

# Radial Cement Bond Gamma Ray Casing Collar Log

Company	Kerr-McGee Oil & Gas Onshore, L.P.	Company	Kerr-McGee Oil & Gas Onshore, L.P.
Well	Badger 22C-3HZ	Well	Badger 22C-3HZ
Field	Wattenberg	Field	Wattenberg
County	Weld	County	Weld
State	Colorado	State	Colorado
Location:	API #: 05-123-36456		
Permanent Datum	SEC 15 TWP 1N RGE 68W	Ground Level	Elevation 5133'
Log Measured From	Kelly Bushing	Drilling Measured From	Kelly Bushing
			Elevation 5133'
			G.L. 5133'

Date	2-JUL-2015
Run Number	One
Depth Driller	16288 FT
Depth Logger	7741 FT
Bottom Logged Interval	7731 FT
Top Log Interval	Surface
Open Hole Size	8.765"
Type Fluid	Water
Density / Viscosity	8.34 lbm/gal
Max. Recorded Temp.	234°F
Estimated Cement Top	-3 FT
Time Well Ready	ROA
Time Logger on Bottom	2:01 PM
Equipment Number	HD-0324
Location	Ft. Lupton, CO
Recorded By	Andrew Olmsted
Witnessed By	Darrel Bothwell

Borehole Record				Tubing Record			
Run Number	Bit	From	To	Size	Weight	From	To
Casing Record	Size (in)	Wgt (lbs/ft)	Grade	Top	Bottom		
Surface Casing	9 5/8	36	J-55 LTC	Surface	1326 FT		
Intermediate #1	7	26	HCP-110 LTC	Surface	8284 FT		
Intermediate #2							
Liner	4 1/2	11.6	HCP-110 LTC	7329 FT	16284 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 casing tally reported liner top at 7329 FT  
 Adjusted log -42 FT from KB zero to correlate with liner top  
 Log ran with 2800 PSI surface induced pressure

Thank you for choosing FMC Technologies Completion Services, Inc.!!

Database File: x:\logs\_for\_processing\logs to be reviewed\0512336456\_anadarko\_badger 22c-3hz\_07-02-15\_mit\_rk

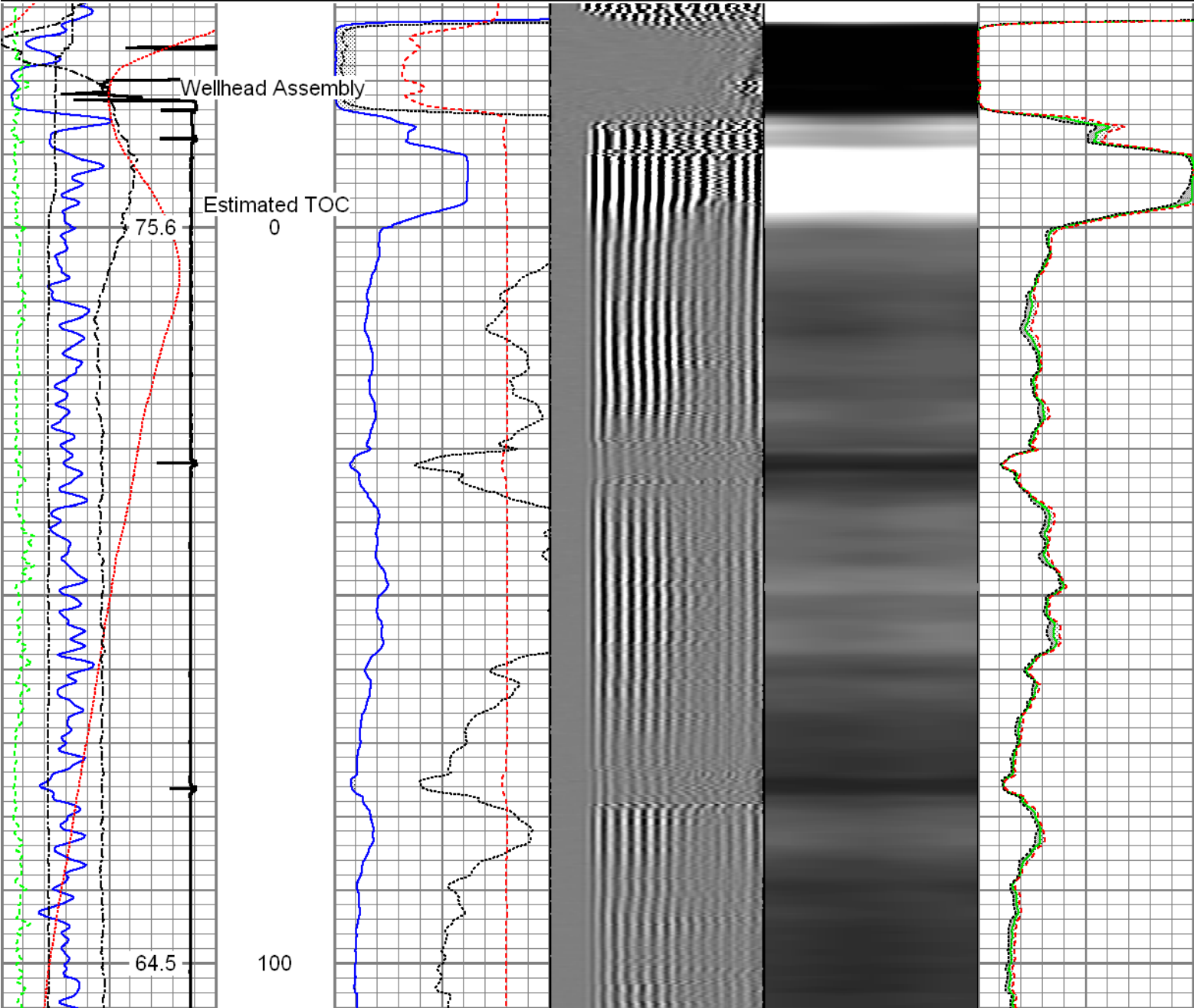
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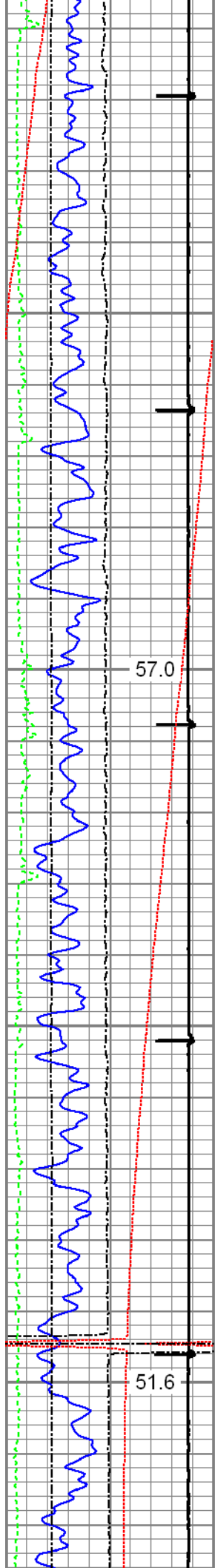
Presentation Format: rbt4\_mit

Dataset Creation: Mon Jul 06 13:12:08 2015 by Calc SCH 120430

Charted by: Depth in Feet scaled 1:240

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



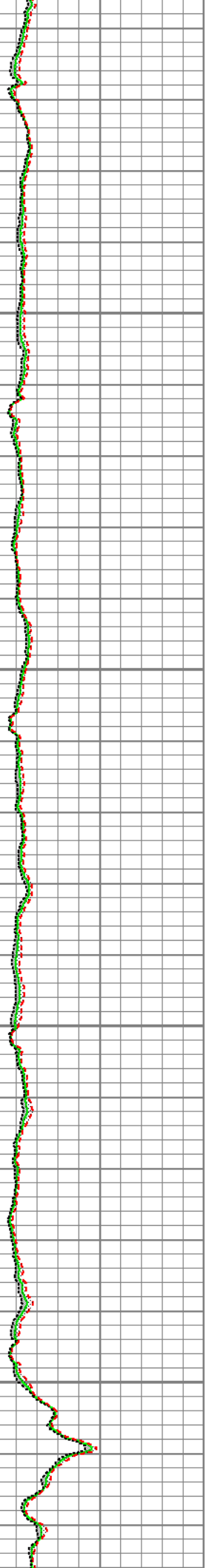
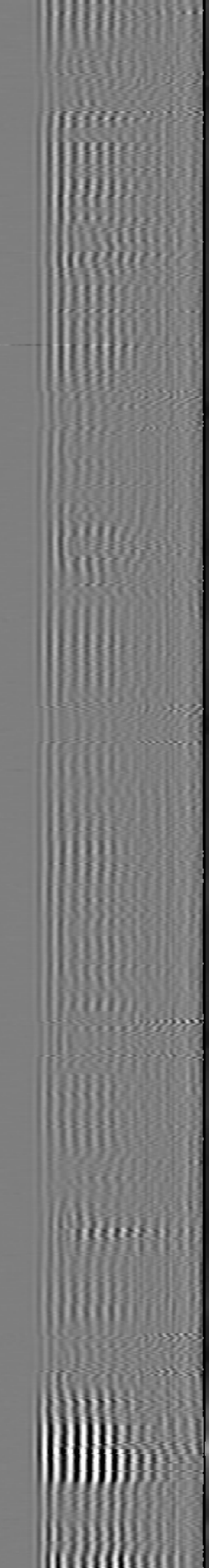
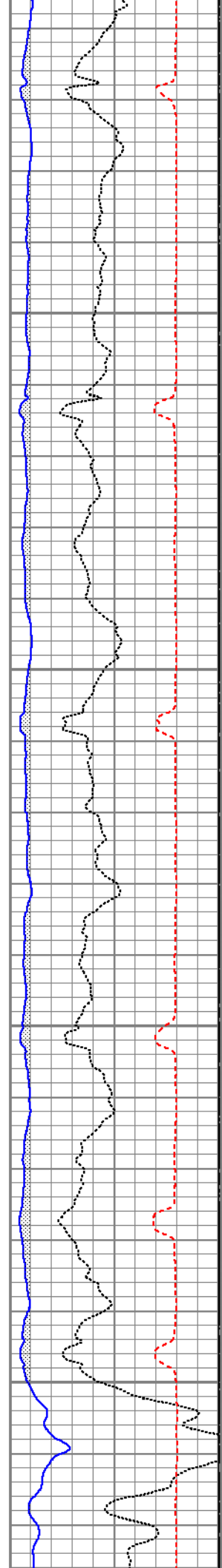


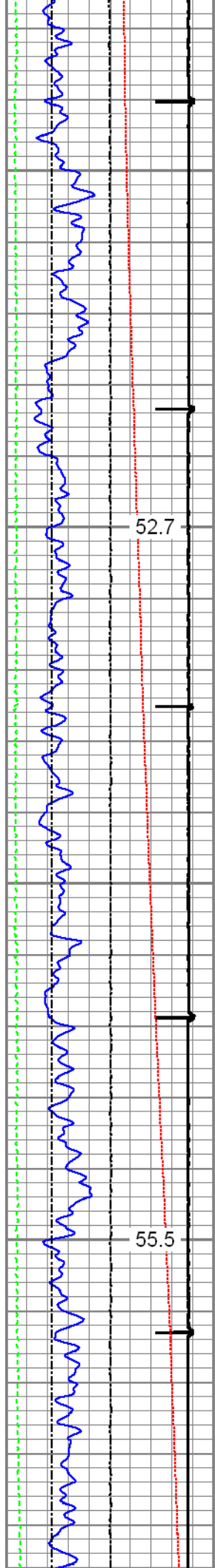
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200

51.6

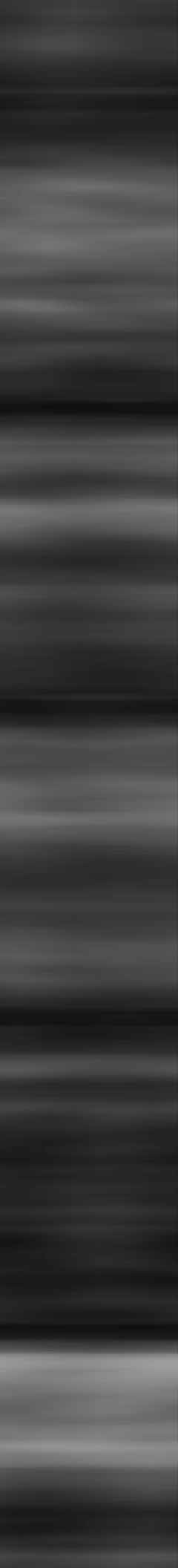
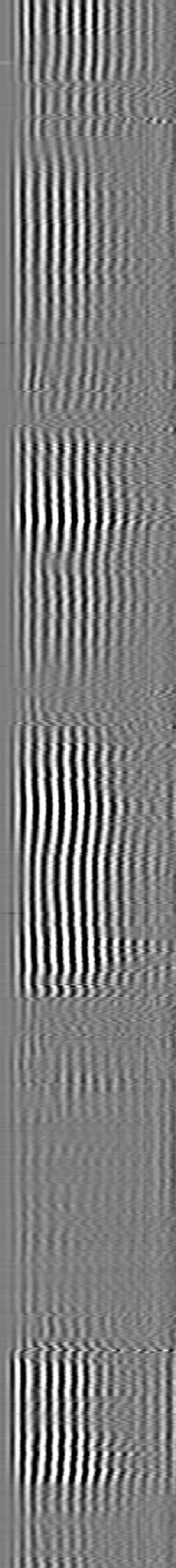
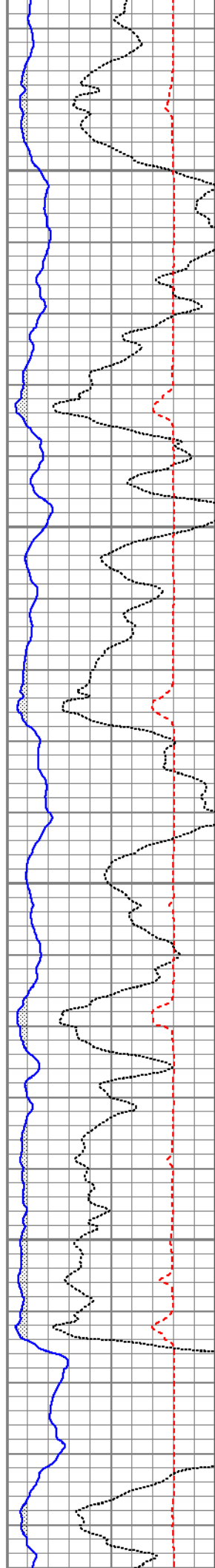
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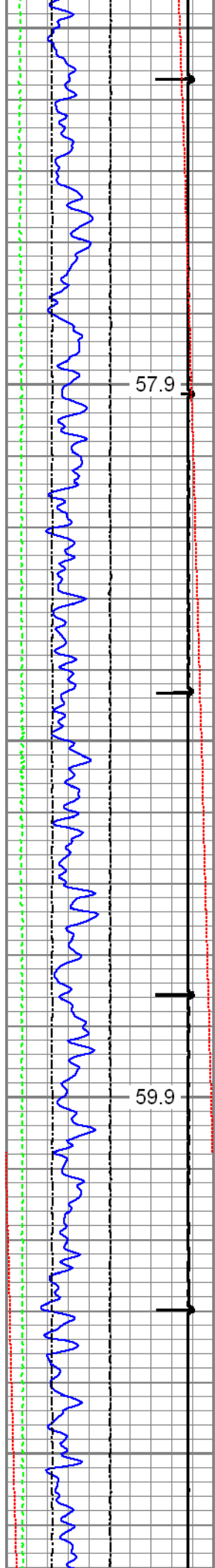


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500

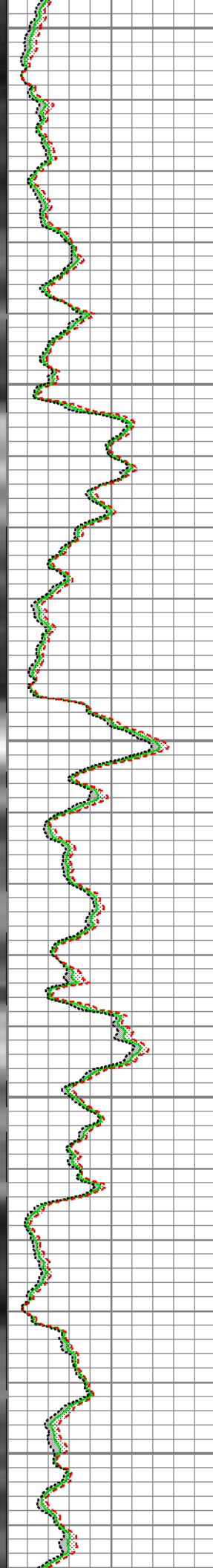
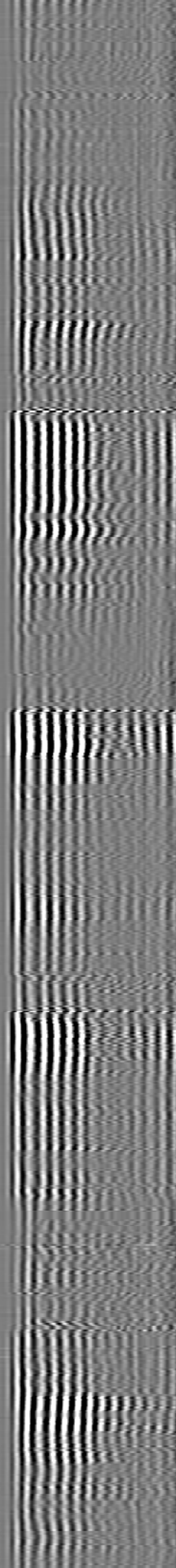
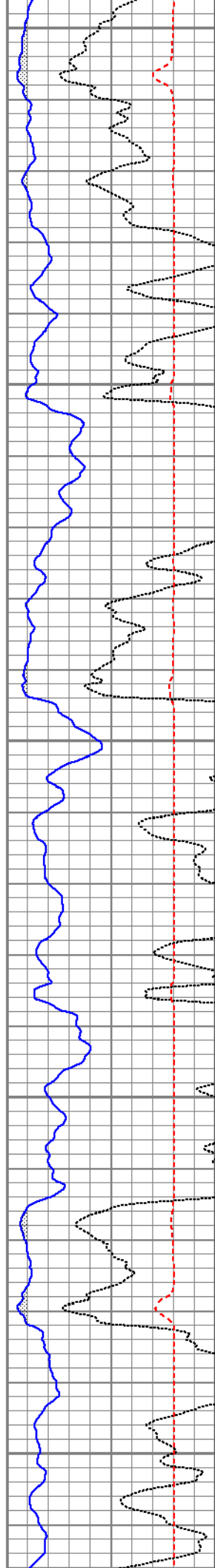


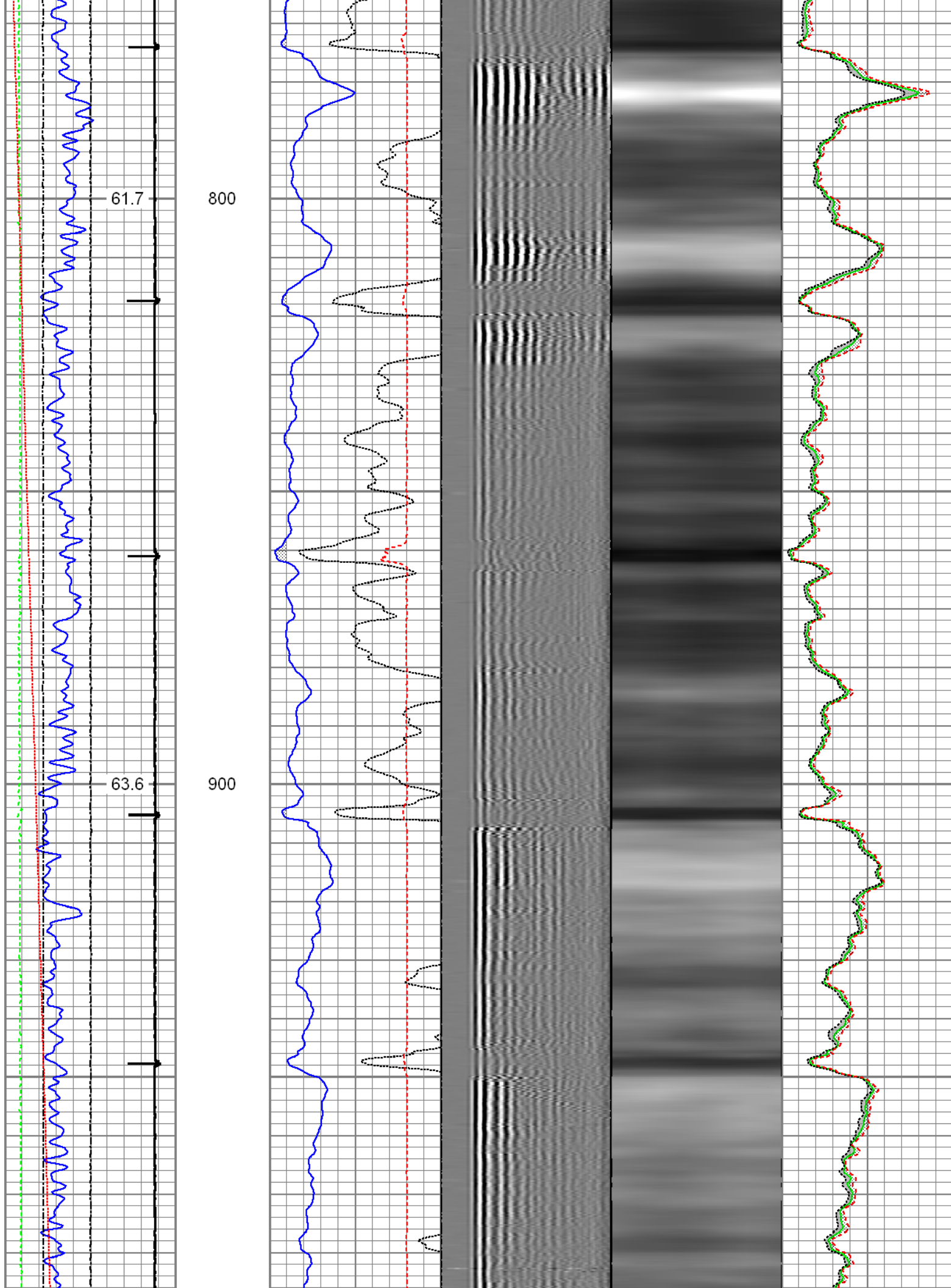


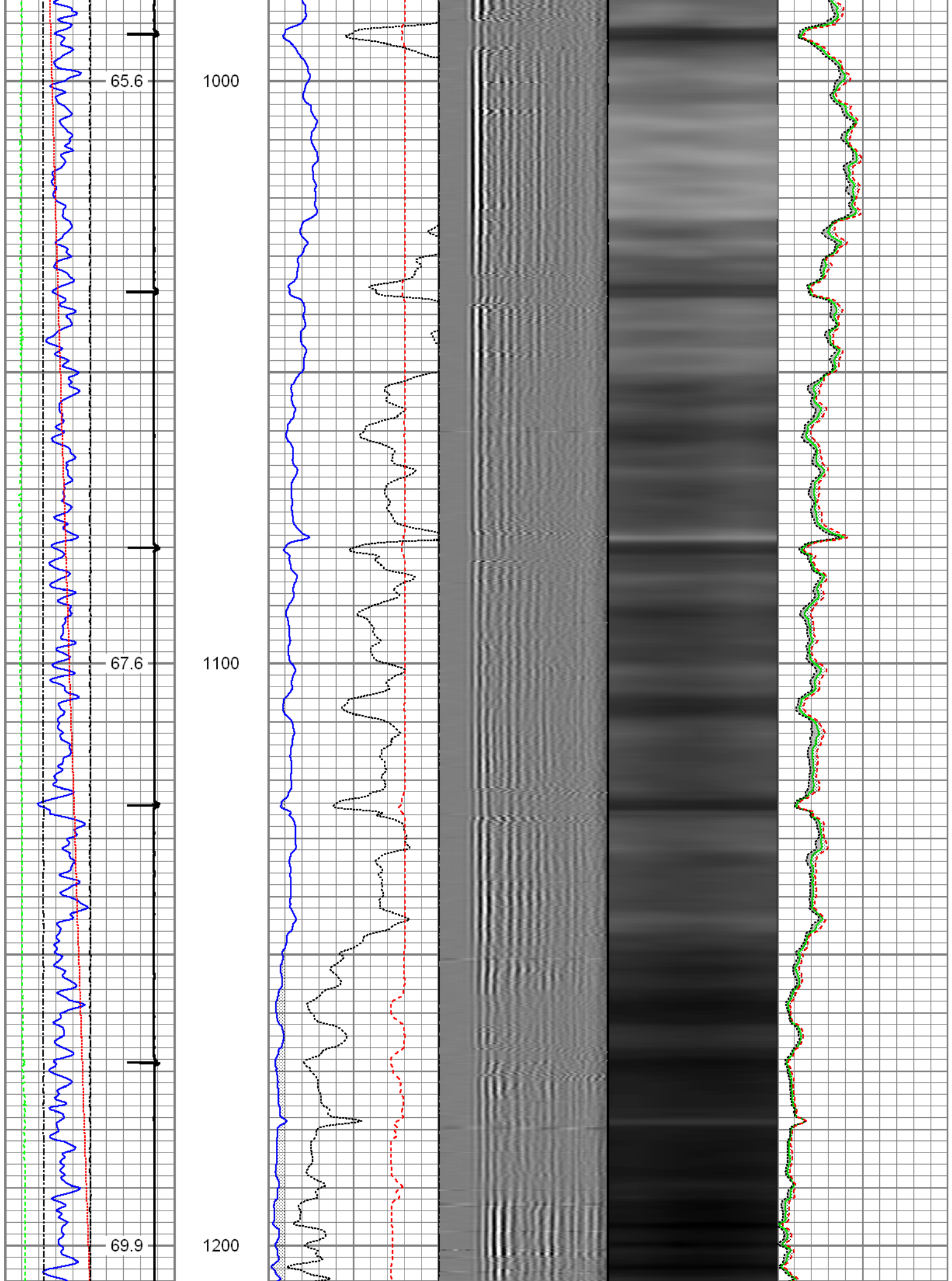


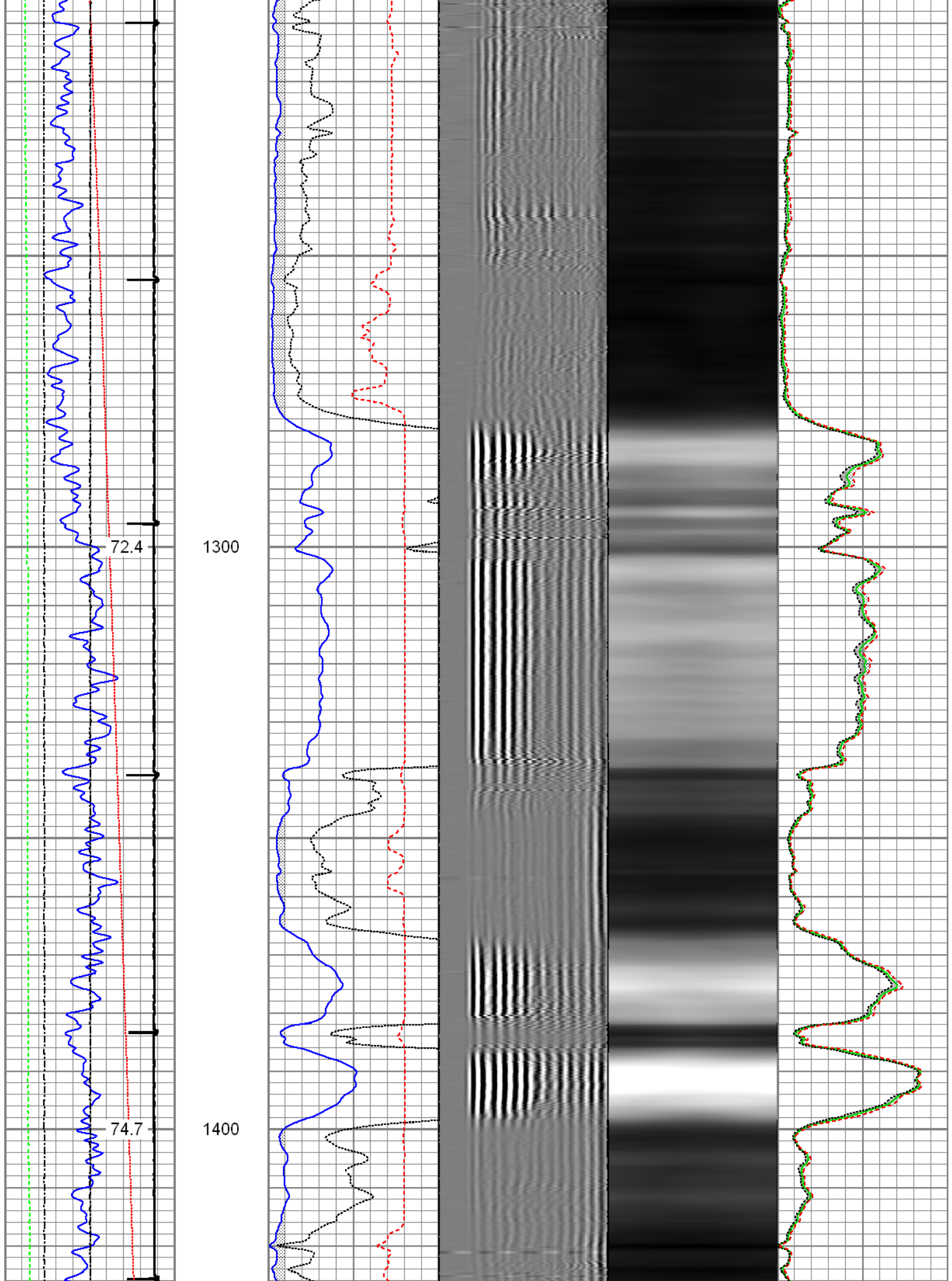
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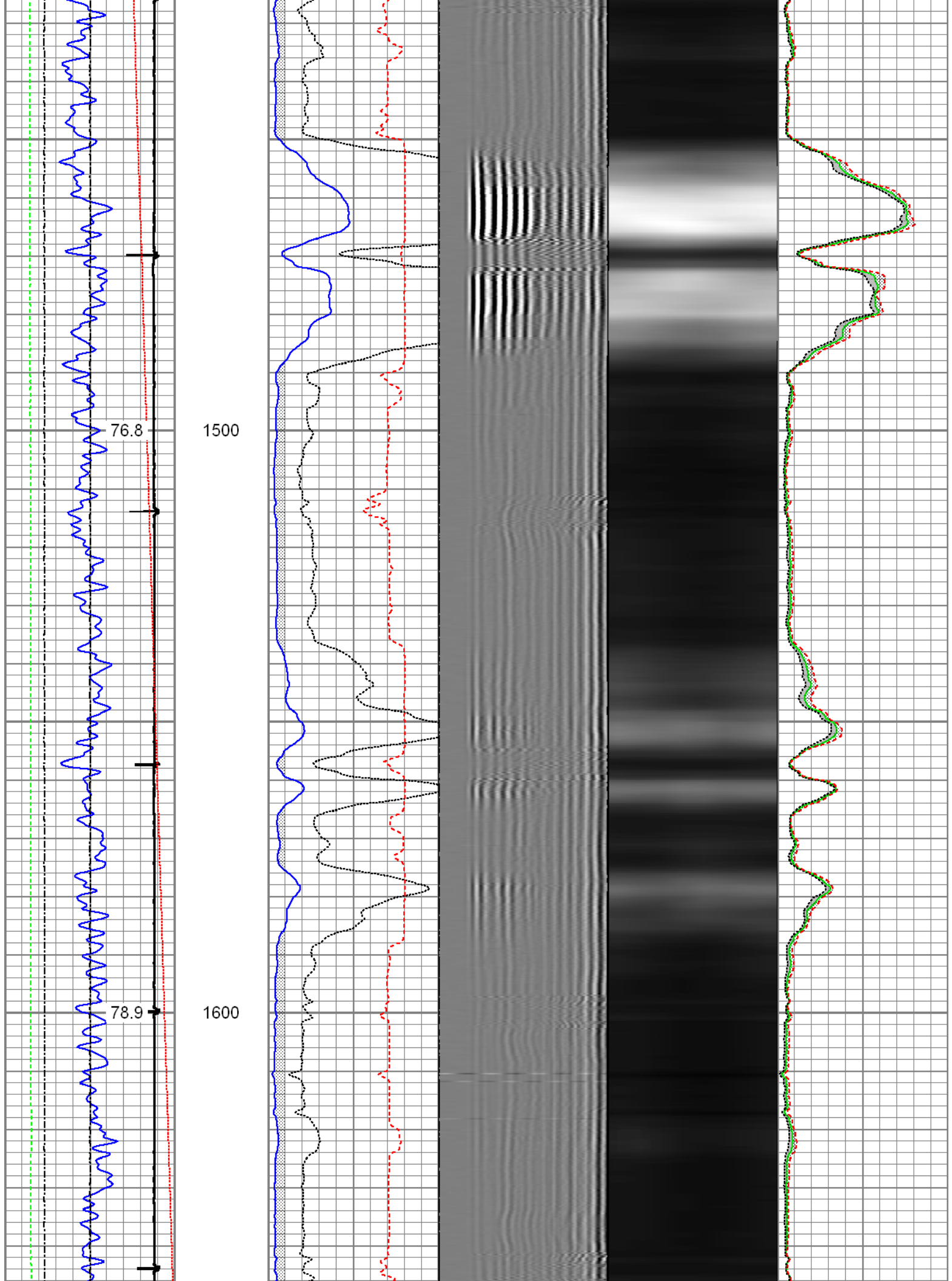


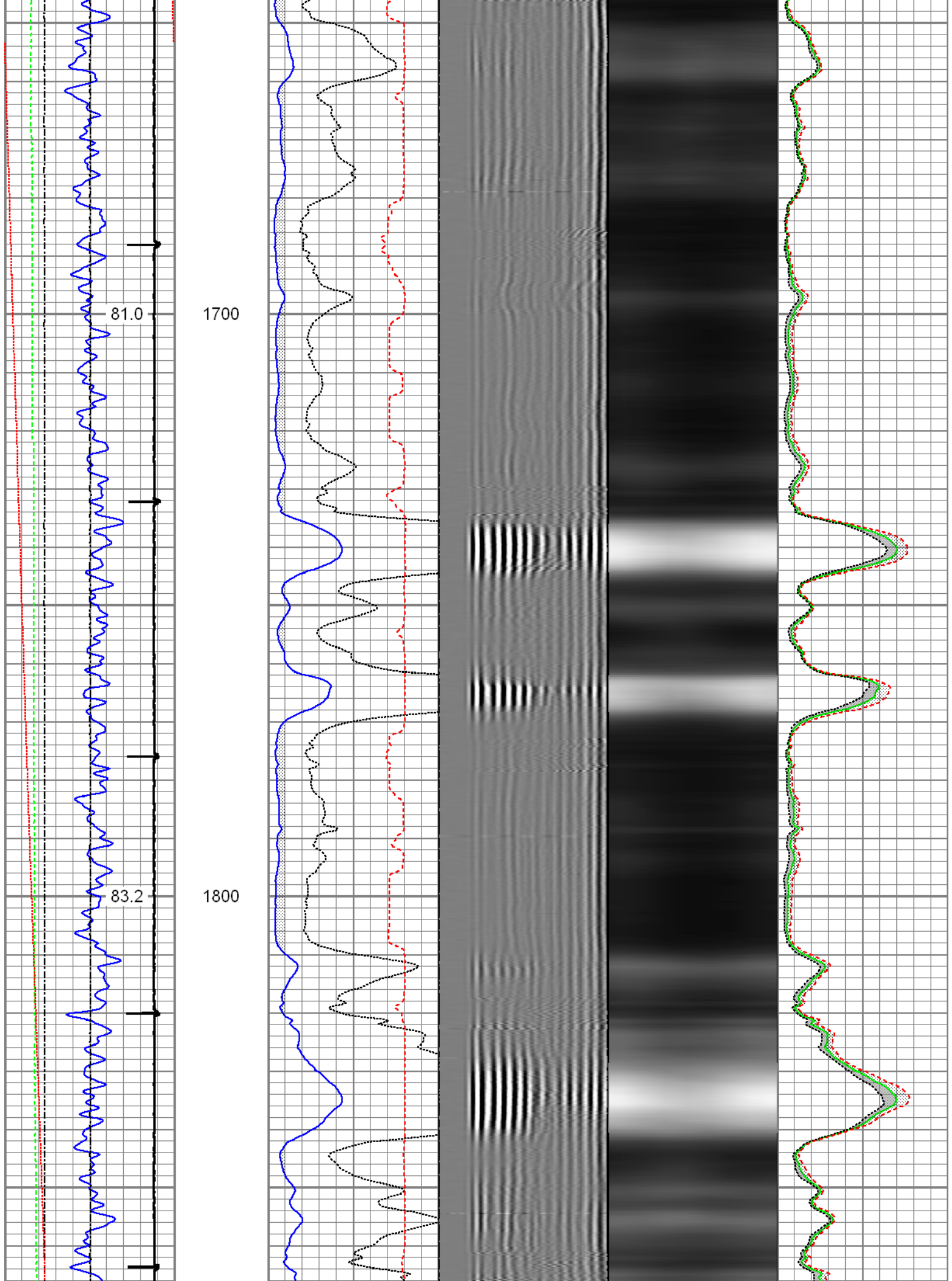


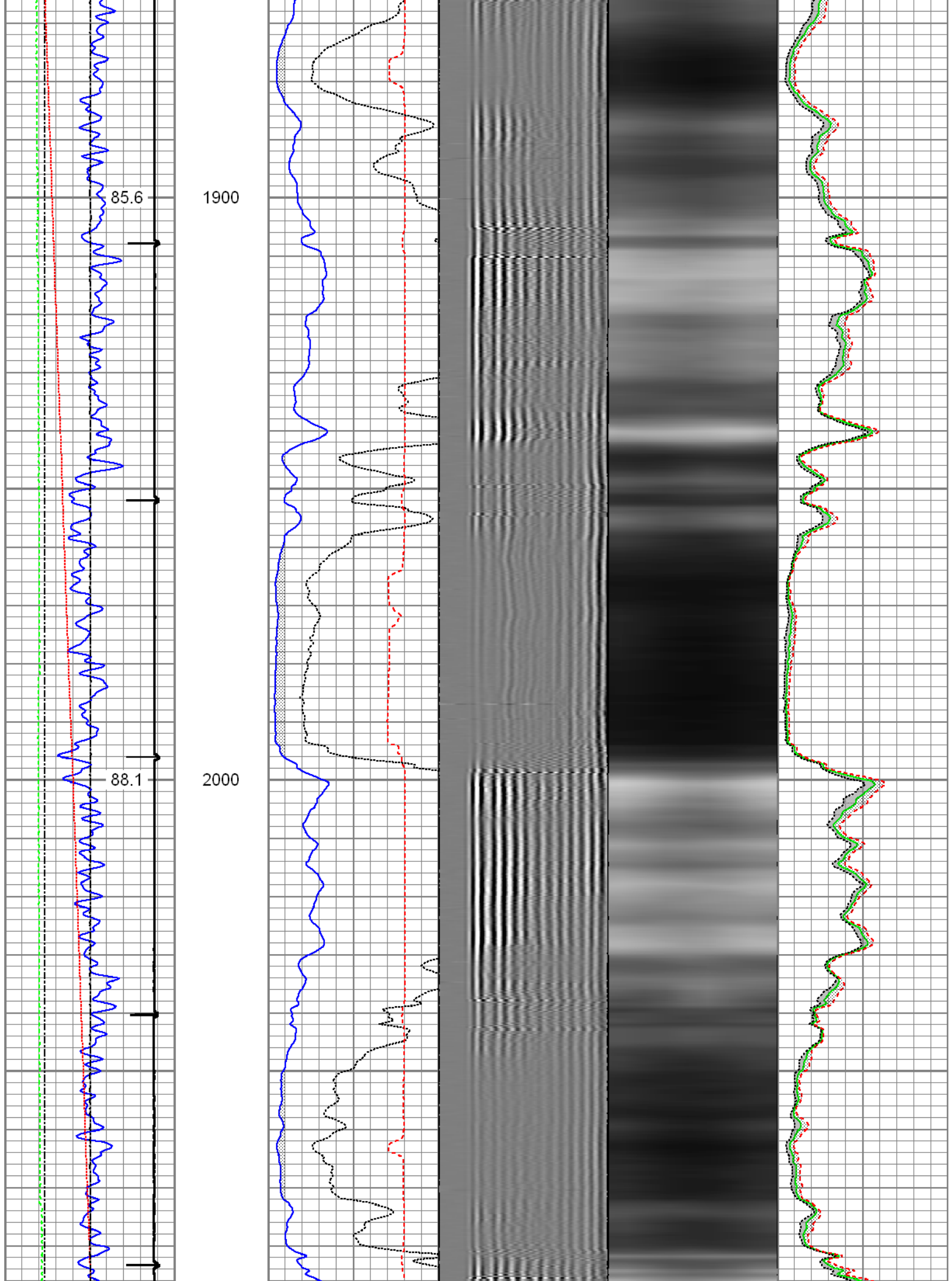


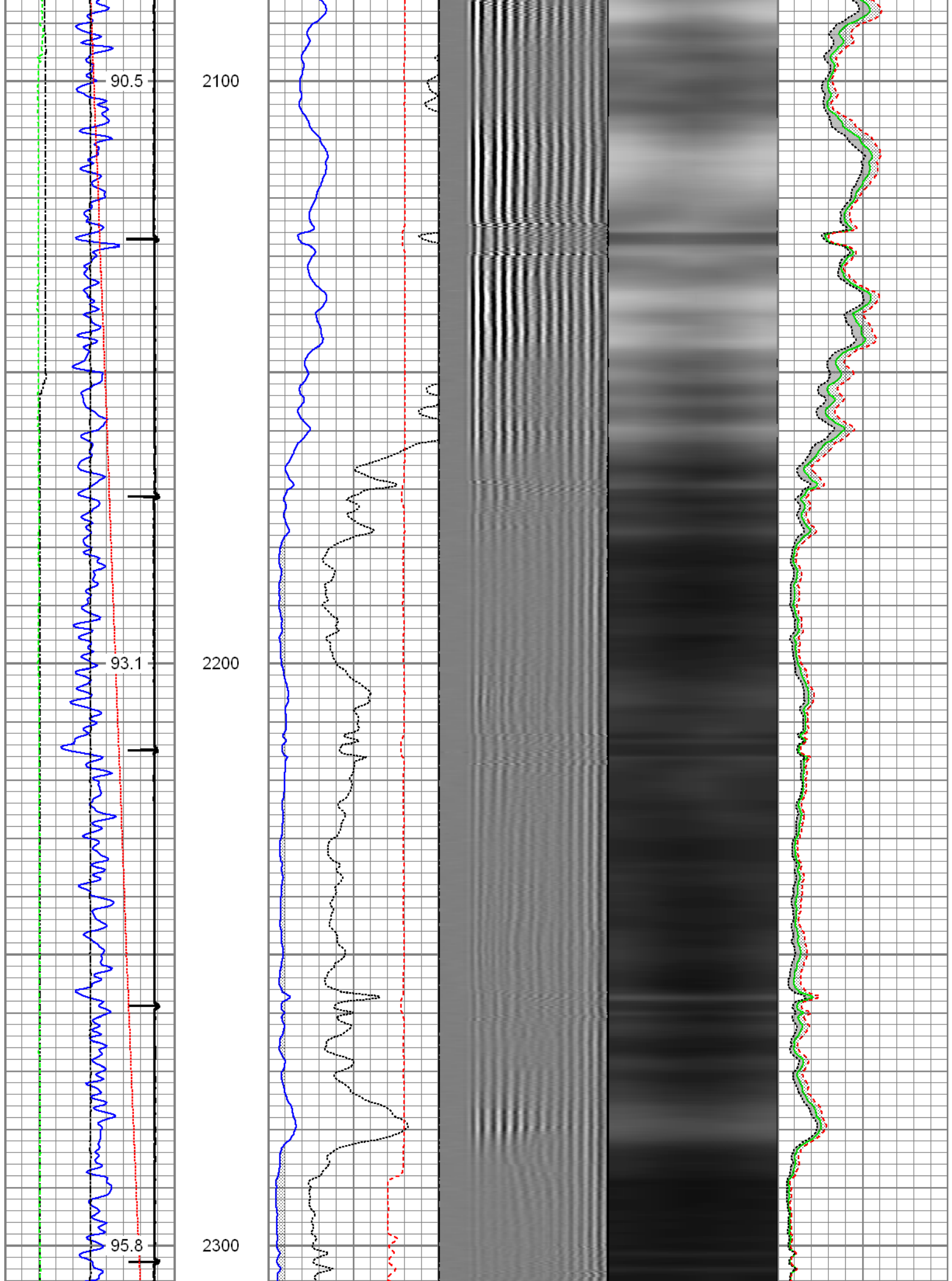




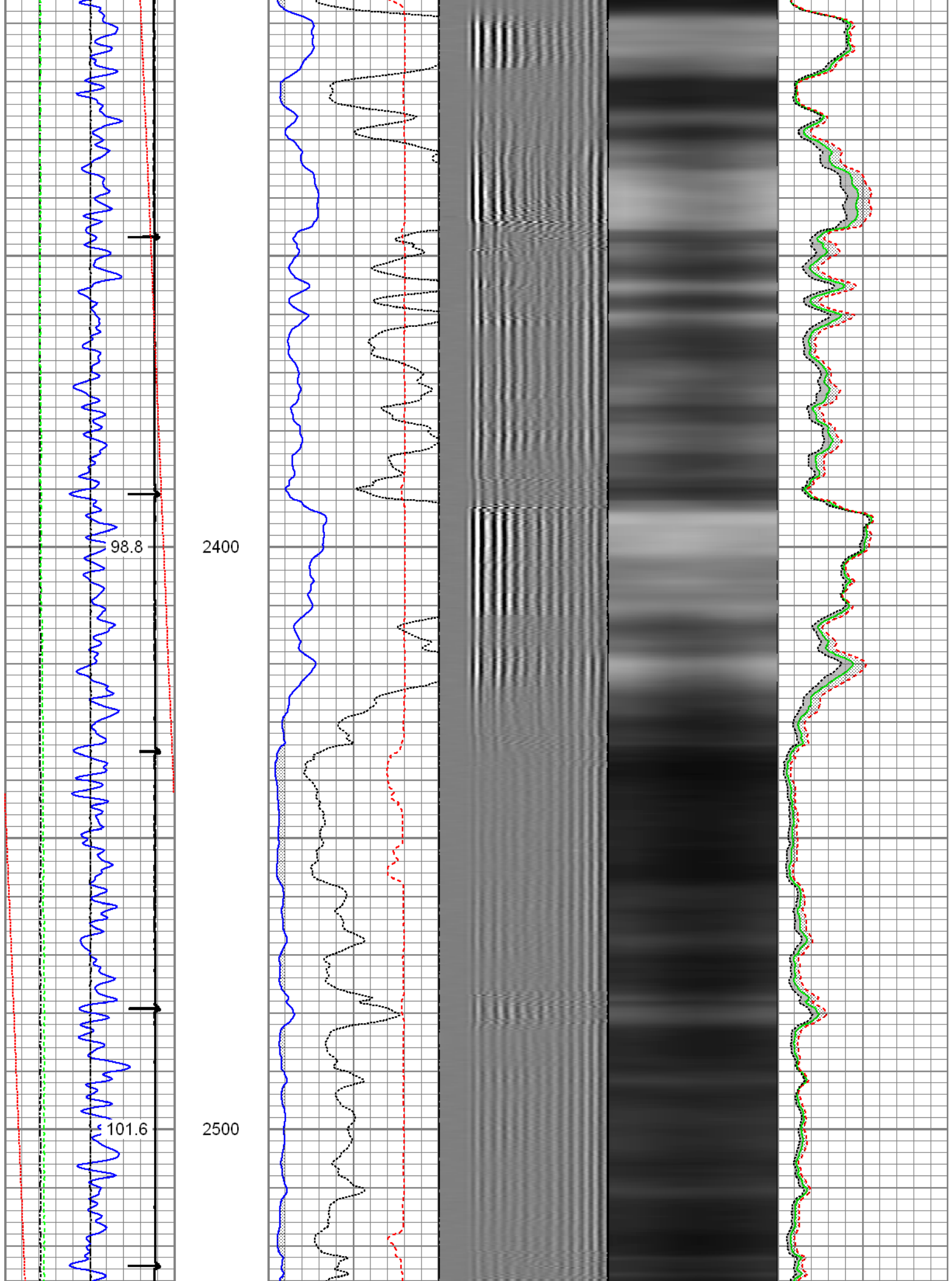


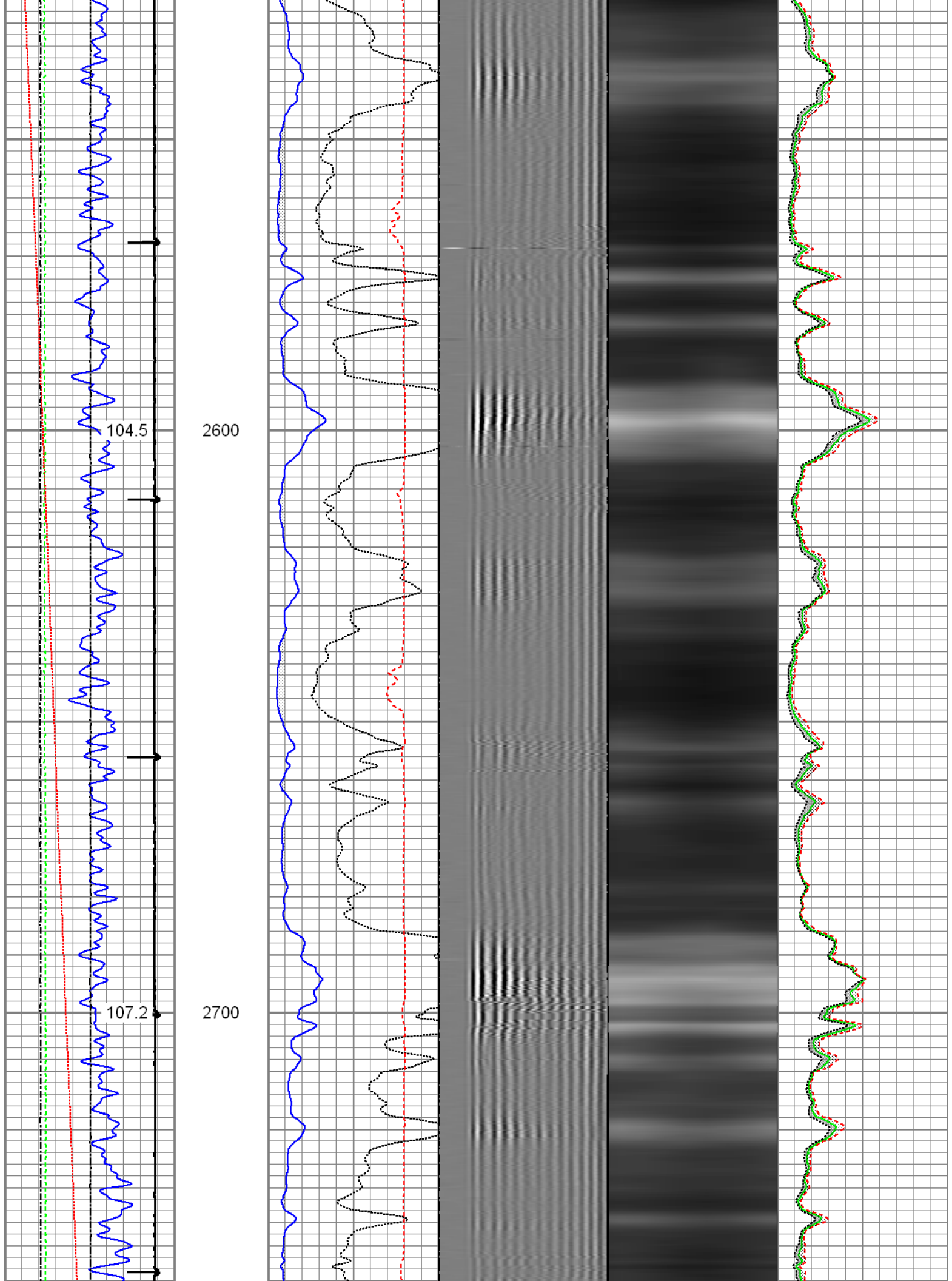


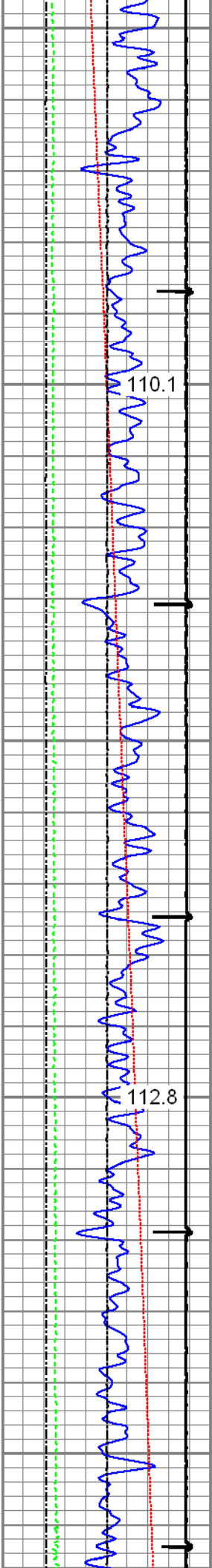










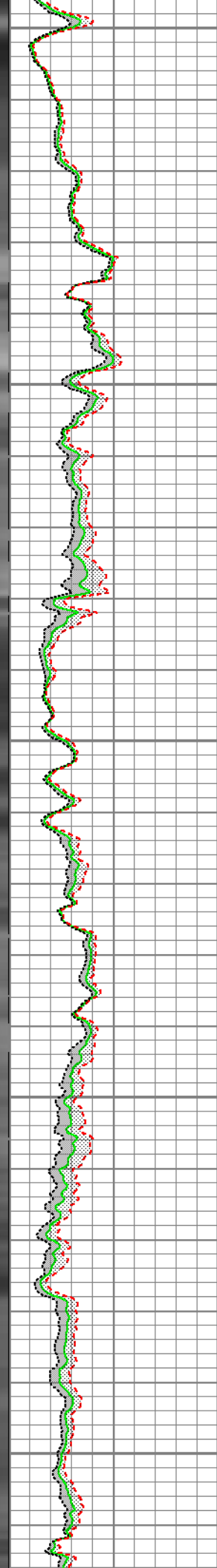
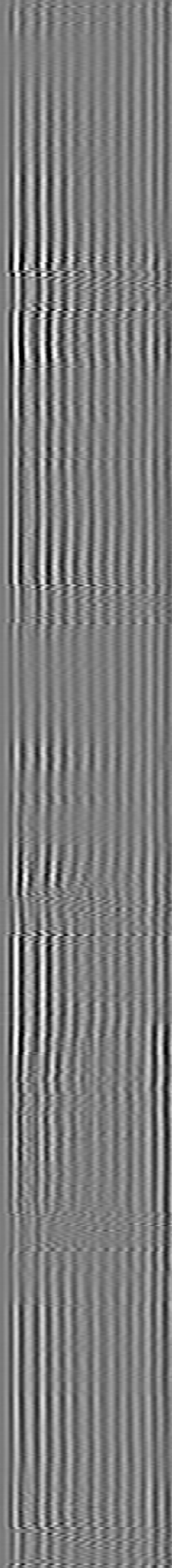
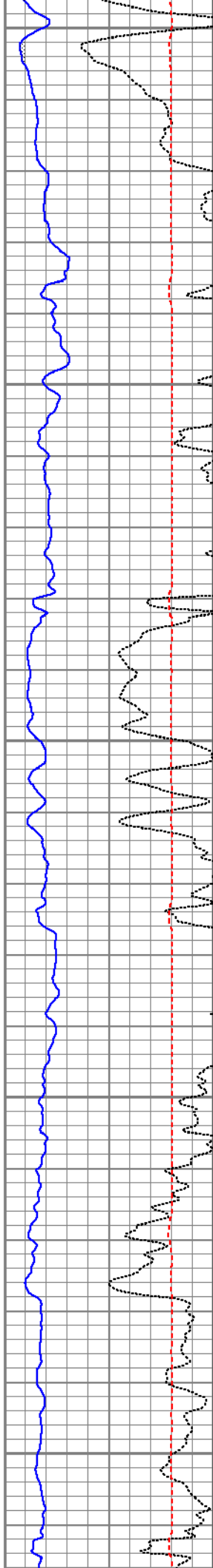


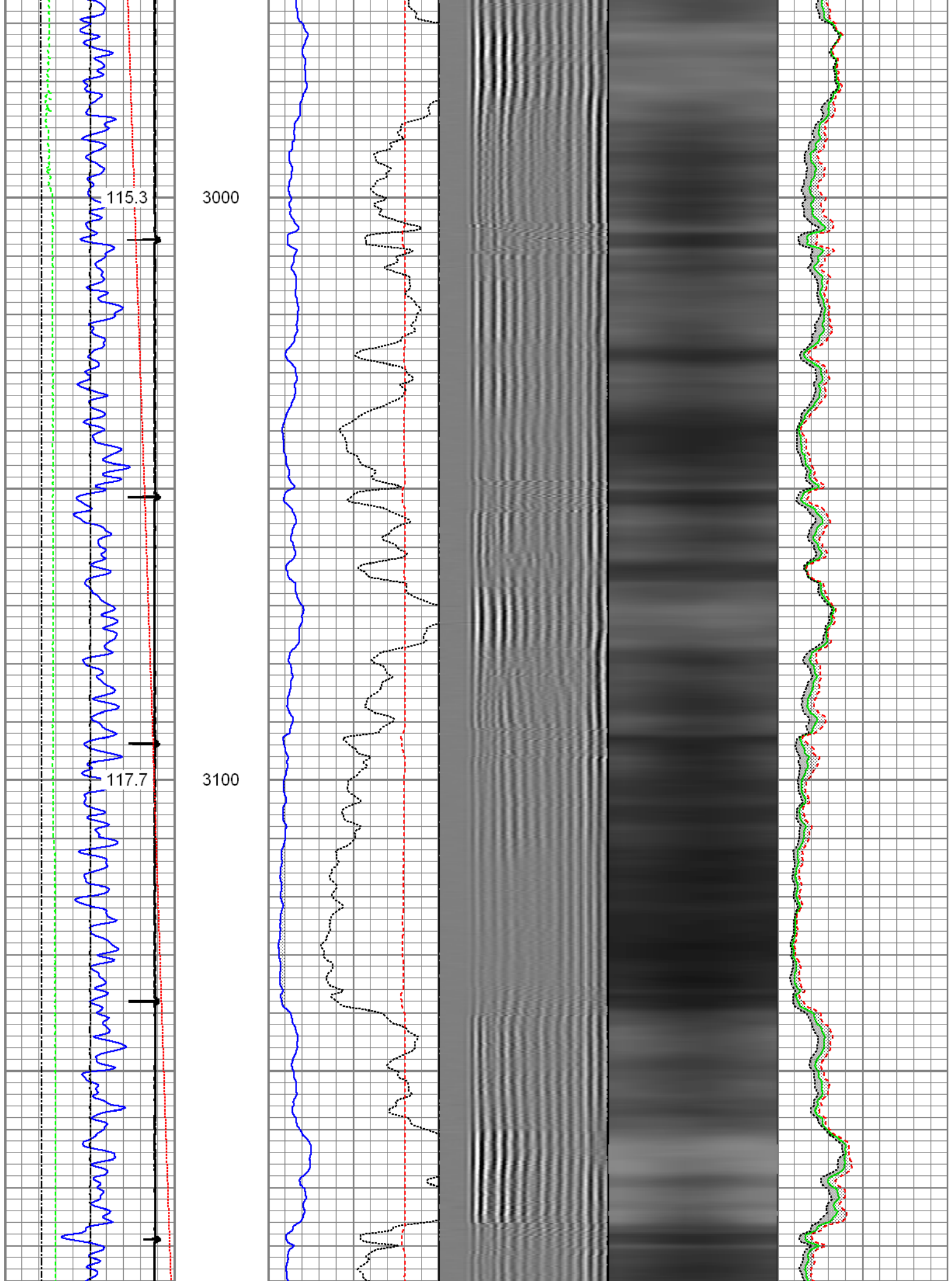
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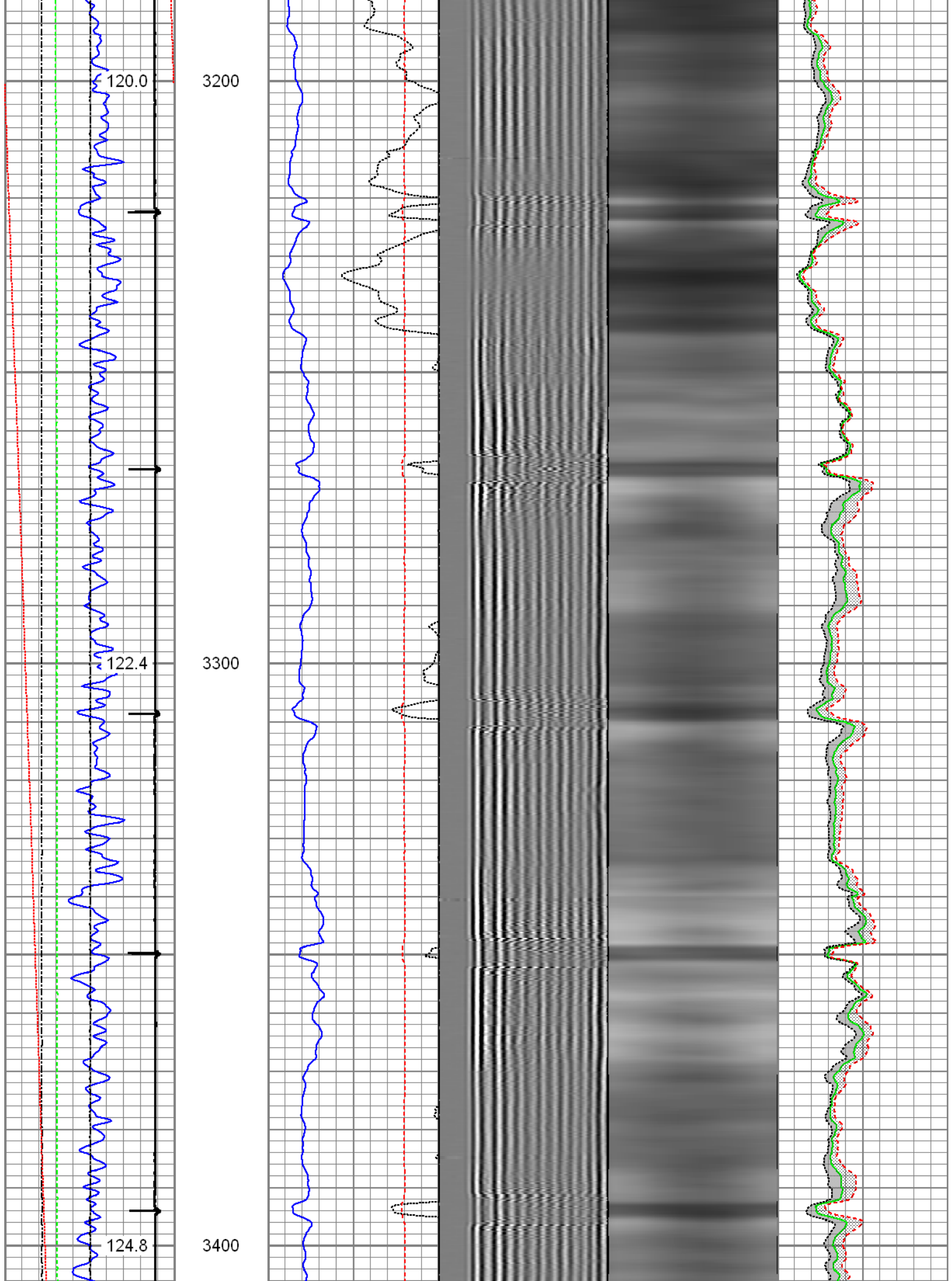
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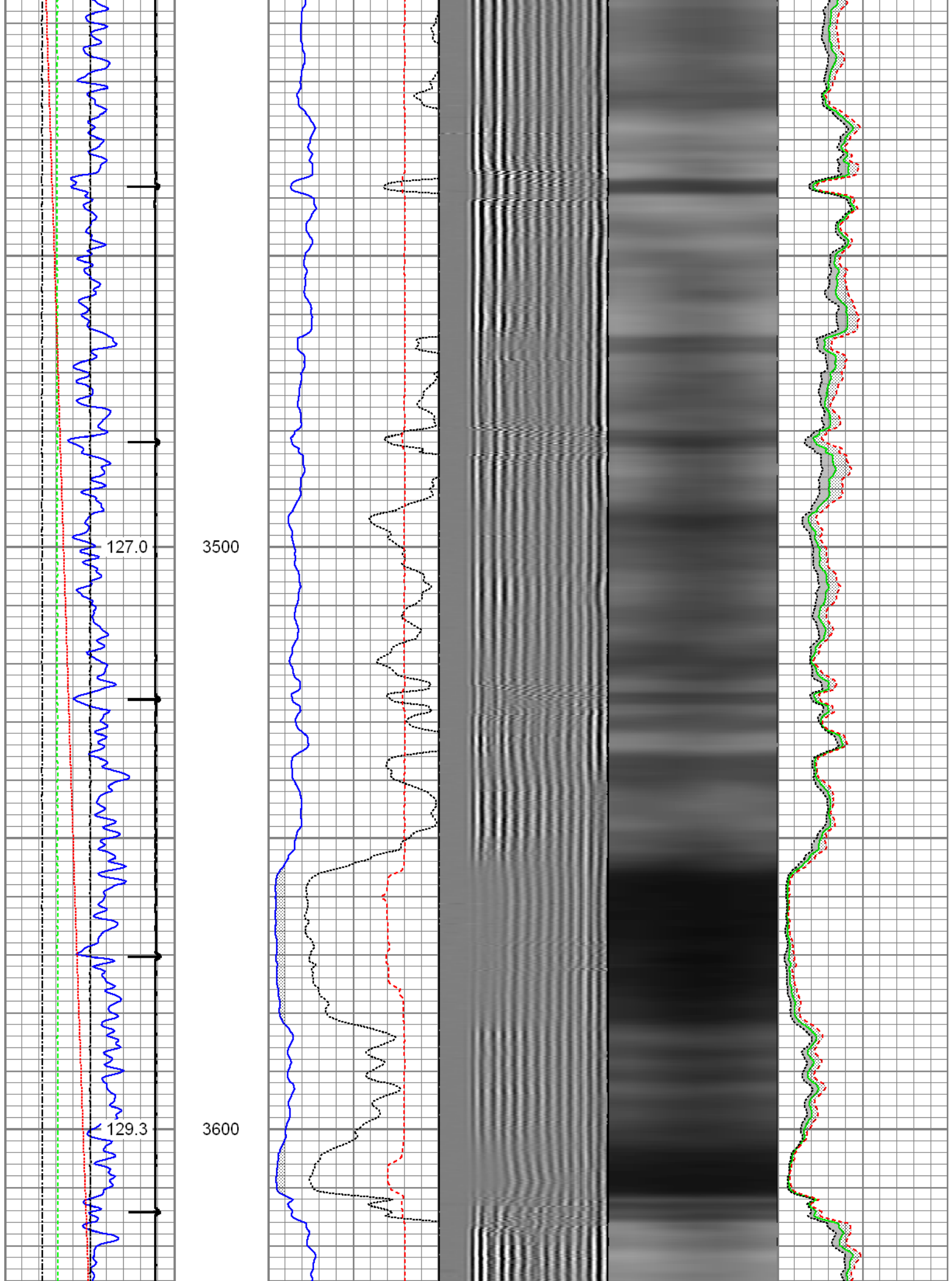
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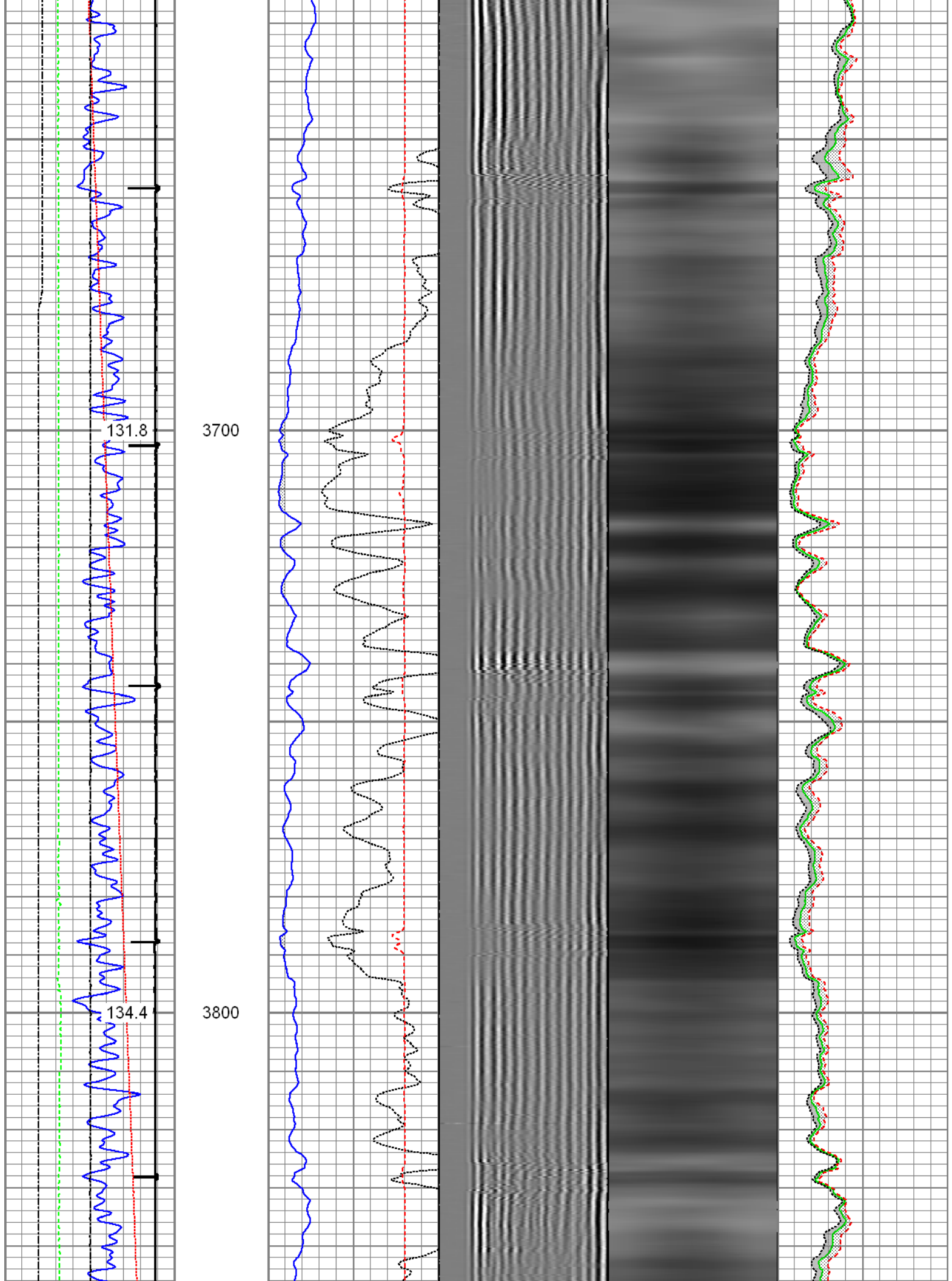


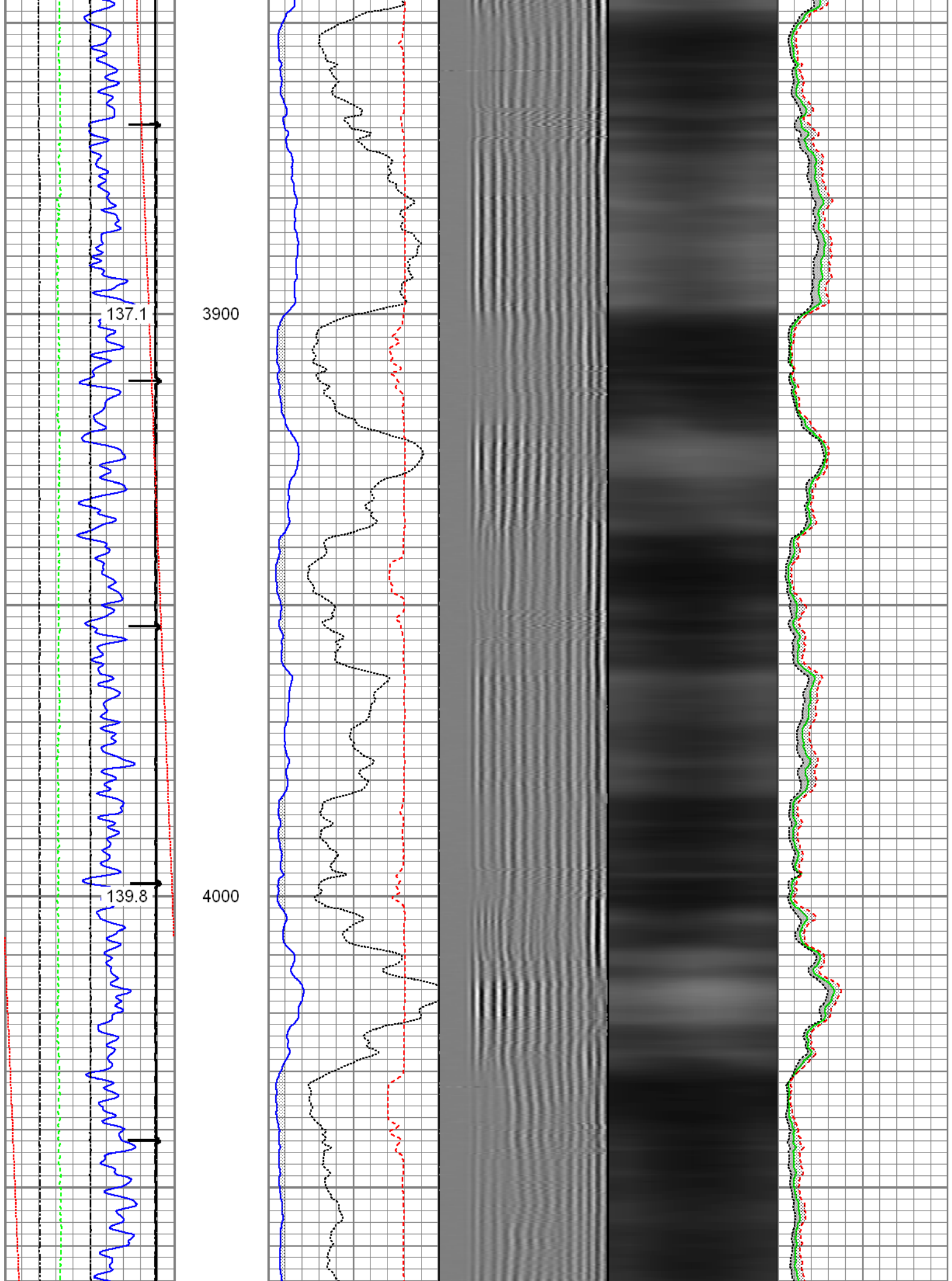




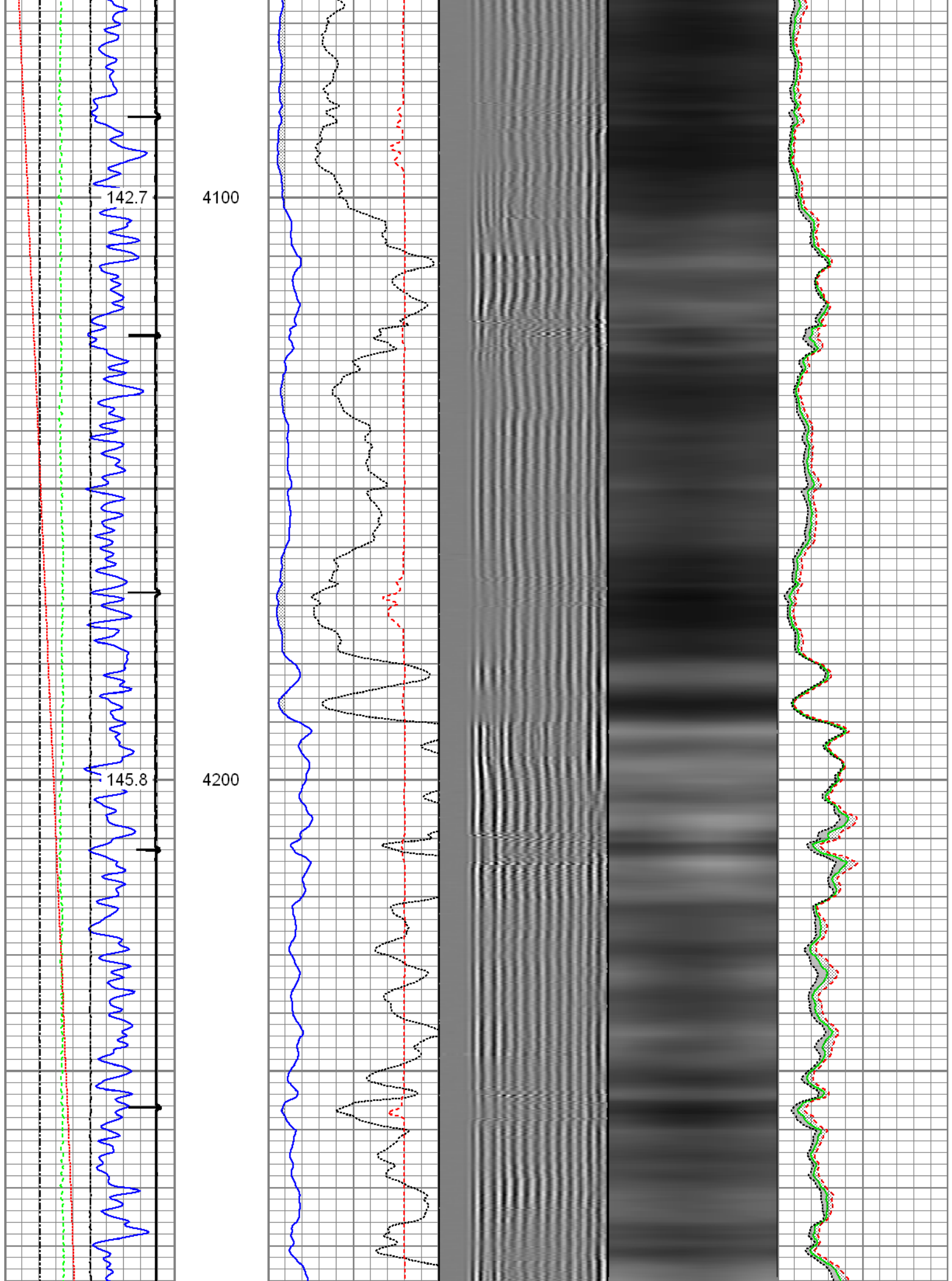


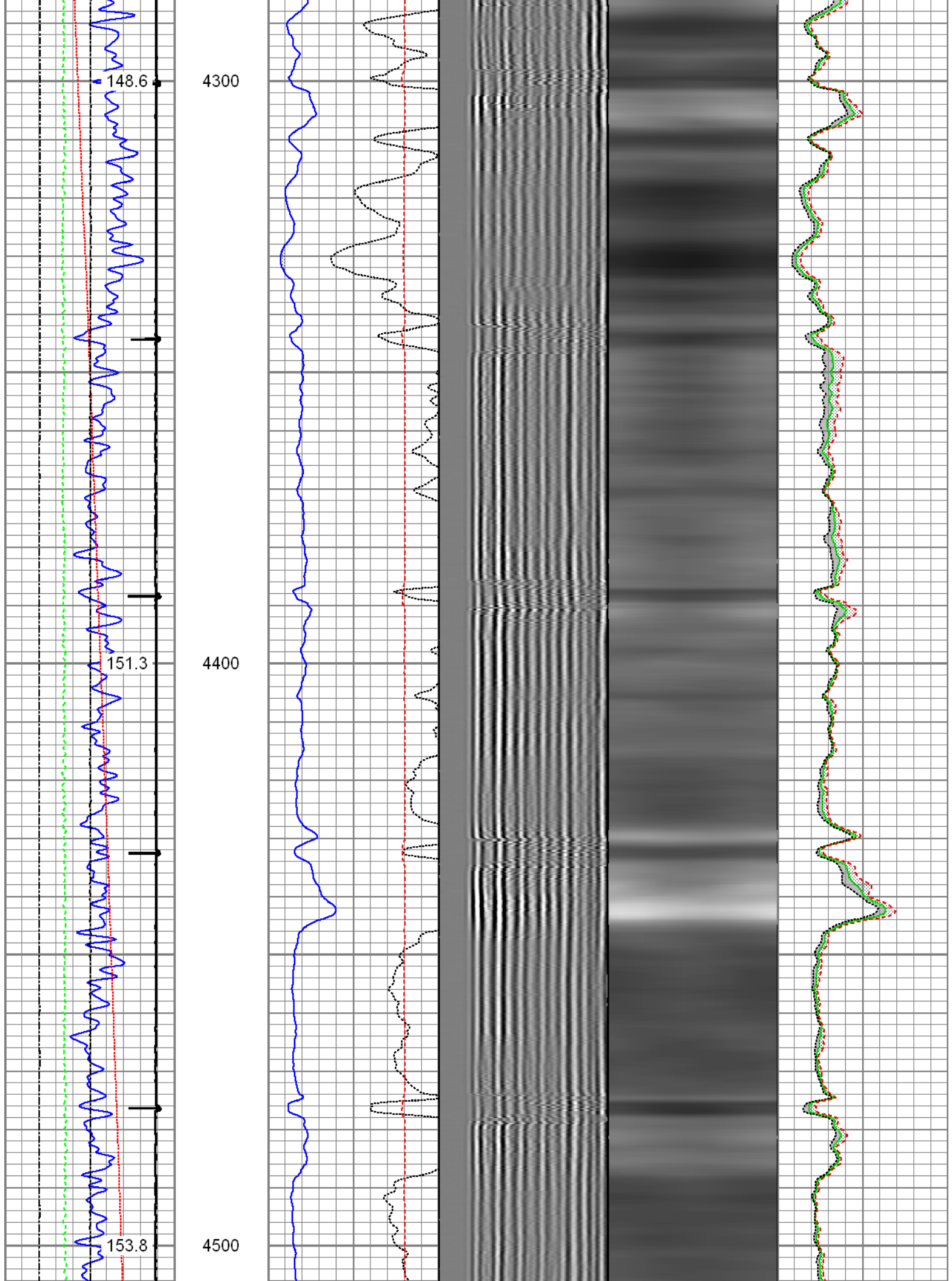


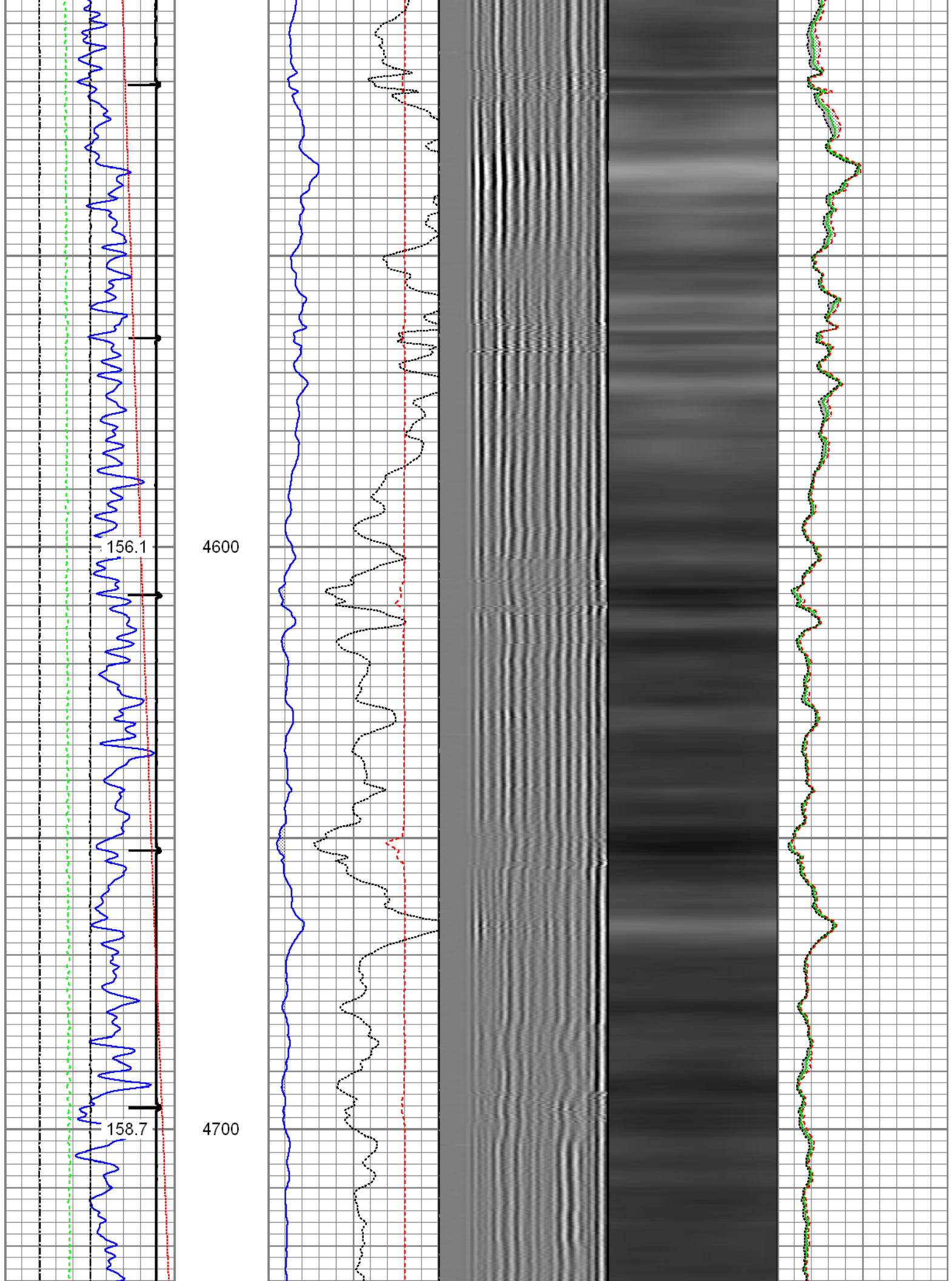


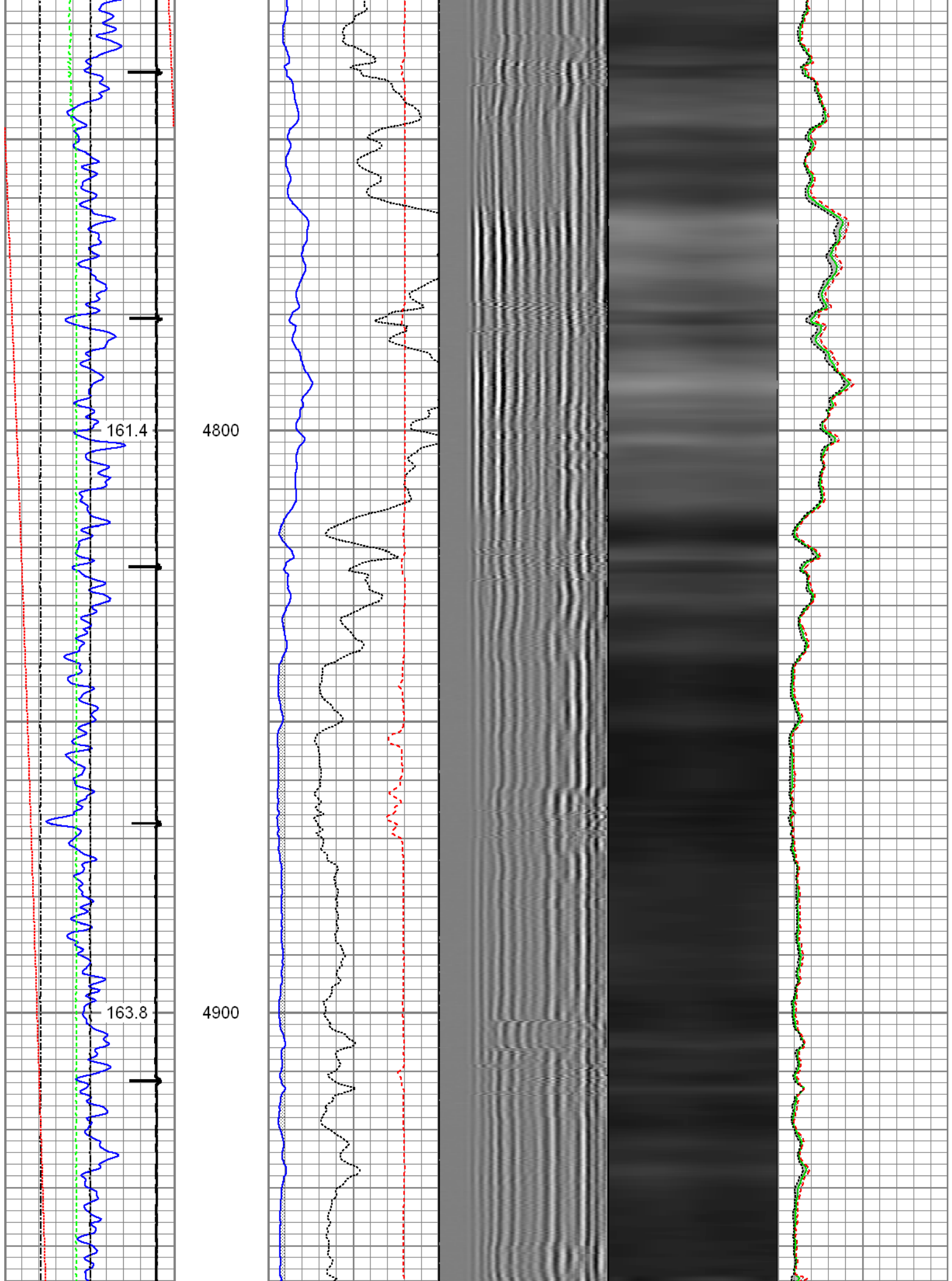




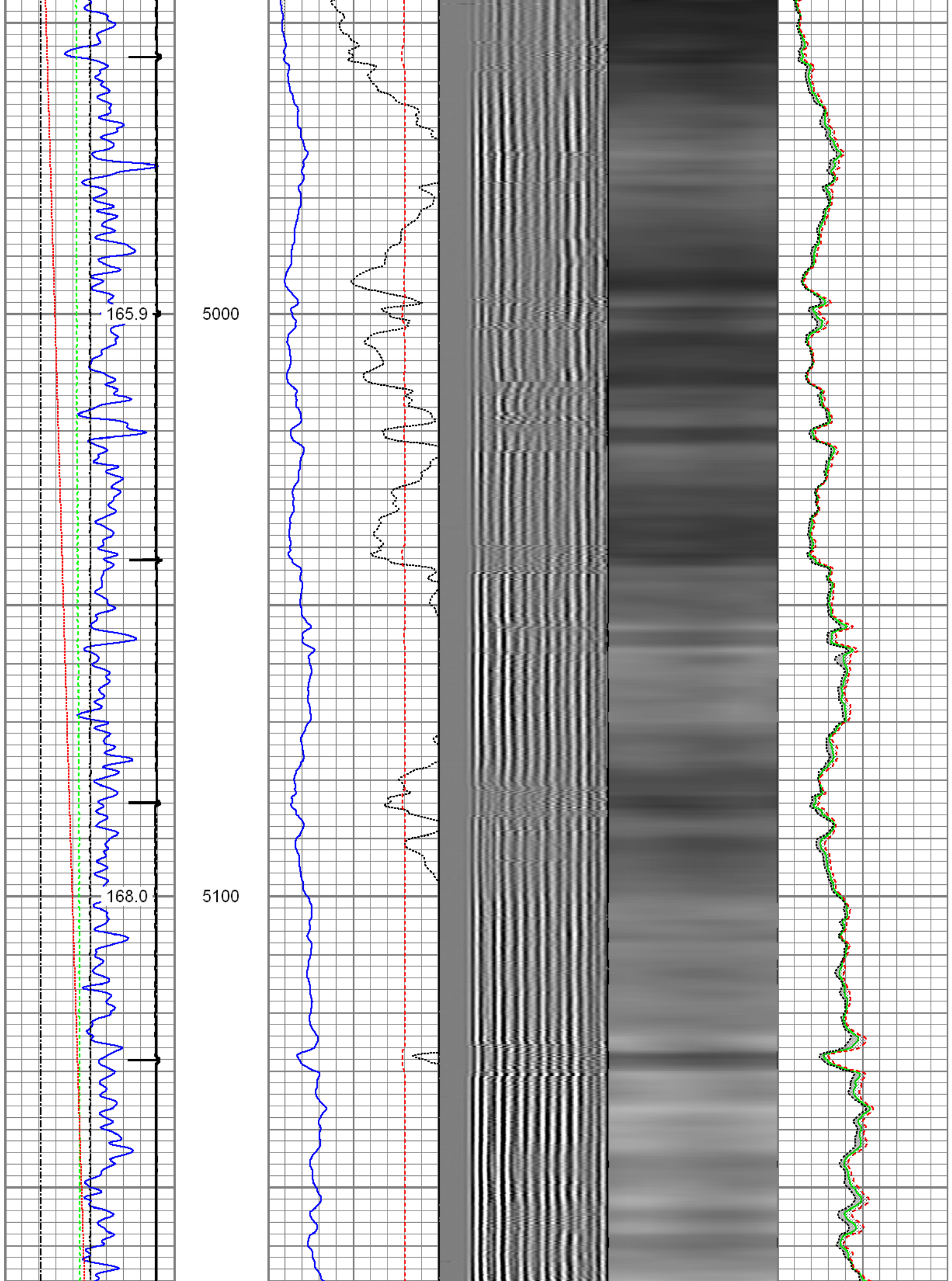


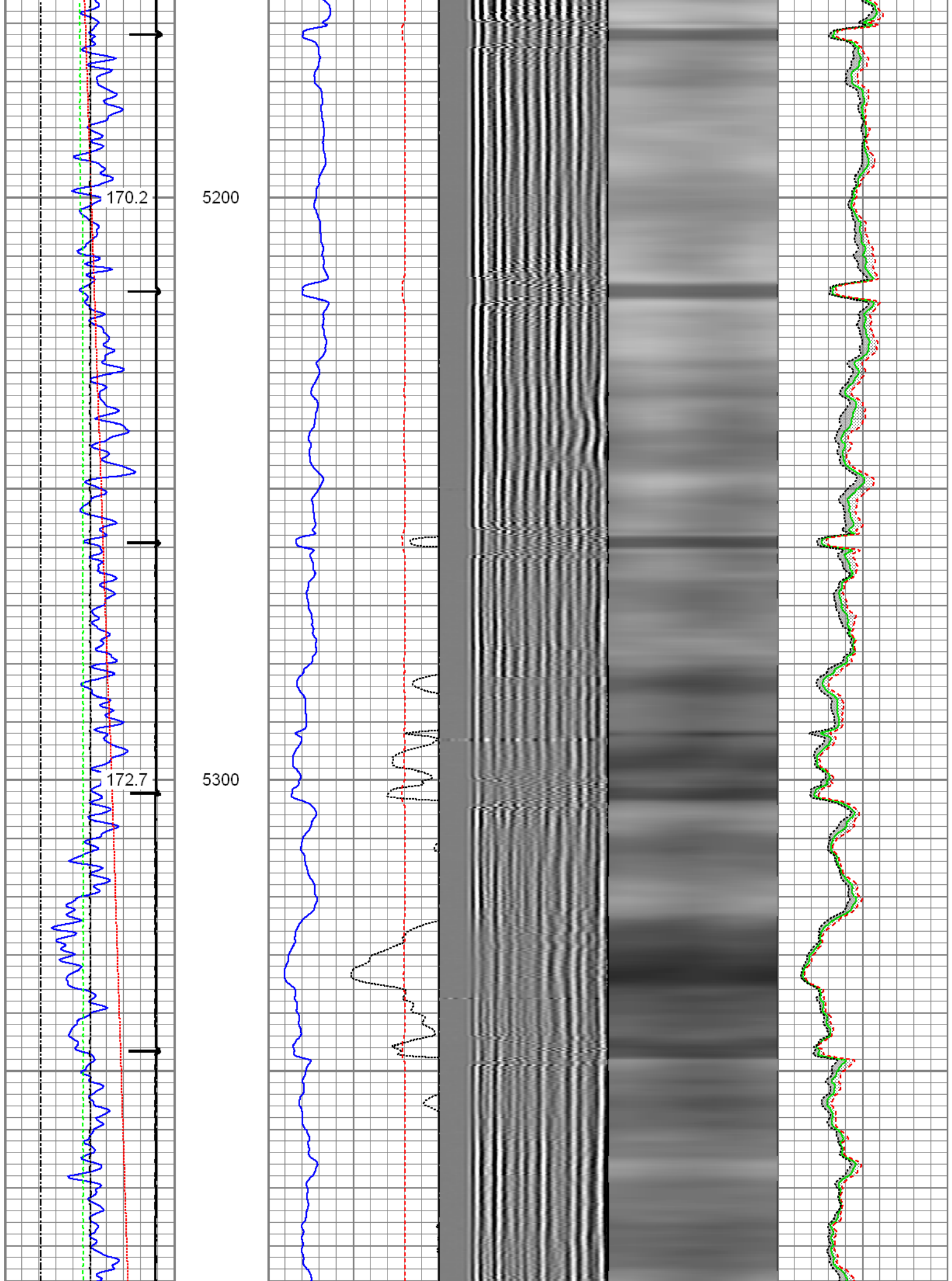


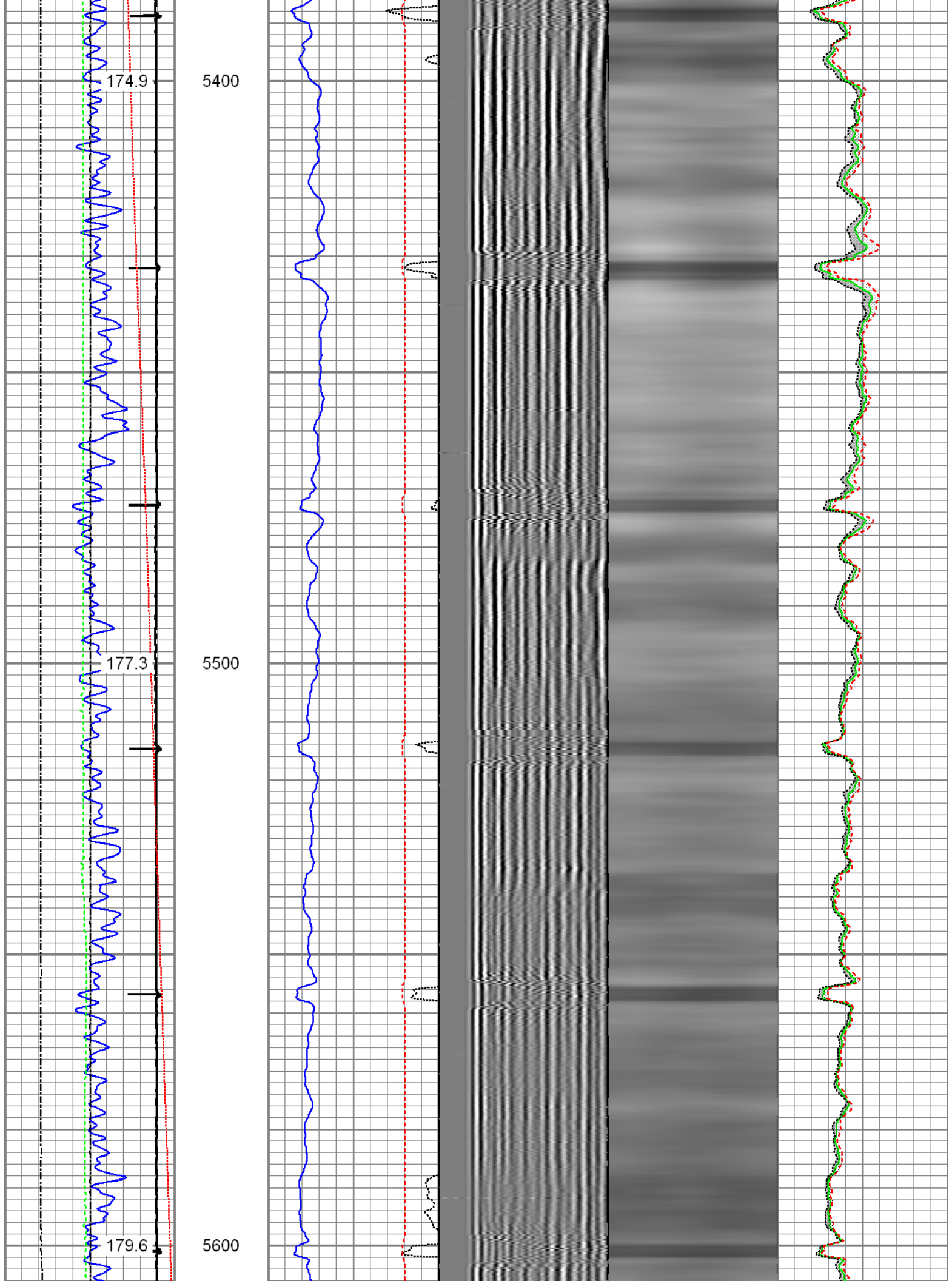


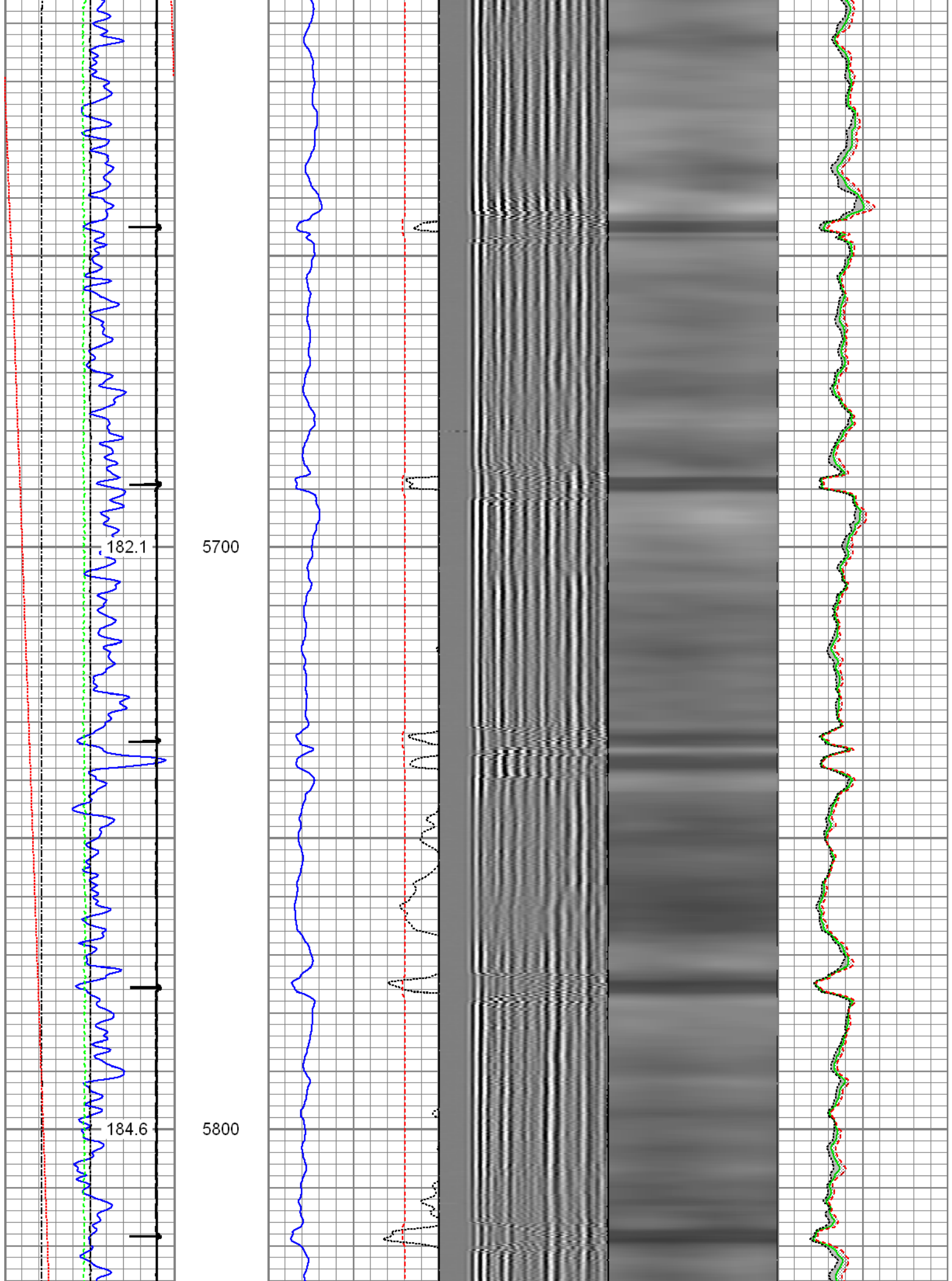




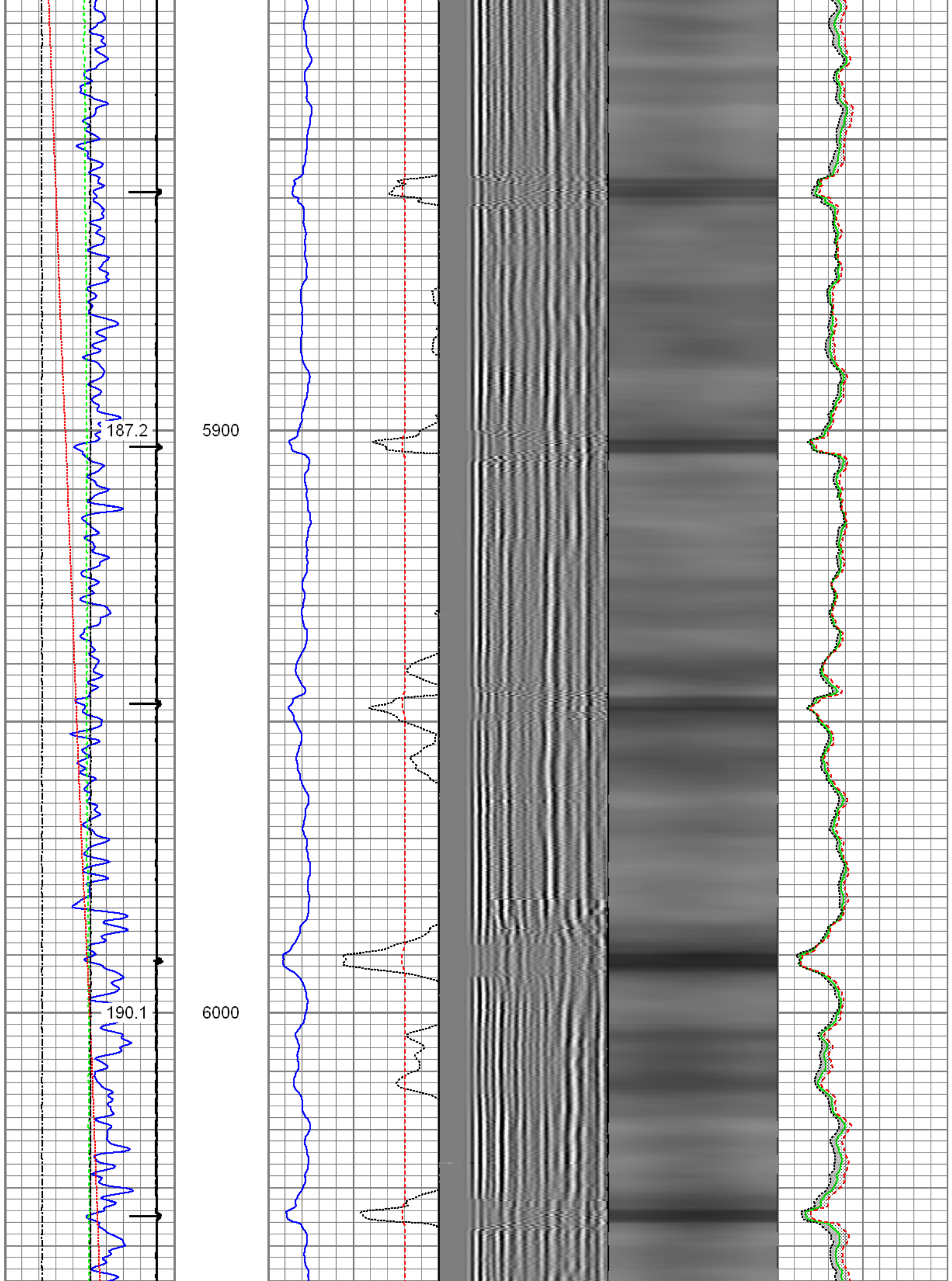


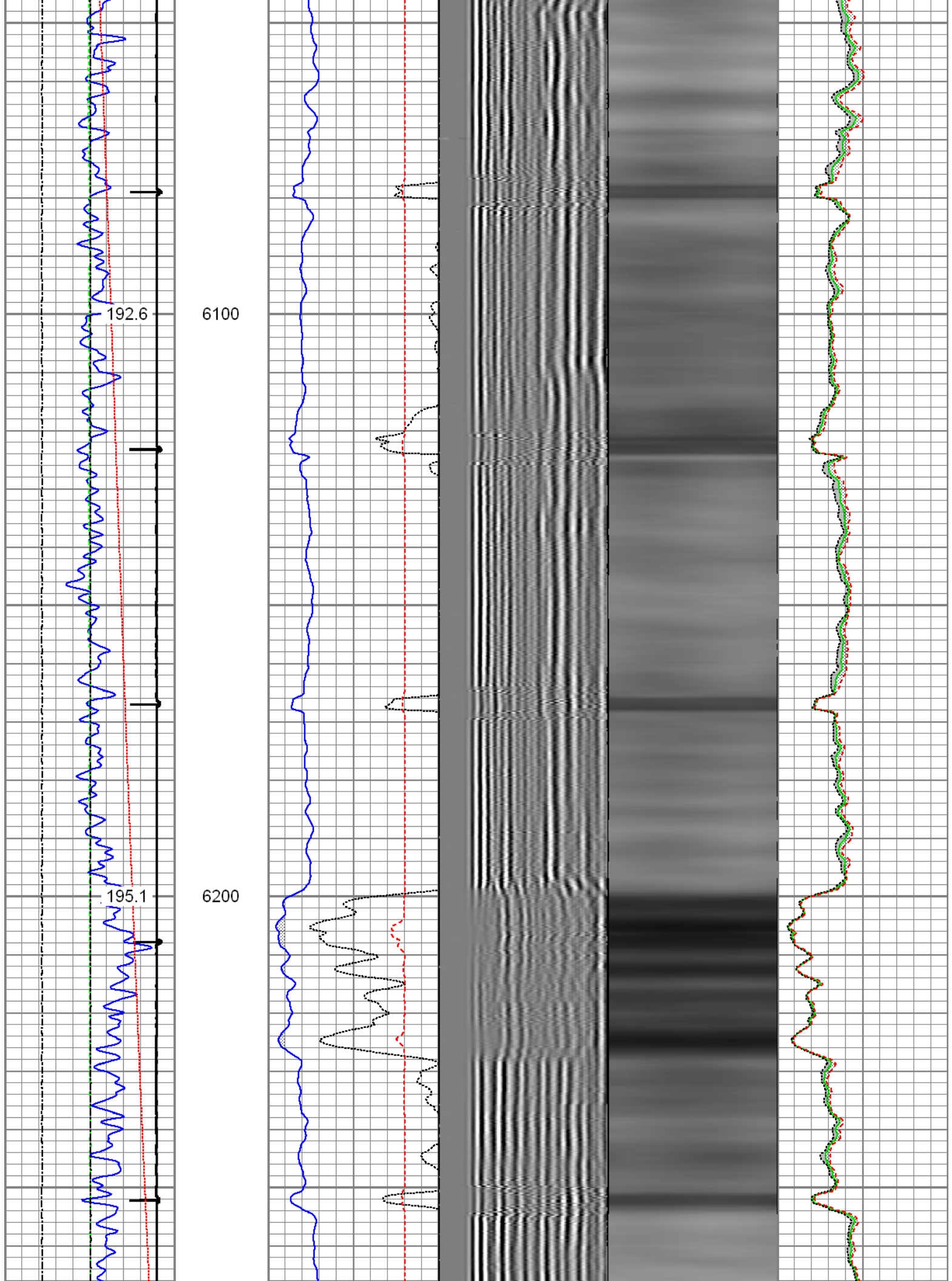


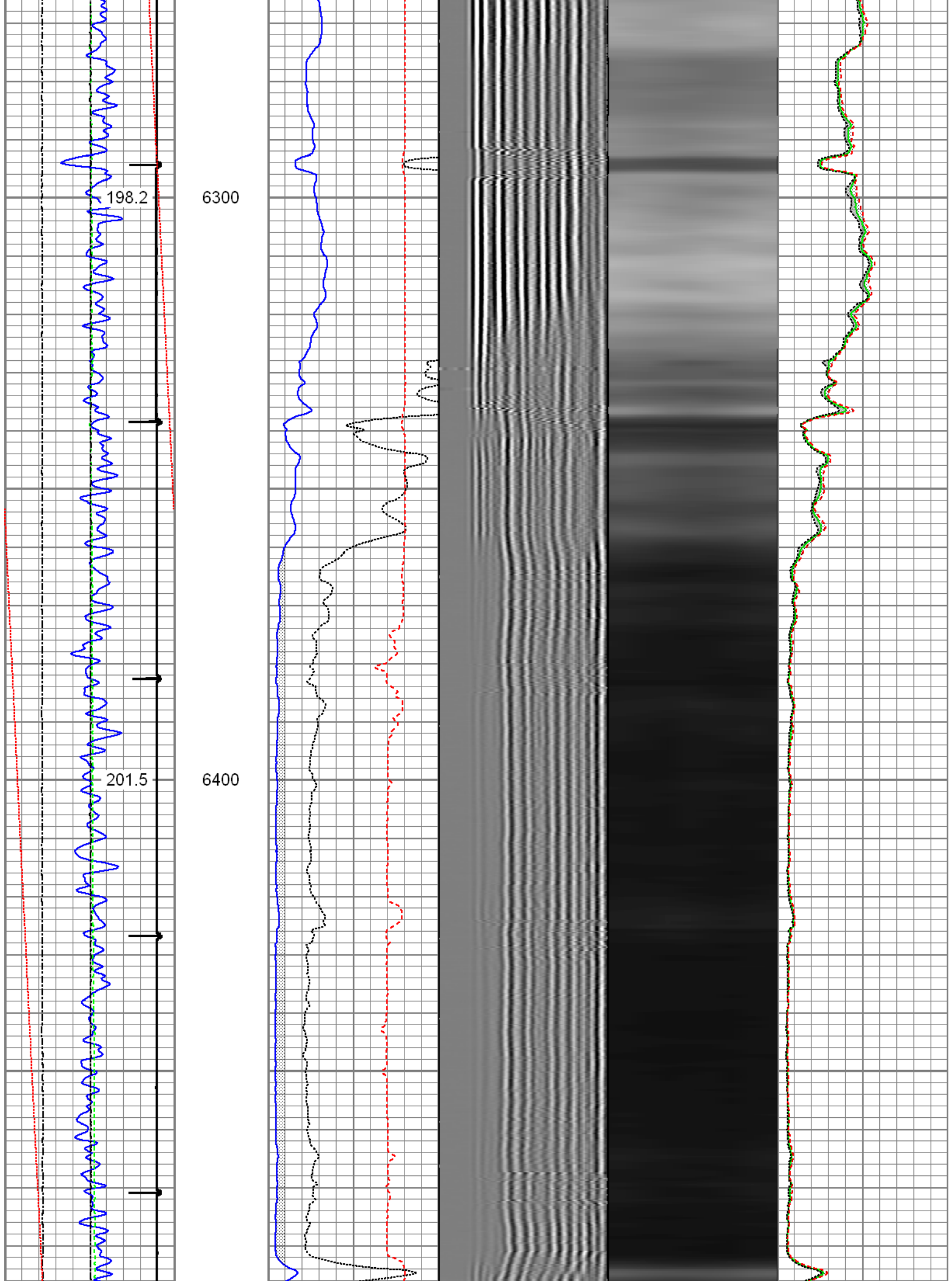


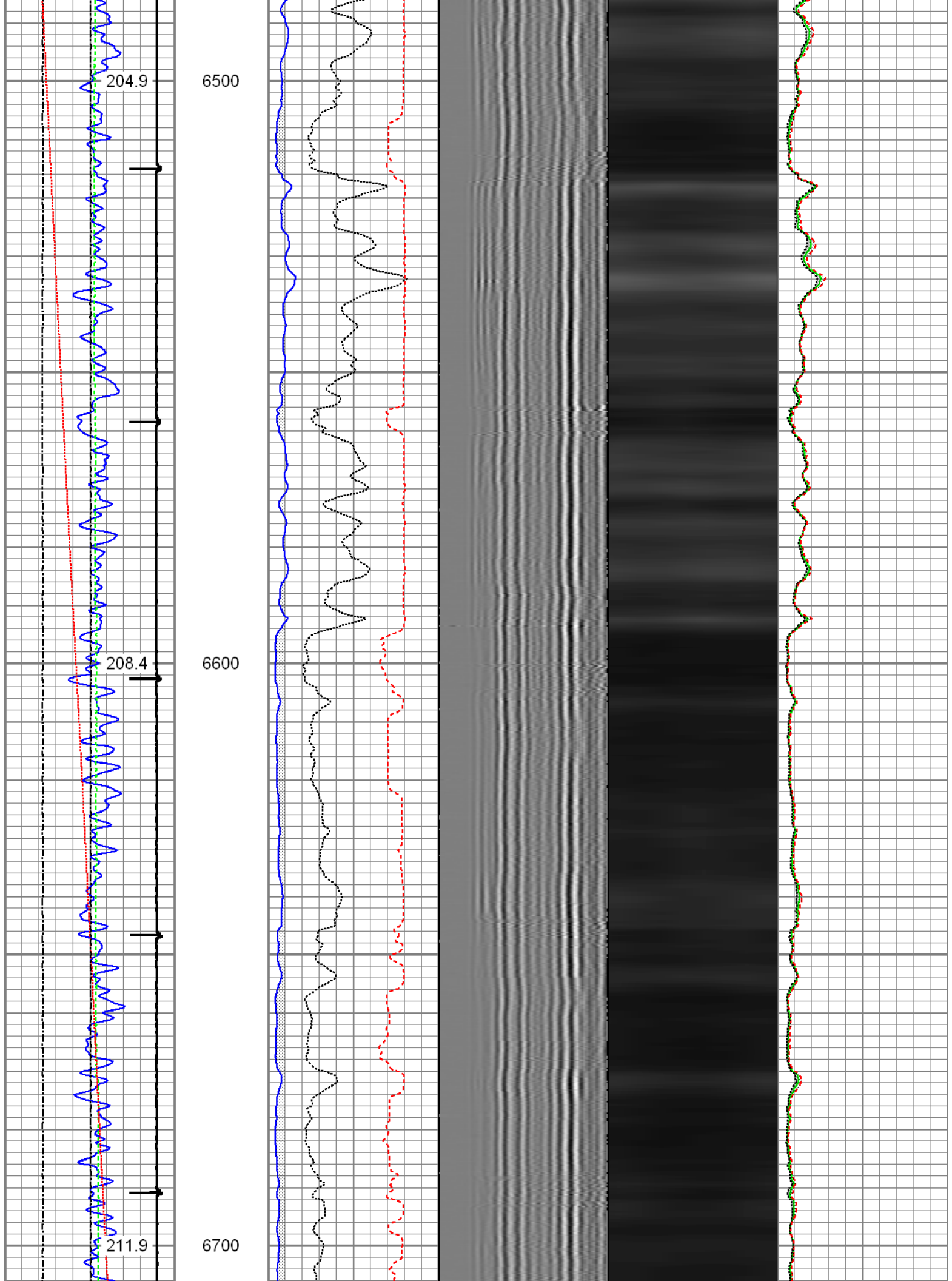




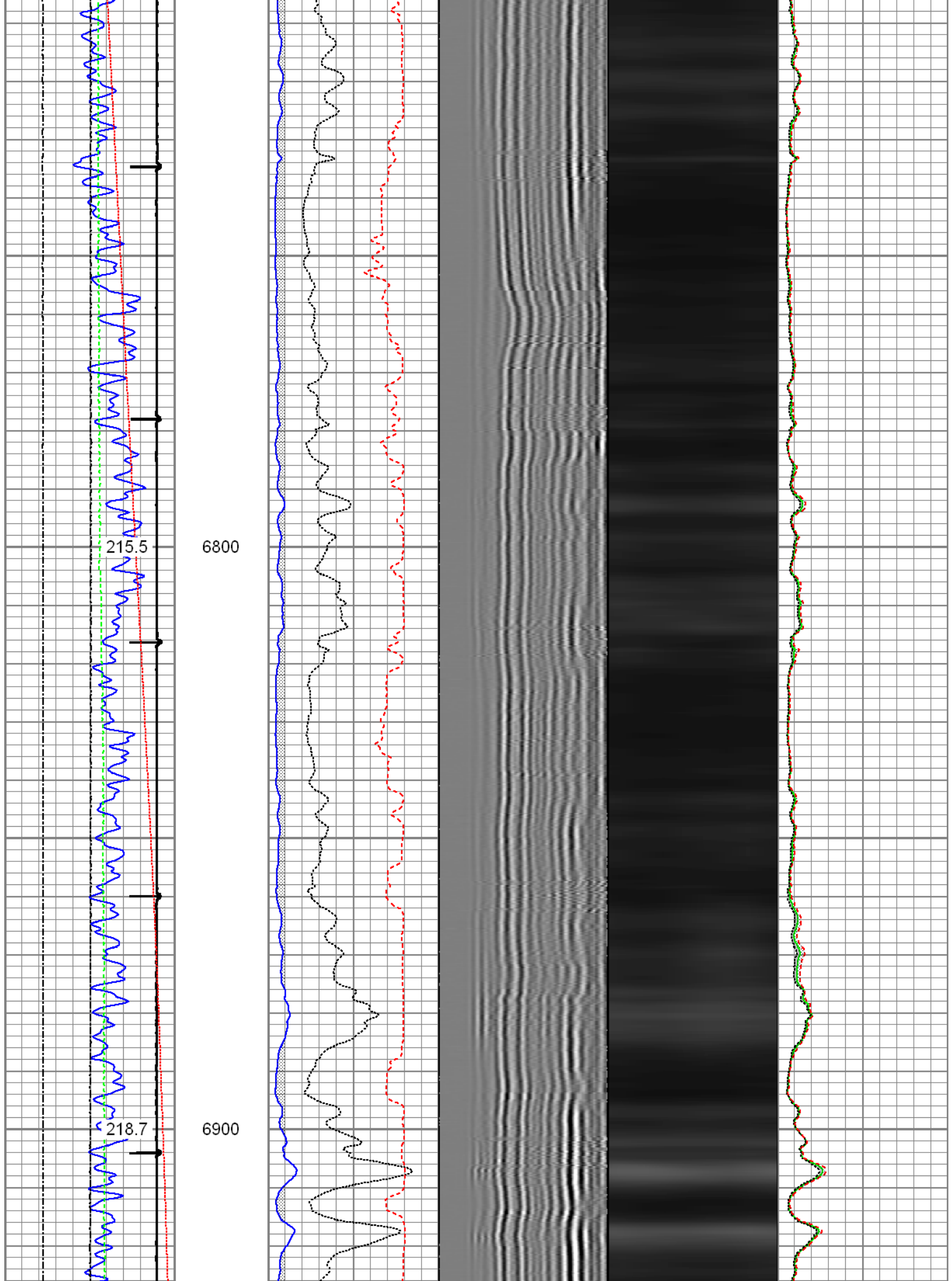


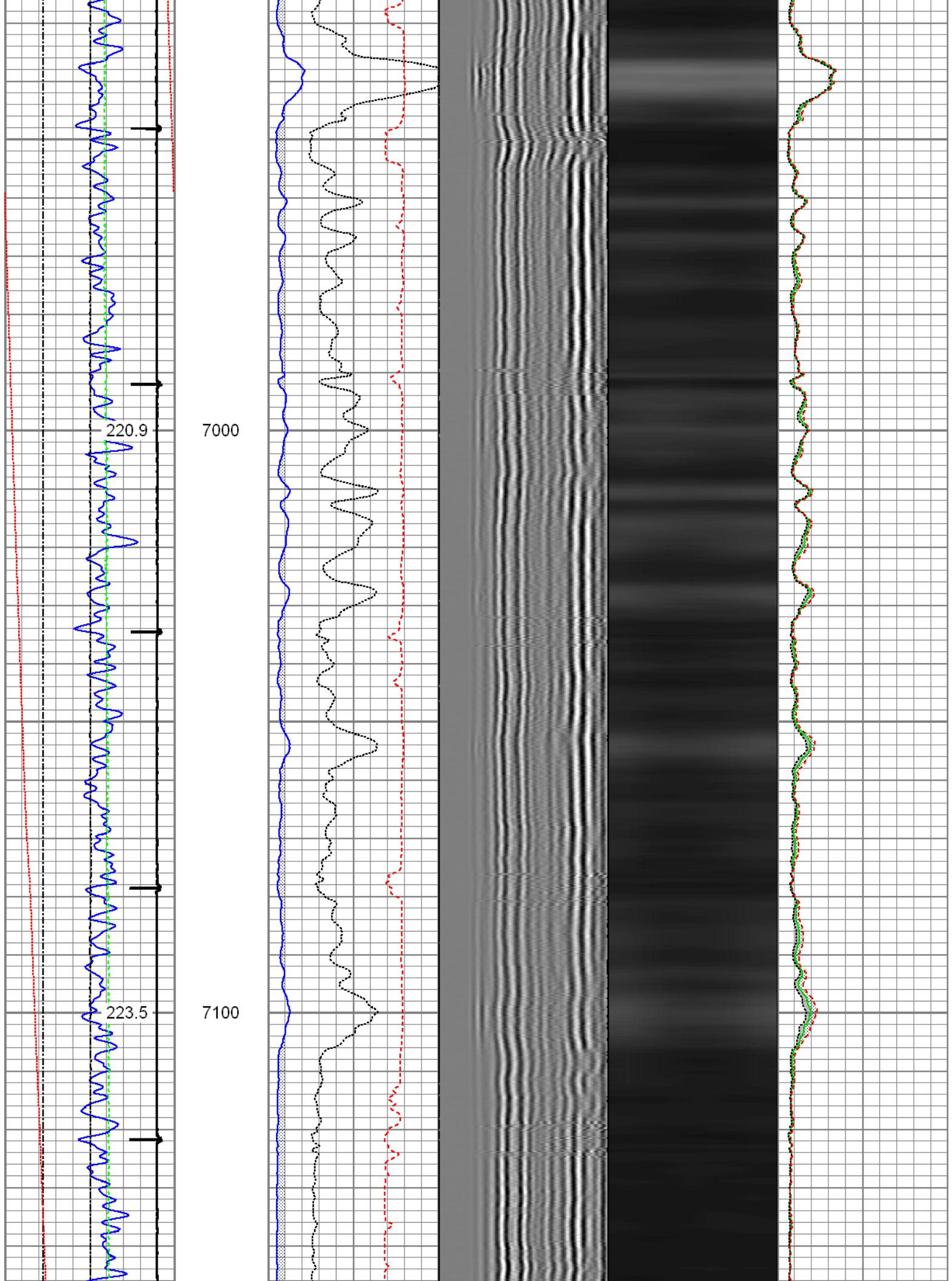


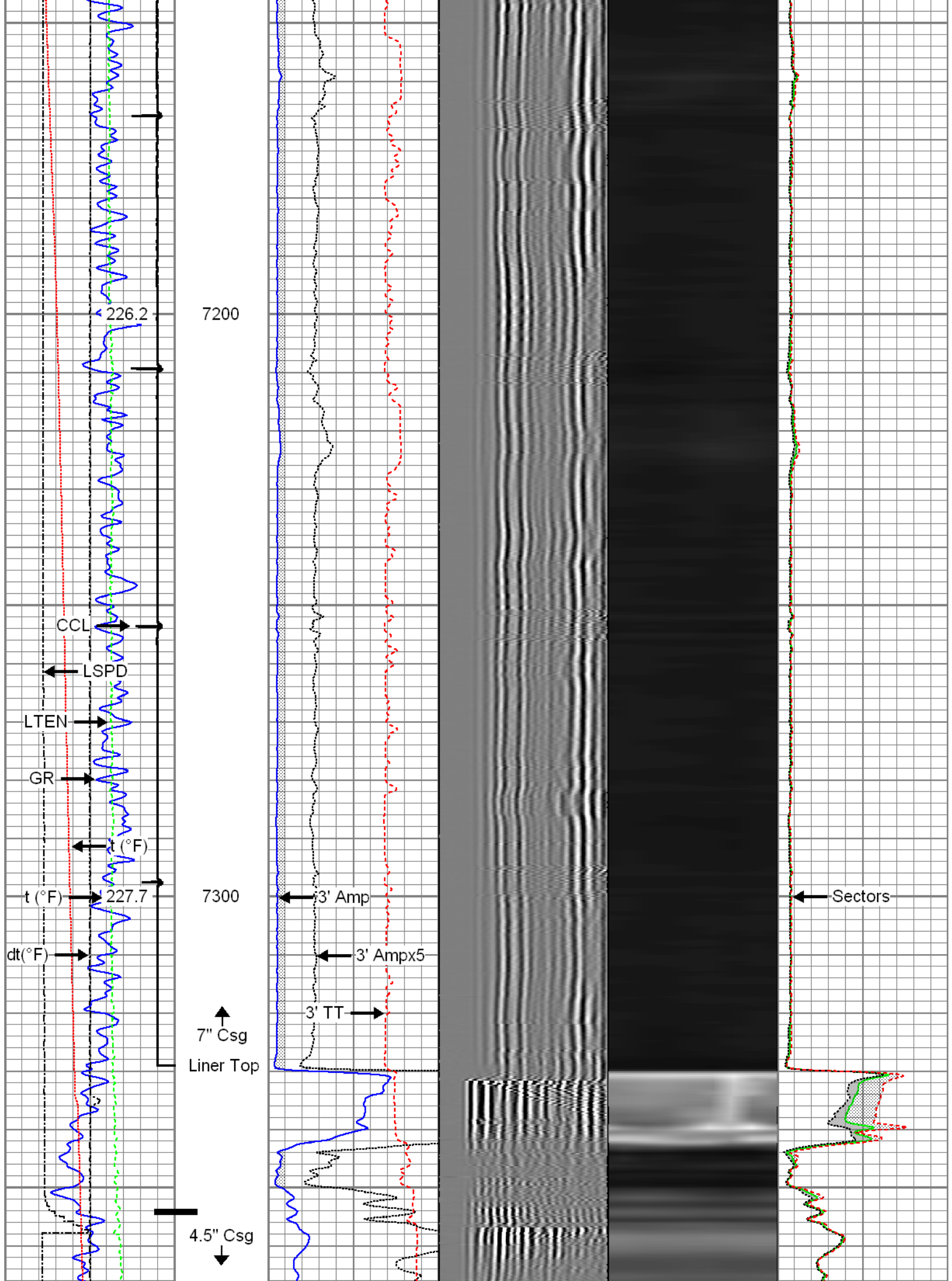


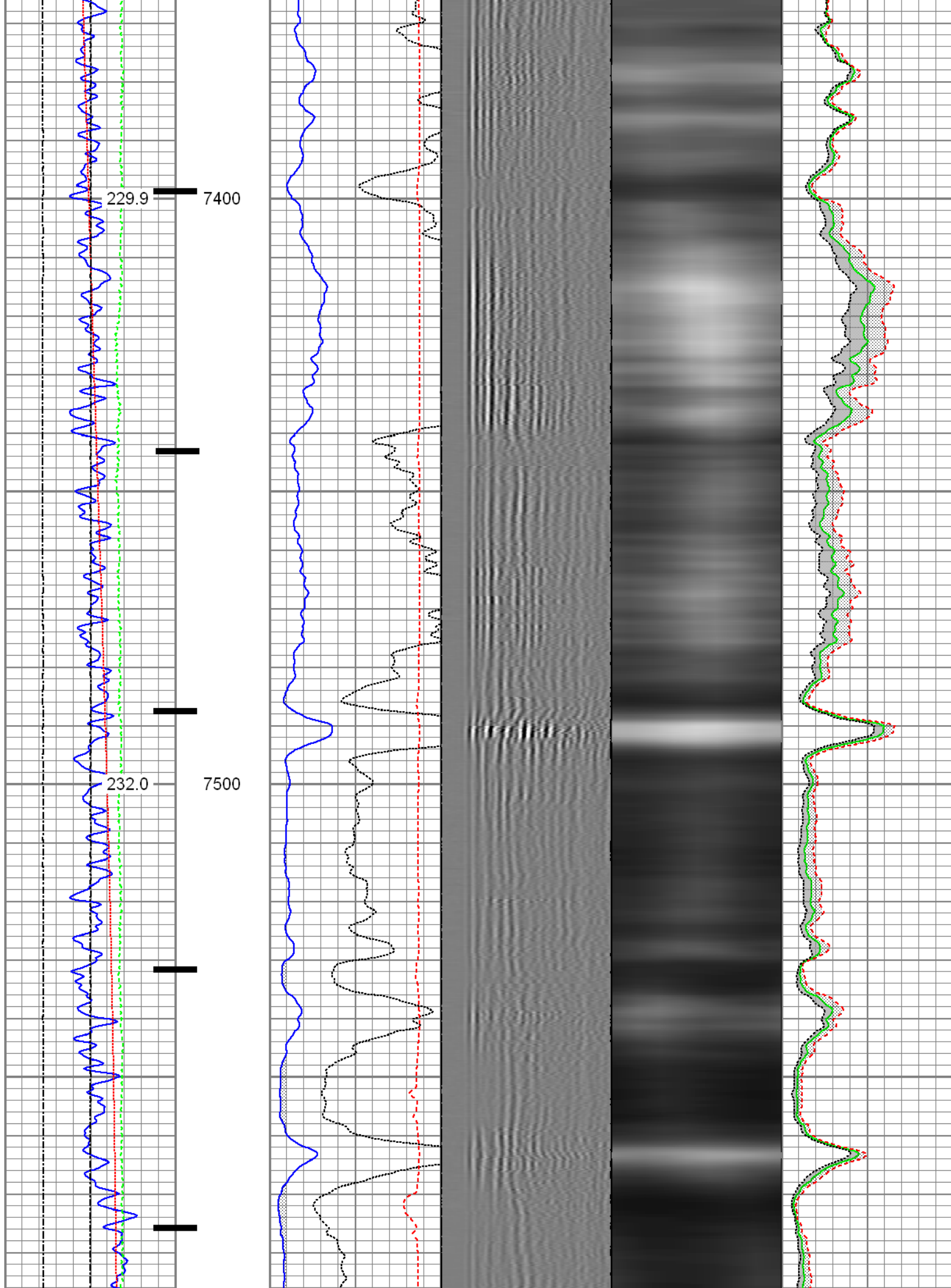




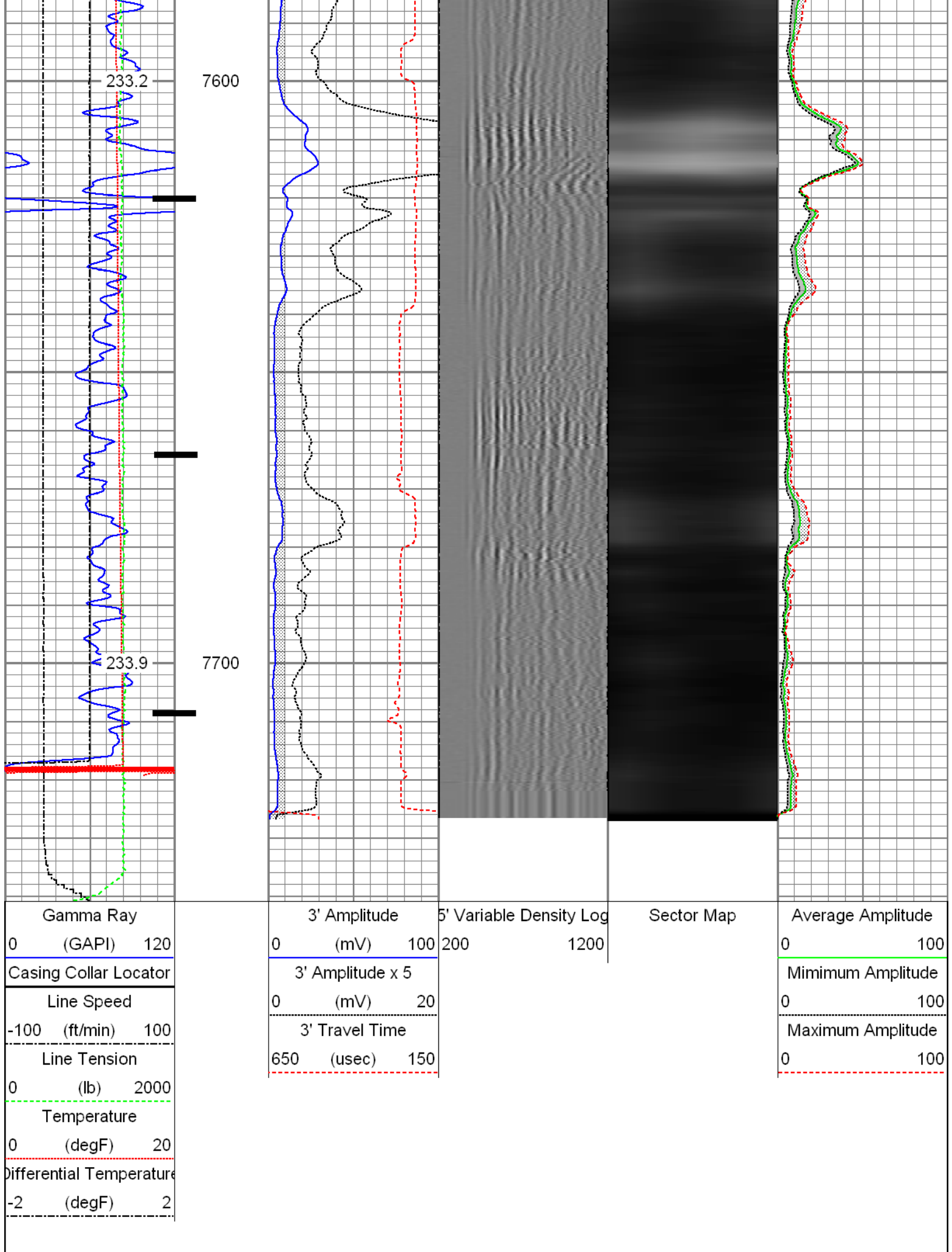






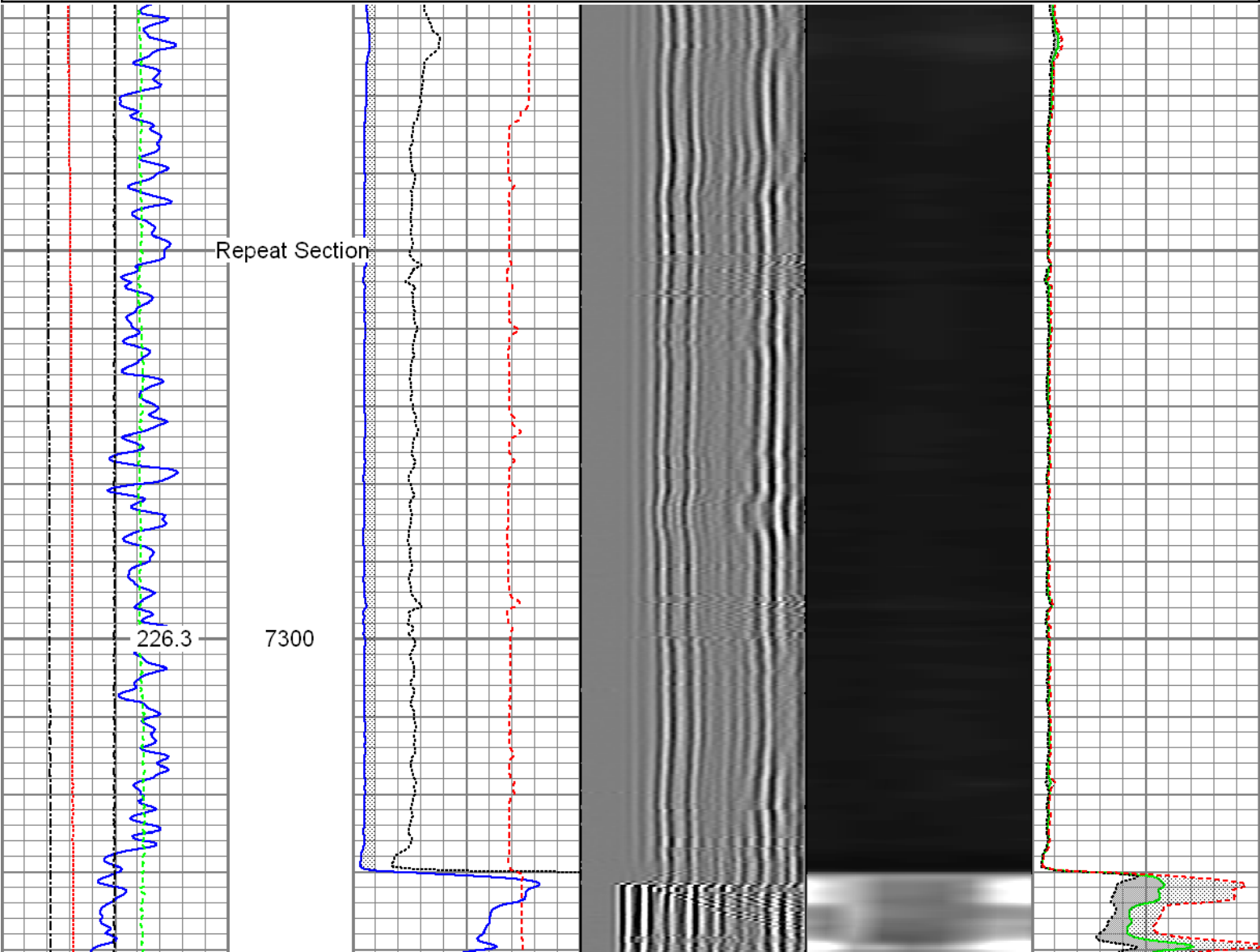


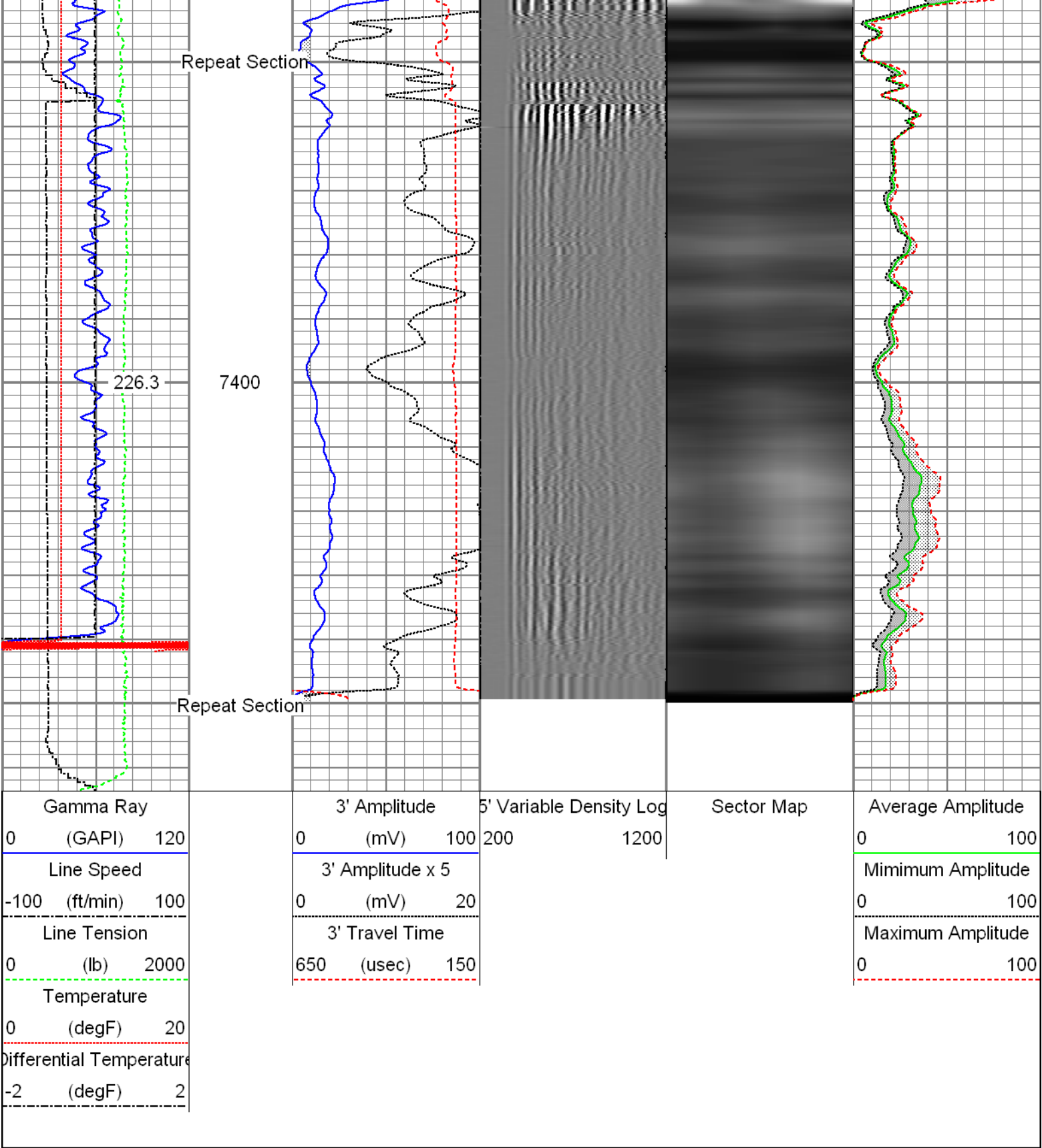





Database File: x:\logs\_for\_processing\logs to be reviewed\0512336456\_anadarko\_badger 22c-3hz\_07-02-15\_mit\_rk  
Dataset Pathname: pass2.1  
Presentation Format: rbt4\_mit  
Dataset Creation: Mon Jul 06 13:23:41 2015 by Calc SCH 120430  
Charted by: Depth in Feet scaled 1:240

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





Sensor	Offset (ft)	Schematic	Description	Len (ft)	OD (in)	Wt (lb)
GR	23.85		T_CH14375_1_GO Titan 1-7/16" Assembled Electric Cable Head with 1" Fishing Neck	1.03	1.44	4.00
			UW_AGS-UW_AGS_001 (215017) Sondex Adapter - GO Box to Sondex Pin	0.21	1.69	1.00
			UW_XTU-UW_XTU_002 (10017430) Crossover Ultrawire Toolbus to Ultralink	1.58	1.69	6.50
			UW_PGR-UW_PGR_020 (10013899) Production Gamma Ray	1.93	1.69	9.50

CR	28.00							
TEMP	22.45			UW_PRT-UW_PRT_016 (10025100) Platinum Resistance Thermometer	1.04	1.69	5.20	
				UW_PRC #3 -DSSRAC (081) 2-3/4" DSS 5 Arm Roller Centralizer	2.55	2.75	32.00	
WVFS3FT	15.42							
WVFS1	15.42			UW_RBT-UW_RBT_004 (1063) Sondex Ultrawire 3-1/8" Radial Bond Tool	9.47	3.13	140.00	
WVFS2	15.42							
WVFS3	15.42							
WVFS4	15.42							
WVFS5	15.42							
WVFS6	15.42							
WVFS7	15.42							
WVFS8	15.42							
CBLTEMP	15.42							
CBLROT	15.42							
WVFS5FT	14.42			UW_PRC-DSSRAC (080) 2-3/4" DSS 5 Arm Roller Centralizer	2.55	2.75	32.00	
MIT	5.41			UW_MIT-UW_MIT40_042 (10014703) 40 Multifinger Imaging Tool	4.54	2.75	61.10	
				UW_PRC #4 -UW_PRC_057 (1101) Sondex 2-3/4" 4-Arm Production Roller Centraliser	2.98	2.75	32.00	
TSTAMP	0.00			UW_BUL-UW_BUL_006 (218707) Sondex Ultrawire Bullnose Terminator	0.22	1.69	1.20	
Dataset: 0512336456_Anadarko_Badger 22C-3HZ_07-02-15_MIT_RBL.db: field/well/run1/pass4.1 Total Length: 28.09 ft Total Weight: 324.50 lb O.D. 3.13 in								

Calibration Report	
Database File:	X:\Logs_For_Processing\Logs to be reviewed\0512336456_Anadarko_Badger 22C-3HZ_07-02-15_MIT_RBL.db: field/well/run1/pass4.1
Dataset Pathname:	pass4.1
Dataset Creation:	Mon Jul 06 13:12:08 2015 by Calc SCH 120430
Multi-finger Imaging Tool Calibration Report	
Serial Number:	10014703
Number of Fingers:	40



Number of Fingers: 40  
Tool Model:

UW\_MIT40\_042

### Inclinometer Calibration Report

Performed: Fri Sep 20 11:47:48 2013  
Calibration Angle: 45

Vertical:		Inc X	Inc Y
Finger 1 up:		1963	1960
Finger 31 up:		1748	1727
Finger 21 up:		2195	1742
Finger 11 up:		2178	2188
		1727	2173
Sensitivity ratio:	1.00706		
X-axis angle:	132.825		
Deviation const.:	317.775		

### Finger Calibration Report

Performed: Thu Jul 02 13:15:58 2015

Ring size: (in)	4	Sens	5	Sens	6	Sens	7
Finger 01:	1082	370.0	1452	383.0	1835	401.0	2236
Finger 02:	1042	374.0	1416	398.0	1814	421.0	2235
Finger 03:	1053	365.0	1418	384.0	1802	411.0	2213
Finger 04:	982	374.0	1356	406.0	1762	439.0	2201
Finger 05:	1012	358.0	1370	380.0	1750	400.0	2150
Finger 06:	1010	371.0	1381	395.0	1776	417.0	2193
Finger 07:	1007	369.0	1376	387.0	1763	411.0	2174
Finger 08:	983	373.0	1356	403.0	1759	427.0	2186
Finger 09:	1050	379.0	1429	390.0	1819	402.0	2221
Finger 10:	1013	375.0	1388	392.0	1780	411.0	2191
Finger 11:	994	375.0	1369	395.0	1764	419.0	2183
Finger 12:	1075	372.0	1447	376.0	1823	386.0	2209
Finger 13:	1024	371.0	1395	393.0	1788	418.0	2206
Finger 14:	1006	386.0	1392	408.0	1800	427.0	2227
Finger 15:	966	382.0	1348	412.0	1760	434.0	2194
Finger 16:	1023	379.0	1402	397.0	1799	419.0	2218
Finger 17:	1055	376.0	1431	391.0	1822	401.0	2223
Finger 18:	1093	379.0	1472	389.0	1861	404.0	2265
Finger 19:	1056	385.0	1441	397.0	1838	413.0	2251
Finger 20:	976	380.0	1356	409.0	1765	428.0	2193
Finger 21:	1079	377.0	1456	388.0	1844	414.0	2258
Finger 22:	1059	380.0	1439	398.0	1837	416.0	2253
Finger 23:	1101	384.0	1485	396.0	1881	415.0	2296
Finger 24:	1068	347.0	1415	372.0	1787	391.0	2178
Finger 25:	1079	383.0	1462	402.0	1864	417.0	2281
Finger 26:	1045	368.0	1413	393.0	1806	414.0	2220
Finger 27:	1214	389.0	1603	396.0	1999	409.0	2408
Finger 28:	1091	359.0	1450	383.0	1833	406.0	2239
Finger 29:	1037	367.0	1404	396.0	1800	419.0	2219
Finger 30:	1024	367.0	1391	398.0	1789	430.0	2219
Finger 31:	1241	396.0	1637	409.0	2046	421.0	2467
Finger 32:	1012	362.0	1374	383.0	1757	404.0	2161
Finger 33:	1111	387.0	1498	410.0	1908	432.0	2340
Finger 34:	984	359.0	1343	390.0	1733	417.0	2150
Finger 35:	1146	389.0	1535	408.0	1943	424.0	2367
Finger 36:	1056	353.0	1409	376.0	1785	396.0	2181
Finger 37:	1127	388.0	1515	405.0	1920	425.0	2345
Finger 38:	1091	363.0	1454	380.0	1834	400.0	2234
Finger 39:	1079	355.0	1434	370.0	1804	391.0	2195
Finger 40:	986	378.0	1364	413.0	1777	437.0	2214

### Segmented Cement Bond Log Calibration Report

Serial Number: 1063  
Tool Model: UW\_PBT\_004

Tool Model: UW\_RBT\_004  
Calibration Casing Diameter: 7.000 in  
Calibration Depth: -17.295 ft

Master Calibration, performed Mon Jul 06 13:12:05 2015:

	Raw (v)		Calibrated (mv)		Results	
	Zero	Cal	Zero	Cal	Gain	Offset
3FT	-0.001	0.680	0.800	62.165	90.107	0.919
5FT	-0.005	0.689	0.800	62.165	88.394	1.263
S1	-0.001	0.652	0.000	100.000	153.030	0.161
S2	-0.003	0.667	0.000	100.000	149.235	0.394
S3	-0.003	0.678	0.000	100.000	146.863	0.388
S4	-0.003	0.703	0.000	100.000	141.722	0.411
S5	-0.002	0.699	0.000	100.000	142.697	0.215
S6	-0.002	0.677	0.000	100.000	147.240	0.258
S7	-0.002	0.665	0.000	100.000	149.892	0.350
S8	-0.002	0.650	0.000	100.000	153.317	0.333

#### Temperature Calibration Report

Serial Number: 10025100  
Tool Model: UW\_PRT\_016  
Performed: Wed Feb 11 13:47:59 2015

Point #	Reading	Reference
1	13249.00 cps	68.00 degF
2	18454.00 cps	104.00 degF
3	29735.00 cps	176.00 degF
4	41457.00 cps	248.00 degF
5	52851.00 cps	320.00 degF
6	59128.00 cps	356.00 degF
7	cps	degF
8	cps	degF
9	cps	degF
10	cps	degF

#### Gamma Ray Calibration Report

Serial Number: 10013899  
Tool Model: UW\_PGR\_020  
Performed: Sun Jun 13 13:33:21 1993

Calibrator Value: 1.0 GAPI

Background Reading: 0.0 cps  
Calibrator Reading: 1.0 cps

Sensitivity: 1.0000 GAPI/cps



Company Kerr-McGee Oil & Gas Onshore, L.P.  
Well Badger 22C-3HZ  
Field Wattenberg  
County Weld  
State Colorado