



**Radial Cement Bond  
Gamma Ray  
Casing Collar Log**

**Company** Kerr-McGee Oil & Gas Onshore, L.P.  
**Well** Azul 13-2HZ  
**Field** Wattenberg  
**County** Weld **State** Colorado

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**Location:** SEC 13 TWP 1N RGE 66W  
 API #: 05-123-45915  
 Permanent Datum Ground Level Elevation 5071'  
 Log Measured From Kelly Bushing 17 FT  
 Drilling Measured From Kelly Bushing  
 Other Services  
 JBGR  
 RBP  
 RBL 0PSI  
 Elevation  
 K.B. 5088'  
 D.F. ---  
 G.L. 5071'

Date	09-MAY-2018						
Run Number	Four						
Depth Driller	12447 FT						
Depth Logger	6982 FT						
Bottom Logged Interval	6980 FT						
Top Log Interval	Surface						
Open Hole Size	7.875"						
Type Fluid	Water						
Density / Viscosity	8.34 lb/gal						
Max. Recorded Temp.	219°F						
E. estimated Cement Top	See Log						
Time Well Ready	ROA						
Time Logger on Bottom	12:30						
E. equipment Number	HD-363						
Location	Fort Lupton, CO						
Recorded By	M. Hayes						
Witnessed By	Justin McMillian						
<b>Borehole Record</b>							
Run Number	Bit	From	To	Size	Weight	From	To
<b>Tubing Record</b>							
Casing Record	Size (in)	Wgt (lbs/ft)	Grade	Top	Bottom		
Surface Casing	9.5/8	36	J-55	Surface	1867 FT		
Intermediate #1	5.1/2	17	HCP-110	Surface	12437 FT		
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**  
**Log Correlated 5 FT to Marker Joint 6938 FT**  
**Gauge Ring/Junk Basket ran to 7860 FT with no debris**  
**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**

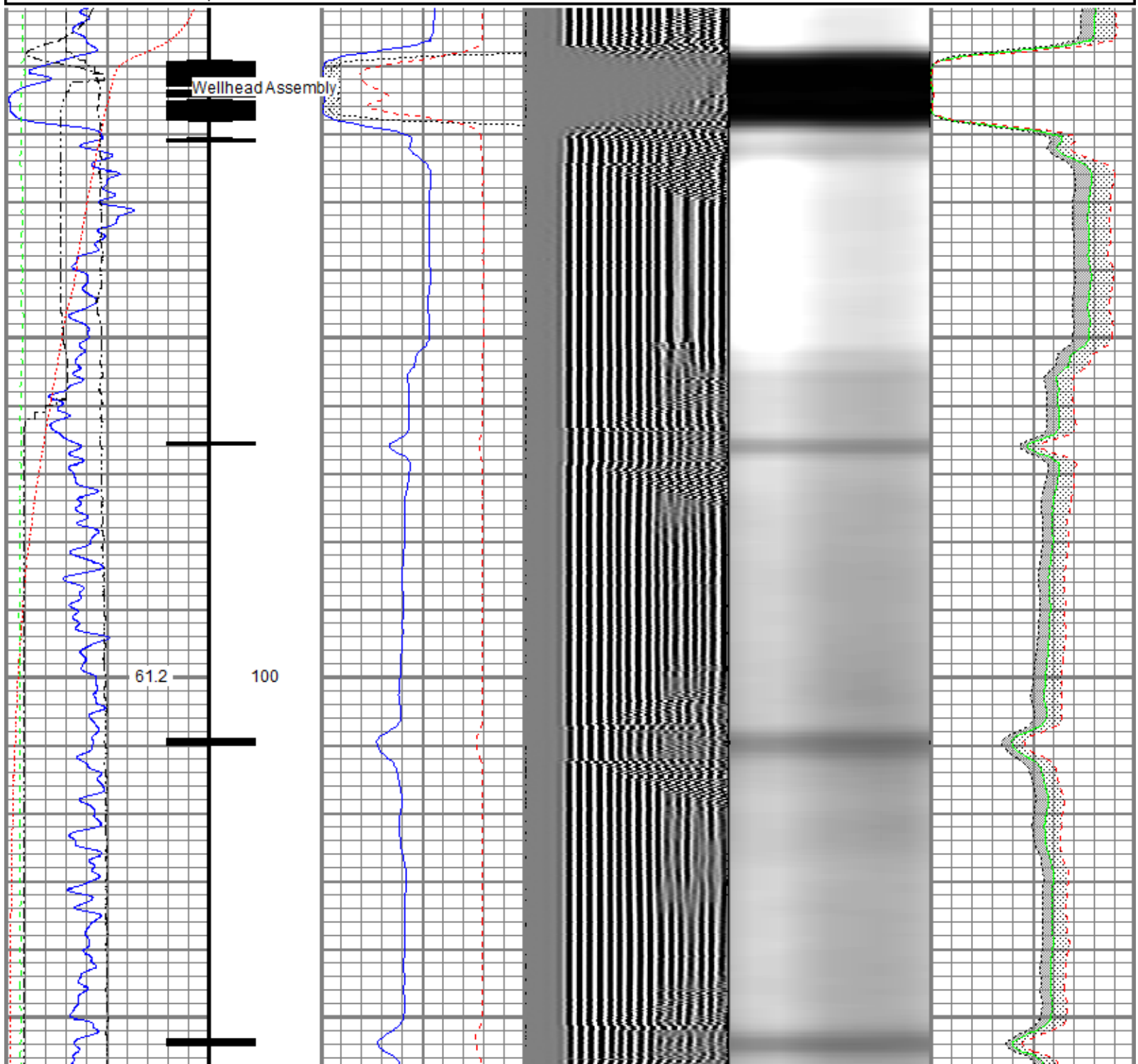


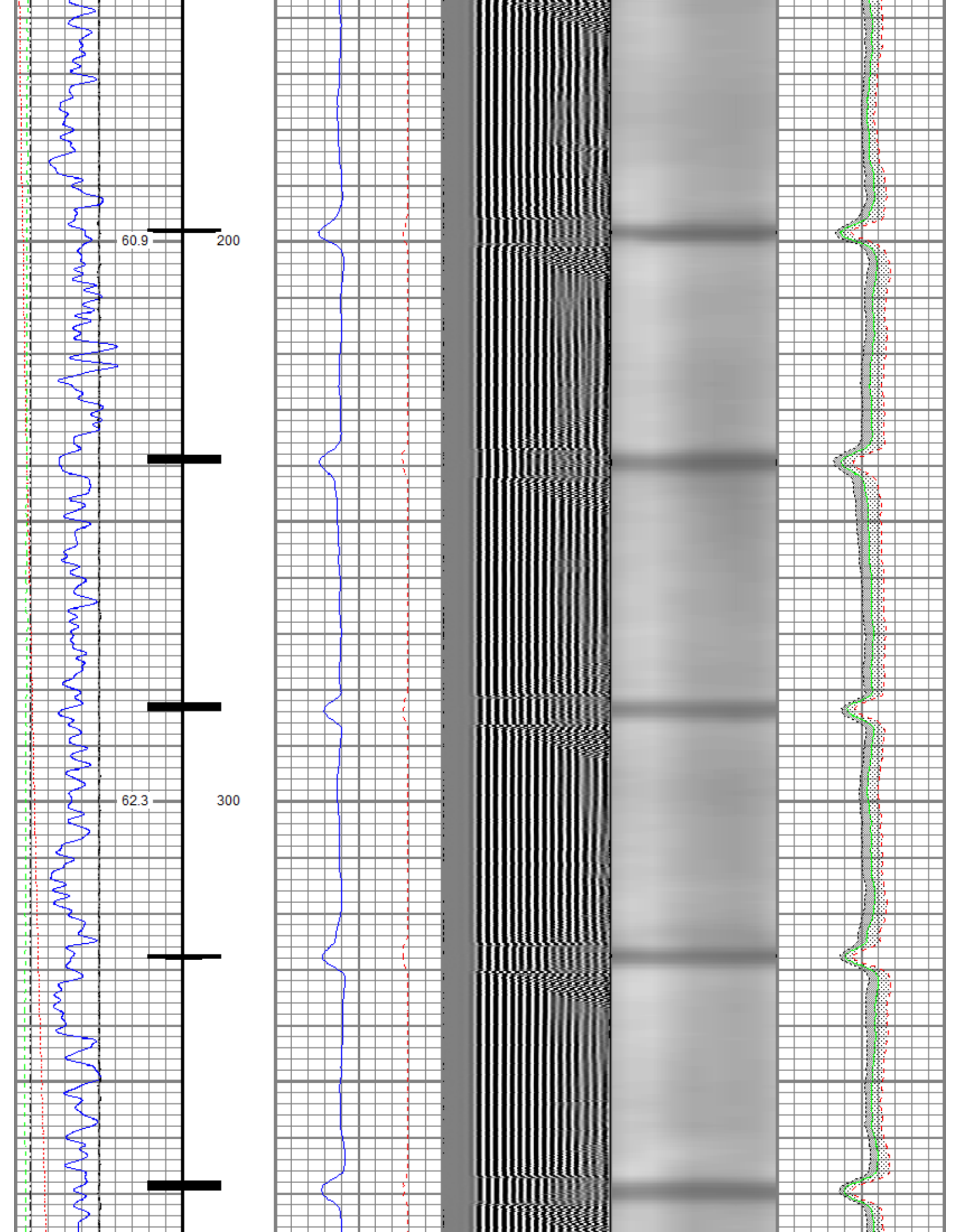
Recorded With 2800 PSI Surface Induced Pressure

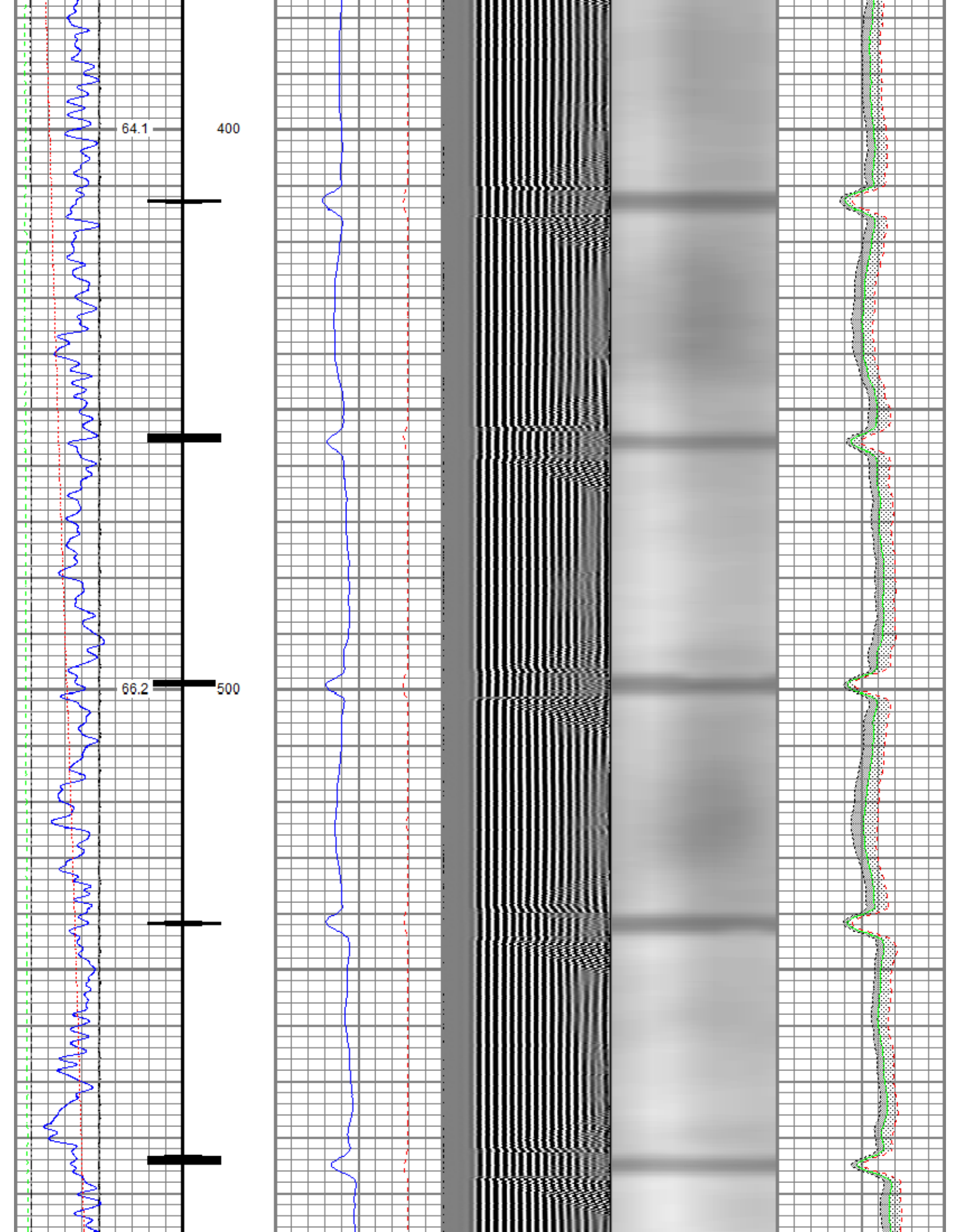
# Recorded With 2800 PSI Surface Induced Pressure

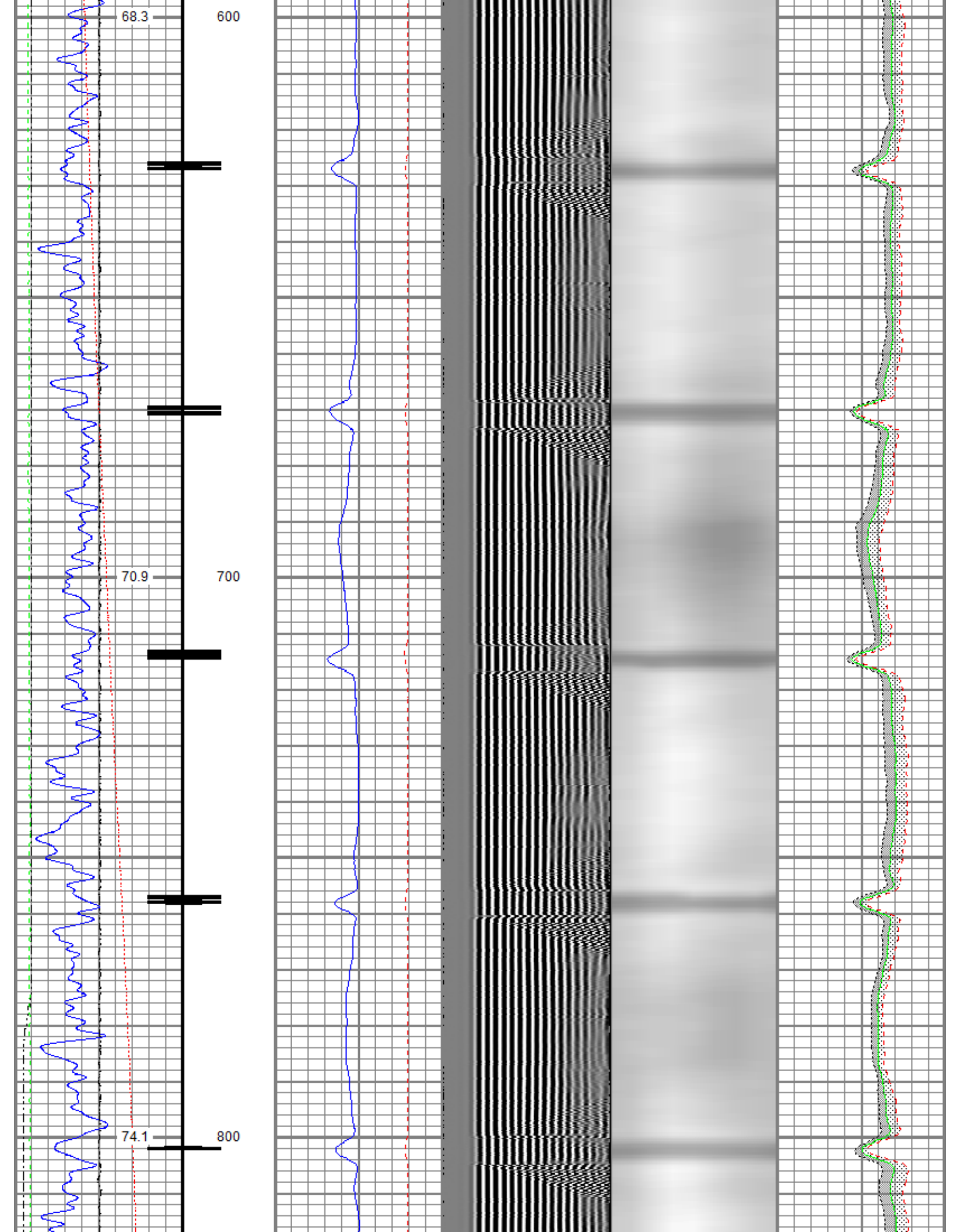
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 Presentation Format    ros\_radrii  
 Dataset Creation      Fri May 11 13:38:47 2018  
 Charted by            Depth in Feet scaled 1:240

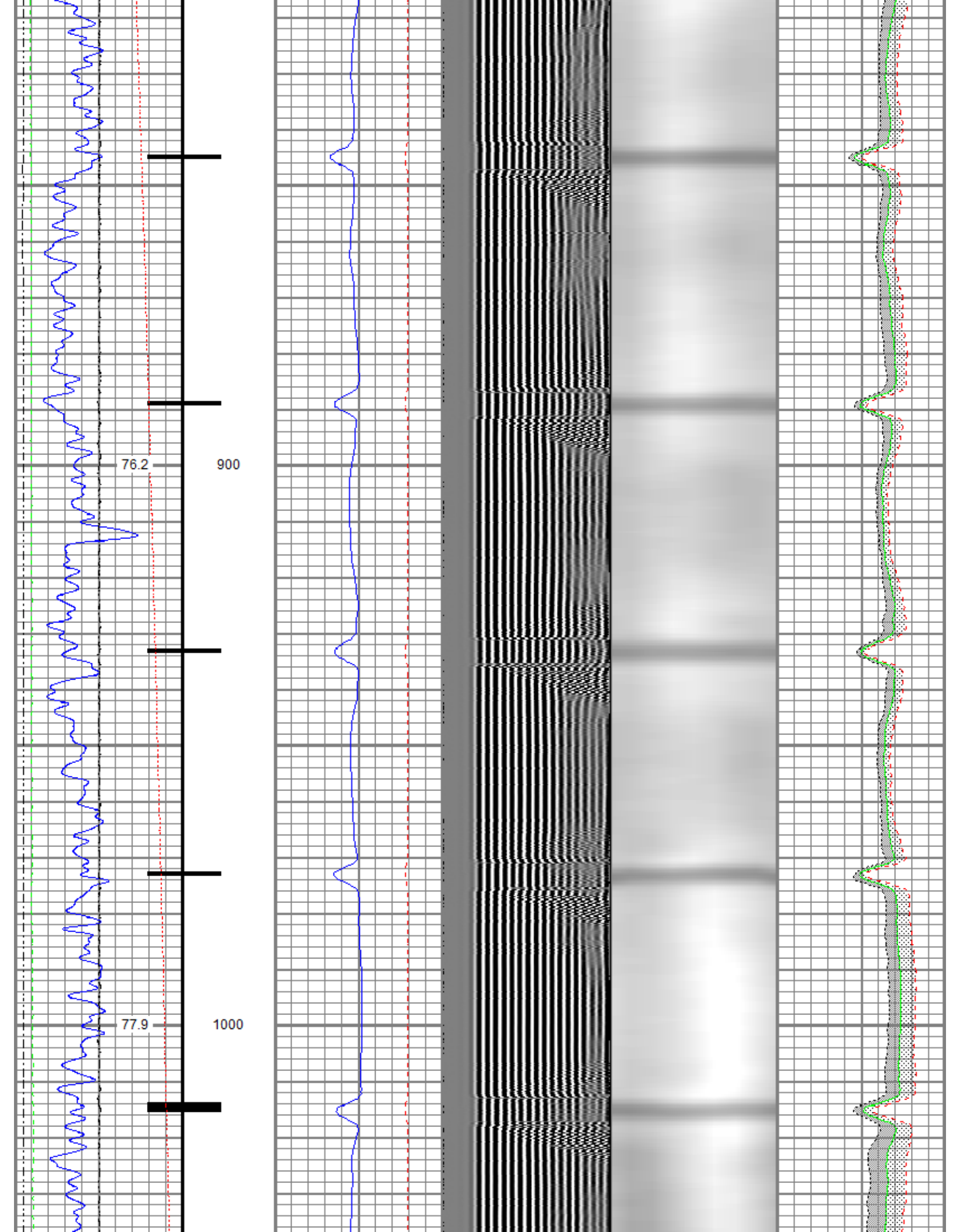
Gamma Ray (GAPI)      120	0    3' Amplitude (mV) 100	5' Variable Density Log	Sector Map	0    Average Amplitude 100
<i>Casing Collar Locator</i>	3' Amplitude x 5      200      1200			Minimum Amplitude
0    Temperature (degF) 20	0      (mV)      20			0      100
Line Speed	3' Travel Time			Maximum Amplitude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

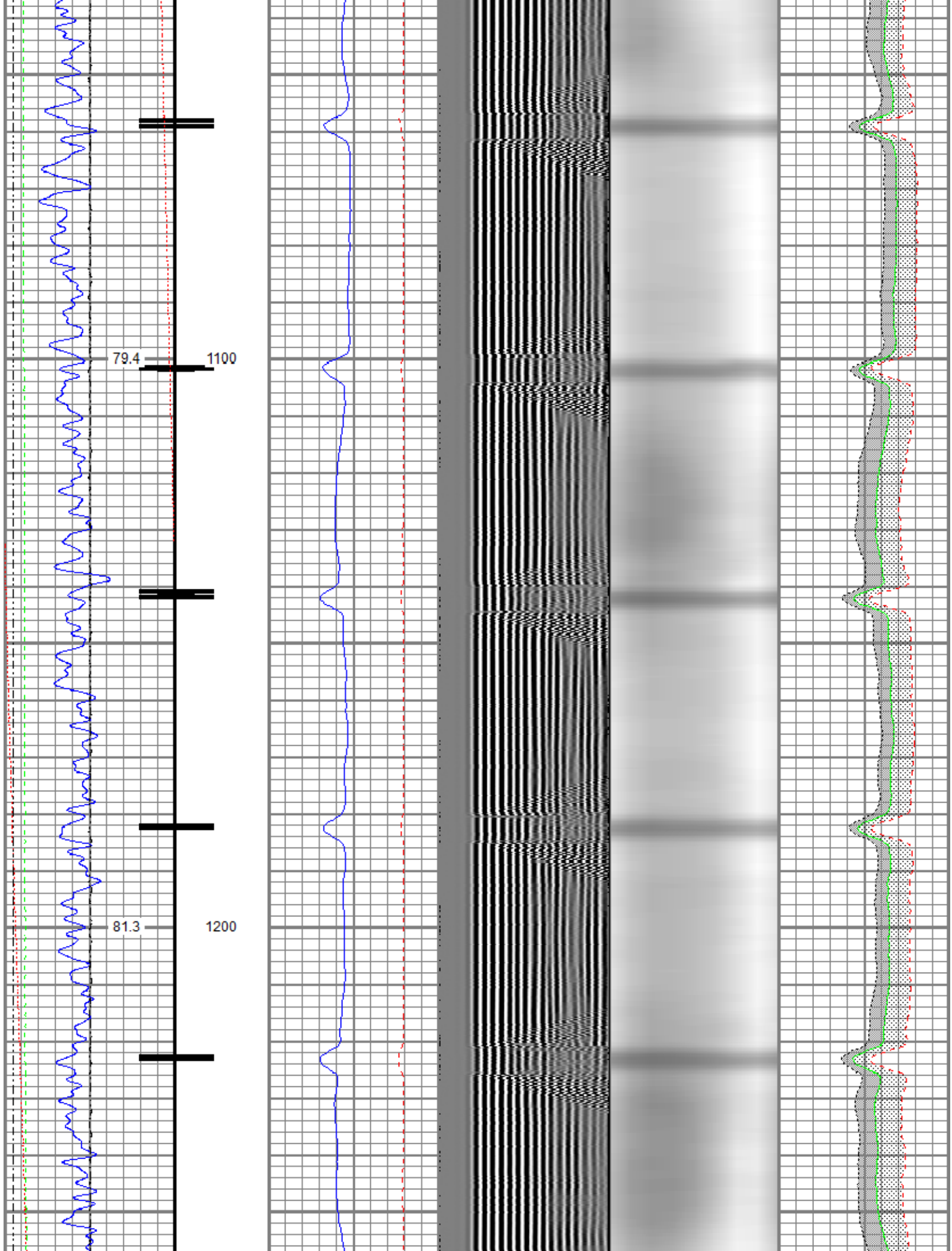


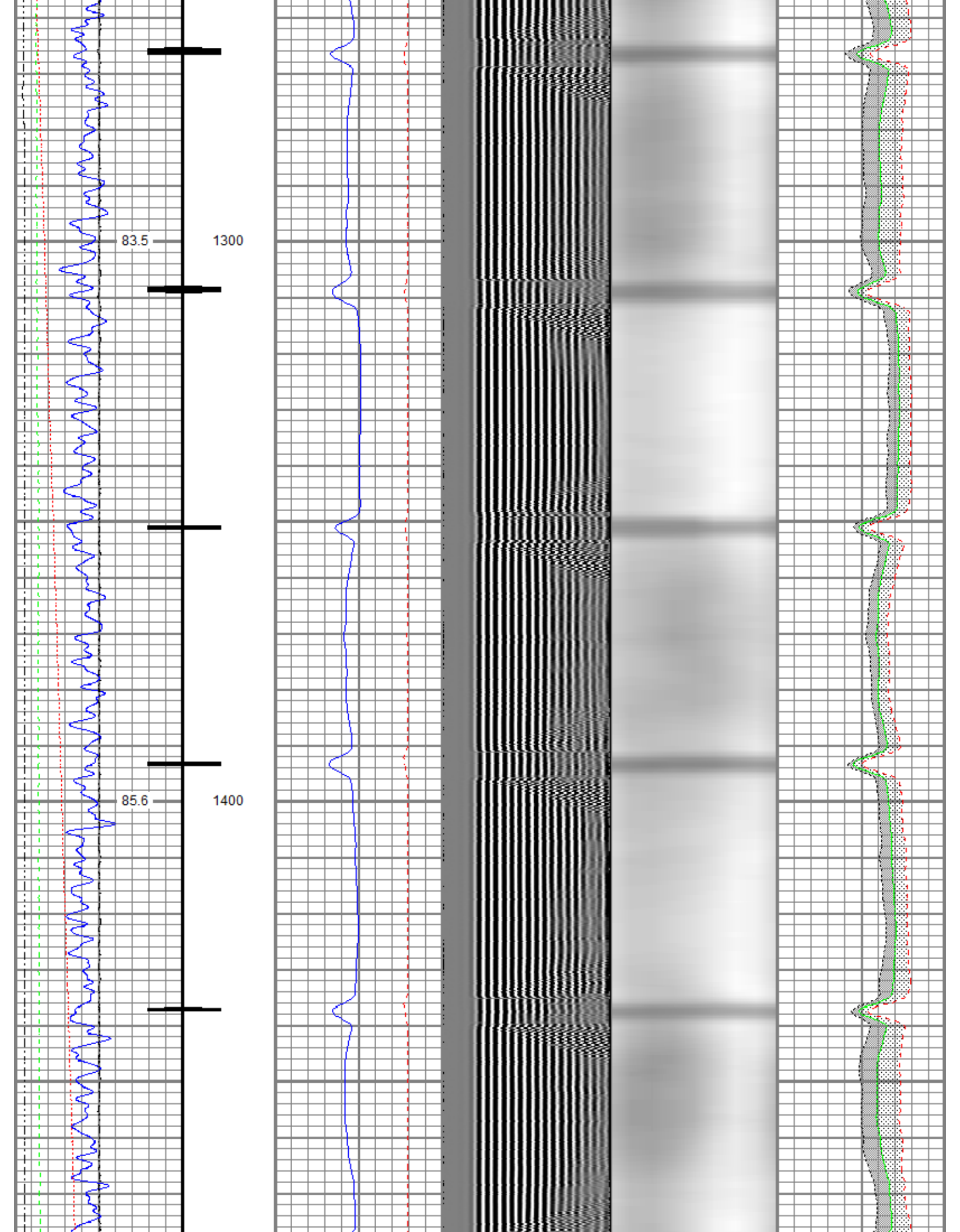




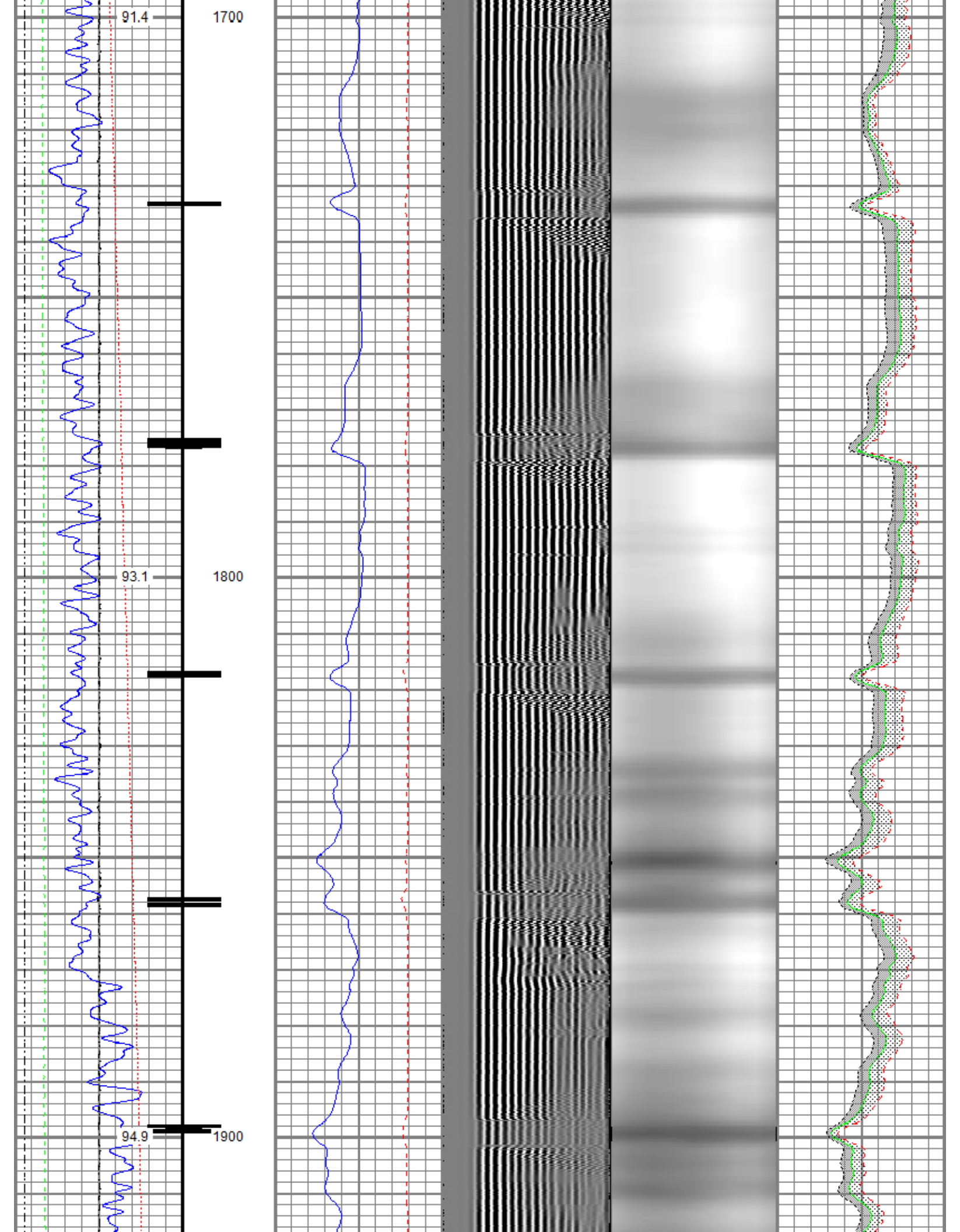


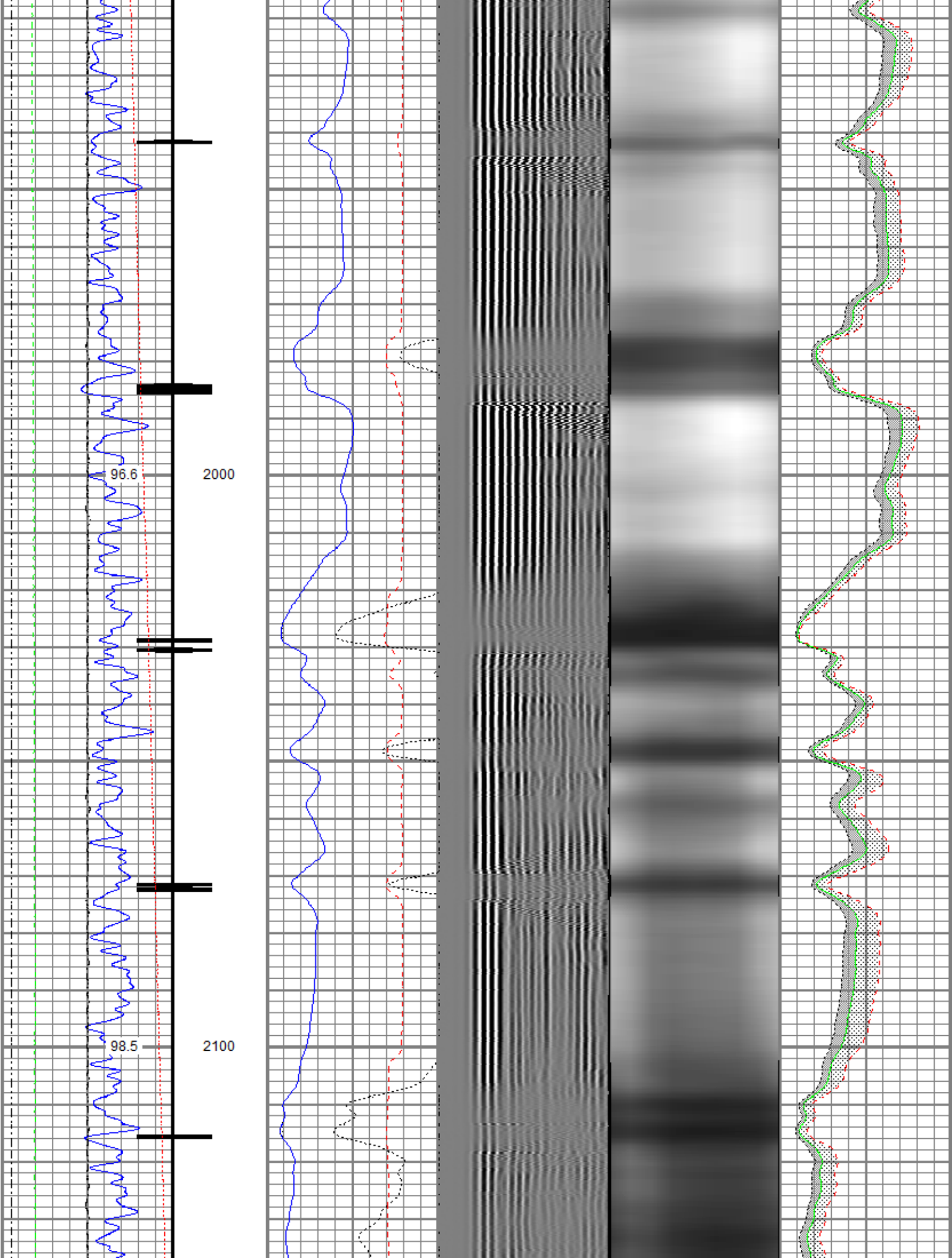


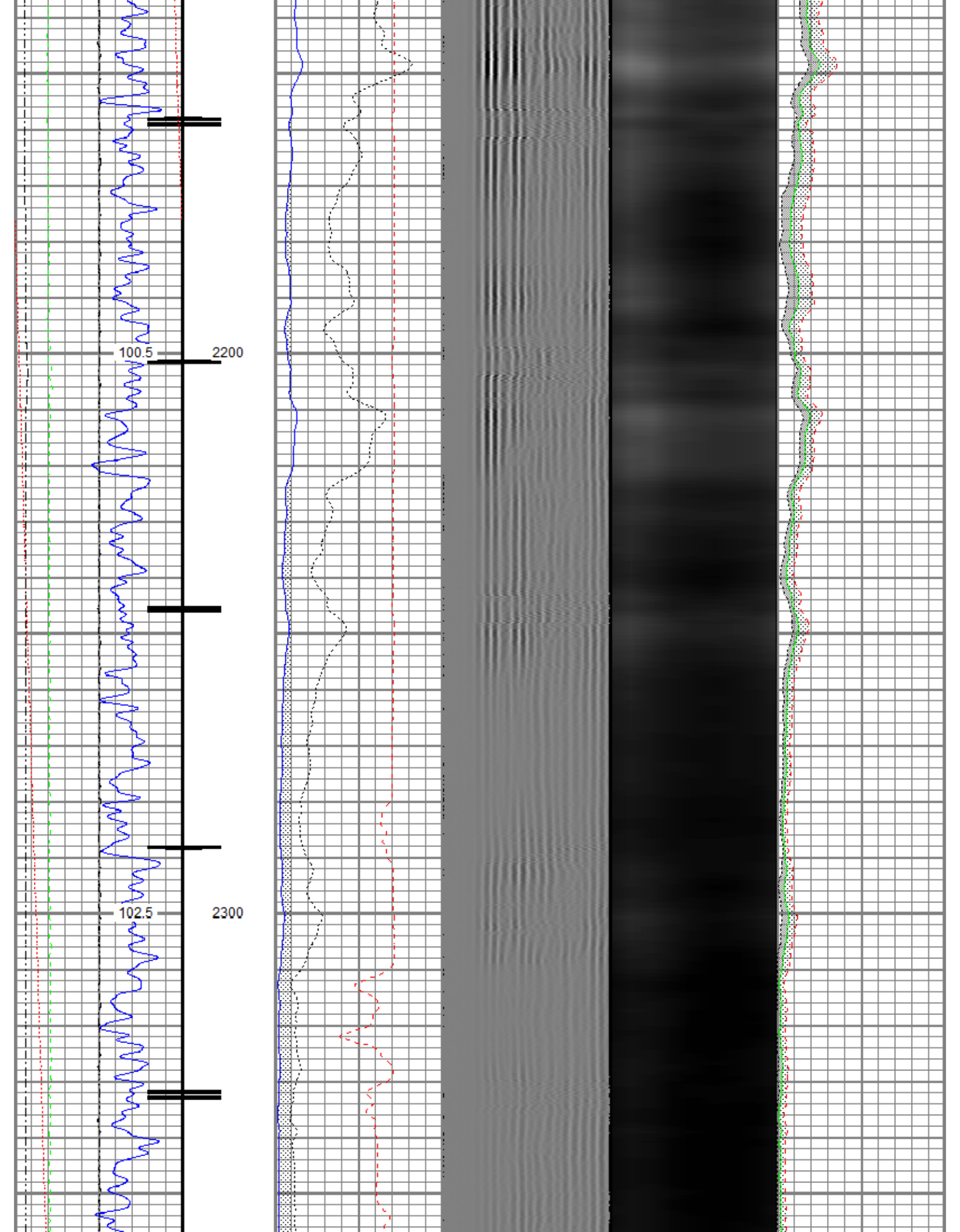


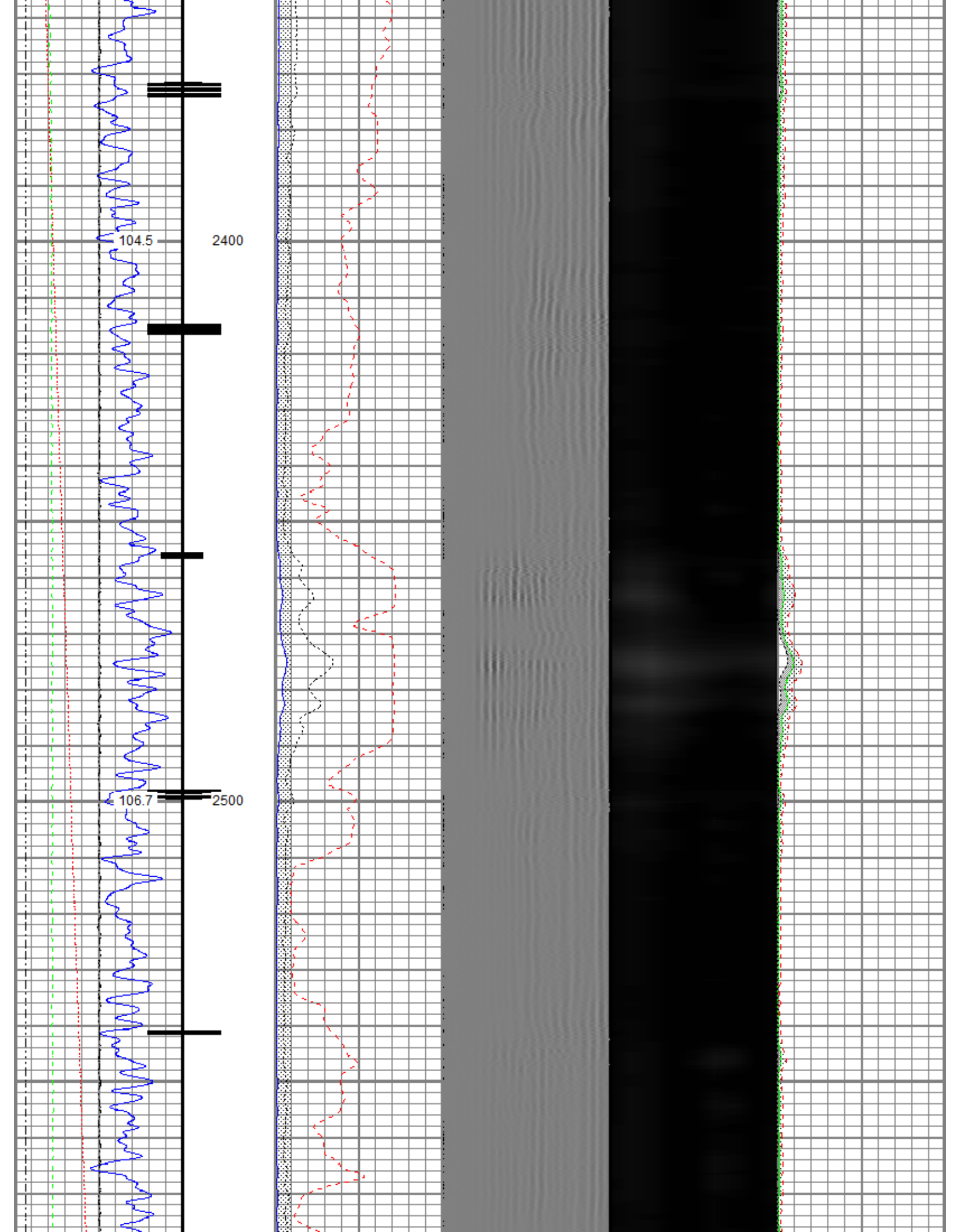


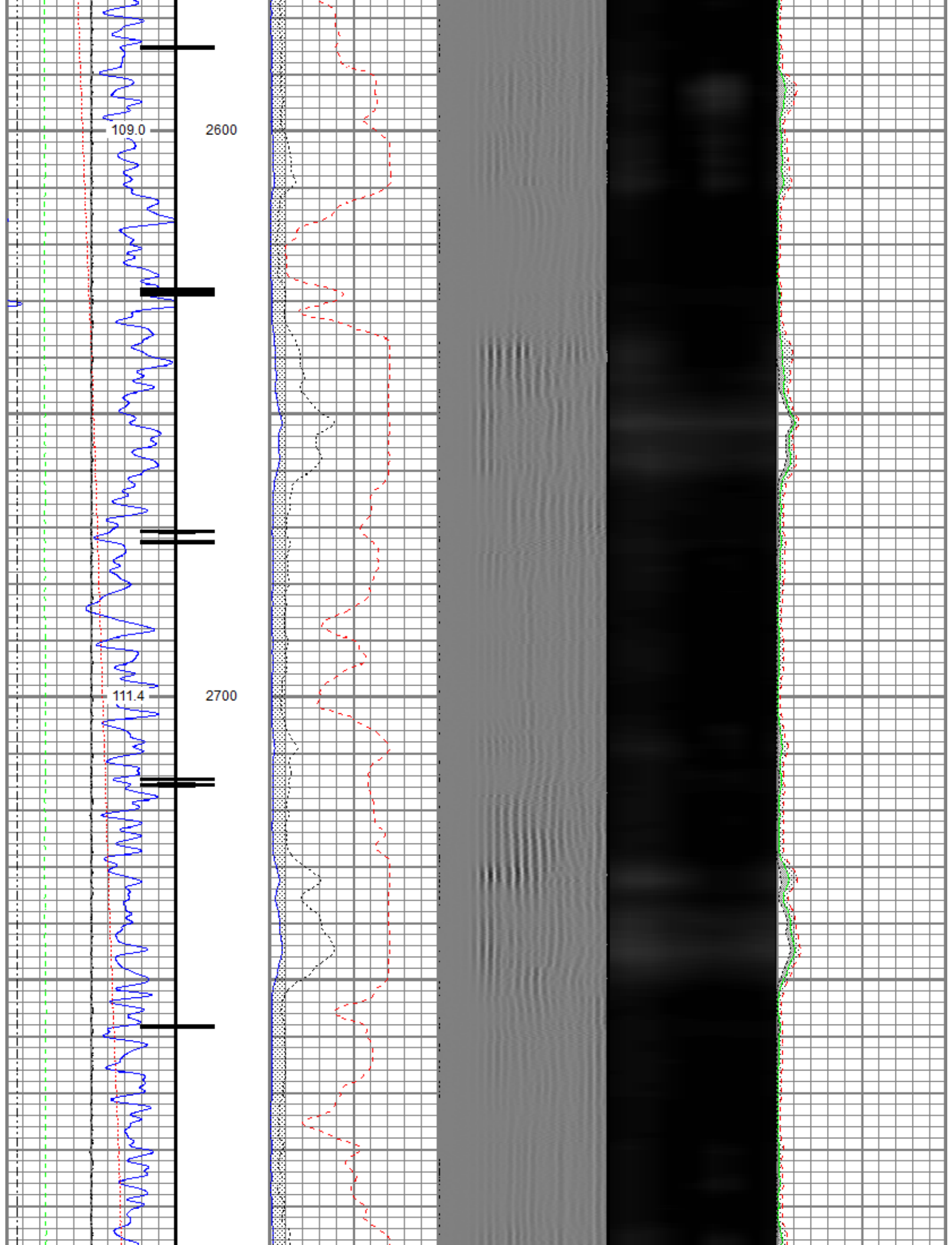


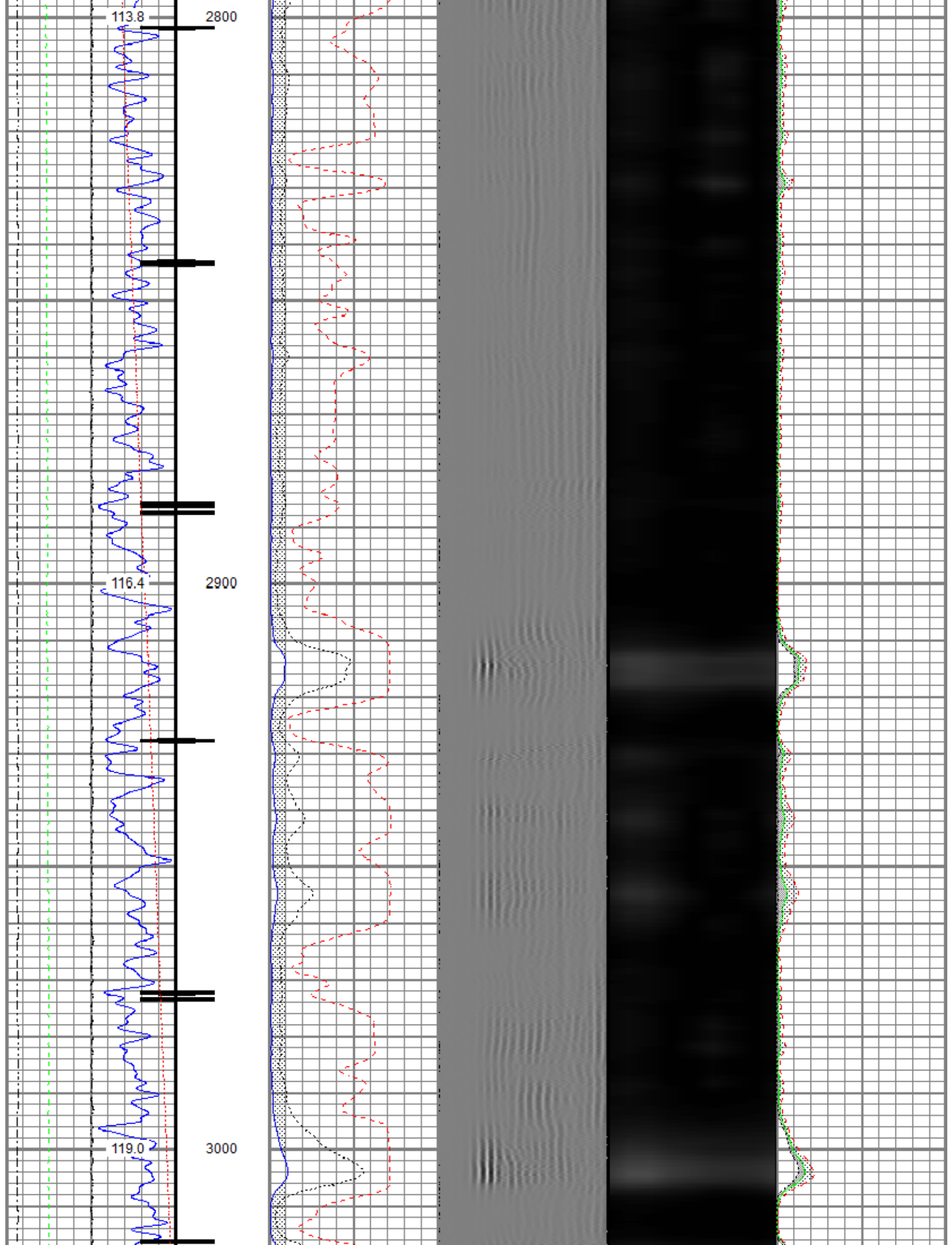




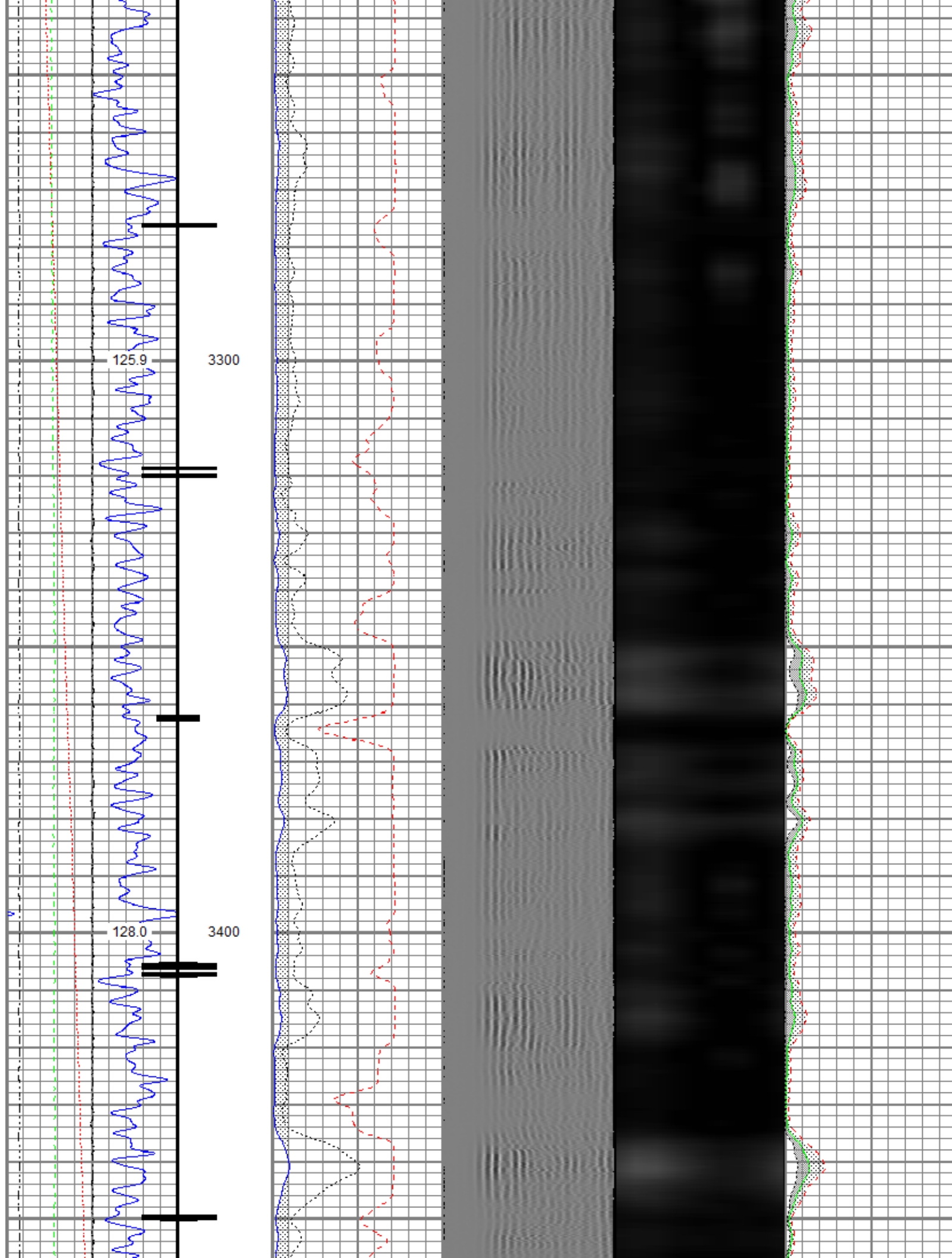


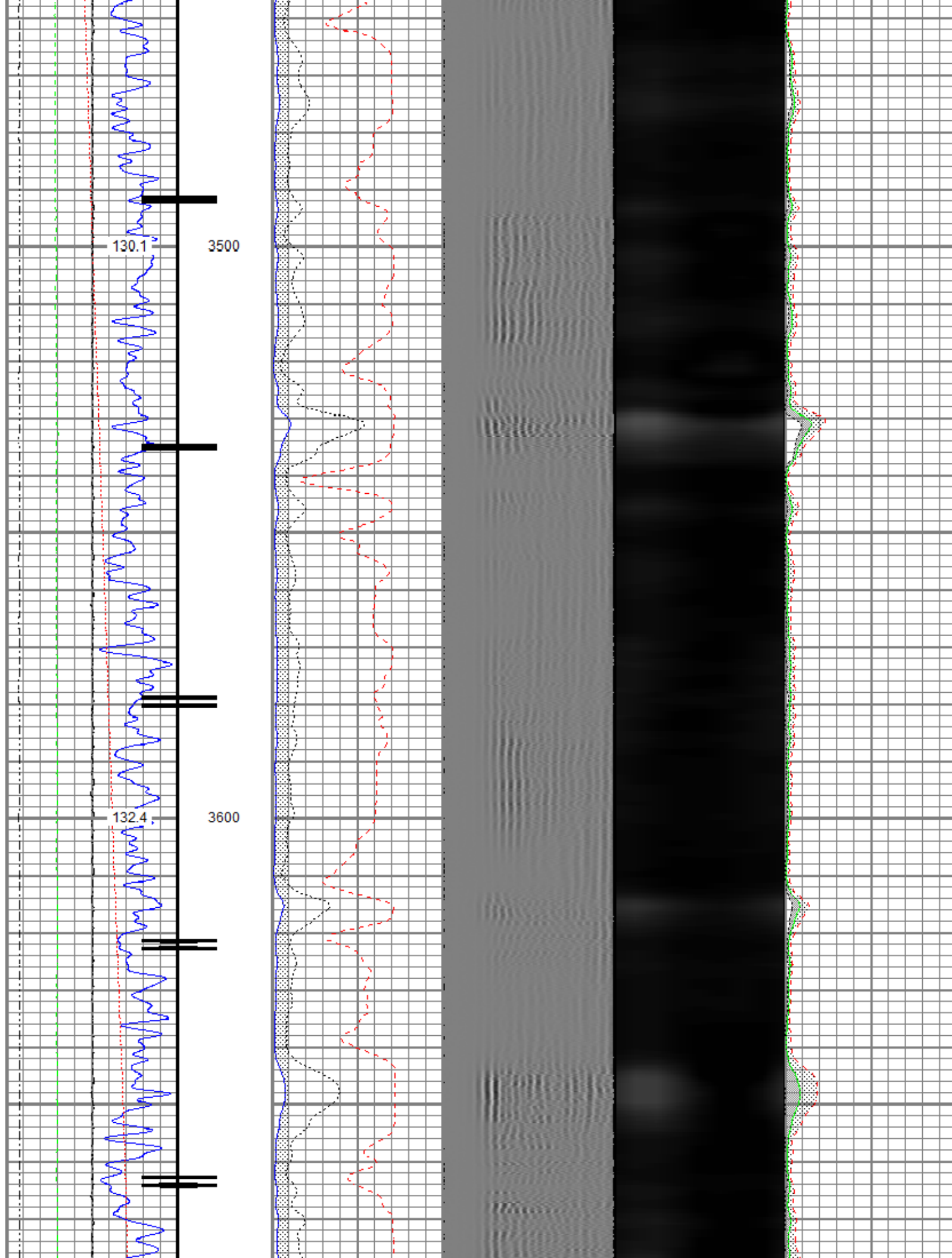


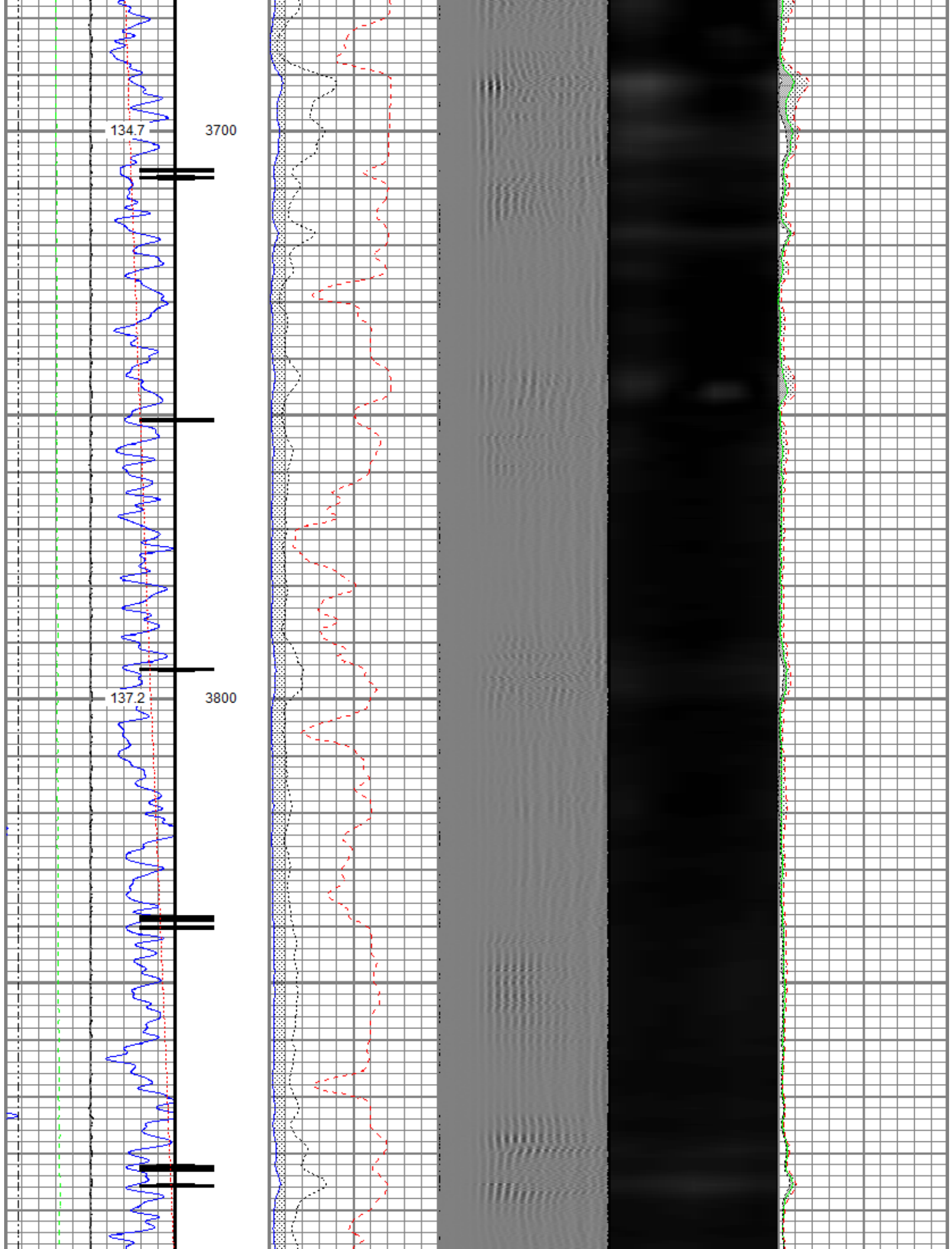












140.0

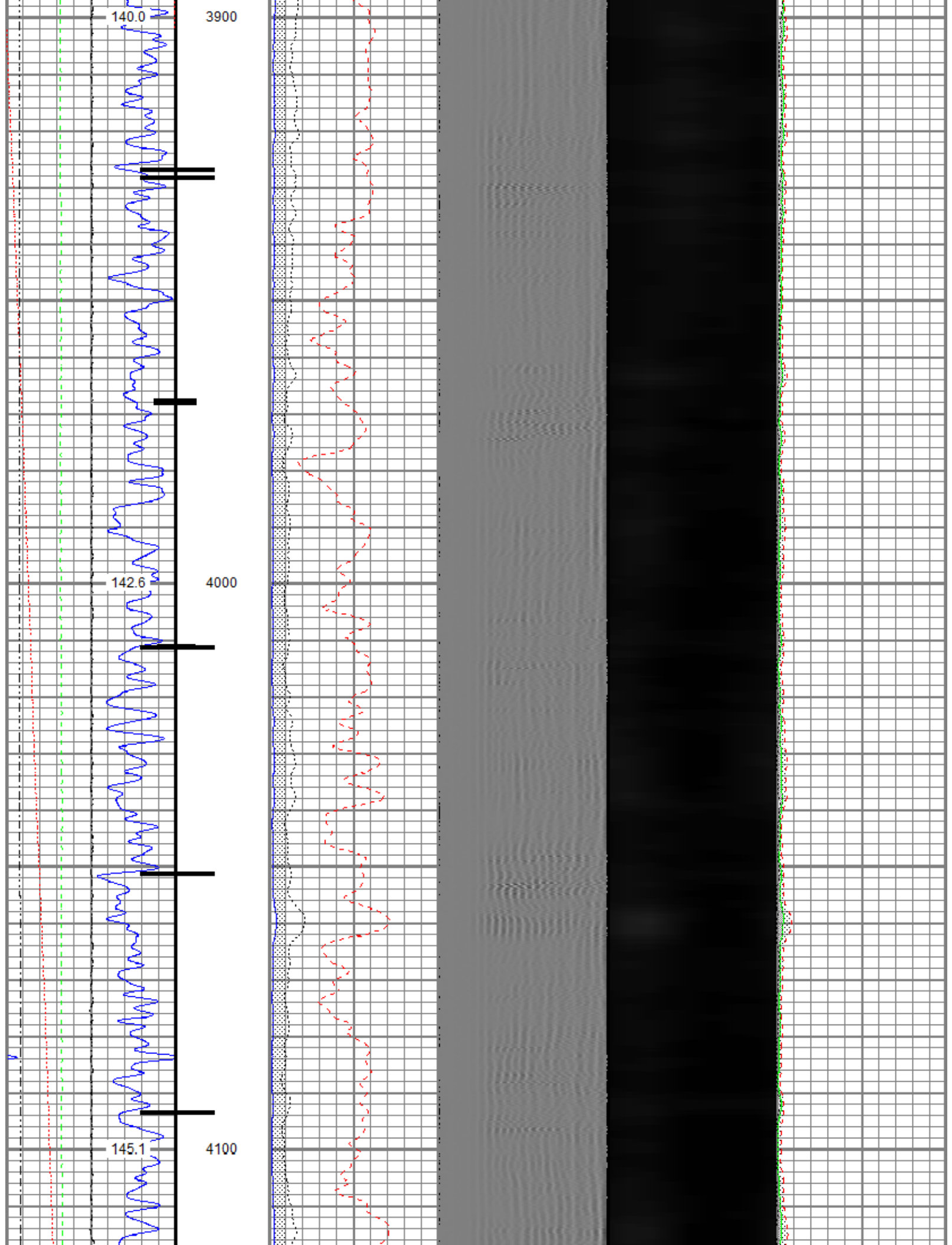
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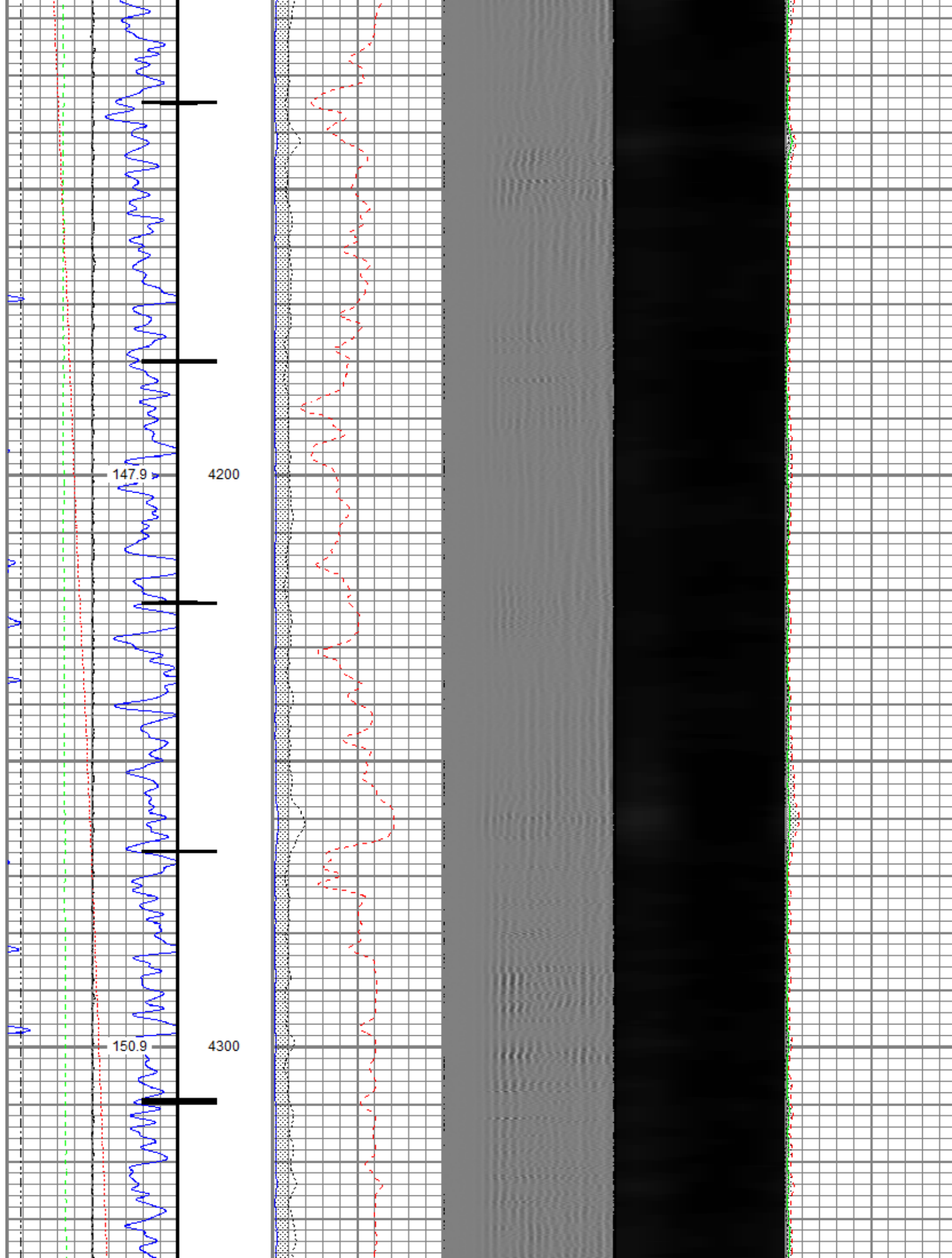
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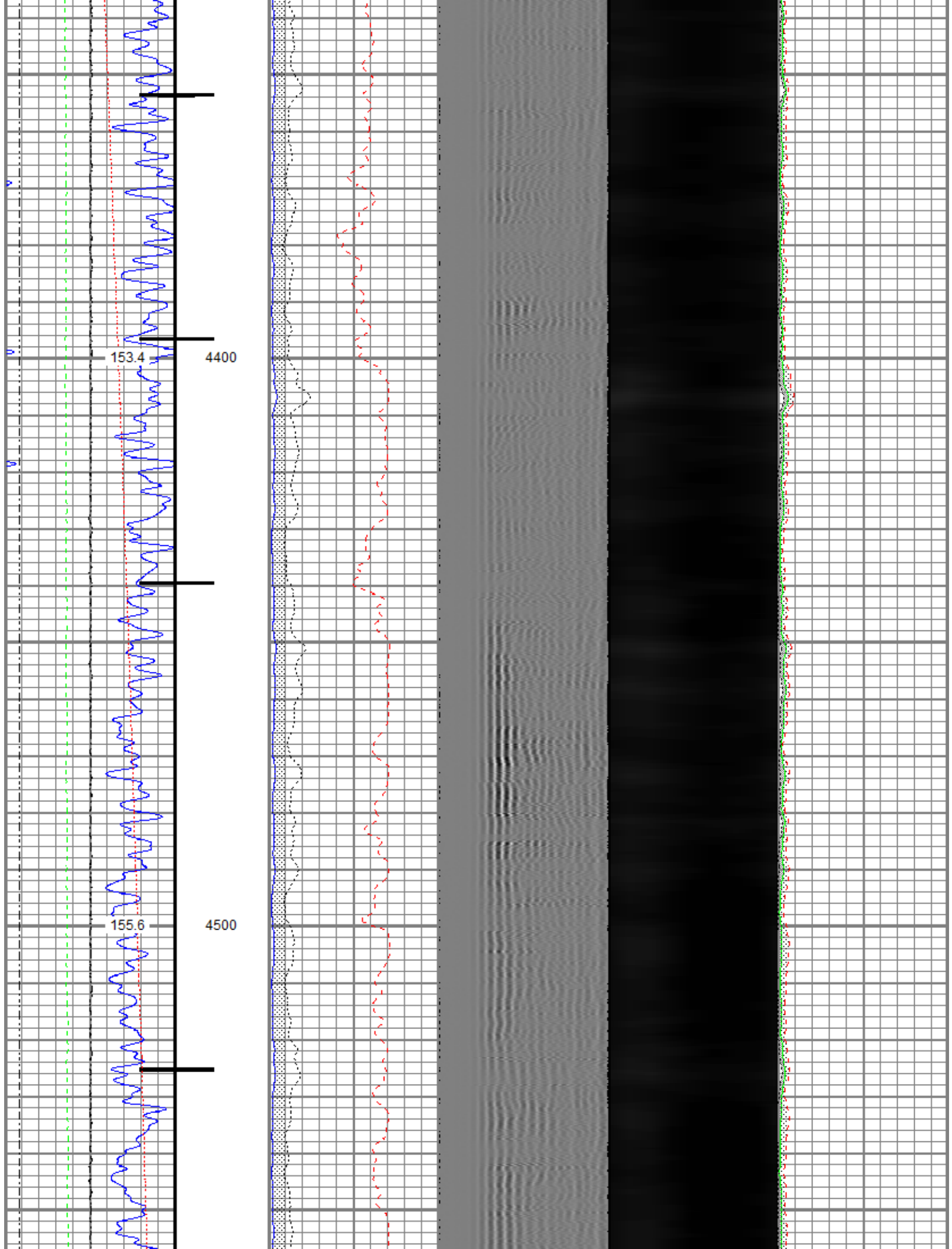
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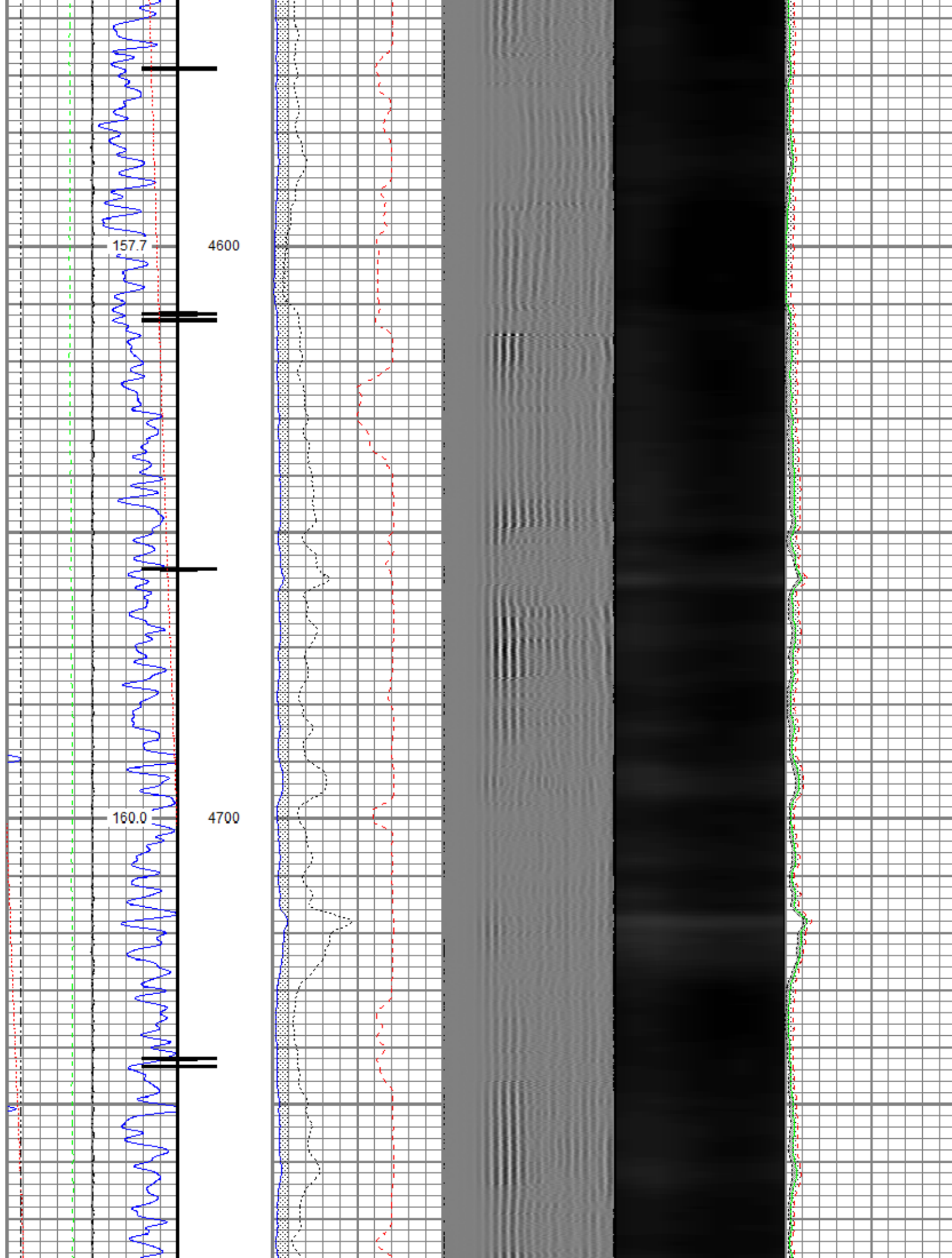
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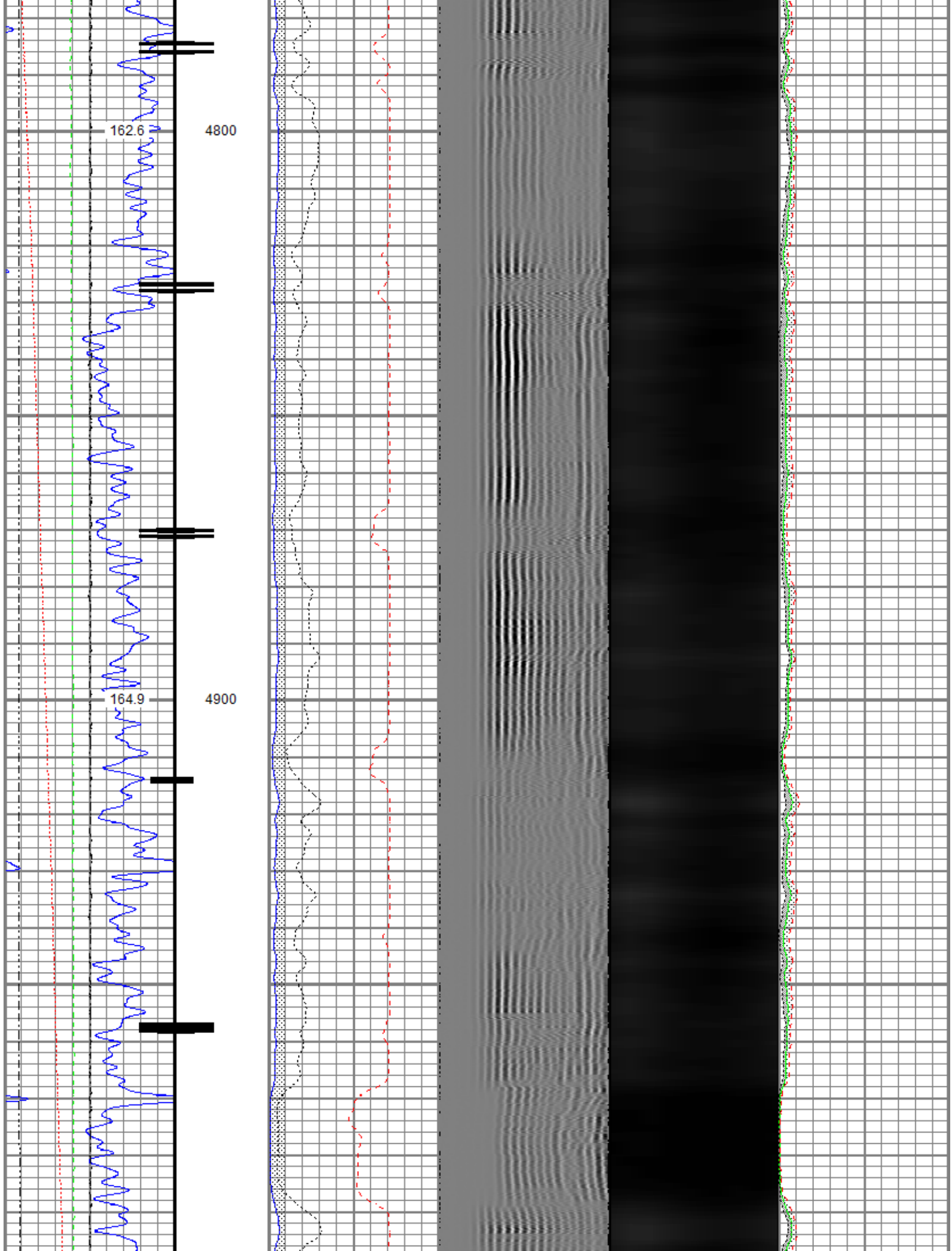
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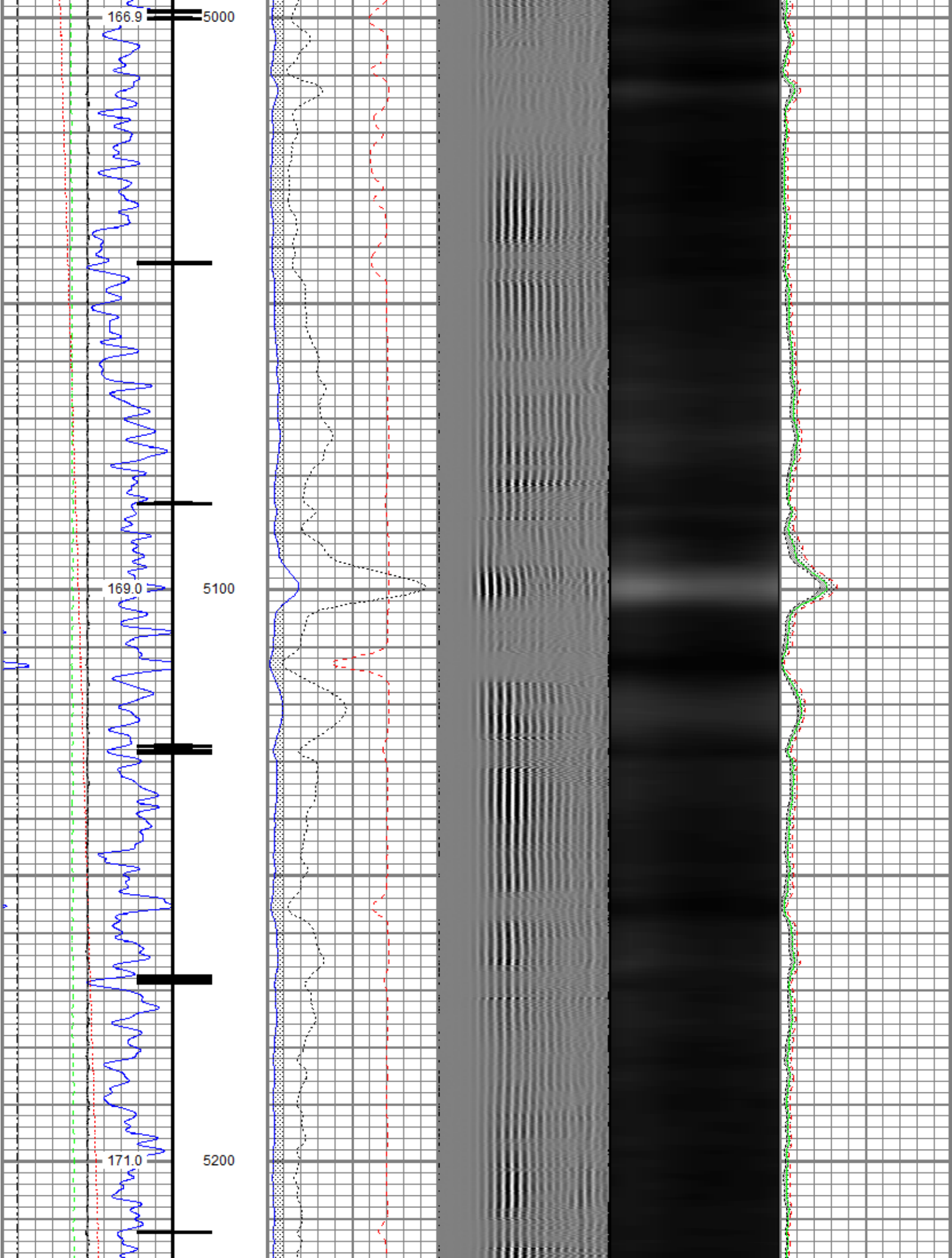


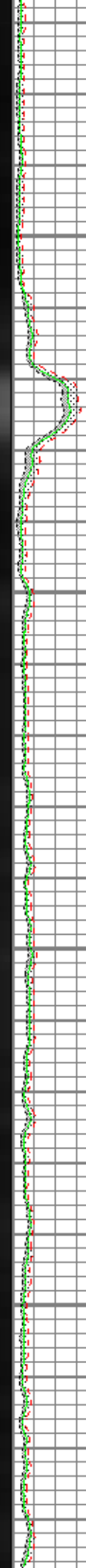
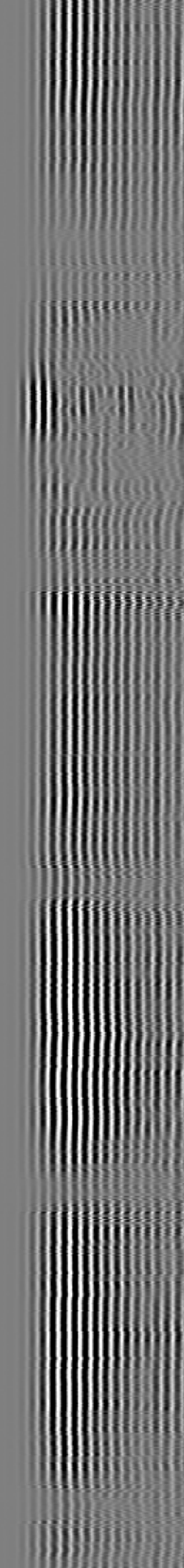
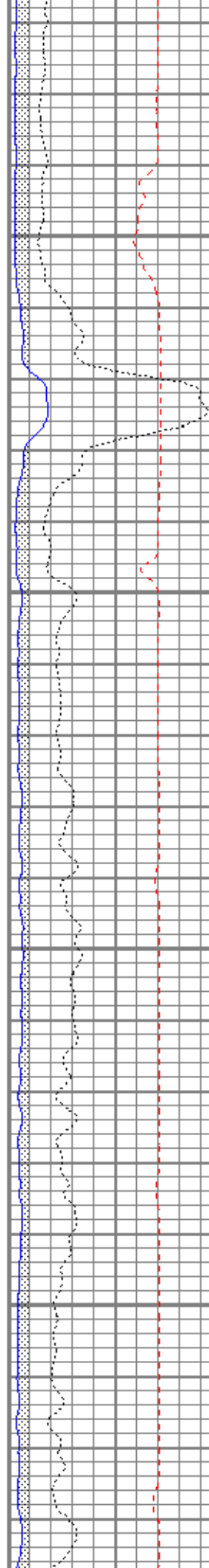
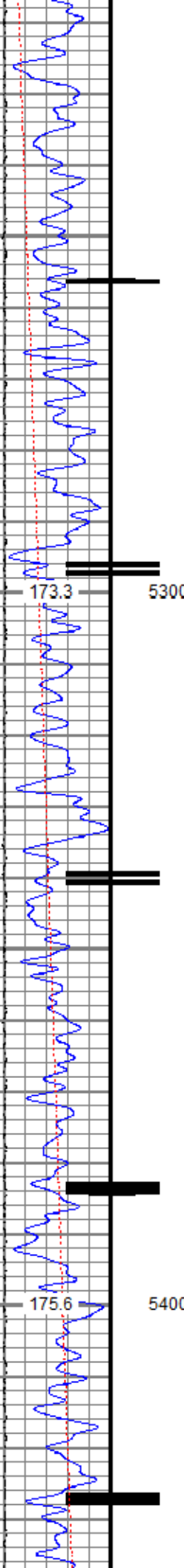


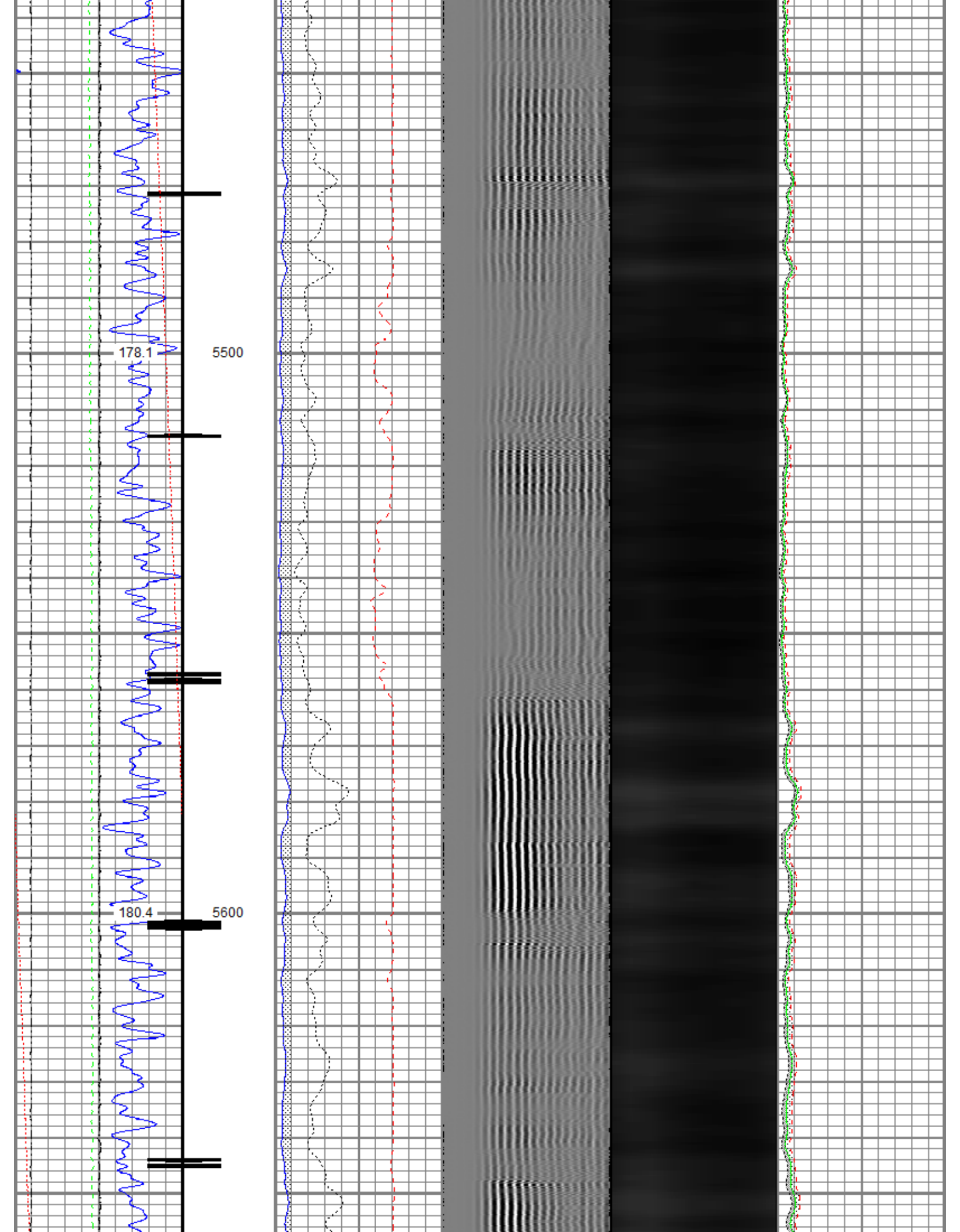
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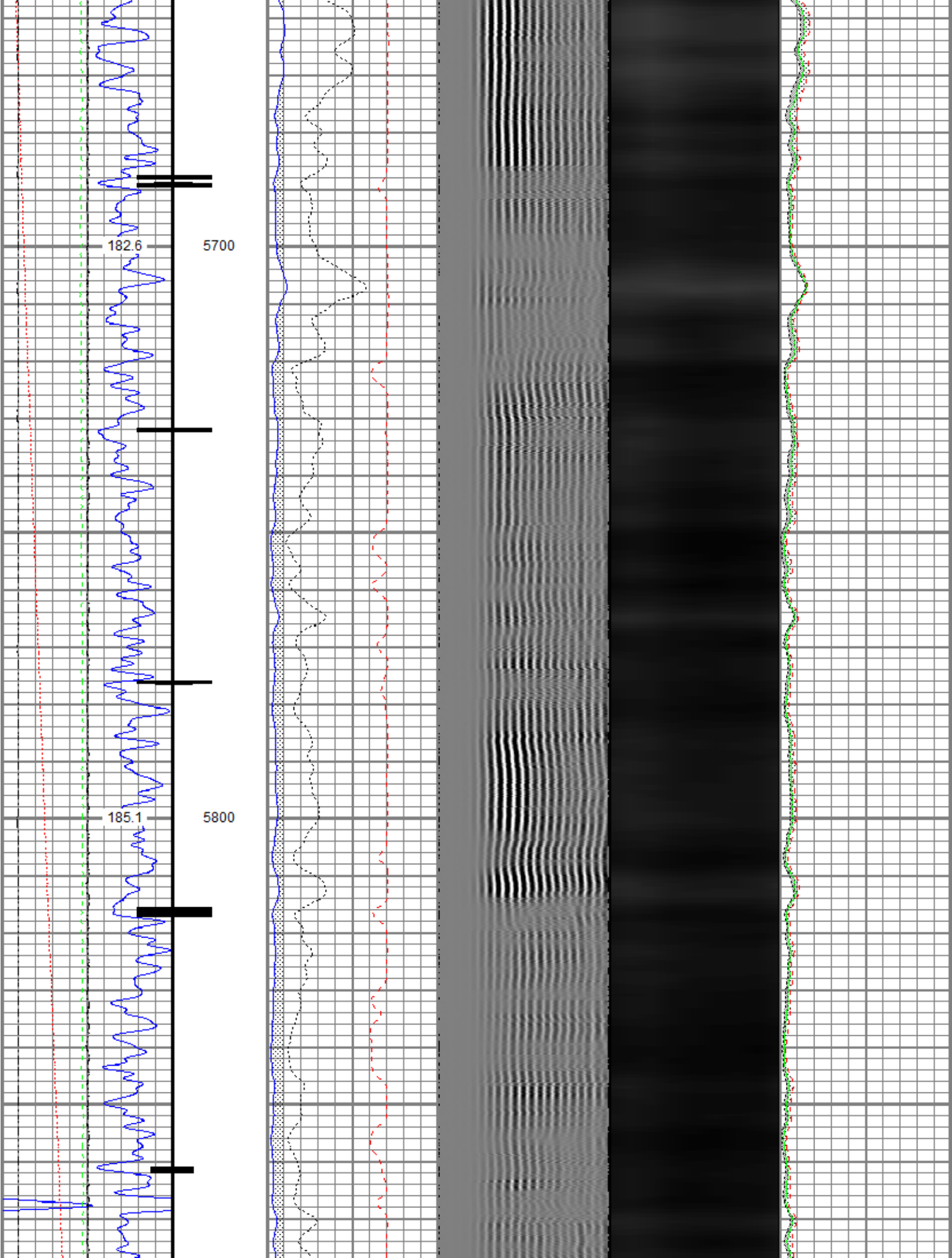
169.0 5100

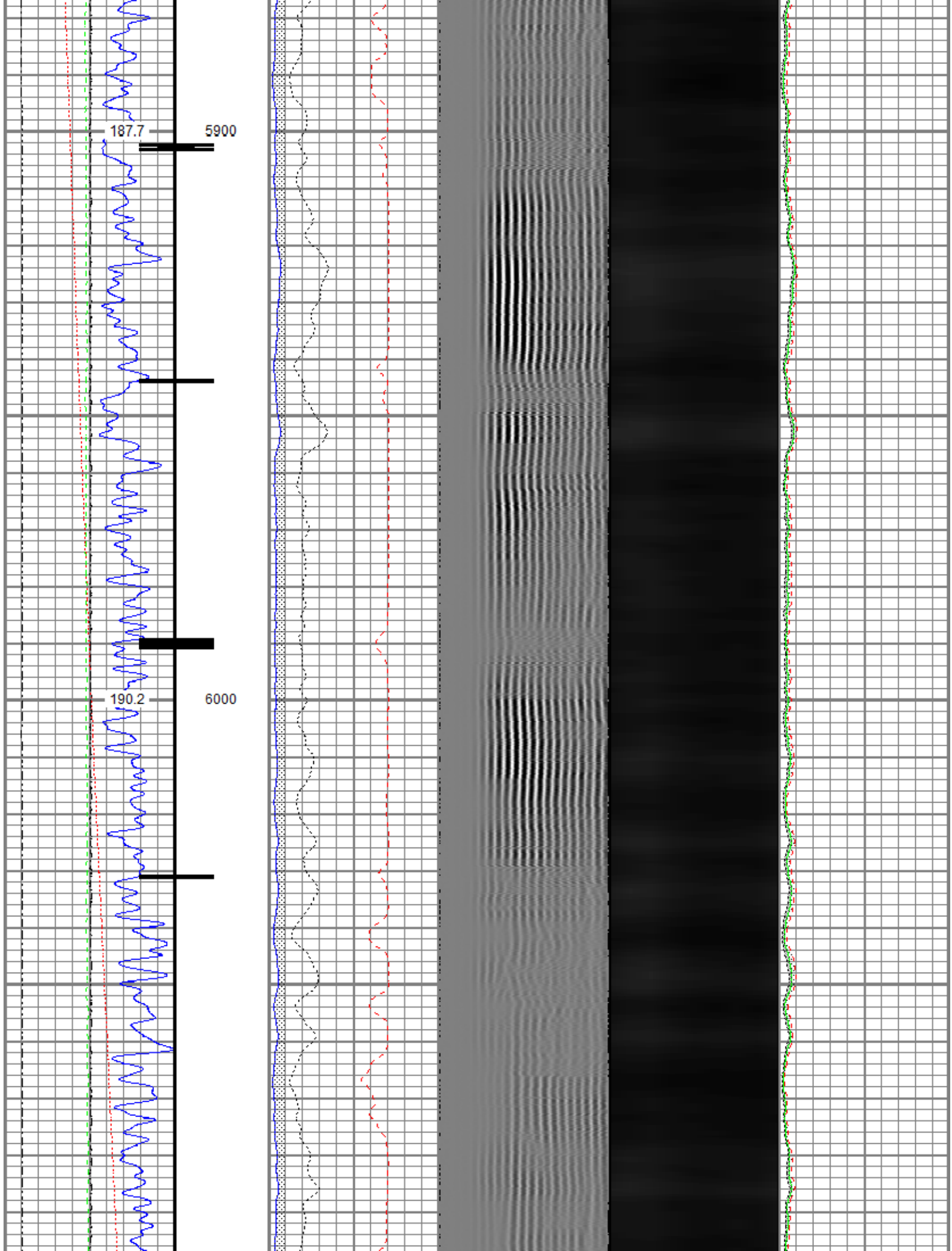
171.0 5200



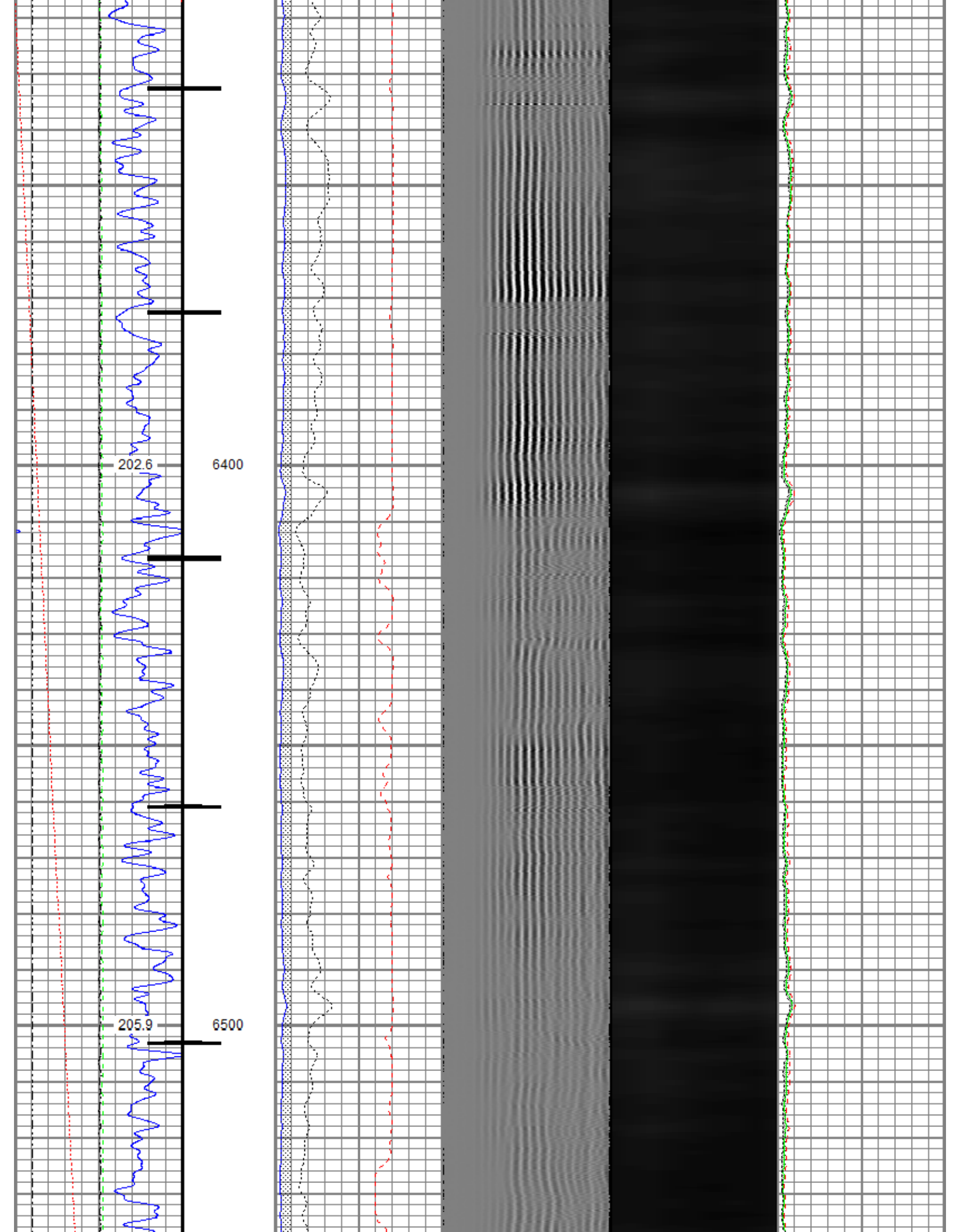


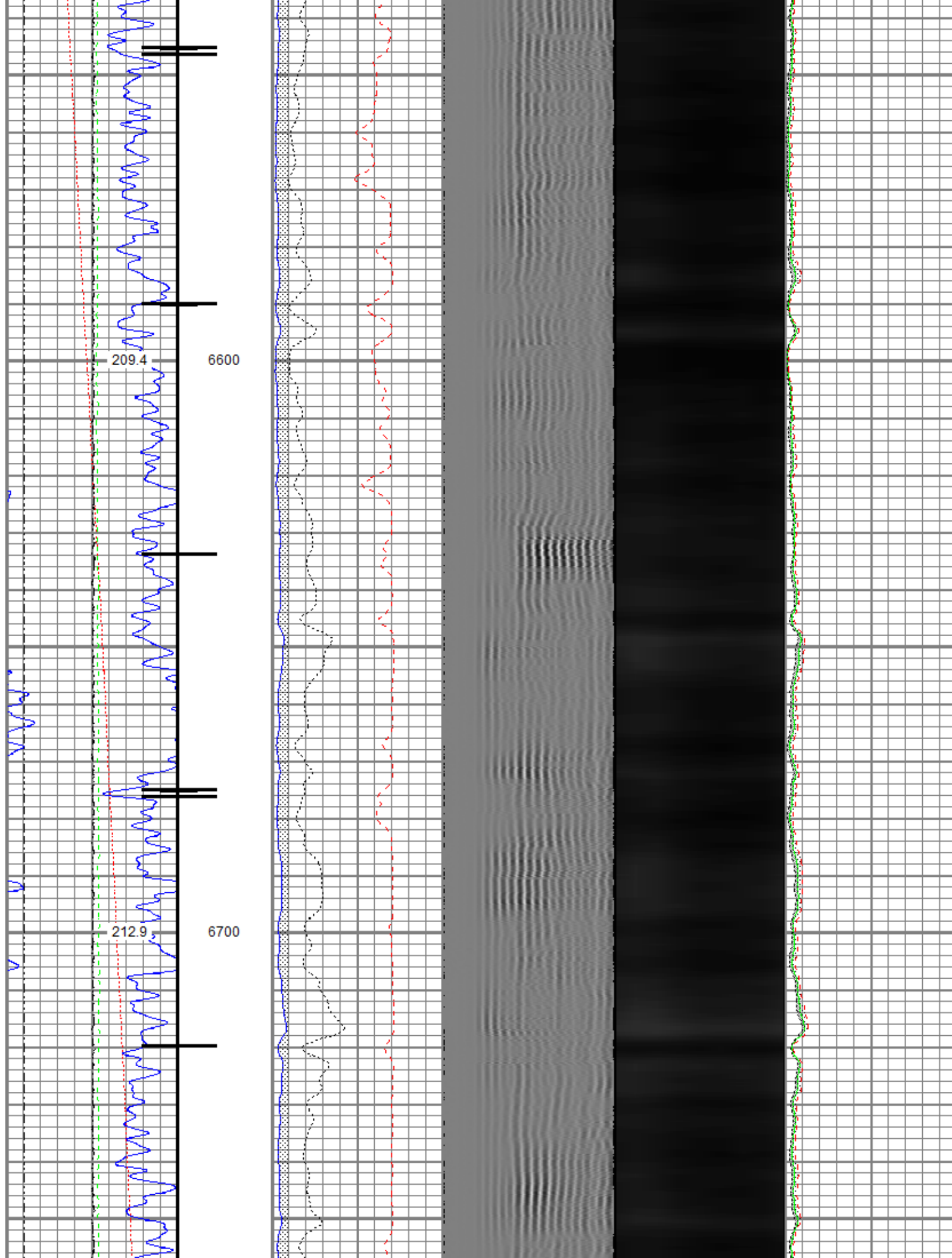


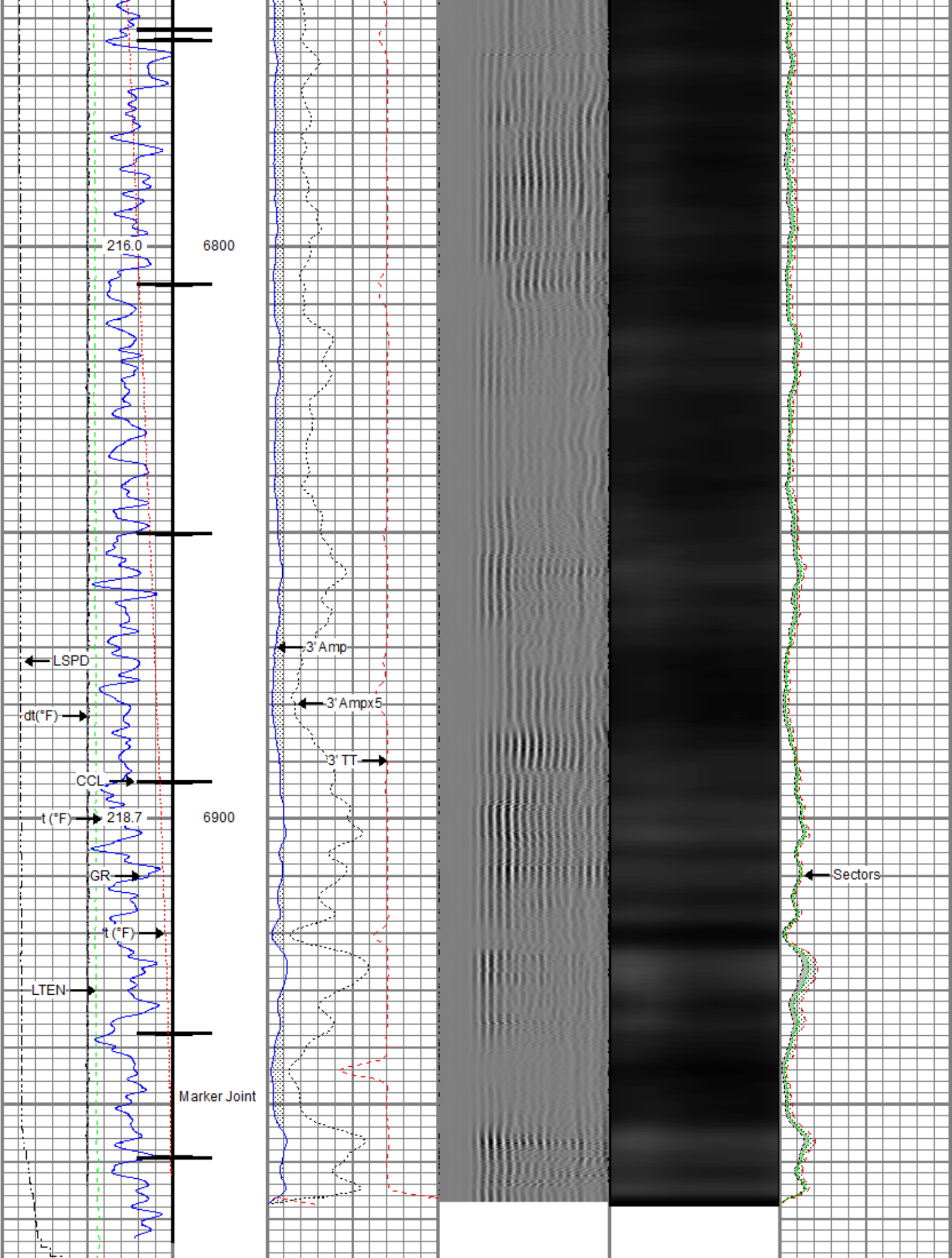












Gamma Ray (GAPI)	0 120	3' Amplitude (mV)	100	5' Variable Density Log	Sector Map	Average Amplitude	100
Casing Collar Locator		3' Amplitude x 5	200	1200		Minimum Amplitude	
Temperature (degF)	0 20	(mV)	20			Maximum Amplitude	100
Line Speed	-150 150	3' Travel Time	650	150			
(ft/min)		(usec)					
Line Tension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

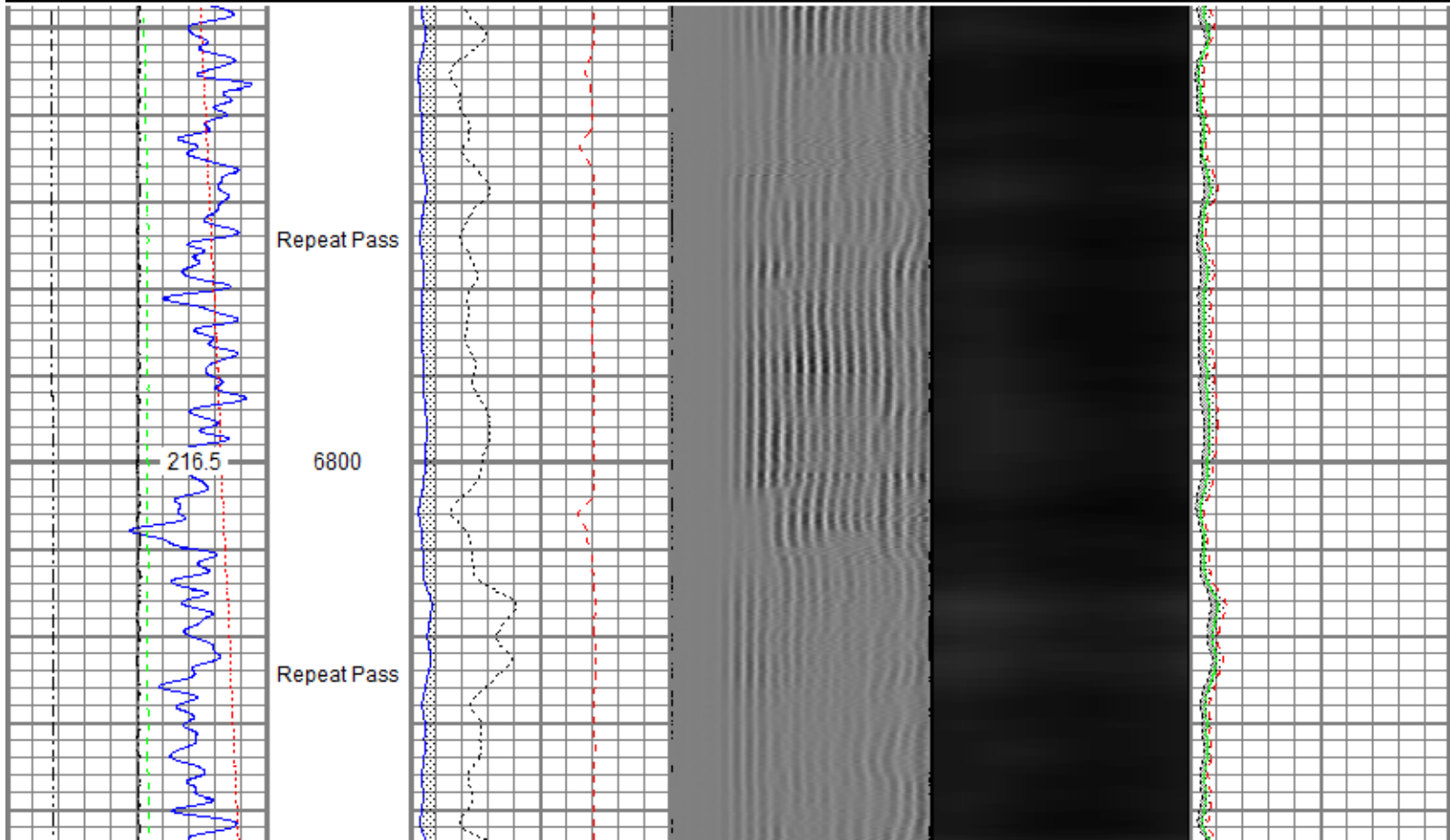


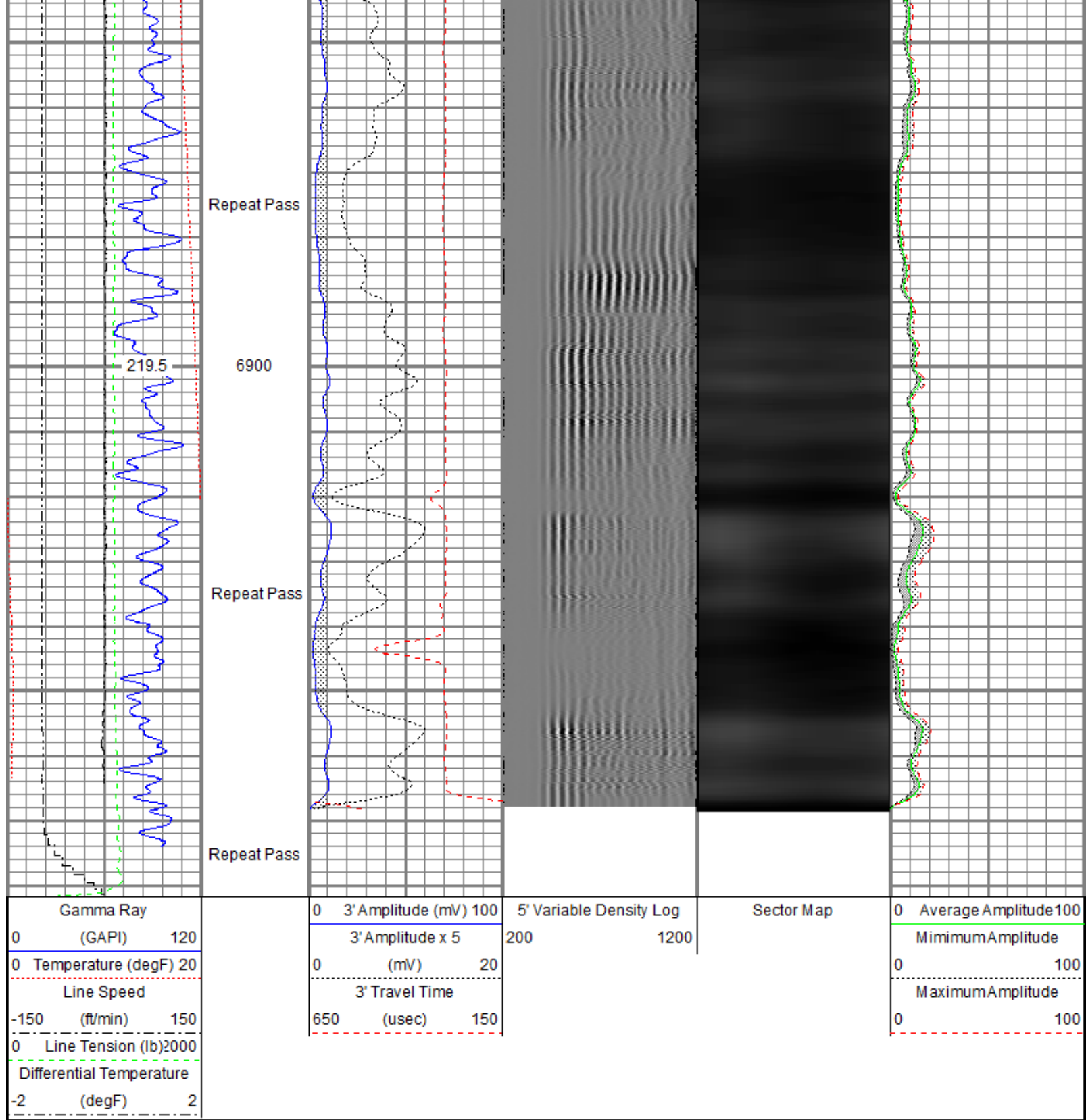
## Repeat Pass

Recorded With 2800 PSI Surface Induced Pressure

Database File: anadarko\_azul 13-2hz\0512345915\_anadarko\_azul 13-2hz\_rbl\_05-09-18\_2800 psi.db  
 Dataset Pathname: pass2.1  
 Presentation Format: ros\_radrii  
 Dataset Creation: Fri May 11 08:52:13 2018  
 Charted by: Depth in Feet scaled 1:240

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





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	17.04					
WVFS8	14.81		Probe Radii-2750 RBT (FW1305-096)	9.39	2.75	105.00
WVFS7	14.81		Probe 2-3/4" Radial Cement Bond Tool with Integral Temperature Sub			
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					
CCL\$2	6.80		Probe CENT-2750	2.88	2.75	20.00
CCL\$1	6.80		Probe 2-3/4" Electric Inline Bowspring Centralizer			
GR	5.46		Probe GR-CCL-2750 6PB (101001)	4.80	2.75	55.00
			Probe 2-3/4" rev.1 Digital Scintillation Gamma Ray/CCL Combined with 6 Pin Bottom for CNT			
			Probe CENT-2750	2.88	2.75	20.00
			Probe 2-3/4" Electric Inline Bowspring Centralizer			
Dataset: 0512345915_anadarko_azul 13-2hz_rbl_05-09-18_2800 psi.db: field/well/run1/pass5.5 Total length: 23.86 ft Total weight: 223.60 lb O.D.: 2.75 in						

Calibration Report	
Database File	c:\programdata\warrior\data\anadarko_azul 13-2hz\0512345915_anadarko_azul 13-2hz_rbl_05-09-18_2800 psi.db
Dataset Pathname	pass5.5
Dataset Creation	Fri May 11 13:38:47 2018

Gamma Ray Calibration Report	
Serial Number:	101001
Tool Model:	2750 6PB
Performed:	Sun Nov 12 11:25:32 2017
Calibrator Value:	637.0
	CARI

Calibrator Value:	0.37.0	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:	1.090 ft

Master Calibration, performed Wed May 09 06:25:52 2018:

	Raw (v)		Calibrated (mv)		Results	
	Zero	Cal	Zero	Cal	Gain	Offset
3'	0.004	0.430	0.800	71.921	166.864	0.105
CAL	0.004	0.433				
5'	0.004	0.405	0.800	71.921	177.111	0.104
SUM						
S1	0.004	0.433	0.000	100.000	233.118	-0.950
S2	0.004	0.434	0.000	100.000	232.602	-0.934
S3	0.004	0.429	0.000	100.000	235.119	-0.933
S4	0.004	0.425	0.000	100.000	237.353	-0.976
S5	0.004	0.427	0.000	100.000	236.047	-0.899
S6	0.004	0.427	0.000	100.000	236.108	-0.891
S7	0.004	0.429	0.000	100.000	234.984	-0.912
S8	0.004	0.427	0.000	100.000	236.476	-0.976

Internal Reference Calibration, performed (Not Performed):

	Raw (v)		Calibrated (v)		Results	
	Zero	Cal	Zero	Cal	Gain	Offset
CAL	0.000	0.000	0.004	0.433	1.000	0.000

Air Zero Calibration, performed Wed May 09 06:26:18 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:	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



<b>Company</b>	Kerr-McGee Oil & Gas Onshore, L.P.
<b>Well</b>	Azul 13-2HZ
<b>Field</b>	Wattenberg
<b>County</b>	Weld
<b>State</b>	Colorado