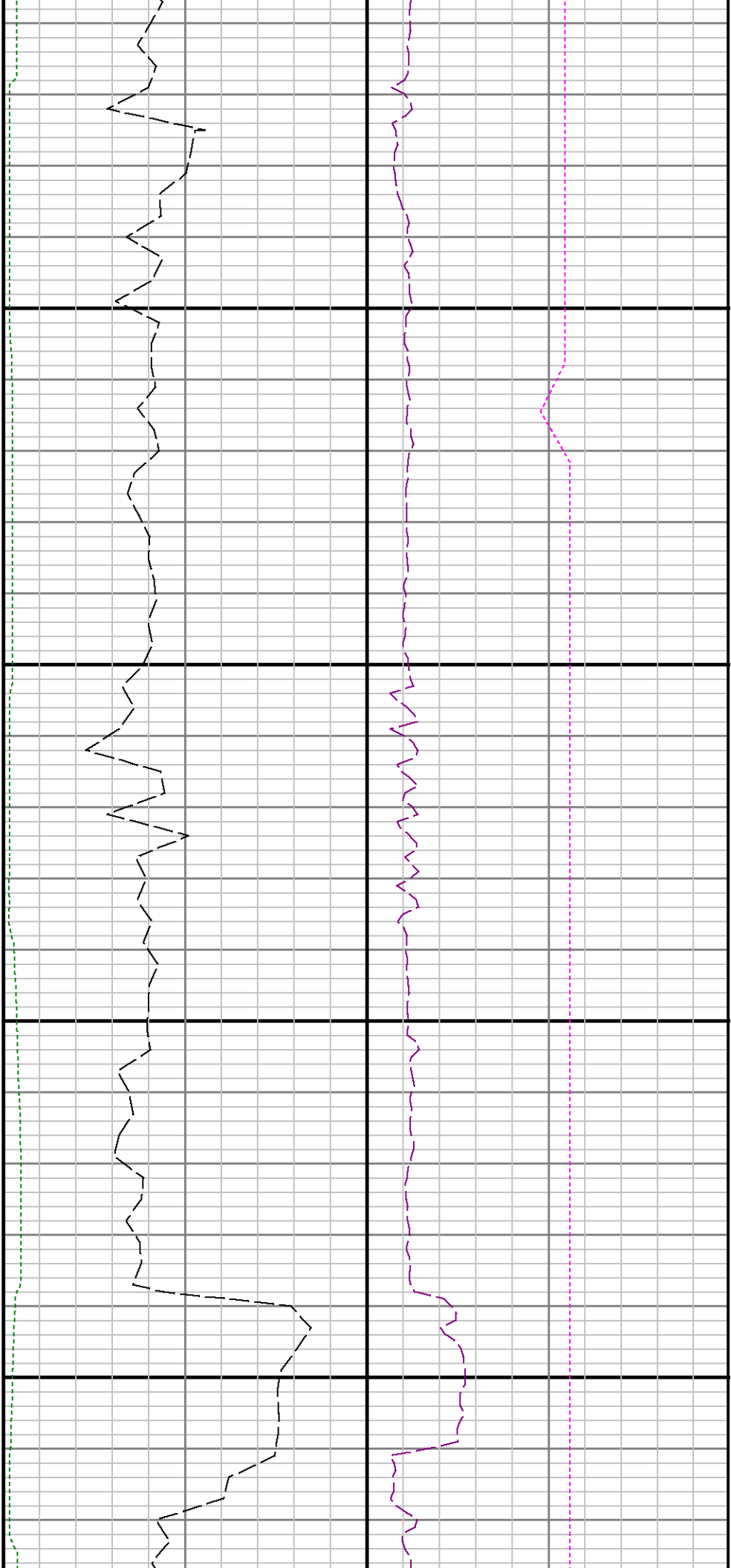




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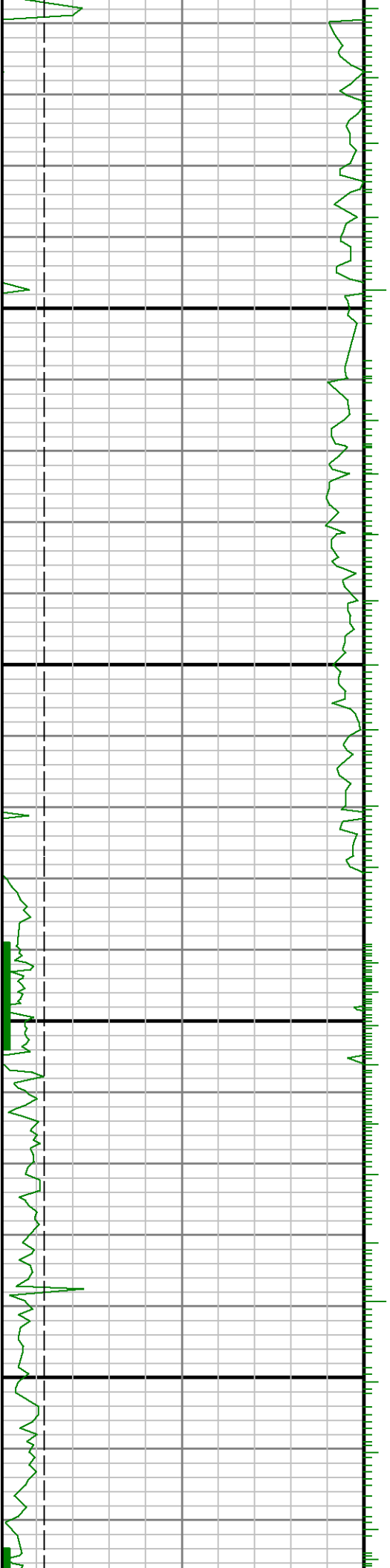
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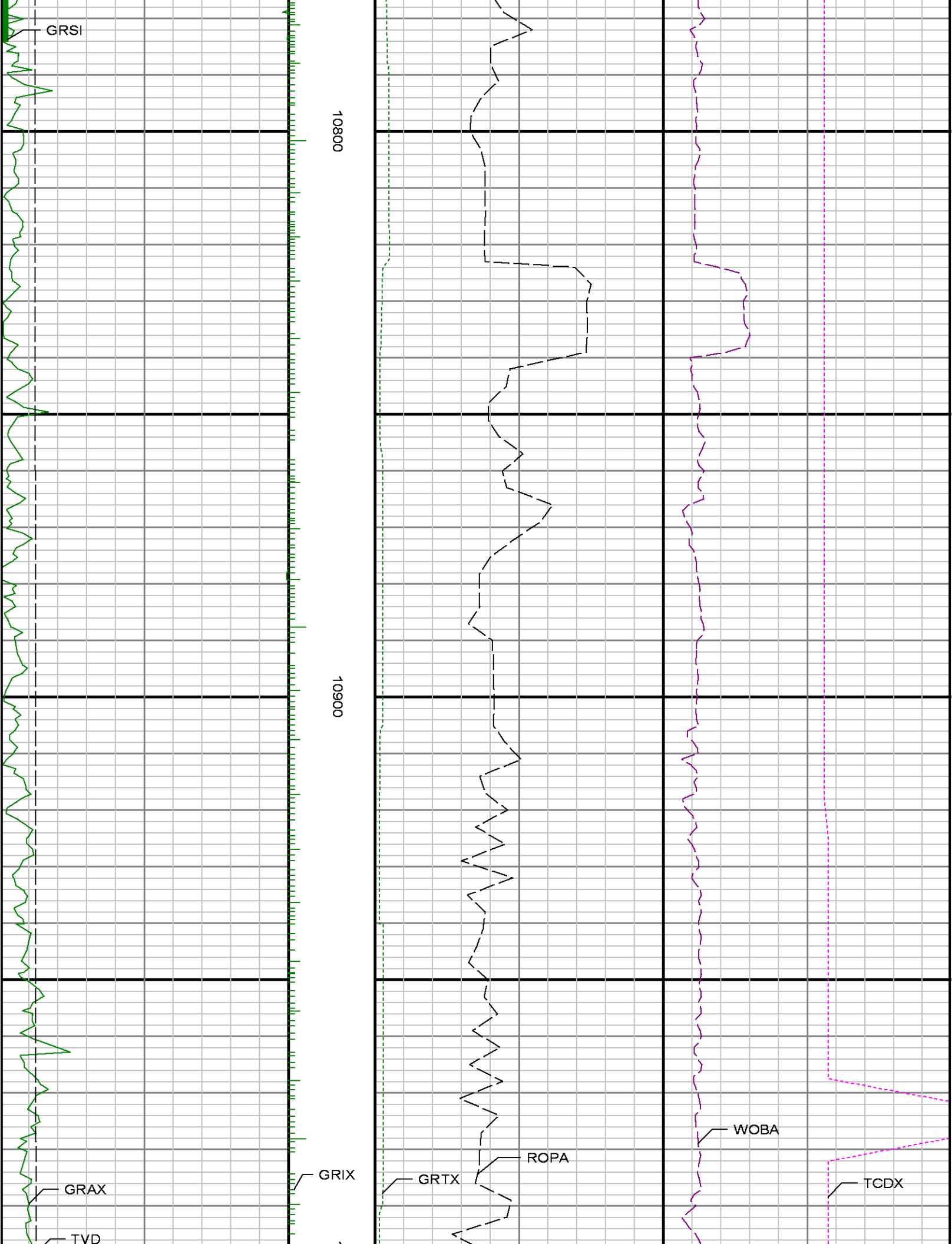


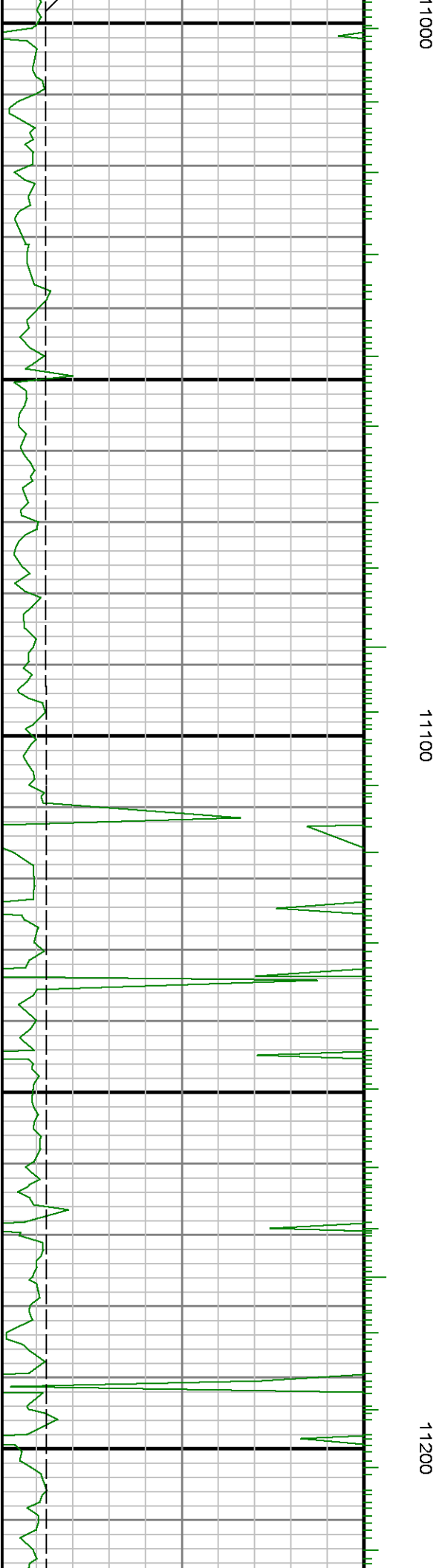
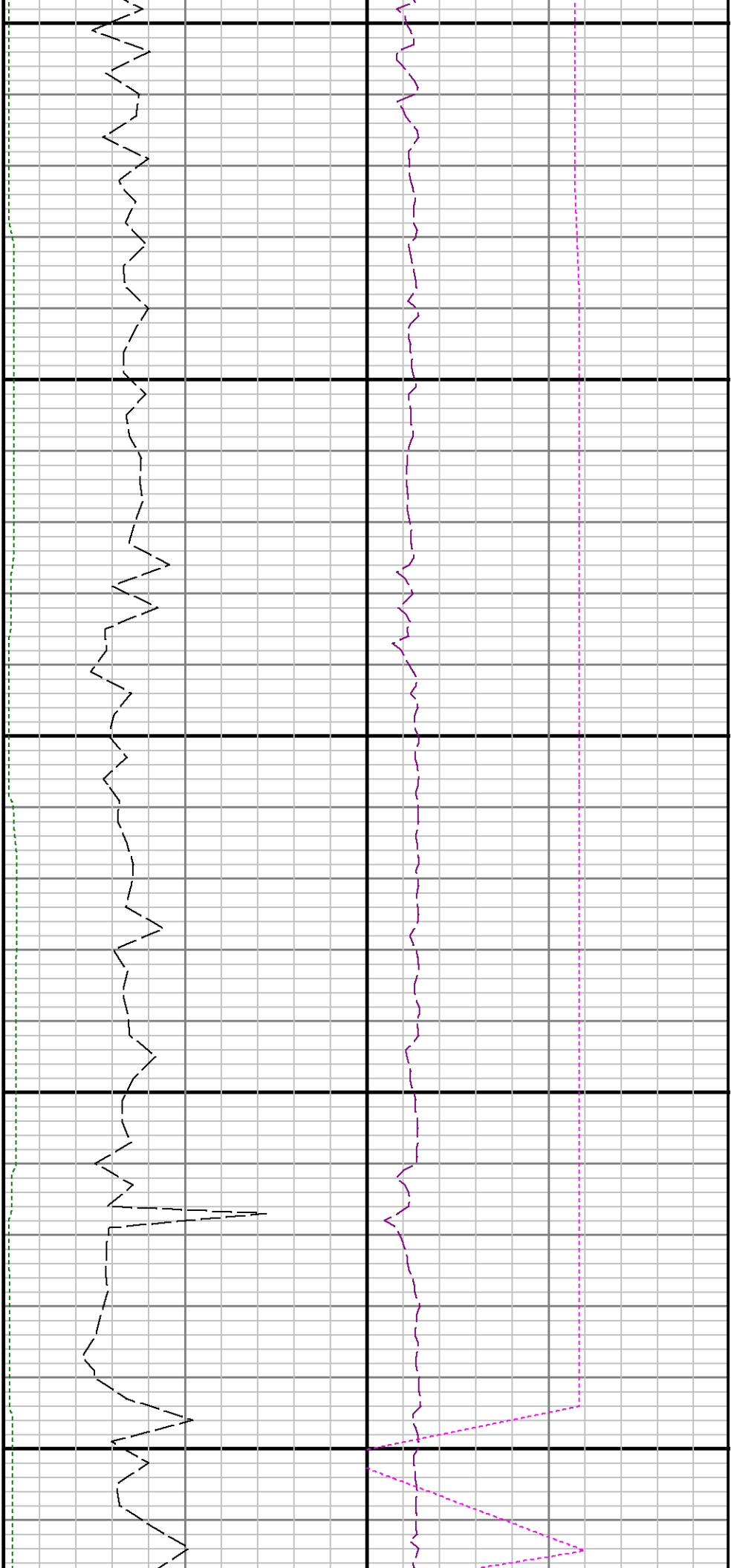


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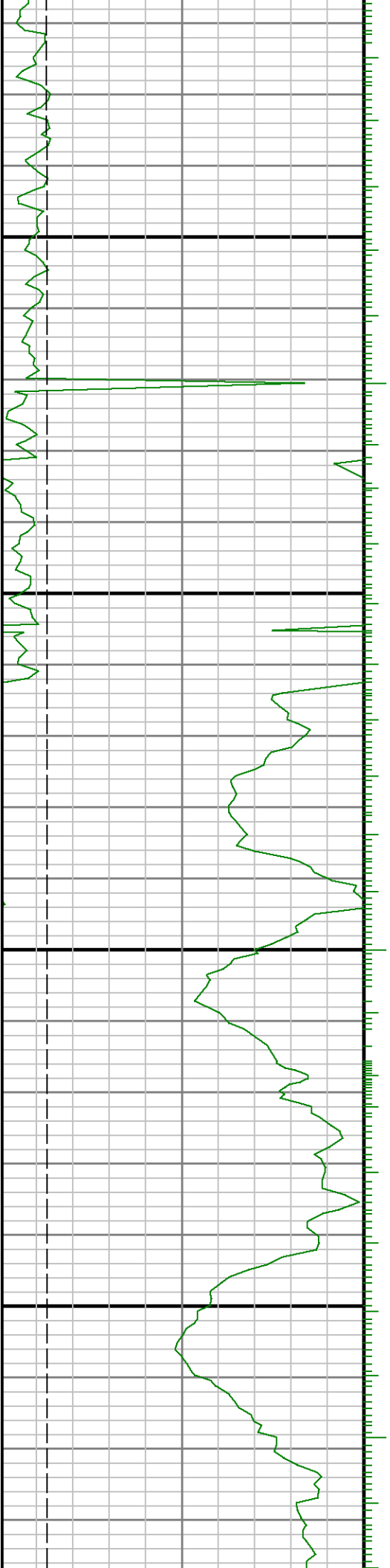






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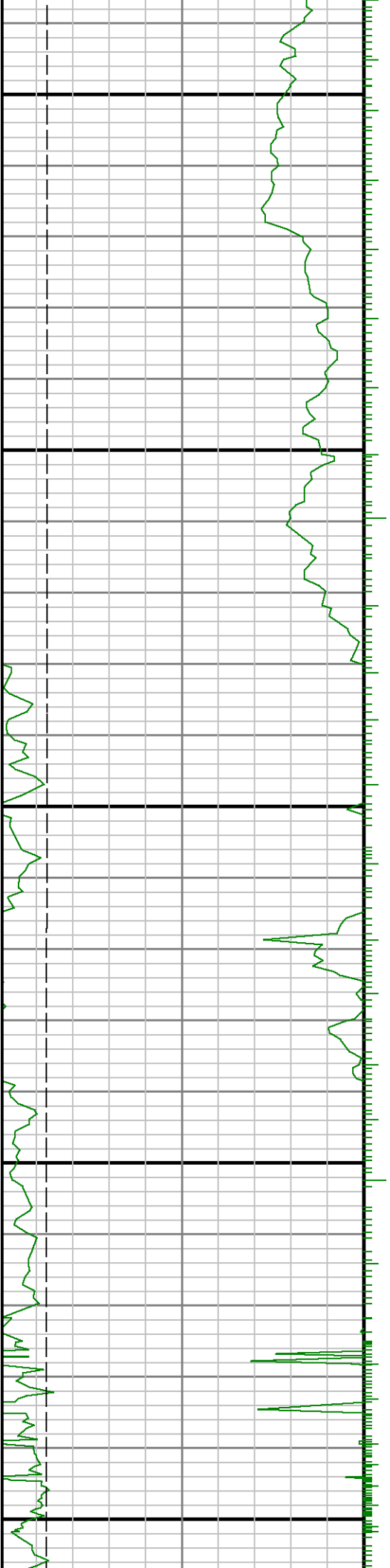
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