



Realtime Log

Natural Formation Evaluation
Gamma Ray

Scale:

1:240
Measured Depth

Company: Kerr-McGee Oil & Gas Onshore LP

Well: Brotemarkle 3C-13HZ

Field: Weld County (Kerr-McGee)

County: Weld State: Colorado

Status: Final Print

Surface Location:

Latitude: 40° 13' 7.788" N

Longitude: 104° 43' 38.431" W

Other Services:

Directional
VSS

API Number: 05-123-36394-00

SEC: 13 TWP: 3N RNG: 66W

Permanent Datum (P.D.): Ground Level Elevation: 5032.00 ft.

Log Measured From: Rig Floor 5048.00 ft. Above P.D.

Depth Reference: Drillers Depth

Elevations: KB: N/A
DF: 5048.00 ft.
GL: 5032.00 ft.

Interval Logged

Dates

Magnetic Field Reference

Top: 6820.0 ft. Date From: 10/Apr/14 Dip Angle: 66.83° Azi Reference North: True

Bottom: 11881.0 ft. Date To: 13/Apr/14 Total Mag to Reference

Spud Date: 08/Apr/14 Field Strength: 52568.0 nT North Correction: 8.59°

Borehole Record

Casing Record

Hole Size	From	To	Size	Weight	From	To
13.500 in.	0.0 ft.	1323.0 ft.	9.625 in.	36.00 lb/ft	0.0 ft.	1310.0 ft.
8.750 in.	1310.0 ft.	7860.0 ft.	7.000 in.	29.00 lb/ft	0.0 ft.	7853.0 ft.
6.125 in.	7860.0 ft.	11927.0 ft.				

Mud Record

Deviation Record

Type	From	To	Hole Size	Interval	Inc / Az (Start)	Inc / Az (End)
Fresh Water	1323.0 ft.	4700.0 ft.	13.500 in.	1323.0 ft.	0.0° / 0.0°	1.0° / 41.5°
Water Based	4700.0 ft.	11927.0 ft.	8.750 in.	6537.0 ft.	0.8° / 33.5°	89.3° / 359.6°
			6.125 in.	4067.0 ft.	90.3° / 358.8°	91.3° / 0.5°
					/	/
					/	/
					/	/

Acquisition System Software Version

Other

Advantage	2.20U4	Rig:	Xtreme 6	/ Kerr-McGee Oil & Gas Onshore LP		
PATS	6.4.1.34	Job No:	6262182	/ D&E		
		District / Unit:	RMD			

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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	6.000	Steerable	6820.0	7860.0	1323.0	7860.0	08/Apr/2014 22:00	11/Apr/2014 12:30	29.02		
2	2	3	6.125	PDC	6.000	Steerable	7816.0	11881.0	7860.0	11927.0	11/Apr/2014 22:00	14/Apr/2014 00:00	32.5		

Crew

Name	Arrive	Depart	Name	Arrive	Depart	Name	Arrive	Depart
	Wellsite	Wellsite		Wellsite	Wellsite		Wellsite	Wellsite
Matthew Delmore	08/Apr/2014	10/Apr/2014	Stephen Gray	11/Apr/2014	14/Apr/2014	David Campbell	08/Apr/2014	14/Apr/2014

Date / Time		LWD	Measured	Mud	Density	Viscosity	pH	Fluid	Oil /	Source	Total	K+
		Run No.	Depth	Type	(ppg)	(cp)		Loss	Water		Chlorides	
			(ft.)					(cc)			(ppm)	(%)
09/Apr/2014	08:00	1	2481.0	Water Based	8.5	28	9.3	N/A	0 / 99	Active Mud Pit	1400	0.0
09/Apr/2014	23:00	2	5900.0	Water Based	9.7	39	9.4	4.9	0 / 92	Active Mud Pit	2700	0.0
10/Apr/2014	23:00	2	7860.0	Water Based	10.1	41	9.2	4.5	0 / 91	Active Mud Pit	2600	0.0
13/Apr/2014	08:53	2	7860.0	Water Based	9.5	42	9.0	4.7	0 / 94	Active Mud Pit	2500	0.0
13/Apr/2014	08:53	2	9000.0	Water Based	9.2	42	9.4	4.8	0 / 95	Active Mud Pit	2500	0.0

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	Tool	Serial	Measurement	Bit	Max	Min
Run		Number		Offset	O.D.	I.D.
No.				(ft)	(in.)	(in.)
1	DIR	13108409	Directional	46.81	6.750	0.000
1	SRIG	11734840	Gamma	43.44	6.750	0.000
2	DIR	12373467	Directional	49.78	4.750	0.000
2	SRIG	12899613	Gamma	46.40	4.750	0.000

Service and Tool Mnemonics

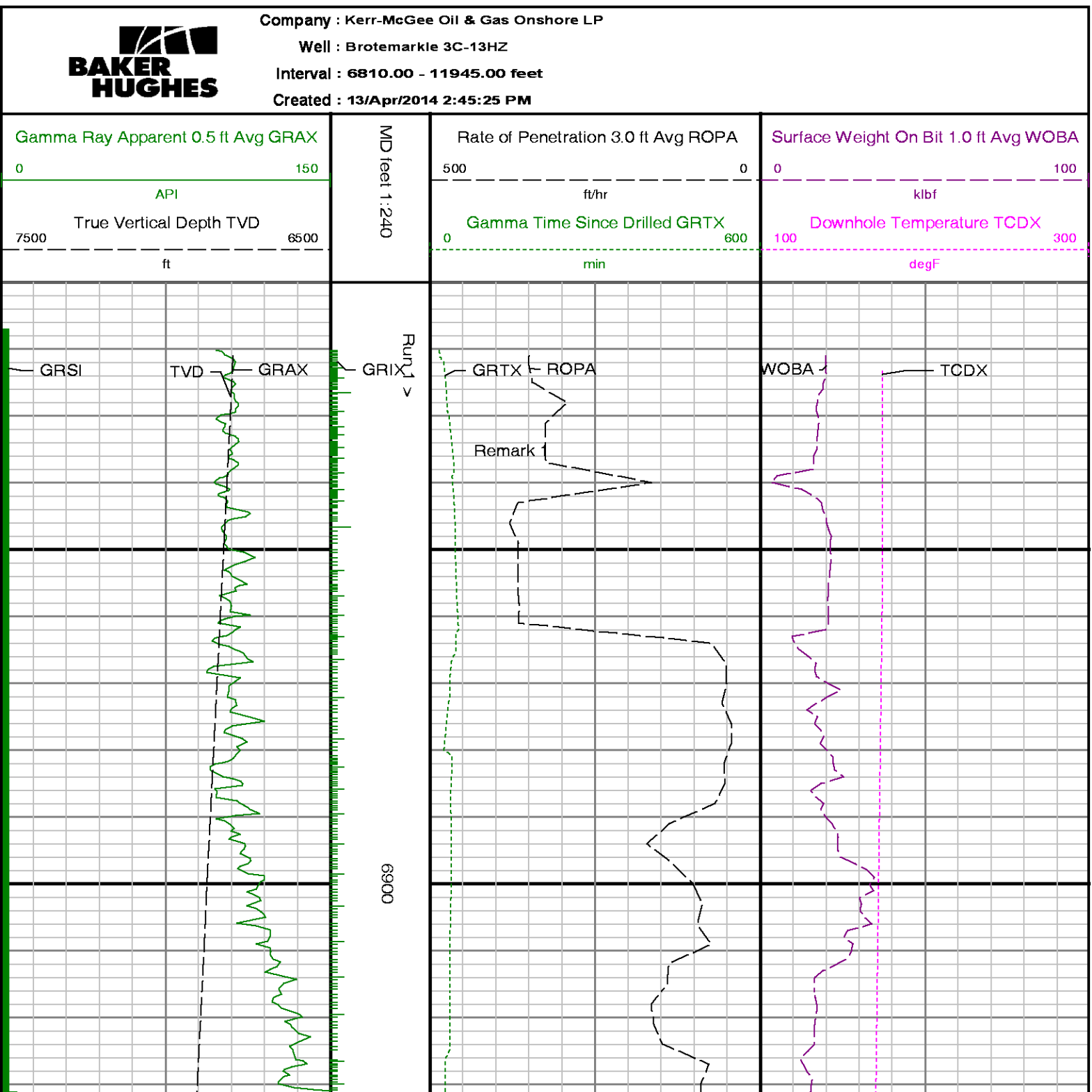
Mnemonic	Name	Description
DIR	Directional	Wellbore directional survey
SRIG	Inclination and Gamma	Probe based gamma ray and inclination module

Comments

<p>1.) Baker Hughes LWD run 1 utilized 6 3/4 inch NaviTrak Services (VSS, Directional) from 1323 to 6820 ft. MD (1322.91 to 6794.58 ft. TVD) and NaviGamma Services (VSS, Directional, Gamma Ray) from 6820 to 7860 ft. MD (6794.58 to 7451.02 ft.TVD) behind an 8 3/4 inch bit and steerable assembly.</p> <p>2.) Baker Hughes LWD run 2 utilized 4 3/4 inch NaviGamma Services (Directional and Gamma Ray) to drill the horizontal section from 7860 to 11927 ft. MD (7451.02 to 7457.71 ft. TVD) behind a steerable assembly and a 6 1/8 inch bit.</p> <p>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.</p> <p>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.</p>
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Remarks

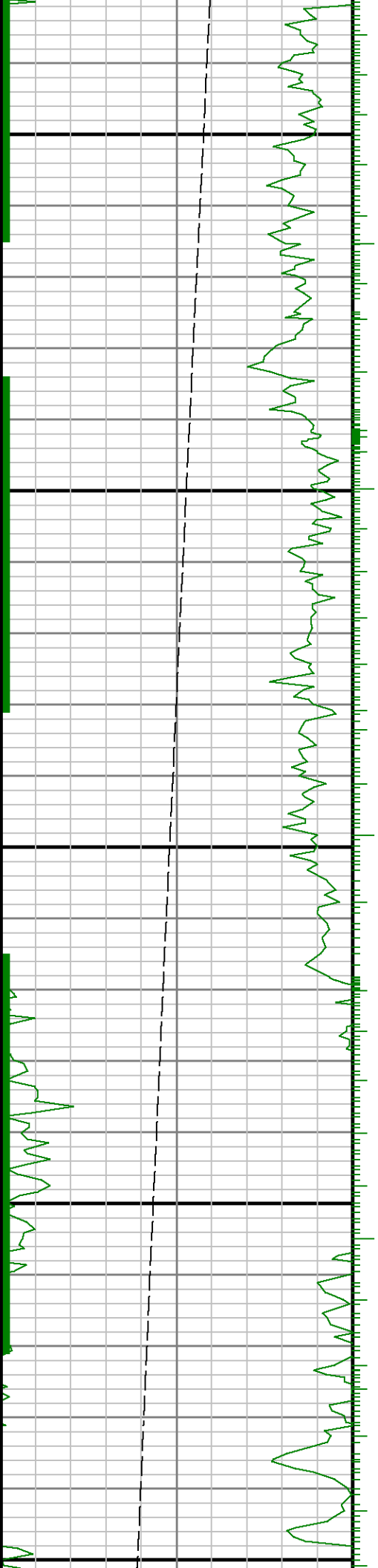
Number	Measured	Hole	LWD	Remark
	Depth (ft)	Section (in.)	Run No.	
1	6820	8.750	1	Begin logging due to directional only service provided through straight hole and nudge section.
2	7835	6.125	2	The interval from 7816 to 7860 ft. MD was logged up to 35.77 hours after being drilled due to a trip to pick up the lateral BHA tools.
2	11915	6.125	2	The interval from 11881 to 11927 ft. MD has no formation evaluation data due to sensor to bit offset at TD.

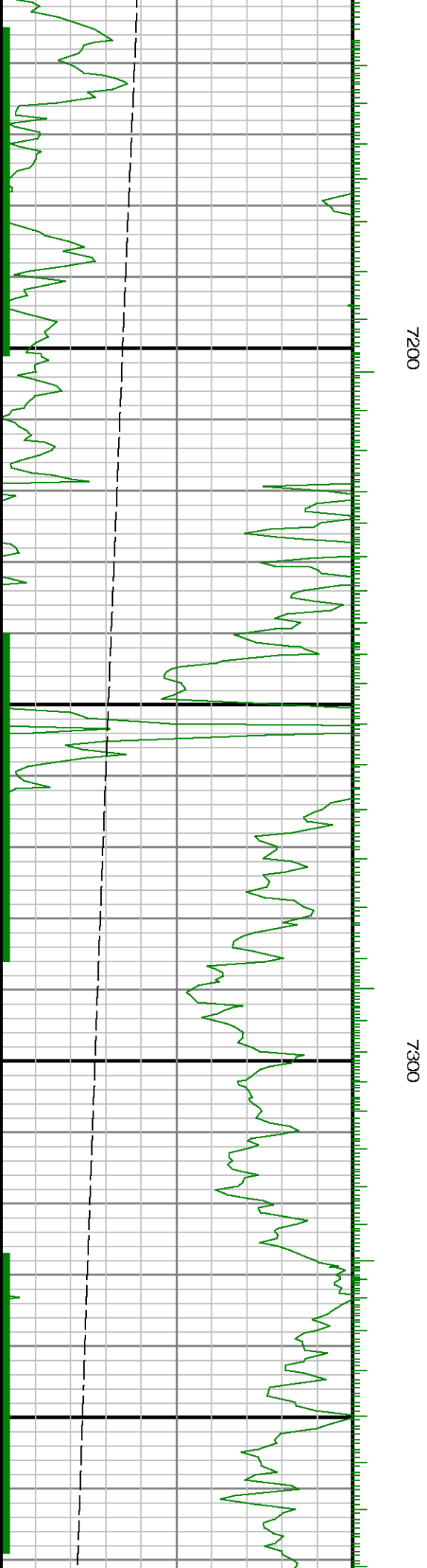
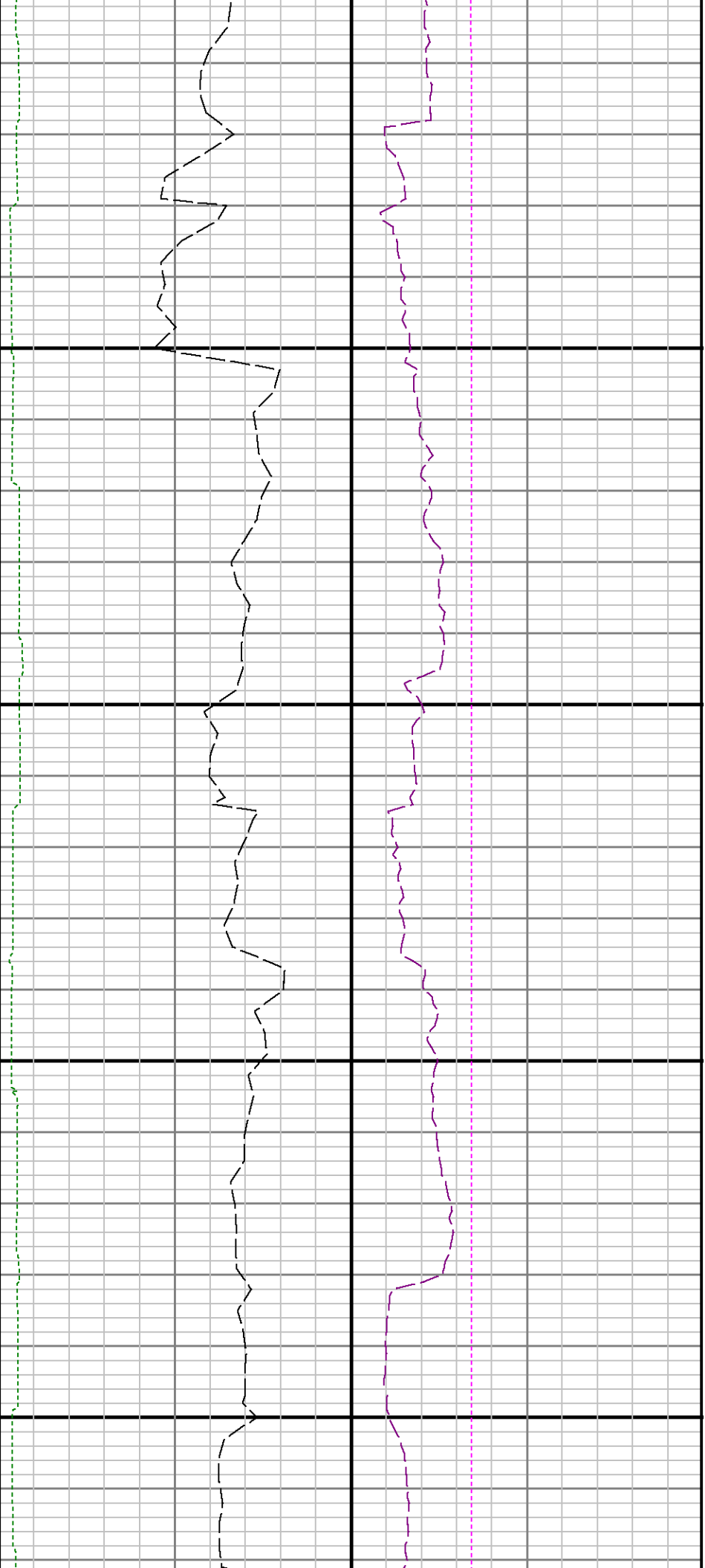


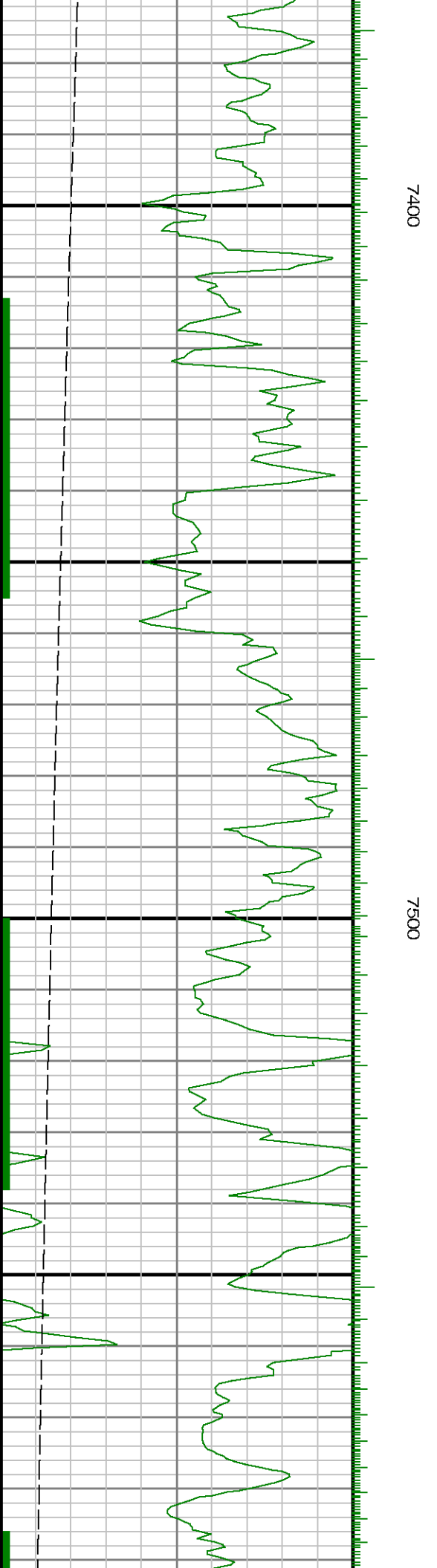


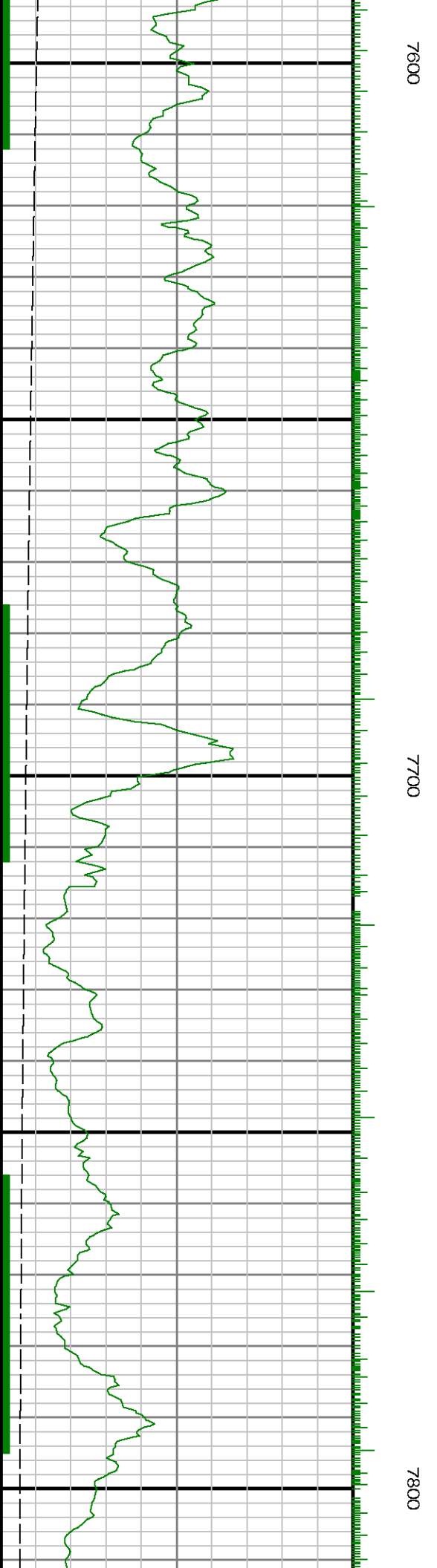
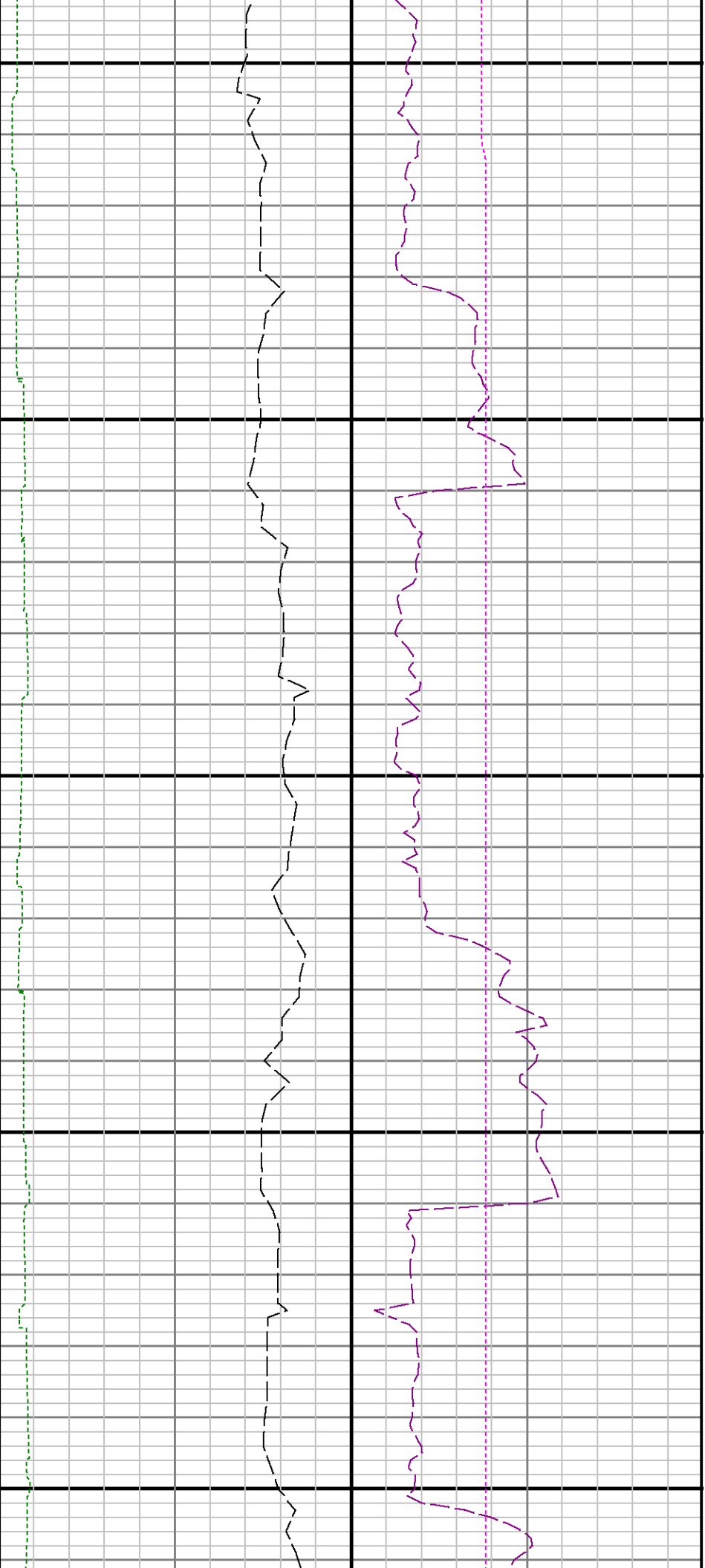
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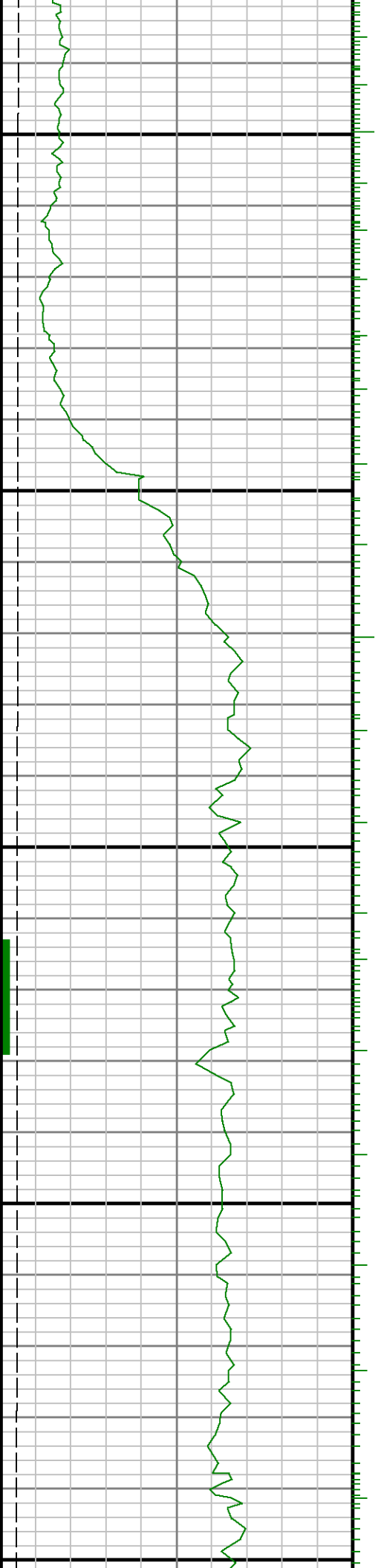


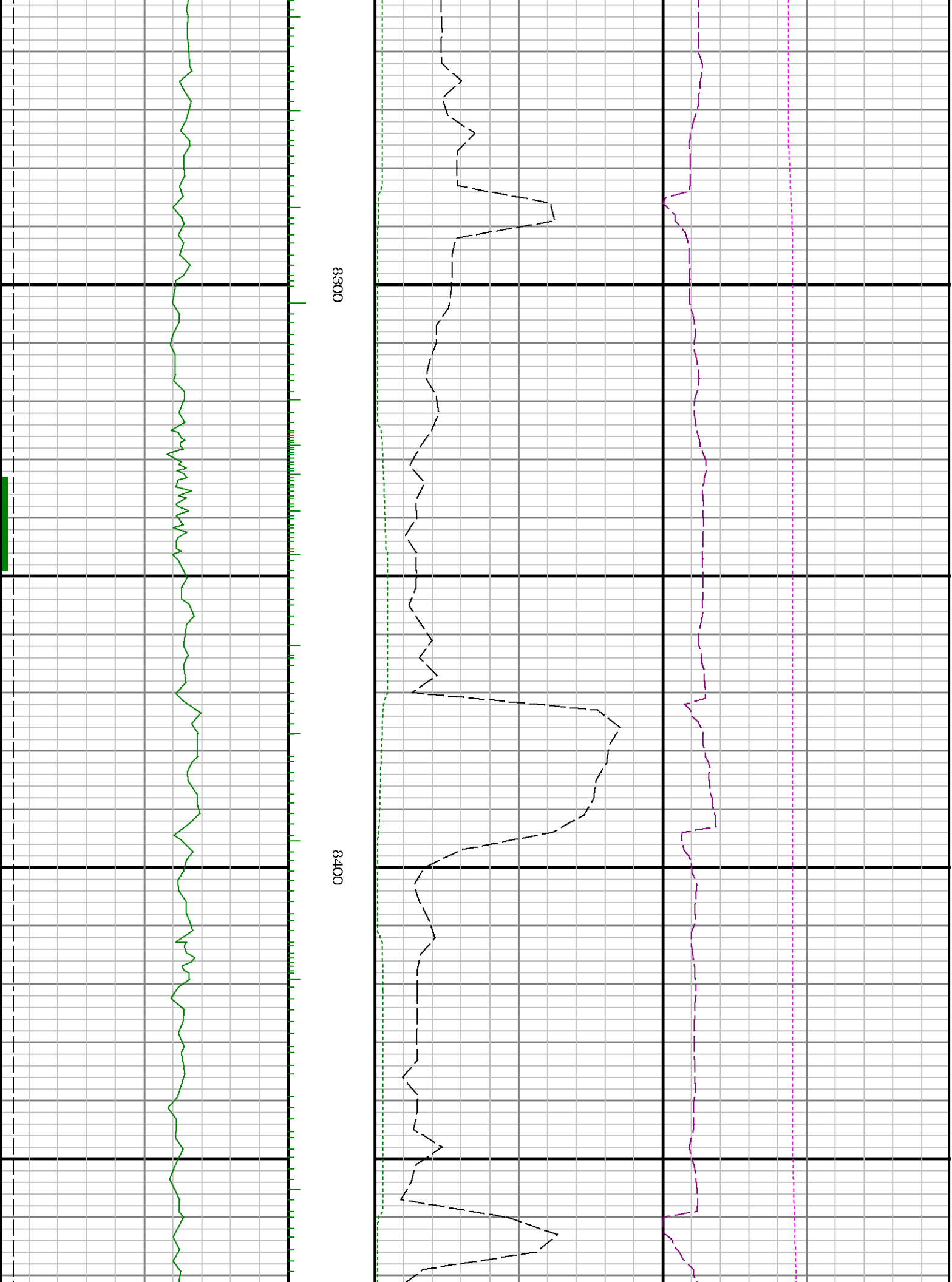


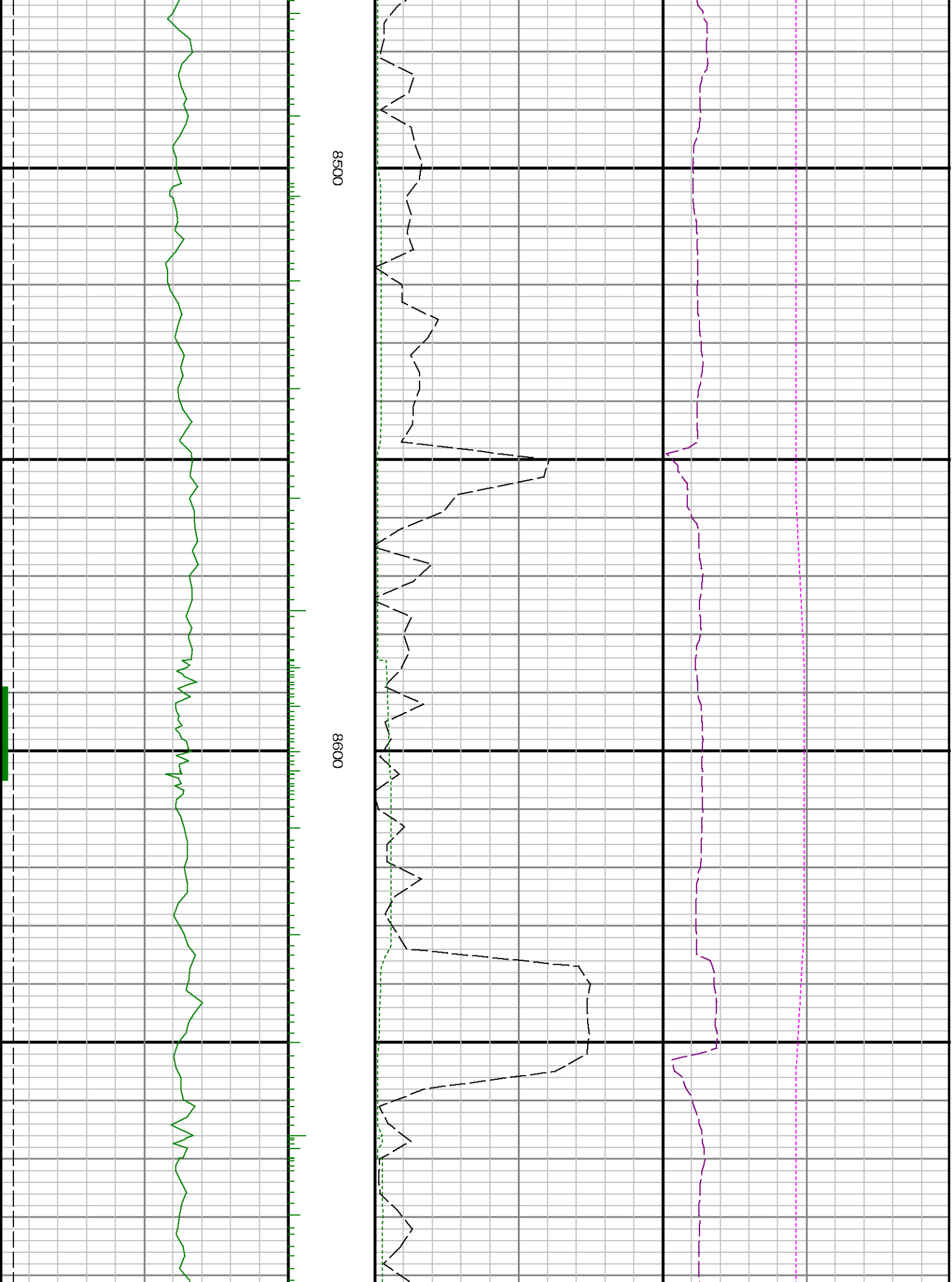


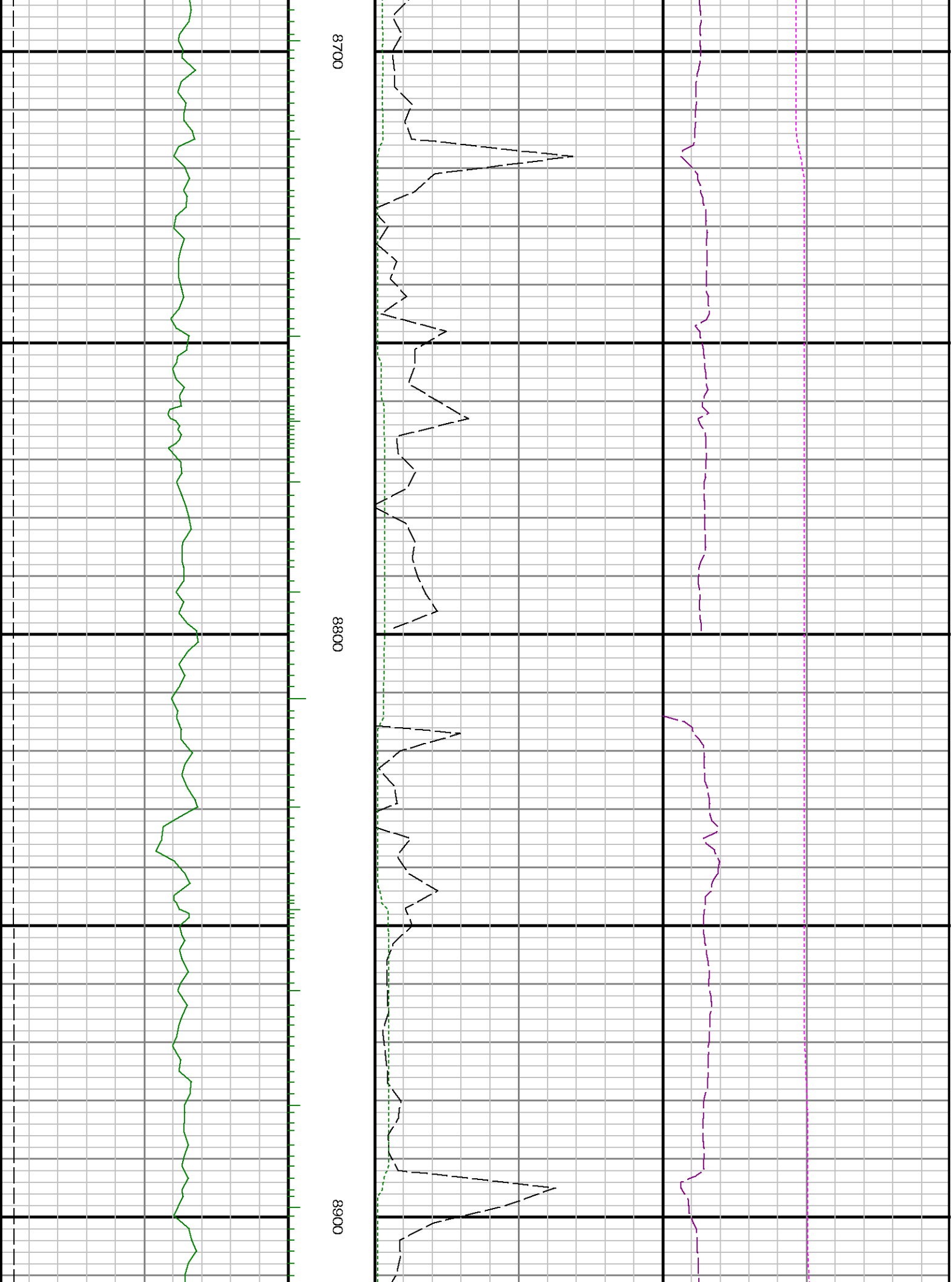
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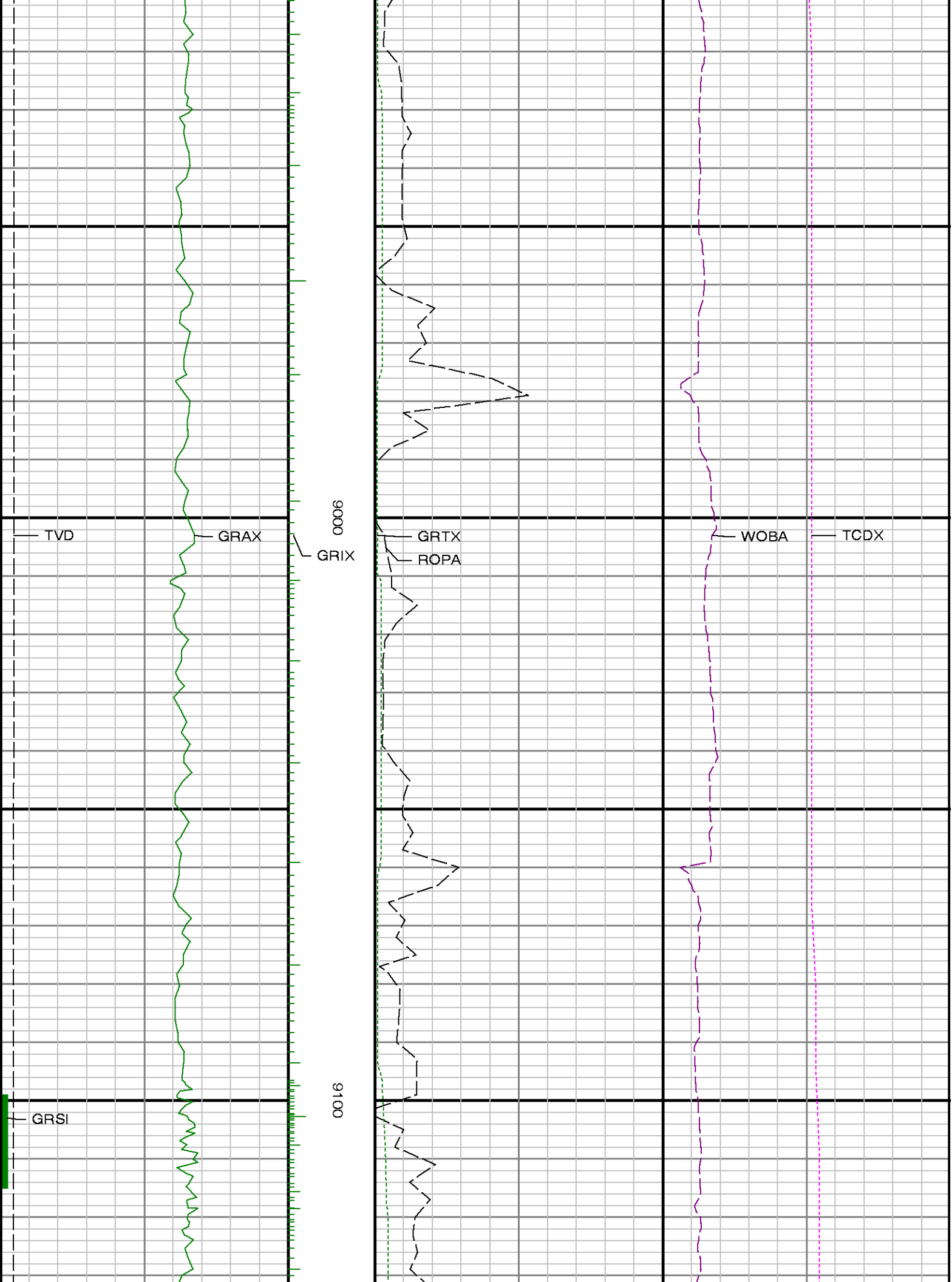
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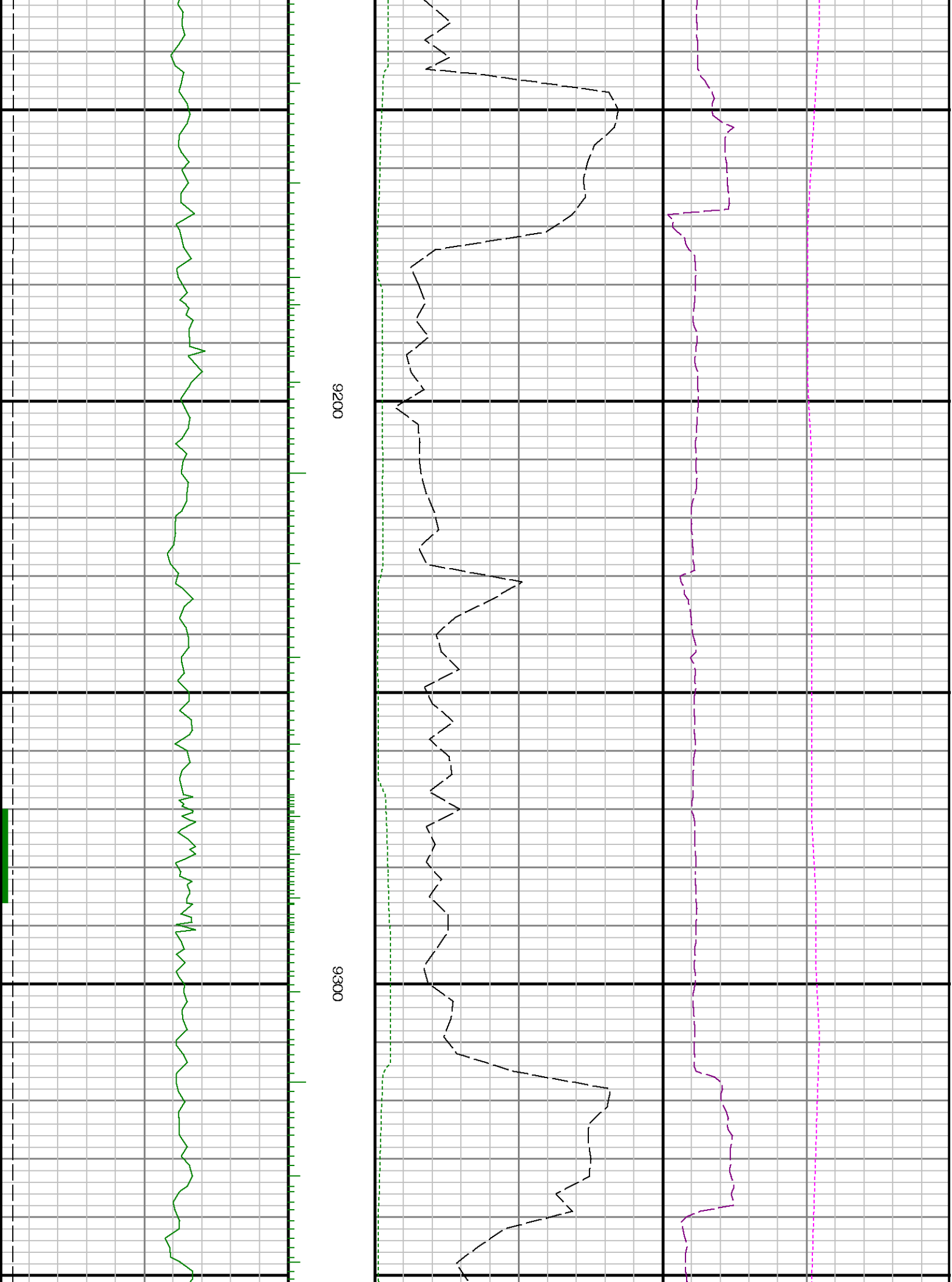


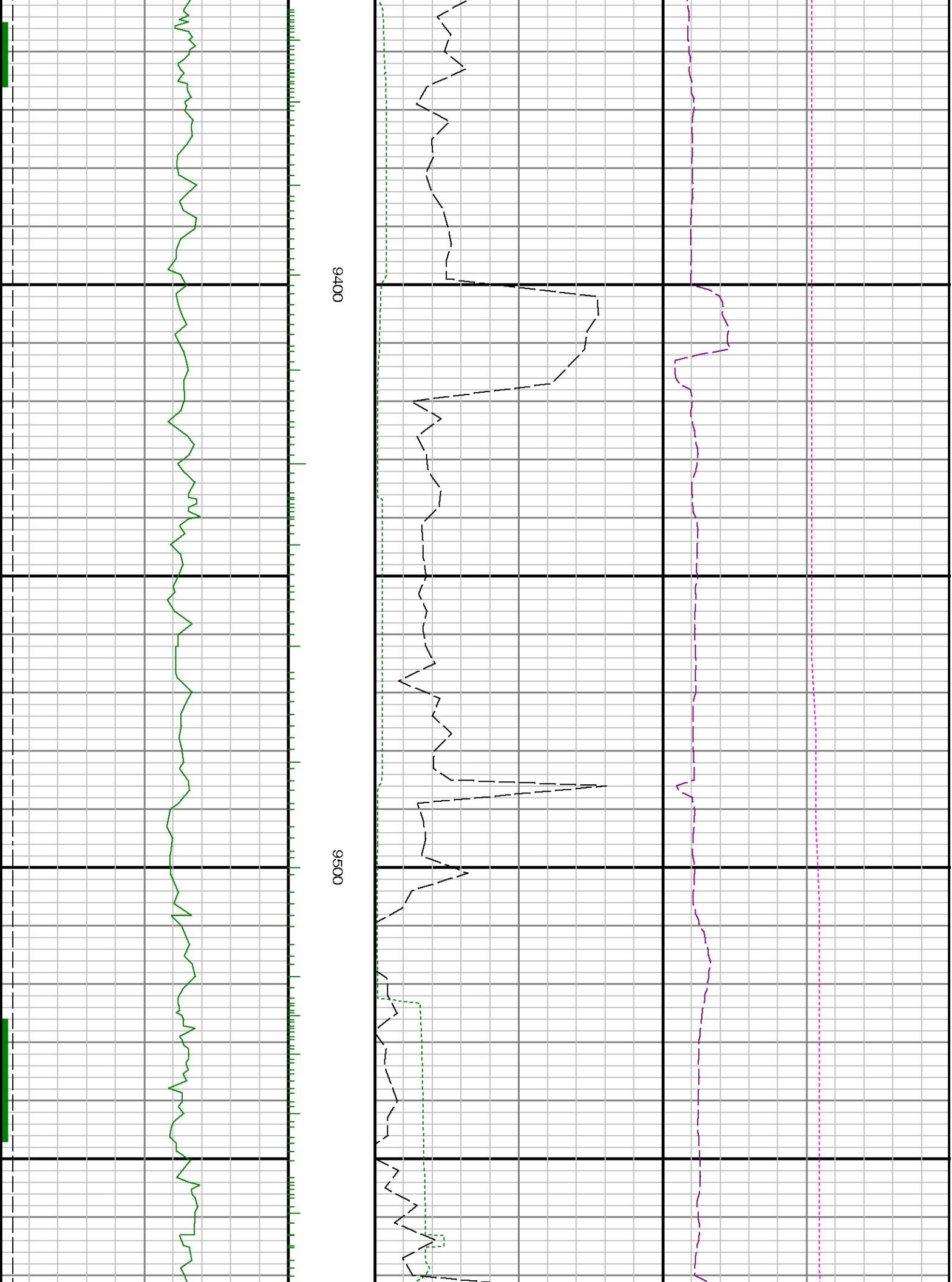


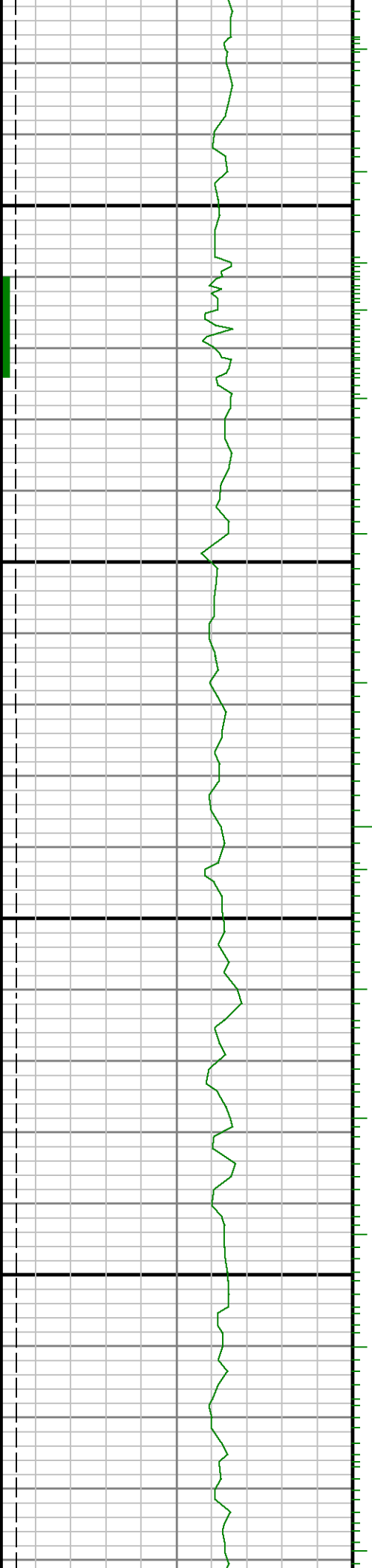






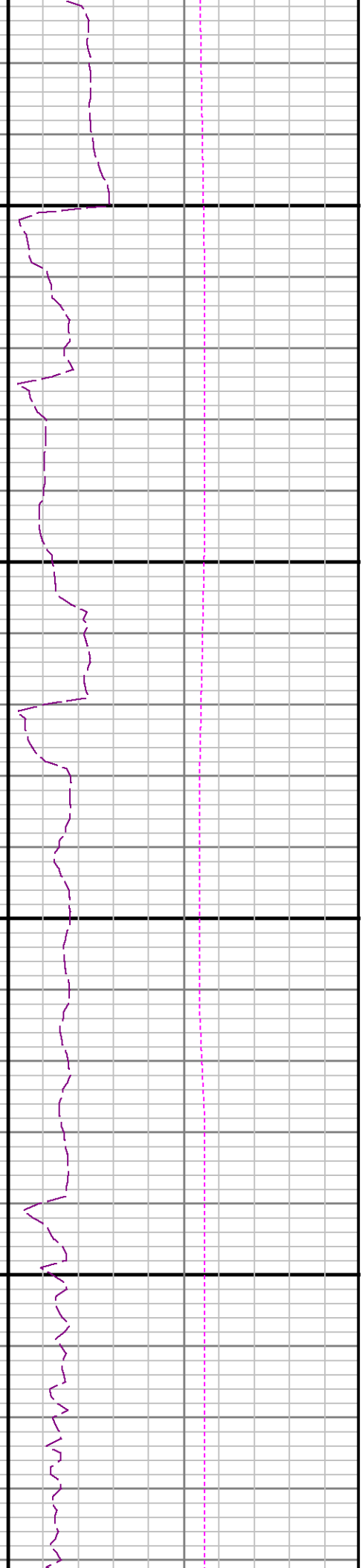
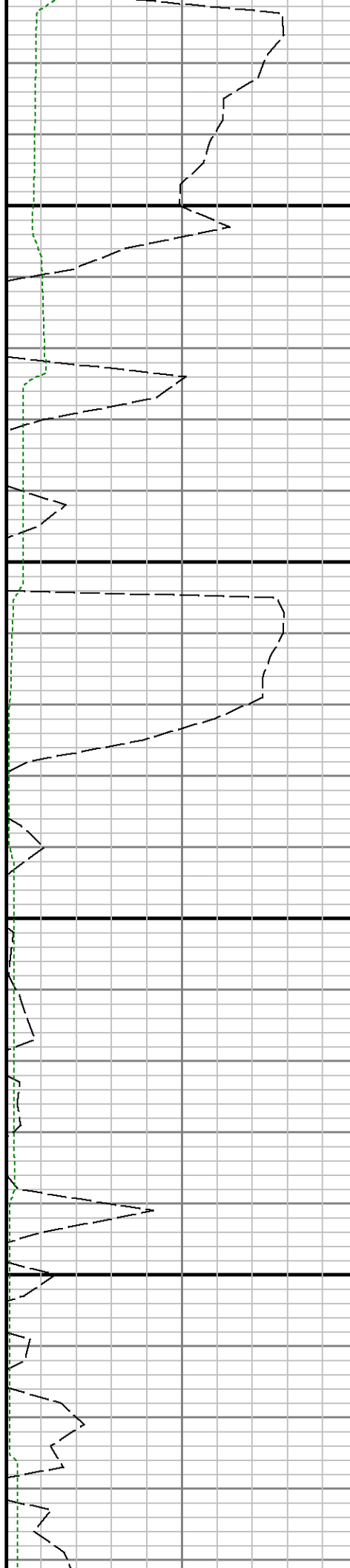


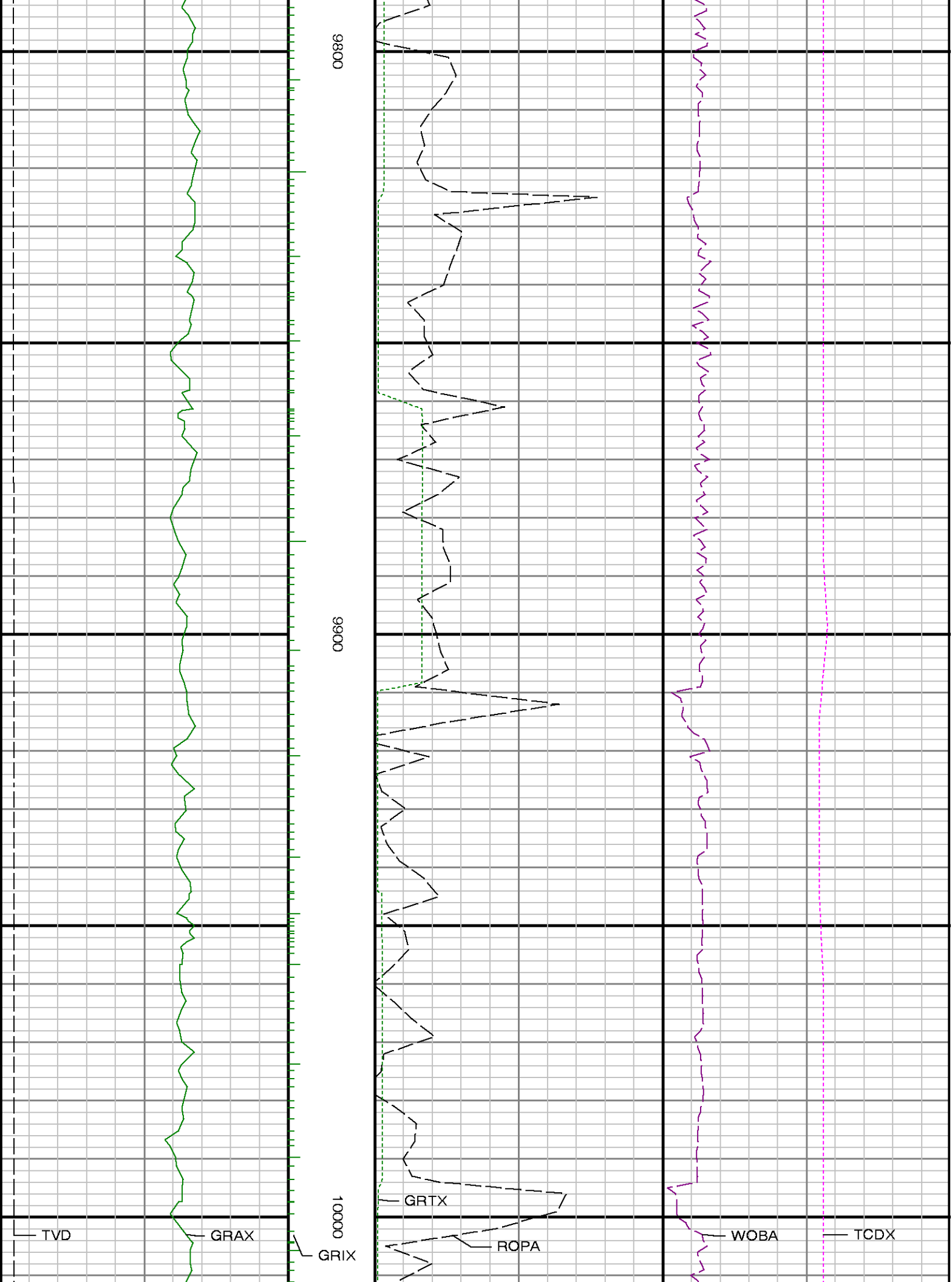


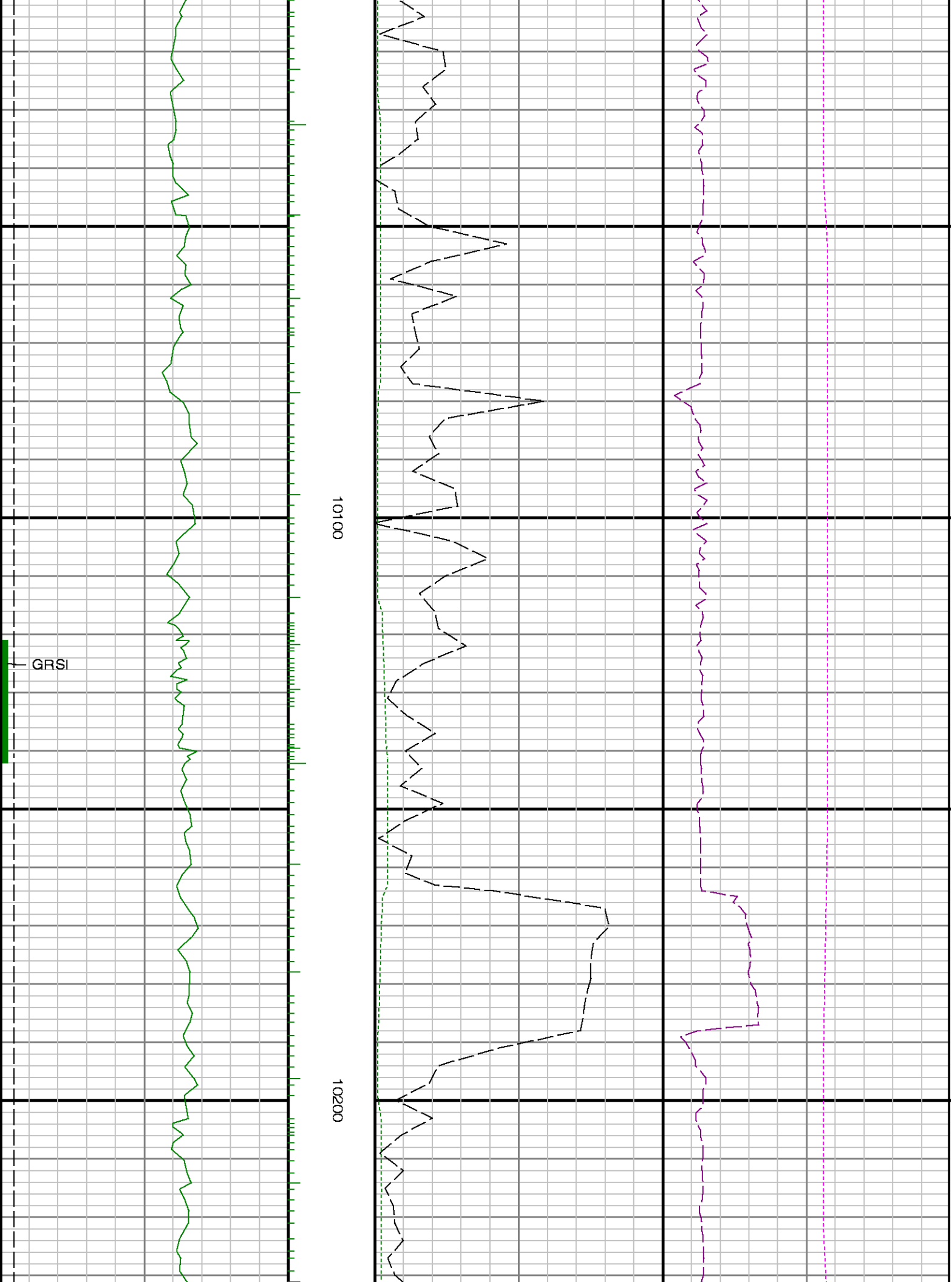


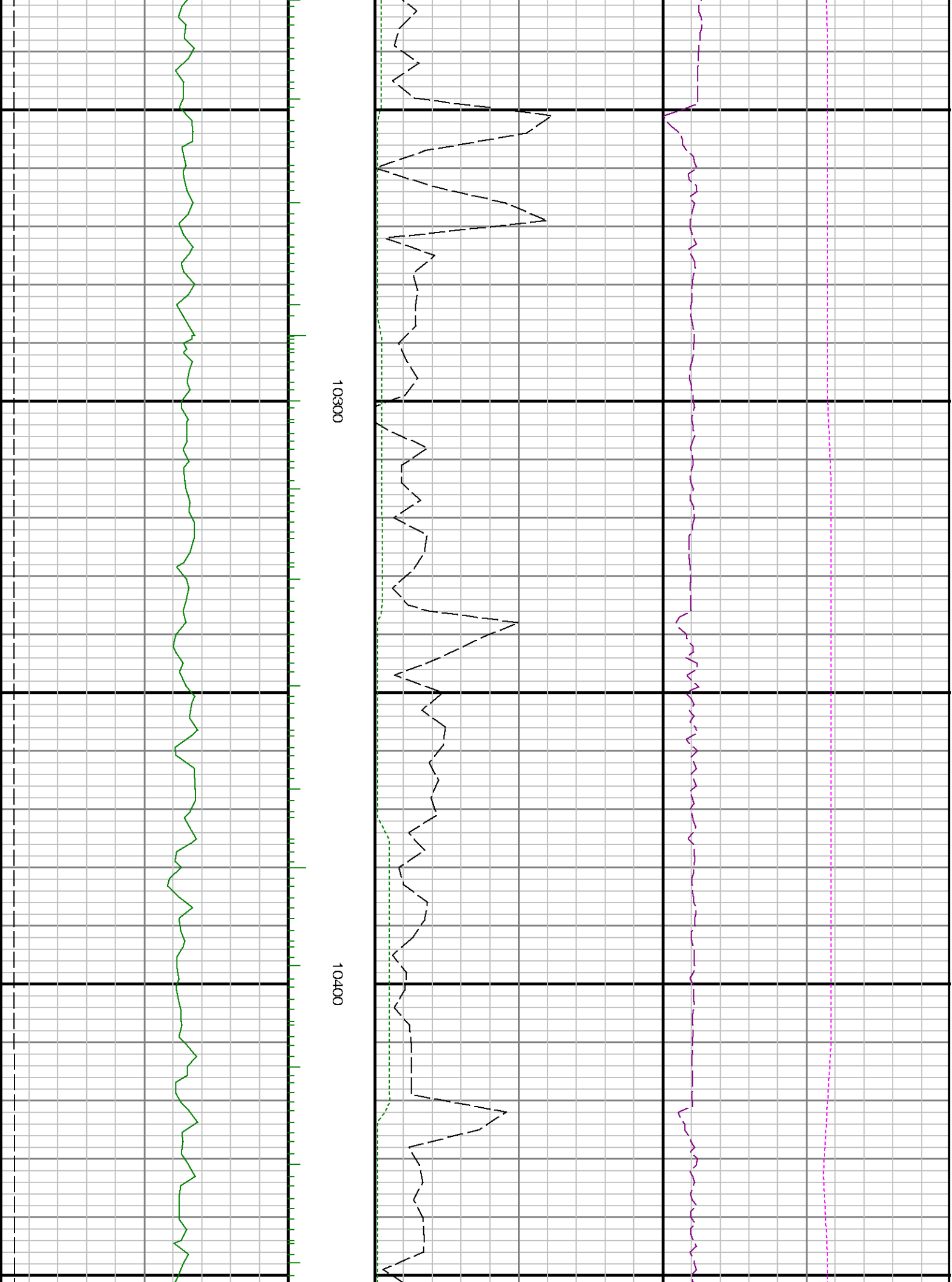
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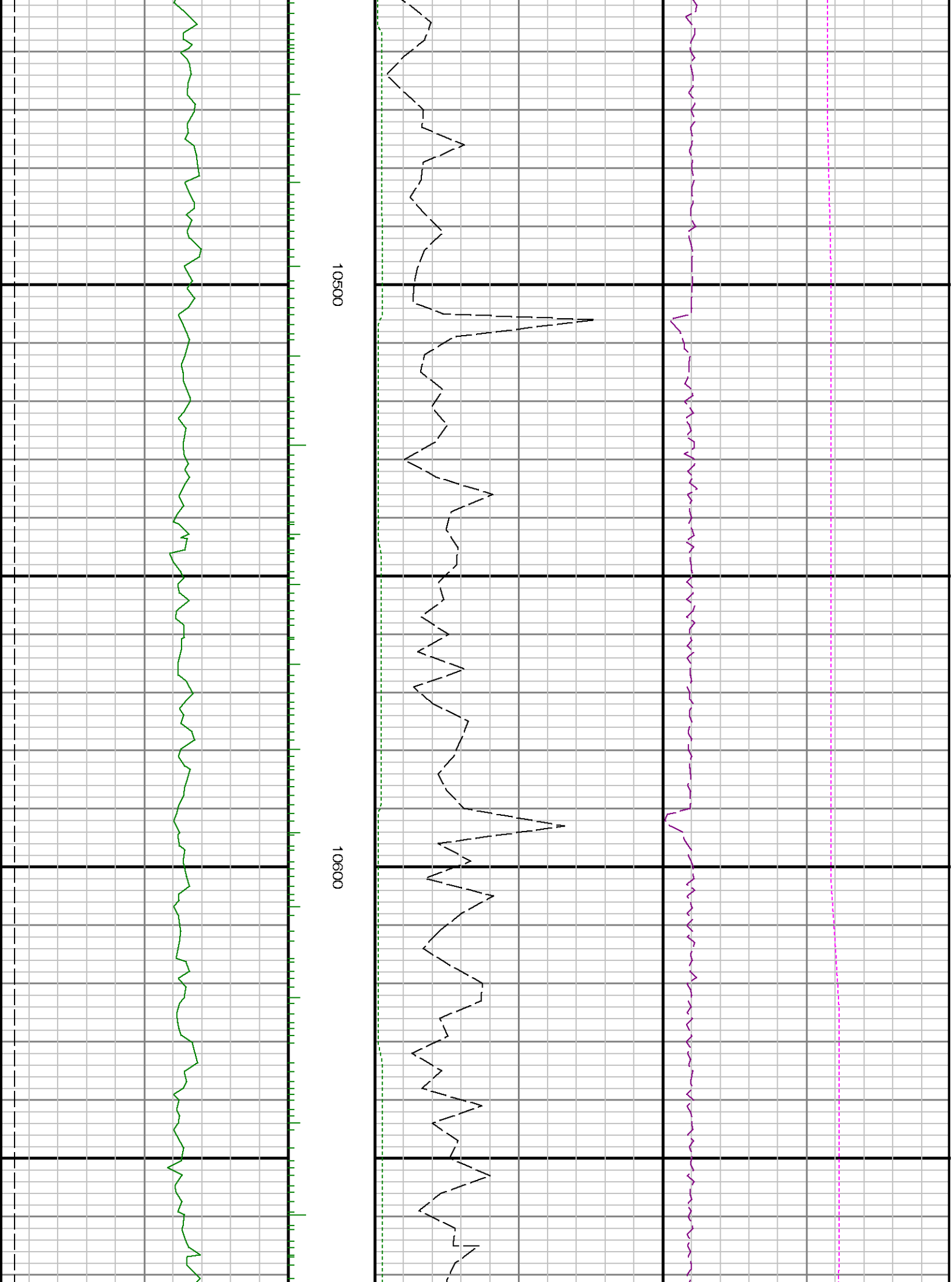
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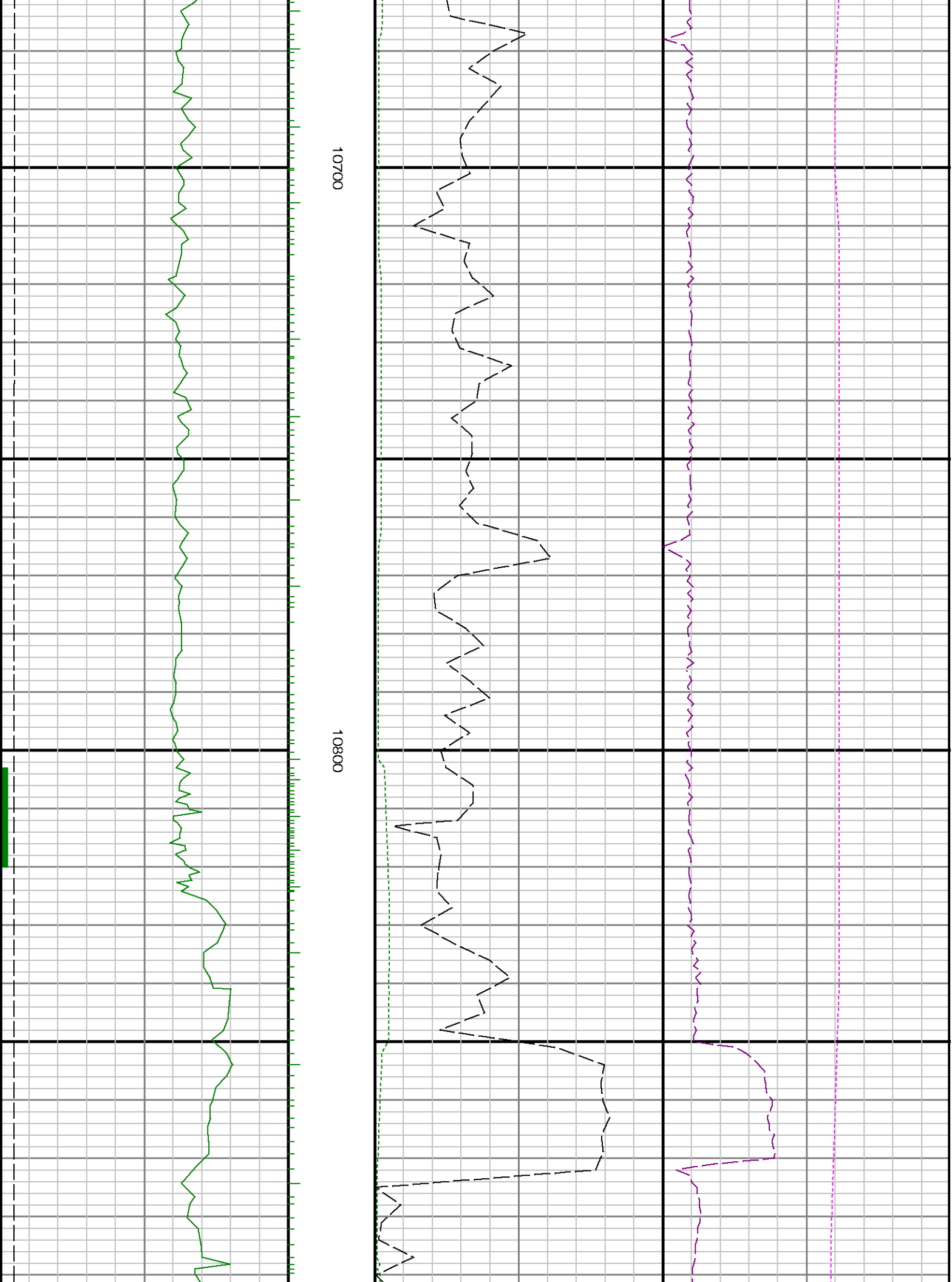


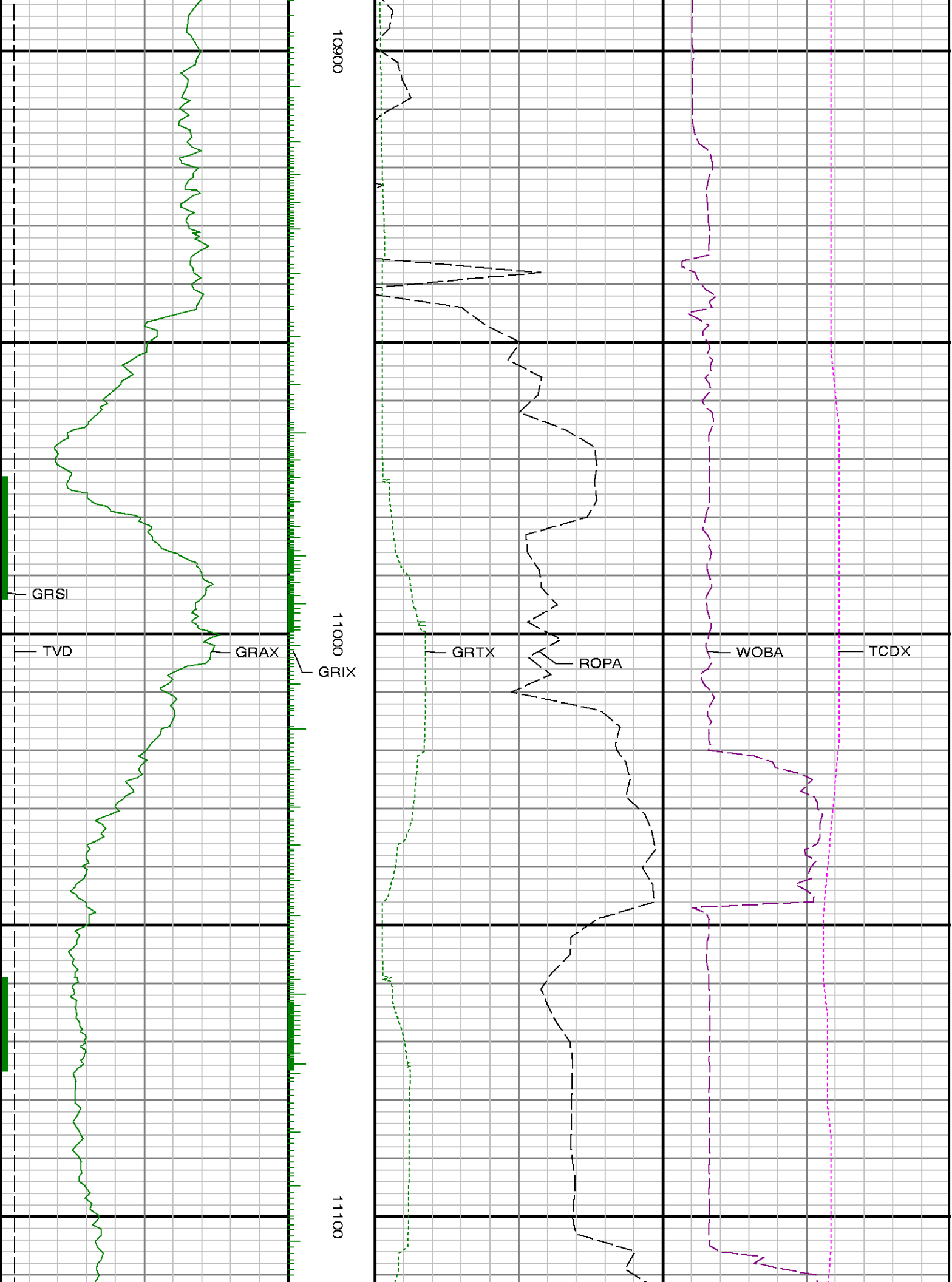


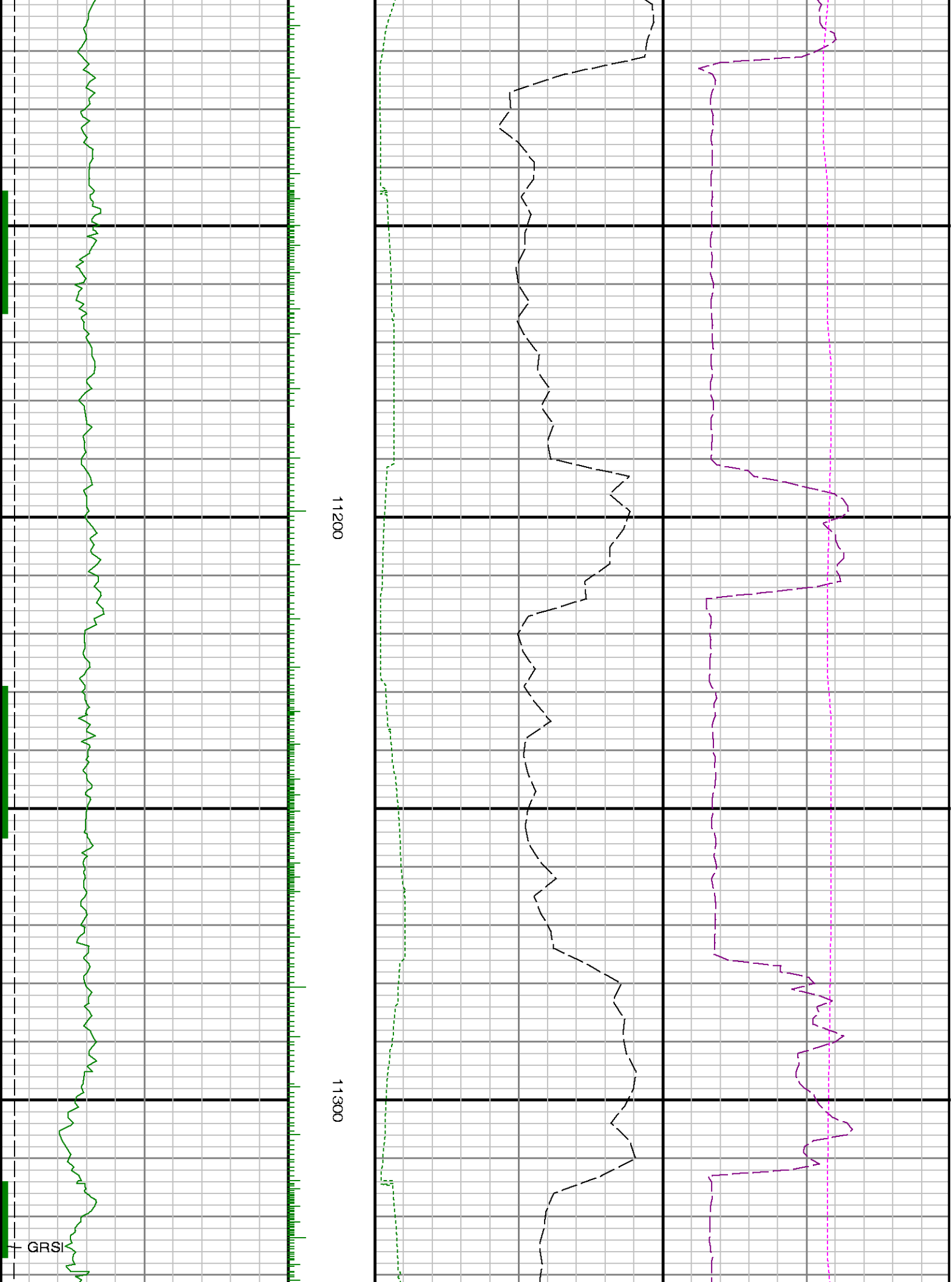


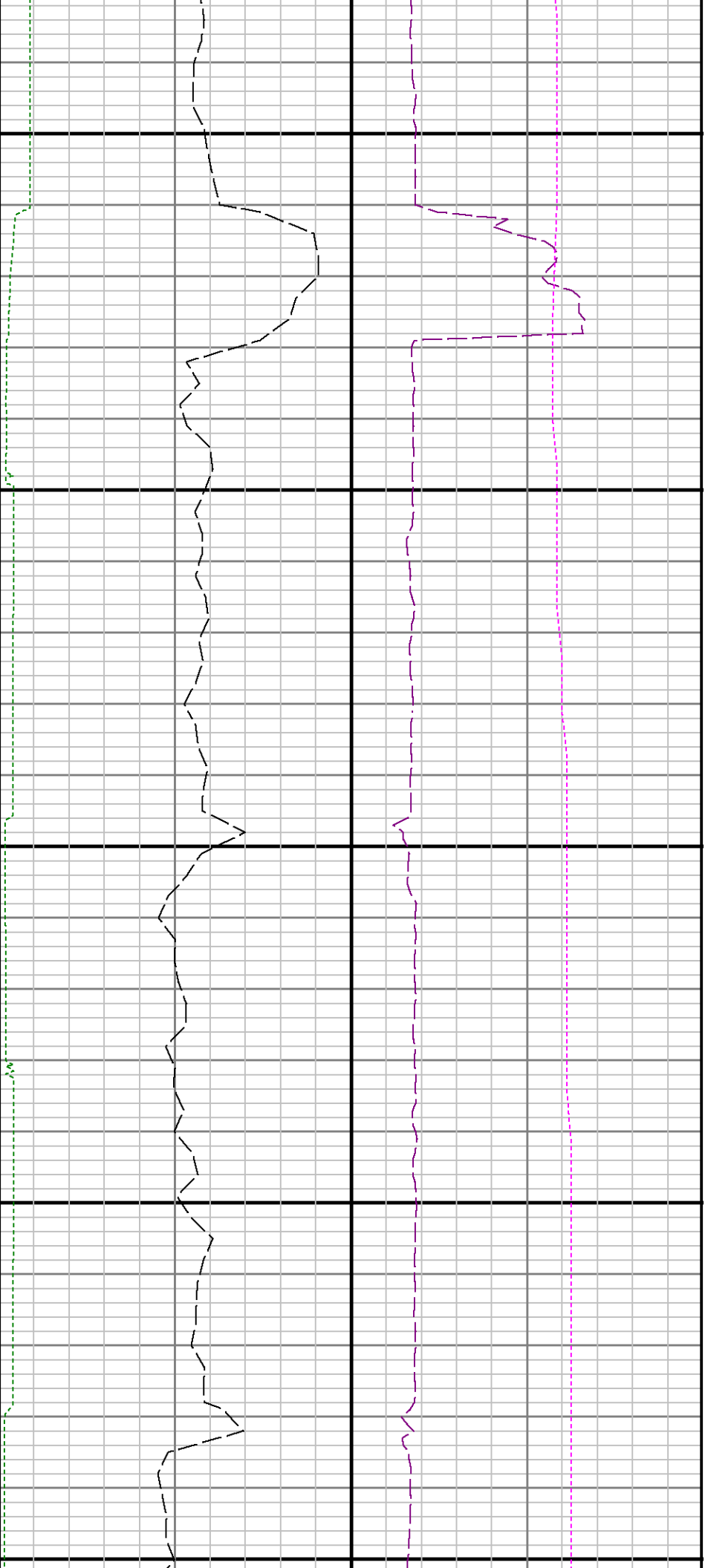






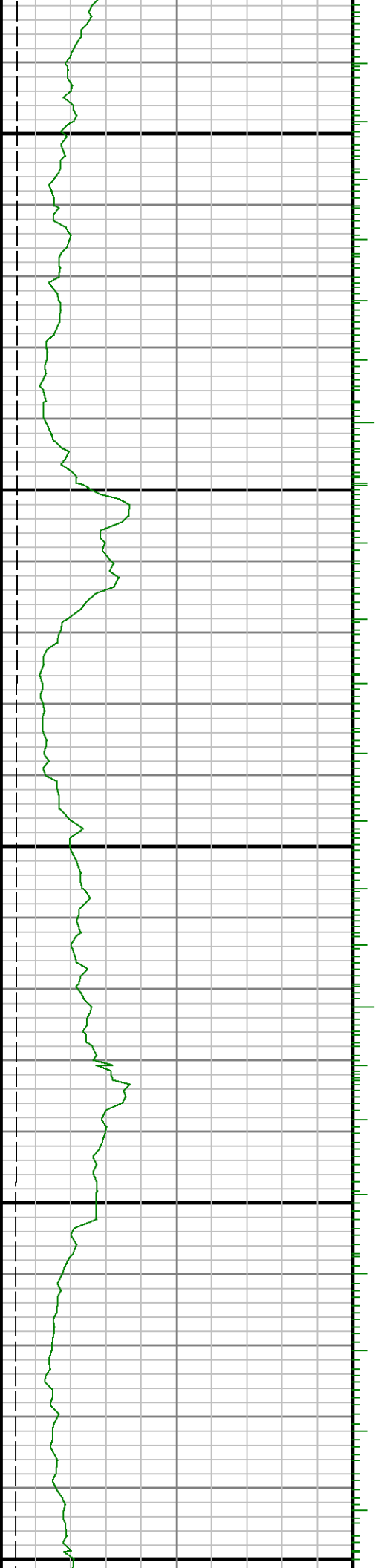






11400

11500





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11700

