

		MEASURED DEPTH COMPENSATED NEUTRON-DENSITY POROSITY SPECTRAL GAMMA RAY LOG	
Company: GREAT WESTERN OPERATING COMPANY LLC Well: OTTESEN LE 09-368HC Field: WATTENBERG County: WELD State: CO		COMPANY: GREAT WESTERN OPERATING COMPANY LLC WELL: OTTESEN LE 09-368HC FIELD: WATTENBERG COUNTY: WELD STATE: CO	
Permanent Datum: GROUND LEVEL Elevation: 5076.5 ft Log meas. from: KELLY BUSHING 20.0 ft above Perm. Datum Drill. meas. from: KELLY BUSHING		API No. 05-123-44343-00 Location LAT:40.004600 LONG:-104.777842 SEC 33 TWP 1N RNG 66W 1510' FSL & 1443' FEL Other Services RT	
Date	16-DEC-2018		
Run No.	1 (HORIZONTAL)	TVD	
Depth Driller	17980.0 ft	7690.8 ft	
Depth Logger	17980.0 ft	7690.8 ft	
Bottom Logged Interval	17757.0 ft	7704.0 ft	
Top Logged Interval	7768.0 ft	7389.3 ft	
Casing Driller	1773.0 ft	1772.7 ft	
Casing Logger	N/A	N/A	
Bitsize	8.5 in		
Type Fluid in Hole	INVERT MUD		
Density / Viscosity	10.5 ppg 68 sec/qt		
pH / Water Loss	N/A N/A		
Source of Sample	N/A		
Rm at Meas. Temp.	N/A		
Rmft at Meas. Temp.	N/A		
Rmc at Meas. Temp.	N/A		
Source Rmft/Rmc	N/A N/A		
Rm at BHT	N/A		
End Circulation	15-DEC-2018 @ 11:50		
Logger on Bottom	16-DEC-2018 @ 02:15		
Max. Recorded Temp.	249.3 °F		
Equip. No / Location	DL-415 OKC		
Recorded by	J. SLAFF	R. BERGERON	
Witnessed by	J. HAINES	A. MALONE	

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In making interpretations of logs, Contractors employees will give the Customer the benefit of their best judgement, but since all interpretations are opinions, based on inferences from electrical or other measurements, Contractor cannot, and does not guarantee the accuracy or the correctness of any interpretation.

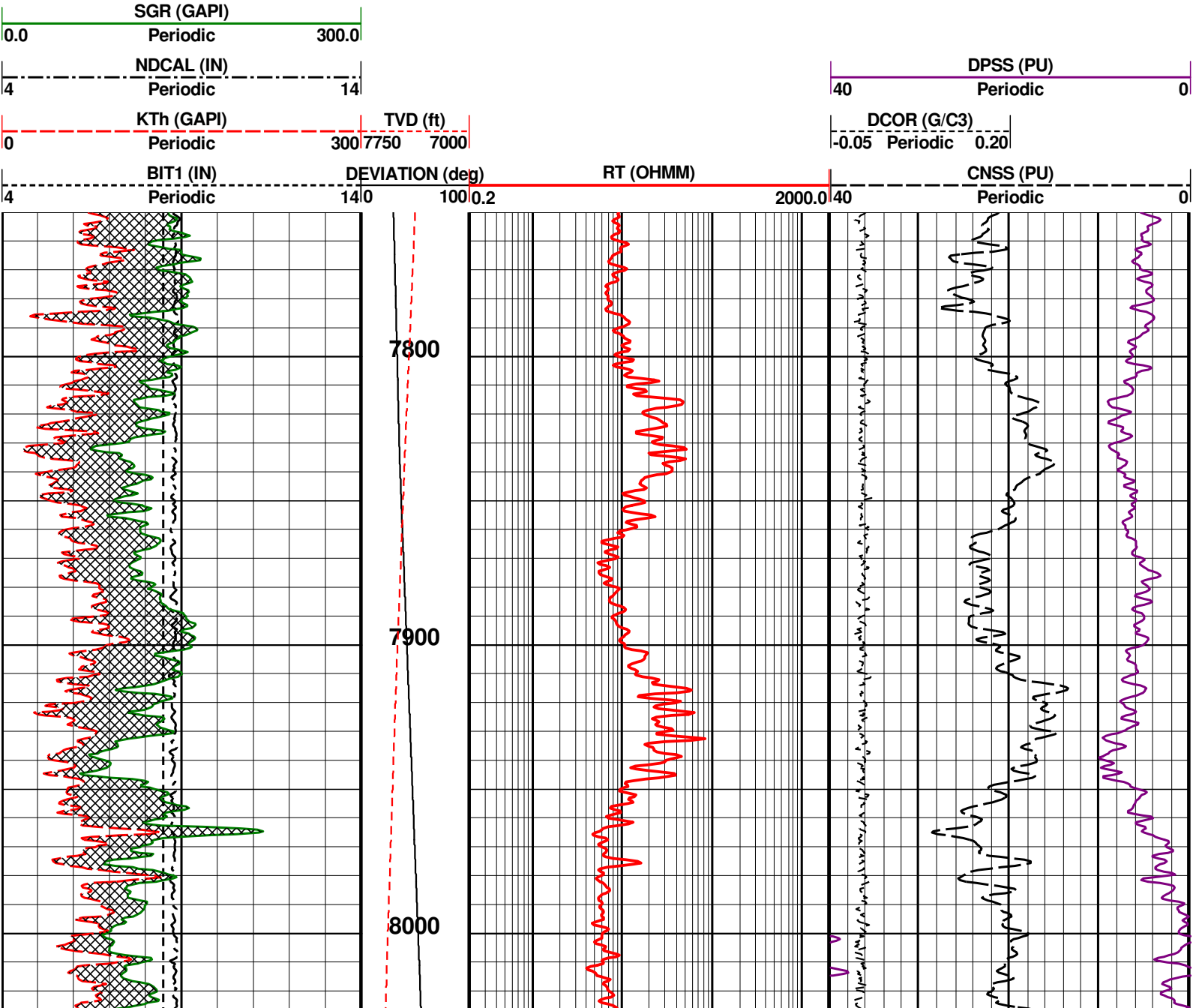
ANTARES WinAPIot Software - Copyright (c) 1997 - 2008 ANTARES Datensysteme GmbH

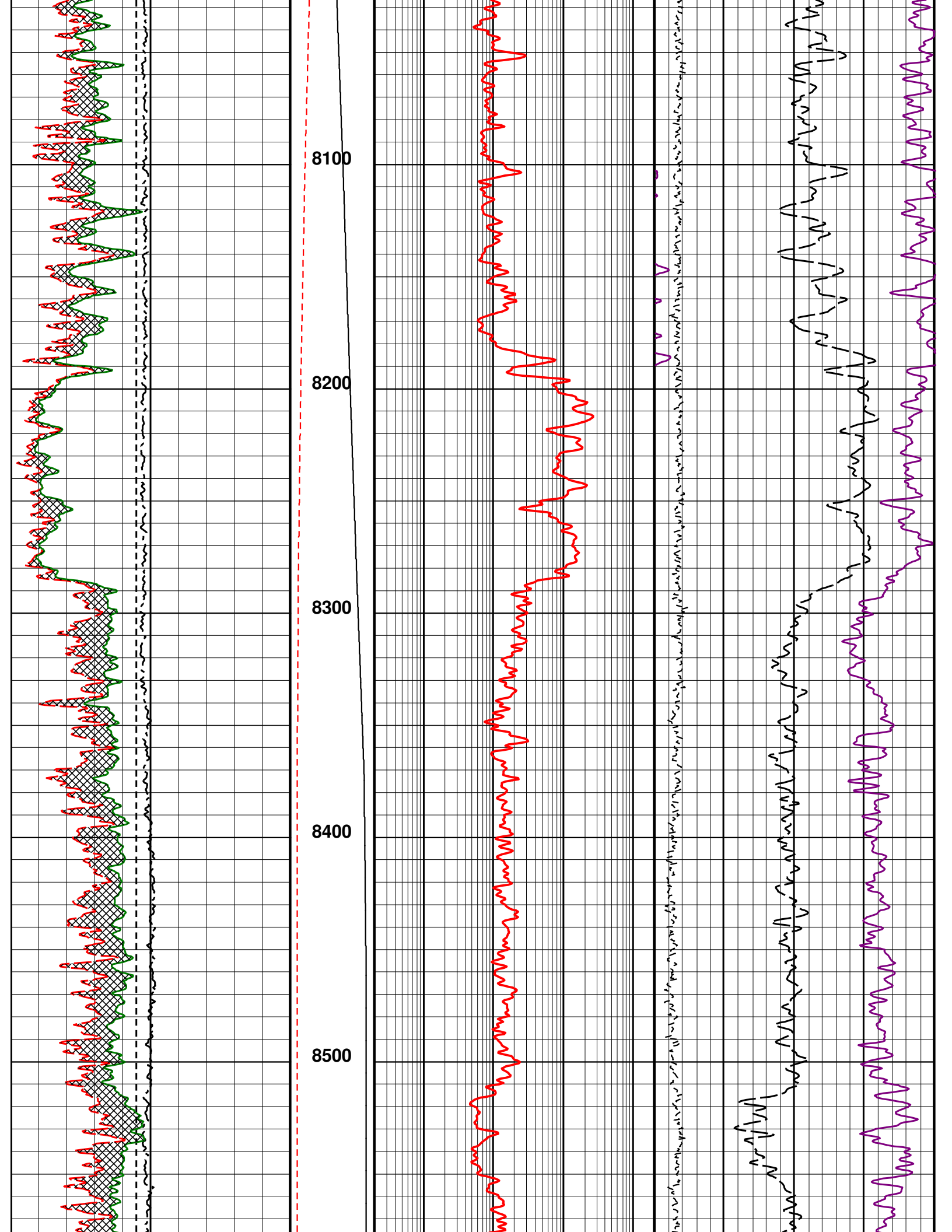
REMARKS				
TOOLS PUMPED DOWN FROM SURFACE; LOGGING PERFORMED WHILE TRIPPING OUT COMPENSATED NEUTRON-DENSITY PRESENTED IN SANDSTONE AND LIMESTONE MATRIX MAX DEVIATION: 91.78 DEG @ 17498.0 ft DRILLING RIG: PRECISION DRILLING 460 SURFACE CASING SIZE: 9.625 in, 36.0 lbm/ft FROM 0.0 ft TO 1773.0 ft BITSIZE: 13.5 in FROM 0.0 ft TO 1773.0 ft BITSIZE: 8.5 in FROM 1773.0 ft TO 17980.0 ft ALL LOG DEPTHS WERE RECORDED WITH EDR (NOV TOTCO), AND CORRECTED TO PIPE TALLY DERIVED RESISTIVITY USED DUE TO PRT TOOL NOT LANDING PROPERLY				
EQUIPMENT DATA				
Run	Trip	Instrument	Serial No.	Series No.
1	1	TELEMETRY	3102013	
1	1	SGR	1460015	
1	1	GR-CN	1473020 U	1473020 L
1	1	KNUCKLE	0813006	
1	1	DENSITY	1481021	
1	1	RESISTIVITY	RX0013	
1	1	OMEGA SQUAR	DS465000	

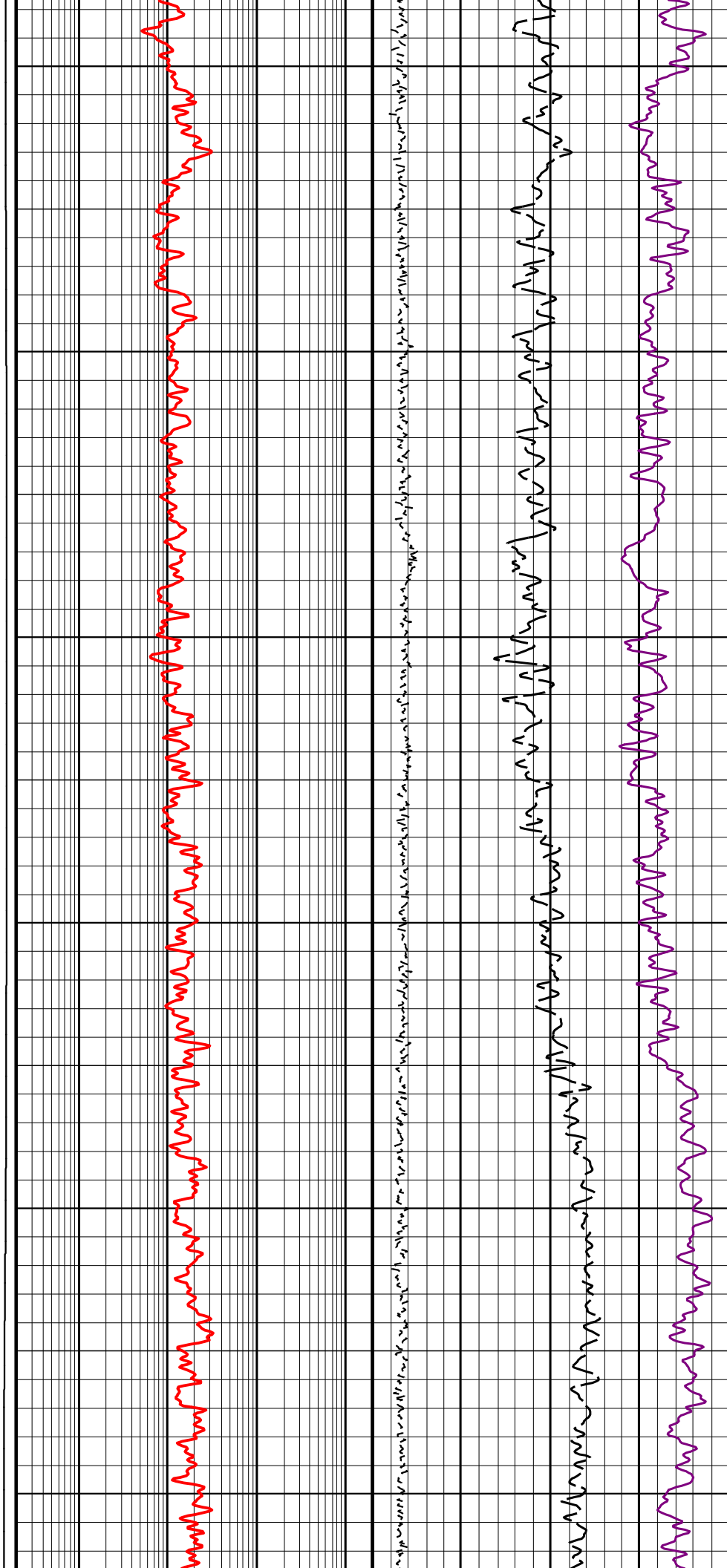
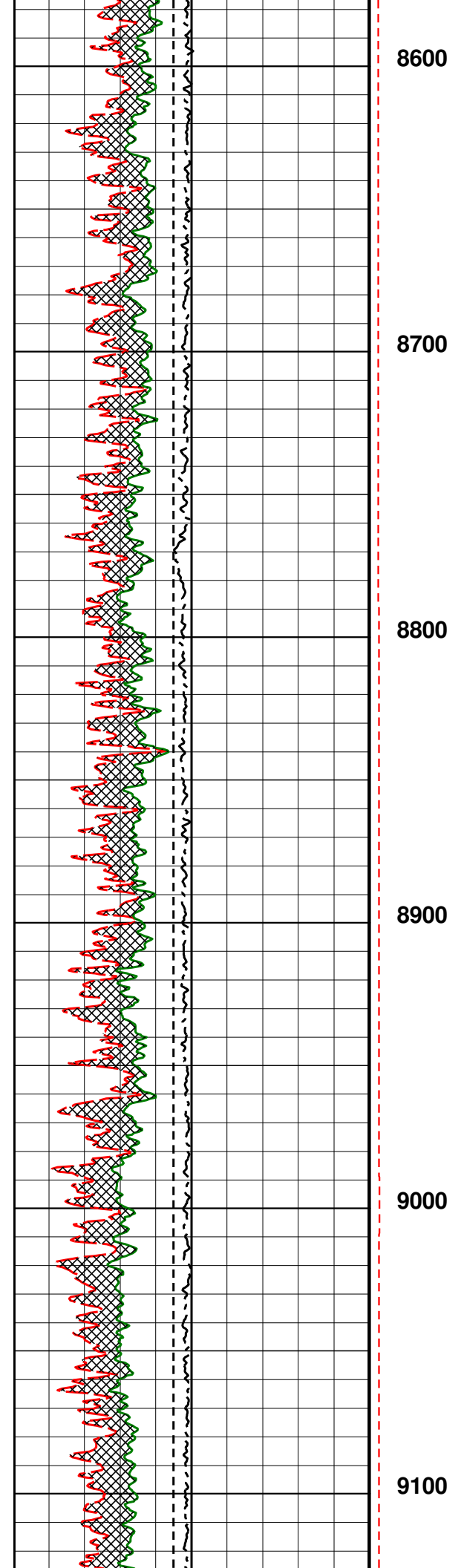
		OMEGA COLLAR	RSA63008		
1	1	STEEL COLLAR	DL-45XH-6		
1	1	STEEL COLLAR	DL-L1972XH-4		
1	1	Am241Be / Cs137	77813	79966B	

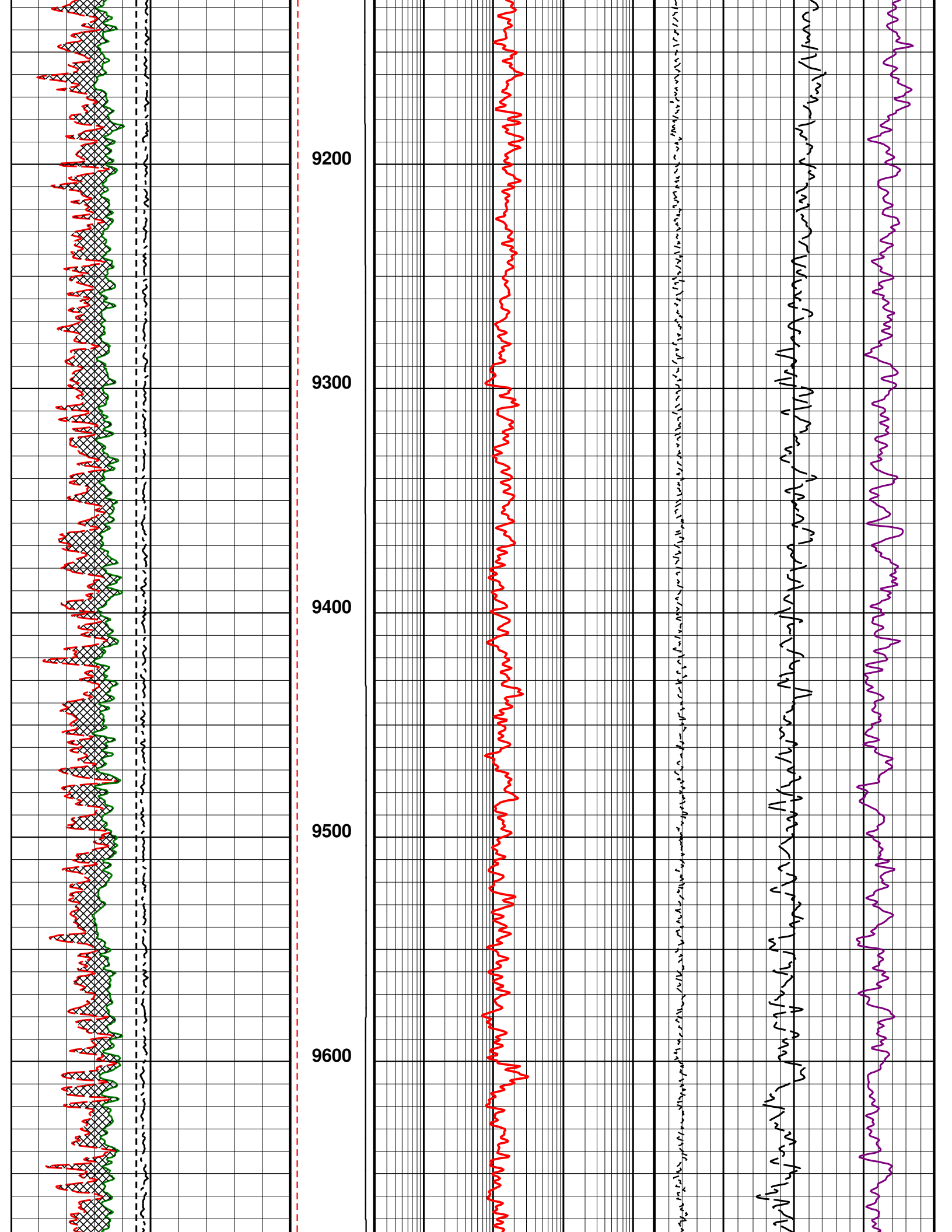
2" MAIN PASS SANDSTONE

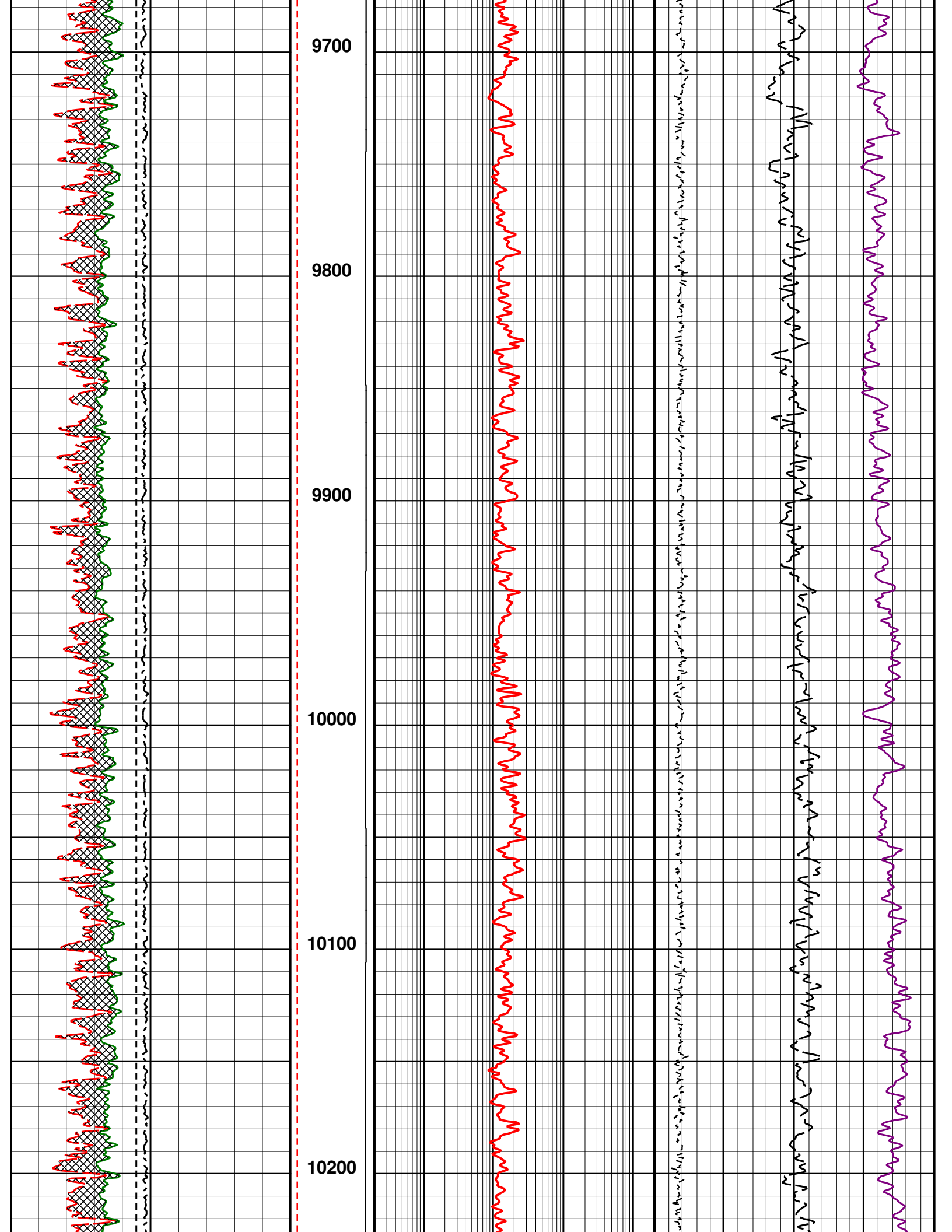
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Well	: OTTESEN LE 09-368HC	Time	:
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Depth in	: Feet		
Software	: WinAPIPlot Ver. 5, 87, 2, 0	File Name	: 812_05-123-44343-00_MAIN MD_REV1

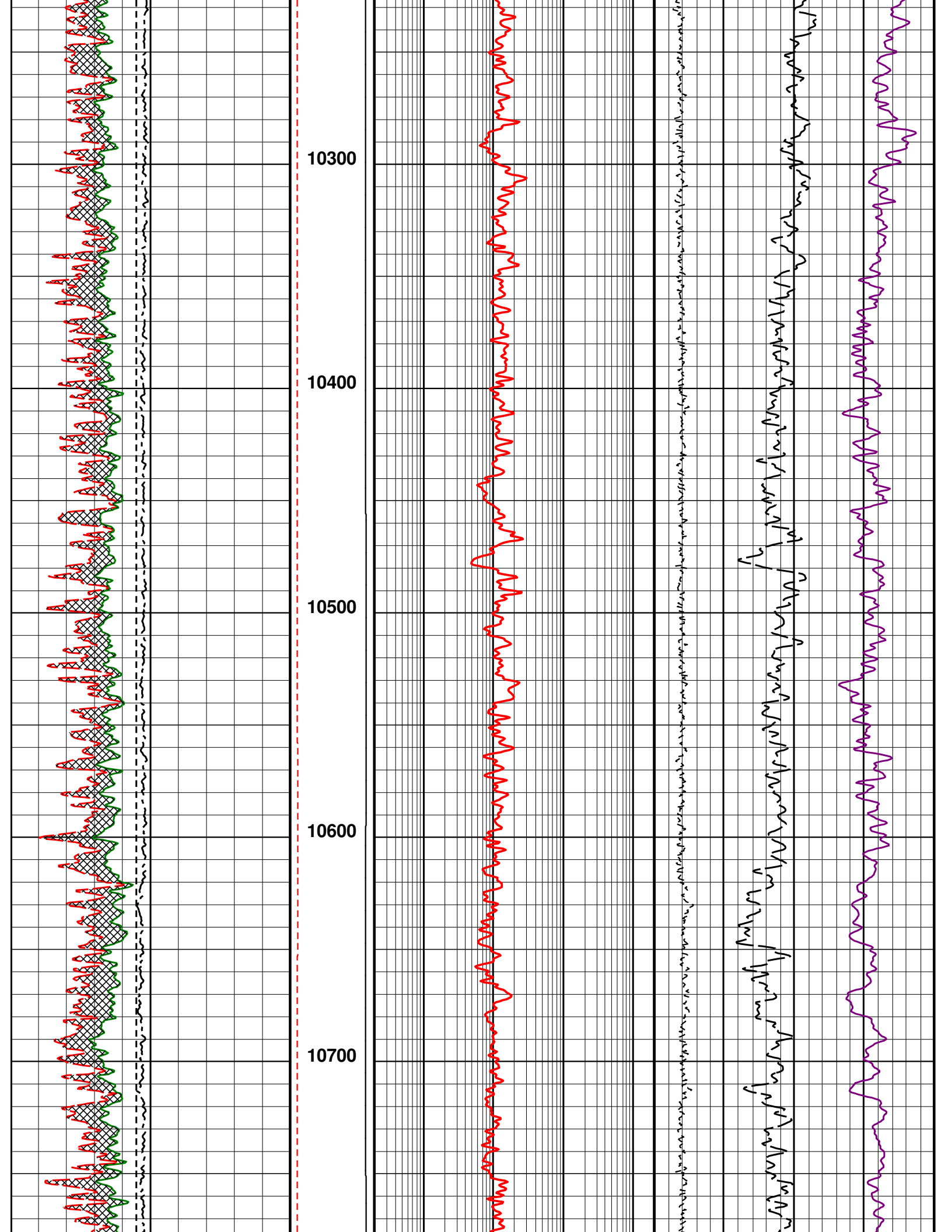


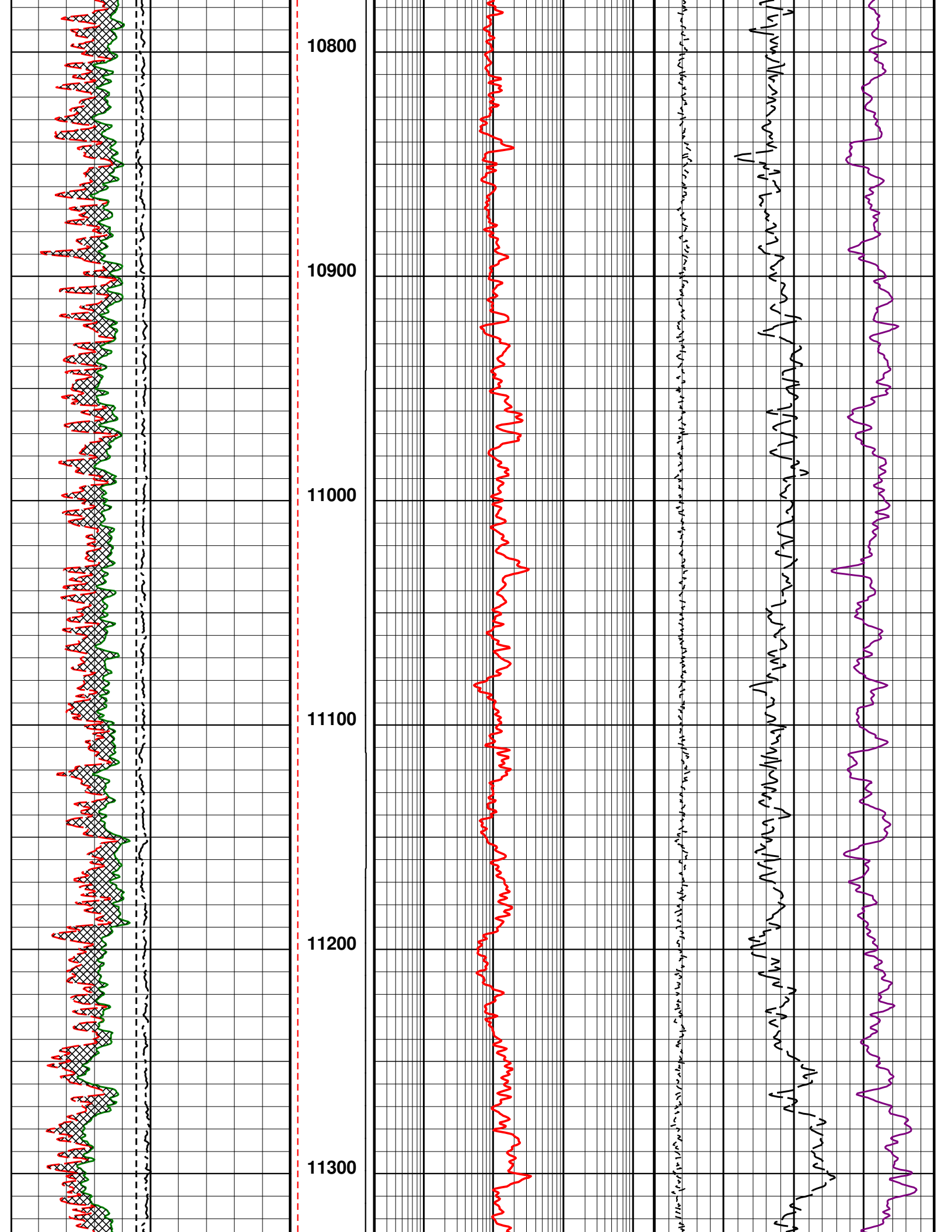


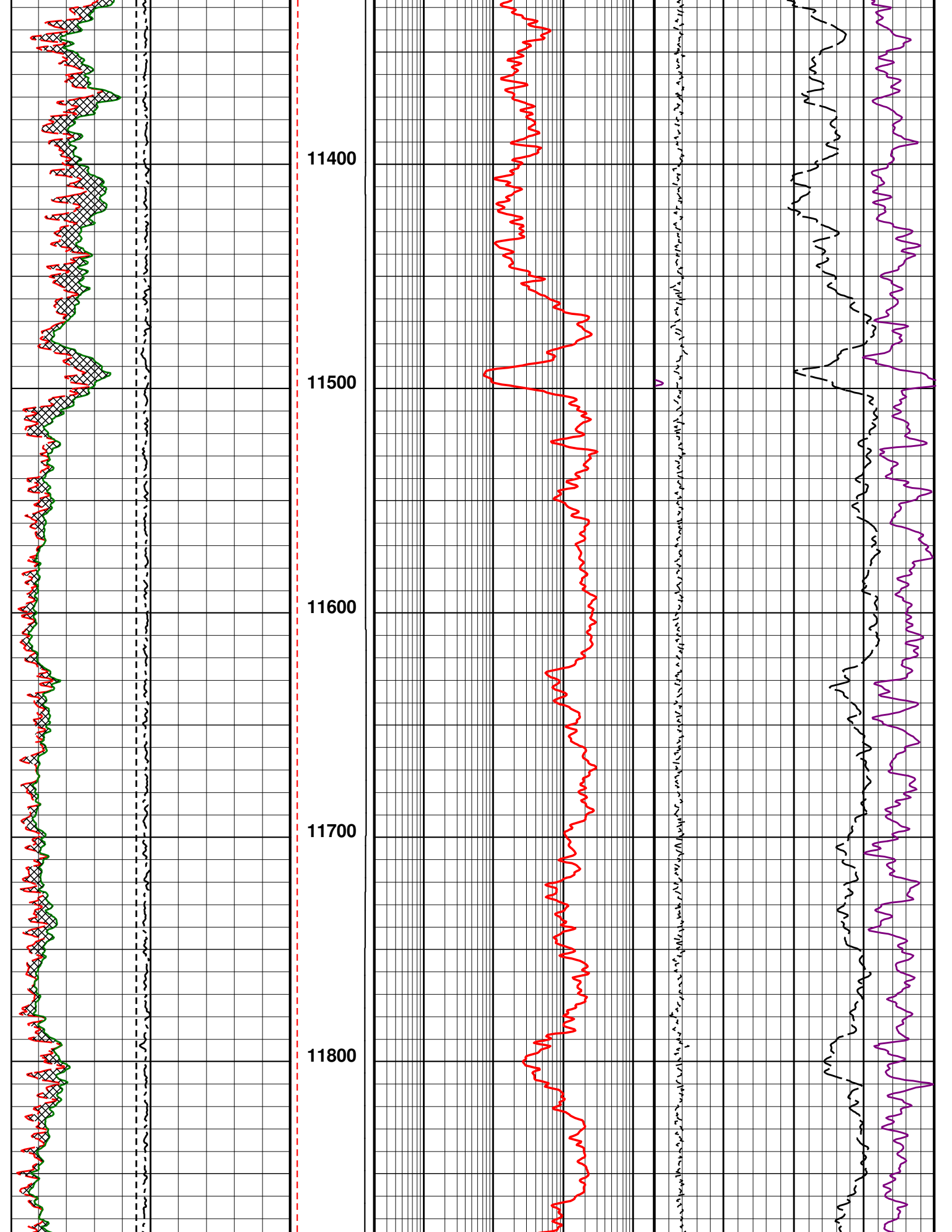


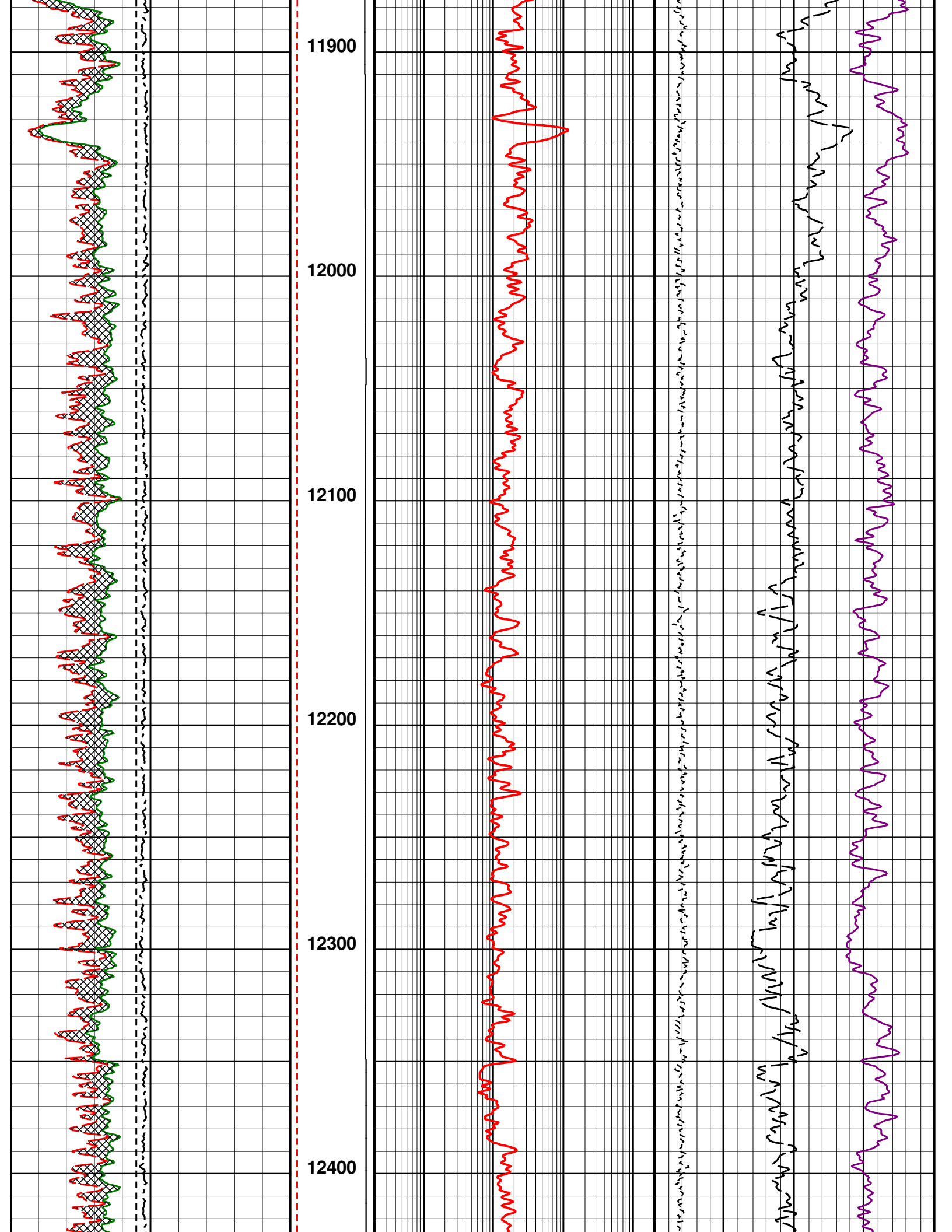


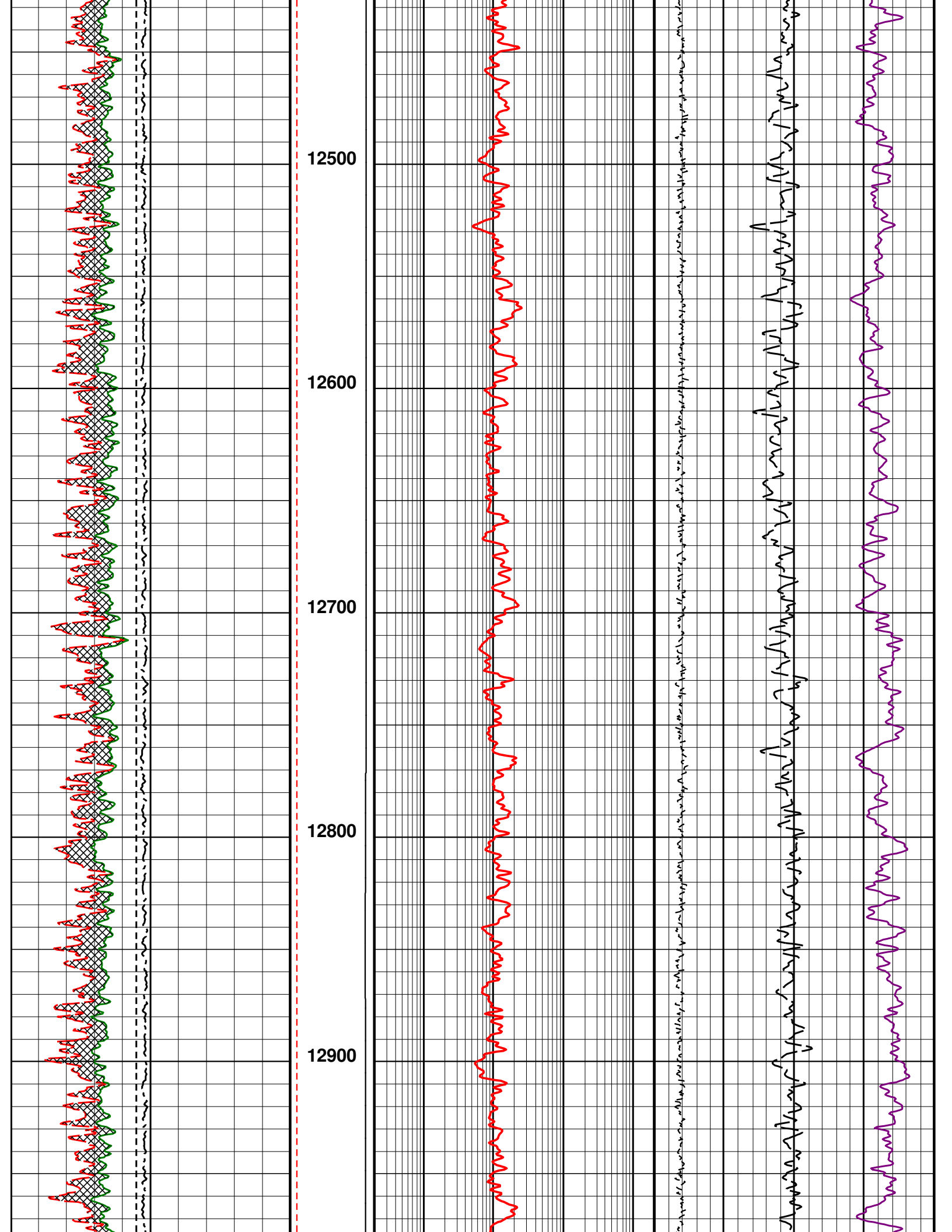


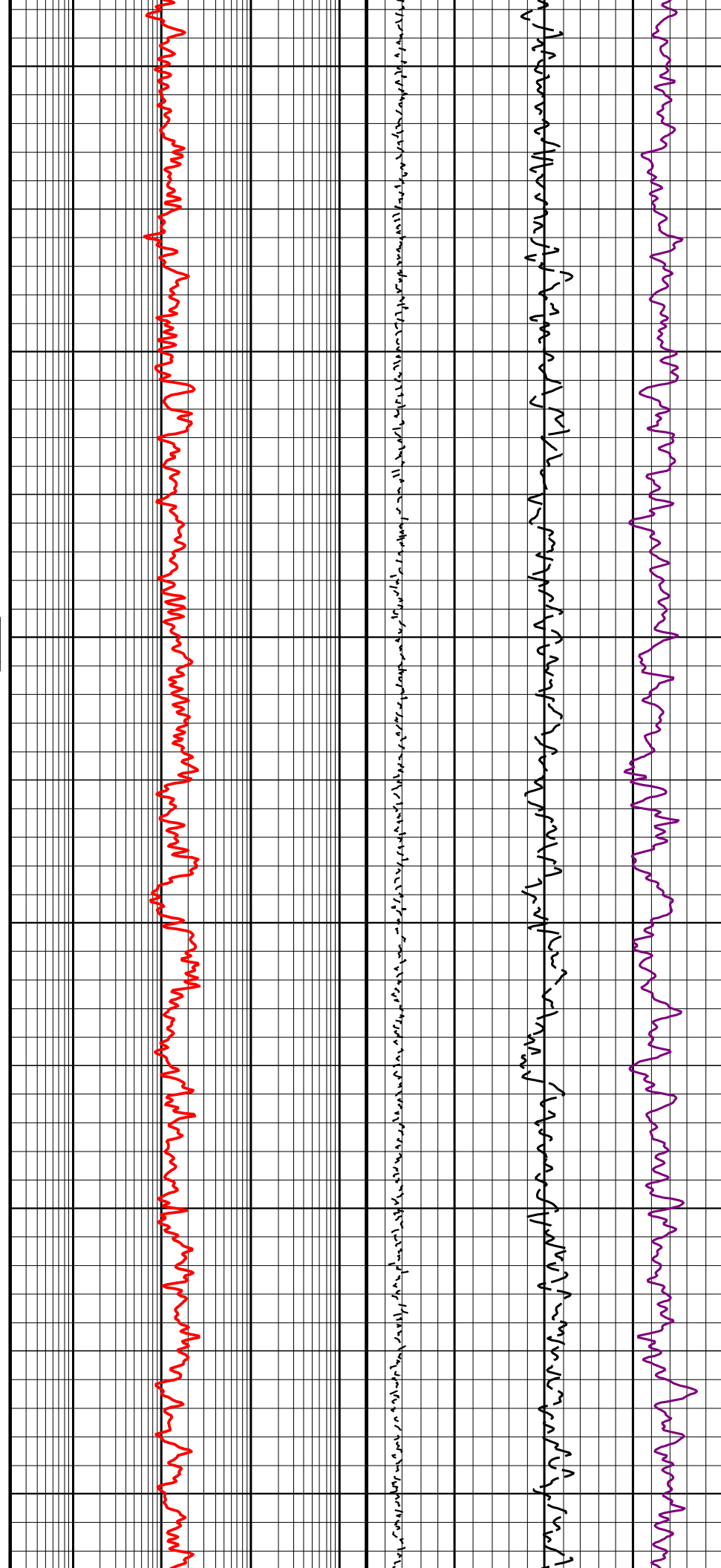
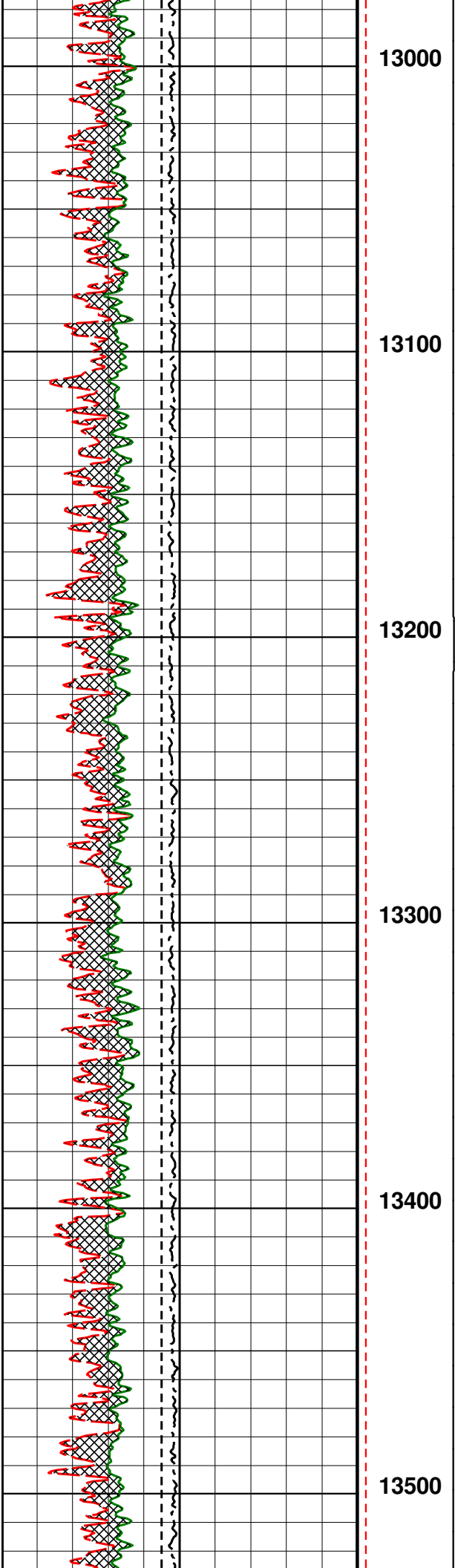


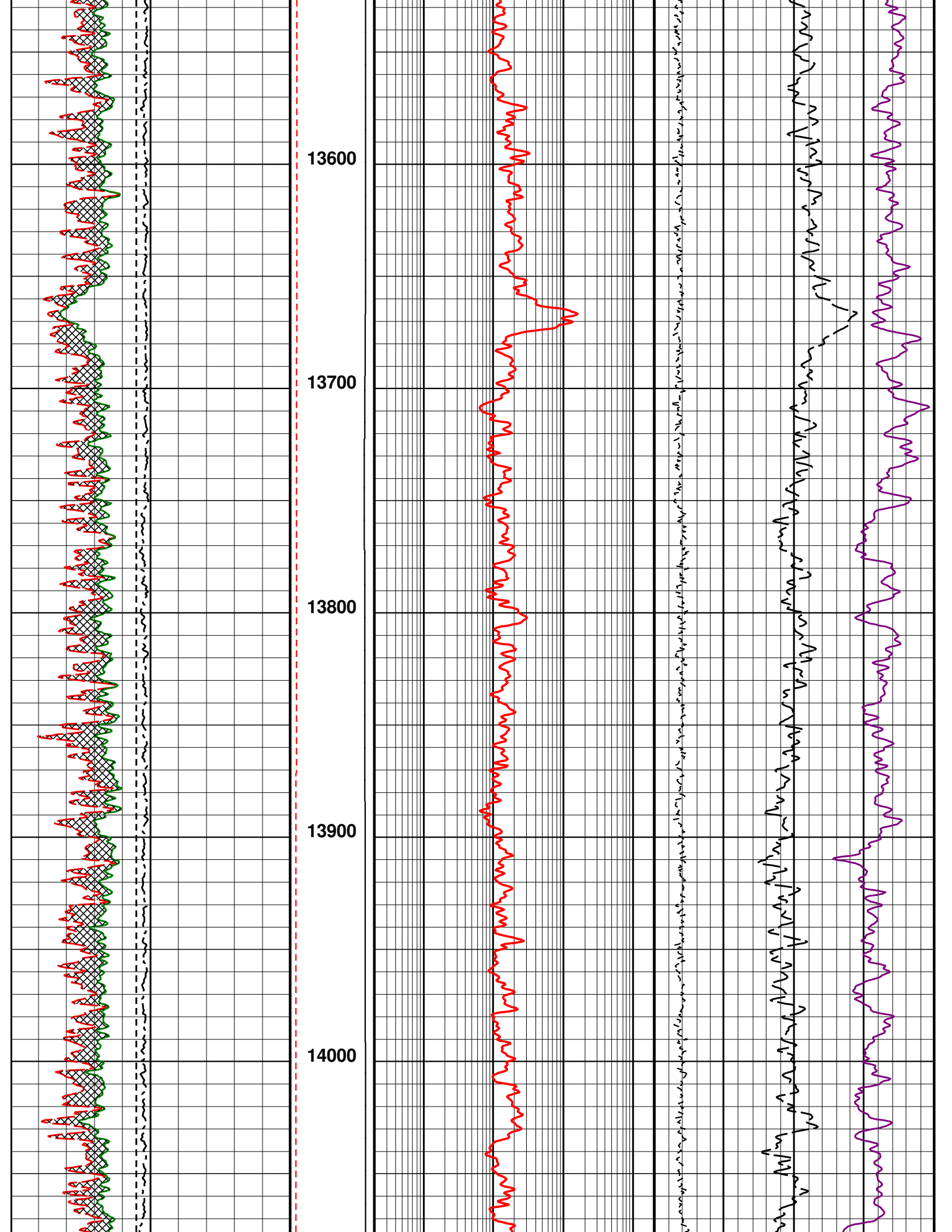


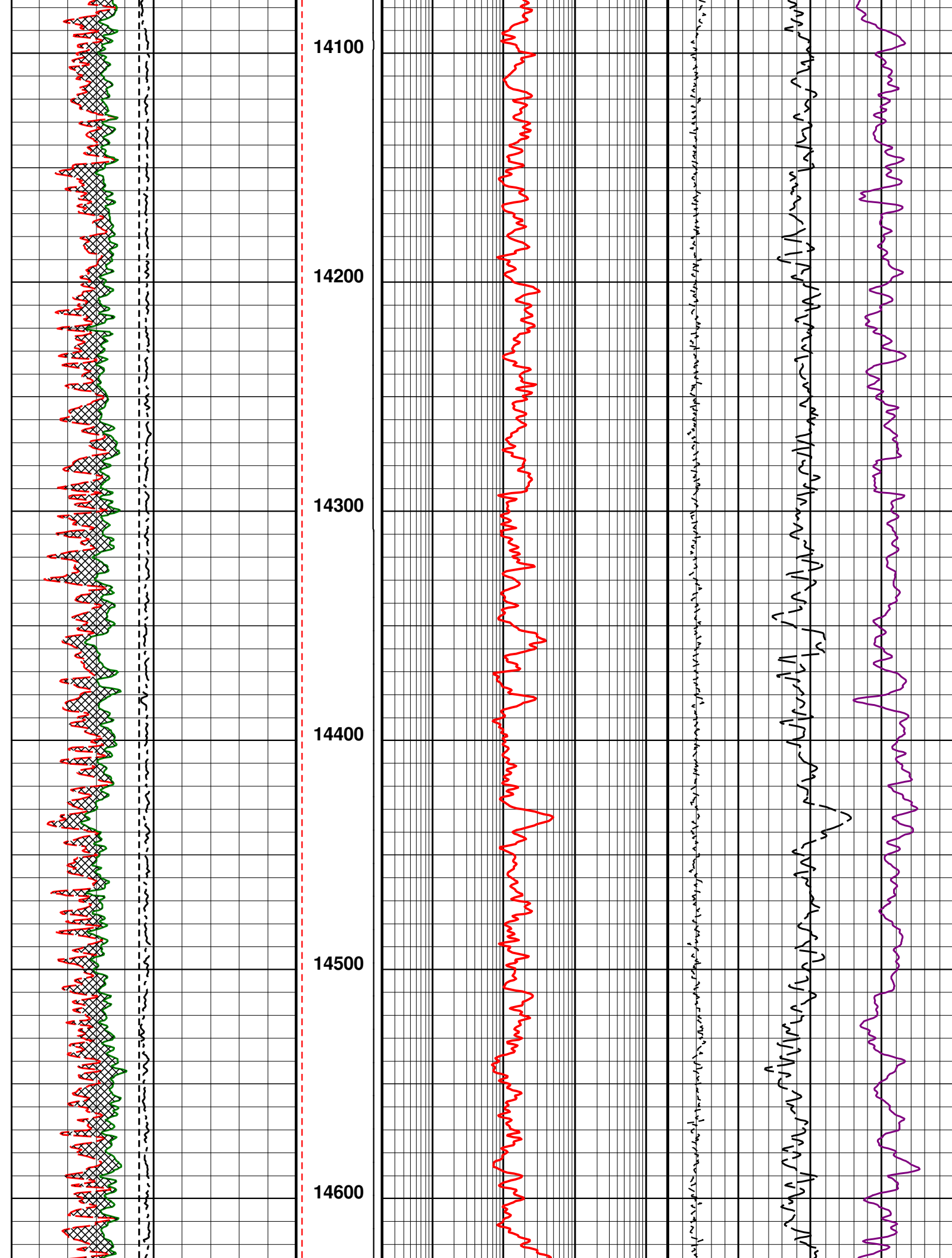


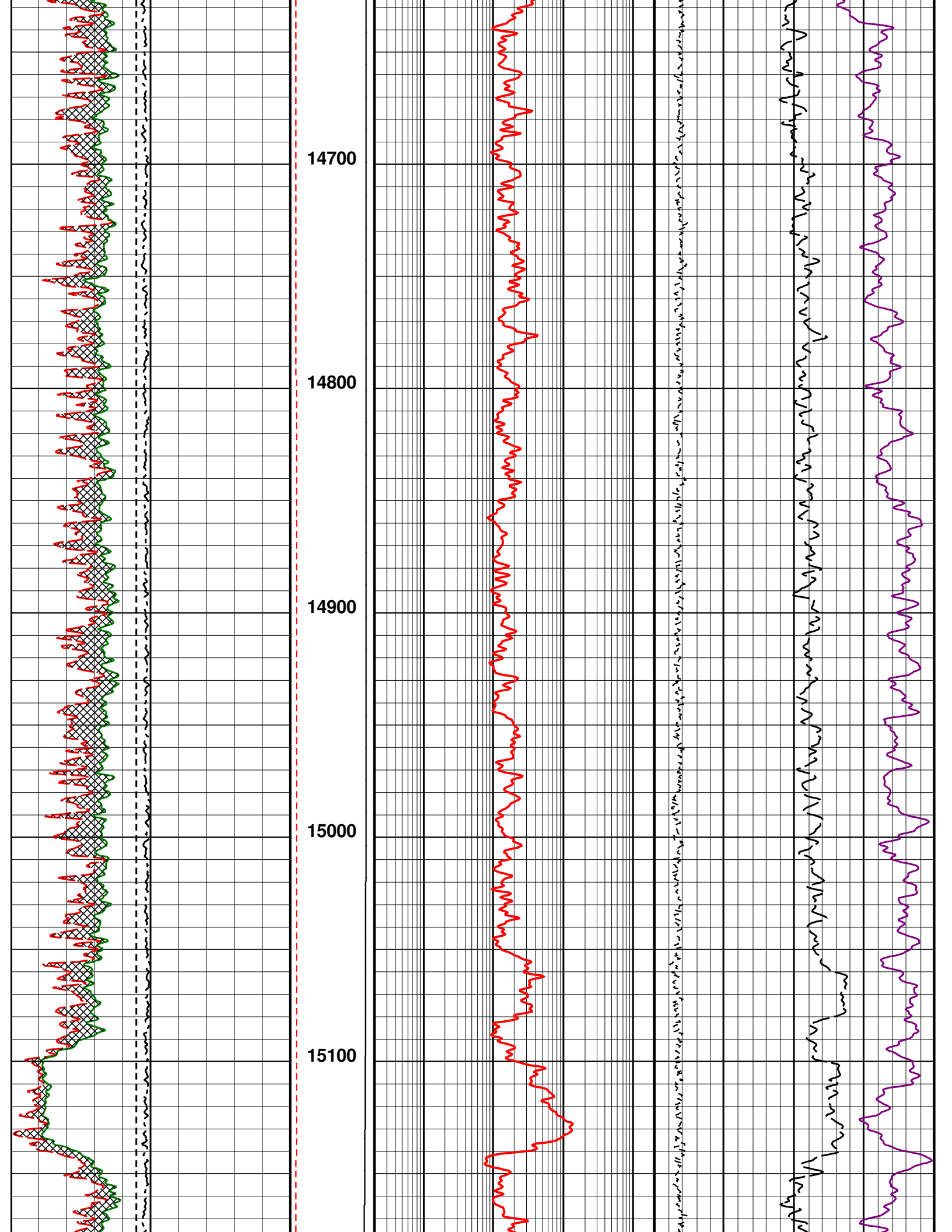


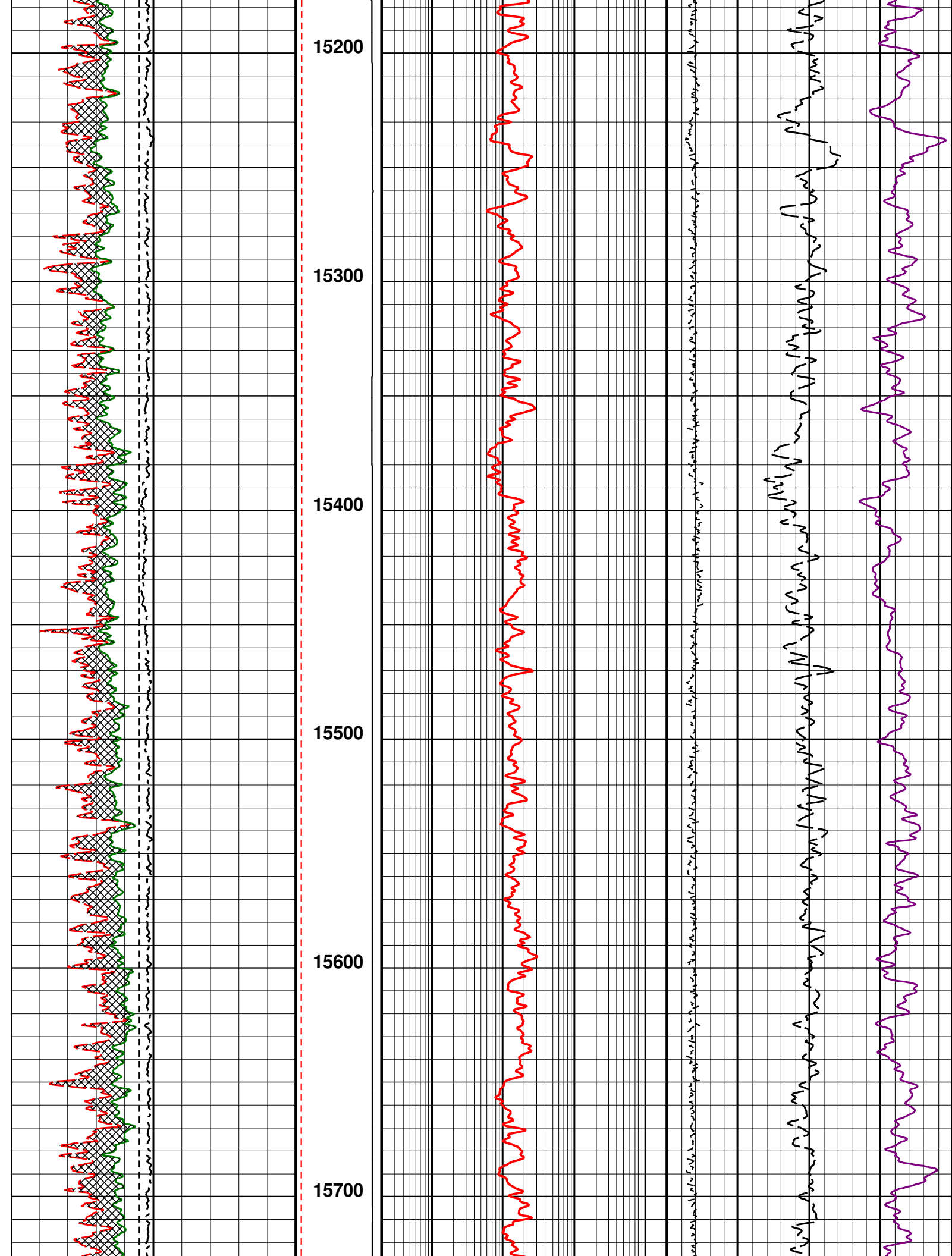


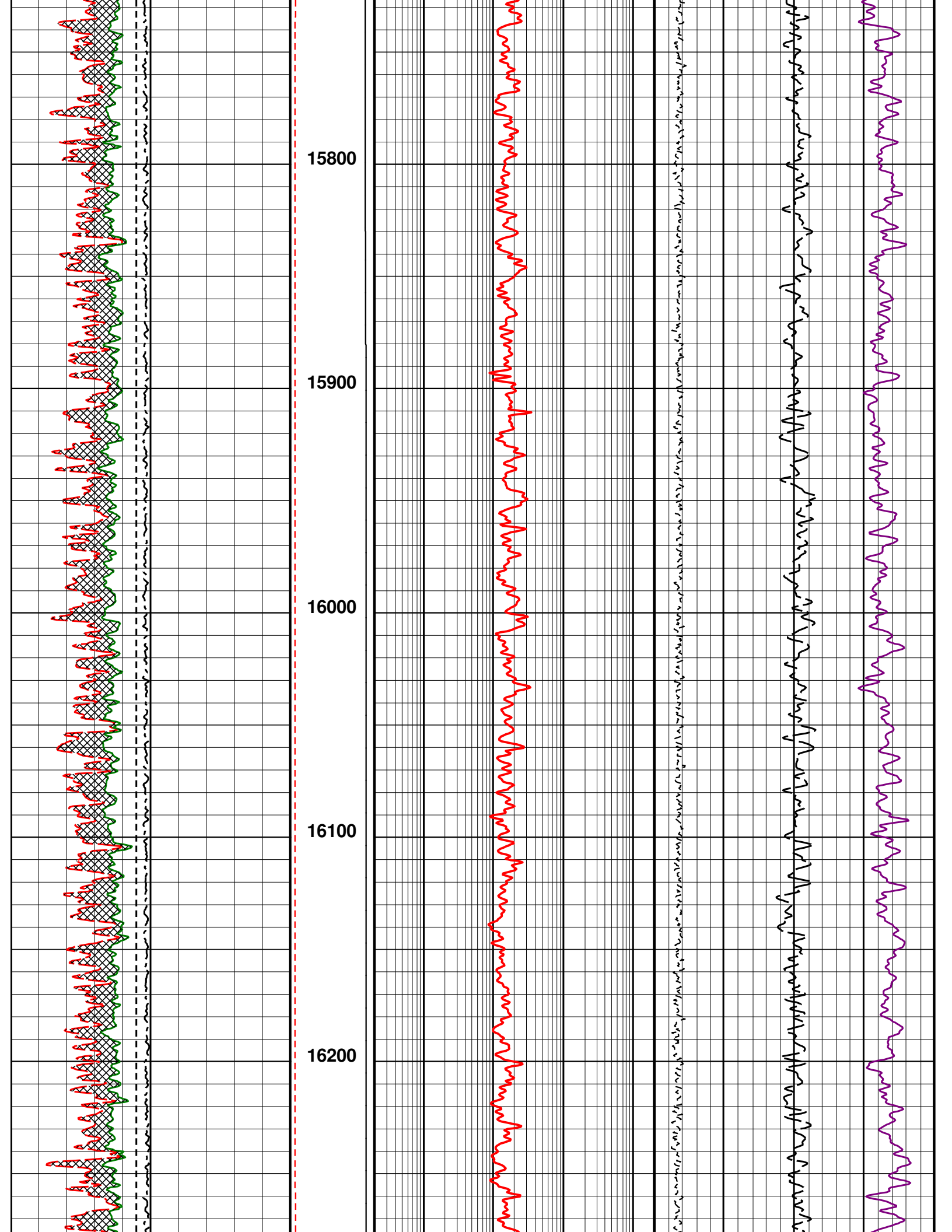


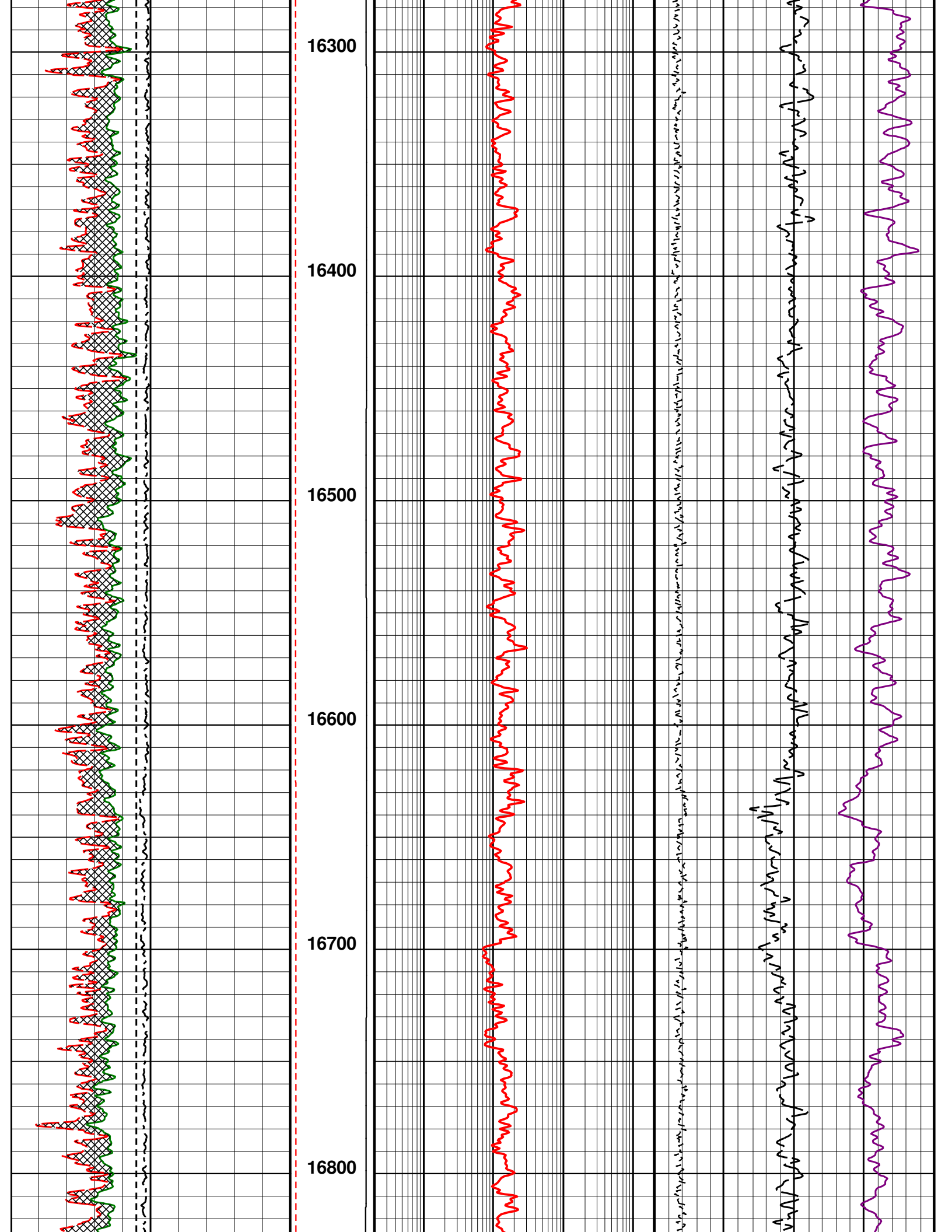


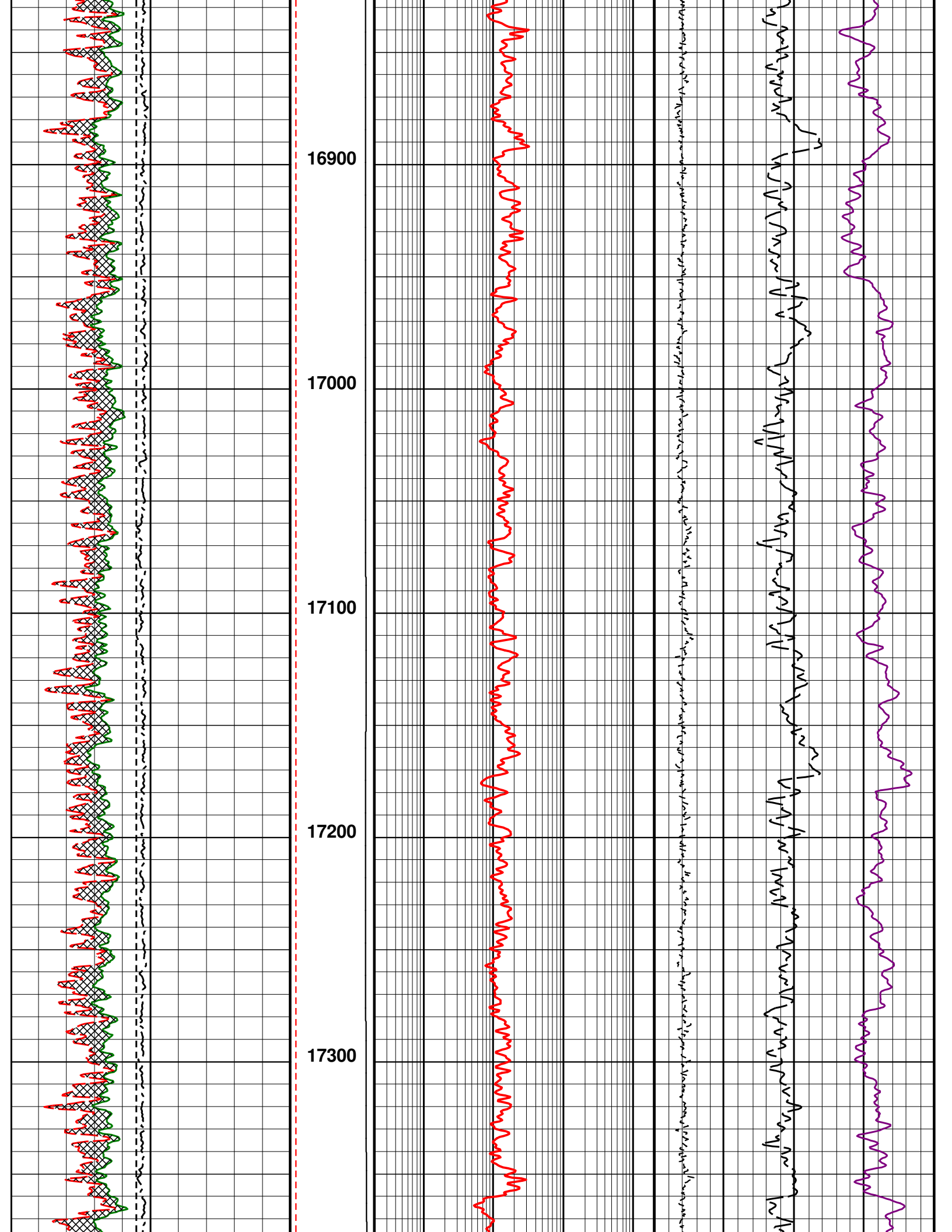


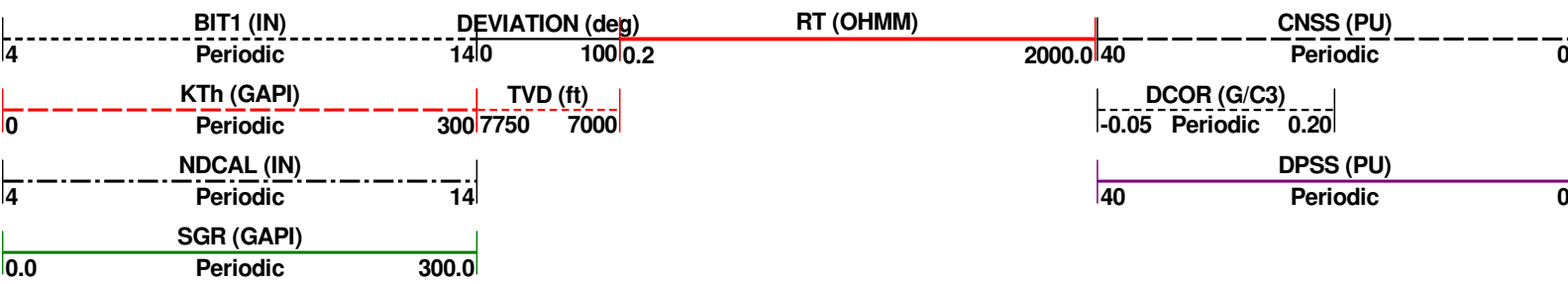
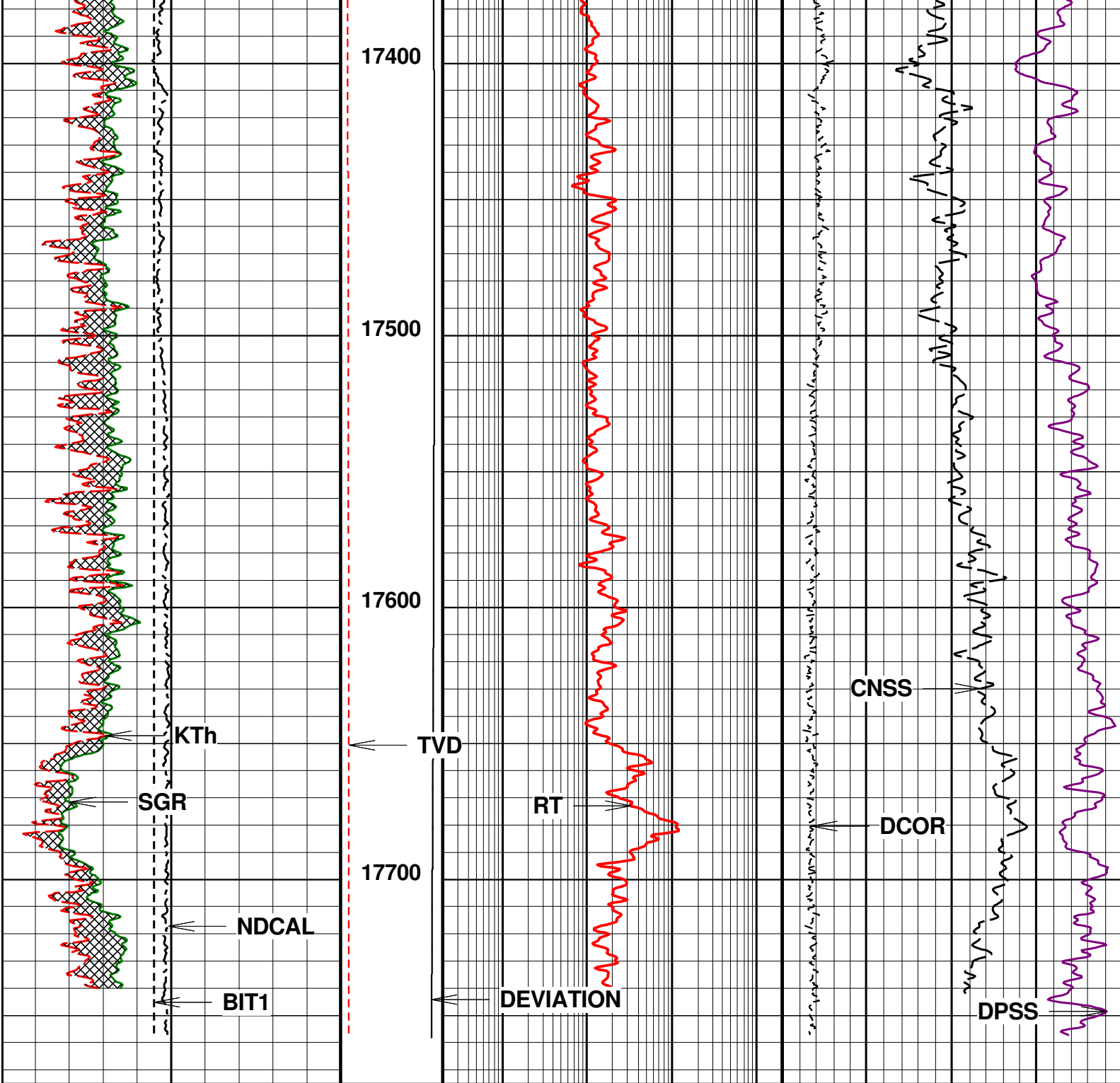








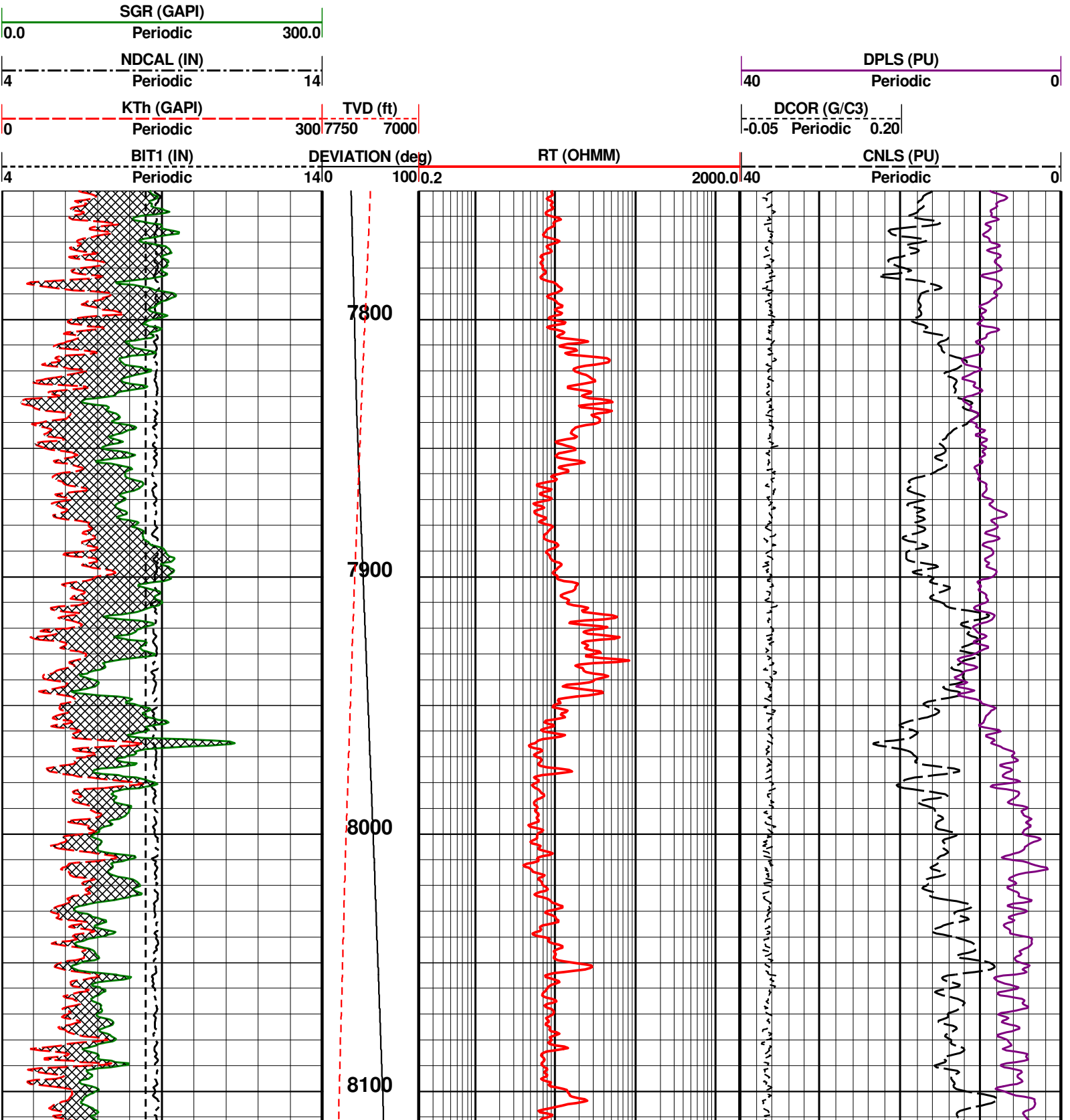


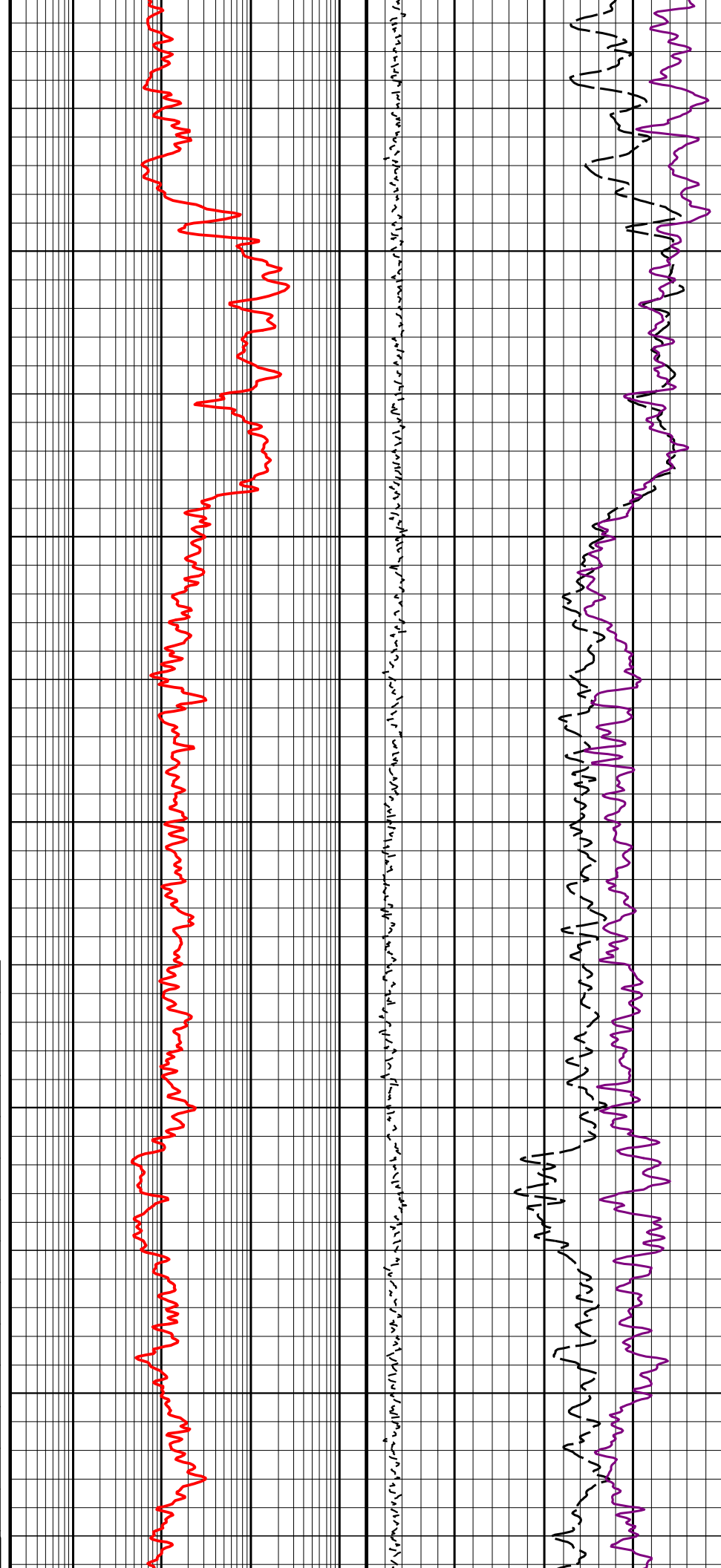
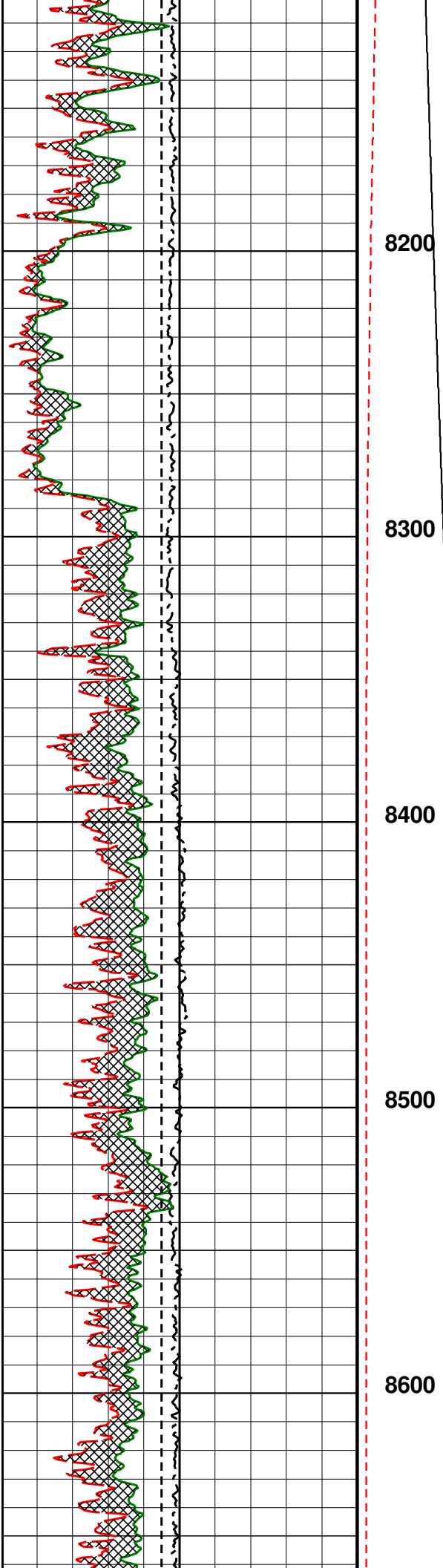


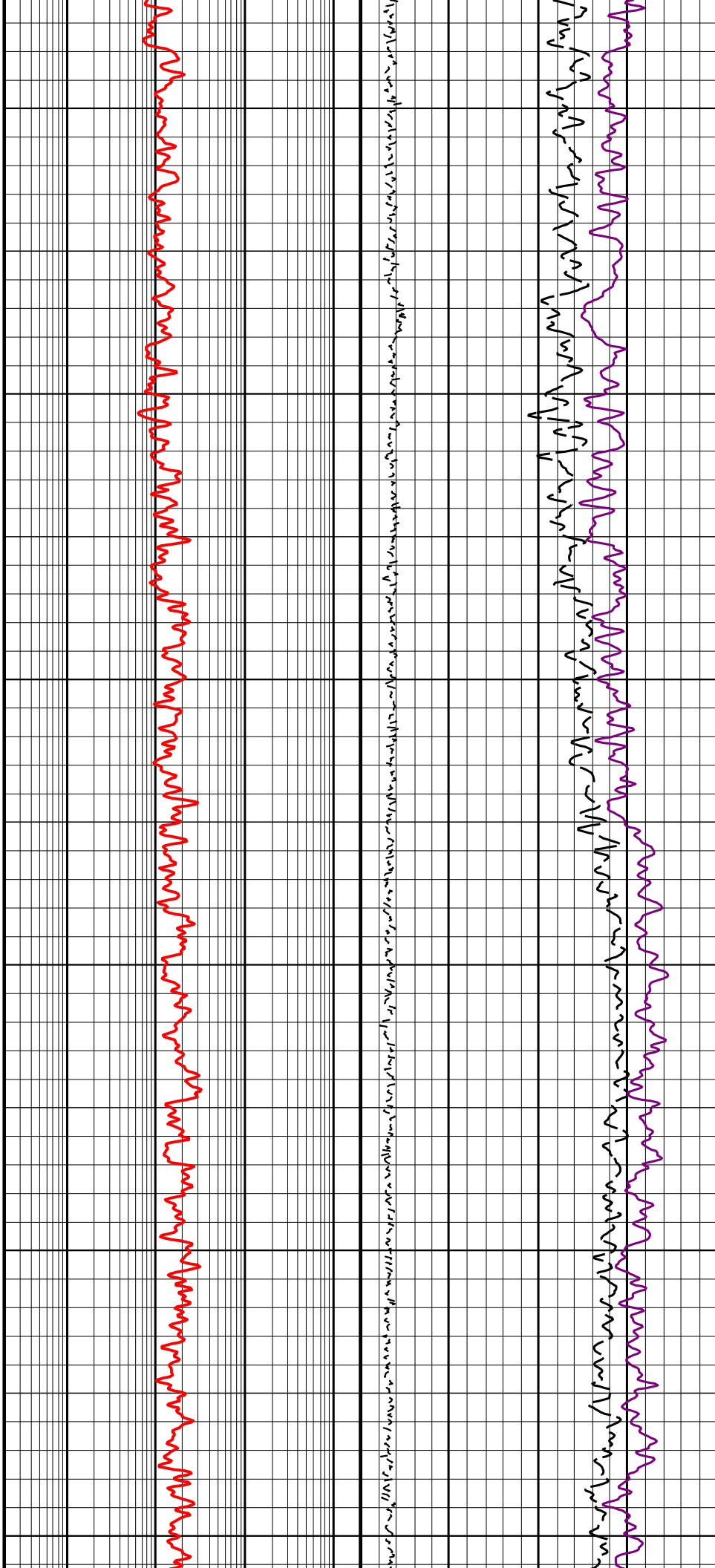
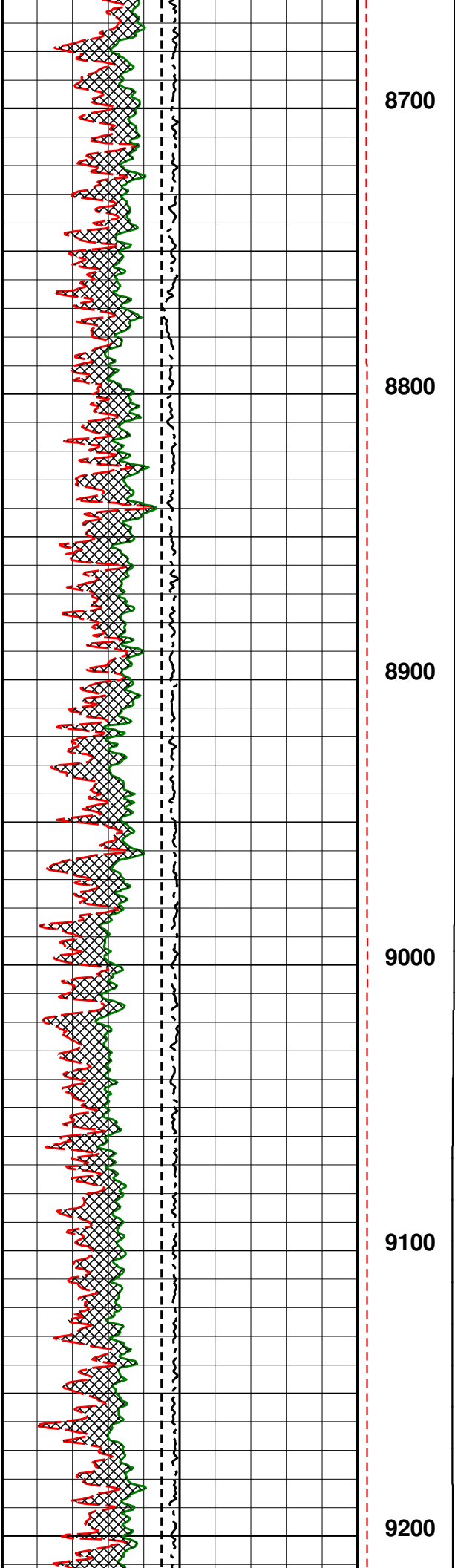
2" MAIN PASS LIMESTONE

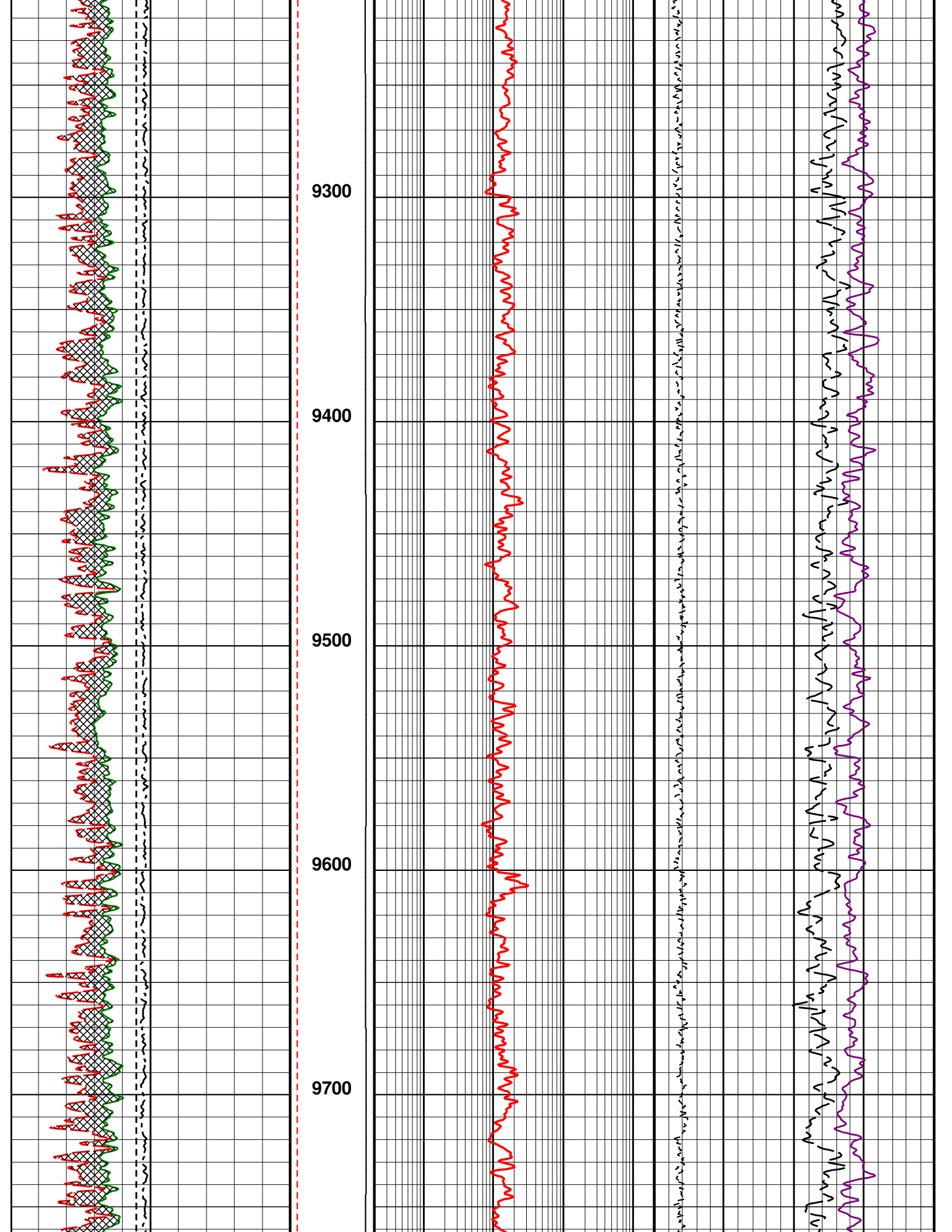
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 Well : OTTESEN LE 09-368HC
 Scale : 1 : 600
 Depth in : Feet
 Software : WinAPlot Ver. 5, 87, 2, 0

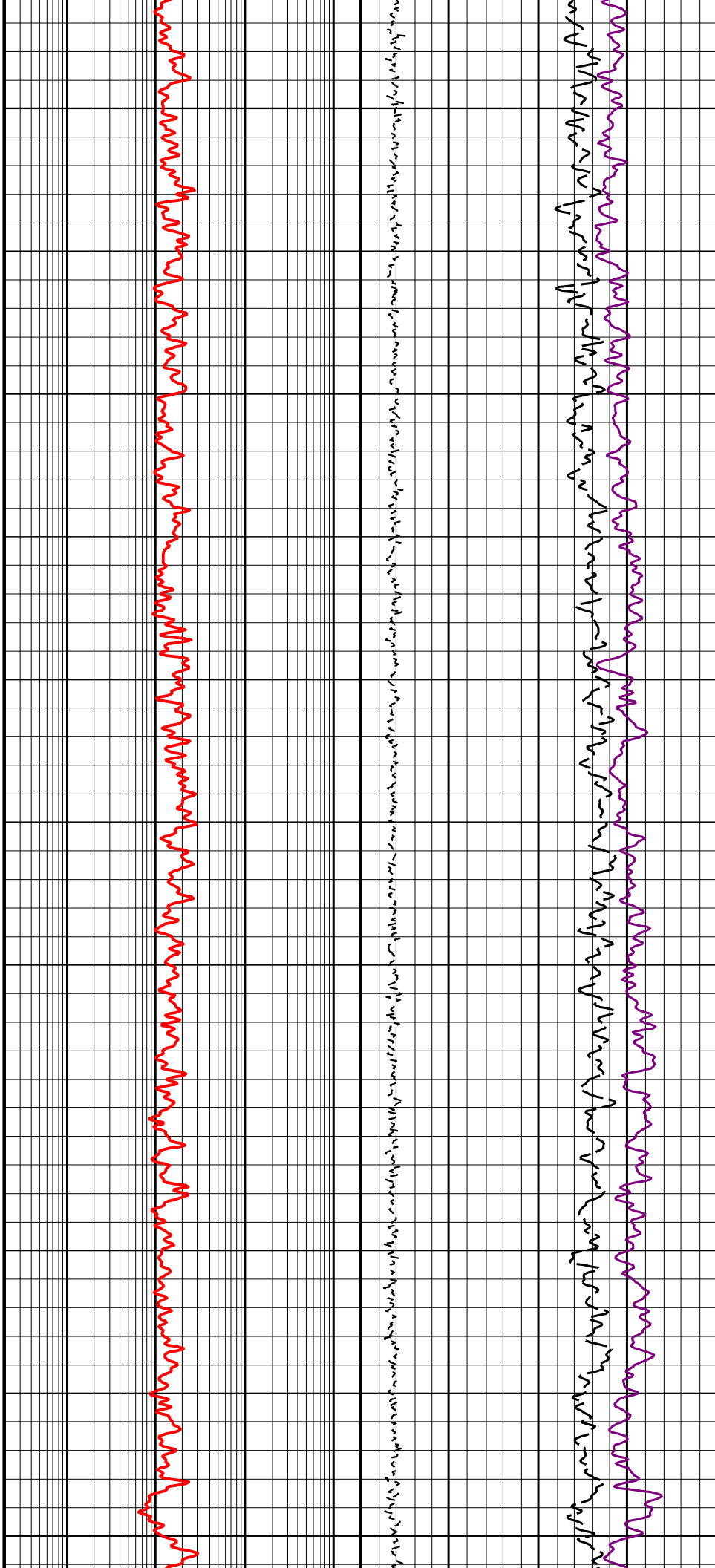
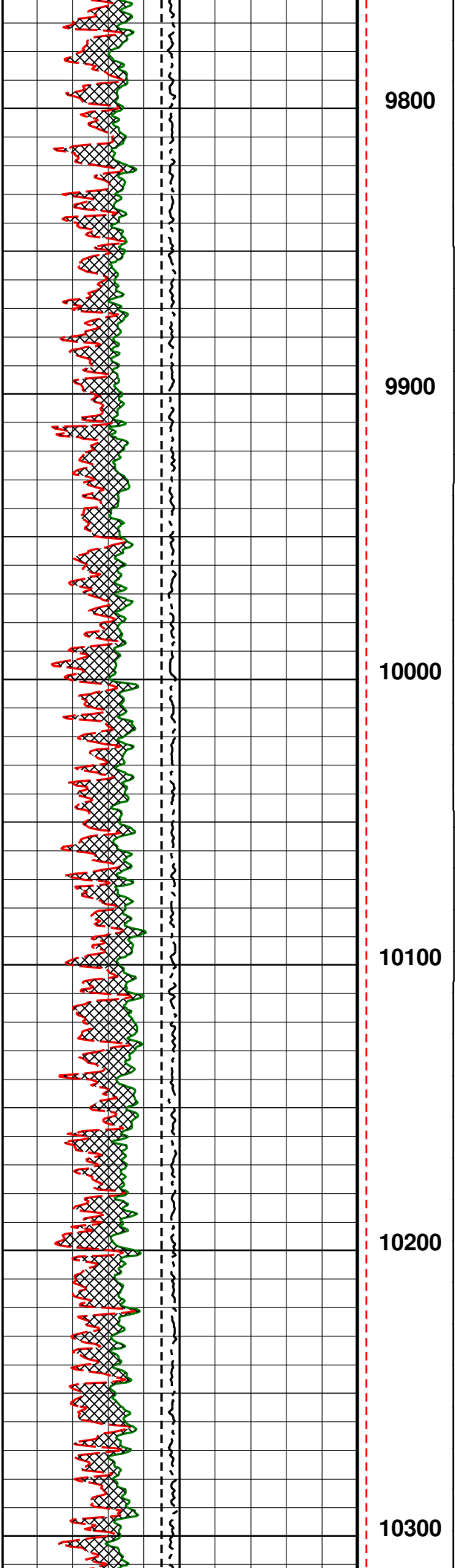
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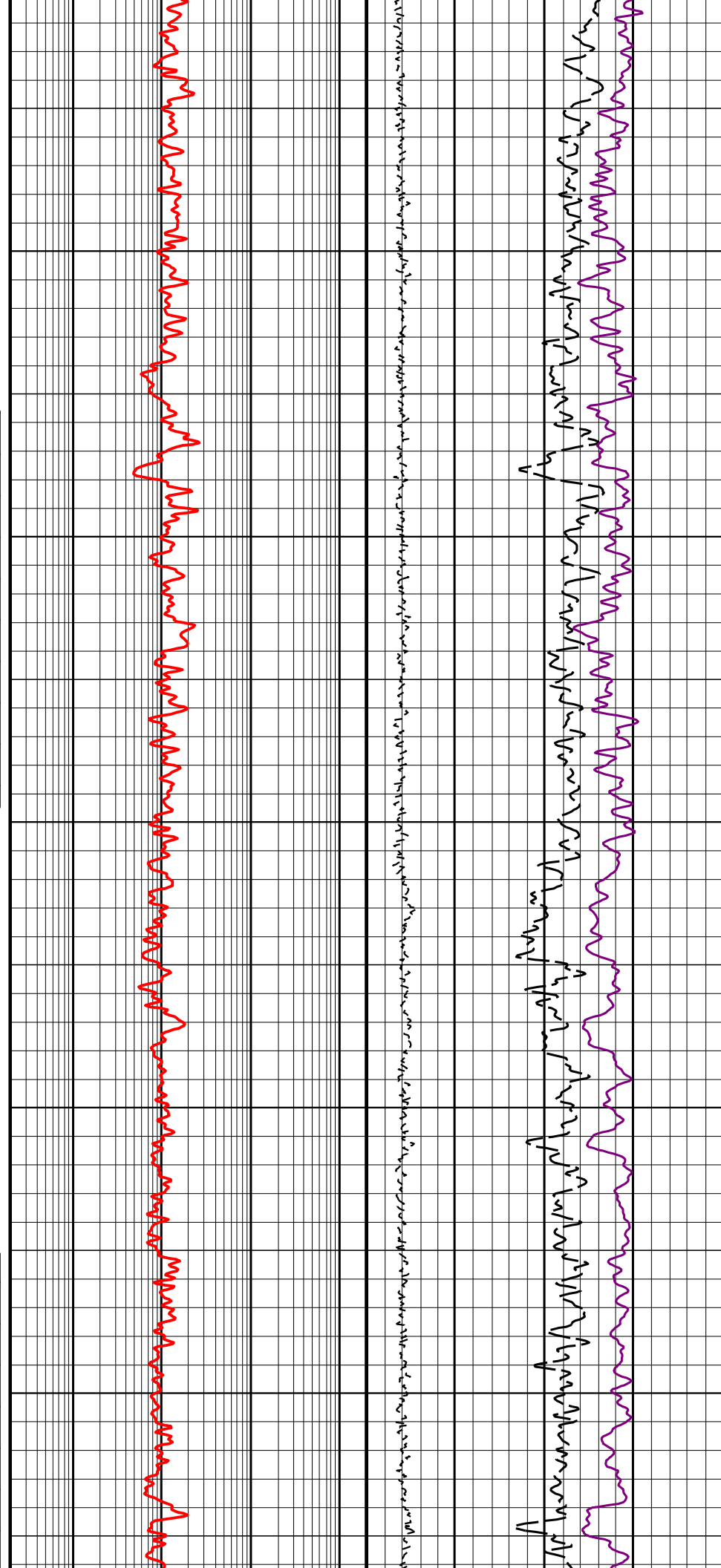
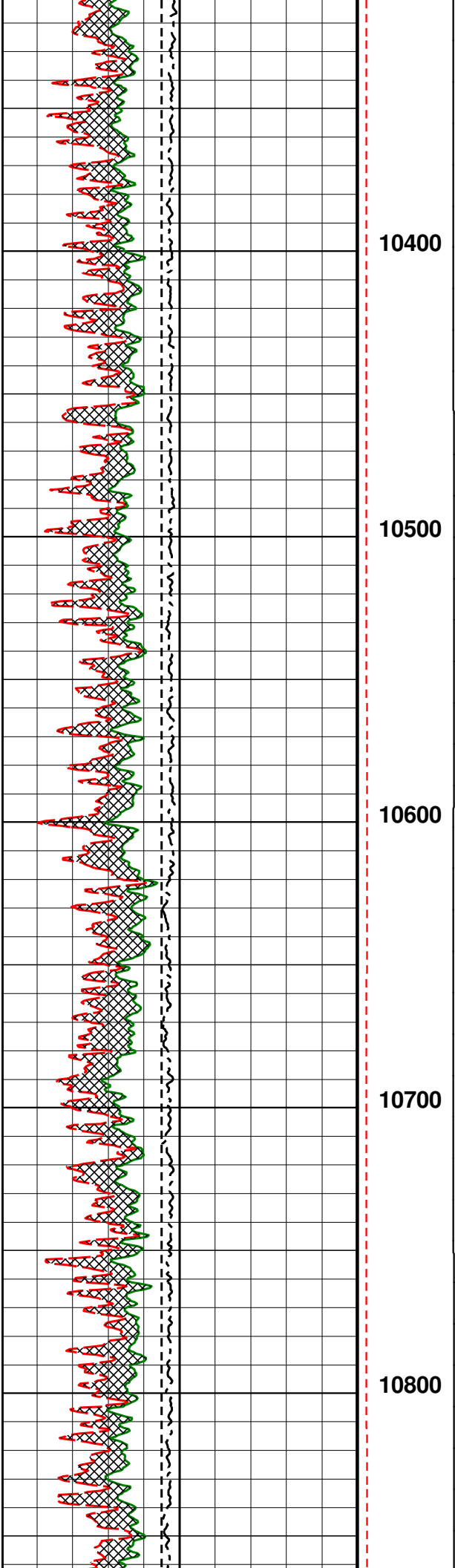


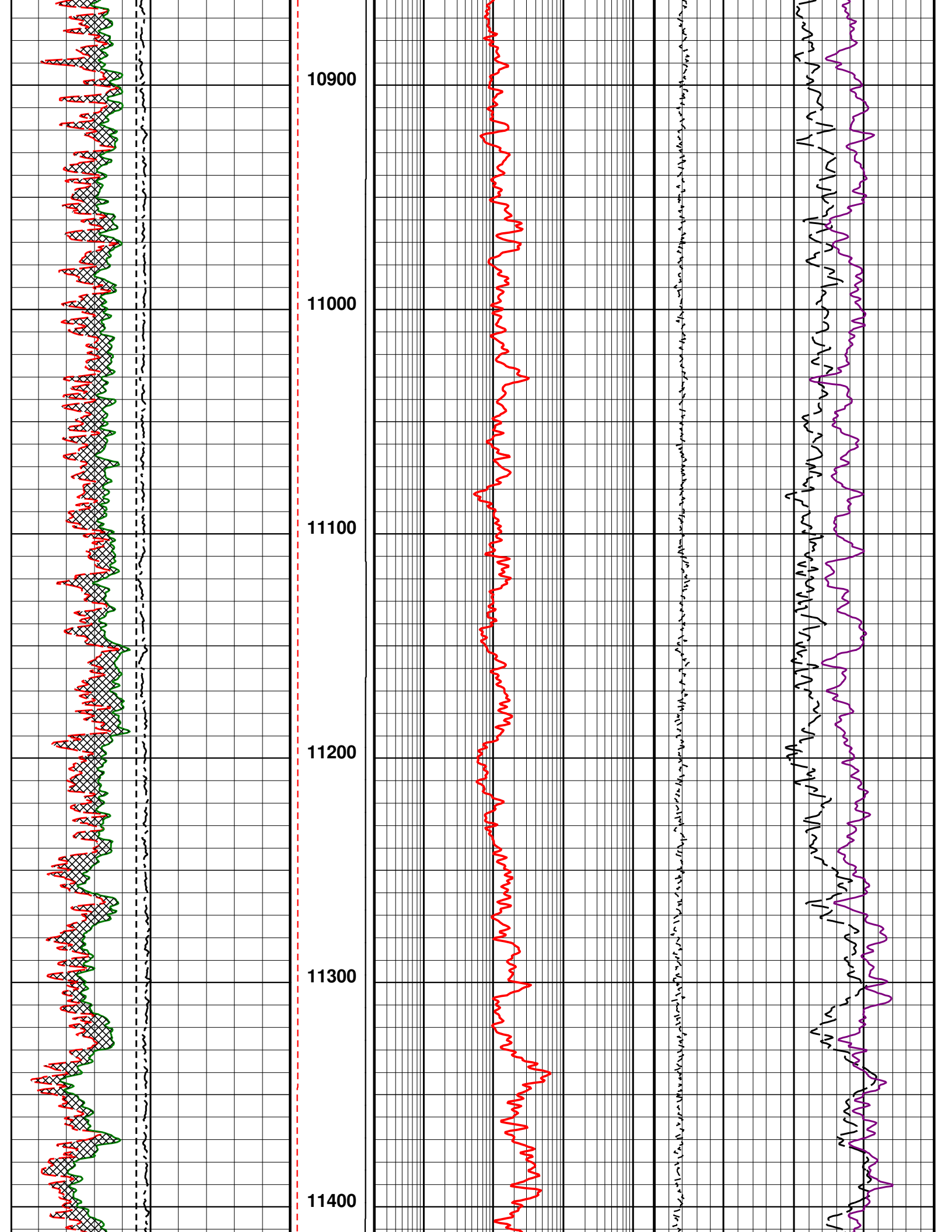


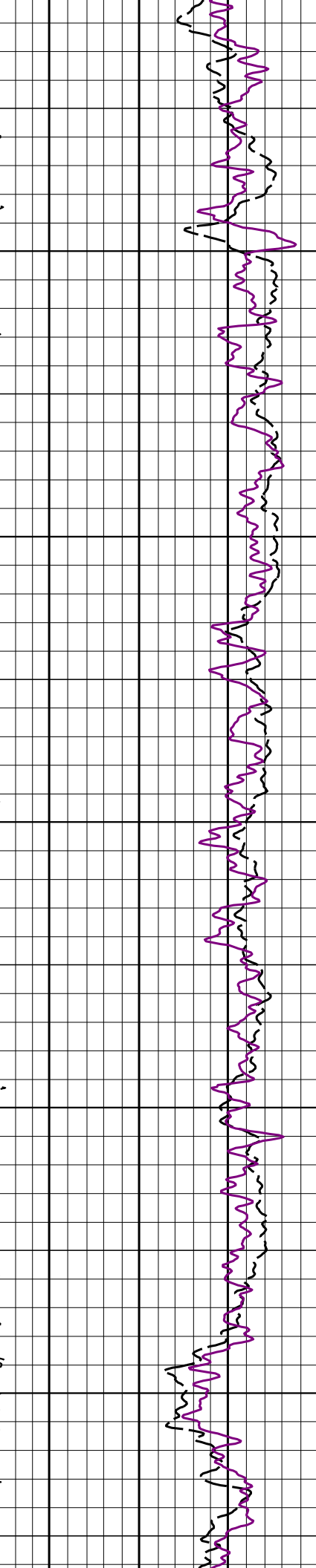
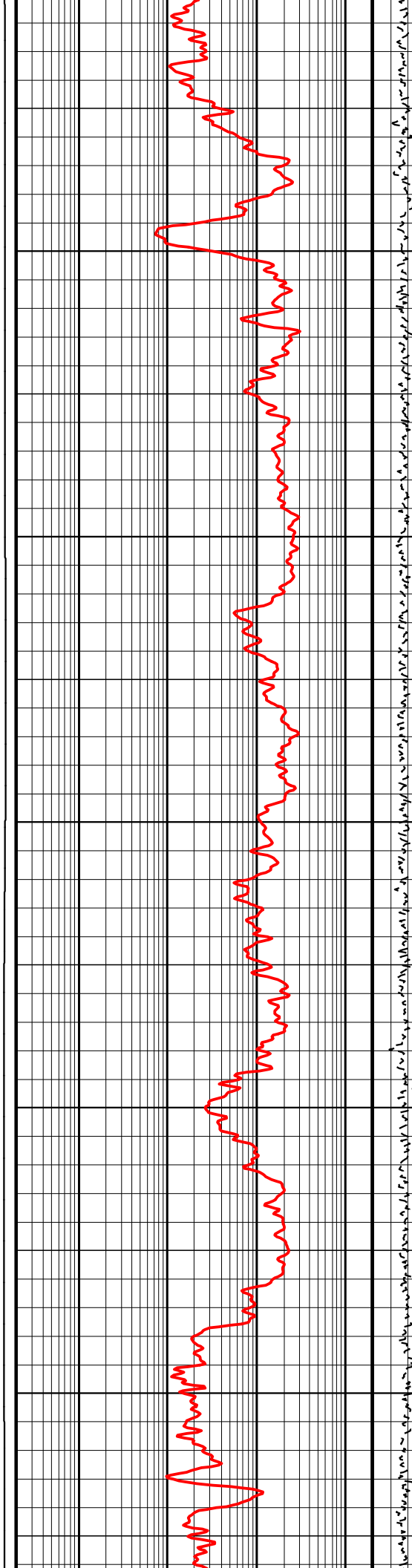
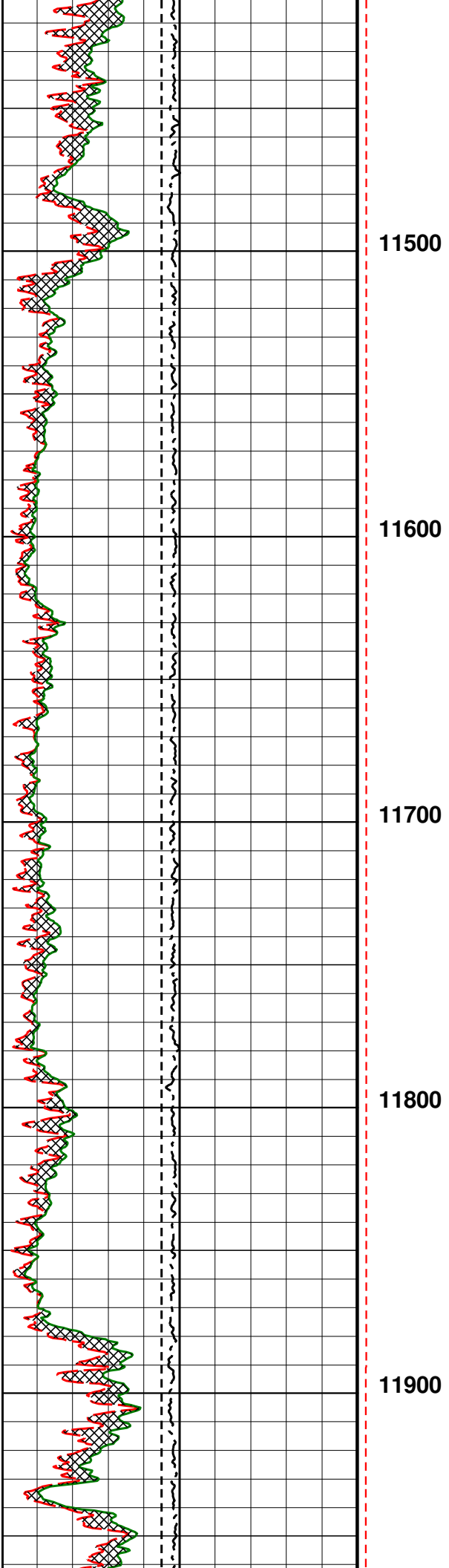


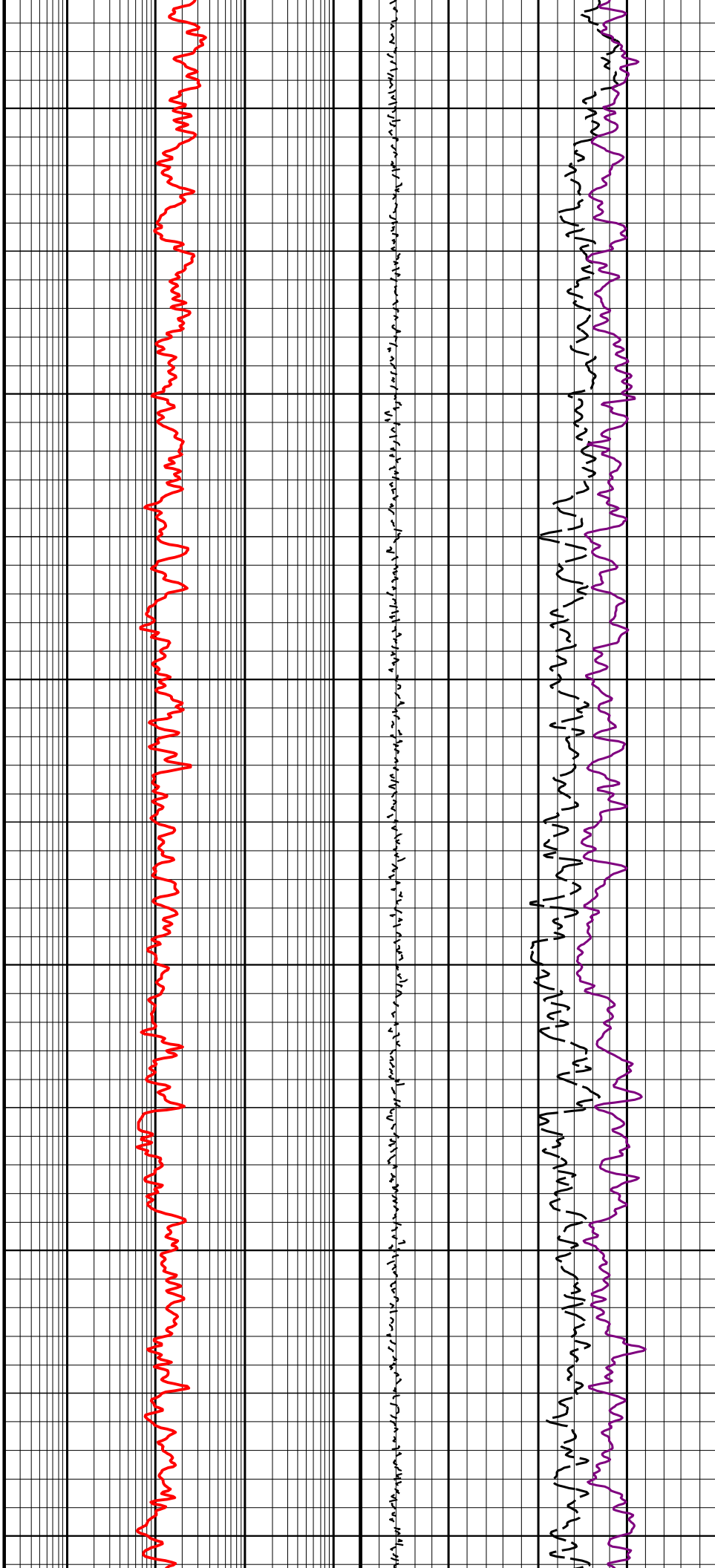
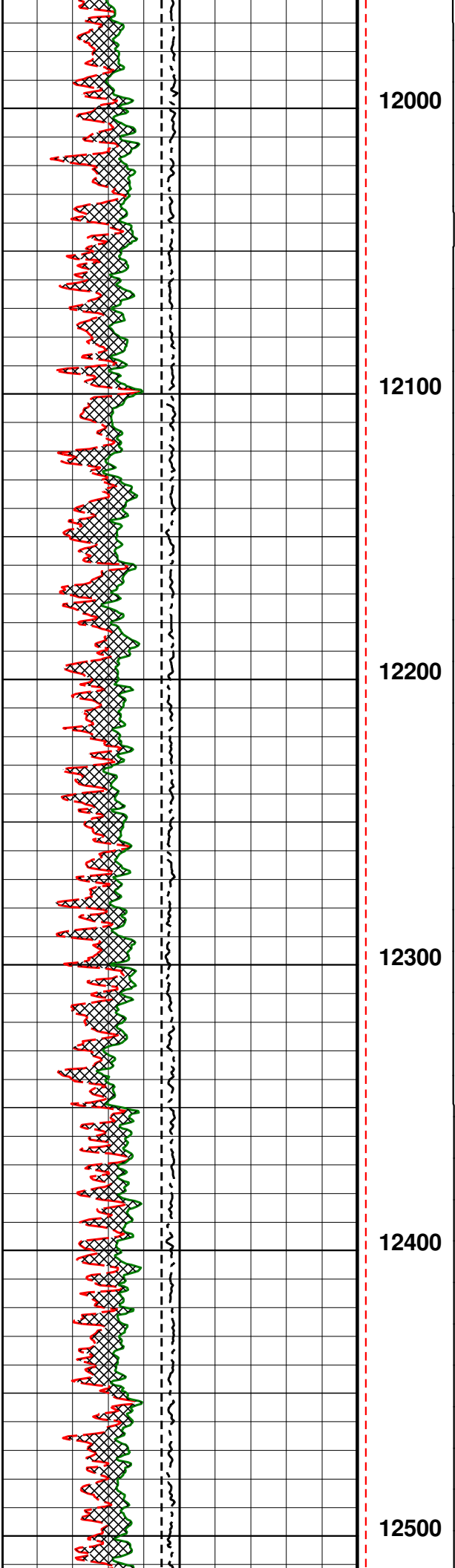


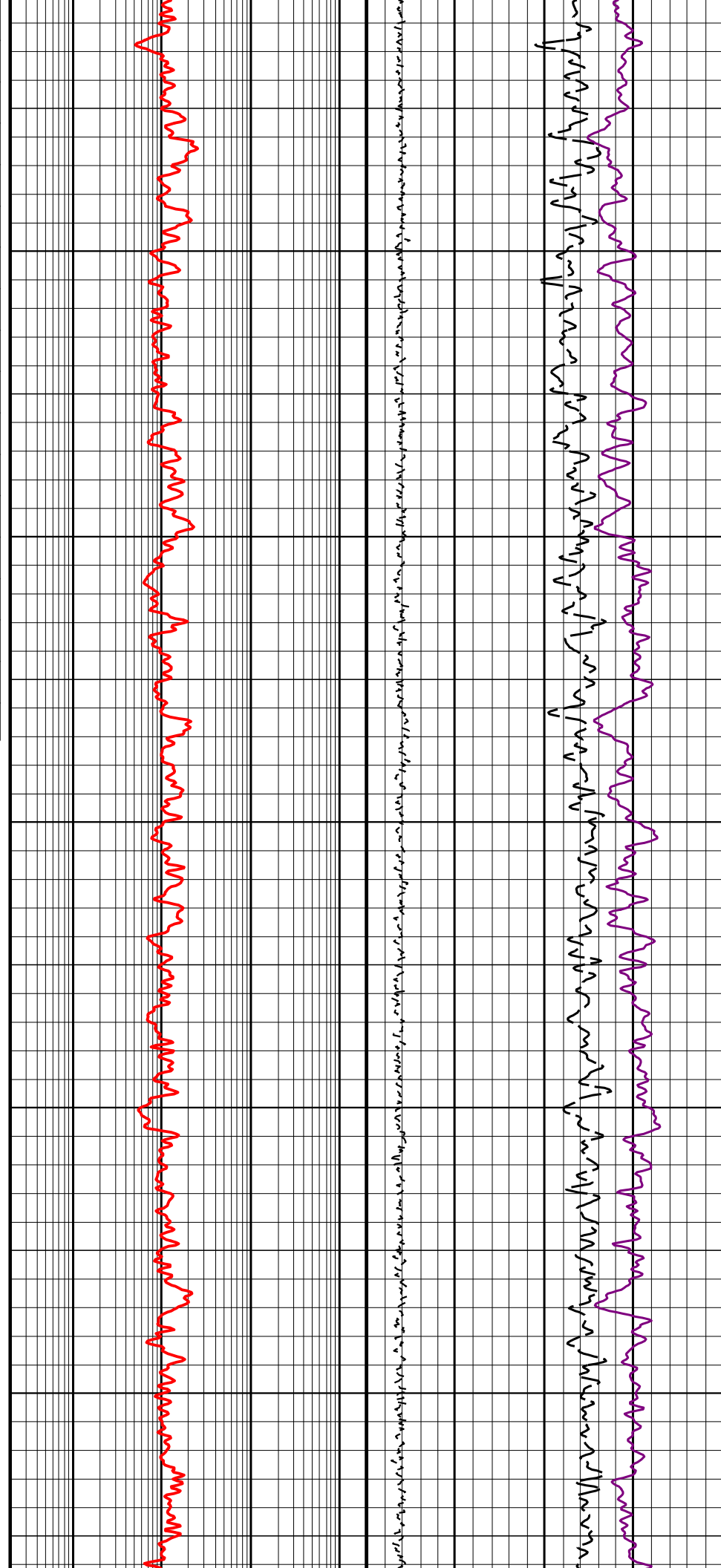
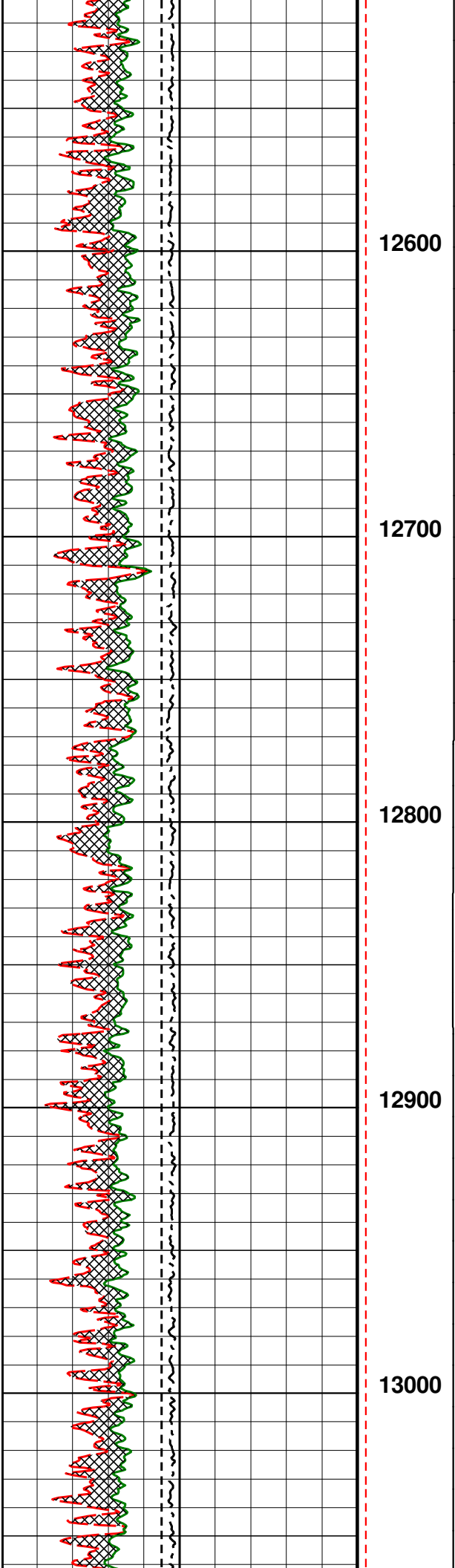


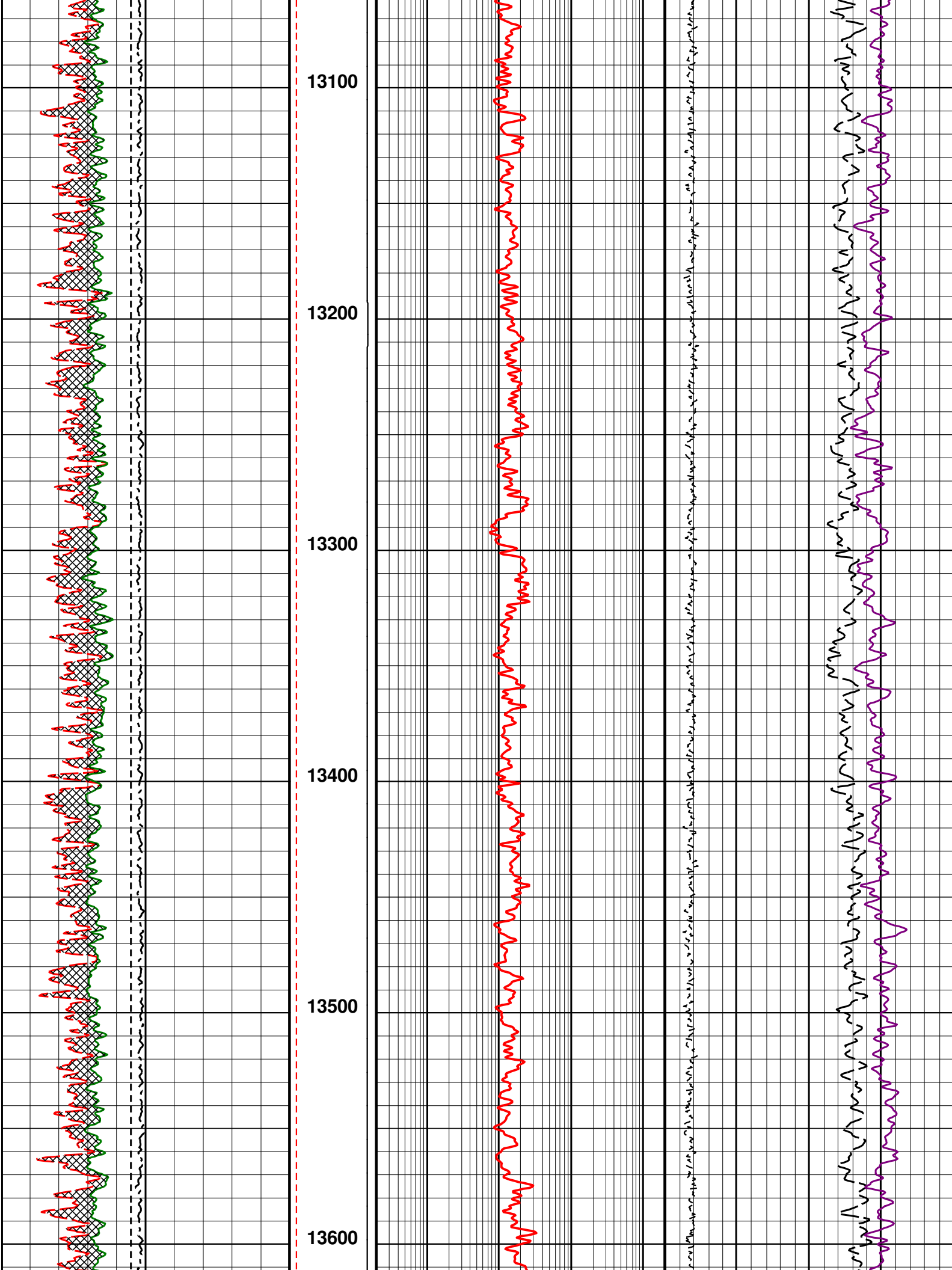


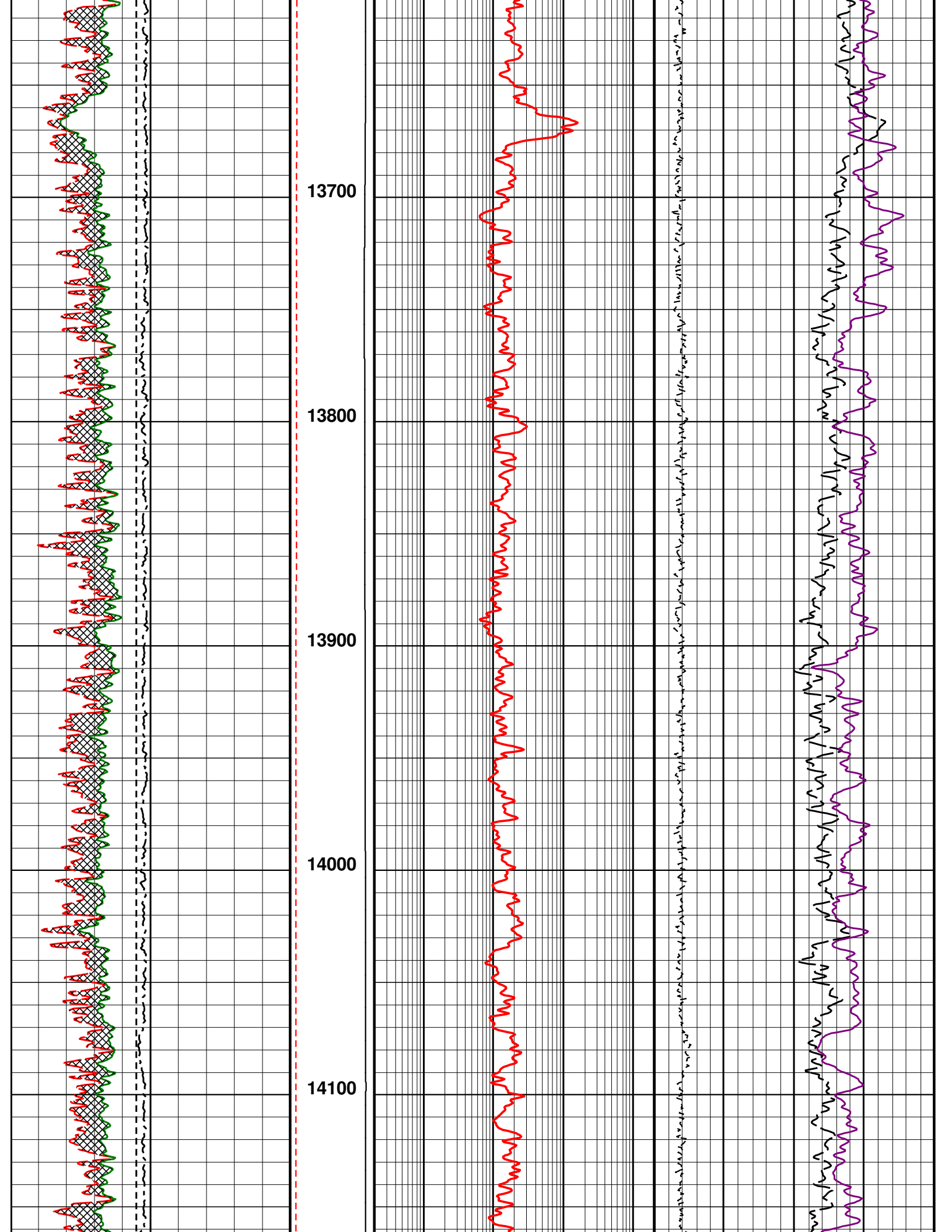


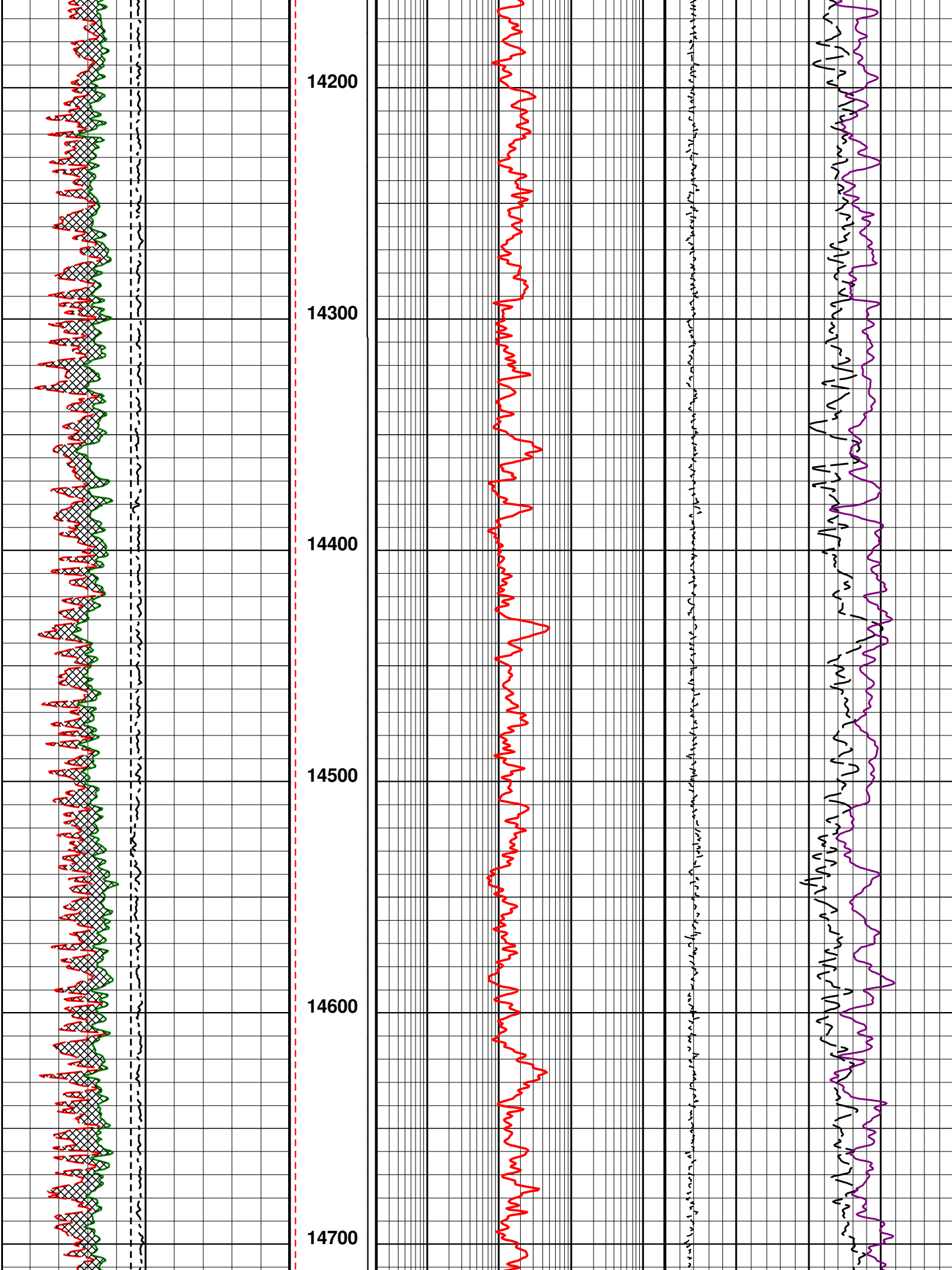


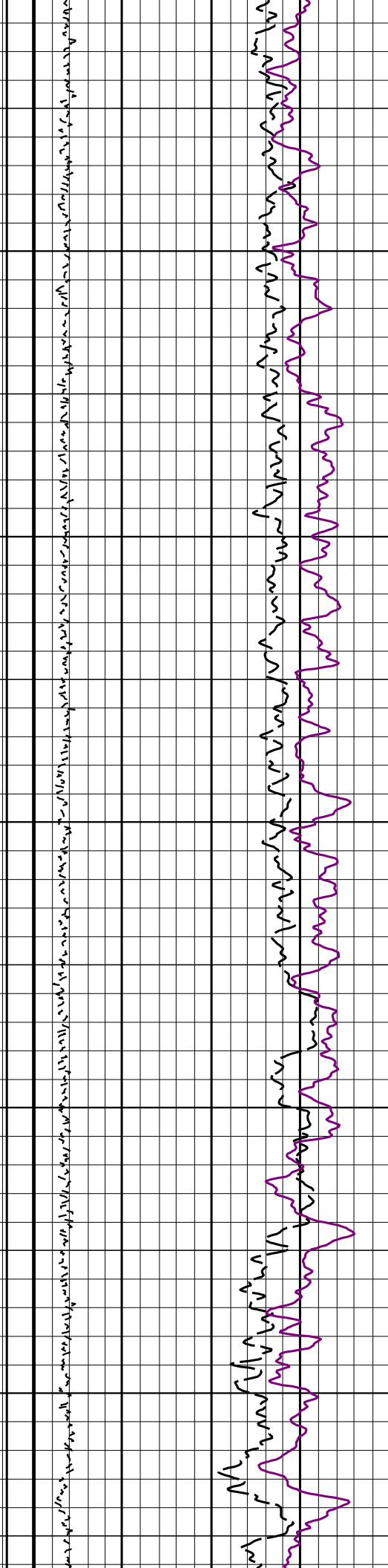
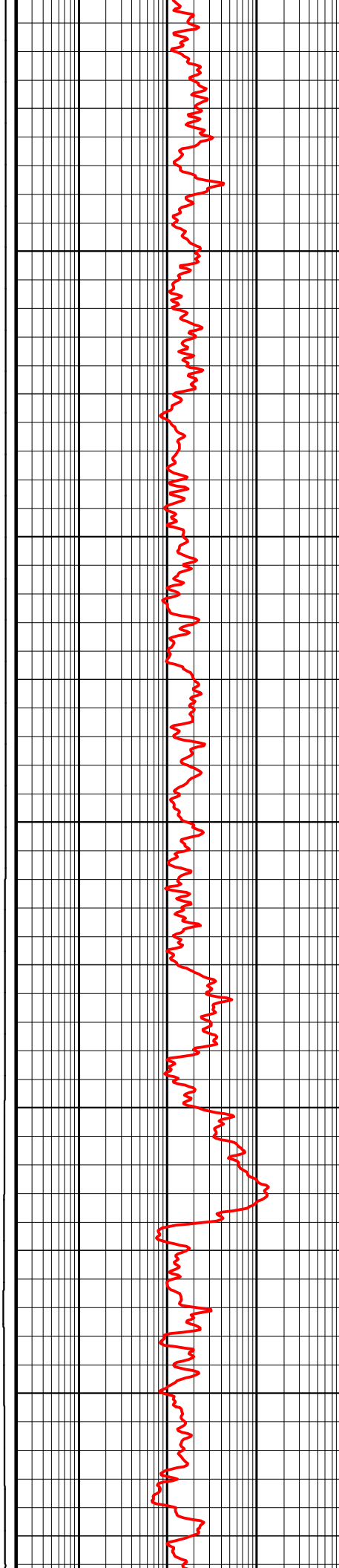
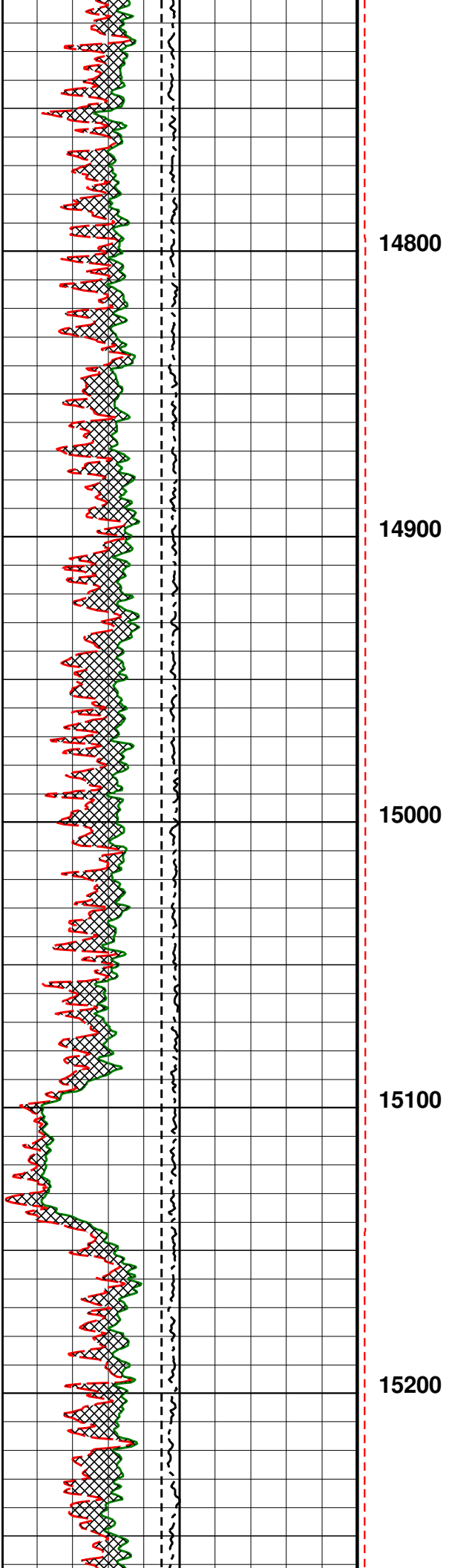


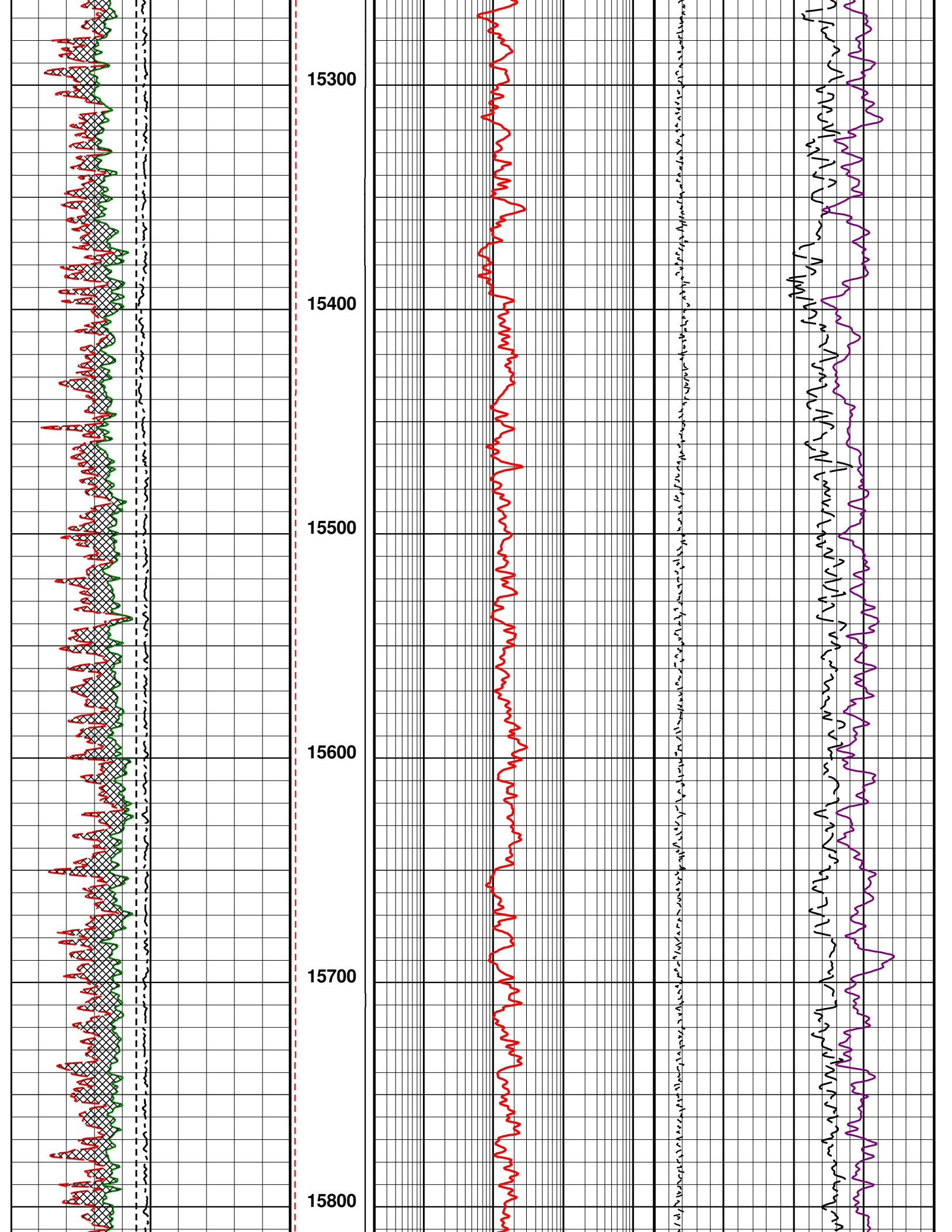


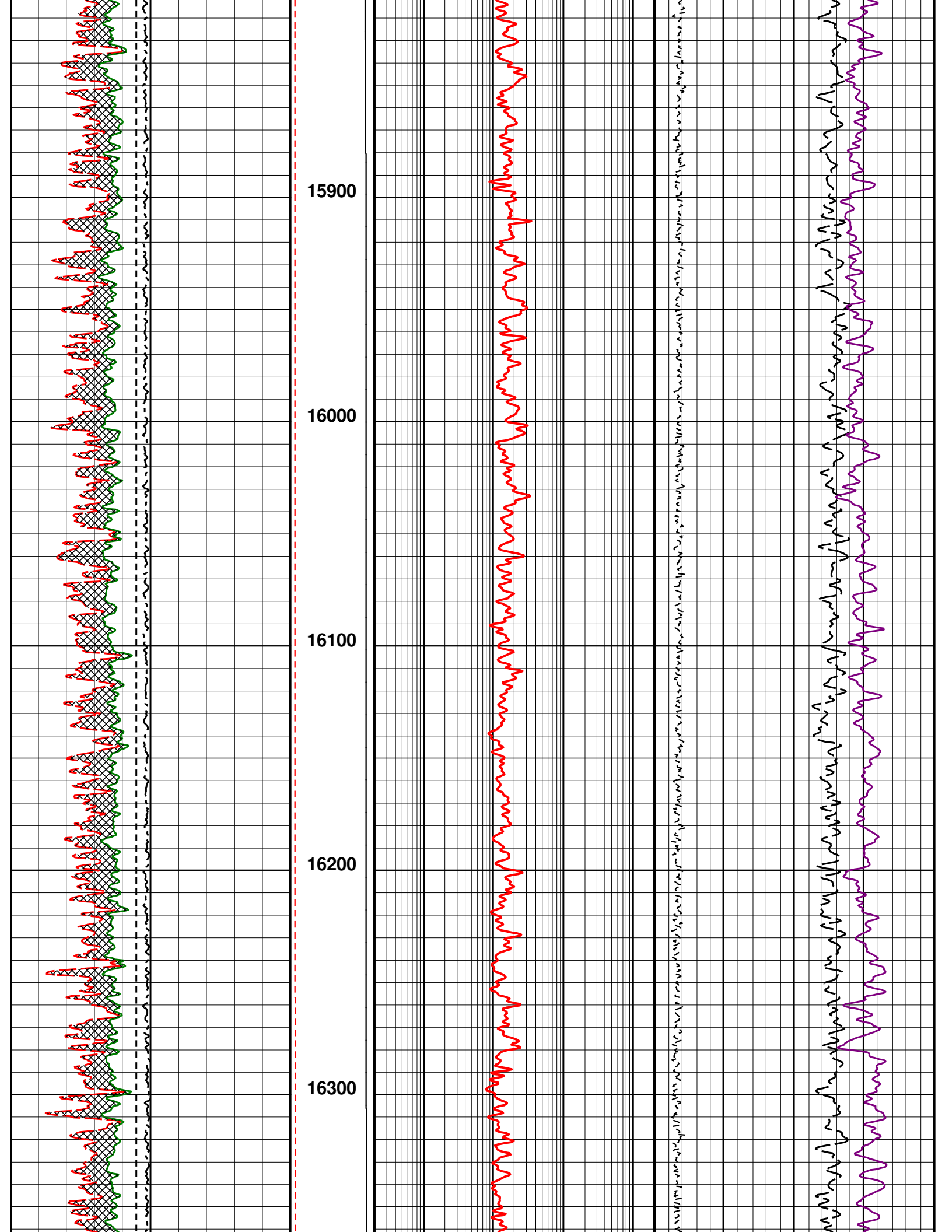


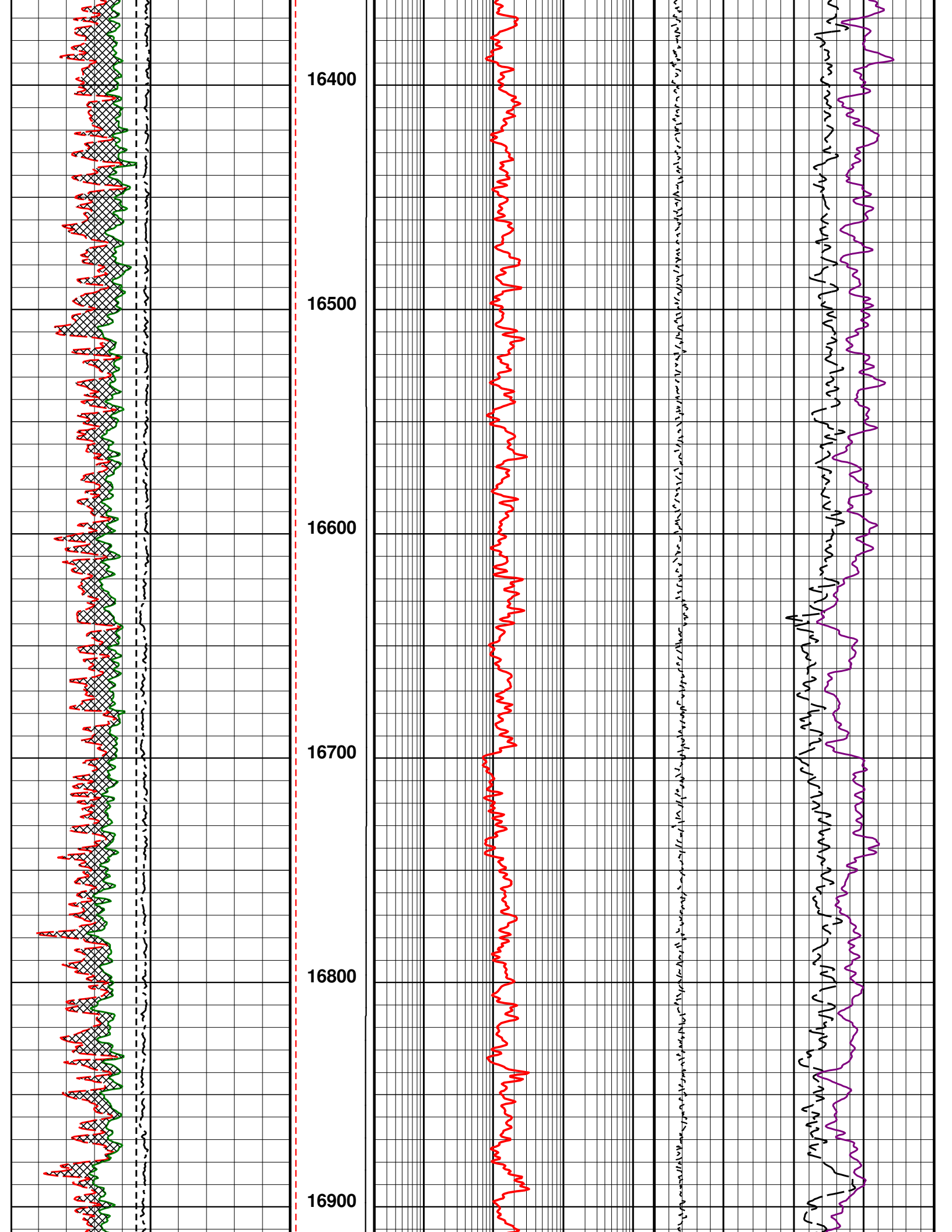


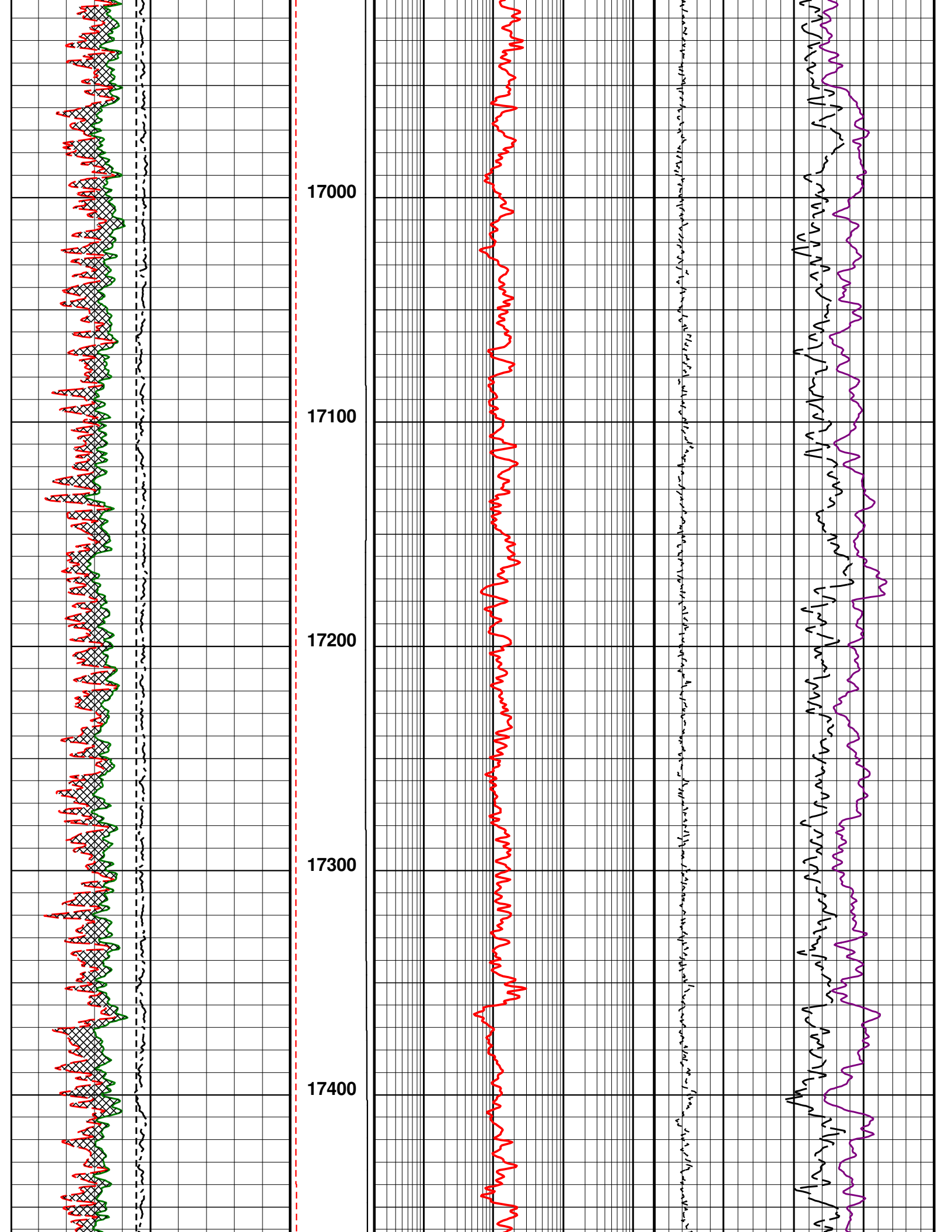


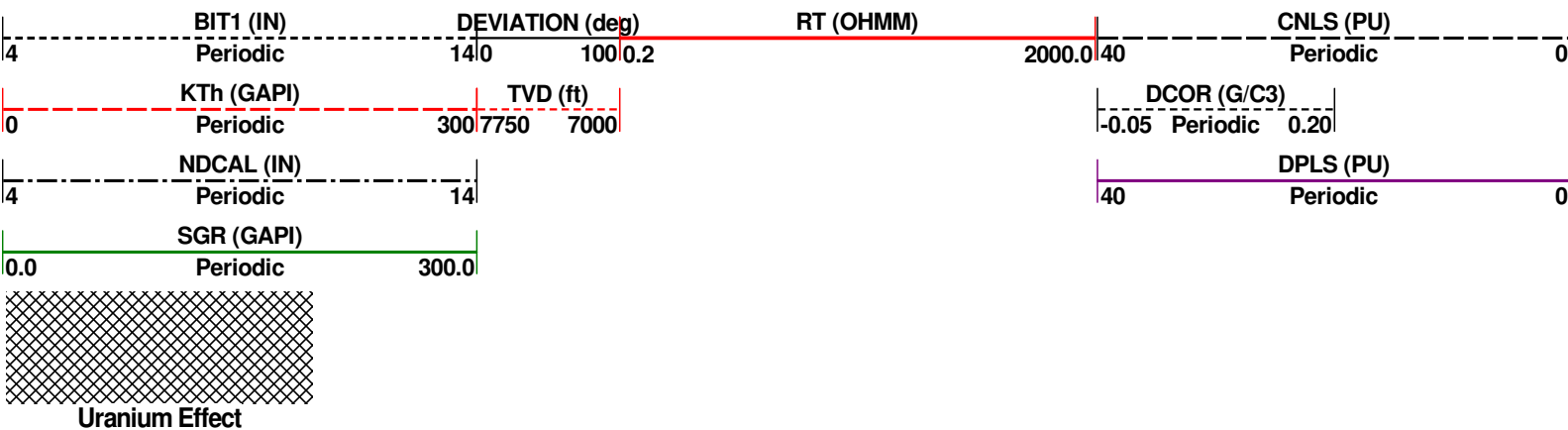
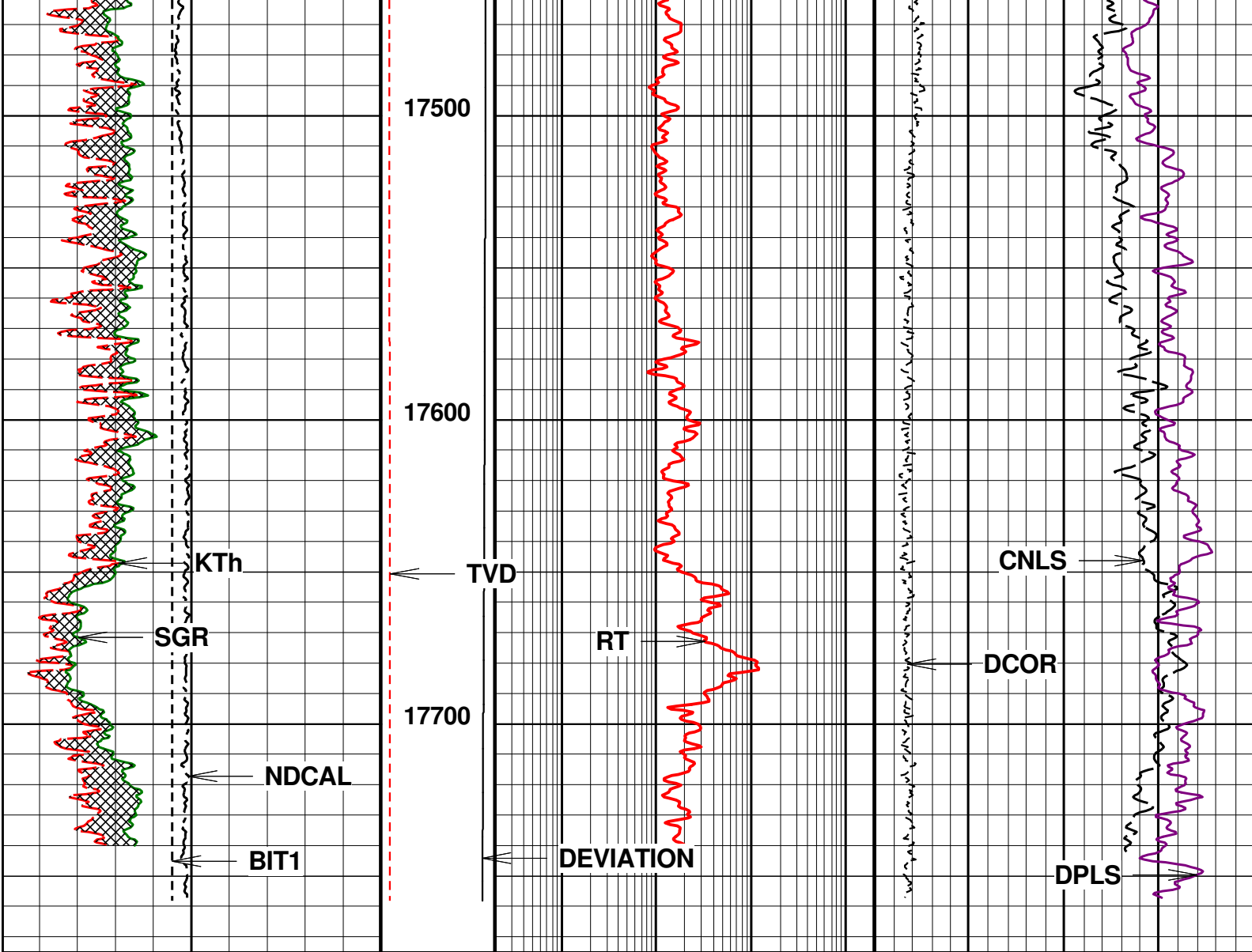




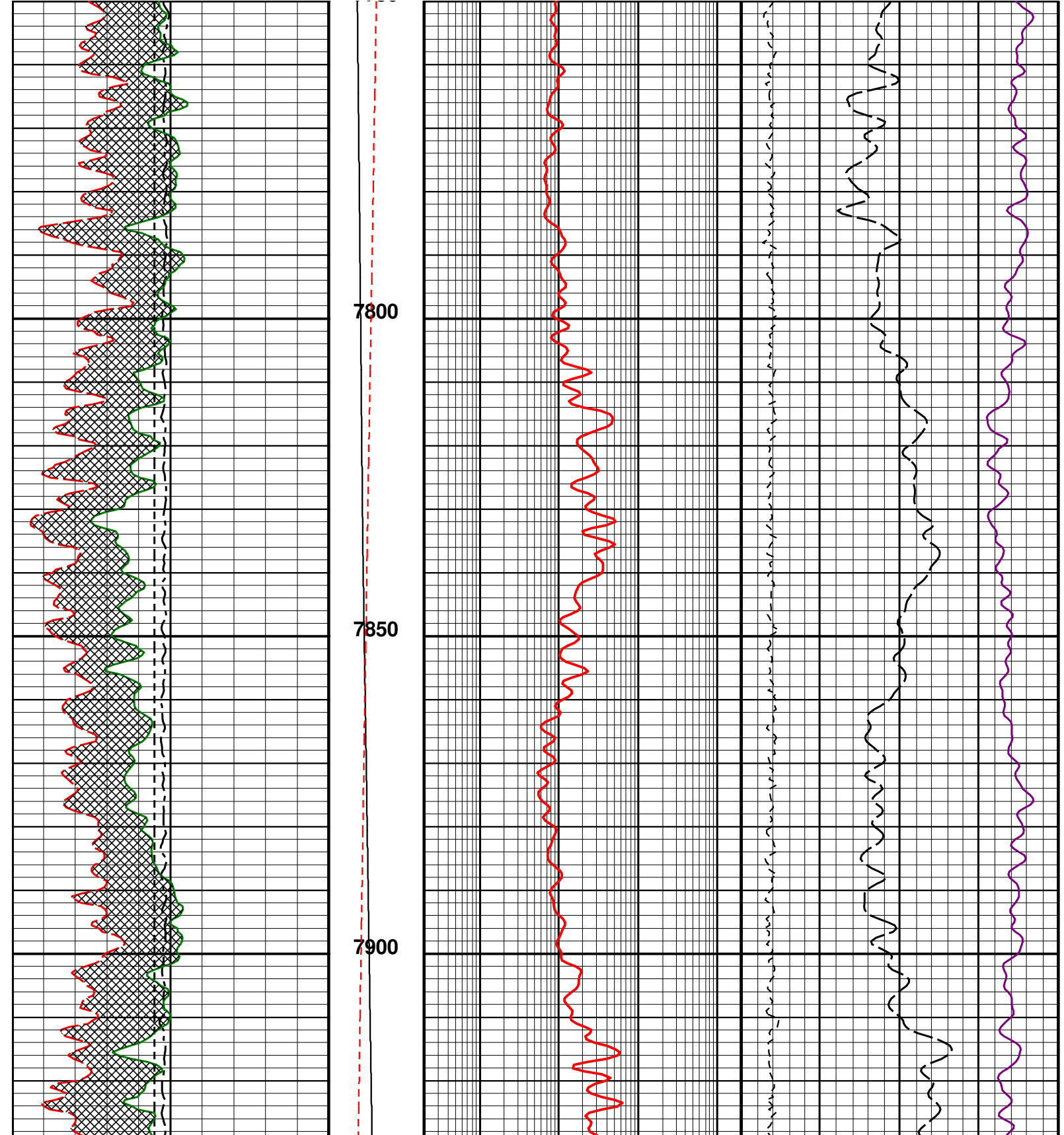
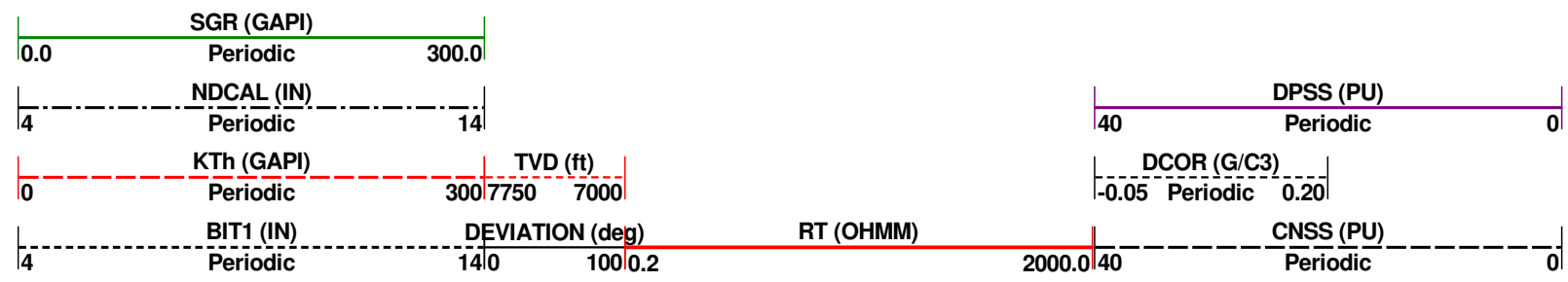


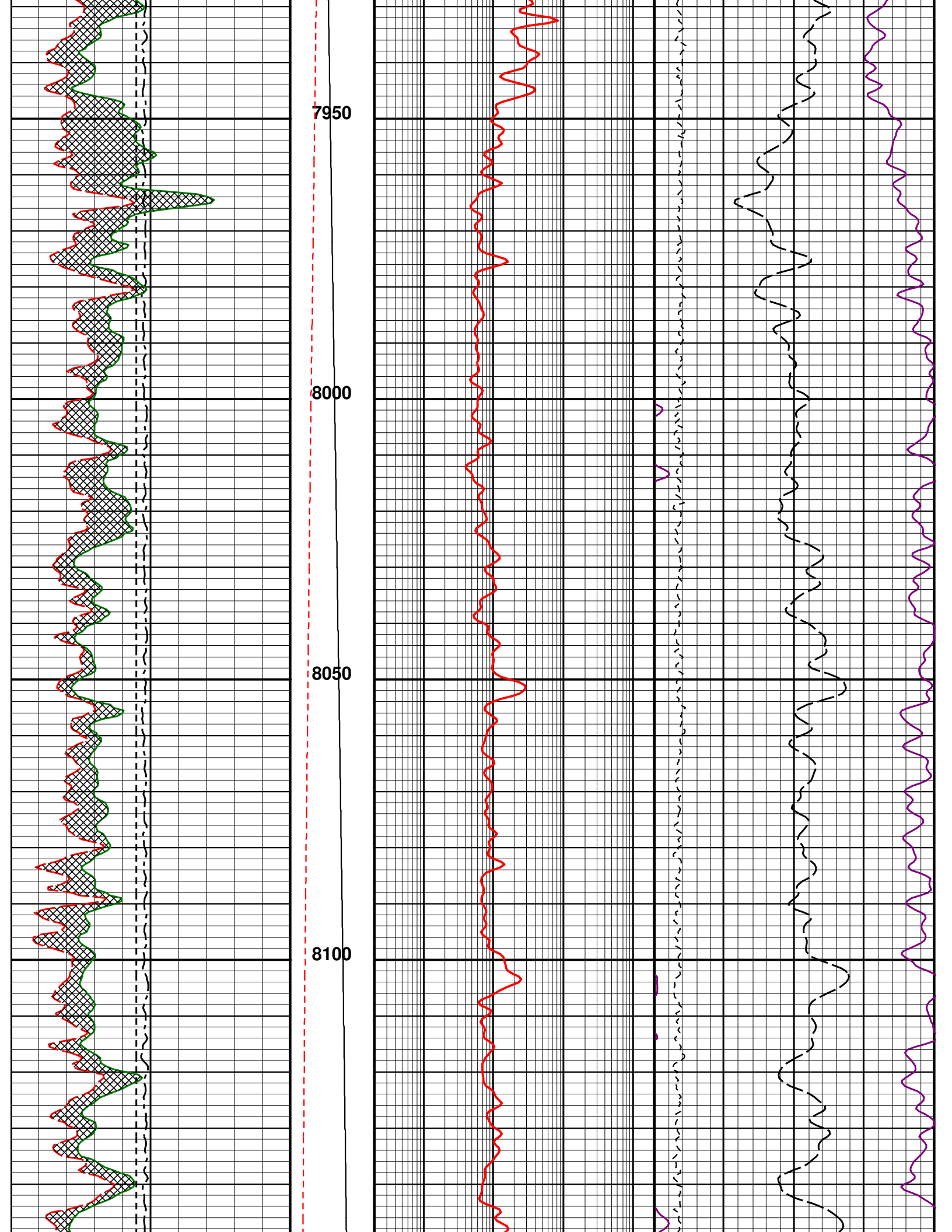


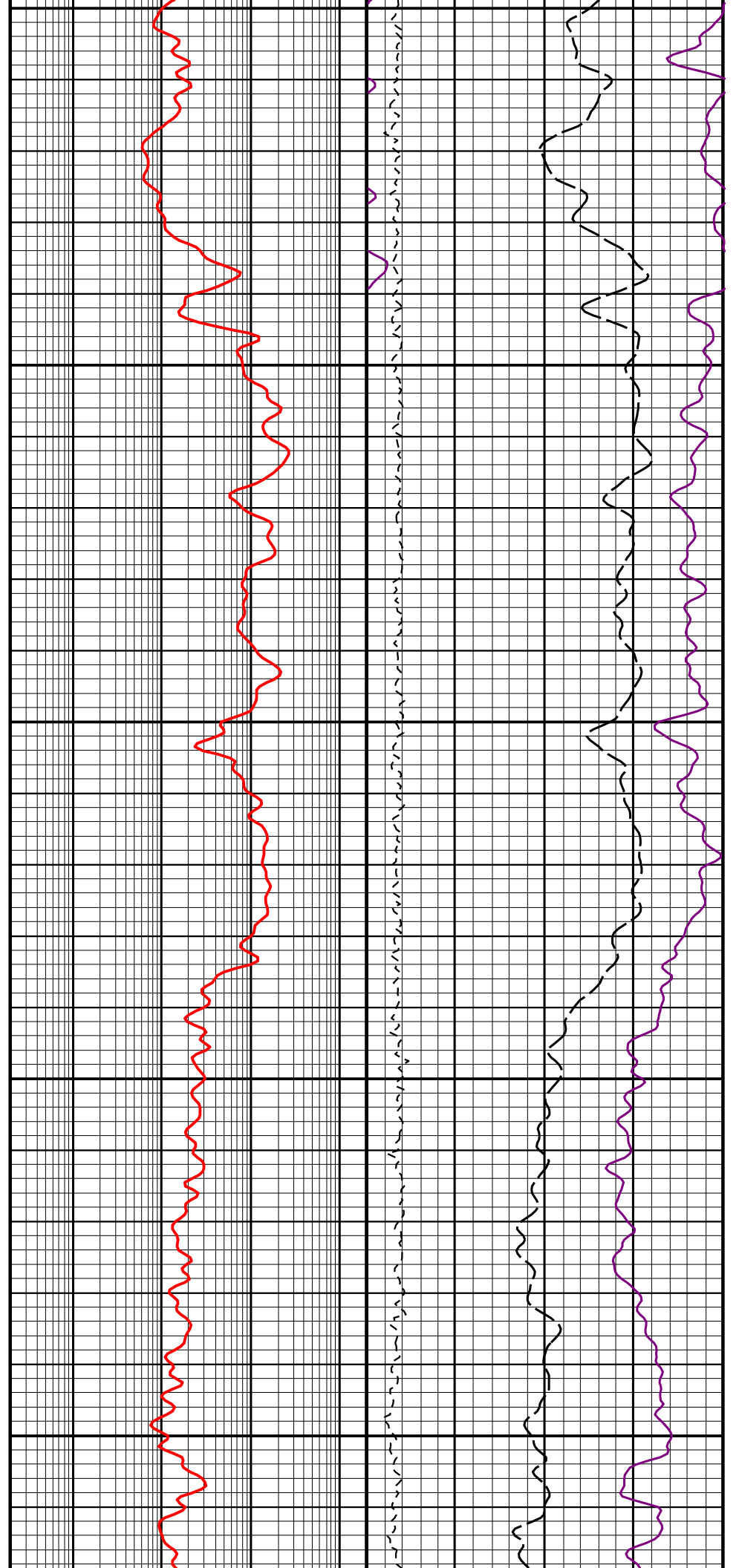
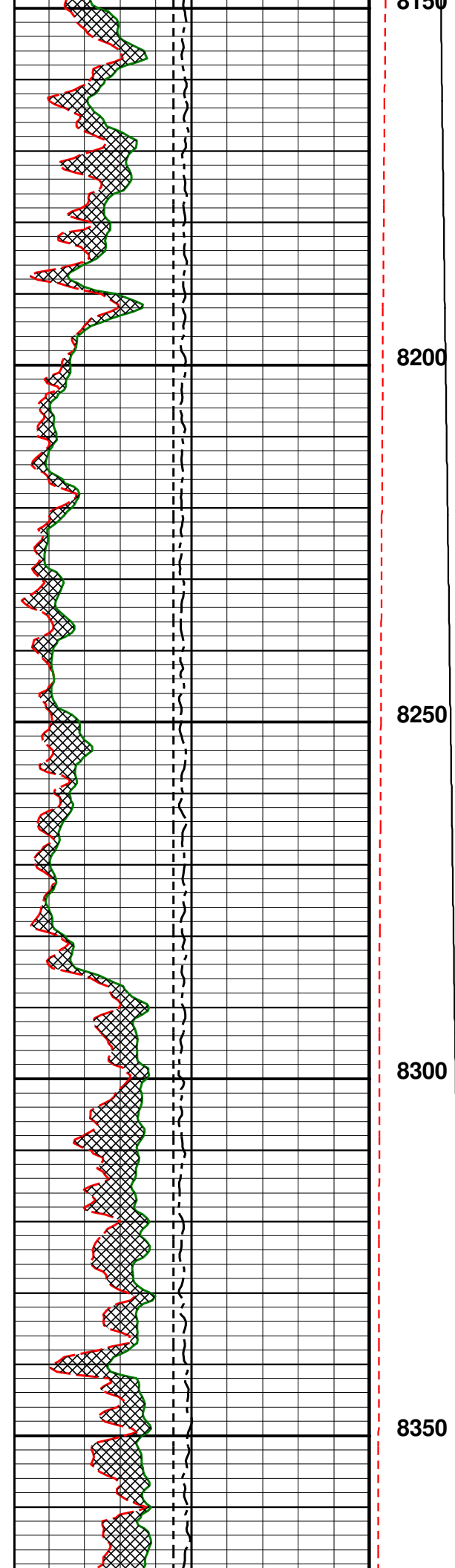


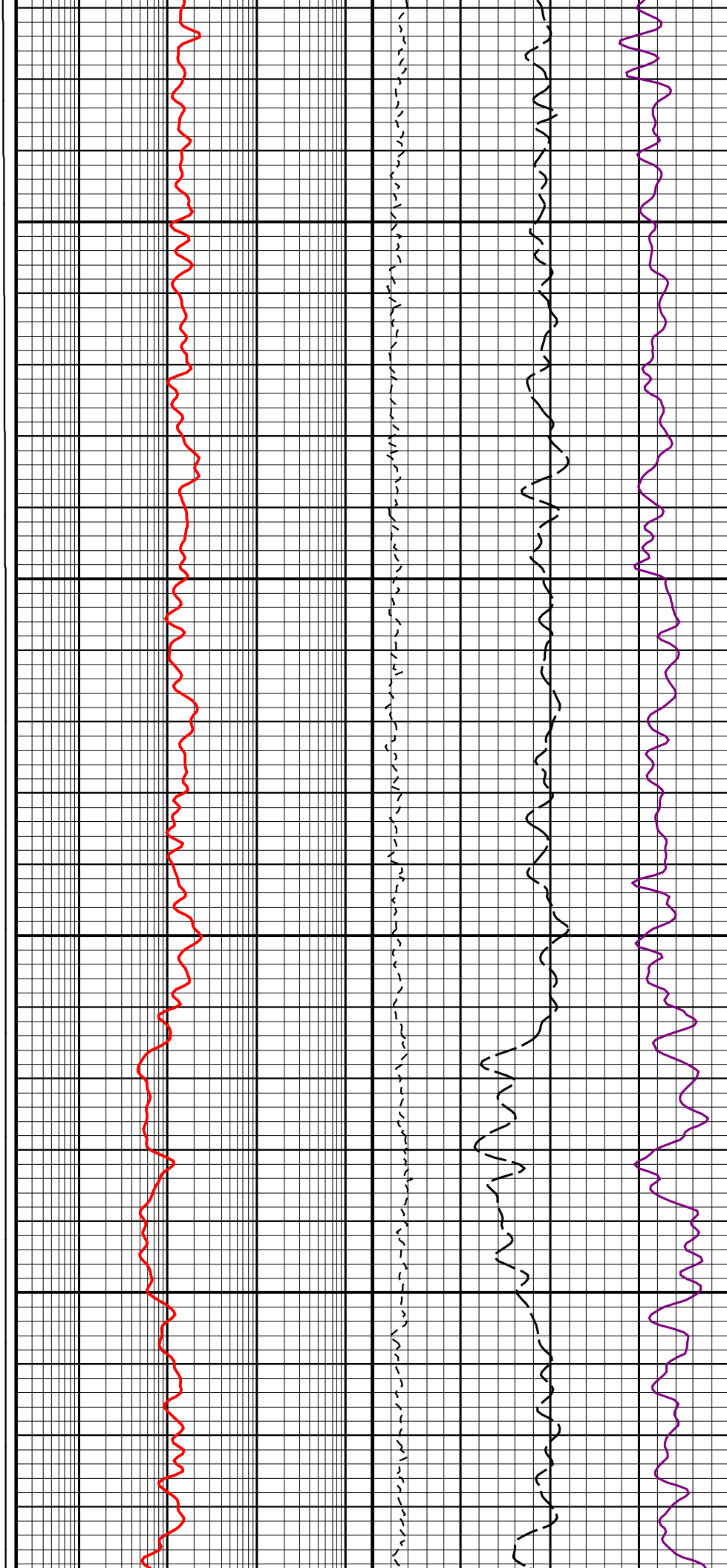
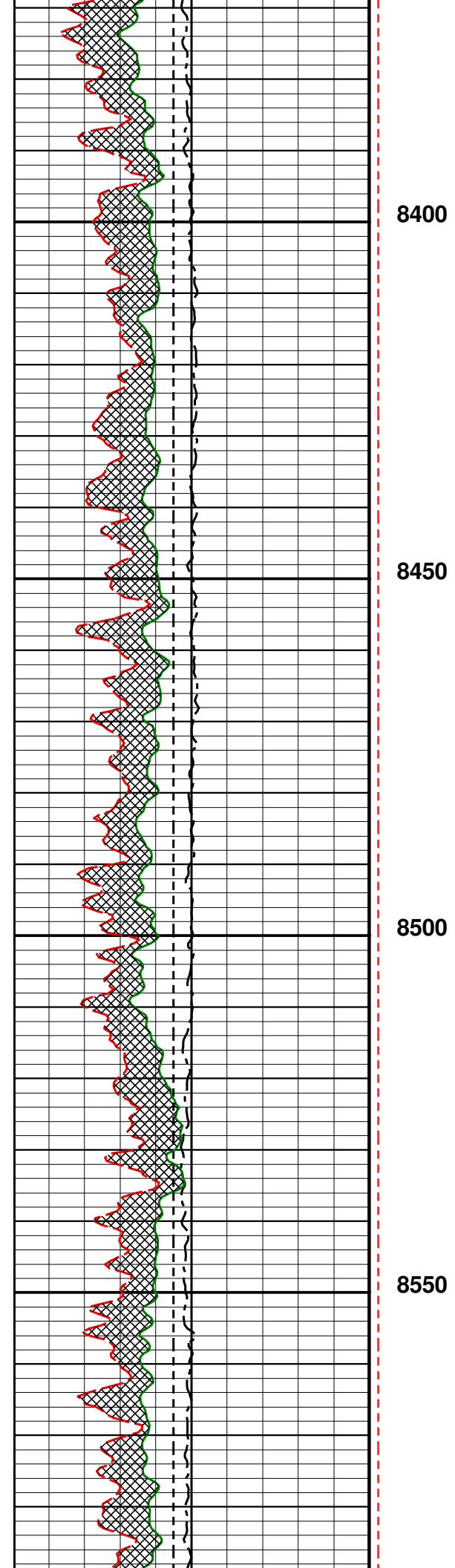


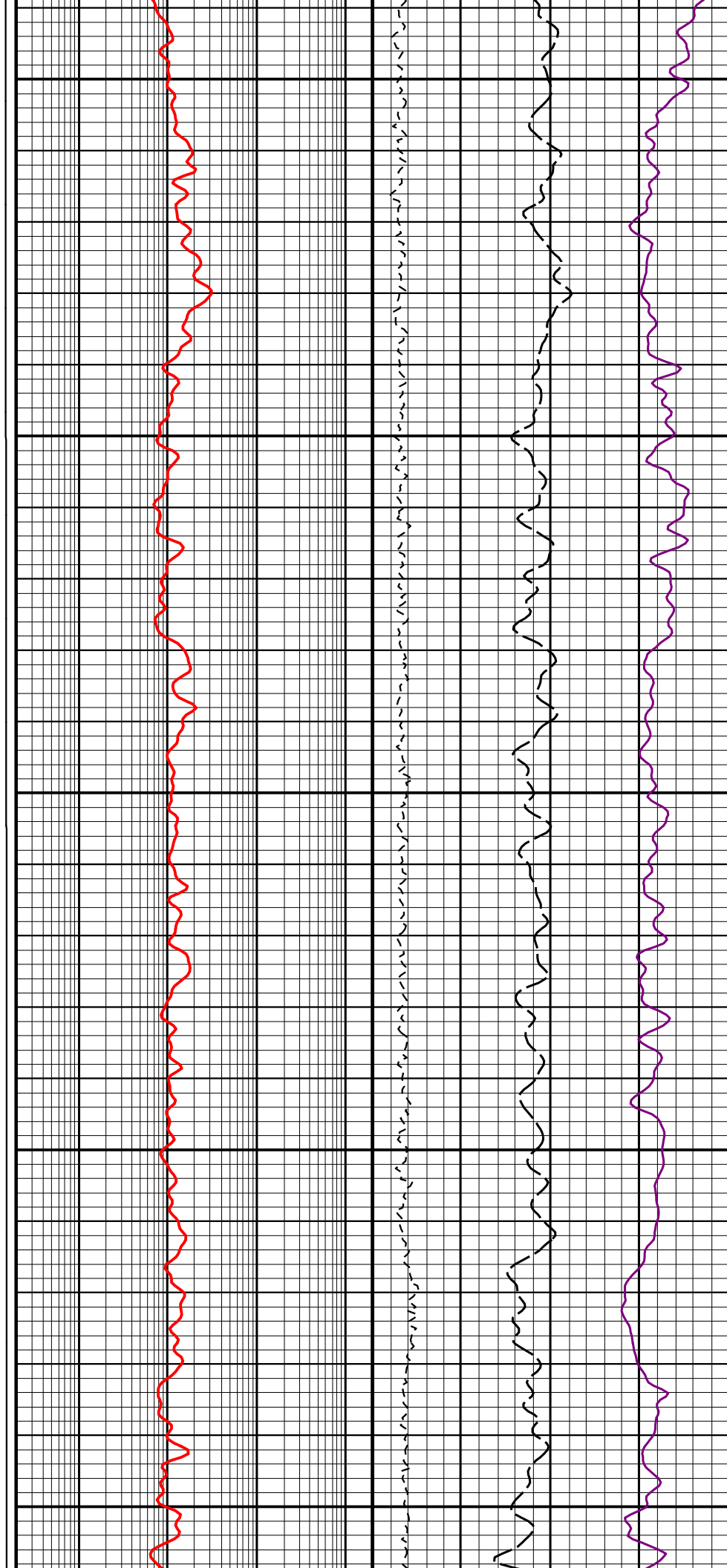
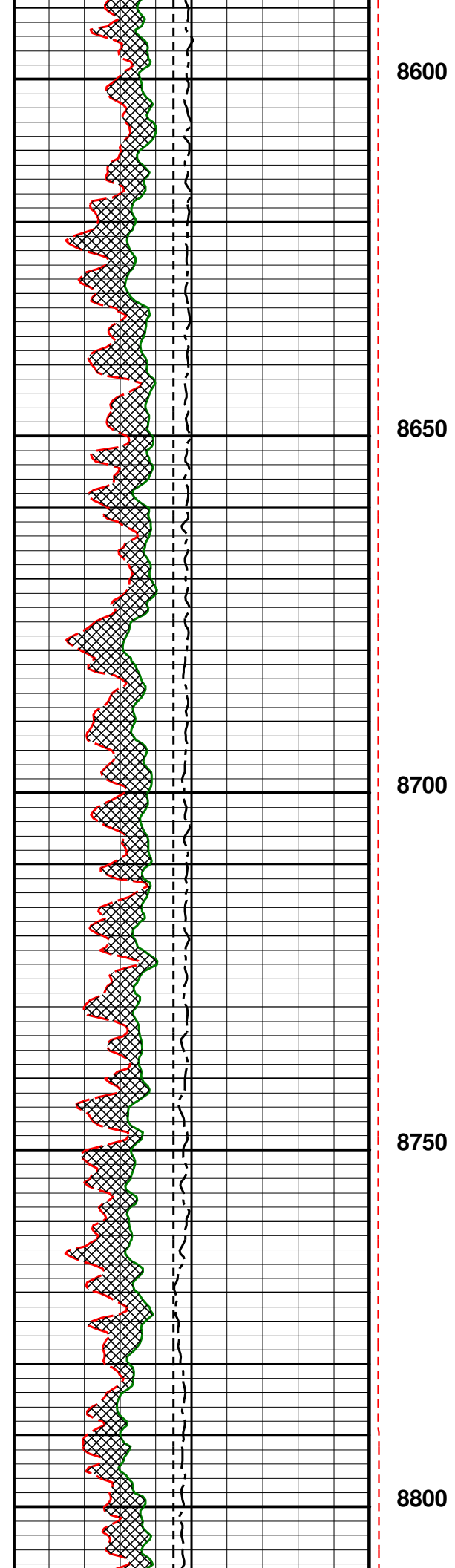
5" MAIN PASS SANDSTONE

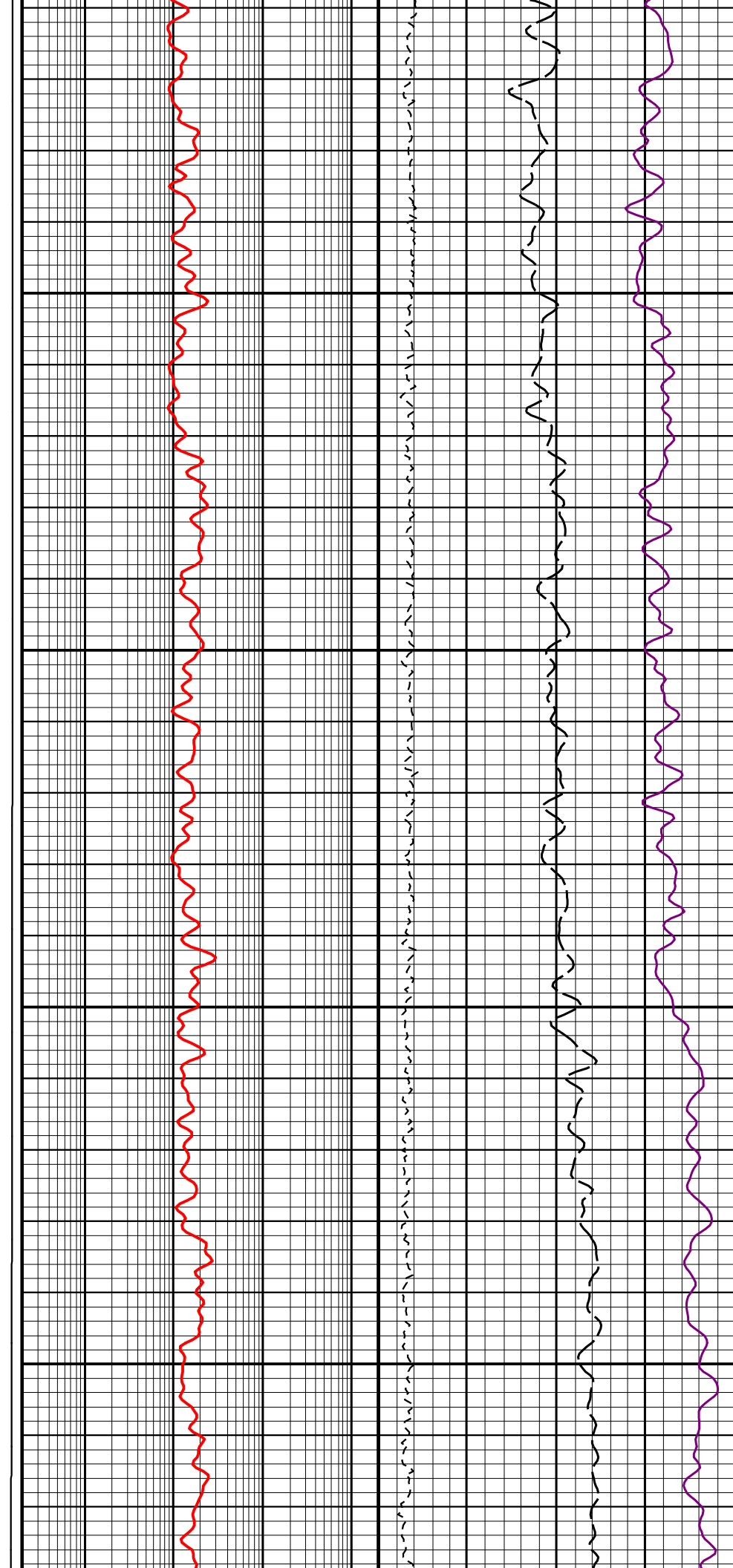
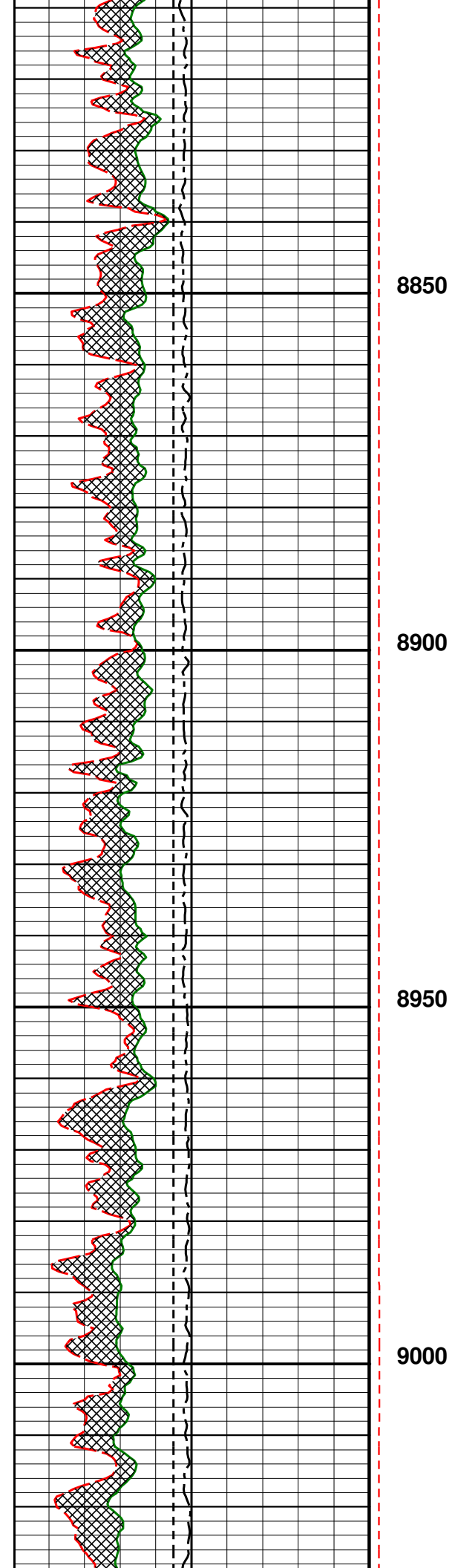


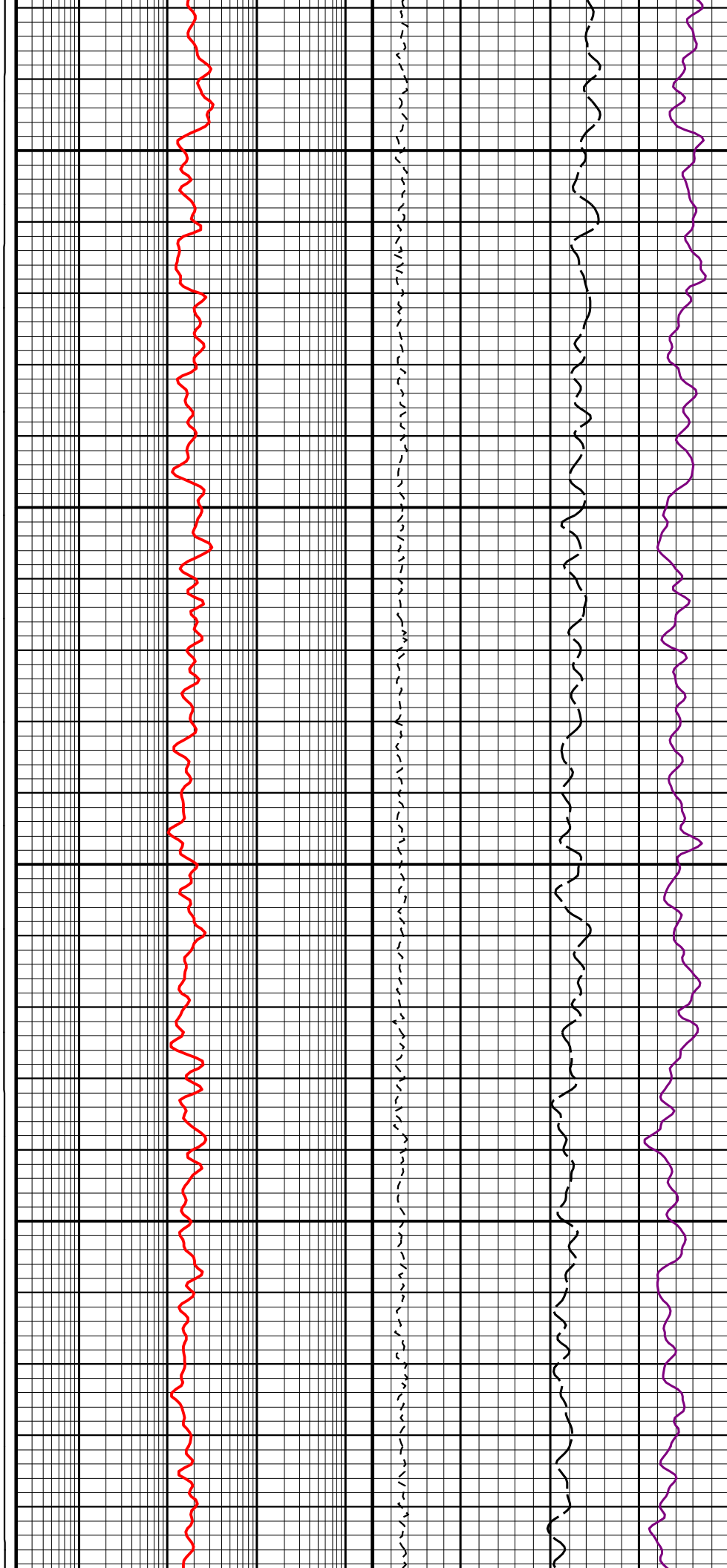
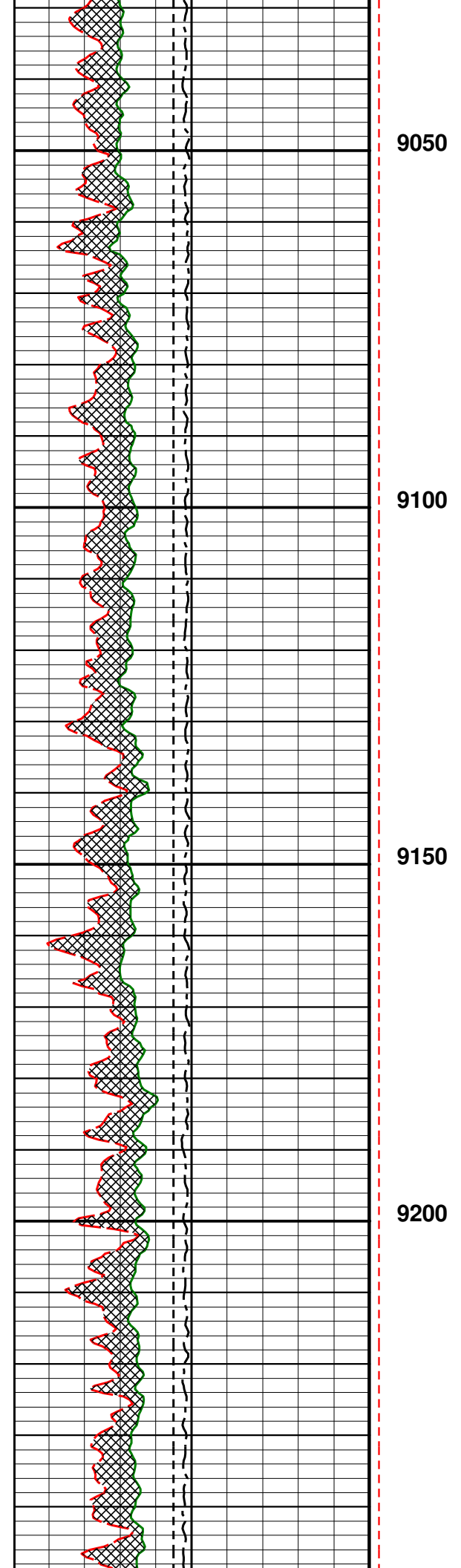


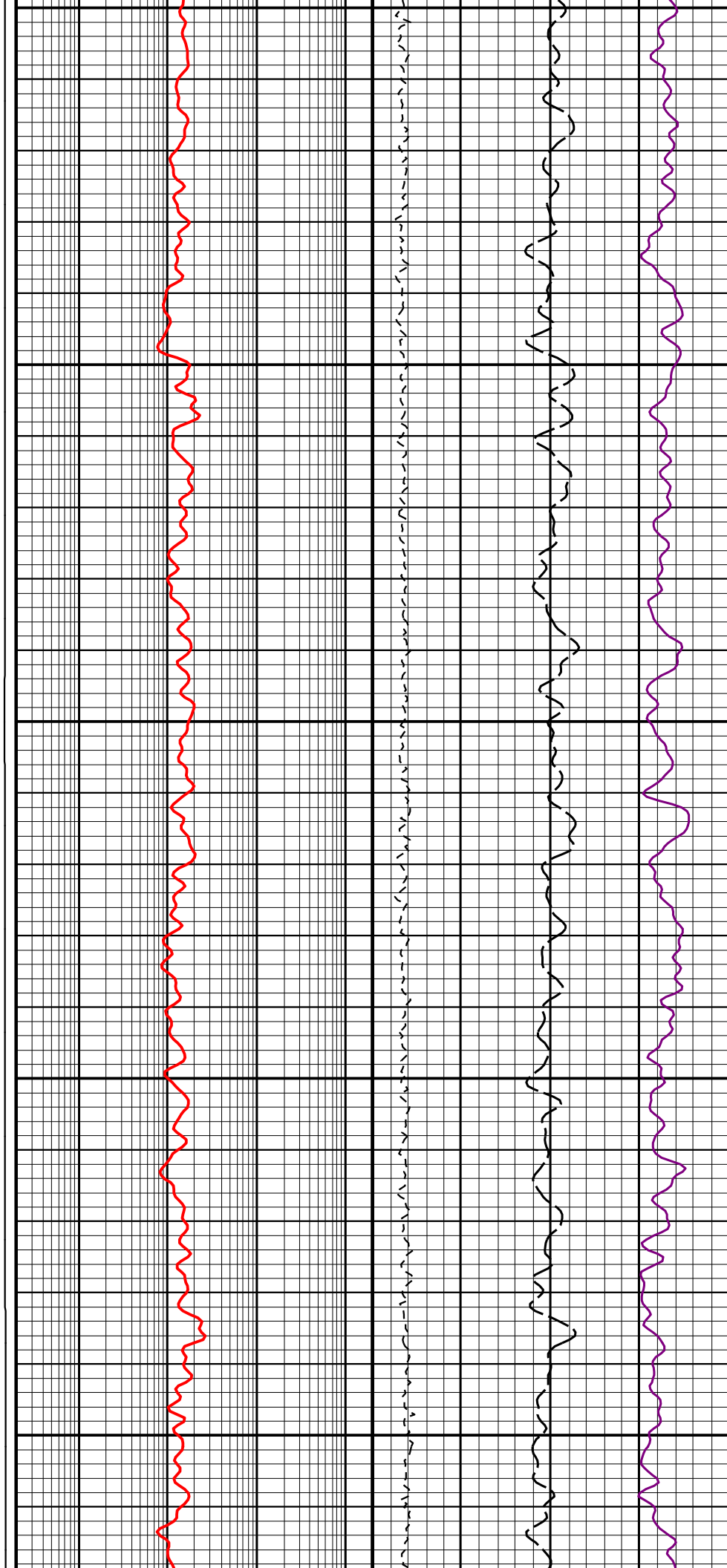
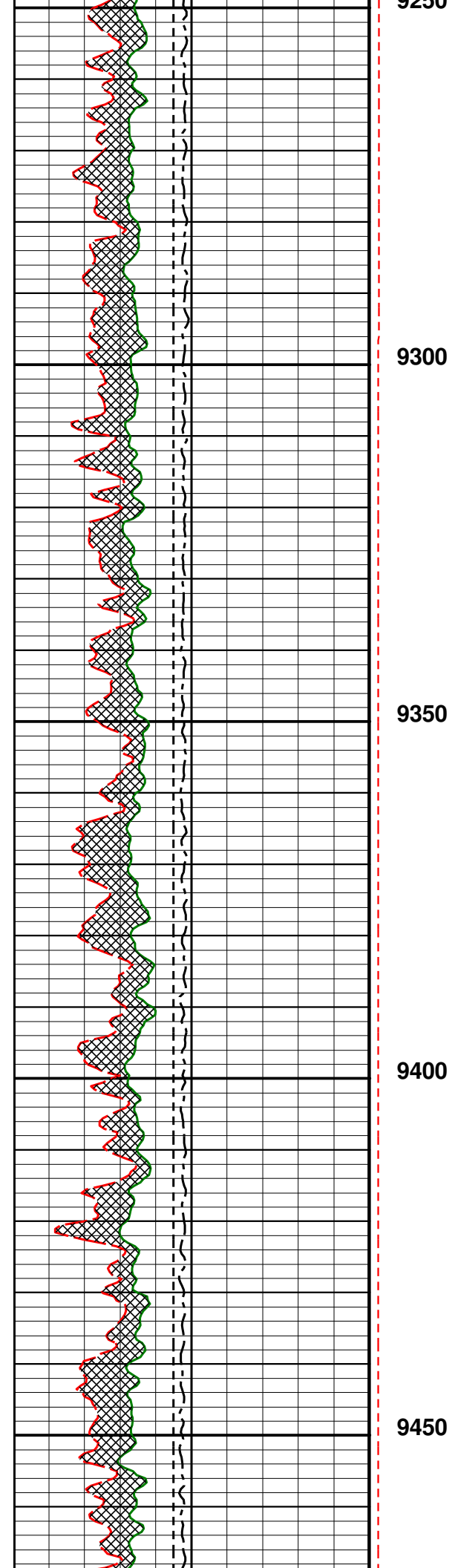


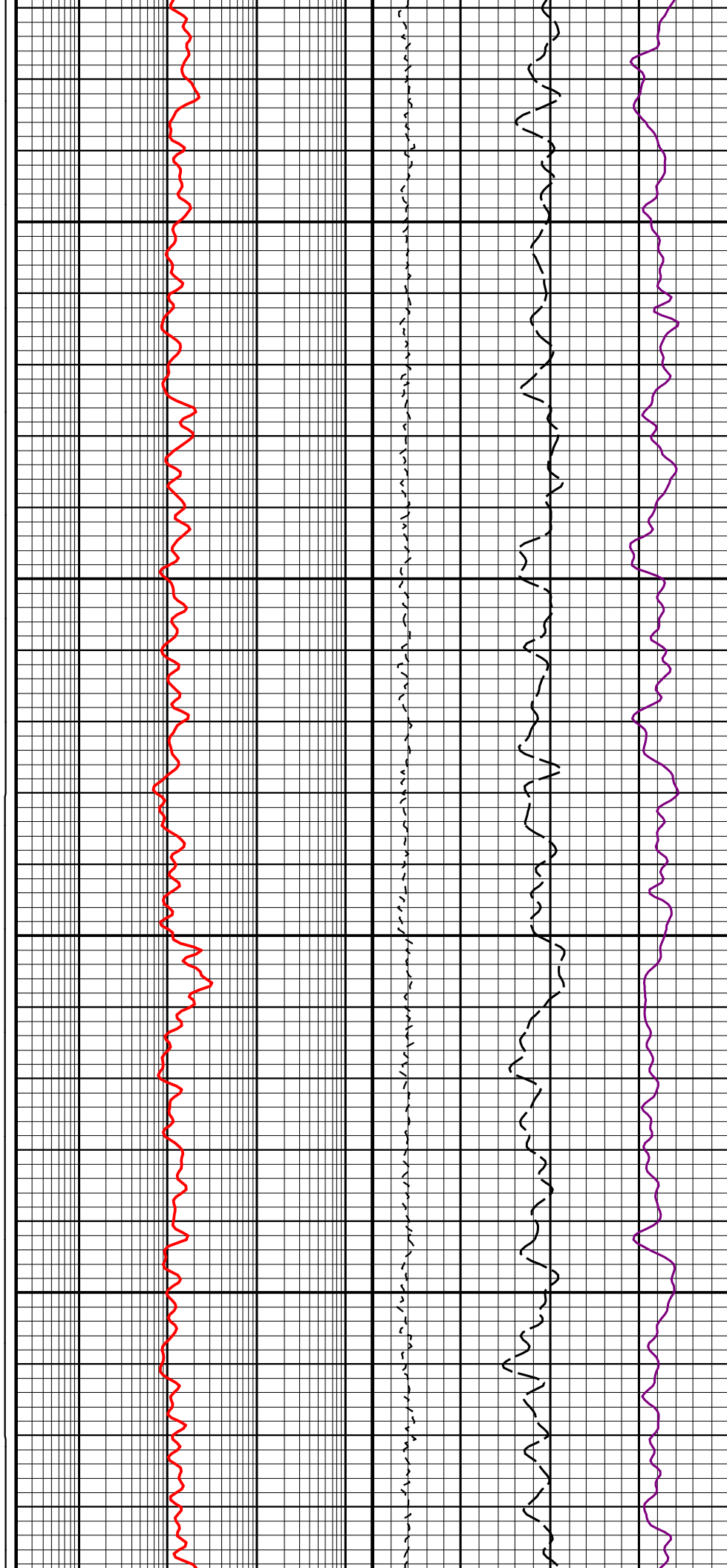
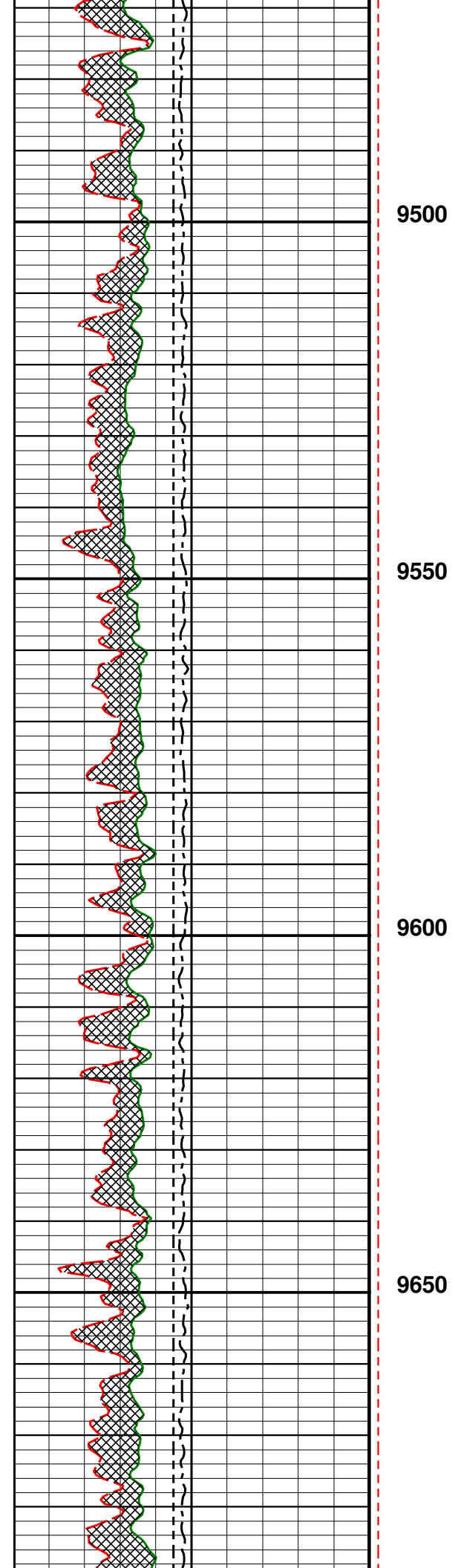


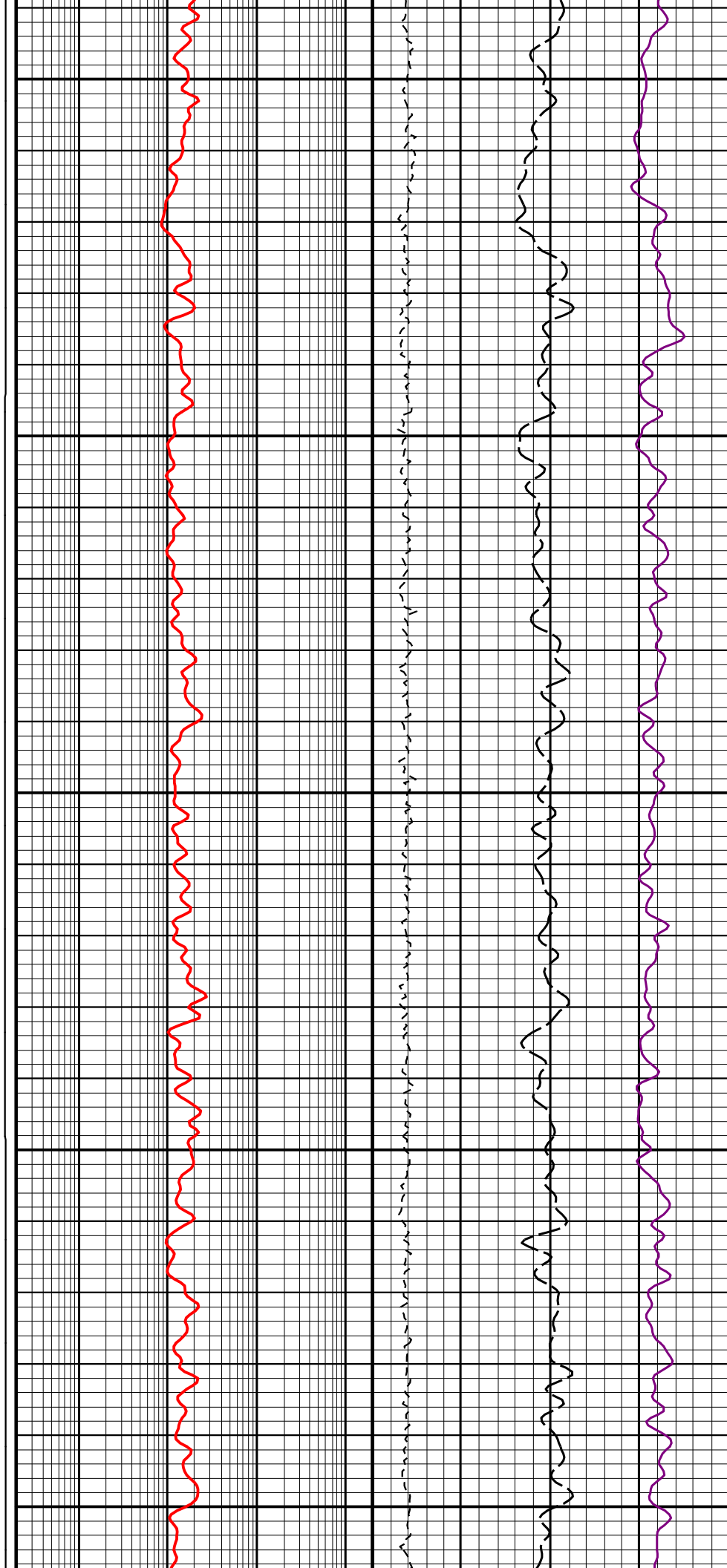
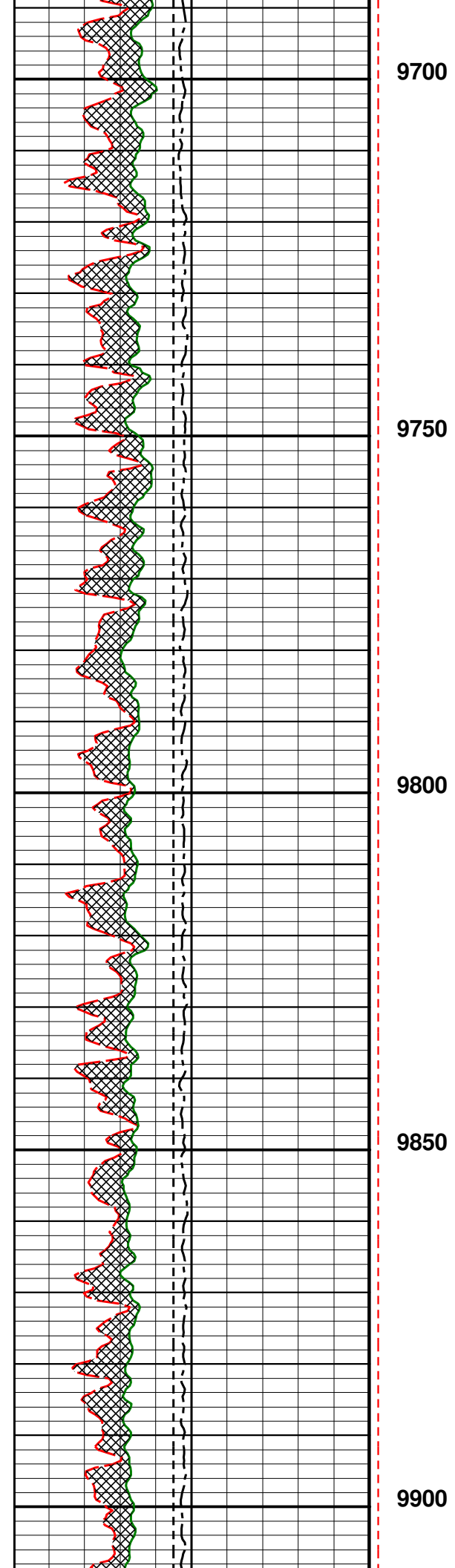


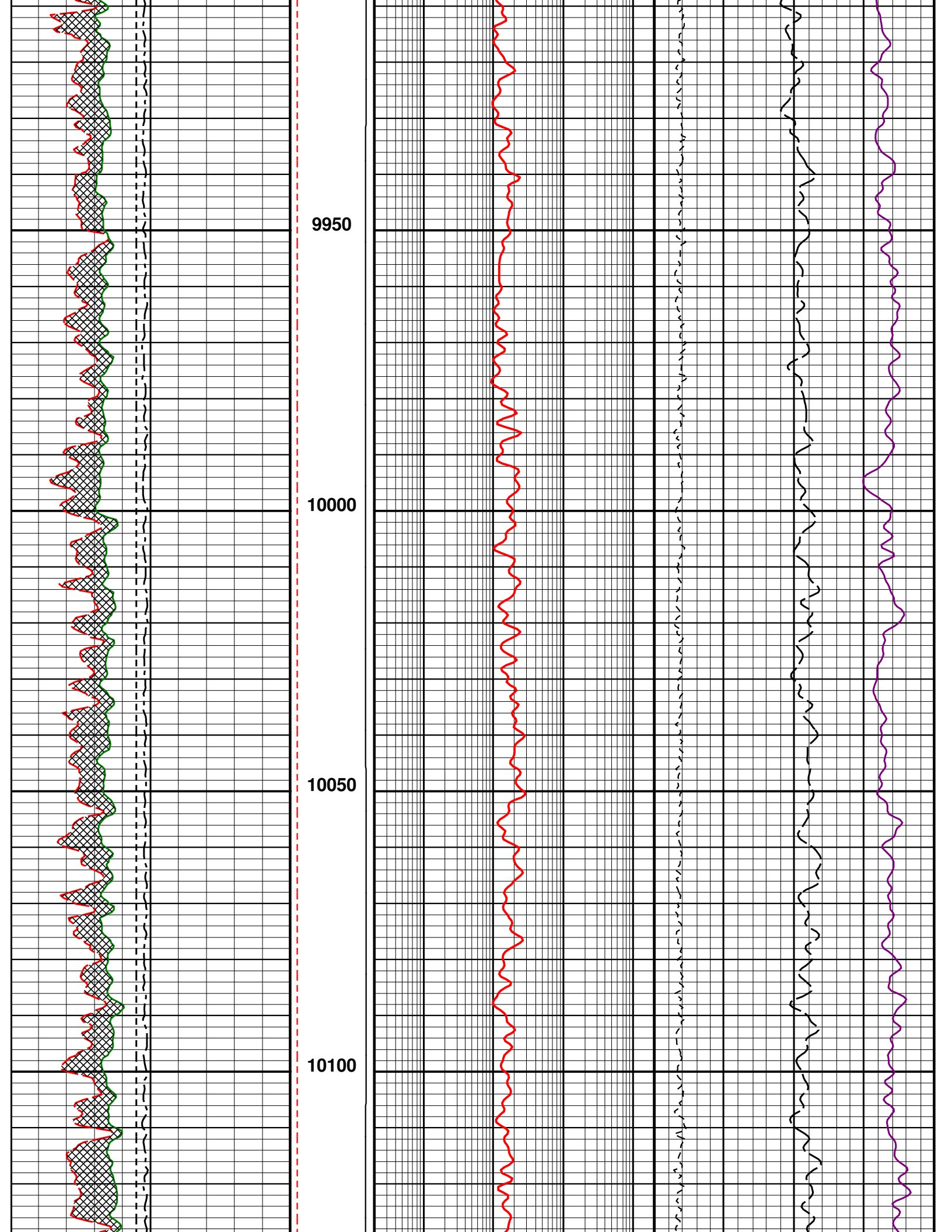


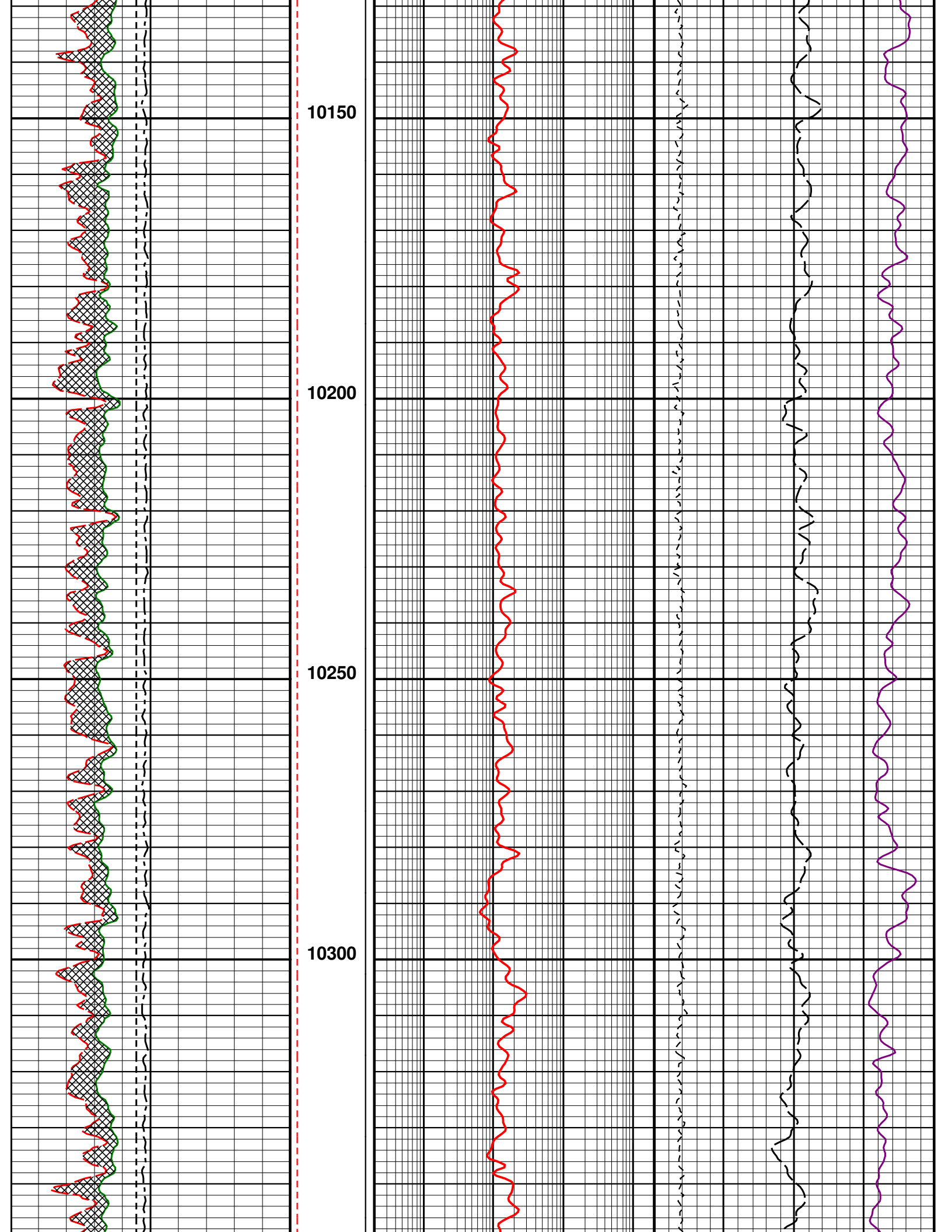


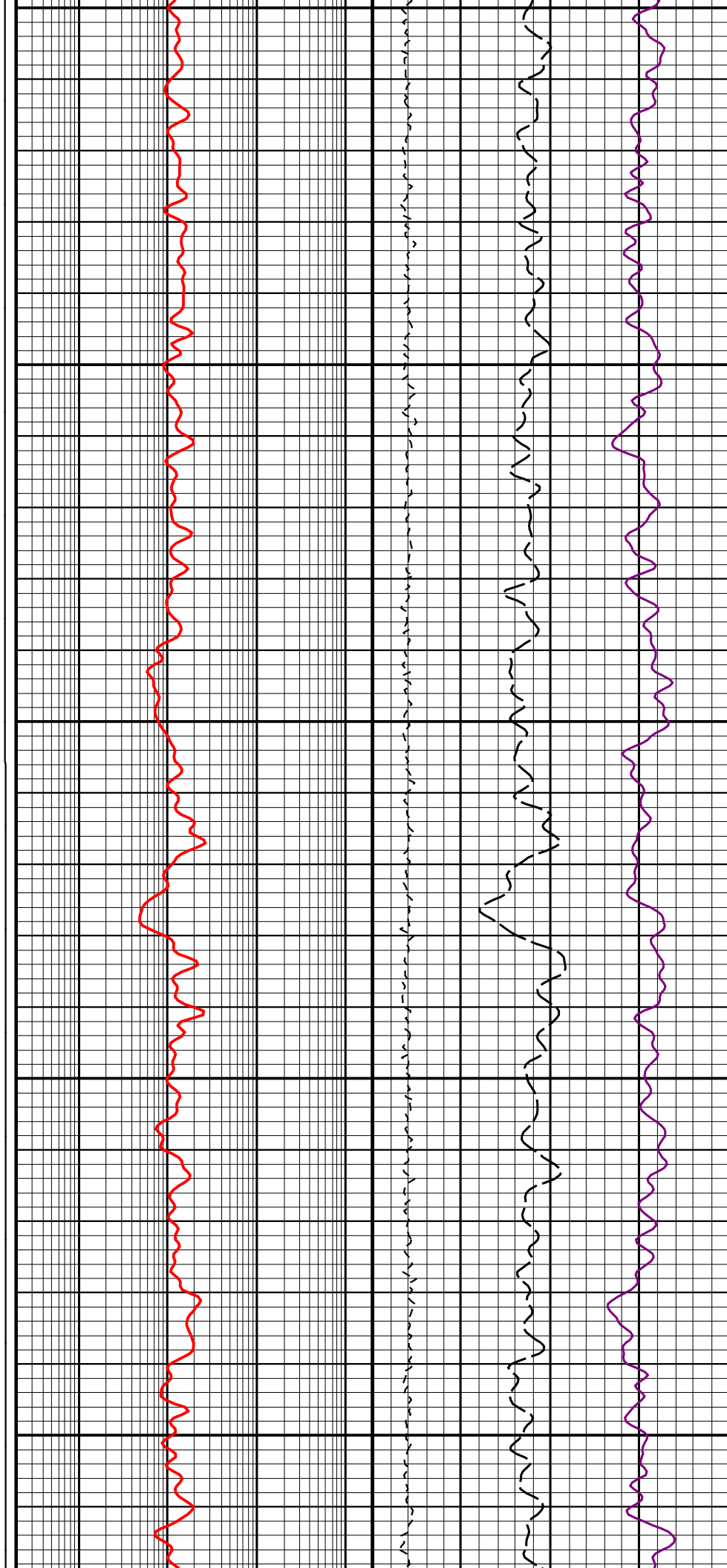
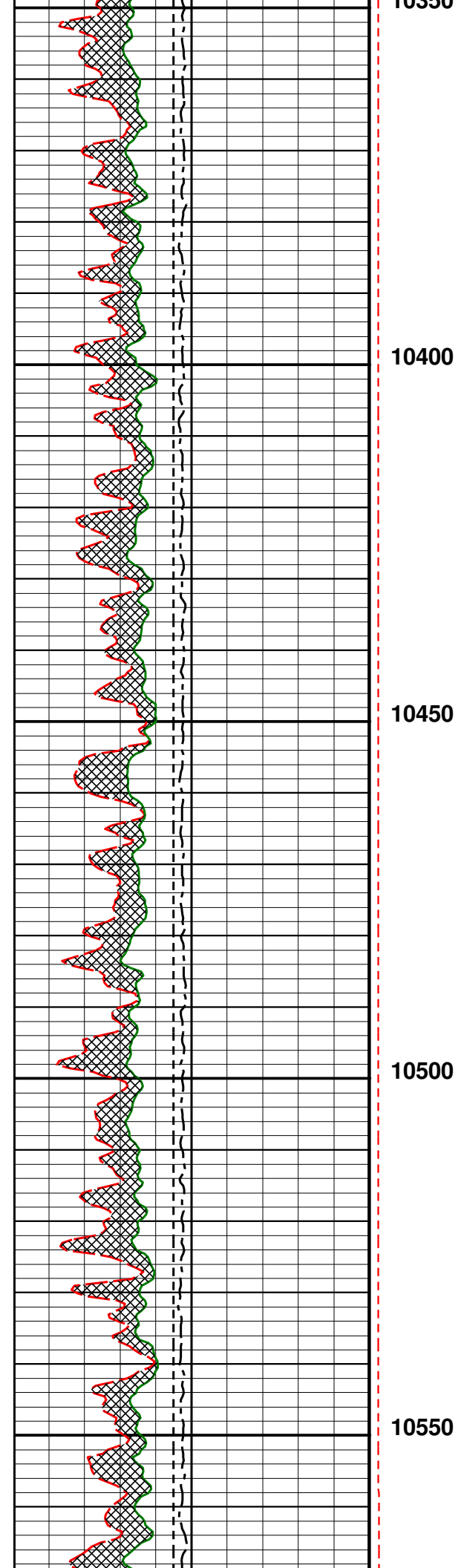


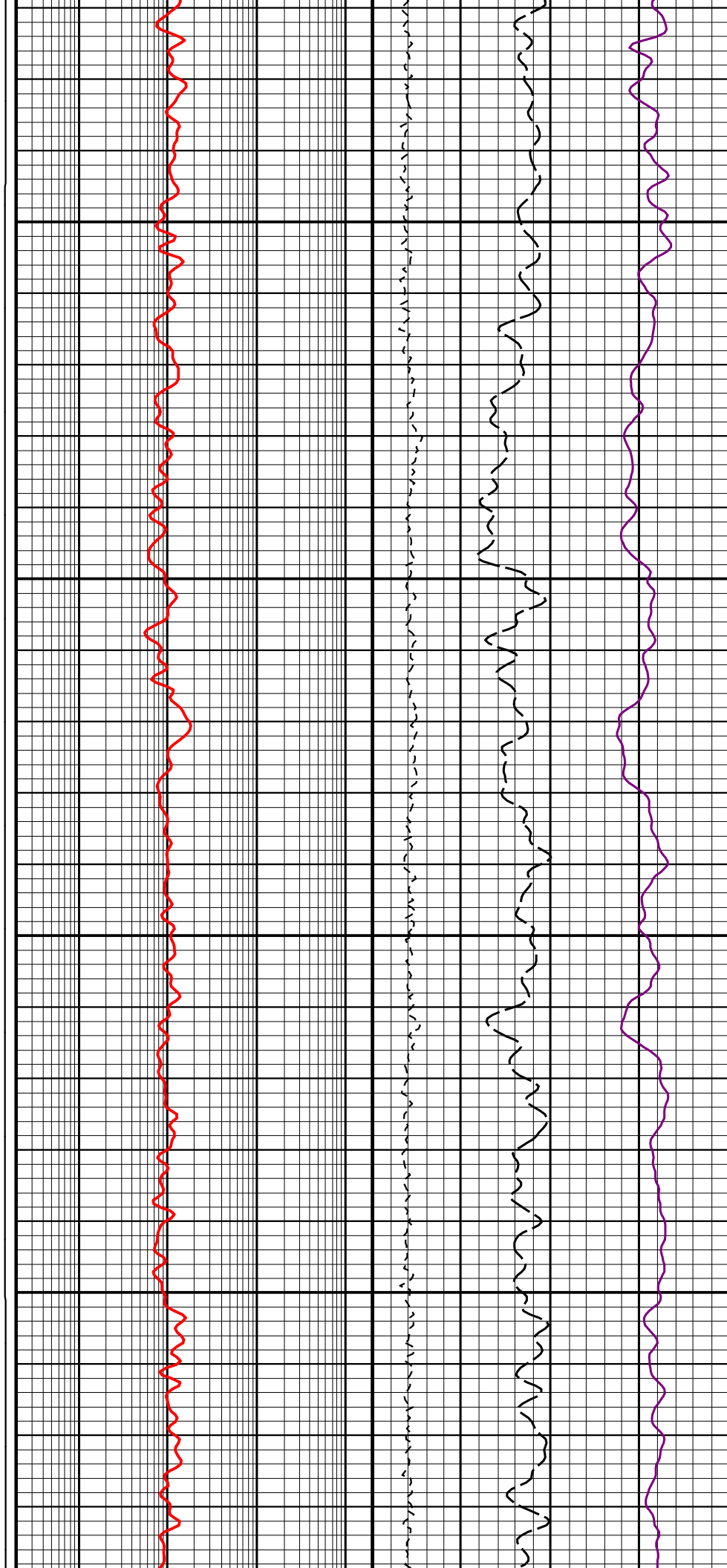
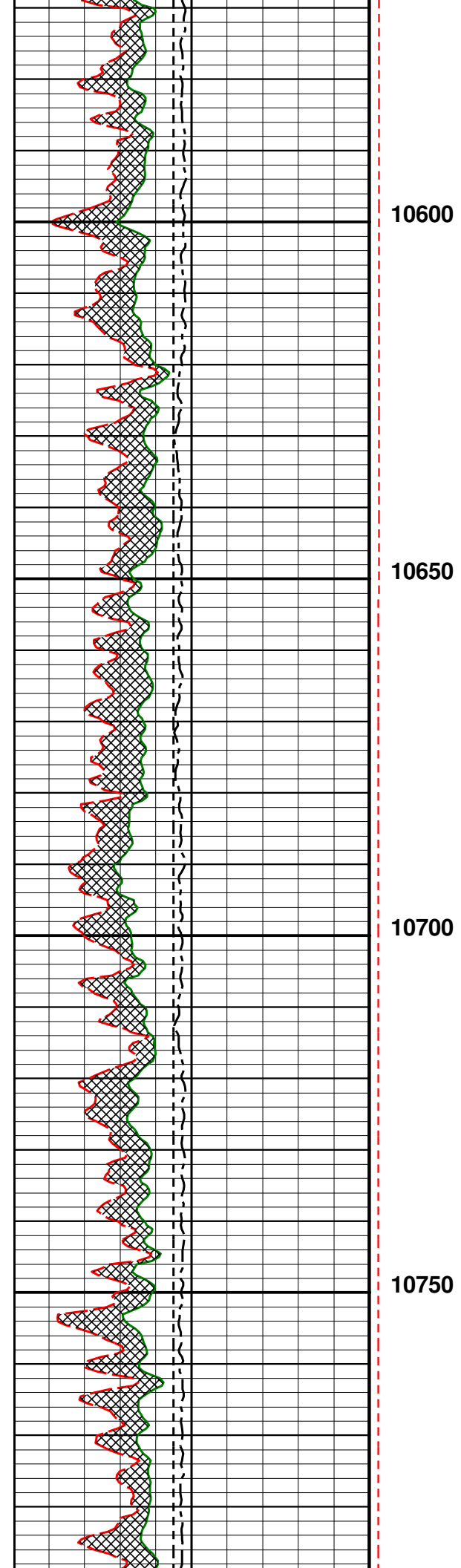


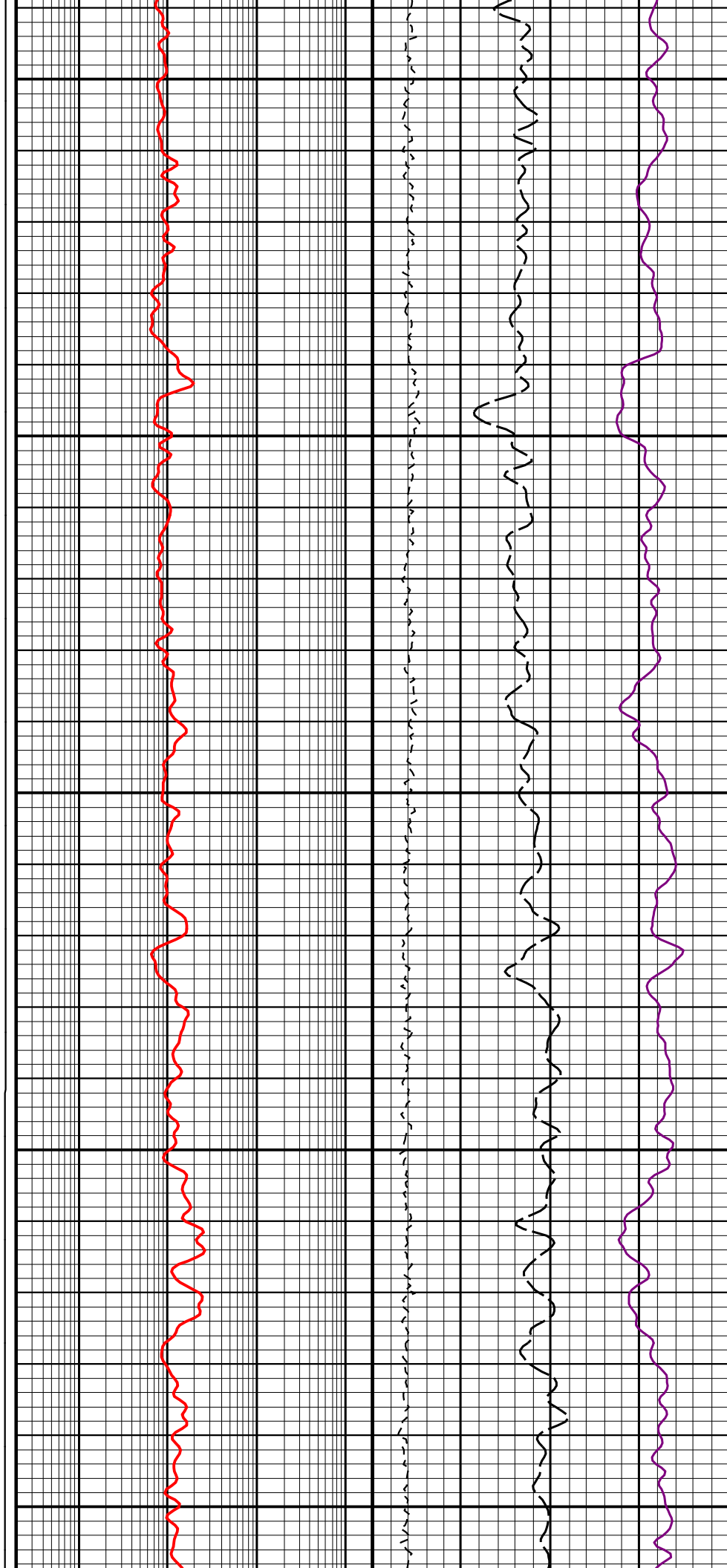
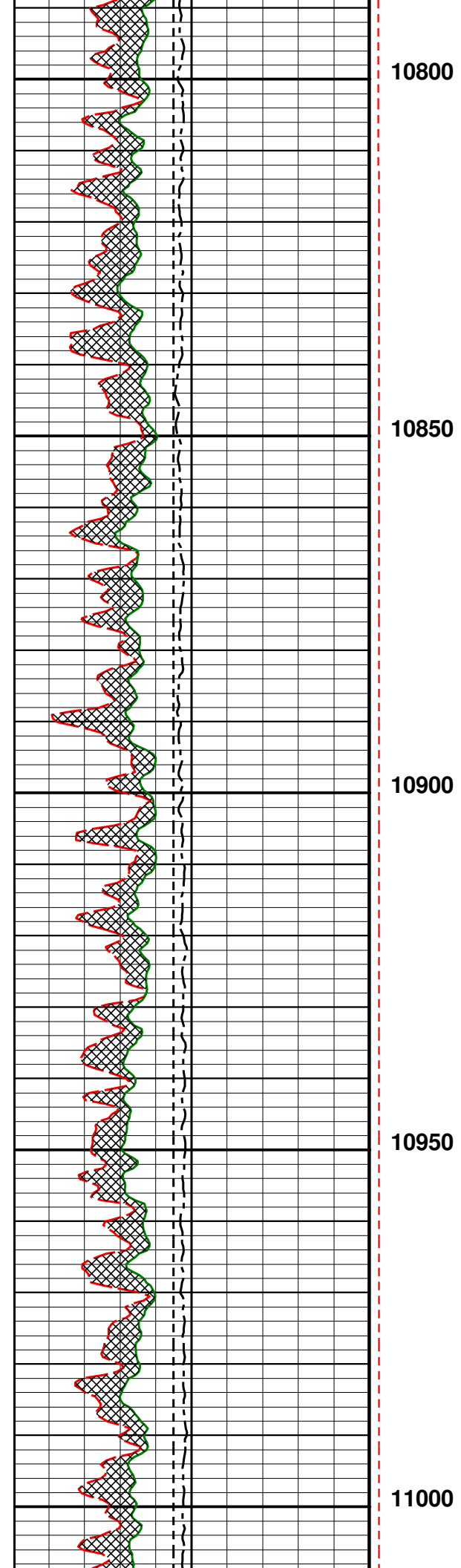


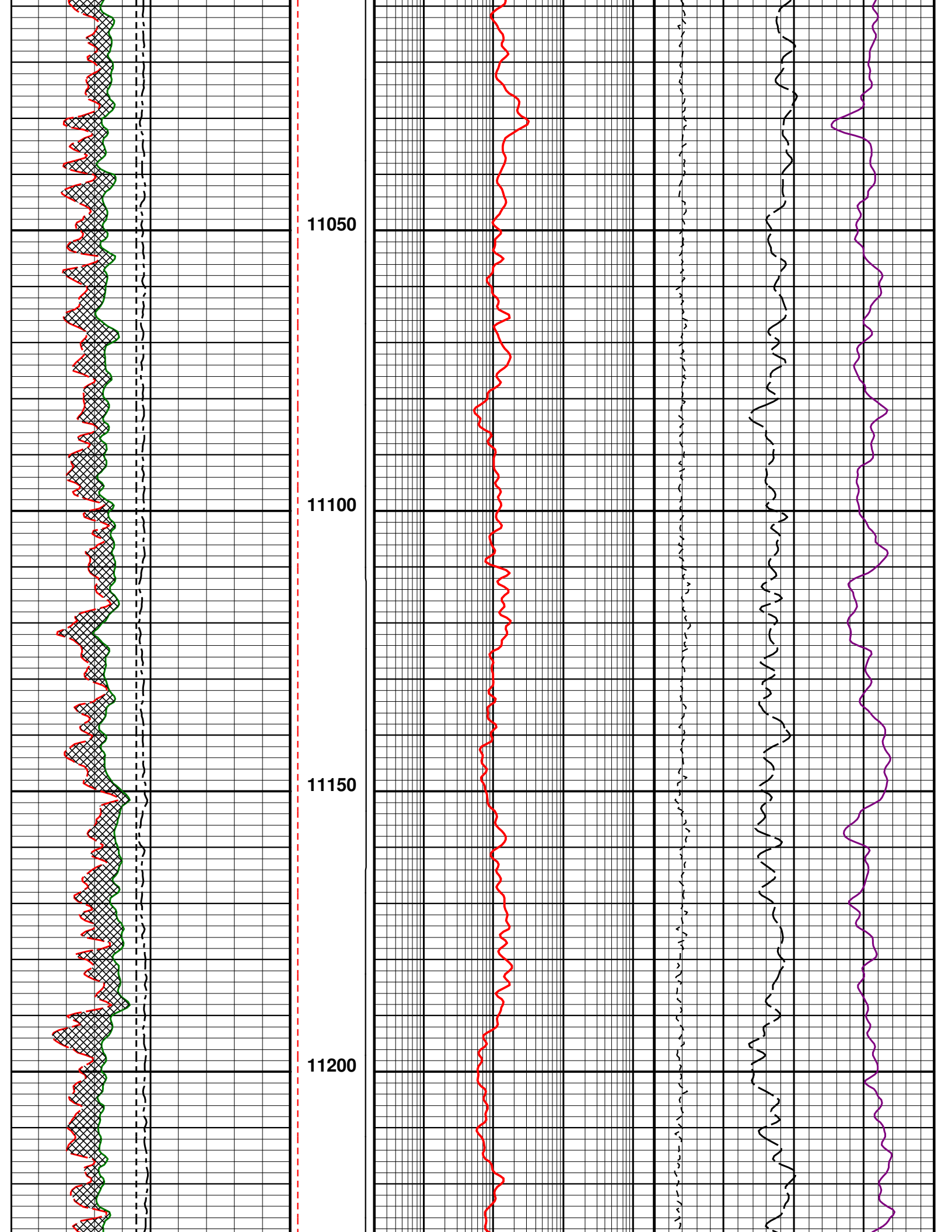


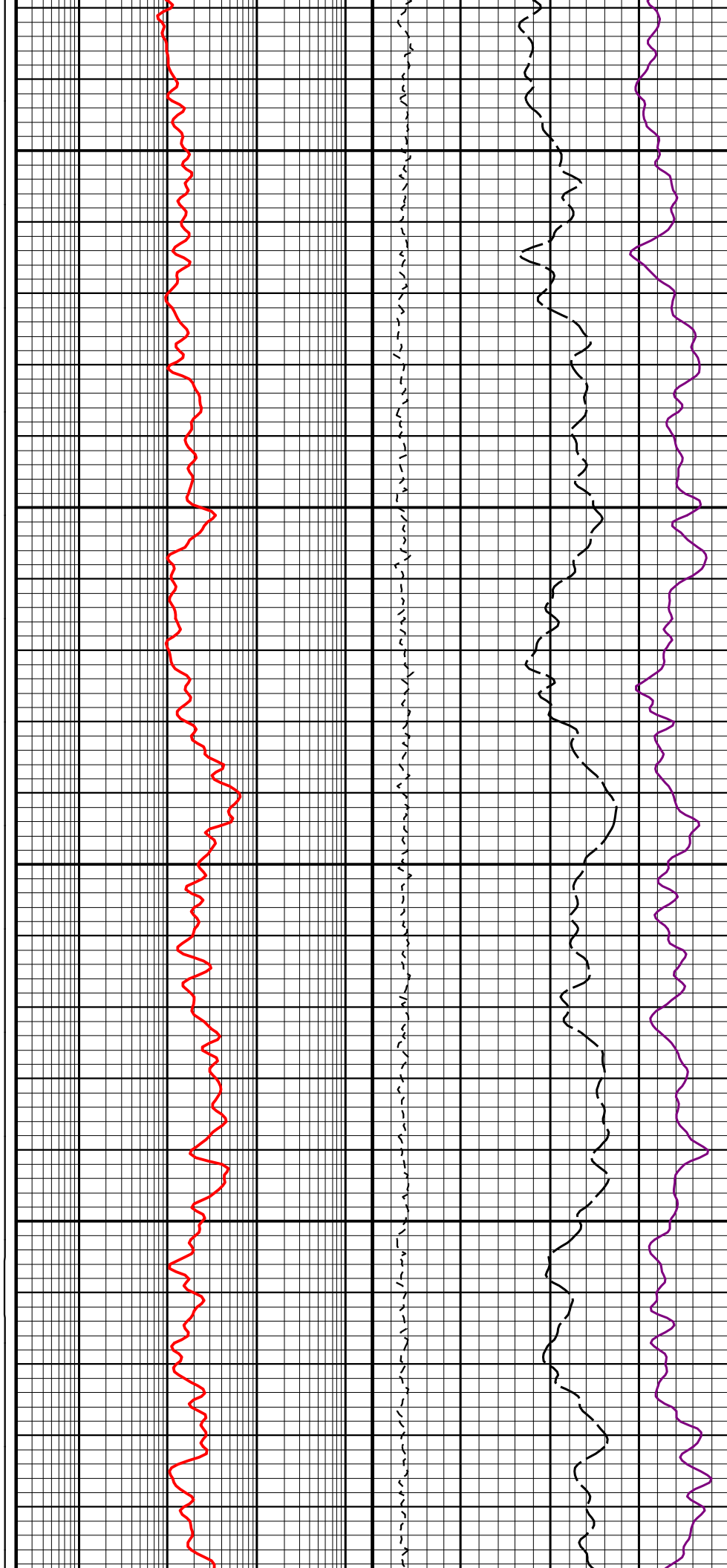
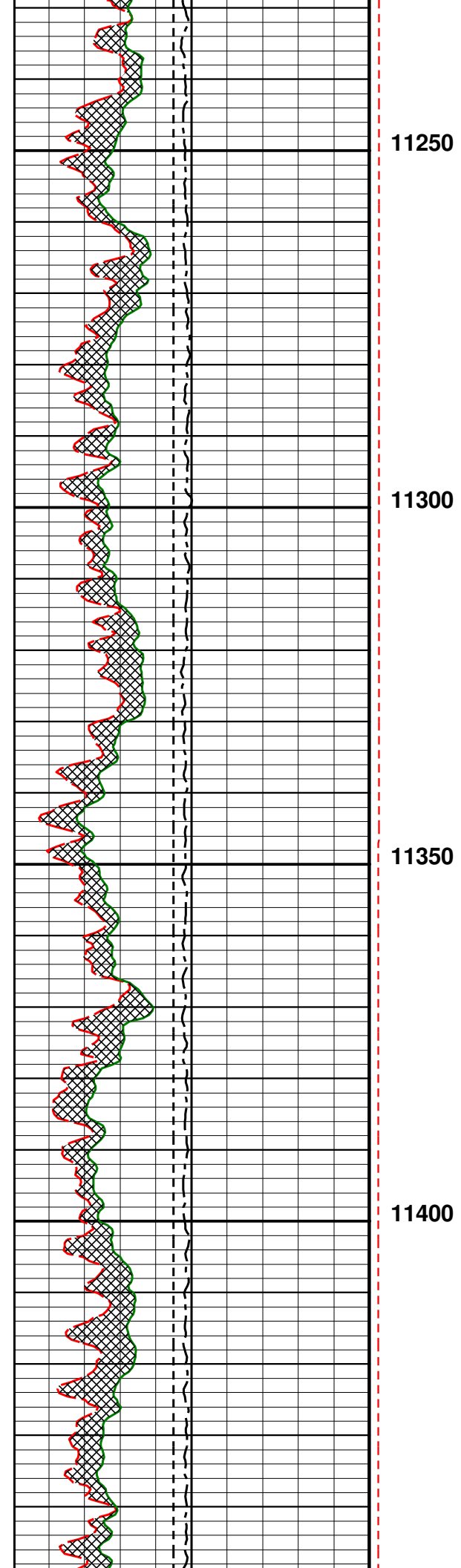


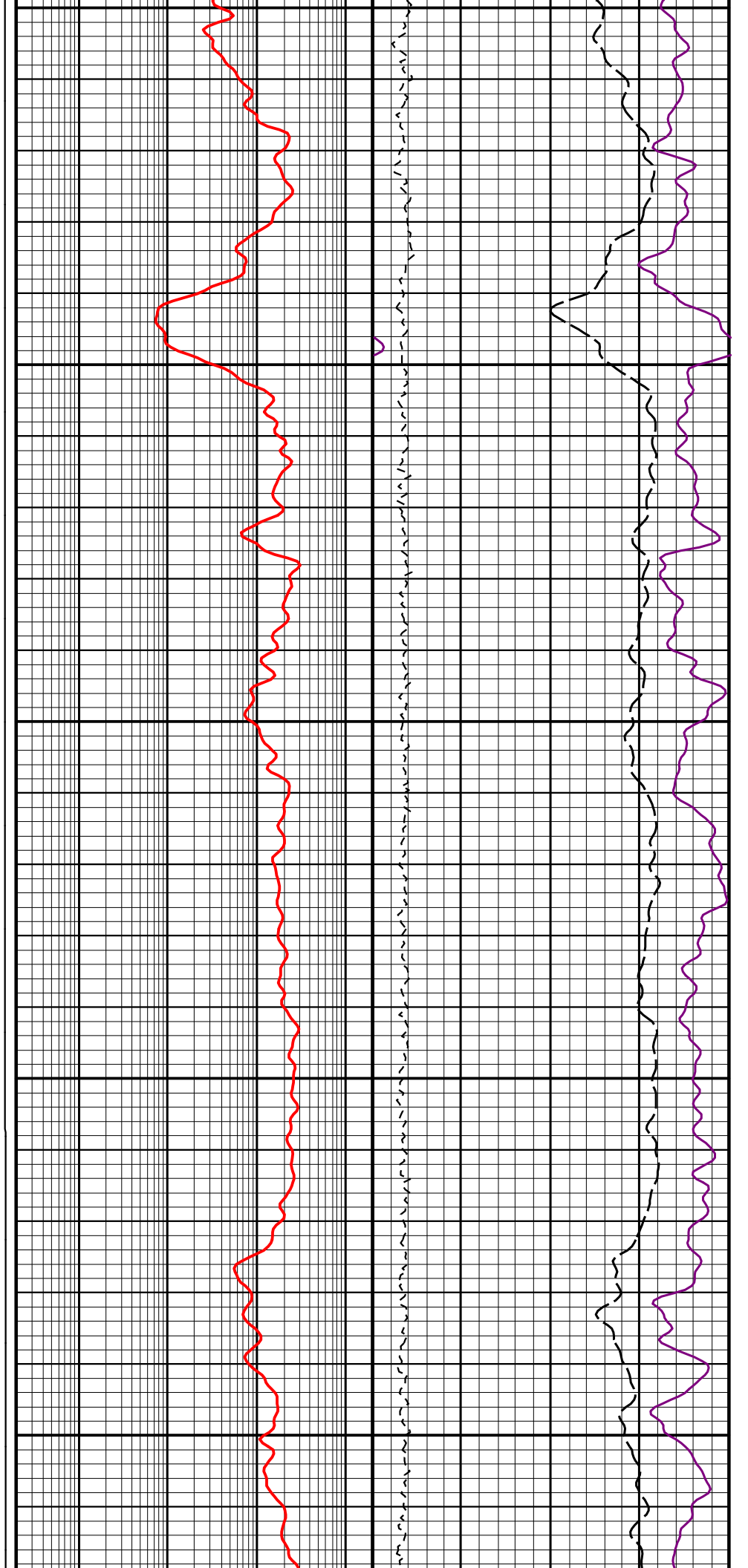
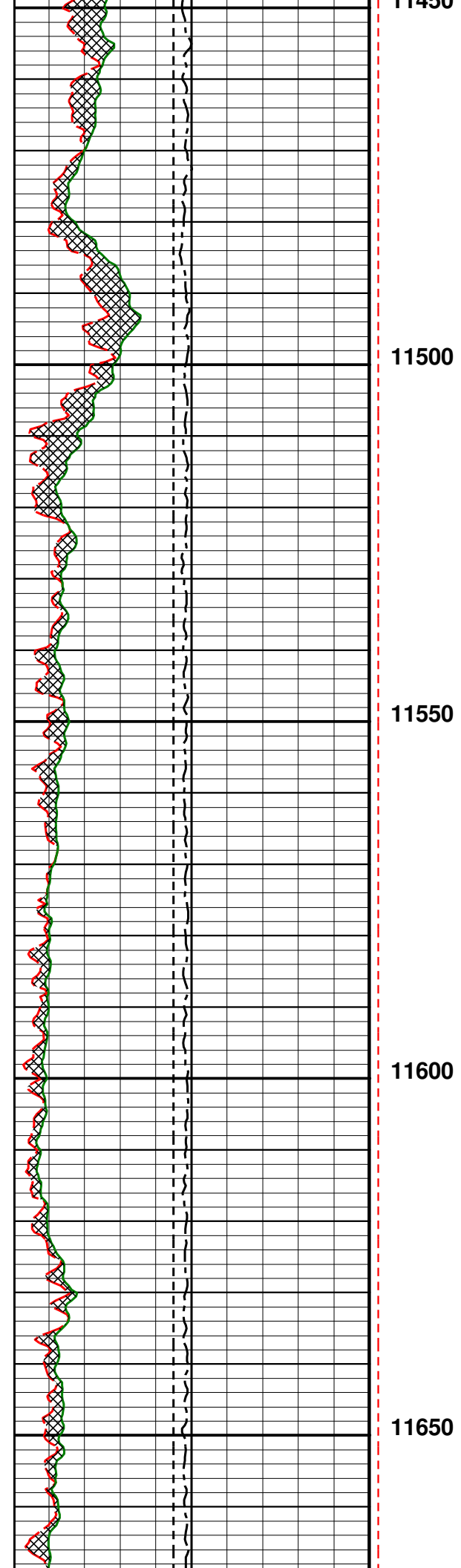


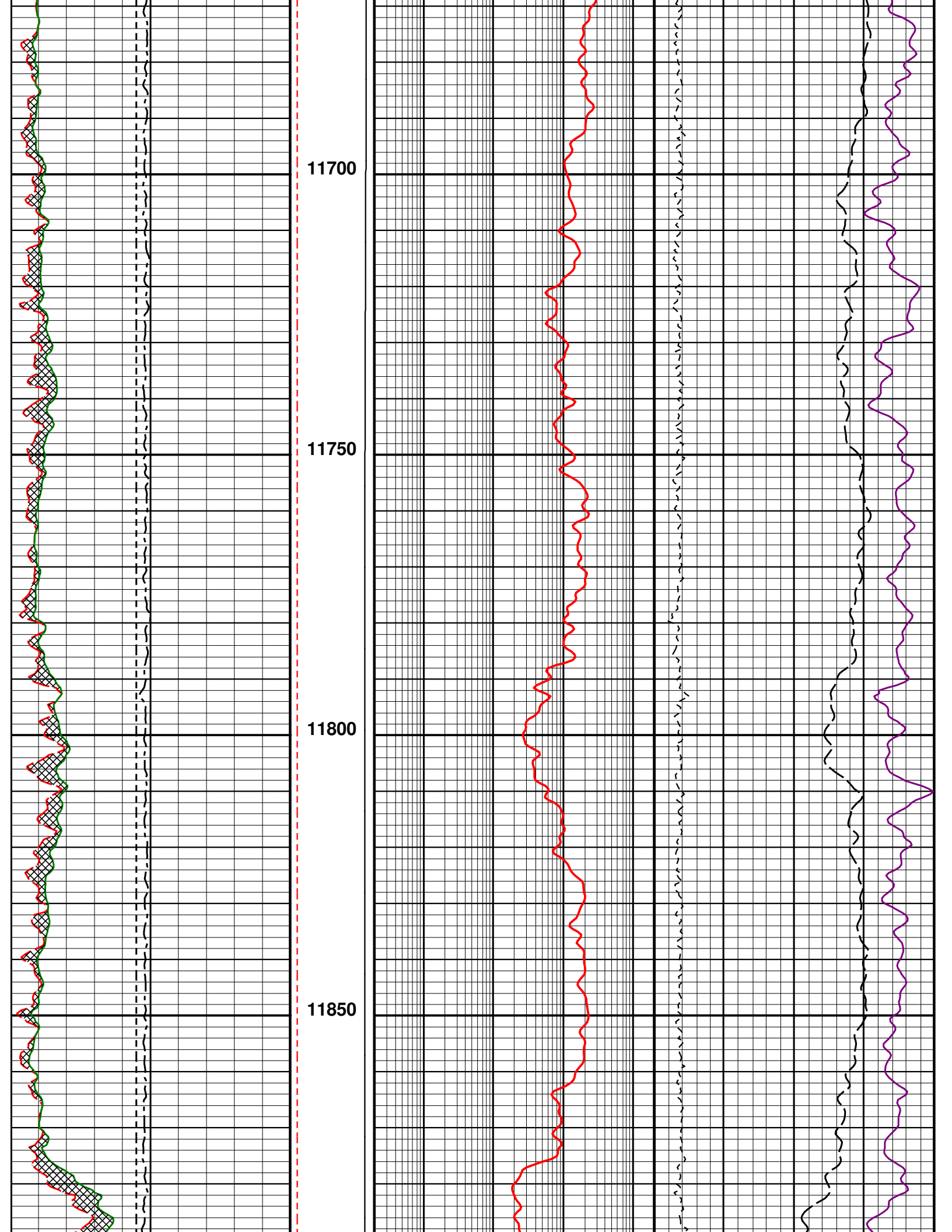


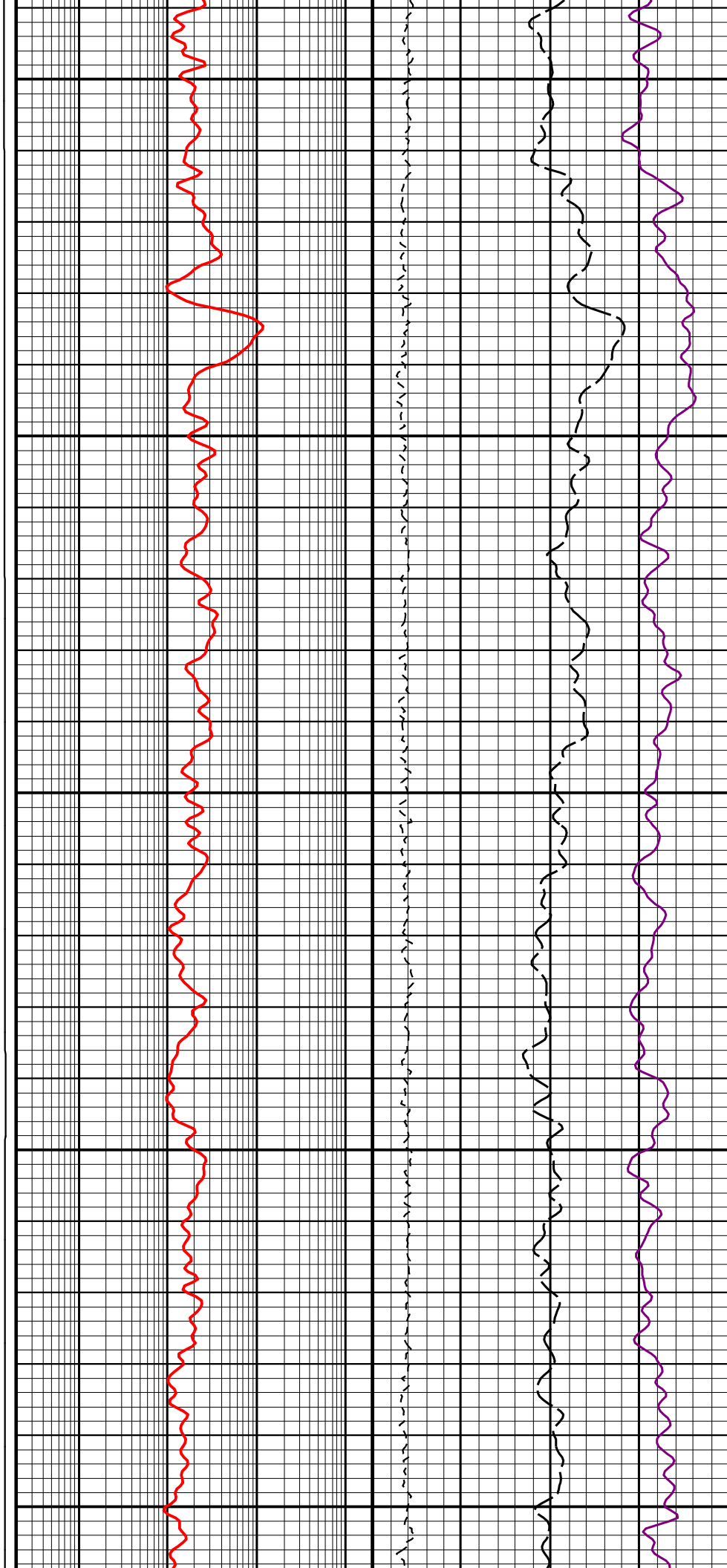
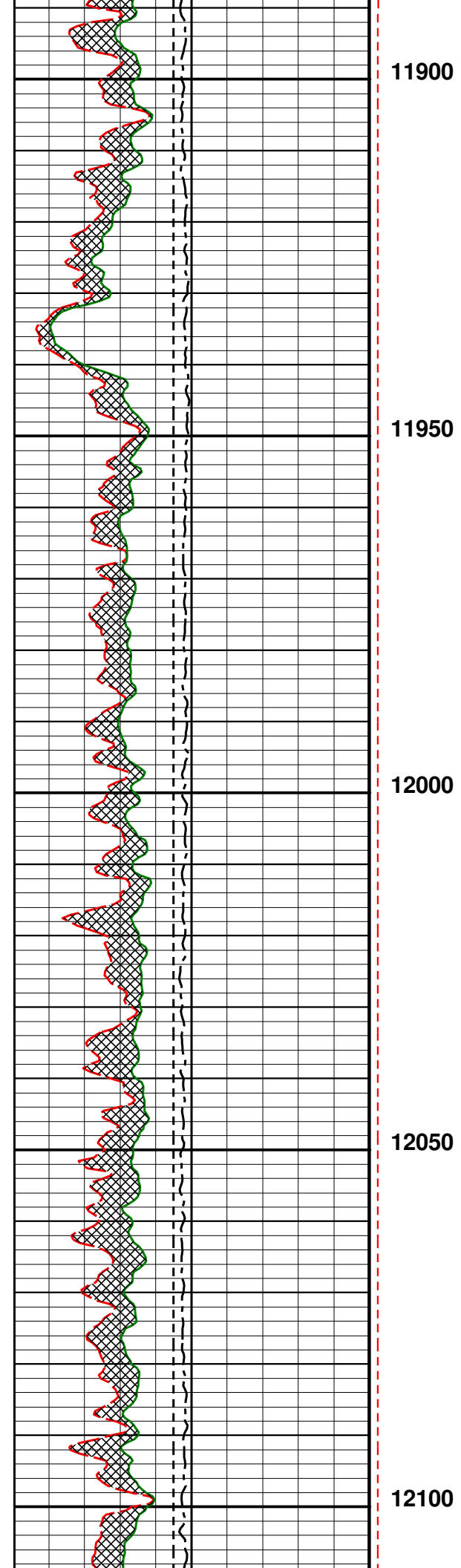


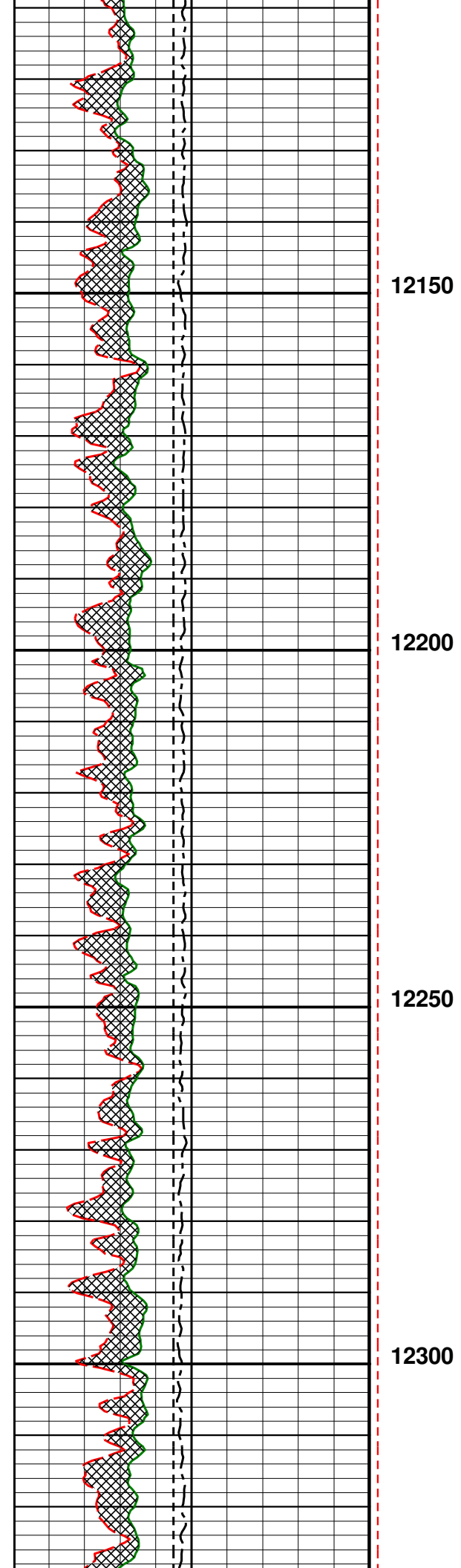


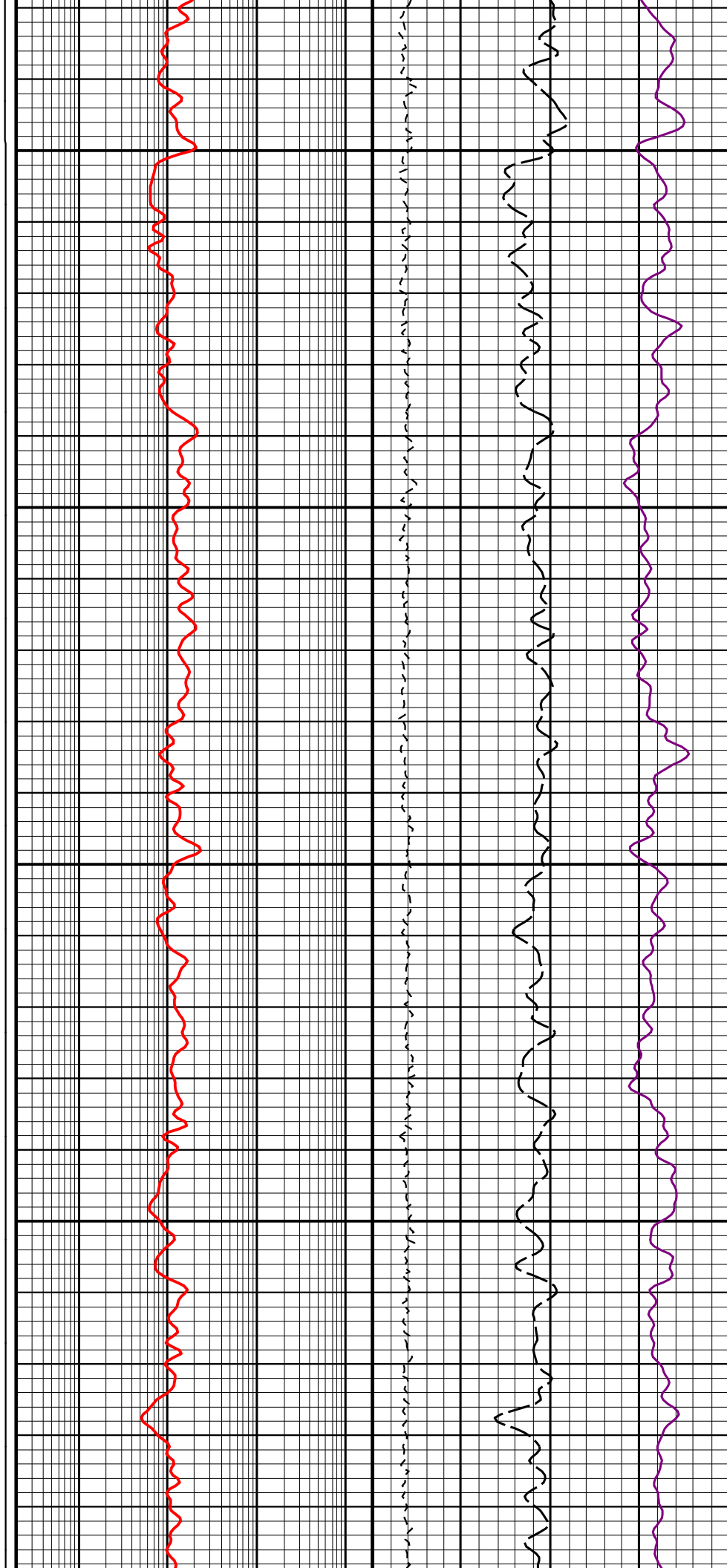
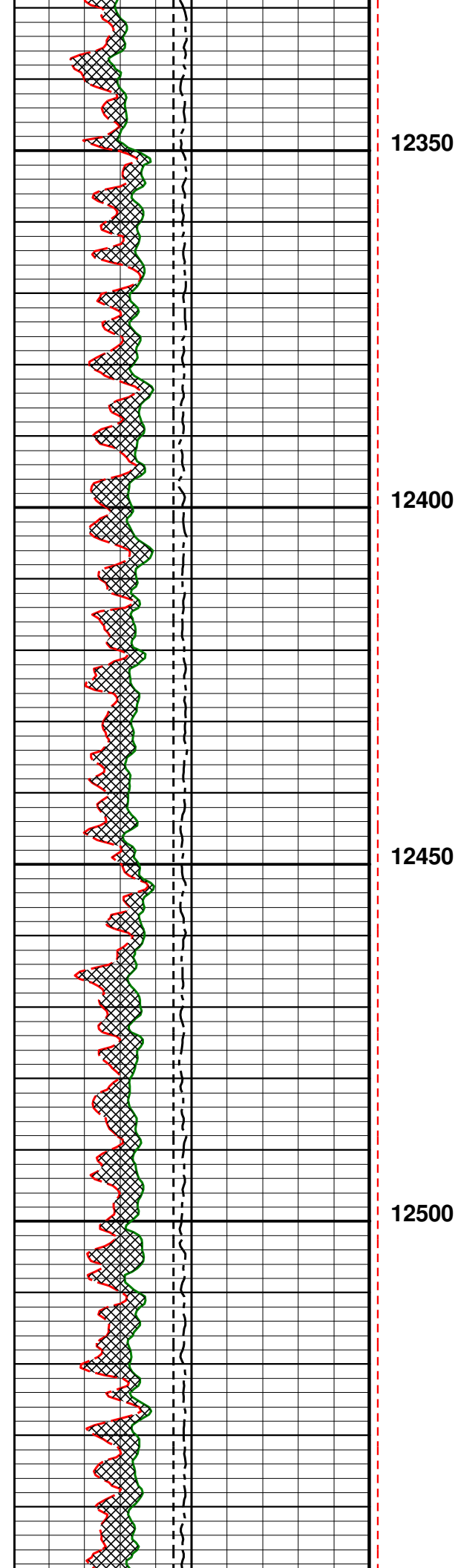


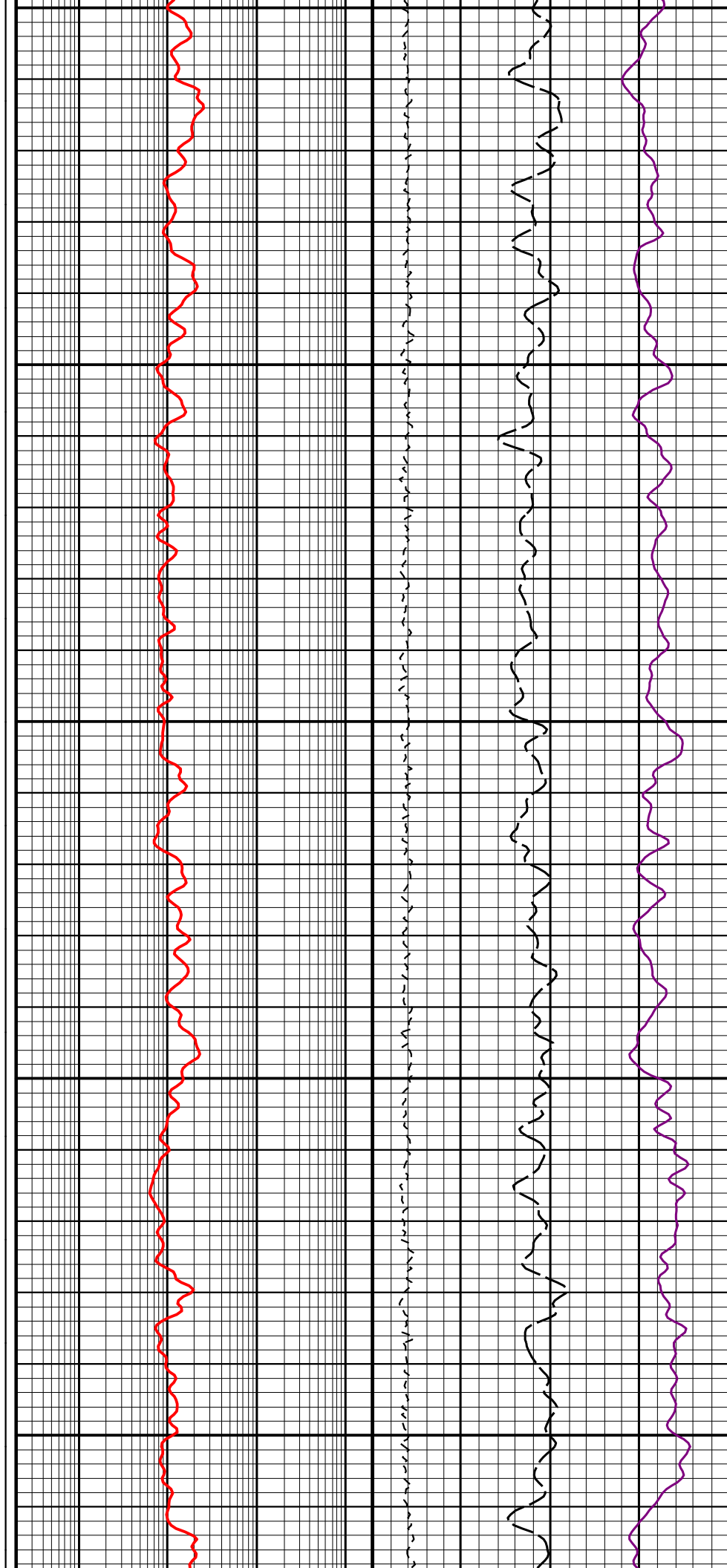
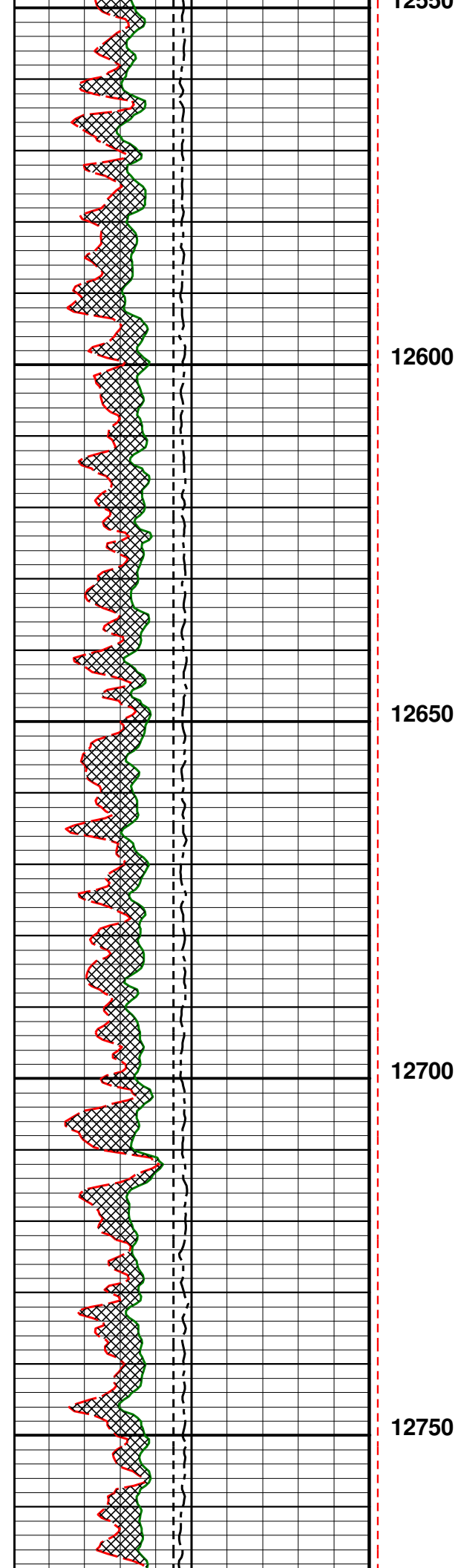


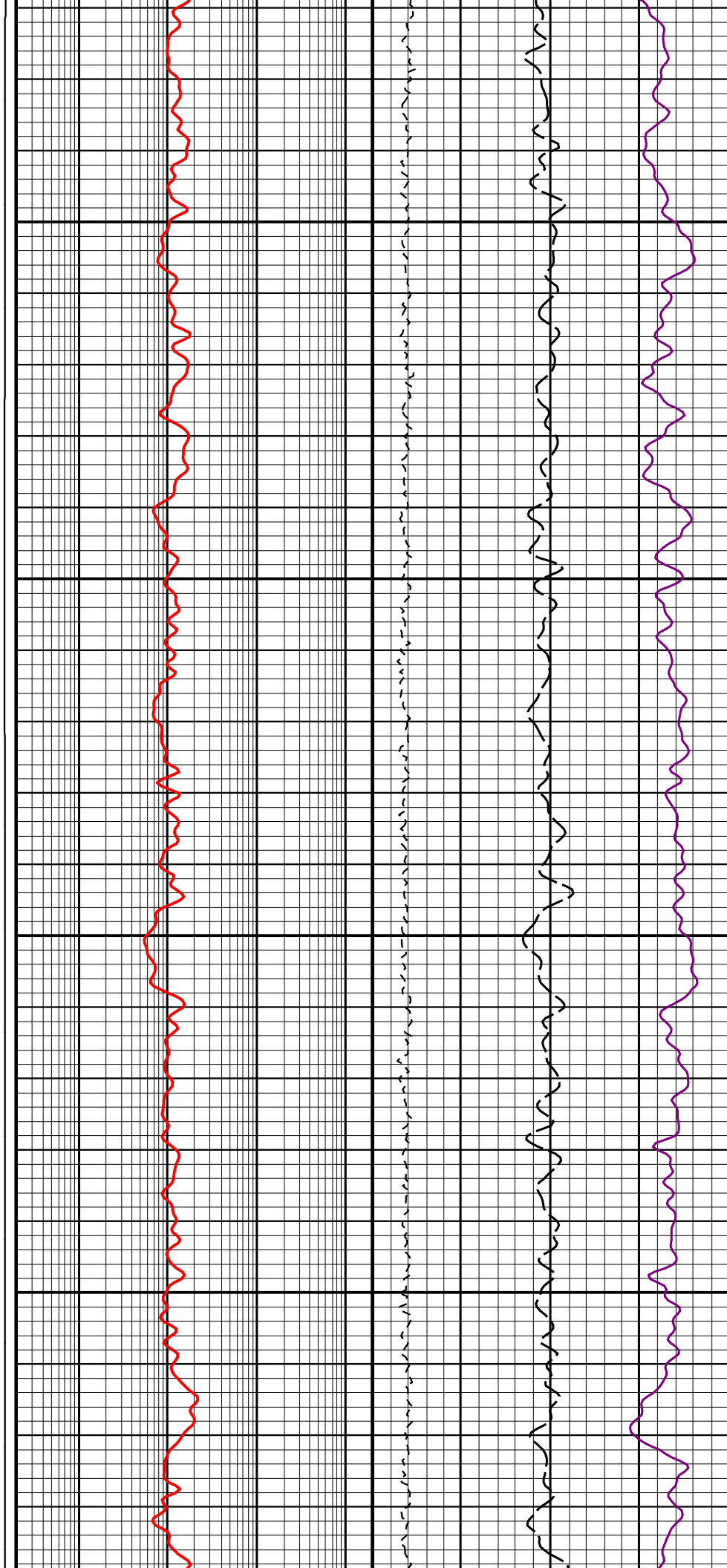
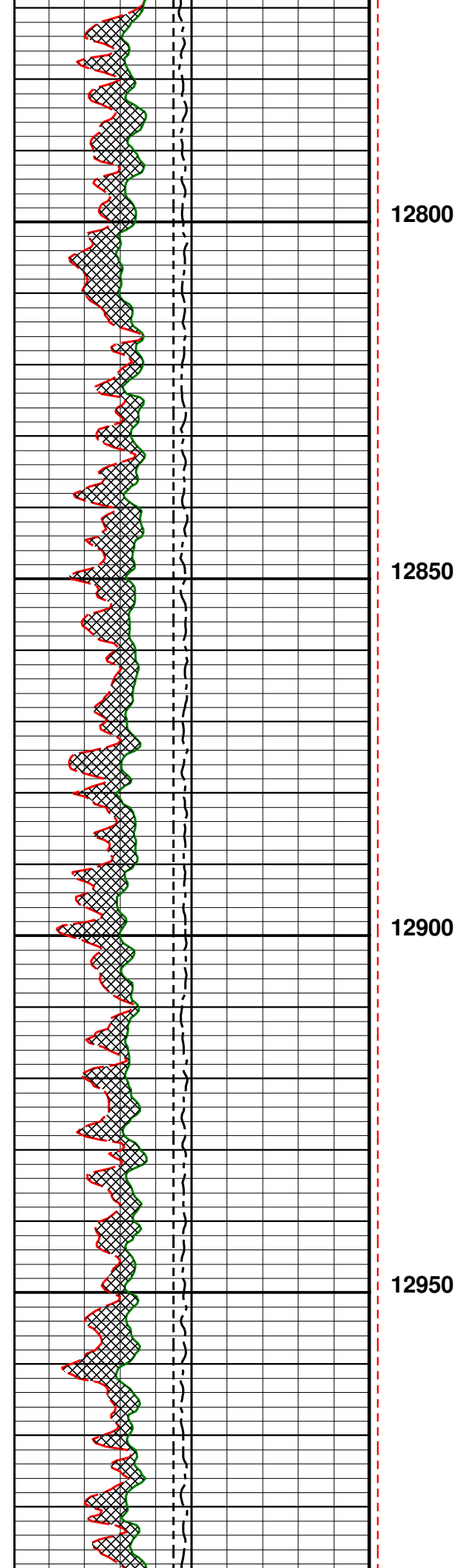


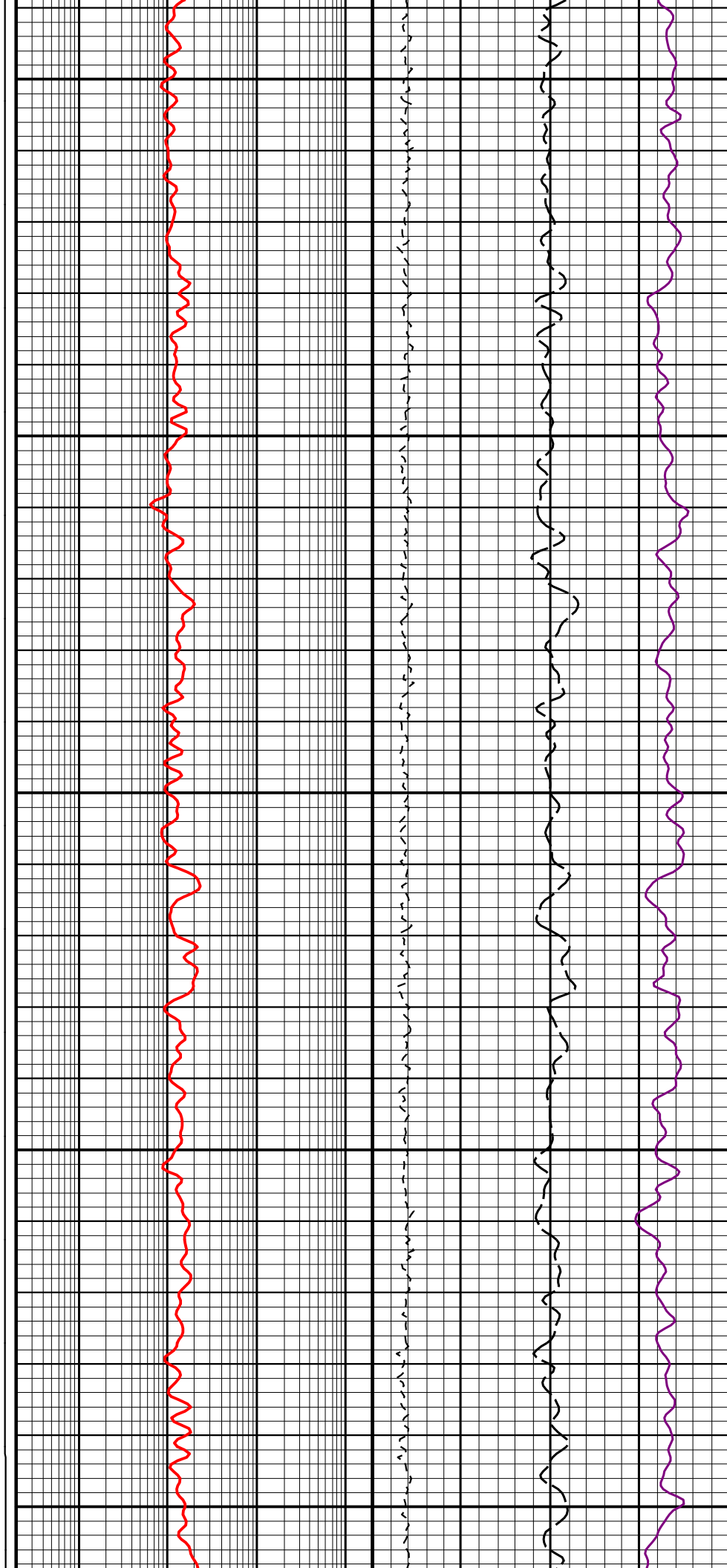
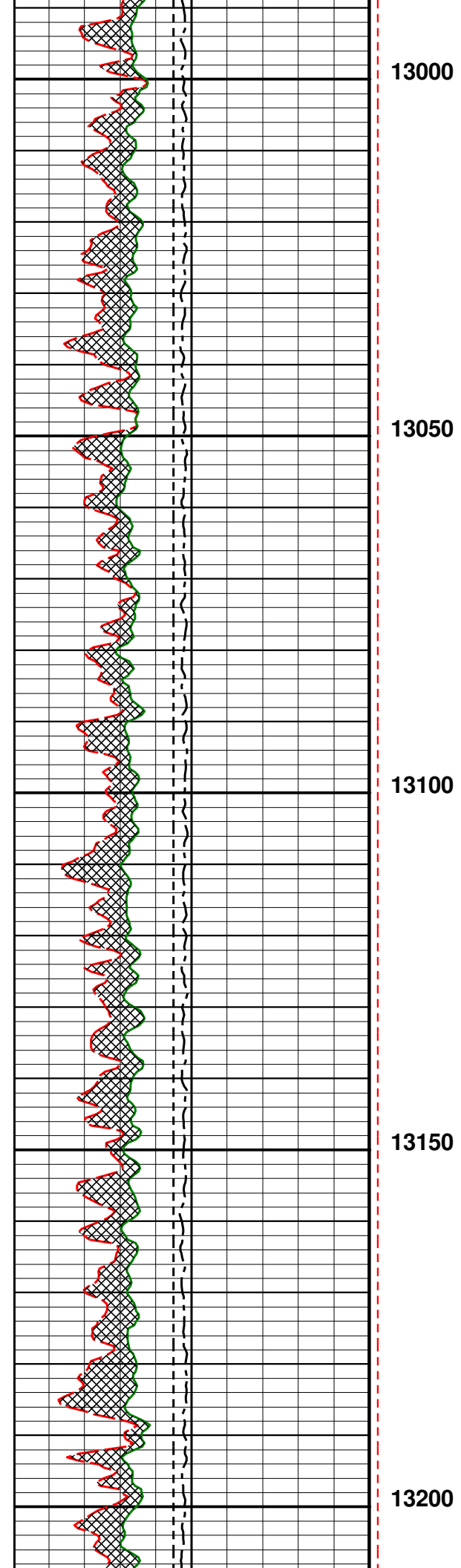


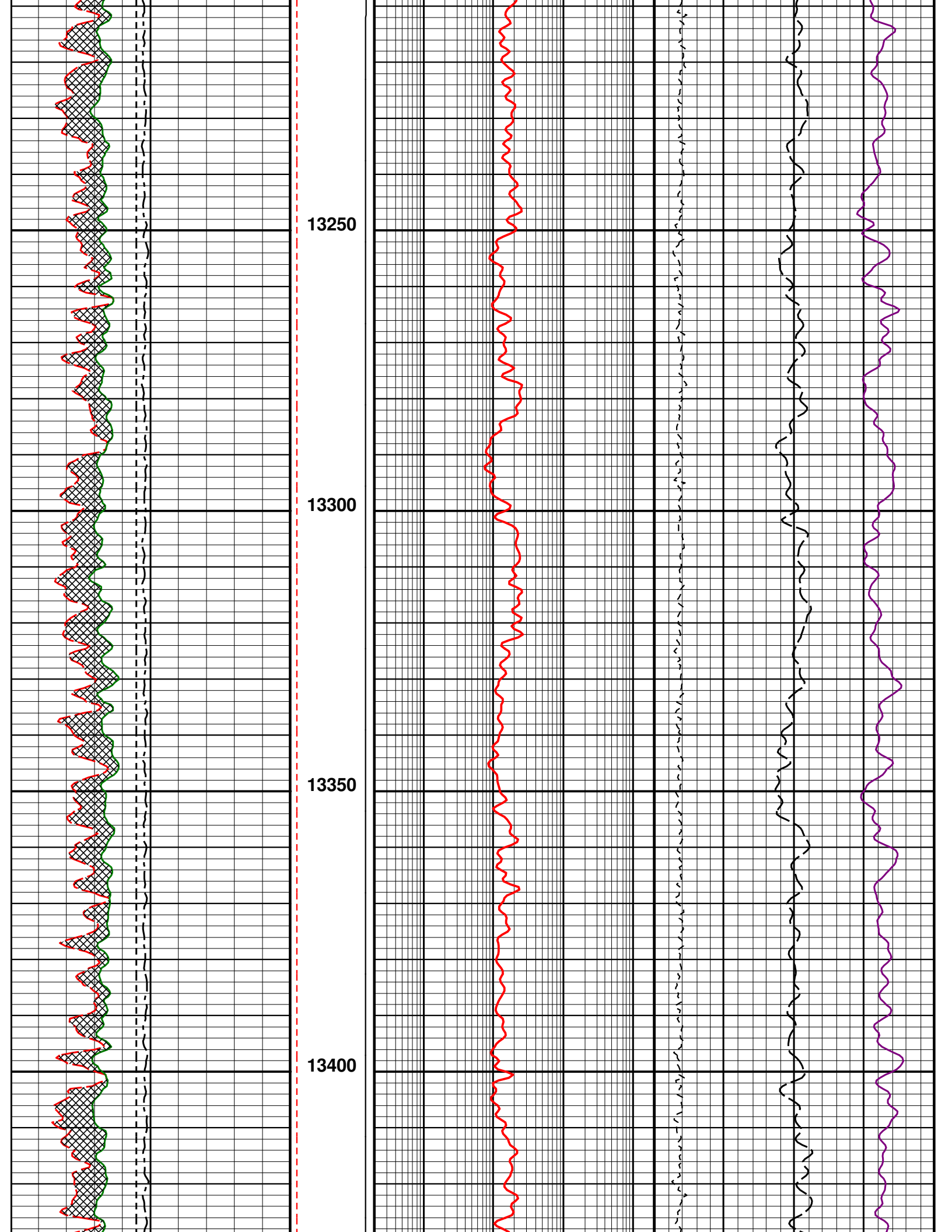


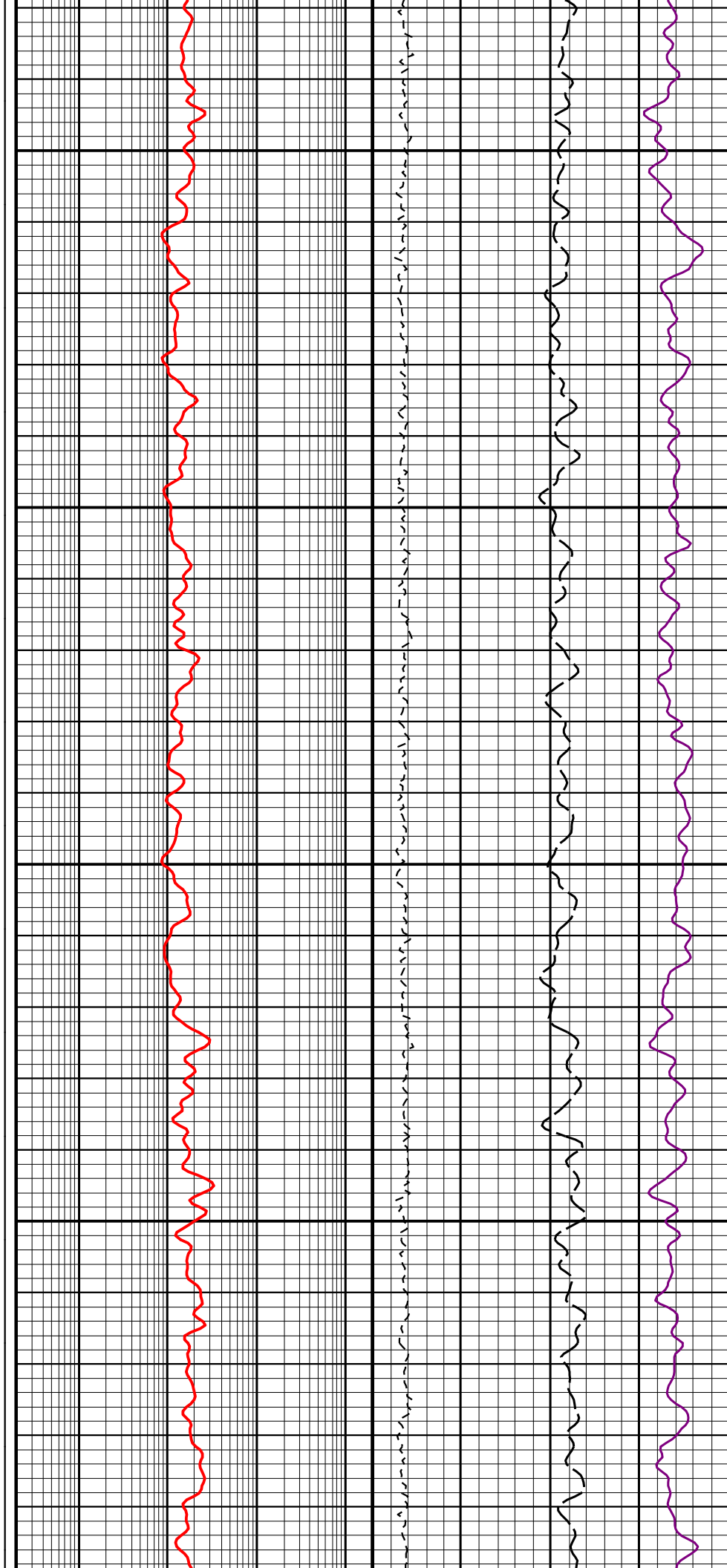
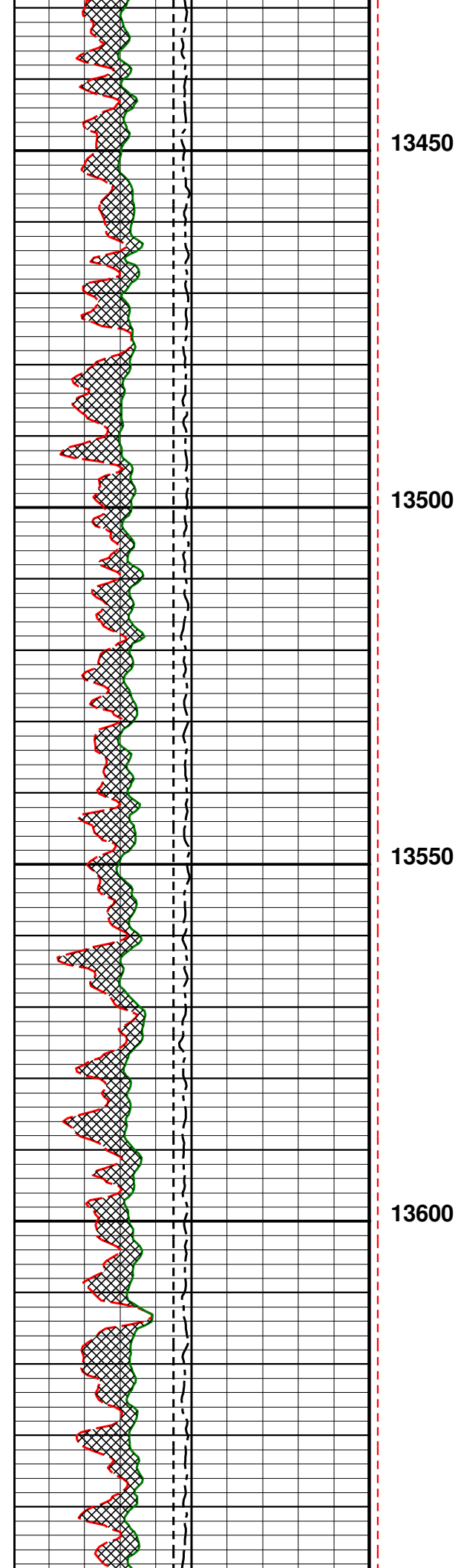


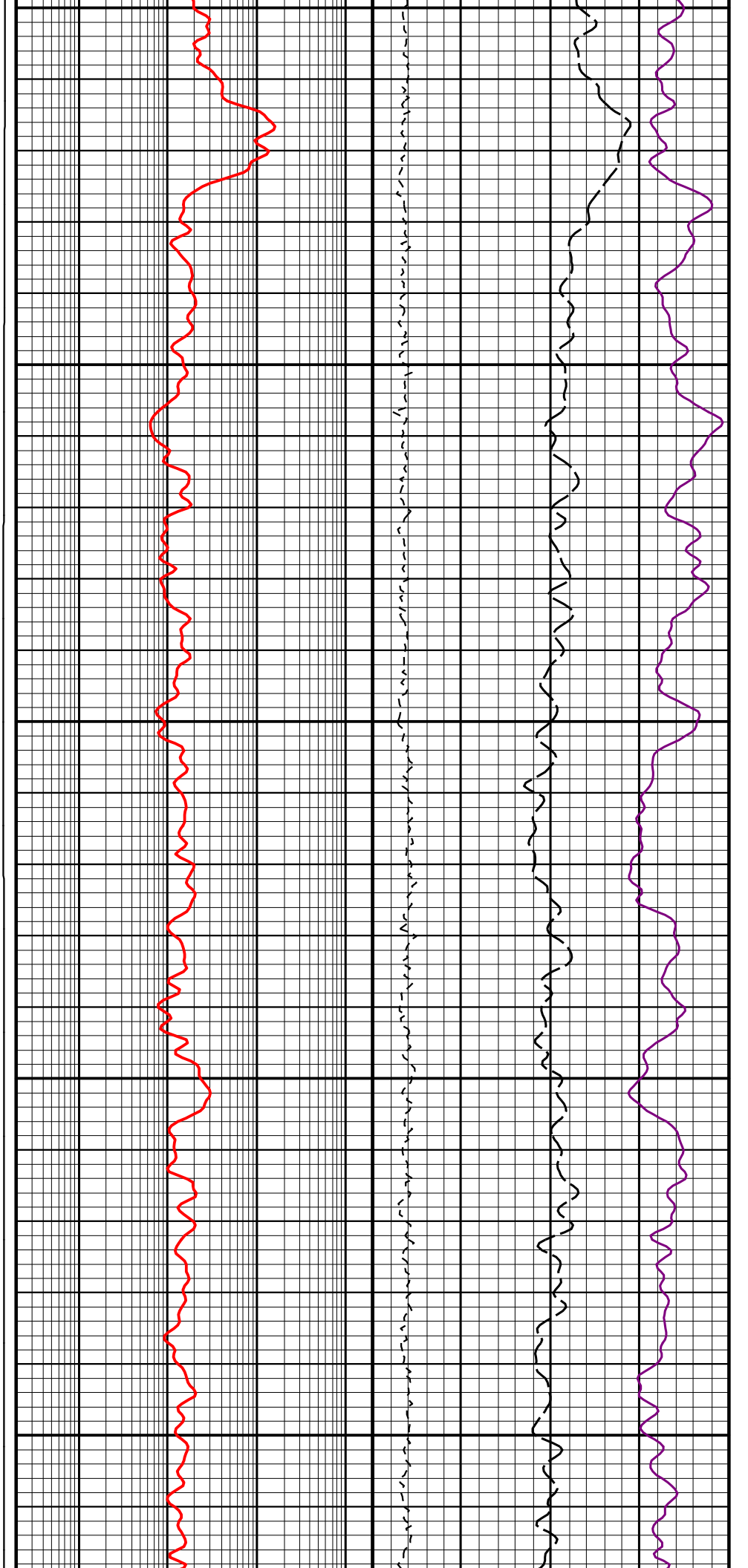
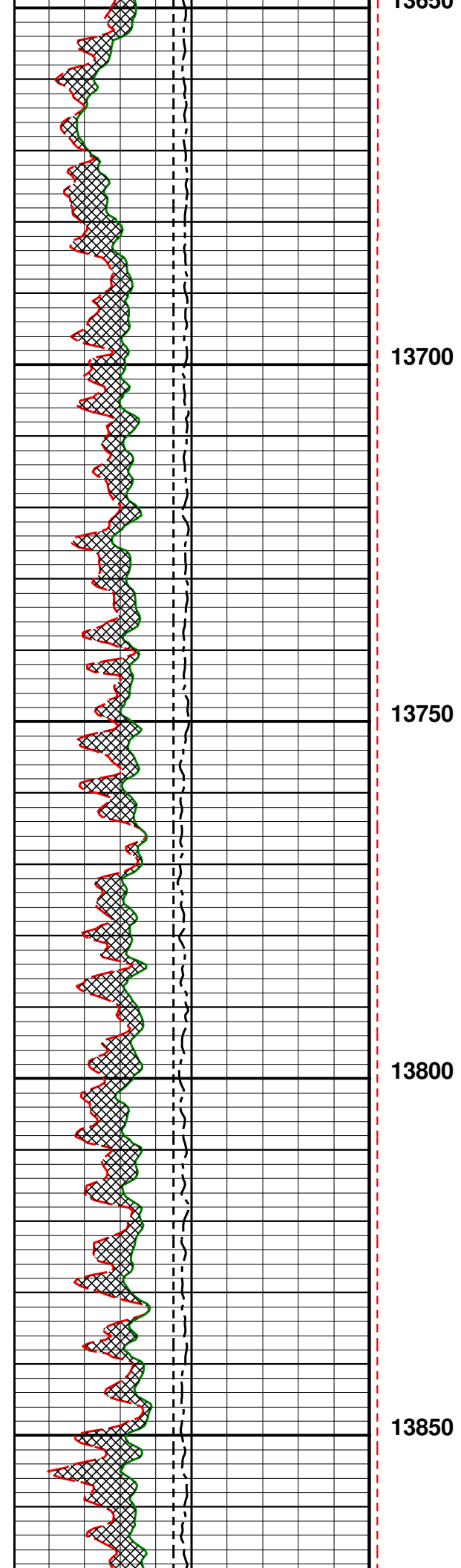


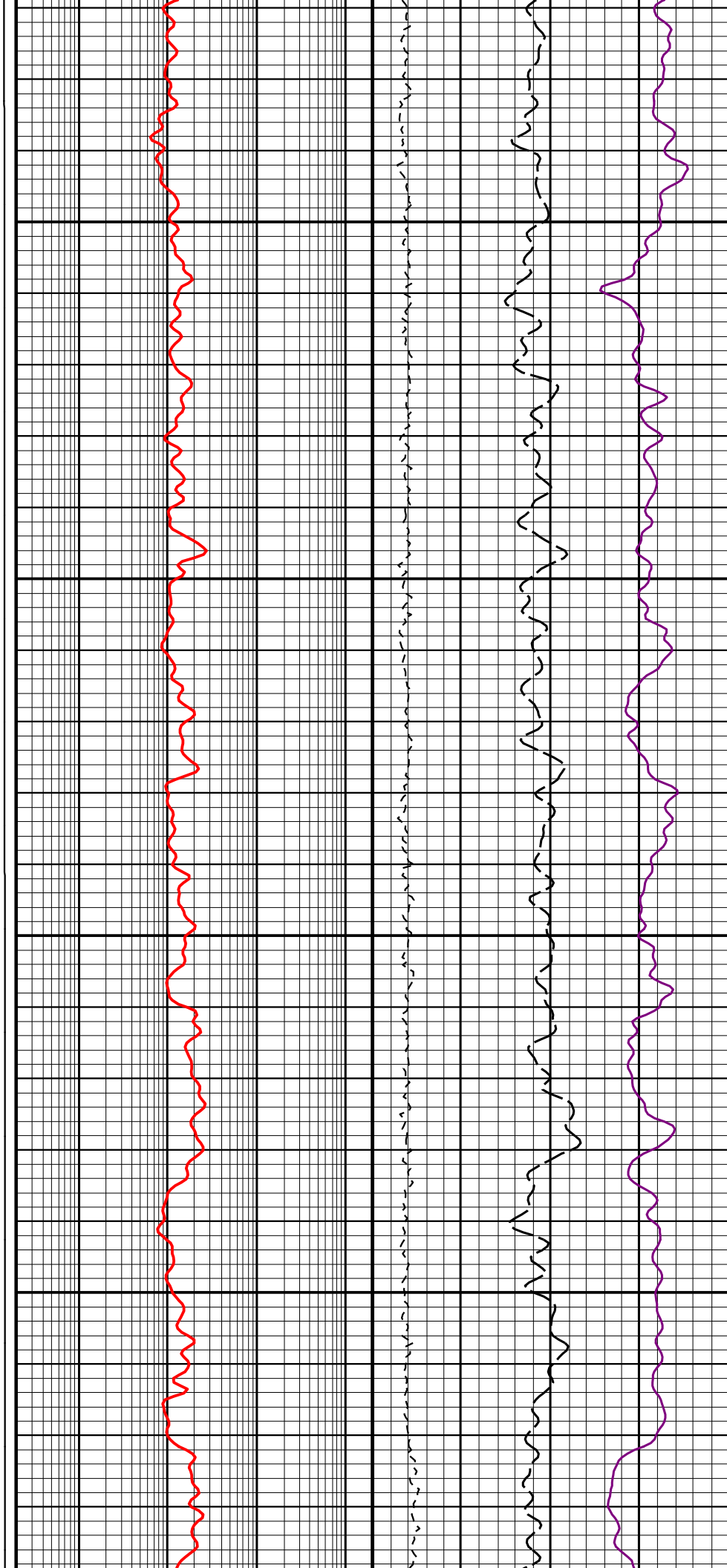
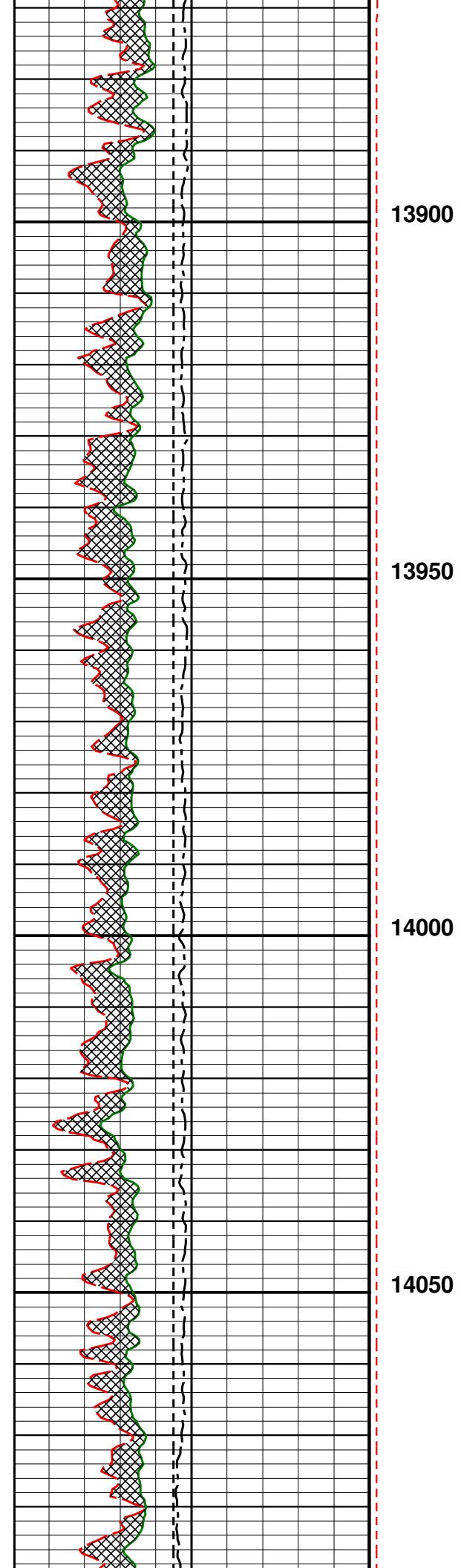


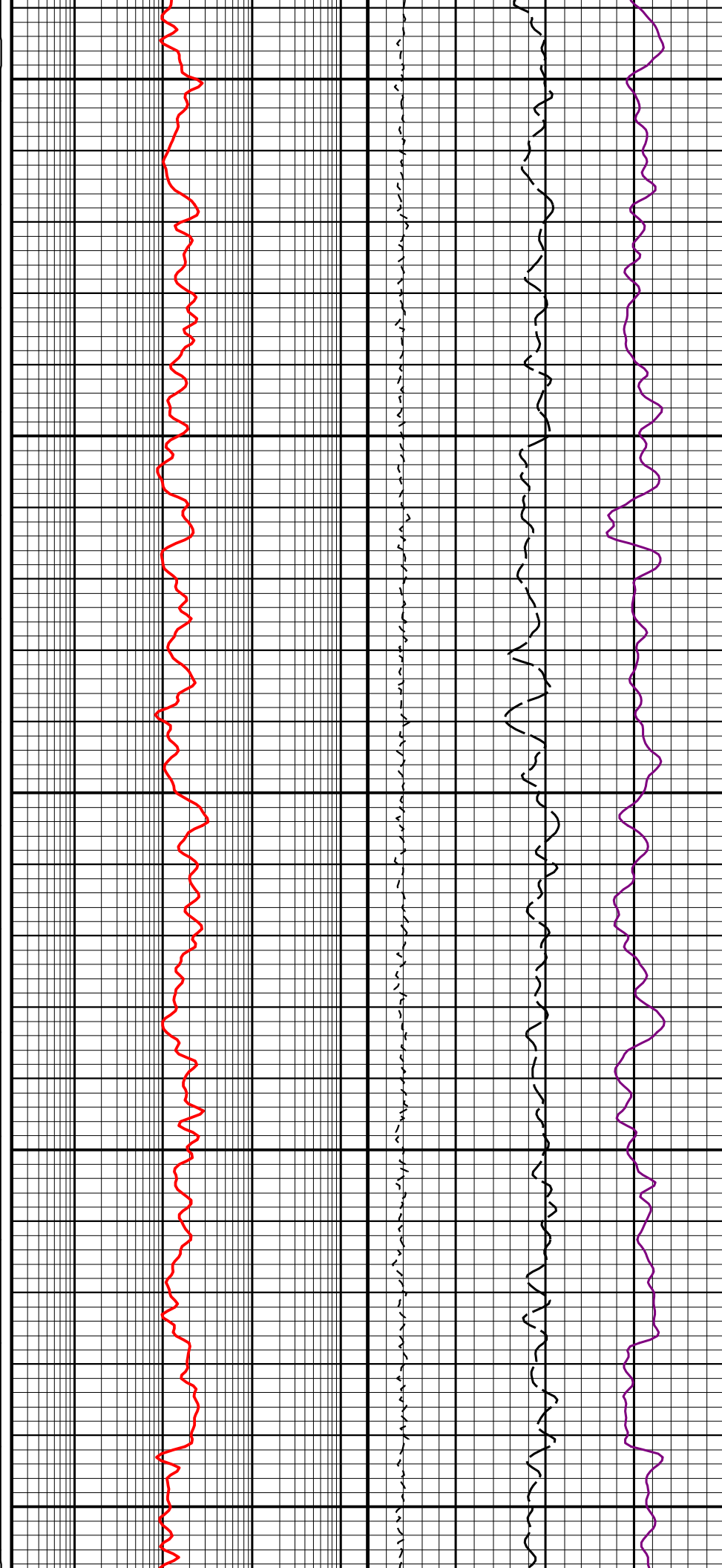
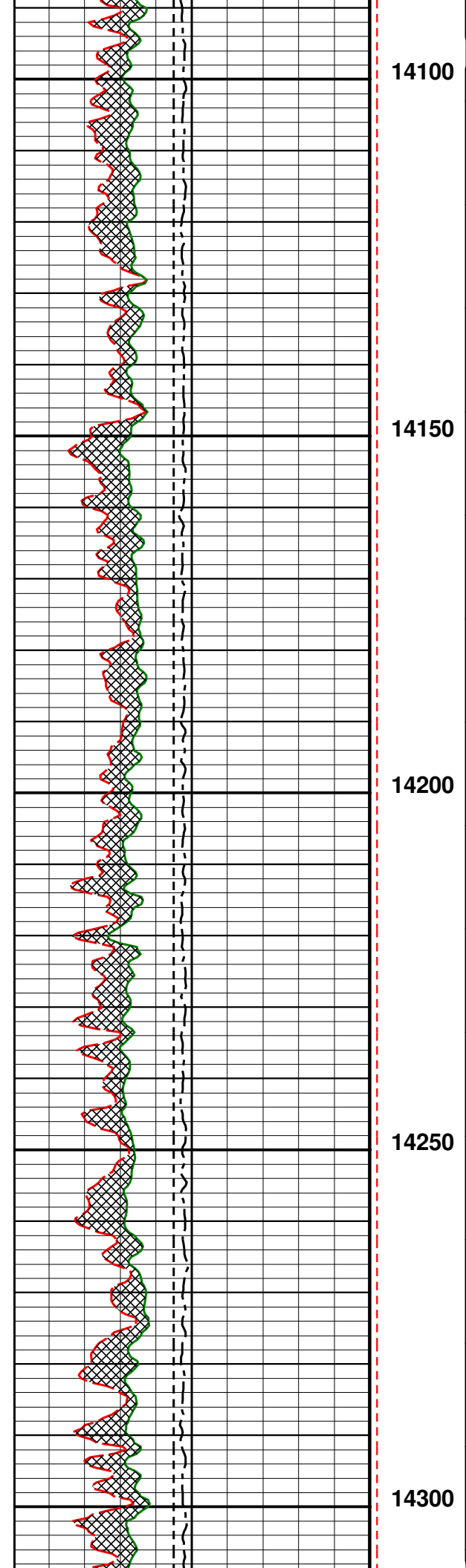


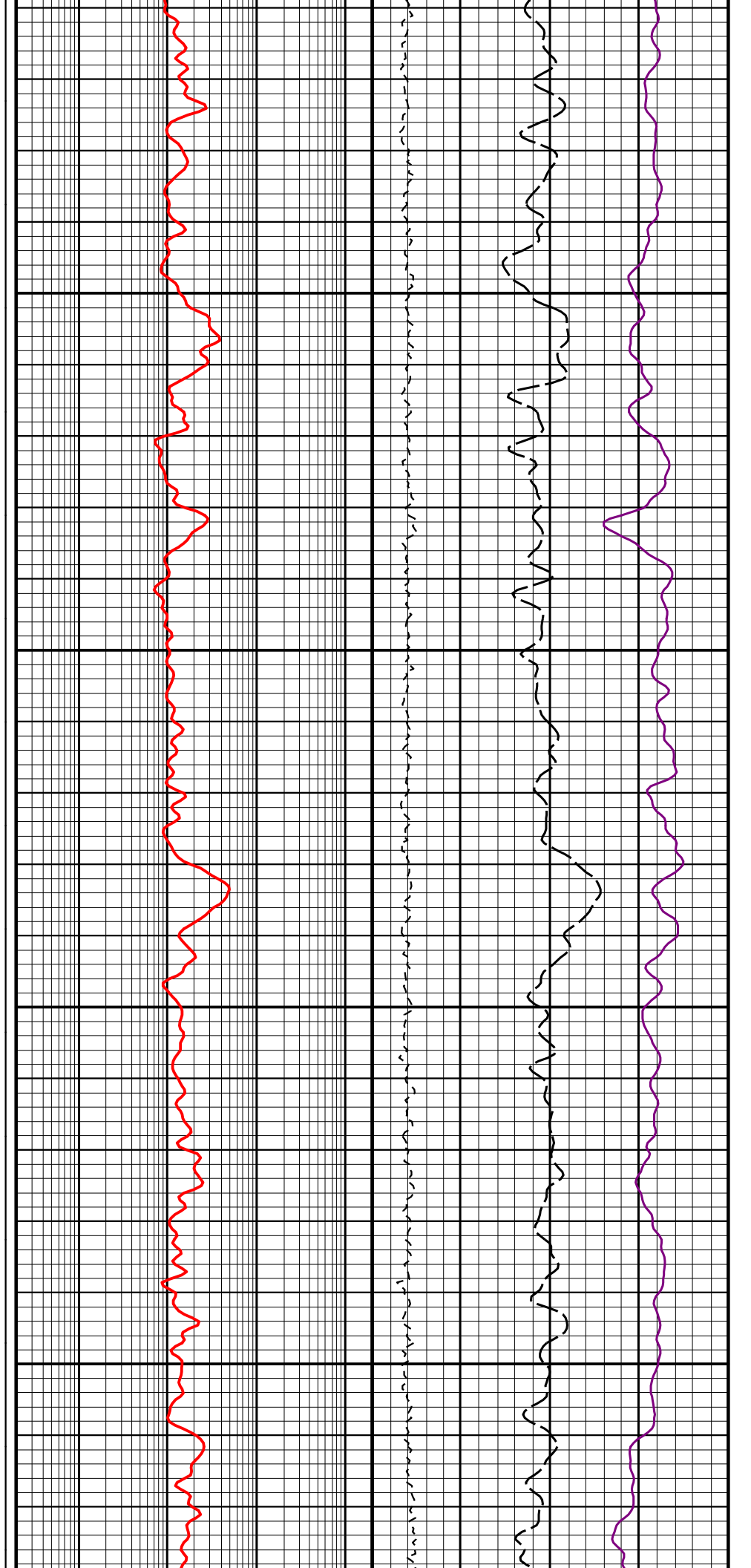
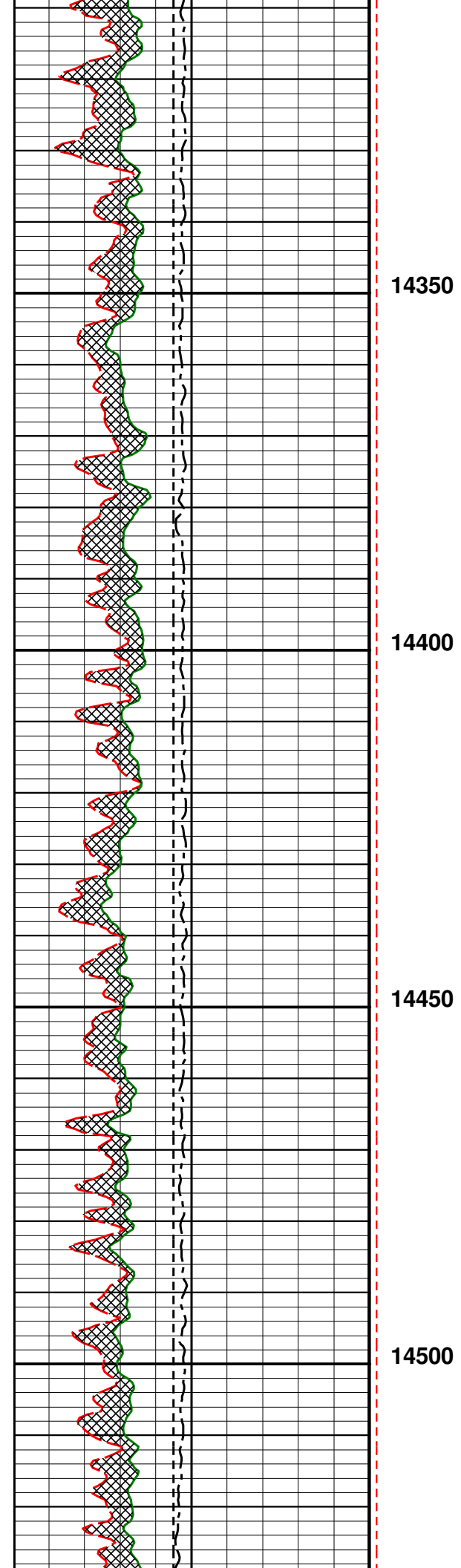


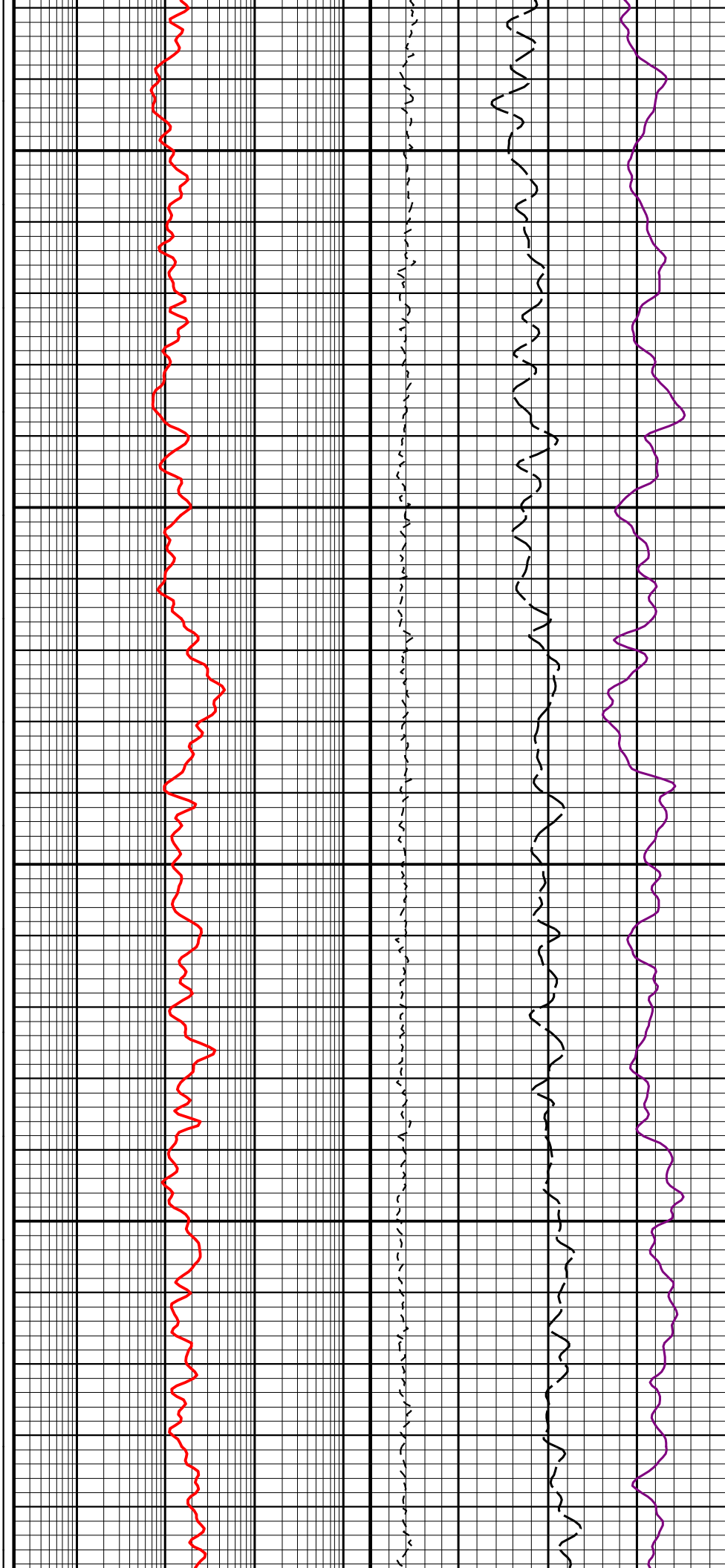
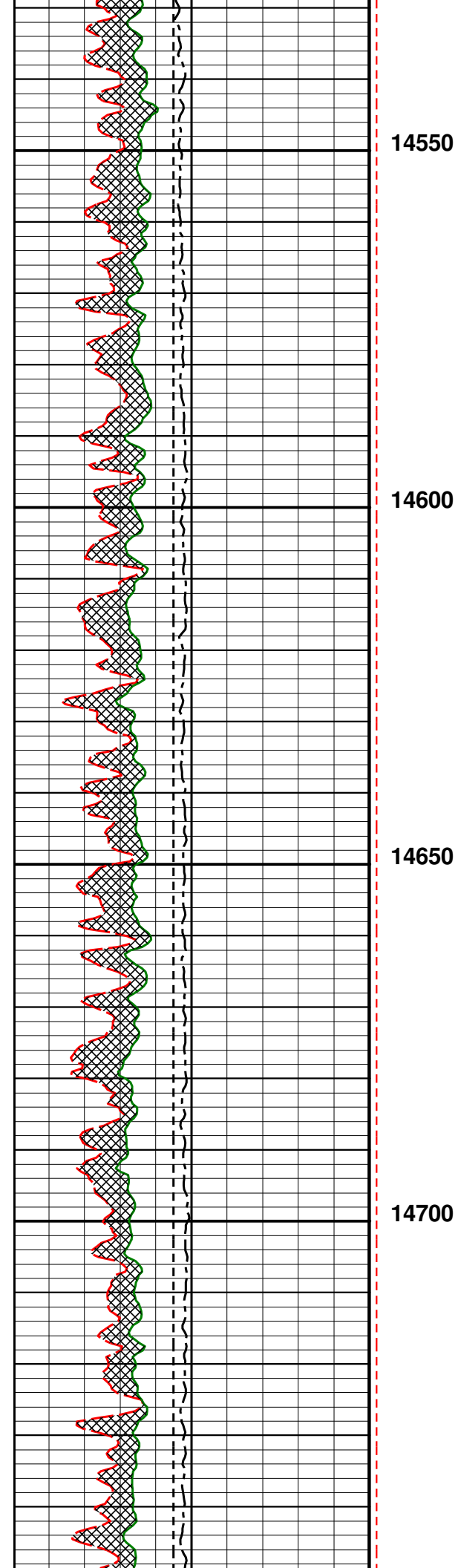


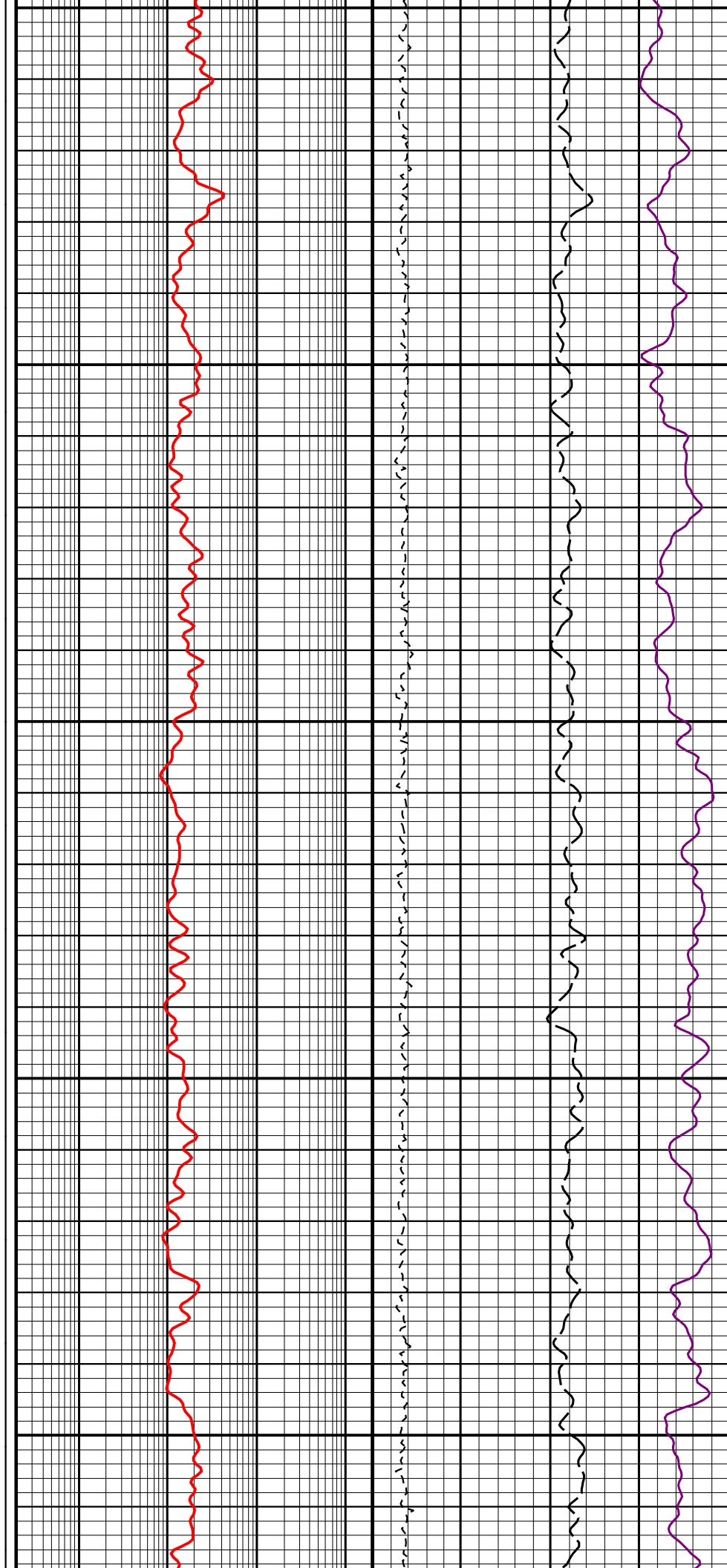
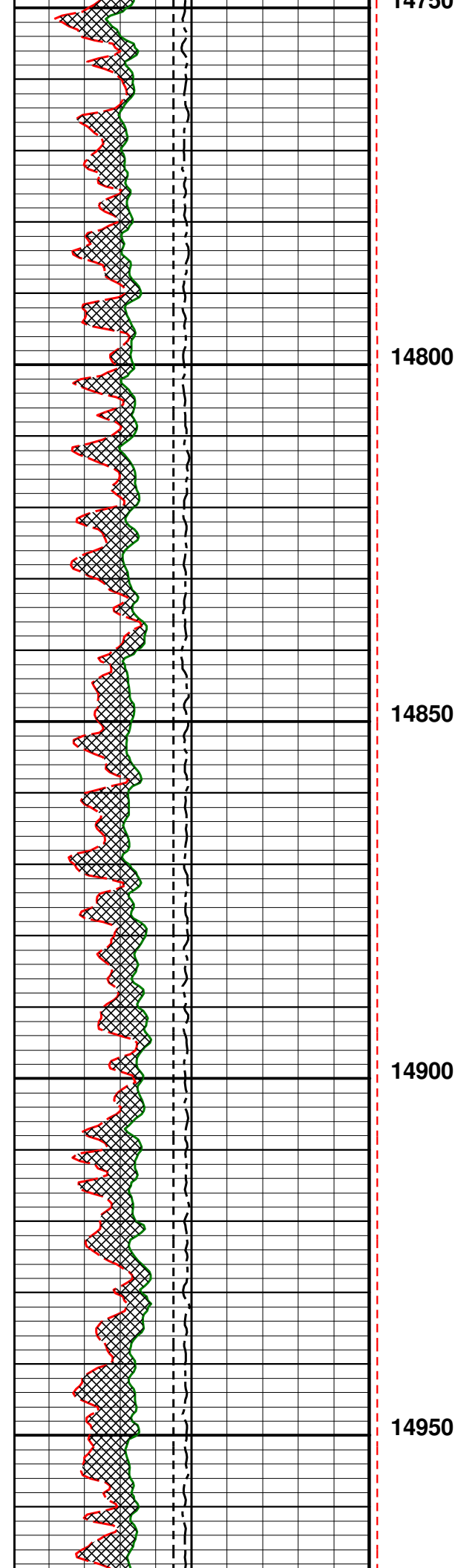


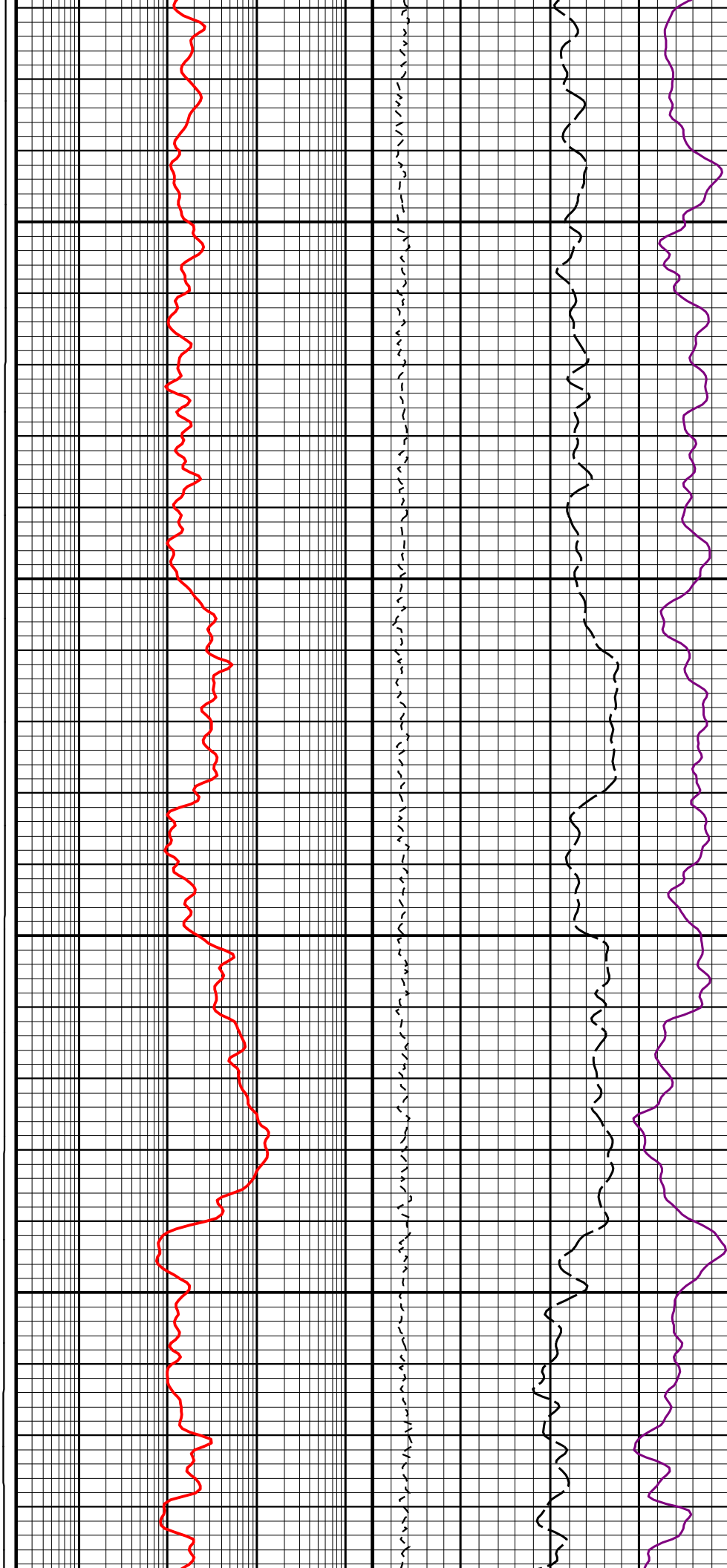
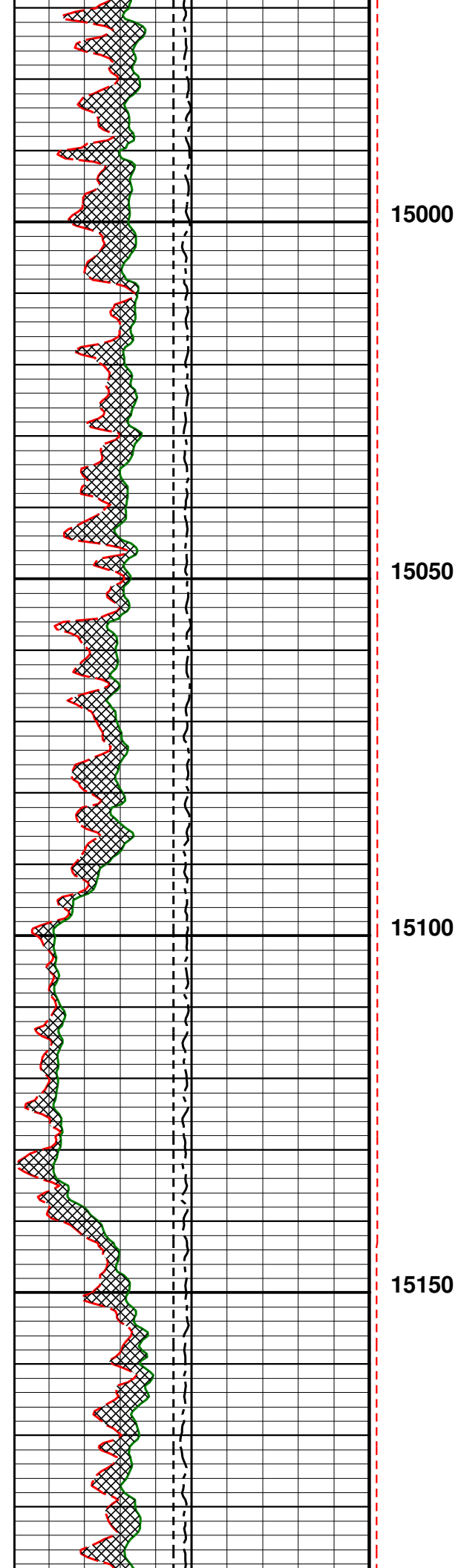


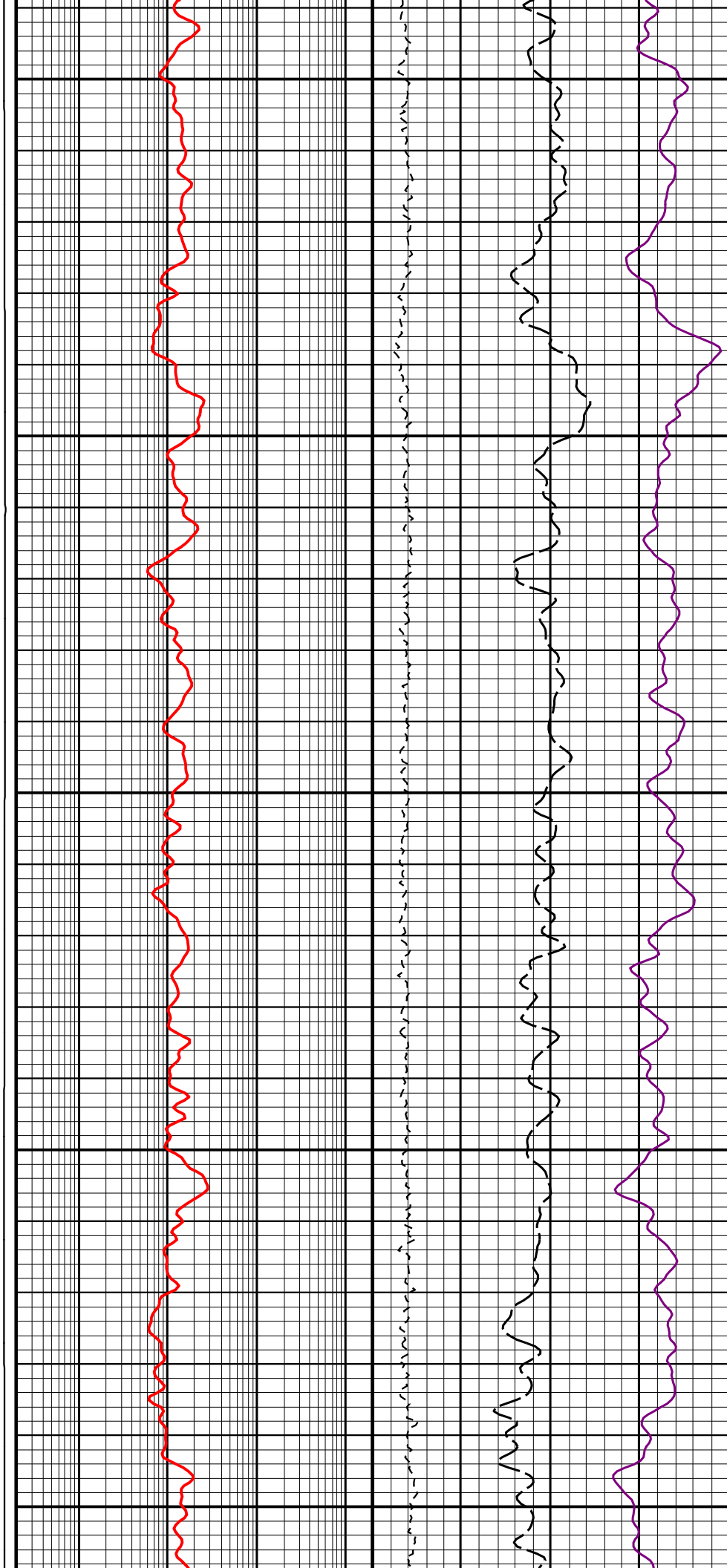
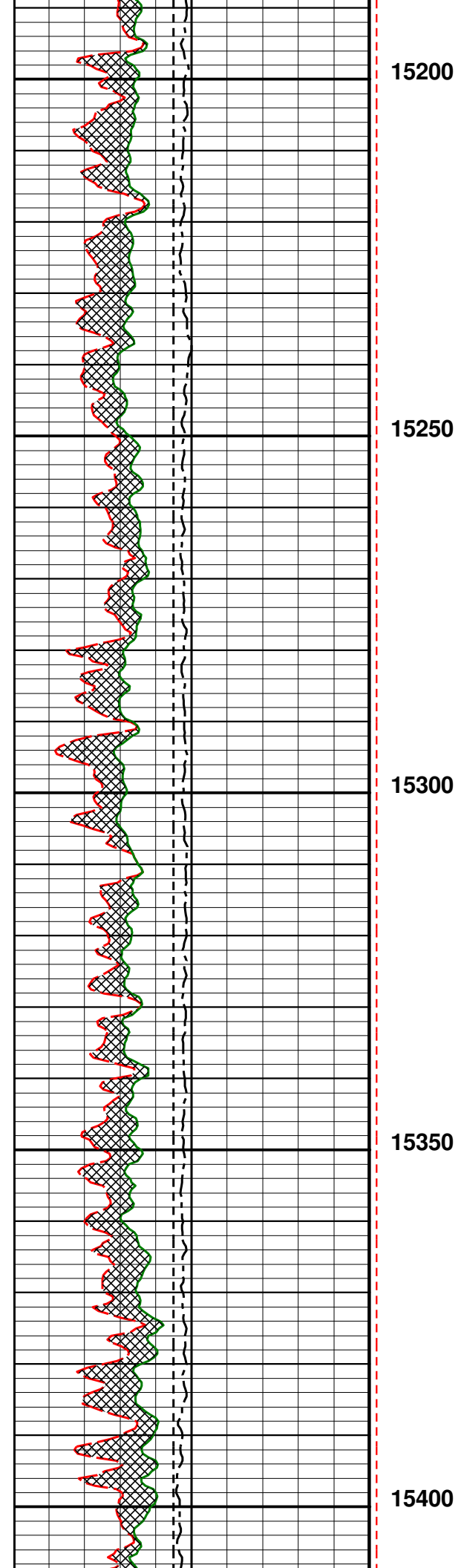


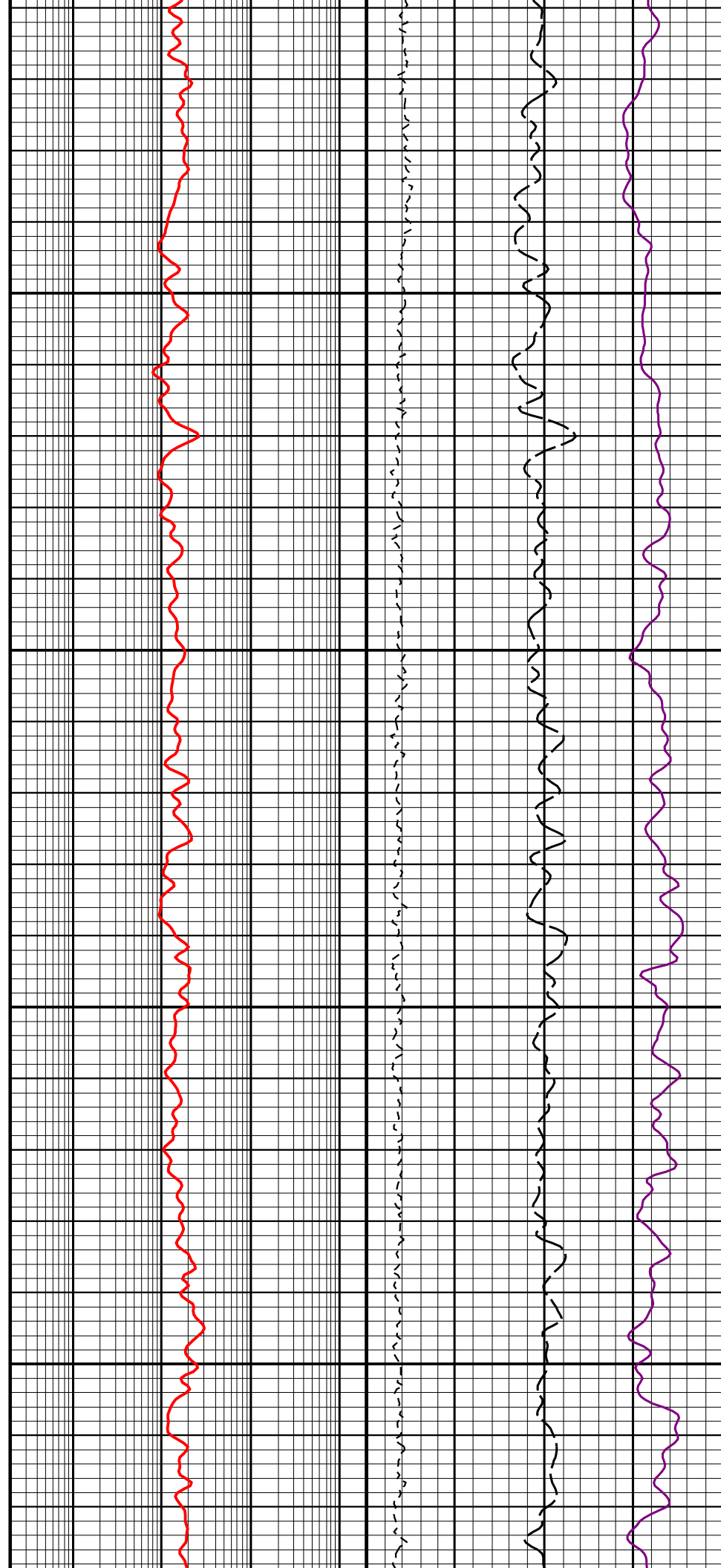
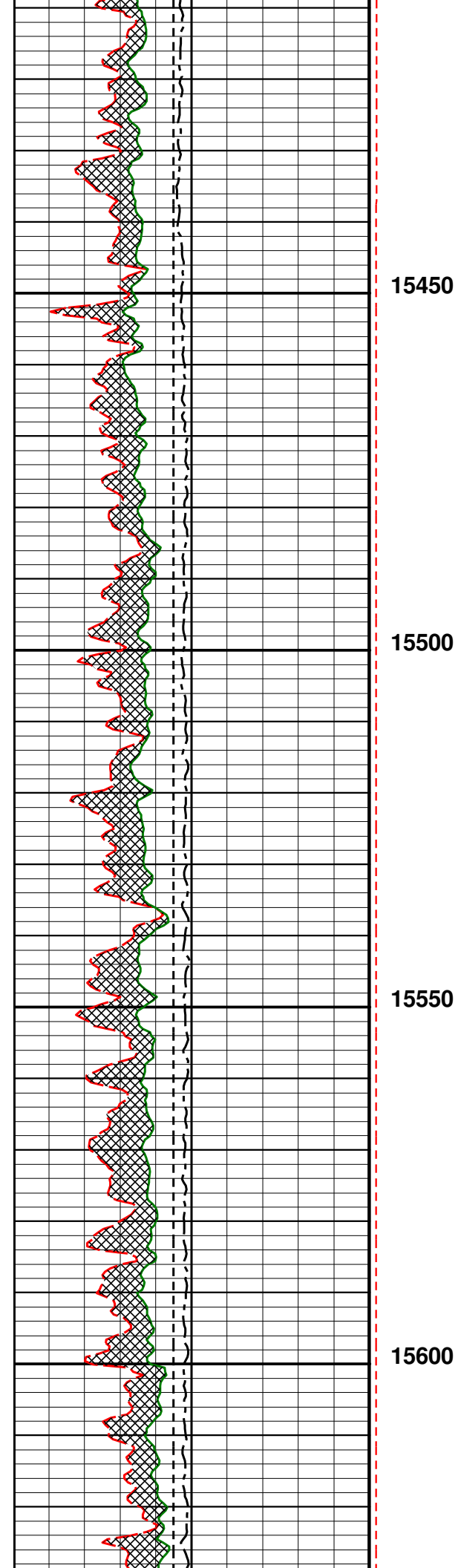


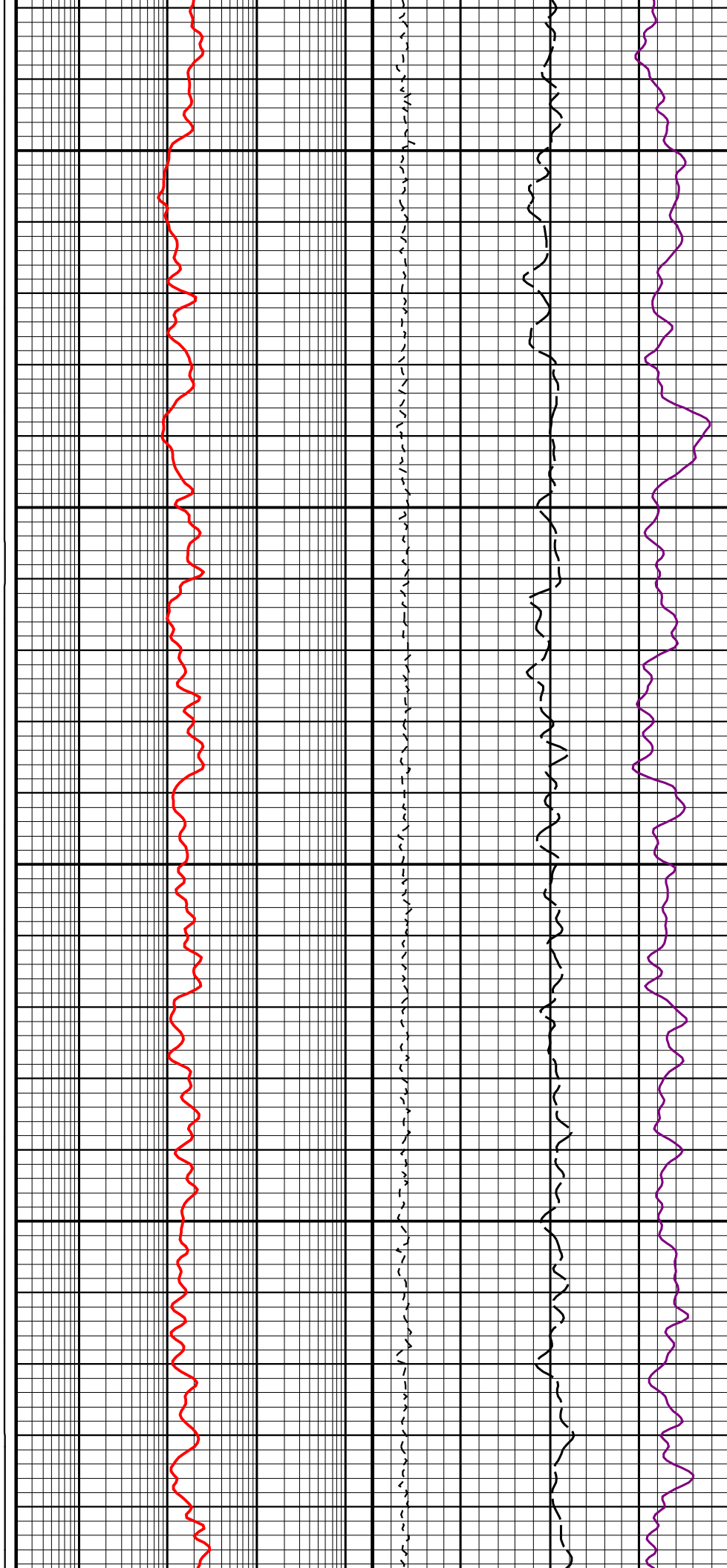
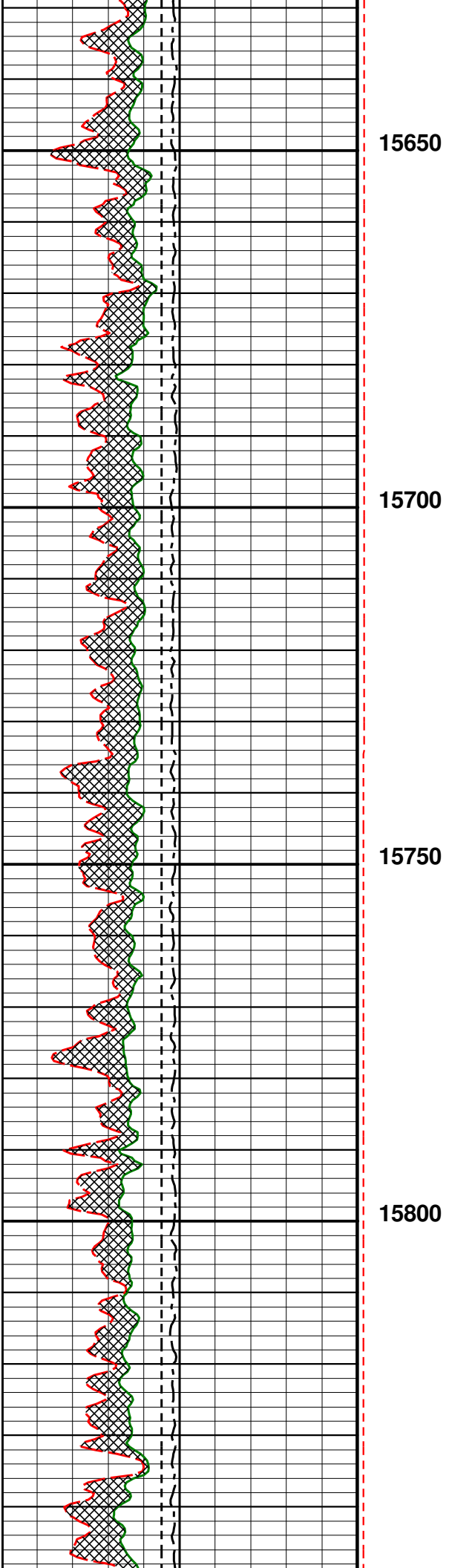


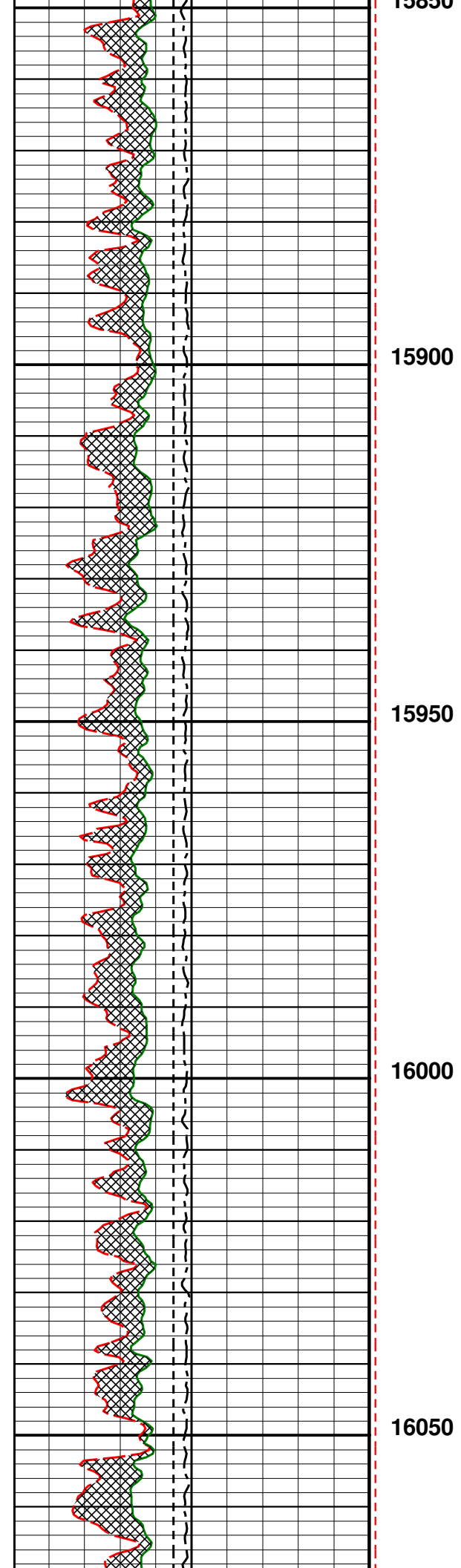


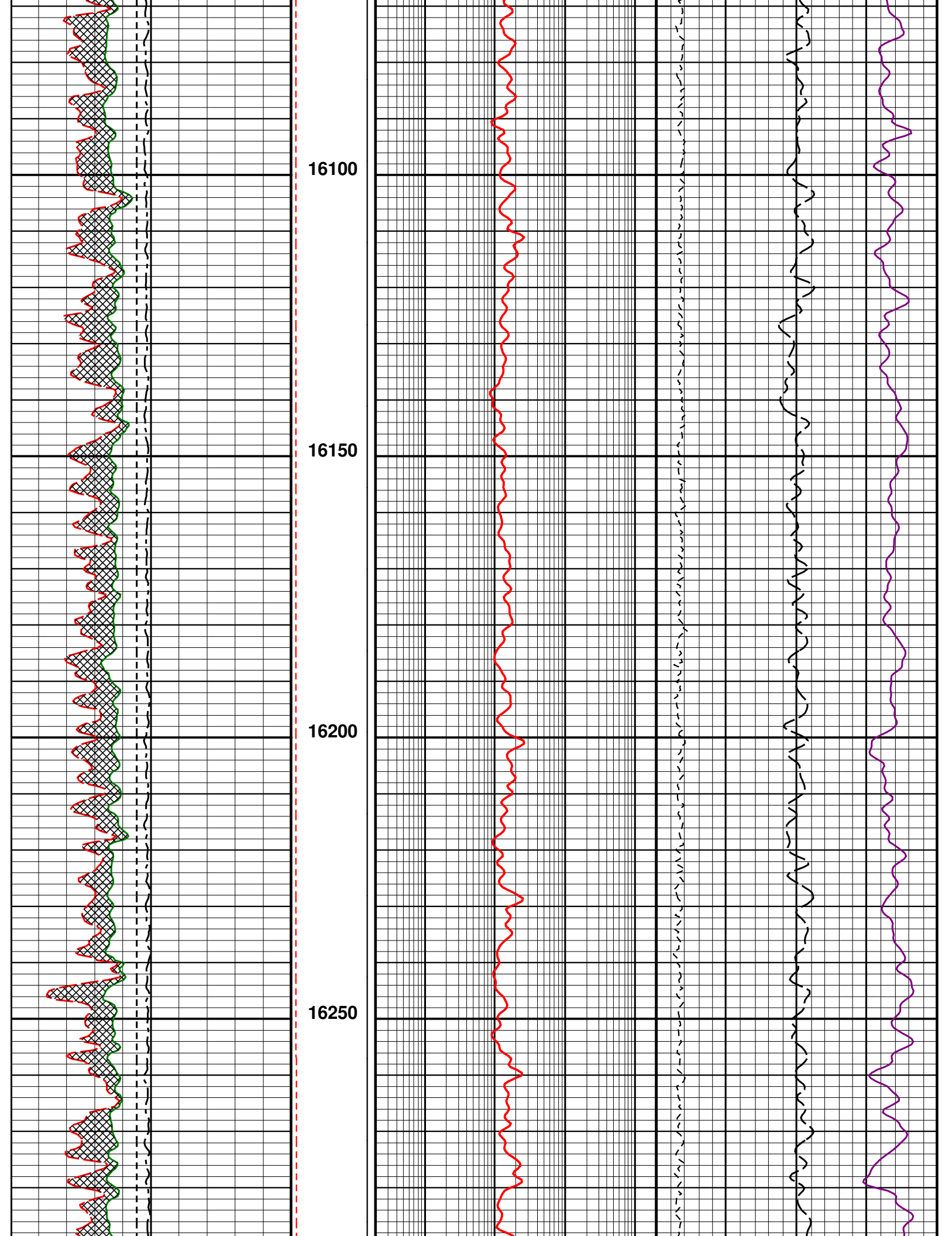


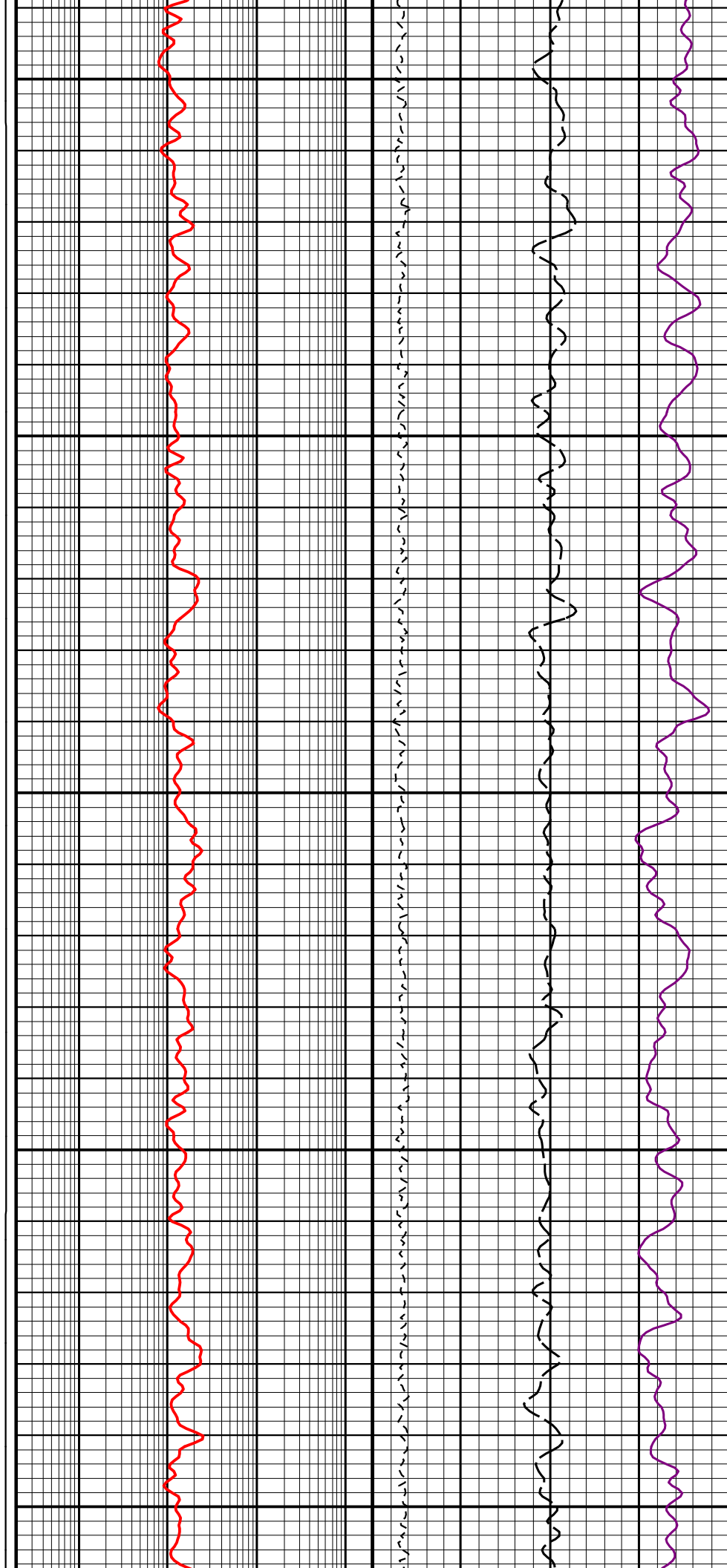
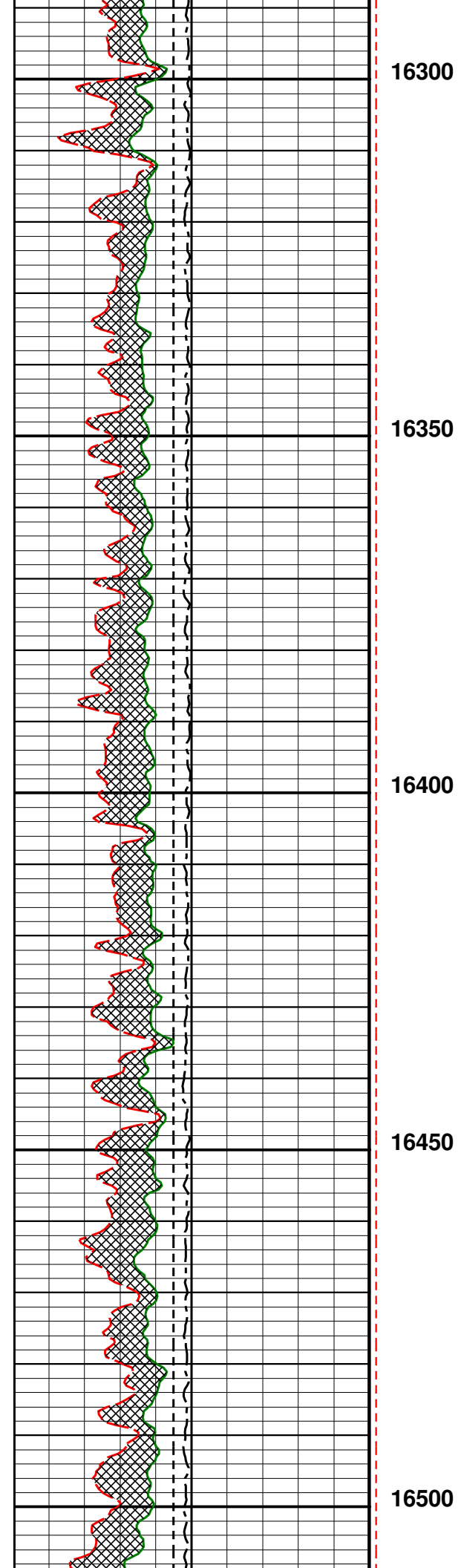


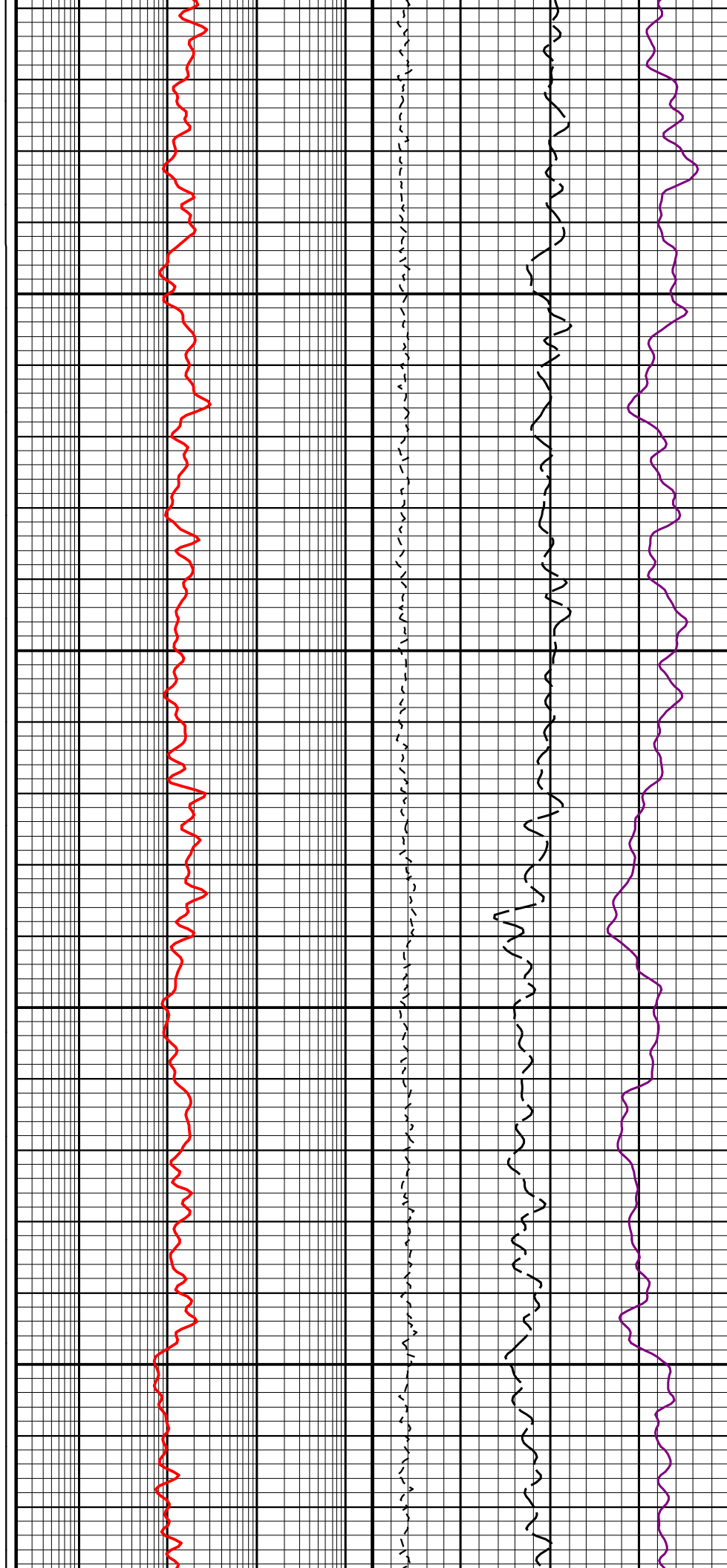
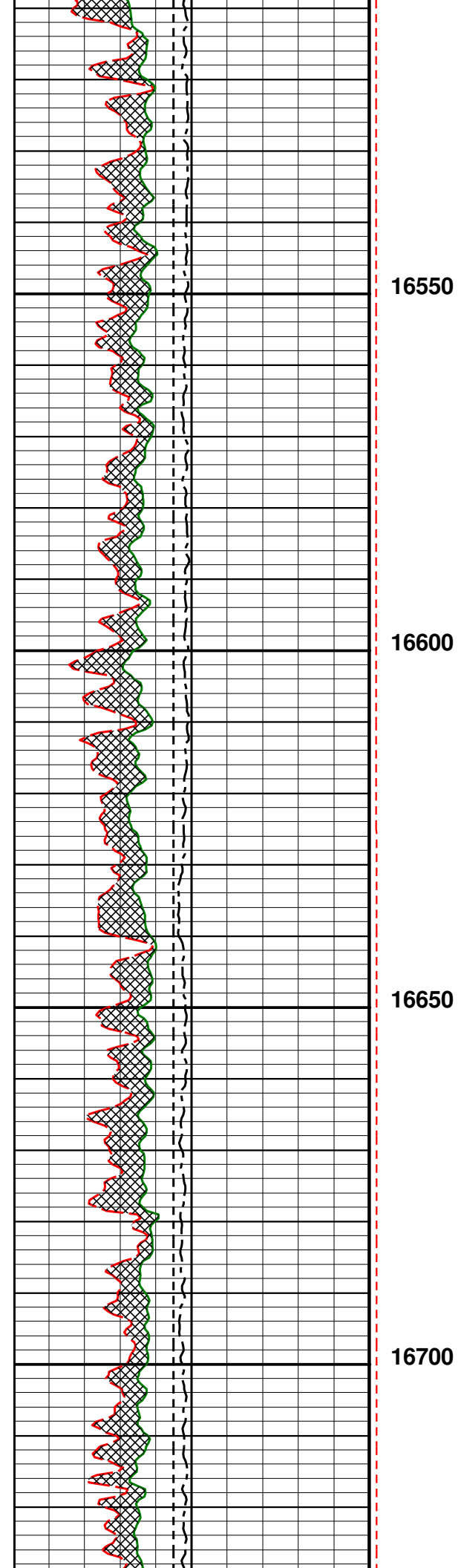


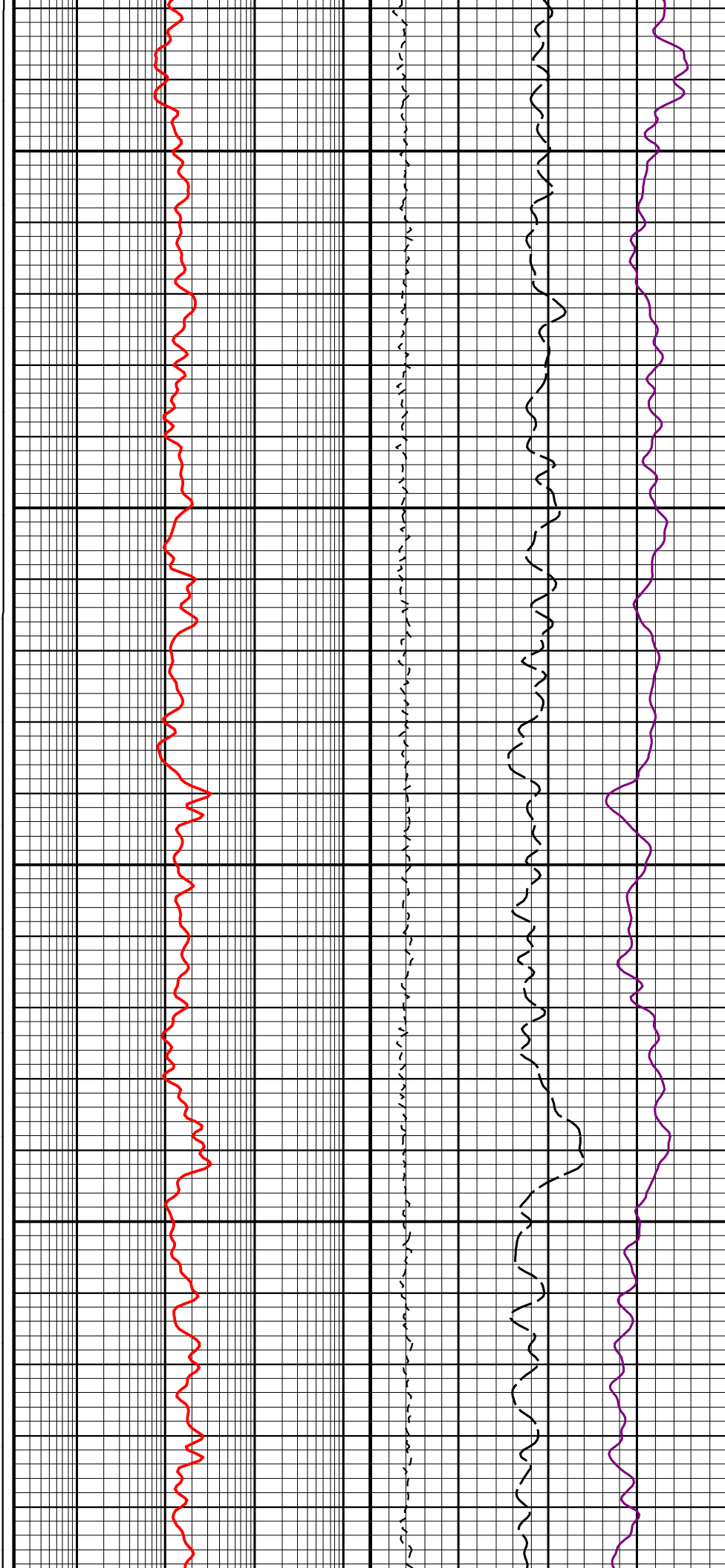
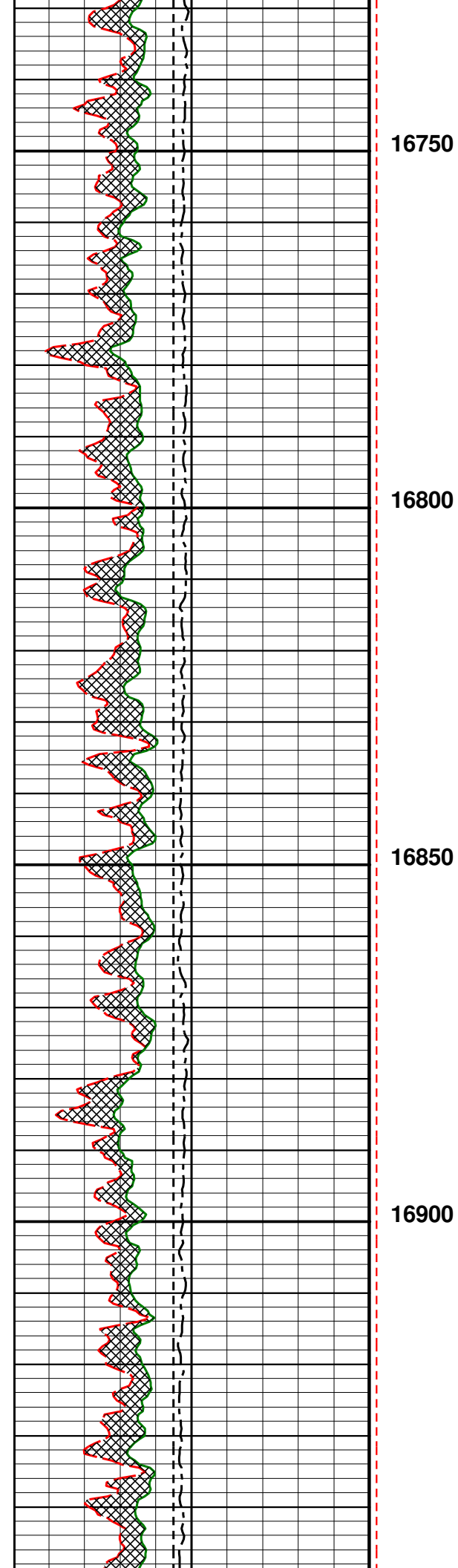


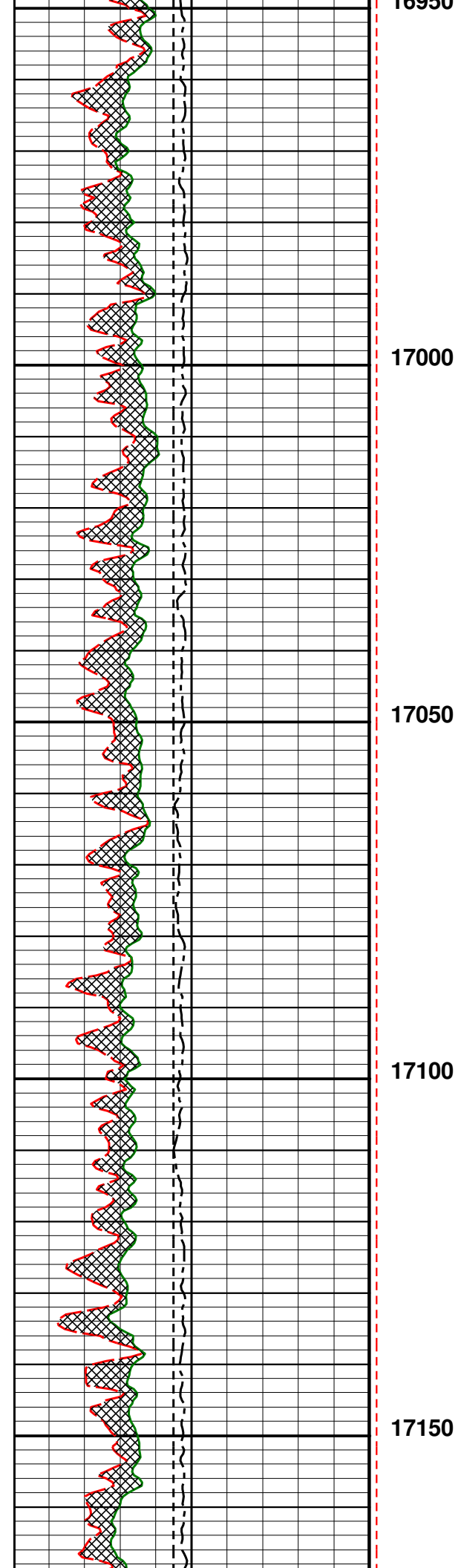


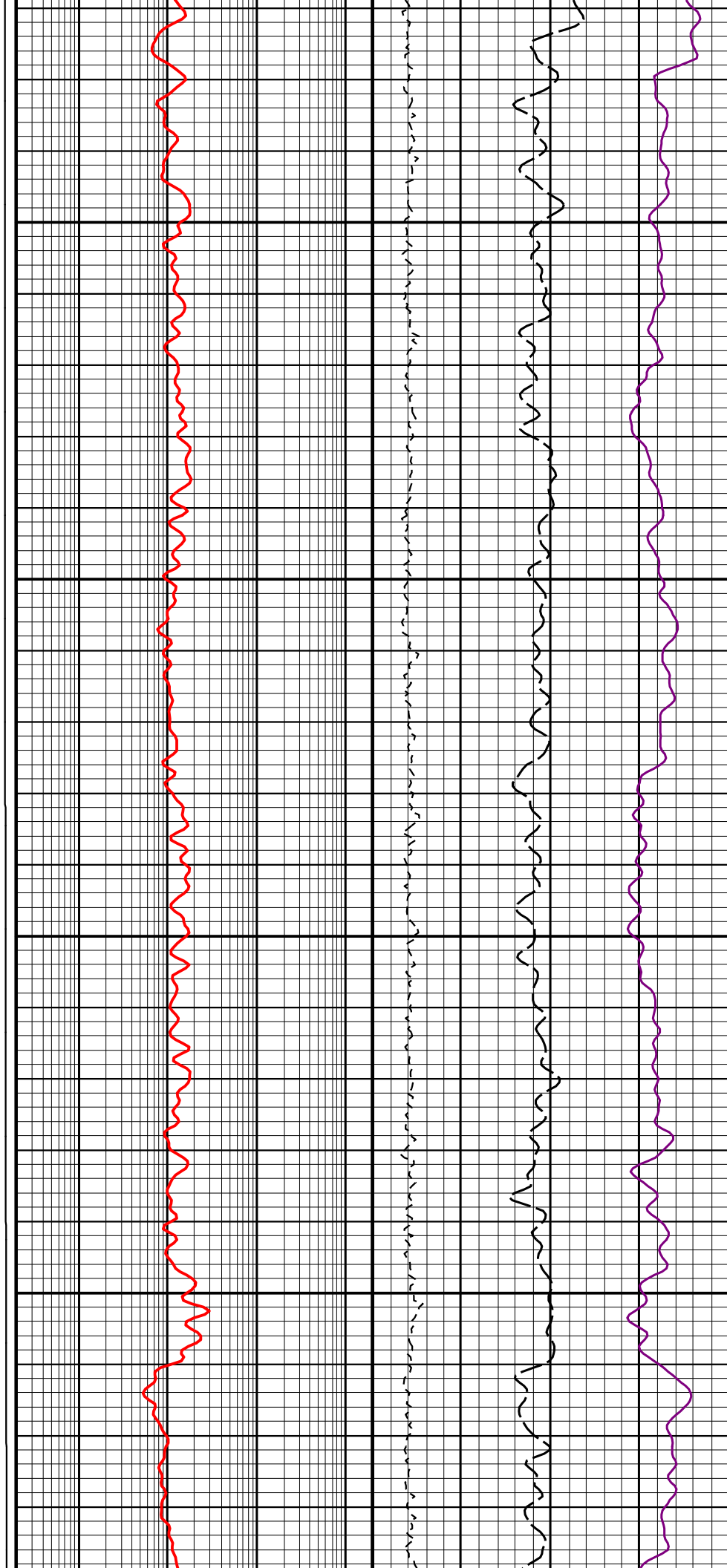
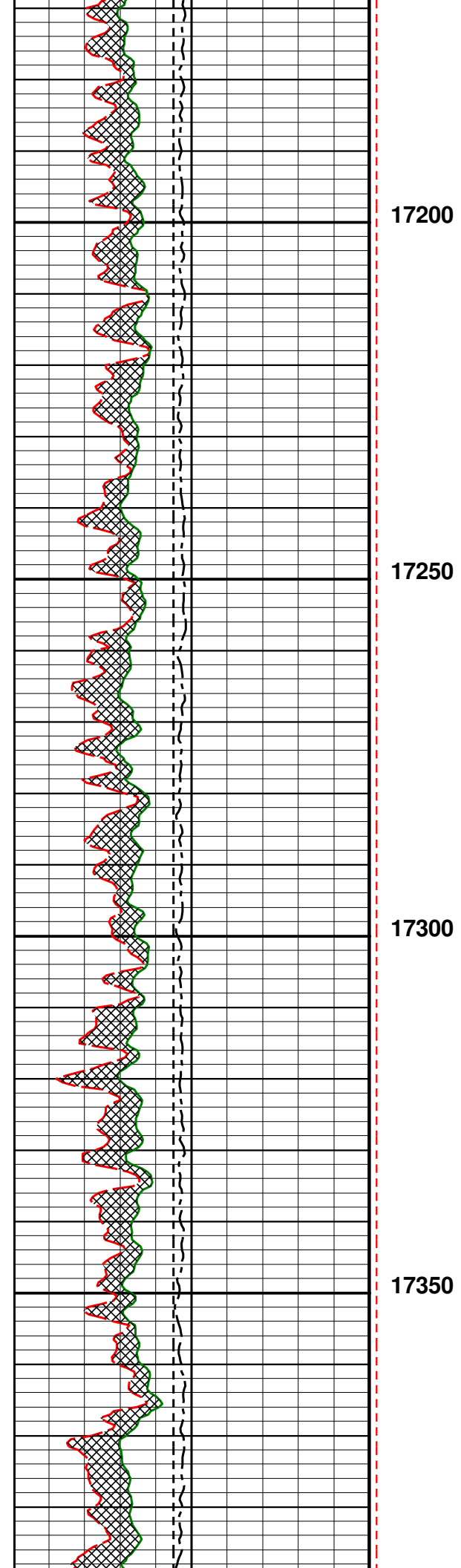


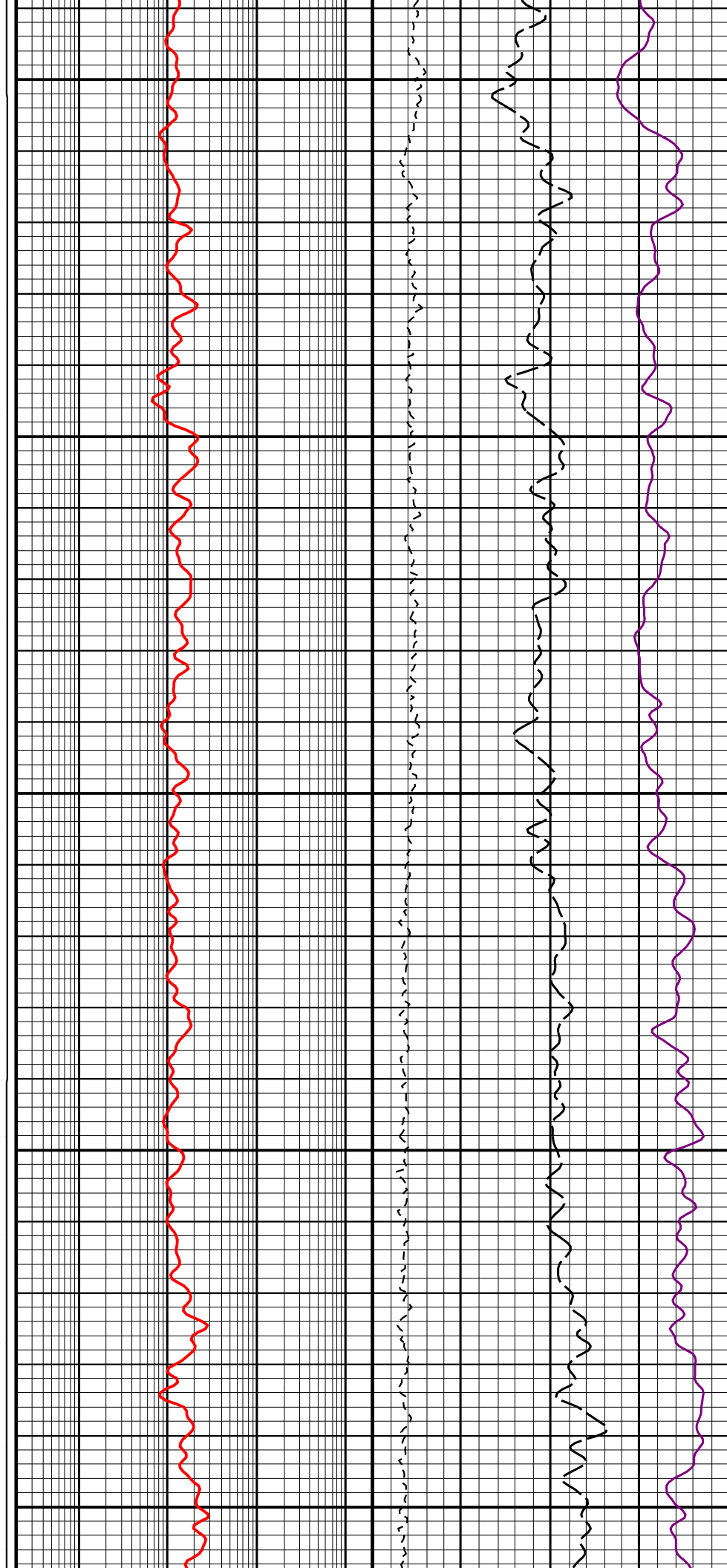
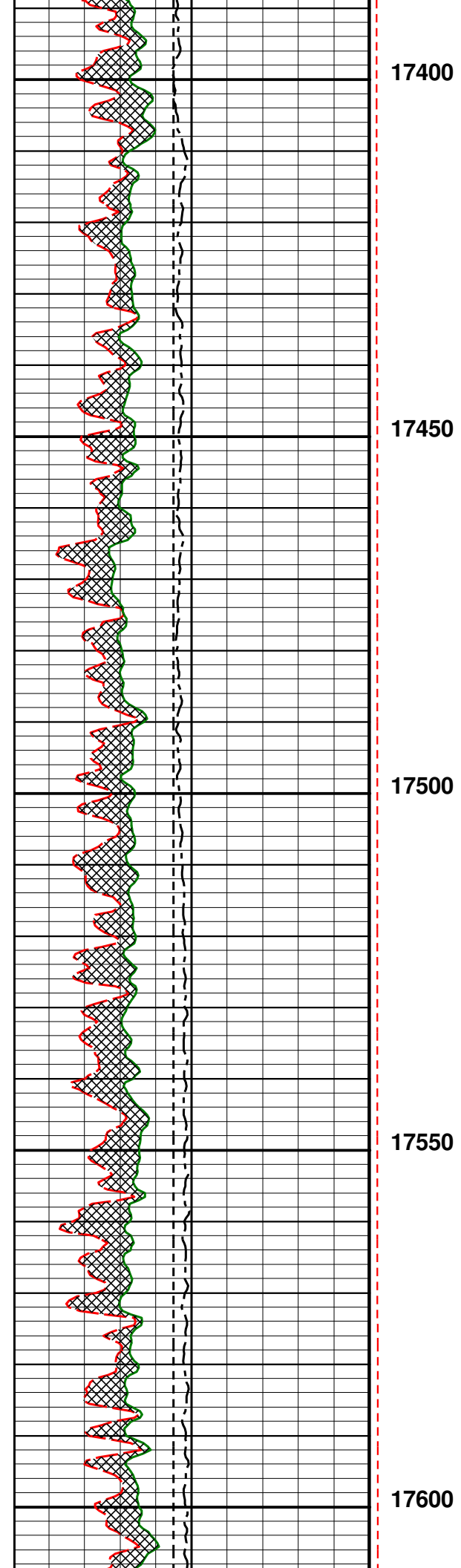


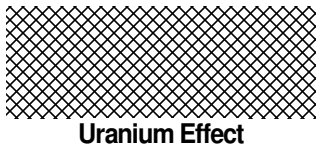
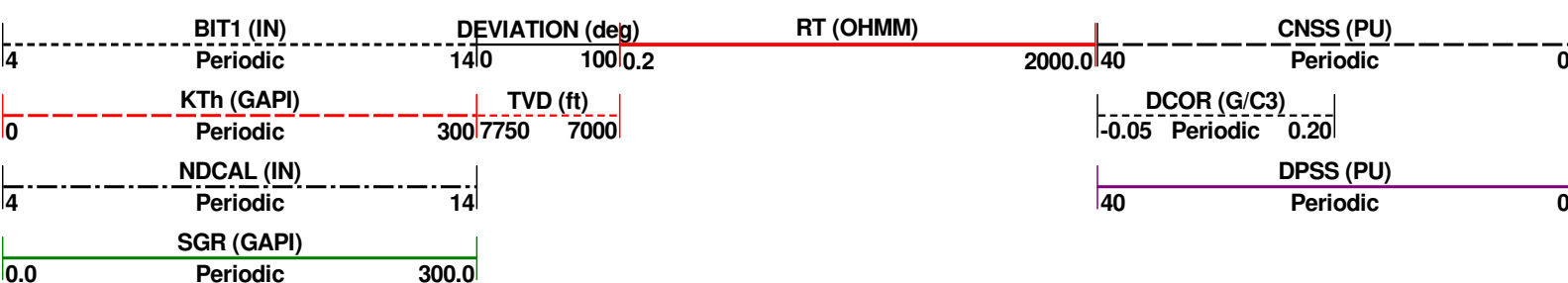
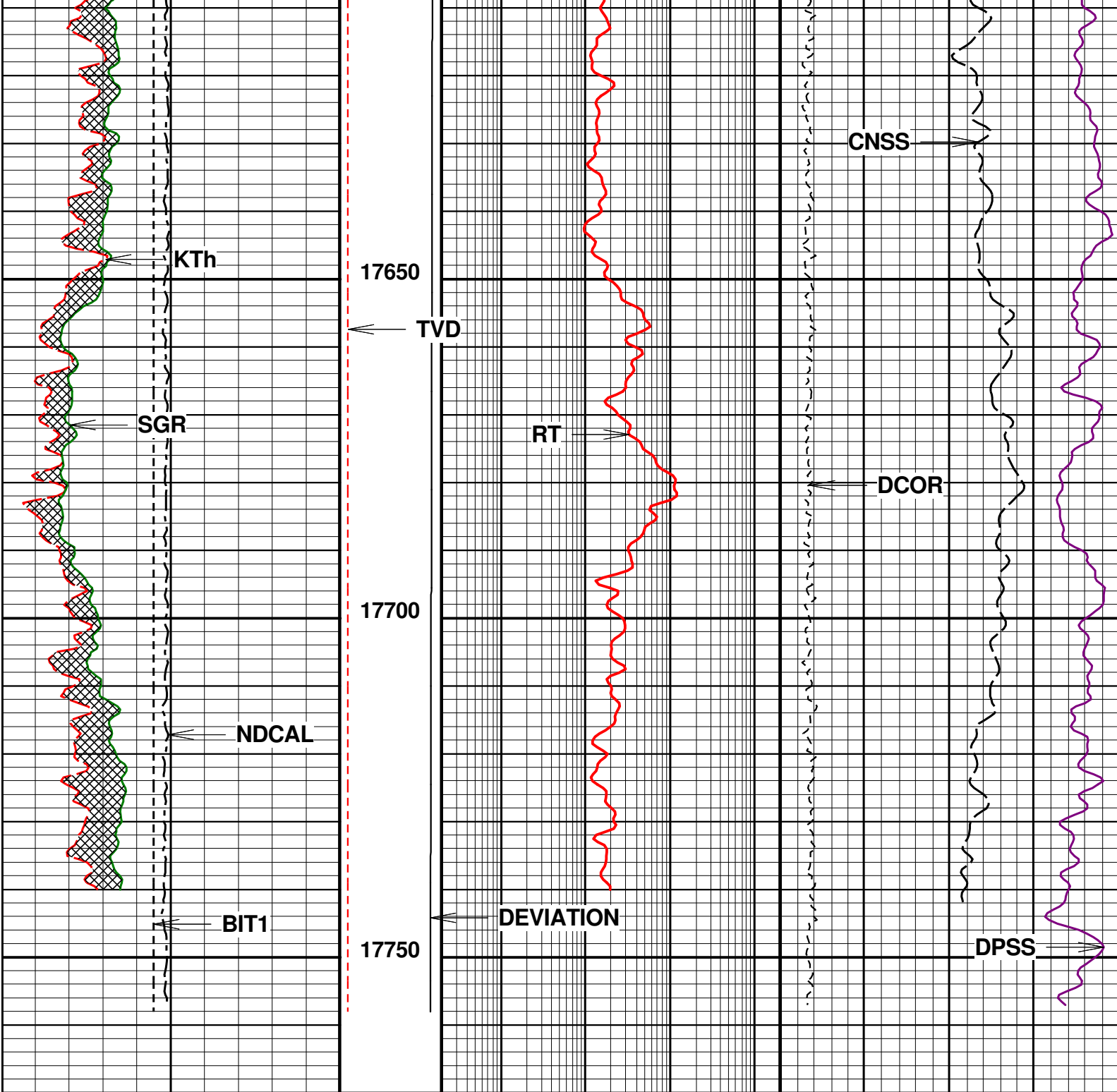










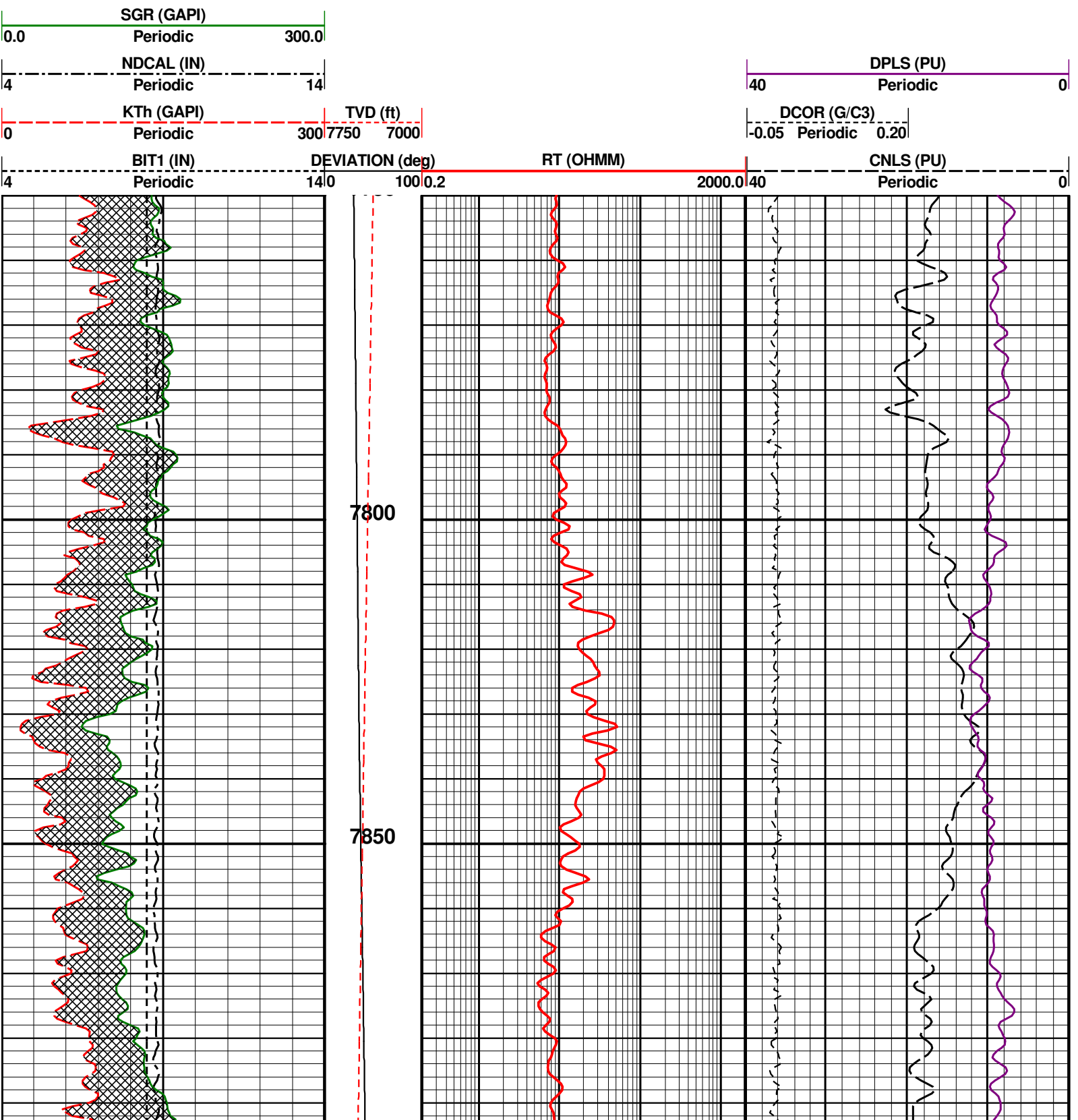


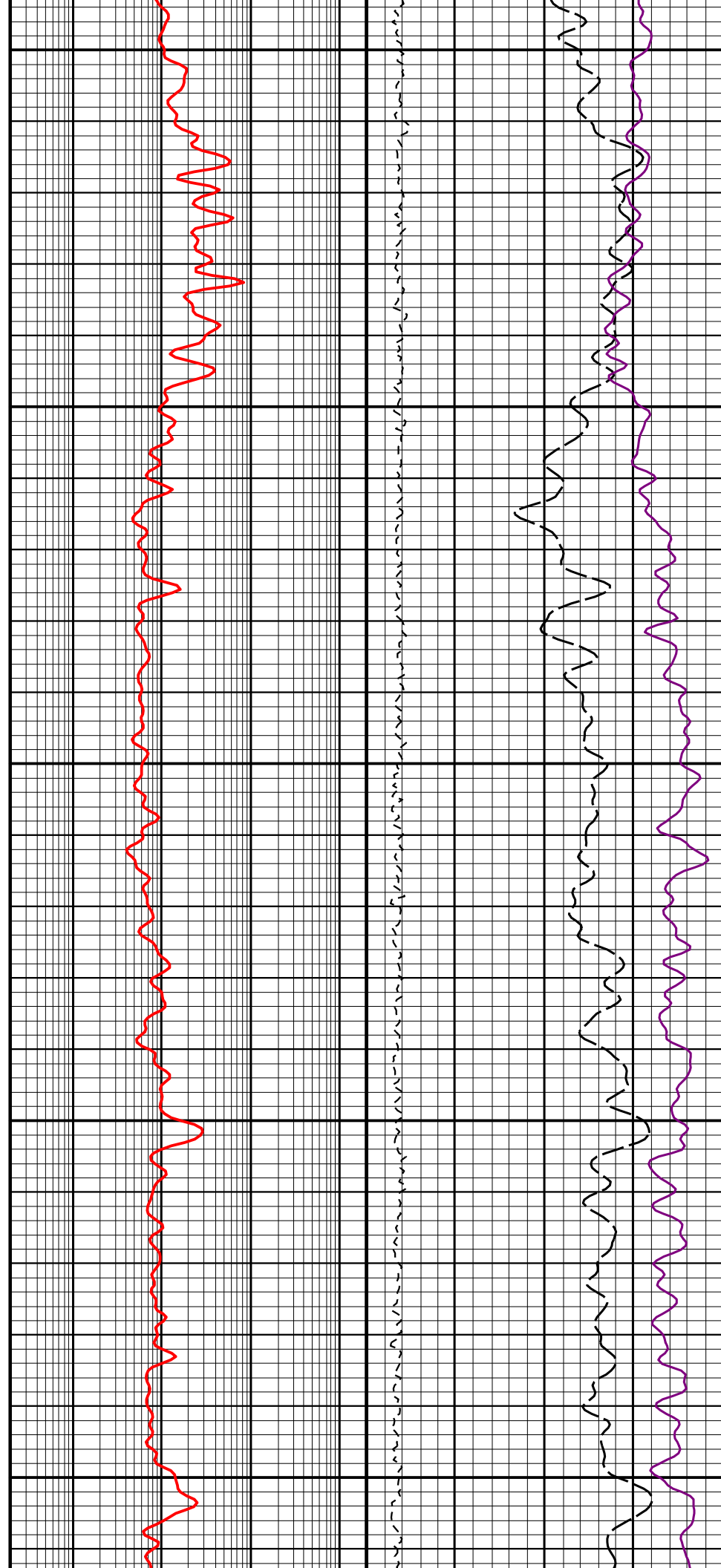
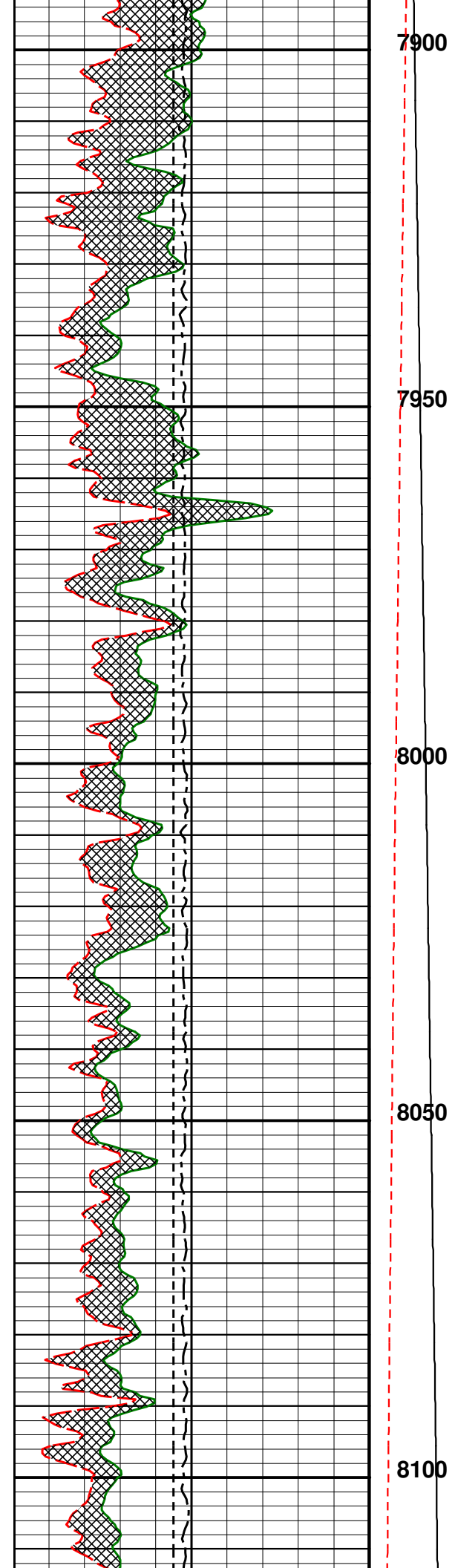
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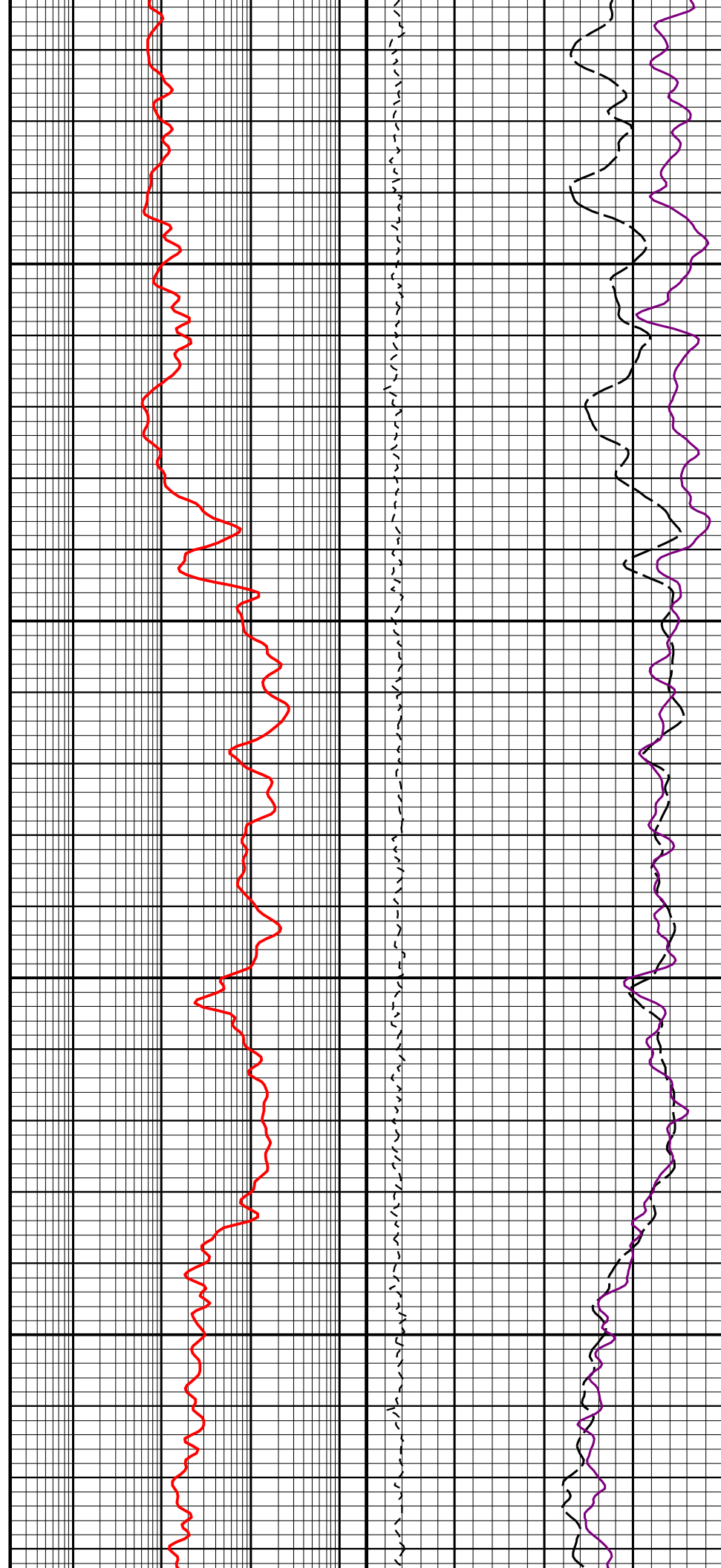
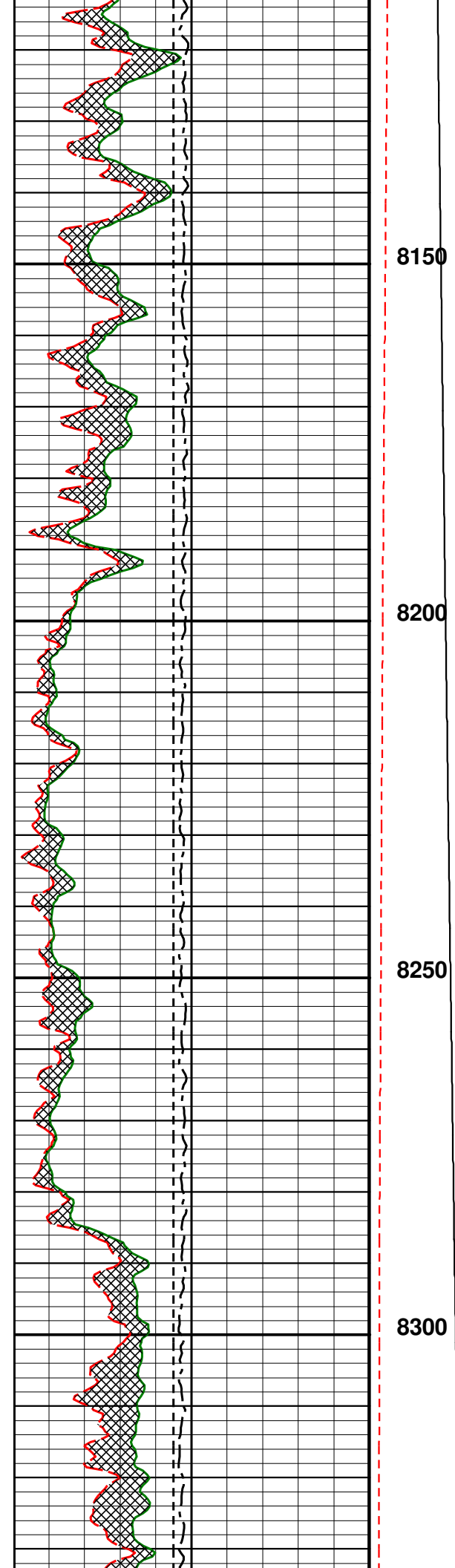
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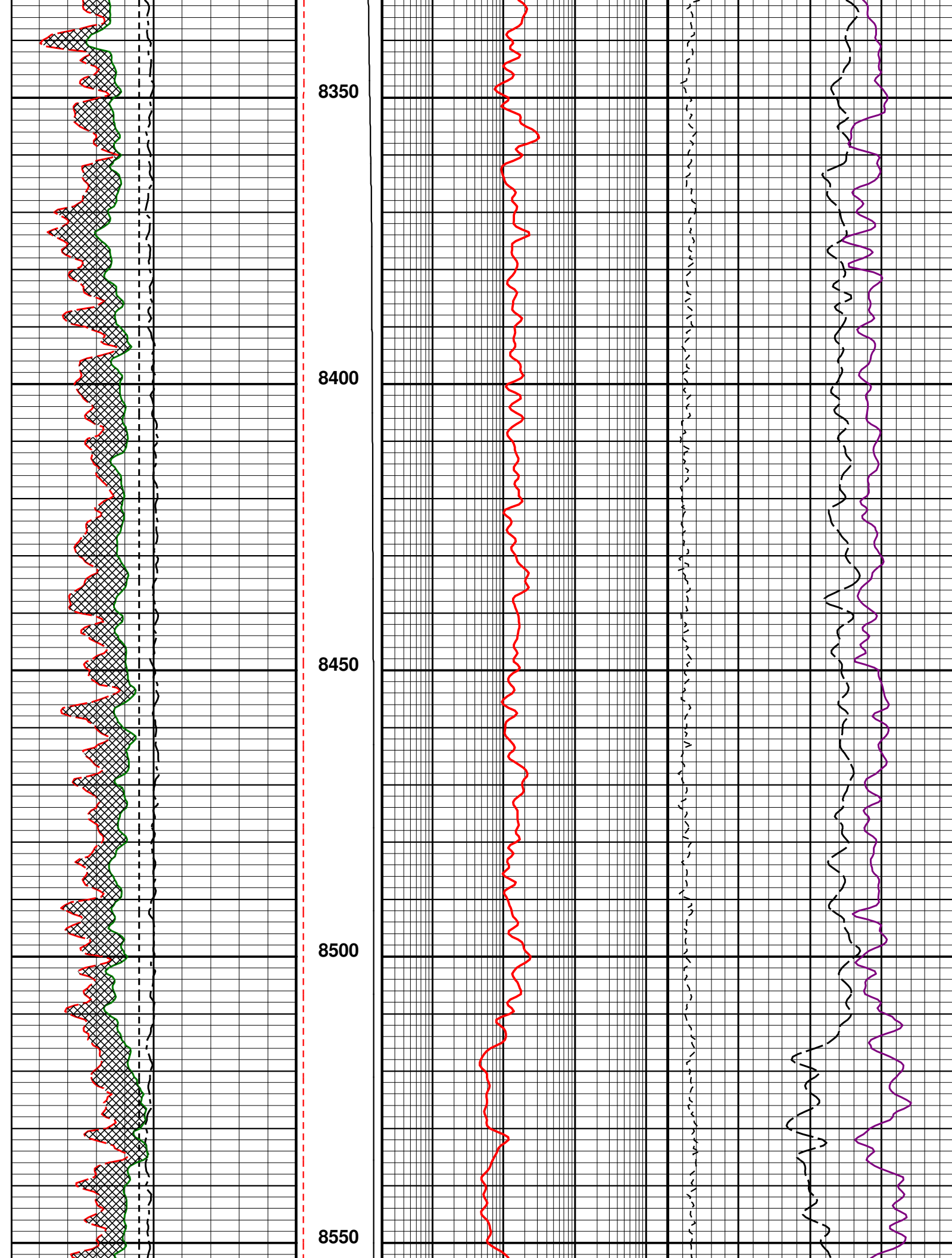
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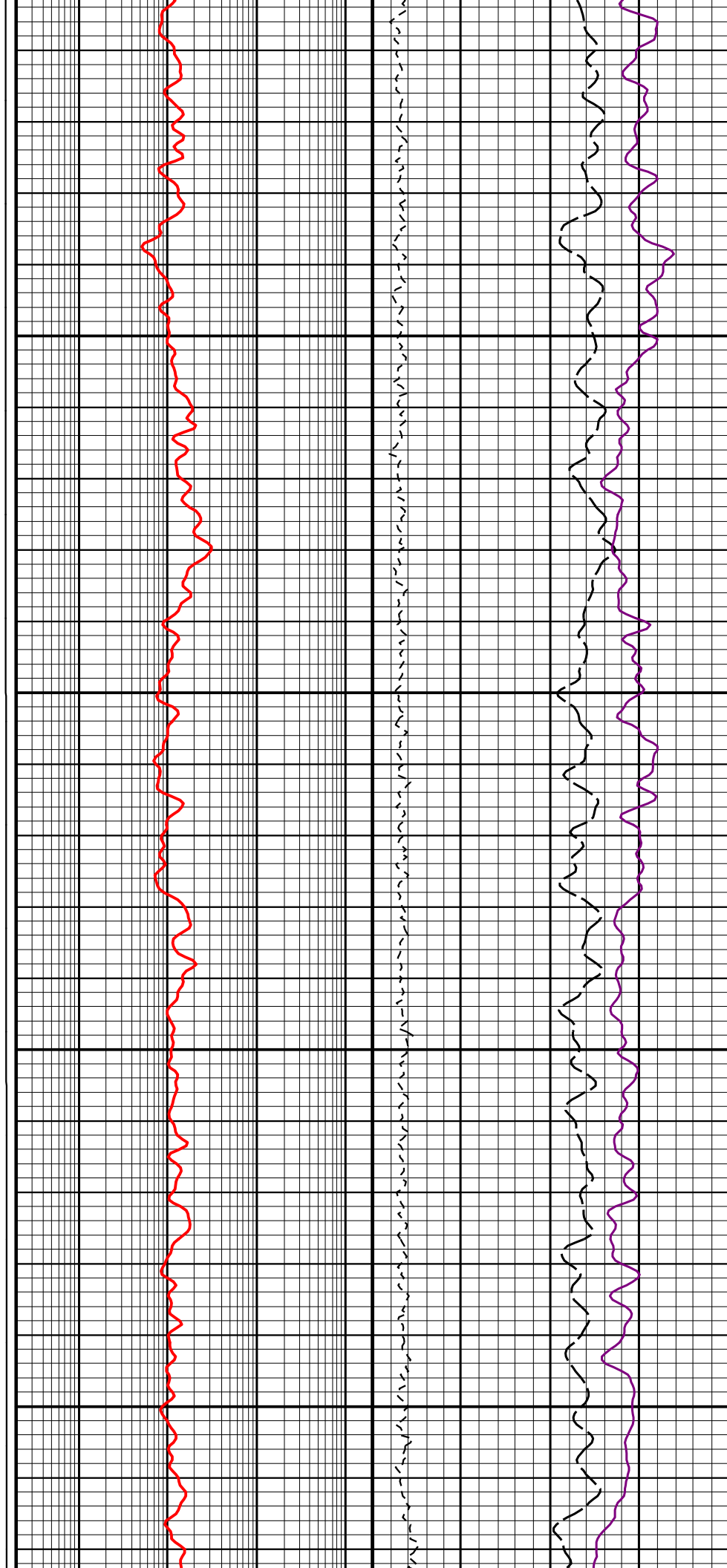
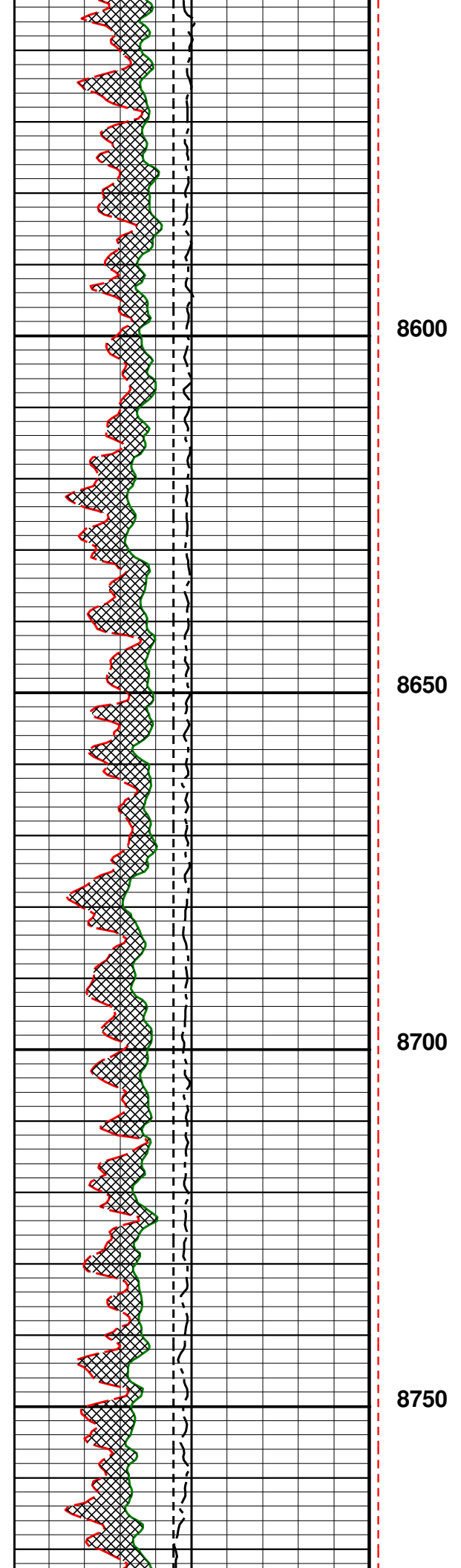
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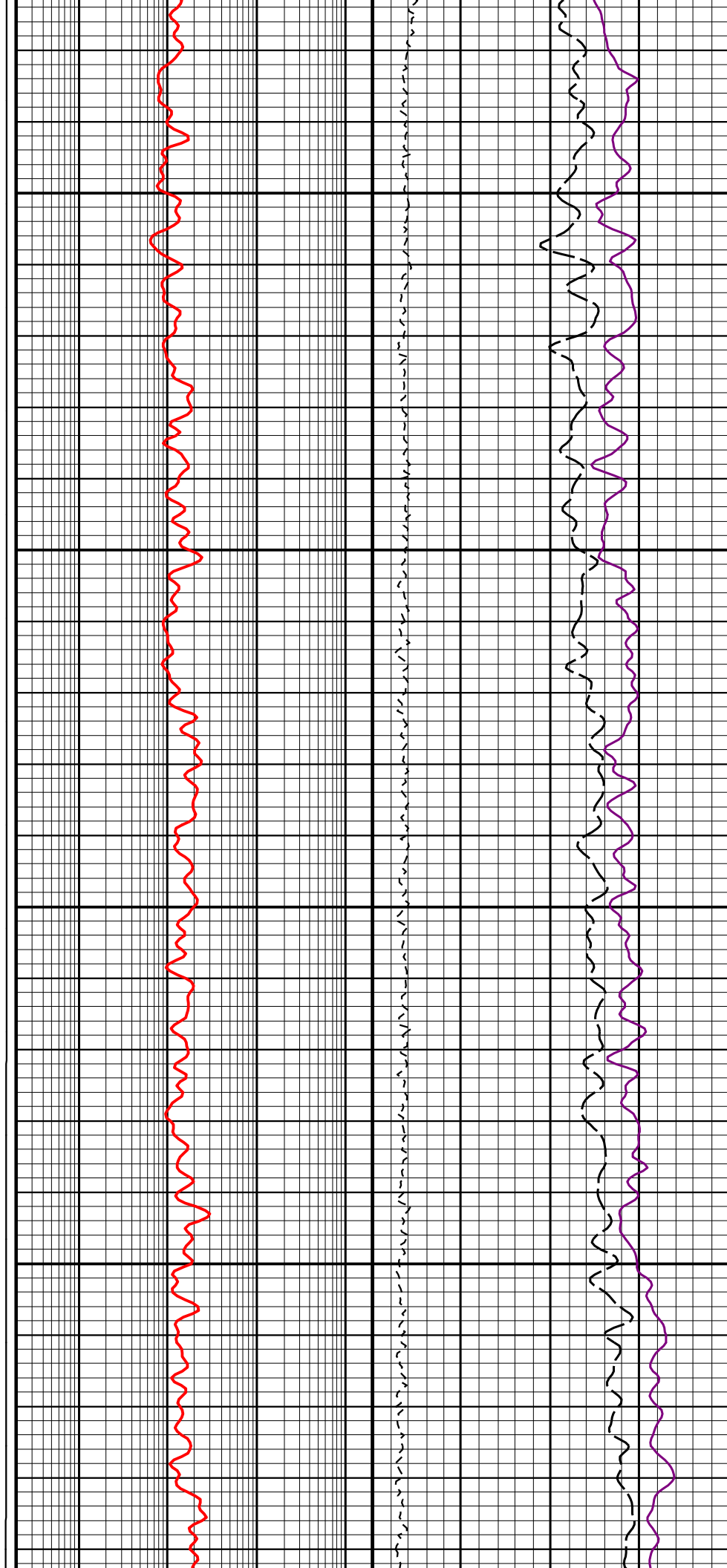
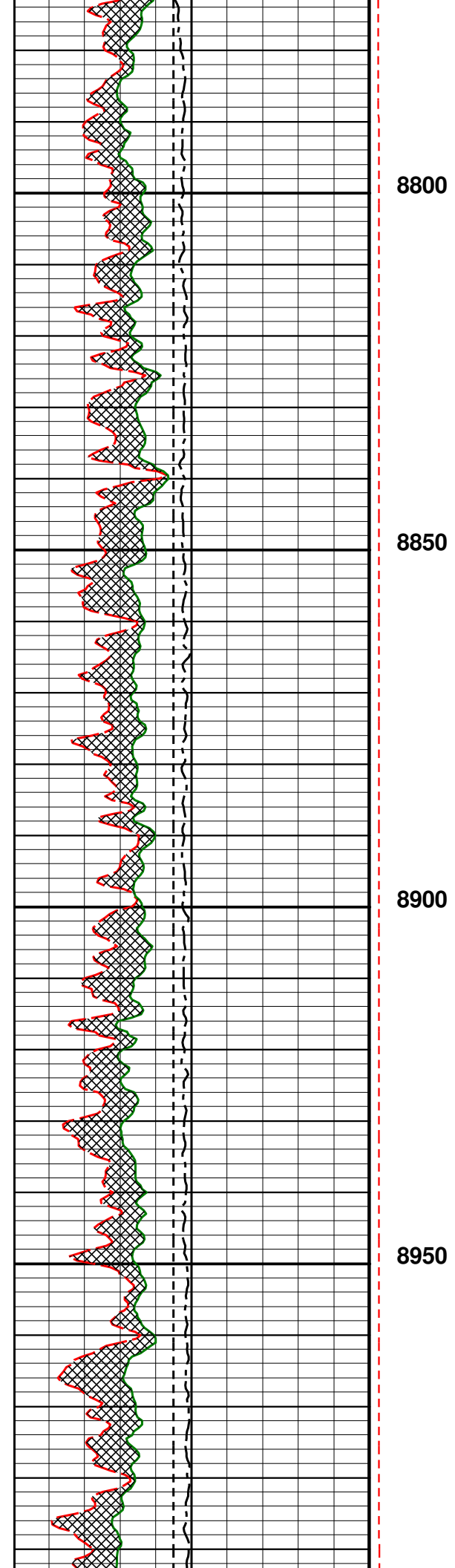


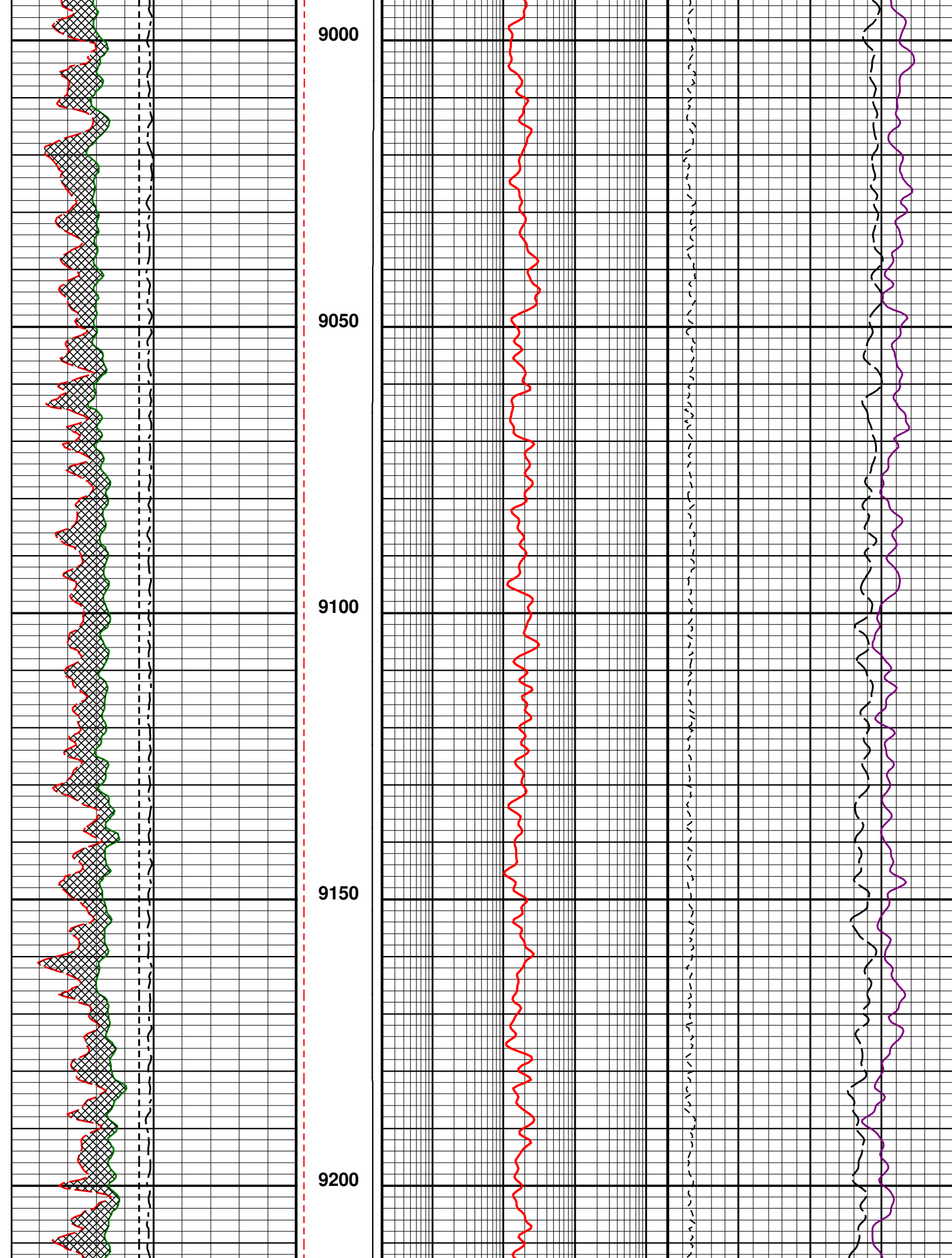


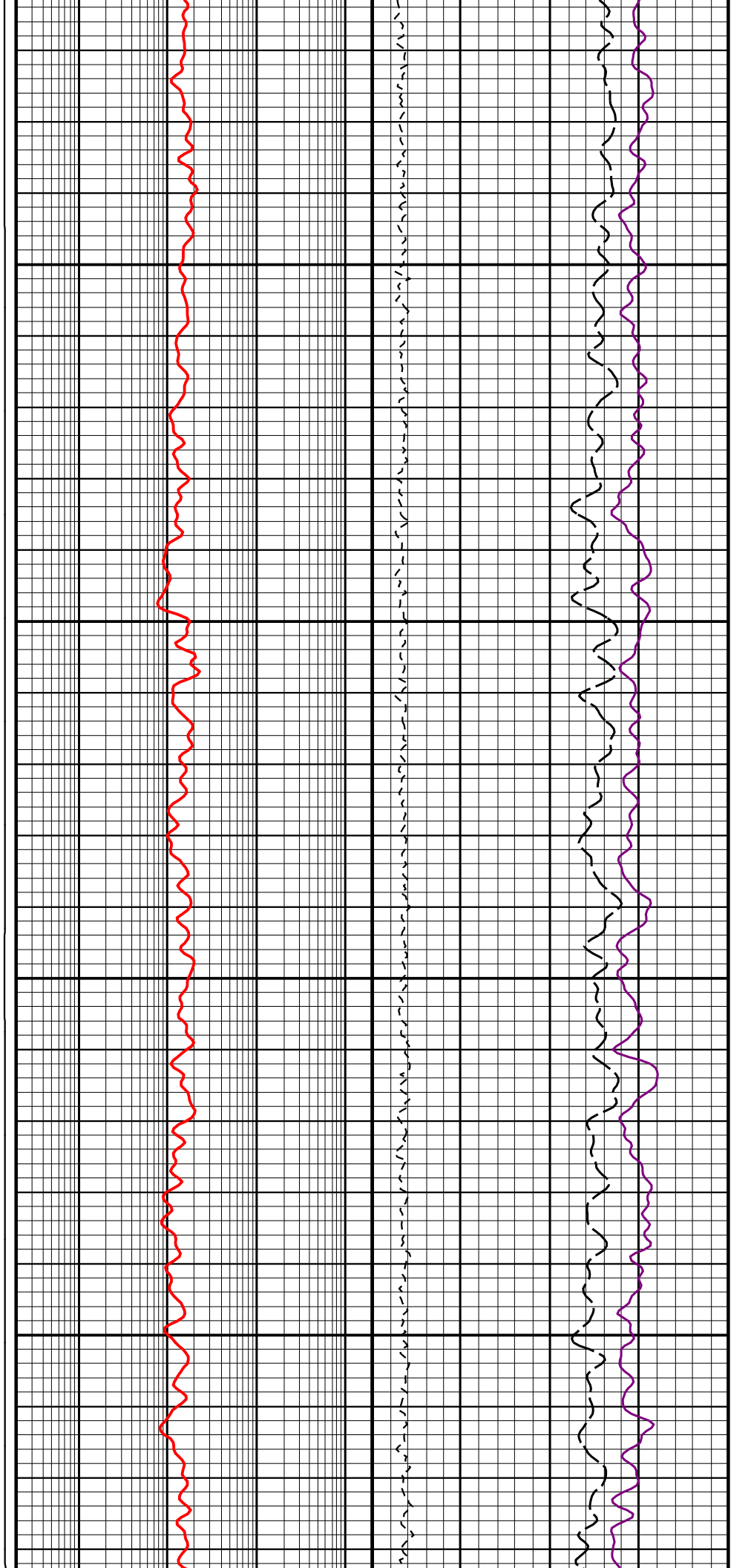
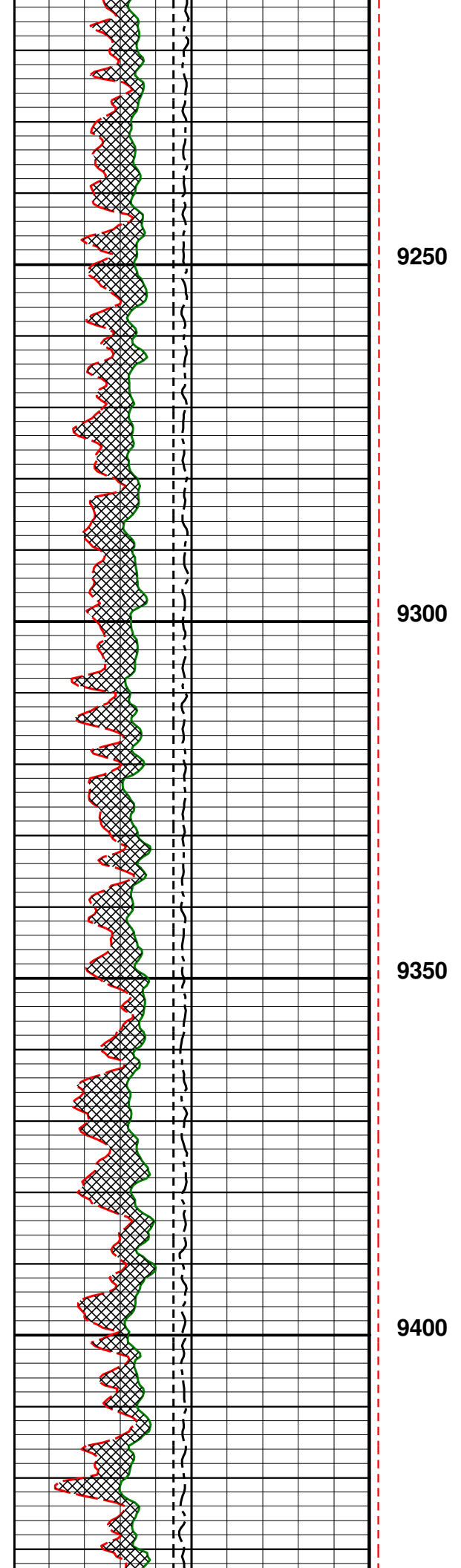


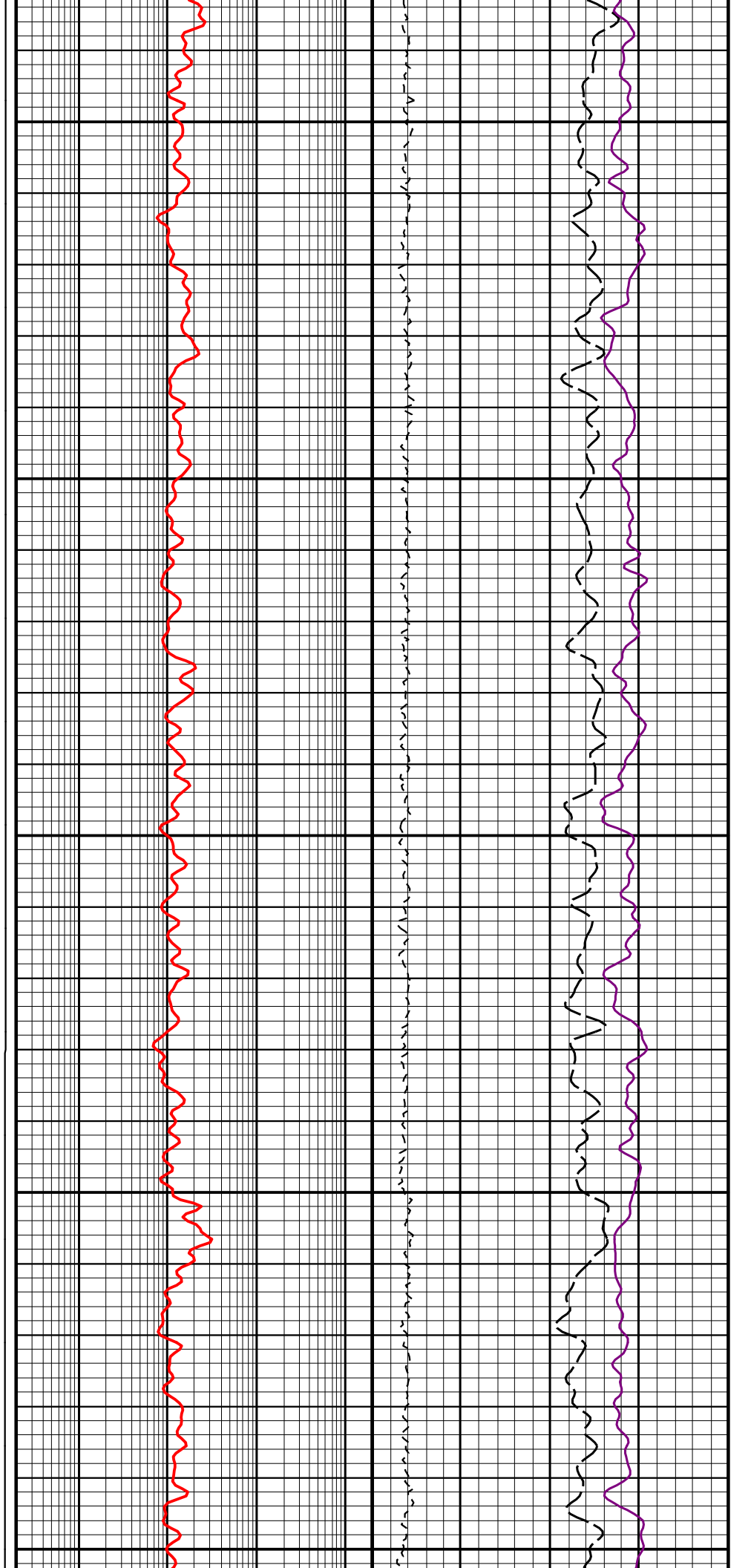
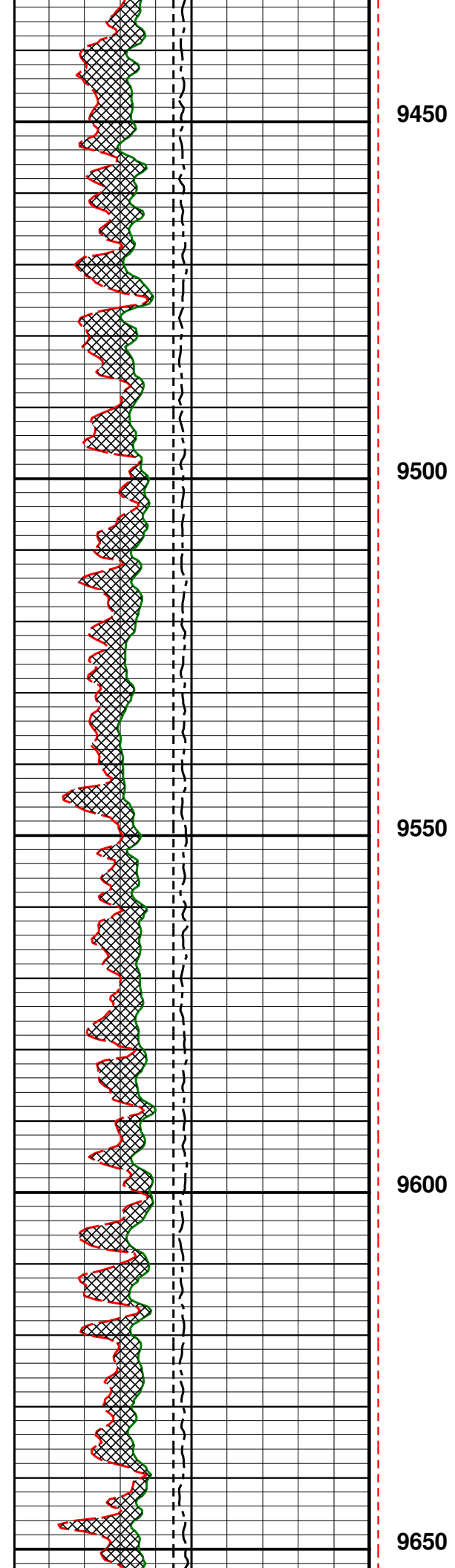


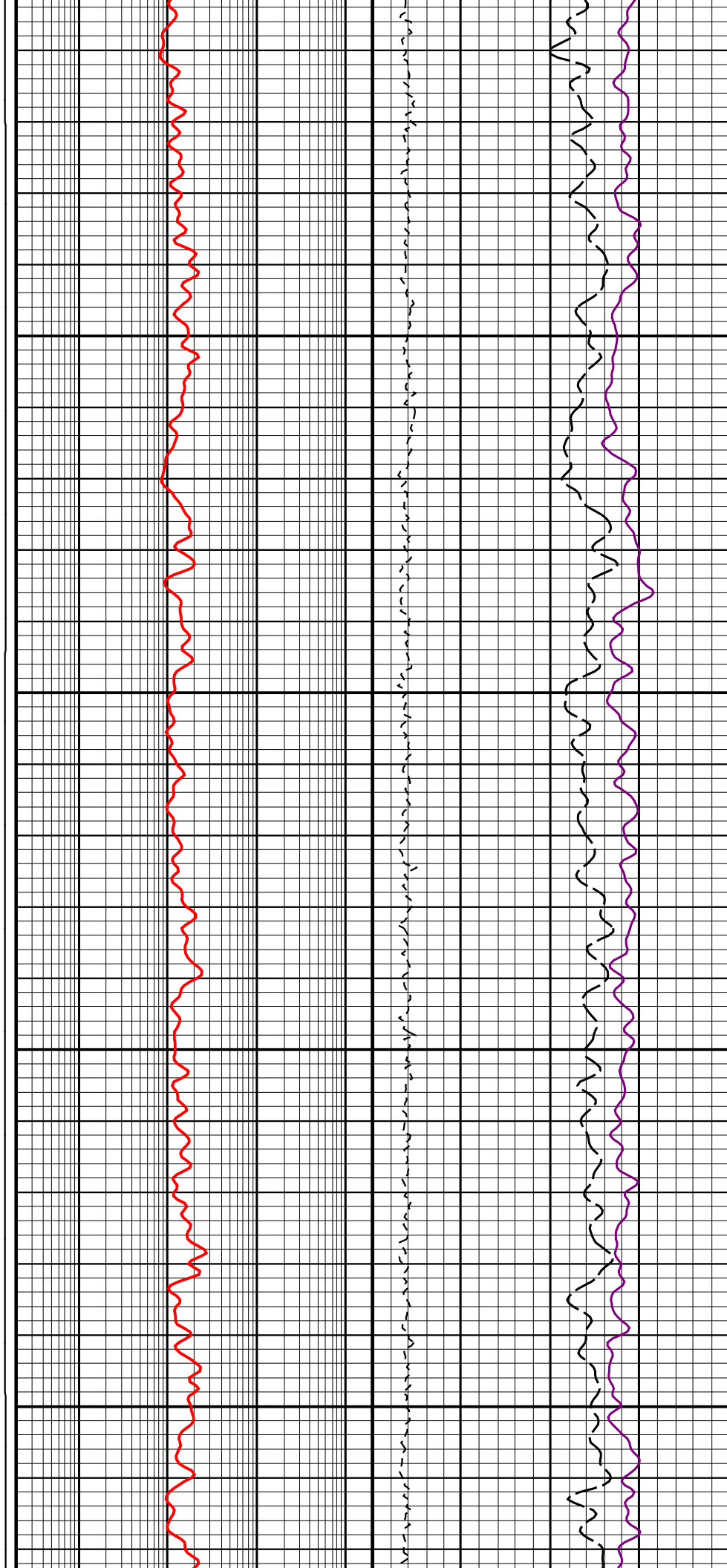
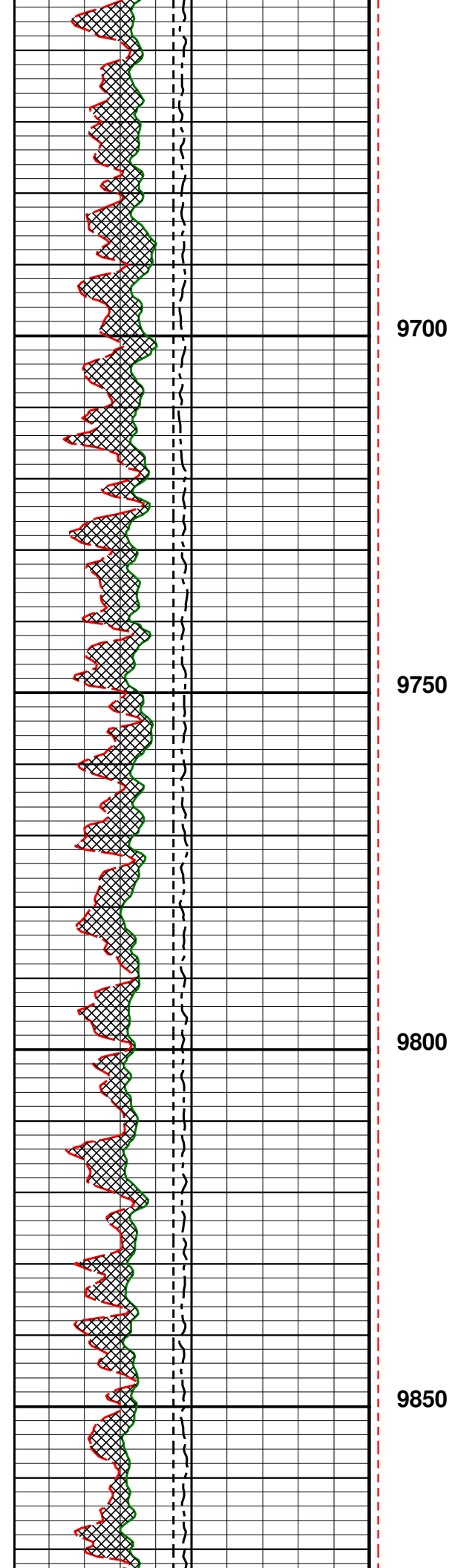


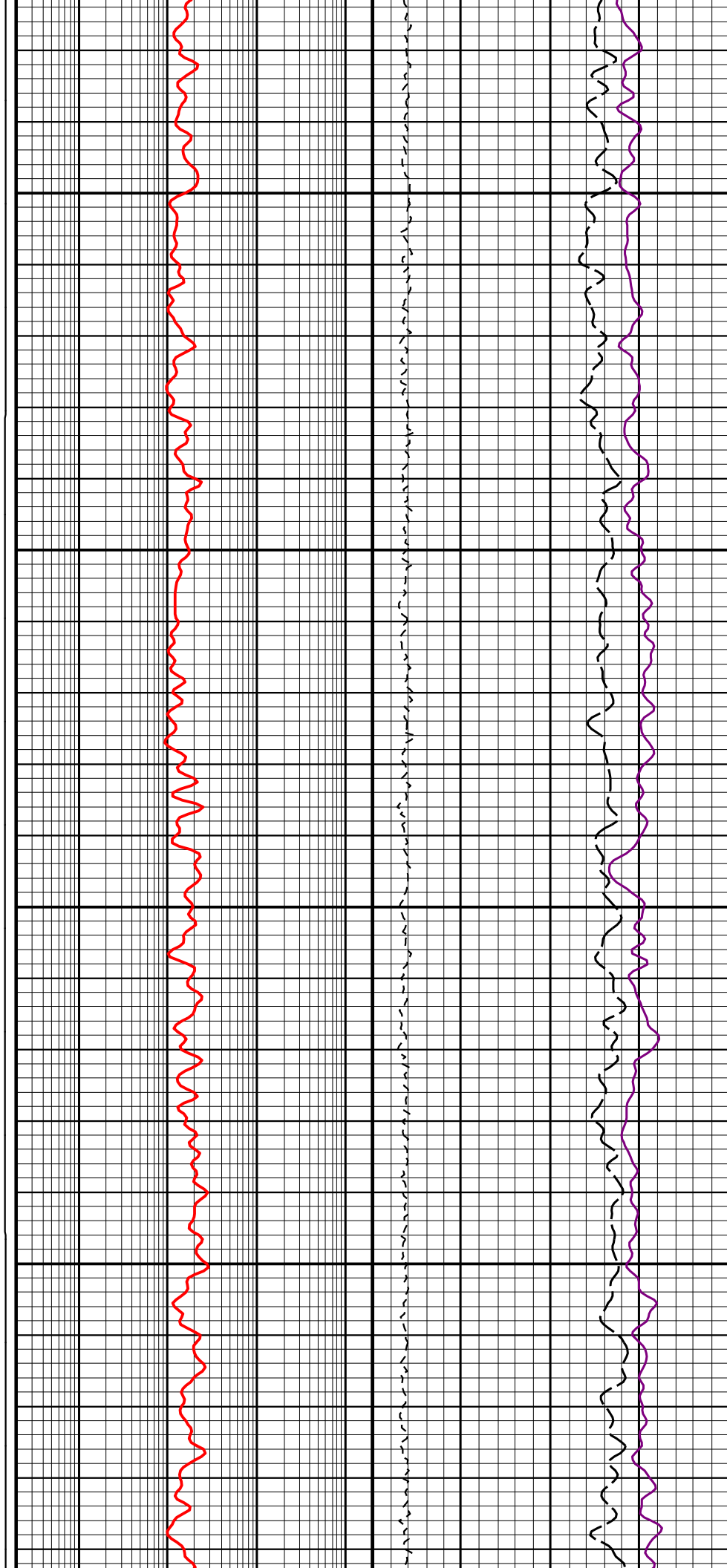
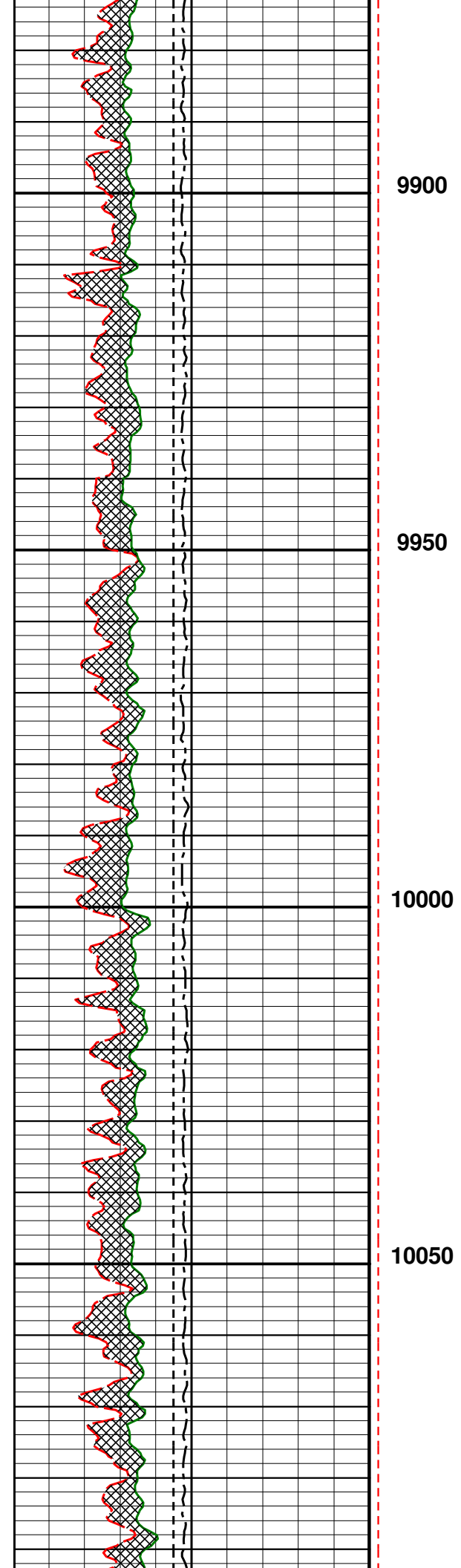


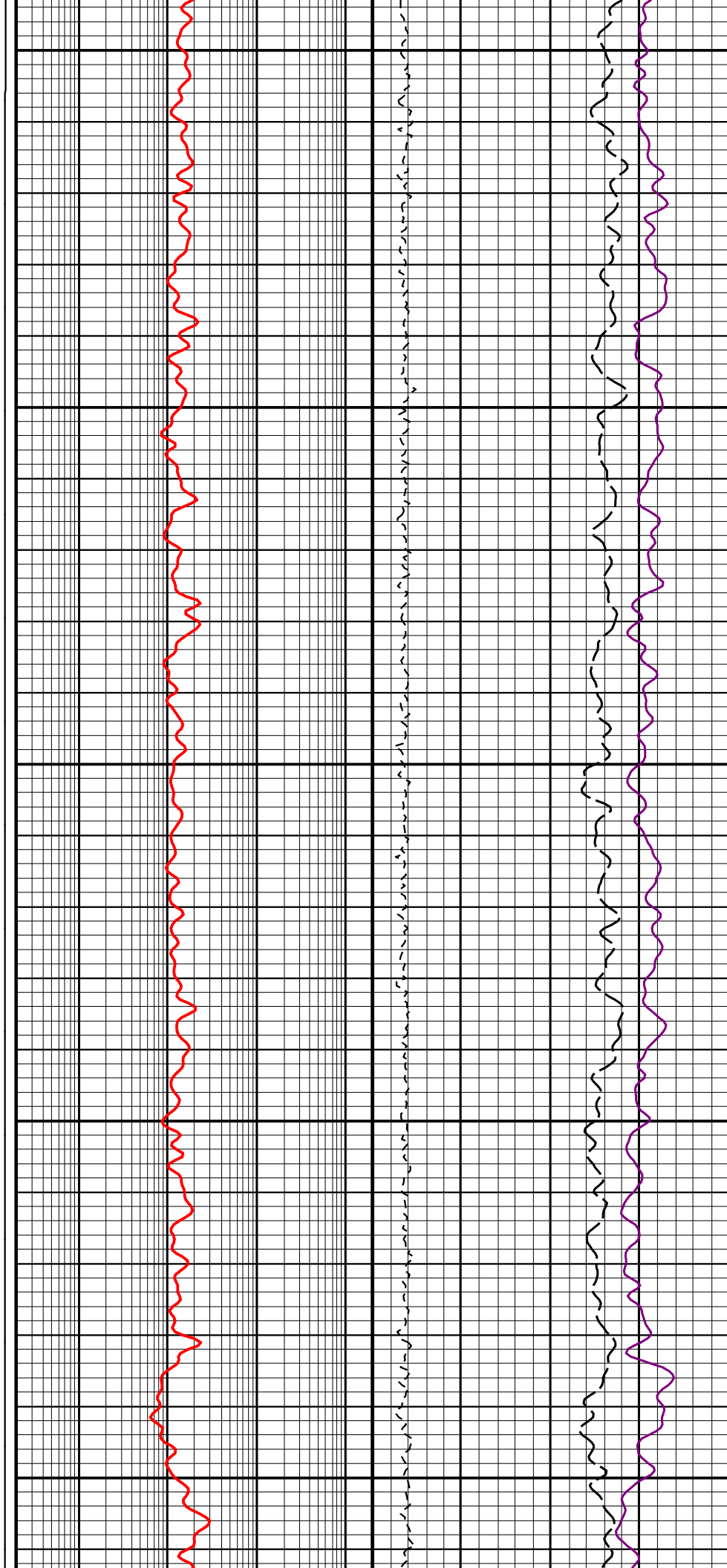
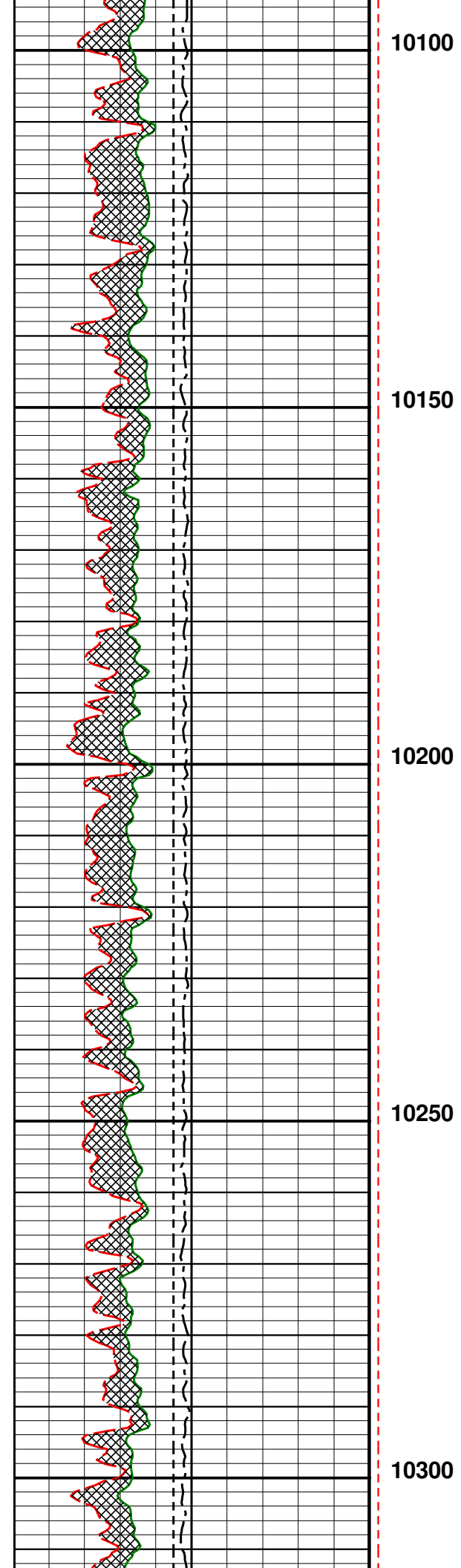


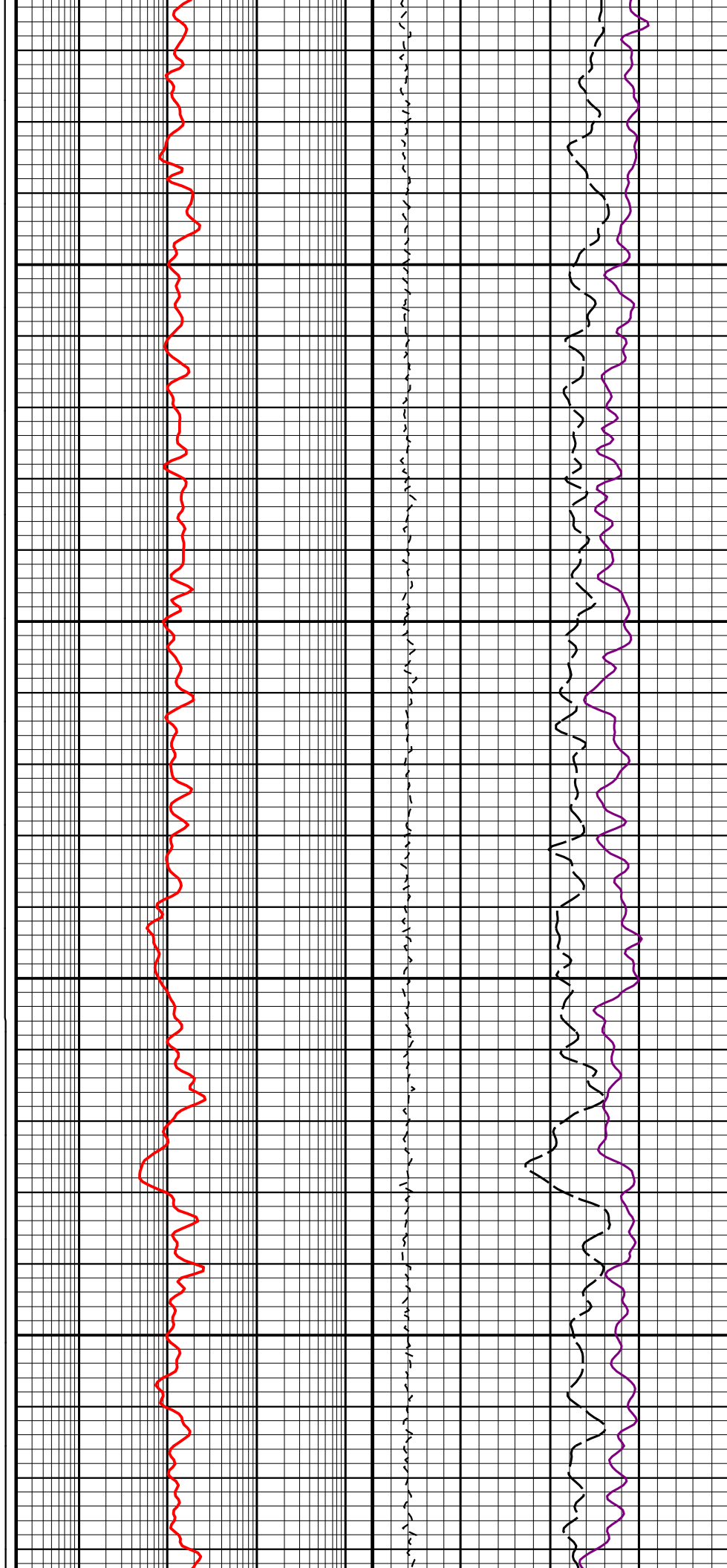
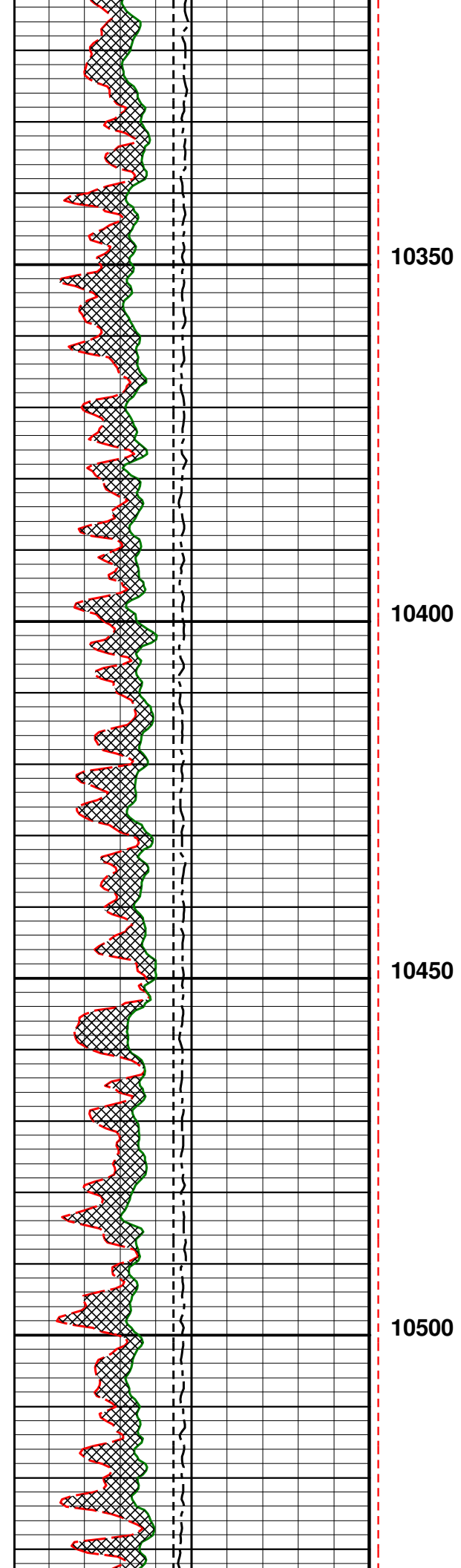


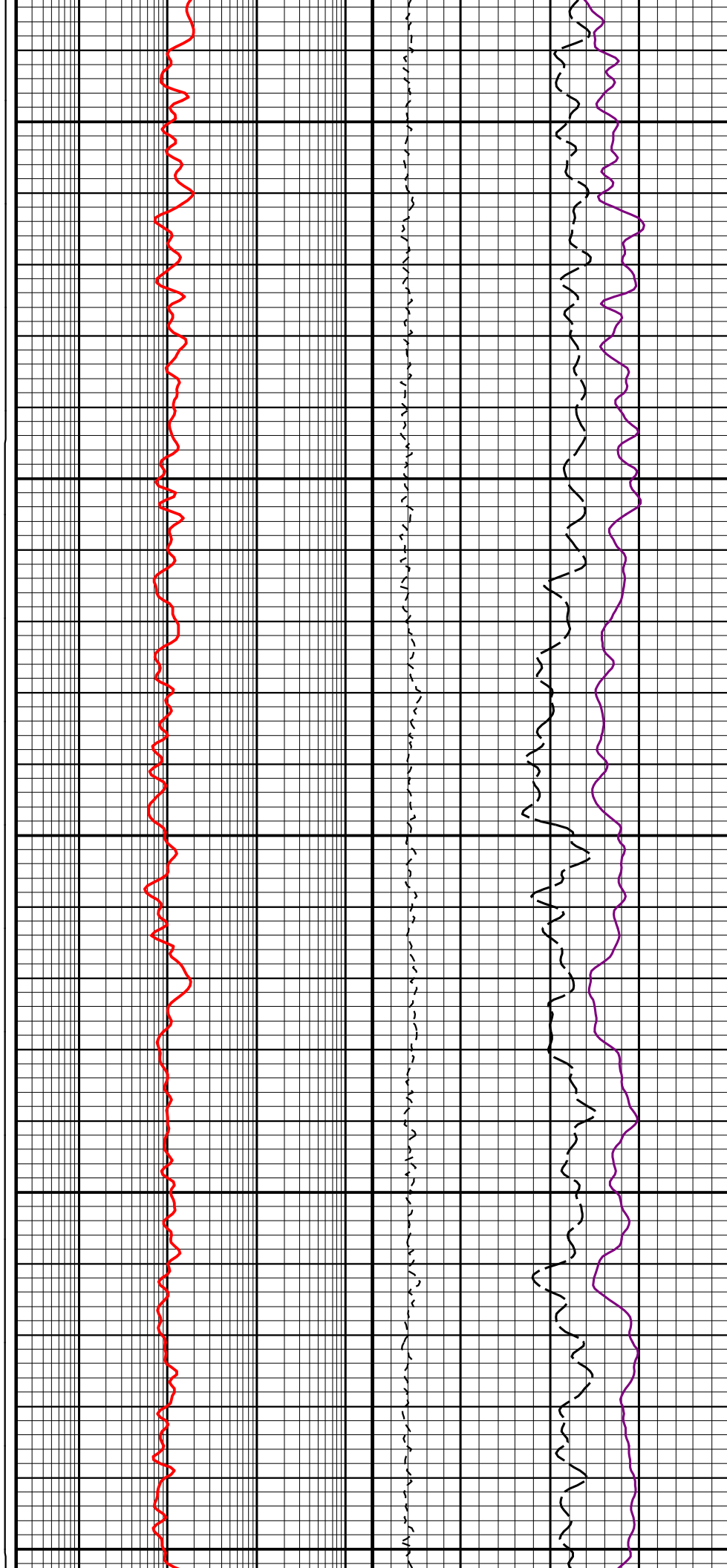
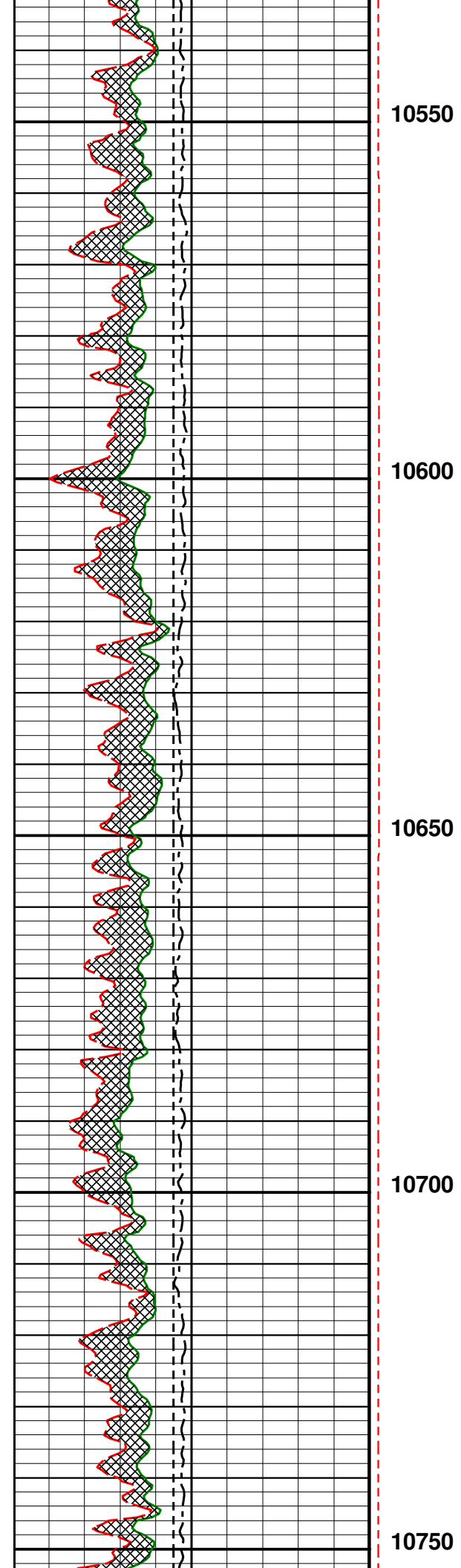


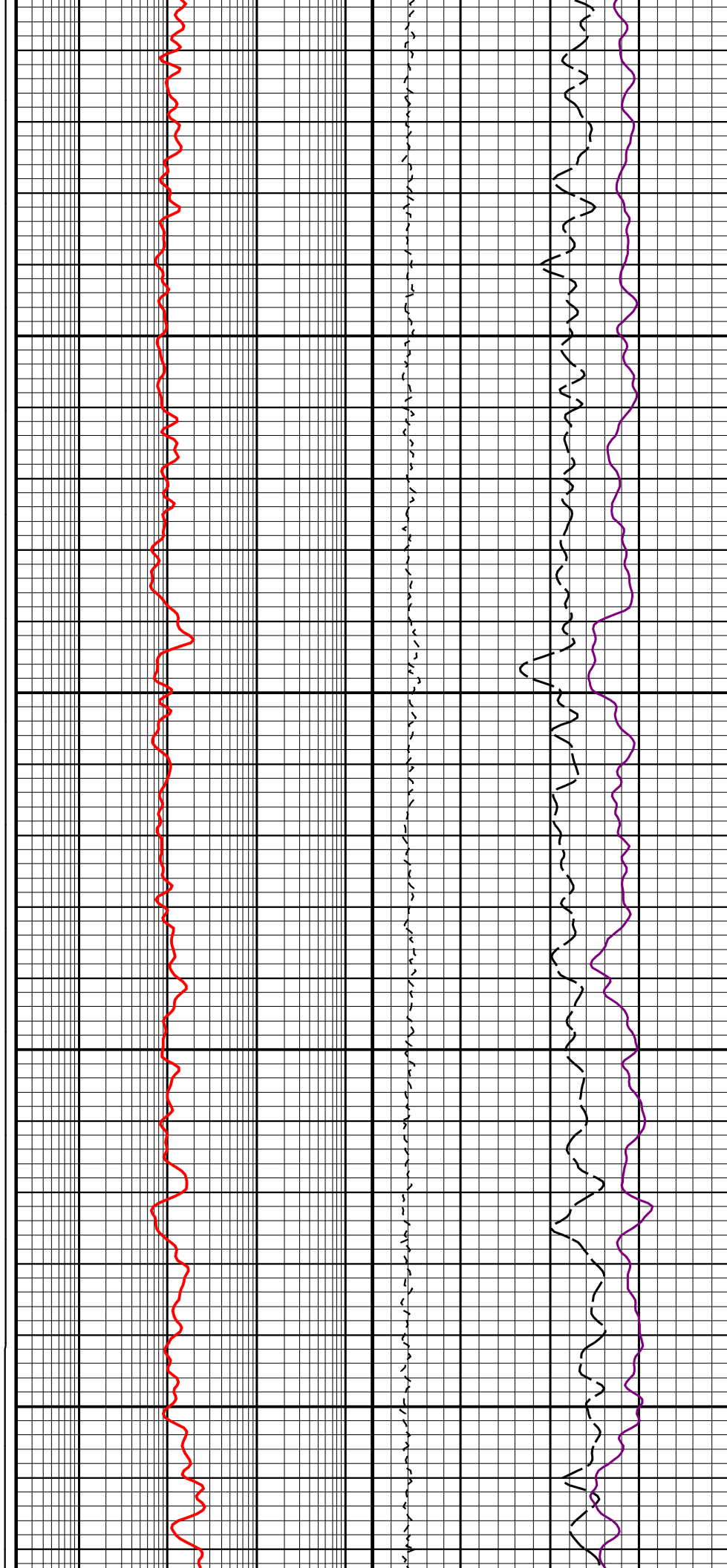
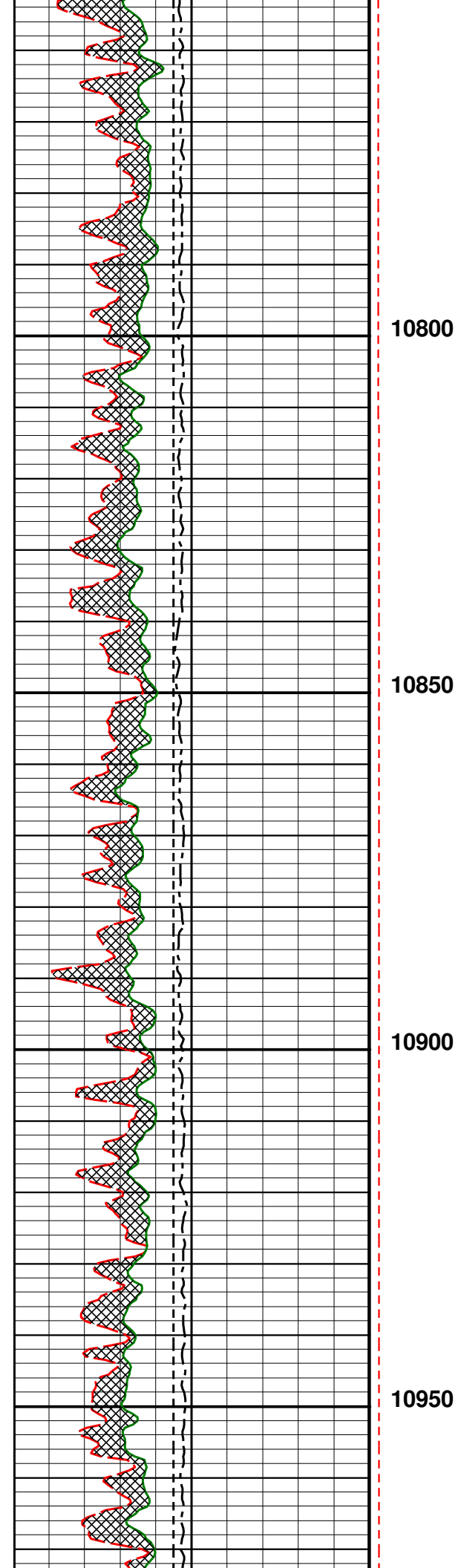


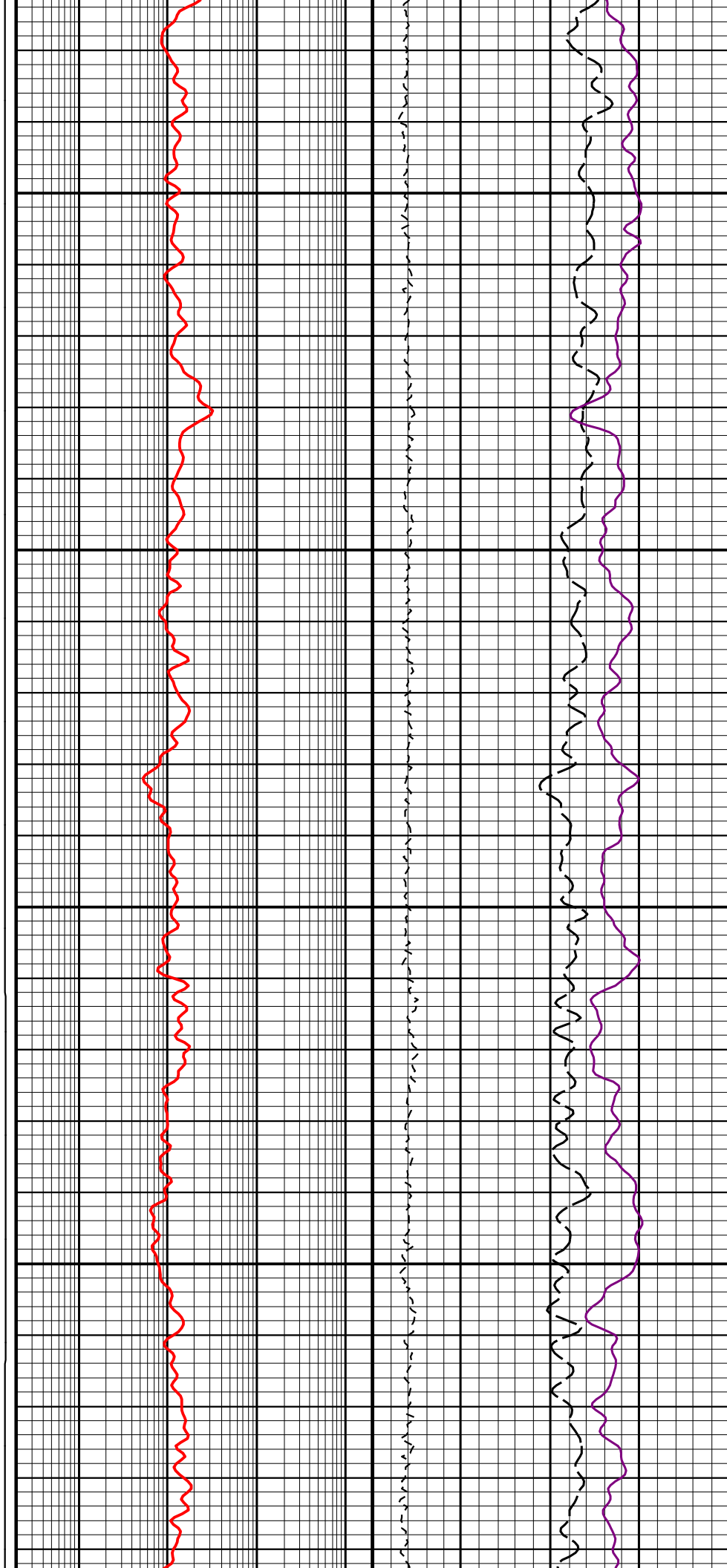
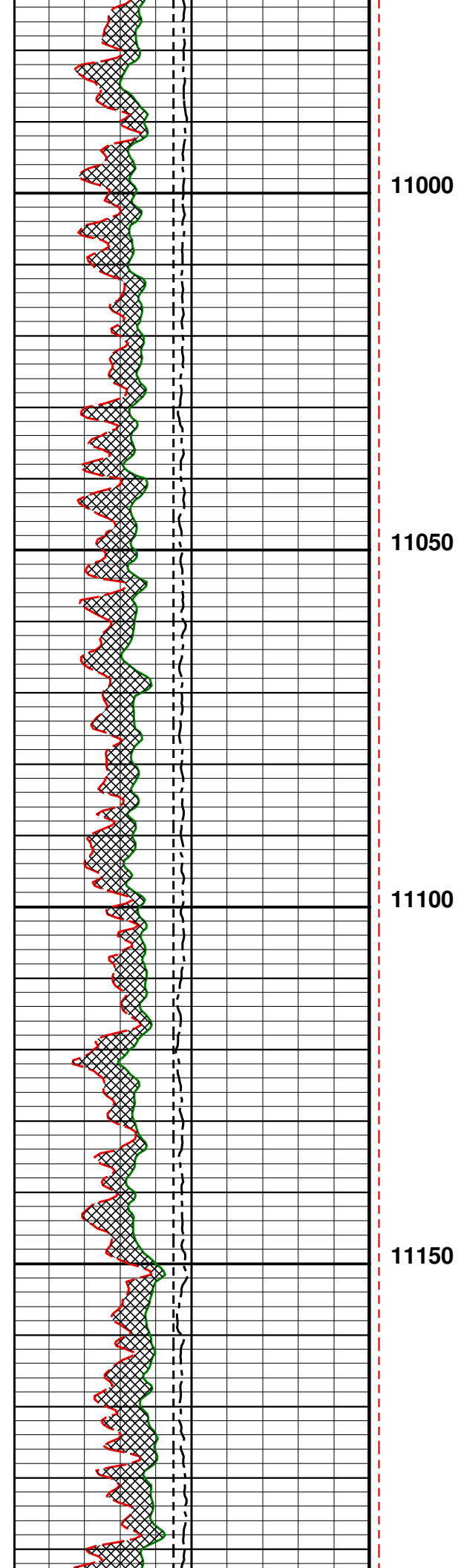


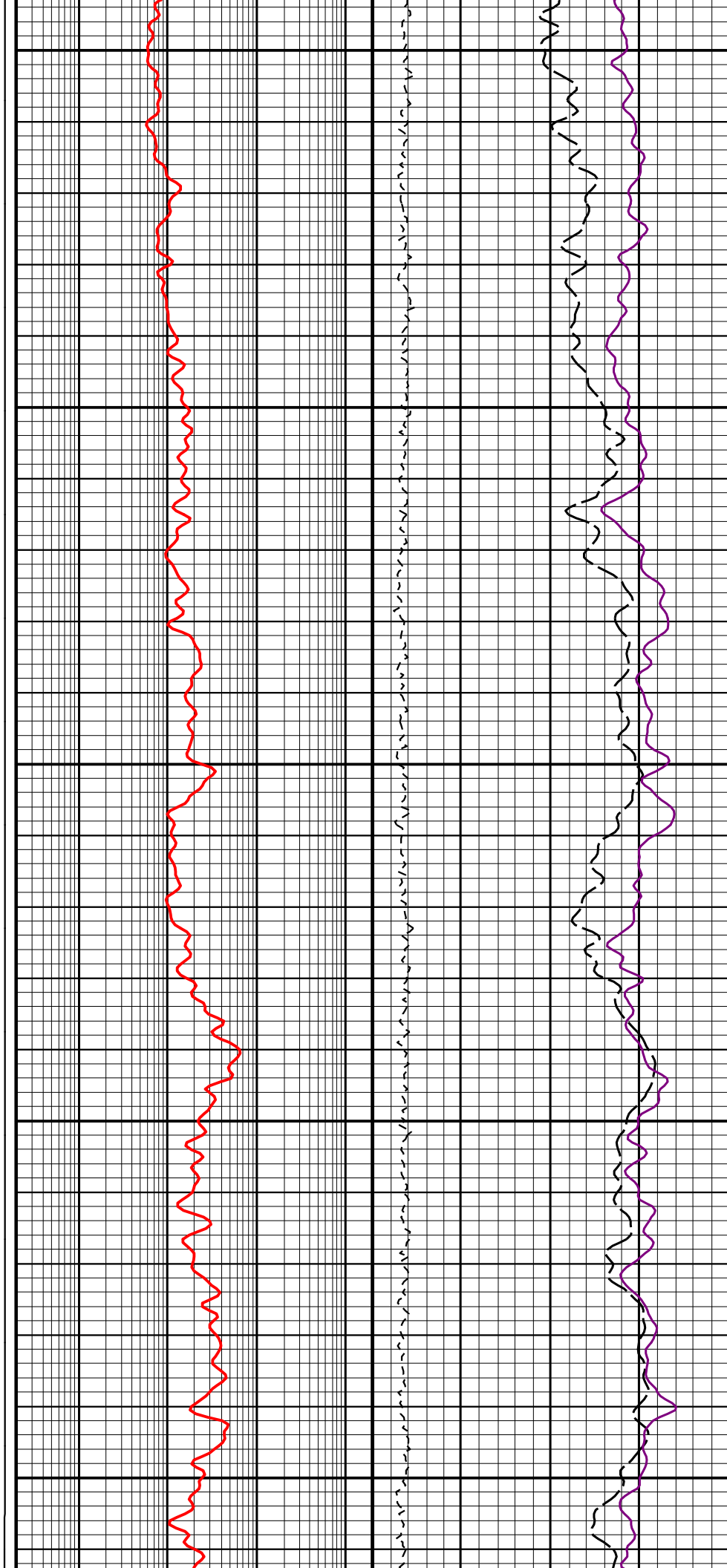
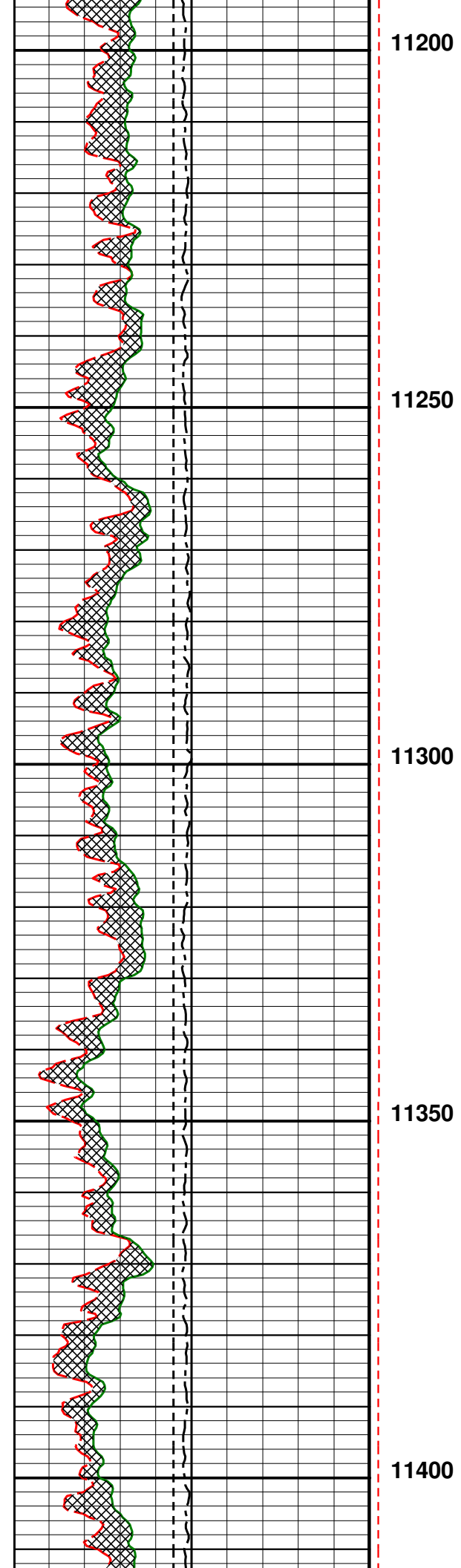


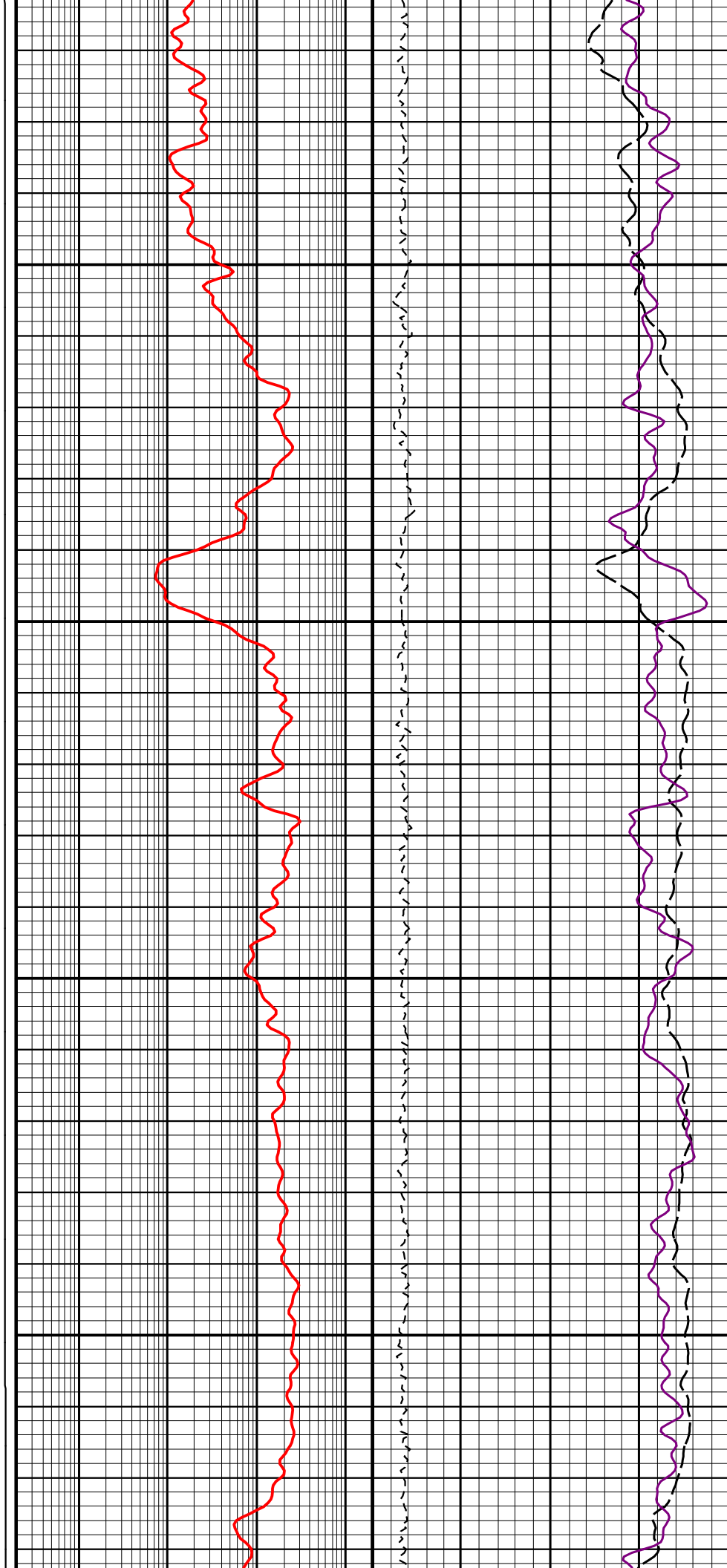
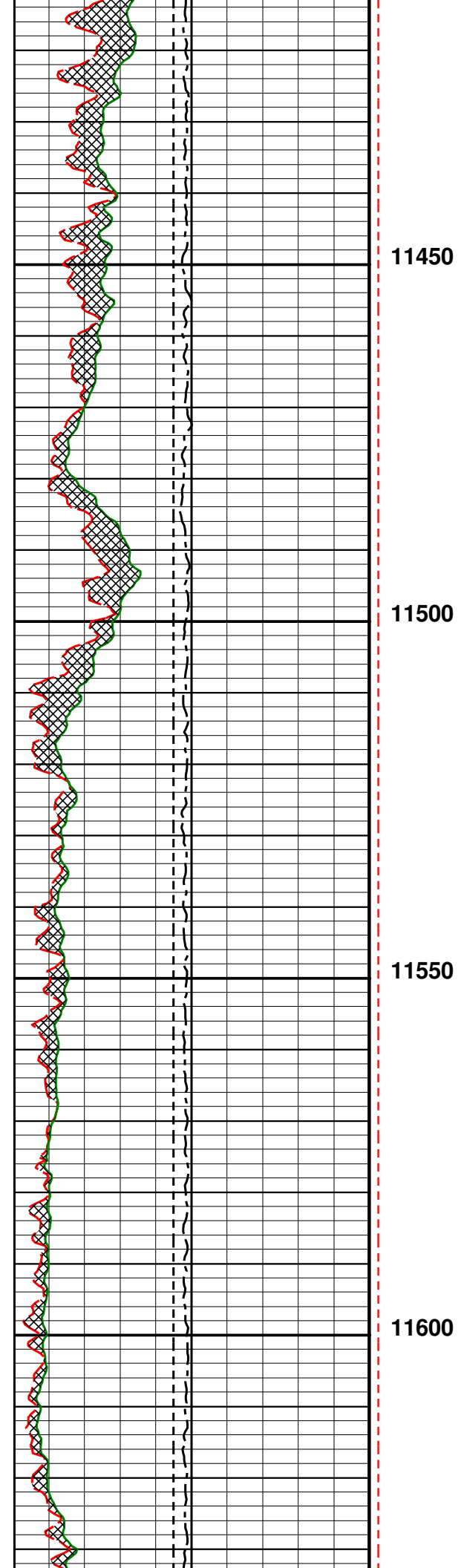


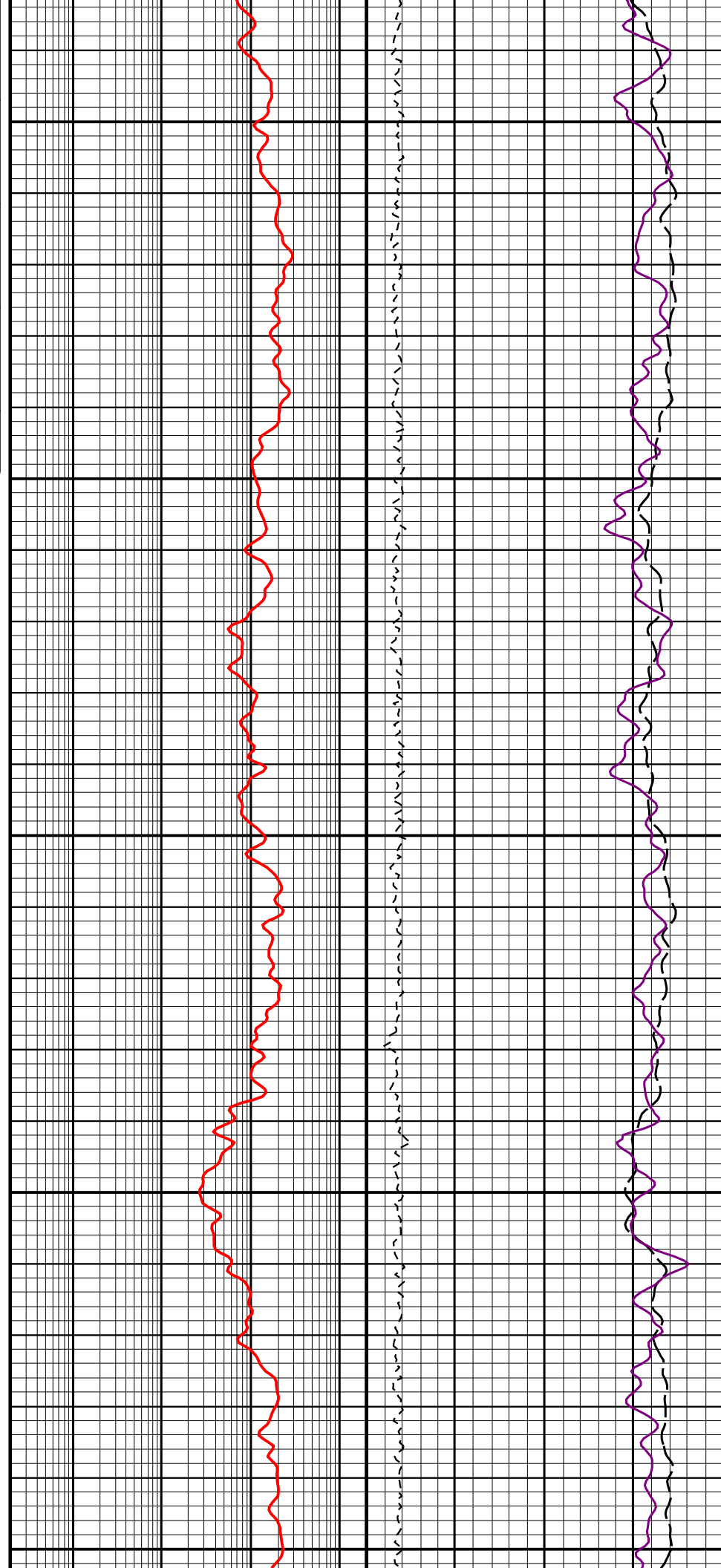
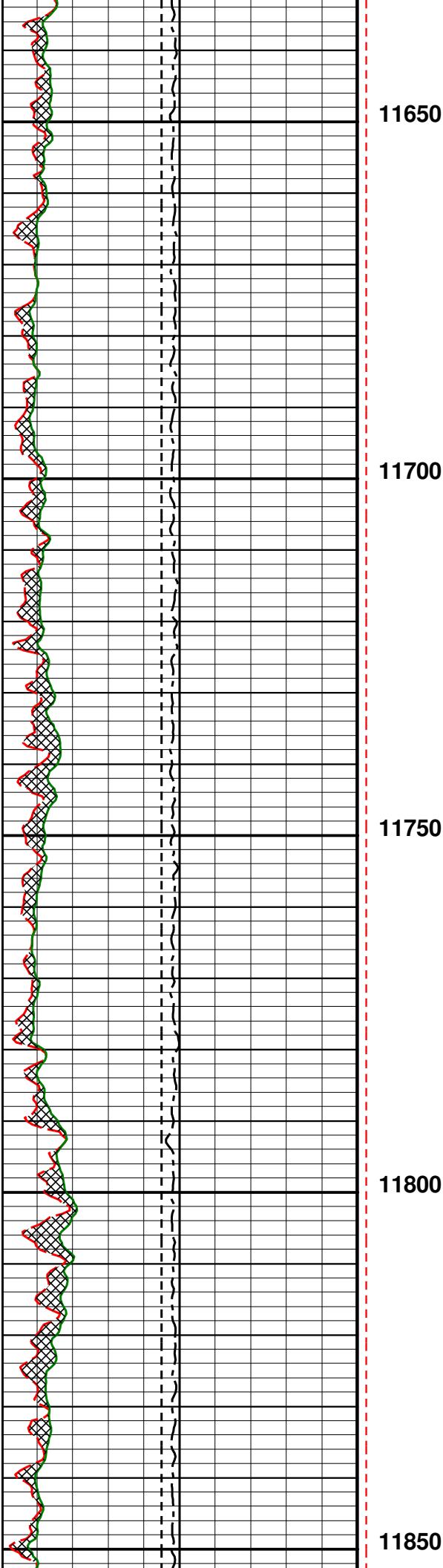


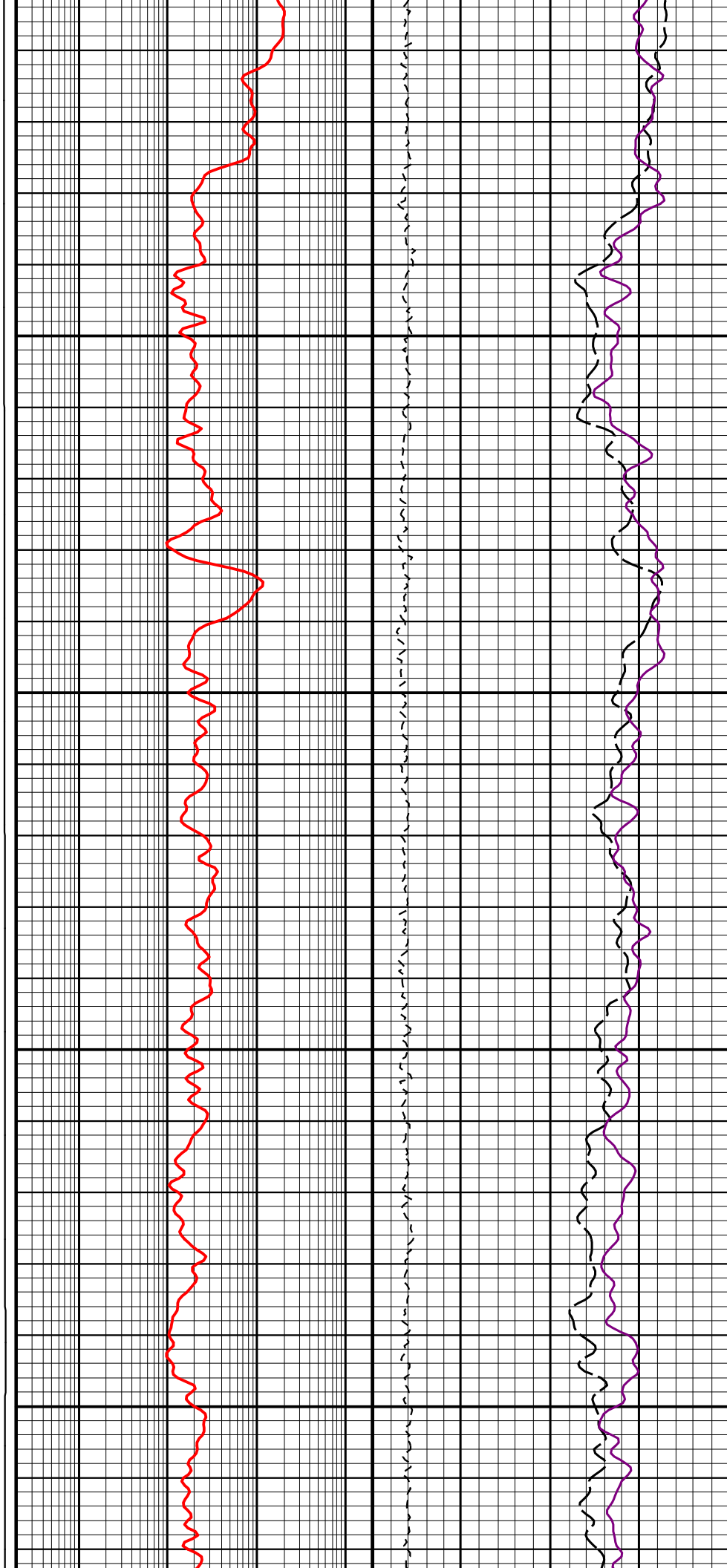
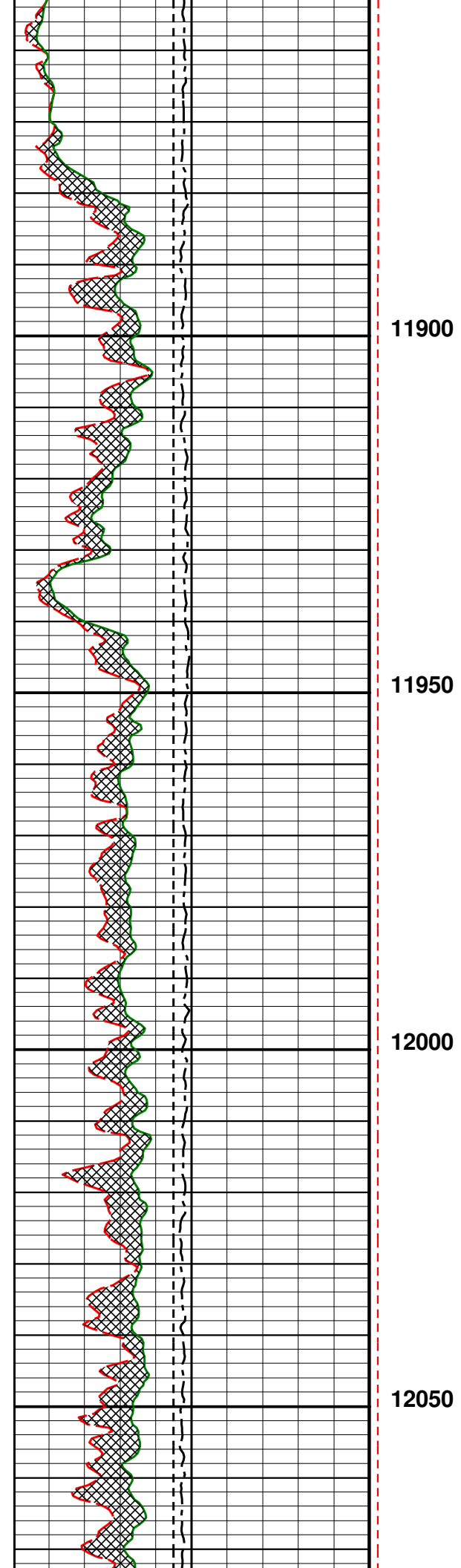


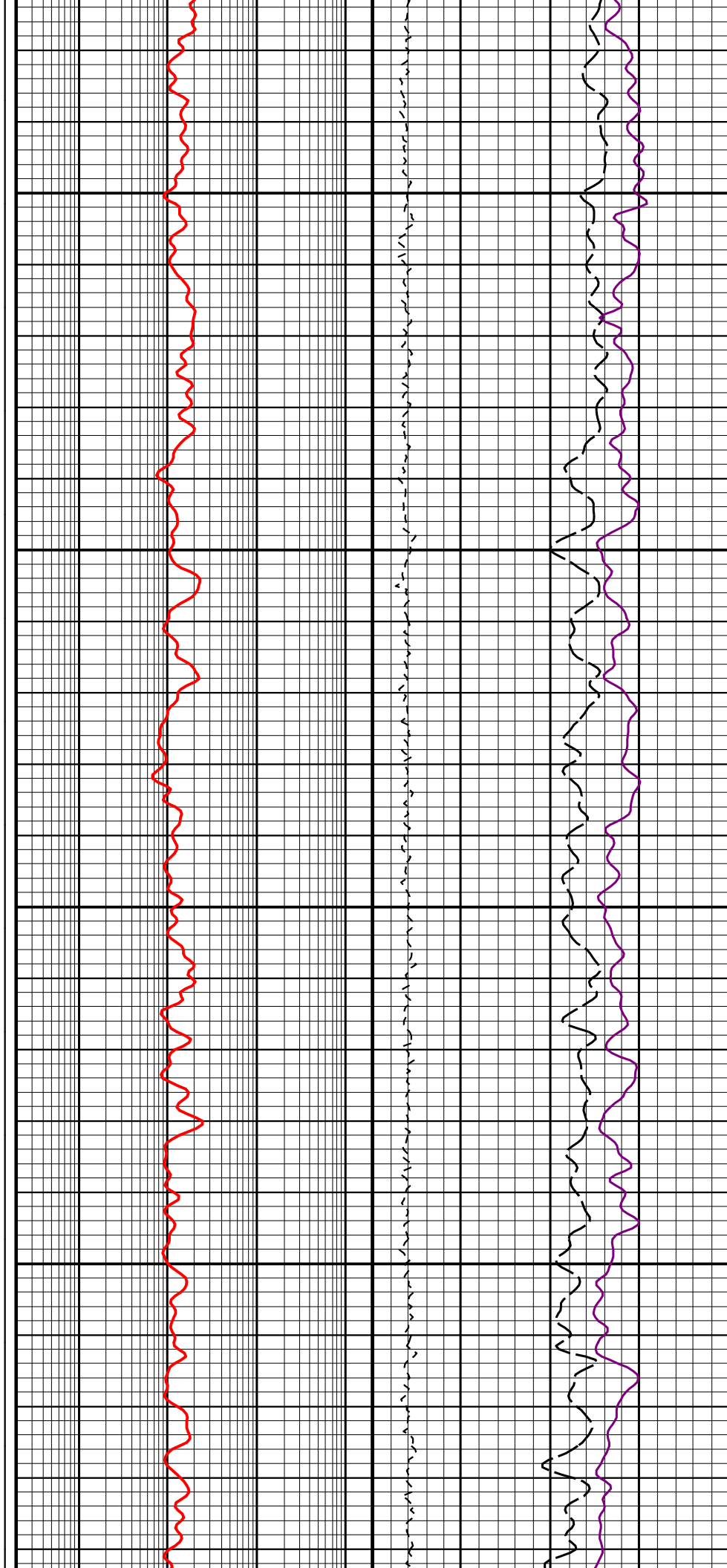
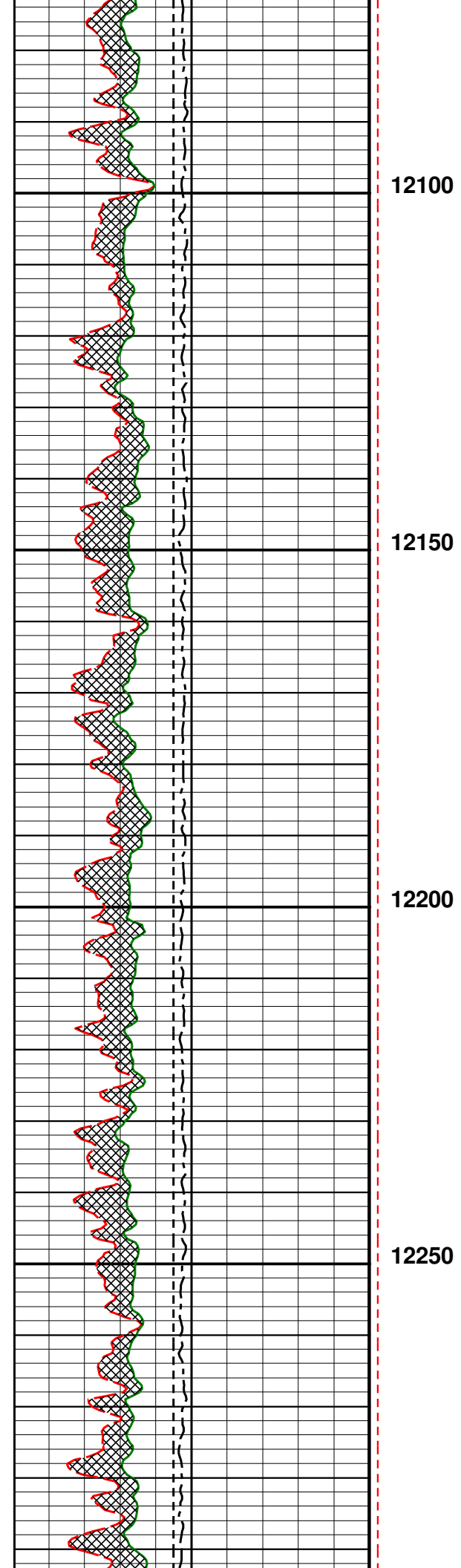


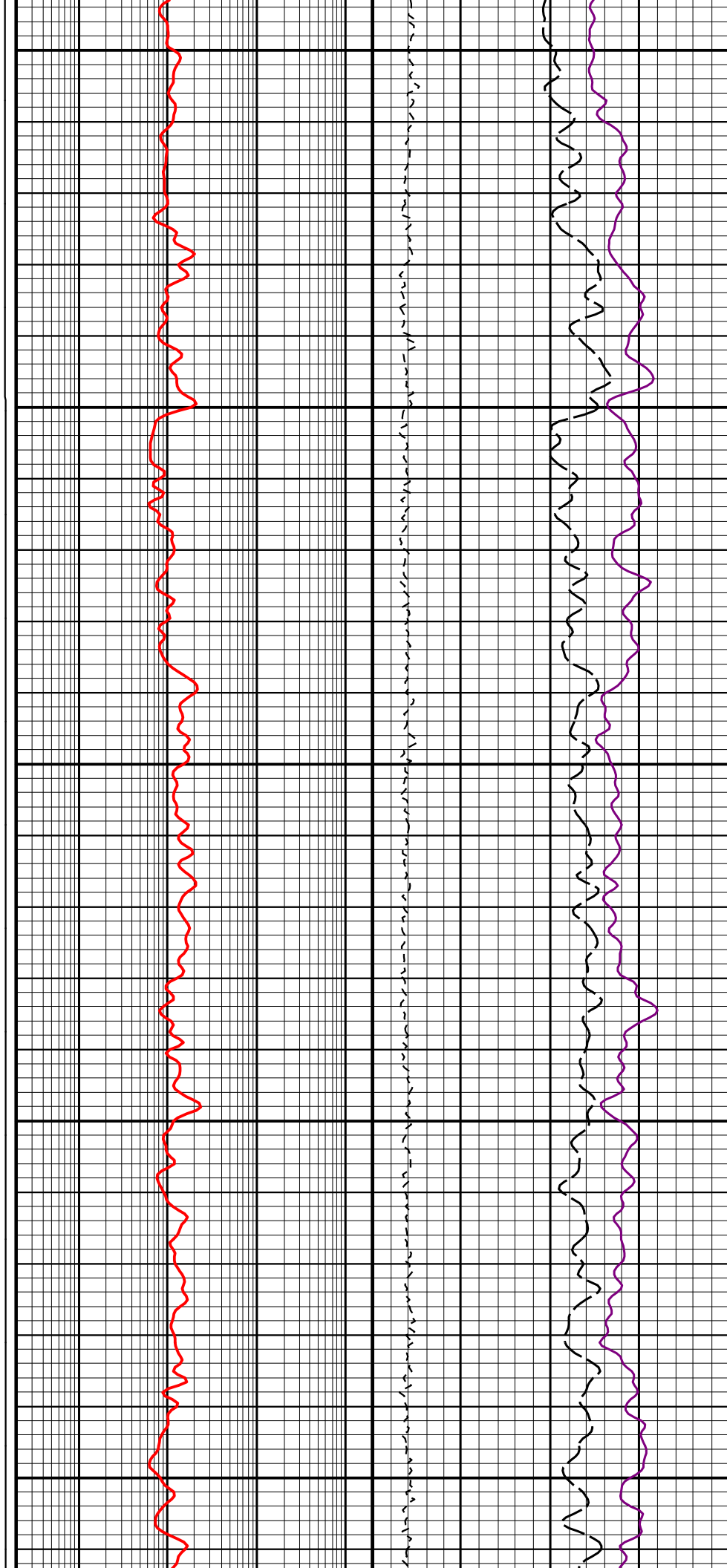
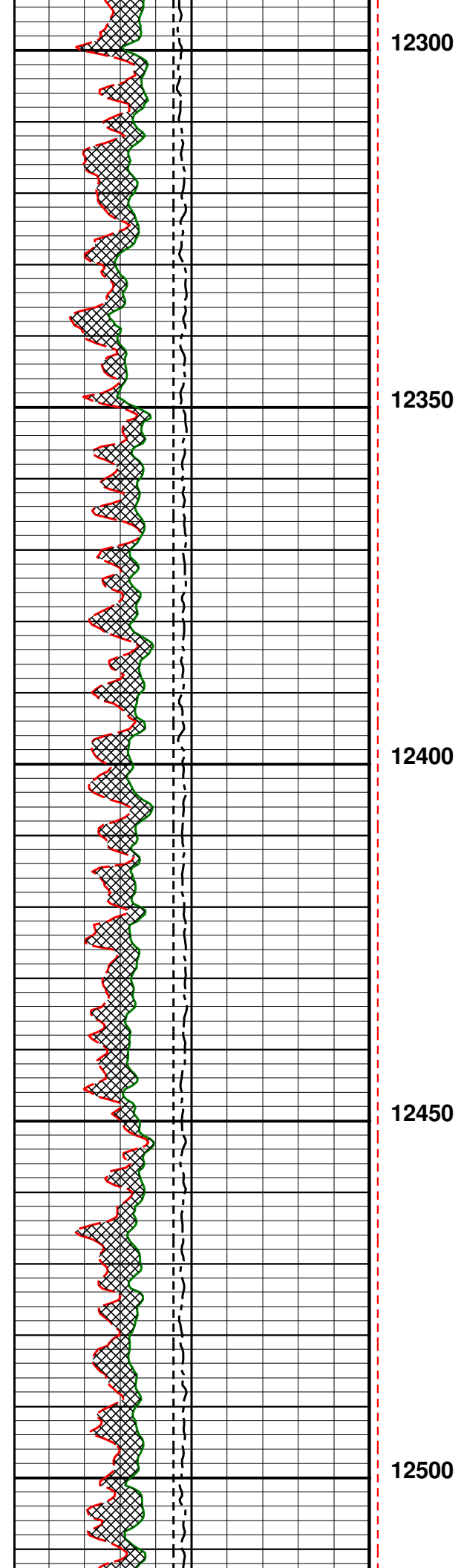


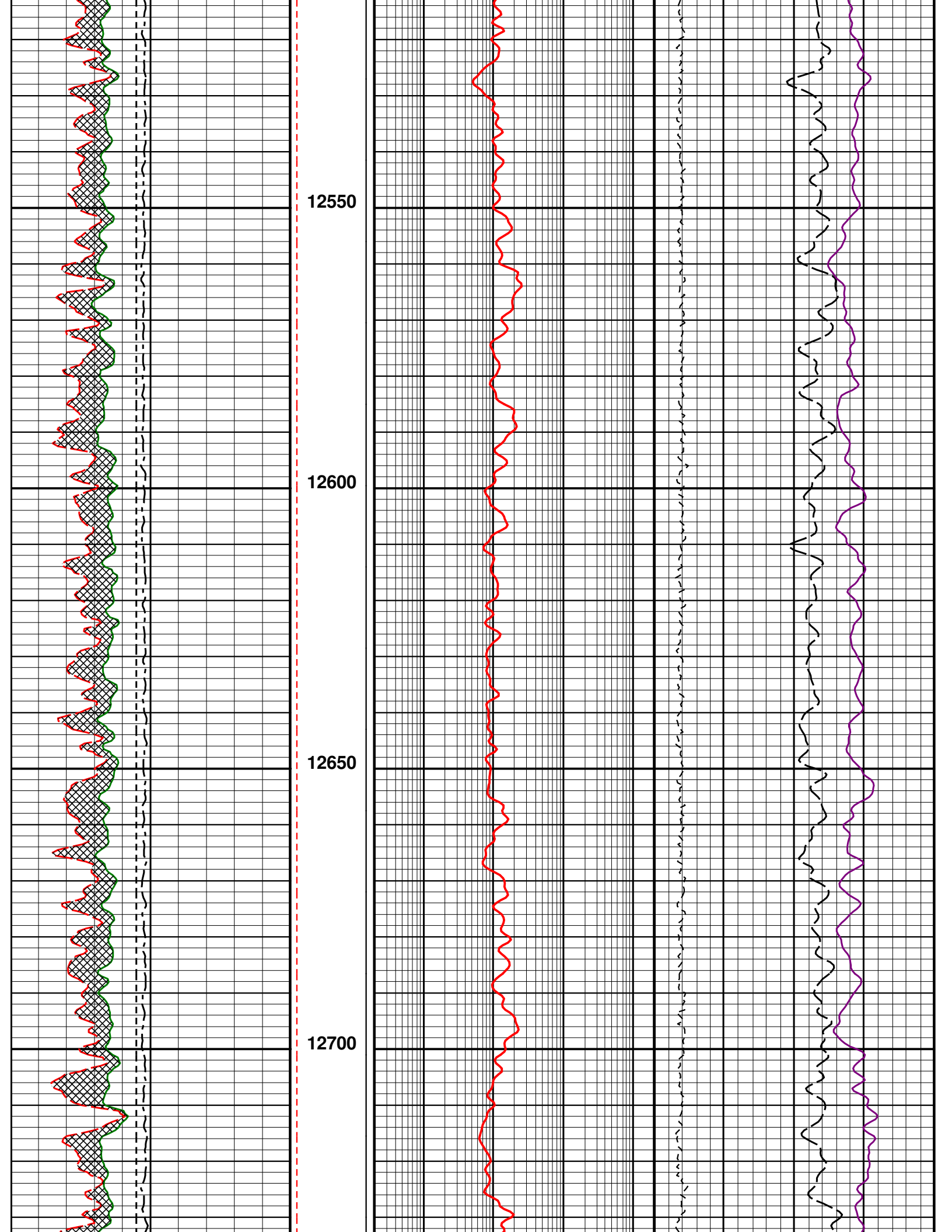


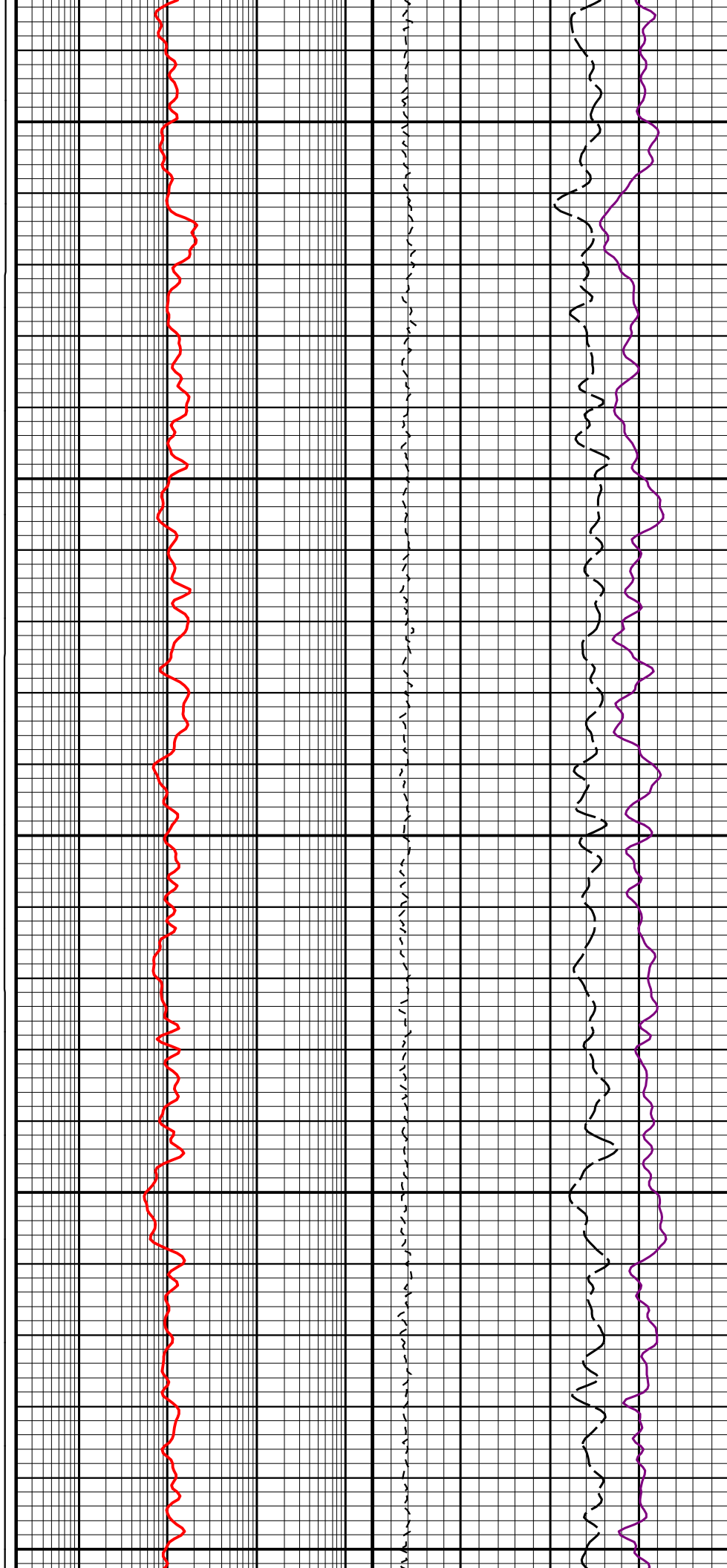
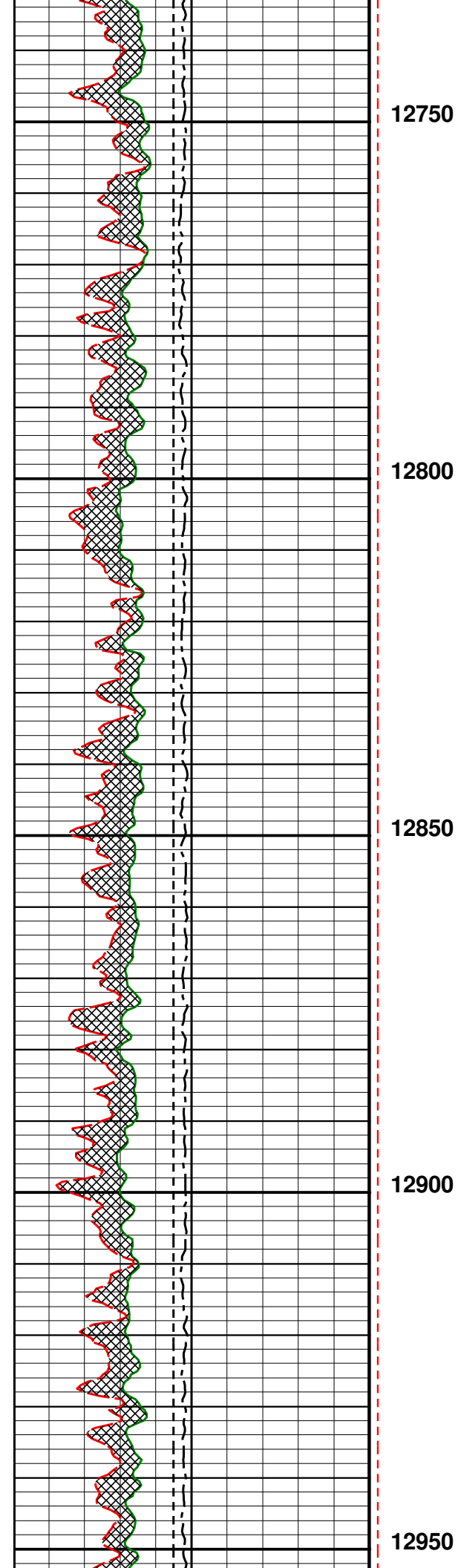


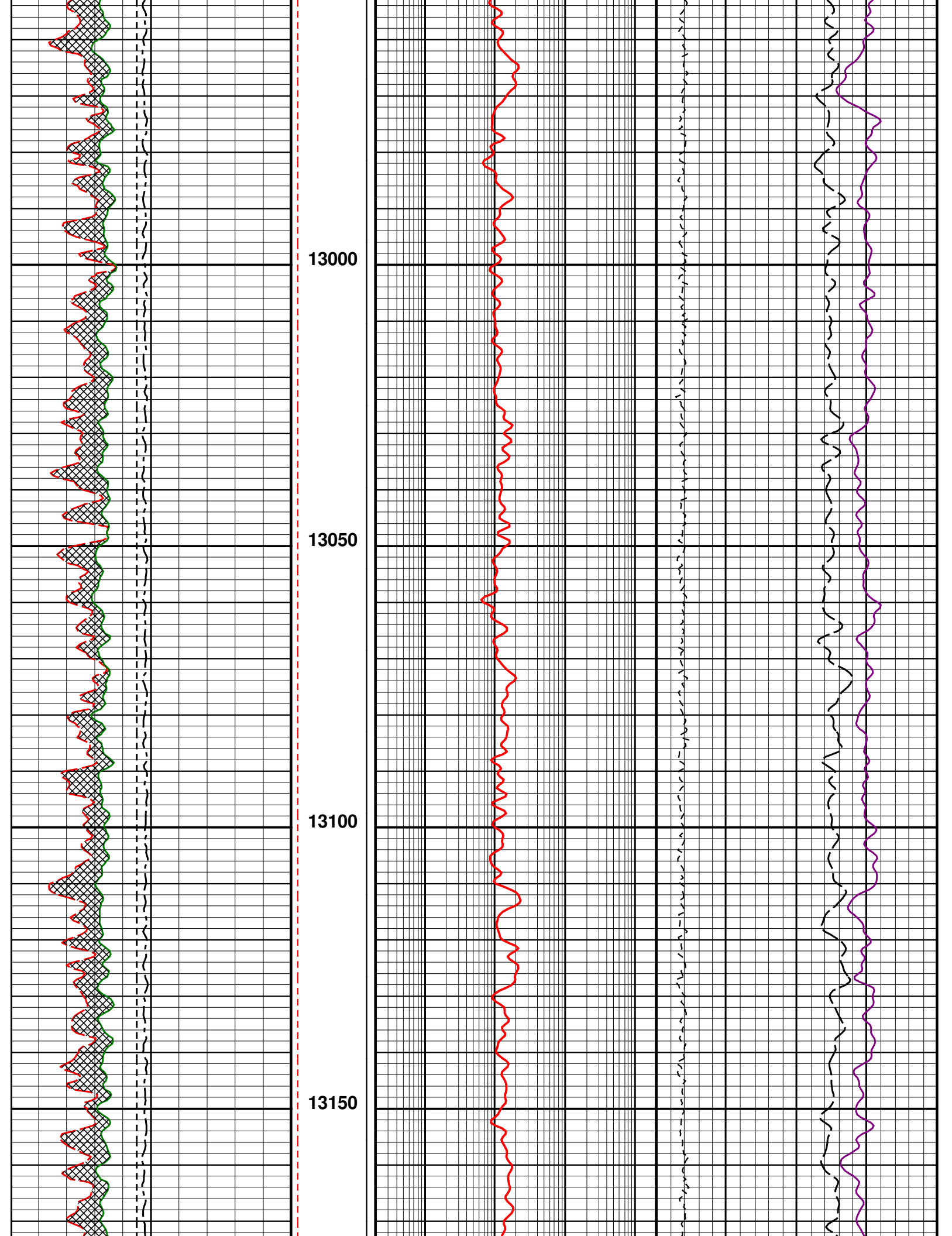


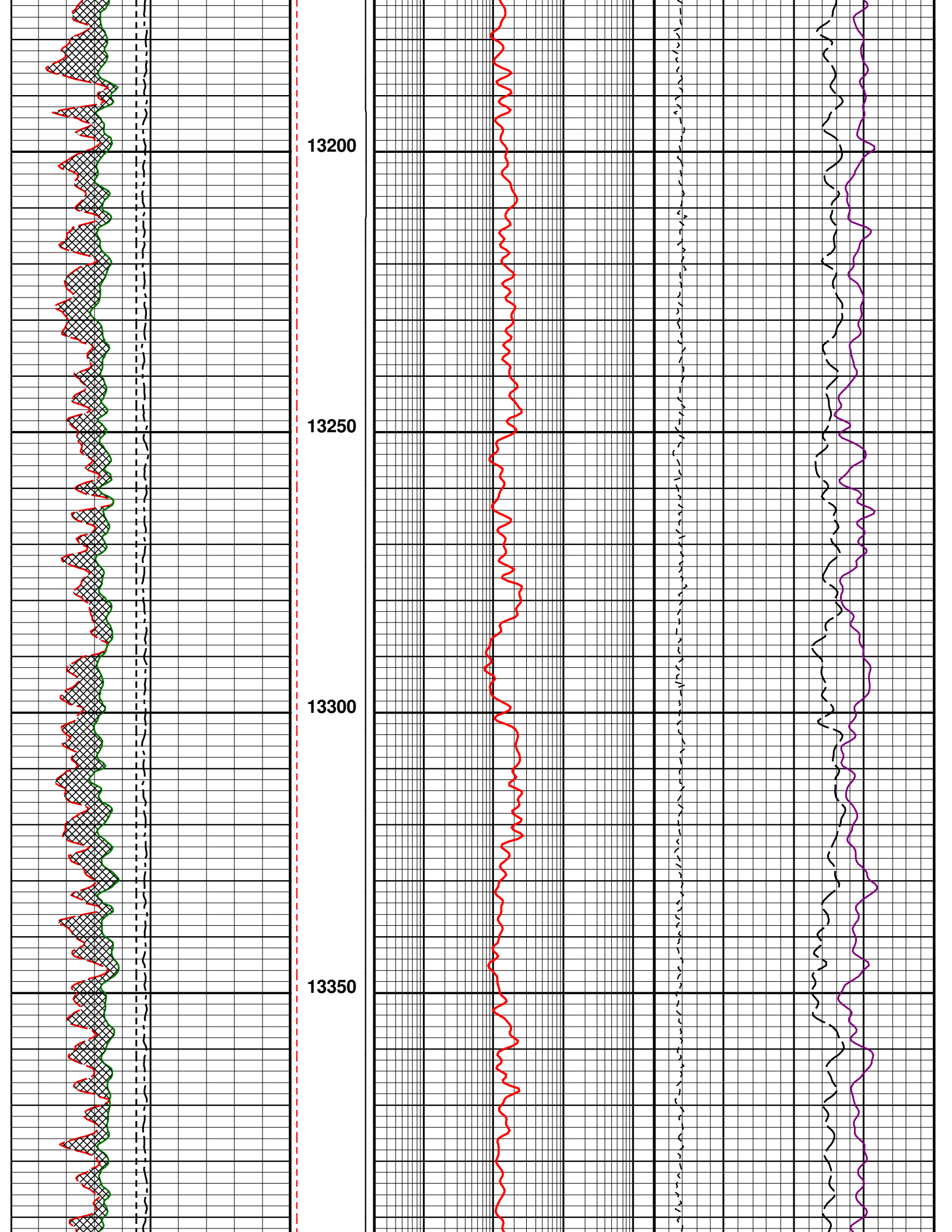


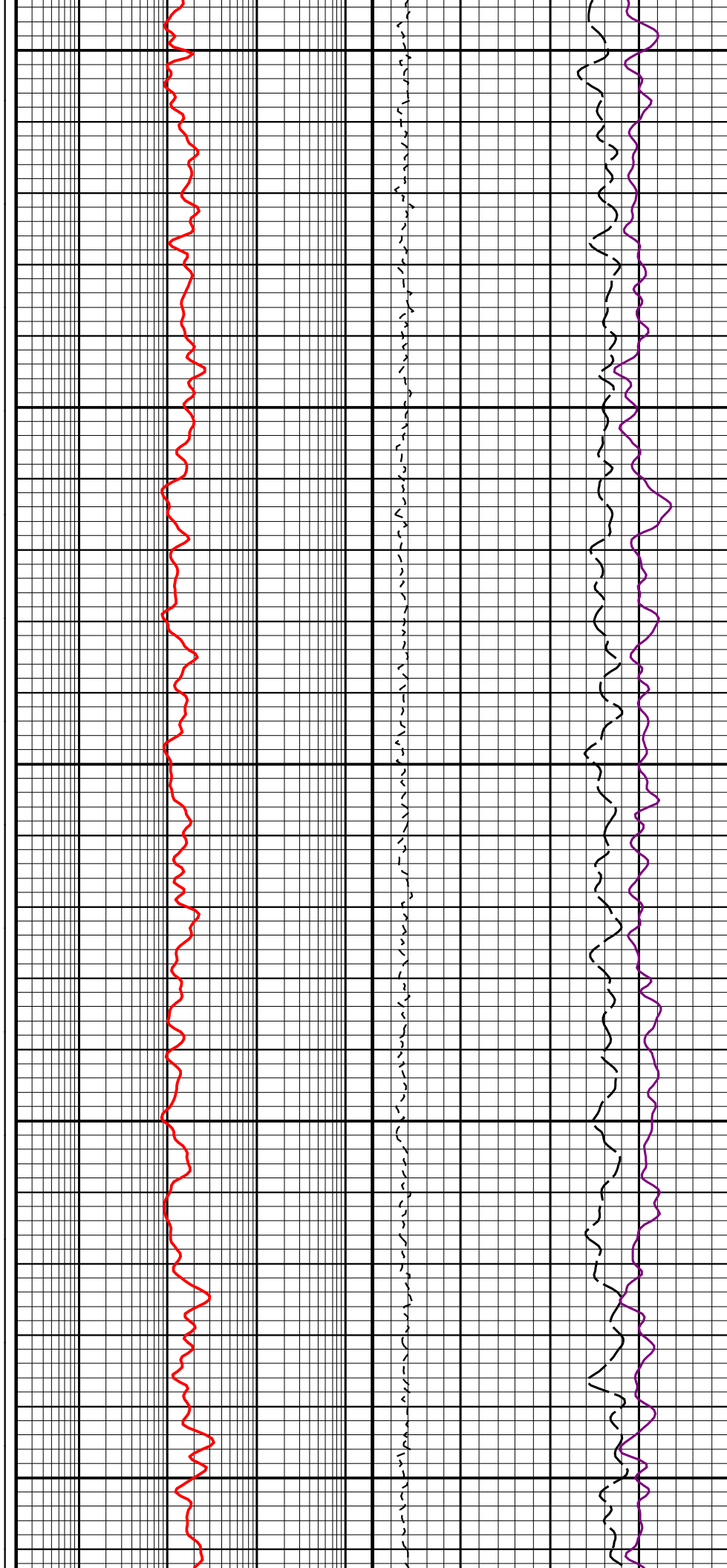
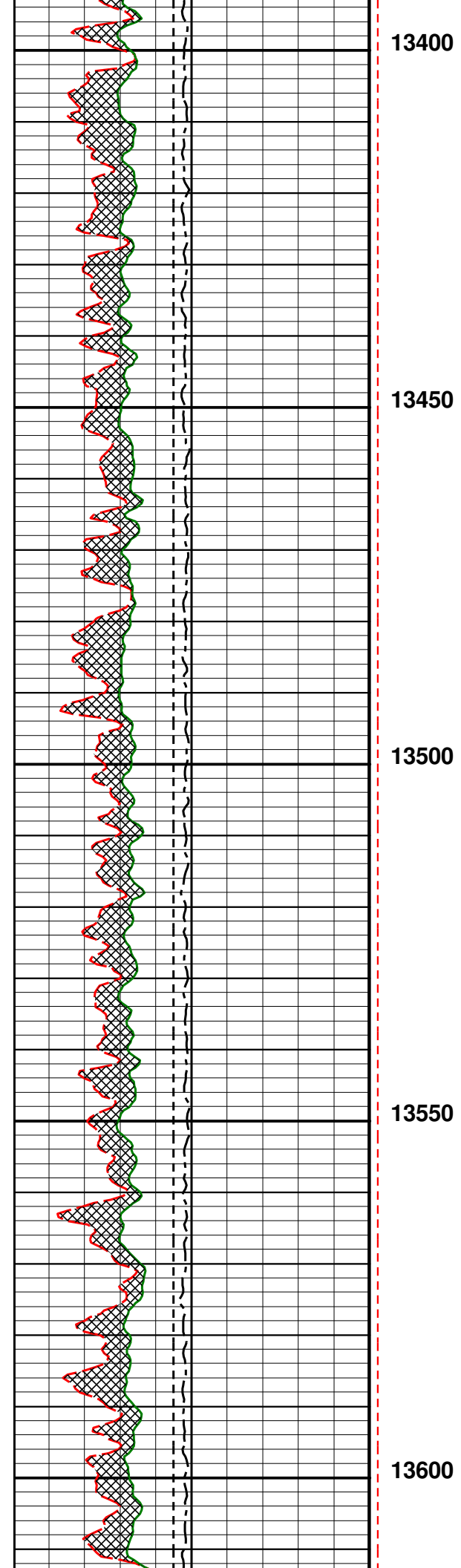


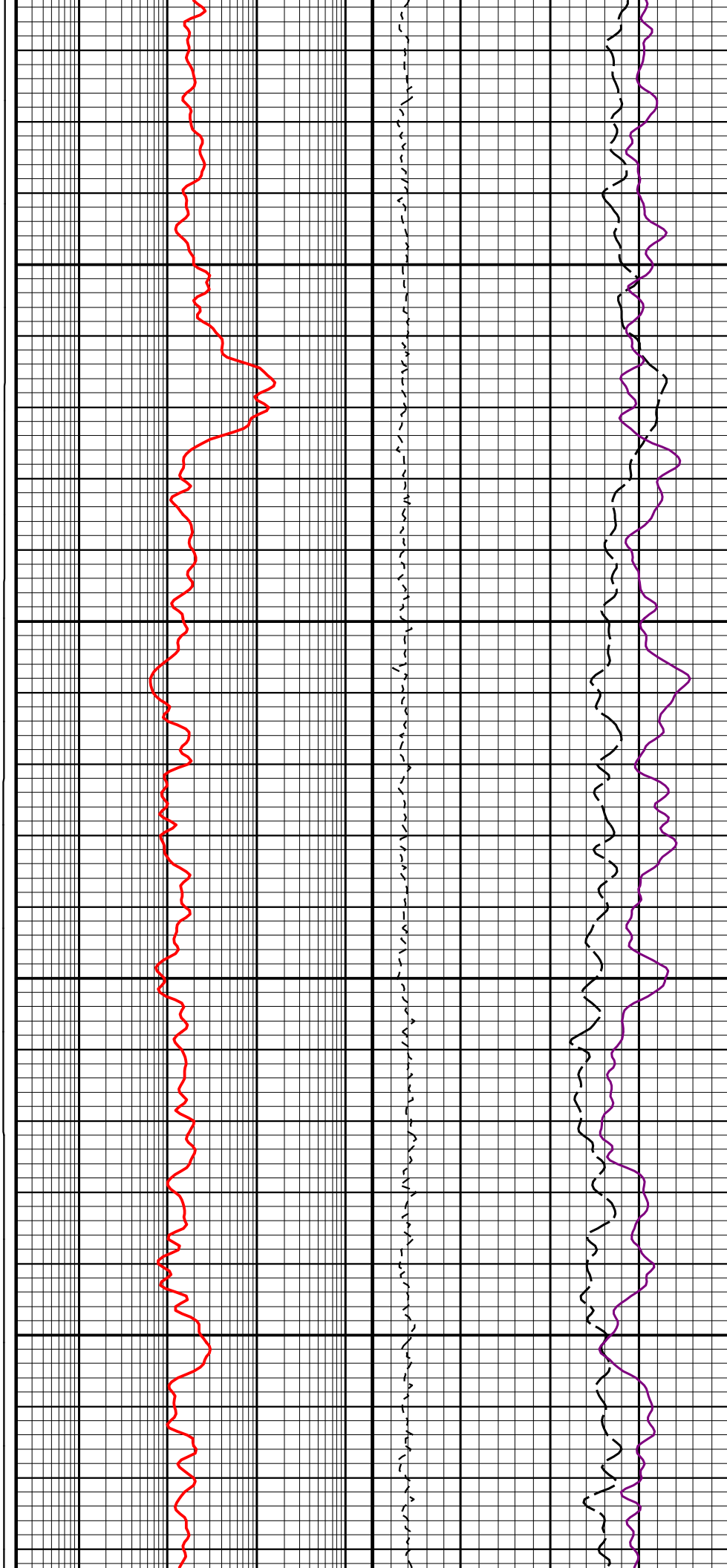
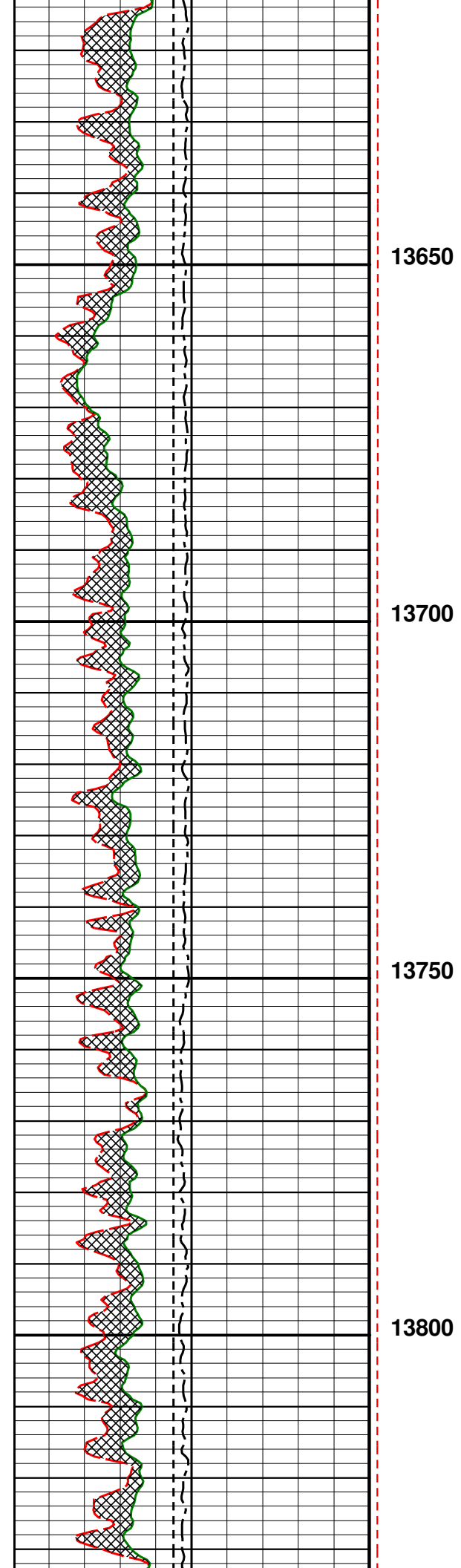


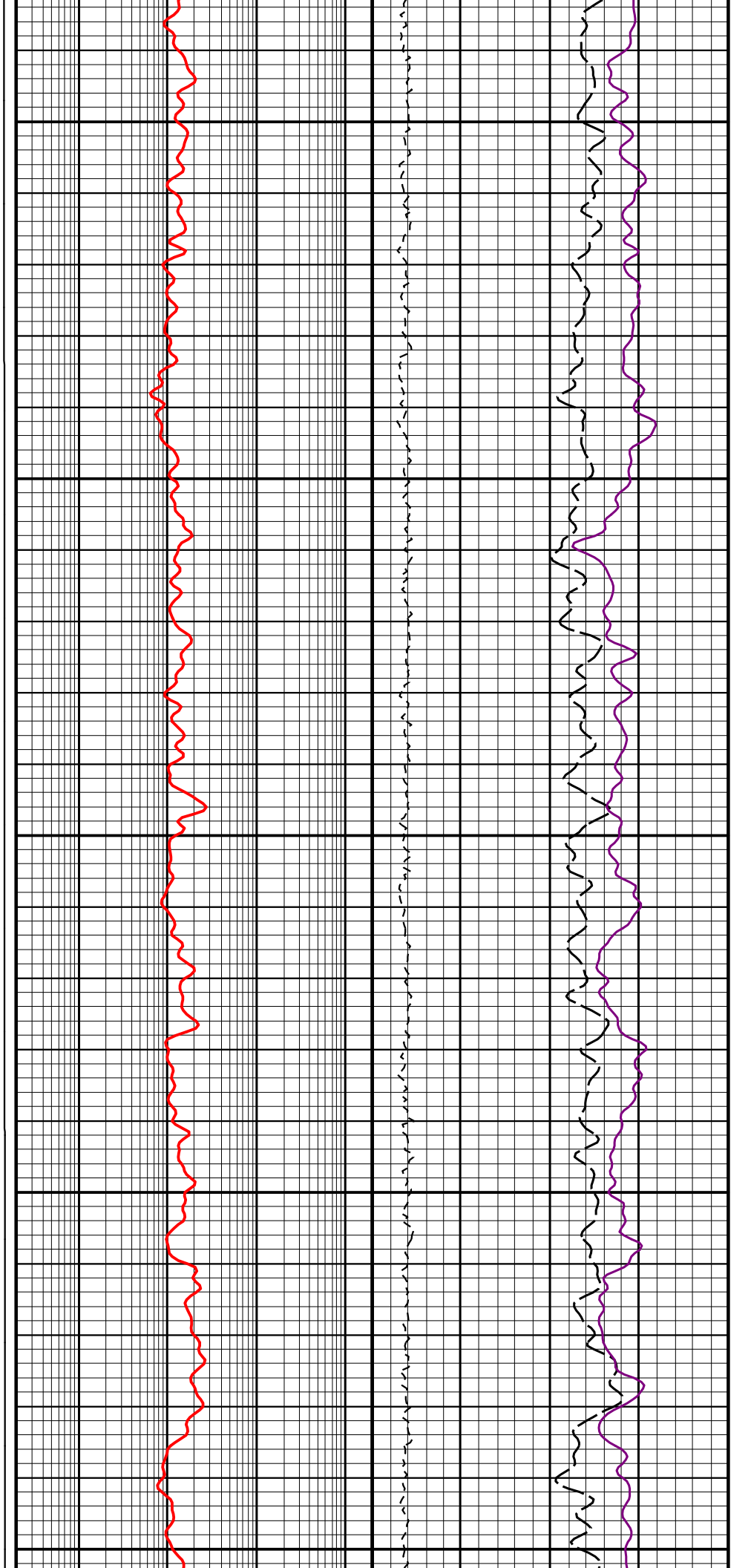
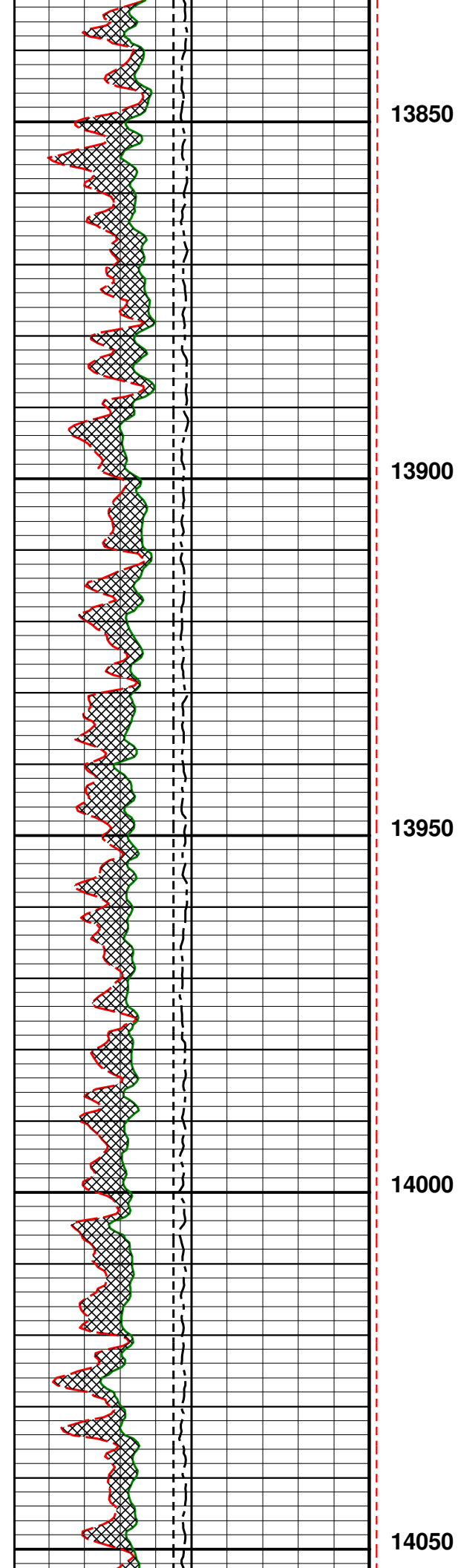


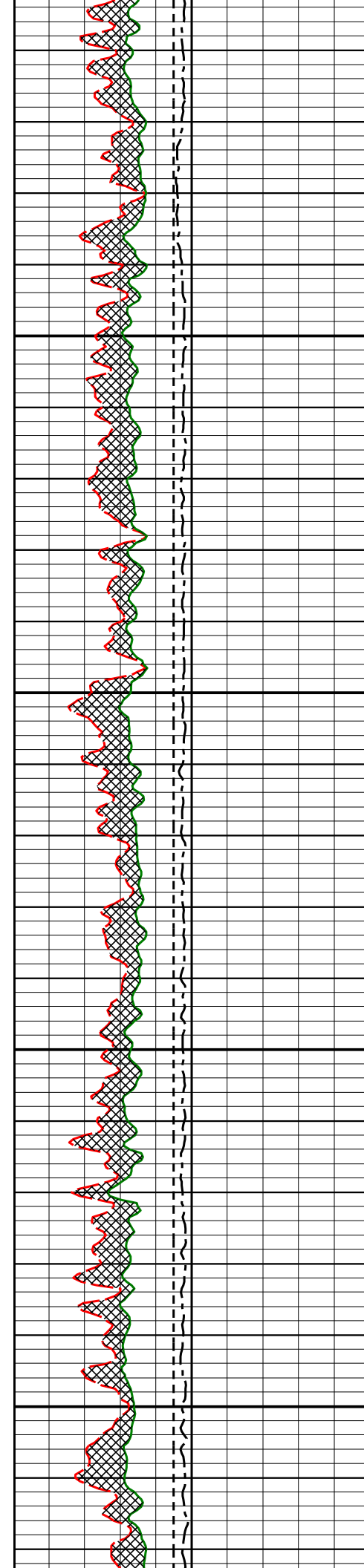










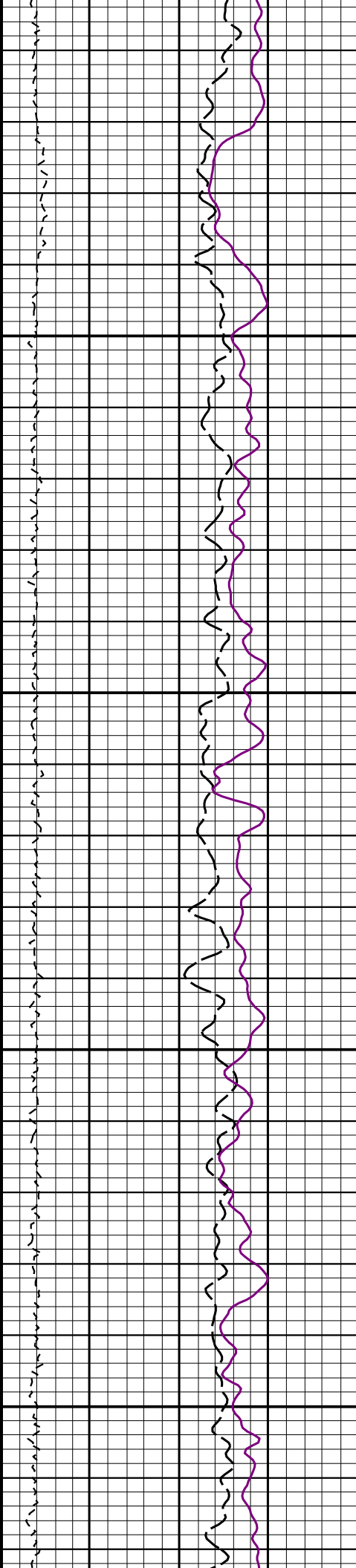
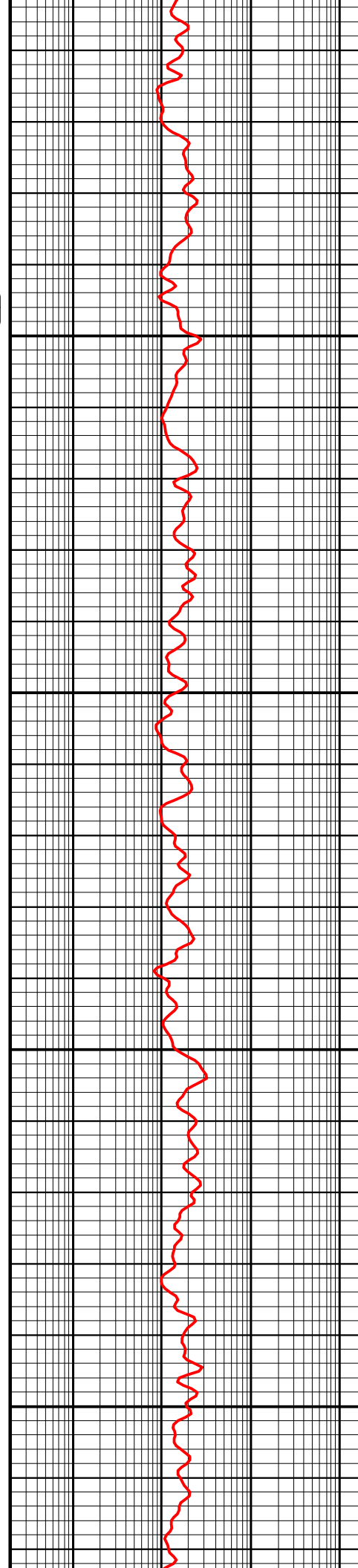


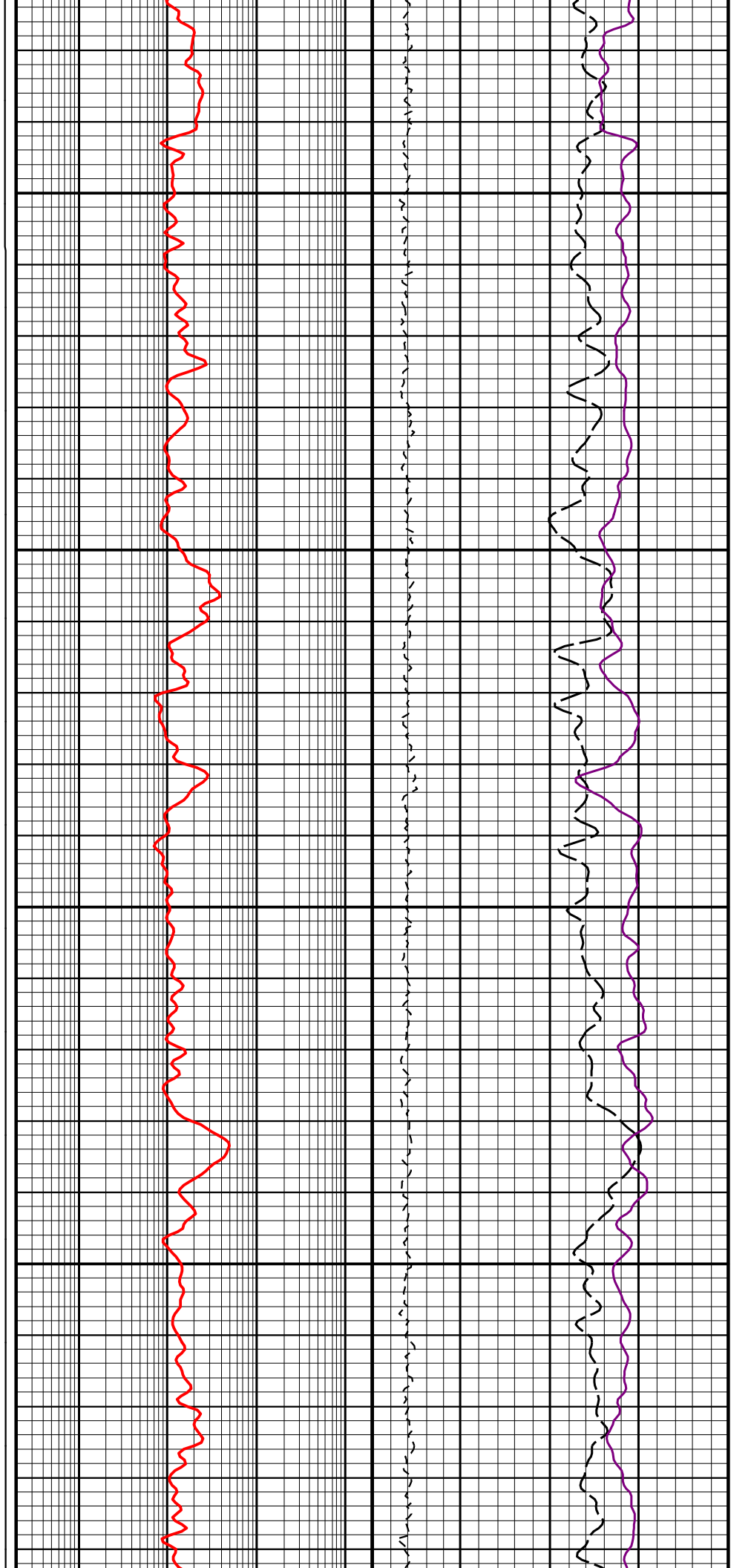
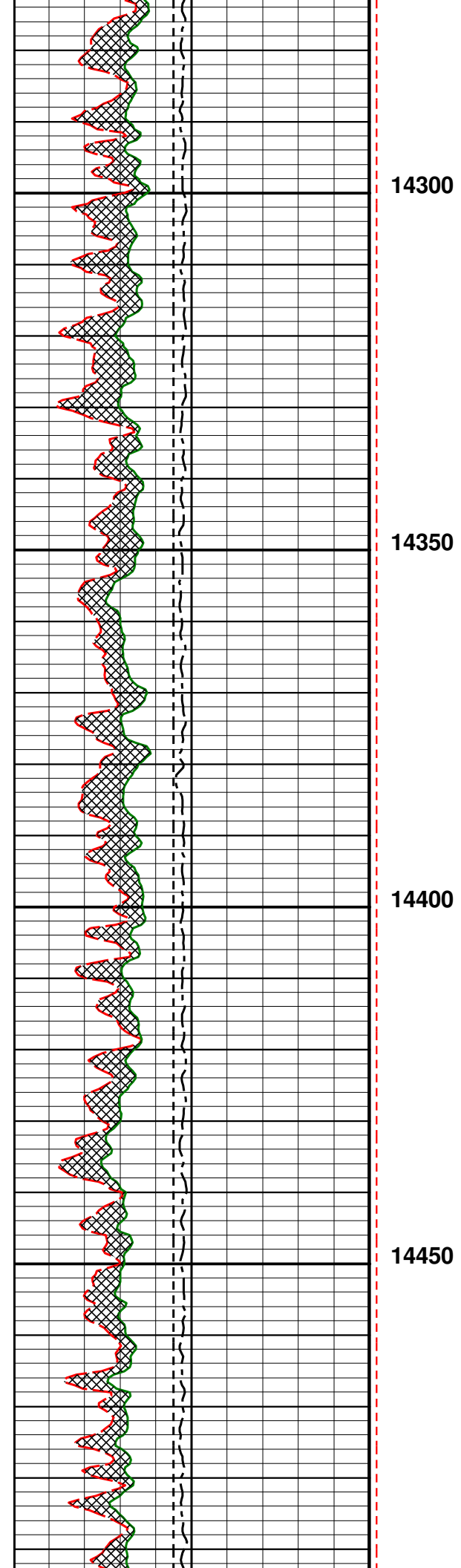
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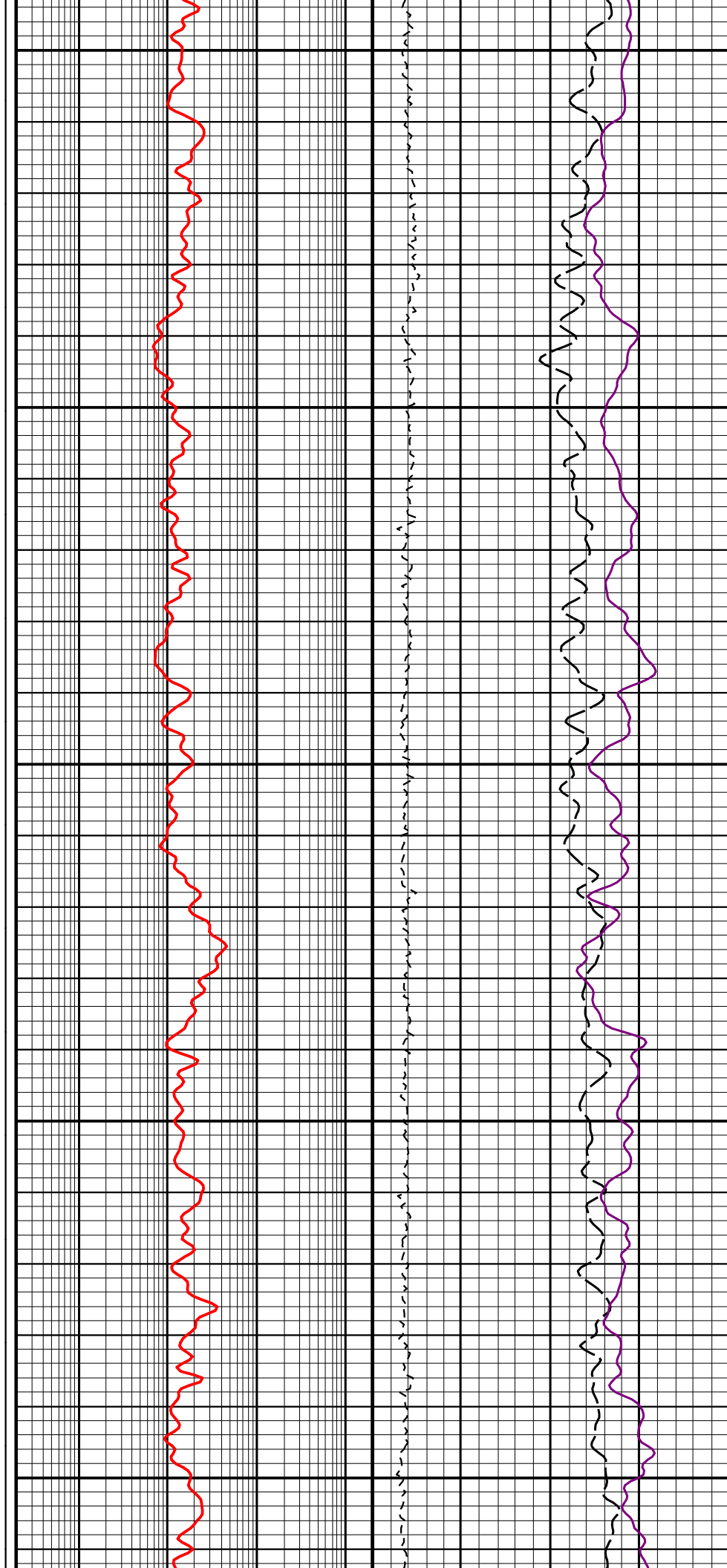
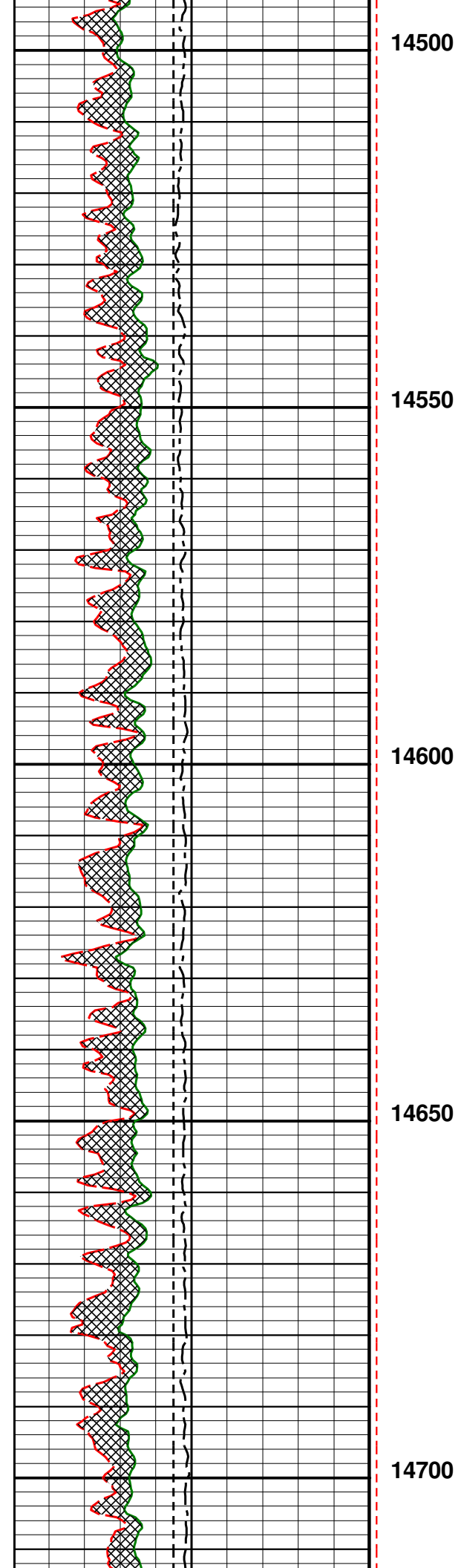
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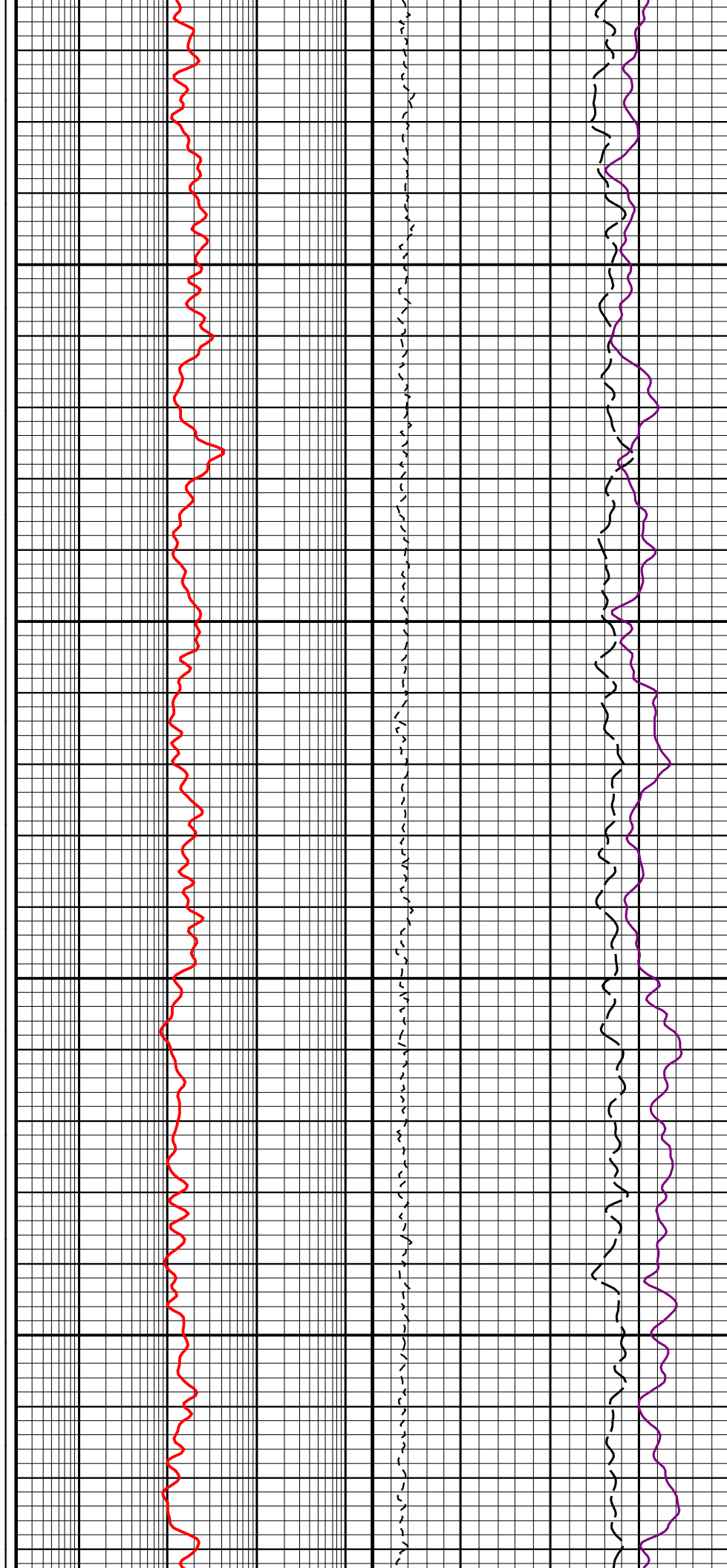
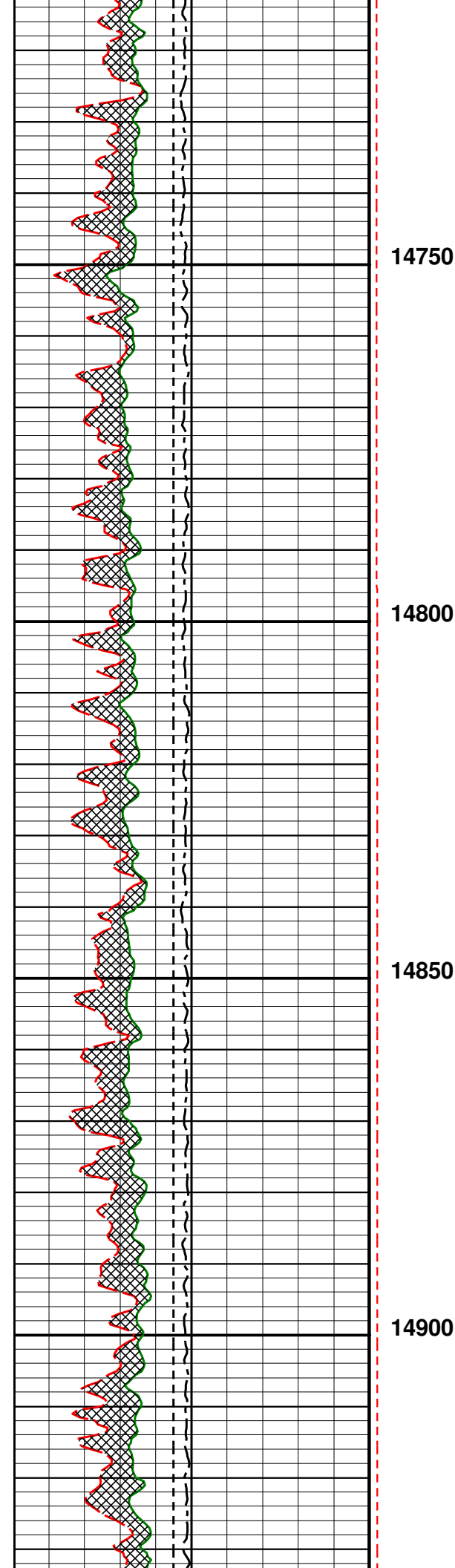
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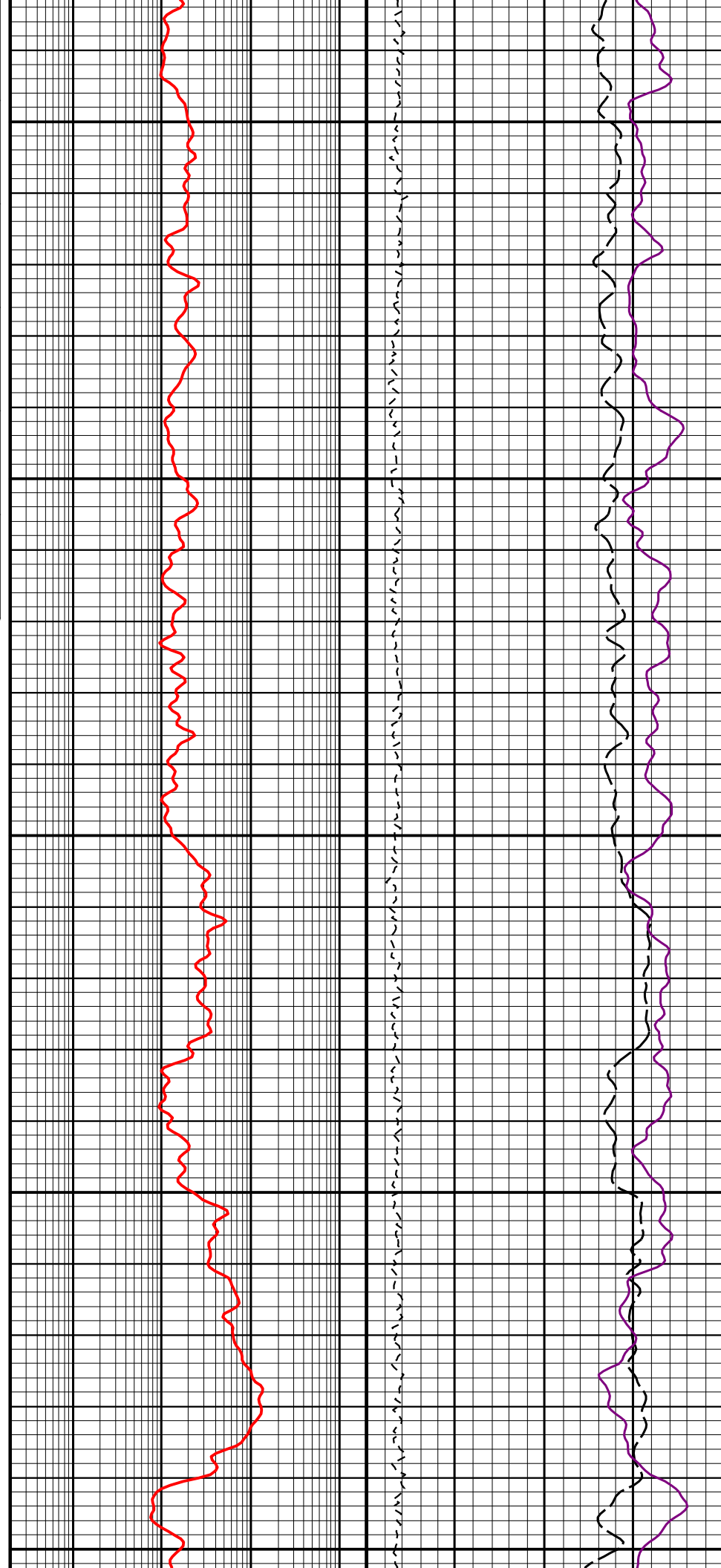
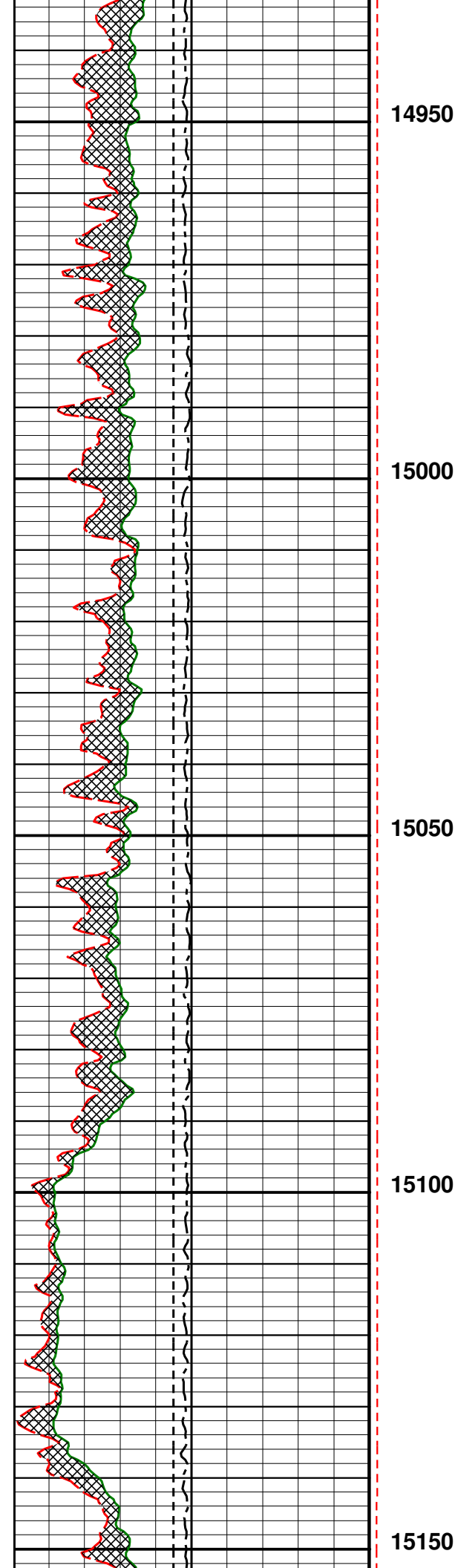
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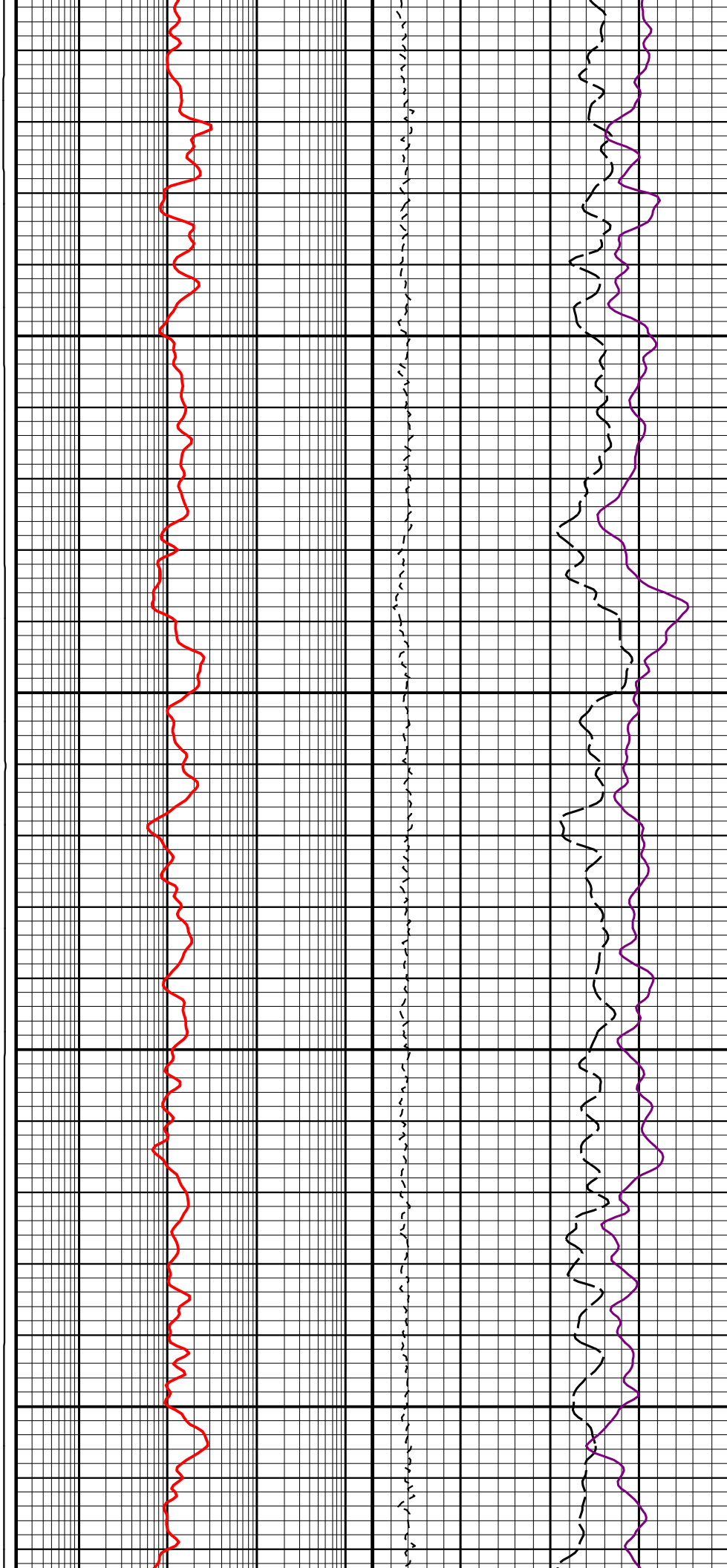
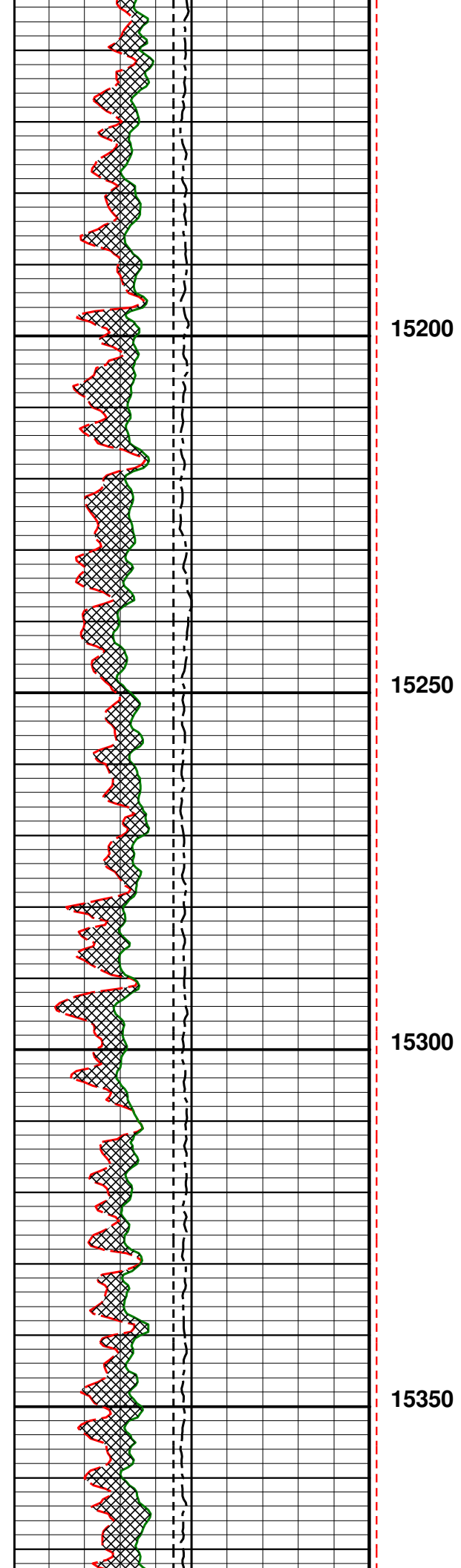


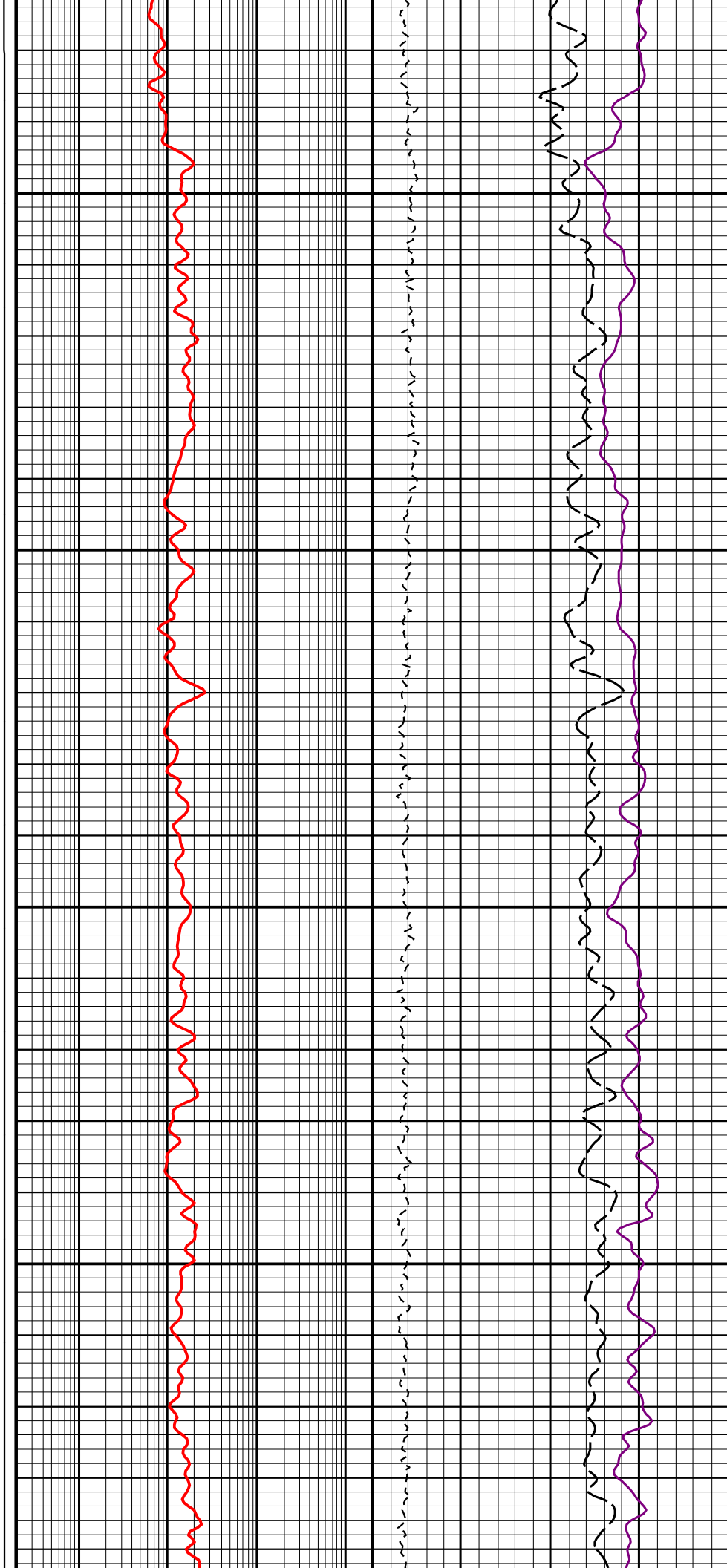
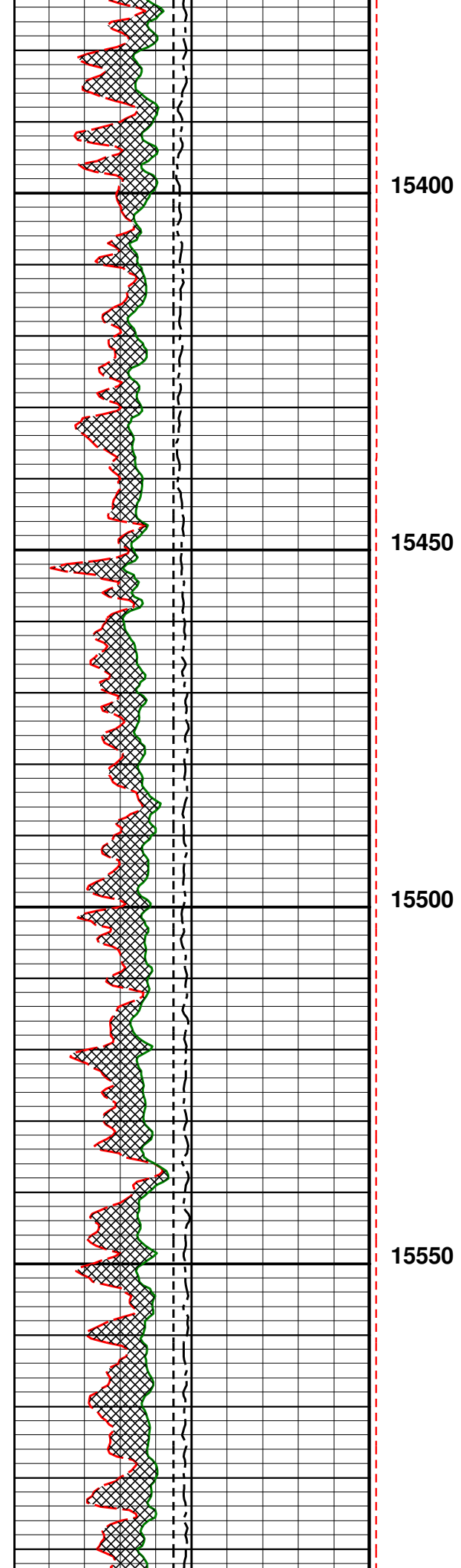


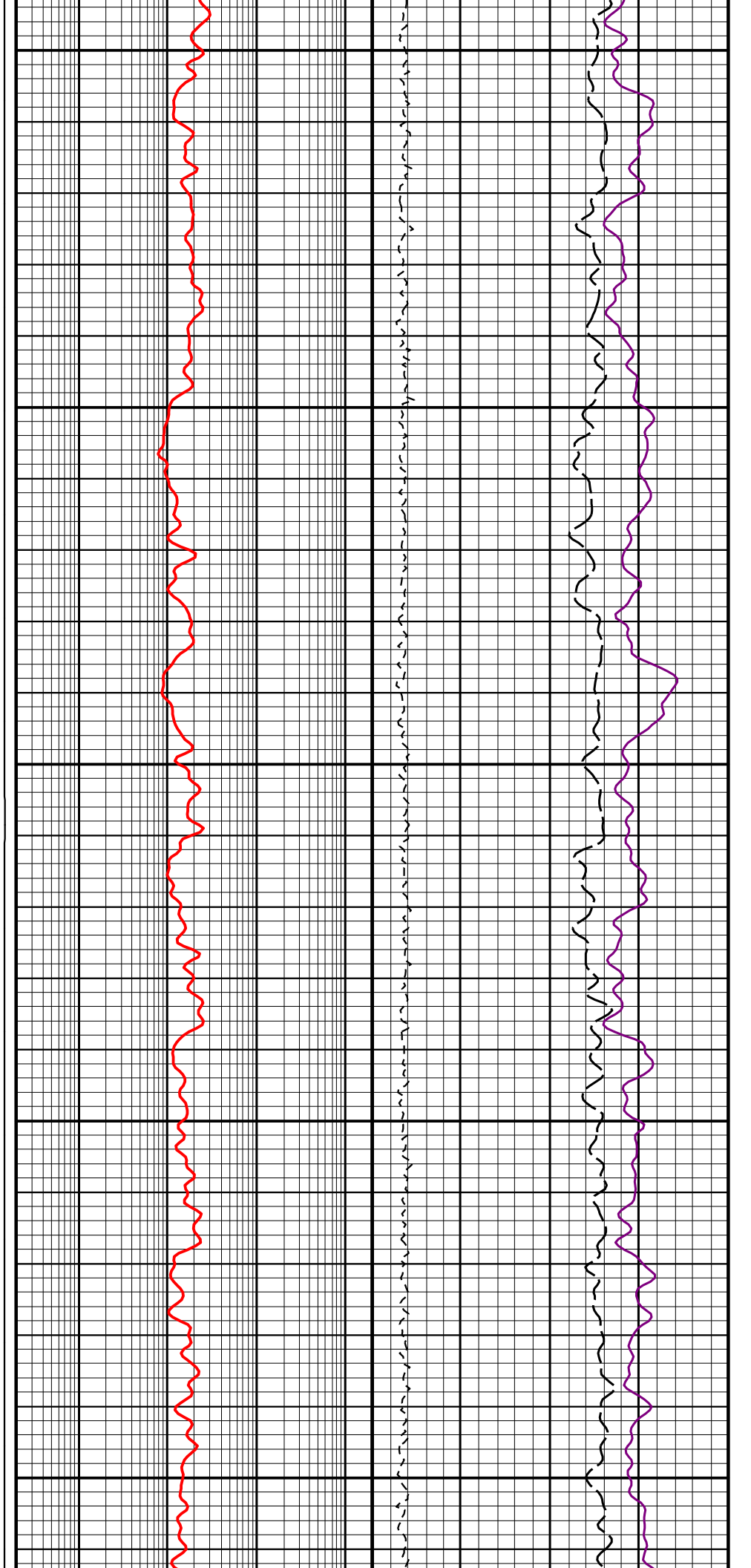
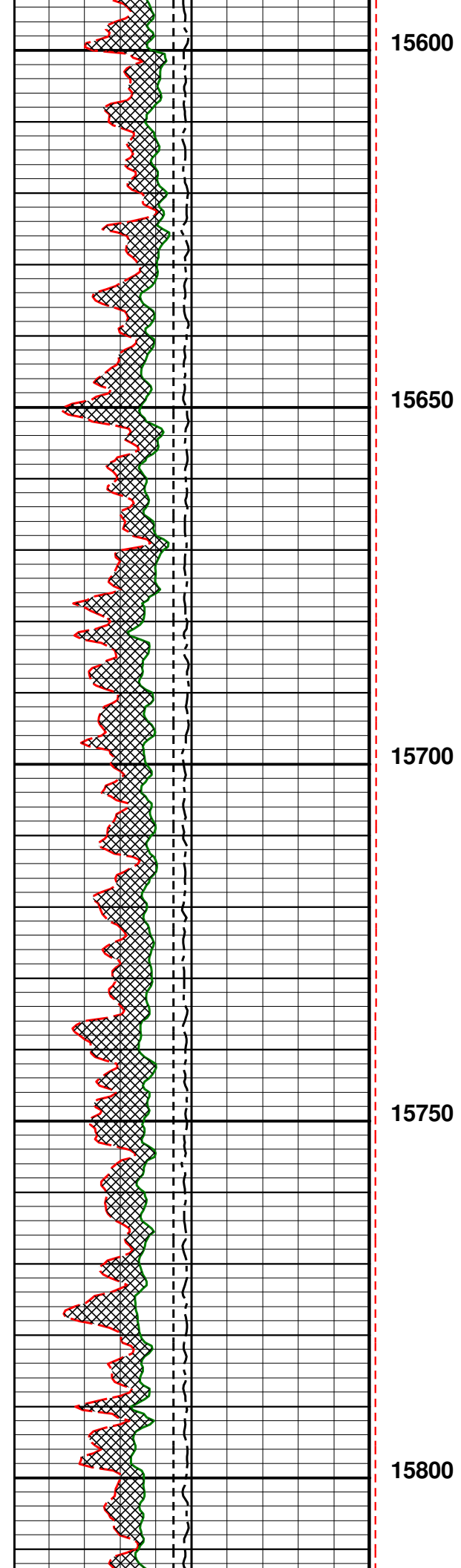


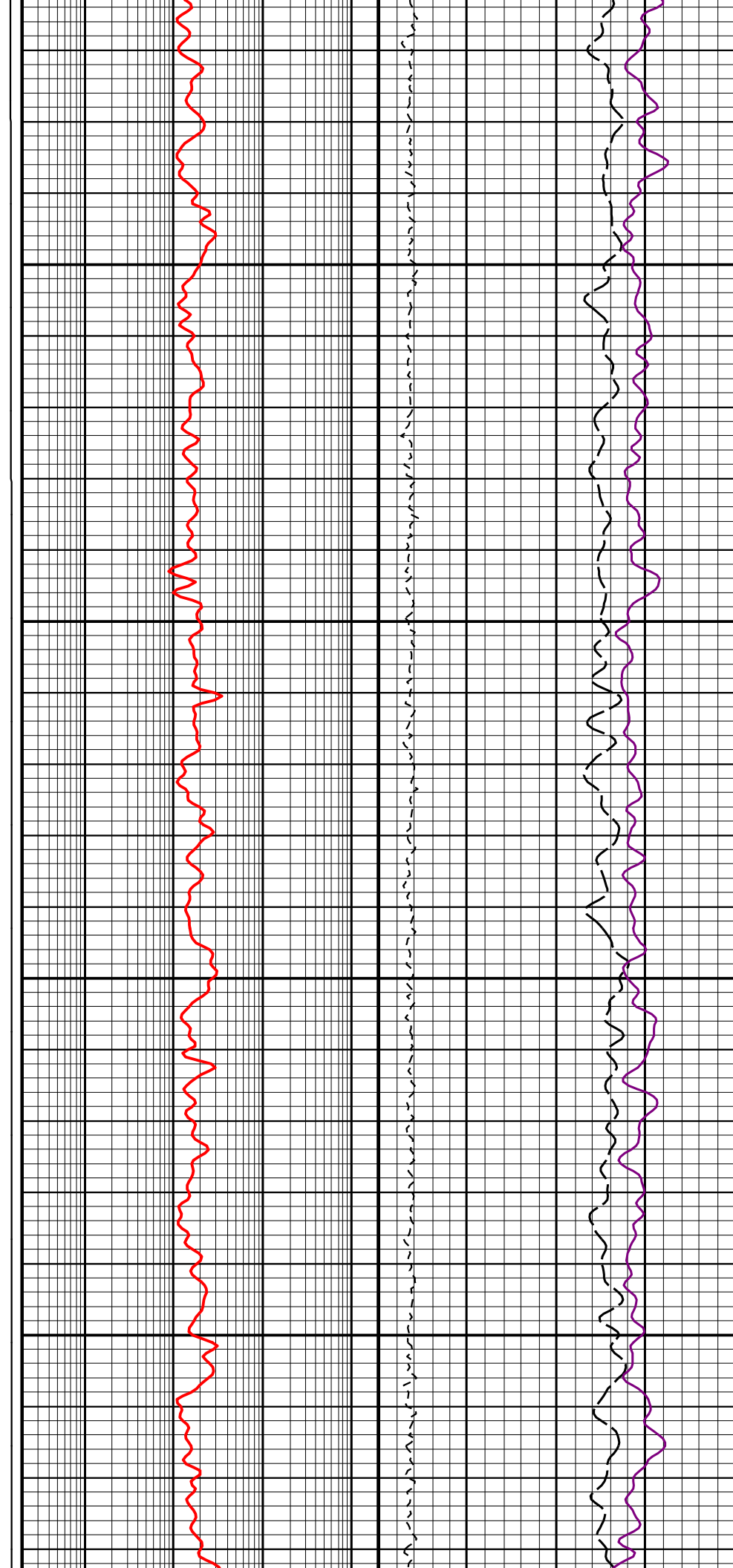
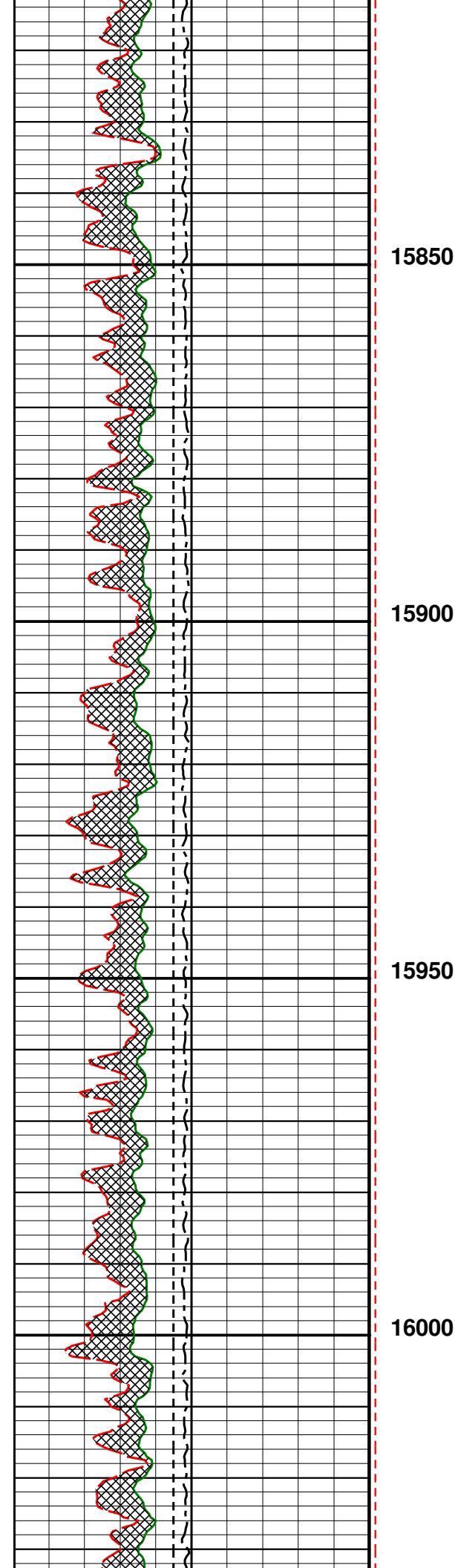


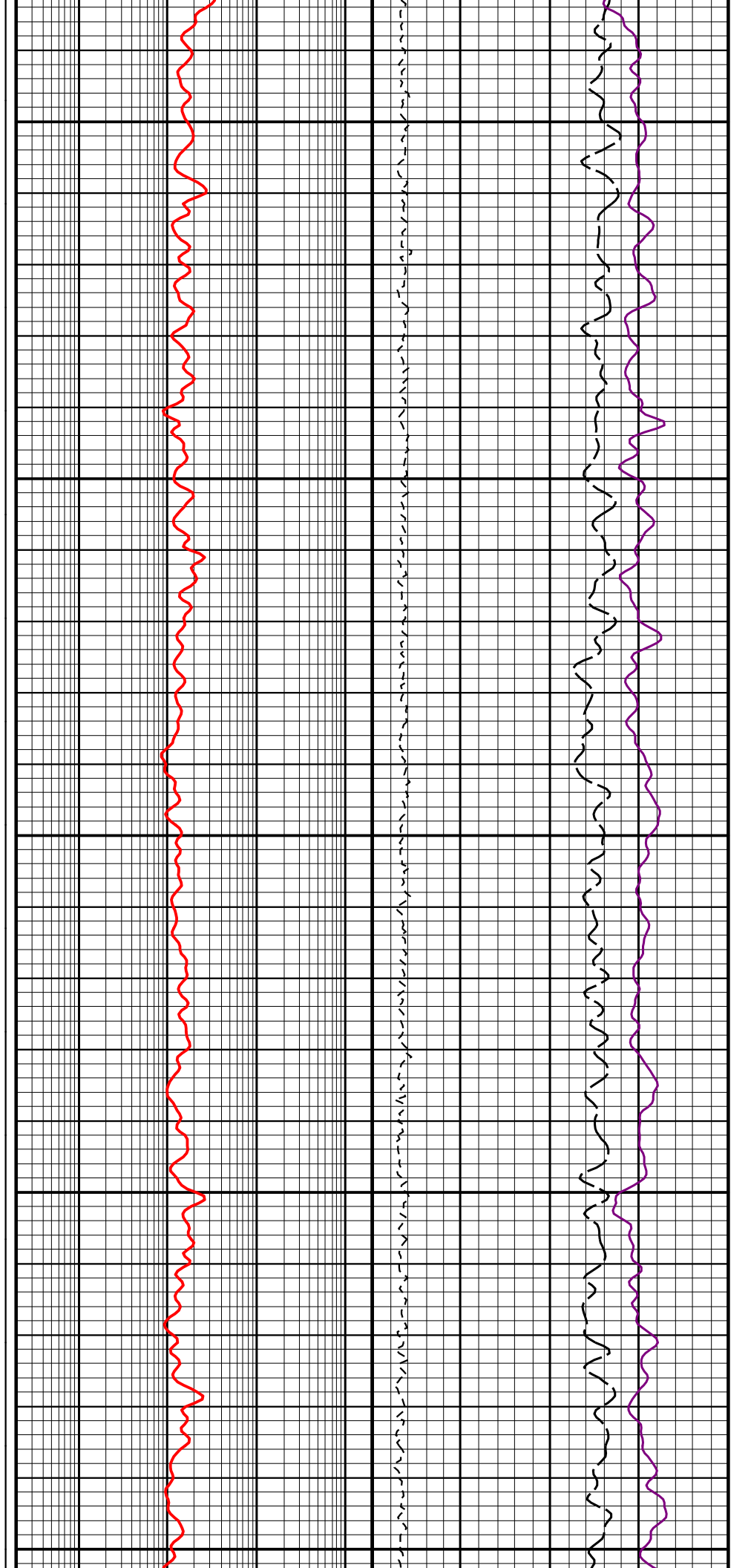
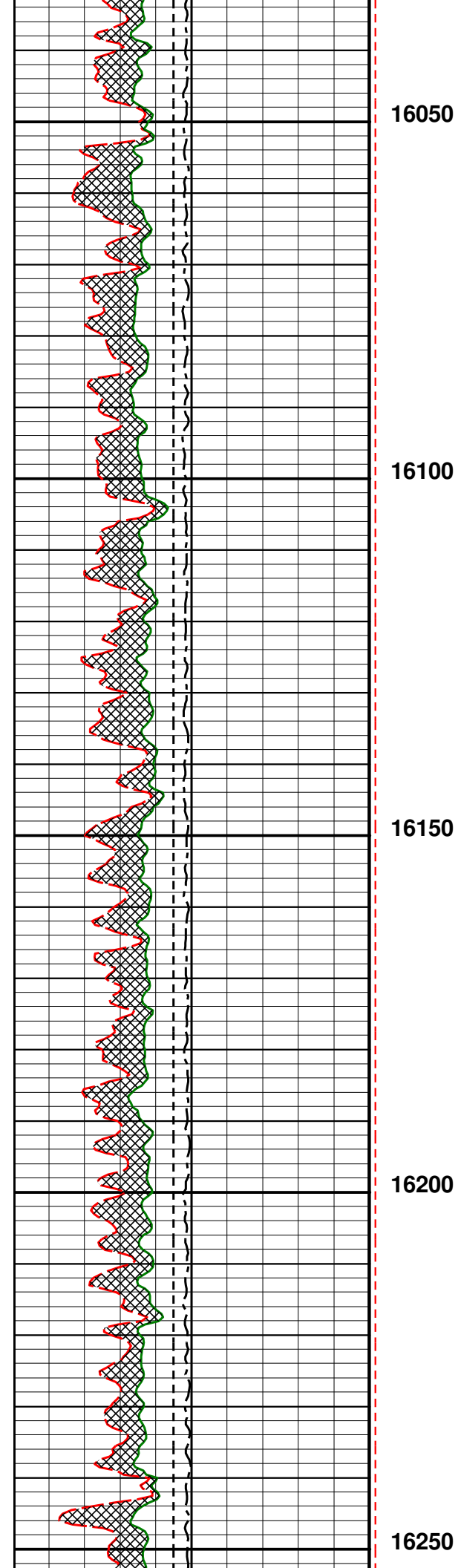


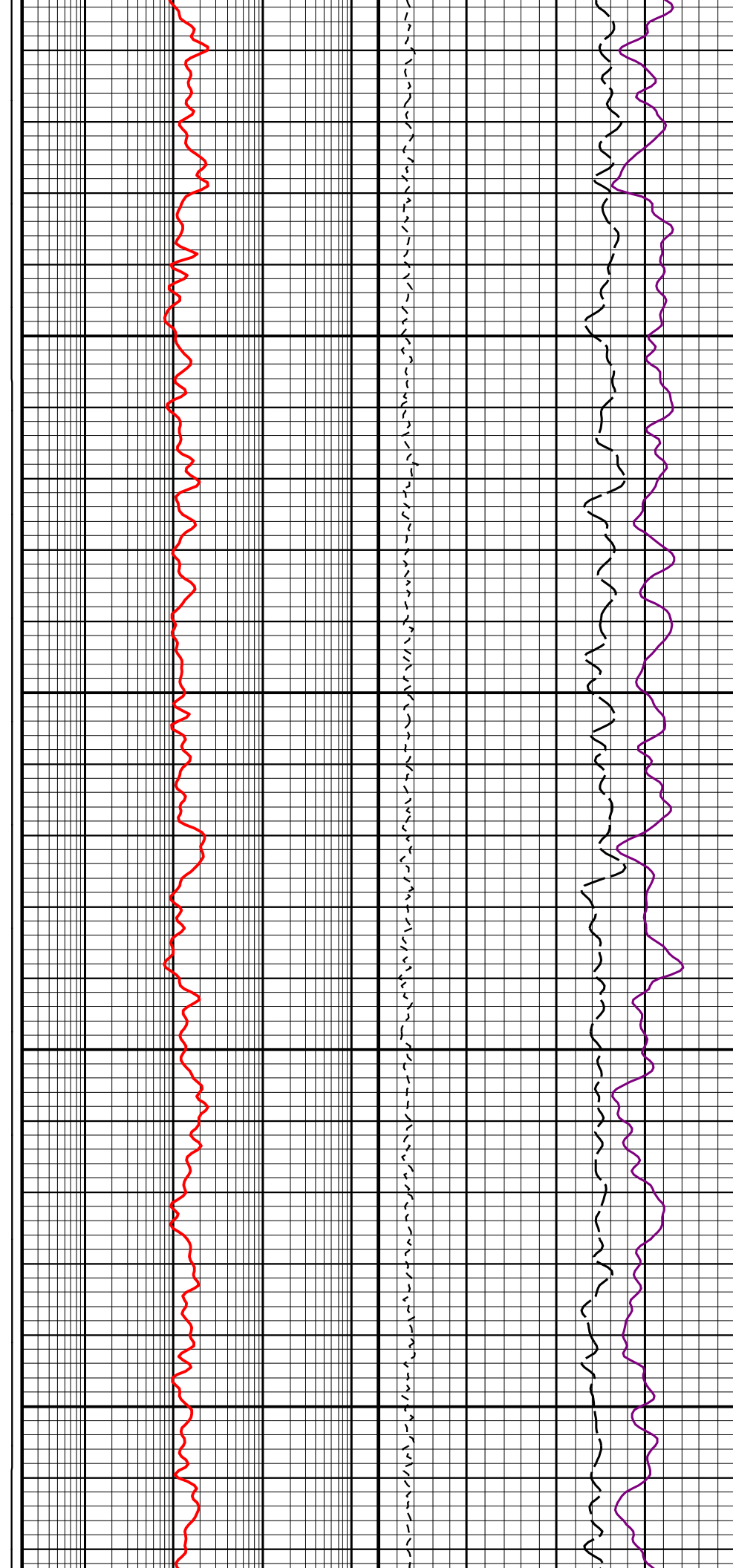
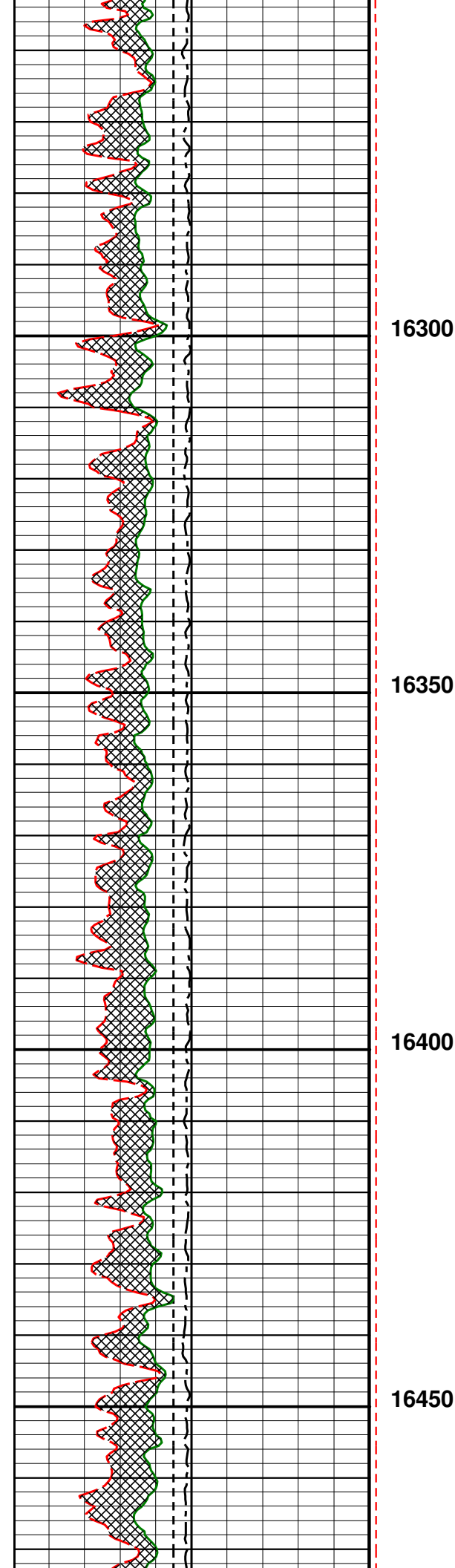


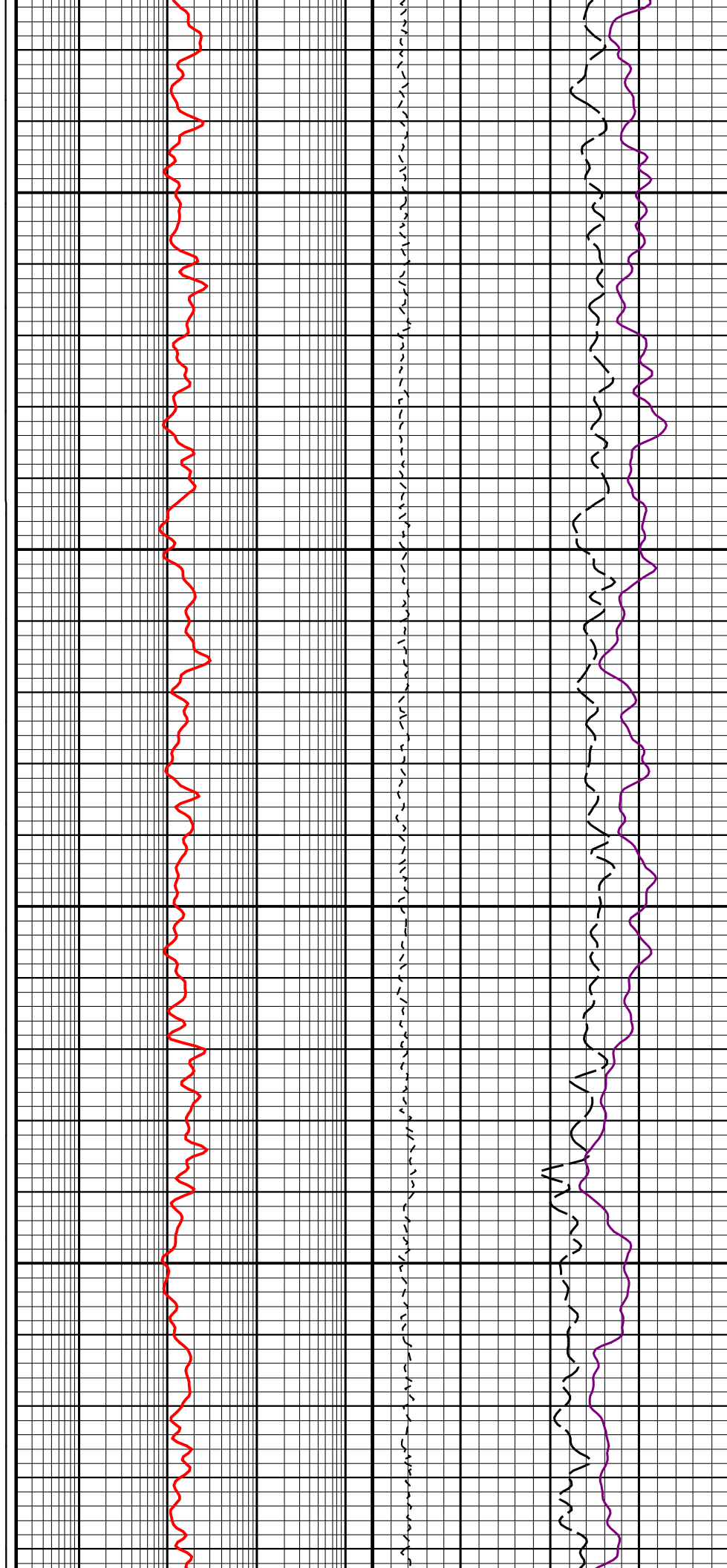
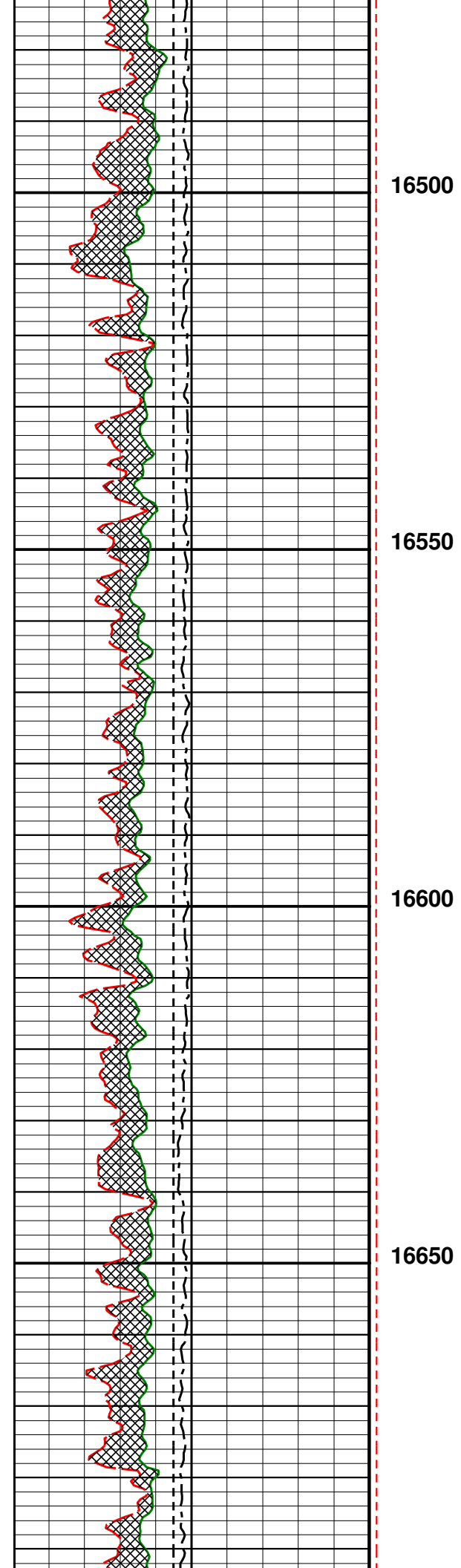


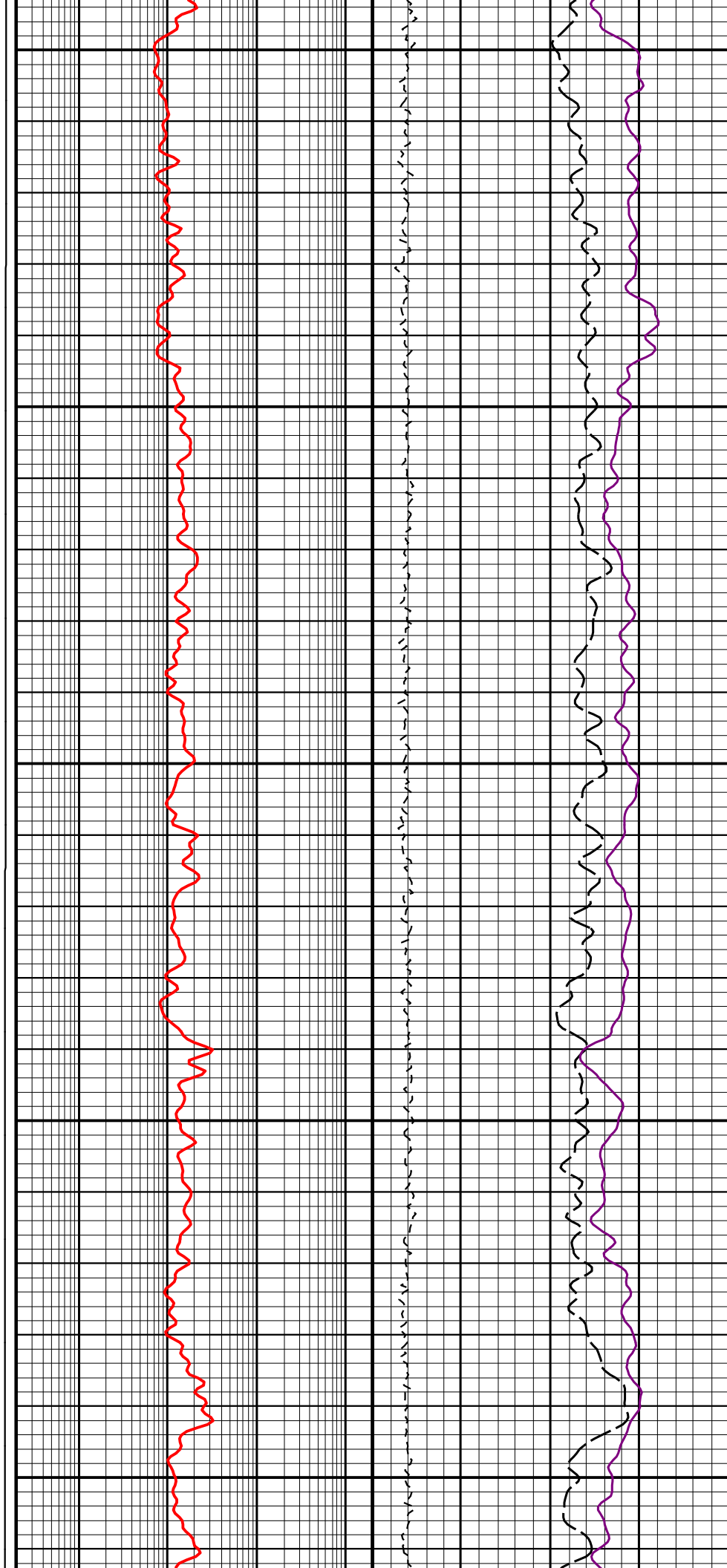
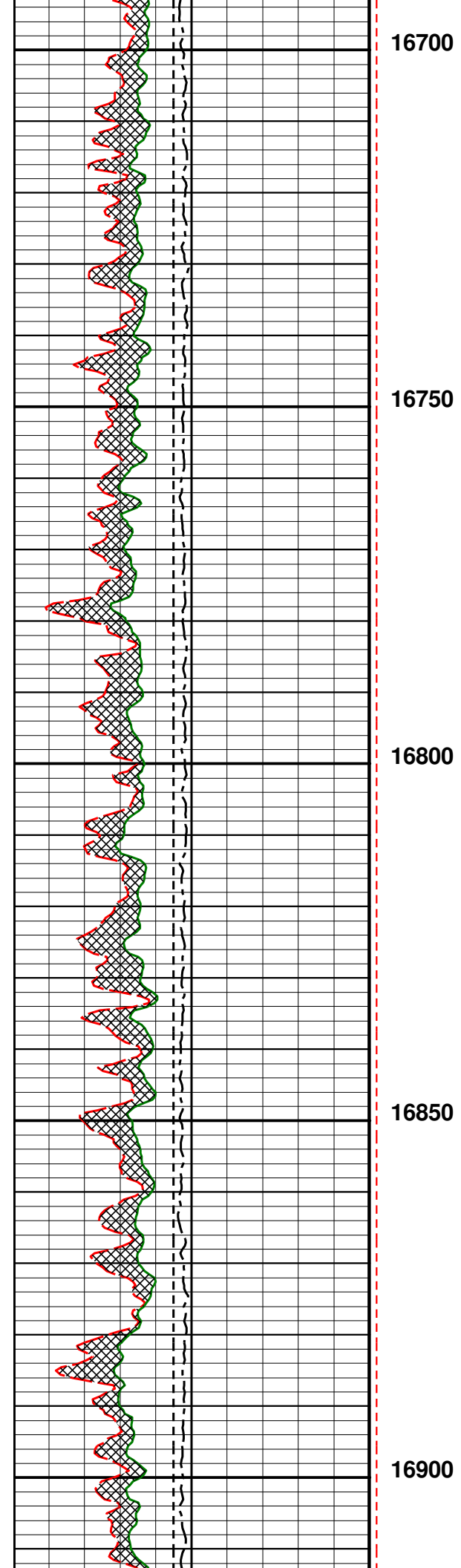


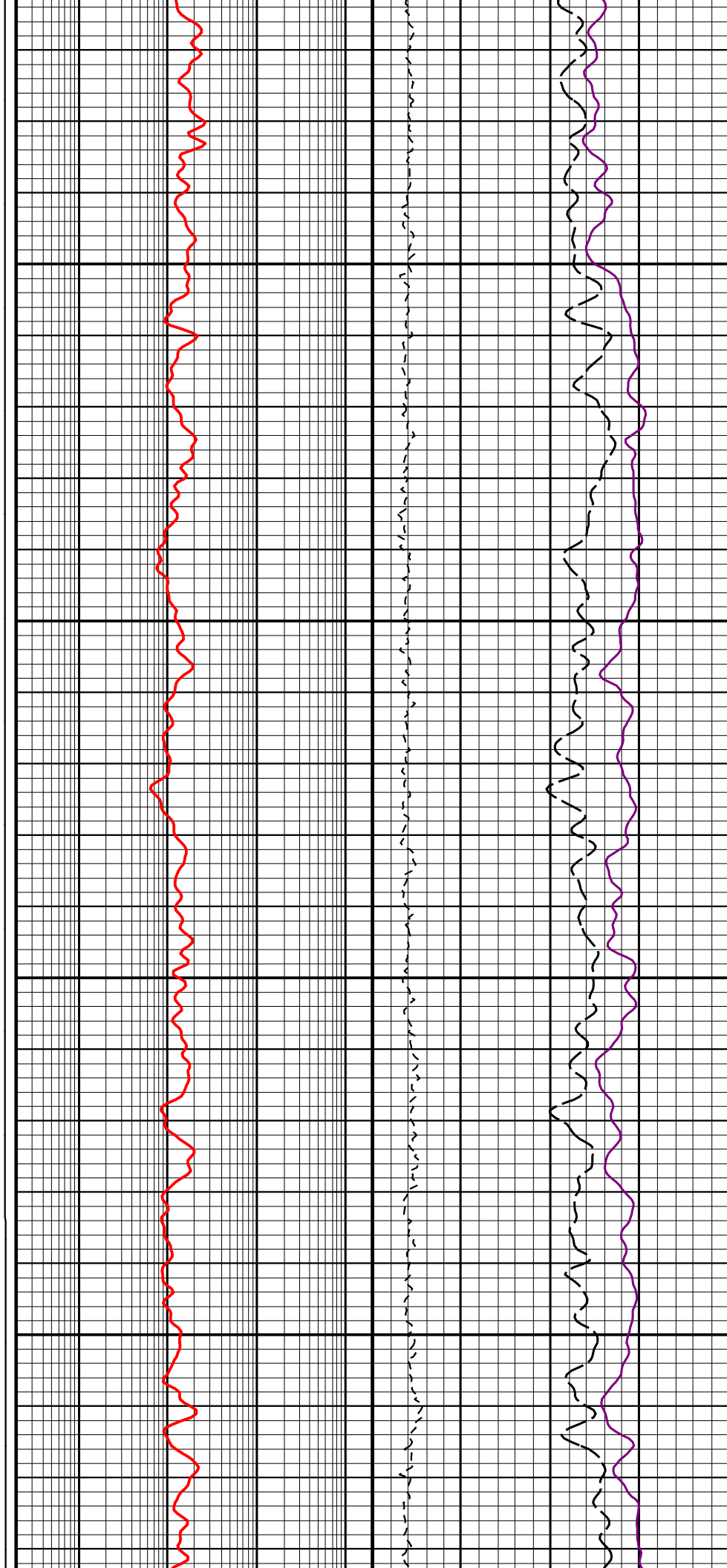
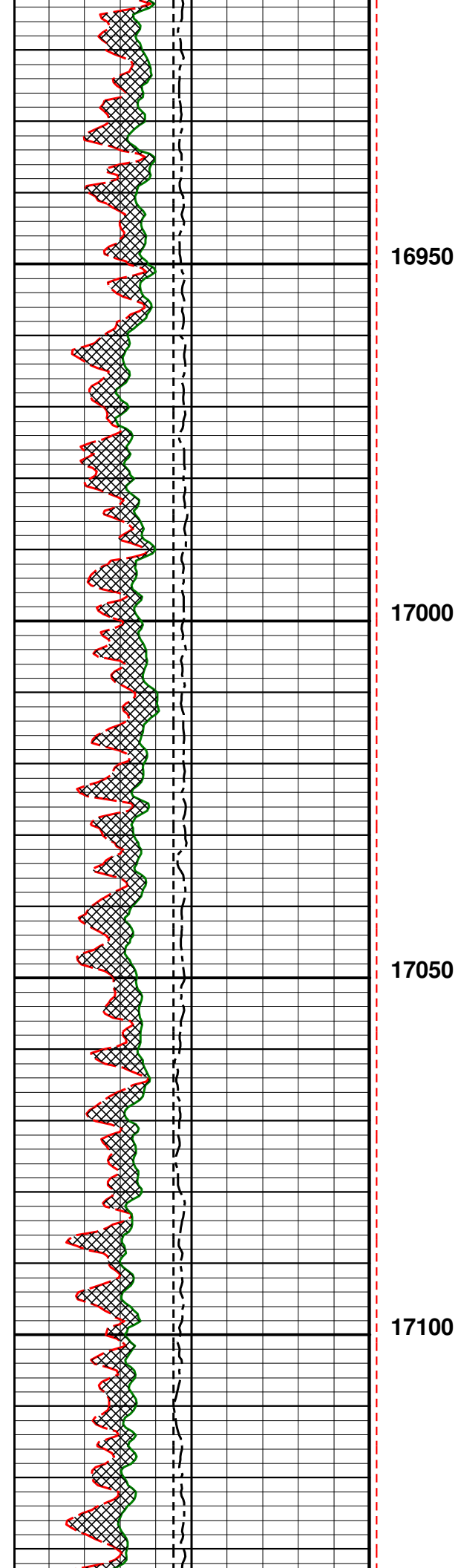


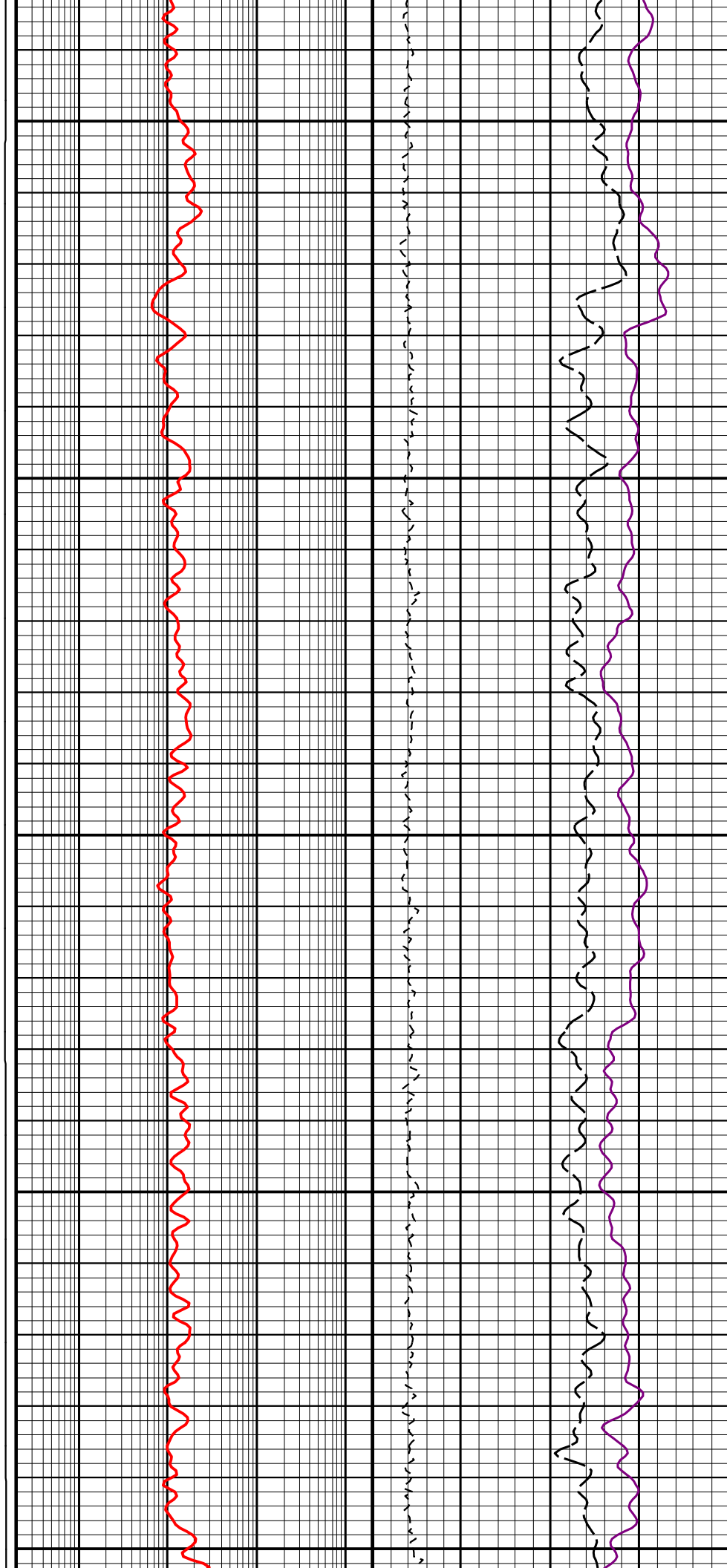
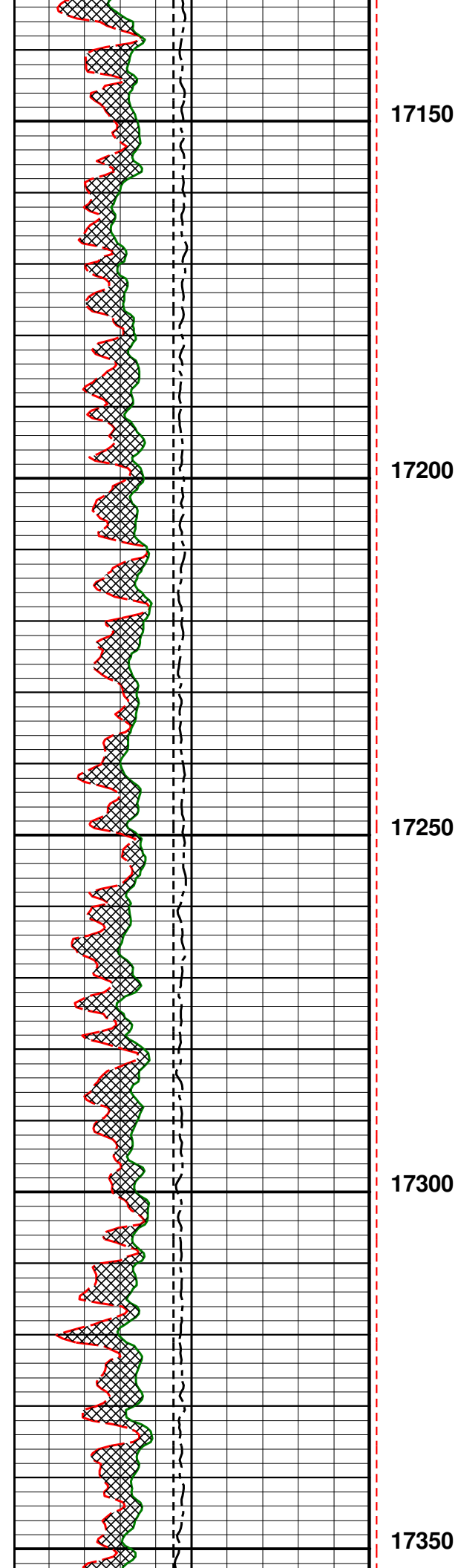


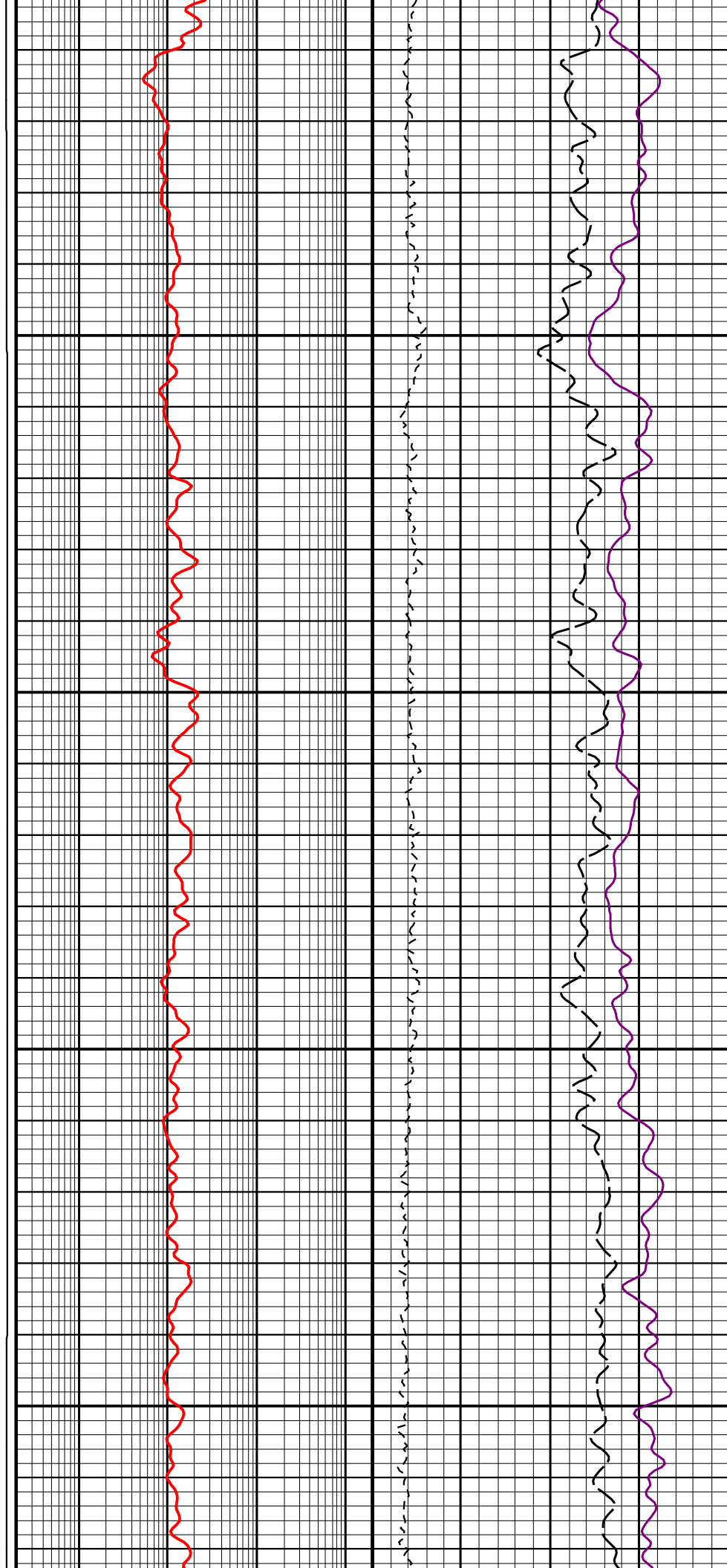
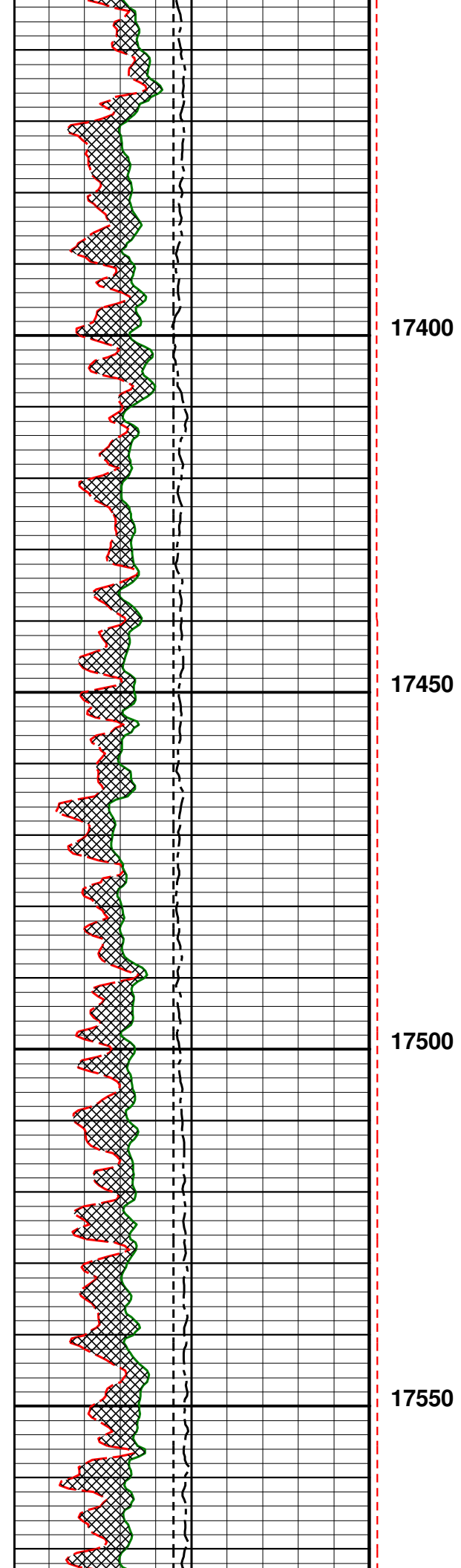


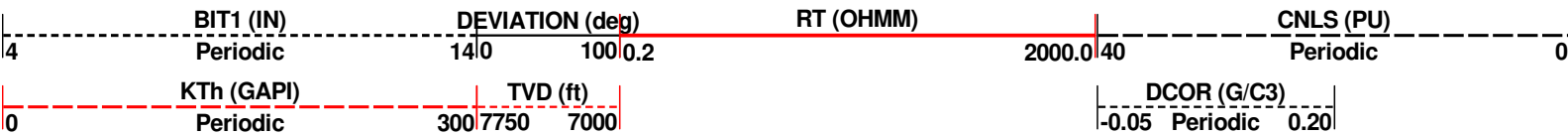
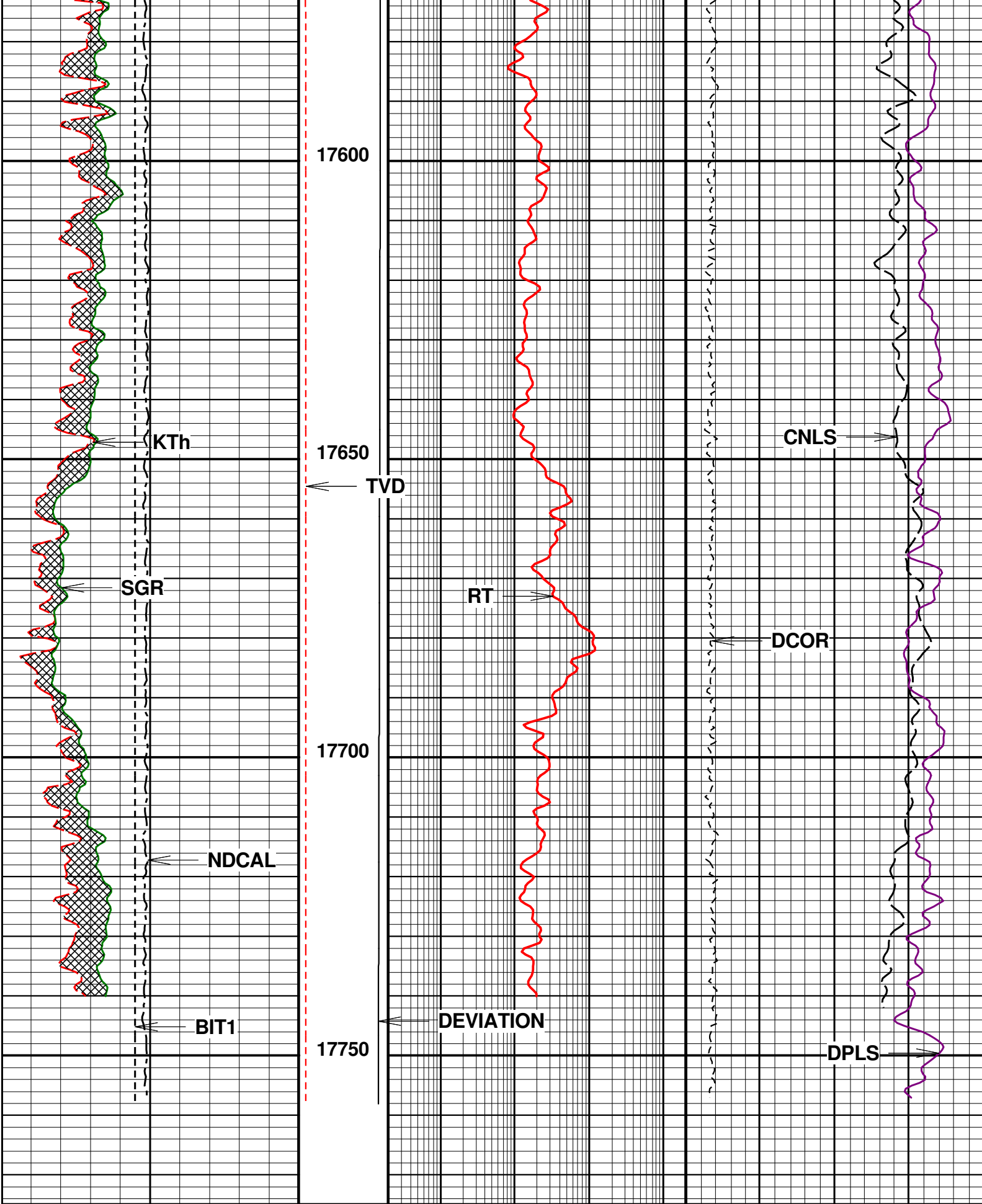


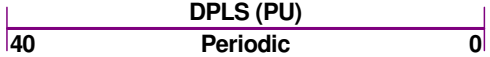
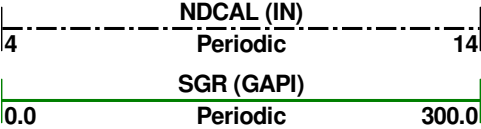












File :

Tool name : **Density**Asset : **021**Series : **1481**Source ID :

Density

Density Calibration

Time

Nov / 15 / 2018 10:04:19

Setup

Description

1481021_79966B_2018ONOV15_JB

Setup Version

00046

Curve Name	pt	Raw Value	User Value	Device	Mult.	Add.
LSDensity	1	0.280968	2.7 g/c3	Aluminum Block	30.628330	-5.906
MSDensity	1	0.226305	2.7 g/c3	Aluminum Block	72.617930	-13.734
SSDensity	1	0.248822	2.7 g/c3	Aluminum Block	127.774800	-29.093
LSDensity	2	0.248645	1.71 g/c3	Concrete Block		
MSDensity	2	0.212672	1.71 g/c3	Concrete Block		
SSDensity	2	0.241074	1.71 g/c3	Concrete Block		

File :

Tool name : **Dual Neutron**Asset : **020**Series : **1473**Source ID :

Gamma

Gamma Calibration

Time

Nov / 15 / 2018 08:39:29

Setup

Description

1473020_1619-93_2018NOV15_JB

Setup Version

00046

Block	Raw Value	User Value	Device	Device SN	Mult.
Background	38.0249				
Jig ON	348.354				
Gamma	310.3291	250.0003 gAPI	Gamma Ray Jig	1619-93	0.8055973

287

325

Gamma Primary Verification

Time

Nov / 15 / 2018 08:45:37

Setup

Description

1473020_1619-93_2018NOV15_JB

Setup Version

00046

Block	Device	Device SN	Raw Value	User Value
Background			36.2864	
Jig ON	Gamma Ray Jig	1619-93	351.857	

Gamma

254.2228 gAPI
244.5 255.5

Tool name : **Dual Neutron** Asset : **020** Series : **1473** Source ID :

Ratio

Compensated Neutron Calibration

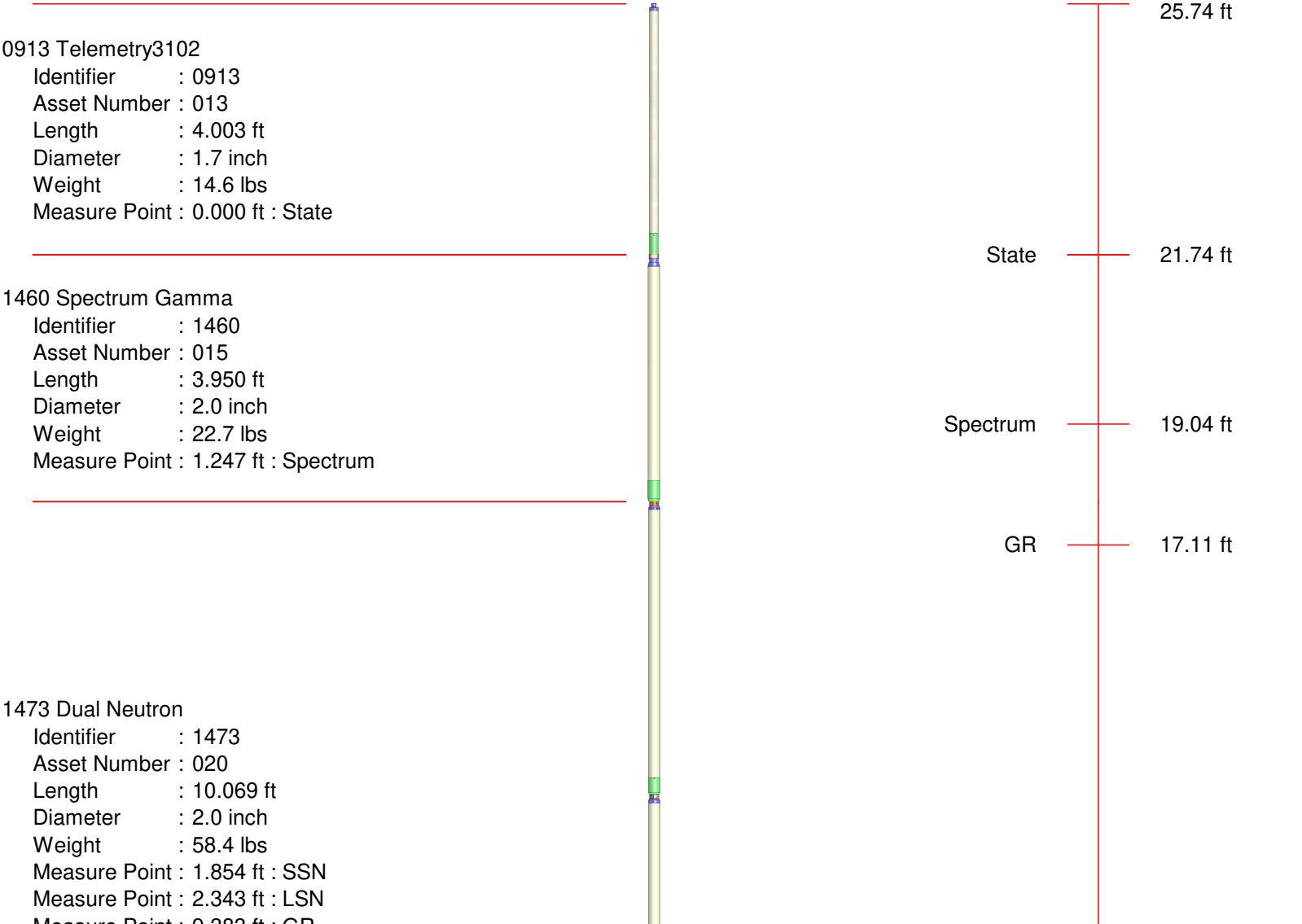
Time Nov / 15 / 2018 09:24:25
Setup
Description 1473020_77813_2018NOV15_JB
Setup Version 00046

Curve Name	pt	Raw Value	User Value	Device	Mult.
Ratio	1	16.2677	17 none	Neutron Ratio	1.045016

Compensated Neutron Primary Verification

Time Nov / 15 / 2018 09:27:19
Setup
Description 1473020_77813_2018NOV15_JB
Setup Version 00046

Curve Name	pt	Device	Device Value	User Value
CN	1	Neutron Porosity	23 pu	23.5289 pu



Measure Point : 9.383 ft : GN

LSN 10.07 ft
SSN 9.58 ft

0813 Knuckle Joint

Identifier : 0813
Length : 2.297 ft
Diameter : 1.7 inch
Weight : 16.1 lbs

1481 Density

Identifier : 1481
Asset Number : 021
Length : 5.427 ft
Diameter : 2.0 inch
Weight : 38.4 lbs
Measure Point : 1.647 ft : Short
Measure Point : 1.870 ft : Mid
Measure Point : 2.139 ft : Long

Long 2.14 ft
Mid 1.87 ft
Short 1.65 ft

0.00 ft

Total Length : 25.74 ft
Total Weight : 150.13 lbs
Max Diameter : 2.0 inch

CORDAX™

COMPANY: GREAT WESTERN OPERATING COMPANY LLC
WELL: OTTESEN LE 09-368HC
FIELD: WATTENBERG
COUNTY: WELD
STATE: CO