



Radial Cement Bond  
Gamma Ray  
Casing Collar Log

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

Well Azul 13-15HZ

Field Wattenberg

County Weld State Colorado

Location: API #: 05-123-46110

SEC 13 TWP 1N RGE 66W

Permanent Datum Ground Level Elevation 5050'  
Log Measured From Kelly Bushing 21 FT  
Drilling Measured From Kelly Bushing

Other Services  
GR/JB  
RBP  
RBL 0 PSI  
Elevation  
K.B. 5071'  
D.F. ---  
G.L. 5050'

Company Kerr-McGee Oil & Gas Onshore, L.P.  
Well Azul 13-15HZ  
Field Wattenberg  
County Weld  
State Colorado

Date	28-JUN-2018	Four		
Run Number		12688 FT		
Depth Driller		6801 FT		
Depth Logger		6786 FT		
Bottom Logged Interval		Surface		
Top Log Interval		7.875'		
Open Hole Size		Water		
Type Fluid		8.34 lb/gal		
Density / Viscosity		213°F		
Max. Recorded Temp.		See Log		
Estimated Cement Top		ROA		
Time Well Ready		4:30 pm		
Time Logger on Bottom		HD-0325		
Equipment Number		Platteville, CO		
Location		R. Cameron		
Recorded By		S. Hopper		
Witnessed By	Justin McMillen			
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	HCP-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

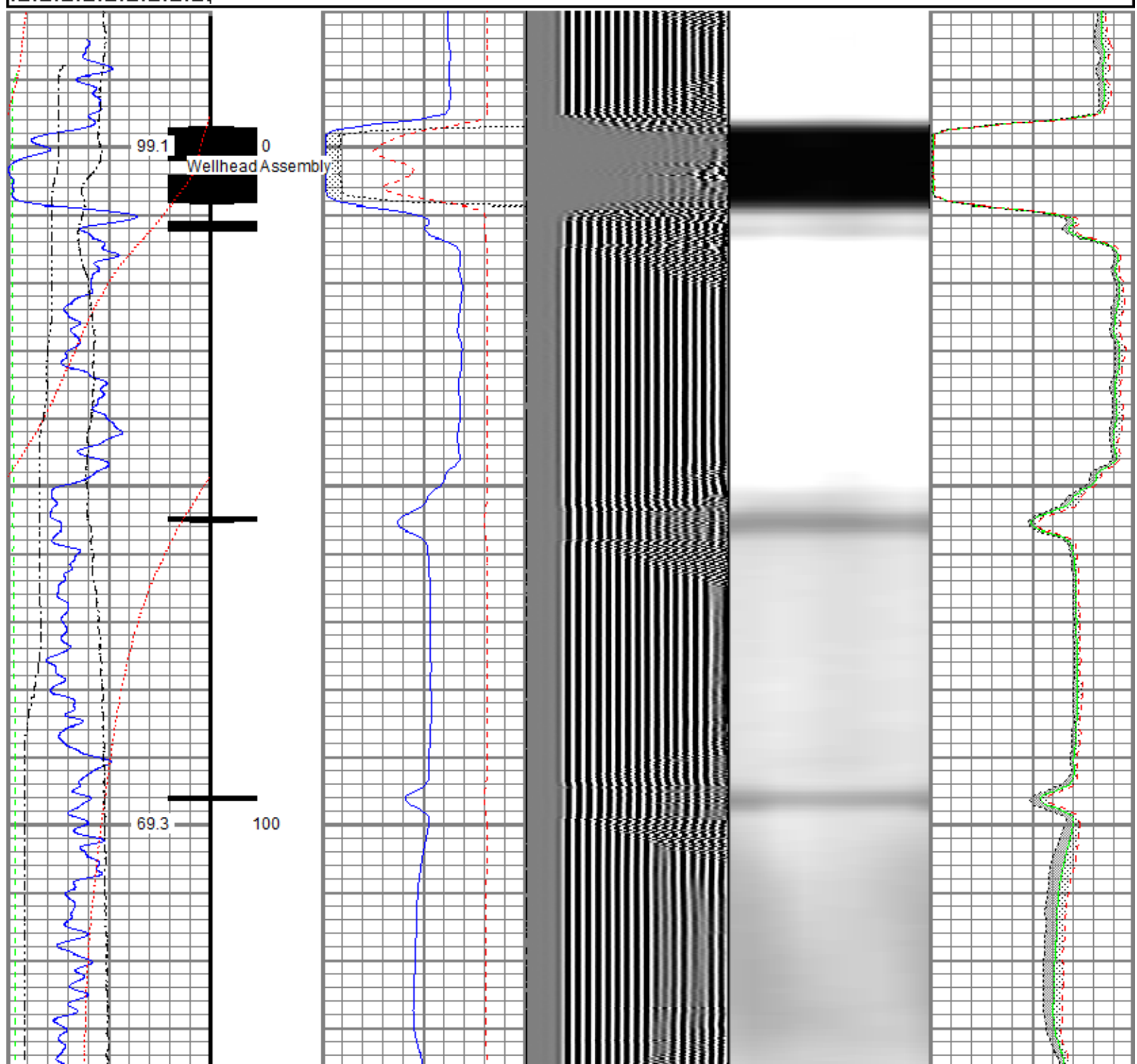
Log ran as per customer request  
Depth referenced to Casing Tally reported Marker Joint at 6756 FT  
Adjusted +4 FT to correlate with Marker Joint Top  
Gauge Ring/Junk Basket ran to 7820 FT with no debris  
5.50" RBP Set @ 6810 FT  
Log ran from 6786 FT to surface  
Recorded with 2800 PSI Surface Induced Pressure  
Logging tools were clean and free of debris upon completion of operations  
Thank you for choosing Reliance Oilfield Services, LLC!!

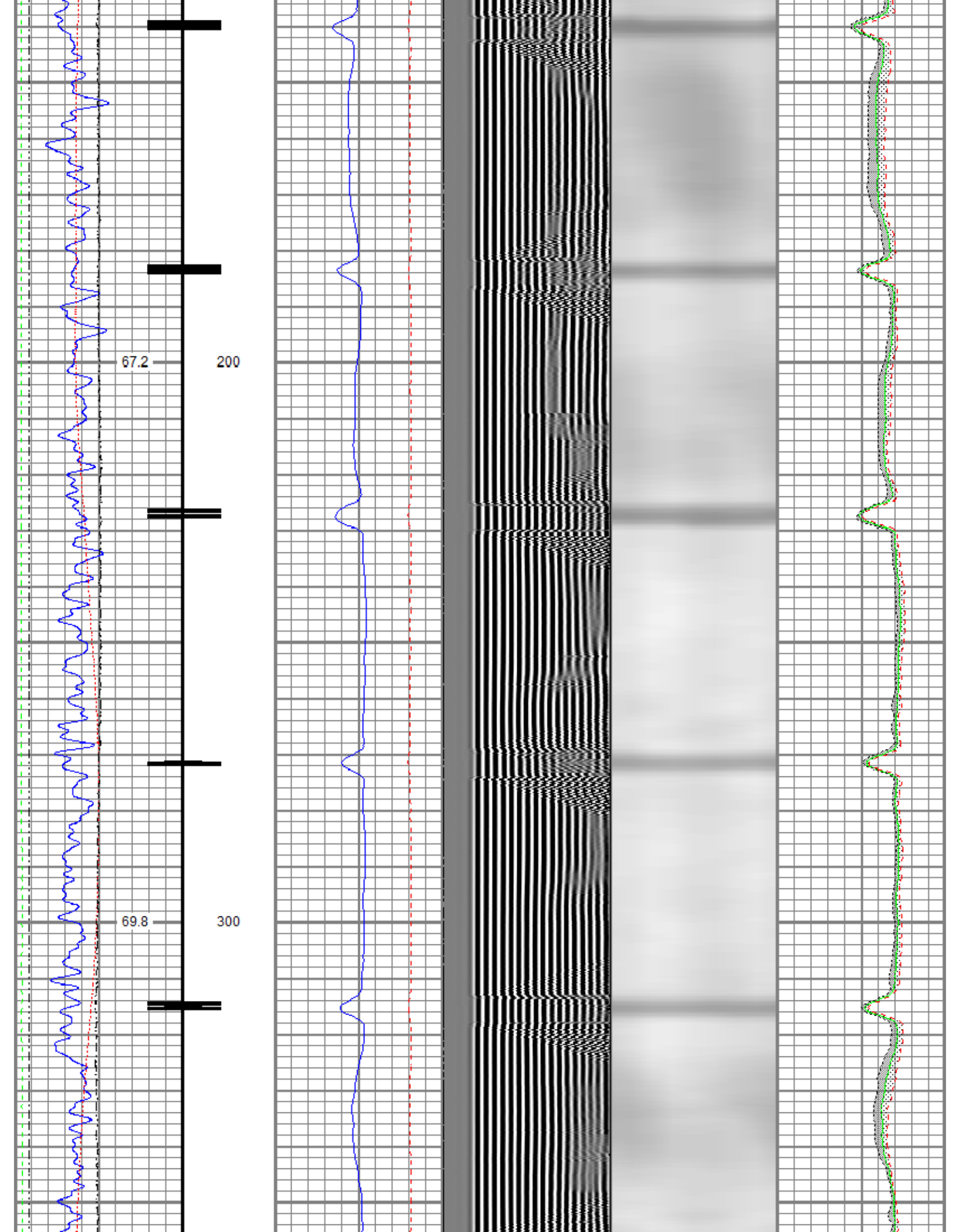
Main Pass

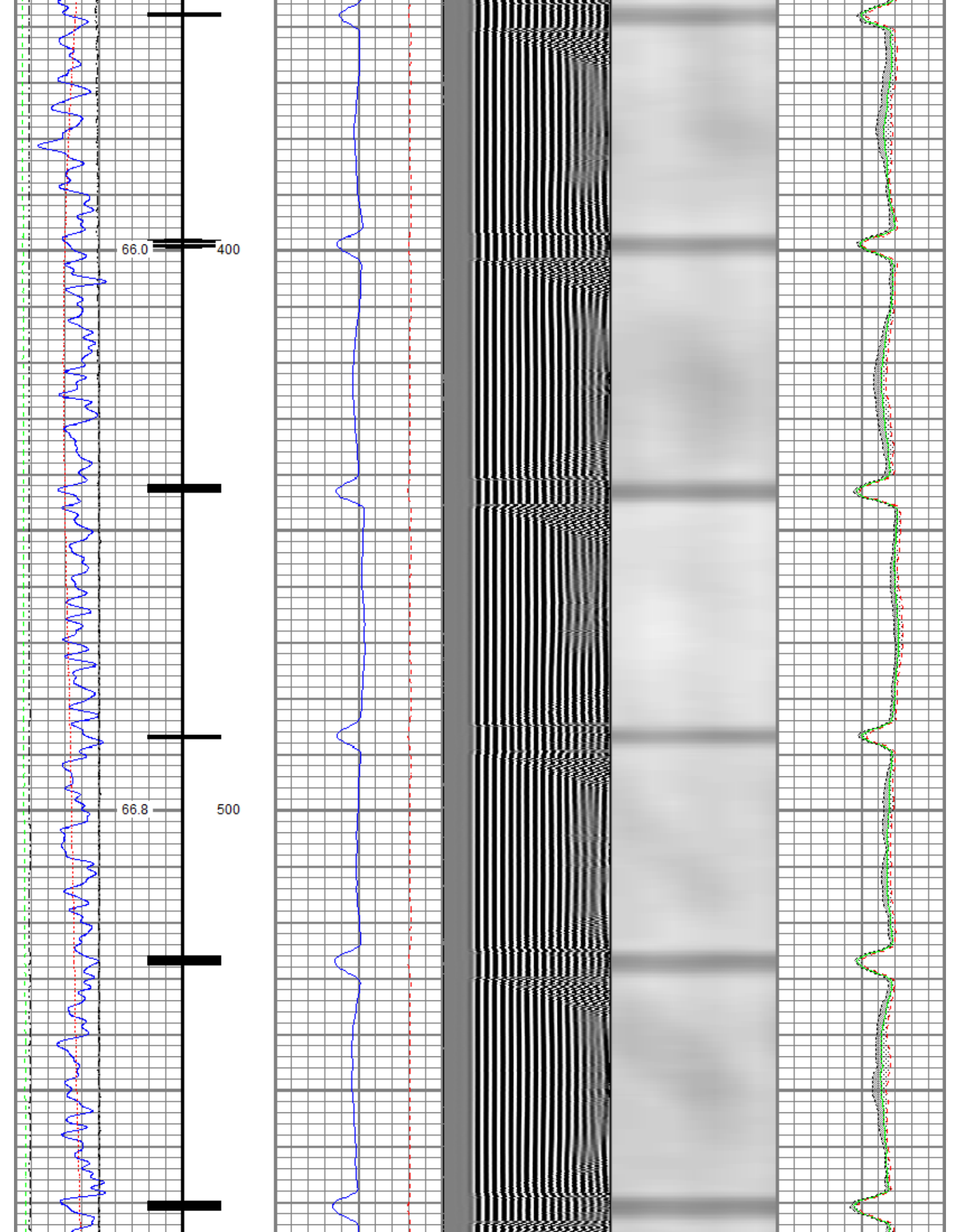


Database File	0512346110_anadarko_azul 13-15hz_rbl_06-28-18\processed_0512346110_anadarko_azul 13-15hz_rbl_06-28-18_2800 psi
Dataset Pathname	pass4
Presentation Format	ros_radri
Dataset Creation	Thu Jun 28 16:33:14 2018
Charted by	Depth in Feet scaled 1:240

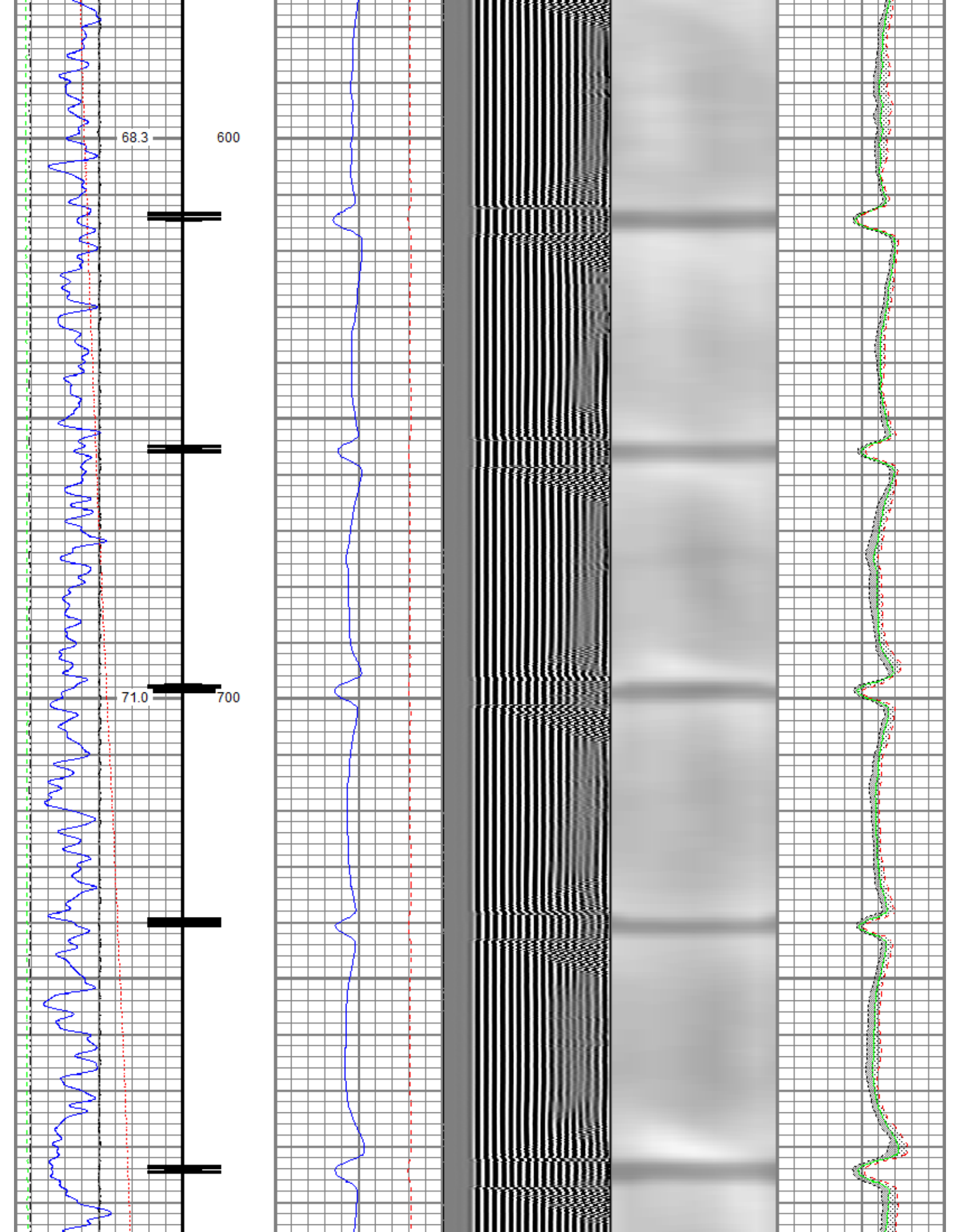
Gamma Ray	0	3' Amplitude (mV) 100	5' Variable Density Log	Sector Map	0	Average Amplitude 100
(GAPI) 120		3' Amplitude x 5	200 (usec) 1200			Minimum Amplitude
Casing Collar Locator	0	(mV) 20			0	100
Temperature (degF) 20		3' Travel Time				Maximum Amplitude
Line Speed	650	(usec) 150			0	100
-150 (ft/min)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

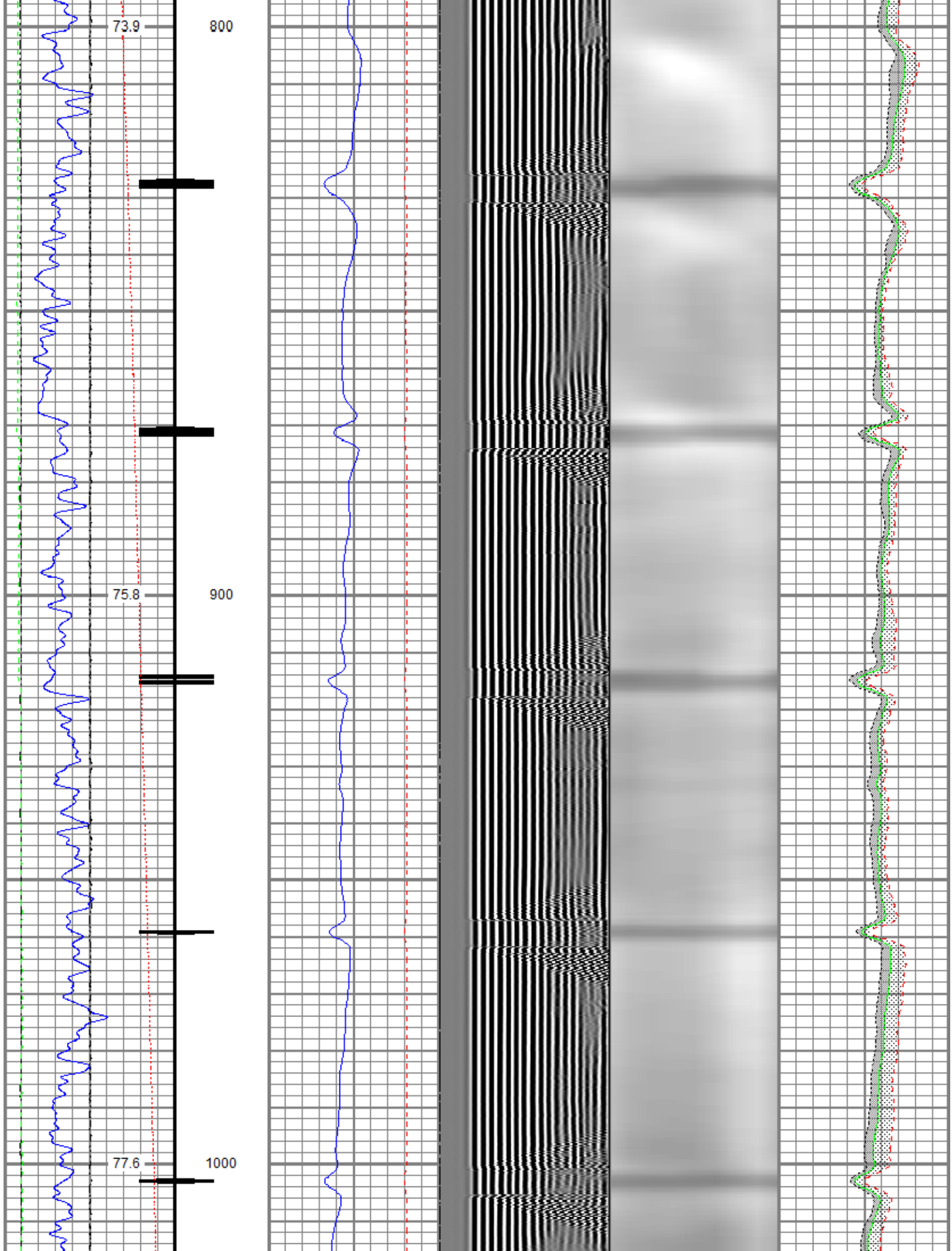


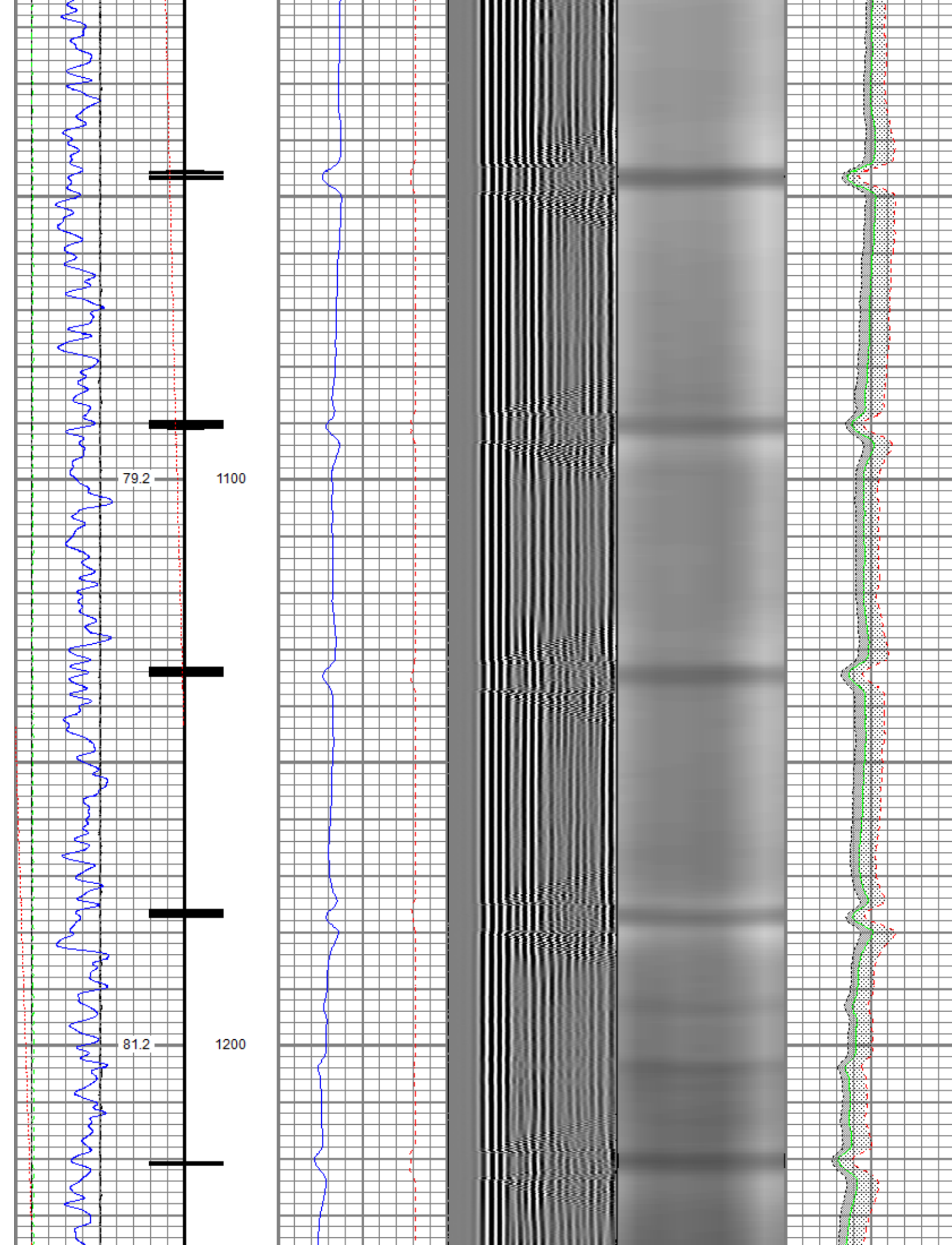


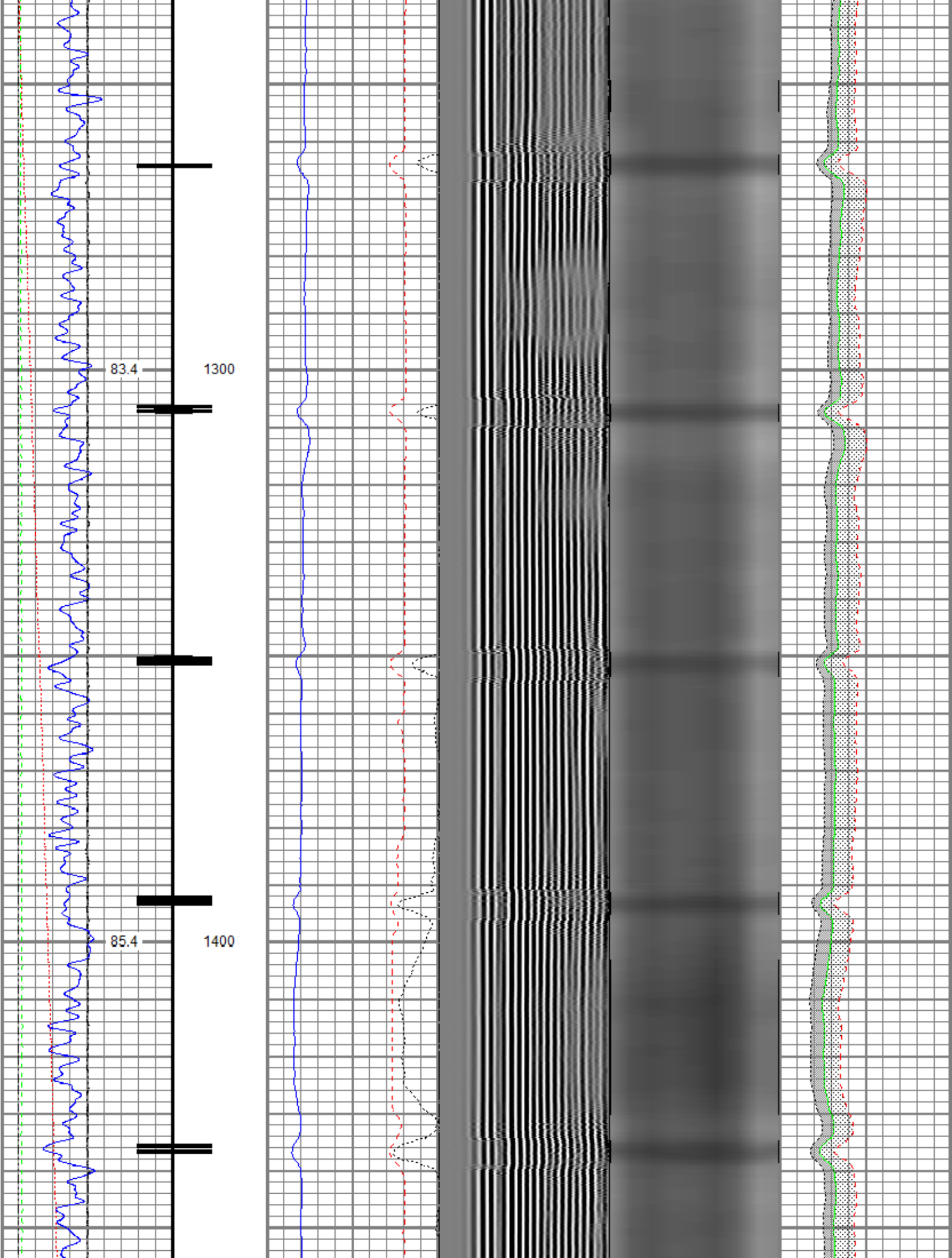




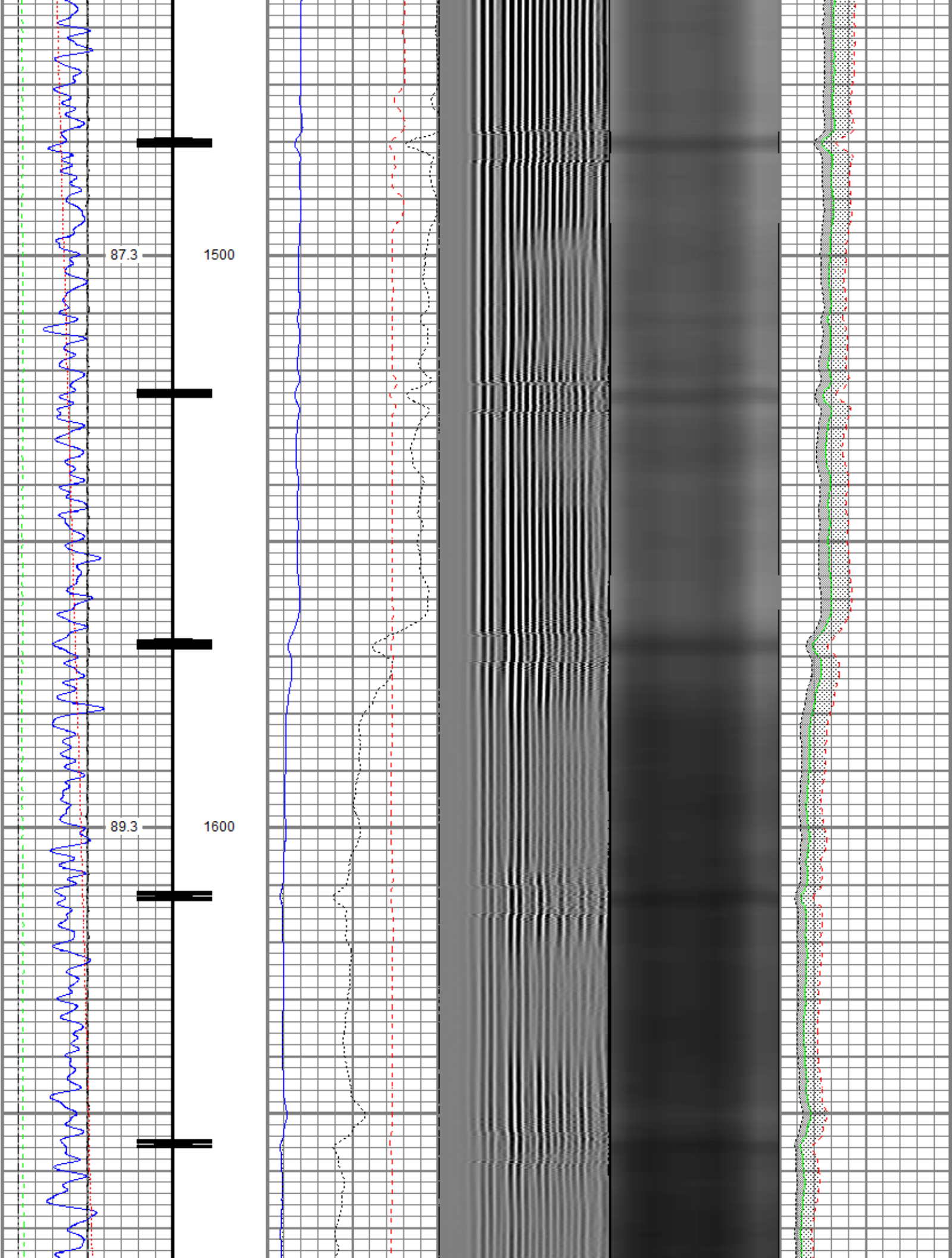


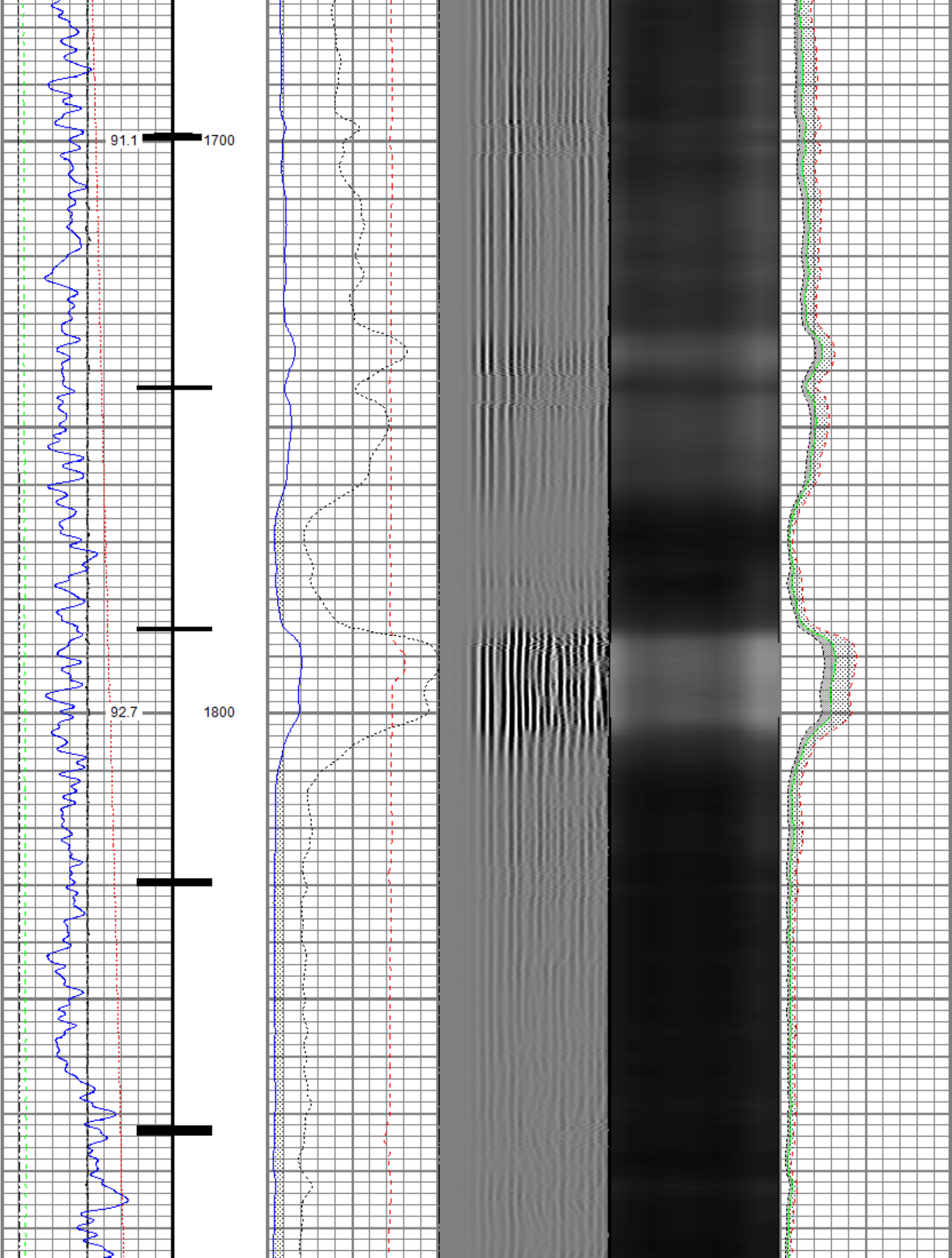


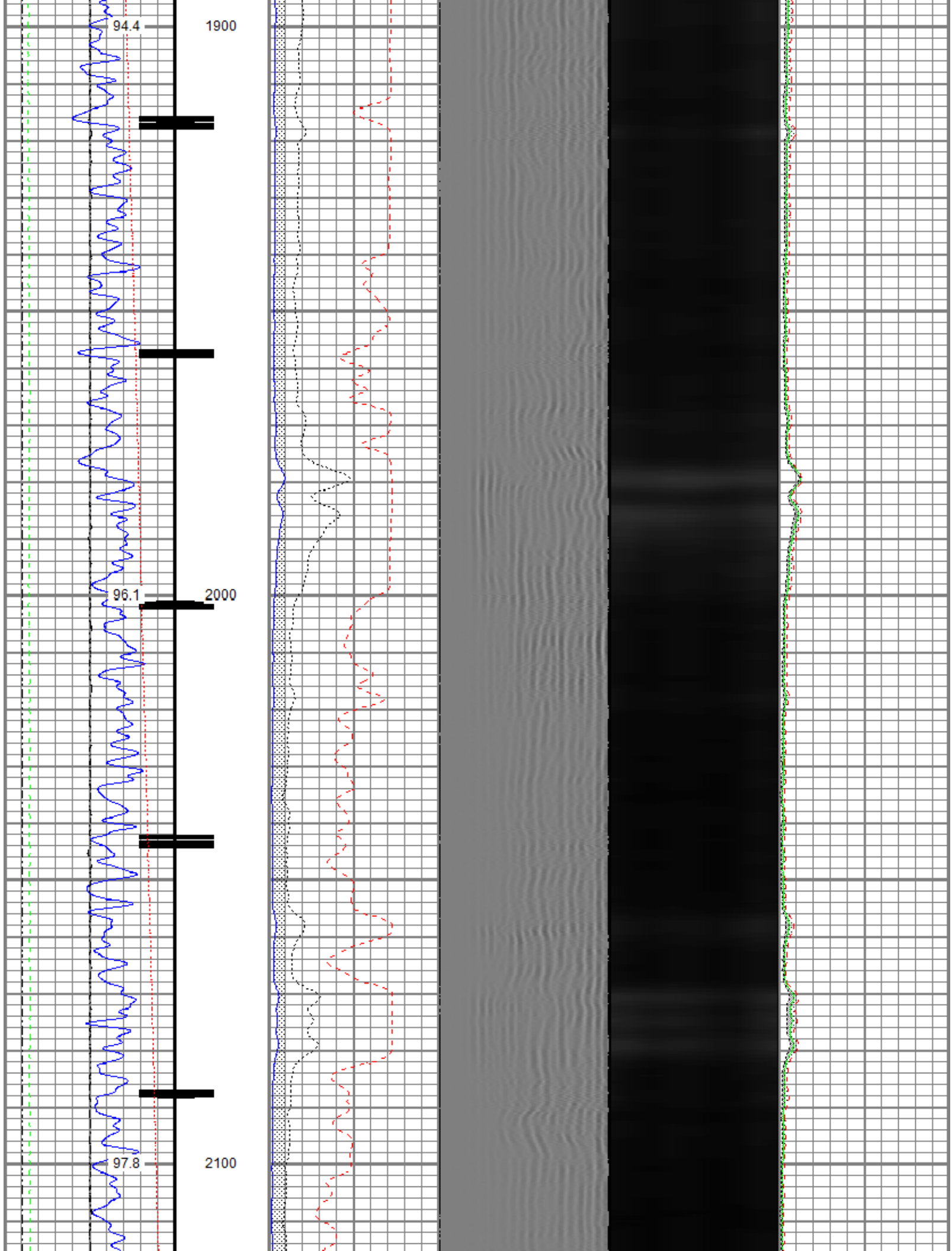


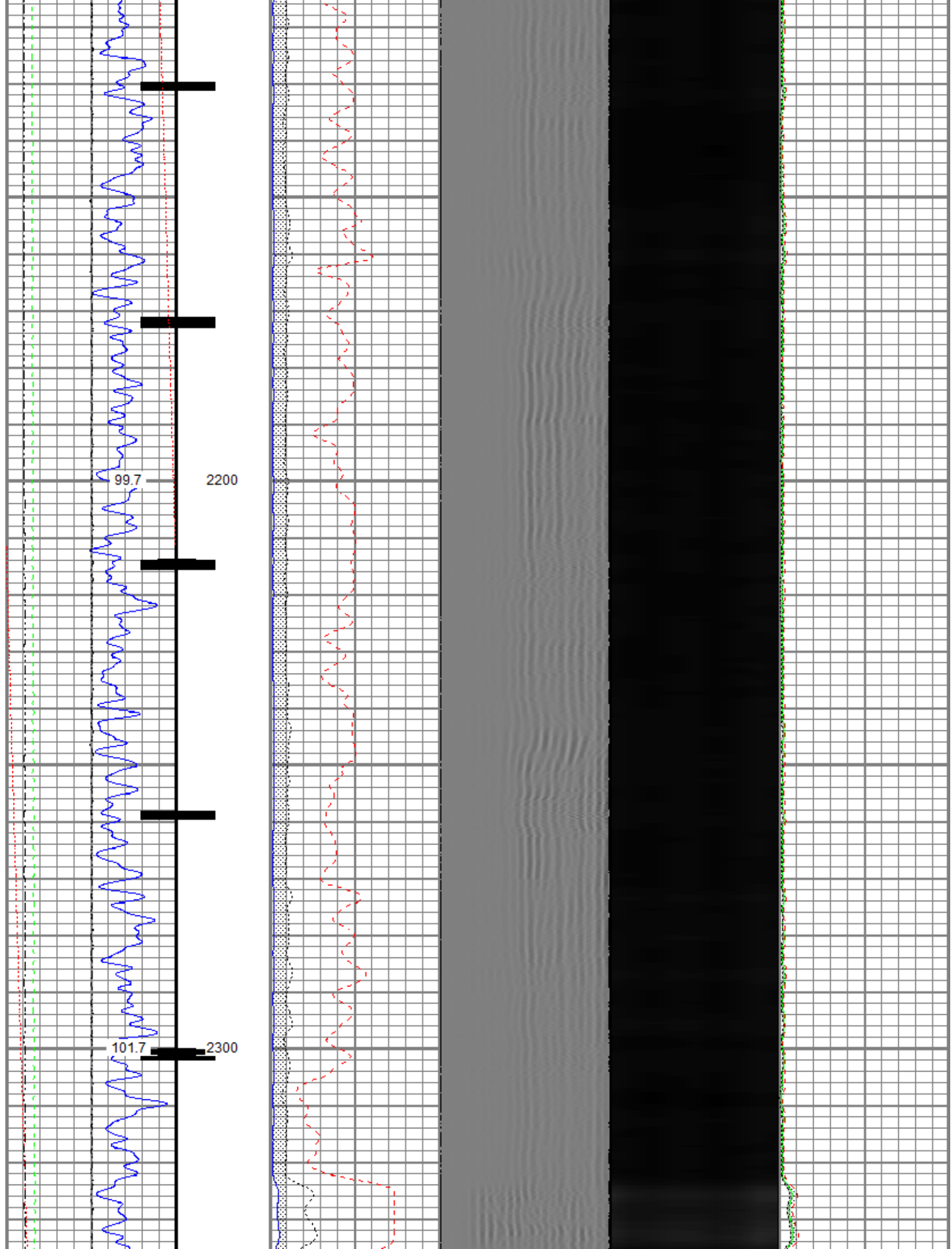




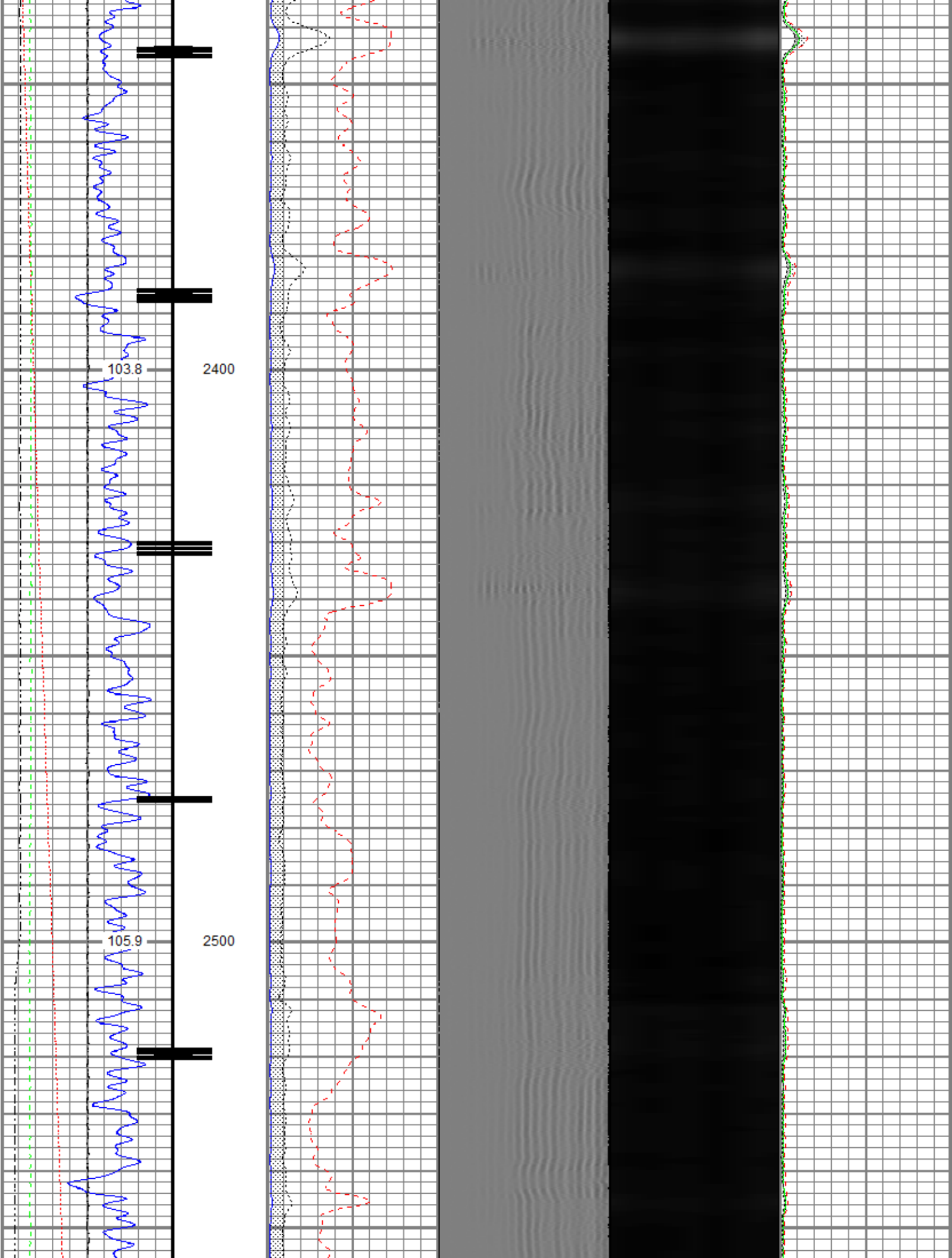


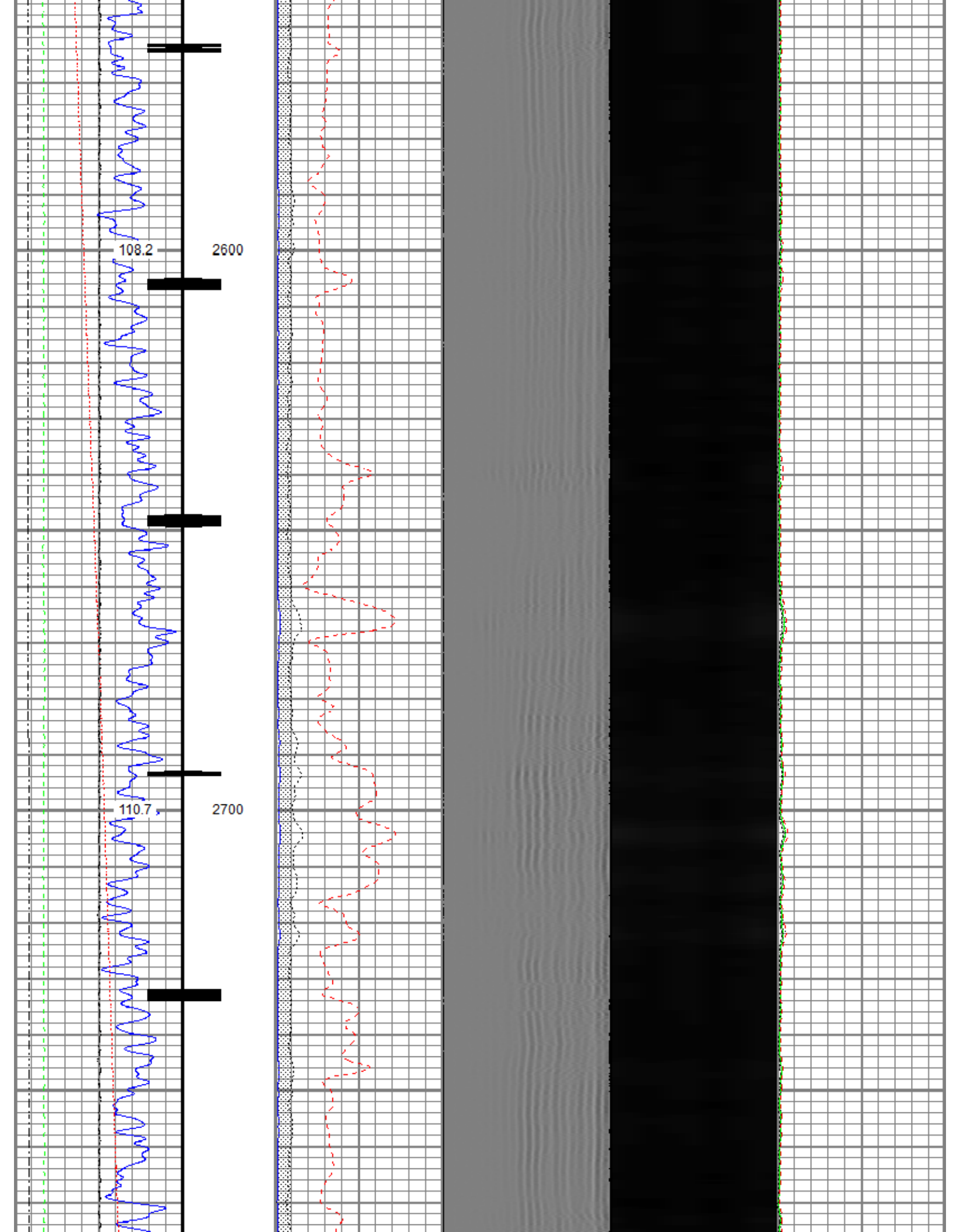


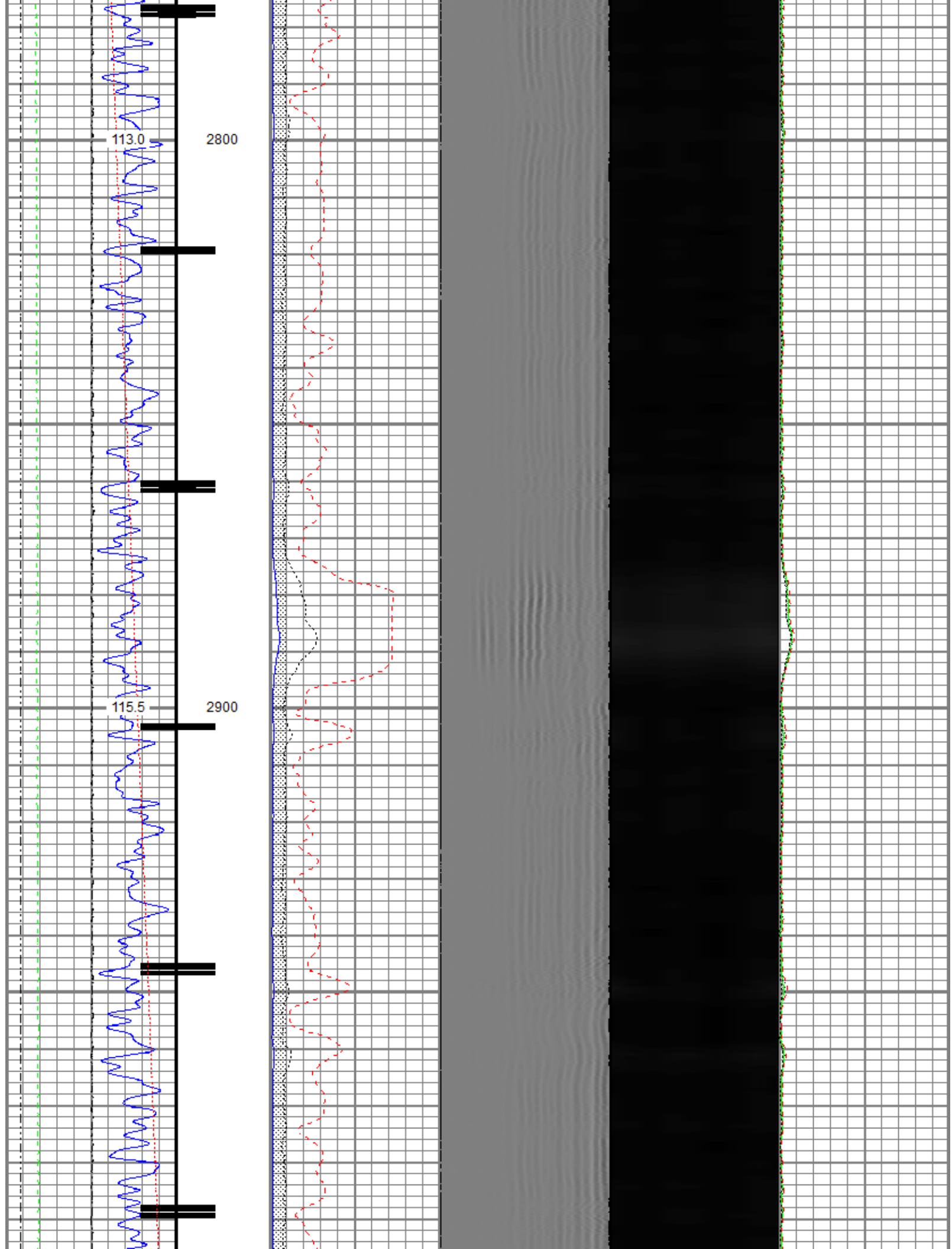


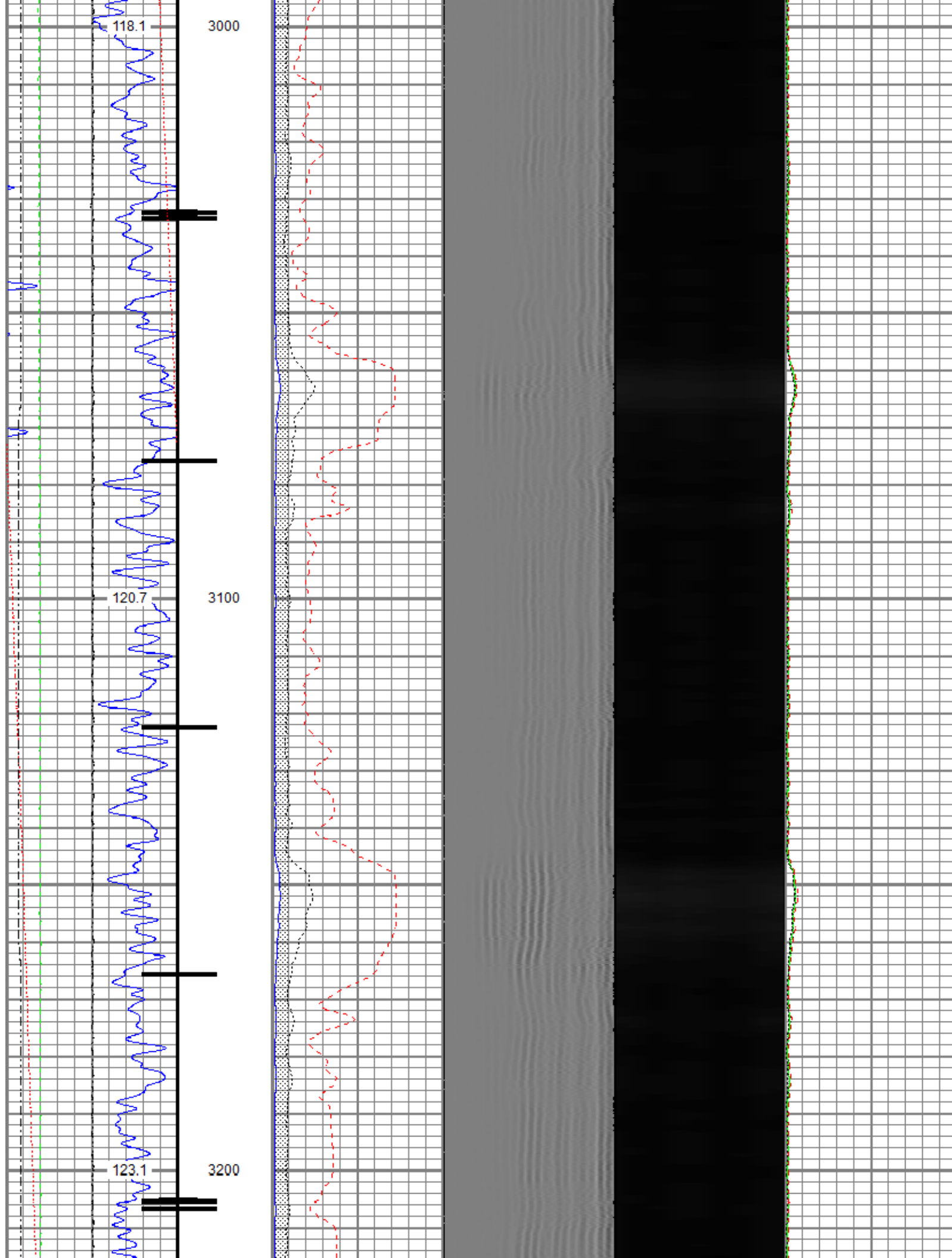




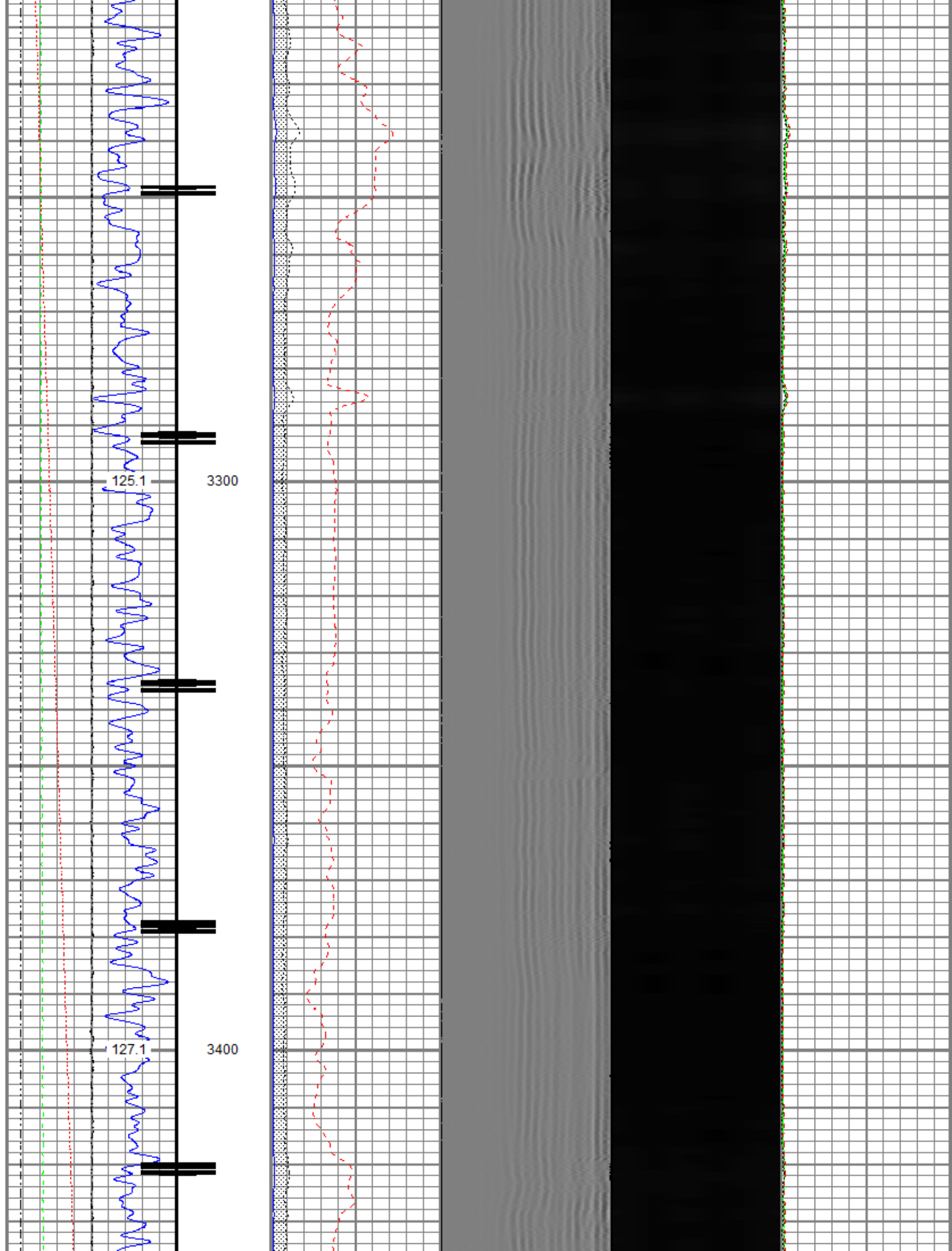


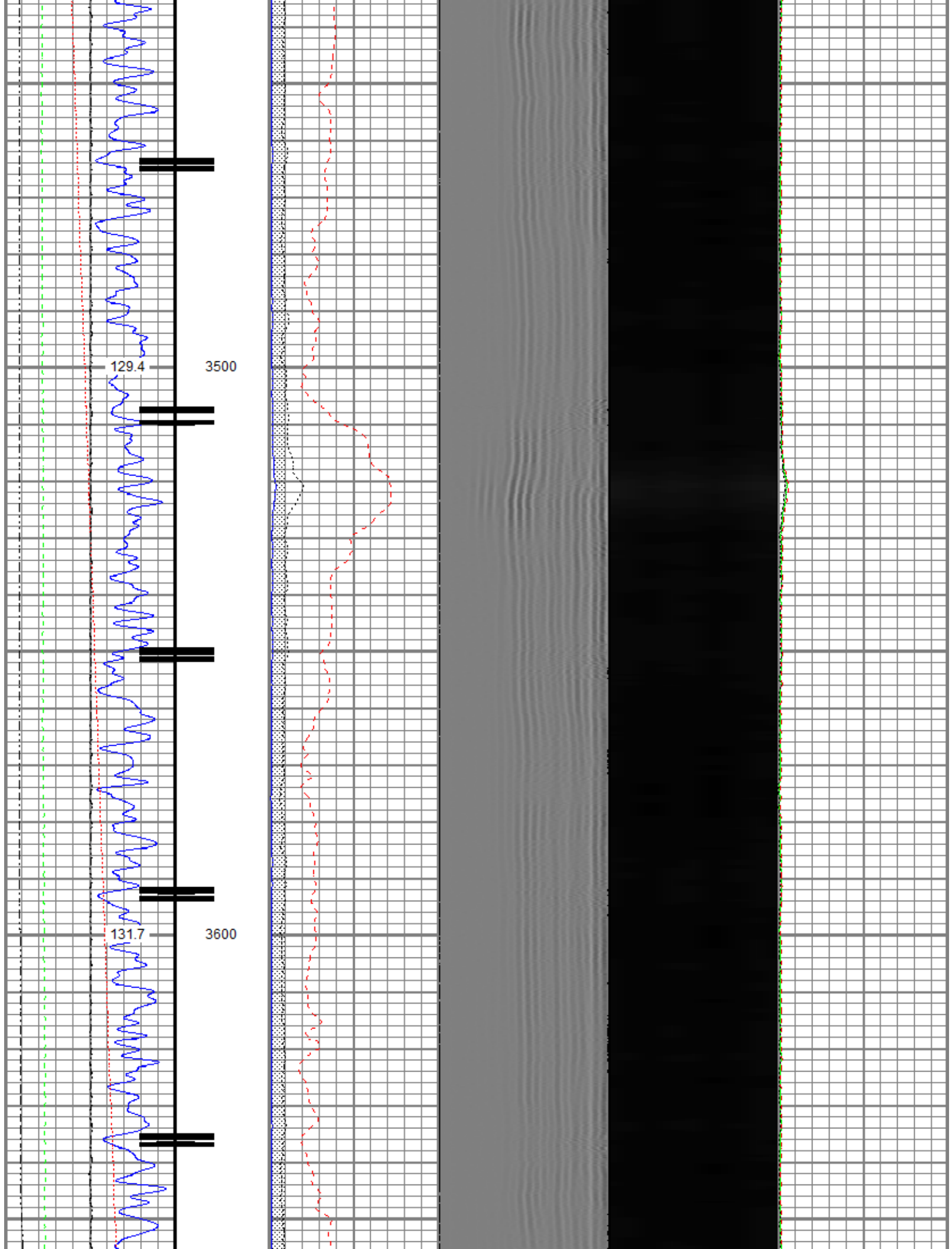


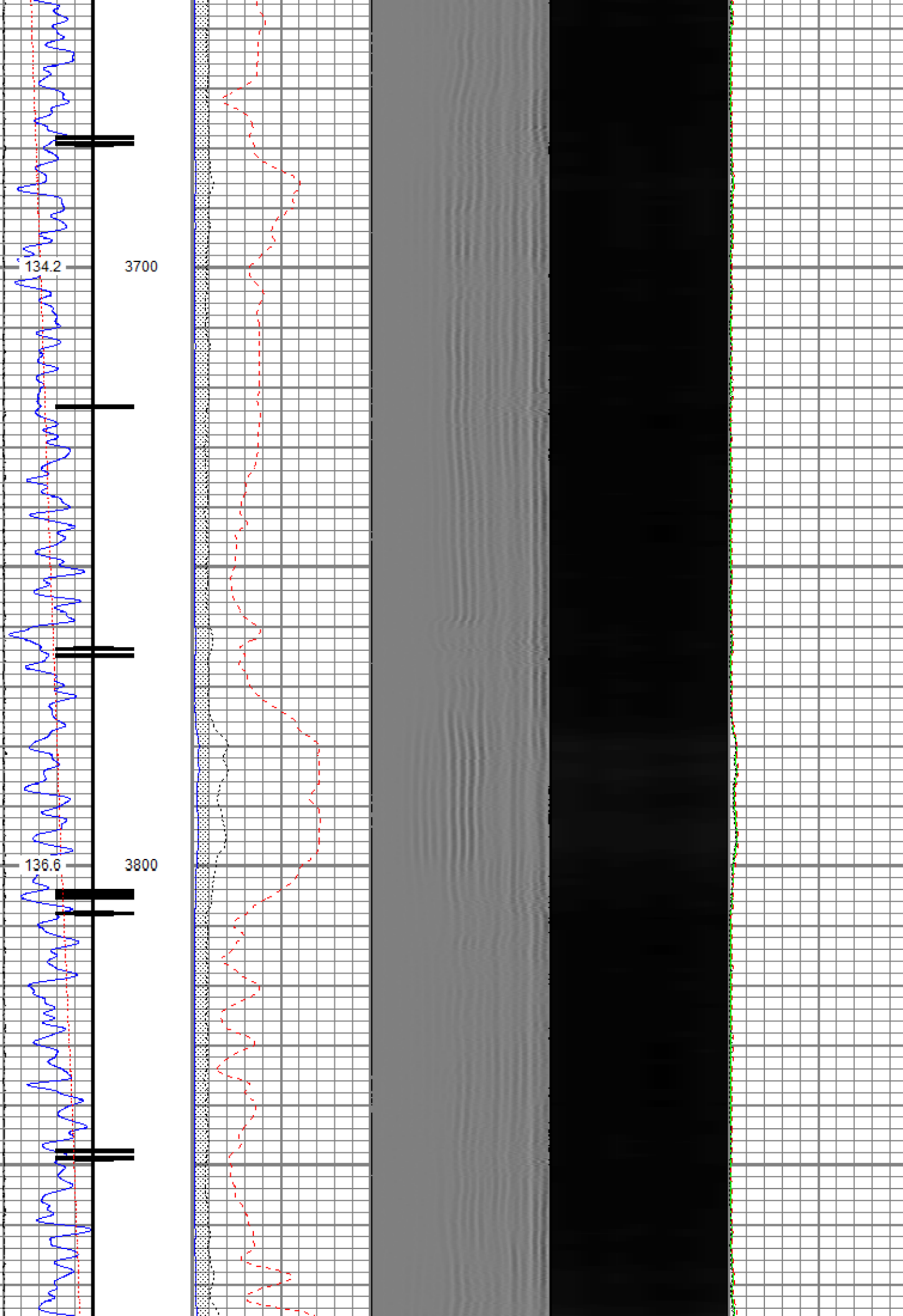


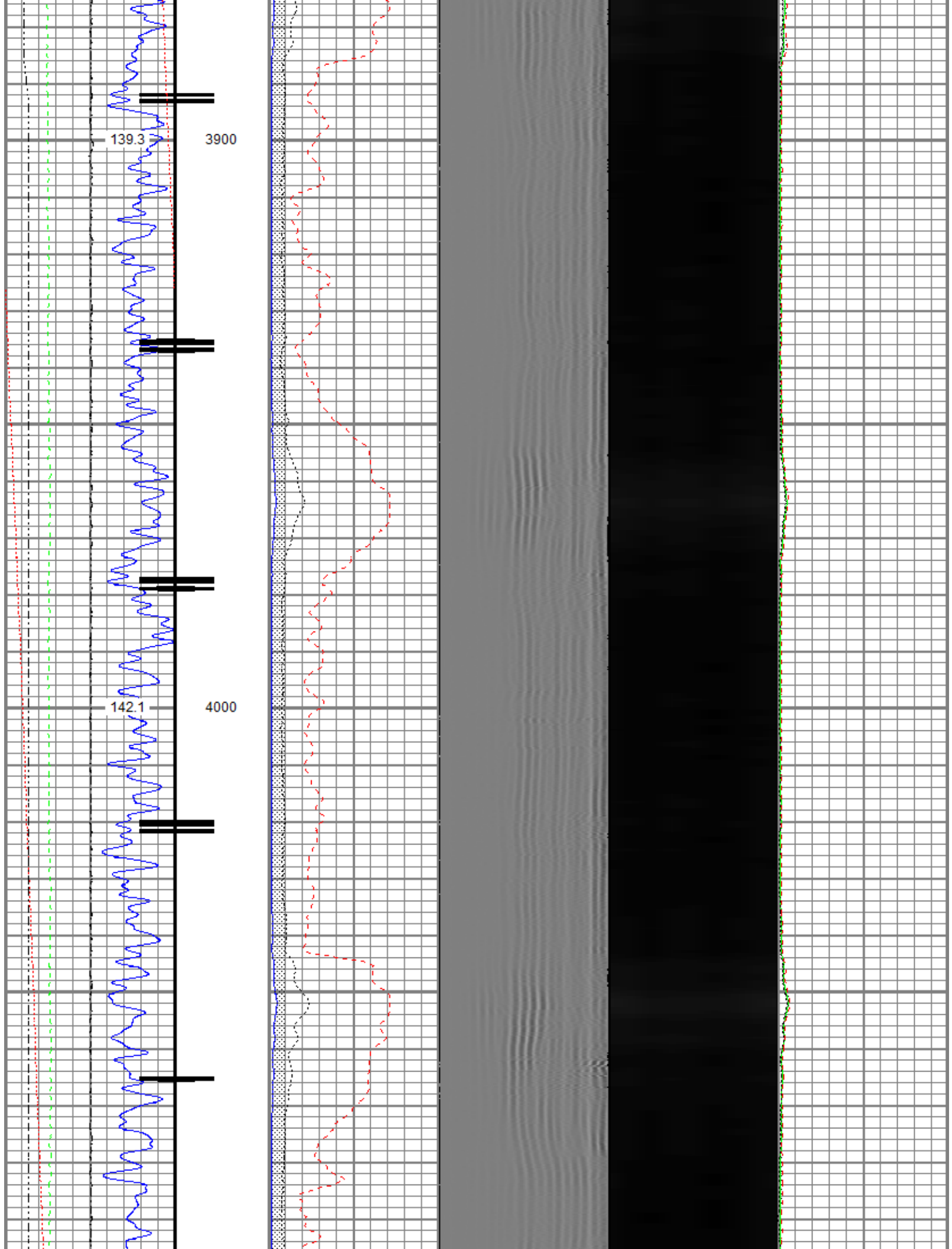




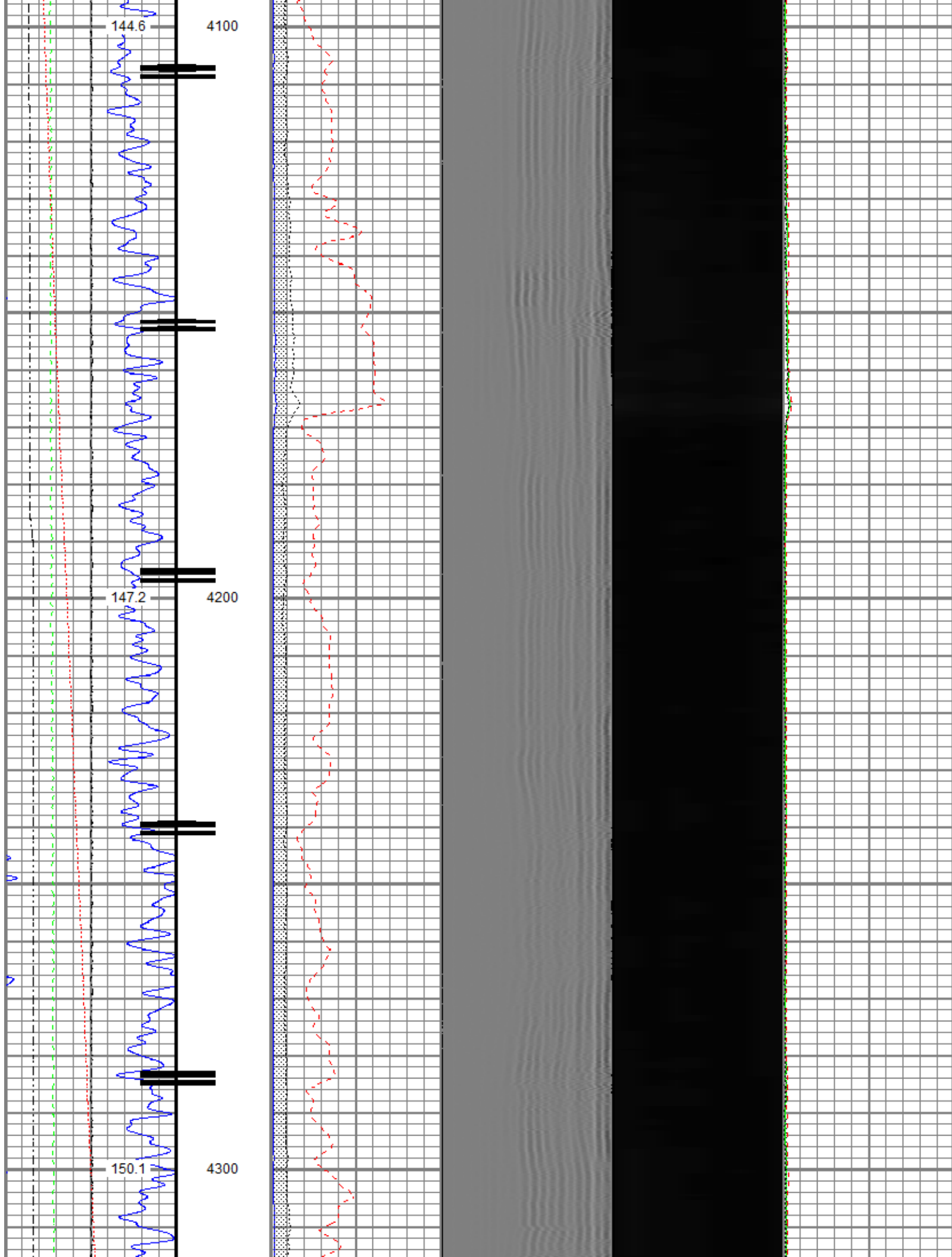


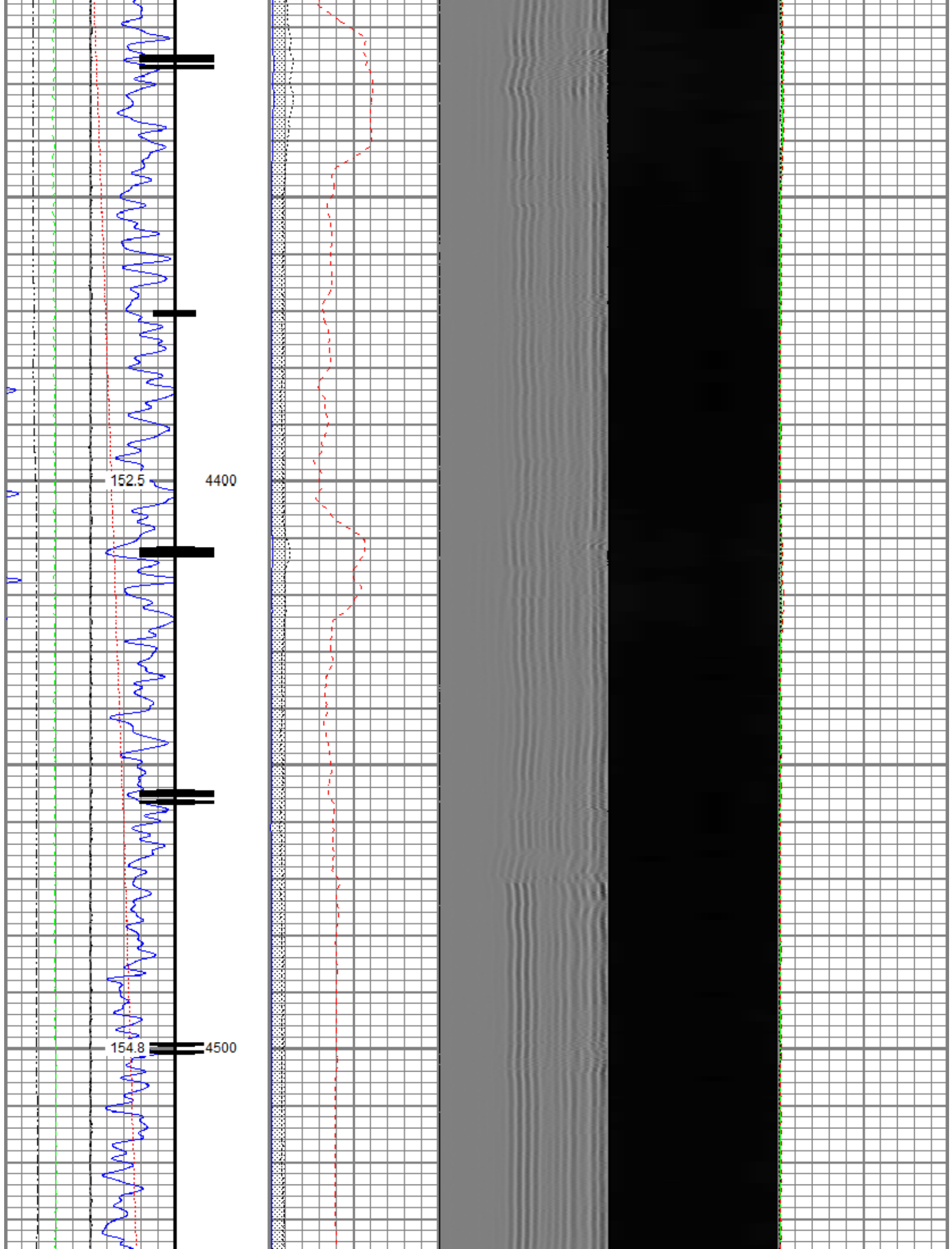


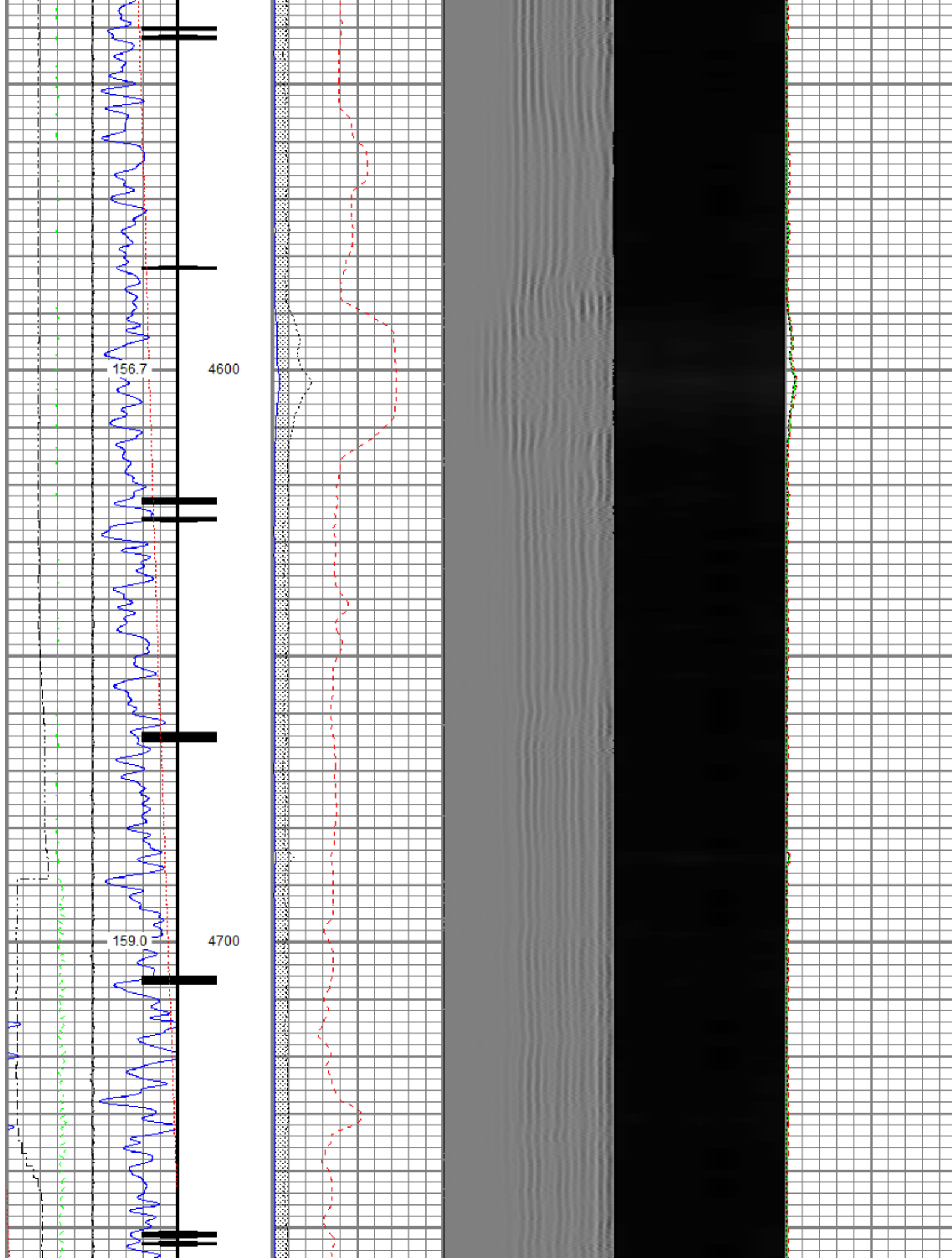


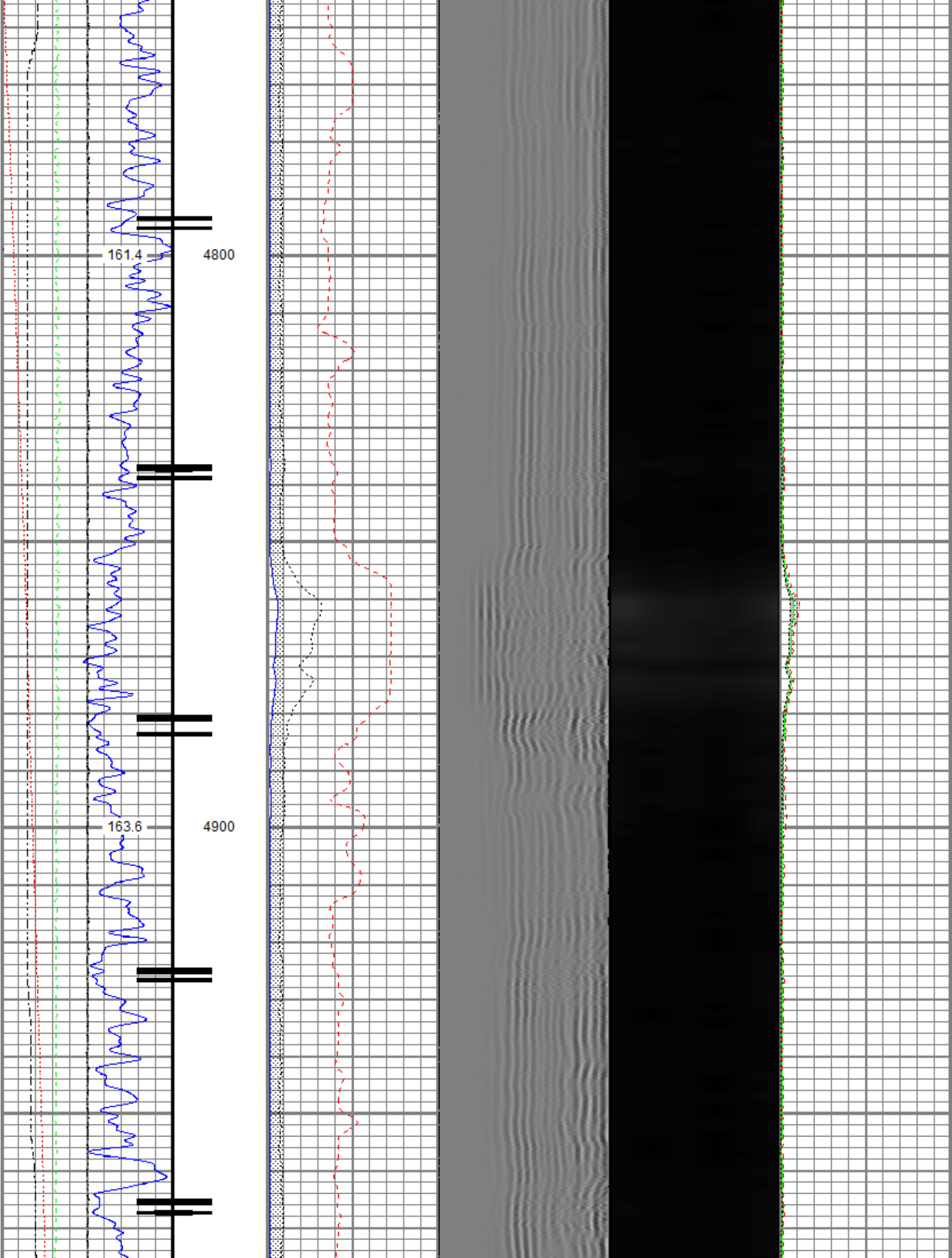




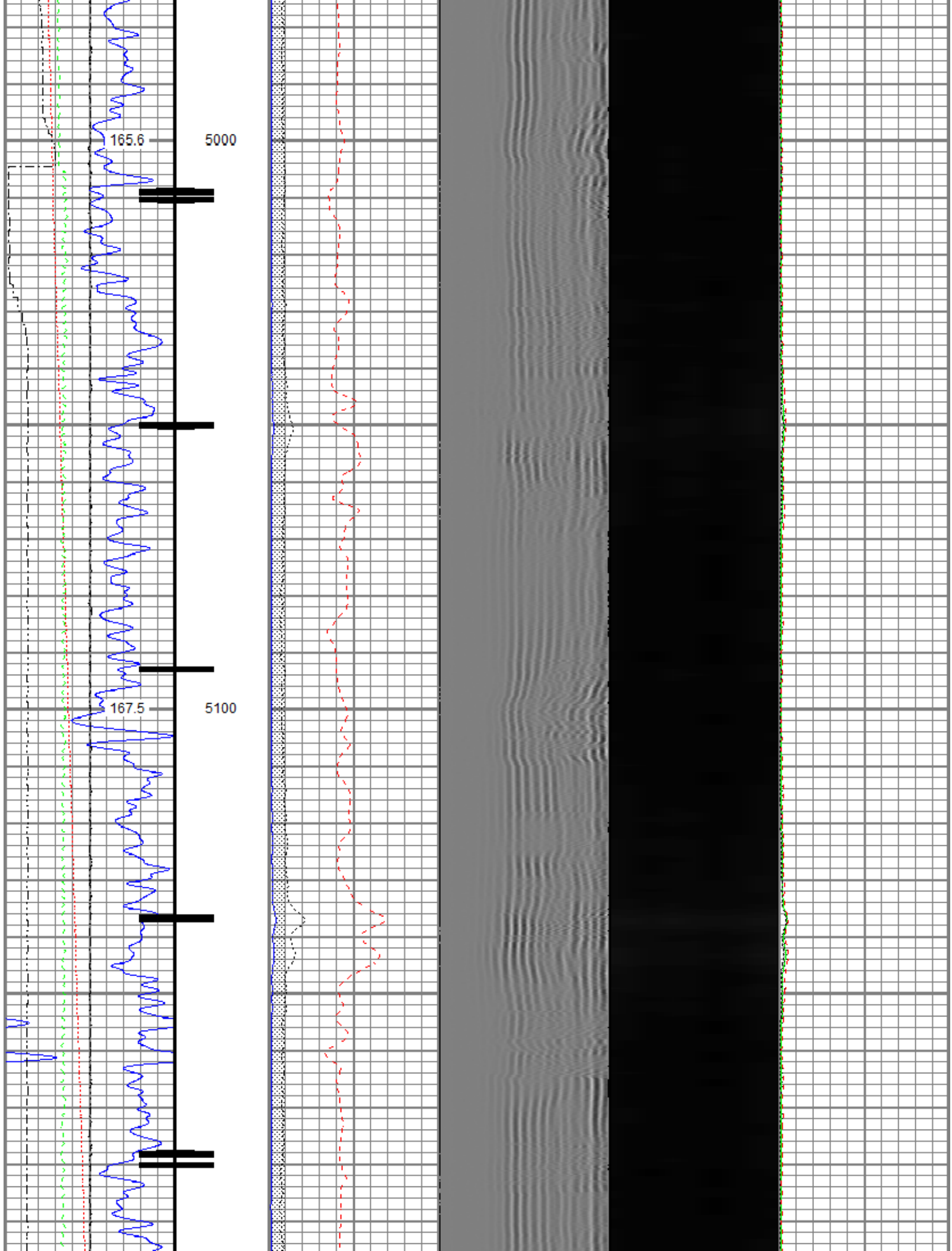


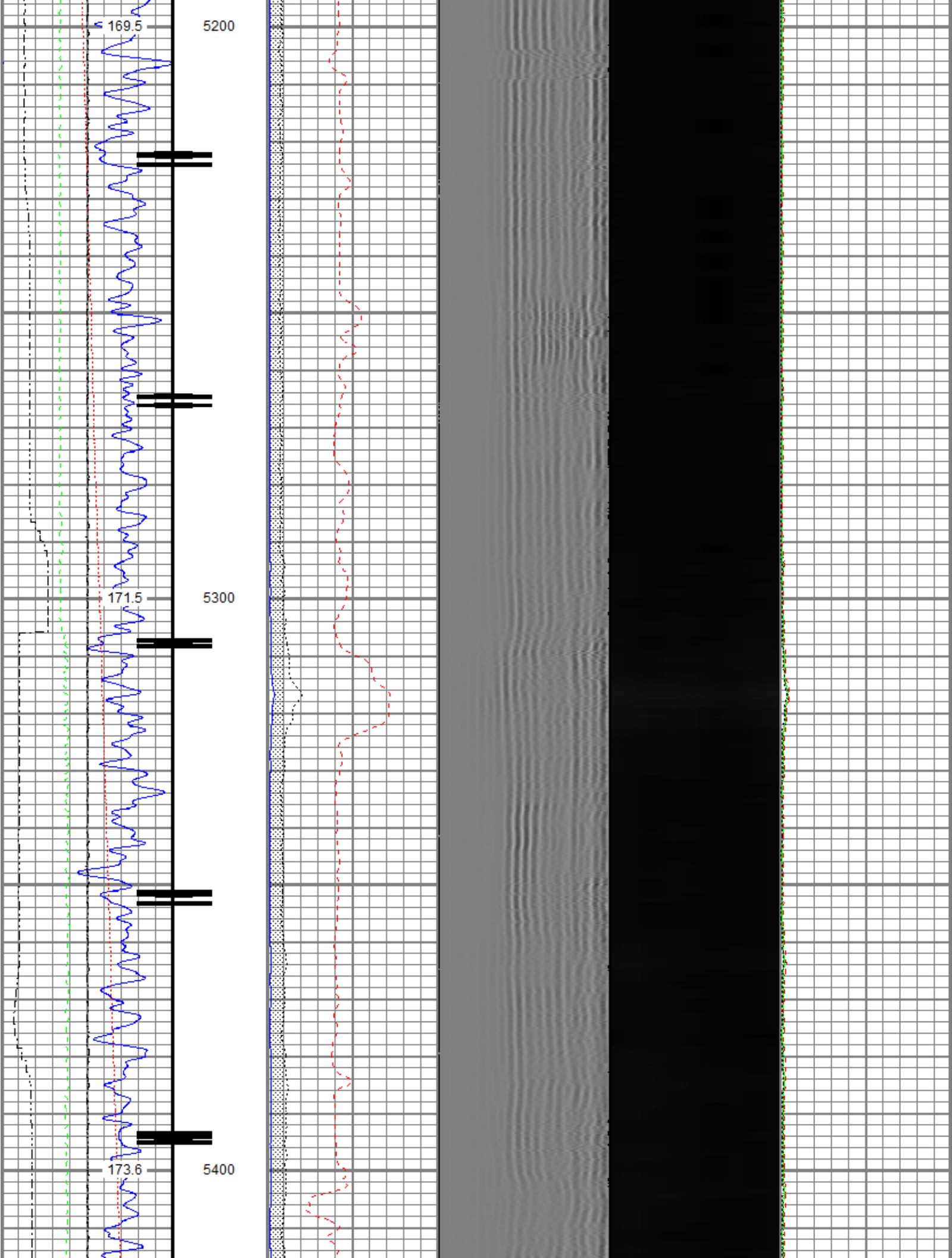


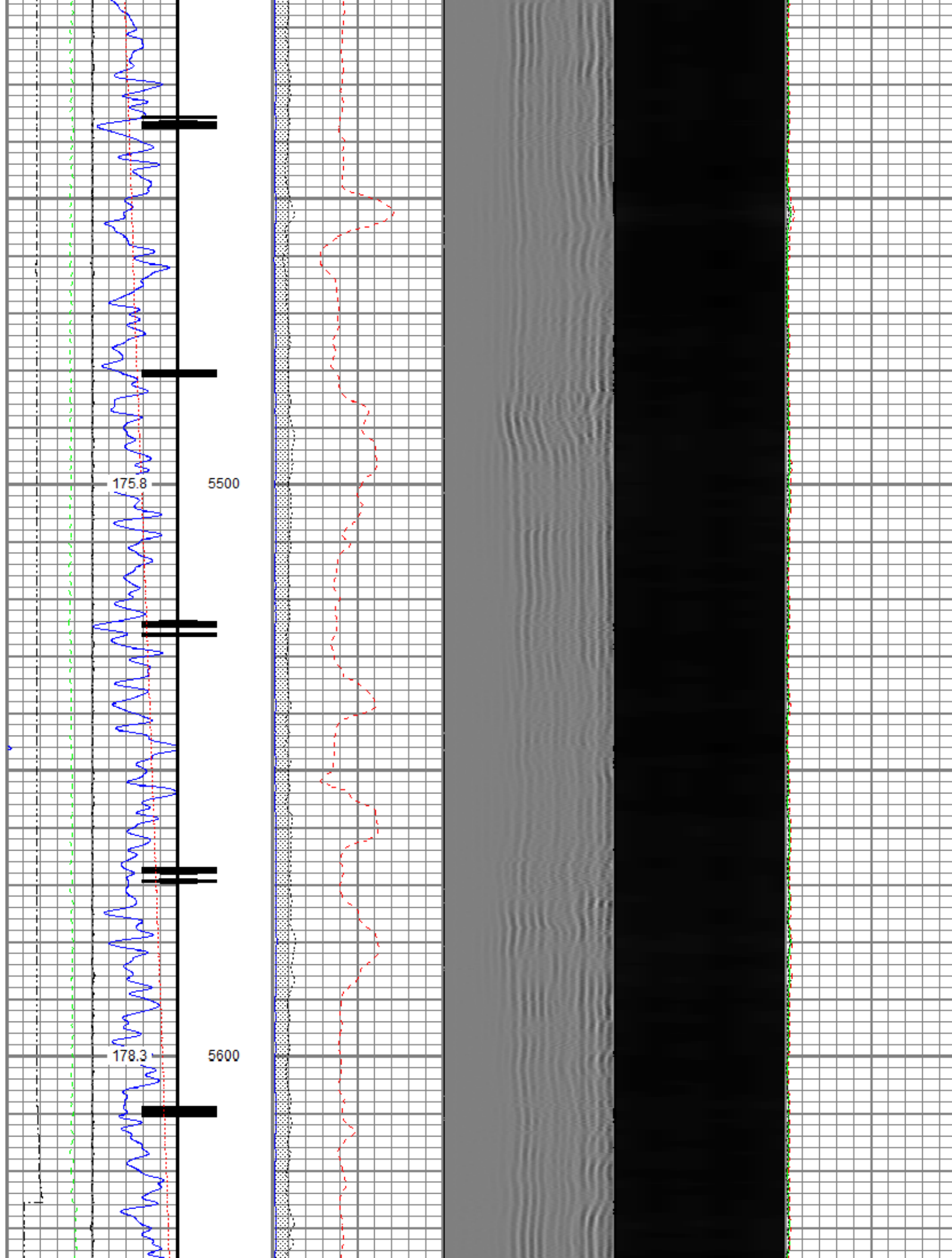


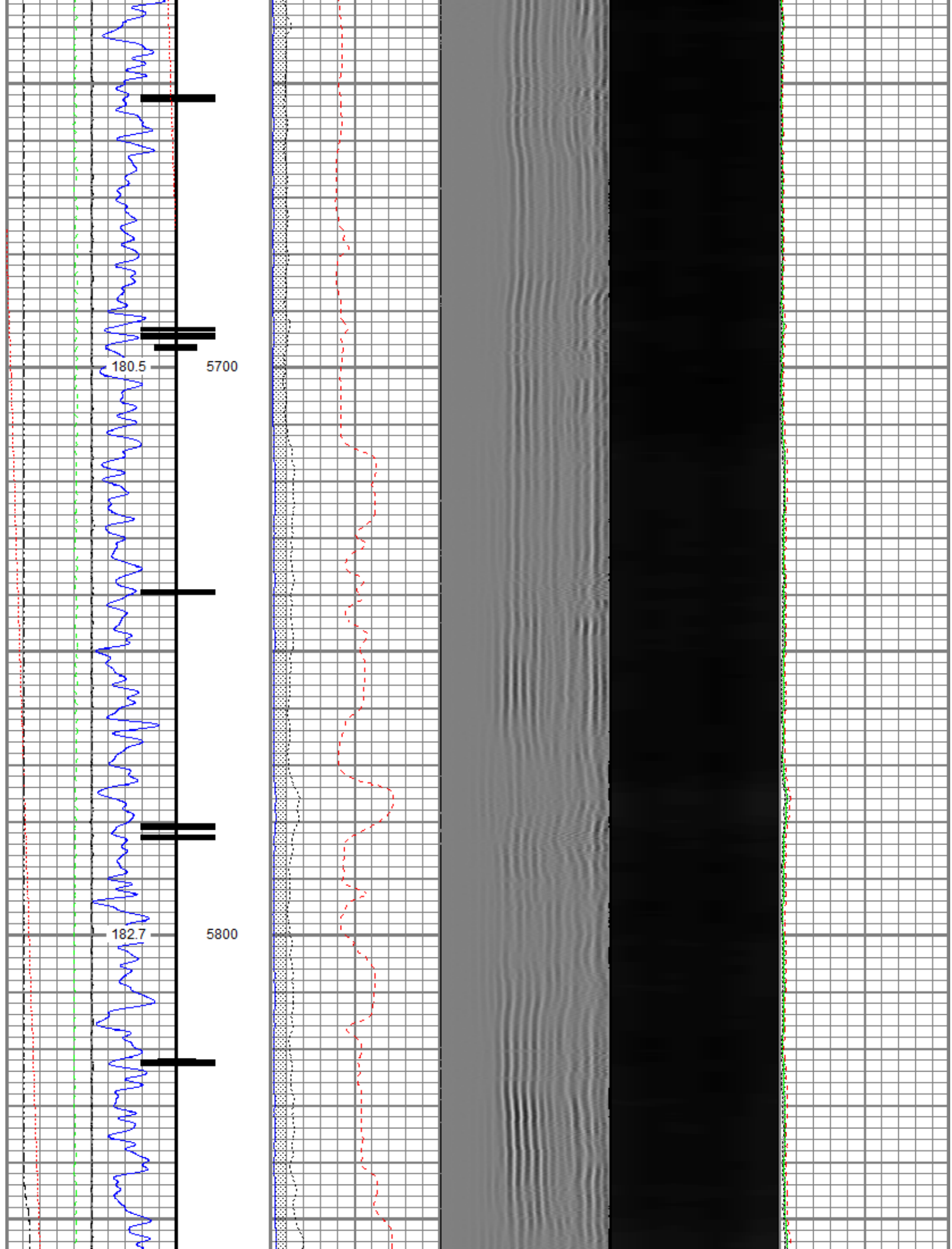




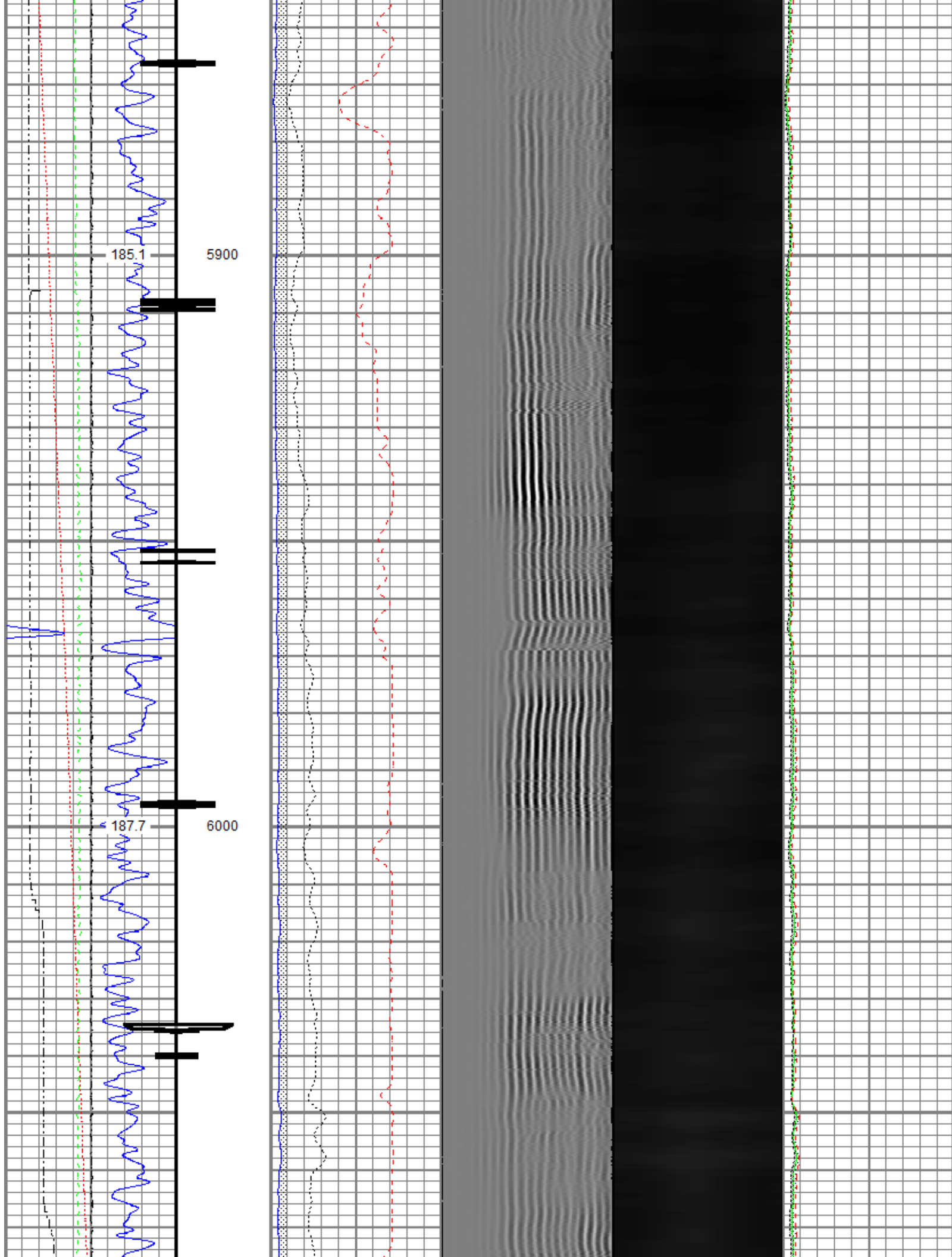


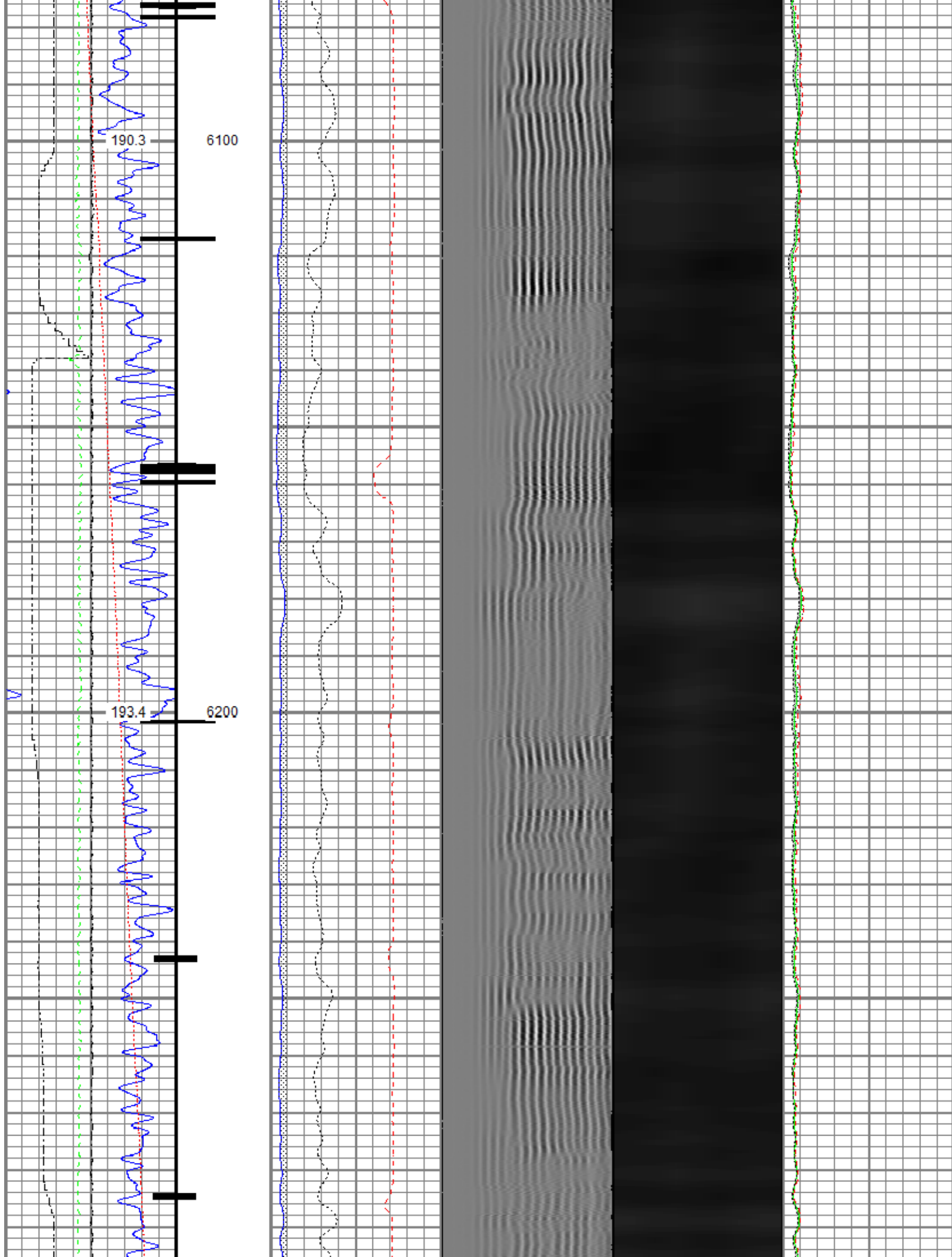


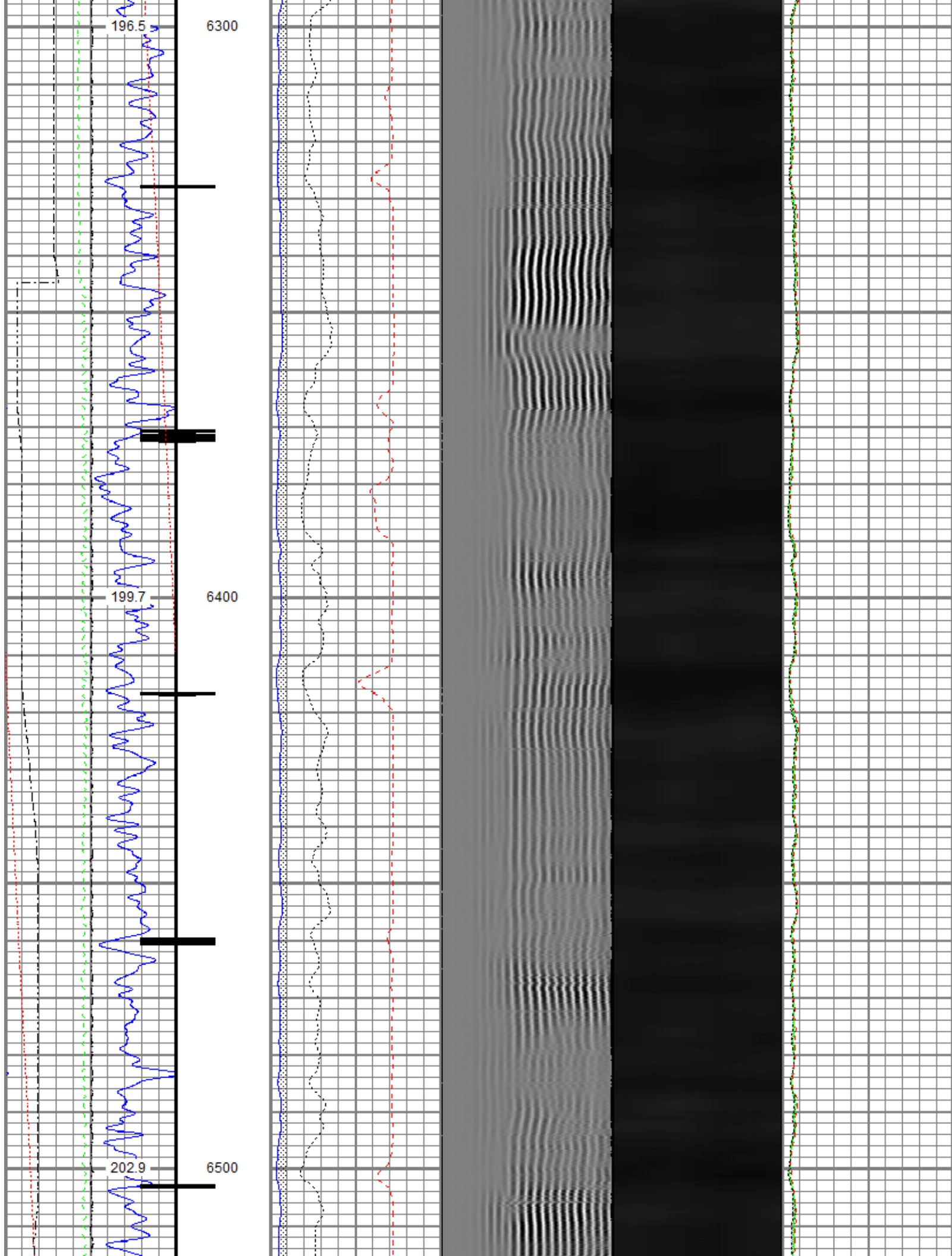


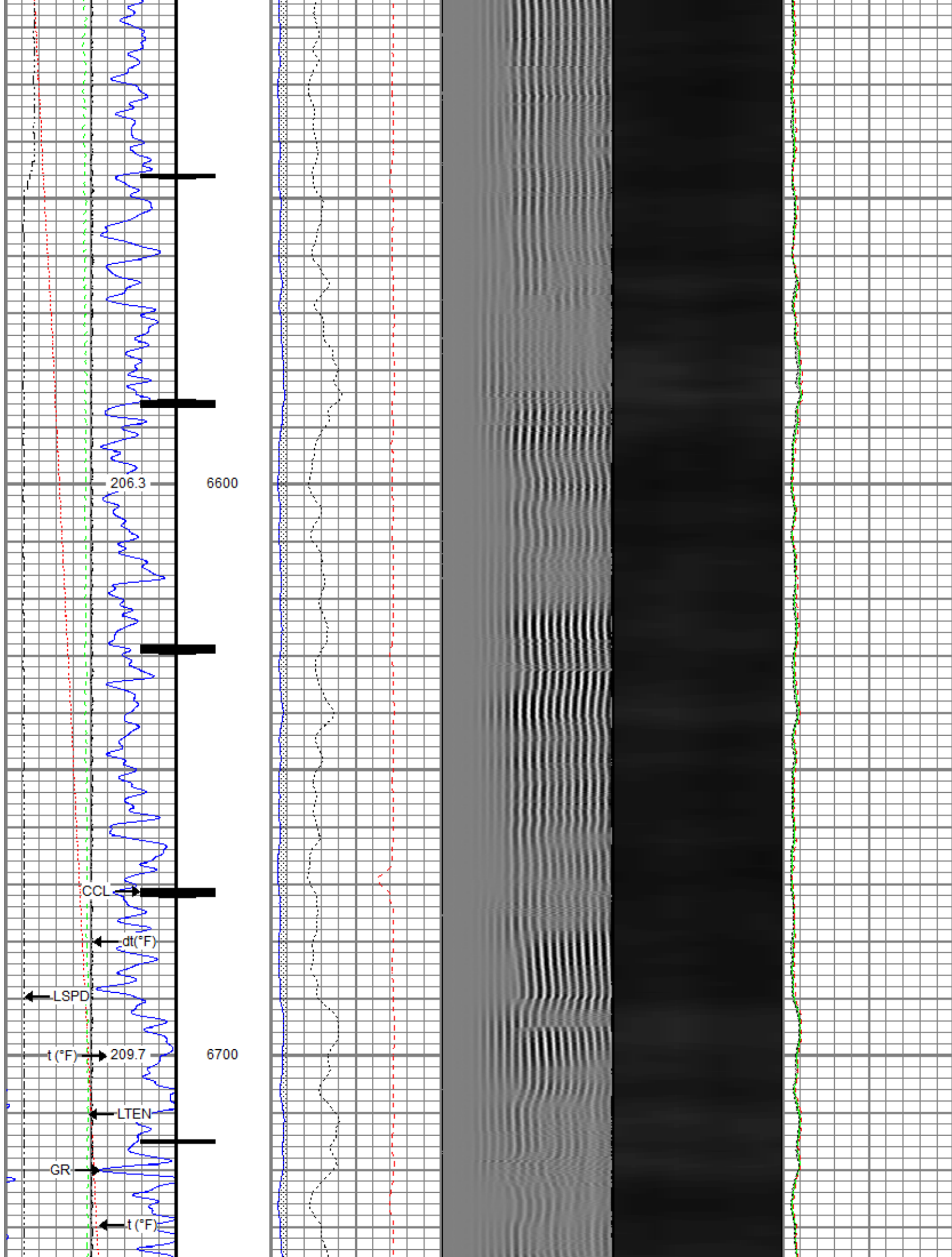




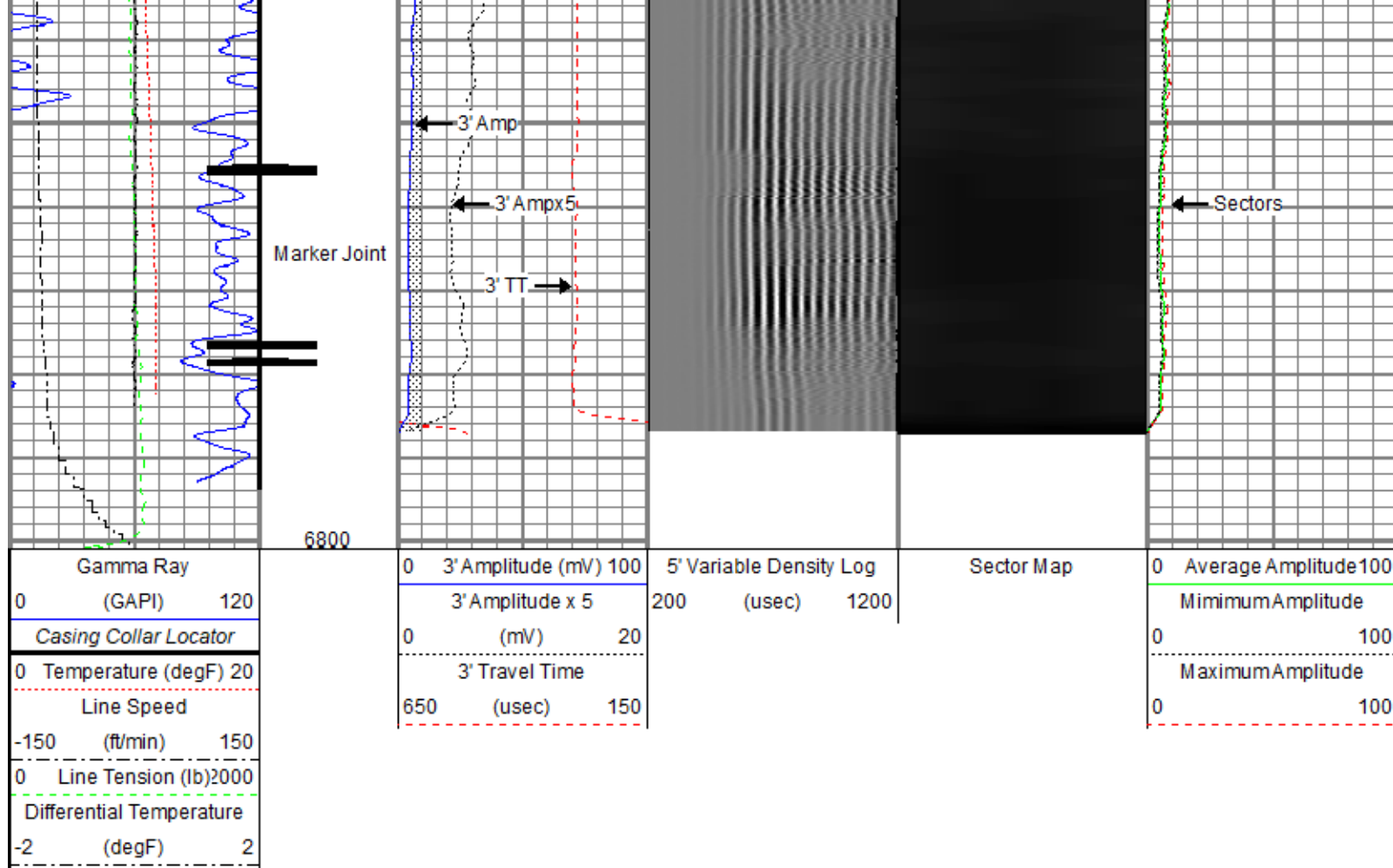








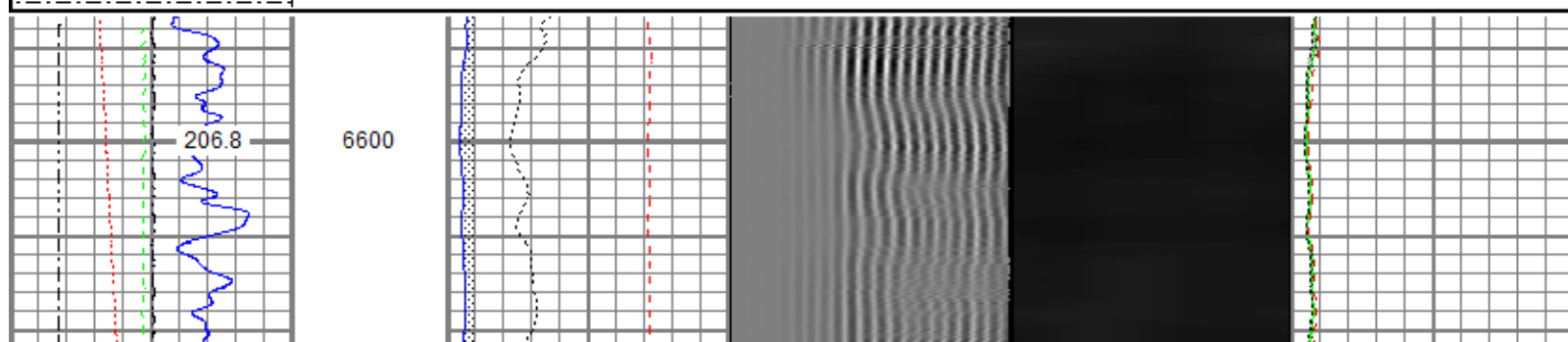
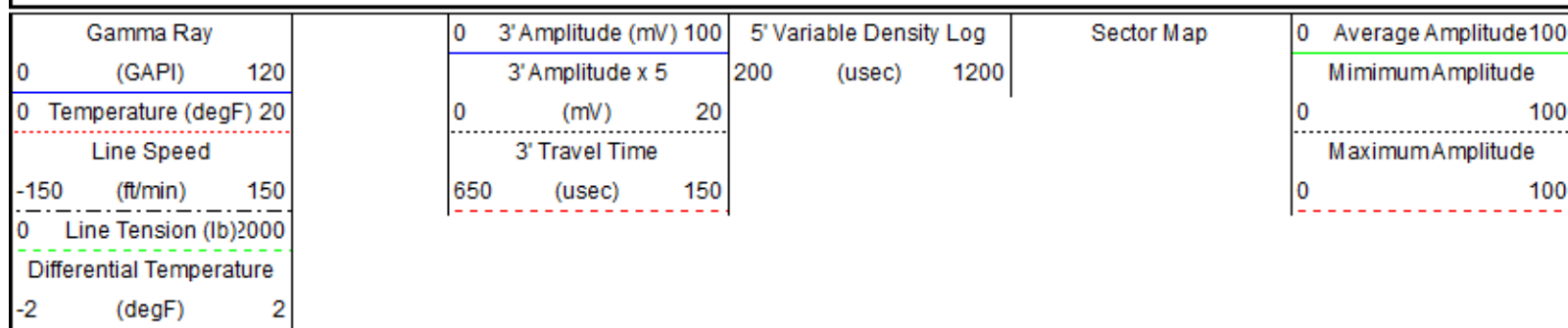


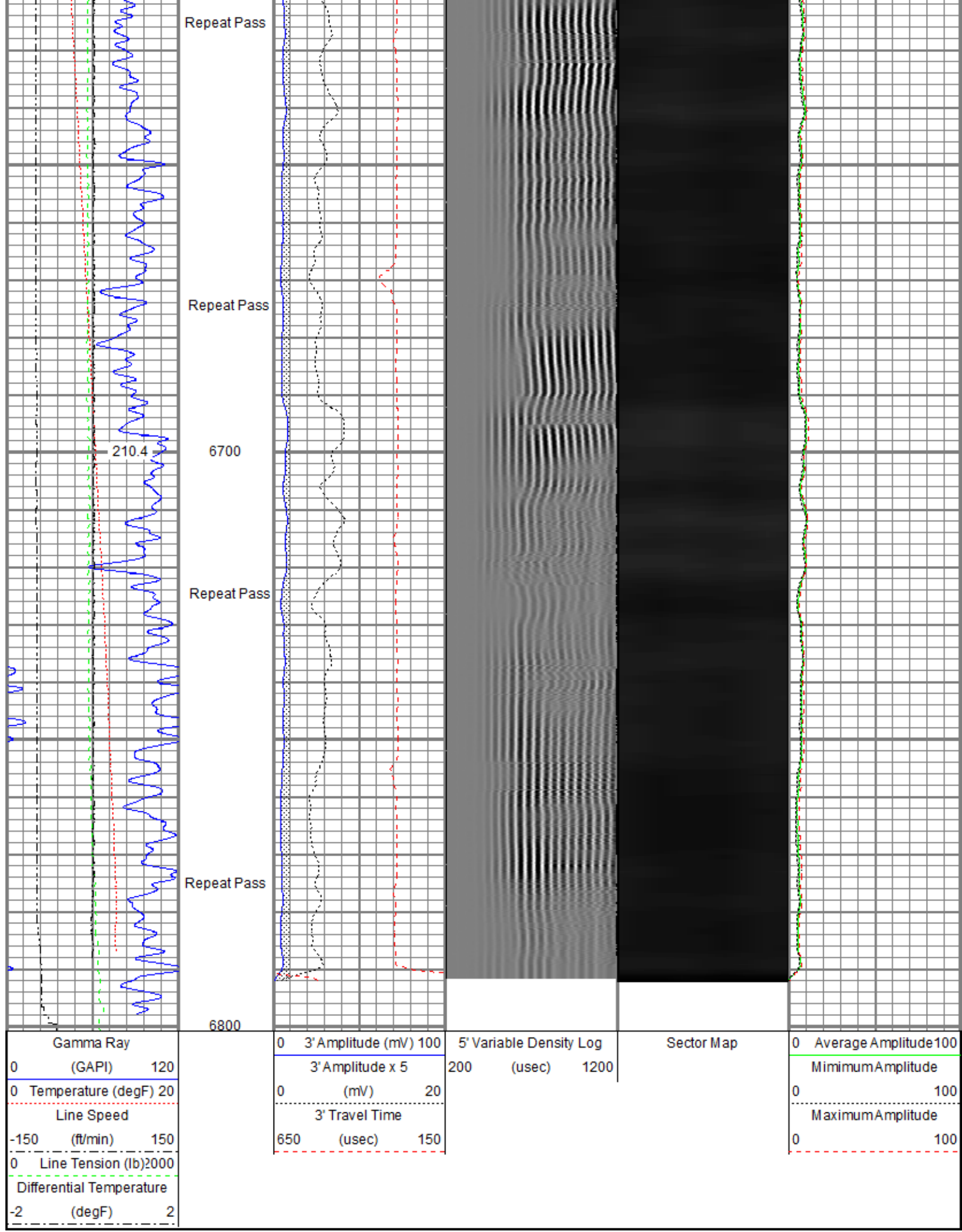


## Repeat Pass

Recorded With 2800 PSI Surface Induced Pressure

Database File: 0512346110\_anadarko\_azul 13-15hz\_rbl\_06-28-18\processed\_0512346110\_anadarko\_azul 13-15hz\_rbl\_06-28-18\_2800 psi  
 Dataset Pathname: pass2  
 Presentation Format: ros\_radrii  
 Dataset Creation: Thu Jun 28 16:28:44 2018  
 Charted by: Depth in Feet scaled 1:240





Repeat Pass

Repeat Pass

Repeat Pass

Repeat Pass

210.4

6700

6800

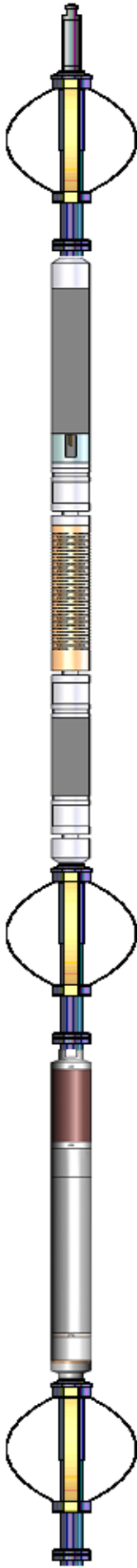
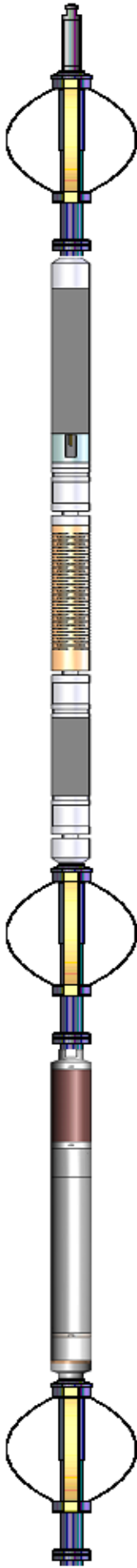
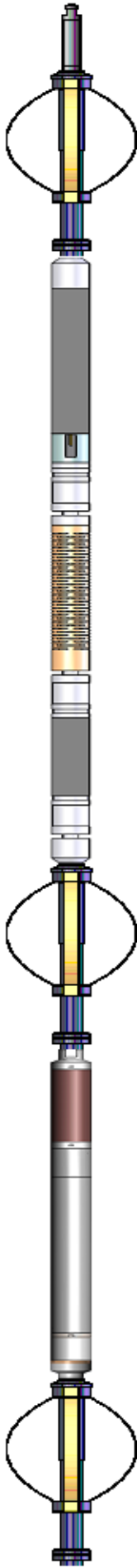
Gamma Ray		
0	(GAPI)	120
0	Temperature (degF)	20
Line Speed		
-150	(ft/min)	150
0	Line Tension (lb)	2000
Differential Temperature		
-2	(degF)	2

0	3' Amplitude (mV)	100
3' Amplitude x 5		
0	(mV)	20
3' Travel Time		
650	(usec)	150

5' Variable Density Log		
200	(usec)	1200

Sector Map

0	Average Amplitude	100
Minimum Amplitude		
0		100
Maximum Amplitude		
0		100

Sensor	Offset (ft)	Schematic	Description	Length (ft)	O.D. (in)	Weight (lb)
TEMP	17.33		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
WVFS8	15.09		Probe Radii-2750 RBT (FW1305-096) Probe 2-3/4" Radial Cement Bond Tool with Integral Temperature Sub	9.39	2.75	105.00
WVFS7	15.09					
WVFS6	15.09					
WVFS5	15.09					
WVFS4	15.09					
WVFS3	15.09					
WVFS2	15.09					
WVFS1	15.09					
WVFCAL	15.09					
WVF3FT	15.09					
WVF5FT	14.09					
HEADVOLT	10.84					
CCL\$2 CCL\$1	7.08		Probe CENT-2750 Probe 2-3/4" Electric Inline Bowspring Centralizer	2.88	2.75	20.00
	7.08					
GR	5.75		Probe GR-CCL-2750 6PB (101001) Probe 2-3/4" rev.1 Digital Scintillation Gamma Ray/CCL Combined with 6 Pin Bottom for CNT	4.80	2.75	55.00
			Probe ADPT-6P-GO Probe 2-3/4" 6-Pin Top to GO Bottom Adaptor Sub	0.28	2.75	2.00
			Probe CENT-2750 Probe 2-3/4" Electric Inline Bowspring Centralizer	2.88	2.75	20.00

Dataset: PROCESSED\_0512346110\_Anadarko\_Azul 13-15HZ\_RBL\_06-28-18\_2800 PSI.db: field/well/run1/pass4  
 Total length: 24.15 ft  
 Total weight: 225.60 lb  
 O.D.: 2.75 in

Calibration Report		
Database File	C:\ProgramData\Warrior\Data\0512346110_Anadarko_Azul 13-15HZ_RBL_06-28-18\PROCESSED_0512346110_Anadarko_Azul	
Dataset Pathname	pass4	
Dataset Creation	Thu Jun 28 16:33:14 2018	

#### Gamma Ray Calibration Report

Serial Number: 101001  
 Tool Model: 2750 6PB  
 Performed: Sun Nov 12 11:25:32 2017  
  
 Calibrator Value: 637.0 GAPI  
  
 Background Reading: 100.6 cps  
 Calibrator Reading: 981.1 cps  
  
 Sensitivity: 0.7235 GAPI/cps

#### Segmented Cement Bond Log Calibration Report

Serial Number: FW1305-096  
 Tool Model: 2750 RBT  
  
 Calibration Casing Diameter: 5.500 in  
 Calibration Depth: -62.051 ft

#### Master Calibration, performed (Derived):

	Raw (v)		Calibrated (mv)		Results	
	Zero	Cal	Zero	Cal	Gain	Offset
3'	0.000	0.469	0.800	71.921	151.814	0.728
CAL	0.006	0.502				
5'	-0.000	0.465	0.800	71.921	153.026	0.829
SUM						
S1	0.000	0.486	0.000	100.000	205.576	-0.010
S2	0.000	0.491	0.000	100.000	203.854	-0.072
S3	0.000	0.479	0.000	100.000	208.773	-0.010
S4	-0.003	0.485	0.000	100.000	205.009	0.623
S5	-0.003	0.499	0.000	100.000	199.240	0.618
S6	0.001	0.497	0.000	100.000	201.409	-0.149
S7	0.001	0.483	0.000	100.000	207.457	-0.238
S8	0.001	0.475	0.000	100.000	210.990	-0.178

#### Internal Reference Calibration, performed (Not Performed):

	Raw (v)		Calibrated (v)		Results	
	Zero	Cal	Zero	Cal	Gain	Offset
CAL	0.000	0.000	0.006	0.502	1.000	0.000

#### Air Zero Calibration, performed Thu Jun 28 06:56:00 2018:

	Raw (v)	Calibrated (v)	Results
	Zero	Zero	Offset
3'	0.006	0.000	-0.000
5'	0.006	0.000	-0.000
SUM			
S1	0.006	0.000	-0.001
S2	0.006	0.000	-0.000
S3	0.006	0.000	0.000
S4	0.006	0.000	0.000
S5	0.006	0.000	0.000
S6	0.006	0.000	0.000

S7	0.005	0.000	0.001
S8	0.006	0.000	0.000

Temperature Calibration Report

Serial Number: FW1305-096  
Tool Model: 2750 RBT  
Performed: Sun Nov 12 13:42:10 2017

	Reference	Reading
Low Reference:	100.00 degF	109.43 degF
High Reference:	350.00 degF	405.87 degF

Gain: 0.84  
Offset: 7.72  
Delta Spacing 1



**Company** Kerr-McGee Oil & Gas Onshore, L.P.  
**Well** Azul 13-15HZ  
**Field** Wattenberg  
**County** Weld  
**State** Colorado