



Radial Cement Bond
Gamma Ray
Casing Collar Log

Company Kerr-McGee Oil & Gas Onshore, L.P.

Well Cowboy 21-1HZ

Field Wattenberg

County Weld State Colorado

Location: API #: 05-123-47106

Other Services
JB/GR
RBP
RBL 0 PSI

SEC 21 TWP 2N RGE 67W

Elevation

Permanent Datum Ground Level Elevation 5041'
Log Measured From Kelly Bushing 26 FT
Drilling Measured From Kelly Bushing

K.B. 5067'
D.F. ---
G.L. 5041'

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State Colorado

Date	11-NOV-18			
Run Number	Two			
Depth Driller	15706 FT			
Depth Logger	7192 FT			
Bottom Logged Interval	7176 FT			
Top Log Interval	Surface			
Open Hole Size	---			
Type Fluid	Water			
Density / Viscosity	8.34 lb/gal			
Max. Recorded Temp.	216°F			
Estimated Cement Top	See Log			
Time Well Ready	ROA			
Time Logger on Bottom	9:33			
Equipment Number	HD-325			
Location	Platteville, CO			
Recorded By	J. Morrison			
Witnessed By	Kyle Carver			
Borehole Record				
Run Number	Bit	From	To	Size
				Weight
				From
				To
Tubing Record				
Casing Record	Size (in)	Wgt (lbs/ft)	Grade	Top
Surface Casing	9 5/8	36	J-55	Surface
Intermediate #1	5 1/2	17	P-110	Surface
Intermediate #2				
Inner				

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All interpretations are opinions based on inferences from electrical or other measurements and we cannot and do not guarantee the accuracy or correctness of any interpretation, and we shall not, except in the case of gross or willful negligence on our part, be liable or responsible for any loss, costs, damages, or expenses incurred or sustained by anyone resulting from any interpretation made by any of our officers, agents or employees. These interpretations are also subject to our general terms and conditions set out in our current Price Schedule.

Comments

Log ran as per customer request
Depth referenced to Casing Tally reported Marker Joint at 7105 FT
Adjusted +3 FT to correlate with Marker Joint
Gauge Ring/Junk Basket ran to 8031 FT
Retrievable Bridge Plug set at 7200 FT
Log ran with 2800 PSI Surface Induced Pressure
Logging tools were clean and free of debris upon completion of operations

Thank you for choosing Reliance Oilfield Services, LLC!!

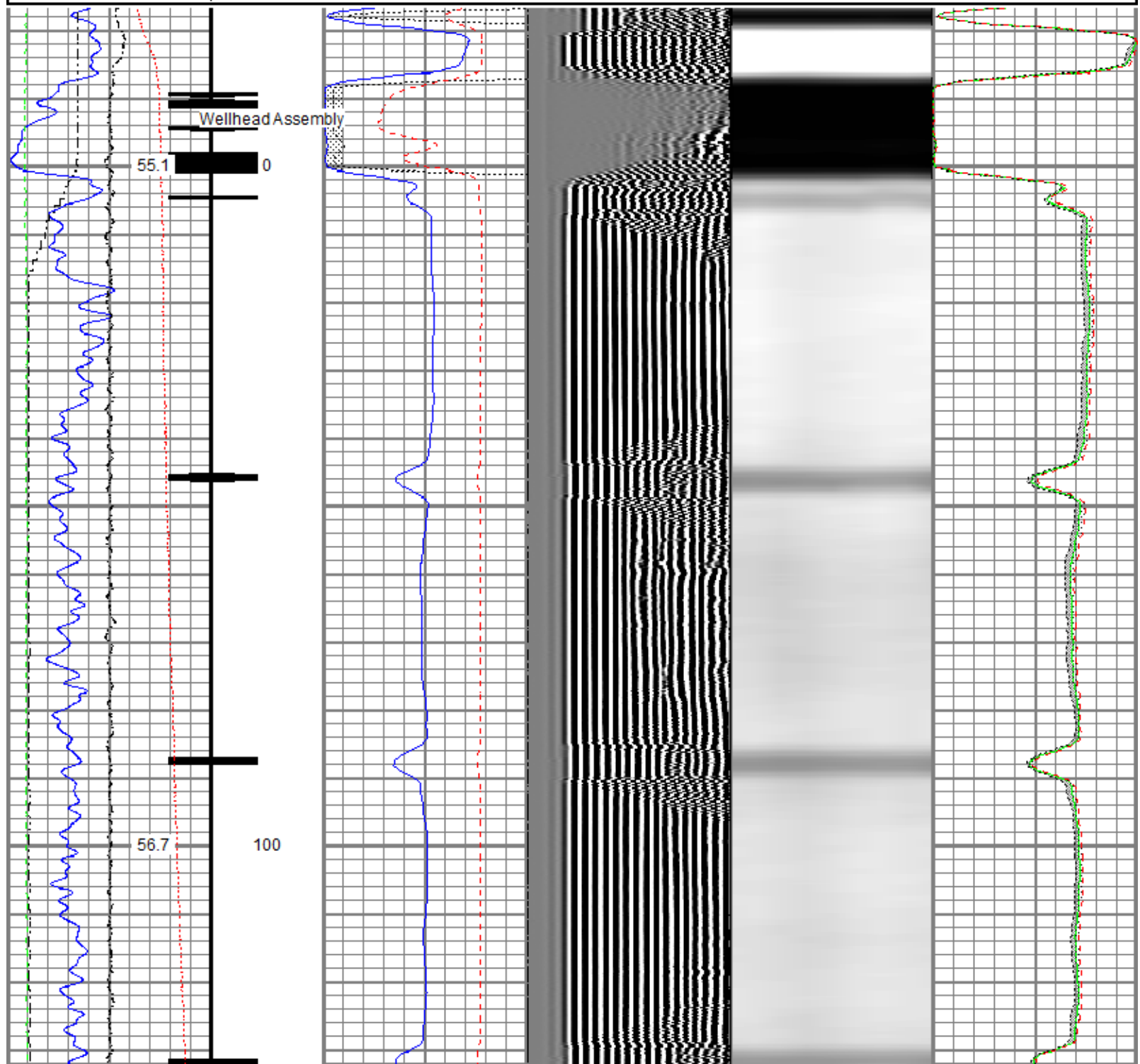
Main Pass

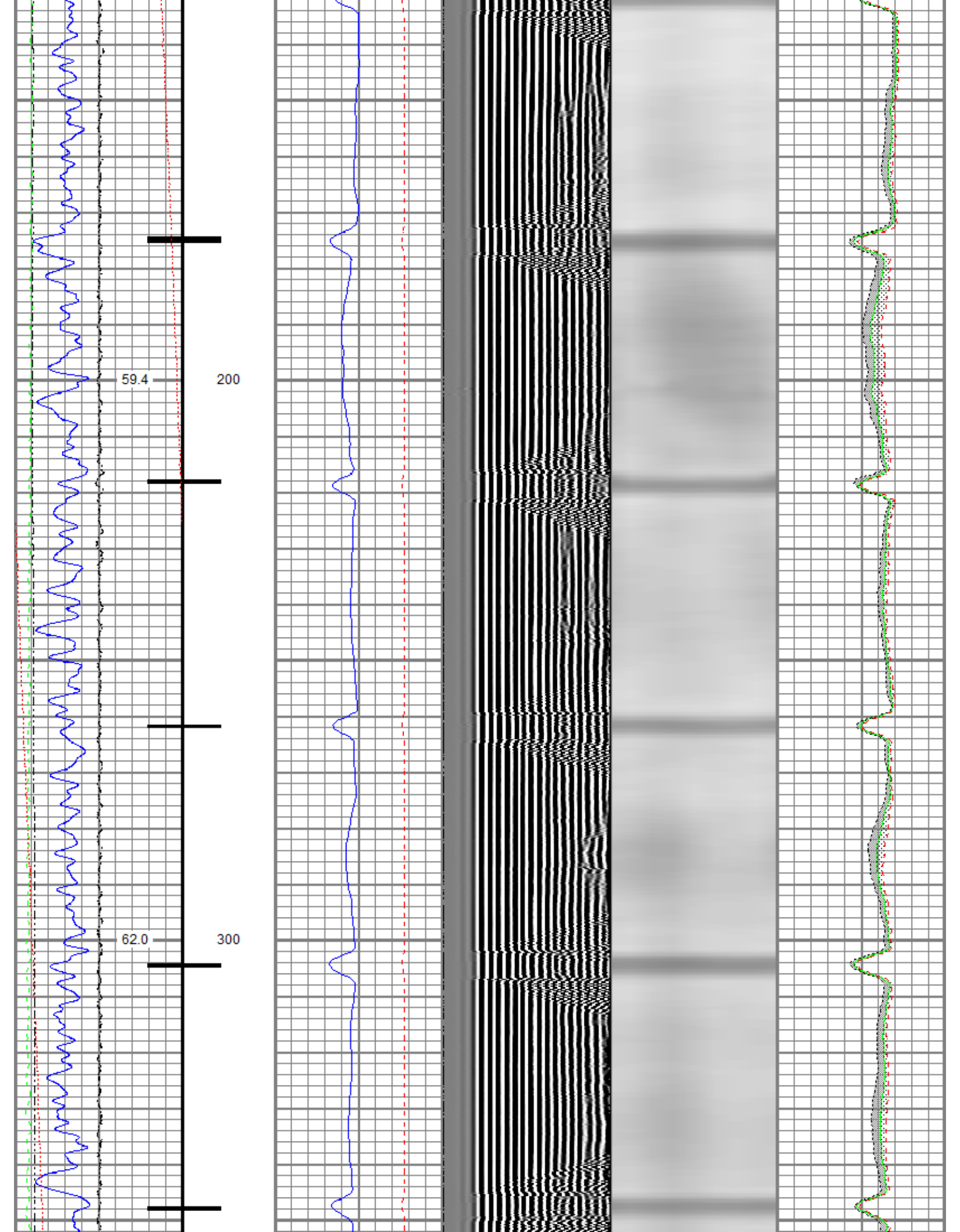


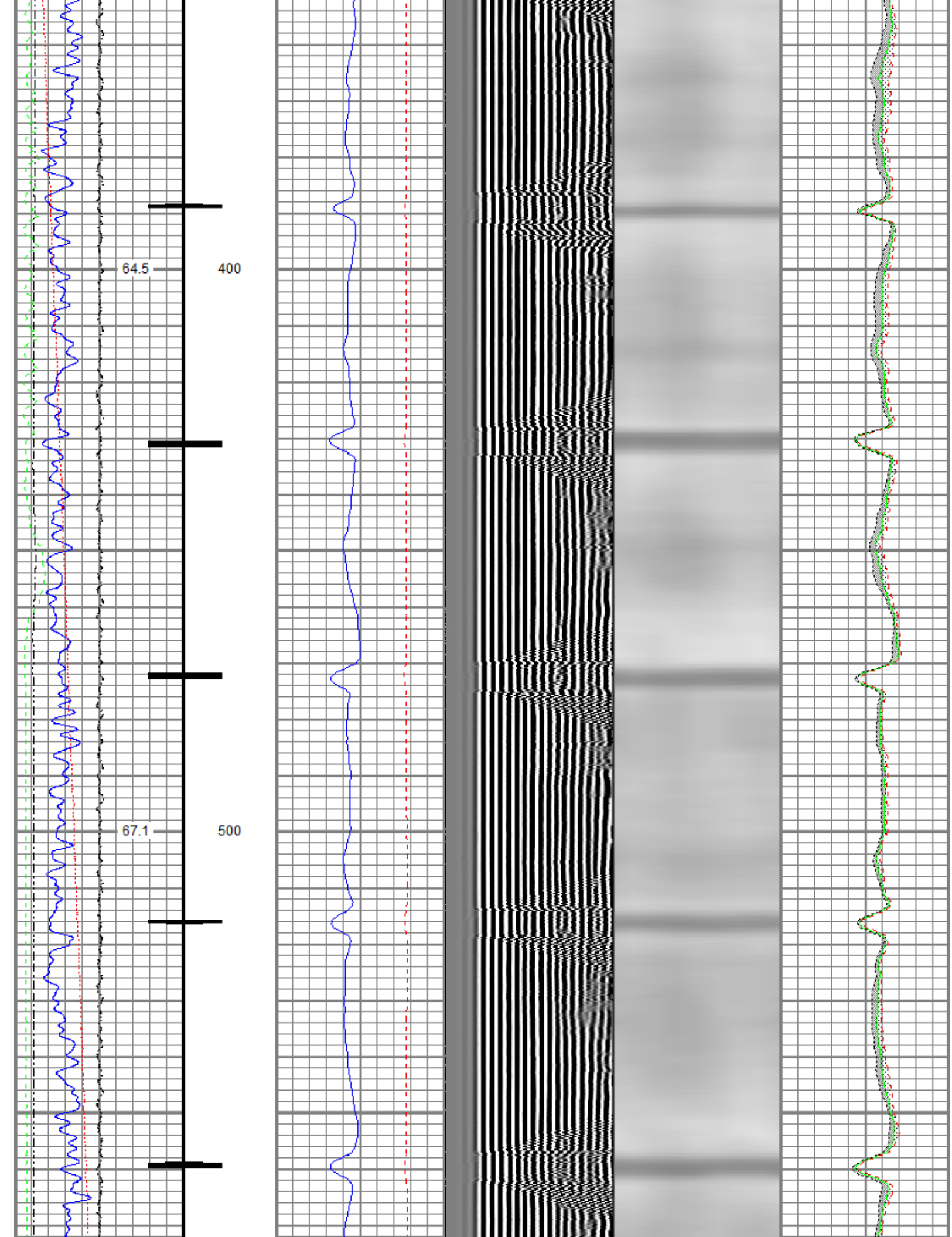
Recorded With 2800 PSI Surface Induced Pressure

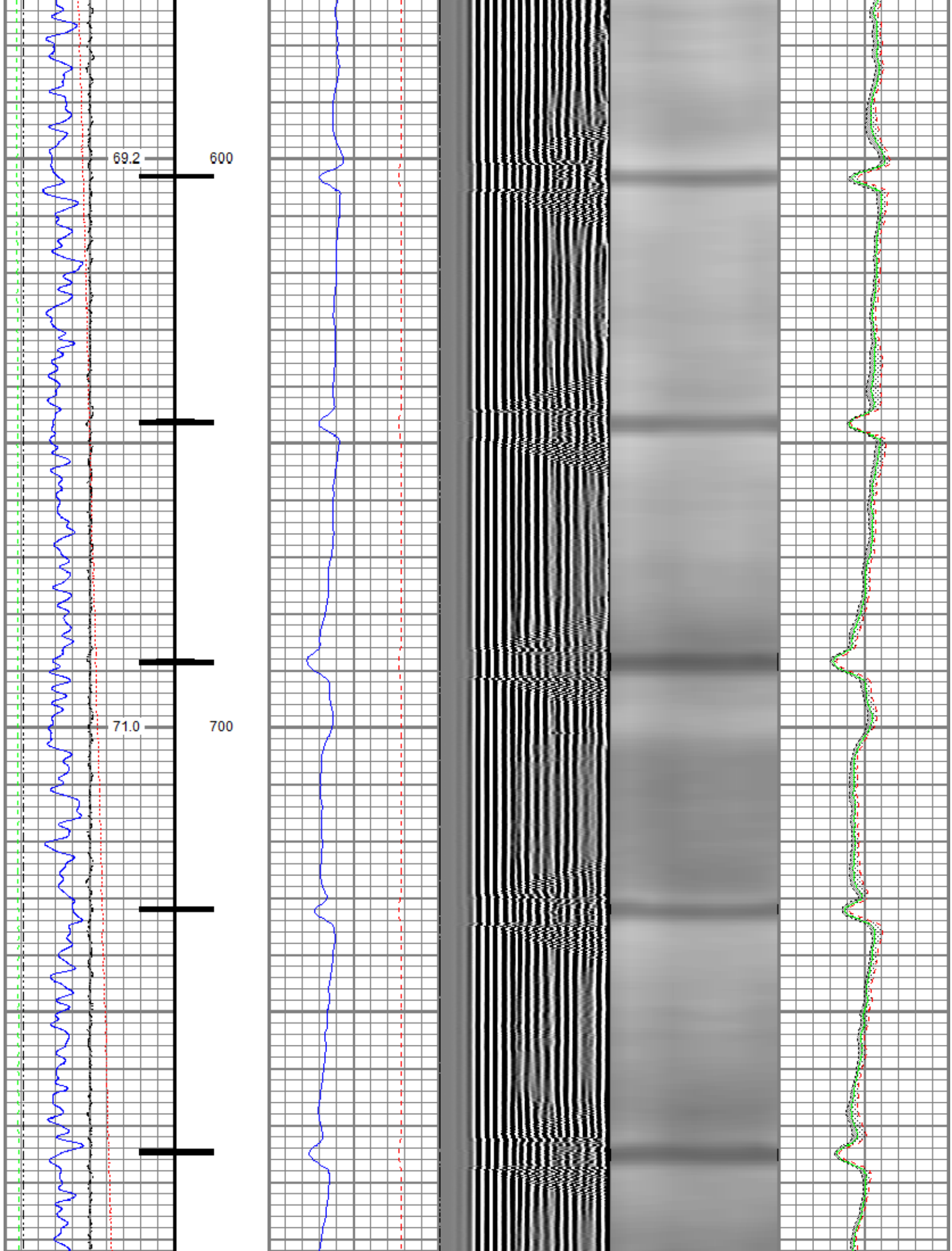
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Dataset Pathname	Main.2
Presentation Format	ros_radri
Dataset Creation	Wed Nov 14 10:30:59 2018
Charted by	Depth in Feet scaled 1:240

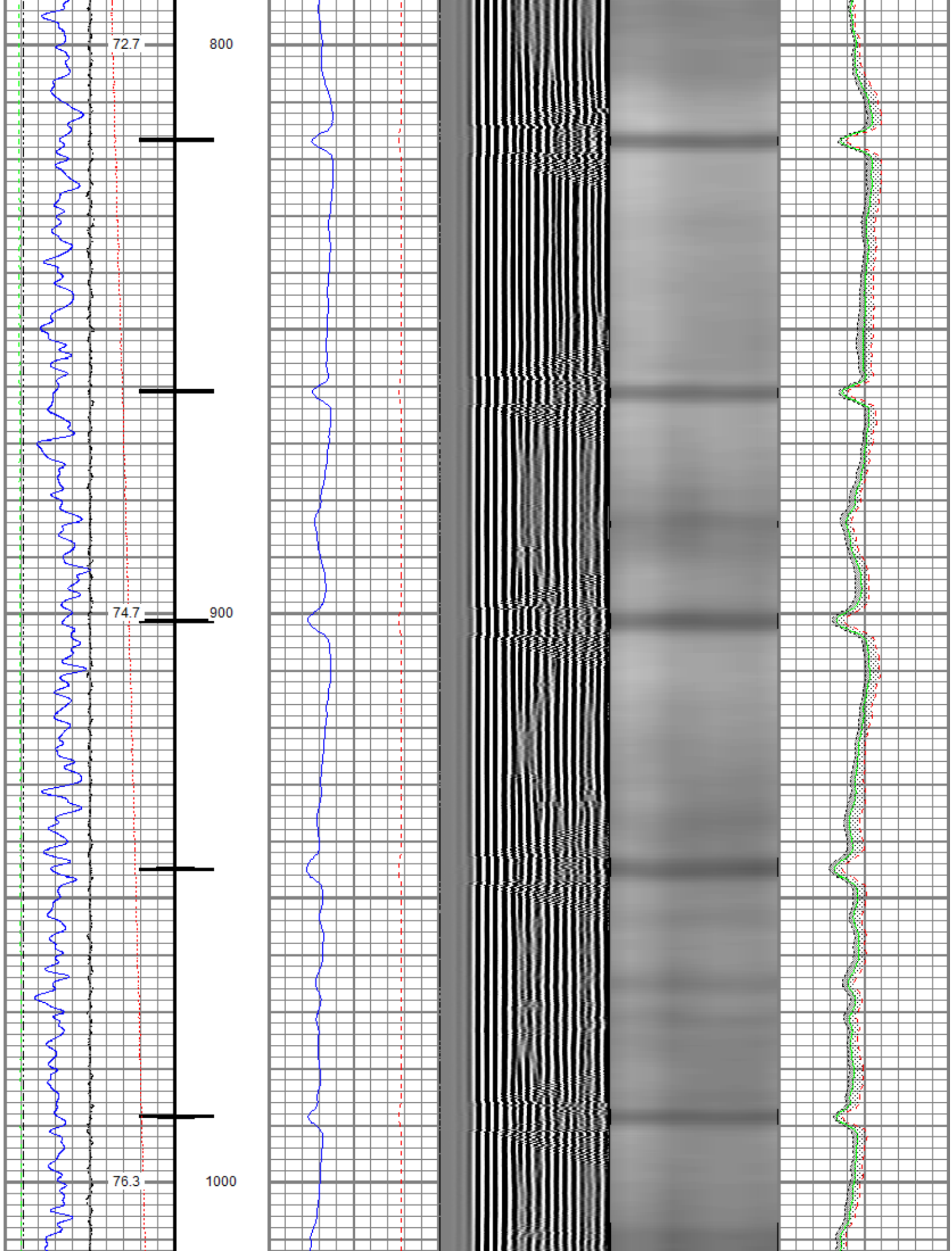
Gamma Ray	0	3' Amplitude (mV) 100	5' Variable Density Log	Sector Map	0	Average Amplitude 100
(GAPI) 120		3' Amplitude x 5	200	1200		Minimum Amplitude
Casing Collar Locator	0	(mV) 20			0	100
Temperature (degF) 20		3' Travel Time				Maximum Amplitude
Line Speed	650	(usec) 150			0	100
(ft/min) 150						
Line Tension (lb) 2000						
Differential Temperature						
(degF) 2						

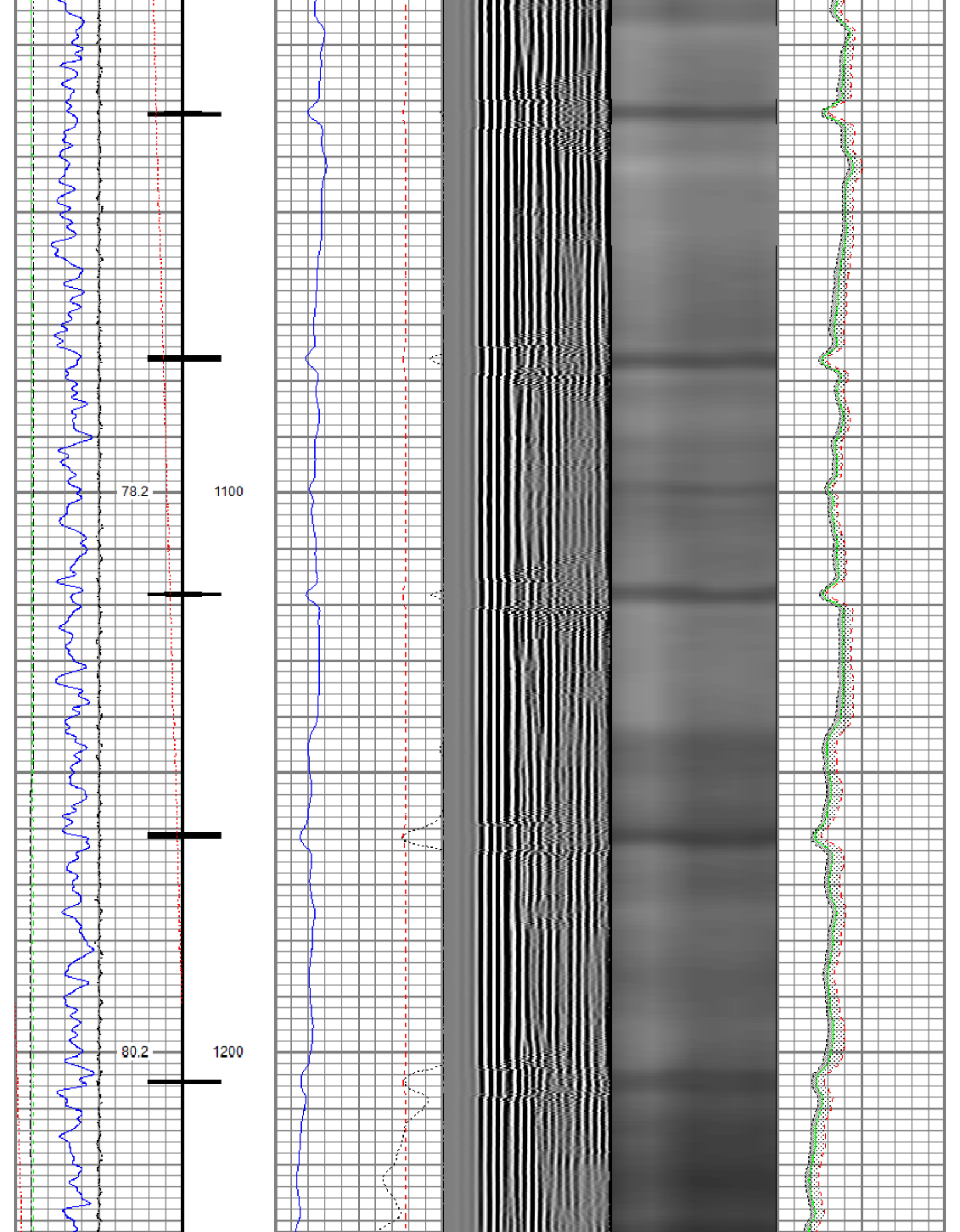


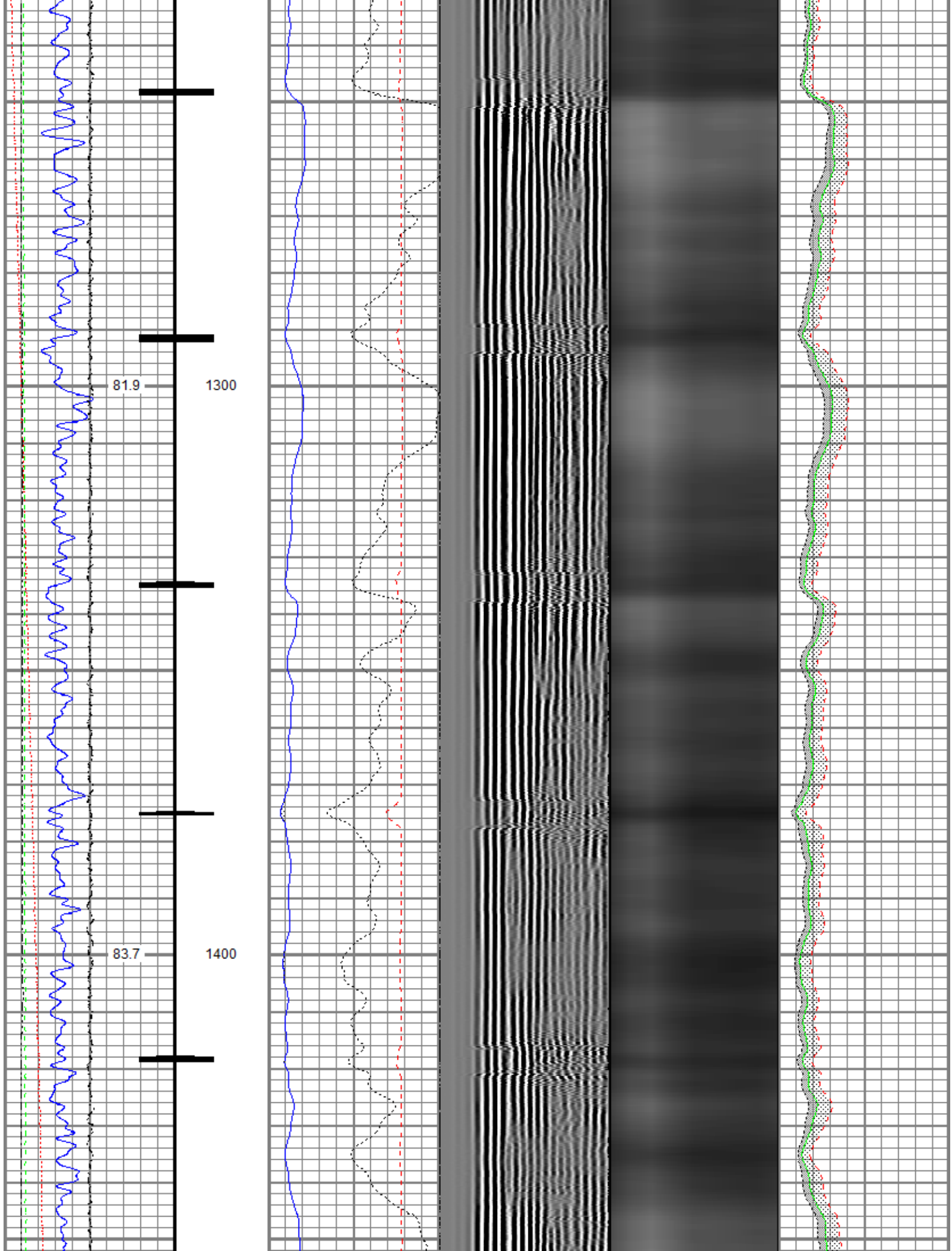


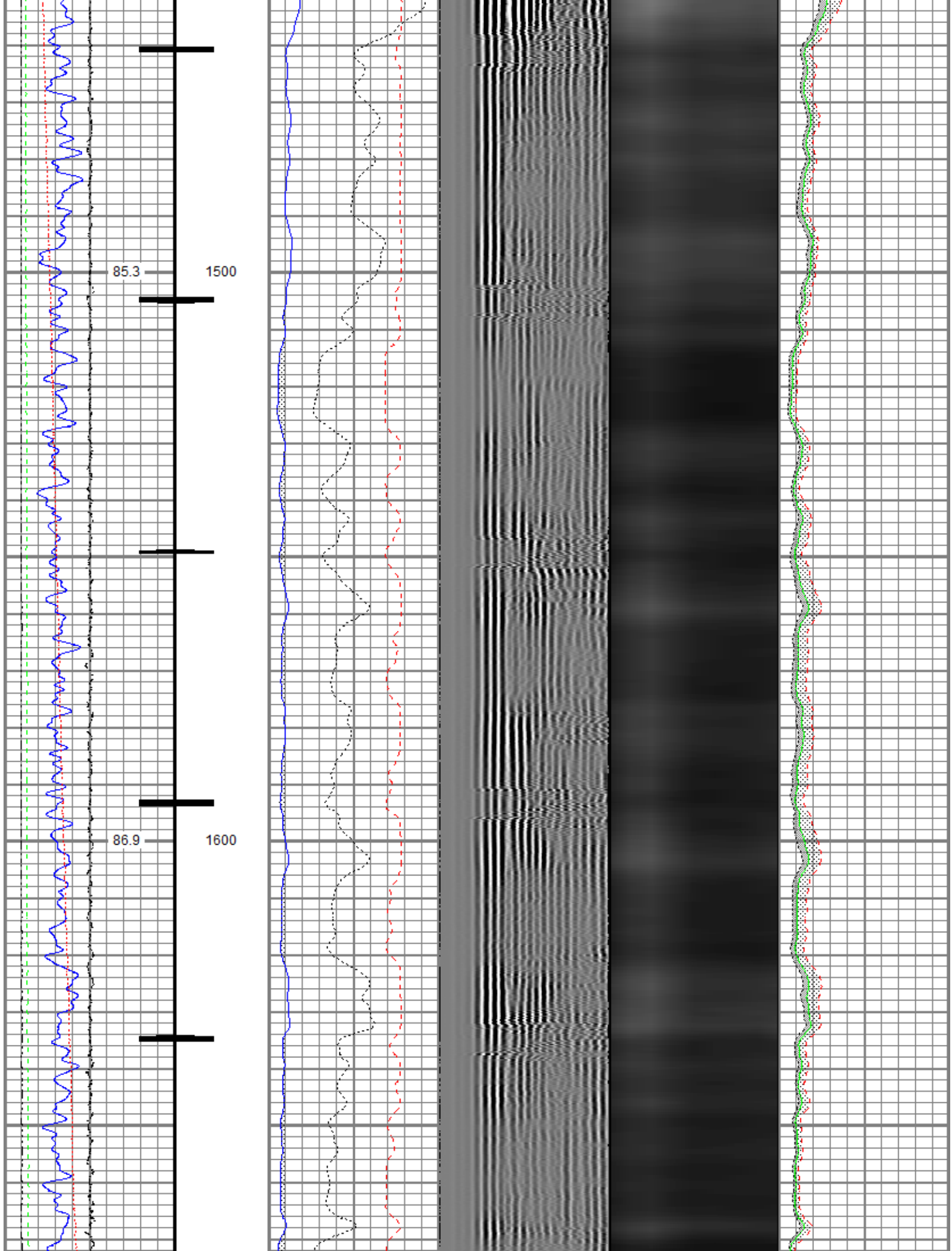


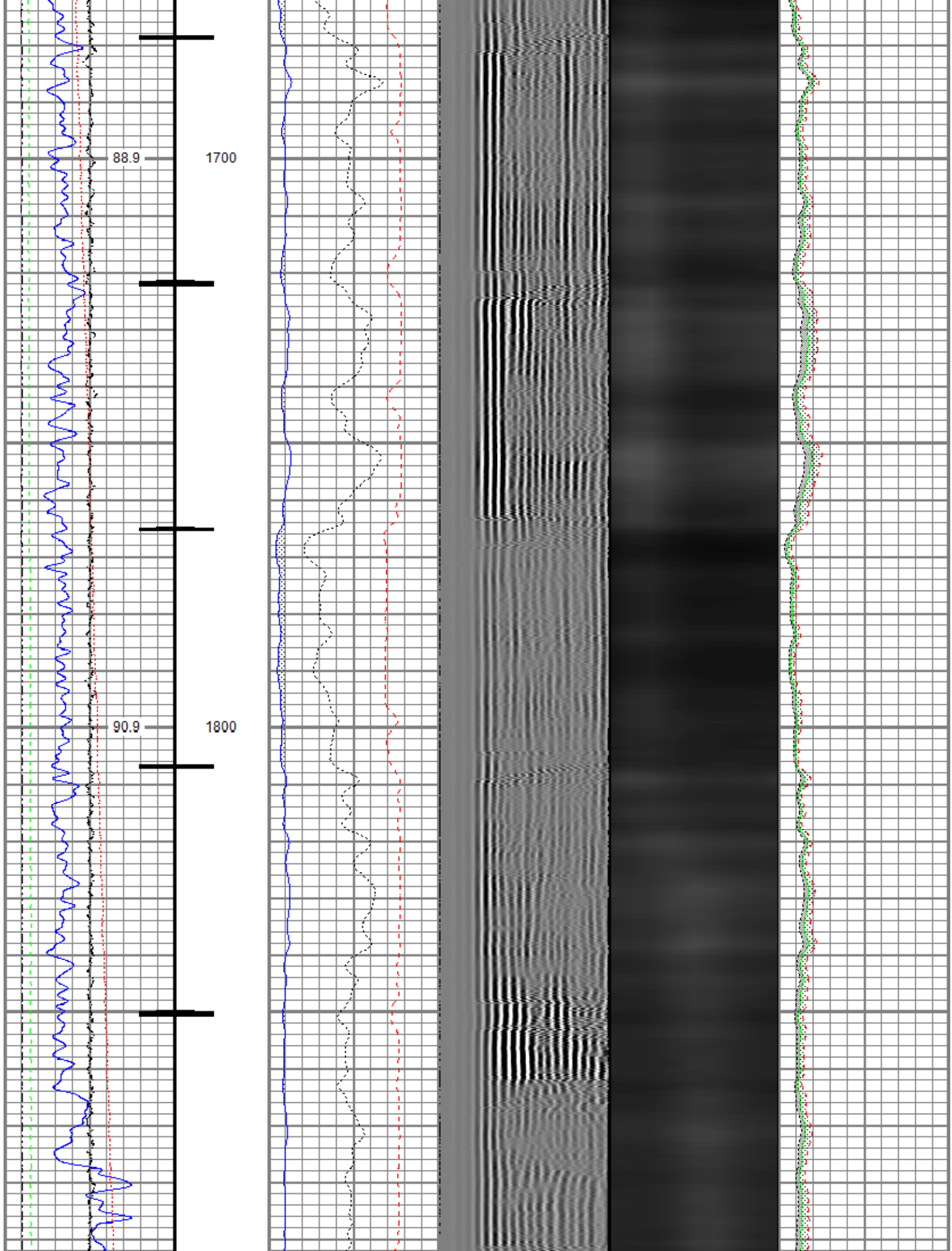


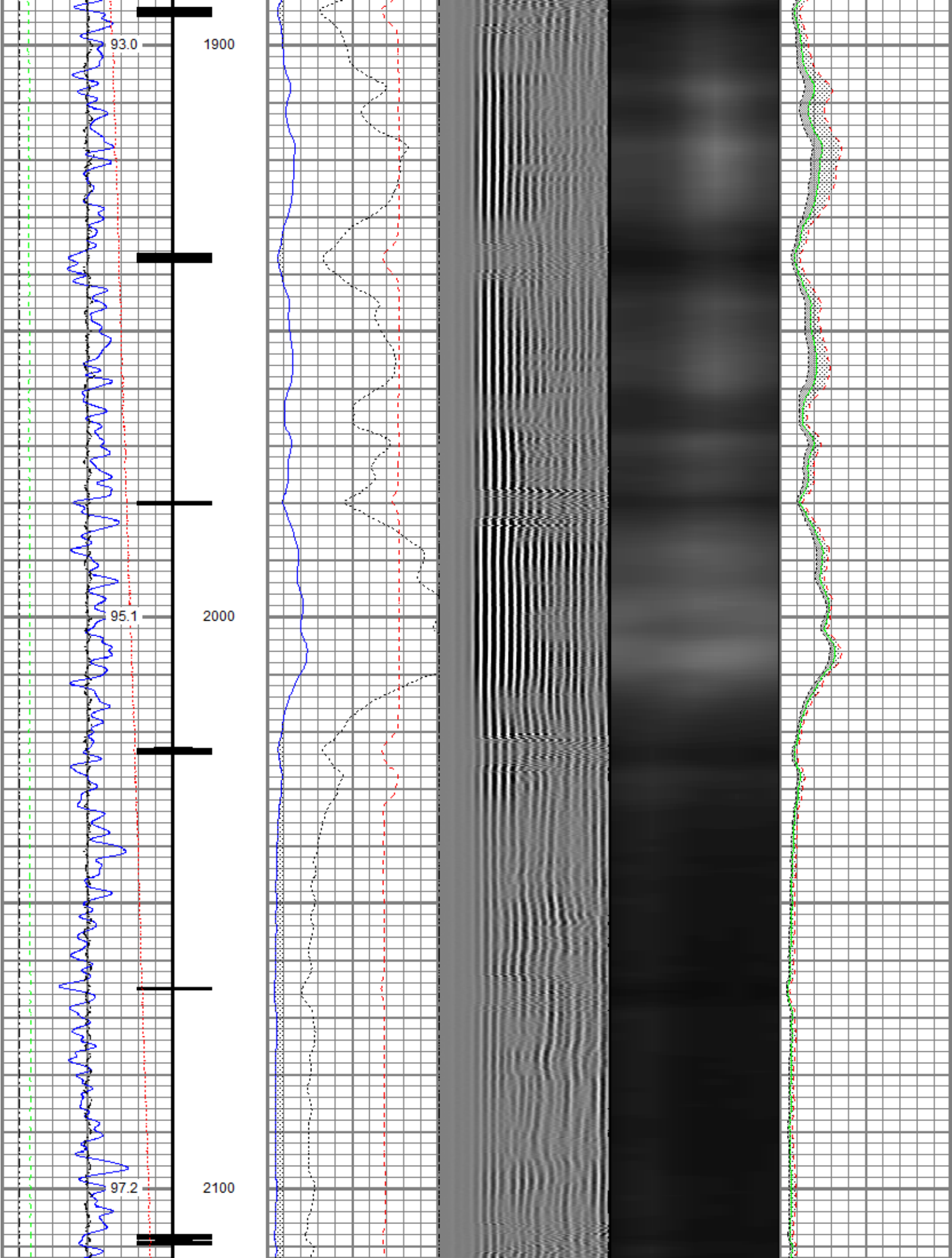


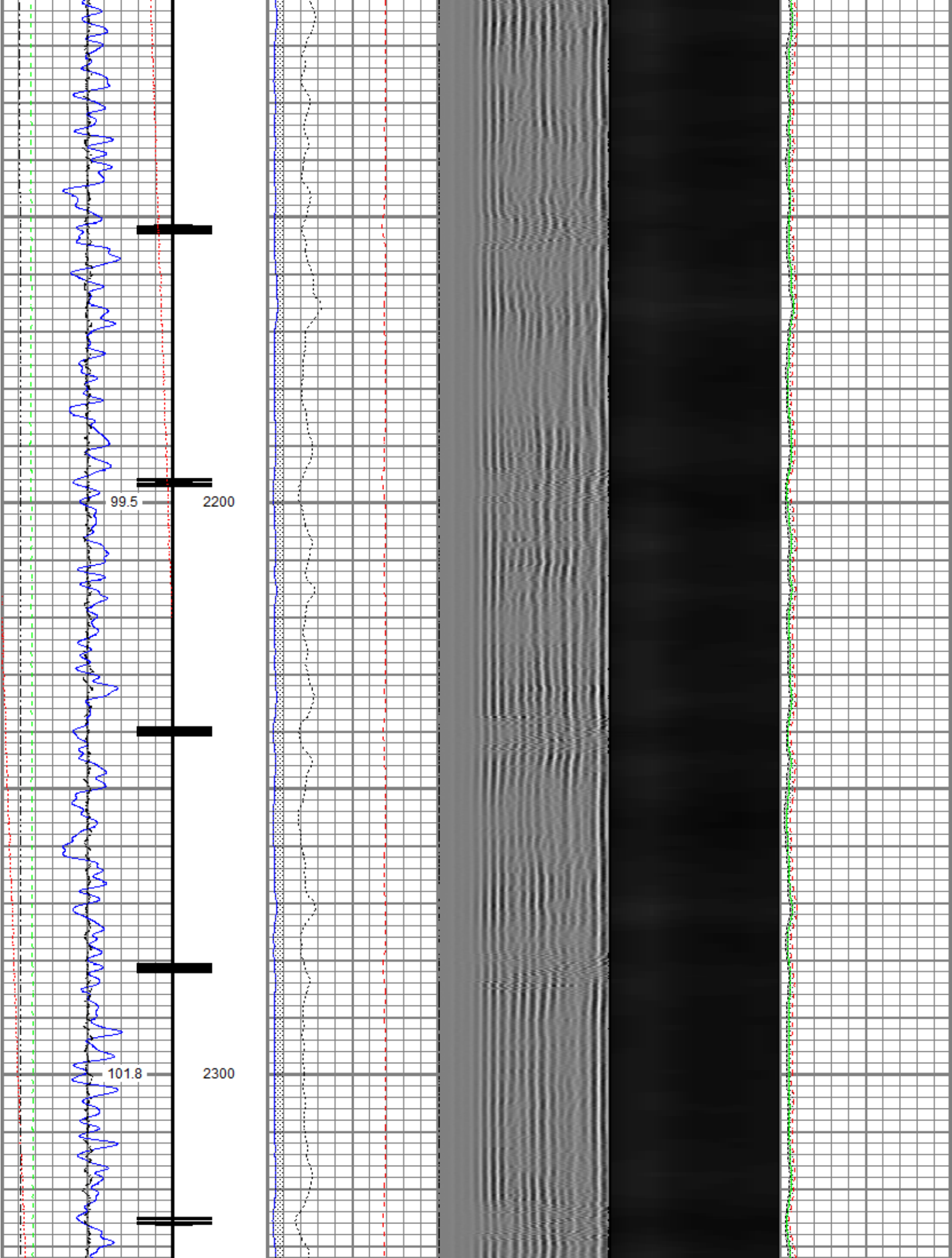


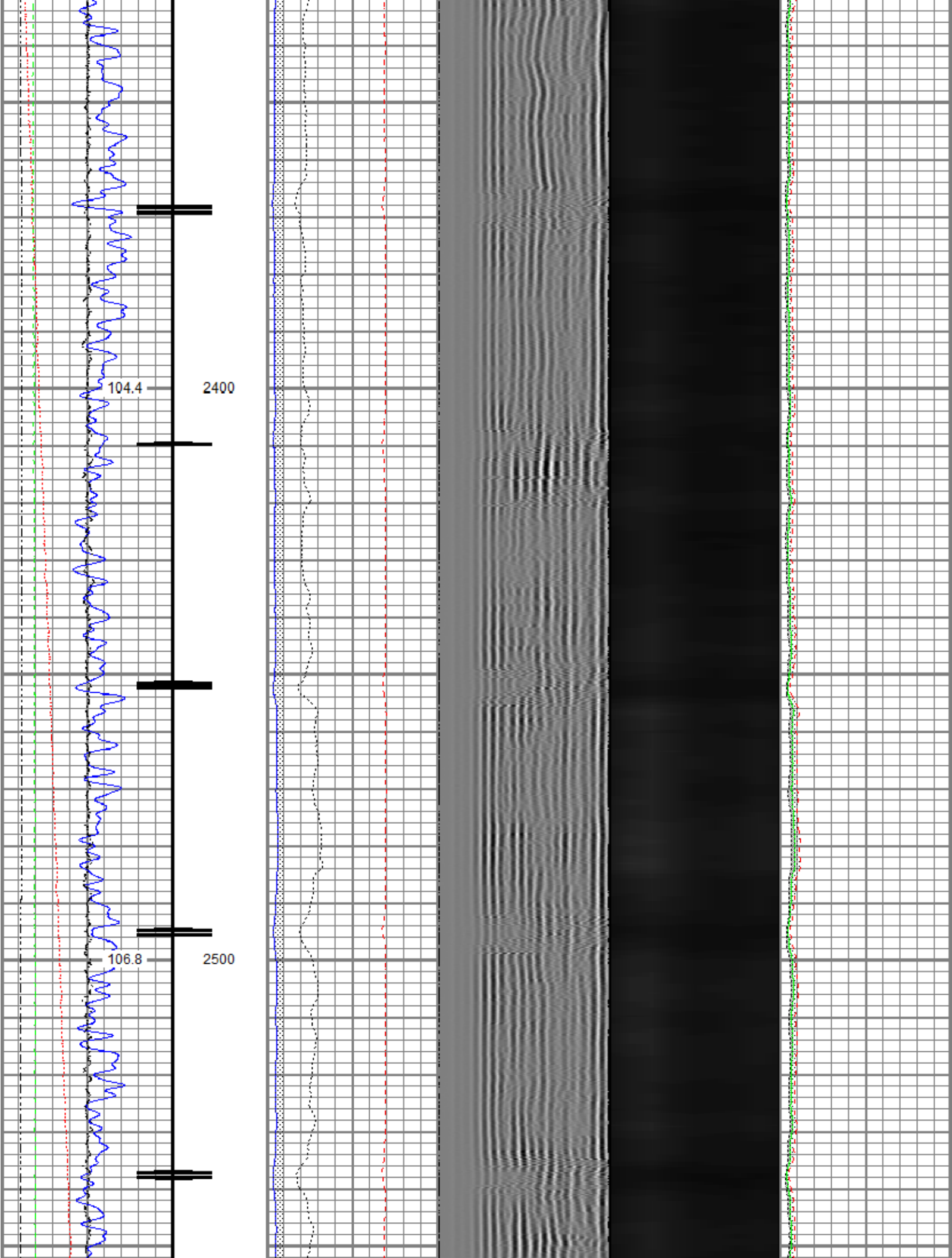


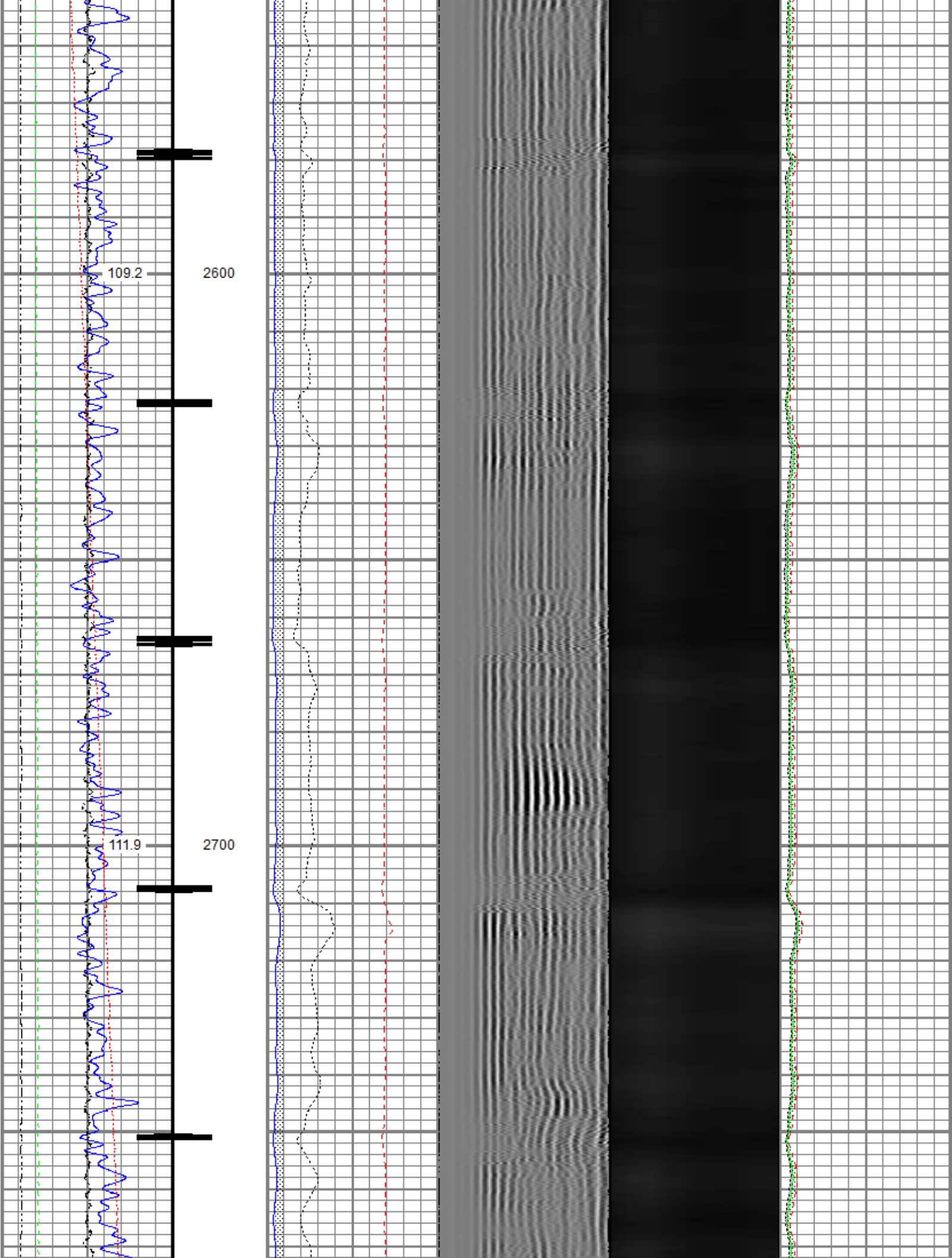


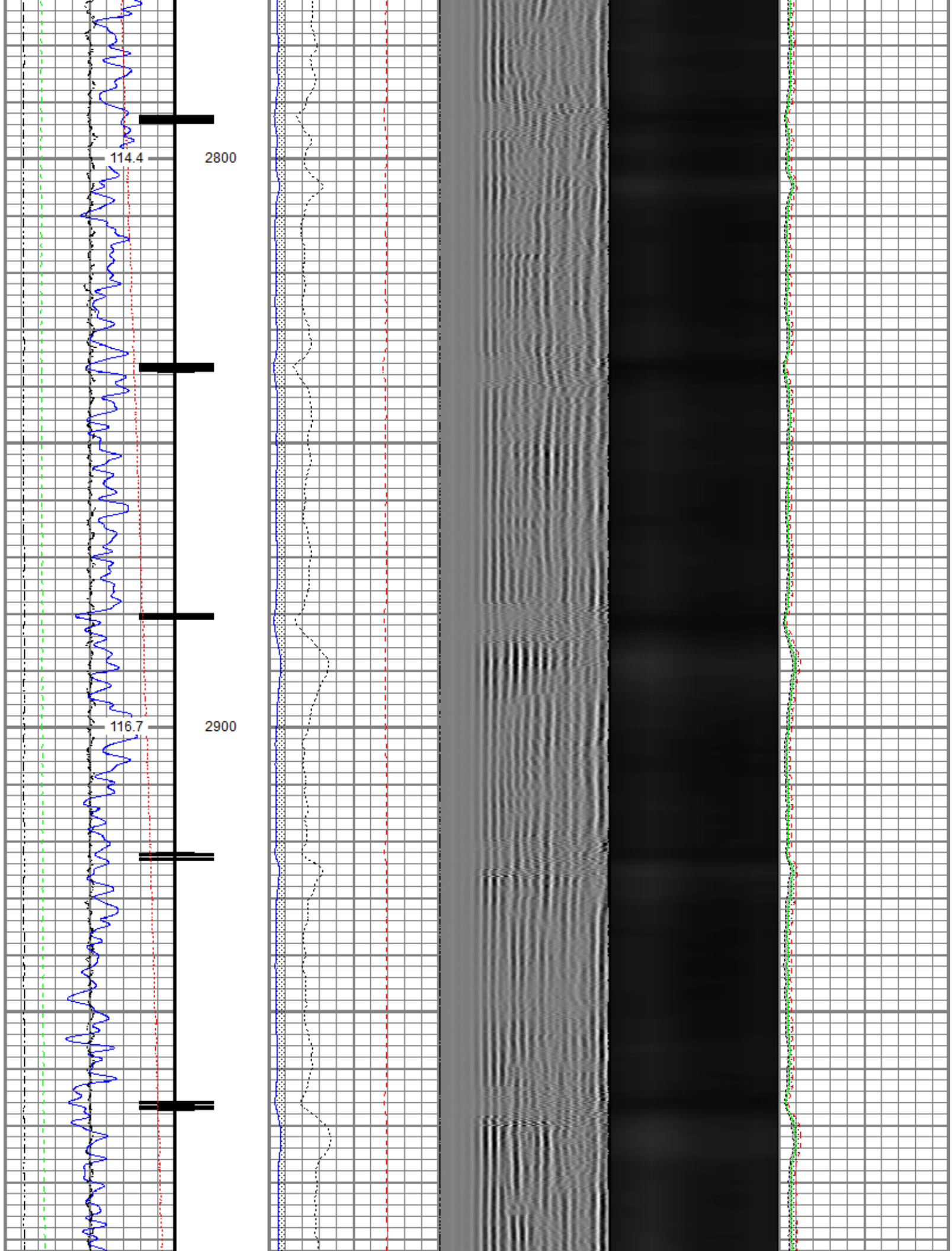


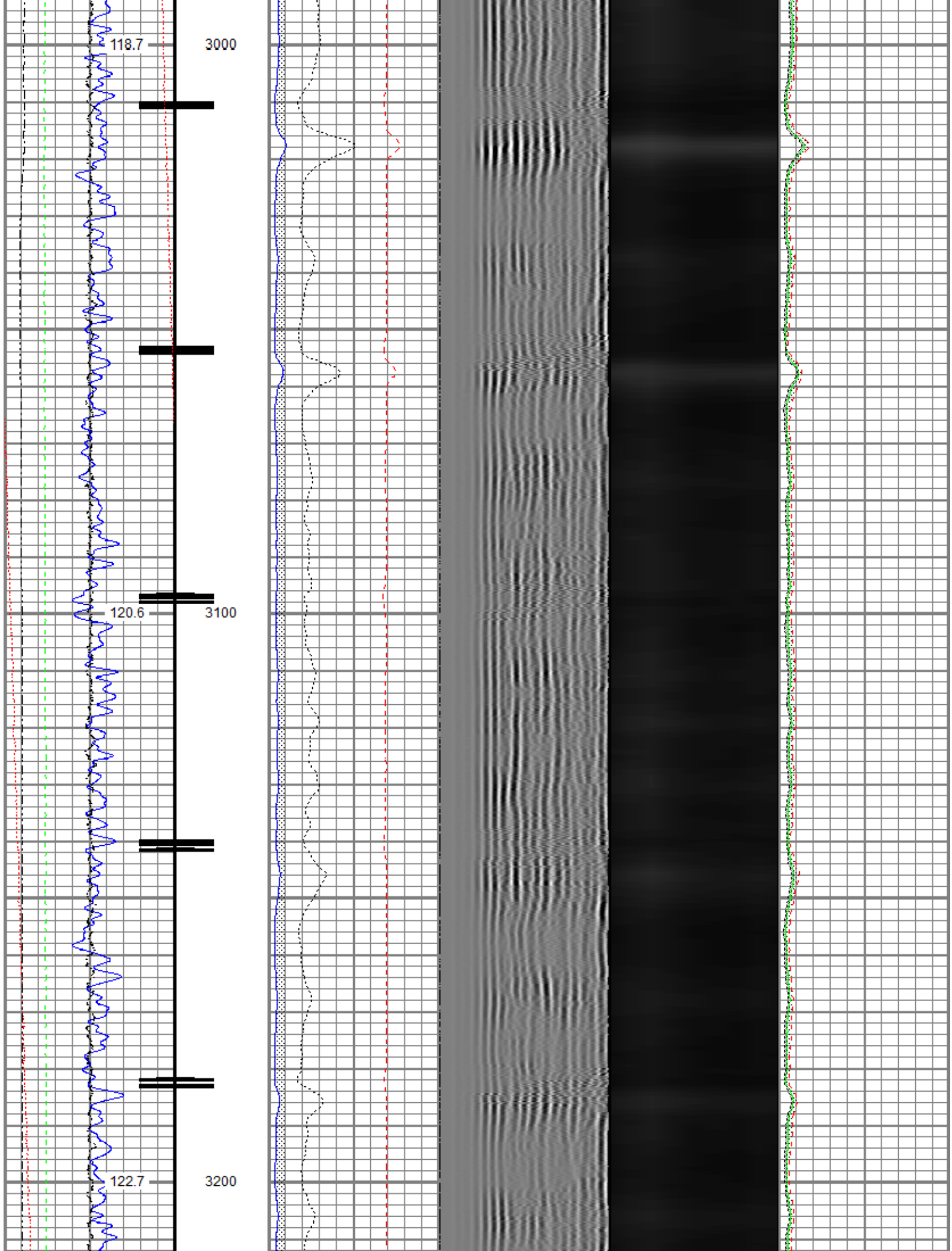


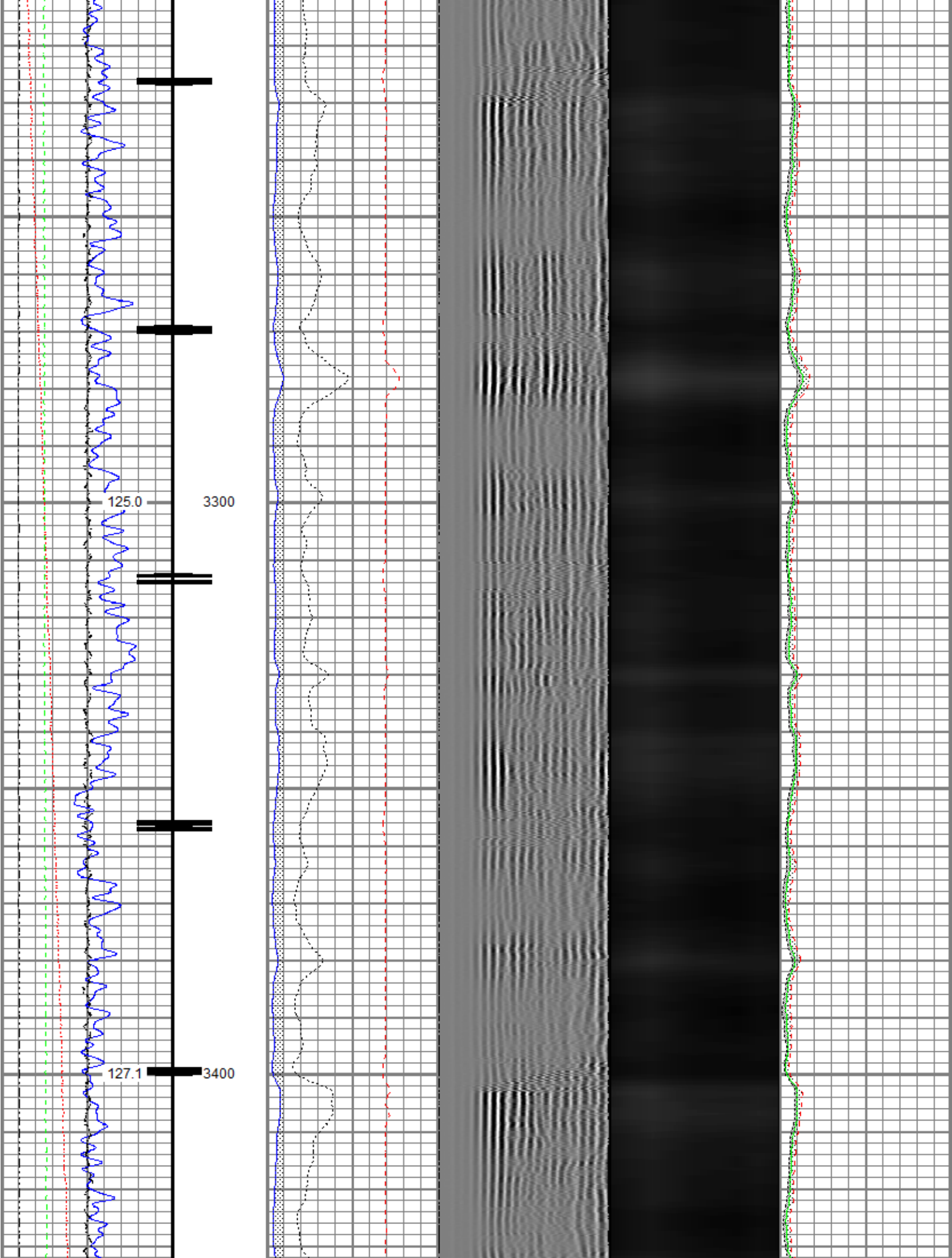


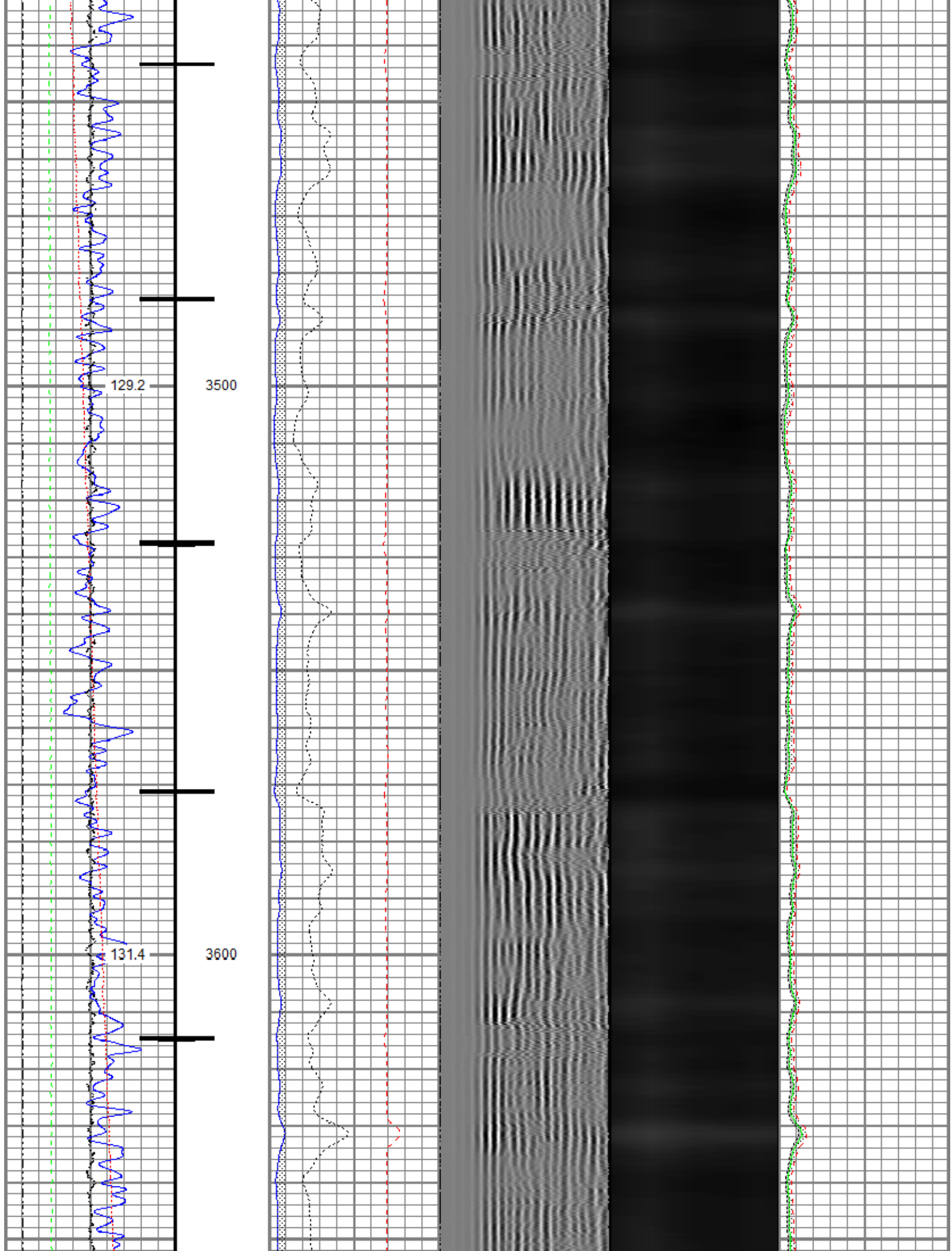


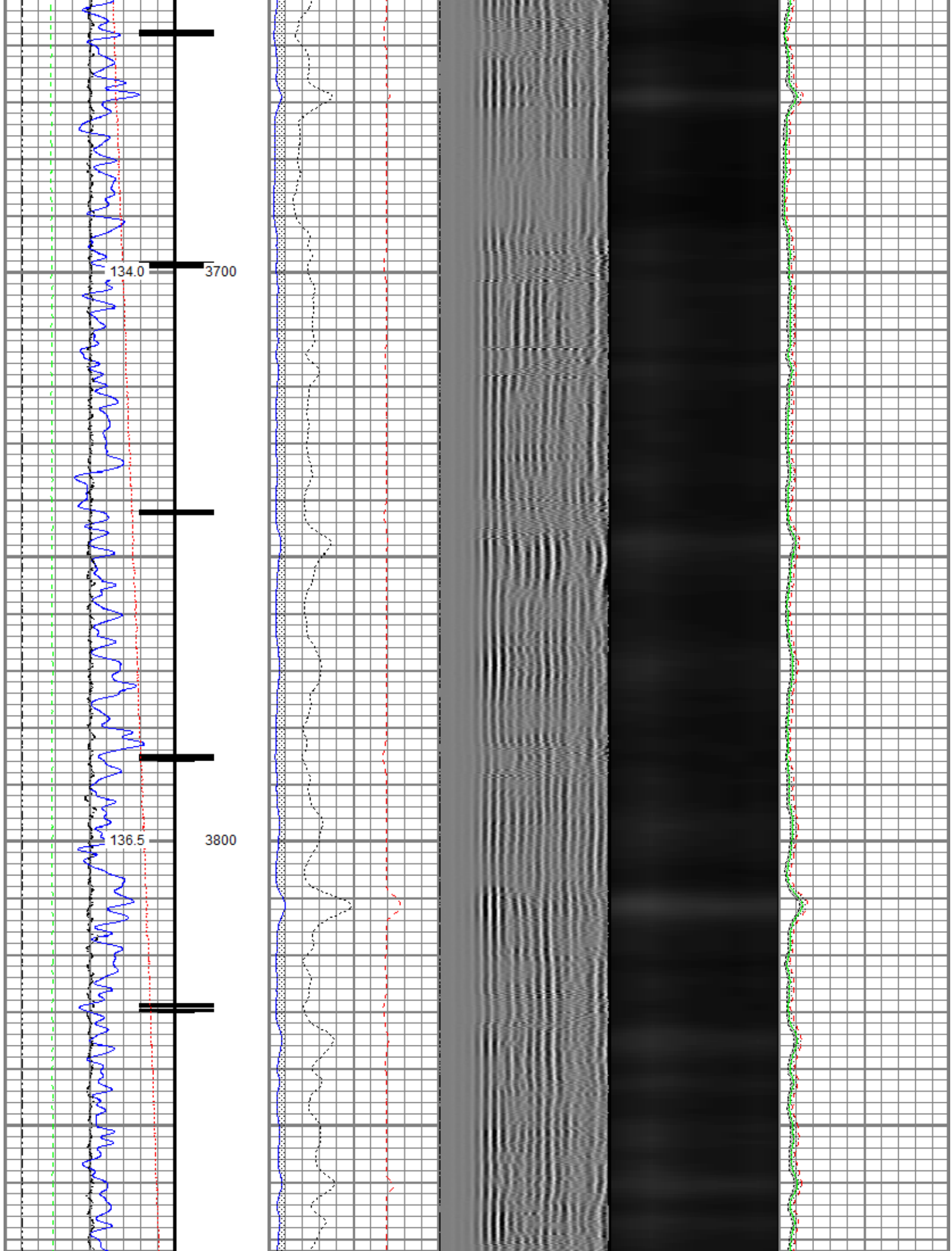


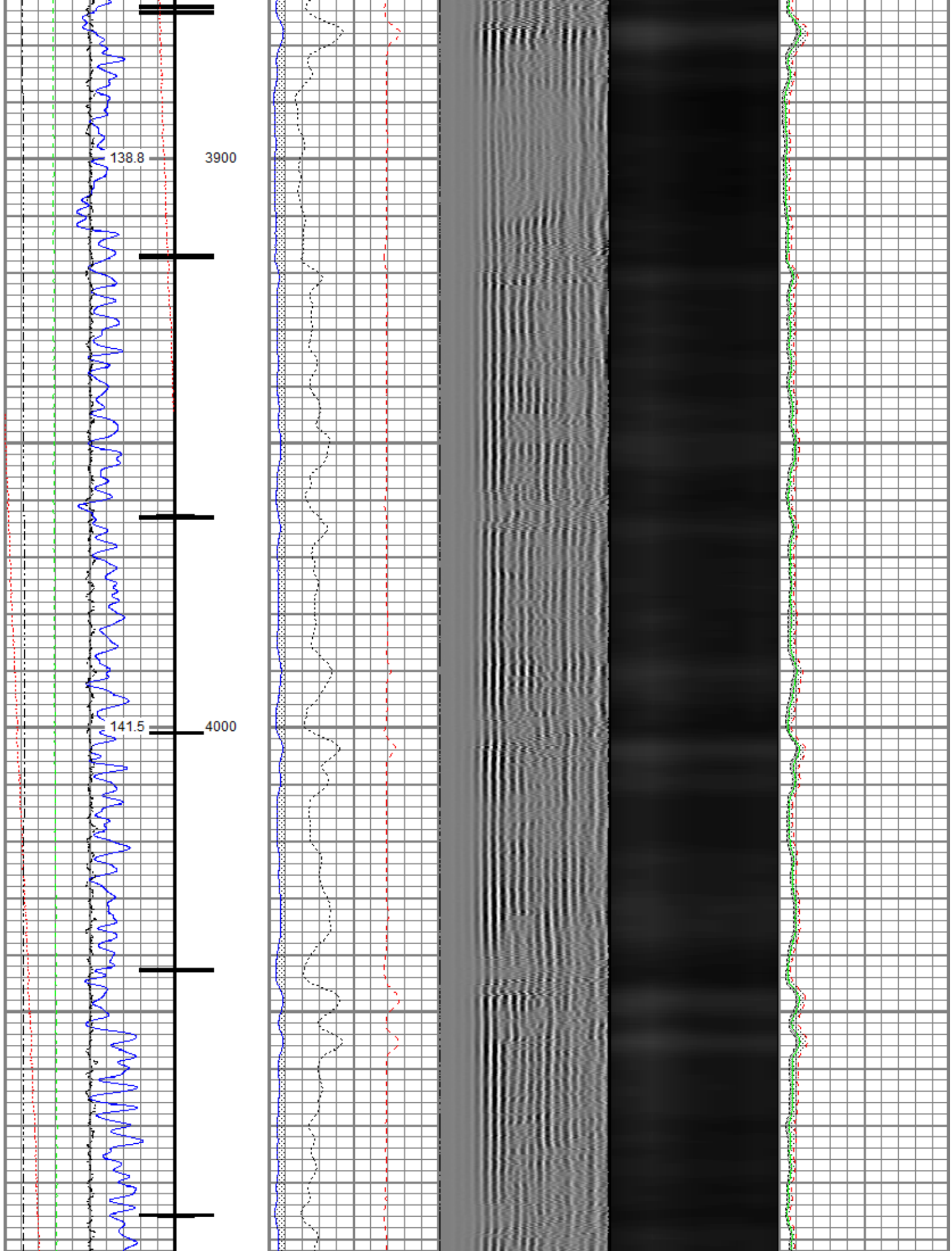


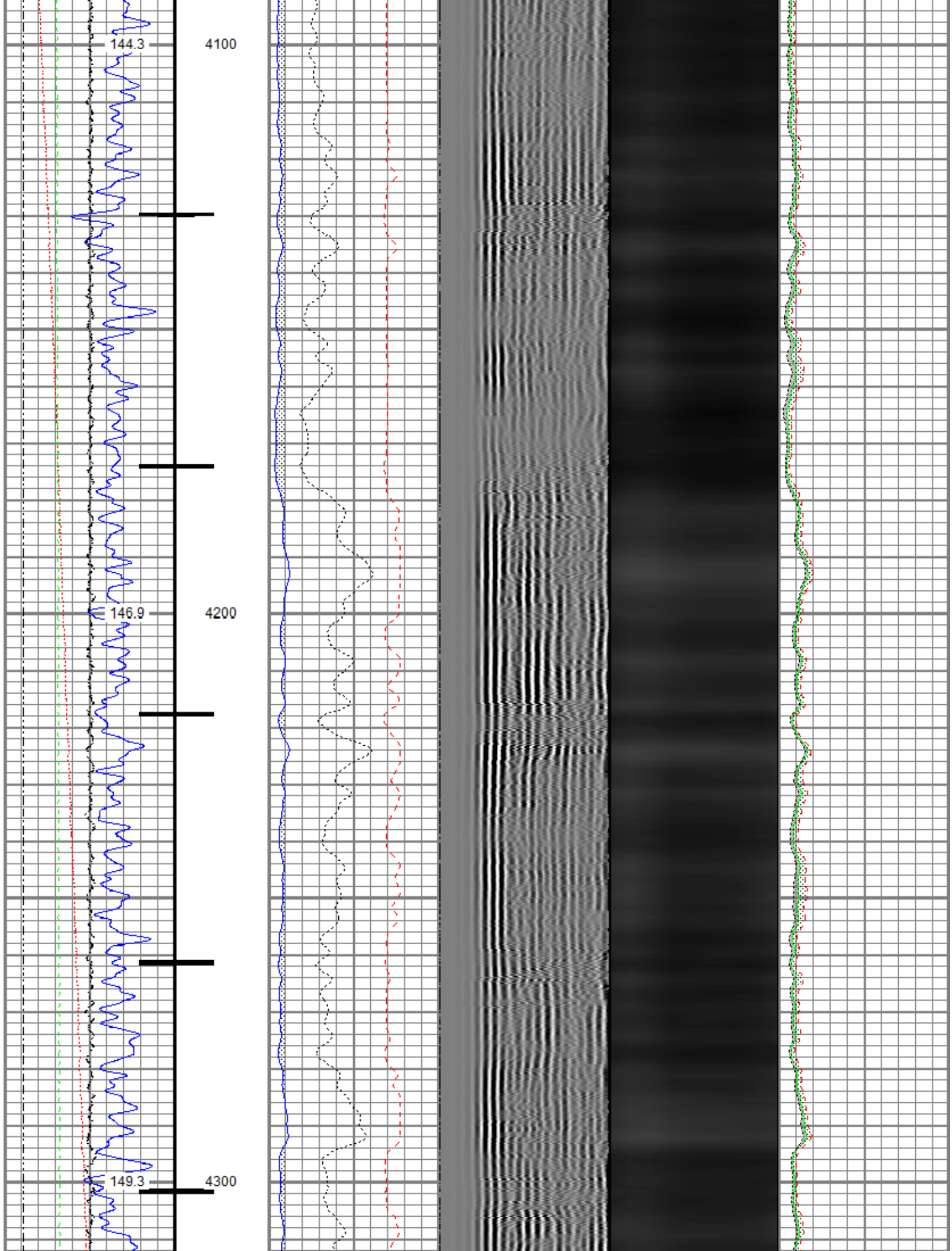


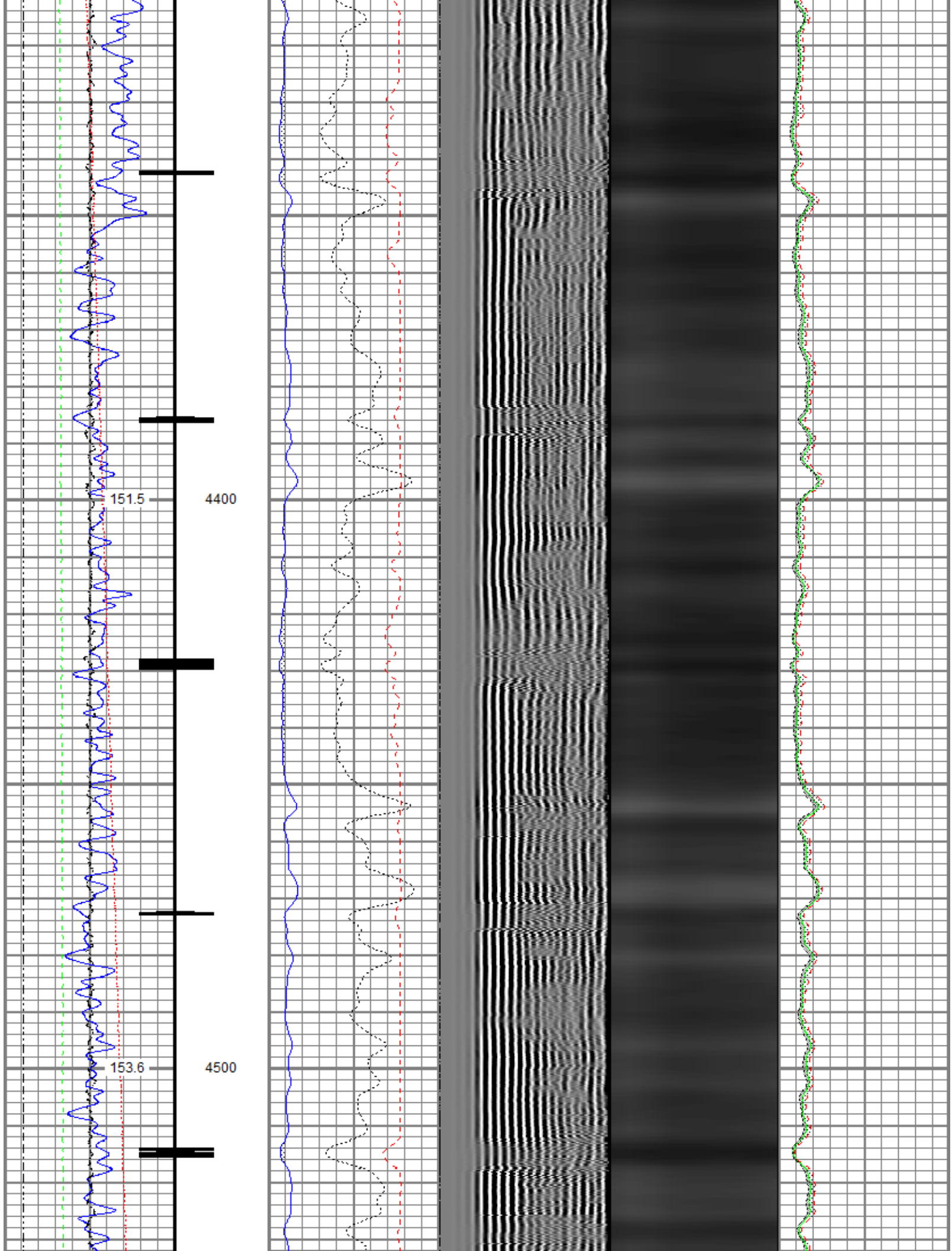


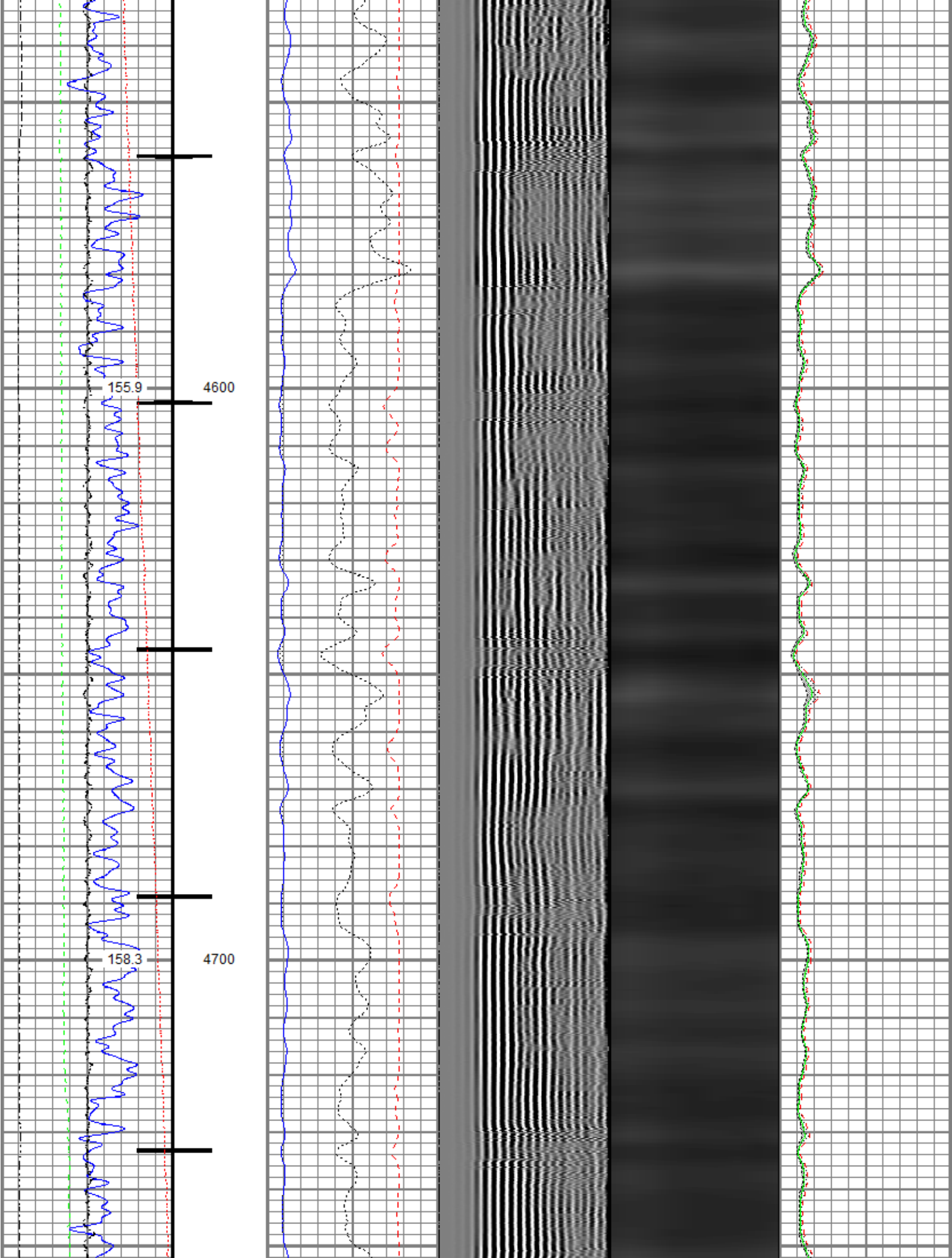


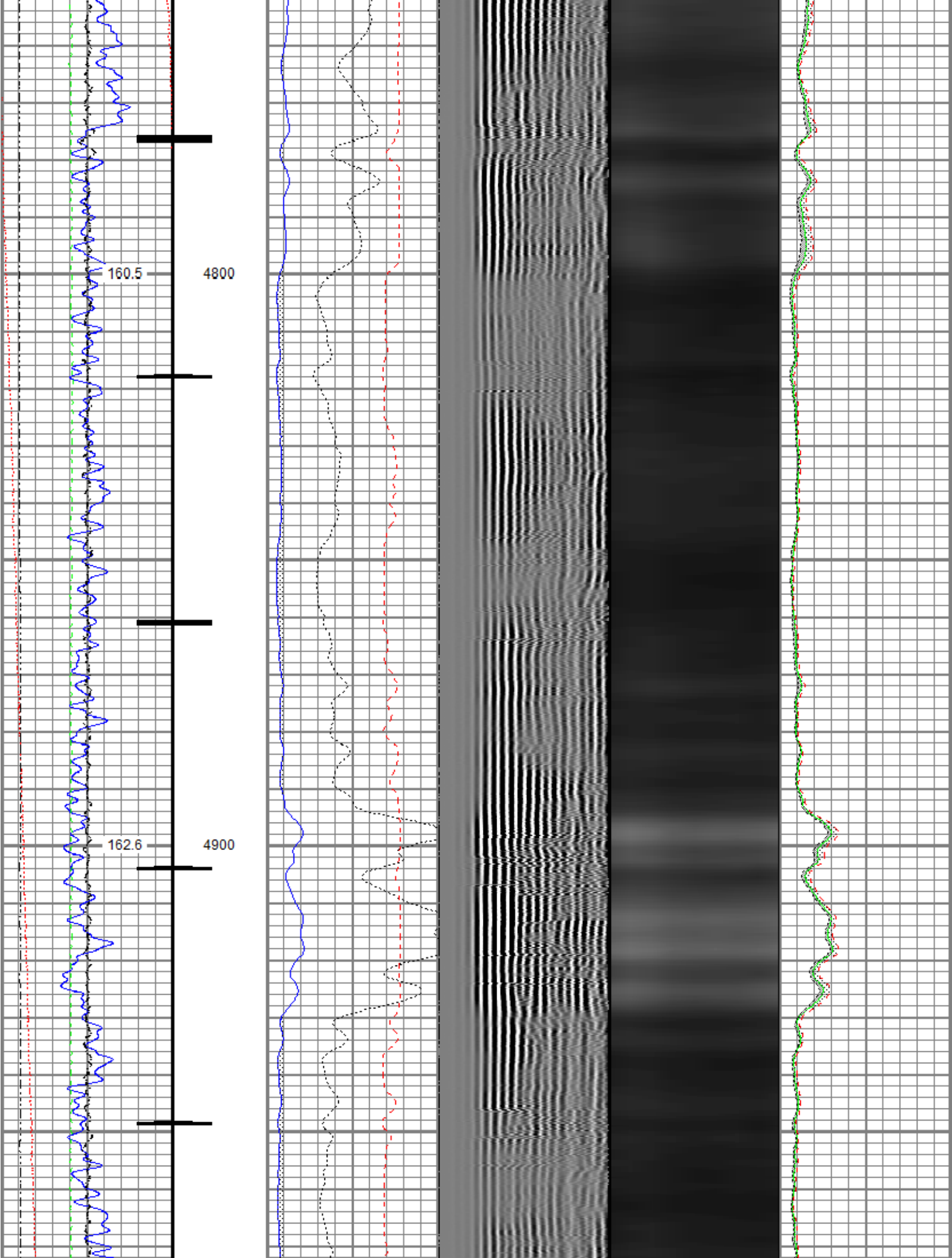


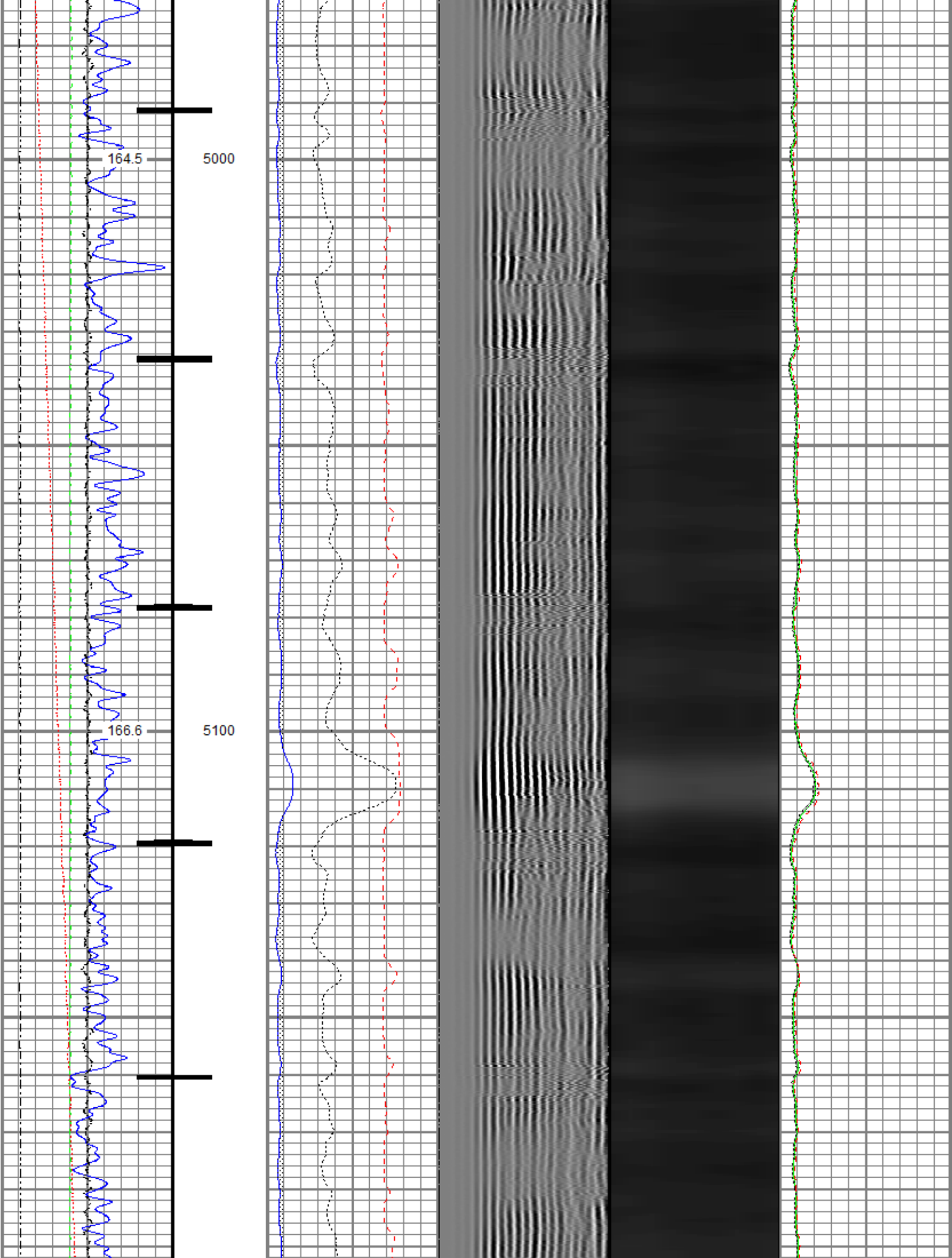


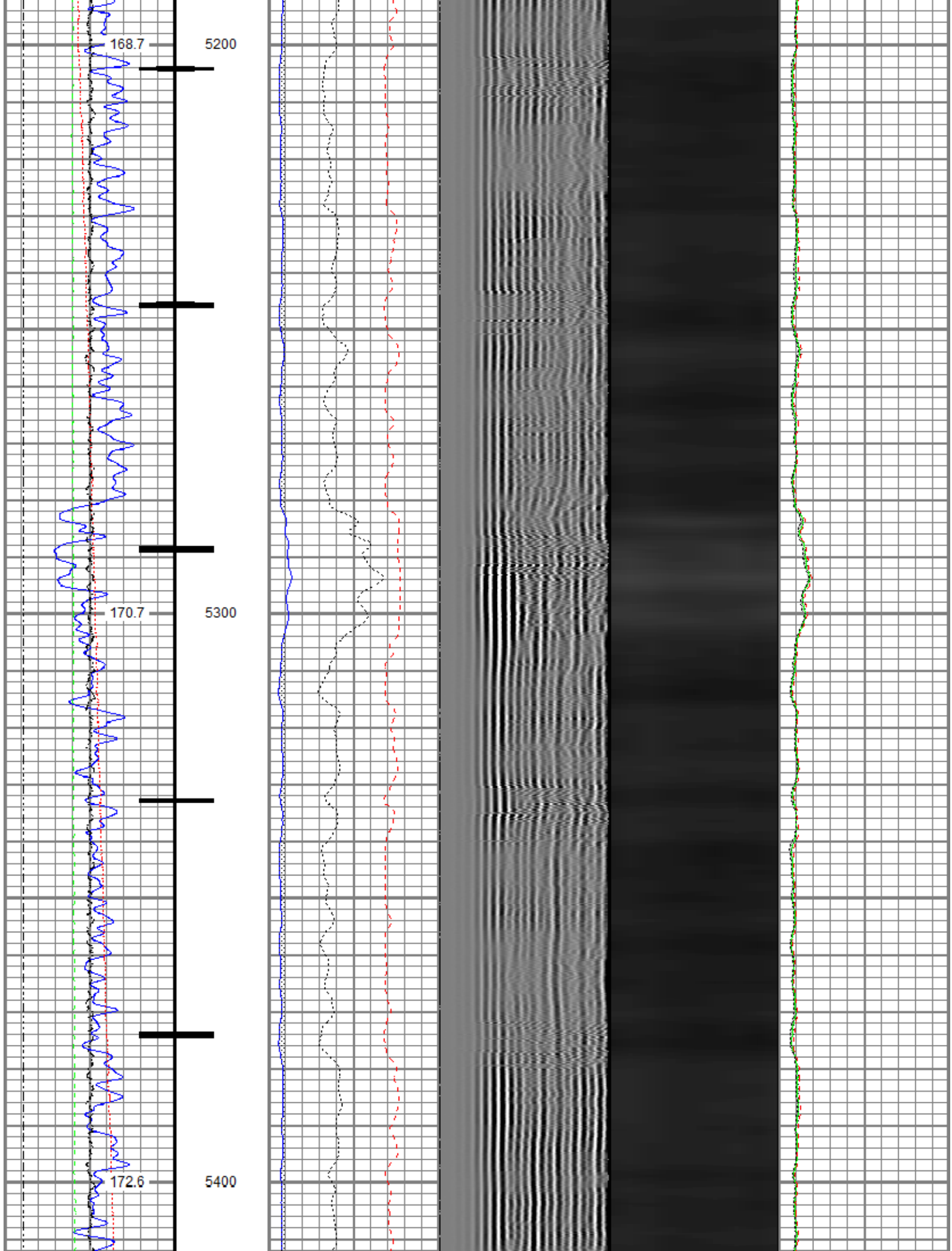


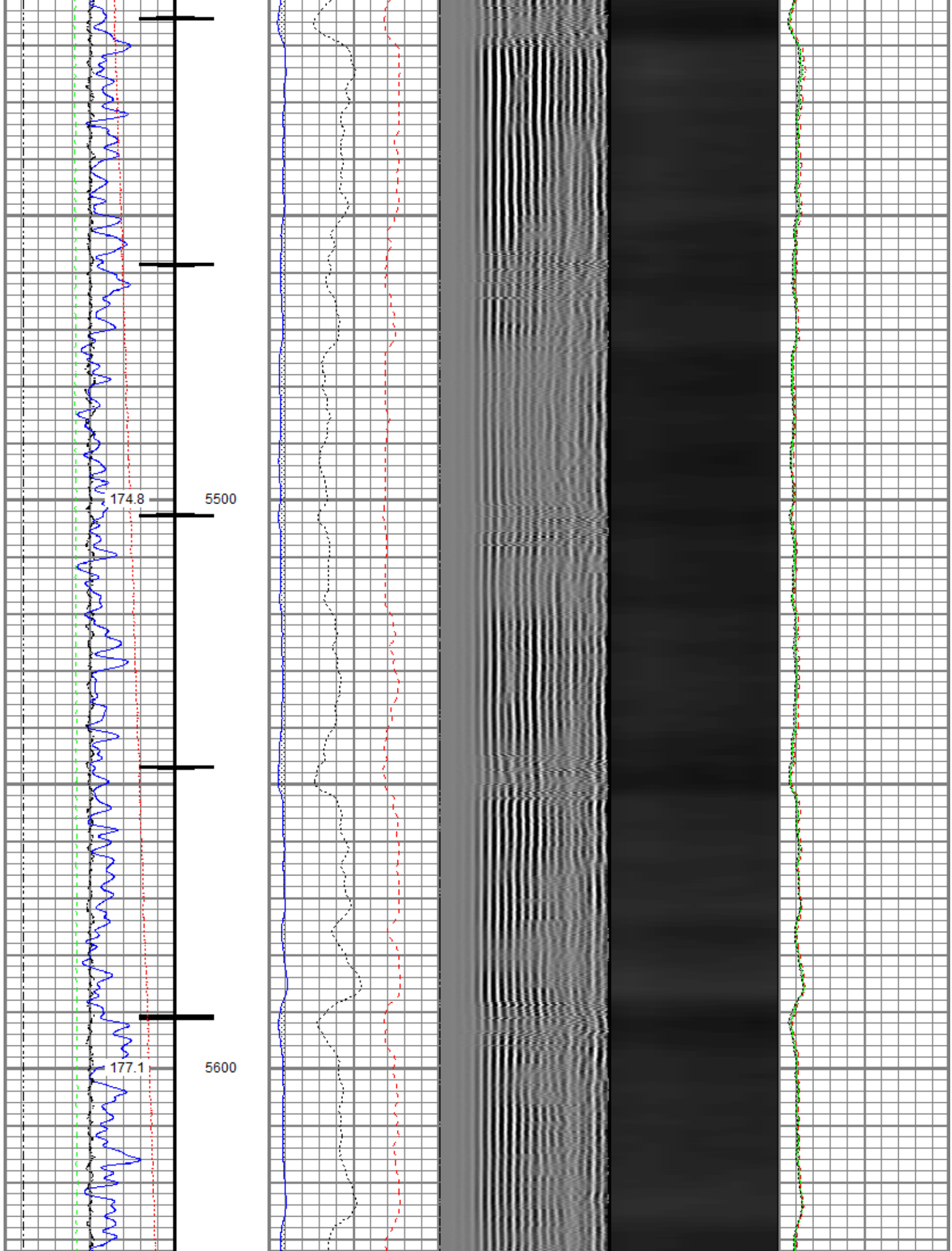


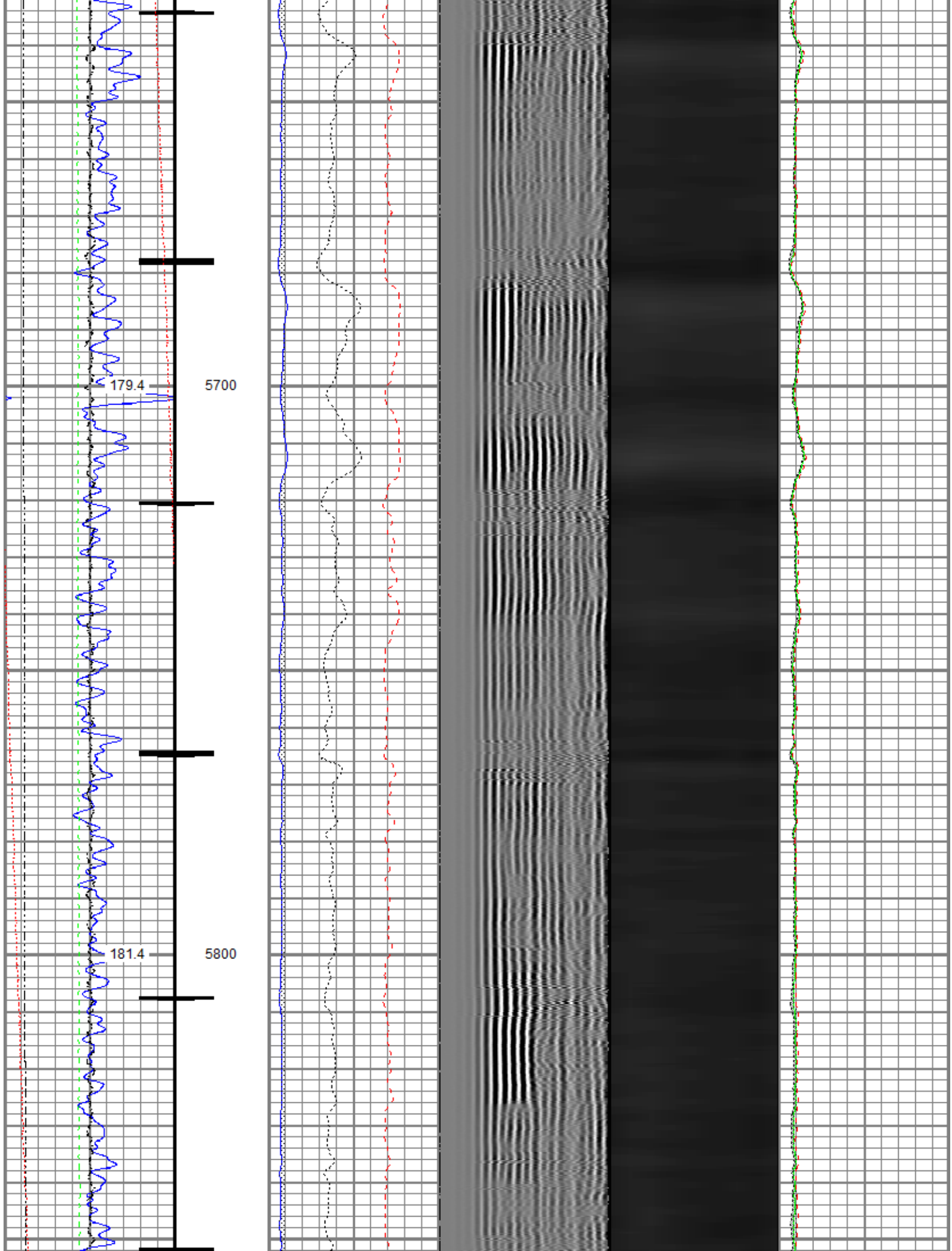


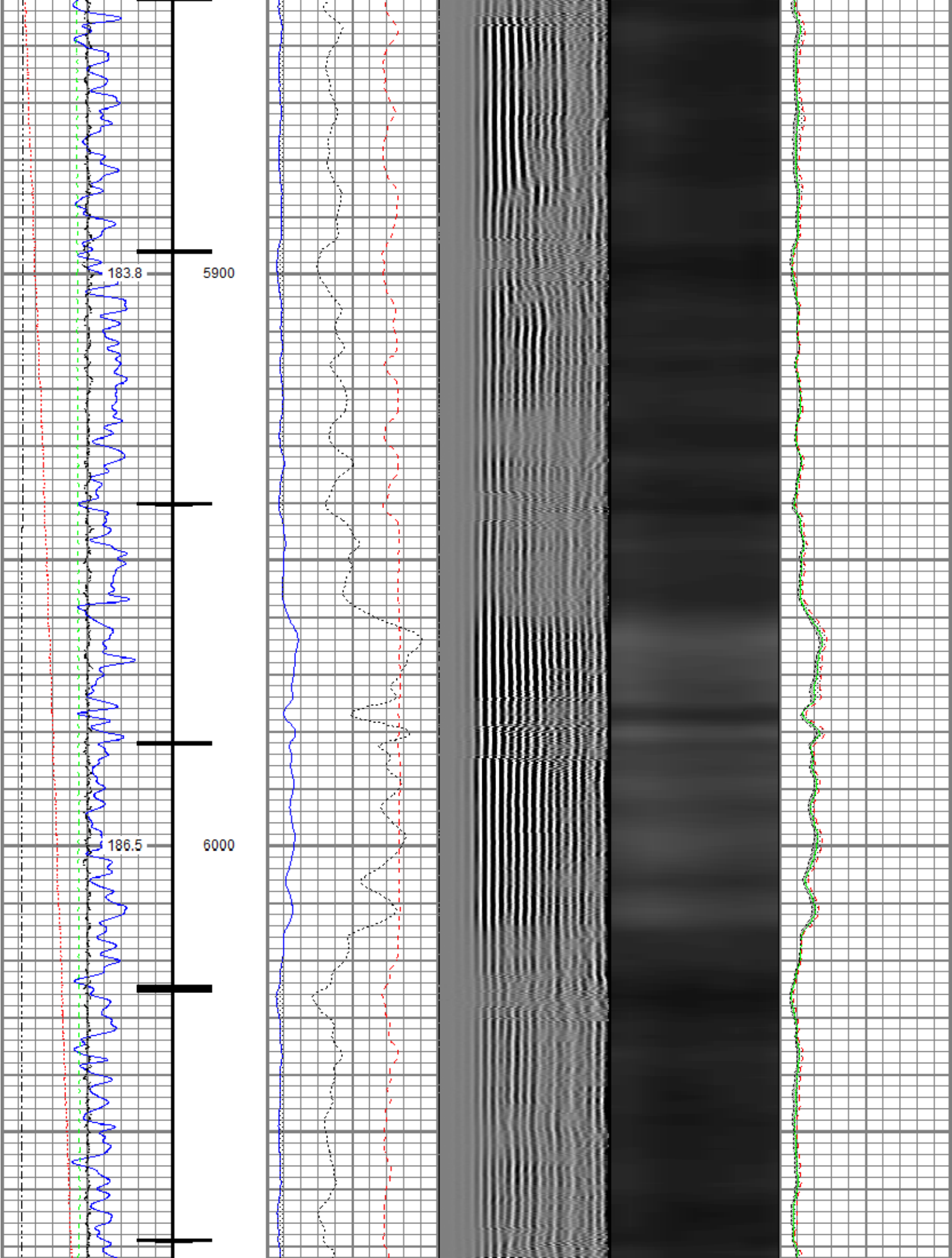


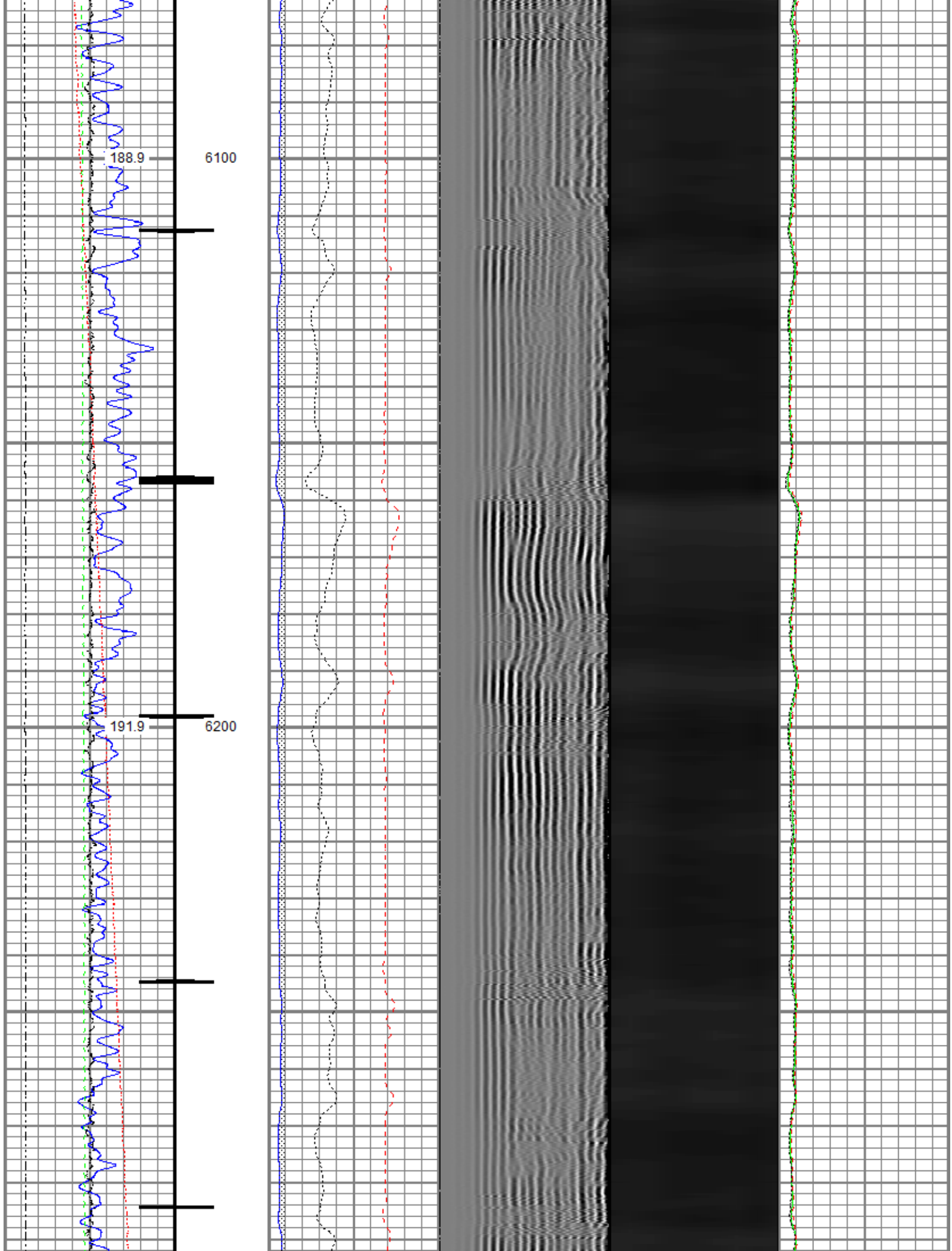


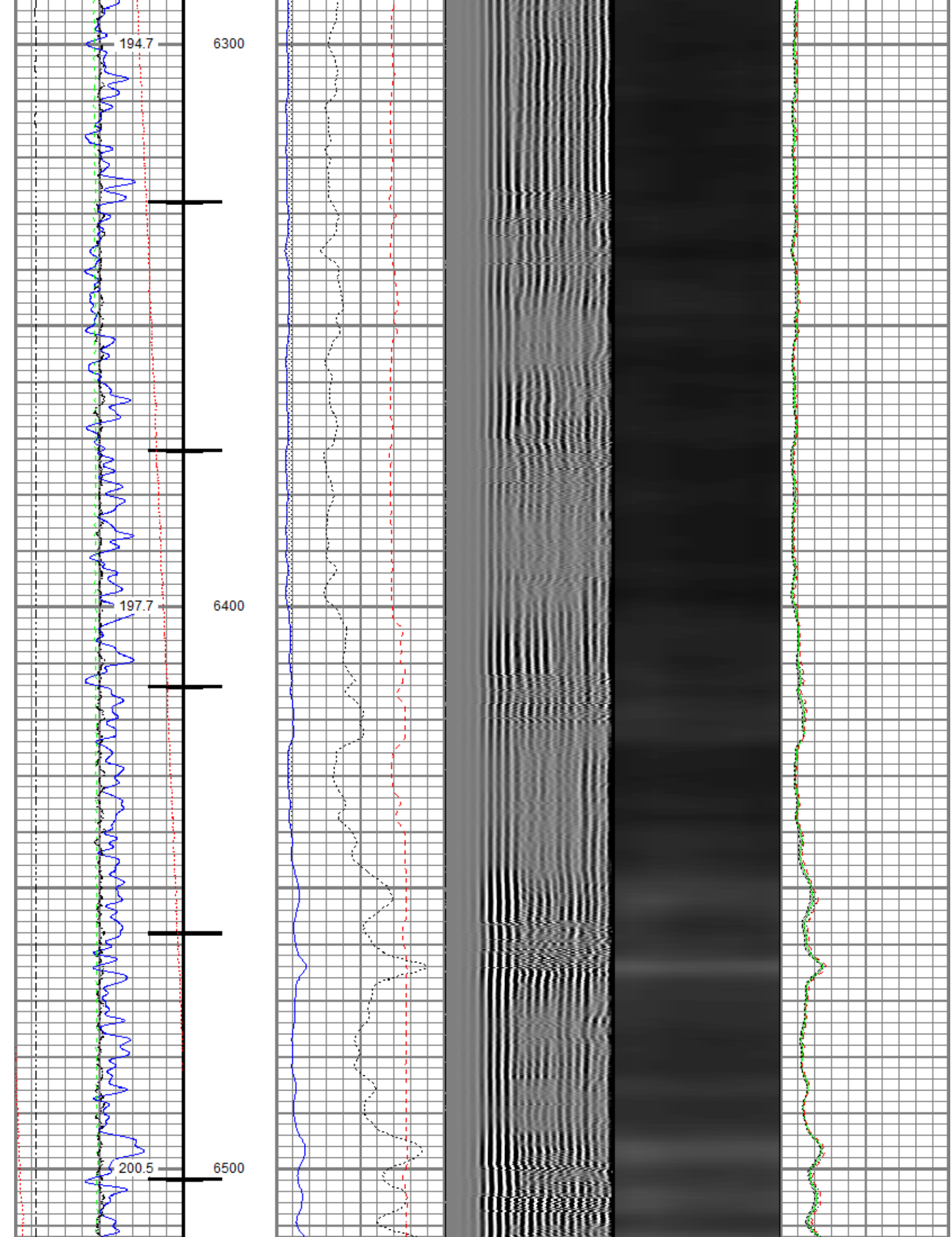


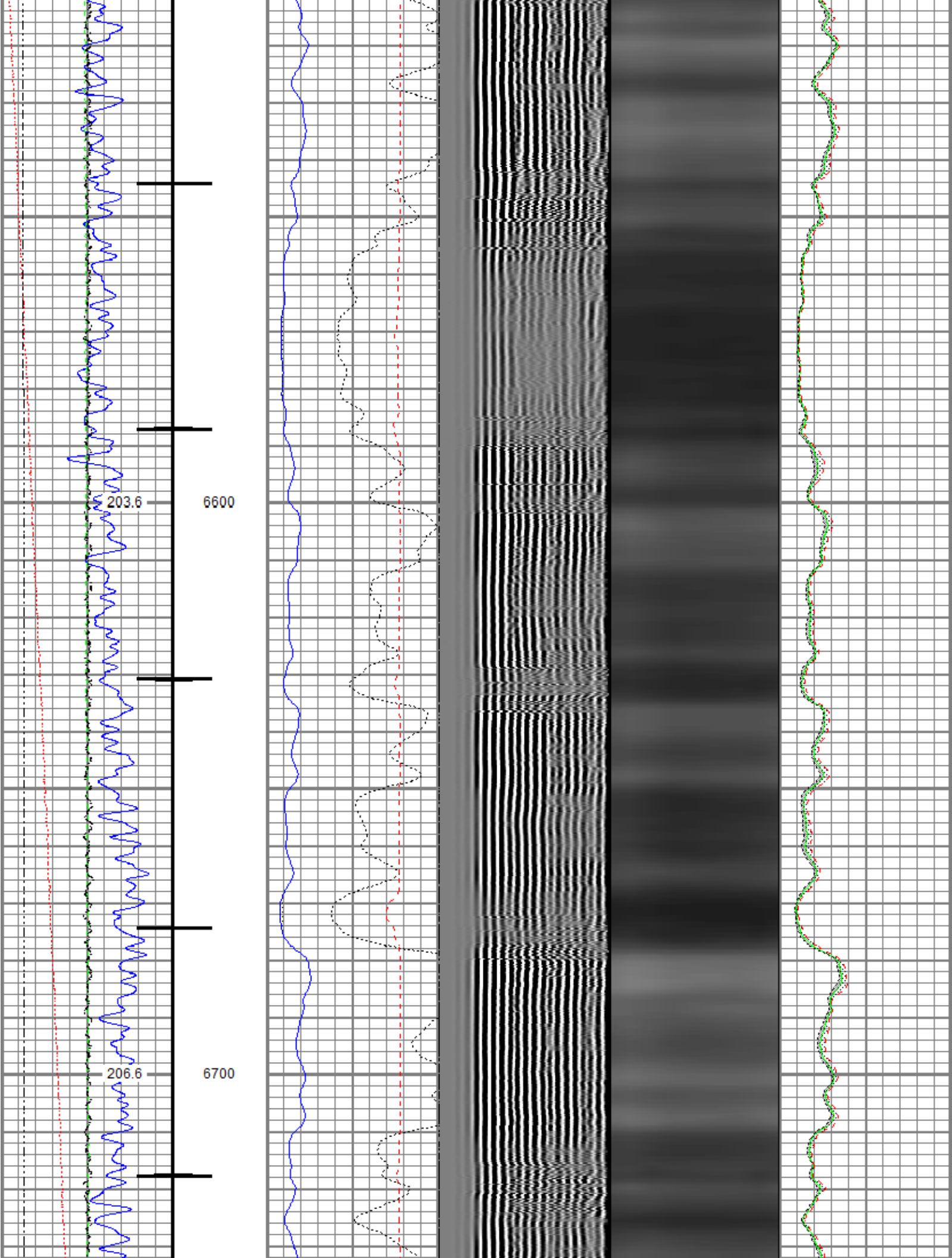


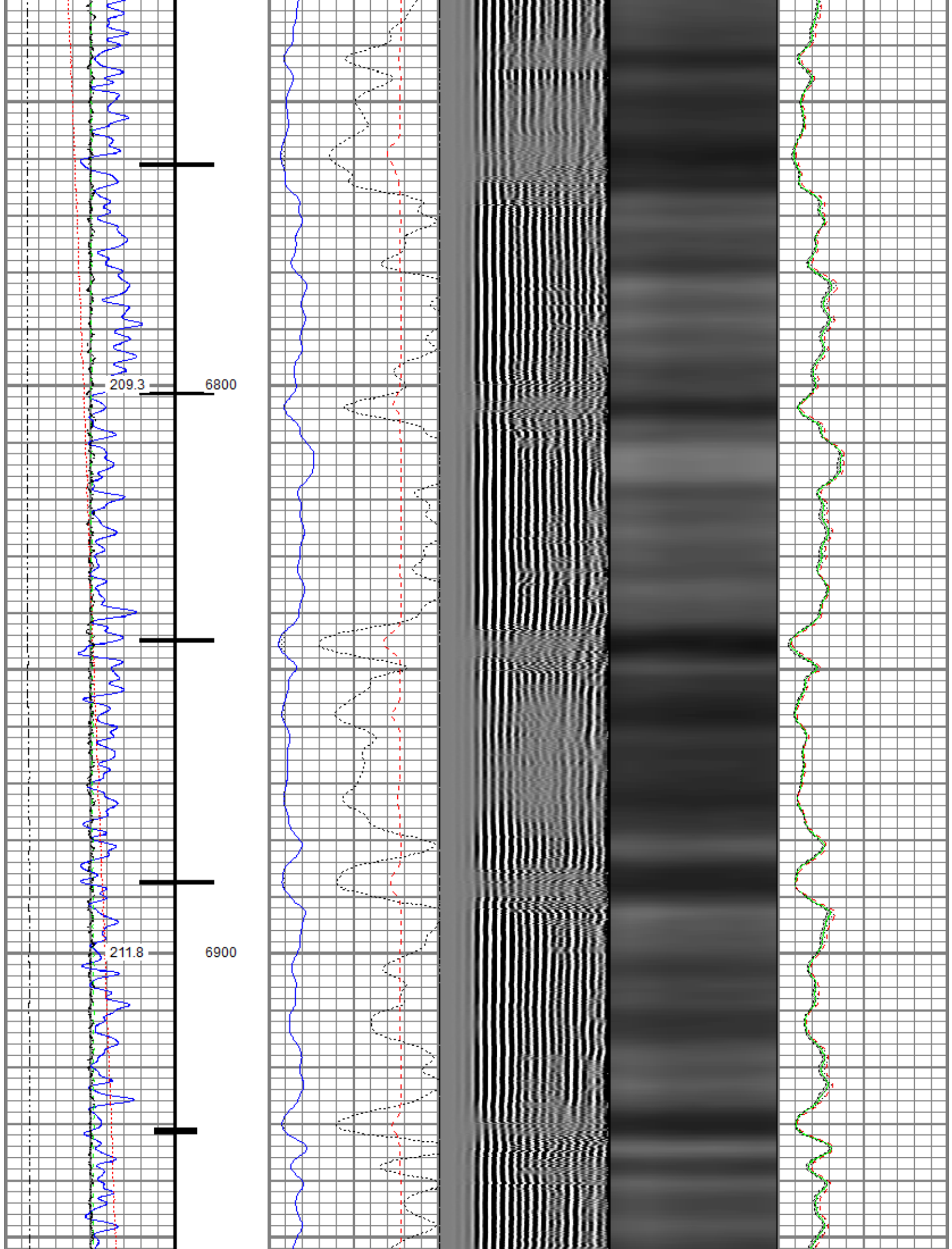


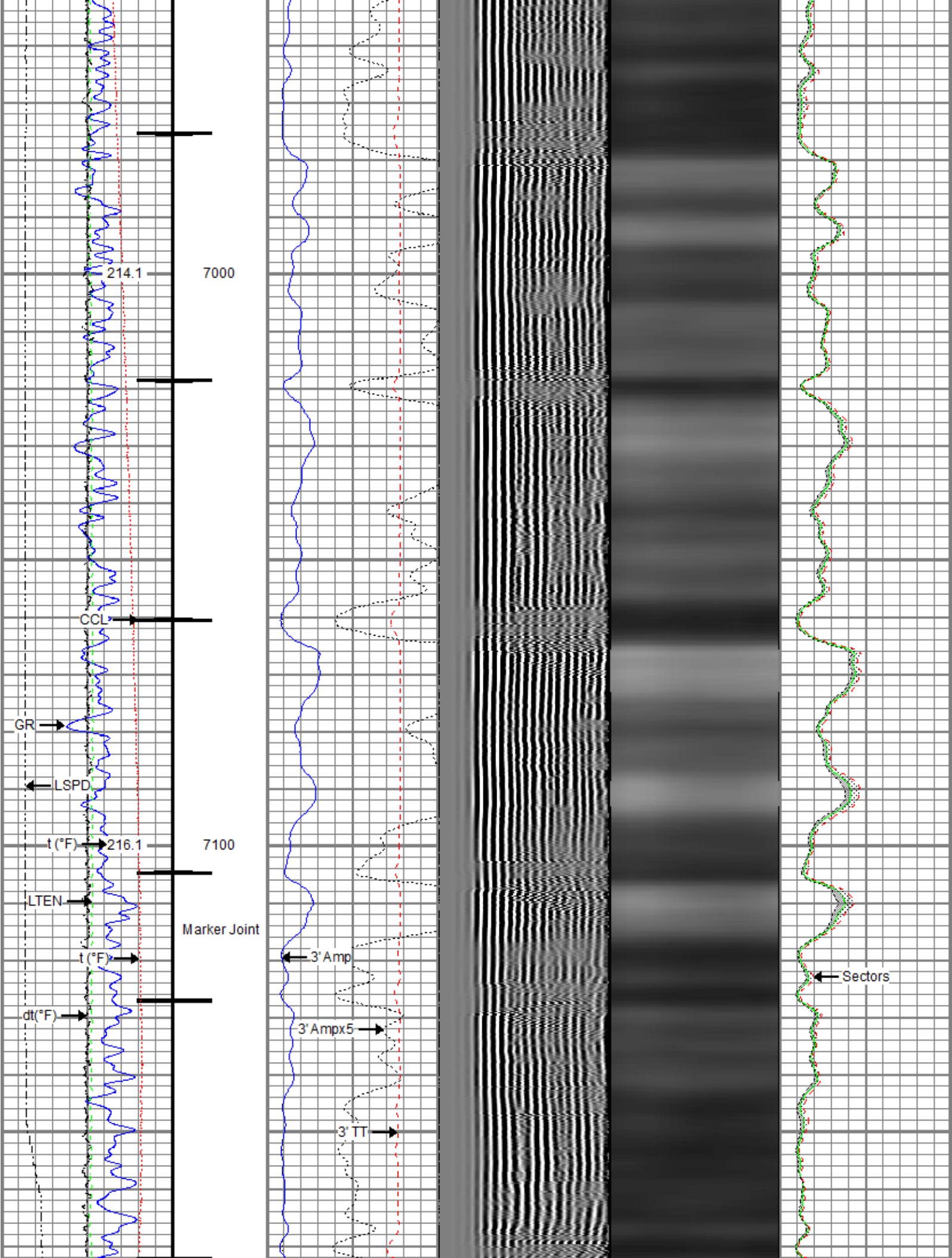


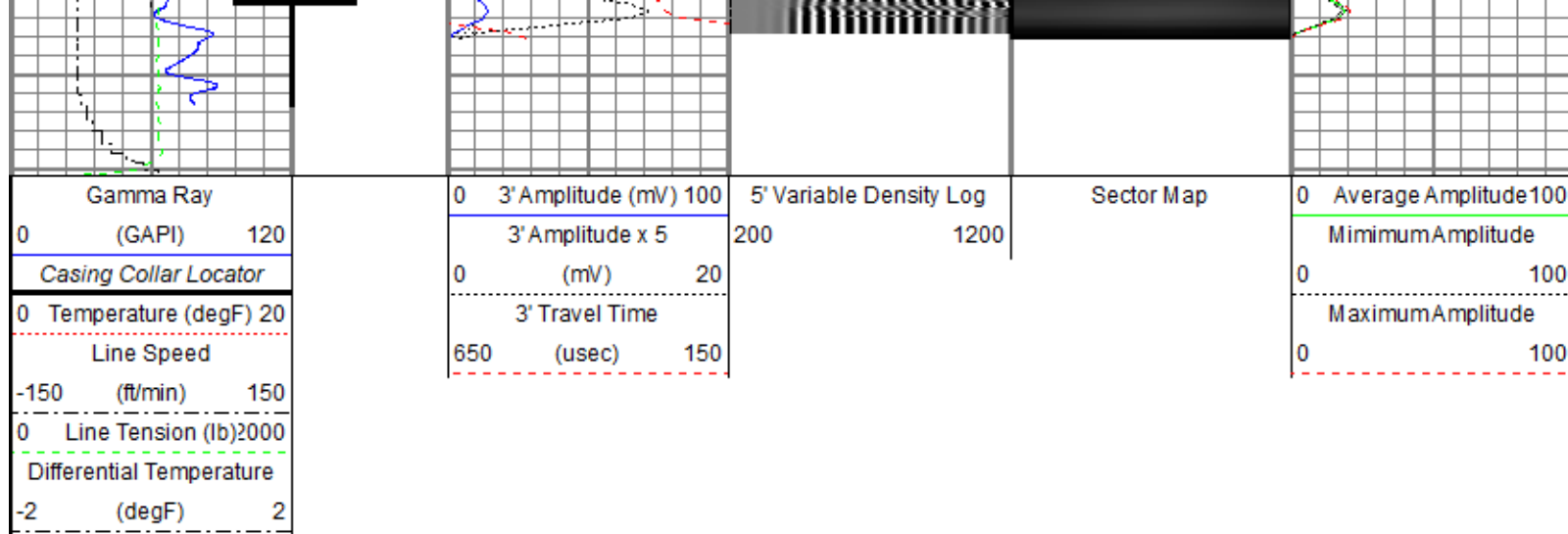








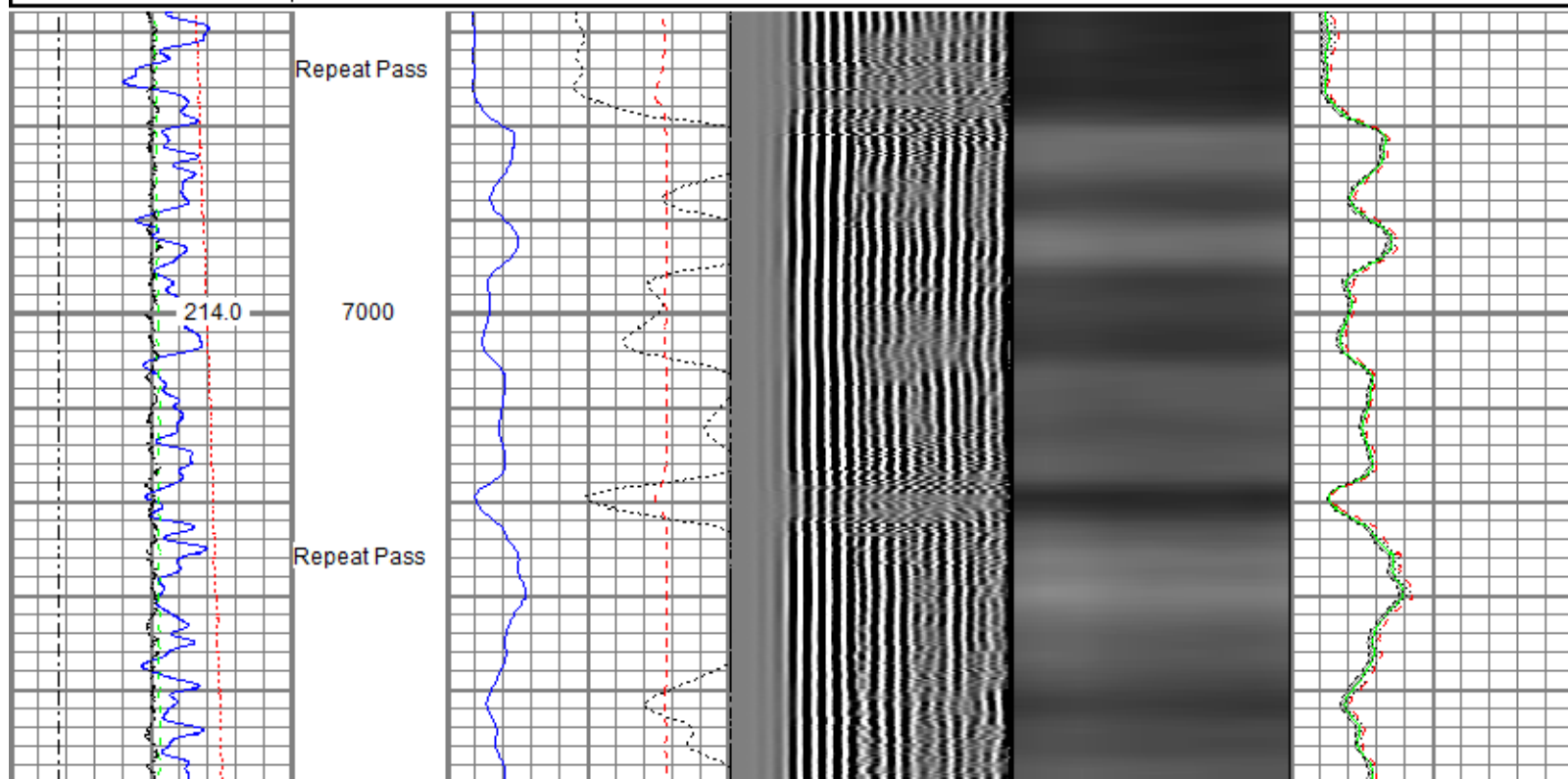
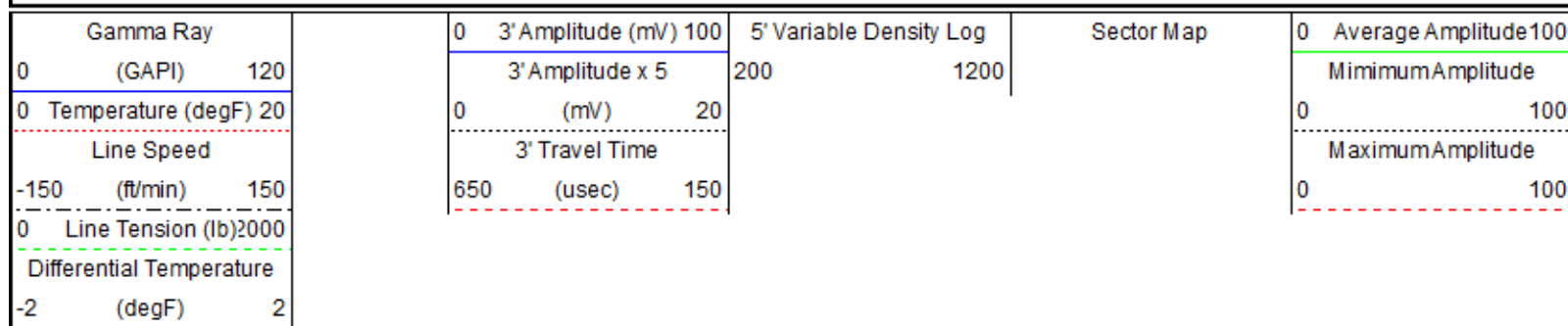


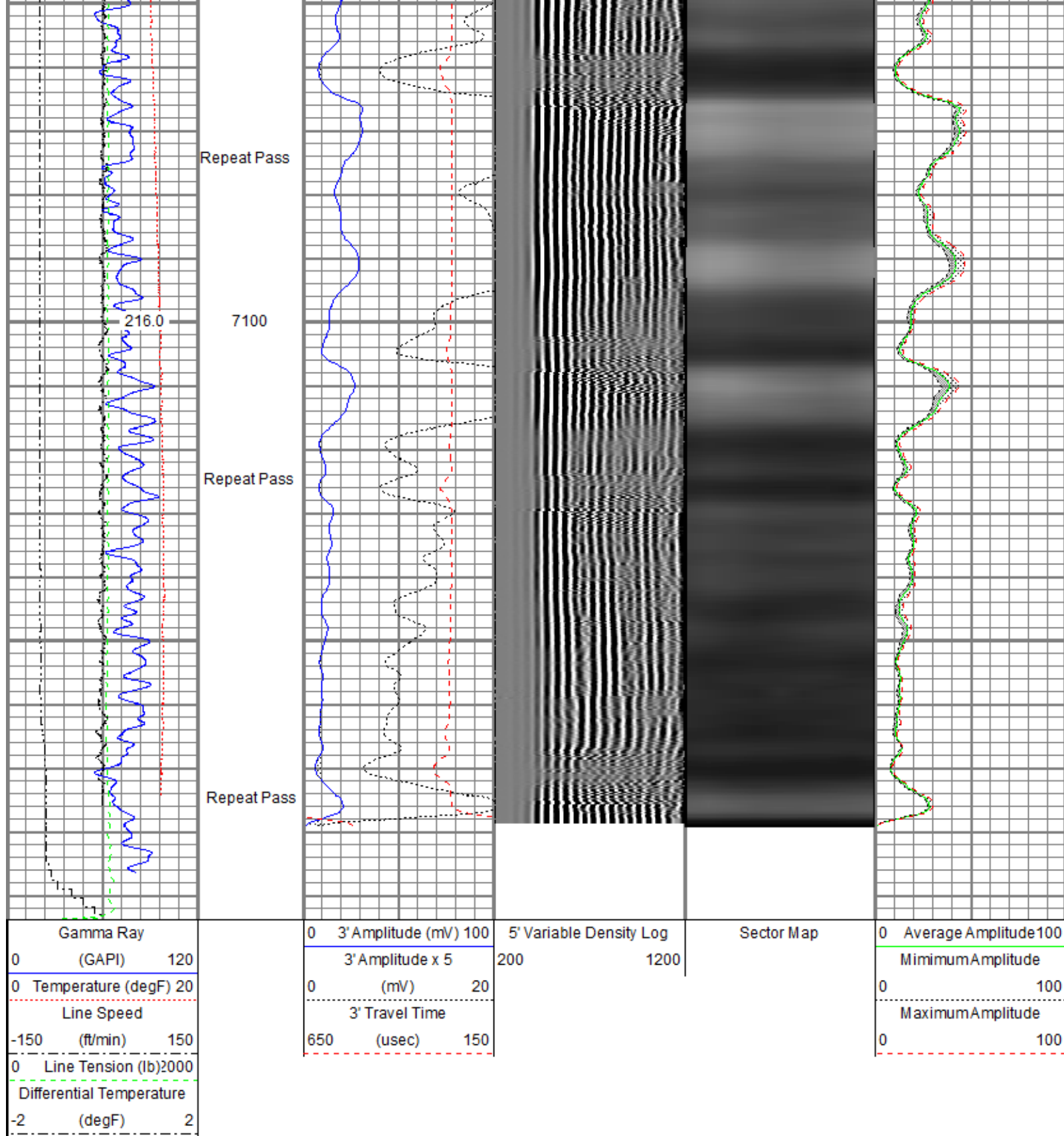


Repeat Pass

Recorded With 2800 PSI Surface Induced Pressure

Database File: anadarko\0512347106_anadarko_cowboy 21-1hz_rbl_11-11-18\0512347106_anadarko_cowboy 21-1hz_rbl_11-11-18_2800
 Dataset Pathname: Repeat.2
 Presentation Format: ros_radrii
 Dataset Creation: Wed Nov 14 10:48:42 2018
 Charted by: Depth in Feet scaled 1:240





Sensor	Offset (ft)	Schematic	Description	Length (ft)	O.D. (in)	Weight (lb)
			Titan CHD-14375 GO Titan 1-7/16" Assembled Electric Cable Head w/ 1" Fishing Neck	1.03	1.44	3.60
			Probe CENT-2750 Probe 2-3/4" Electric Inline Bowspring Centralizer	2.88	2.75	20.00

TEMP	18.23					
WVFS8	16.00					
WVFS7	16.00					
WVFS6	16.00					
WVFS5	16.00					
WVFS4	16.00					
WVFS3	16.00					
WVFS2	16.00					
WVFS1	16.00					
WVFCAL	16.00					
WVF3FT	16.00					
WVF5FT	15.00					

Calibration Report	
Database File	c:\programdata\warrior\data\anadarko\0512347106_anadarko_cowboy 21-1hz_rbl_11-11-18\0512347106_anadarko_cowboy 21-1hz_rbl_11-11-18
Dataset Pathname	Main.2
Dataset Creation	Wed Nov 14 10:30:59 2018
Gamma Ray Calibration Report	
Serial Number:	FW1307-078
Tool Model:	2750 SA
Performed:	Mon Oct 01 11:32:38 2018

Performed:

Mon Oct 01 11:32:36 2018

Calibrator Value:	637.0	GAPI
Background Reading:	108.2	cps
Calibrator Reading:	1134.5	cps
Sensitivity:	0.6207	GAPI/cps

Segmented Cement Bond Log Calibration Report

Serial Number: FW1302-001
Tool Model: 2750 RBT

Calibration Casing Diameter: 5.500 in
Calibration Depth: -52.936 ft

Master Calibration, performed (Derived):

	Raw (v)		Calibrated (mv)		Results	
	Zero	Cal	Zero	Cal	Gain	Offset
3'	0.005	1.198	0.800	71.921	59.630	0.501
CAL	1.173	1.150				
5'	0.003	1.292	0.800	71.921	55.191	0.613
SUM						
S1	0.004	1.232	0.000	100.000	81.455	-0.322
S2	0.005	1.170	0.000	100.000	85.798	-0.402
S3	0.005	1.157	0.000	100.000	86.753	-0.392
S4	0.005	1.157	0.000	100.000	86.776	-0.427
S5	0.006	1.206	0.000	100.000	83.288	-0.480
S6	0.006	1.272	0.000	100.000	79.008	-0.478
S7	0.005	1.281	0.000	100.000	78.379	-0.414
S8	0.004	1.248	0.000	100.000	80.396	-0.328

Internal Reference Calibration, performed (Not Performed):

	Raw (v)		Calibrated (v)		Results	
	Zero	Cal	Zero	Cal	Gain	Offset
CAL	0.000	0.000	1.173	1.150	1.000	0.000

Air Zero Calibration, performed Sun Nov 11 07:13:56 2018:

	Raw (v)		Calibrated (v)		Results	
	Zero		Zero		Offset	
3'	0.008		0.000		0.000	
5'	0.016		0.000		0.001	
SUM						
S1	0.005		0.000		0.000	
S2	0.008		0.000		0.000	
S3	0.008		0.000		-0.000	
S4	0.008		0.000		-0.000	
S5	0.008		0.000		0.000	
S6	0.009		0.000		0.000	
S7	0.010		0.000		-0.000	
S8	0.009		0.000		-0.001	

Temperature Calibration Report

Serial Number: FW1302-001
Tool Model: 2750 RBT
Performed: Mon Oct 01 11:32:14 2018

	Reference	Reading
Low Reference:	100.00 degF	107.47 degF

Low Reference:	100.00	degF	107.47	degF
High Reference:	350.00	degF	404.08	degF
Gain:	0.84			
Offset:	9.42			
Delta Spacing	1			



Company	Kerr-McGee Oil & Gas Onshore, L.P.
Well	Cowboy 21-1HZ
Field	Wattenberg
County	Weld
State	Colorado