



Radial Cement Bond  
Gamma Ray  
Casing Collar Log

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

Well Pettinger 18-4HZ

Field Wattenberg

County Weld State Colorado

Location: API #: 05-123-47350

SEC 18 TWP 1N RGE 65W

Permanent Datum Ground Level Elevation 4996'  
Log Measured From Kelly Bushing 21 FT  
Drilling Measured From Kelly Bushing

Other Services  
JB/GR  
RBP  
RBL 0 PSI  
Elevation  
K.B. 5017'  
D.F. ---  
G.L. 4996'

Company Kerr-McGee Oil & Gas Onshore, L.P.  
Well Pettinger 18-4HZ  
Field Wattenberg  
County Weld  
State Colorado

Date	25-OCT-2018	Run Number	Four
Depth Driller	12986 FT	Depth Logger	6545 FT
Bottom Logged Interval	6530 FT	Top Log Interval	Surface
Open Hole Size	7.875"	Type Fluid	Water
Density / Viscosity	8.34 lb/gal	Max. Recorded Temp.	211°F
Estimated Cement Top	See Log	Time Well Ready	ROA
Time Logger on Bottom	10:45	Equipment Number	HD-363
Location	Plateville, CO	Recorded By	M. Hayes
Witnessed By	Justin McMillan		
Borehole Record		Tubing Record	
Run Number	Bit	From	To
		Size	Weight
		From	To
Casing Record	Size (in)	Wgt (lbs/ft)	Grade
Surface Casing	9 5/8	36	J-55
Intermediate #1	5 1/2	17	HCP 110
Intermediate #2			Surface
Inner			Bottom
			1837 FT
			12958 FT

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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 Kelly Bushing of 21 FT  
Adjusted -7 FT to correlate with Kelly Bushing  
Gauge Ring/Junk Basket ran down to 7510 FT  
Casing Tally reported Marker Joint at 6613 FT was not logged due to RBP set depth  
Log ran with 2800 PSI Surface Induced Pressure  
Logging tools were clean and free of any debris upon completion of operations  
  
Thank you for choosing Reliance Oilfield Services, LLC!!

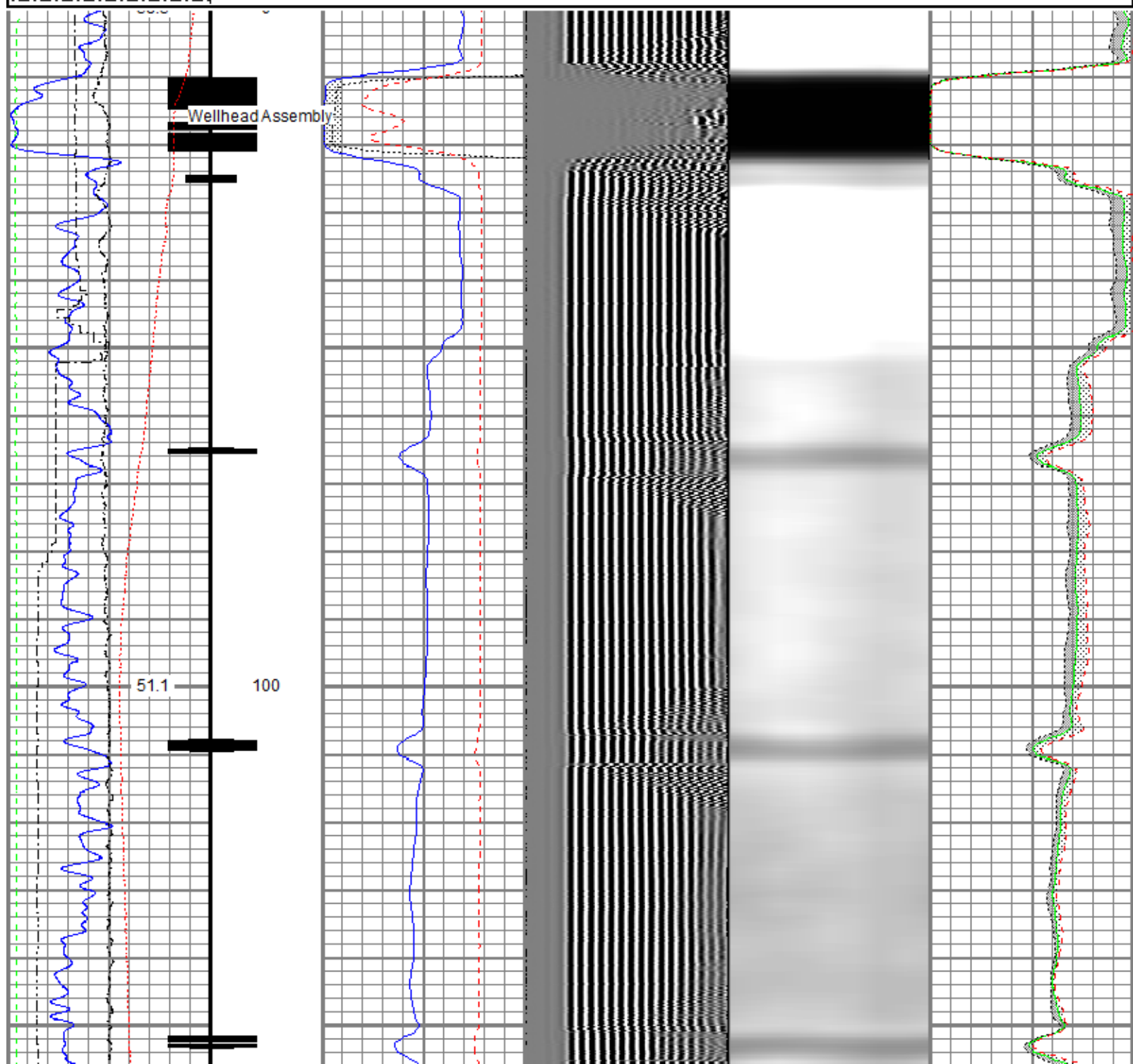
Main Pass

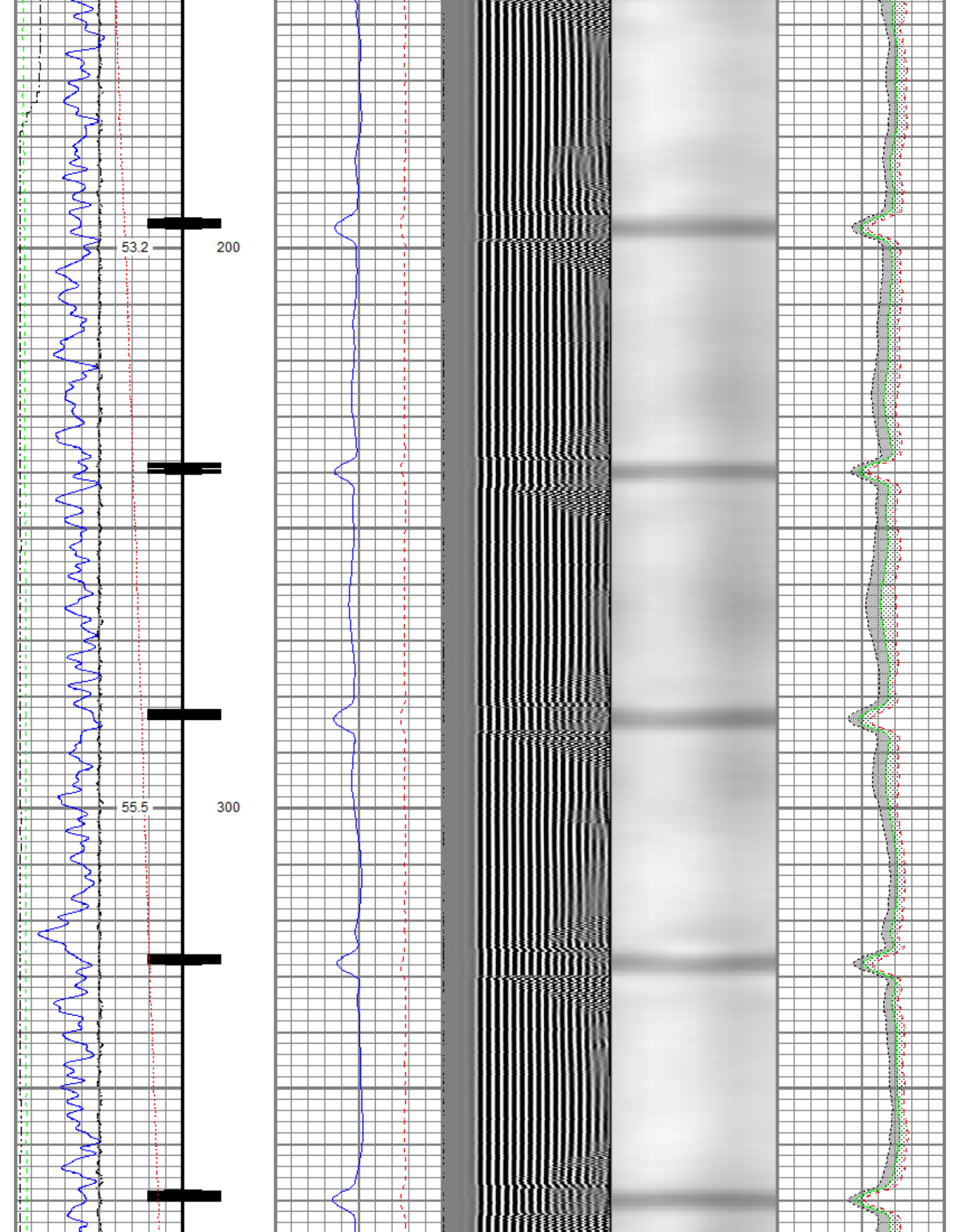


Recorded With 2800 PSI Surface Induced Pressure

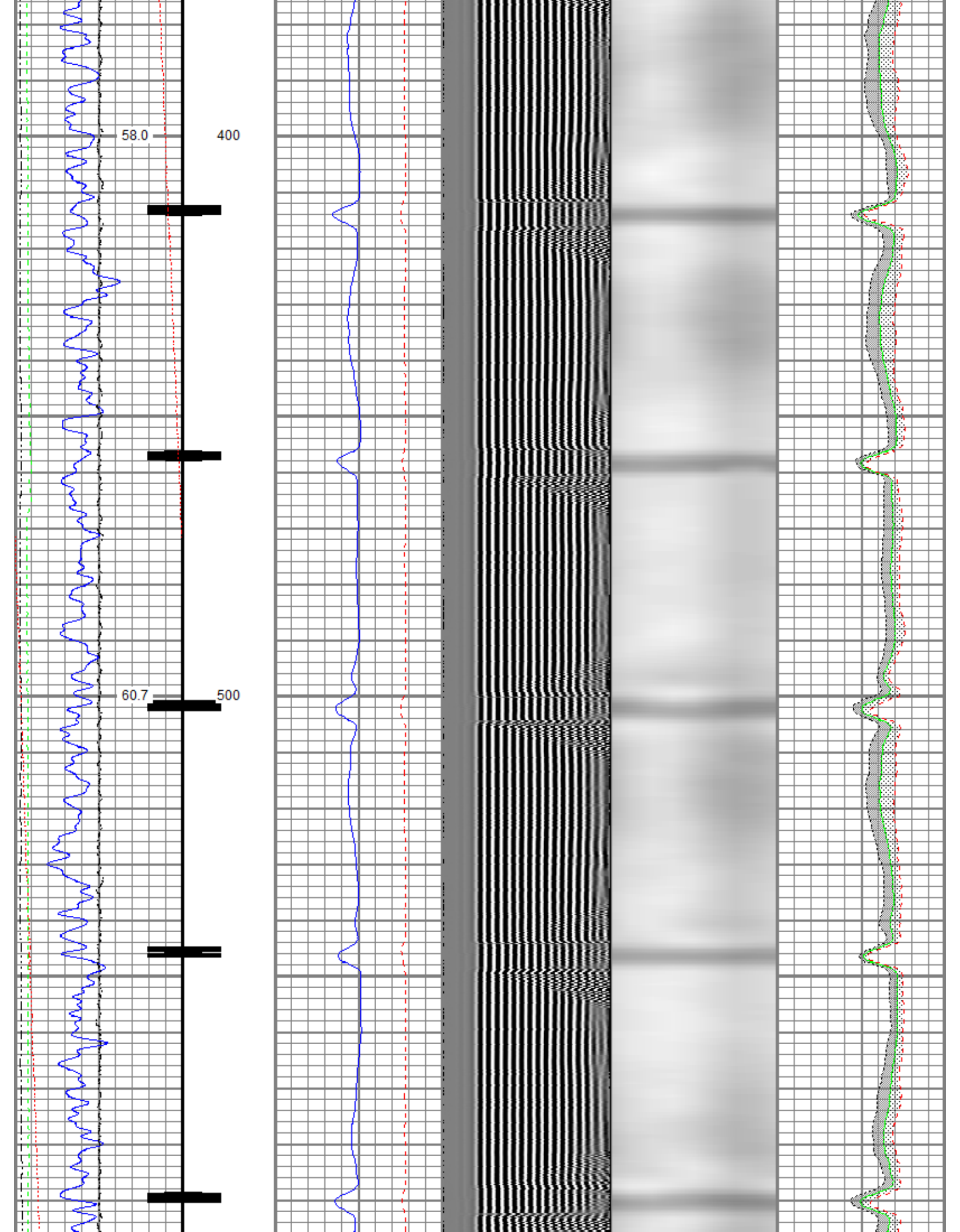
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Dataset Pathname	pass4.2
Presentation Format	ros_radri
Dataset Creation	Fri Oct 26 14:21:11 2018
Charted by	Depth in Feet scaled 1:240

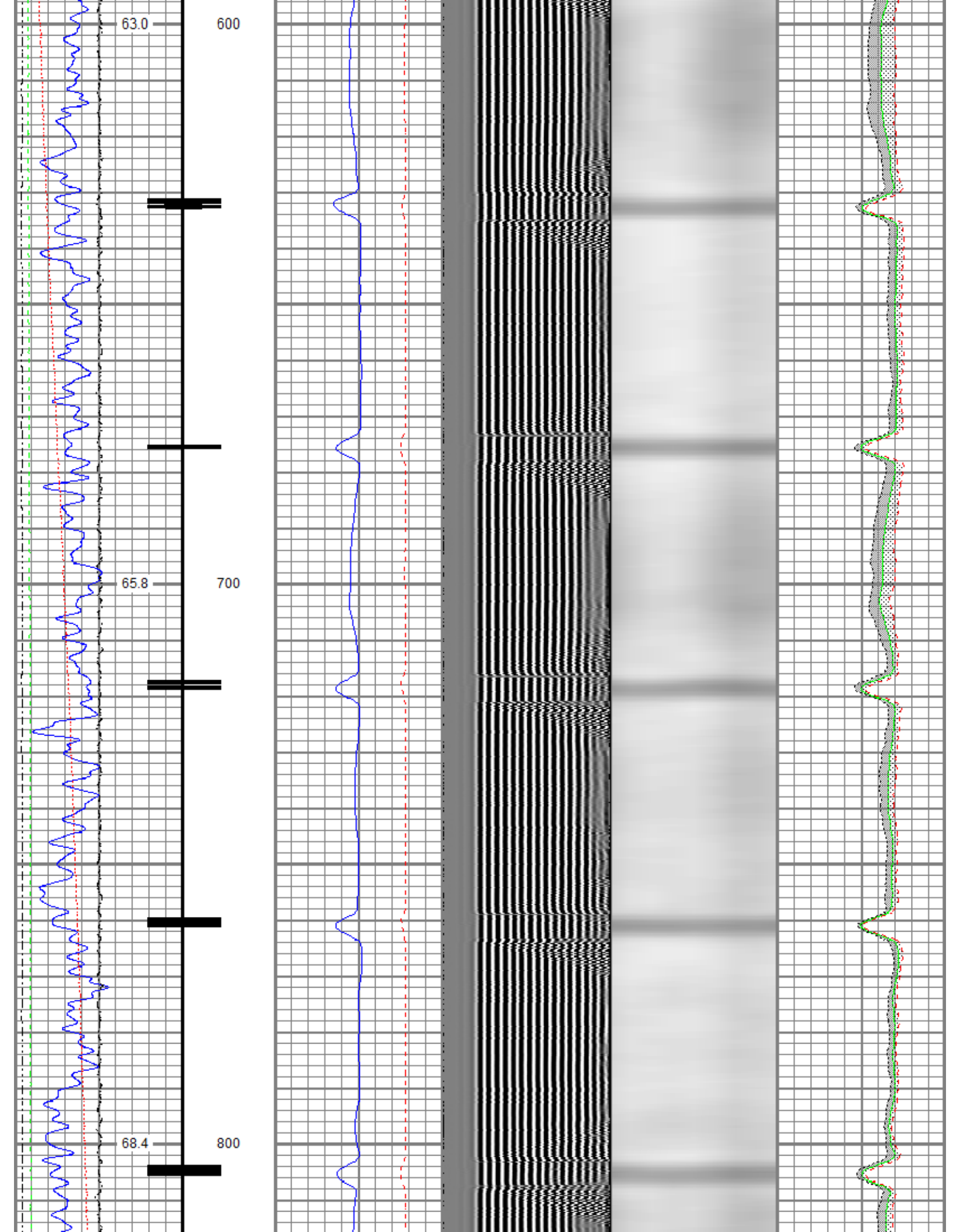
Gamma Ray	0	3' Amplitude (mV) 100	5' Variable Density Log	Sector Map	0	Average Amplitude 100
(GAPI) 120		3' Amplitude x 5	200			Minimum Amplitude
Casing Collar Locator	0	(mV) 20			0	100
Temperature (degF) 20		3' Travel Time				Maximum Amplitude
Line Speed	650	(usec) 150			0	100
(ft/min) 150						
Line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

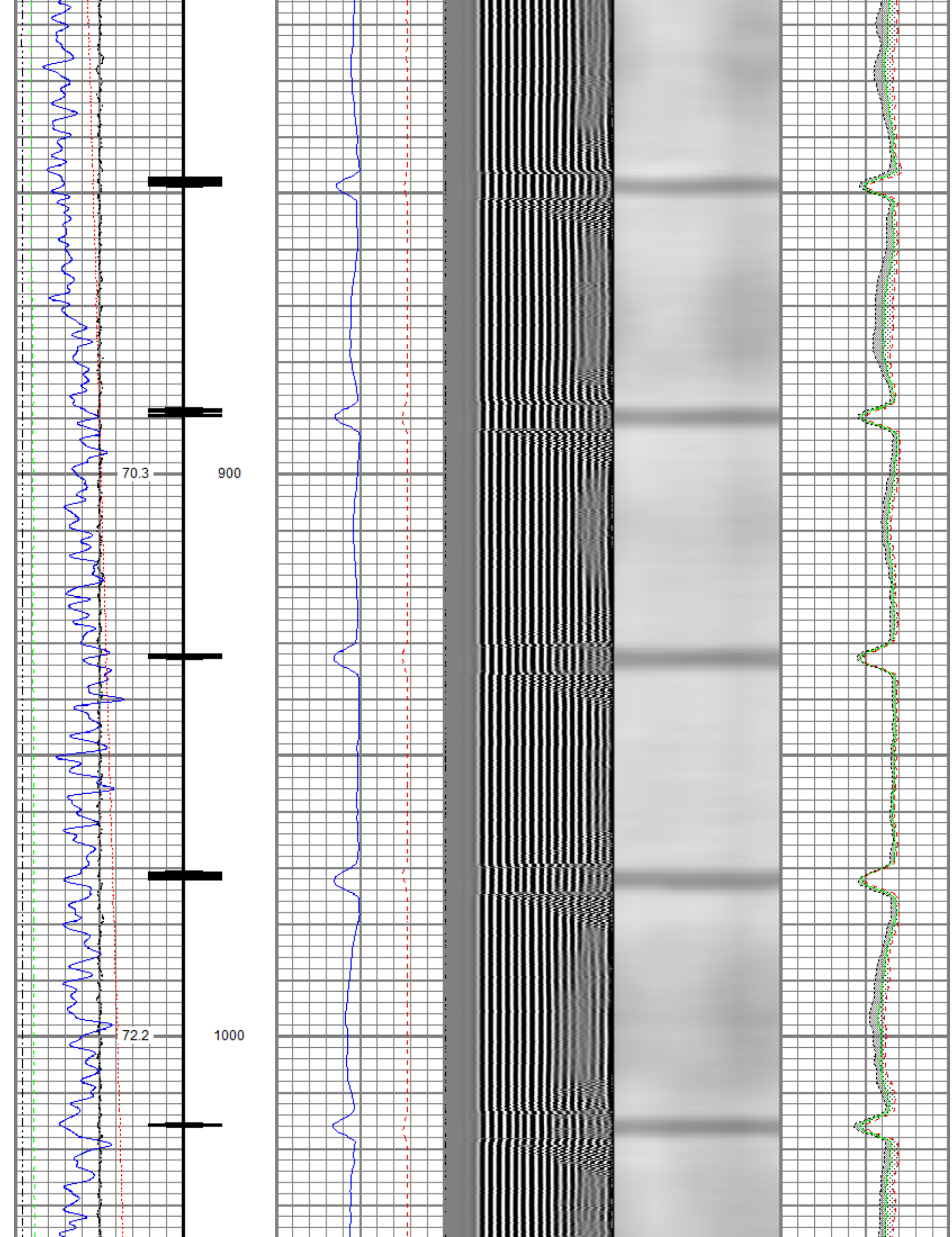




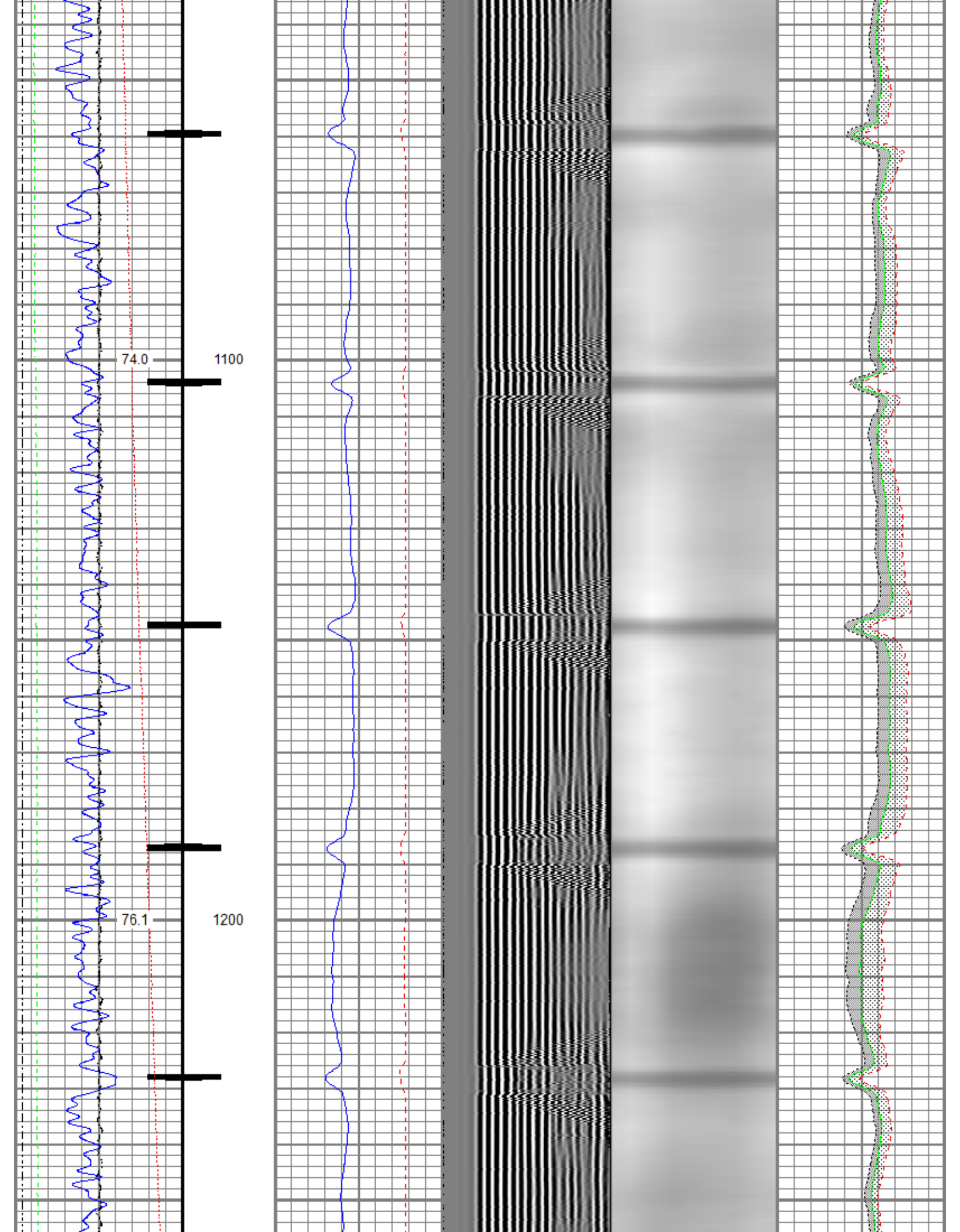


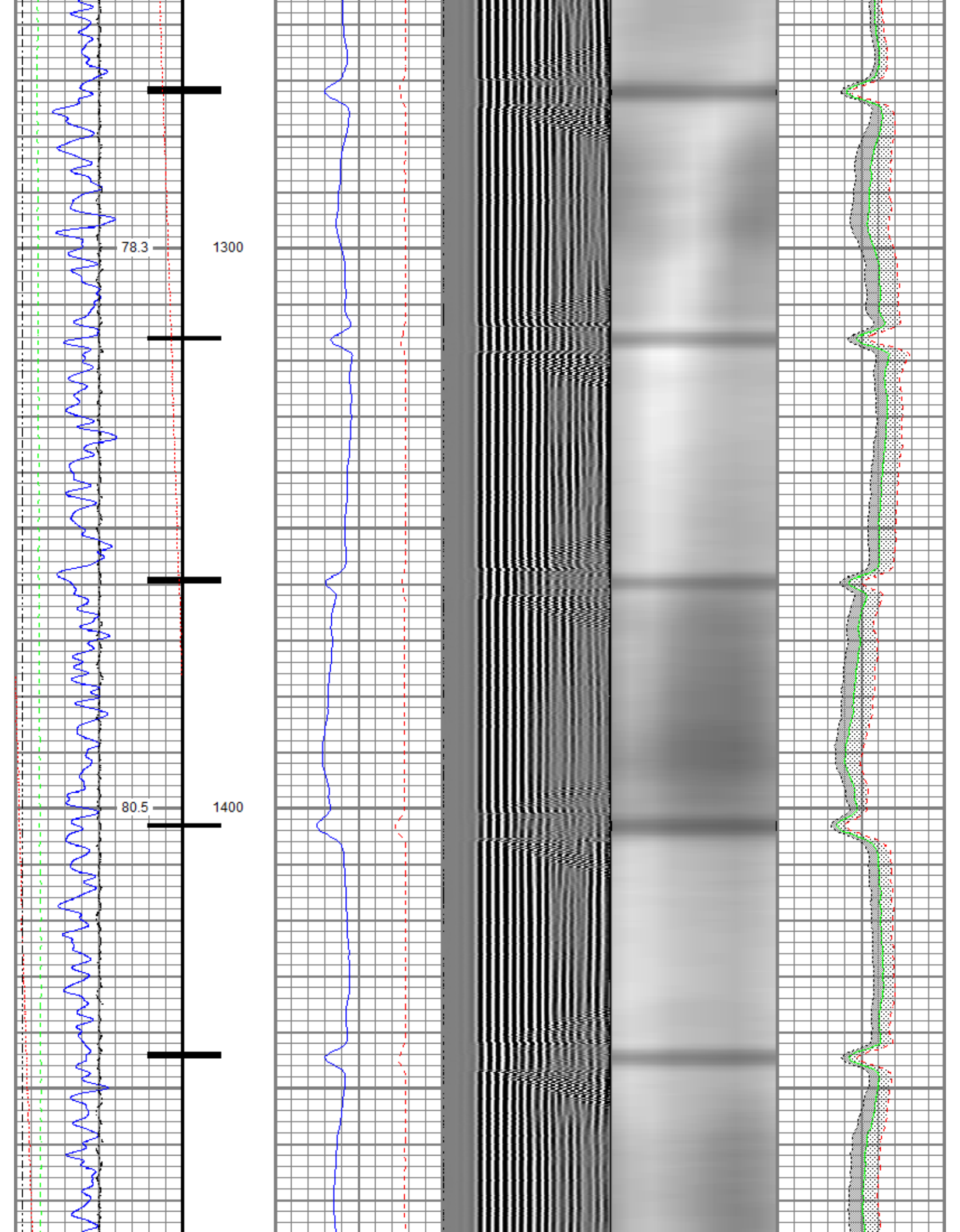




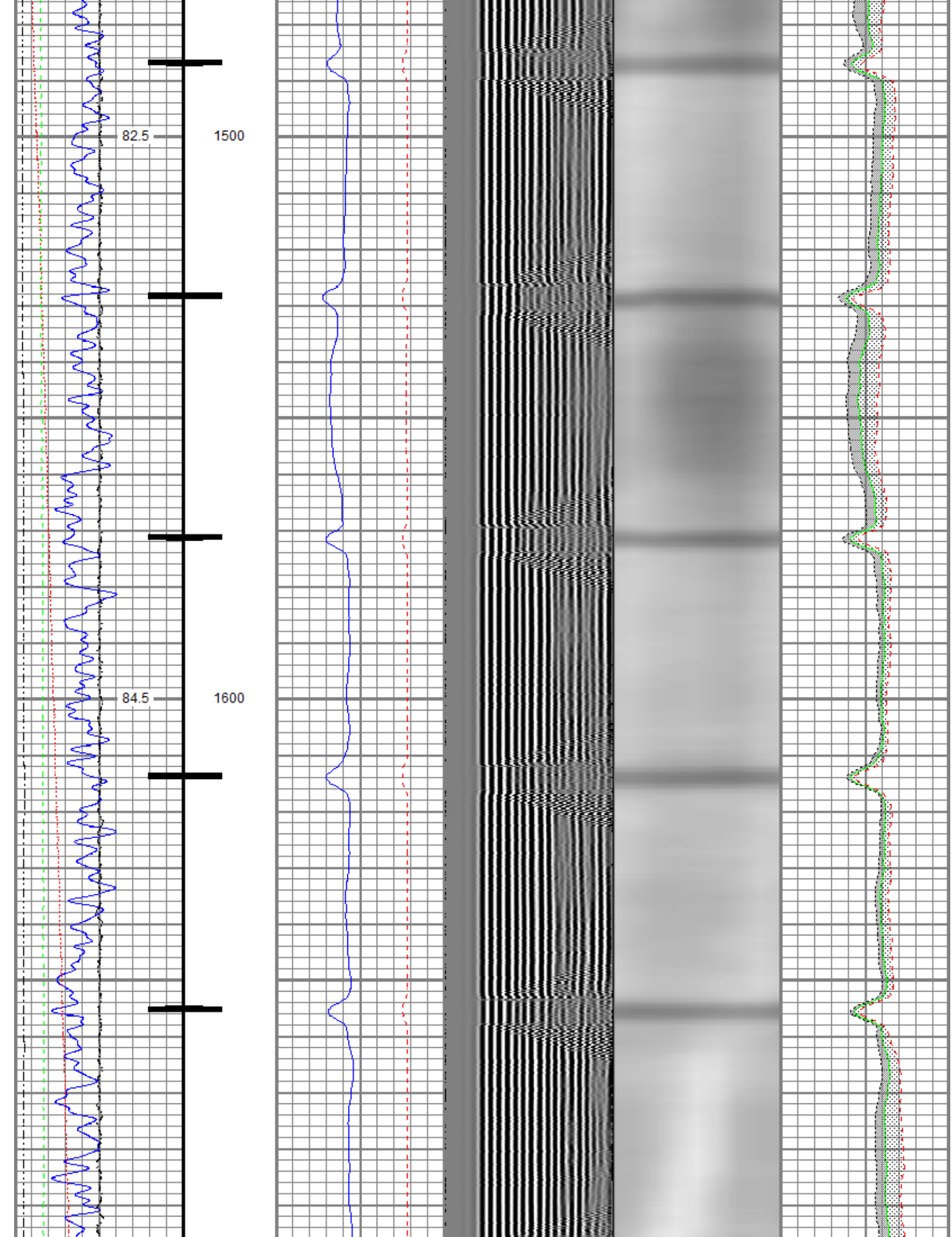


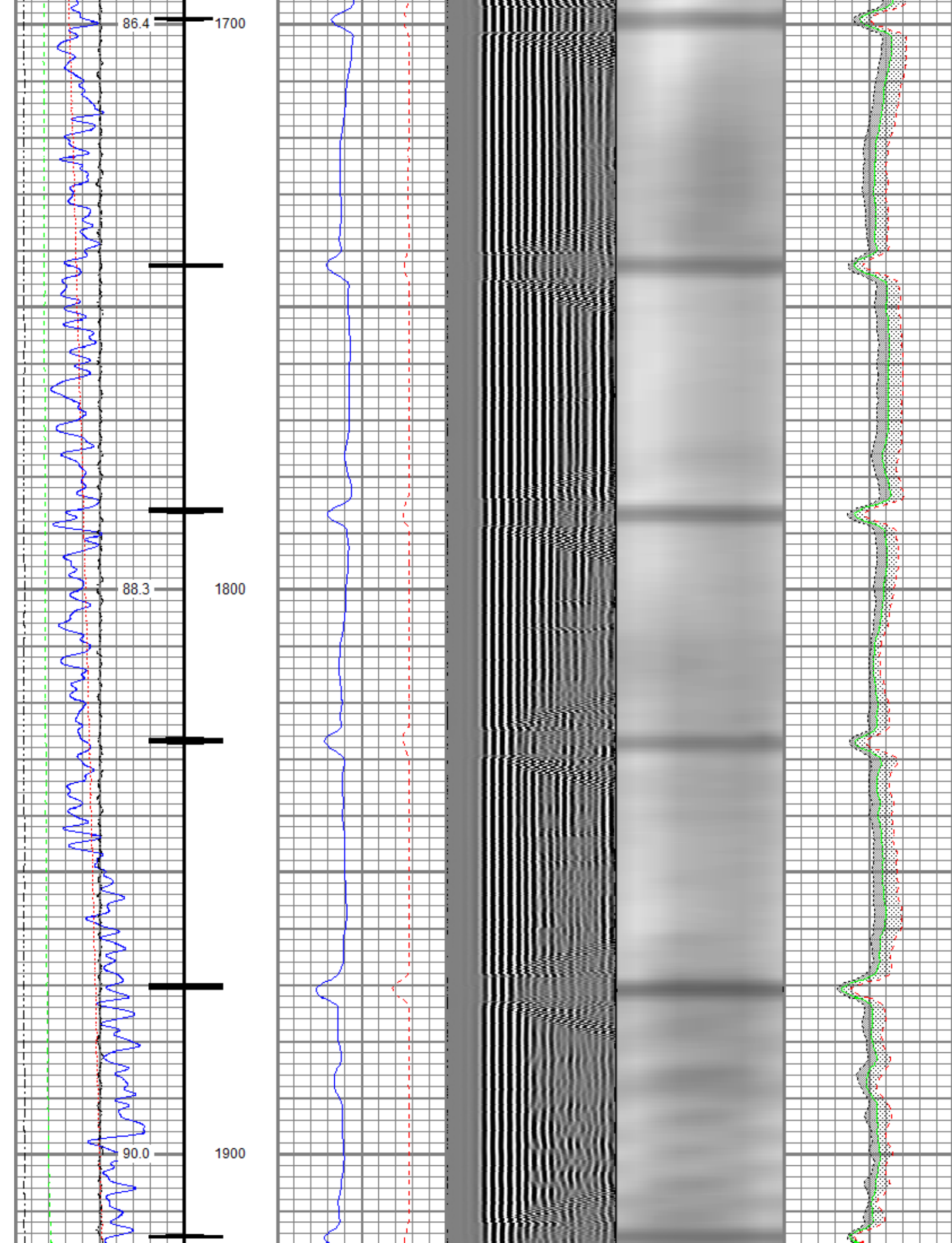


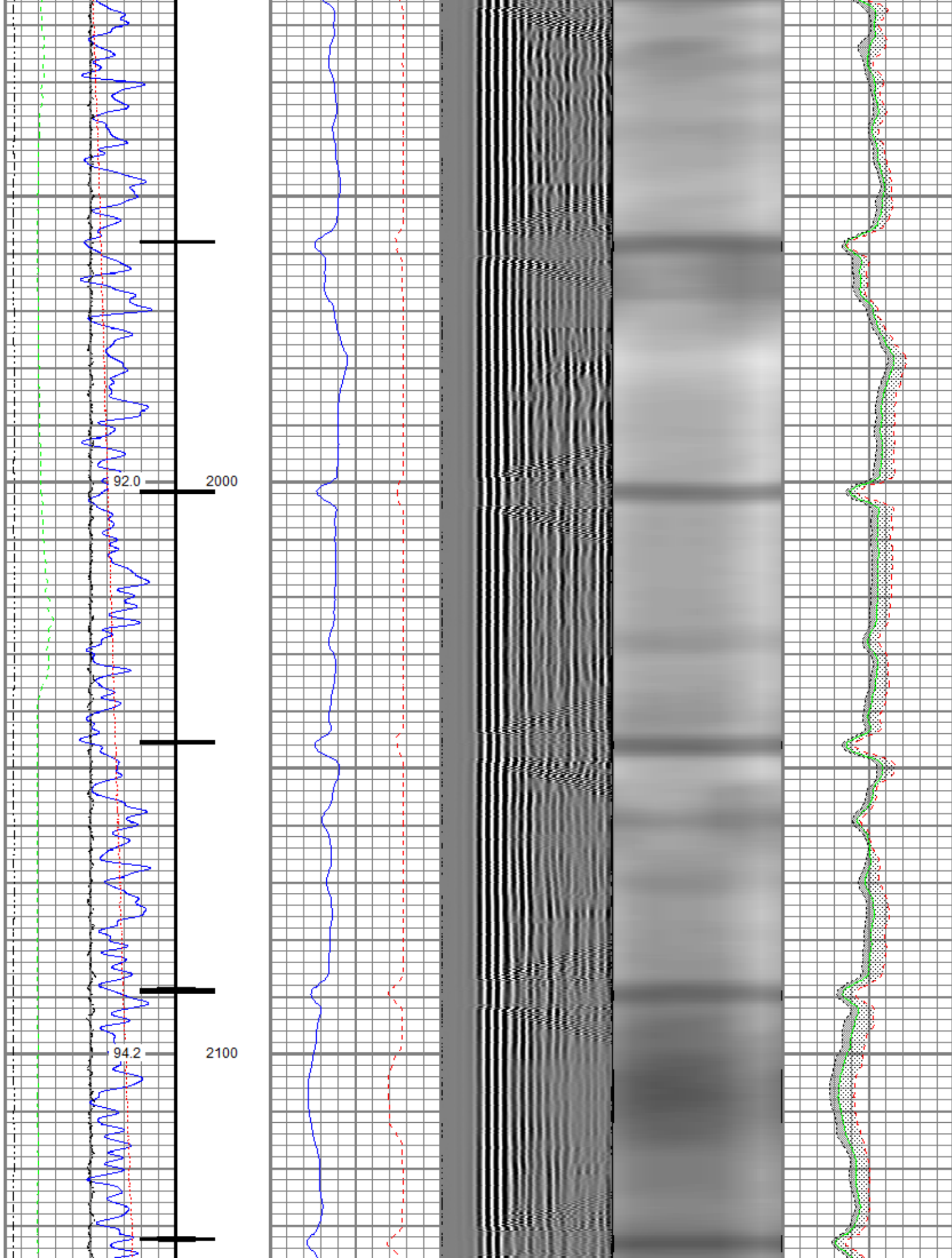




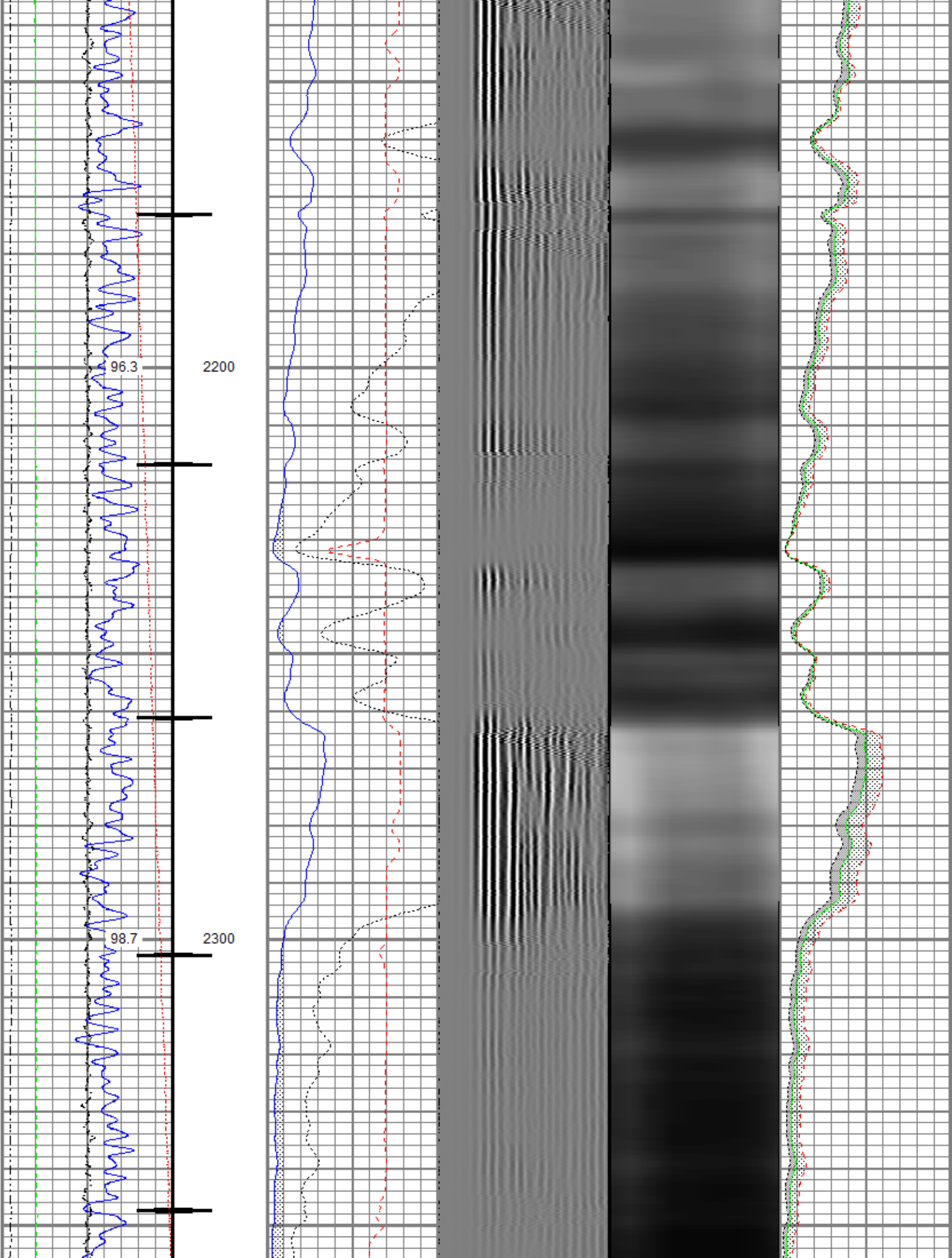


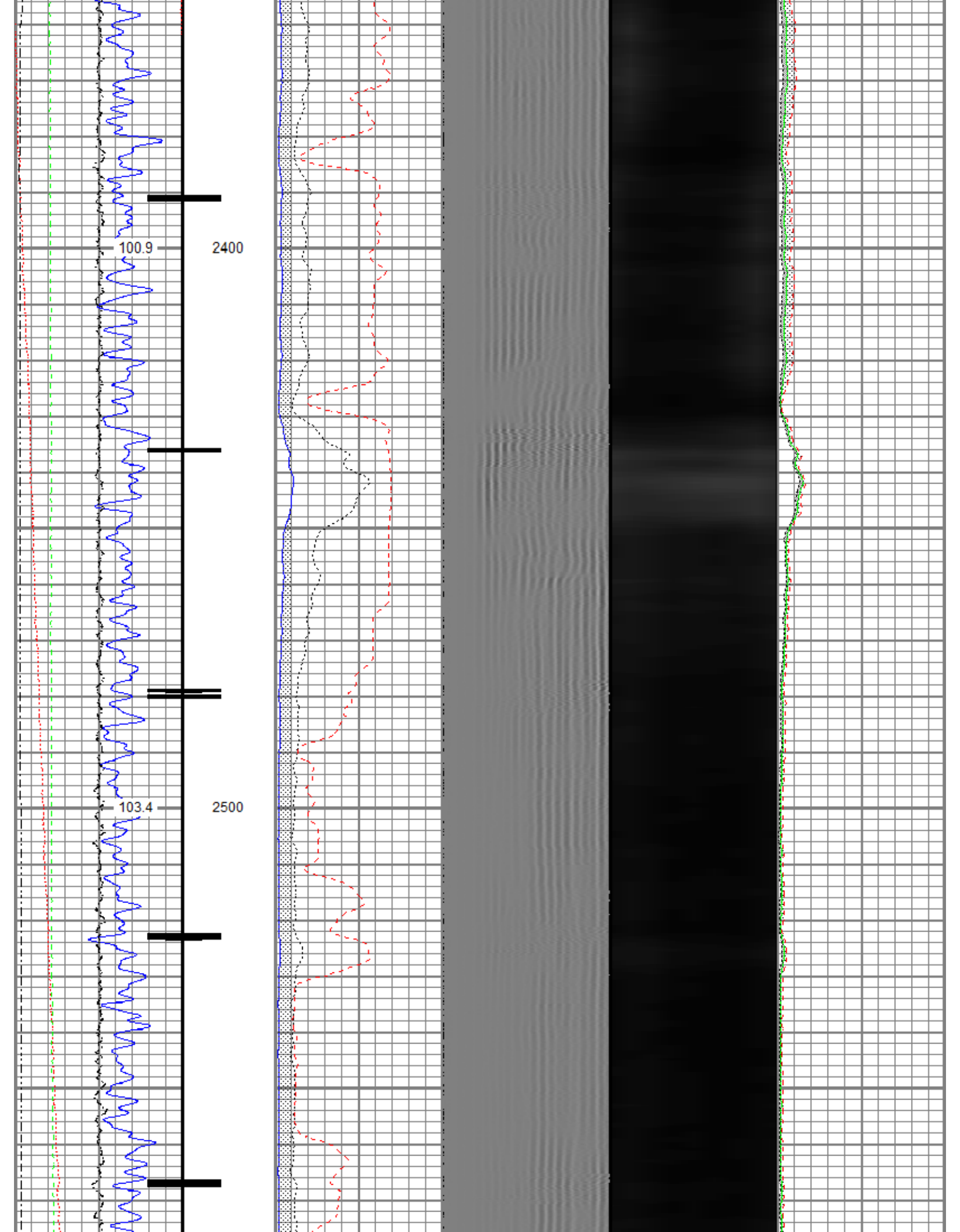


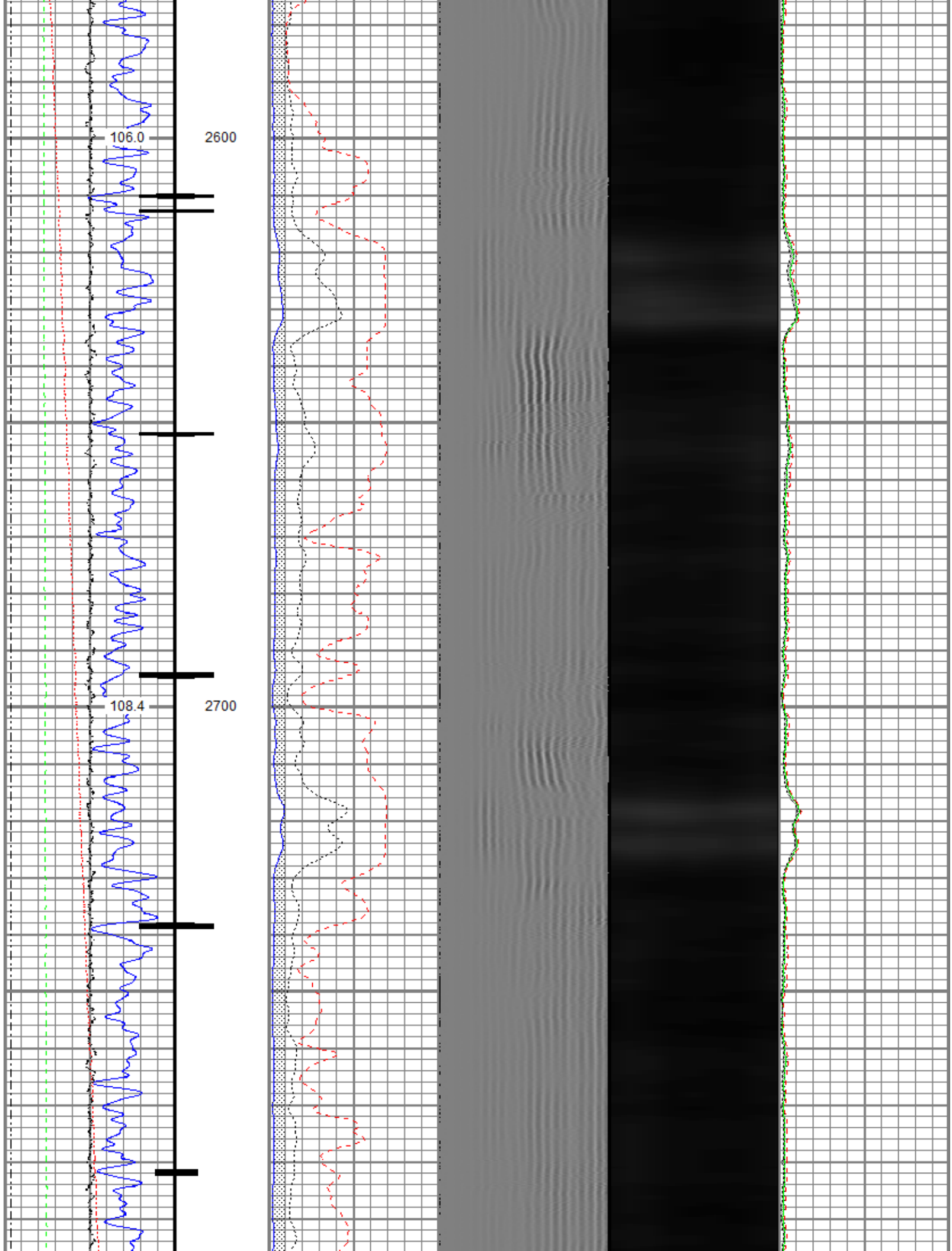




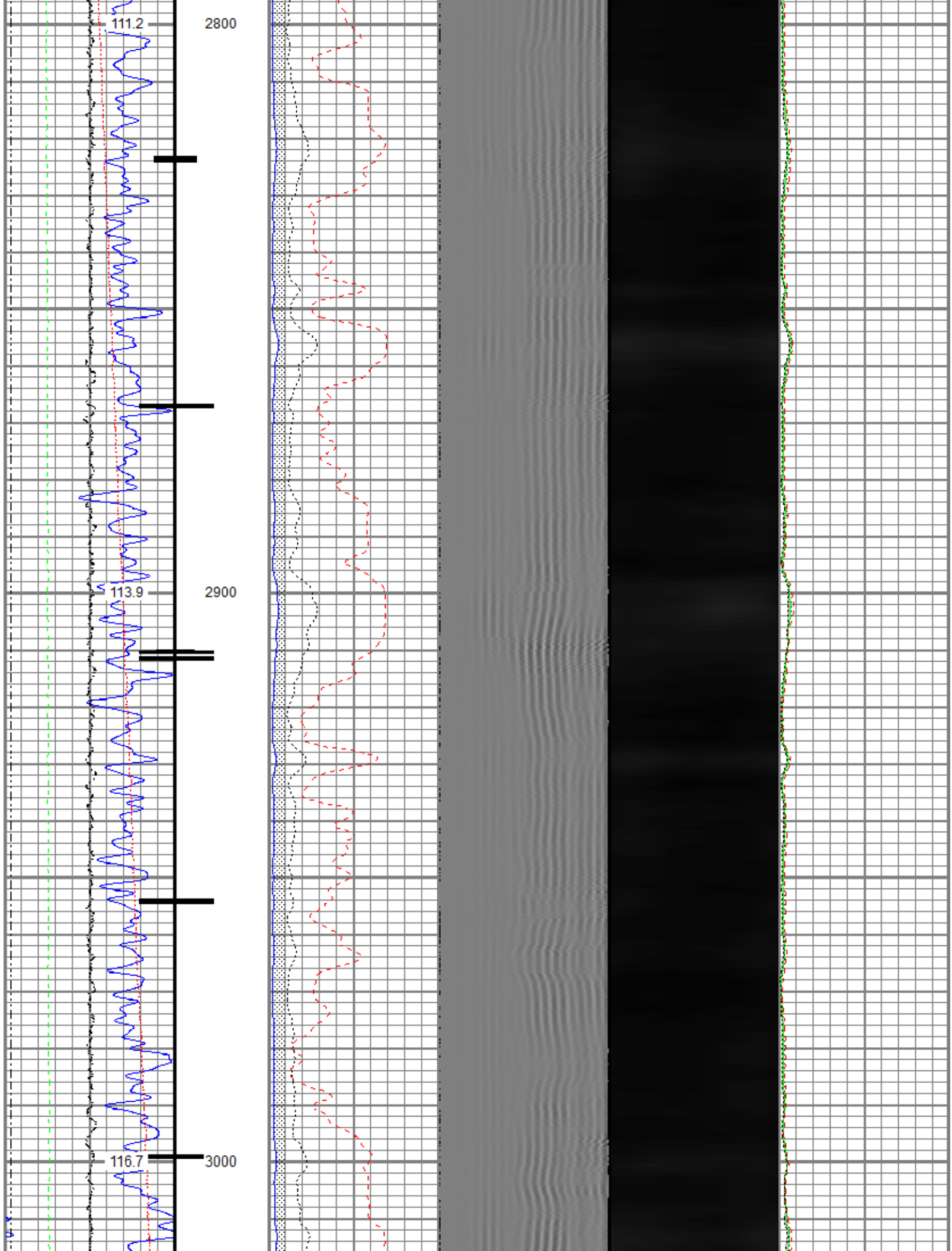


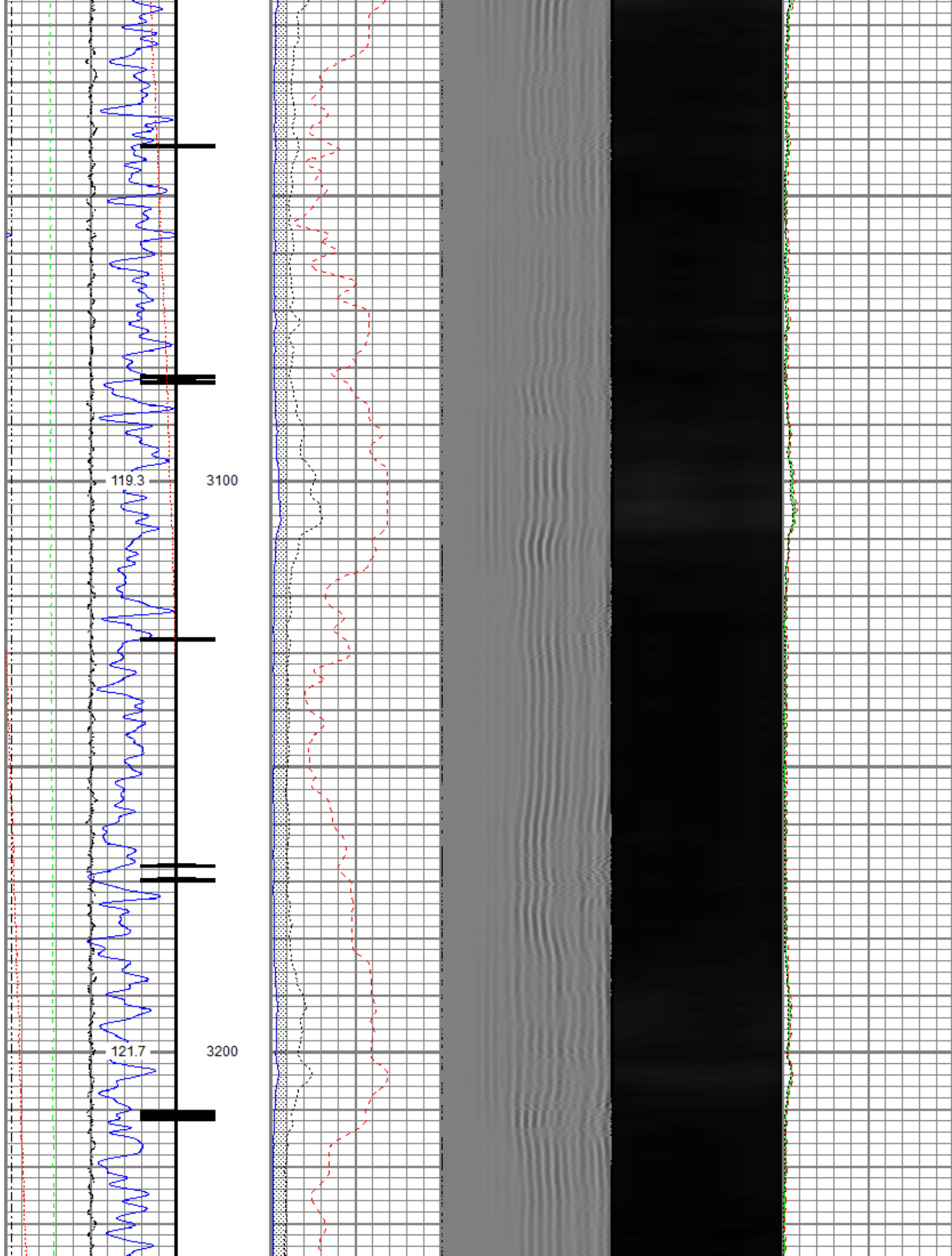


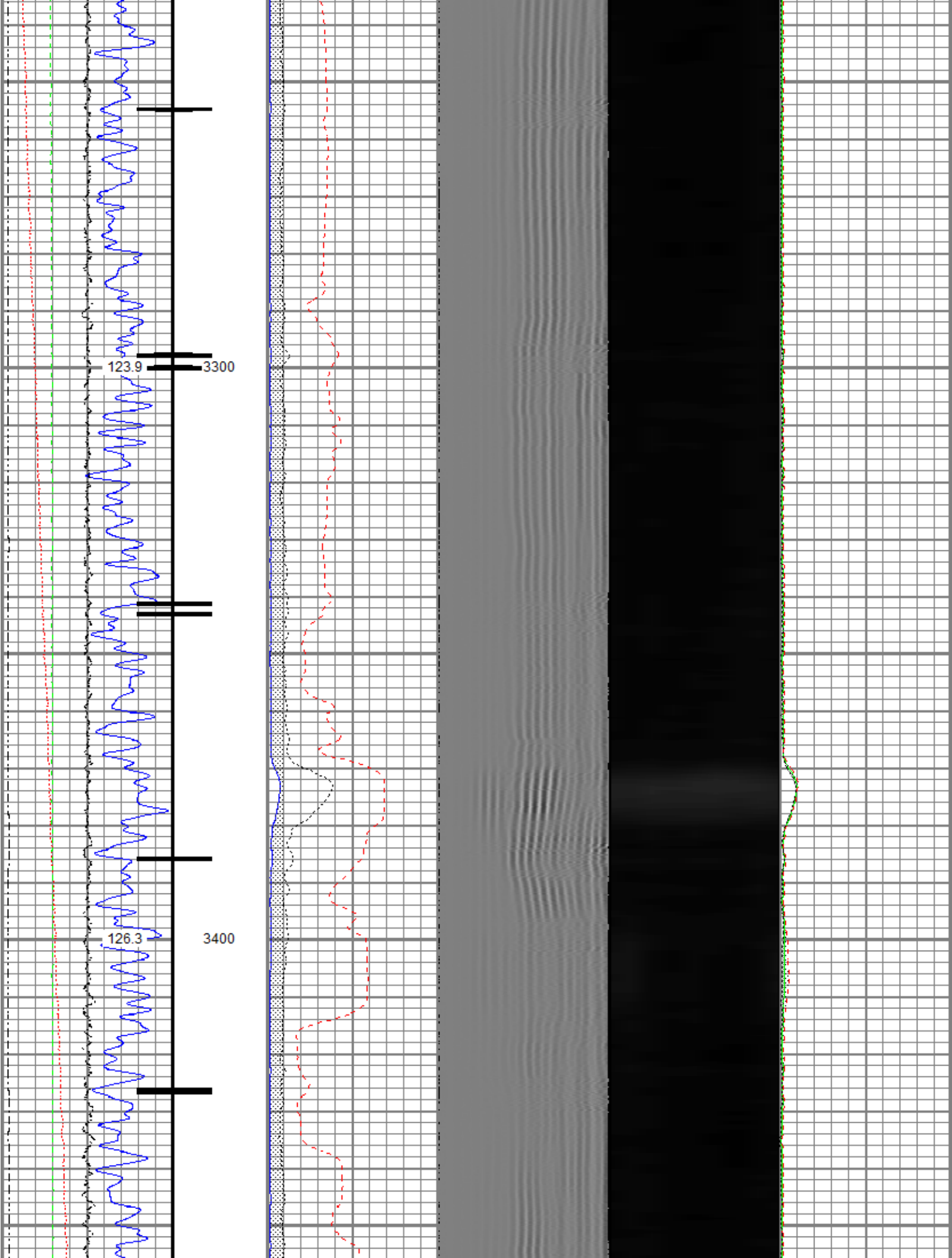




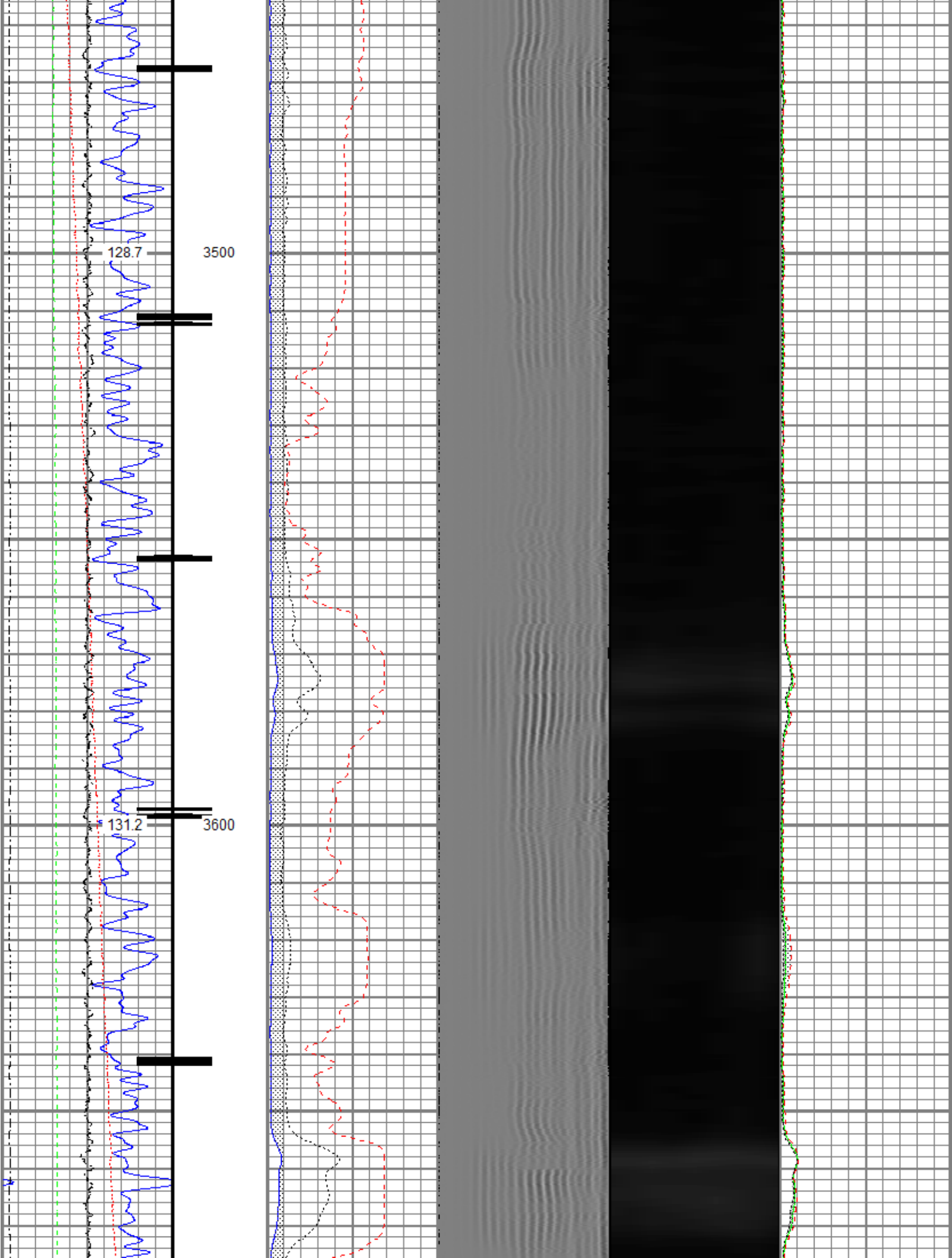


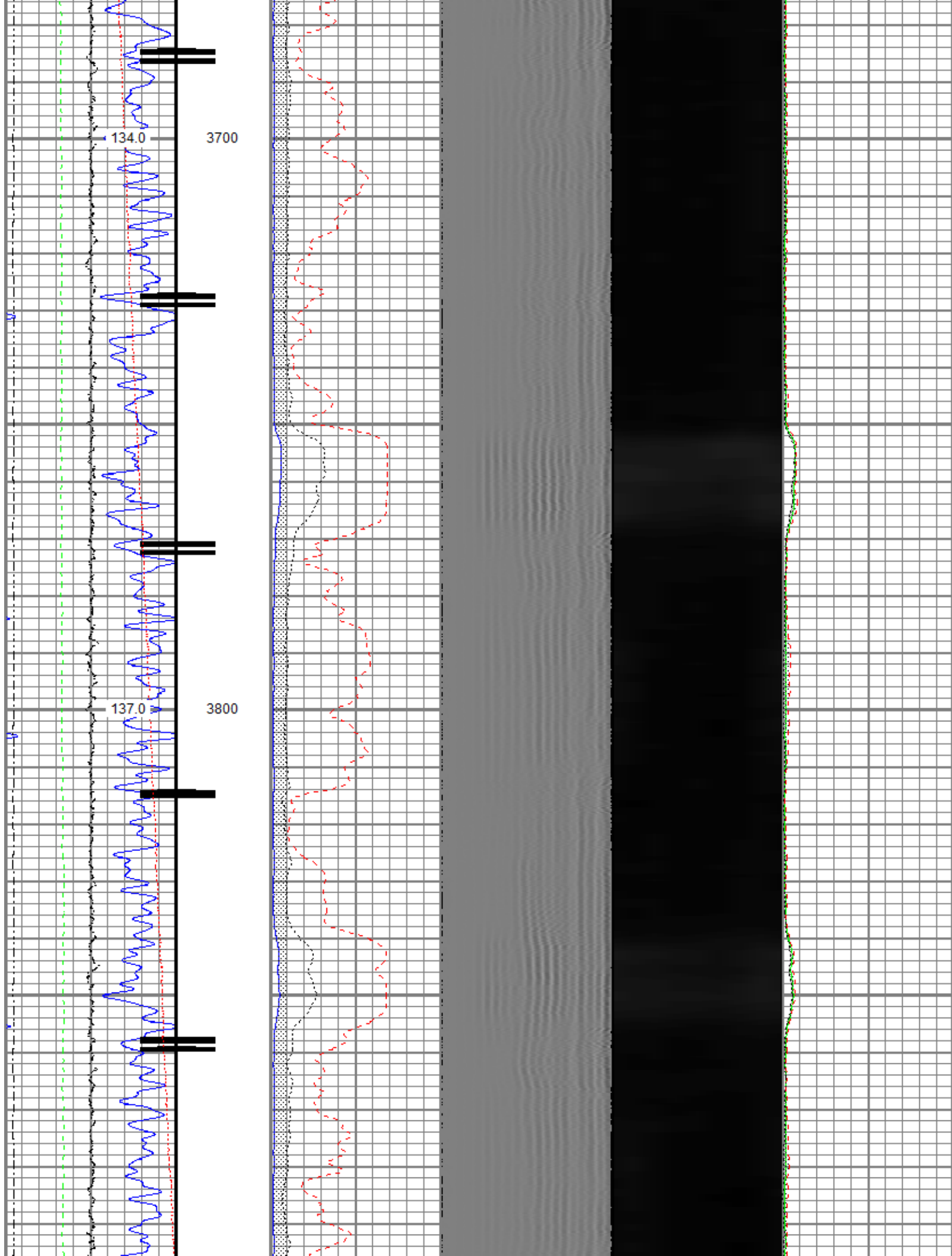


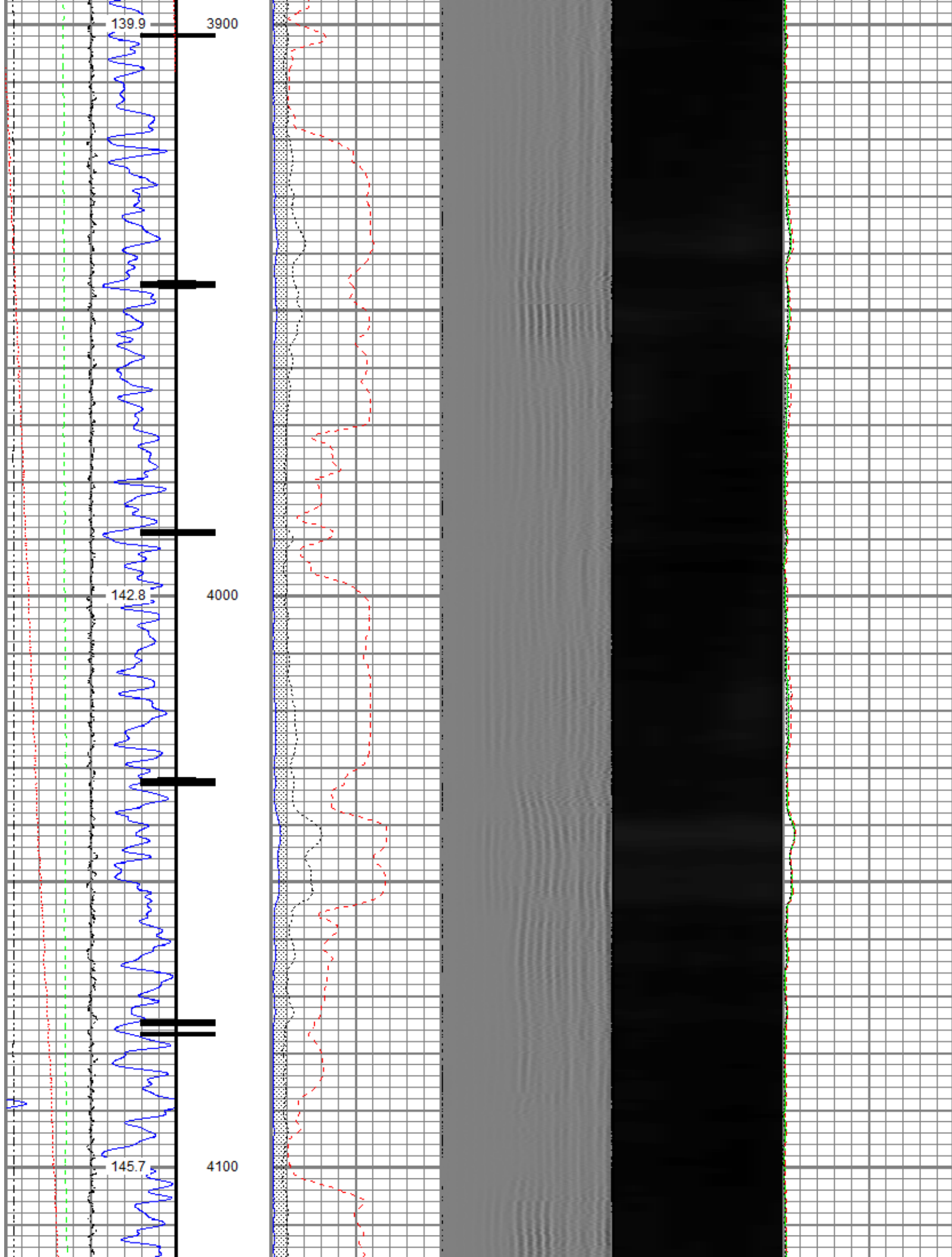




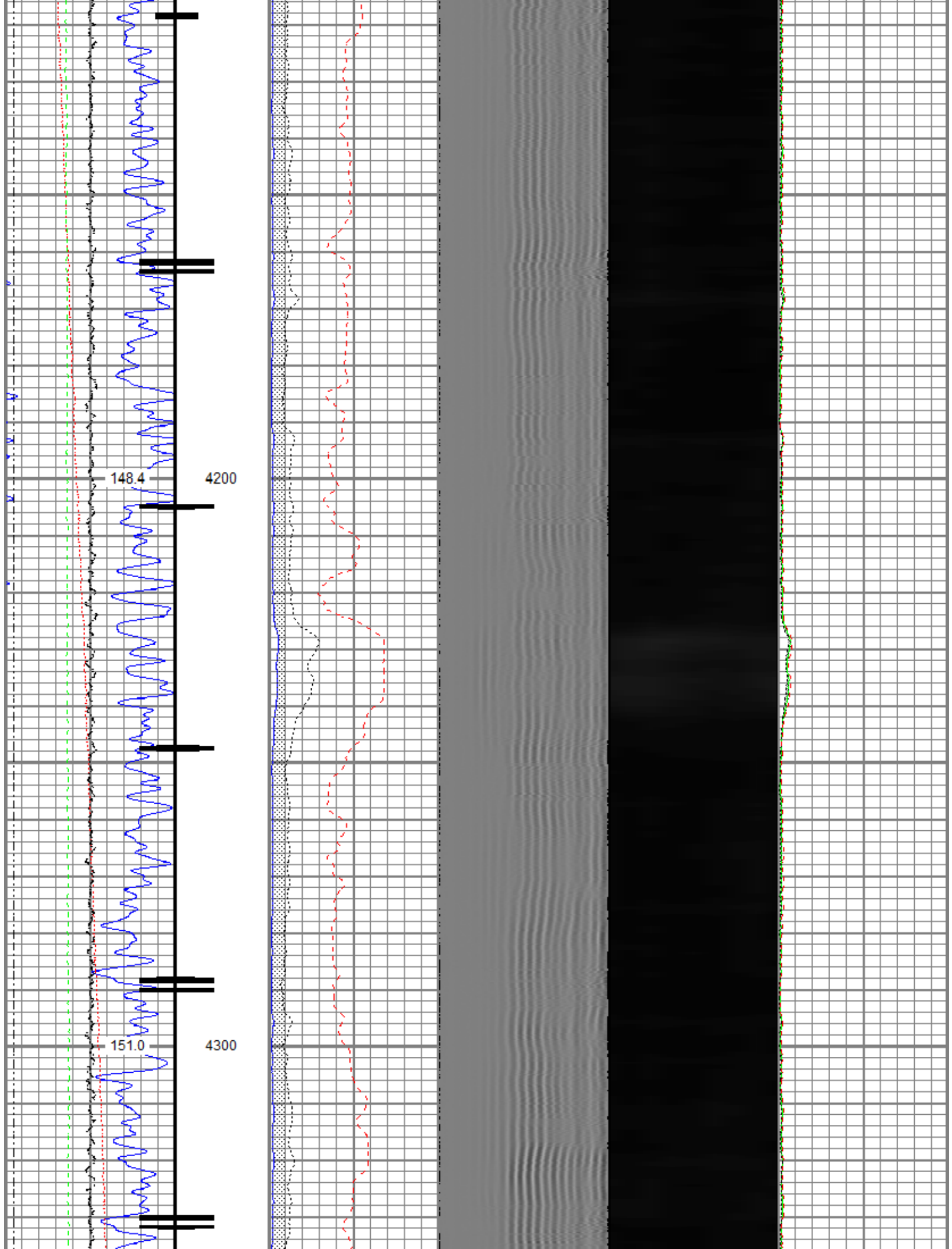


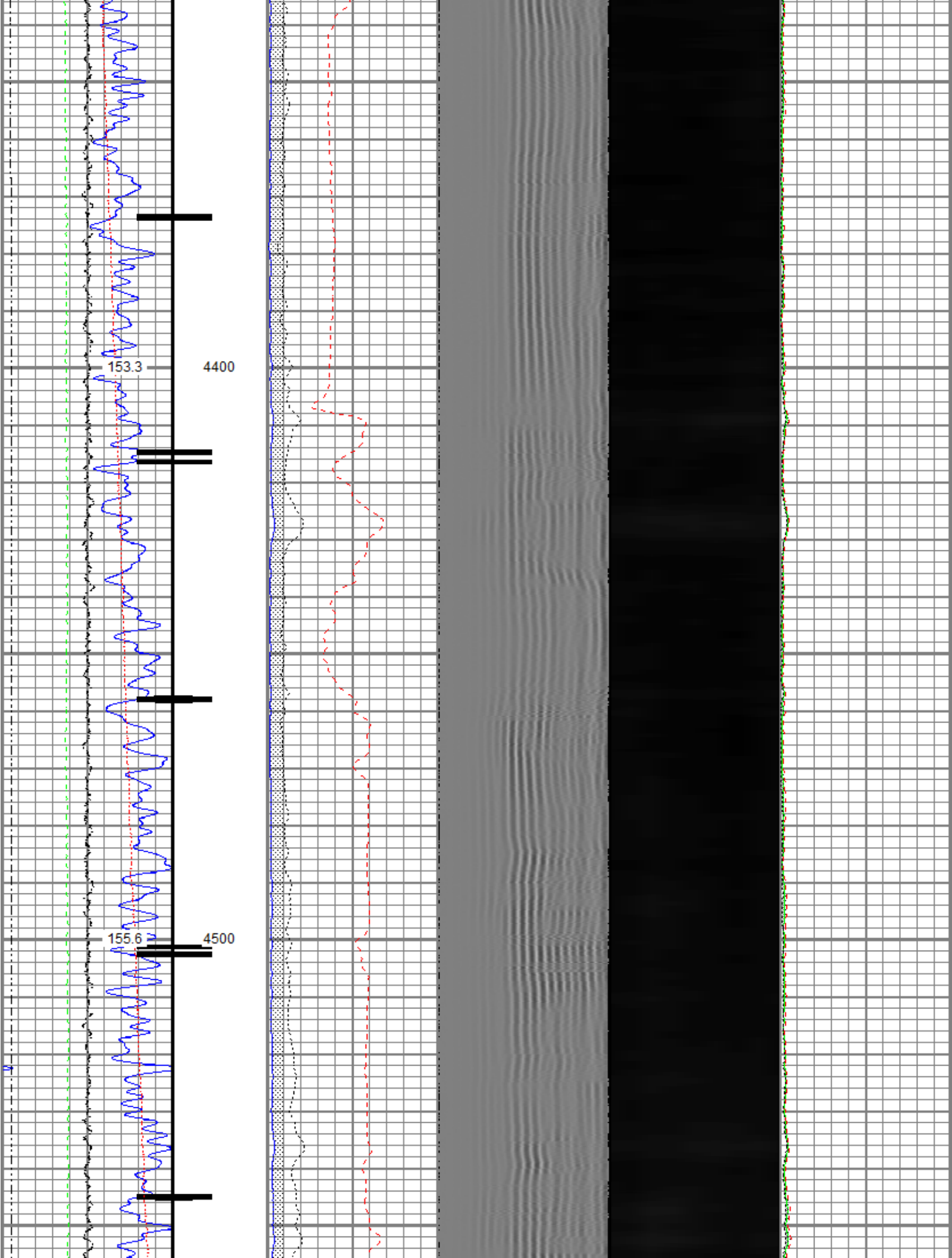


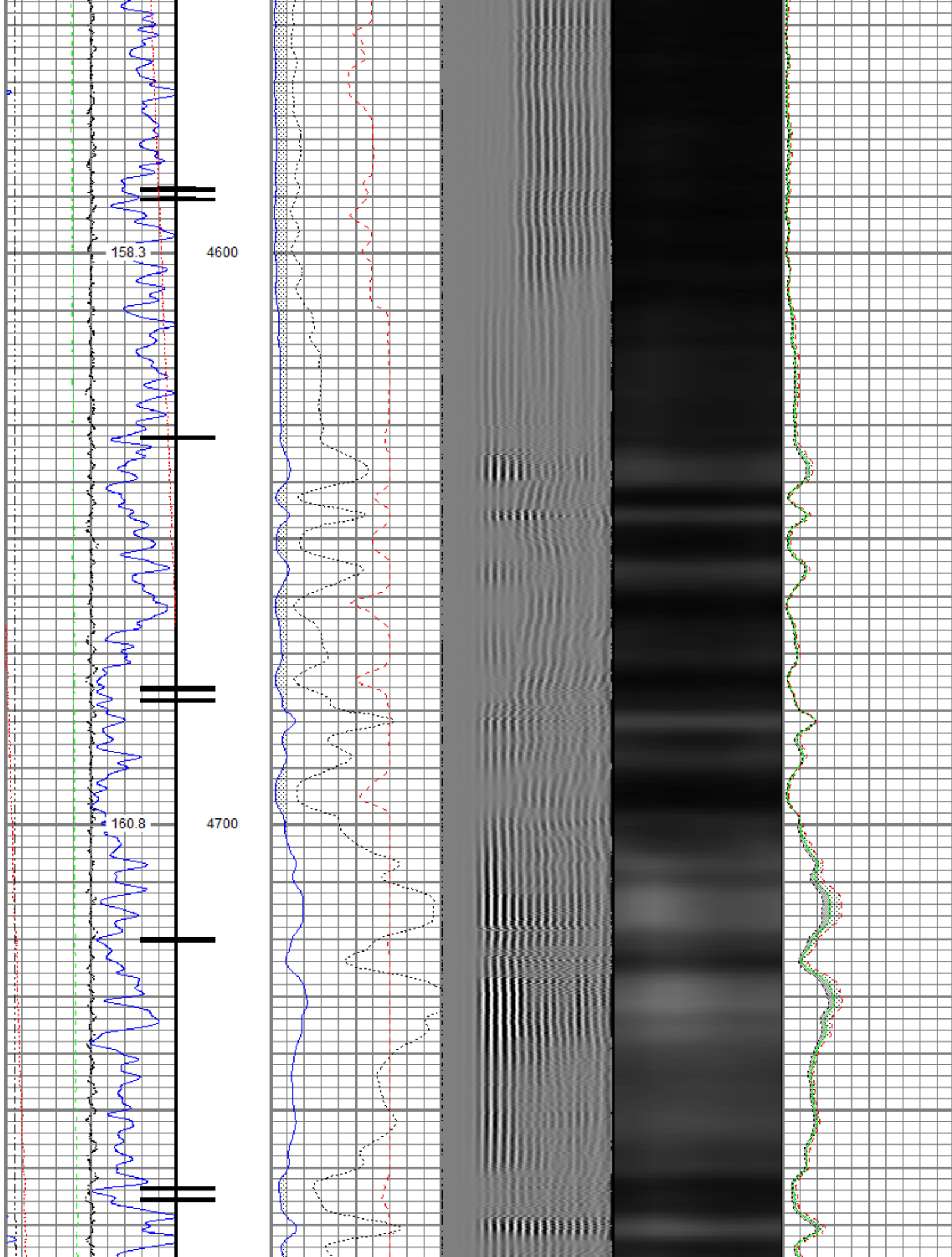


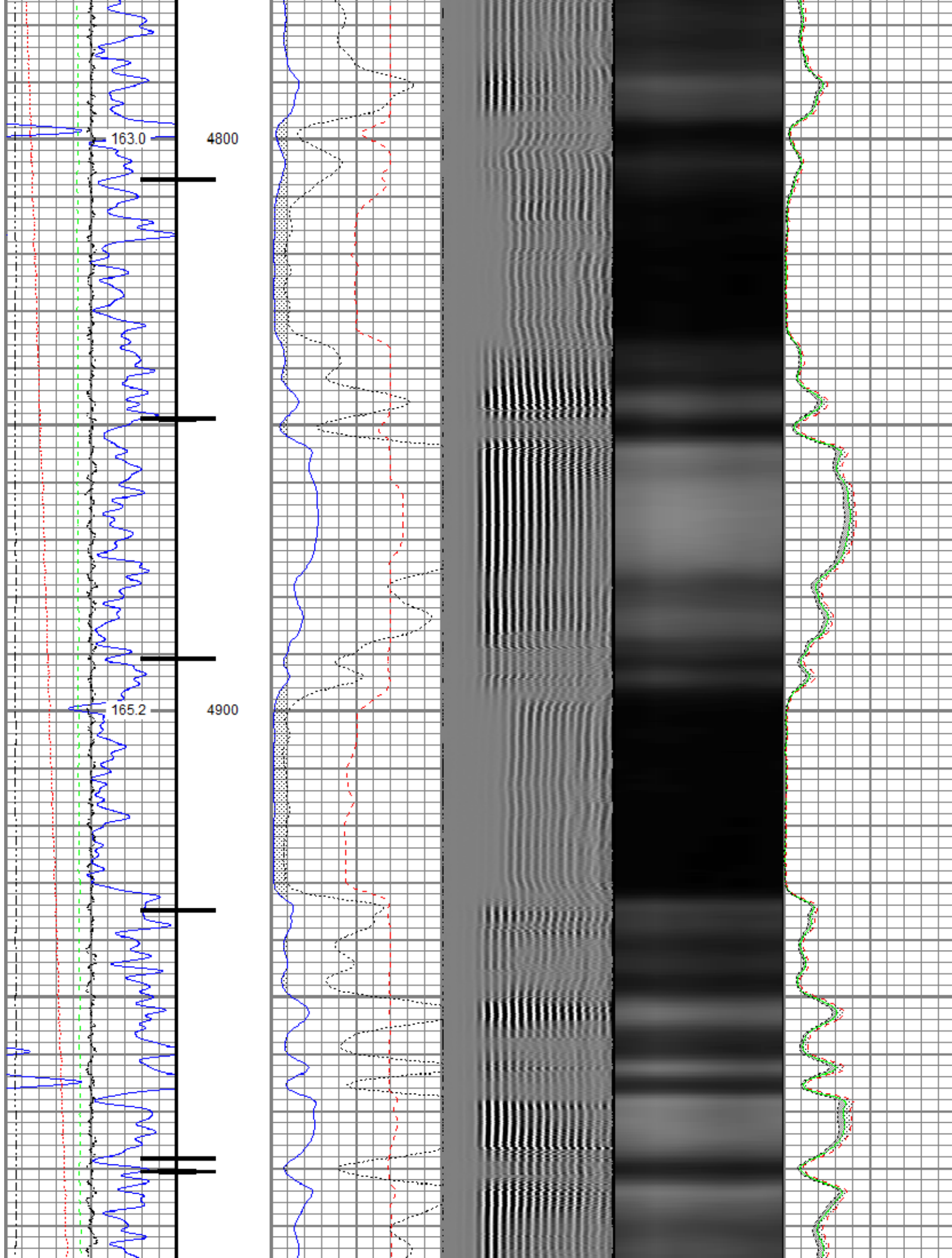




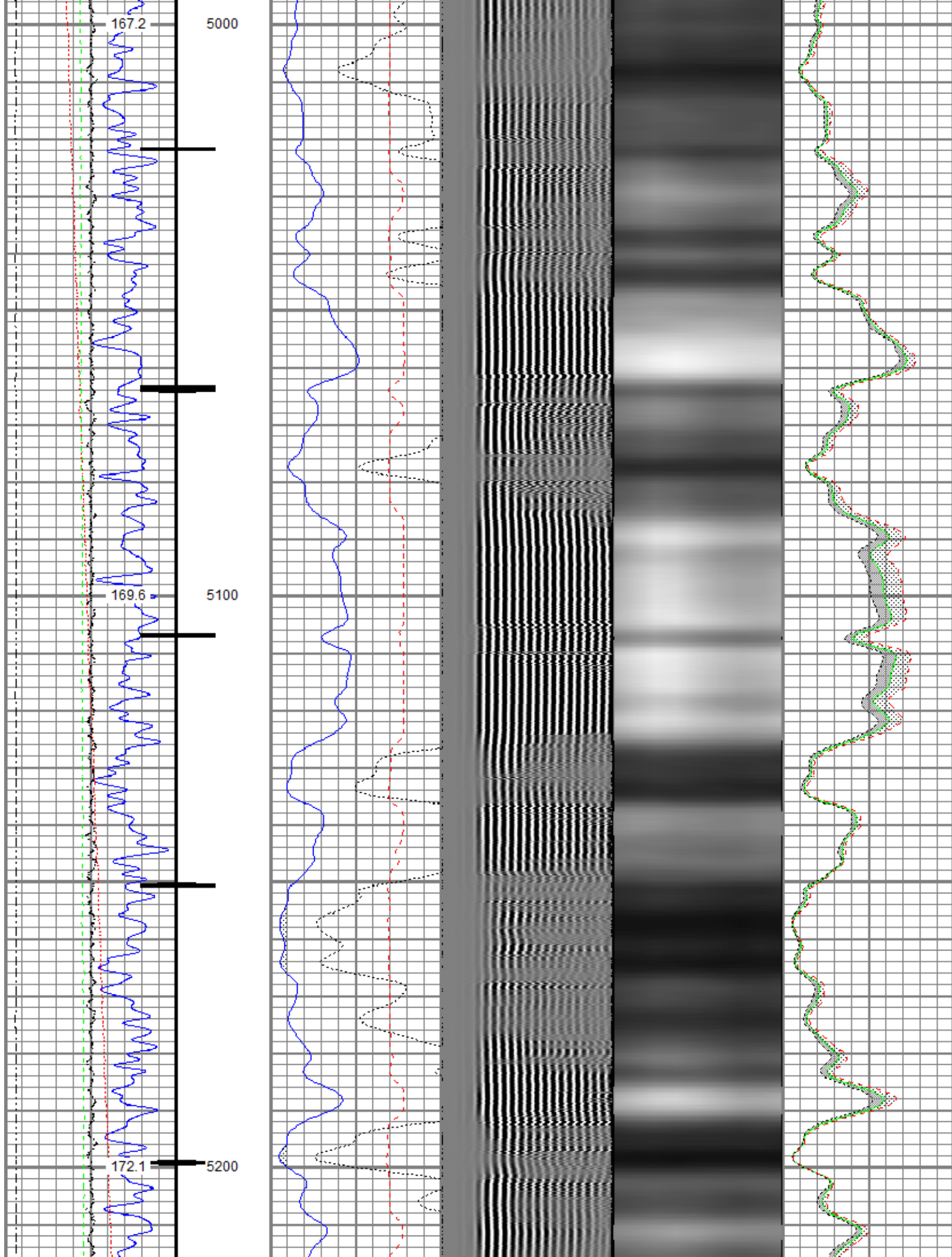


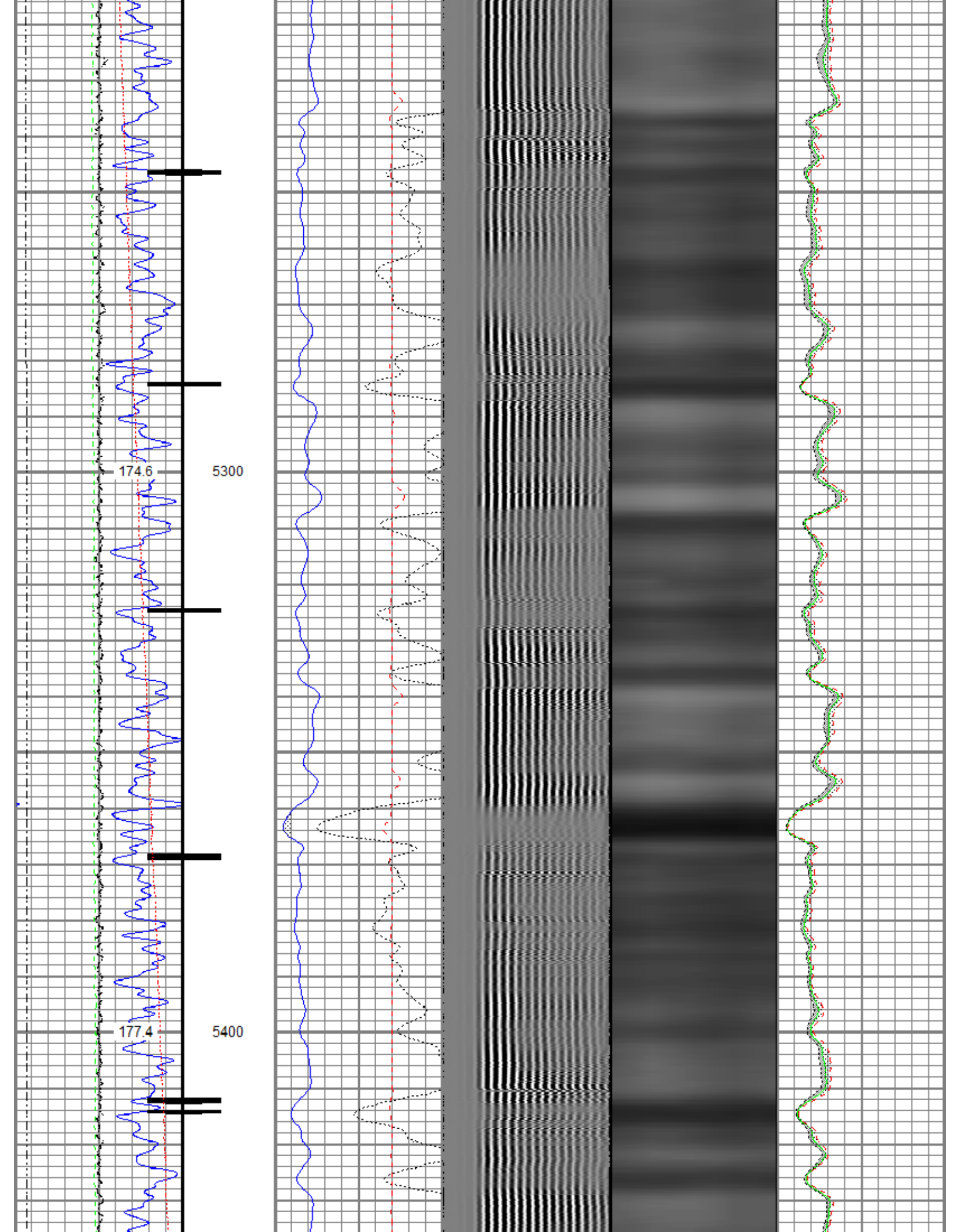


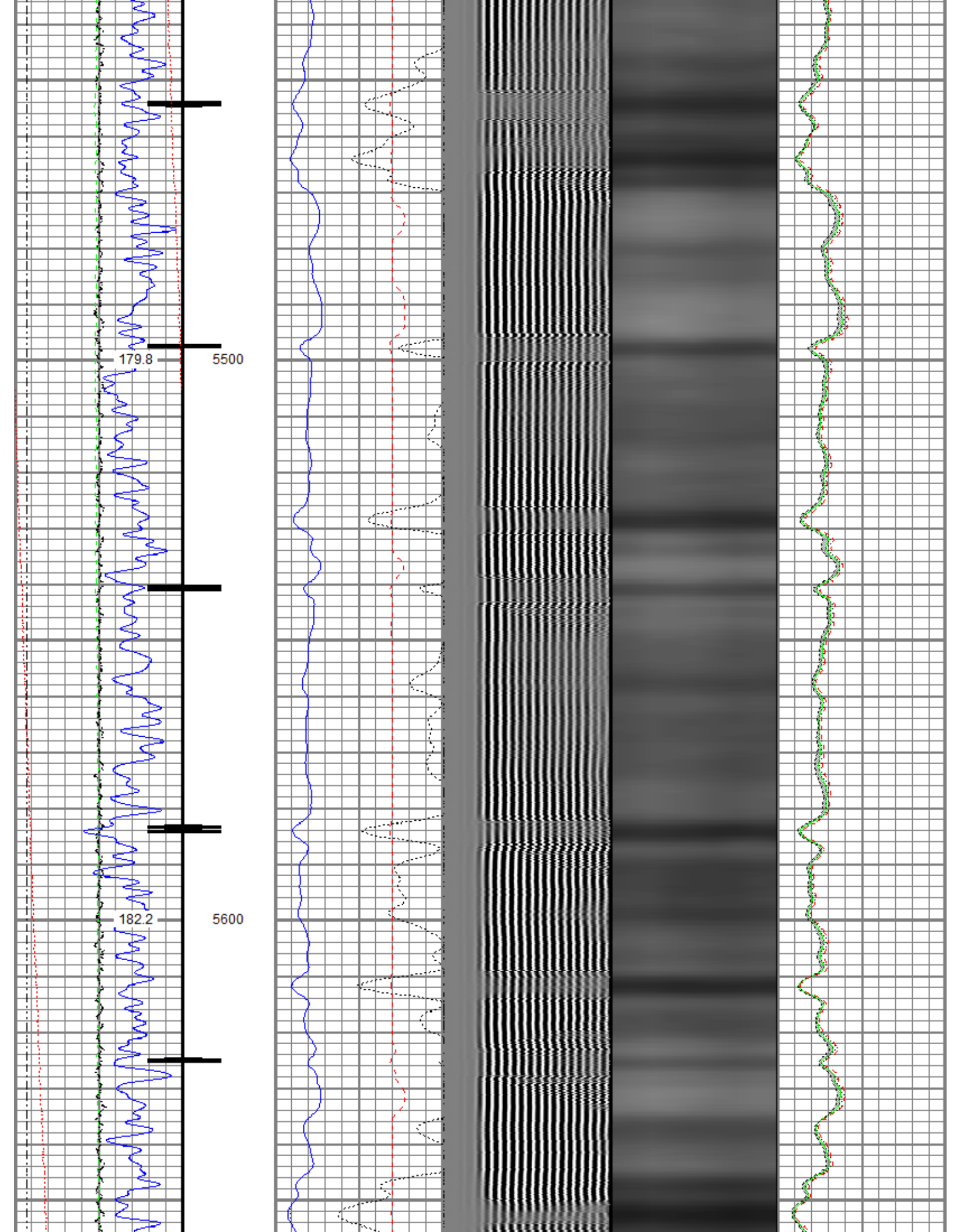




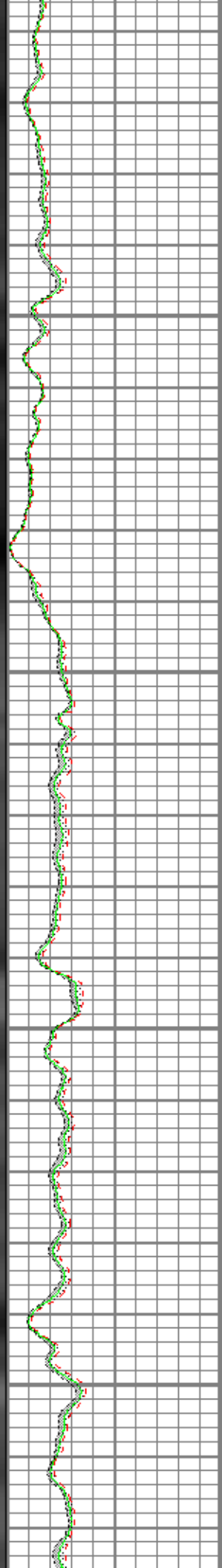
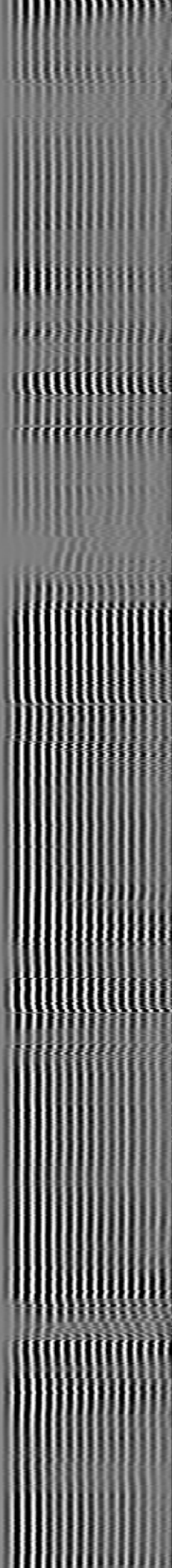
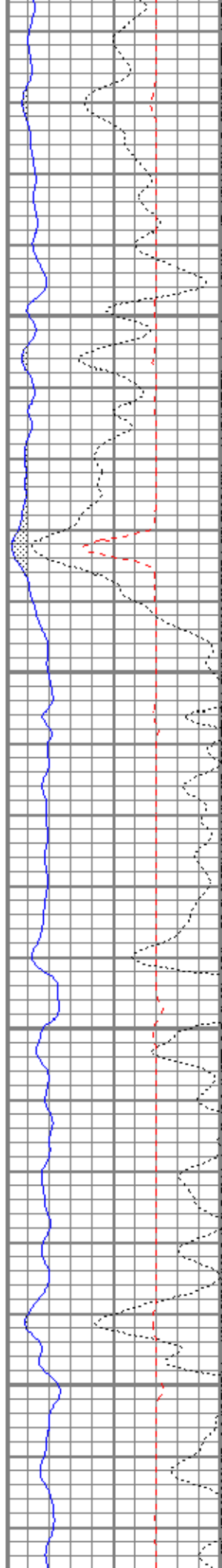
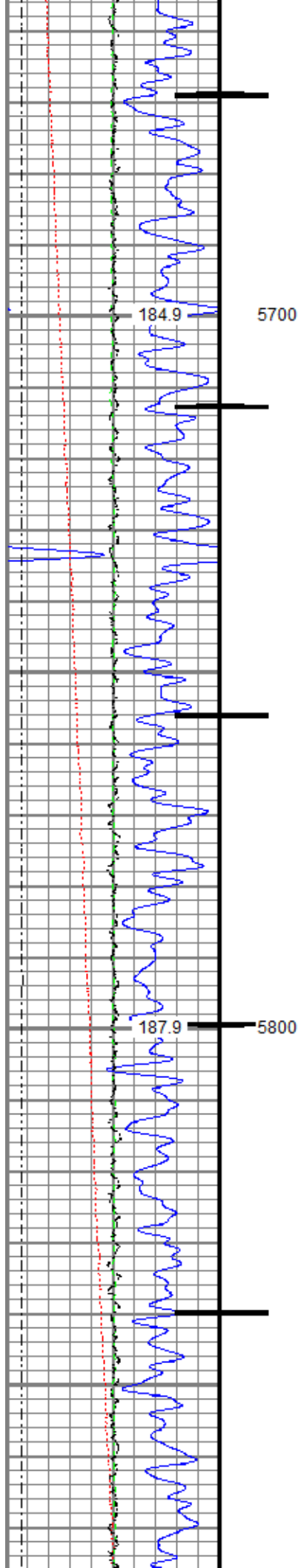




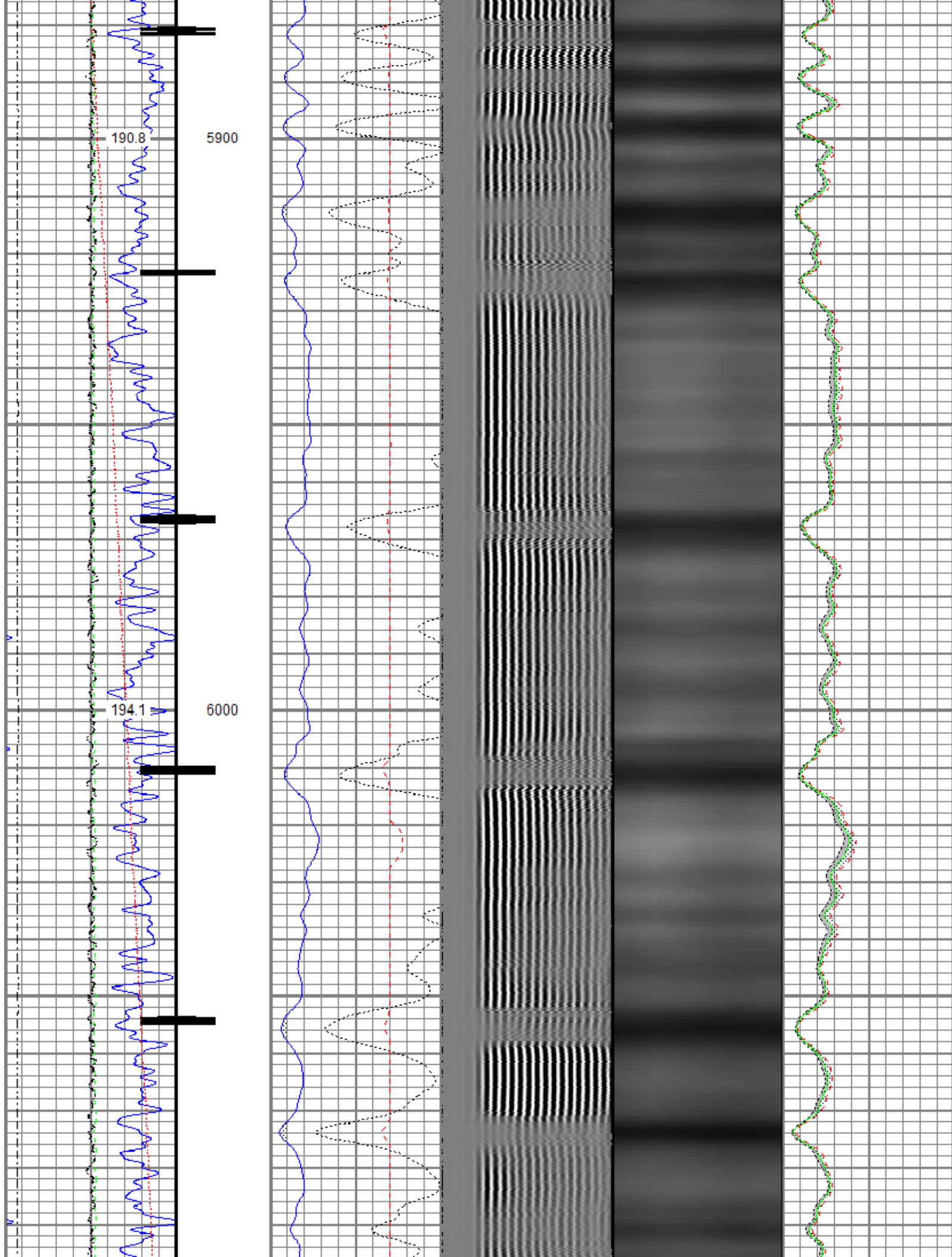


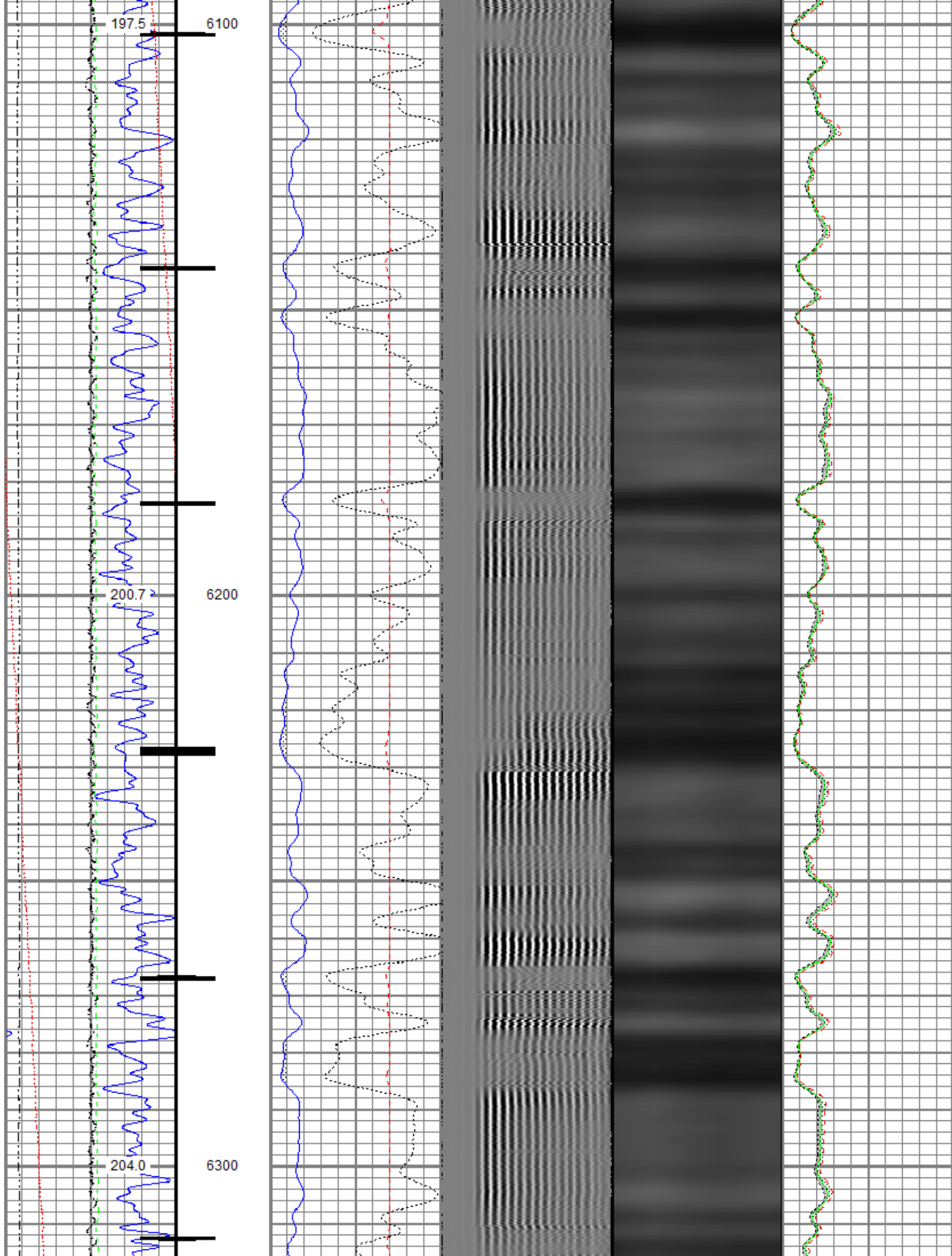


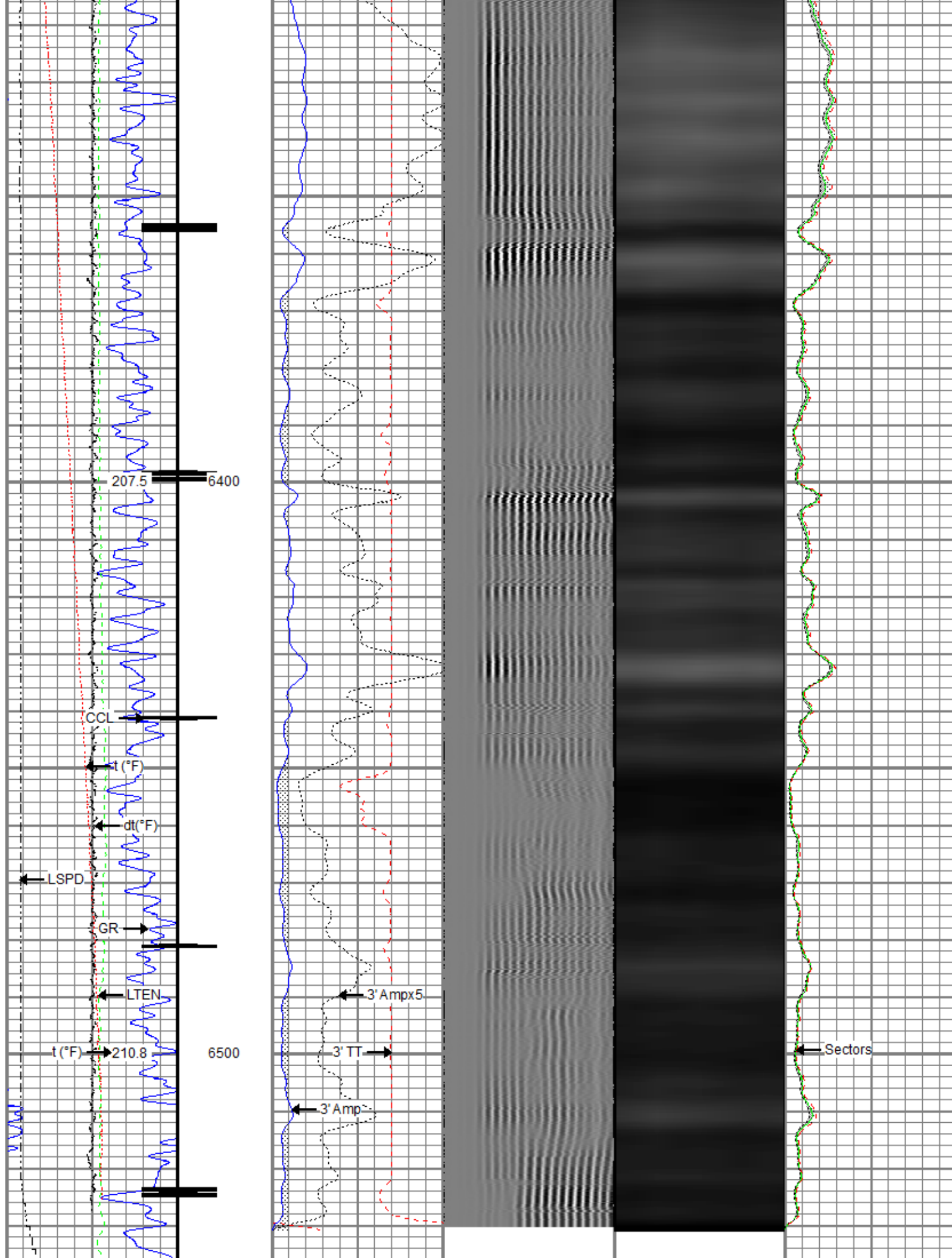


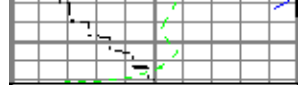










					
Gamma Ray		0	3' Amplitude (mV) 100	5' Variable Density Log	Sector Map
0	(GAPI) 120		3' Amplitude x 5	200	1200
Casing Collar Locator		0	(mV) 20		
0 Temperature (degF) 20			3' Travel Time		
Line Speed		650	(usec) 150		
-150	(ft/min) 150				
0 Line Tension (lb) 2000					
Differential Temperature					
-2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

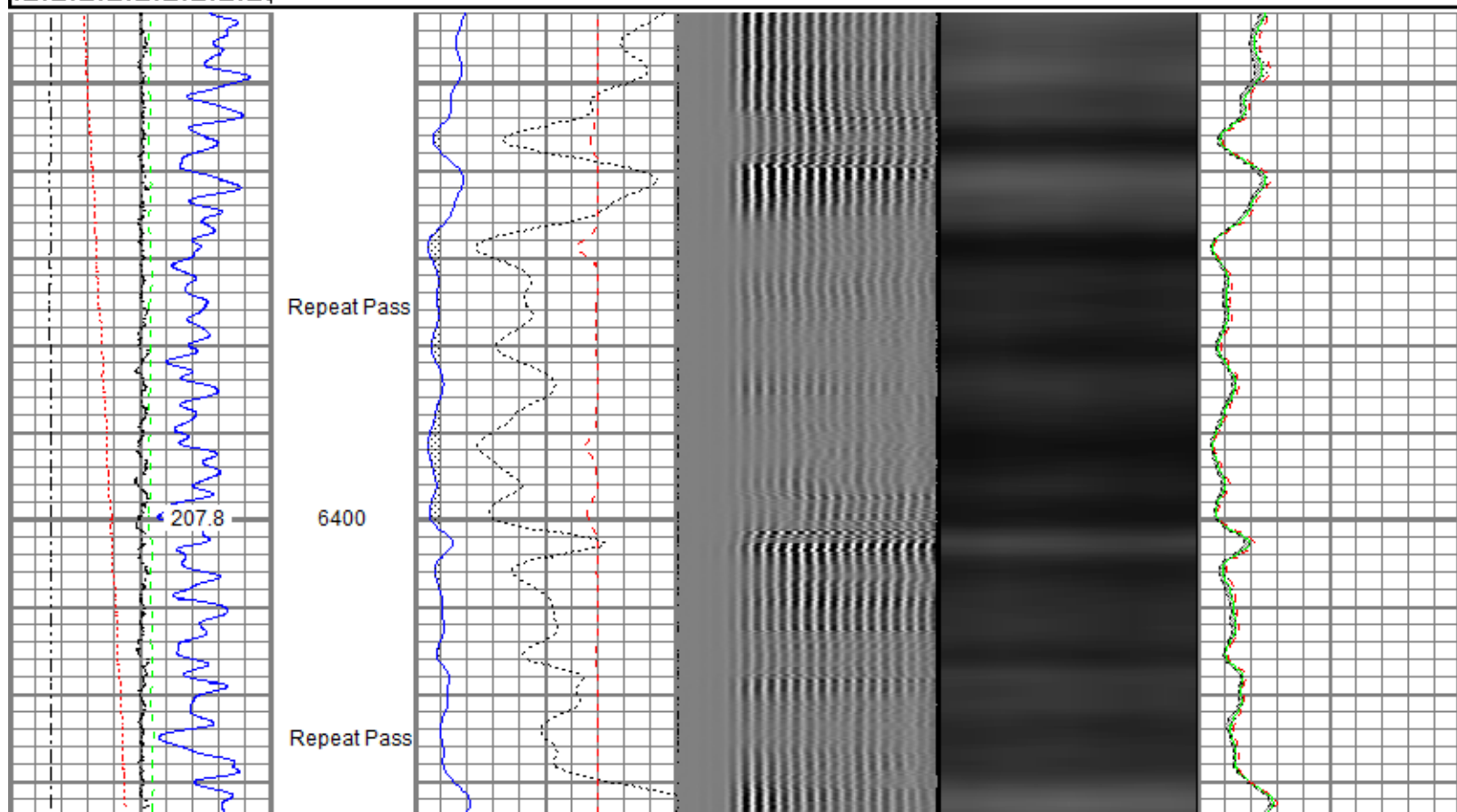


## Repeat Pass

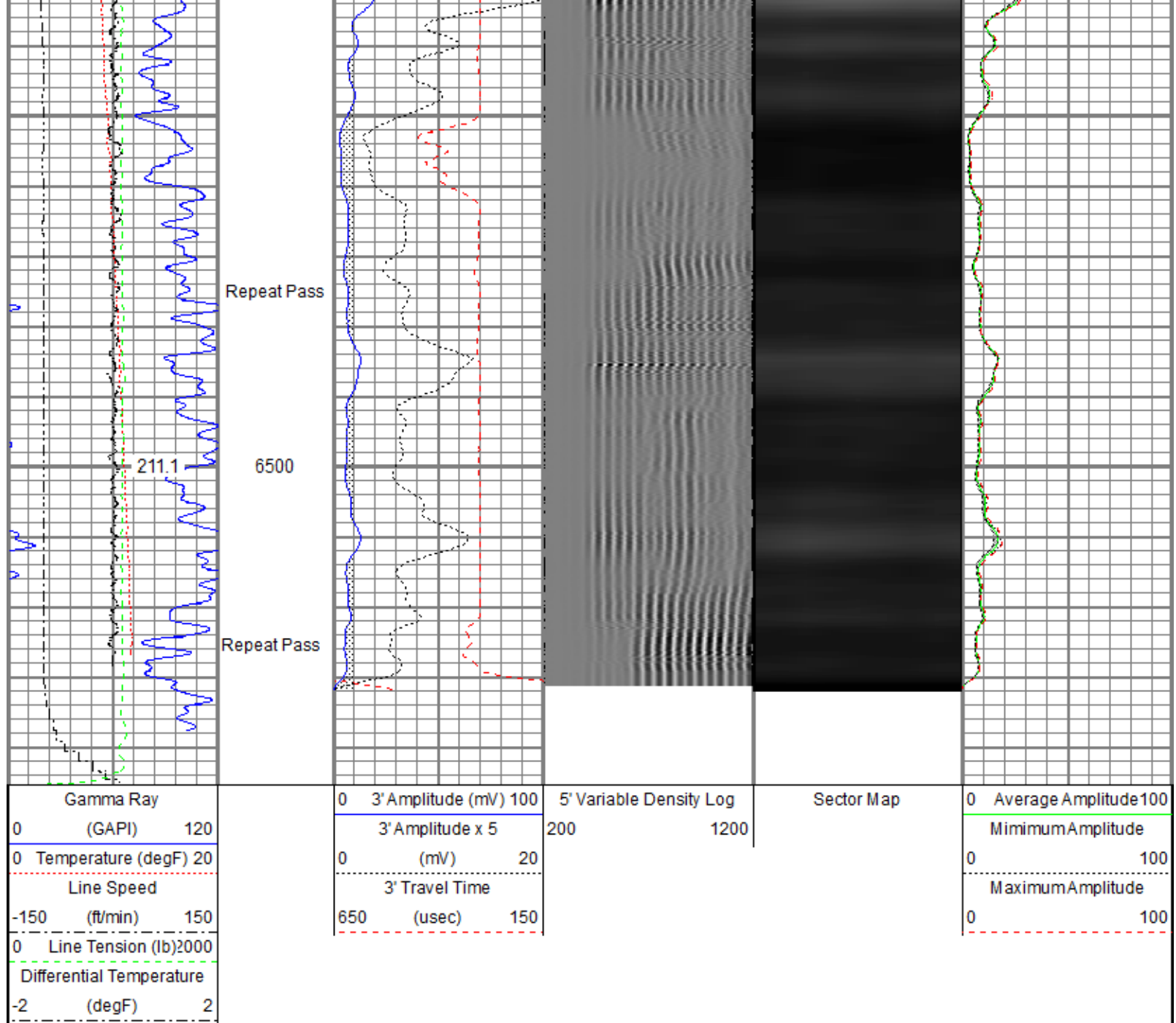
Recorded With 2800 PSI Surface Induced Pressure

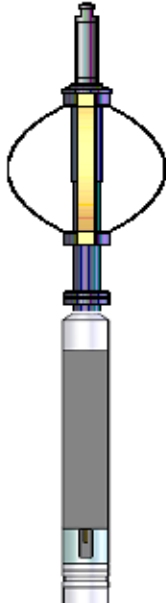
Database File: anadarko\0512307350\_pettinger 18-4hz\_rbl\_10-25-18\processed\_0512347350\_pettinger 18-4hz\_rbl\_10-25-18\_2800 psi.db  
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 Presentation Format: ros\_radrii  
 Dataset Creation: Fri Oct 26 14:24:28 2018  
 Charted by: Depth in Feet scaled 1:240

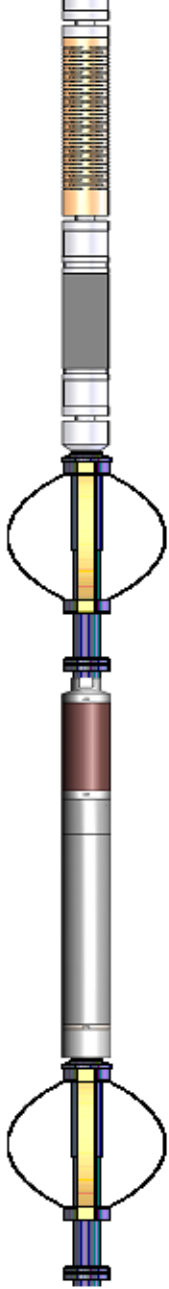
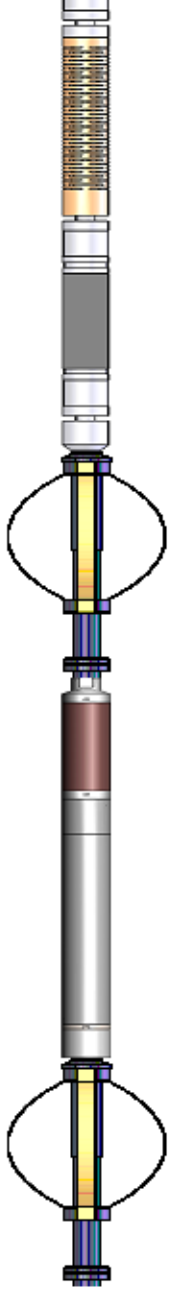
Gamma Ray		0	3' Amplitude (mV) 100	5' Variable Density Log	Sector Map	0	Average Amplitude 100
0	(GAPI) 120		3' Amplitude x 5	200	1200		Minimum Amplitude
0	Temperature (degF) 20	0	(mV) 20			0	100
Line Speed			3' Travel Time				Maximum Amplitude
-150	(ft/min) 150	650	(usec) 150			0	100
0 Line Tension (lb)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







Sensor	Offset (ft)	Schematic	Description	Length (ft)	O.D. (in)	Weight (lb)
TEMP	17.04		Titan CHD-14375 GO	1.03	1.44	3.60
			Titan 1-7/16" Assembled Electric Cable Head w/ 1" Fishing Neck			
			Probe CENT-2750	2.88	2.75	20.00
			Probe 2-3/4" Electric Inline Bowspring Centralizer			

WVFS8	14.81		Probe Radii-2750 RBT (120855) Probe 2-3/4" Radial Cement Bond Tool with Integral Temperature Sub	9.39	2.75	105.00
WVFS7	14.81					
WVFS6	14.81					
WVFS5	14.81					
WVFS4	14.81					
WVFS3	14.81					
WVFS2	14.81					
WVFS1	14.81					
WVFCAL	14.81					
WVF3FT	14.81					
WVF5FT	13.81		Probe CENT-2750 Probe 2-3/4" Electric Inline Bowspring Centralizer	2.88	2.75	20.00
CCL\$2	6.80					
CCL\$1	6.80					
GR	5.46		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 CENT-2750 Probe 2-3/4" Electric Inline Bowspring Centralizer	2.88	2.75	20.00
Dataset: processed_0512347350_pettinger 18-4hz_rbl_10-25-18_2800 psi.db: field/well/run1/pass4.2 Total length: 23.86 ft Total weight: 223.60 lb O.D.: 2.75 in						

Calibration Report		
Database File	c:\programdata\warrior\data\anadarko\0512307350_pettinger 18-4hz_rbl_10-25-18\processed_0512347350_pettinger 18-4hz_rbl_10-25-18	
Dataset Pathname	pass4.2	
Dataset Creation	Fri Oct 26 14:21:11 2018	
Gamma Ray Calibration Report		
Serial Number:	101001	
Tool Model:	2750 6PB	
Performed:	Mon Oct 01 11:32:32 2018	
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: 120855  
Tool Model: 2750 RBT  
Calibration Casing Diameter: 5.500 in  
Calibration Depth: -17.496 ft

Master Calibration, performed Thu Oct 25 08:34:57 2018:

	Raw (v)		Calibrated (mv)		Results	
	Zero	Cal	Zero	Cal	Gain	Offset
3'	0.004	0.353	0.800	71.921	203.993	-0.059
CAL	0.004	0.374				
5'	0.004	0.316	0.800	71.921	228.068	-0.035
SUM						
S1	0.004	0.353	0.000	100.000	286.283	-1.031
S2	0.004	0.356	0.000	100.000	284.514	-1.247
S3	0.004	0.356	0.000	100.000	283.735	-1.056
S4	0.004	0.353	0.000	100.000	287.348	-1.291
S5	0.004	0.354	0.000	100.000	286.123	-1.195
S6	0.004	0.355	0.000	100.000	284.949	-1.252
S7	0.004	0.353	0.000	100.000	286.313	-1.188
S8	0.004	0.354	0.000	100.000	285.794	-1.088

Internal Reference Calibration, performed (Not Performed):

	Raw (v)		Calibrated (v)		Results	
	Zero	Cal	Zero	Cal	Gain	Offset
CAL	0.000	0.000	0.004	0.374	1.000	0.000

Air Zero Calibration, performed Thu Oct 25 08:35:25 2018:

	Raw (v)		Calibrated (v)		Results	
	Zero		Zero		Offset	
3'	0.004		0.000		-0.000	
5'	0.004		0.000		-0.000	
SUM						
S1	0.004		0.000		-0.000	
S2	0.004		0.000		0.000	
S3	0.004		0.000		-0.000	
S4	0.004		0.000		0.000	
S5	0.004		0.000		-0.000	
S6	0.004		0.000		0.000	
S7	0.004		0.000		-0.000	
S8	0.004		0.000		-0.000	

#### Temperature Calibration Report

Serial Number: 120855  
Tool Model: 2750 RBT  
Performed: Mon Oct 01 11:32:15 2018

	Reference	Reading
Low Reference:	100.00 degF	112.30 degF
High Reference:	350.00 degF	394.75 degF
Gain:	0.89	
Offset:	0.60	
Delta Spacing	1	

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



**RELIANCE**  
OILFIELD SERVICES

Well

Pettinger 18-4HZ

Field

Wattenberg

County

Weld

State

Colorado