



Realtime Log

Natural Formation Evaluation  
Gamma Ray

Scale:	Company: Kerr-McGee
1:240	Well: Griswold 2N-11HZ
Measured Depth	Field: Weld County (Kerr McGee)
	Region: Continental US Country: United States

Status:	Final	Surface Location: Latitude: 40° 3' 36.248" N Longitude: 104° 44' 31.722" W	Other Services:  Directional VSS
API Number:	05123409220000	Section: 11 TWN: 1N Range: 66E	

Permanent Datum (P.D.):	Ground Level	Elevation:	5125.00 ft.	Elevations:	N/A
Log Measured From:	Rig Floor	16.00 ft.	Above P.D.	KB: DF: GL:	5141.00 ft. 5125.00 ft.
Depth Reference:	Driller's Depth				

Interval Logged	Dates	Magnetic Field Reference
Top: 6600 ft. Date From: 13/Mar/15	Dip Angle: 66.55 °	Azi Reference North: True
Bottom: 12983 ft. Date To: 17/Mar/16	Total	Mag to Reference
Spud Date: 13/Mar/15	Field Strength: 52822.7 nT	North Correction: 8.19 °

Borehole Record				Casing Record			
Hole Size	From	To	Size	Weight	From	To	
13,000 in.	16 ft.	1743 ft.	9.625 in.	N/A	Surface	1743 ft.	
8,500 in.	1743 ft.	13033 ft.					

Mud Record				Deviation Record			
Type	From	To	Hole Size	Interval	Inc / Az (Start)	Inc / Az (End)	
Oil Based Mud	1743 ft.	13033 ft.	13,000 in.	1743 ft.	10.3 ° / 192.5 °	90.4 ° / 2.1 °	
			8,500 in.	11290 ft.	90.4 ° / 2.1 °	90.2 ° / 2.0 °	
					/	/	
					/	/	
					/	/	
					/	/	
					/	/	
					/	/	

Acquisition System		Software Version		Other	
Advantage	2.20U4	Rig / Contractor:	Xtreme 24	/ Advance Drilling	
PATS	6.4.1.34	Job No:	7070044	/ 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.
Run	Run	Run	Size	Type	Gauge  Length		Top	Bottom	From	To	Start		End		Time
No.	No.	No.	(in.)		(in.)		(ft.)	(ft.)	(ft.)	(ft.)					(hrs.)
1	1	1	8.500	PDC	2.000	Steerable	6600	8133	6641	8174	14/Mar/15	18:00	15/Mar/15	11:00	30.9
2	2	2	8.500	PDC	2.000	Steerable	8124	12983	8174	13033	15/Mar/15	12:01	17/Mar/15	07:00	25.4

Crew										
Name	Arrive	Depart		Name	Arrive	Depart		Name	Arrive	Depart
	Wellsite	Wellsite			Wellsite	Wellsite			Wellsite	Wellsite
Osagie Otoikhine	13/Mar/15	17/Mar/15		Matt Leopold	13/Mar/15	17/Mar/15				

Date / Time	LWD Run No.	Measured Depth (ft.)	Mud Type	Density (ppg)	Viscosity (sec/qt)	pH	Fluid Loss (cc)	Oil / Water	Source	Total Chlorides (mg/L)	K+ (%)
15/Mar/2015 09:10	1	1743	Oil Based Mud	9.2	65	N/A	4.8	62 / 38	Active Pits	70100	N/A
15/Mar/2015 09:10	1	7125	Oil Based Mud	9.3	64	N/A	4.6	61 / 38	Active Pits	78000	N/A
16/Mar/2015 06:33	2	8588	Oil Based Mud	9.3	62	N/A	3.4	62 / 38	Active Pits	73200	N/A

Mnemonics

Curve	Description	Units
GRAX	Gamma Ray Apparent, 0.5 ft. Avg.	API
GRTX	Gamma Ray Time Since Drilled	Min.
GRIX	Gamma Ray Data Density	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	12617359	Directional	43.95	6.750	2.750
1	SRIG	10266573	Gamma	40.58	6.750	2.750
2	DIR	12617359	Directional	53.06	6.750	2.750
2	SRIG	10266573	Gamma	49.69	6.750	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

Comments

<p>1) Baker Hughes INTEQ runs 1 and 2 utilized a 6.75 inch NaviGamma (Directional and Gamma Ray) tool ran behind an 8.5 inch bit with a steerable assembly from 6600 feet to 13033 feet MD (6477 feet to 7355 feet TVD).</p> <p>2) A sliding indicator is shown on the left side of track 1 as a heavy line. The indicator has been shifted to the Gamma Ray sensor offset to correspond with Gamma Ray data acquired while sliding.</p> <p>3) Depth measurements obtained from a depth control system not supplied or operated by Baker Hughes INTEQ. Due to lack of control by Baker Hughes INTEQ logging engineers, depth calibration and measurements could not be independently verified.</p>
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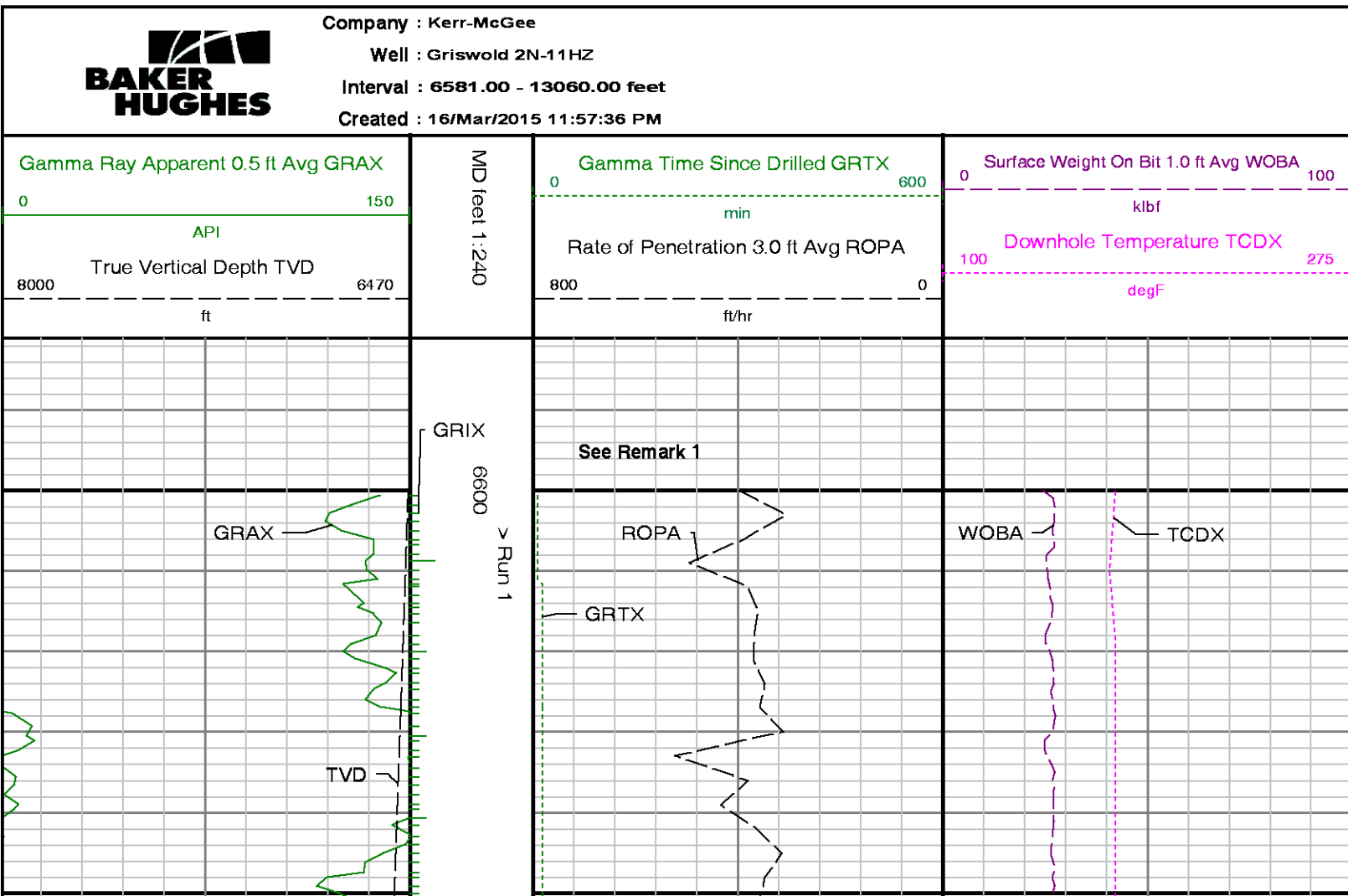
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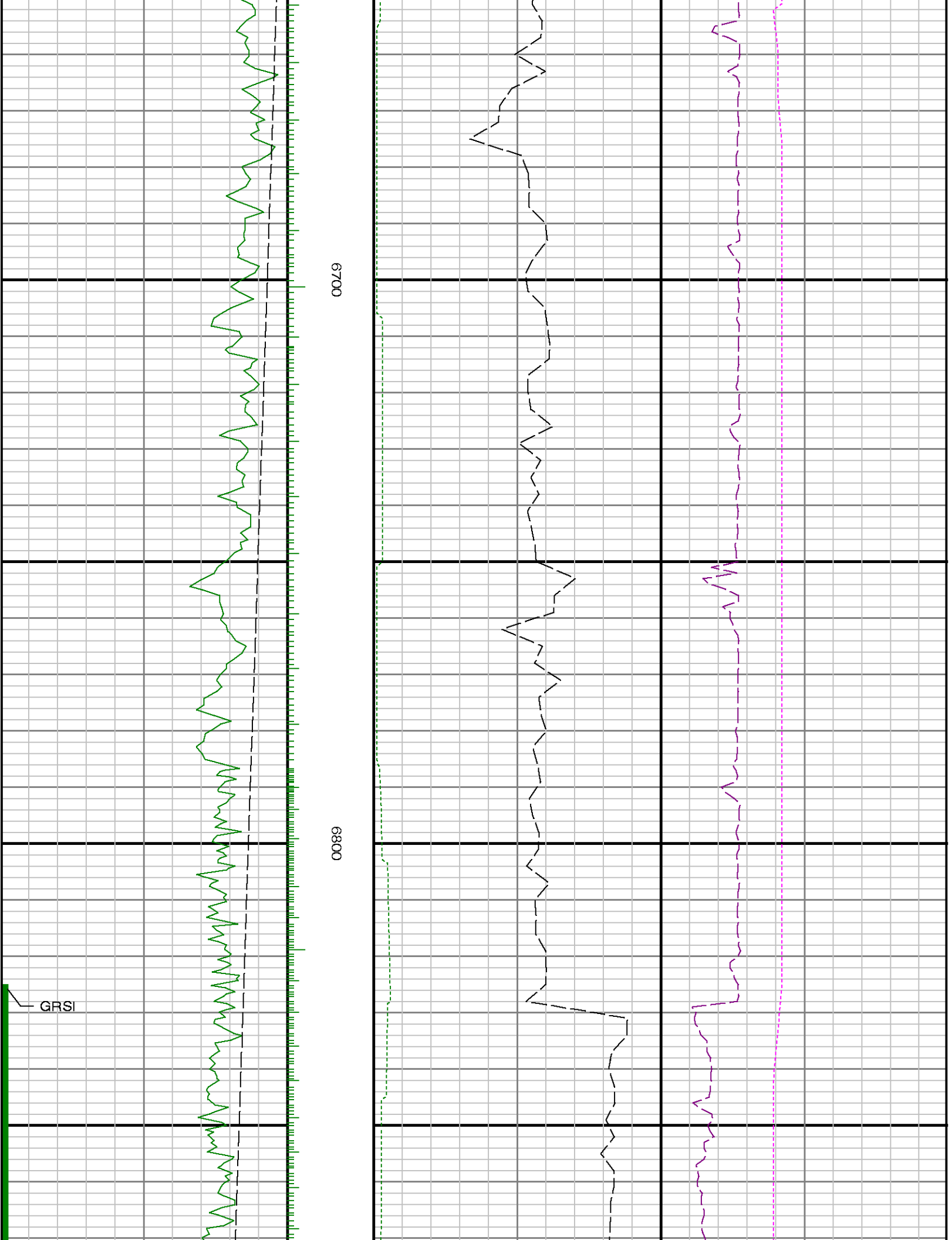
Number	Measured Depth	Hole Section	LWD Run No.	Remark
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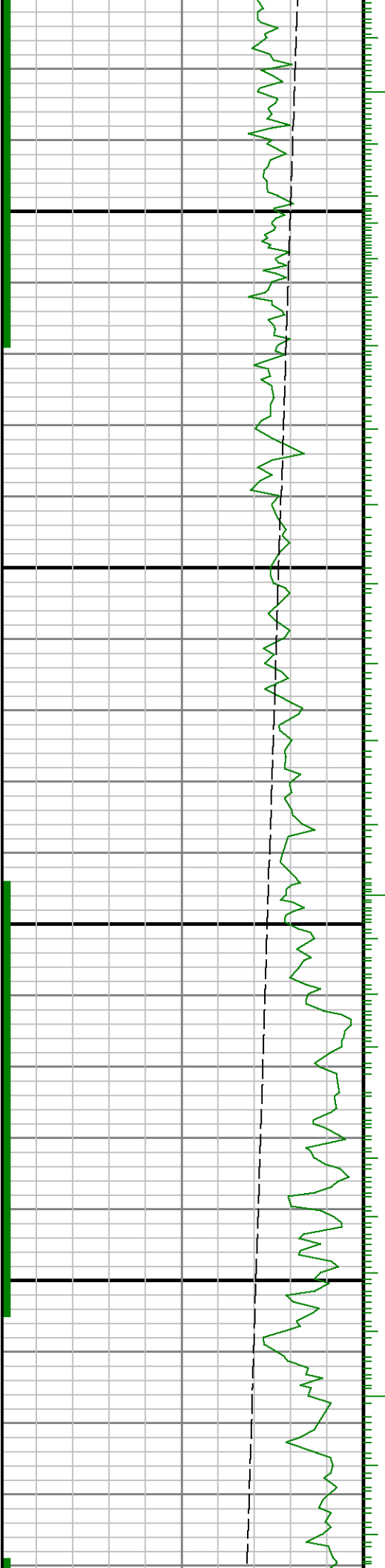
	(ft.)	(in.)		
1	6595	8.500	1	The interval from surface to 6600 feet MD (6477 feet TVD) was not logged since logging services began at kick off point.
2	8133	8.500	1	The depth from 8129 feet to 8176 feet MD (7388 feet to 7386 feet TVD ) was logged more than 12 hours after drilling due to tripping to change motor and bit in order to increase ROP.
3	13006	8.500	2	The interval from 12983 feet to 13033 feet MD (7355 feet to 7355 feet TVD) was not logged due to bit sensor offset at TD.

### 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

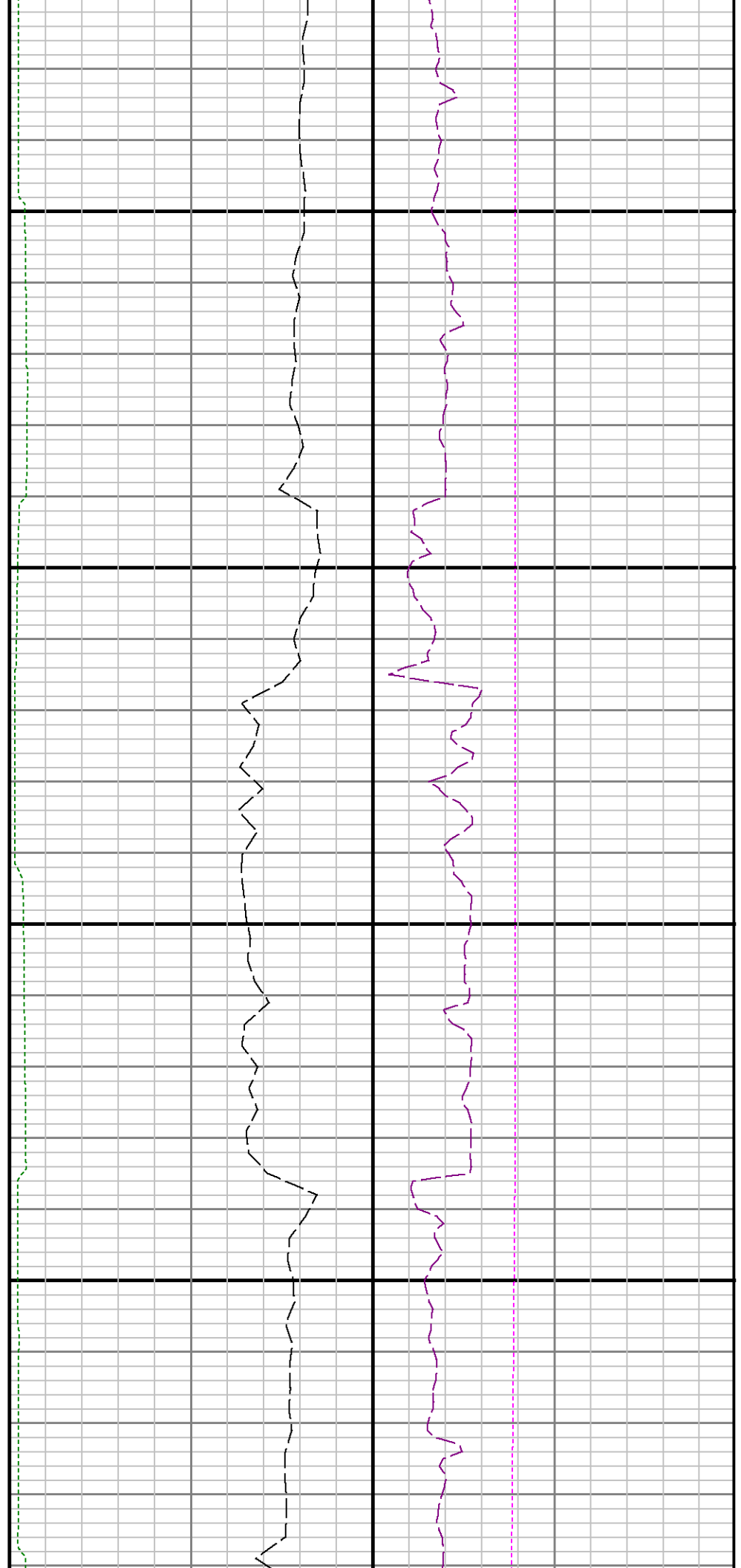


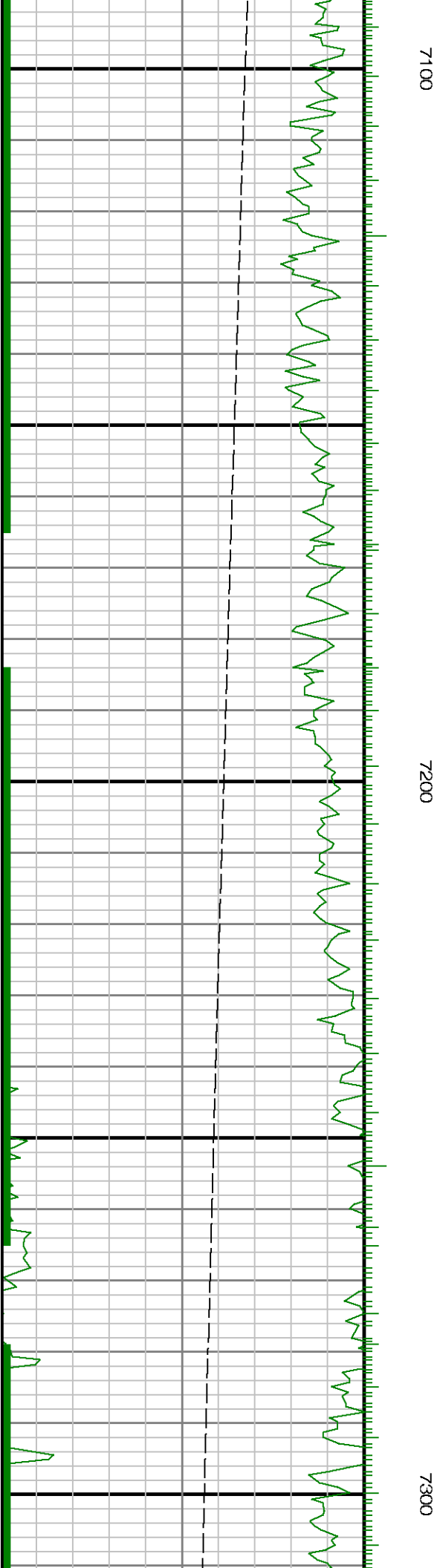
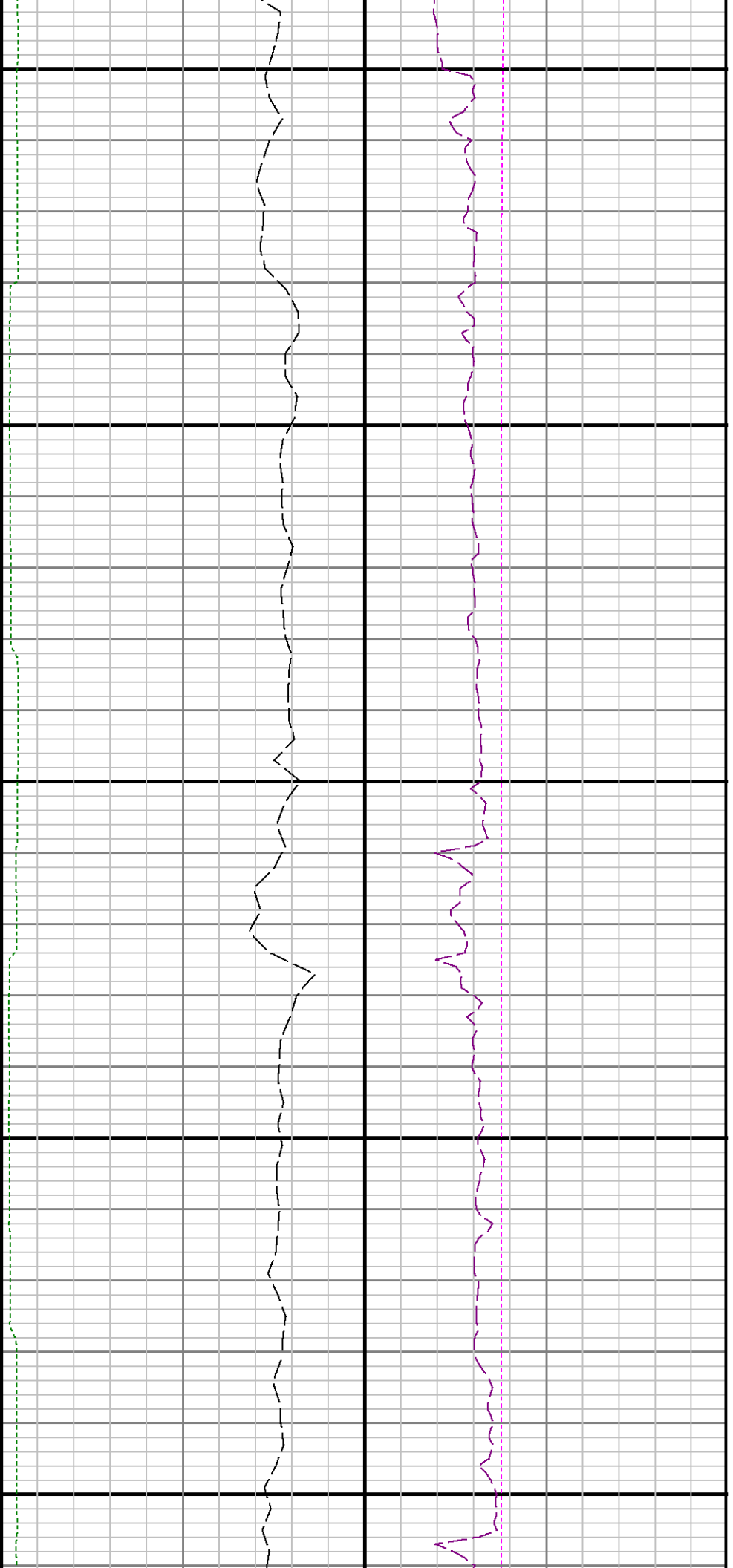


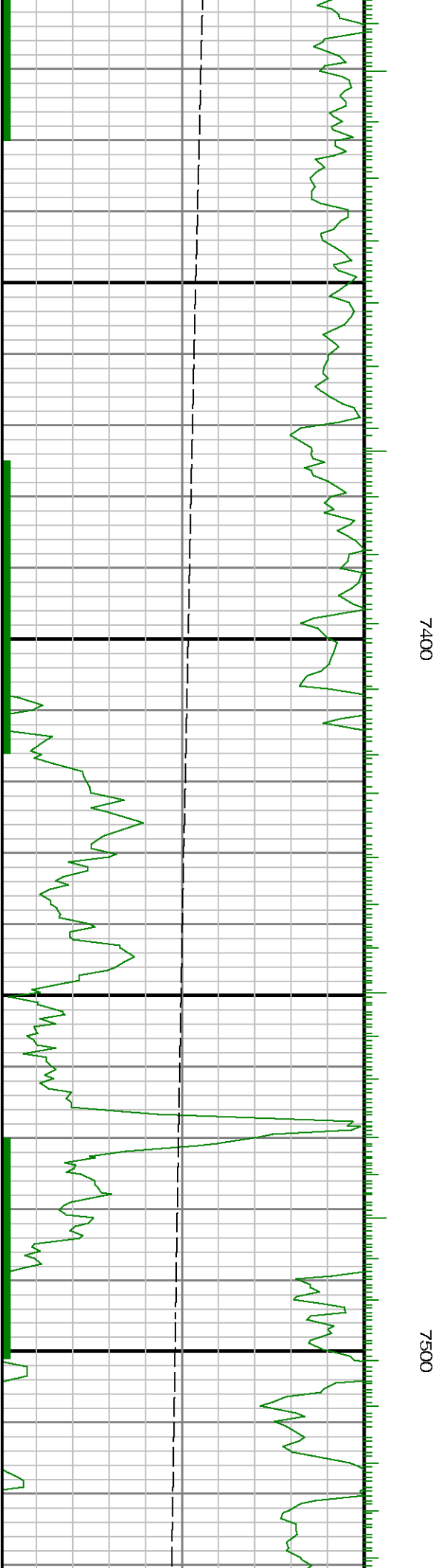
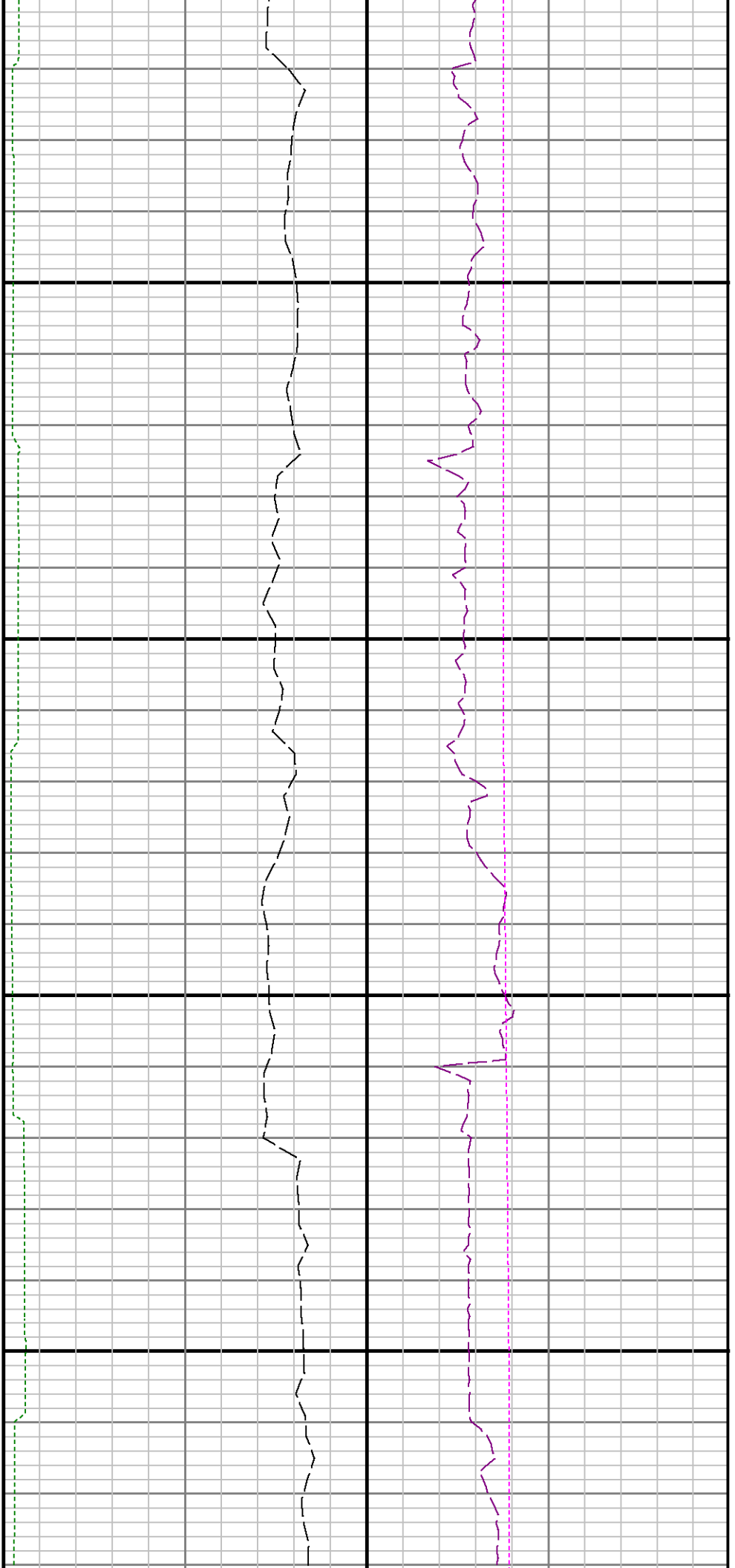


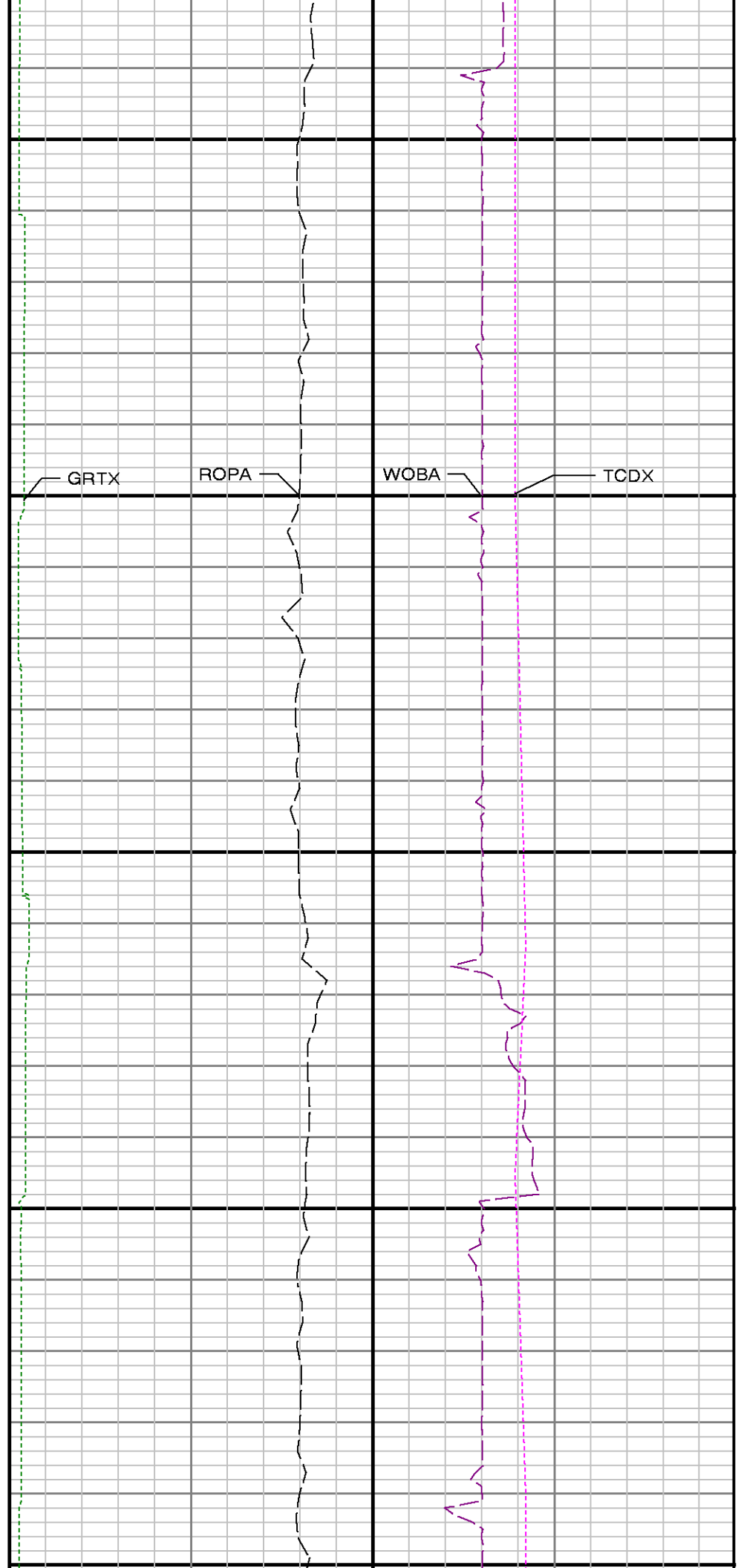
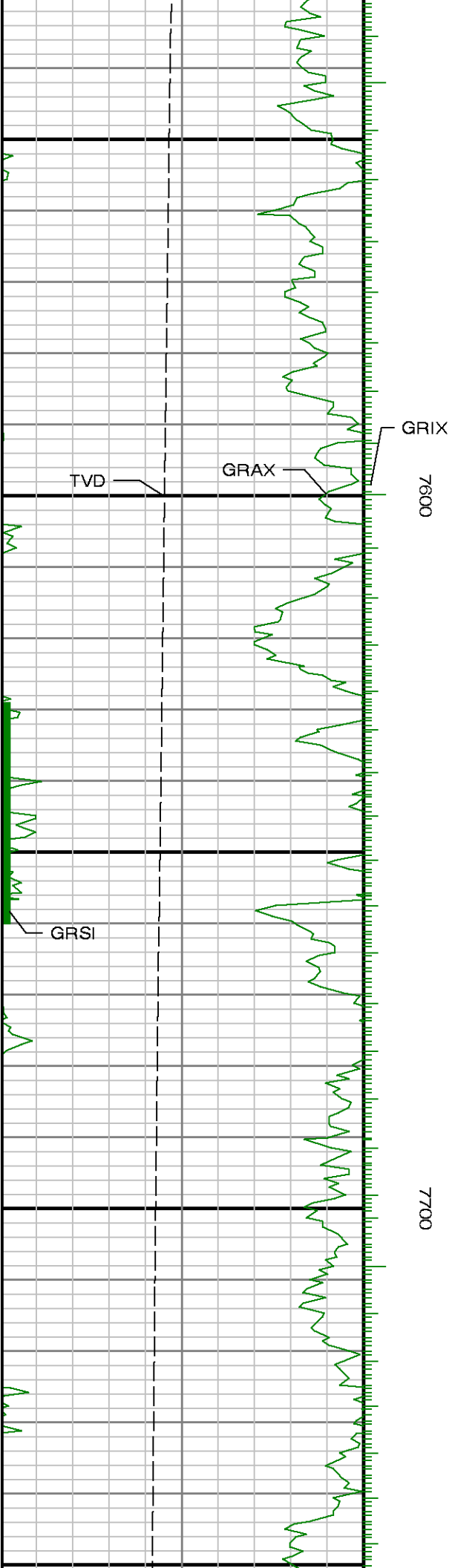
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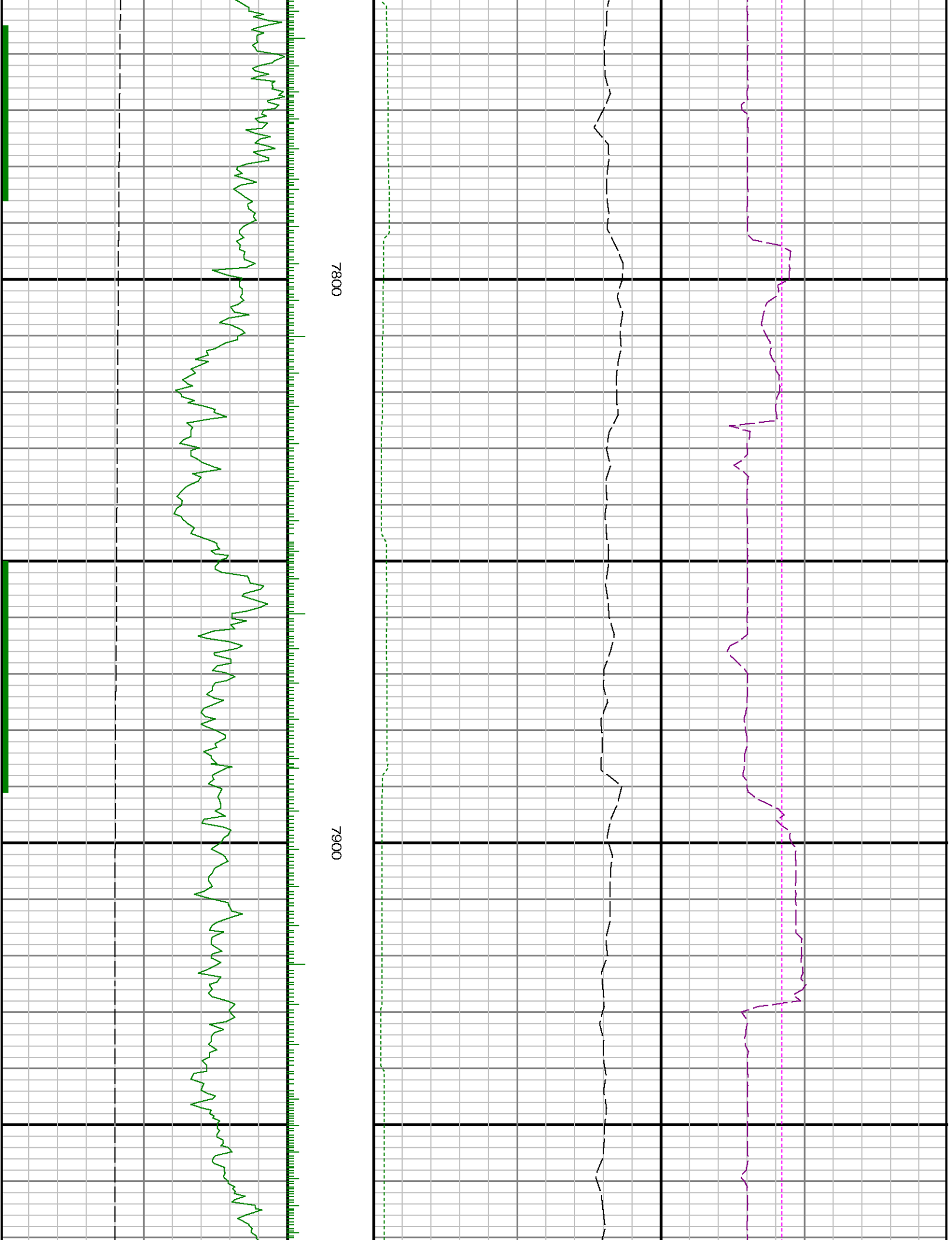


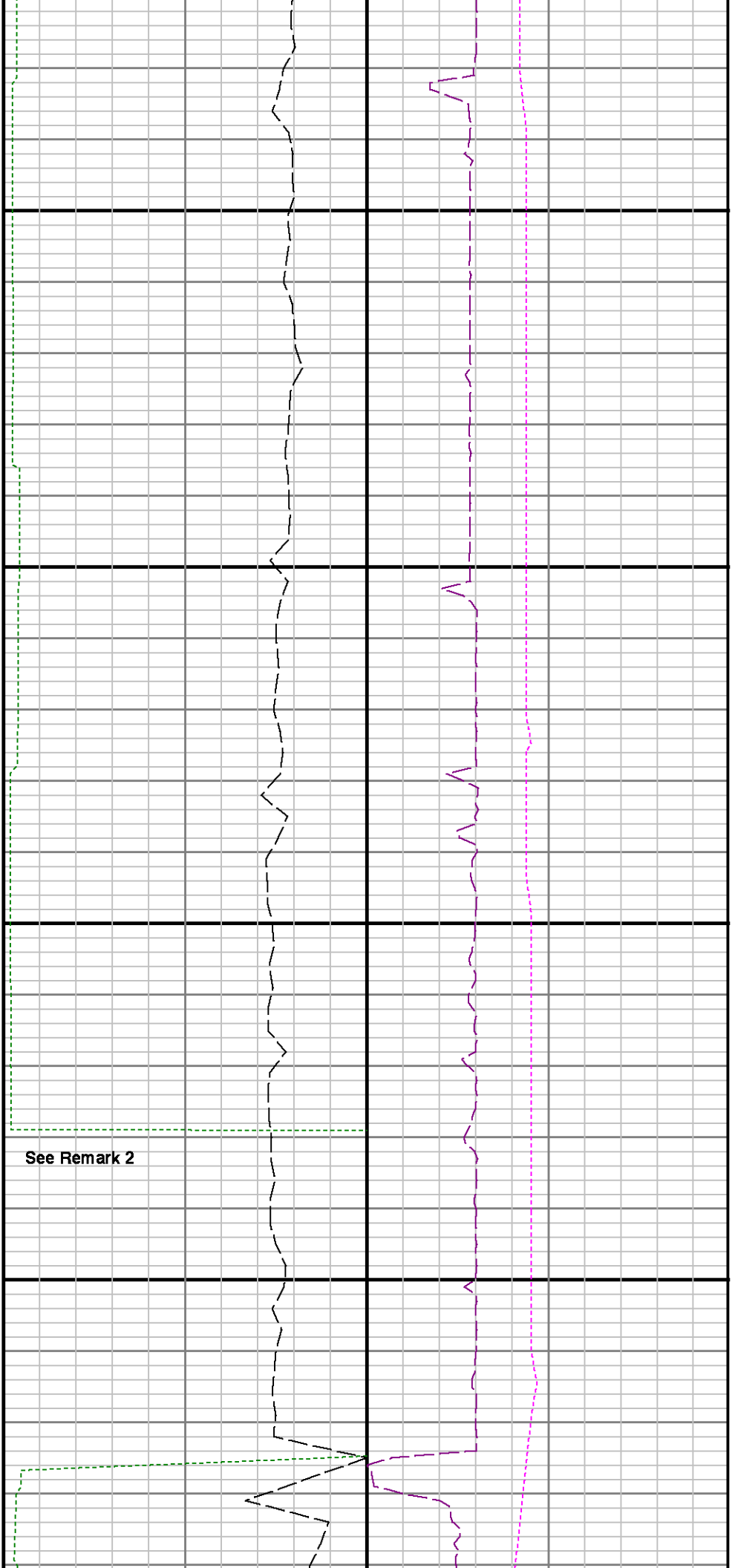










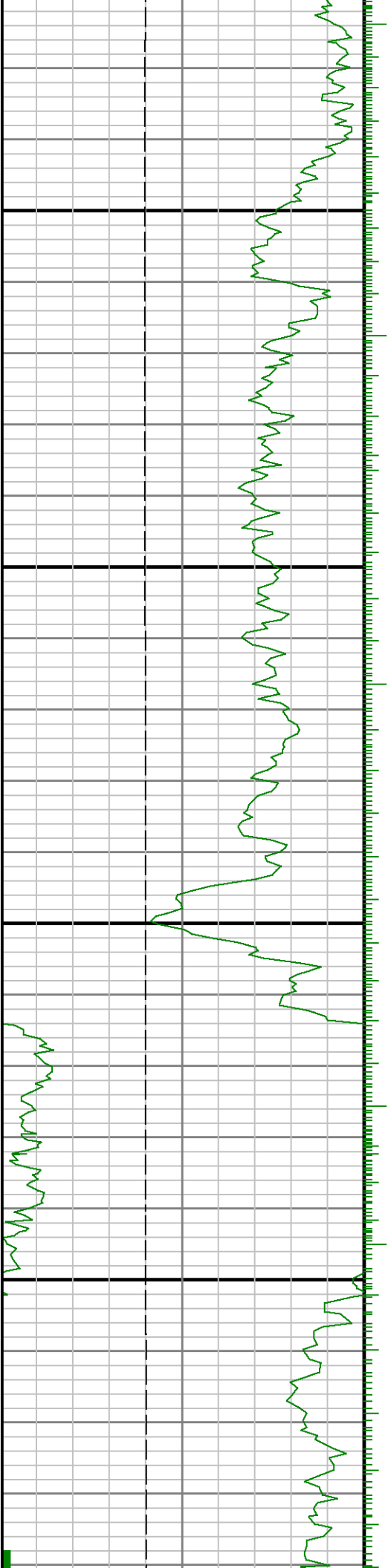


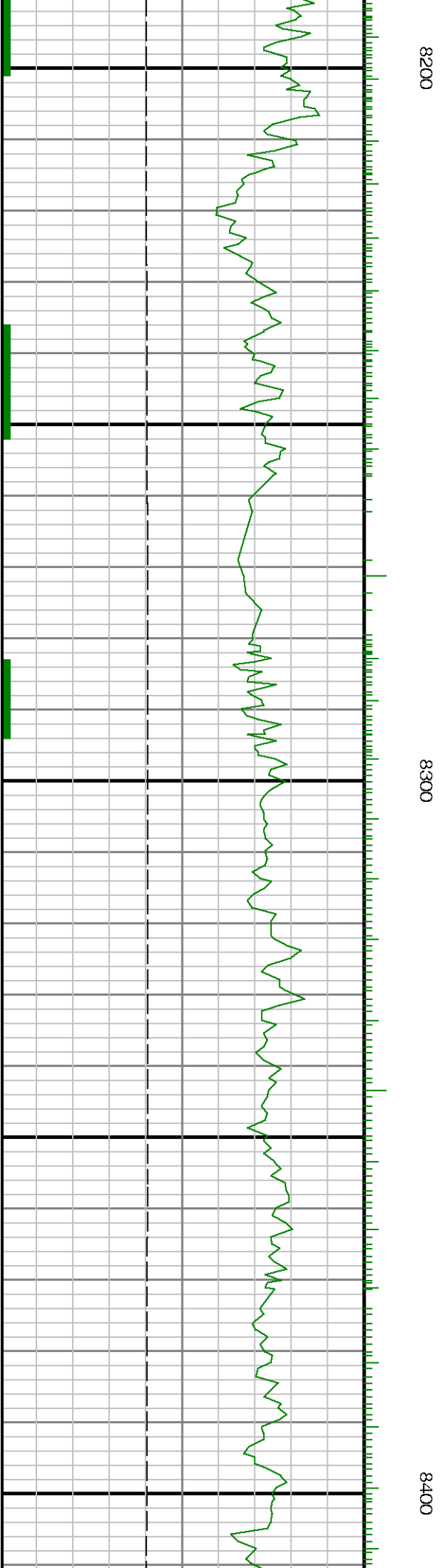
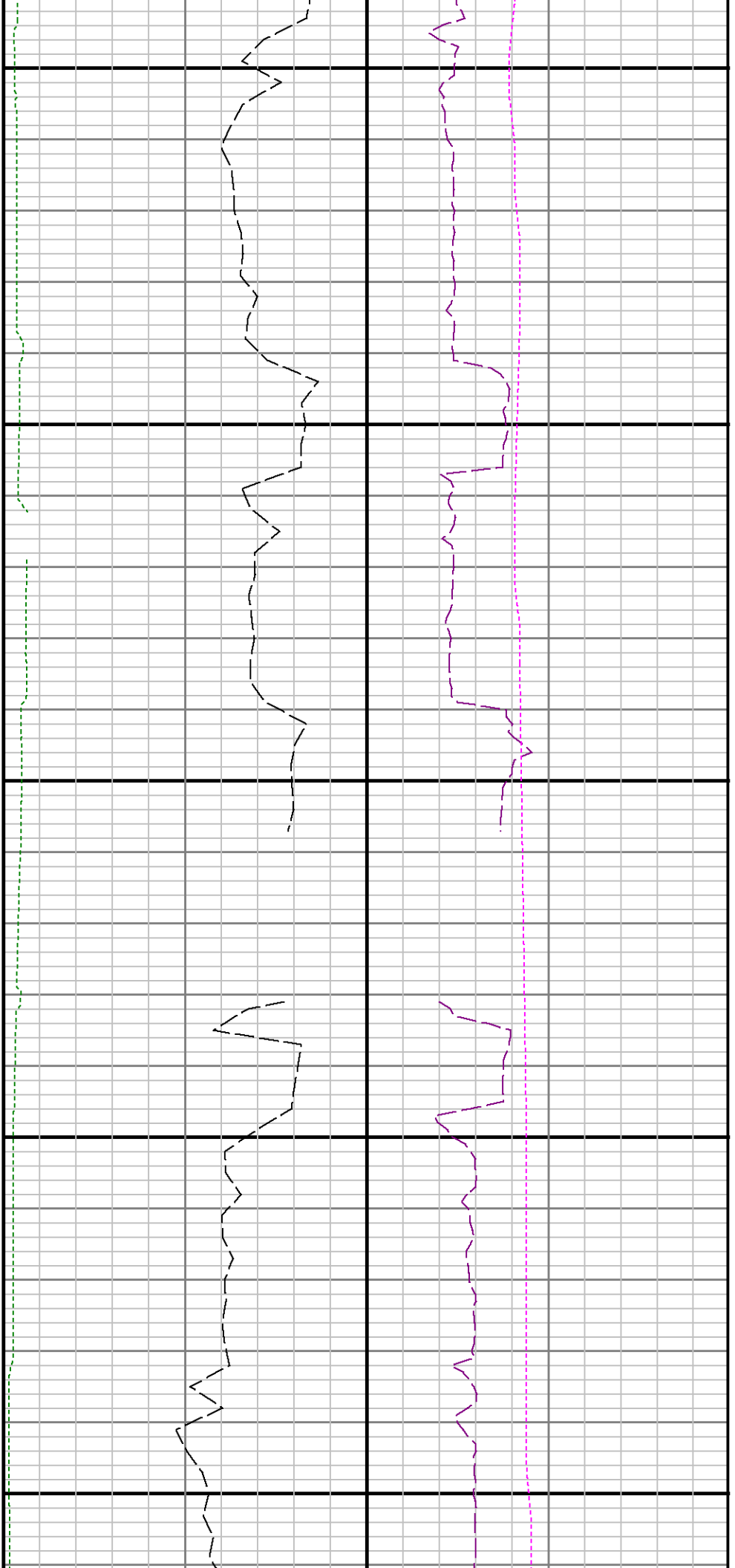
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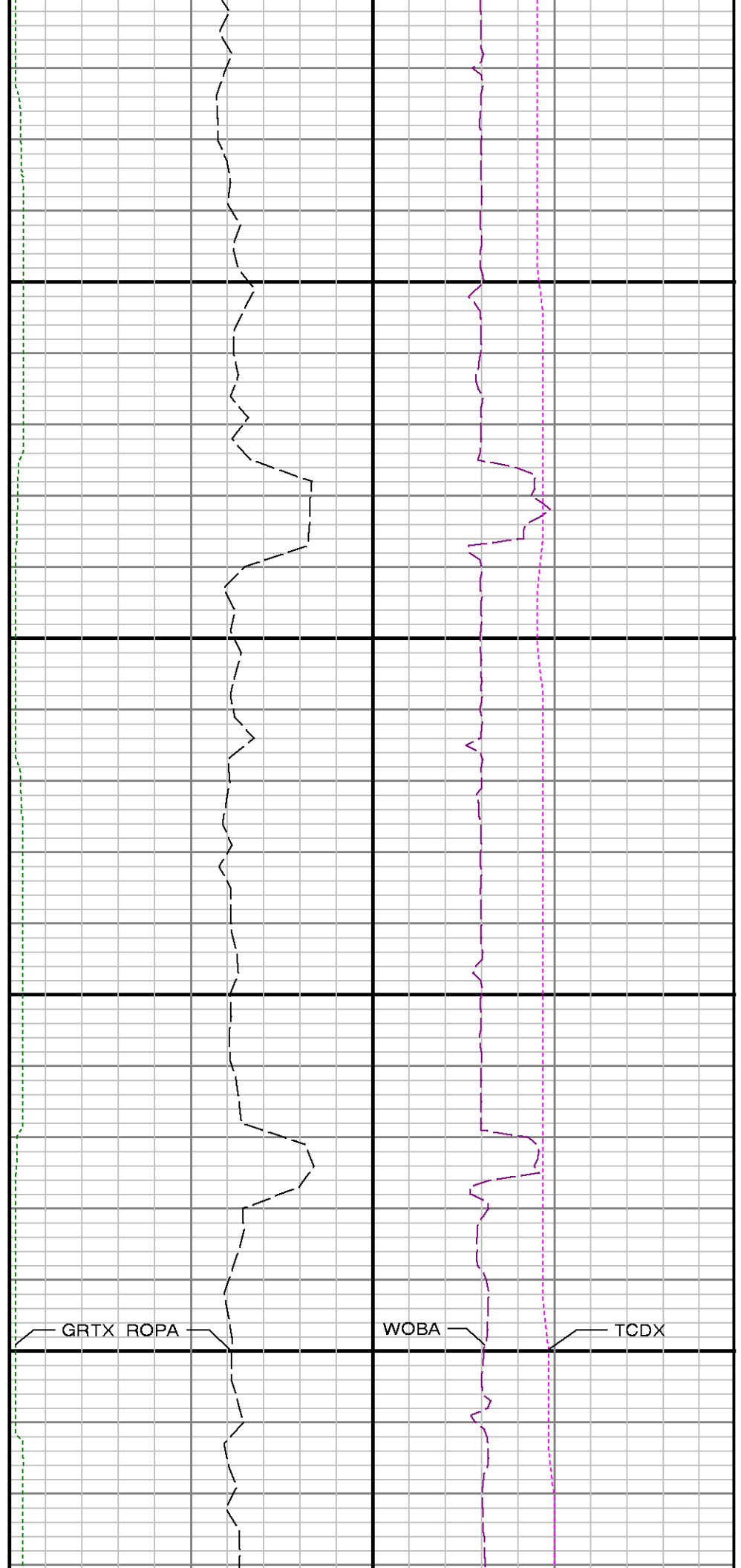
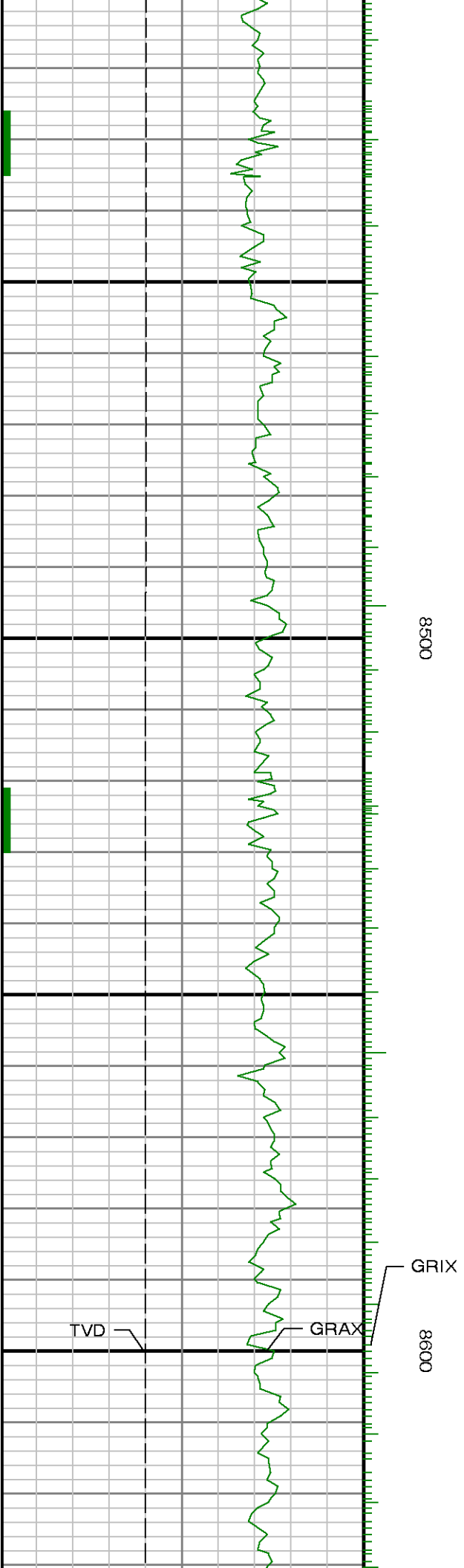
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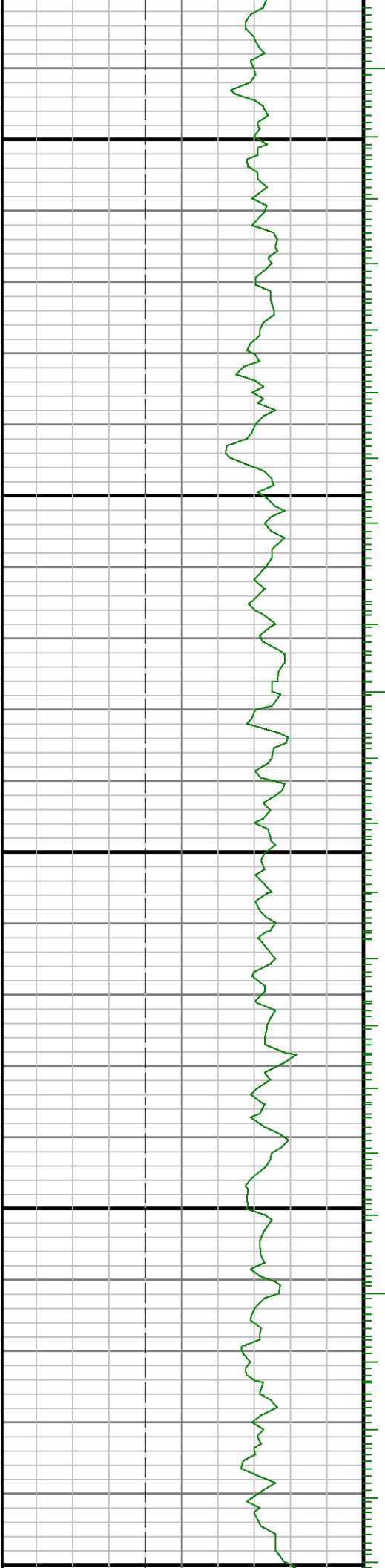
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Run 1 <> Run 2



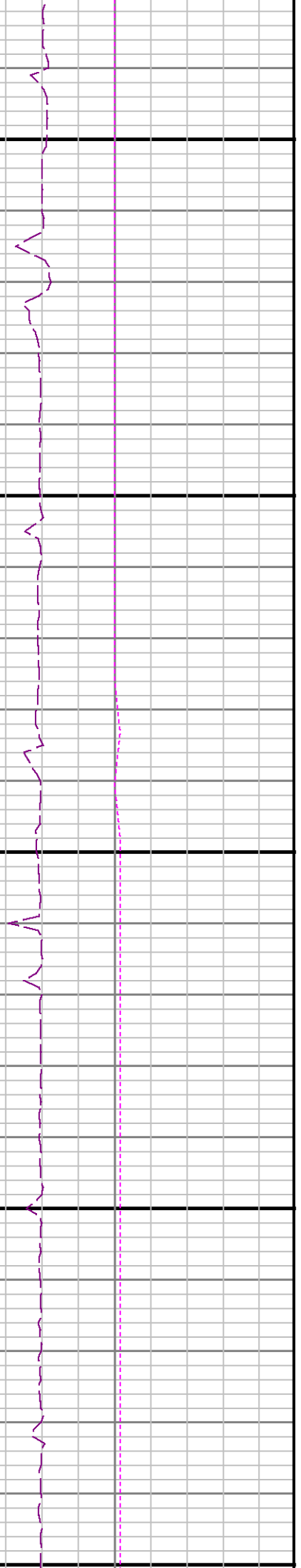
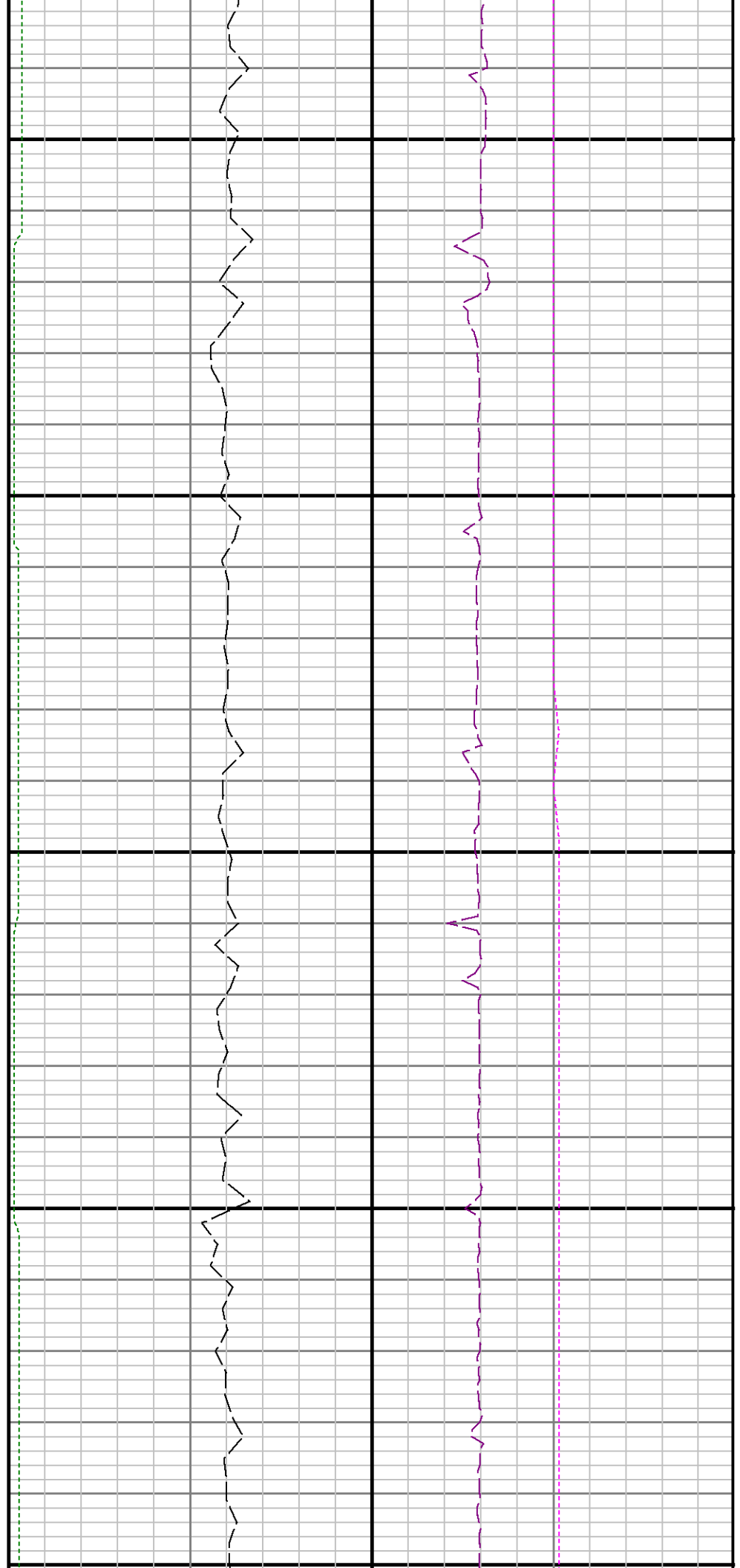


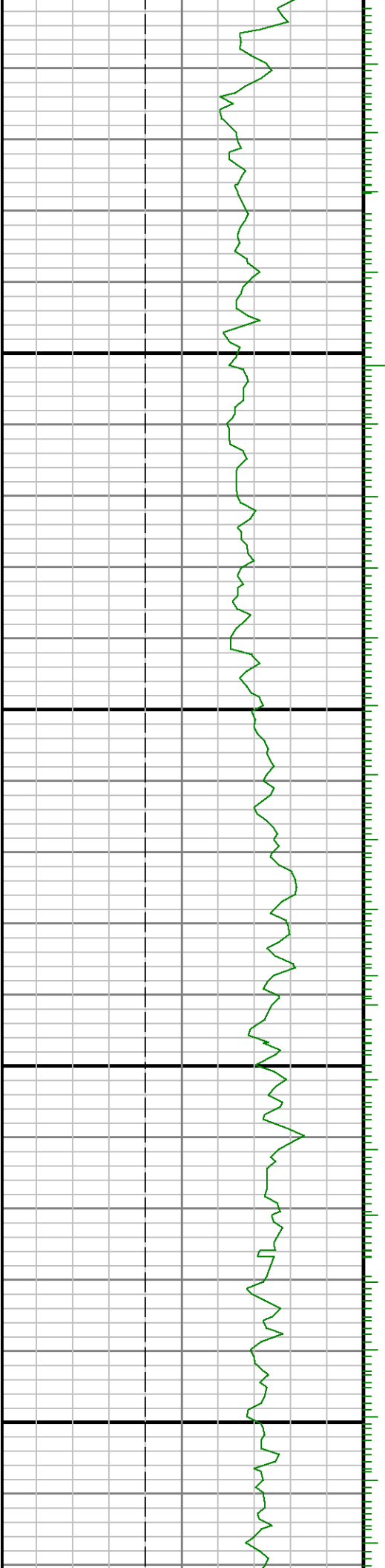




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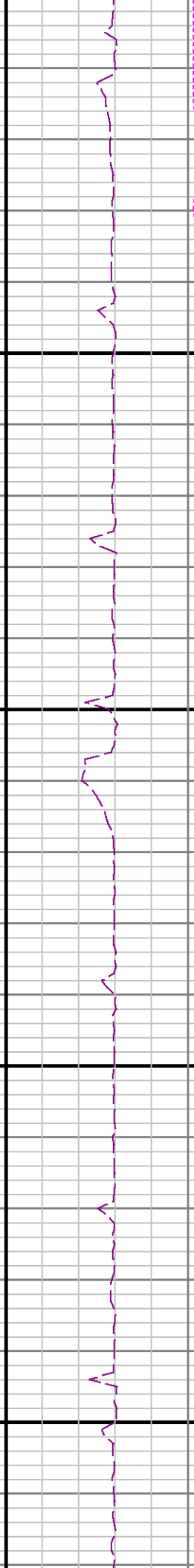
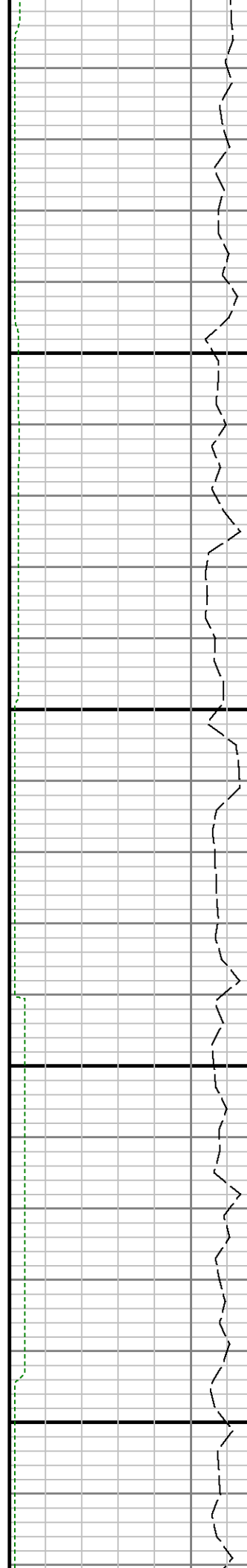
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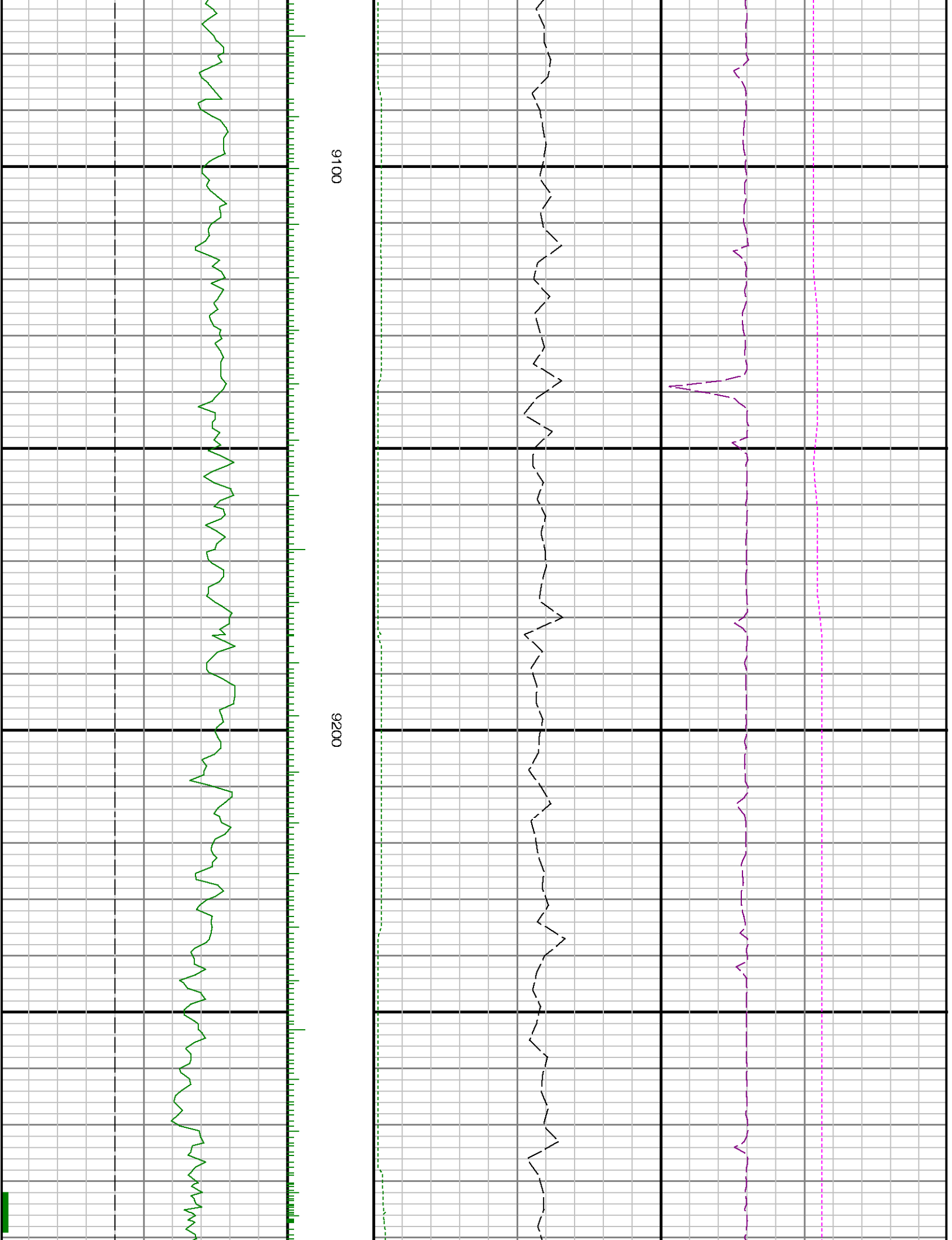


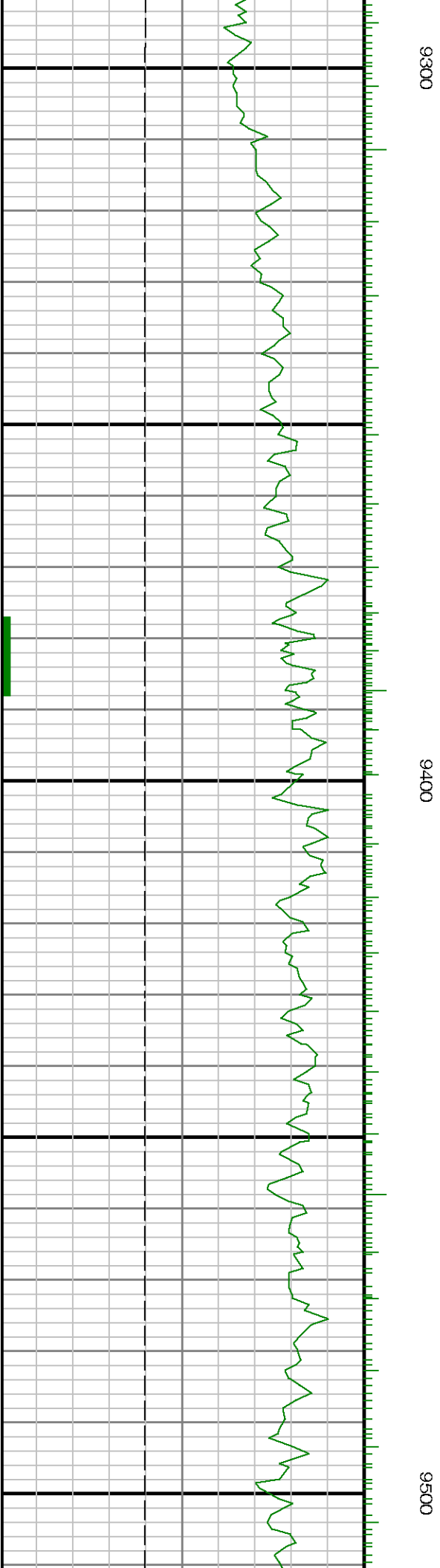
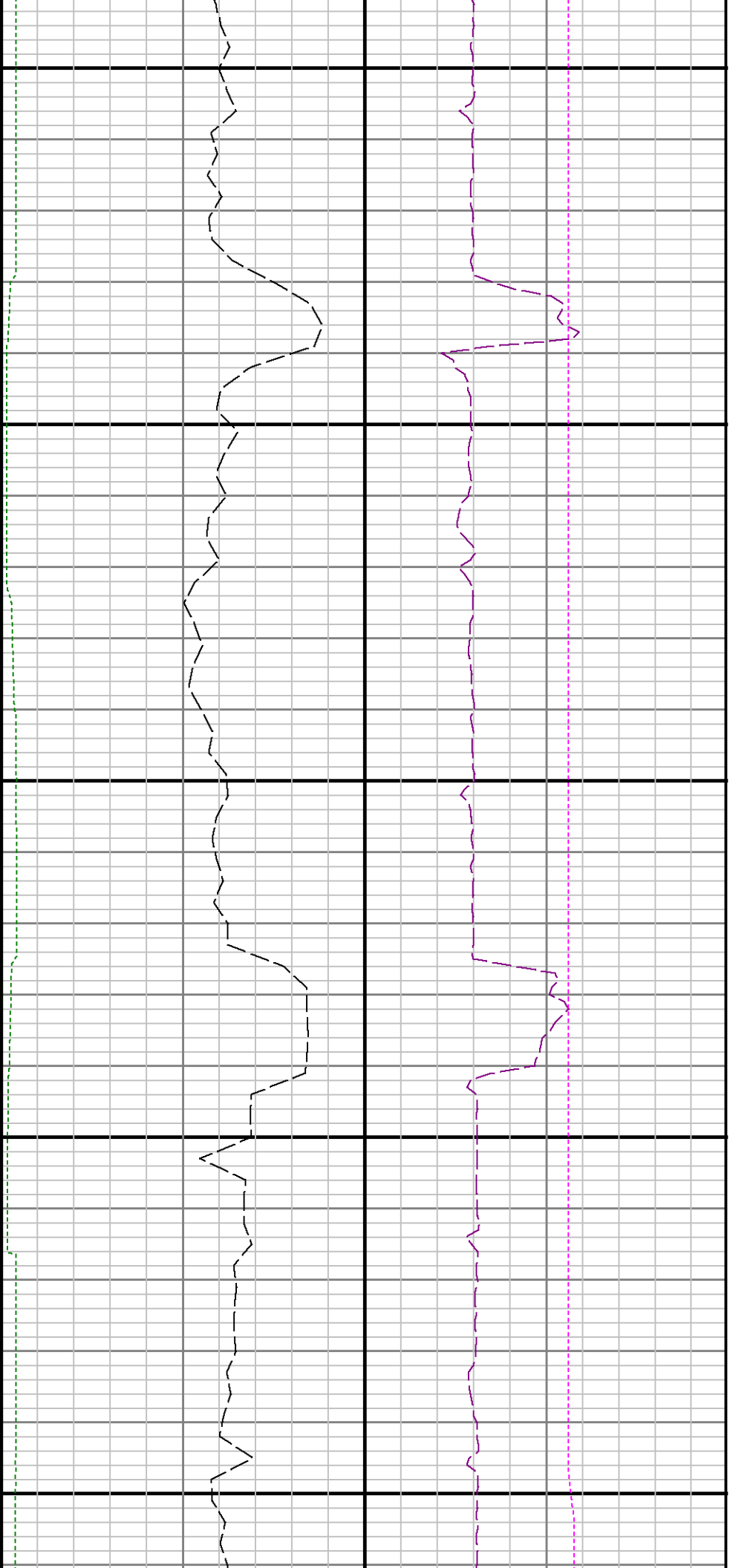


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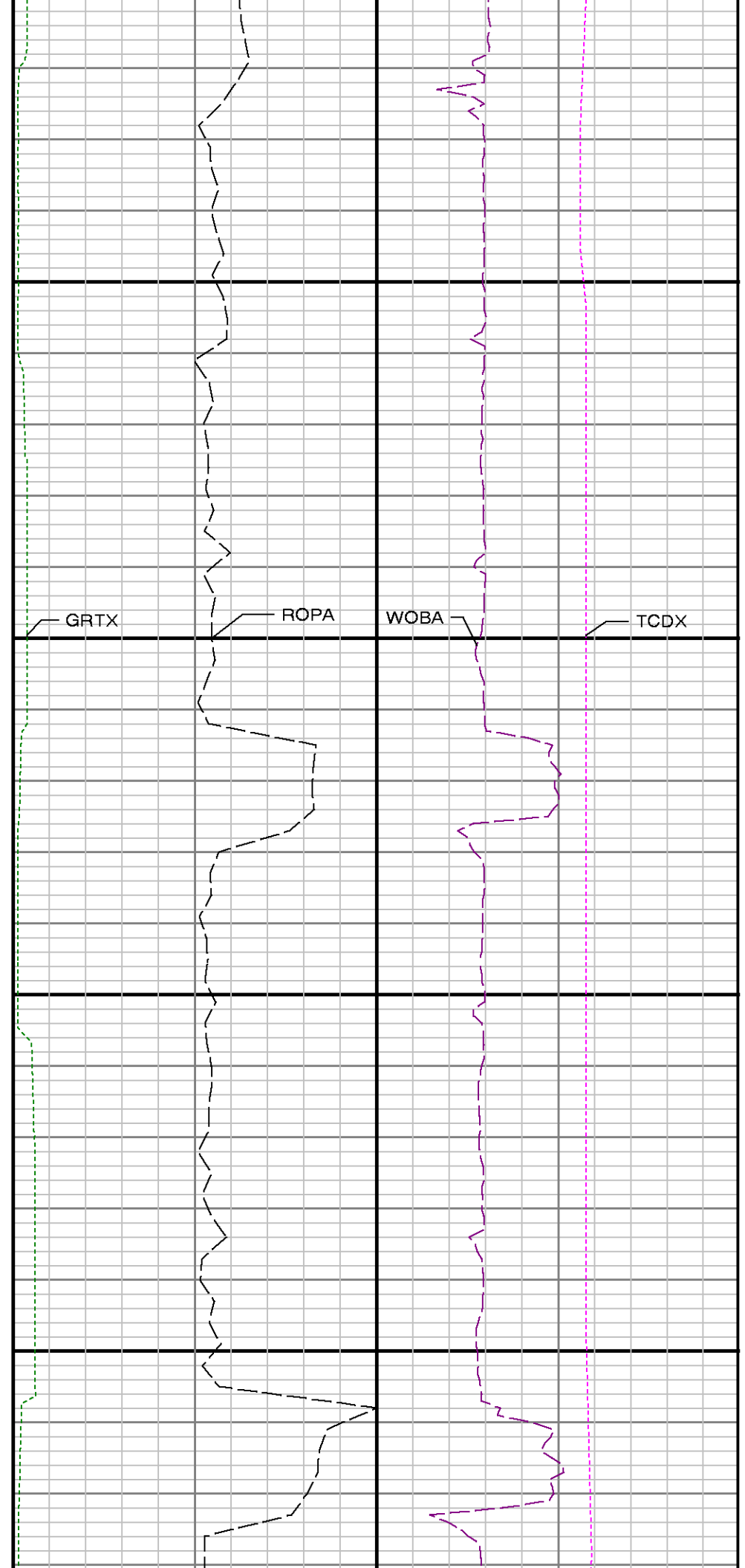
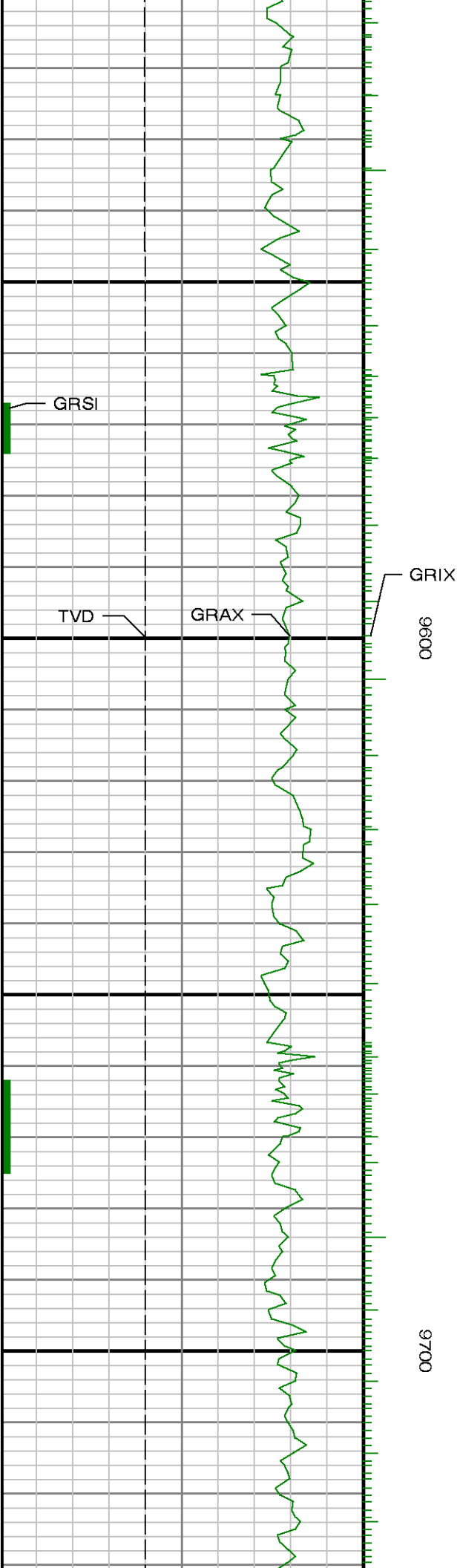
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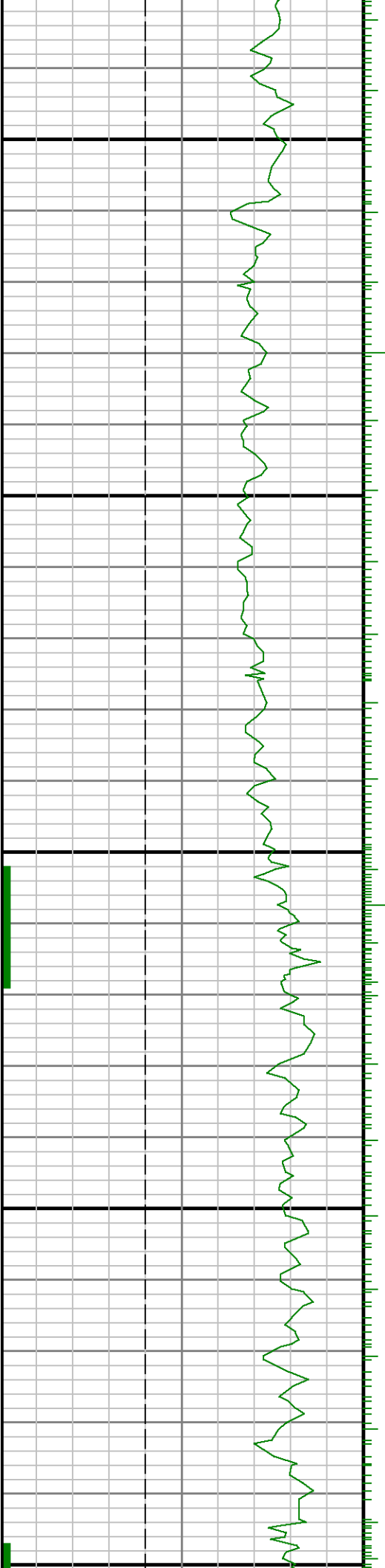






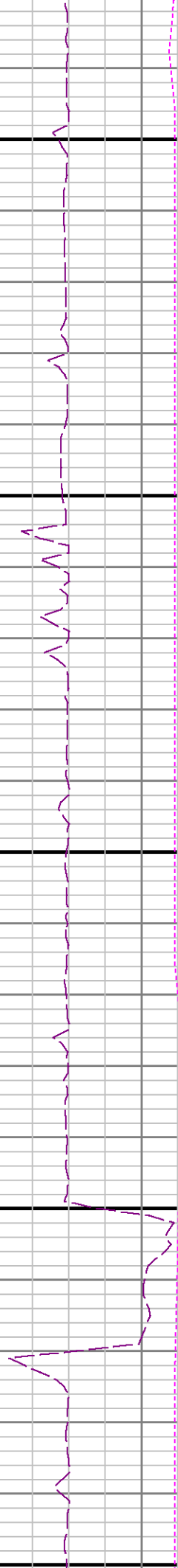


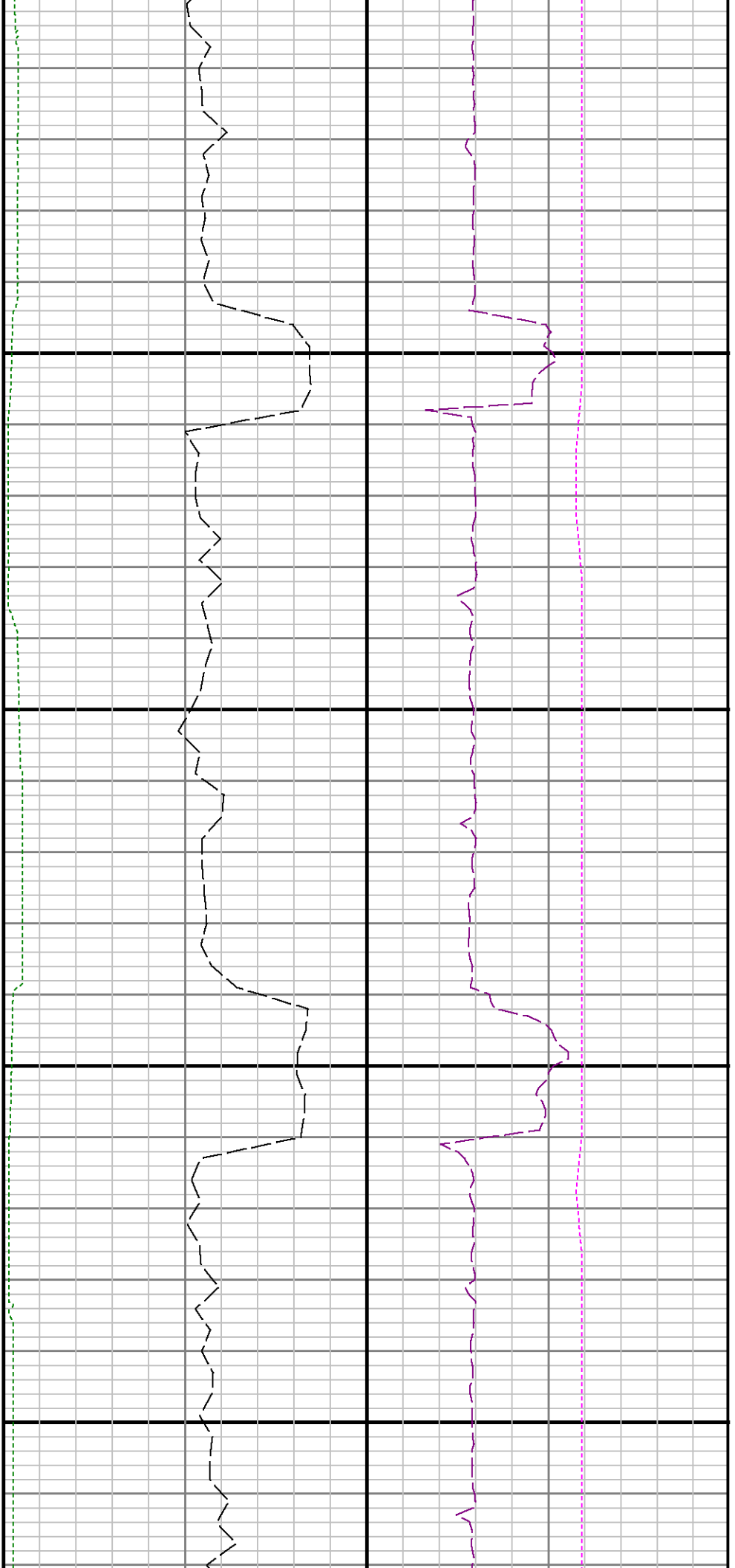




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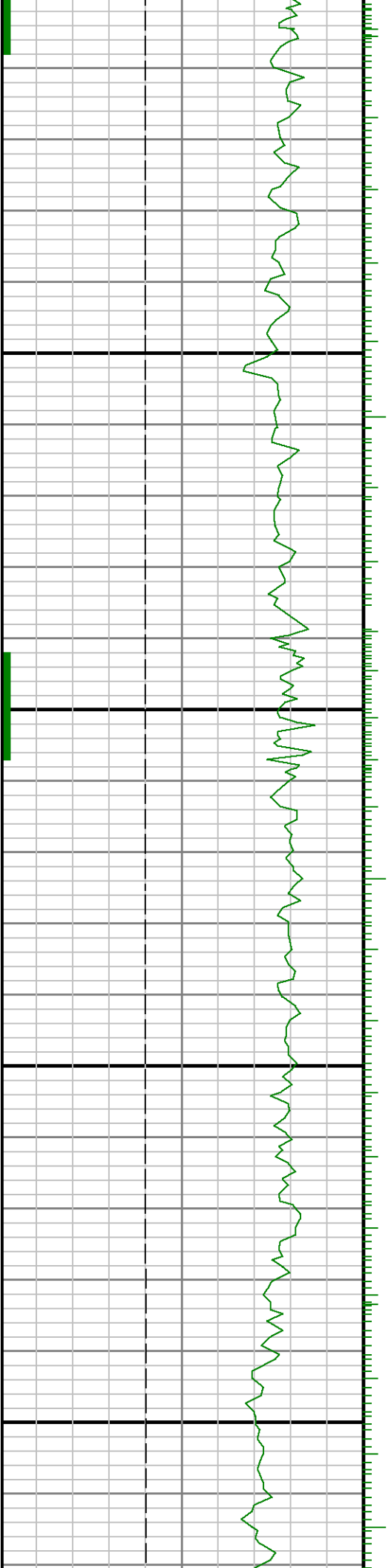
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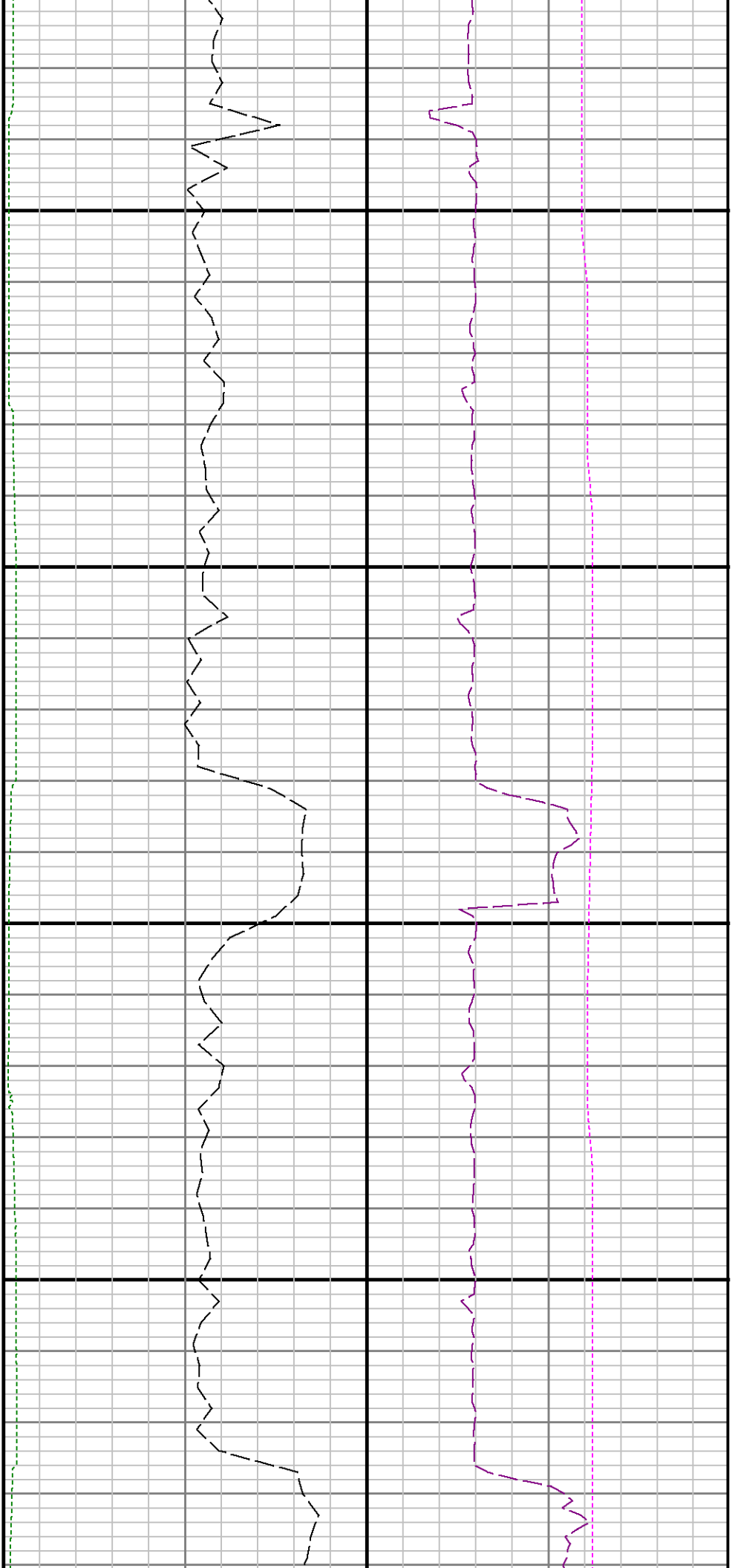




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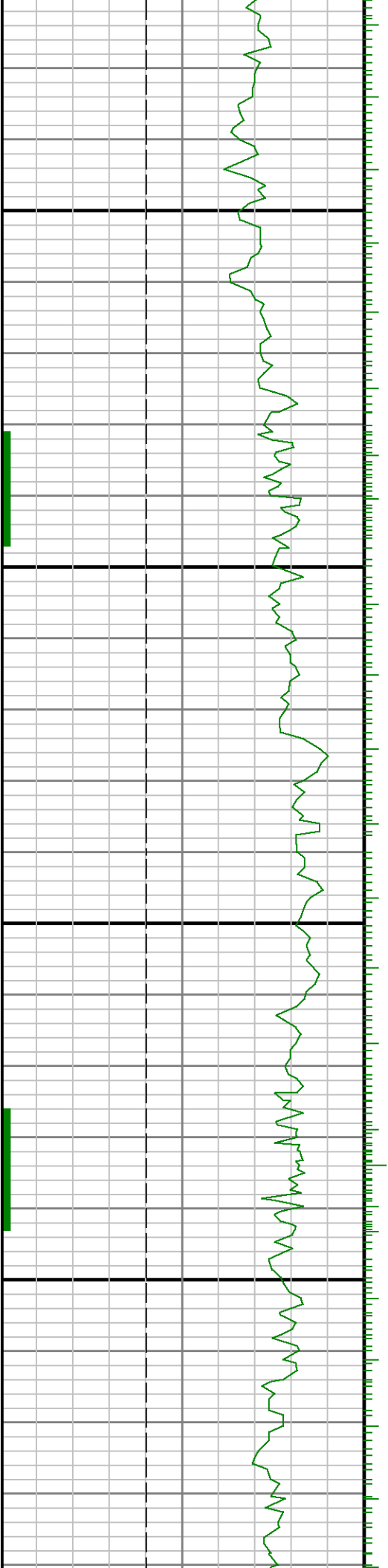
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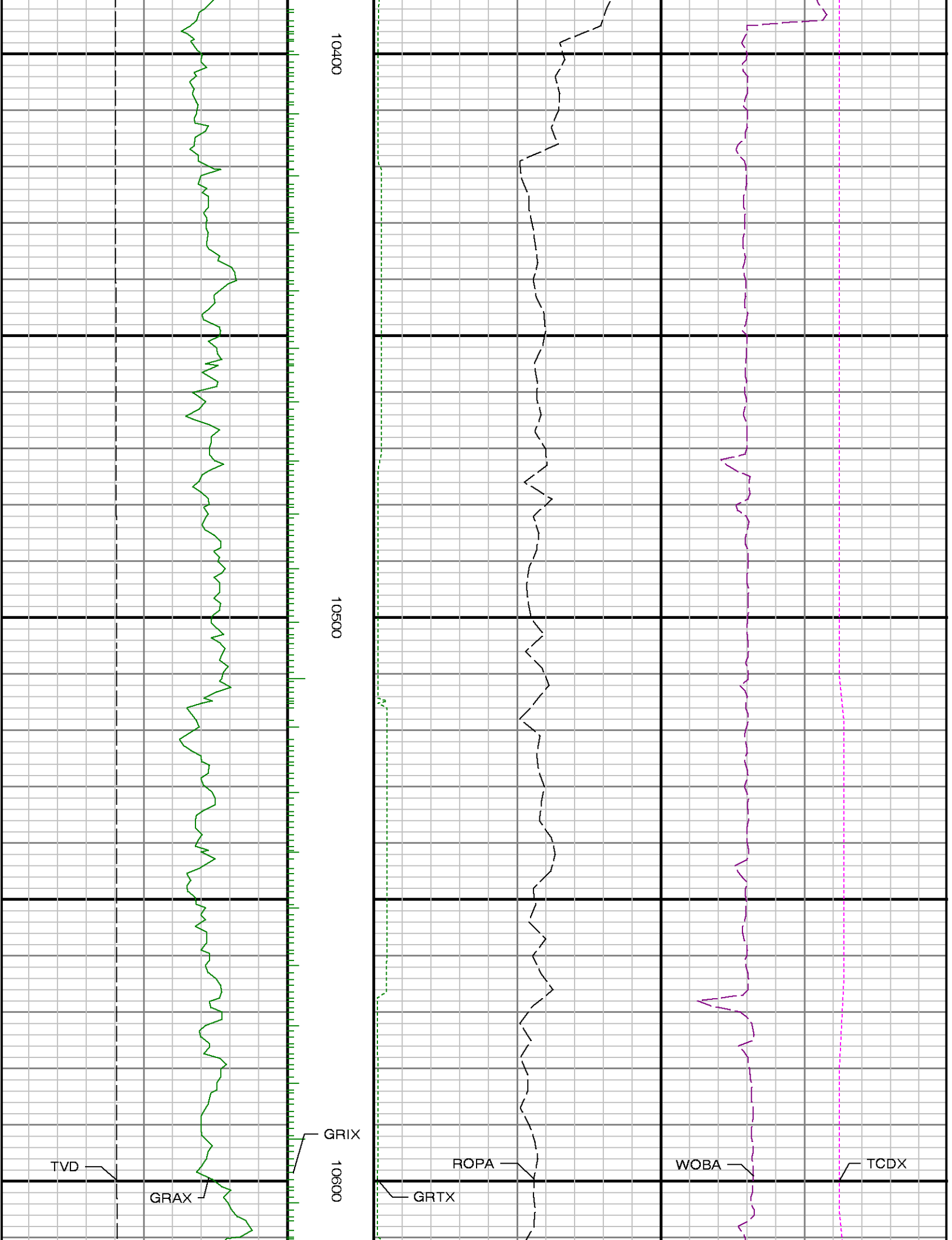


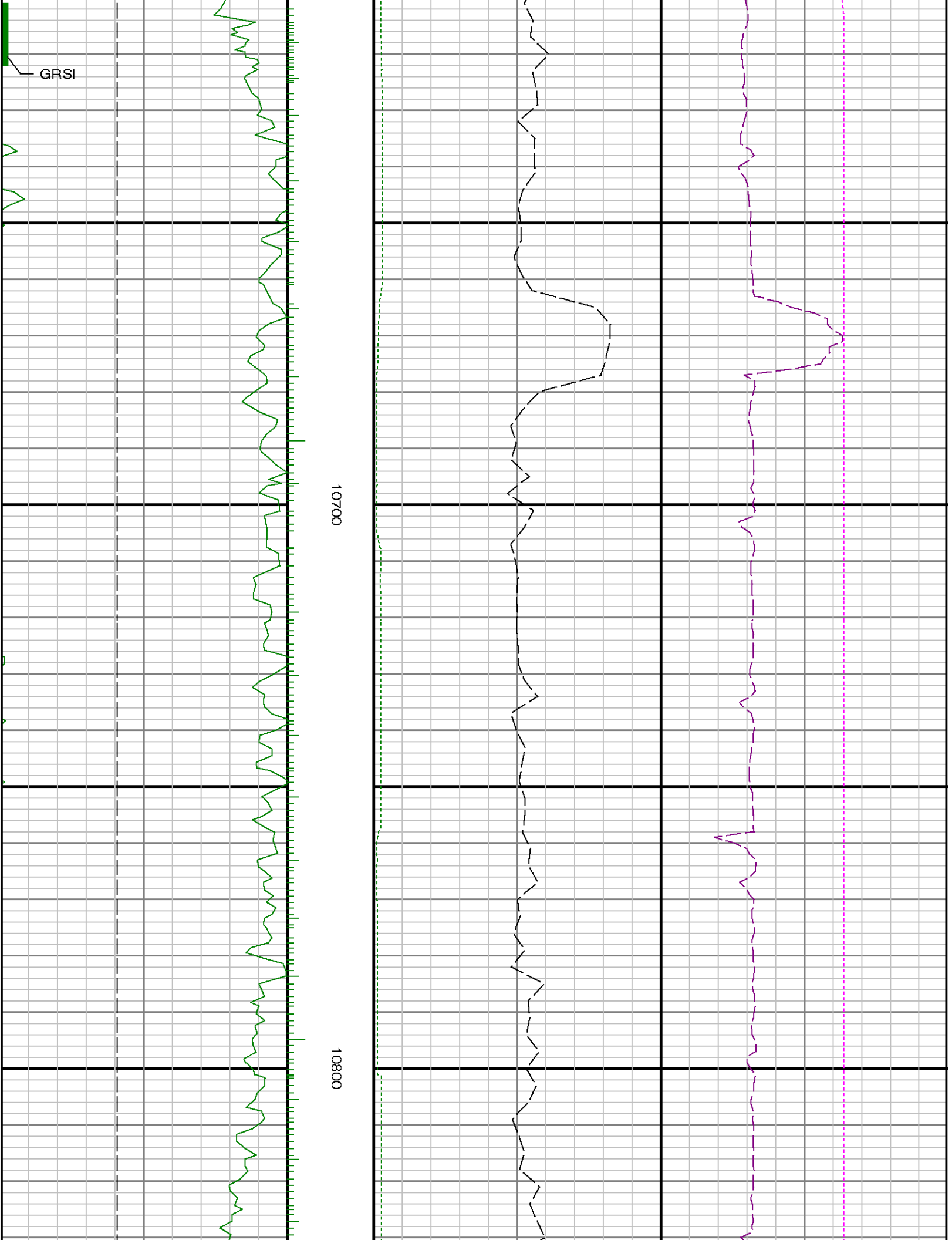


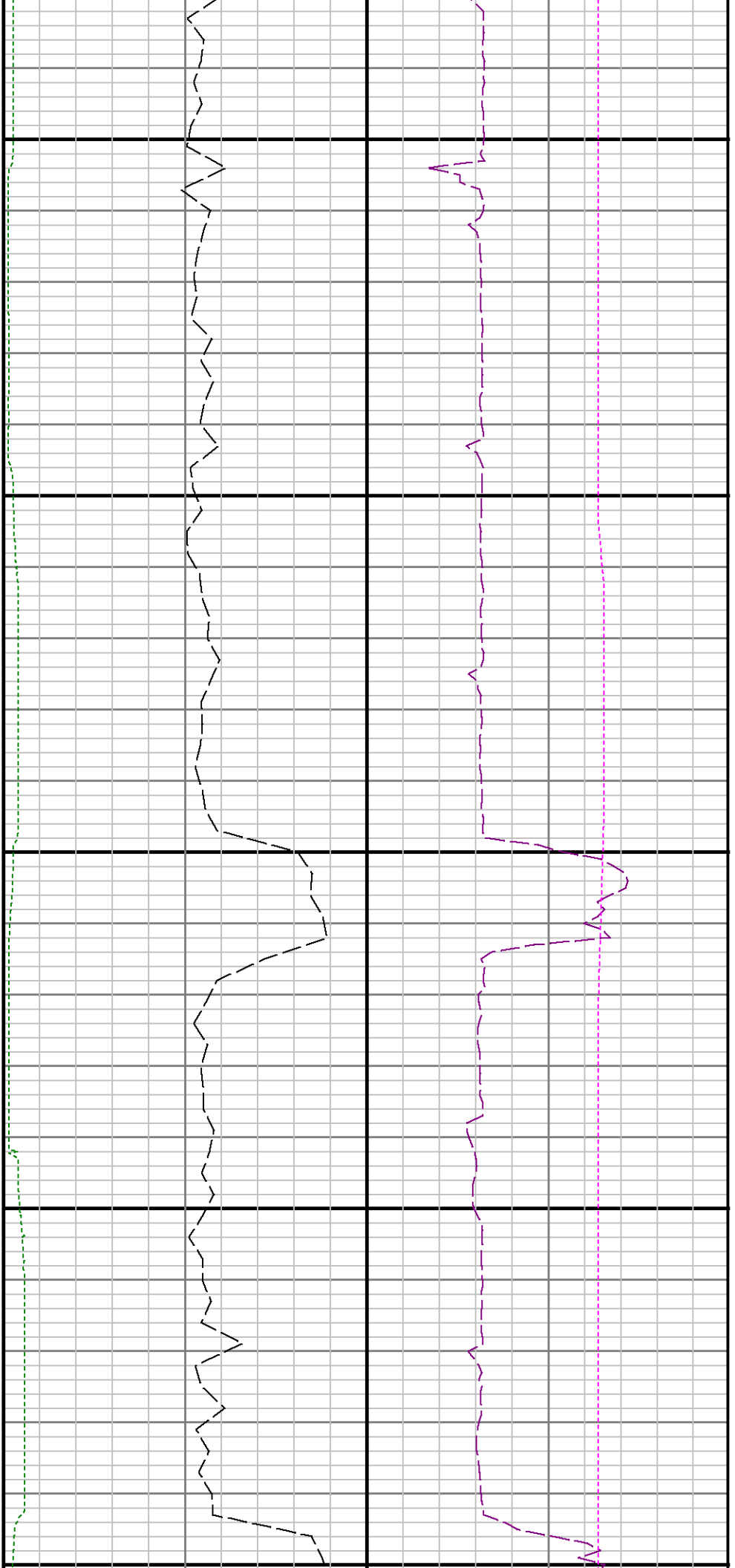
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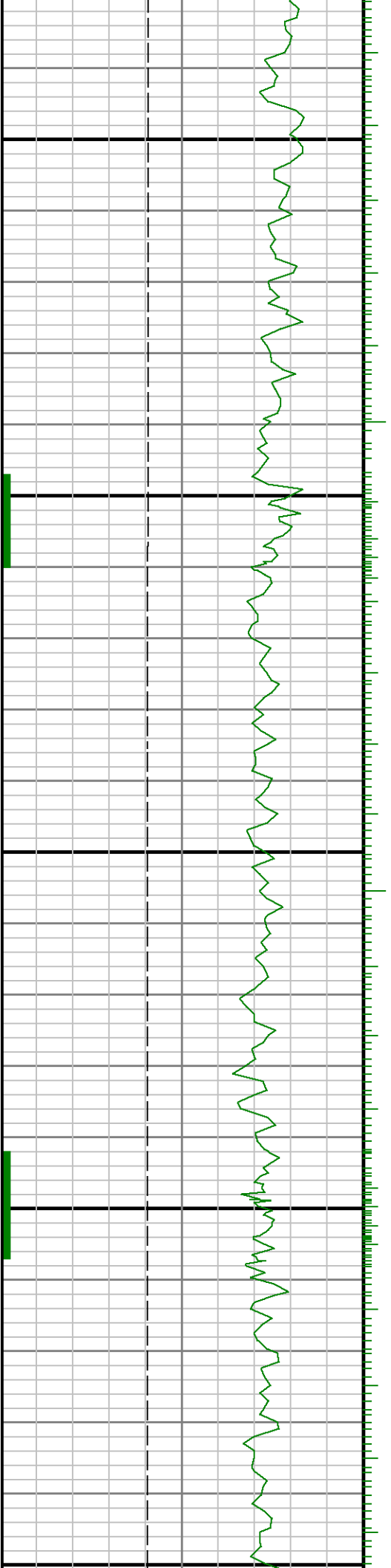


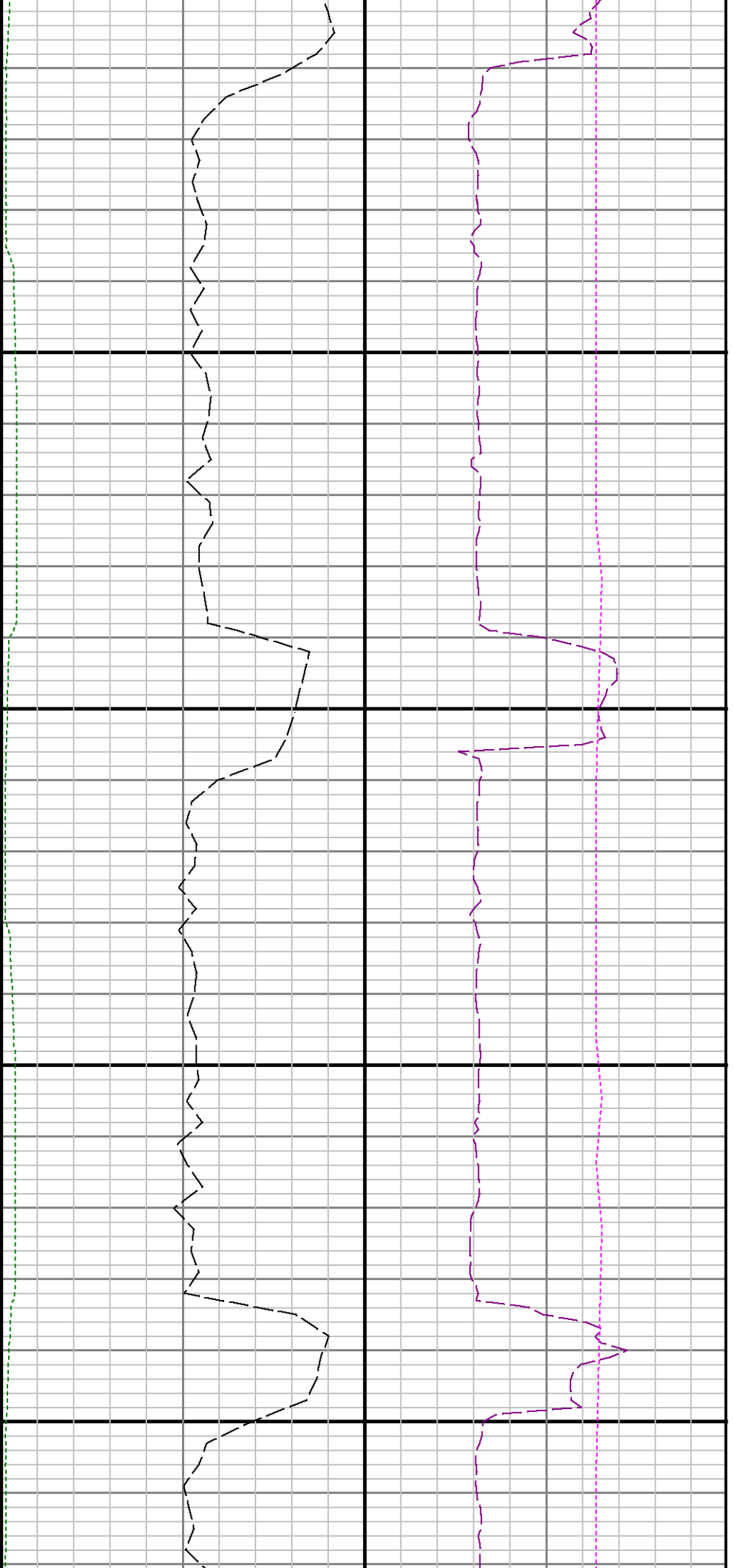




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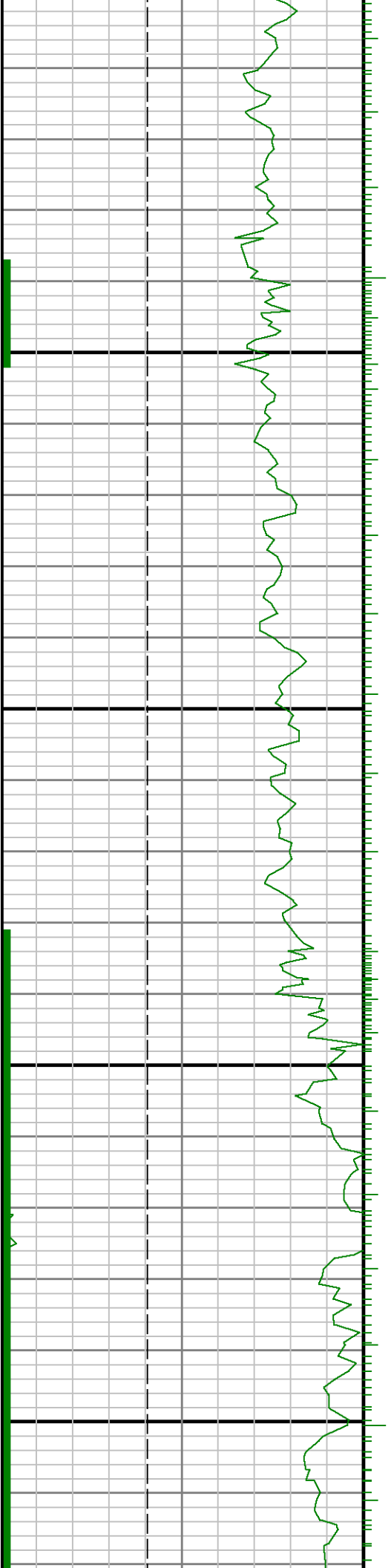
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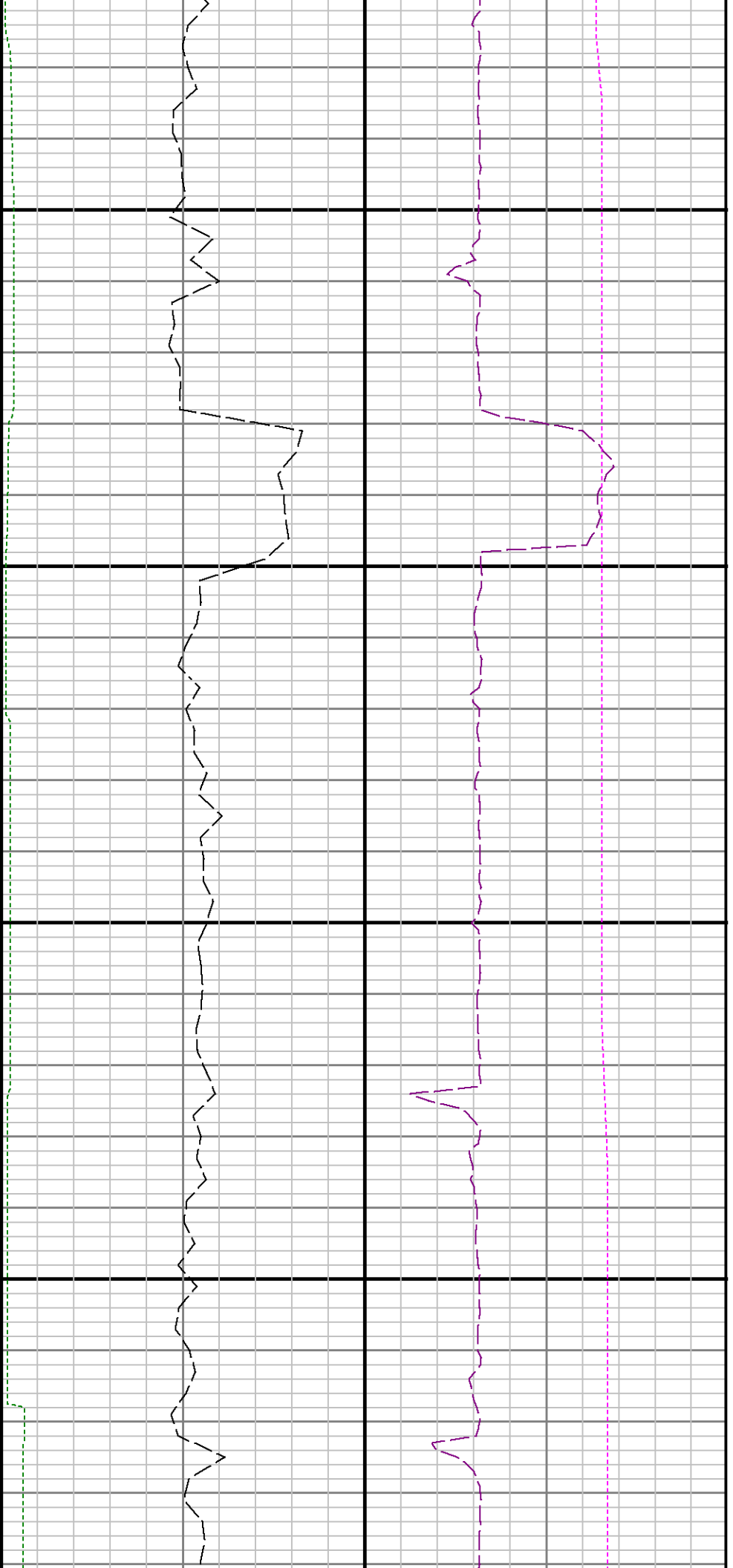


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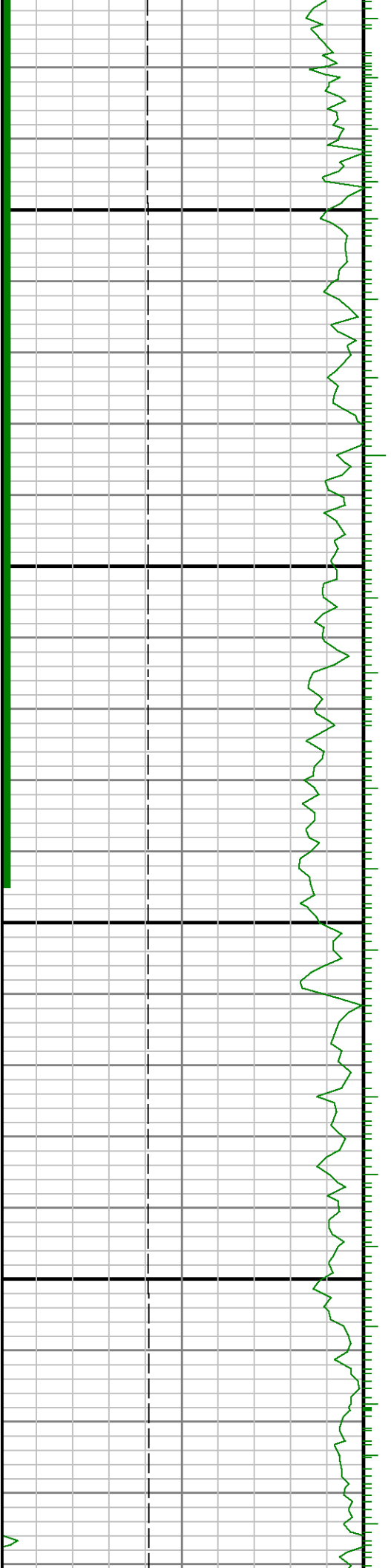


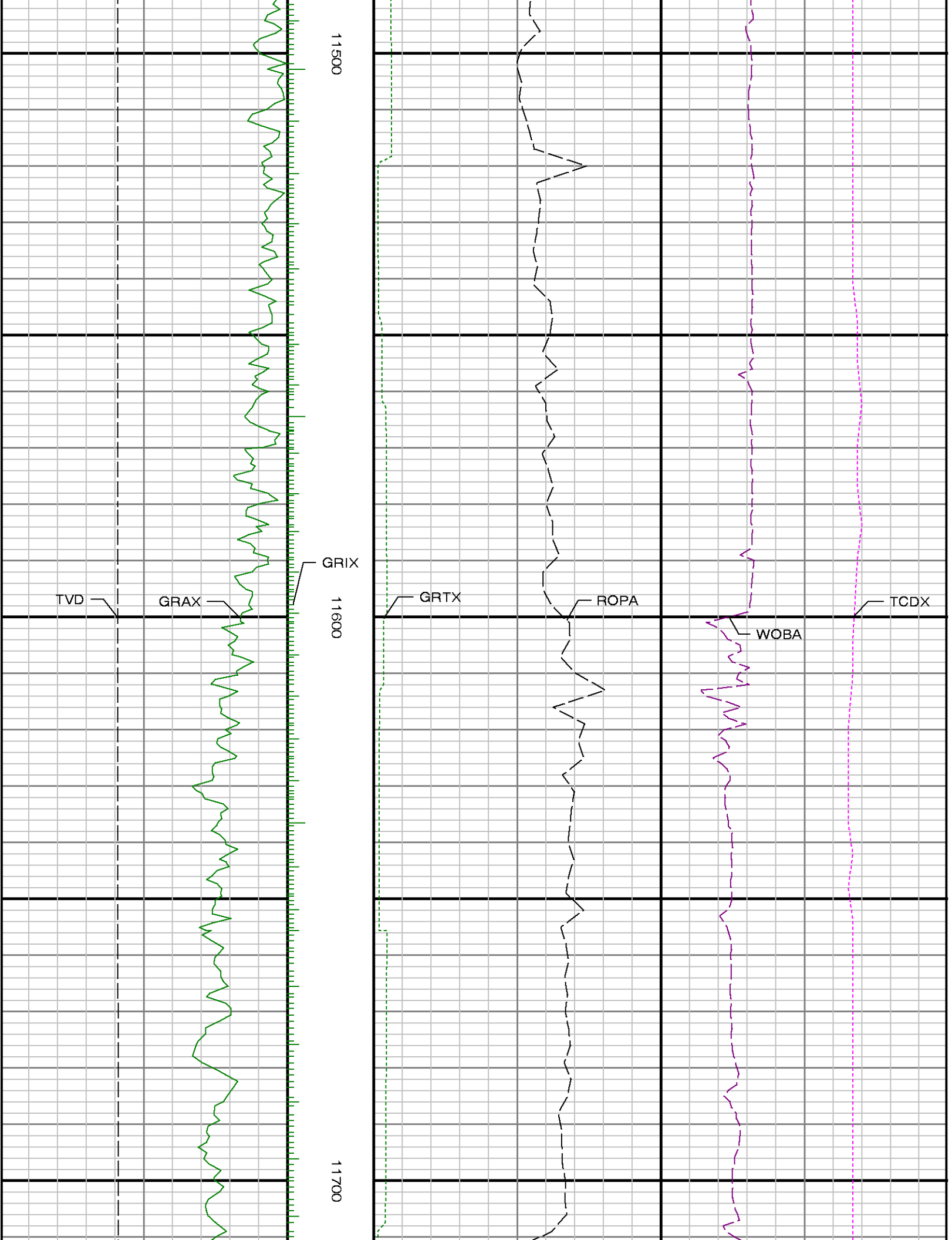




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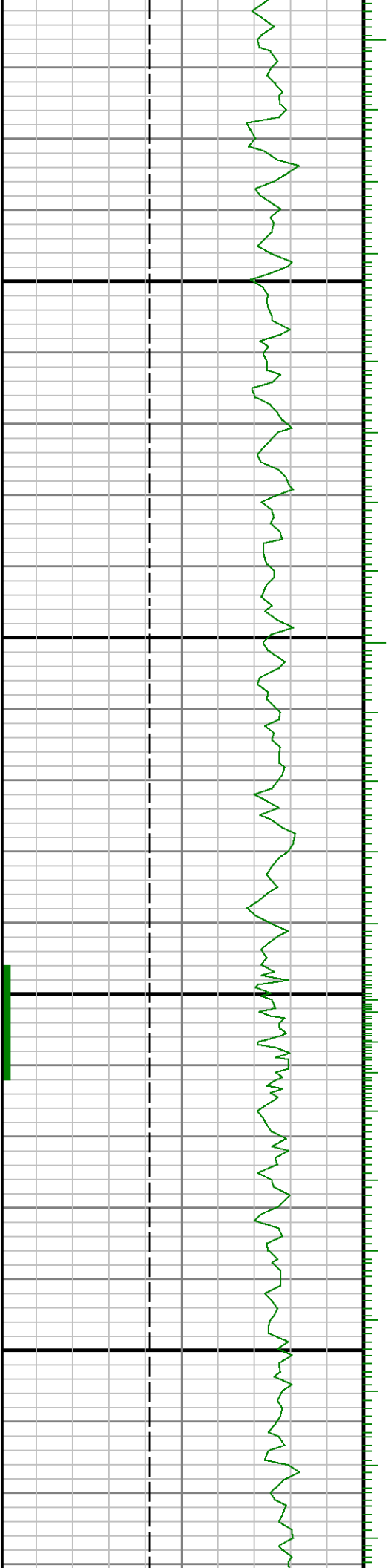


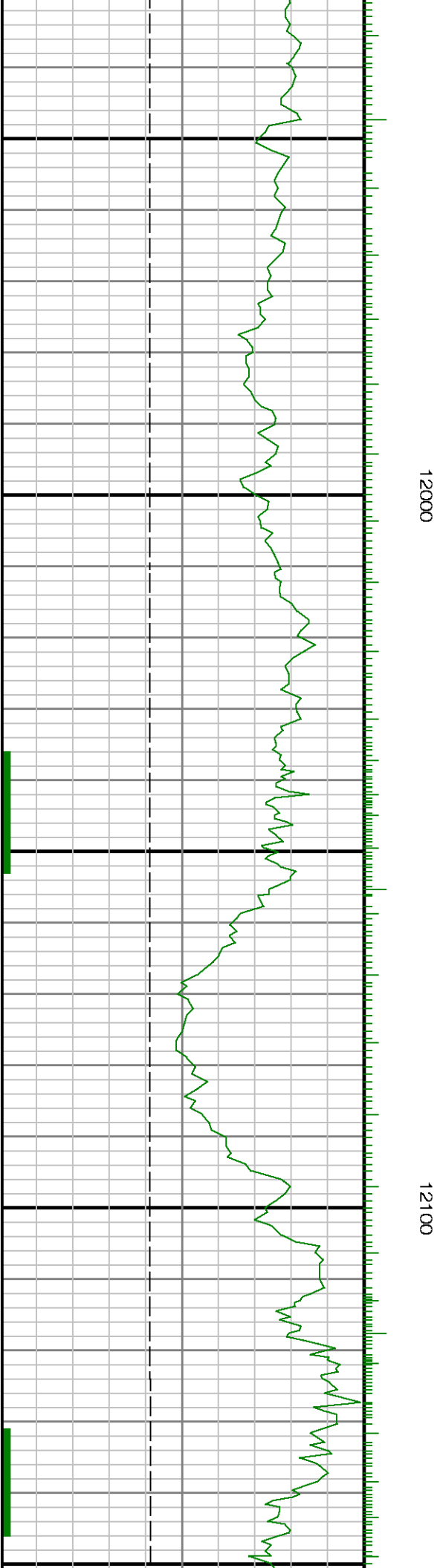
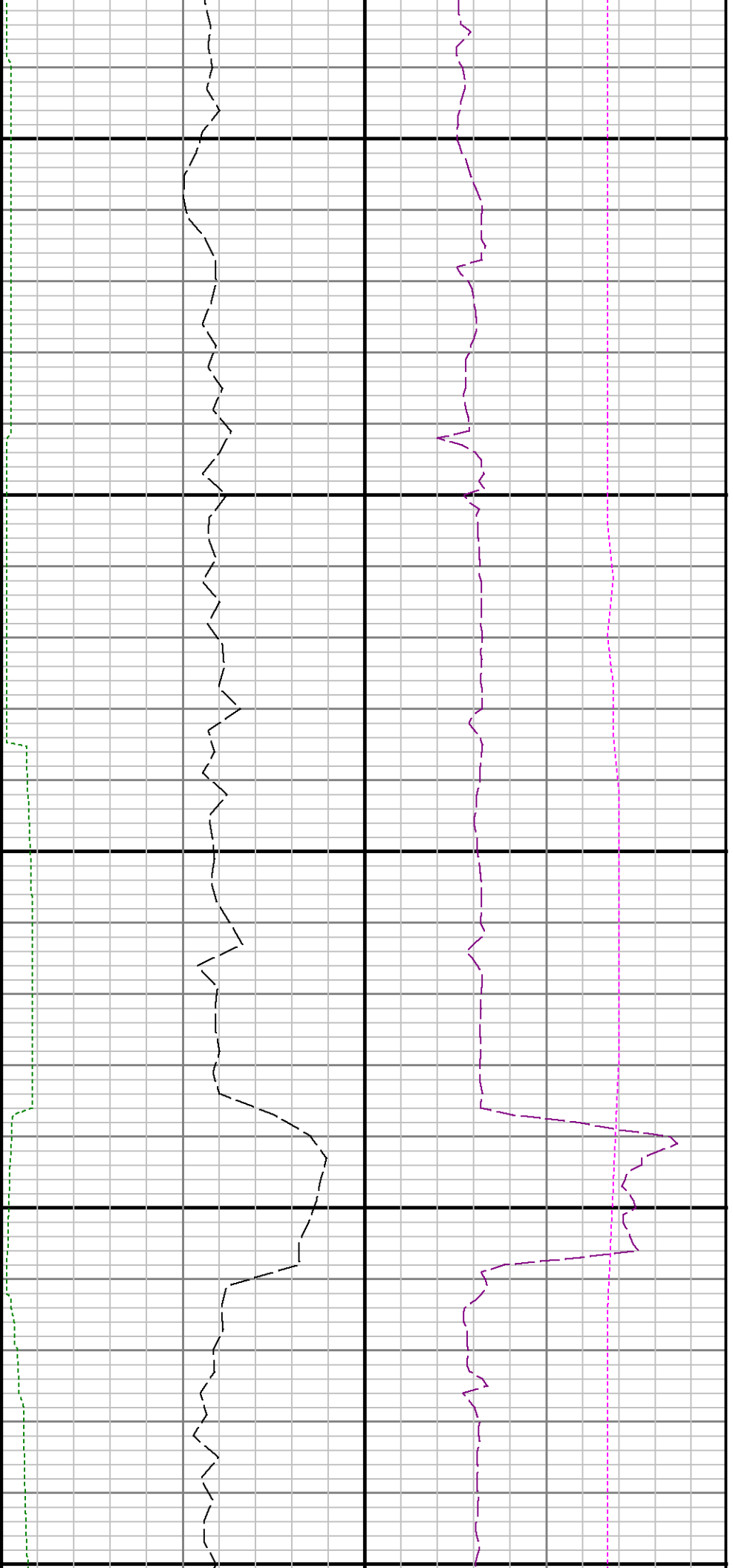


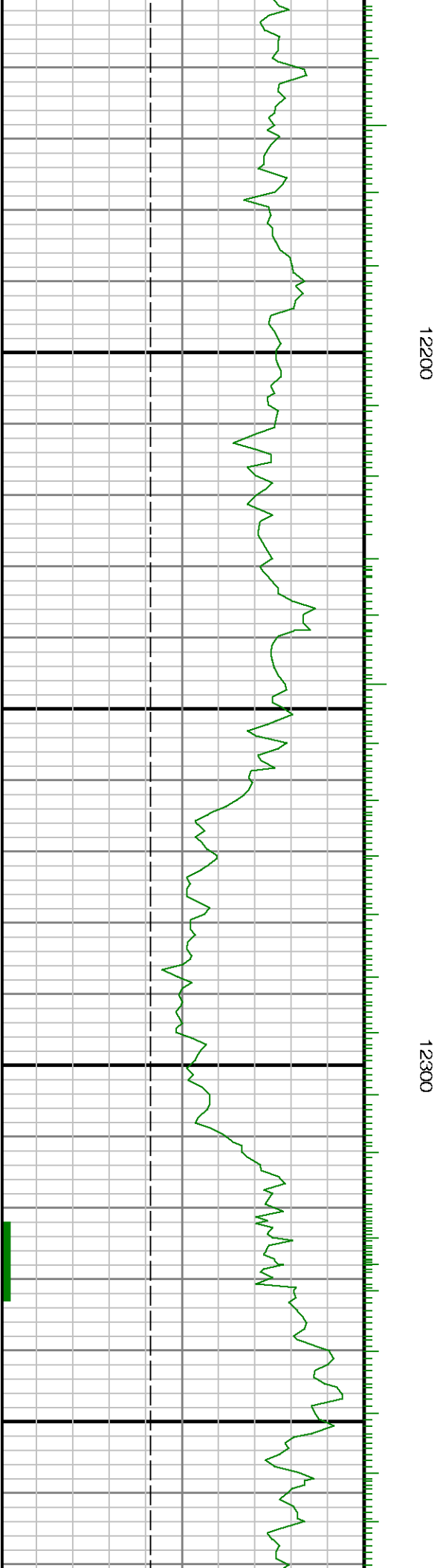
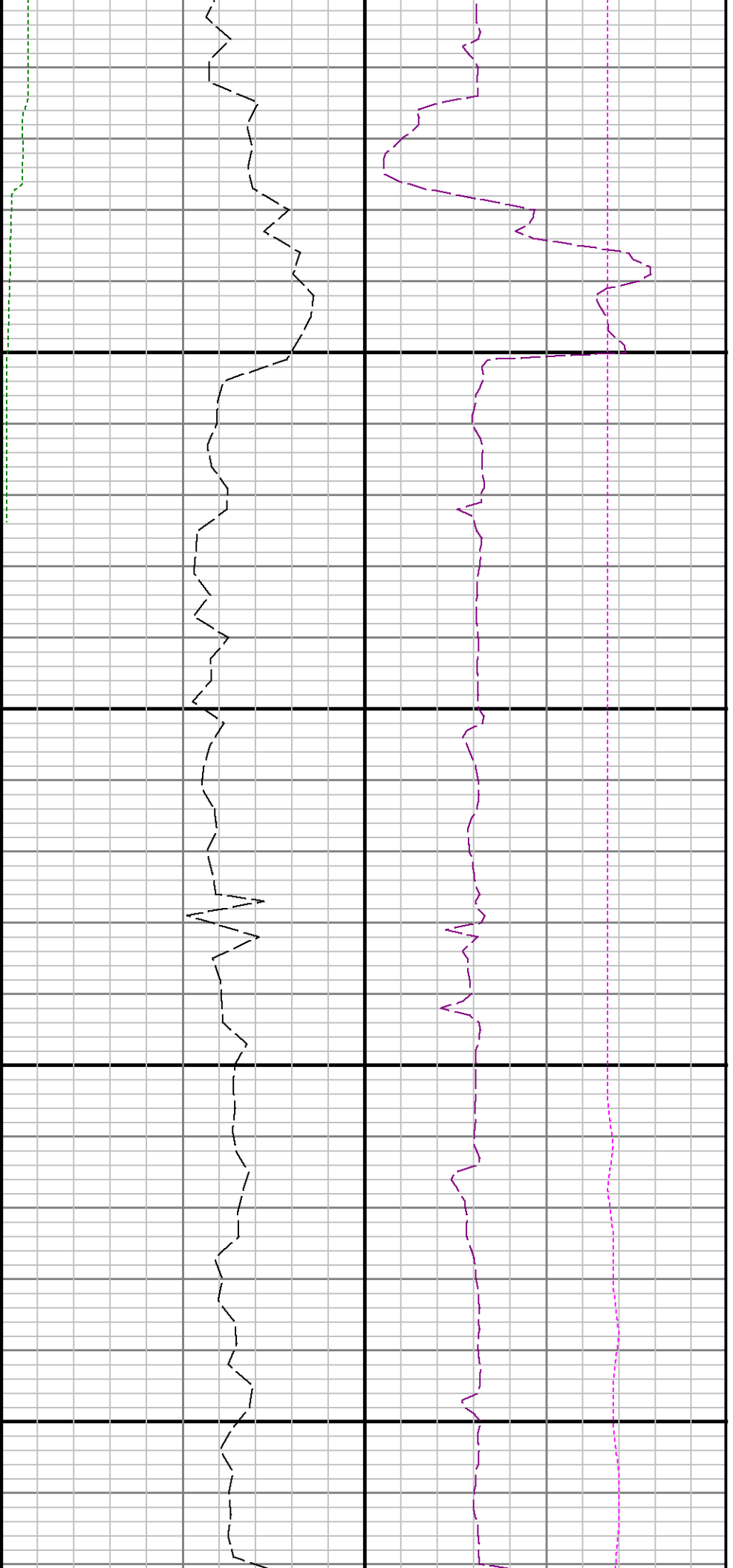


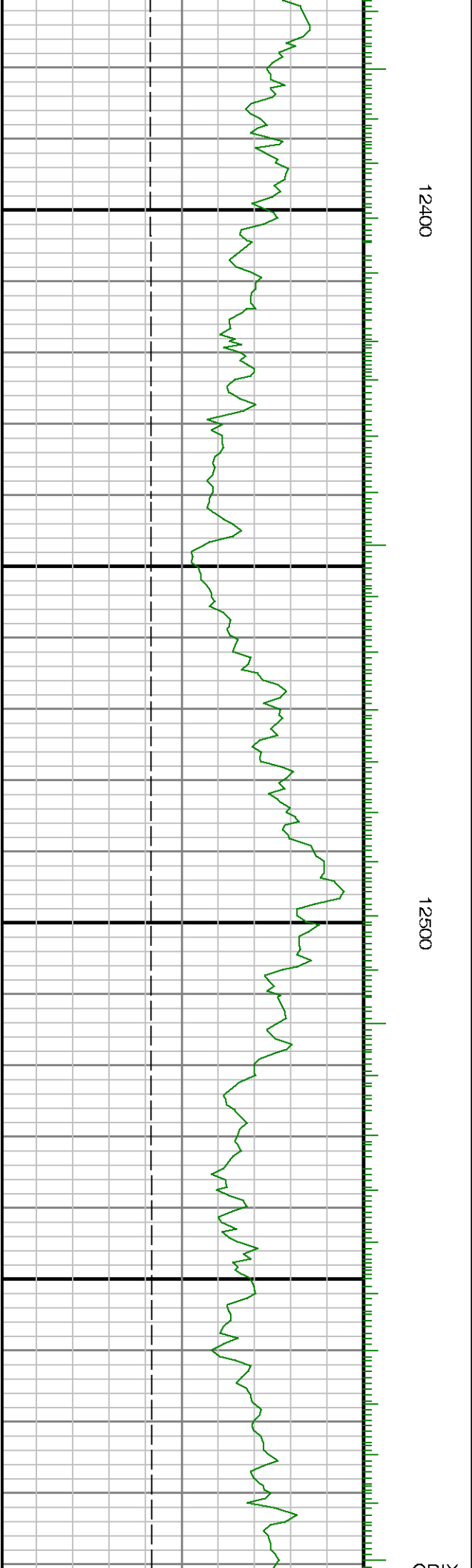
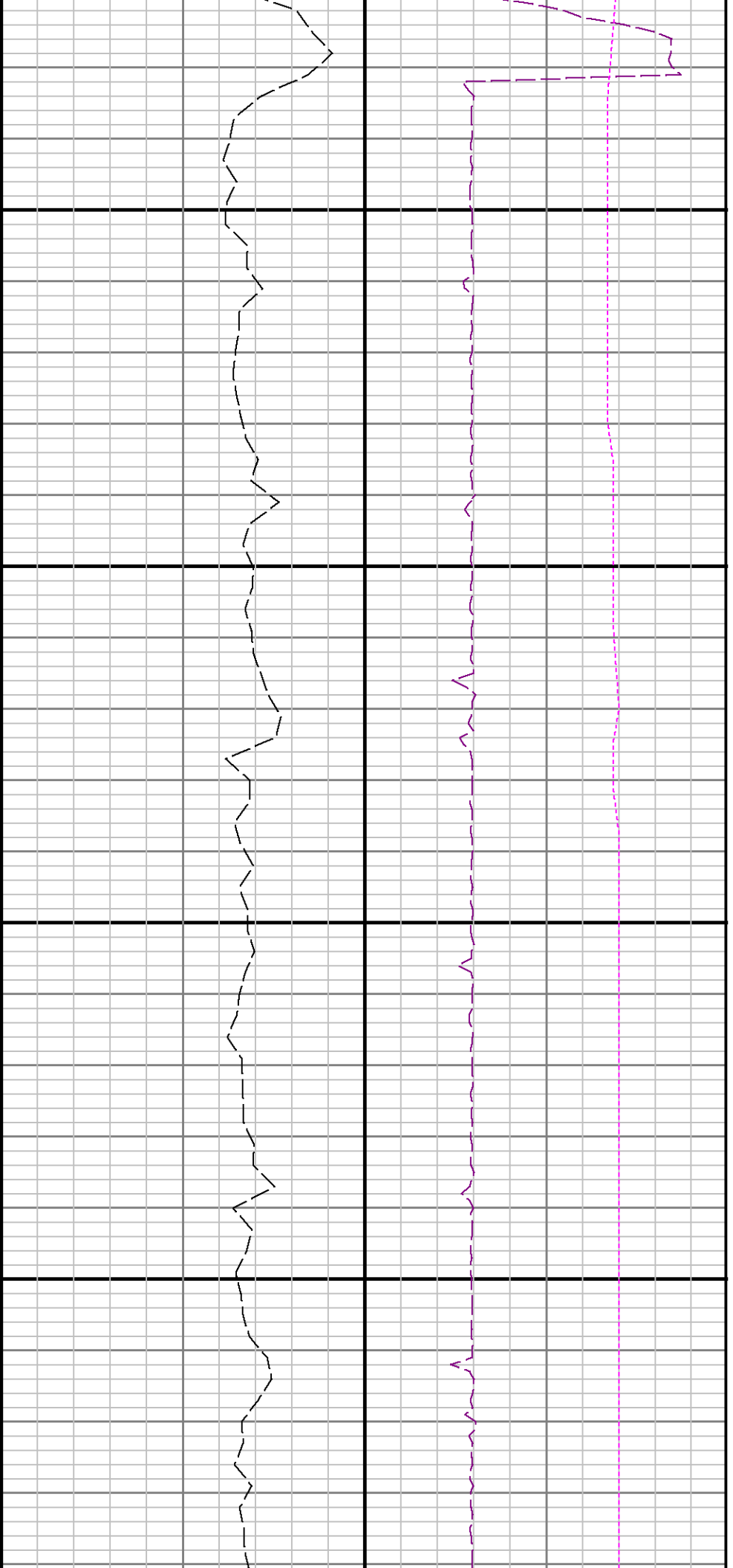
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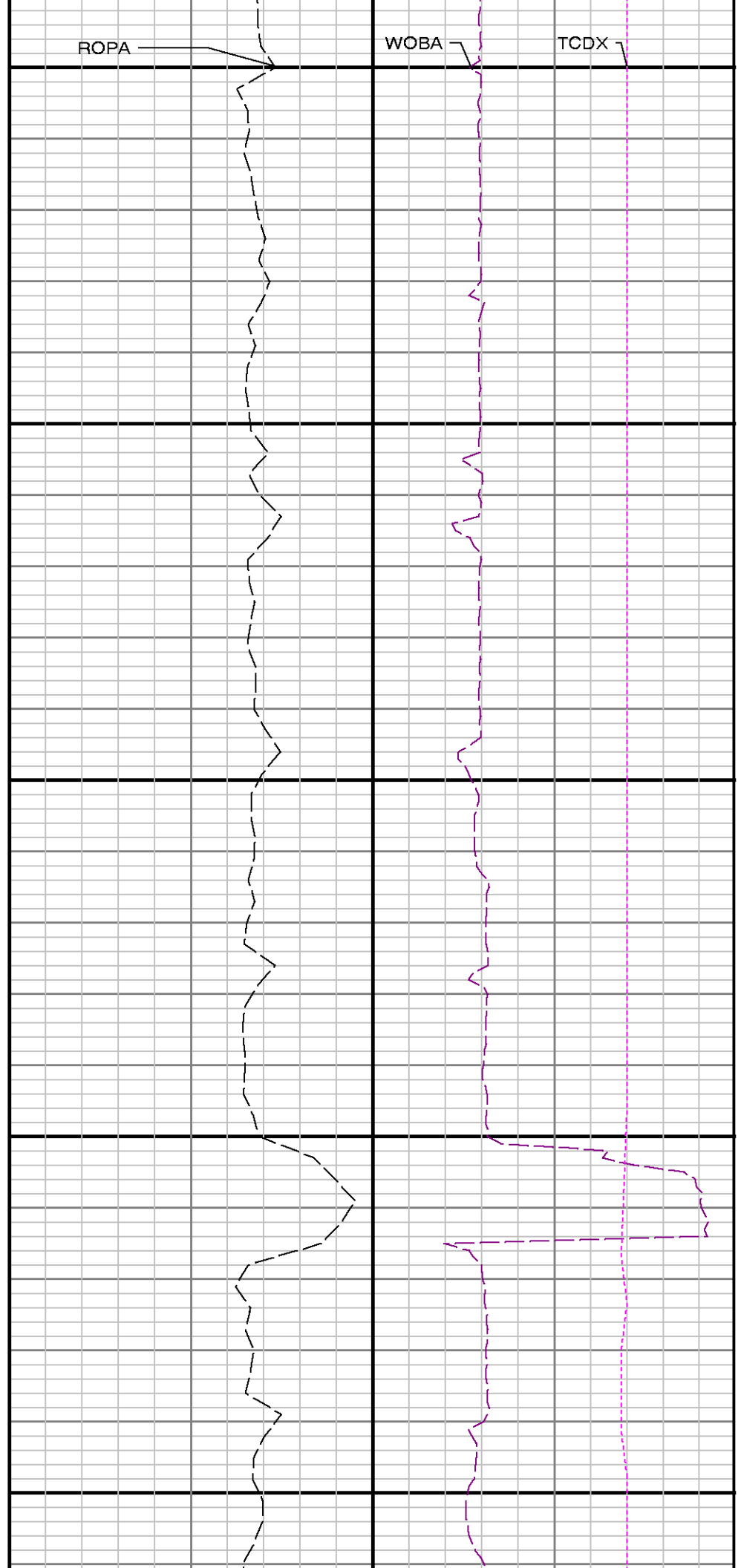
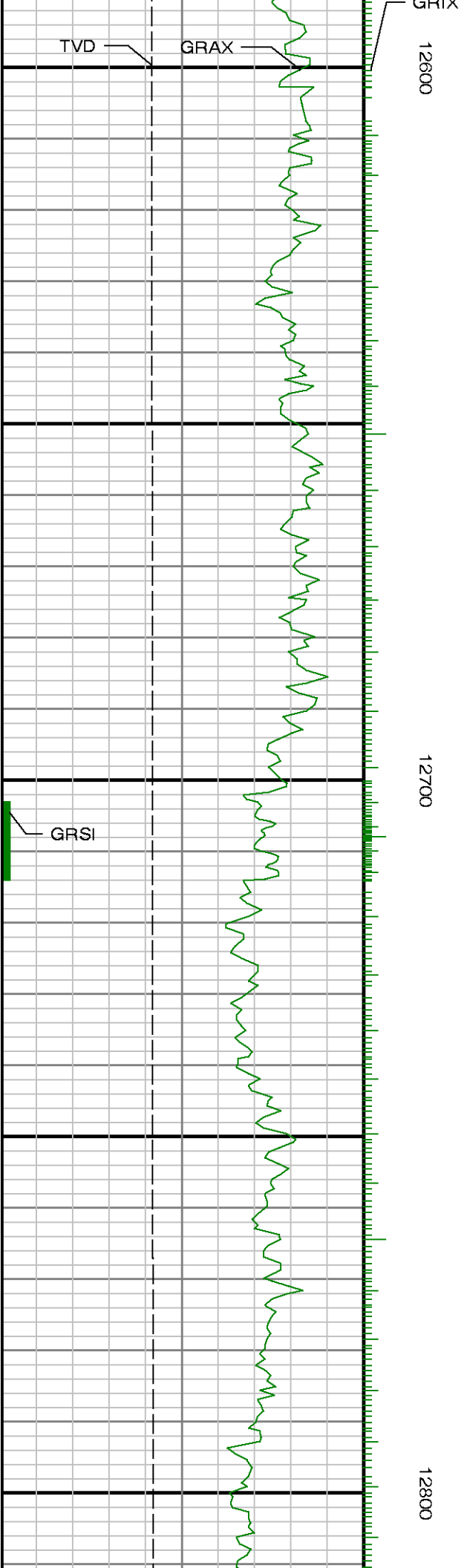
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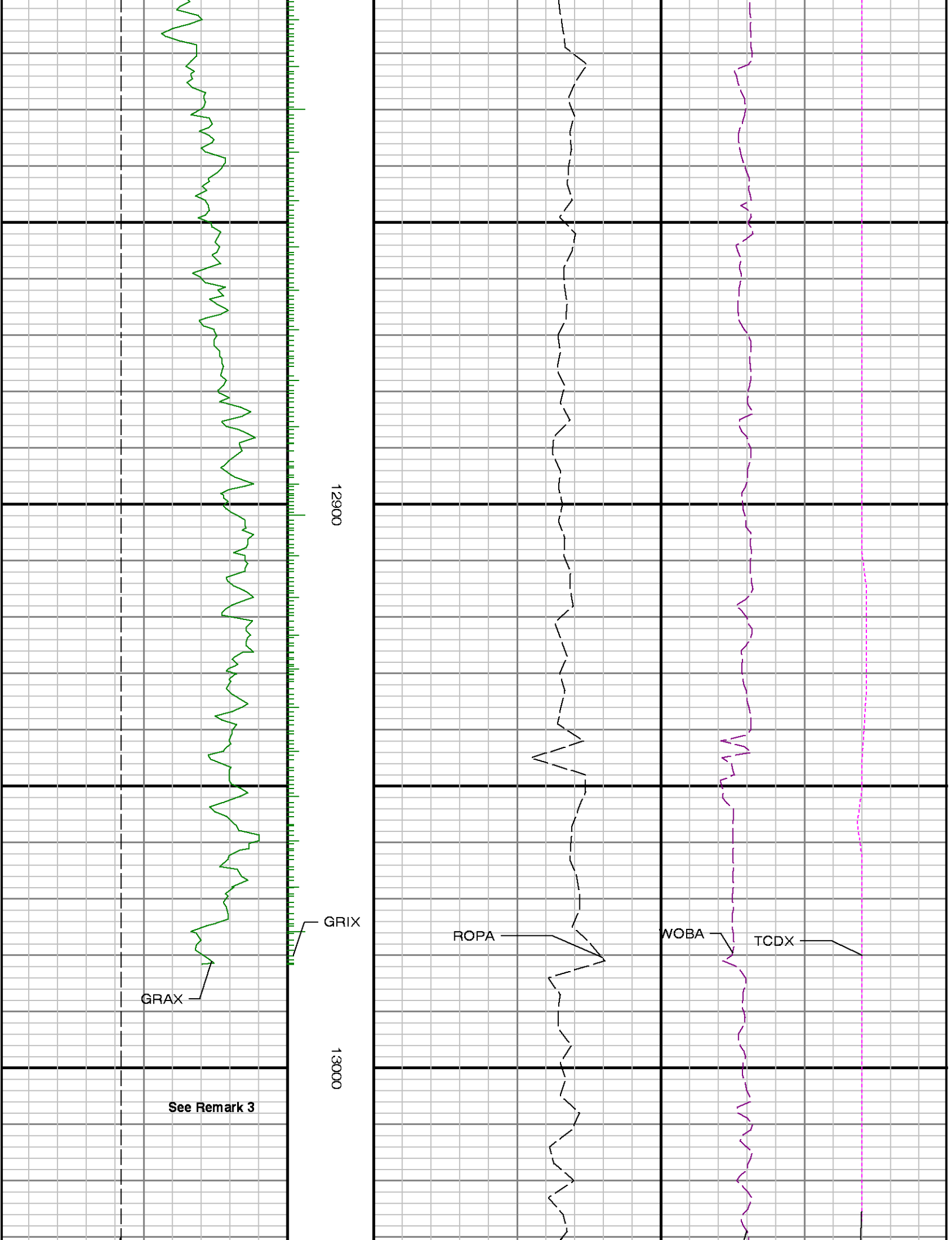














<div>TVD</div>	<div>MD</div>	<div>ROPA</div>	<div>WOBA</div> <div>TCDX</div>
<div>Gamma Ray Apparent 0.5 ft Avg GRAX</div> <div>0150</div> <div>API</div> <div>True Vertical Depth TVD</div> <div>80006470</div> <div>ft</div>	<div>MD feet 1:240</div>	<div>Gamma Time Since Drilled GRTX</div> <div>0600</div> <div>min</div> <div>Rate of Penetration 3.0 ft Avg ROPA</div> <div>8000</div> <div>ft/hr</div>	<div>Surface Weight On Bit 1.0 ft Avg WOBA</div> <div>0100</div> <div>klbf</div> <div>Downhole Temperature TCDX</div> <div>100275</div> <div>degF</div>