



Azimuthal Gamma Ray Multiple Propagation Resistivity

LWD MEMORY LOG

Scale:	Company: Anadarko					
1:240 MD	Well:	Verde 13-18HZ				
	Field:	Weld County				
Depth Reference:	Country:	Weld County	State:	United States		
Driller's Depth						
Status:	Surface Location:		Other Services:			
Final Print	Latitude:	Easting: N/A				
API No: 0512346258	Longitude:	N/A				
Job ID: 9052799	UTM:	N/A				
	SEC: 13	TMW: 1N	RGE: 66W			
Permanent Datum (P.D.): Mean Sea Level	Elevation:	0.00 ft	KB: N/A			
Log Measured From: Rig Floor	Above P.D.	5098.00 ft	DF: 5098.00 ft			
			GL: 5072.00 ft			
Dates	Interval Logged		Magnetic Field Reference			
Date From: 2018-03-17	Top: (ft) 1924.00	Azi Reference North: True	Dip Angle: (deg) 66.56			
Date To: 2018-03-22	Bottom: (ft) 19170.00	Total Magnetic Field Strength: (nT)	52476			
Spud Date: 2018-03-18		Mag to Reference North Correction: (deg)	7.82 E			
Borehole Record	Casing Record					
Hole Size (in)	From (ft)	To (ft)	Size (in)	Weight (lb/ft)	From (ft)	To (ft)
8.500	1924.00	19170.00	9.625	32.00		26.00

©"4239"Dcmgt"Jwjjgu."c"IG"eqorcp{."NNE"ô"Cnn"tkijvu"tgugt xgf0"Dcmgt"Jwjjgu."c"IG"eqorcp{."NNE"cpf"kvu"chhknkcvgu"*ôDJIGö+"rtqxfku"vjku"kphqtocvkqp"qp"cp"ôcu"kuô"dcuku"hqt"igpgtcn"kphqtocvkqp" purposes and believes it to be accurate as of the date of publication. BHGE does not make any representation as to the accuracy or completeness of the information and makes no warranties of any kind, specific, implied or oral, to the fullest extent permissible by law, including those of merchantability and fitness for a particular purpose or use. BHGE hereby disclaims any and all liability for any direct, indirect, consequential or special damages, claims for lost profits, or third party claims arising from the use of the information, whether a claim is asserted in contract, tort, or otherwise. The BHGE logo is a trademark of Baker Hughes, a GE company, LLC. GE and the GE monogram are trademarks of General Electric Company used under trademark license.

Log Run Summary

Run	Bit	Bit	Bit	Bit	Assembly	Logged Interval	Bit Depth Interval	Date / Time	Circ.
-----	-----	-----	-----	-----	----------	-----------------	--------------------	-------------	-------

No	Run No.	Size (in)	Type	Gauge Length (in)	Type	Top (ft)	Bottom (ft)	From (ft)	To (ft)	Start Logging	End Logging	Hours (h)
1	1	7.875	PDC	2.00	Steerable	1924.00	10014.00	1924.00	10064.00	2018-03-18 18:18	2018-03-20 17:55	40.08
2	2	8.500	PDC	2.00	AutoTrak Curve	10014.00	19158.00	10064.00	19170.00	2018-03-21 08:01	2018-03-23 20:09	57.74

Crew

Name	Arrive Wellsite	Depart Wellsite	Name	Arrive Wellsite	Depart Wellsite	Name	Arrive Wellsite	Depart Wellsite
Matt Yule	2018-03-17	2018-03-24	Ryan Hull	2018-03-17	2018-03-21	Doug Rusco	2018-03-21	2018-03-24

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 22:21	1	1924.00	Diesel-Oil Based Mud	9.0	81	N/A	7.2	72/28	Active Pit	25000	0.00
2018-03-19 20:12	1	7090.00	Diesel-Oil Based Mud	9.0	61	N/A	5.3	72/28	Active Pit	25000	0.00
2018-03-20 18:12	1	9860.00	Diesel-Oil Based Mud	9.1	65	N/A	6.2	72/28	Active Pit	35000	0.00
2018-03-21 00:50	2	9860.00	Diesel-Oil Based Mud	9.1	65	N/A	6.2	72/28	Active Pit	35000	0.00
2018-03-22 23:57	2	15745.00	Diesel-Oil Based Mud	9.2	55	N/A	6.8	73/27	Active Pit	36000	0.00
2018-03-24 00:02	2	18484.00	Diesel-Oil Based Mud	9.2	53	N/A	5.6	76/24	Active Pit	34000	0.00

Mud Resistivity Record

Date / Time	Run No.	Measured Depth (ft)	Surface Temp (degF)	Rm (ohm.m)	Rmf (ohm.m)	Rmc (ohm.m)	BHCT (degF)	Rm @ BHCT (ohm.m)	Rmf @ BHCT (ohm.m)	Rmc @ BHCT (ohm.m)
2018-03-24 06:26	2	19170.93	N/A	100.000	N/A	N/A	250.0	100.000	N/A	N/A

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	NaviGamma	11912316	Gamma (single)	10.61	46.64	6.500	3.250
1	NaviGamma	11912316	Directional (mag)	14.03	50.06	6.500	3.250
1	NaviGamma	11912316	VSS	14.03	50.06	6.500	3.250
2	OnTrak	11783371	Pressure	1.19	11931.96	6.750	0.000
2	OnTrak	11783371	Gamma (double)	2.08	11932.85	6.750	0.000
2	OnTrak	11783371	Resistivity (4tx)	6.12	11936.89	6.750	0.000
2	OnTrak	11783371	Directional (mag)	11.91	11942.68	6.750	0.000

Service and Tool Mnemonics

Mnemonic	Name	Description
GAM	NaviGamma	Probe Based Gamma Module, NaviTrak Platform
OTK	OnTrak	Sensor Sub (Inc, Azi, Temp, Azimuthal GR, Res, AP, VSS), OnTrak Platform
BCPM	BCPM	Bi-Directional Communication and Power Module, OnTrak Platform

Comments


- 1

Baker Hughes run 2 utilized a 6 3/4 inch OnTrak services (Multiple Propagation Resistivity) that was run 11928 feet behind a 8.5 inch bit and rotary steerable assembly to perform a MAD (Measurement After Drilling) pass from 1914 to 7234 feet MD (1837 to 6646 feet TVD).
- 2

Depth measurements were obtained from a depth control system not supplied or operated by Baker Hughes. Due to the lack of control by Baker Hughes LWD logging engineers, depth calibrations and measurements could not be independently verified and the unverified depths as supplied to Baker Hughes are being used to present logging data.

Curve Mnemonics

Presented Curves	Description	Units
CACLM	Conductivity Attenuation - Corrected - 400kHz	mmho/m
RACHM	Resistivity Attenuation - Corrected - 2MHz	ohm.m
RACLM	Resistivity Attenuation - Corrected - 400kHz	ohm.m
RPCHM	Resistivity Phase - Corrected - 2MHz	ohm.m
RPCLM	Resistivity Phase - Corrected - 400kHz	ohm.m
RPTHM	Resistivity Time Since Drilled	min
RPSIM	Sliding Indicator Flag	unitless
ROPA	Depth Averaged ROP 3 ft Average	ft/h
GRAM	Gamma Ray - Apparent - Memory 0.5 ft Average	API
GRIM	Gamma Ray - Data Point Indicator - Memory	unitless
GRADM	Gamma Ray - Apparent - Down Quadrant - Memory	API
GRAUM	Gamma Ray - Apparent - Up Quadrant - Memory	API
TCDM	Downhole Temperature	degF



Company

Well

Interval

Created

Anadarko

Verde 13-18HZ

Date From:2018-03-17 18:00:00

Date To:2018-03-22 18:00:00

2018-03-24 07:39:56

Top:1924.00

Bottom:19170.00

Gamma Ray - Apparent 0.5 ft Average [GRAM]

0300

API

Depth Averaged ROP 3 ft Average [ROPA]

15000

ft/h

Gamma Ray Apparent UP

0300

API

Gamma Ray Apparent DOWN

0300

API

MD 1:240 feet

Resistivity Phase - Corrected - 2MHz [RPCHM]

0.2200

ohm.m

Resistivity Phase - Corrected - 400kHz [RPCLM]

0.2200

ohm.m

Resistivity Attenuation - Corrected - 2MHz [RACHM]

0.2200

ohm.m

Resistivity Attenuation - Corrected - 400kHz [RACLM]

0.2200

ohm.m

Conductivity Attenuation - Corrected - 400kHz [CACLM]

10000

mmho/m

Downhole Temperature [TCDM]

0300

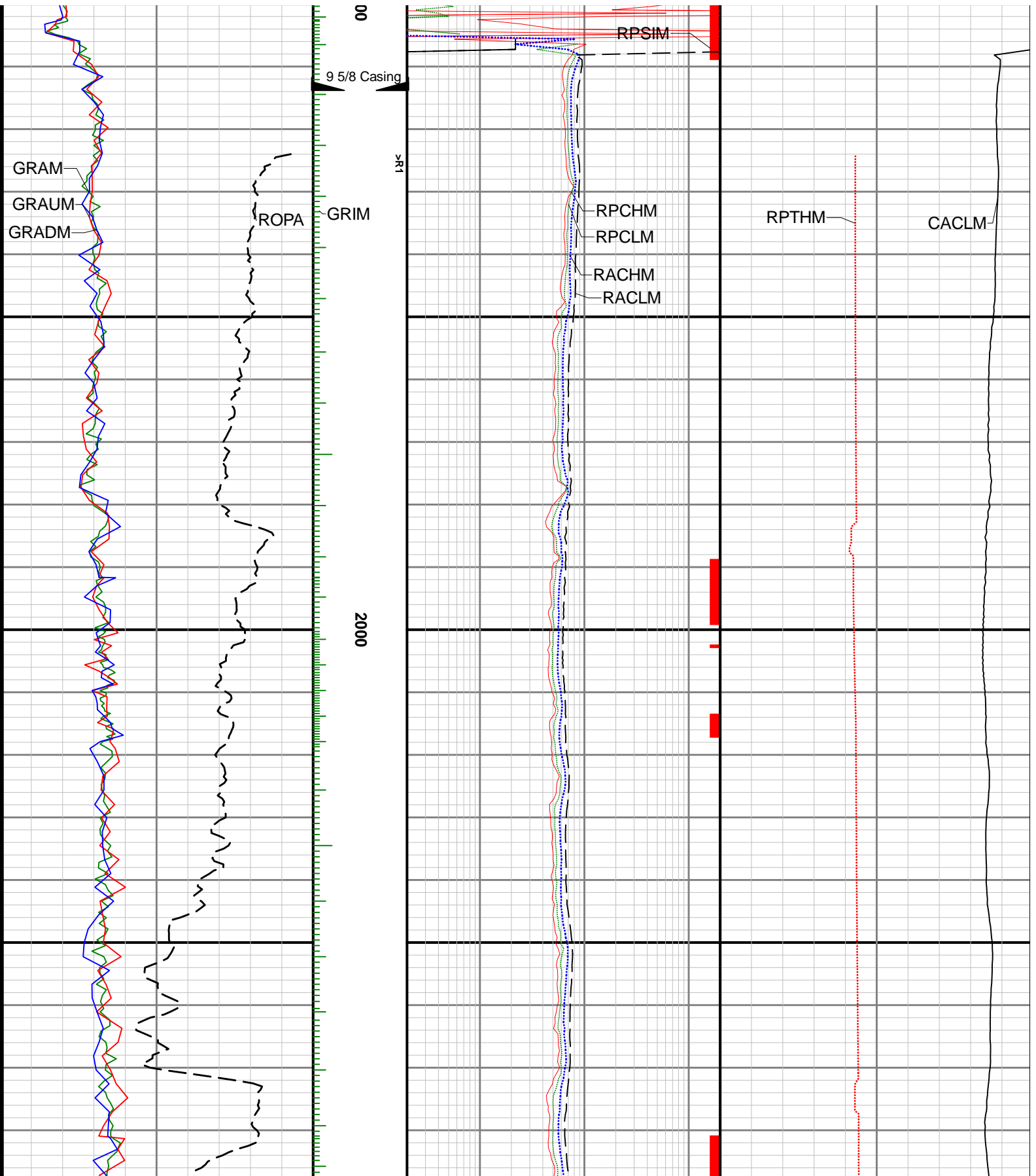
degF

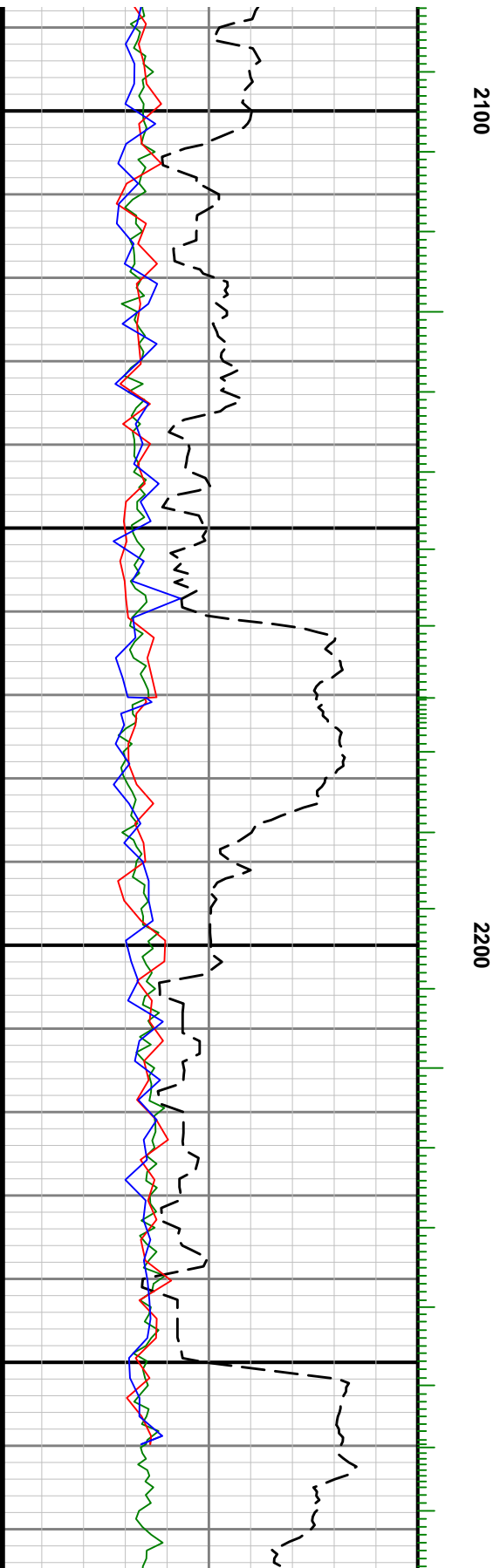
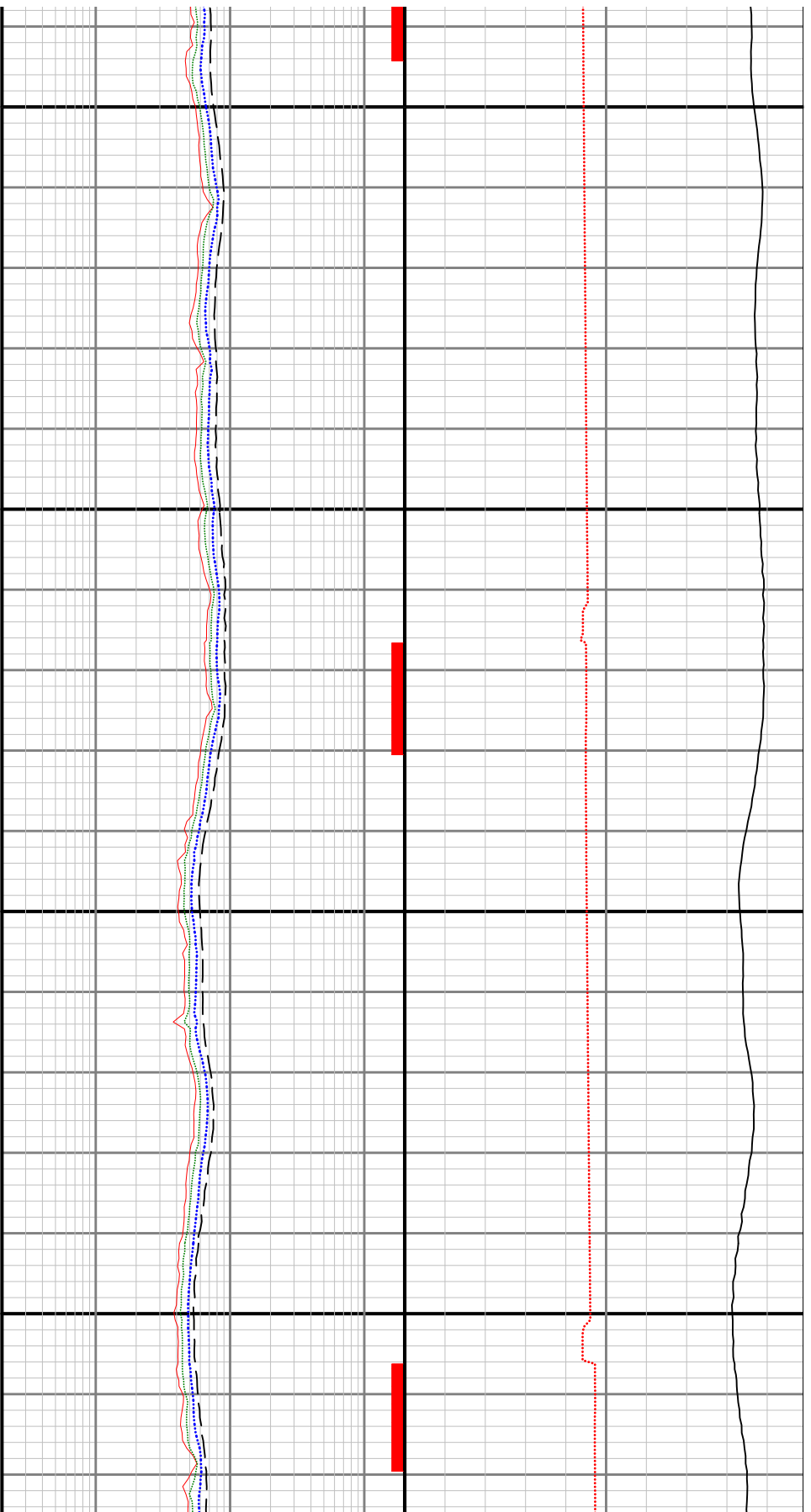
Resistivity Time Since Drilled [RPTHM]

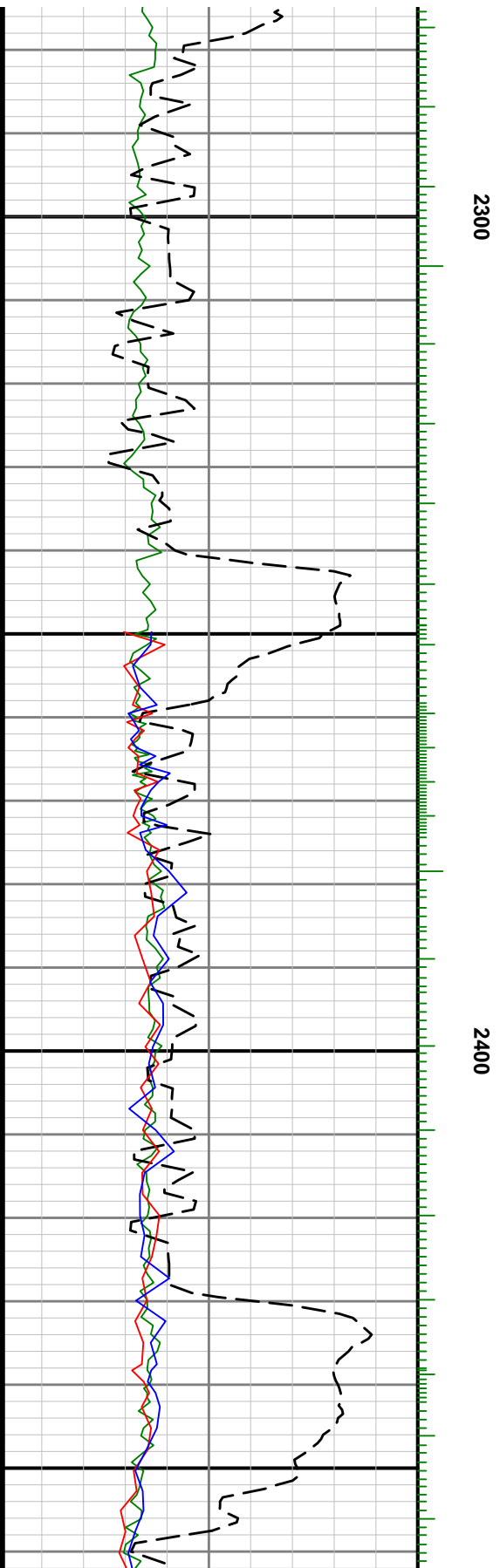
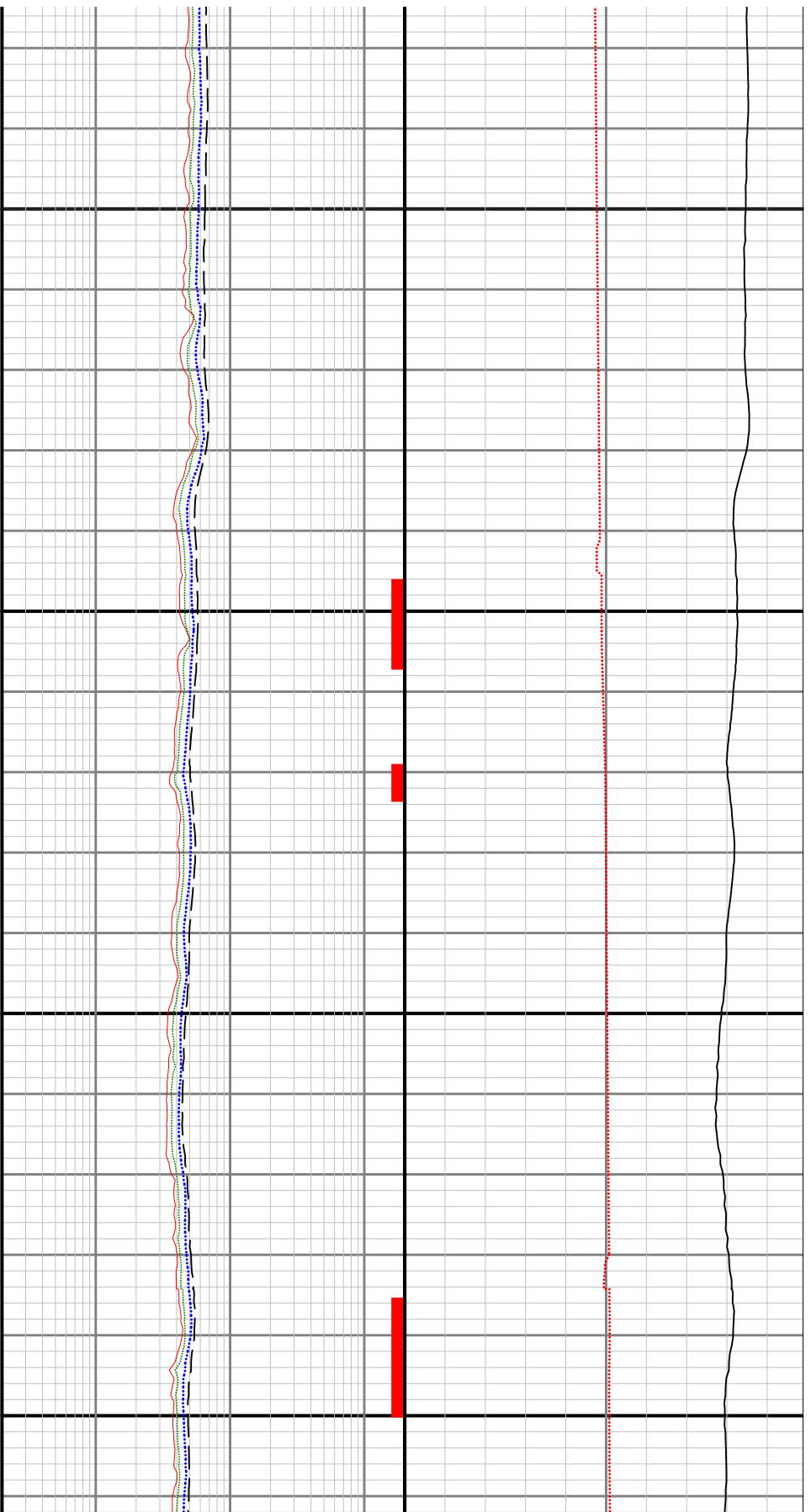
0600

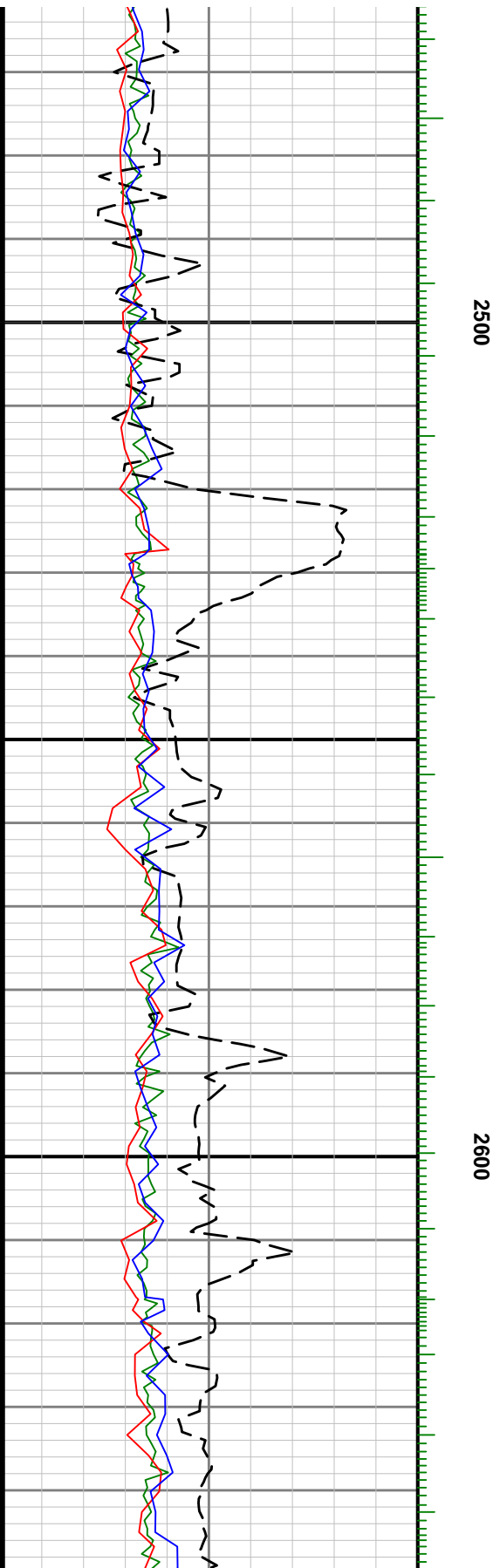
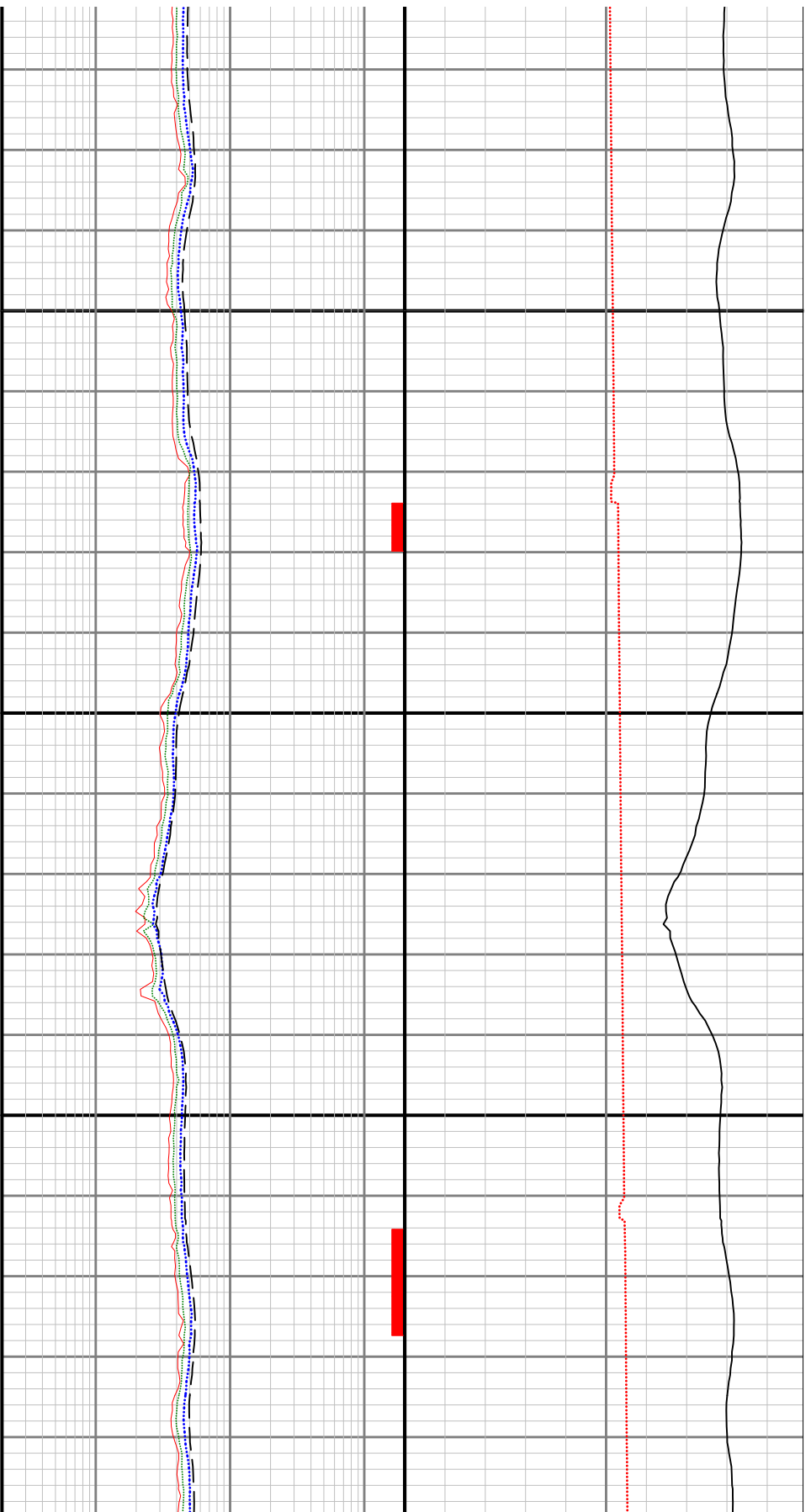
min

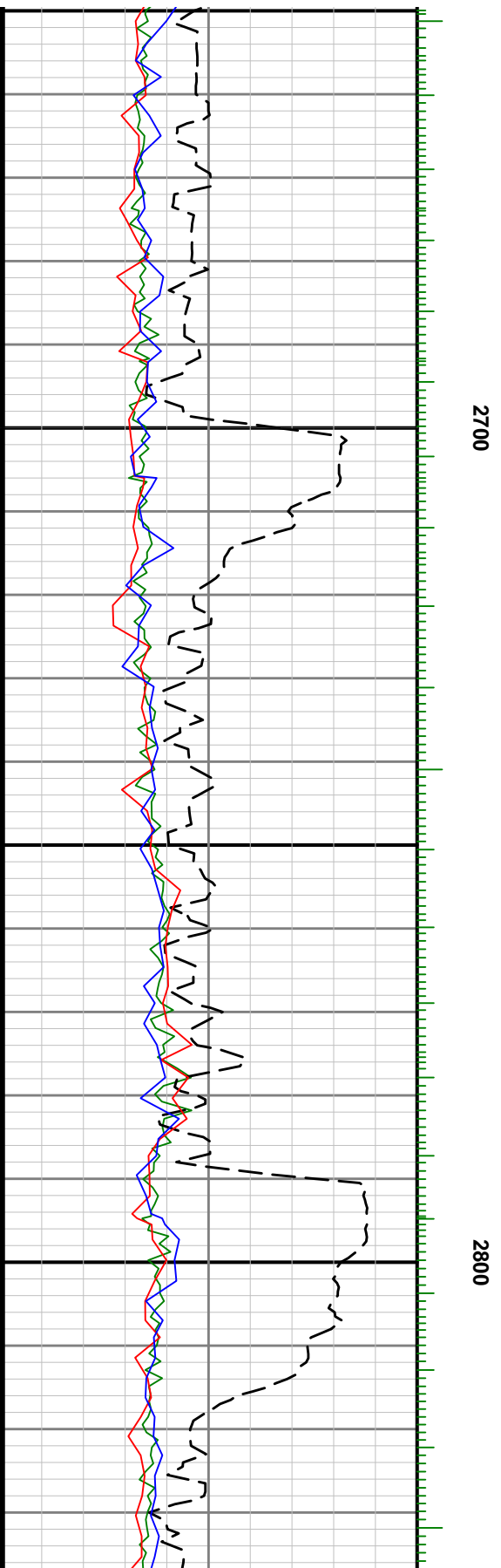
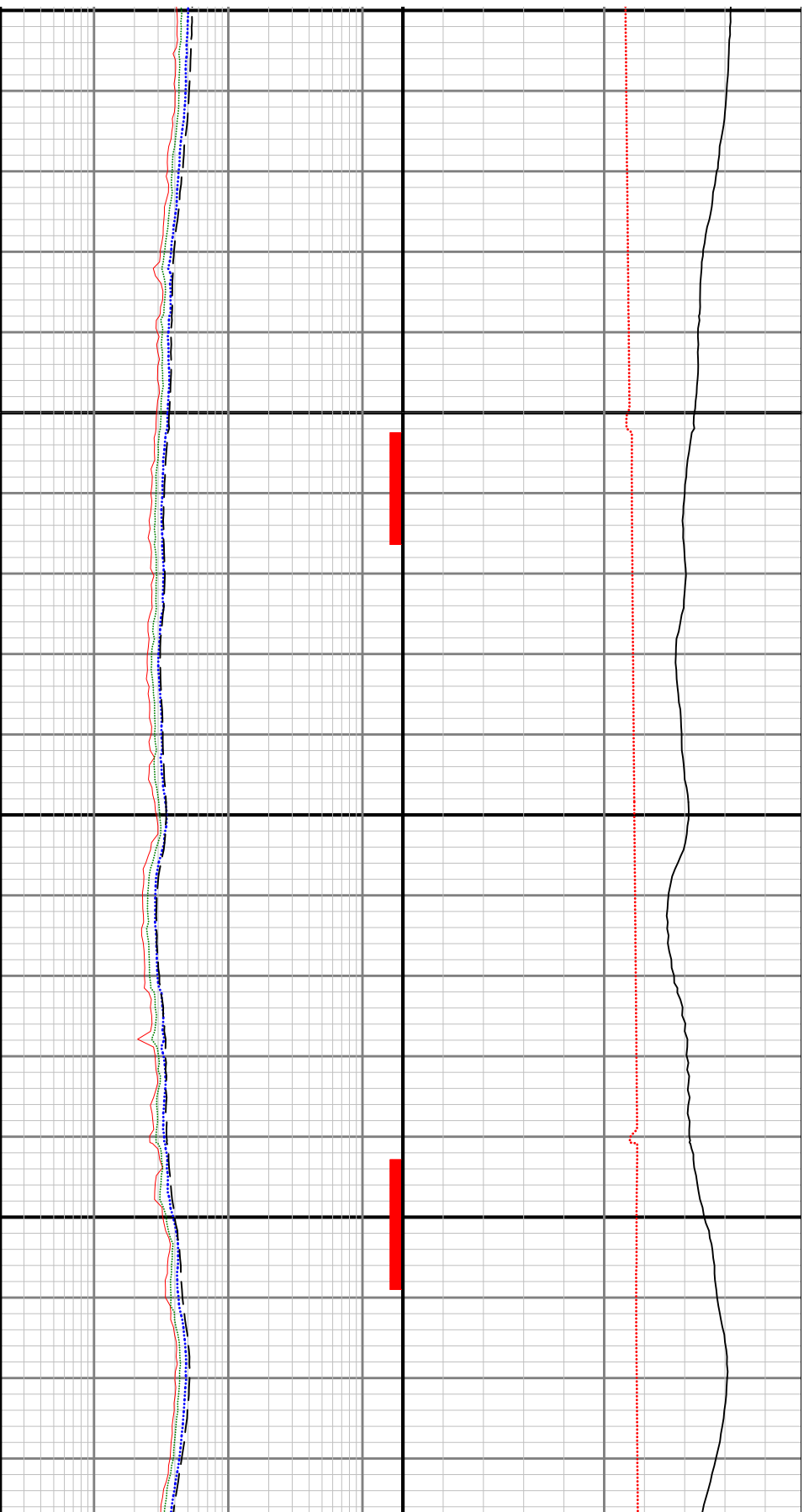
19

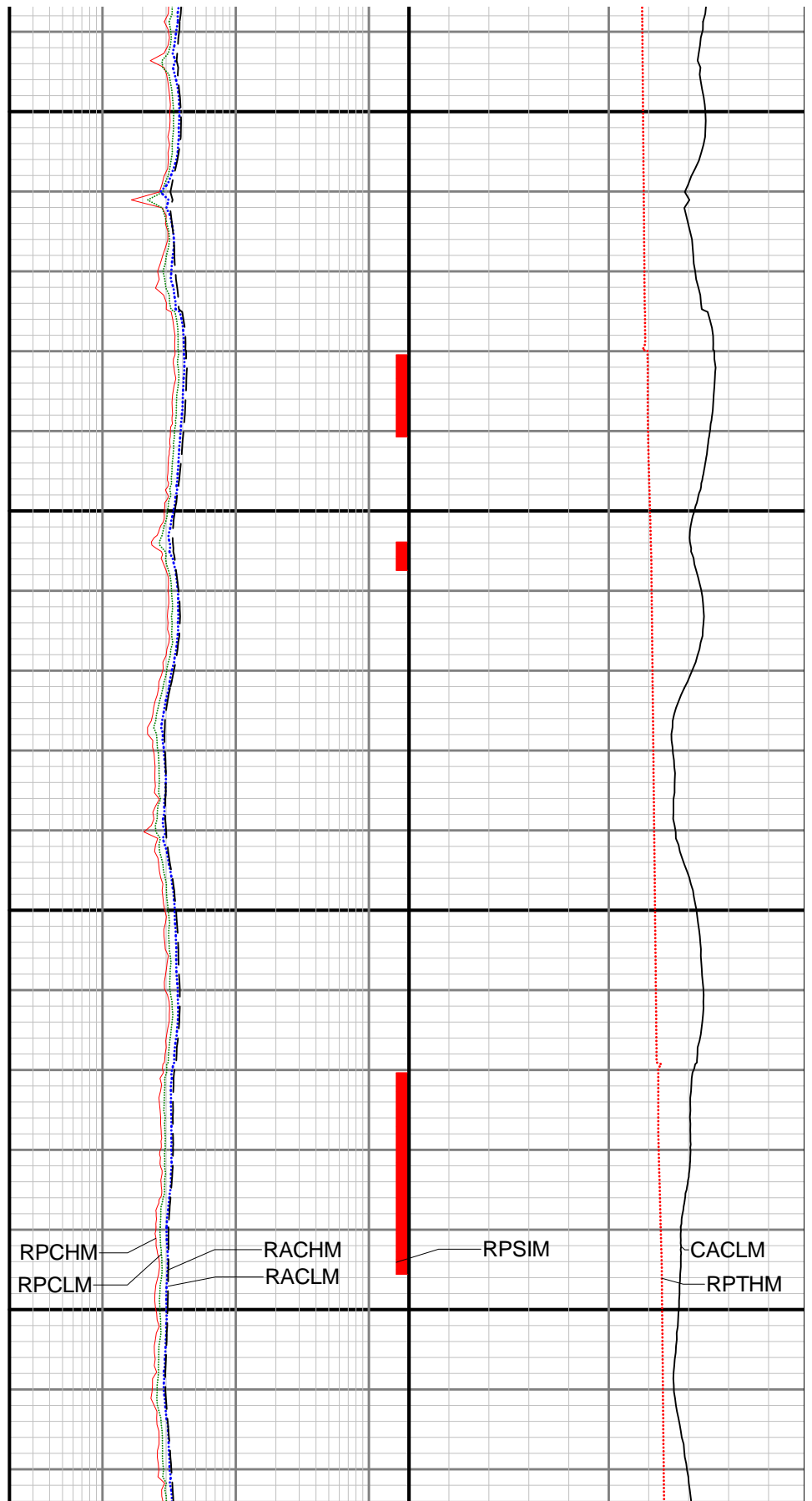
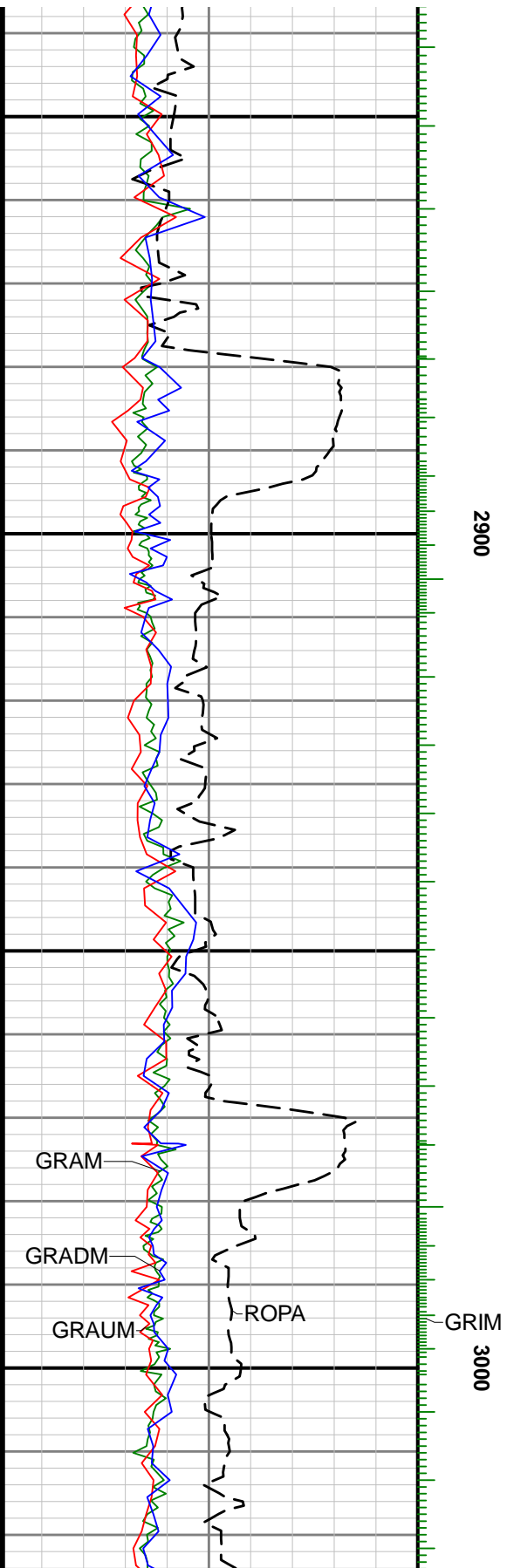


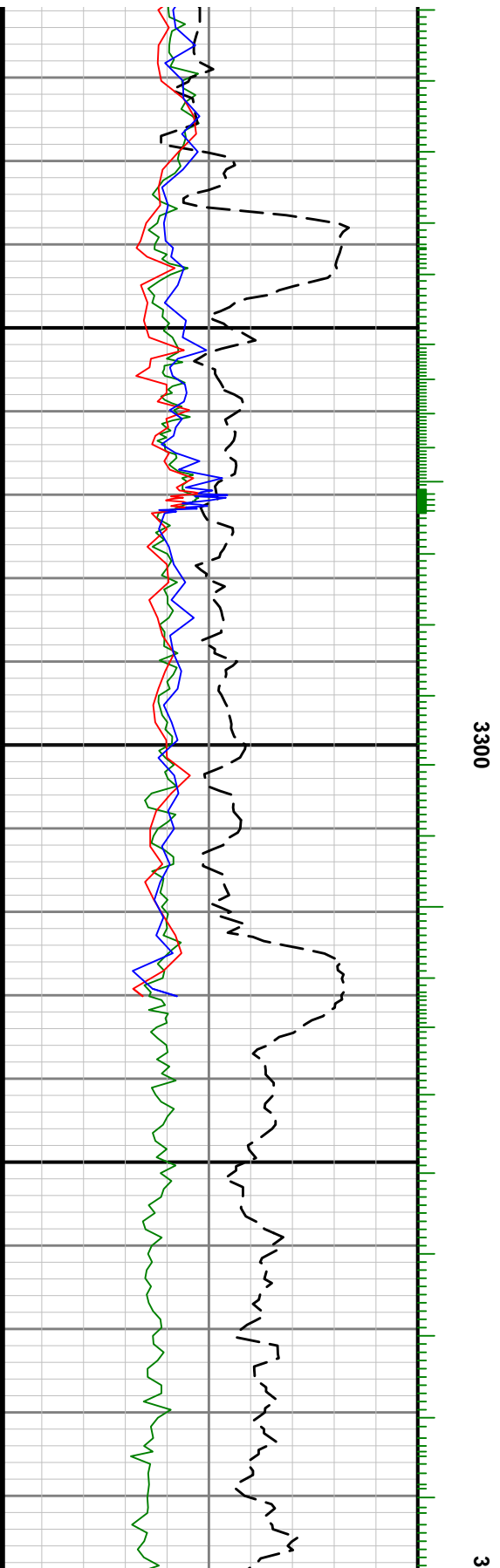
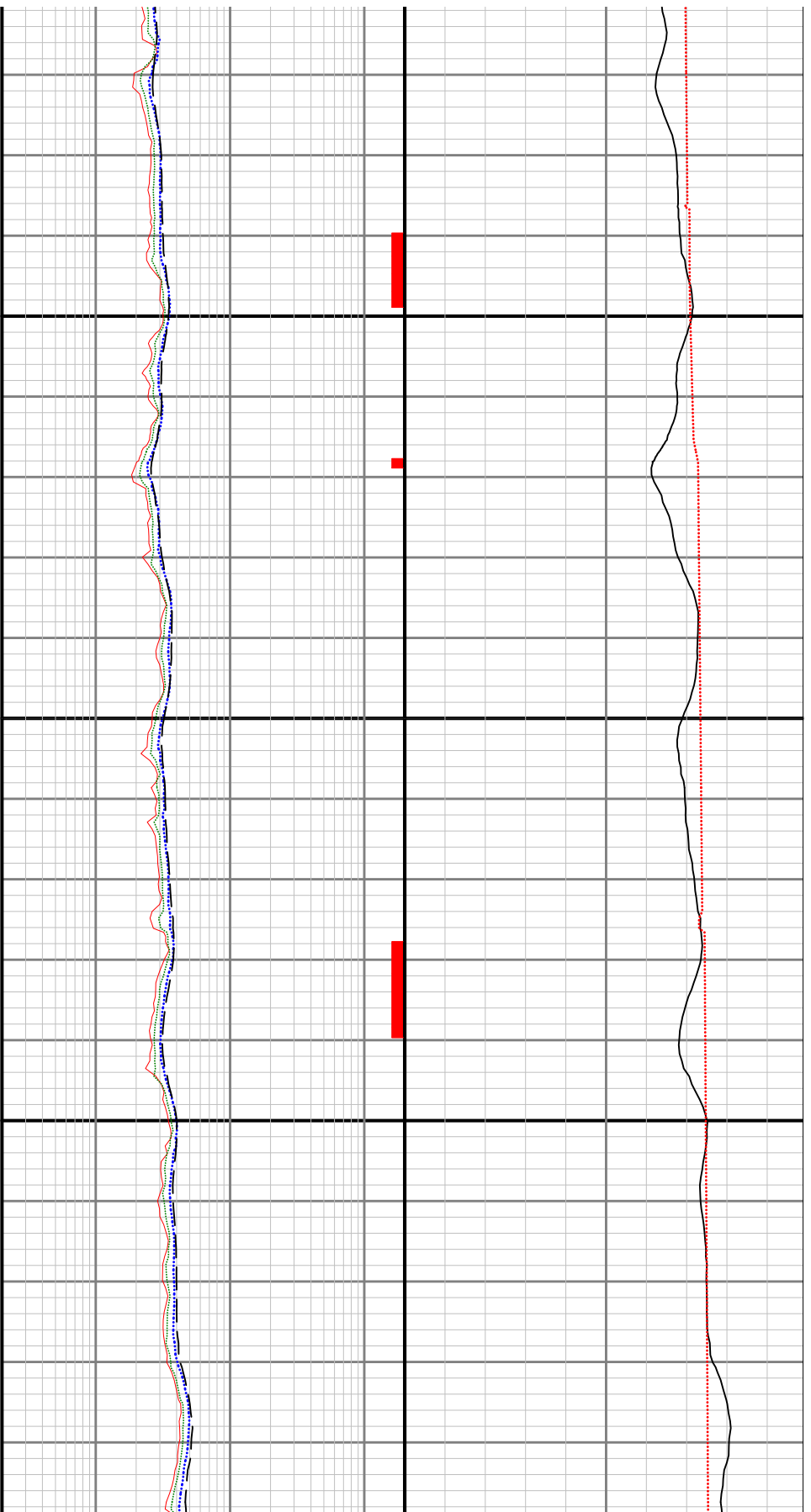


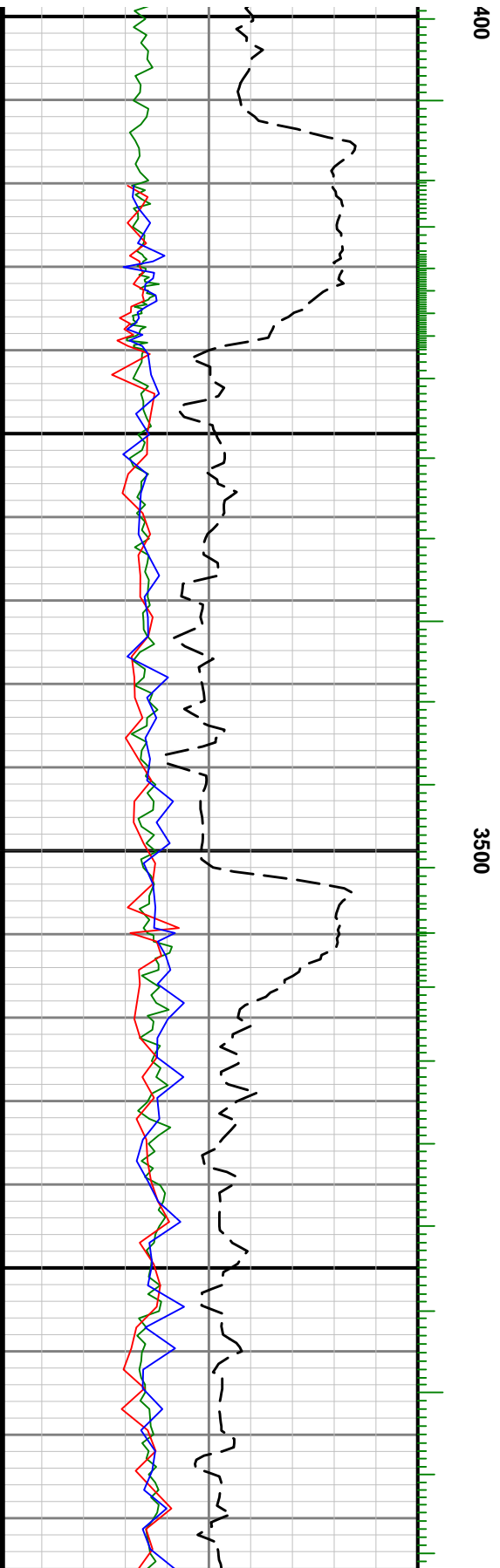
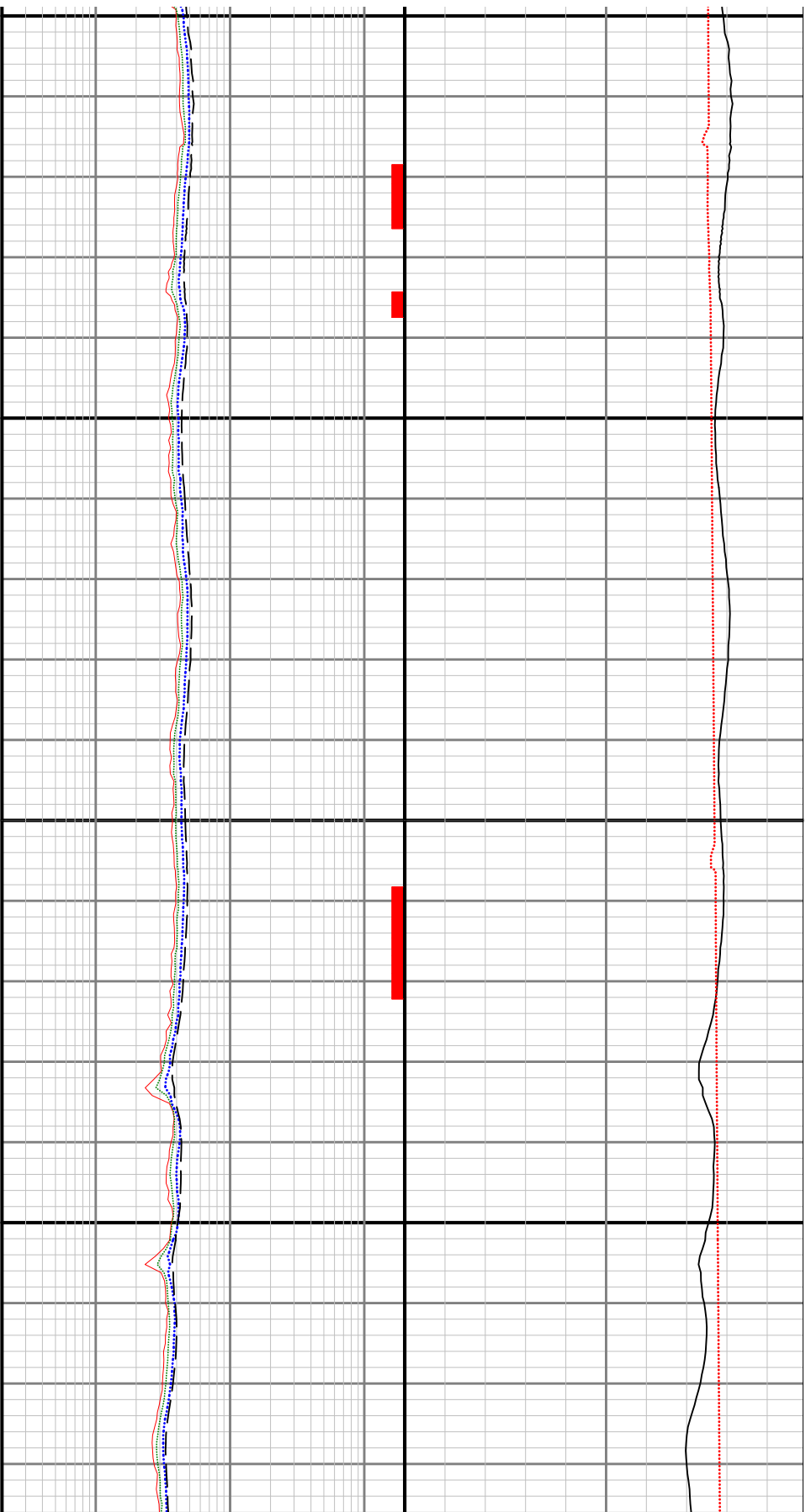


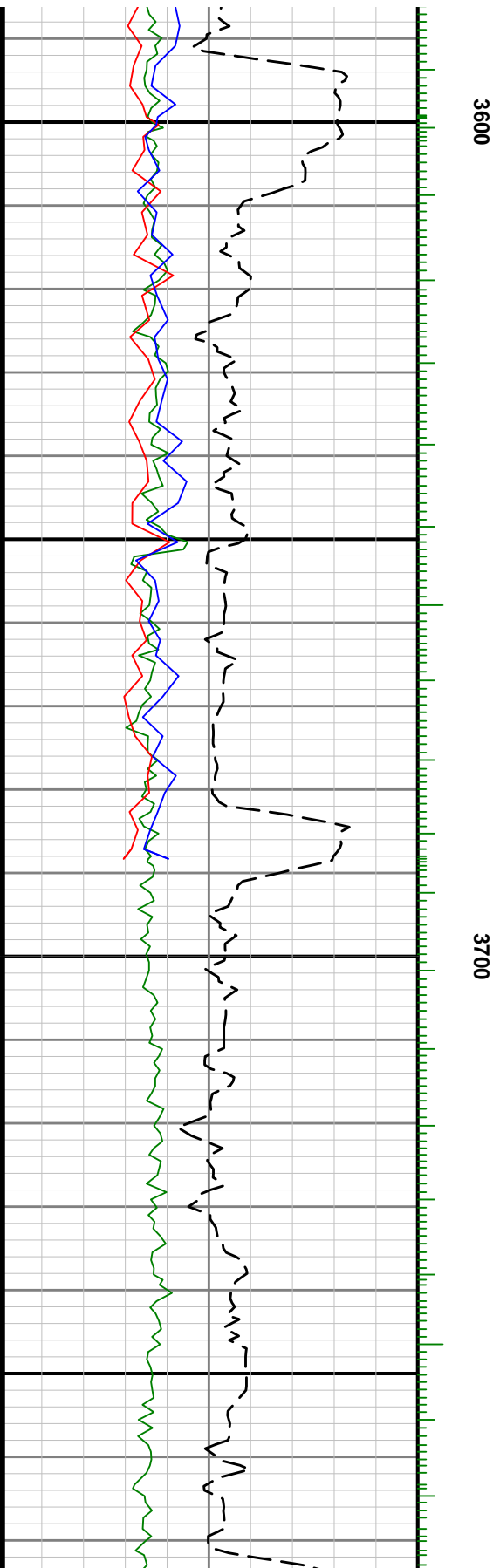
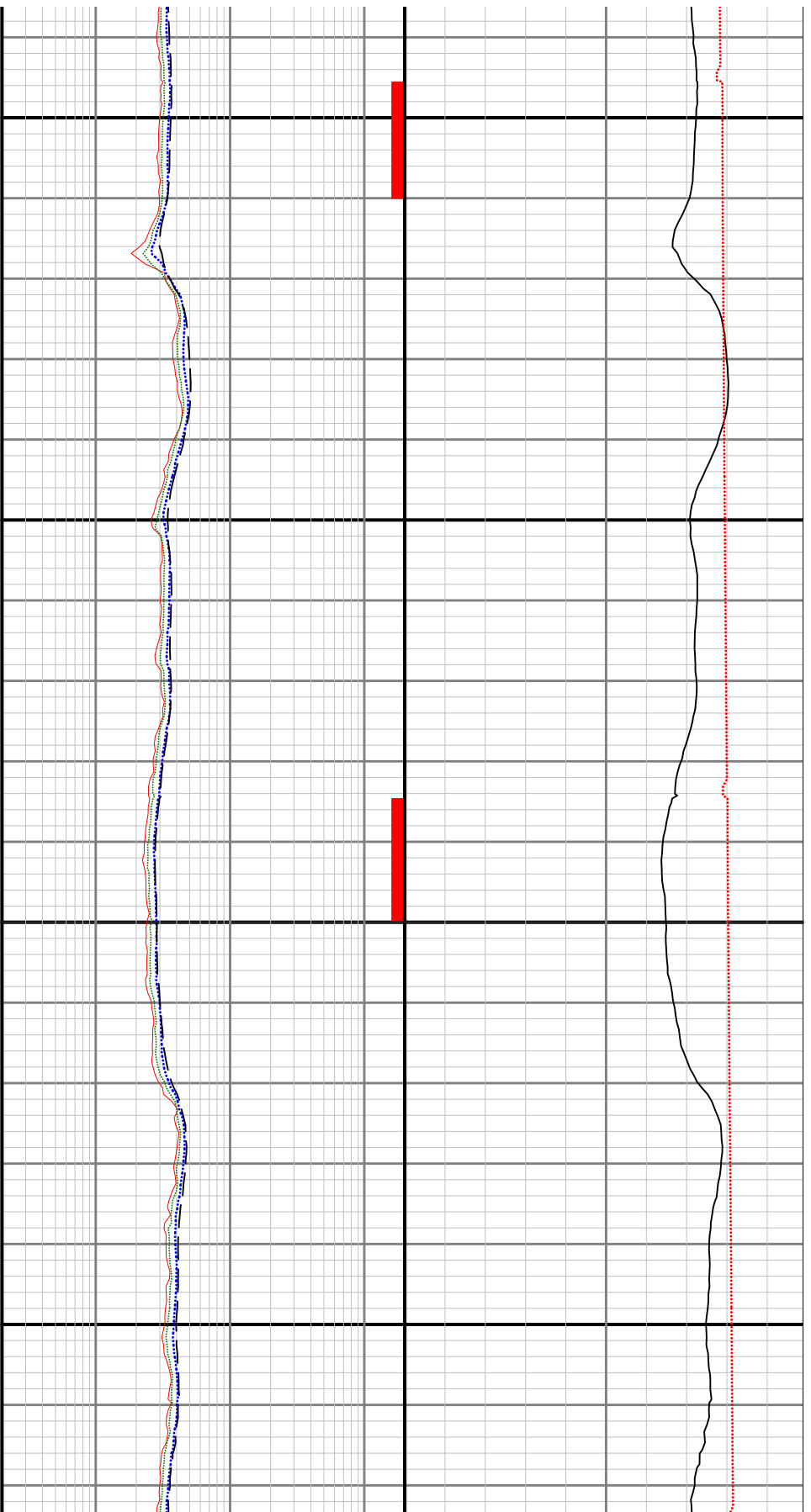


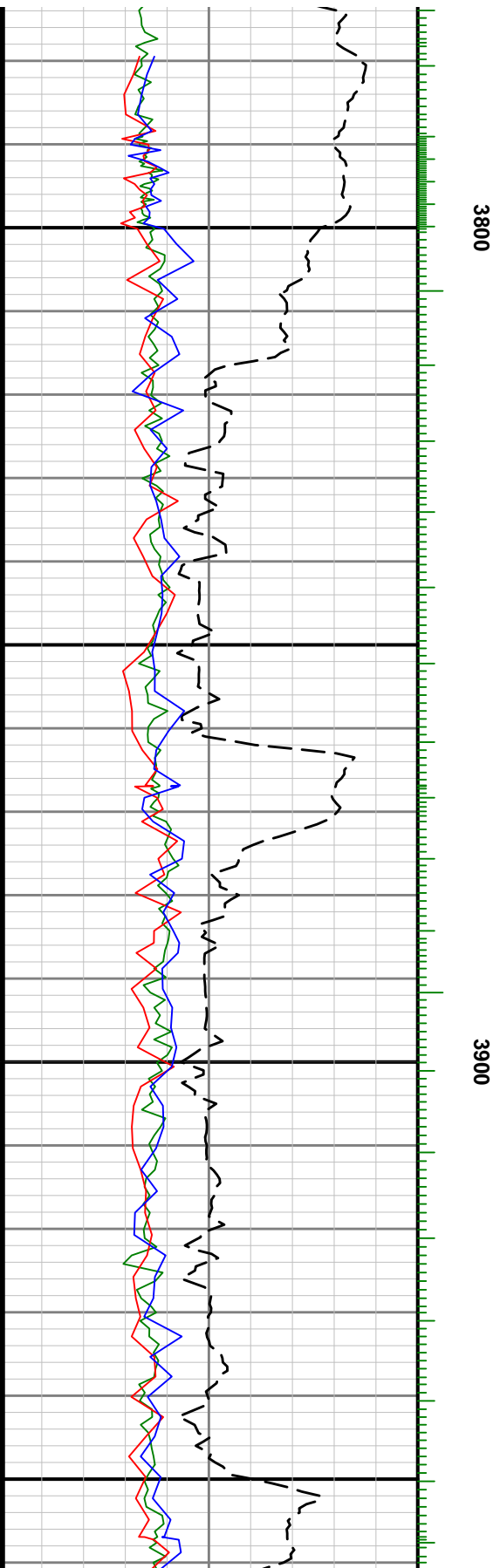
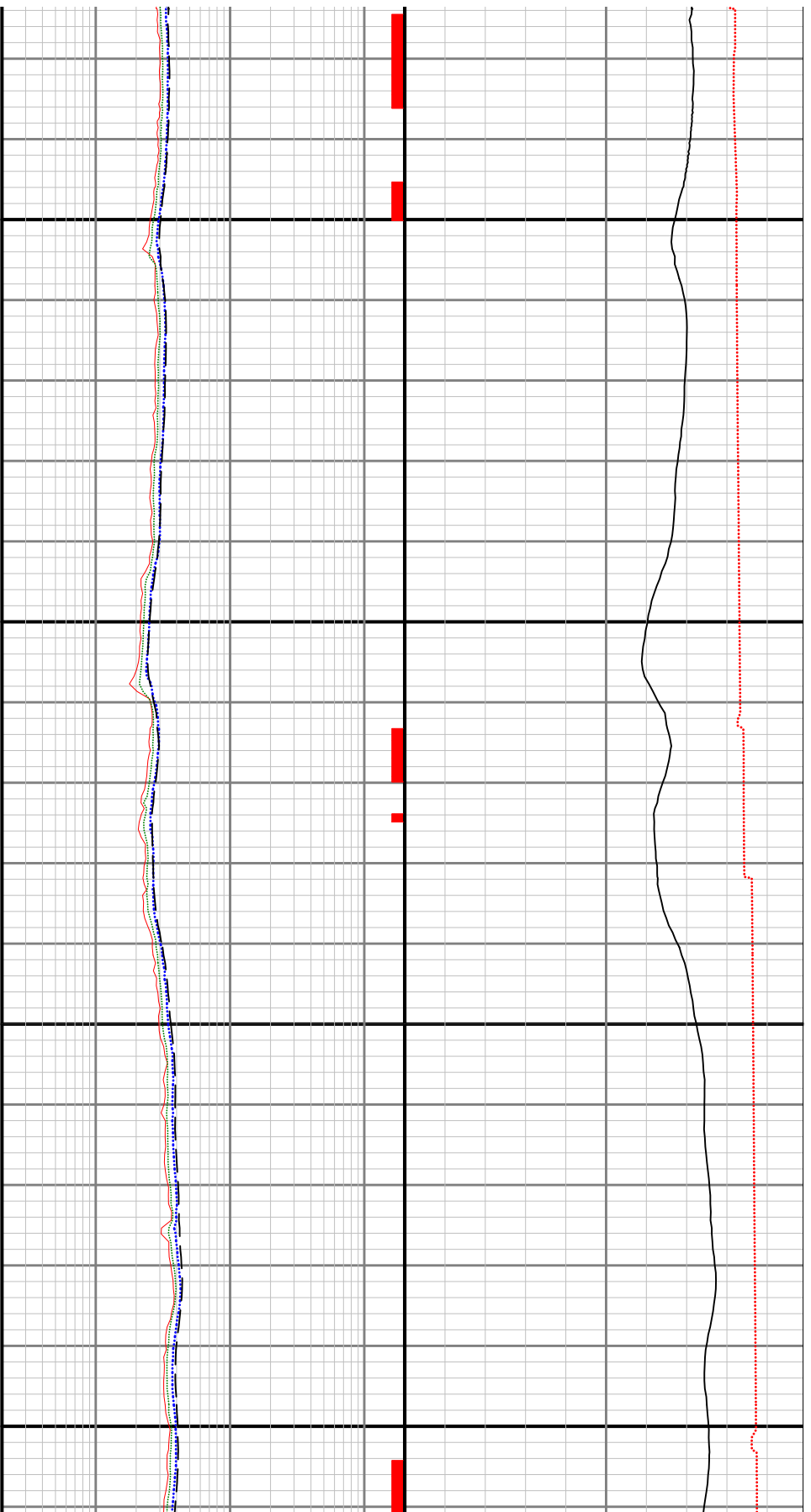


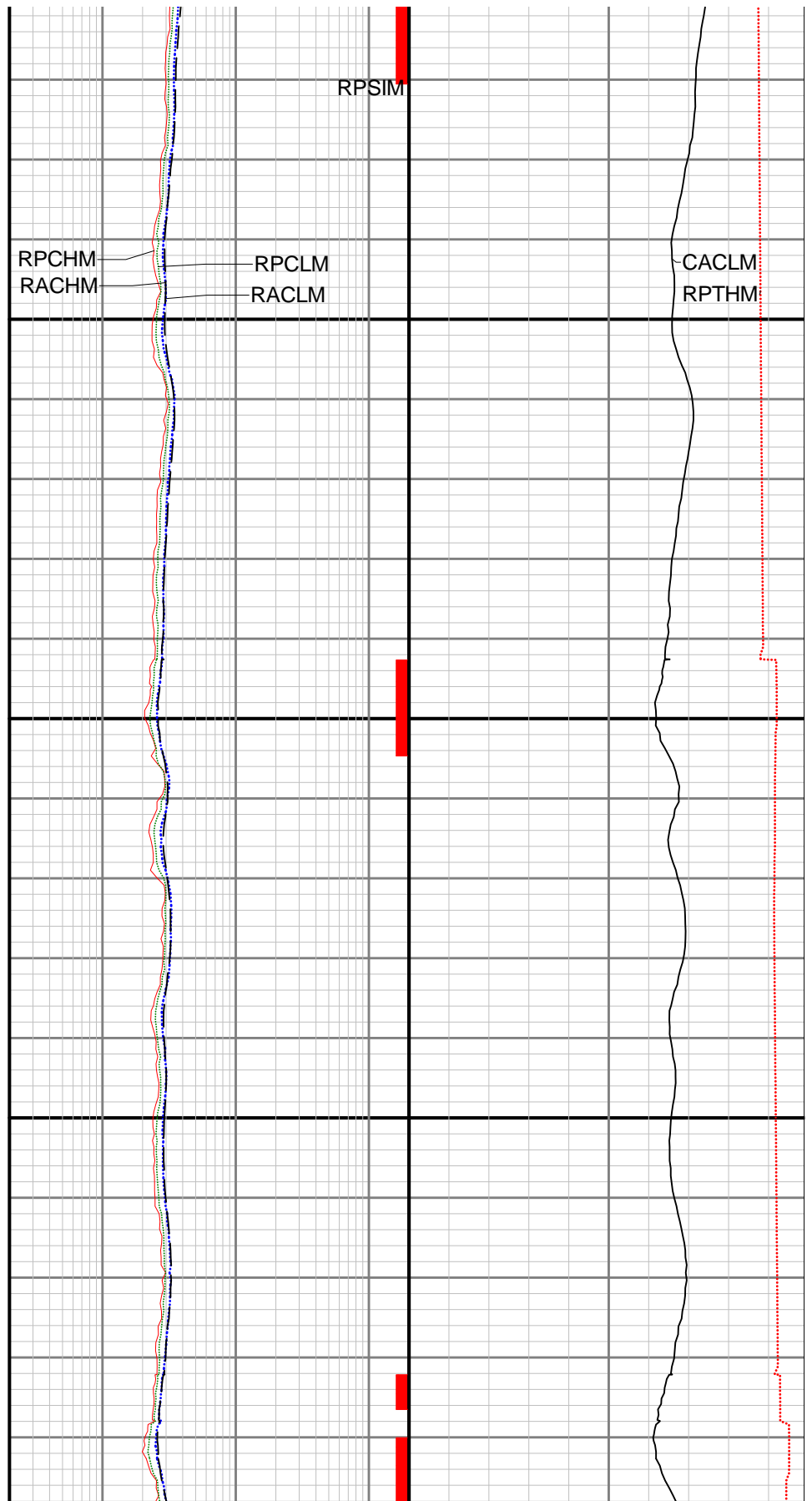
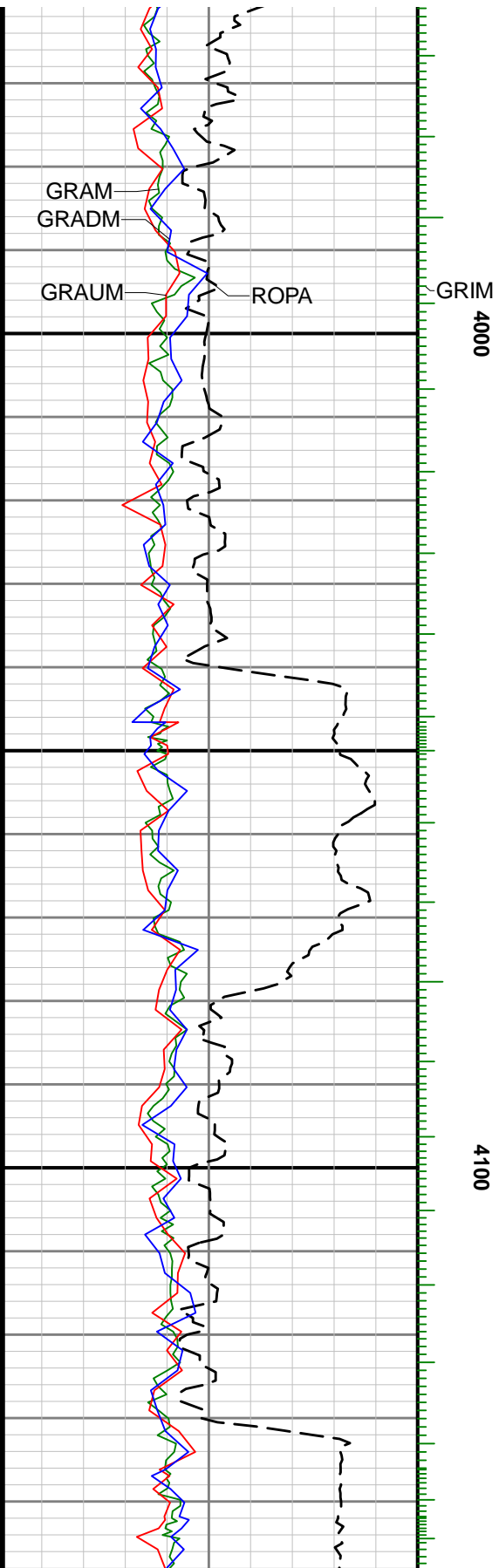


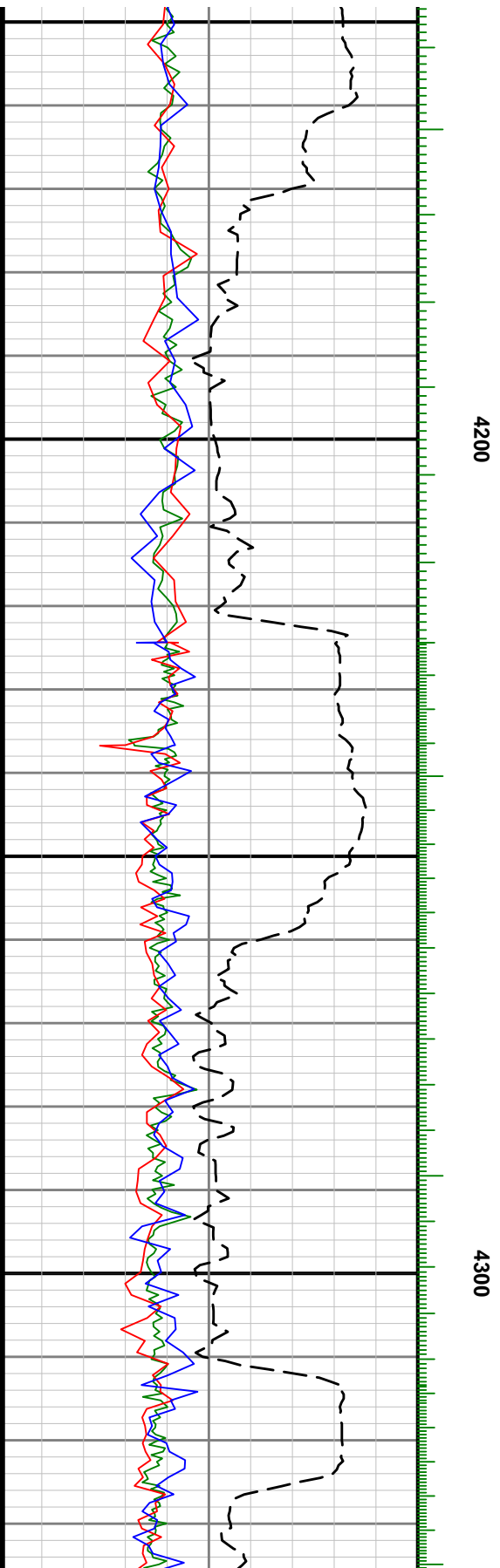
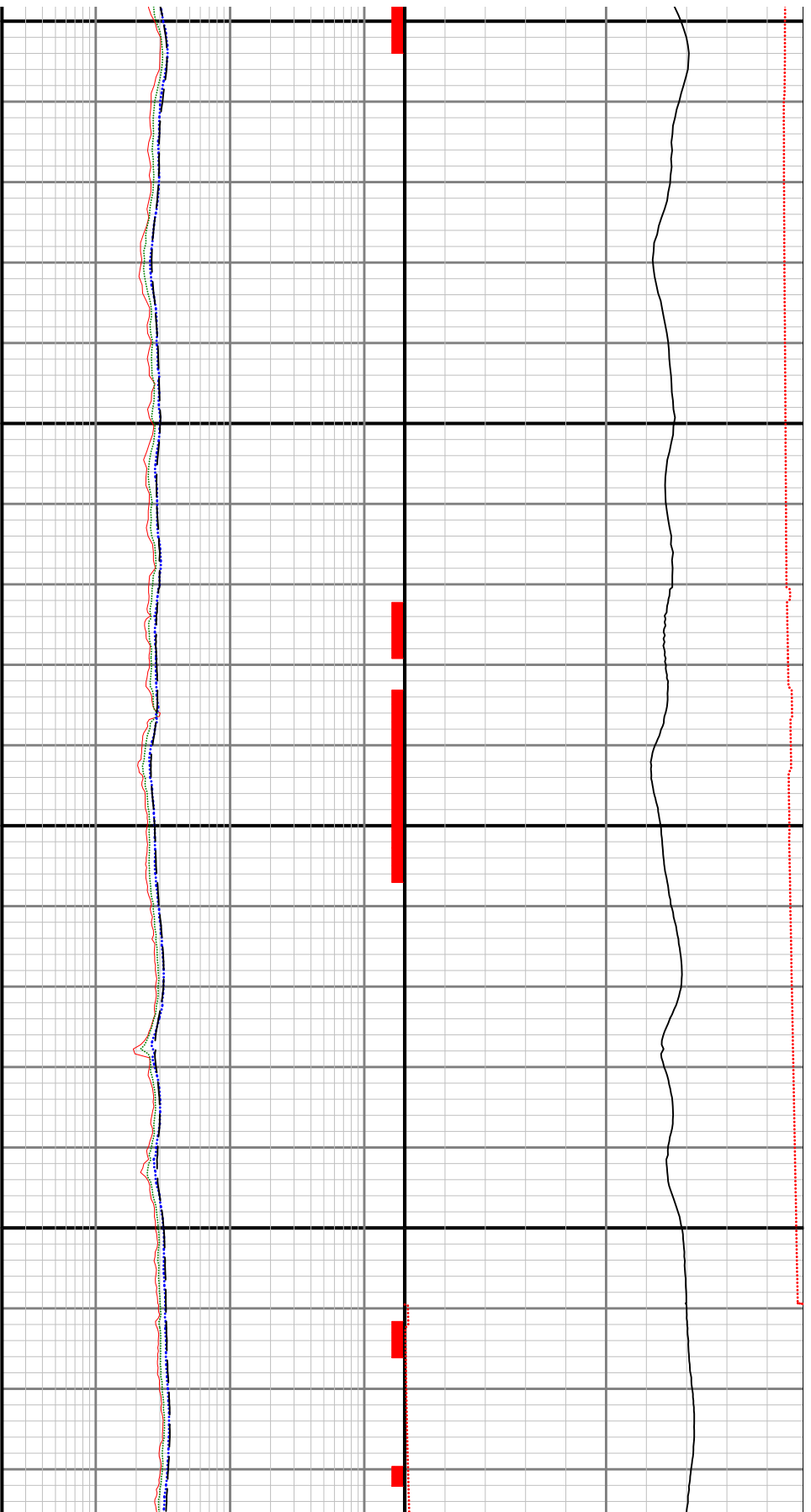


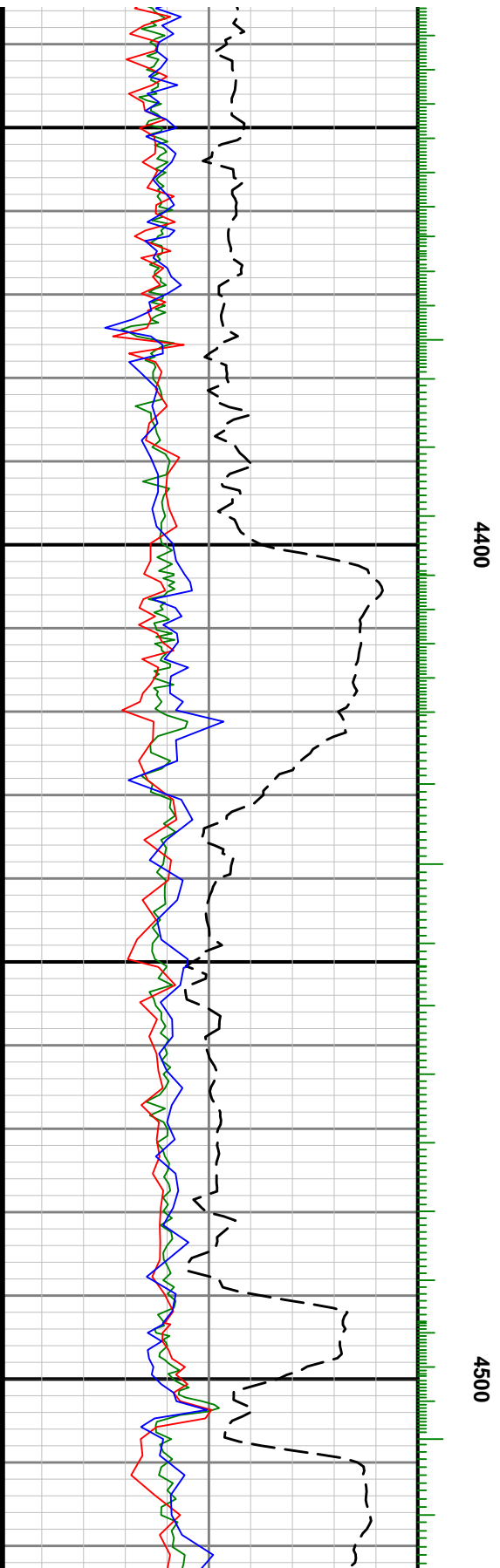
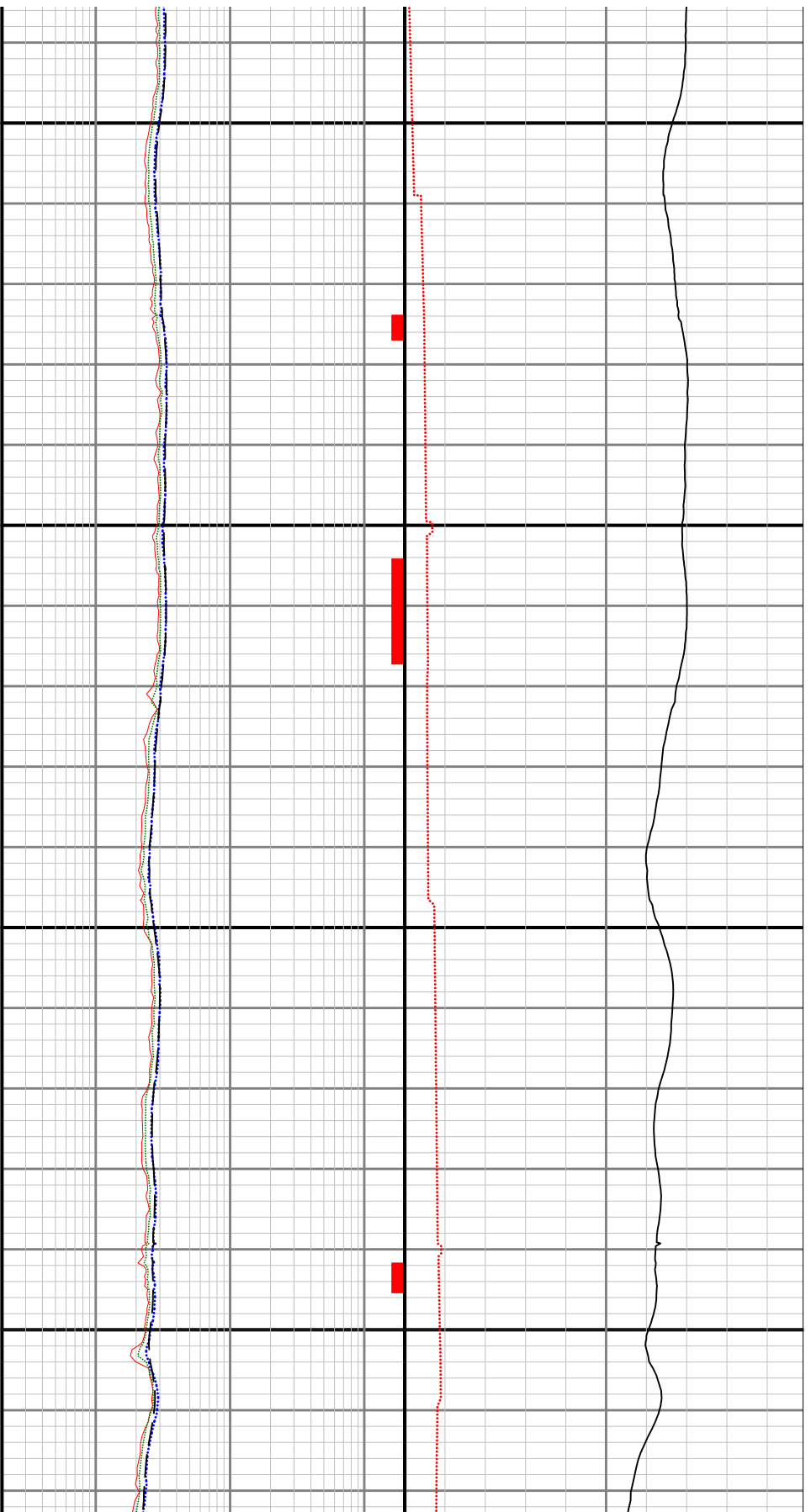


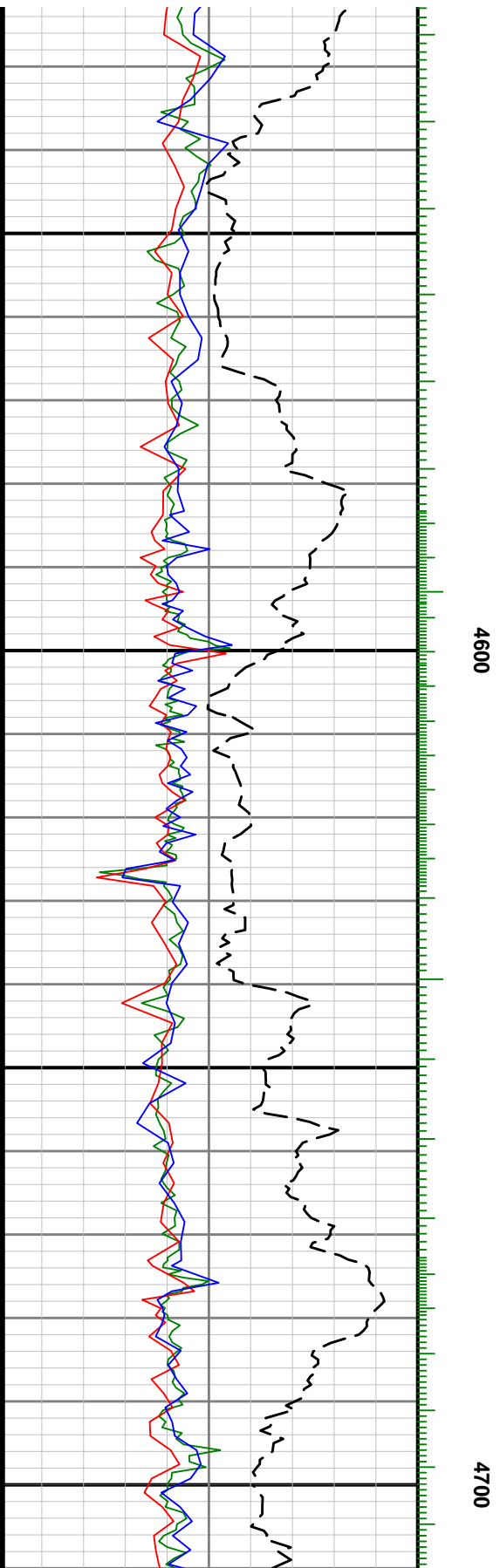
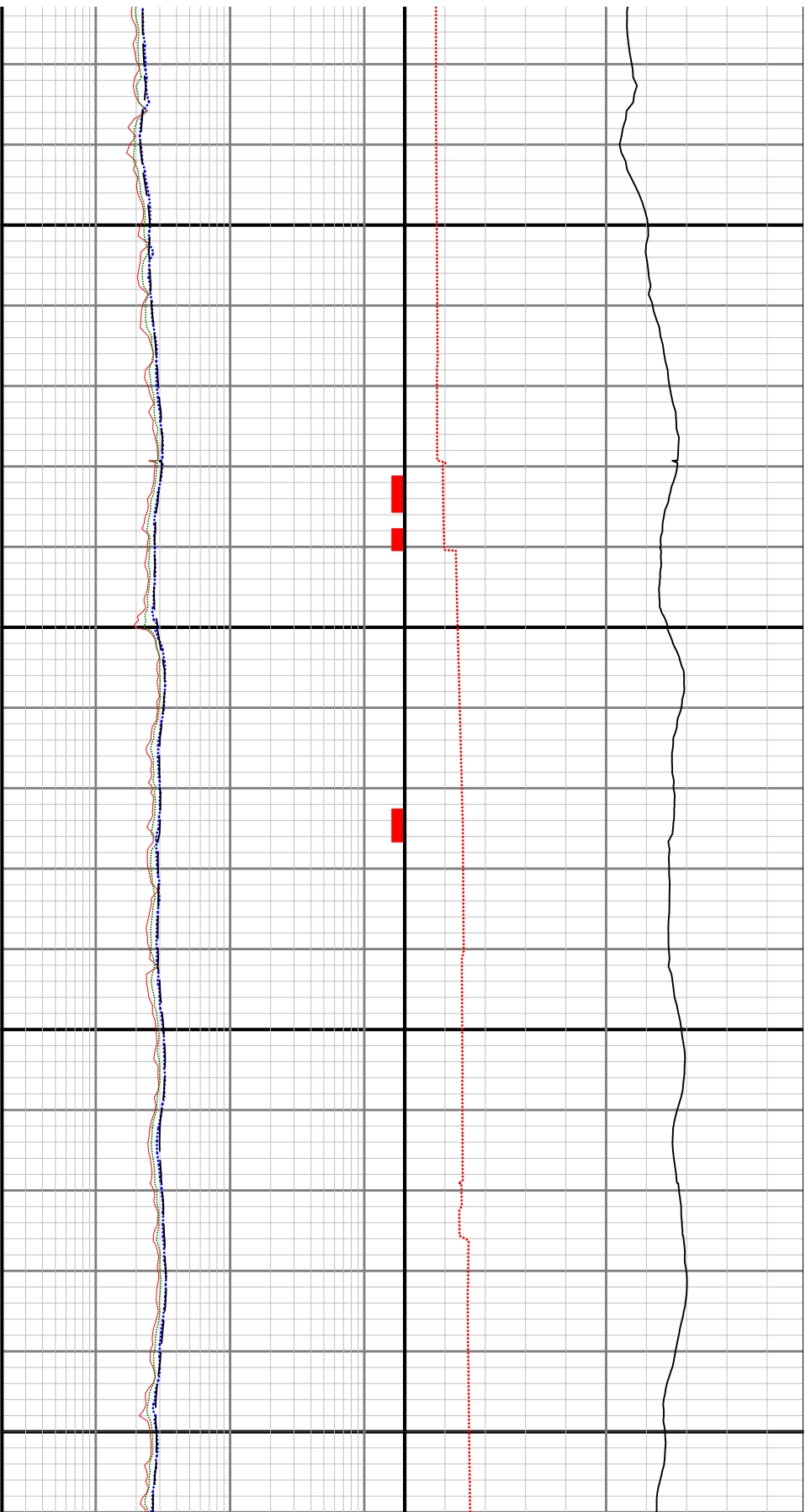


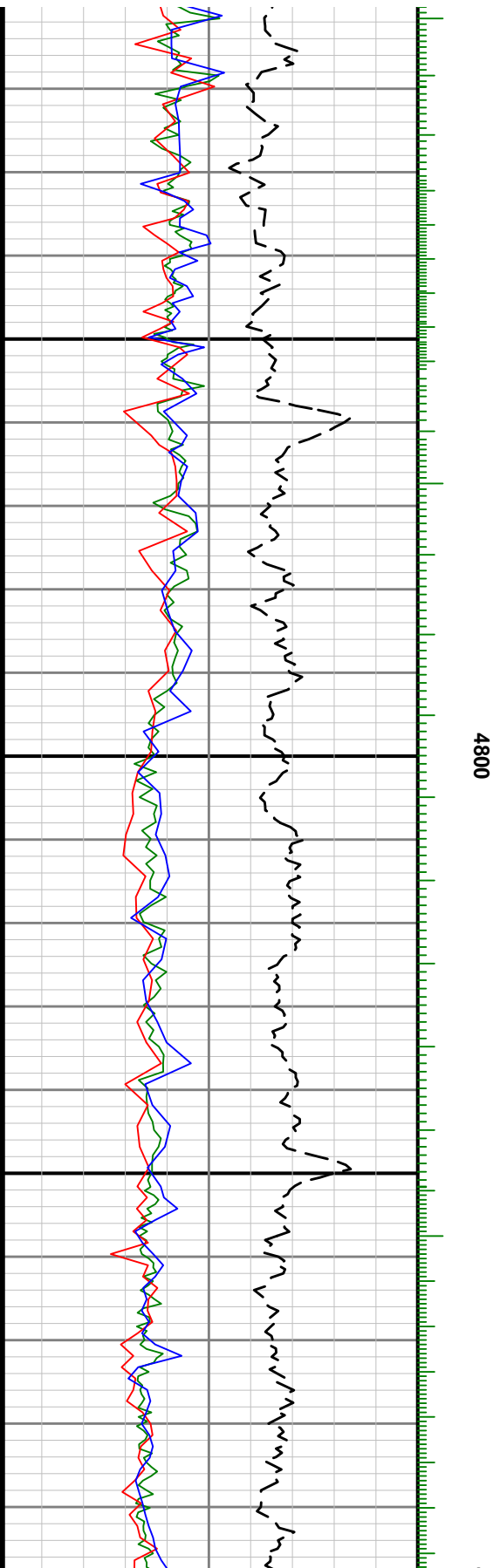
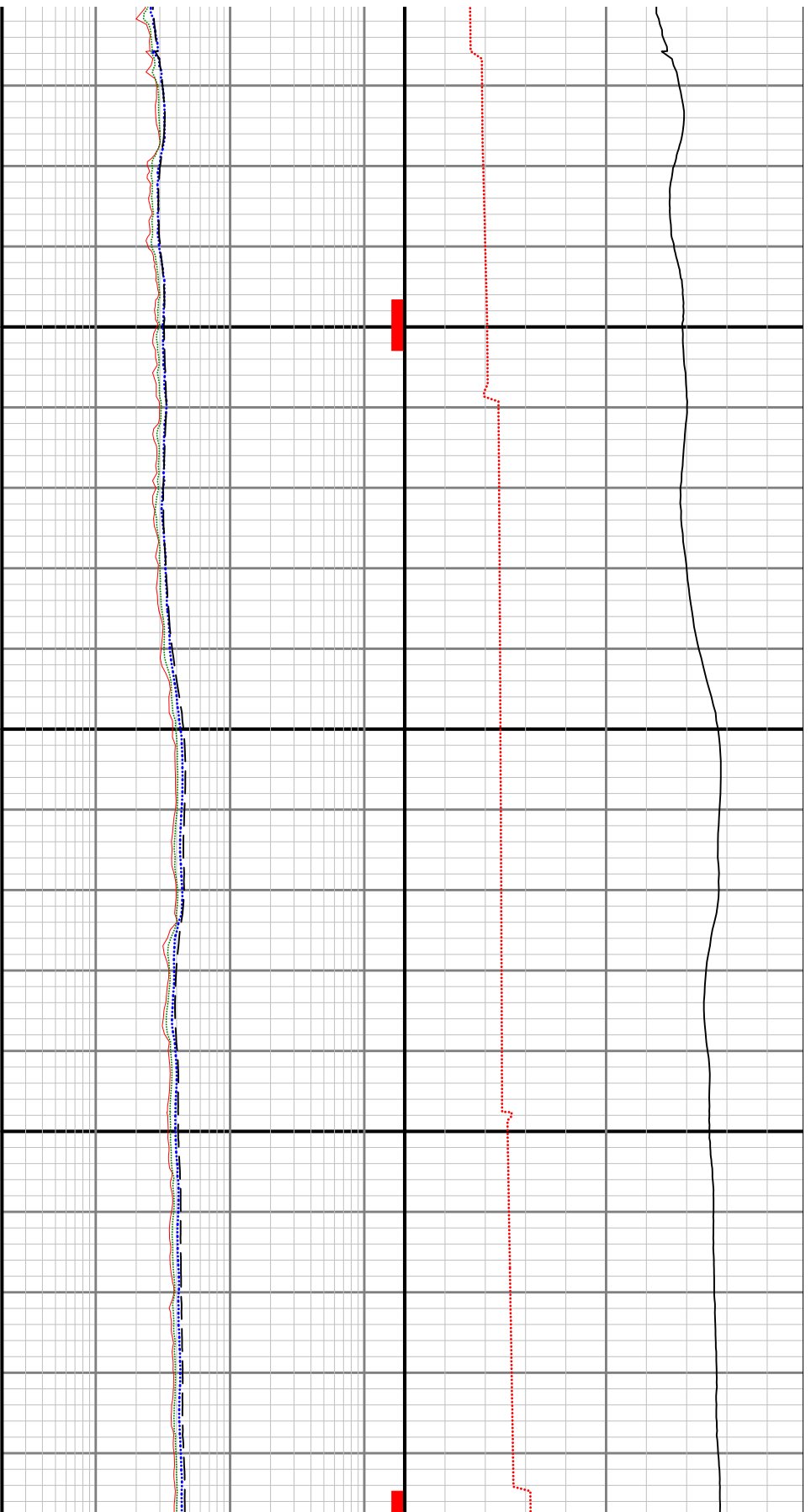


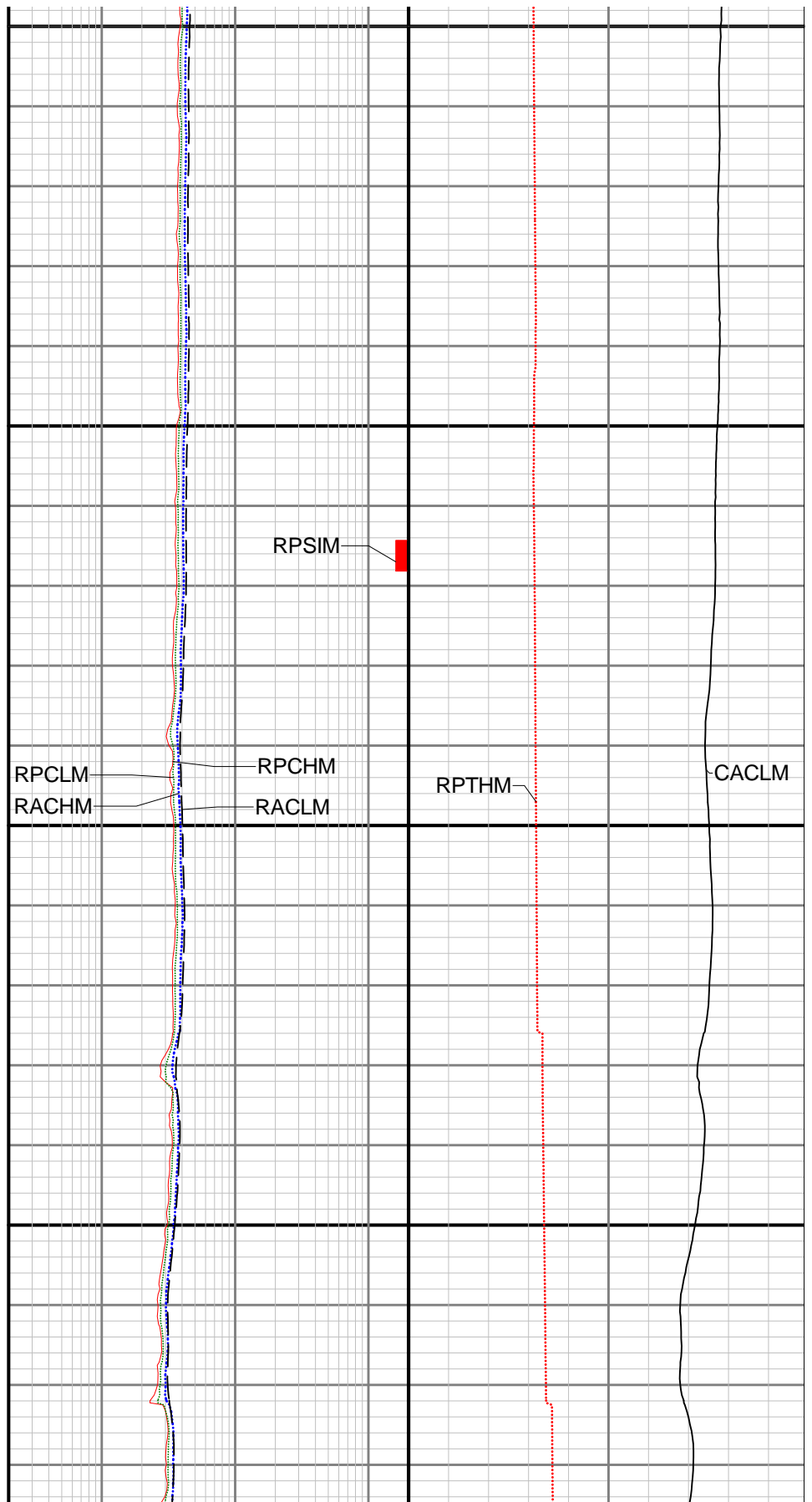
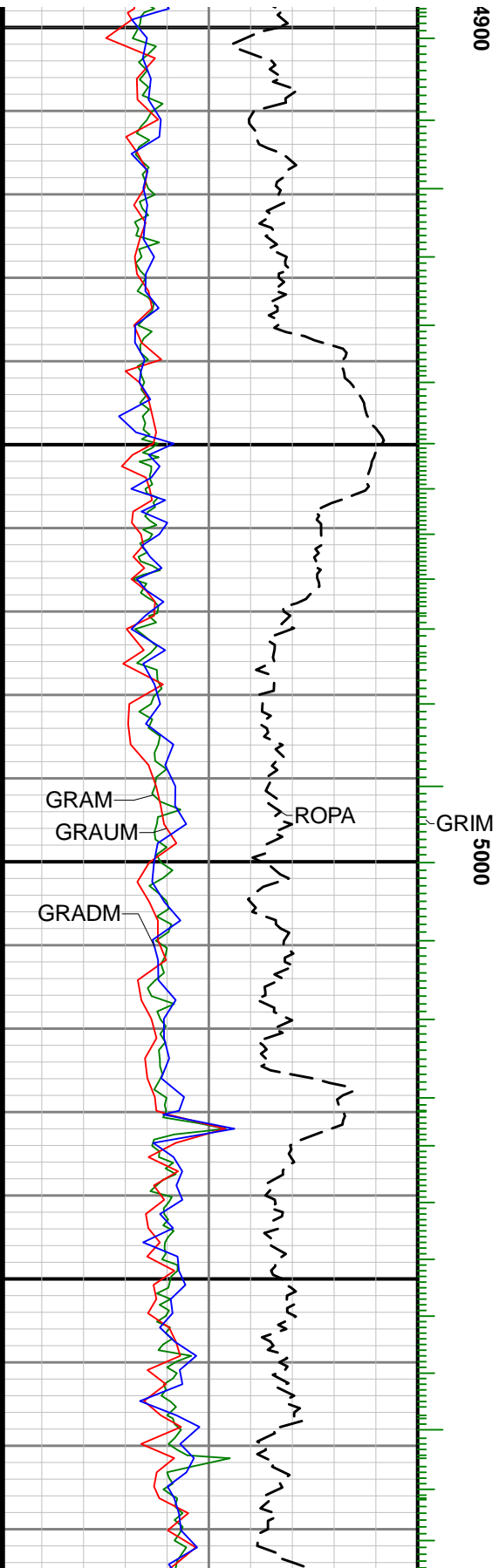


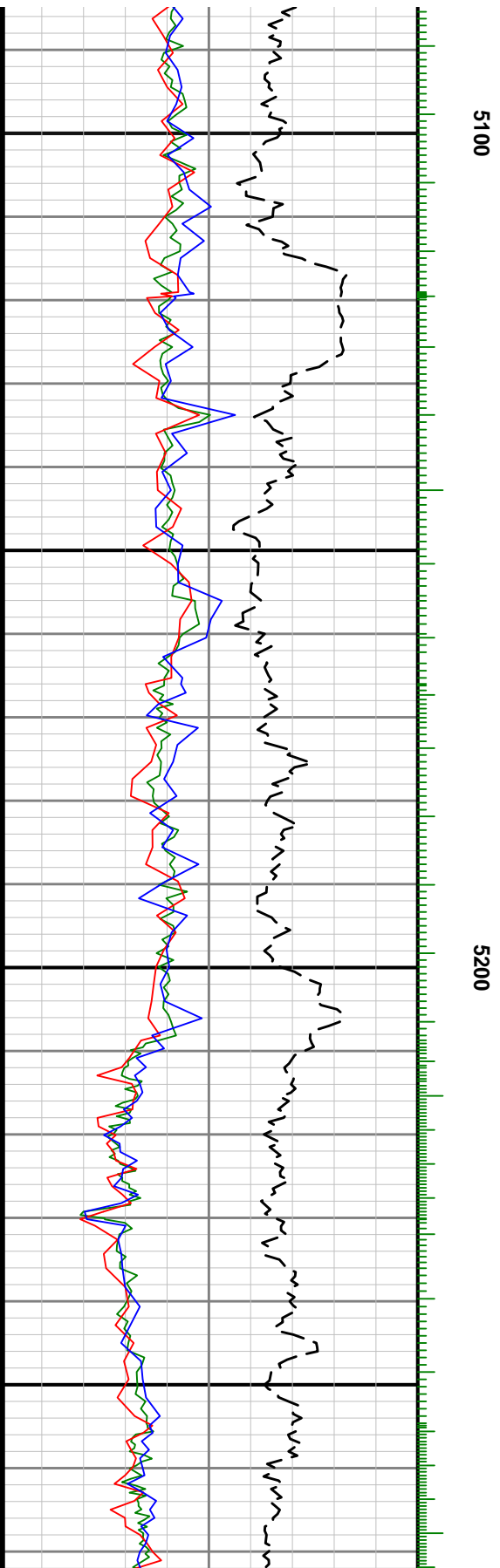
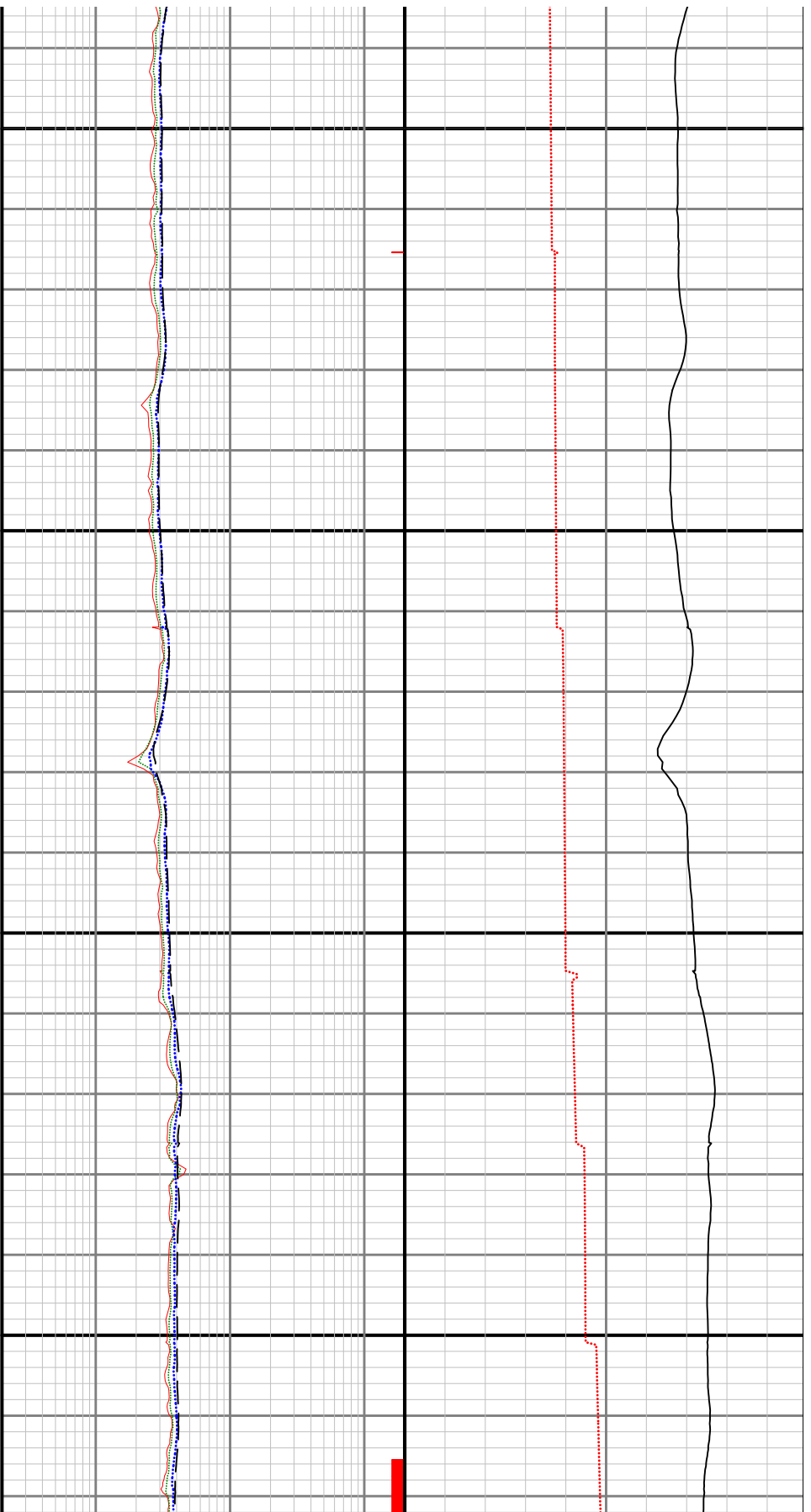


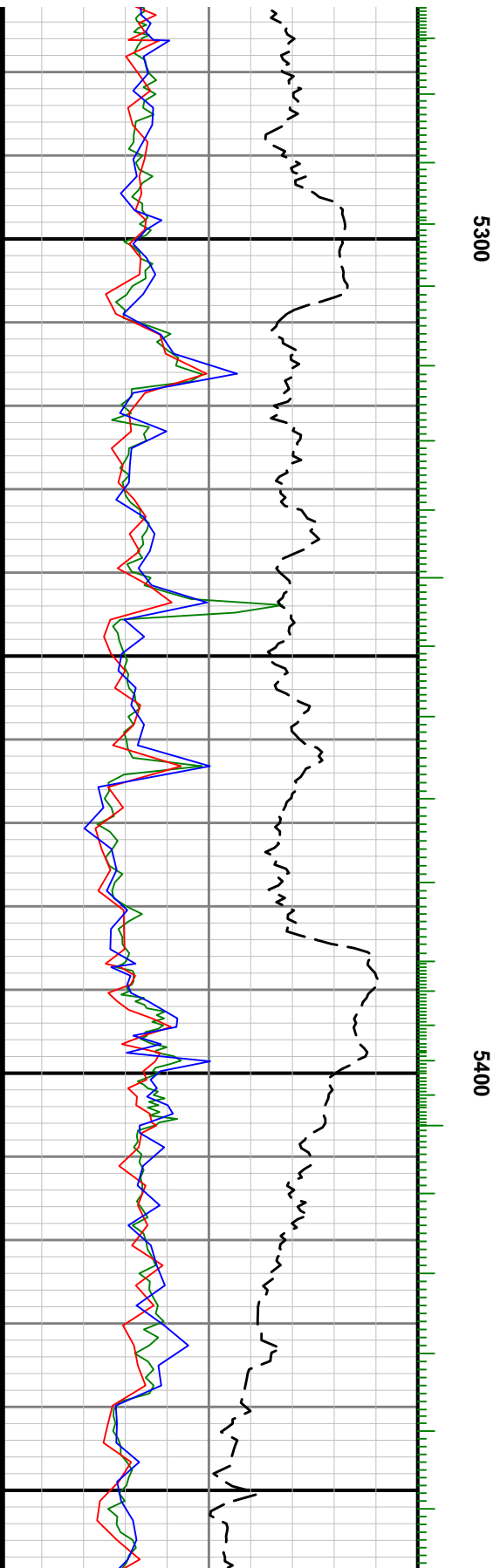


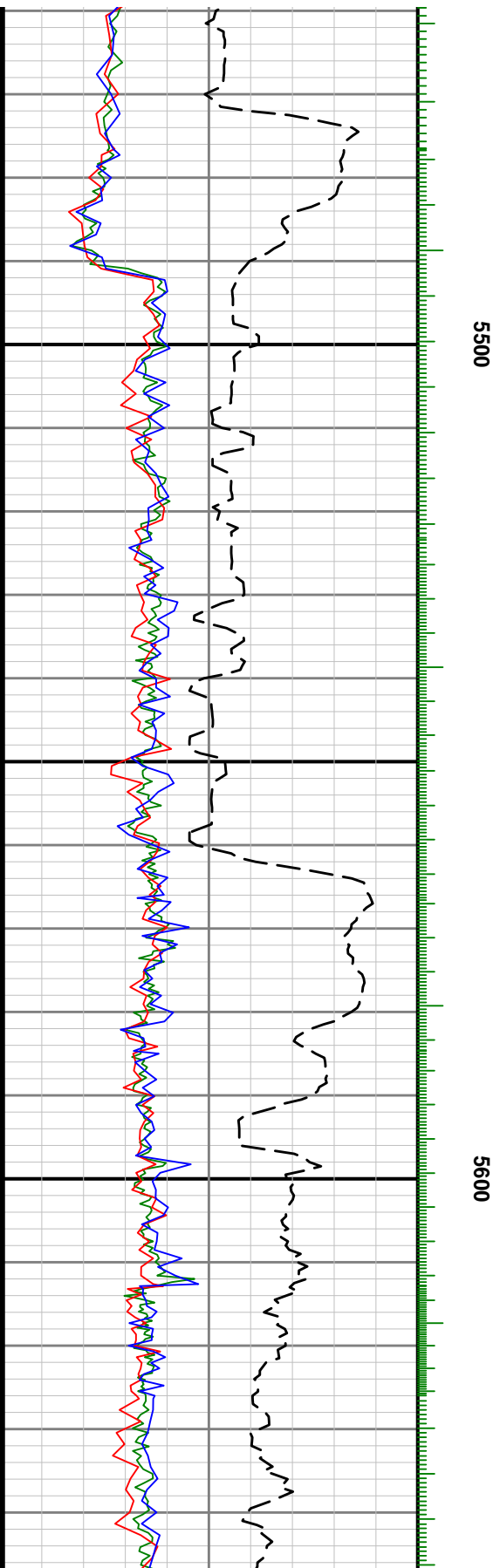
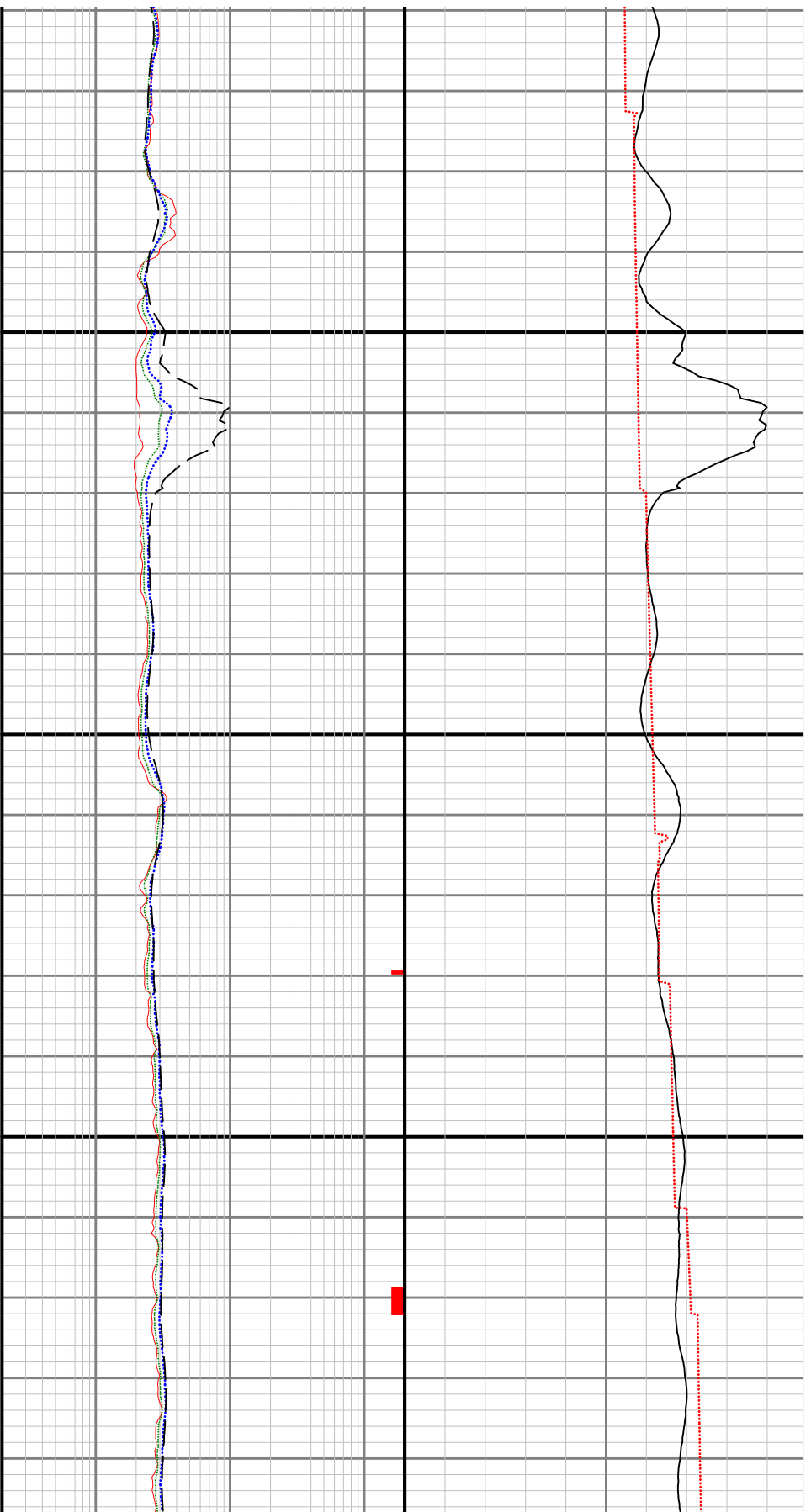


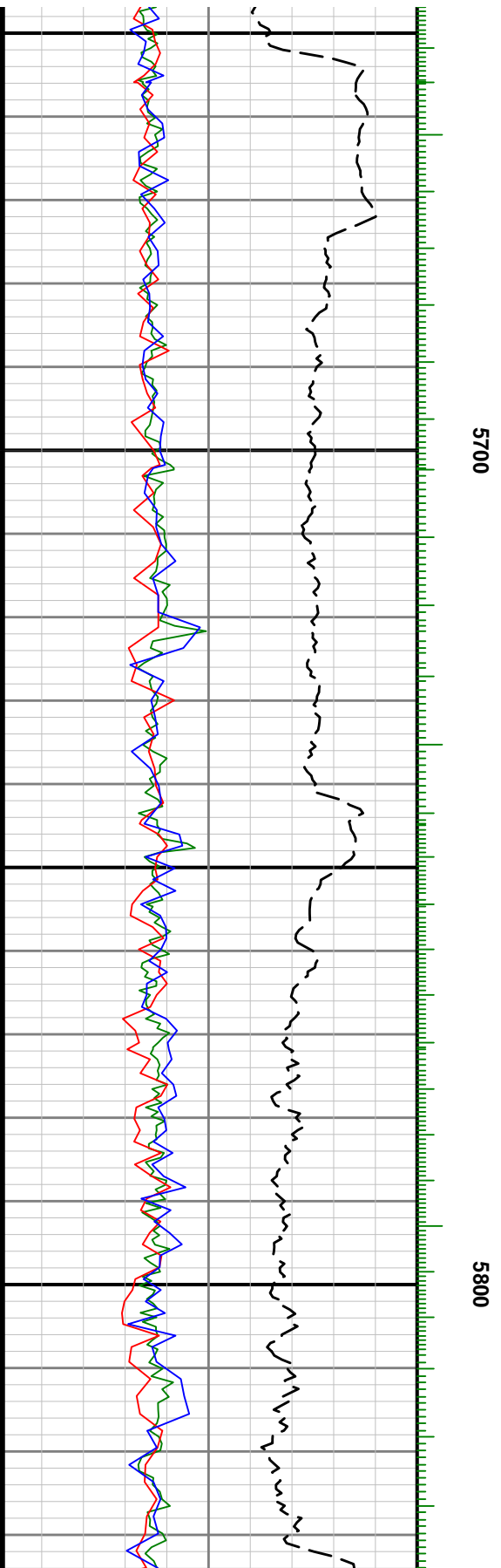
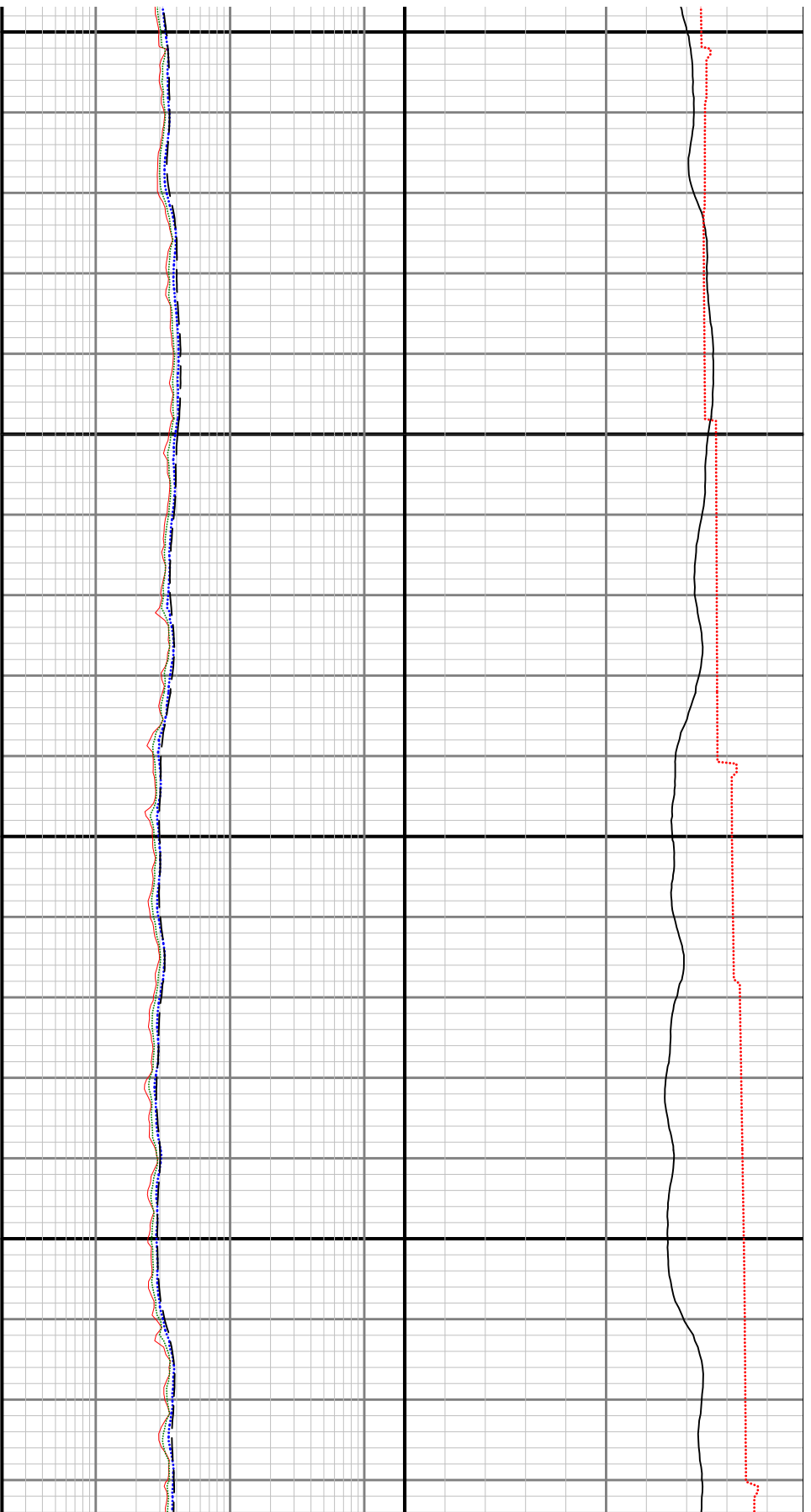


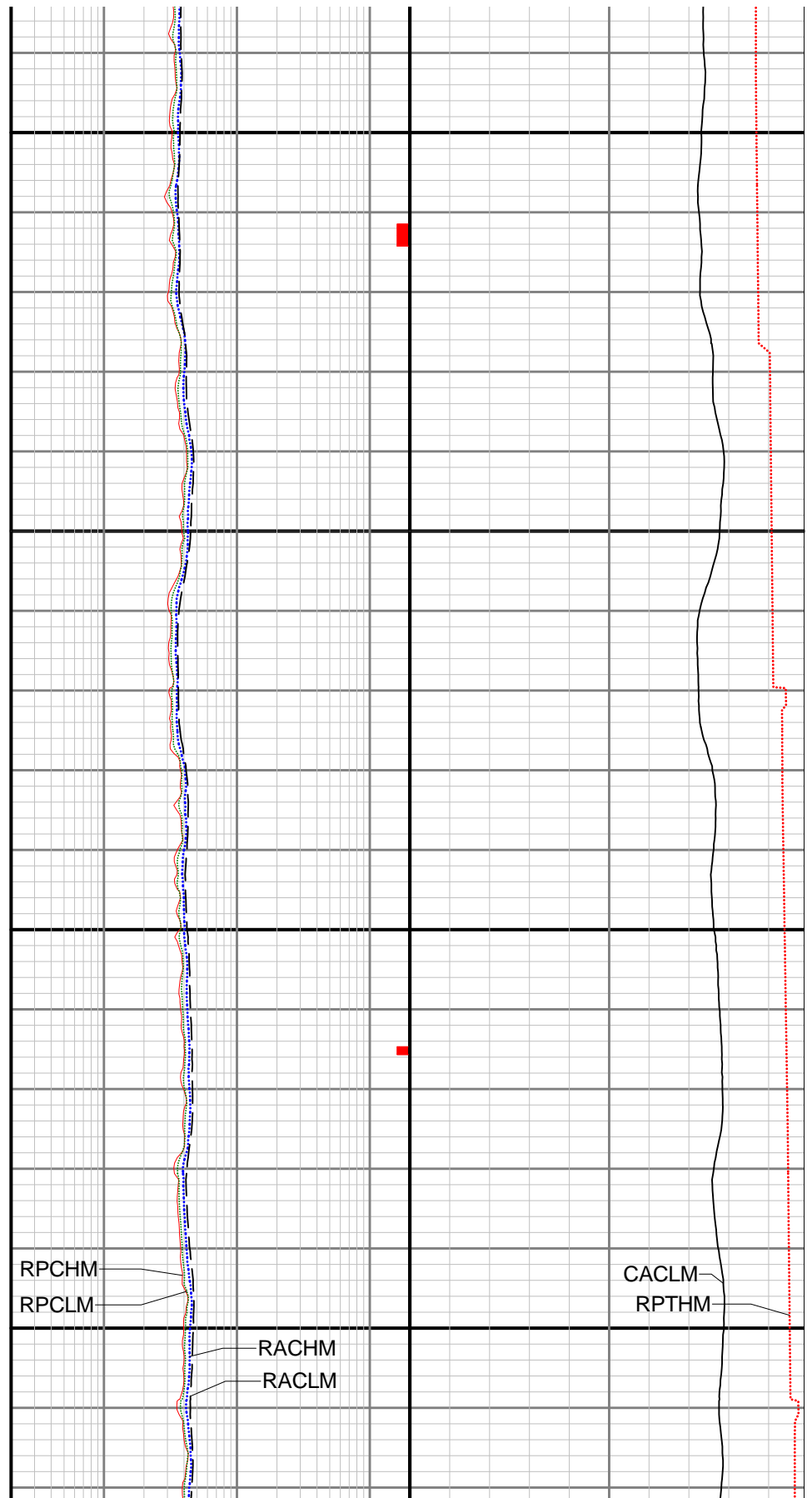
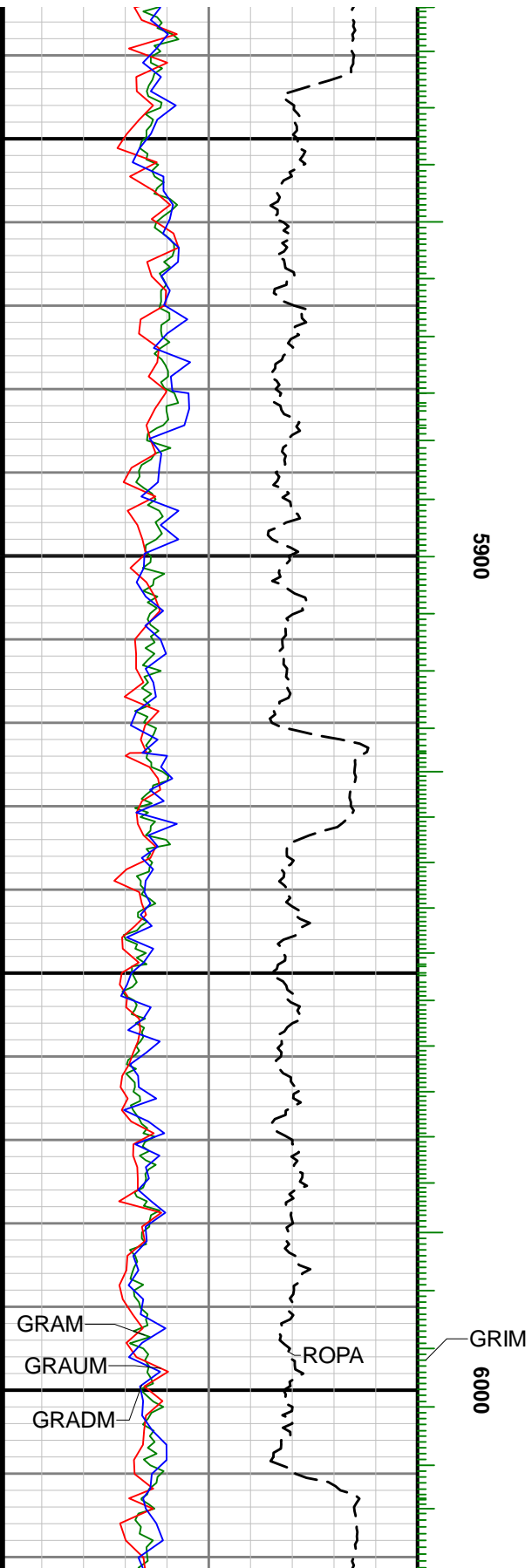


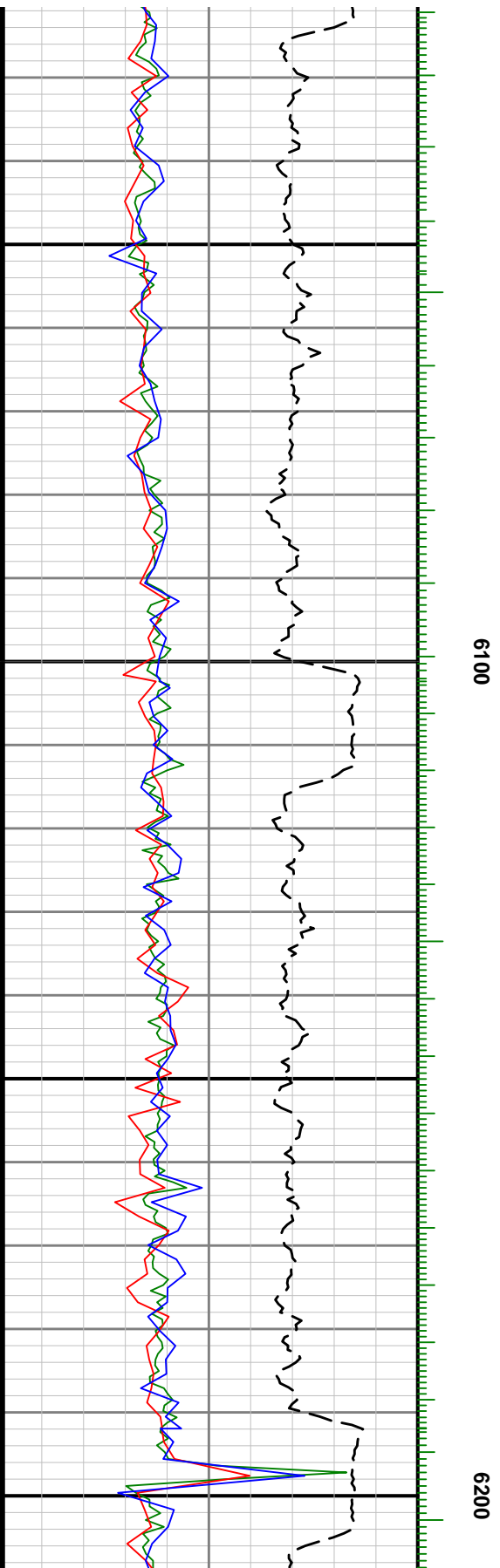
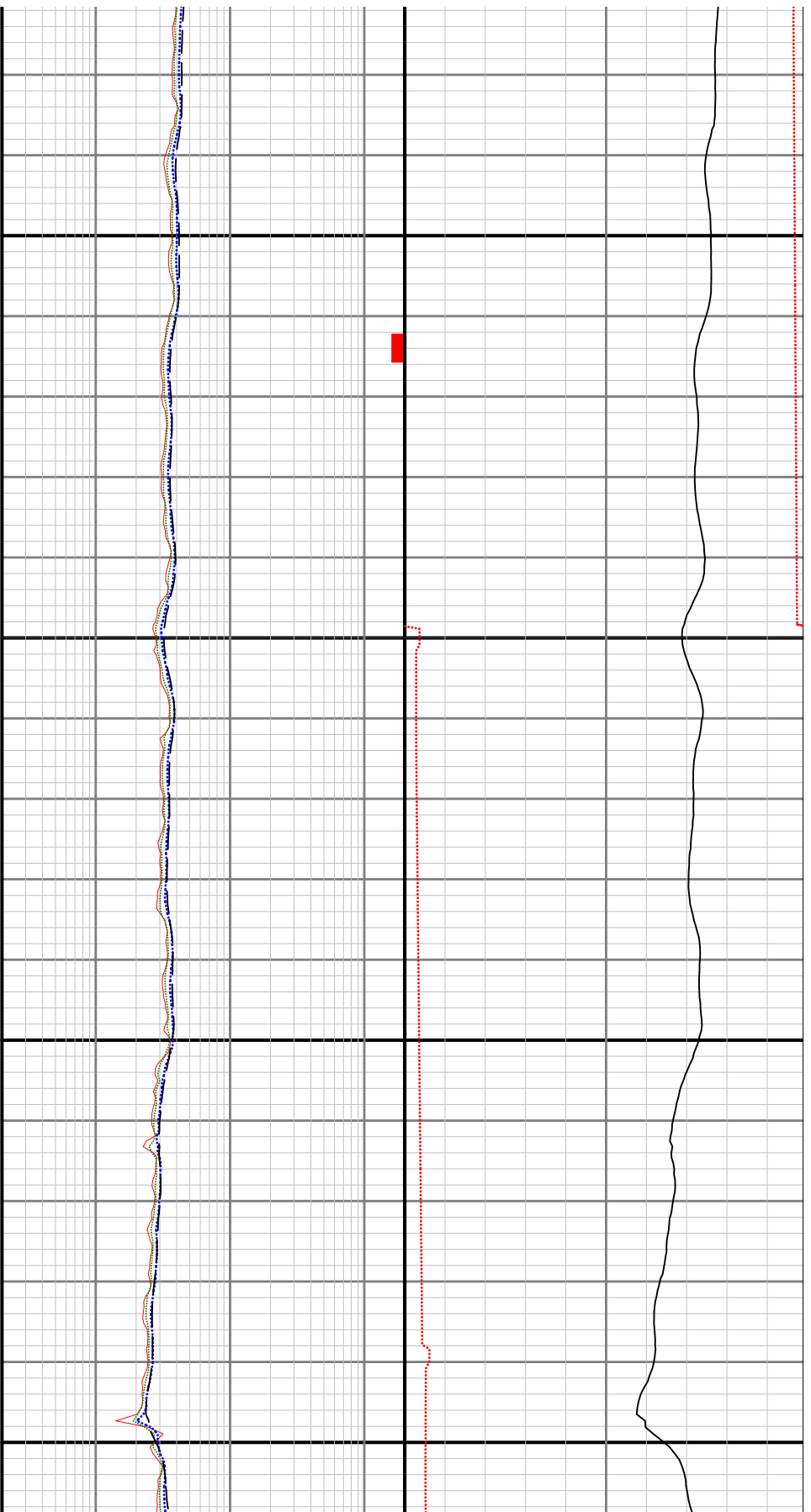


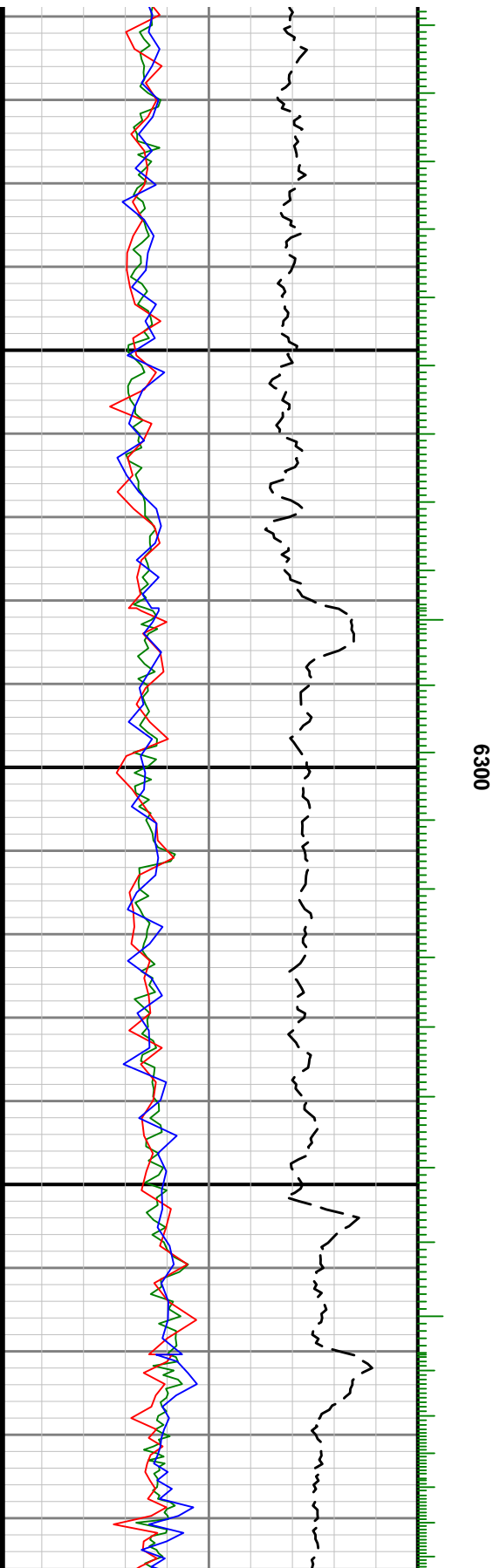
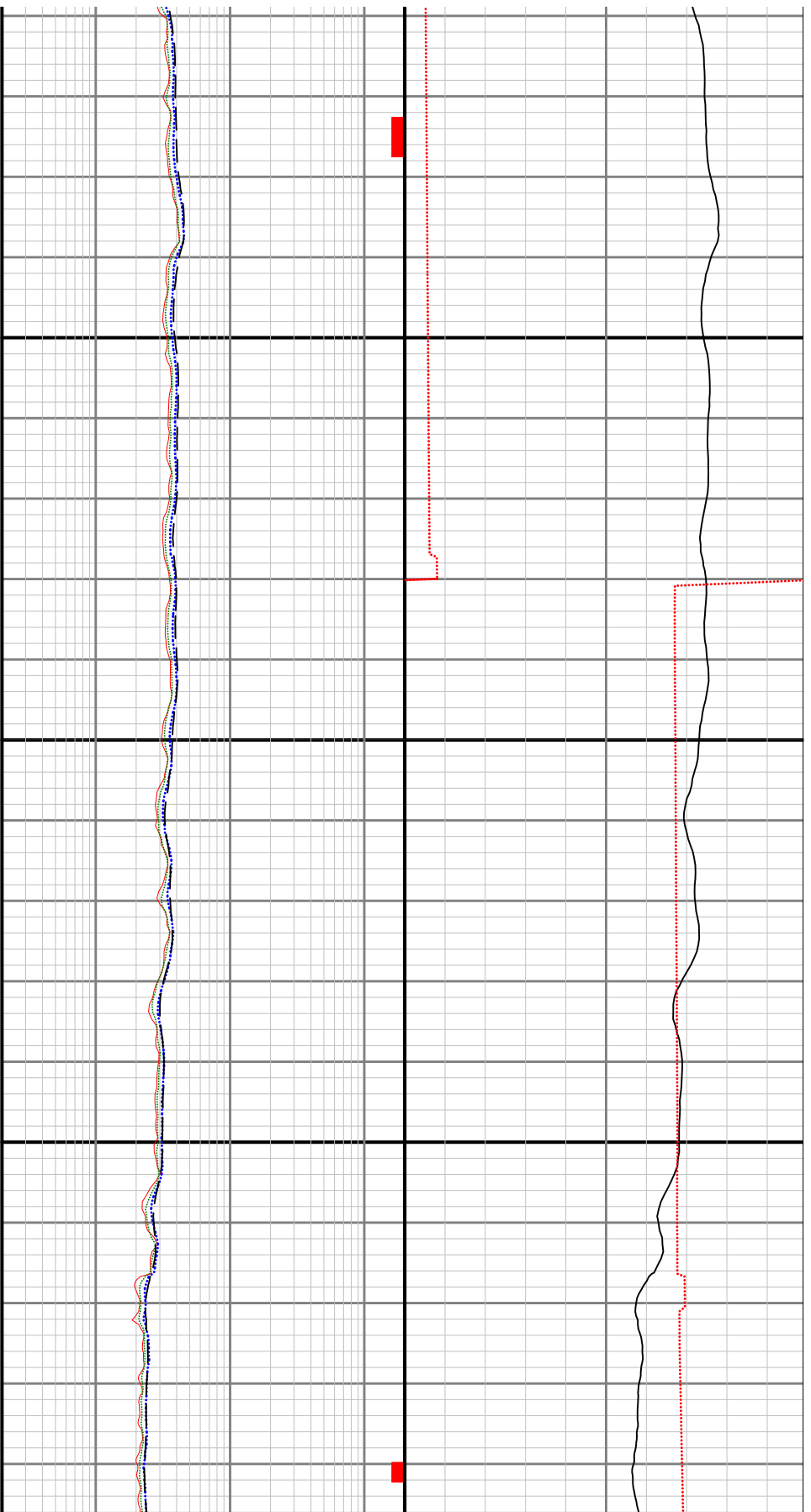


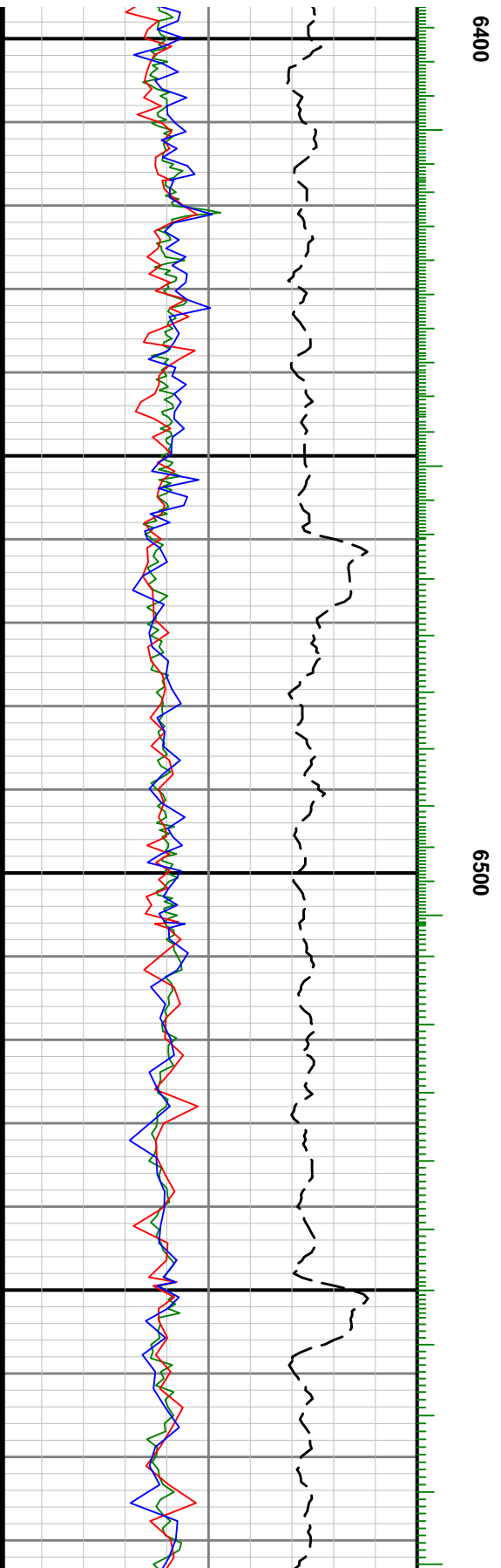
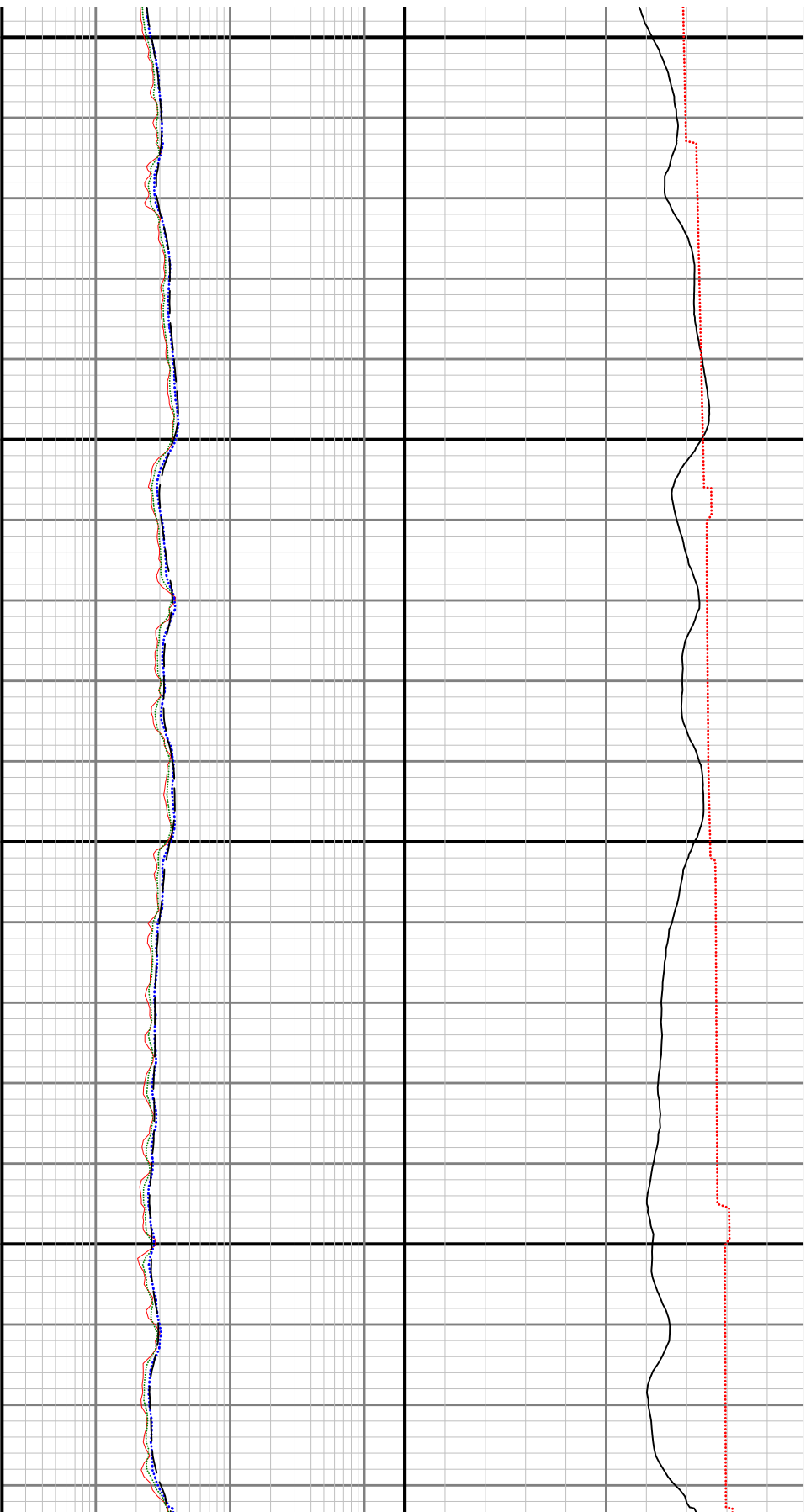


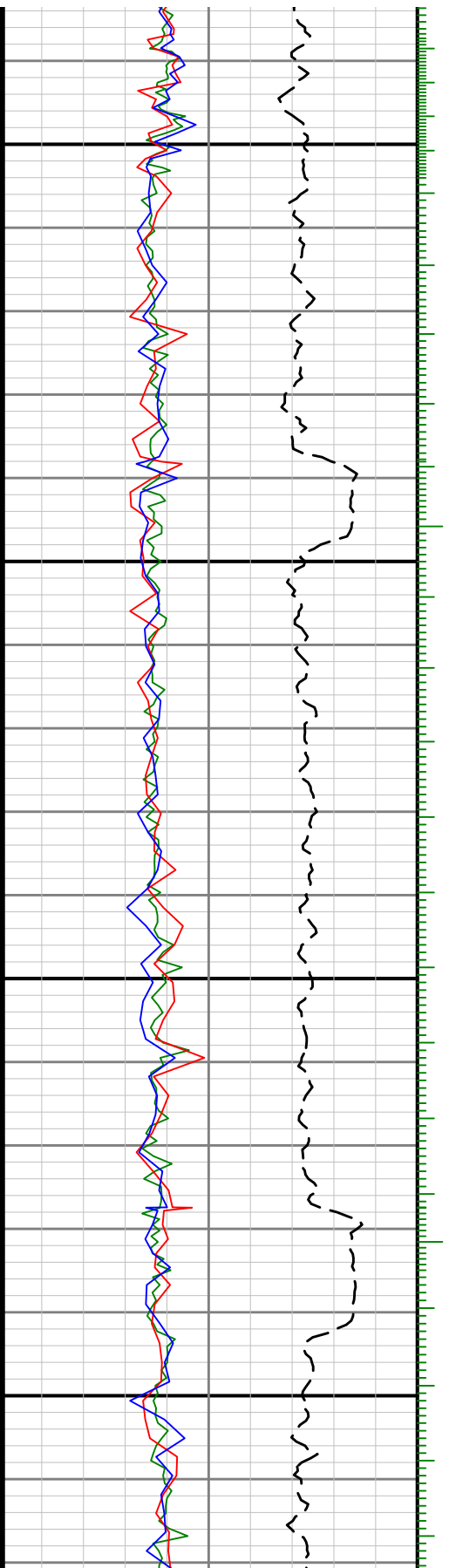






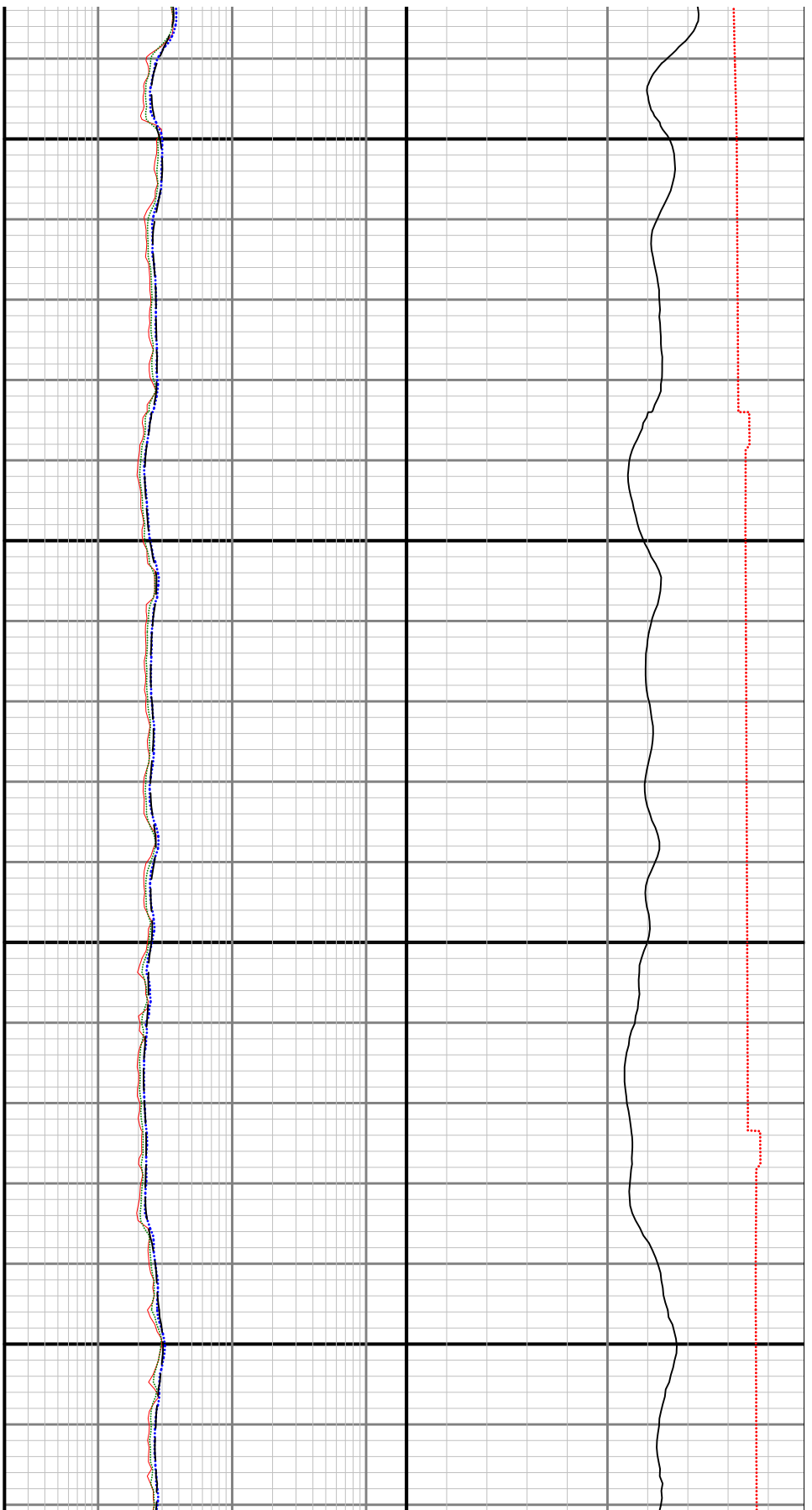


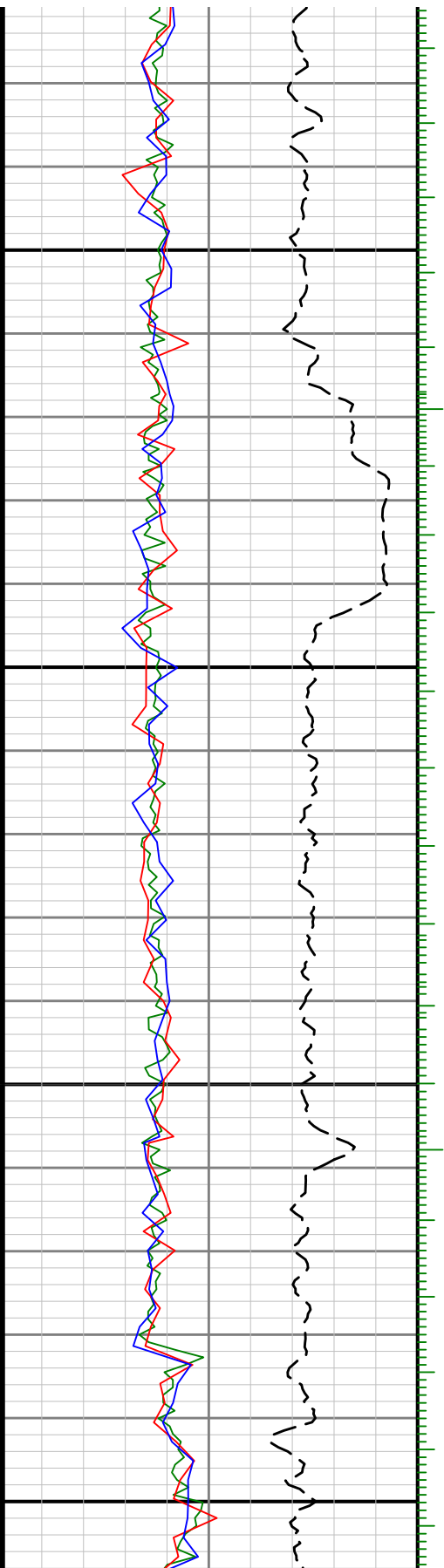




0099

6700





0069

0089

