

Radial Cement Bond Gamma Ray Casing Collar Log

Company		Noble Energy Inc.	
Well		Wells Ranch AA11-623	
Field		Wattenberg	
County		Weld	
State		Colorado	
Location:		API #: 05-123-41248	
SEC 11 TWP 6N RGE 63W		Other Services MIT	
Permanent Datum		Ground Level	
Log Measured From		Kelly Bushing	
Drilling Measured From		Kelly Bushing	
		Elevation 4833'	
		K.B. 4857'	
		D.F. 4856'	
		G.L. 4833'	

Date	13-JUL-2015
Run Number	One
Depth Driller	13872 FT
Depth Logger	6866 FT
Bottom Logged Interval	6860 FT
Top Log Interval	Surface
Open Hole Size	8.750"
Type Fluid	Water
Density / Viscosity	8.34 lbm/gal
Max. Recorded Temp.	222°F
Estimated Cement Top	108 FT
Time Well Ready	ROA
Time Logger on Bottom	12:10
Equipment Number	HD-0119
Location	Fort Lupton, CO
Recorded By	Jack Amidei
Witnessed By	Bill Mansfield

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	24 FT	606.6 FT		
Intermediate #1	7	26	P-110	24 FT	7082.8 FT		
Intermediate #2							
Liner	4 1/2	11.6	P-110 IC	6843.3 FT	13857 FT		

<<< Fold Here >>>

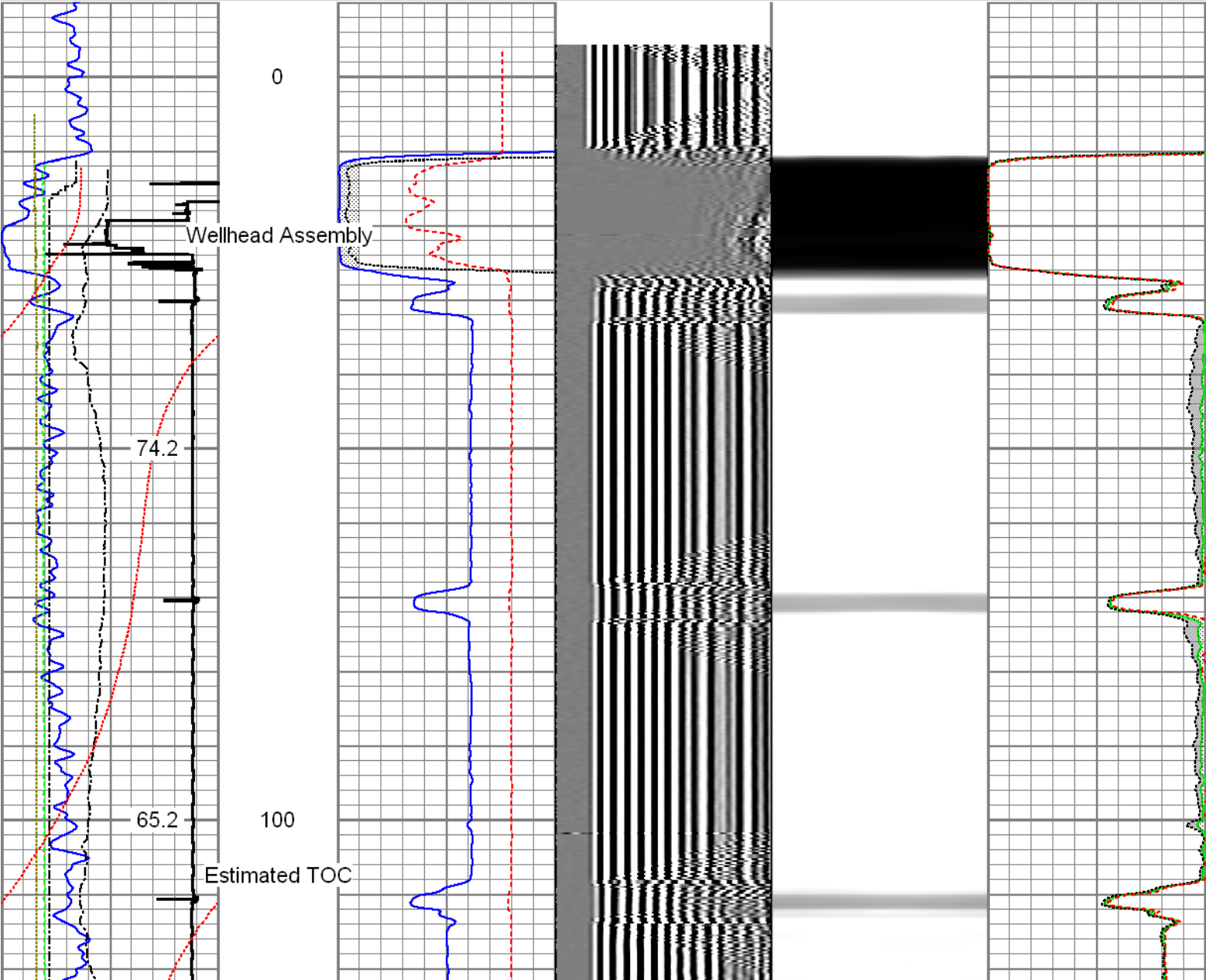
All interpretations are opinions based on inferences from electrical or other measurements and we cannot and do not guarantee the accuracy or correctness of any interpretation, and we shall not, except in the case of gross or willful negligence on our part, be liable or responsible for any loss, costs, 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.

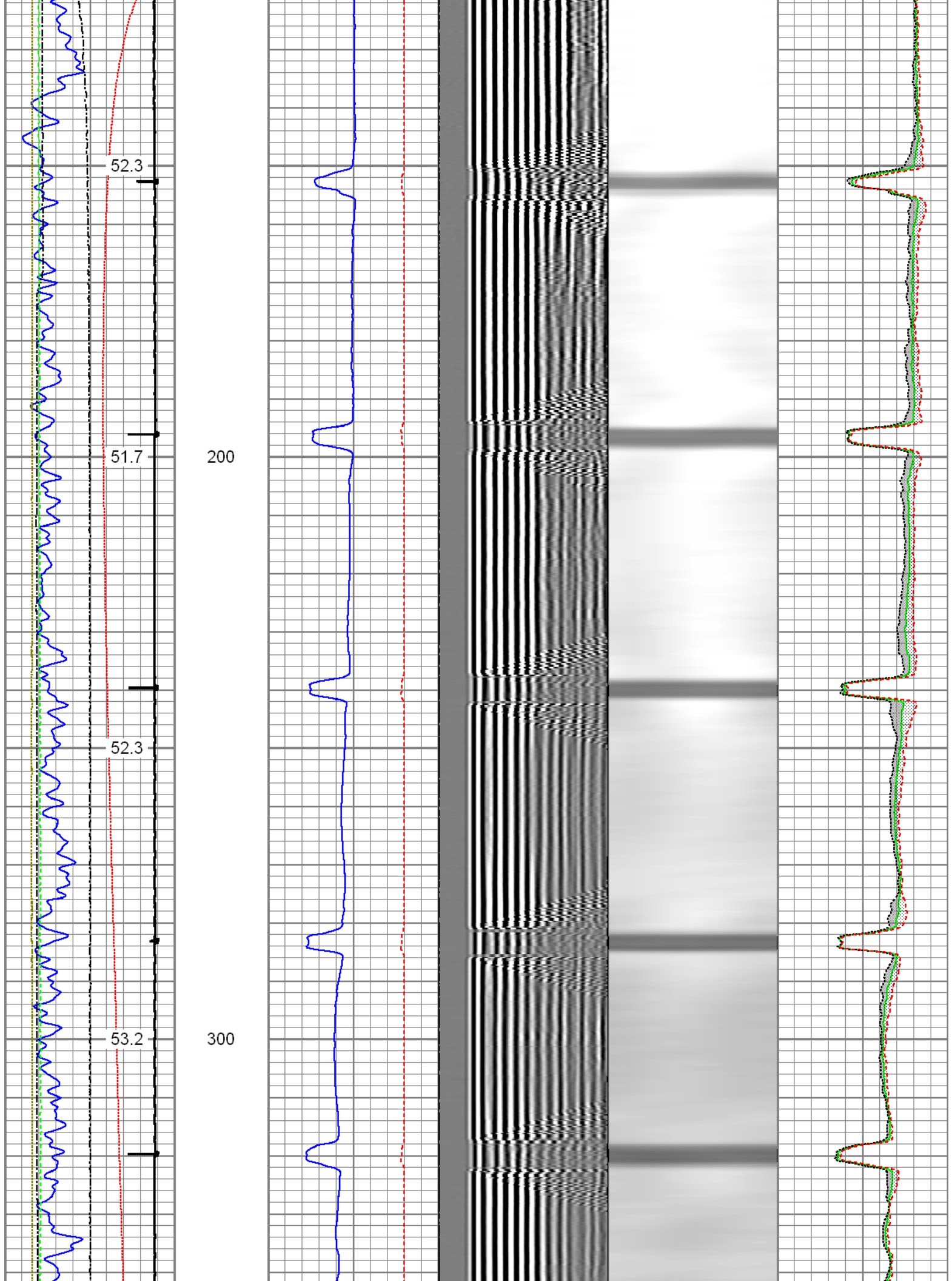
Comments

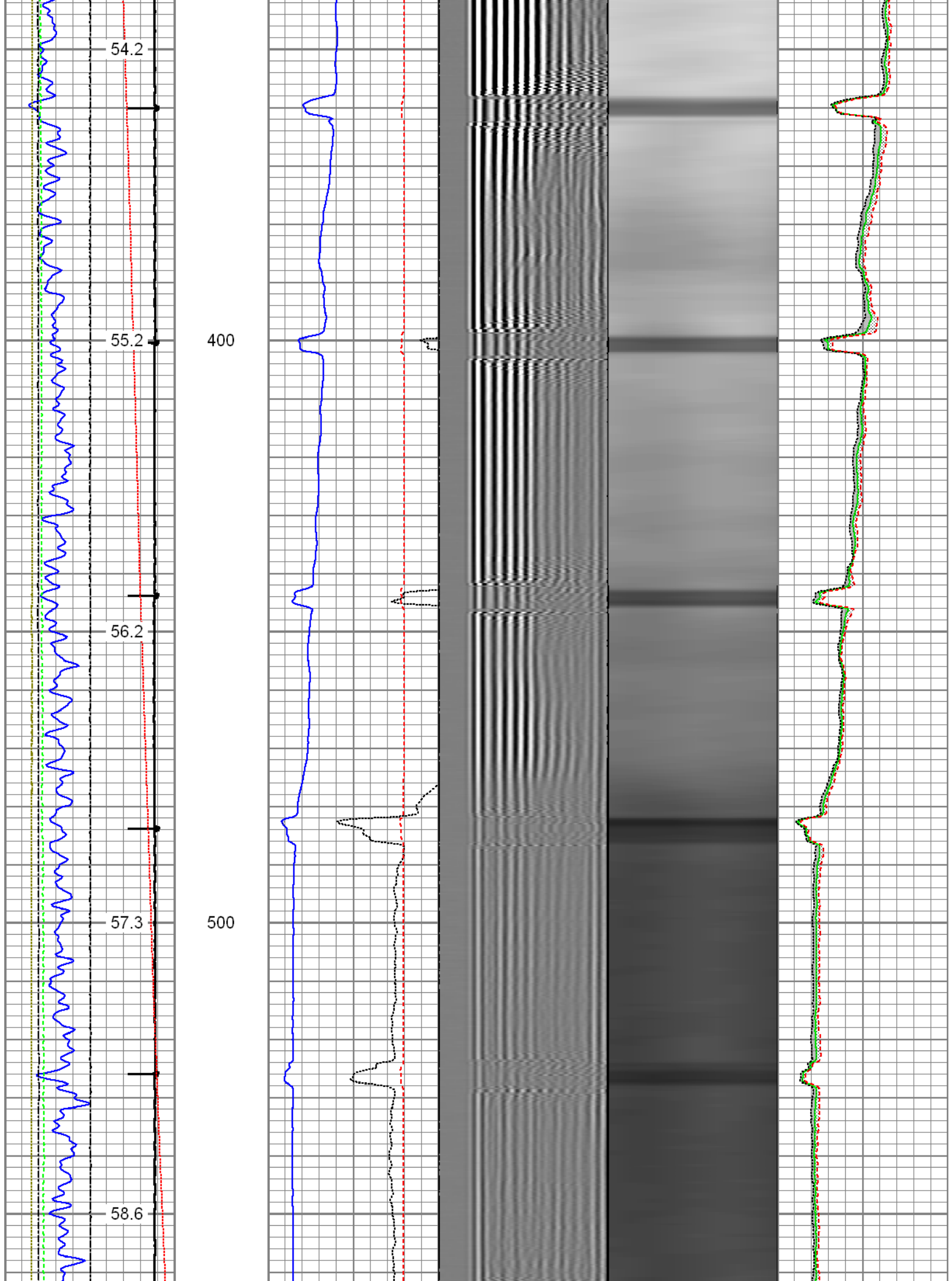
Log ran as per customer request
 Depth referenced to Kelly Bushing at 24 FT
 Adjusted -0- FT to correlate with Kelly Bushing
 Logging tools stacked out approximately at liner top, with several attempts
 Log ran from as deep as possible to surface
 Recorded with 2500 PSI surface induced pressure
 Logging tools were clean and free of any debris upon completion of operations
 Thank you for choosing FMC Technologies Completion Services, Inc.!!

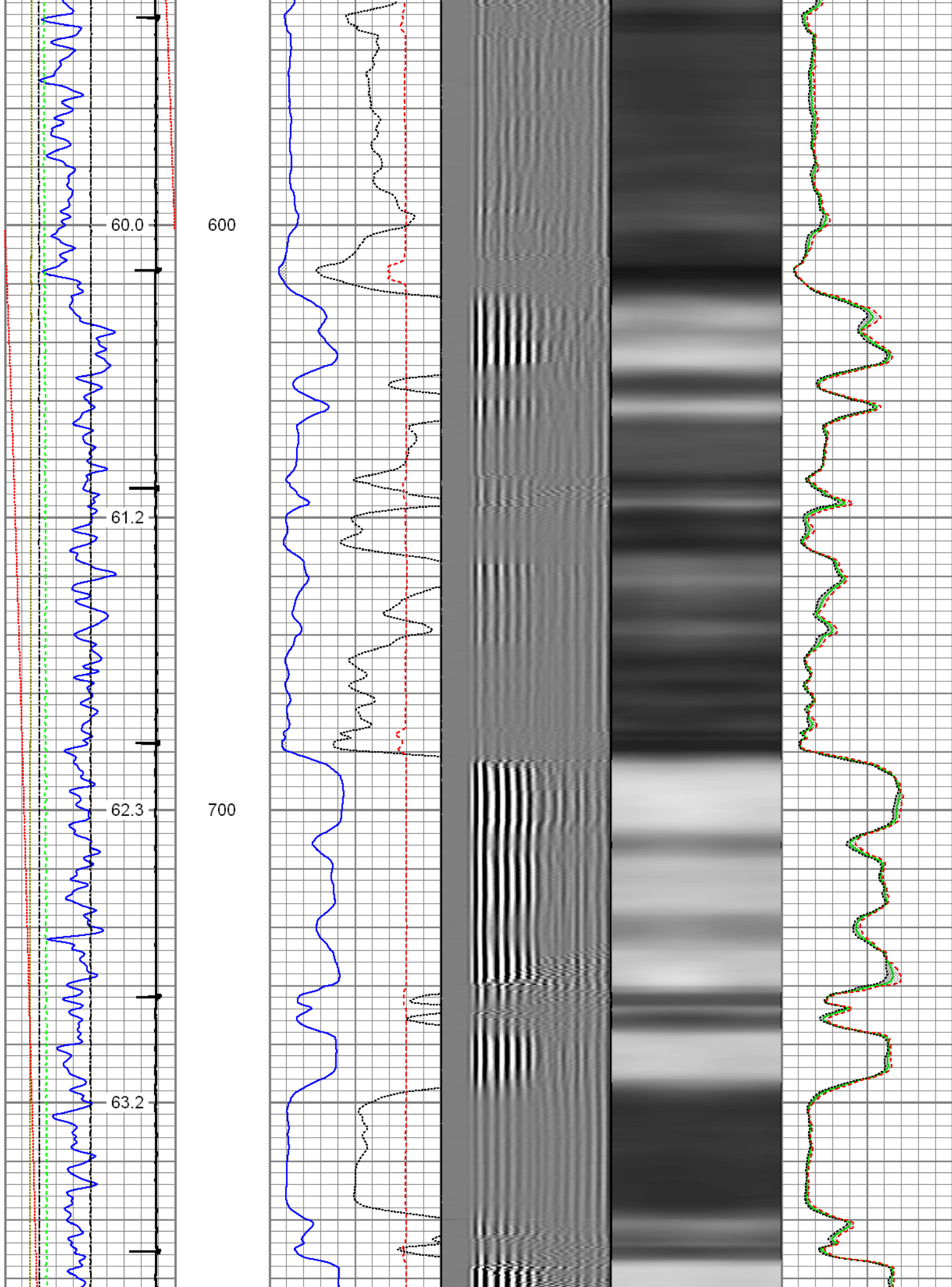
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Dataset Pathname: pass11.1
Presentation Format: rbt4_mit
Dataset Creation: Mon Jul 13 22:35:51 2015 by Calc 7.0 B1
Charted by: Depth in Feet scaled 1:240

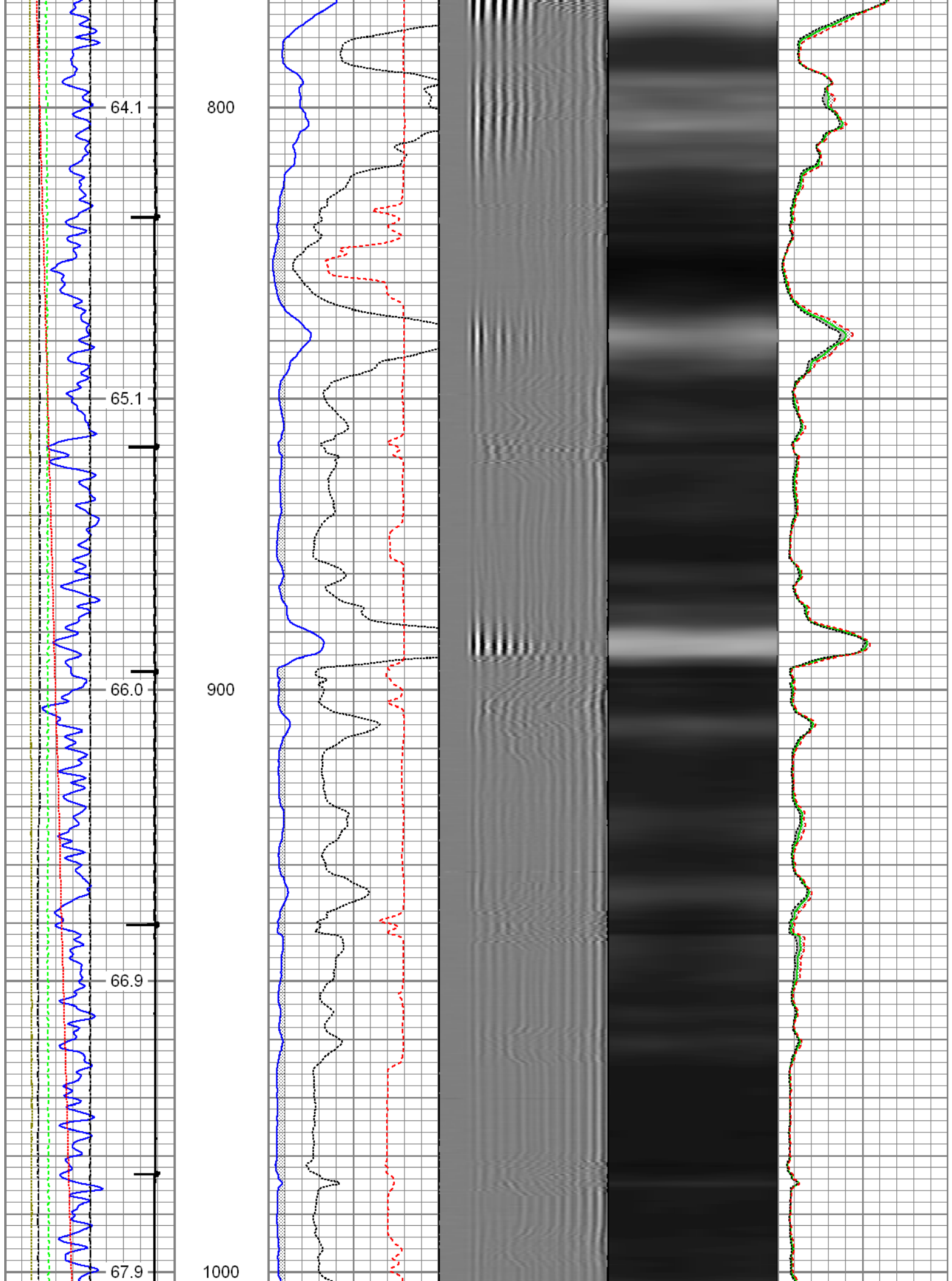
Gamma Ray	3' Amplitude	5' Variable Density Log	Sector Map	Average Amplitude
0 (GAPI) 120	0 (mV) 100	200 1200		0 100
Casing Collar Locator	3' Amplitude x 5			Mimimum Amplitude
Line Speed	0 (mV) 20			0 100
-100 (ft/min) 100	3' Travel Time			Maximum Amplitude
Line Tension	650 (usec) 150			0 100
0 (lb) 2000				
Differential Temperature				
-2 (degF) 2				
-10 Deviation (°) 90				
Temperature				
0 (degF) 20				

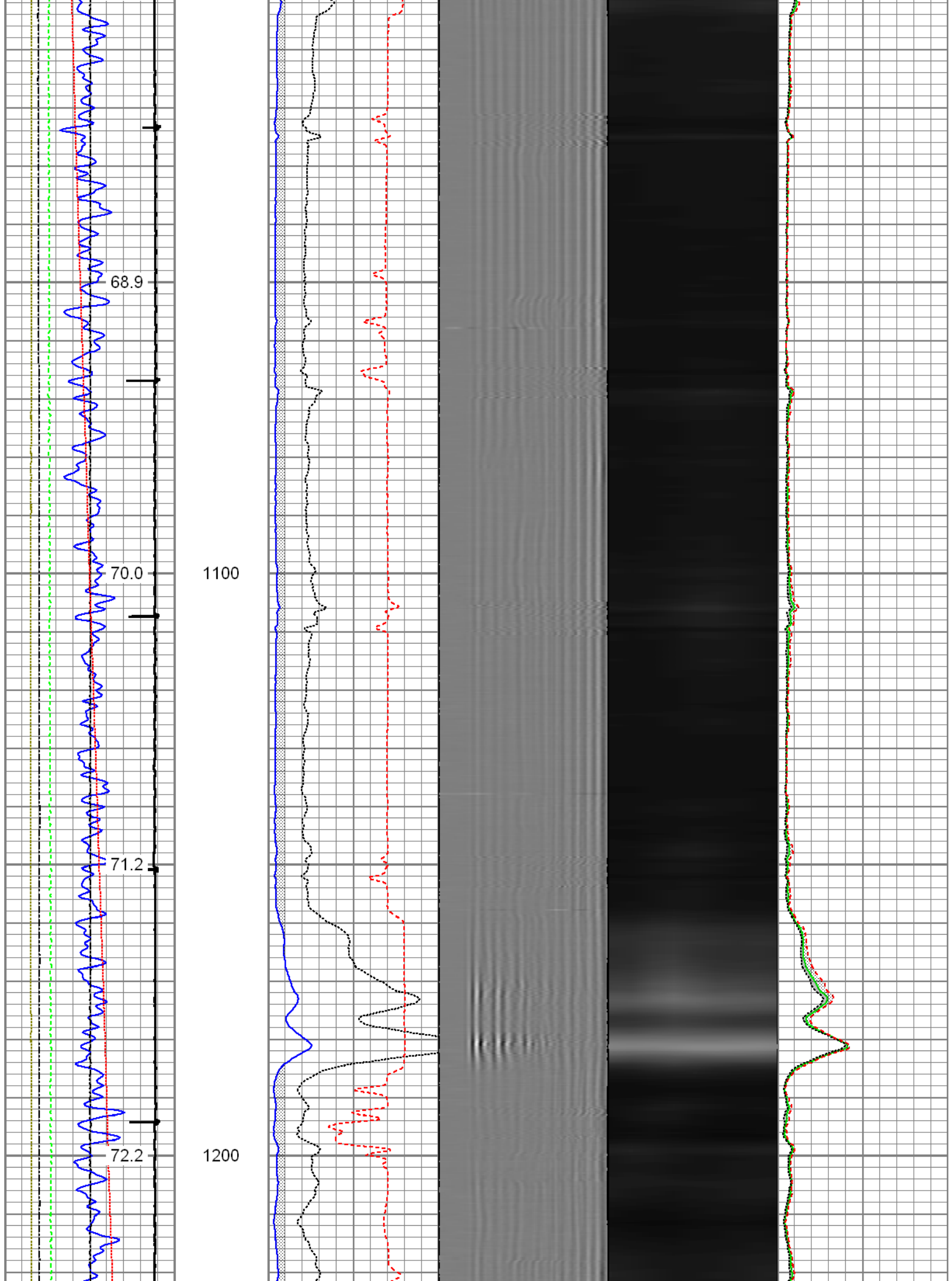


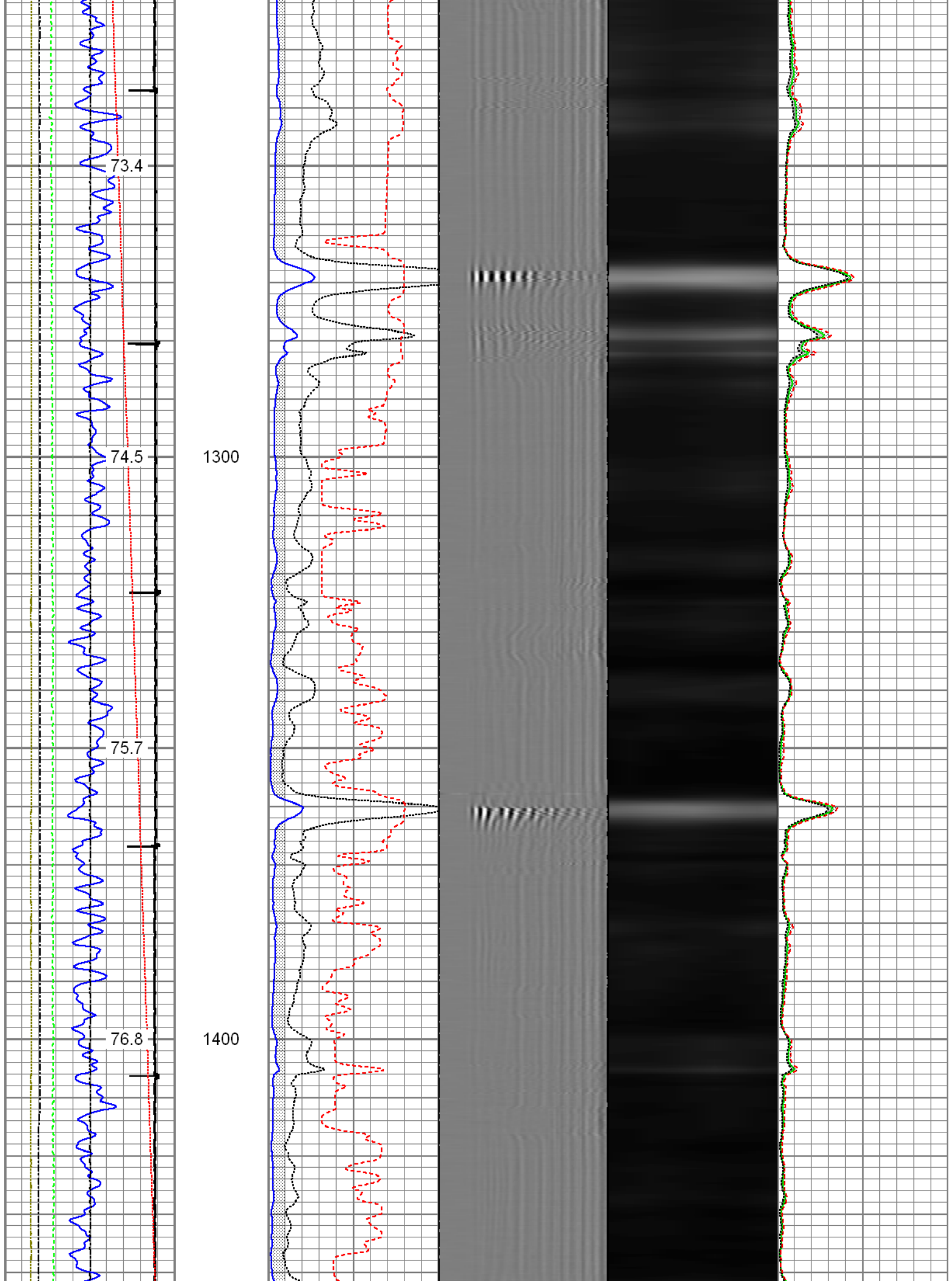


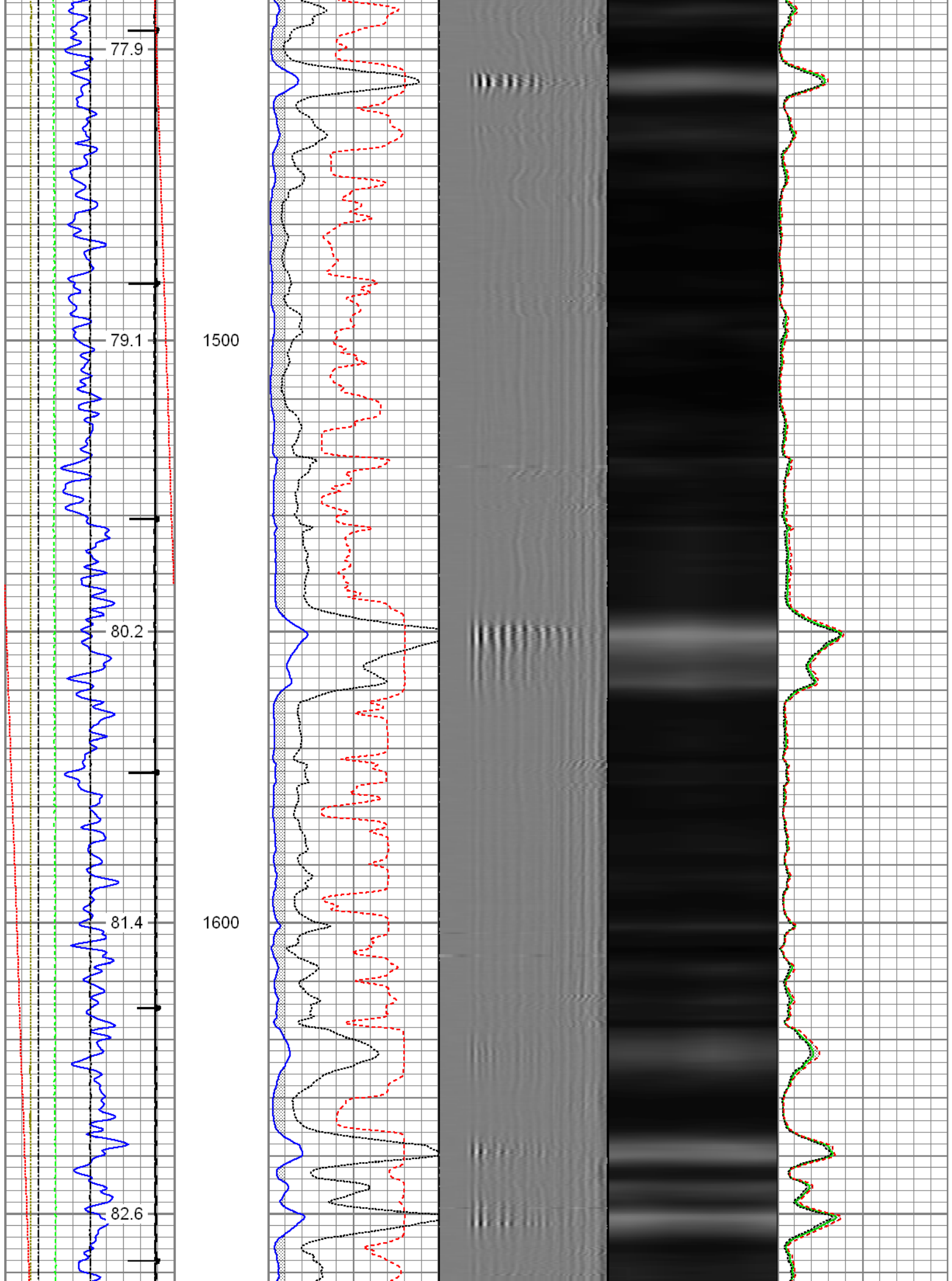


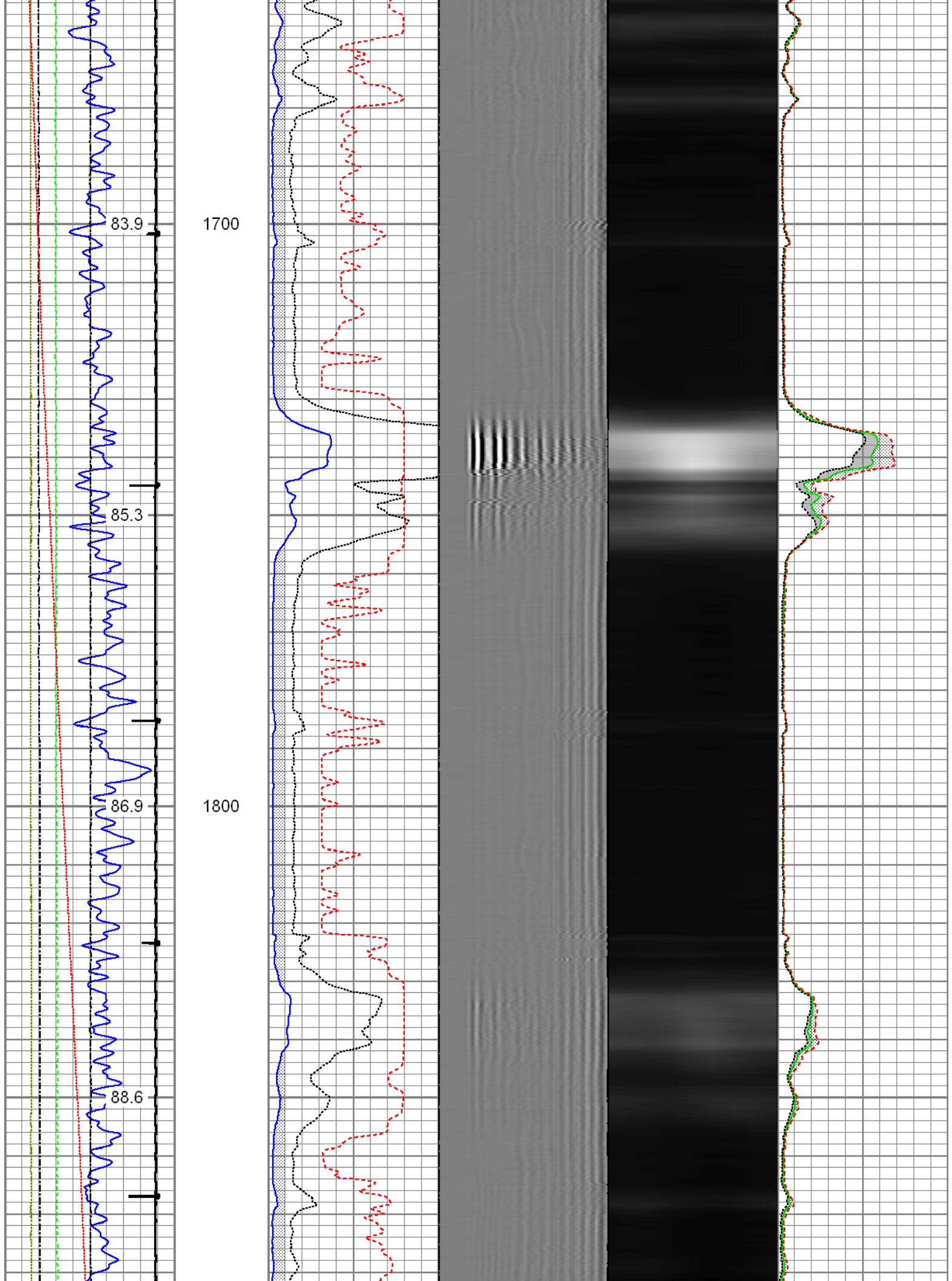


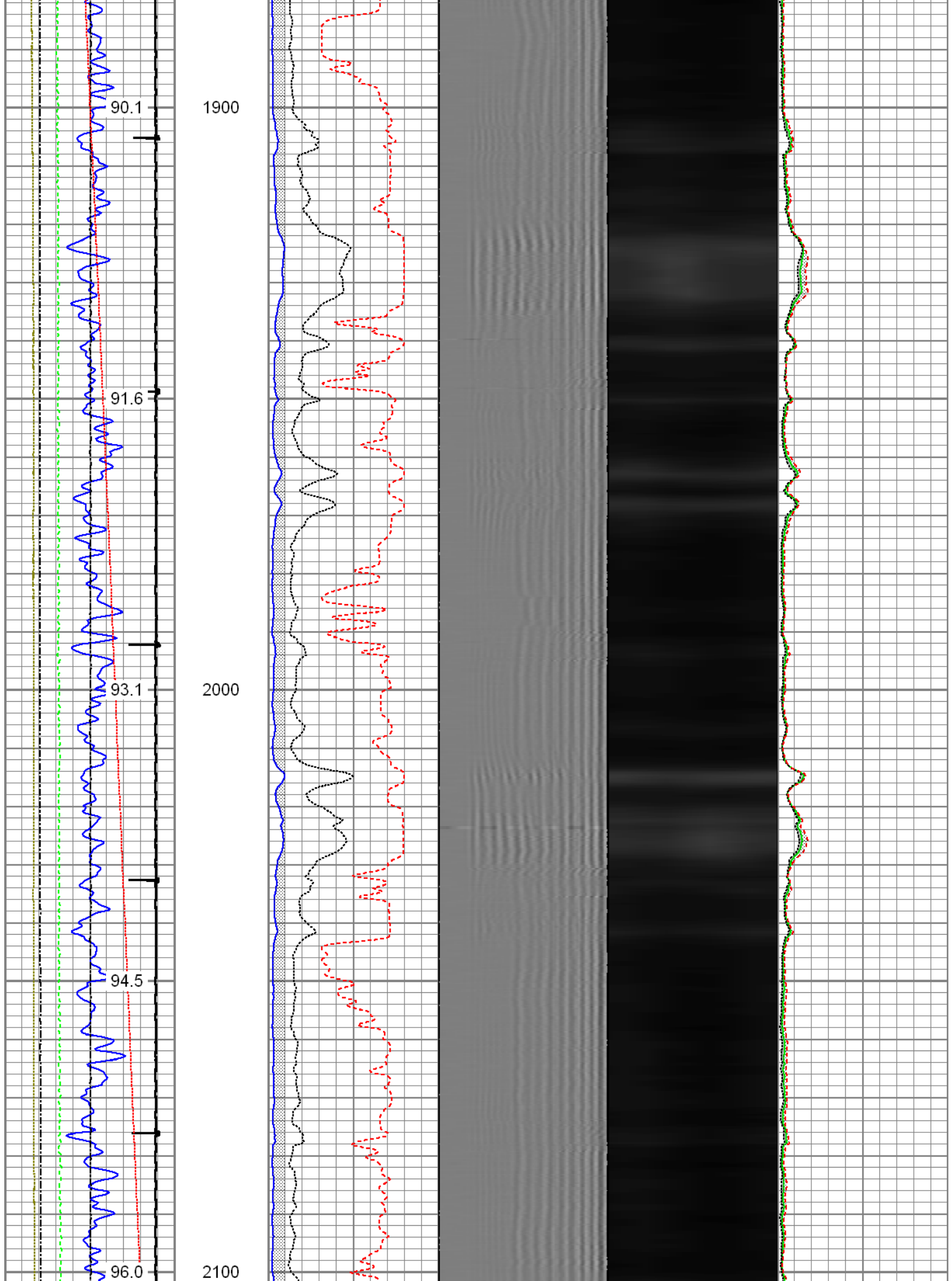


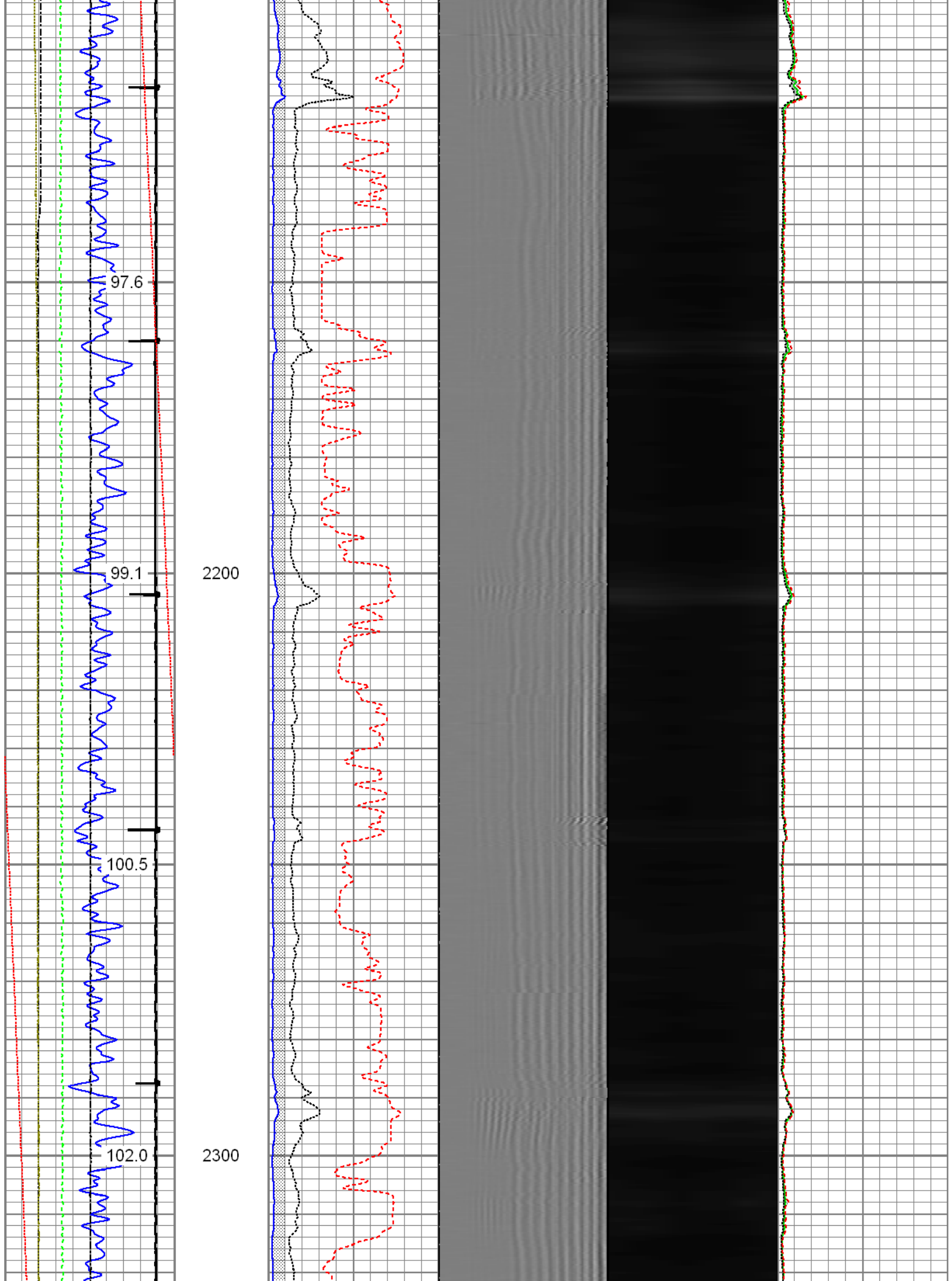


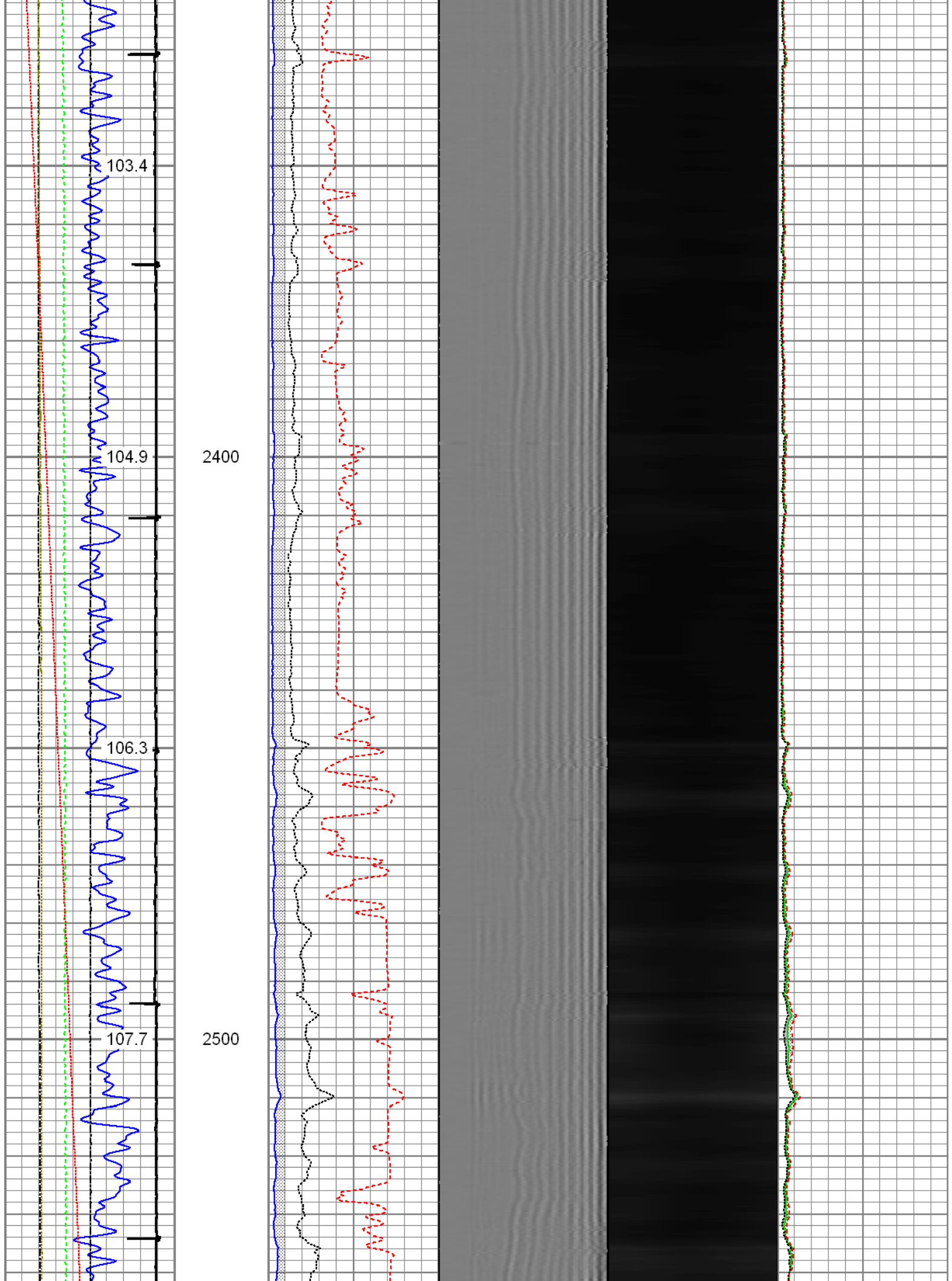


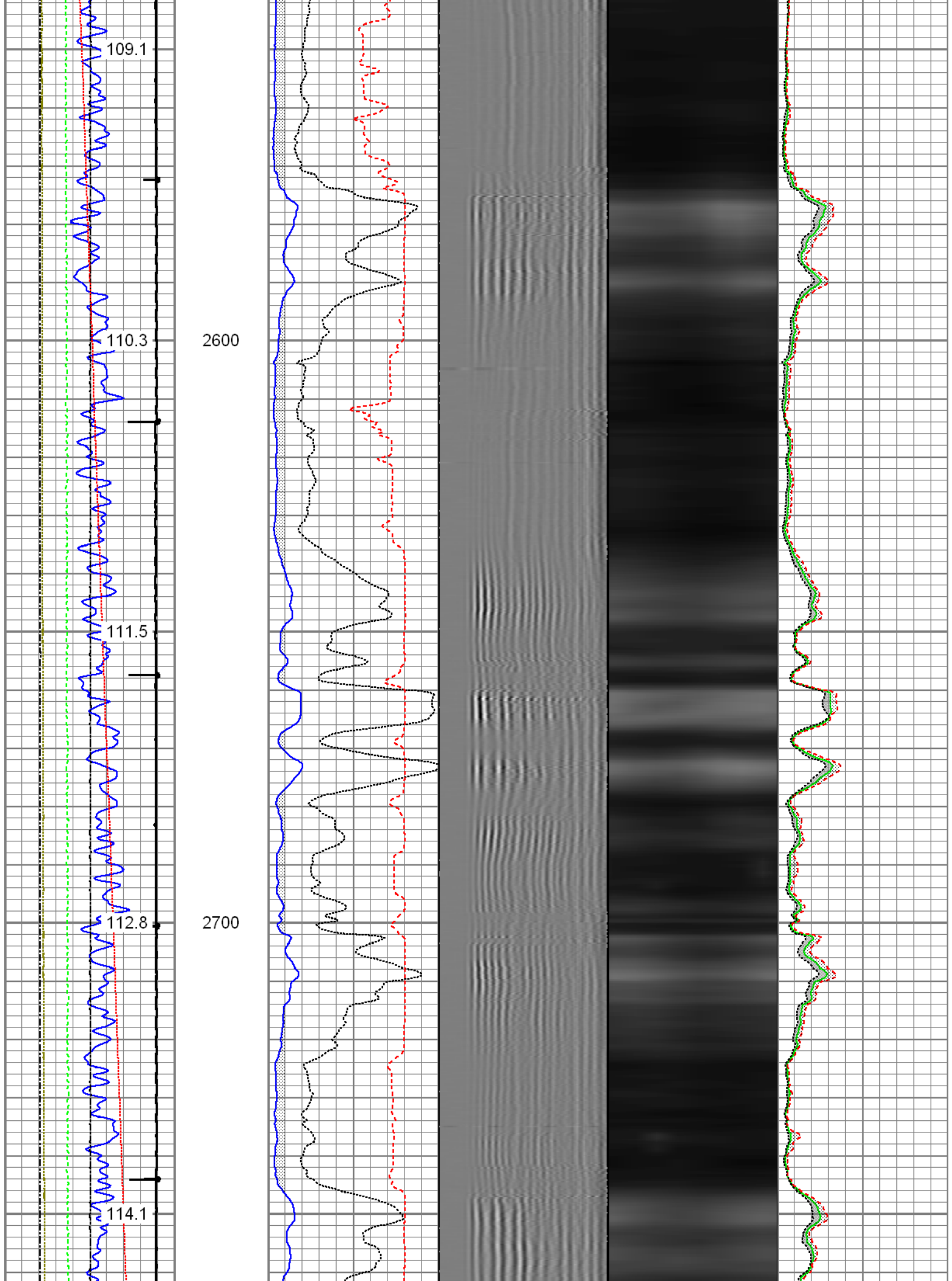


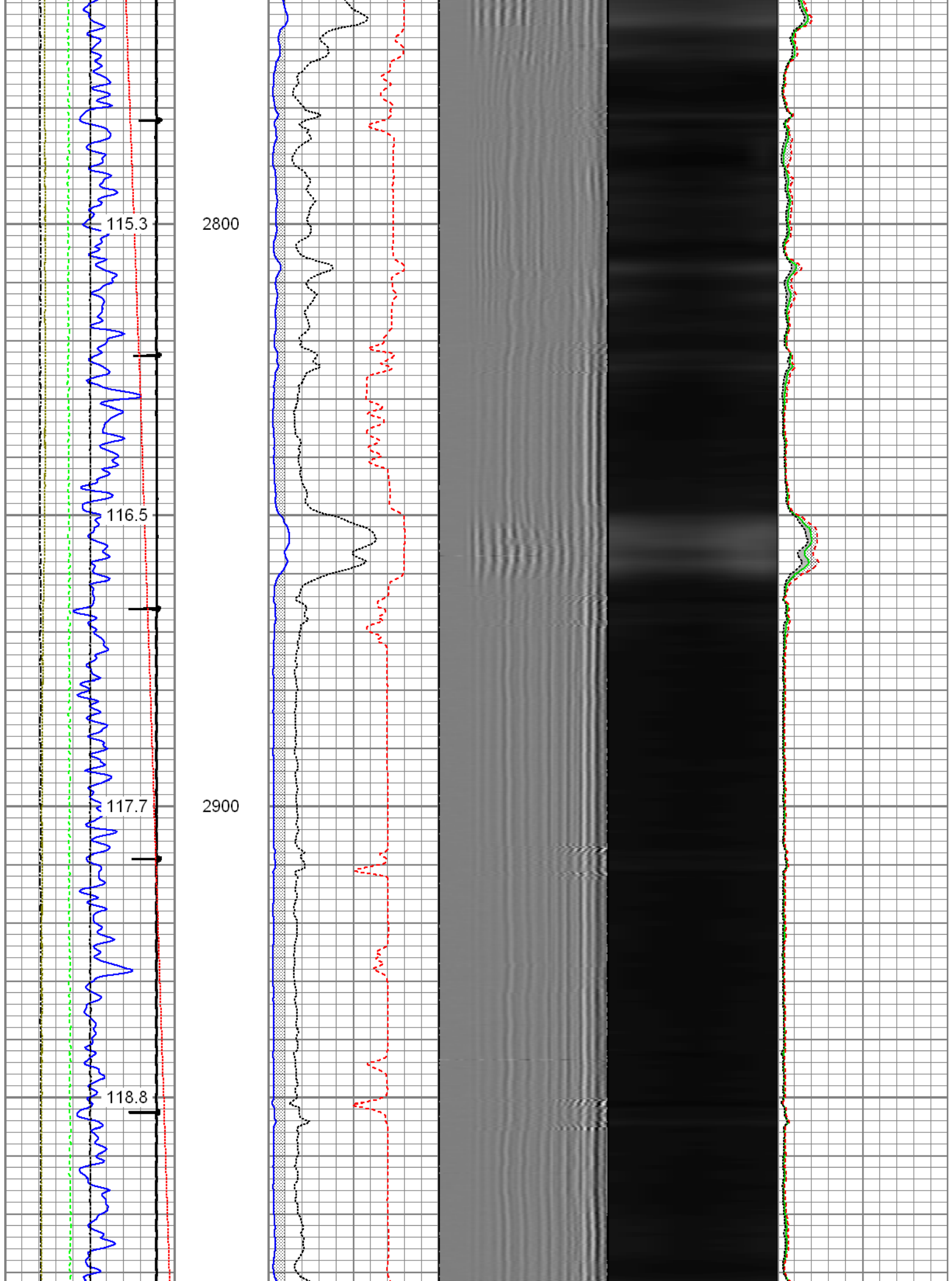


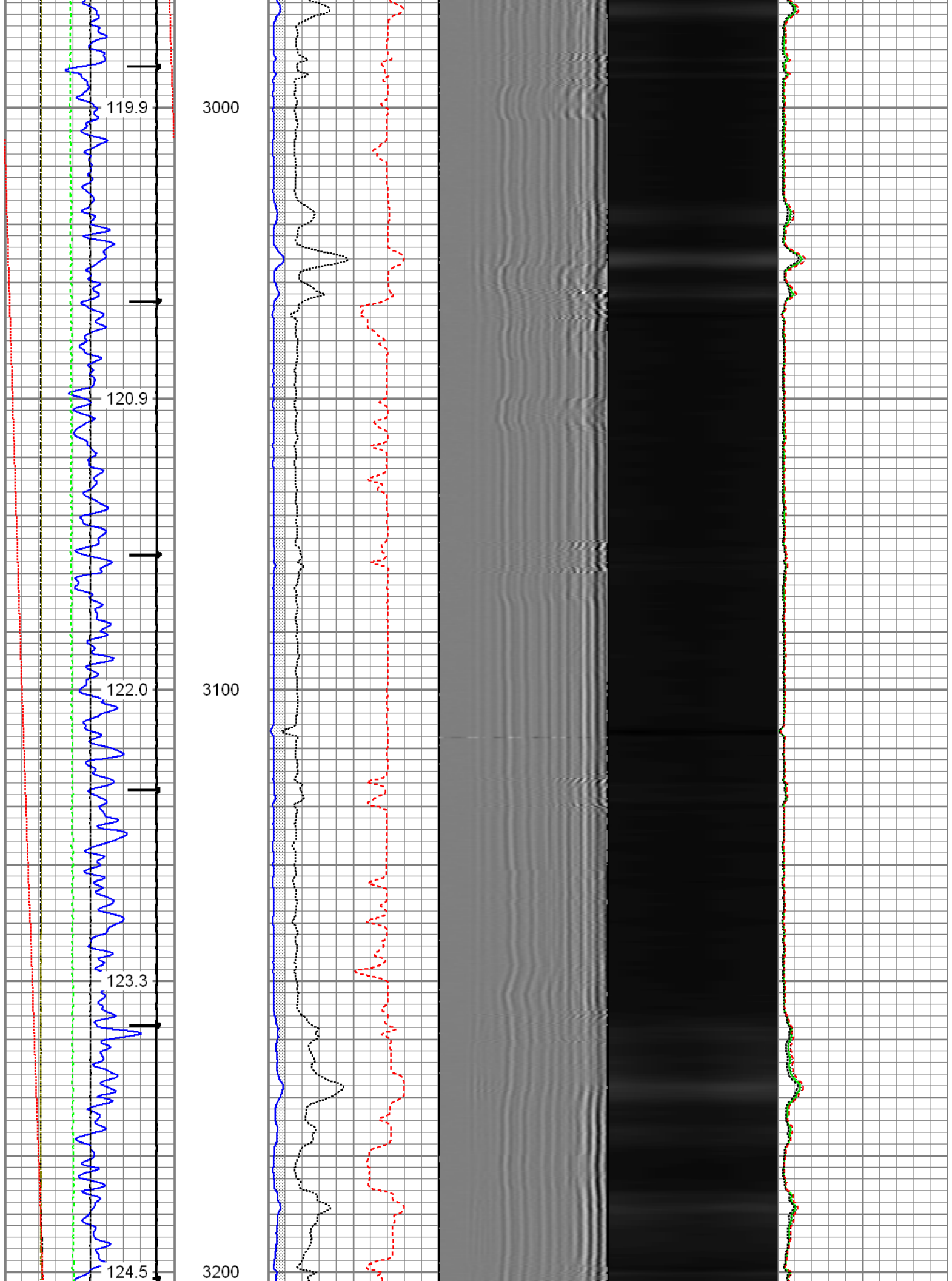


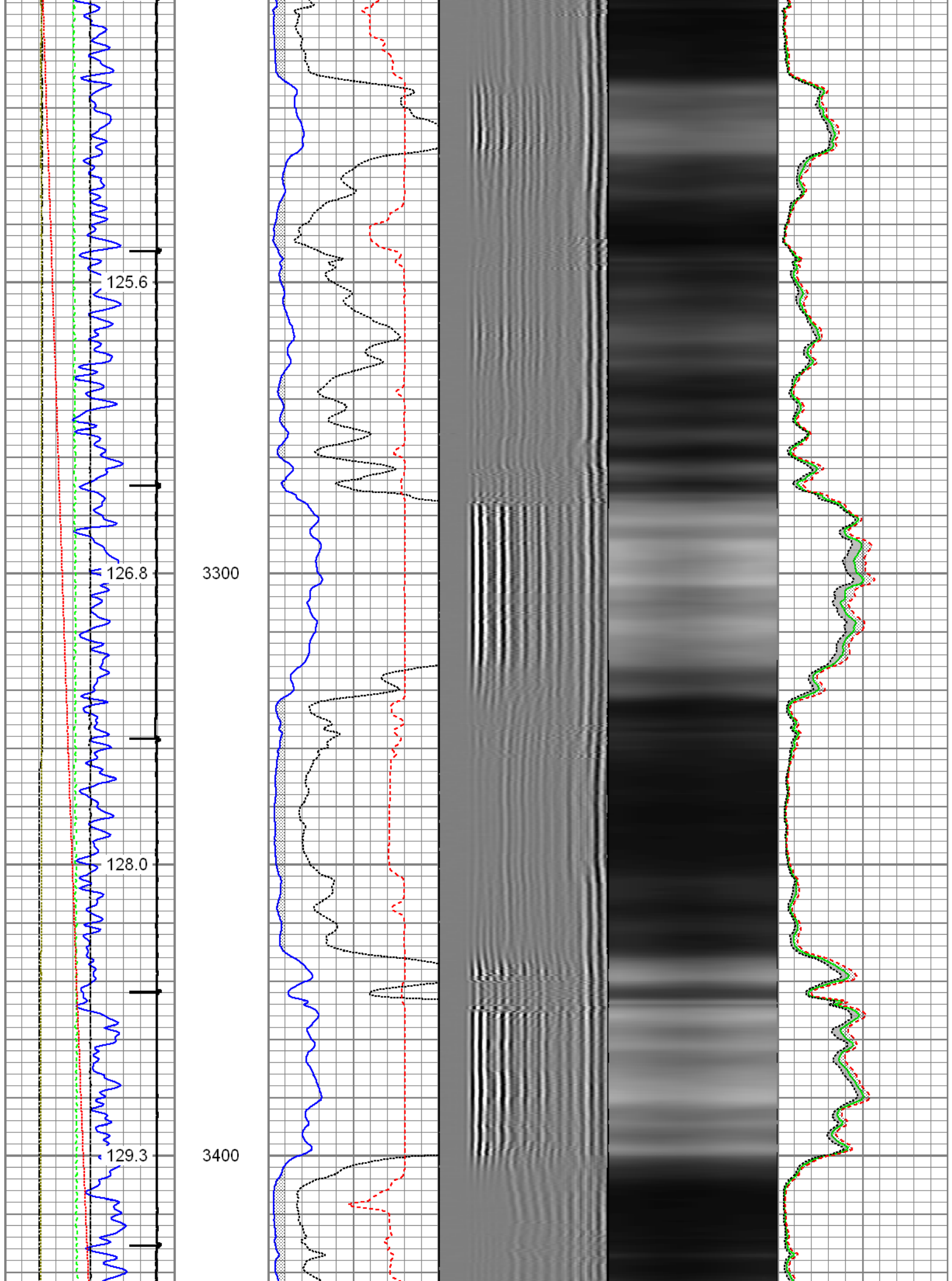


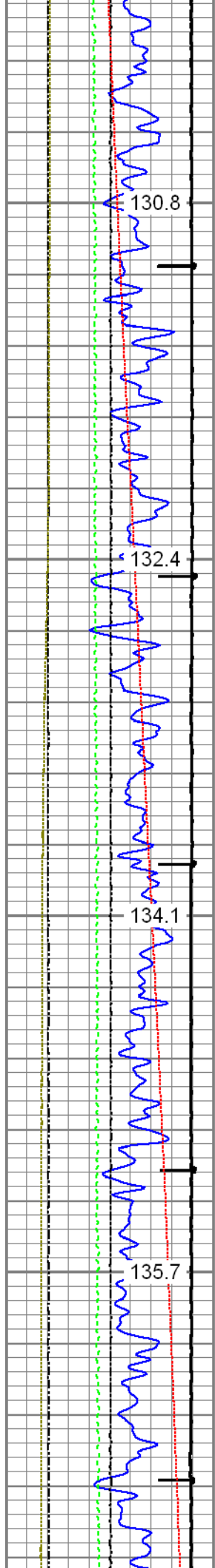






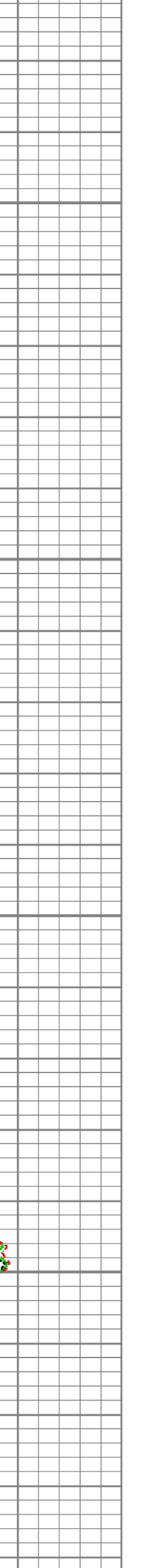
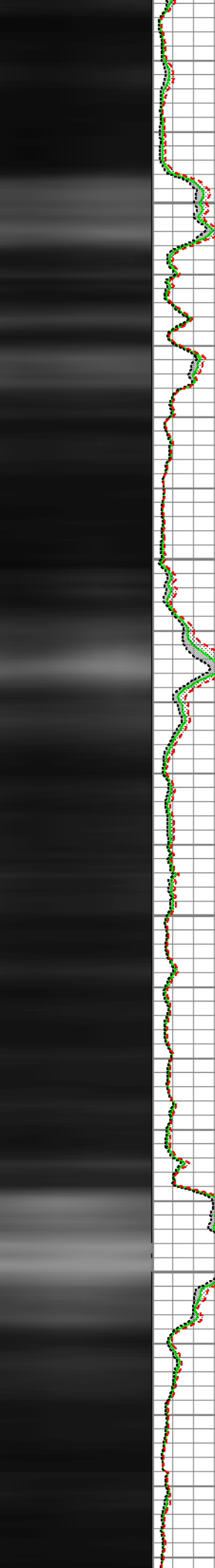
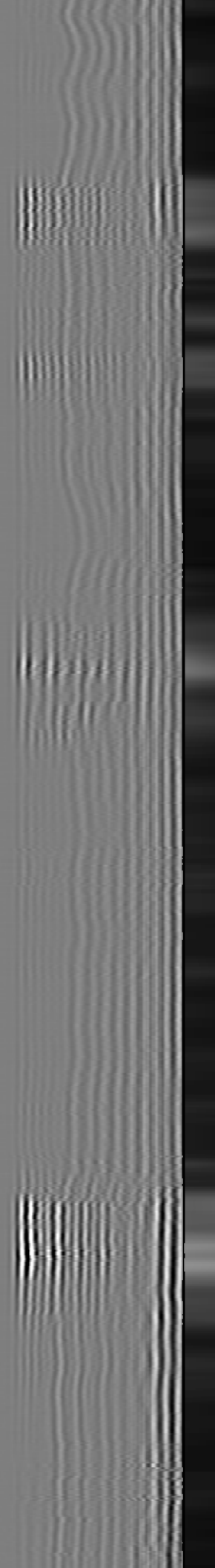
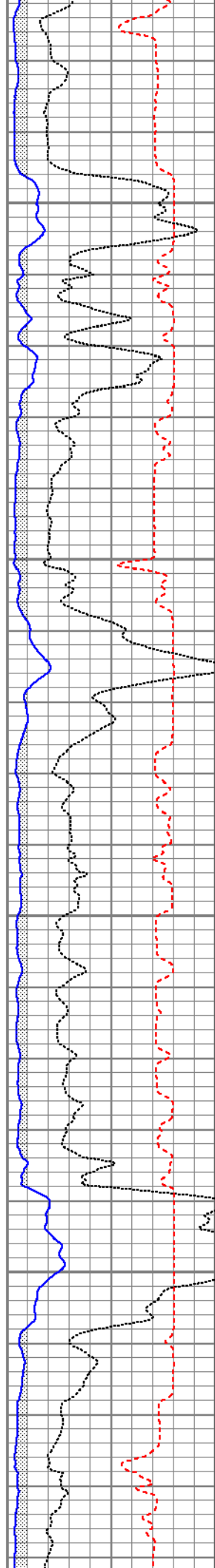


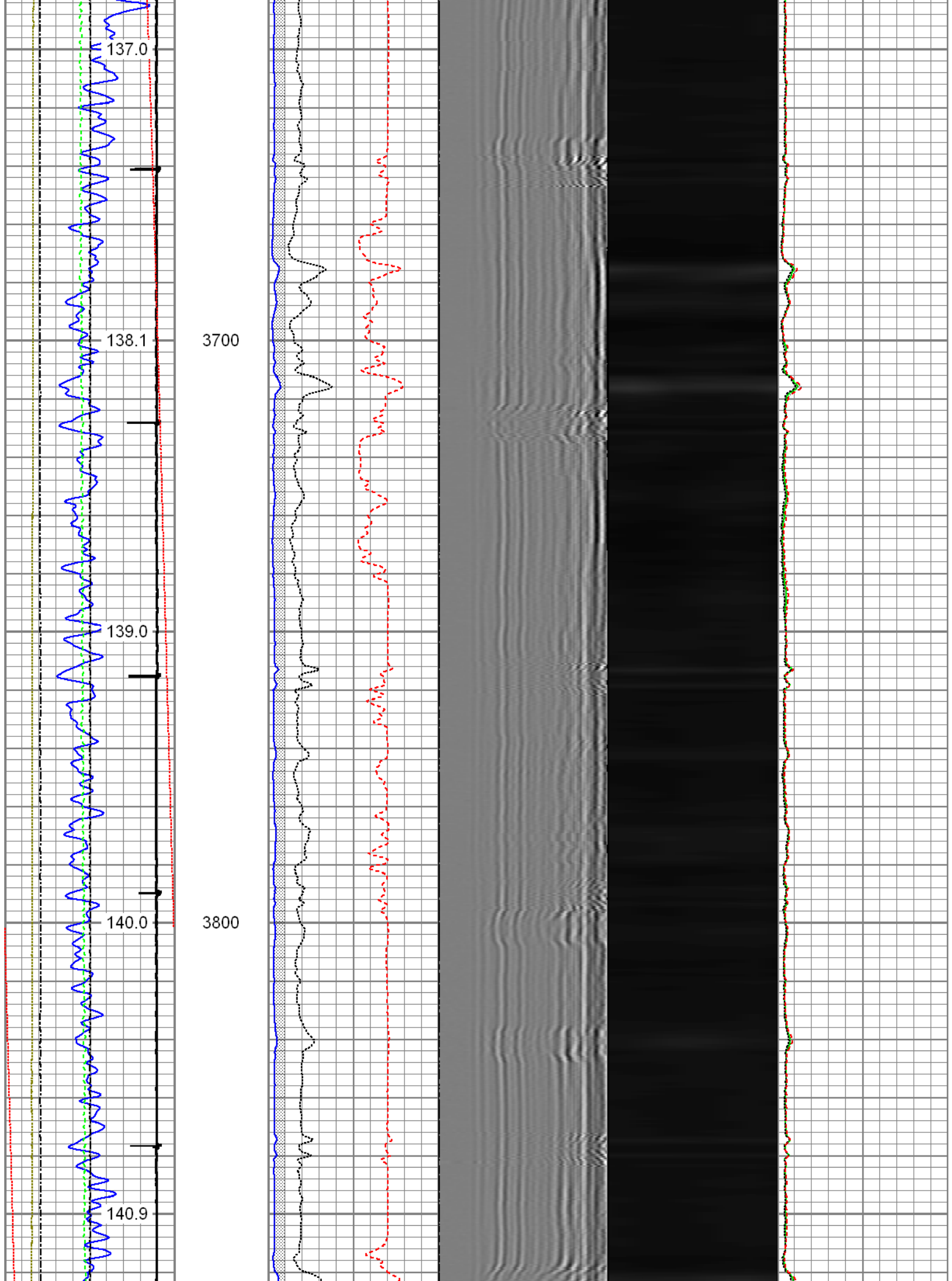


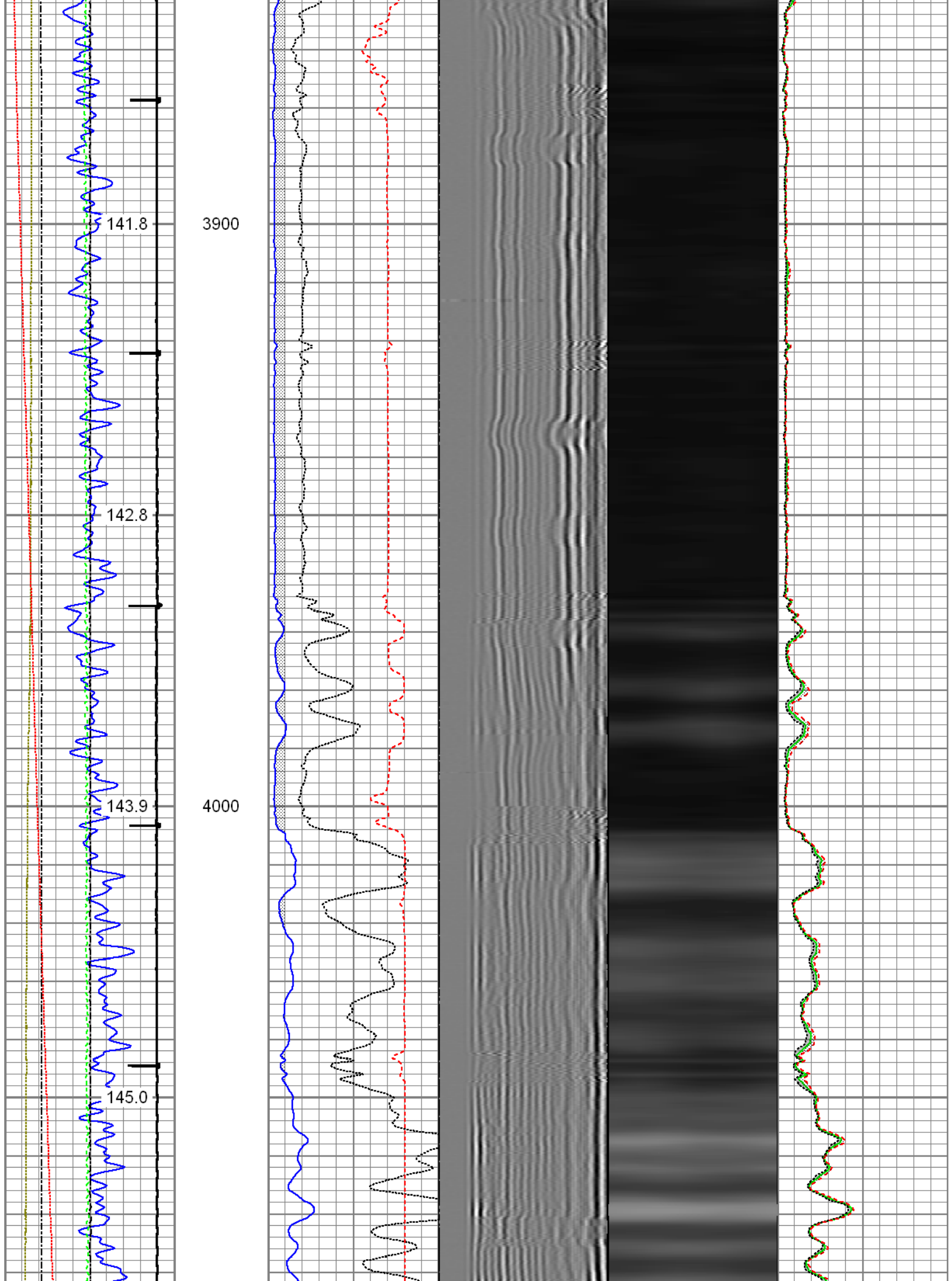


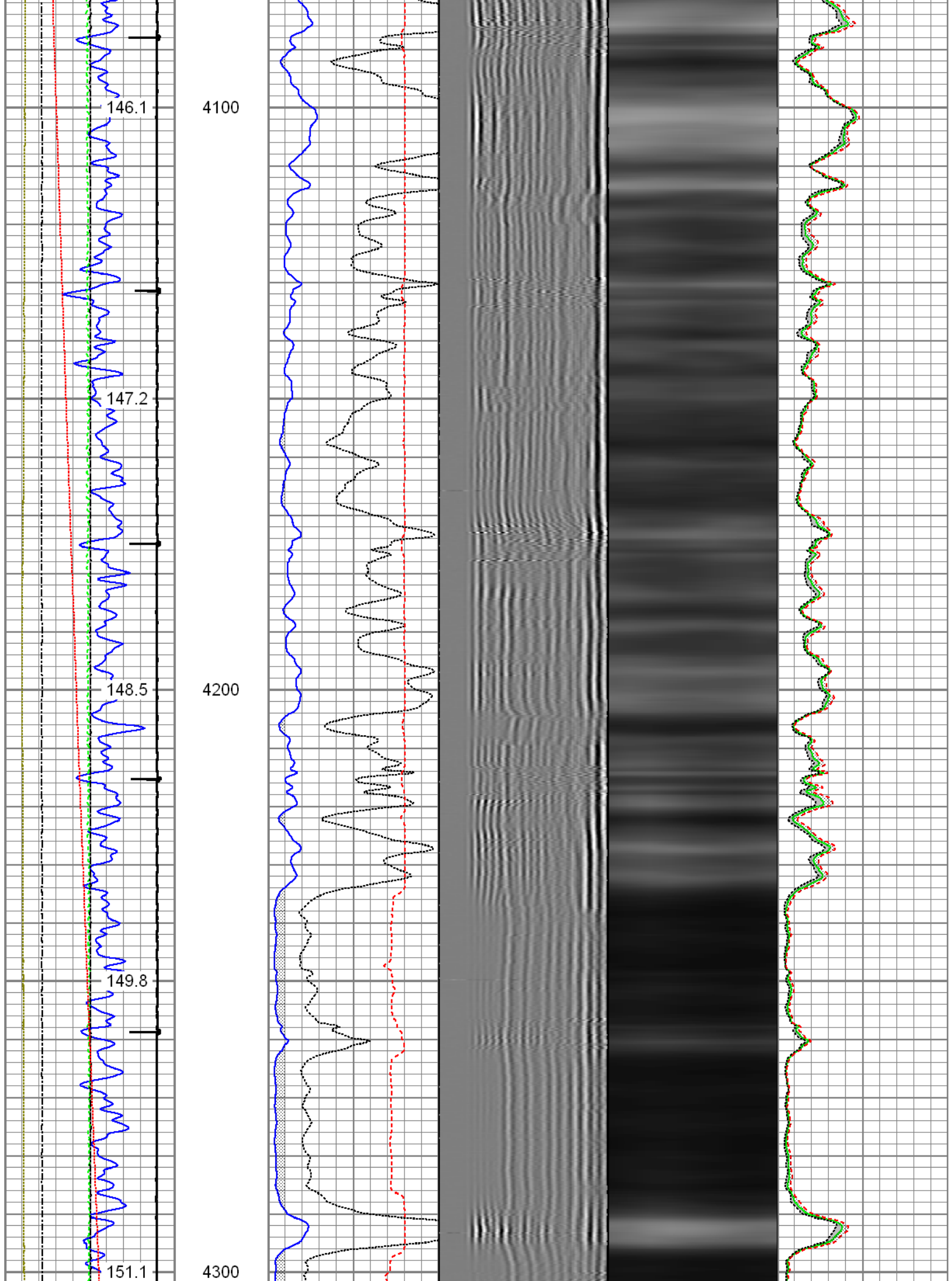
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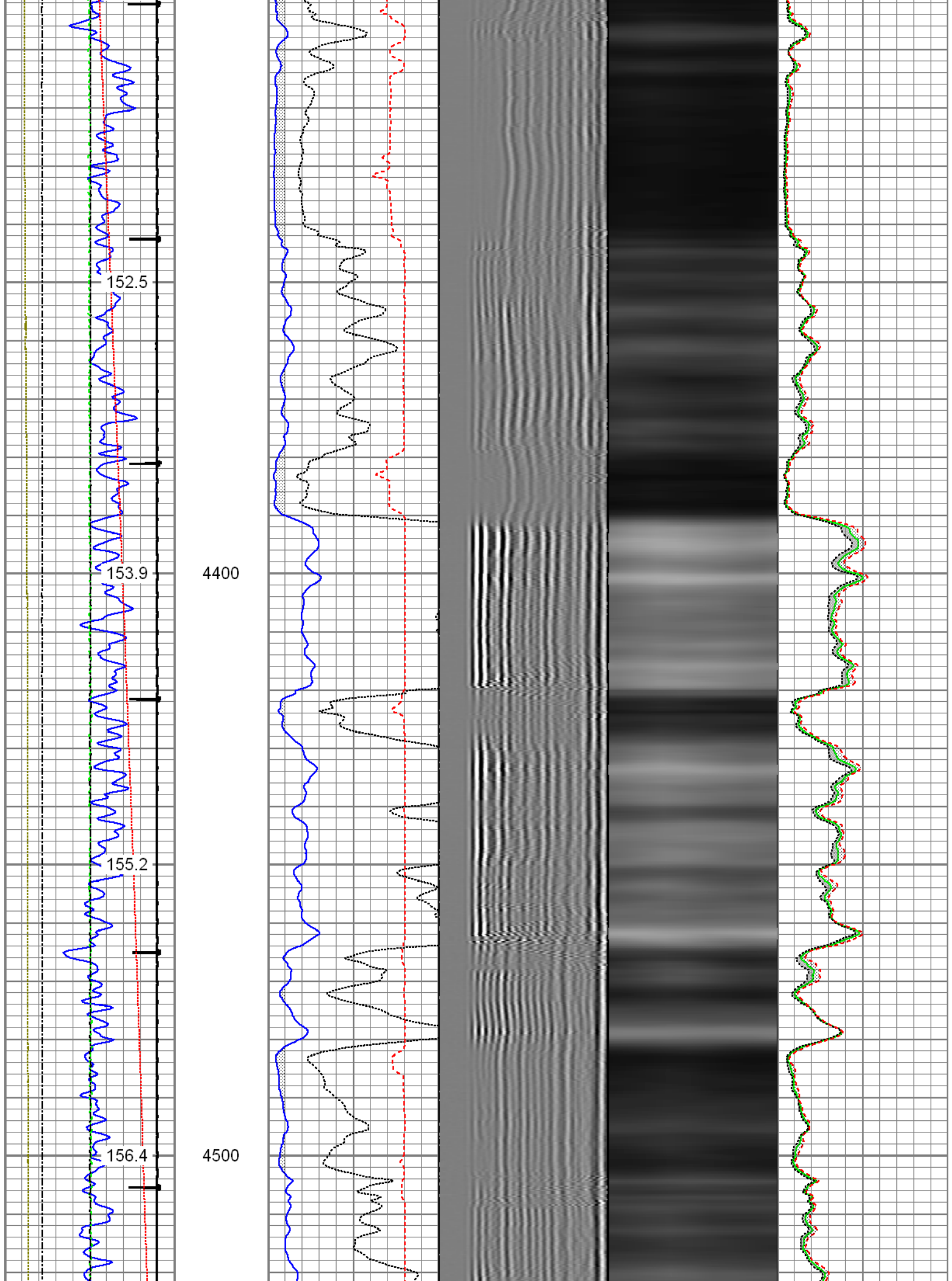
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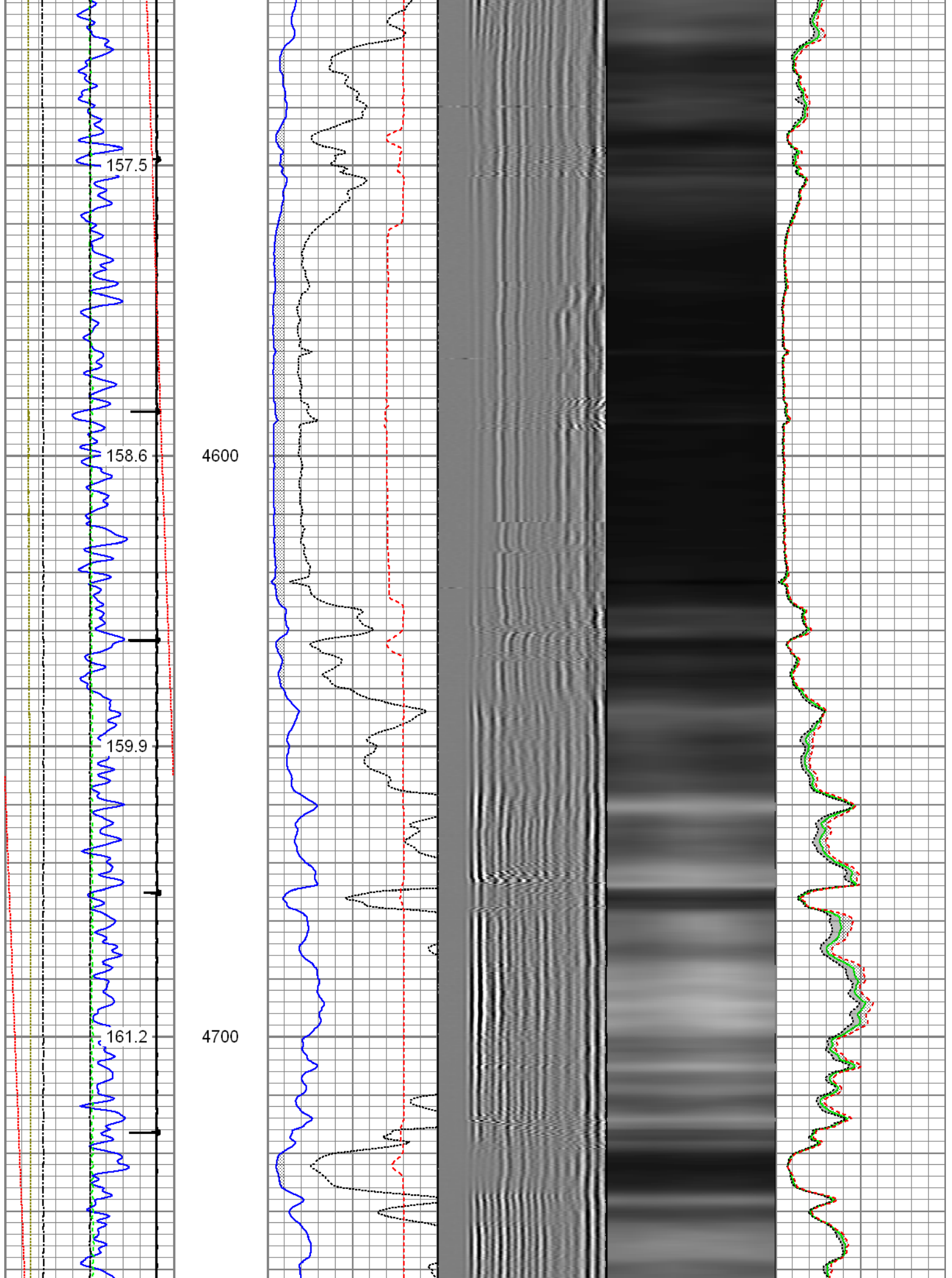


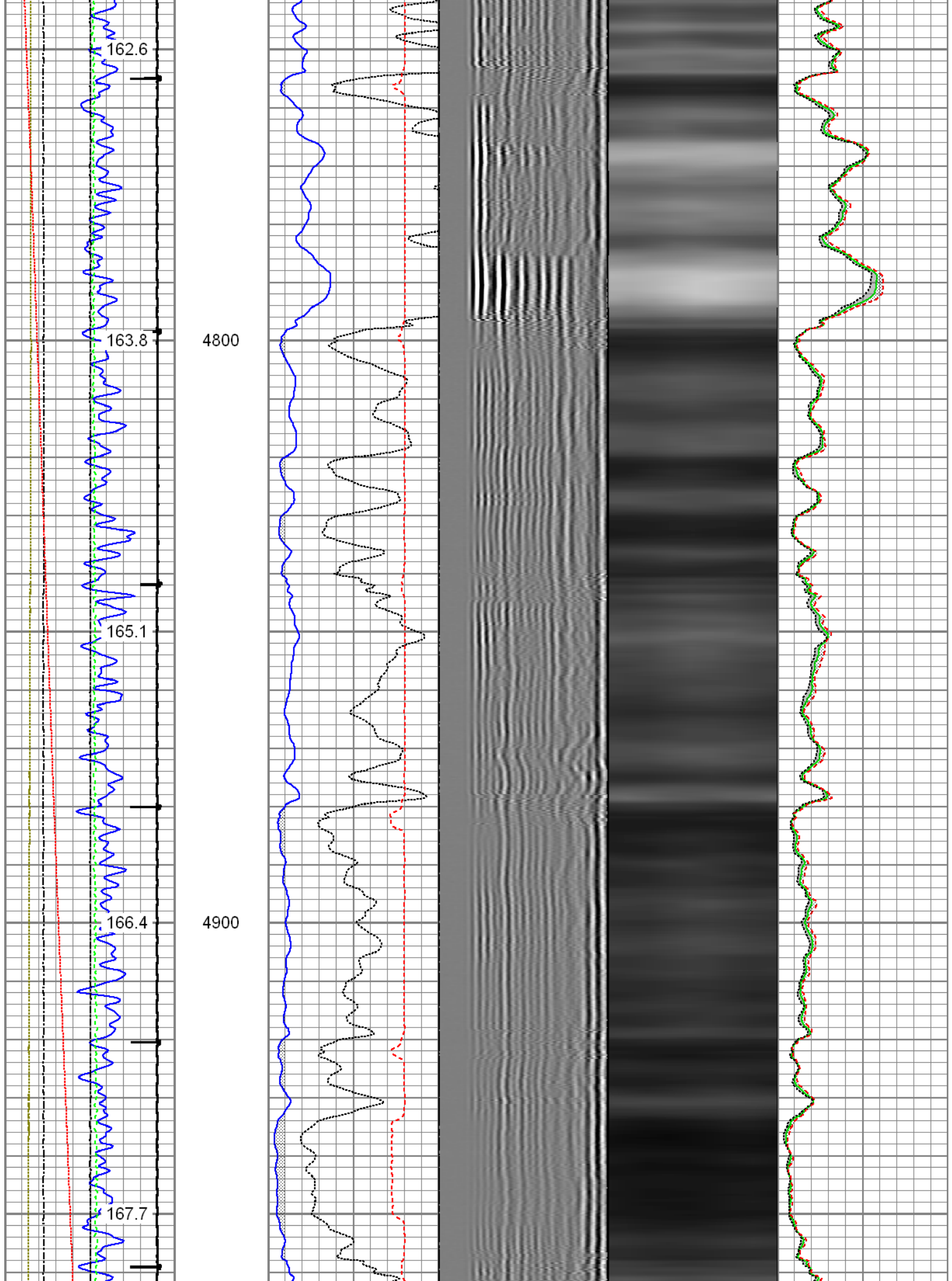


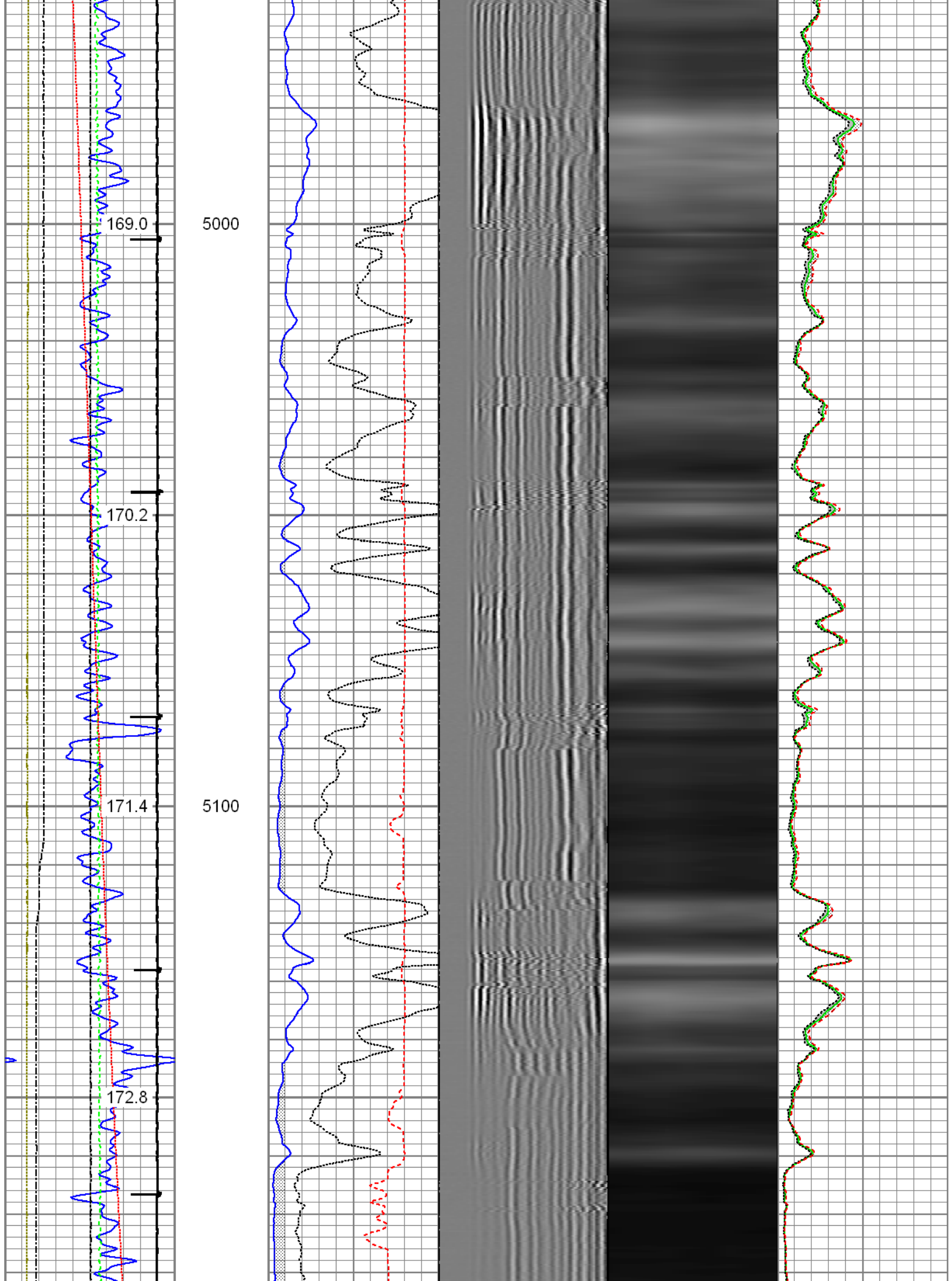


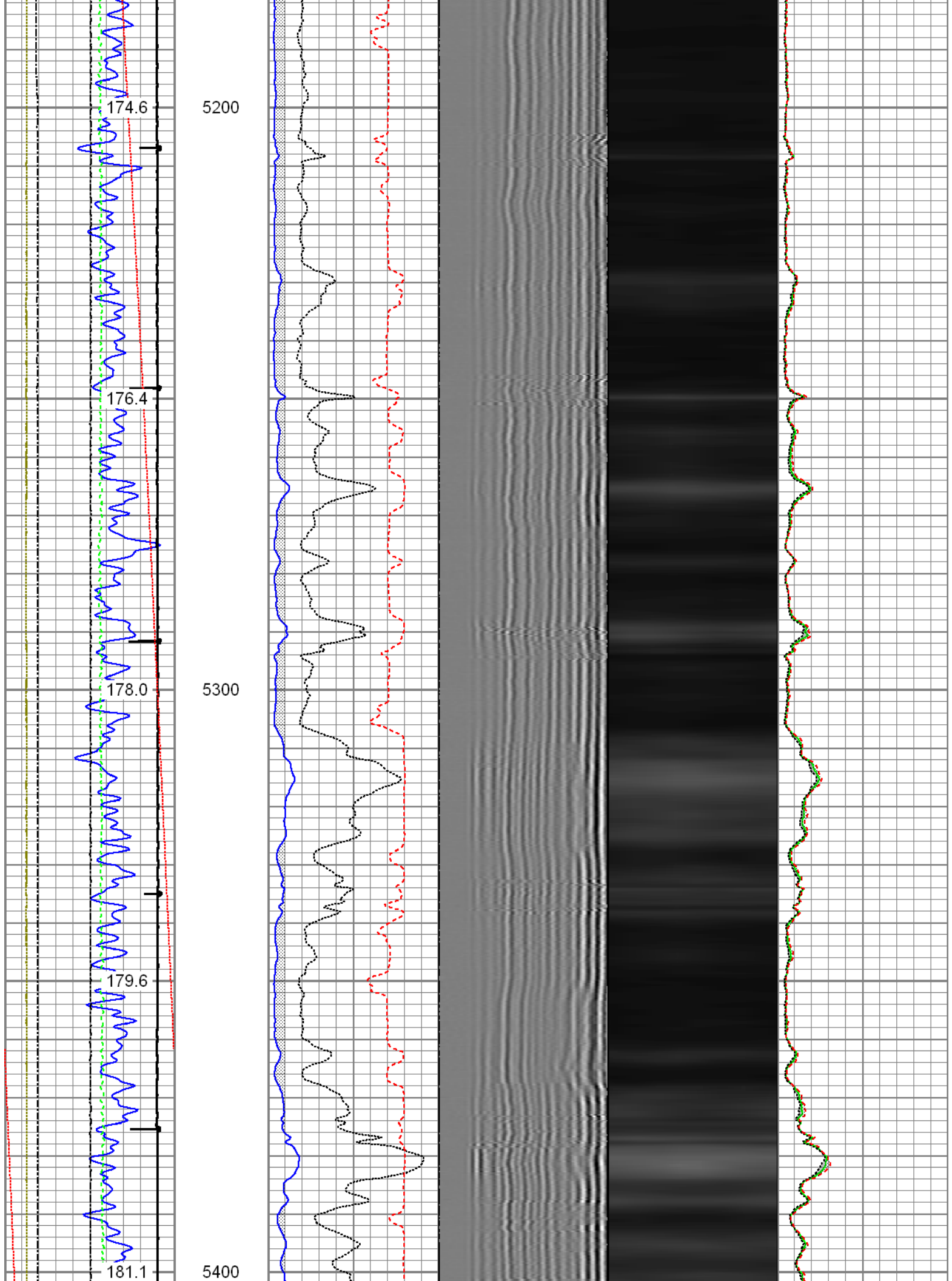


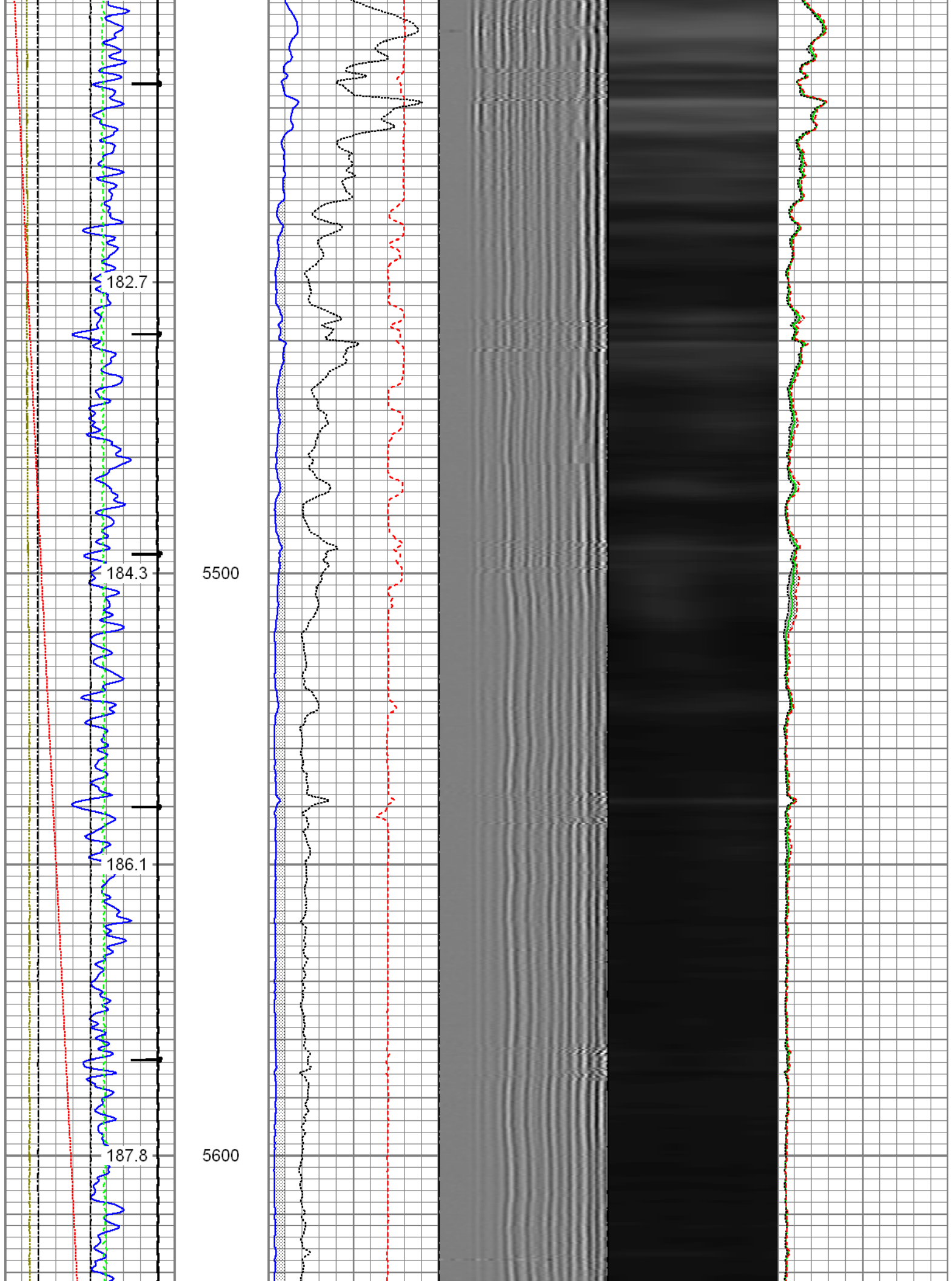


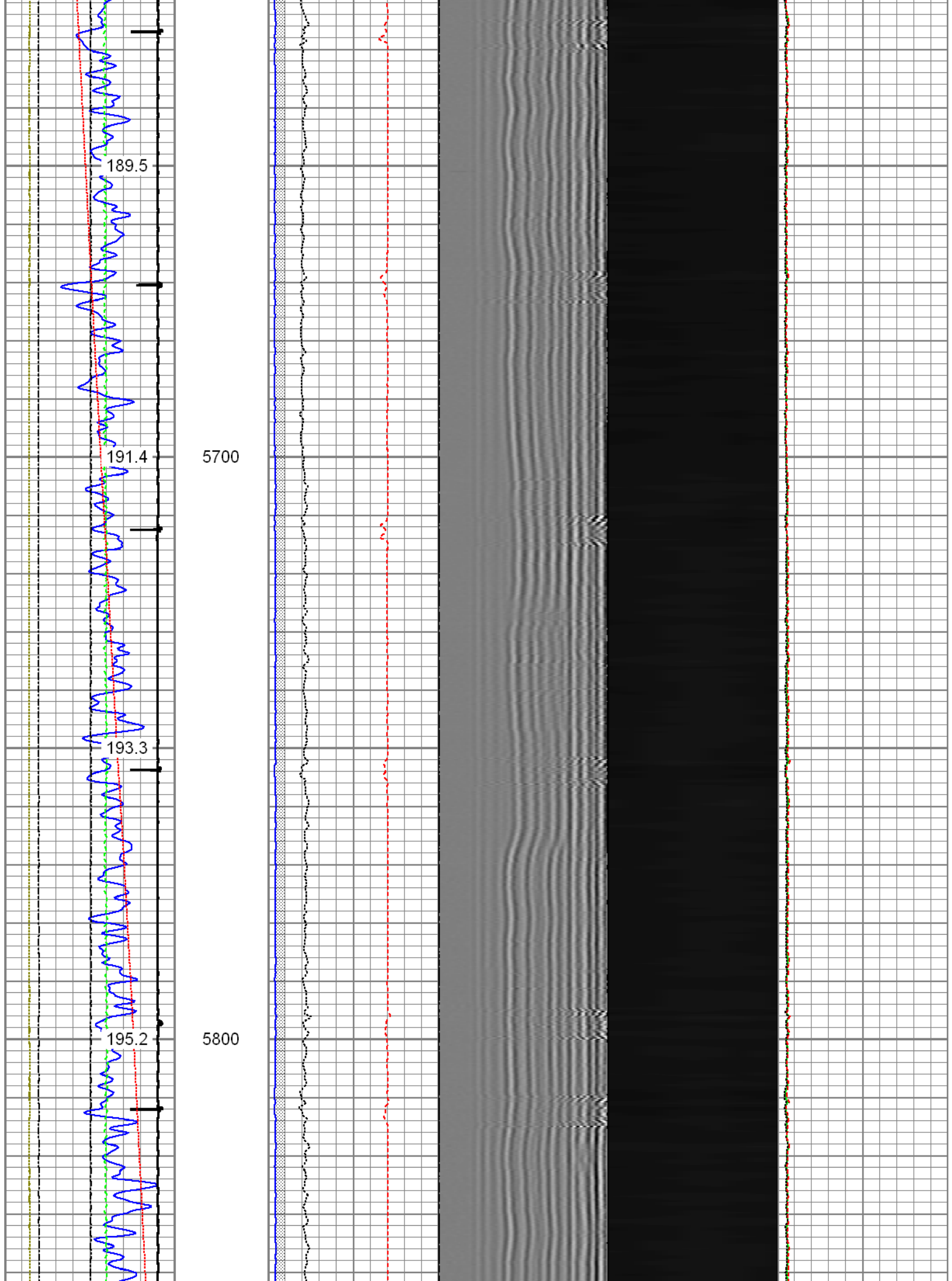


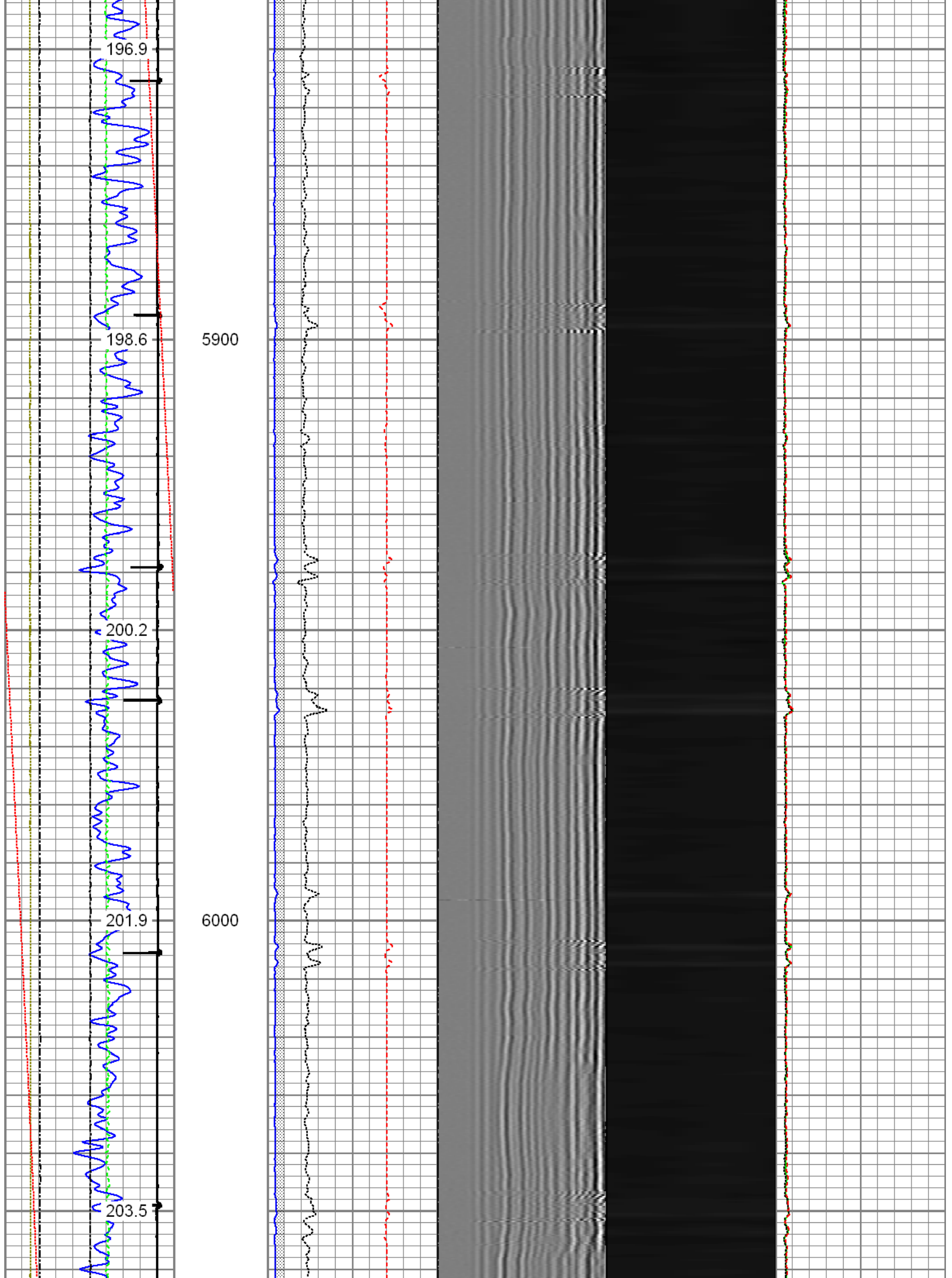


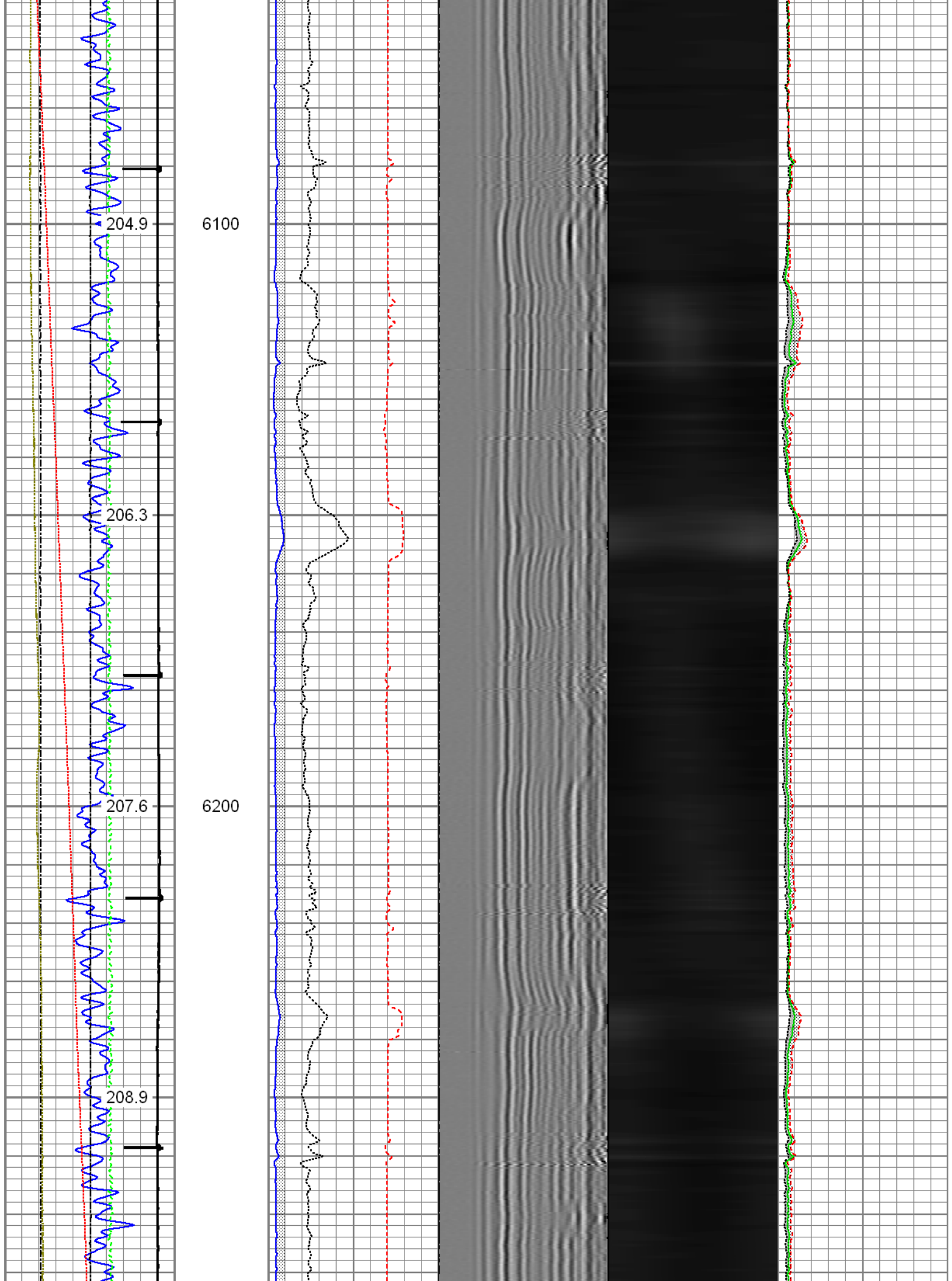


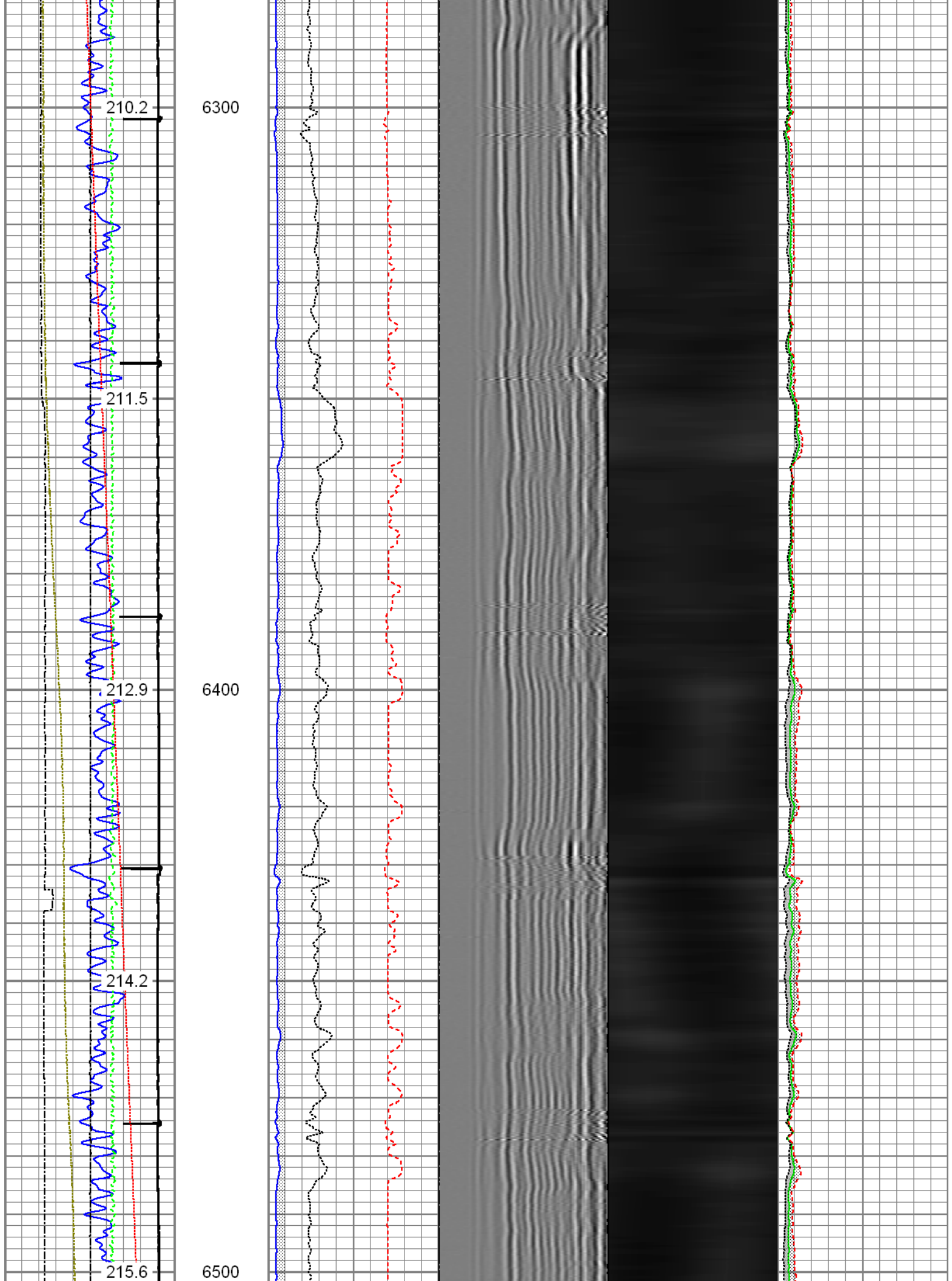


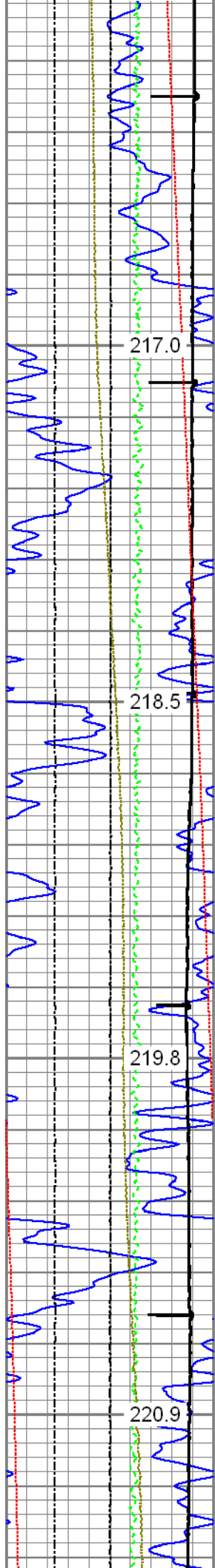












217.0

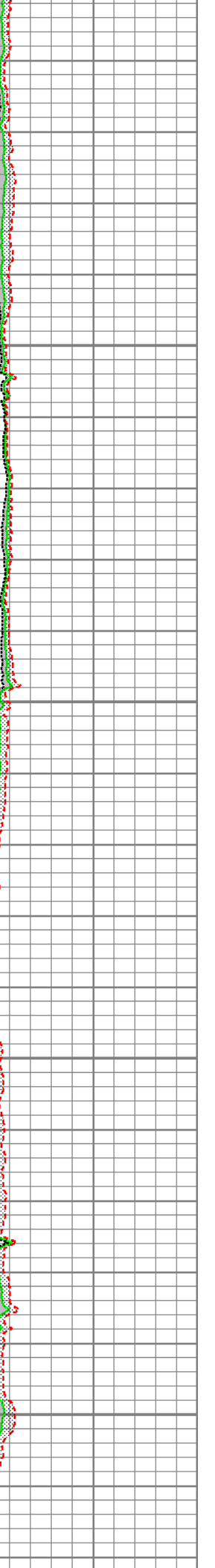
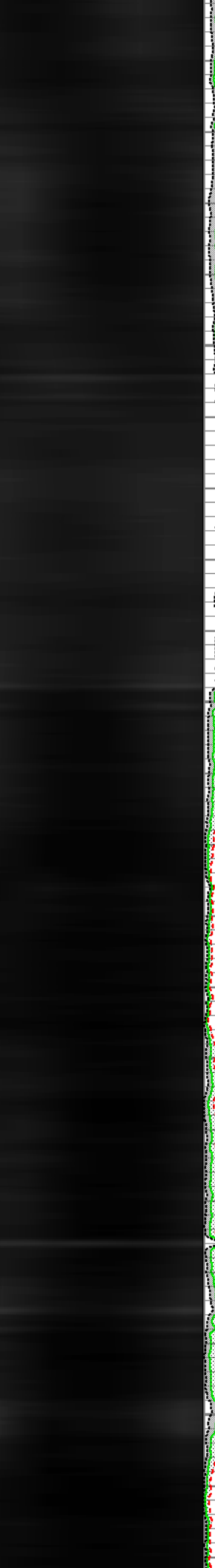
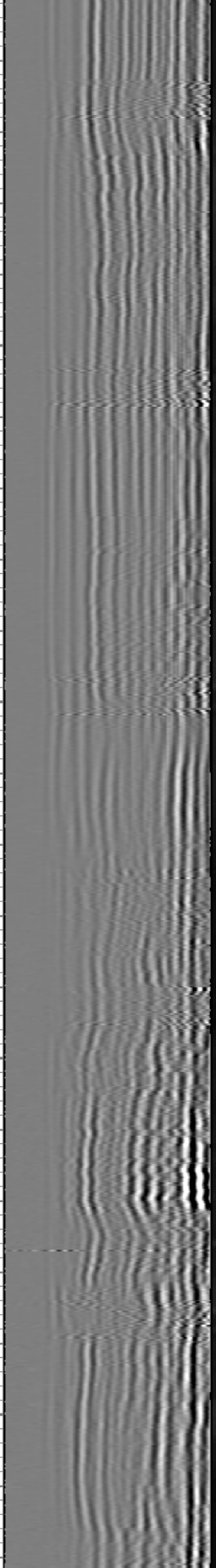
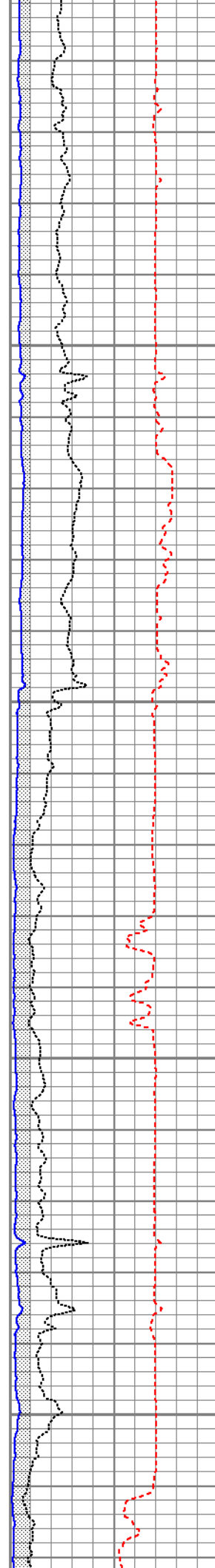
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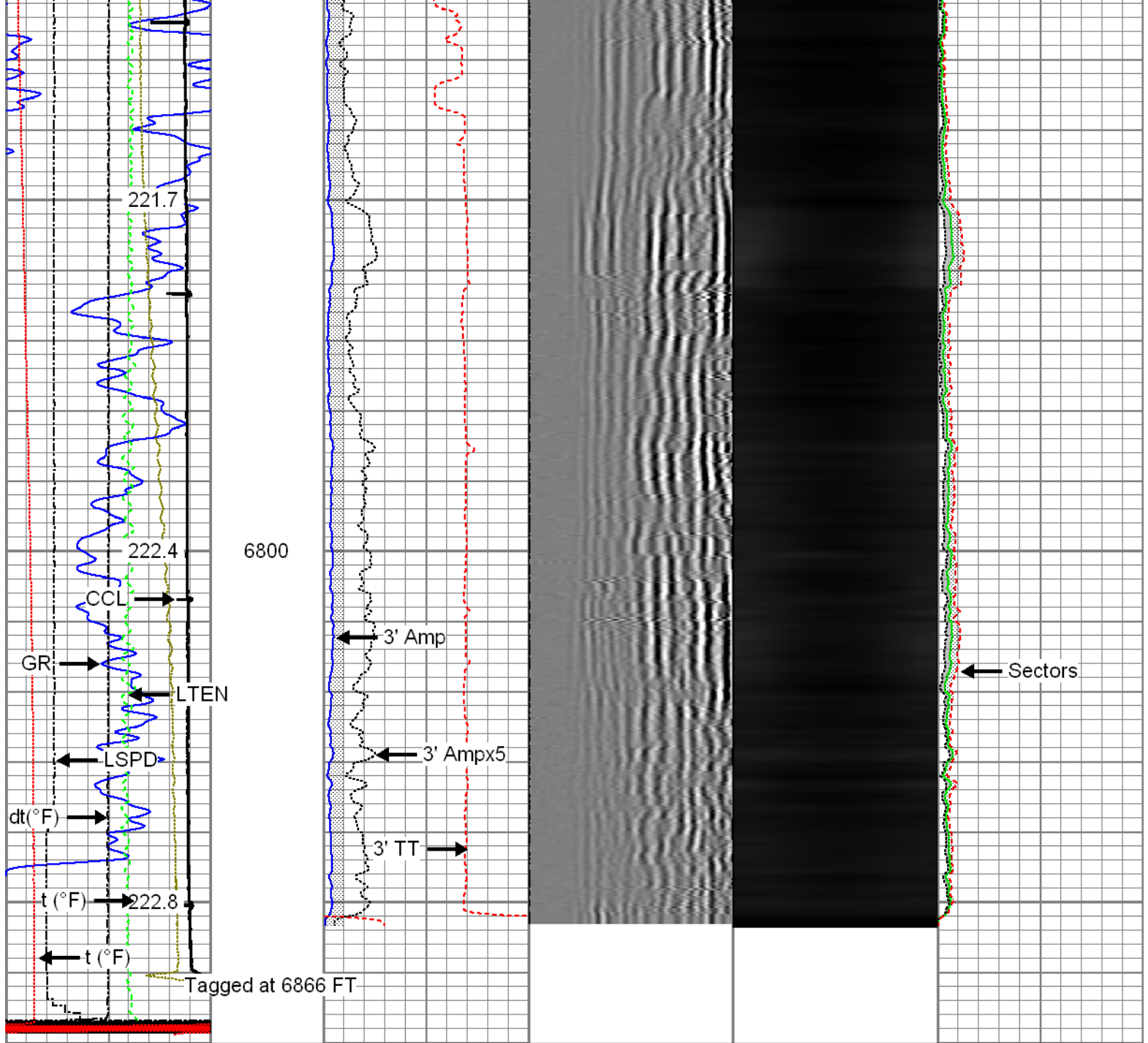
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220.9

6600

6700

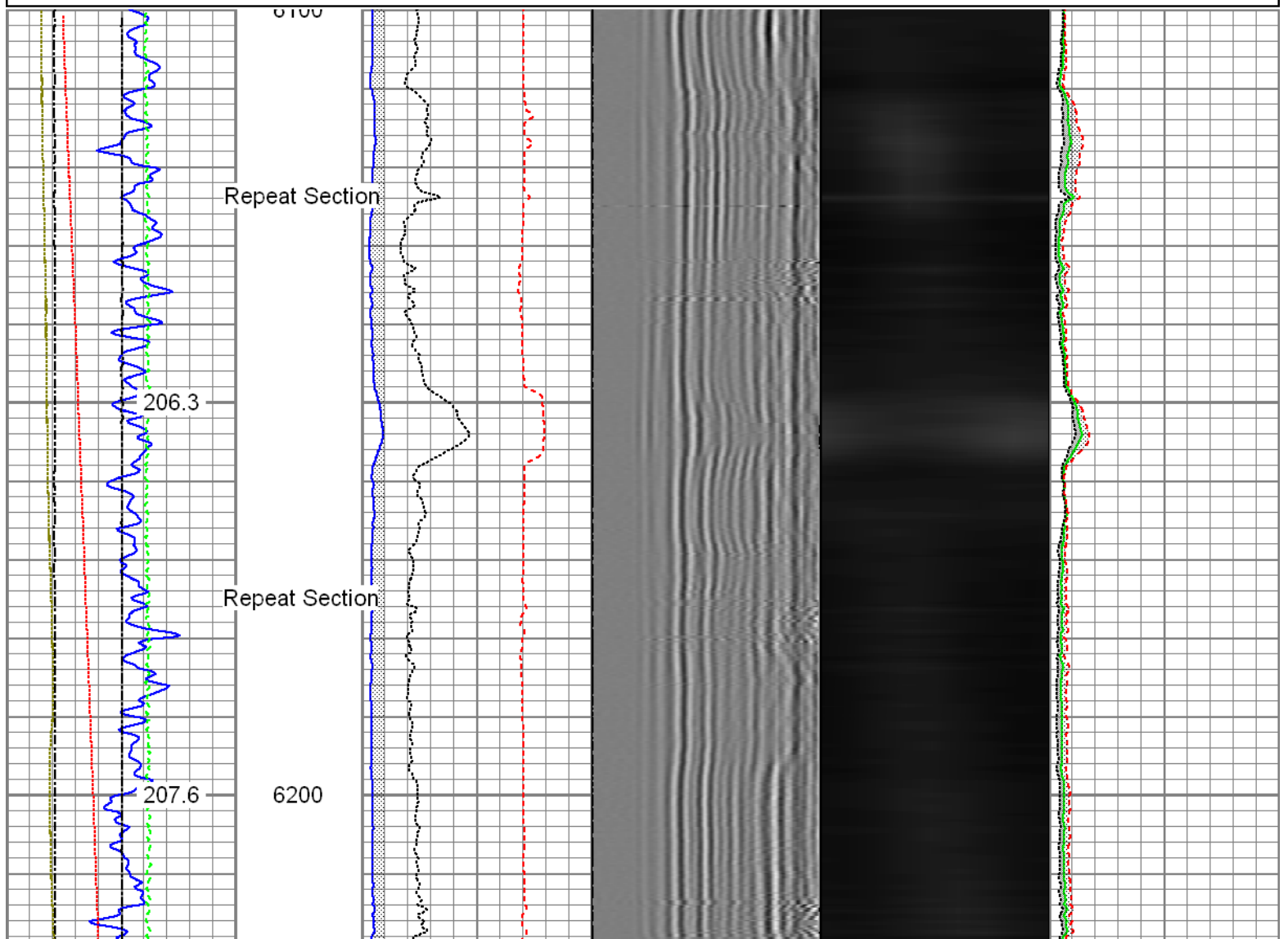


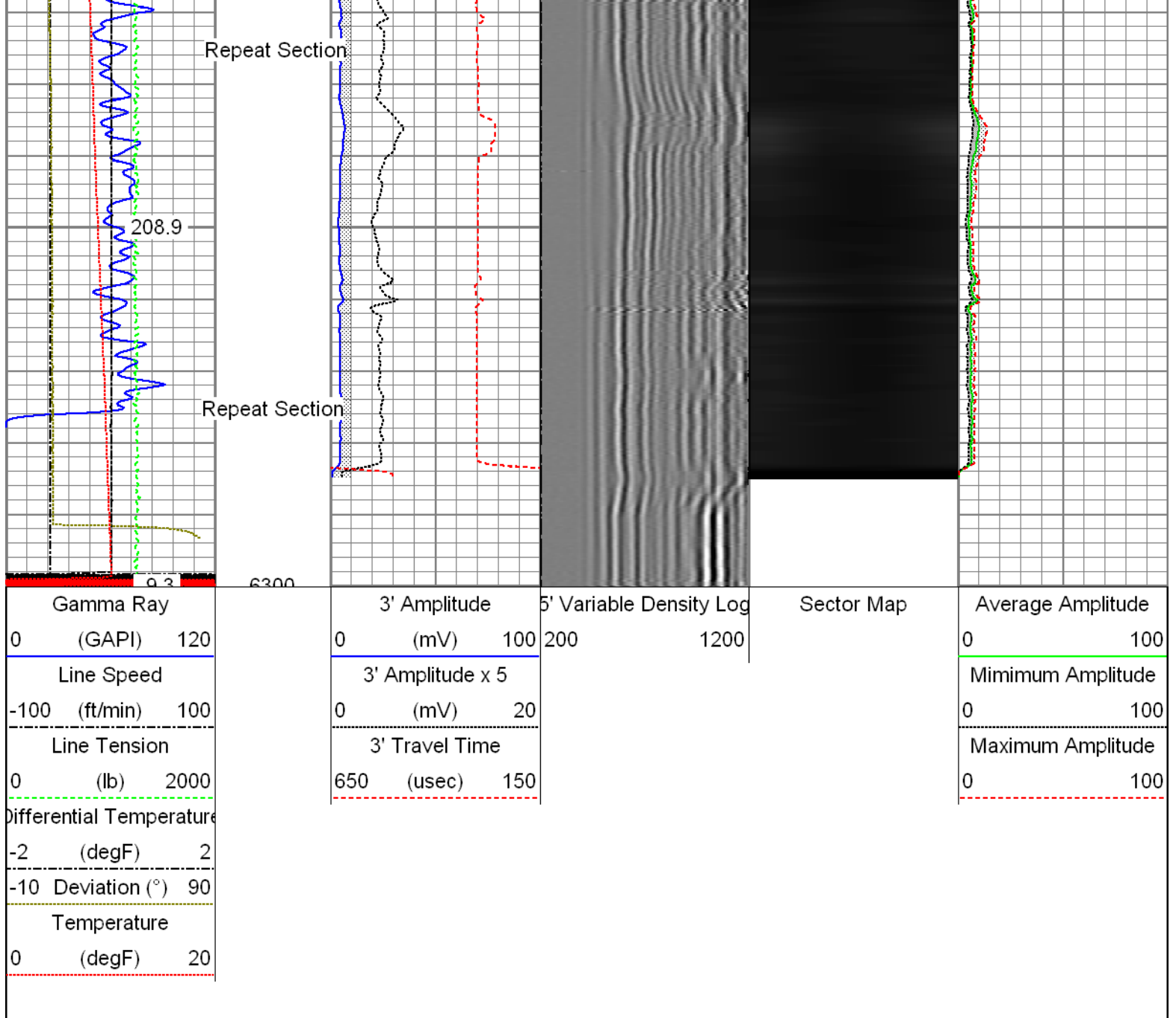


Gamma Ray	3' Amplitude	5' Variable Density Log	Sector Map	Average Amplitude
0 (GAPI) 120	0 (mV) 100	200 1200		0 100
Casing Collar Locator	3' Amplitude x 5			Minimum Amplitude
Line Speed	0 (mV) 20			0 100
-100 (ft/min) 100	3' Travel Time			Maximum Amplitude
Line Tension	650 (usec) 150			0 100
0 (lb) 2000				
Differential Temperature				
-2 (degF) 2				
-10 Deviation (°) 90				
Temperature				
0 (degF) 20				

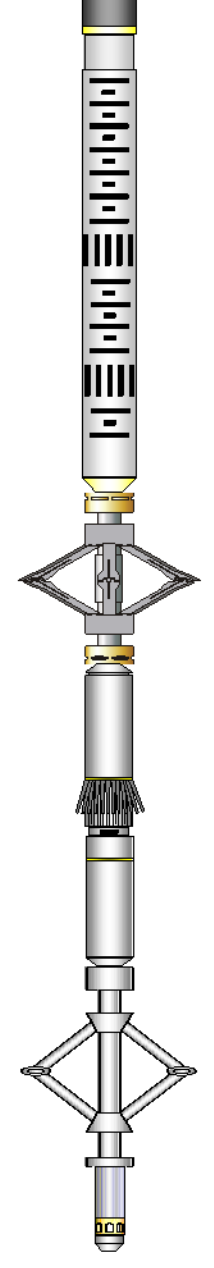
Database File: 07-13-15_noble energy_wells ranch aa11-623_mit_rbl.db
 Dataset Pathname: repeat.1
 Presentation Format: rbt4_mit
 Dataset Creation: Mon Jul 13 22:42:48 2015 by Calc 7.0 B1
 Charted by: Depth in Feet scaled 1:240

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
Differential Temperature				
-2 (degF) 2				
-10 Deviation (°) 90				
Temperature				
0 (degF) 20				





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
			GOpin-GOpin 2" GO Pin to GO Pin Connection	0.23	2.00	5.00
			UW_AGS-UW_AGS_001 (218874) Sondex Adapter - GO Box to Sondex Pin	0.21	1.69	1.00
			UW_XTU-UW_XTU_002 (219135) Crossover Ultrawire Toolbus to Ultralink	1.58	1.69	6.50
			UW_PGR-UW_PGR_020 (10013902) Production Gamma Ray	1.93	1.69	9.50
			UW_PRC-DSSRAC (084) 2-3/4" DSS 5 Arm Roller Centralizer	2.55	2.75	32.00

WVF3FT	16.46		UW_RBT-UW_RBT_004 (1063) Sondex Ultrawire 3-1/8" Radial Bond Tool	9.47	3.13	140.00
WVFS1	16.46					
WVFS2	16.46					
WVFS3	16.46					
WVFS4	16.46					
WVFS5	16.46					
WVFS6	16.46					
WVFS7	16.46					
WVFS8	16.46					
CBLTEMP	16.46					
CBLROT	16.46	UW_PRC-DSSRAC (083) 2-3/4" DSS 5 Arm Roller Centralizer	2.55	2.75	32.00	
WVF5FT	15.46					
MIT	6.45	UW_MIT-UW_MIT40_042 (10012912) 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	
		UW_PRT-UW_PRT_016 (10025100) Platinum Resistance Thermometer	1.04	1.69	5.20	
TEMP	0.37	UW_BUL-UW_BUL_006 (218707) Sondex Ultrawire Bullnose Terminator	0.22	1.69	1.20	
TSTAMP	0.00					
Dataset: 07-13-15_Noble Energy_Wells Ranch AA11-623_MIT_RBL.db: field/well/run1/tool-dia Total Length: 28.32 ft Total Weight: 329.50 lb O.D. 3.13 in						

Calibration Report					
Database File:	07-13-15_noble energy_wells ranch aa11-623_mit_rbl.db				
Dataset Pathname:	pass11.1				
Dataset Creation:	Mon Jul 13 22:35:51 2015 by Calc 7.0 B1				
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	

7	cps	degF
8	cps	degF
9	cps	degF
10	cps	degF

Multi-finger Imaging Tool Calibration Report

Serial Number:

10020664

Number of Fingers:

40

Tool Model:

UW_MIT40_042

Inclinometer Calibration Report

Performed:

Wed Nov 26 12:28:41 2014

Calibration Angle:

45

		Inc X	Inc Y
Vertical:		1946	1932
Finger 1 up:		1712	1699
Finger 31 up:		2180	1700
Finger 21 up:		2165	2167
Finger 11 up:		1708	2156
Sensitivity ratio:	1.00121		
X-axis angle:	134.04		
Deviation const.:	327.106		

Finger Calibration Report

Performed:

Mon Jul 13 13:33:01 2015

Ring size:	4		5		6		7
(in)		Sens		Sens		Sens	
Finger 01:	1185	341.0	1526	390.0	1916	392.0	2308
Finger 02:	1199	349.0	1548	393.0	1941	398.0	2339
Finger 03:	1144	342.0	1486	389.0	1875	397.0	2272
Finger 04:	1155	358.0	1513	408.0	1921	413.0	2334
Finger 05:	1140	350.0	1490	399.0	1889	407.0	2296
Finger 06:	1166	350.0	1516	388.0	1904	392.0	2296
Finger 07:	1074	367.0	1441	415.0	1856	429.0	2285
Finger 08:	1133	353.0	1486	394.0	1880	406.0	2286
Finger 09:	1094	359.0	1453	399.0	1852	416.0	2268
Finger 10:	1013	359.0	1372	414.0	1786	439.0	2225
Finger 11:	1090	350.0	1440	393.0	1833	390.0	2223
Finger 12:	1070	356.0	1426	392.0	1818	410.0	2228
Finger 13:	1047	348.0	1395	384.0	1779	402.0	2181
Finger 14:	1013	356.0	1369	385.0	1754	406.0	2160
Finger 15:	1081	350.0	1431	371.0	1802	380.0	2182
Finger 16:	1029	355.0	1384	377.0	1761	394.0	2155
Finger 17:	1030	353.0	1383	387.0	1770	400.0	2170
Finger 18:	970	350.0	1320	388.0	1708	432.0	2140
Finger 19:	984	353.0	1337	390.0	1727	410.0	2137
Finger 20:	1018	361.0	1379	390.0	1769	401.0	2170
Finger 21:	1035	350.0	1385	382.0	1767	396.0	2163
Finger 22:	1034	365.0	1399	381.0	1780	400.0	2180
Finger 23:	1148	347.0	1495	352.0	1847	364.0	2211
Finger 24:	1008	355.0	1363	390.0	1753	406.0	2159
Finger 25:	987	353.0	1340	391.0	1731	409.0	2140
Finger 26:	1066	355.0	1421	383.0	1804	398.0	2202
Finger 27:	1093	359.0	1452	388.0	1840	404.0	2244
Finger 28:	1079	358.0	1437	391.0	1828	407.0	2235
Finger 29:	1078	366.0	1444	403.0	1847	418.0	2265
Finger 30:	1130	354.0	1484	386.0	1870	397.0	2267
Finger 31:	1132	352.0	1484	389.0	1873	399.0	2272
Finger 32:	1170	349.0	1519	378.0	1897	389.0	2286
Finger 33:	1190	355.0	1545	388.0	1933	393.0	2326
Finger 34:	1143	356.0	1499	403.0	1902	411.0	2313
Finger 35:	1171	356.0	1527	405.0	1932	408.0	2340
Finger 36:	1217	348.0	1565	390.0	1955	393.0	2348
Finger 37:	1148	354.0	1502	412.0	1914	418.0	2332

Finger 37:	1148	334.0	1302	412.0	1914	418.0	2332
Finger 38:	1111	363.0	1474	423.0	1897	432.0	2329
Finger 39:	1141	356.0	1497	407.0	1904	412.0	2316
Finger 40:	1173	350.0	1523	402.0	1925	404.0	2329

Segmented Cement Bond Log Calibration Report

Serial Number:	1063
Tool Model:	UW_RBT_004
Calibration Casing Diameter:	5.500 in
Calibration Depth:	-2.785 ft

Master Calibration, performed Mon Jul 13 22:35:44 2015:

	Raw (v)		Calibrated (mv)		Results	
	Zero	Cal	Zero	Cal	Gain	Offset
3FT	-0.003	0.669	0.800	62.198	91.338	1.099
5FT	-0.004	0.686	0.800	62.198	89.019	1.145
S1	-0.003	0.780	0.000	100.000	127.665	0.418
S2	-0.003	0.750	0.000	100.000	132.825	0.395
S3	-0.003	0.719	0.000	100.000	138.666	0.361
S4	-0.004	0.733	0.000	100.000	135.608	0.564
S5	-0.003	0.757	0.000	100.000	131.575	0.386
S6	-0.003	0.782	0.000	100.000	127.330	0.426
S7	-0.003	0.810	0.000	100.000	122.982	0.387
S8	-0.003	0.804	0.000	100.000	124.012	0.338

Gamma Ray Calibration Report

Serial Number:	10013902
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	Noble Energy Inc.
Well	Wells Ranch AA11-623
Field	Wattenberg
County	Weld
State	Colorado