

Schlumberger

Company: **SandRidge Energy, Inc**

Well: **Hebron 0780 4-7H**

Field: **North Park Horizontal Niobrara**

County: **Jackson** State: **Colorado**

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[illegible]

Logging Date			
Run Number			
Depth Driller			
Schlumberger Depth			
Bottom Log Interval			
Top Log Interval			
Casing Driller Size @ Depth		@	
Casing Schlumberger			
Bit Size			
Type Fluid In Hole			
Density	Viscosity		
Fluid Loss	PH		
Source Of Sample			
RM @ Measured Temperature		@	
RMF @ Measured Temperature		@	
RMC @ Measured Temperature		@	
Source RMF	RMC		
RM @ MRT	RMF @ MRT	@	@
Maximum Recorded Temperatures			
Circulation Stopped	Time		
Logger On Bottom	Time		
Unit Number	Location		
Recorded By			
Witnessed By			

THE USE OF AND RELIANCE UPON THIS RECORDED-DATA BY THE HEREIN NAMED COMPANY (AND ANY OF ITS AFFILIATES, PARTNERS, REPRESENTATIVES, AGENTS, CONSULTANTS AND EMPLOYEES) IS SUBJECT TO THE TERMS AND CONDITIONS AGREED UPON BETWEEN SCHLUMBERGER AND THE COMPANY, INCLUDING: (a) RESTRICTIONS ON USE OF THE RECORDED-DATA; (b) DISCLAIMERS AND WAIVERS OF WARRANTIES AND REPRESENTATIONS REGARDING COMPANY'S USE OF AND RELIANCE UPON THE RECORDED-DATA; AND (c) CUSTOMER'S FULL AND SOLE RESPONSIBILITY FOR ANY INFERENCE DRAWN OR DECISION MADE IN CONNECTION WITH THE USE OF THIS RECORDED-DATA.

OS1:
OS2:
OS3:
OS4:
OS5:

OS1:
OS2:
OS3:
OS4:
OS5:

Tool Ran as per toolsketch.	
This is the first log in the well.	
Log depth taken from NOV Bit depth.	
Logs on limestone matrix as per clients request.	
Logs recorded via memory.	
Log data is provided via memory processing.	
Orientation data gathered by GYRODATA.	
Logs correlated to MWD GR	
Drillers bit depth was determined to be a stand short when tools were deployed.	
Caliper shifted -0.125" in casing.	

ed.

LOGGED INTERVAL	START	STOP

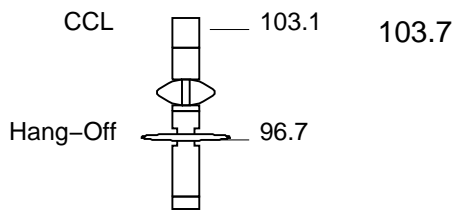
LOGGED INTERVAL	START	STOP

RUN 1

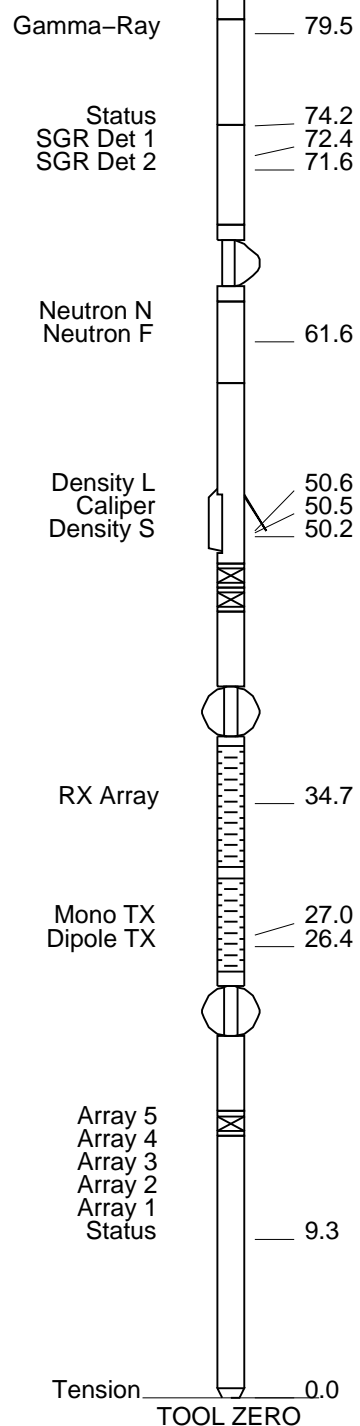
RUN 2

WITM (ThruBit)

TBT-A
CCL
BDOT-B
THOT
T10_1
TBAT1
TBAT2
TMG-A



TBSG-A
TILE-A
TBN-A
NNLS-EWA
TBD-A
GGLS-FZ
KAH-TB_2
KAH-TB_1
TBDS-A
KAH-TB_3
TBI-A

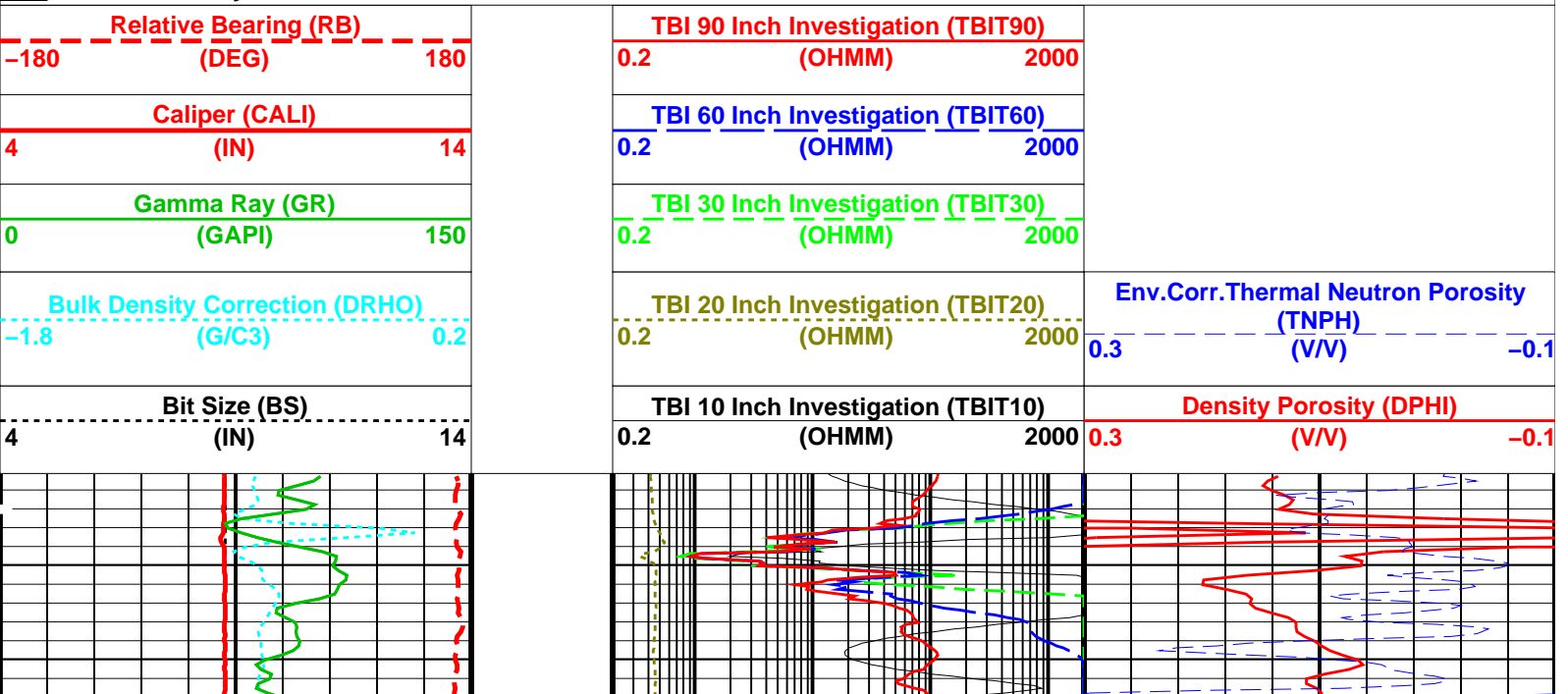


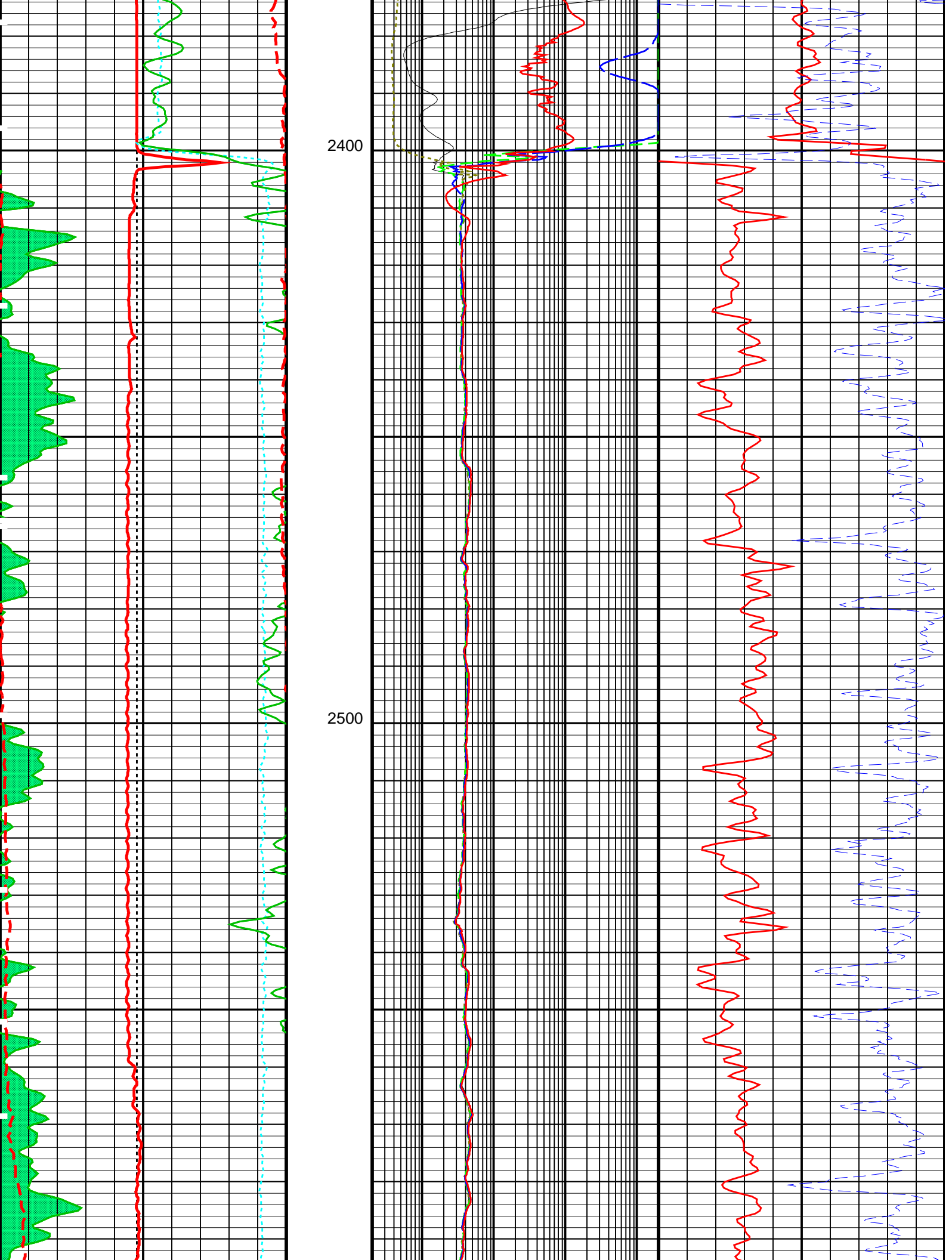
MAXIMUM STRING DIAMETER 2.13 IN
MEASUREMENTS RELATIVE TO TOOL ZERO
ALL LENGTHS IN FEET

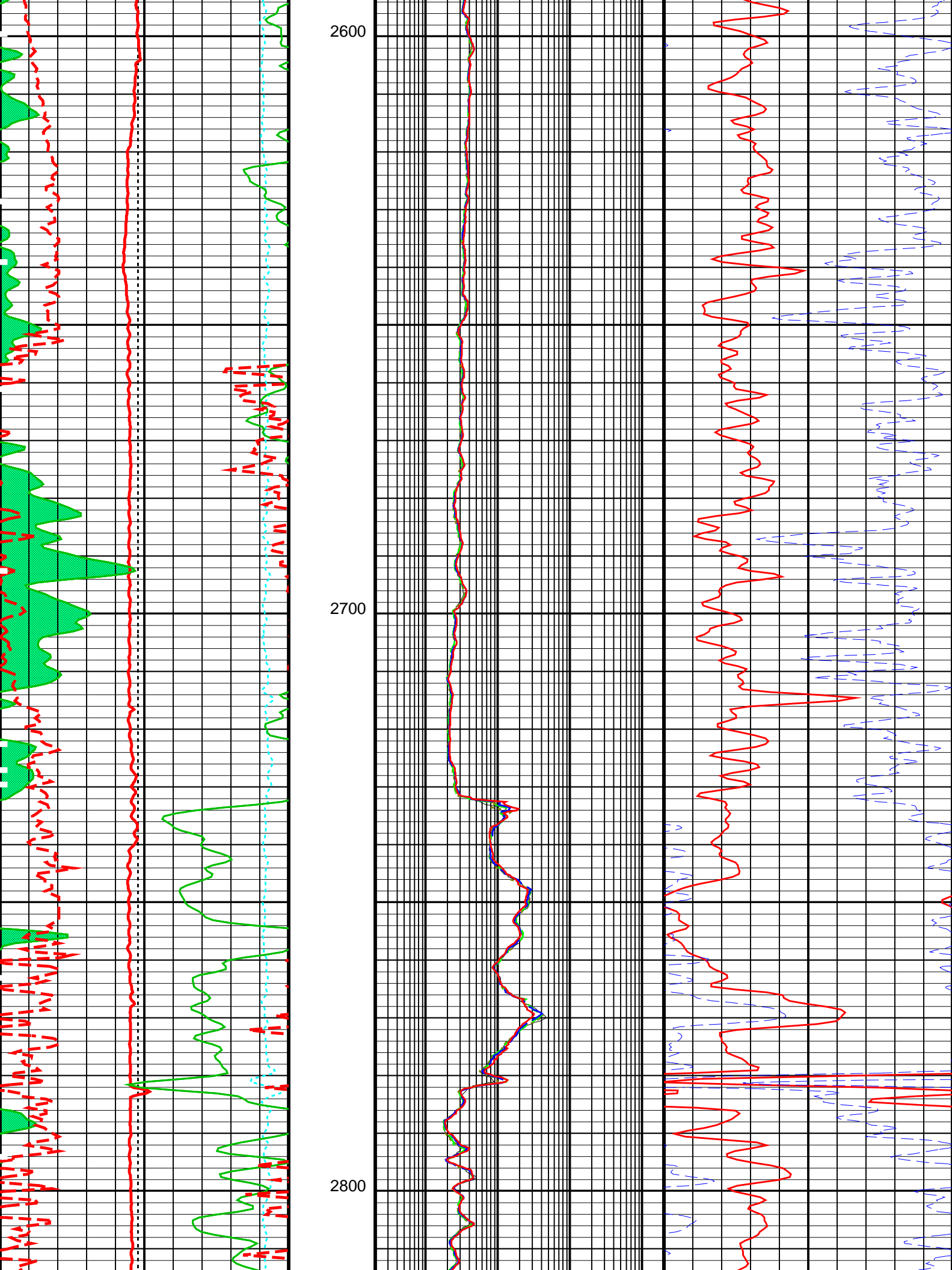
Input DLIS Files						
DEFAULT	ThruBit_036PUP	FN:31	PRODUCER	17-Apr-2016 15:29	11952.6 FT	1860.1 FT
Output DLIS Files						
DEFAULT	ThruBit_037PUP	FN:32	PRODUCER	17-Apr-2016 15:46	11952.5 FT	2350.0 FT

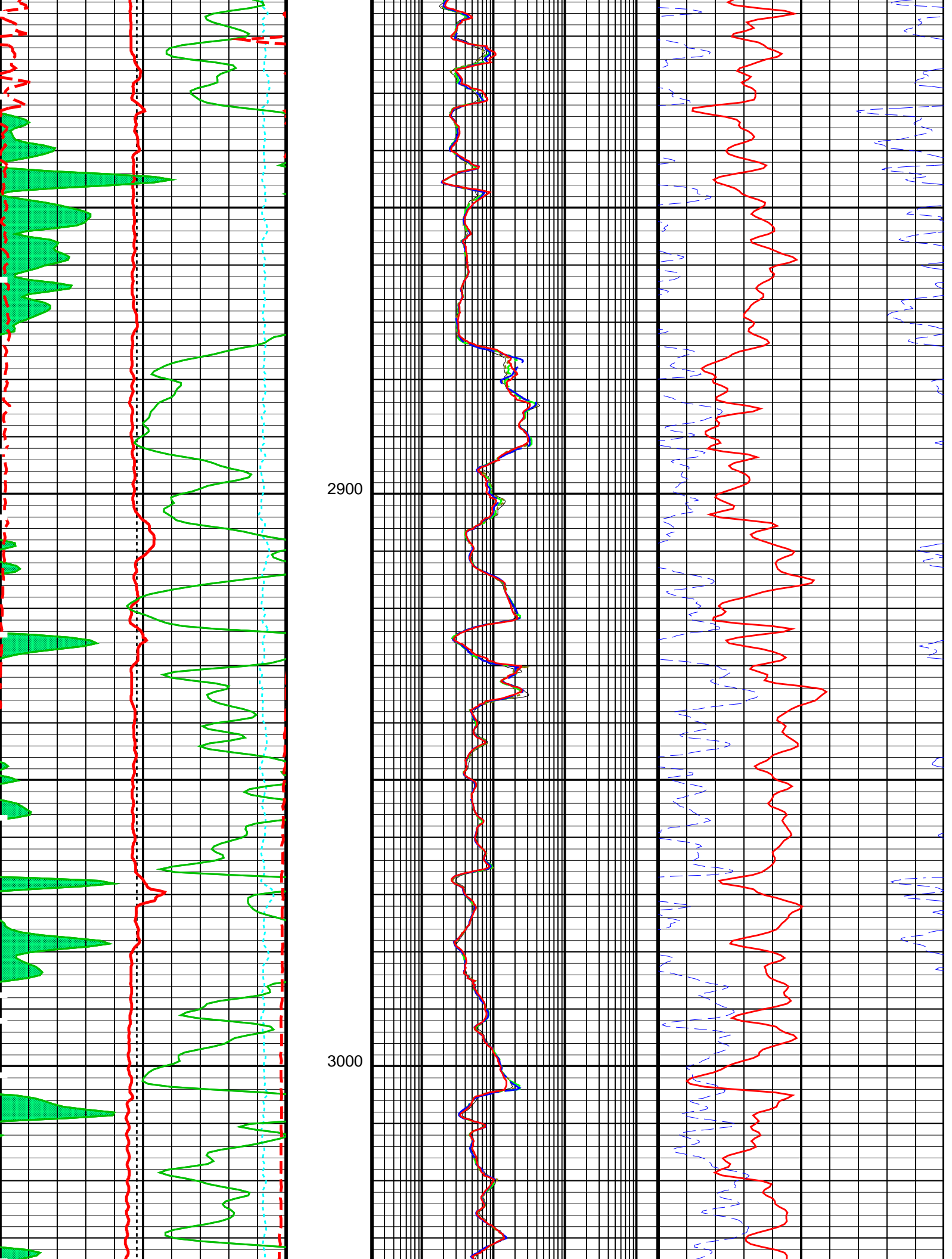
OP System Version: 19C2-270	
eWAFE Version: 1.210	
TBT-A	SRPC-5314-Thrubit_b

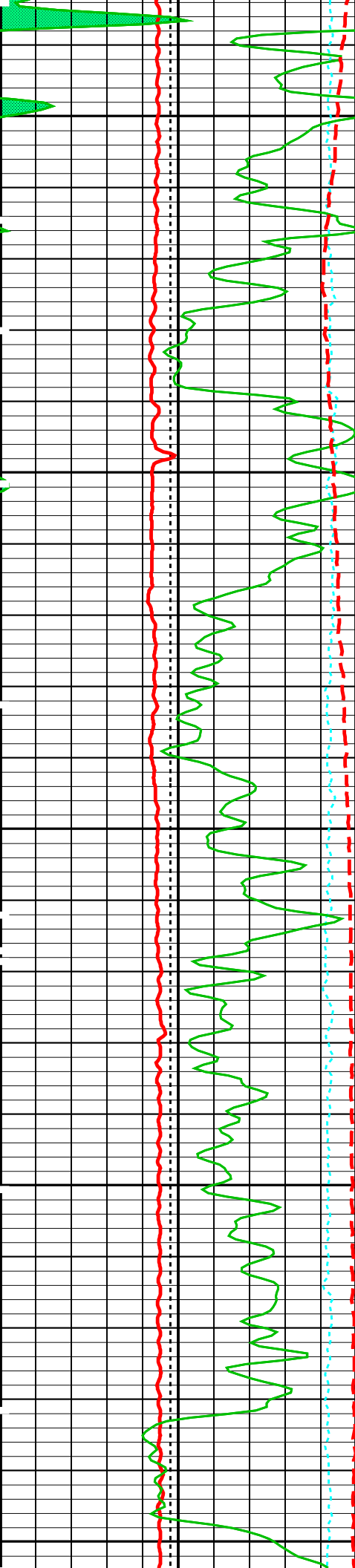
PIP SUMMARY	
Time Mark Every 60 S	





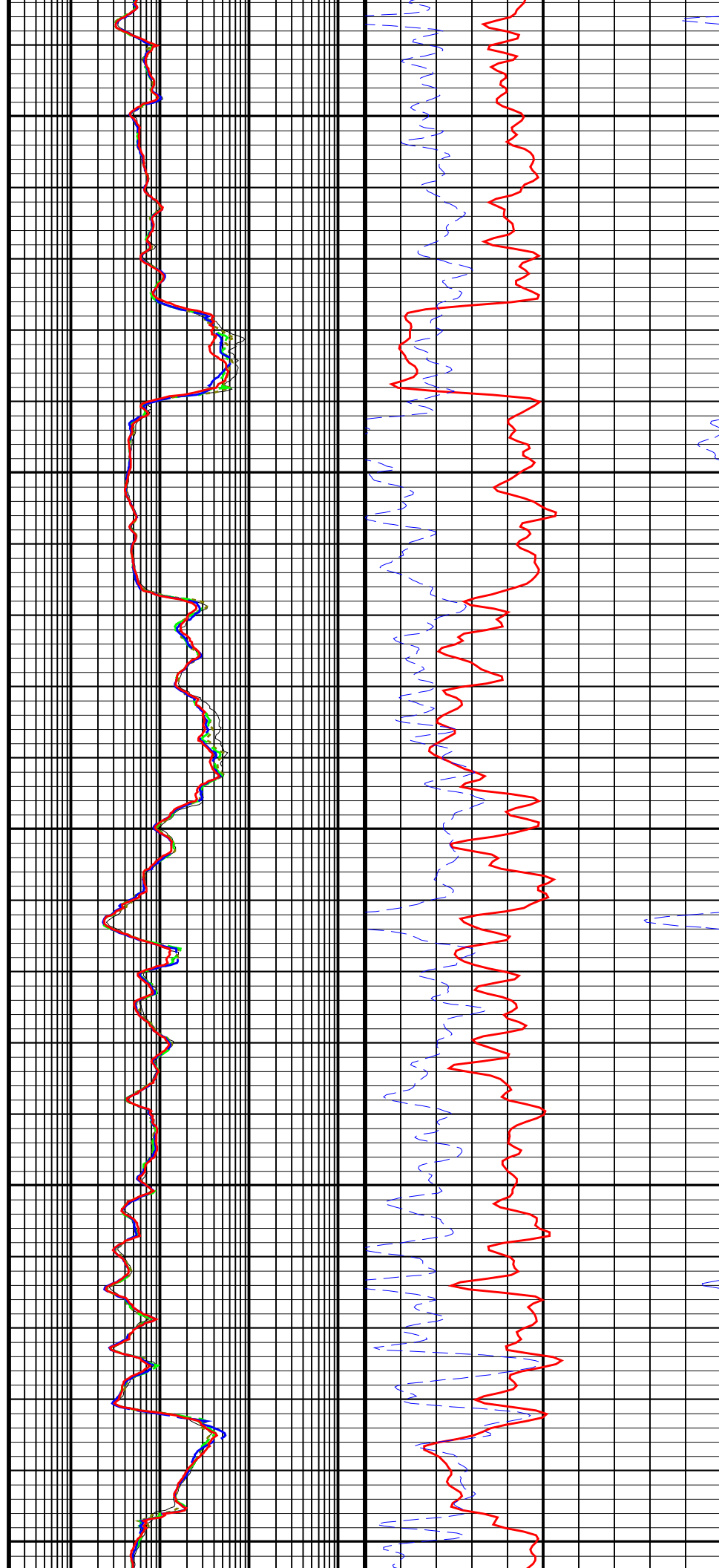


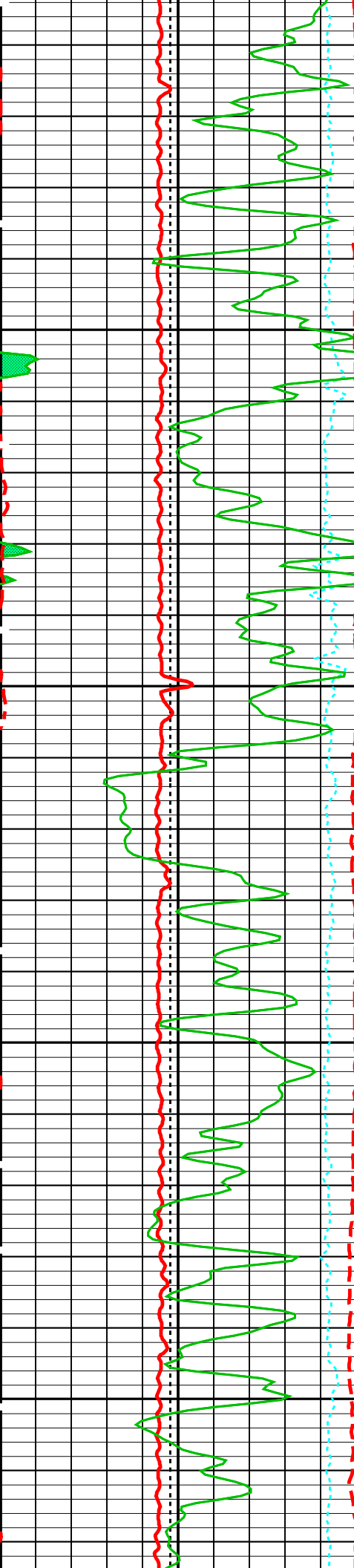




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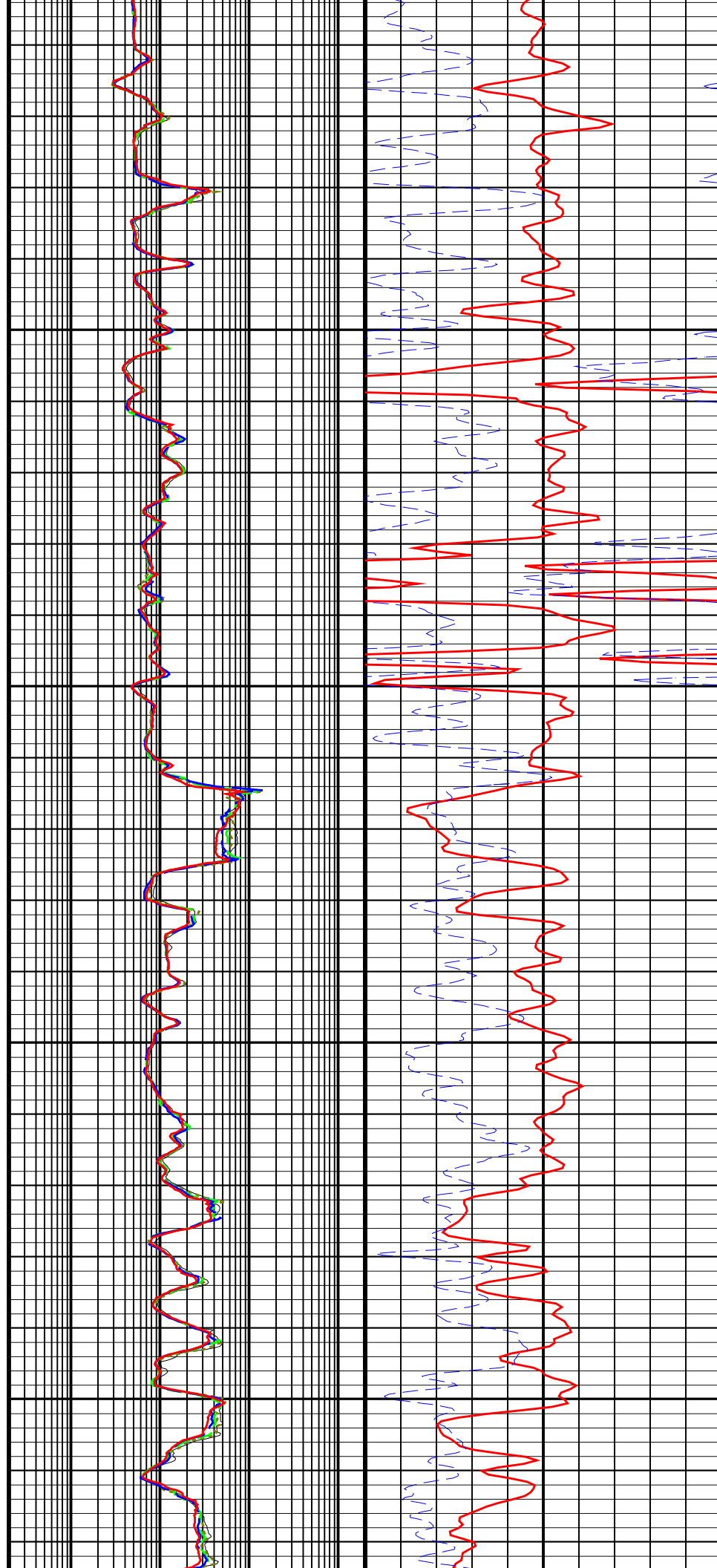
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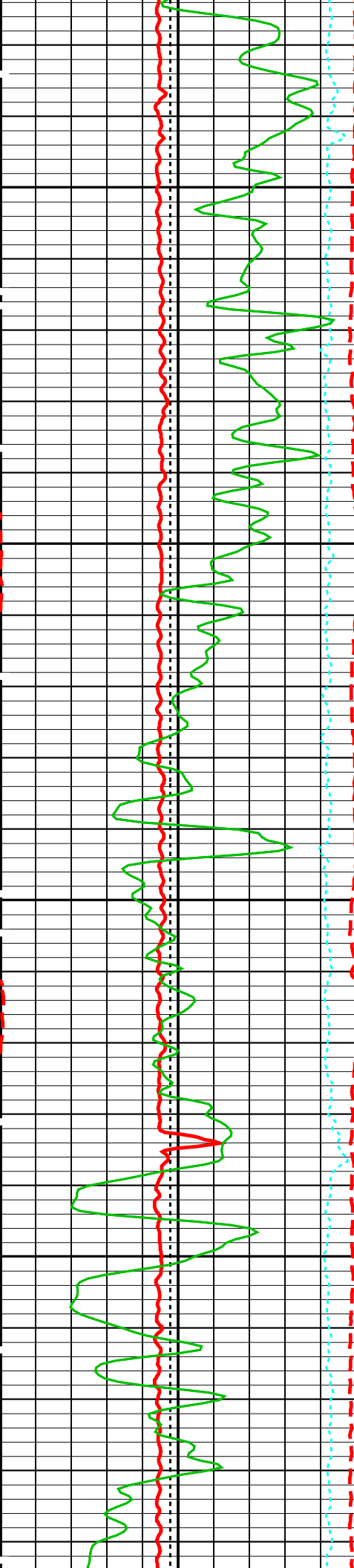




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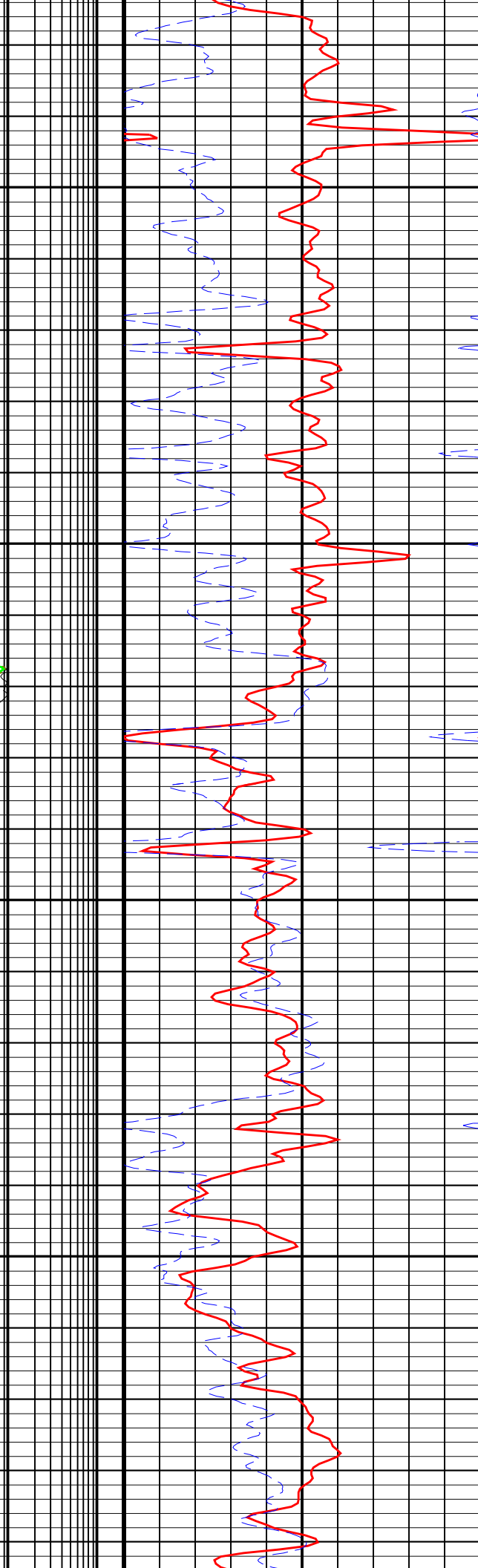
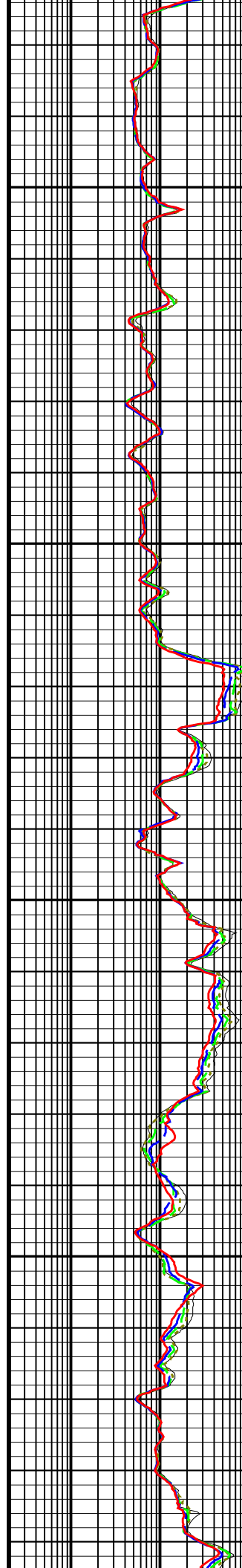
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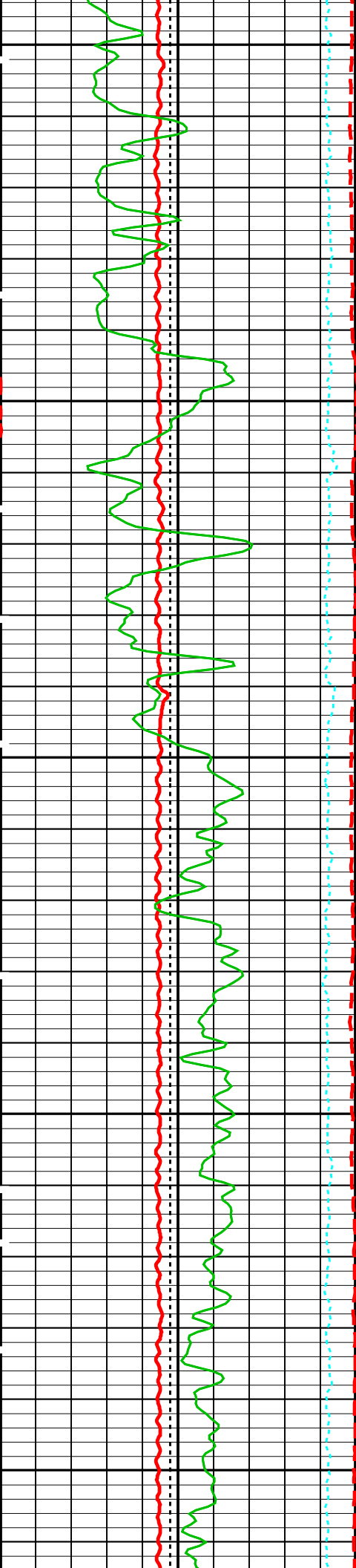




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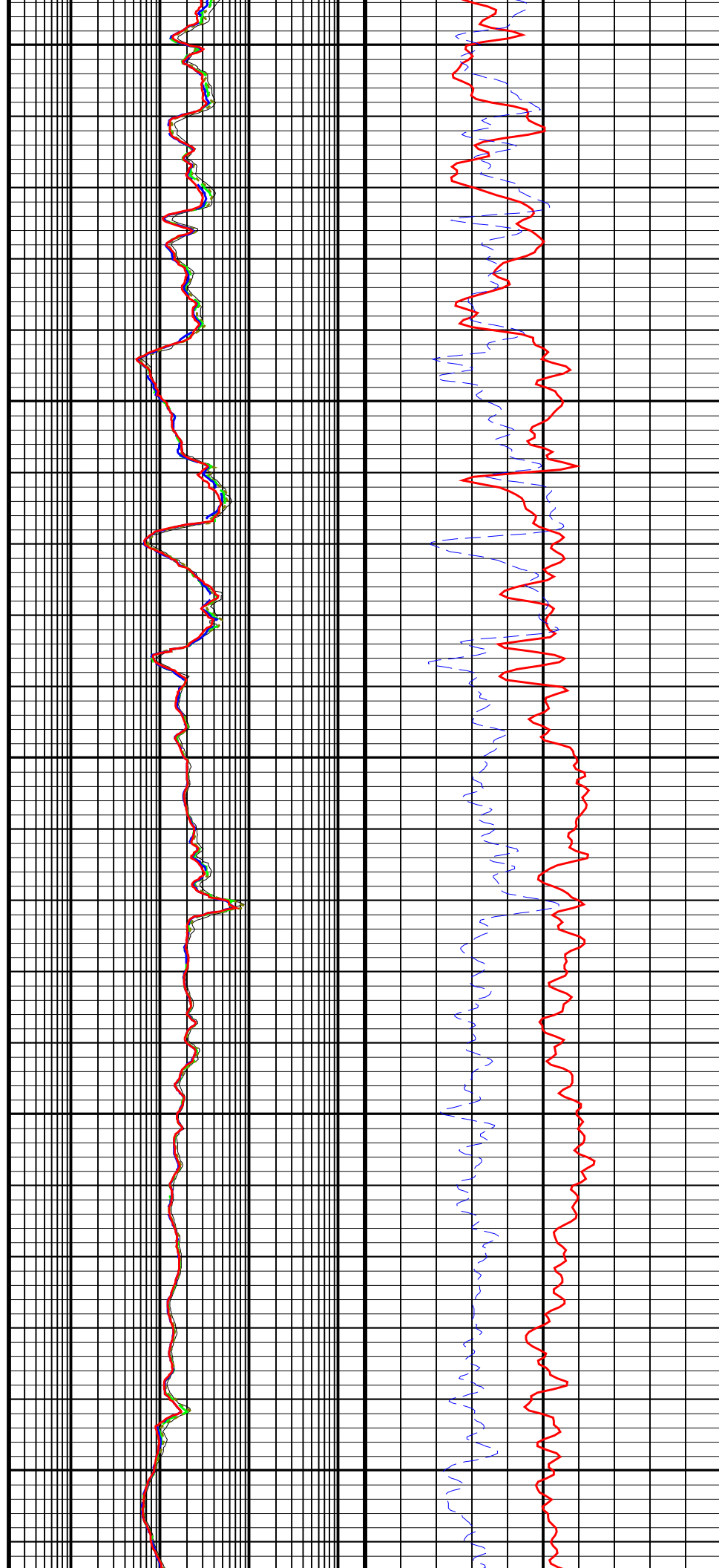


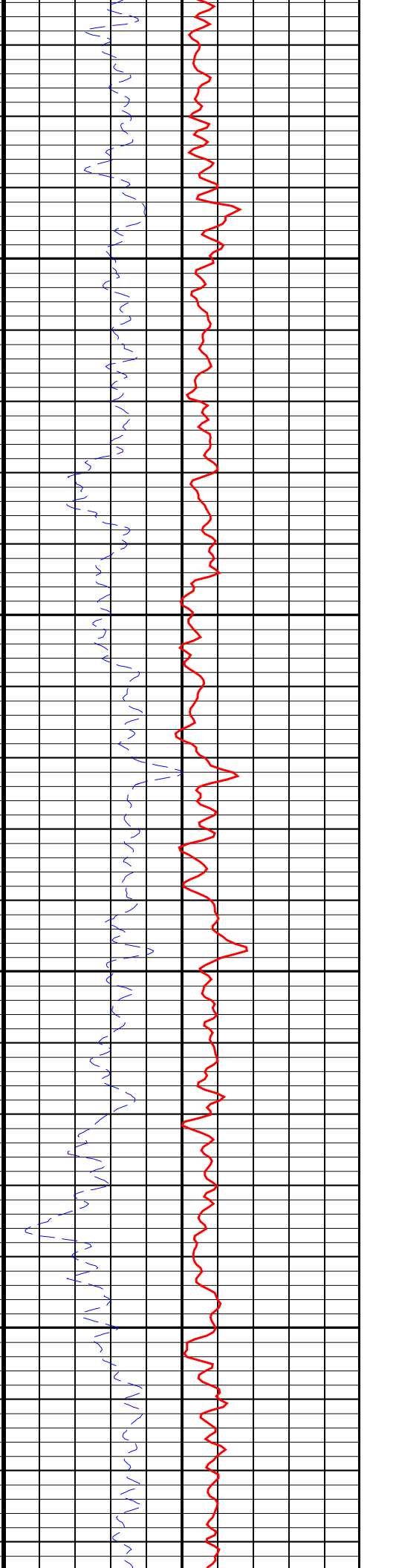
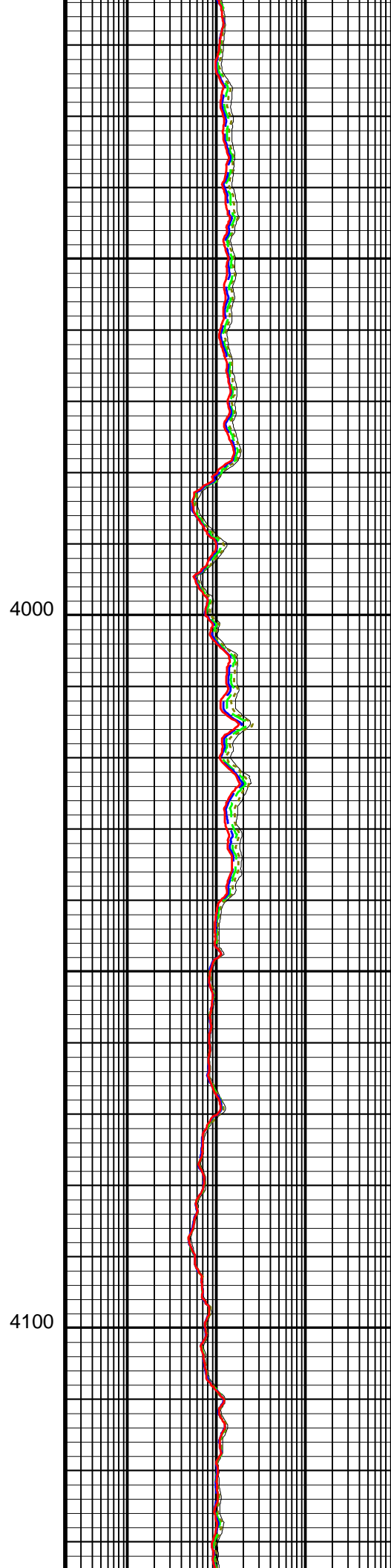
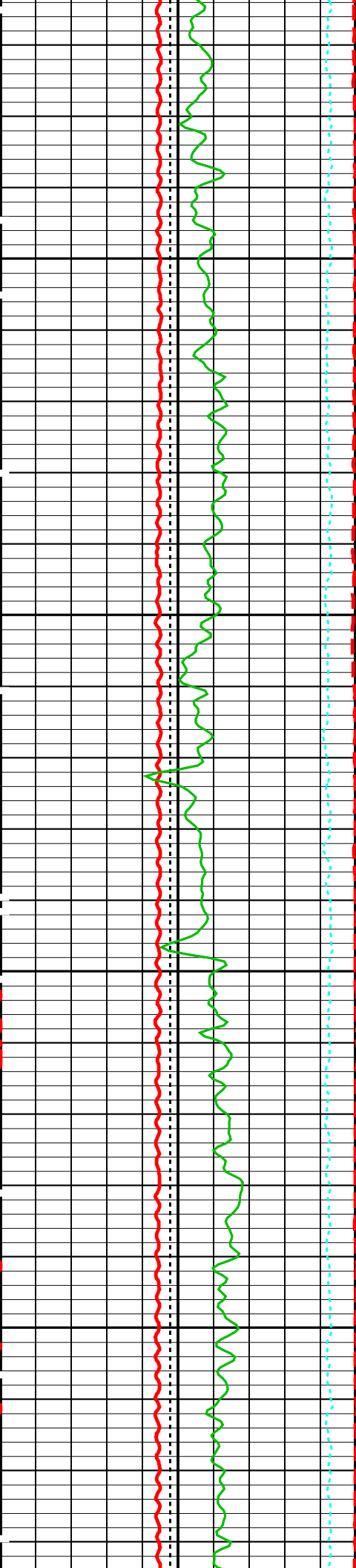


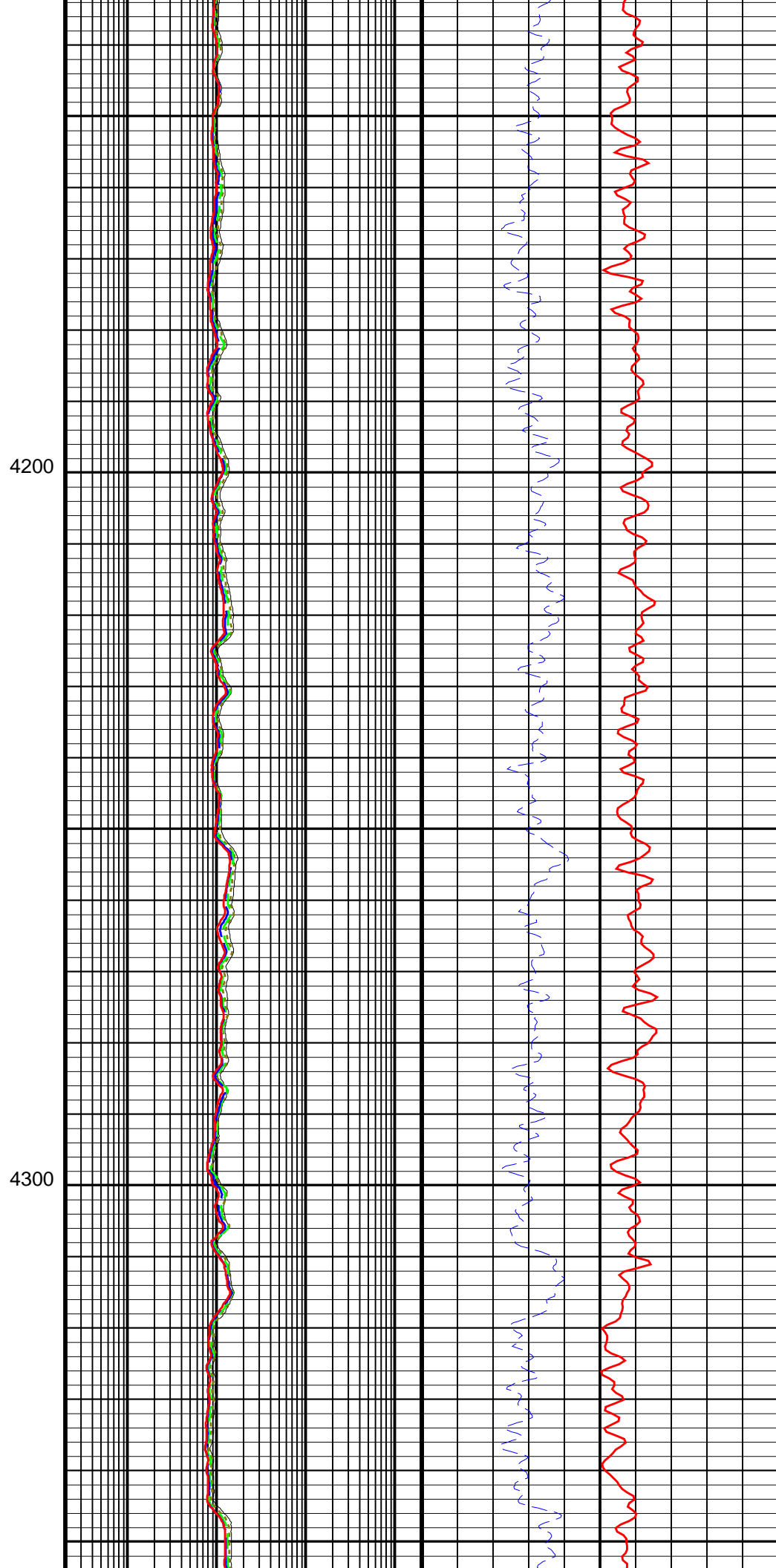
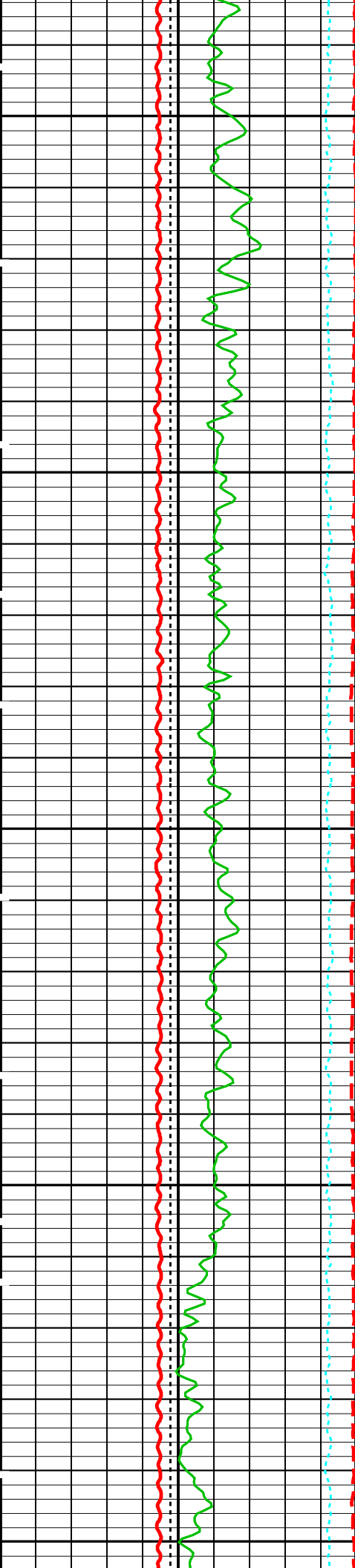
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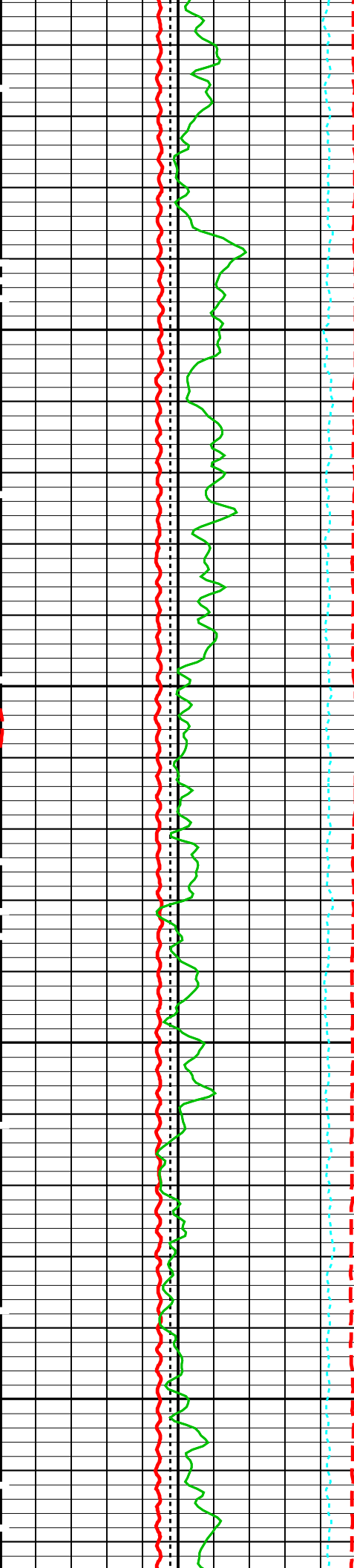
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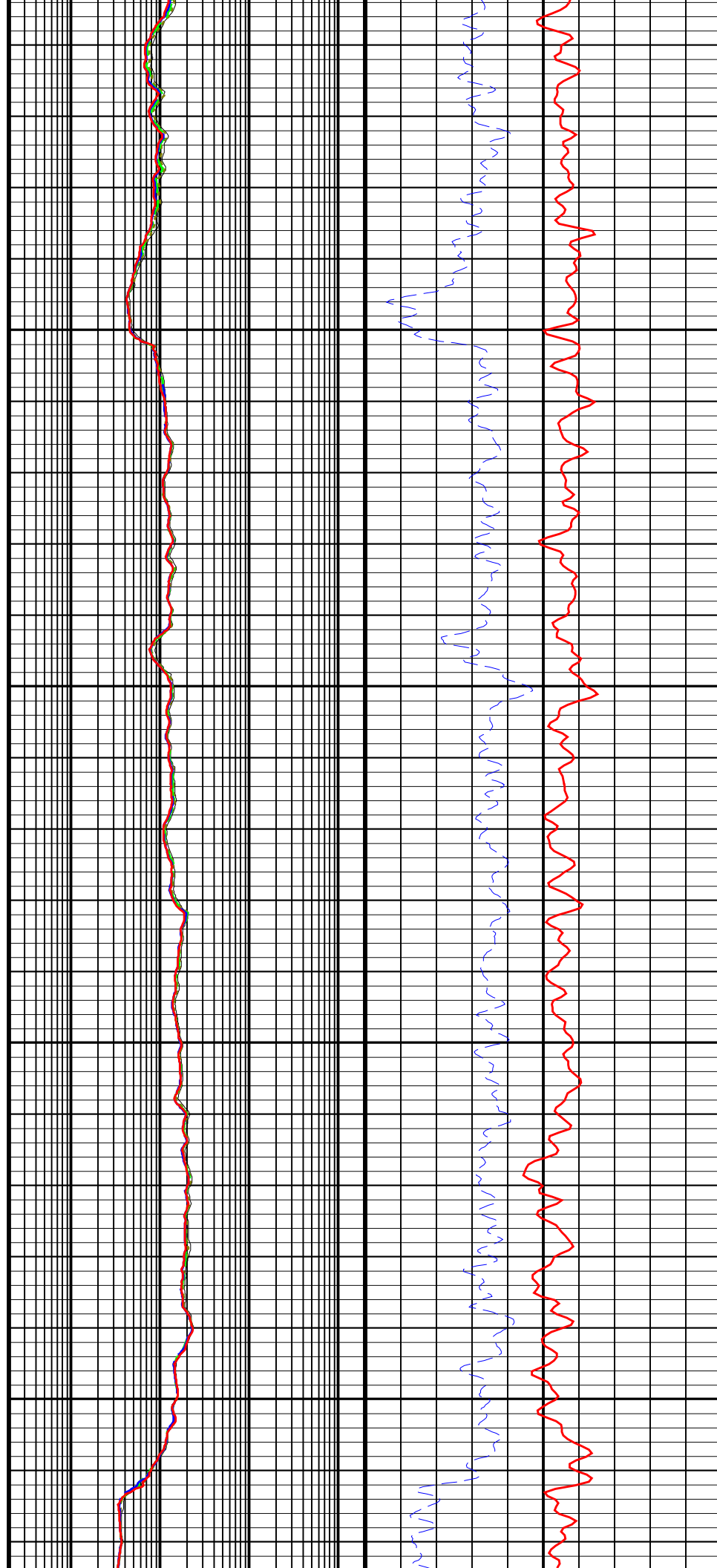


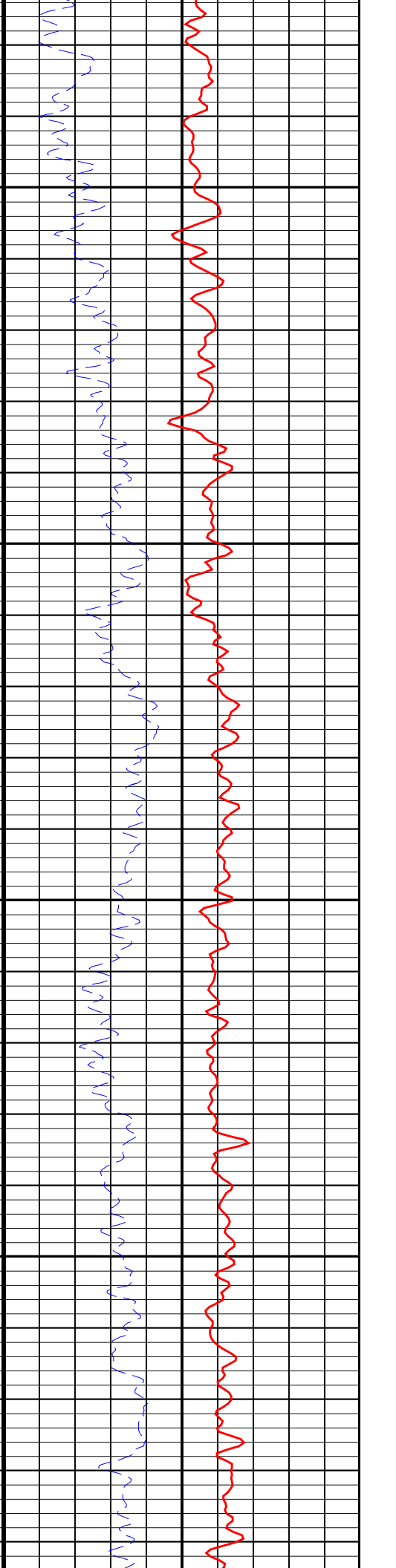
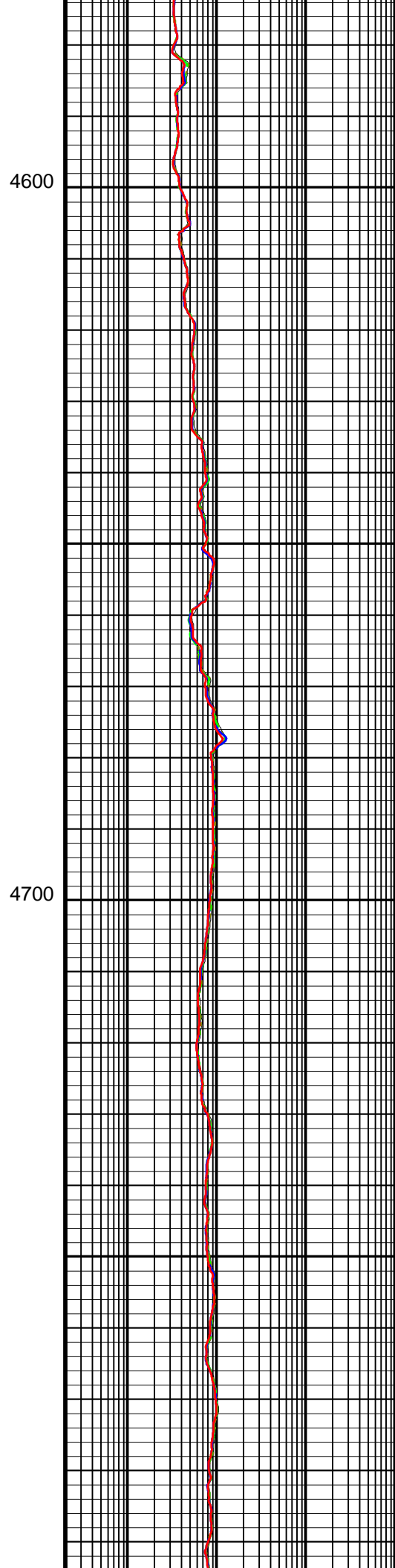
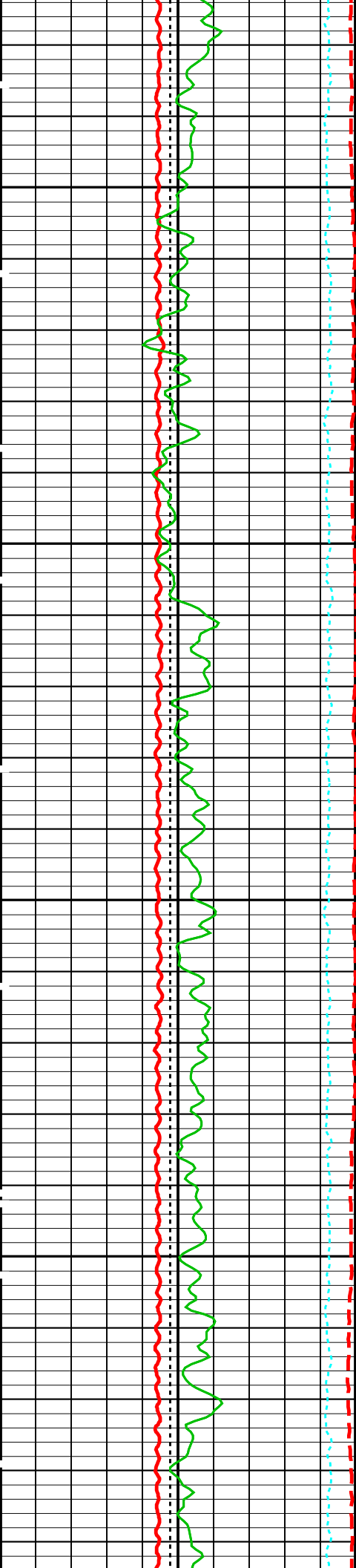


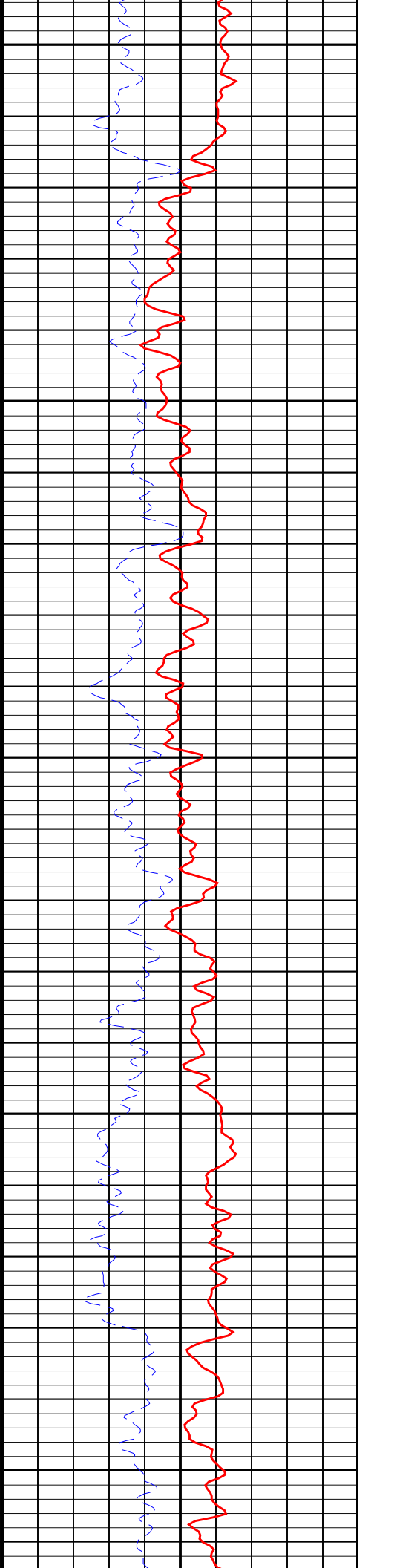
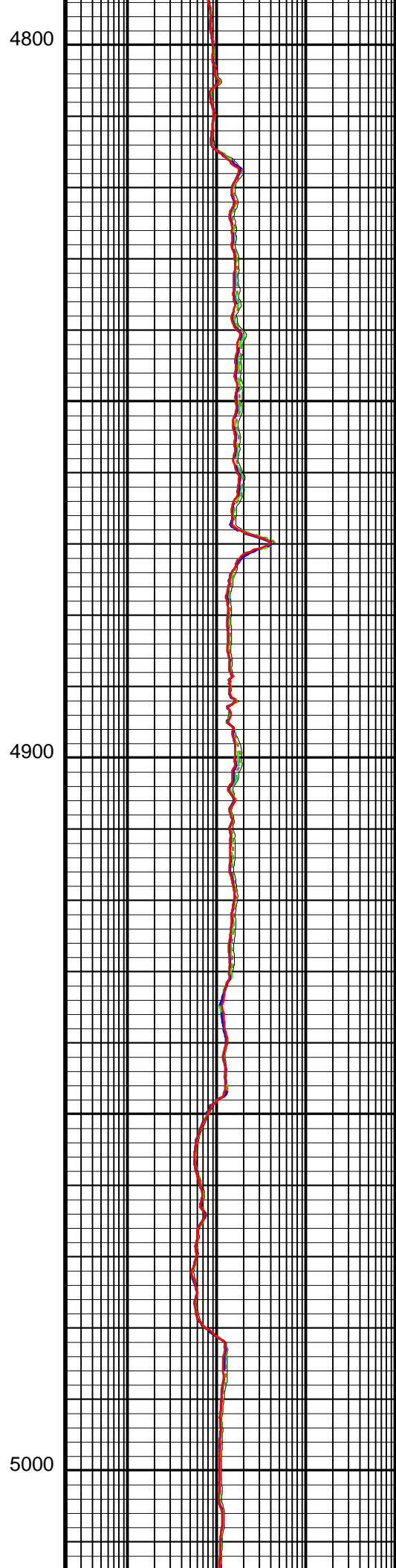
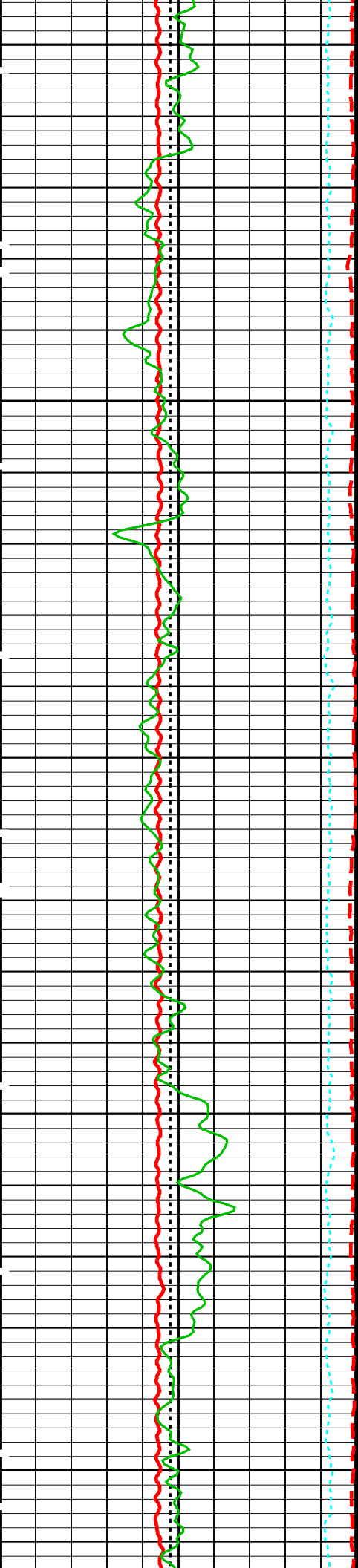


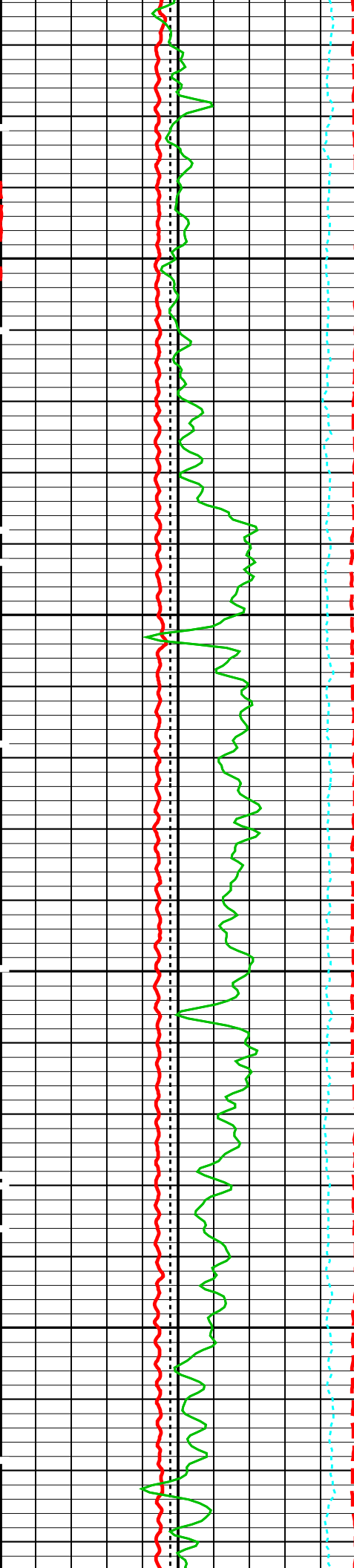
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4500



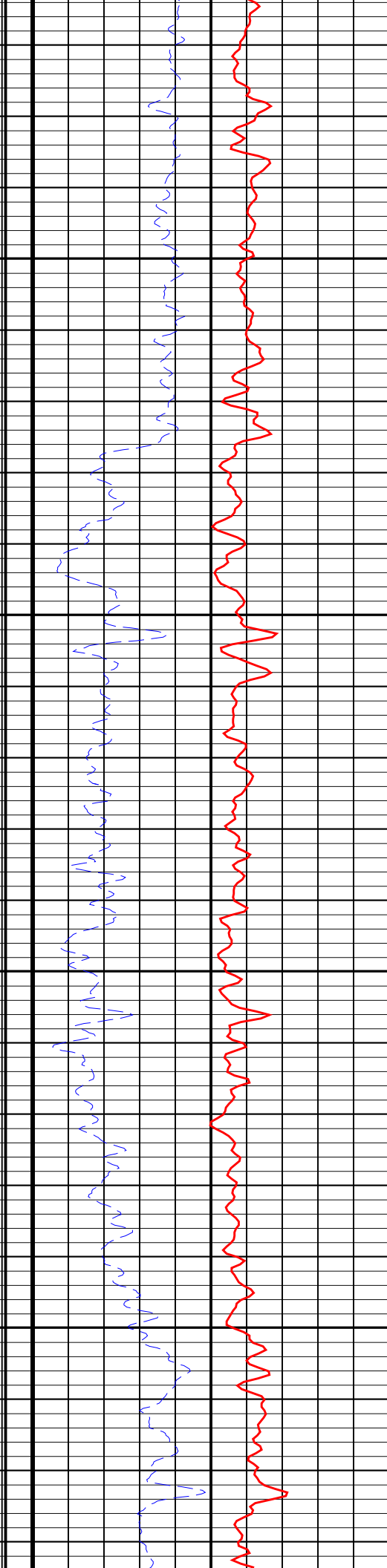
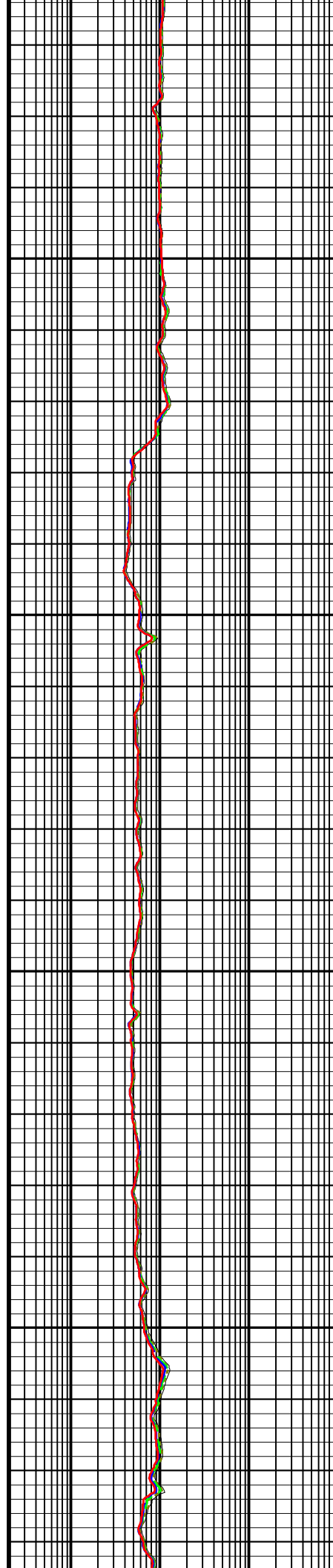


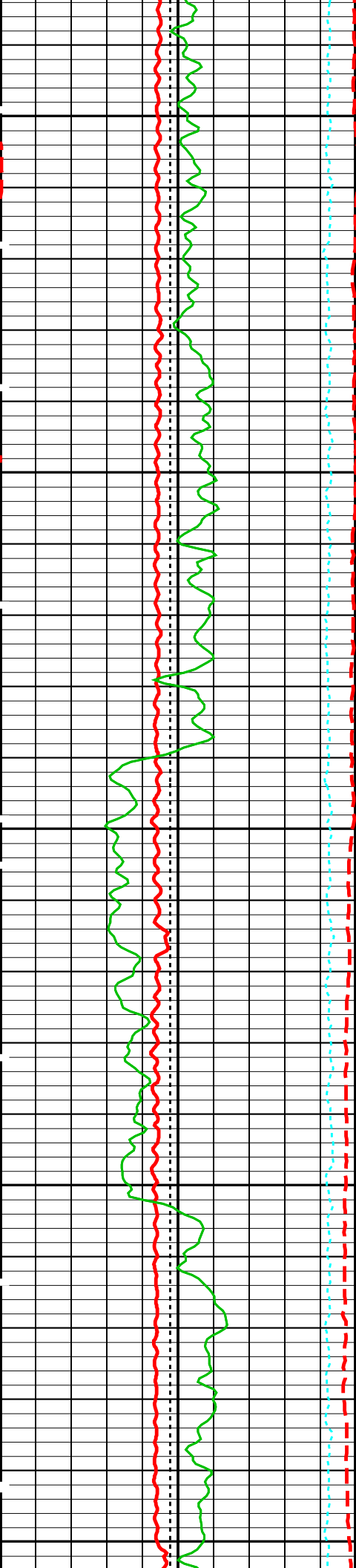




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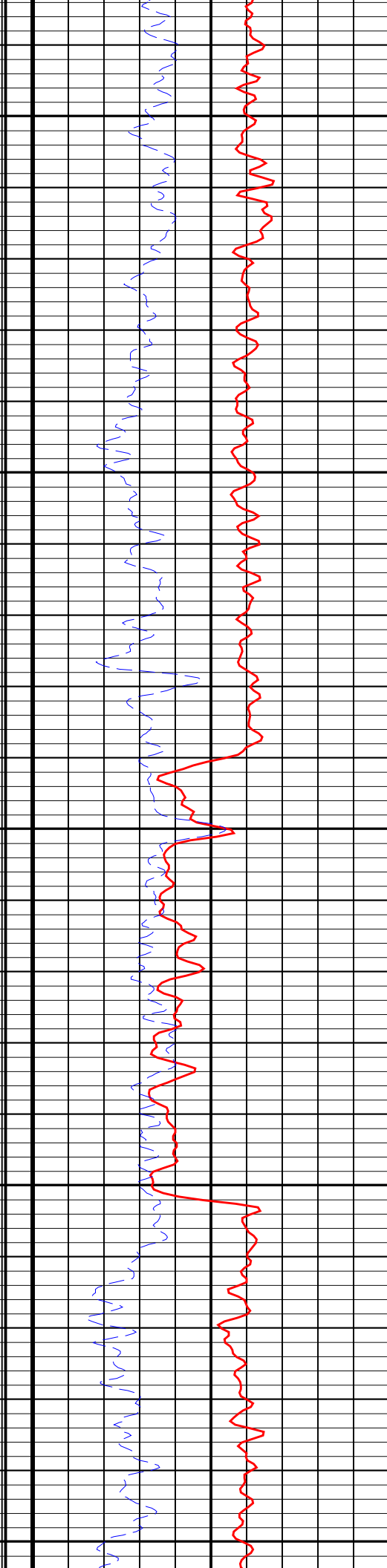
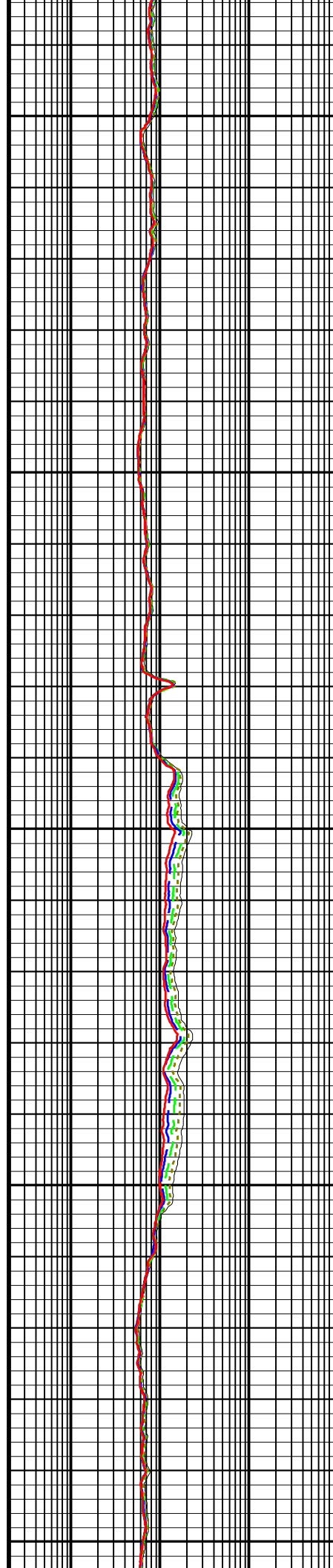
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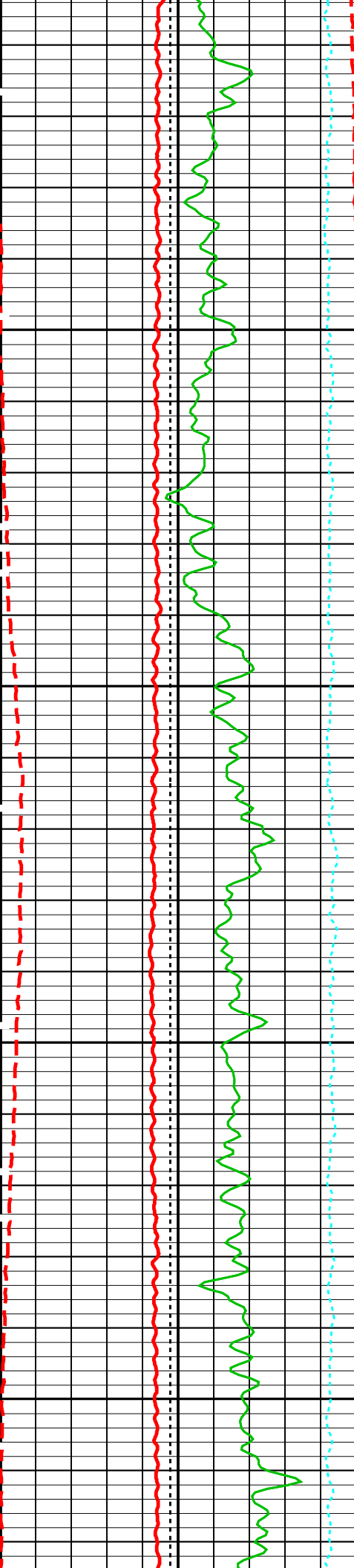




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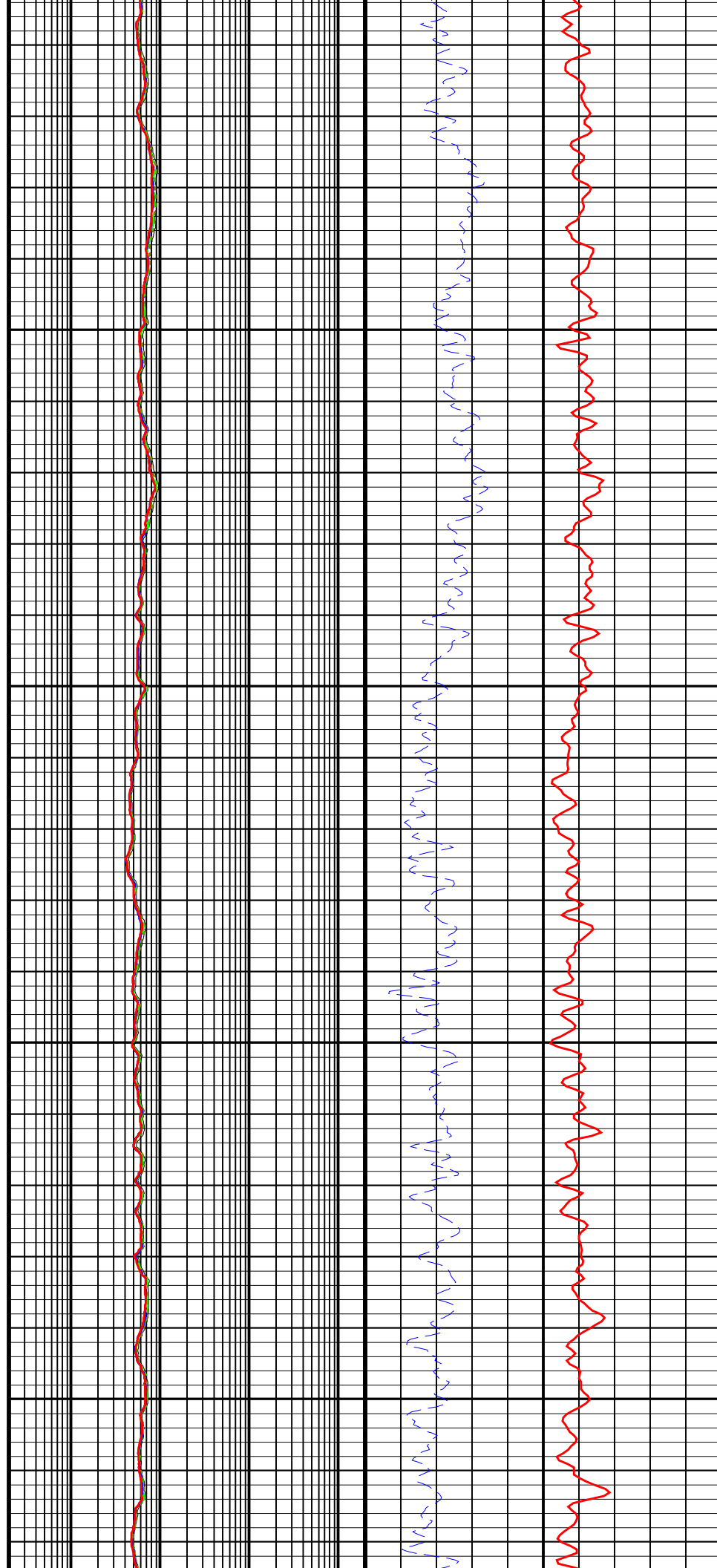
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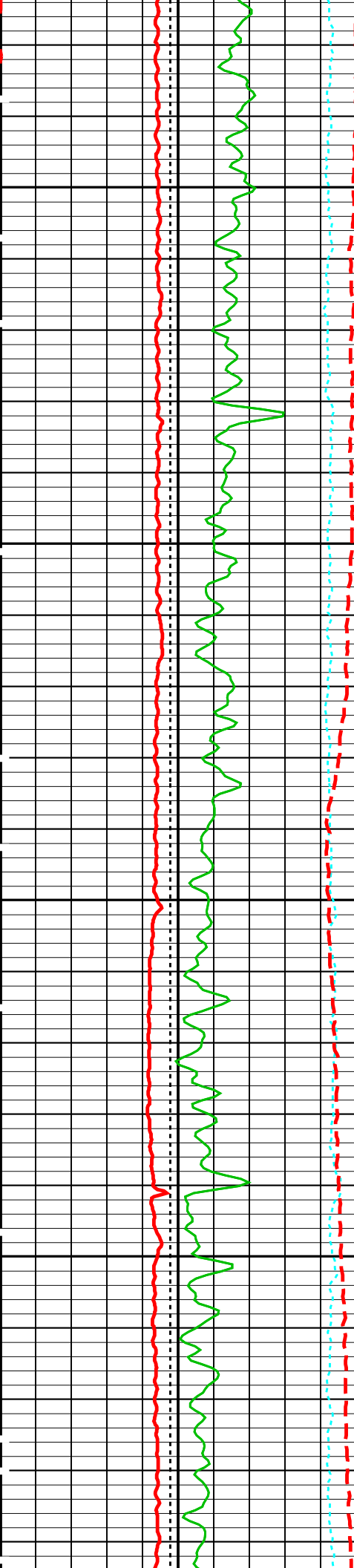




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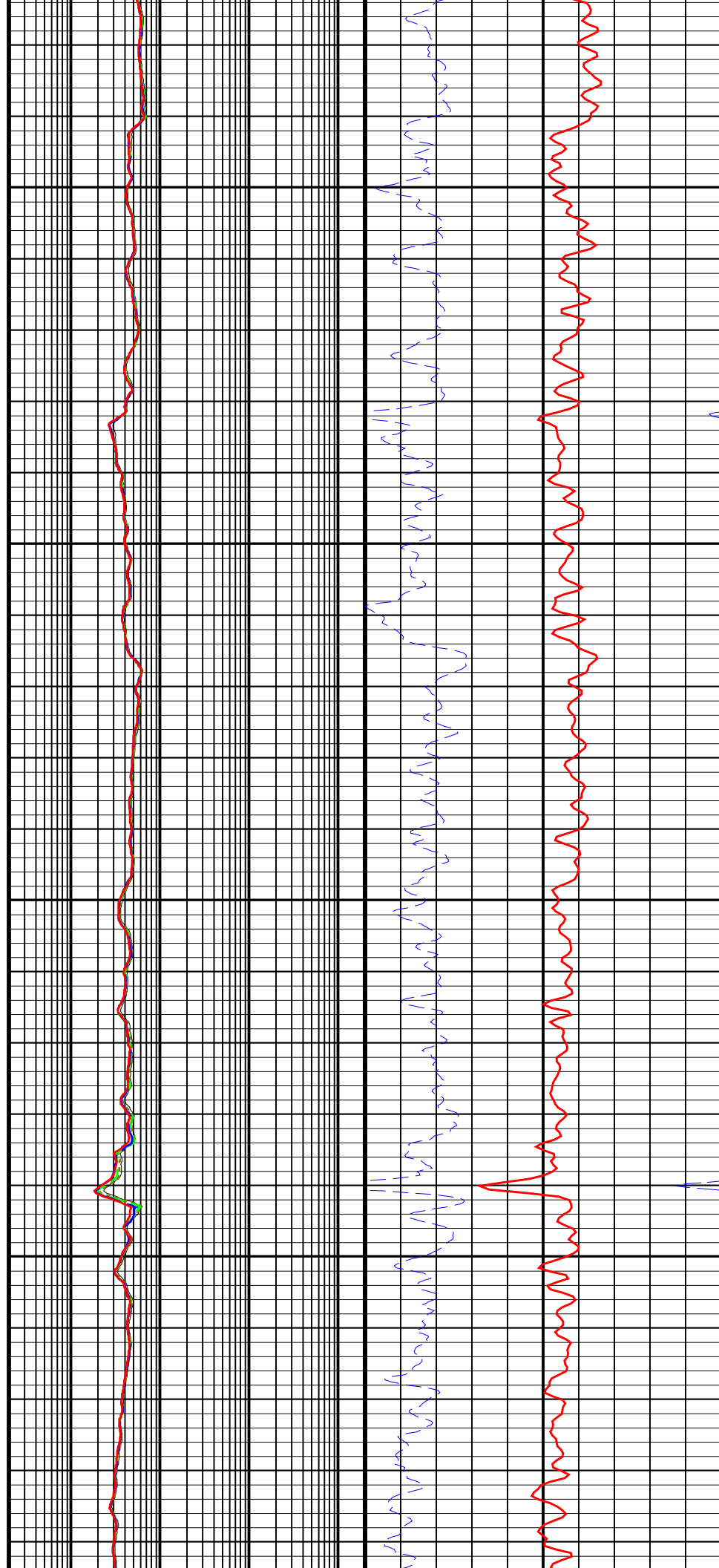
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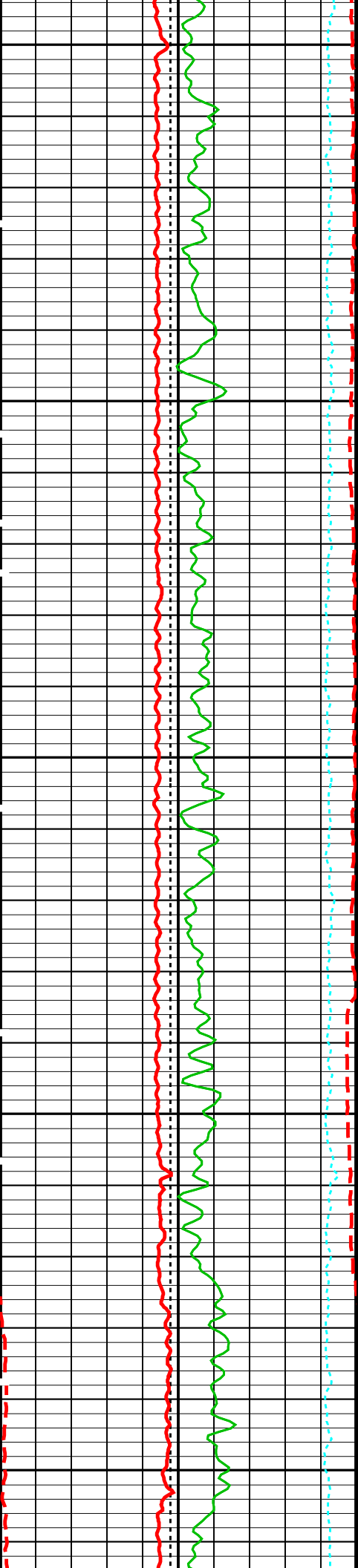




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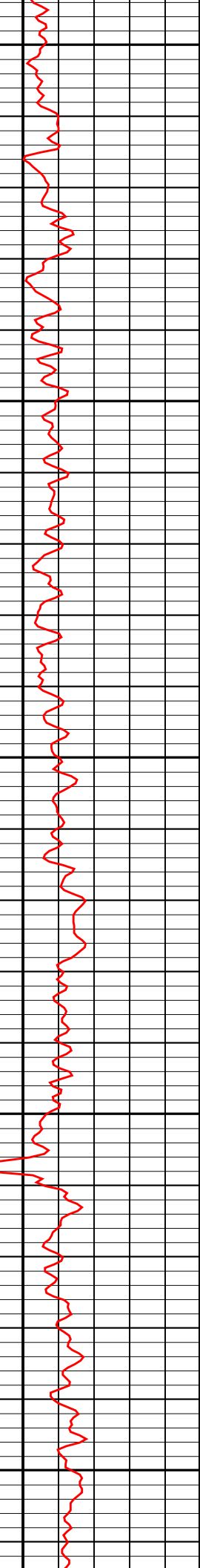
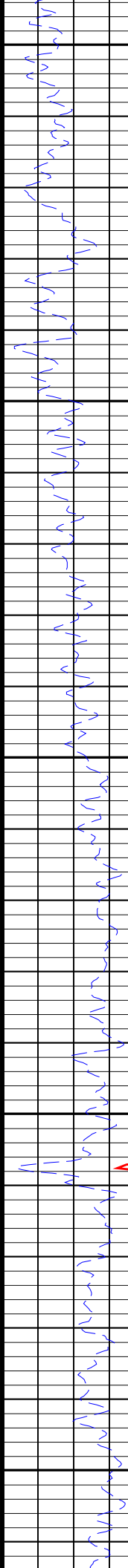
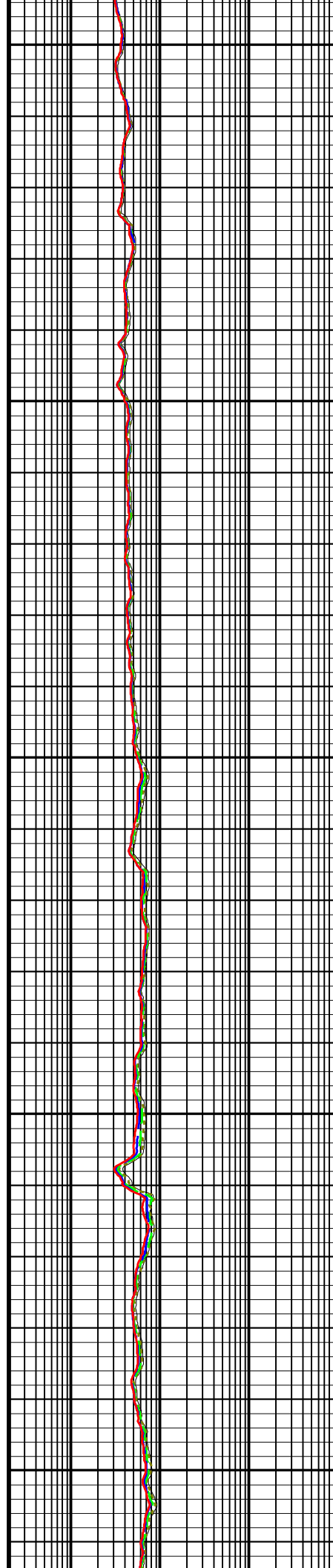


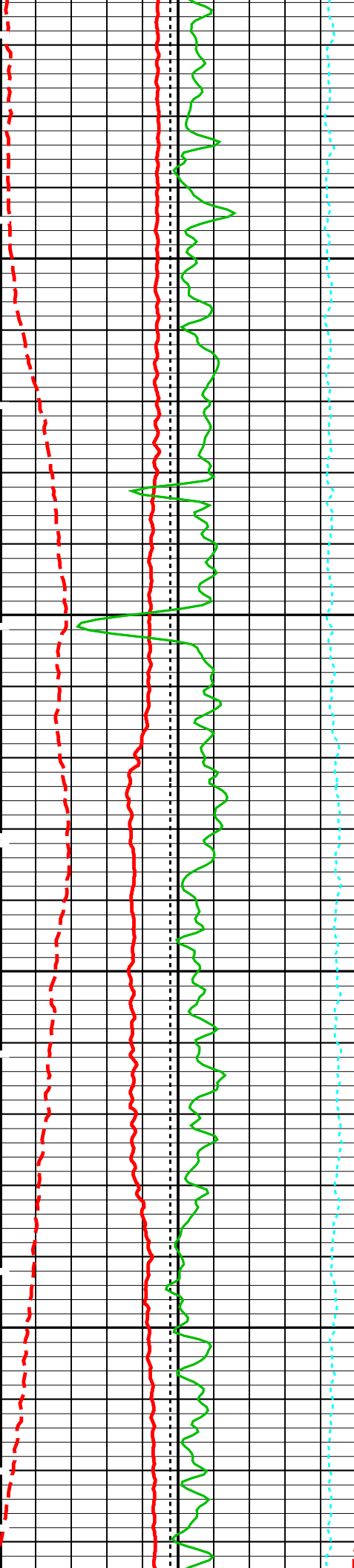


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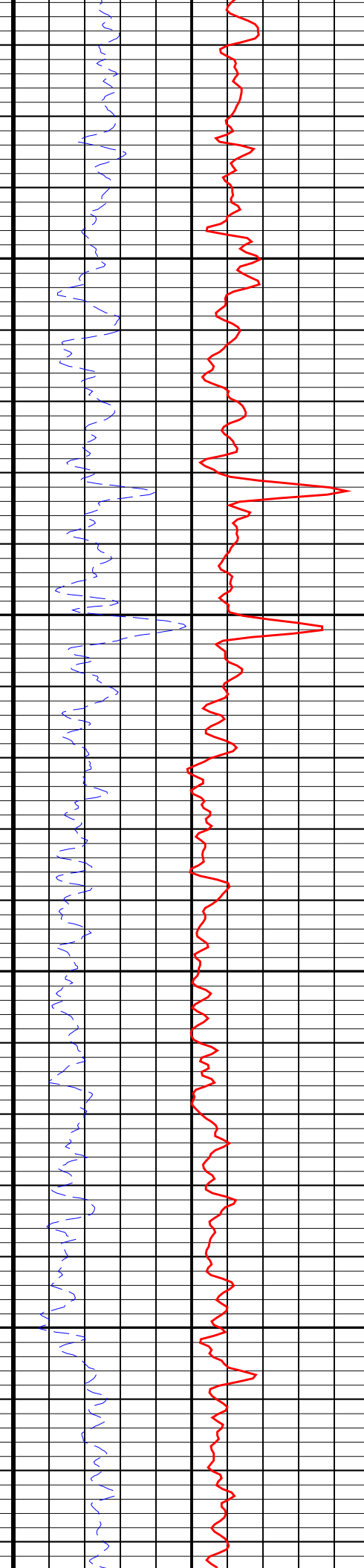
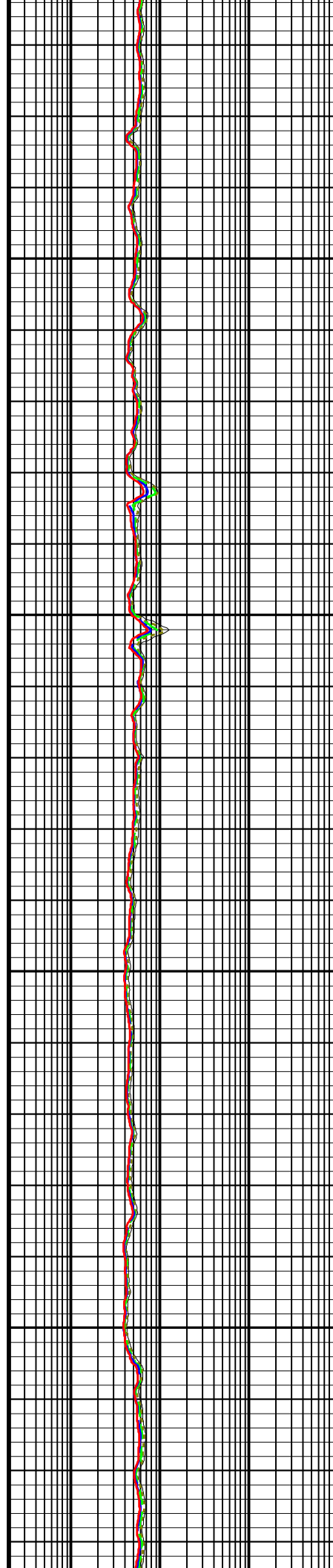
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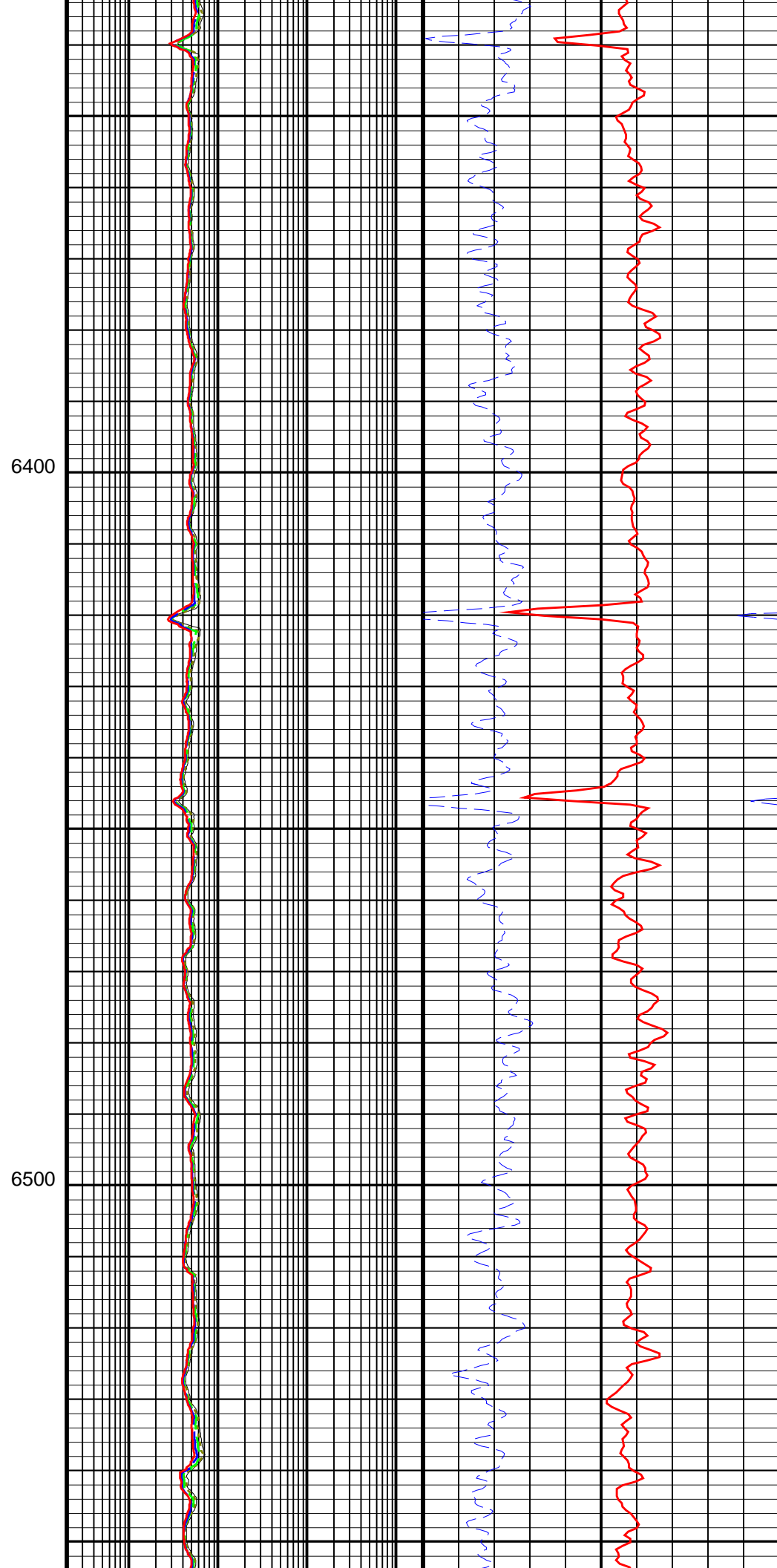
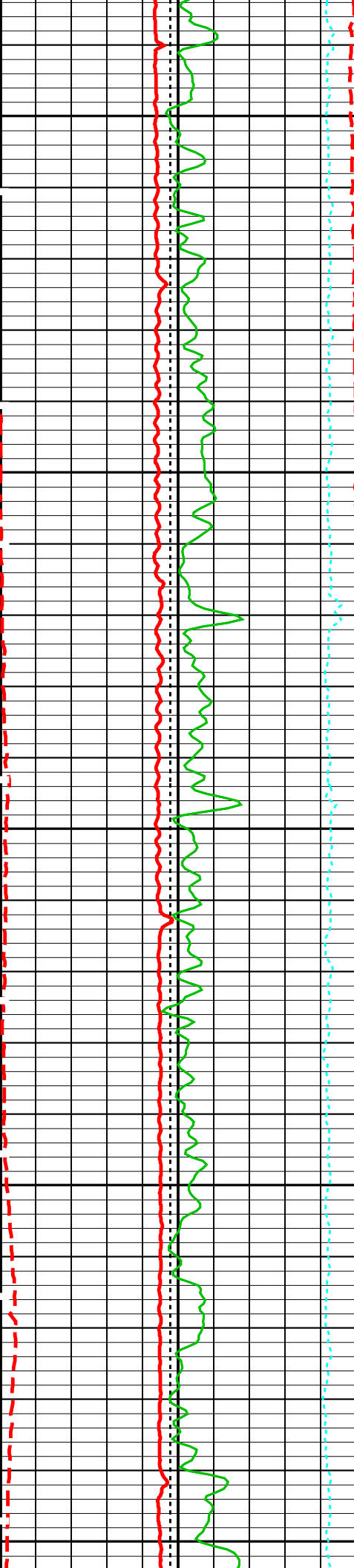


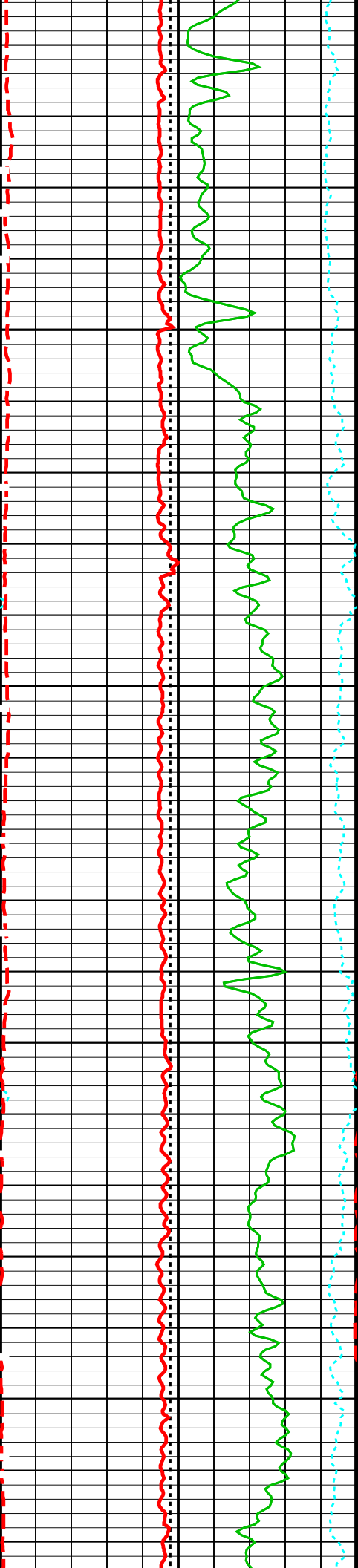


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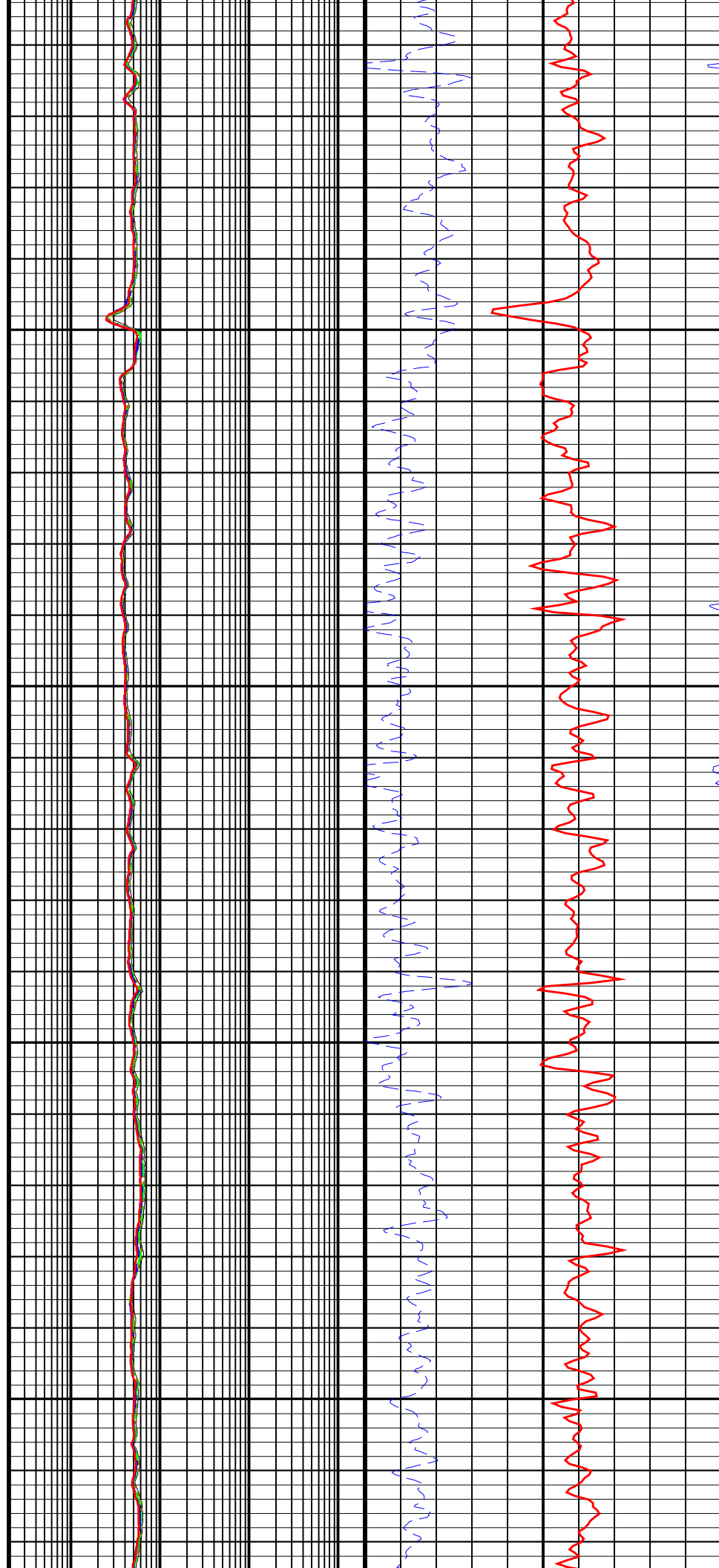


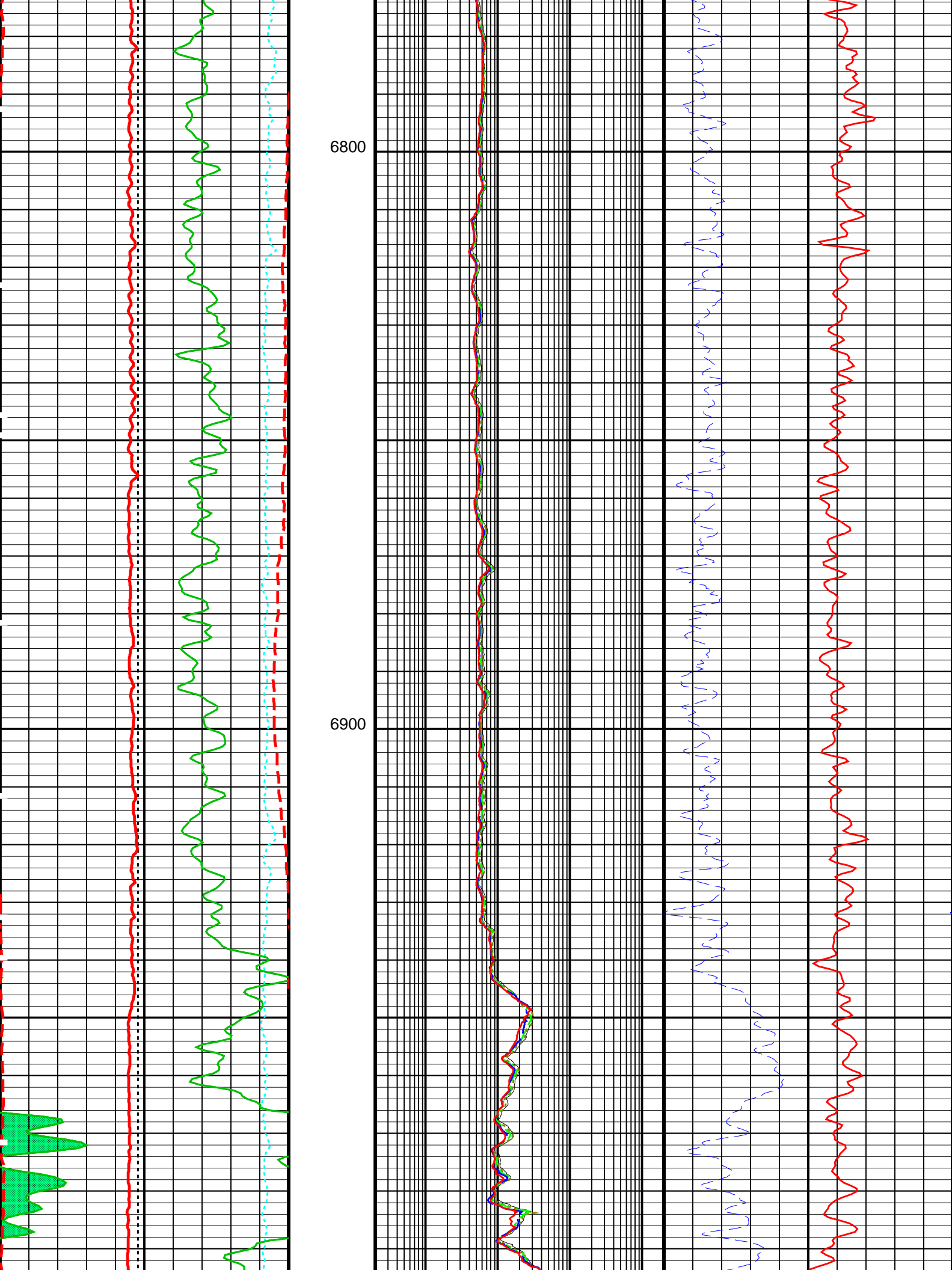


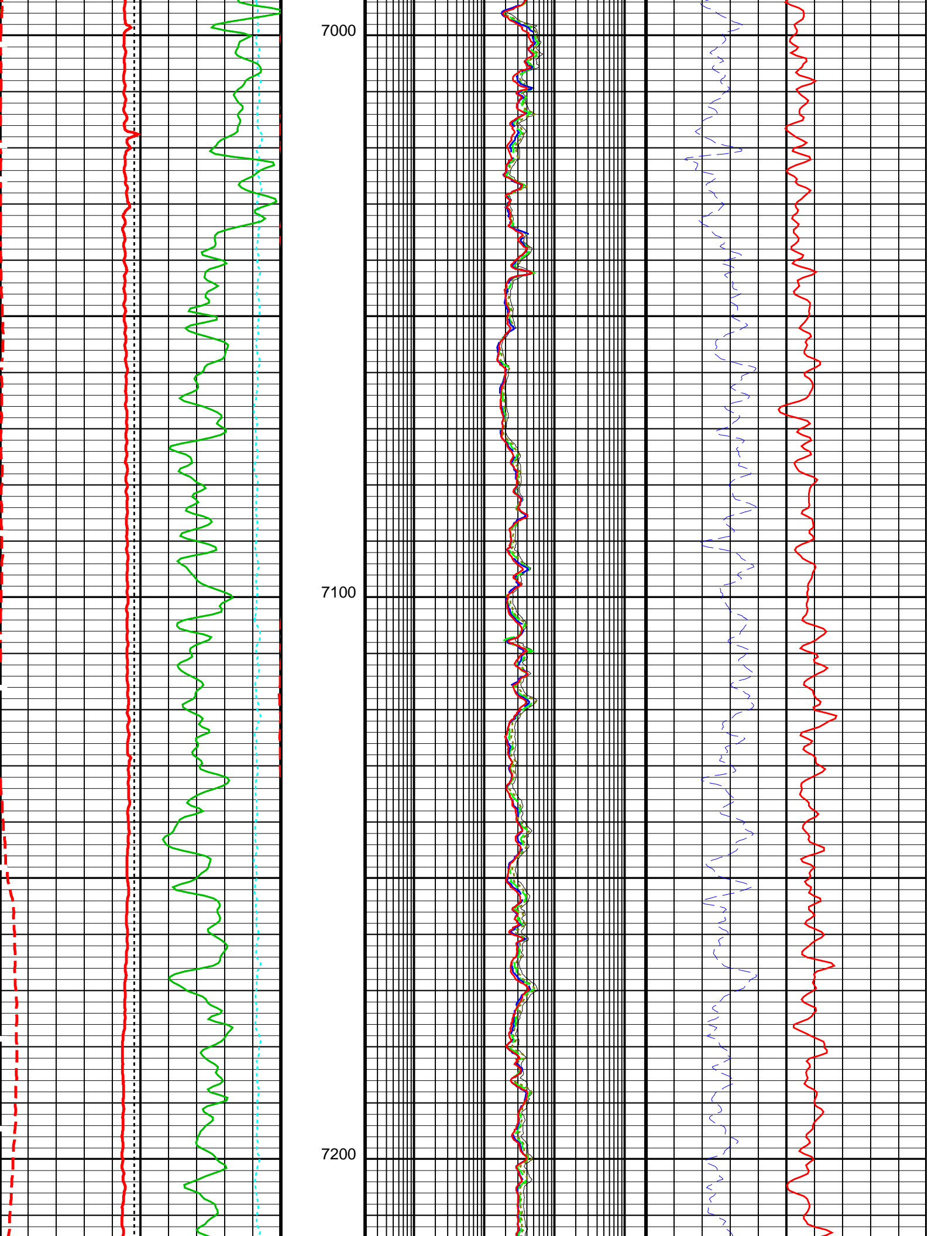


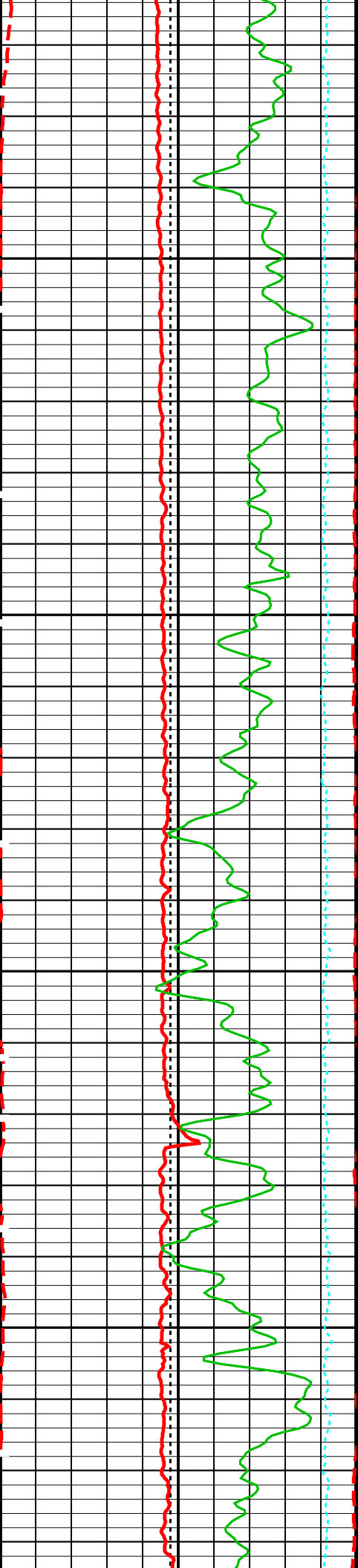
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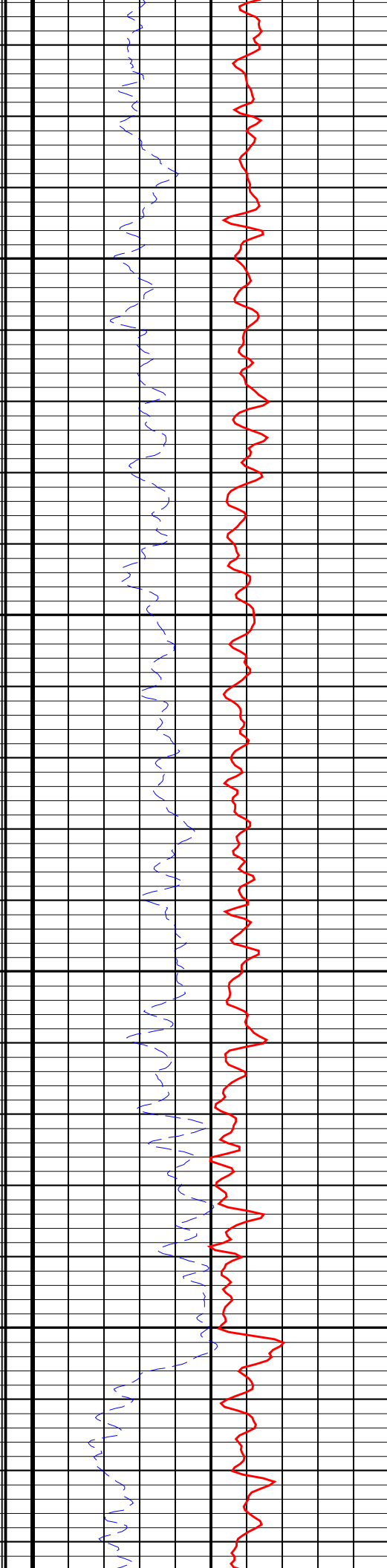
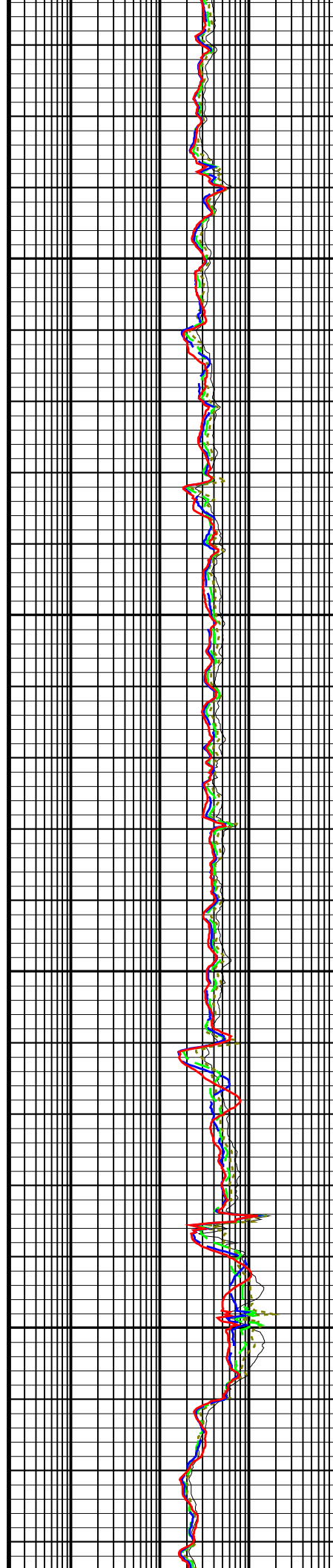


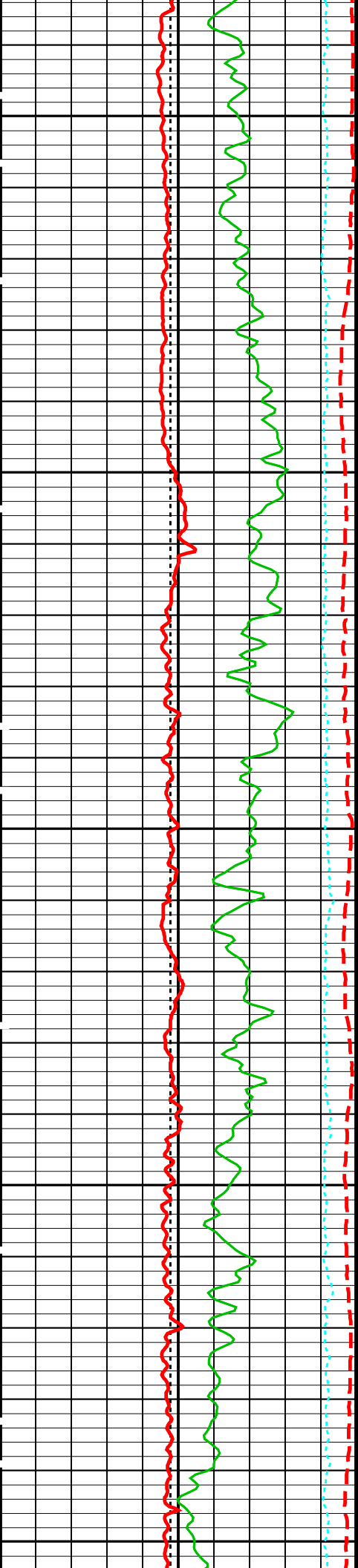




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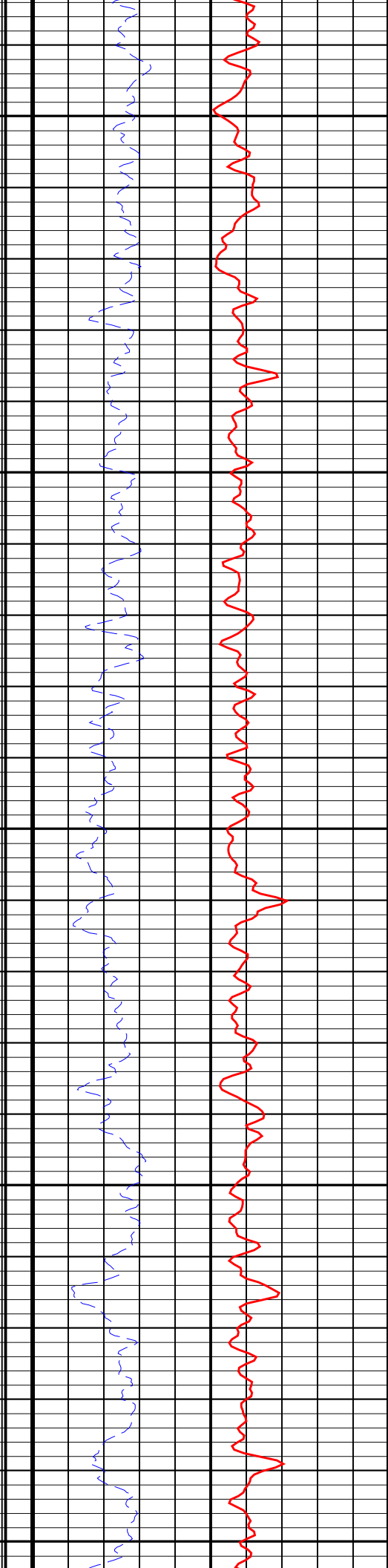
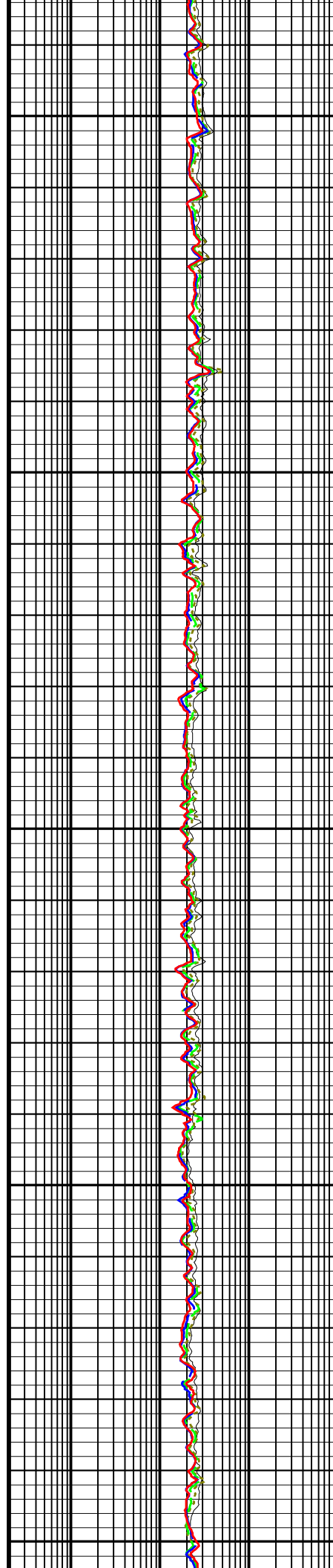
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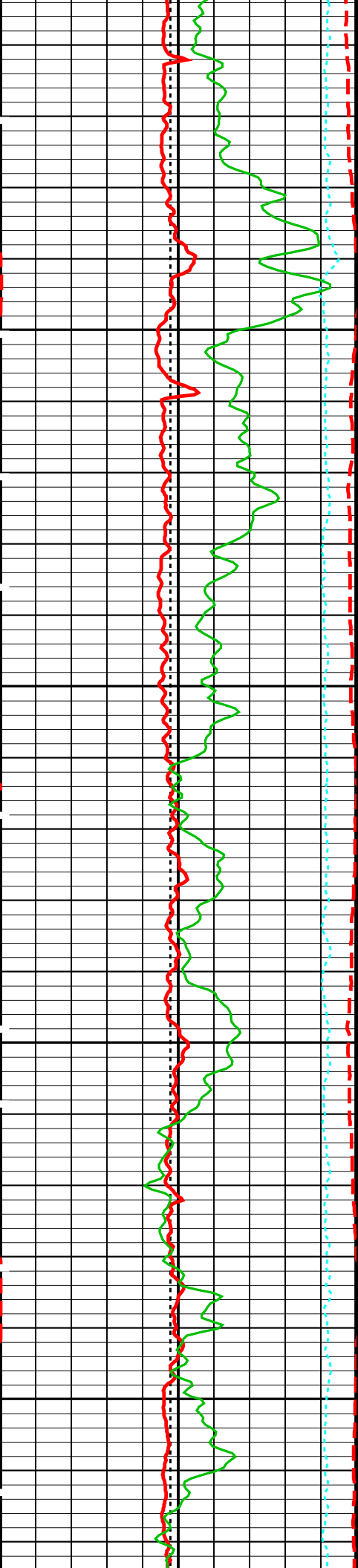




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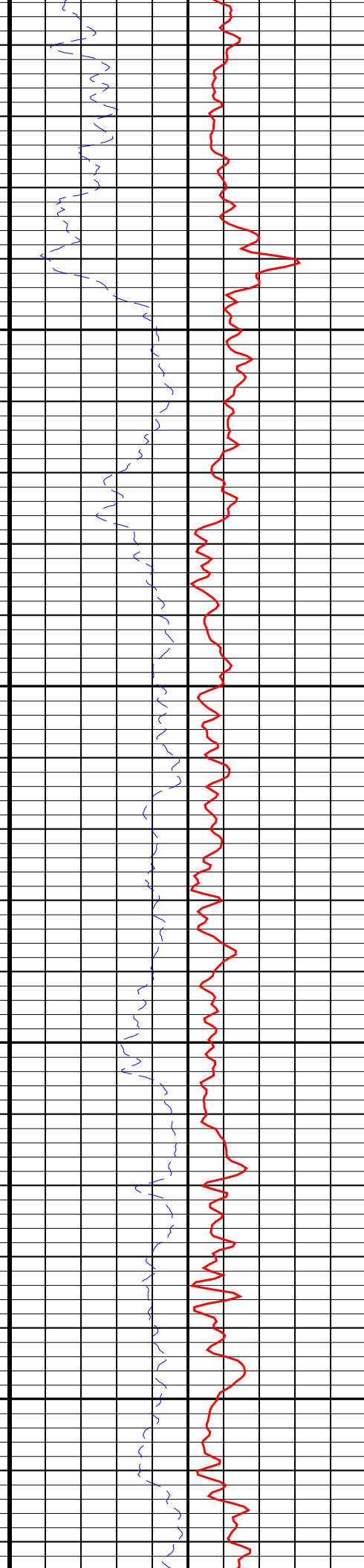
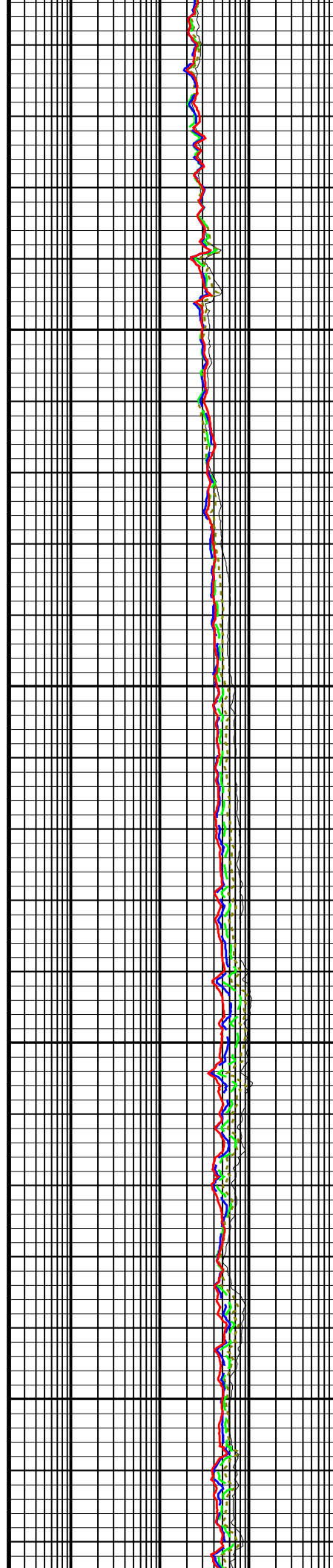
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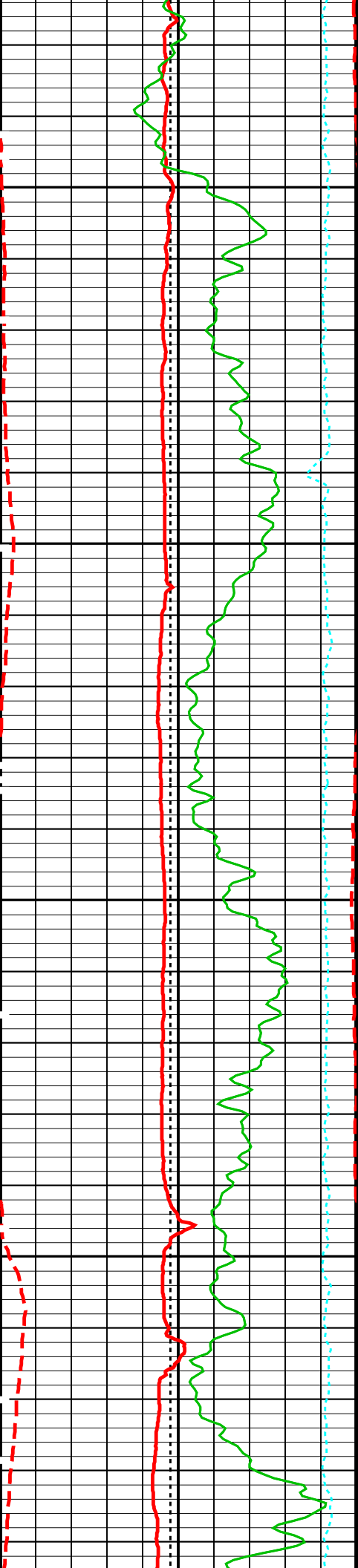




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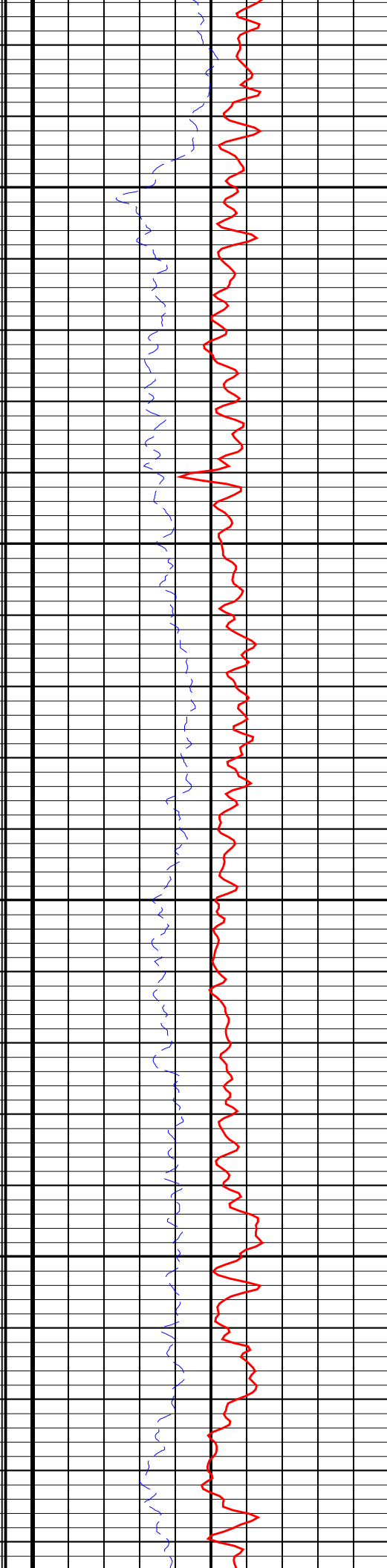
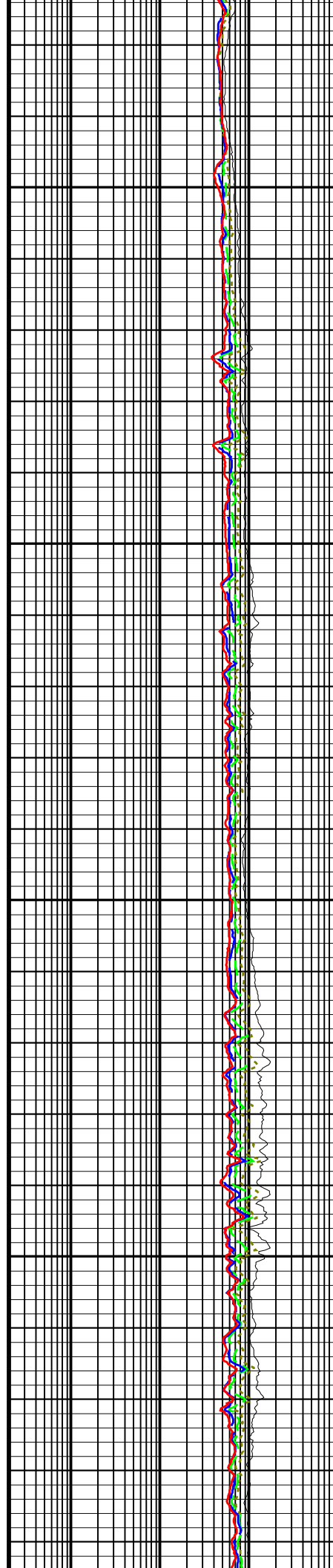
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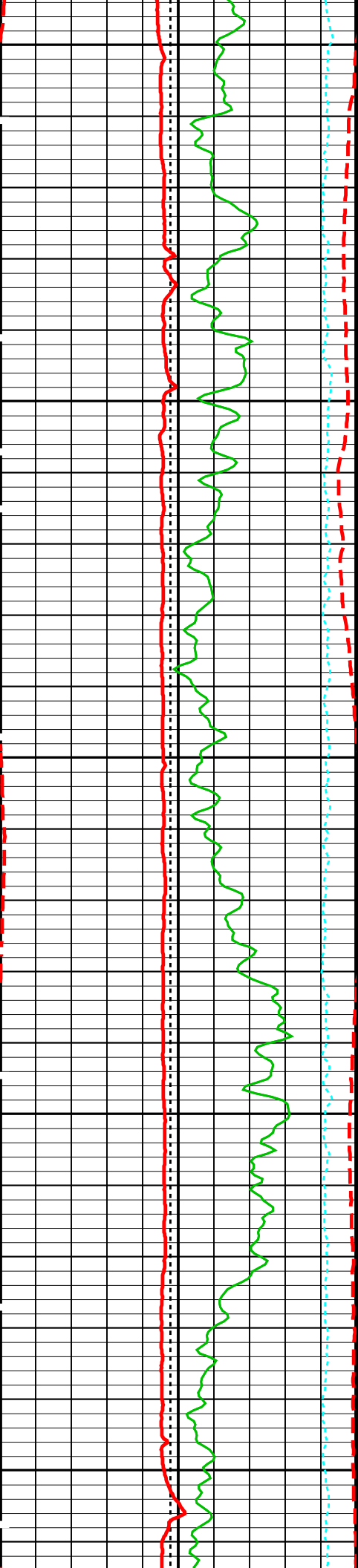




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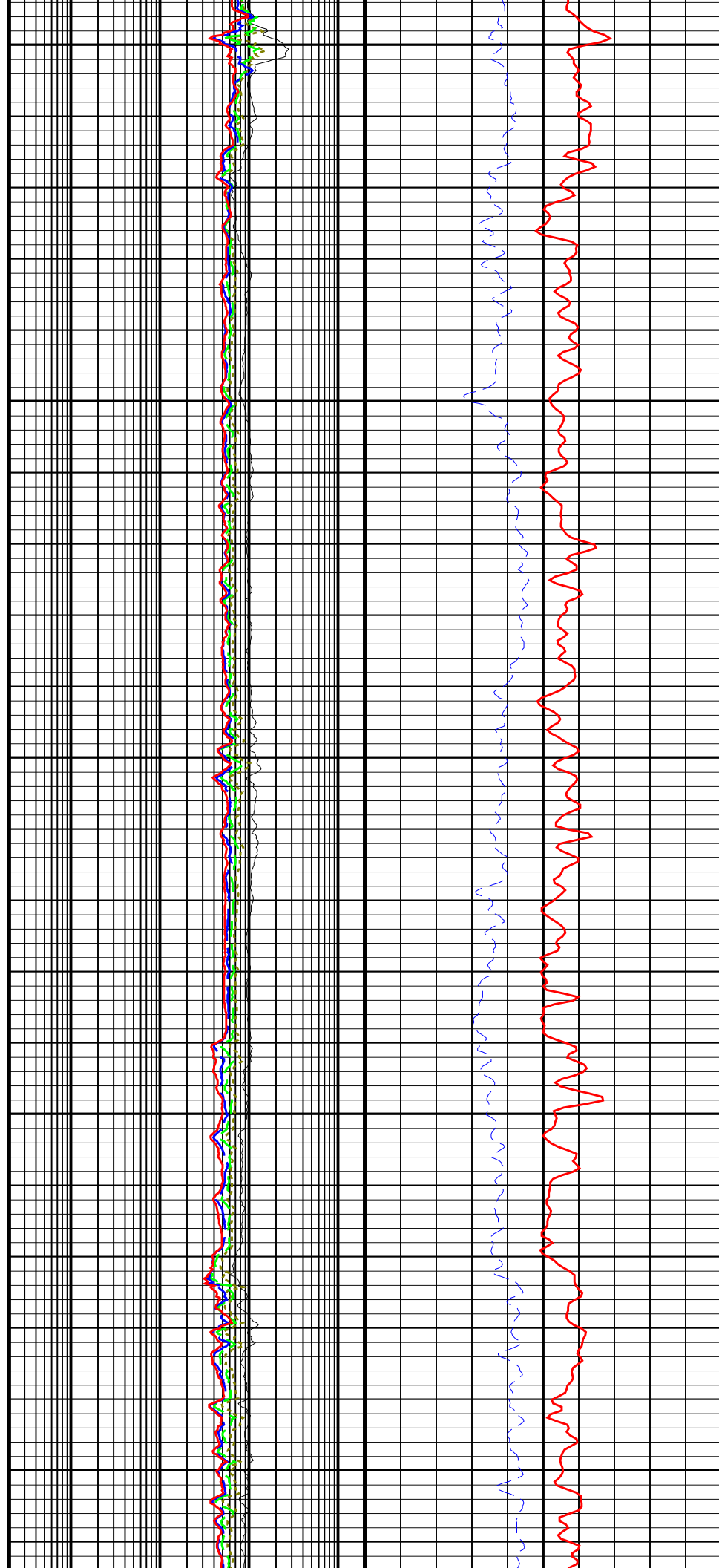


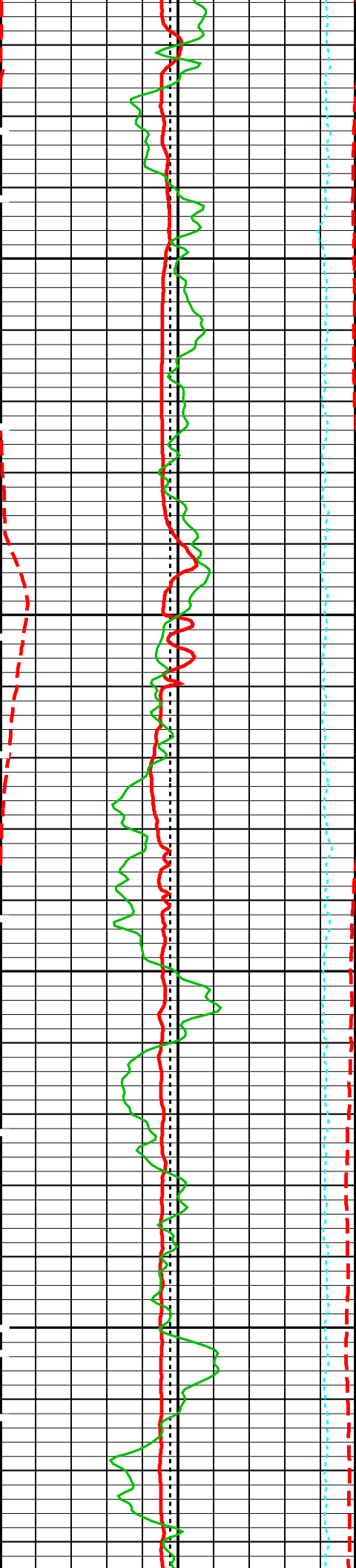


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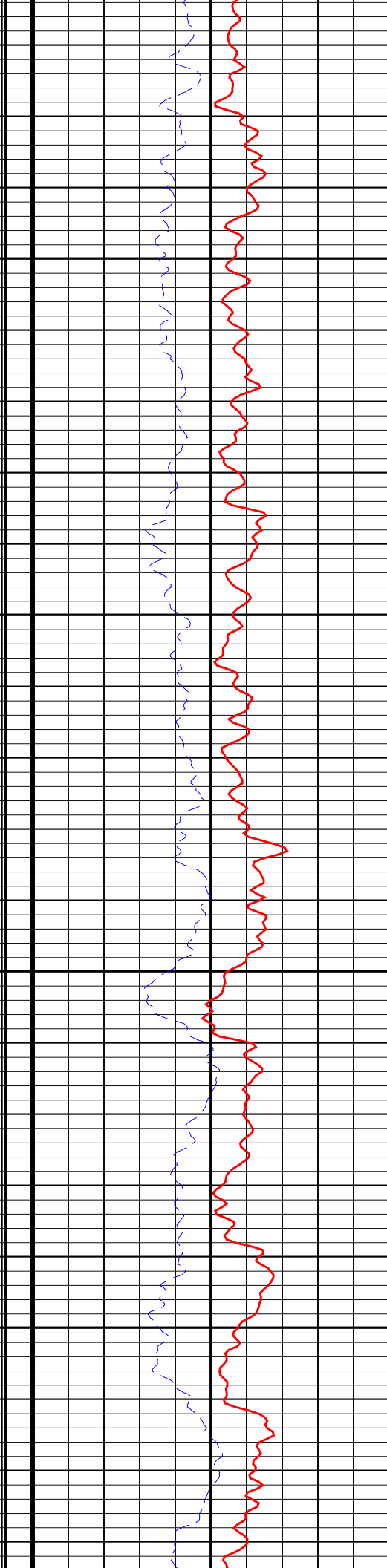
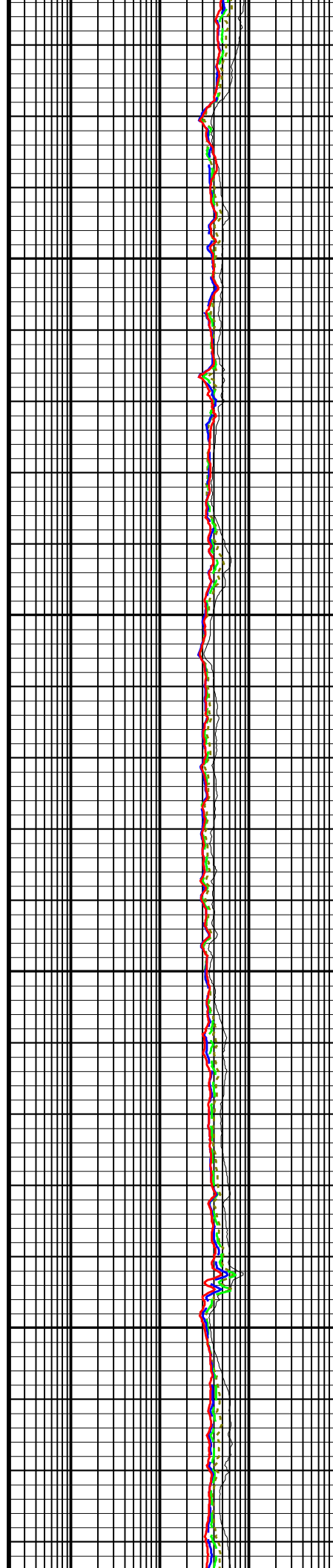
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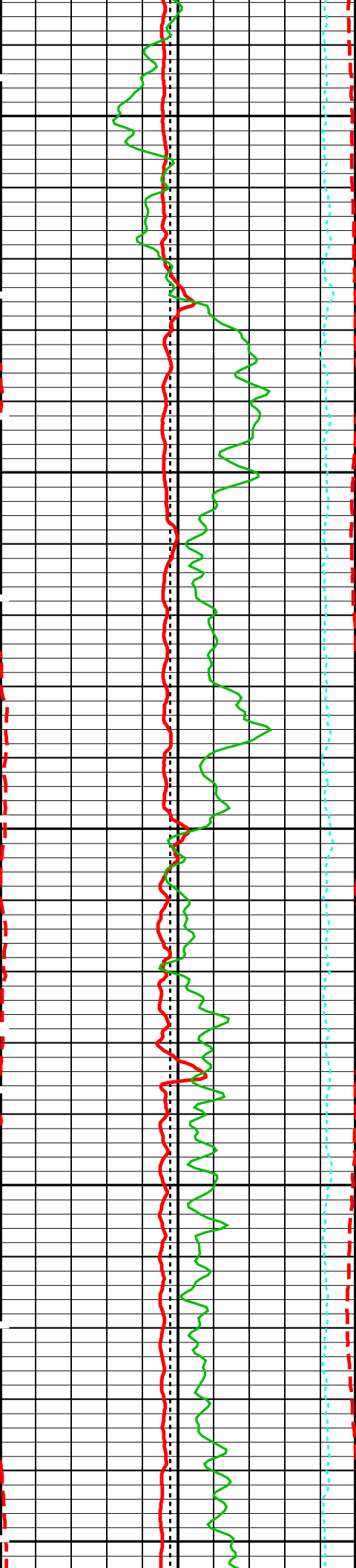




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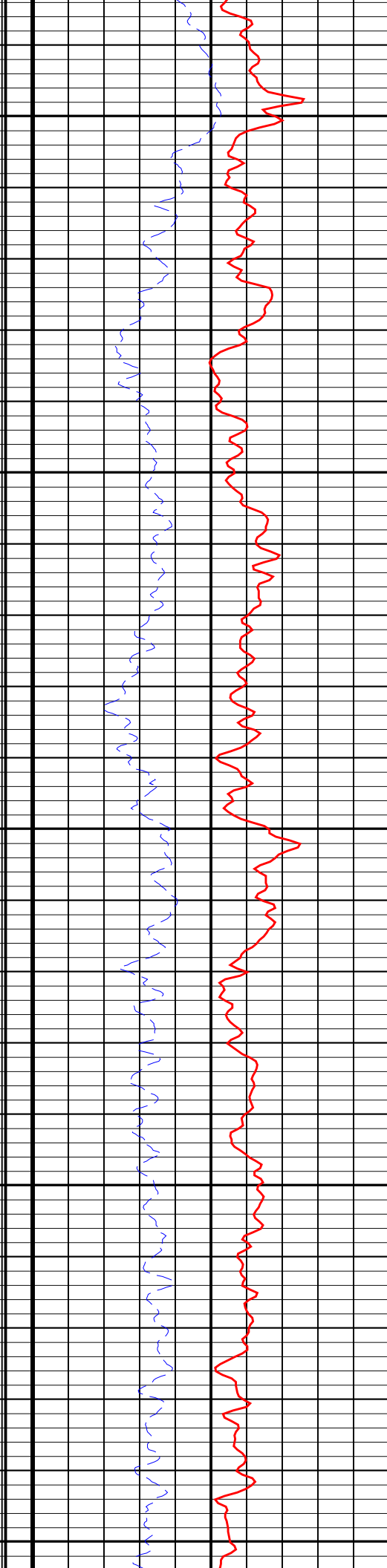
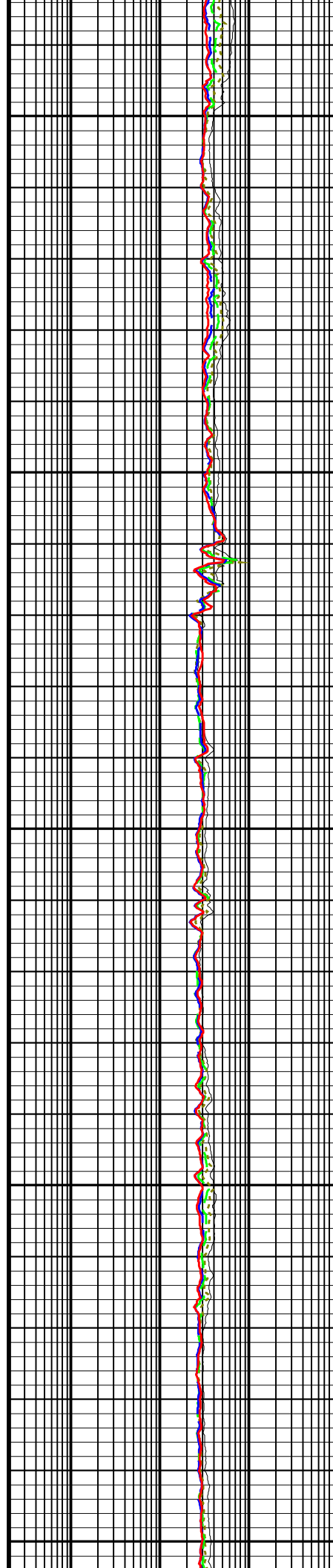
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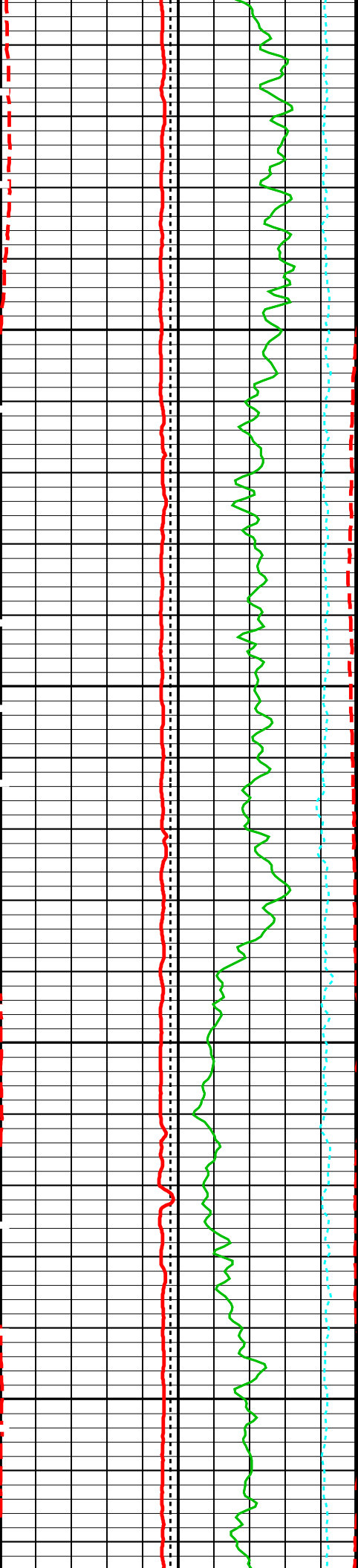




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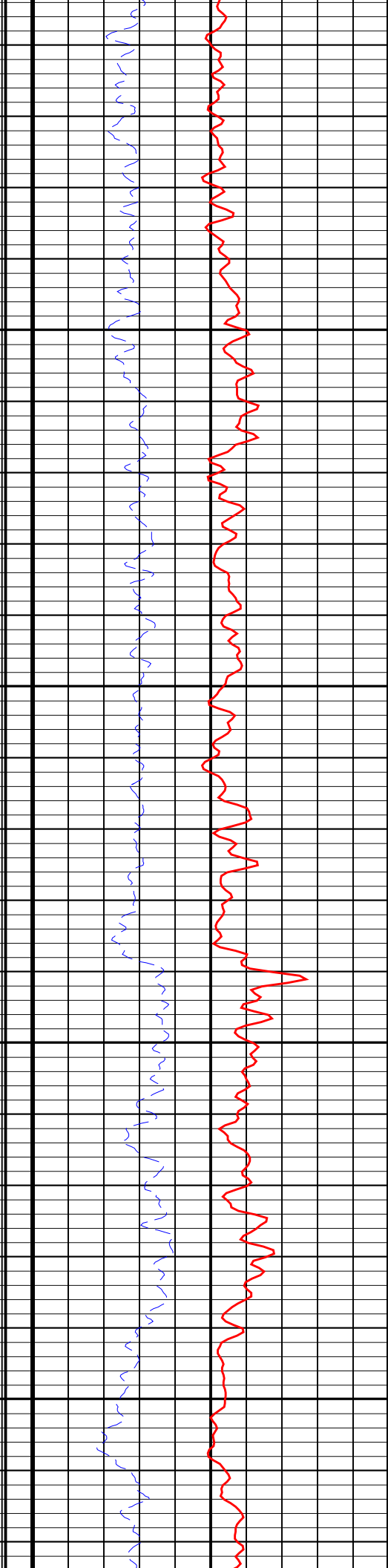
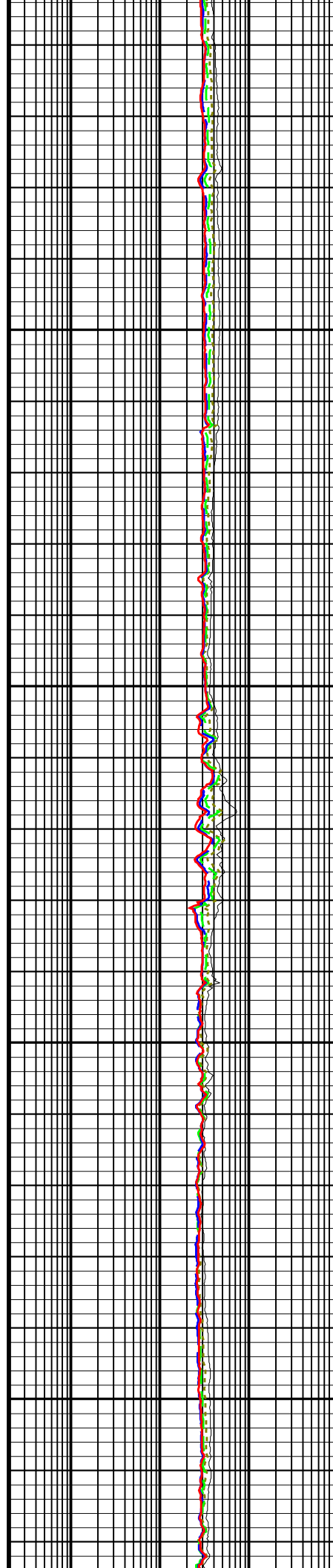
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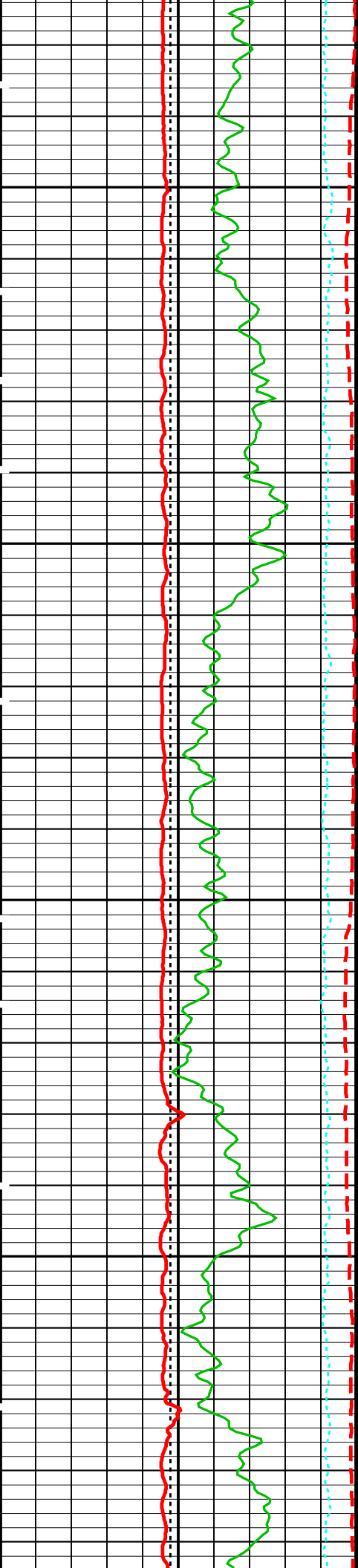




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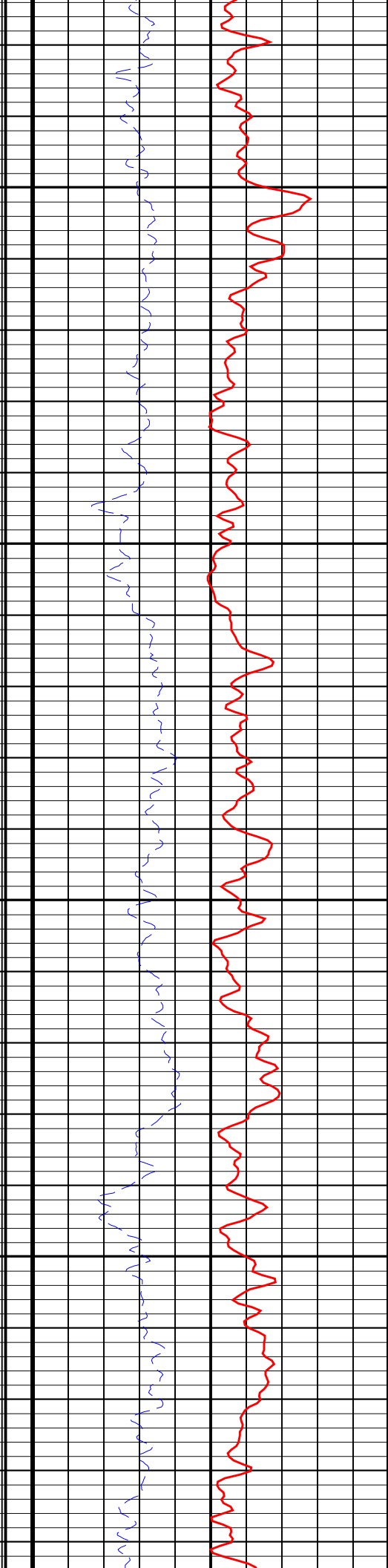
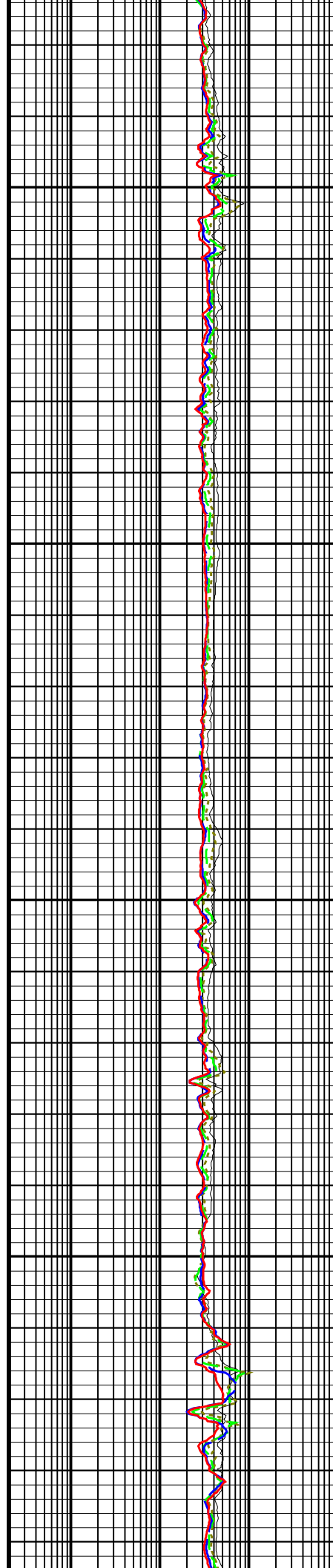
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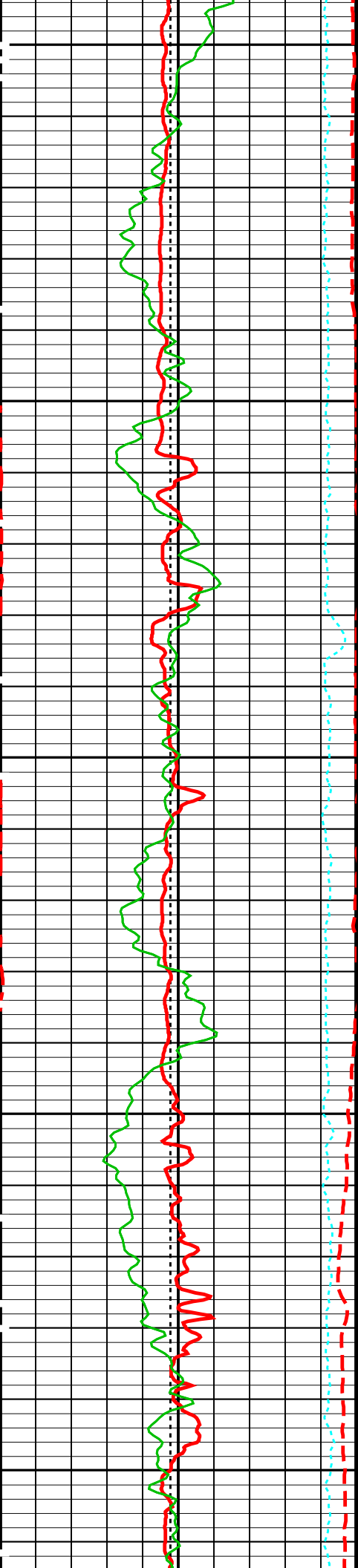




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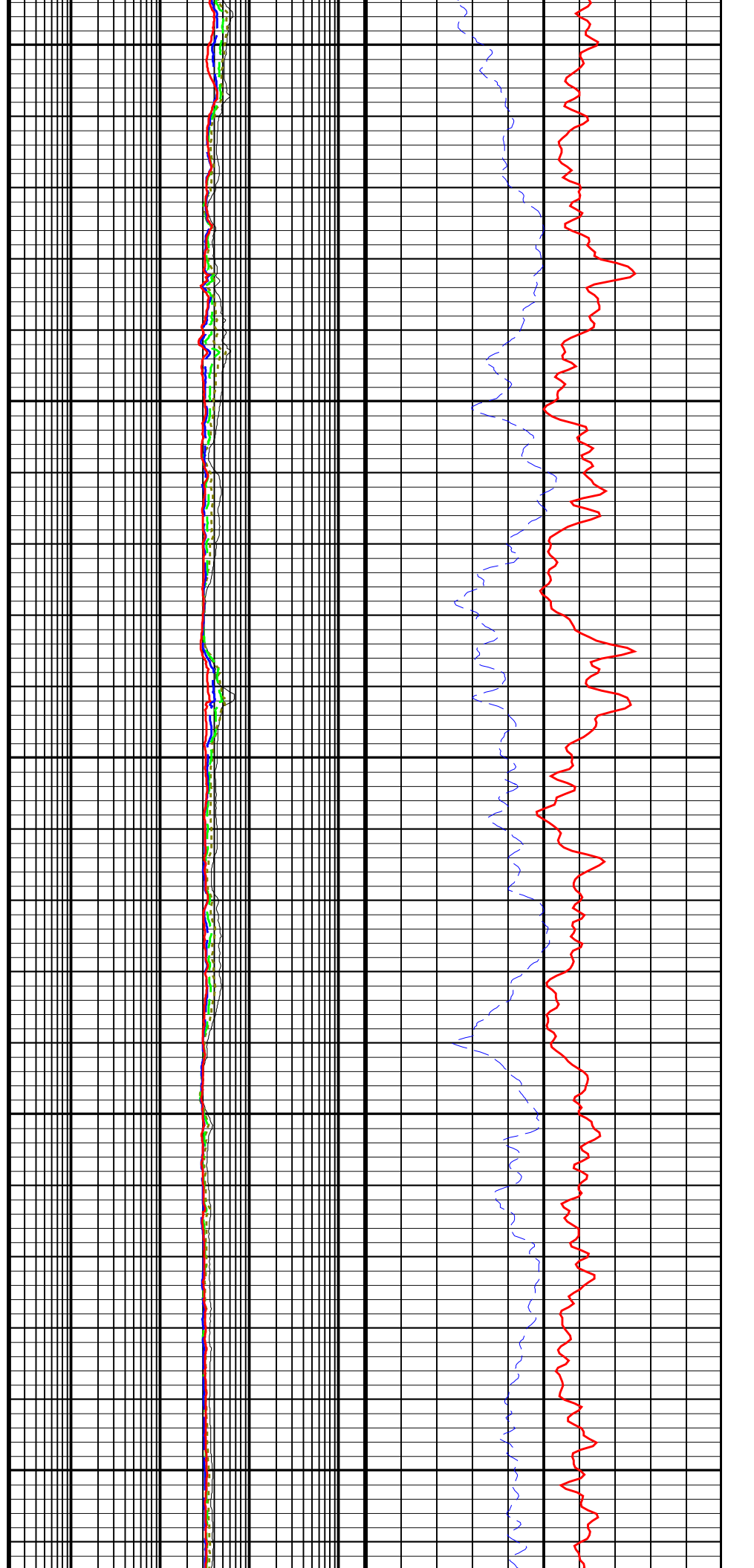


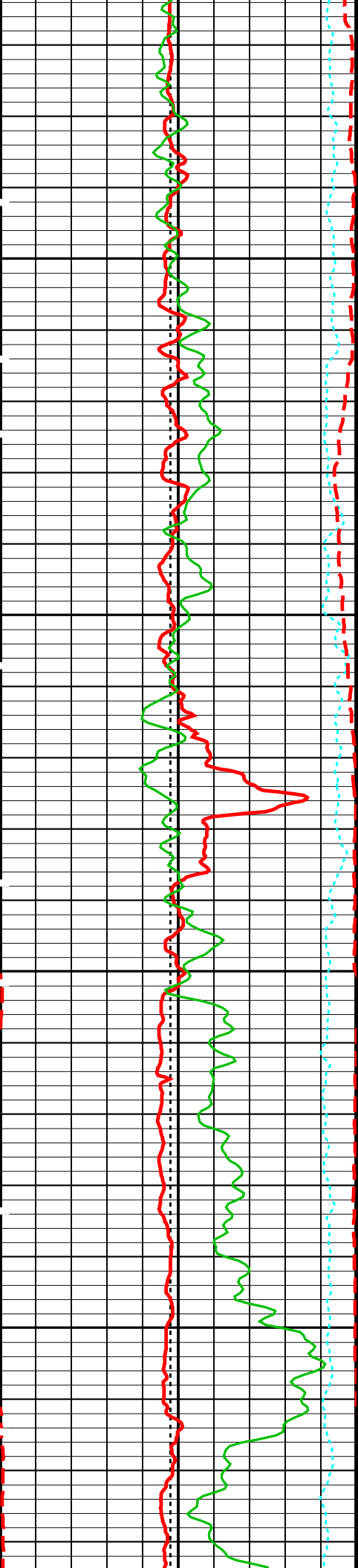


9200

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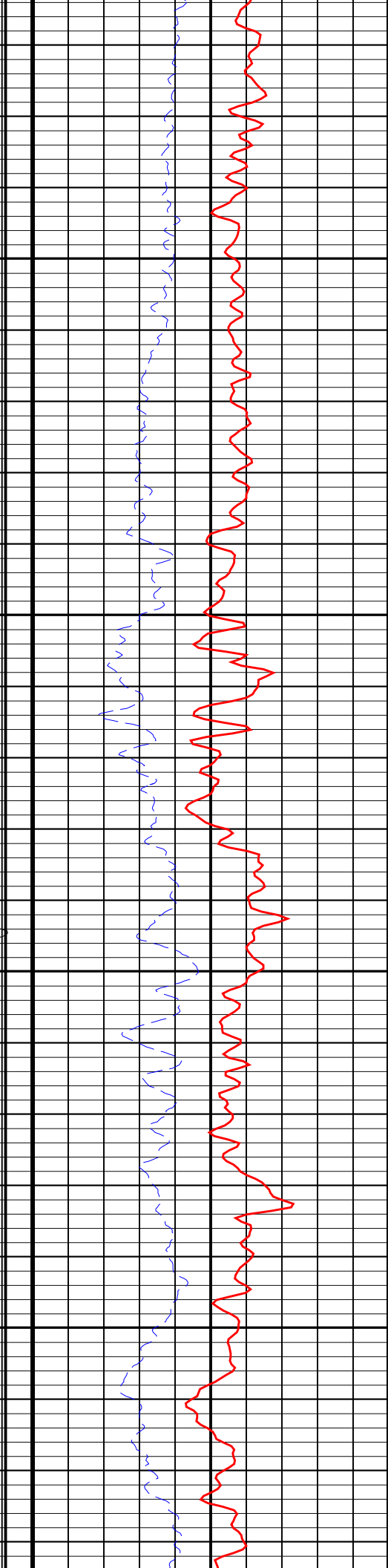
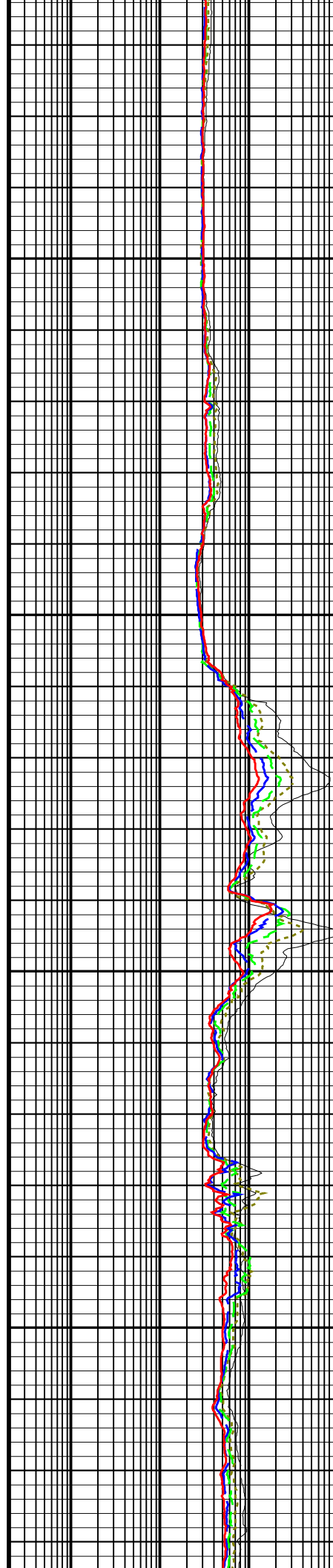
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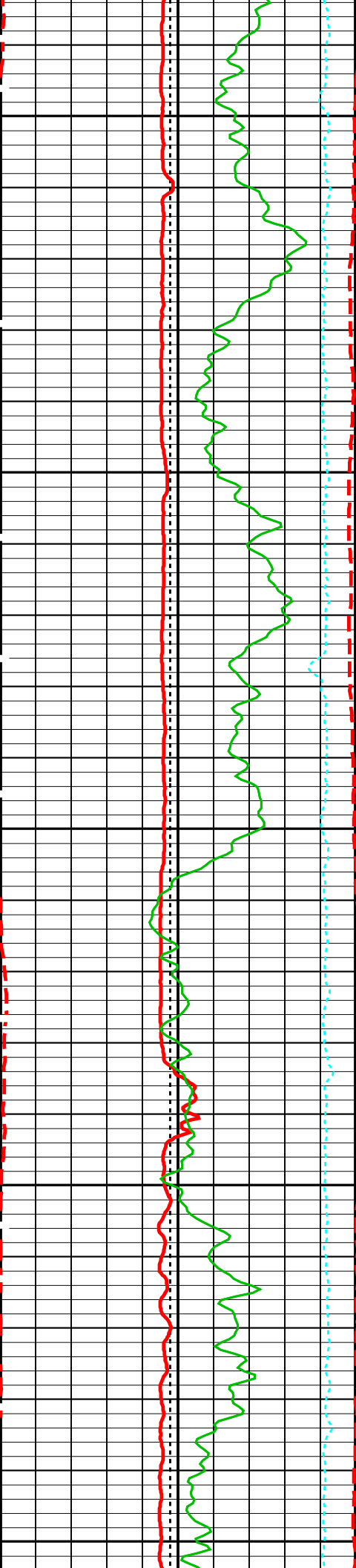




9500

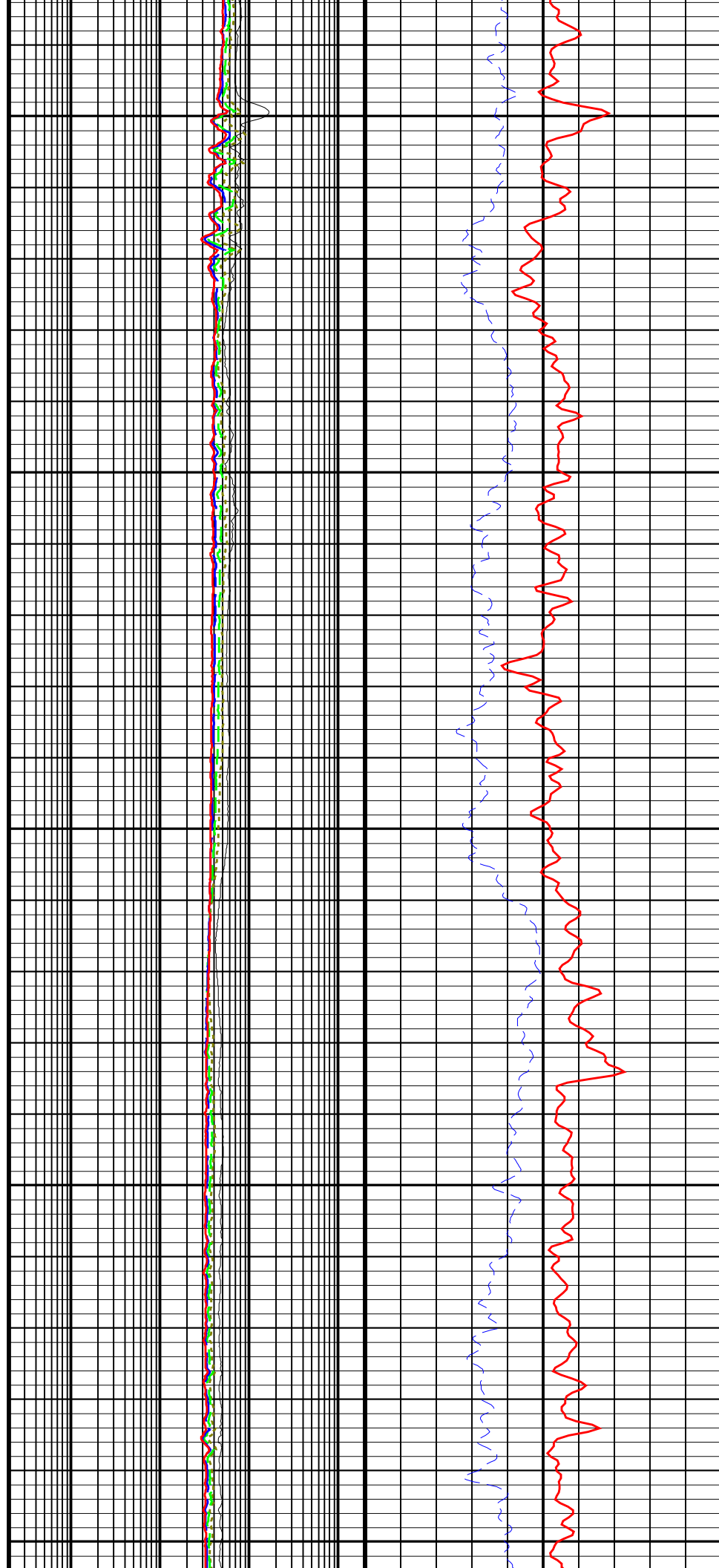
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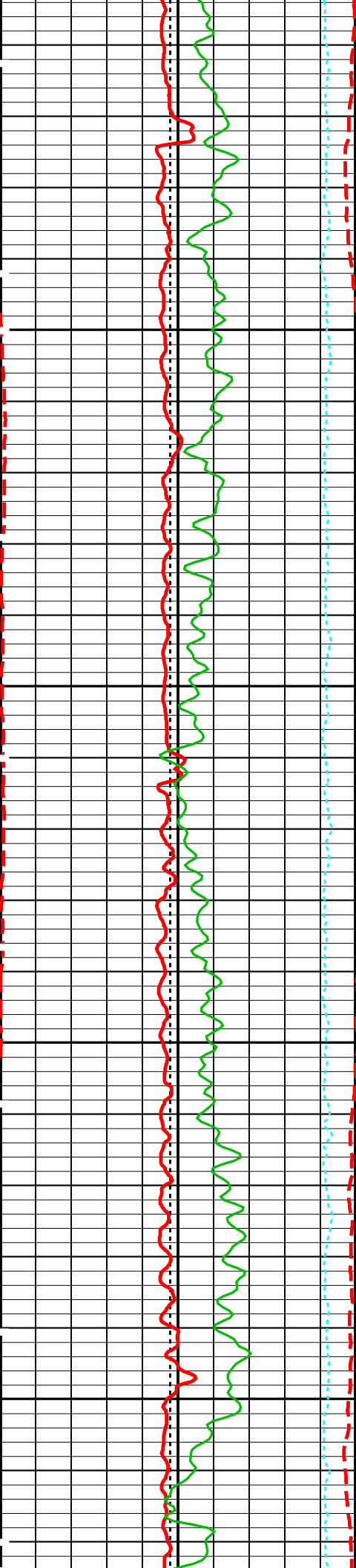




9700

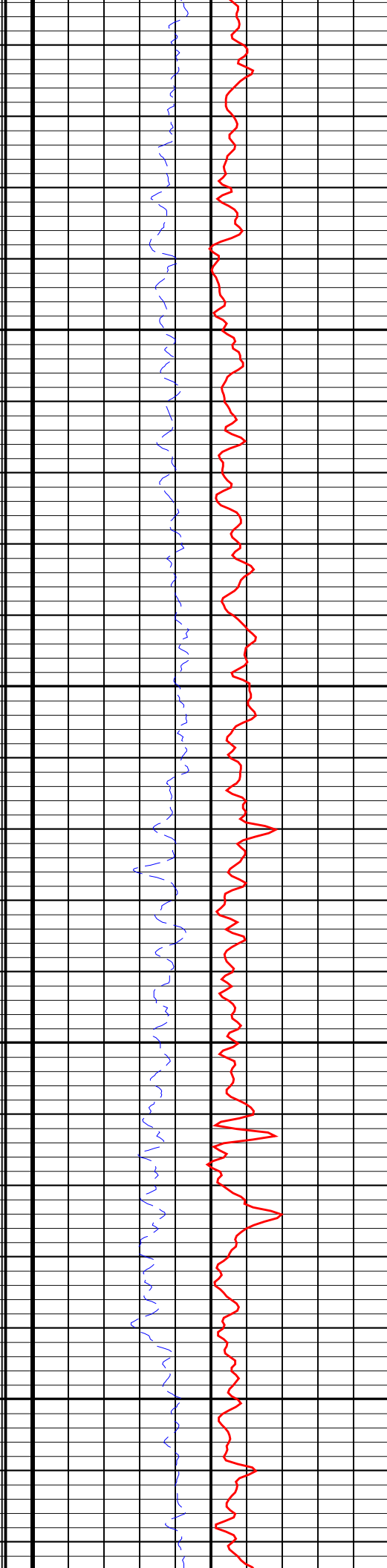
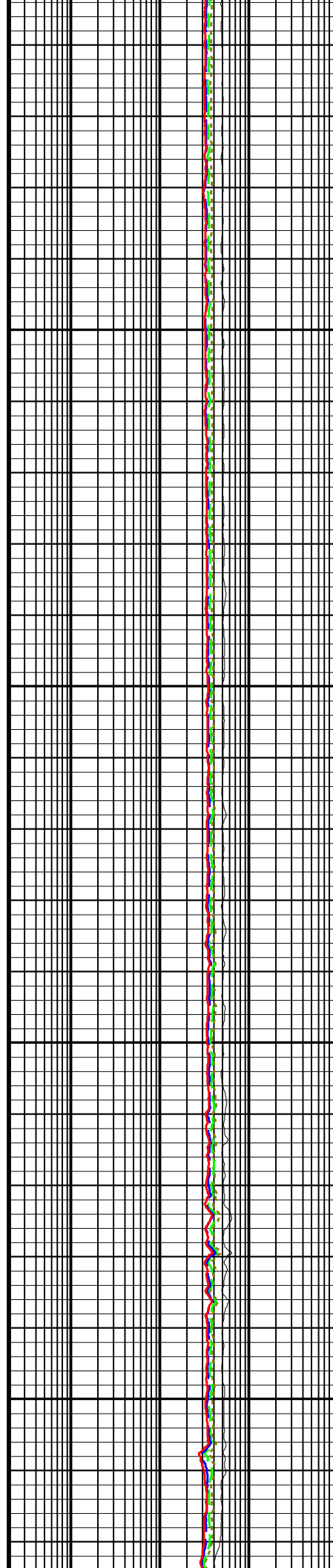
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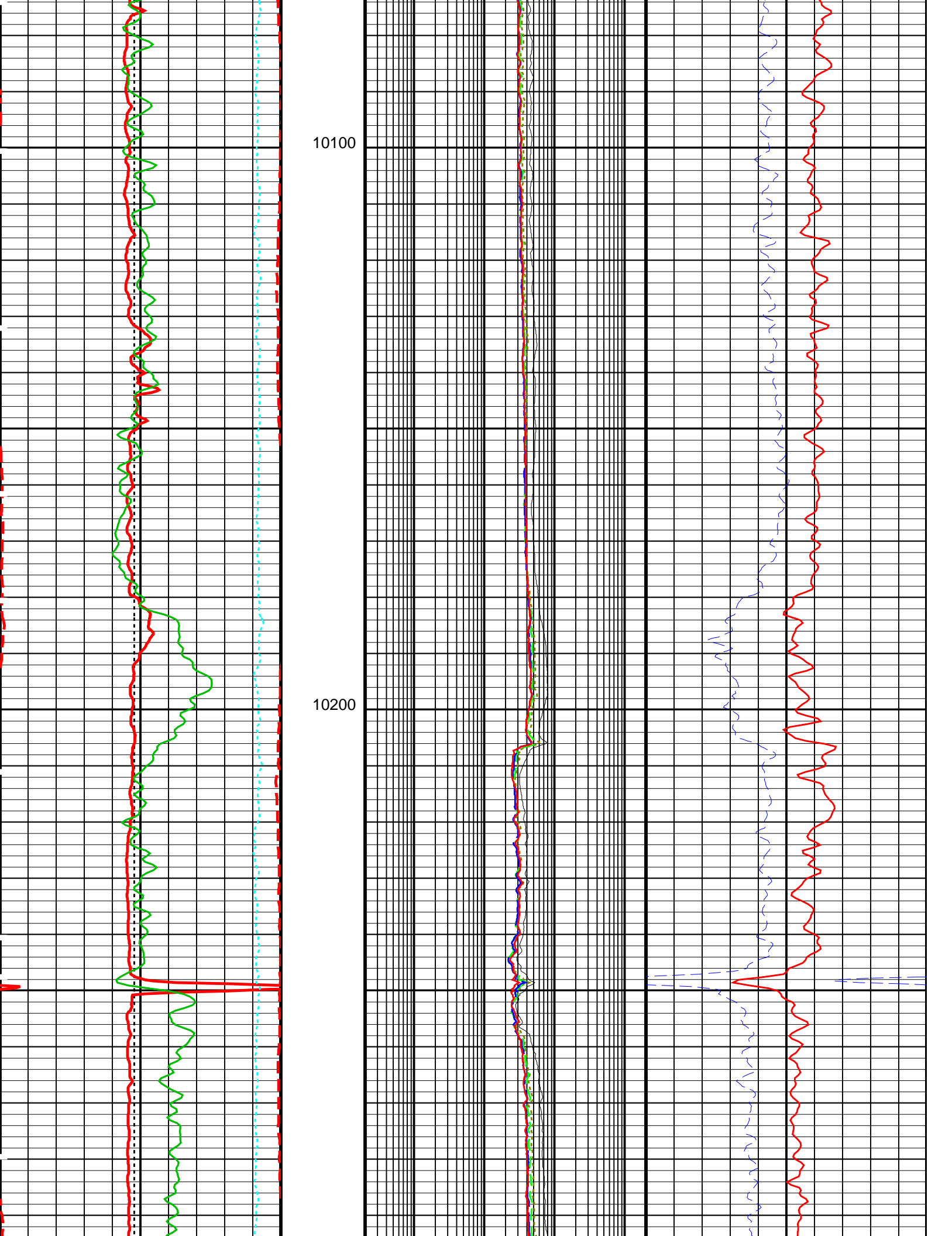


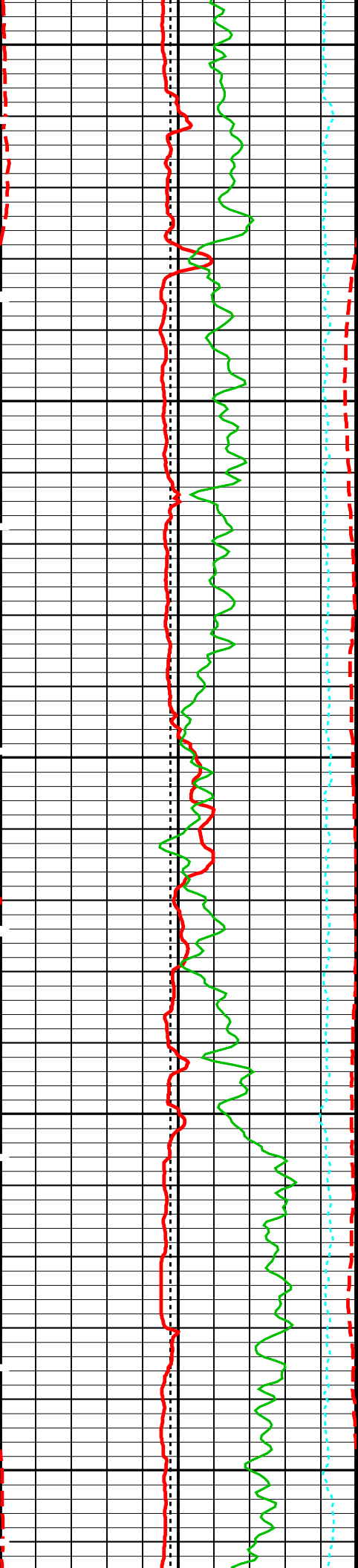


9900

10000



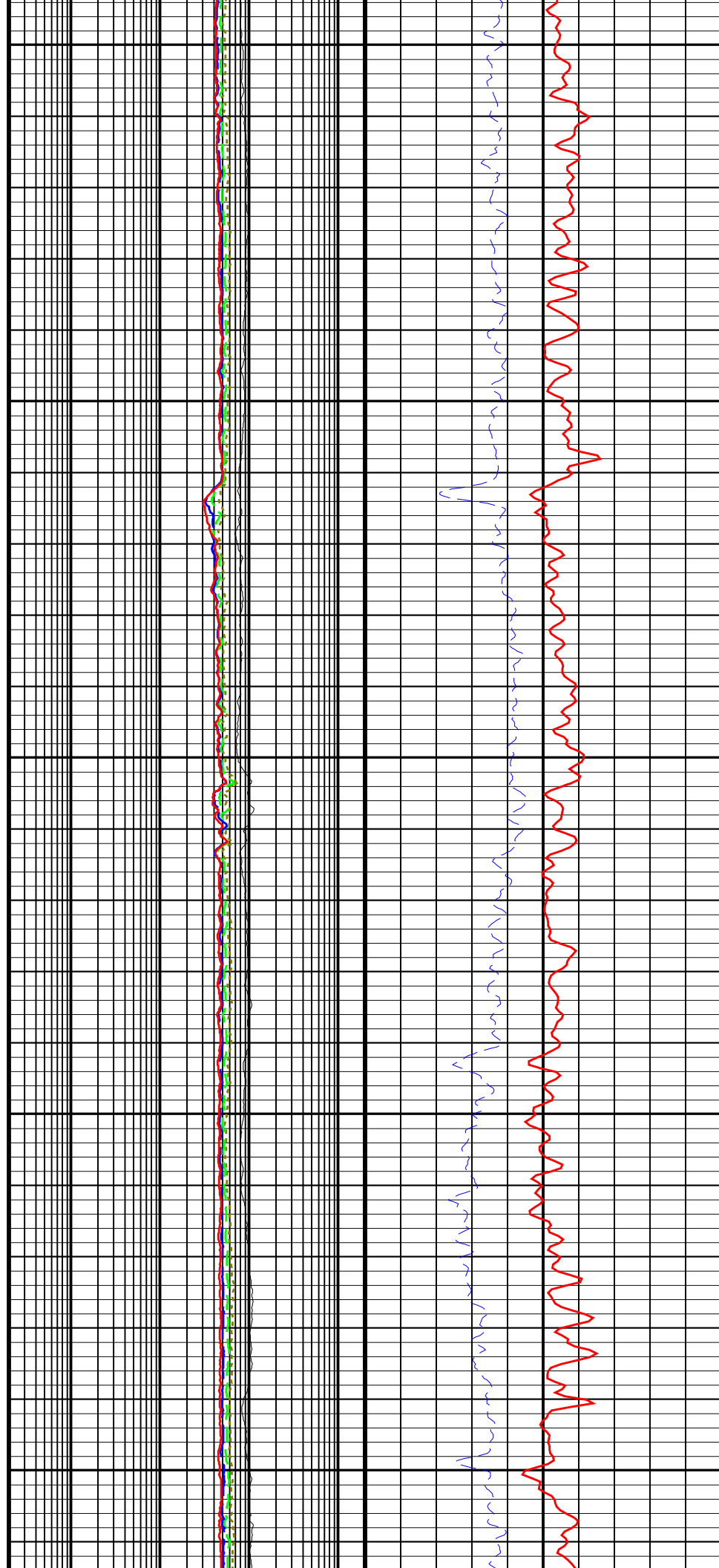


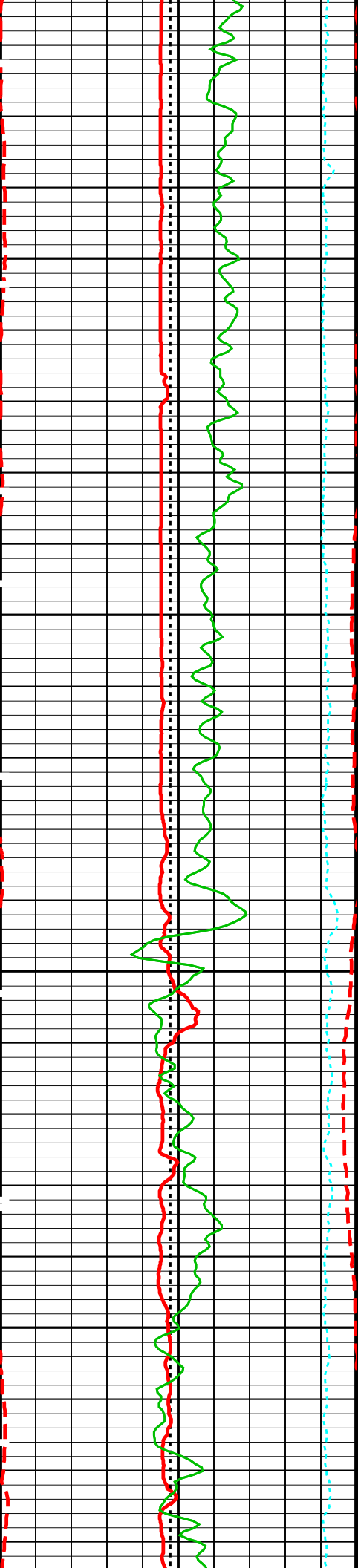


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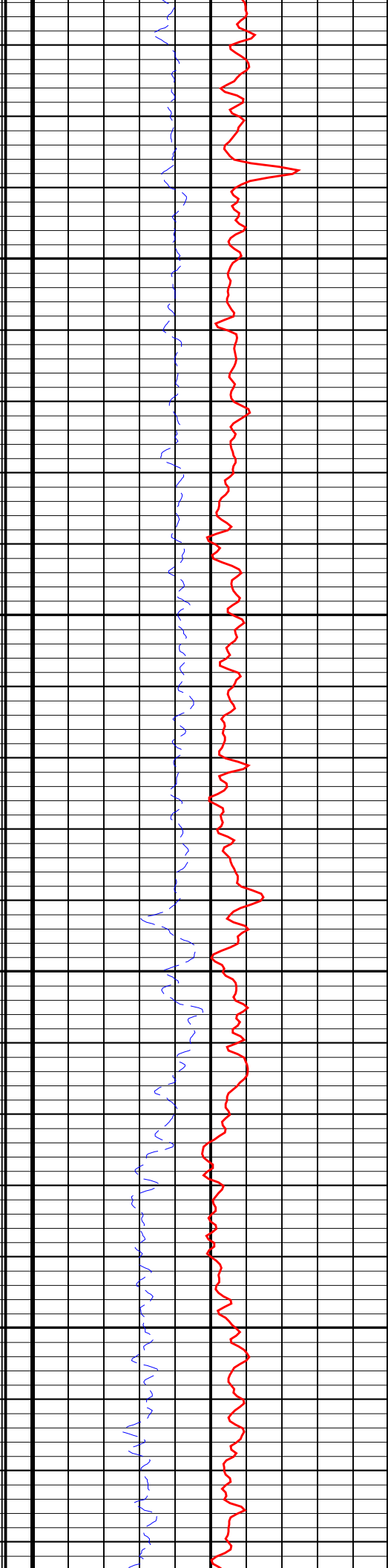
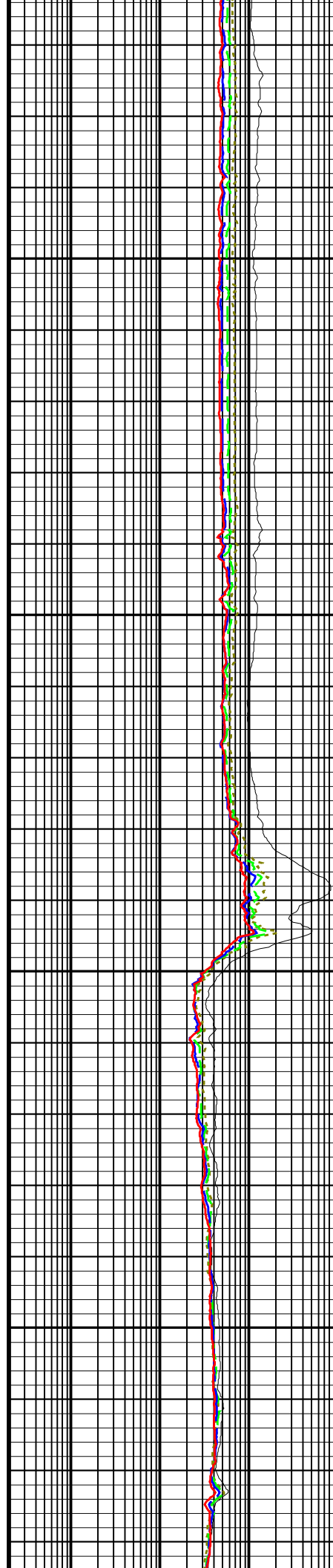
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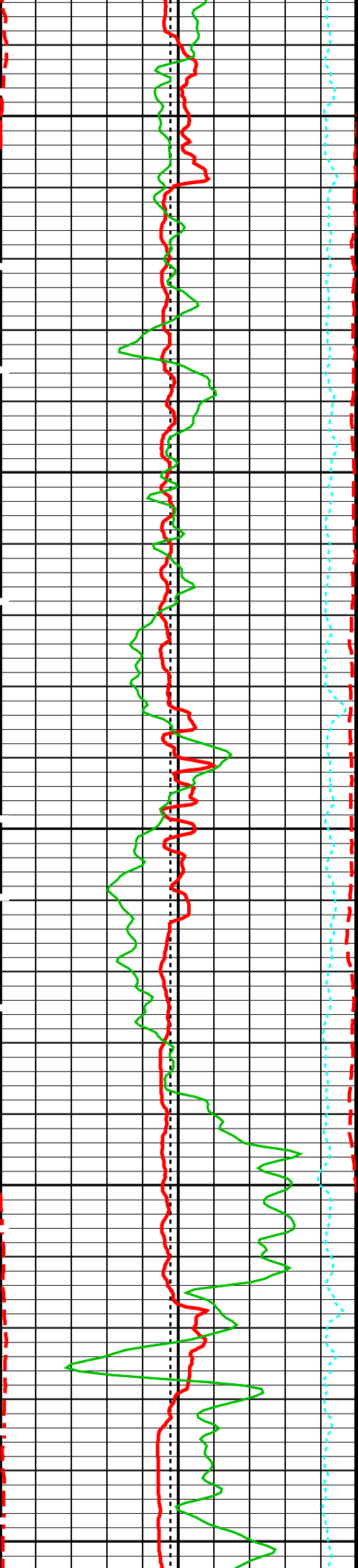




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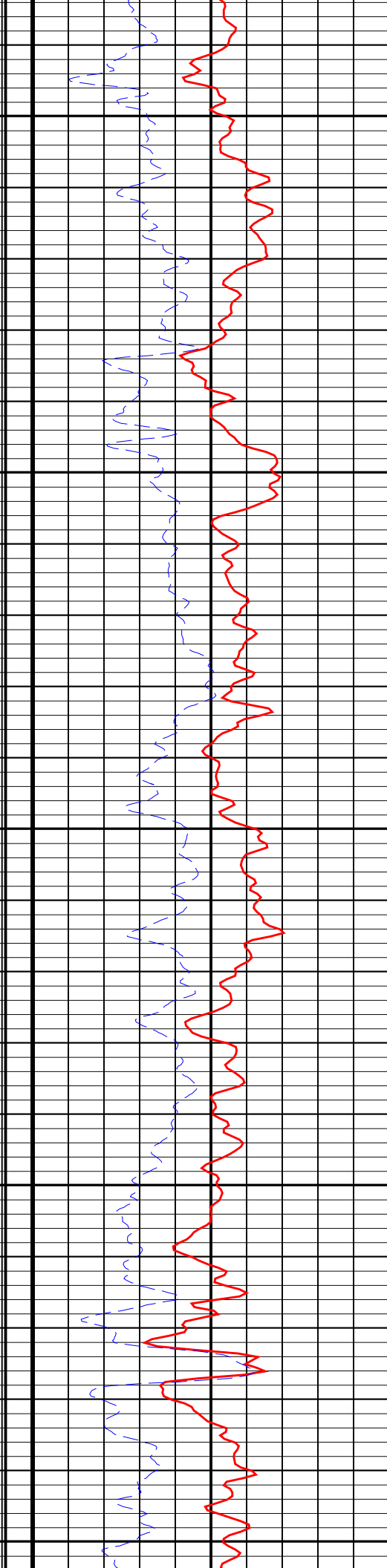
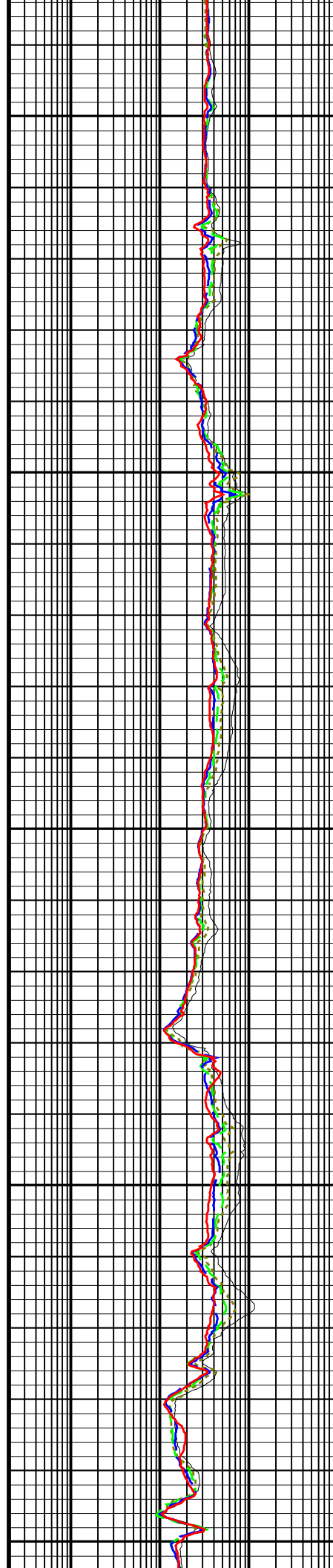
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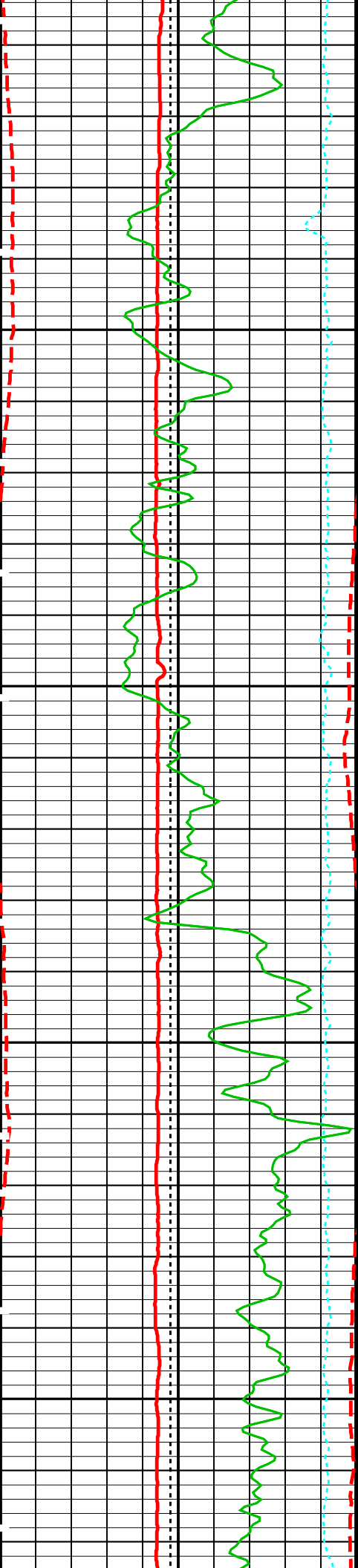




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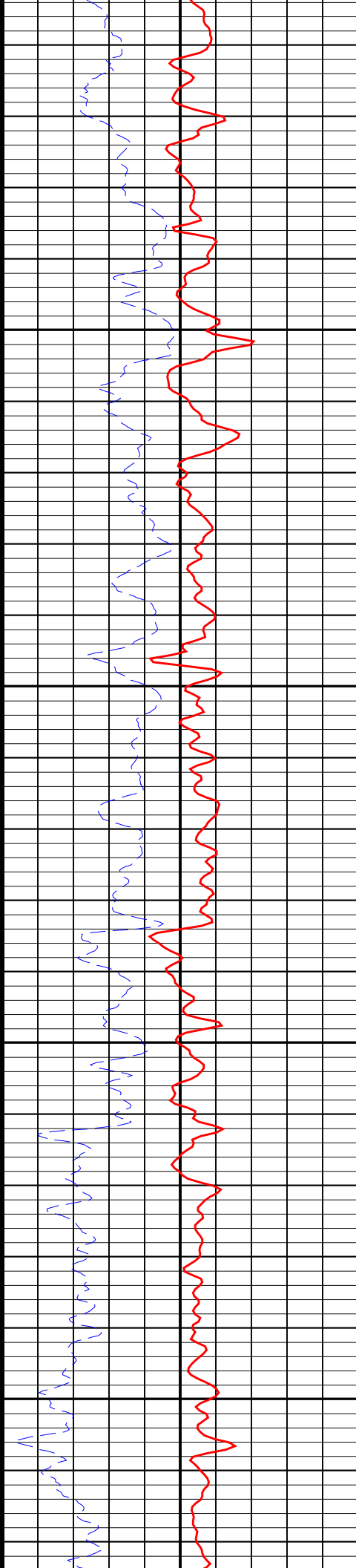
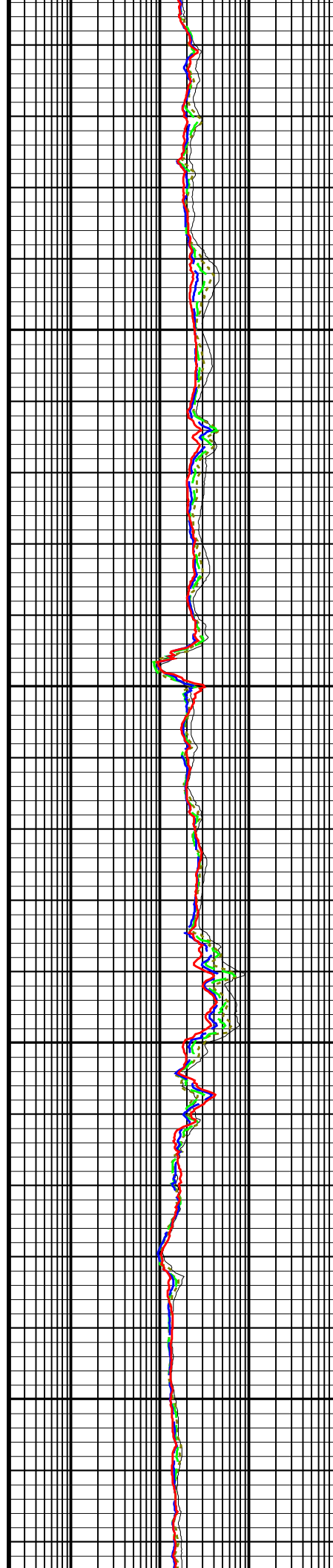
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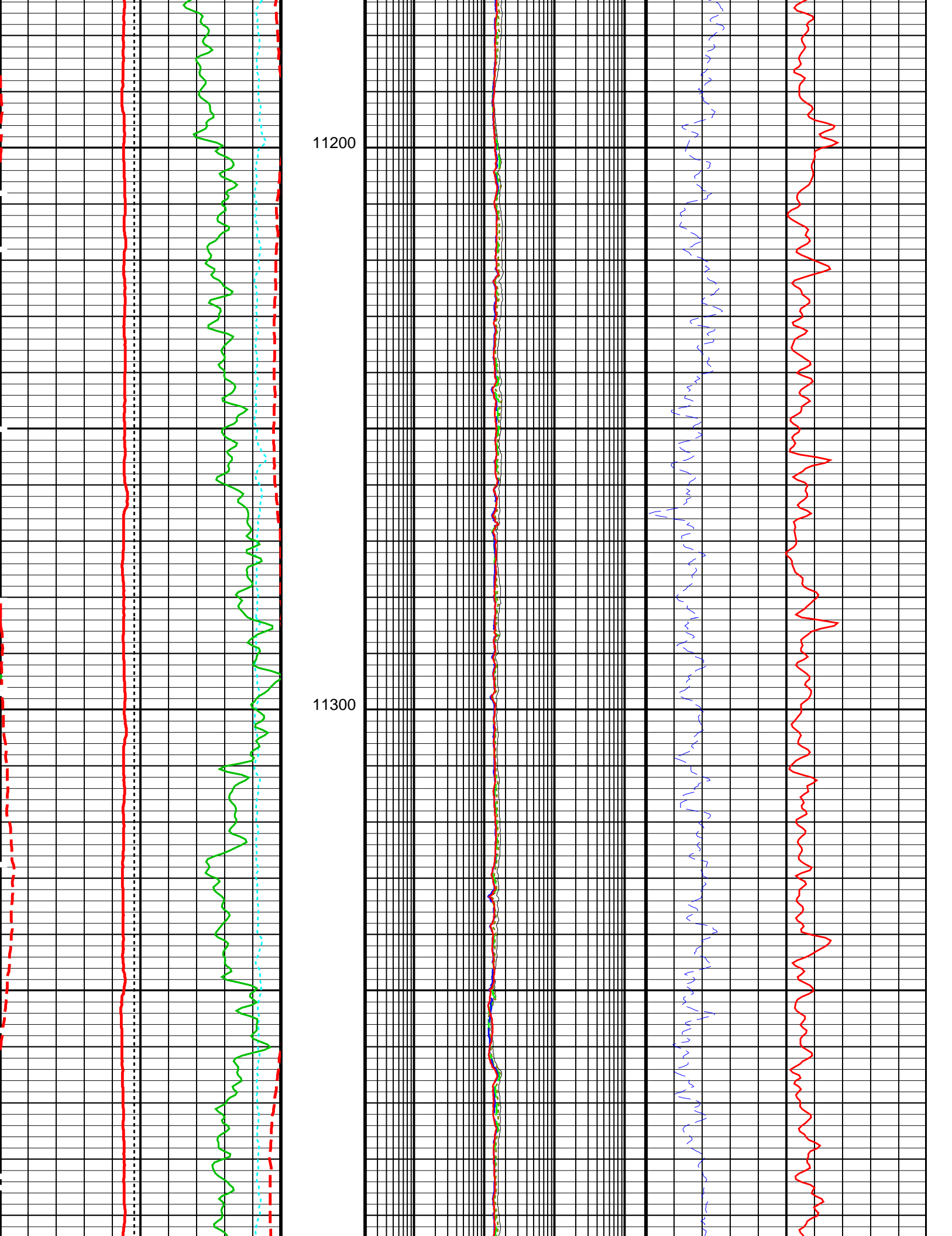


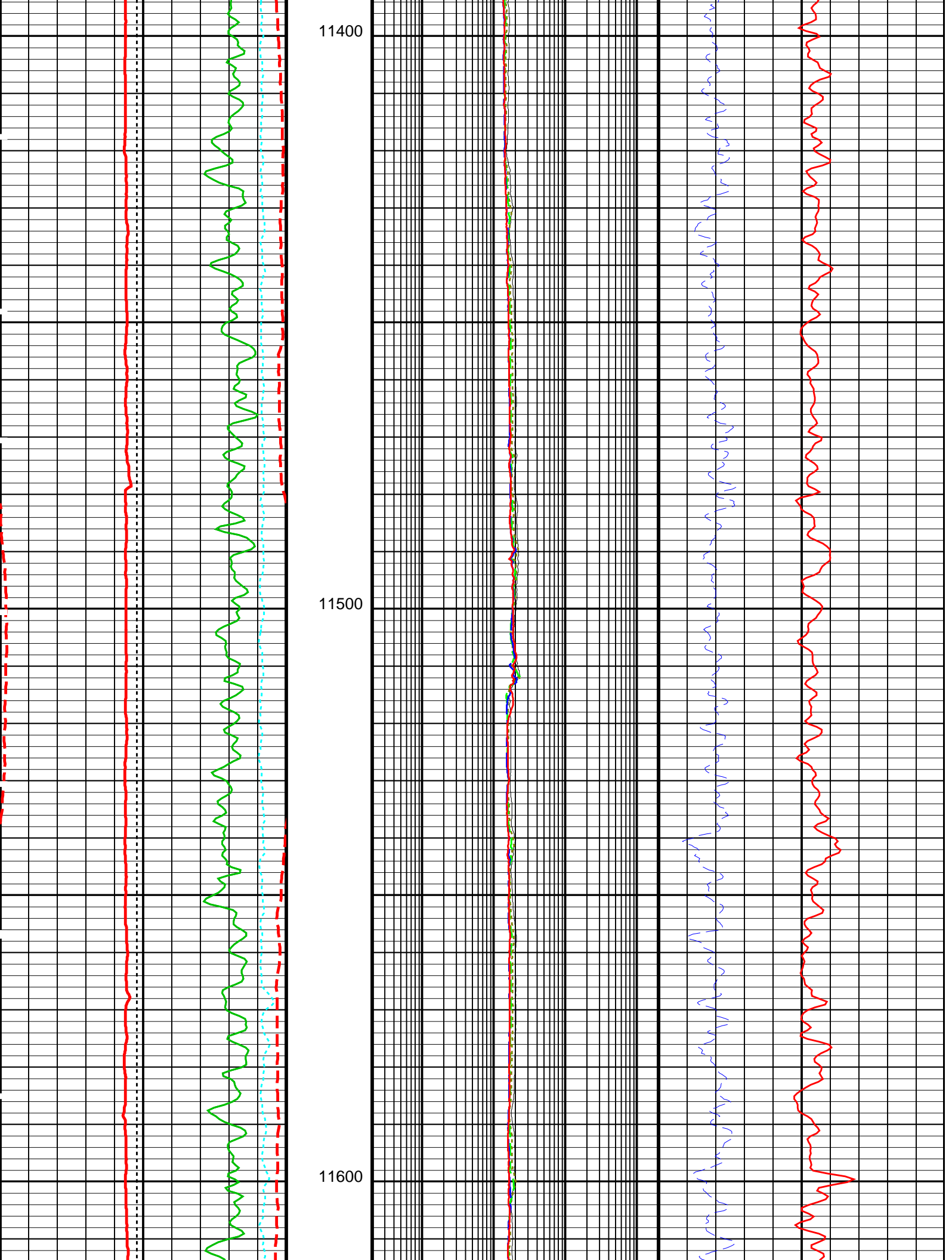


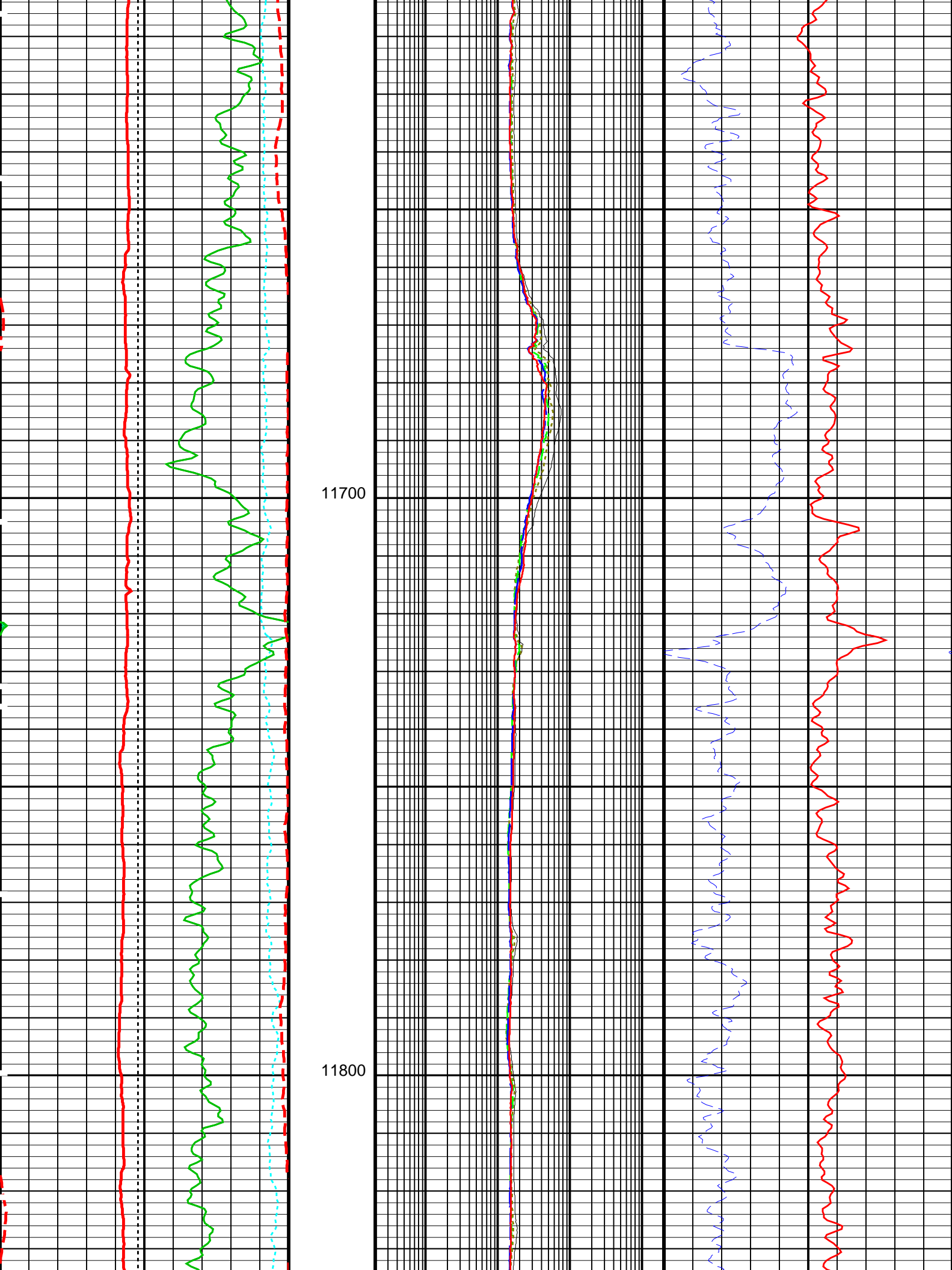
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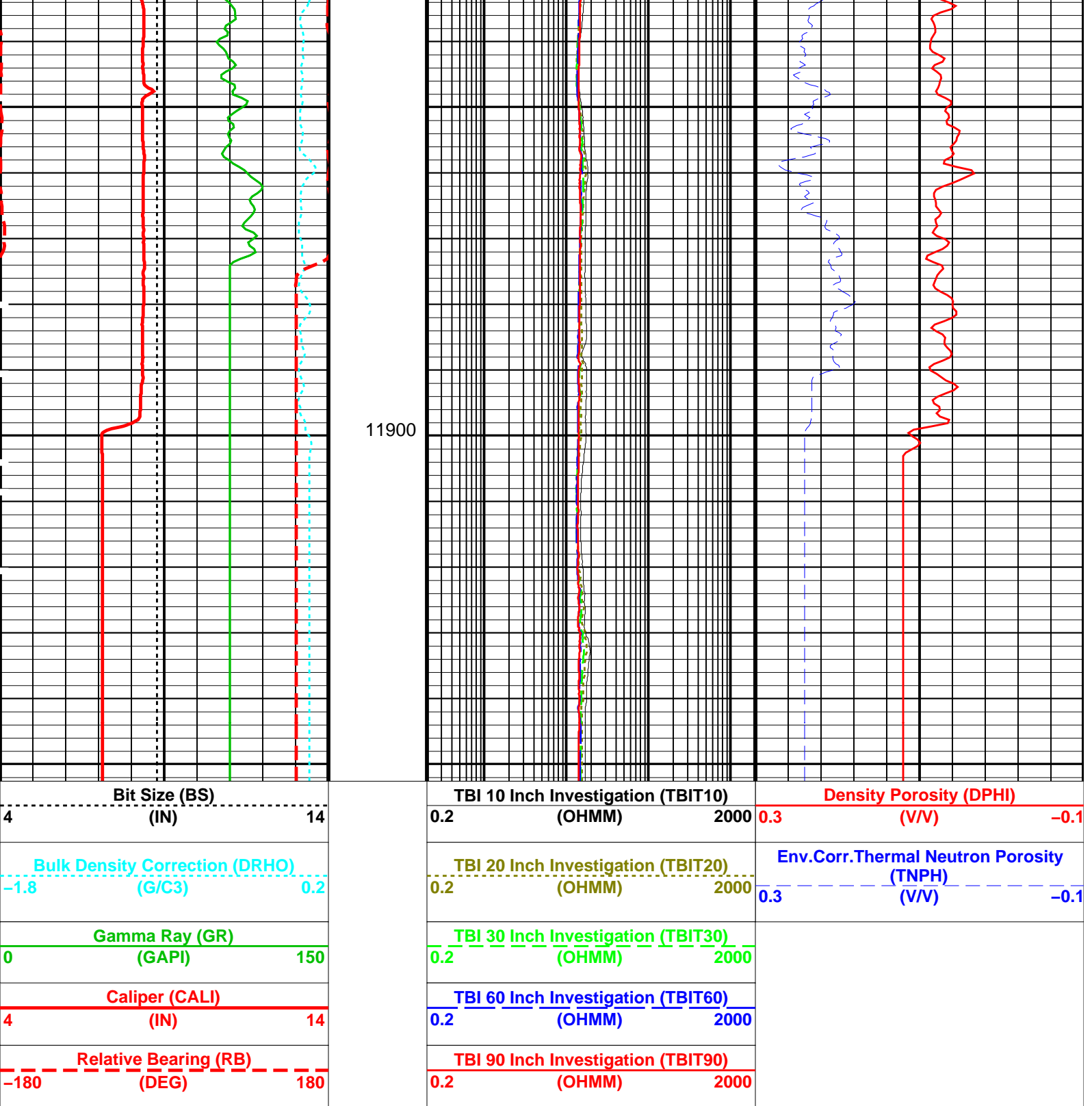
11100











PIP SUMMARY

Time Mark Every 60 S

Parameters

DLIS Name	Description	Value
TBT-A: ThruBit String		
BHS	Borehole Status	OPEN
BSCO	Borehole Salinity Correction Enabled? (for TBN)	No
CSAL	Cement Salinity	0 PPM
CSID	Casing Size I.D.	8.921 IN
DHC	Density Hole Correction	CALIPER
FD	Fluid Density	1 G/C3
FSAL	Formation Salinity	0 PPM
FSCO	Formation Salinity Correction Enabled? (for TBN)	No
MATR	Rock Matrix for Neutron Porosity Corrections	LIMESTONE

MDEN	Matrix Density	2.71	G/C3
MT	Mud Type (for TBN and TBI correction)	OBM	
MWCO	Mud Weight Correction Enabled? (for TBN)	No	
RB_OFFSET	Additional RB offset (degrees)	0	DEG
SOCO	Stand-Off Correction Enabled? (for TBN)	No	
SOFF	TBN Standoff	0	IN
TBDS_SAMPLING	TBDS Sampling	6_Inches	
TBD_CAL_BLOCK	TBD Calibration Block Type	Schlumberger	
TBD_SPIKE_REJECT	TBD Spike Detection Option	Correct	
TBD_SPIKE_THRESHOLD	TBD Attenuation Change Threshold for Spike Detection	5	%
TBI_ALGO	TBI Algorithm Selection	AIT	
TBI_BHC_MODE	Borehole Correction Mode (for TBI)	Solve_For_Standoff	
TBI_BHC_OP	Borehole Correction Option (for TBI)	Caliper	
TBI_CALTYP	TBI Mastercal Type	Schlumberger	
TBI_REPL_ARRAY_DEST	TBI: Replace This Array	None	
TBI_REPL_ARRAY_SOURCE	TBI: With This Array	None	
TBI_RMUD_SRC	RMUD Source for Borehole Correction (for TBI)	Data_Channel_RMUD	
TBI_TC_OP	Induction Temperature Correction Option	Lower	
TBN_ALGO	Porosity Algorithm	Schmid	
TBN_BHC_OP	Borehole Correction Option (for TBN)	Caliper	
TBN_CAL_TANK	TBN Calibration Tank Type	Schlumberger	
TBN_FILTER	Filter Length	3_point	
TBN PRES_OP	Pressure Correction Enabled? (for TBN)	No	
TBN_TEMP_OP	Temperature Correction Enabled? (for TBN)	No	
TBN_WPRE	Well Pressure (for TBN)	0	PSIG
WMUD	Mud Weight	8.345	LB/G
	HOLEV: Integrated Hole/Cement Volume		
BHS	Borehole Status	OPEN	
MATR	Rock Matrix for Neutron Porosity Corrections	LIMESTONE	
	System and Miscellaneous		
BS	Bit Size	8.750	IN
BSAL	Borehole Salinity	26000.00	PPM
CSIZ	Current Casing Size	9.625	IN
DO	Depth Offset for Playback	0.0	FT
MST	Mud Sample Temperature	-50000.00	DEGF
PP	Playback Processing	NORMAL	
RMB	Resistivity of Mud - BHT	-50000.0000	OHMM
RMS	Resistivity of Mud Sample	-50000.0000	OHMM

Format: ThruBit_TCOM Vertical Scale: 5" per 100' Graphics File Created: 17-Apr-2016 15:46

OP System Version: 19C2-270

eWAFE Version: 1.210

TBT-A SRPC-5314-ThruBit_b

Input DLIS Files

DEFAULT	ThruBit_036PUP	FN:31	PRODUCER	17-Apr-2016 15:29	11952.6 FT	1860.1 FT
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Output DLIS Files

DEFAULT	ThruBit_037PUP	FN:32	PRODUCER	17-Apr-2016 15:46	
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Company: SandRidge Energy, Inc Well: Hebron 0780 4-7H

Input DLIS Files

DEFAULT	ThruBit_036PUP	FN:31	PRODUCER	17-Apr-2016 15:29	11952.6 FT	1860.1 FT
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Output DLIS Files

DEFAULT	ThruBit_037PUP	FN:32	PRODUCER	17-Apr-2016 15:46	11952.5 FT	2350.0 FT
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OP System Version: 19C2-270

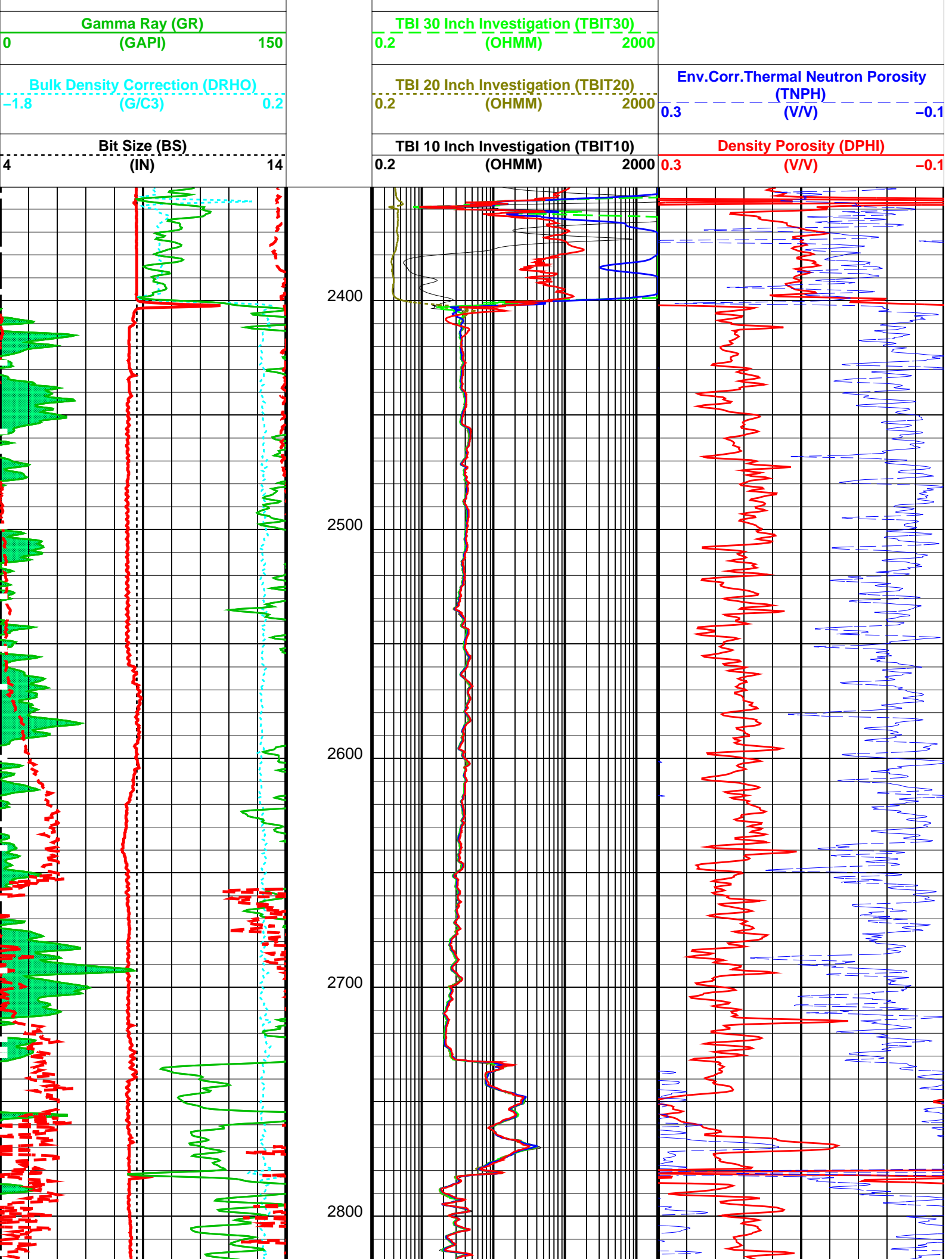
eWAFE Version: 1.210

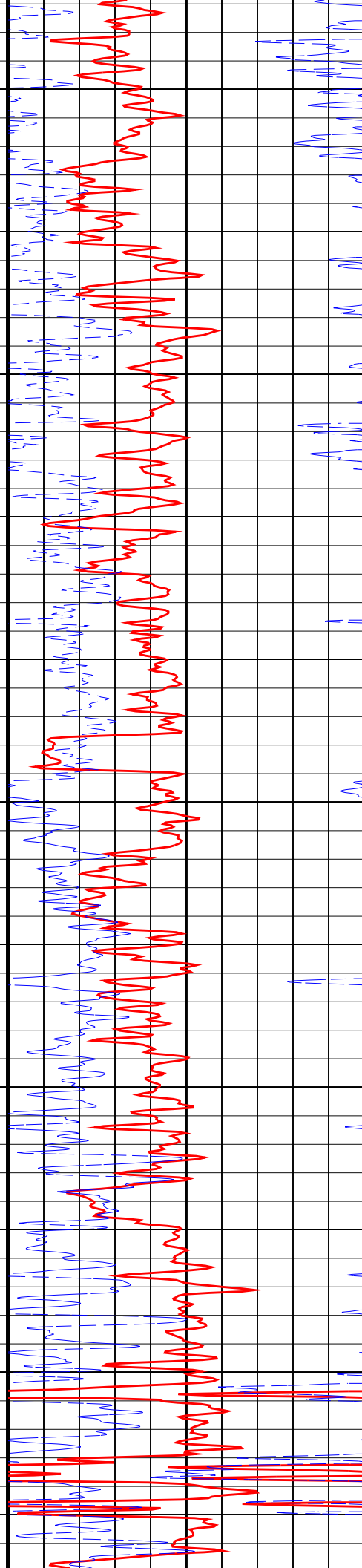
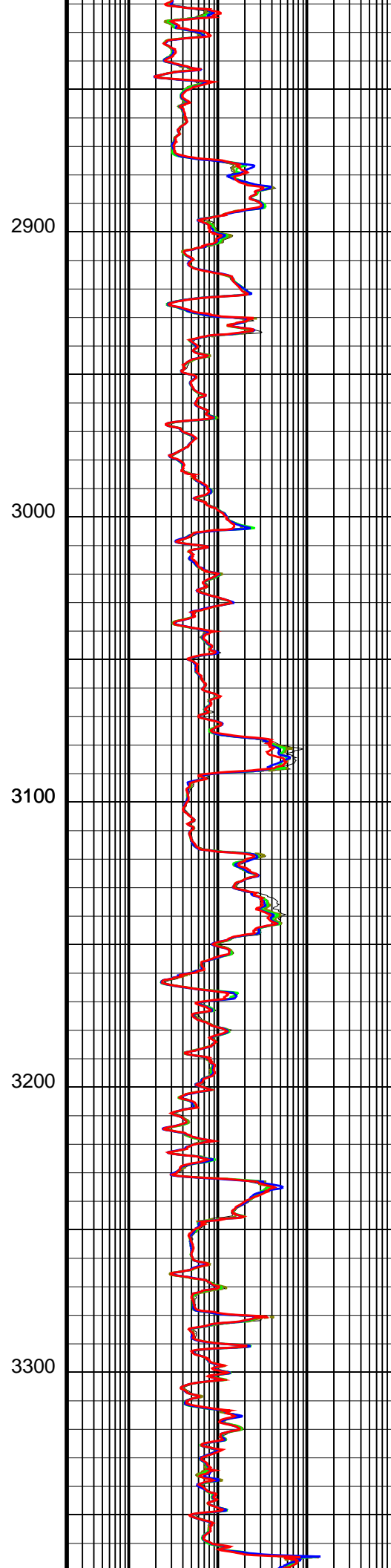
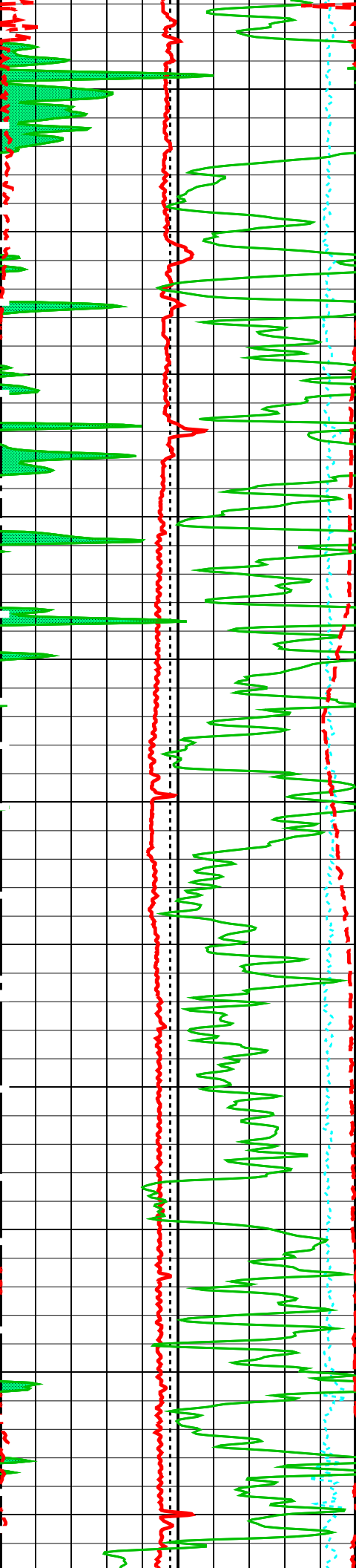
TBT-A SRPC-5314-ThruBit_b

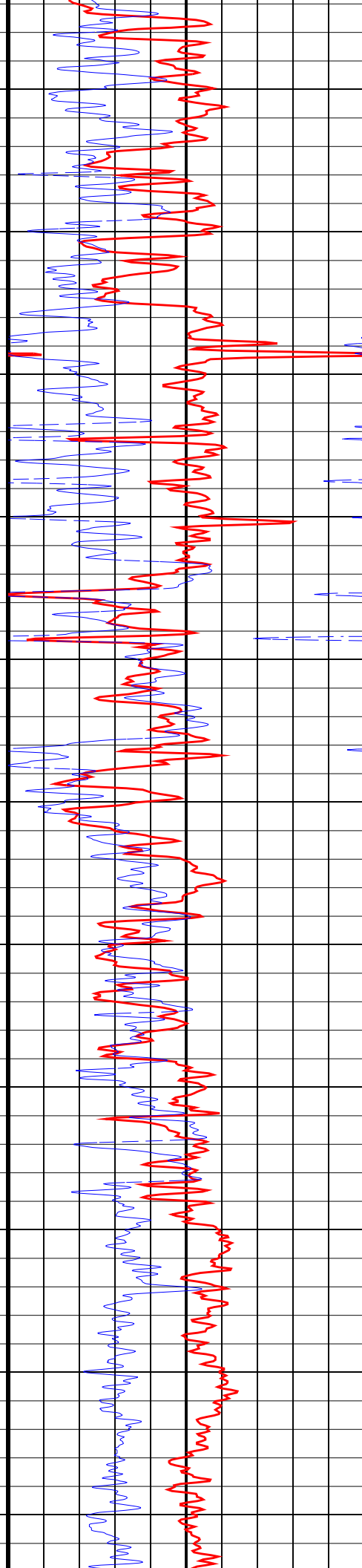
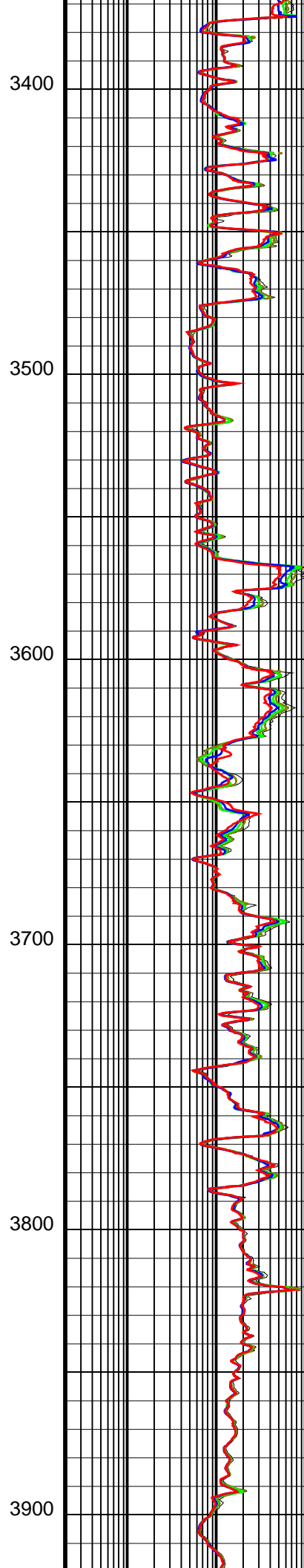
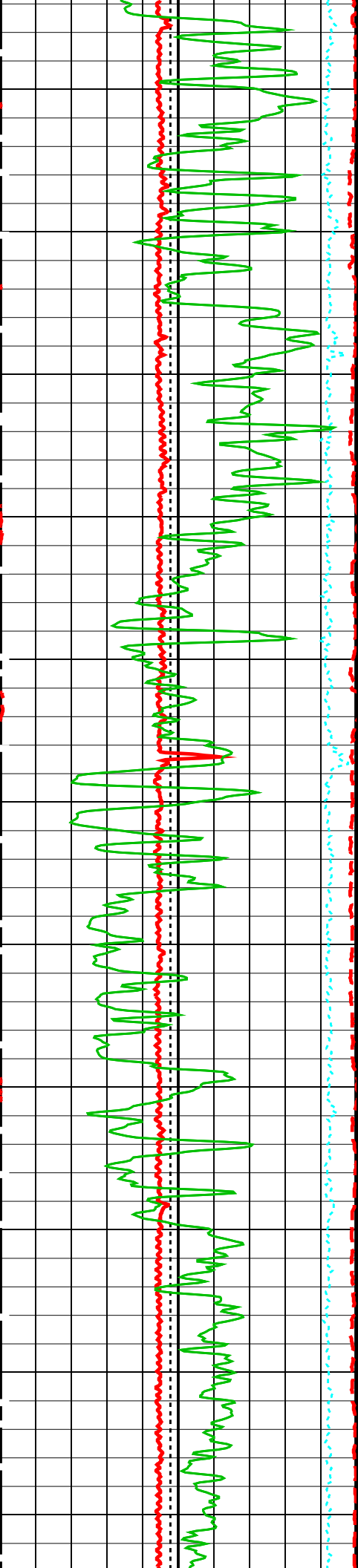
PIP SUMMARY

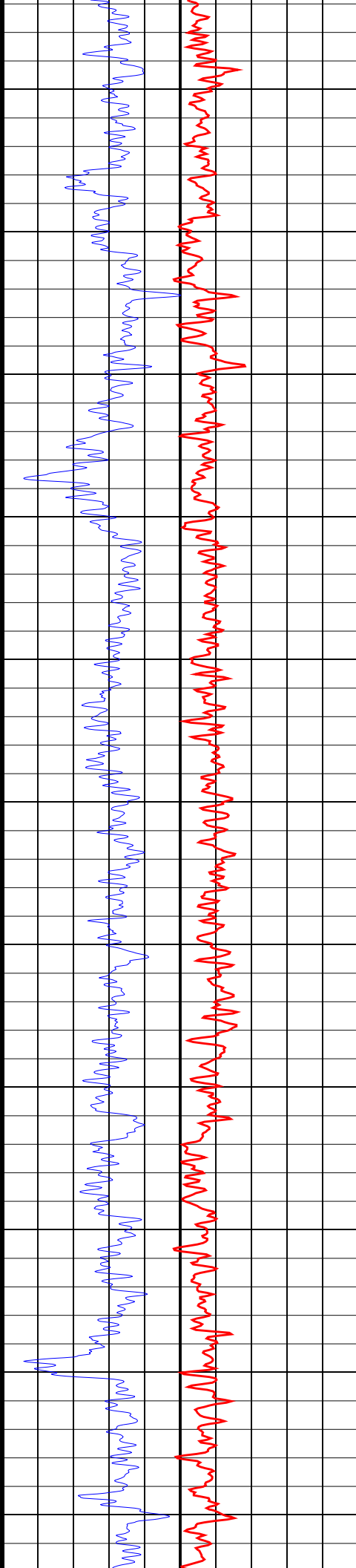
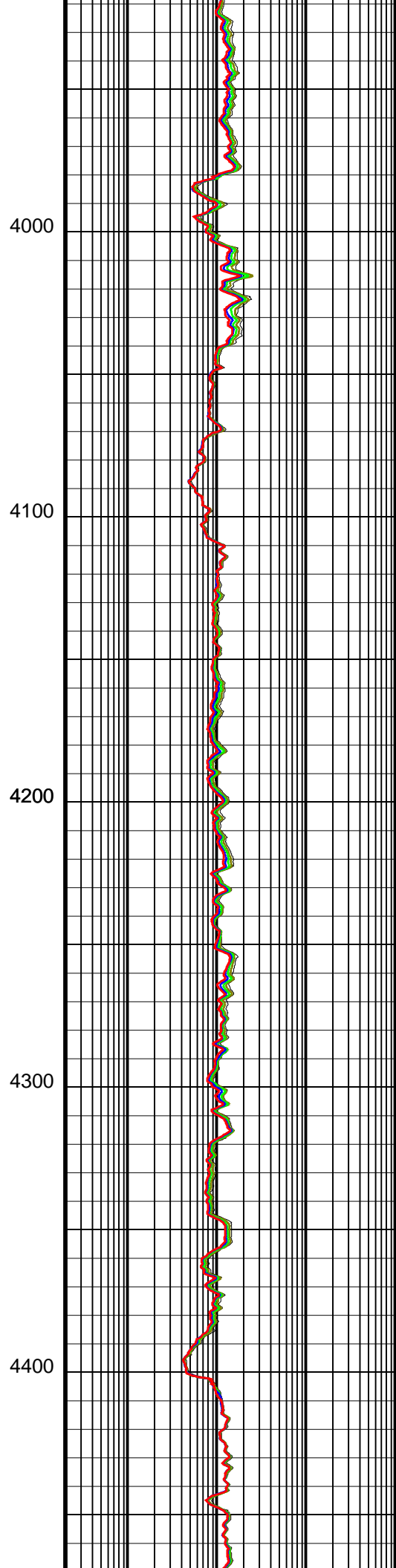
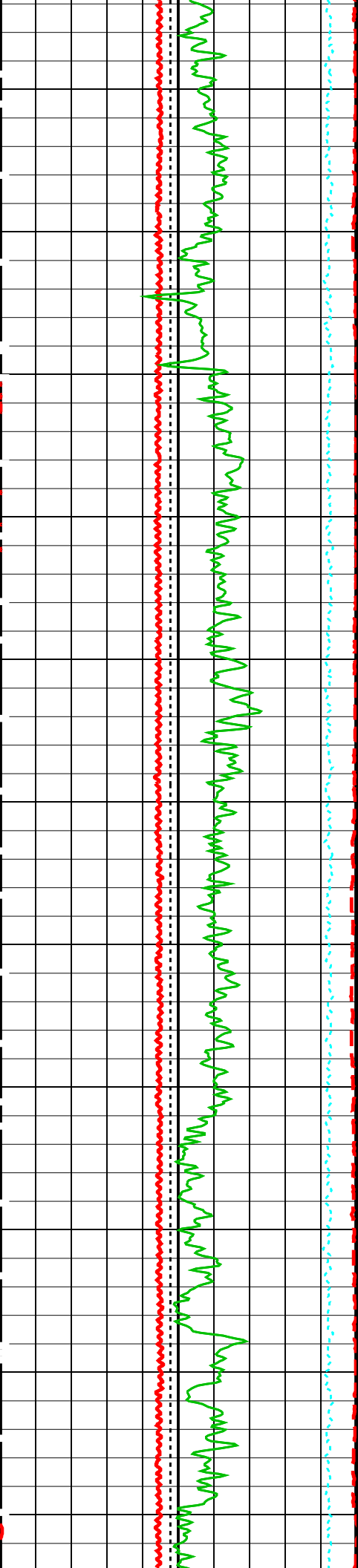
Time Mark Every 60 S

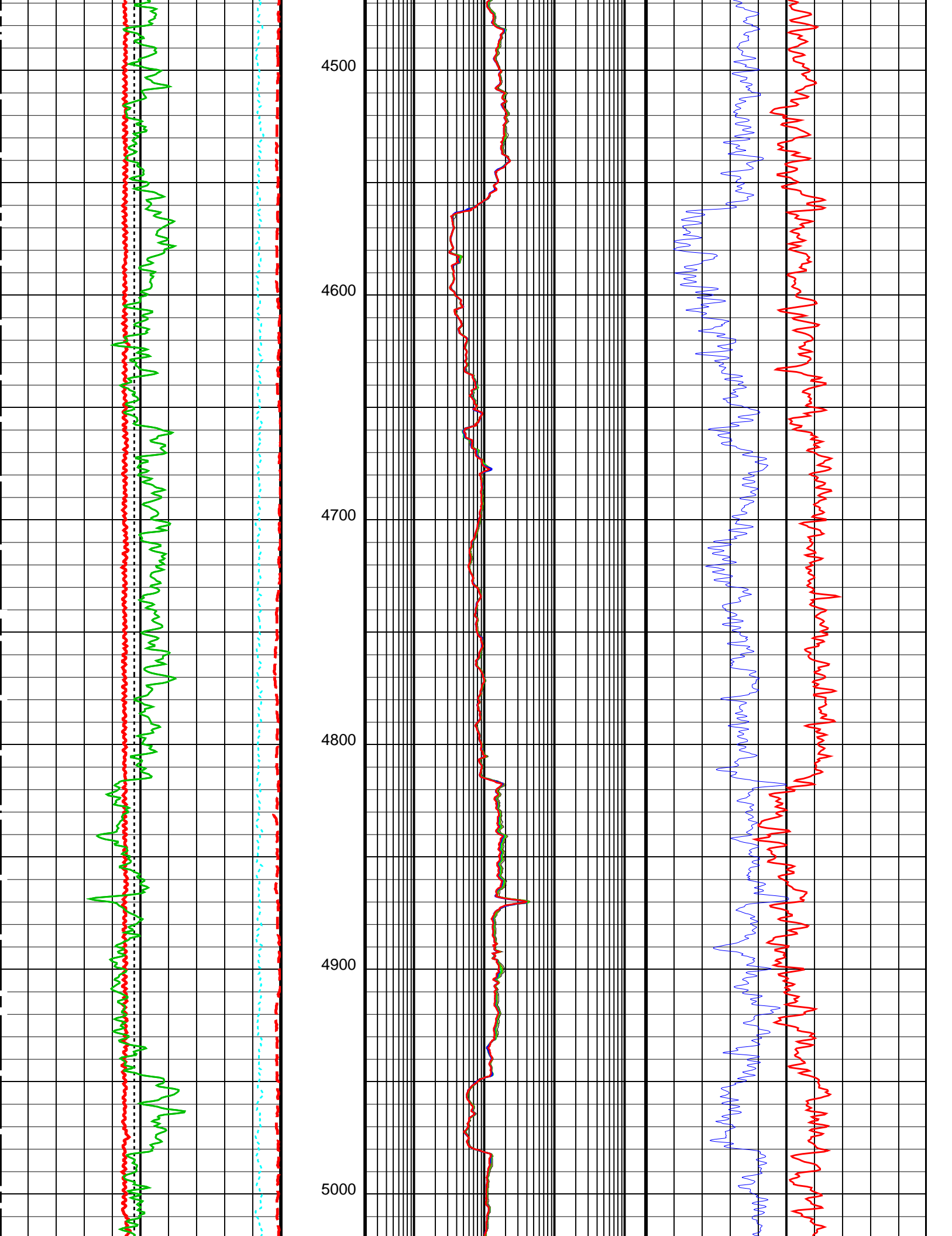
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-180	180	0.2	2000
(DEG)		(OHMM)	
Caliper (CALI)		TBI 60 Inch Investigation (TBIT60)	
4	14	0.2	2000
(IN)		(OHMM)	

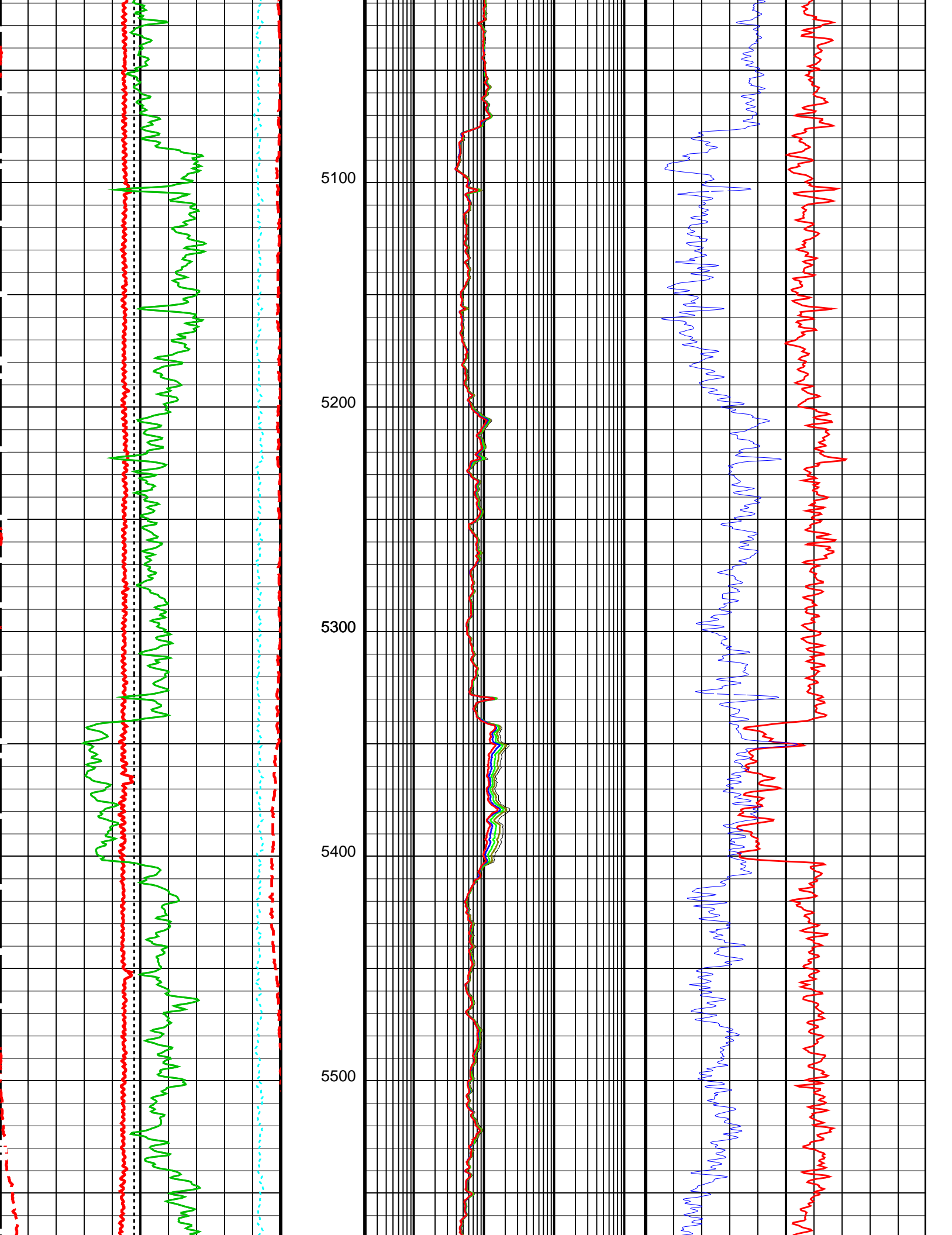


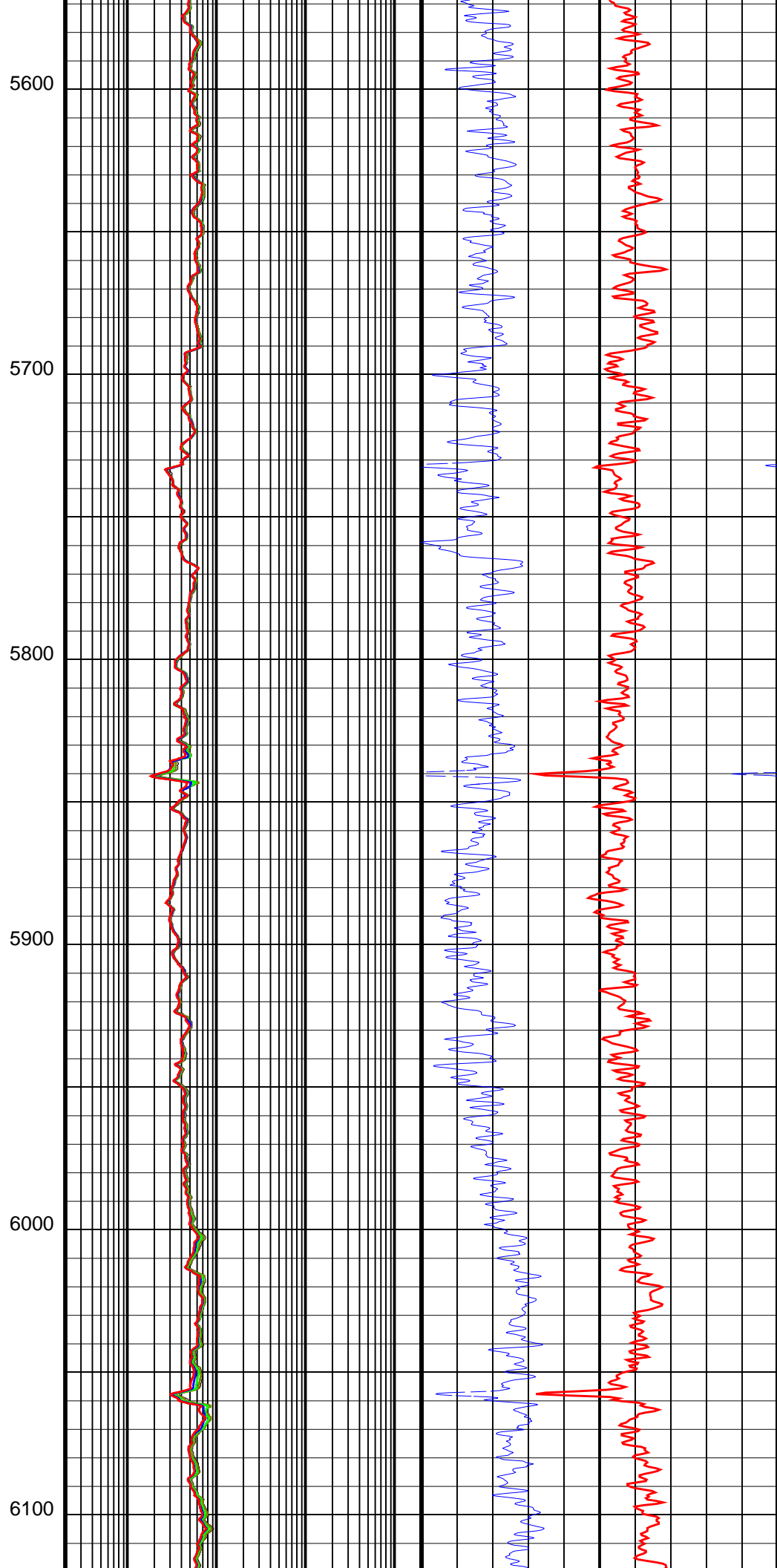
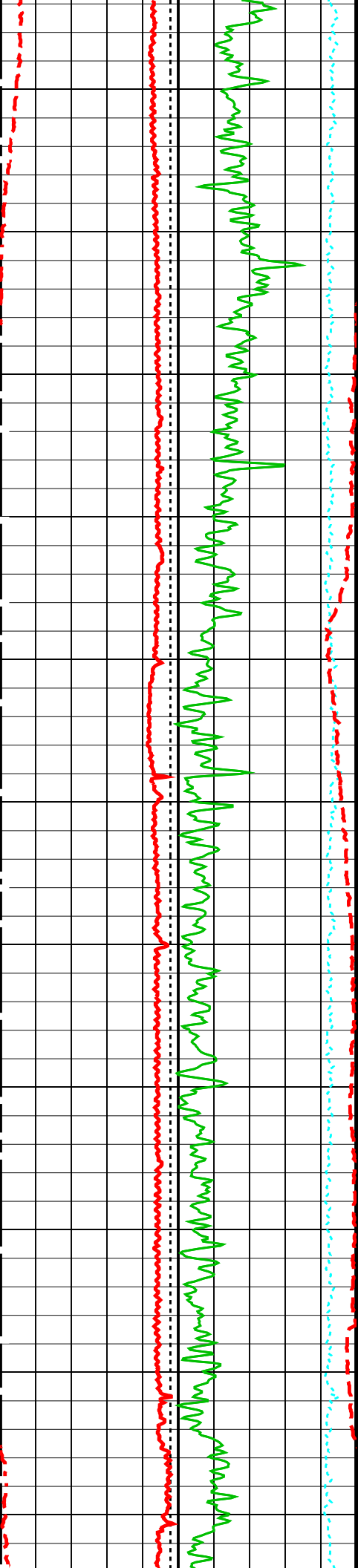


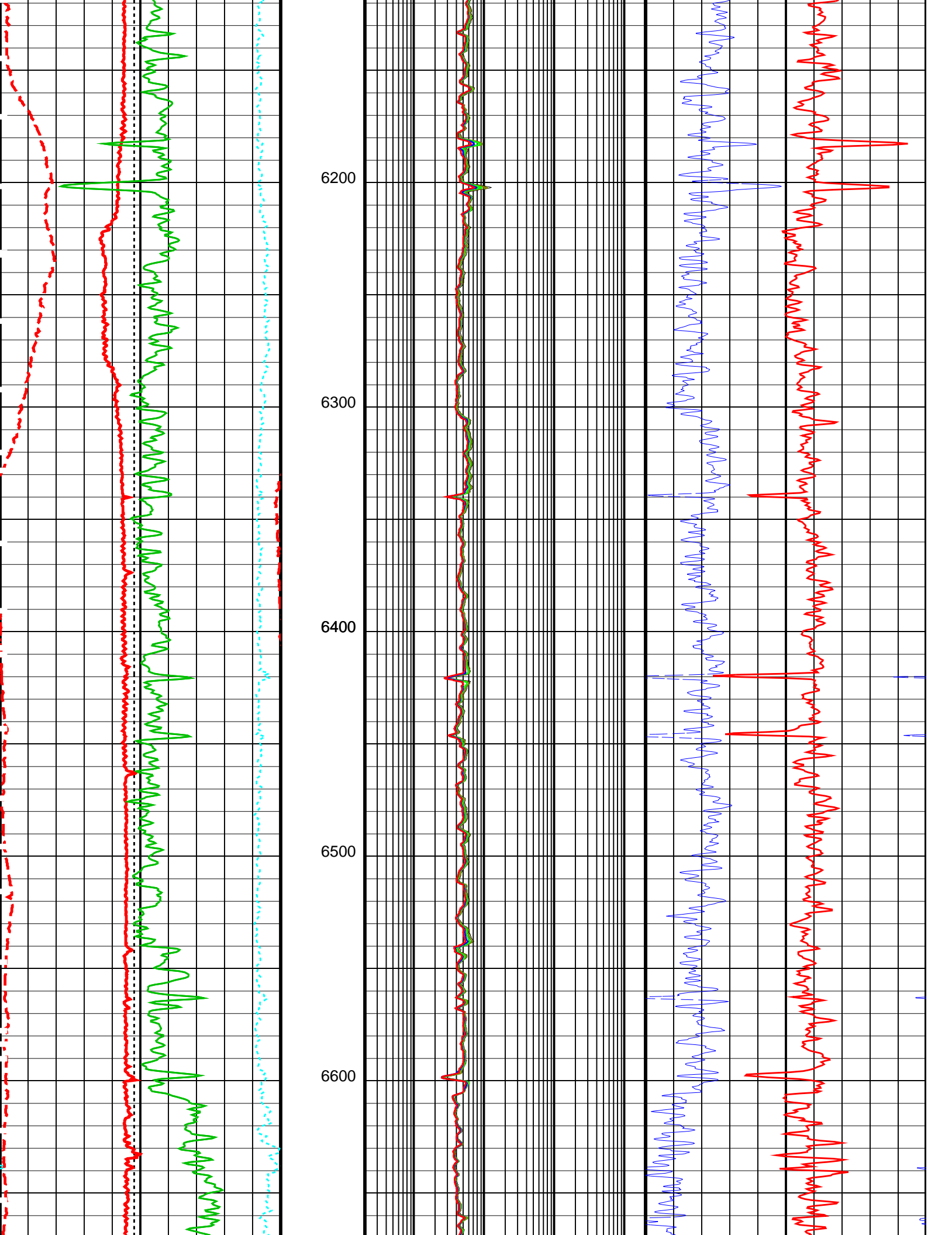


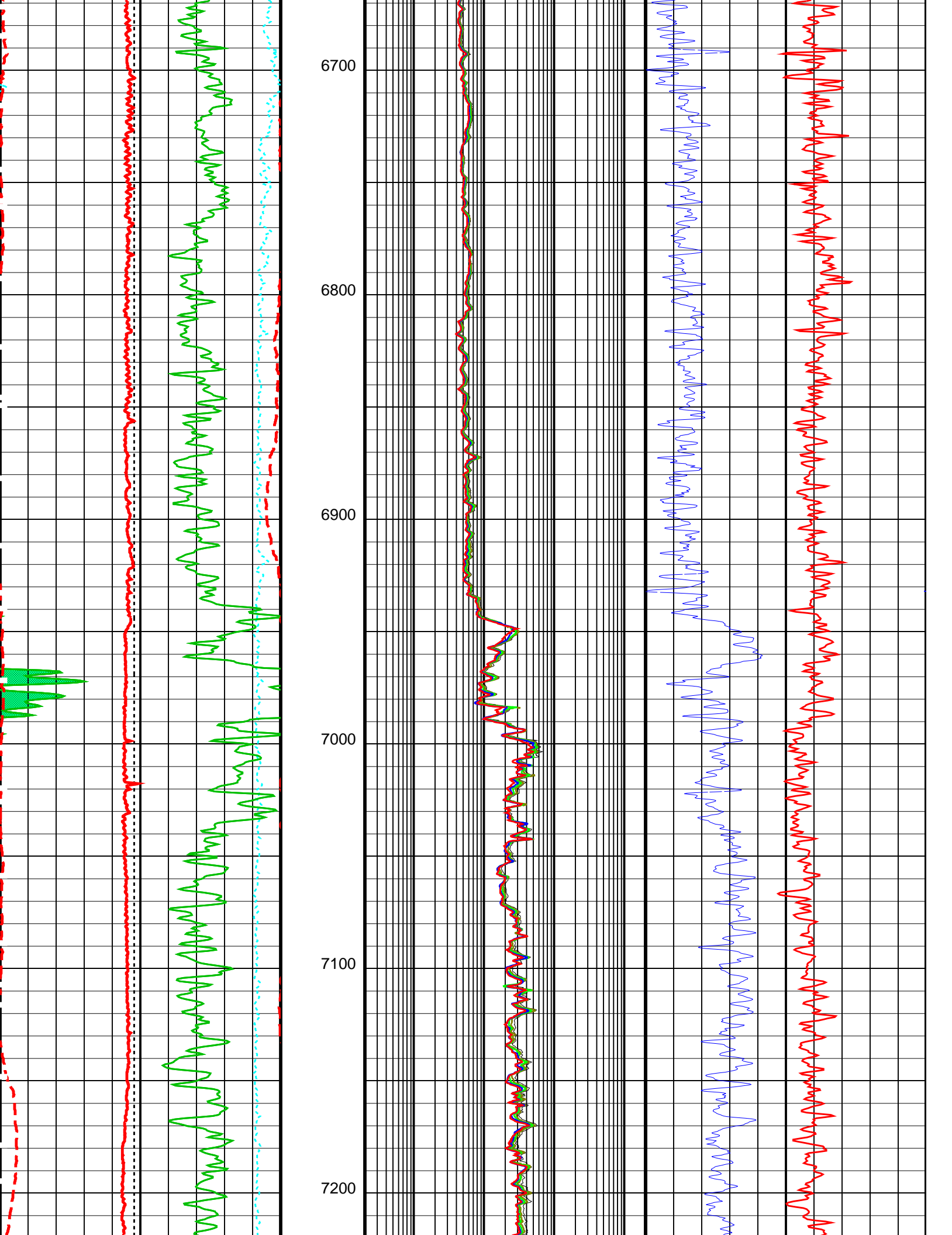


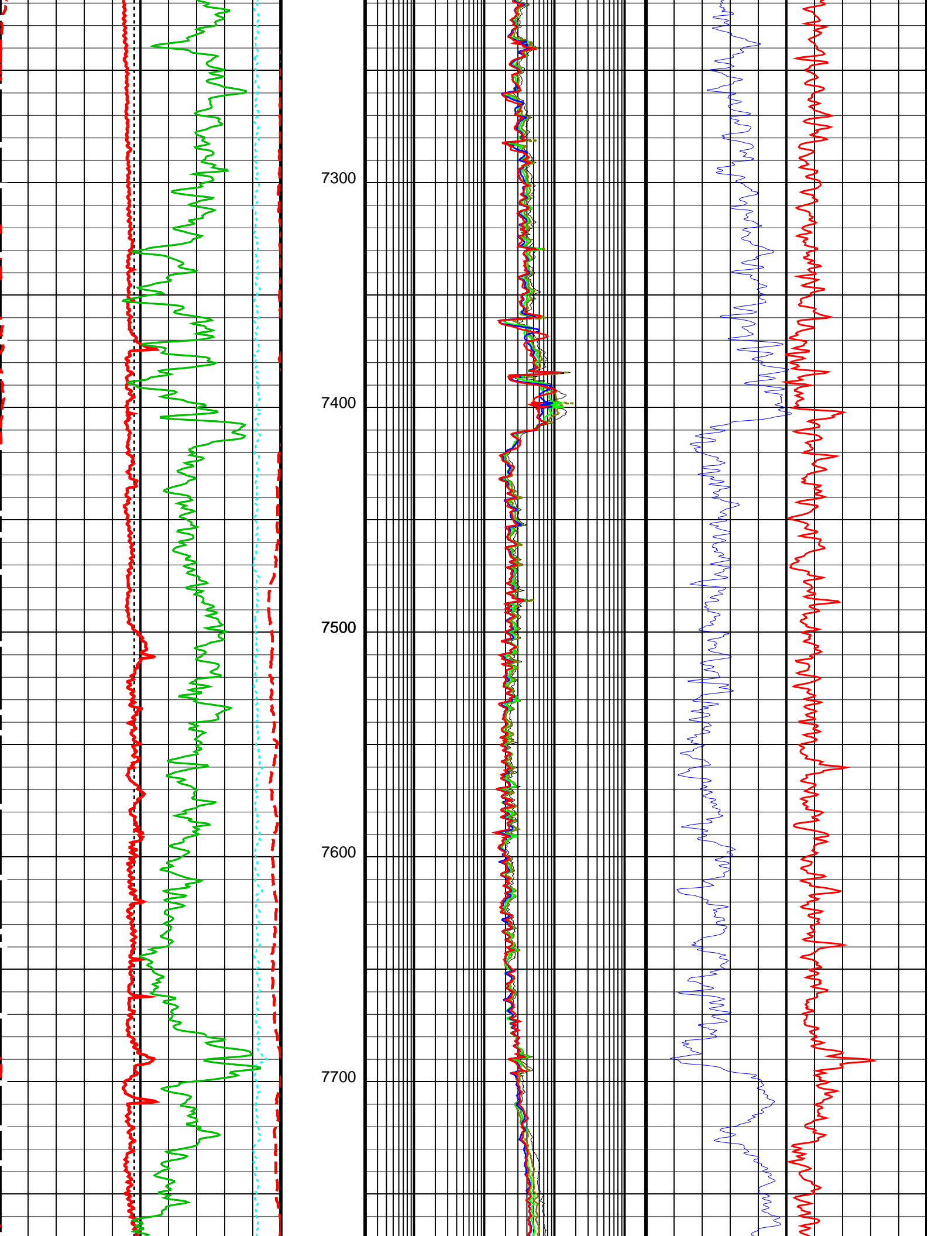


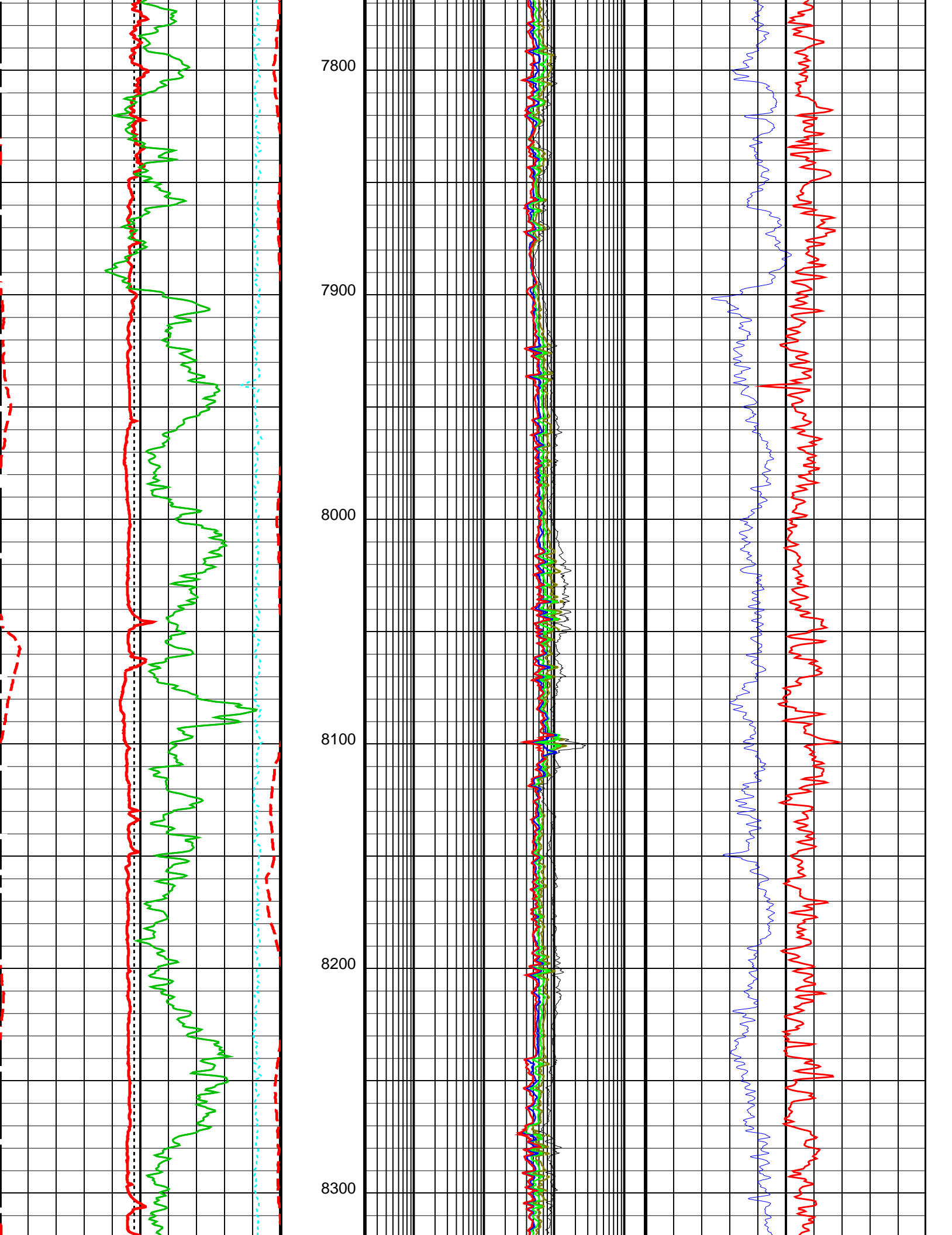


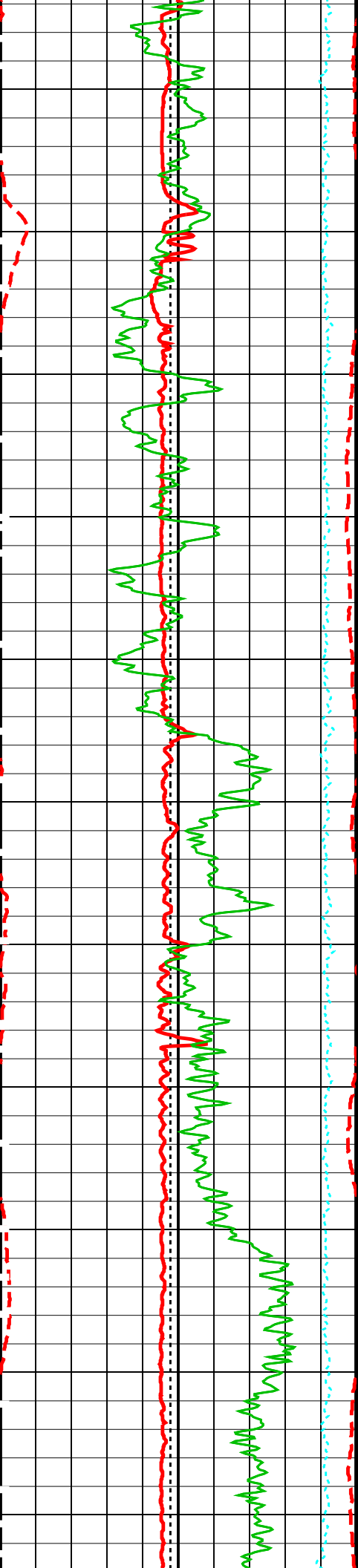












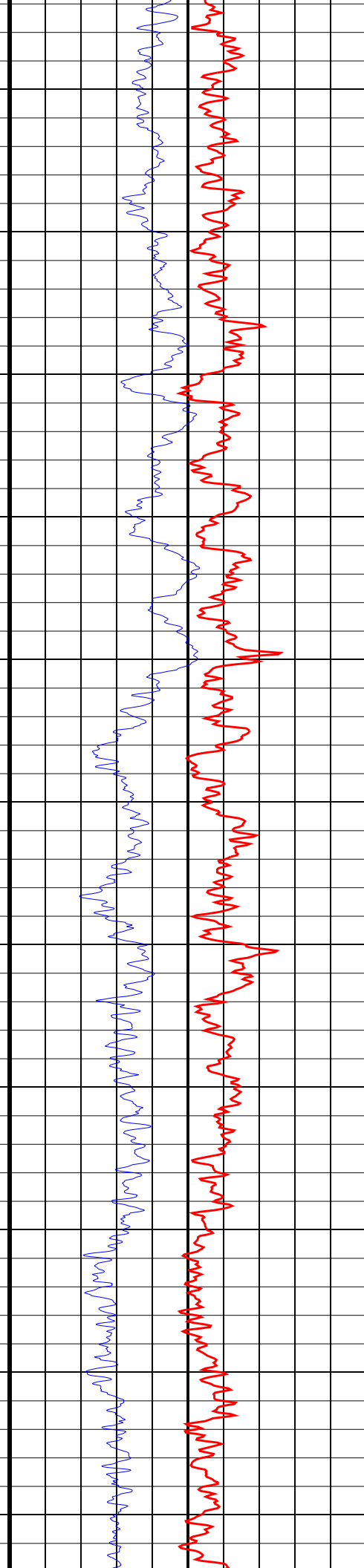
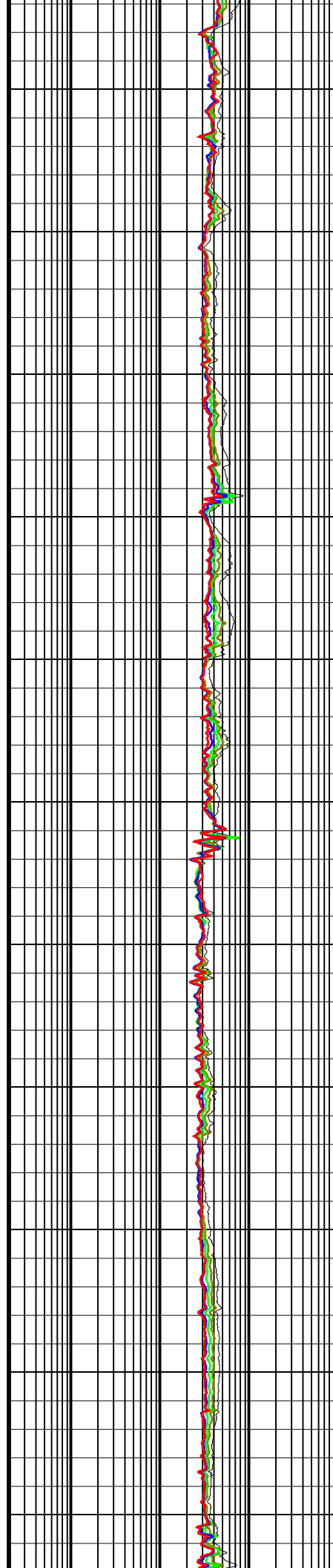
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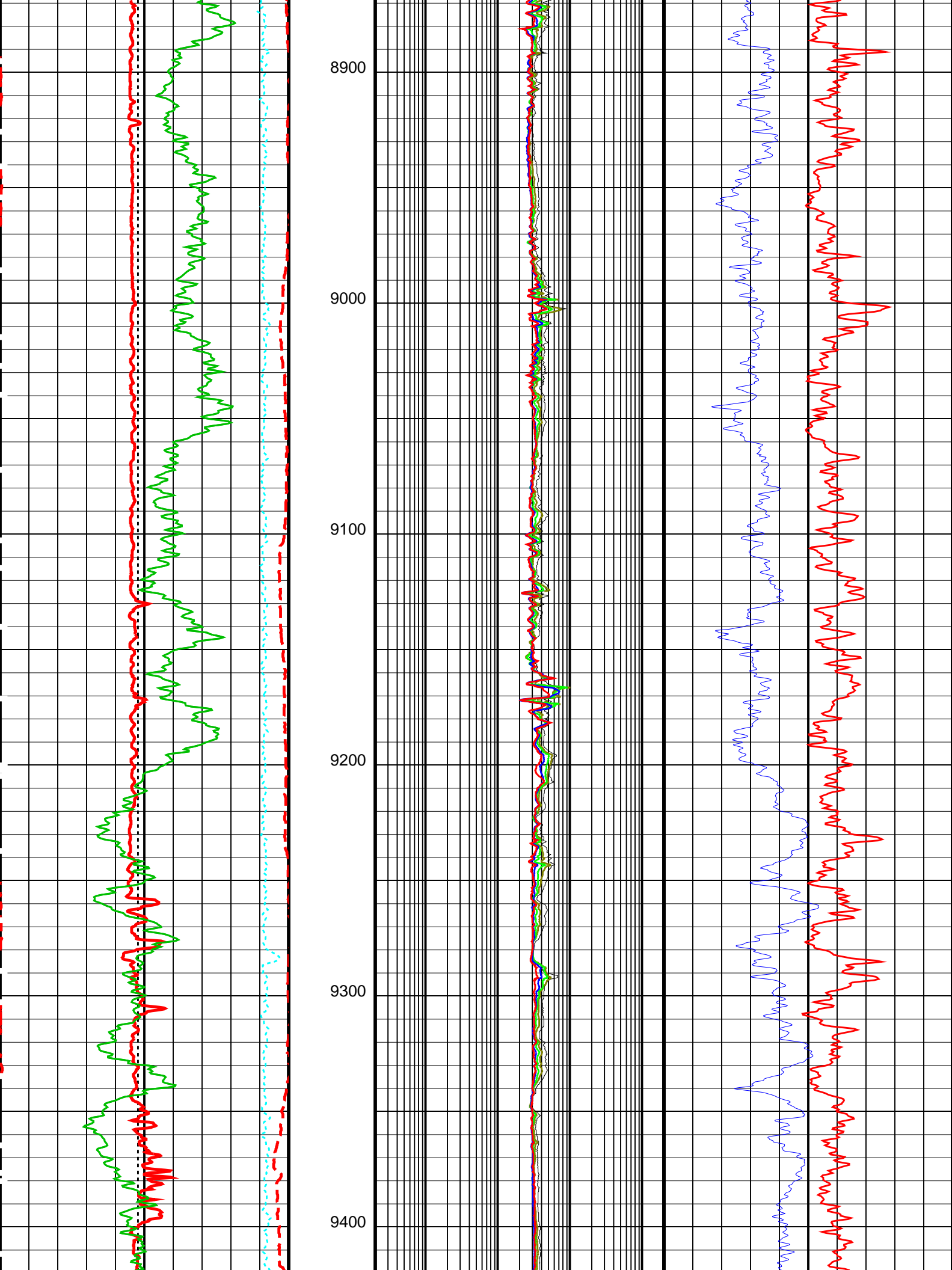
8500

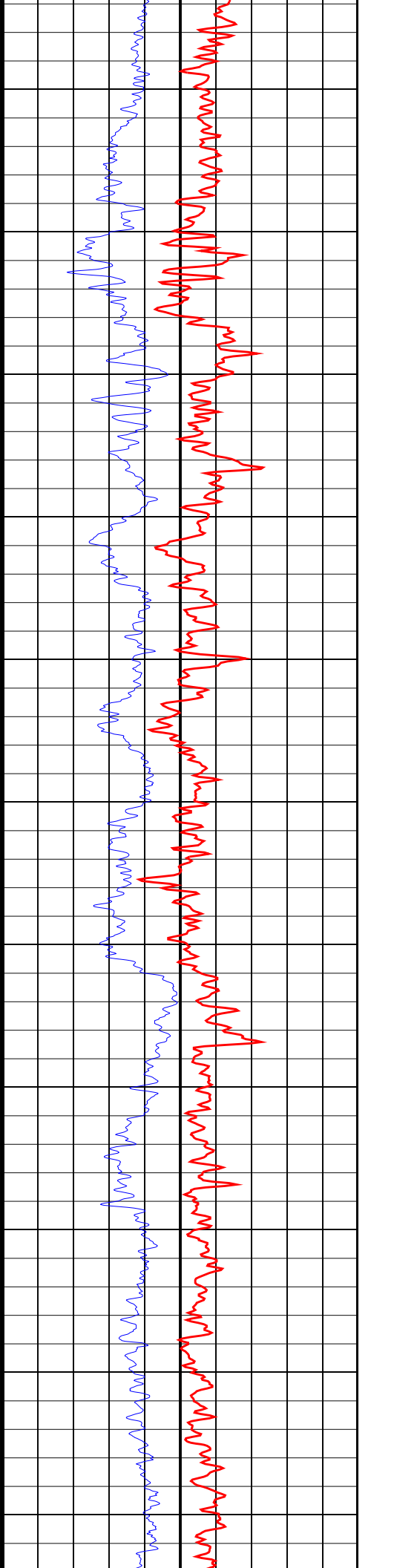
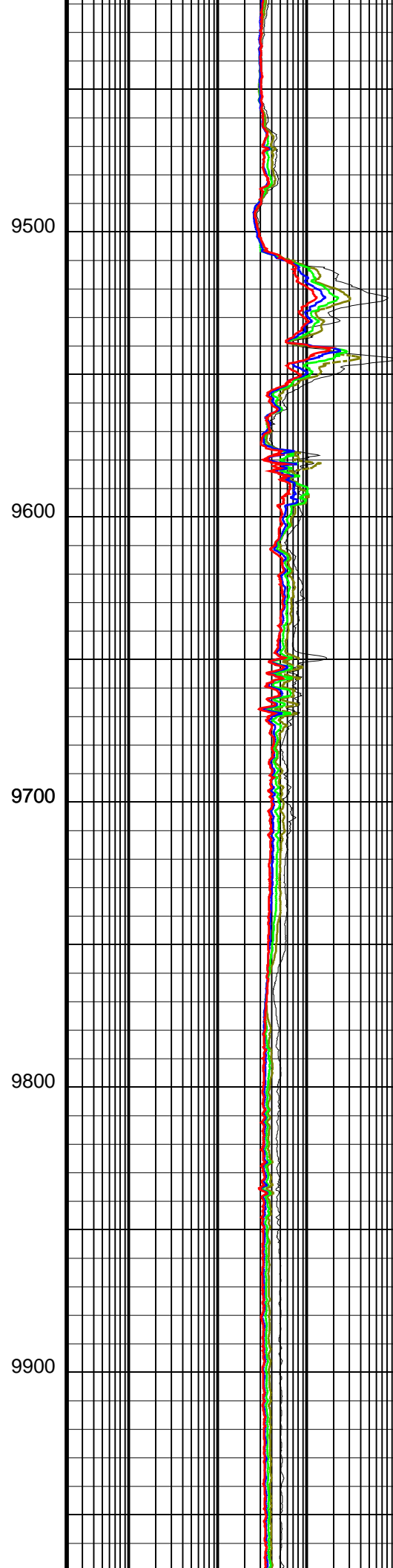
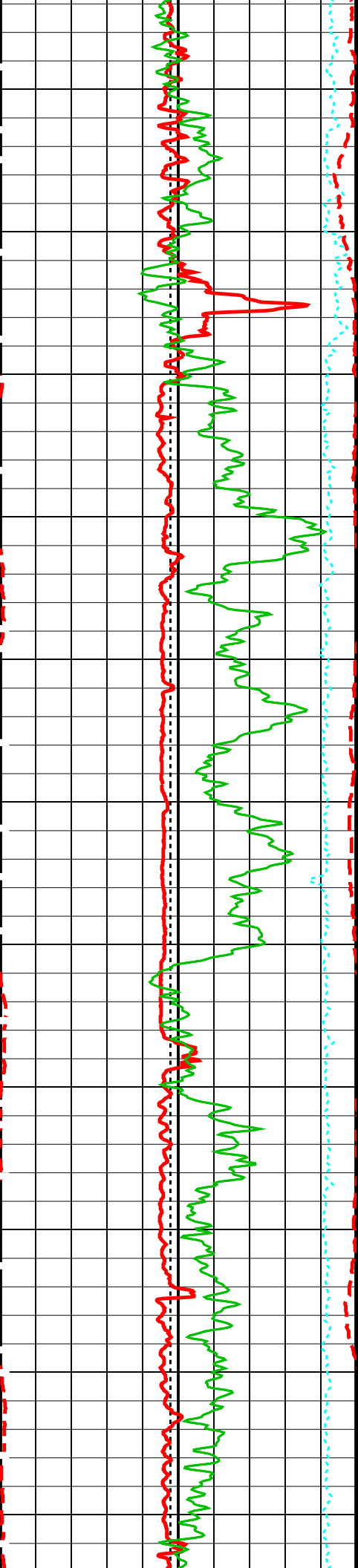
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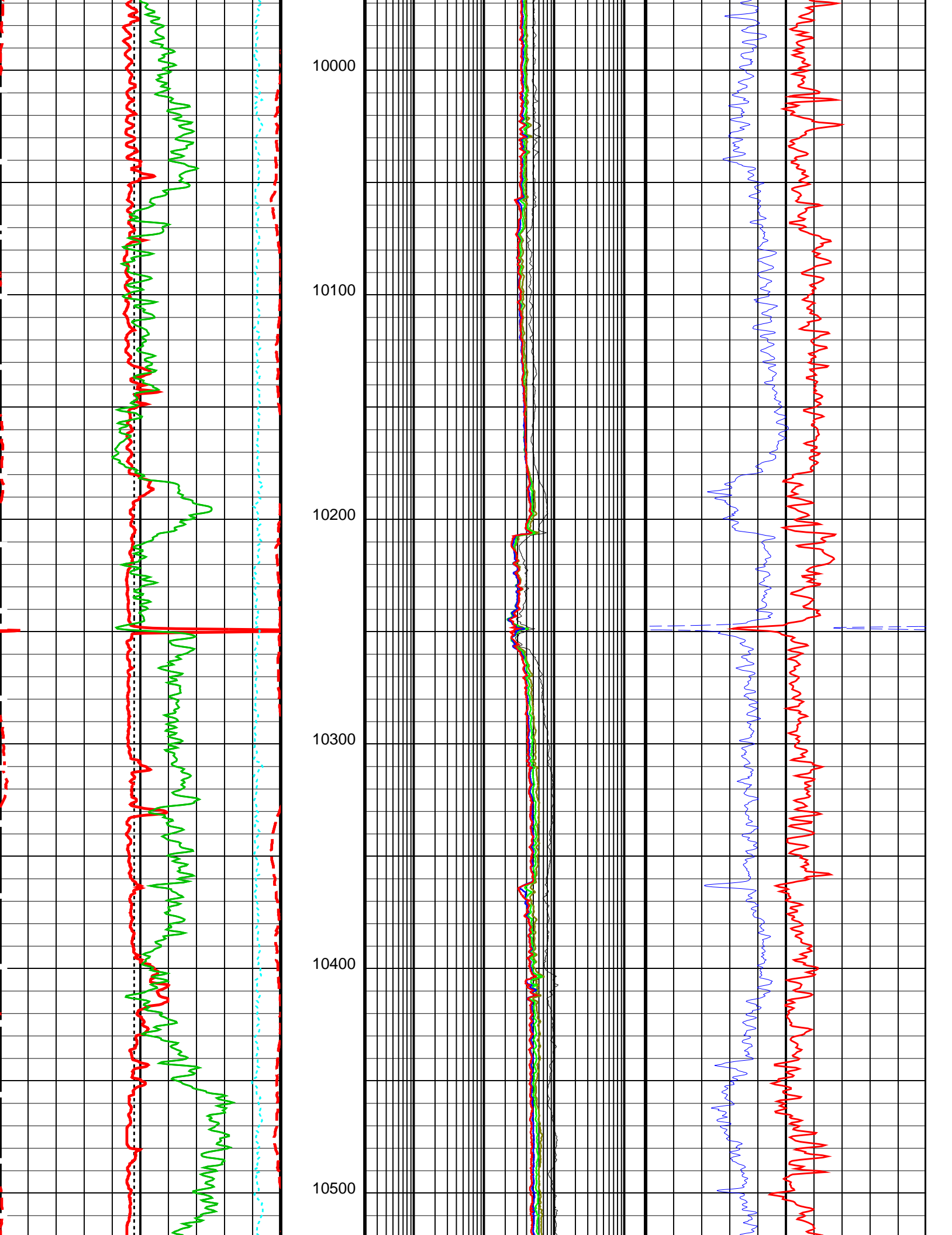
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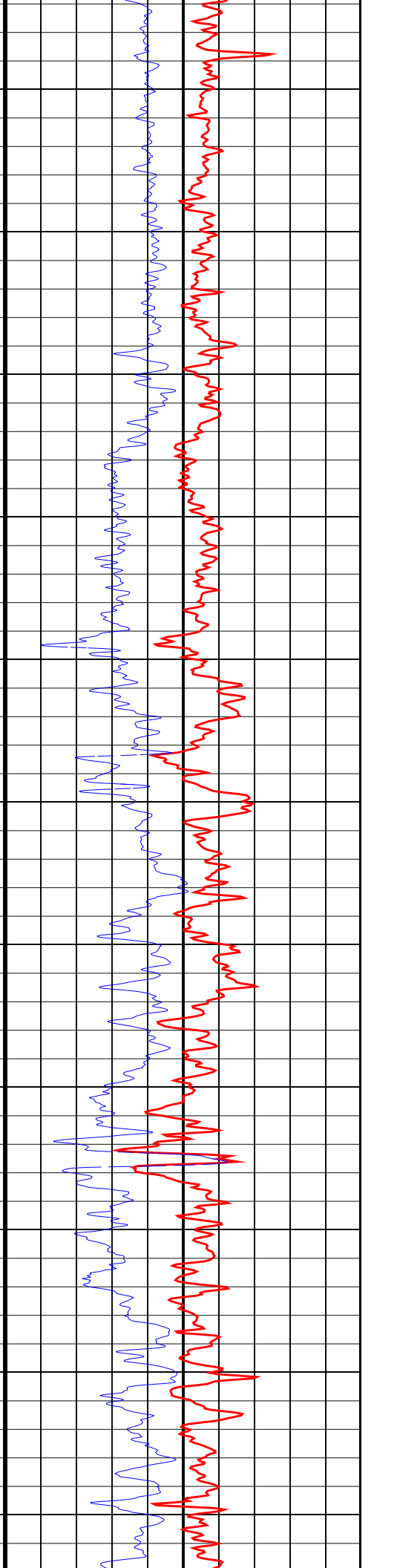
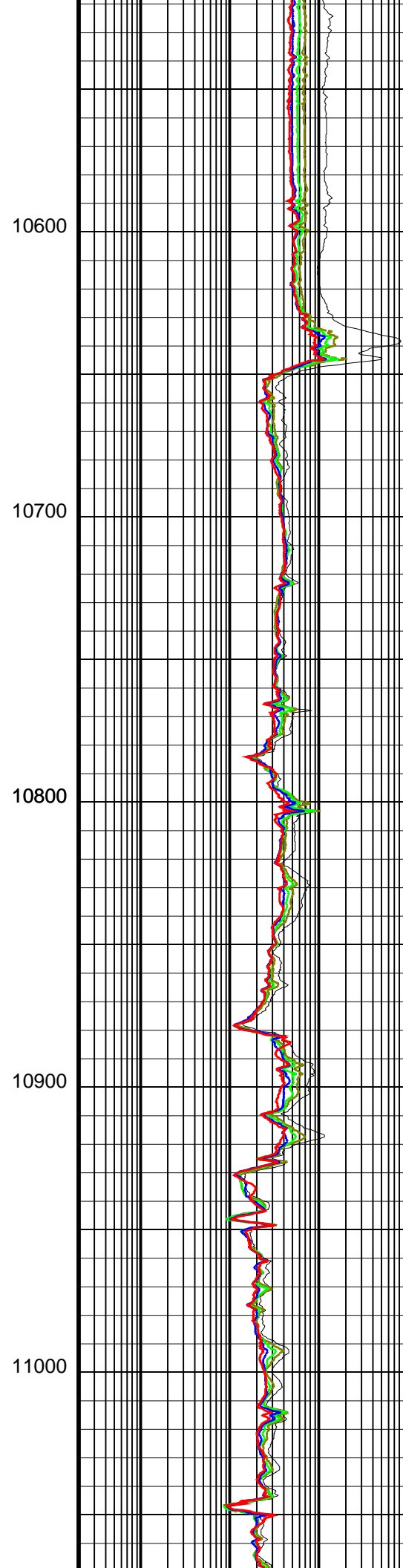
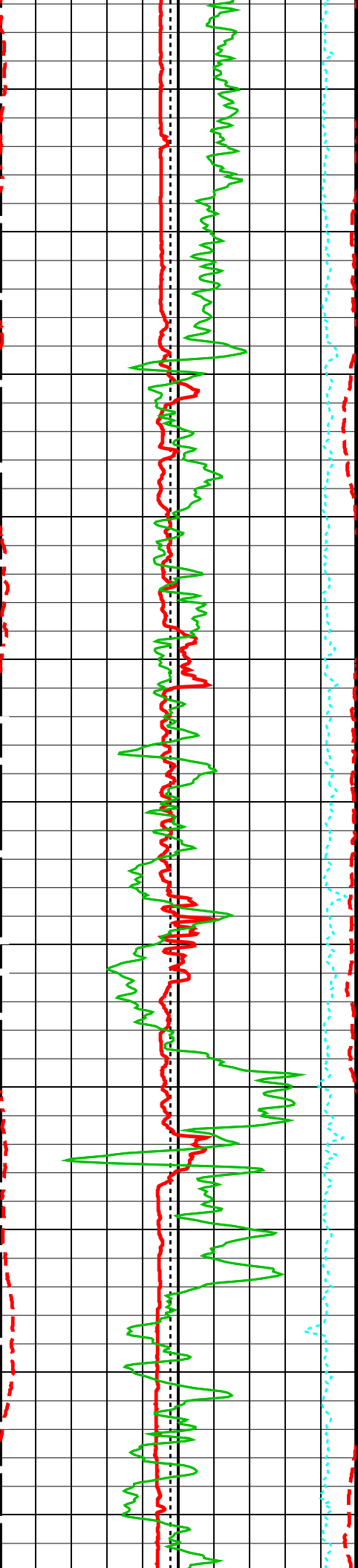
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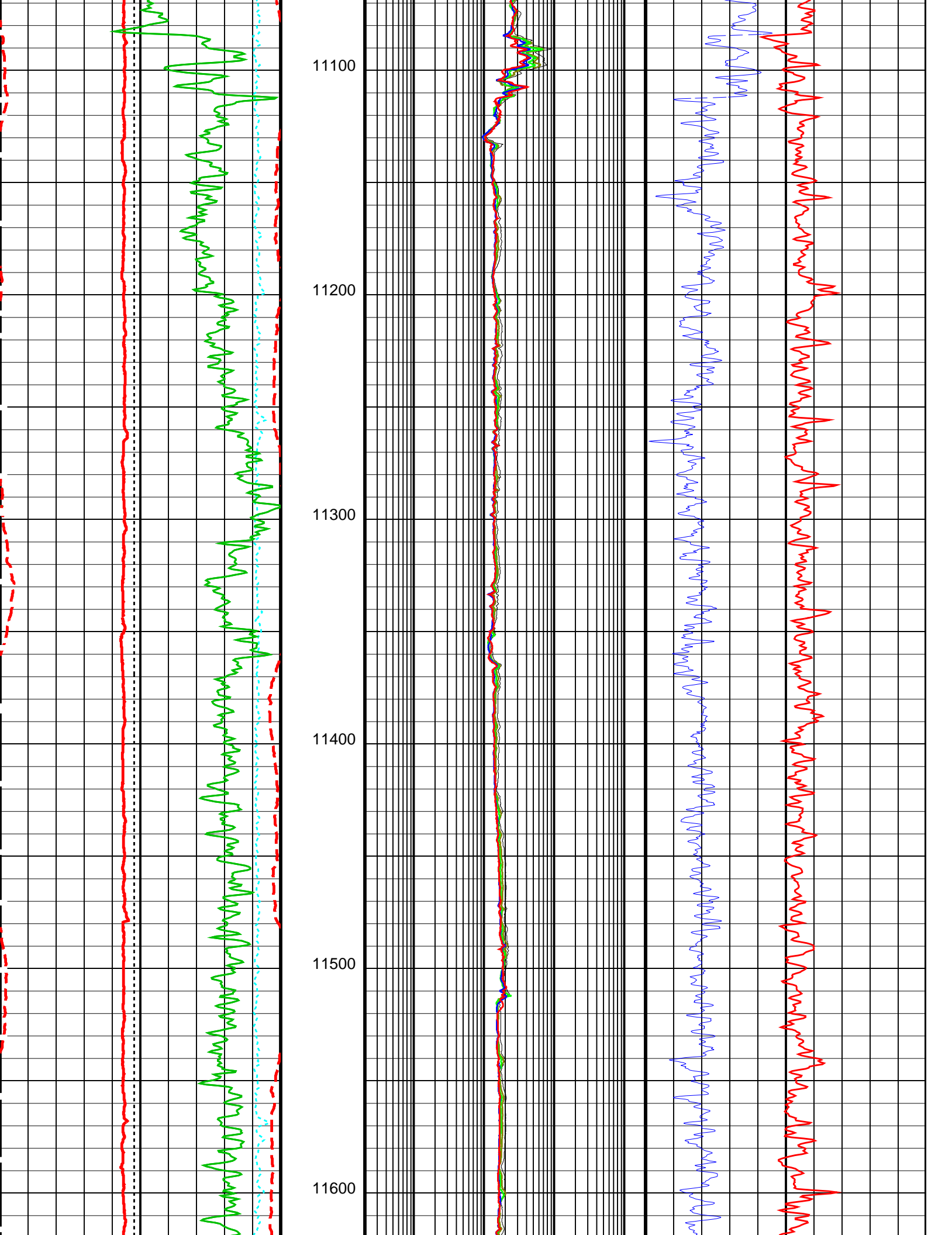


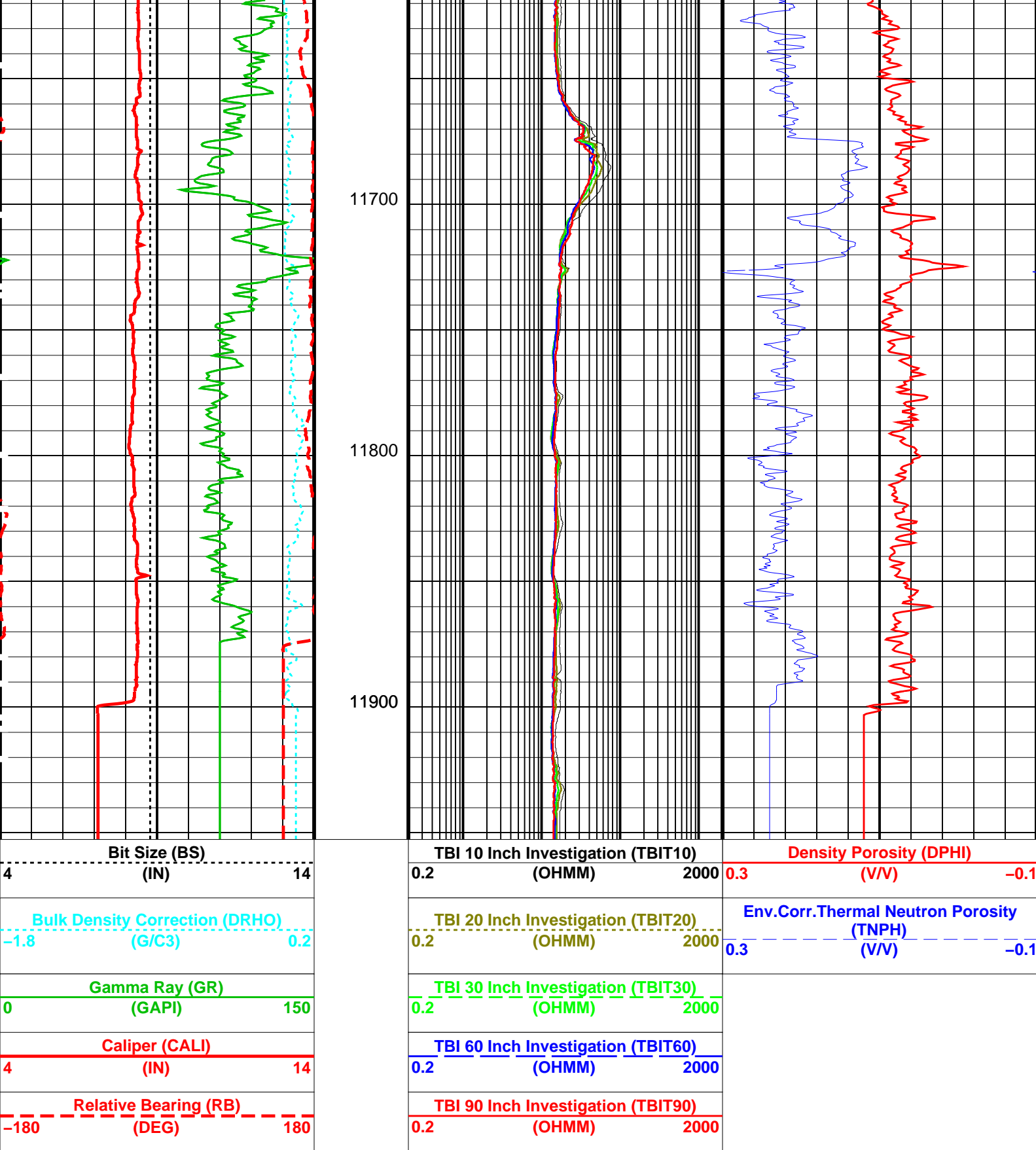












PIP SUMMARY

Time Mark Every 60 S

Parameters		
DLIS Name	Description	Value
TBT-A: ThruBit String		
BHS	Description of this pass	
BSCO	Borehole Status	OPEN
CSAL	Borehole Salinity Correction Enabled? (for TBN)	No
CSID	Cement Salinity	0 PPM
CSID	Casing Salinity	0 PPM

CSID	Casing Size I.D.	8.921	IN
DHC	Density Hole Correction	CALIPER	
FD	Fluid Density	1	G/C3
FSAL	Formation Salinity	0	PPM
FSCO	Formation Salinity Correction Enabled? (for TBN)	No	
MATR	Rock Matrix for Neutron Porosity Corrections	LIMESTONE	
MDEN	Matrix Density	2.71	G/C3
MT	Mud Type (for TBN and TBI correction)	OBM	
MWCO	Mud Weight Correction Enabled? (for TBN)	No	
RB_OFFSET	Additional RB offset (degrees)	0	DEG
SOCO	Stand-Off Correction Enabled? (for TBN)	No	
SOFF	TBN Standoff	0	IN
TBDS_SAMPLING	TBDS Sampling	6_Inches	
TBD_CAL_BLOCK	TBD Calibration Block Type	Schlumberger	
TBD_SPIKE_REJECT	TBD Spike Detection Option	Correct	
TBD_SPIKE_THRESHOLD	TBD Attenuation Change Threshold for Spike Detection	5	%
TBI_ALGO	TBI Algorithm Selection	AIT	
TBI_BHC_MODE	Borehole Correction Mode (for TBI)	Solve_For_Standoff	
TBI_BHC_OP	Borehole Correction Option (for TBI)	Caliper	
TBI_CALTYP	TBI Mastercal Type	Schlumberger	
TBI_REPL_ARRAY_DEST	TBI: Replace This Array	None	
TBI_REPL_ARRAY_SOURCE	TBI: With This Array	None	
TBI_RMUD_SRC	RMUD Source for Borehole Correction (for TBI)	Data_Channel_RMUD	
TBI_TC_OP	Induction Temperature Correction Option	Lower	
TBN_ALGO	Porosity Algorithm	Schmid	
TBN_BHC_OP	Borehole Correction Option (for TBN)	Caliper	
TBN_CAL_TANK	TBN Calibration Tank Type	Schlumberger	
TBN_FILTER	Filter Length	3_point	
TBN_PRES_OP	Pressure Correction Enabled? (for TBN)	No	
TBN_TEMP_OP	Temperature Correction Enabled? (for TBN)	No	
TBN_WPRE	Well Pressure (for TBN)	0	PSIG
WMUD	Mud Weight	8.345	LB/G
HOLEV: Integrated Hole/Cement Volume			
BHS	Borehole Status	OPEN	
MATR	Rock Matrix for Neutron Porosity Corrections	LIMESTONE	
System and Miscellaneous			
BS	Bit Size	8.750	IN
BSAL	Borehole Salinity	26000.00	PPM
CSIZ	Current Casing Size	9.625	IN
DO	Depth Offset for Playback	0.0	FT
MST	Mud Sample Temperature	-50000.00	DEGF
PP	Playback Processing	NORMAL	
RMB	Resistivity of Mud - BHT	-50000.0000	OHMM
RMS	Resistivity of Mud Sample	-50000.0000	OHMM

Format: ThruBit_TCOM_1 Vertical Scale: 2" per 100' Graphics File Created: 17-Apr-2016 15:46

OP System Version: 19C2-270

eWAFE Version: 1.210

TBT-A SRPC-5314-ThruBit_b

Input DLIS Files

DEFAULT	ThruBit_036PUP	FN:31	PRODUCER	17-Apr-2016 15:29	11952.6 FT	1860.1 FT
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Output DLIS Files

DEFAULT	ThruBit_037PUP	FN:32	PRODUCER	17-Apr-2016 15:46
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Calibration and Check Summary

Measurement	Nominal	Master	Before	After	Change	Limit	Units
ThruBit String Master Calibration - TBI Master Calibration Sonde Errors							
Master: 9-Mar-2016 11:43							
Freq 2, A1, R	-249.000	-229.731	--	--	--	--	
Freq 2, A1, X	150.000	-116.333	--	--	--	--	
Freq 2, A2, R	-98.0000	-88.3595	--	--	--	--	
Freq 2, A2, X	160.000	-16.4406	--	--	--	--	
Freq 2, A3, R	-23.0000	-19.9704	--	--	--	--	
Freq 2, A3, X	-20.0000	-54.9789	--	--	--	--	
Freq 2, A4, R	-19.0000	-21.0274	--	--	--	--	
Freq 2, A4, X	100.000	49.1507	--	--	--	--	
Freq 2, A5, R	-20.0000	-19.5517	--	--	--	--	
Freq 2, A5, X	-25.0000	-20.8558	--	--	--	--	

ThruBit String Master Calibration – TBI Master Calibration COMPLEX GAINS

Master: 9–Mar–2016 11:43

Freq 2, R – 0	1.000	1.004	--	--	--	--
Freq 2, R – 1	1.000	0.9987	--	--	--	--
Freq 2, R – 2	1.000	1.001	--	--	--	--
Freq 2, R – 3	1.000	1.006	--	--	--	--
Freq 2, R – 4	1.000	1.013	--	--	--	--
Freq 2, X – 0	0	0.007550	--	--	--	--
Freq 2, X – 1	0	0.008244	--	--	--	--
Freq 2, X – 2	0	0.009125	--	--	--	--
Freq 2, X – 3	0	0.01355	--	--	--	--
Freq 2, X – 4	0	0.01328	--	--	--	--

ThruBit String Master Calibration – TBD Caliper Master Calibration

Master: 10–Apr–2016 19:29

Caliper 12in Ring	1949.8	1867.3	--	--	--	--	IN
Caliper 9in Ring	2096.7	2027.7	--	--	--	--	IN
Caliper 6in Ring	2285.7	2185.9	--	--	--	--	IN

ThruBit String Master Calibration – TBD Density Master Calibration. Be Window, Schlumberger blocks

Master: 10–Apr–2016 19:29

Aluminium Density	2.607	2.607	--	--	--	--	G/C3
Magnesium Density	1.752	1.752	--	--	--	--	G/C3
LS1 Background	143.00	135.69	--	--	--	--	CPS
SS1 Background	143.00	147.68	--	--	--	--	CPS
LS4 Background	30.00	29.03	--	--	--	--	CPS
SS1 Aluminium	7900.00	7129.89	--	--	--	--	CPS
LS1 Aluminium	1220.0	1068.8	--	--	--	--	CPS
SS1 Magnesium	13160.0	11628.7	--	--	--	--	CPS
LS4 Aluminium	830.00	759.46	--	--	--	--	CPS
SS Slope	1.645	1.699	--	--	--	--	
LS1 Block + Sleeve	50000	4572.0	--	--	--	--	CPS
LS Slope	0.4150	0.4231	--	--	--	--	
LS4 Block + Sleeve	50000	1793.5	--	--	--	--	CPS
Pef K Factor	4.840	12.60	--	--	--	--	
LS1 Magnesium	8260.00	7070.52	--	--	--	--	CPS
Pef B Factor	–0.5550	–0.2910	--	--	--	--	

ThruBit String Master Calibration – TBD Density Master Calibration. Ti Window, Schlumberger blocks

Master: 10–Apr–2016 19:29

SS1 Background	143.00	147.68	--	--	--	--	CPS
SS2 Background	38.0000	38.3111	--	--	--	--	CPS
SS3 Background	23.0000	23.3230	--	--	--	--	CPS
SS4 Background	31.0000	32.5054	--	--	--	--	CPS
LS1 Background	143.00	135.69	--	--	--	--	CPS
LS2 Background	37.0000	34.7229	--	--	--	--	CPS
LS3 Background	22.0000	20.8538	--	--	--	--	CPS
LS4 Background	30.00	29.03	--	--	--	--	CPS
SS1 Aluminium	7900.00	7129.89	--	--	--	--	CPS
SS2 Aluminium	4050.00	3673.95	--	--	--	--	CPS
SS3 Aluminium	3420.00	3123.06	--	--	--	--	CPS
SS4 Aluminium	3360.0000	3061.7249	--	--	--	--	CPS
LS1 Aluminium	1220.0	1068.8	--	--	--	--	CPS
LS2 Aluminium	1140.00	1005.53	--	--	--	--	CPS
LS3 Aluminium	1080.00	979.628	--	--	--	--	CPS
LS4 Aluminium	830.00	759.46	--	--	--	--	CPS
Magnesium RHOS	1.6700	1.6704	--	--	--	--	
Magnesium RHOLS	1.6880	1.6890	--	--	--	--	
Magnesium RHOB	1.7040	1.7046	--	--	--	--	
Magnesium PEF	2.5210	2.5487	--	--	--	--	
Magnesium + Sleeve RHOS	2.1520	2.1504	--	--	--	--	
Magnesium + Sleeve RHOLS	1.8550	1.8535	--	--	--	--	
Magnesium + Sleeve RHOB	1.6060	1.6044	--	--	--	--	
Magnesium + Sleeve PEF	6.8000	7.7802	--	--	--	--	

ThruBit String Master Calibration – Thermal Neutron Master Calibration

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TNF, Background	1.0	0.15	--	--	--	--	CPS
TNN, Background	1.0	0.055	--	--	--	--	CPS
TNF, Tank	27990	13320	--	--	--	--	CPS
TNN, Tank	69600	38171	--	--	--	--	CPS
TNF, Tank + Al Sleeve	1750.0	759.55	--	--	--	--	CPS
TNN, Tank + Al Sleeve	18350.0	8462.49	--	--	--	--	CPS
Tank + Al Sleeve Ratio	11.128	11.141	--	--	--	--	
Tank + Al Sleeve Porosity	15.19	15.19	--	--	--	--	PU
Tank, Ratio	2.6300	2.8649	--	--	--	--	
Tank, Temperature	70.0	55.0	--	--	--	--	DEGF

ThruBit String Master Calibration – TMG Accelerometer Calibration

Master: 10–Apr–2016 21:31

Minimum Ax, m/s2	–9.810	–10.30	--	--	--	--
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Maximum Ax, m/s2	9.810	9.611	--	--	--	--
Minimum Ay, m/s2	-9.810	-9.807	--	--	--	--
Maximum Ay, m/s2	9.810	9.807	--	--	--	--
Minimum Az, m/s2	0	-0.07160	--	--	--	--
Maximum Az, m/s2	9.810	9.767	--	--	--	--
RB Offset, degrees	0	-17.49	--	--	--	--

ThruBit String Master Calibration – TMG Gamma-Ray Calibration

Master: 10-Apr-2016 21:25


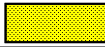

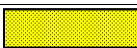






GR Background	30.00	74.17	--	--	--	--	GAPI
GR Jig-Background	160.0	159.9	--	--	--	--	GAPI











ThruBit String / Equipment Identification

Primary Equipment:

Induction Resistivity	TBI – A
Dipole Sonic	TBDS – A
Density	TBD – A
Gamma-Ray Logging Source	GGLS – FZ
Thermal Neutron	TBN – A
Neutron Logging Source	NNLS – EWA
Telemetry Memory GR	TMG – A
Battery	TBAT –

Auxiliary Equipment:




ThruBit String Master Calibration					
TBI Master Calibration Sonde Errors					
Freq 2, A1, R	Value	Nominal	Freq 2, A1, X	Value	Nominal
	-229.731	-249.000		-116.333	150.000
-336.000 (Minimum)	-186.000 (Maximum)		-375.000 (Minimum)	675.000 (Maximum)	
Freq 2, A2, R	Value	Nominal	Freq 2, A2, X	Value	Nominal
	-88.3595	-98.0000		-16.4406	160.000
-138.000 (Minimum)	-76.0000 (Maximum)		-100.000 (Minimum)	425.000 (Maximum)	
Freq 2, A3, R	Value	Nominal	Freq 2, A3, X	Value	Nominal
	-19.9704	-23.0000		-54.9789	-20.0000
-31.0000 (Minimum)	-13.0000 (Maximum)		-325.000 (Minimum)	250.000 (Maximum)	
Freq 2, A4, R	Value	Nominal	Freq 2, A4, X	Value	Nominal
	-21.0274	-19.0000		49.1507	100.000
-28.0000 (Minimum)	-7.00000 (Maximum)		-75.0000 (Minimum)	275.000 (Maximum)	
Freq 2, A5, R	Value	Nominal	Freq 2, A5, X	Value	Nominal
	-19.5517	-20.0000		-20.8558	-25.0000
-27.0000 (Minimum)	-10.0000 (Maximum)		-125.000 (Minimum)	100.000 (Maximum)	
Master: 9-Mar-2016 11:43					

ThruBit String Master Calibration					
TBI Master Calibration COMPLEX GAINS					
Freq 2, R	Value	Nominal	Freq 2, X	Value	Nominal
	1.004	1.000		0.007550	0
	0.9987	1.000		0.008244	0
	1.001	1.000		0.009125	0
	1.006	1.000		0.01355	0
	1.013	1.000		0.01328	0
0.9500 (Minimum)	1.050 (Maximum)		-0.05000 (Minimum)	0.05000 (Maximum)	
Master: 9-Mar-2016 11:43					























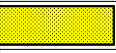

ThruBit String Master Calibration

TBD Caliper Master Calibration

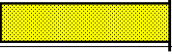
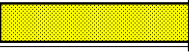
Caliper 12in Ring IN	Value	Nominal	Caliper 9in Ring IN	Value	Nominal	Caliper 6in Ring IN	Value	Nominal
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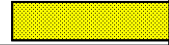







Caliper String HV	Value	Nominal	Caliper String HV	Value	Nominal	Caliper String HV	Value	Nominal
	1867.3	1949.8		2027.7	2096.7		2185.9	2285.7
1799.8 (Minimum)	(Nominal)	2099.8 (Maximum)	1946.7 (Minimum)	(Nominal)	2246.7 (Maximum)	2135.7 (Minimum)	(Nominal)	2435.7 (Maximum)








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ThruBit String Master Calibration						
TBD Density Master Calibration. Ti Window, Schlumberger blocks						
LS1 Background CPS	Value	Nominal	SS1 Background CPS	Value	Nominal	
	135.69	143.00		147.68	143.00	
100.00 (Minimum)	(Nominal)	186.00 (Maximum)	100.00 (Minimum)	(Nominal)	186.00 (Maximum)	
LS2 Background CPS	Value	Nominal	SS2 Background CPS	Value	Nominal	
	34.7229	37.0000		38.3111	38.0000	
26.0000 (Minimum)	(Nominal)	48.0000 (Maximum)	27.0000 (Minimum)	(Nominal)	50.0000 (Maximum)	
LS3 Background CPS	Value	Nominal	SS3 Background CPS	Value	Nominal	
	20.8538	22.0000		23.3230	23.0000	
15.0000 (Minimum)	(Nominal)	29.0000 (Maximum)	16.0000 (Minimum)	(Nominal)	30.0000 (Maximum)	
LS4 Background CPS	Value	Nominal	SS4 Background CPS	Value	Nominal	
	29.03	30.00		32.5054	31.0000	
20.00 (Minimum)	(Nominal)	40.00 (Maximum)	22.0000 (Minimum)	(Nominal)	40.0000 (Maximum)	
LS1 Aluminium CPS	Value	Nominal	SS1 Aluminium CPS	Value	Nominal	
	1068.8	1220.0		7129.89	7900.00	
850.00 (Minimum)	(Nominal)	1590.0 (Maximum)	5530.00 (Minimum)	(Nominal)	10270.0 (Maximum)	
LS2 Aluminium CPS	Value	Nominal	SS2 Aluminium CPS	Value	Nominal	
	1005.53	1140.00		3673.95	4050.00	
800.000 (Minimum)	(Nominal)	1480.00 (Maximum)	2840.00 (Minimum)	(Nominal)	5270.00 (Maximum)	
LS3 Aluminium CPS	Value	Nominal	SS3 Aluminium CPS	Value	Nominal	
	979.628	1080.00		3123.06	3420.00	
760.000 (Minimum)	(Nominal)	1400.00 (Maximum)	2400.00 (Minimum)	(Nominal)	4450.00 (Maximum)	
LS4 Aluminium CPS	Value	Nominal	SS4 Aluminium CPS	Value	Nominal	
	759.46	830.00		3061.7249	3360.0000	
580.00 (Minimum)	(Nominal)	1080.0 (Maximum)	2350.0000 (Minimum)	(Nominal)	3700.0000 (Maximum)	
Magnesium RHOLS	Value	Nominal	Magnesium RHOSS	Value	Nominal	
	1.6890	1.6880		1.6704	1.6700	
1.6630 (Minimum)	(Nominal)	1.7130 (Maximum)	1.6350 (Minimum)	(Nominal)	1.7050 (Maximum)	
Magnesium PEF	Value	Nominal	Magnesium RHOB	Value	Nominal	
	2.5487	2.5210		1.7046	1.7040	
2.3700 (Minimum)	(Nominal)	2.6700 (Maximum)	1.6870 (Minimum)	(Nominal)	1.7210 (Maximum)	
Magnesium + Sleeve RHOLS	Value	Nominal	Magnesium + Sleeve RHOSS	Value	Nominal	
	1.8535	1.8550		2.1504	2.1520	
1.7950 (Minimum)	(Nominal)	1.9150 (Maximum)	2.0920 (Minimum)	(Nominal)	2.2120 (Maximum)	
Magnesium + Sleeve PEF	Value	Nominal	Magnesium + Sleeve RHOB	Value	Nominal	
	7.7802	6.8000		1.6044	1.6060	
5.1000 (Minimum)	(Nominal)	8.5000 (Maximum)	1.5780 (Minimum)	(Nominal)	1.6340 (Maximum)	

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ThruBit String Master Calibration						
Thermal Neutron Master Calibration						
TNF, Background CPS	Value	Nominal	TNN, Background CPS	Value	Nominal	
	0.15	1.0		0.055	1.0	
0 (Minimum)	(Nominal)	2.0 (Maximum)	0 (Minimum)	(Nominal)	2.0 (Maximum)	
TNF, Tank CPS	Value	Nominal	TNN, Tank CPS	Value	Nominal	

9330 (Minimum)		(Nominal)	56000 (Maximum)	13320	27990	23200 (Minimum)		(Nominal)	139200 (Maximum)	38171	69600
TNF, Tank + AI Sleeve CPS			Value	Nominal		TNN, Tank + AI Sleeve CPS			Value	Nominal	
			759.55	1750.0					8462.49	18350.0	
580.00 (Minimum)		(Nominal)	3500.0 (Maximum)			6100.00 (Minimum)		(Nominal)	36700.0 (Maximum)		
Tank + AI Sleeve Ratio			Value	Nominal		Tank + AI Sleeve Porosity PU			Value	Nominal	
			11.141	11.128					15.19	15.19	
10.528 (Minimum)		(Nominal)	11.728 (Maximum)			14.69 (Minimum)		(Nominal)	15.69 (Maximum)		
Tank, Ratio			Value	Nominal		Tank, Temperature DEGF			Value	Nominal	
			2.8649	2.6300					55.0	70.0	
2.0300 (Minimum)		(Nominal)	3.2300 (Maximum)			20.0 (Minimum)		(Nominal)	120 (Maximum)		
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ThruBit String Master Calibration					
TMG Accelerometer Calibration					
Minimum Ax, m/s2		Value	Nominal	Maximum Ax, m/s2	
		-10.30	-9.810		
-10.81 (Minimum)	(Nominal)	-8.810 (Maximum)		8.810 (Minimum)	10.81 (Maximum)
Minimum Ay, m/s2		Value	Nominal	Maximum Ay, m/s2	
		-9.807	-9.810		
-10.81 (Minimum)	(Nominal)	-8.810 (Maximum)		8.810 (Minimum)	10.81 (Maximum)
Minimum Az, m/s2		Value	Nominal	Maximum Az, m/s2	
		-0.07160	0		
-1.000 (Minimum)	(Nominal)	1.000 (Maximum)		8.810 (Minimum)	10.81 (Maximum)
RB Offset, degrees		Value	Nominal		
		-17.49	0		
-360.0 (Minimum)	(Nominal)	360.0 (Maximum)			
Master: 10-Apr-2016 21:31					

ThruBit String Master Calibration					
TMG Gamma-Ray Calibration					
GR Background GAPI		Value	Nominal	GR Jig-Background GAPI	
		74.17	30.00		
0 (Minimum)		(Nominal)	120.0 (Maximum)	128.0 (Minimum)	192.0 (Maximum)
Master: 10-Apr-2016 21:25					

Company: **SandRidge Energy, Inc**

Schlumberger

Well: **Hebron 0780 4-7H**

Field: **North Park Horizontal Niobrara**

County: **Jackson**

State: **Colorado**

TB TCOM

TBI TBD. TBN. TMG

Induction, Density/Neutron Porosity, GR