



LWD MEMORY LOG

Gamma Ray

Scale:		Company: SRC Energy			
1:240 MD		Well: Harvesters State 4C-16-M			
Depth Reference:		Field: Weld County		Country: United States	
Driller's Depth		County: Weld		State: Colorado	
Status:	Surface Location:		Other Services:		
Final Print		Latitude:		Elev. KB:	
API No: 05-123-46372-00		Longitude:		Elev. DF: 4822.00 ft	
Job ID: 9051224		SEC: 15 TWN: 6N RGE: 66W		Elev. GL: 4802.00 ft	
Permanent Datum (P.D.): Ground Level		Elevation: Above P.D.		20.00 ft	
Log Measured From: Rig Floor		Elev. KB:		N/A	
Dates		Interval Logged		Magnetic Field Reference	
Date From: 2018-04-19		Top: (ft) 20.00		Azi Reference North: True	
Date To: 2018-04-22		Bottom: (ft) 15205.00		Dip Angle: (deg) 66.92	
Spud Date: 2018-03-18		Total Magnetic Field Strength: (nT)		52663	
Borehole Record		Mag to Reference North Correction: (deg)		7.51 E	
Hole Size (in)		From (ft)		To (ft)	
13.500		20.00		1811.00	
8.500		1811.00		15218.00	

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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	6.00	Steerable	0.00	0.00	20.00	1811.00	2018-03-18 02:19	2018-03-18 10:14	13.90
2	2	8.500	PDC	3.00	AutoTrak Curve	1811.00	8217.00	1811.00	8230.00	2018-04-19 16:26	2018-04-21 00:17	27.22
3	3	8.500	PDC	3.00	AutoTrak Curve	8217.00	15205.00	8230.00	15218.00	2018-04-21 12:12	2018-04-22 17:32	27.04

Crew

[illegible]

Name	Arrive	Depart	Name	Arrive	Depart	Name	Arrive	Depart
	Wellsite	Wellsite		Wellsite	Wellsite		Wellsite	Wellsite
John Moisan	2018-03-18	2018-03-18	John Bryson	2018-04-19	2018-04-23			

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+ (%)
2018-03-17 17:32	1	20.00	Water Based Mud	8.4	1	N/A	N/A	0/100	Active Pit	800	0.00
2018-04-19 14:40	2	1811.00	Diesel-Oil Based Mud	9.5	21	N/A	28.0	79/21	Suction	32500	0.00
2018-04-20 04:00	2	4569.00	Diesel-Oil Based Mud	9.6	21	N/A	16.8	76/24	Suction	37000	0.00
2018-04-20 16:00	2	6897.00	Diesel-Oil Based Mud	9.6	25	N/A	7.4	77/23	Suction	38000	0.00
2018-04-21 04:00	3	8230.00	Diesel-Oil Based Mud	9.9	24	N/A	7.6	79/21	Suction	37000	0.00
2018-04-21 16:00	3	8863.00	Diesel-Oil Based Mud	10.0	25	N/A	6.8	79/21	Suction	38000	0.00
2018-04-22 04:00	3	11942.00	Diesel-Oil Based Mud	9.9	27	N/A	5.2	78/22	Suction	38000	0.00
2018-04-22 16:00	3	14827.00	Diesel-Oil Based Mud	10.0	28	N/A	4.6	79/21	Suction	35000	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	Sensor Sub	ZAPS230949	Directional (mag)	12.17	61.94	8.000	3.250
1	Sensor Sub	ZAPS230949	VSS	12.17	61.94	8.000	3.250
1	Sensor Sub	ZAPS230949	Pressure	32.77	82.54	8.000	3.250
2	ATC_SU	14279931	Near Bit VSS	5.93	6.73	7.000	4.330
2	ATC_SU	14279931	Near Bit Inclination	5.93	6.73	7.000	4.330
2	ATC_MWD	13012733	Gamma (single)	2.76	12.90	7.000	3.250
2	ATC_MWD	13012733	Directional (mag)	12.28	22.42	7.000	3.250
3	ATC_SU	12160765	Near Bit Inclination	5.93	6.73	7.000	4.330
3	ATC_SU	12160765	Near Bit VSS	5.93	6.73	7.000	4.330
3	ATC_MWD	11800471	Gamma (single)	2.75	12.90	7.000	3.250
3	ATC_MWD	11800471	Directional (mag)	12.28	22.43	7.000	3.250

Service and Tool Mnemonics

Mnemonic	Name	Description
GAM	APS	APS EM Module
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 LWD Run 1 utilized 8 inch APS EM Services (Directional only) behind a 13 1/2 inch bit and steerable assembly from surface to 1811 feet MD (surface to 1795 feet TVD). No logging data was acquired during this run.
3	Baker Hughes LWD Runs 2 and 3 utilized 6 3/4 inch NaviGamma services (Gamma Ray and Directional) behind an 8 1/2 inch bit and rotary steerable assembly from 1811 to 15218 feet MD (1795 to 7235 feet TVD).
4	Gamma Ray Curve (GRAM) is presented 0 to 300 API per customer request.


Remarks

Number	Measured Depth (ft)	Hole Section (in)	Run No.	Remark
1	2959.00	8.500	2	The interval from 2959 to 3027 feet MD (2927 to 2994 feet TVD) has no Gamma data and erroneous surface parameters due to PASON going down while drilling ahead.
2	8217.00	8.500	3	The interval from 8217 to 8230 feet MD (7272 feet TVD) was logged up to 12.3 hours after being drilled due to a trip out of the hole for a tool failure.

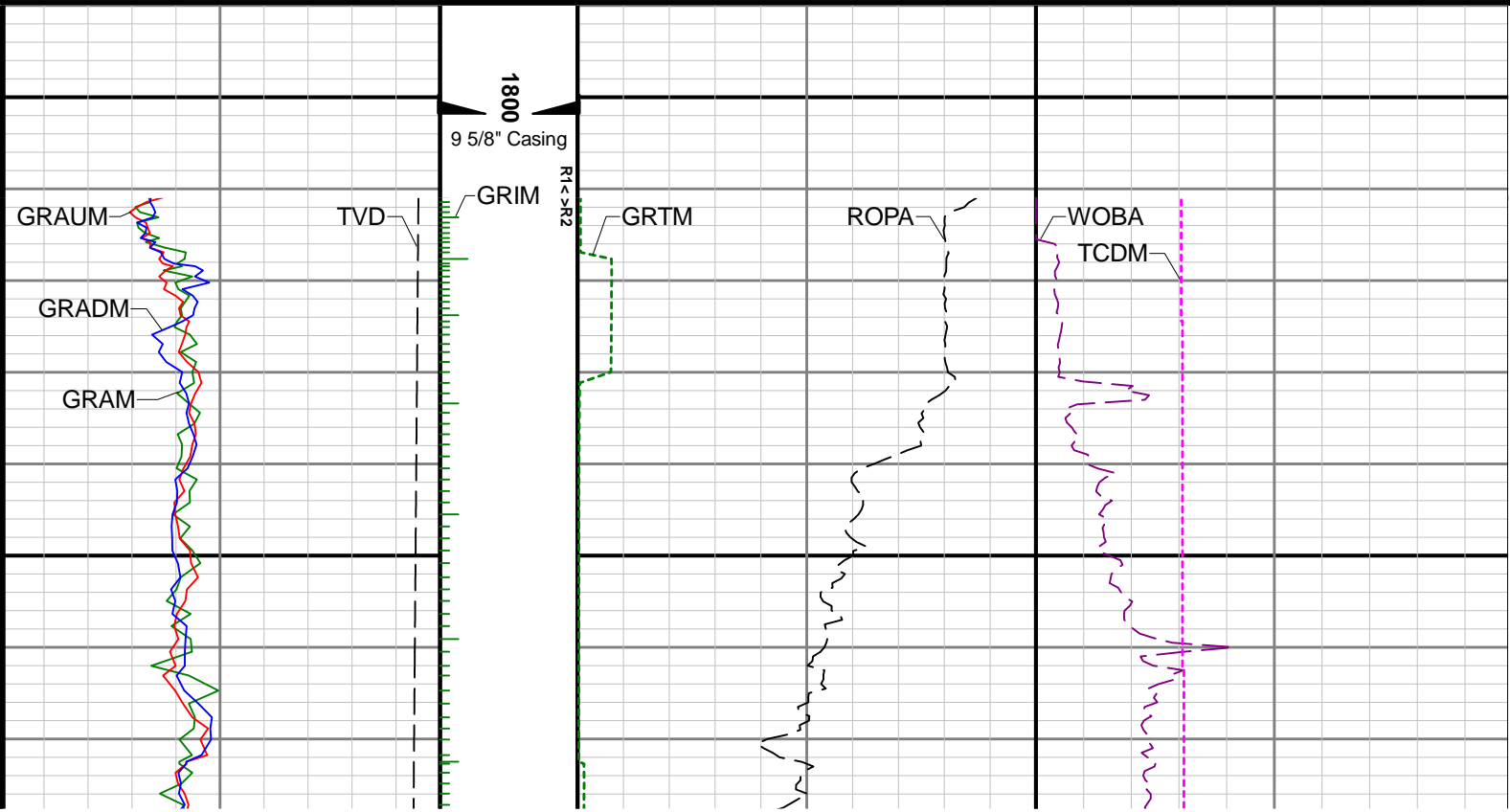
				for a tool failure.
3	15205.00	8.500	3	The interval from 15205 to 15218 feet MD (7235 feet TVD) was not logged due to sensor to bit offset at well TD.

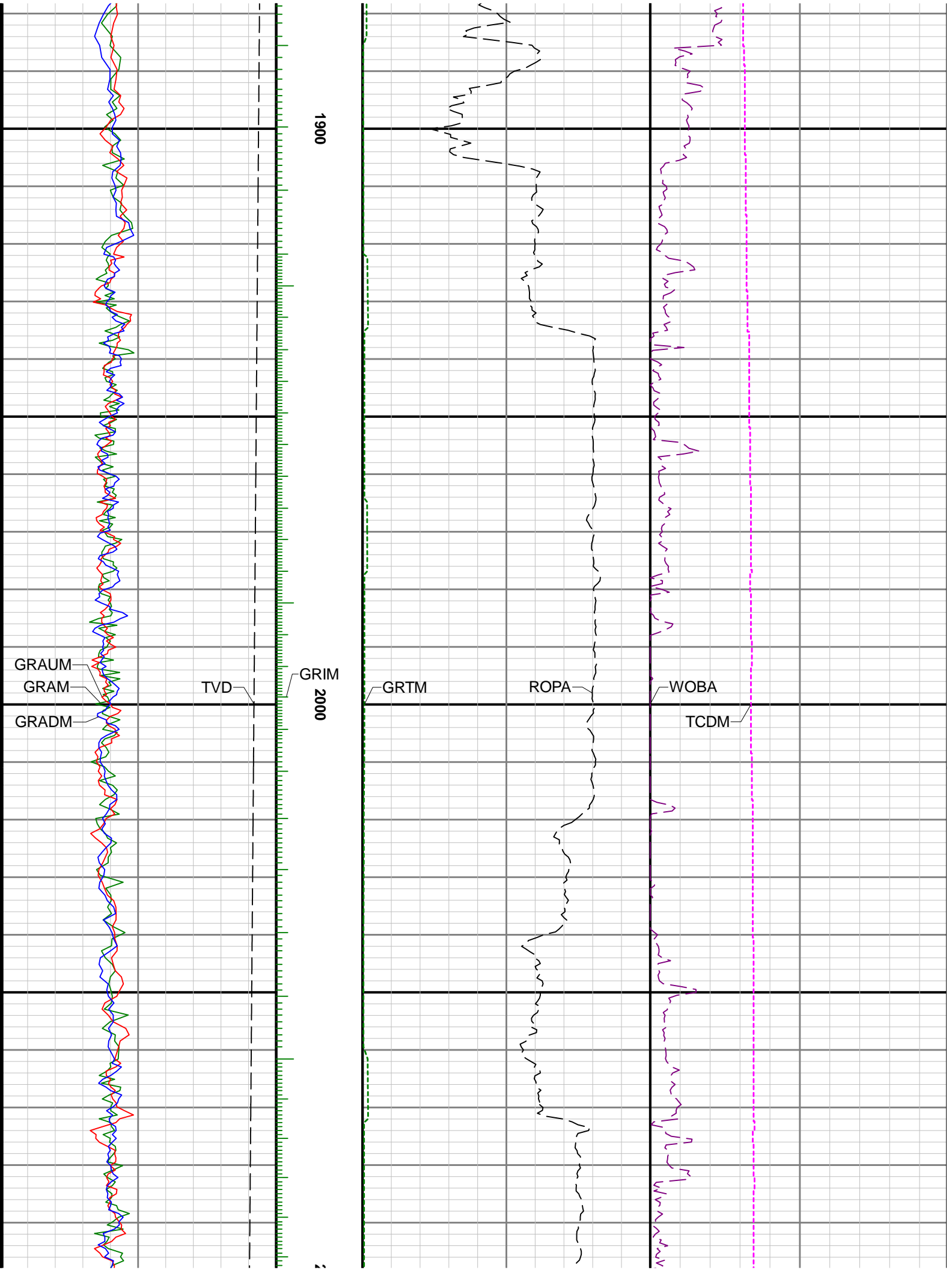
Curve Mnemonics

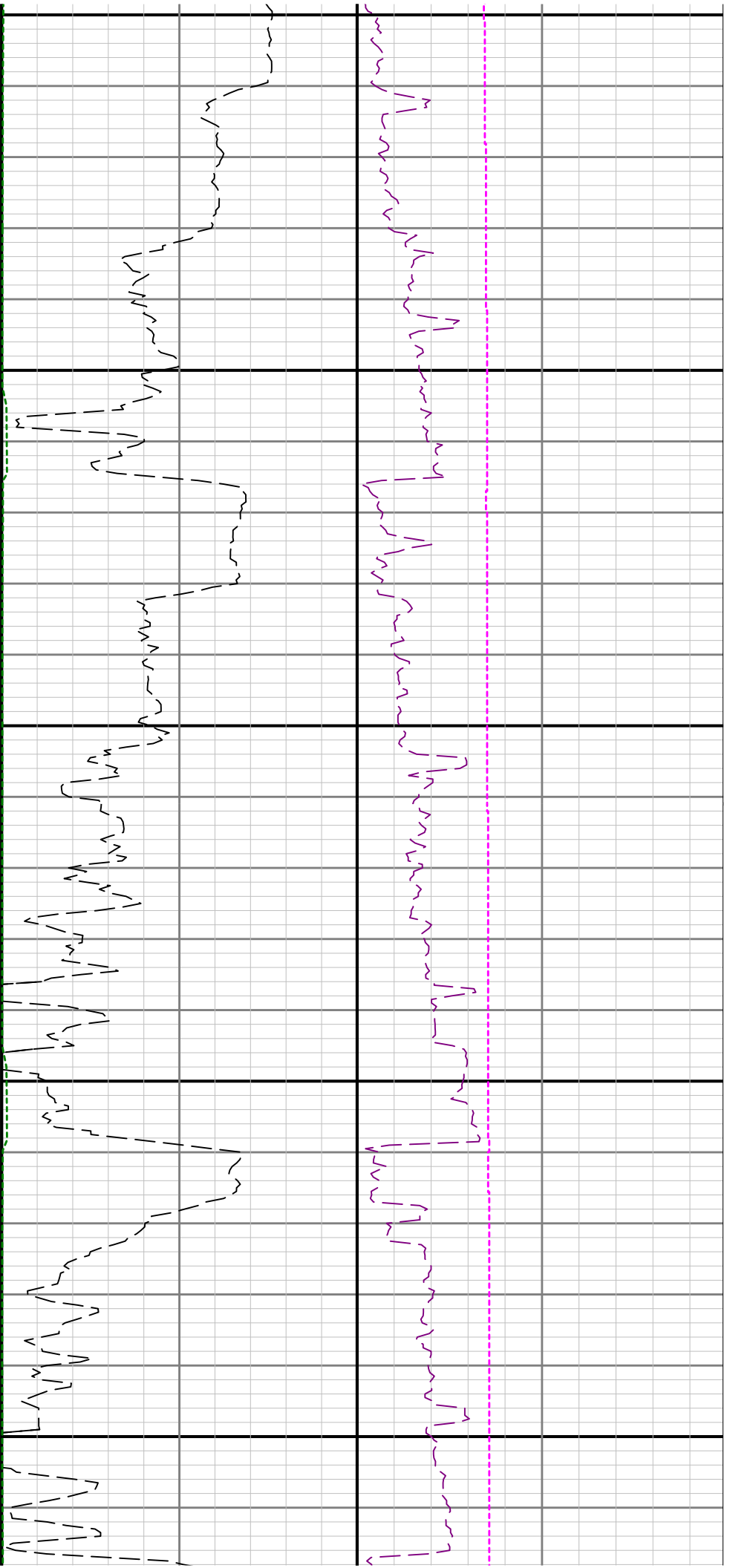
Presented Curves	Description	Units
ROPA	Depth Averaged ROP 3 ft Average	ft/h
TVD	True Vertical Depth	ft
WOBA	Weight On Bit, Average 1 ft Average	klb
GRAM	Gamma Ray - Apparent - Memory 0.5 ft Average	API
GRIM	Gamma Ray - Data Point Indicator - Memory	unitless
GRTM	Gamma Ray - Time Since Drilled - Memory	min
GRADM	Gamma Ray - Apparent - Down Quadrant - Memory 0.5 ft Average	API
GRAUM	Gamma Ray - Apparent - Up Quadrant - Memory 0.5 ft Average	API
TCDM	Downhole Temperature	degF

<div> <div> <div>BAKER HUGHES</div> <div>a GE company</div> </div> <div>  </div> </div>	Company	SRC Energy			
	Well	Harvesters State 4C-16-M			
	Interval	Date From:	2018-04-19 10:26:09	Top:	1811.00
	Created	Date To:	2018-04-22 11:32:17	Bottom:	15218.00
		2018-04-23 14:14:38			

Gamma Ray - Apparent 0.5 ft Average GRAM	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 - Up Quadrant 0.5 ft Average GRAUM		Gamma Time Since Drilled GRTM	Downhole Temperature TCDM
0 300		0 600	0 300
API		min	degF
Azimuthal Gamma Ray - Apparent - Down Quadrant 0.5 ft Average GRADM			
0 300			
API			
True Vertical Depth TVD			
7500 1500			
ft			



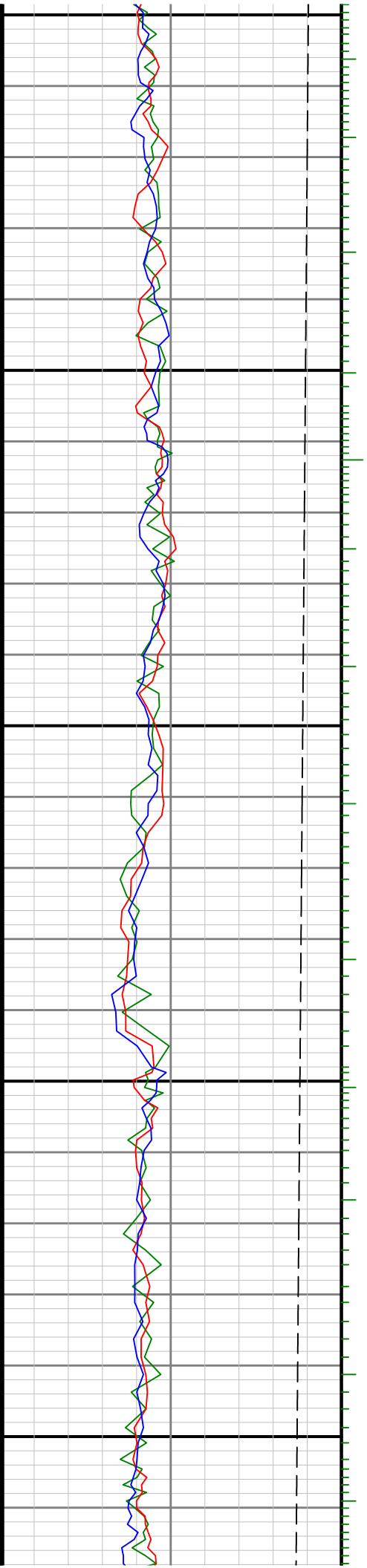


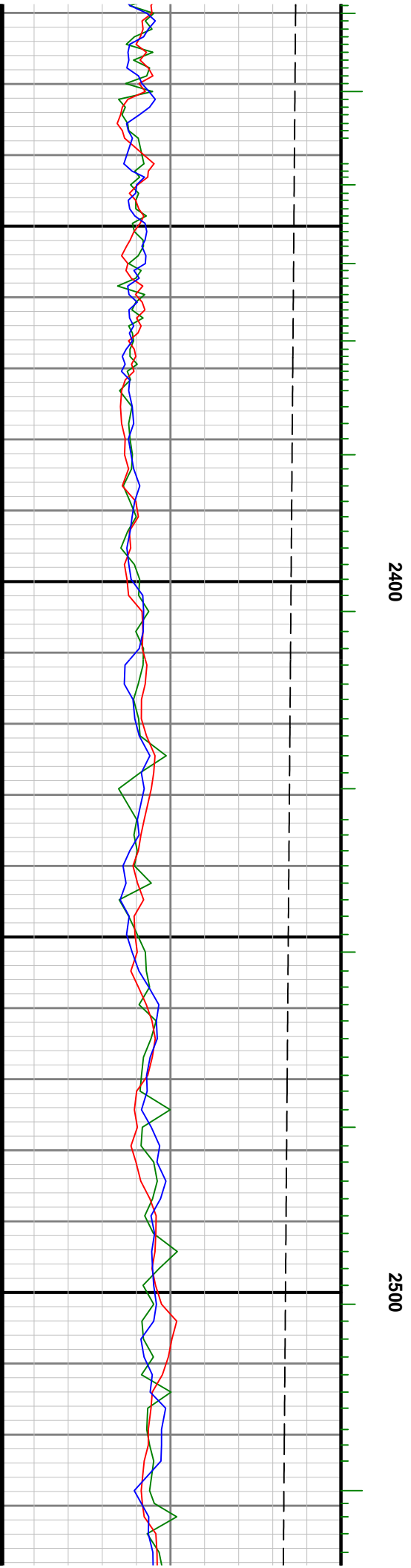
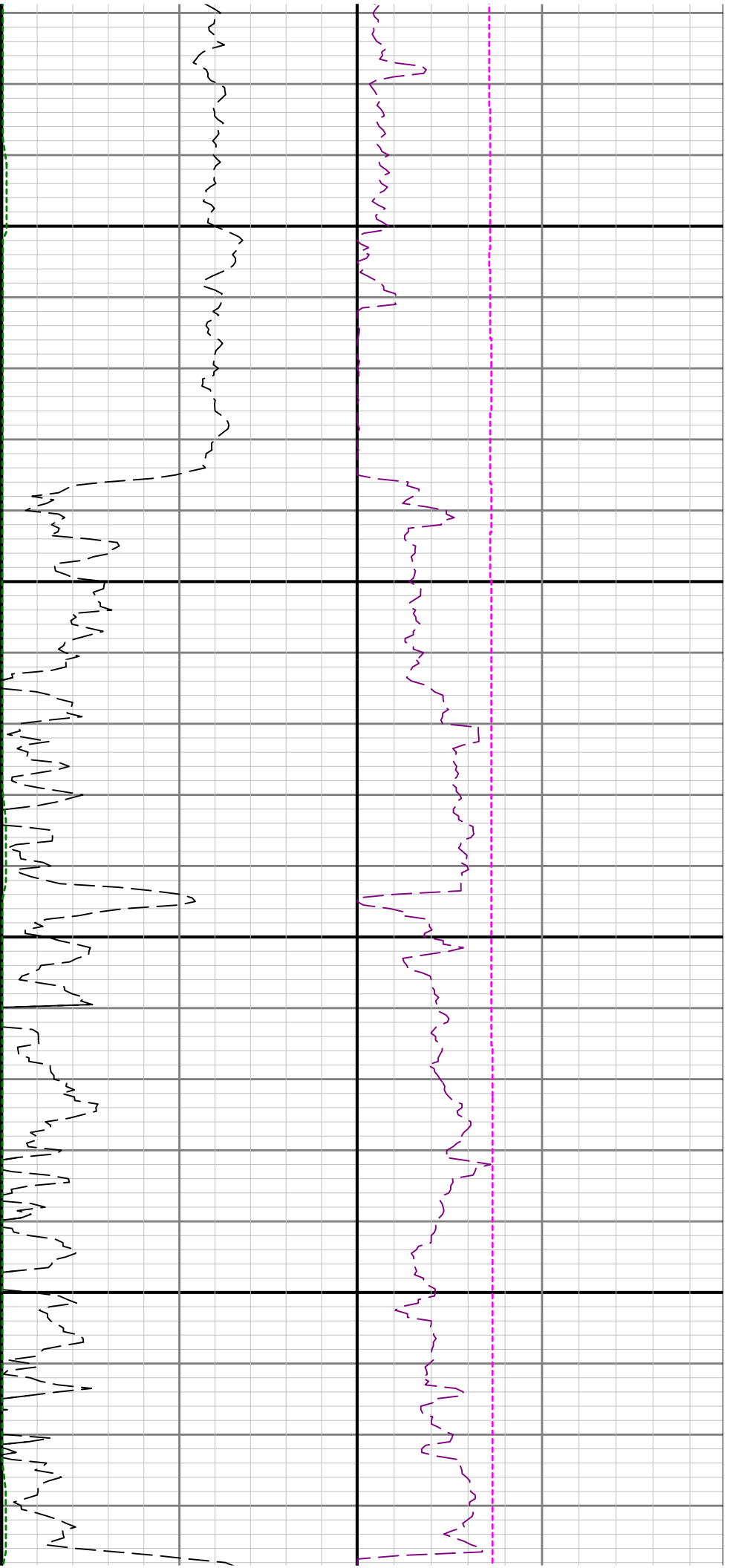


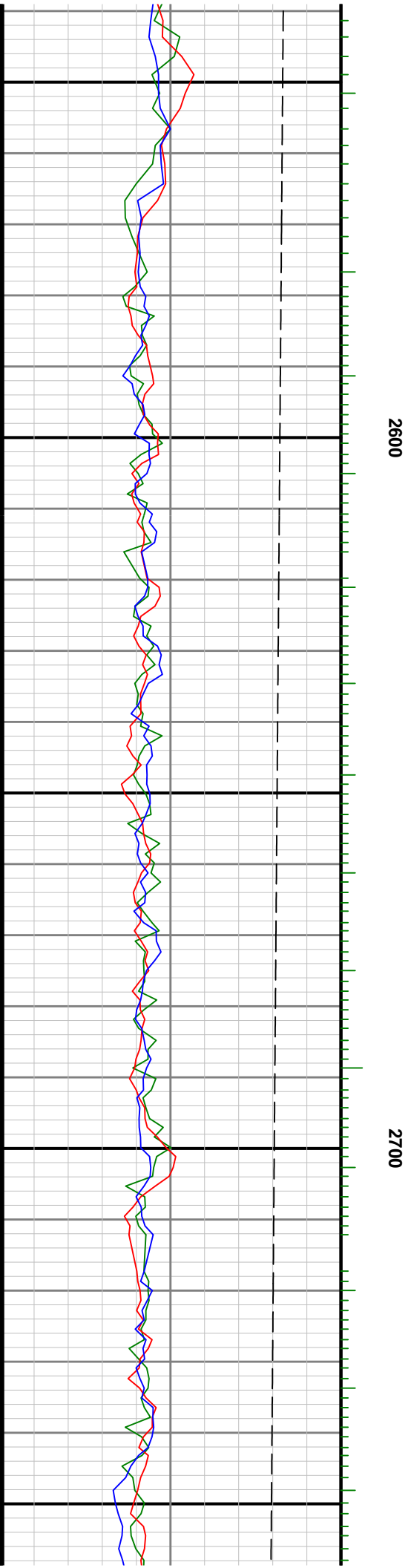
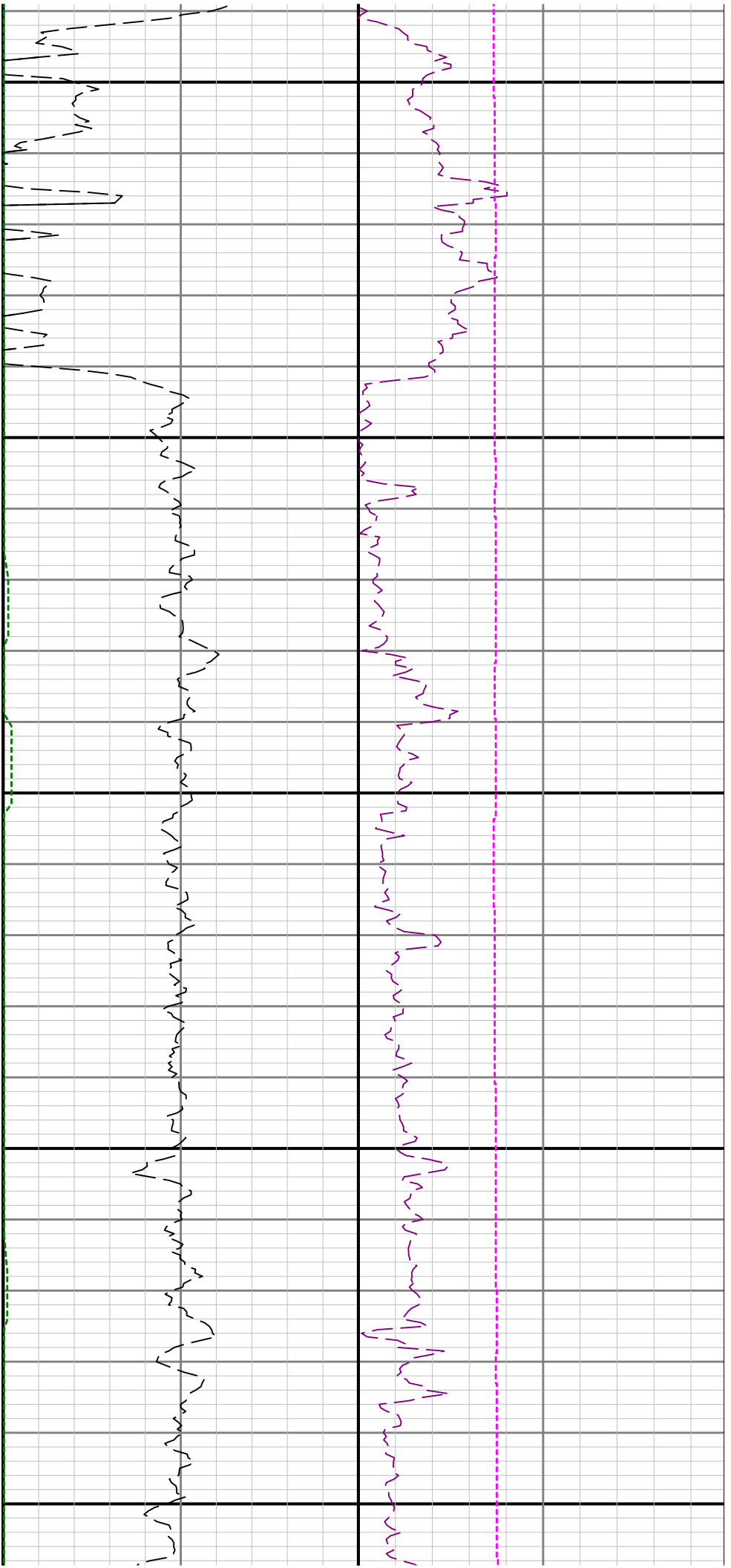
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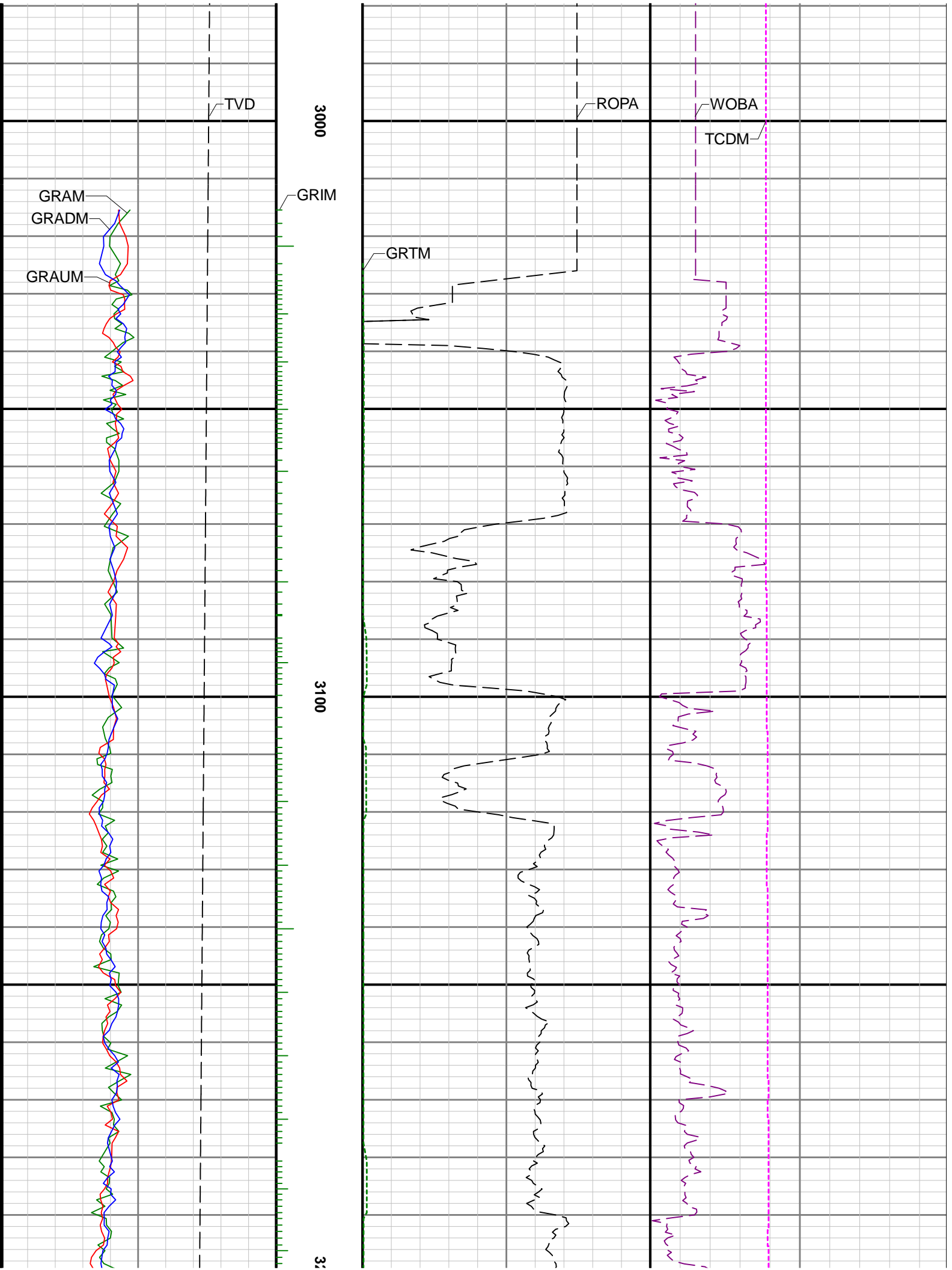
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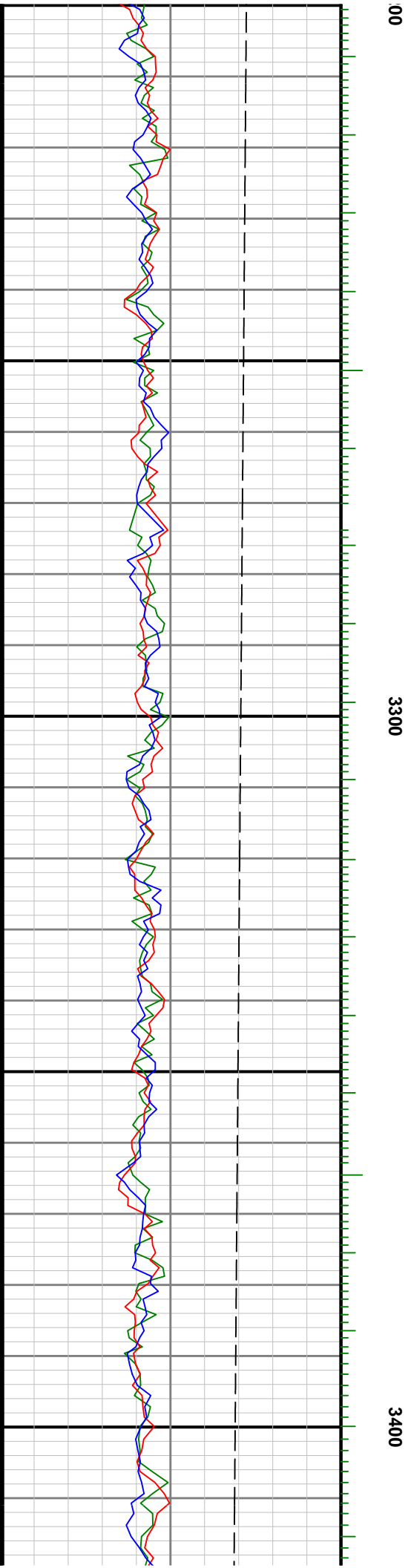
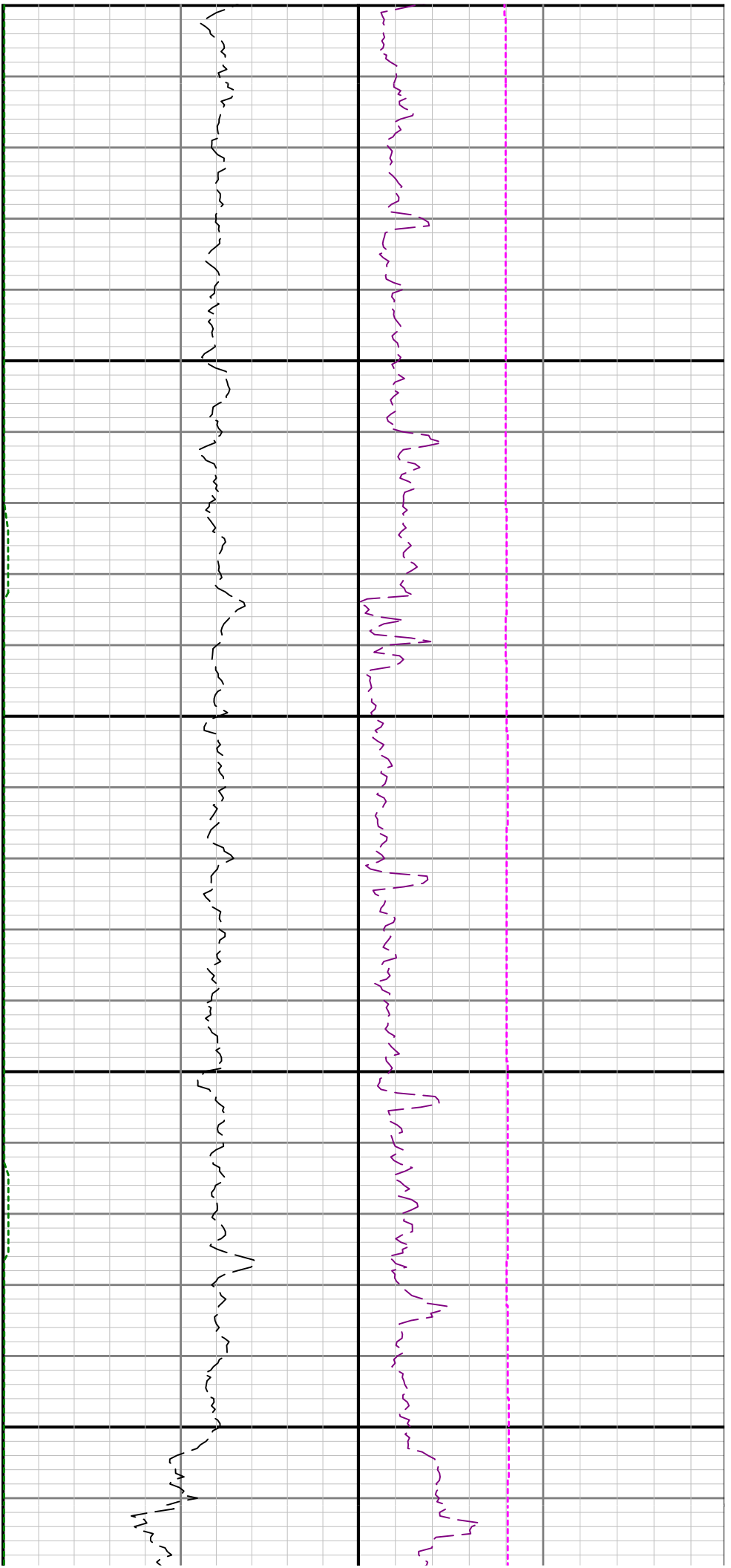
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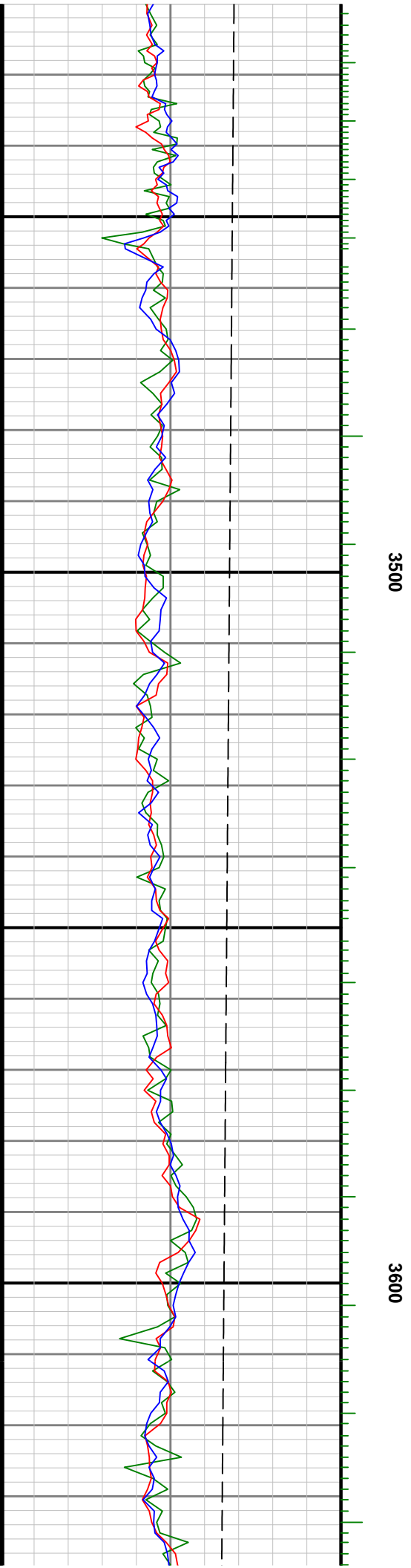
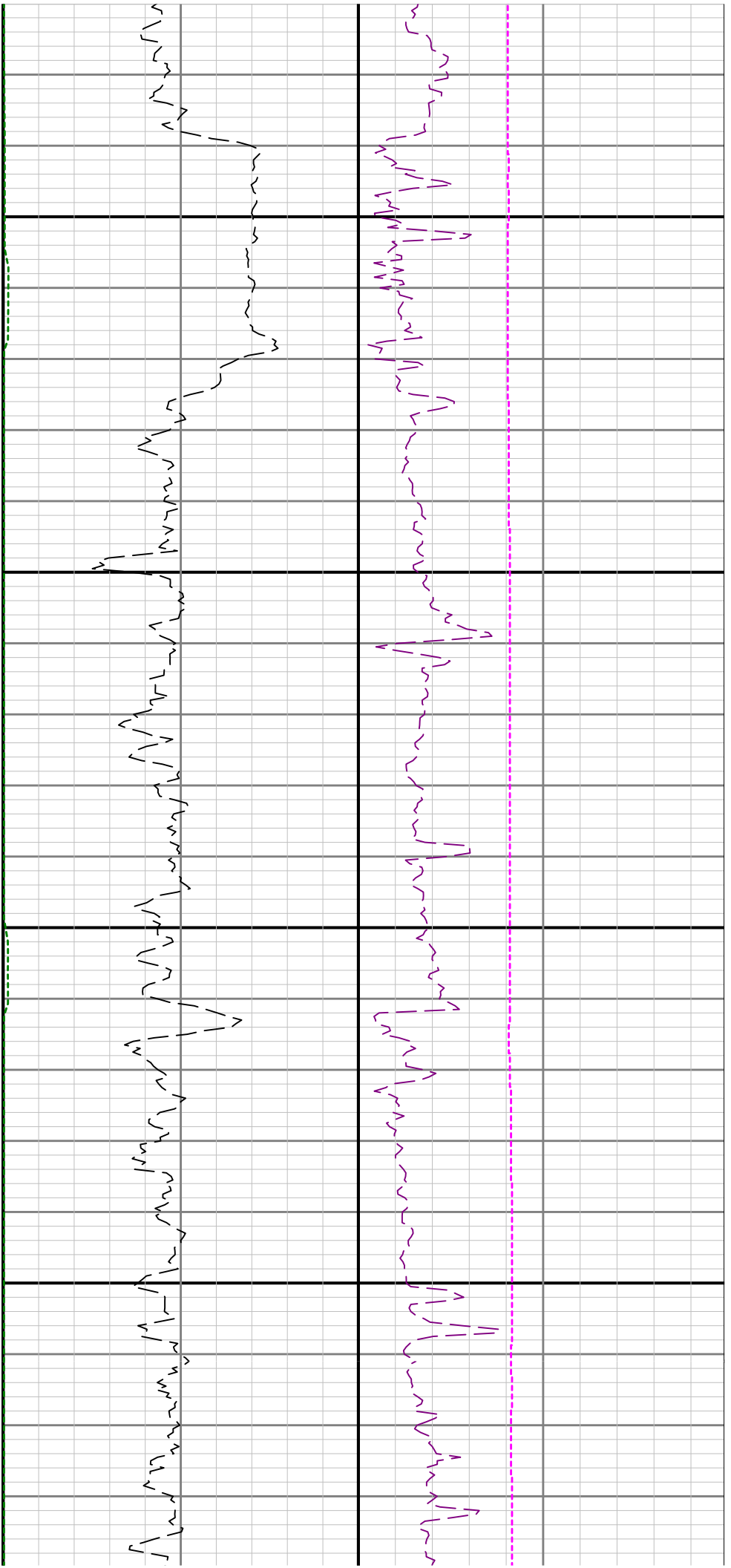


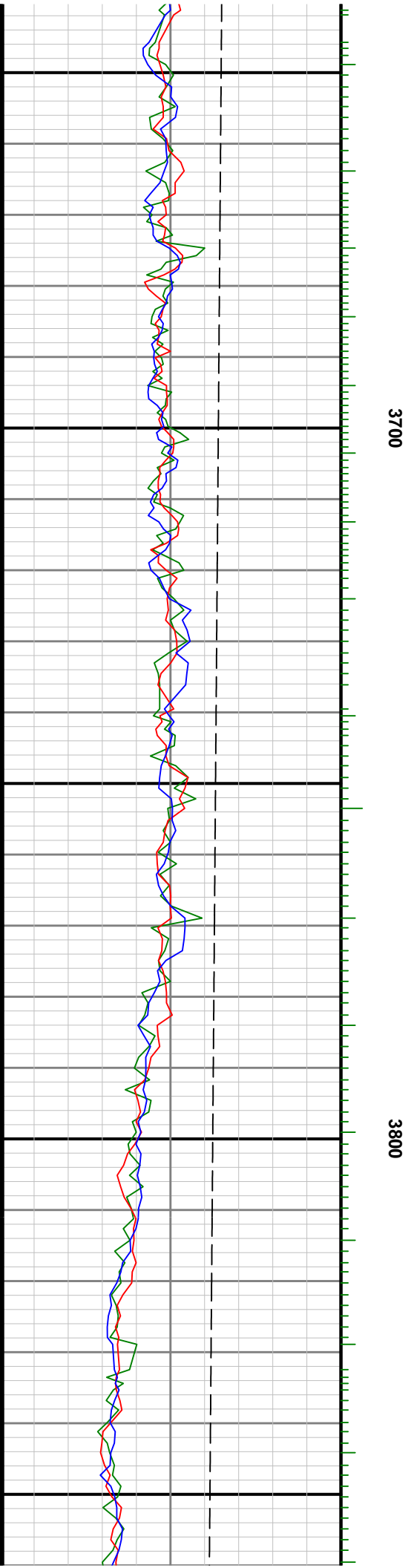
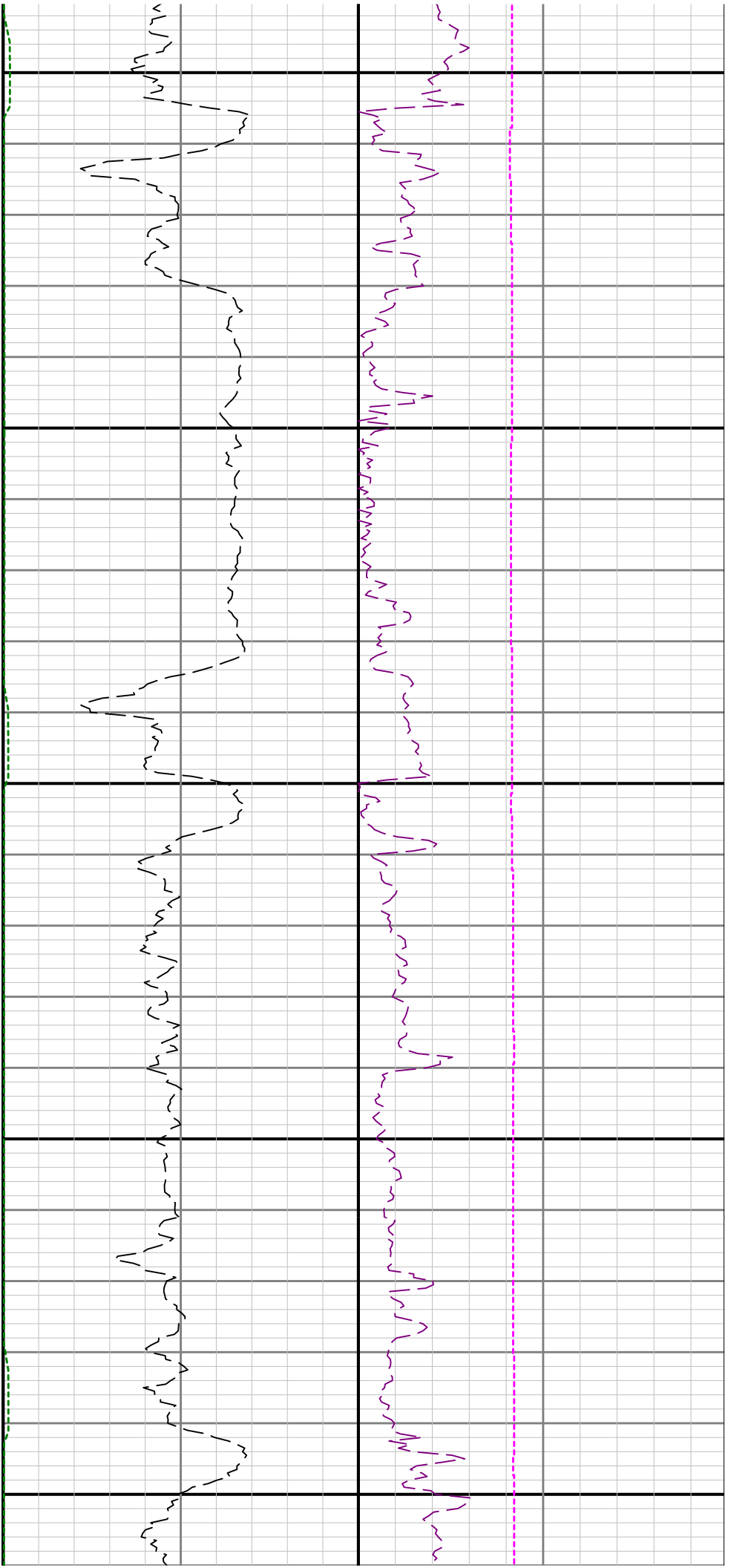


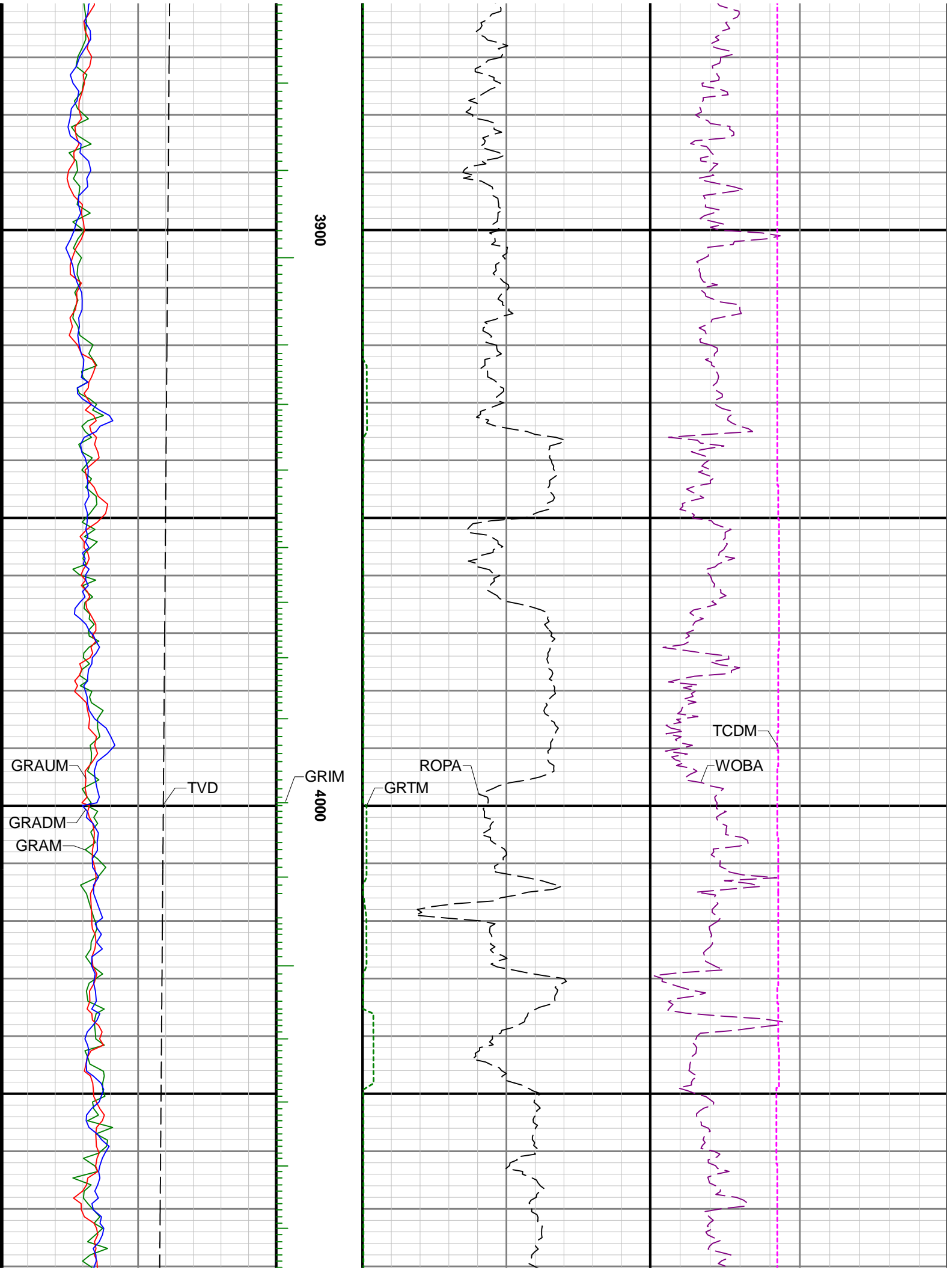


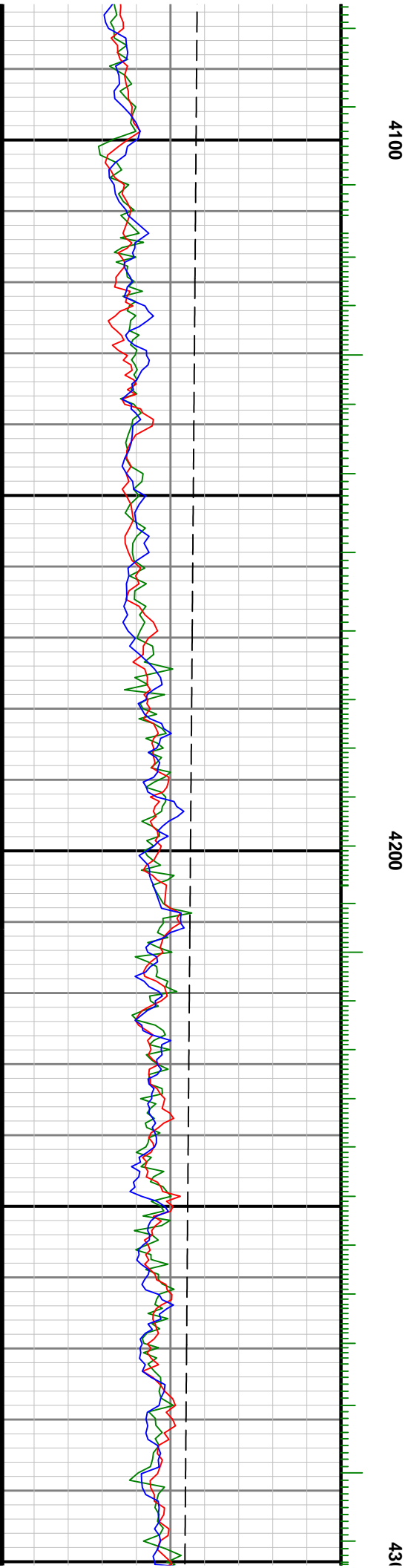
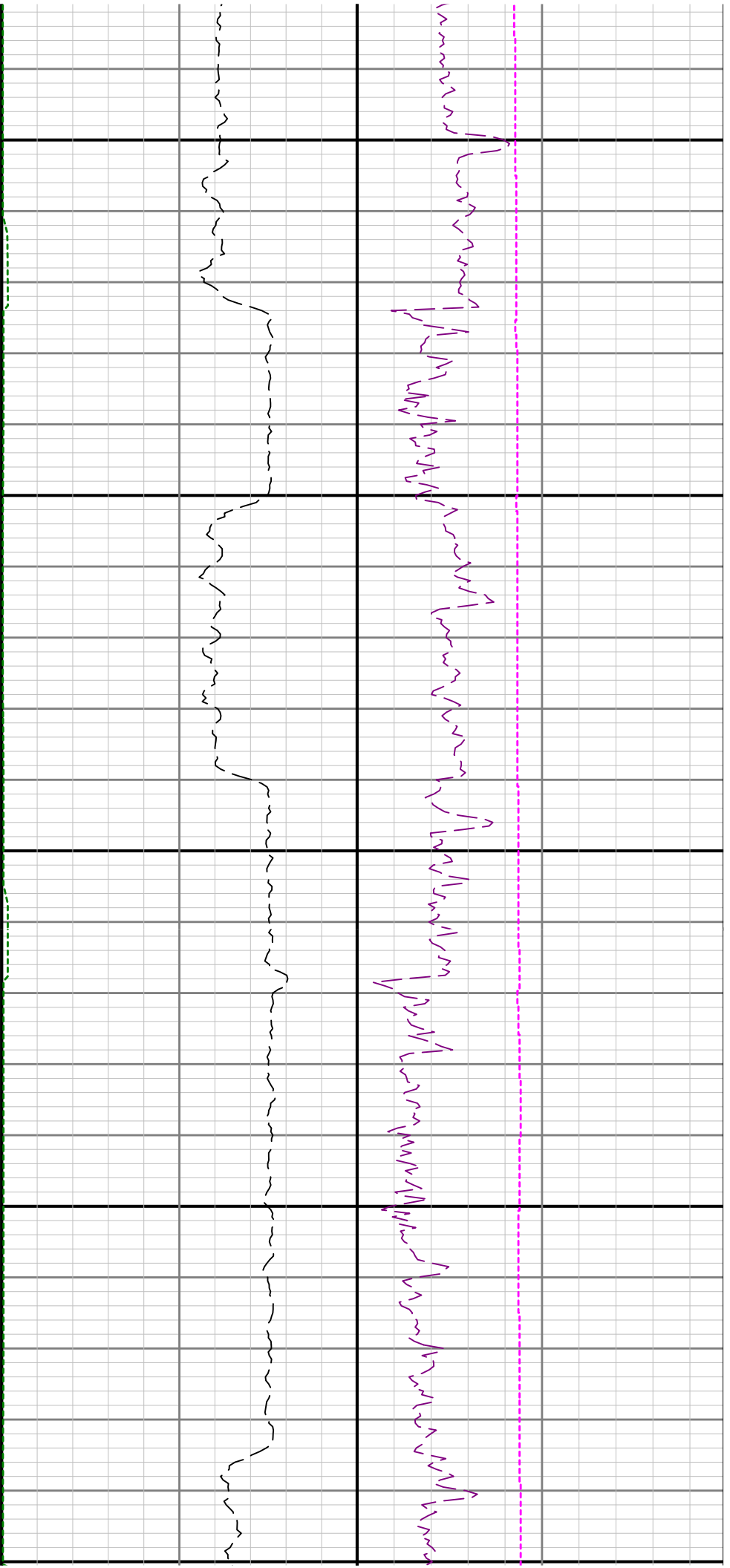


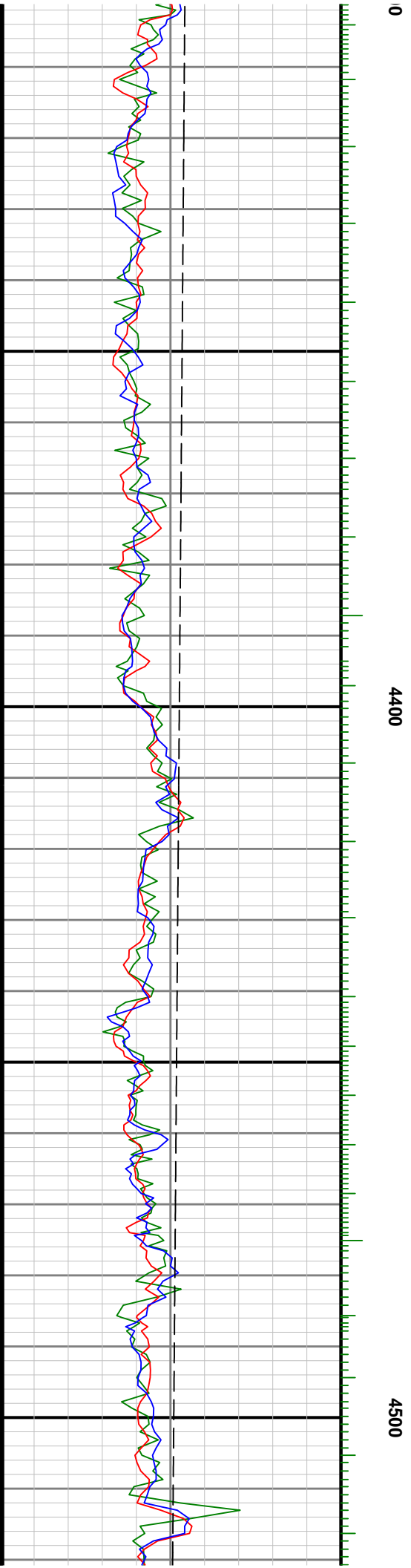
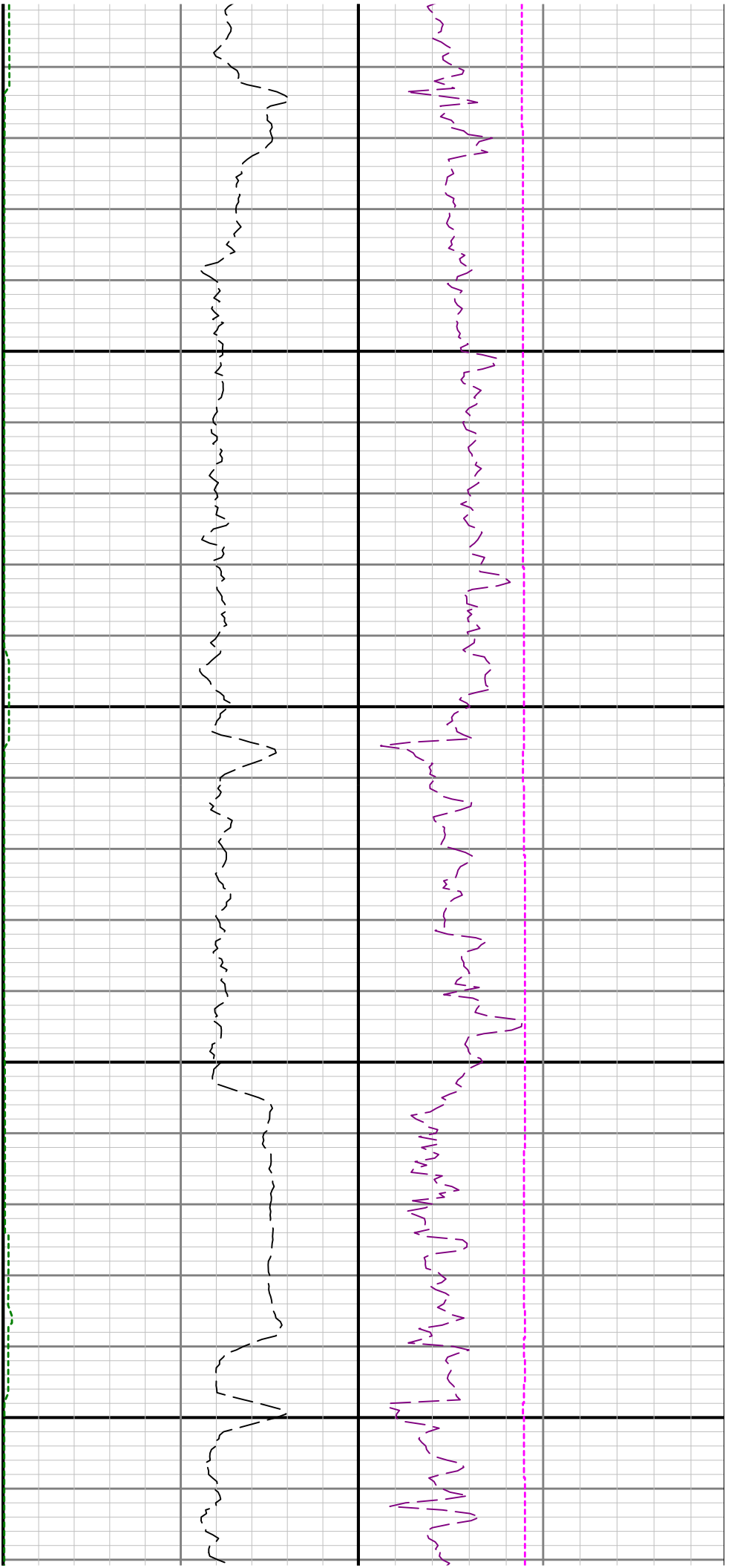


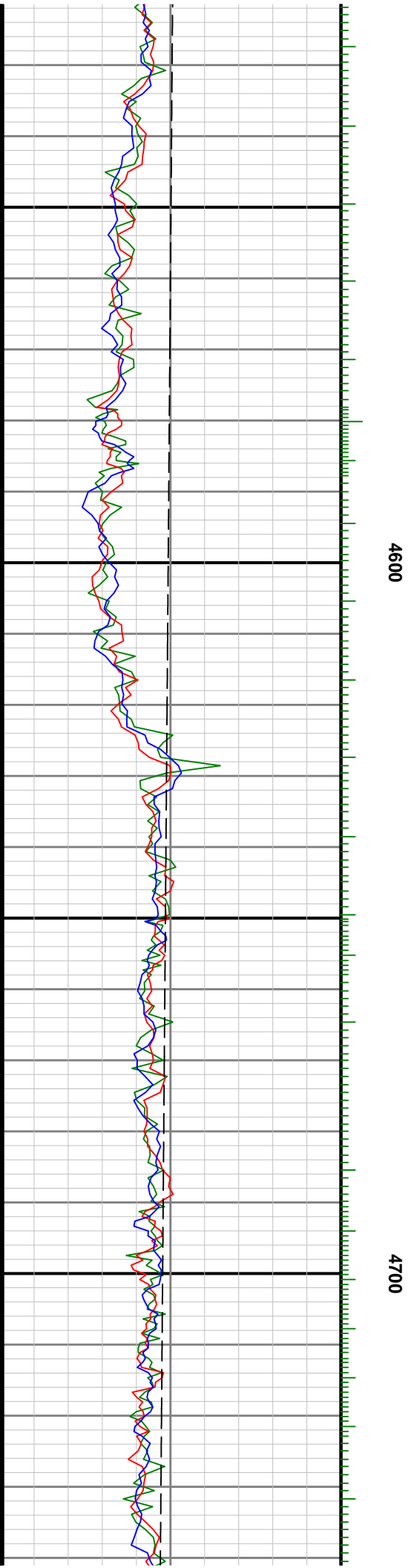


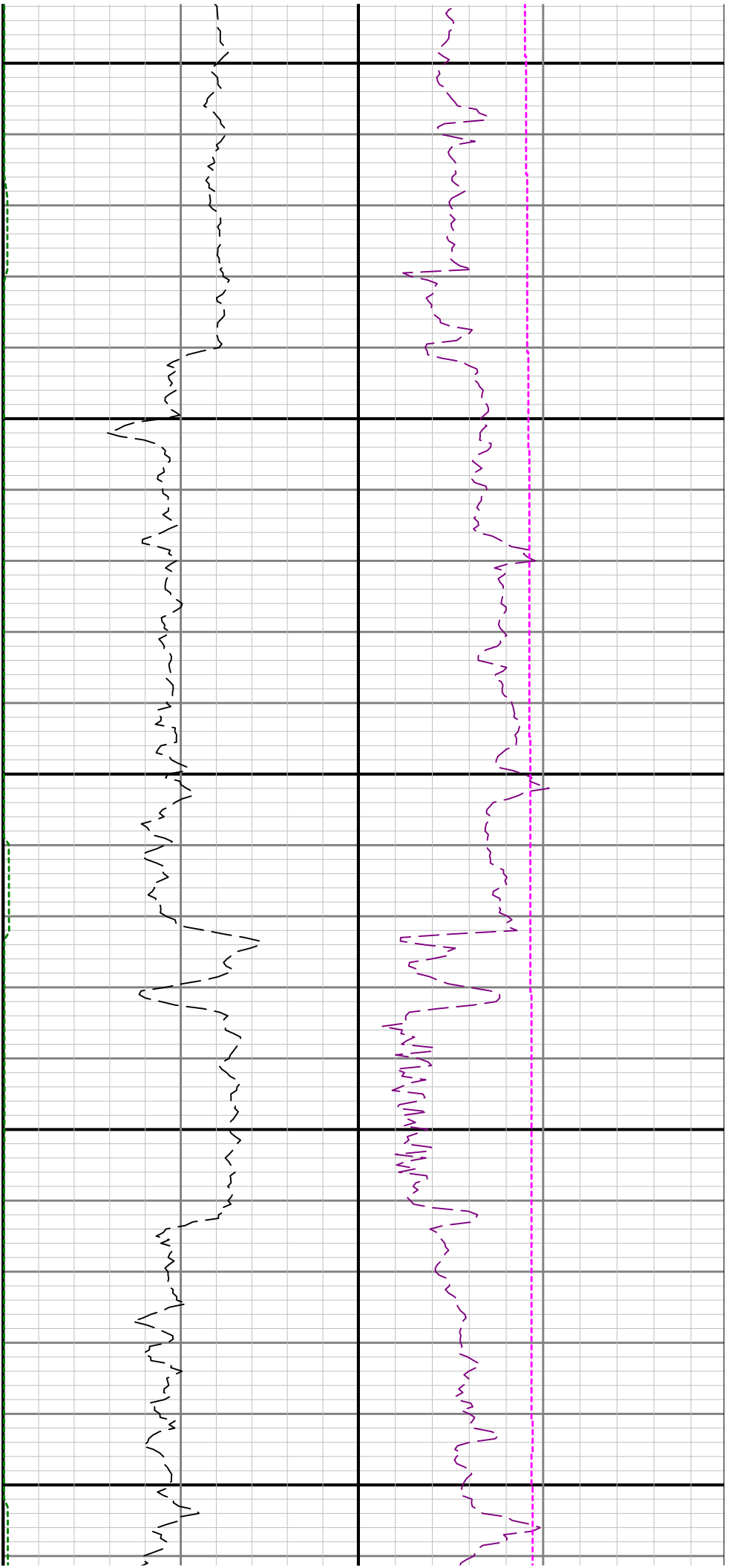






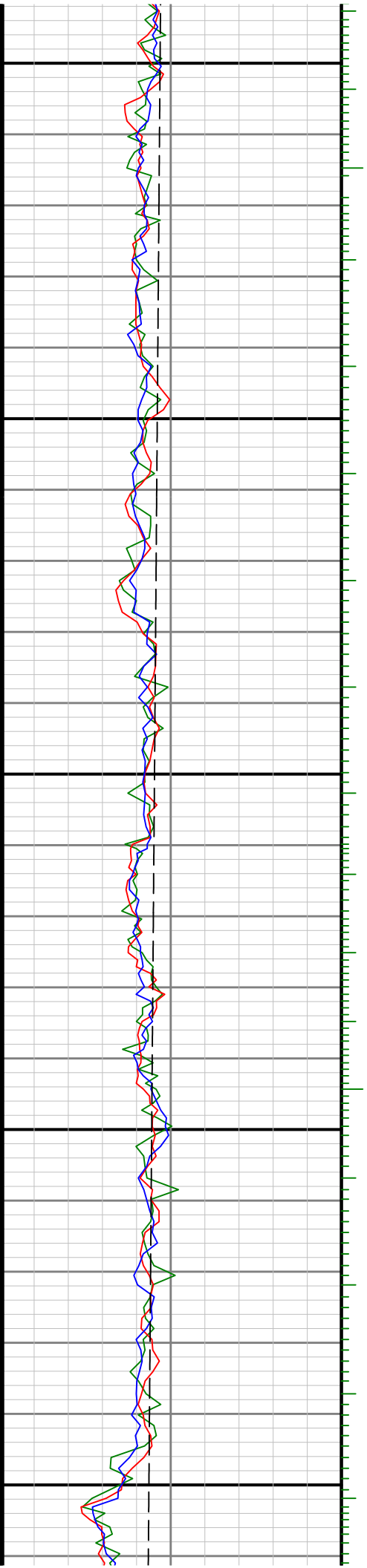


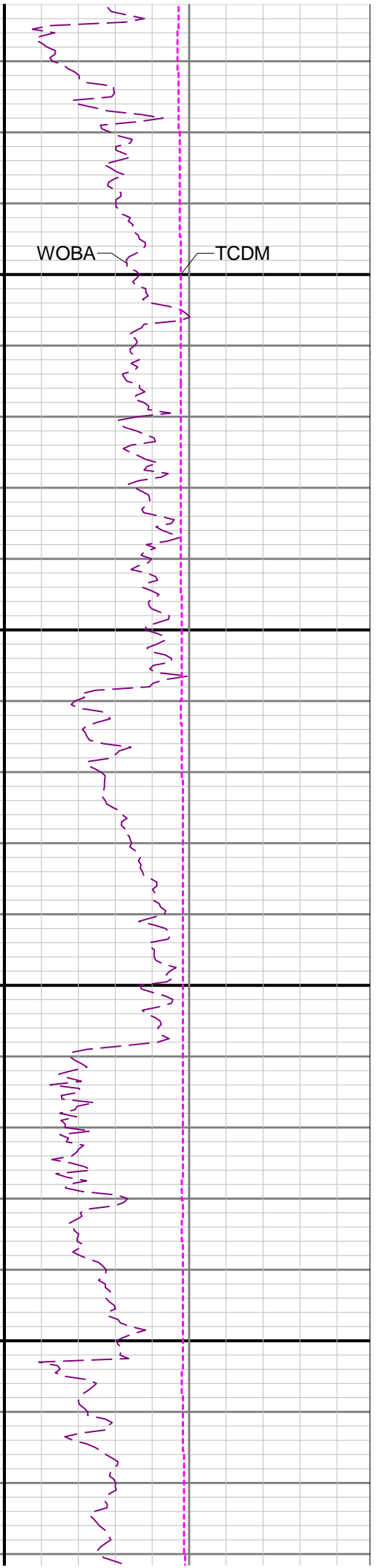
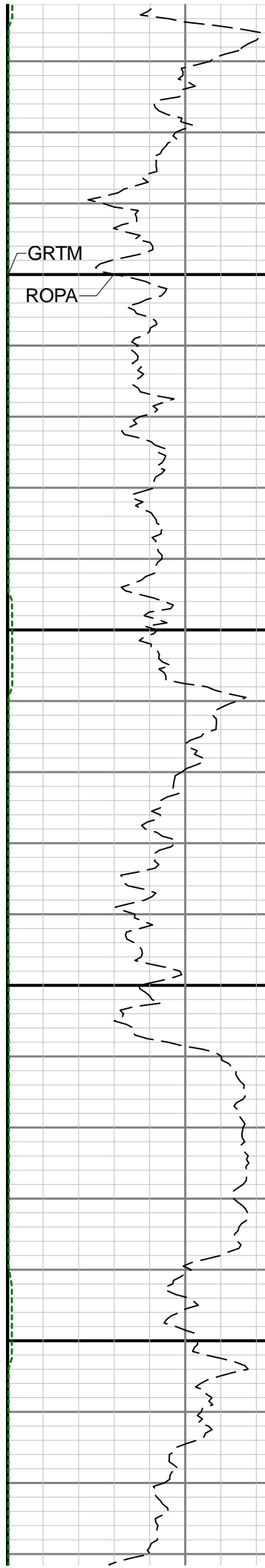
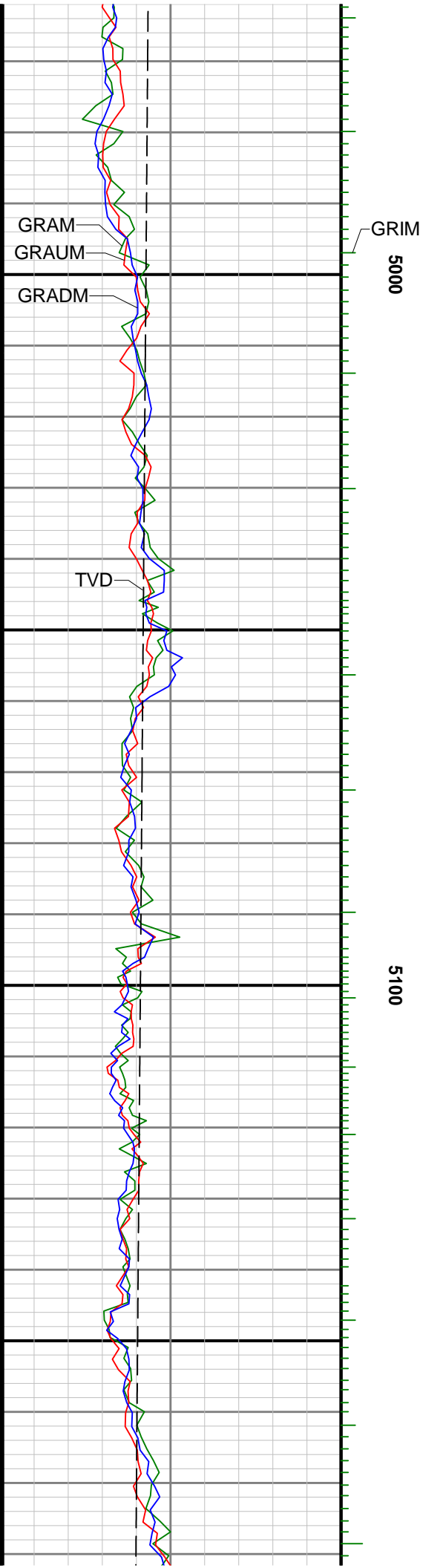


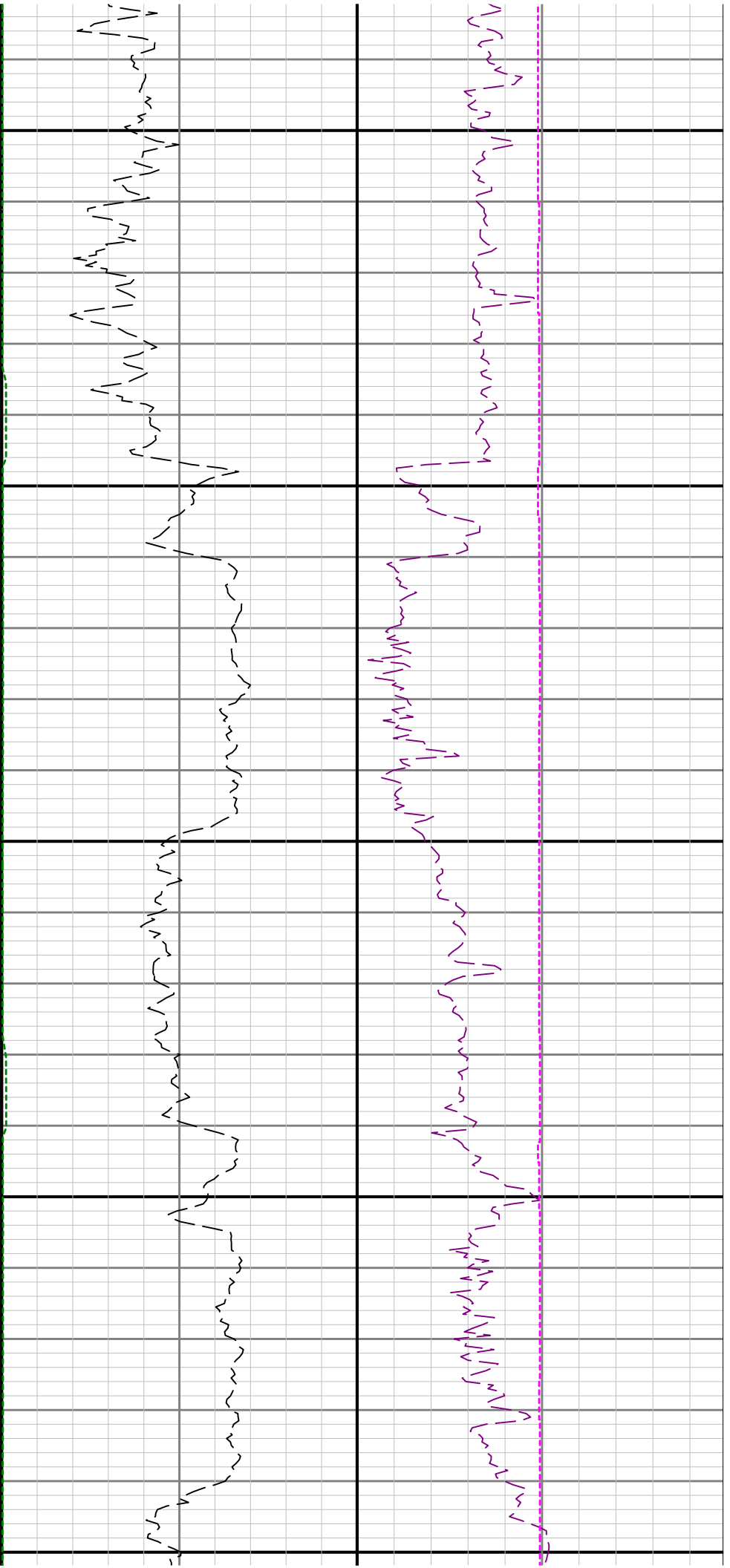


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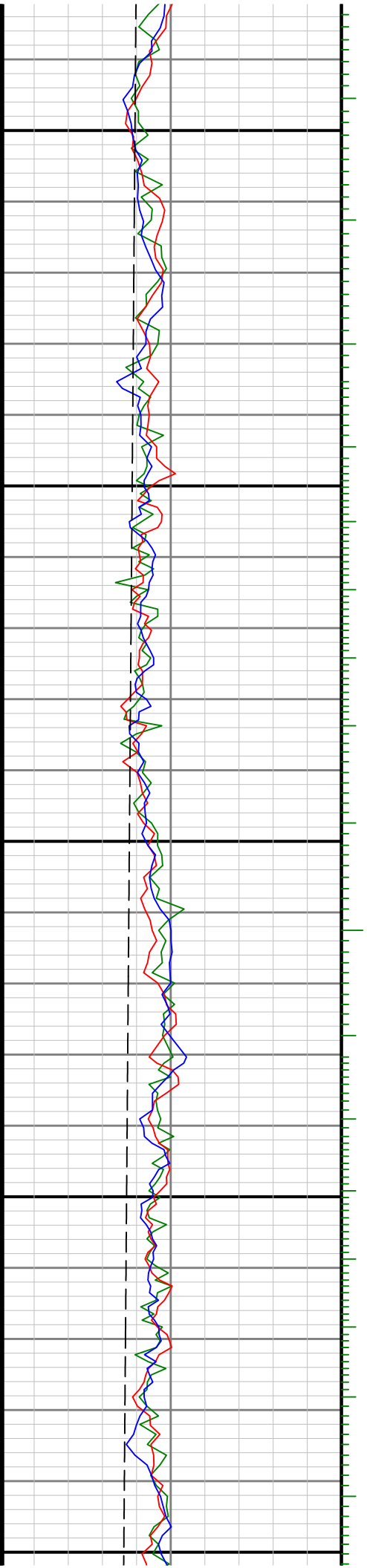


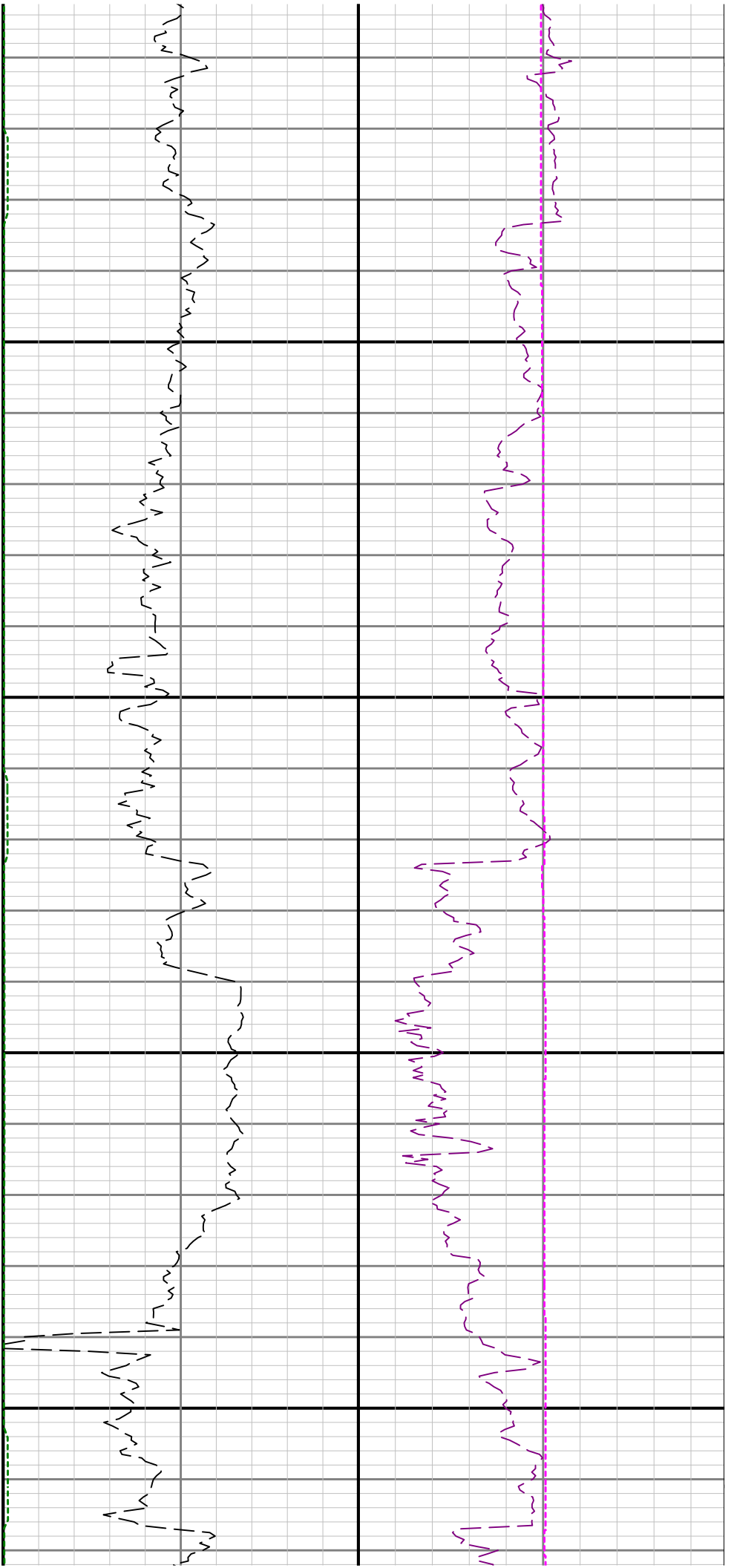


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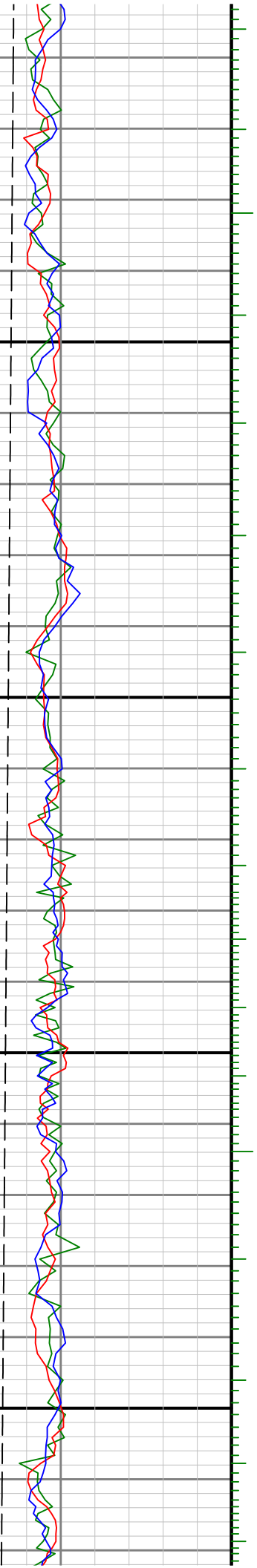
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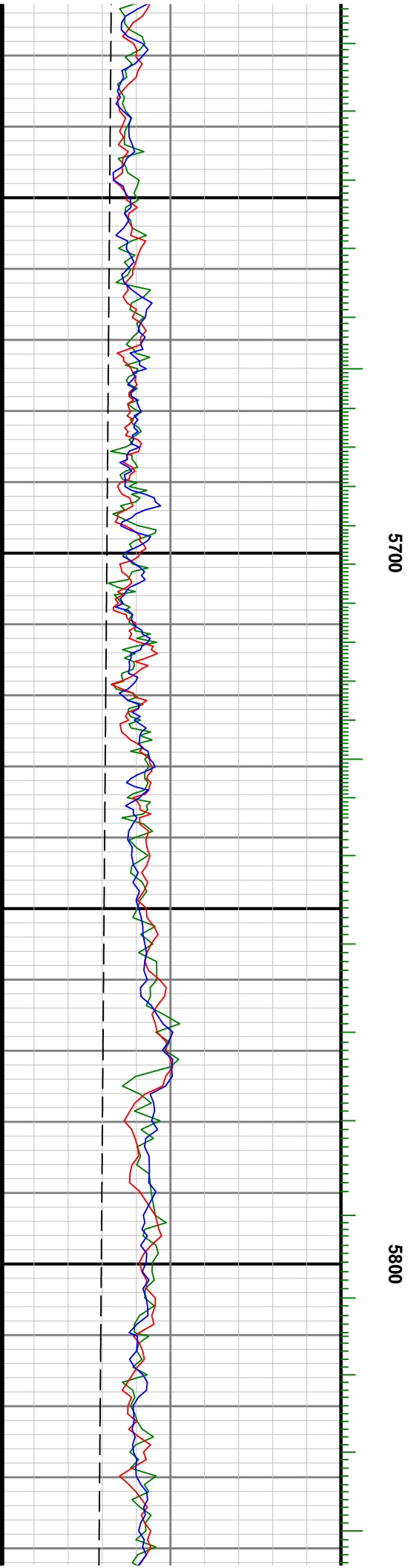
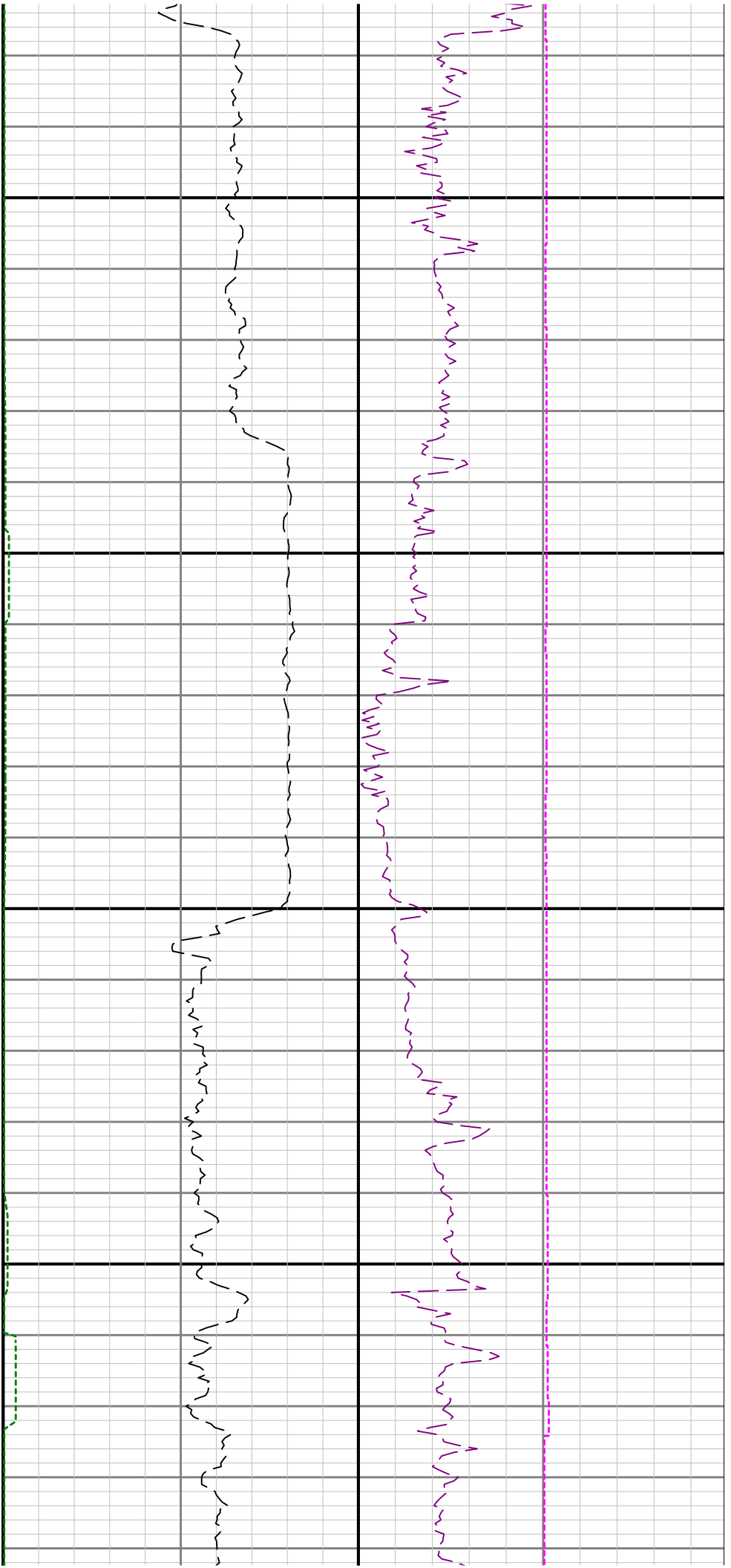


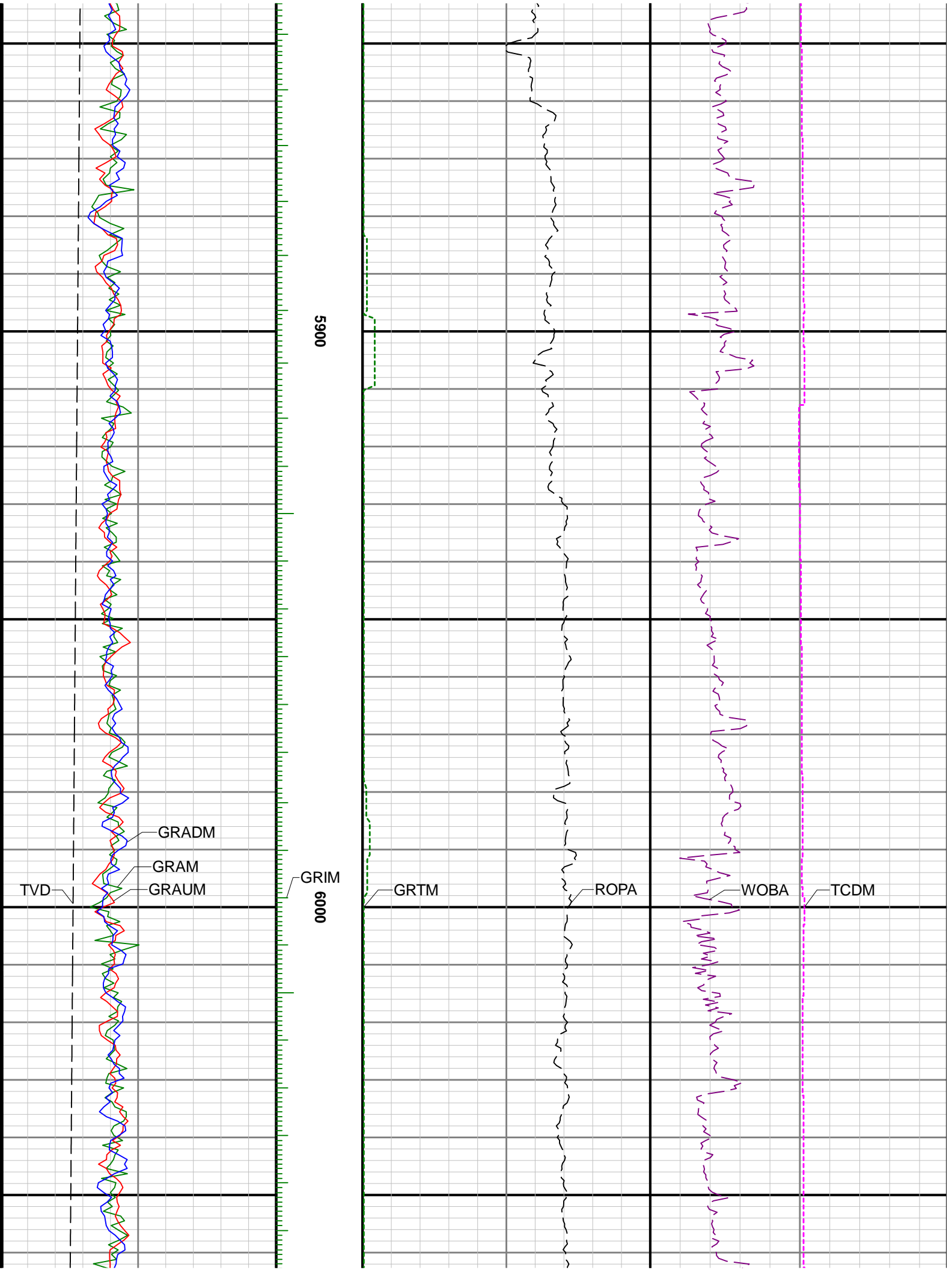


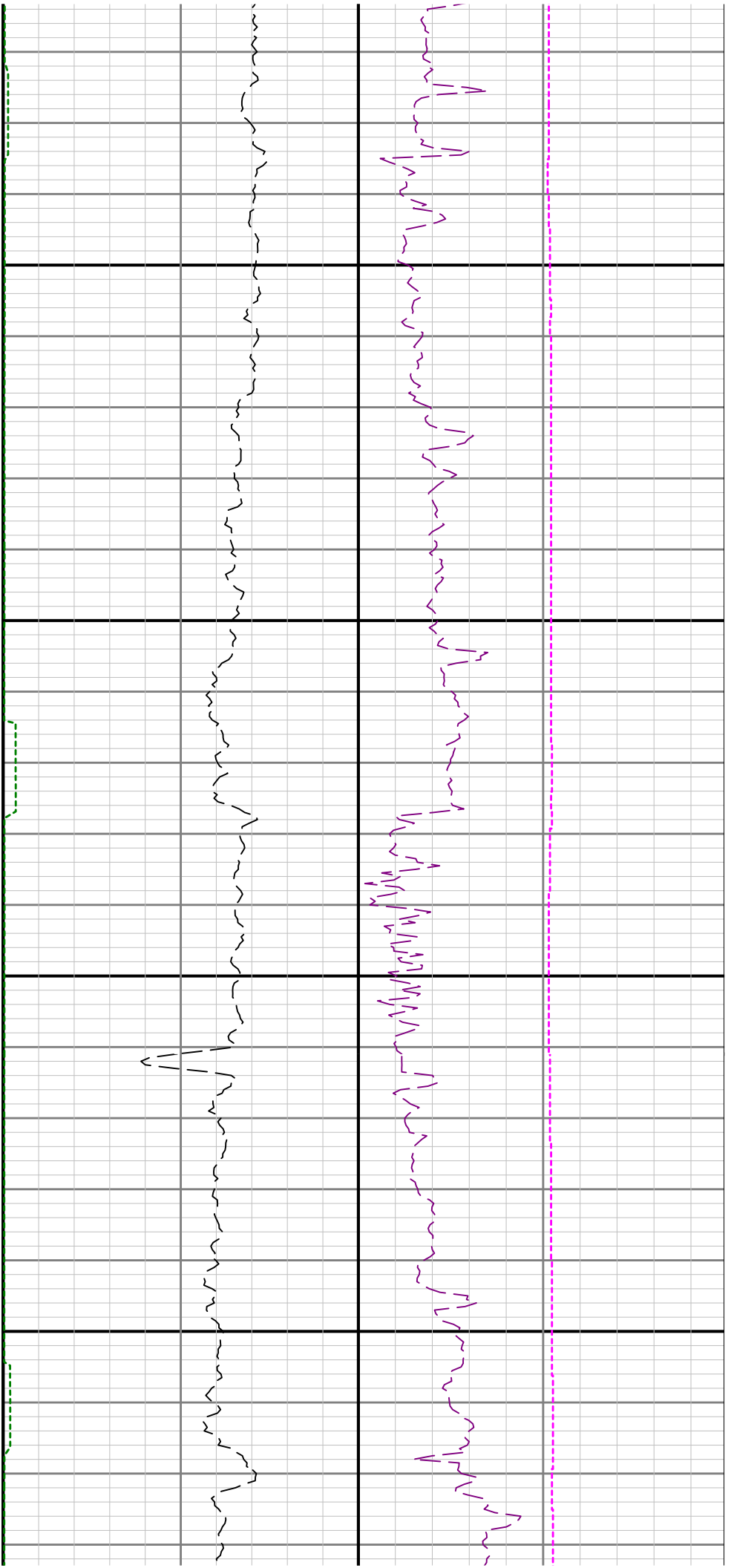
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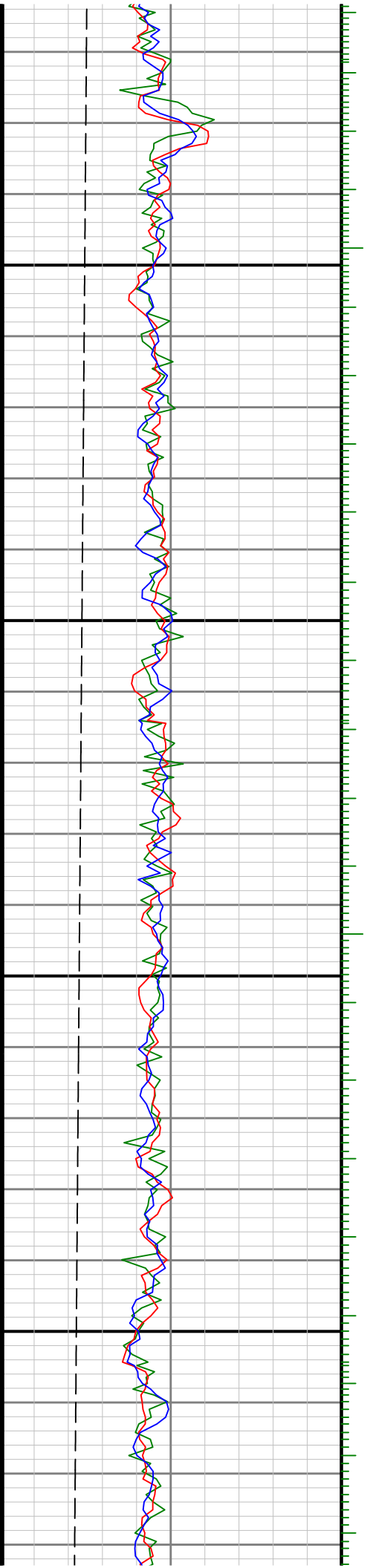


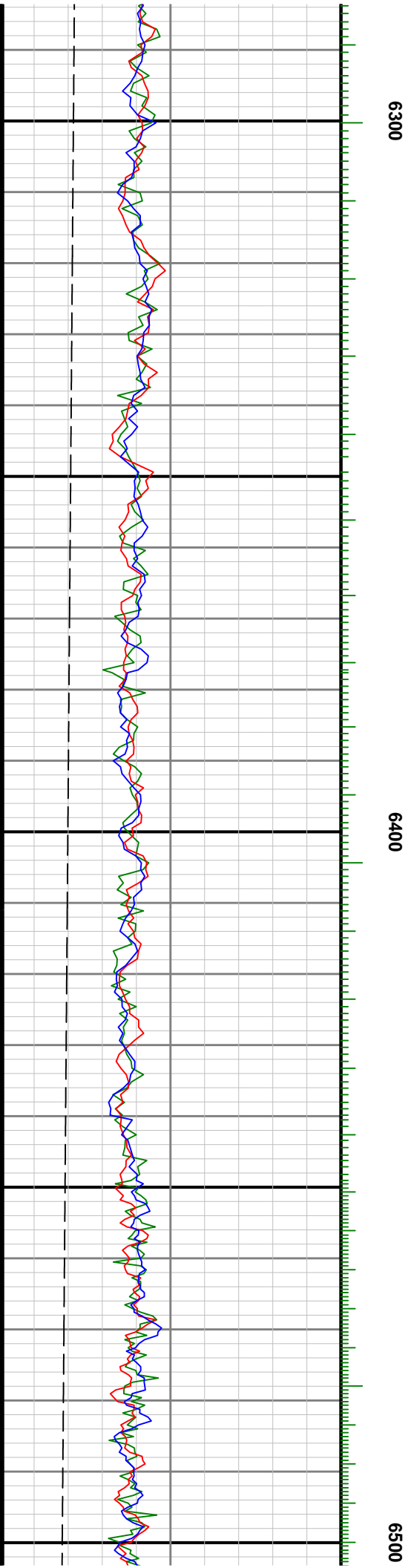
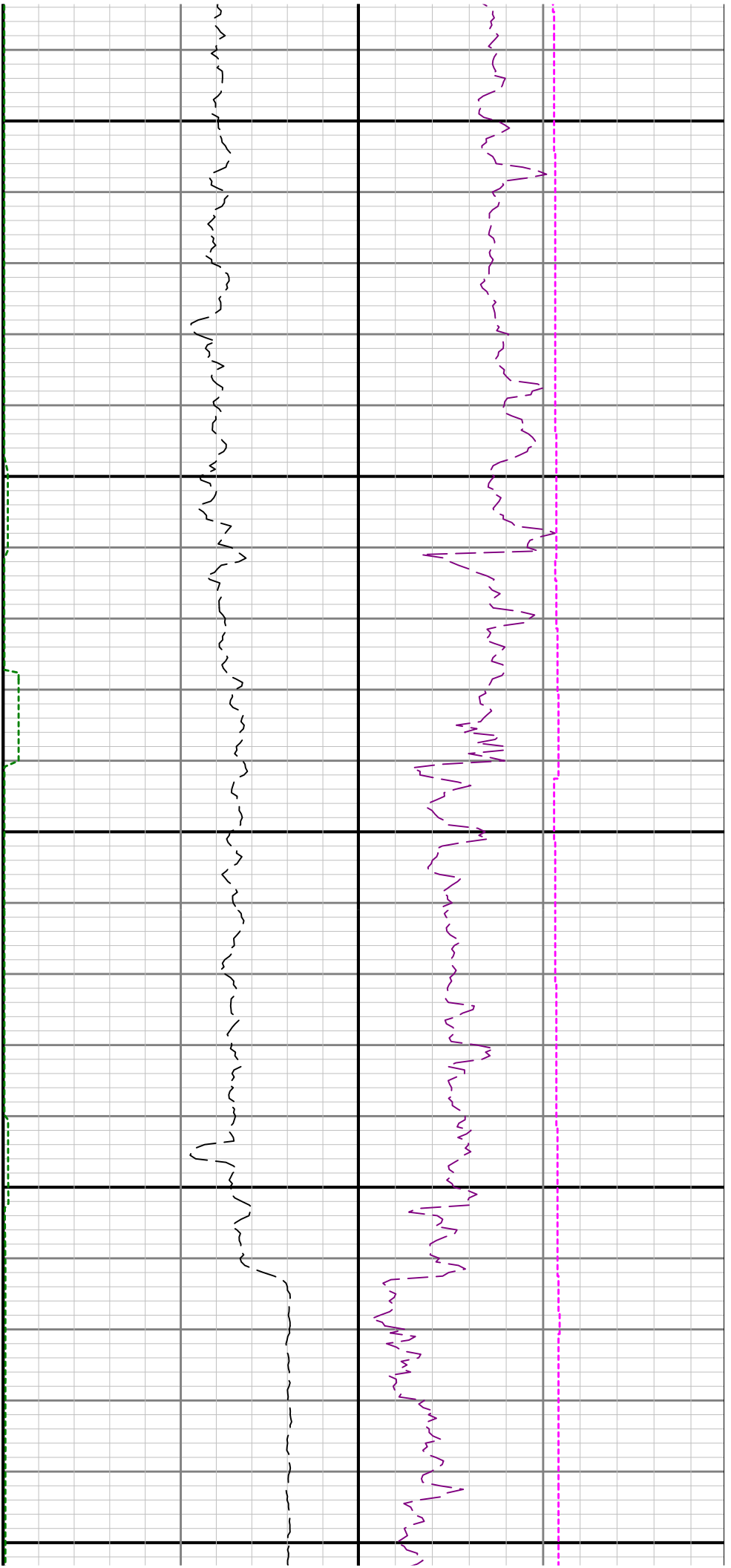


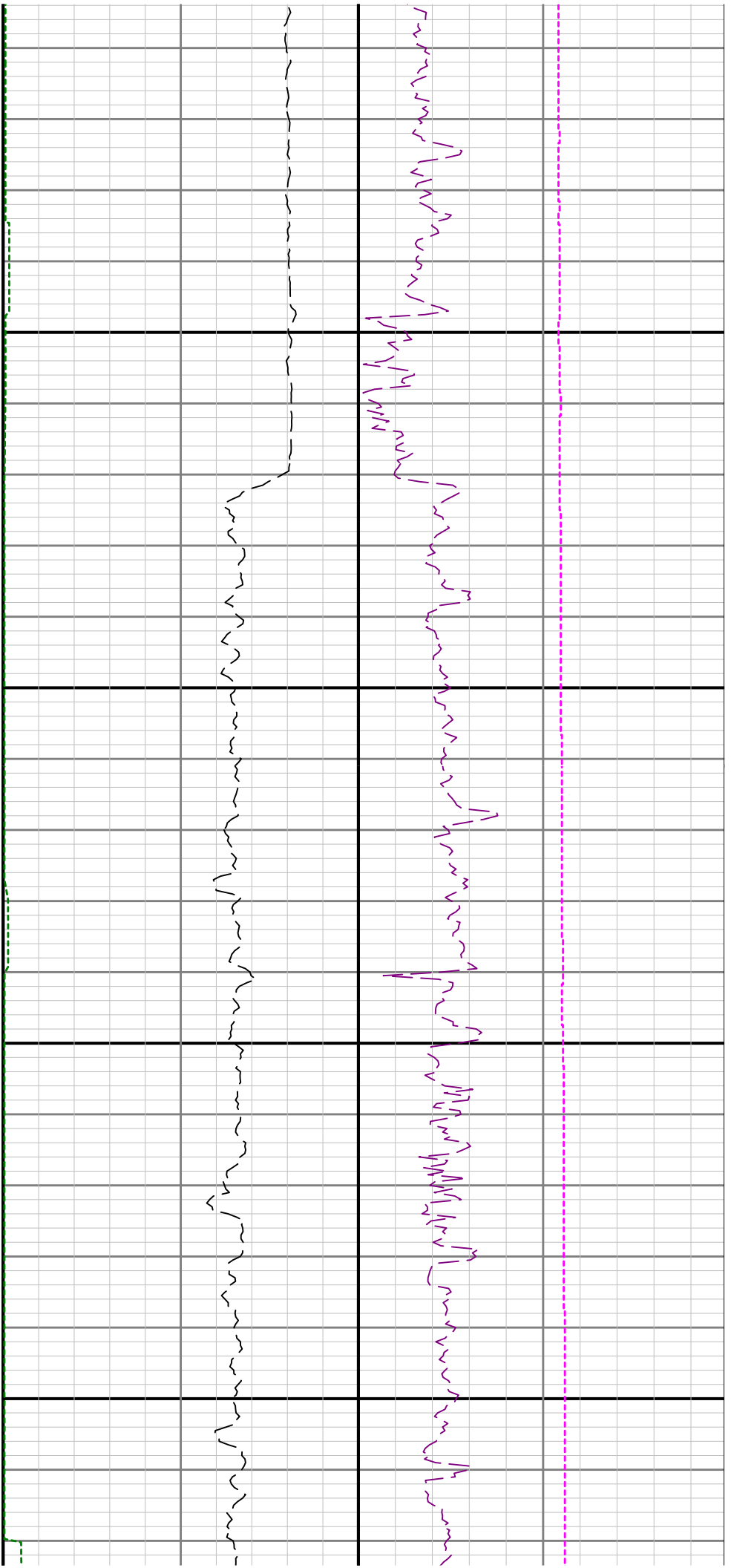


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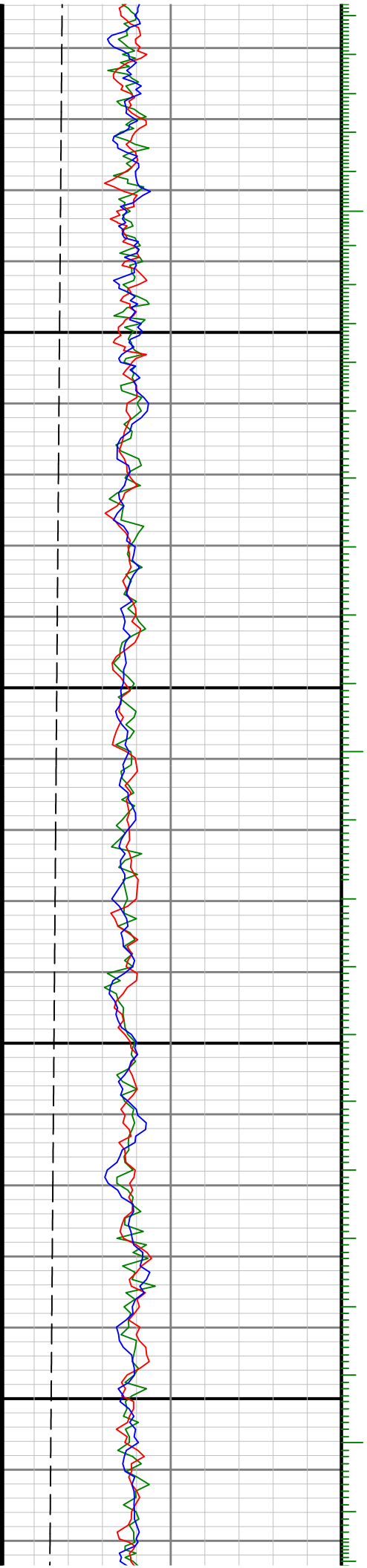


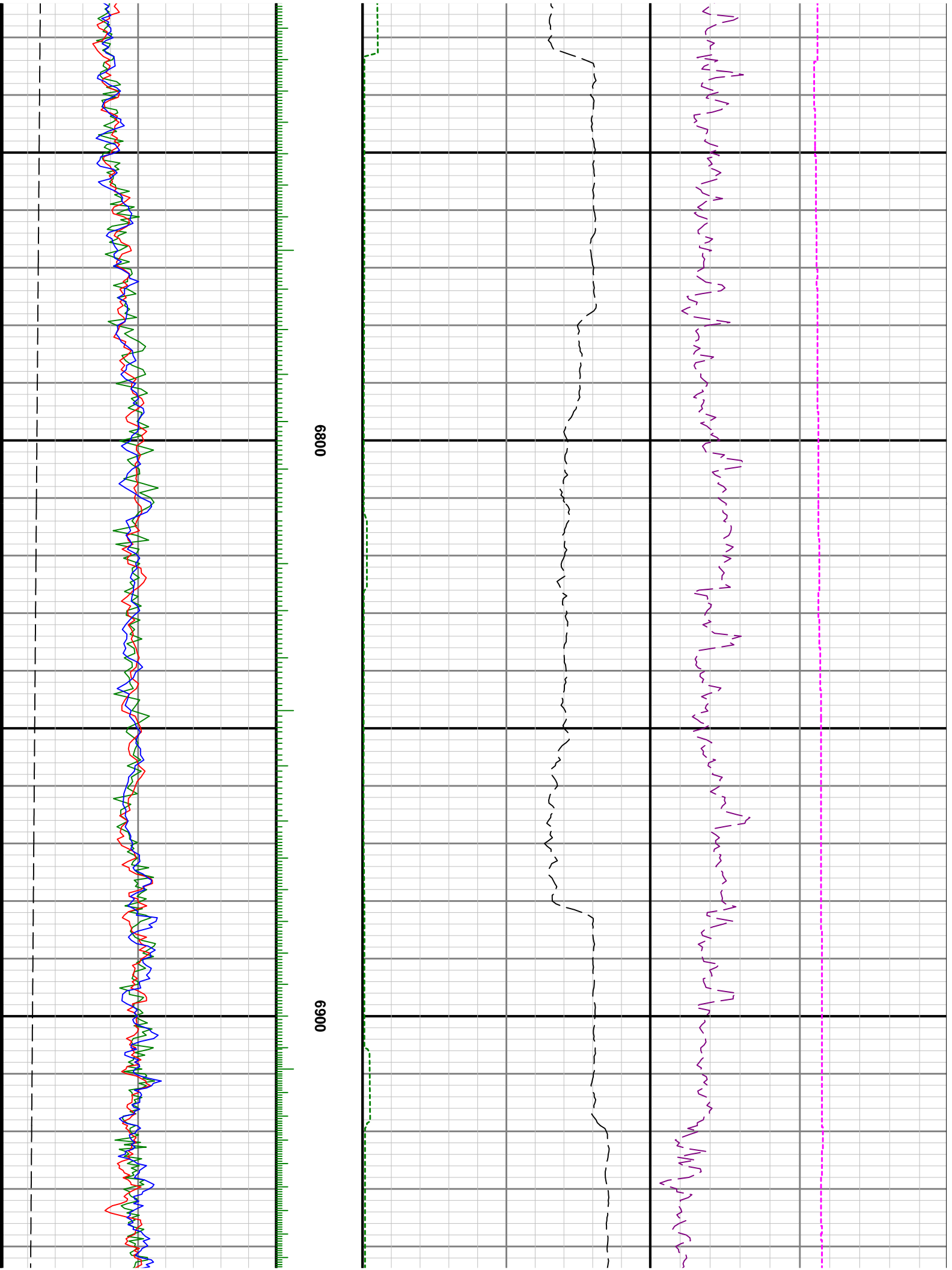


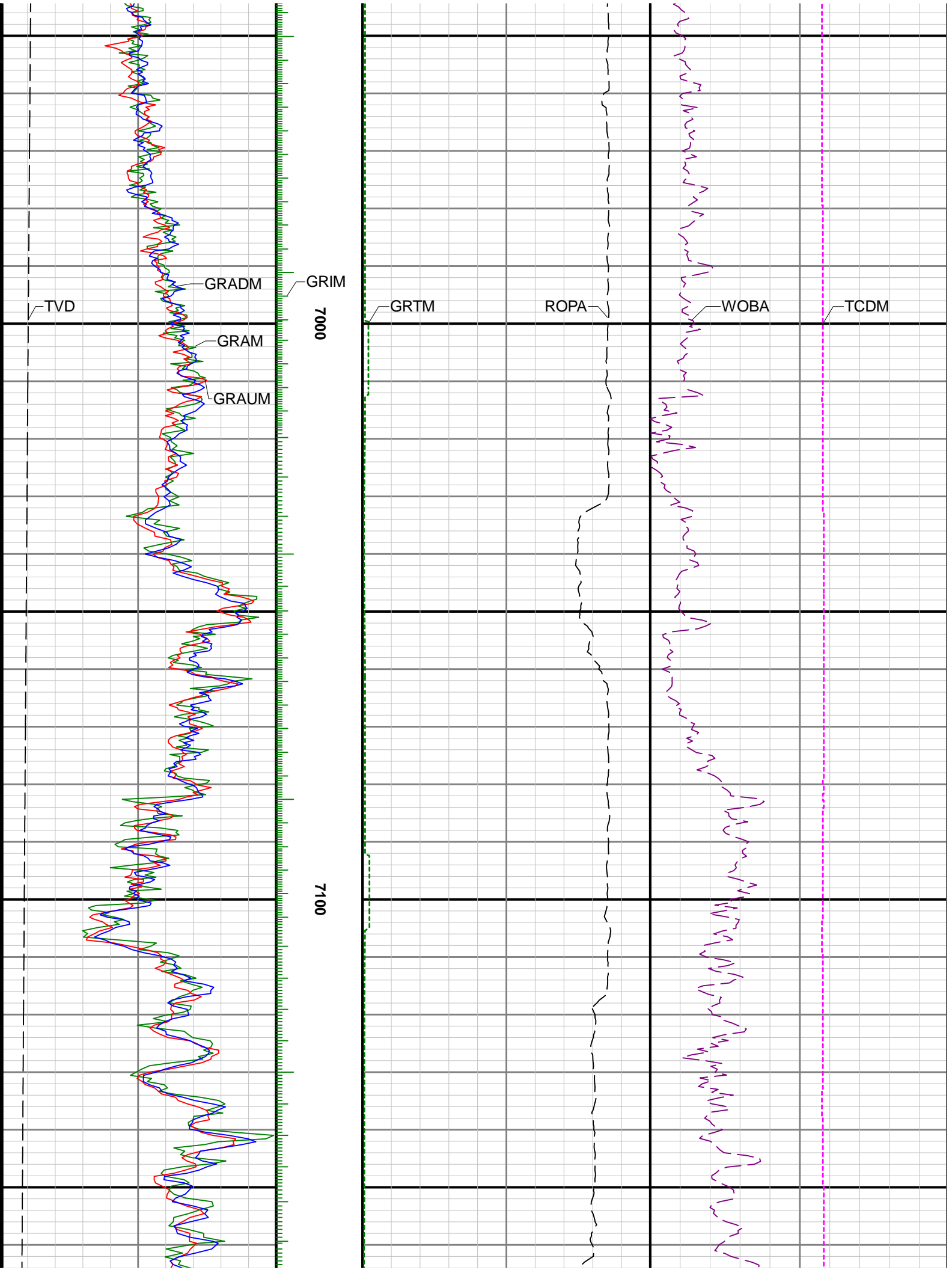


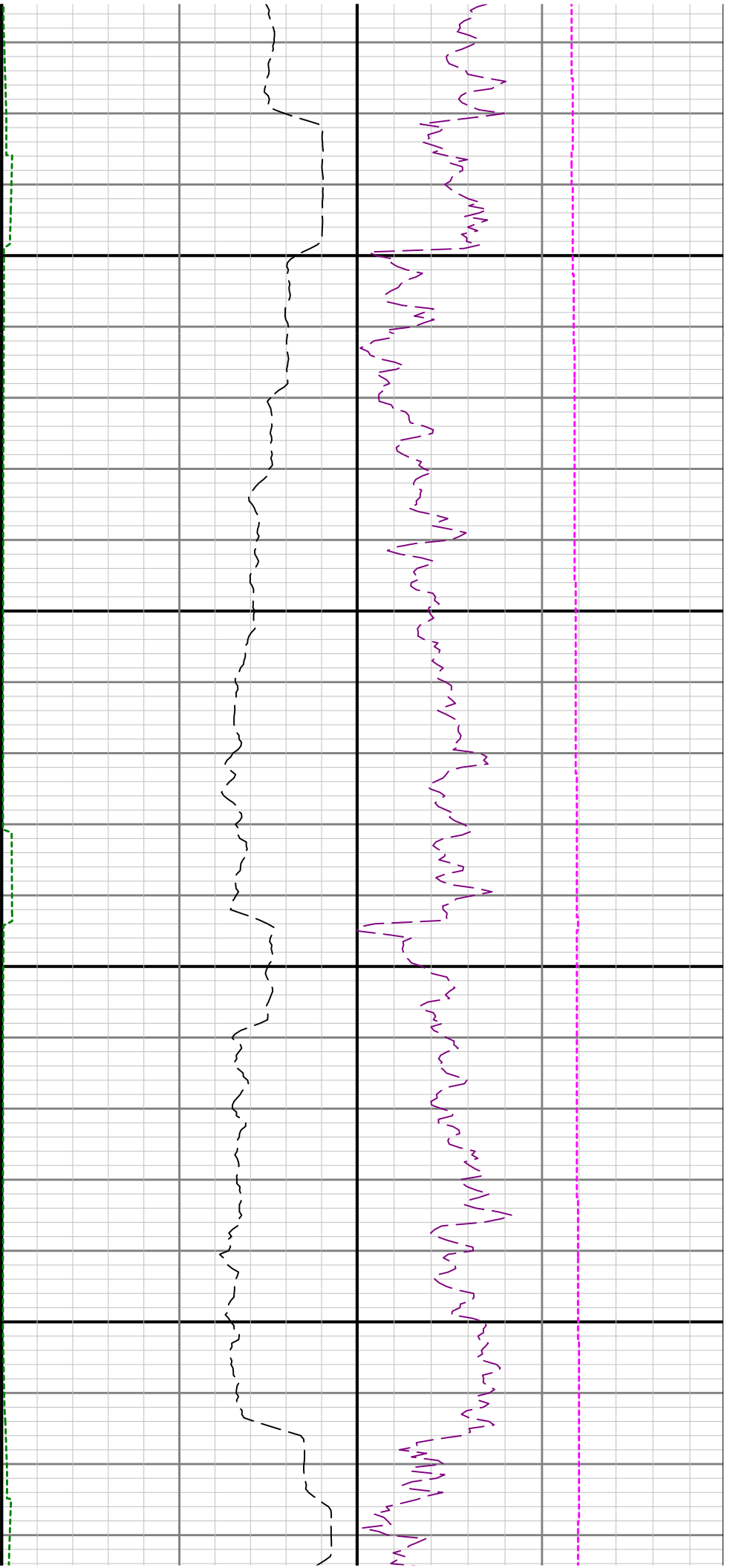
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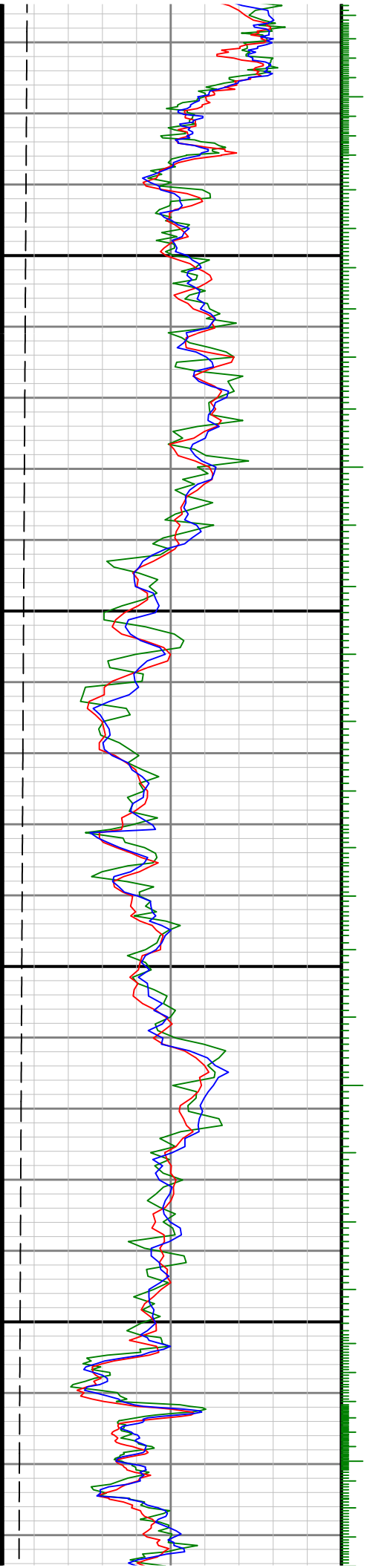


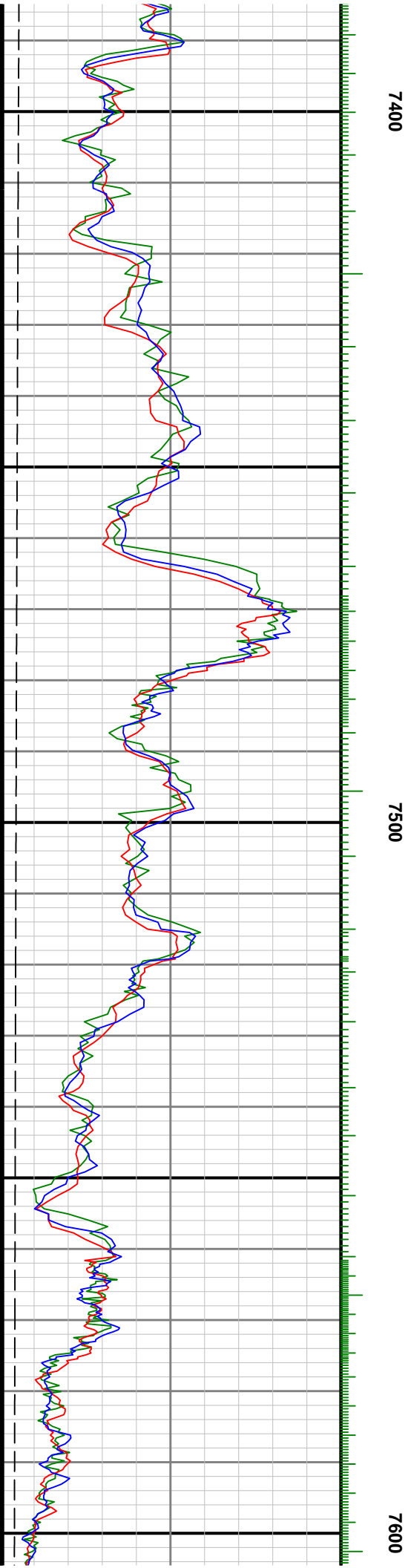
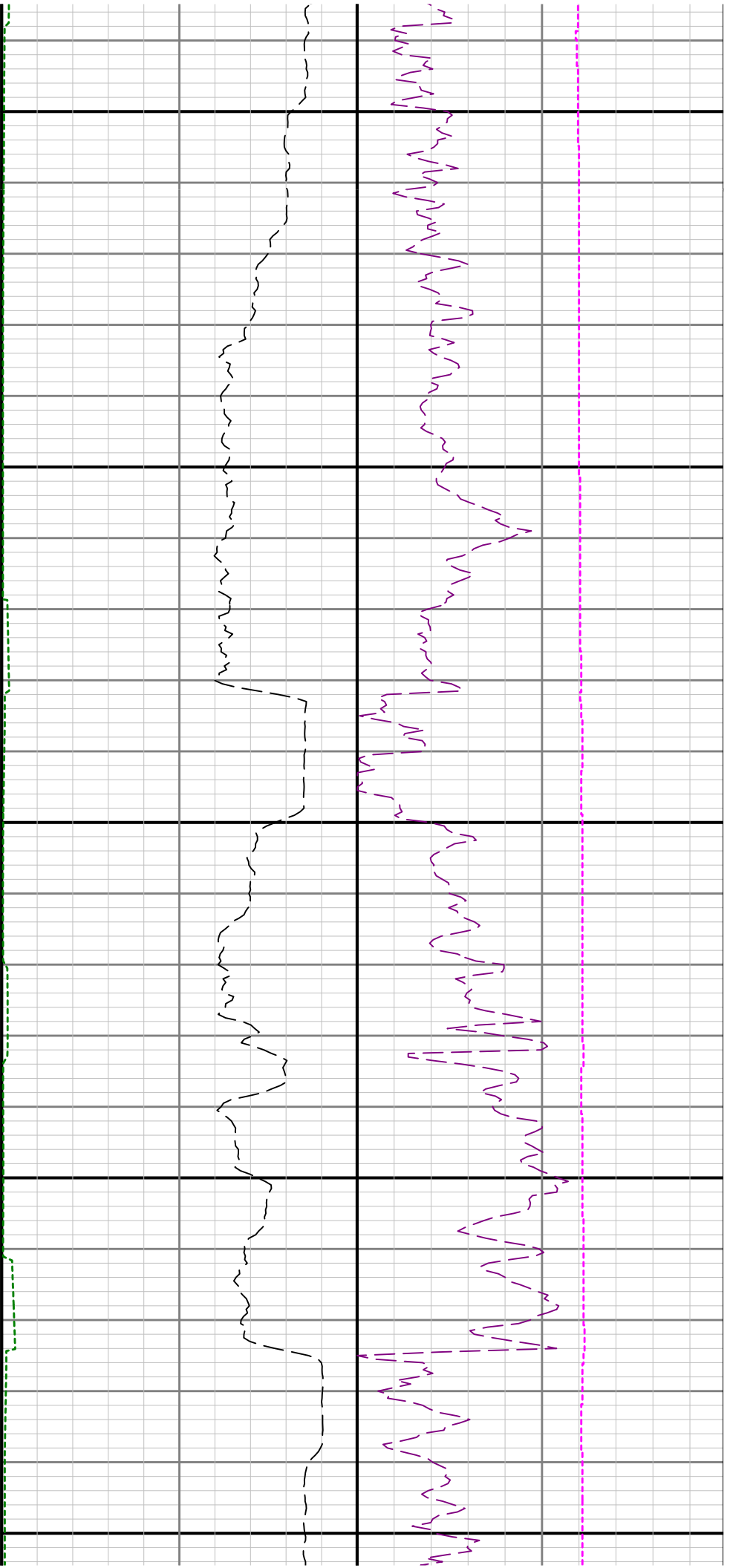


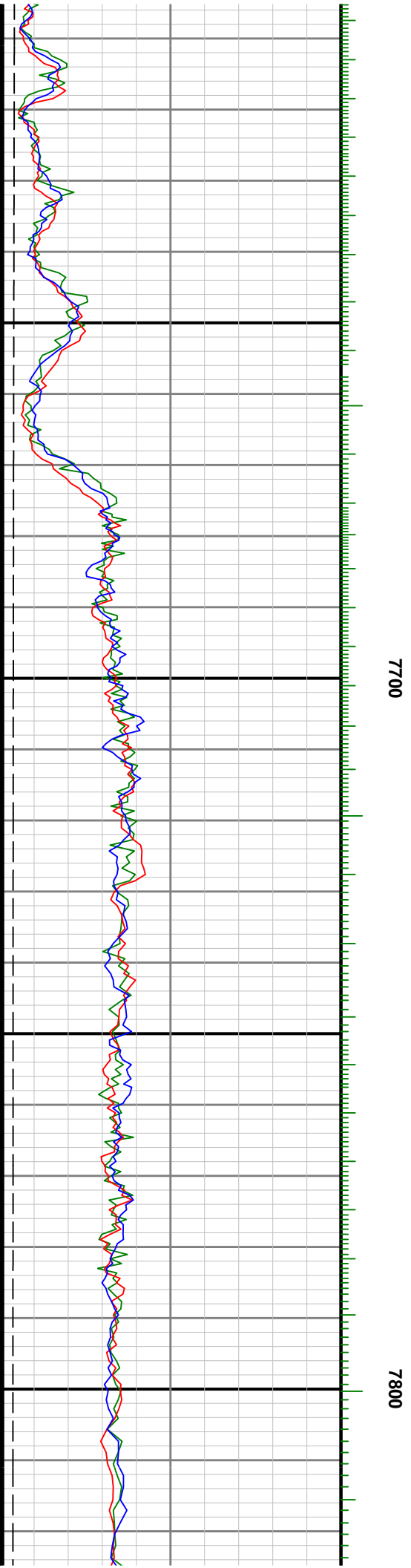
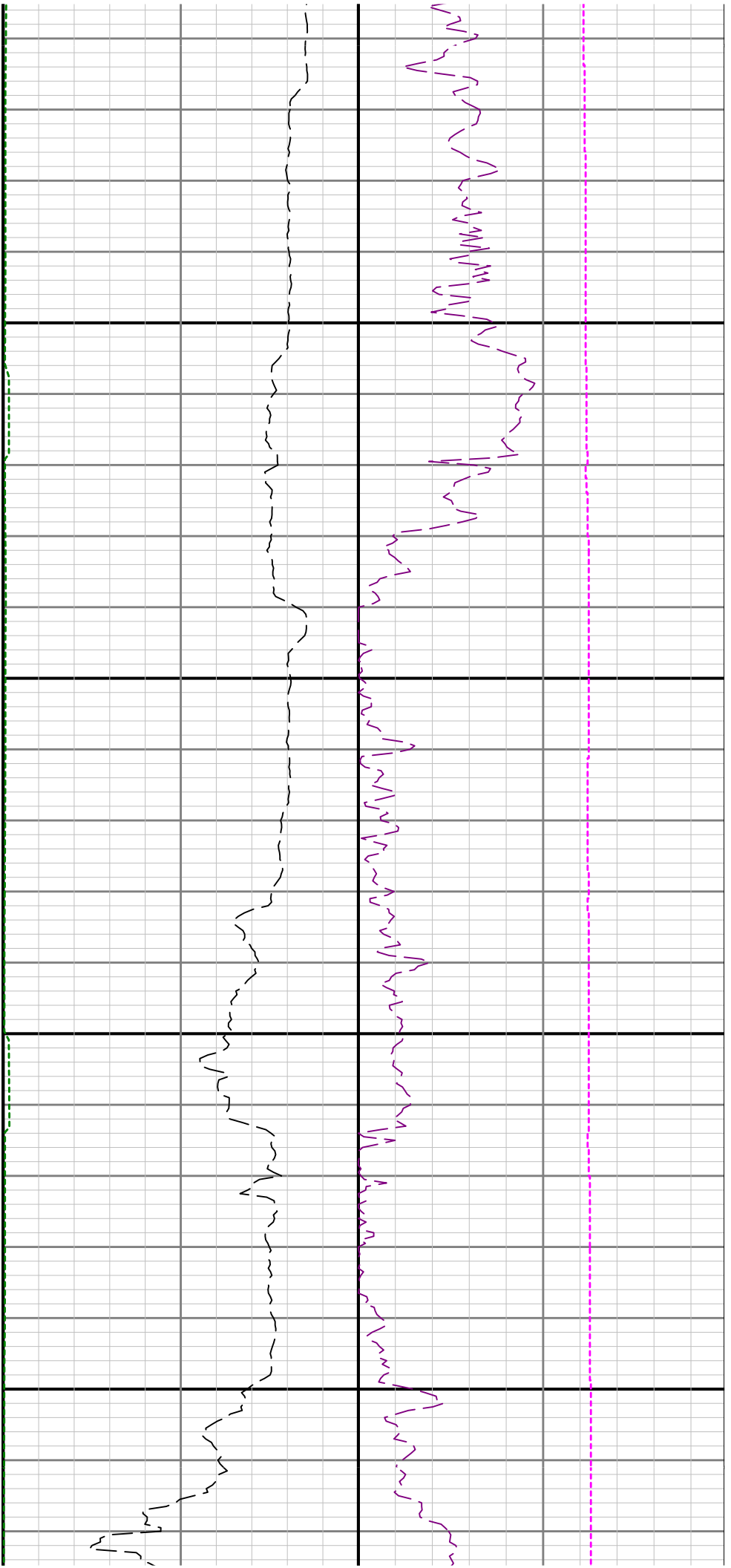


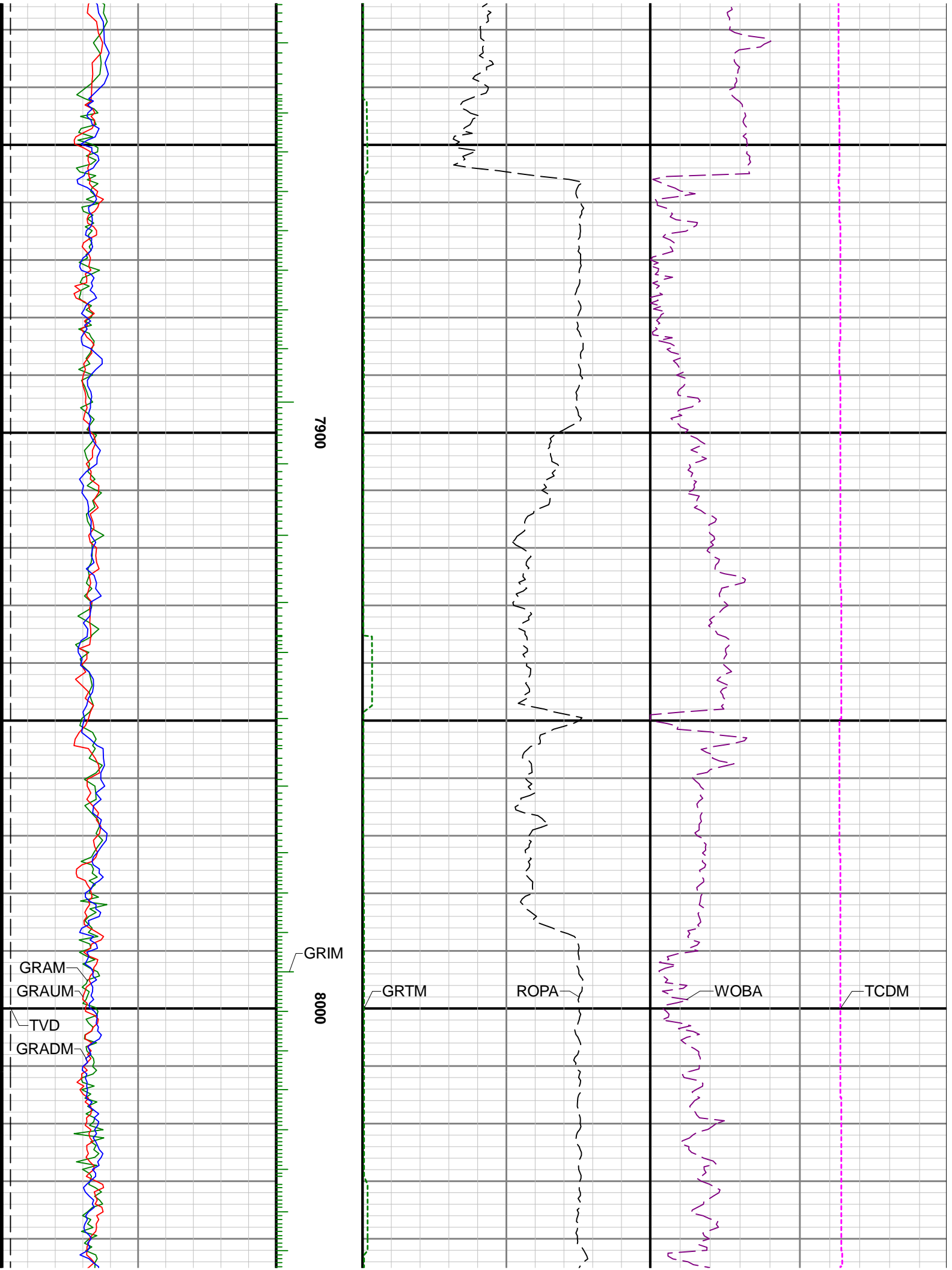
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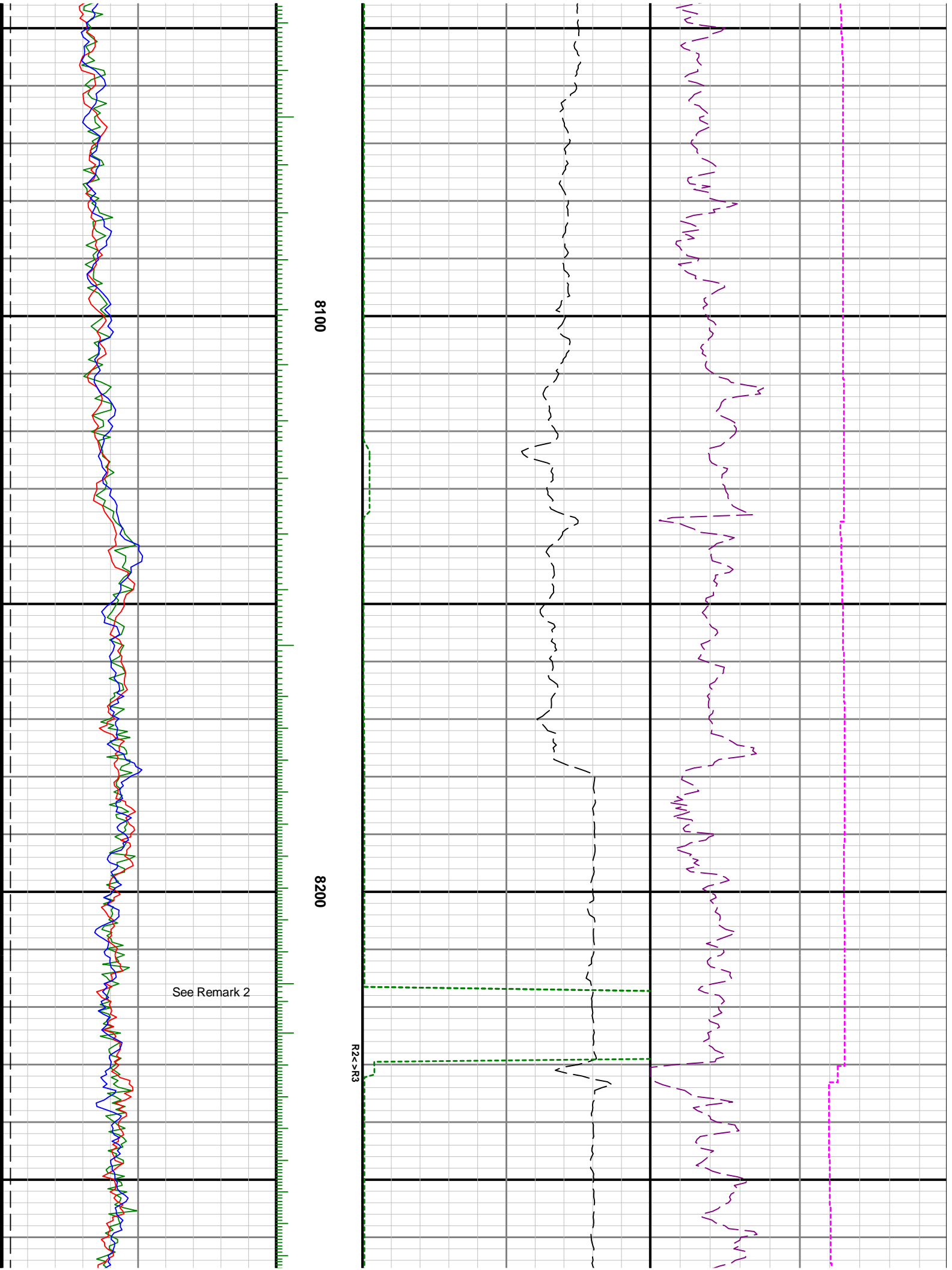
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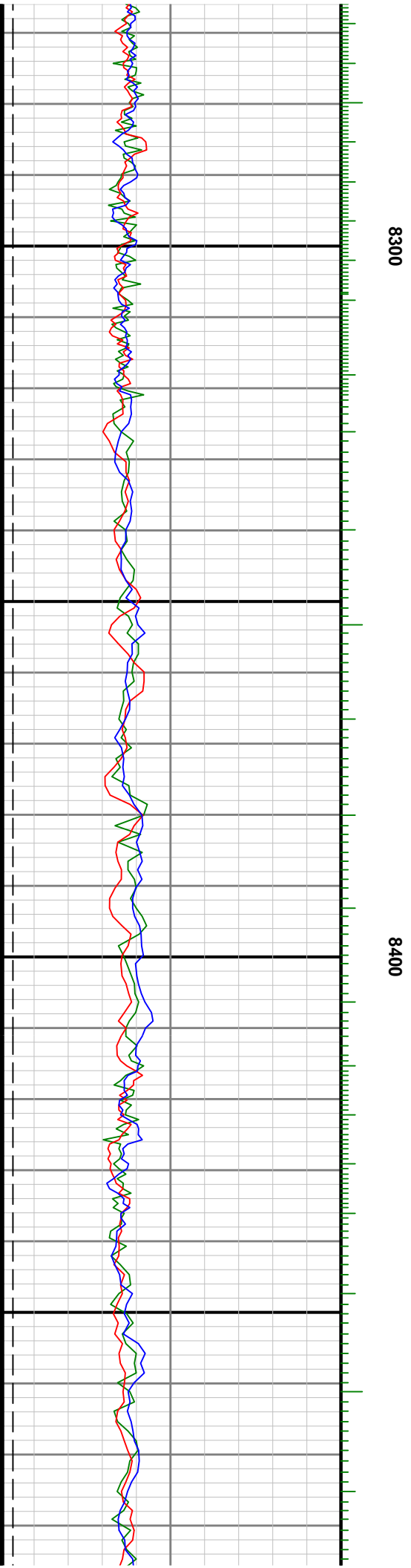
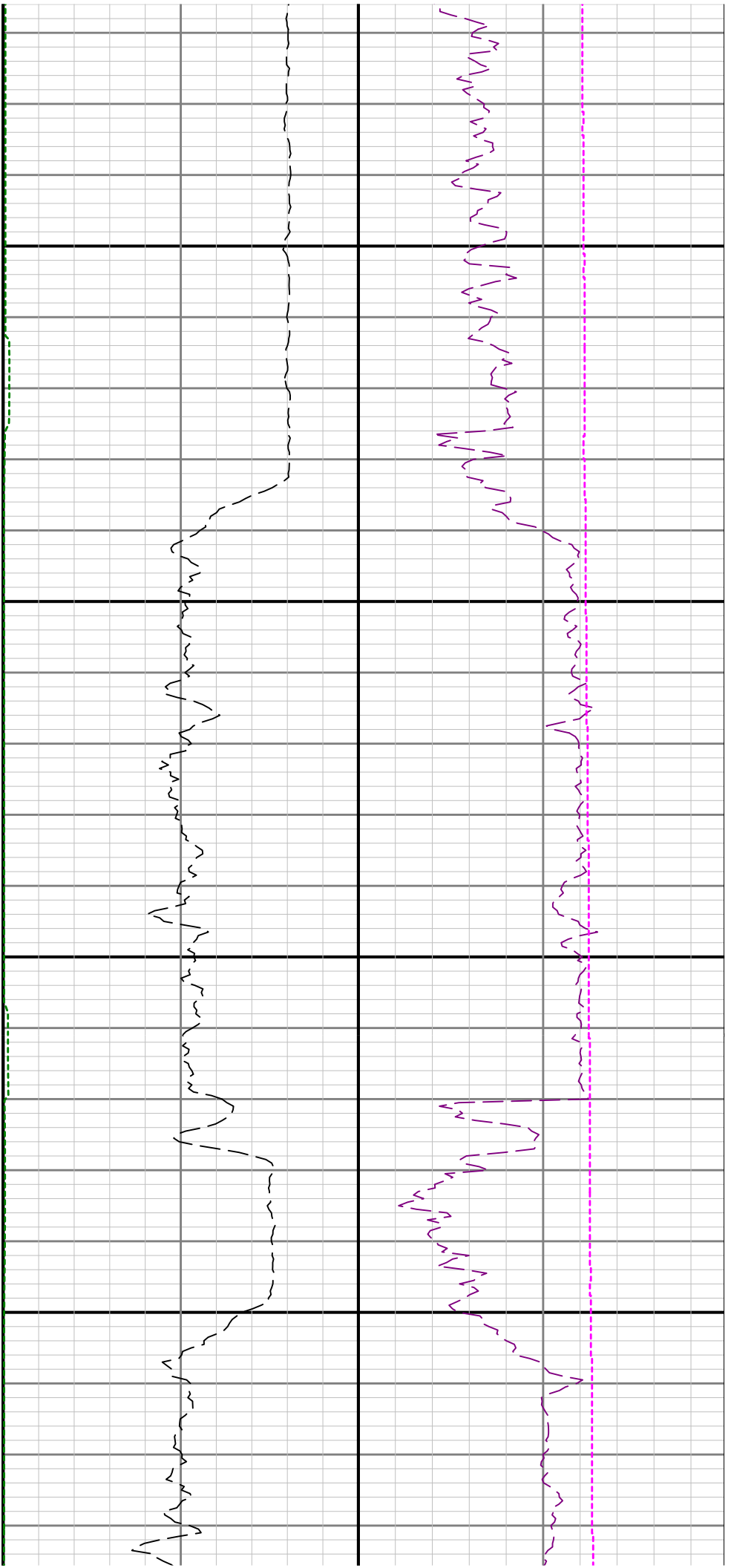


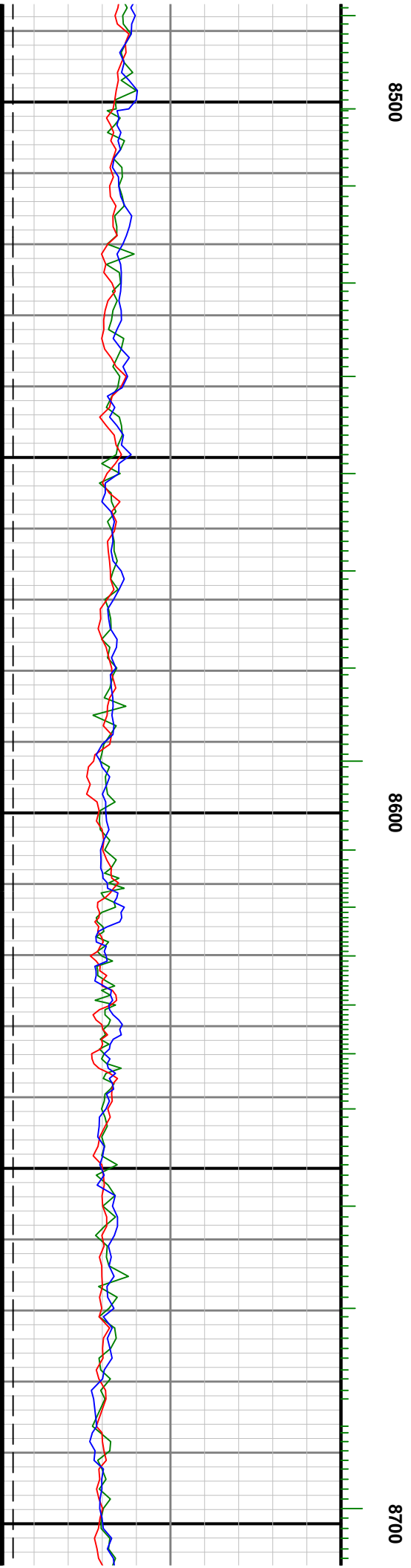
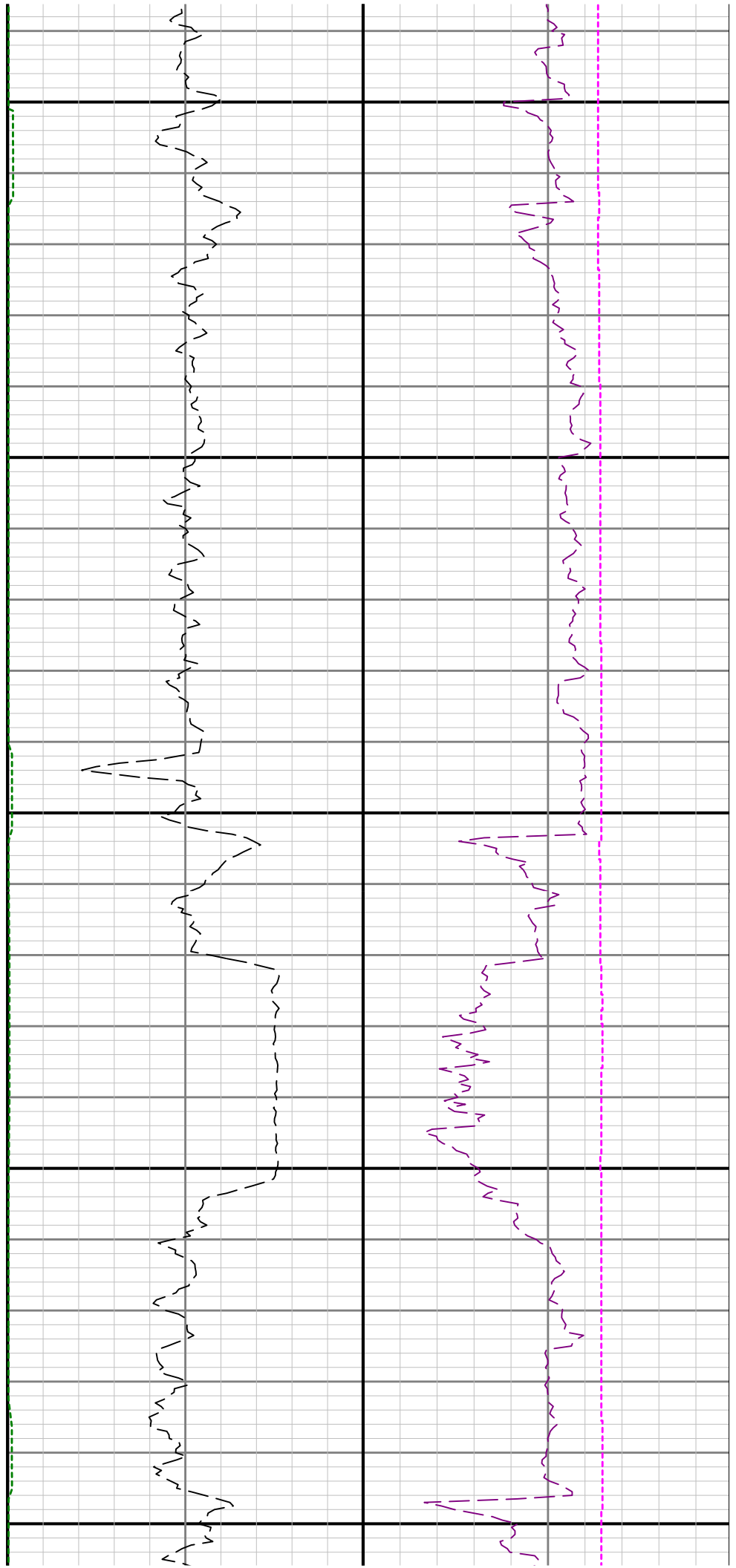


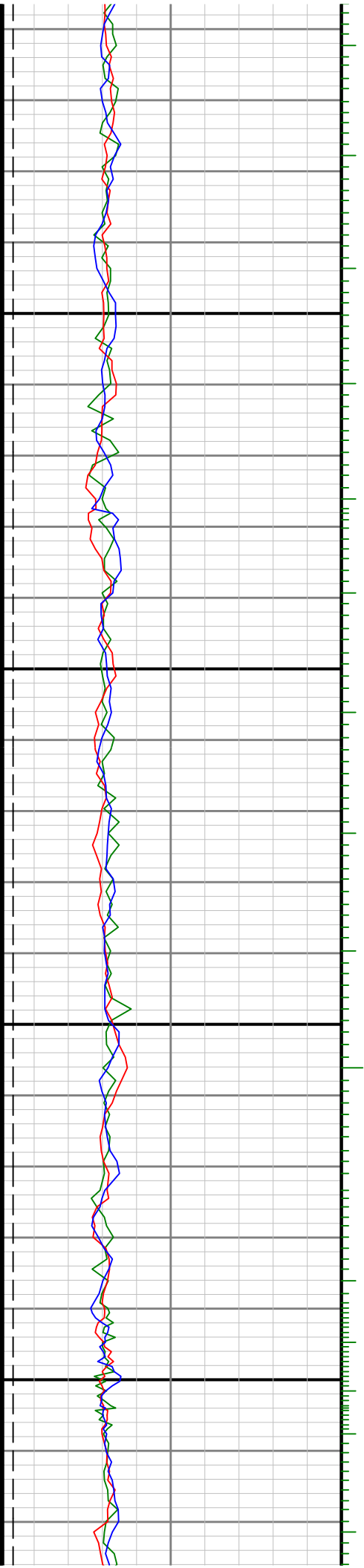






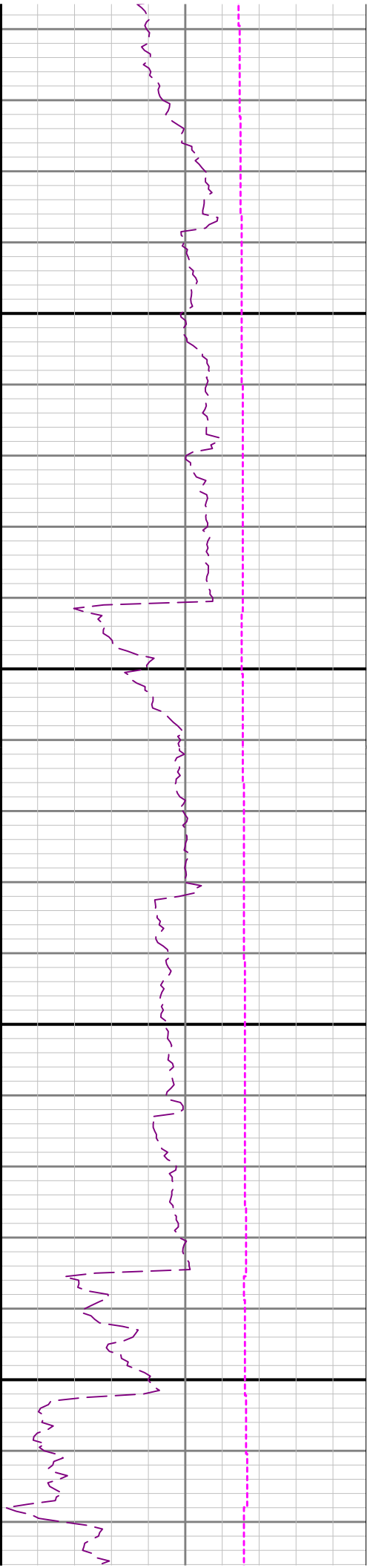
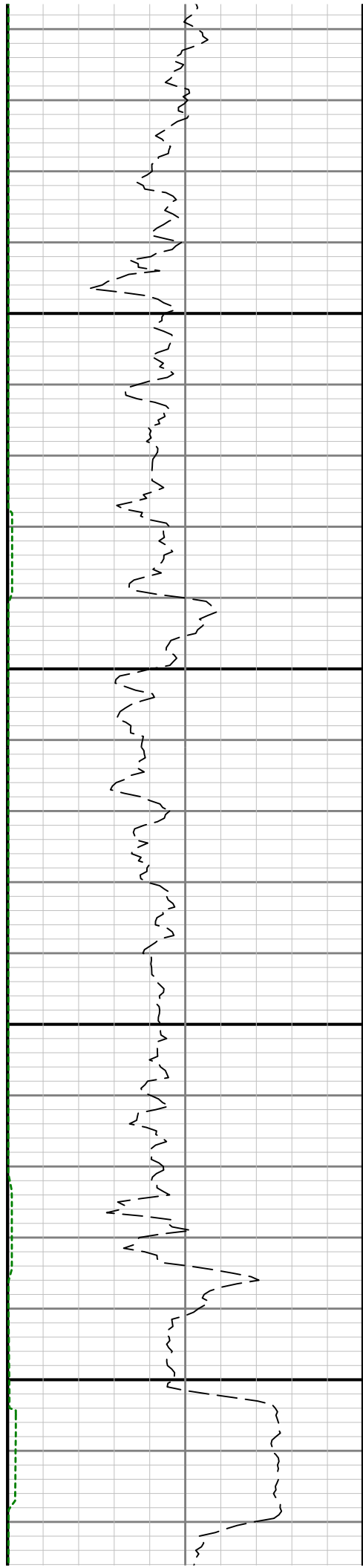


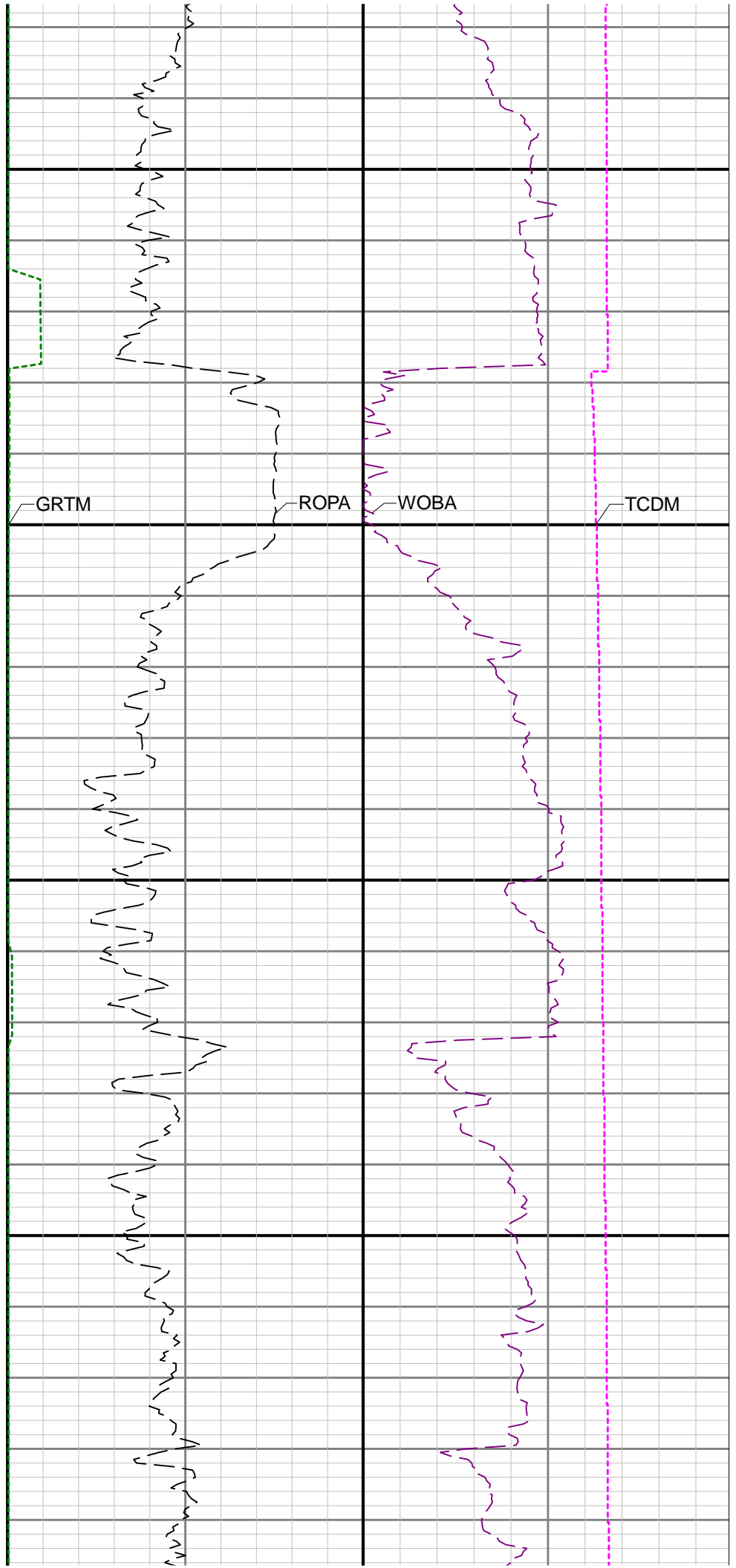
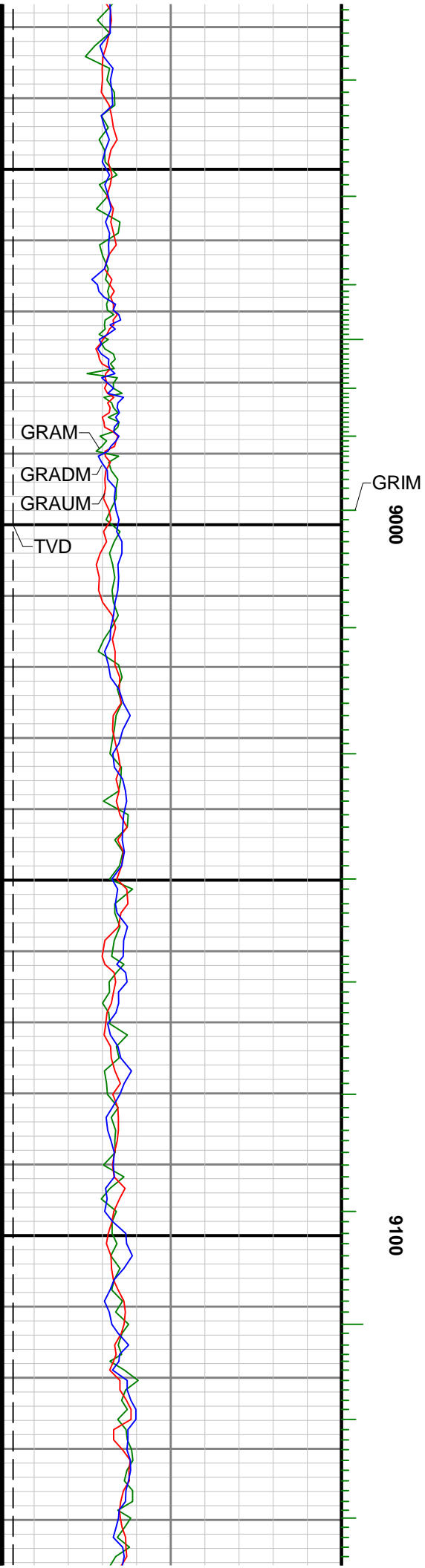


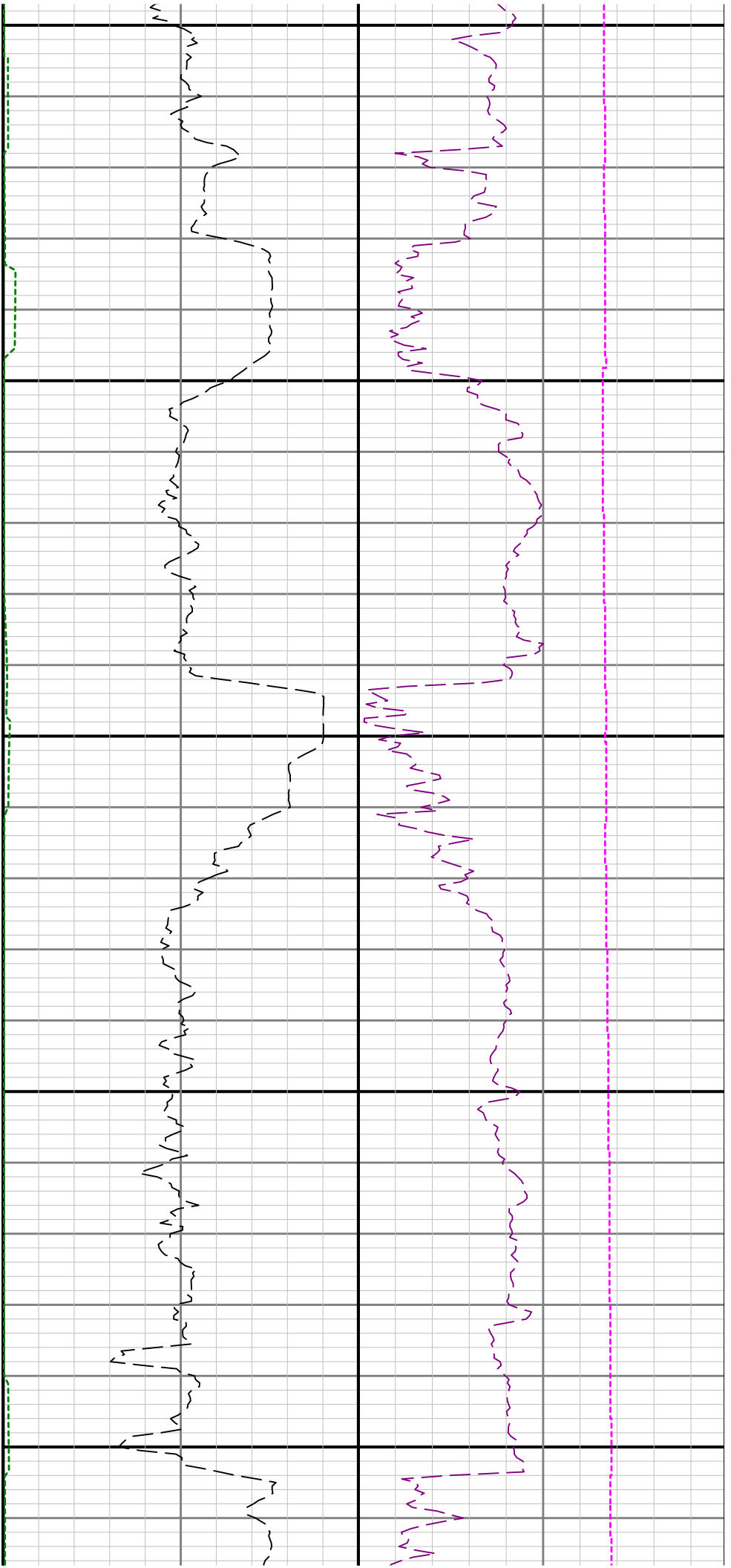


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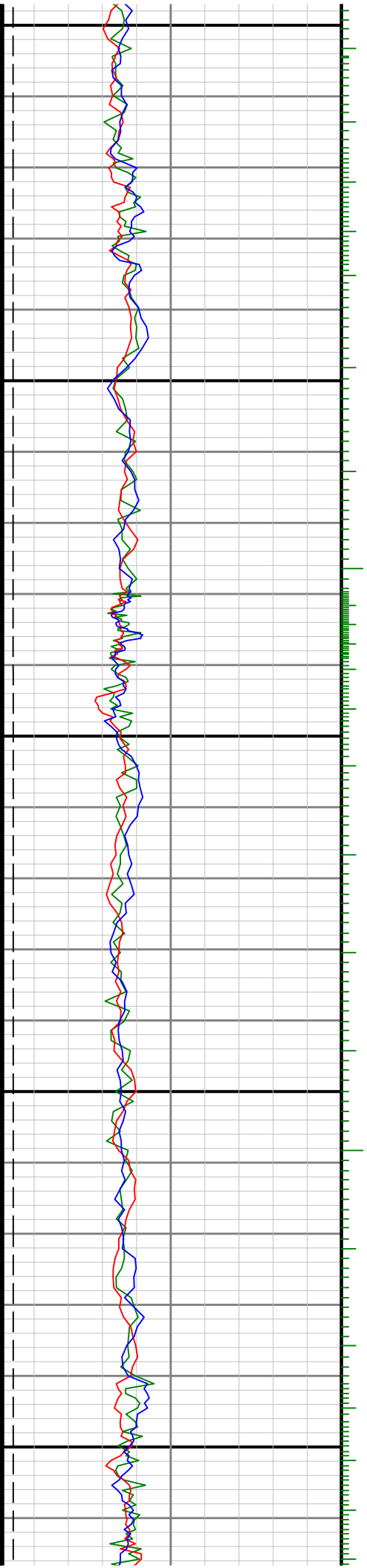


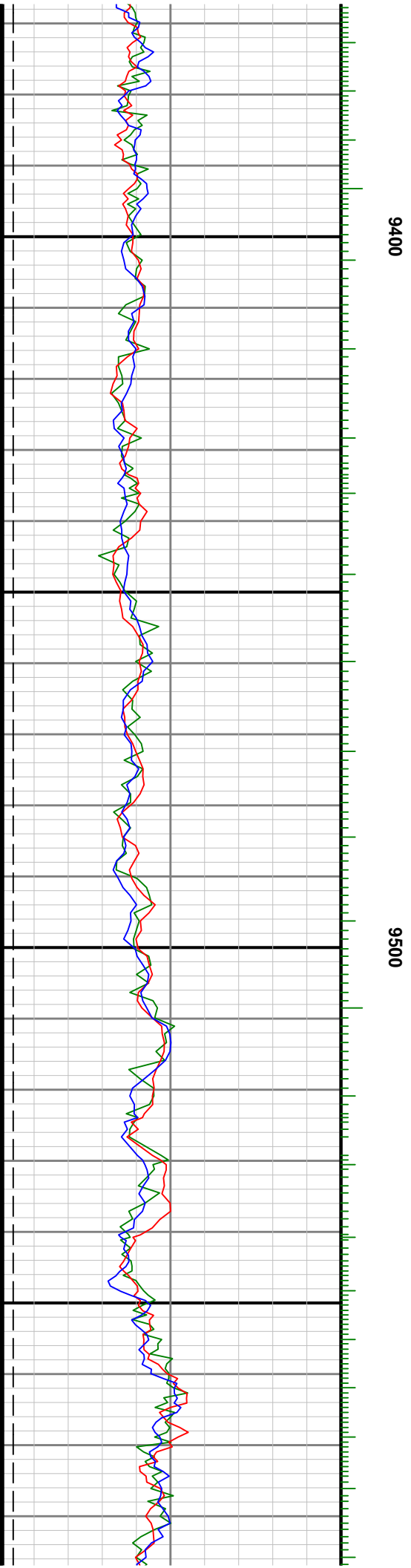
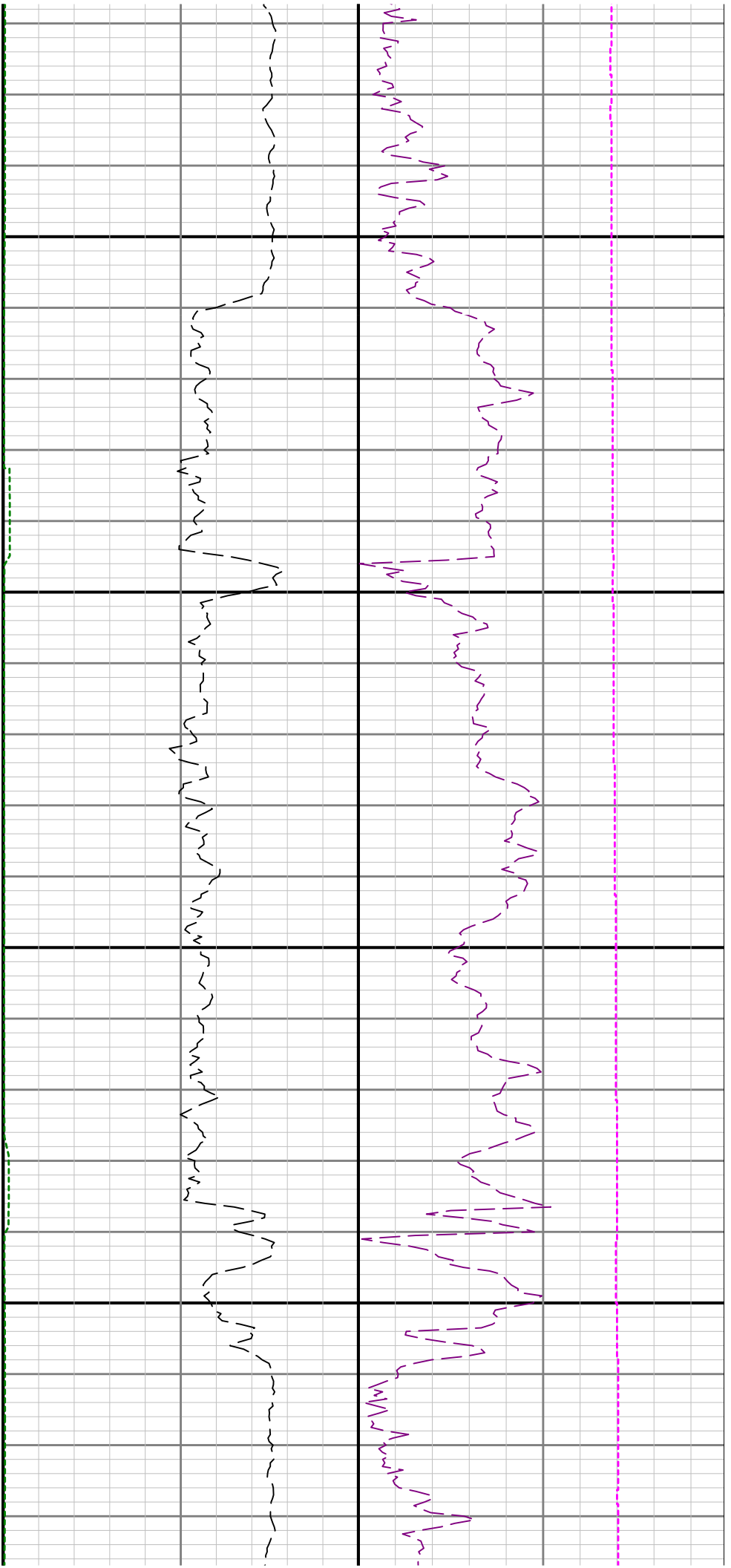


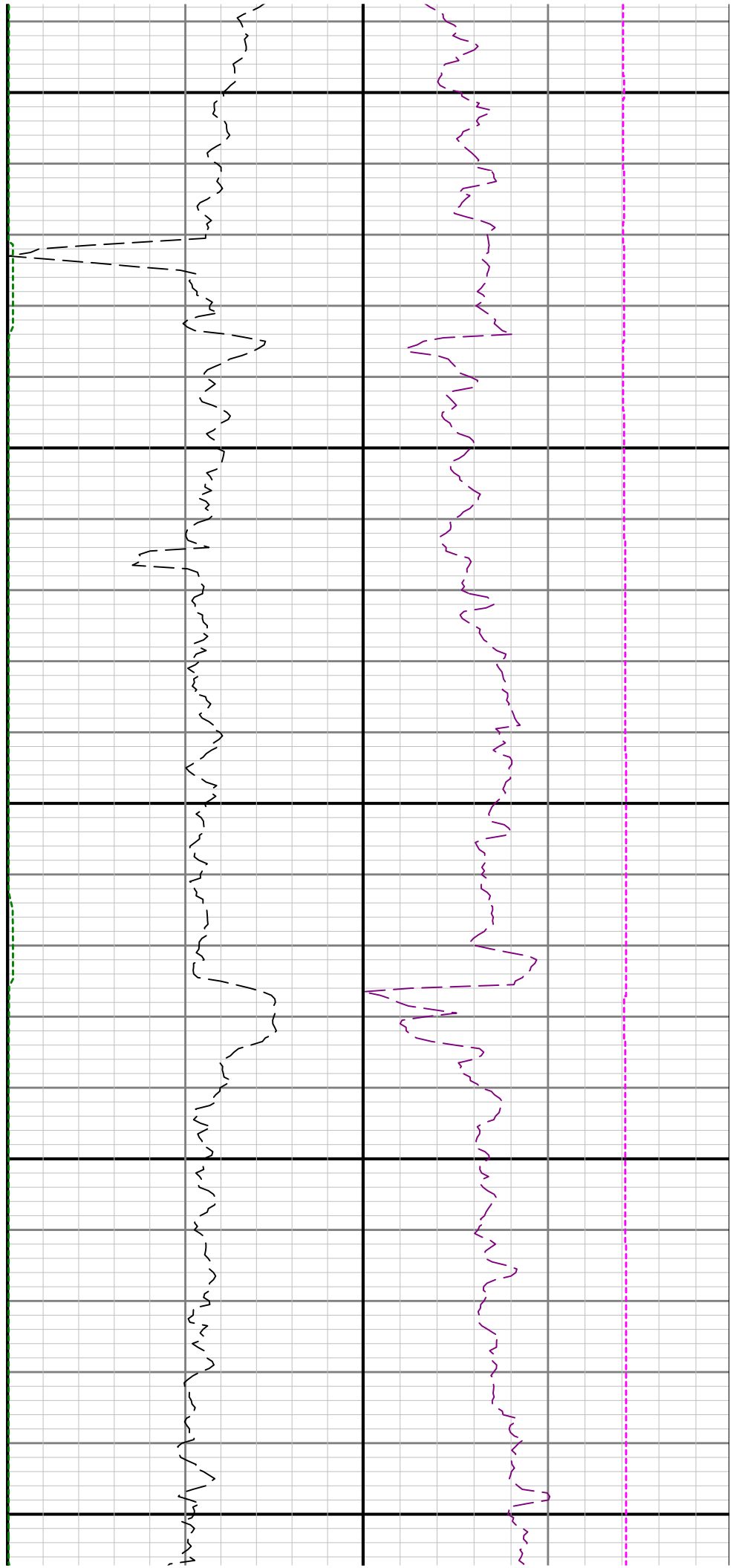
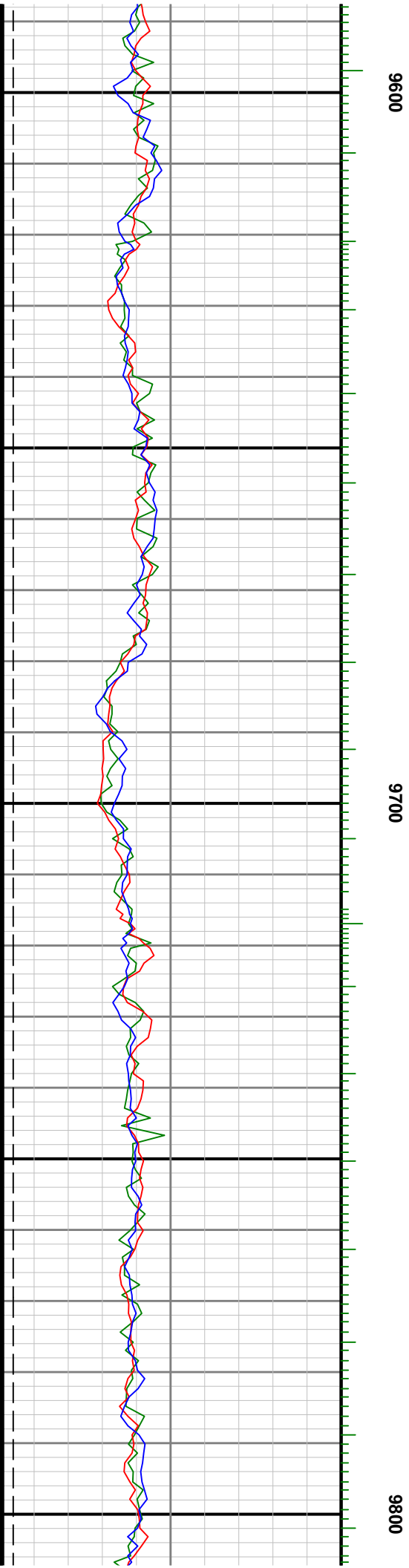


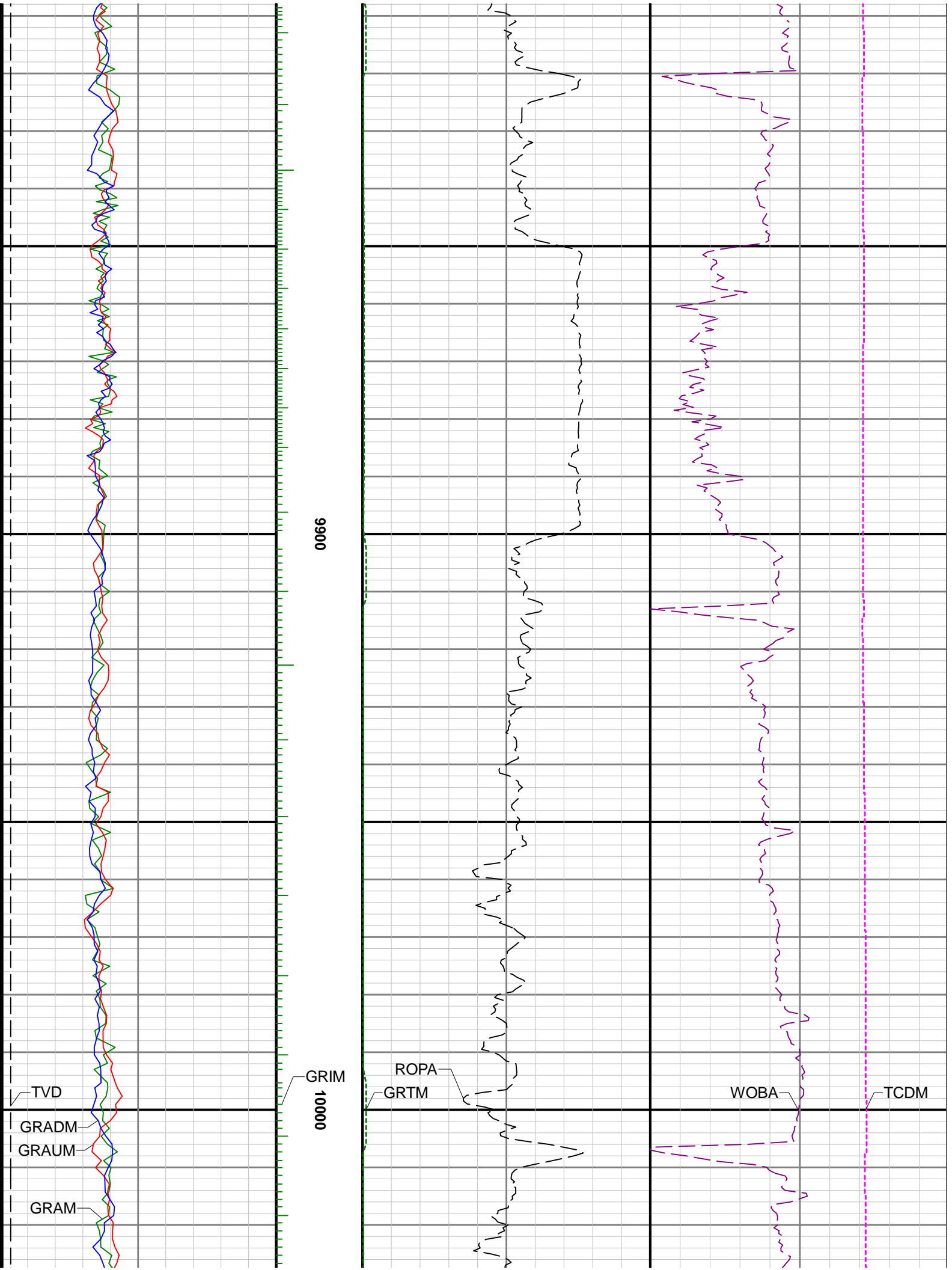
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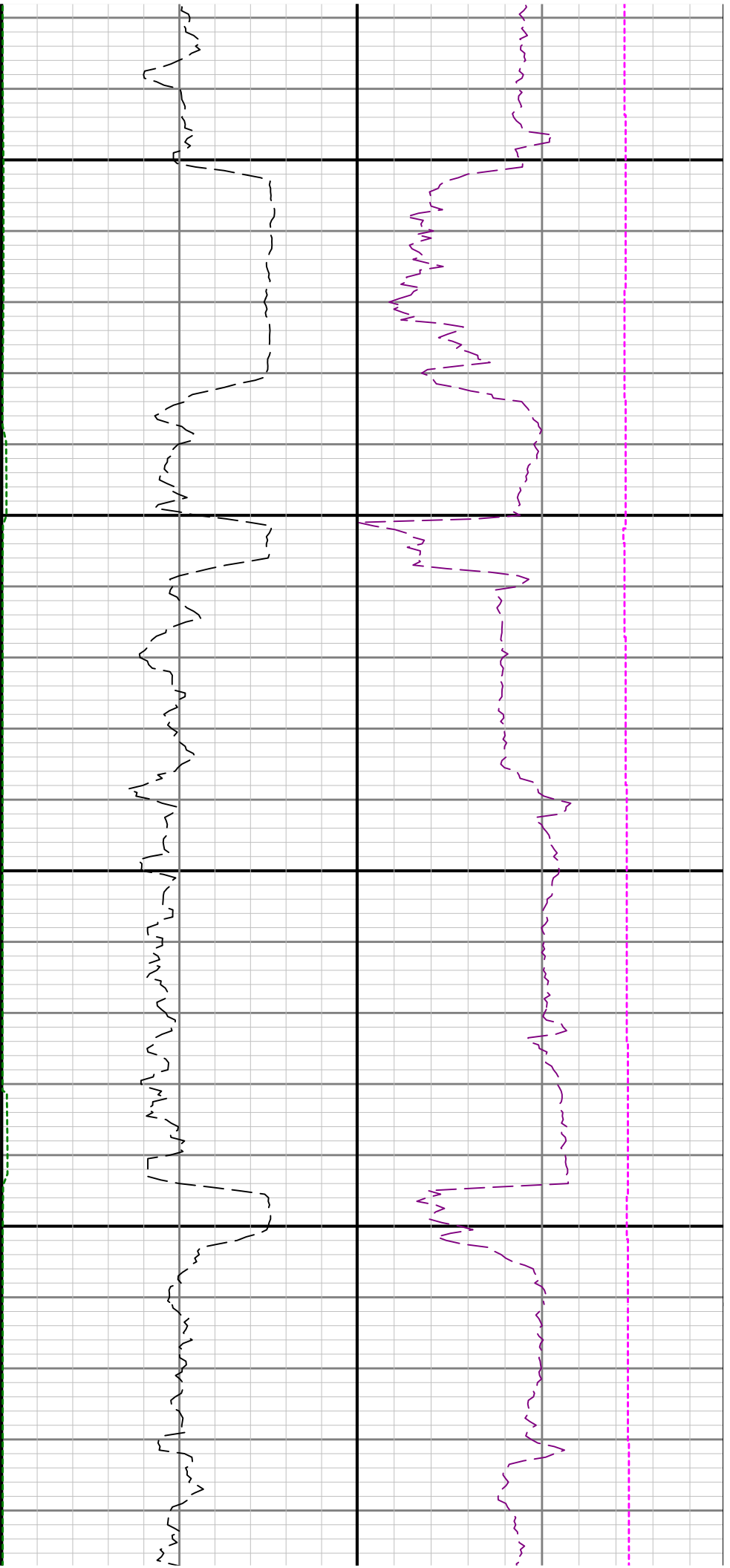
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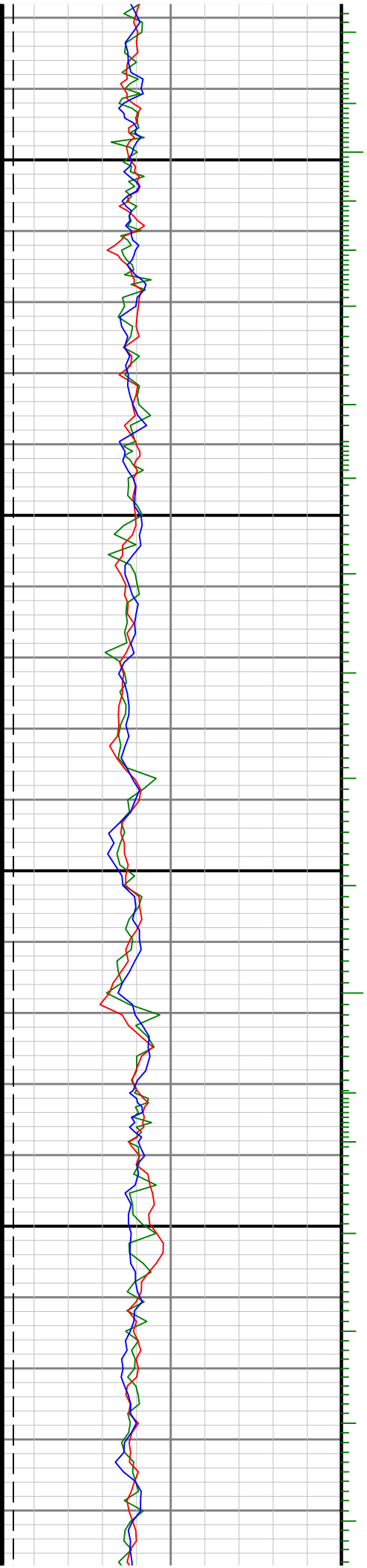


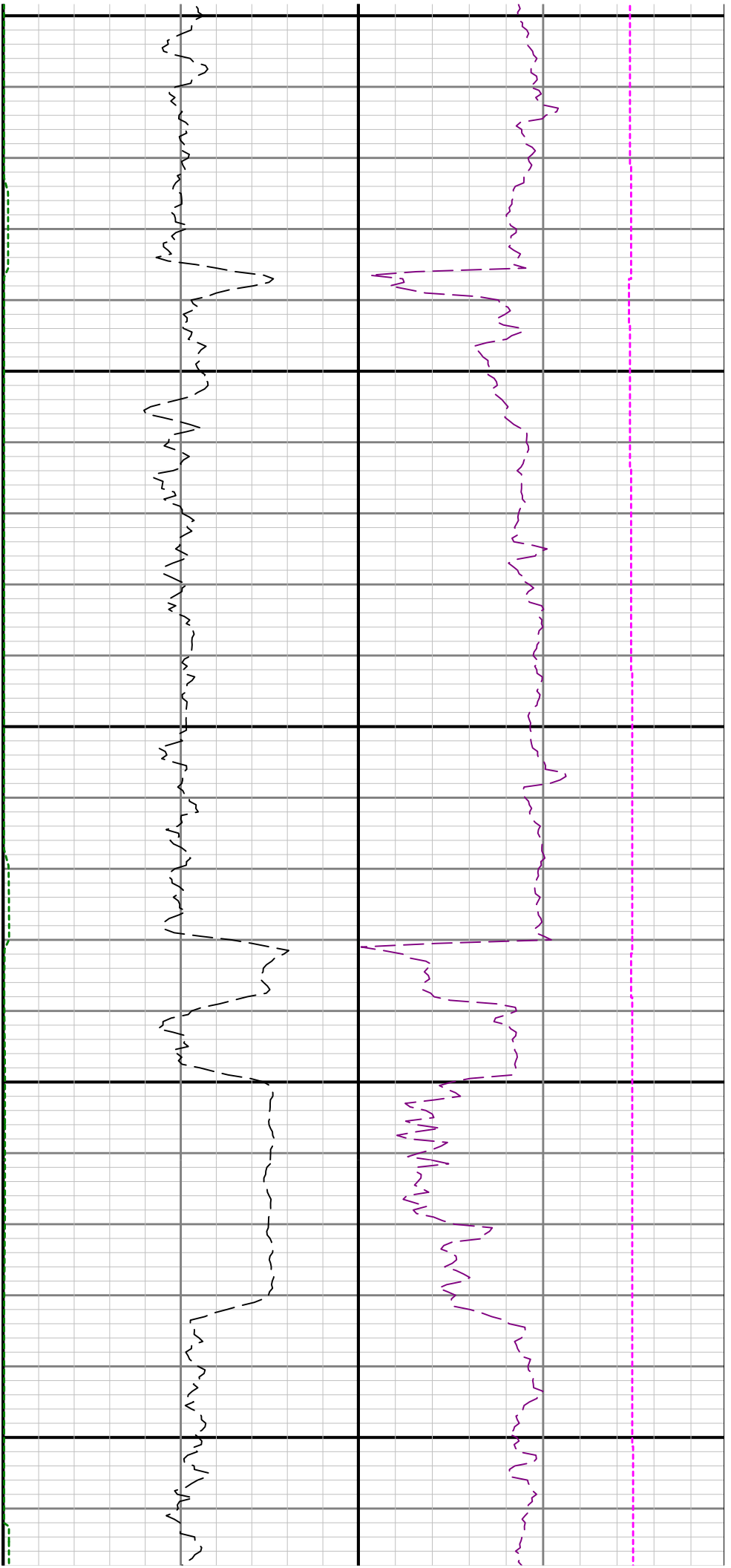




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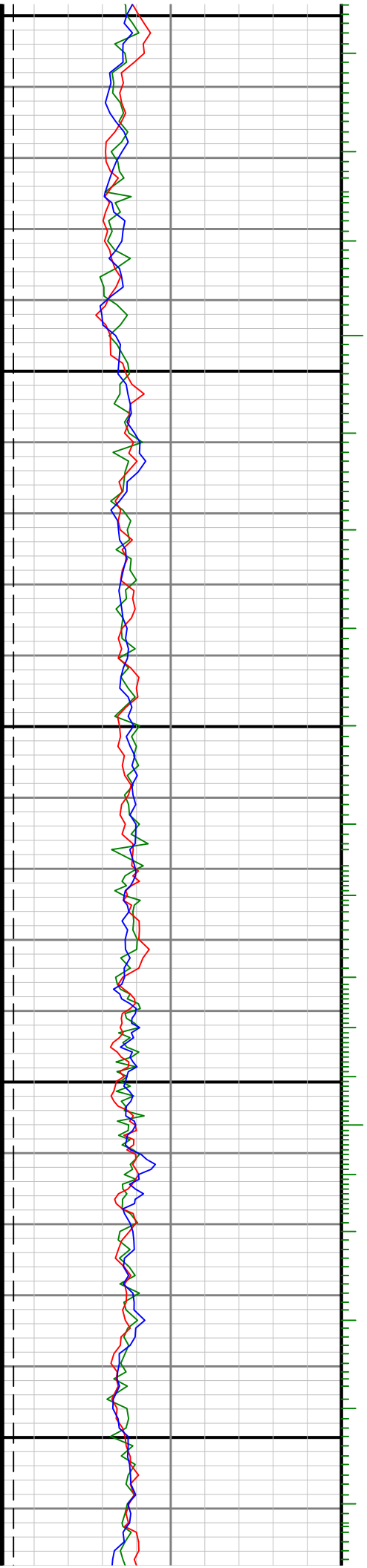
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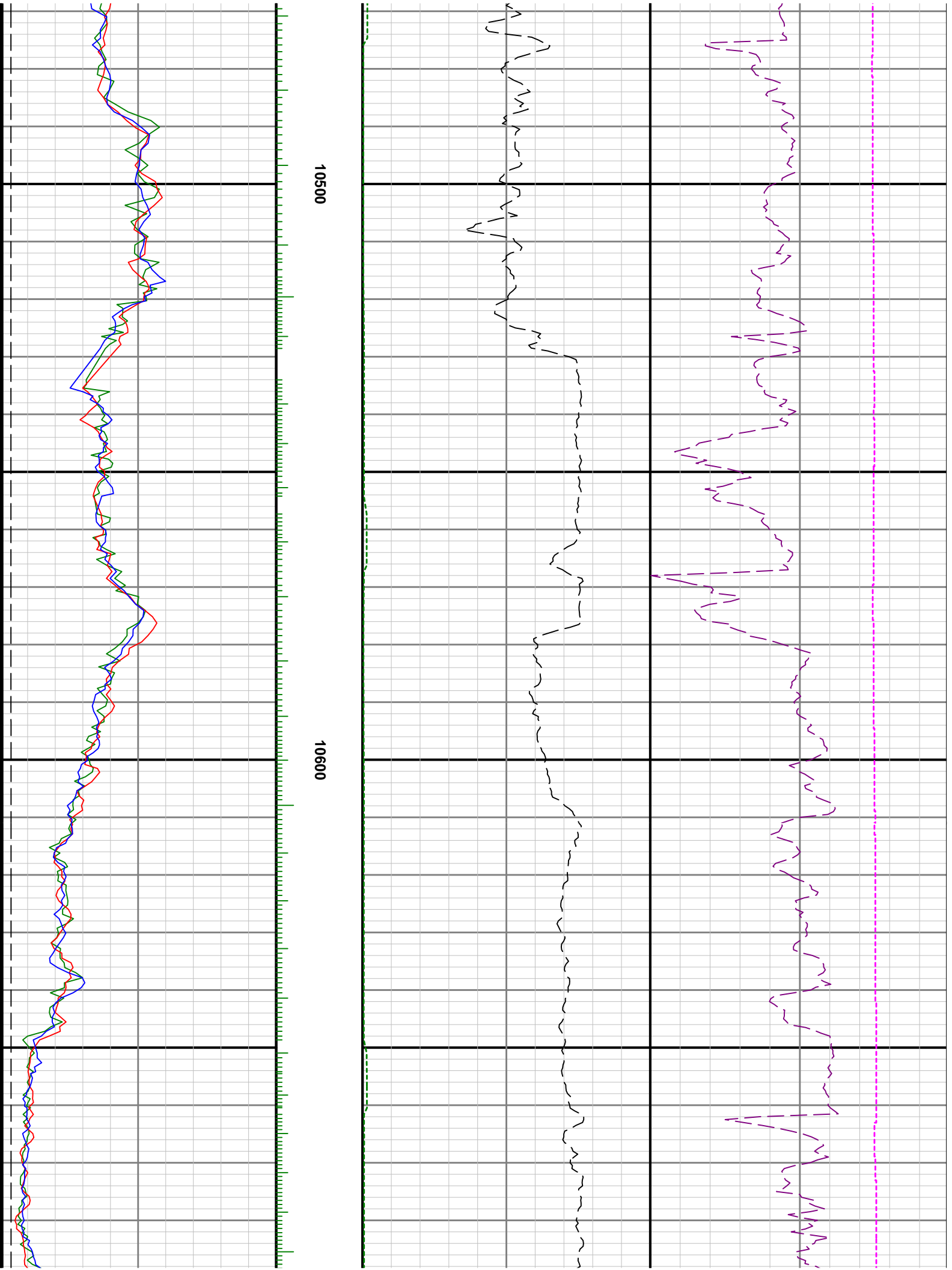


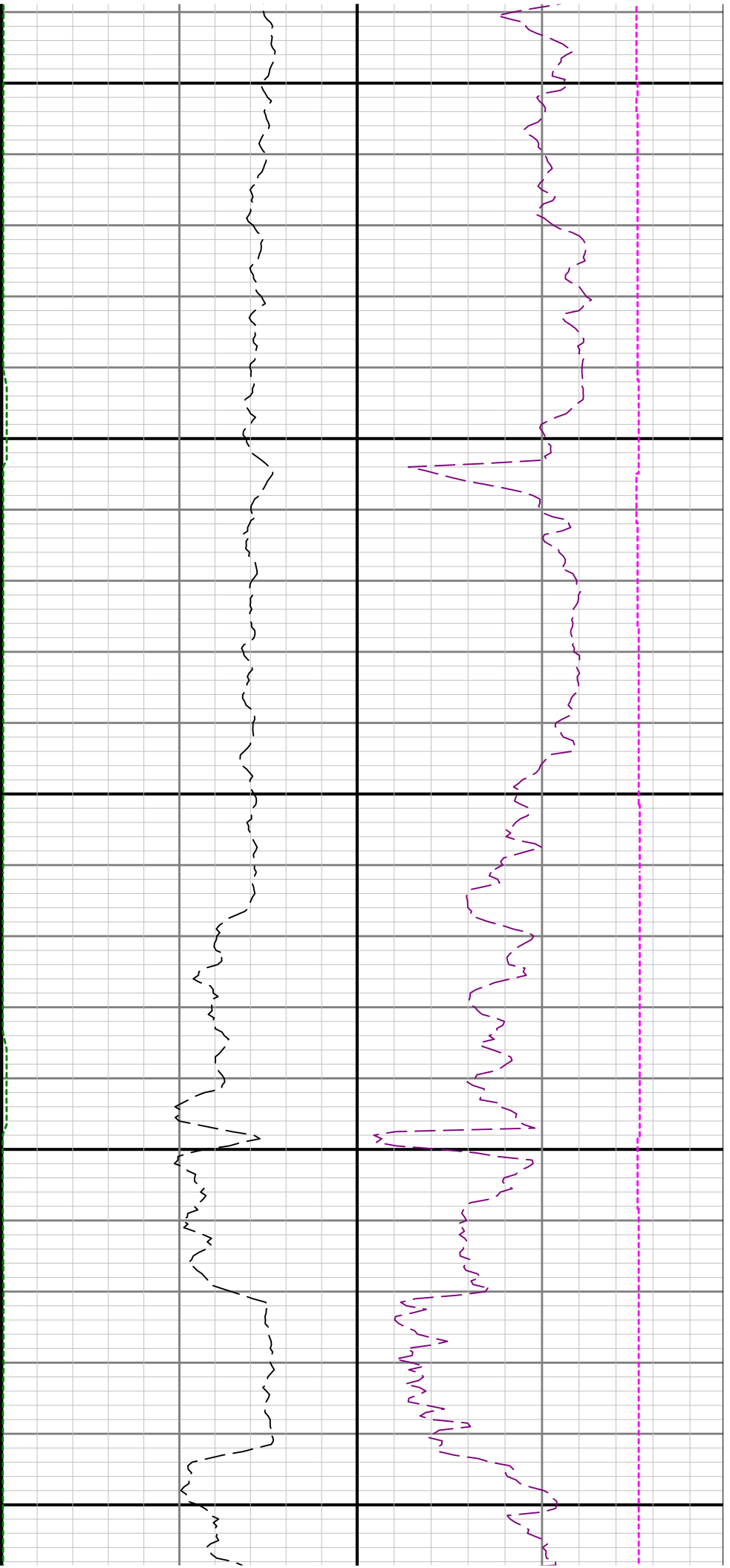


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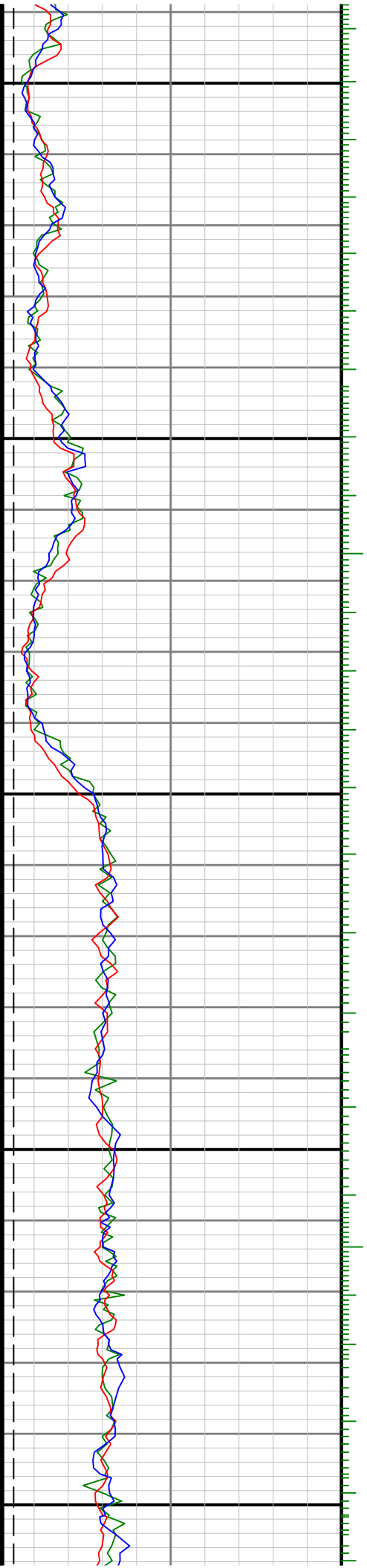


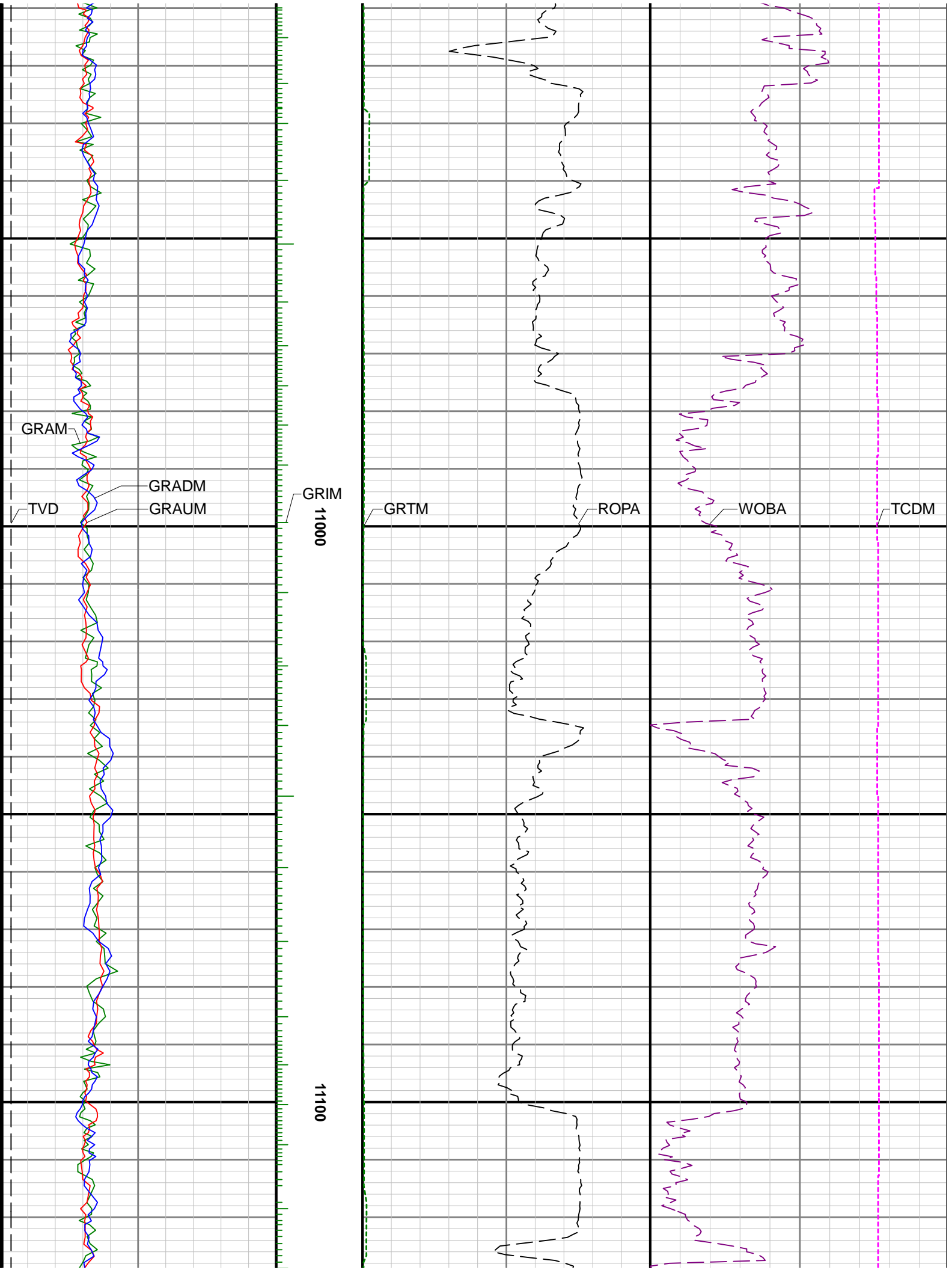


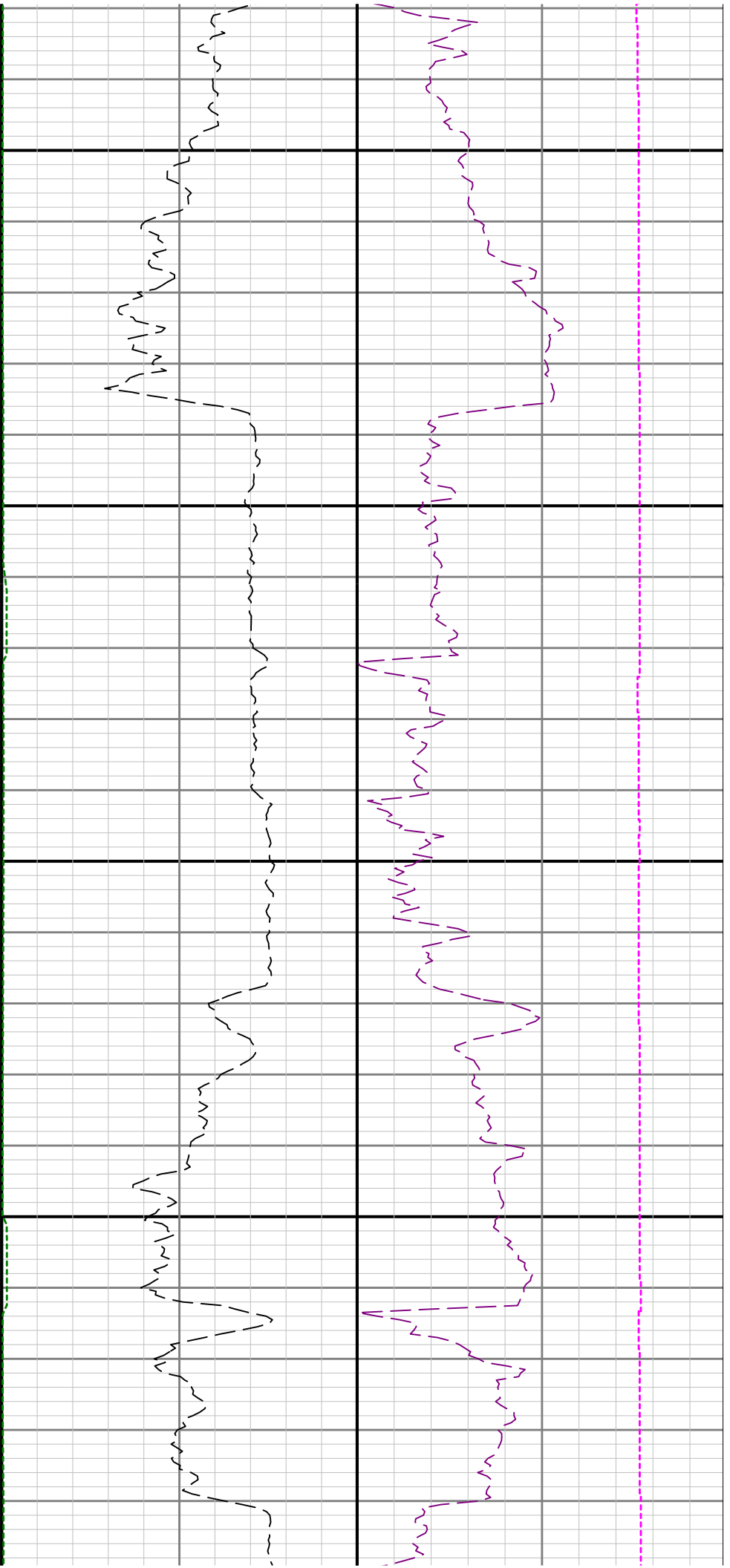
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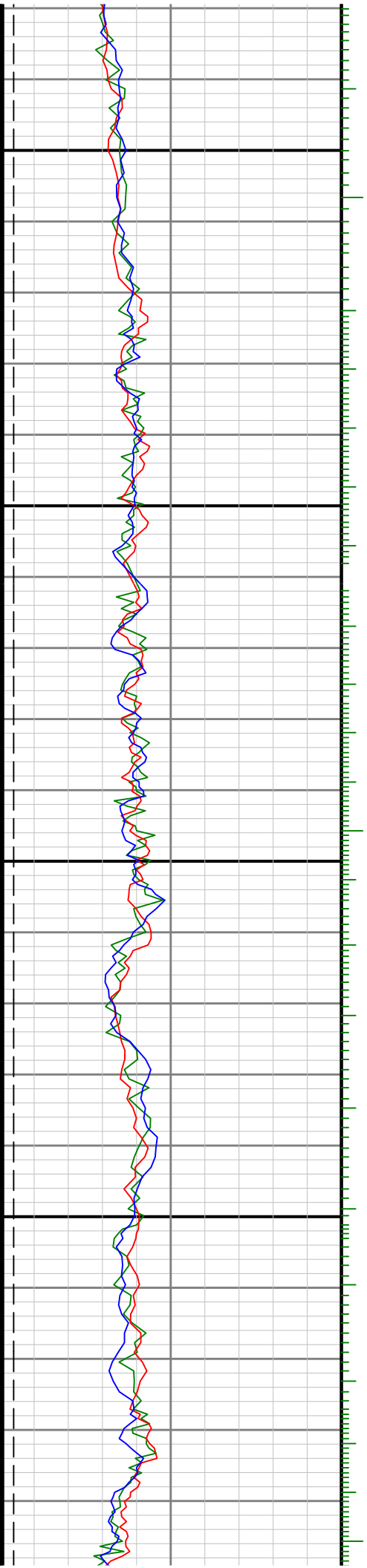


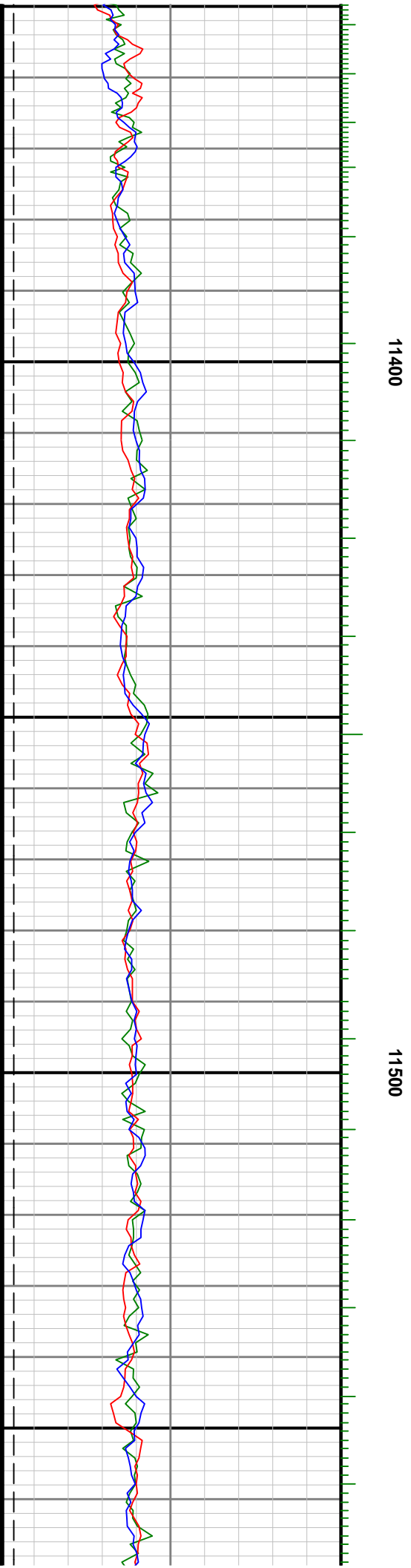
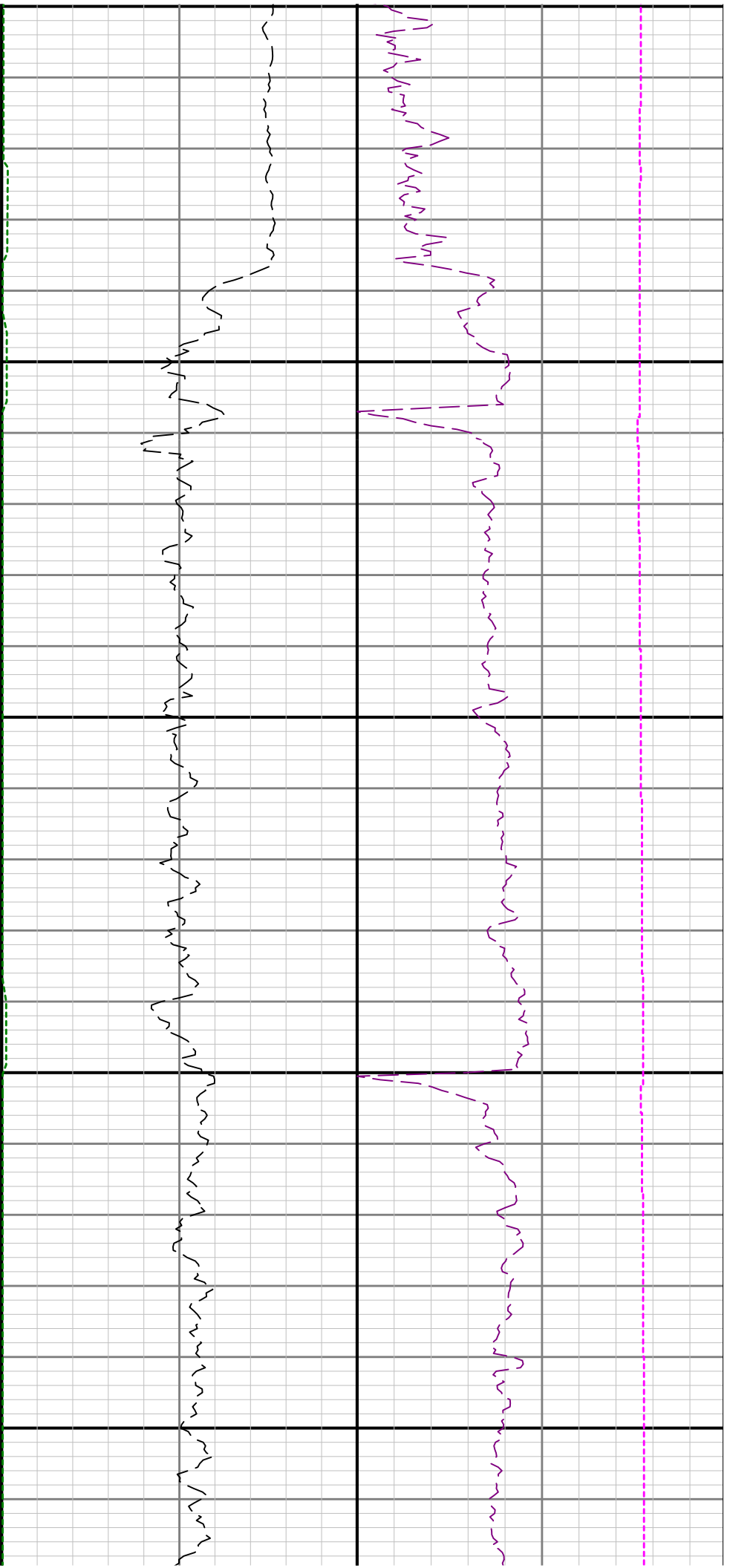


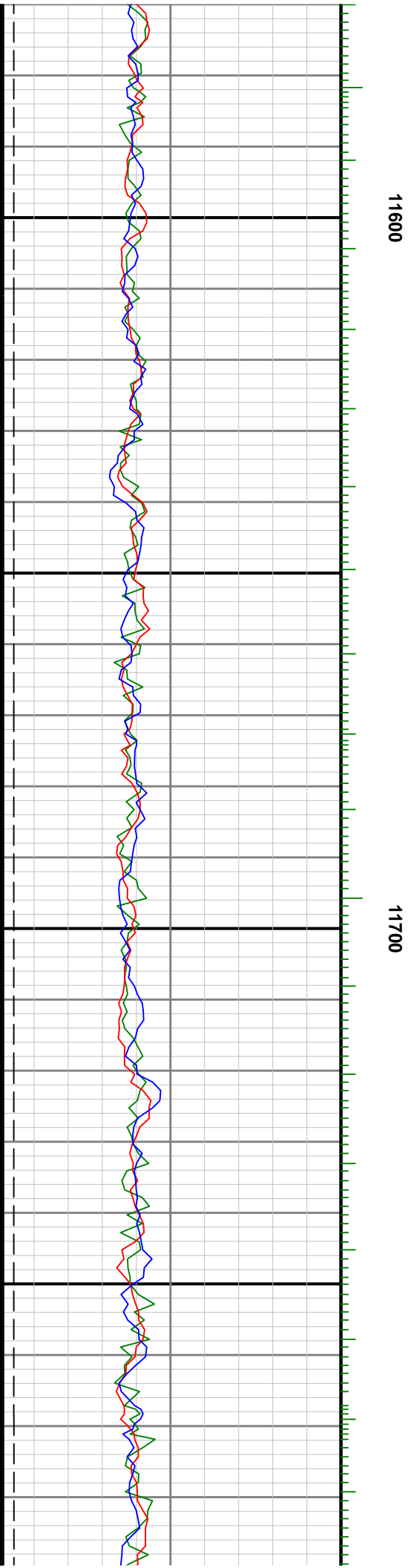
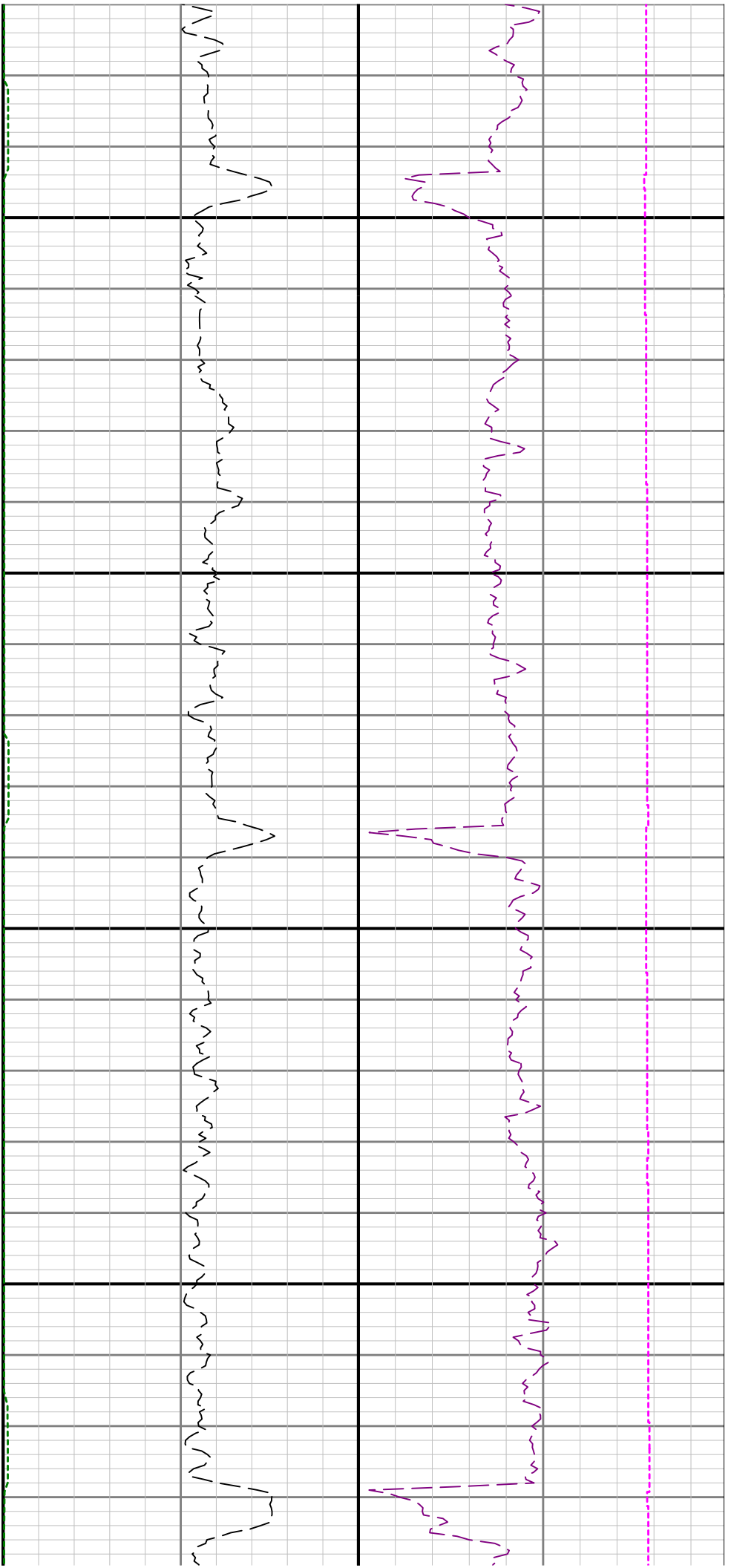


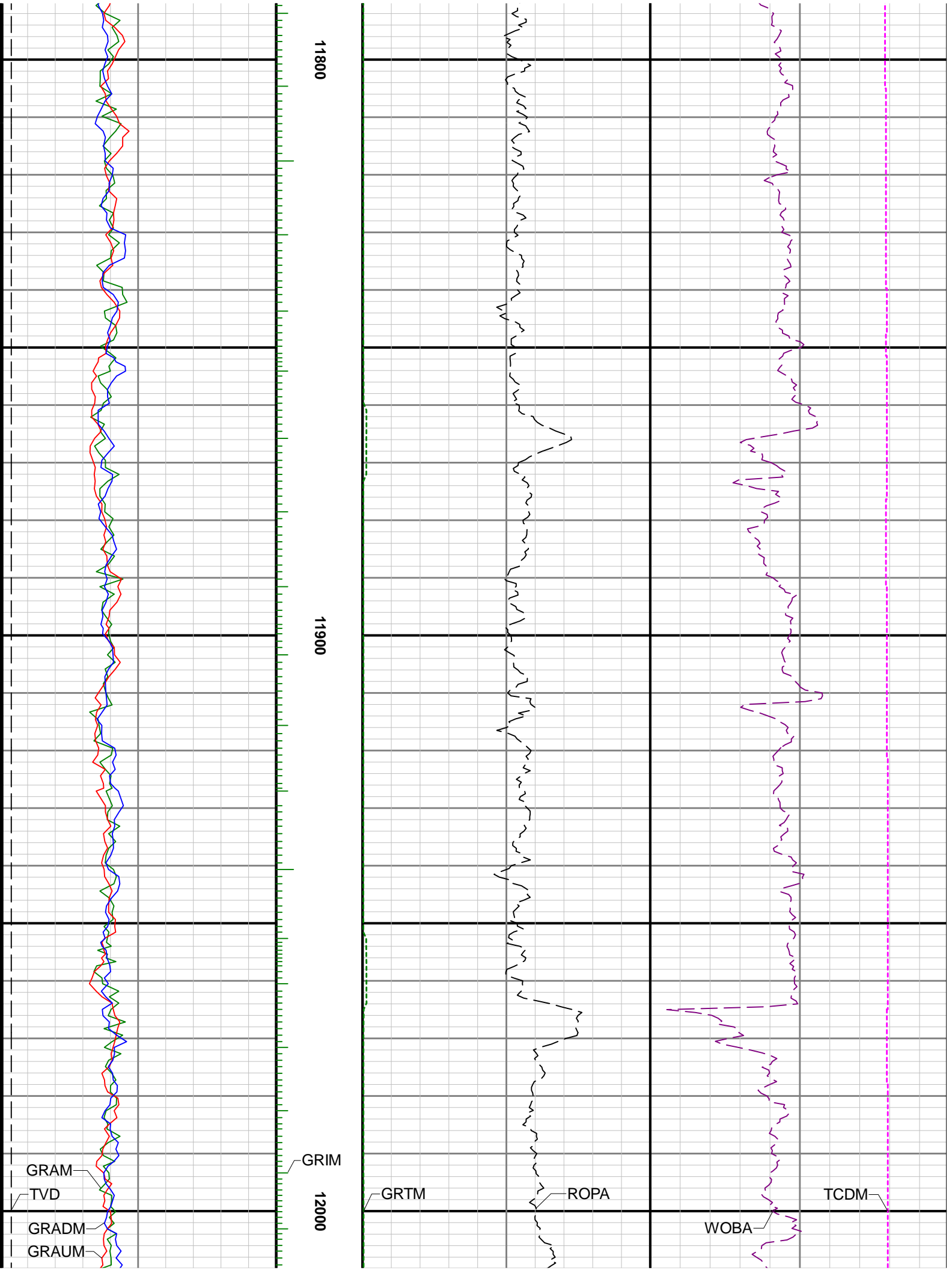
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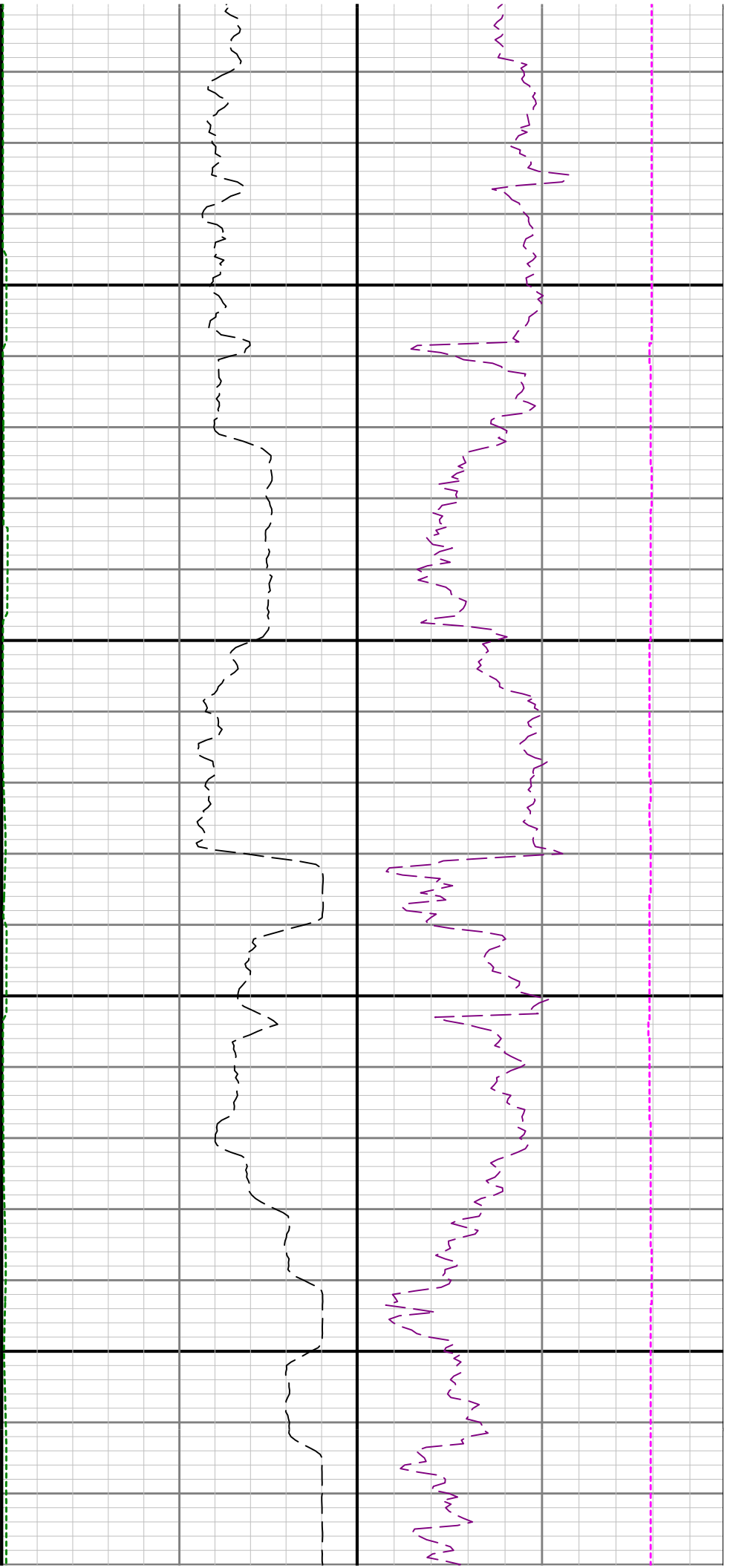
11300











12100

12200

