



Memory Log

Gamma Ray, Propagation Resistivity

Scale:

1:240 MEASURED DEPTH

Company: Kerr-McGee Oil & Gas Onshore LP

Well: Gobbler 13N-23HZ

Field: Wattenburg

County: Weld State: Colorado

Status:

Field Print

Surface Location:

Latitude: 40° 7' 46.362" N

Longitude: 104° 45' 17.626" W

Other Services:

Wellbore Survey

API Number: 05-123-36478

Section: 22 TWN: 2N Range: 66W

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

Elevation: 0.00 ft.

Elevations:

Log Measured From:

Drill Floor

5100.00 ft.

Above P.D.

KB: N/A
DF: 5100.00 ft.
GL: 5084.00 ft.

Depth Reference: Driller's Depth

Interval Logged

Dates

Magnetic Field Reference

Top: 6885.0 ft. Date From: 14/Jul/13

Dip Angle: 66.95° Azi Reference North:

True

Bottom: 11936.0 ft. Date To: 22/Jul/13

Total

Mag to Reference

Spud Date: 14/Jul/13 Field Strength: 52958.0 nT North Correction: 8.45°

Borehole Record

Casing Record

Hole Size	From	To	Size	Weight	From	To
13.500 in.	Surface	1016.0 ft.	9.625 in.	36.00 lb/ft	Surface	1016.0 ft.
8.750 in.	1016.0 ft.	7889.0 ft.	7.000 in.	26.00 lb/ft	Surface	7882.0 ft.
6.125 in.	7889.0 ft.	11980.0 ft.				

Mud Record

Deviation Record

Type	From	To	Hole Size	Interval	Inc / Az (Start)	Inc / Az (End)
Water Based Mud	1016.0 ft.	11980.0 ft.	13.500 in.	1016.0 ft.	0.0° / 81.4°	0.0° / 227.6°
			8.750 in.	6873.0 ft.	0.1° / 293.2°	84.8° / 180.5°
			6.125 in.	4091.0 ft.	89.9° / 179.9°	90.6° / 179.0°
					/	/
					/	/
					/	/
					/	/

Acquisition System

Software Version

Other

Advantage 2.20U4 Rpt: / Contractor: Xtreme 20 / Xtreme Coil Drilling Corp.

PATS 6.4.1.34 Job No: 5587373 District: / Unit: RMD / D&E

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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.
							Top	Bottom	From	To	Start		End		Time (hrs.)
							(ft.)	(ft.)	(ft.)	(ft.)					
2	2	2	8.750	PDC	3.000	Steerable	6885.0	7839.0	6932.0	7889.0	17/Jul/2013 09:00	18/Jul/2013 03:00	23.5		
3	3	3	6.125	PDC	3.000	Steerable	7839.0	11928.0	7889.0	11980.0	20/Jul/2013 00:13	21/Jul/2013 22:44	45.9		

Crew

Name	Arrive	Depart	Name	Arrive	Depart	Name	Arrive	Depart
	Wellsite	Wellsite		Wellsite	Wellsite		Wellsite	Wellsite
Mark Dix	16 July 2013	22 July 2013	Andy King	18 July 2013	22 July 2013	Jeremiah Davidson	18 July 2013	22 July 2013
Adam Schlenz	13 July 2013	22 July 2013						

Witness	
Name	LWD Run Number
Charlie Daigle	1,2
Marvin Hackeworth	3

Mud Properties Record												
Date / Time		LWD Run No.	Measured Depth (ft.)	Mud Type	Density (ppg)	Viscosity (sec/qt)	pH	Fluid Loss (cc)	Oil / Water	Source	Total Chlorides (ppm)	K+ (%)
16 July 2013	20:00	2	6550.0	Water Based	10.2	44	8.3	N/A	4.5/87.1	Active Mud Pit	1500	0.0
17 July 2013	08:00	2	6935.0	Water Based	10.2	46	8.2	N/A	4.5/87.1	Active Mud Pit	1600	0.0
17 July 2013	20:00	2	7605.0	Water Based	10.2	46	8.3	N/A	4.5/87.1	Active Mud Pit	1700	0.0
18 July 2013	08:00	2	7890.0	Water Based	10.2	47	8.2	N/A	4.5/86.7	Active Mud Pit	1800	0.0
18 July 2013	20:00	2	7890.0	Water Based	10.4	45	8.3	N/A	4.5/86.7	Active Mud Pit	1700	0.0
19 July 2013	08:00	2	7890.0	Water Based	10.3	45	8.2	N/A	5/86.2	Active Mud Pit	1700	0.0
19 July 2013	20:00	2	7890.0	Water Based	10.3	42	8.3	N/A	4.5/86.7	Active Mud Pit	1700	0.0
20 July 2013	08:00	3	8389.0	Water Based	10.1	43	8.2	N/A	5/87	Active Mud Pit	1700	0.0
20 July 2013	20:00	3	9600.0	Water Based	9.9	45	8.3	N/A	5.5/87.2	Active Mud Pit	1700	0.0
21 July 2013	08:00	3	10750.0	Water Based	10.1	43	8.3	N/A	5.5/86.4	Active Mud Pit	1700	0.0
21 July 2013	20:00	3	11618.0	Water Based	9.9	44	8.2	N/A	6.5/86.1	Active Mud Pit	1600	0.0

Mud Resistivity Record					Surface			Downhole			
Date / Time		LWD Run No.	Measured Depth (ft.)	Surface Temp (deg F)	Rm (ohm.m)	Rmf (ohm.m)	Rmc (ohm.m)	BHCT (deg F)	Rm @ BHCT (ohm.m)	Rmf @ BHCT (ohm.m)	Rmc @ BHCT (ohm.m)
19/Jul/2013	12:29	3	7889.0	90	1.40	N/A	N/A	160	0.80	N/A	N/A
19/Jul/2013	23:42	3	7889.0	71	1.84	N/A	N/A	201	0.67	N/A	N/A
20/Jul/2013	14:16	3	9130.0	78	1.46	N/A	N/A	196	0.60	N/A	N/A
21/Jul/2013	00:21	3	10129.0	70	1.63	N/A	N/A	210	0.56	N/A	N/A
21/Jul/2013	14:14	3	11225.0	81	1.51	N/A	N/A	220	0.57	N/A	N/A

Mnemonics		
Curve	Description	Units
ROPA	Rate of Penetration, 3.0 ft. Avg	ft/hr
GRIM	Gamma Ray Data Point Indicator	unitless
GRAM	Gamma Ray – Apparent, 0.5 ft. Avg	API
GRAUFM	Gamma Ray – Apparent, Up	API
GRADFM	Gamma Ray – Apparent, Down	API
RPCHM	Resistivity Phase – Corrected – 2MHz	ohm.m
RPCLM	Resistivity Phase – Corrected – 400kHz	ohm.m
RACHM	Resistivity Attenuation – Corrected – 2MHz	ohm.m
RACLM	Resistivity Attenuation – Corrected – 400kHz	ohm.m
RPTHM	Resistivity Time Since Drilled	min

RPSIHM	Resistivity Phase Short Space Sliding Indicator – 2MHz	unitless
CACHM	Conductivity Attenuation – Corrected – 2MHz	mmho/m
TCDM	Downhole Temperature	degF

Equipment and Service Data

LWD Run No.	Tool	Serial Number	Measurement	Bit Offset (ft.)	Max O.D. (in.)	Min I.D. (in.)
2	DIR	10307183	Directional	53.34	6.750	3.250
2	SRIG	12613296	Gamma	49.96	6.750	3.250
3	CS	12114978	-	76.81	5.000	1.750
3	BCPM	11702318	Telemetry	65.92	5.000	1.750
3	STAB	11938368	-	62.68	5.625	1.750
3	OTK	11592386	Directional	57.07	5.066	1.750
3	OTK	11592386	Resistivity	43.89	7.031	2.165
3	OTK	11592386	Gamma	52.38	5.066	1.750
3	OTK	11592386	Pressure	48.33	5.066	1.750
3	CS	12202688	-	36.78	5.000	1.750

Service and Tool Mnemonics

Mnemonic	Name	Description
BCPM	BCPM	Mud pulse telemetry and downhole tool power module
DIR	Directional	Wellbore directional survey
OTK	OnTrak	Propagation resistivity, propagation conductivity, gamma ray, directional, annular pressure, system memory and VSS
SRIG	Inclination and Gamma	Probe based gamma ray and inclination module
STAB	Stabilizer	Stabilizer assembly
CS	Closure Sub	BHA power ring isolator allowing insertion of inert sub into electrically powered BHA

Comments

<p>(1) Baker Hughes INTEQ runs 1 and 2 utilized 6 3/4 inch NaviGamma services (Gamma Ray and Directional) behind an 8 3/4 inch bit and steerable assembly from 6885 to 7889 feet MD (6758 to 7402 feet TVD).</p> <p>(2) Baker Hughes INTEQ run 3 utilized 4 3/4 inch OnTrak services (Multiple Propagation Resistivity, Gamma Ray, and Directional) behind a 6 1/8 inch bit and steerable assembly from 7890 to 11980 feet MD (7402 to 7380 feet TVD).</p> <p>(3) A sliding indicator is shown to the right edged of track 2 as a heavy line. The indicator has been depth–shifted to the resistivity sensor offset to correspond with resistivity data acquired while sliding.</p> <p>(4) Resistivity curve AT LS 400kHz RACLM did not show any change throughout the lateral section, quality check log showed no issues with any of the transmitters or recievers.</p>

Remarks

Number	Measured Depth (ft.)	Hole Section (in.)	LWD Run No.	Remark
1	6932	8.750	2	The interval from 6885 to 6932 feet MD (6758 to 6805 feet TVD) was logged more than 10 hours after being drilled due to a trip out of the hole to change out the motor and bit.
2	7839	8.750	2	The interval from 7839 to 7890 feet MD (7399 to 7401 feet TVD) was logged up to 45 hours after being drilled due to a trip out of the hole for casing and cement operations, and to pickup the lateral assembly.

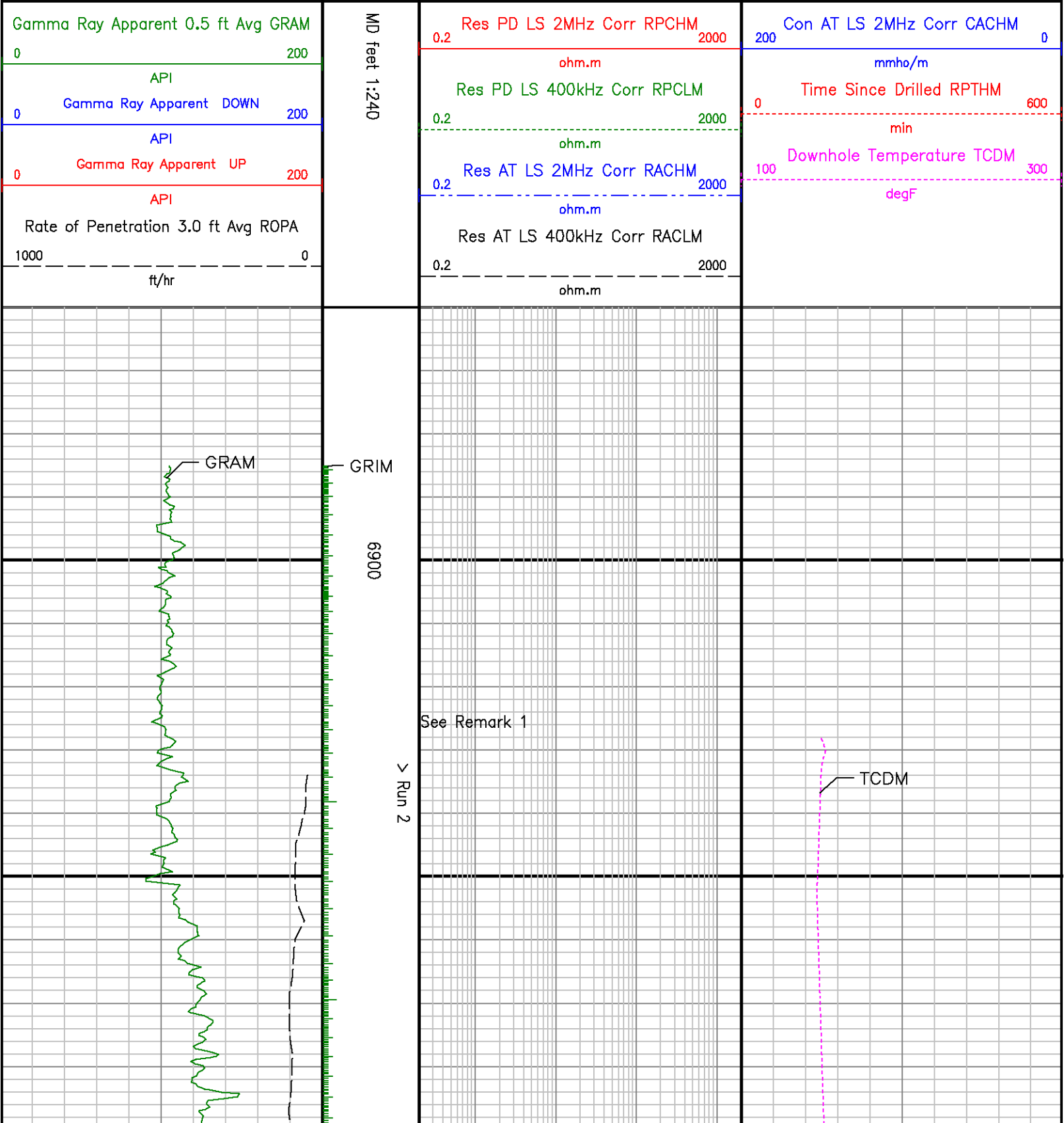


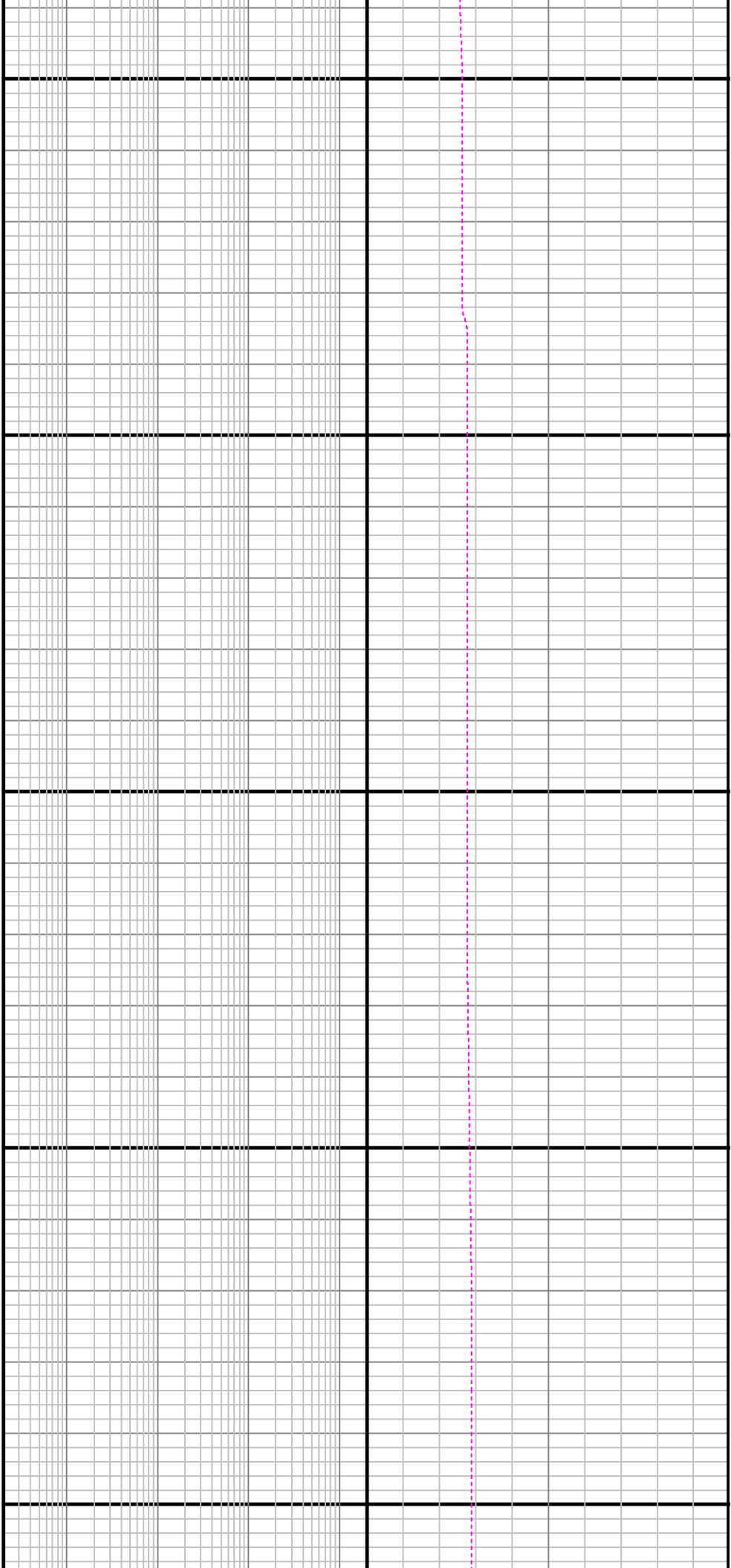
Company : Kerr-McGee Oil & Gas Onshore LP

Well : Gobbler 13N-23HZ

Interval : 6860.00 - 12010.00 feet

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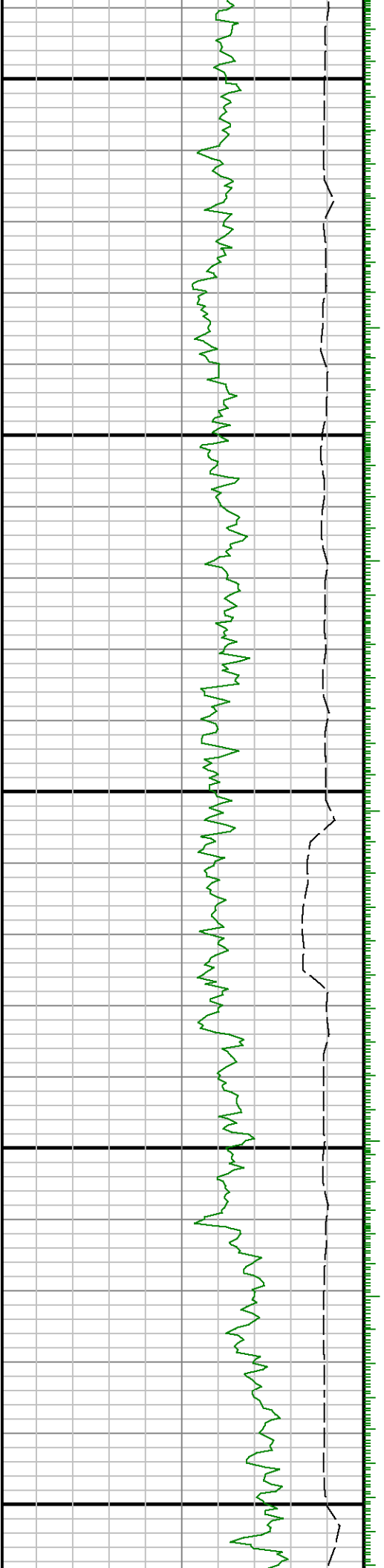


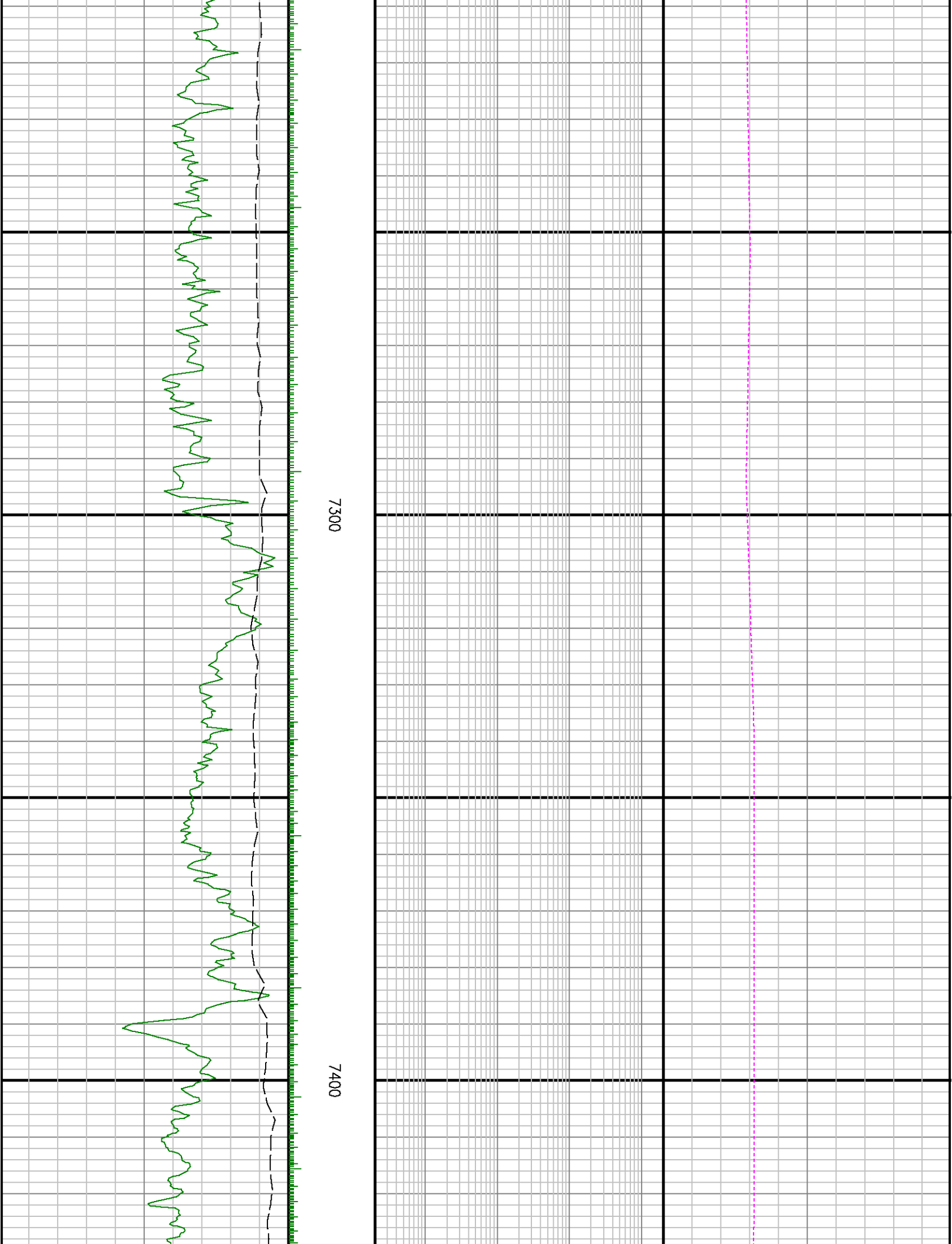


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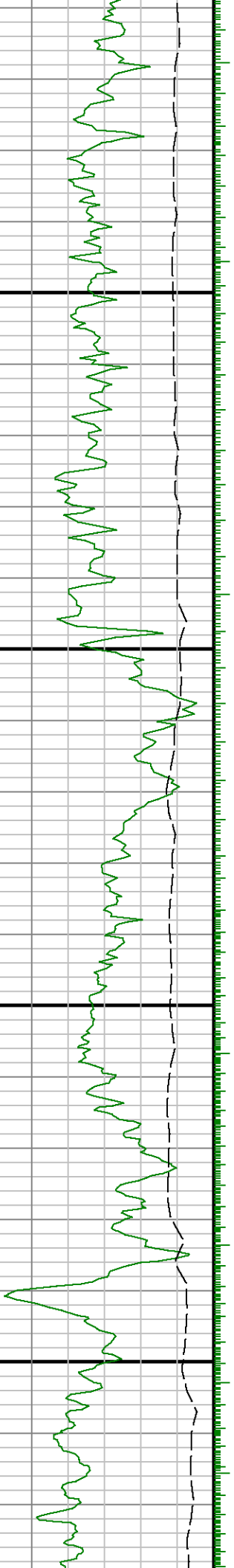
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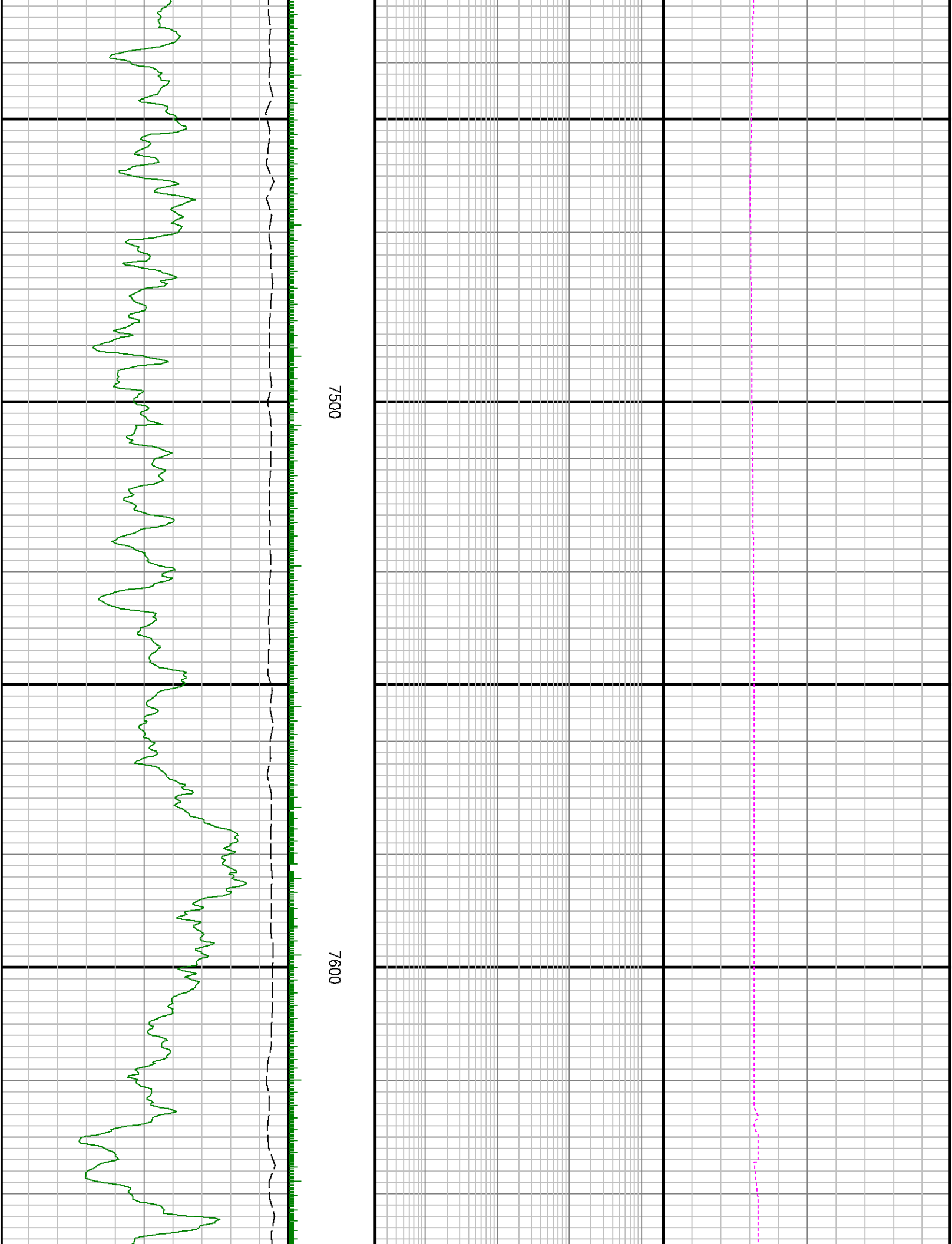


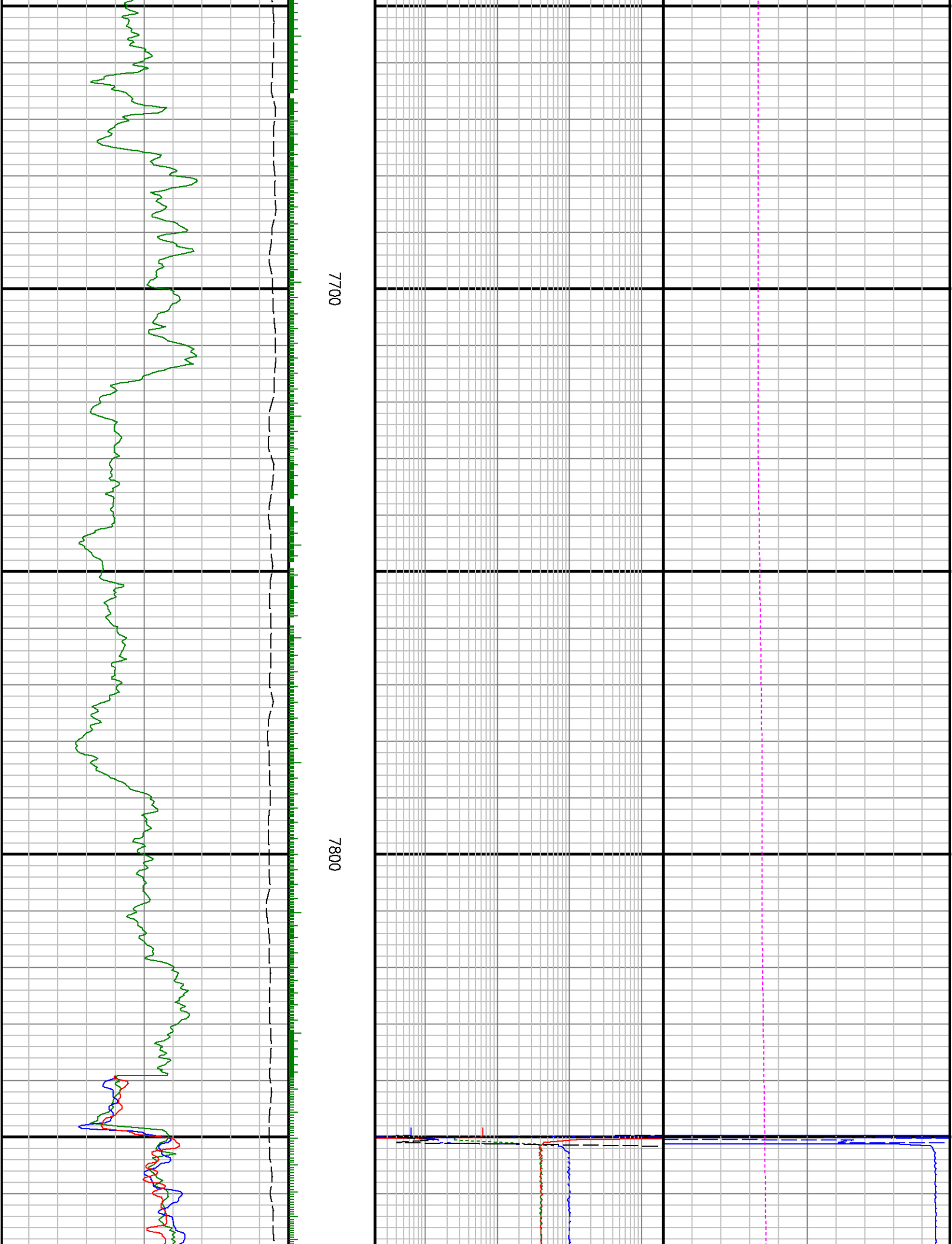


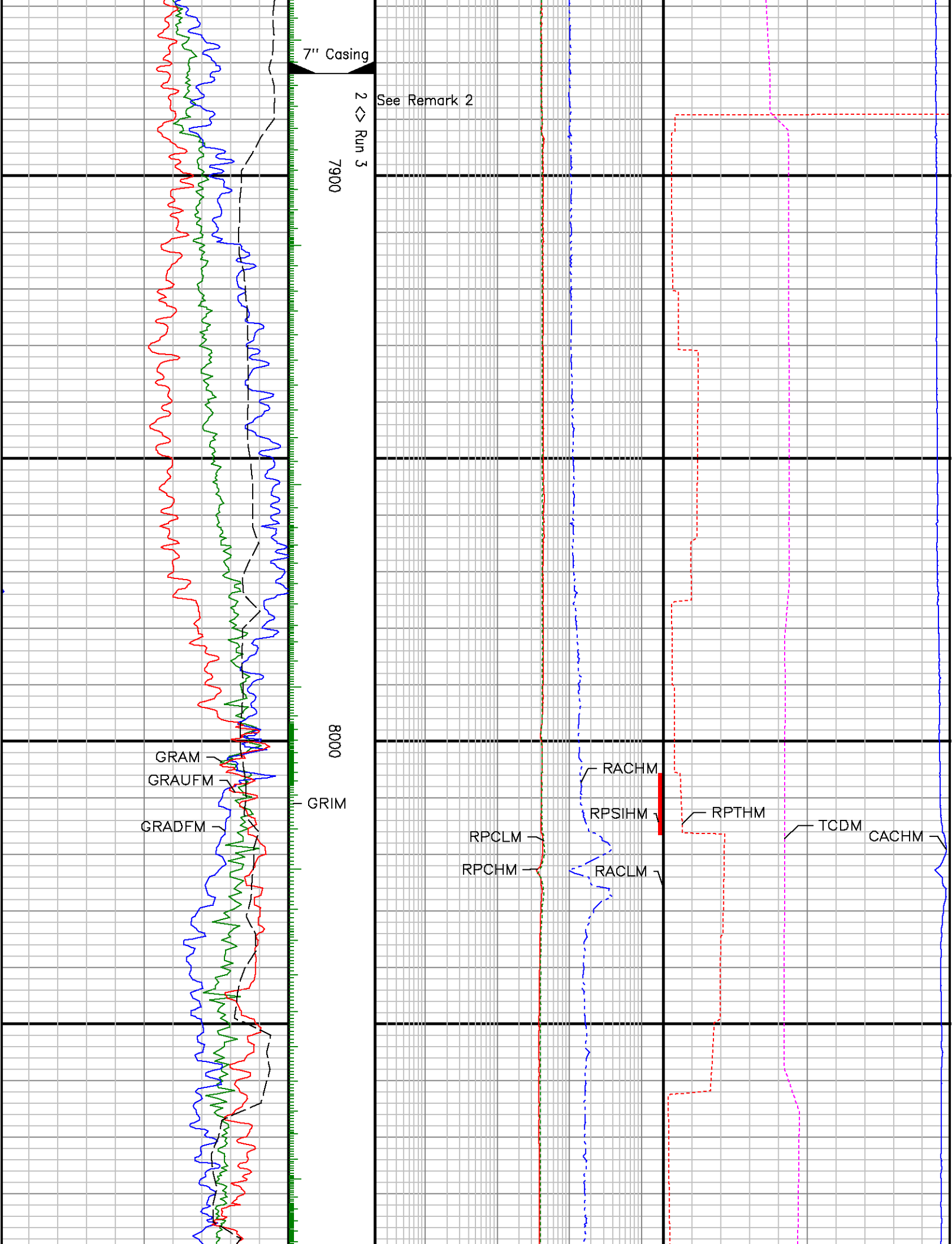
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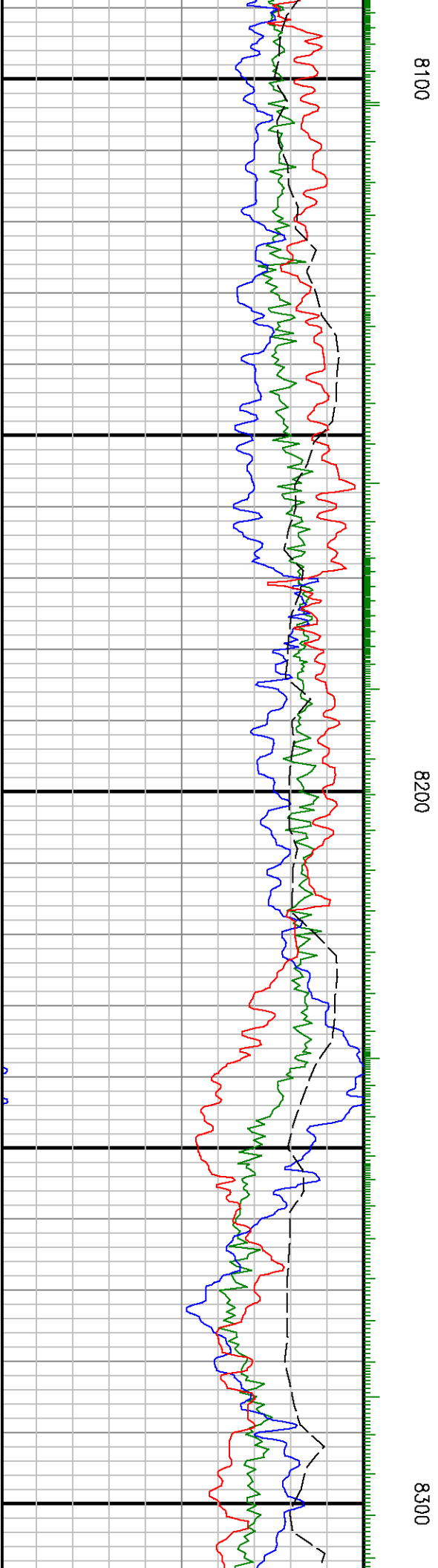
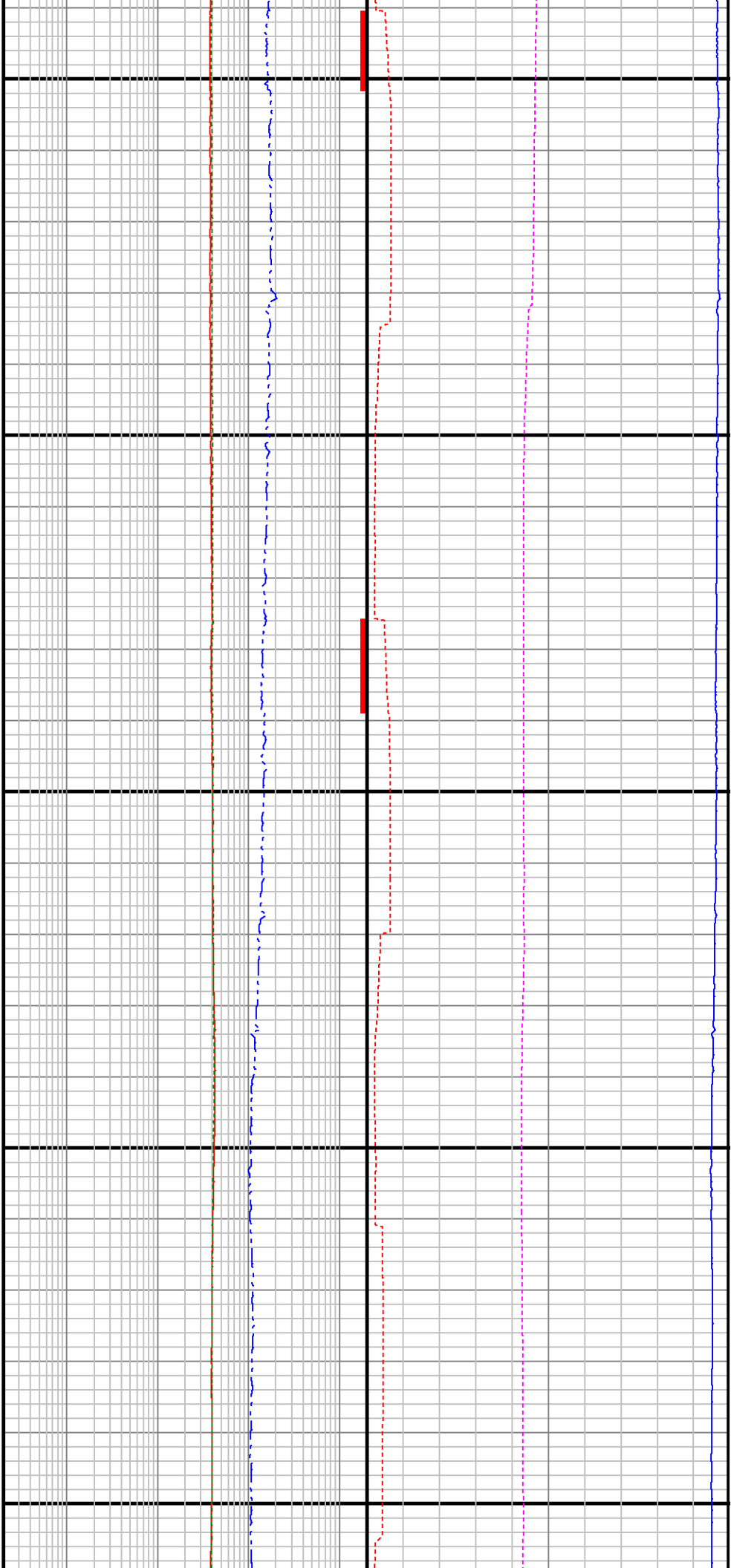
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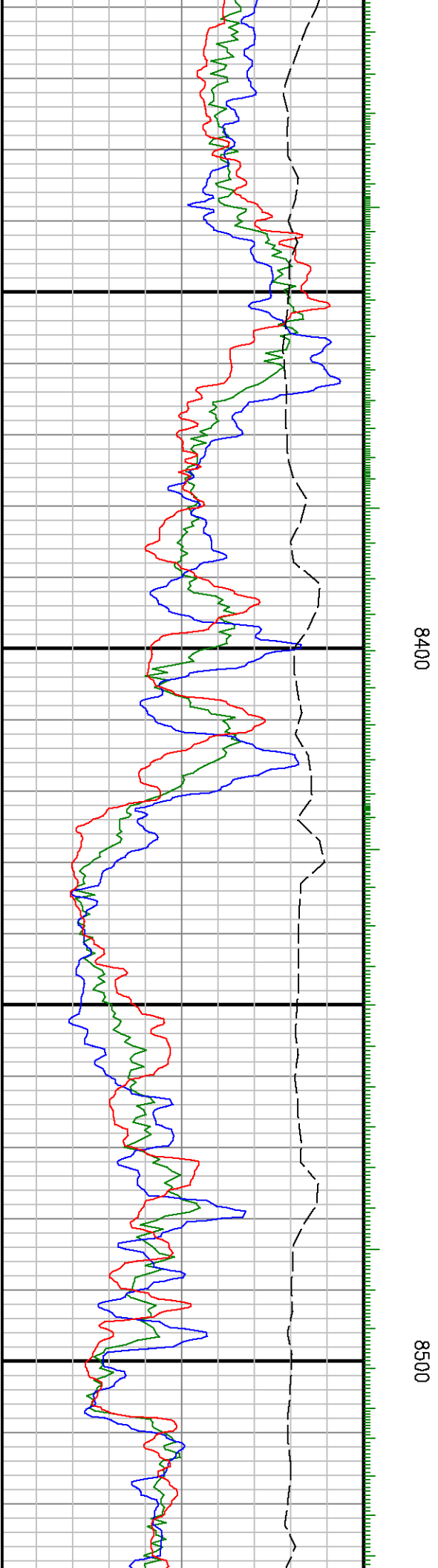
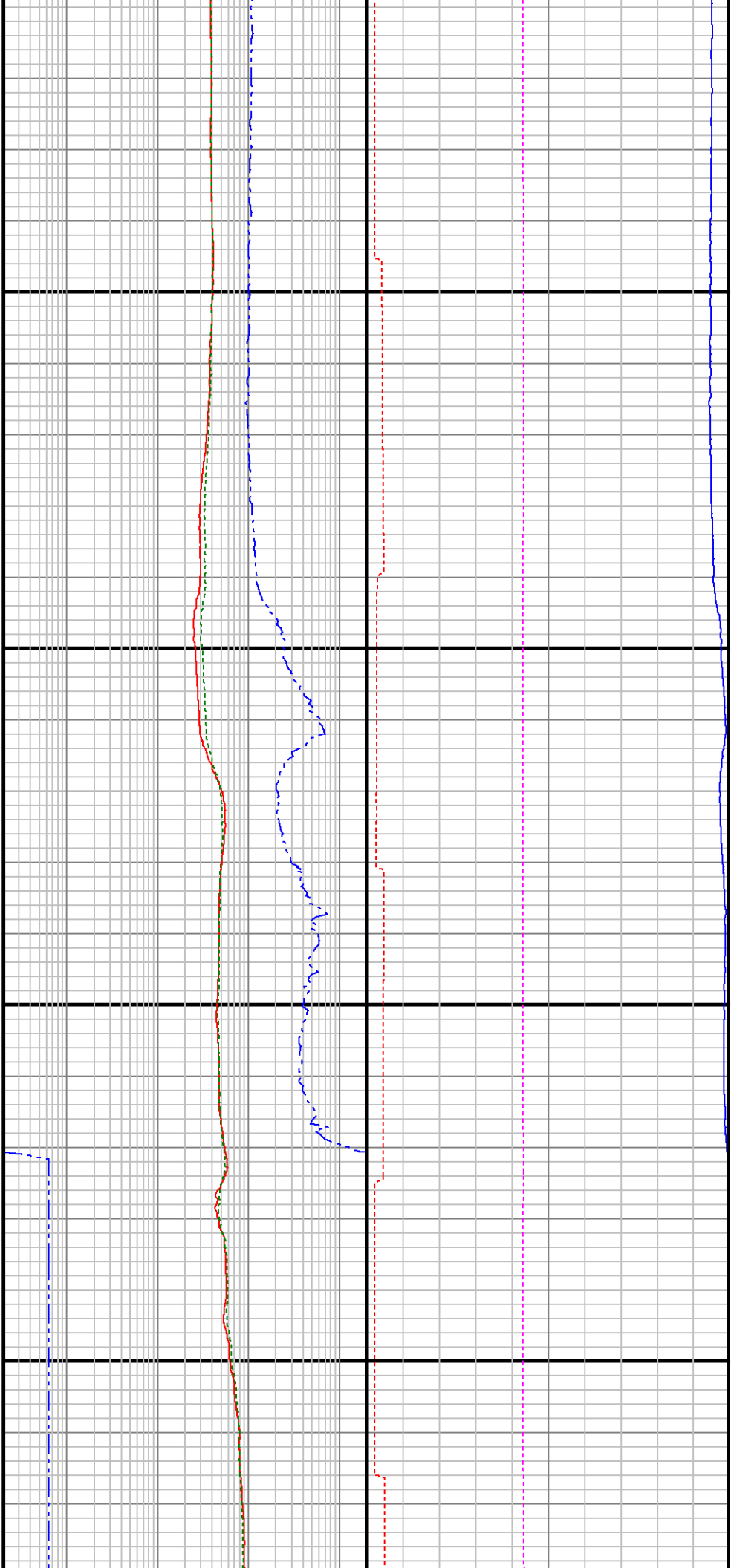


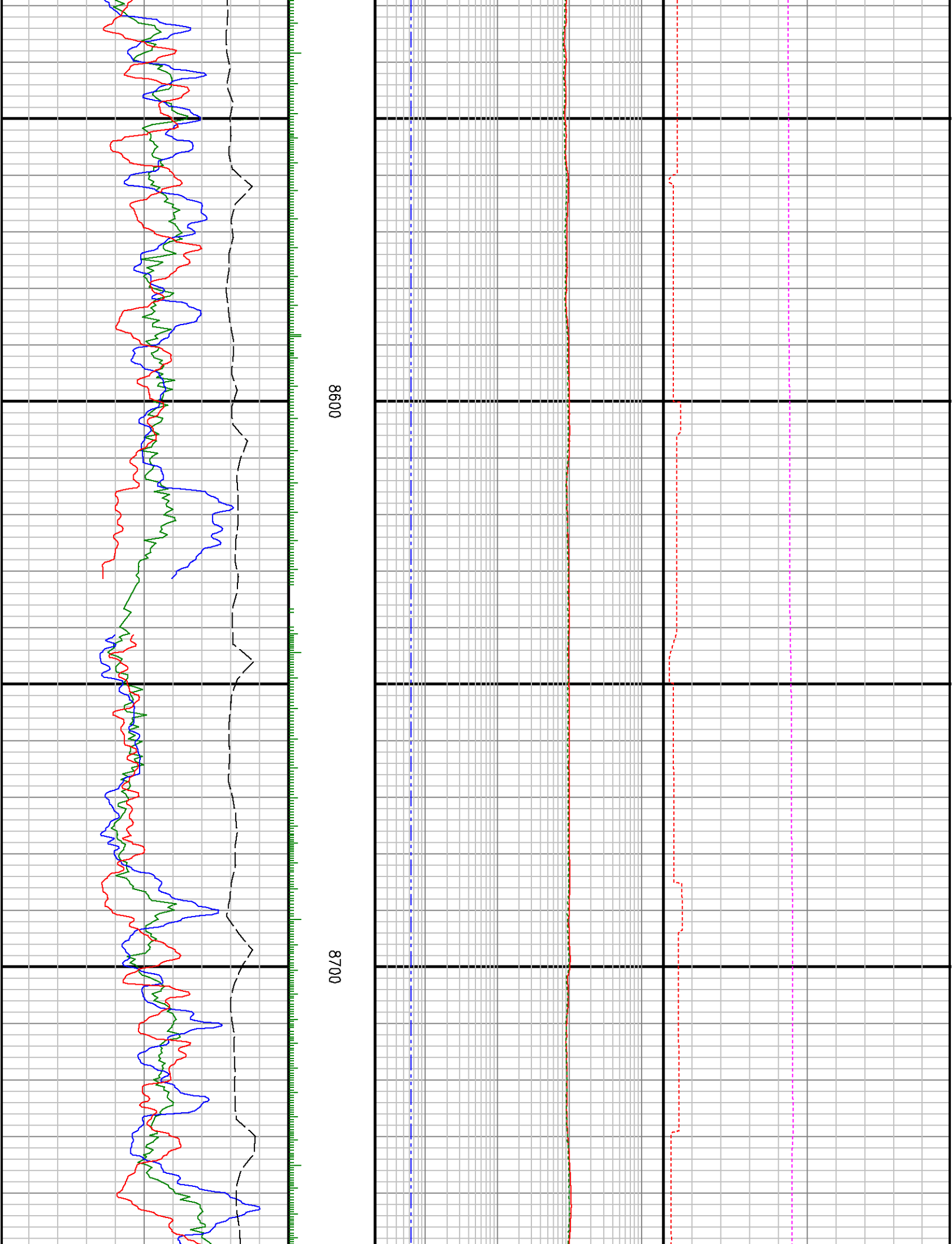


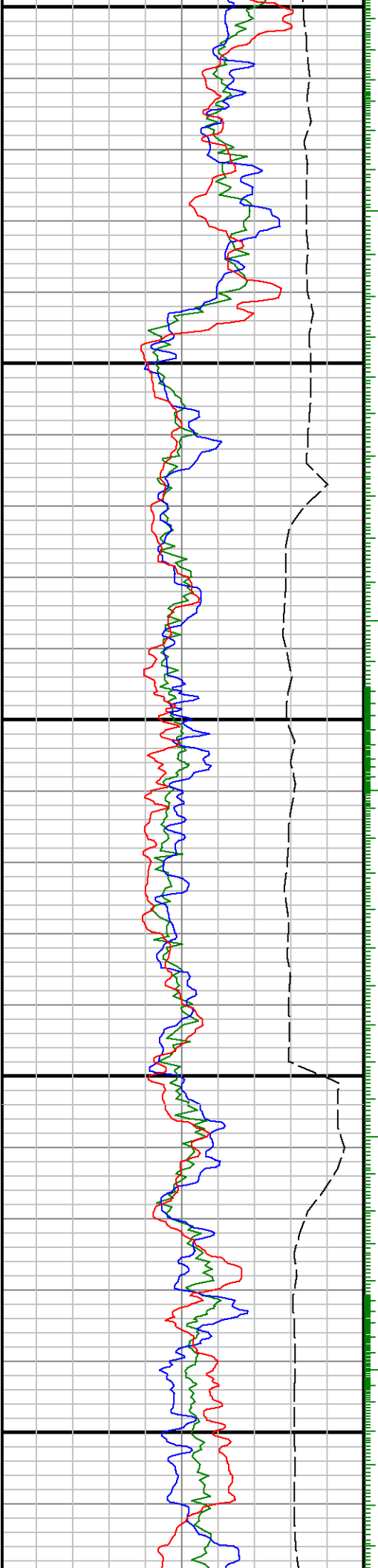






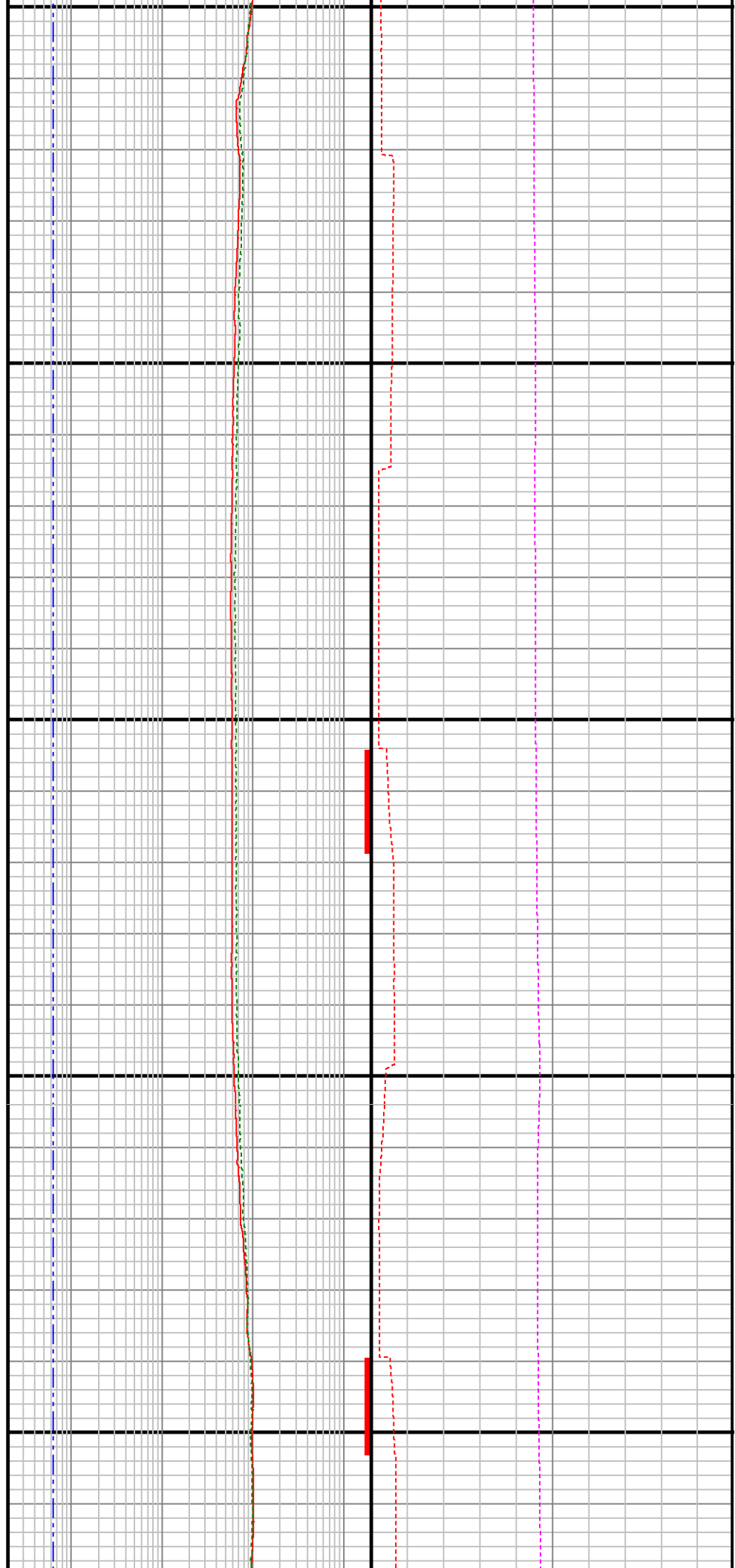


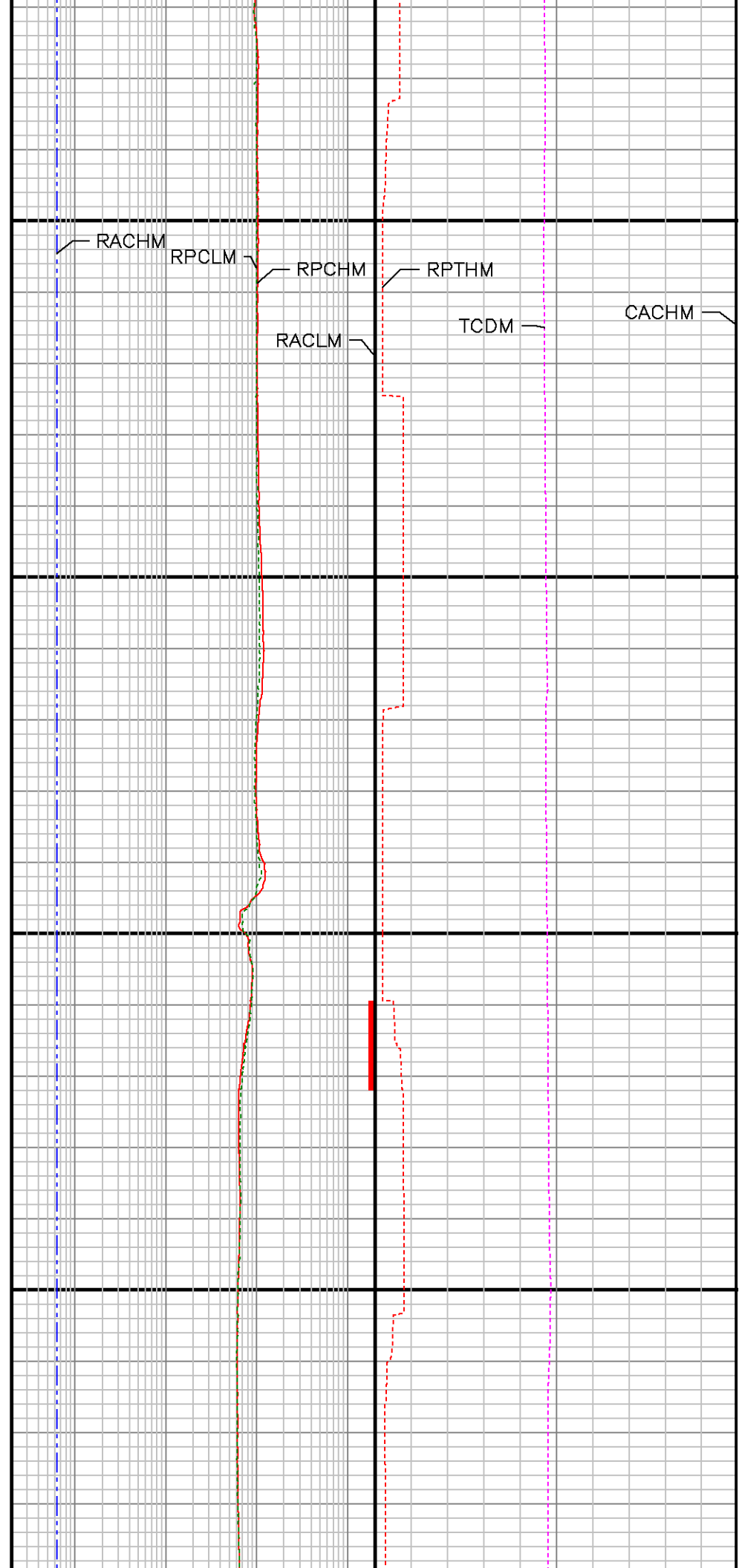
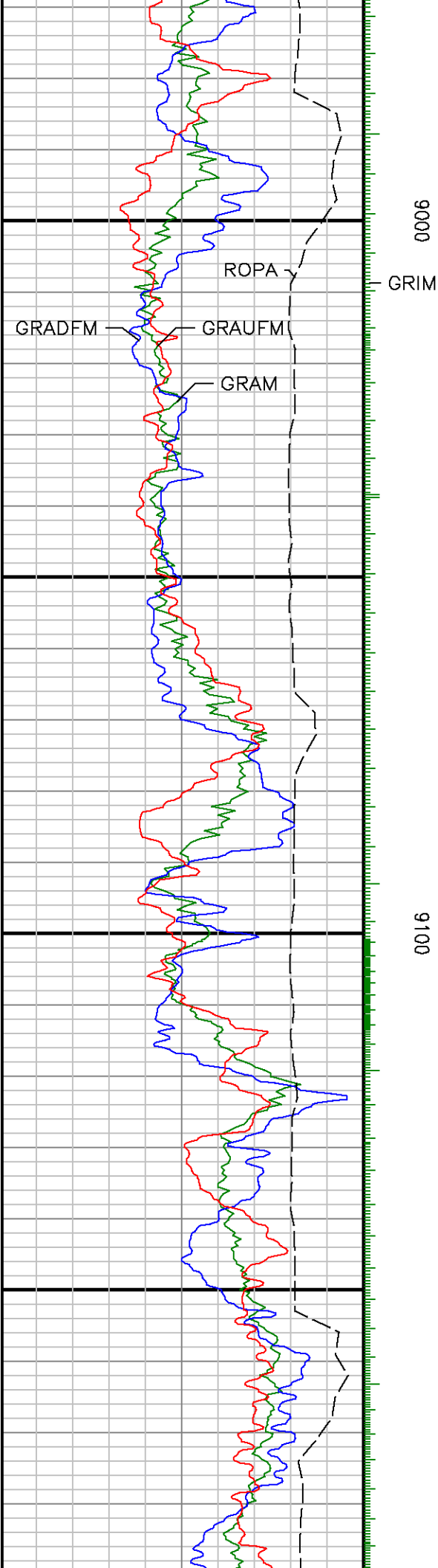


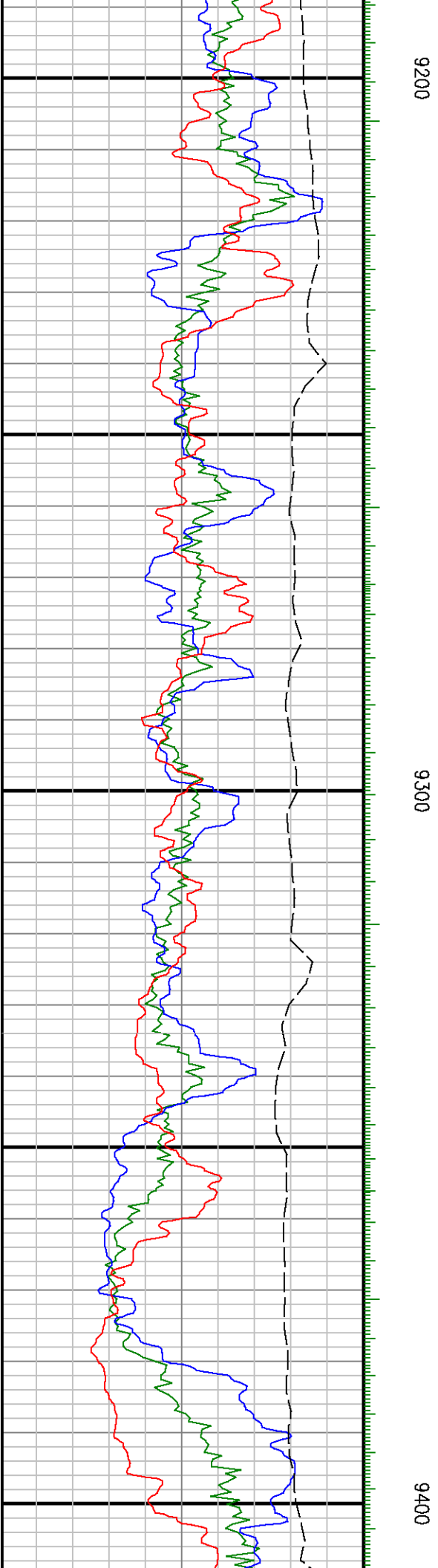
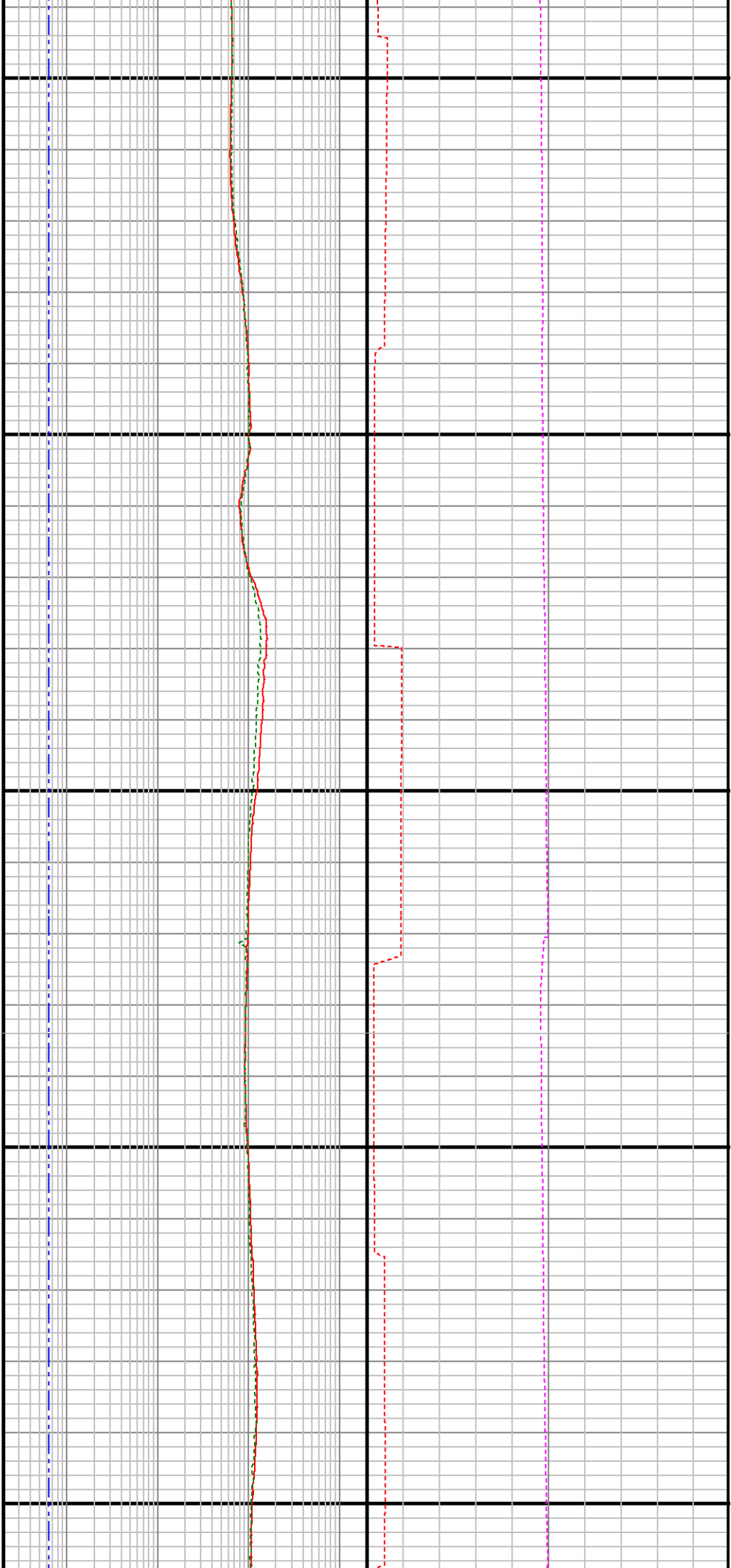


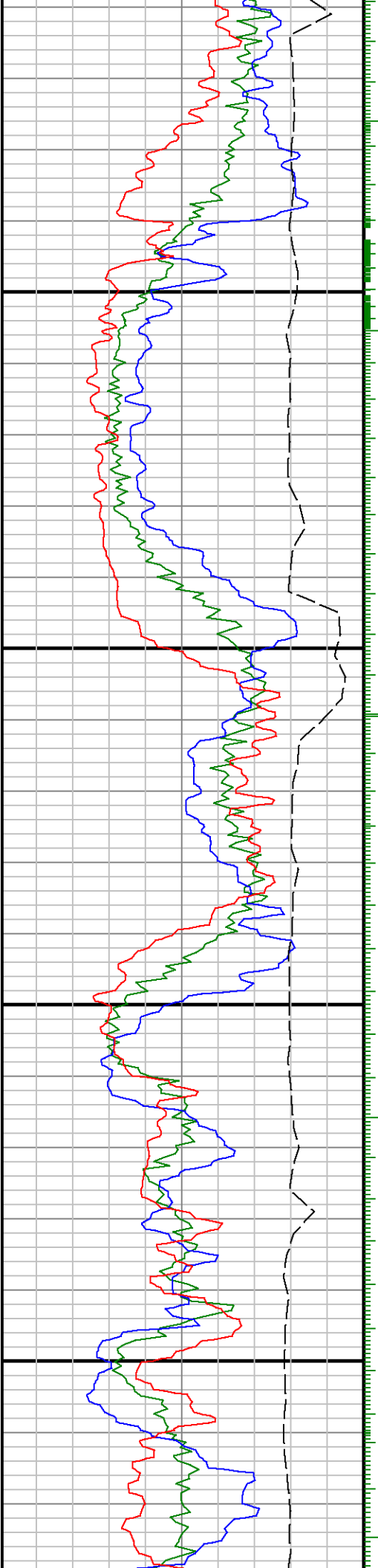
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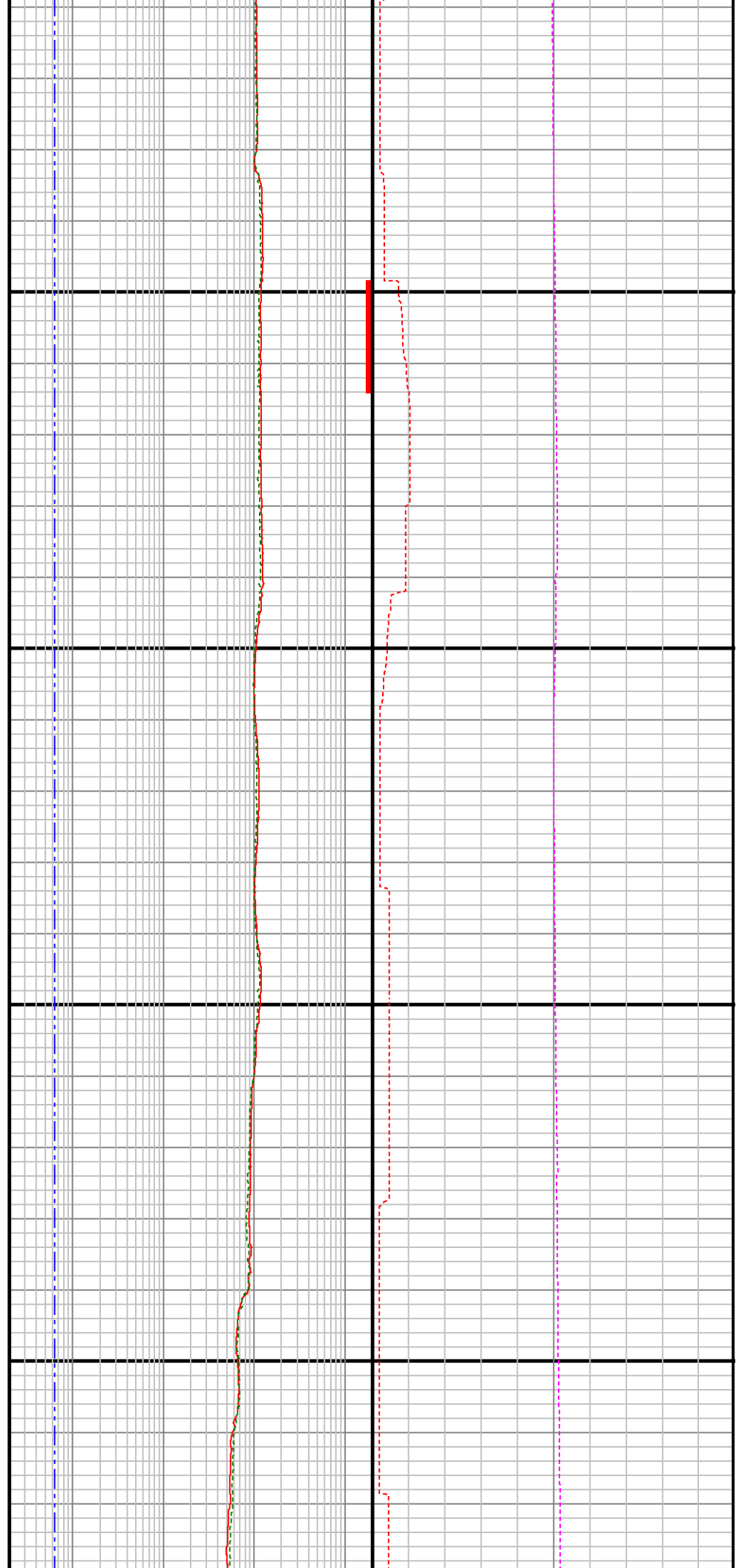


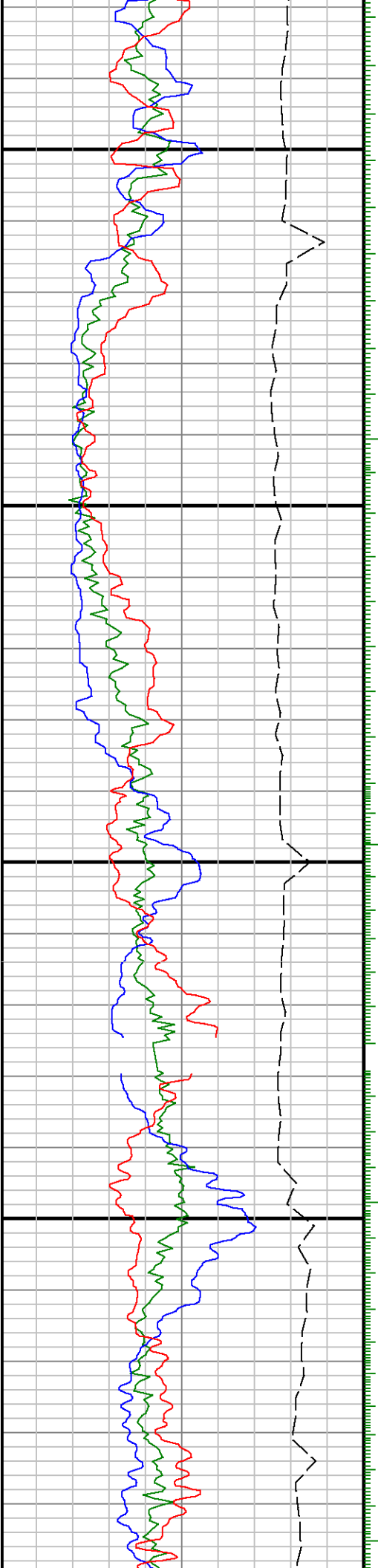




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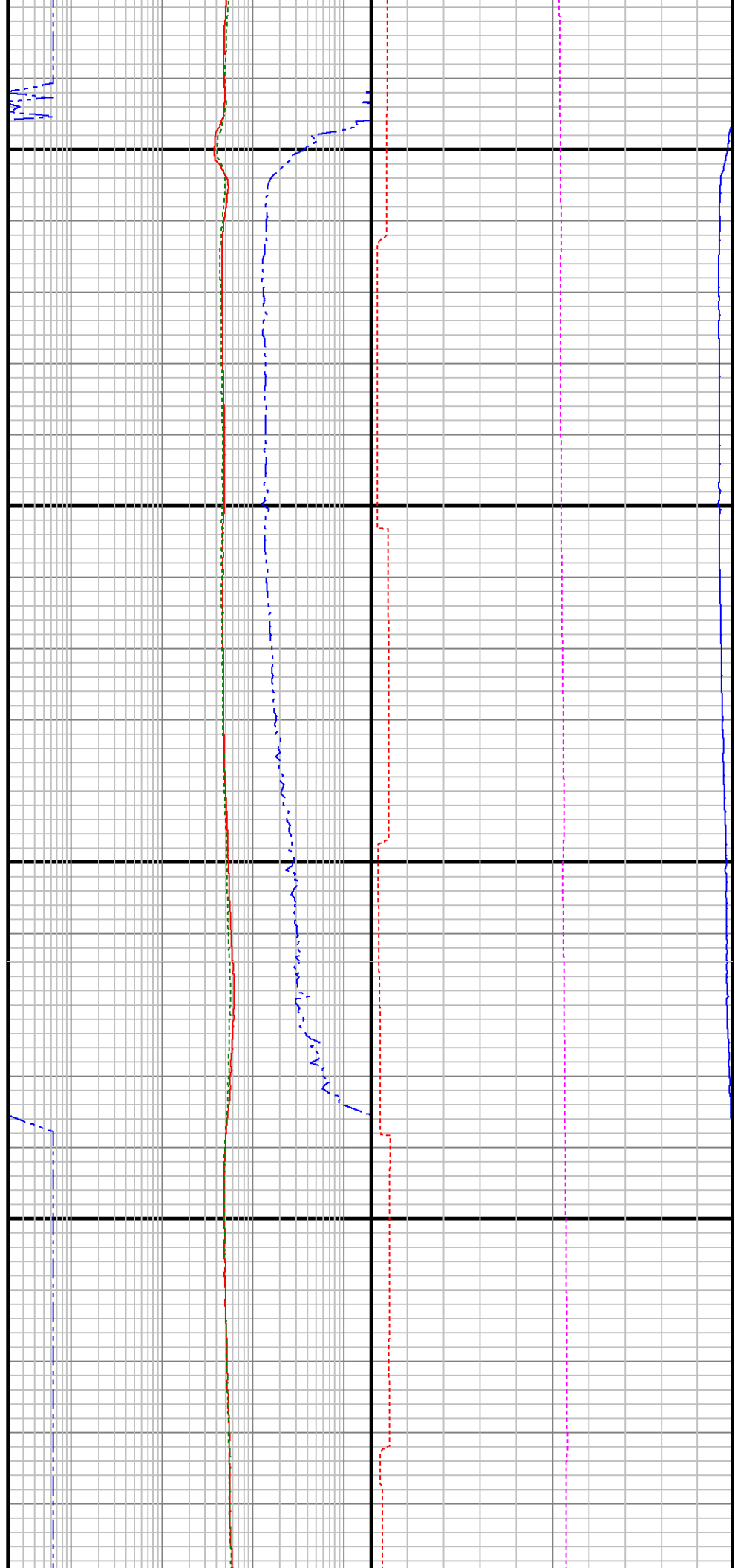
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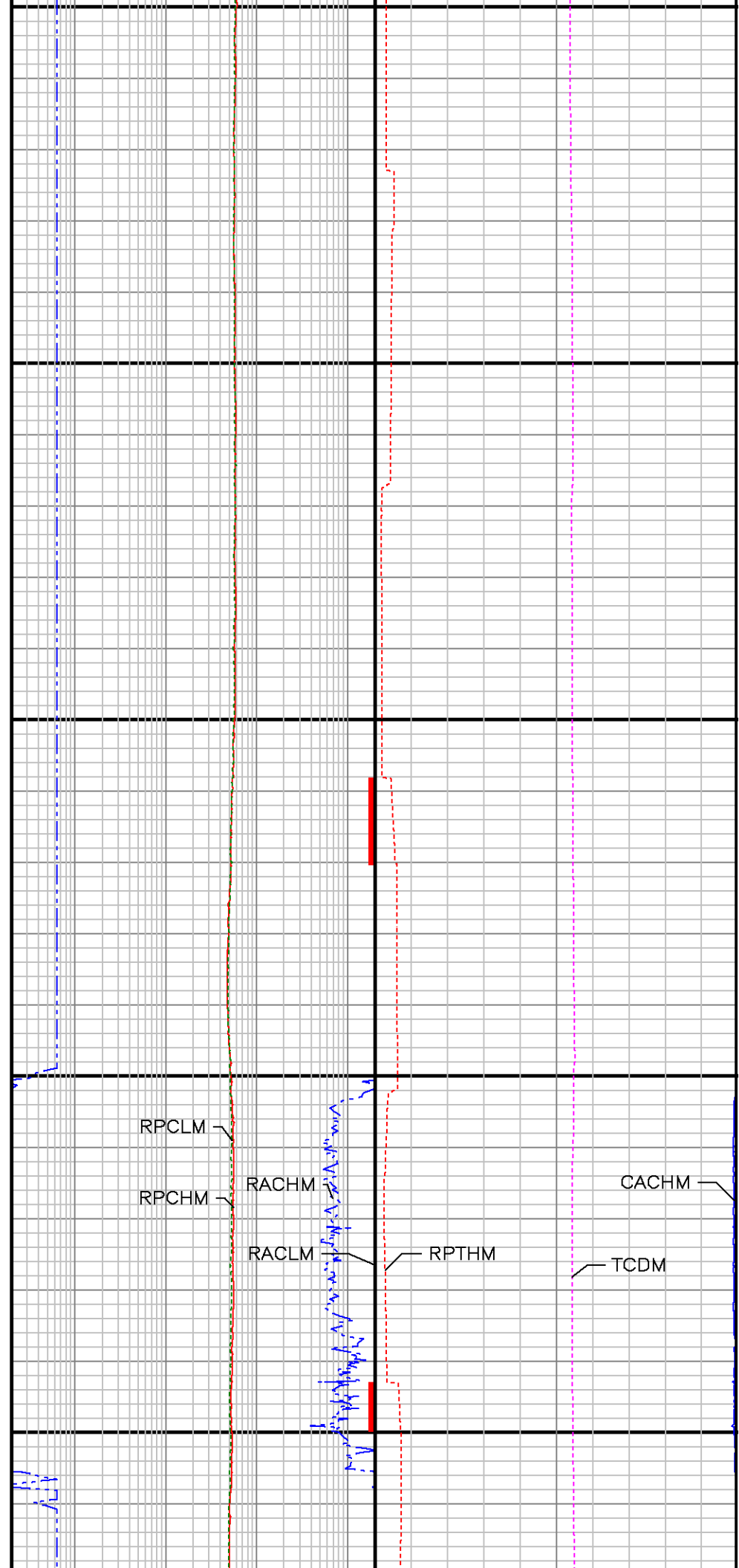
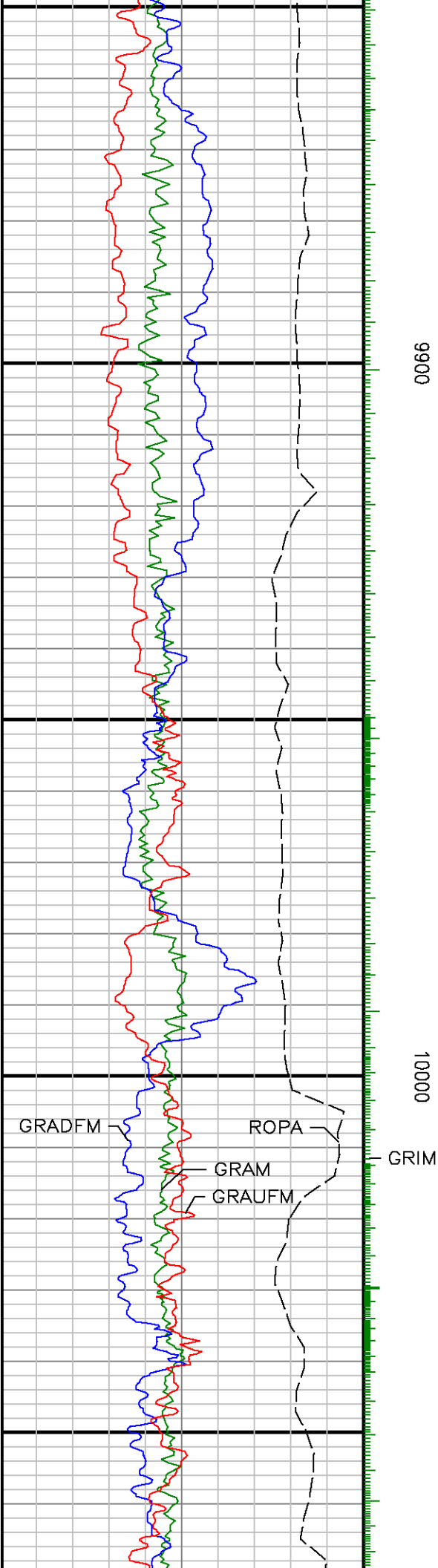


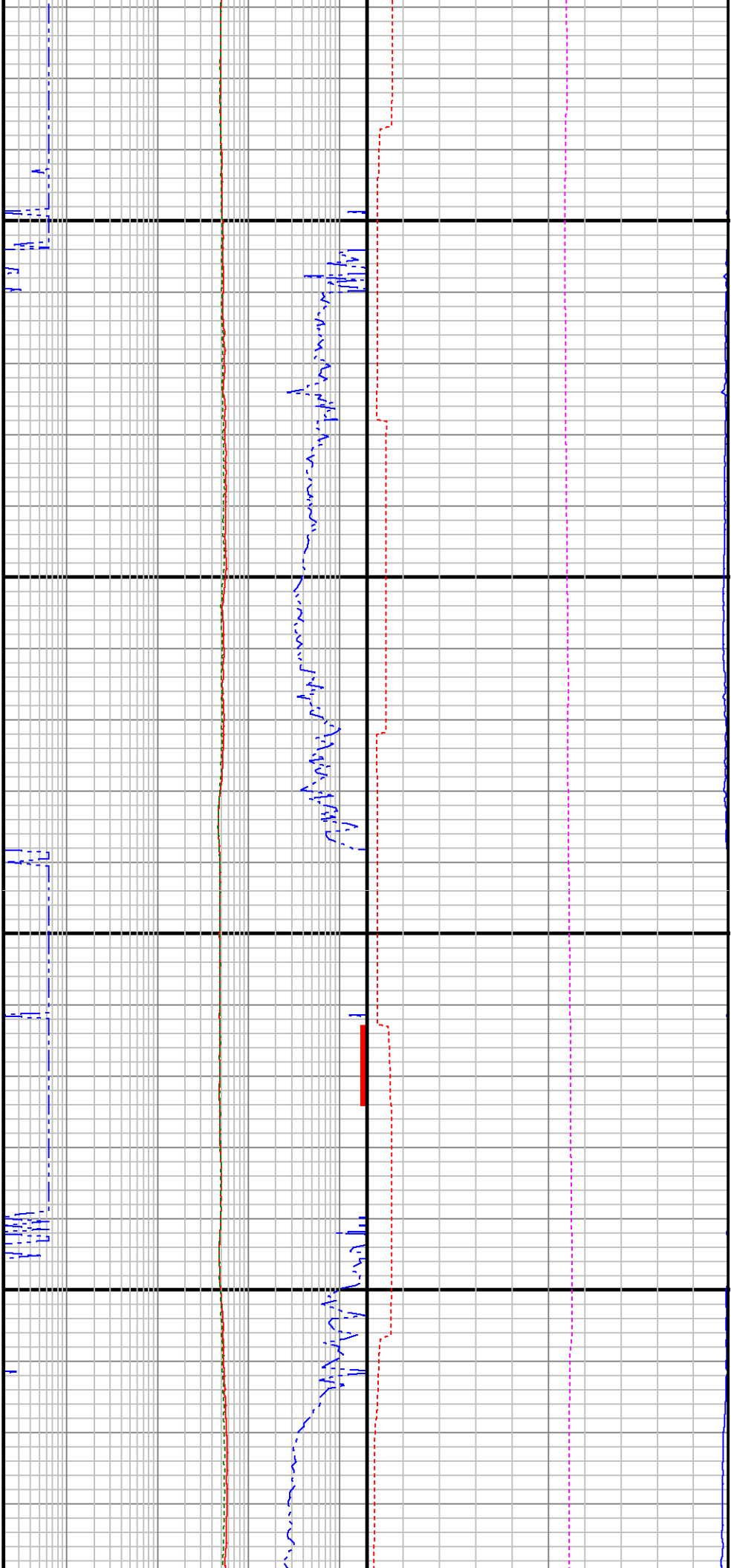


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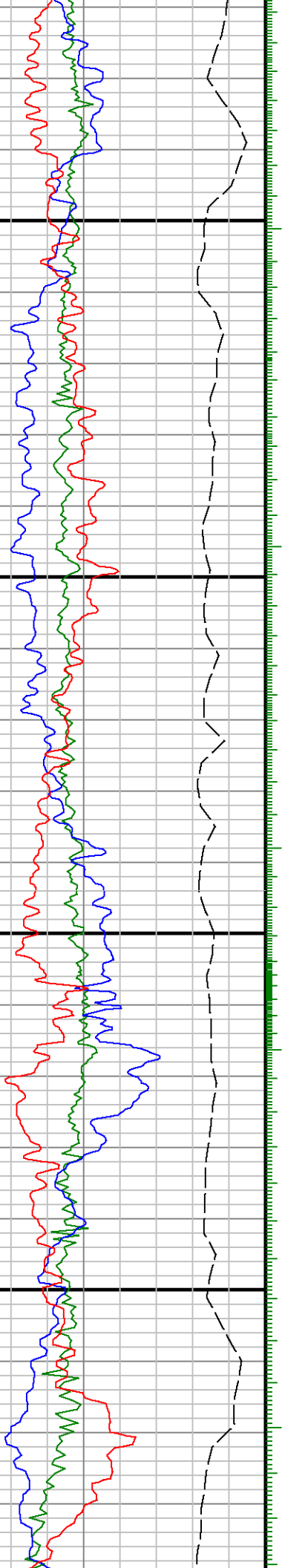


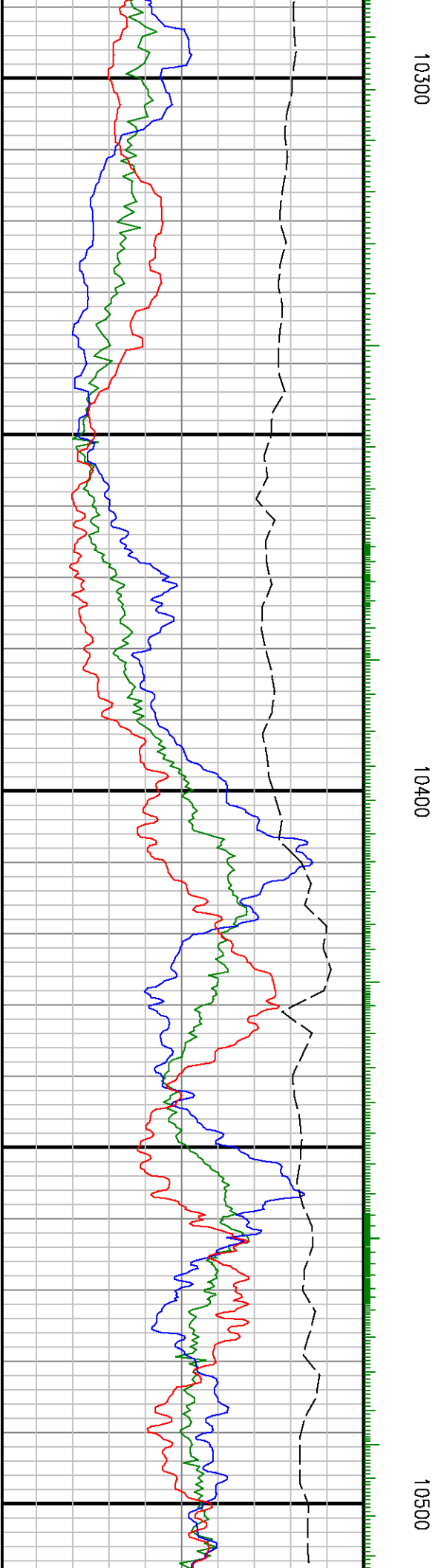
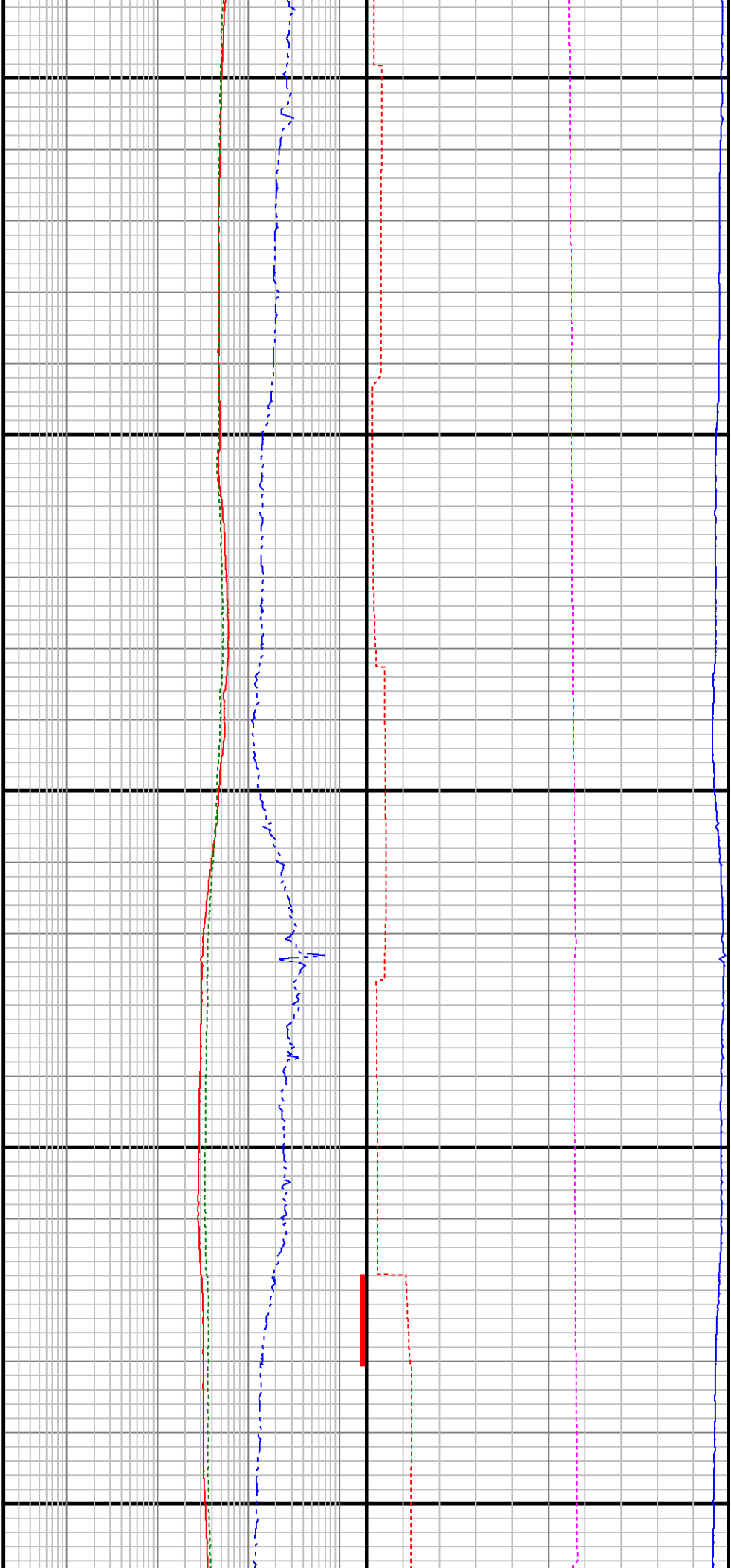


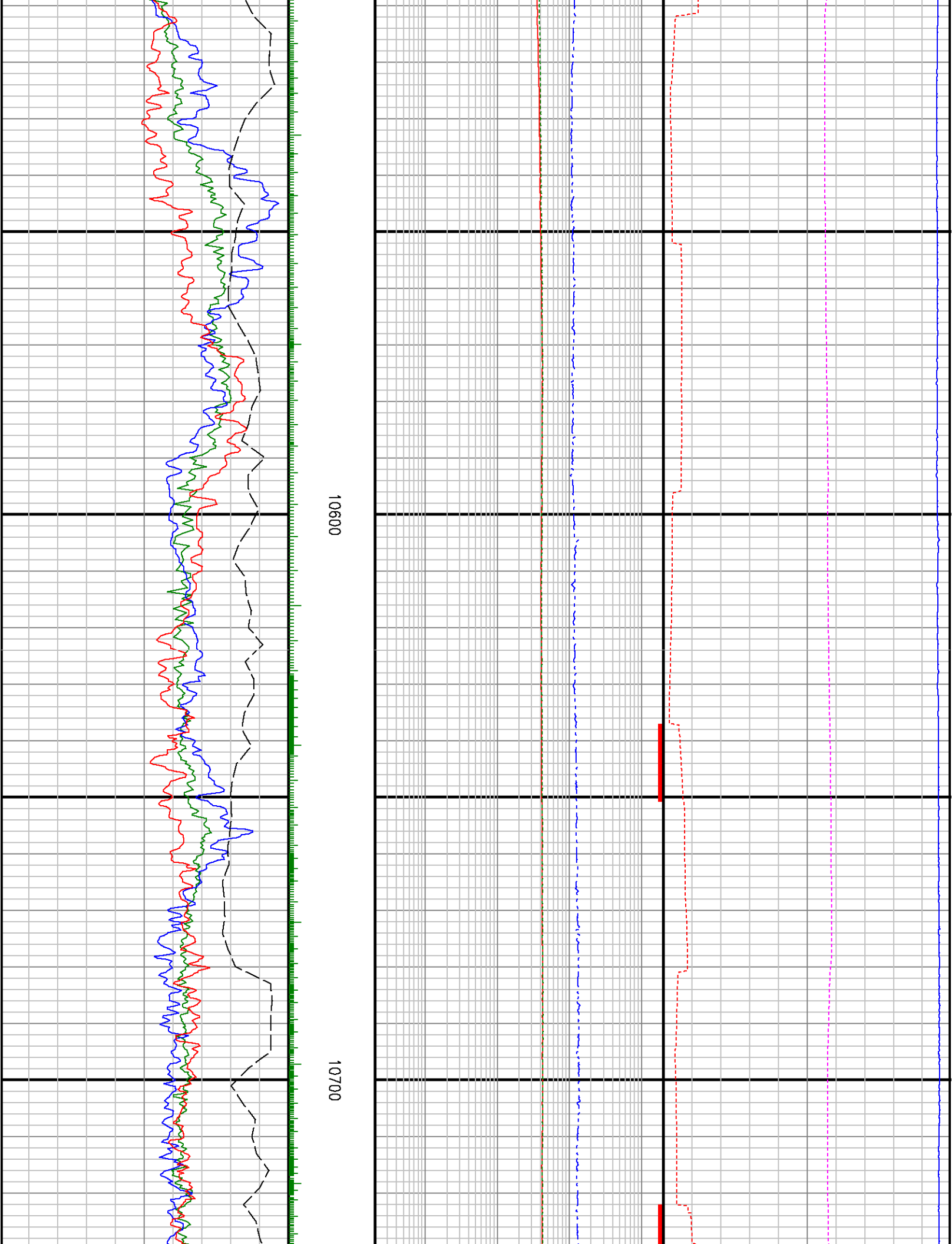


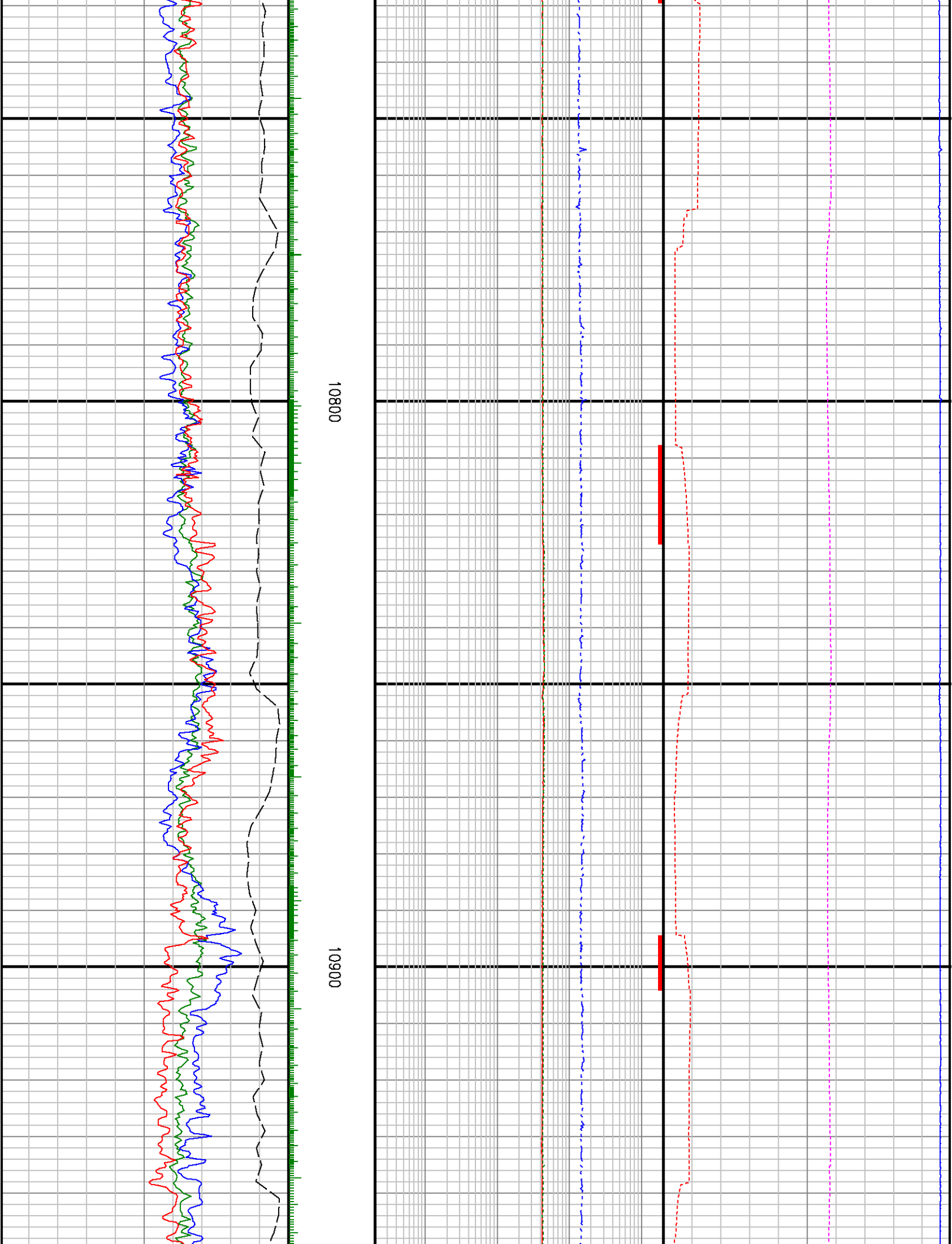
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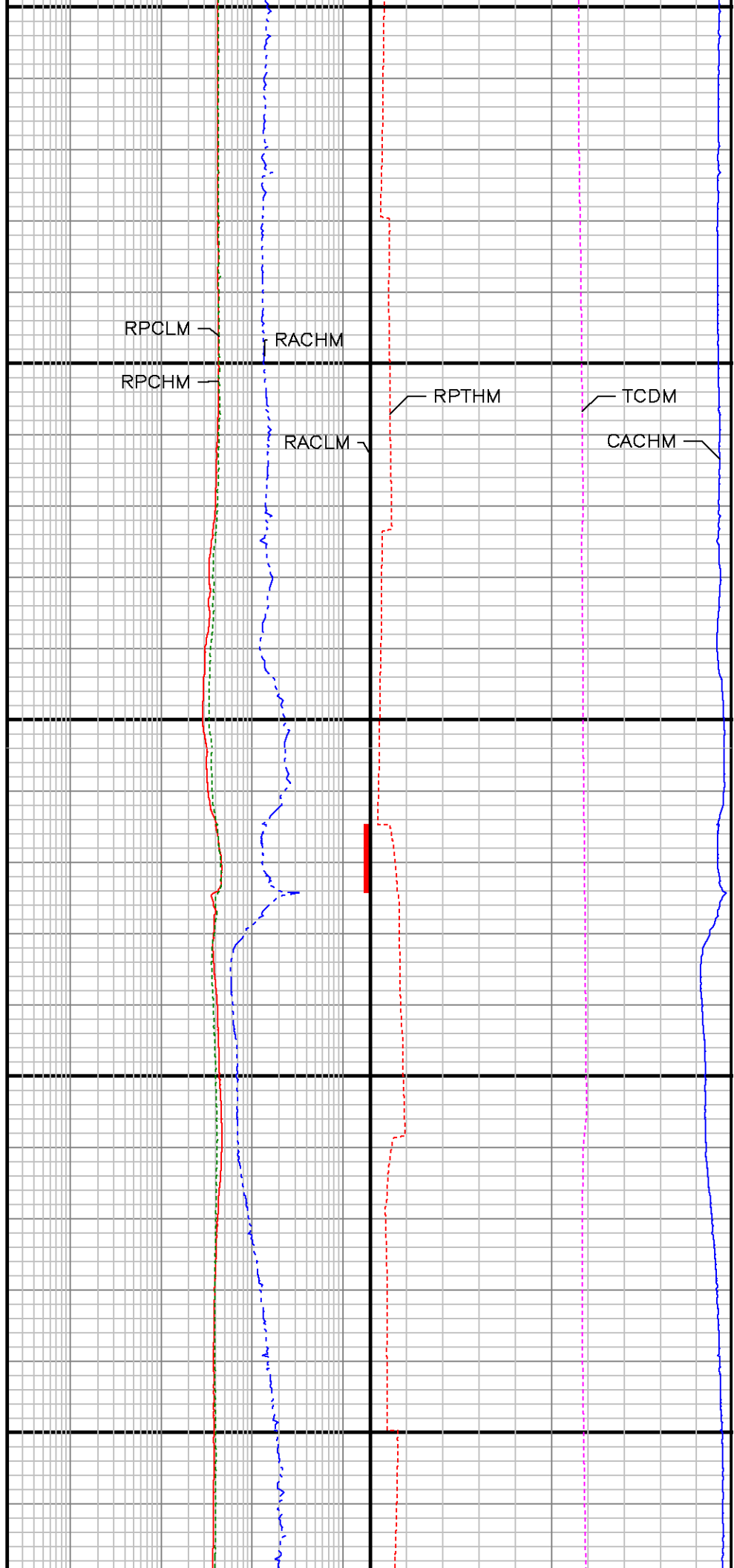
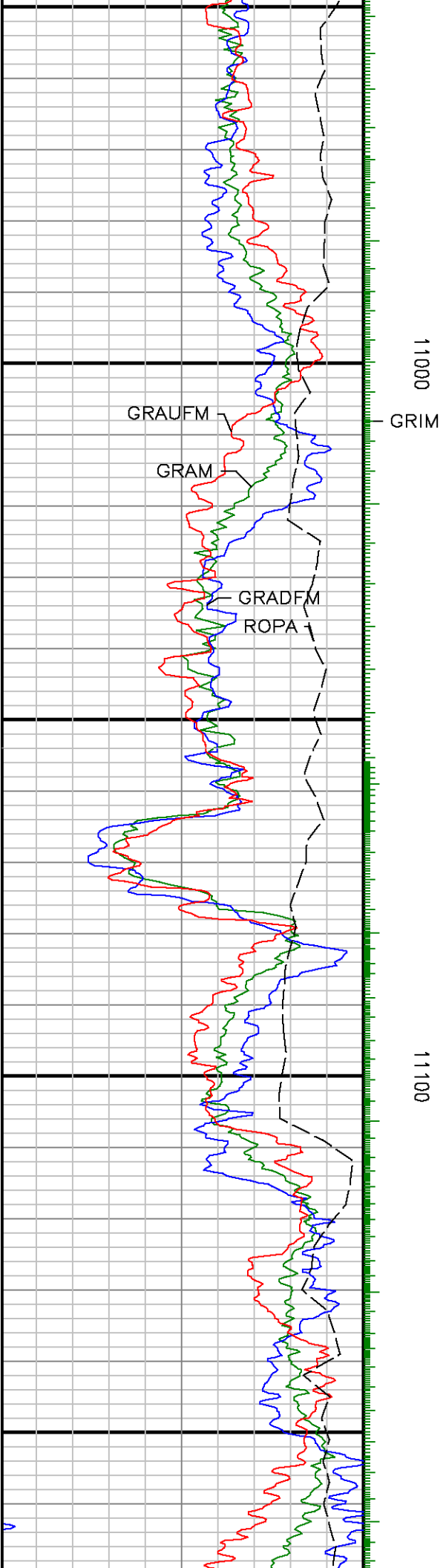
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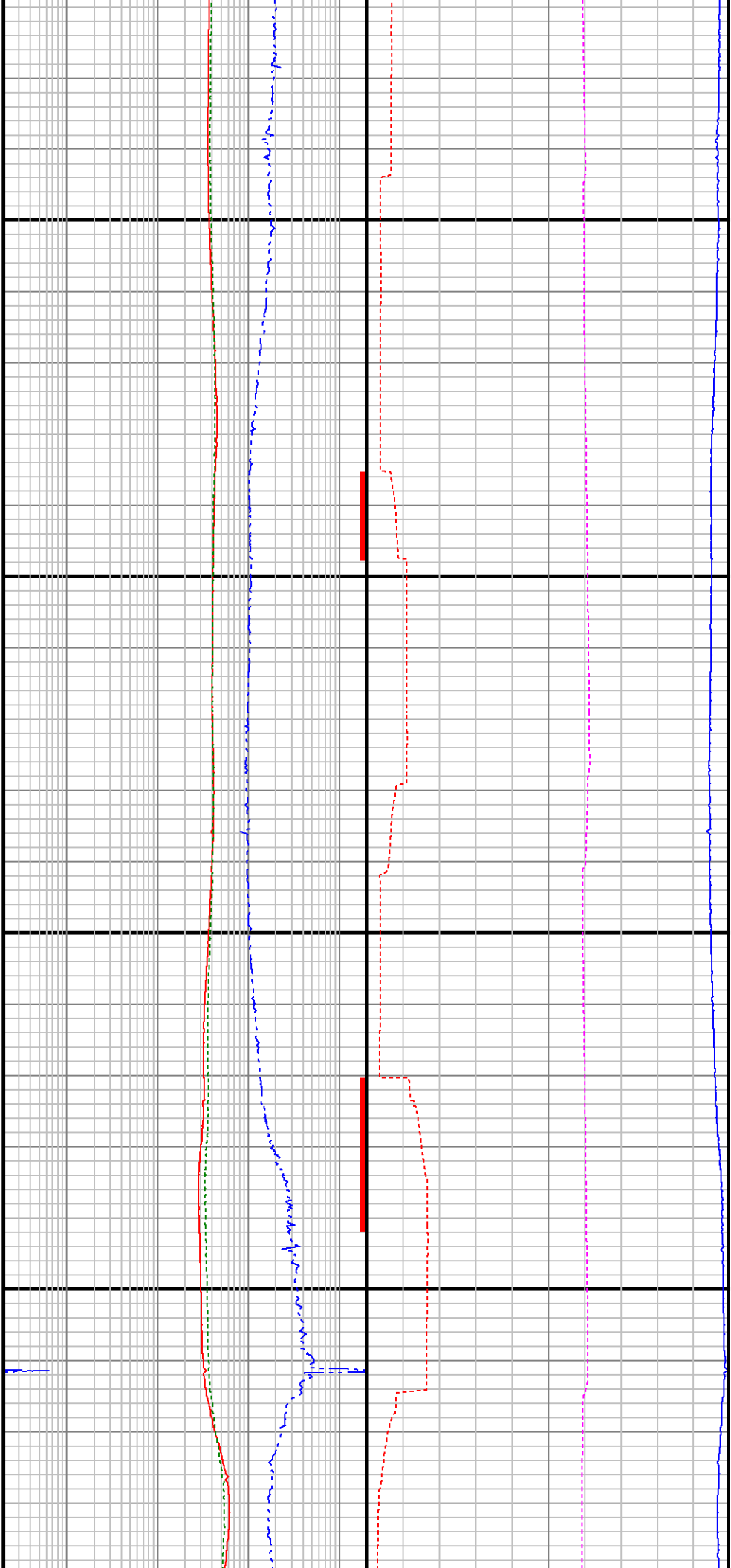






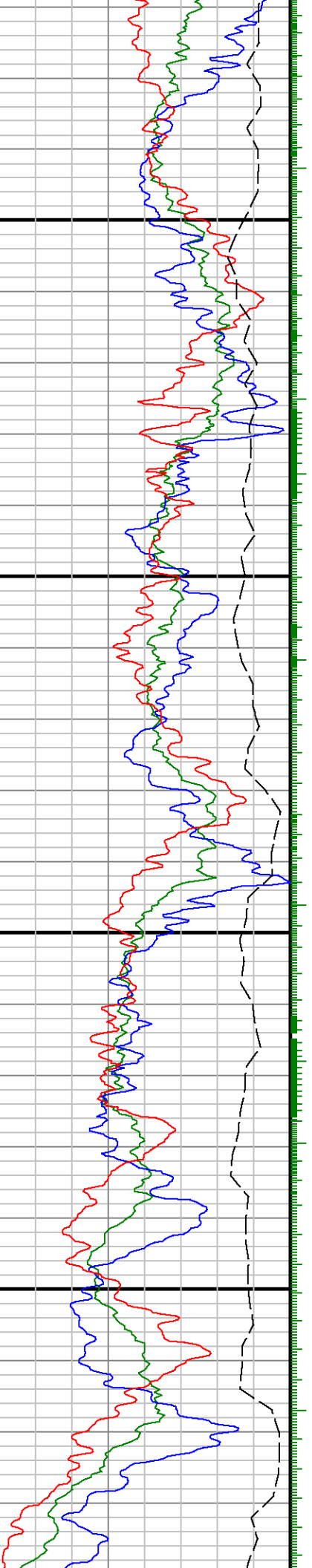


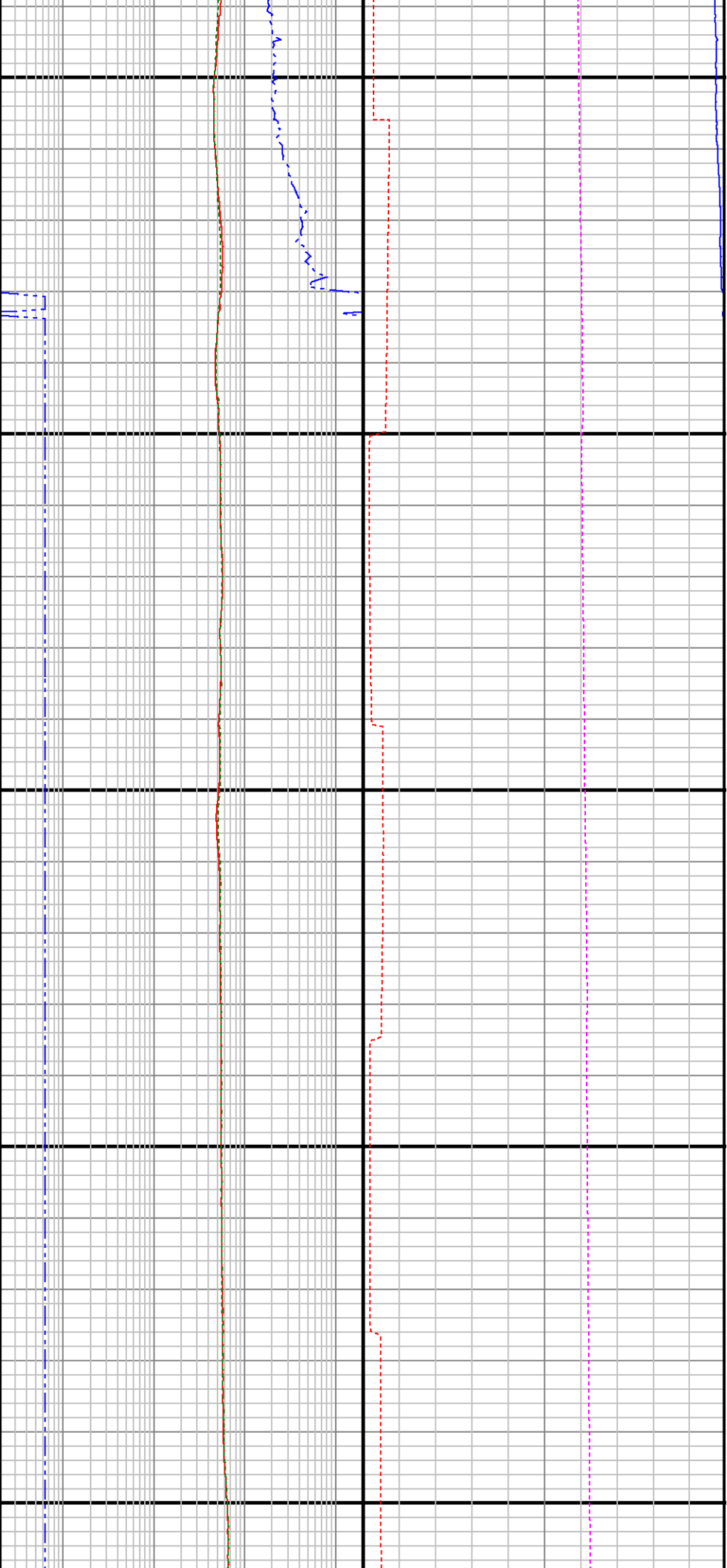




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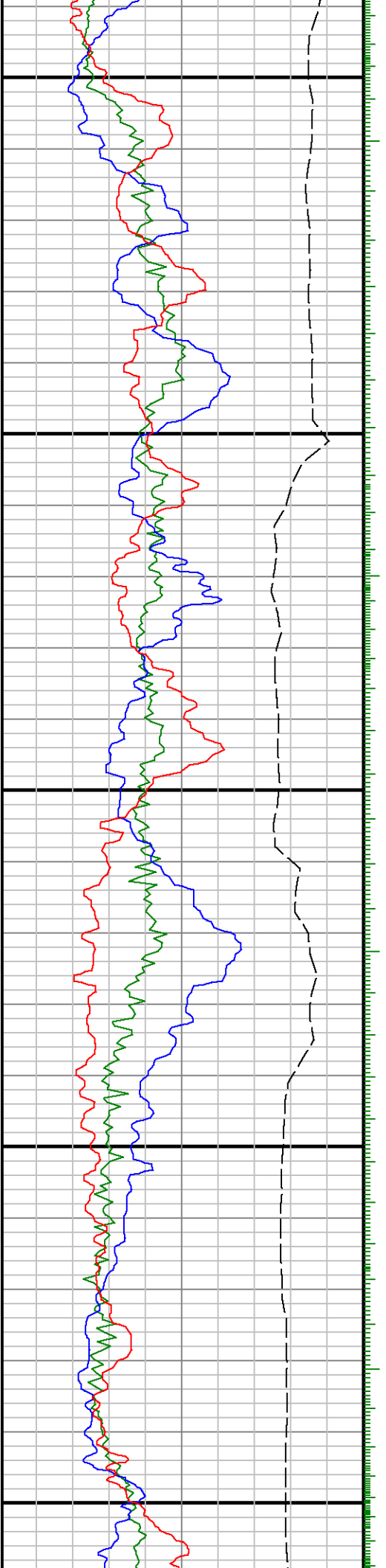


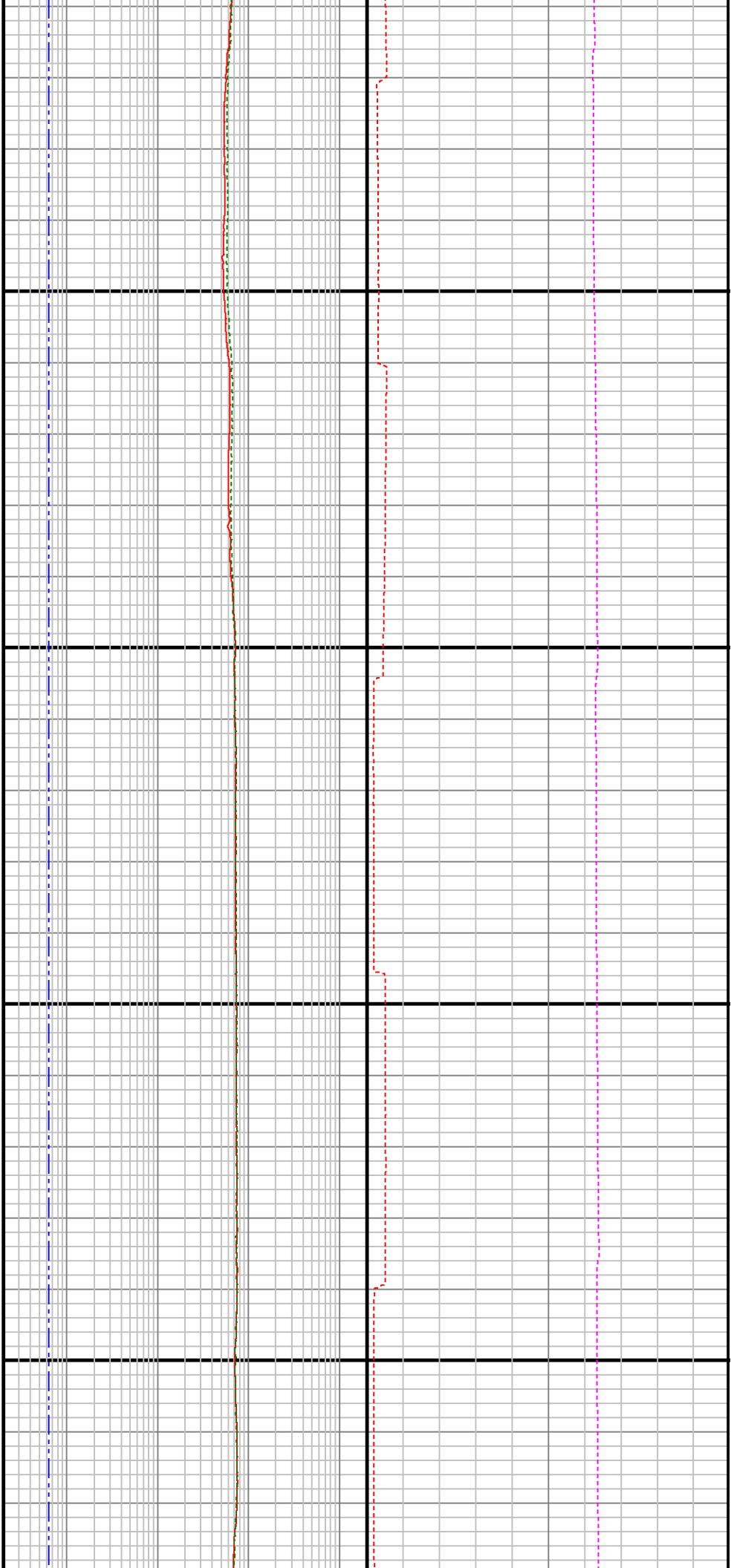


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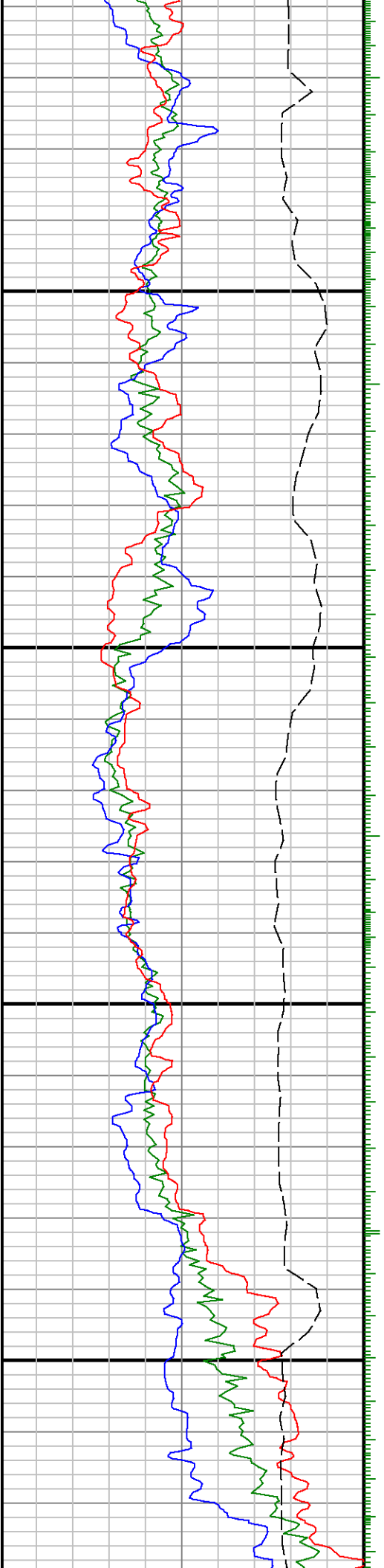
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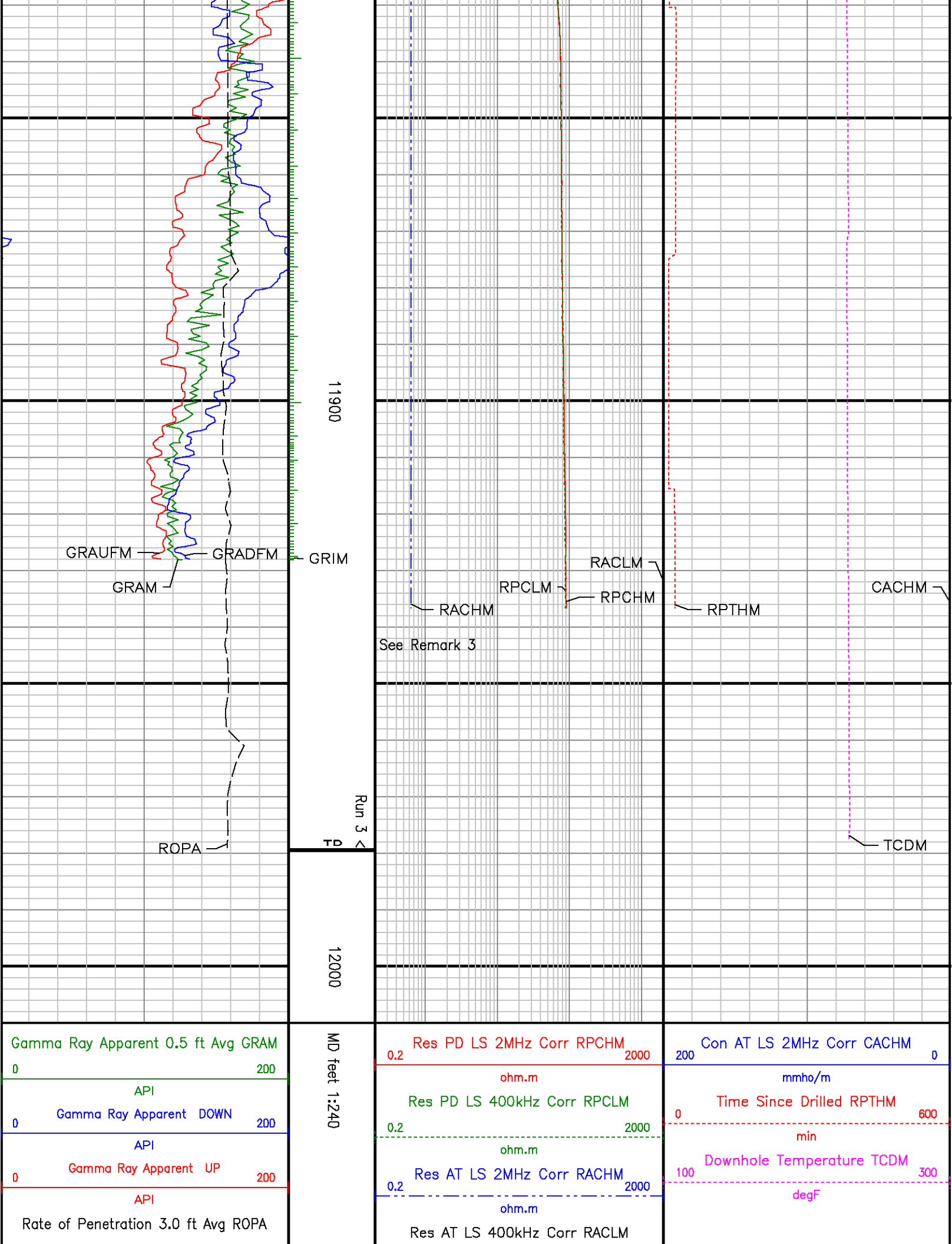




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ft/hr		ohm.m	