



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 Buffalo 13C-15HZ				Well Buffalo 13C-15HZ			
Field Wattenberg				Field Wattenberg			
County Weld				County Weld			
State Colorado				State Colorado			
Location:				API # : 05-123-36459			
SEC 15 TWP 1N RGE 68W				Other Services Gauge Ring MIT			
Permanent Datum				Ground Level			
Log Measured From				Kelly Bushing			
Drilling Measured From				Kelly Bushing			
Elevation				5141'			
K.B. 5161'				D.F. 5160'			
G.L. 5141'							
Date	12-AUG-2015						
Run Number	Two						
Depth Driller	12.438 FT						
Depth Logger	7.935 FT						
Bottom Logged Interval	7.929 FT						
Top Log Interval	Surface						
Open Hole Size	8.750"						
Type Fluid	Water						
Density / Viscosity	8.34 lbm/gal						
Max. Recorded Temp.	245°F						
Estimated Cement Top	Surface						
Time Well Ready	ROA						
Time Logger on Bottom	9:14 A.M.						
Equipment Number	HD-0119						
Location	Ft. Lupton, CO						
Recorded By	A. Olmsted						
Witnessed By	Steve Vigil						
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	Surface	1,322 FT		
Intermediate #1	7	26	HCP 110 LTC	Surface	8,227 FT		
Intermediate #2							
Liner	4 1/2	11.6	P-110 LTC/DOX	7,247 FT	12,438 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 7,247 FT
Adjusted -40 FT to correlate to liner top
Gauge Ring/Junk Basket ran to 7,945 FT
Log ran from as deep as possible in heel to surface
Log ran with 2800 PSI surface induced pressure
Logging tools were clean and free of debris upon completion of operations

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



Main Pass

Reorded with 2800 PSI Surface Induced Pressure

Database File:0512336459_anadarko_buffalo 13c-15hz_08-12-15_mit_rbl.db

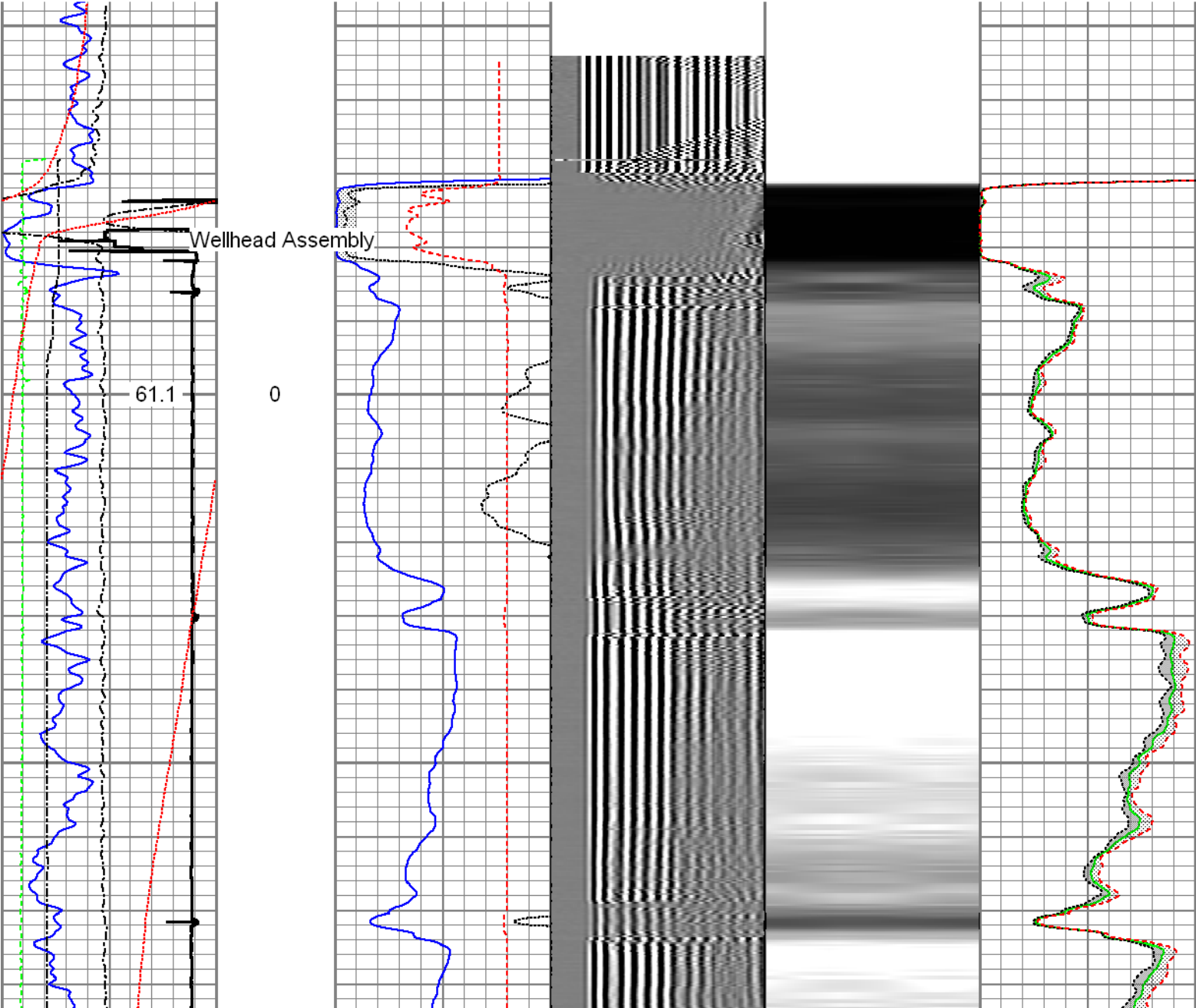
Dataset Pathname:pass4

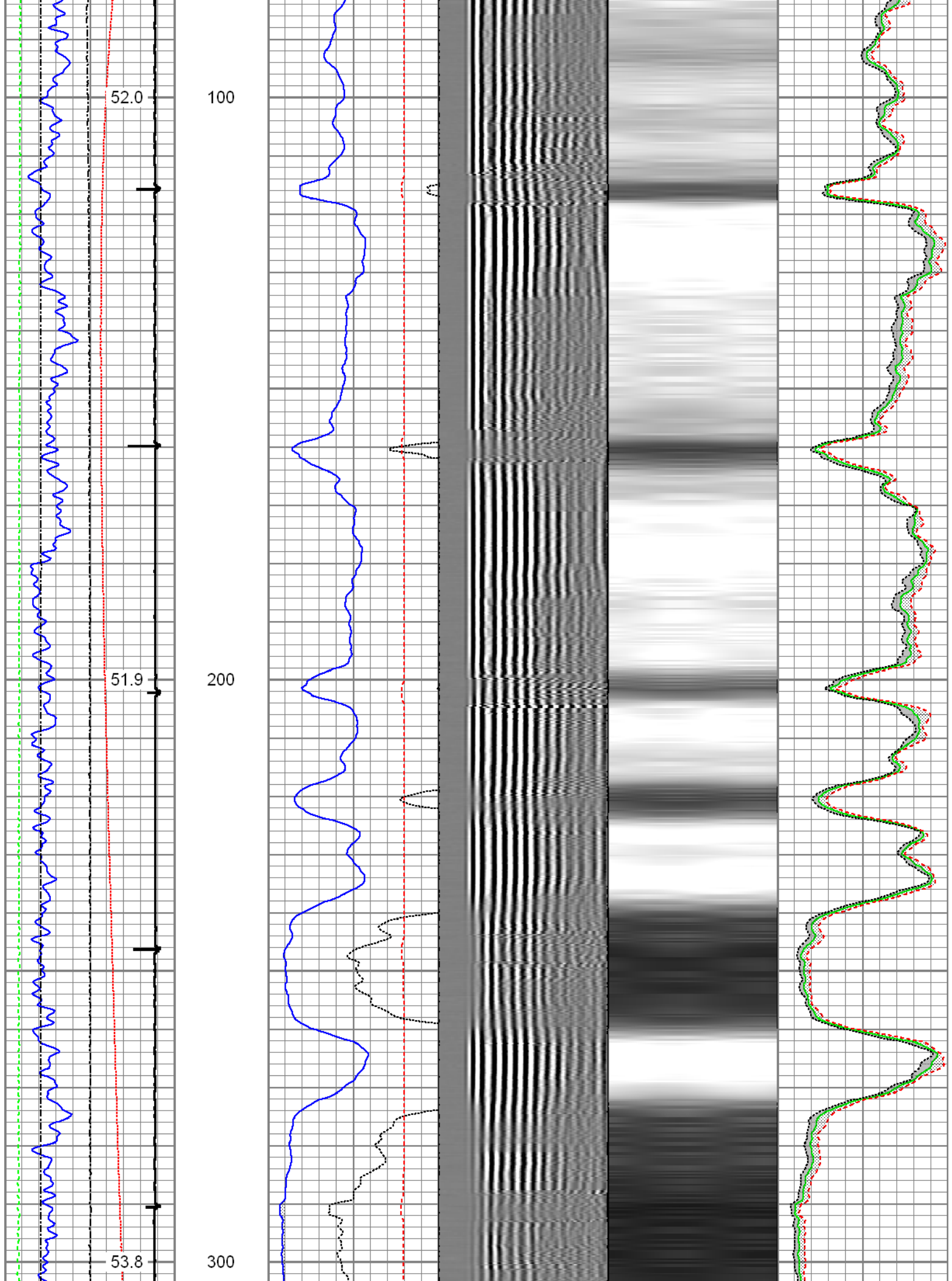
Presentation Format:rbt4_mit

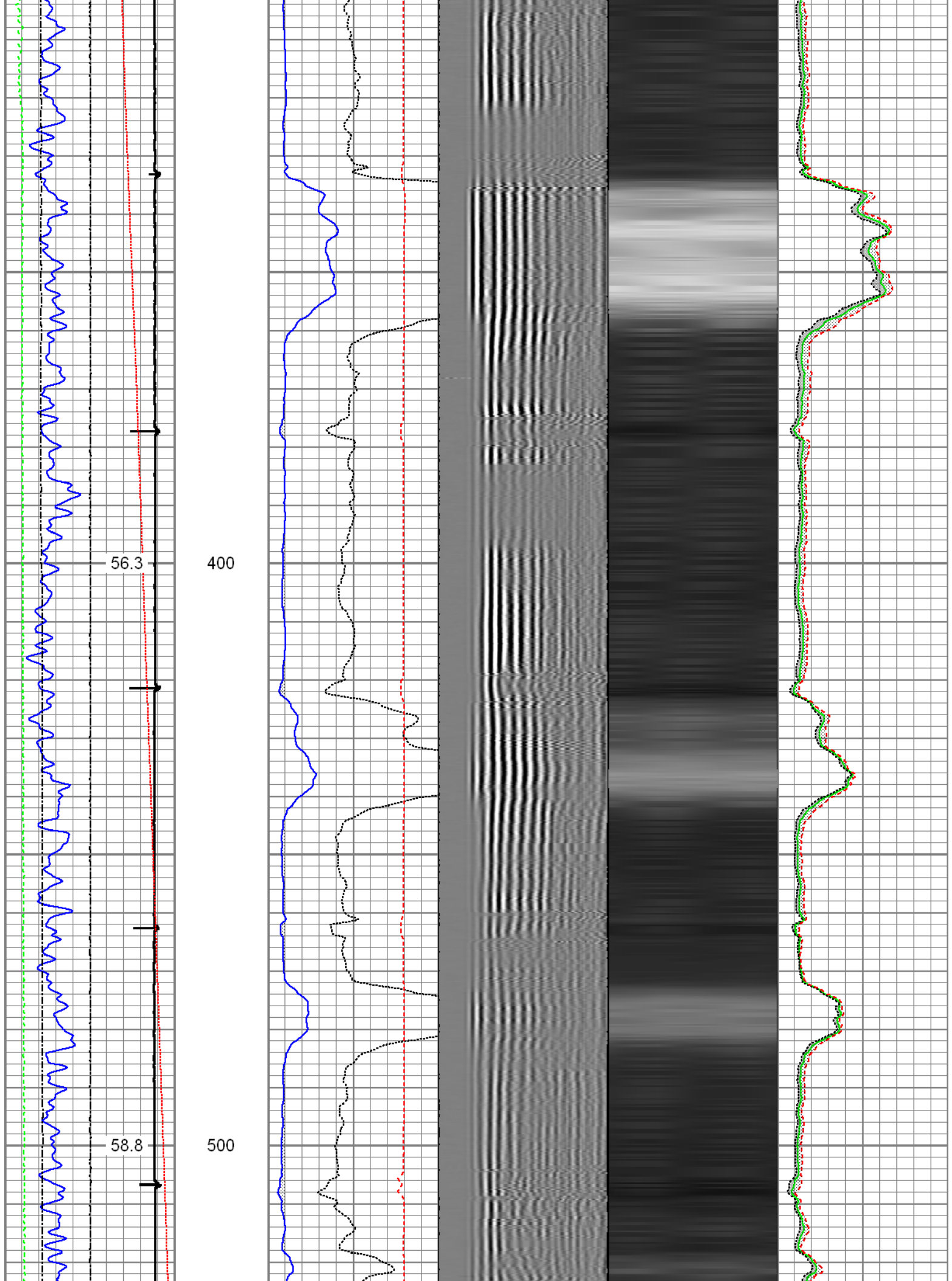
Dataset Creation:Wed Aug 12 09:14:13 2015 by Log 7.0 B1

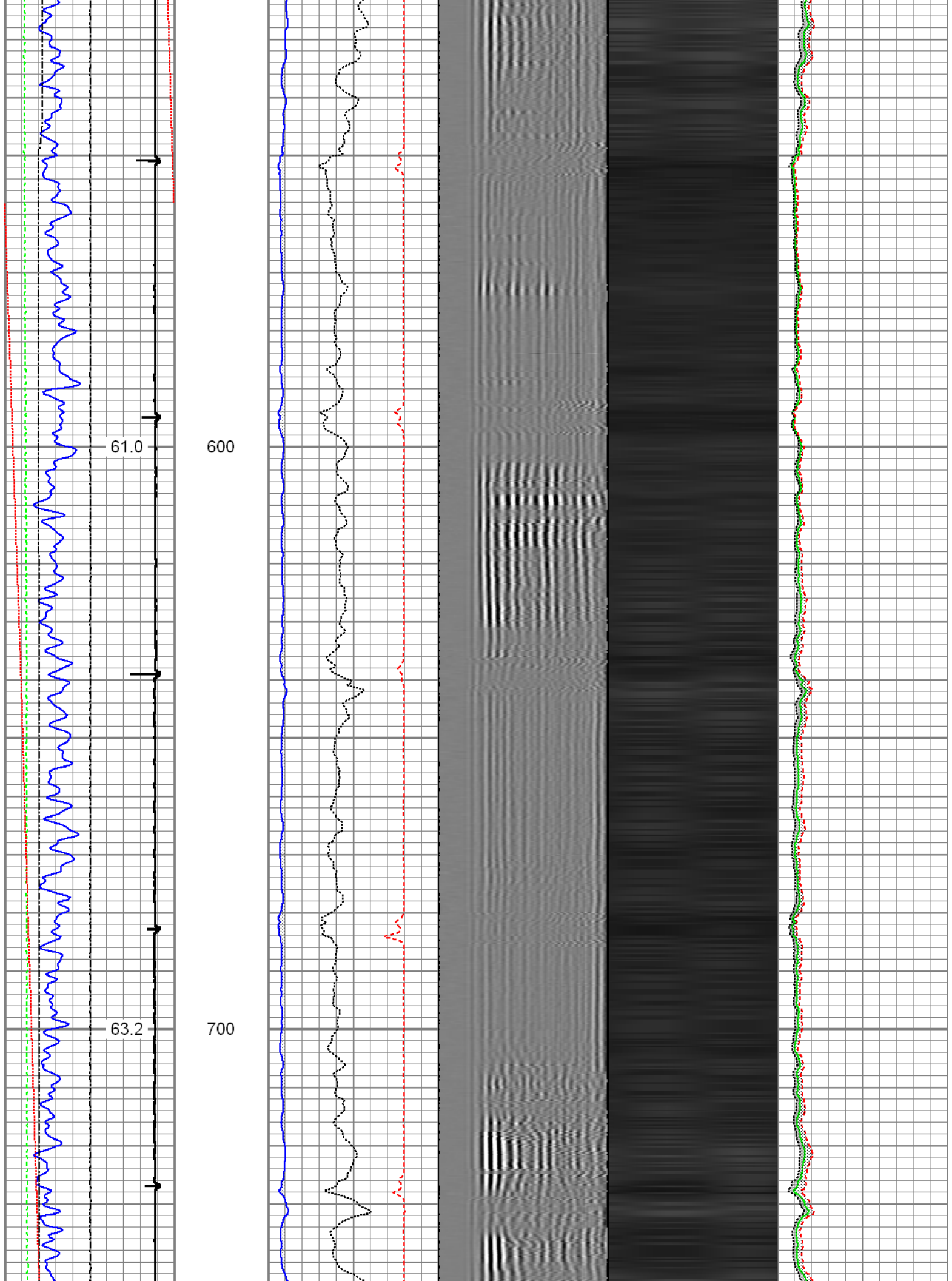
Charted by:Depth in Feet scaled 1:240

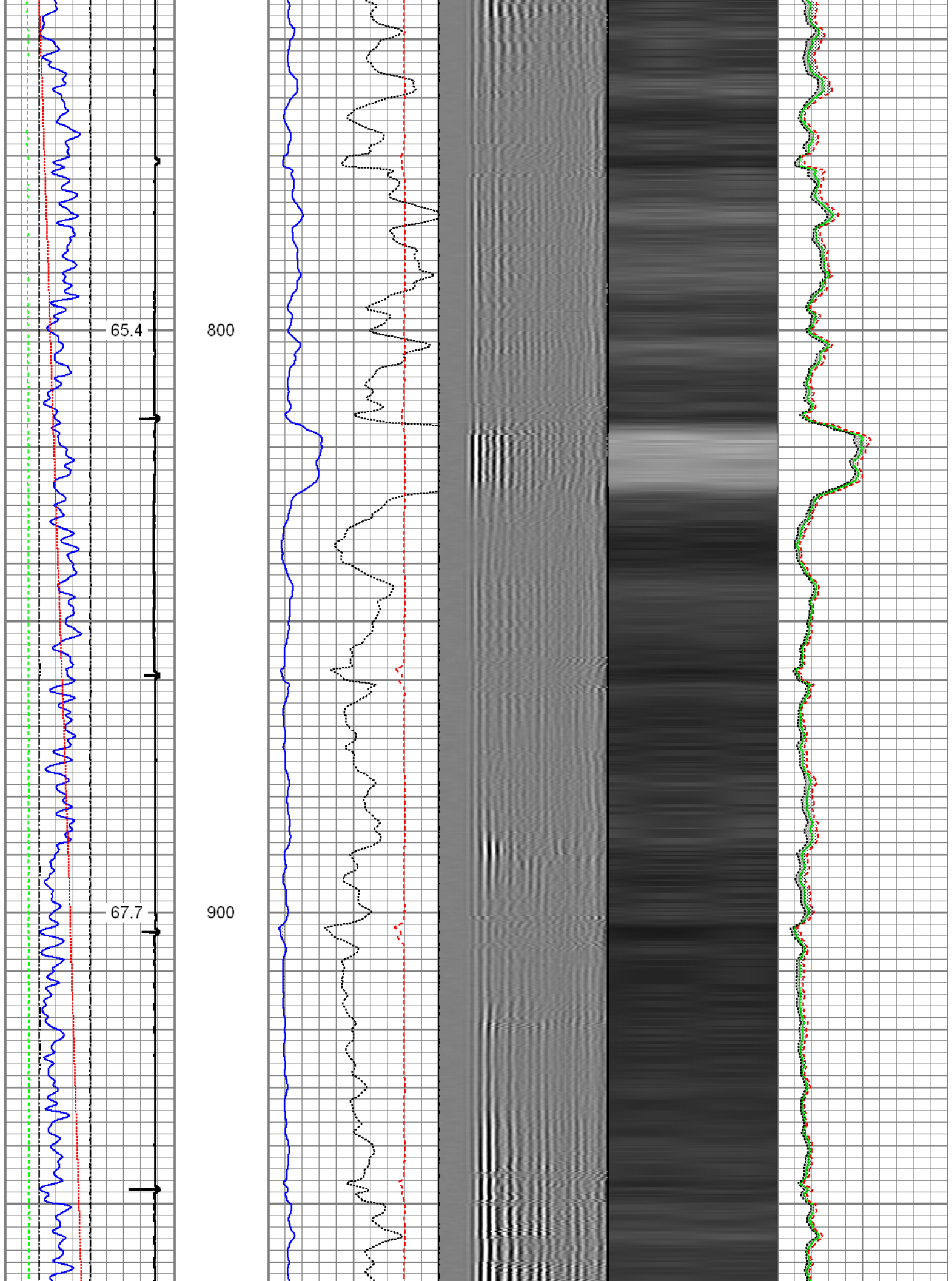
Gamma Ray	3' Amplitude	5' Variable Density Log	Sector Map	Average Amplitude
0 (GAPI) 120	0 (mV) 100	200 1200		0 100
Casing Collar Locator	3' Amplitude x 5			Mimimum Amplitude
Line Speed	0 (mV) 20			0 100
-100 (ft/min) 100	3' Travel Time			Maximum Amplitude
Line Tension	650 (usec) 150			0 100
0 (lb) 2000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

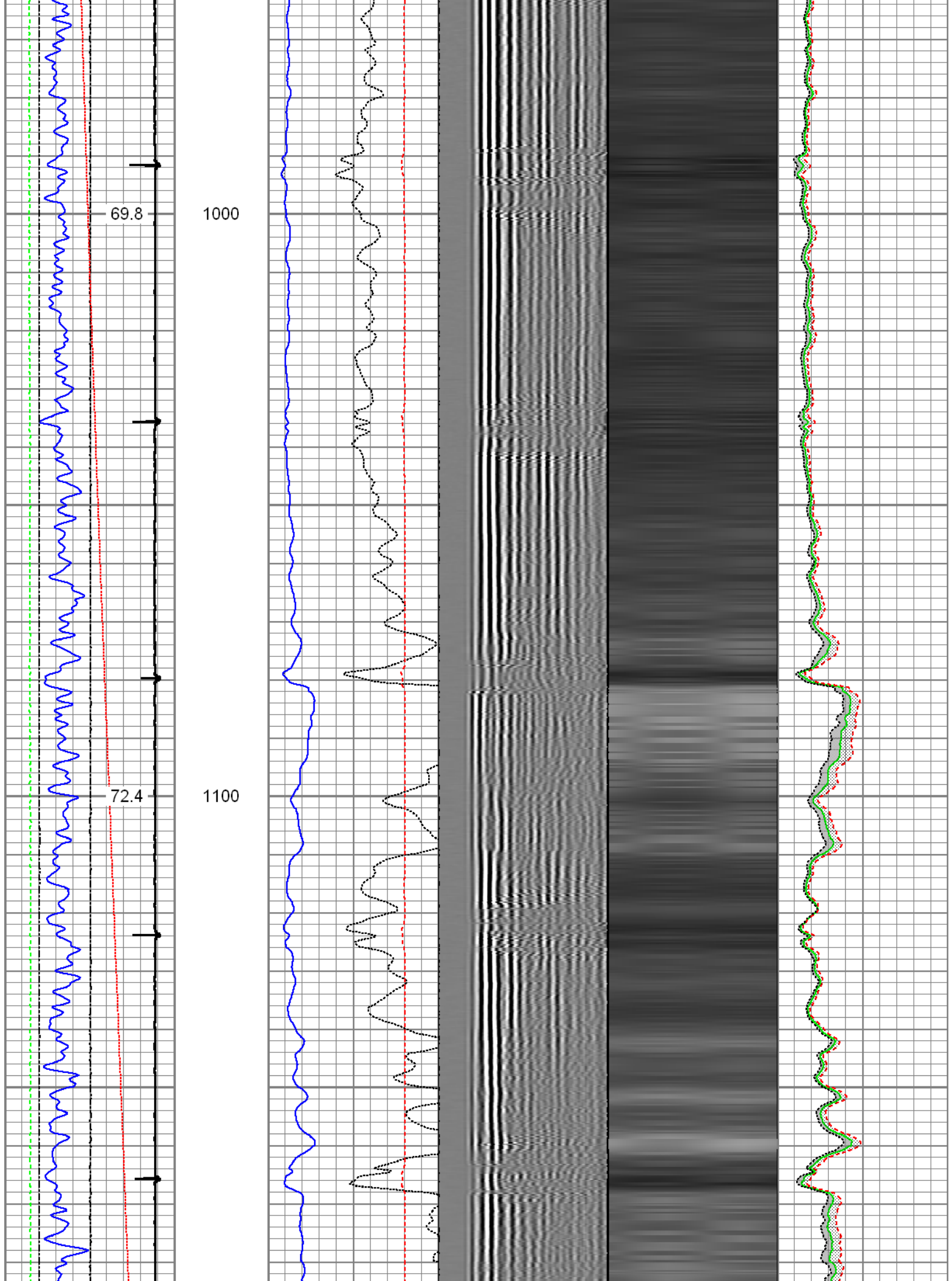


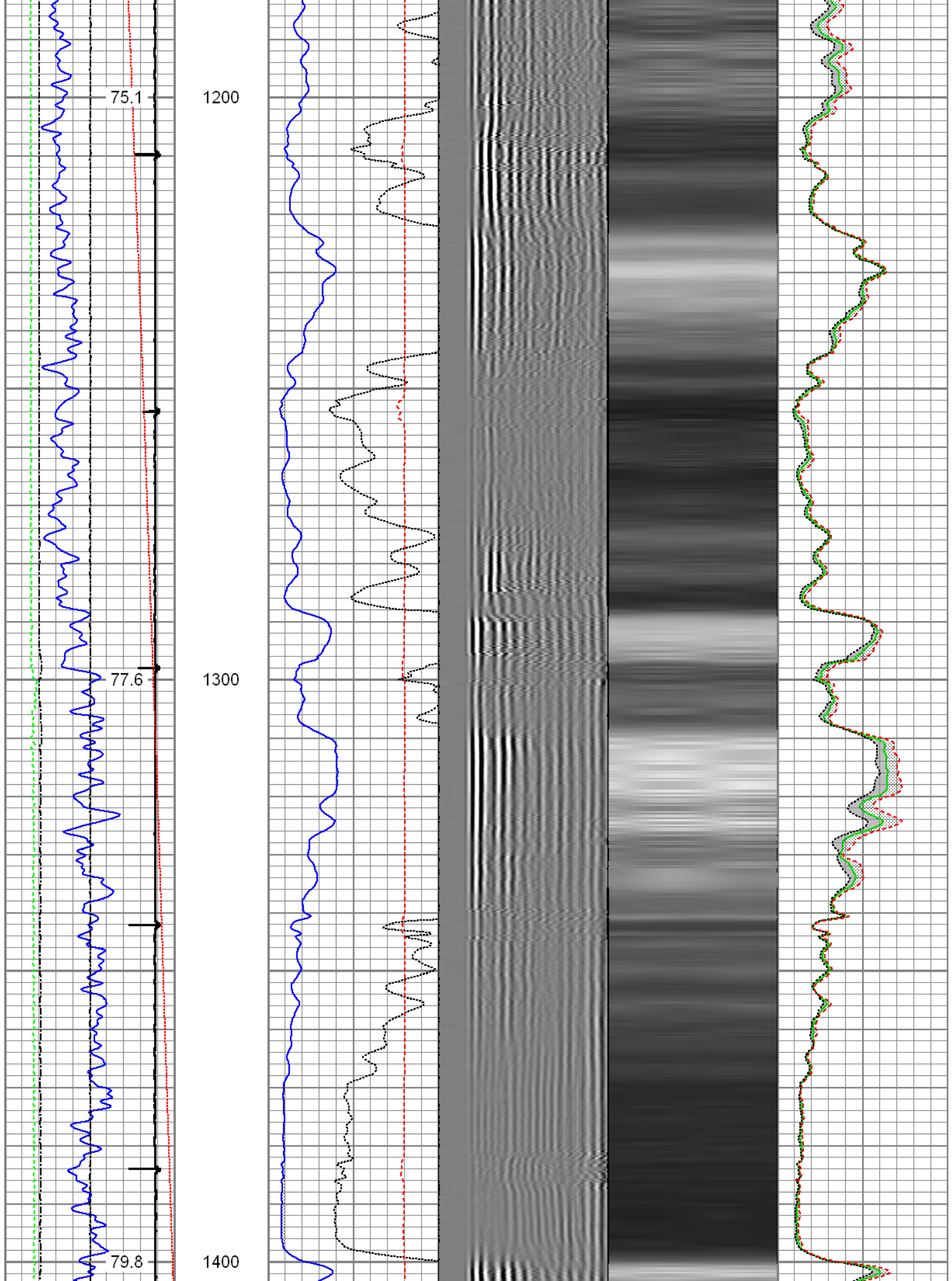


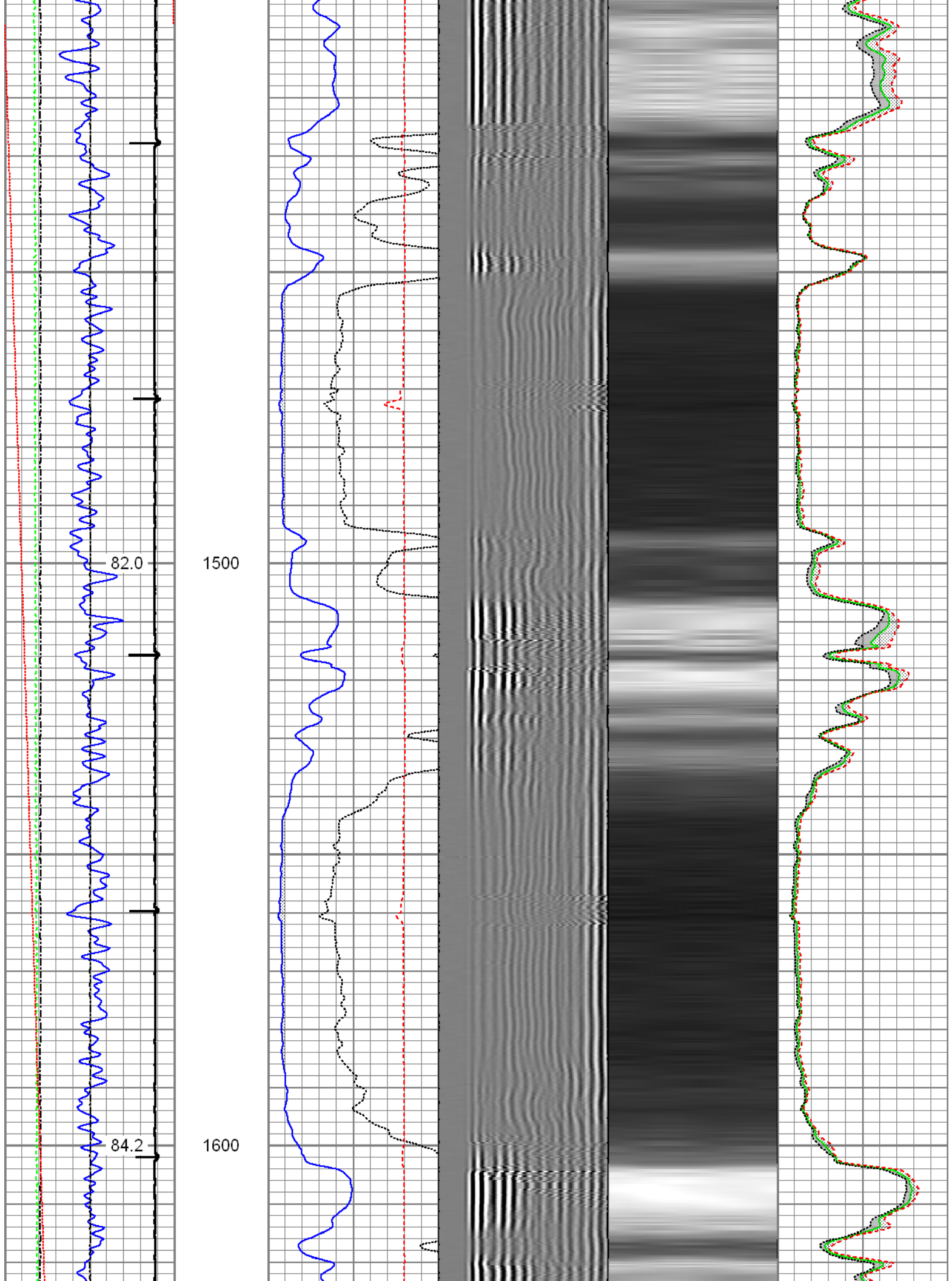


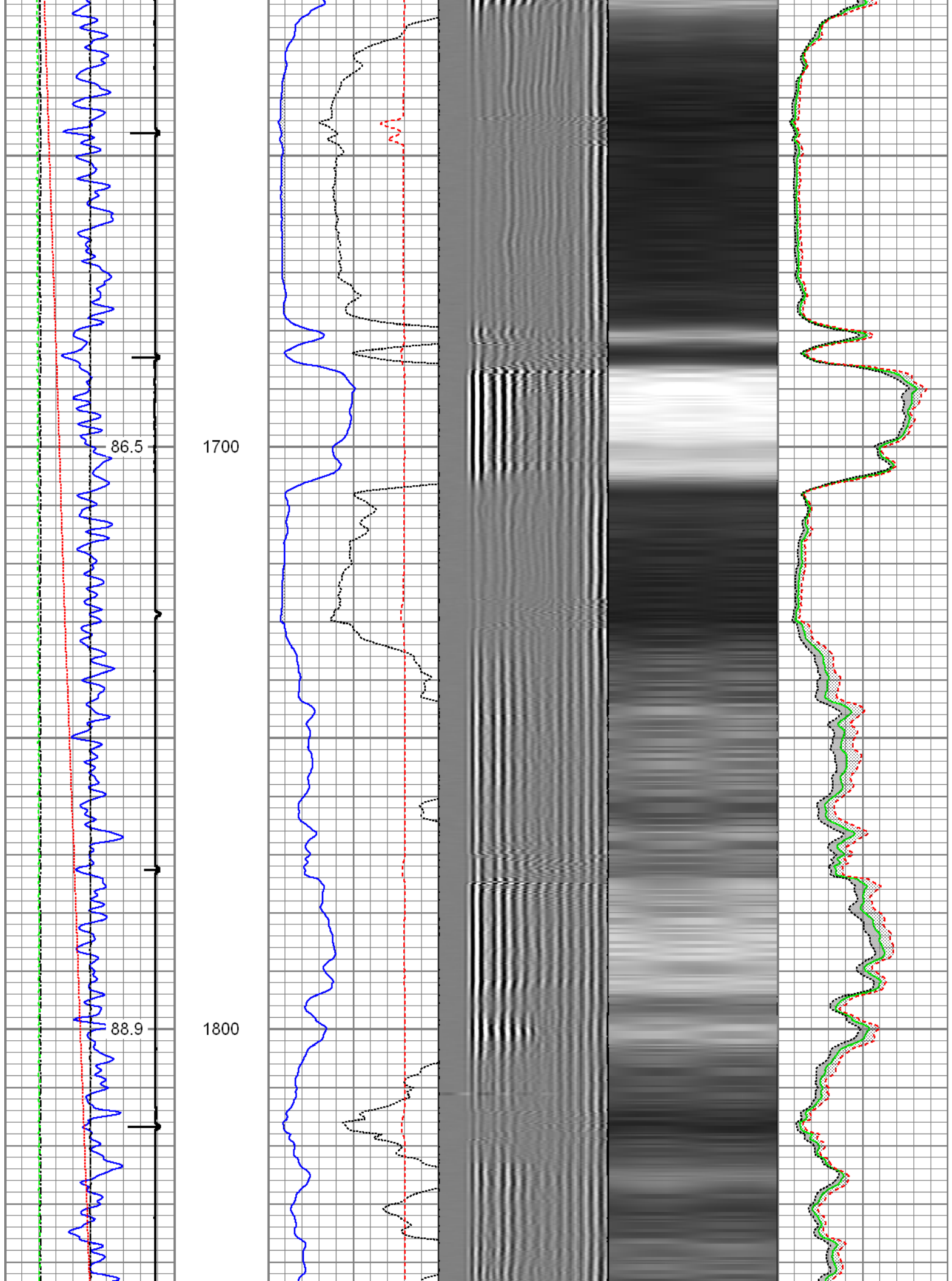


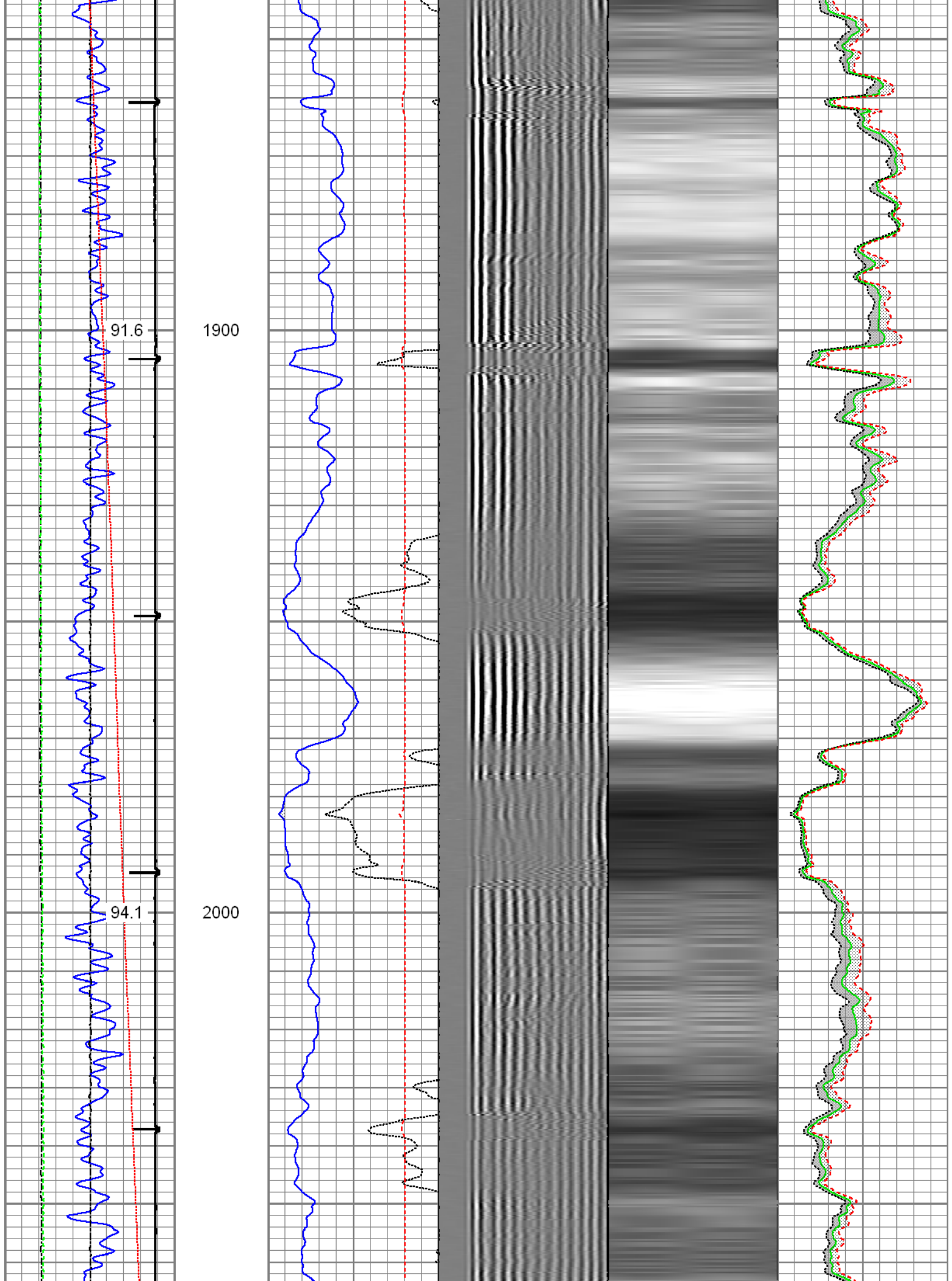


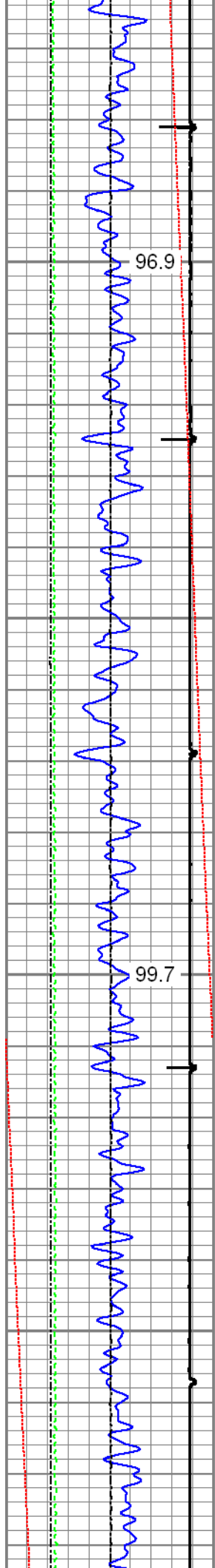






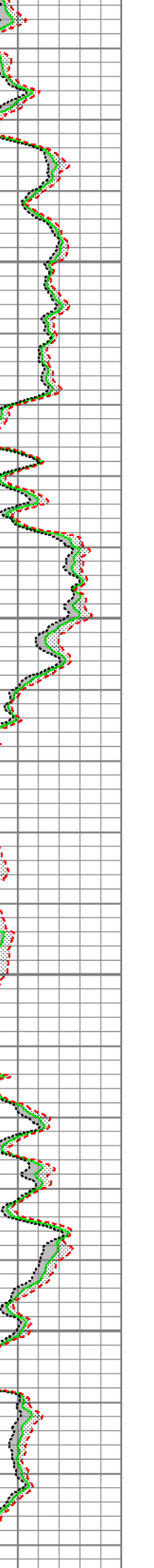
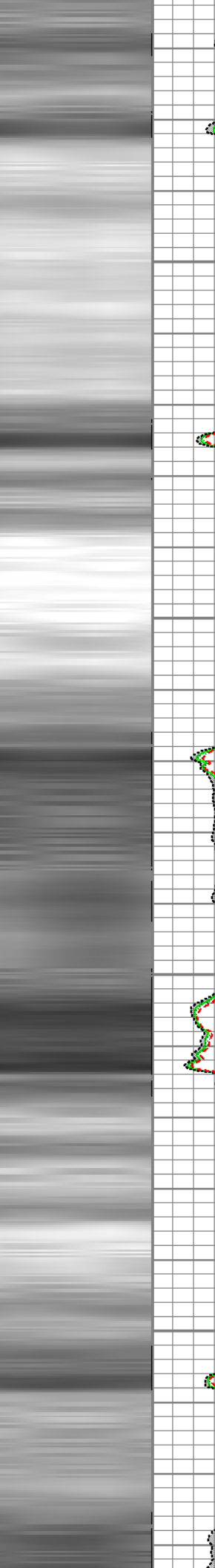
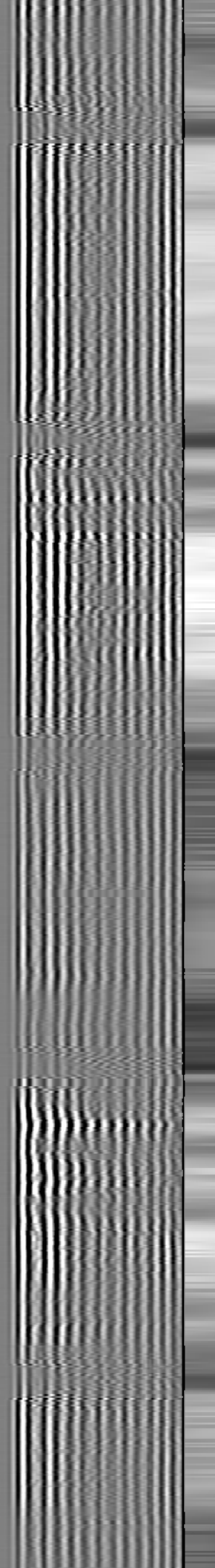
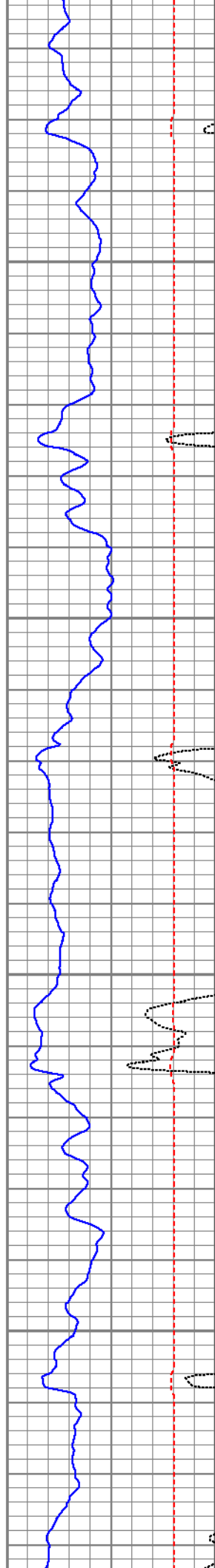


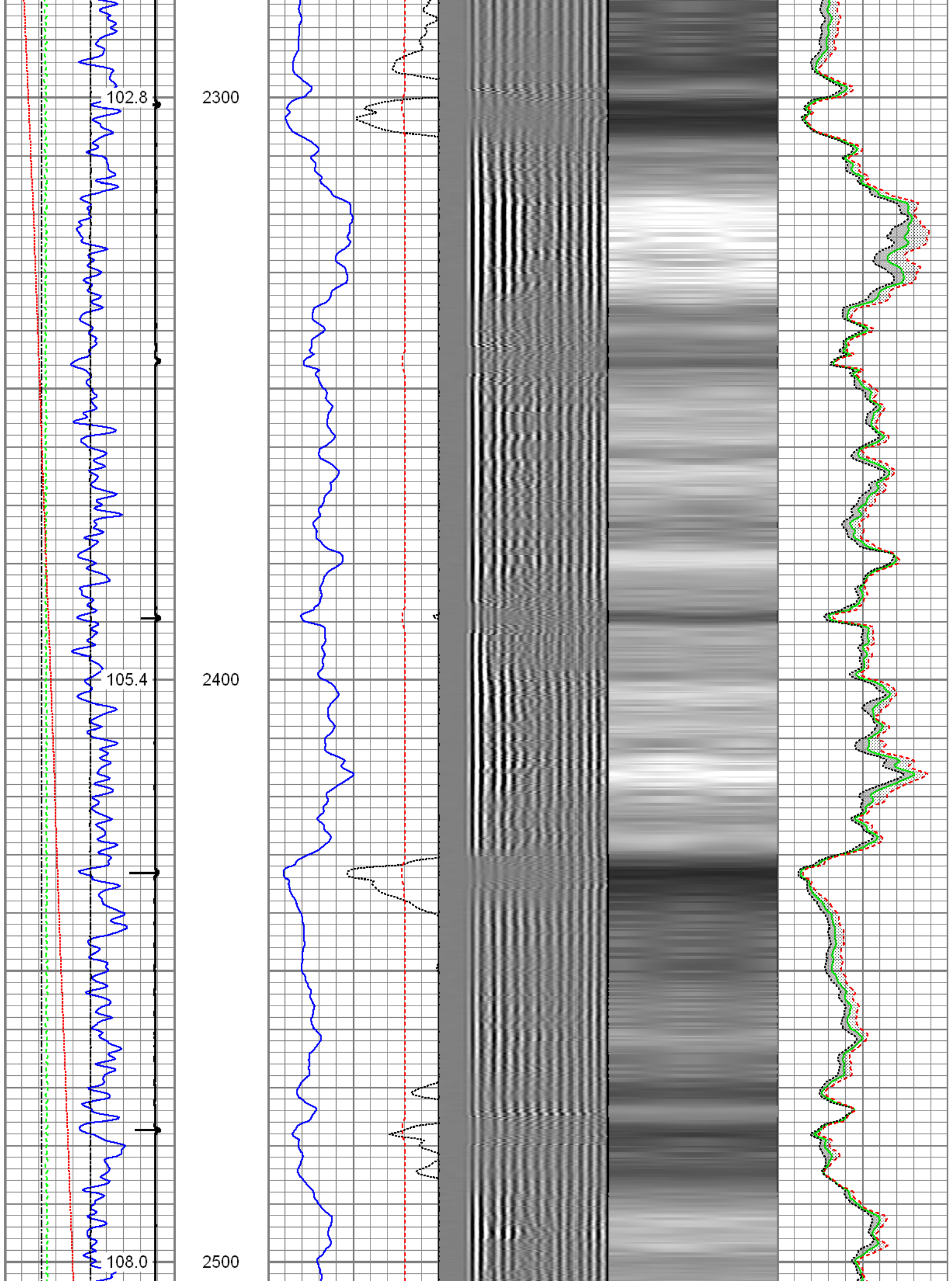


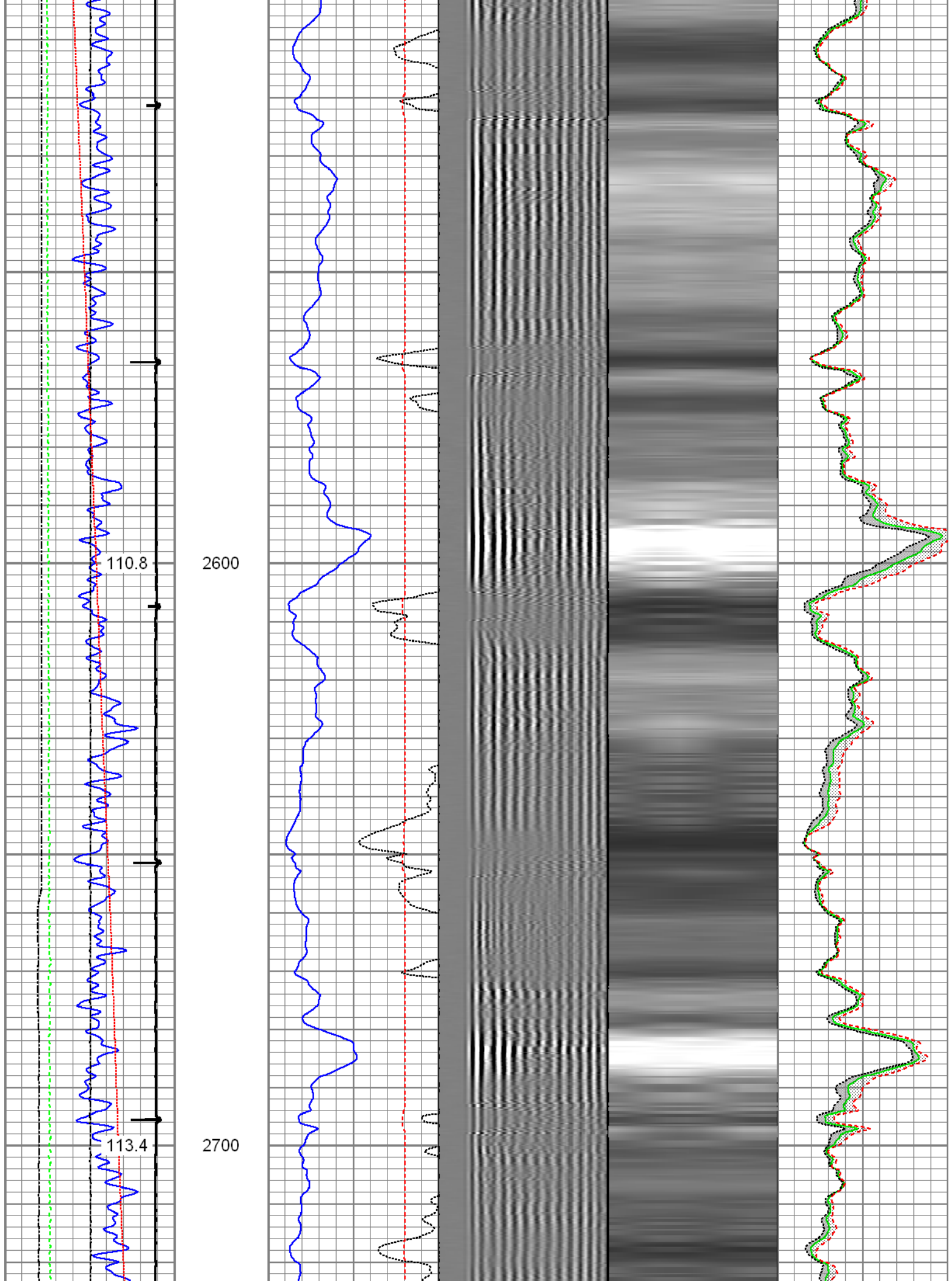


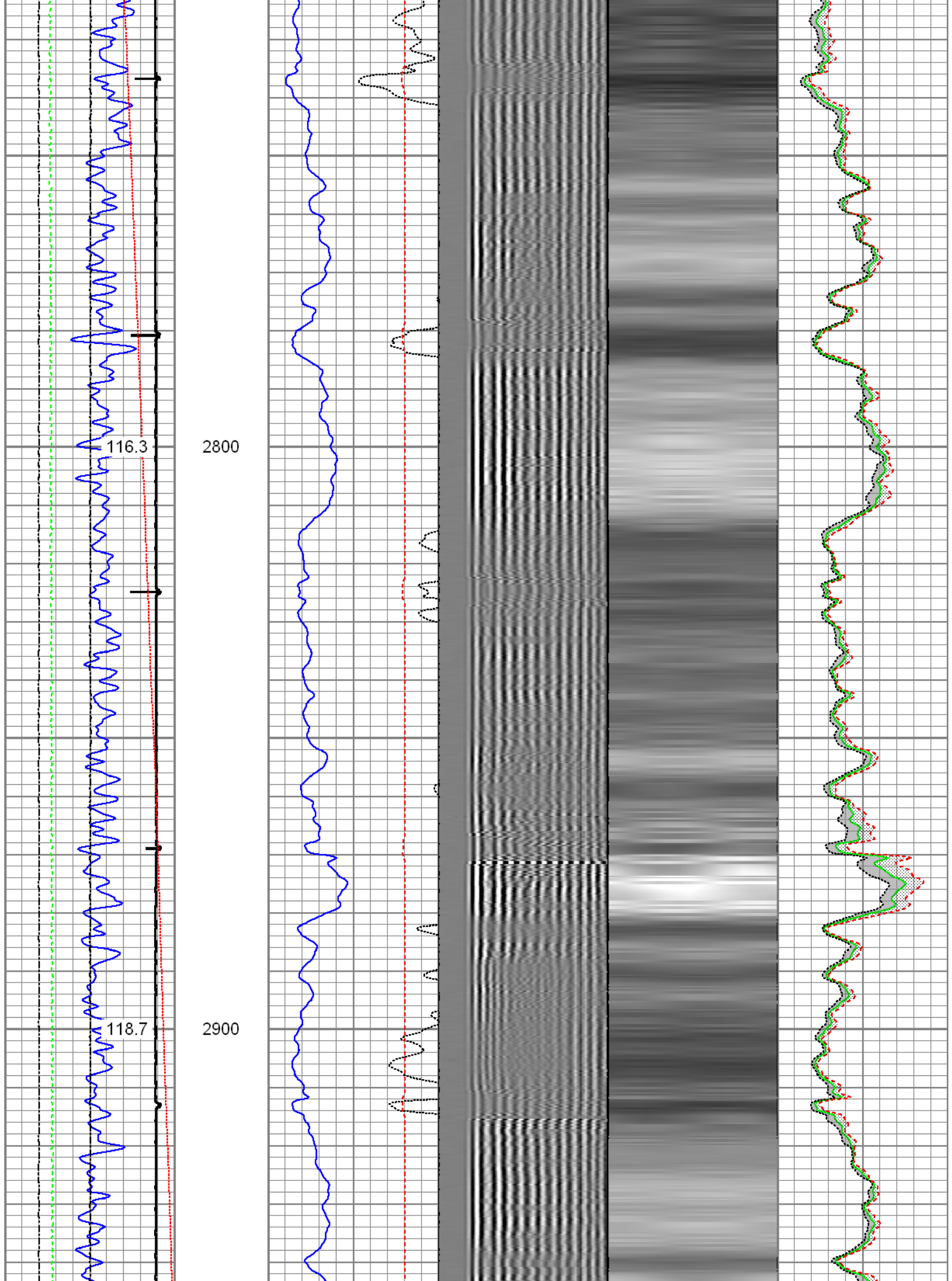
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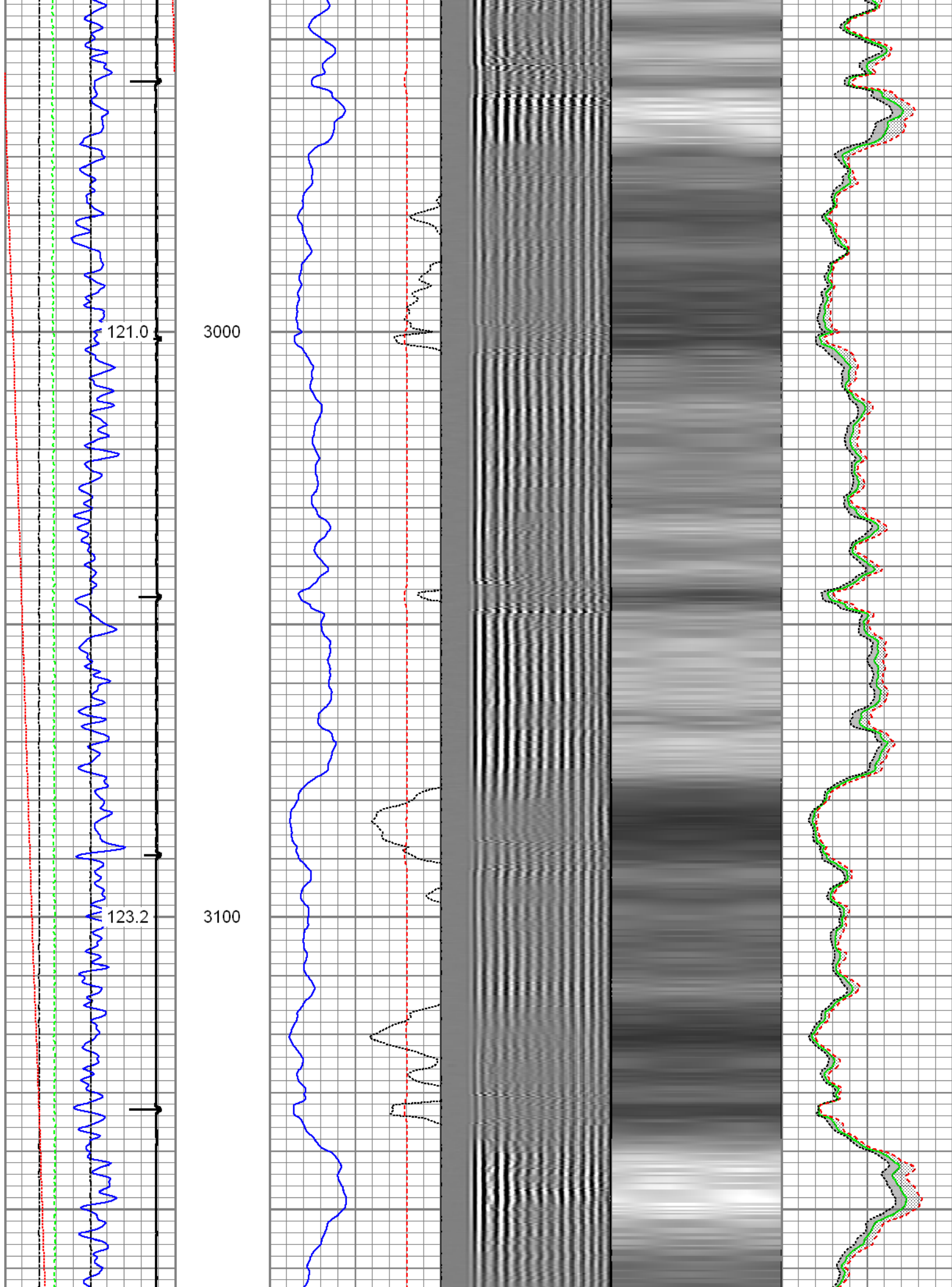
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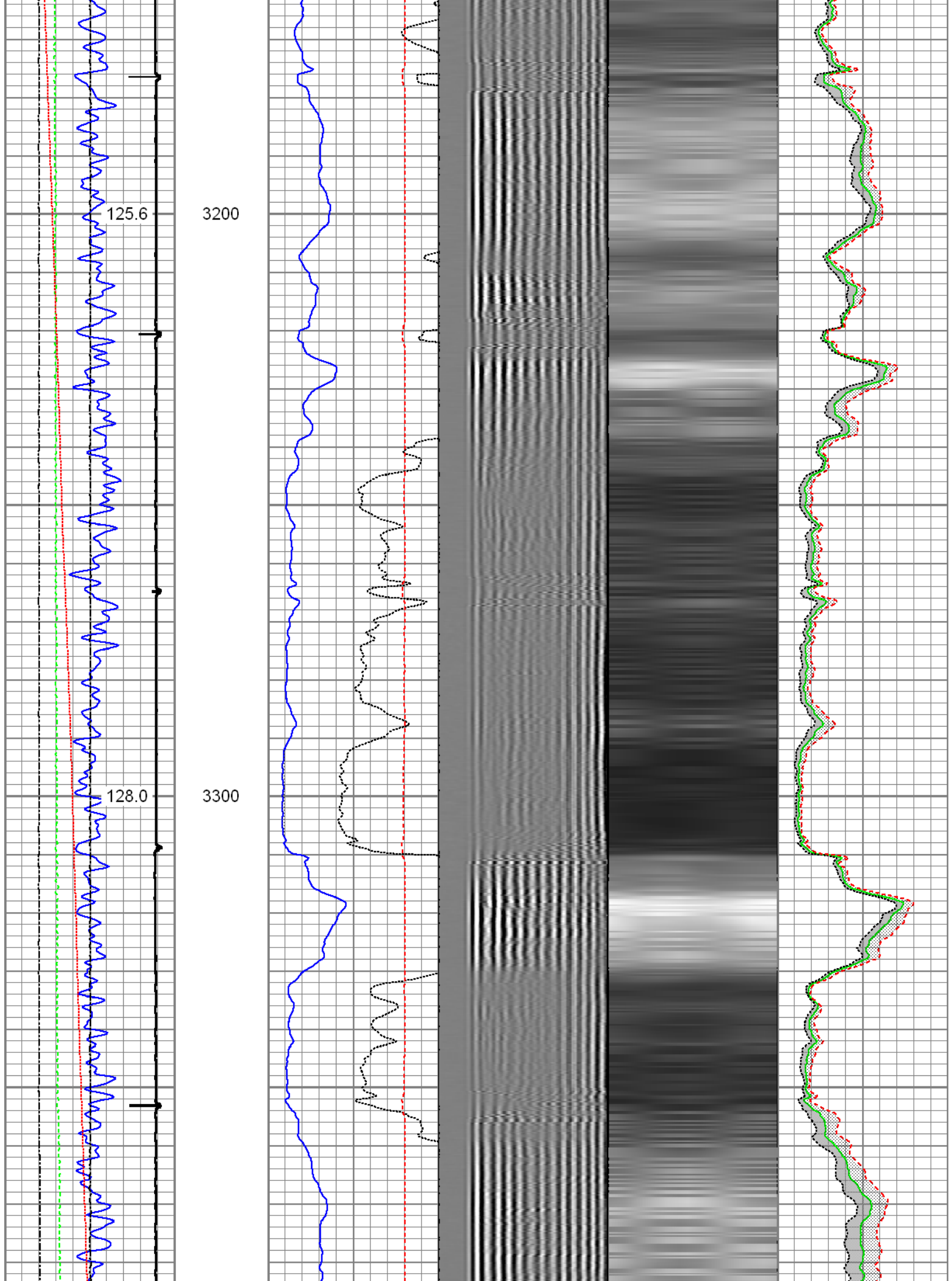


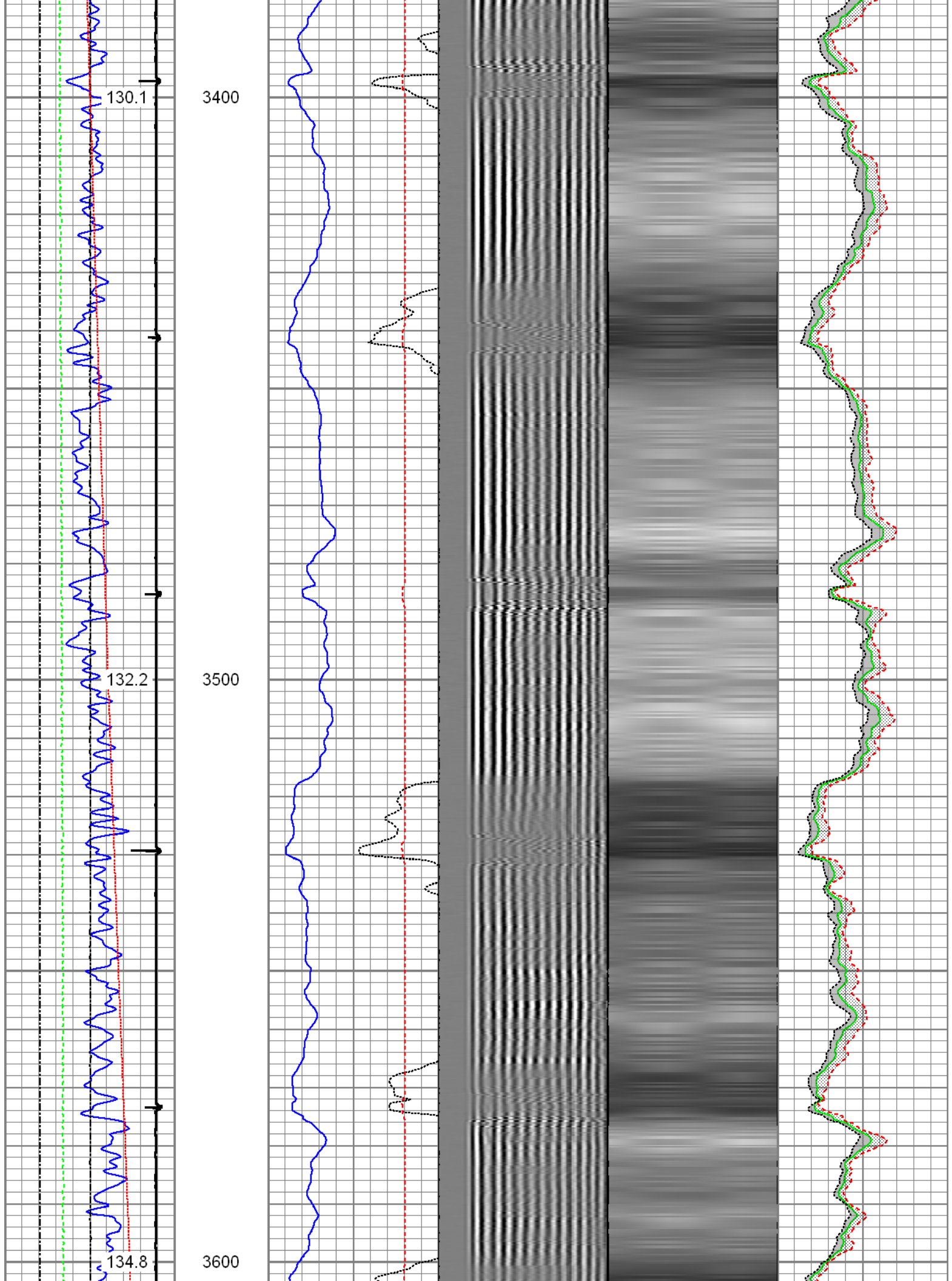


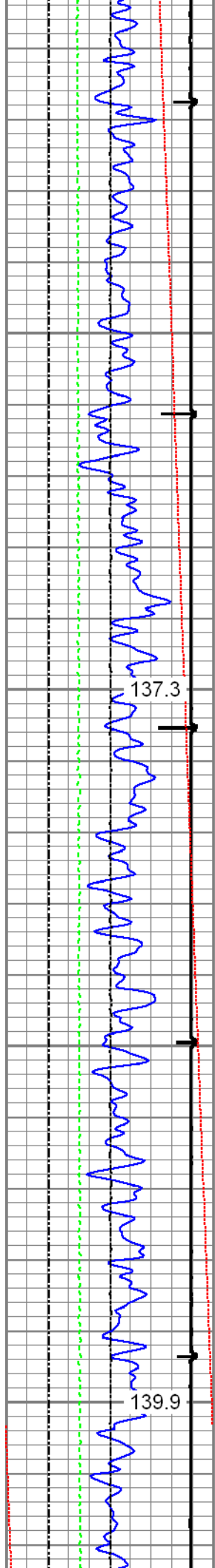






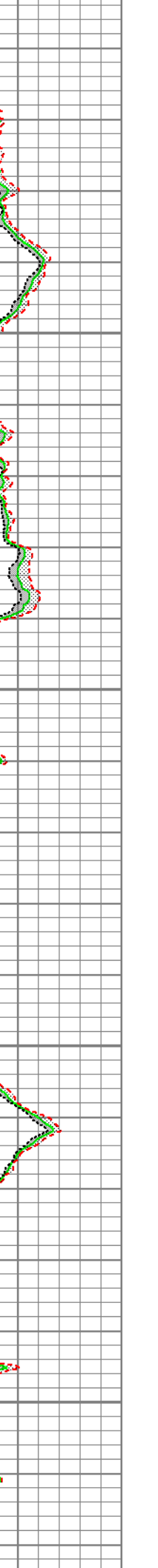
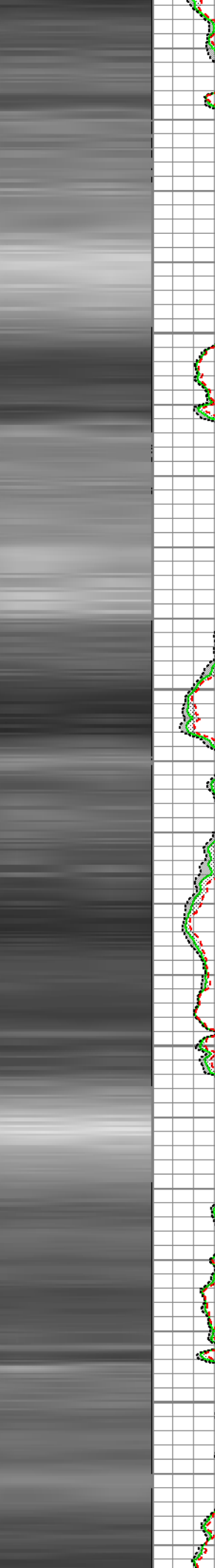
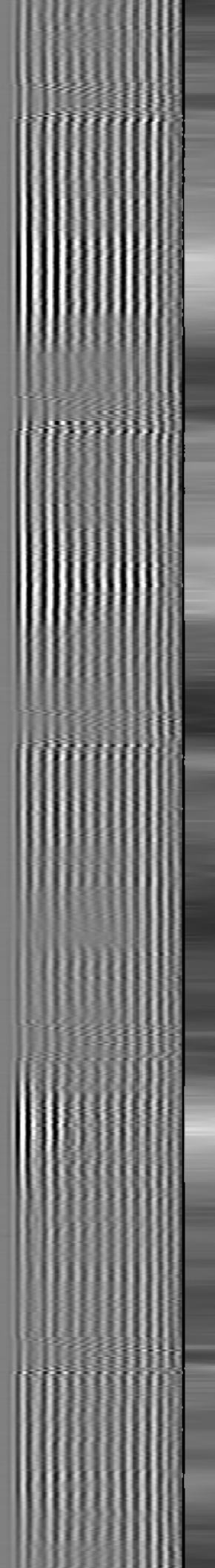
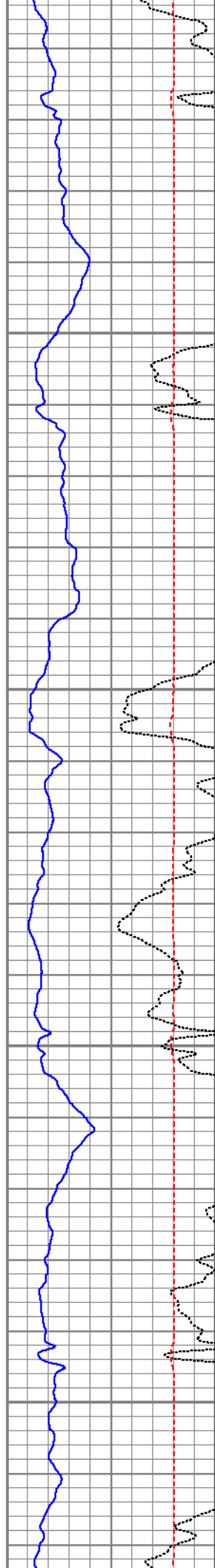


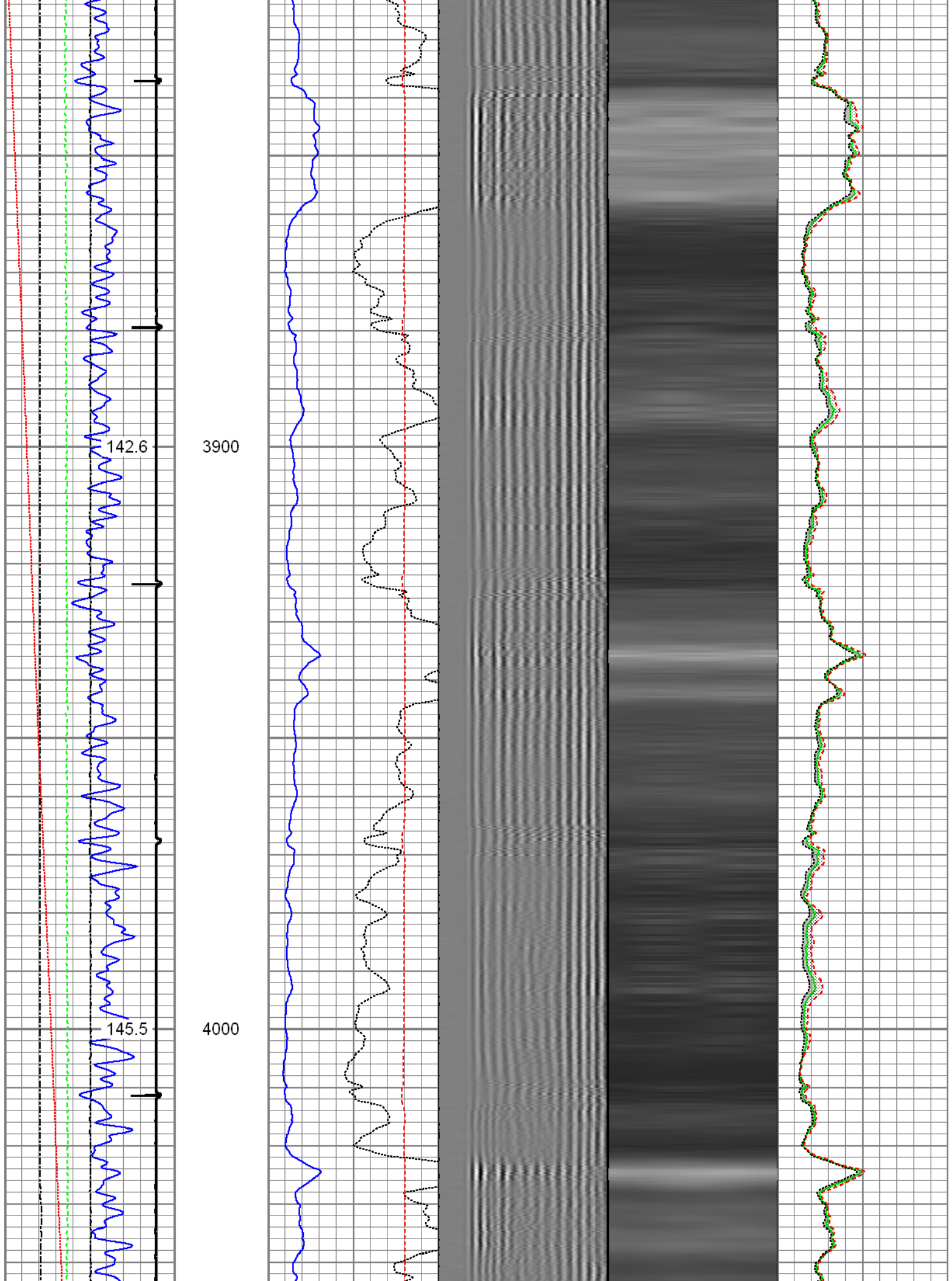


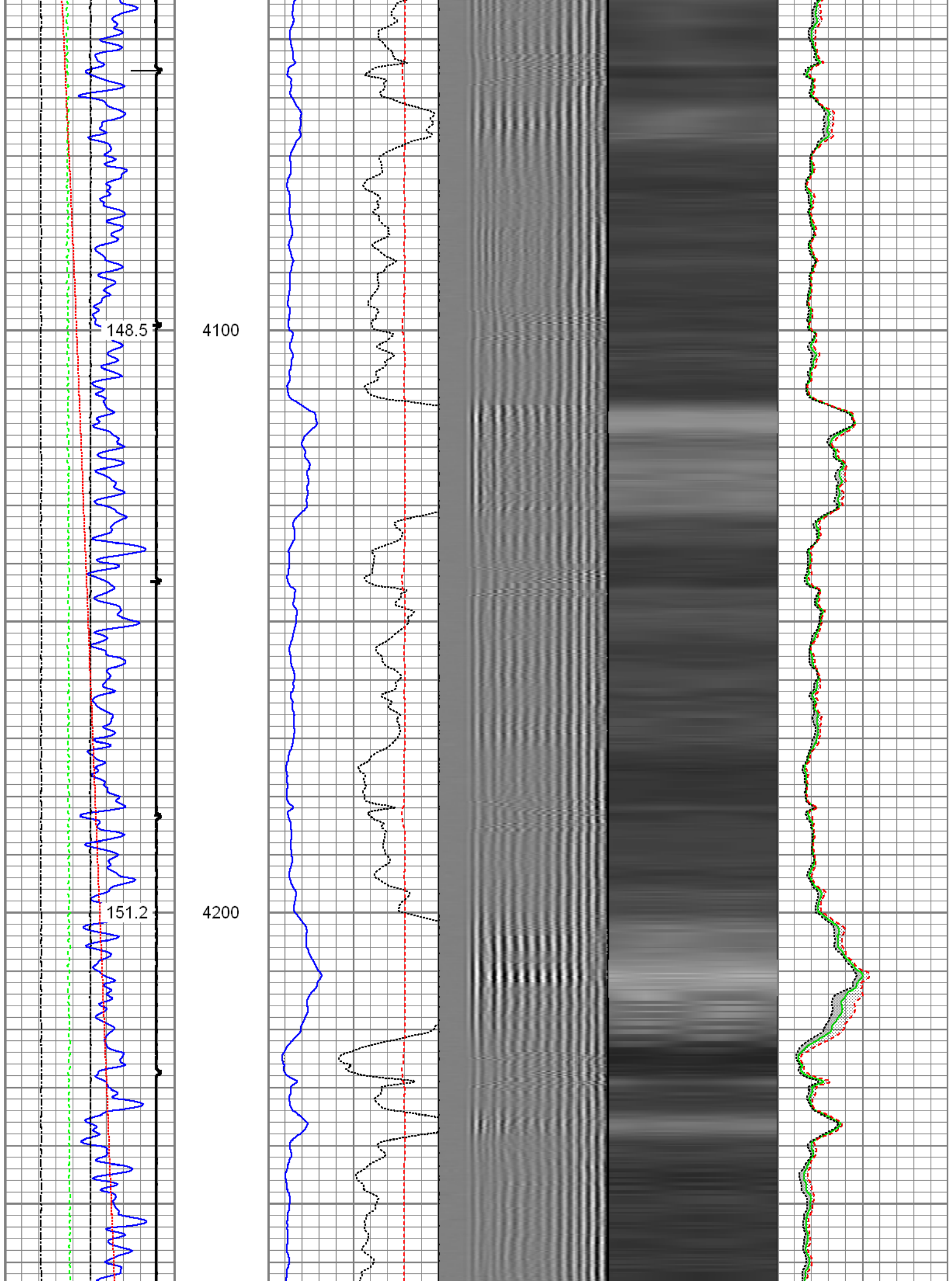


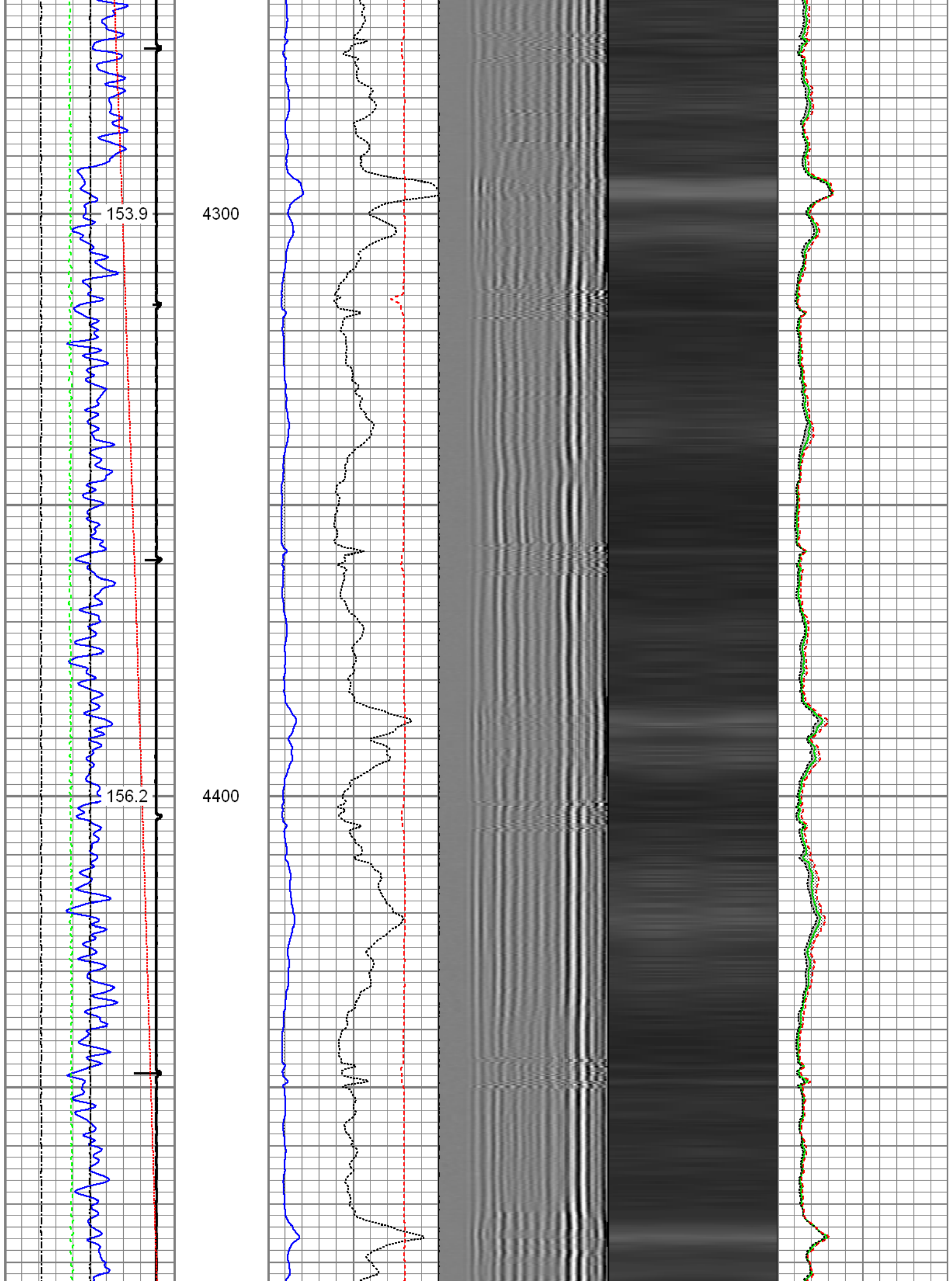
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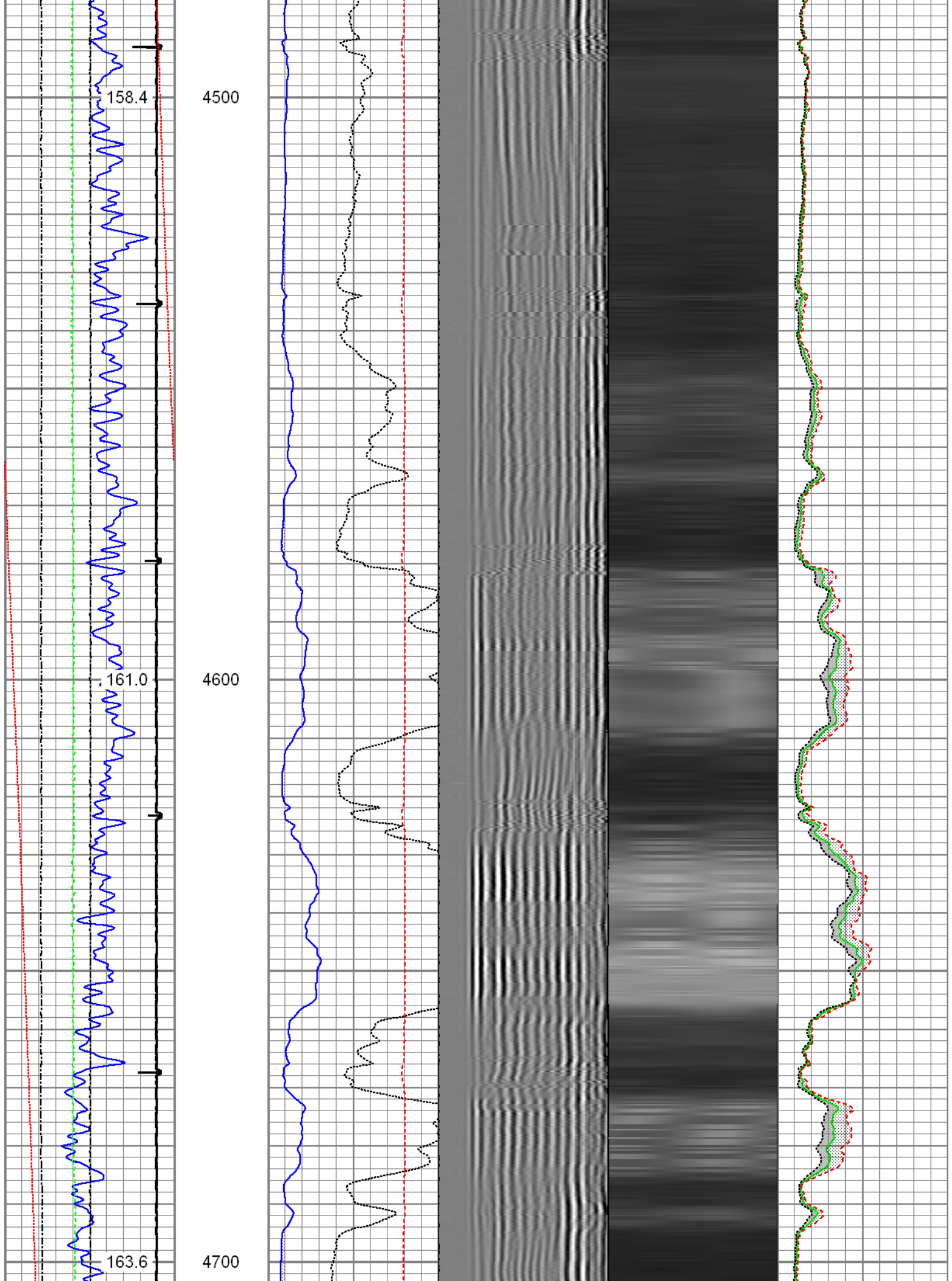
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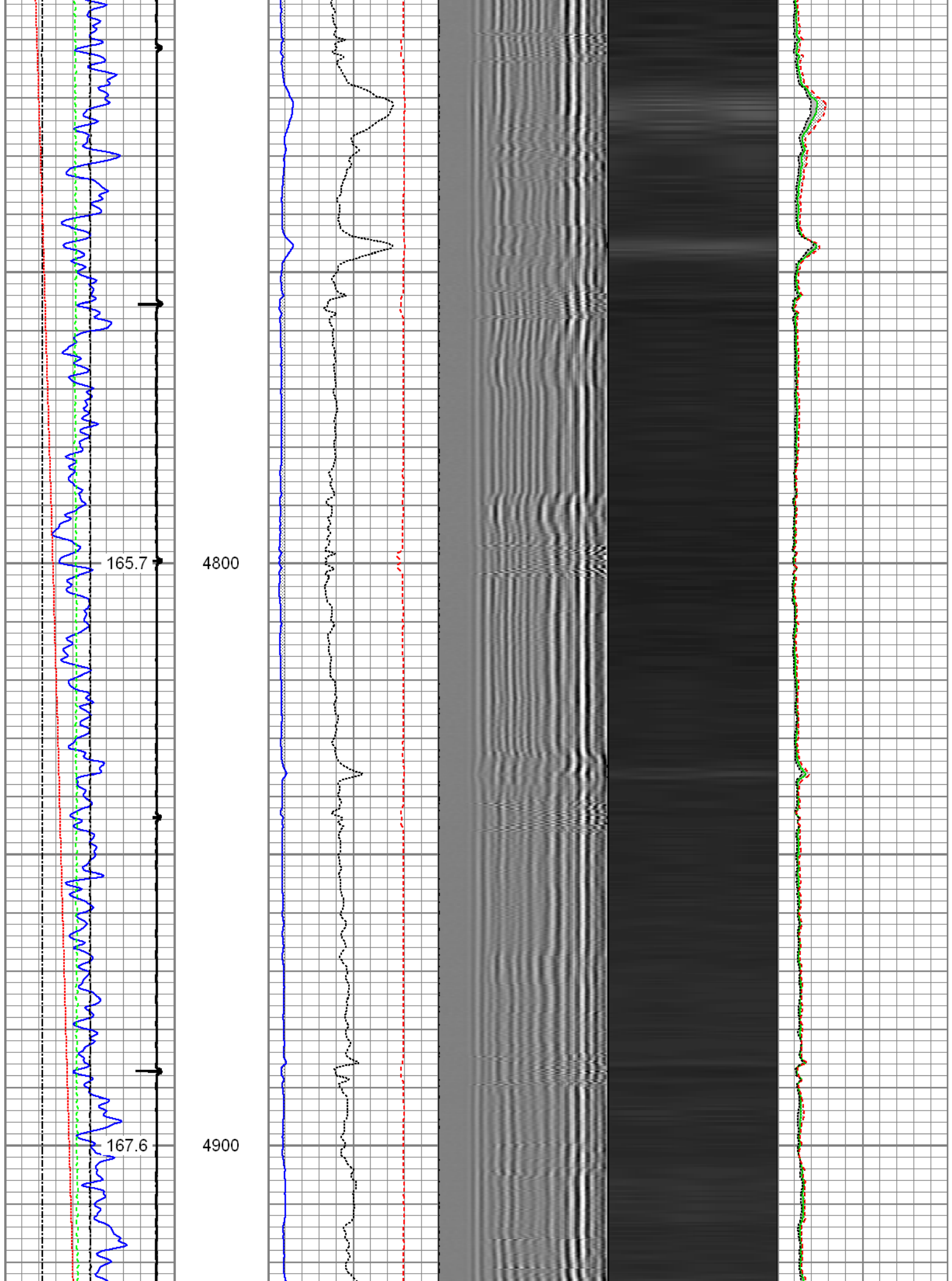


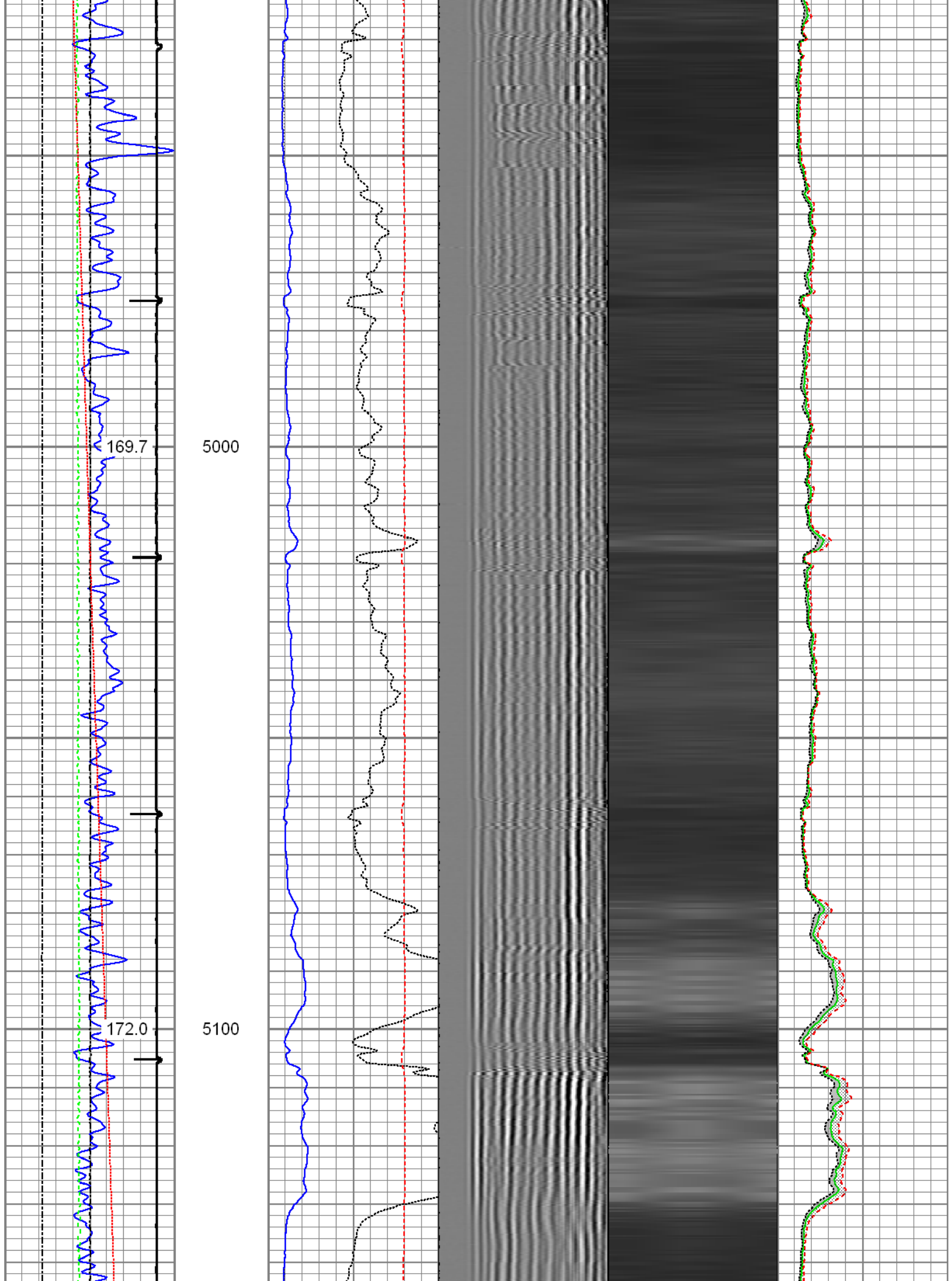


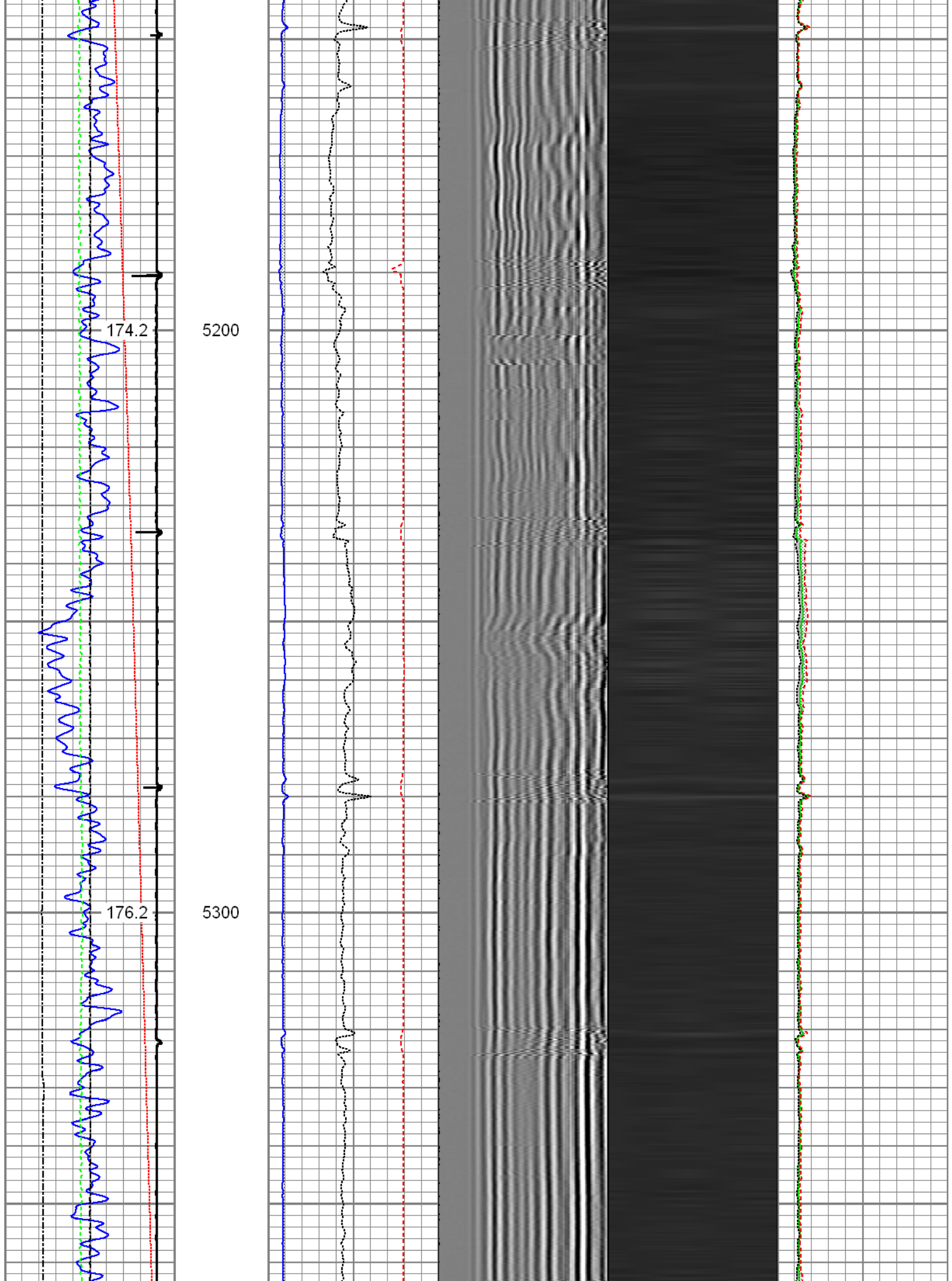


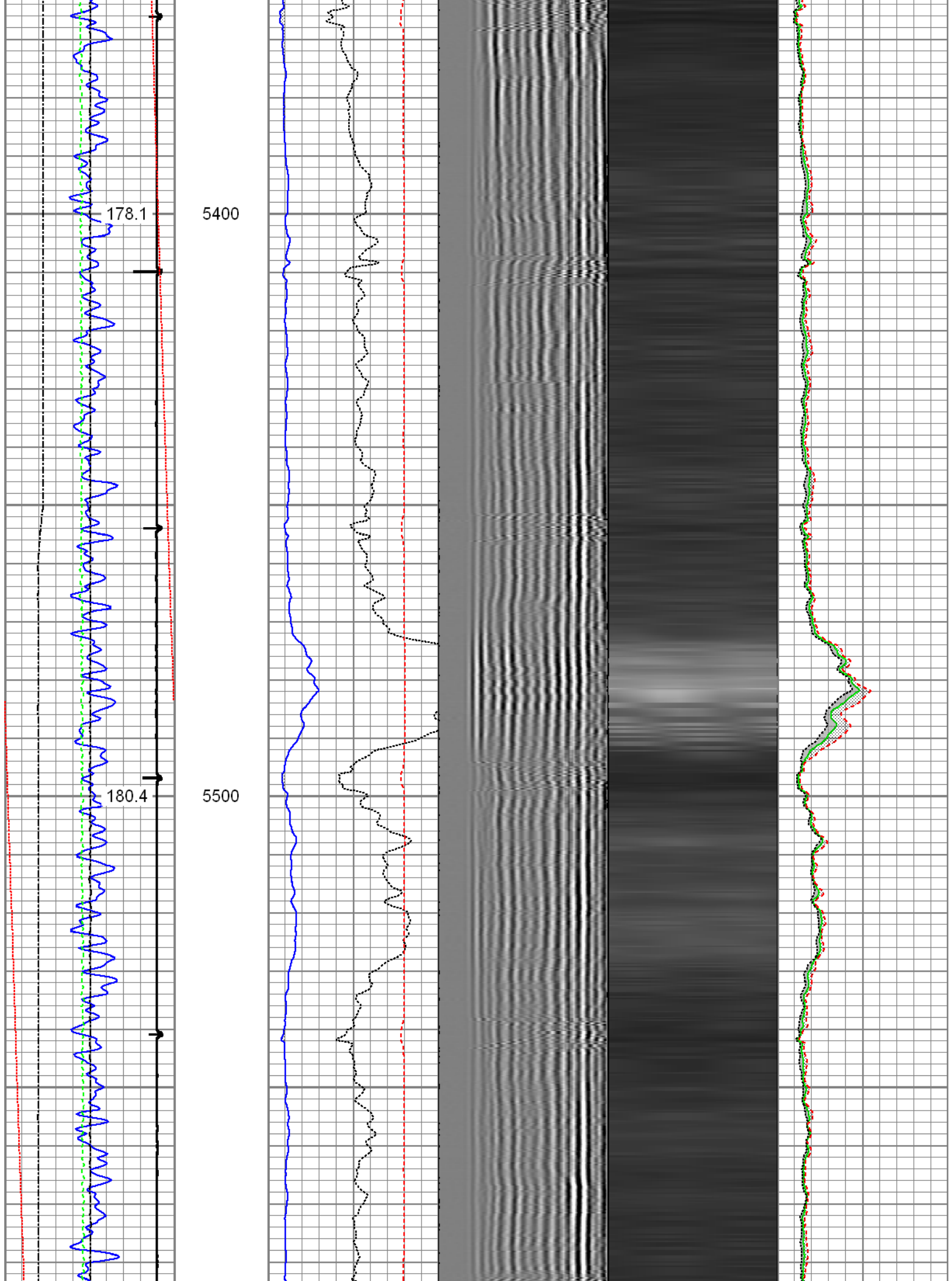


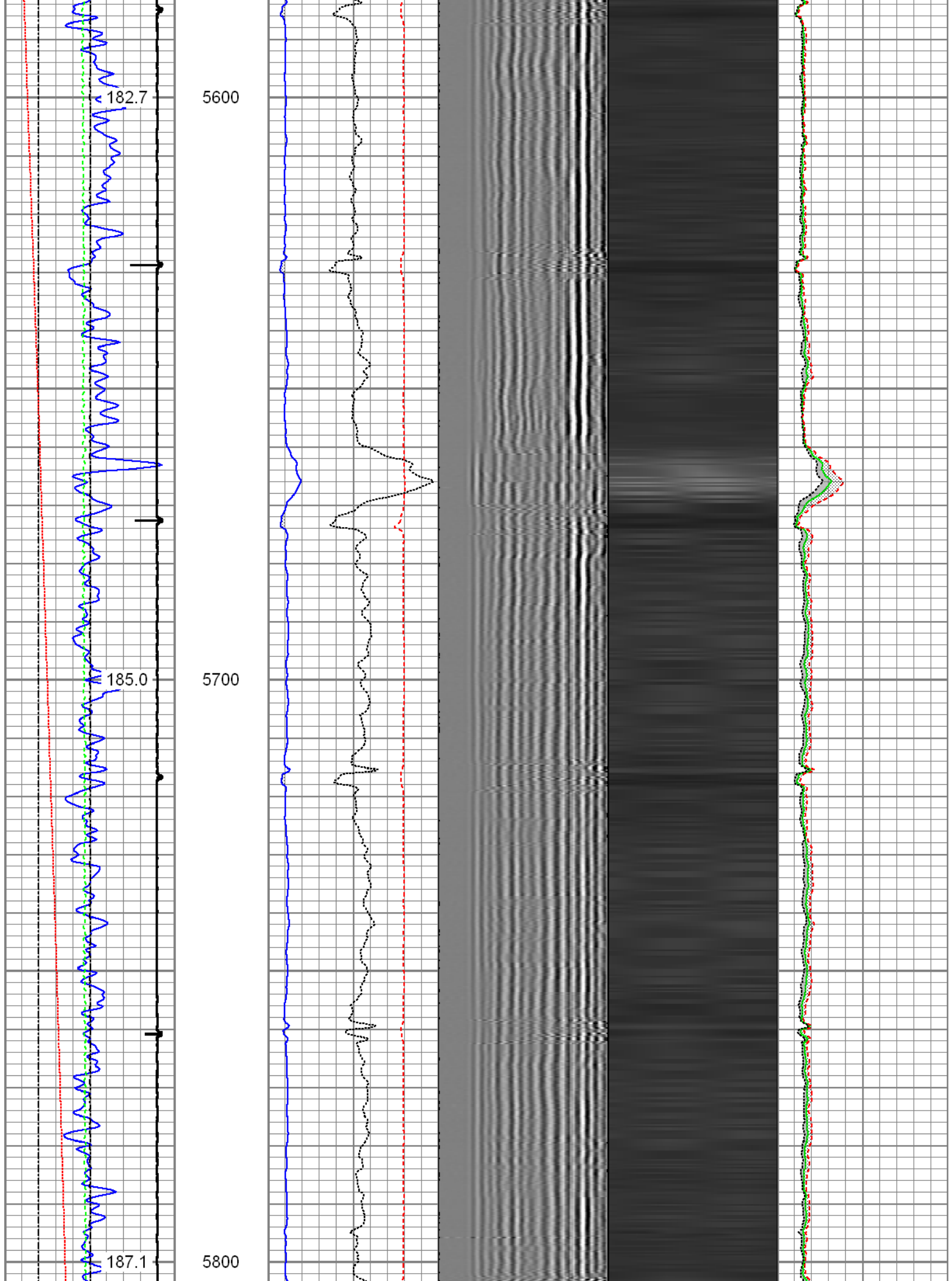


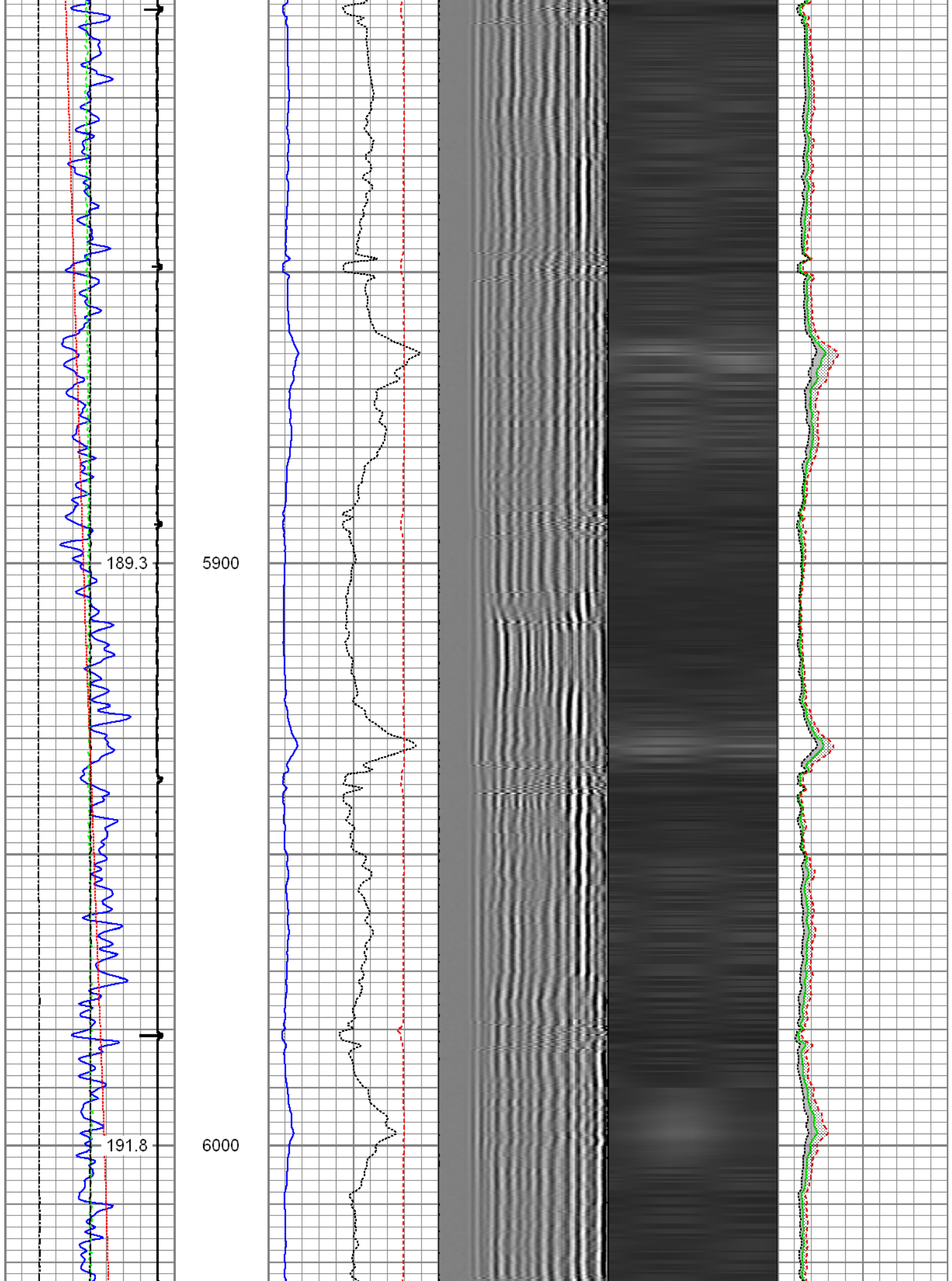


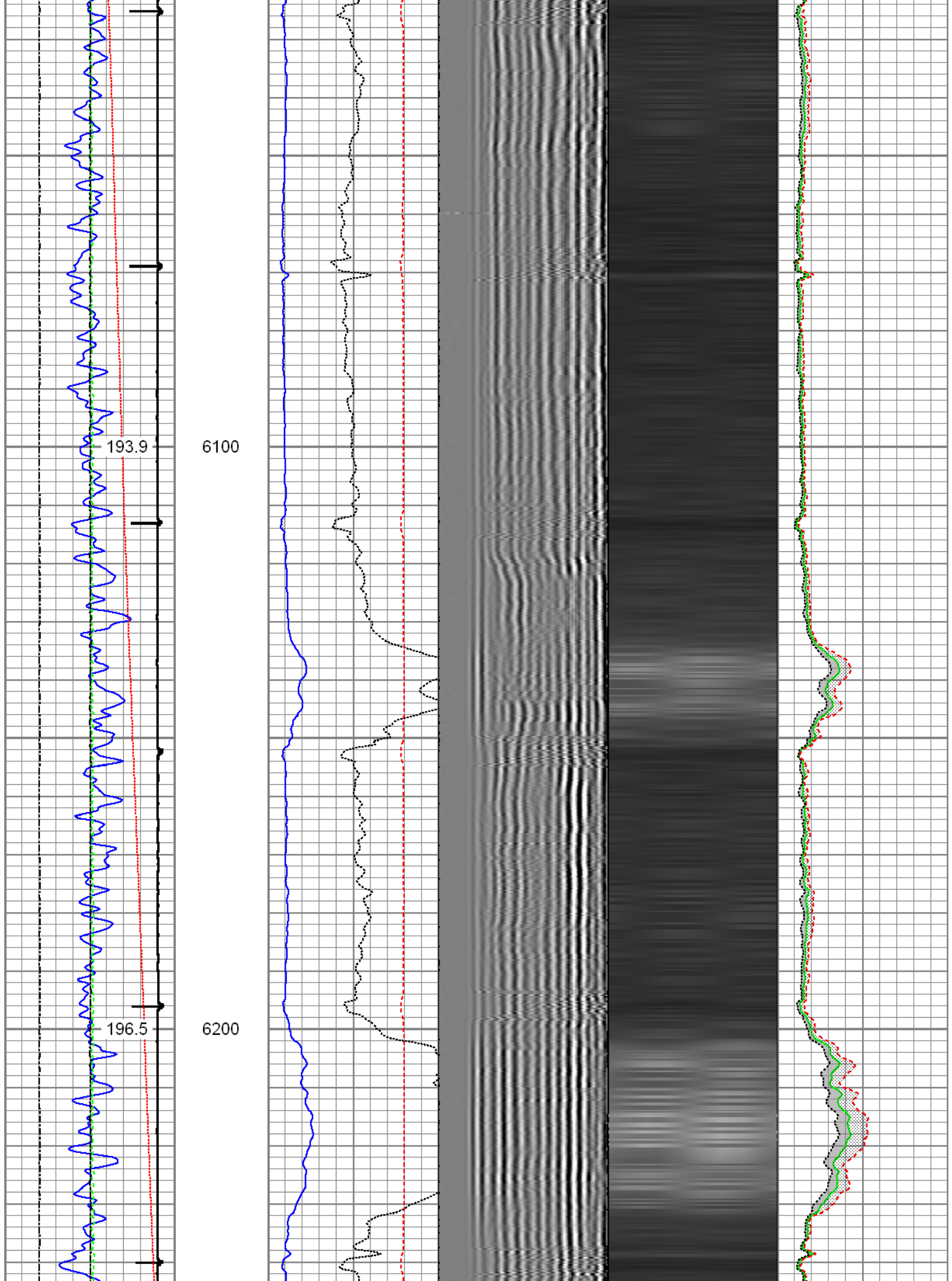


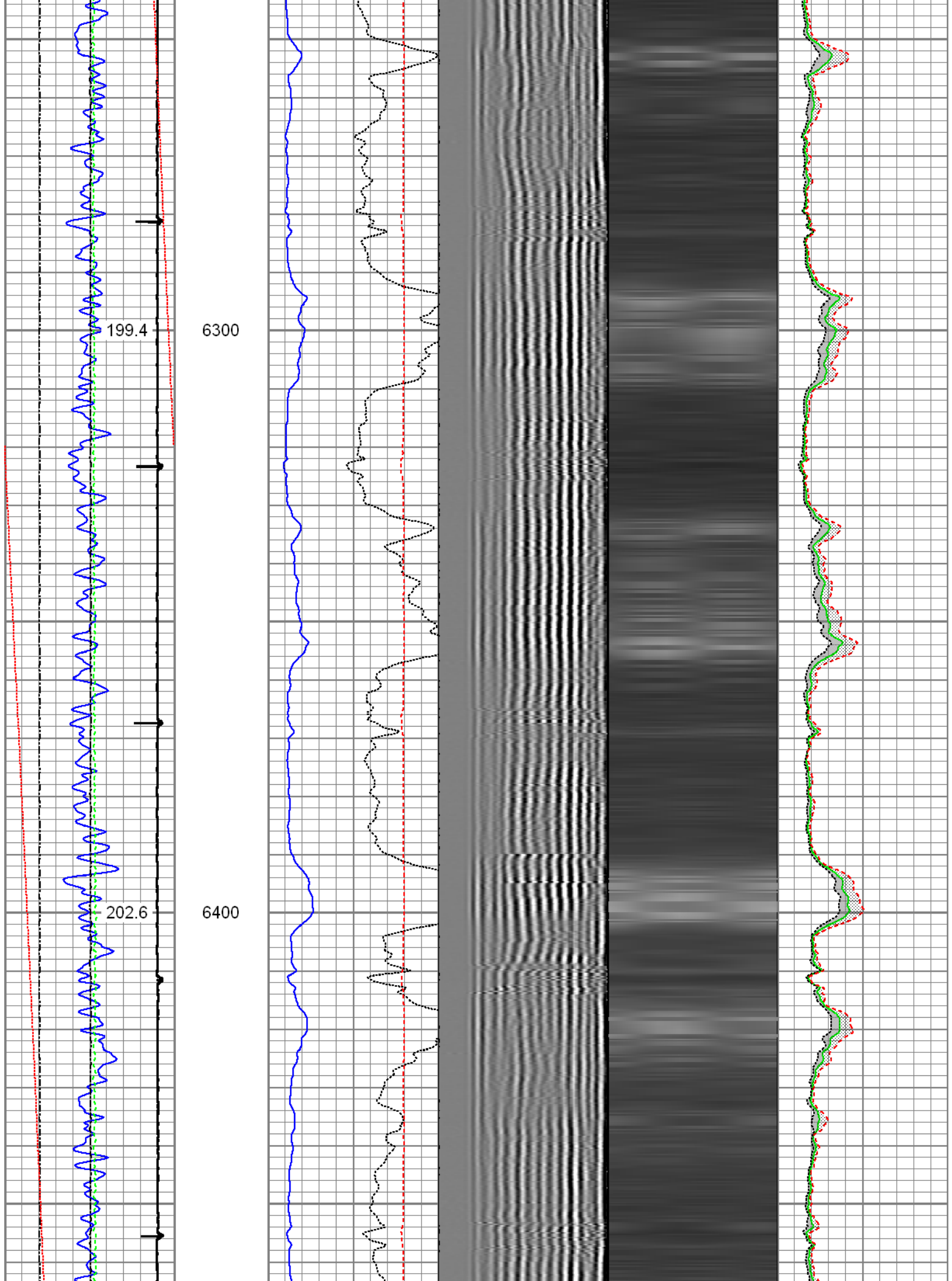


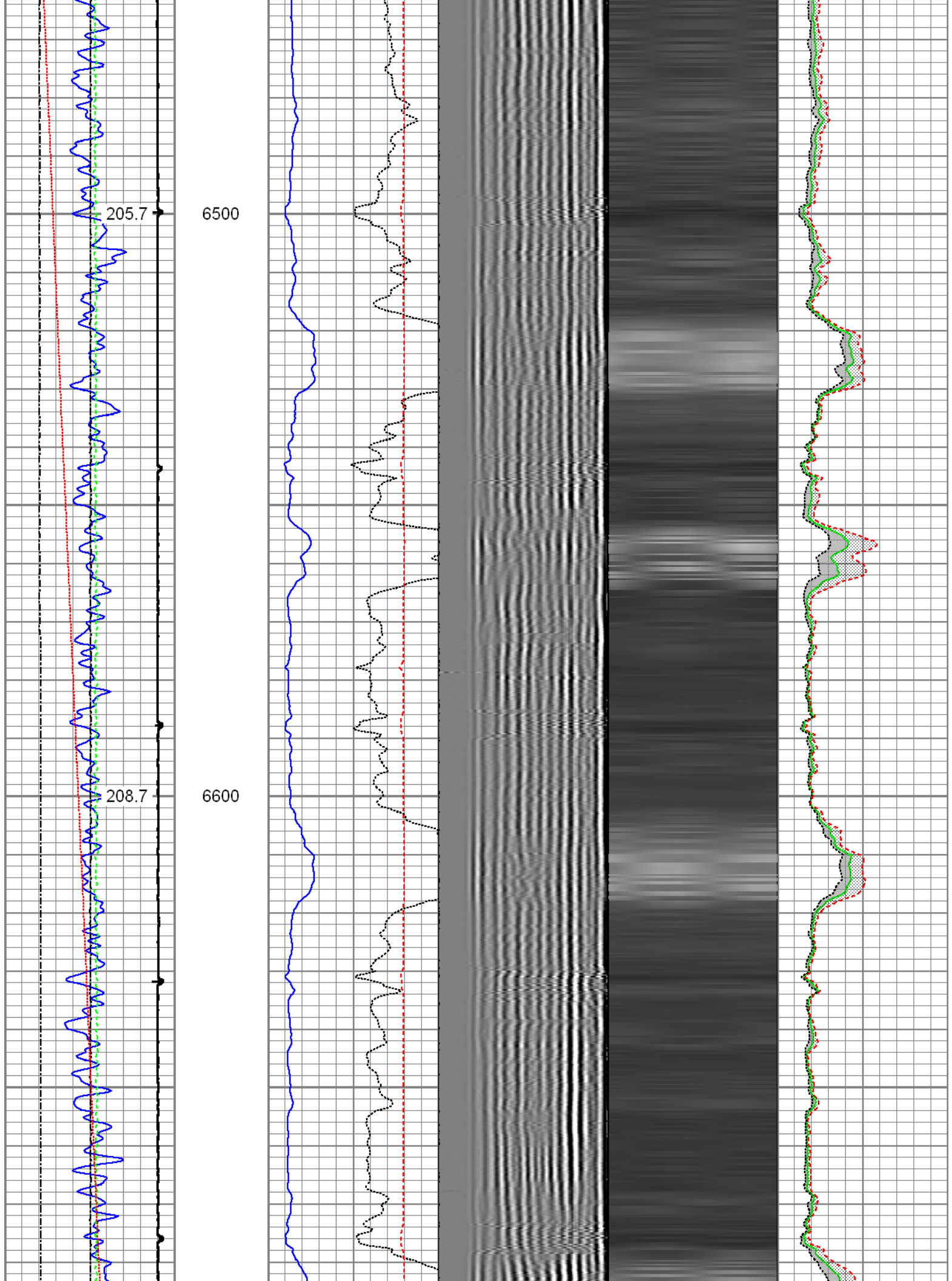


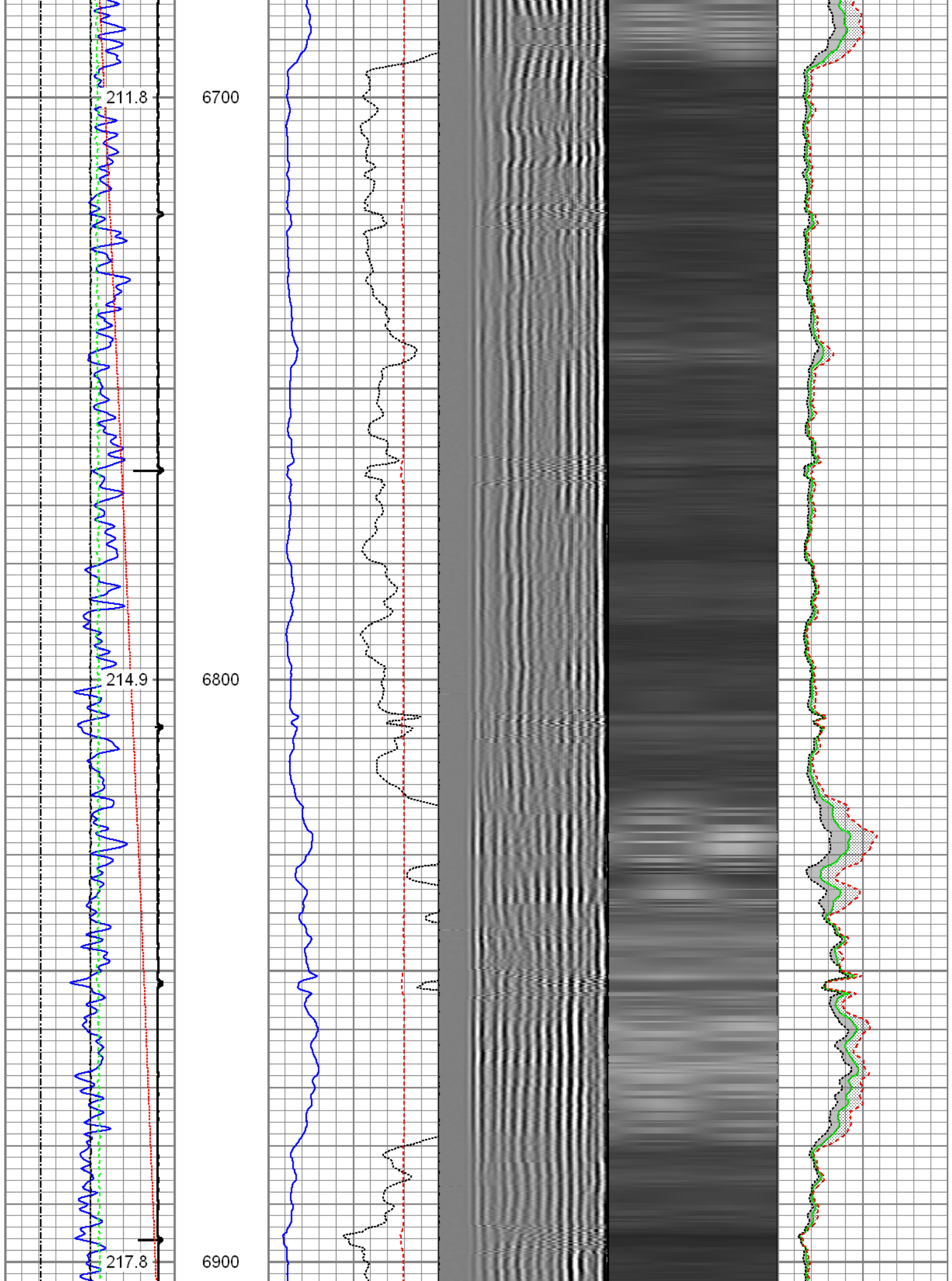


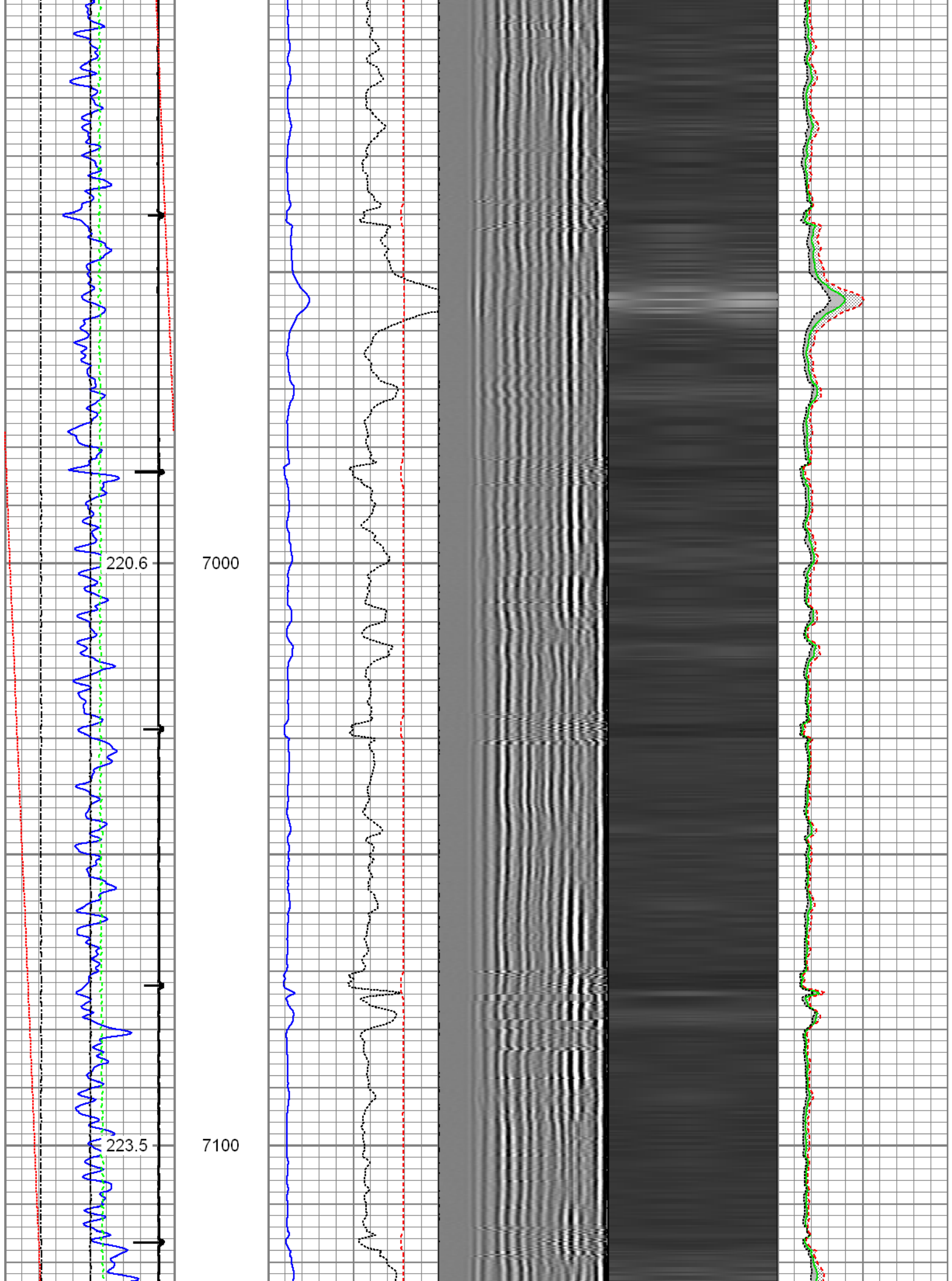


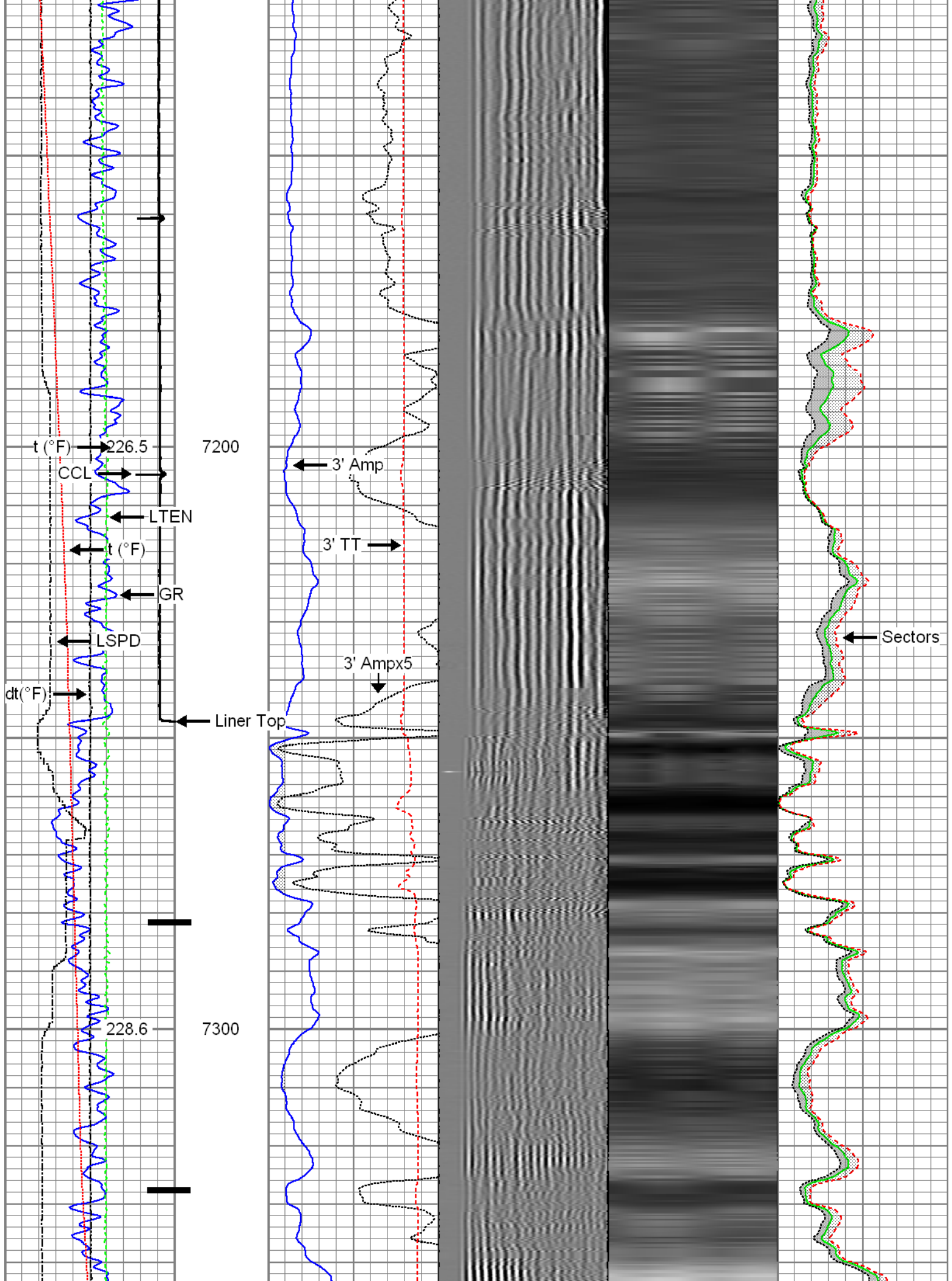


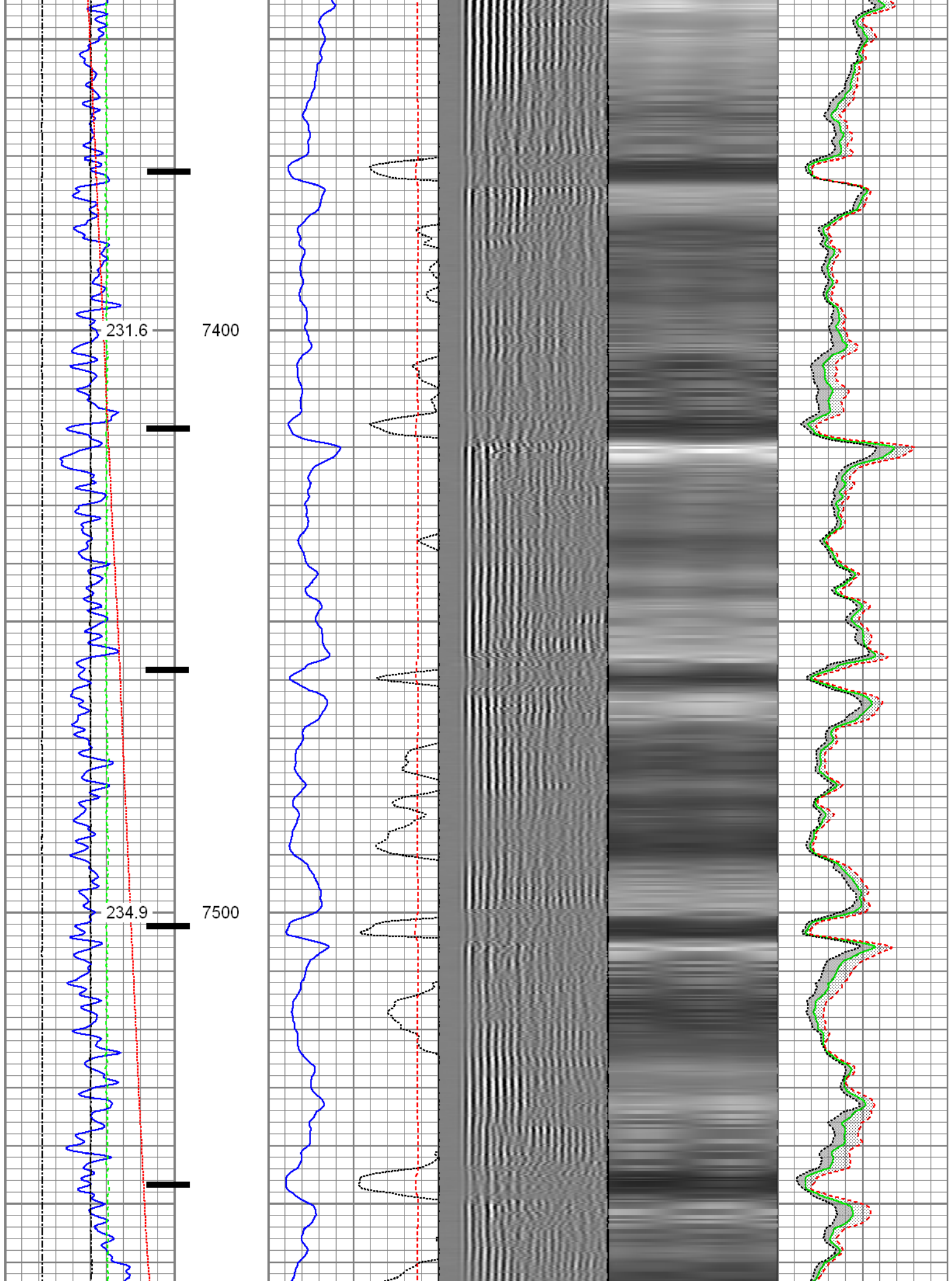


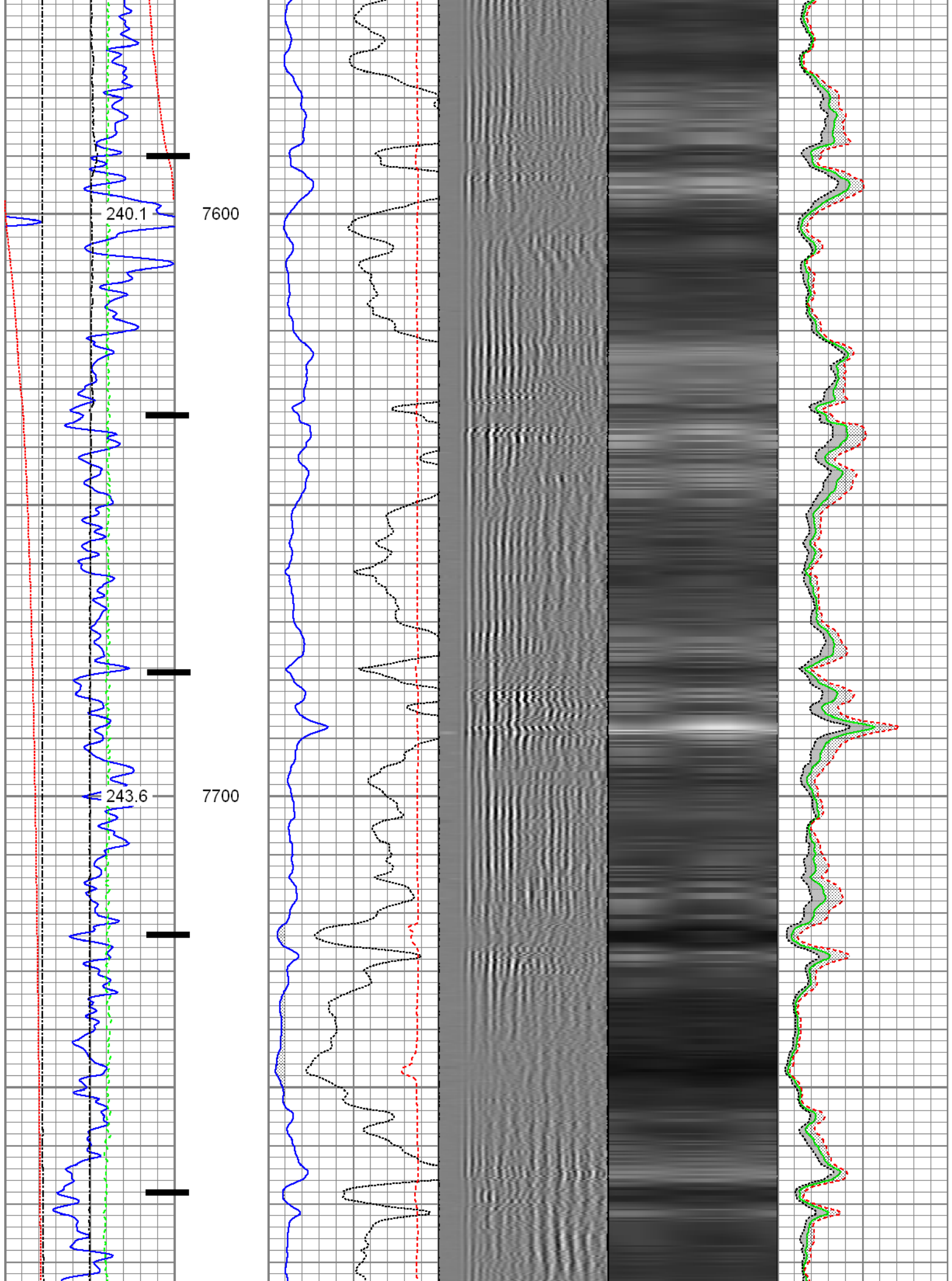


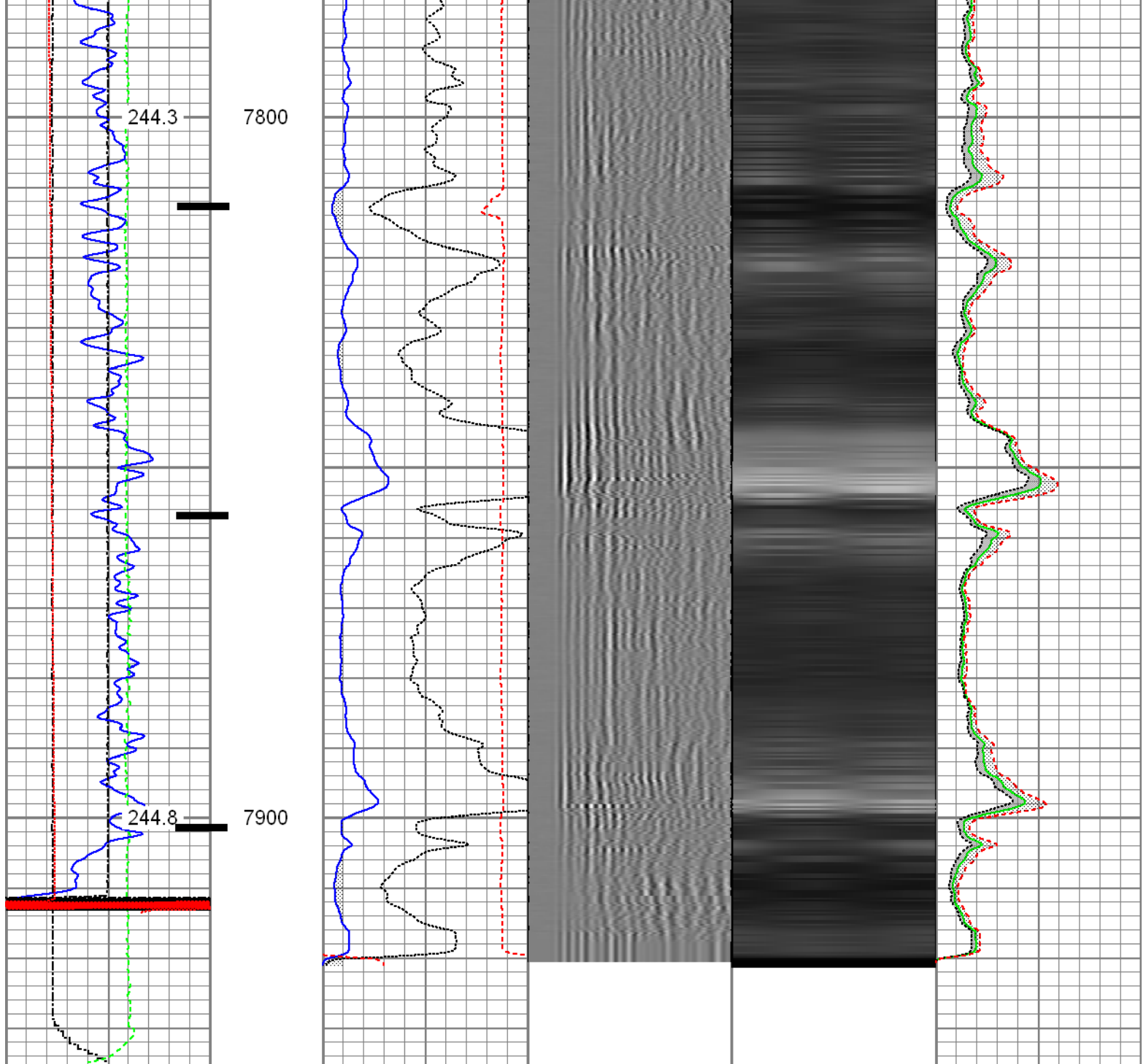








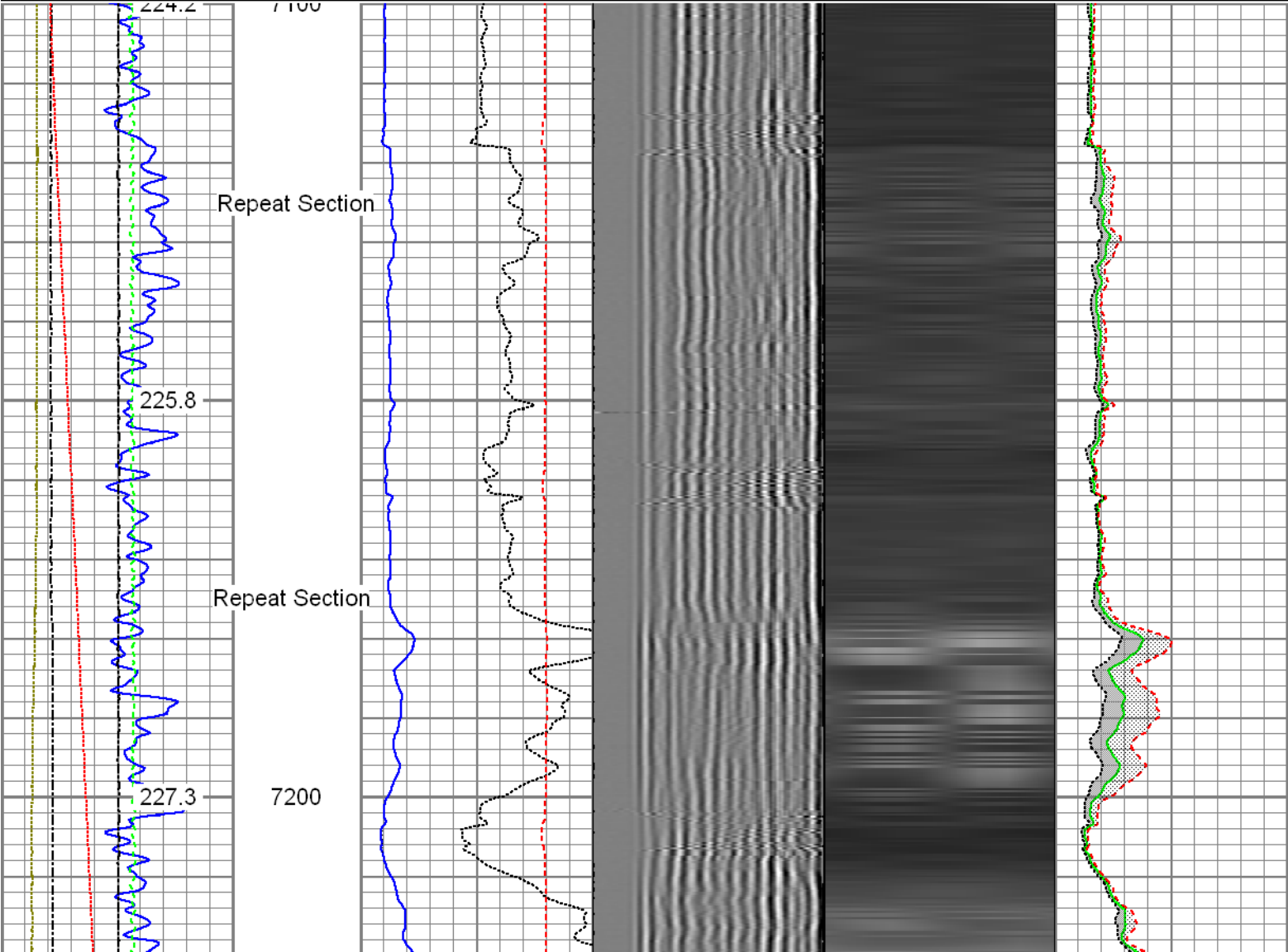


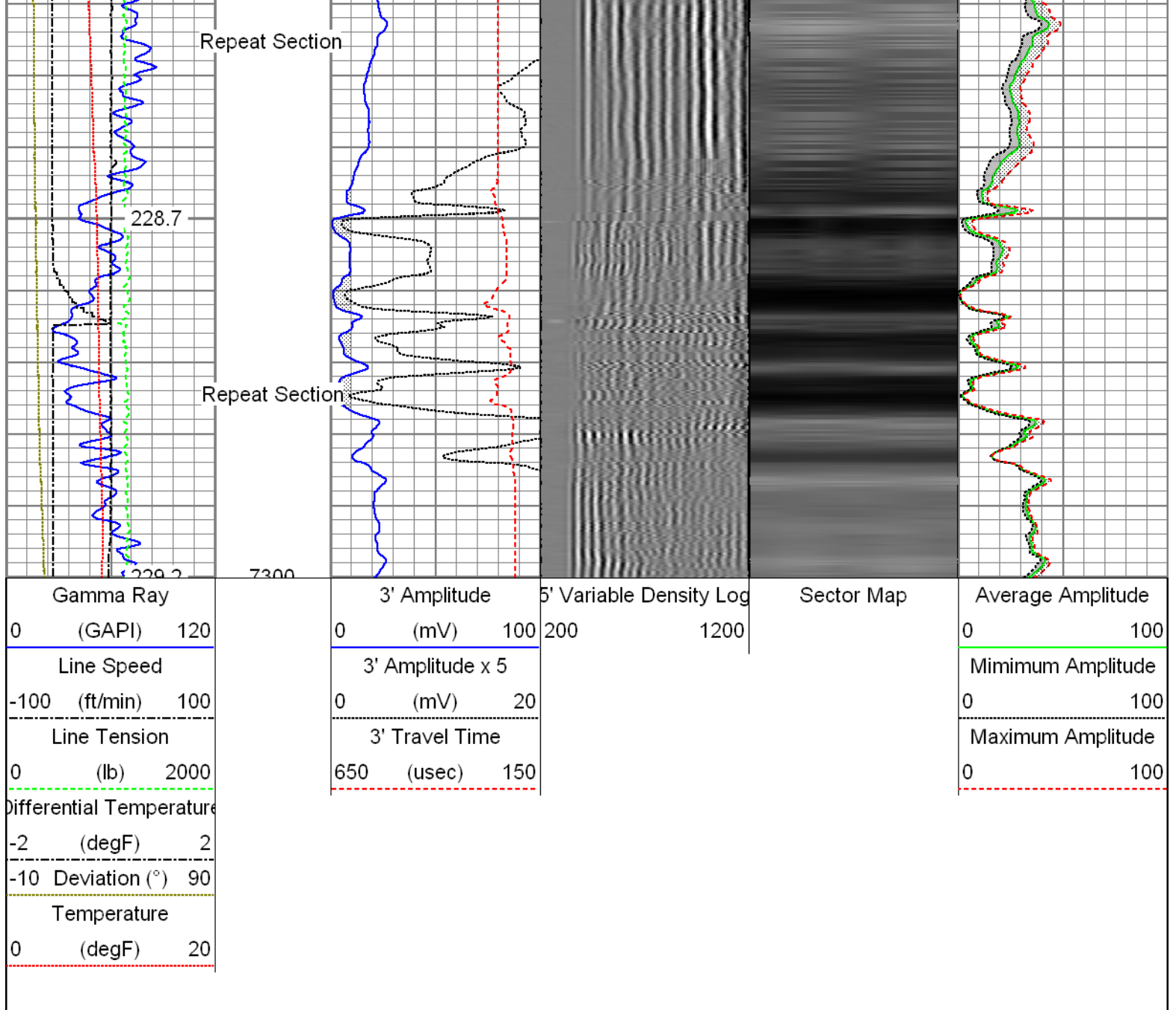


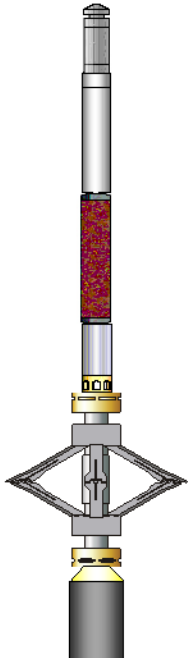
Gamma Ray	3' Amplitude	5' Variable Density Log	Sector Map	Average Amplitude
0 (GAPI) 120	0 (mV) 100	200 1200		0 100
Casing Collar Locator	3' Amplitude x 5			Minimum Amplitude
Line Speed	0 (mV) 20			0 100
-100 (ft/min) 100	3' Travel Time			Maximum Amplitude
Line Tension	650 (usec) 150			0 100
0 (lb) 2000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

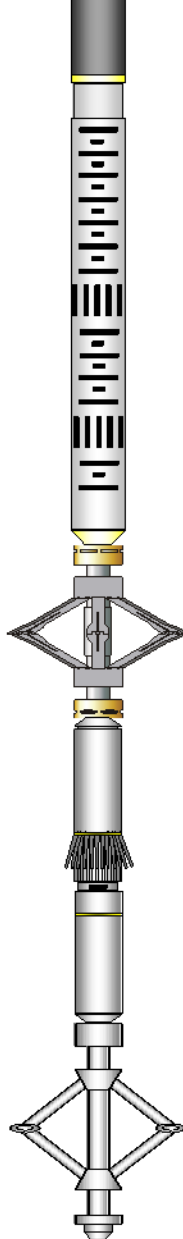
Database File: 0512336459_anadarko_buffalo 13c-15hz_08-12-15_mit_rbl.db
Dataset Pathname: pass2
Presentation Format: rbt4_mit
Dataset Creation: Wed Aug 12 09:01:26 2015 by Log 7.0 B1
Charted by: Depth in Feet scaled 1:240

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
			UW_AGS-UW_AGS_001 (218874) Sondex Adapter - GO Box to Sondex Pin	0.21	1.69	1.00
			UW_XTU-UW_XTU_002 (10010522) Crossover Ultrawire Toolbus to Ultralink	1.58	1.69	6.50
			UW_PGR-UW_PGR_020 (211727) Production Gamma Ray	1.93	1.69	9.50
TEMP	22.45		UW_PRT-UW_PRT_016 (10025097) Platinum Resistance Thermometer	1.04	1.69	5.20
			UW_PRC-DSSRAC (080) 2-3/4" DSS 5 Arm Roller Centralizer	2.55	2.75	32.00

WVF3FT	15.42		UW_RBT-UW_RBT_004 (1066) Sondex Ultrawire 3-1/8" Radial Bond Tool	9.47	3.13	140.00
WVFS1	15.42					
WVFS2	15.42					
WVFS3	15.42					
WVFS4	15.42					
WVFS5	15.42					
WVFS6	15.42					
WVFS7	15.42					
WVFS8	15.42					
CBLTEMP	15.42		UW_PRC-DSSRAC (083) 2-3/4" DSS 5 Arm Roller Centralizer	2.55	2.75	32.00
CBLROT	15.42					
WVF5FT	14.42					
MIT	5.41		UW_MIT-UW_MIT40_042 (10020664) 40 Multifinger Imaging Tool	4.54	2.75	61.10
TSTAMP	0.00		UW_PRC #4 -UW_PRC_057 (1037) Sondex 2-3/4" 4-Arm Production Roller Centraliser	2.98	2.75	32.00
			UW_BUL-UW_BUL_006 (218707) Sondex Ultrawire Bullnose Terminator	0.22	1.69	1.20
Dataset: 0512336459_Anadarko_Buffalo 13C-15HZ_08-12-15_MIT_RBL.db: field/well/run1/pass5 Total Length: 28.09 ft Total Weight: 324.50 lb O.D. 3.13 in						

Calibration Report		
Database File:	0512336459_Anadarko_Buffalo 13C-15HZ_08-12-15_MIT_RBL.db	
Dataset Pathname:	pass5	
Dataset Creation:	Wed Aug 12 11:57:17 2015 by Log 7.0 B1	
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:
Sensitivity ratio: 1.00121
X-axis angle: 134.04
Deviation const.: 327.106

1708

2156

Finger Calibration Report

Performed:

Wed Aug 12 08:37:44 2015

Ring size: (in)	4	Sens	5	Sens	6	Sens	7
Finger 01:	1134	368.0	1502	381.0	1883	390.0	2273
Finger 02:	1143	377.0	1520	389.0	1909	393.0	2302
Finger 03:	1089	371.0	1460	384.0	1844	395.0	2239
Finger 04:	1096	385.0	1481	406.0	1887	414.0	2301
Finger 05:	1079	380.0	1459	398.0	1857	406.0	2263
Finger 06:	1110	382.0	1492	391.0	1883	391.0	2274
Finger 07:	1015	397.0	1412	412.0	1824	426.0	2250
Finger 08:	1071	382.0	1453	397.0	1850	415.0	2265
Finger 09:	1035	399.0	1434	403.0	1837	414.0	2251
Finger 10:	958	397.0	1355	420.0	1775	437.0	2212
Finger 11:	1044	388.0	1432	391.0	1823	395.0	2218
Finger 12:	1018	394.0	1412	406.0	1818	411.0	2229
Finger 13:	994	385.0	1379	399.0	1778	405.0	2183
Finger 14:	971	383.0	1354	403.0	1757	408.0	2165
Finger 15:	1038	390.0	1428	387.0	1815	383.0	2198
Finger 16:	987	390.0	1377	394.0	1771	399.0	2170
Finger 17:	994	394.0	1388	397.0	1785	403.0	2188
Finger 18:	948	392.0	1340	404.0	1744	416.0	2160
Finger 19:	949	390.0	1339	399.0	1738	419.0	2157
Finger 20:	994	392.0	1386	399.0	1785	408.0	2193
Finger 21:	1010	386.0	1396	388.0	1784	399.0	2183
Finger 22:	1011	398.0	1409	394.0	1803	402.0	2205
Finger 23:	1128	378.0	1506	358.0	1864	367.0	2231
Finger 24:	990	388.0	1378	397.0	1775	408.0	2183
Finger 25:	970	389.0	1359	396.0	1755	411.0	2166
Finger 26:	1042	390.0	1432	387.0	1819	400.0	2219
Finger 27:	1075	393.0	1468	392.0	1860	404.0	2264
Finger 28:	1061	389.0	1450	390.0	1840	405.0	2245
Finger 29:	1007	383.0	1390	395.0	1785	409.0	2194
Finger 30:	1112	382.0	1494	383.0	1877	393.0	2270
Finger 31:	1109	383.0	1492	383.0	1875	395.0	2270
Finger 32:	1152	373.0	1525	371.0	1896	384.0	2280
Finger 33:	1158	381.0	1539	374.0	1913	385.0	2298
Finger 34:	1114	386.0	1500	391.0	1891	411.0	2302
Finger 35:	1139	380.0	1519	391.0	1910	401.0	2311
Finger 36:	1148	370.0	1518	374.0	1892	391.0	2283
Finger 37:	1113	382.0	1495	396.0	1891	409.0	2300
Finger 38:	1068	389.0	1457	409.0	1866	427.0	2293
Finger 39:	1095	376.0	1471	399.0	1870	421.0	2291
Finger 40:	1125	377.0	1502	390.0	1892	402.0	2294

Post Survey Calibration Check

Performed:

Wed Aug 12 11:57:11 2015

Ring size: (in)	4	Nom. wear	5	Nom. wear	6	Nom. wear	7	Nom. wear
Finger 01:	3.999	-0.000	5.012	0.006	6.004	0.002	7.001	0.000
Finger 02:	4.001	0.000	5.014	0.007	6.009	0.004	7.015	0.007
Finger 03:	4.003	0.002	5.013	0.006	6.009	0.004	7.016	0.008
Finger 04:	4.002	0.001	5.017	0.008	6.001	0.001	6.995	-0.003
Finger 05:	4.000	0.000	5.017	0.009	6.015	0.007	7.015	0.008
Finger 06:	3.994	-0.003	5.009	0.004	6.006	0.003	7.005	0.002
Finger 07:	4.000	-0.000	5.008	0.004	6.011	0.005	7.018	0.009
Finger 08:	4.001	0.001	5.024	0.012	6.023	0.011	7.014	0.007
Finger 09:	3.998	-0.001	4.999	-0.001	6.015	0.007	7.012	0.006
Finger 10:	3.995	-0.002	4.999	-0.001	6.004	0.002	7.009	0.005

Finger 11:	3.993	-0.004	5.004	0.002	6.004	0.002	7.010	0.005
Finger 12:	3.998	-0.001	5.013	0.007	6.008	0.004	7.014	0.007
Finger 13:	3.997	-0.002	5.013	0.007	6.015	0.007	7.013	0.006
Finger 14:	3.993	-0.003	5.013	0.007	6.004	0.002	7.006	0.003
Finger 15:	4.002	0.001	5.006	0.003	5.990	-0.005	6.986	-0.007
Finger 16:	4.007	0.004	5.016	0.008	6.010	0.005	7.015	0.008
Finger 17:	3.999	-0.001	5.014	0.007	6.016	0.008	7.014	0.007
Finger 18:	3.986	-0.007	4.984	-0.008	5.993	-0.003	6.978	-0.011
Finger 19:	4.008	0.004	5.015	0.008	6.013	0.007	6.990	-0.005
Finger 20:	3.992	-0.004	5.009	0.004	6.014	0.007	7.008	0.004
Finger 21:	4.004	0.002	5.014	0.007	6.012	0.006	7.012	0.006
Finger 22:	4.003	0.002	5.012	0.006	6.009	0.005	7.014	0.007
Finger 23:	4.000	0.000	5.009	0.005	6.011	0.006	7.011	0.005
Finger 24:	3.996	-0.002	5.002	0.001	6.001	0.001	7.003	0.001
Finger 25:	4.000	0.000	5.000	0.000	6.003	0.001	7.005	0.002
Finger 26:	4.004	0.002	5.017	0.008	6.009	0.005	7.011	0.005
Finger 27:	4.000	-0.000	5.003	0.001	6.003	0.001	7.004	0.002
Finger 28:	3.999	-0.000	5.008	0.004	6.006	0.003	7.009	0.005
Finger 29:	3.998	-0.001	5.067	0.033	6.044	0.022	7.048	0.024
Finger 30:	3.991	-0.004	5.007	0.004	6.011	0.005	7.012	0.006
Finger 31:	3.999	-0.000	5.003	0.002	6.006	0.003	7.005	0.003
Finger 32:	3.993	-0.004	5.001	0.000	6.005	0.002	6.999	-0.000
Finger 33:	3.998	-0.001	5.001	0.001	6.003	0.001	7.001	0.001
Finger 34:	3.997	-0.002	4.997	-0.002	5.996	-0.002	6.989	-0.005
Finger 35:	3.995	-0.003	5.004	0.002	6.002	0.001	7.012	0.006
Finger 36:	4.001	0.000	5.002	0.001	6.005	0.003	6.995	-0.003
Finger 37:	4.004	0.002	5.014	0.007	6.018	0.009	7.030	0.015
Finger 38:	3.999	-0.000	5.006	0.003	6.004	0.002	7.008	0.004
Finger 39:	3.997	-0.001	5.008	0.004	6.011	0.005	6.973	-0.014
Finger 40:	4.001	0.000	5.007	0.003	6.011	0.006	7.007	0.003
Average:	3.999	-0.001	5.010	0.005	6.008	0.004	7.007	0.004

Segmented Cement Bond Log Calibration Report						
Serial Number:		1066				
Tool Model:		UW_RBT_004				
Calibration Casing Diameter:		7.000	in			
Calibration Depth:		20.000	ft			
Master Calibration, performed Wed Aug 12 08:35:55 2015:						
	Raw (v)		Calibrated (mv)		Results	
	Zero	Cal	Zero	Cal	Gain	Offset
3FT	0.005	0.693	0.800	62.165	89.238	0.364
5FT	-0.001	0.653	0.800	62.165	93.804	0.915
S1	0.005	0.666	0.000	100.000	151.357	-0.739
S2	0.004	0.677	0.000	100.000	148.565	-0.544
S3	0.004	0.686	0.000	100.000	146.563	-0.603
S4	0.004	0.701	0.000	100.000	143.335	-0.525
S5	0.004	0.705	0.000	100.000	142.770	-0.636
S6	0.004	0.712	0.000	100.000	141.101	-0.517
S7	0.005	0.715	0.000	100.000	140.807	-0.650
S8	0.005	0.688	0.000	100.000	146.459	-0.703
Temperature Calibration Report						

Point #	Reading	Reference
1	13053.00	cps
2	18014.00	cps
3	29668.00	cps
4	41181.00	cps
5	52983.00	cps
6	58931.00	cps
7		cps
8		cps
9		cps
10		cps

Gamma Ray Calibration Report		
Serial Number:	211727	
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	Buffalo 13C-15HZ
	Field	Wattenberg
	County	Weld
	State	Colorado