



Natural Formation Evaluation
Gamma Ray

Realtime Log

Scale: Company: Kerr-McGee Oil & Gas Onshore LP

1:240 Well: Como 13N-14HZ

MEASURED DEPTH Field: Weld County (Kerr McGee)

Status: Region: Continental US State: Colorado

Final Print Surface Location: Latitude: 40° 4' 6.528" N Other Services: Directional VSS

API Number: 05123399440000 Longitude: 104° 58' 31.620" W Section: 11 TWN: 1S Range 68W

Permanent Datum (P.D.): Mean Sea Level Elevation: 5055.00 ft. Elevations: N/A
Log Measured From: Rig Floor 5055.00 ft. Above P.D. KB: 5055.00 ft.
Depth Reference: Drillers Depth GL: 5030.00 ft.

Interval Logged Dates Magnetic Field Reference
Top: 6900 ft. Date From: 05/Dec/14 Dip Angle: 66.48° Azi Reference North: True
Bottom: 16236 ft. Date To: 14/Dec/15 Total Mag to Reference
Spud Date: 02/Dec/14 Field Strength: 52722.0 nT North Correction: 8.60°

Borehole Record				Casing Record			
Hole Size	From	To	Size	Weight	From	To	
8.750 in.	1192 ft.	7905 ft.	9.600 in.	36.00 lb/ft	Surface	1182 ft.	
6.125 in.	7905 ft.	16236 ft.	7.000 in.	26.00 lb/ft	Surface	7892 ft.	

Mud Record				Deviation Record			
Type	From	To	Hole Size	Interval	Inc / Az (Start)	Inc / Az (End)	
Water Based	Surface	16236 ft.	8.750 in.	Vert/Curve	0.3° / 302.2°	83.0° / 180.9°	
			6.125 in.	Lateral	87.0° / 181.0°	90.3° / 181.0°	
					/	/	
					/	/	
					/	/	
					/	/	

Acquisition System Software Version				Other			
Advantage	2.20U4	Rig: / Contractor:	H&P 307	/ Helmerich & Payne Drilling Co			
PAIS	6.4.1.34	Job No:	6792804	/ D & E			
		District / Unit:	RMD				

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Log Run Summary													
LWD	BHA	Bit	Bit	Bit	Bit	Assembly Type	Logged Interval		Bit Depth Interval		Date / Time		Circ. Time (hrs.)
Run	Run	Run	Size	Type	Gauge Length (in.)		Top	Bottom	From	To	Start	End	
No.	No.	No.	(in.)				(ft.)	(ft.)	(ft.)	(ft.)			
1	1	1	8.750	PDC		Mud Motor	6900	7863	1211	7905	05/Dec/2014 16:53	07/Dec/2014 08:37	58.9
2	2	2	6.125	PDC		Mud Motor	7864	11402	7905	11455	09/Dec/2014 09:33	11/Dec/2014 01:49	41.7
3	3	3	6.125	PDC		Mud Motor	11406	16187	11456	16236	12/Dec/2014 07:27	14/Dec/2014 10:18	59.2

Crew								
Name			Arrive	Depart	Name			Arrive
			Wellsite	Wellsite				Wellsite
Andy King			02/Dec/2014	15/Dec/2014	Ramnik Singh			02/Dec/2014
Hans Cary			02/Dec/2014	15/Dec/2014	Mike Gurnsey			11/Dec/2014
								15/Dec/2014
					Bill Herbers			02/Dec/2014
								11/Dec/2014

Mnemonics

Curve	Description	Units
GRAX	Gamma Ray Apparent, 0.5 ft. Avg.	API
GRTX	Gamma Ray Time Since Drilled	Min.
GRIX	Gamma Ray Density, Points	unitless
GRSI	Gamma Ray Slide Indicator	unitless
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.	K. lbs.

Equipment and Service Data

LWD Run No.	Tool	Serial Number	Measurement	Bit Offset (ft.)	Max O.D. (in.)	Min I.D. (in.)
1	DIR	12479858	Directional	44.72	6.750	3.250
1	SRIG	12554657	Gamma	41.35	6.750	3.250
2	DIR	12479852	Directional	53.01	4.750	2.750
2	SRIG	10473320	Gamma	49.59	4.750	2.750
3	DIR	12188484	Directional	52.57	4.750	2.250
3	SRIG	12376064	Gamma	49.15	4.750	2.250

Service and Tool Mnemonics

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

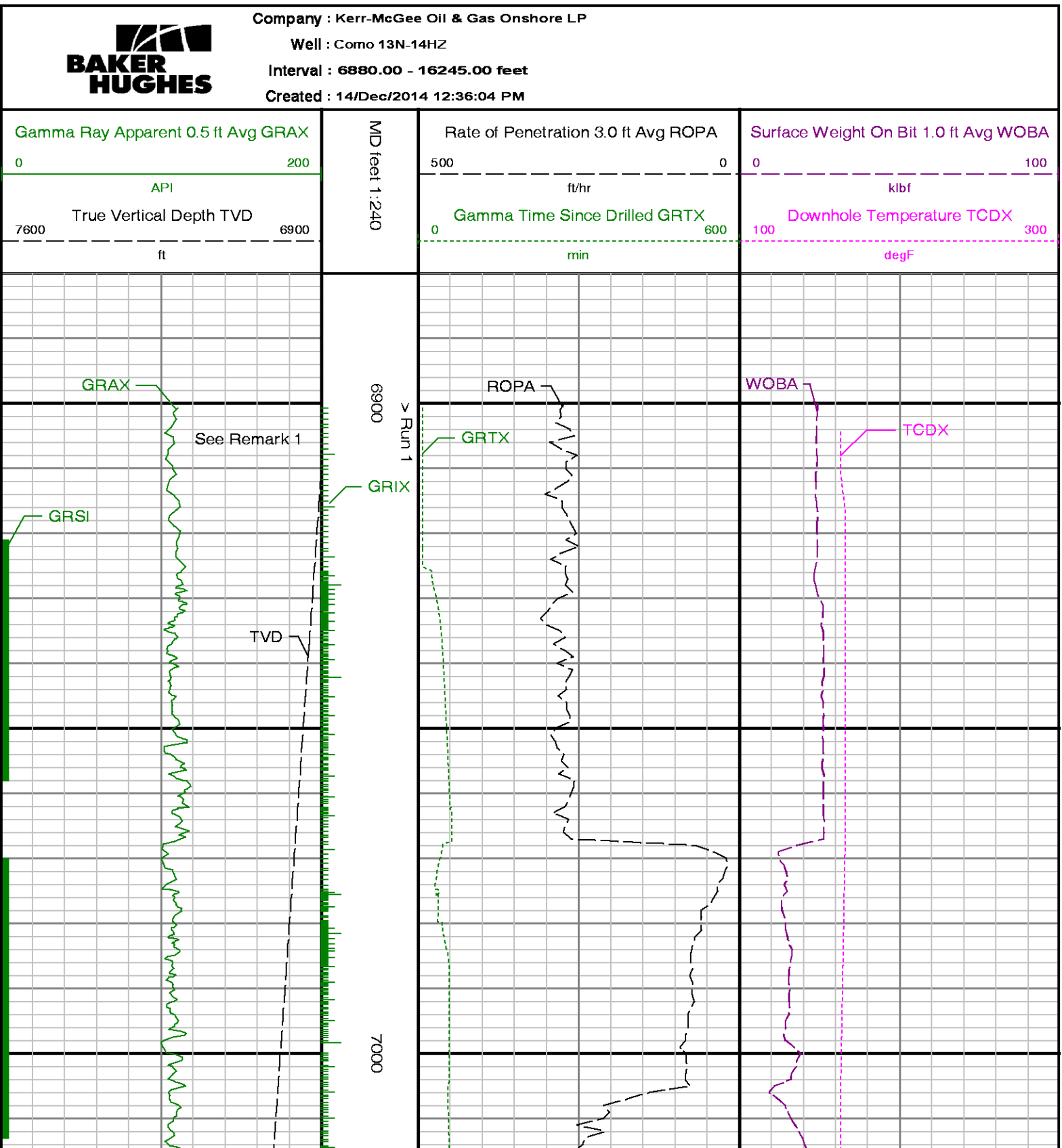
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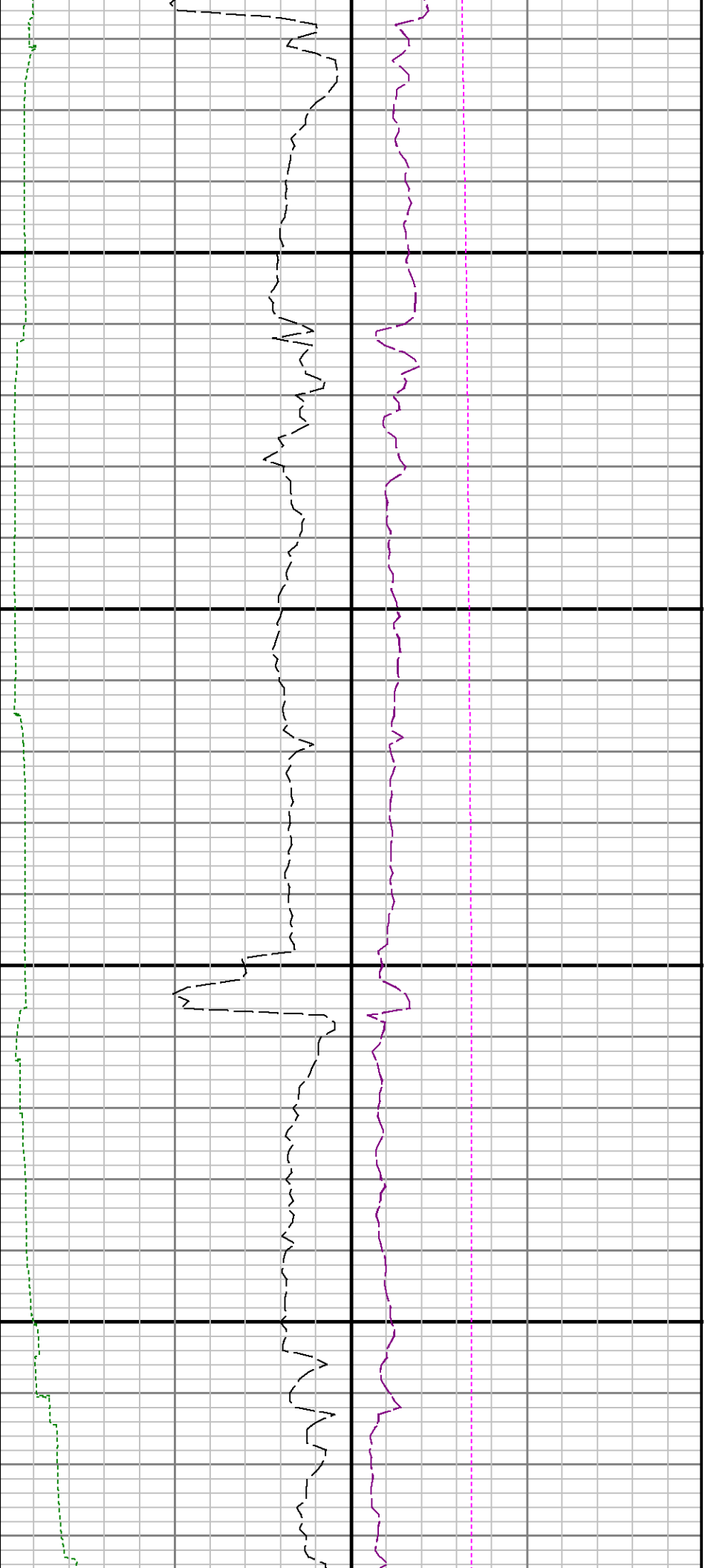
(1) Baker Hughes INTEQ run 1 utilized 6 3/4 inch NaviGamma services (Gamma Ray and Directional) behind an 8 3/4 inch bit and steerable assembly from 1192 to 7905 ft MD (1192 to 7574 ft TVD).
(2) Baker Hughes INTEQ runs 2 and 3 utilized 4 3/4 inch NaviGamma services (Gamma Ray and Directional) behind a 6 1/8 inch bit and steerable assembly from 7905 to 16236 ft MD (7574 to 7572 ft TVD).
(3) Depth measurements were 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.
(4) A sliding indicator is shown to the left side of track 1 as a heavy line and corresponds to the Gamma Ray sensor offset from the bit.

Remarks

Number	Measured Depth (ft.)	Hole Section (in.)	LWD Run No.	Remark
1	6910	8.750	1	Began logging Gamma above Build Section at 6900 ft MD (7062 ft TVD).
2	7250	8.750	1	The interval from 7235 to 7277 ft MD (7219 to 7257 ft TVD) was logged up to 14 hours after being drilled due to pump module replacement.

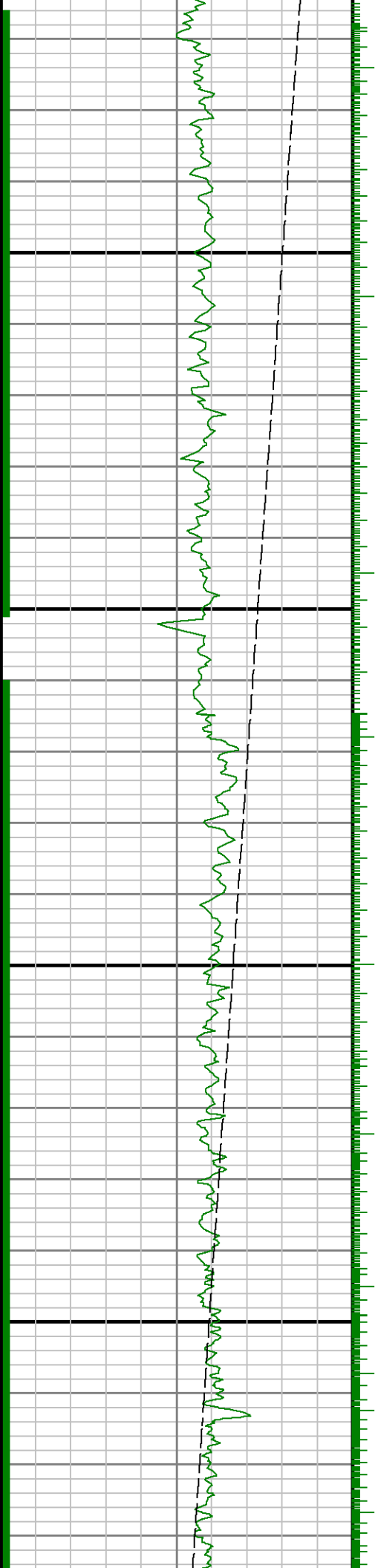
3	7880	6.125	2	The interval from 7863 to 7906 ft MD (7570 to 7575 ft TVD) was logged up to 49 hours after being drilled due to a trip out of hole for casing and cement operations and to pick up Lateral BHA.
4	11420	6.125	3	The interval from 11402 to 11456 ft MD (7570 to 7570 ft TVD) was logged up to 30 hours after being drilled due to a trip out of hole to address a possible motor failure and pick up new Lateral BHA.
5	16200	6.125	3	The interval from 16187 to 16236 ft MD (7570 to 7570 ft TVD) contains no logging data due to sensor offset from the bit at well TD.





7100

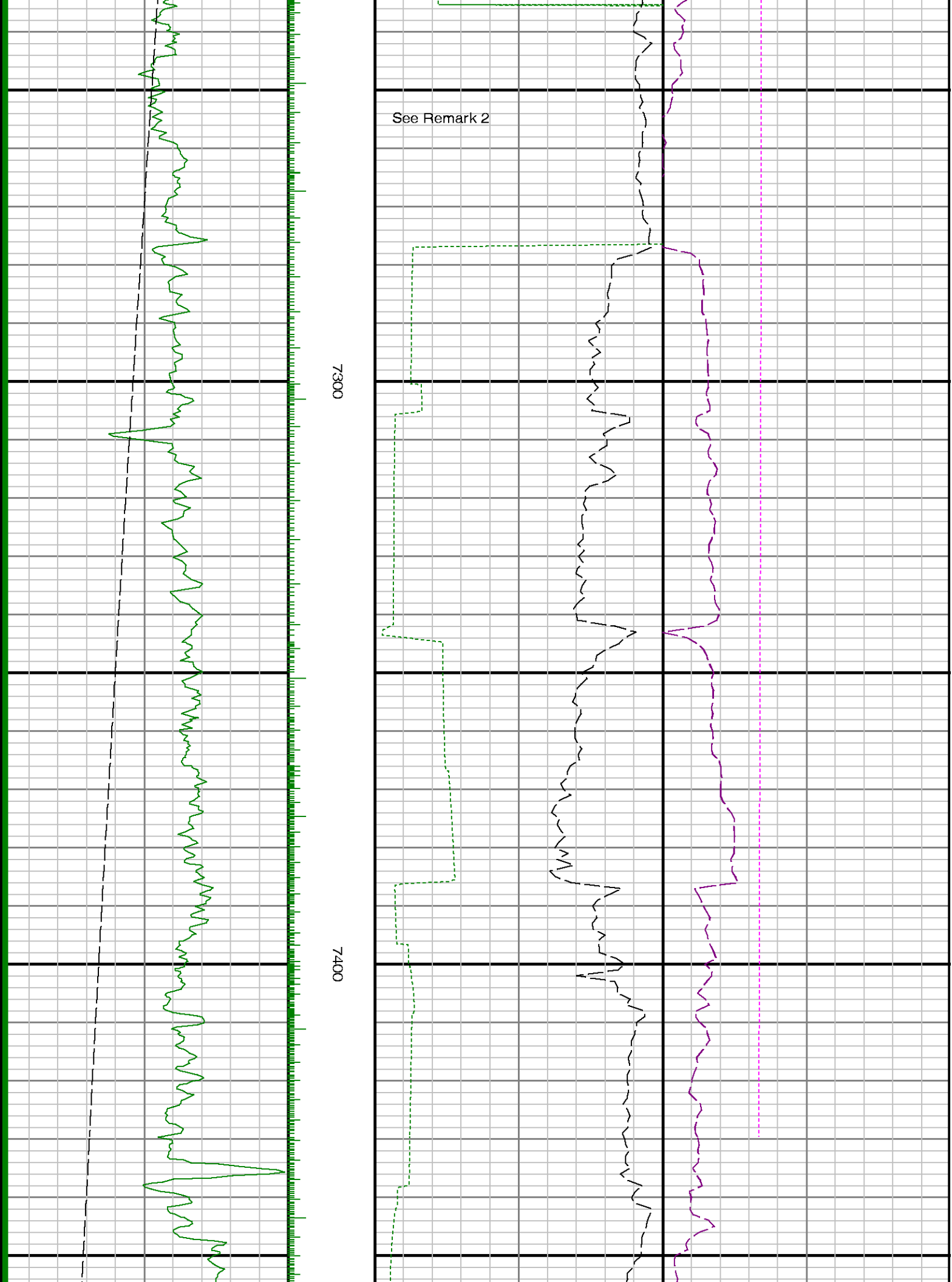
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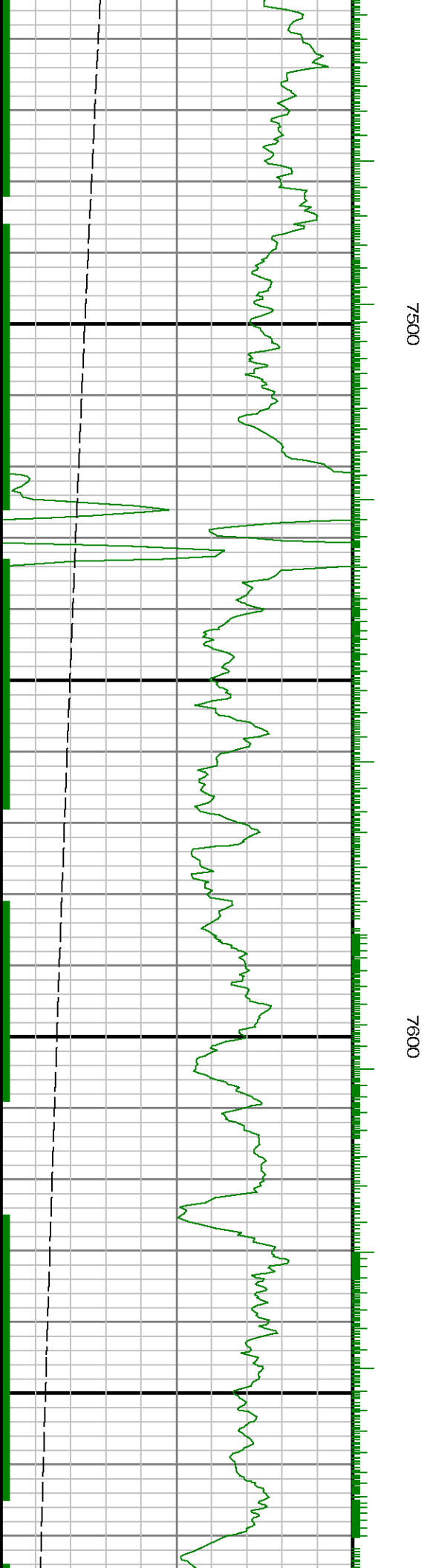
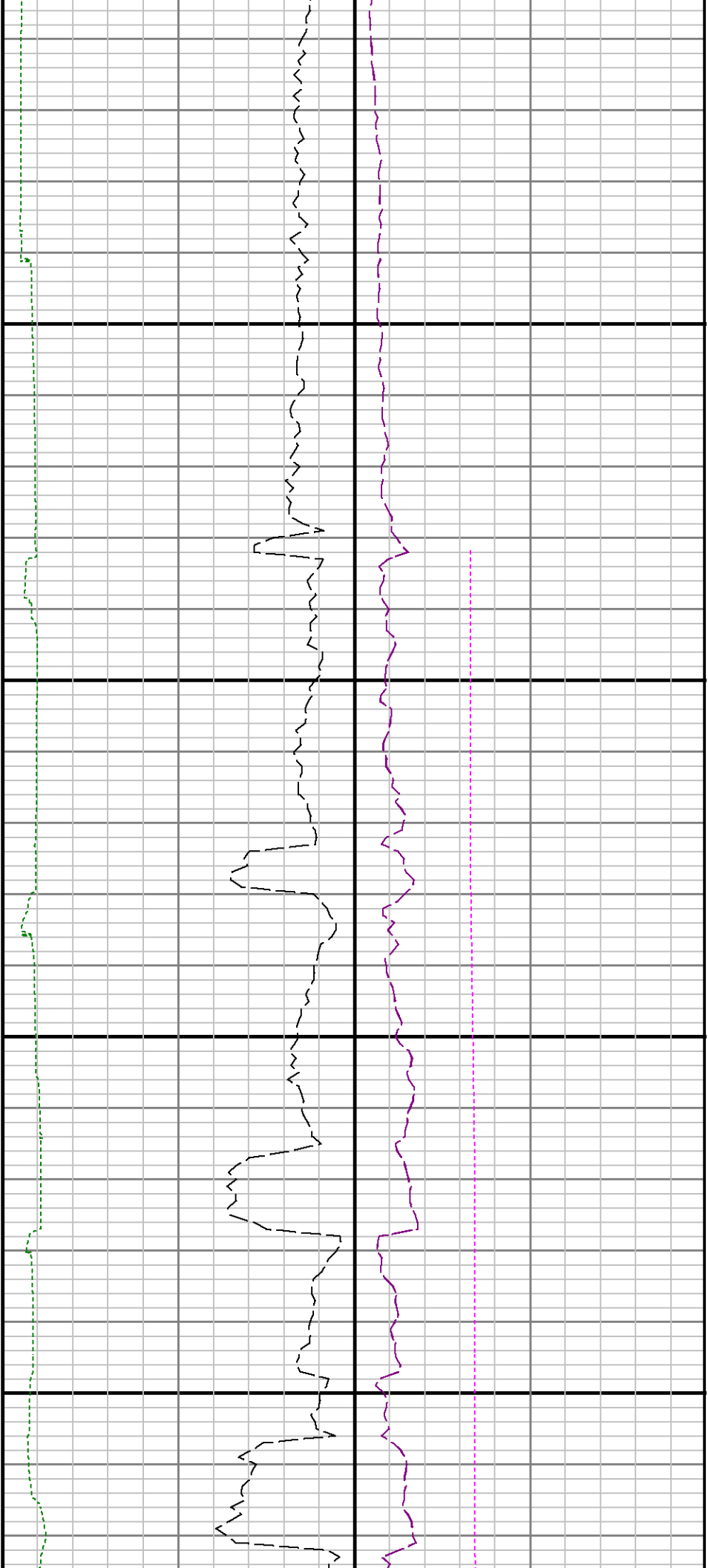


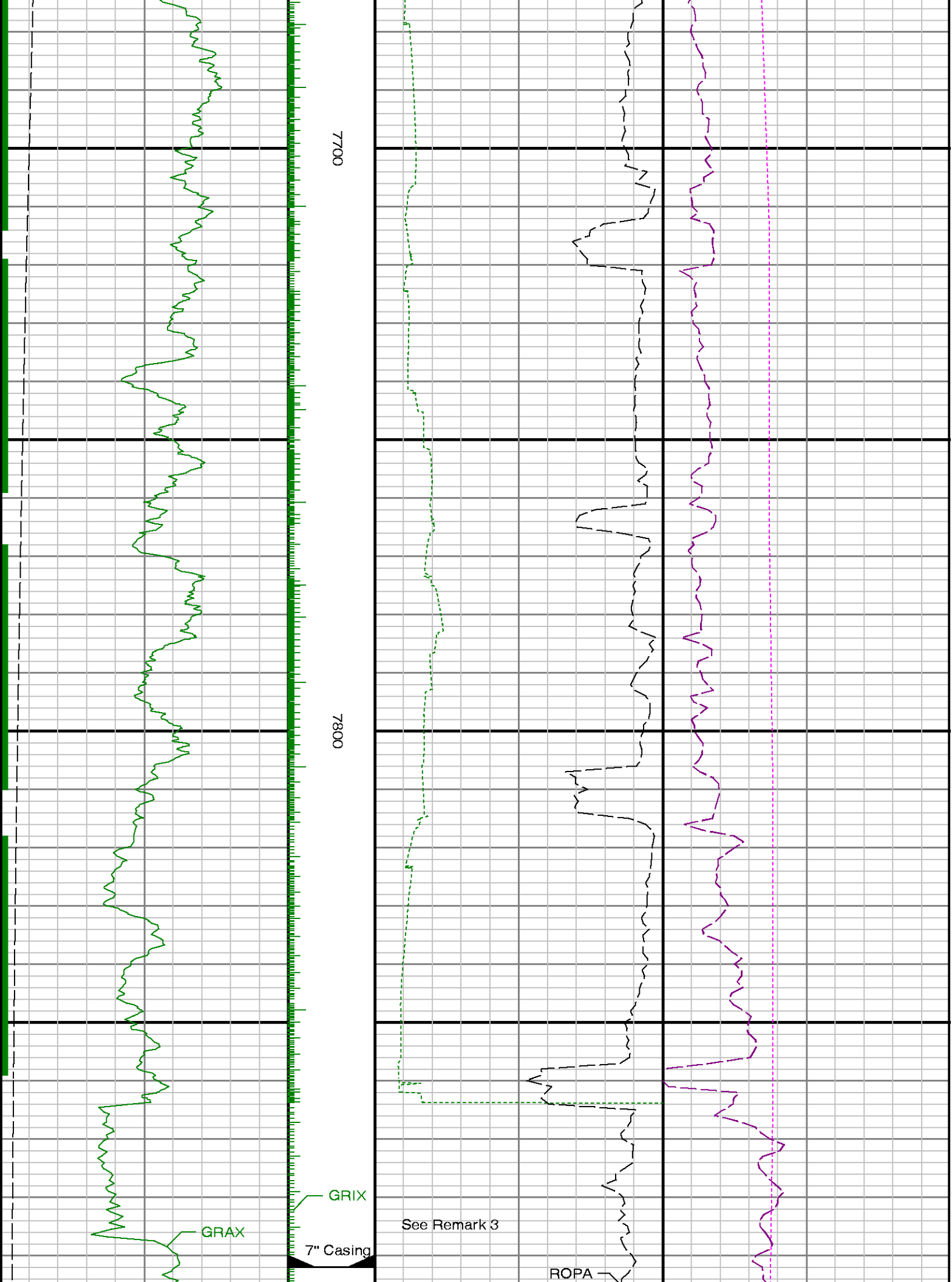
See Remark 2

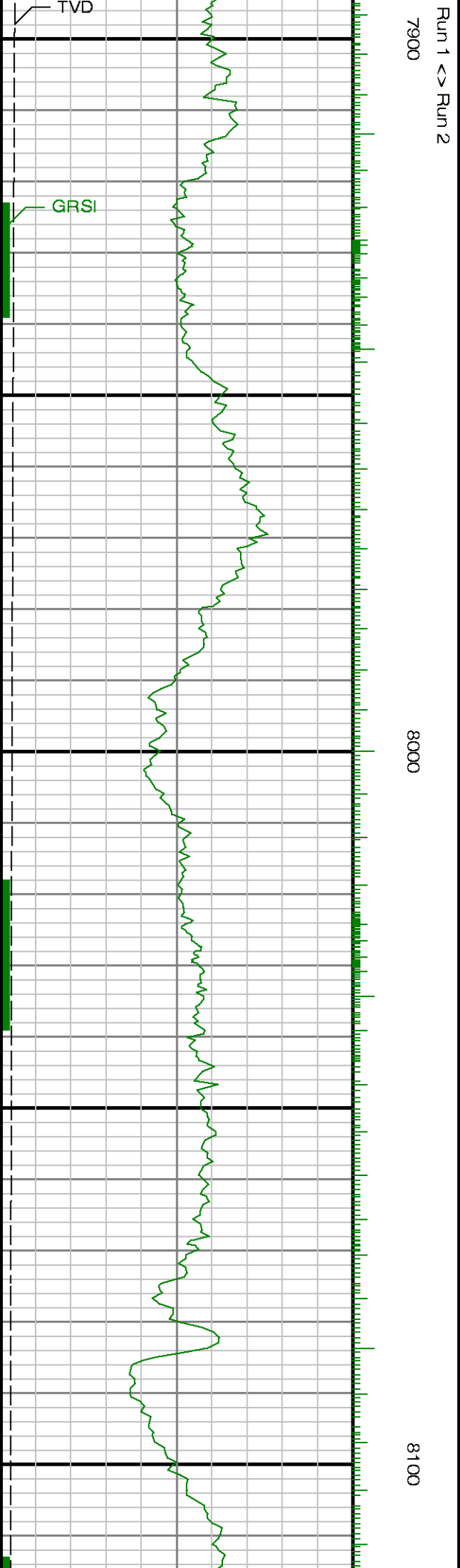
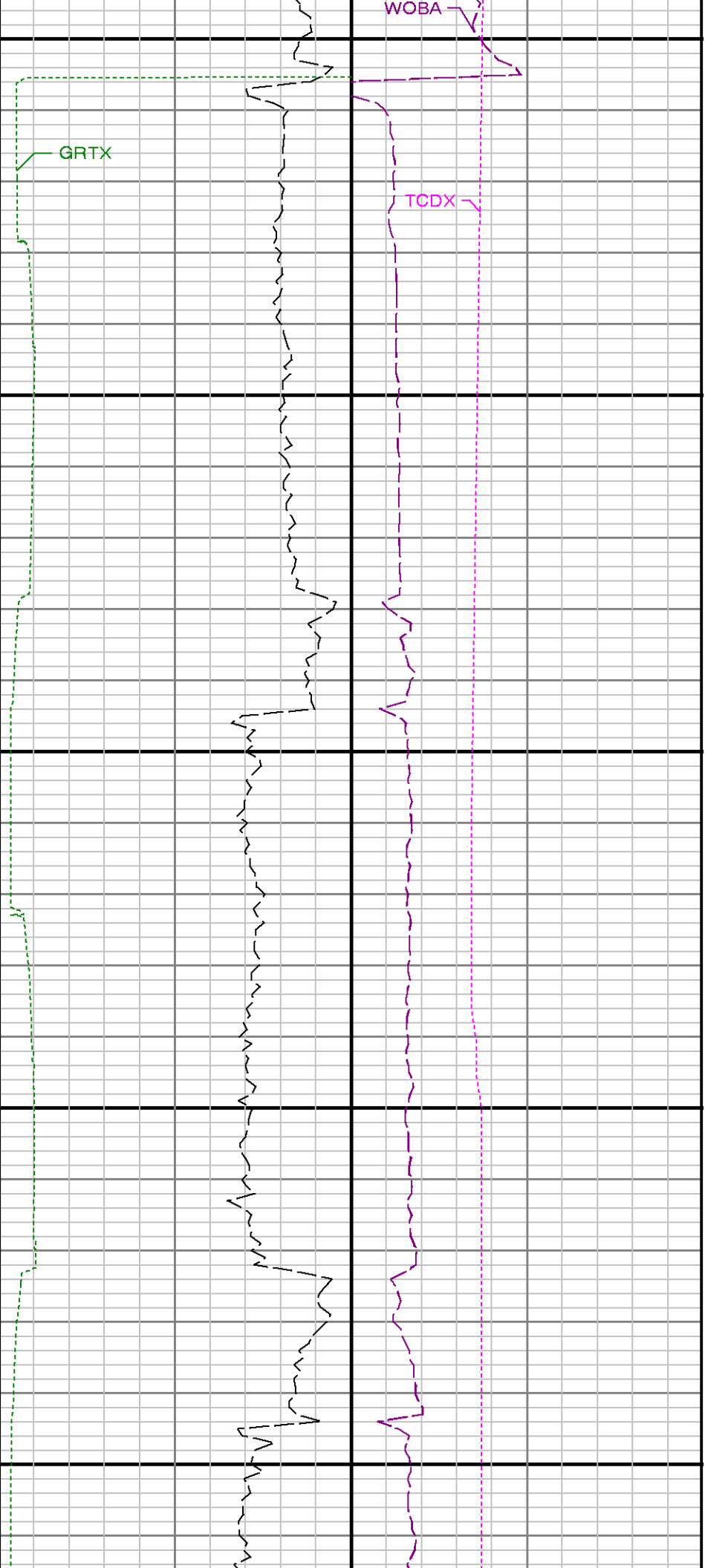
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7400





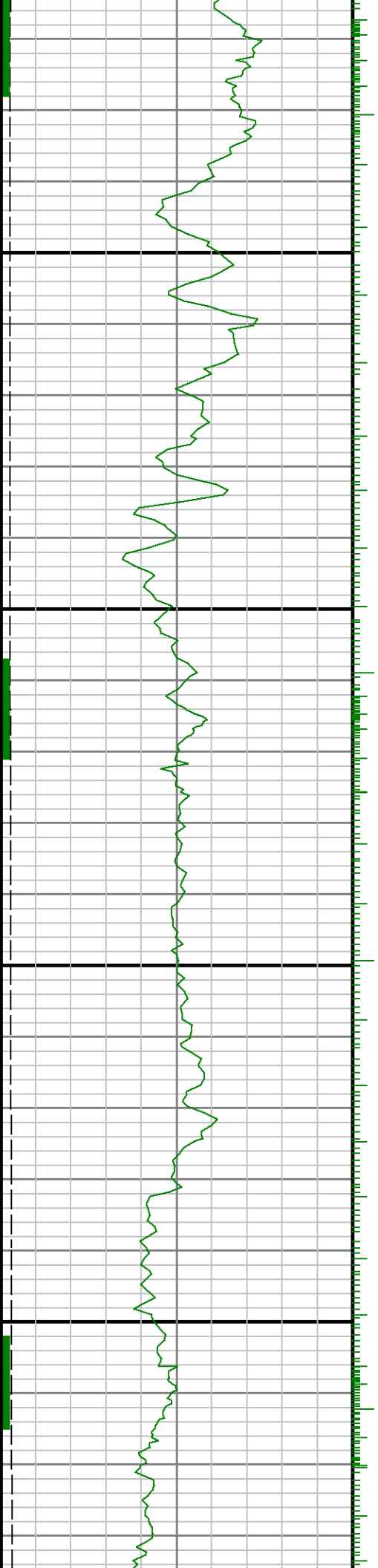


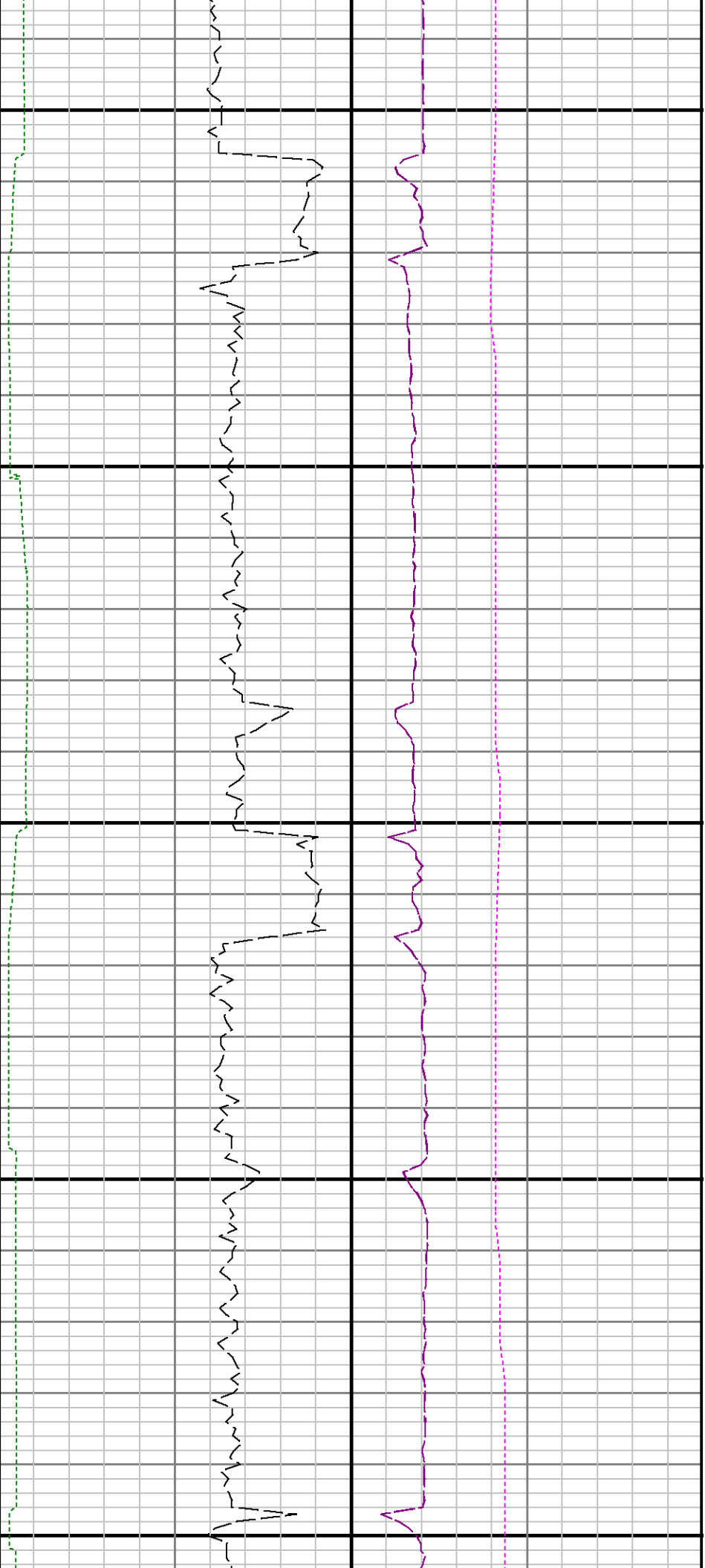




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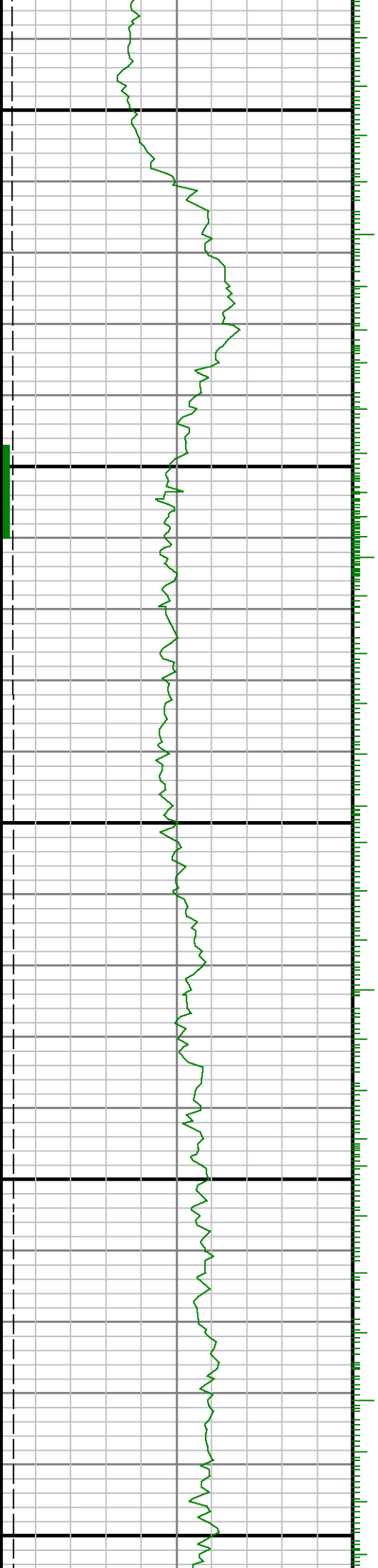
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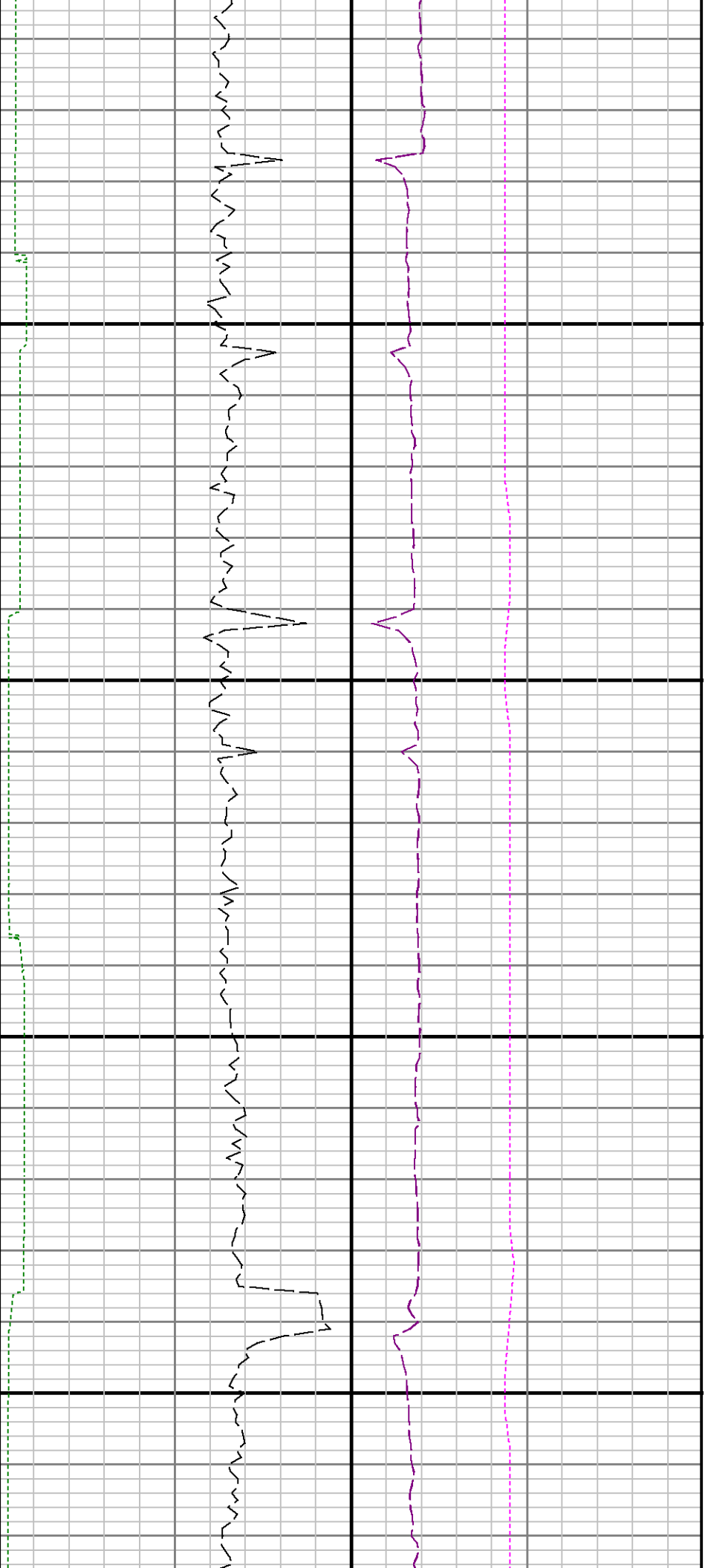




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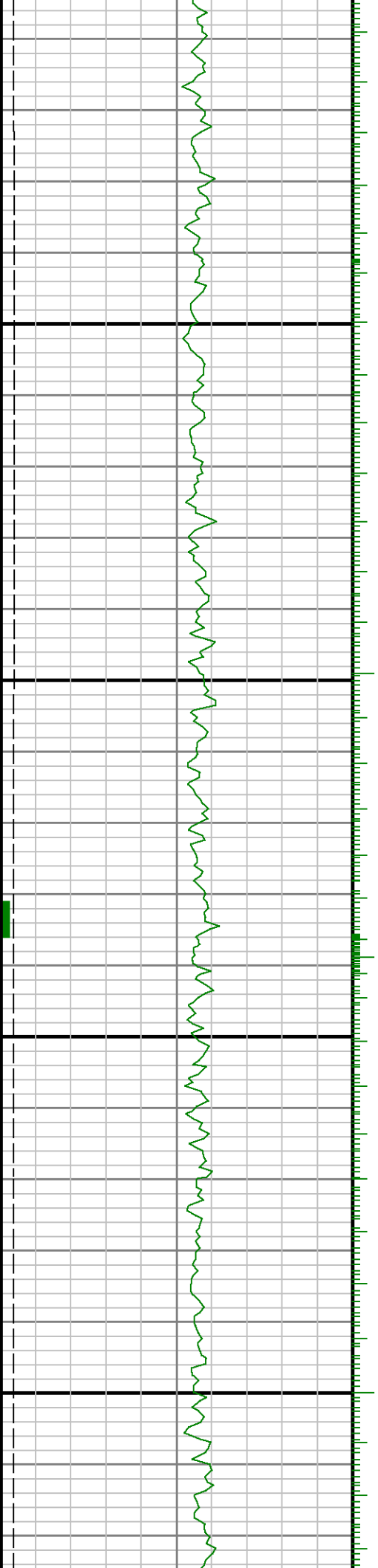
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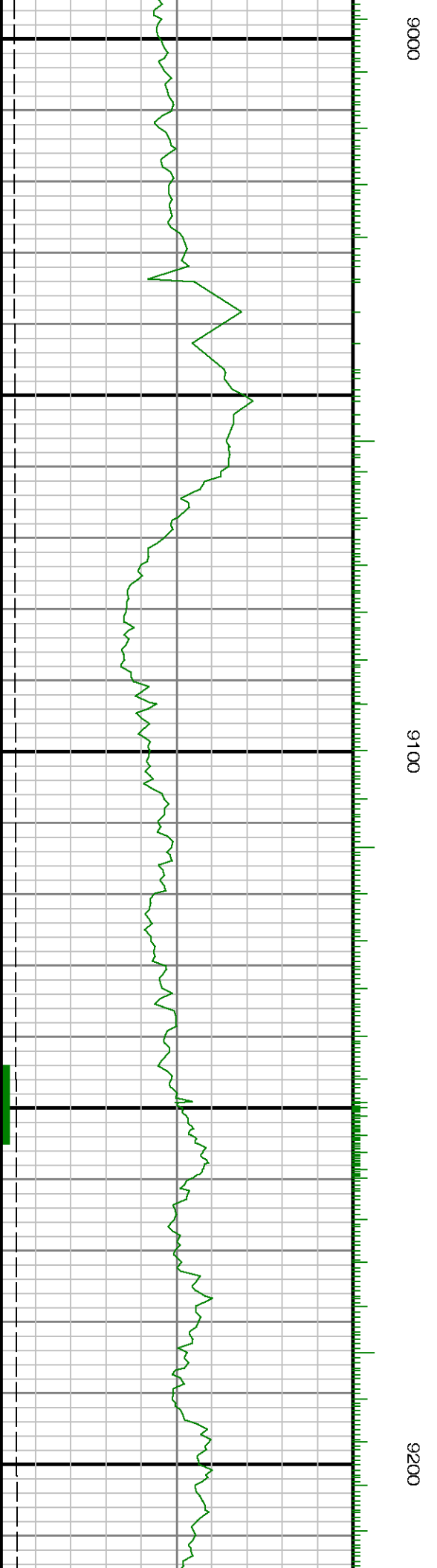


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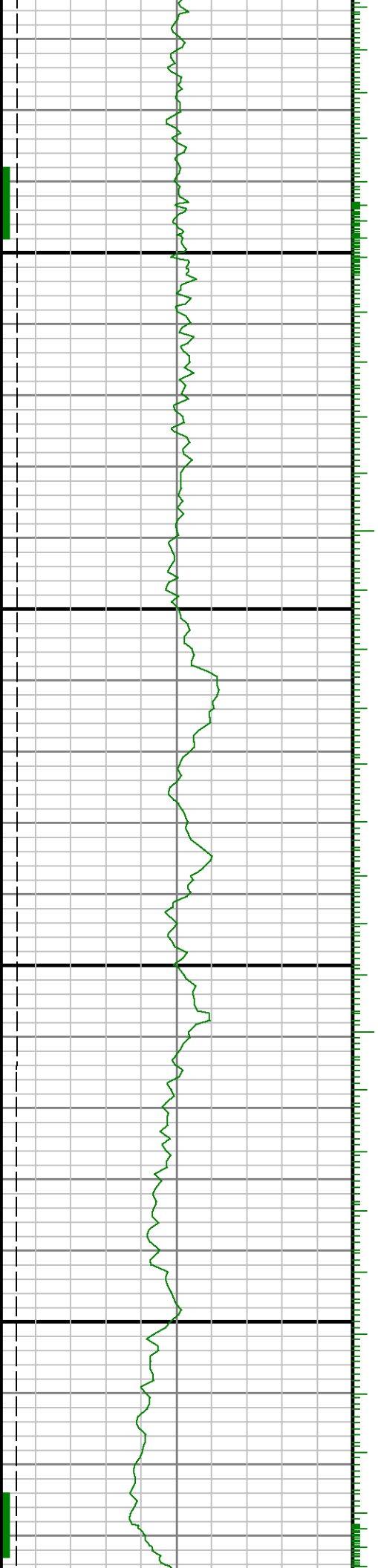


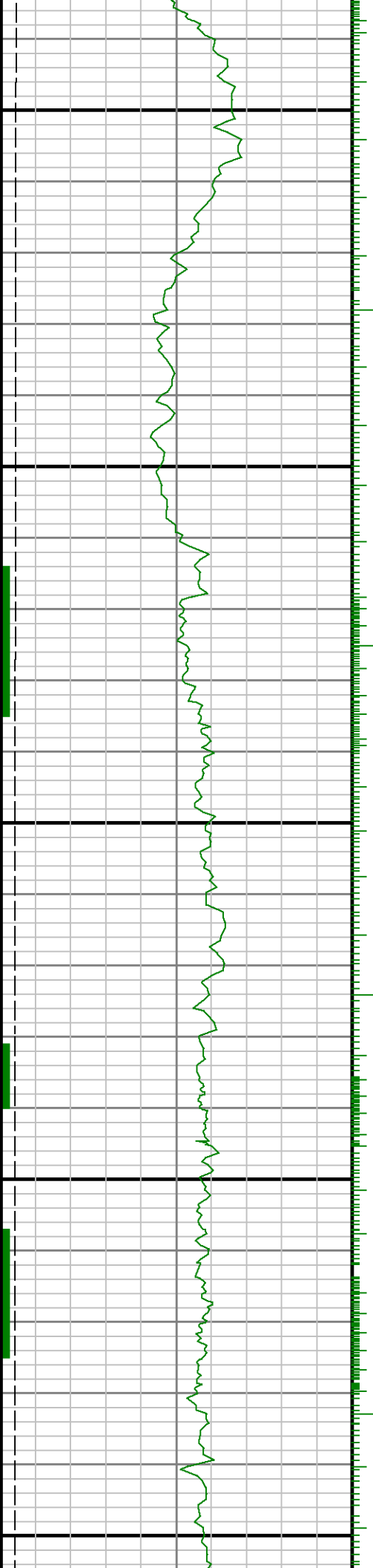




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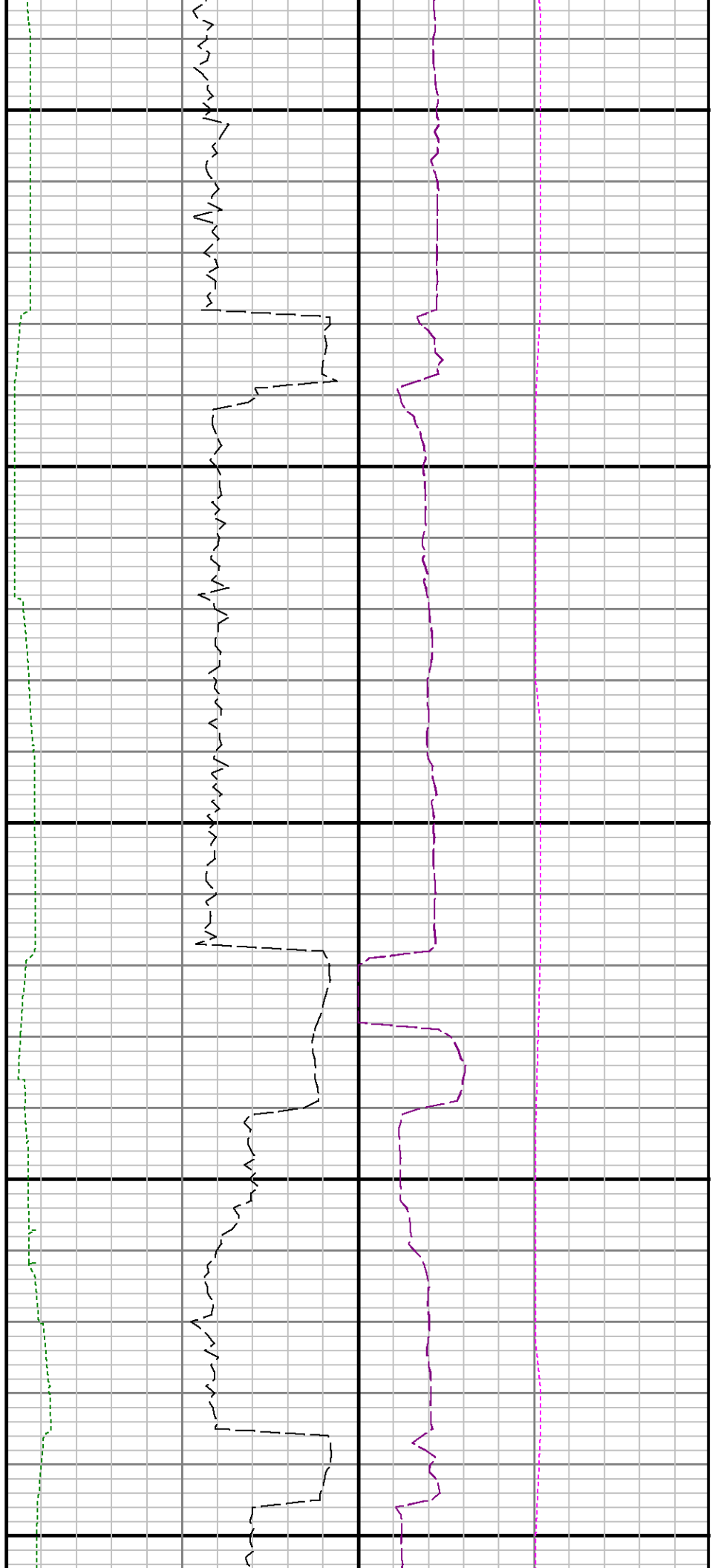
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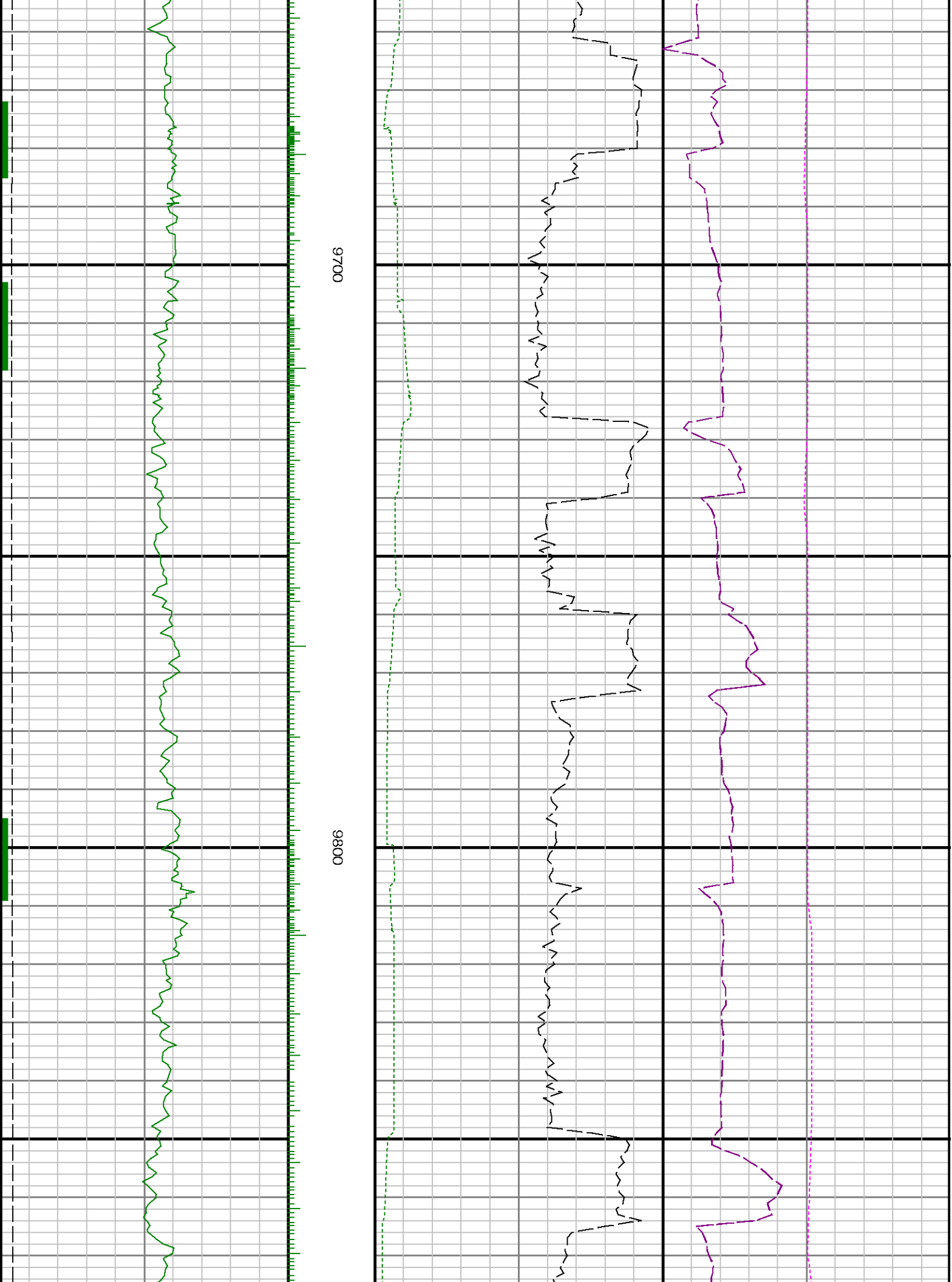


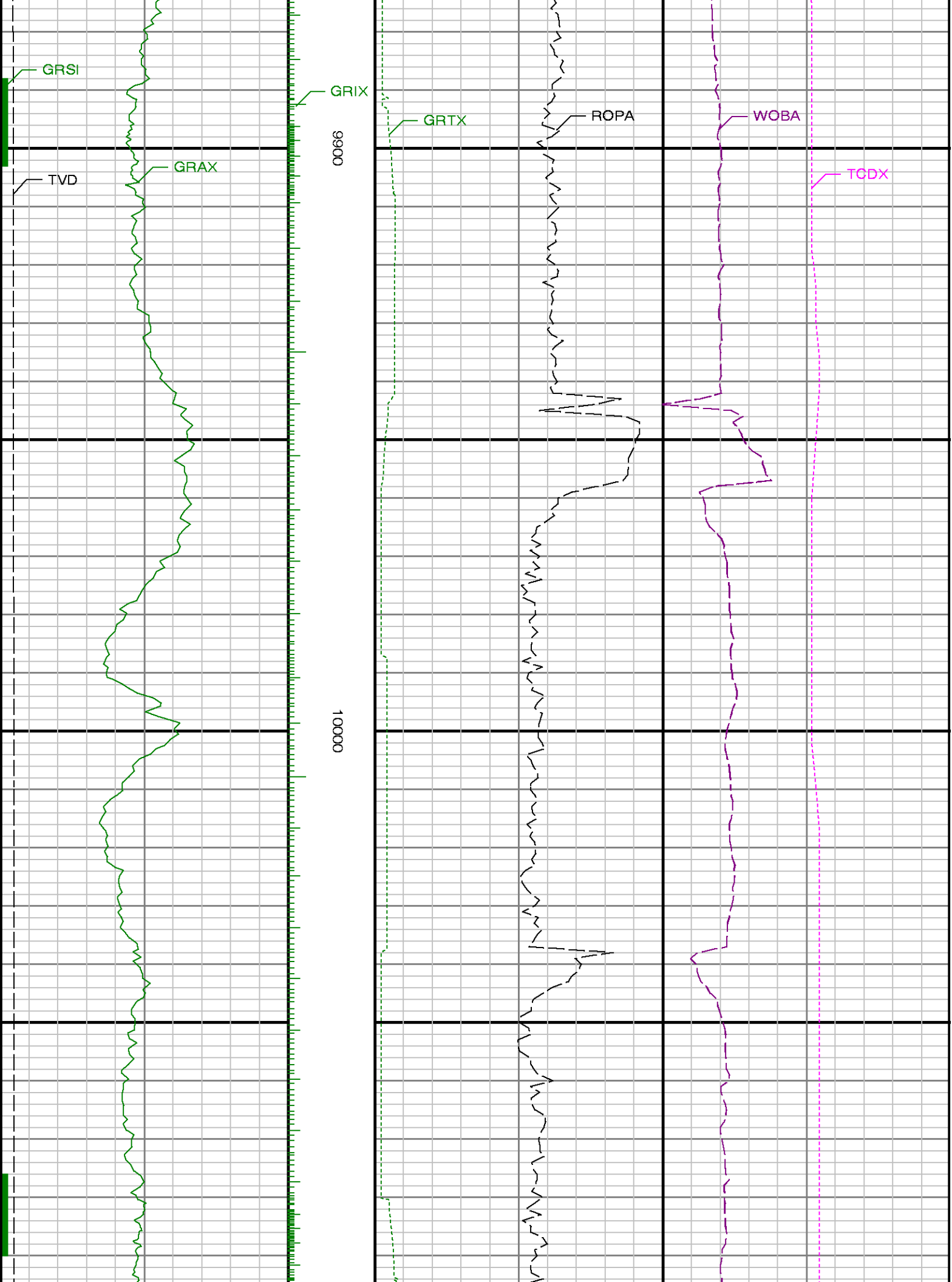


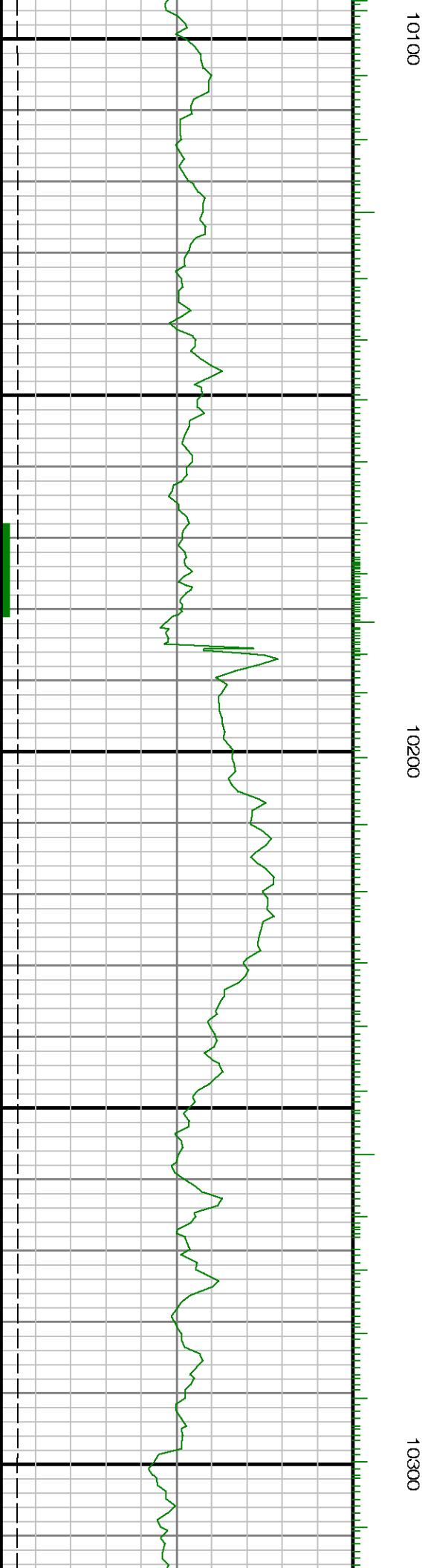
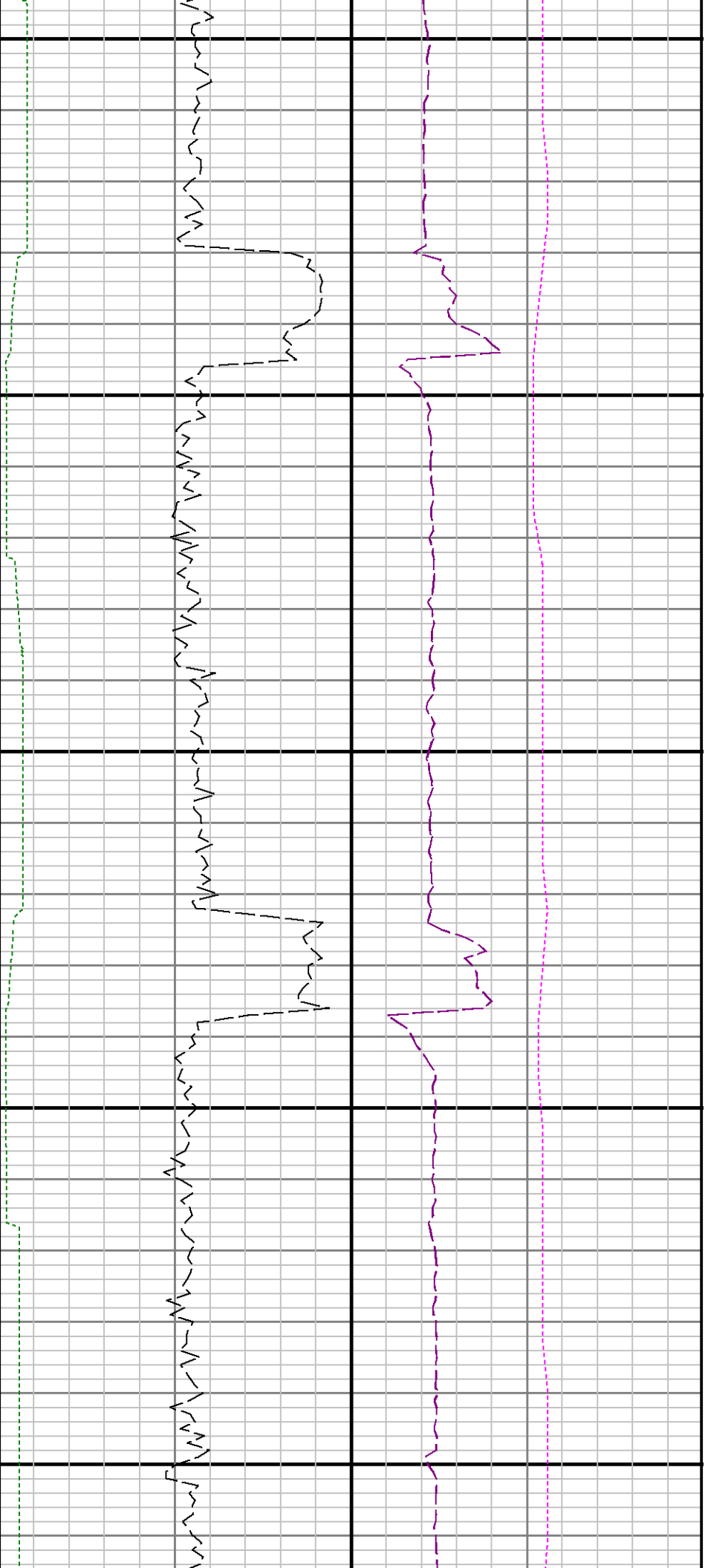
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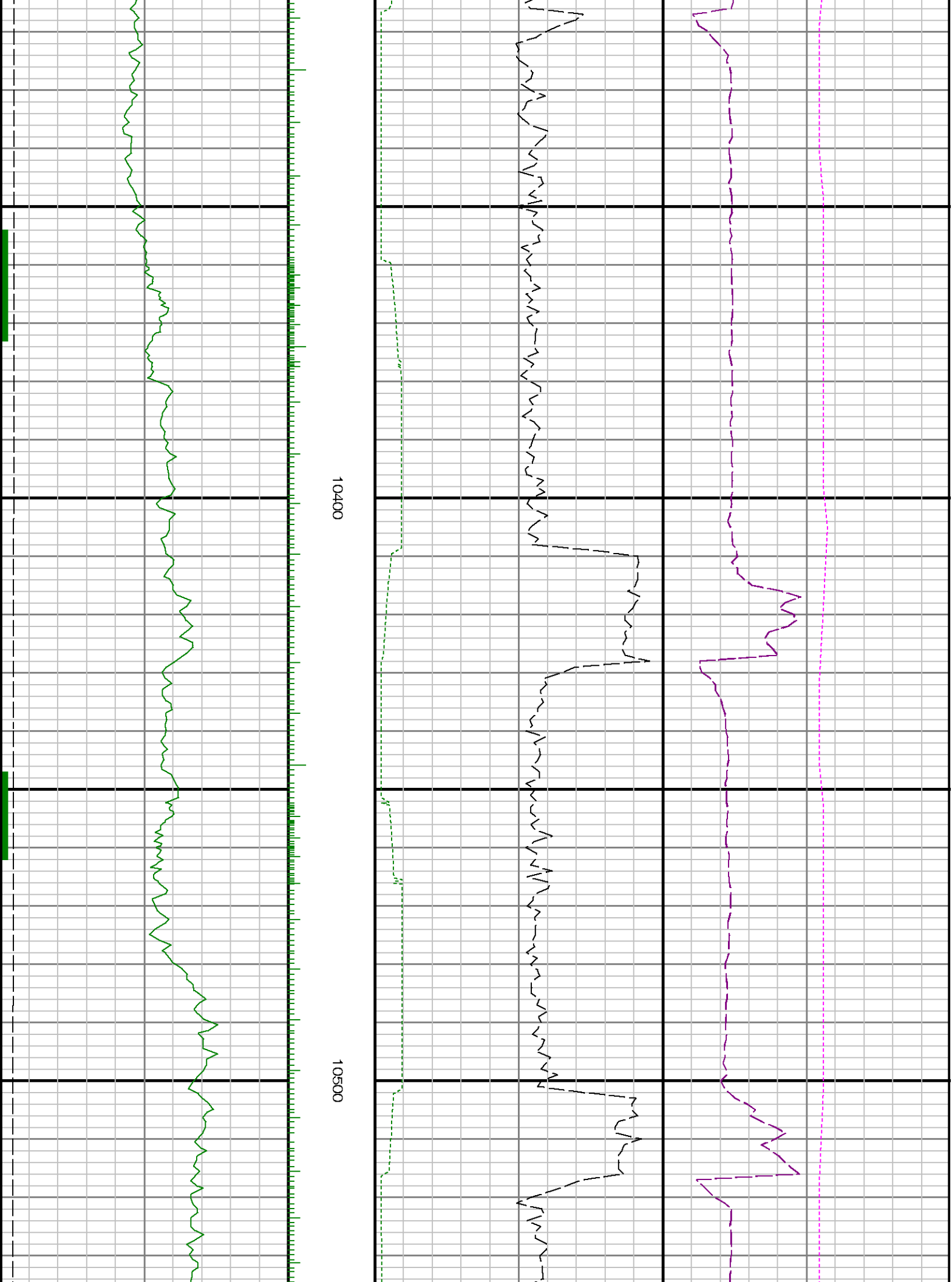
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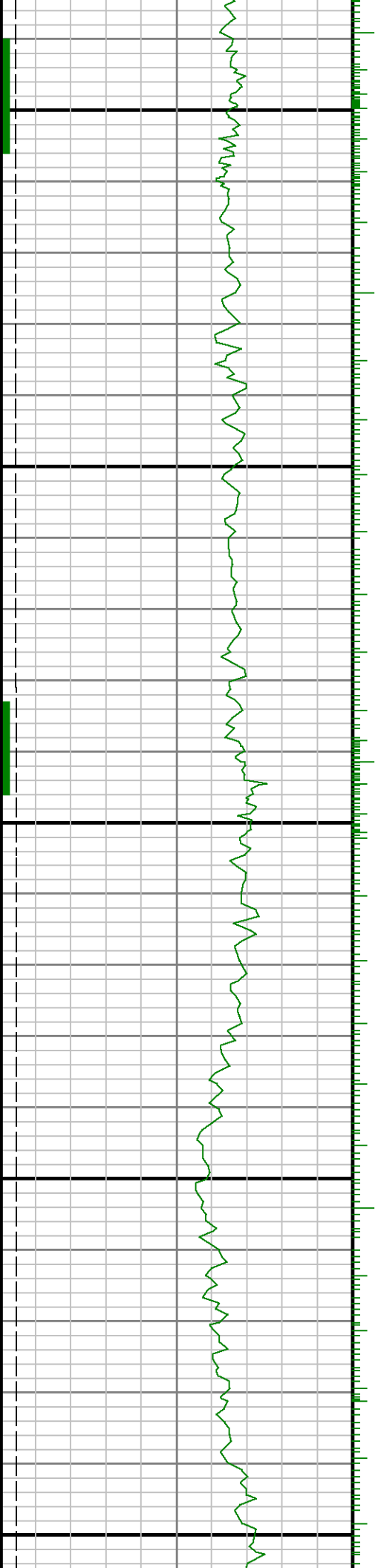


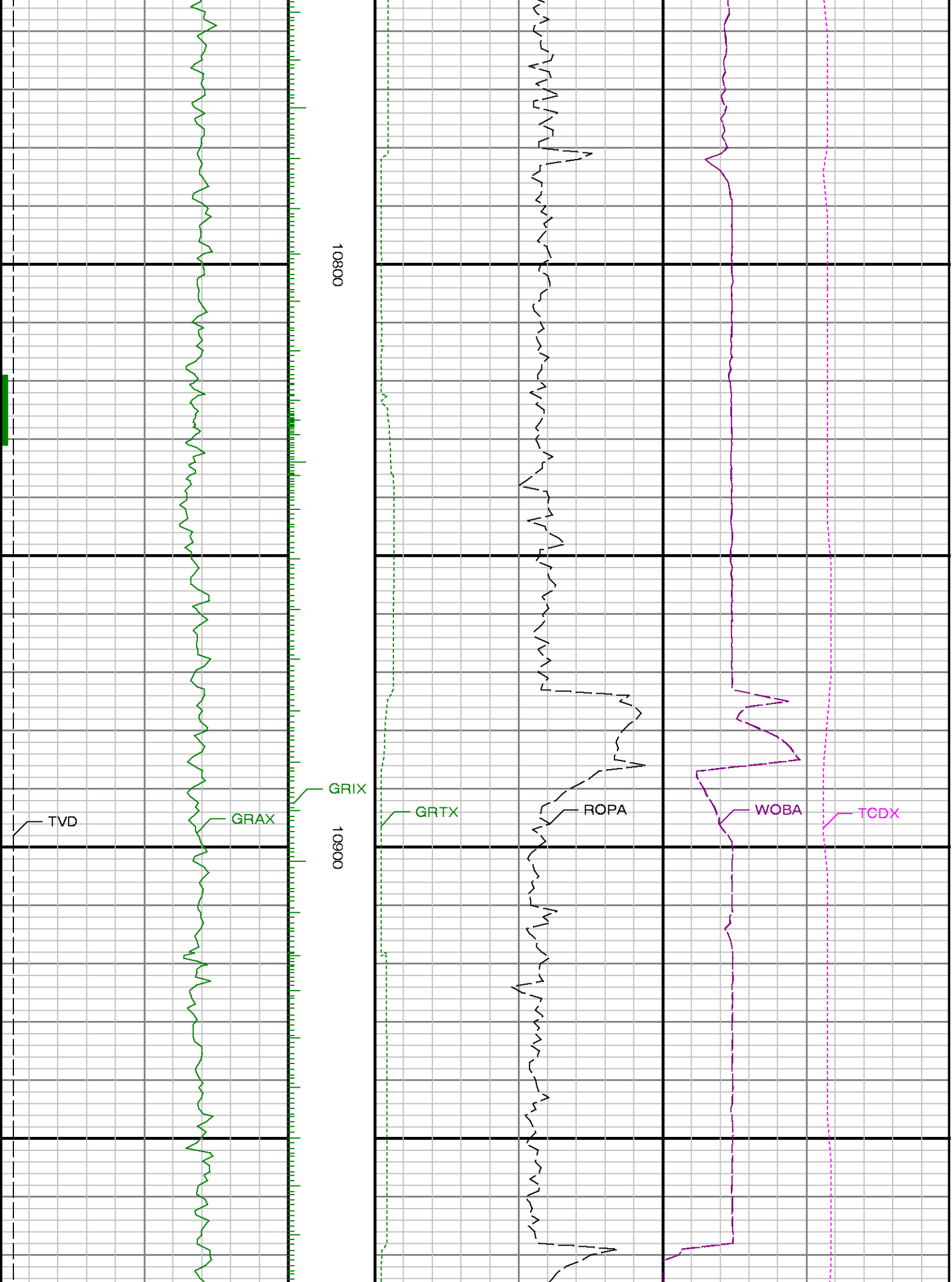


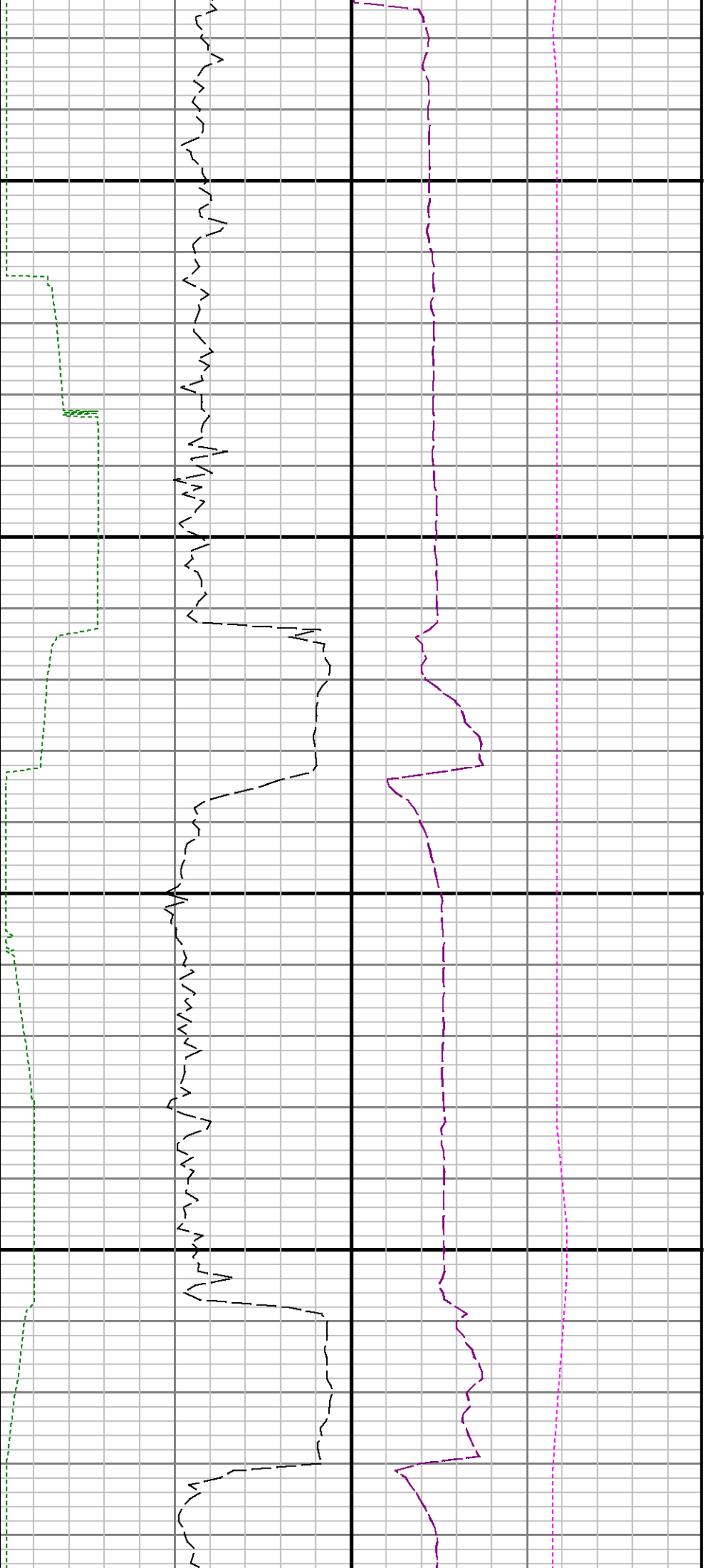


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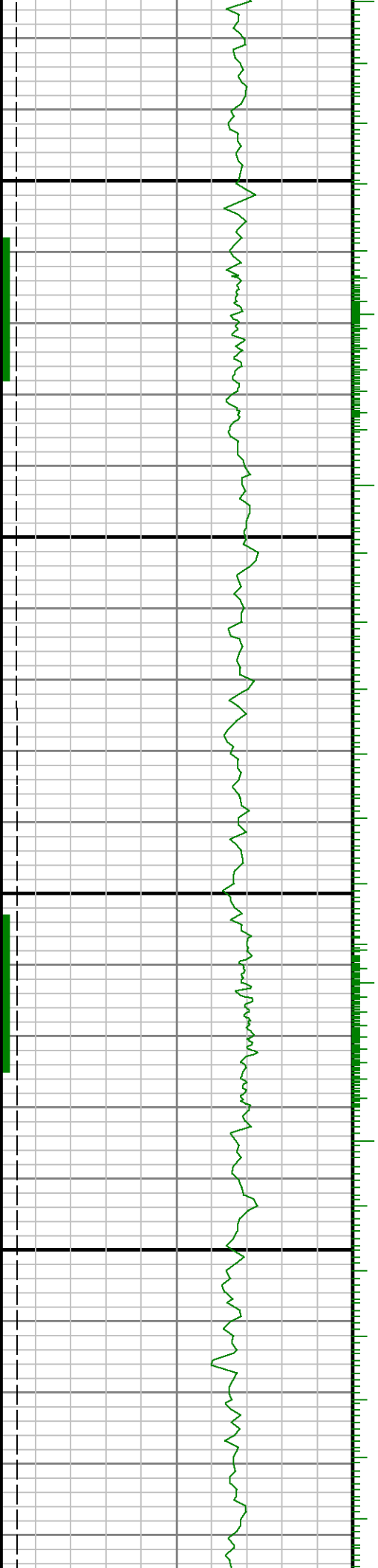


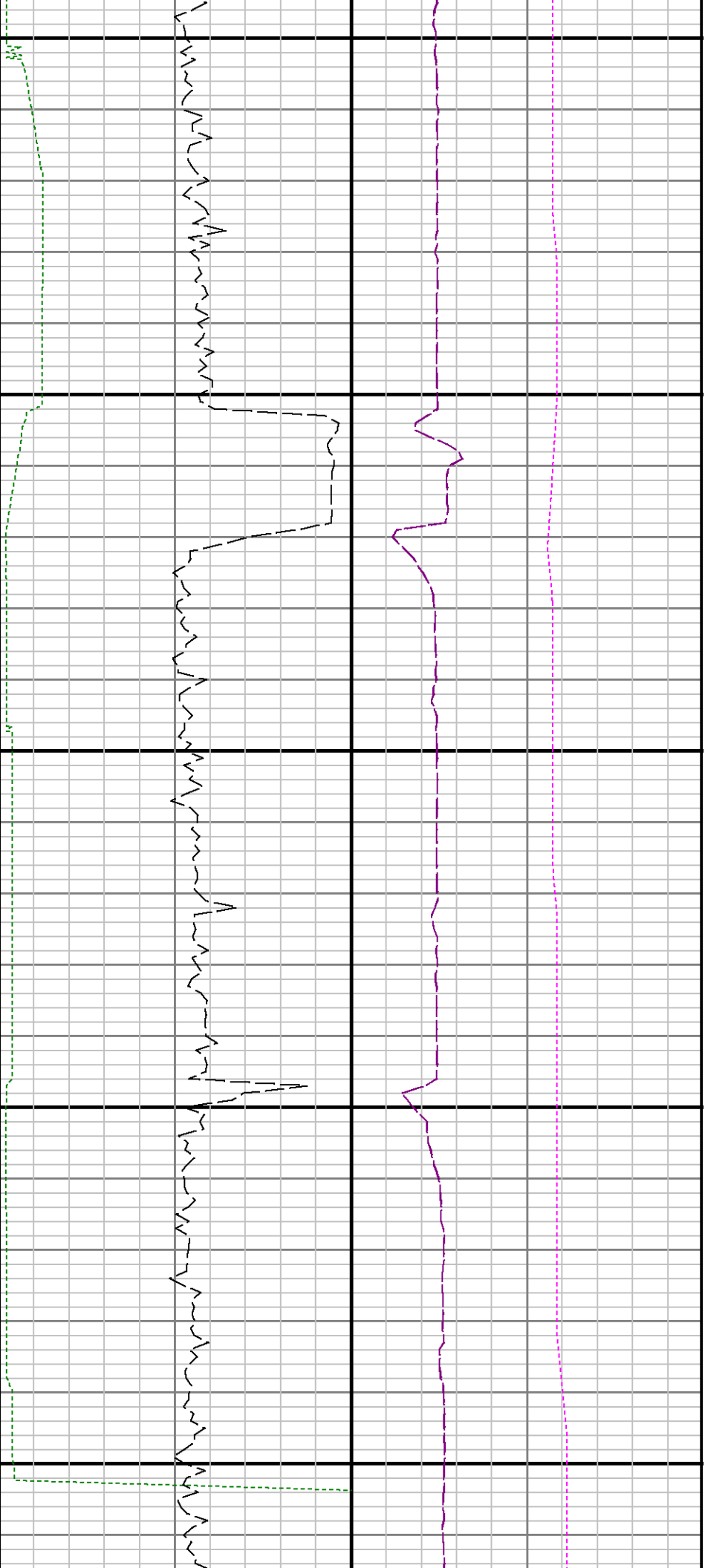




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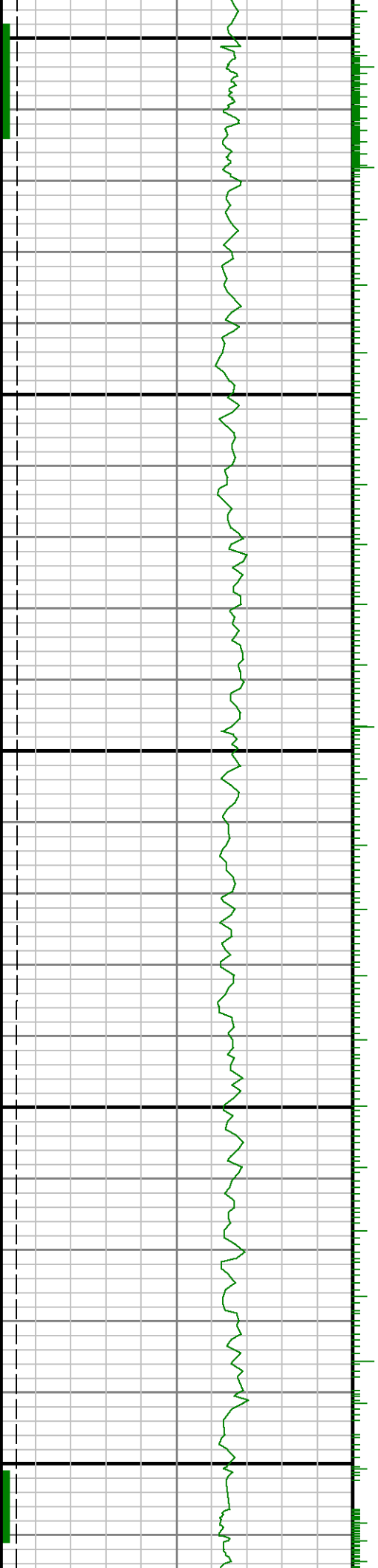


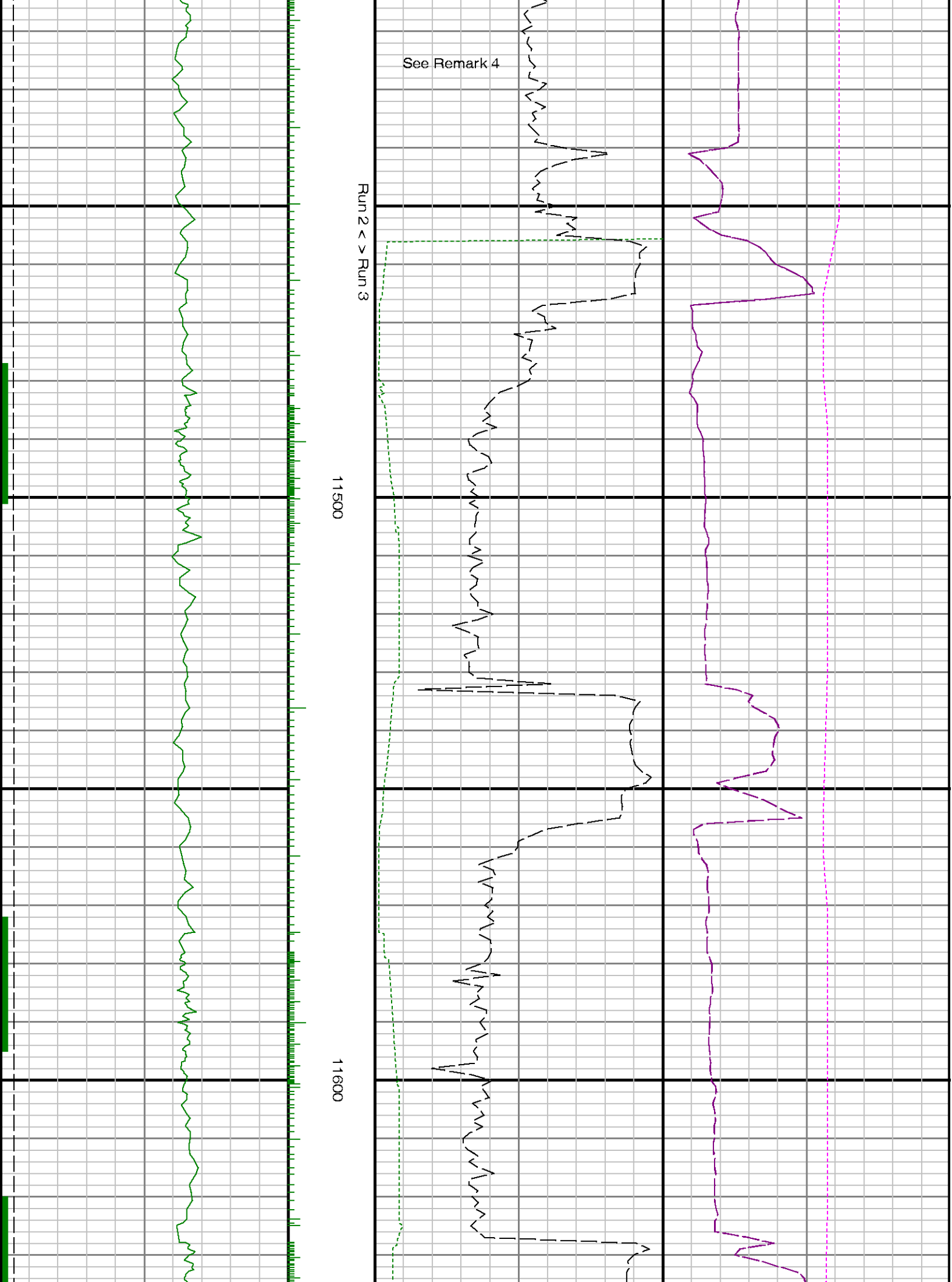


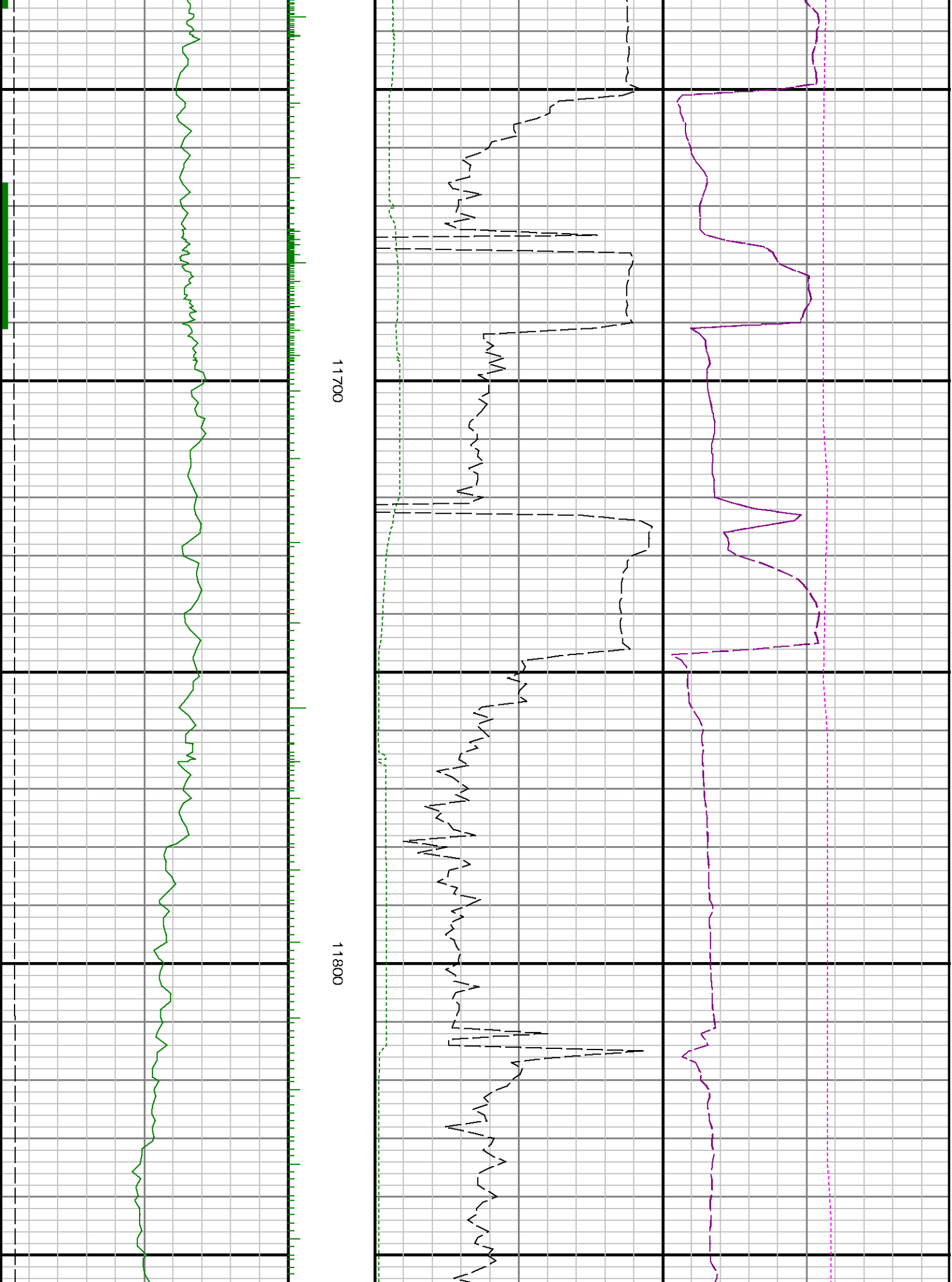
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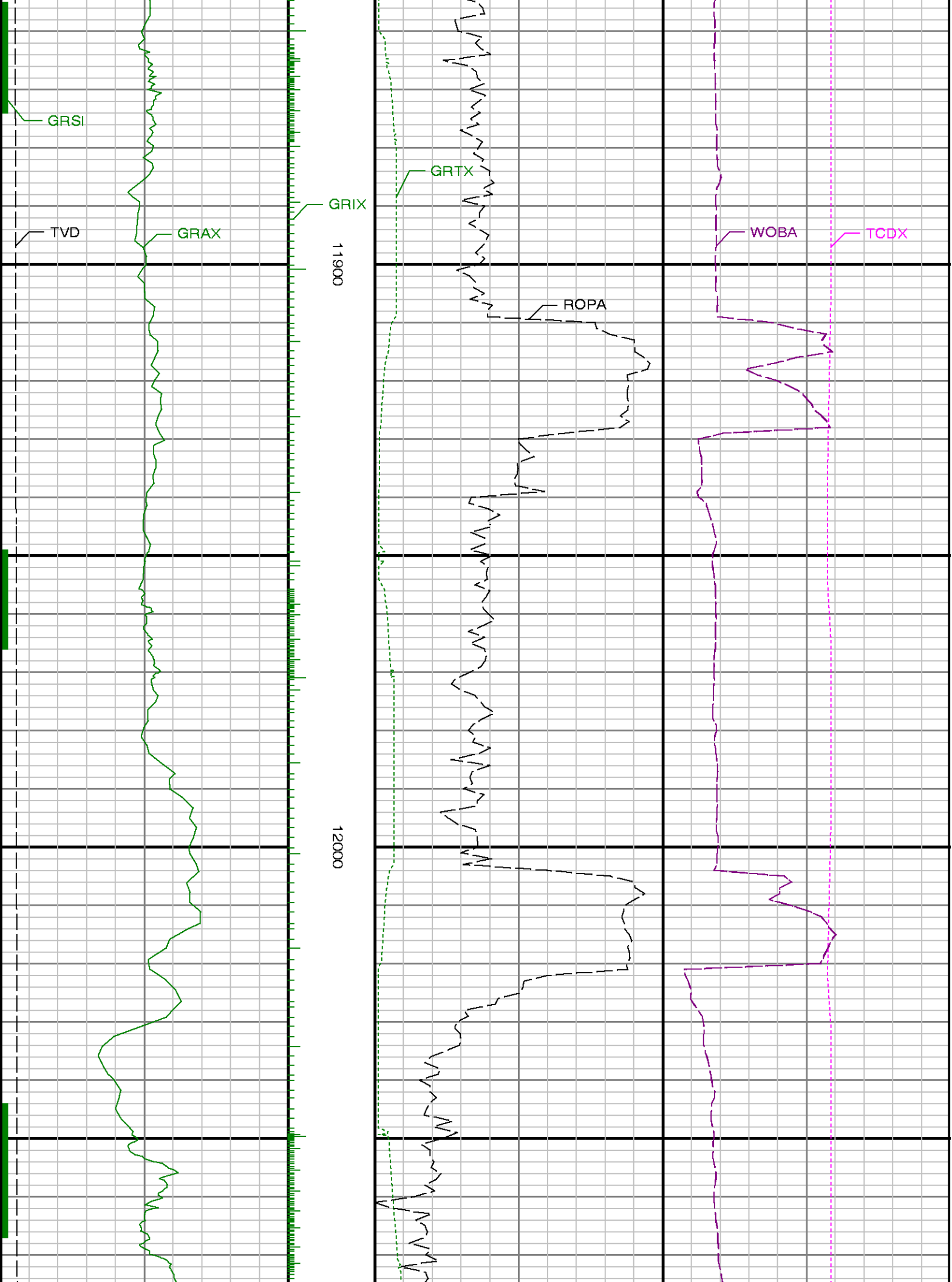
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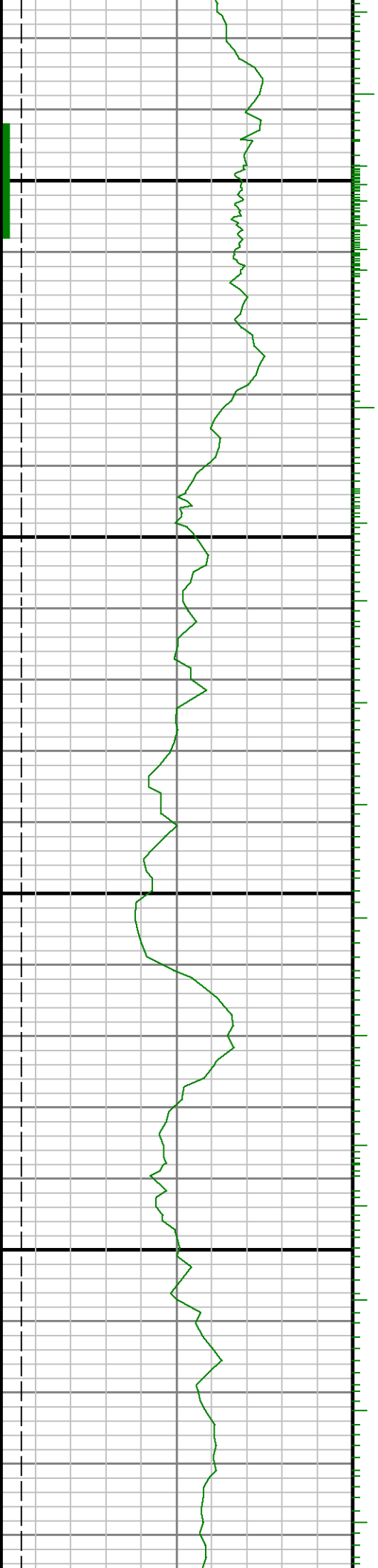


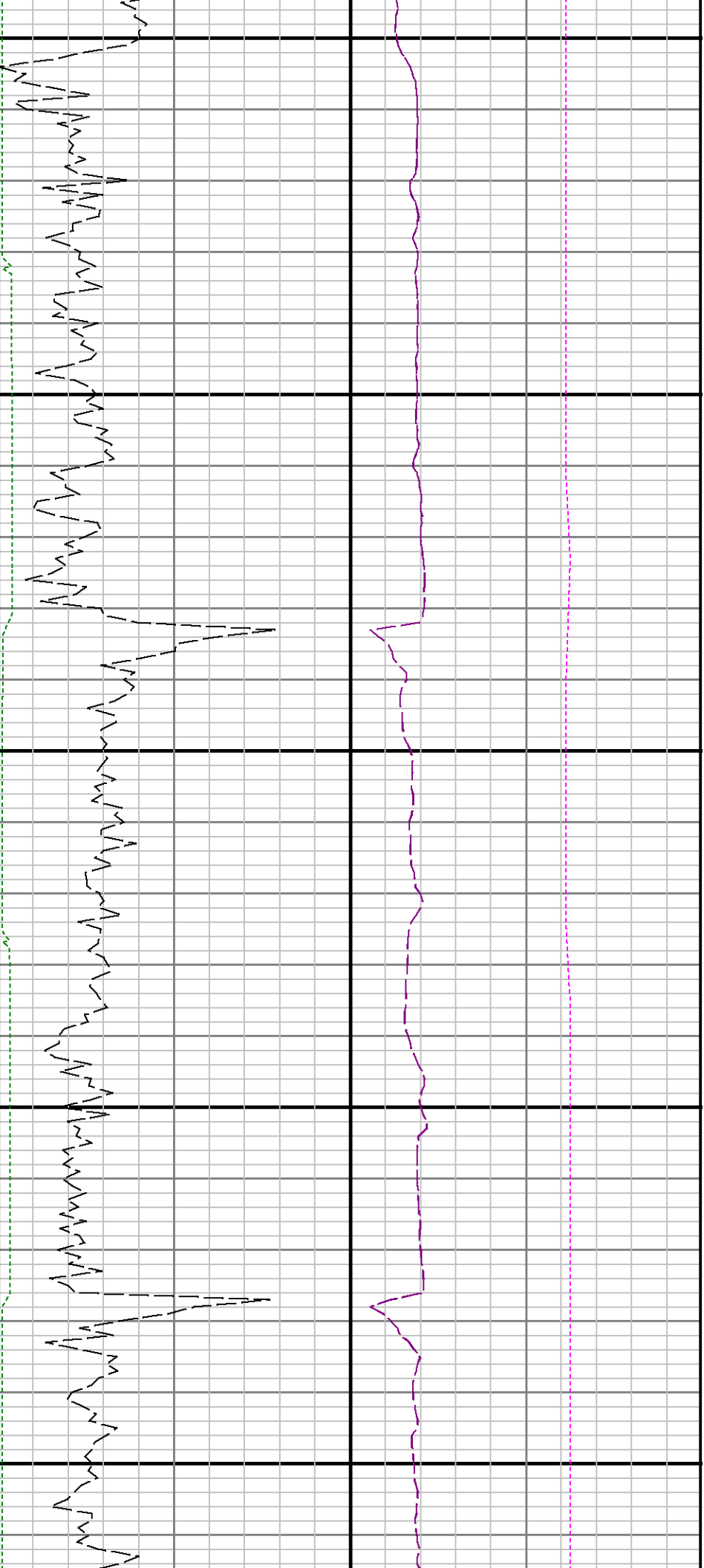




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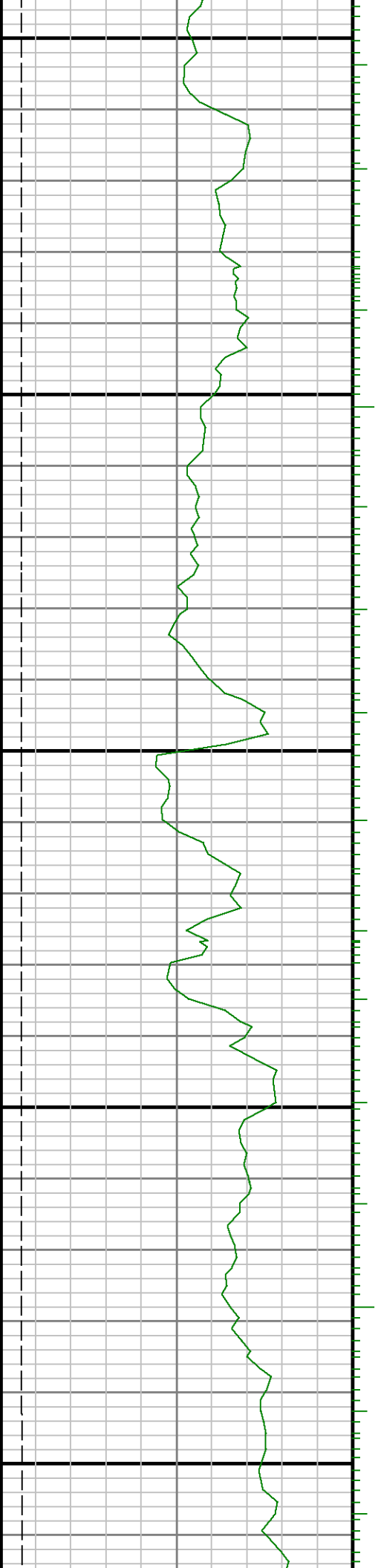
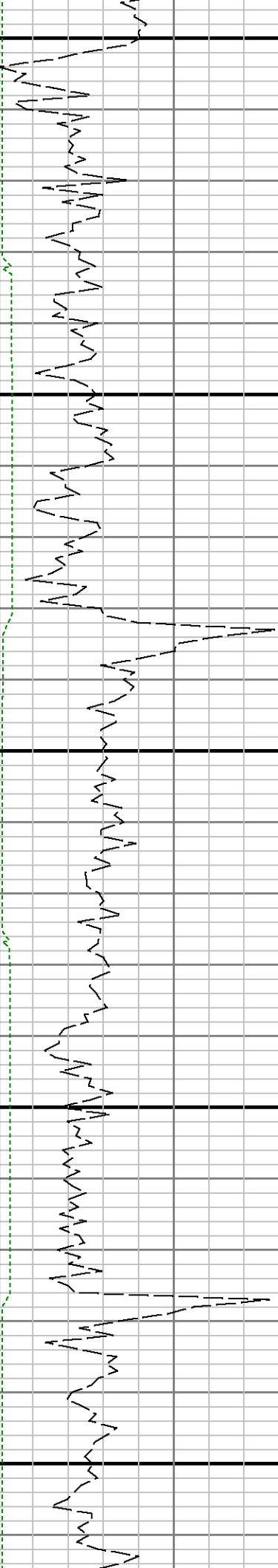


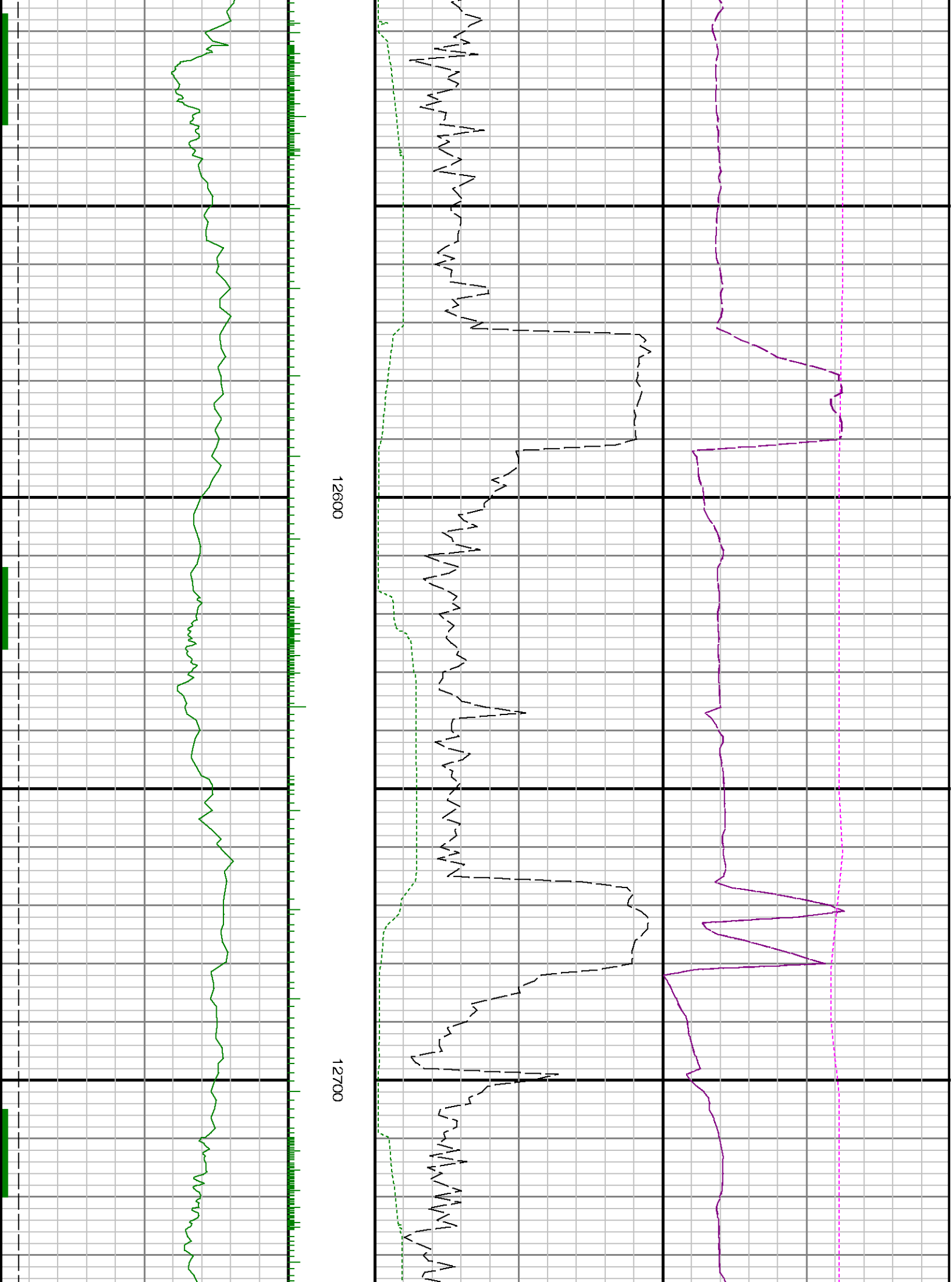


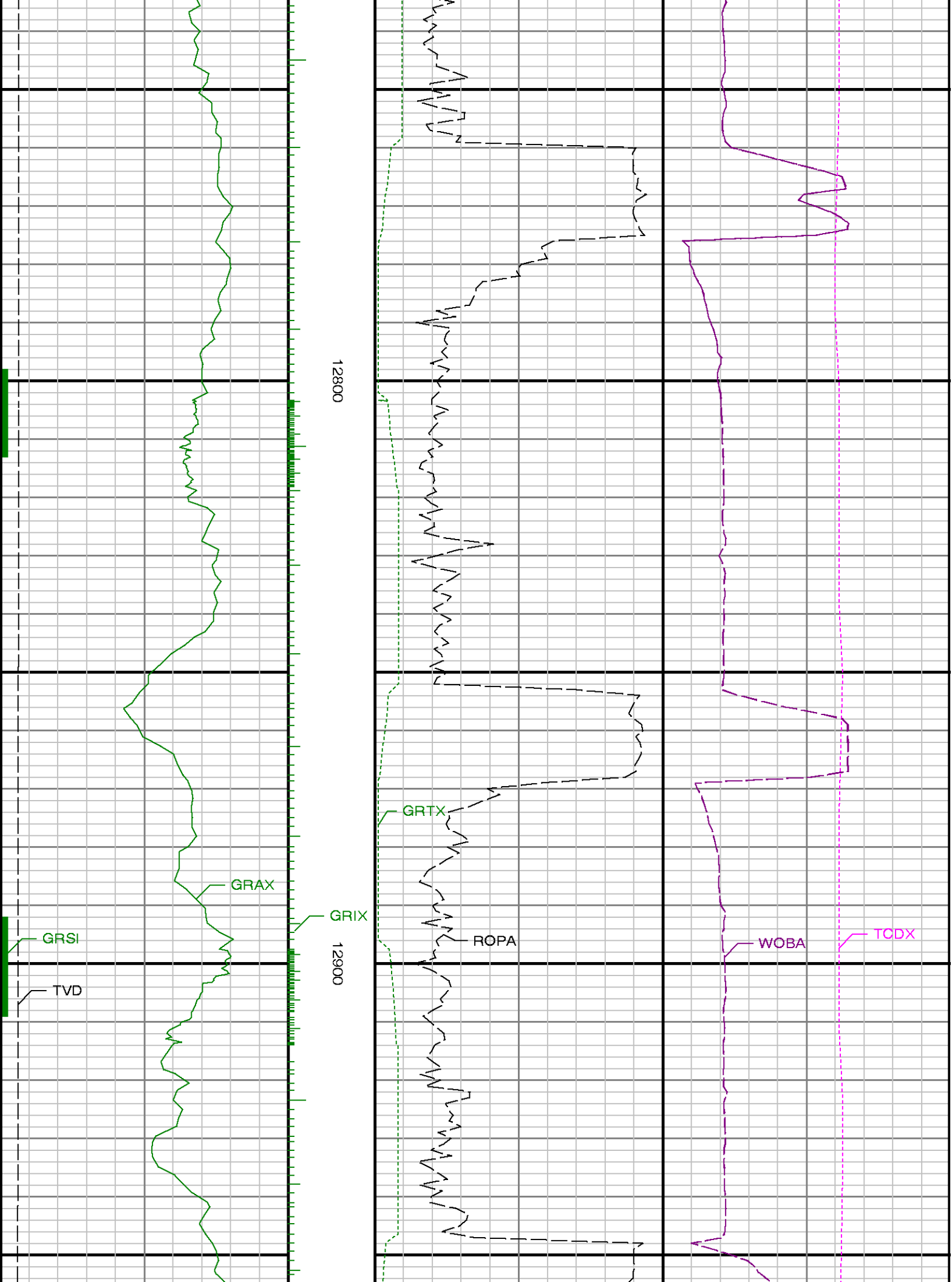
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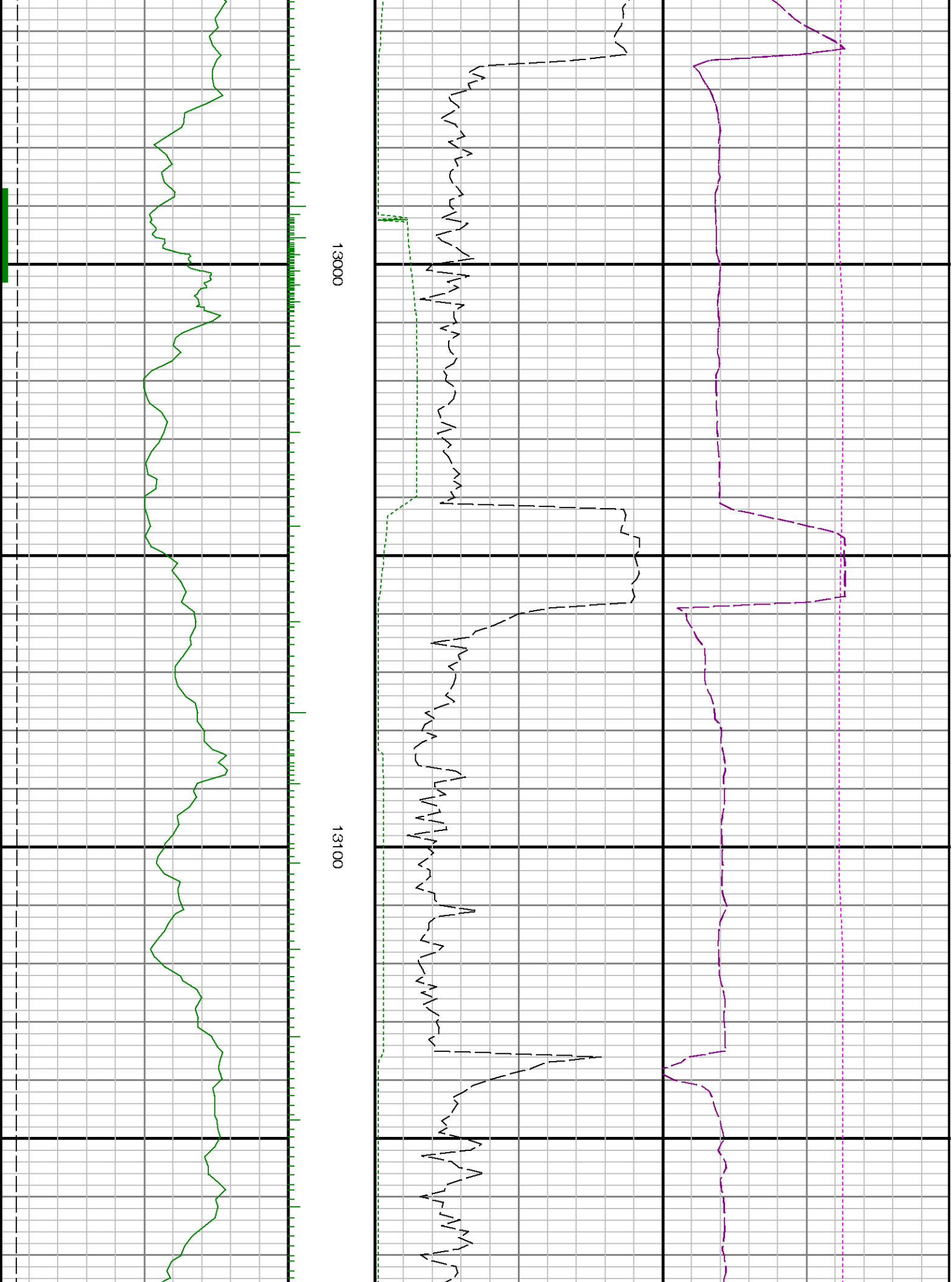
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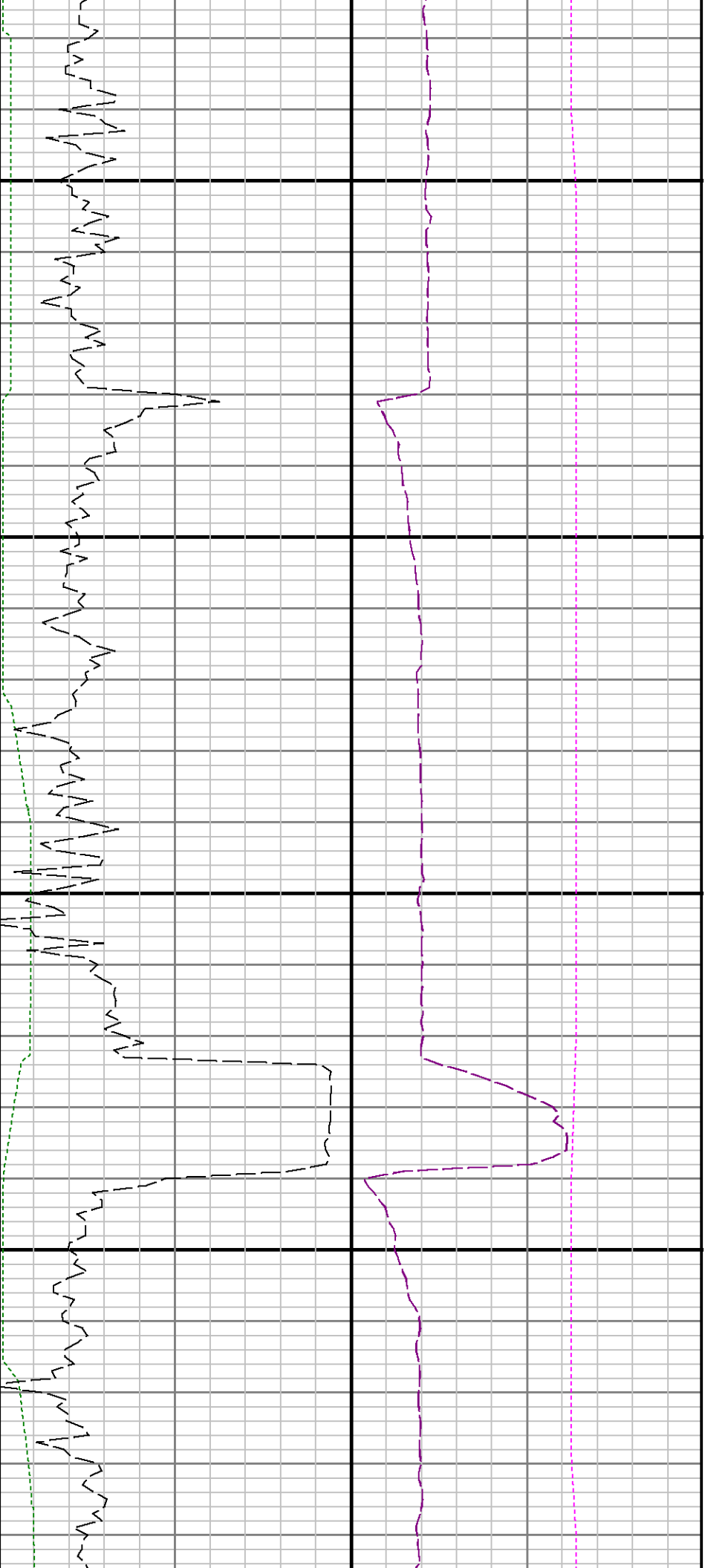
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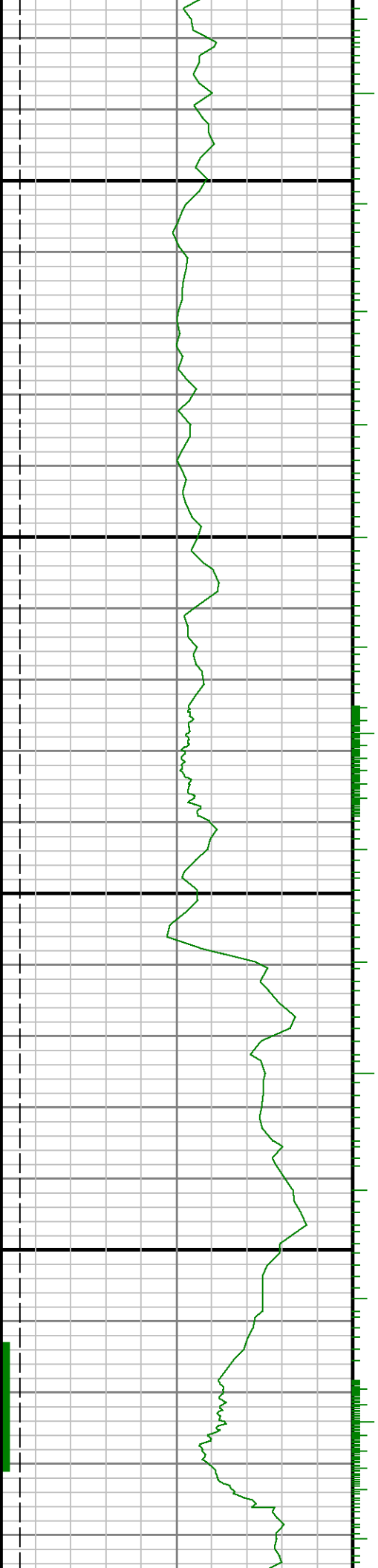


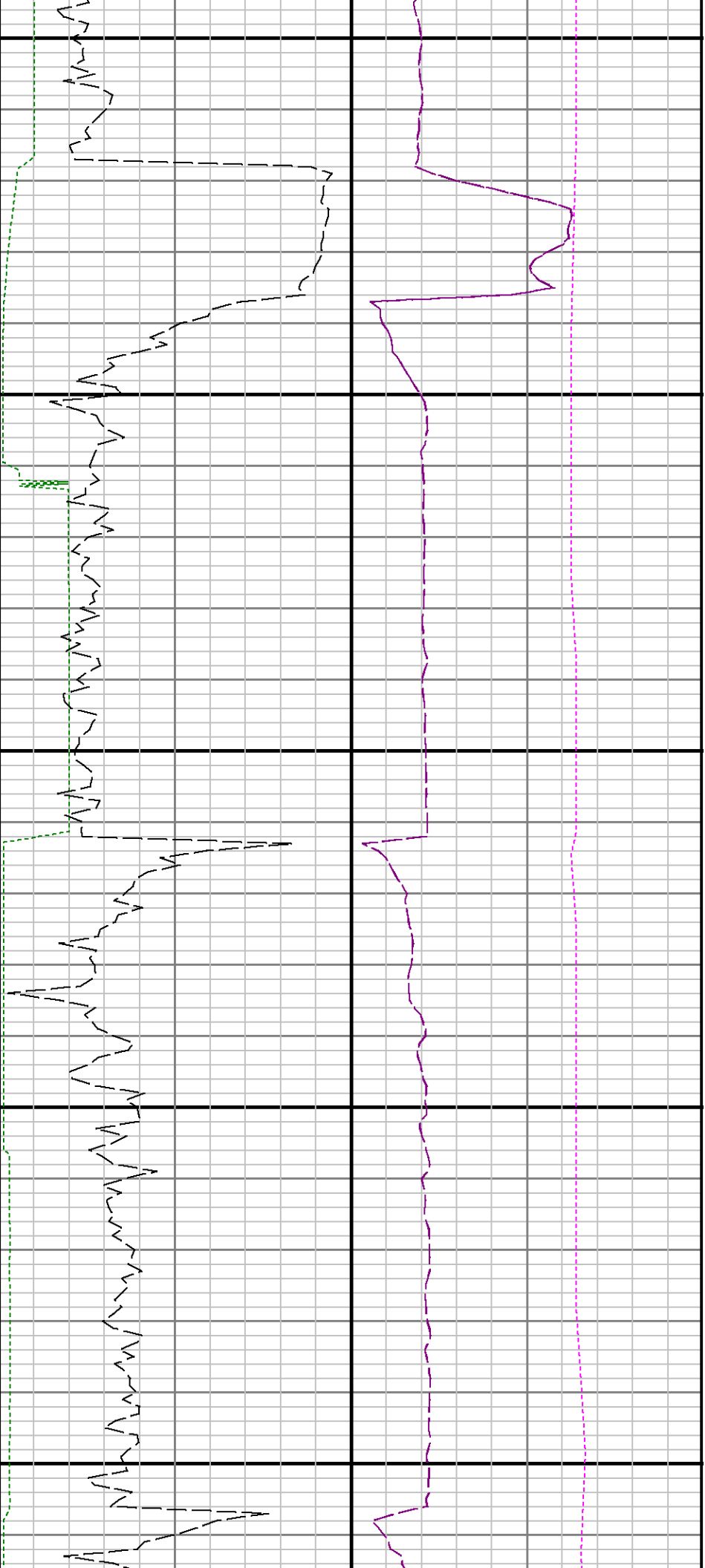




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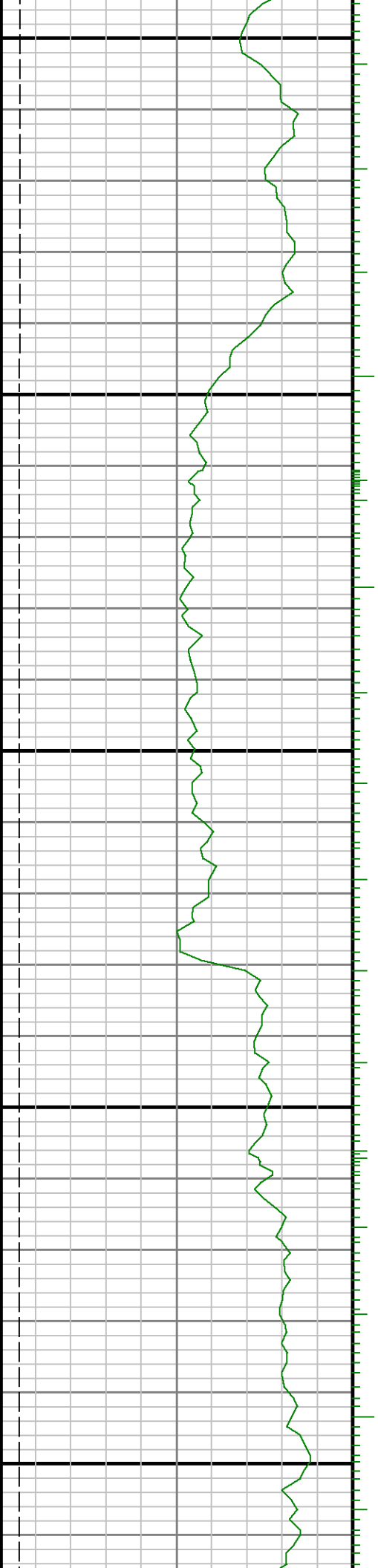


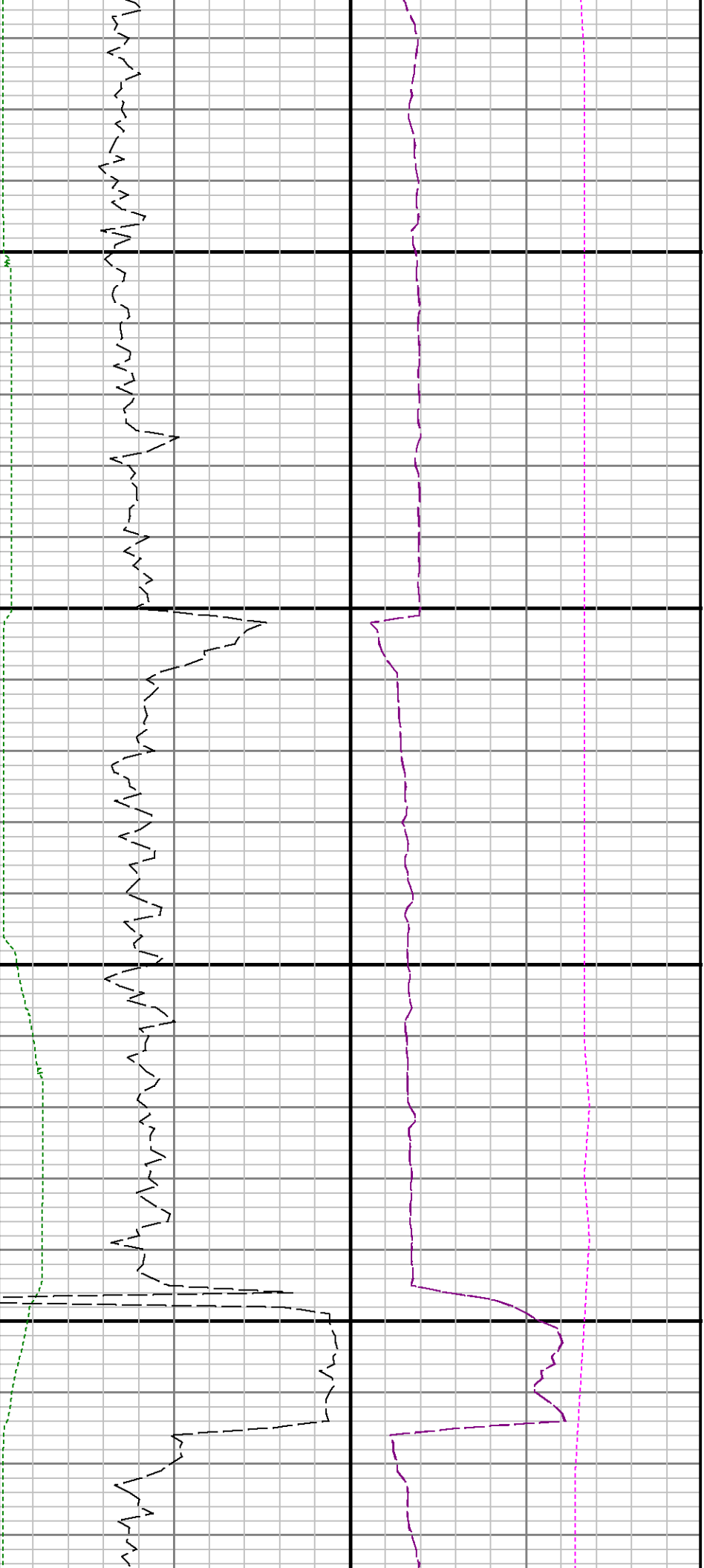


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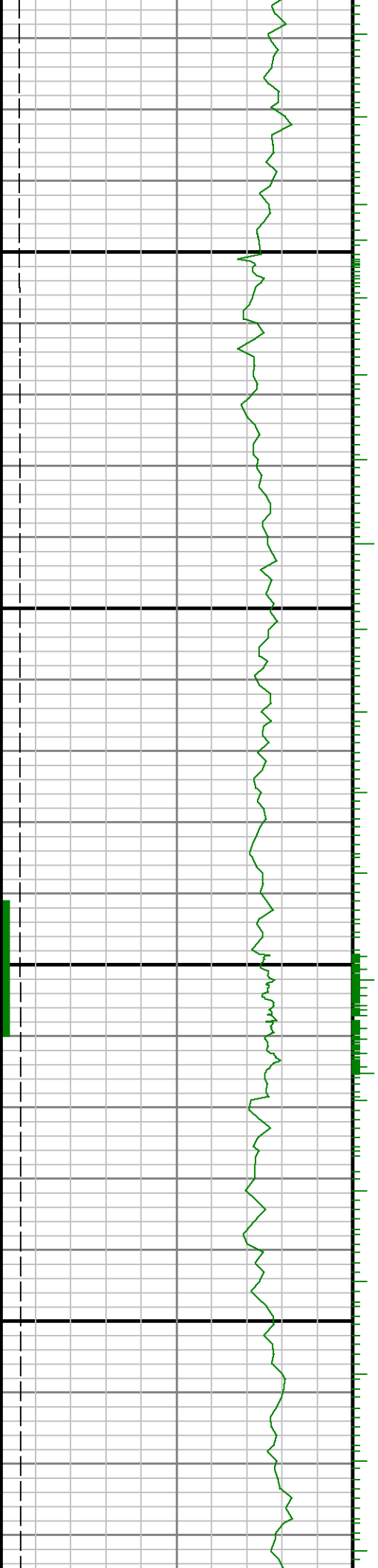
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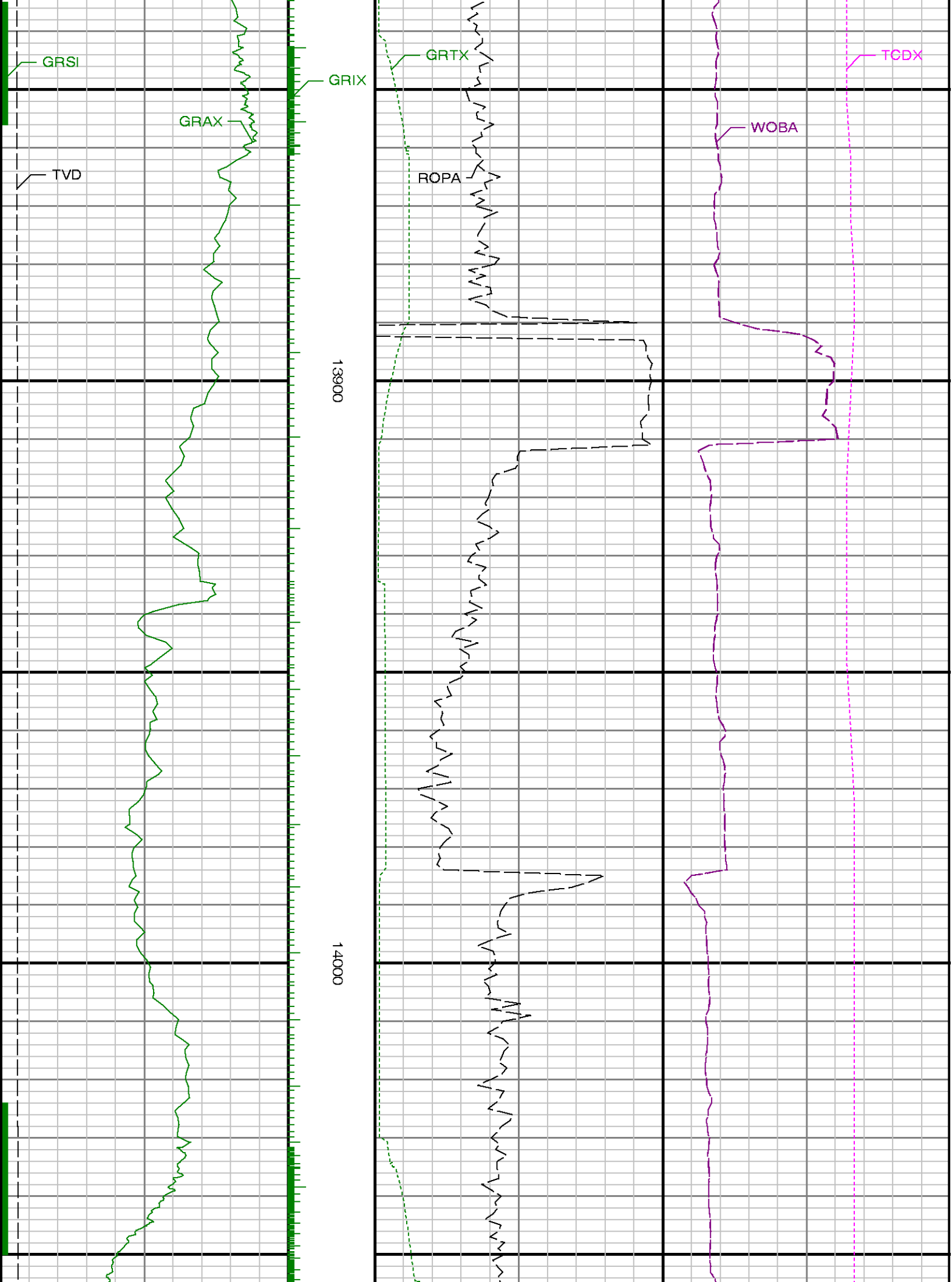


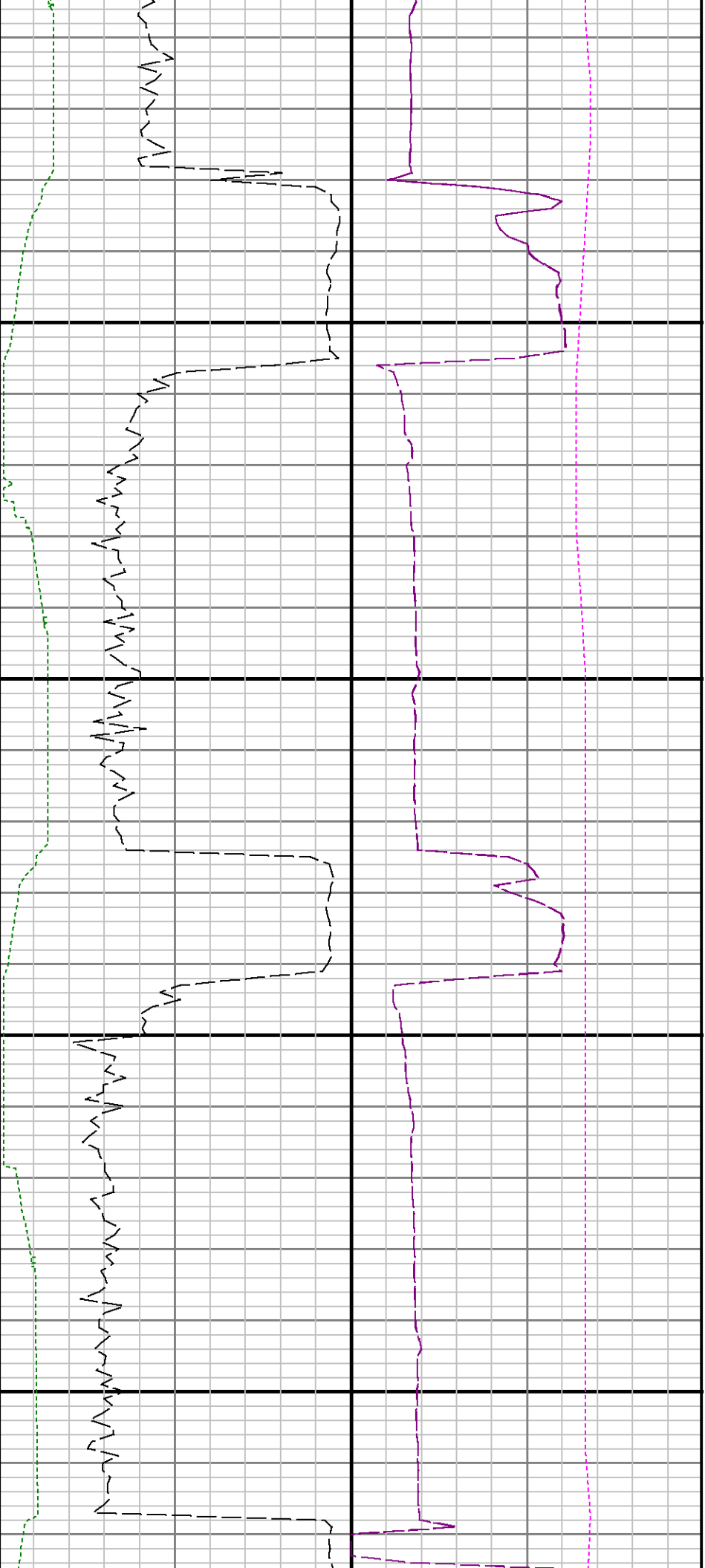


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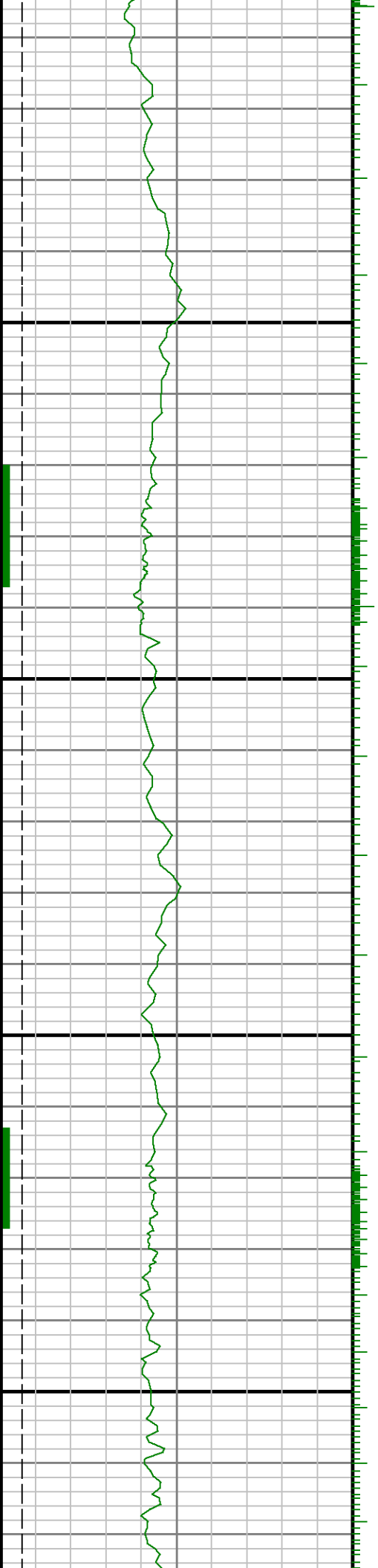






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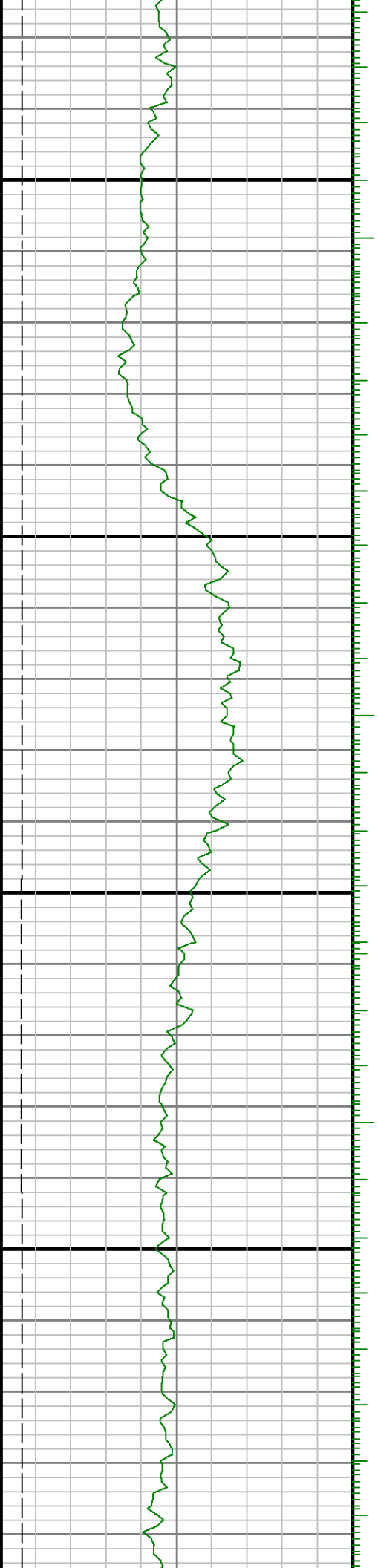
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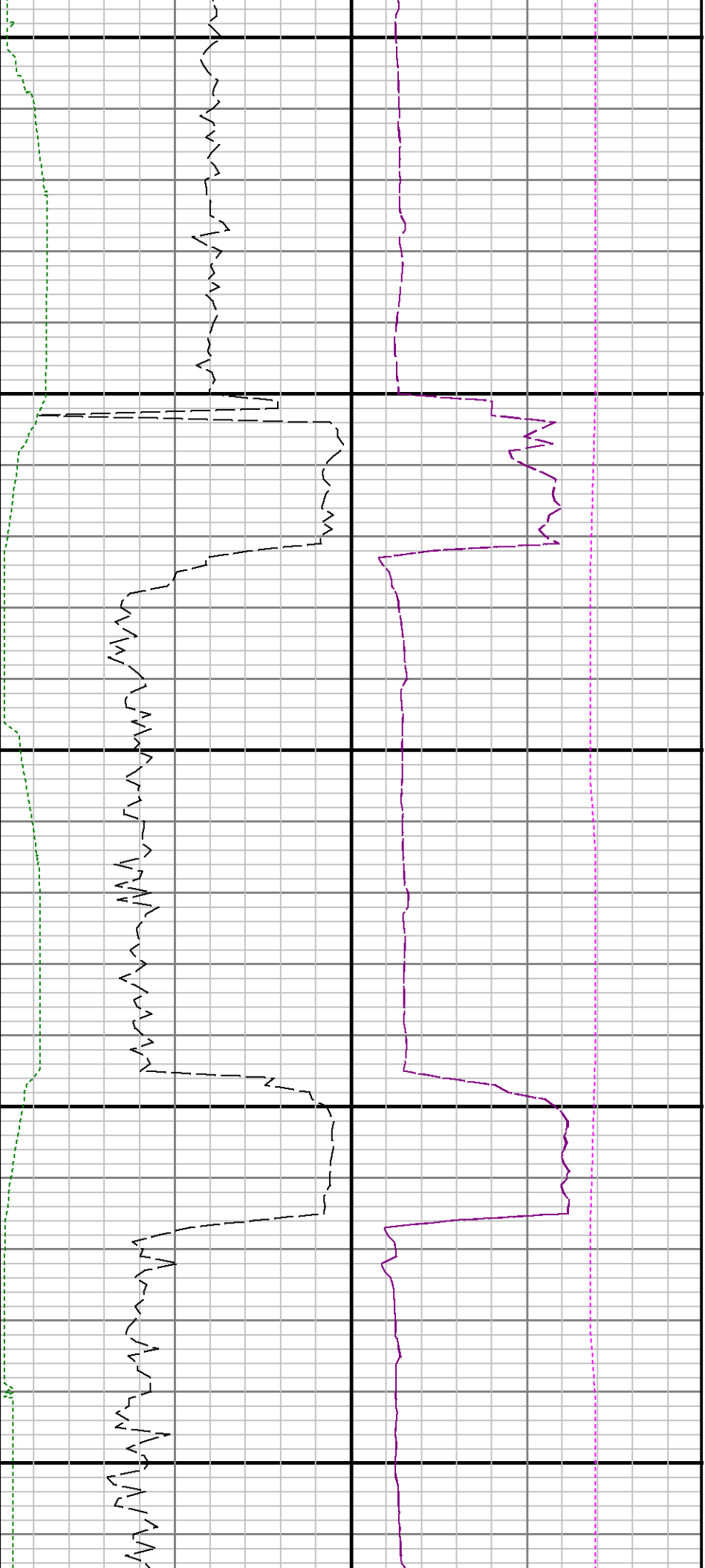




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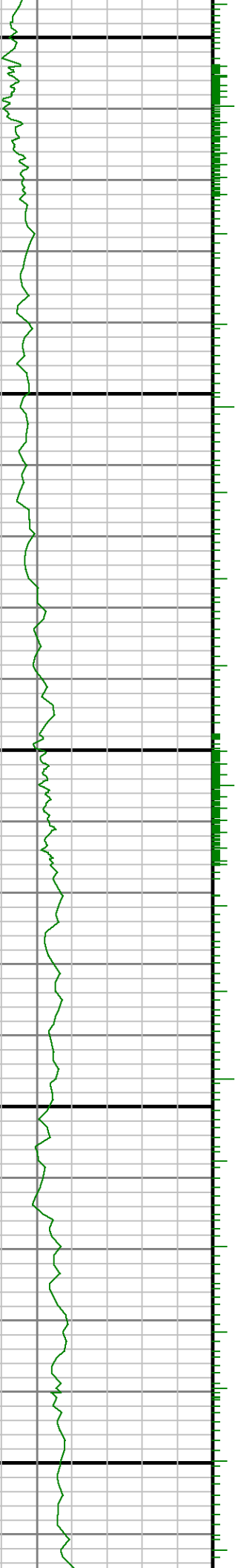


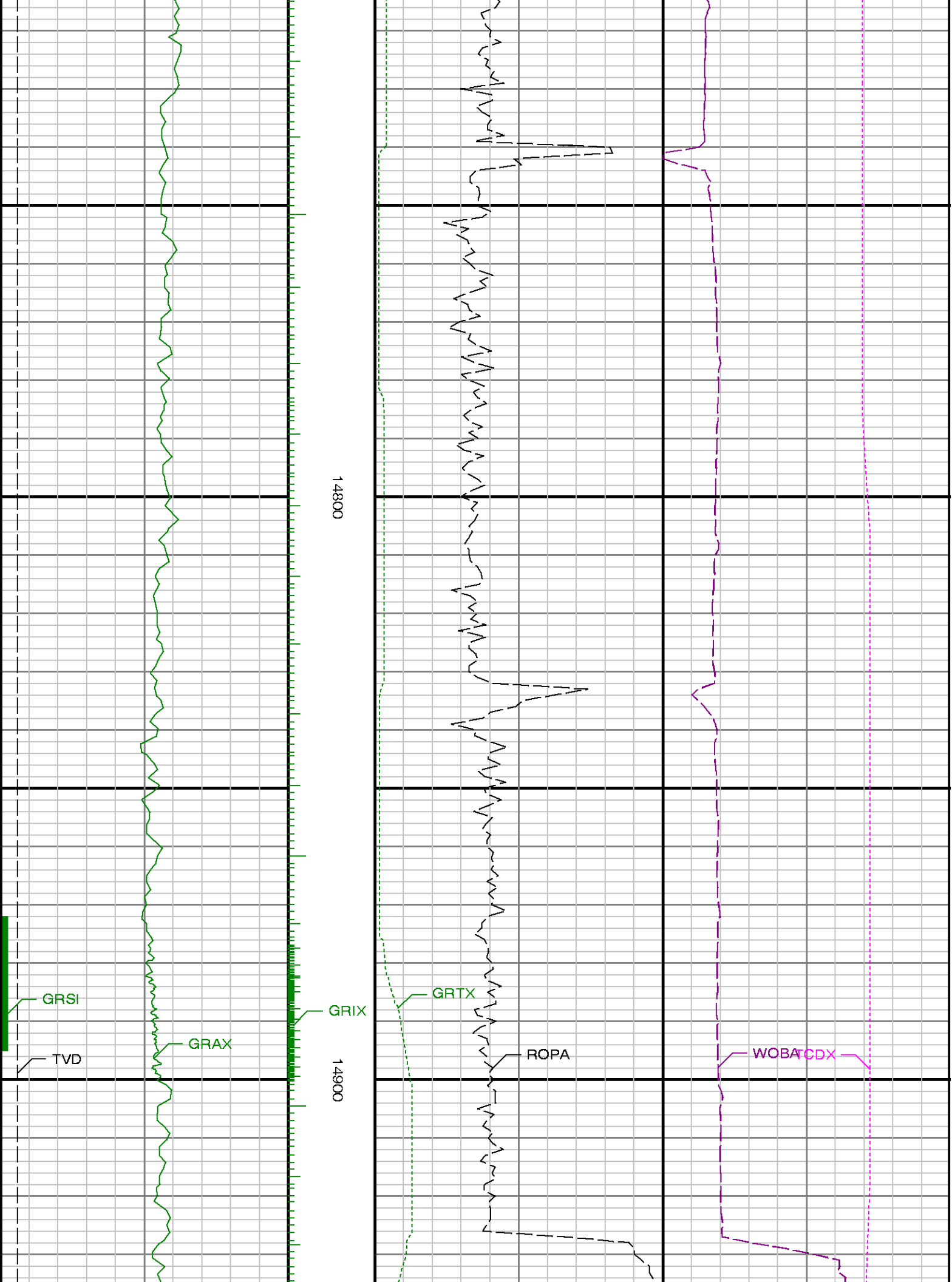


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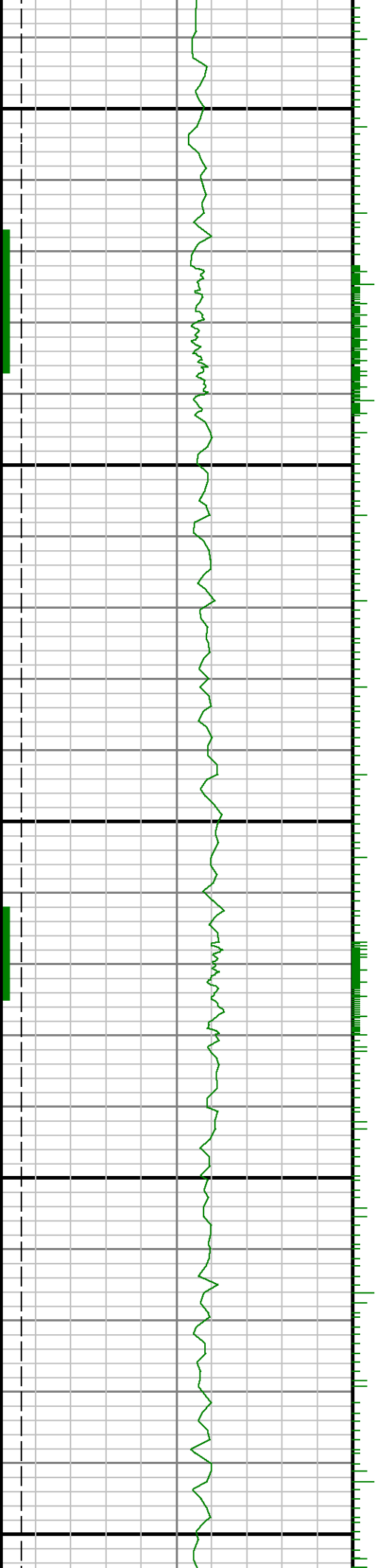


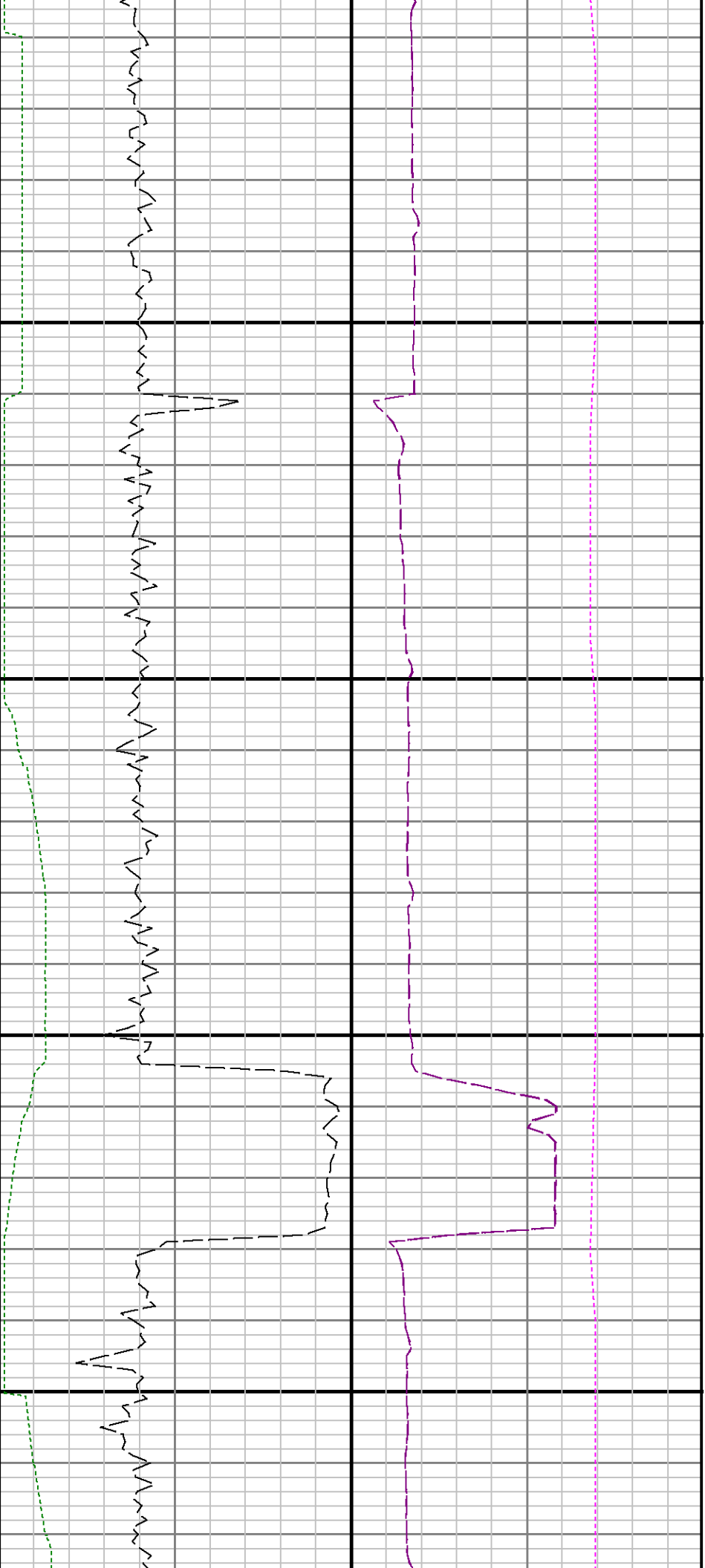




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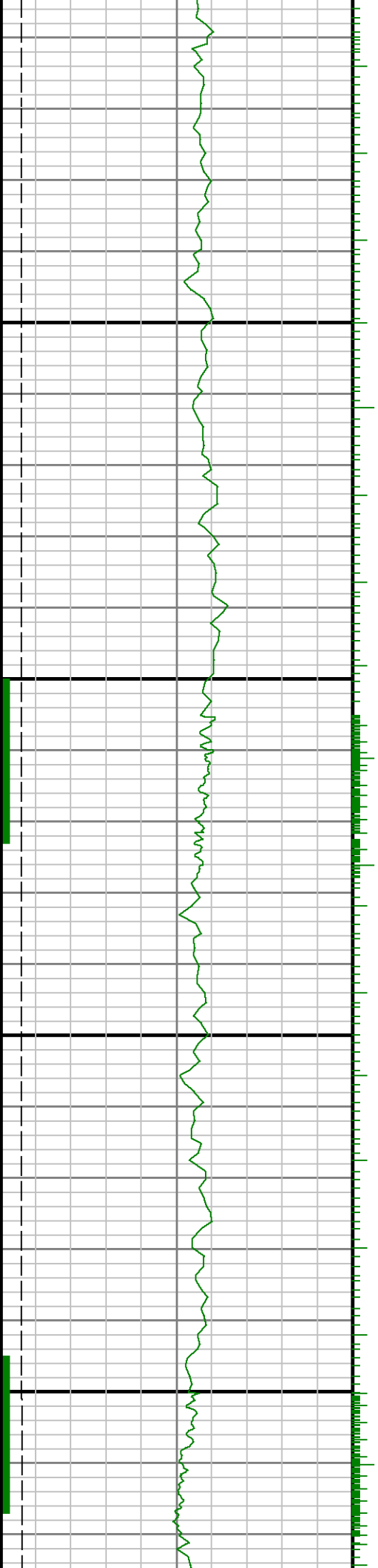
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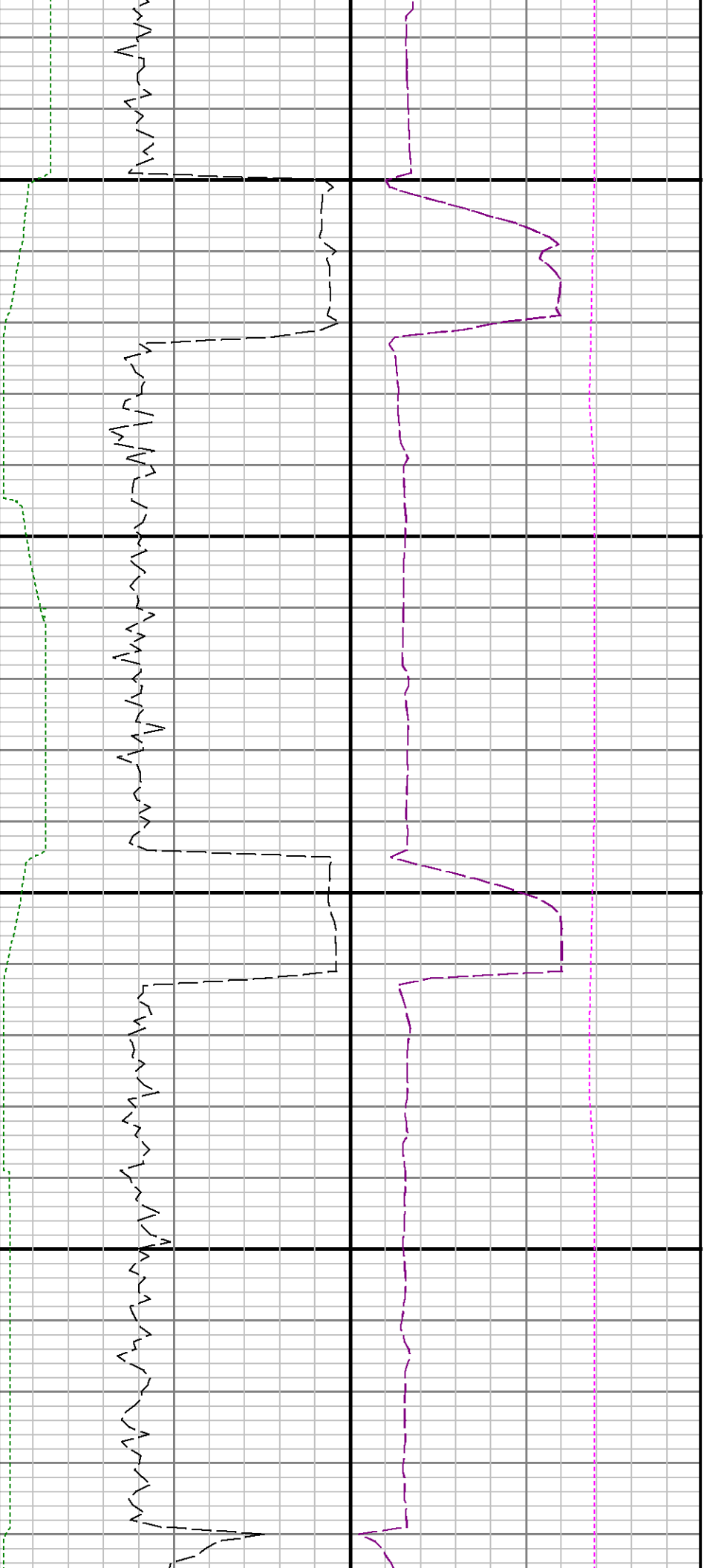




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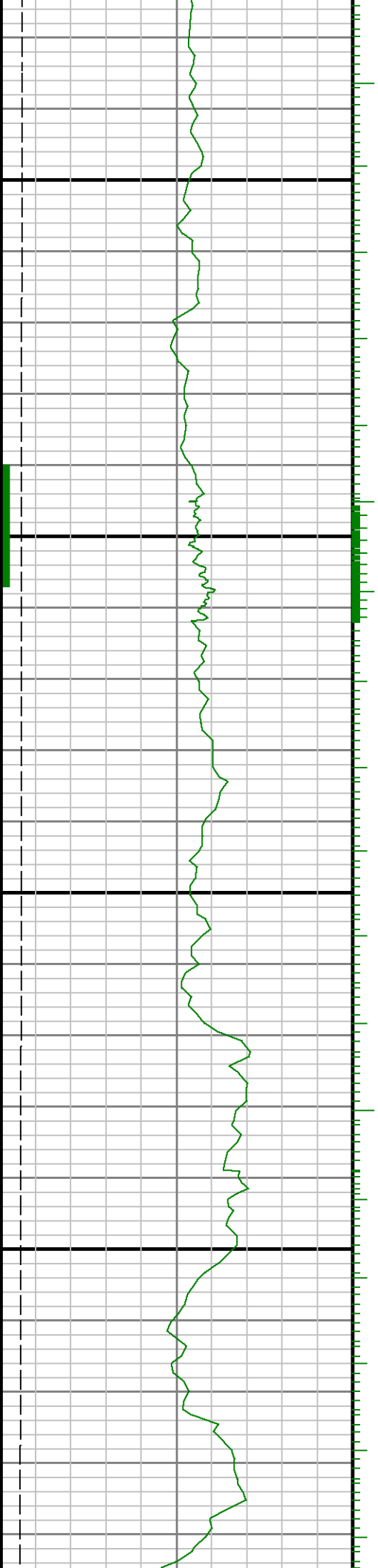
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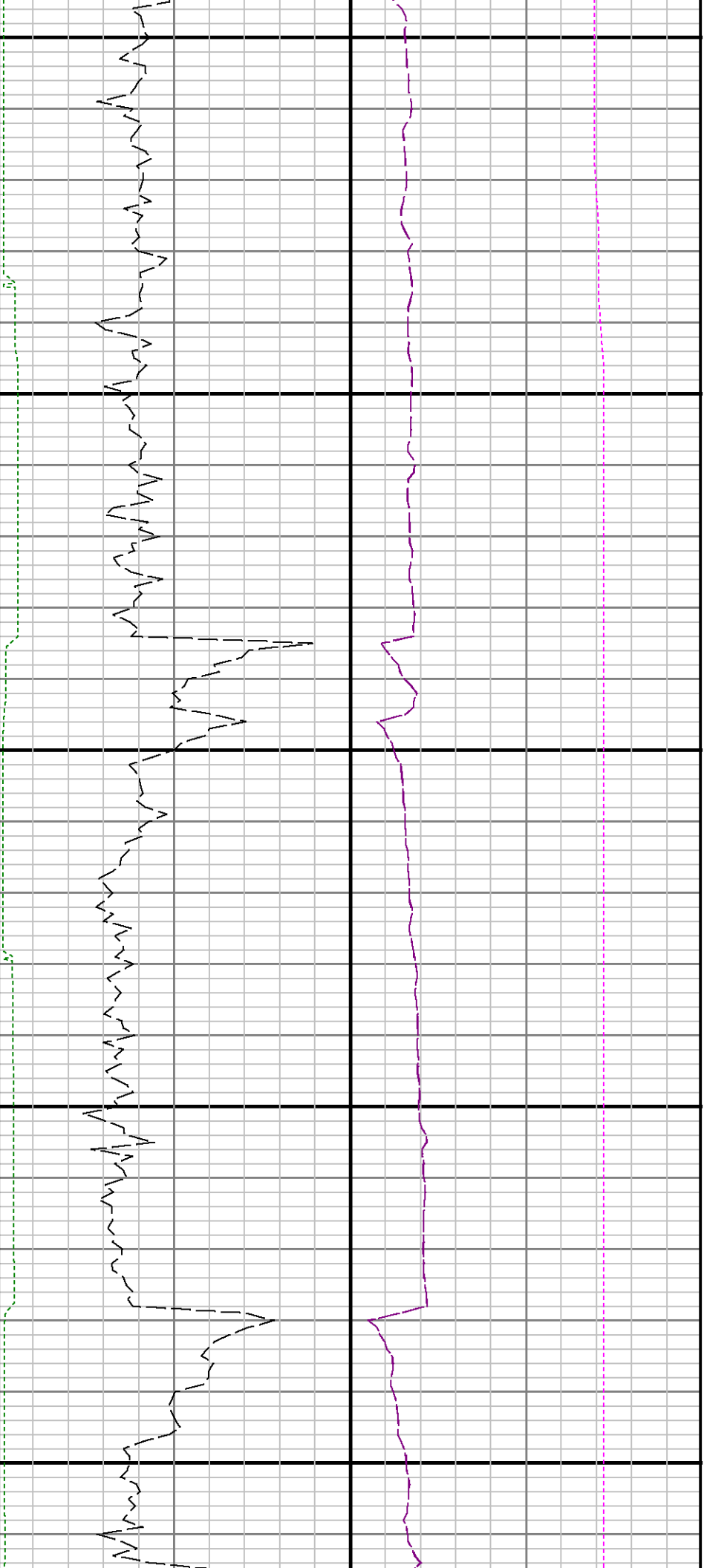




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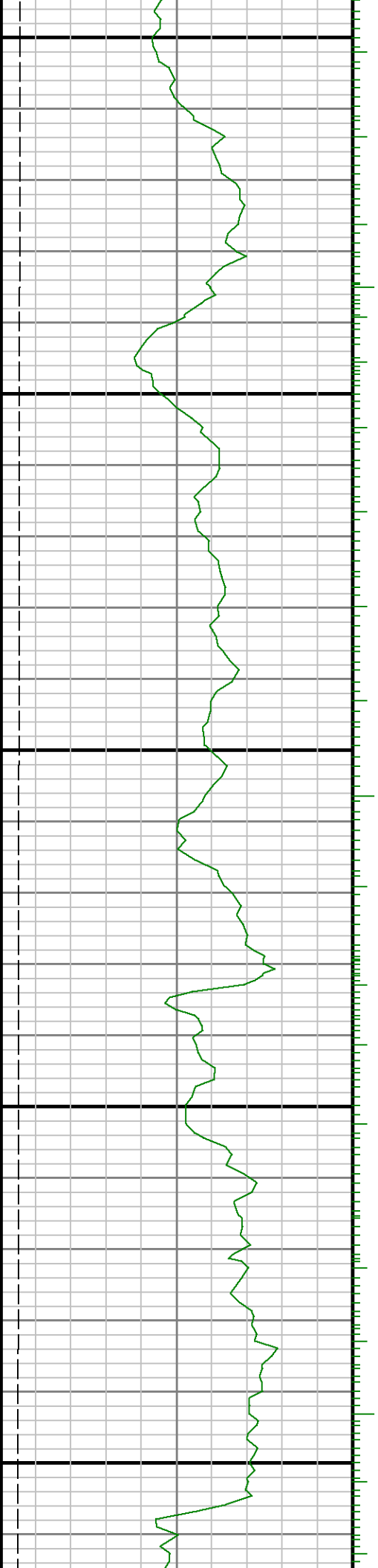


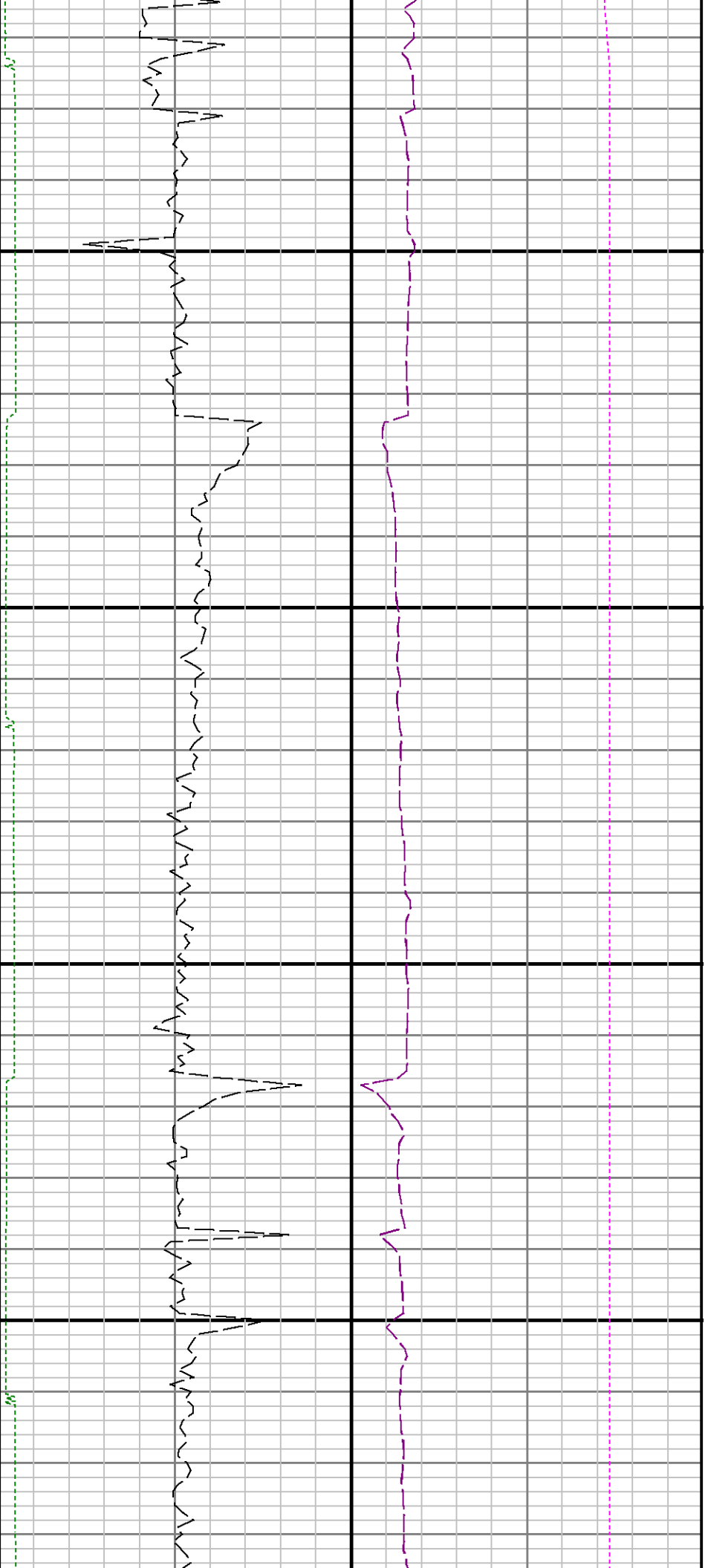


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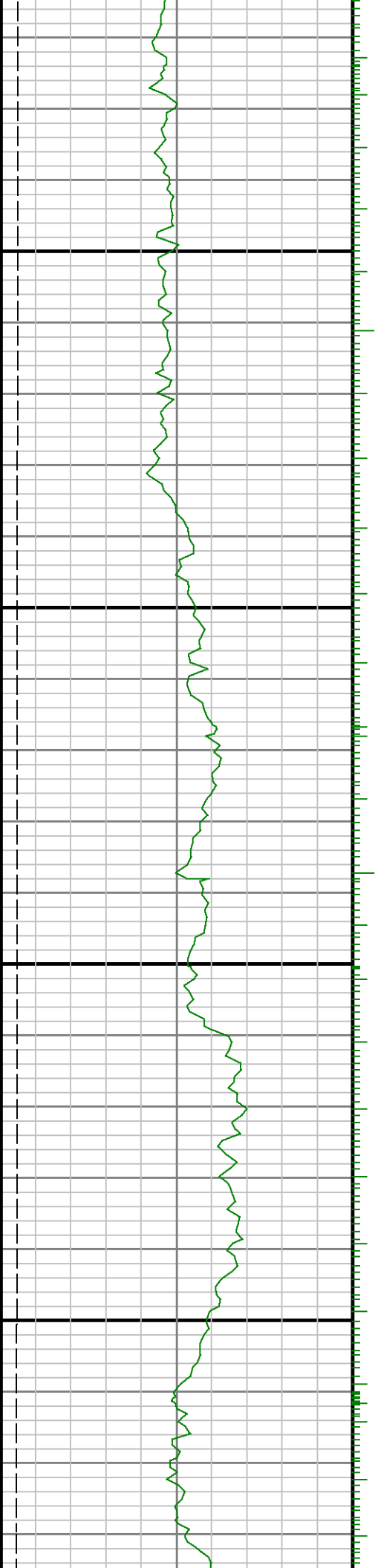
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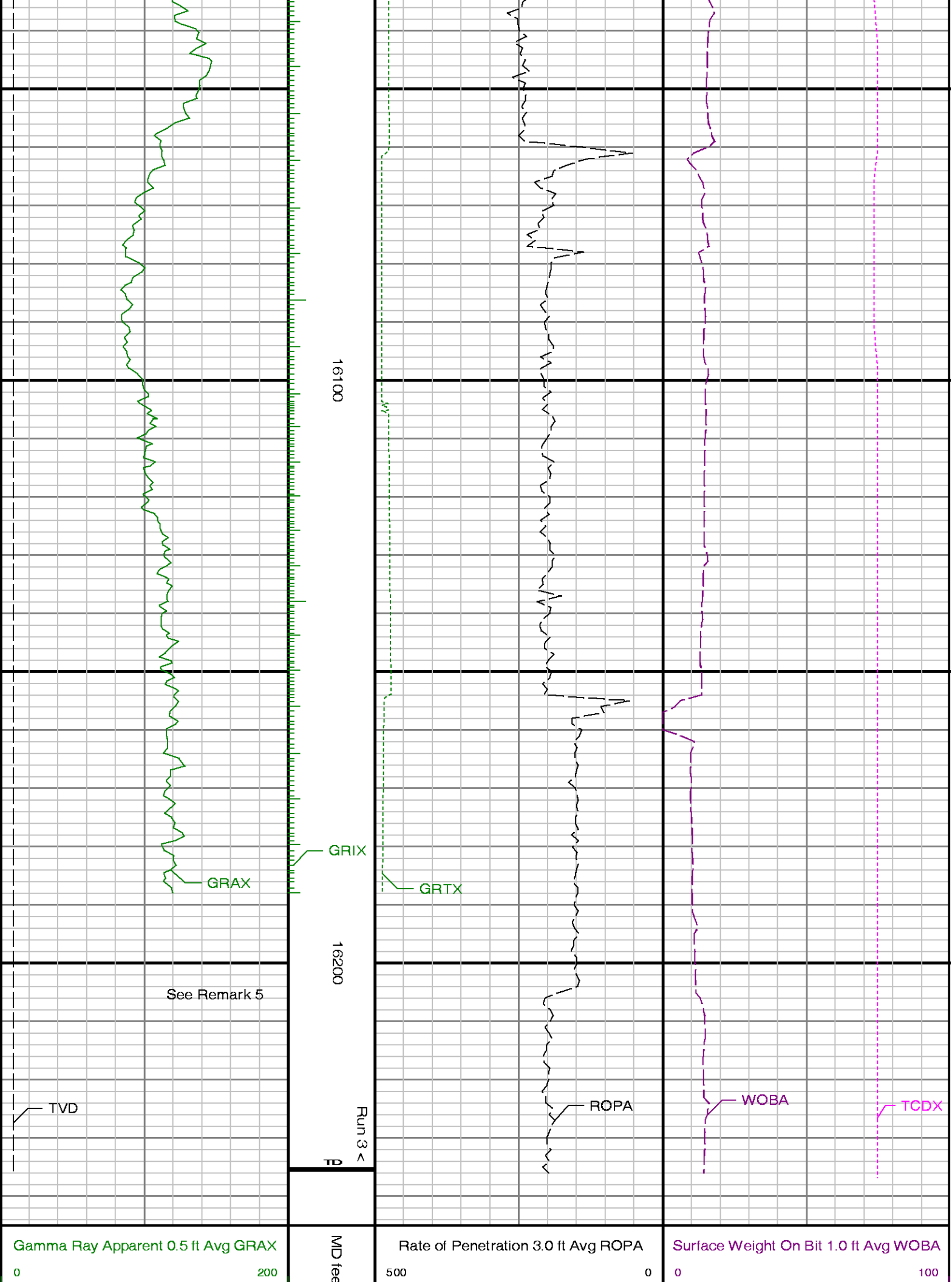




15900

16000





<div>API</div> <div>True Vertical Depth TVD</div> <div>76006900</div> <div>ft</div>	<div>Scale 1:240</div>	<div>ft/hr</div> <div>Gamma Time Since Drilled GRTX</div> <div>0600</div> <div>min</div>	<div>klbf</div> <div>Downhole Temperature TCDX</div> <div>100300</div> <div>degF</div>
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