



Azimuthal Gamma Ray
Gamma Ray

Scale:

Company: Cub Creek Energy, LLC

1:240 MD

Well: Litzenberger 5

Depth Reference:

Field: Weld County

Driller's Depth

County: Weld Country: United States

State: Colorado Block: 1

Status:

Final Print

Surface Location:
Latitude:
Longitude:
Other Services:

API No: 05-123-42782-00-00

Job ID: 8562713

SEC: 8 TWN: 3N RGE: 68W

Permanent Datum (P.D.): Mean Sea Level

Log Measured From: Rig Floor

Elevation: 0.00 ft
Above P.D. 5099.00 ft
Elev. KB: 5099.00 ft
Elev. DF: 5082.00 ft
Elev. GL:

Dates

Interval Logged

Magnetic Field Reference

Date From: 2017-05-31

Azi Reference North: True

Dip Angle: (deg)

66.71

Date To: 2017-06-04

Total Magnetic Field Strength: (mT)

52343

Spud Date: 2017-05-17

Mag to Reference North Correction: (deg)

8.52 E

Borehole Record

Casing Record

Hole Size (in)	From (ft)	To (ft)	Size (in)	Weight (lb/ft)	From (ft)	To (ft)
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13.500	100.00	1552.00	9.625	36.00	17.00	1541.00
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8.500	1552.00	12130.00				
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Mud Record

Deviation Record

Type	From (ft)	To (ft)	Hole Size (in)	Interval (ft)	Inc Az (Start)	Inc Az (End)
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Water Based Mud	100.00	12130.00	13.500	1492.00	0.86 159.01	13.22 49.06
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			8.500	10578.00	13.96 39.72	93.54 268.17
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Acquisition System

Software Version

Other

Baker Hughes Cadence

RT4.1

PlotStudio

4.1.7763.3

Rig: Contractor: District:

Xtreme 18 Xtreme Drilling Corp RMA

Unit:

D&E

"These interpretations and analyses ("Interpretations") are opinions provided by Baker Hughes Oilfield Operations, Inc ("Baker Hughes"), based upon industry practice, empirical relationships, assumptions and measurements, (many of which may be provided by the customer). The Interpretations are not infallible and may be subject to different opinions. Vjwu."Dcmgt"Jwi jgu"fqgu"pqv"ycttcpv"vjgkt"ceewtce{."eqttgevpguu."qt"eqorngvgpguu."qt"vjcv"vjg"ewuvqogtøu"cpflqt"cp{"vjktf"rctv{øu"tgncpeg"qp"uwej"Kpvgtrtgvvcvkqpu"yknn"ceeornkuj"cp{"rctvkewnct"tguwnvu0"Vjg"ewuvqogt"cuuwogu"hwnn"responsibility for the use of the Interpretations and for decisions based thereon and the customer agrees to release, defend and indemnify Baker Hughes, its parent, subsidiaries and affiliated or related entities, and subcontractors, together with its and their officers, directors, employees, agents and invitees against, any and all claims, losses, damages, or expenses sustained by the customer or any third party arising out of reliance upon or use of the Interpretations, without regard to the cause(s) thereof, including without limitation any form of negligence on the part of Baker Hughes. Unless other contract terms have been agreed to by the parties, each party's liabilities and qdnkicvkqpu"ujcnn"dg"iqxgtpgf"d{"Dcmgt"Jwi jgu"Kpeqtrqtcvvgføu"Yqtnfykfg"Vgtou"cpf"Eqpfkvkqpu0\$"

Log Run Summary

Run No	Bit Run No.	Bit Size (in)	Bit Type	Bit Gauge Length (in)	Assembly Type	Logged Interval		Bit Depth Interval		Date / Time		Circ. Hours (h)
						Top	Bottom	From	To	Start Logging	End Logging	
						(ft)	(ft)	(ft)	(ft)			
1	1	13.500	PDC	4.00	Steerable	0.00	0.00	100.00	1552.00	2017-05-17 19:11	2017-05-18 03:59	7.01
2	2	8.500	PDC	3.00	Rotary Steerable	1552.00	7082.00	1552.00	7094.00	2017-05-31 15:28	2017-06-02 07:29	35.02
3	3	8.500	PDC	3.00	Rotary Steerable	7082.00	12117.00	7094.00	12130.00	2017-06-02 18:34	2017-06-04 17:17	49.69

Crew

Name		Arrive Wellsite	Depart Wellsite	Name		Arrive Wellsite	Depart Wellsite	Name		Arrive Wellsite	Depart Wellsite
Enyonam Anyigba		2017-05-17	2017-06-05	Steve Bueghly		2017-05-17	2017-06-05				

Mud Properties Record

Date / Time		Run No.	Measured Depth (ft)	Mud Type	Density (ppg)	Viscosity (cP)	pH	Fluid Loss (cm3)	Oil / Water	Source	Total Chlorides (ppm)	K+ (%)
2017-05-17 03:30		1	96.00	Water Based Mud	8.6	1	8.8	N/A	0/100	Suction	1000	0.00
2017-05-31 12:47		2	1552.00	Water Based Mud	8.5	1	12.5	N/A	0/100	Suction	600	0.00
2017-06-01 21:16		2	5946.00	Water Based Mud	10.0	11	9.5	N/A	1.6 / 89.9	Suction	1300	0.00
2017-06-02 14:17		3	7049.00	Water Based Mud	10.0	12	9.5	N/A	1.5 / 90.1	Suction	1500	0.00
2017-06-03 18:06		3	8982.00	Water Based Mud	10.0	14	9.4	N/A	1.4 / 90.2	Suction	1700	0.00
2017-06-04 19:08		3	12130.00	Water Based Mud	10.0	14	9.5	N/A	2.0 / 89.5	Suction	1500	0.00

Equipment and Service Data

Run No.	Tool	Serial Number	Measurement	Sensor Offset (ft)	Bit Offset (ft)	Max O.D. (in)	Min I.D. (in)
1	NaviTrak	12813116	VSS	14.46	50.33	8.000	3.250
1	NaviTrak	12813116	Directional (mag)	14.46	50.33	8.000	3.250
2	ATC_SU	12142976	Near Bit Inclination	5.93	6.69	7.000	4.330
2	ATC_SU	12142976	Near Bit VSS	5.93	6.69	7.000	4.330
2	ATC_MWD	12075790	Gamma (single)	2.17	12.31	7.000	3.250
2	ATC_MWD	12075790	Directional (mag)	12.27	22.41	7.000	3.250
3	ATC_SU	14169980	Near Bit VSS	5.93	6.69	7.000	4.330
3	ATC_SU	14169980	Near Bit Inclination	5.93	6.69	7.000	4.330
3	ATC_MWD	12398343	Gamma (single)	2.77	12.86	7.000	3.250
3	ATC_MWD	12398343	Directional (mag)	12.27	22.36	7.000	3.250

Service and Tool Mnemonics

Mnemonic	Name	Description
NTK	NaviTrak	Probe Based Directional Module, NaviTrak Platform

ATC_SU	ATC_SU	Auto Trak Curve Steering Unit
ATC_MWD	ATC_MWD	Auto Trak Curve MWD
ATC_LCPM	ATC_LCPM	Auto Trak Curve LCPM

Comments


1	Depth measurements obtained from a depth control system not supplied or operated by Baker Hughes. Due to lack of control by Baker Hughes logging engineers, depth calibrations and measurements could not be independently verified.
2	Baker Hughes drilling services run 1 utilized an 8 inch Navitrak service (Directional only) behind a 13 1/2 inch bit and steerable assembly from 100 to 1552 feet MD (100 to 1525 feet TVD)
3	Baker Hughes drilling services runs 2 and 3 utilized a 6 3/4 inch Navigamma service (Directional and Gamma Ray) behind an 8 1/2 inch bit and rotary steerable assembly from 1552 to 12130 feet MD (1525 to 7274 feet TVD)
4	Numerous gaps in Gamma Ray data are present from 1552 to 6462 feet MD (1525 to 6297 feet TVD) due to downlinking and surveying while drilling ahead.

Remarks

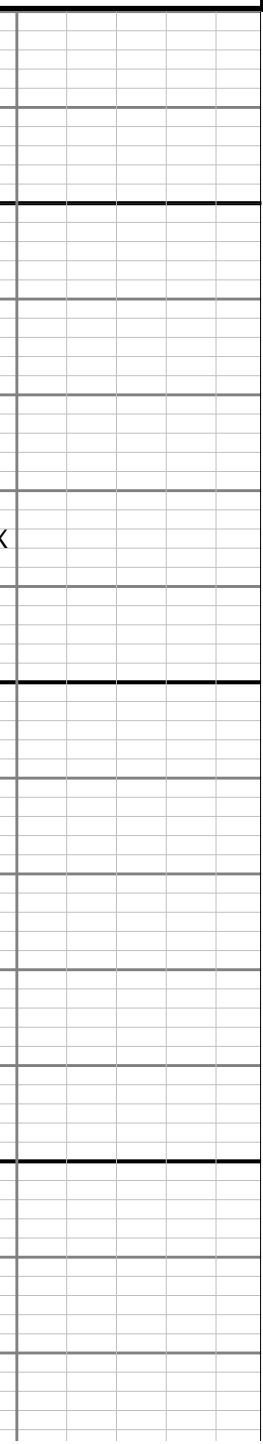
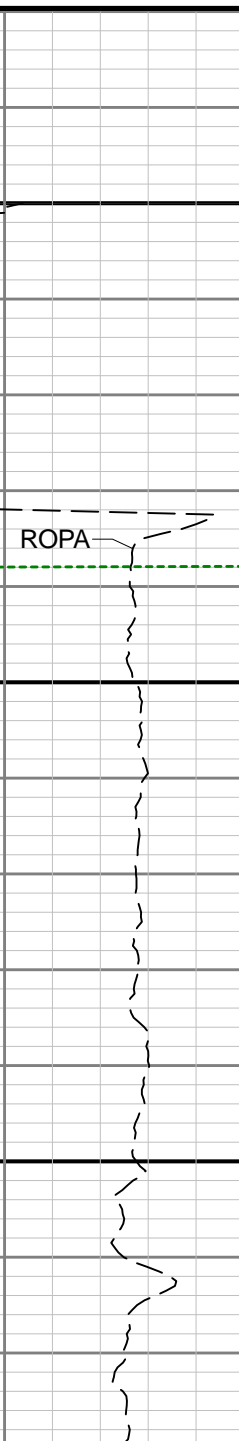
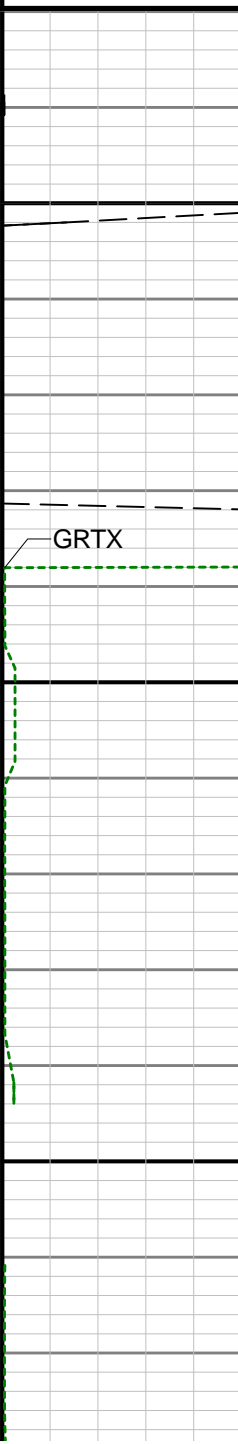
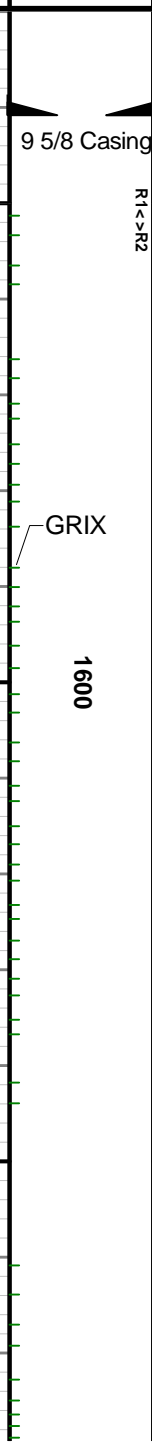
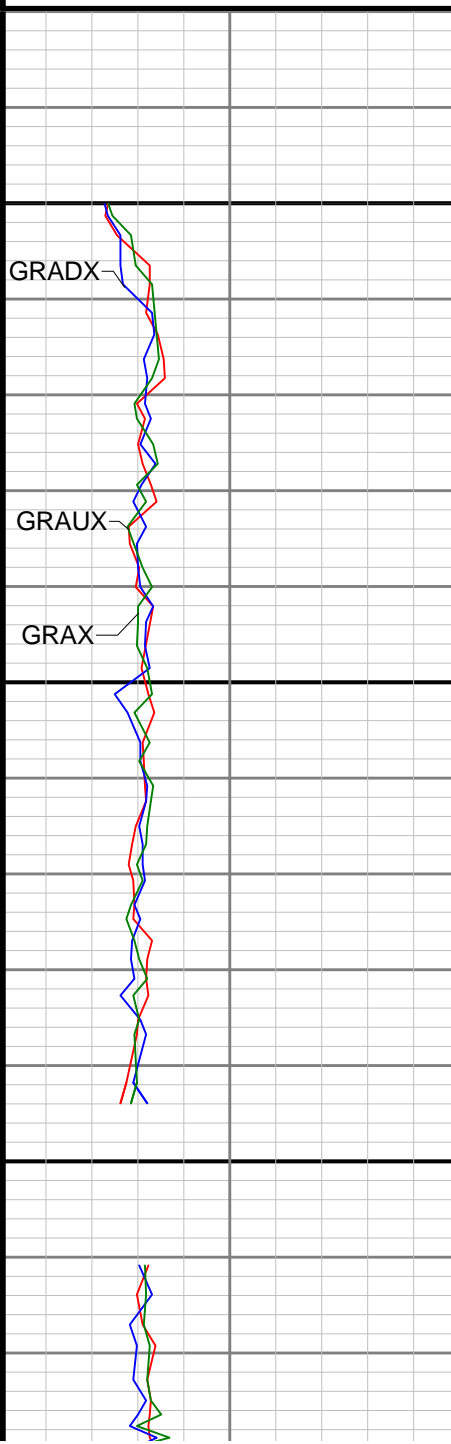
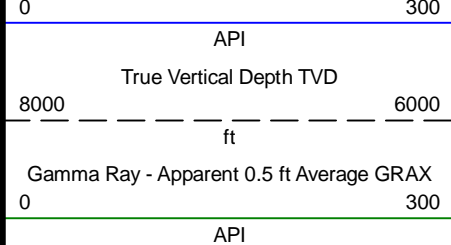
Number	Measured Depth (ft)	Hole Section (in)	Run No.	Remark
1	7080.00	8.500	2	Gamma Ray data from 7080 to 7094 feet MD (6902 to 6915 feet TVD) was logged 11 hours after being drilled due to TOO H
2	11704.00	8.500	3	Gamma Ray data from 11704 to 12130 feet MD (7292 to 7274 feet TVD) was not logged due to MWD Gamma sensor failure.

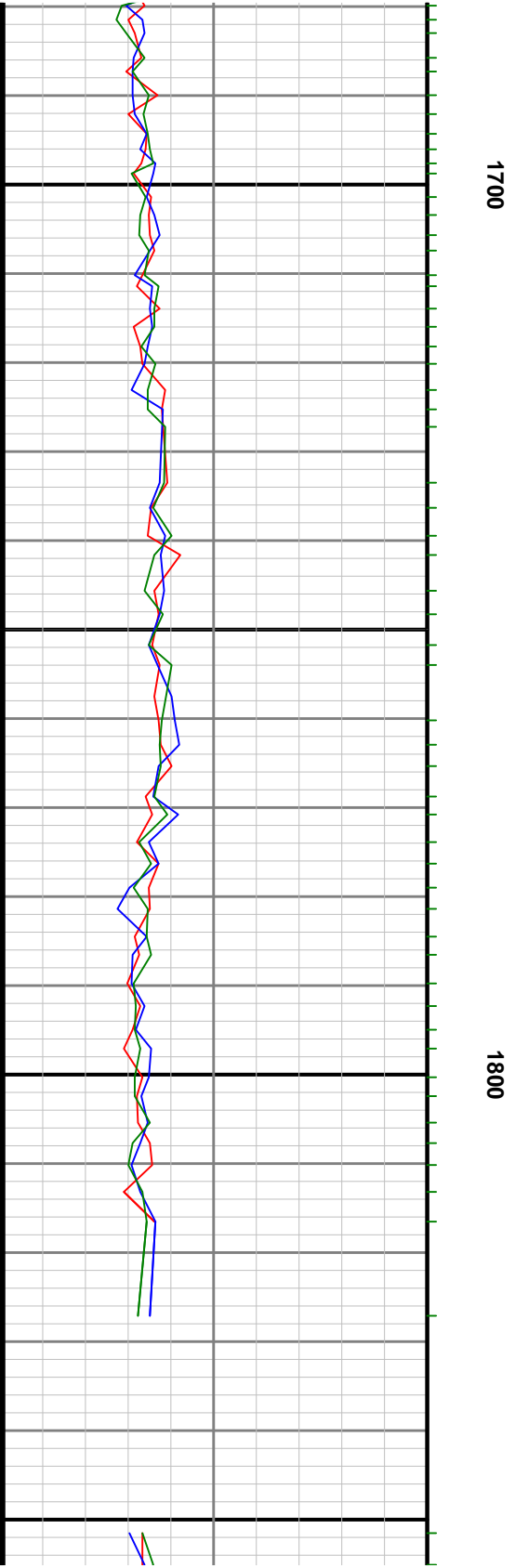
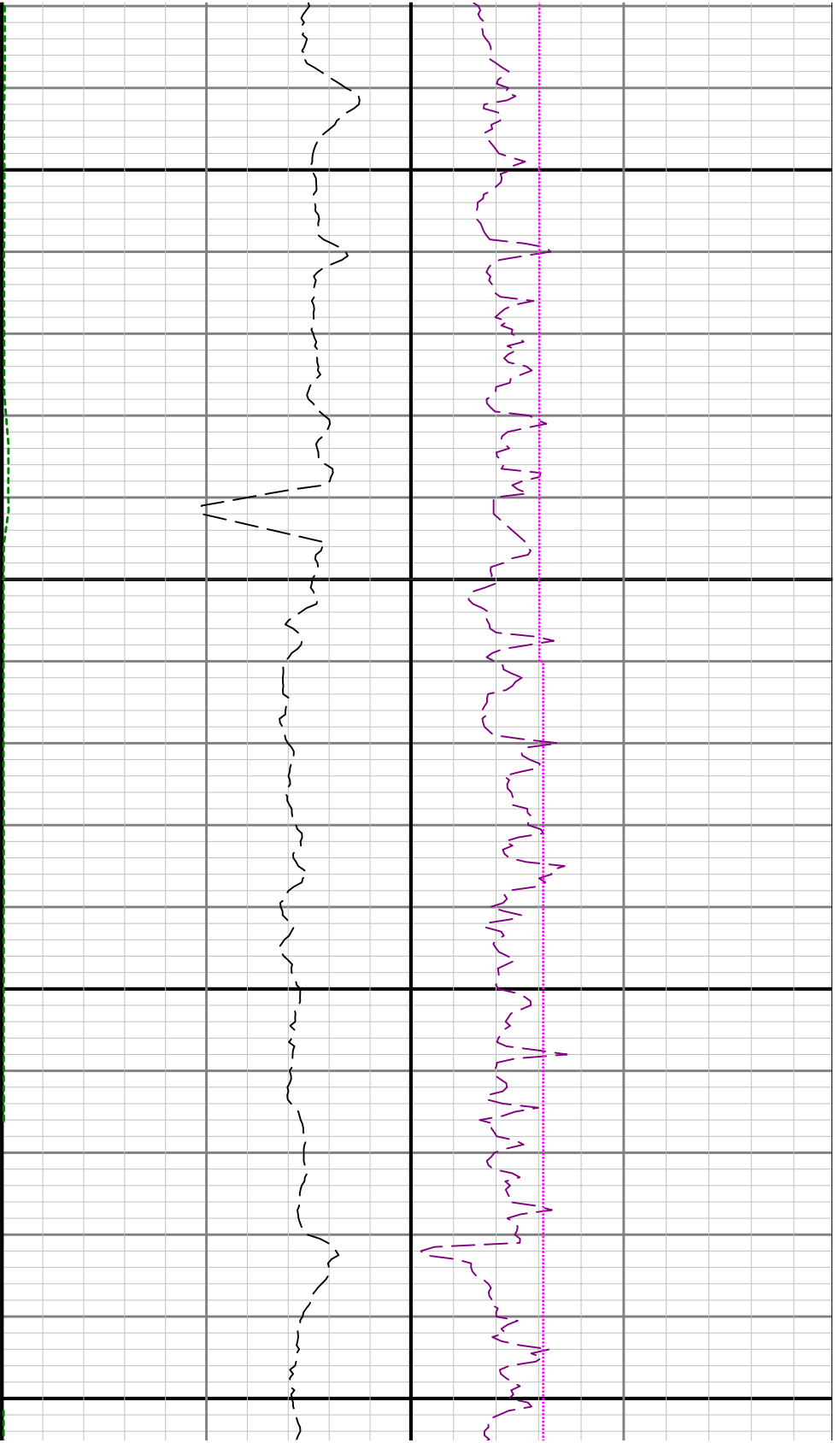
Curve Mnemonics

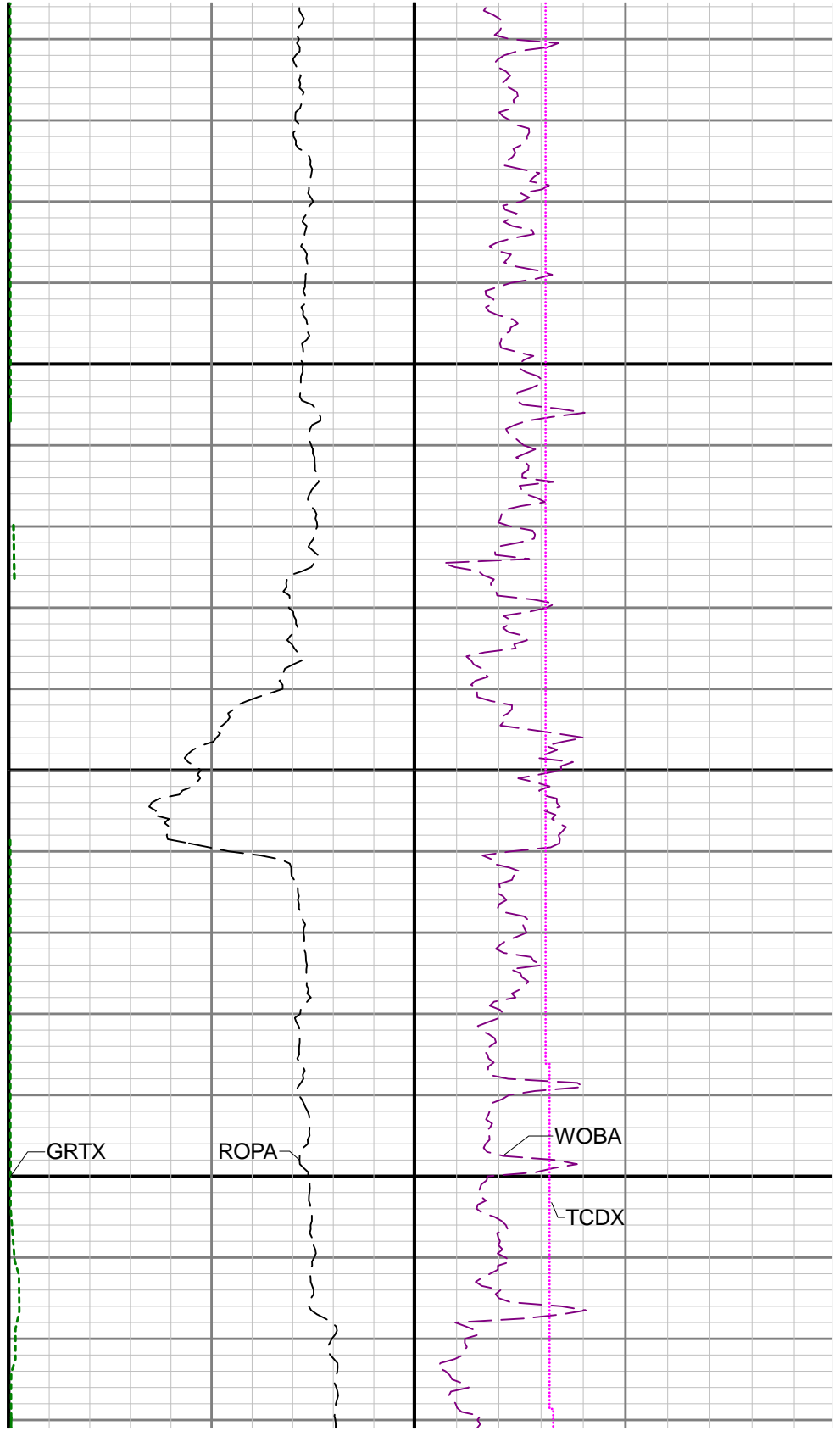
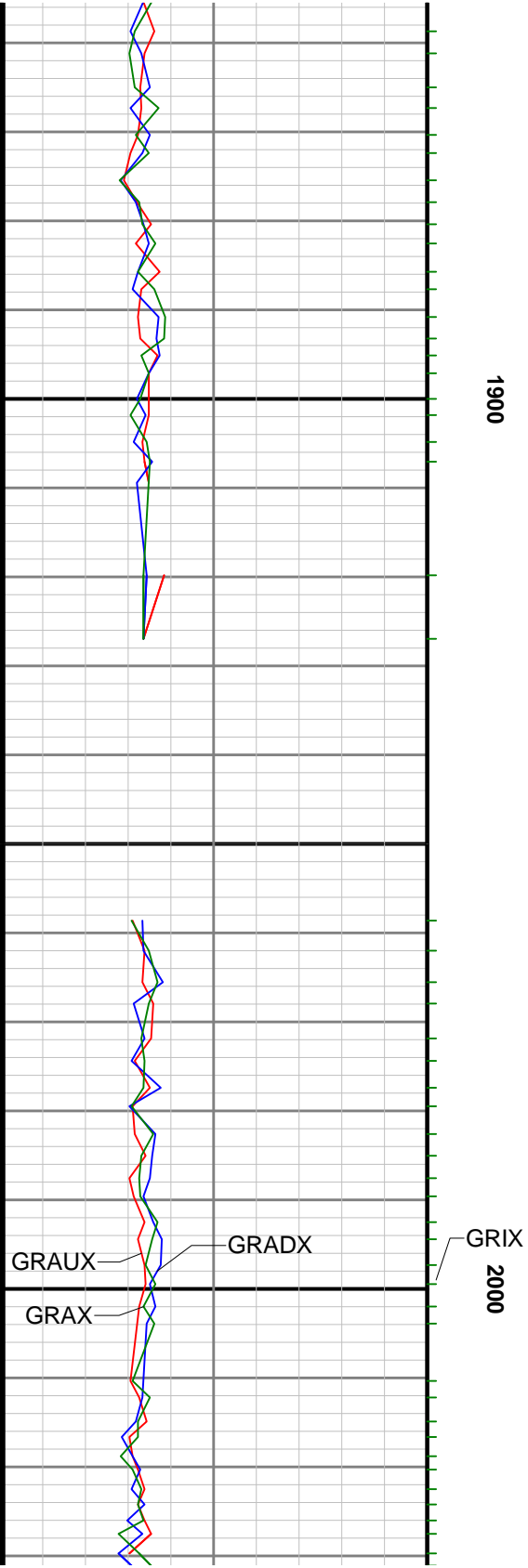
Presented Curves	Description	Units
GRADX	OnTrak - Gamma Ray - Apparent - Down Quadrant - Real-Time 0.5 ft Average	API
GRAUX	OnTrak - Gamma Ray - Apparent - Up Quadrant - Real-Time 0.5 ft Average	API
TCDX	Downhole Temperature	degF
ROPA	Depth Averaged ROP 3 ft Average	ft/h
TVD	True Vertical Depth	ft
WOBA	Weight On Bit, Average 1 ft Average	klb
GRAX	OnTrak - Gamma Ray - Apparent - Real-Time 0.5 ft Average	API
GRIX	OnTrak - Gamma Ray - Data Point Indicator - Real-Time	unitless
GRTX	OnTrak - Gamma Ray - Time Since Drilled - Real-Time	min

	Company	Cub Creek Energy, LLC			
	Well	Litzenberger 5			
	Interval	Date From: 2017-05-31 09:28:08	Top:	1552.00	
	Created	Date To: 2017-06-04 02:06:17	Bottom:	12130.00	
		2017-06-05 14:08:40			

Azimuthal Gamma Ray - Apparent - Up Quadrant 0.5 ft Average GRAUX	MD 1:240 feet	Depth Averaged ROP 3 ft Average ROPA	Weight On Bit, Average 1 ft Average WOBA
0 300		1000 0	0 50
API		ft/h	klb
Azimuthal Gamma Ray - Apparent - Down Quadrant 0.5 ft Average GRADX		Gamma Time Since Drilled GRTX	Downhole Temperature TCDX
0 300		0 600	0 300
		min	degF



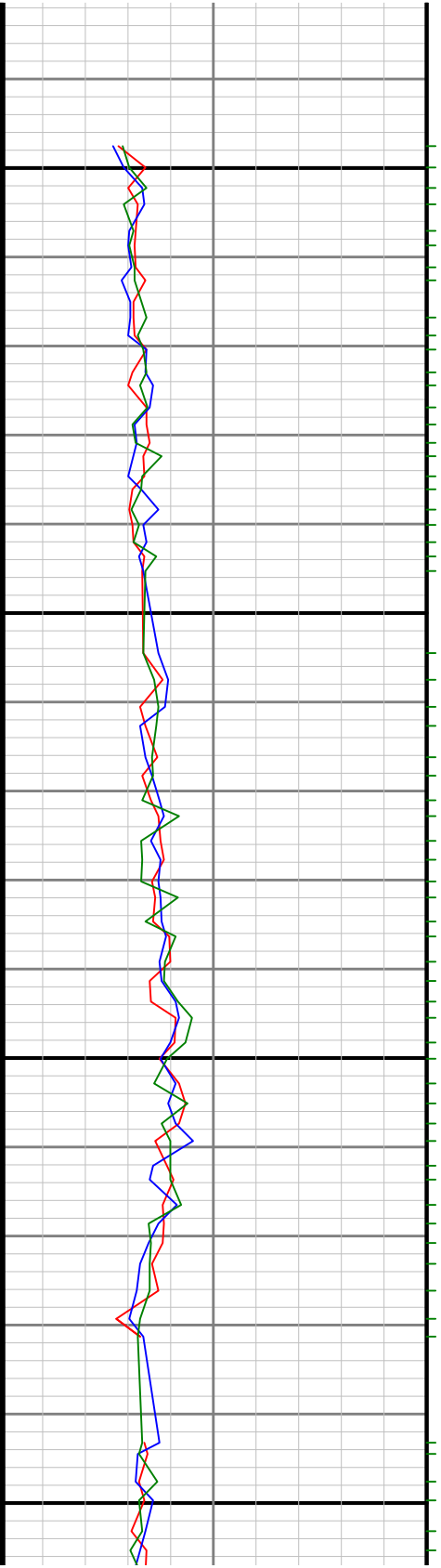


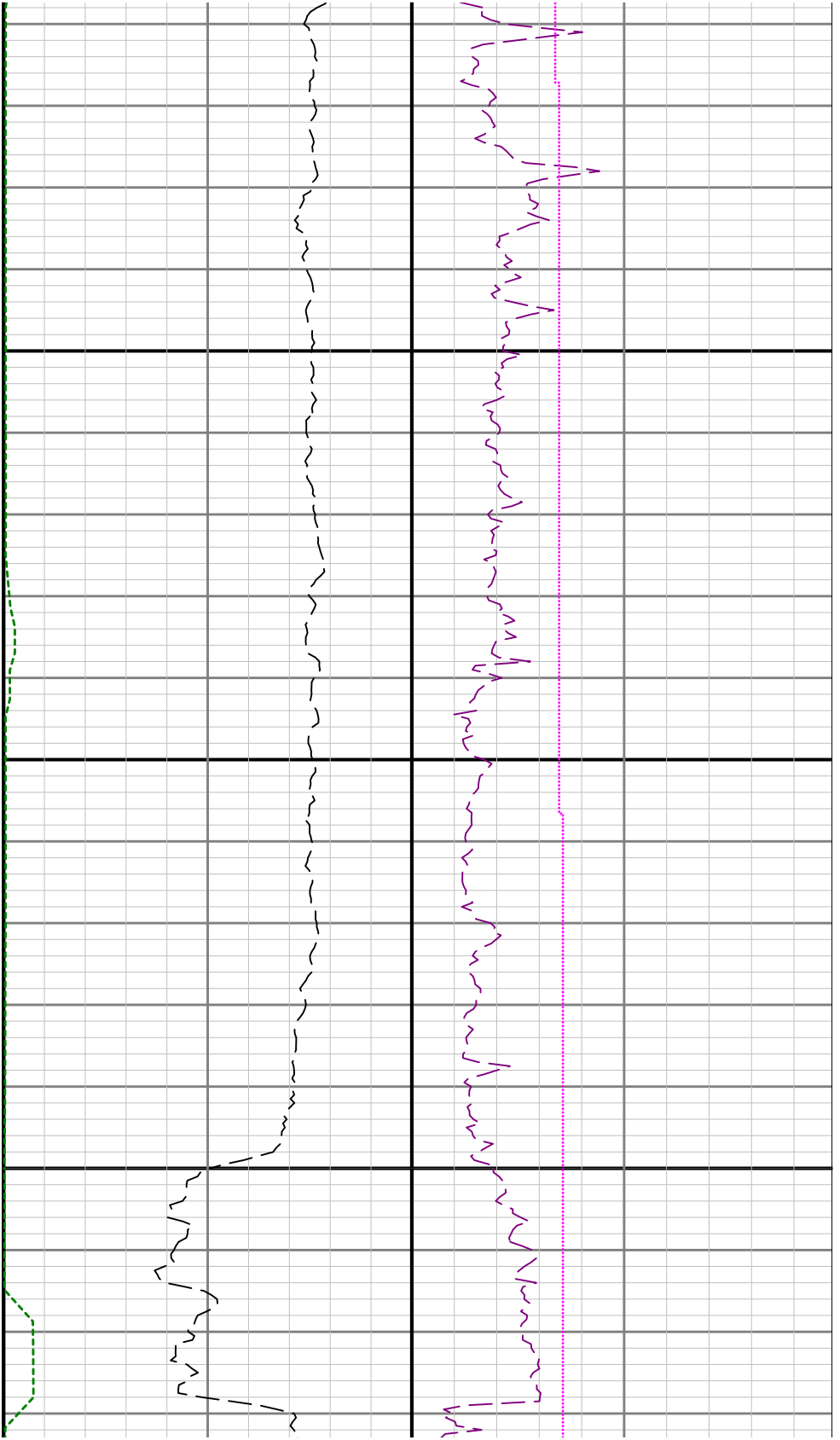




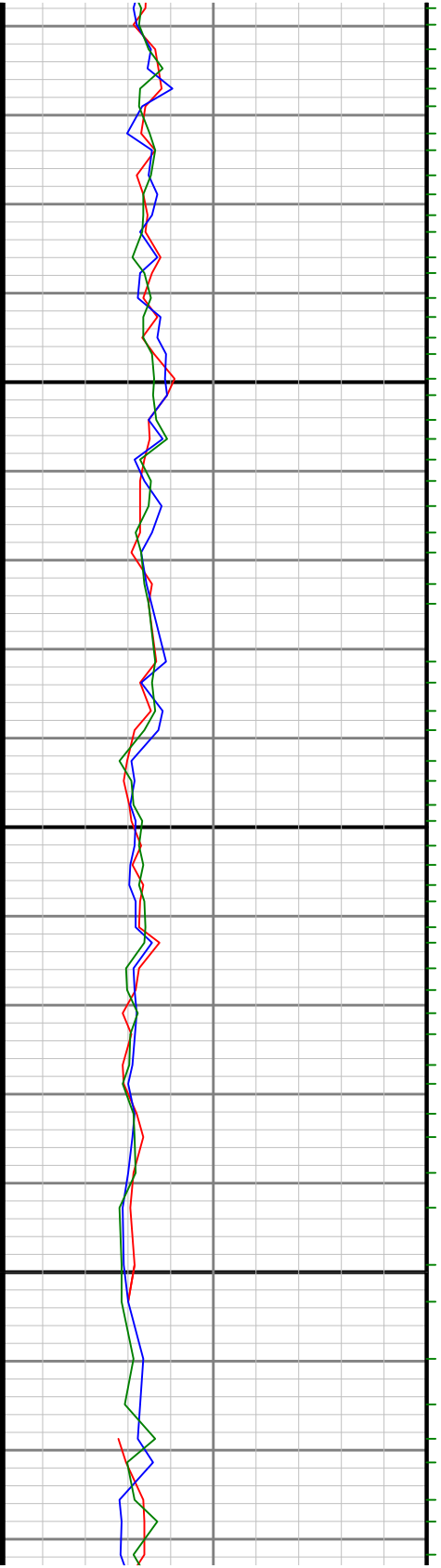
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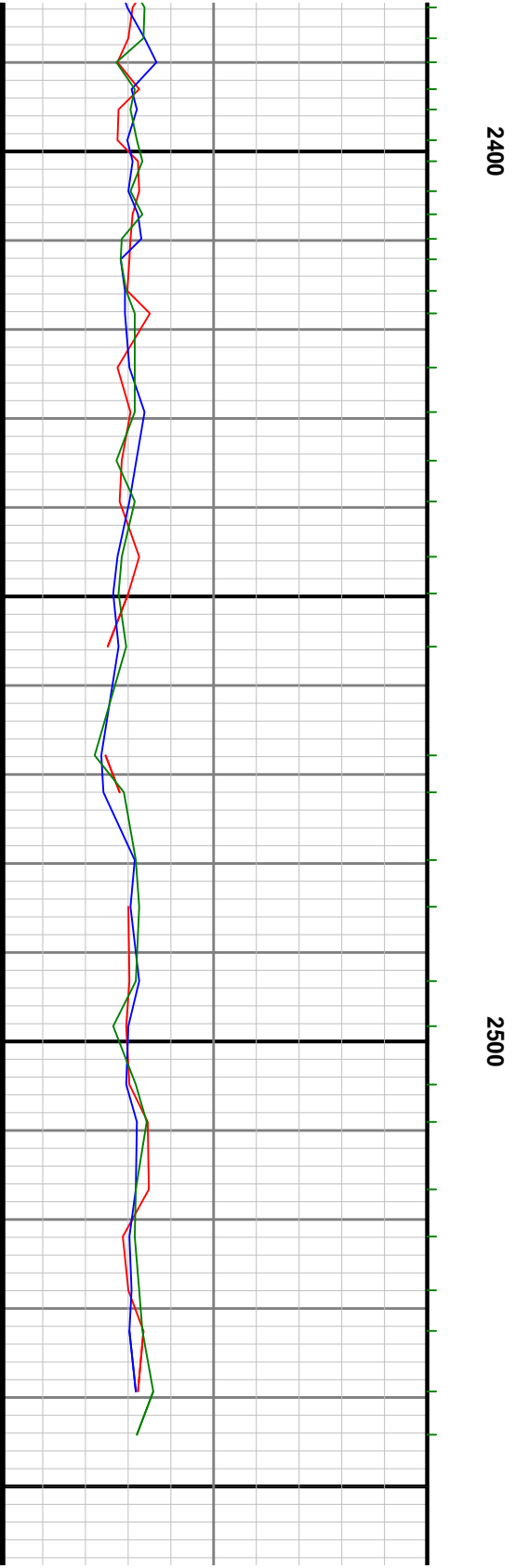
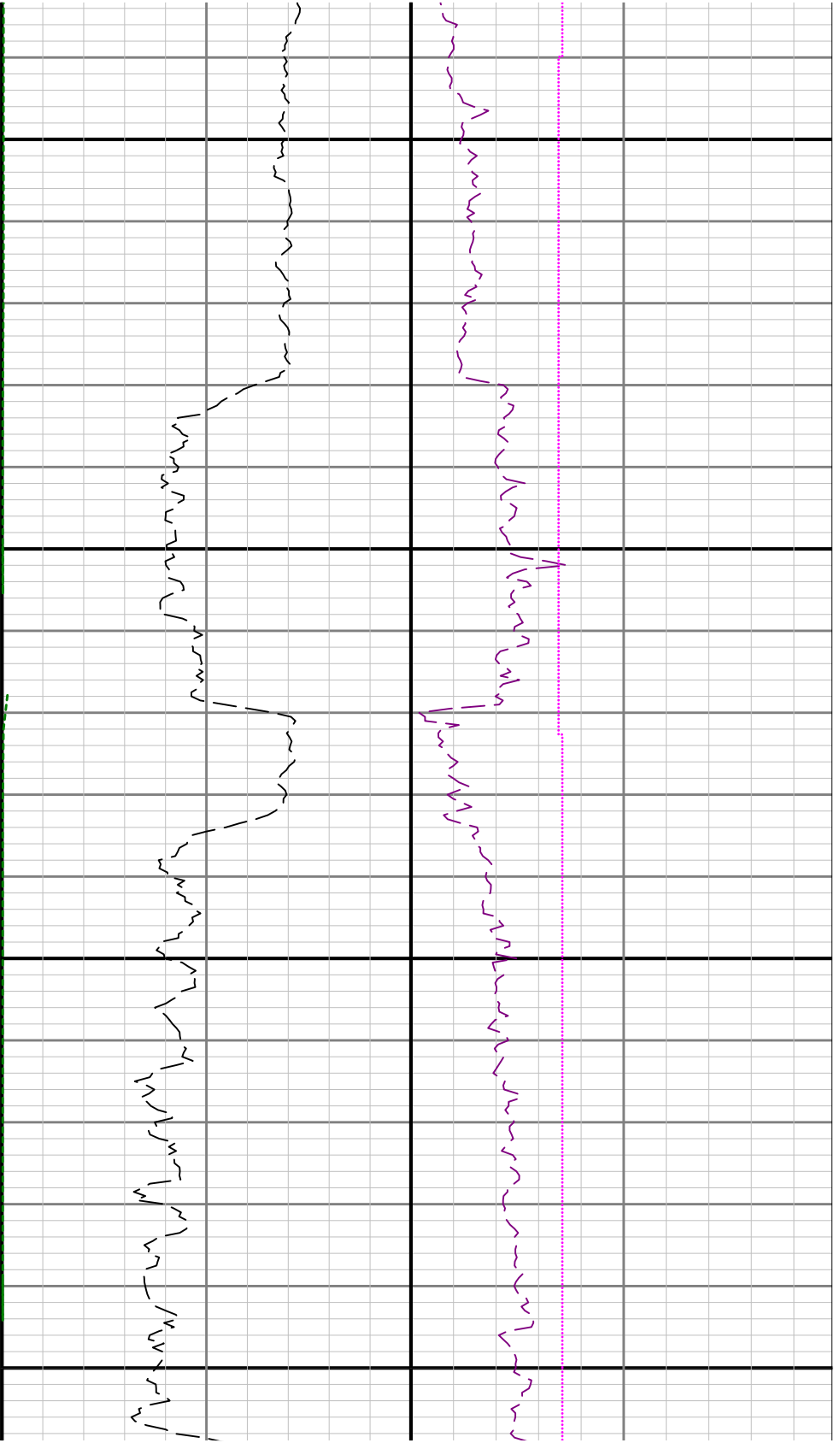
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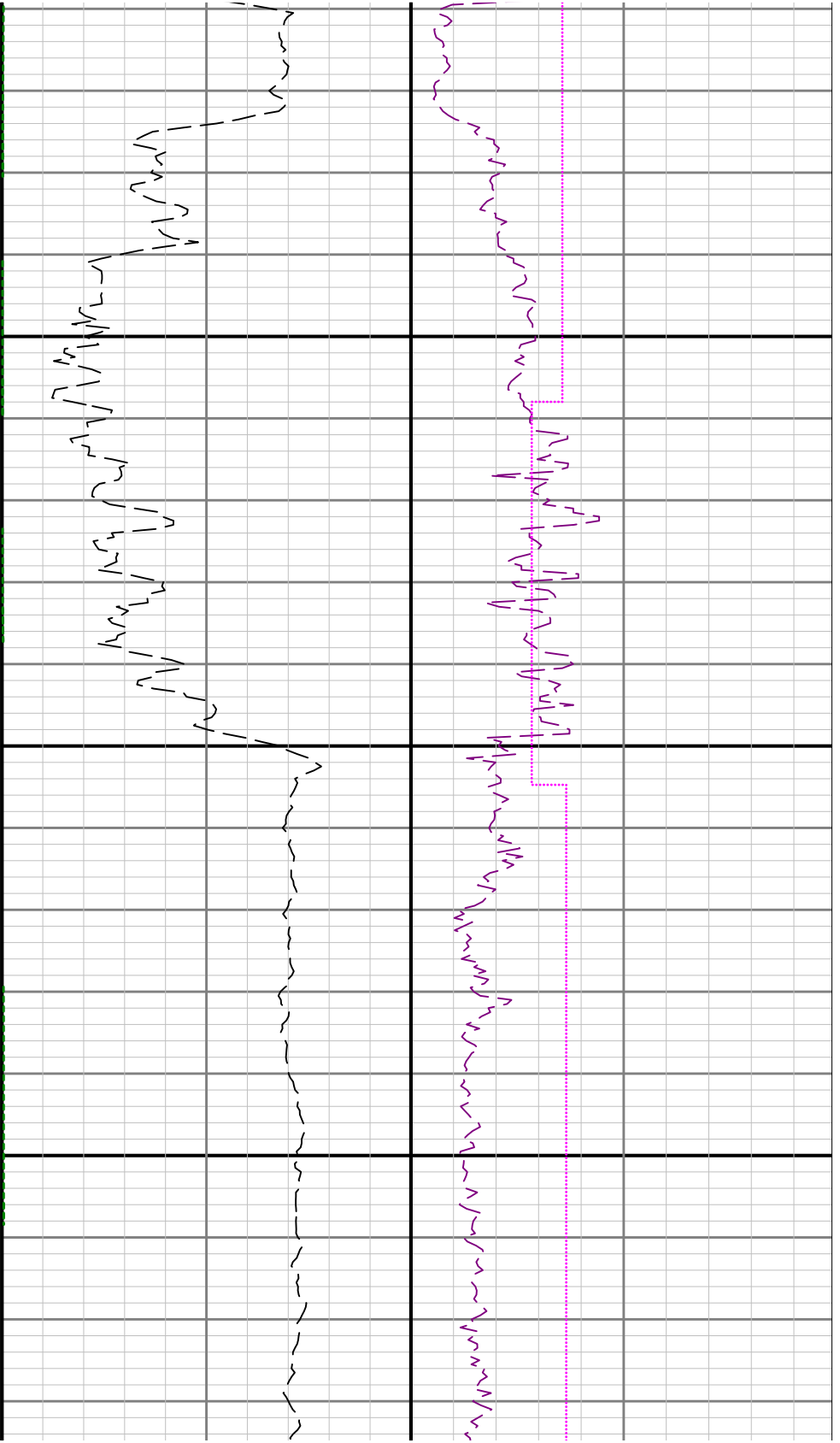




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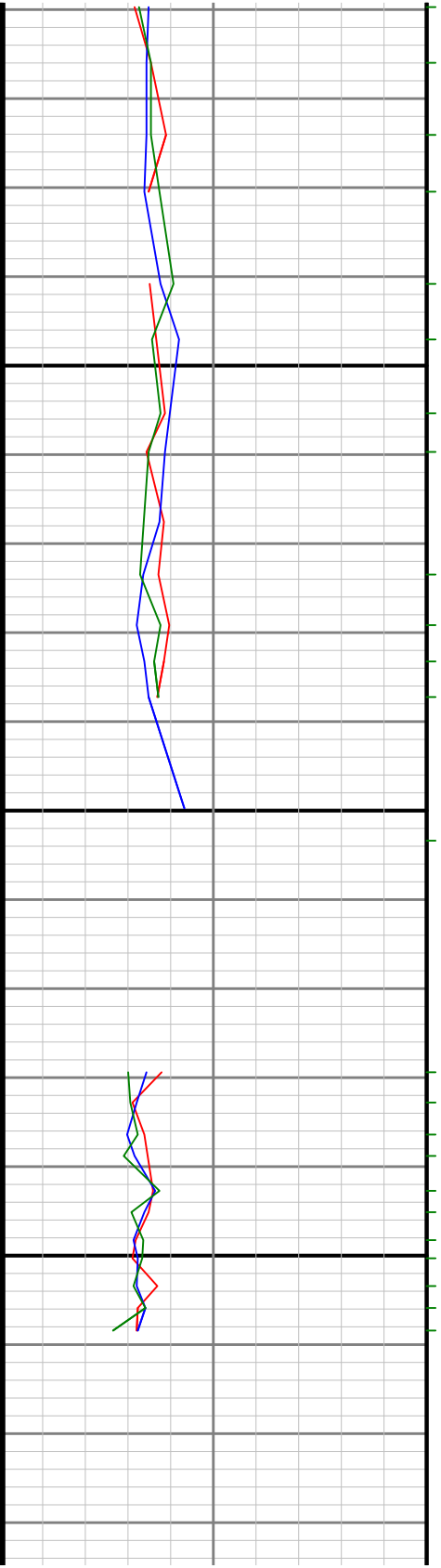


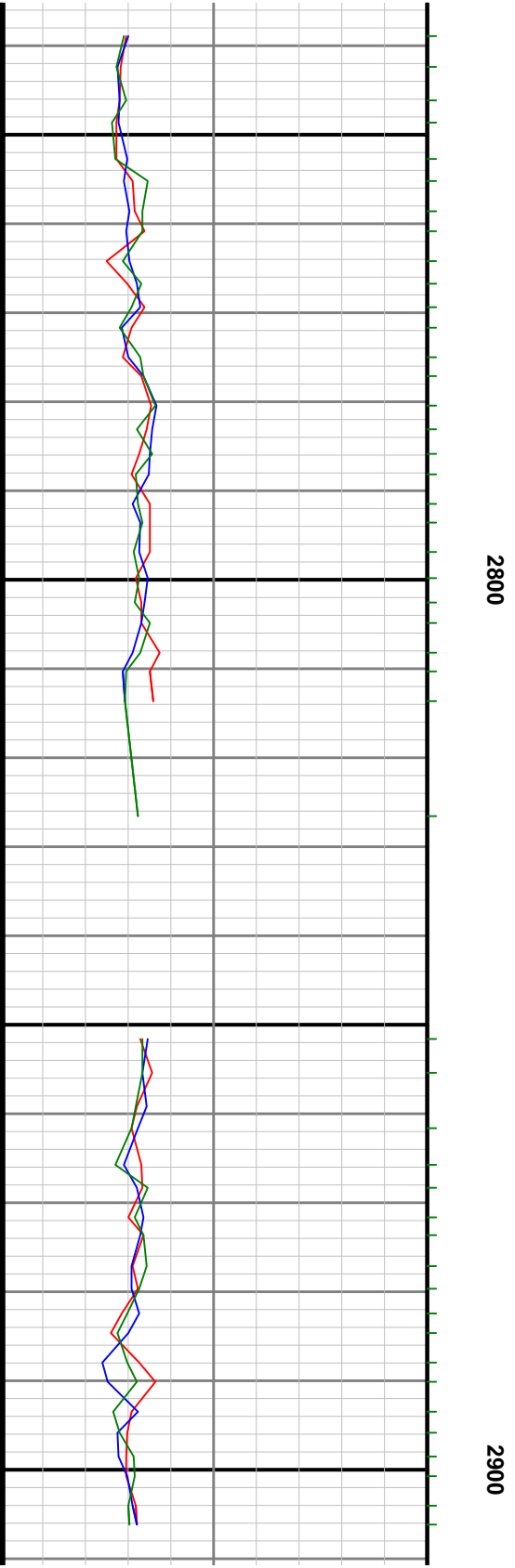


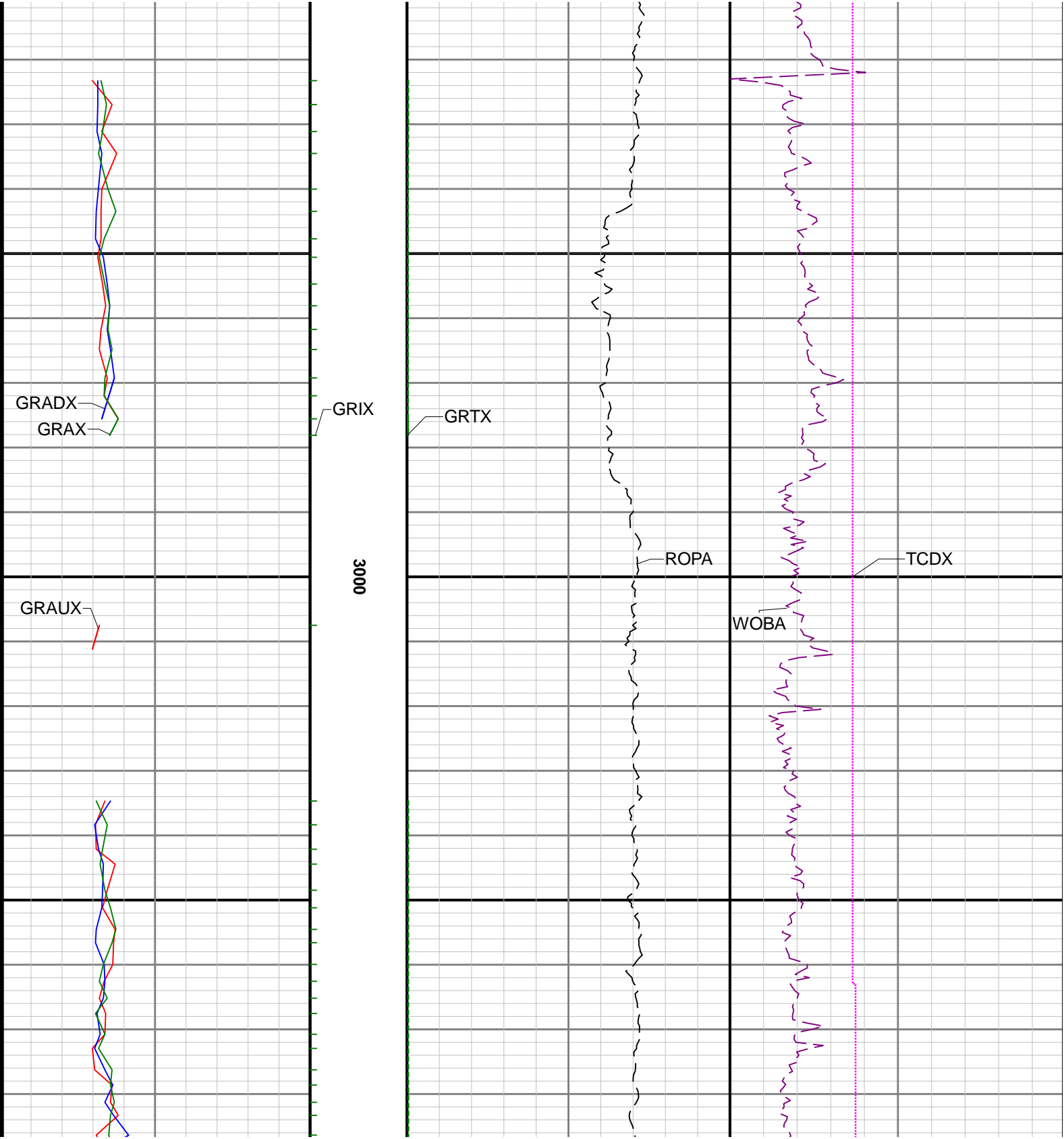


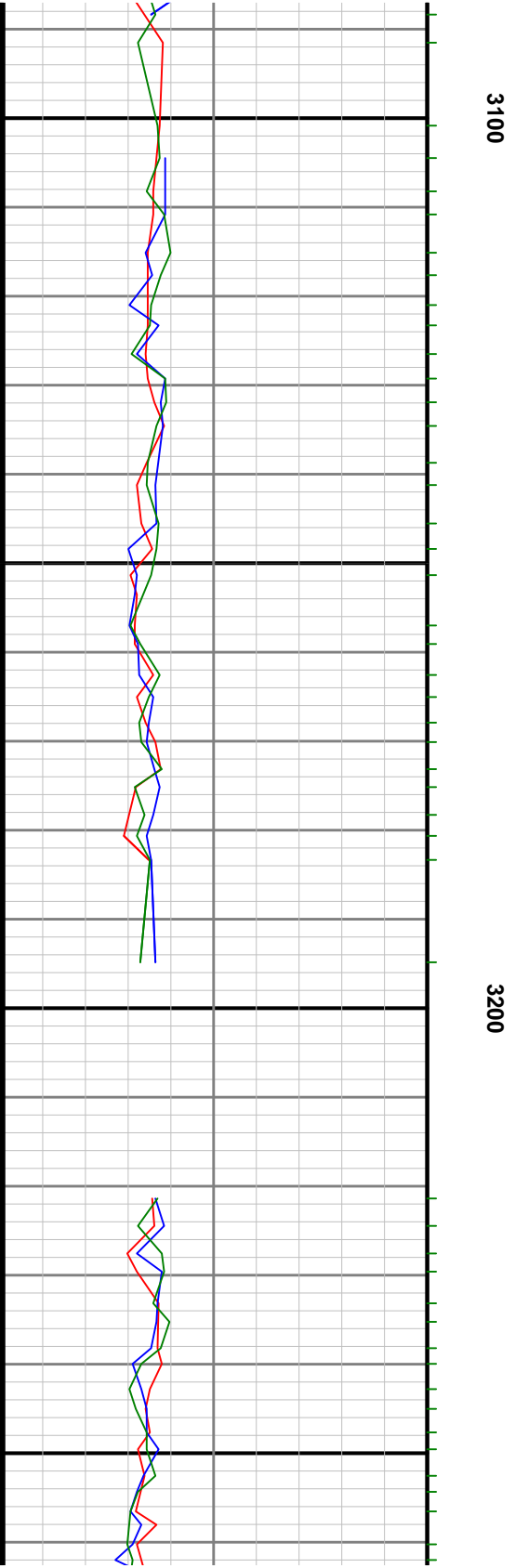
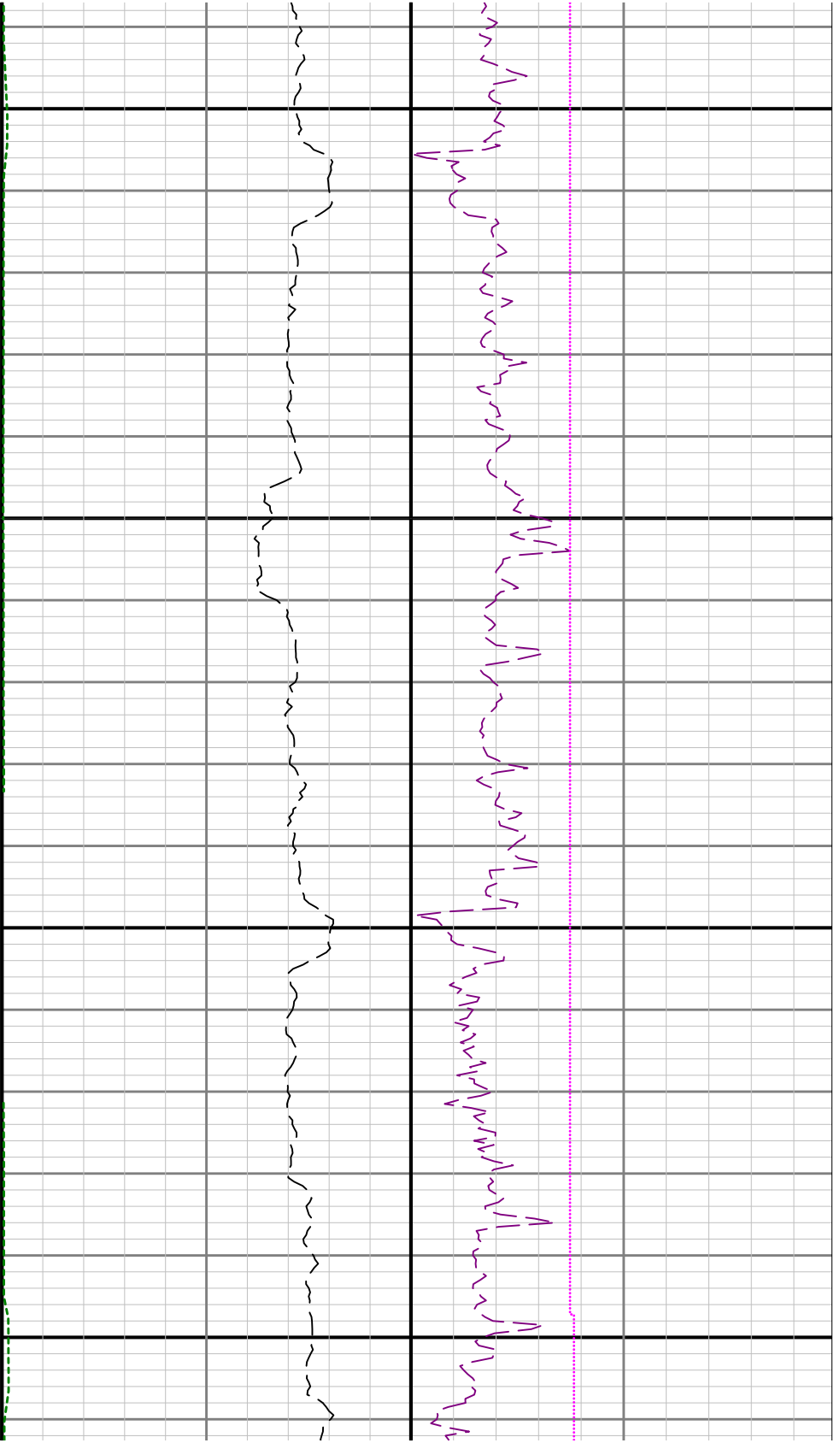
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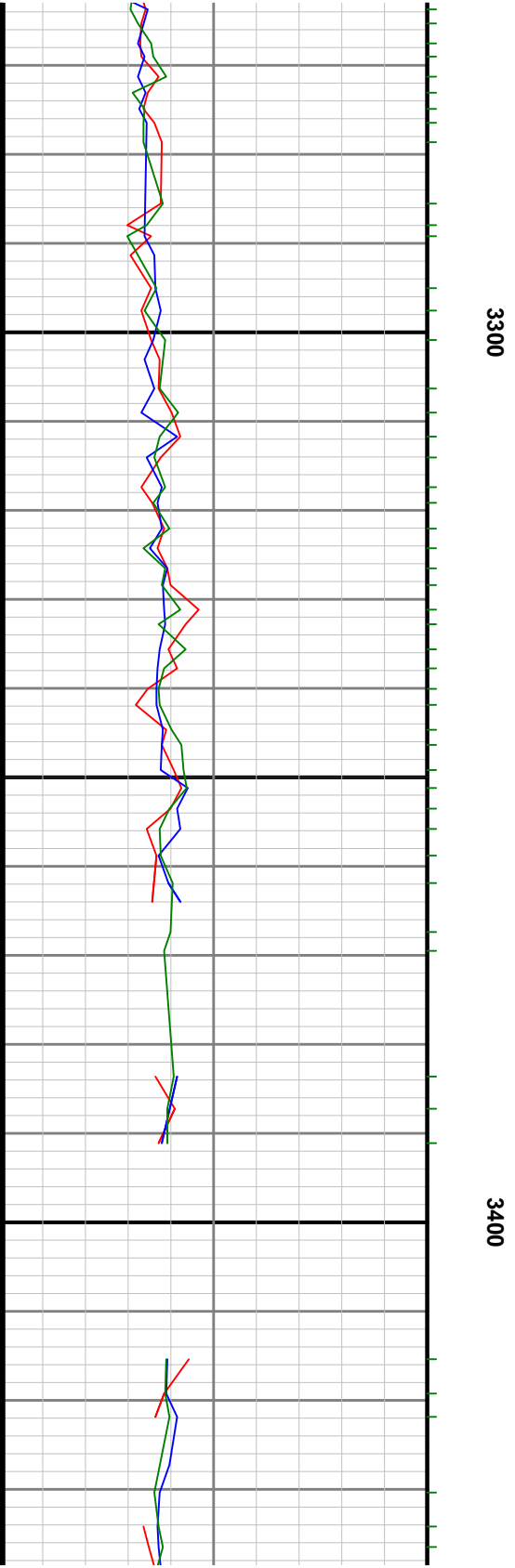
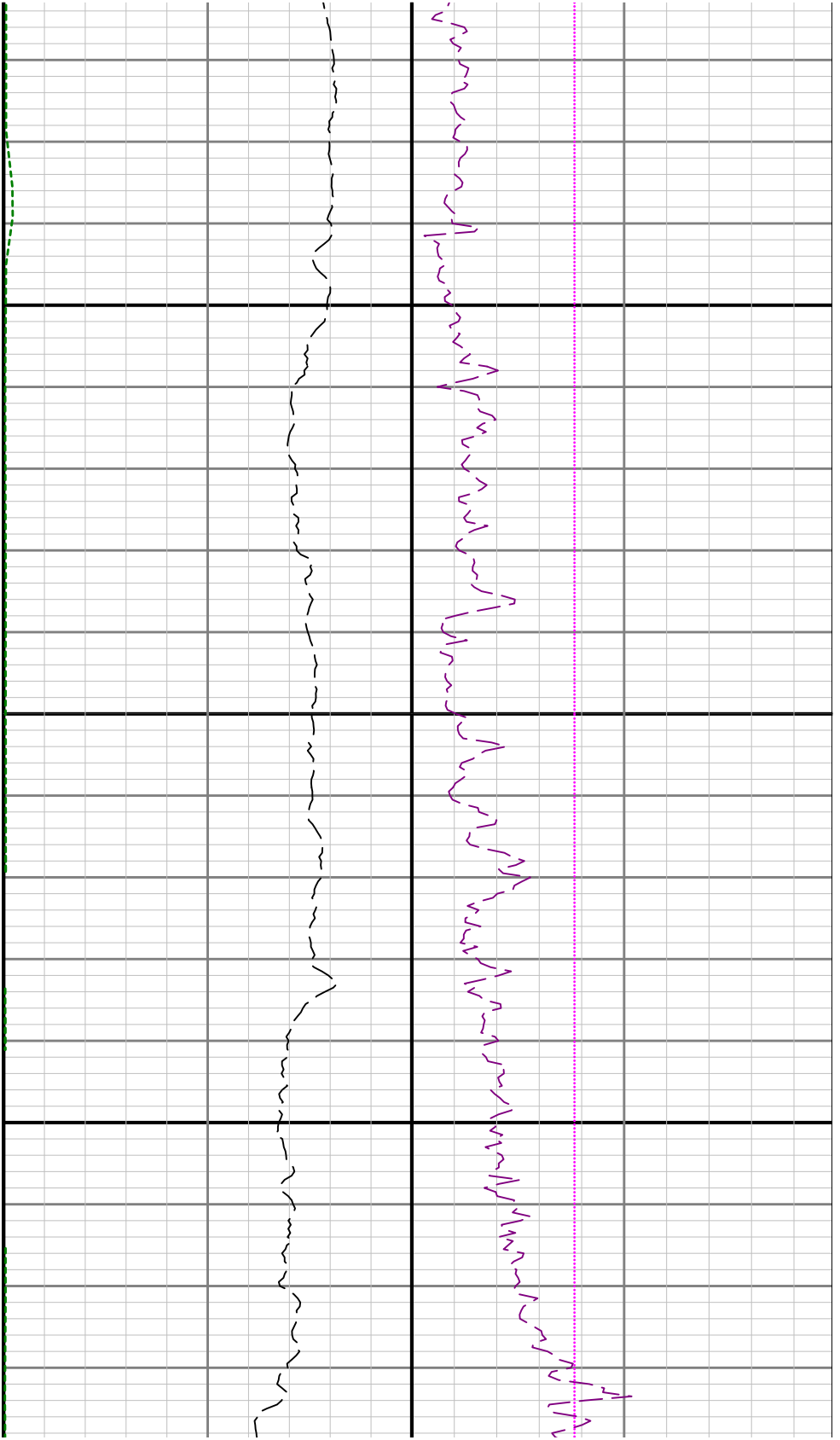
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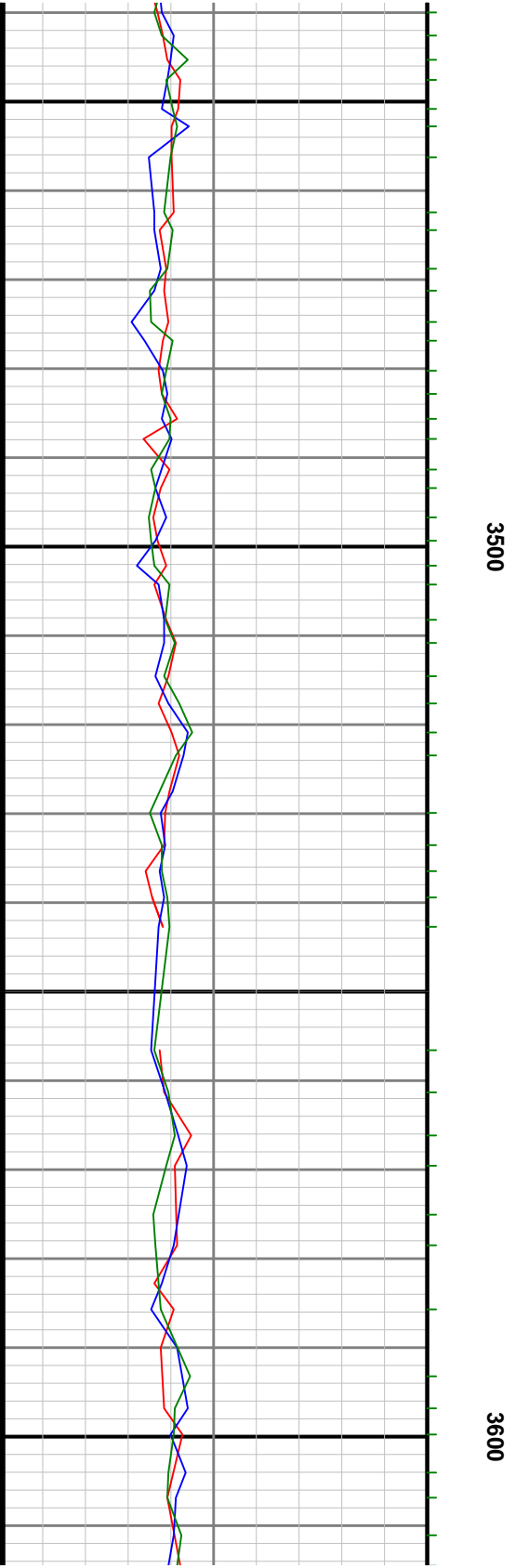
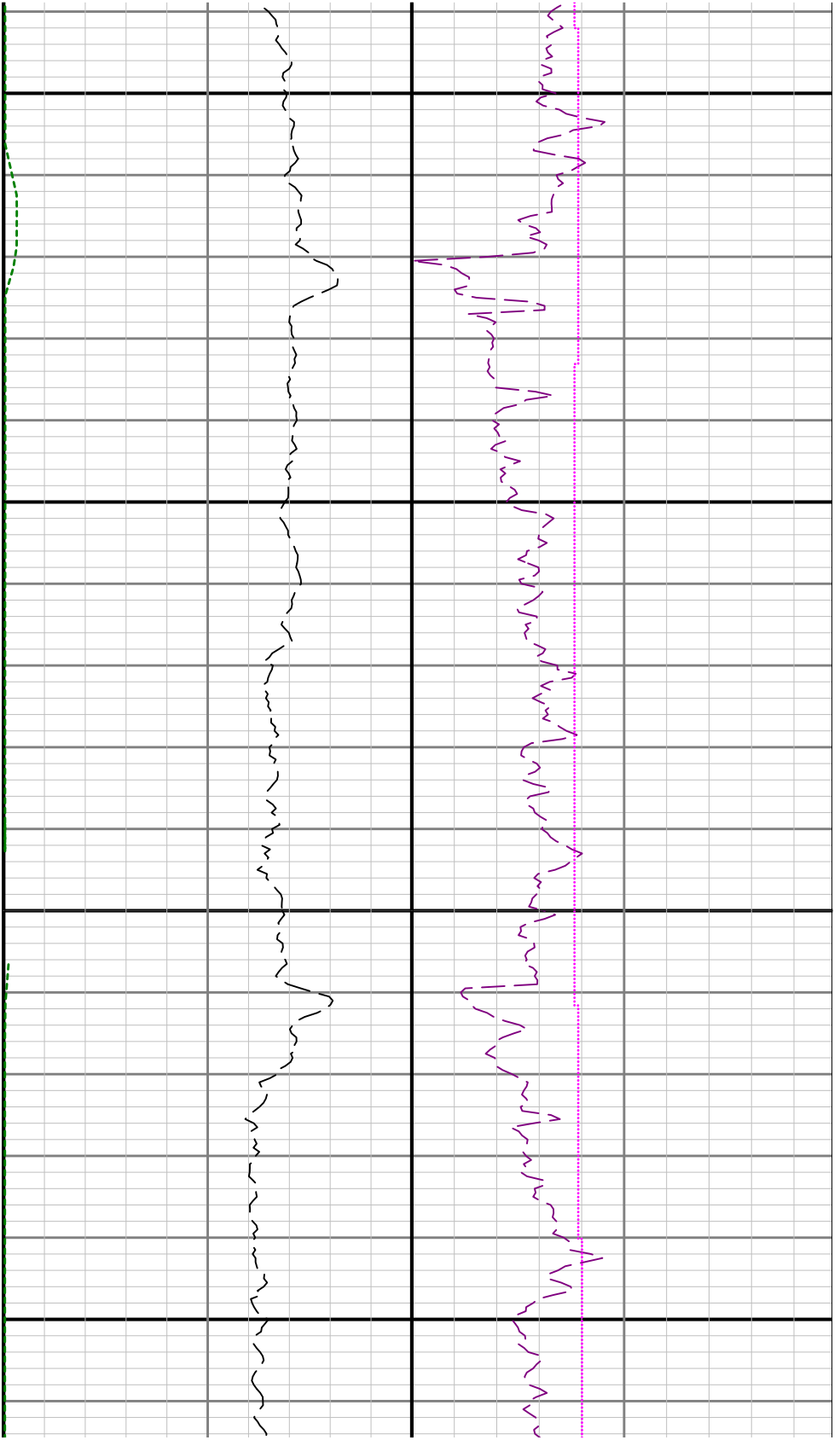


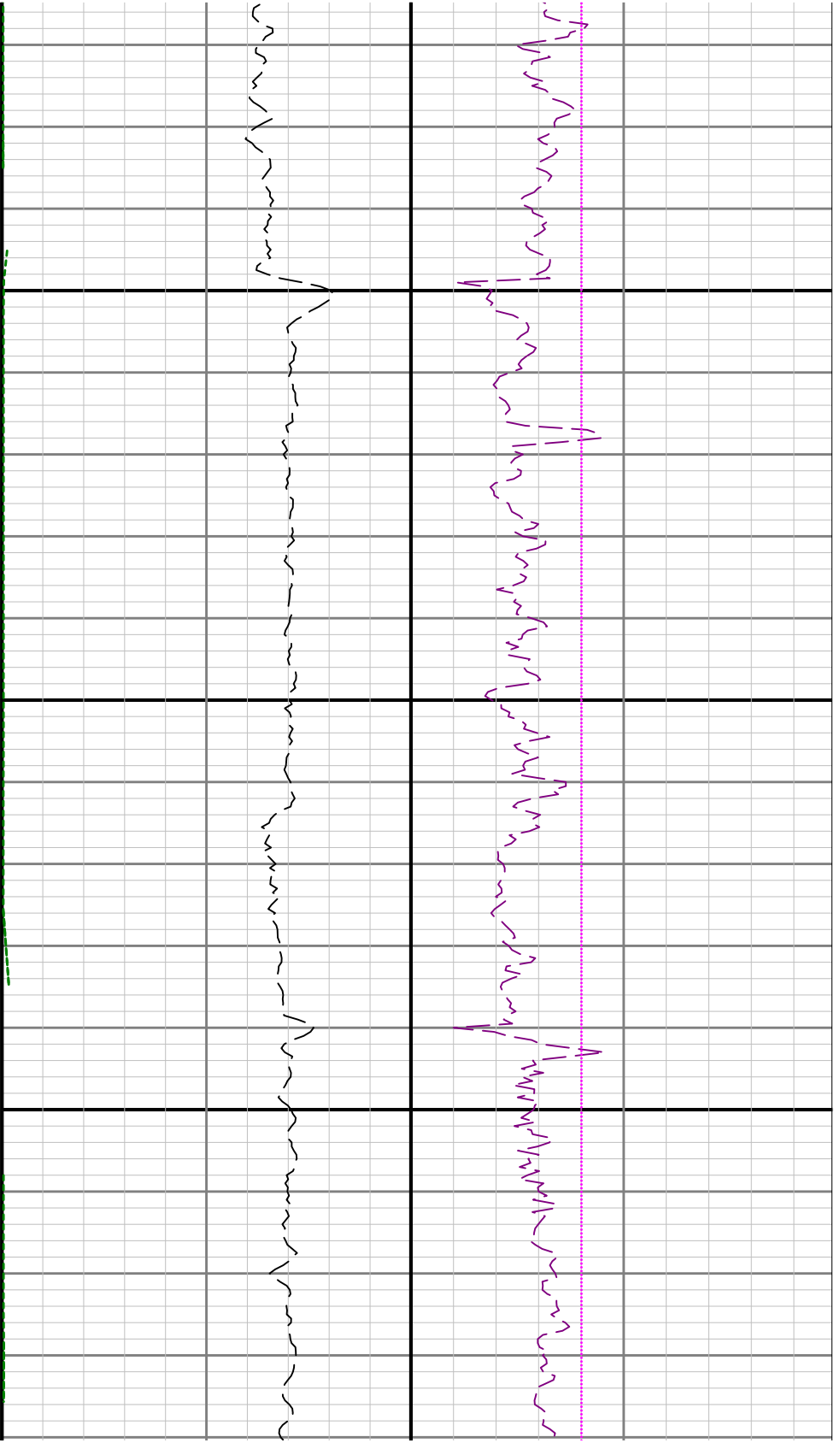




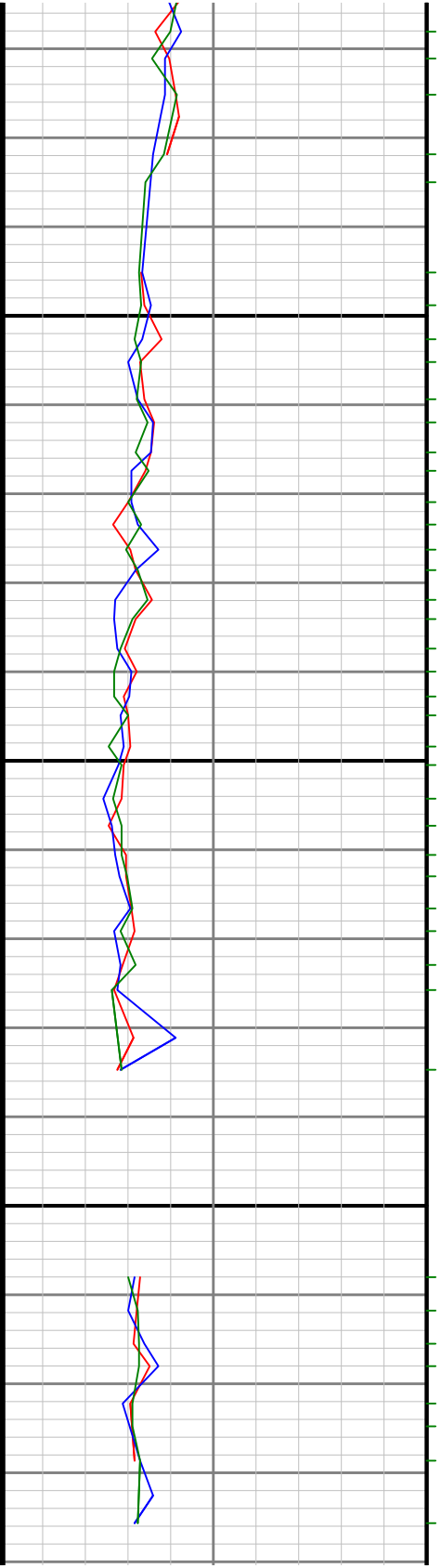


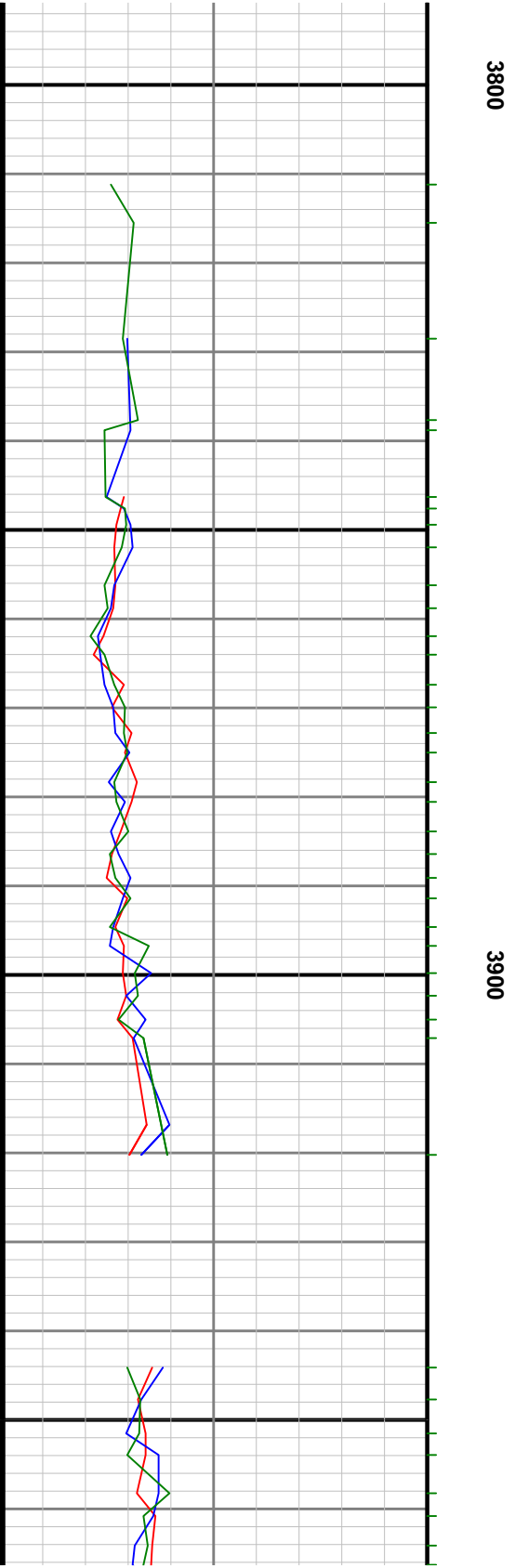
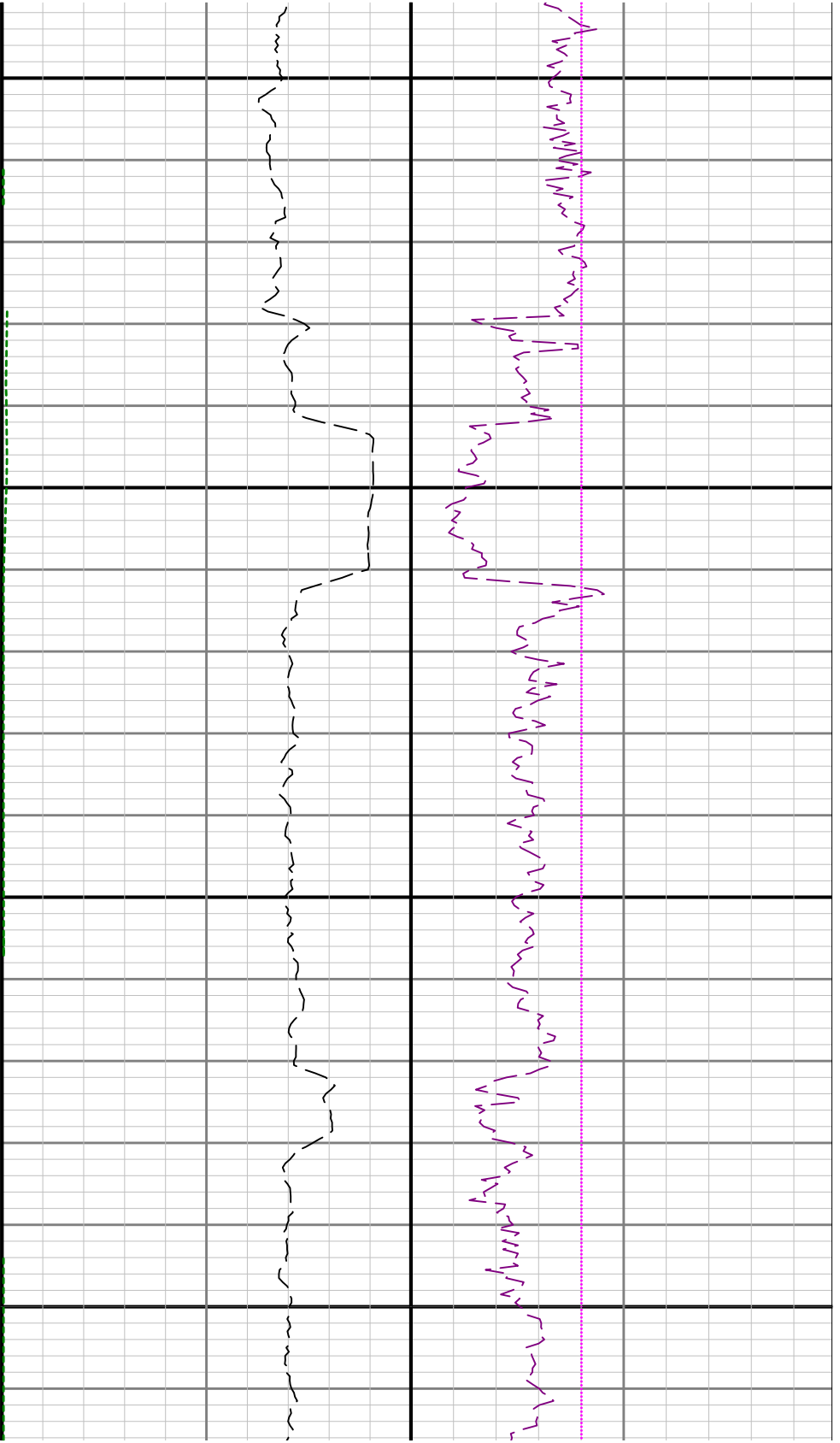


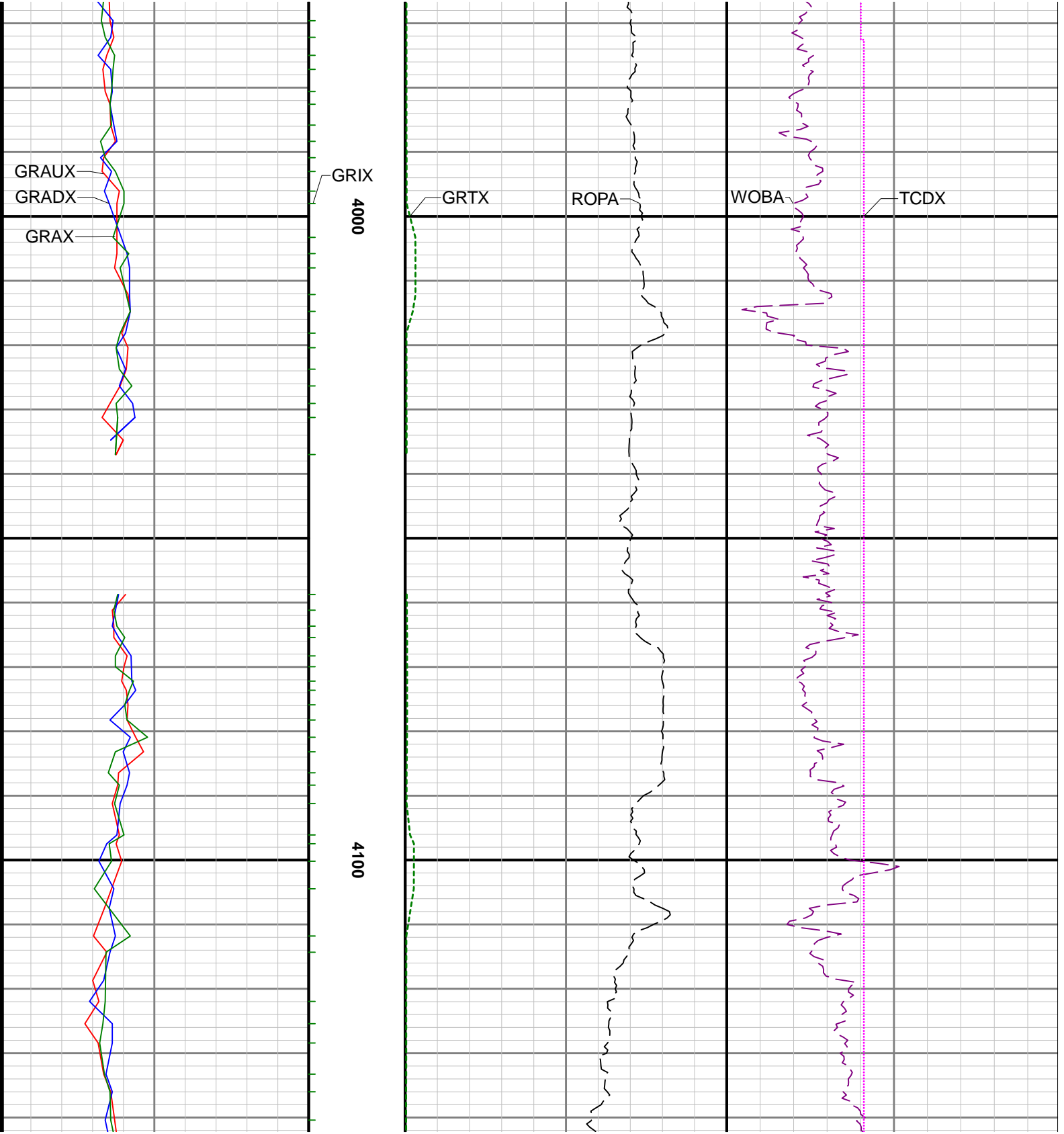


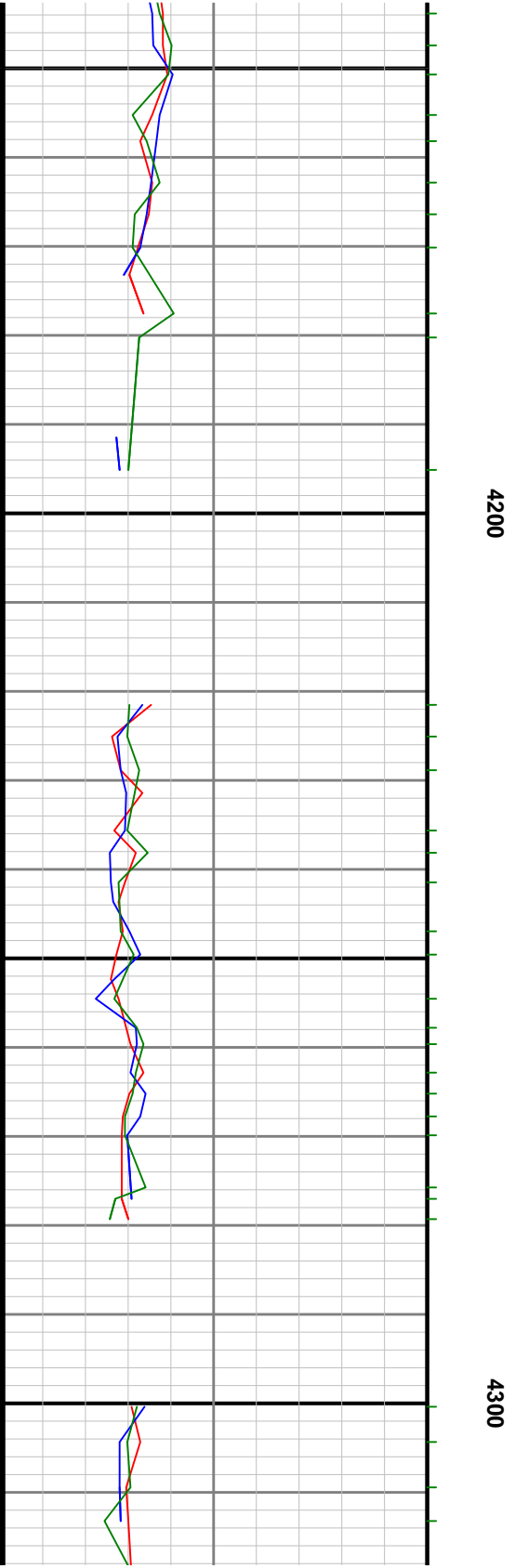
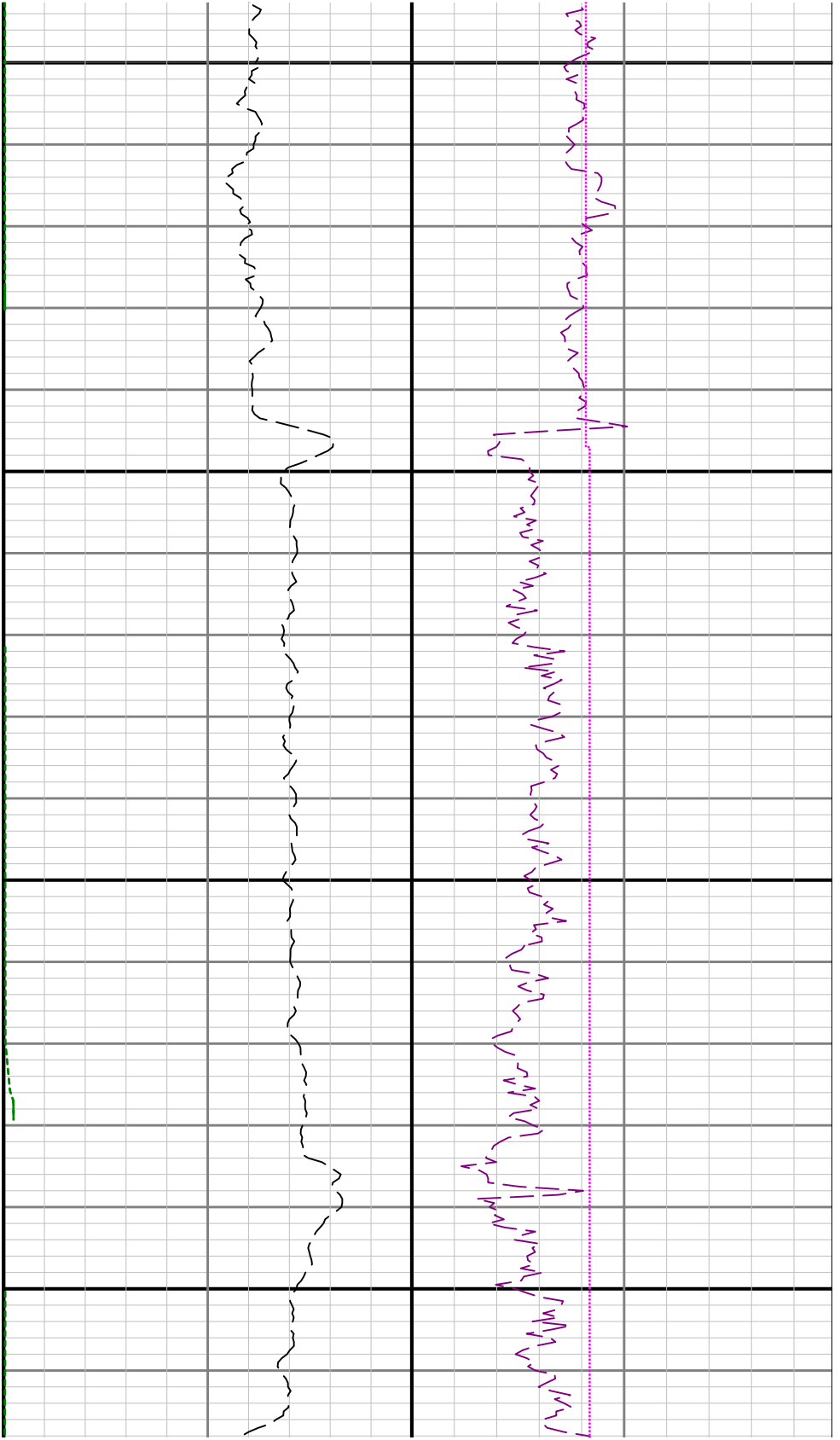


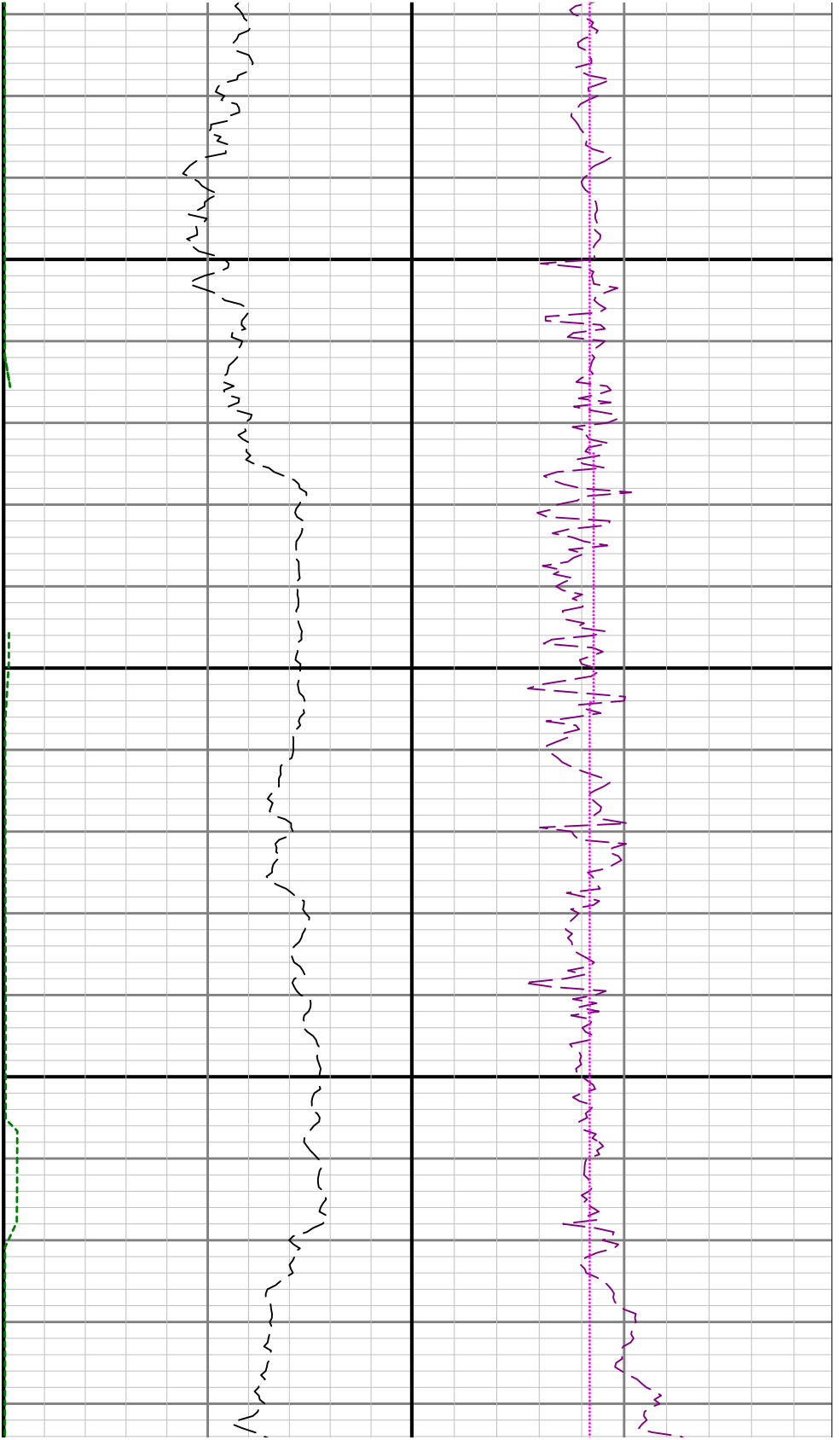
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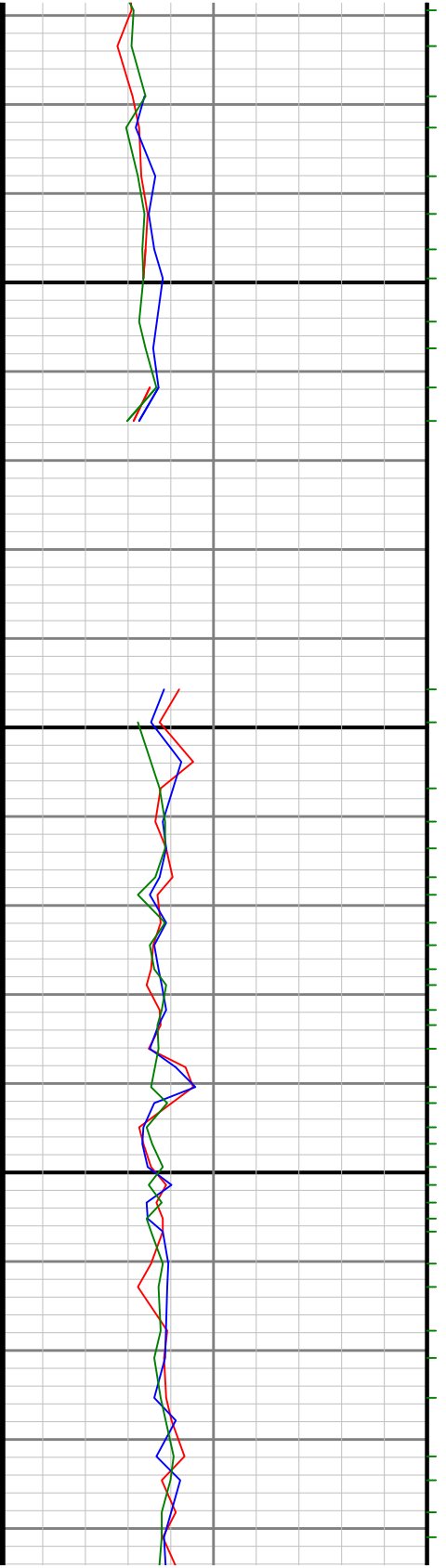


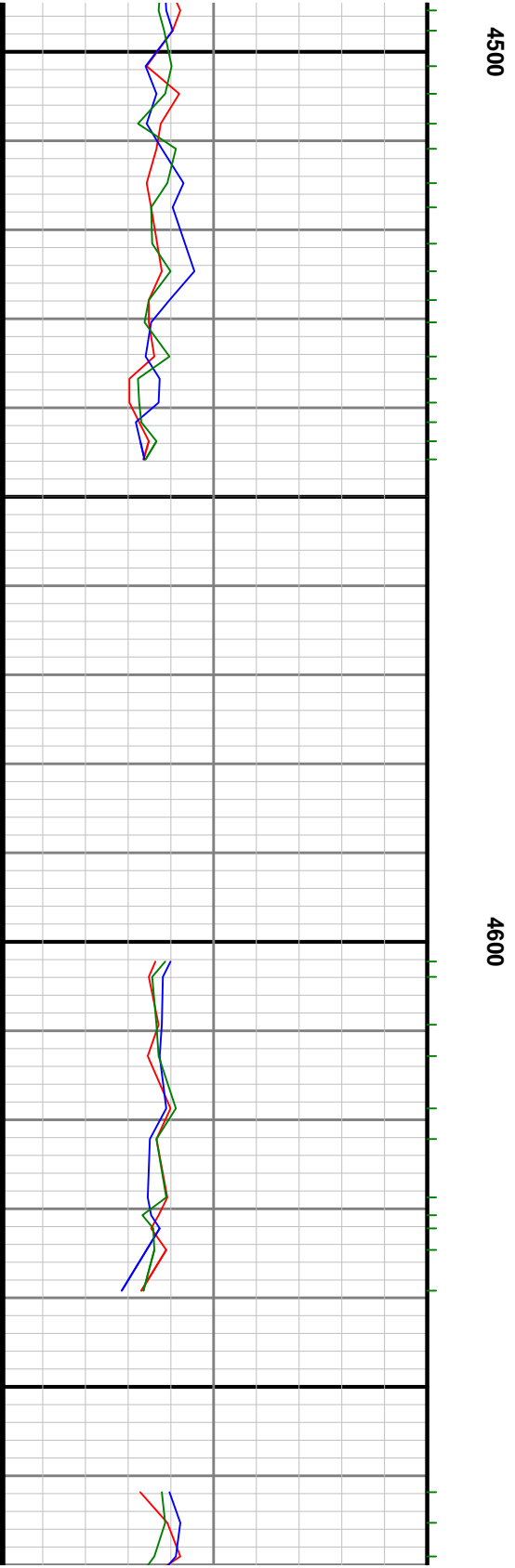
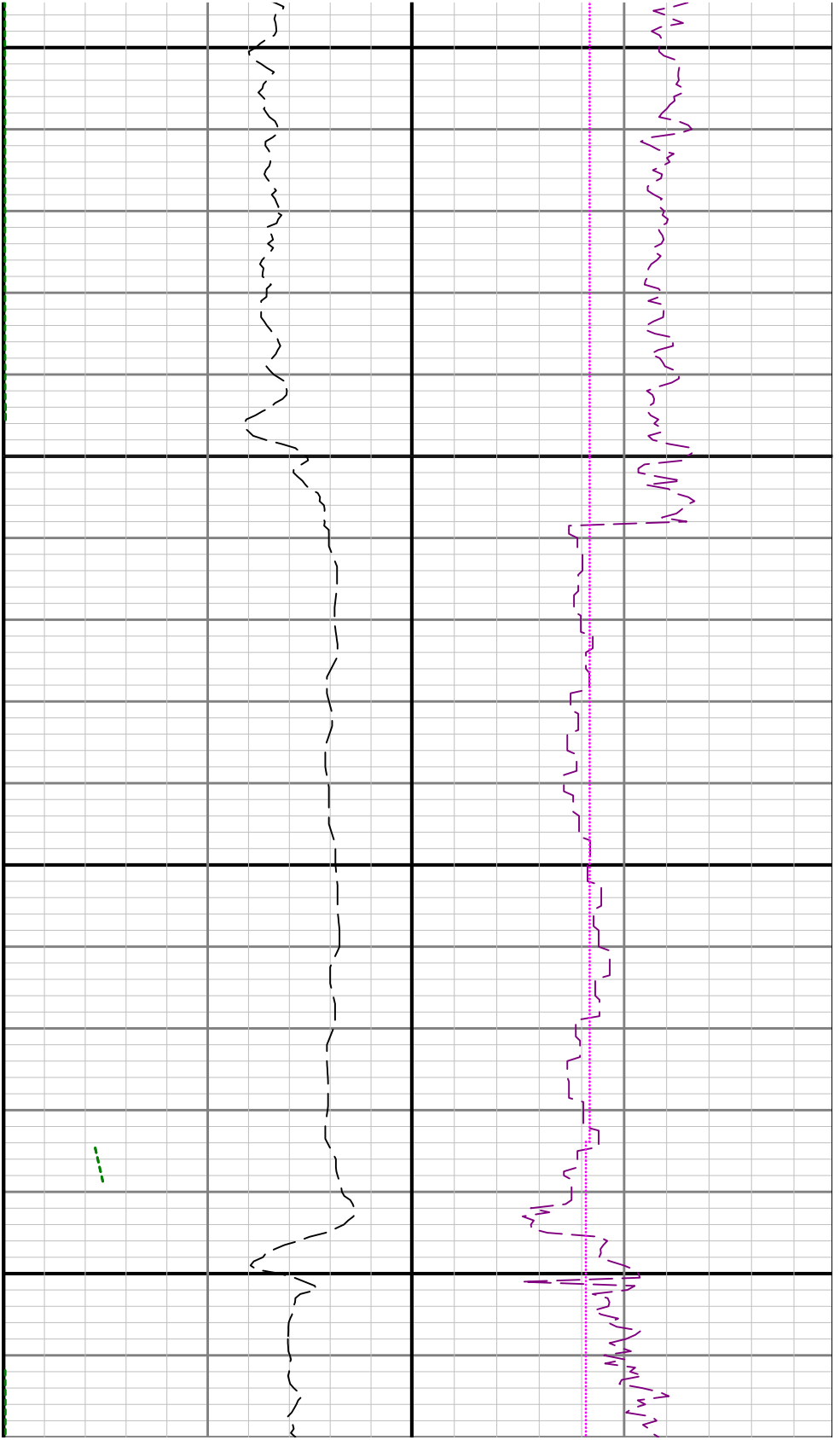


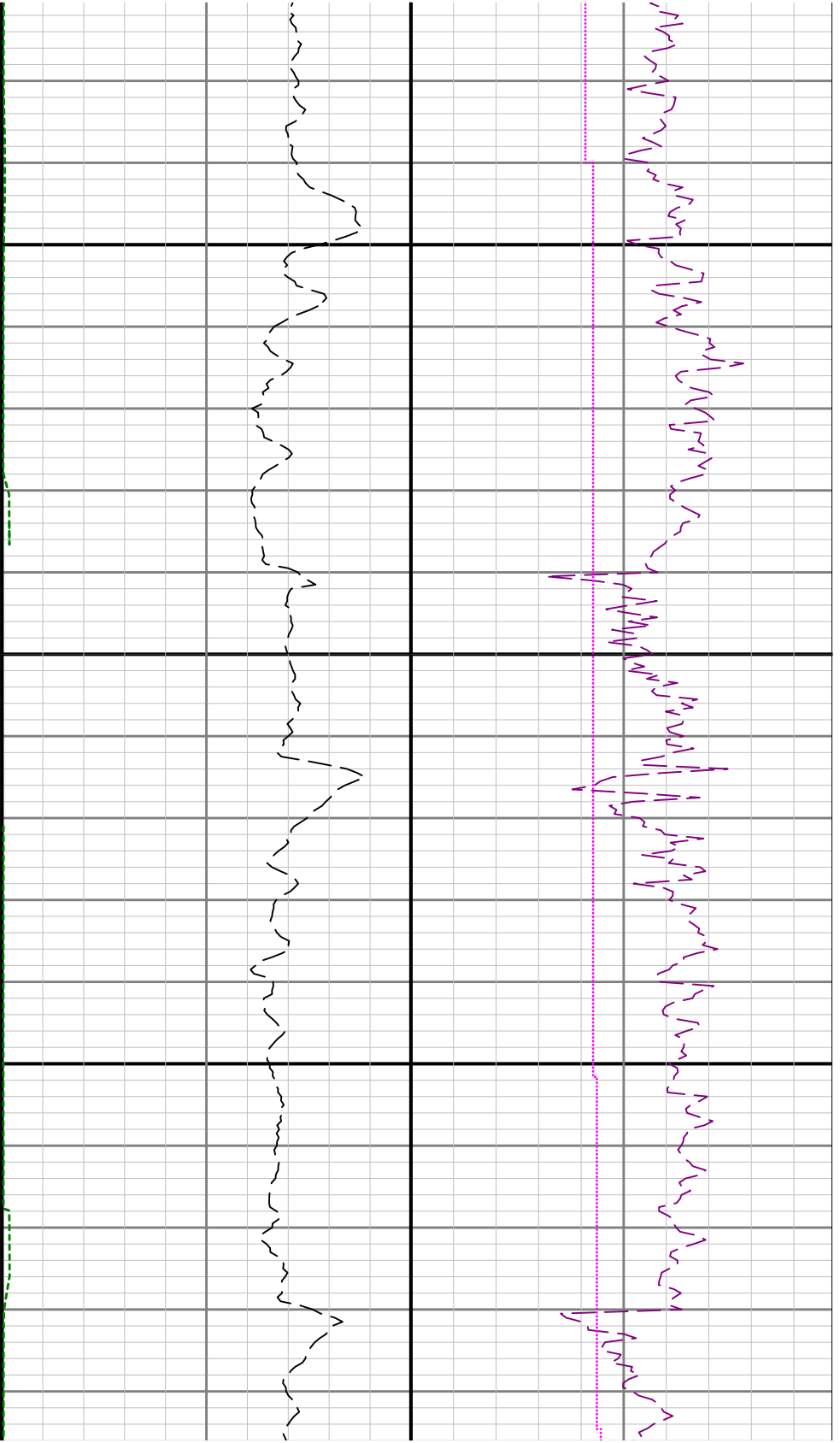




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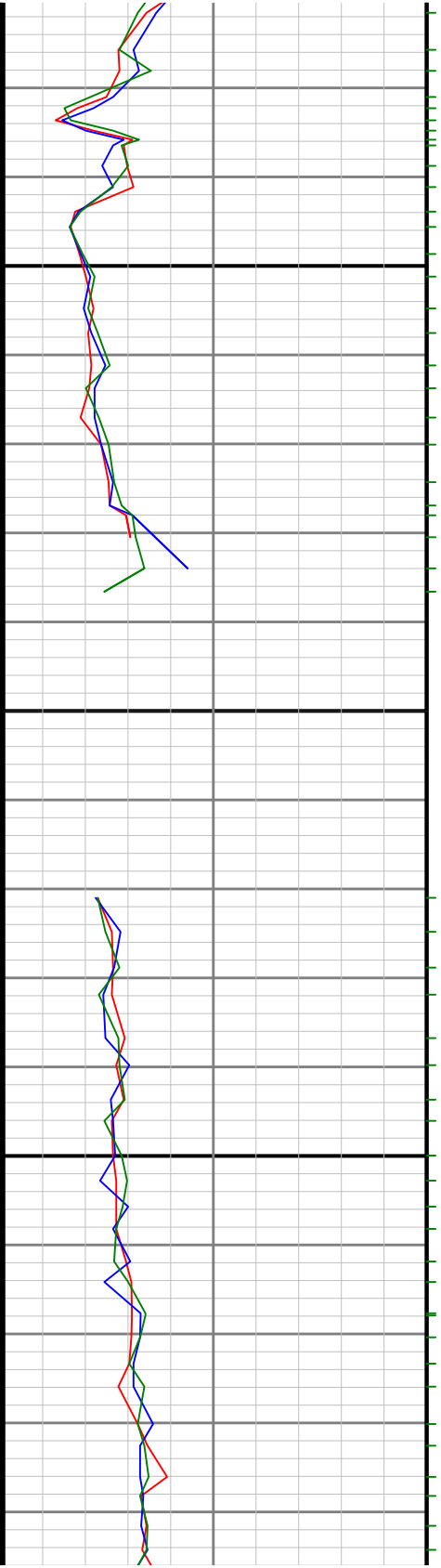


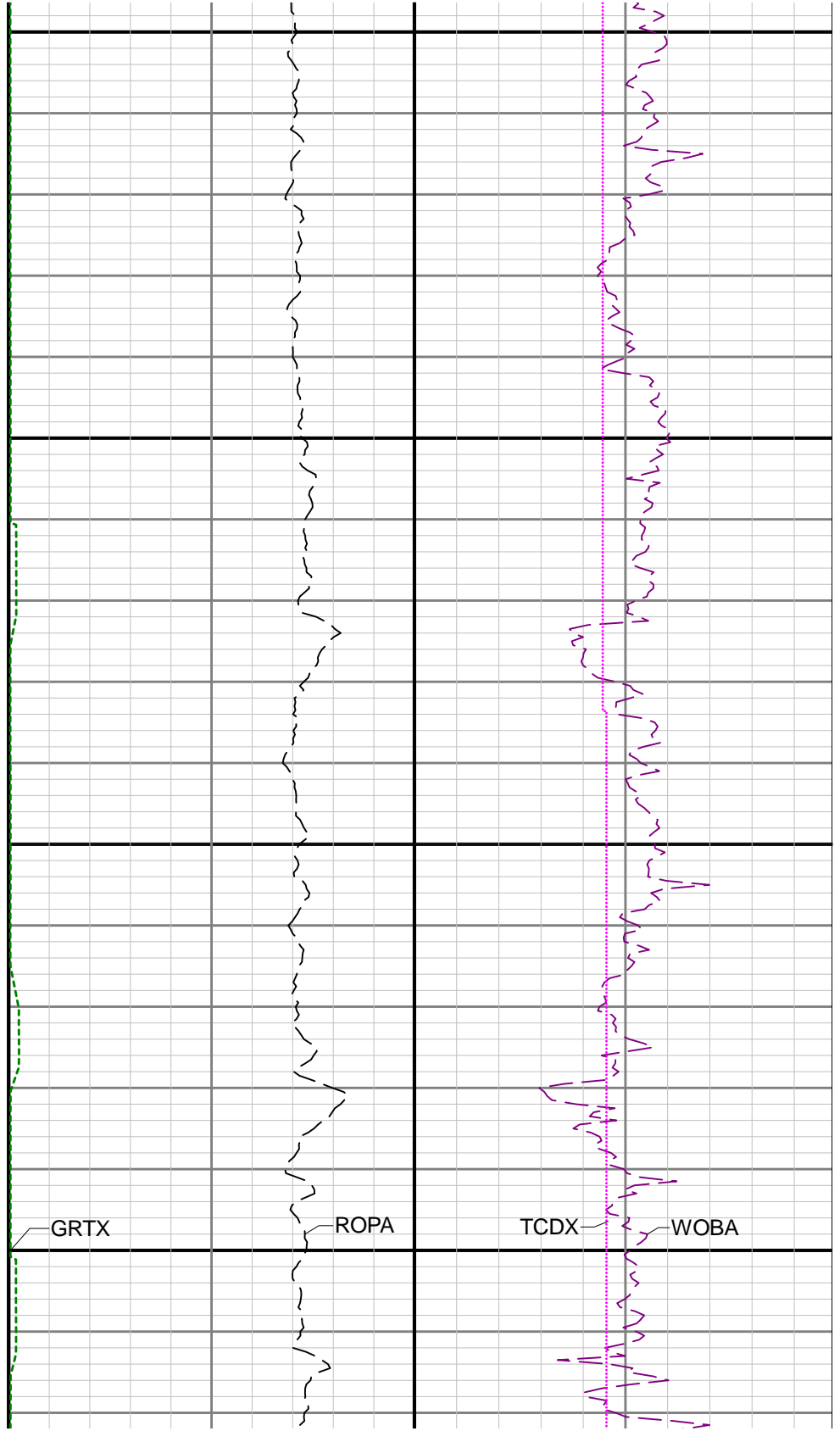
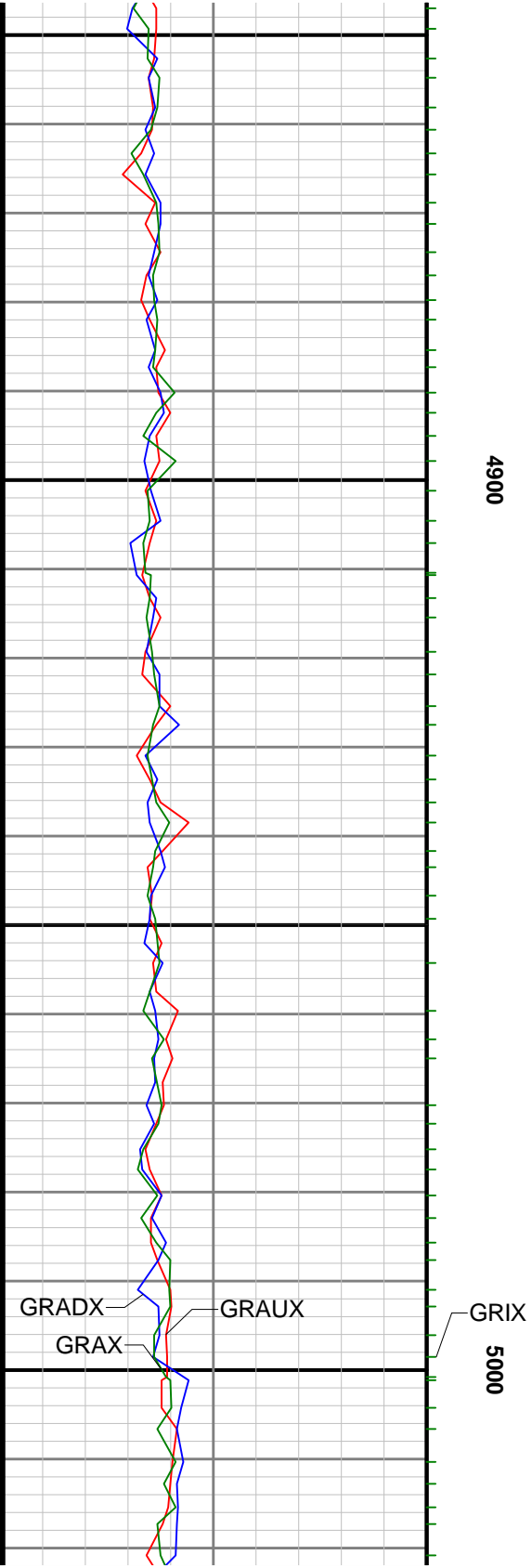


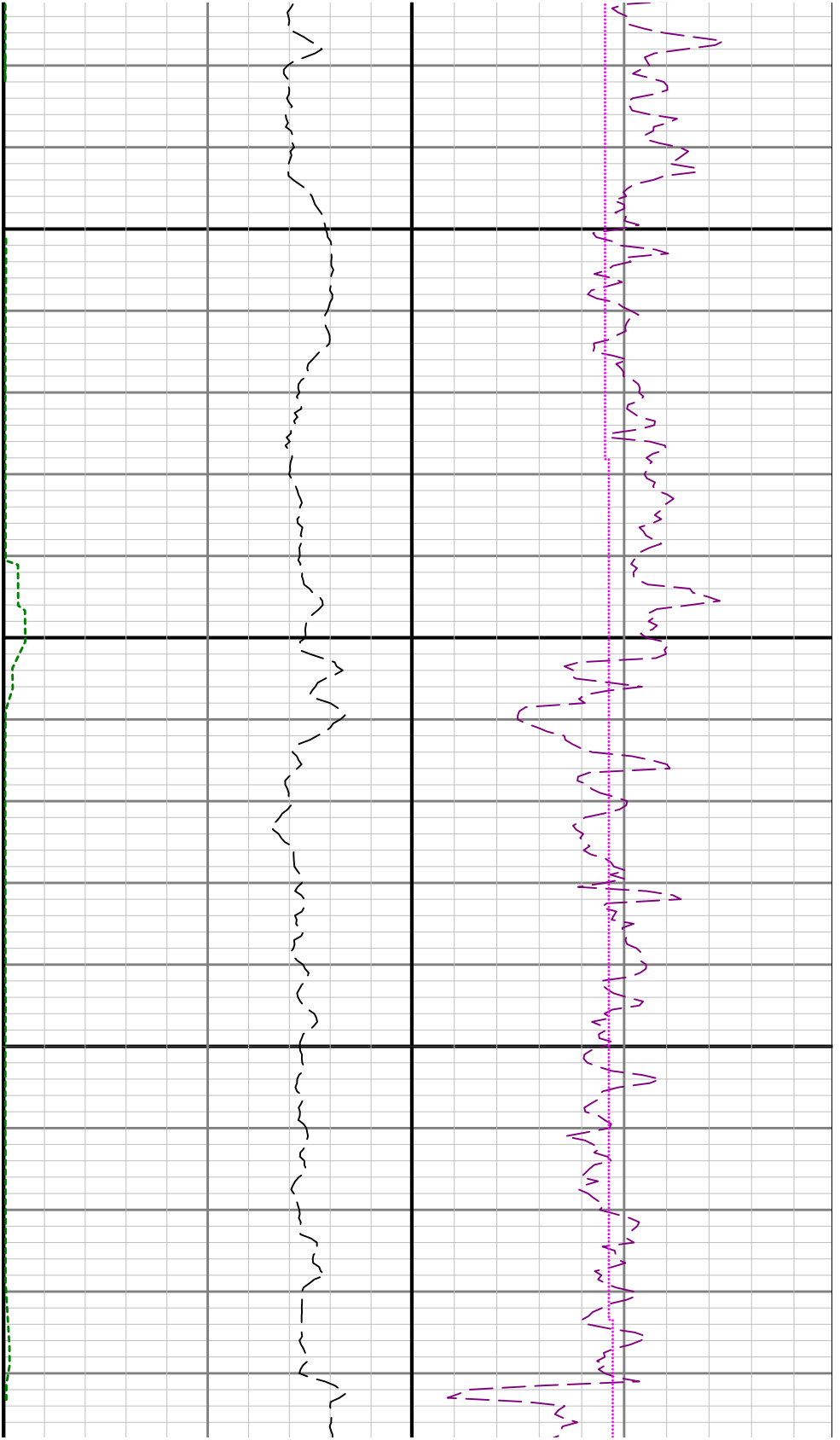


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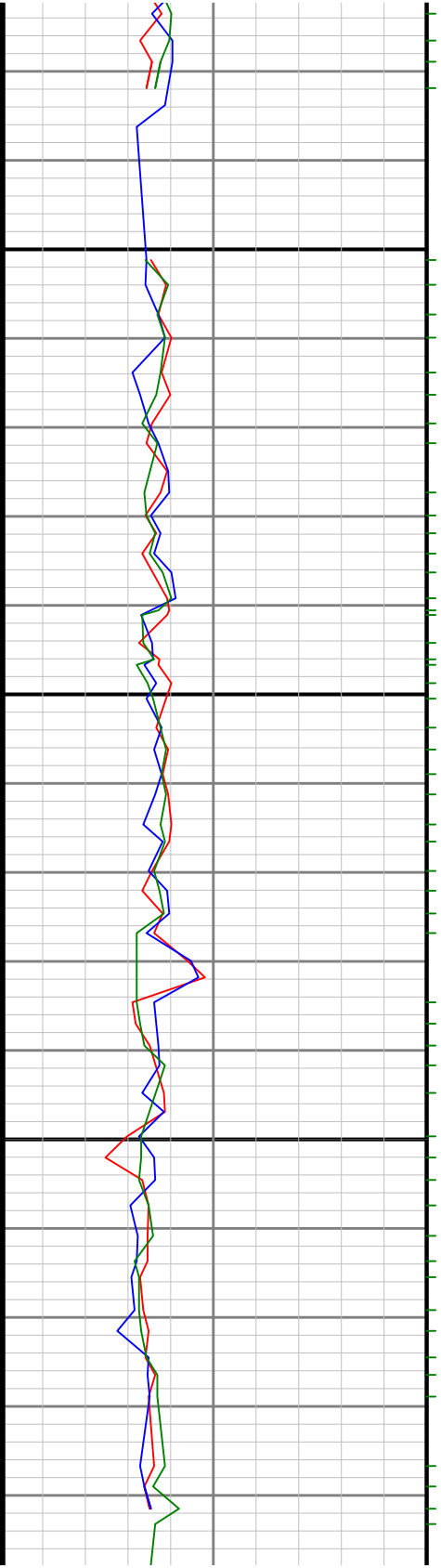
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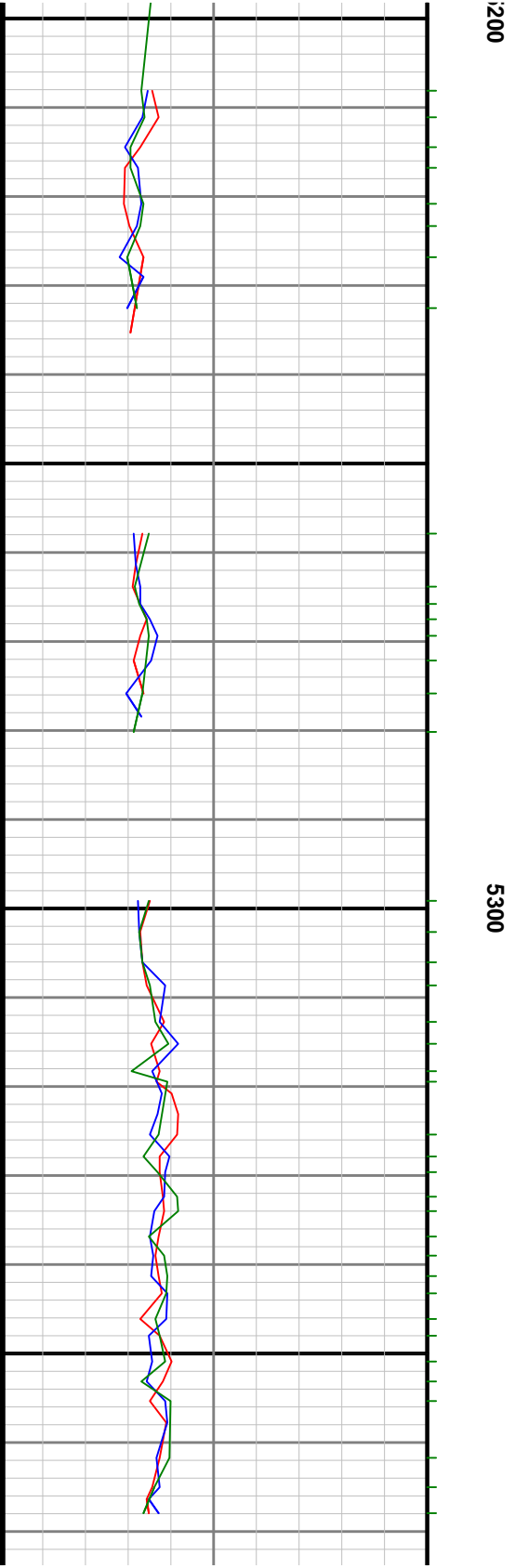
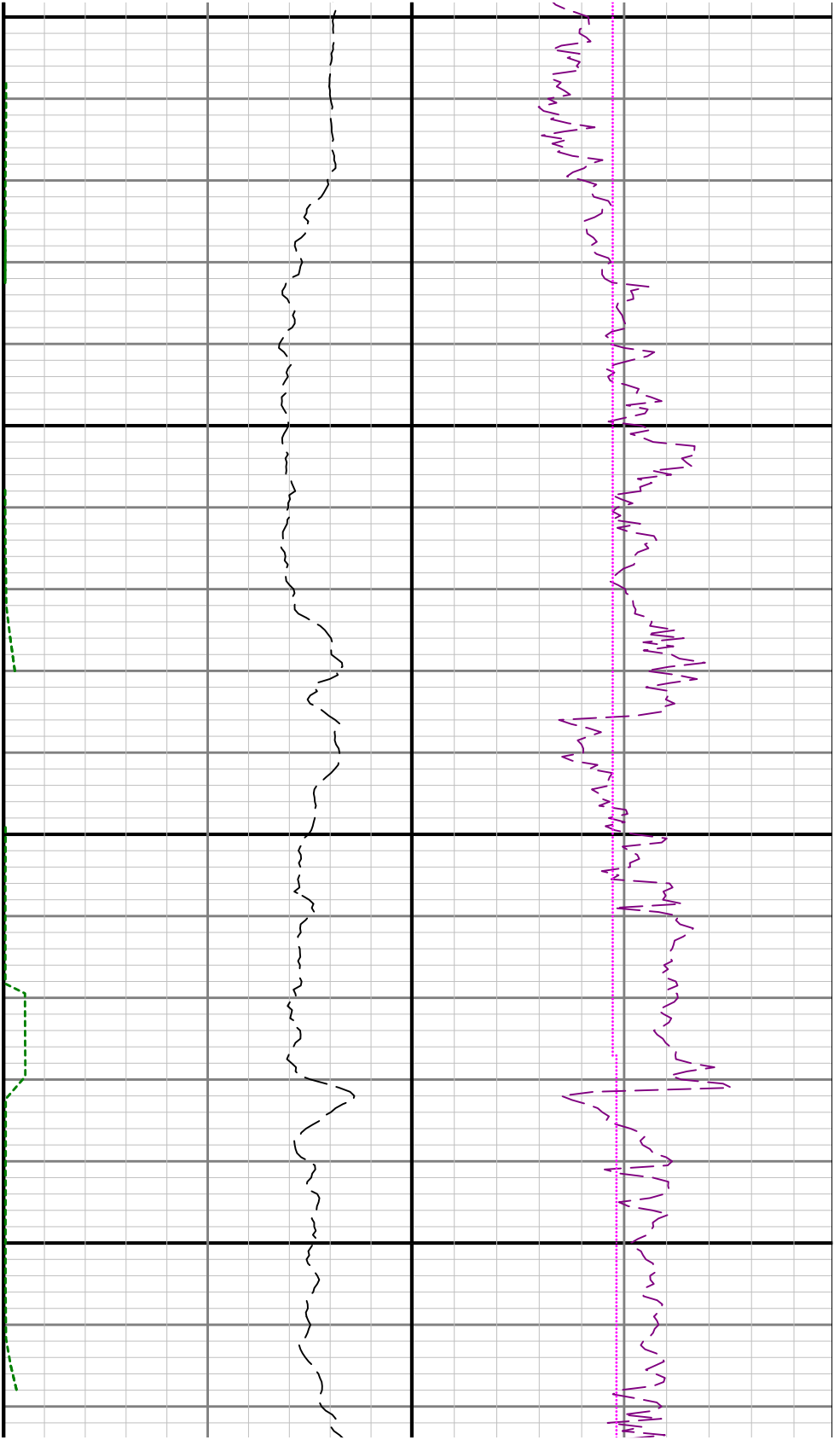


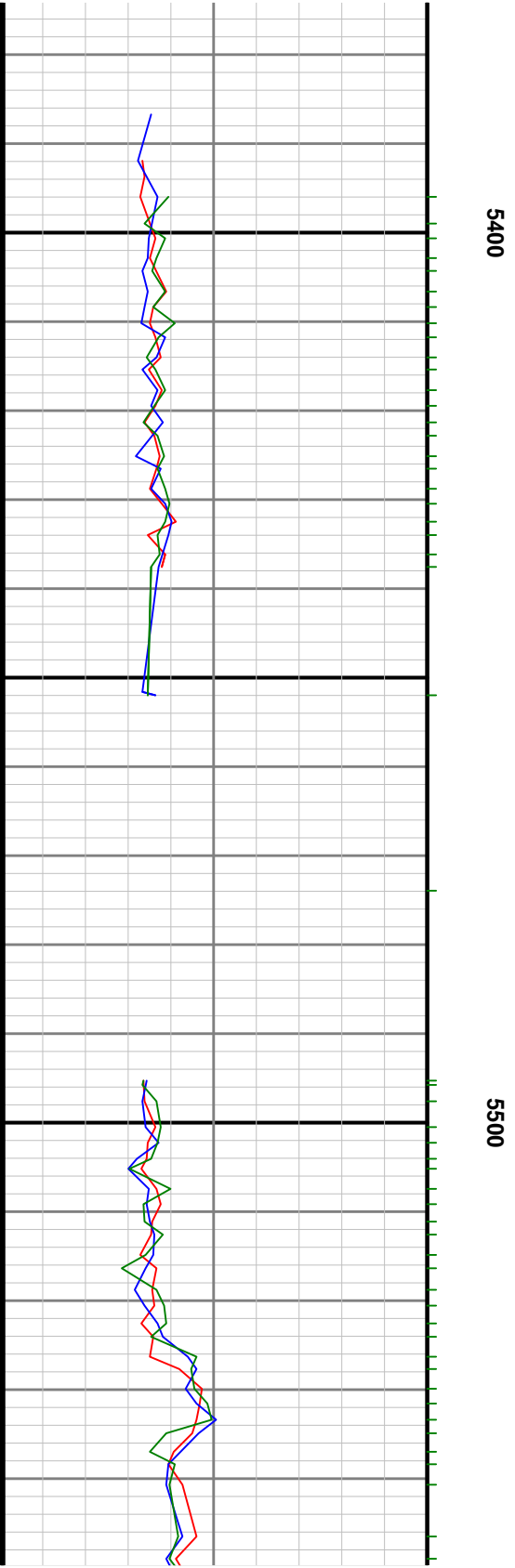
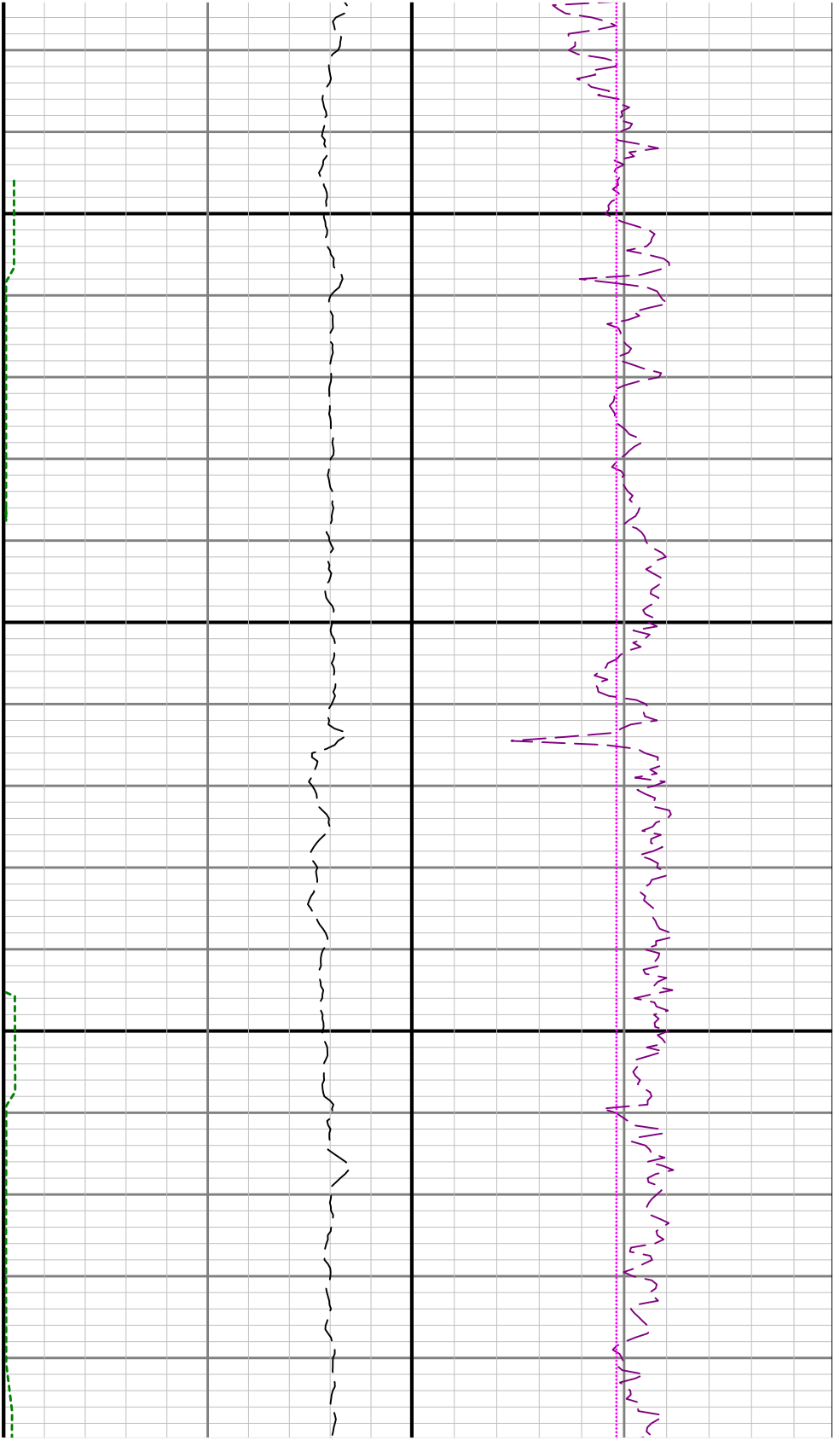


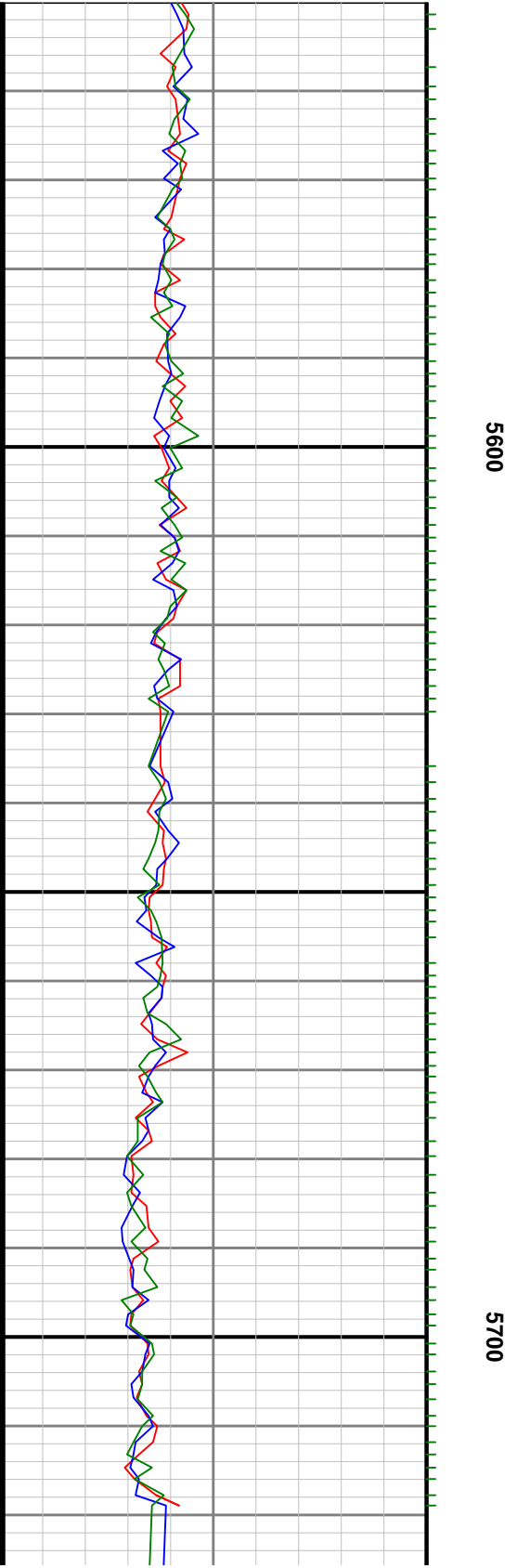
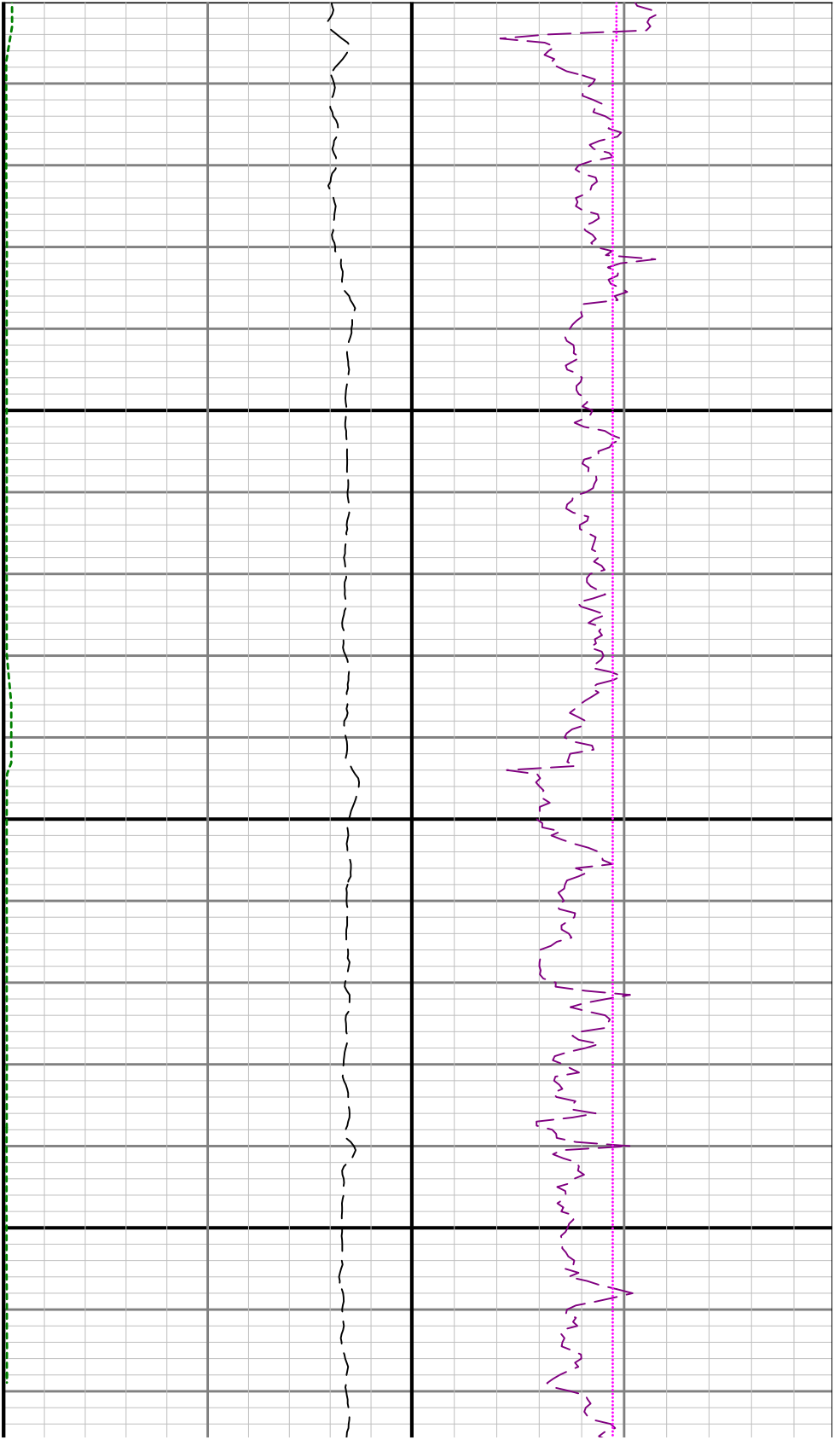


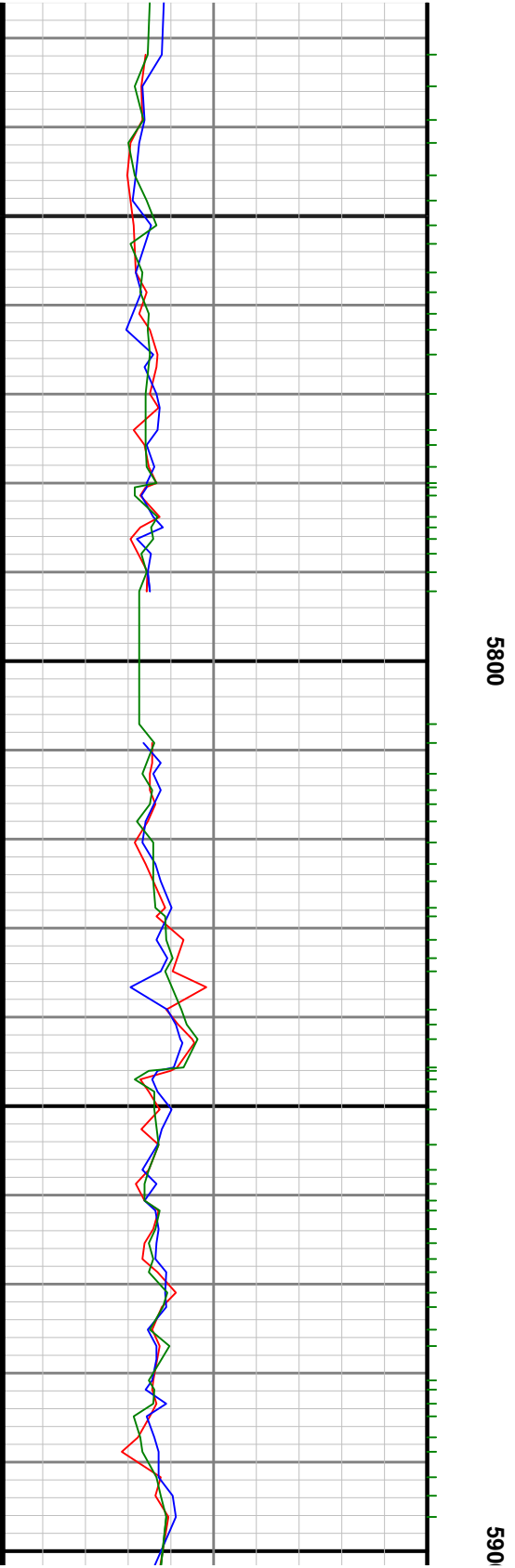
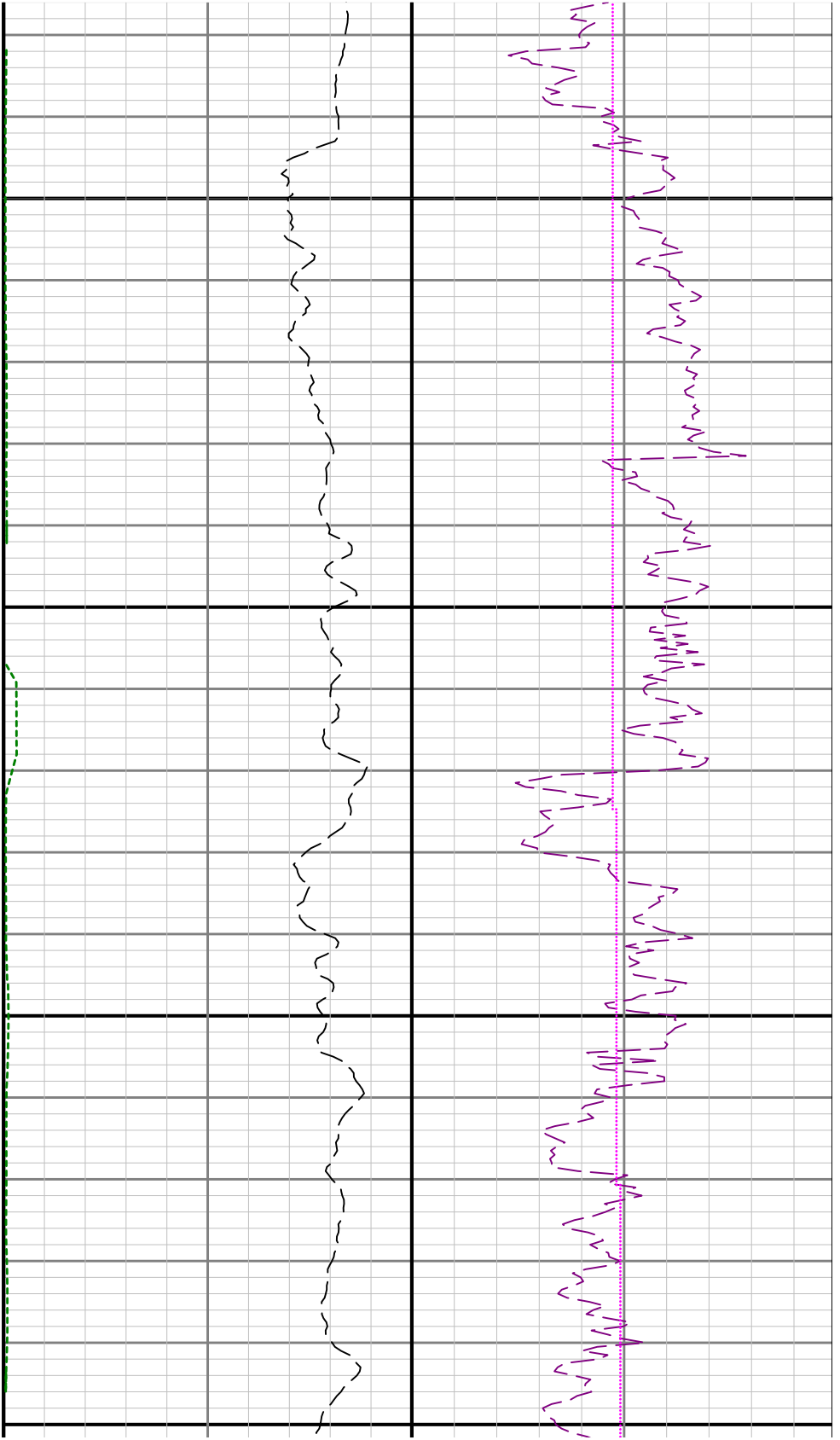
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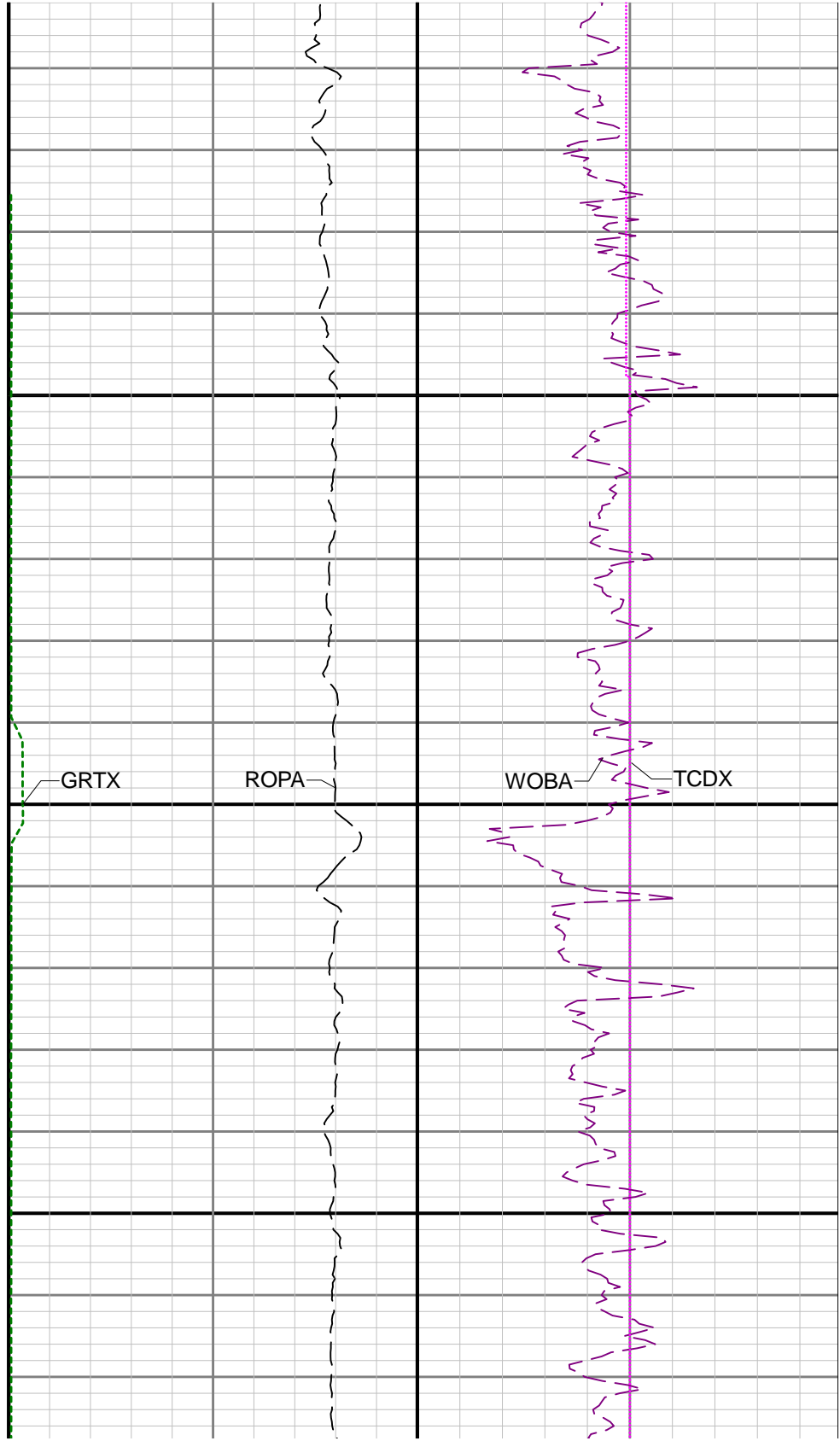
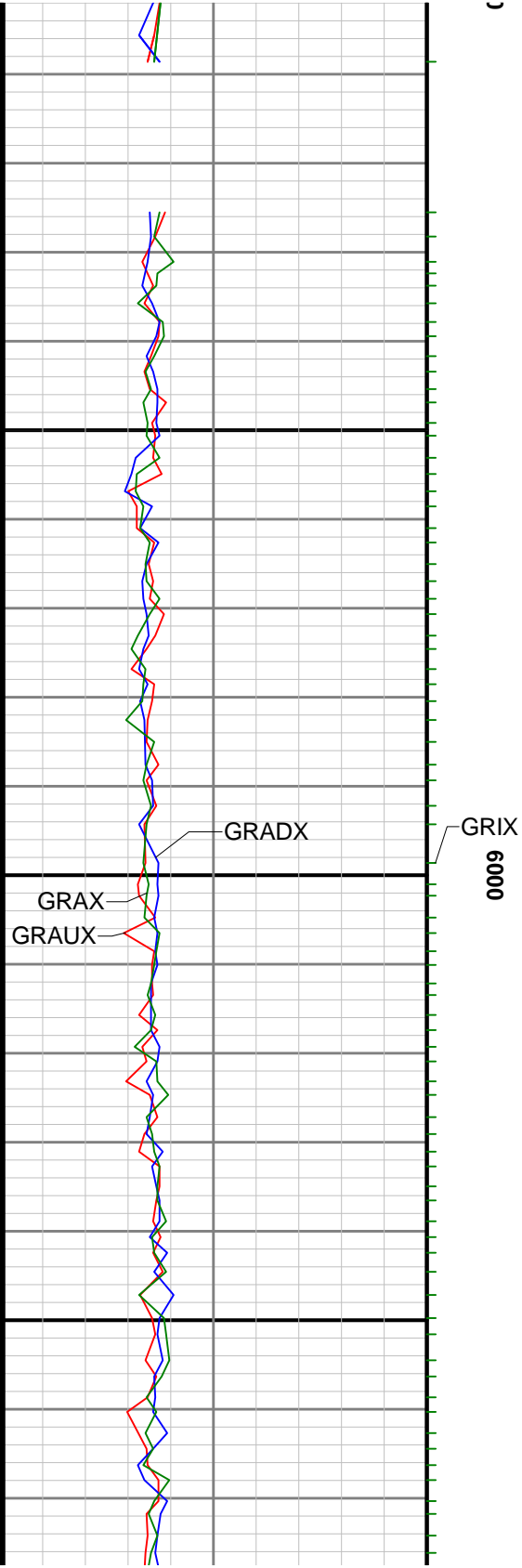


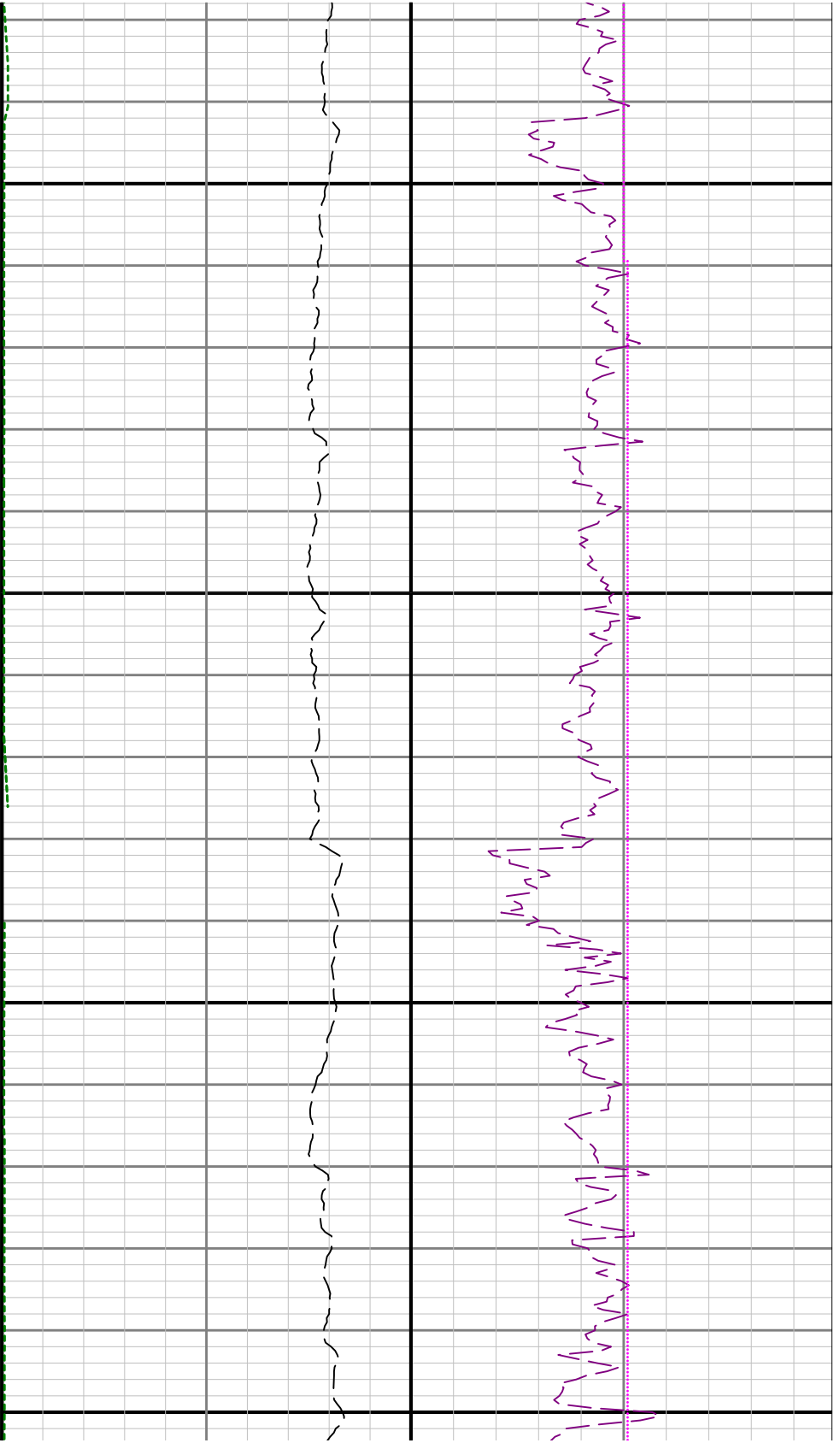








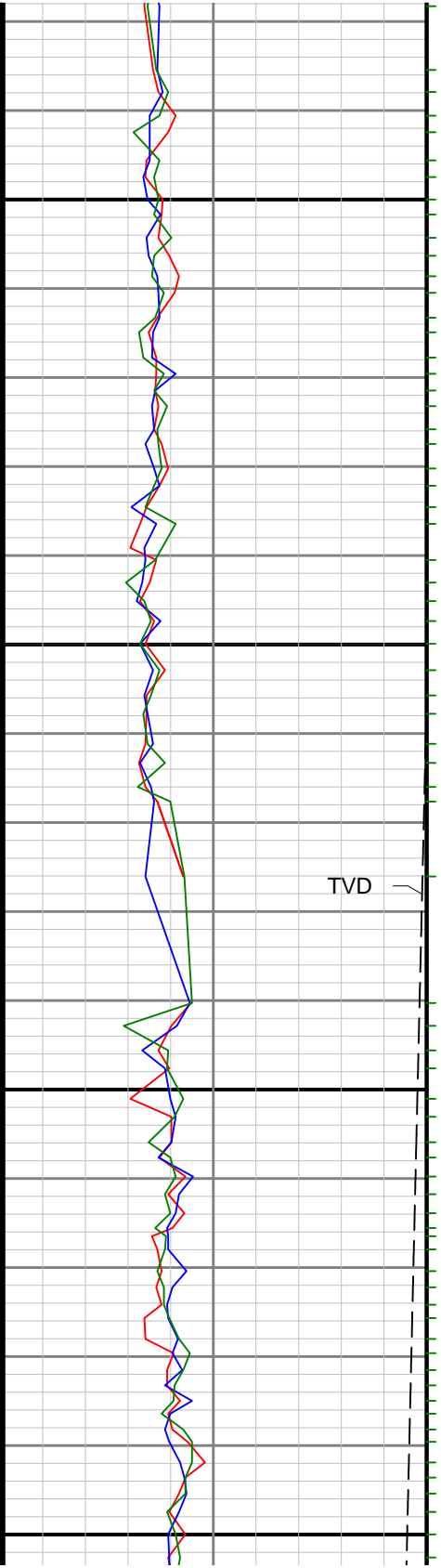


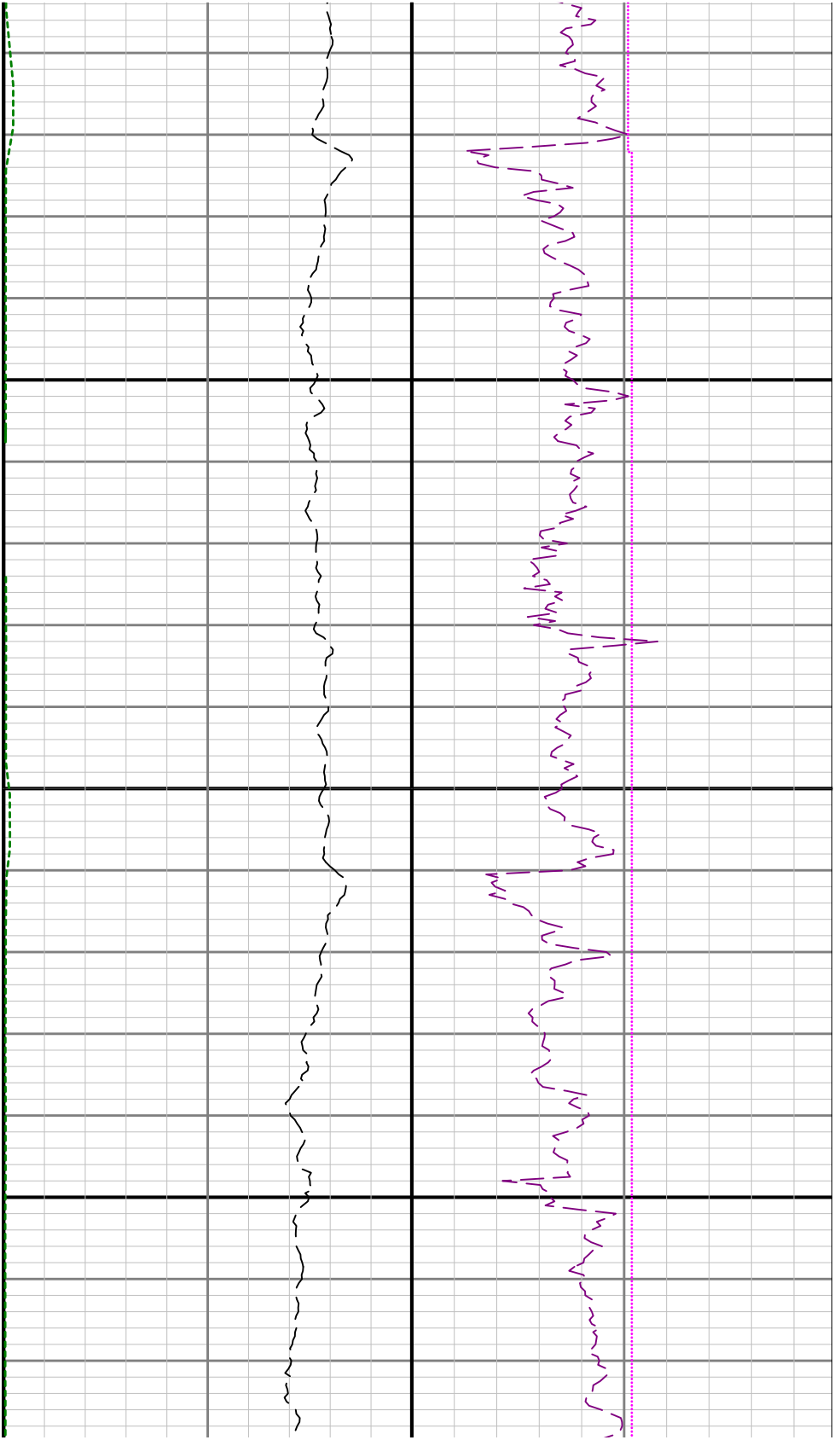


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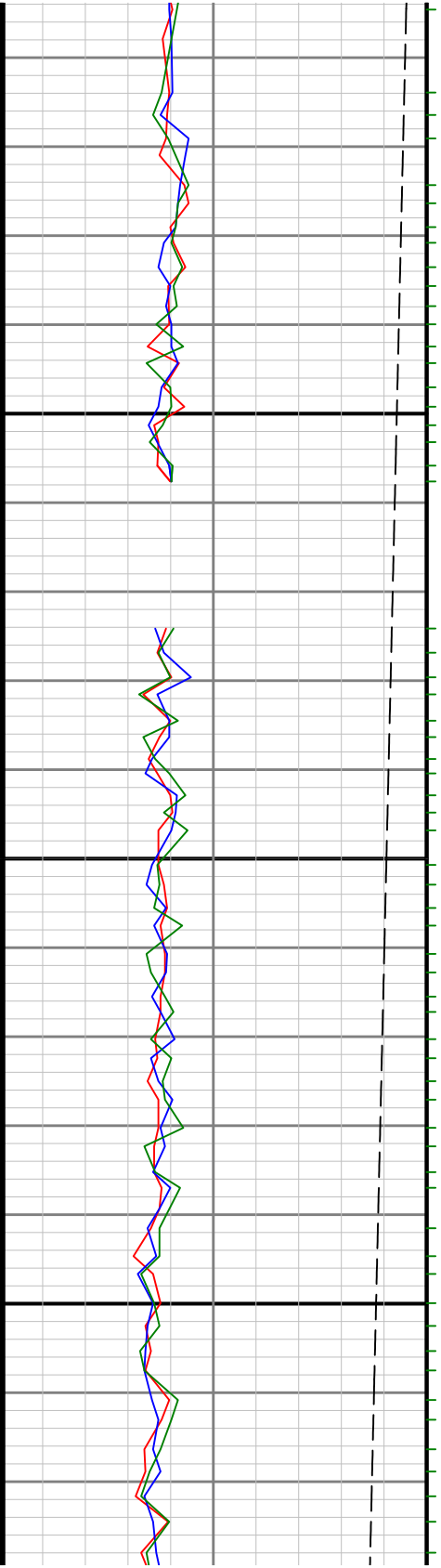
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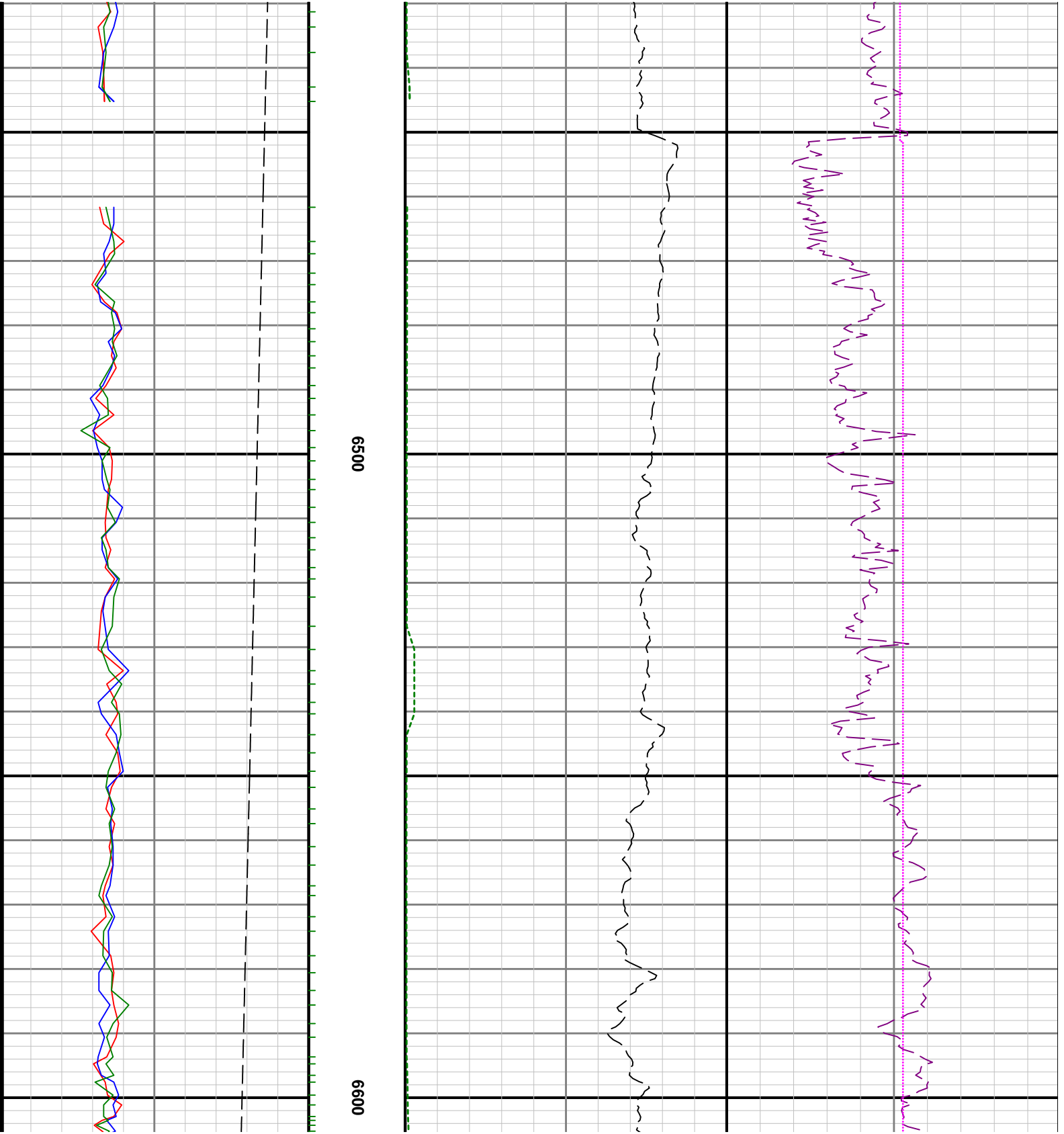


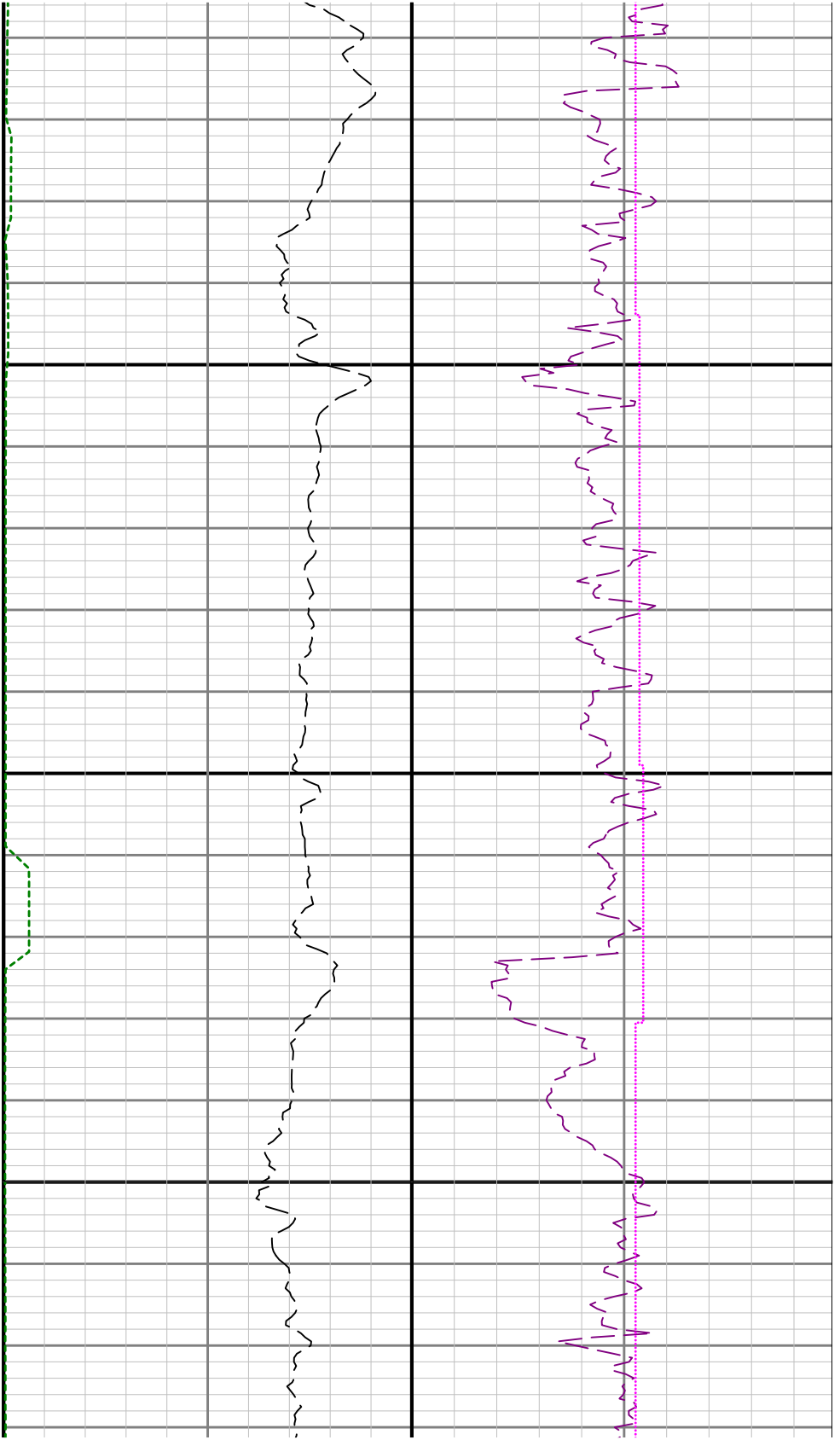


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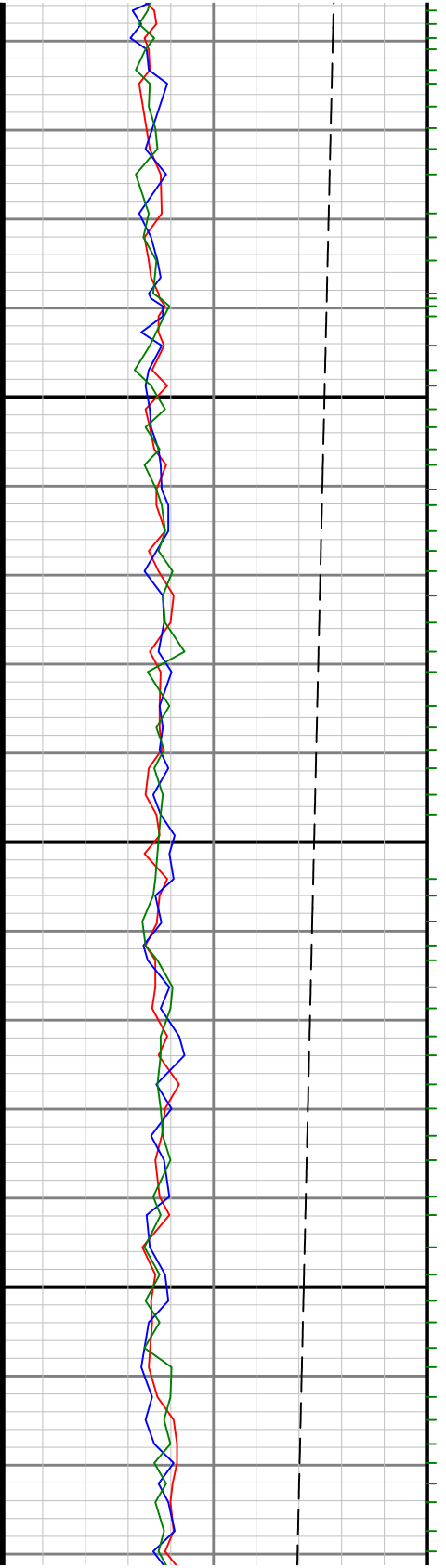
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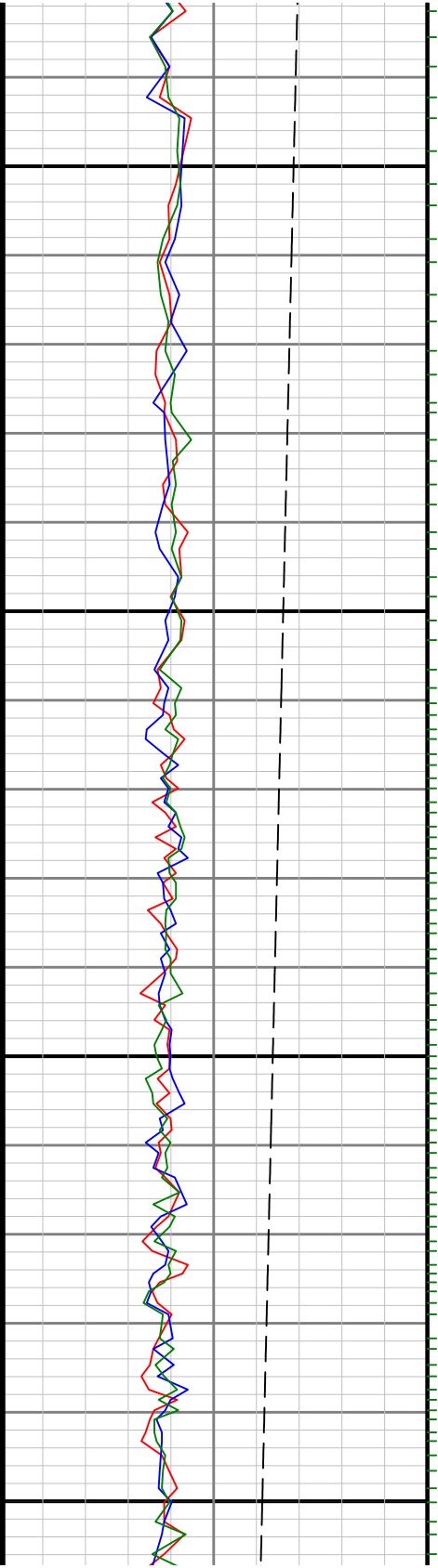






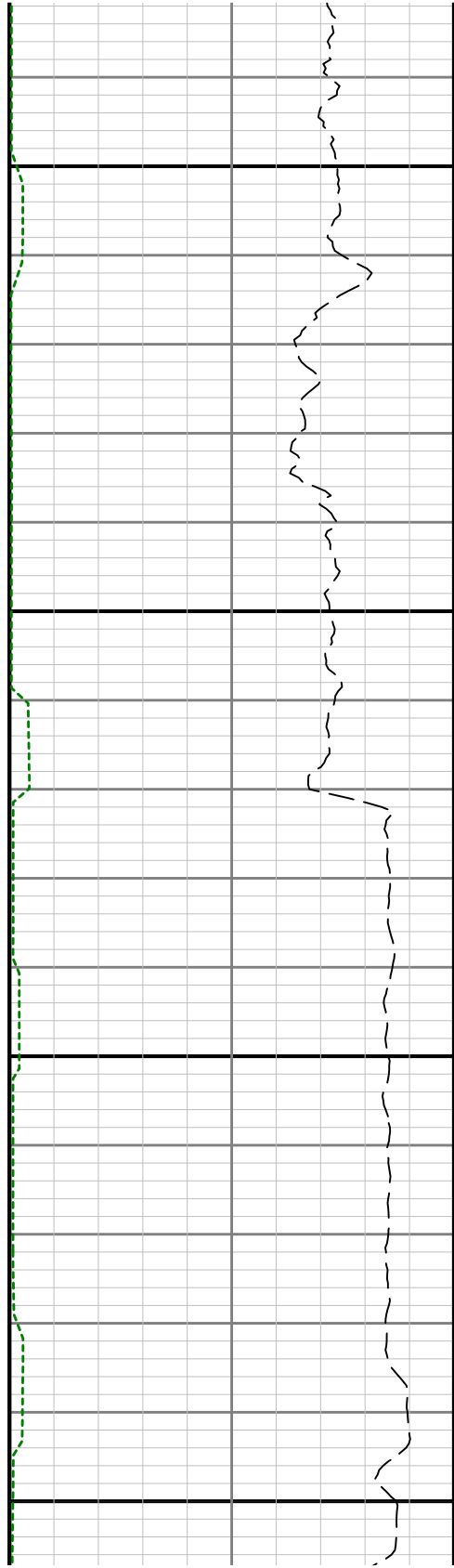
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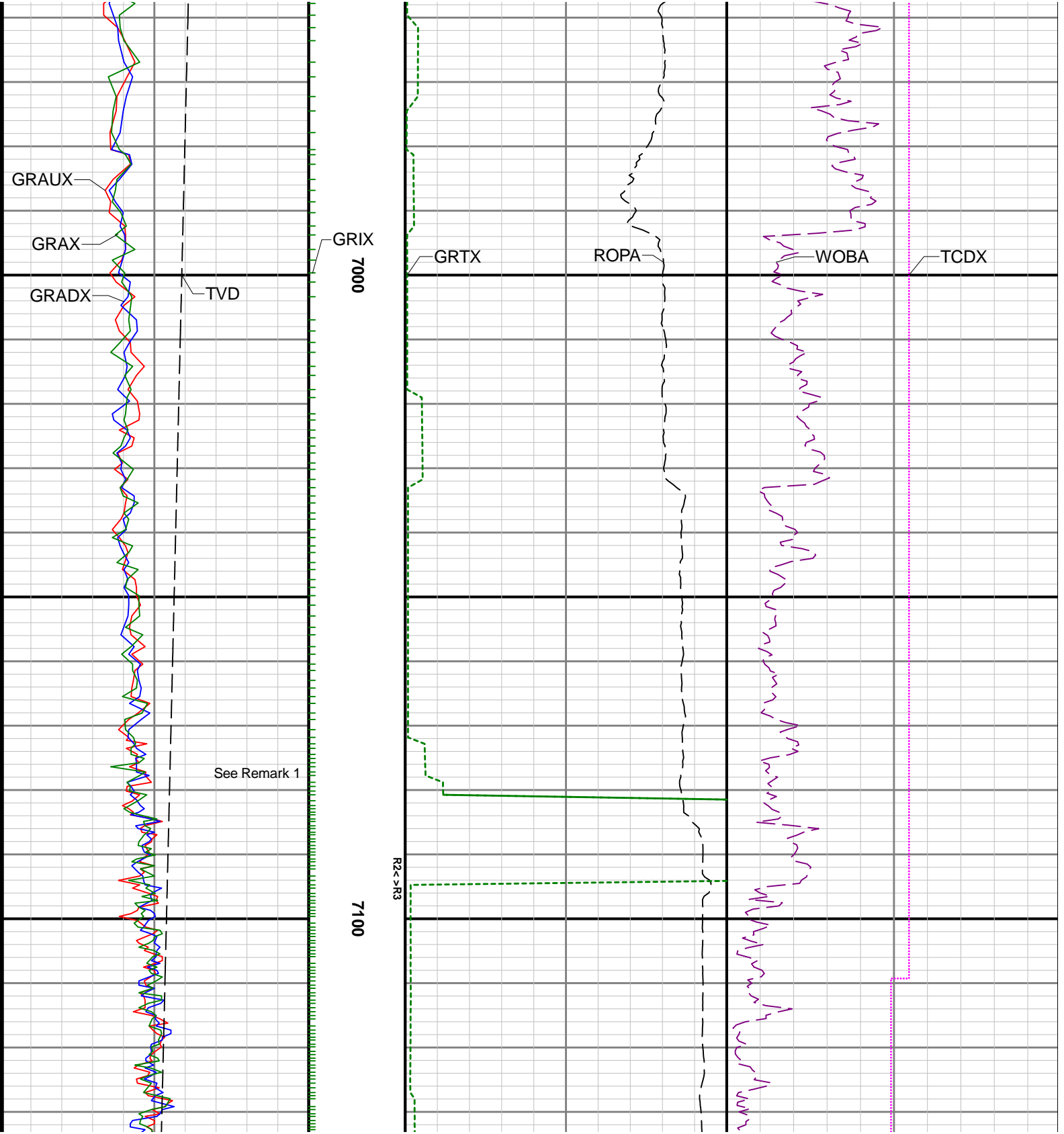


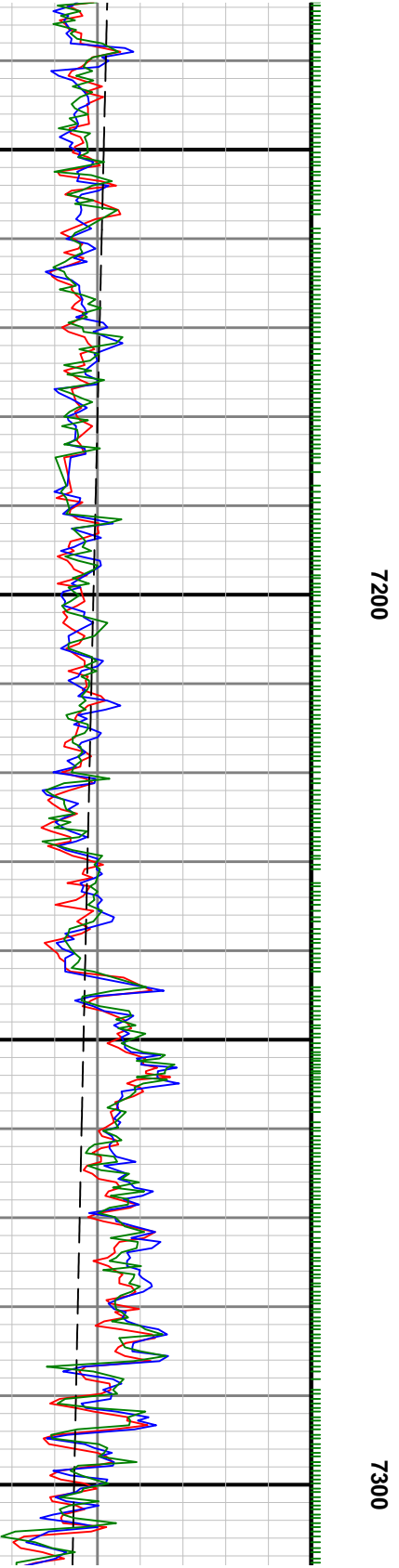
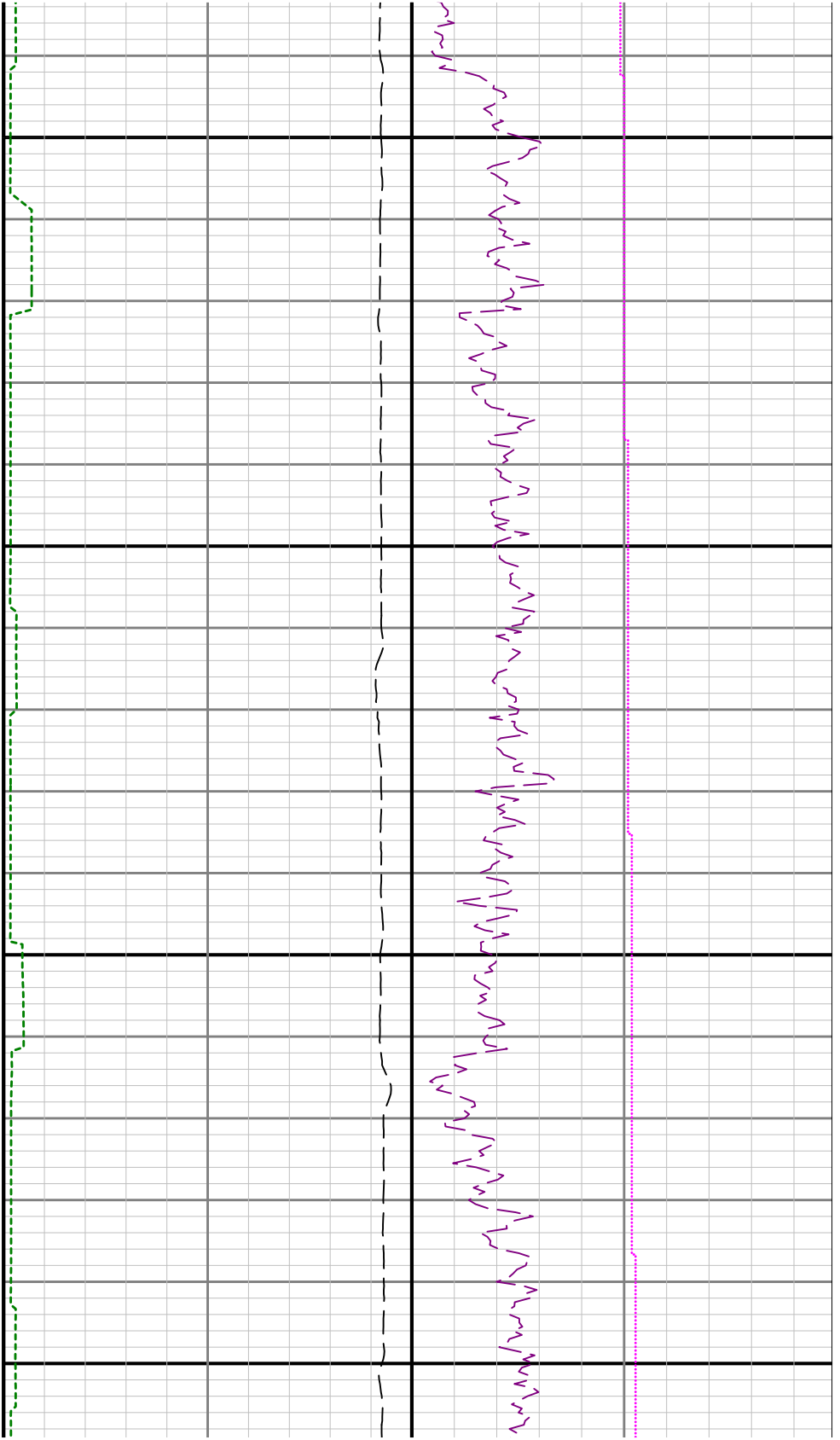


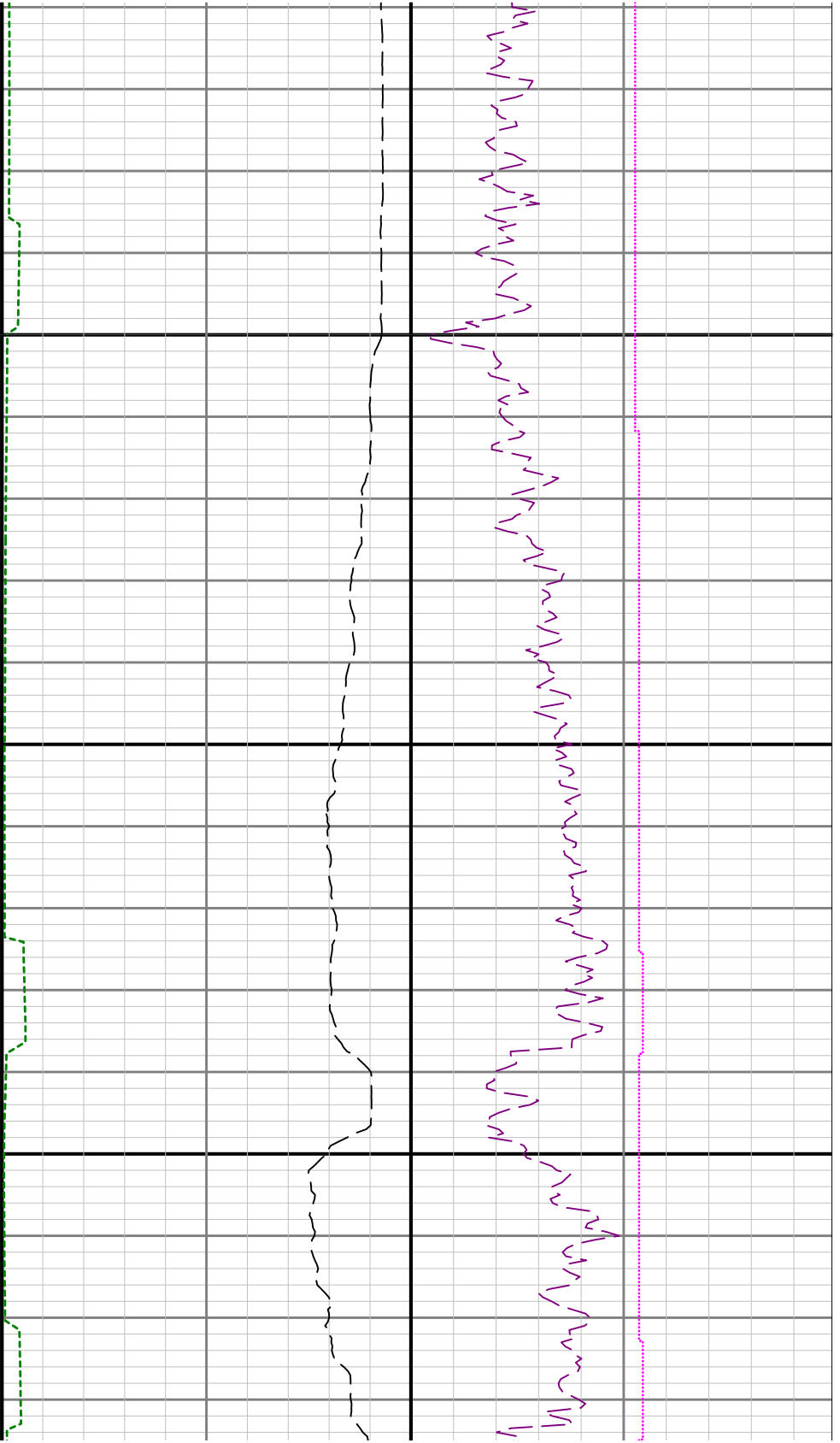
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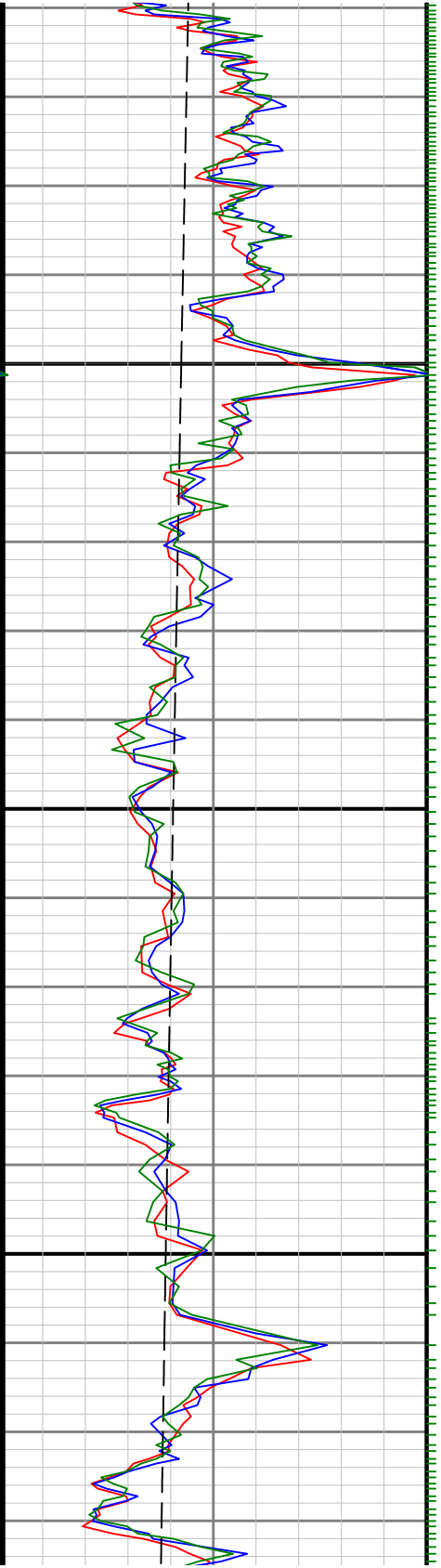


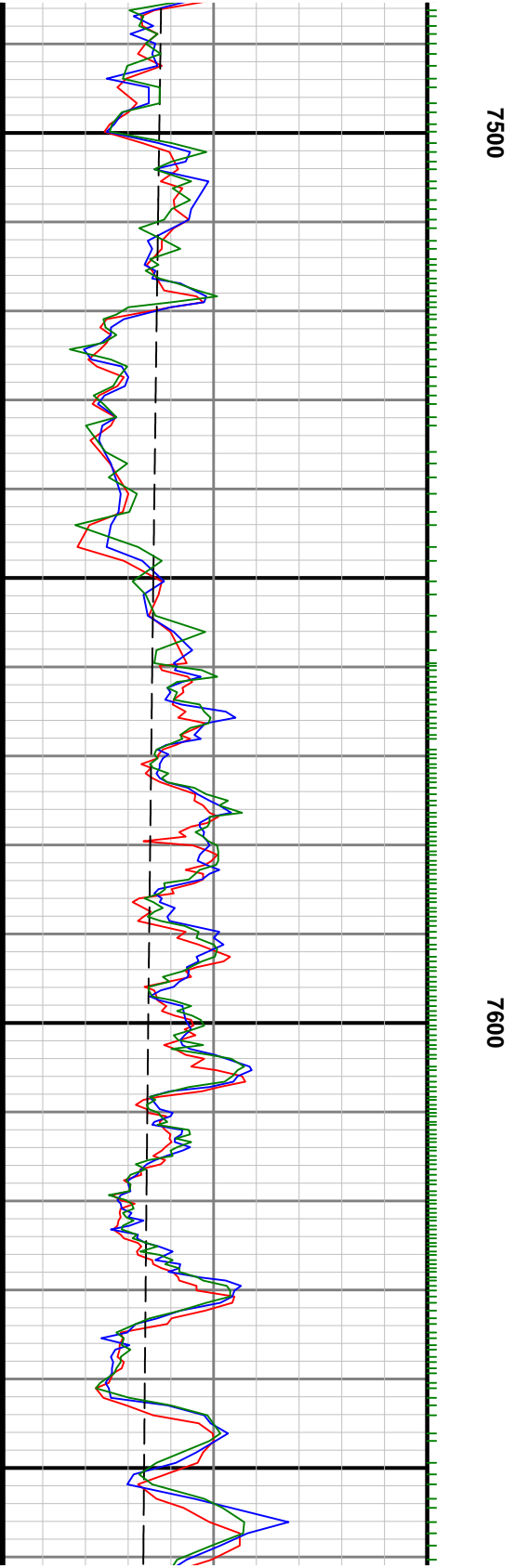
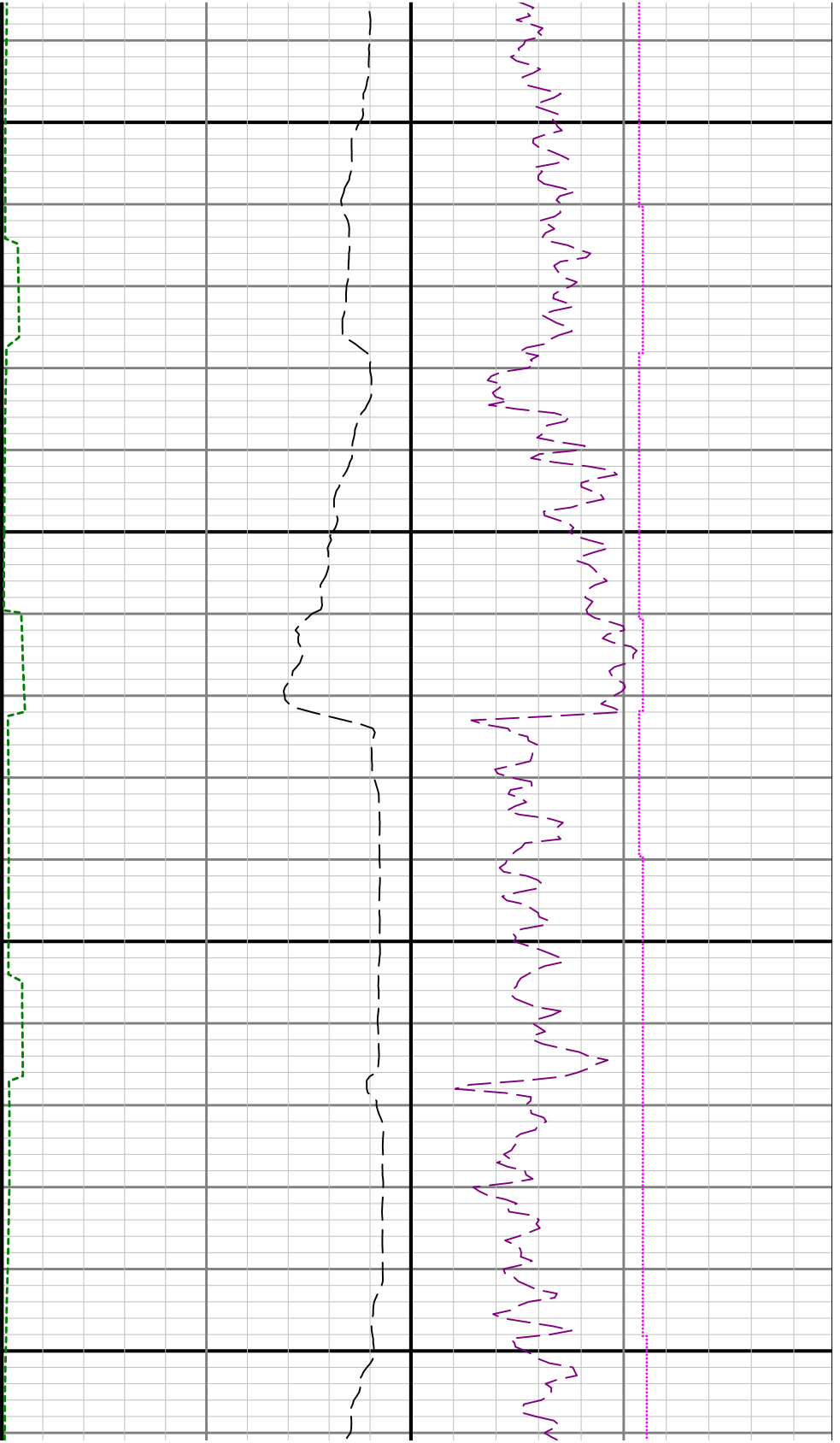


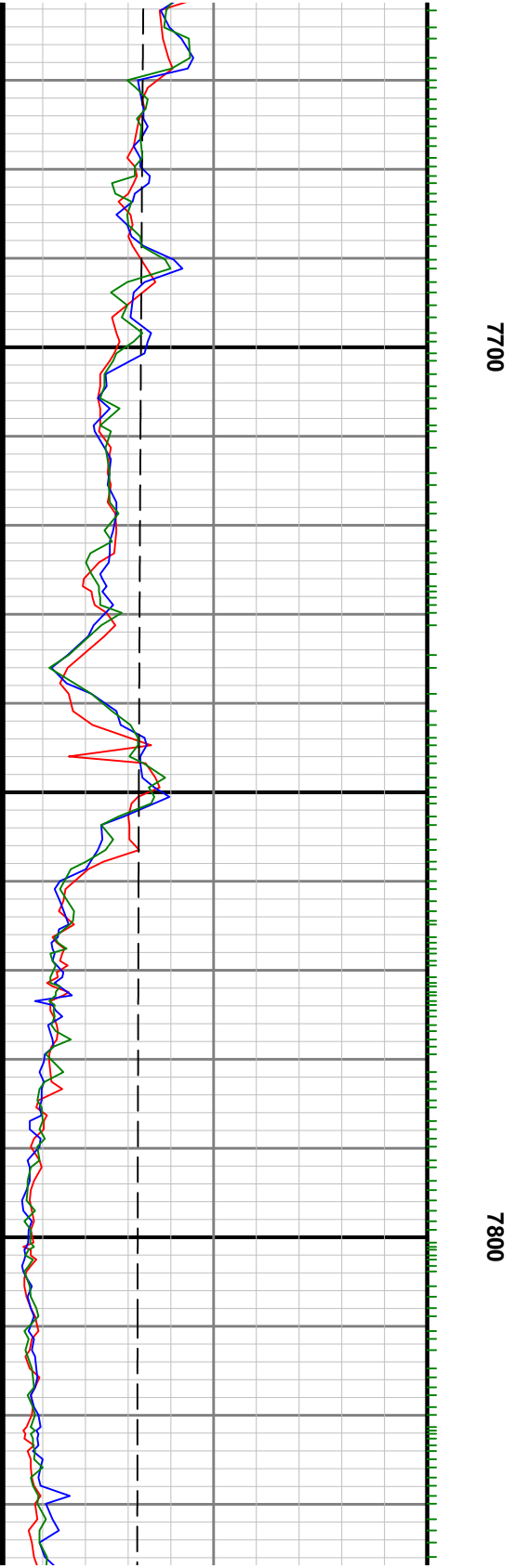
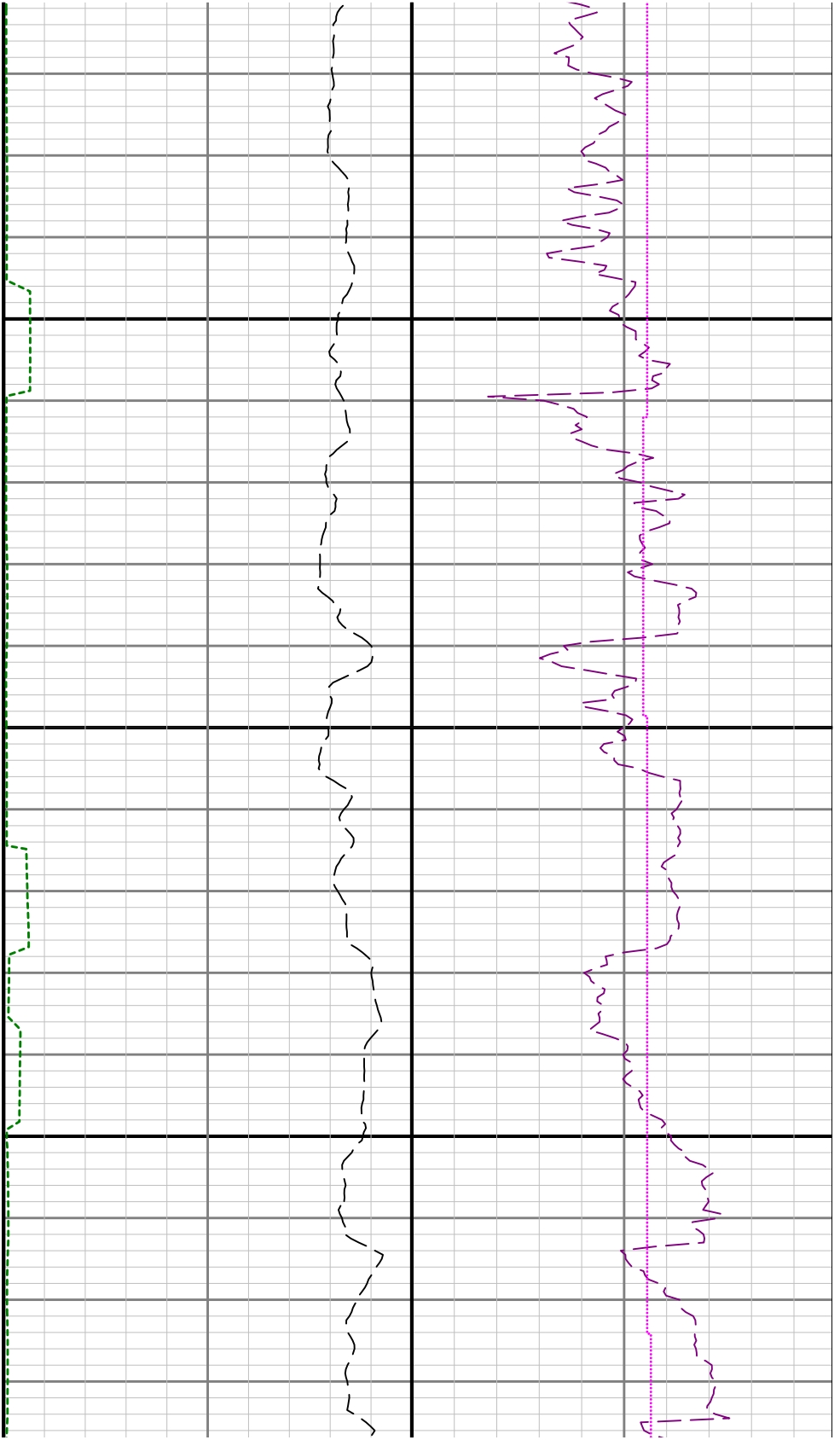


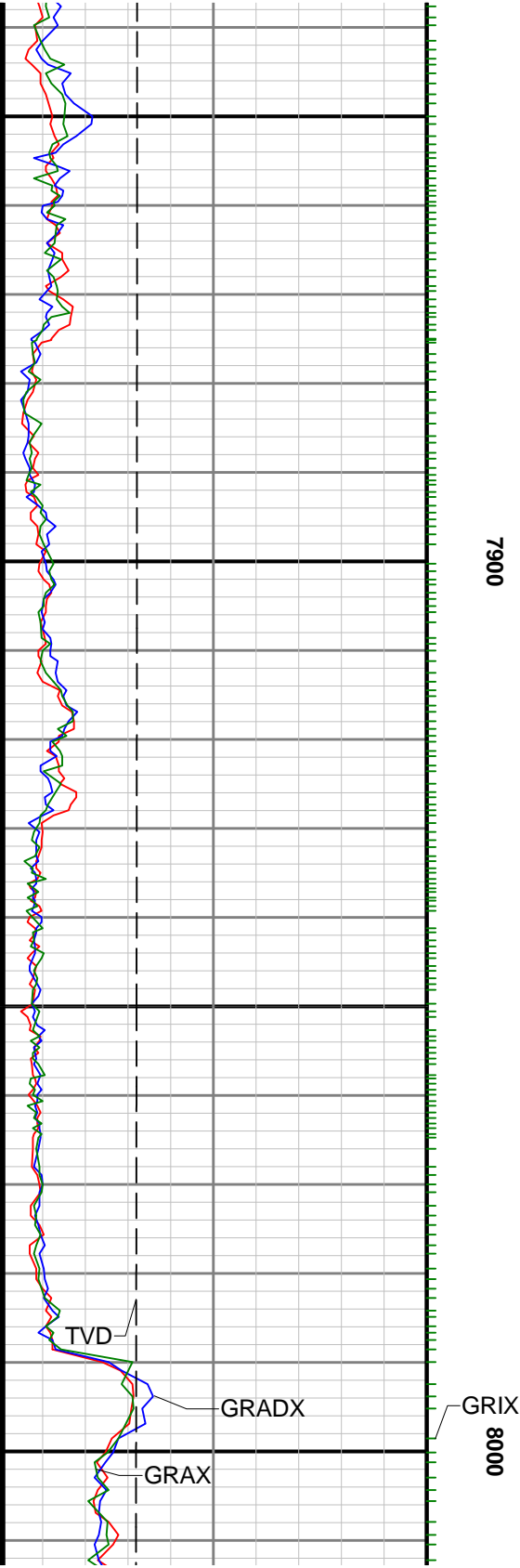


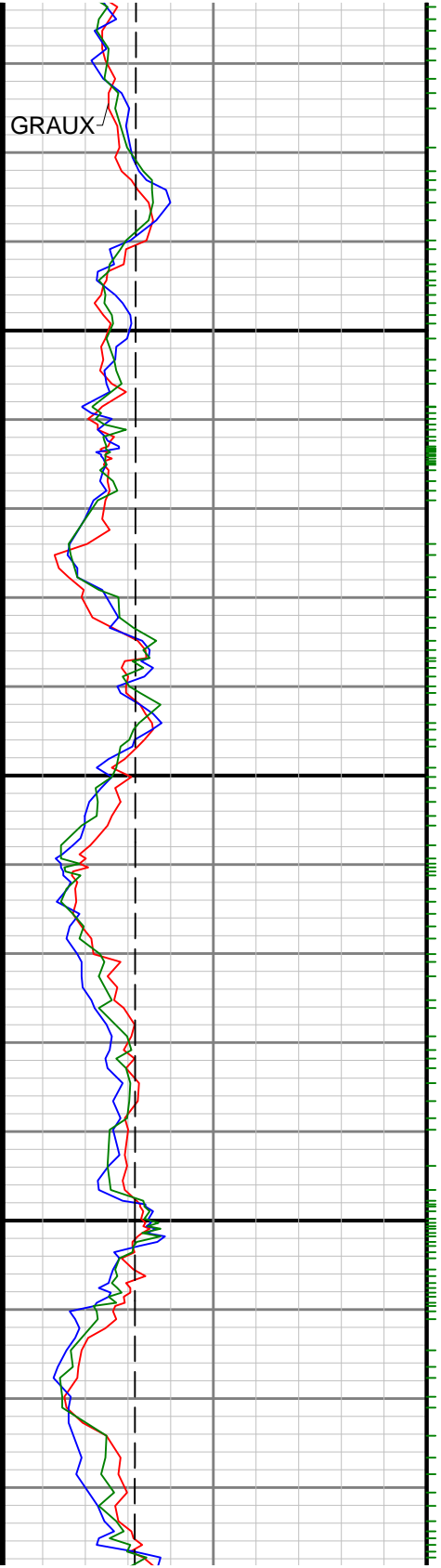
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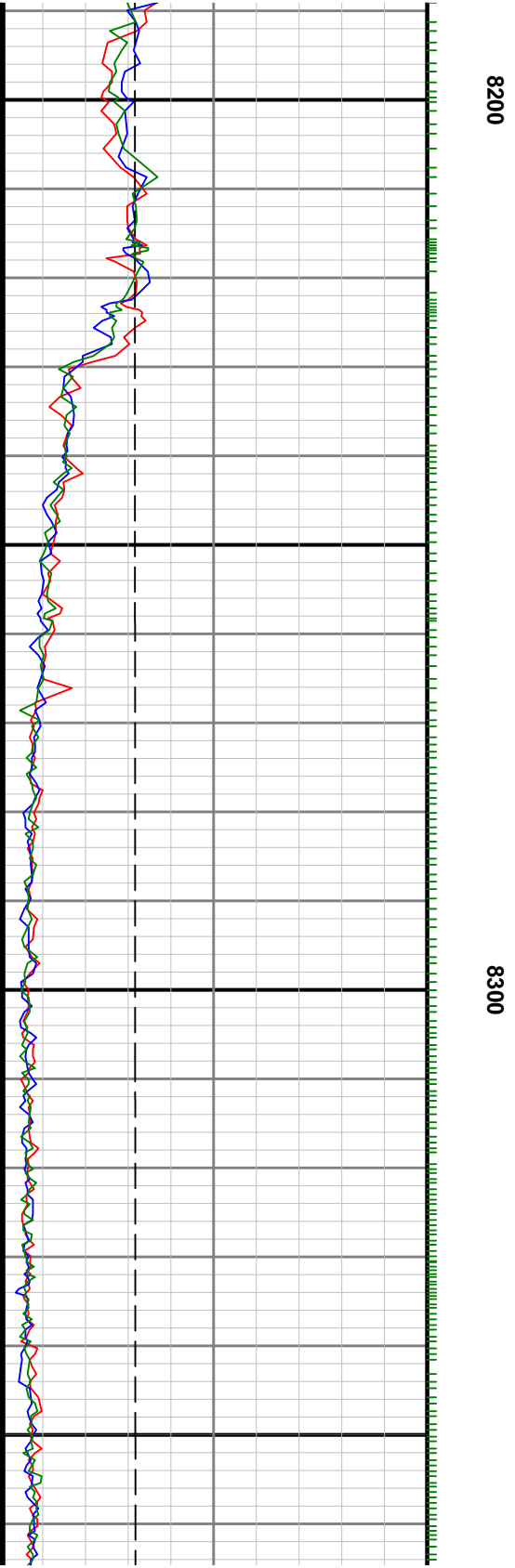
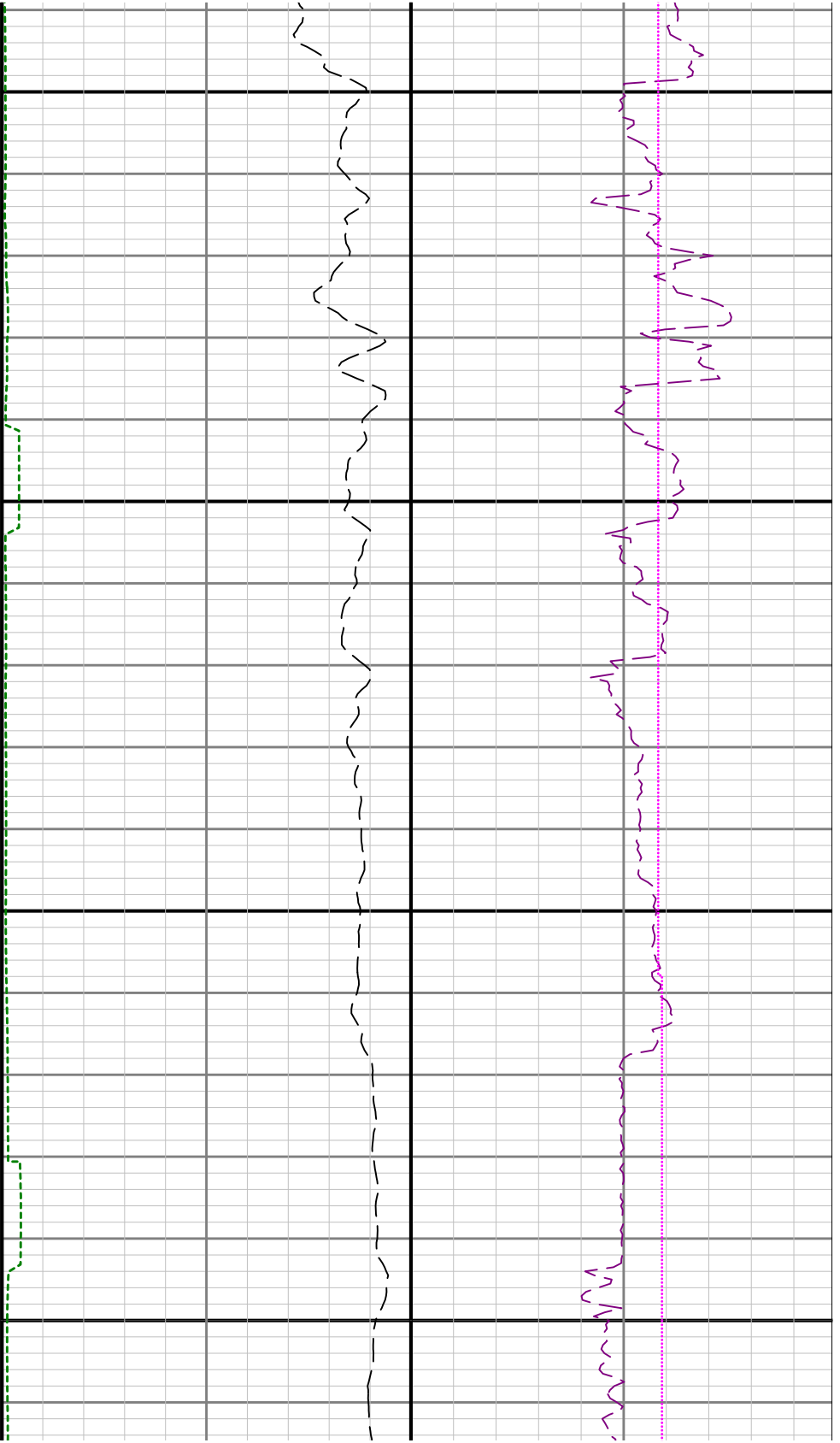


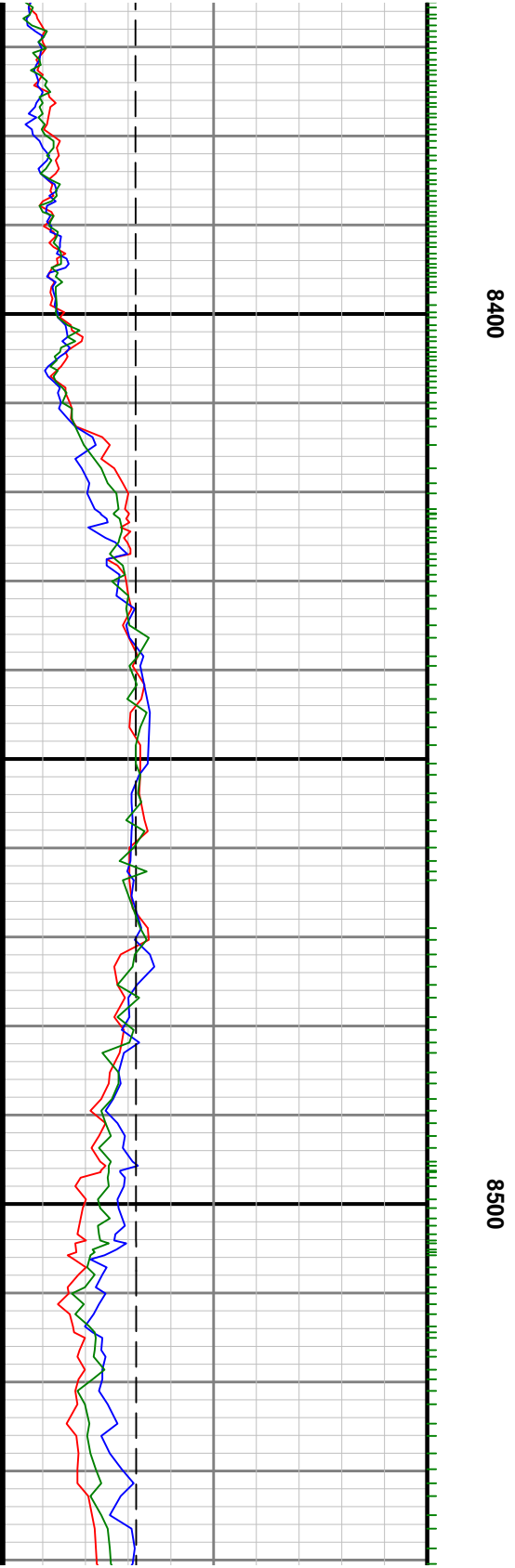


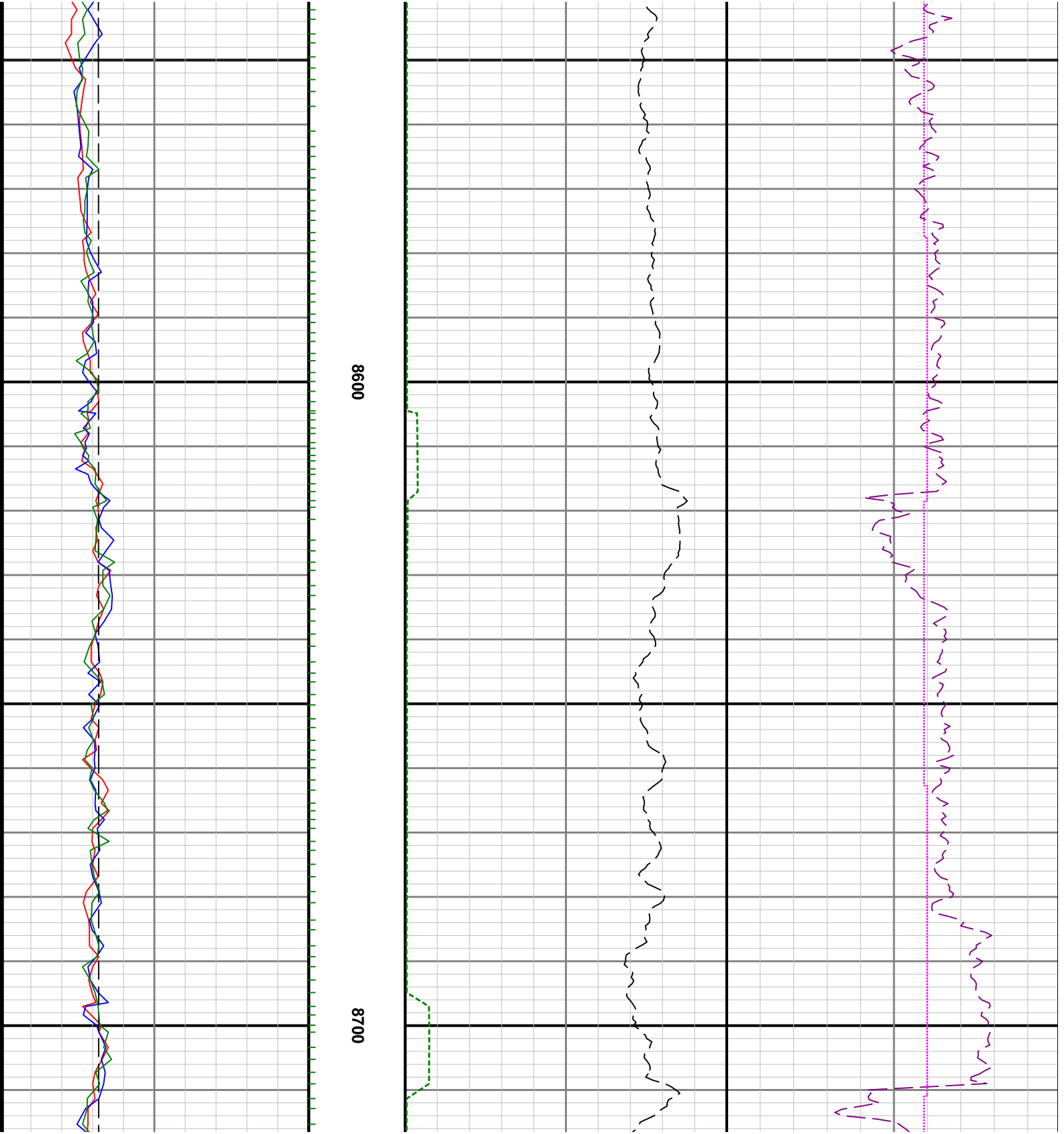


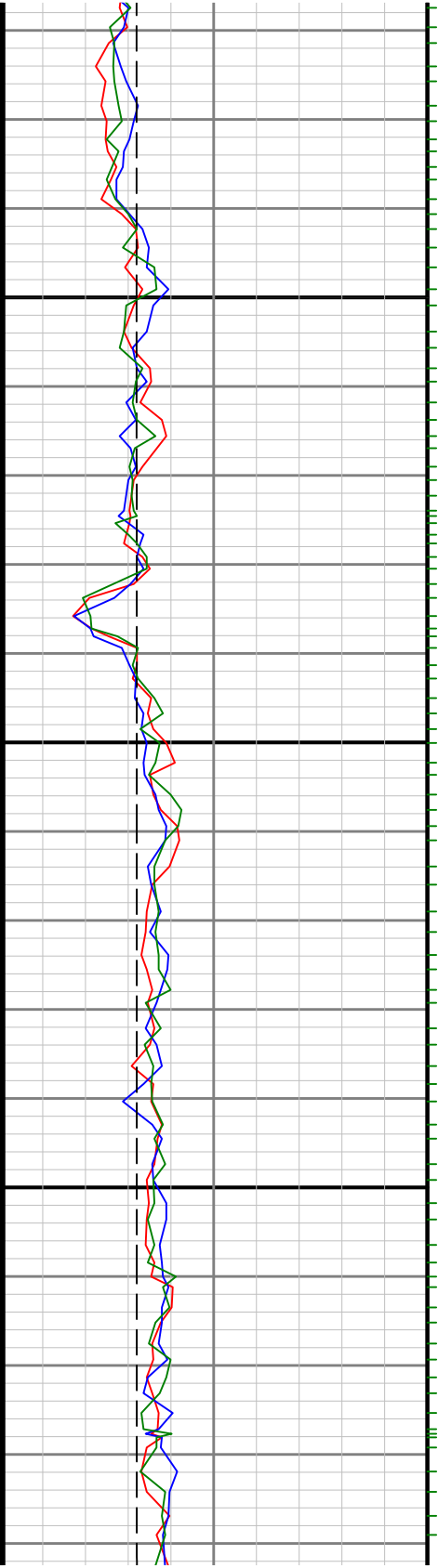
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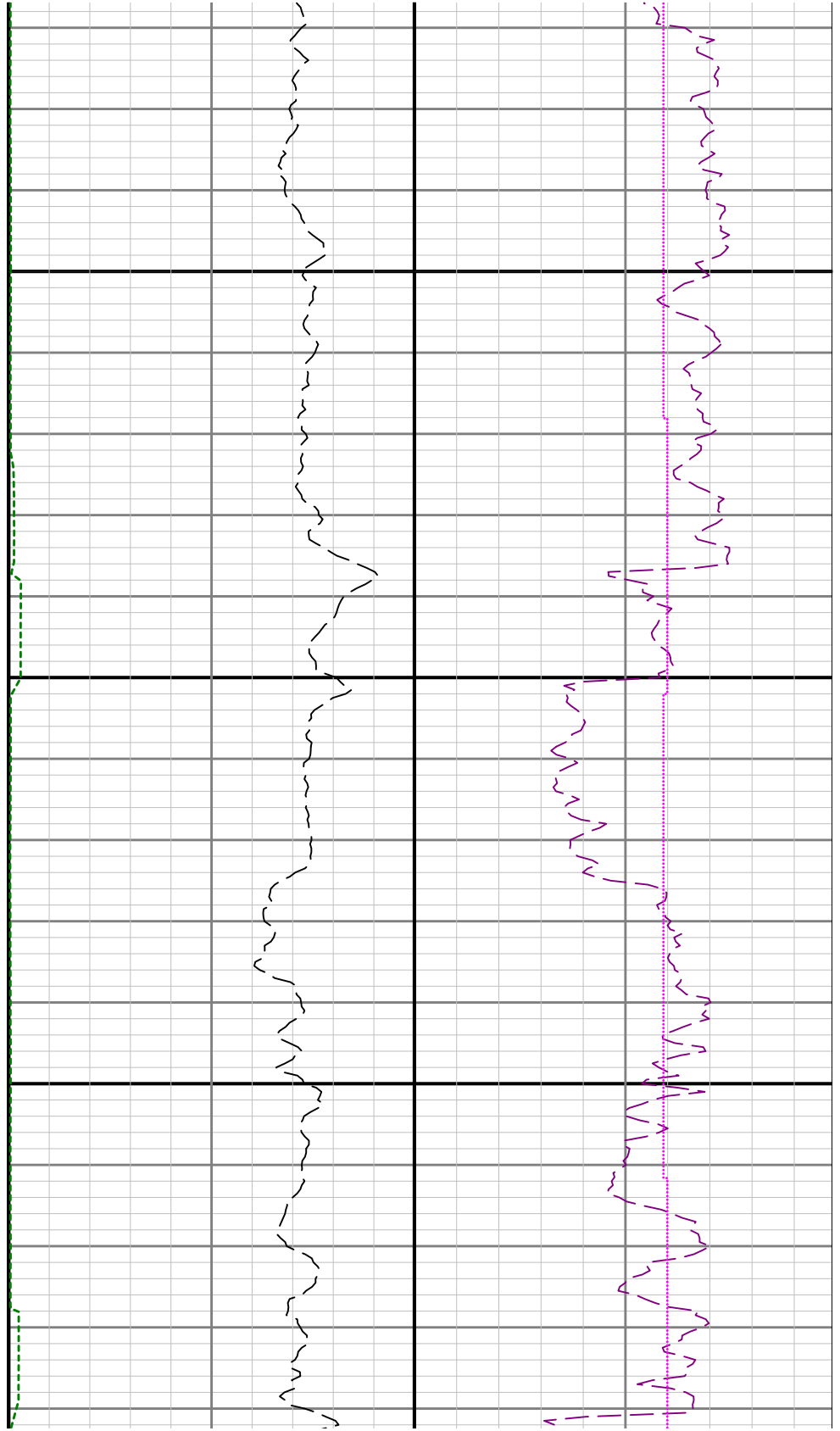


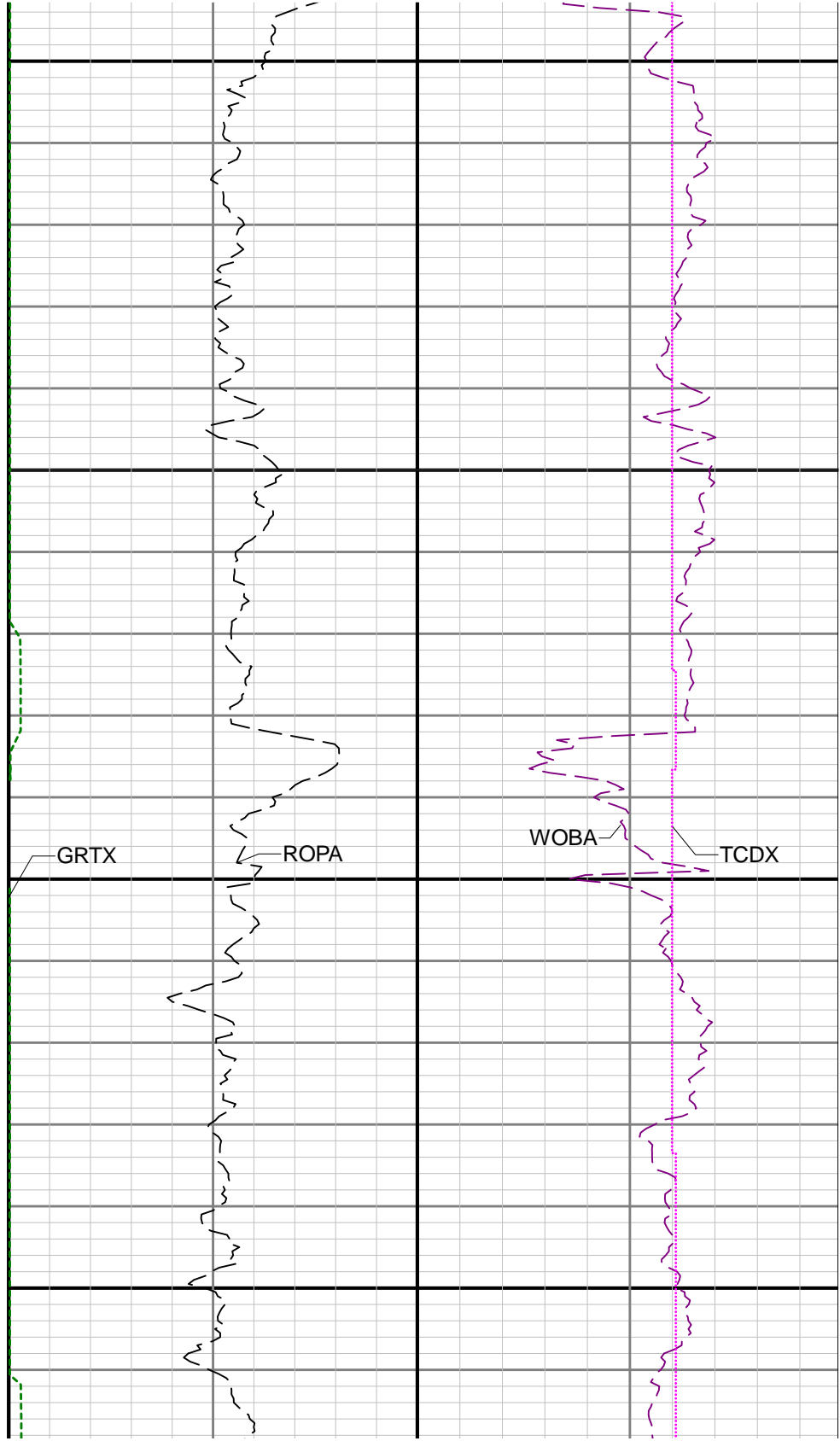
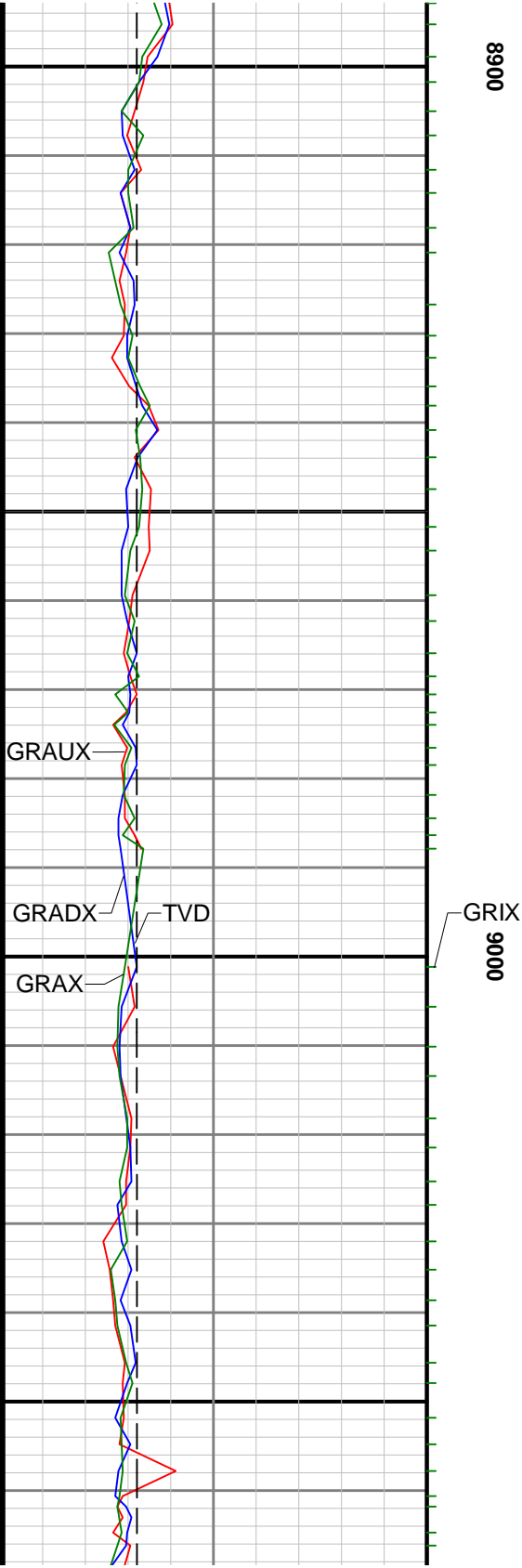


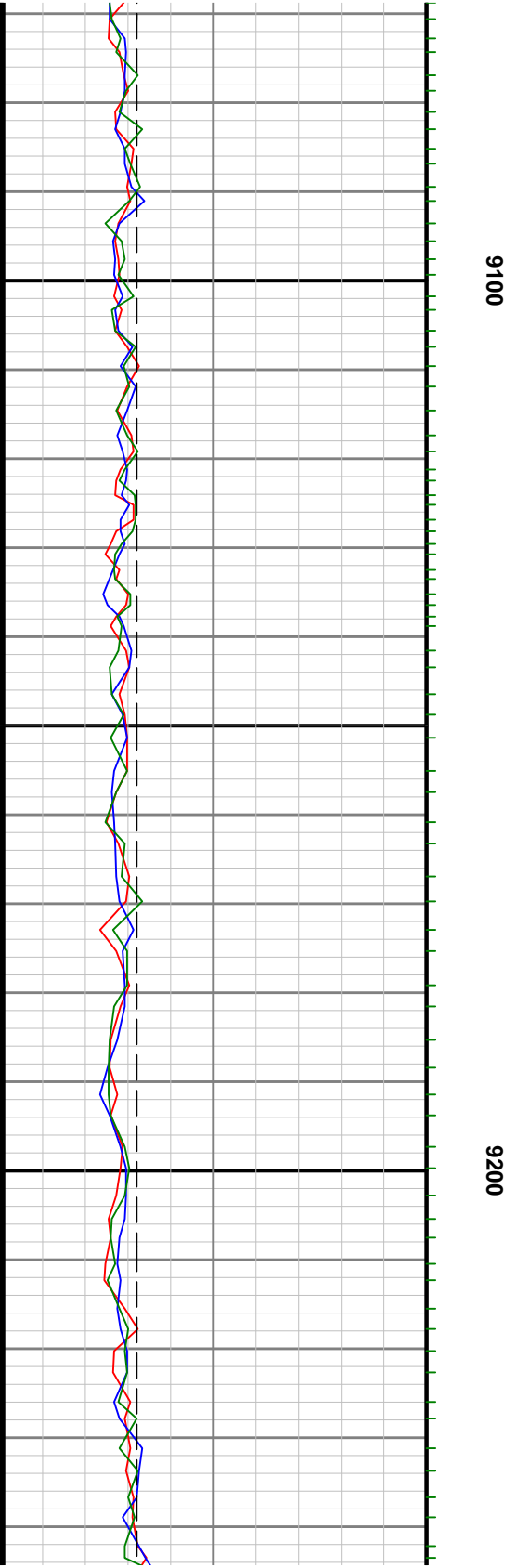
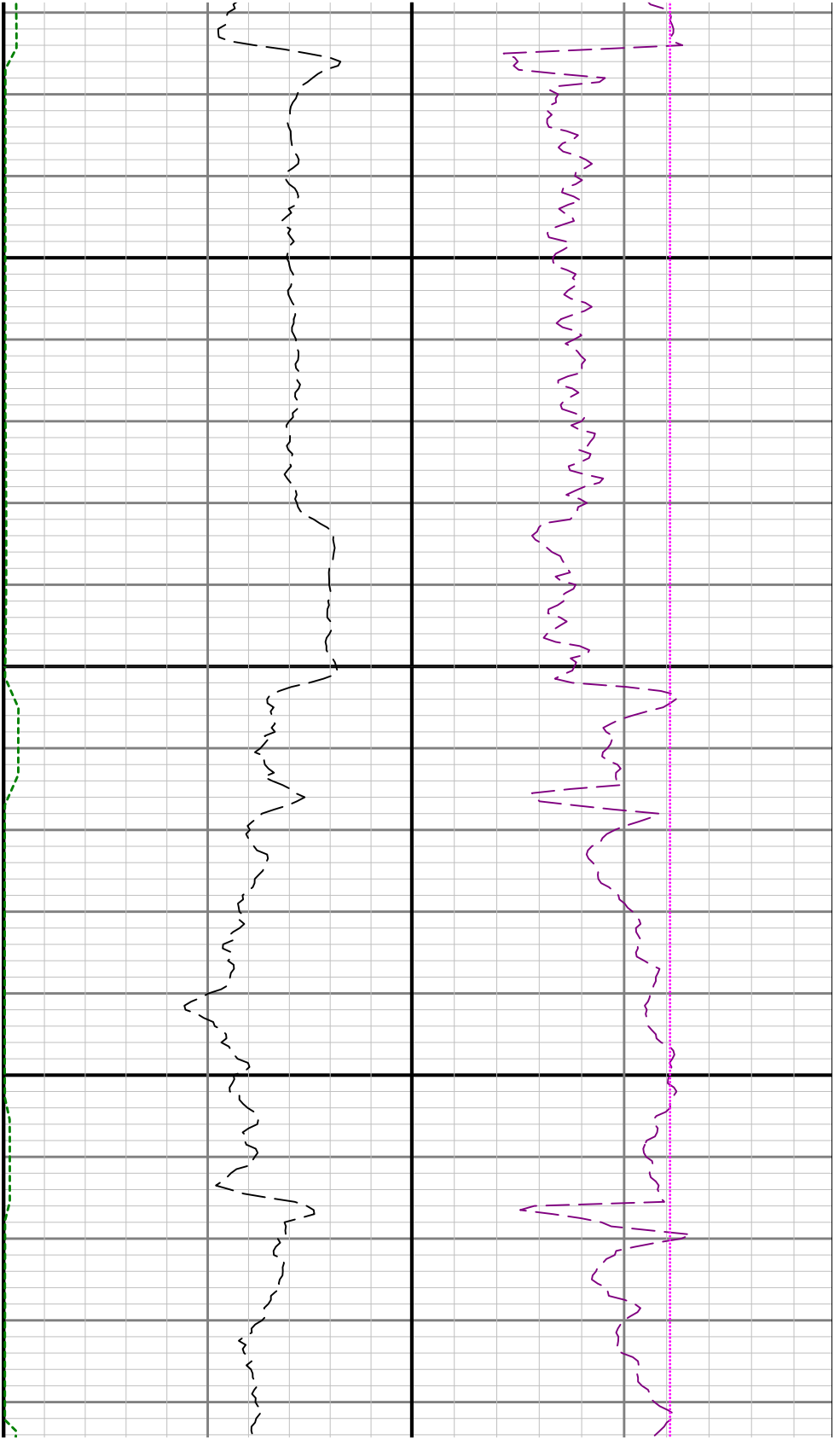


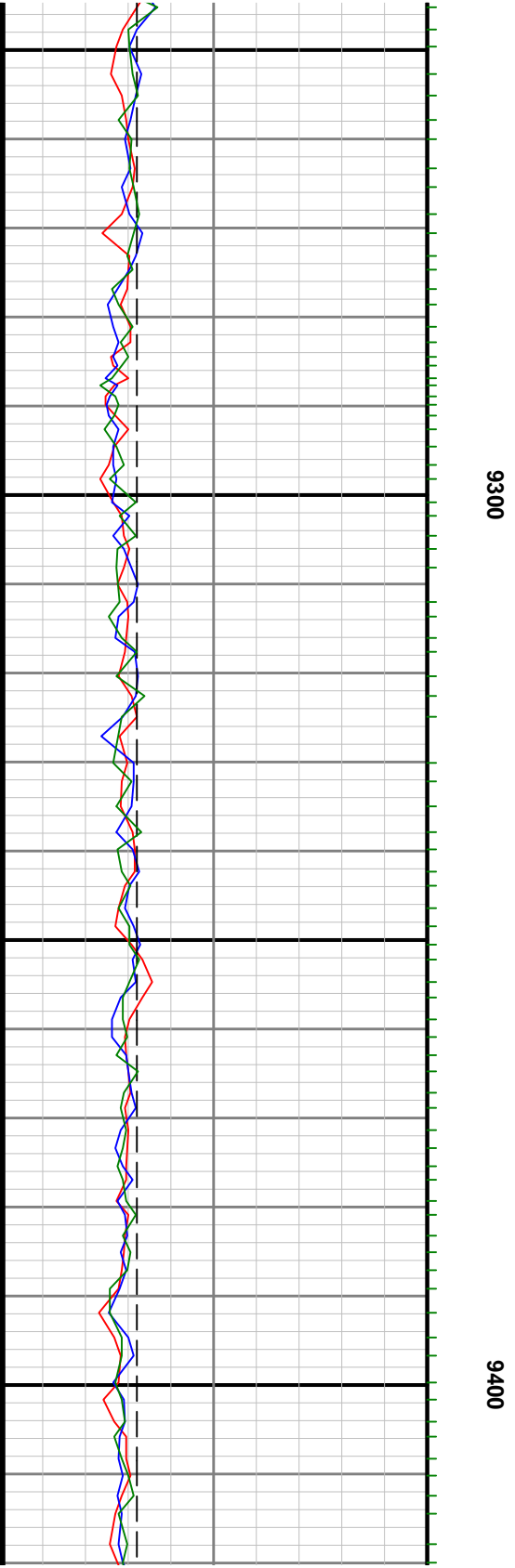
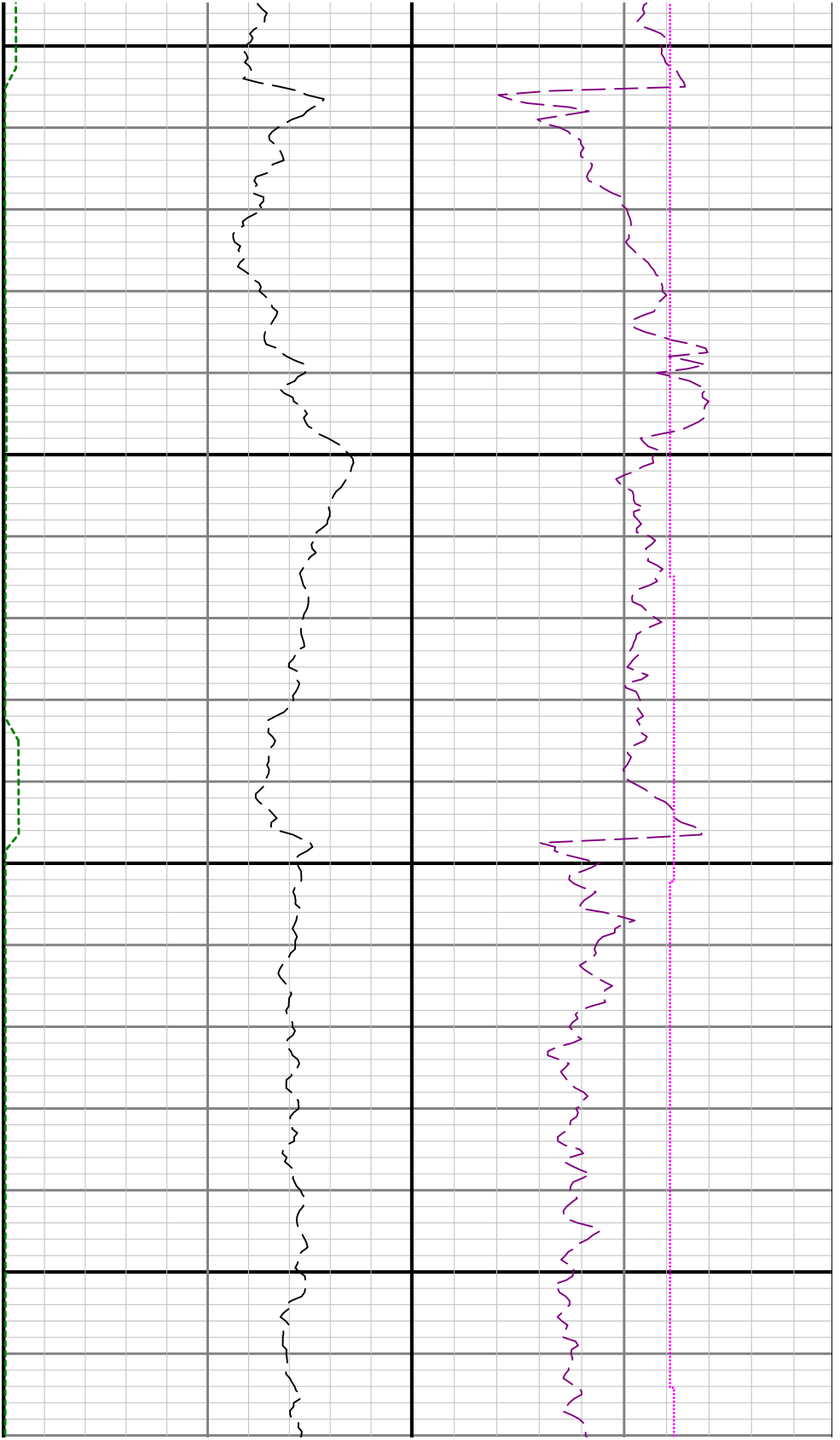


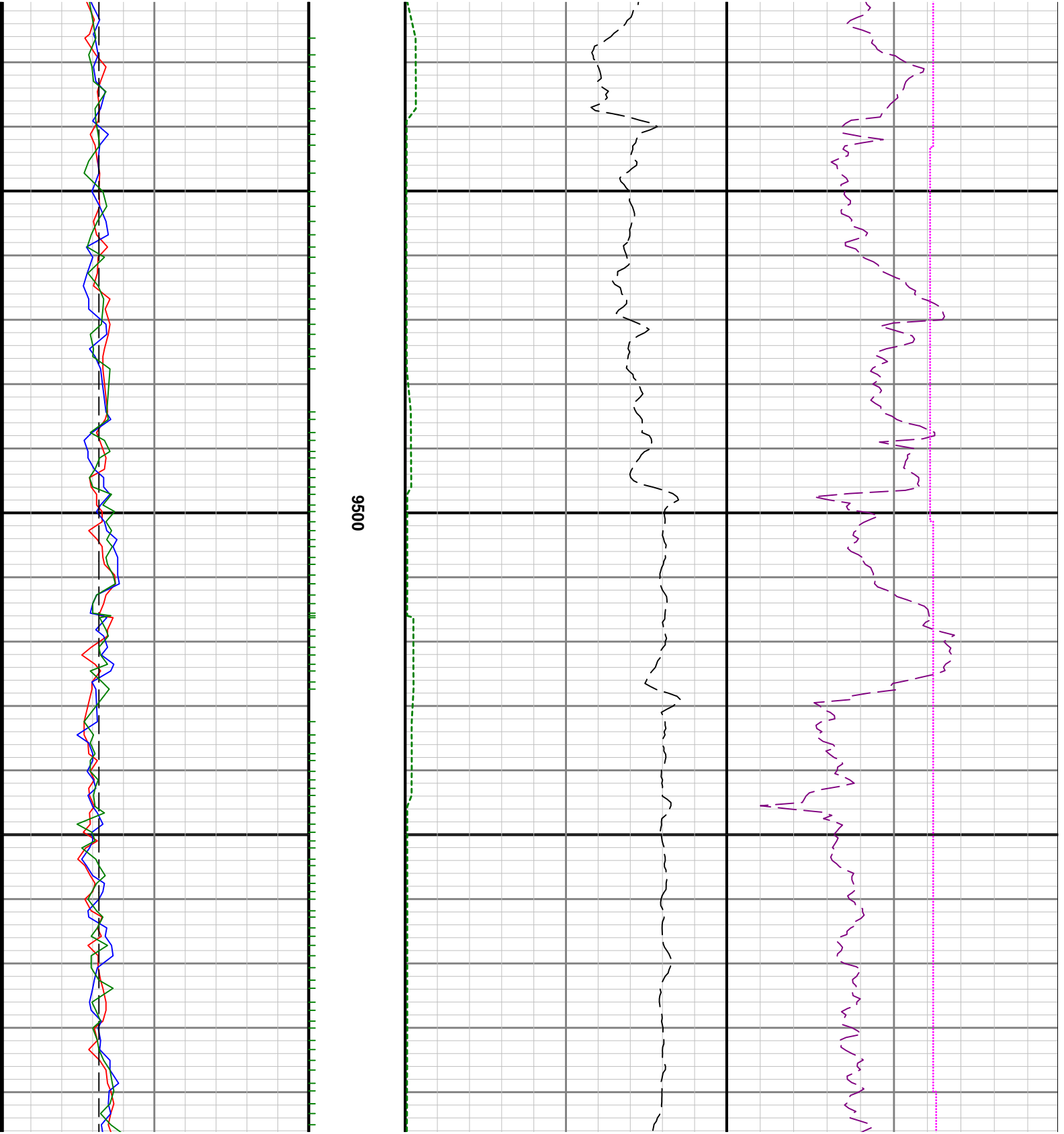
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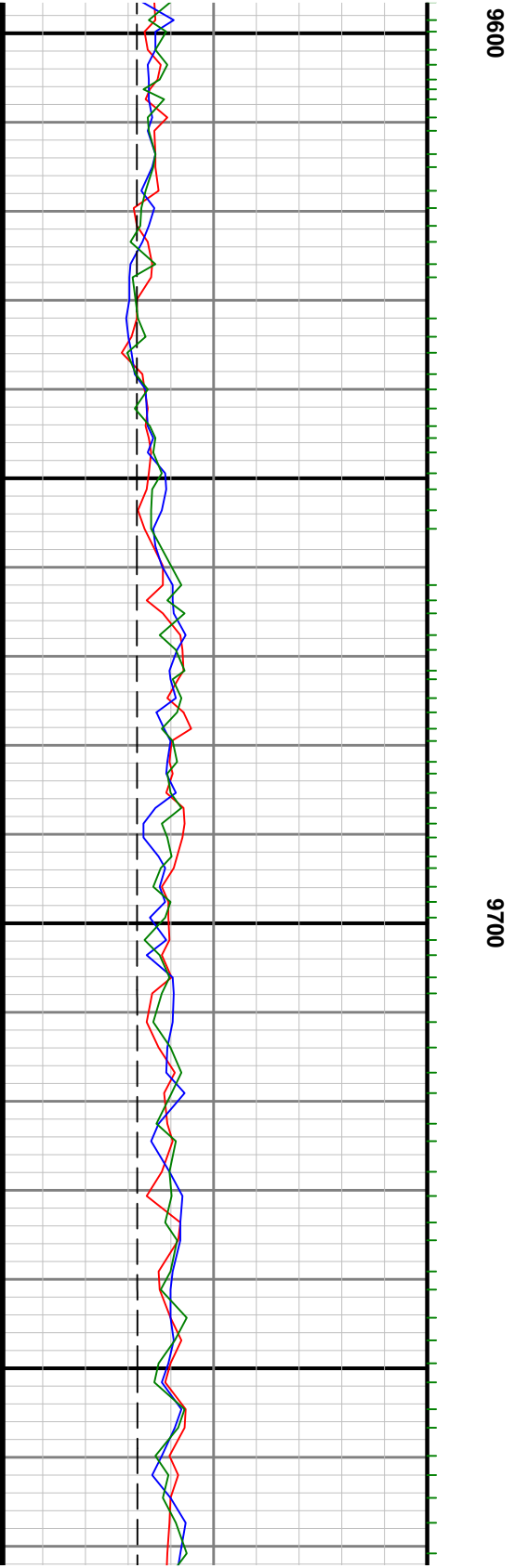
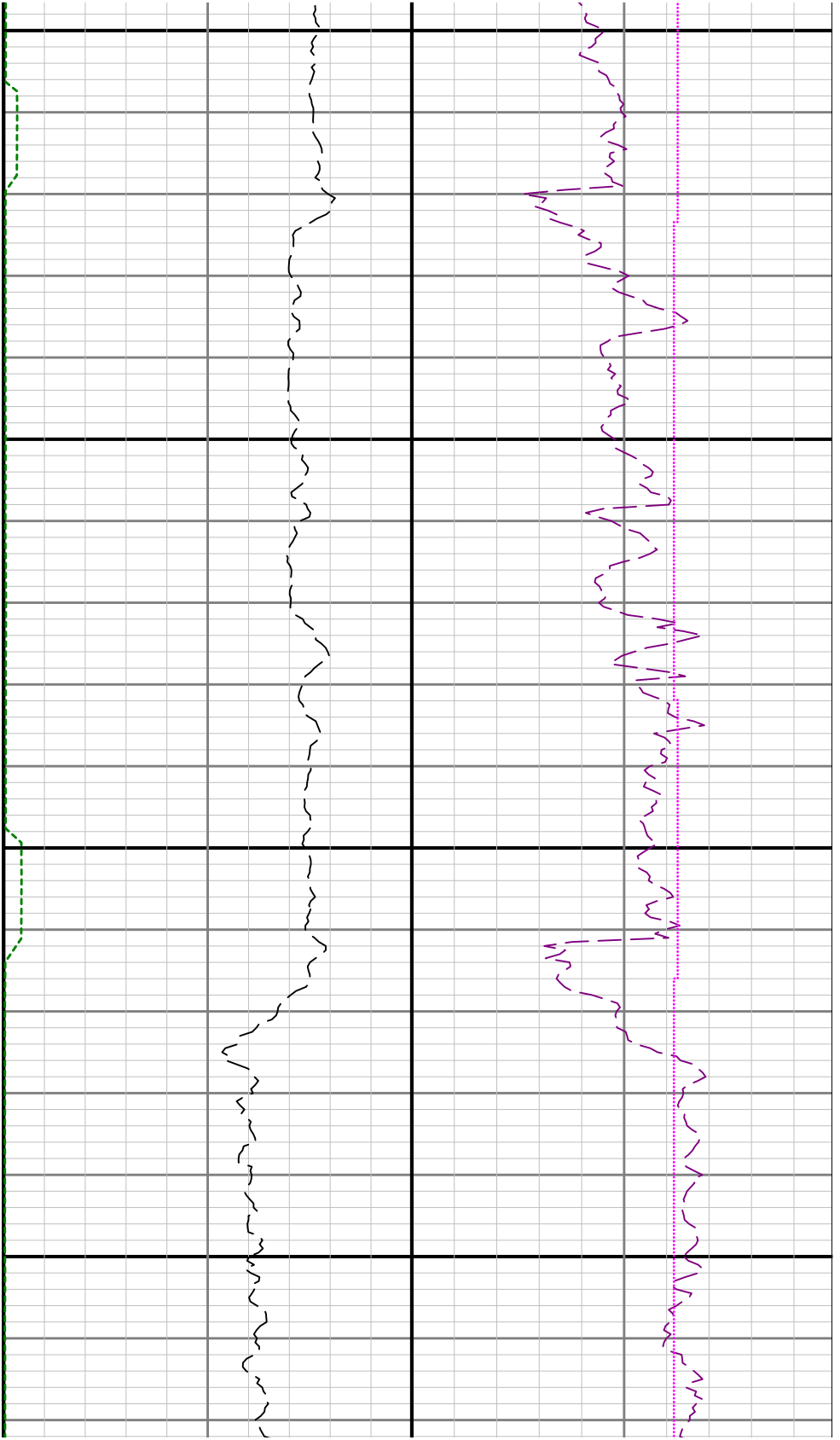


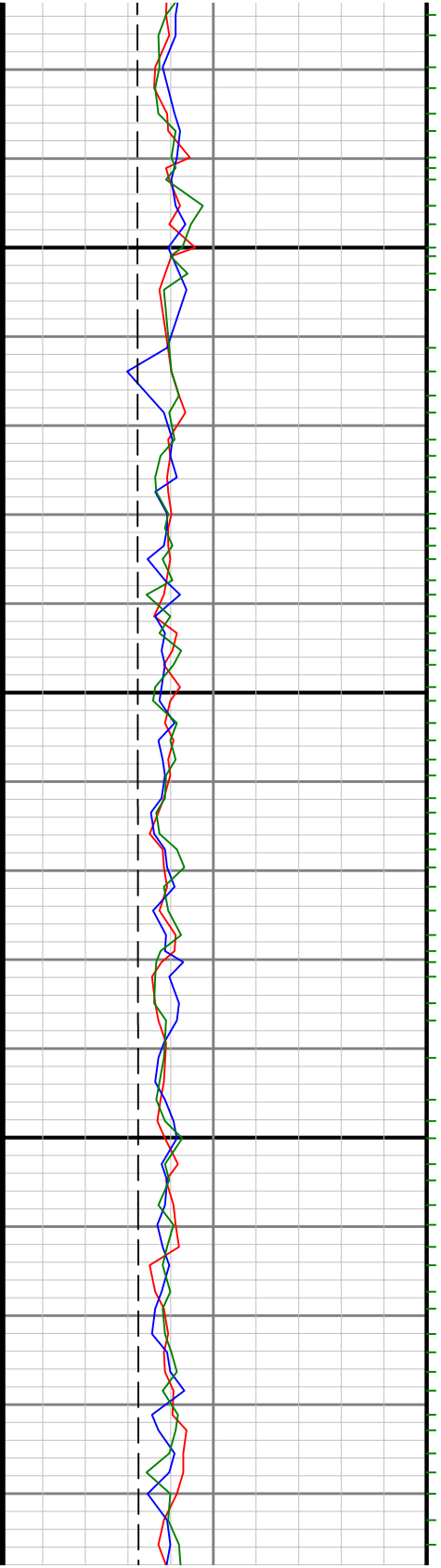






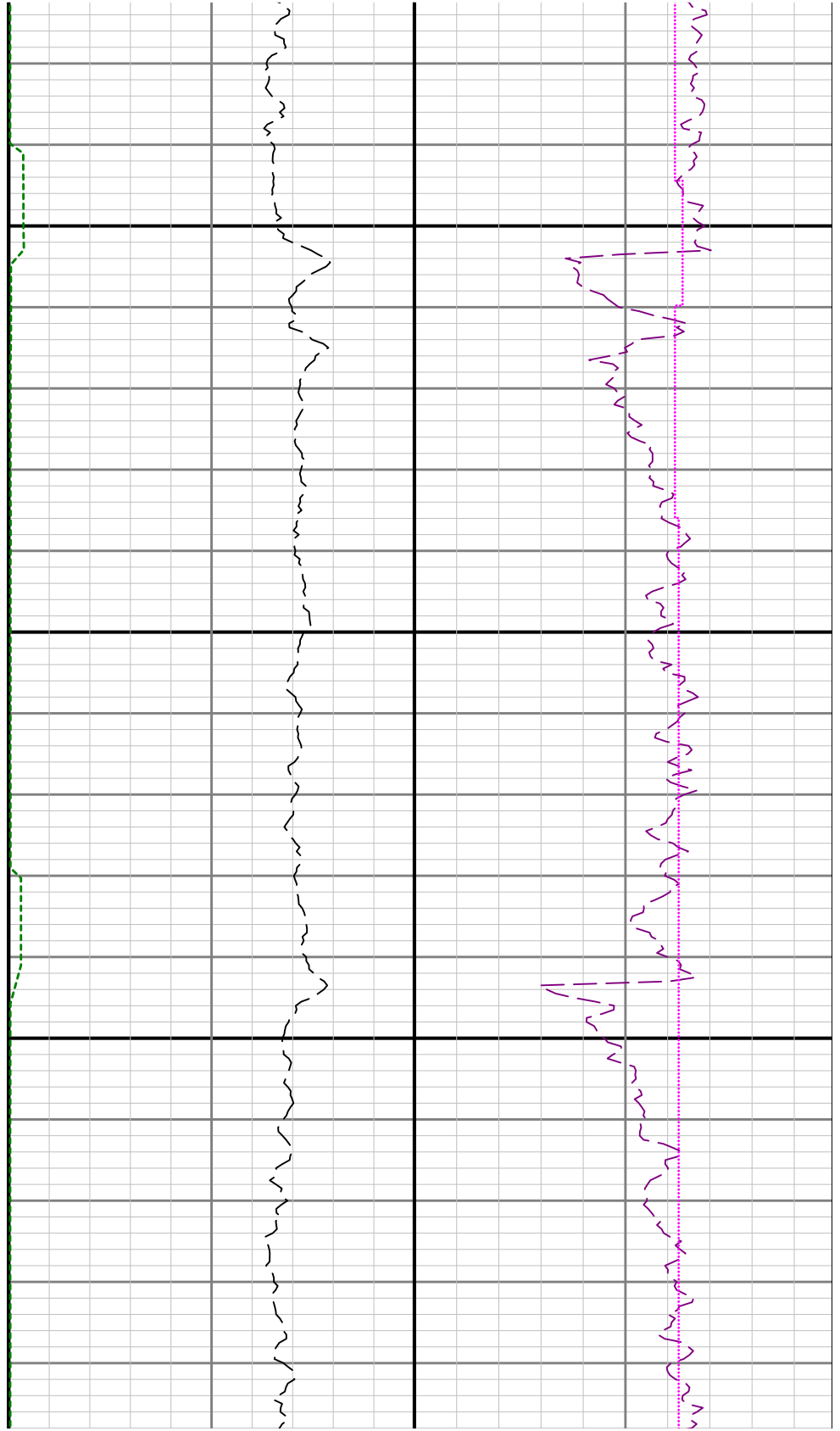


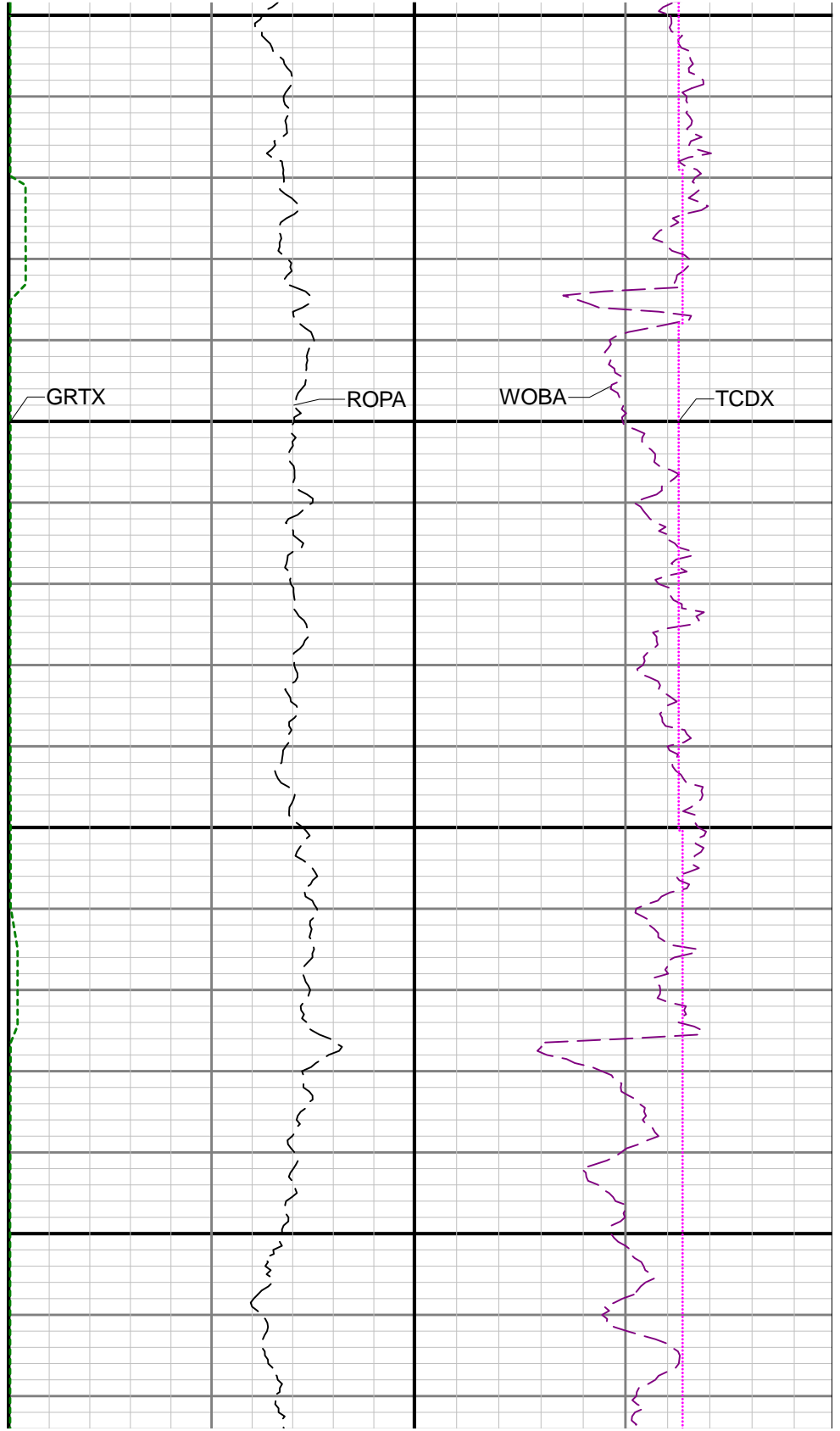
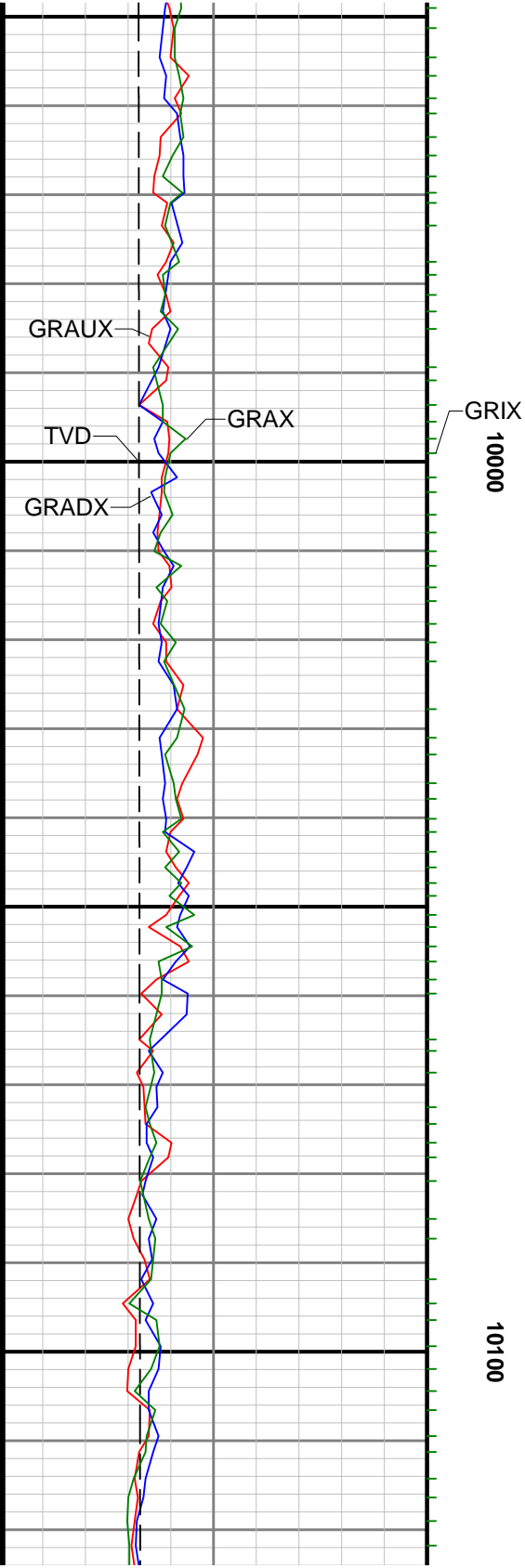


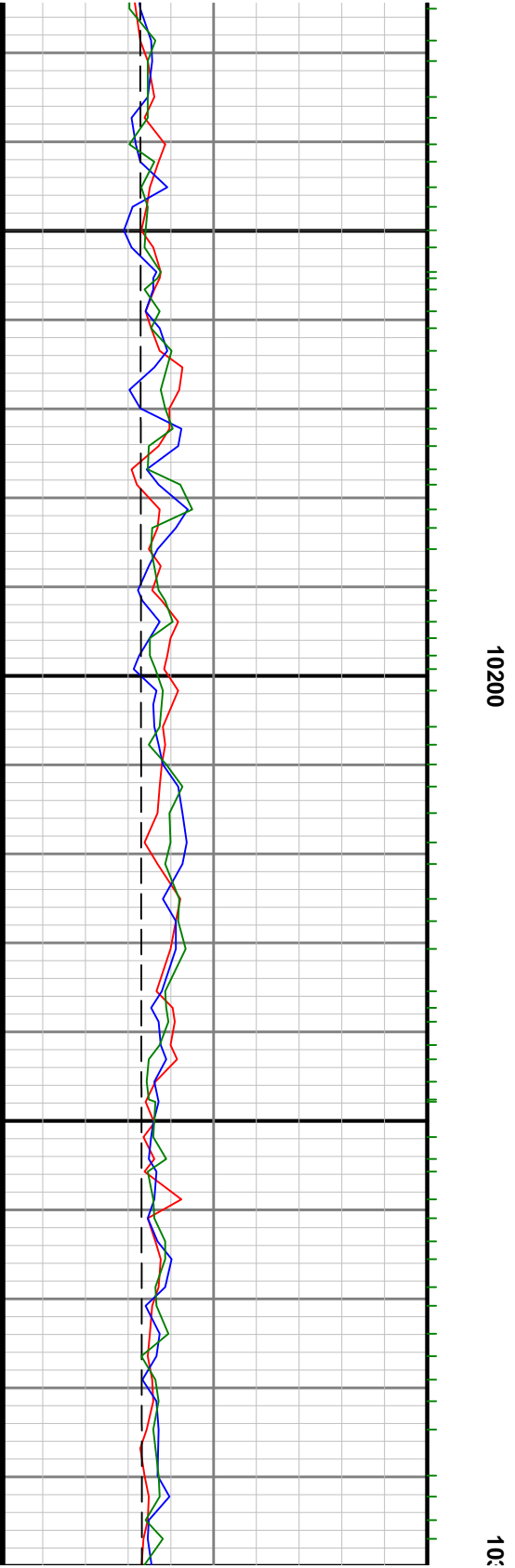
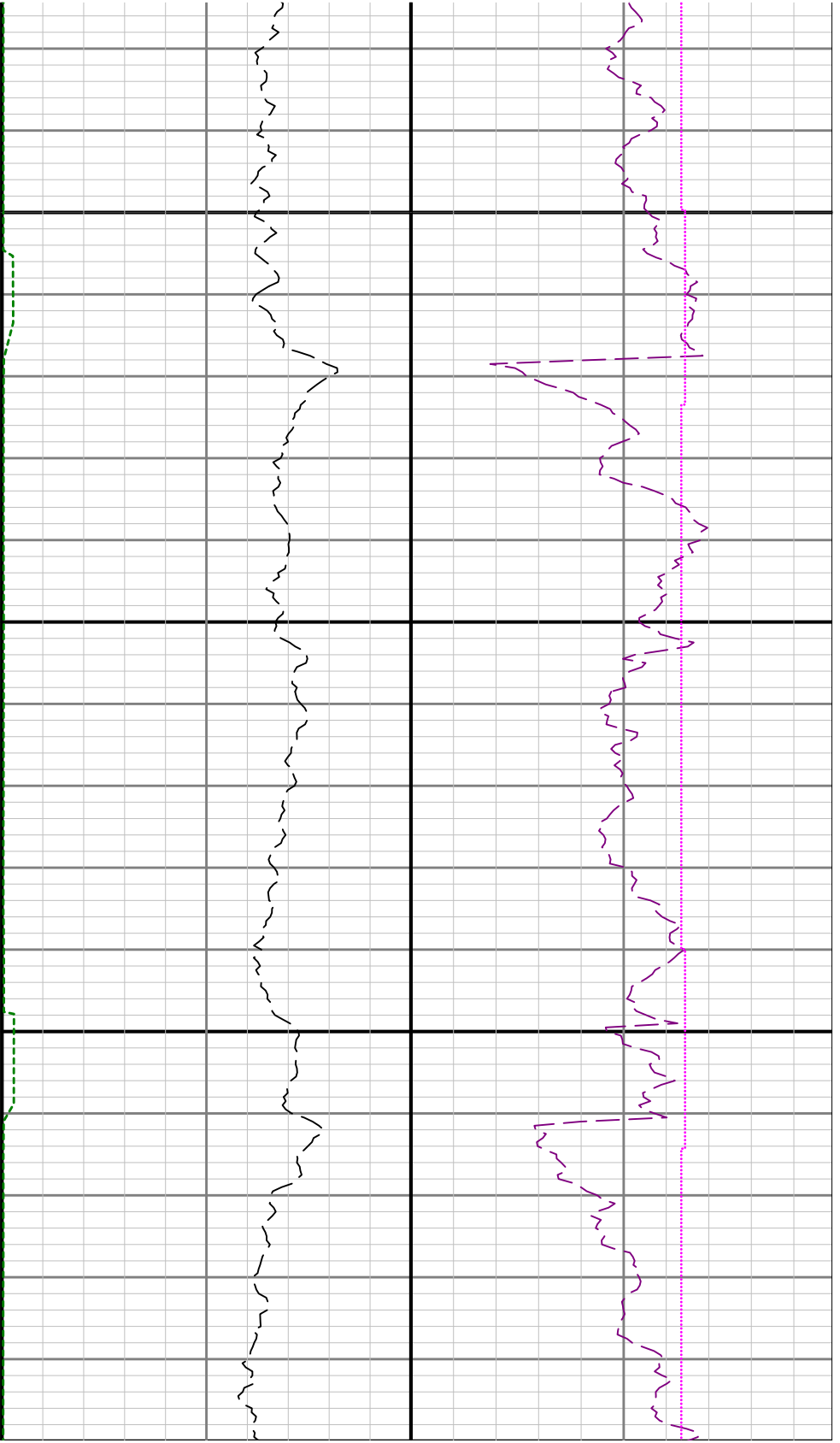


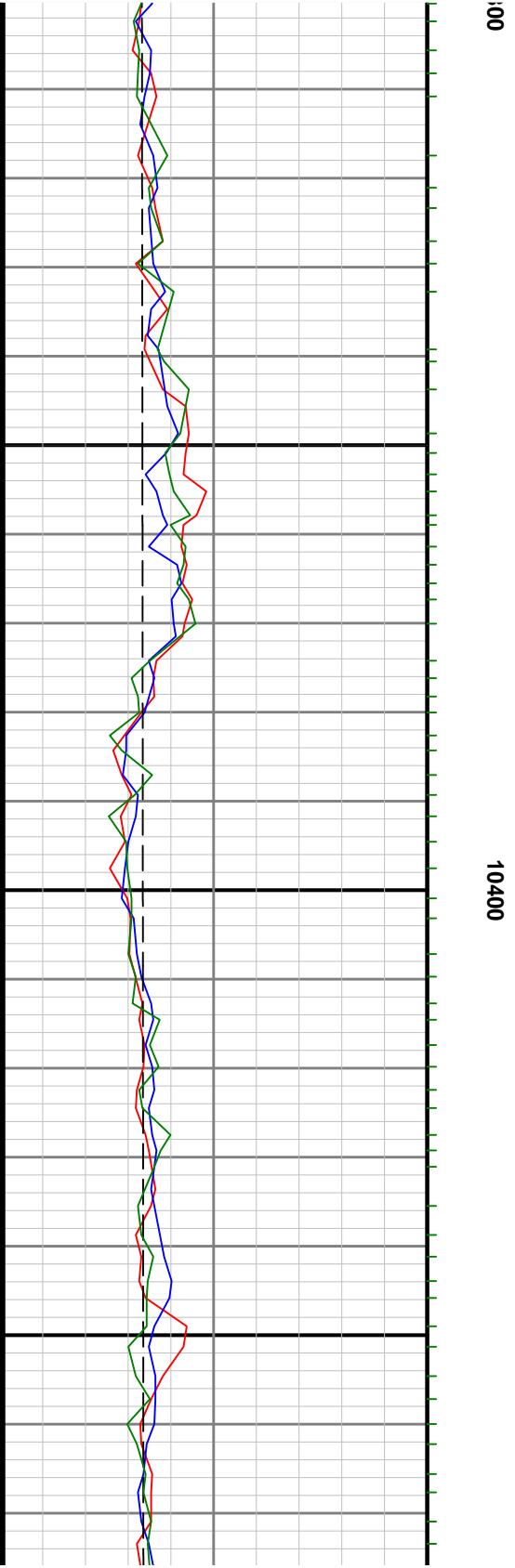
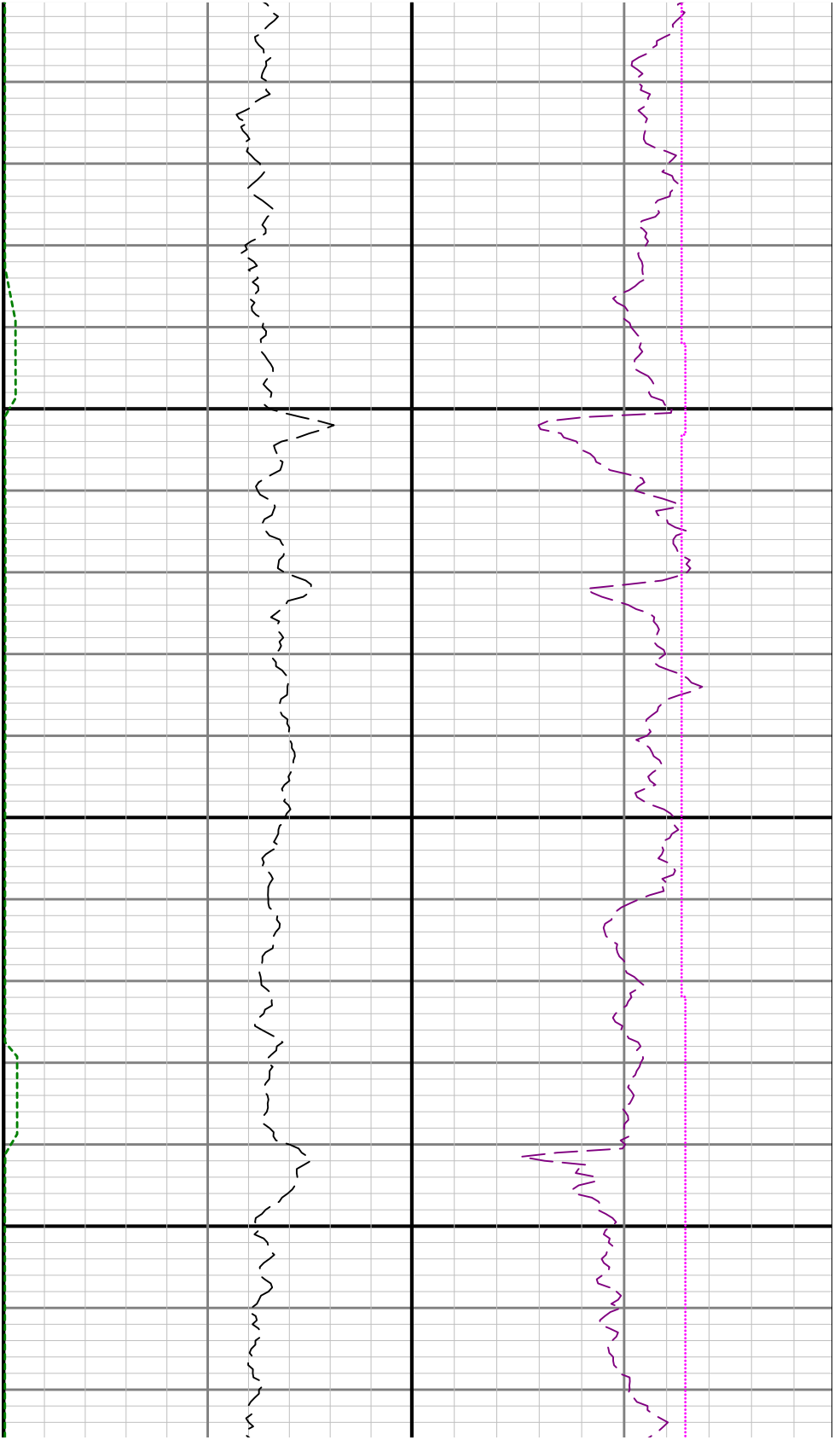
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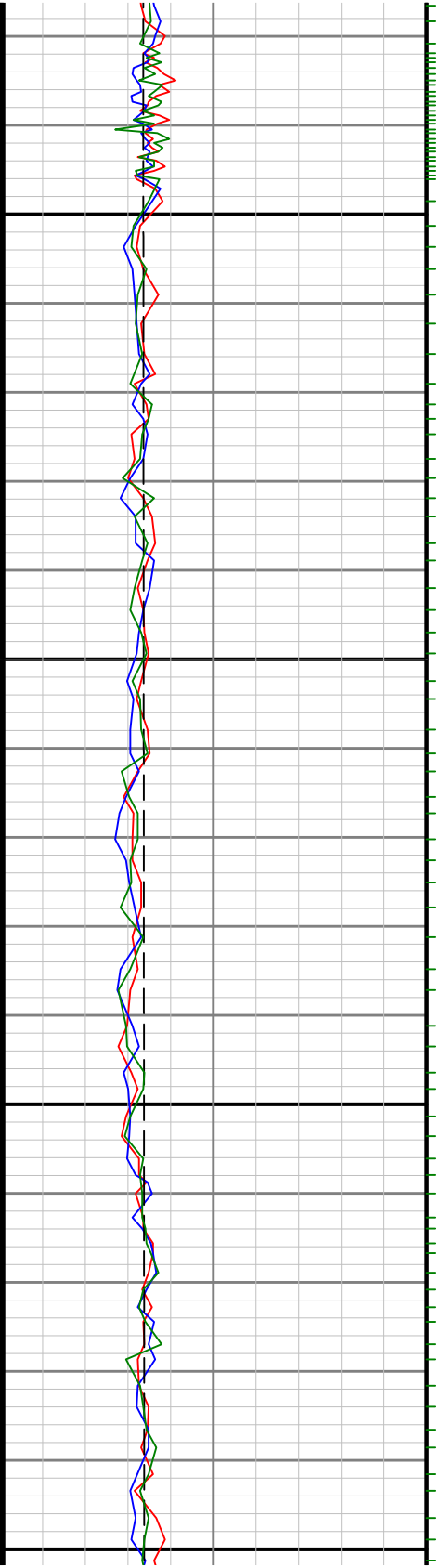


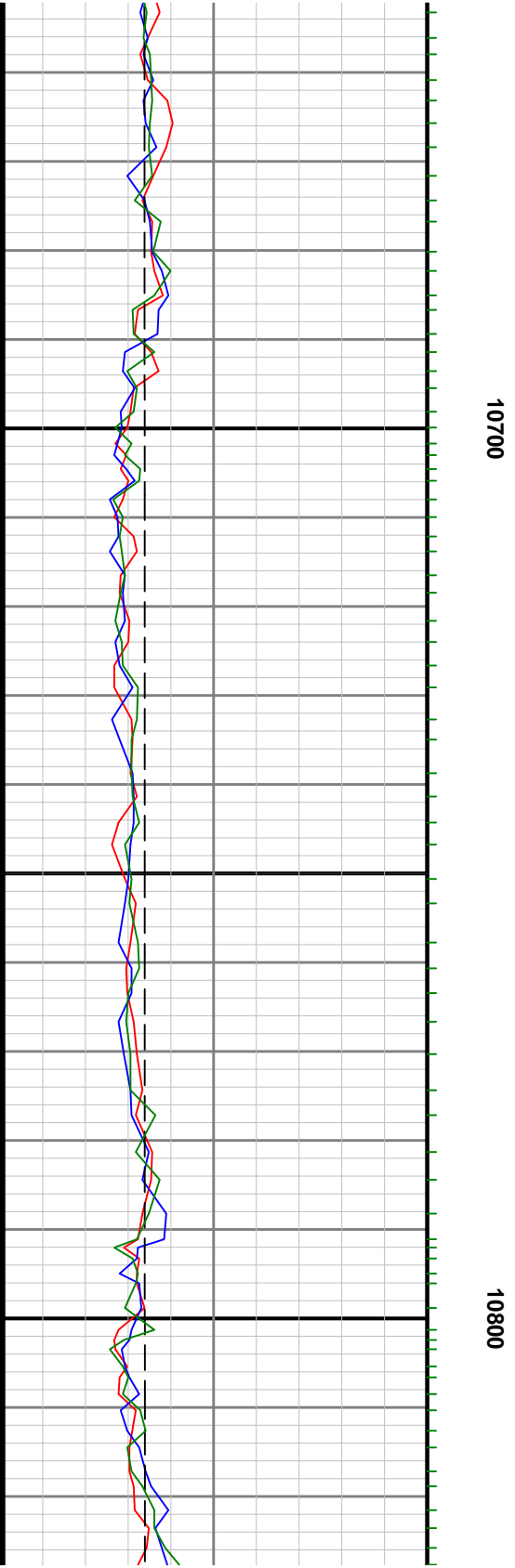
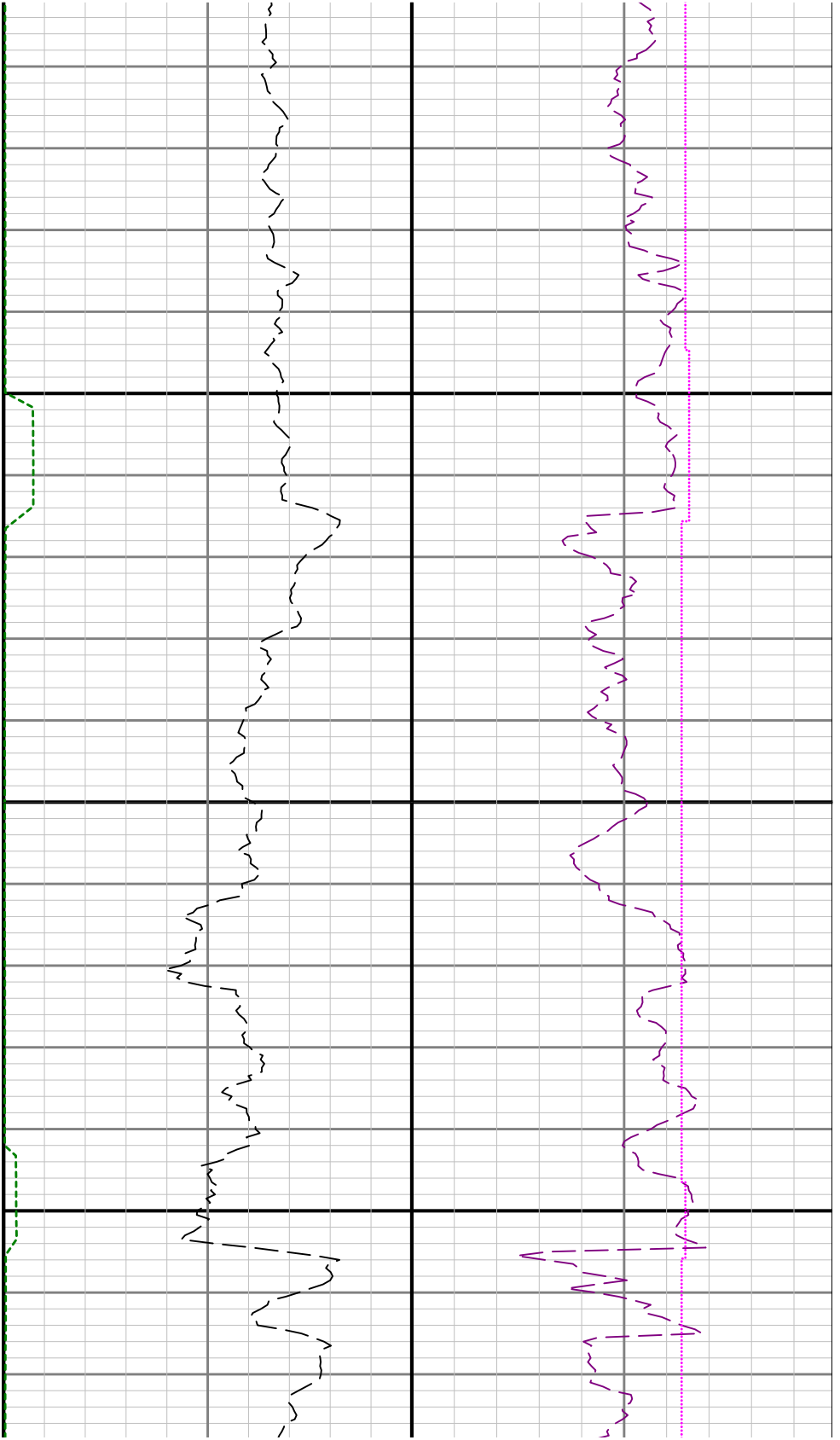


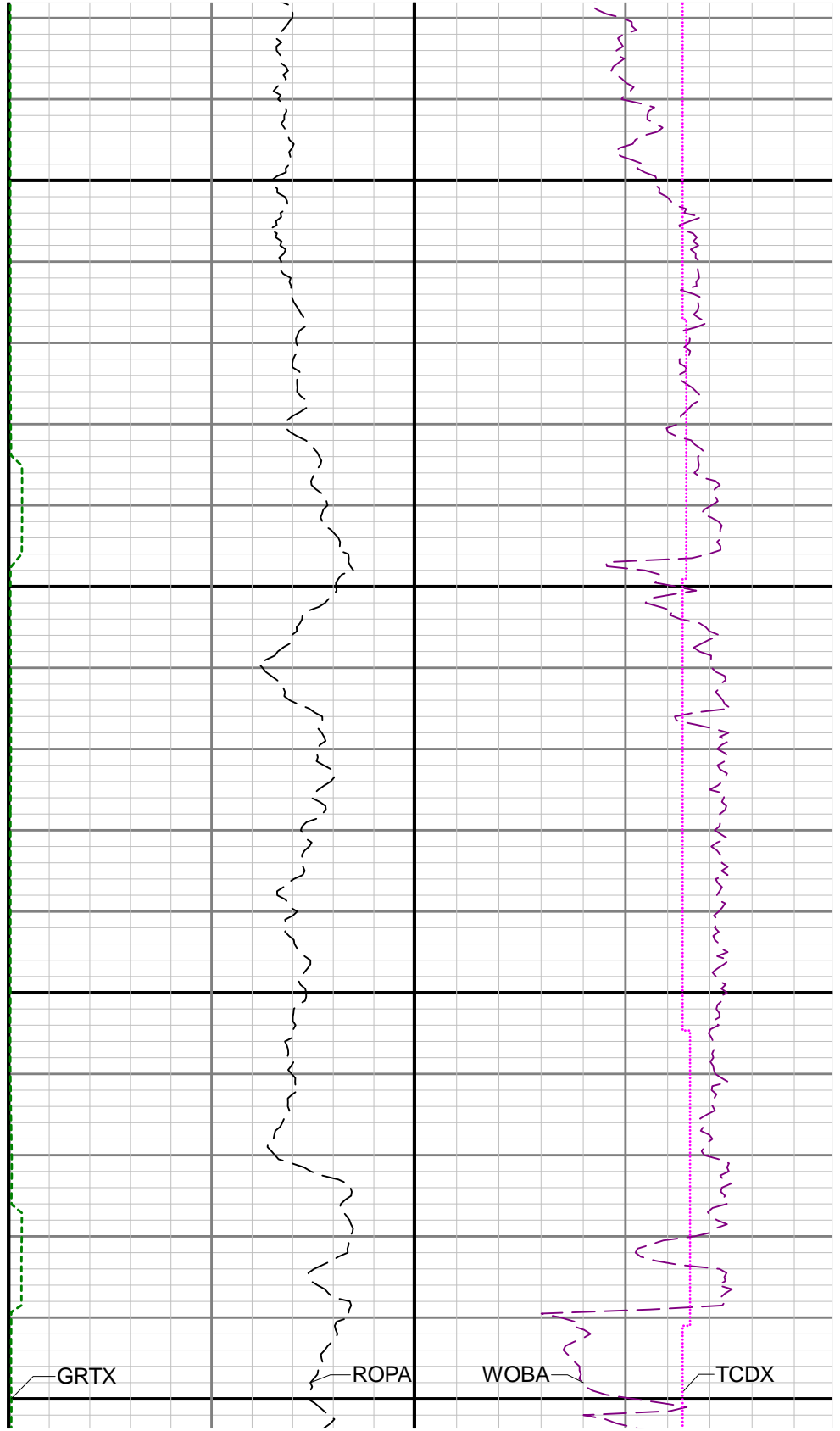
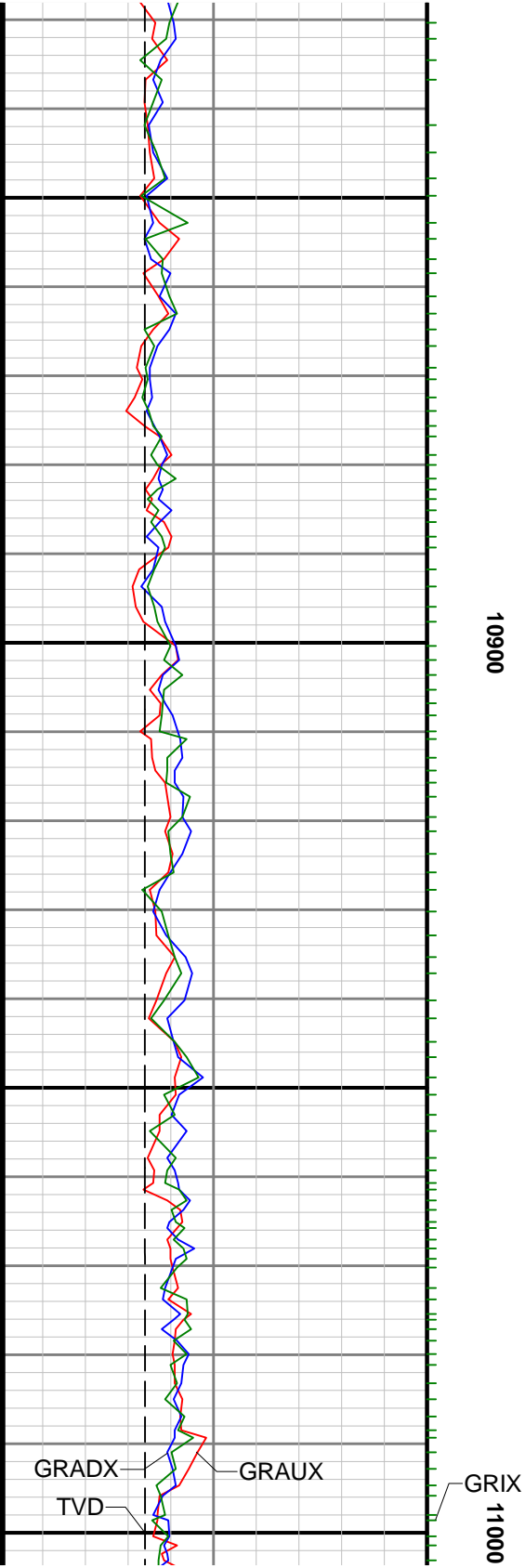


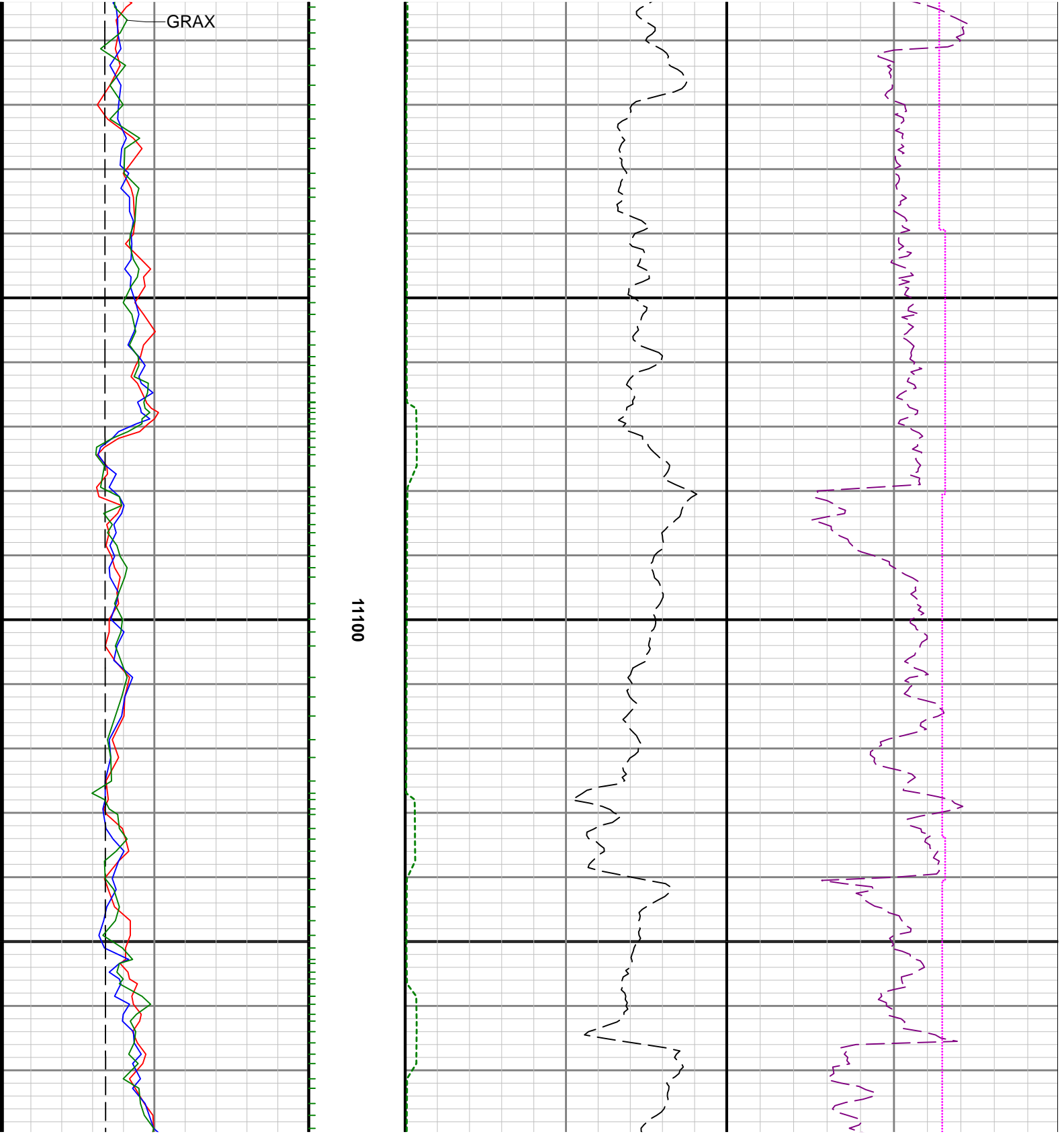
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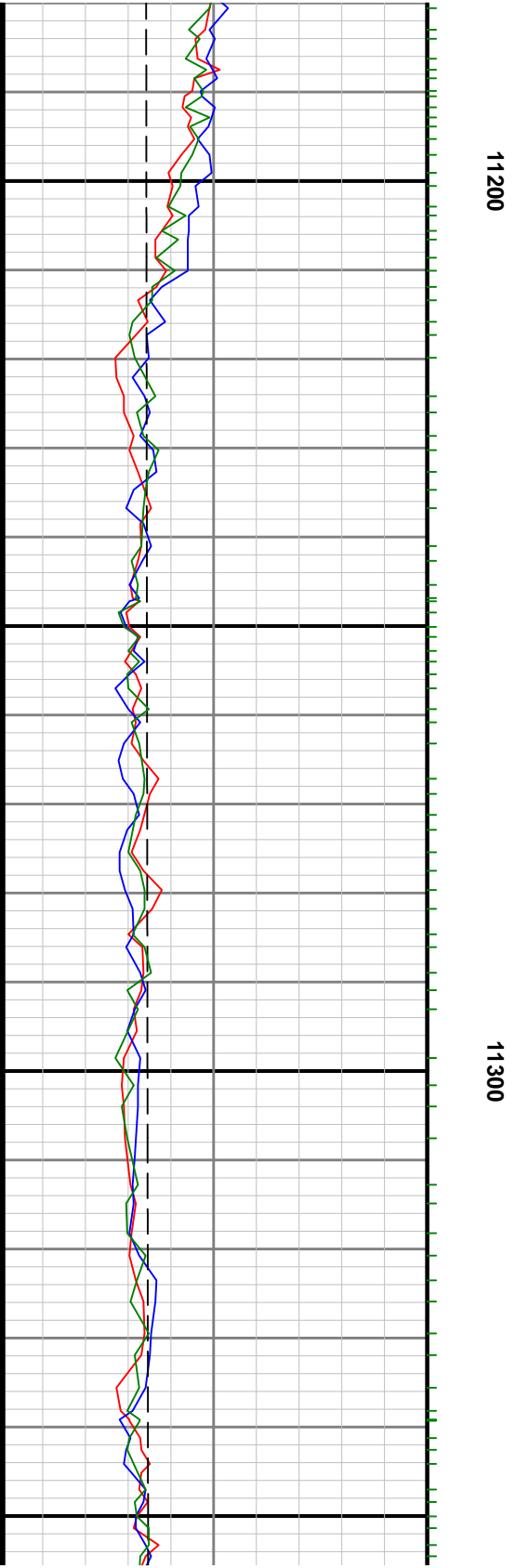
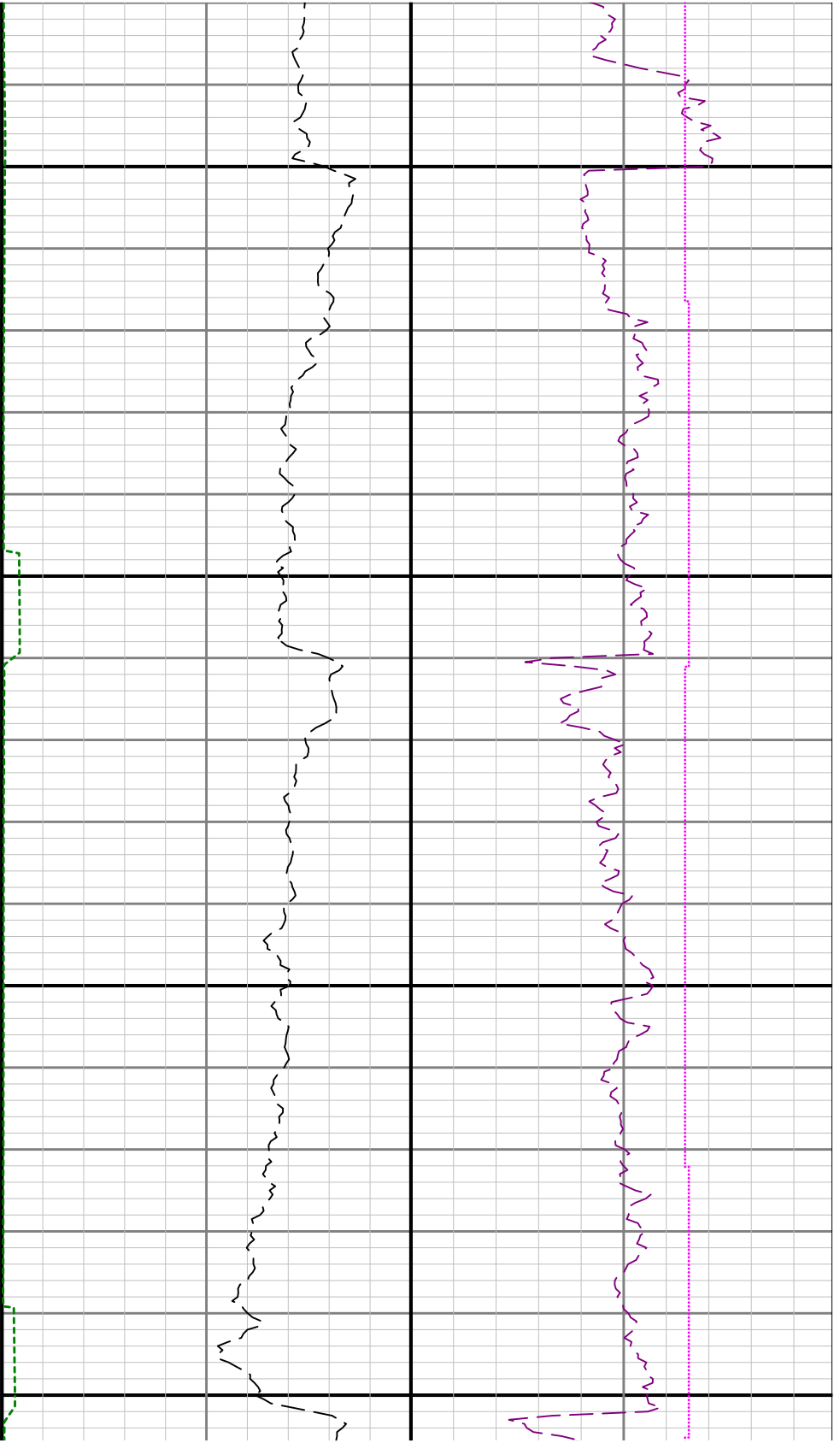
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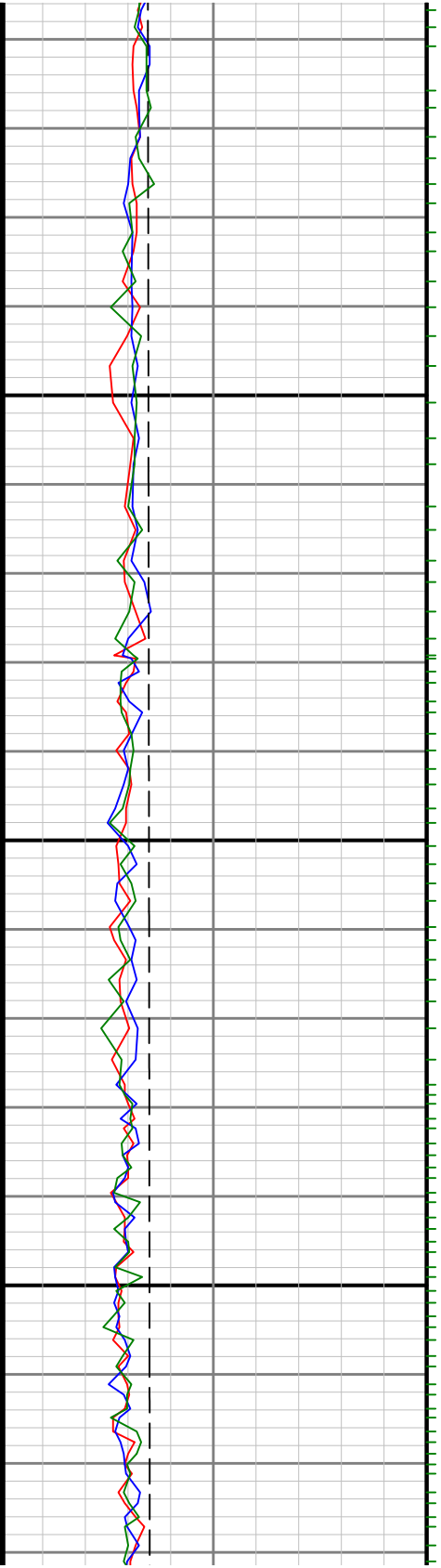


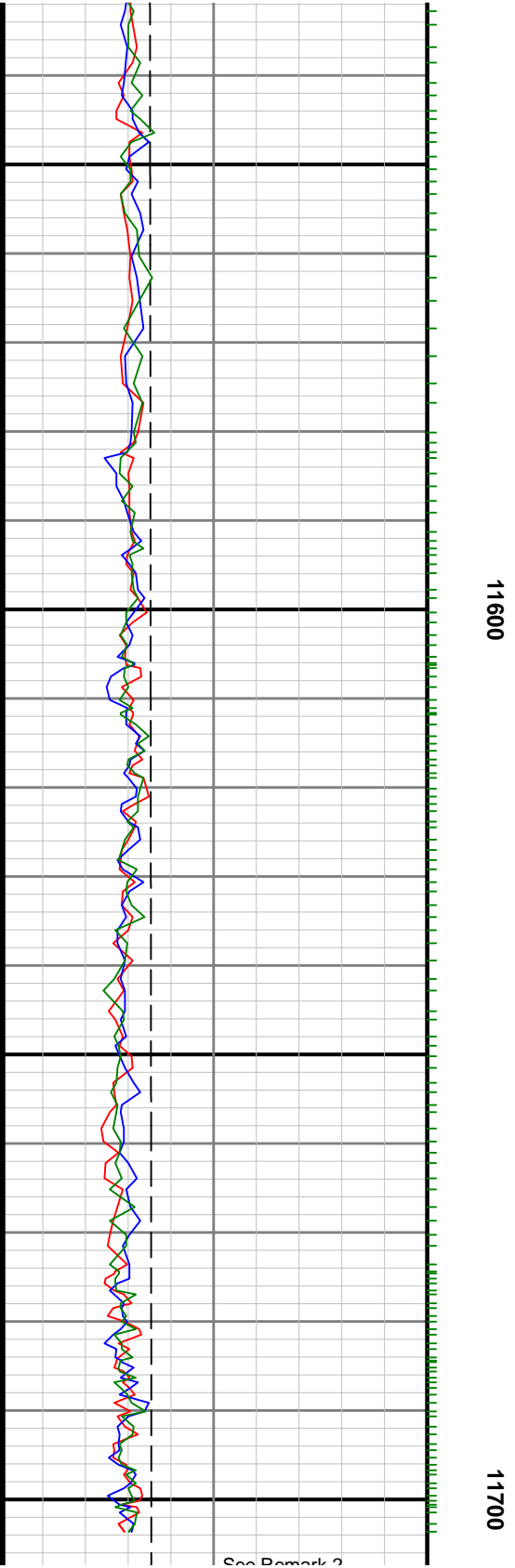
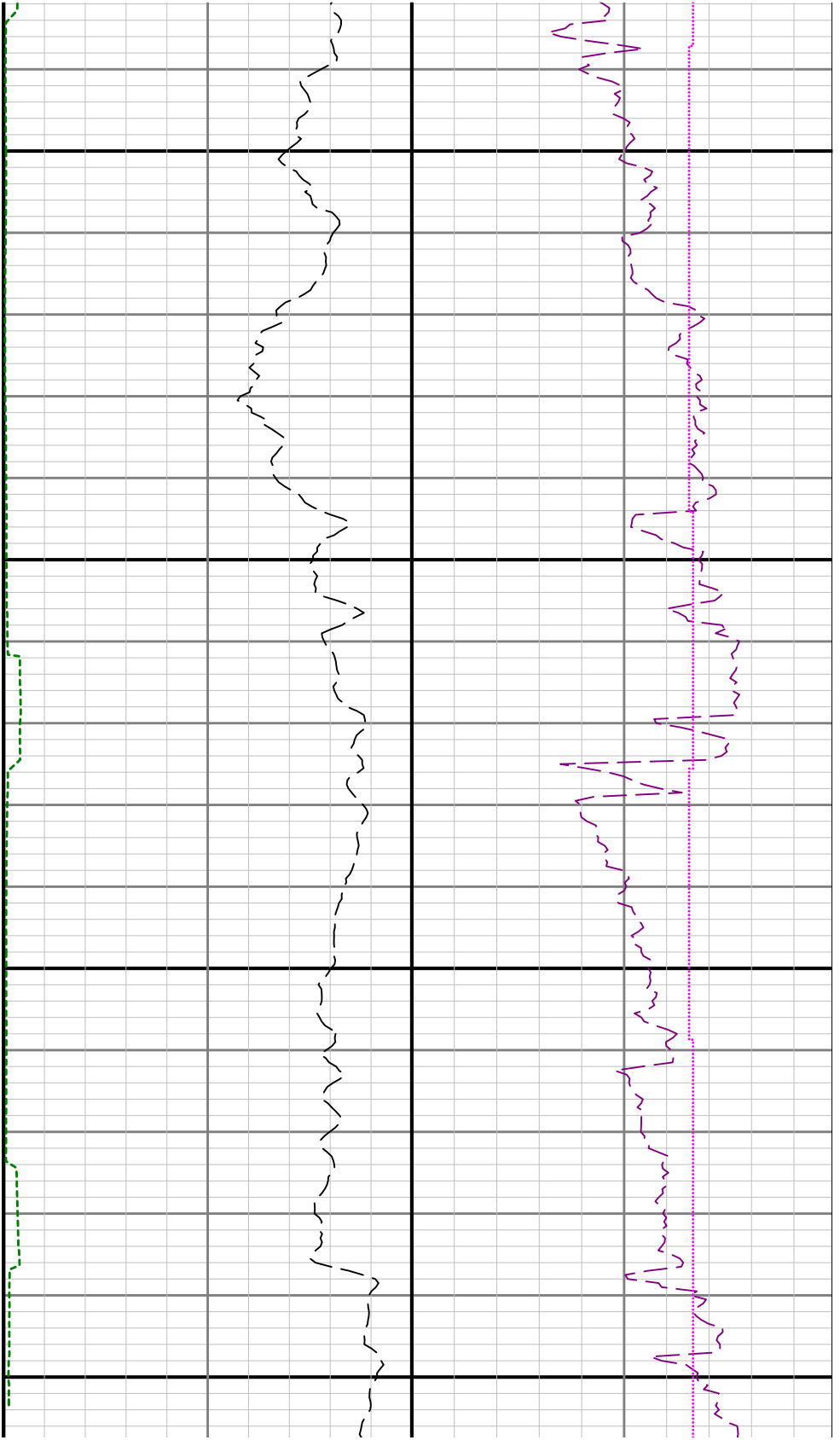




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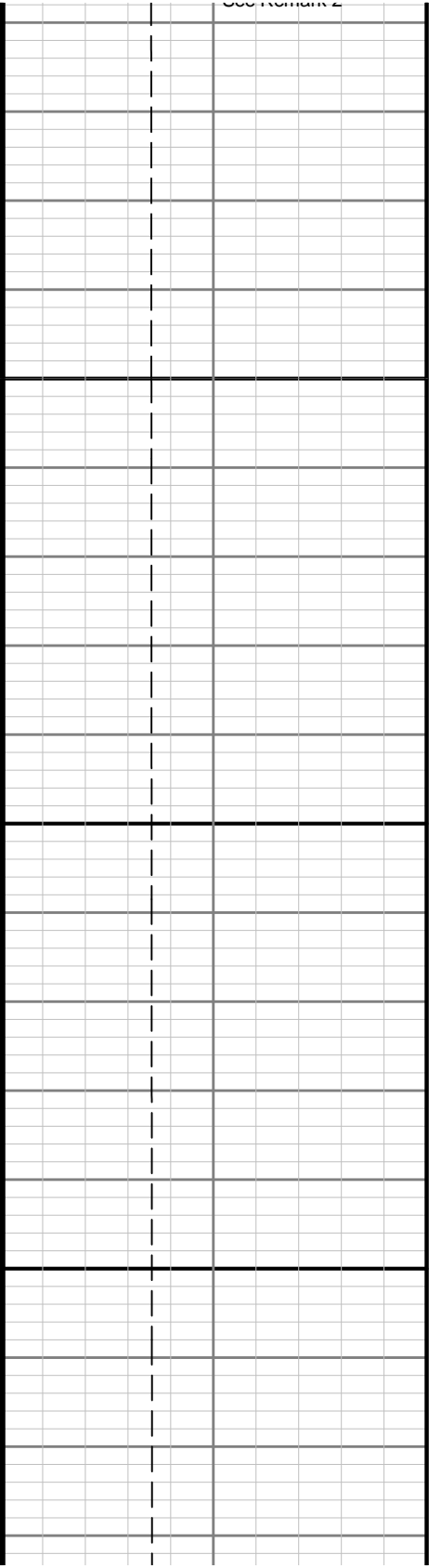
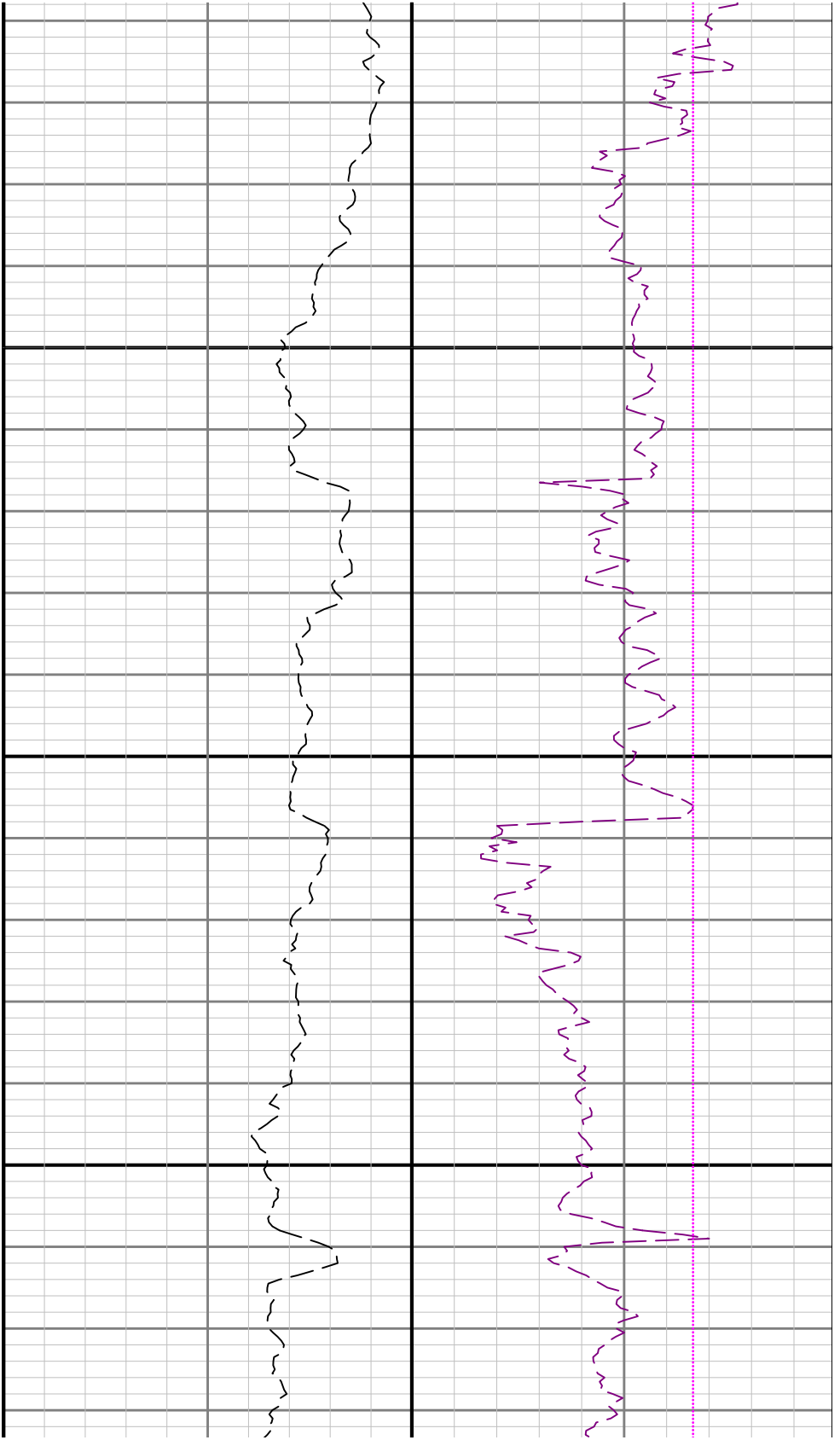
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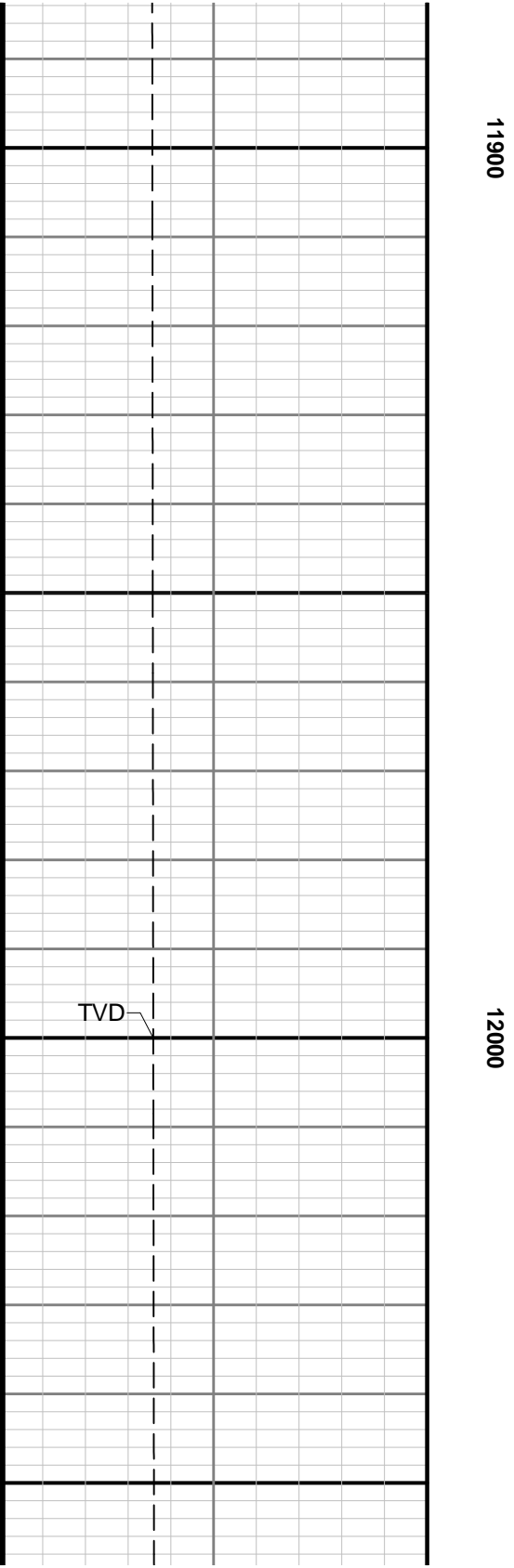
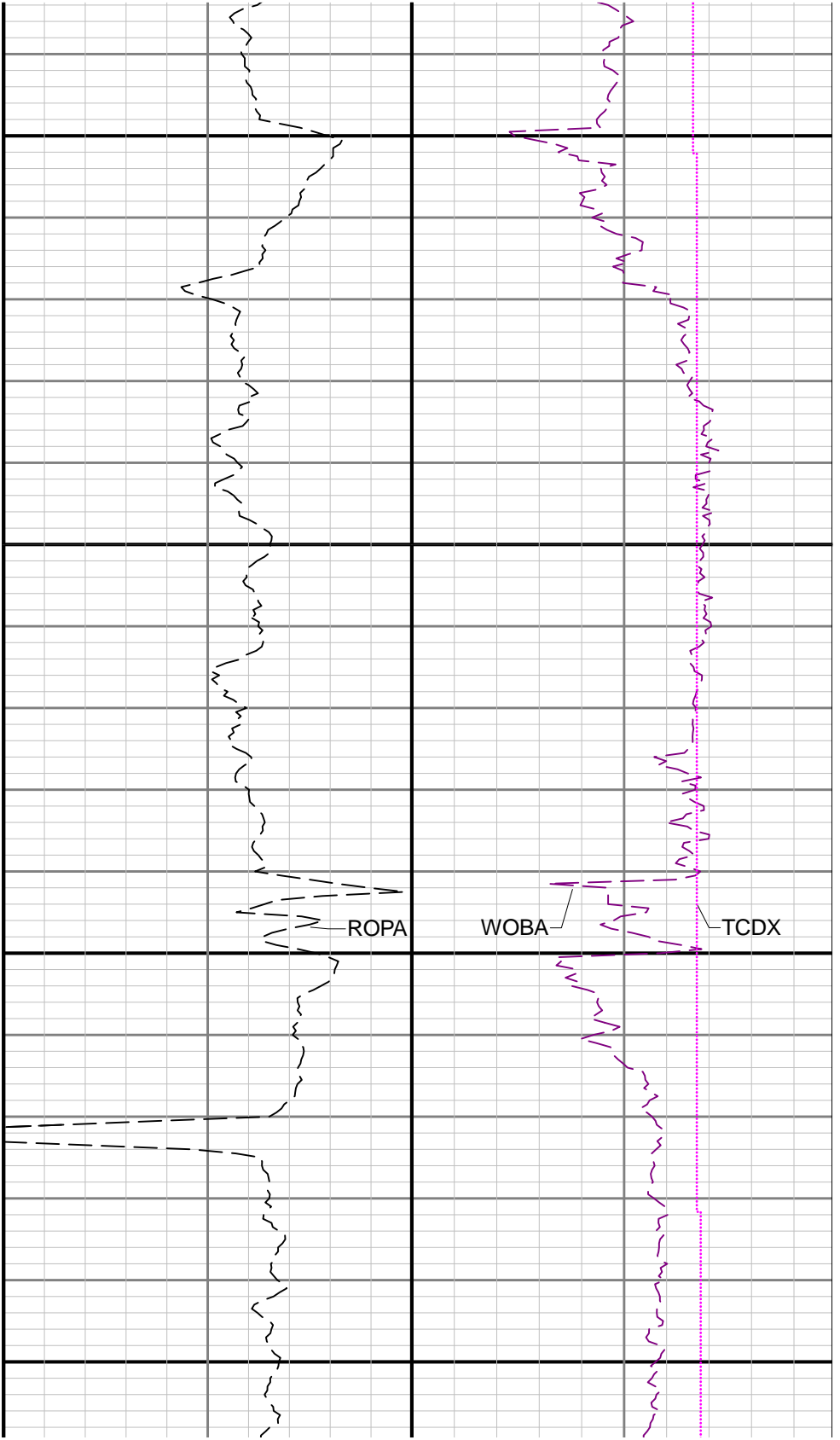


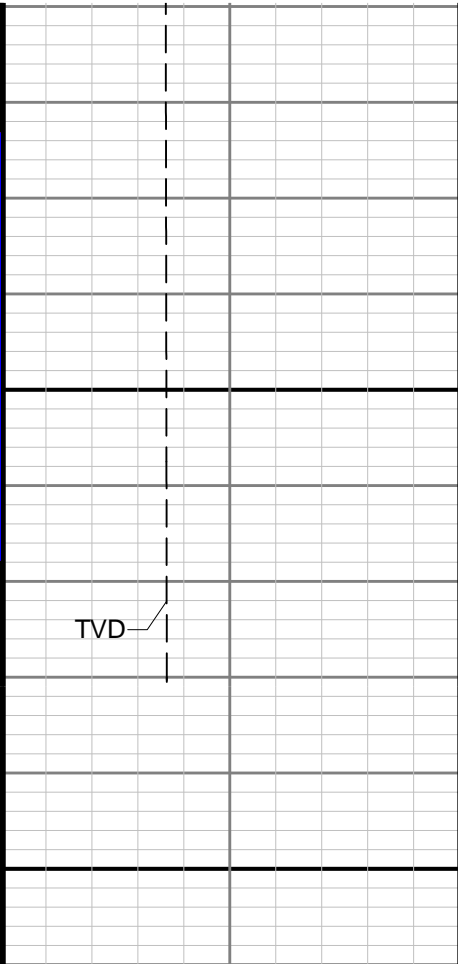


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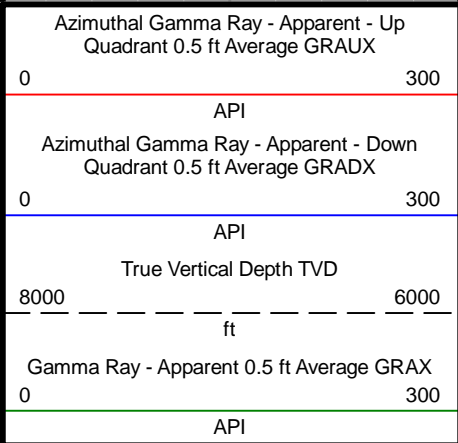






12100

TD



MD 1:240 feet

