



Natural Formation Evaluation  
Gamma Ray

Realtime Log

Scale:   
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Interval Logged		Dates		Magnetic Field Reference	
Top:	6750.0 ft.	Date From: 20/Oct/14	Dip Angle: 66.80 °	Azi Reference North:	True
Bottom:	12392.0 ft.	Date To: 26/Oct/14	Total	Mag to Reference	
		Spud Date: 20/Oct/14	Field Strength: 52767.0 nT	North Correction:	8.20 °

Borehole Record				Casing Record			
Hole Size	From	To	Size	Weight	From	To	
13.500 in.	Surface	1128.0 ft.	9.625 in.	36.00 lb/ft	Surface	1118.0 ft.	
8.750 in.	1118.0 ft.	7717.0 ft.	7.000 in.	26.00 lb/ft	Surface	7715.0 ft.	
6.125 in.	7715.0 ft.	12392.0 ft.					

Mud Record				Deviation Record		
Type	From	To	Hole Size	Interval	Inc / Az (Start)	Inc / Az (End)
Fresh Water	1128.0 ft.	6810.0 ft.	13.500 in.	1112.0 ft.	0.0 ° / 55.5 °	1.1 ° / 330.7 °
Water Based Mud	6810.0 ft.	12392.0 ft.	8.750 in.	6599.0 ft.	1.0 ° / 331.4 °	90.1 ° / 359.7 °
			6.125 in.	4677.0 ft.	90.0 ° / 359.7 °	89.0 ° / 357.3 °
					/	/
					/	/
					/	/

Acquisition System		Software Version		Other	
Advantage	2.20U4	Rig:	Xtreme 6	/ Xtreme Coil Drilling Corp	
PAIS	6.4.1.34	Job No:	6708848		
		District / Unit:	RMD	/ D&E	

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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  No.	Run  No.	Run  No.	Size  (in.)	Type	Gauge  Length  (in.)		Top  (ft.)	Bottom  (ft.)	From  (ft.)	To  (ft.)	Start		End		
1	1	2	8.750	PDC	6.000	Steerable	6750.0	7717.0	1128.0	7717.0	20/Oct/2014 18:15	22/Oct/2014 18:00	35.2		
2	2	3	6.125	PDC	3.600	Steerable	7668.0	12392.0	7717.0	12392.0	23/Oct/2014 14:00	26/Oct/2014 00:30	40.2		

Crew										
Name	Arrive	Depart		Name	Arrive	Depart		Name	Arrive	Depart
	Wellsite	Wellsite			Wellsite	Wellsite			Wellsite	Wellsite
Matthew Delmore	20/Oct/2014	26/Oct/2014		Ryan Kielian	20/Oct/2014	23/Oct/2014				
Stephen Gray	20/Oct/2014	26/Oct/2014		Chad Hough	24/Oct/2014	26/Oct/2014				
				Courtney Koerner	20/Oct/2014	26/Oct/2014				

Witness

Name	LWD Run Number
Joe Wallem	1
David Cornett	1
Derreck Perry	2
Pat Cain	2

Mud Properties Record

Date / Time	LWD Run No.	Measured Depth (ft.)	Mud Type	Density (ppg)	Viscosity (s/qt)	pH	Fluid Loss (cc)	Oil / Water	Source	Total Chlorides (mg/L)	K+ (%)
20/Oct/2014 21:30	1	1218.0	Fresh Water	8.6	30	9.0	0.0	1 / 98	Active Mud Pit	8500	N/A
21/Oct/2014 09:00	1	4200.0	Fresh Water	8.7	29	9.0	0.0	1 / 98	Active Mud Pit	7000	N/A
21/Oct/2014 21:00	1	6810.0	Water Based Mud	10.1	43	9.3	4.0	2 / 90	Active Mud Pit	6000	N/A
22/Oct/2014 09:00	1	7680.0	Water Based Mud	10.2	45	9.3	4.6	2 / 89	Active Mud Pit	6500	N/A
23/Oct/2014 21:00	2	8008.0	Water Based Mud	10.2	41	9.3	4.7	3 / 88	Active Mud Pit	5500	N/A
24/Oct/2014 20:45	2	10950.0	Water Based Mud	10.2	44	9.3	4.6	3 / 88	Active Mud Pit	5000	N/A

Mnemonics

Curve	Description	Units
GRAX	Gamma Ray Apparent, 0.5 ft. Avg.	API
GRIX	Gamma Ray Data Density	points
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 (ft)	Max O.D. (in.)	Min I.D. (in.)
1	DIR	12887296	Directional	45.71	6.750	3.250
1	SRIG	11932890	Gamma	42.34	6.750	3.250
2	DIR	11710699	Directional	52.40	4.750	2.750
2	SRIG	10662886	Gamma	49.02	4.750	2.750

Service and Tool Mnemonics

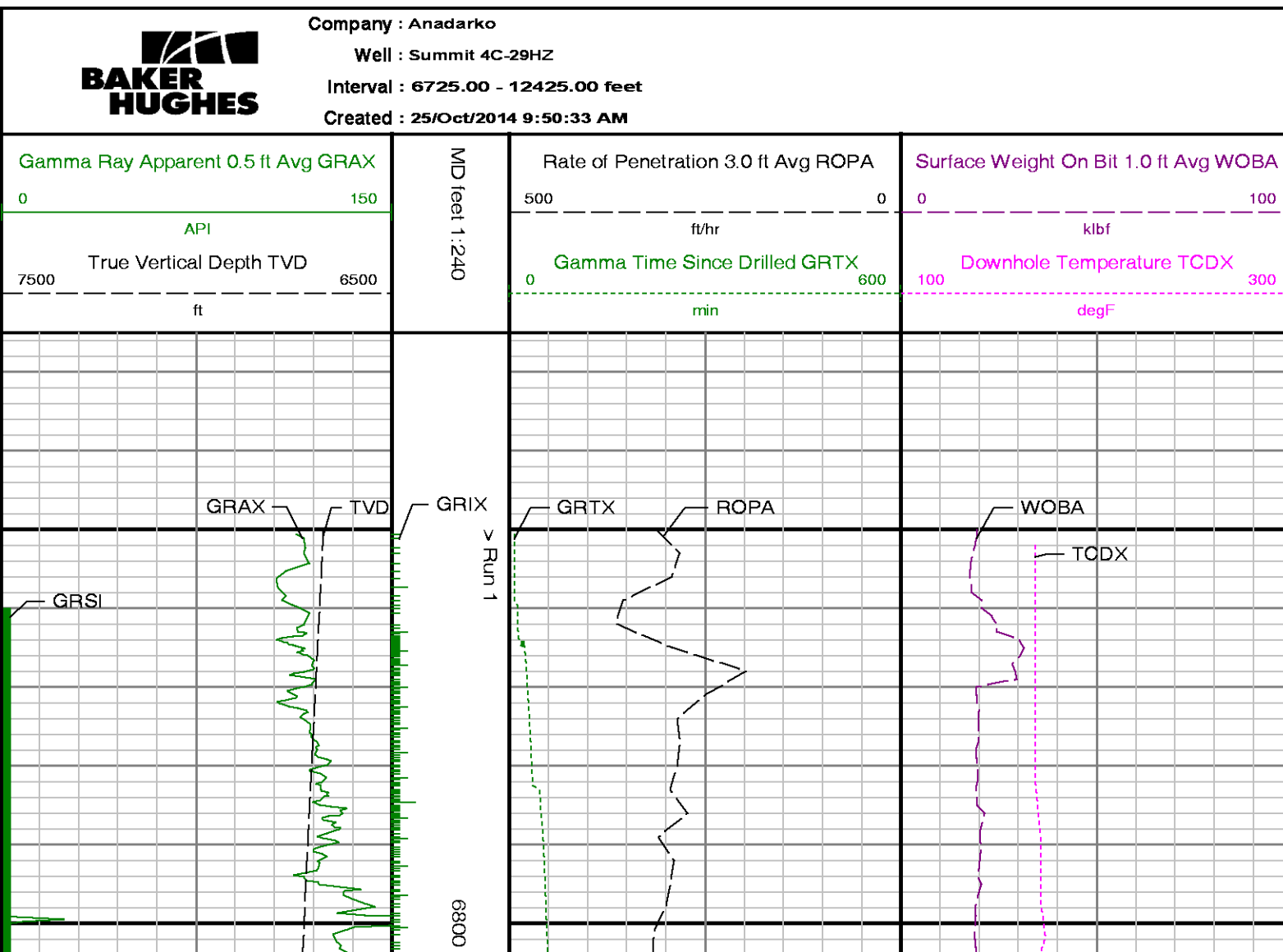
Mnemonic	Name	Description
DIR	Directional	Wellbore directional survey
SRIG	Inclination and Gamma	Probe based gamma ray and inclination module

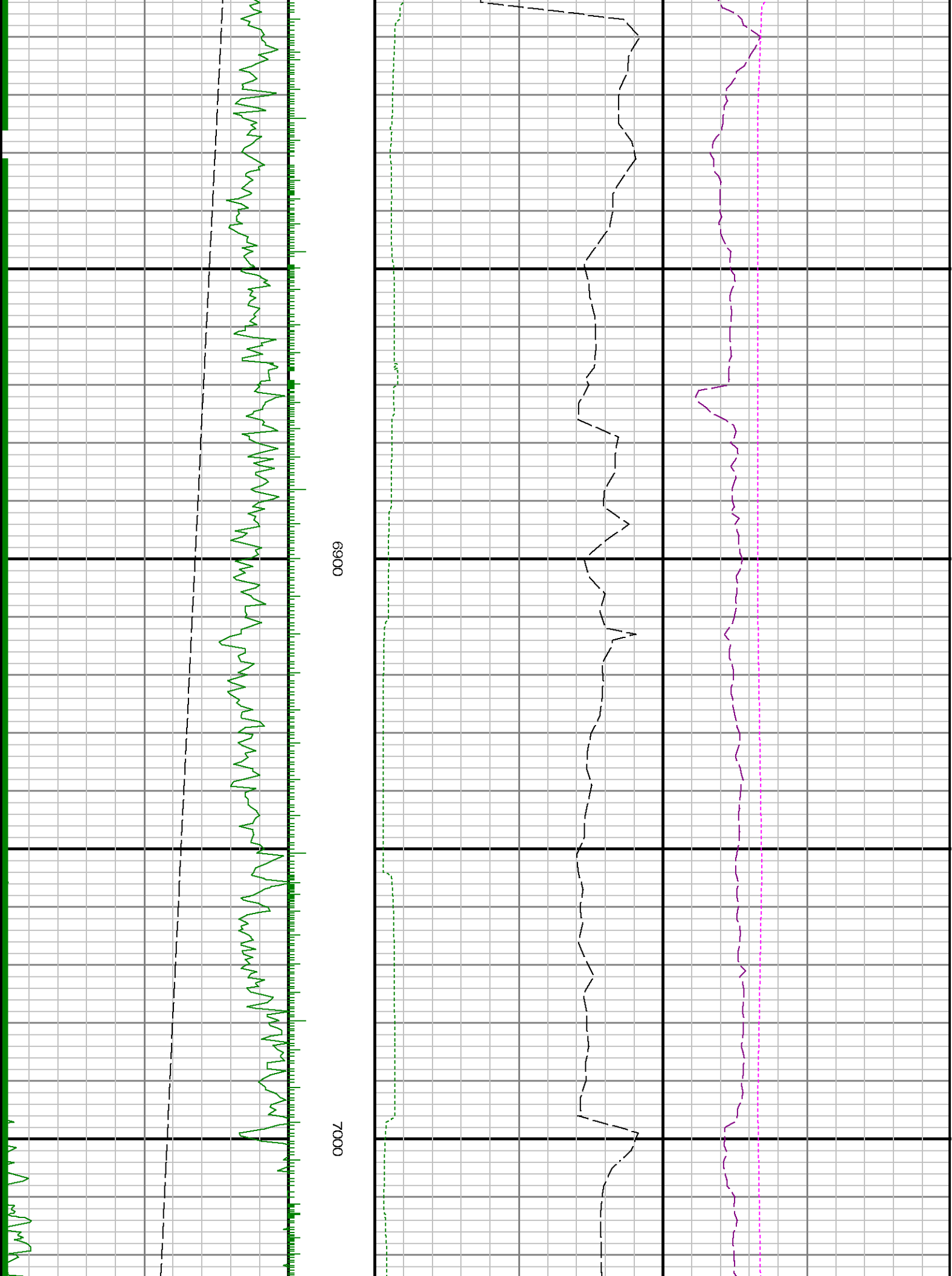
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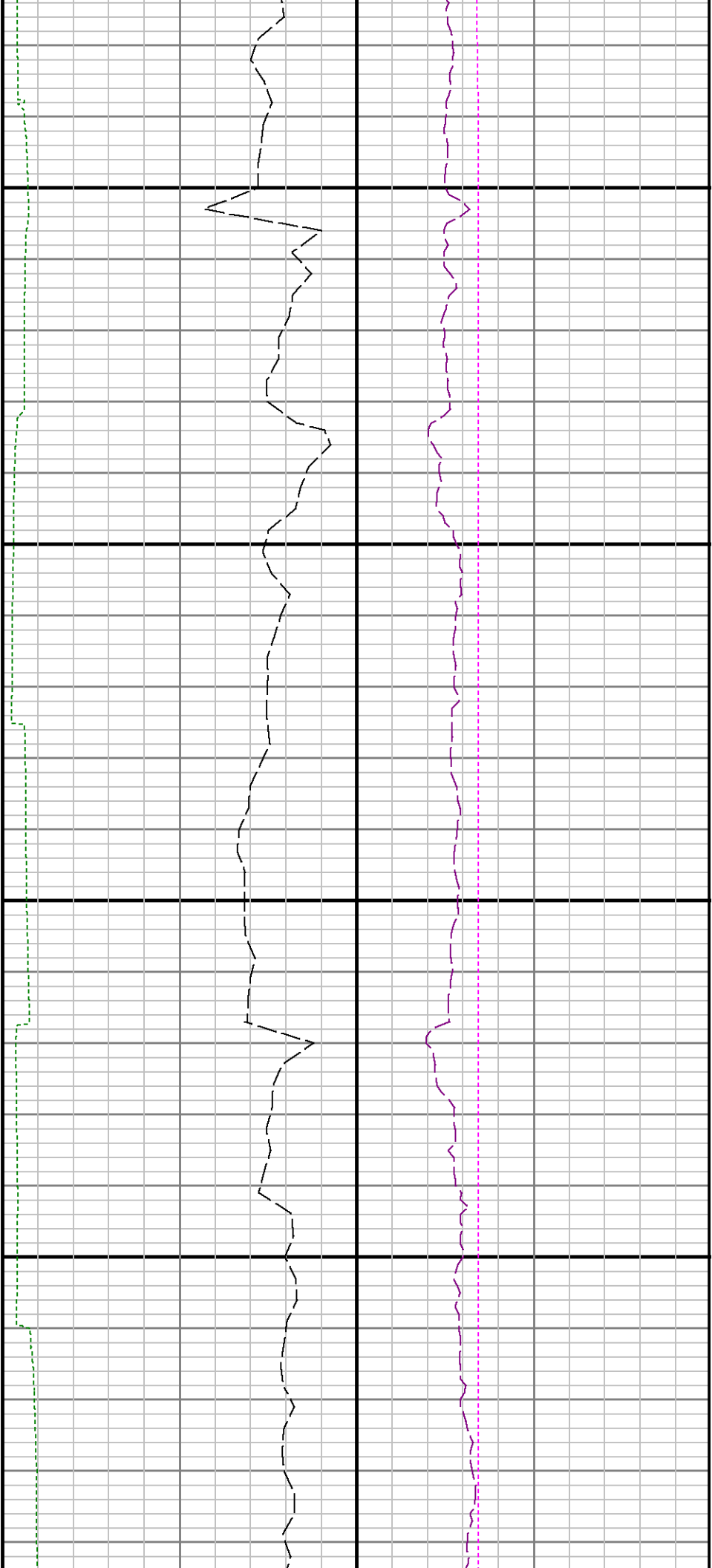
- 1.) Baker Hughes LWD run 1 utilized 6 3/4 inch NaviTrak Services (VSS, Directional) from 1128 to 6750 ft. MD (1127.97 to 6674.90 ft. TVD) and NaviGamma Services (VSS, Directional, Gamma Ray) from 6750 to 7717 ft. MD (6674.90 to 7313.88 ft. TVD) behind an 8 3/4 inch bit and steerable assembly.
- 2.) Baker Hughes LWD run 2 utilized 4 3/4 inch NaviGamma Services (VSS, Directional, Gamma Ray) from 7717 to 12392 ft. MD (7313.88 ft. to 7316.50 TVD) behind an 6 1/8 inch bit and steerable assembly.
- 3.) A sliding indicator is shown on the left edge of track 1 as a heavy line. This indicator has been depth-shifted to the gamma ray sensor offset to correspond with gamma ray data.
- 4.) 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.

Remarks

Number	Measured Depth (ft)	Hole Section (in.)	LWD Run No.	Remark
1	7695	6.125	2	The interval from 7675 to 7717 ft. MD (7313.44 to 7313.88 ft. TVD) was logged up to 35.2 hours after being drilled due to a trip out of the hole to lay down the vertical/curve assembly, run intermediate casing, cementing operations, and to pick up the lateral assembly.
2	12365	6.125	2	The interval from 12343 to 12392 ft. MD (7315.61 to 7316.50 ft. TVD) does not contain GRAX, GRIX or GRTX due to the bit to sensor offset.

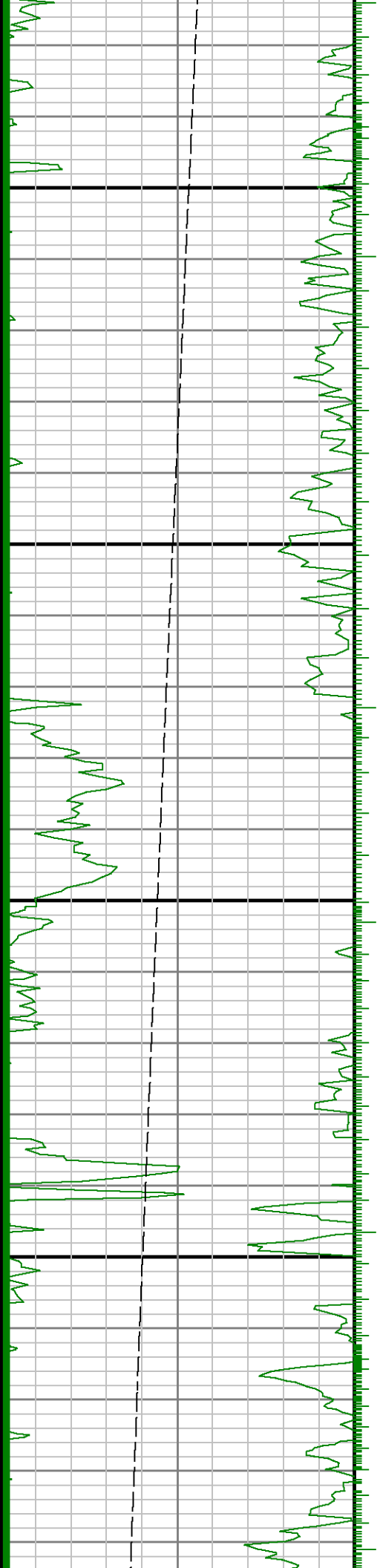


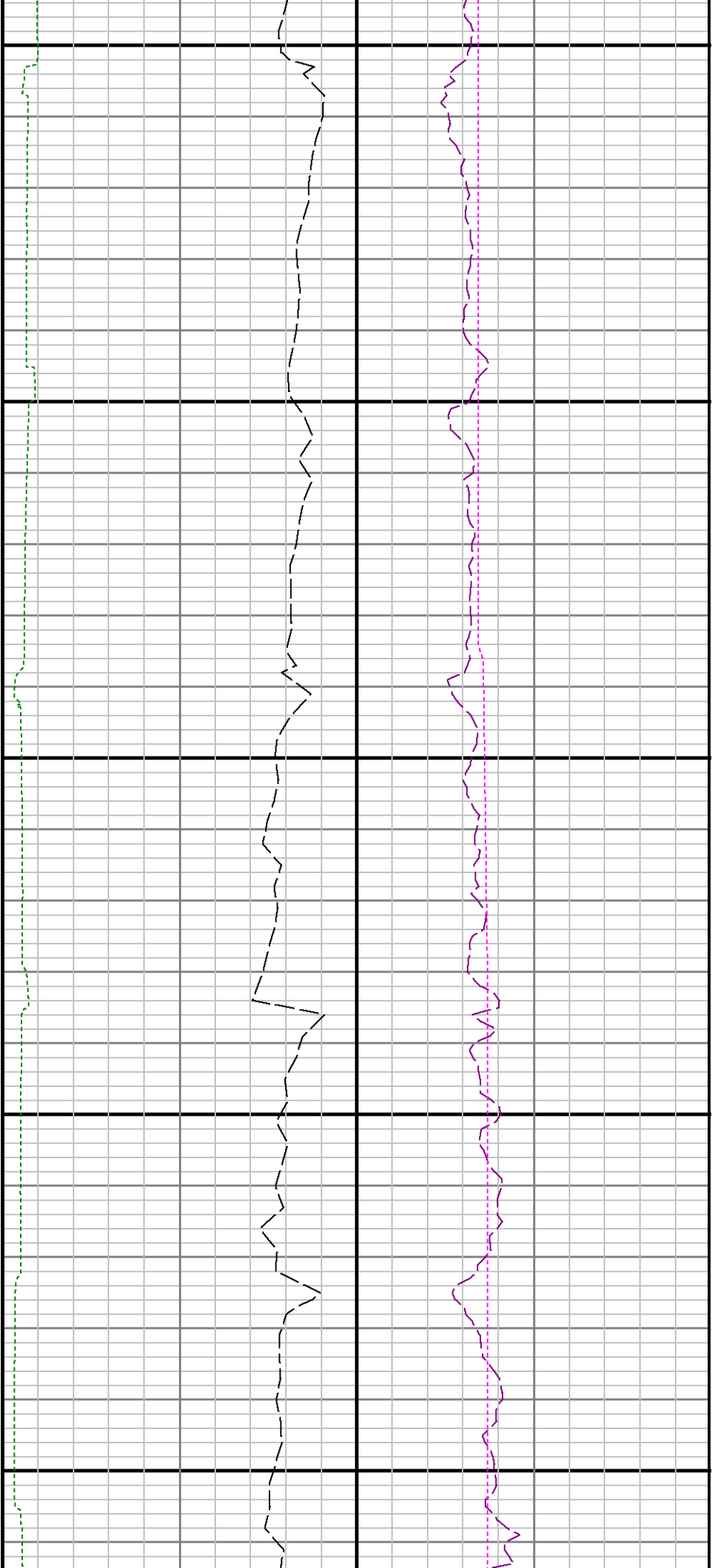




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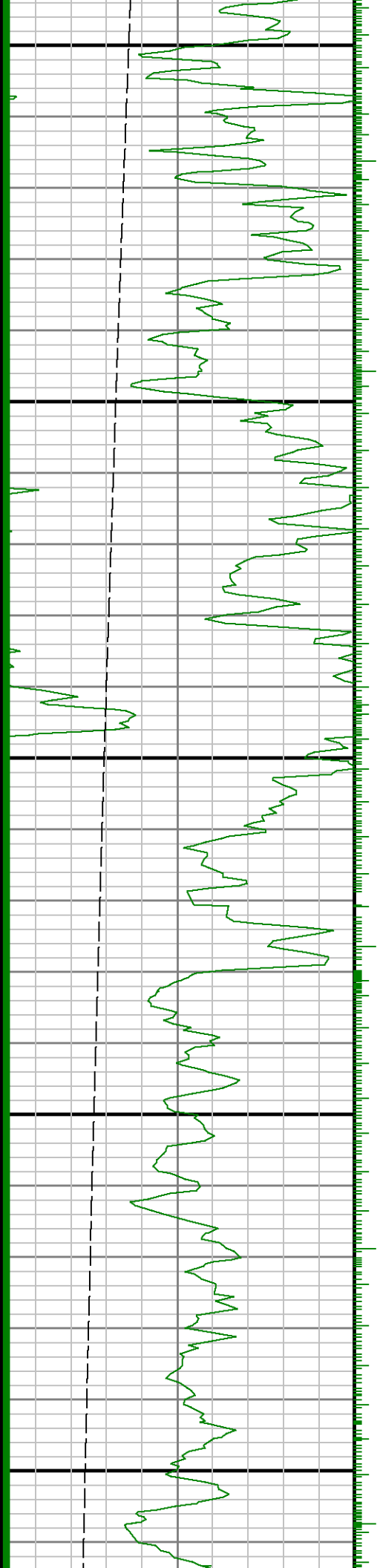
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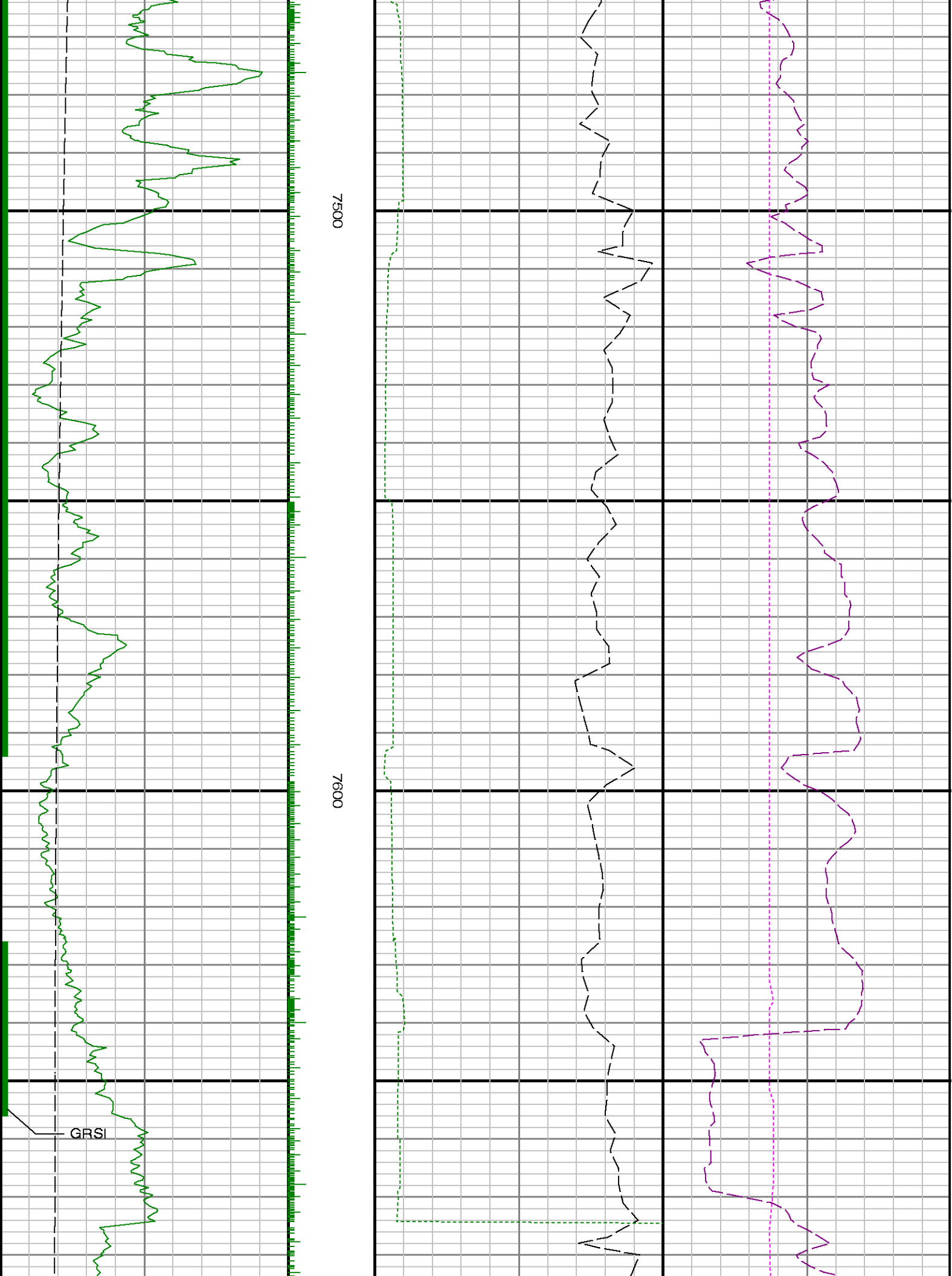


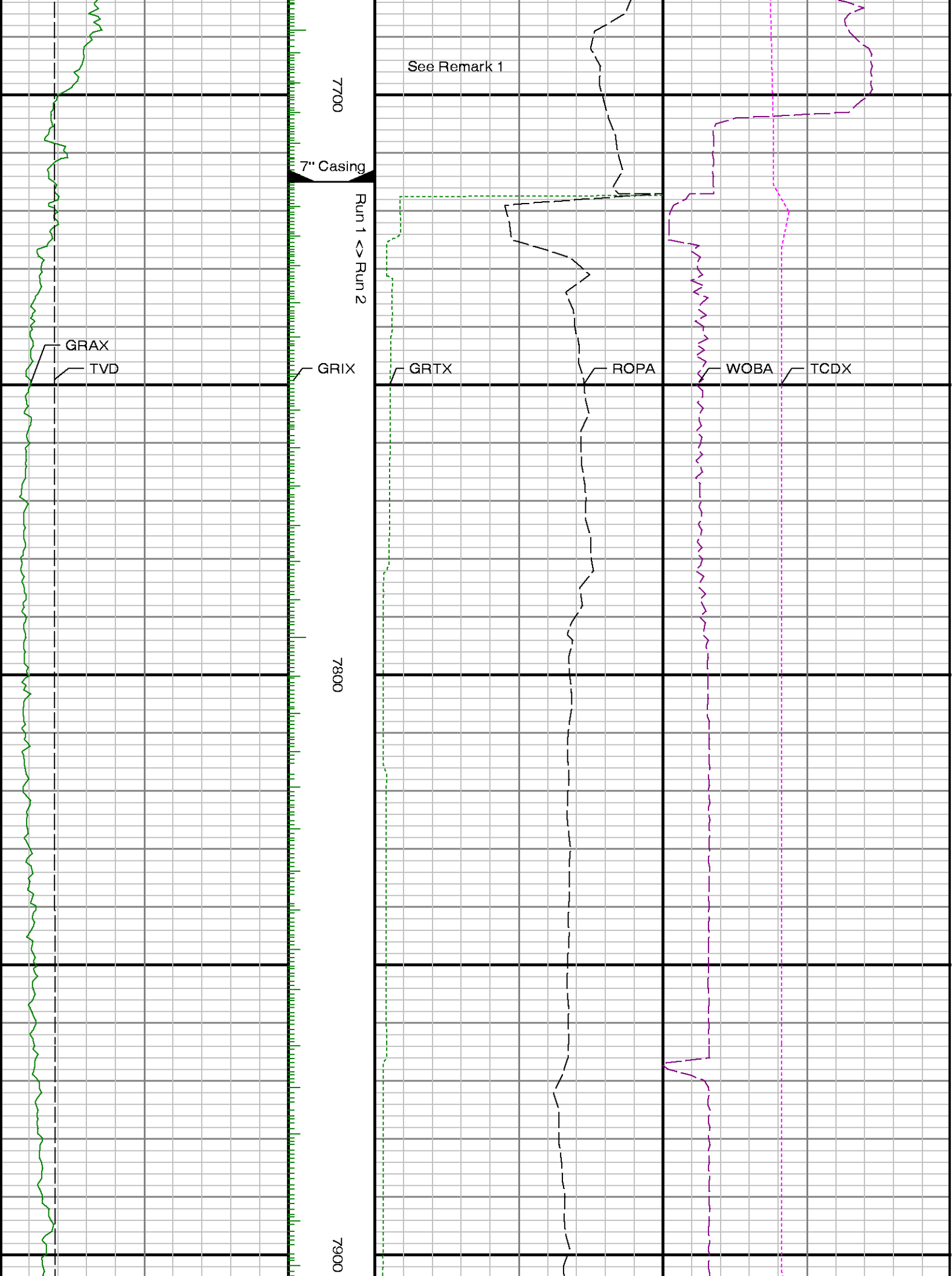


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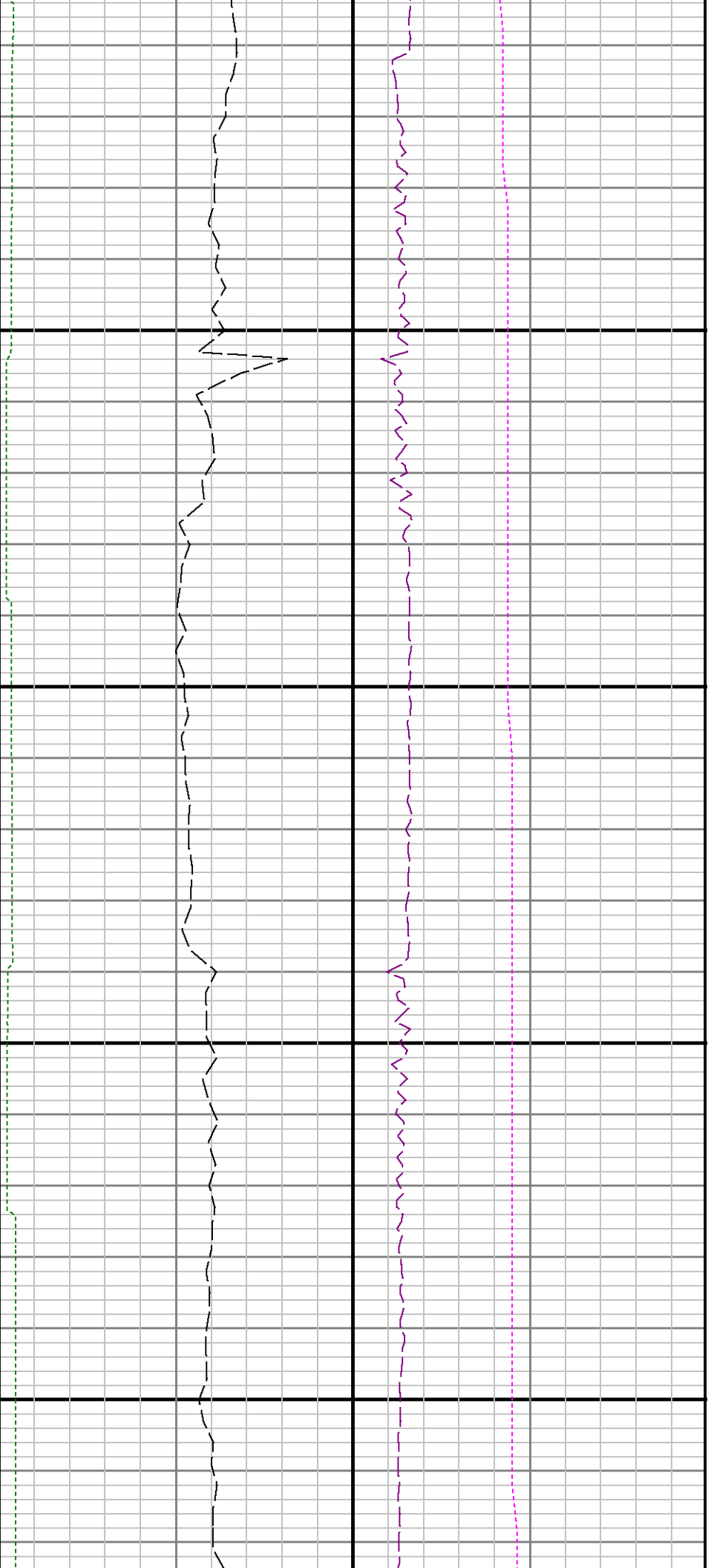
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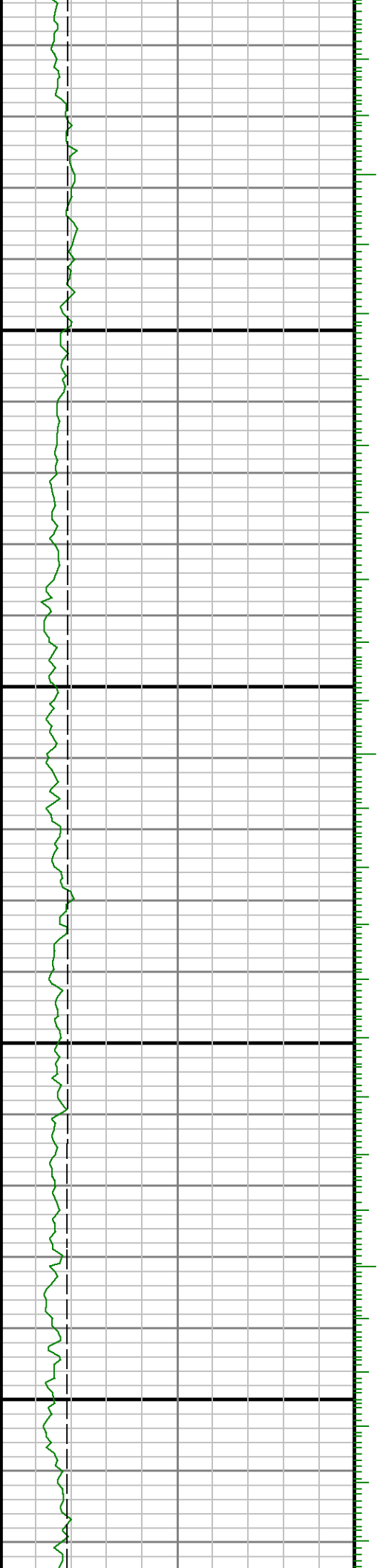


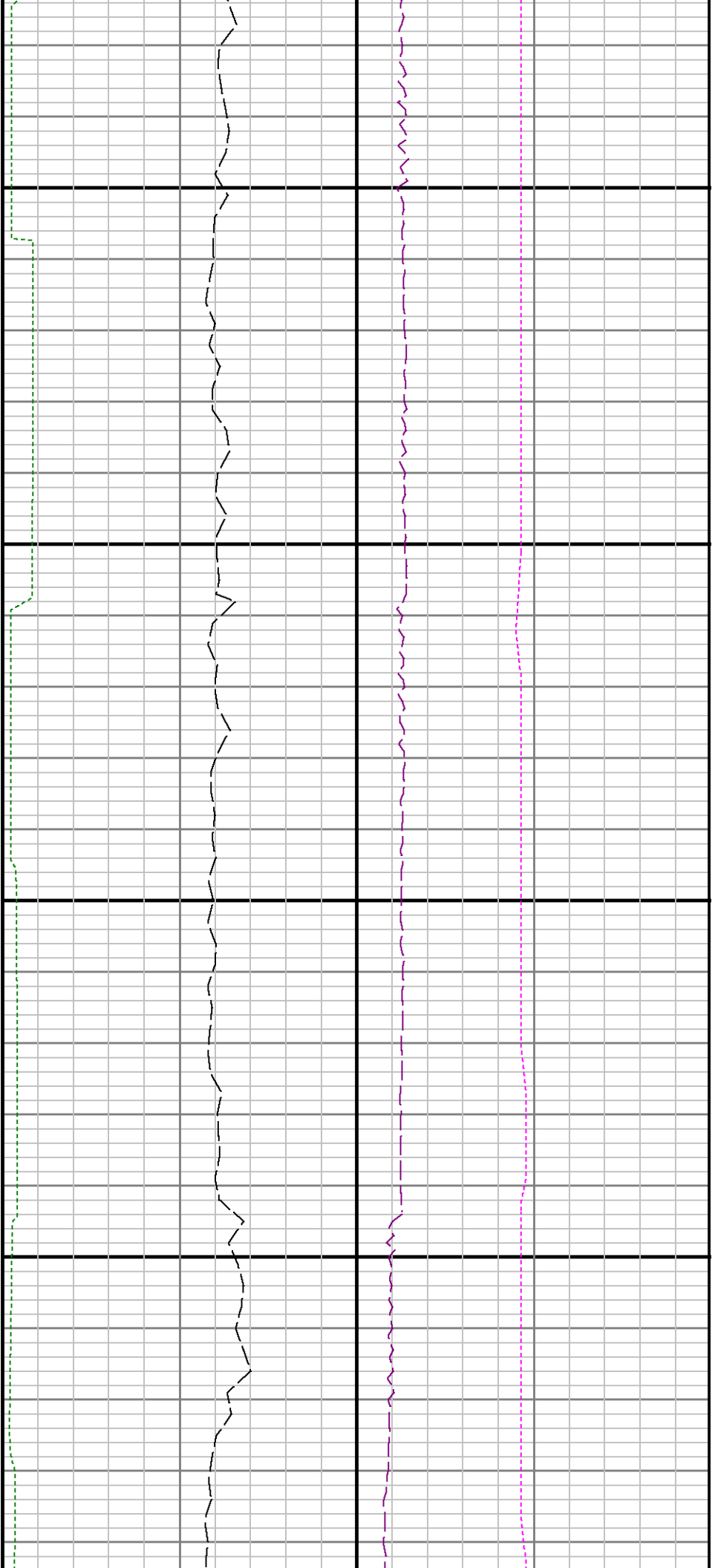




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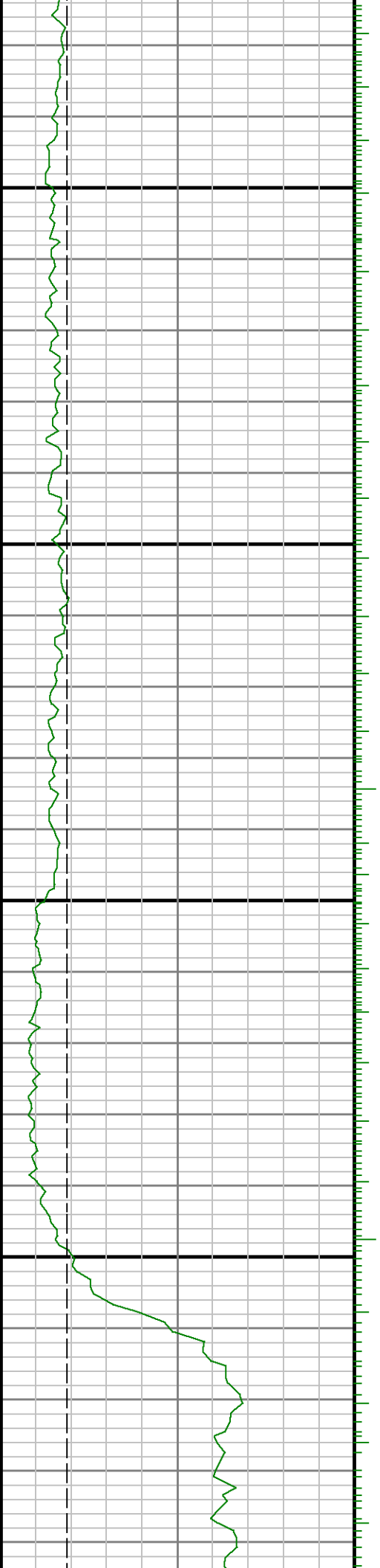
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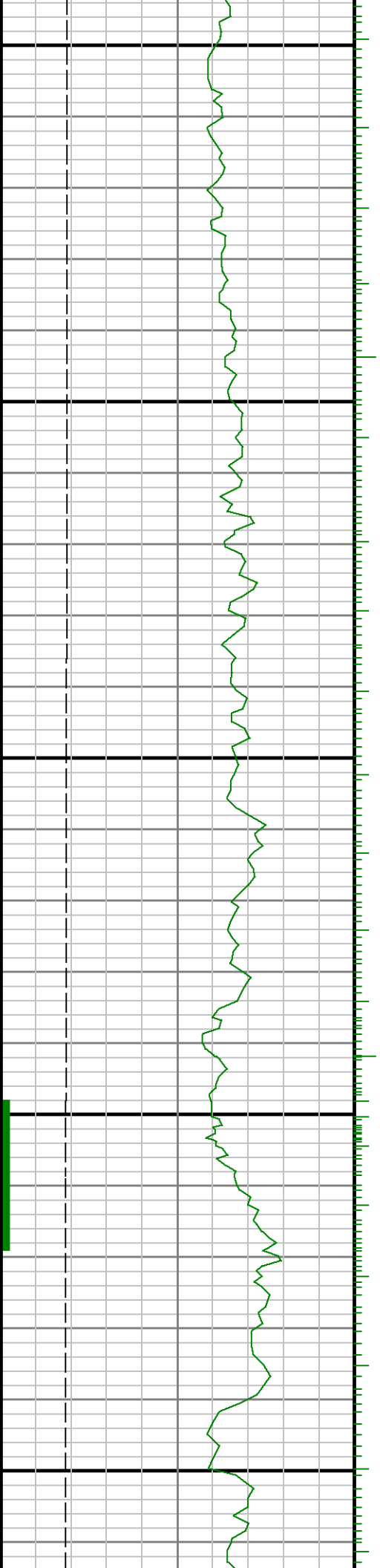
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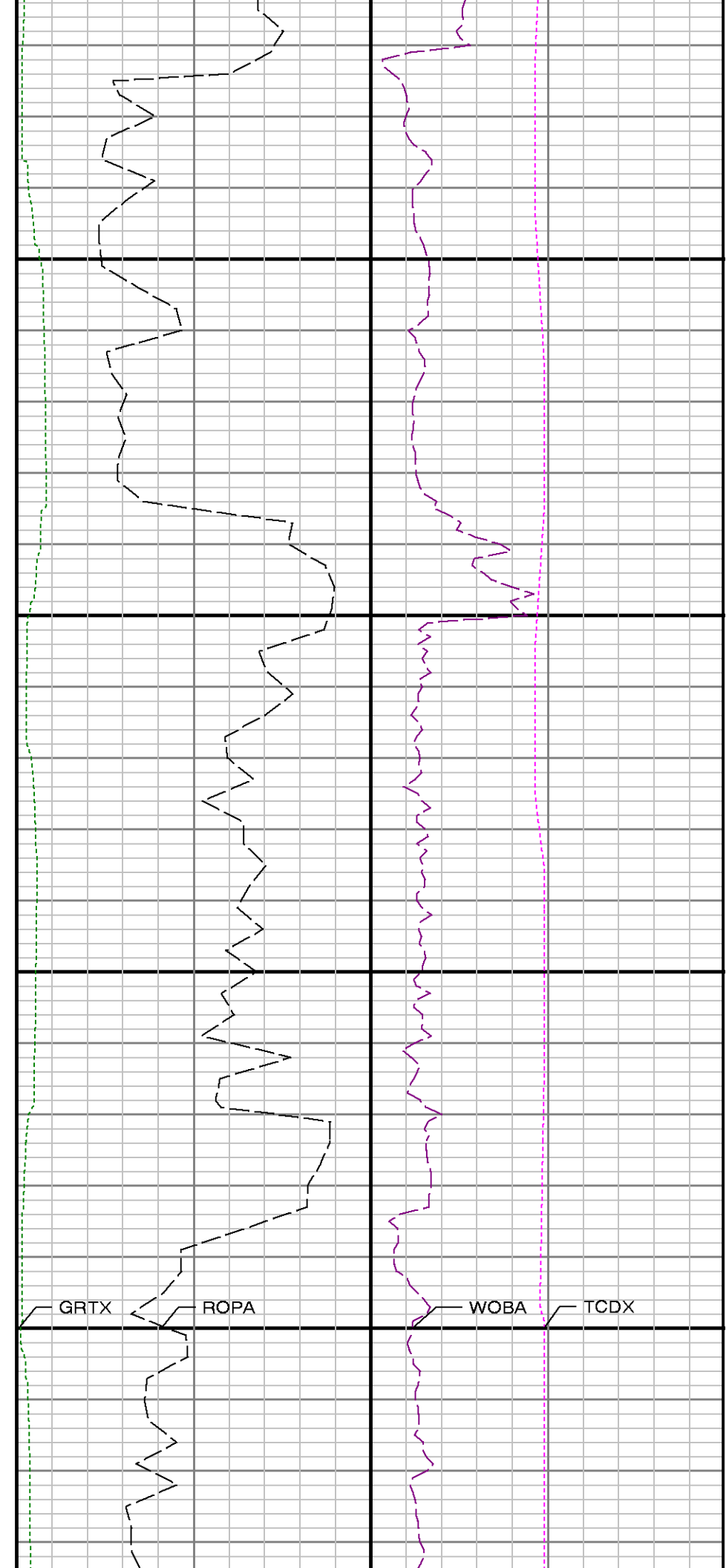
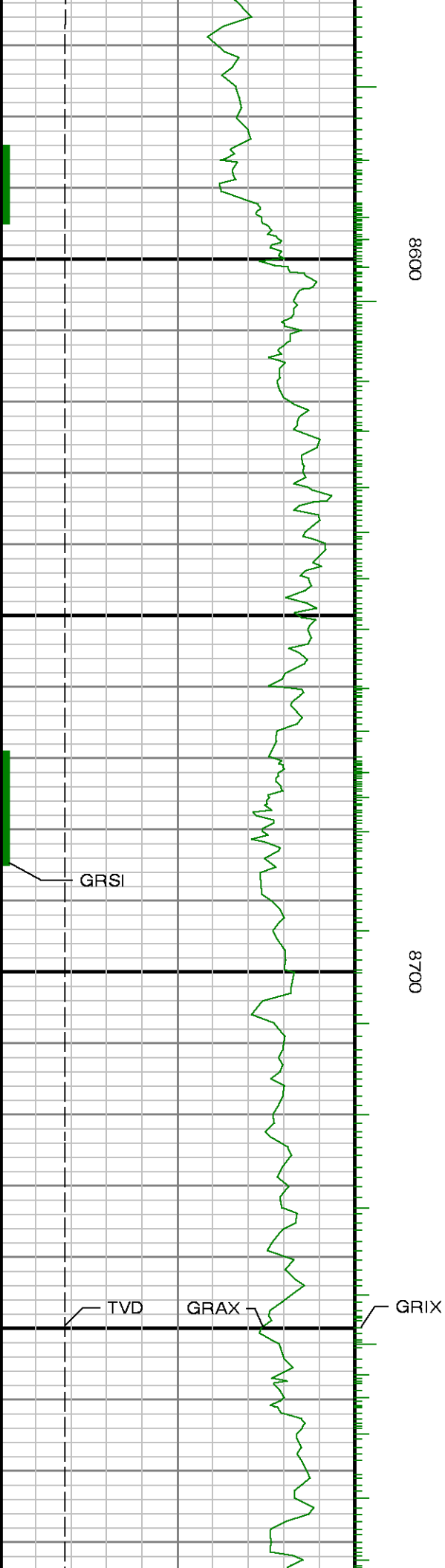


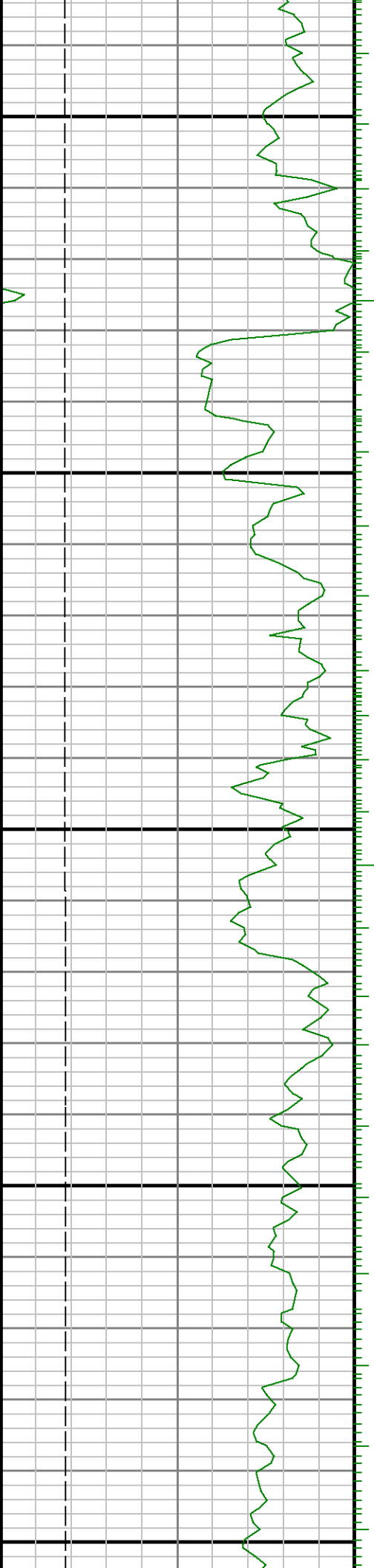


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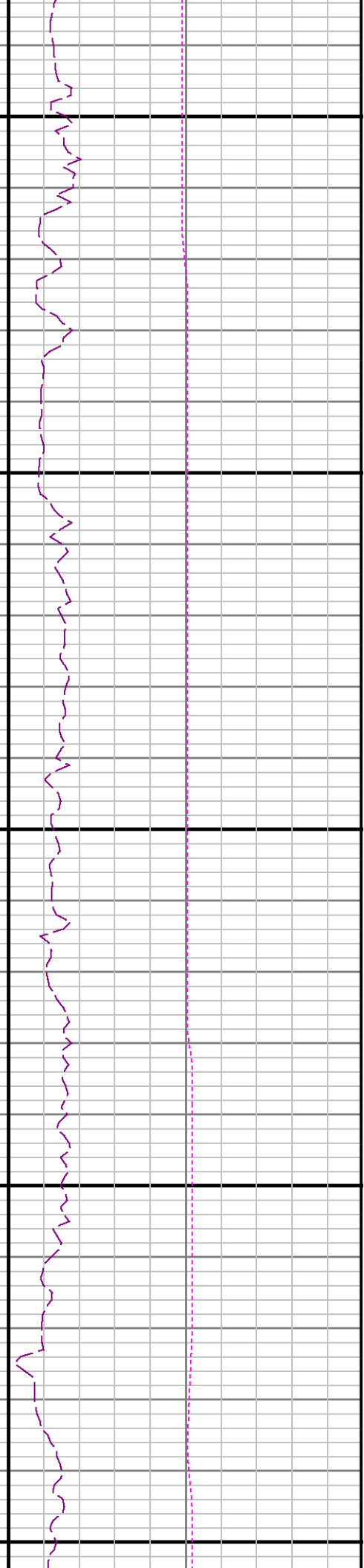
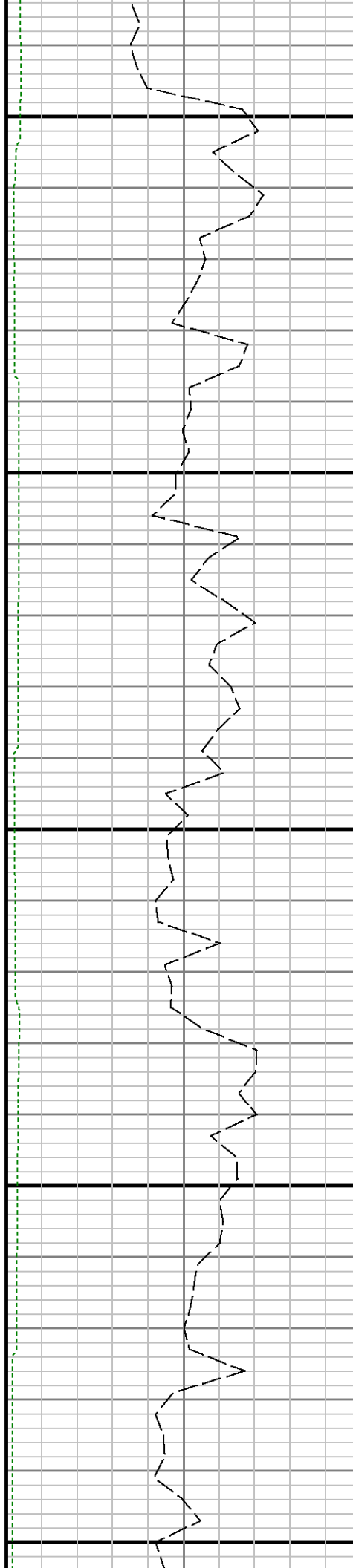




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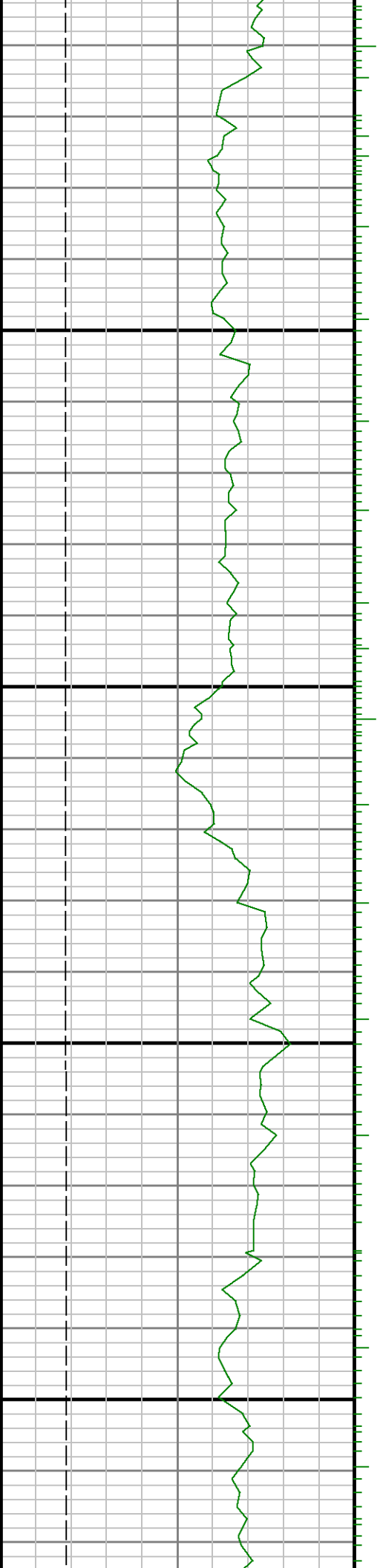
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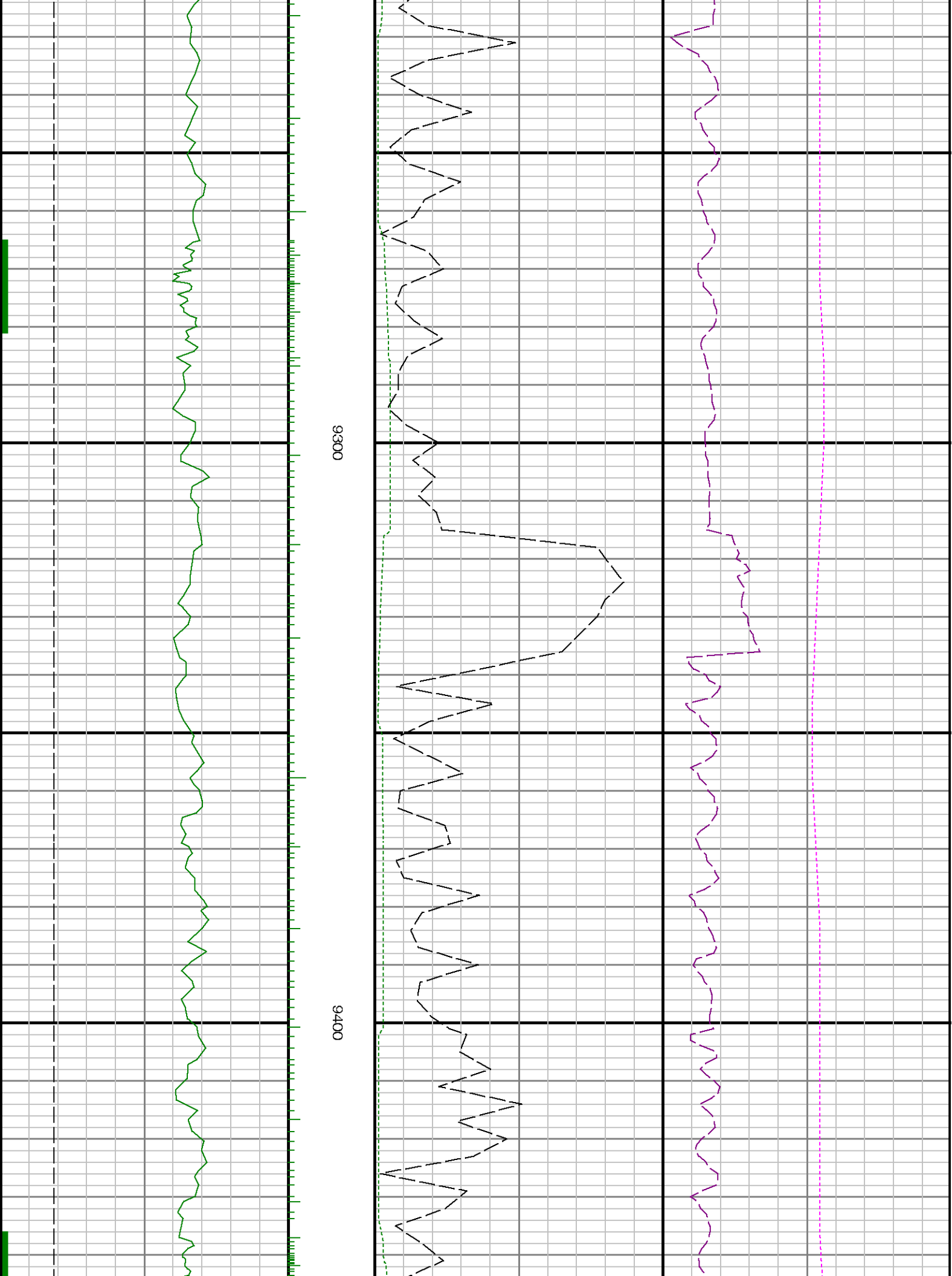


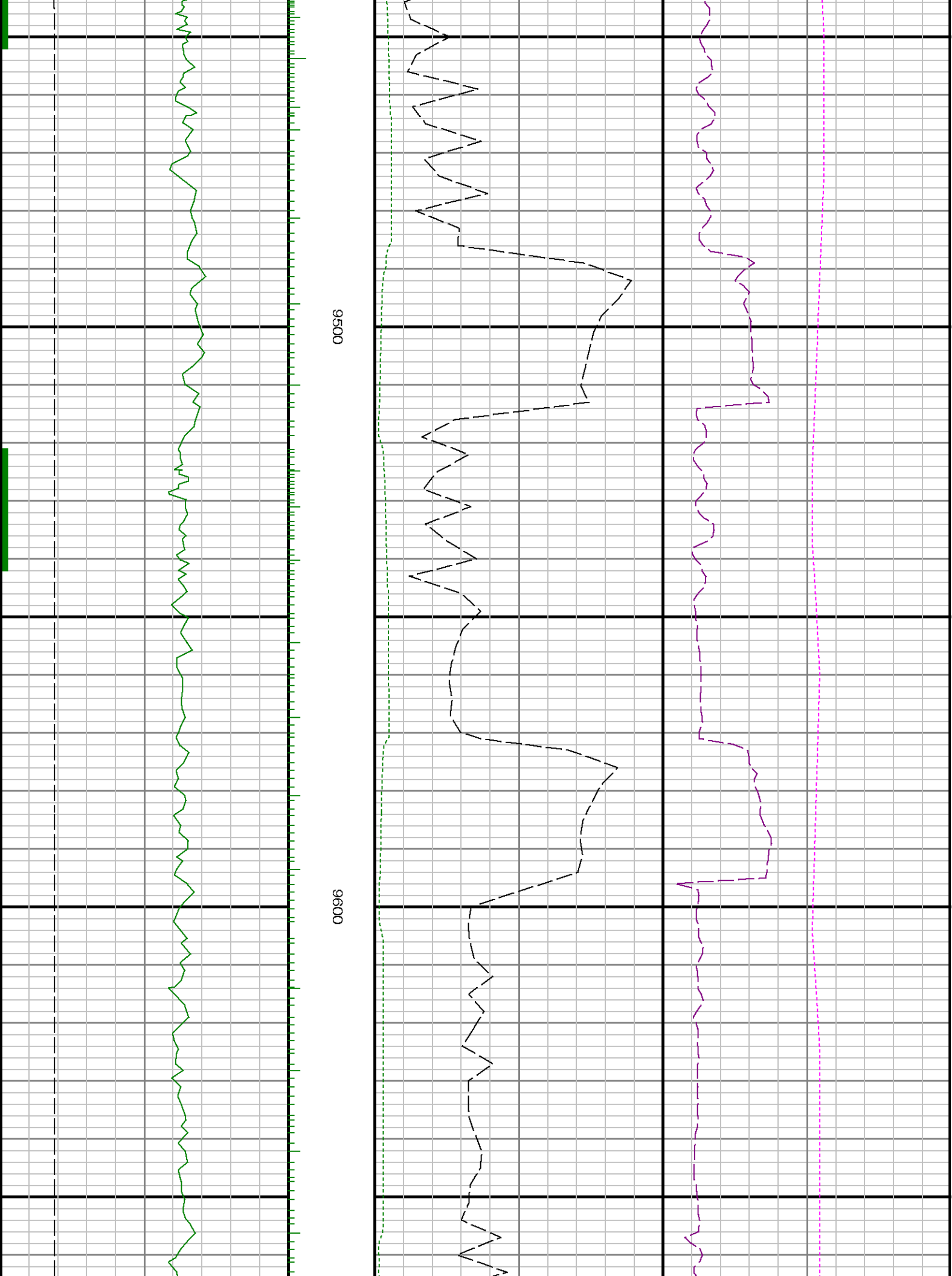


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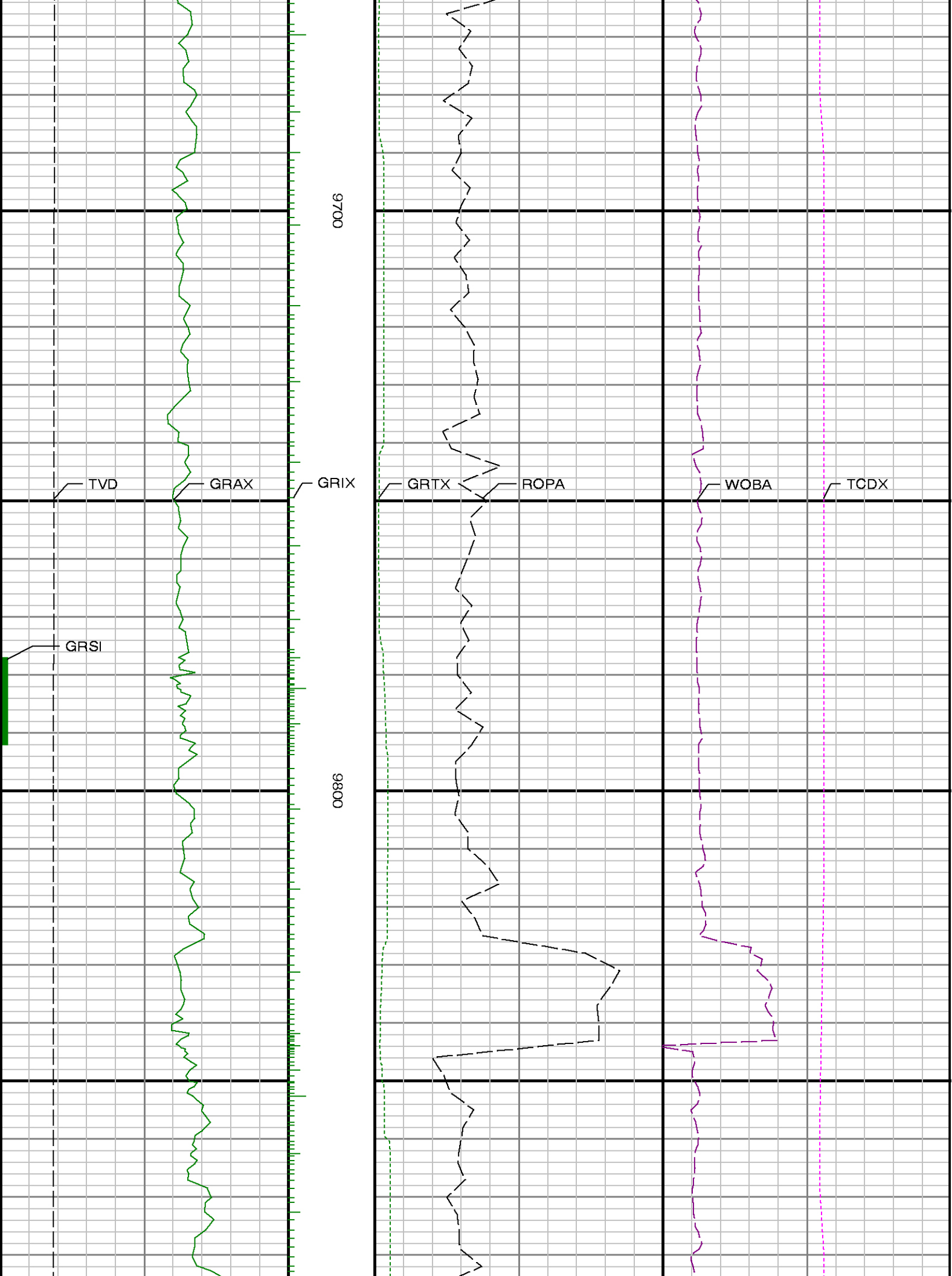
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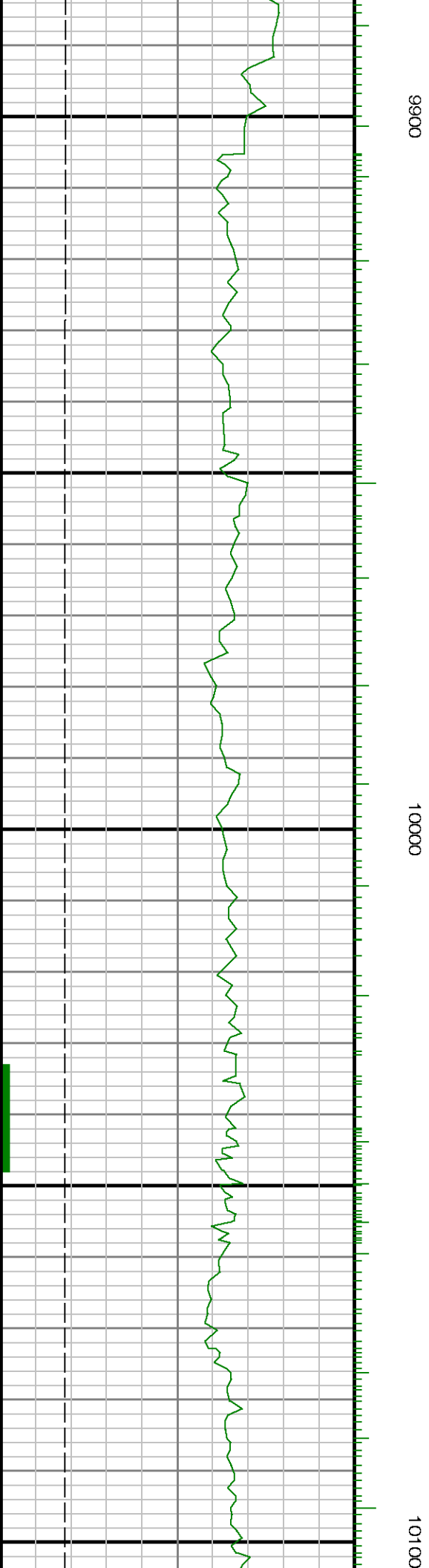


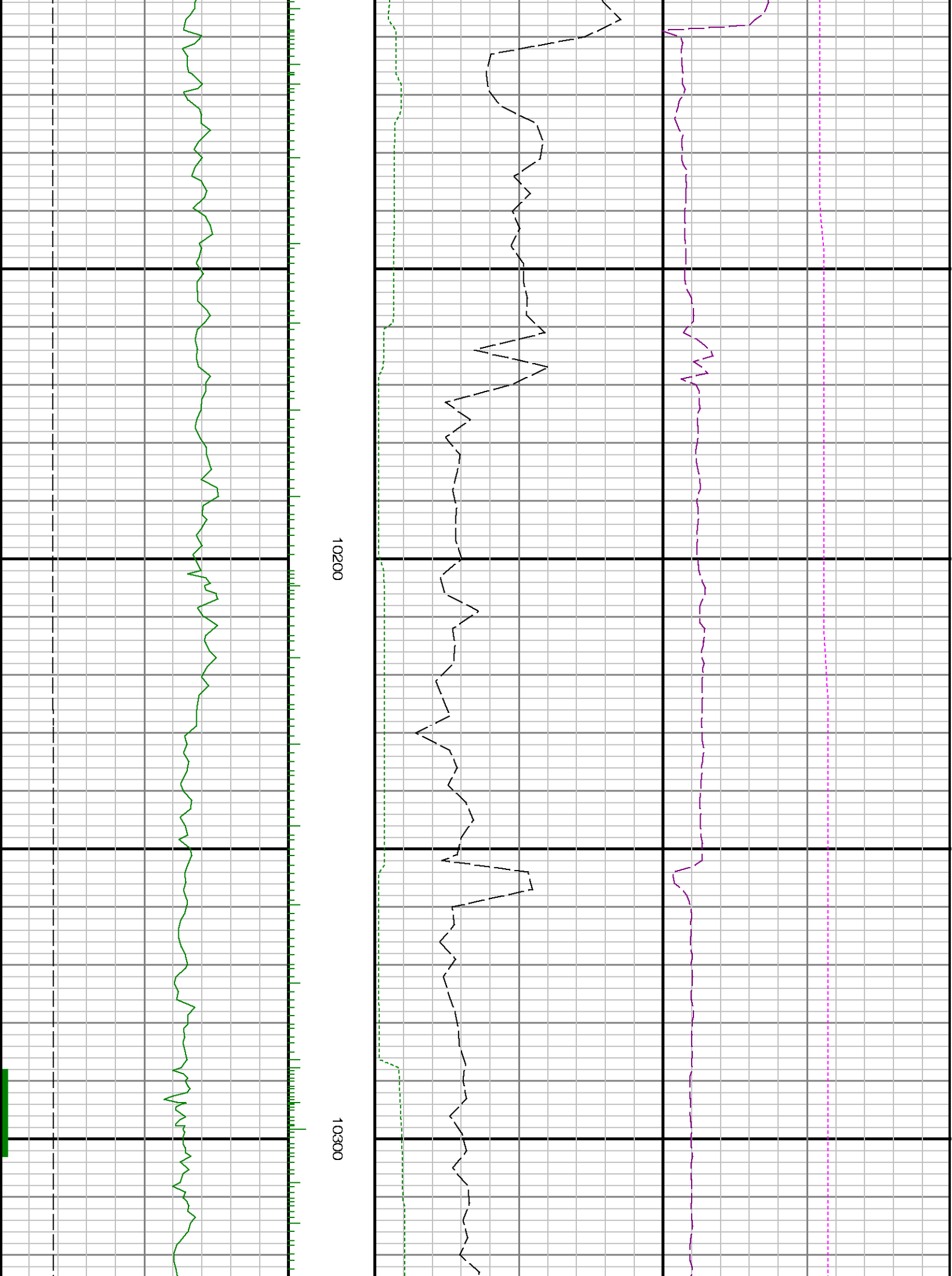








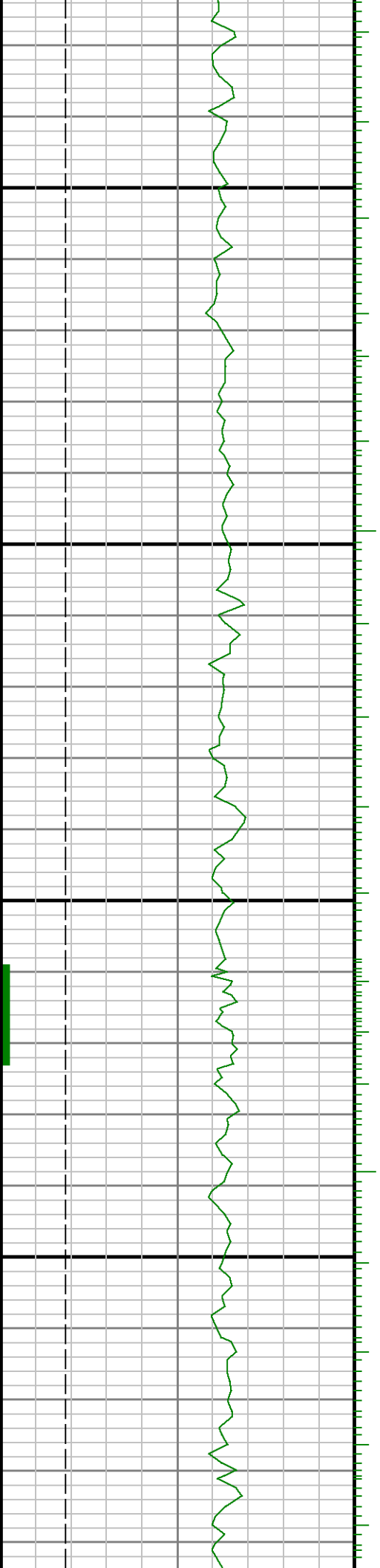


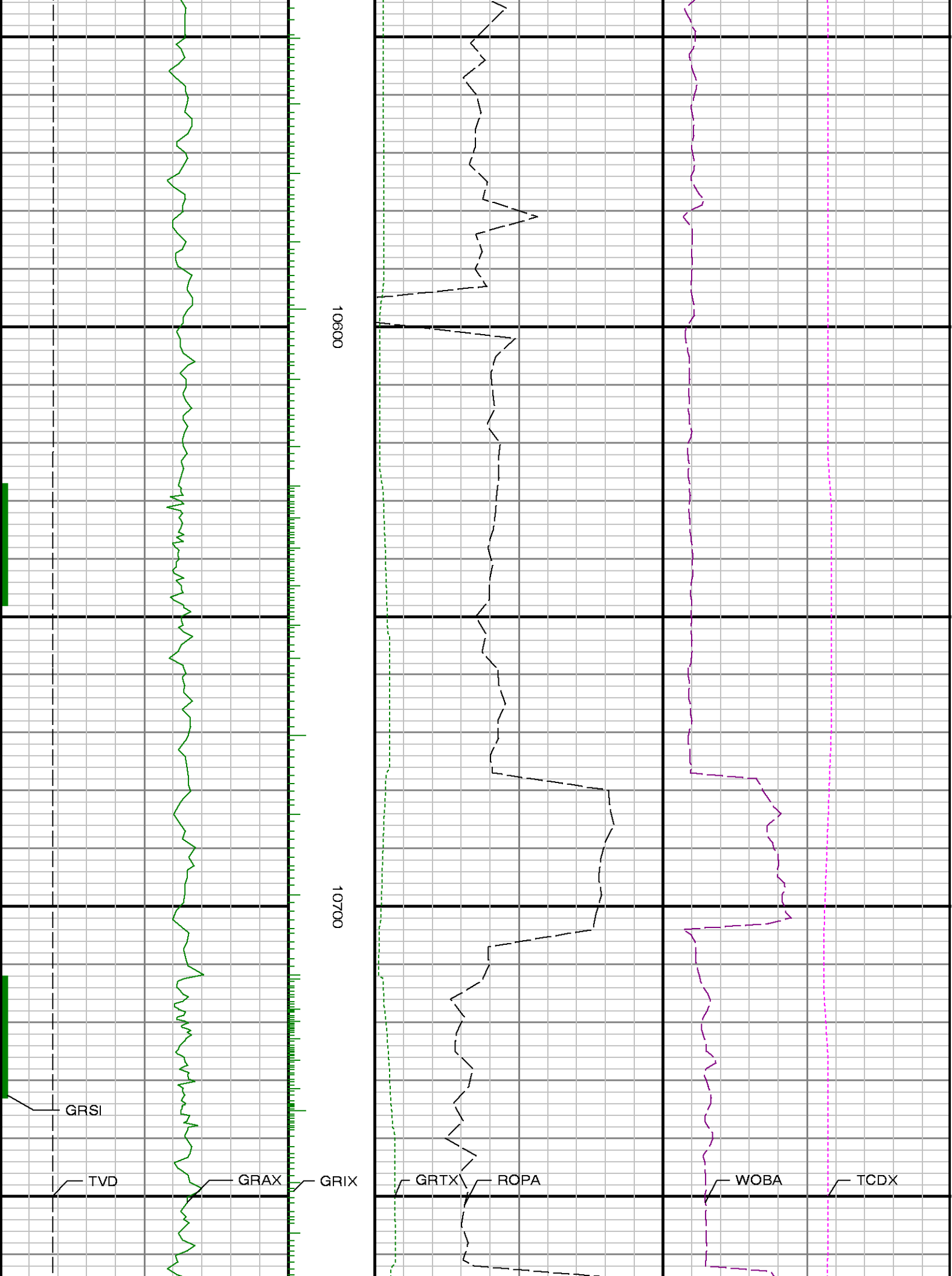


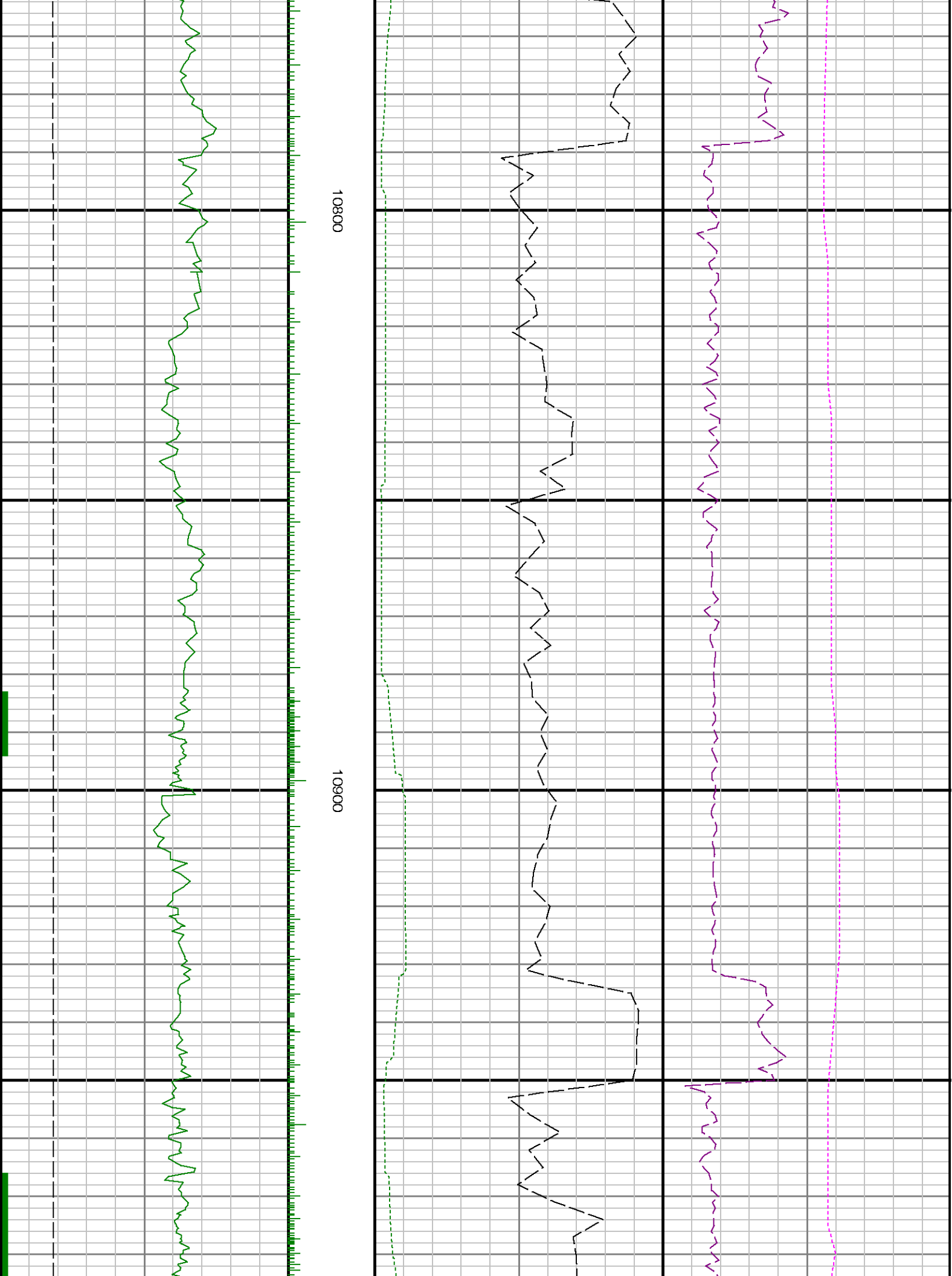


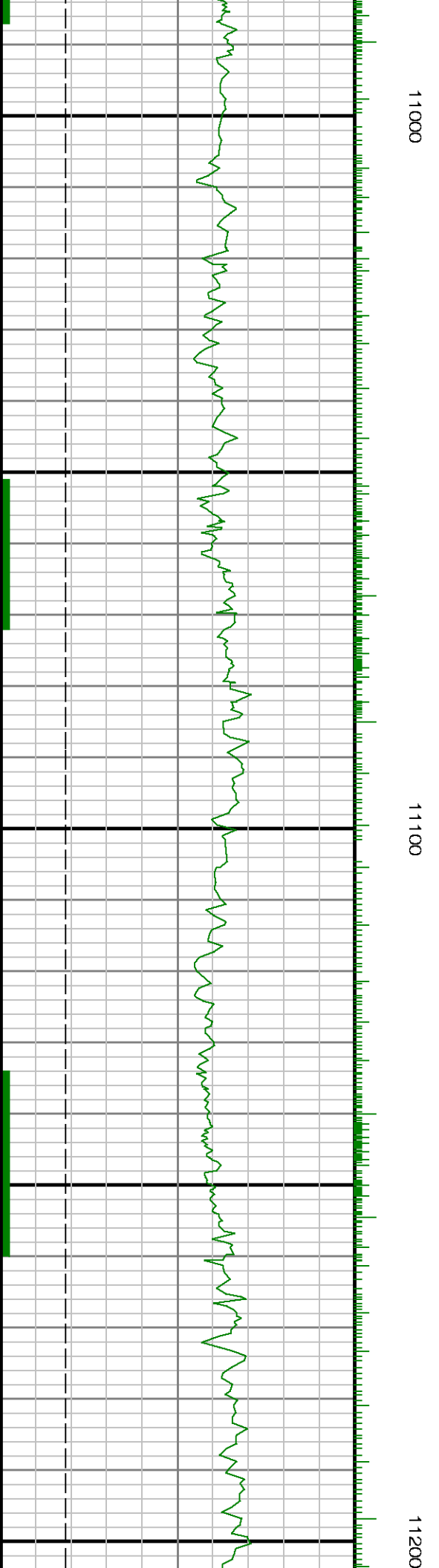
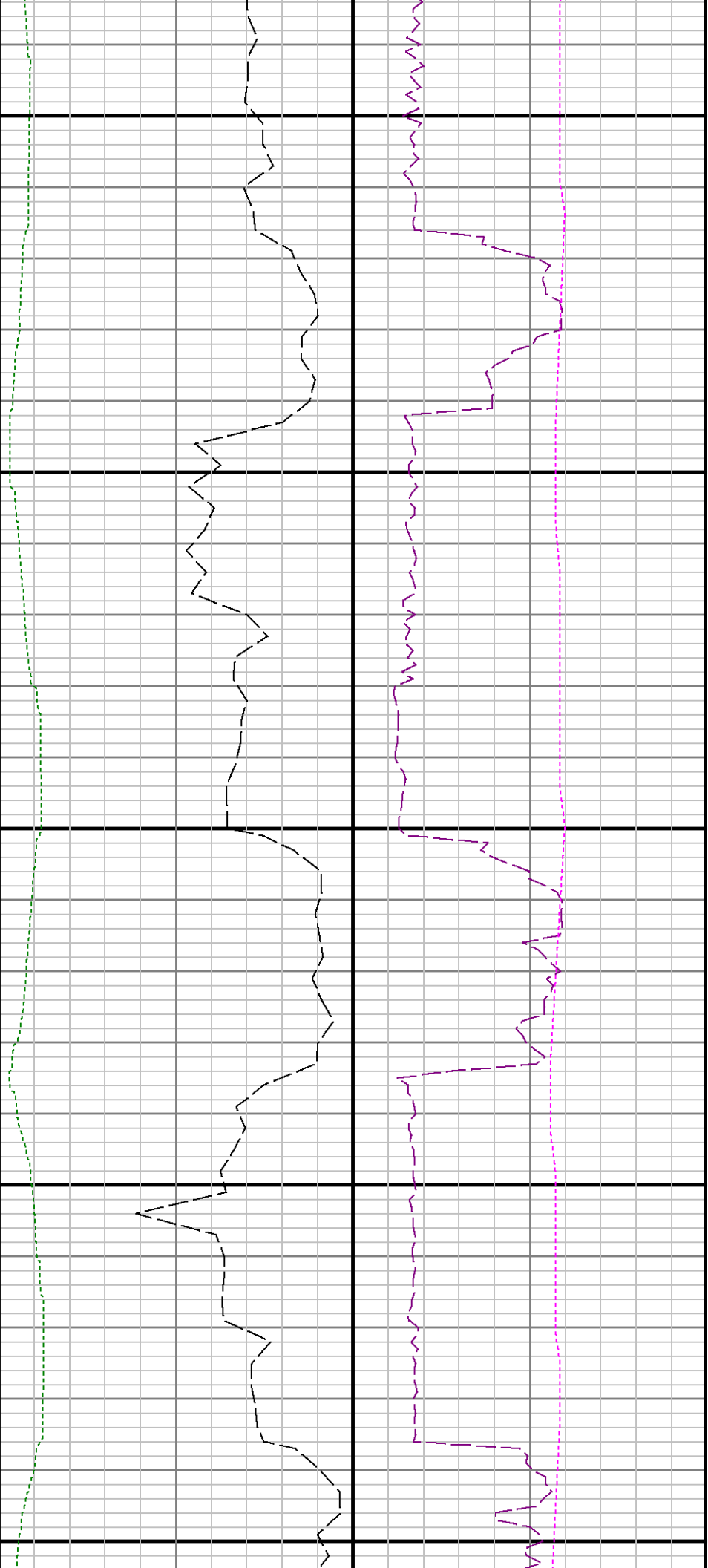
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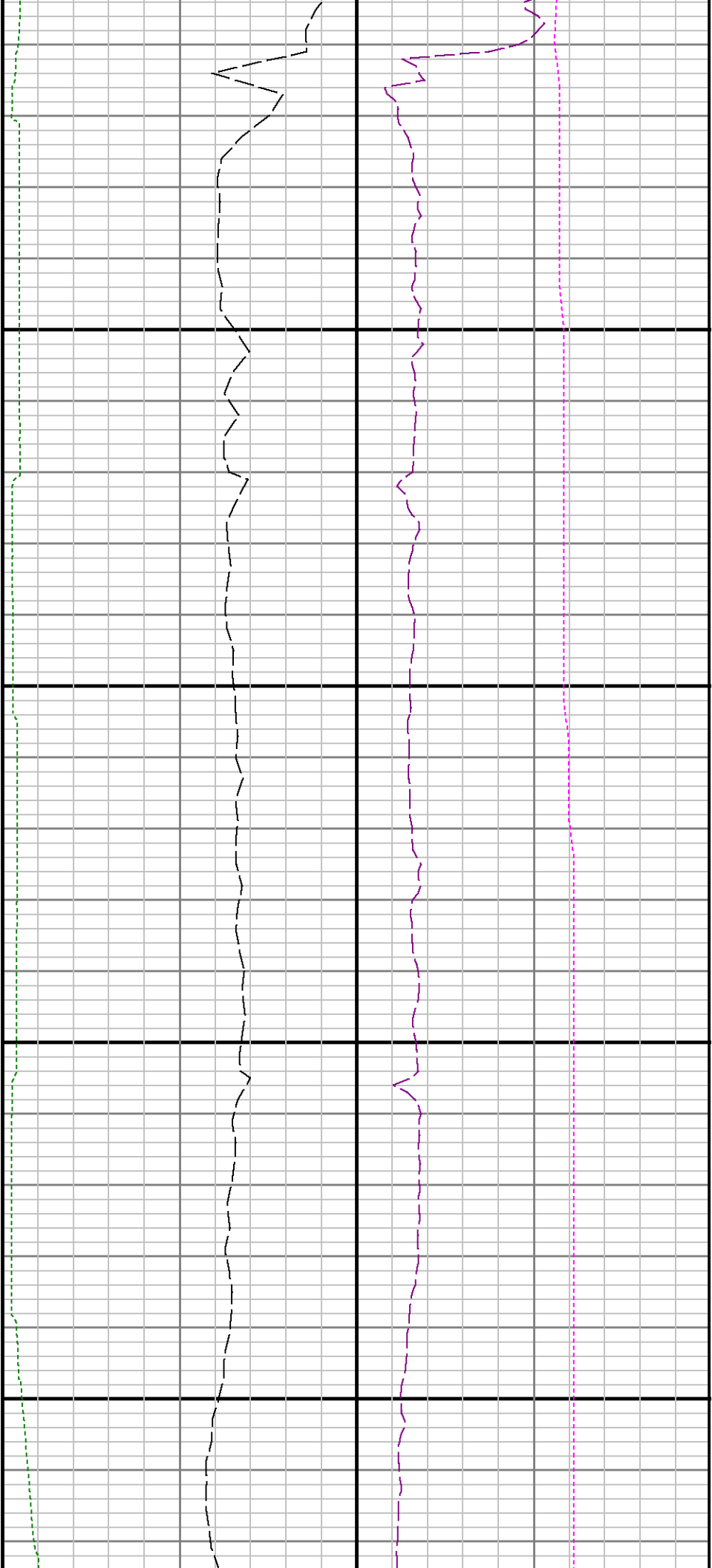
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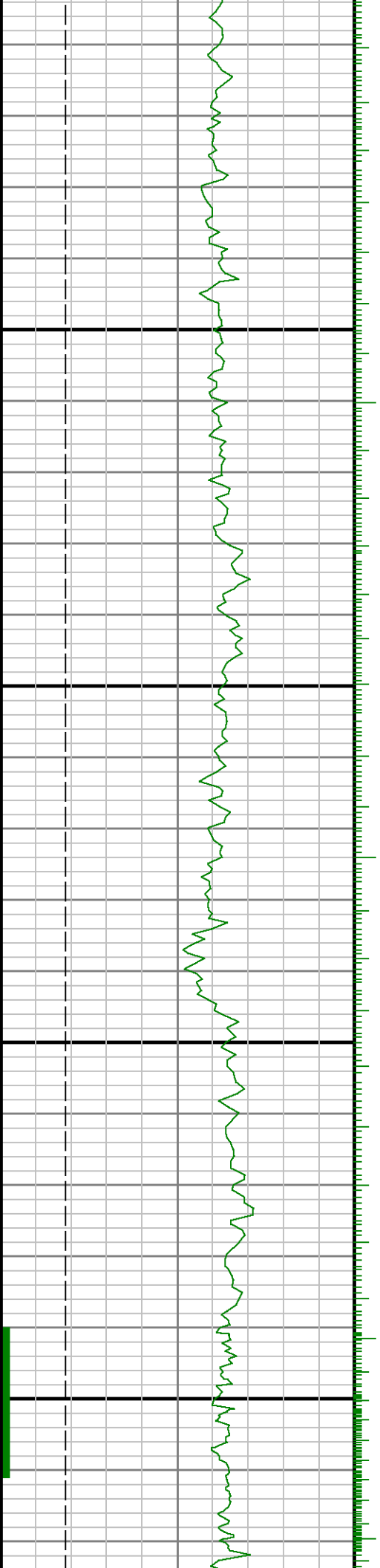




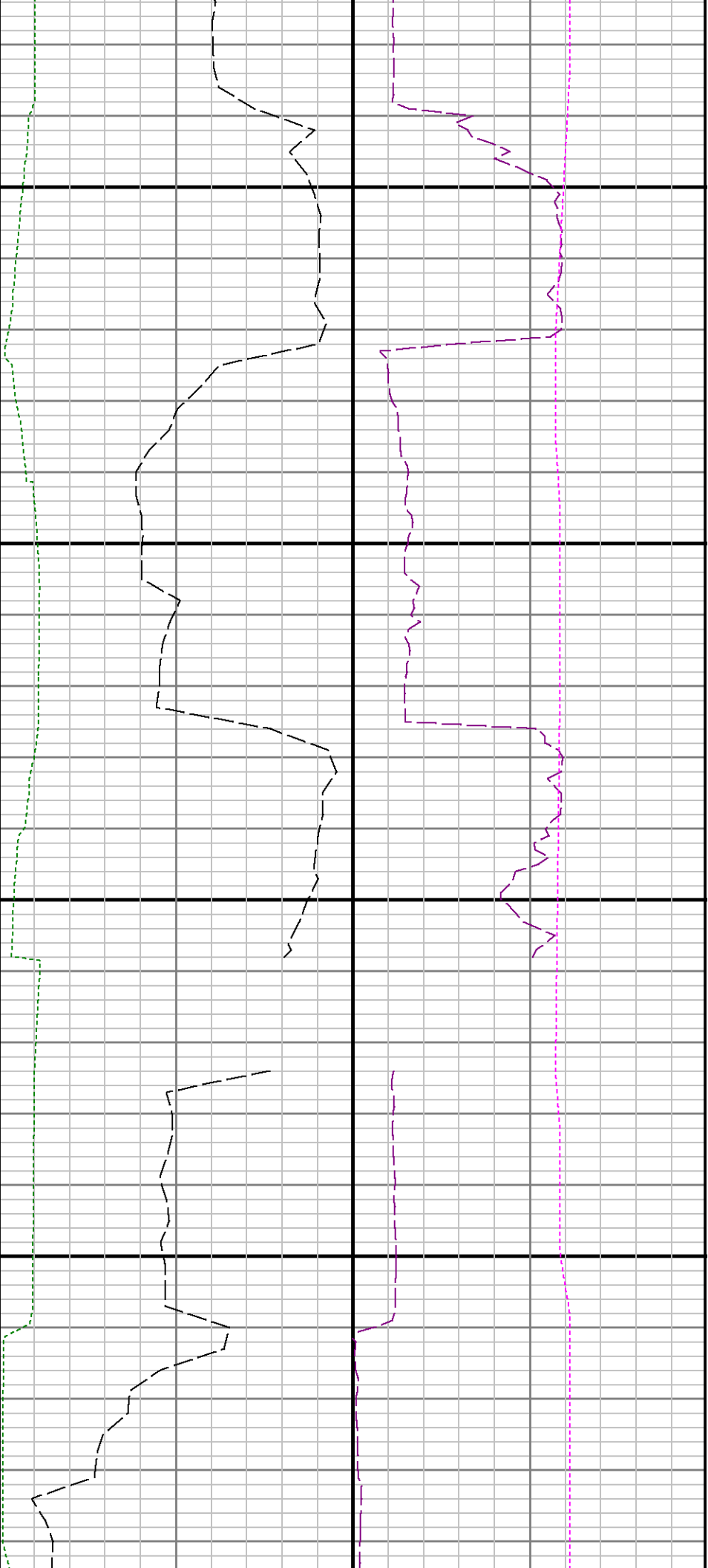


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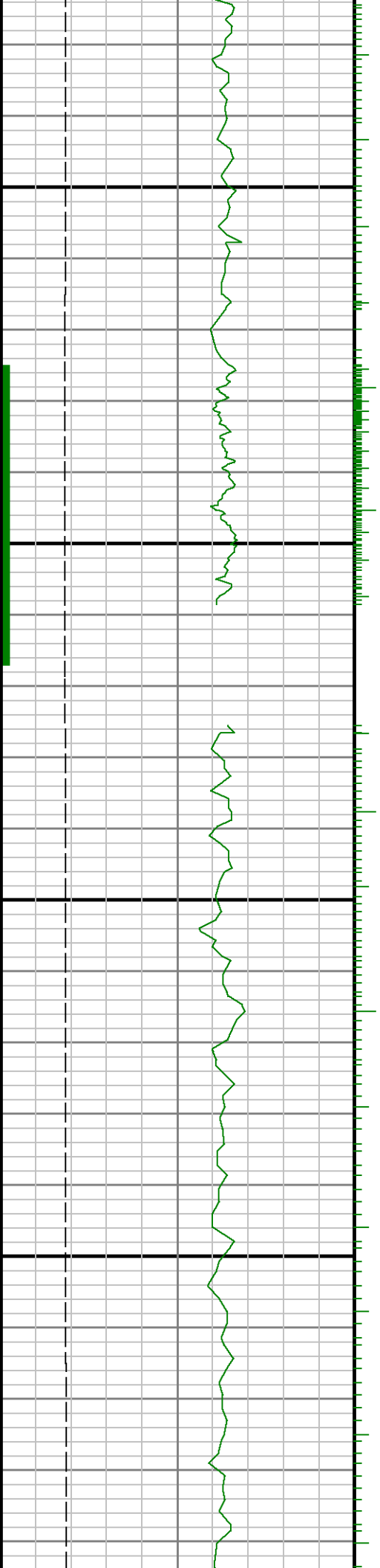


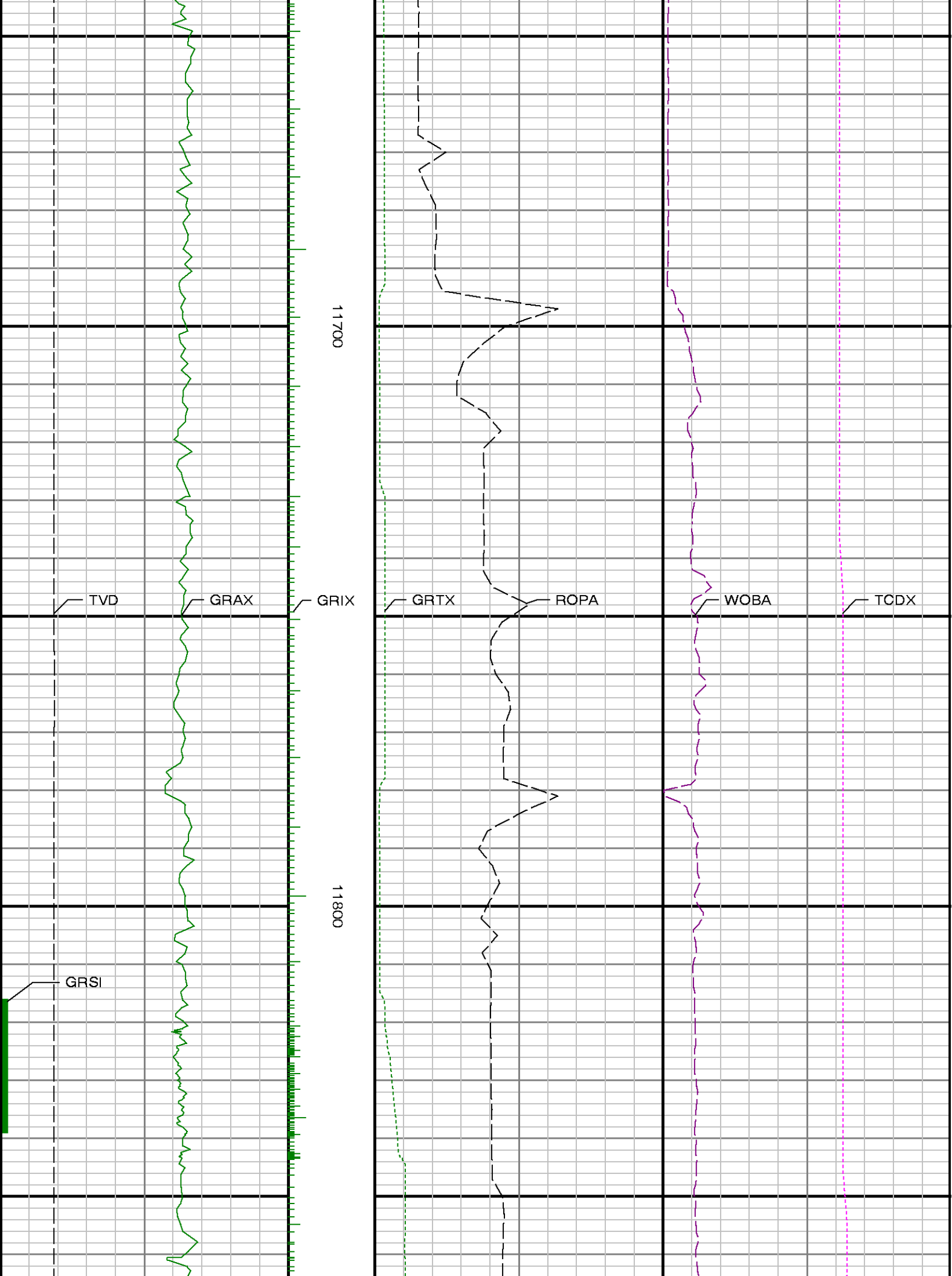




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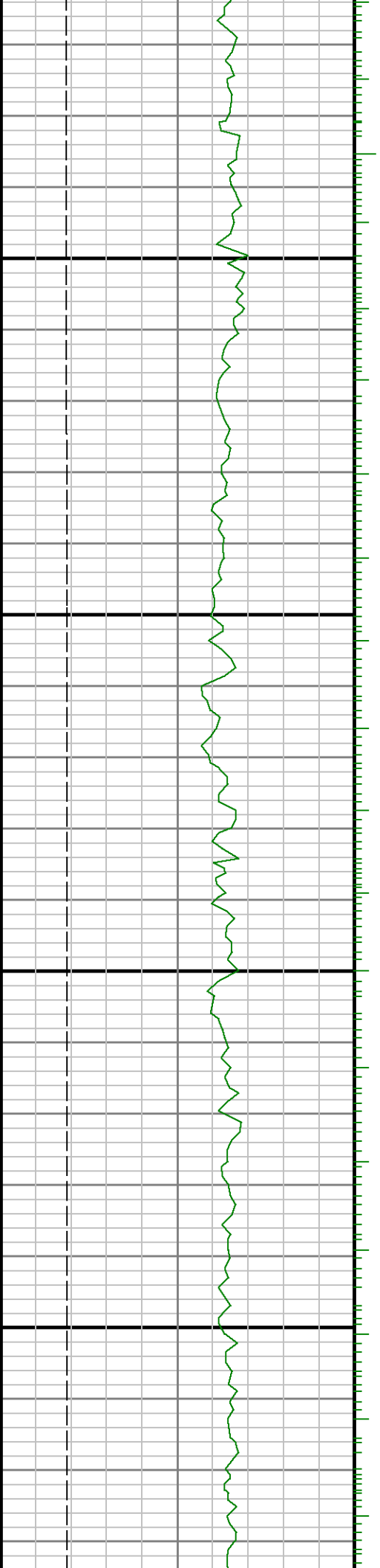


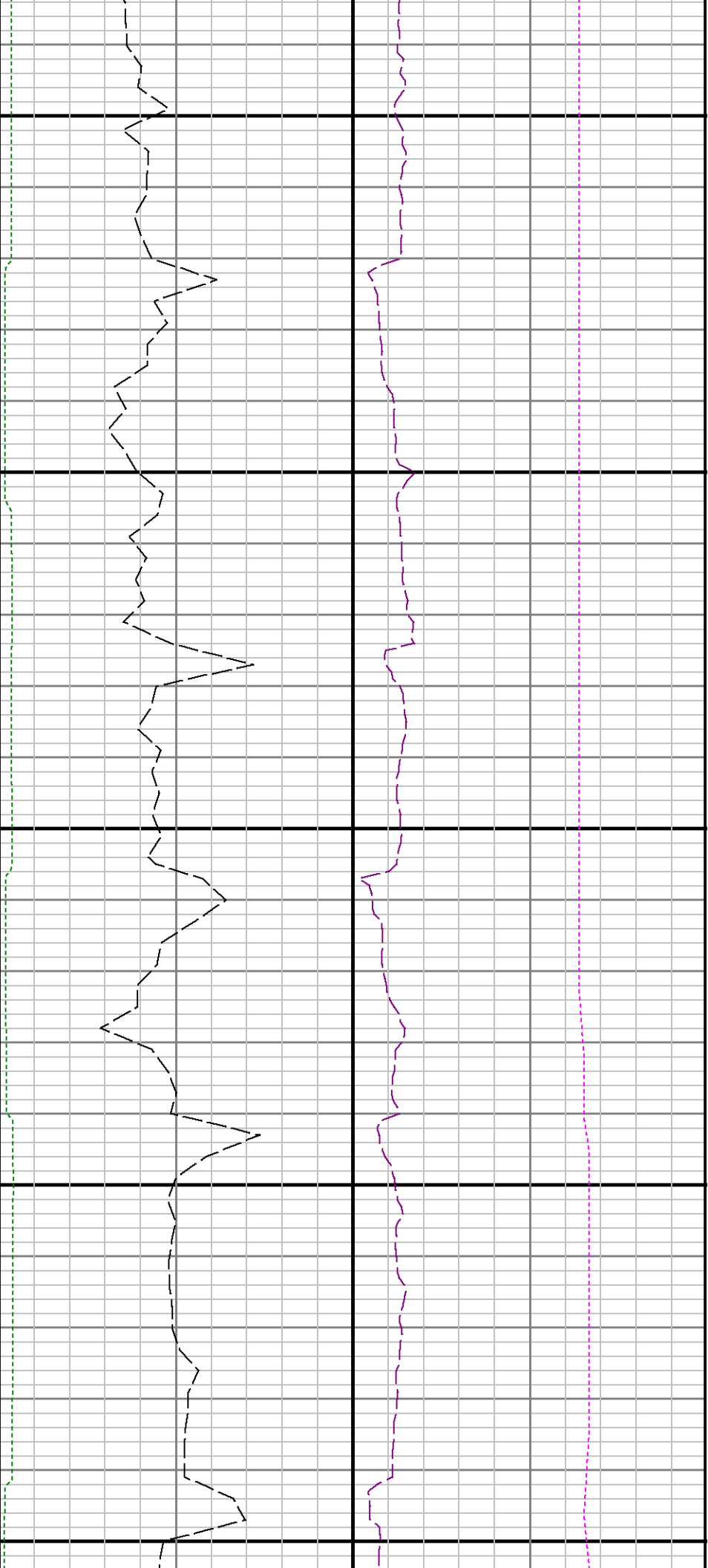




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