



Radial Cement Bond
Gamma Ray
Casing Collar Log

Company	Noble Energy Inc.			Company	Noble Energy Inc.		
Well	Wells Ranch AE32-670			Well	Wells Ranch AE32-670		
Field	Wattenberg			Field	Wattenberg		
County	Weld			County	Weld		
State	Colorado			State	Colorado		
Location:				API # : 05-123-41722			
SEC 32 TWP 6N RGE 62W				Other Services			
				MIT			
Permanent Datum	Ground Level	Elevation	4729'	Elevation			
Log Measured From	Kelly Bushing	30 FT		K.B. 4759'			
Drilling Measured From	Kelly Bushing			D.F. 4758'			
				G.L. 4729'			

Date	16-OCT-2015		
Run Number	One		
Depth Driller	16149 FT		
Depth Logger	6728 FT		
Bottom Logged Interval	6723 FT		
Top Log Interval	Surface		
Open Hole Size	8.750"		
Type Fluid	Water		
Density / Viscosity	8.34 lbm/gal		
Max. Recorded Temp.	223°F		
Estimated Cement Top	96 FT		
Time Well Ready	ROA		
Time Logger on Bottom	8:30 AM		
Equipment Number	HD-0340		
Location	Fort Lupton, CO		
Recorded By	B. Kalkwarf		
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	30 FT	622.8 FT		
Intermediate #1	7	26	P-110	30 FT	6985.6 FT		
Intermediate #2							
Liner	4 1/2	11.6	P-110IC	6820.1 FT	16139 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
Log ran from 6728 FT to Surface
Log was correlated to Casing Tally liner top of 6820 FT
Adjusted log 2 FT from KB to correlate with liner top
Recorded with 2500 PSI surface induced pressure
Logging tools were very dirty, caliper had metal shavings and debris all over fingers

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



Main Pass

Recorded with 2500 PSI Surface Induced Pressure

Database File: c:\warrior\data\noble energy_wells ranch ae32-670\10-16-15_noble energy_wells ranch ae32-670_mit

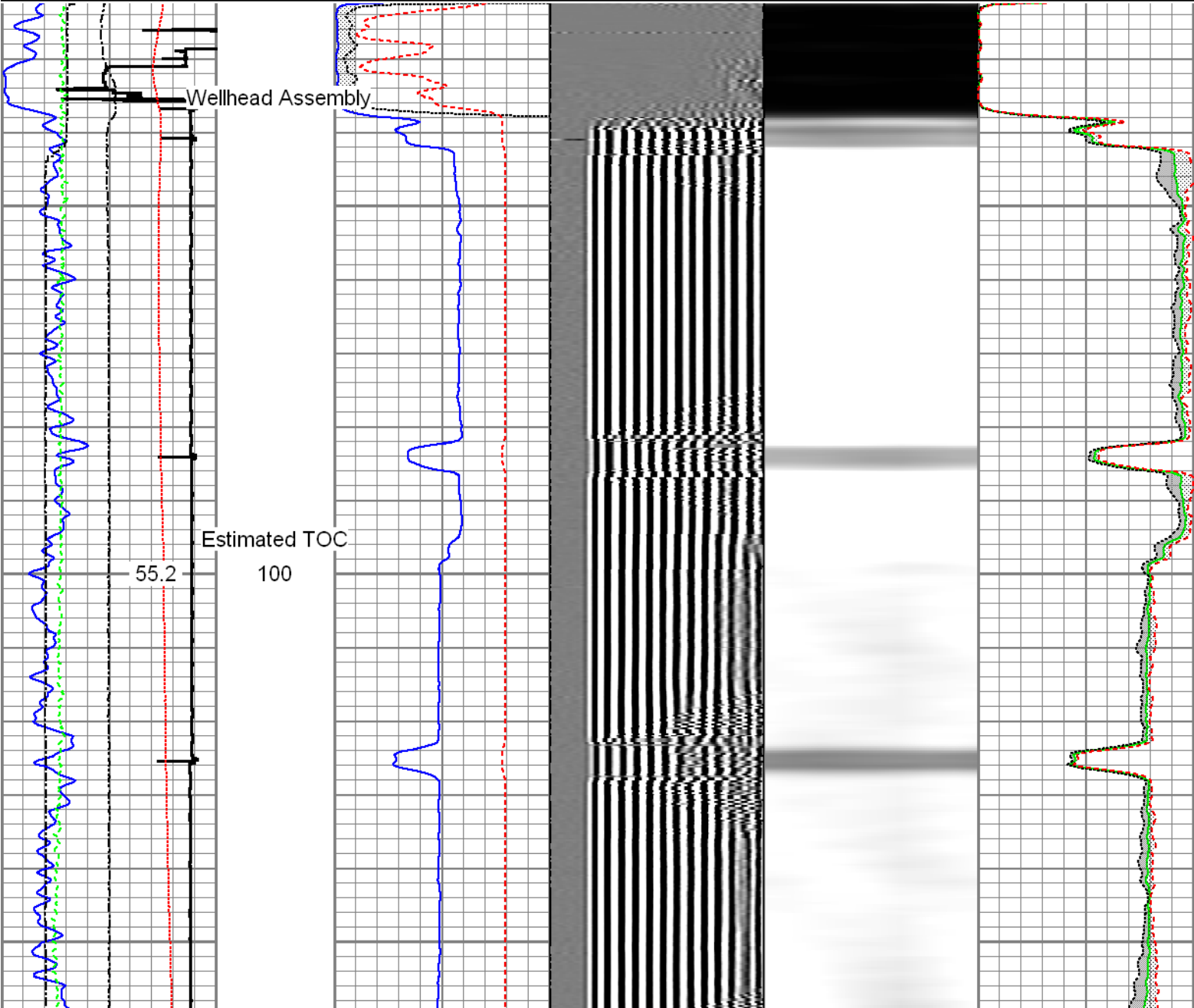
Dataset Pathname: pass3

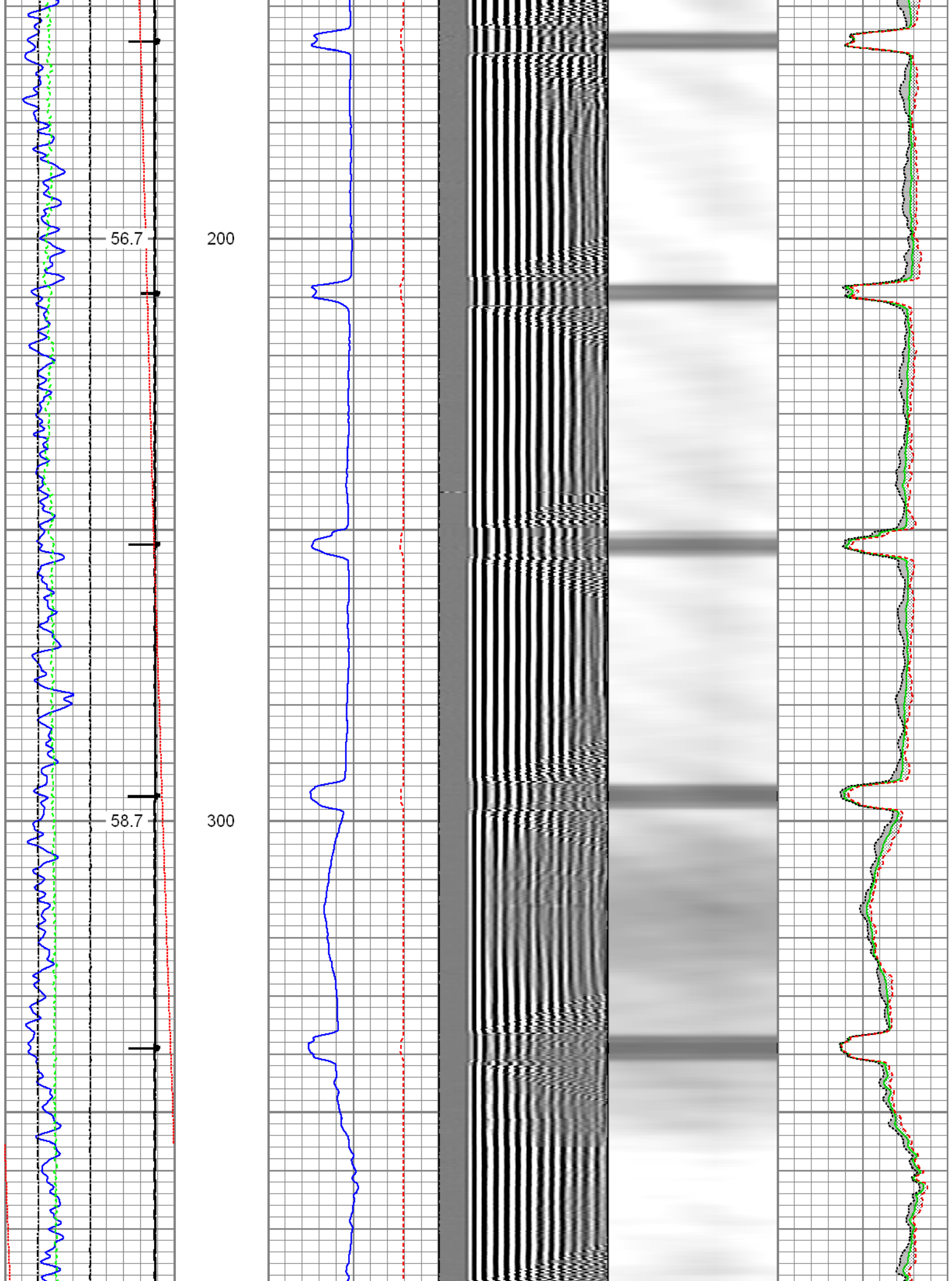
Presentation Format: rbt4_mit

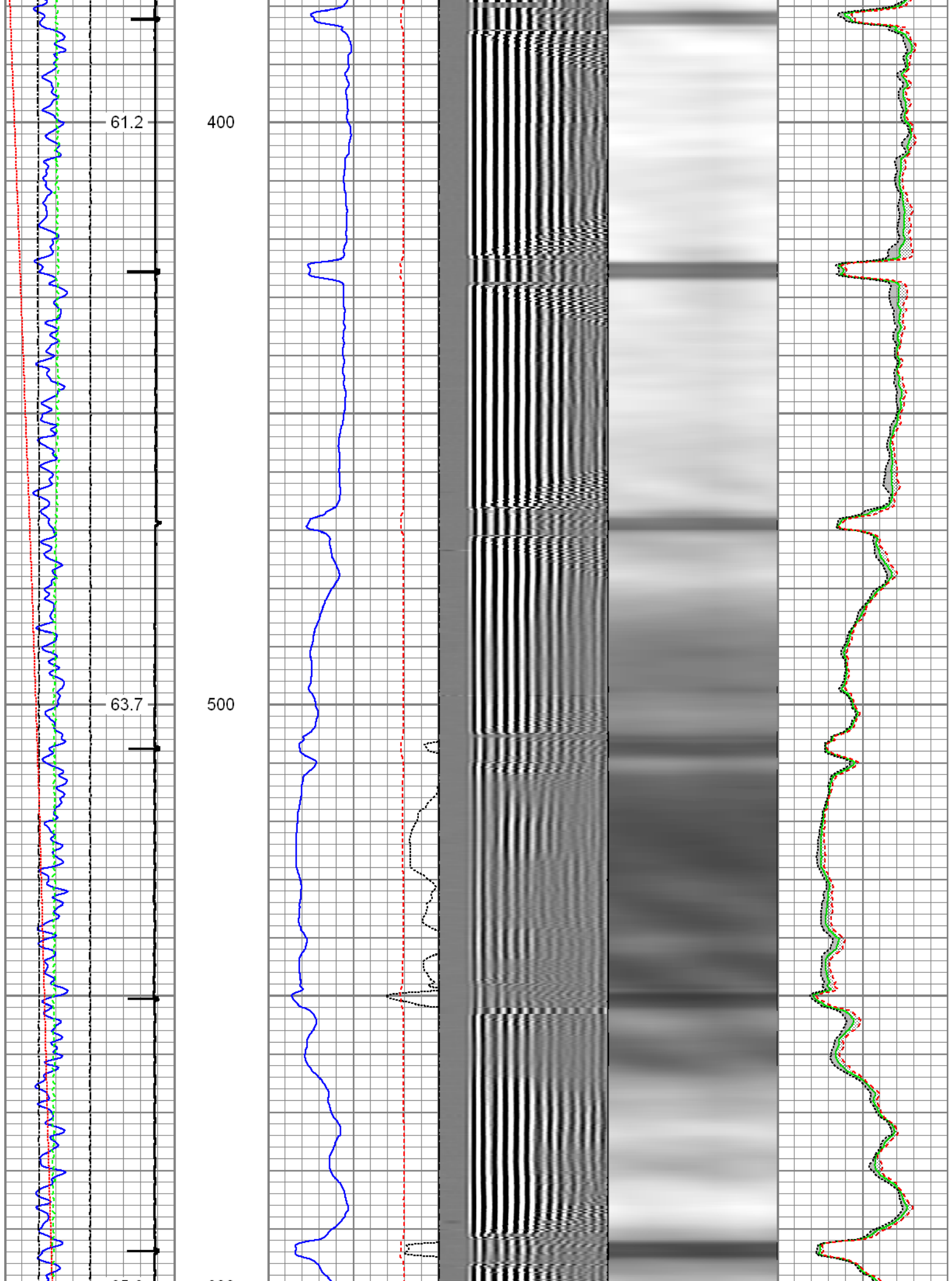
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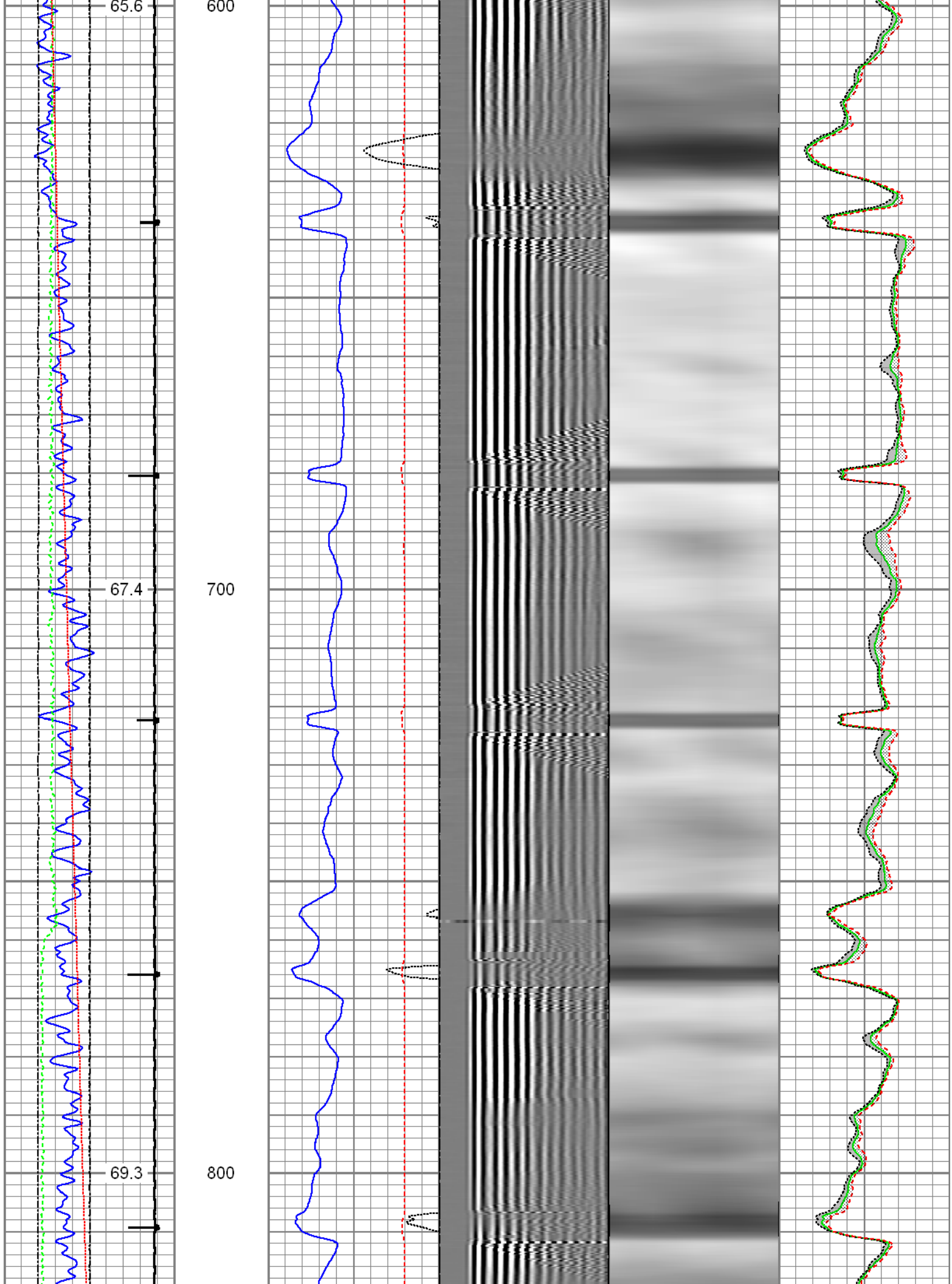
Charted by: Depth in Feet scaled 1:240

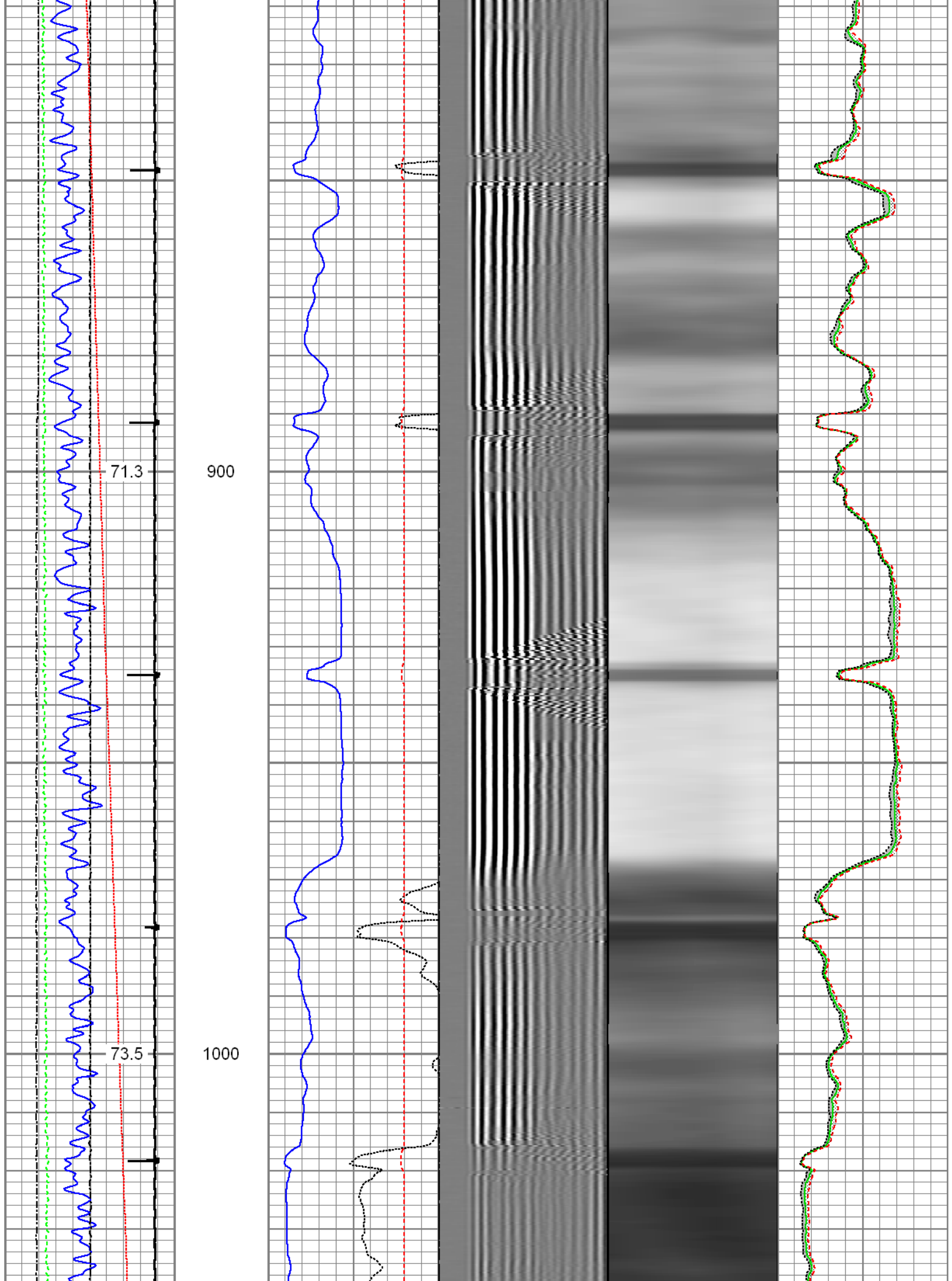
Gamma Ray	3' Amplitude	5' Variable Density Log	Sector Map	Average Amplitude
0 (GAPI) 120	0 (mV) 100	200 1200		0 100
Casing Collar Locator	3' Amplitude x 5			Mimimum Amplitude
Line Speed	0 (mV) 20			0 100
-100 (ft/min) 100	3' Travel Time			Maximum Amplitude
Line Tension	650 (usec) 150			0 100
0 (lb) 2000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

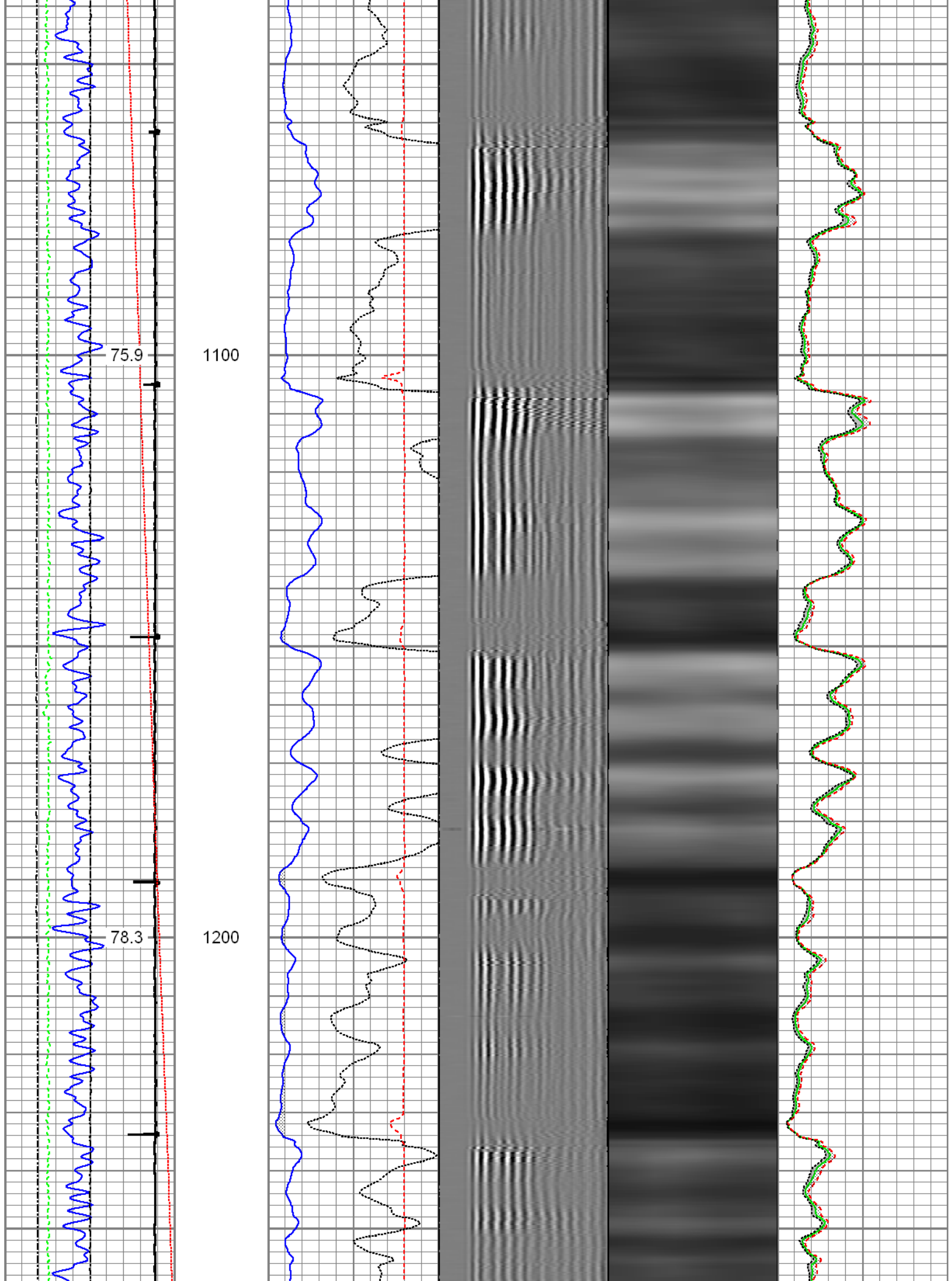


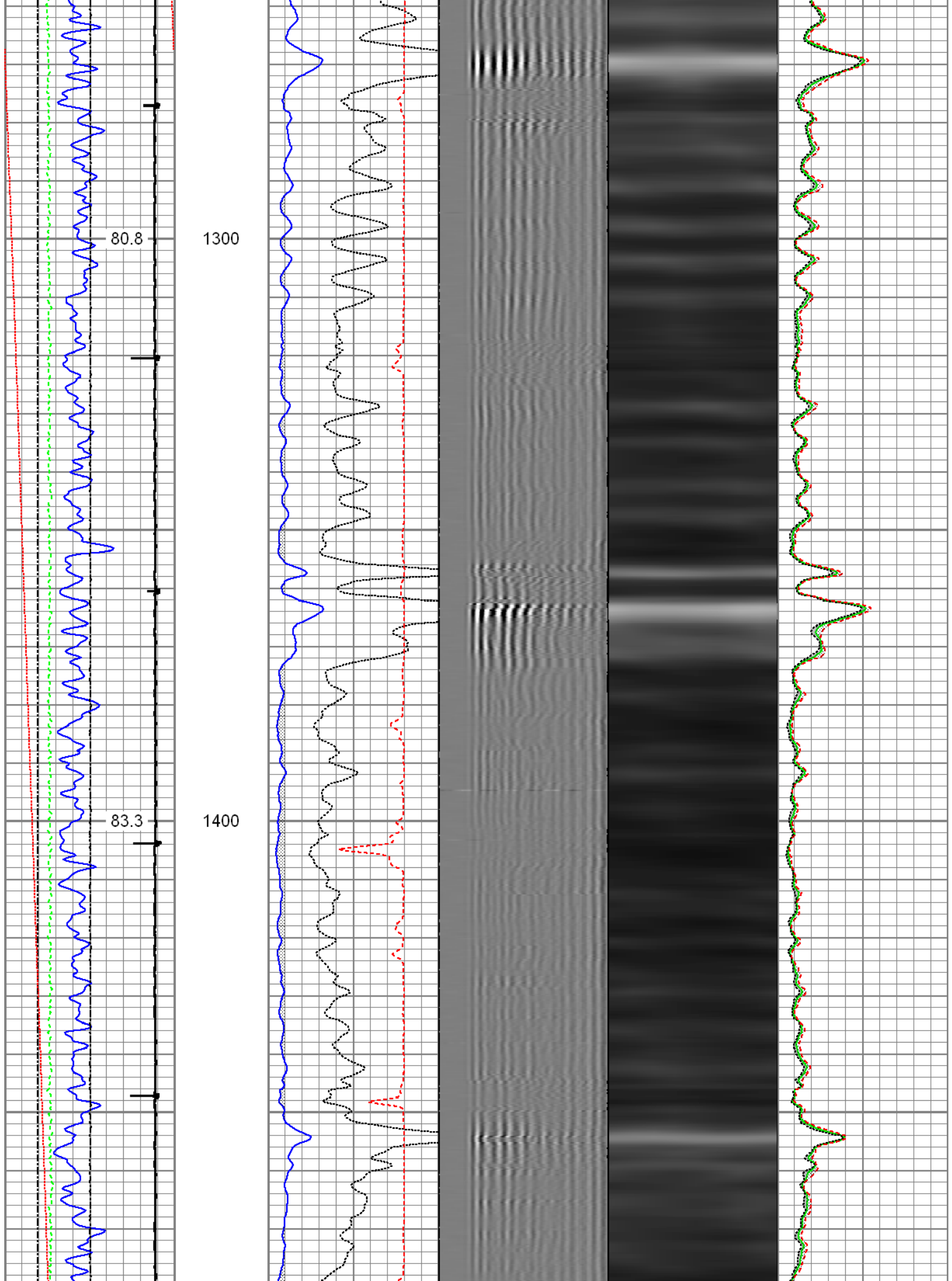


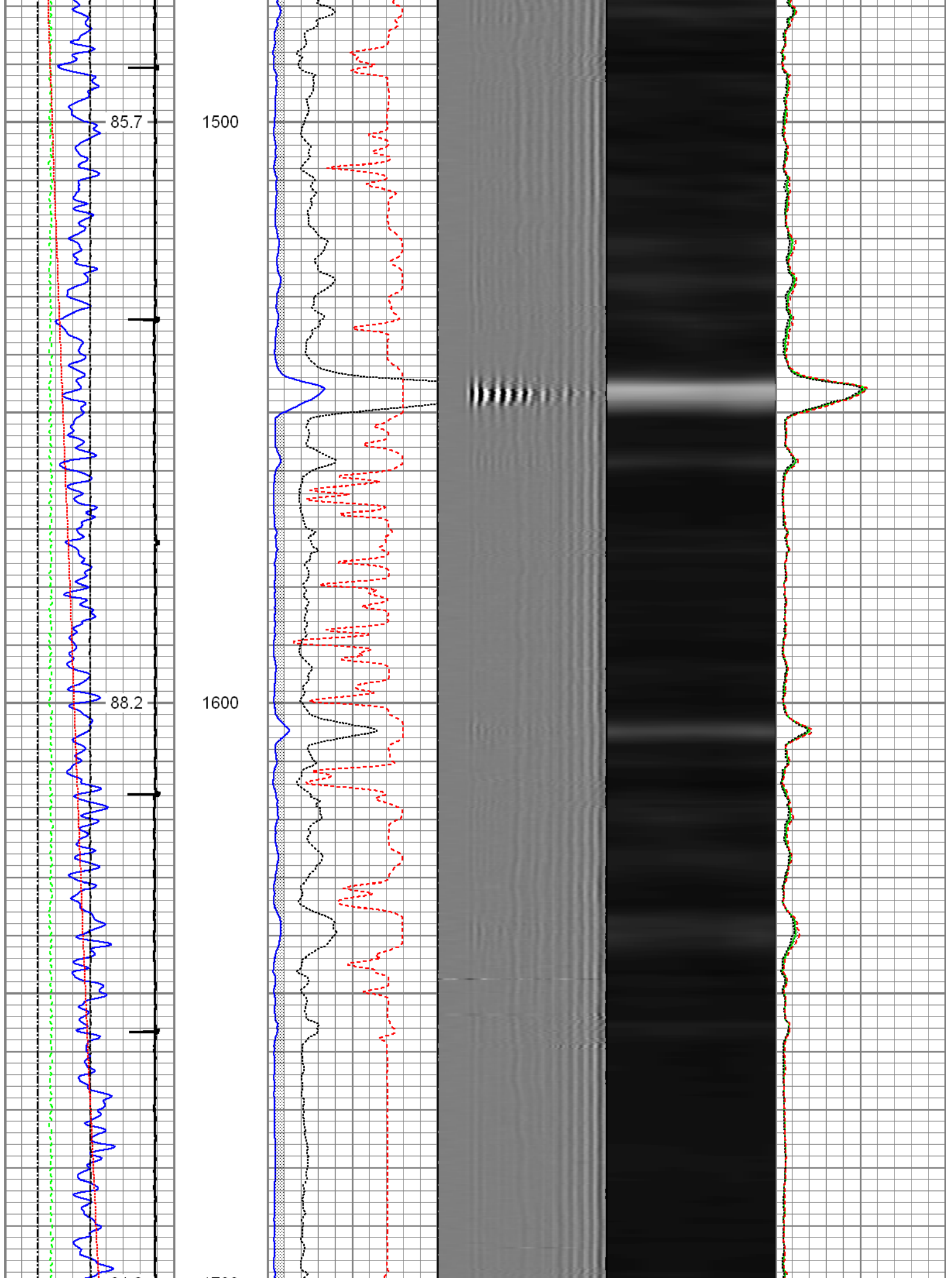


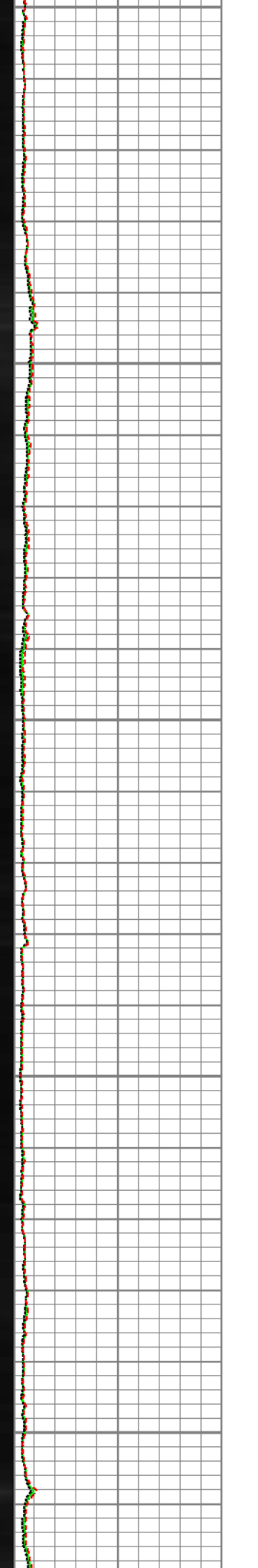
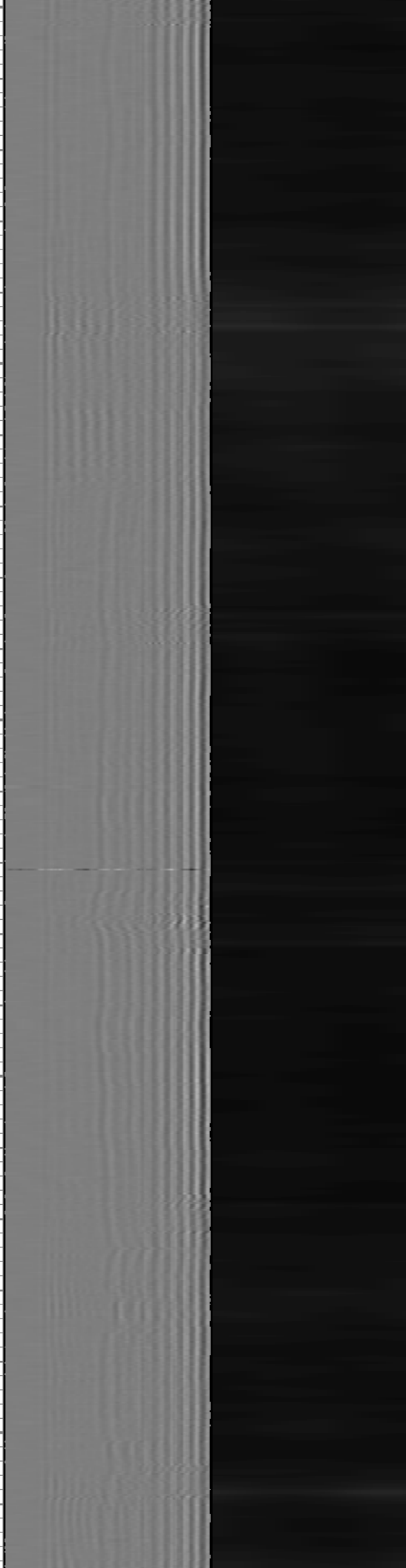
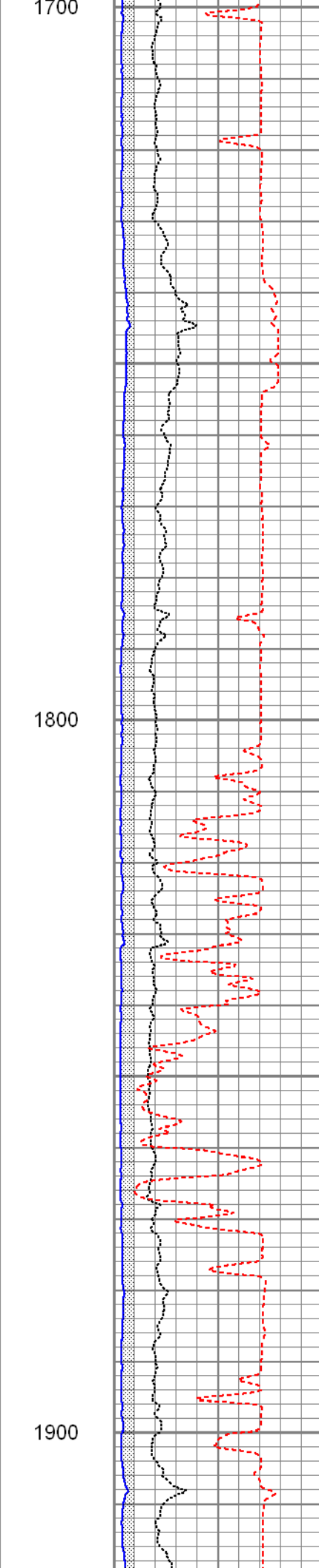
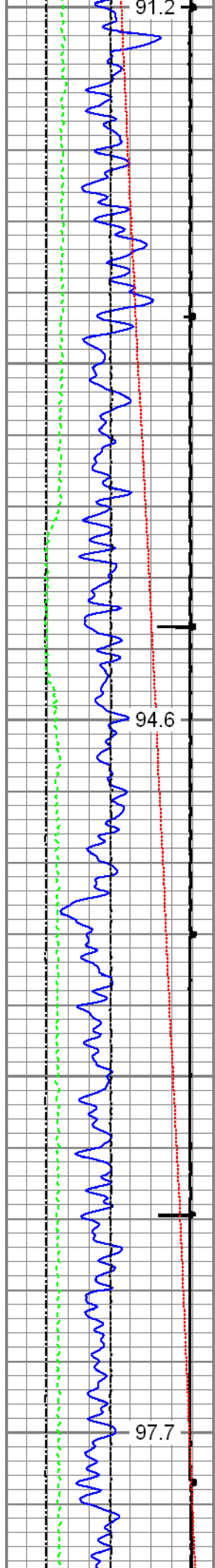


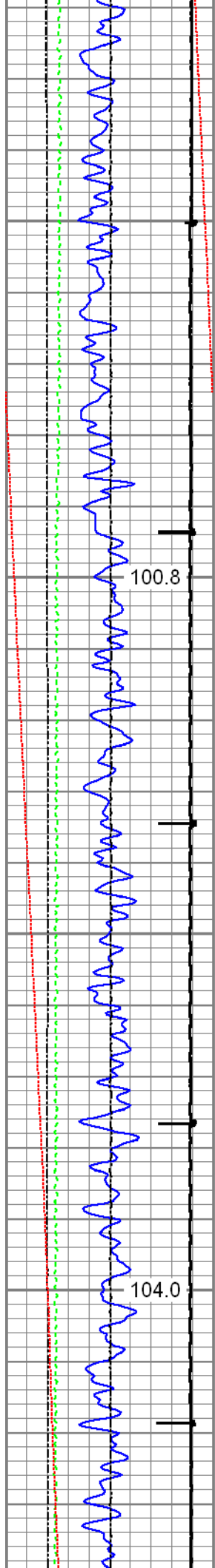






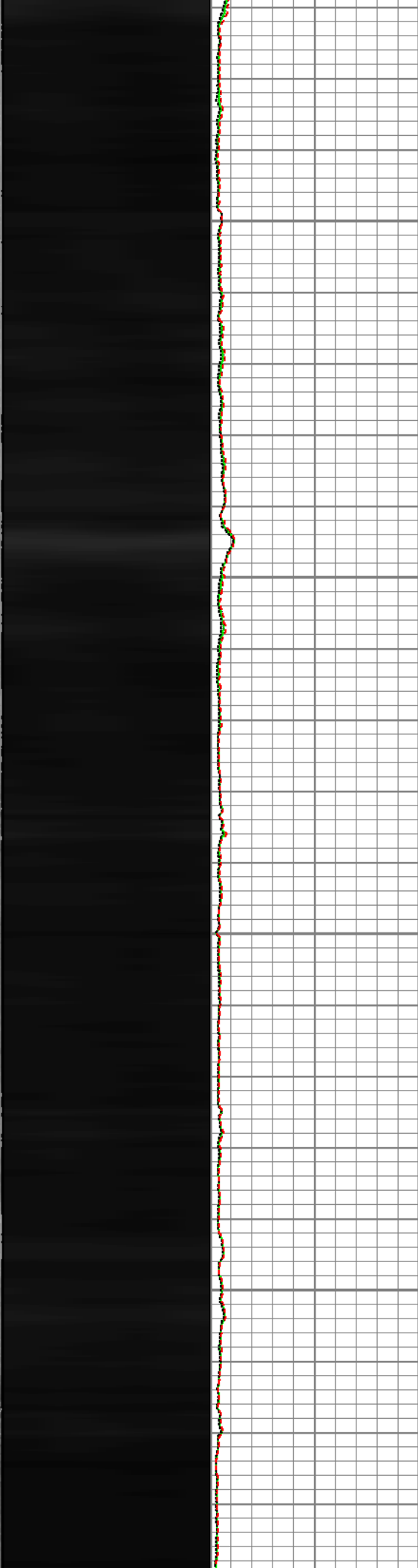
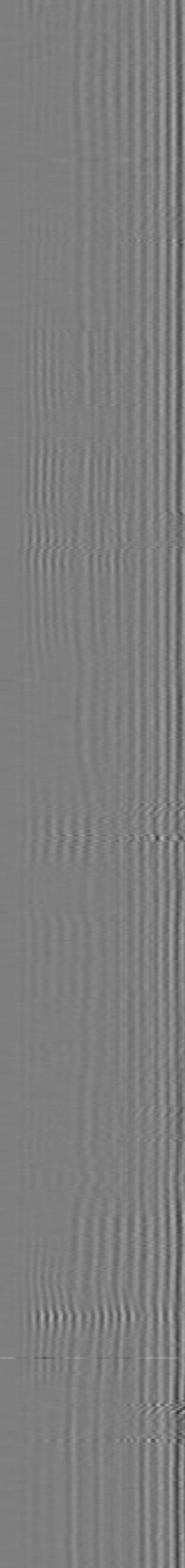
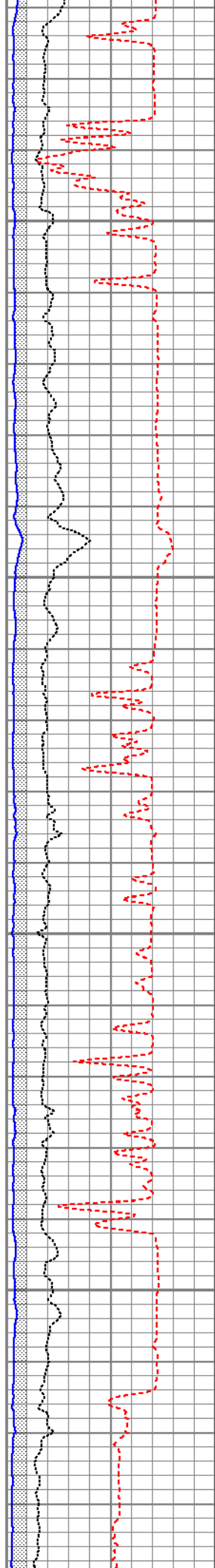


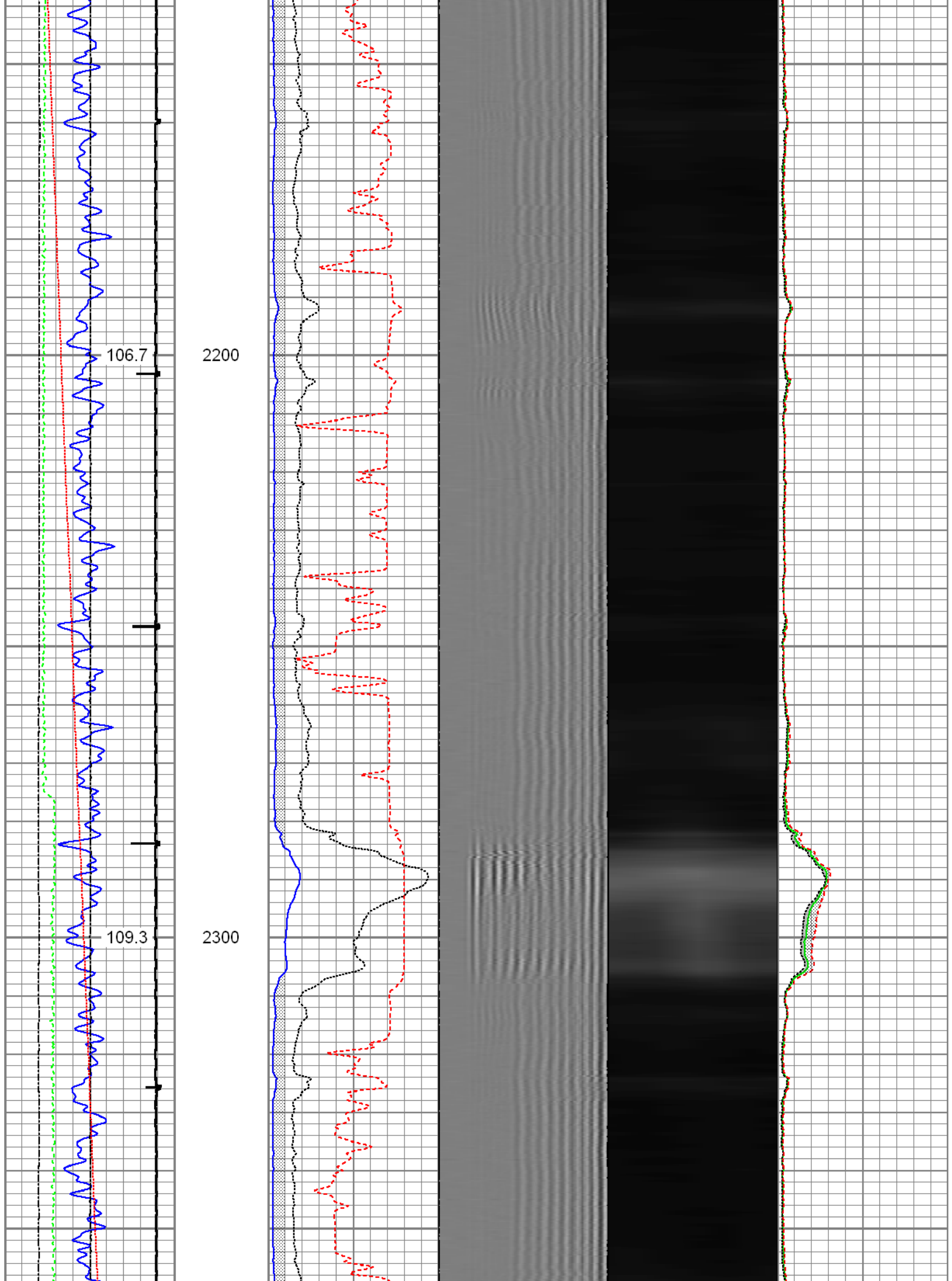


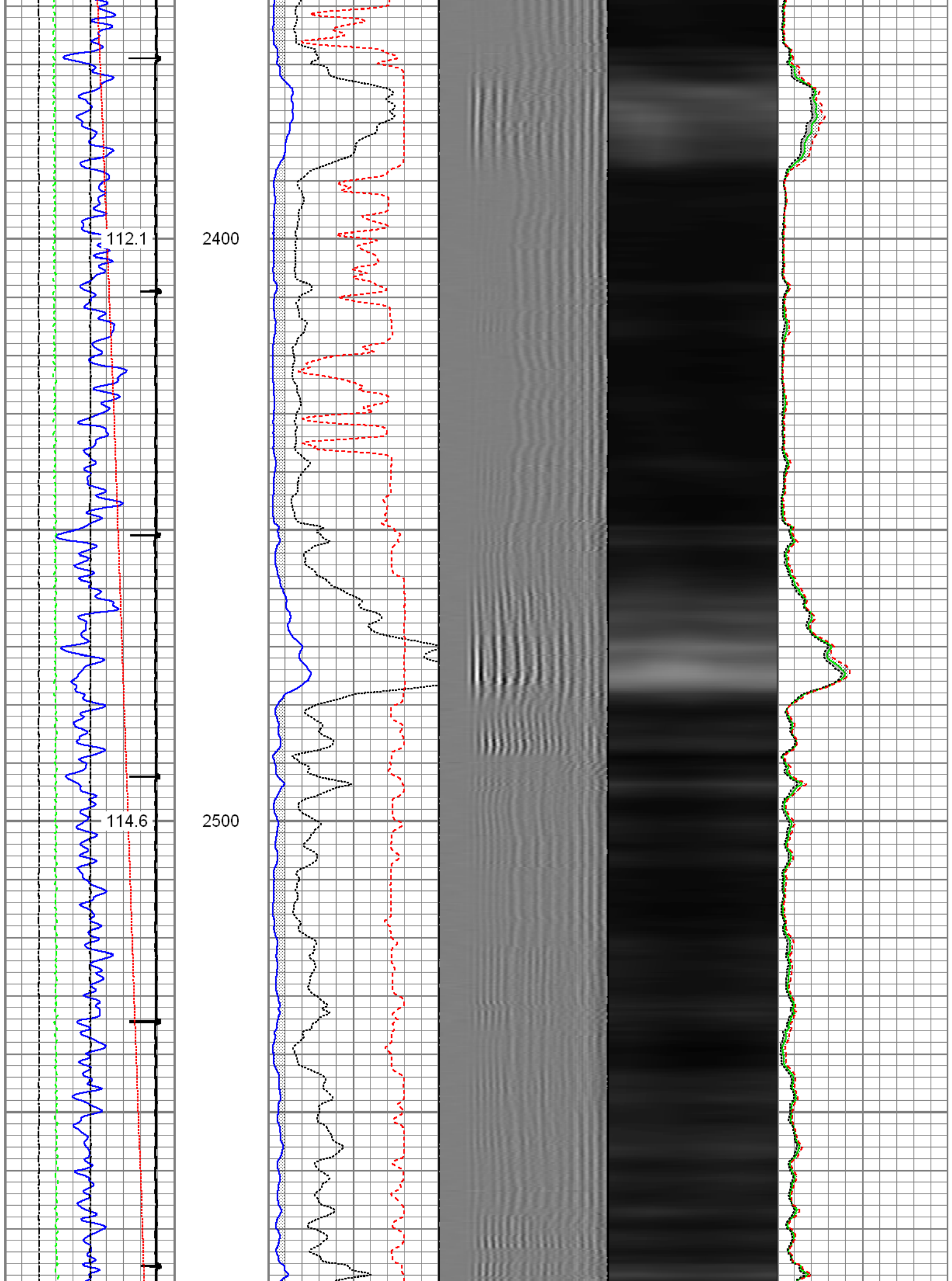


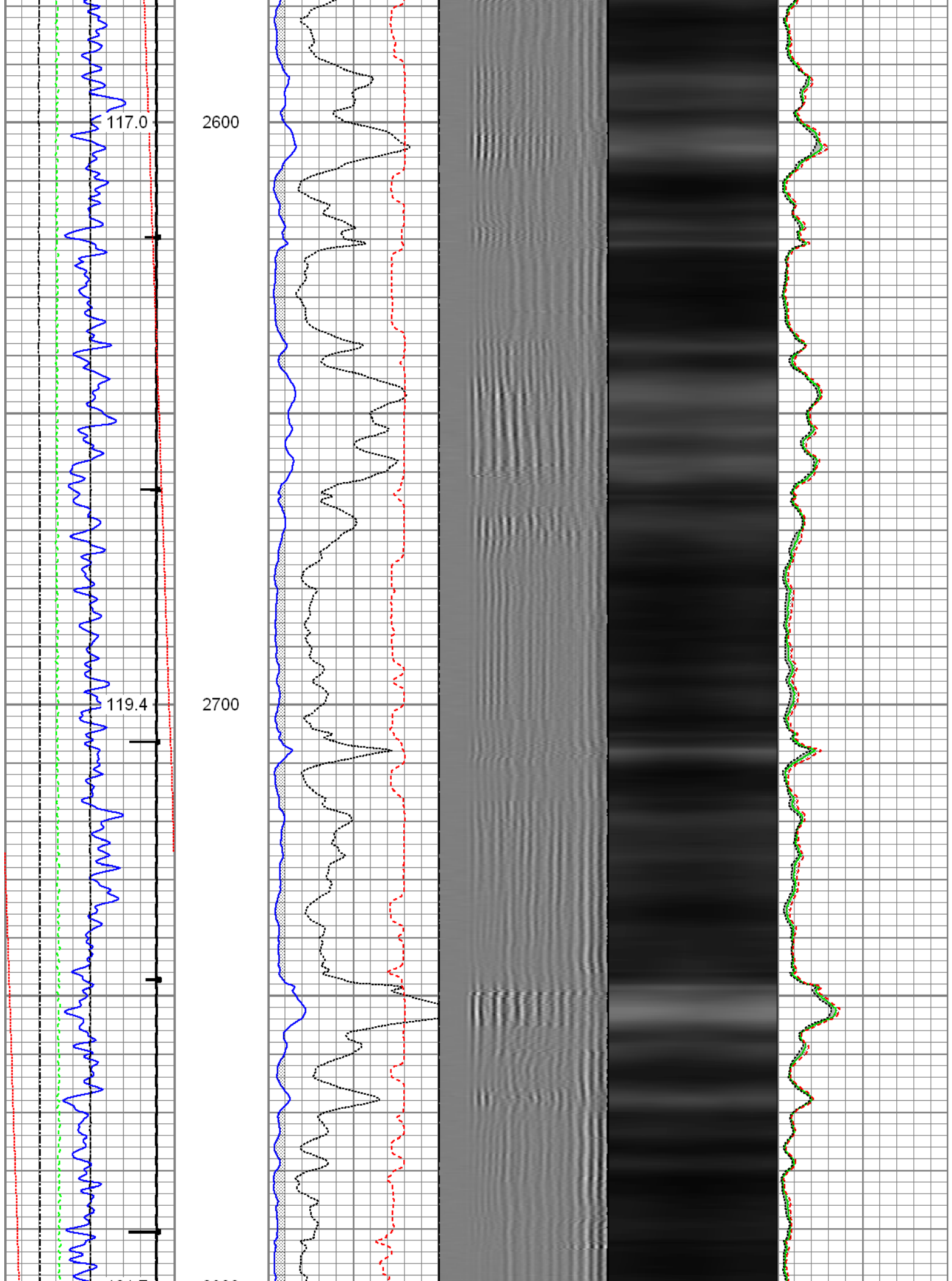
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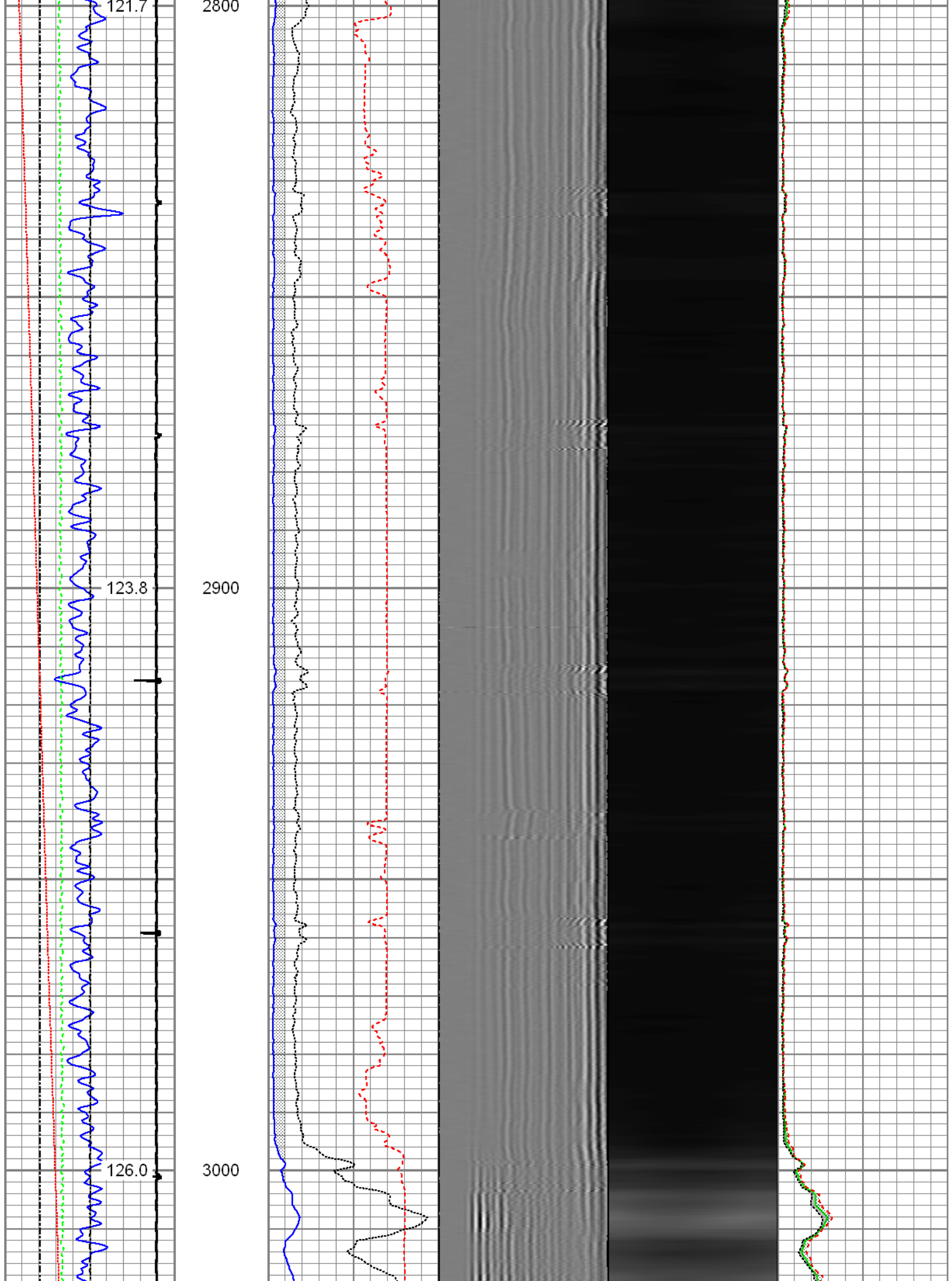
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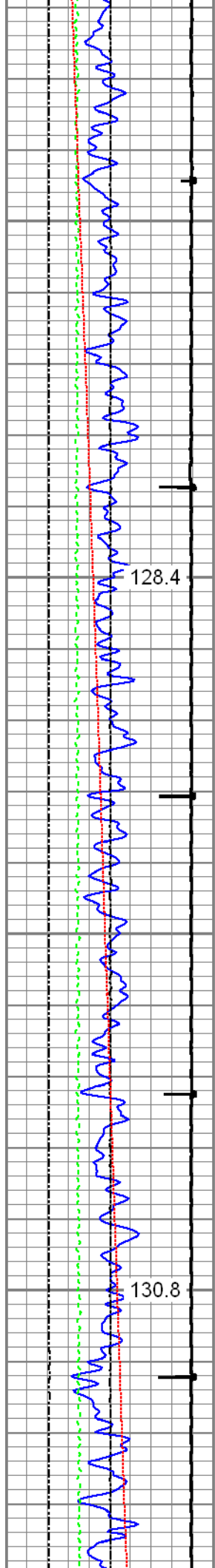






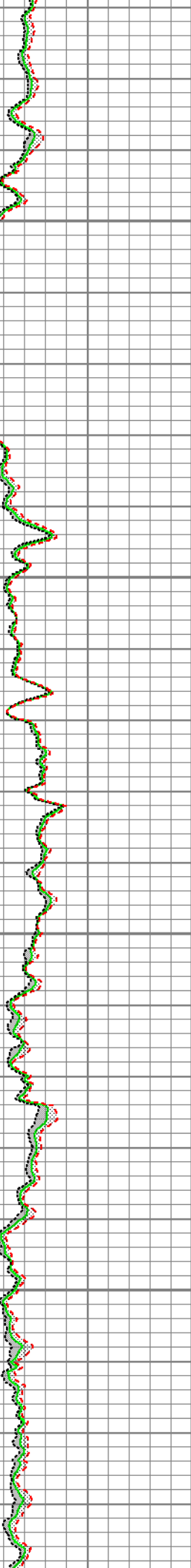
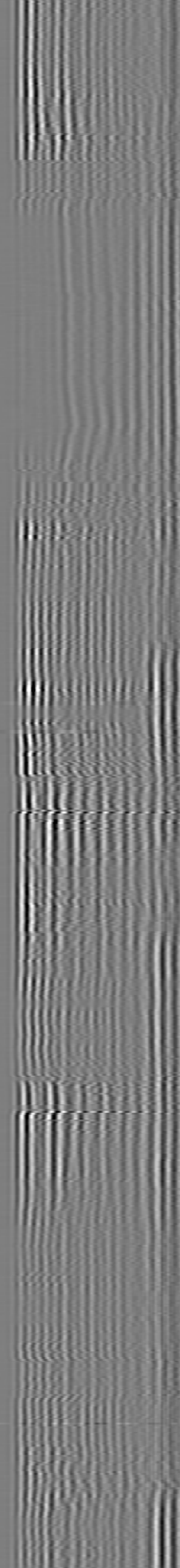
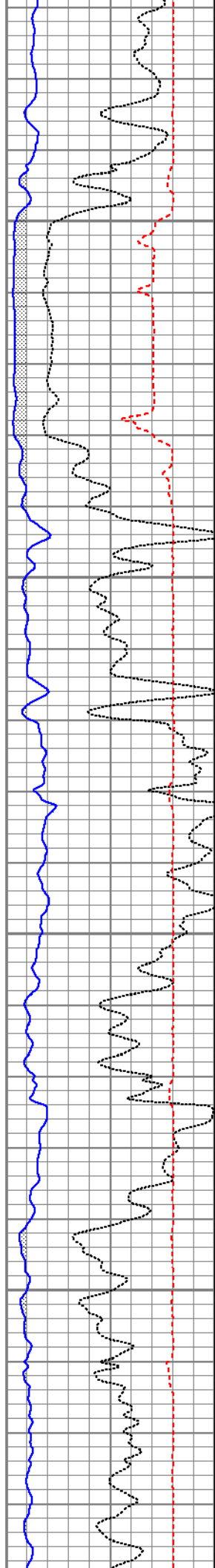


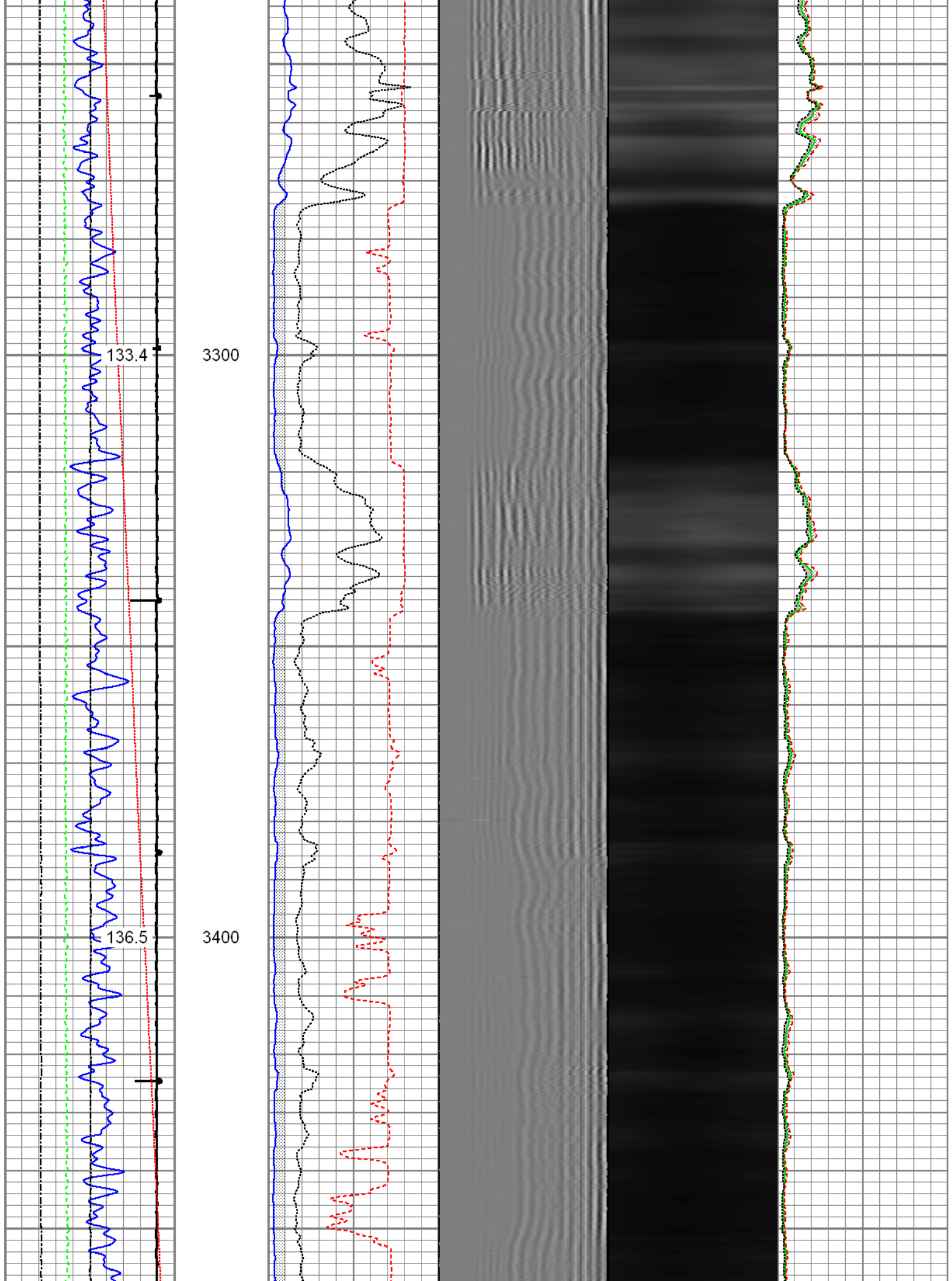


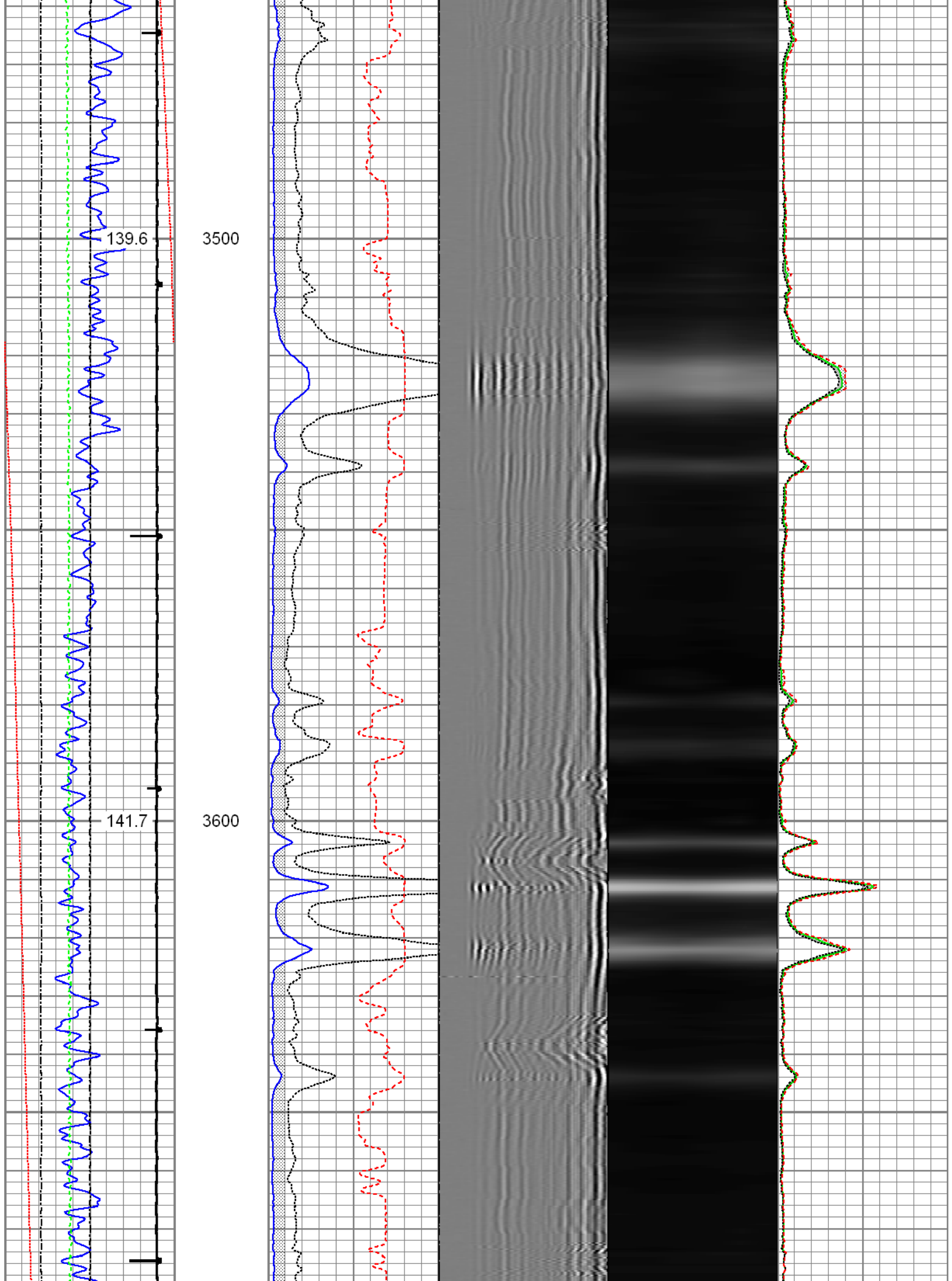


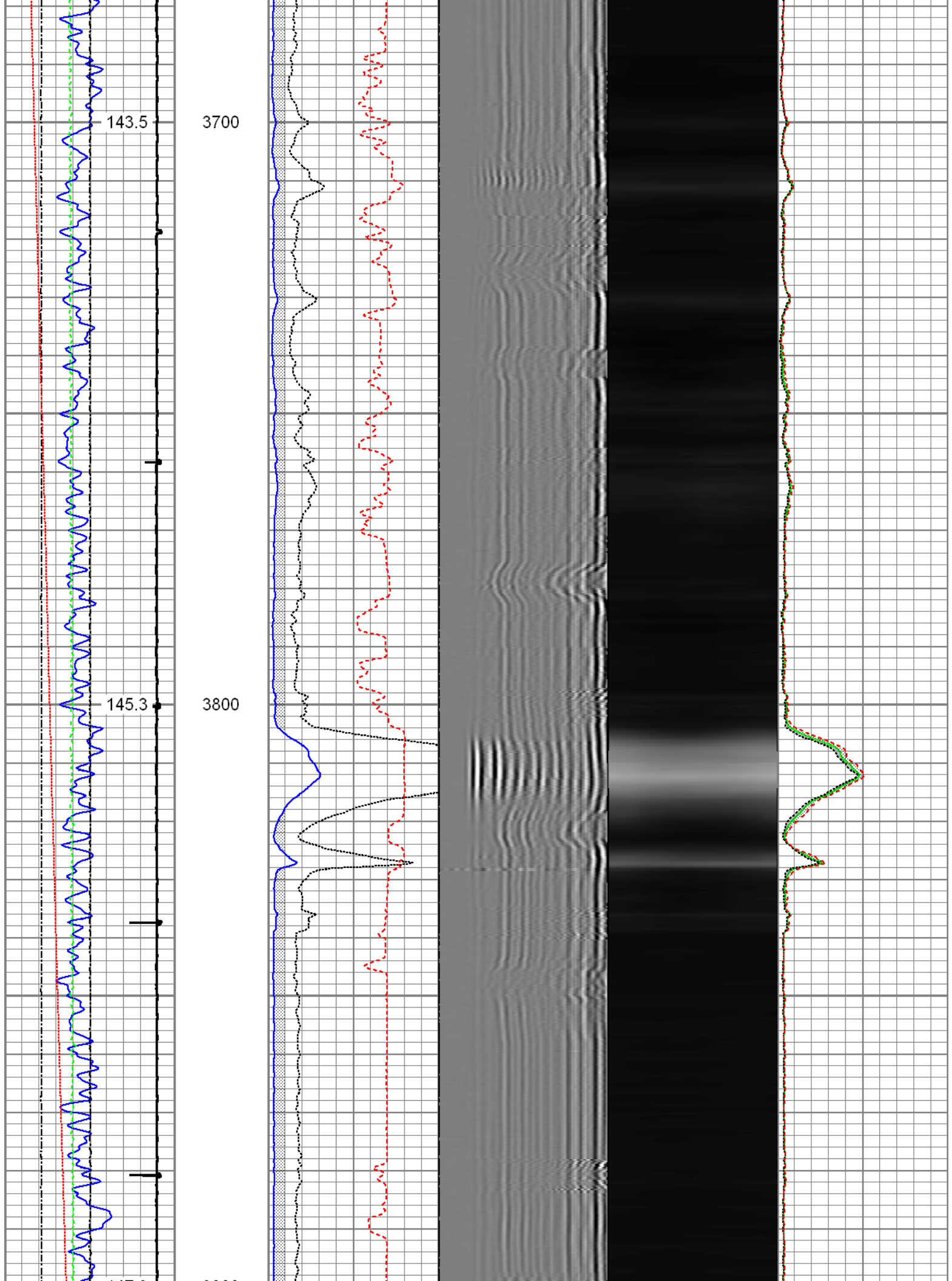
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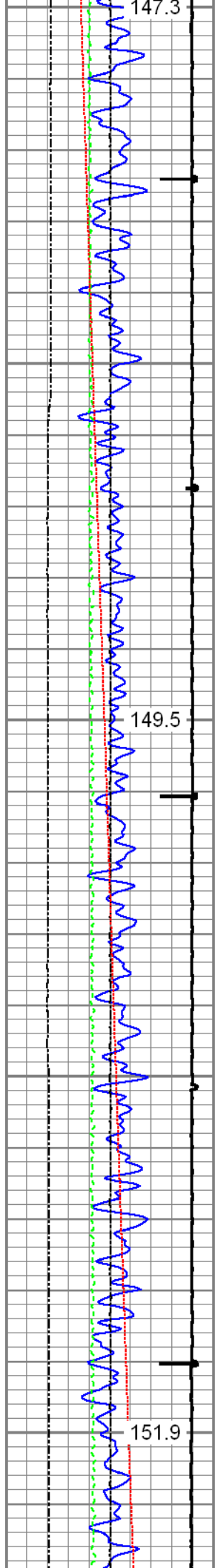
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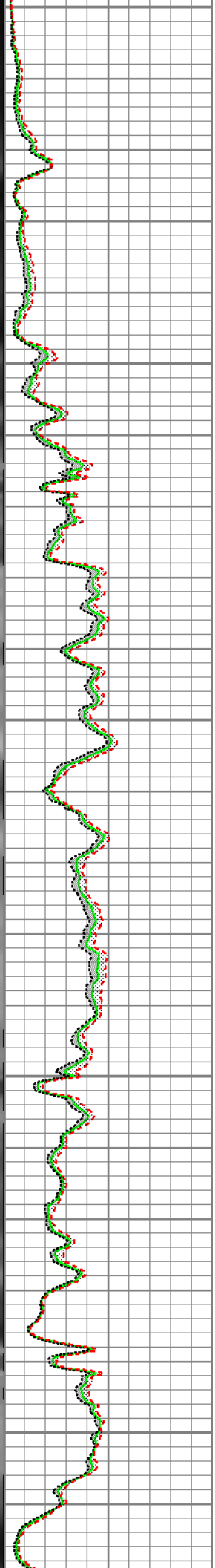
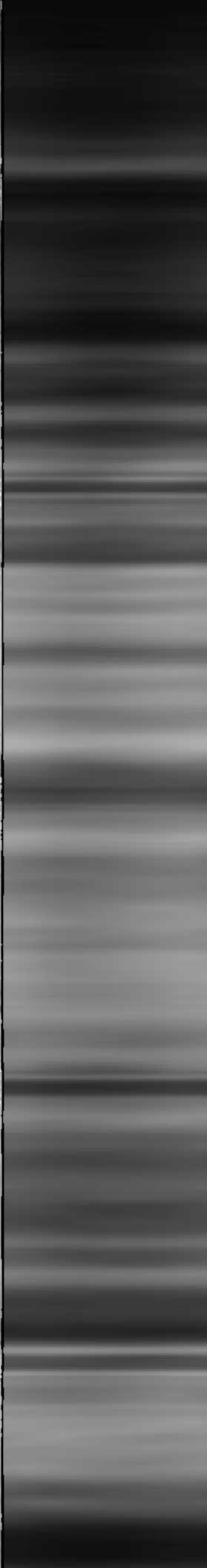
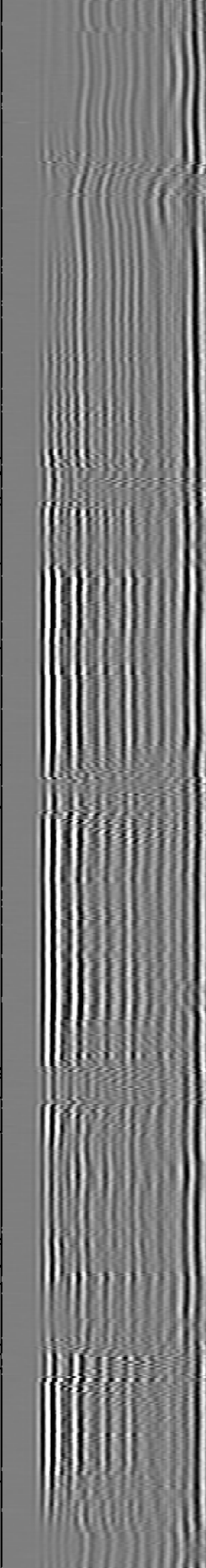
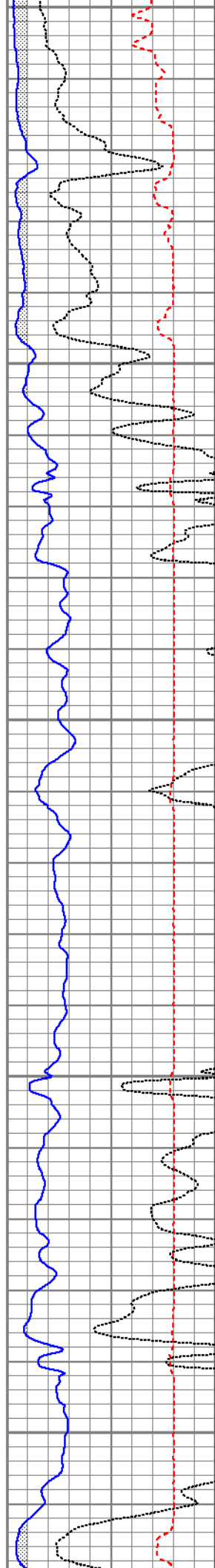


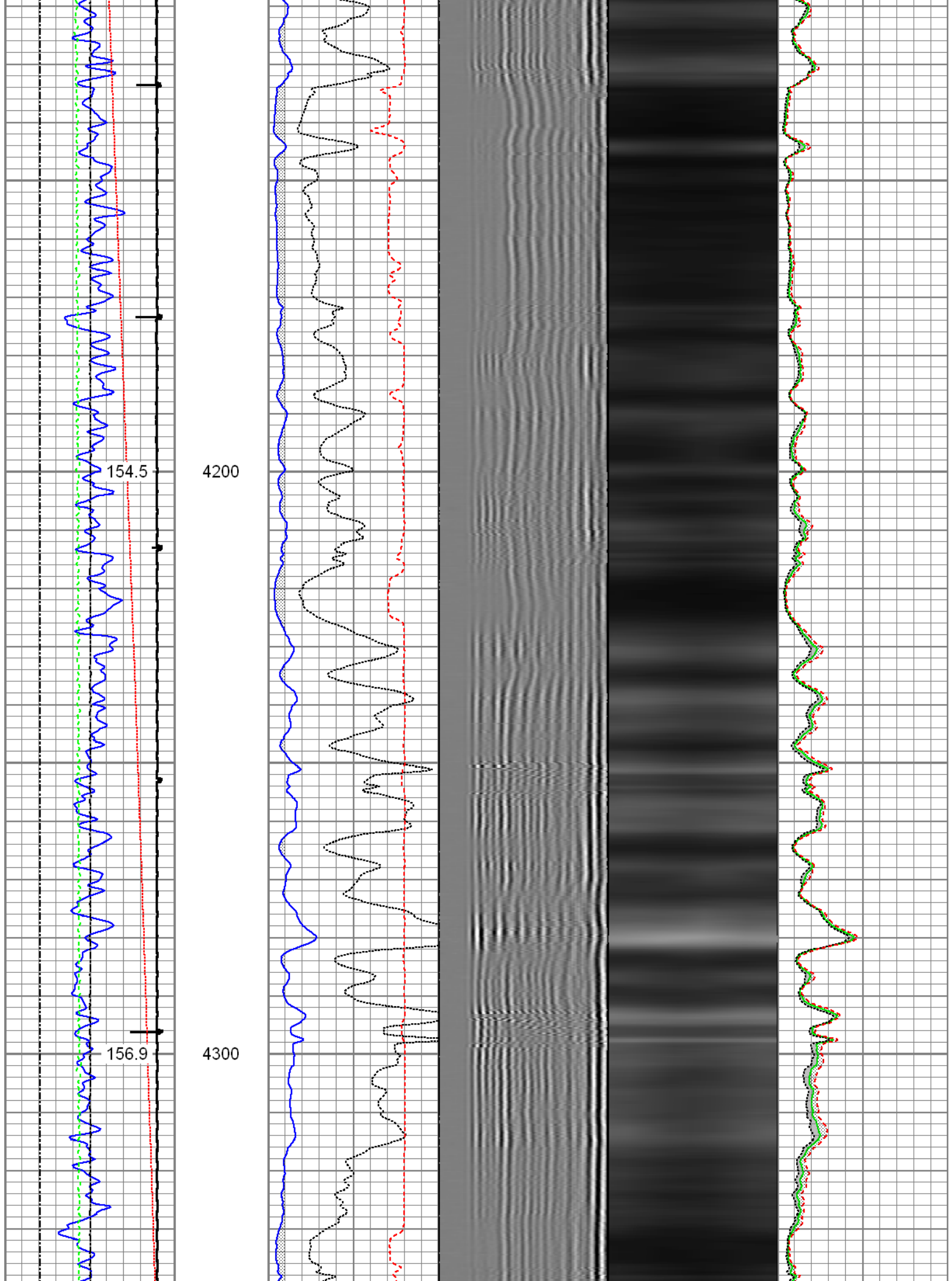


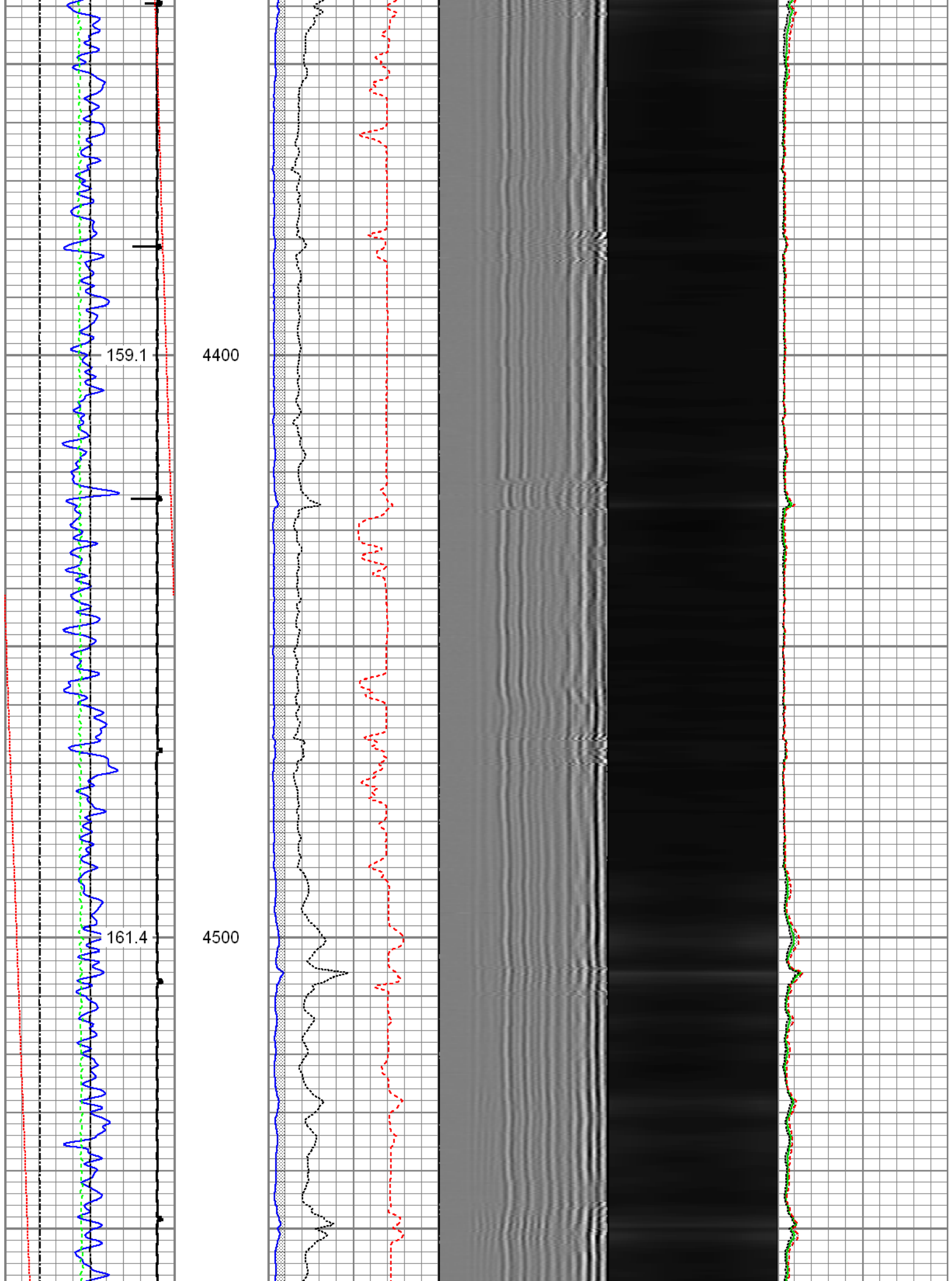


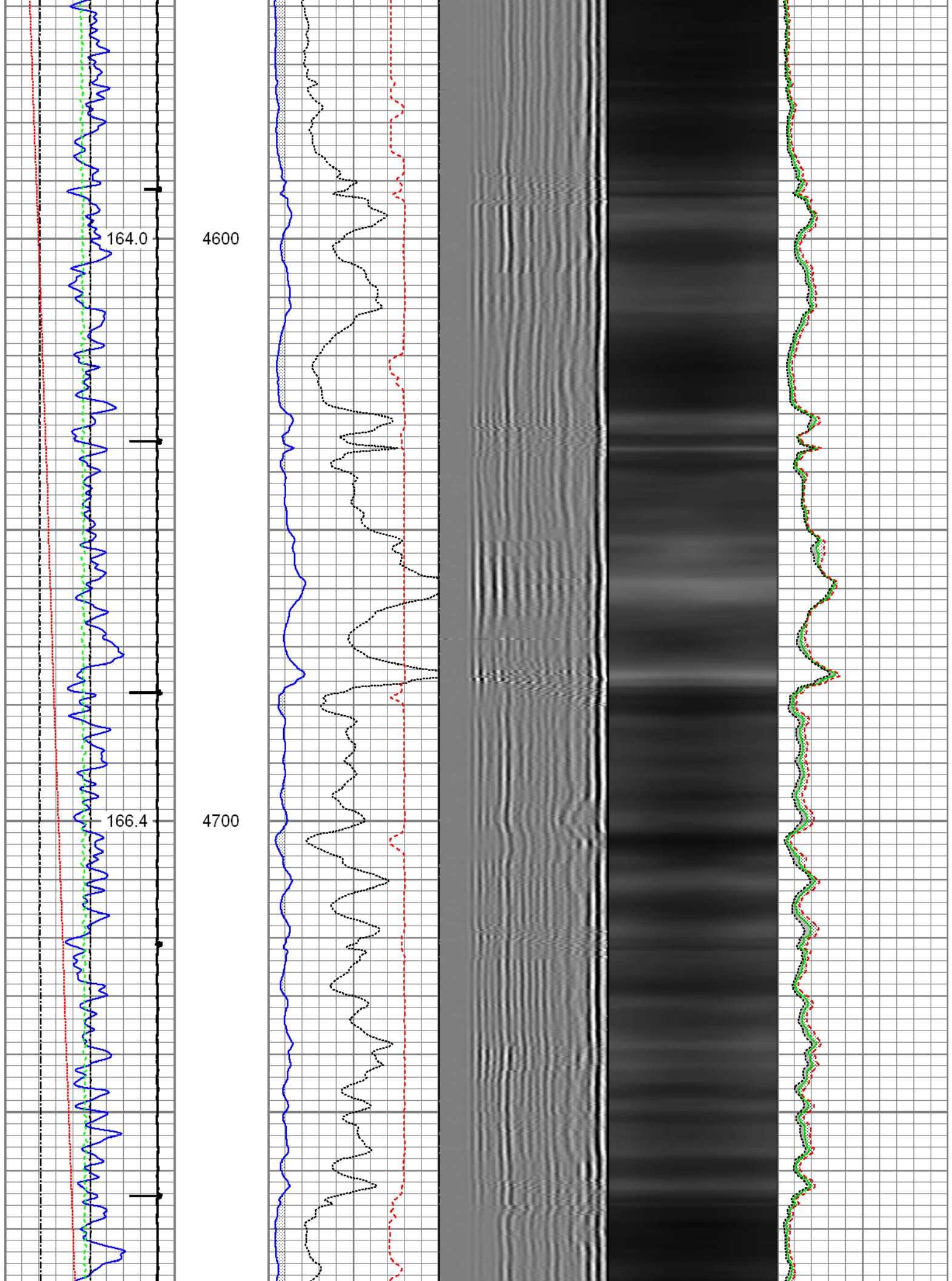


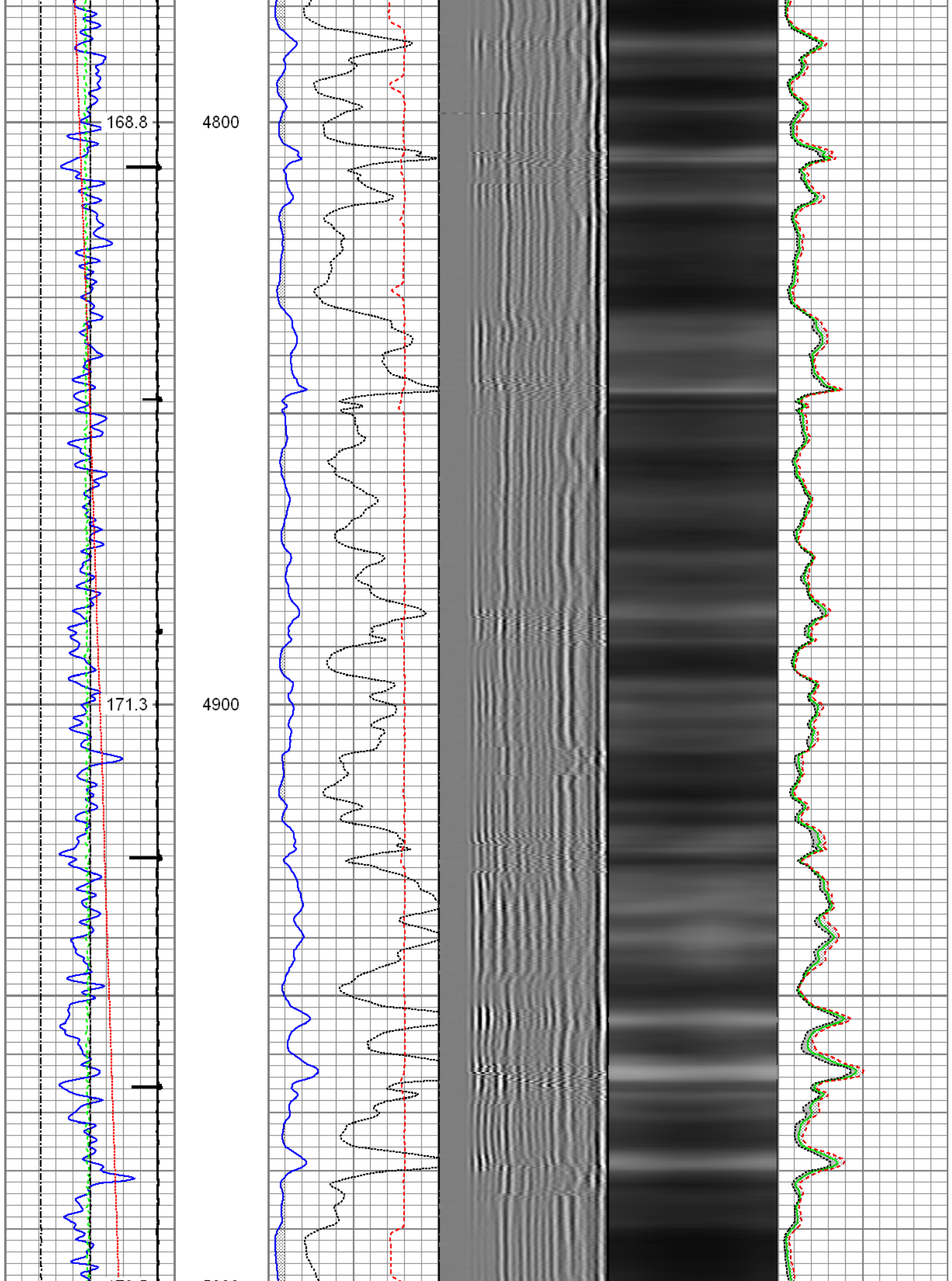
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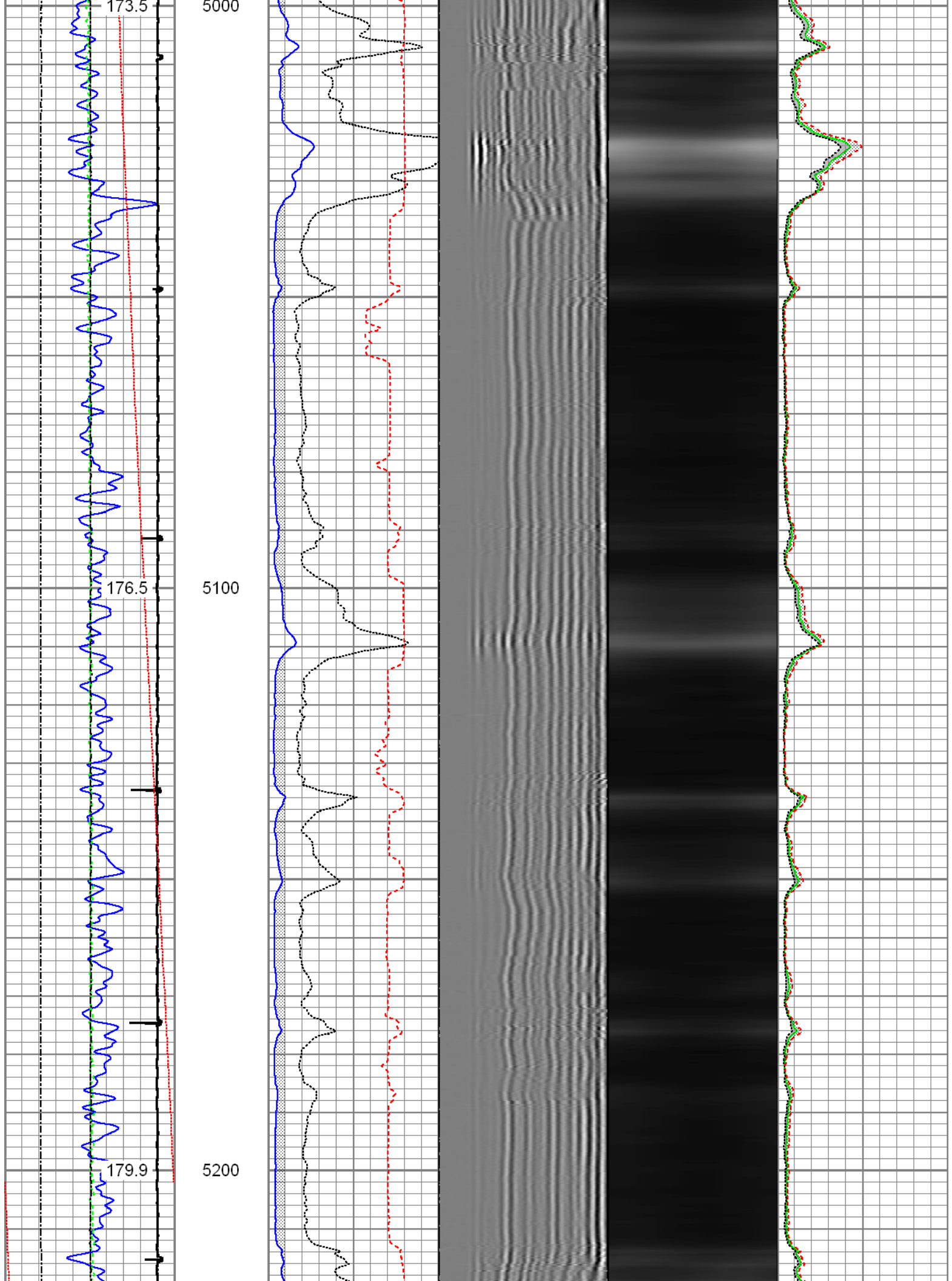


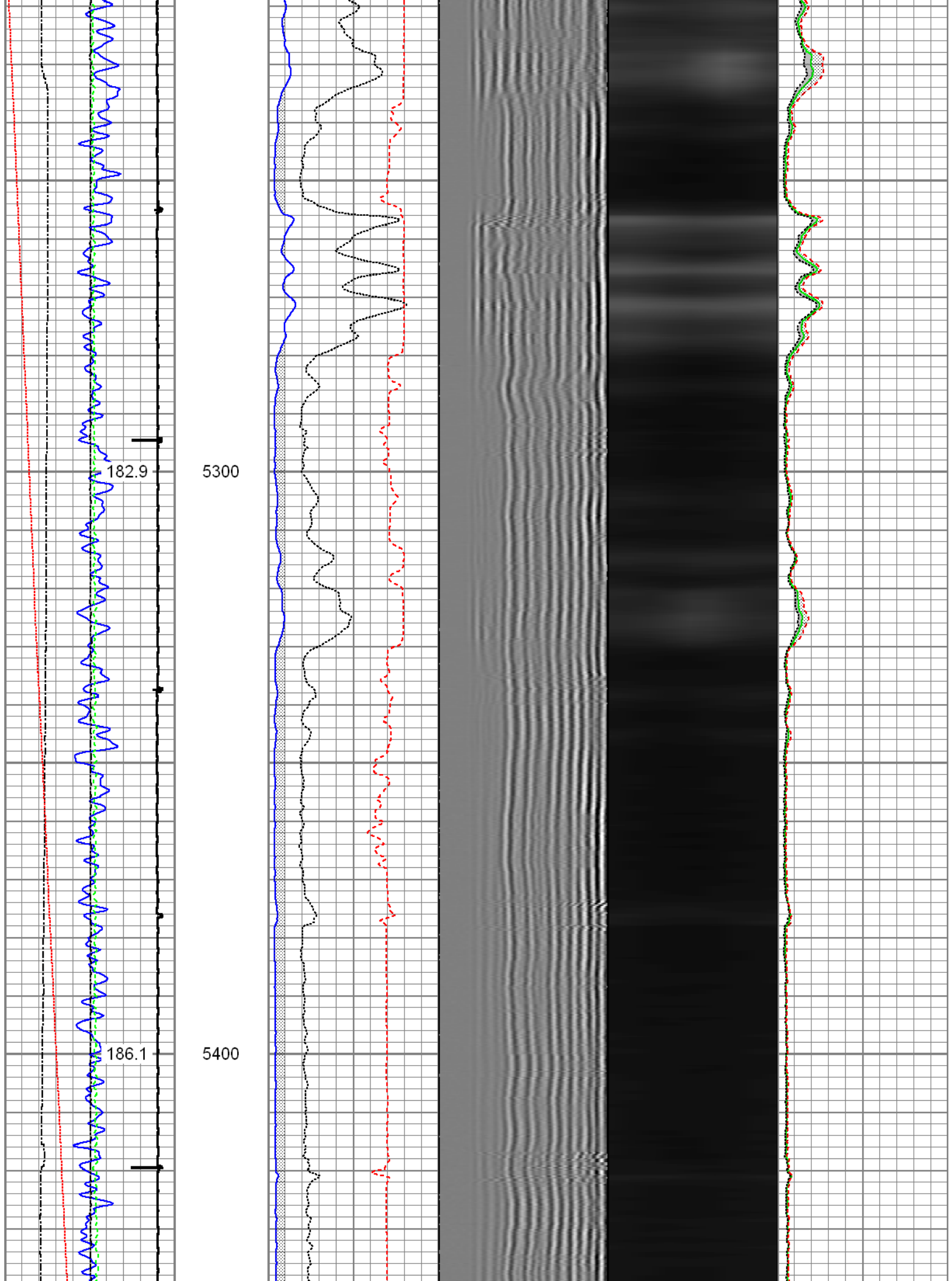


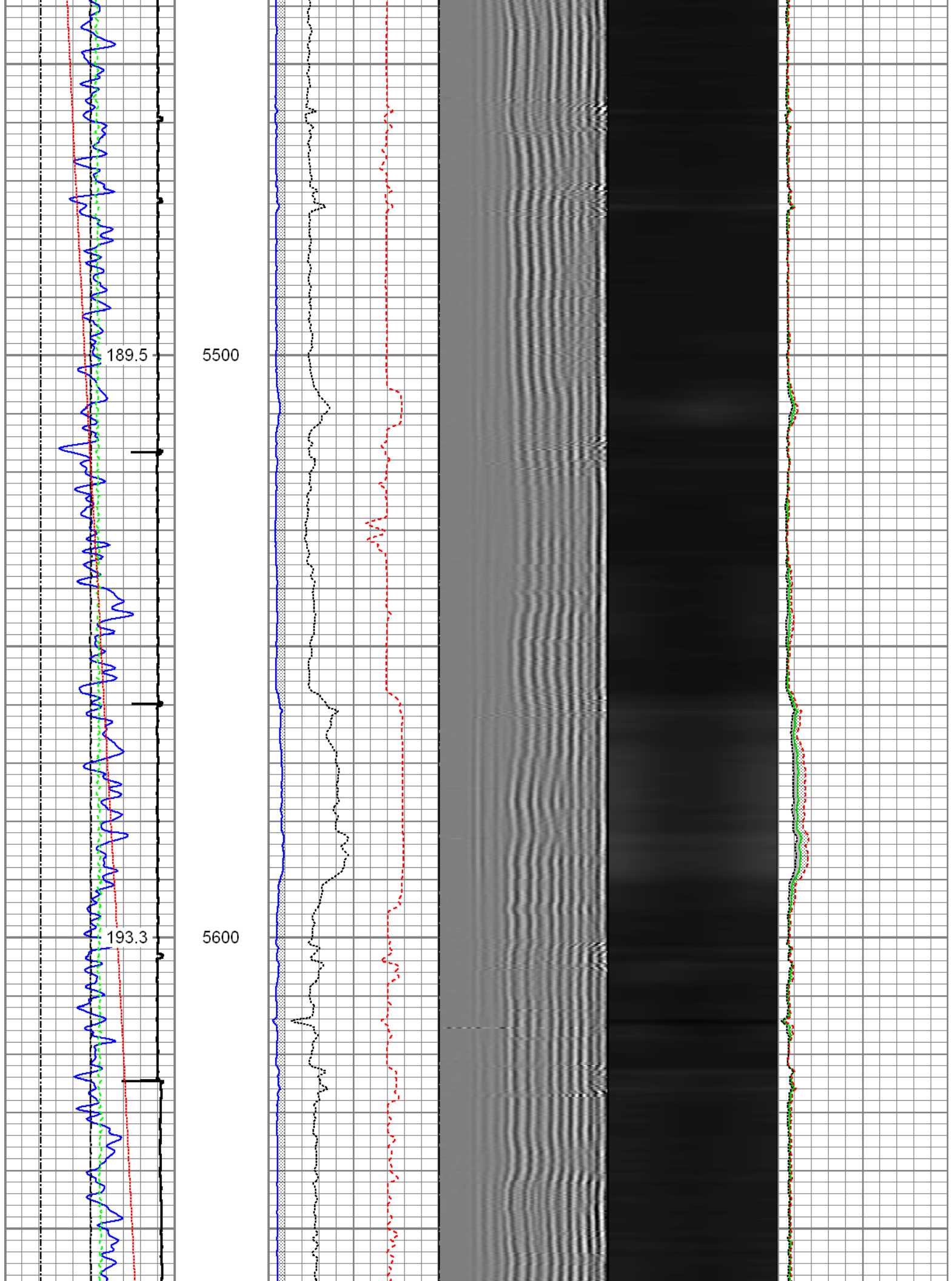


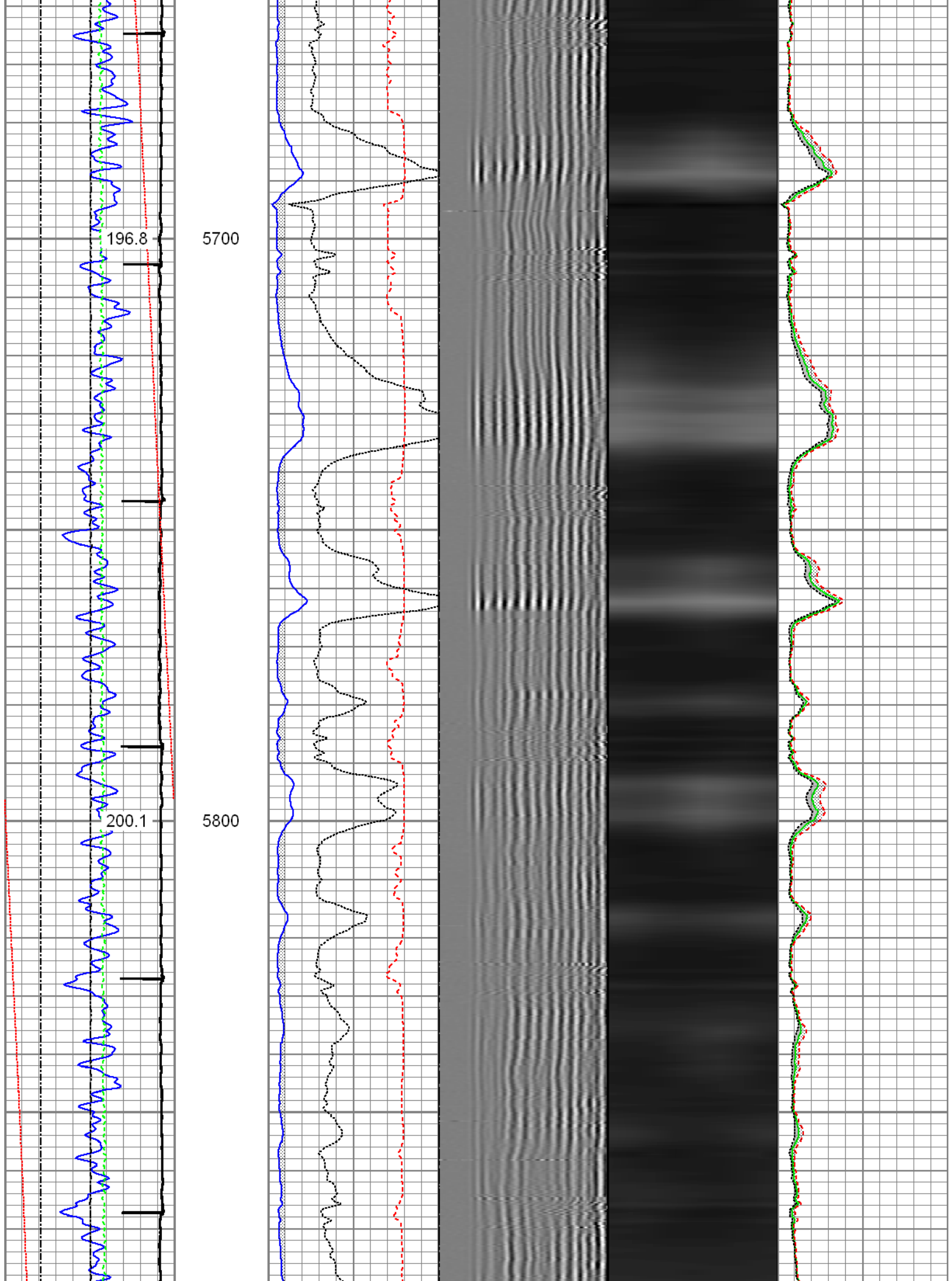


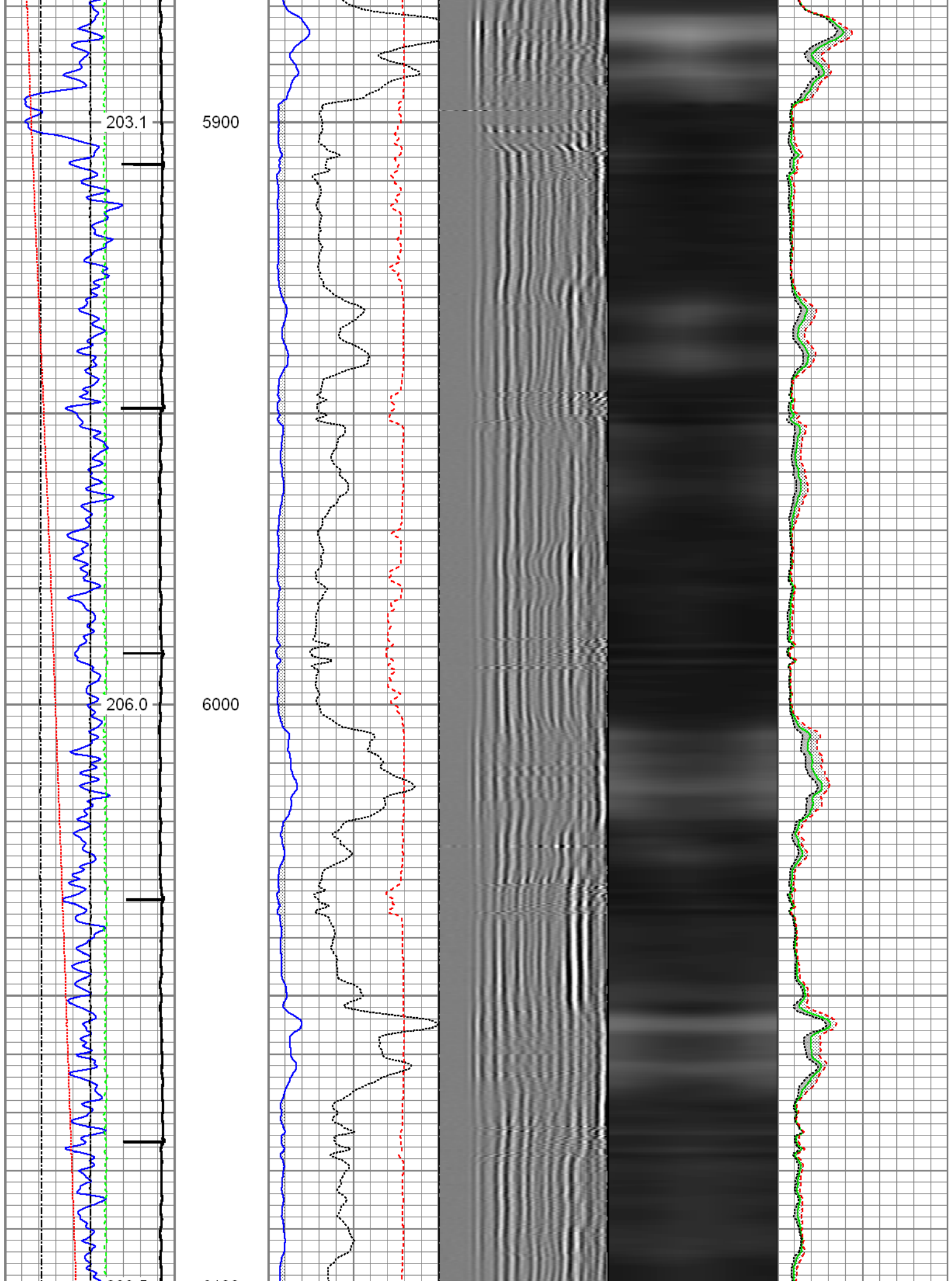


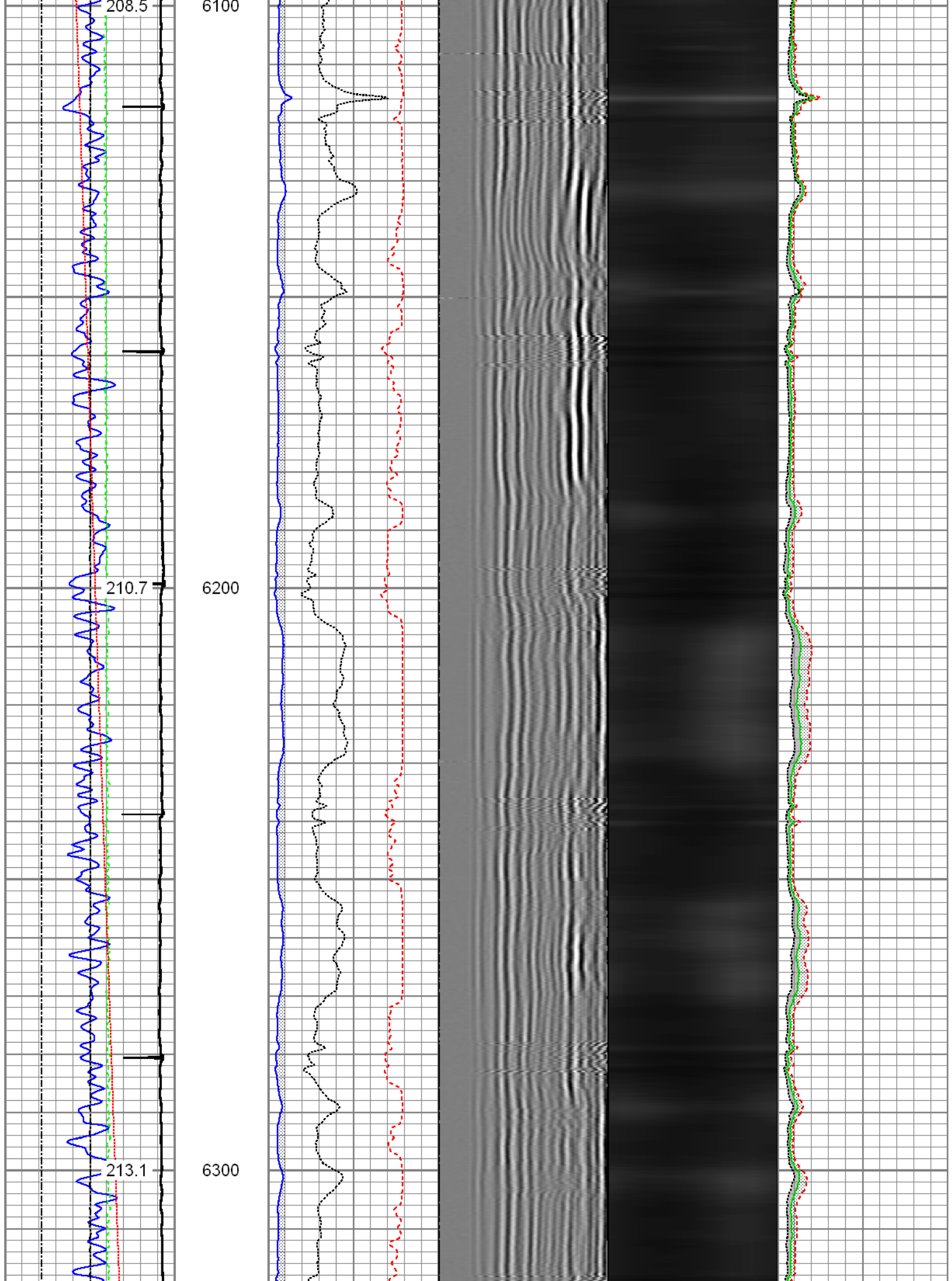


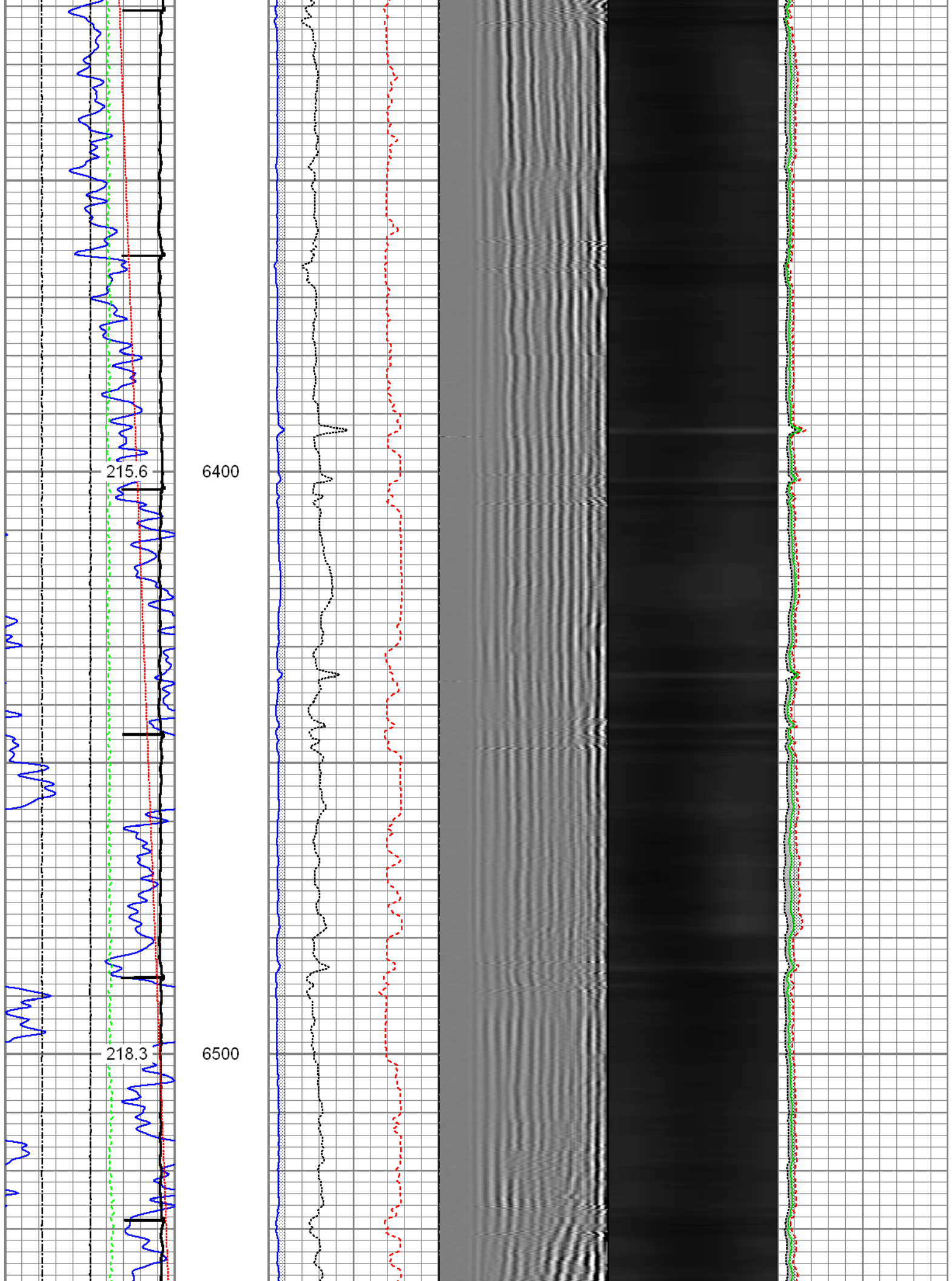


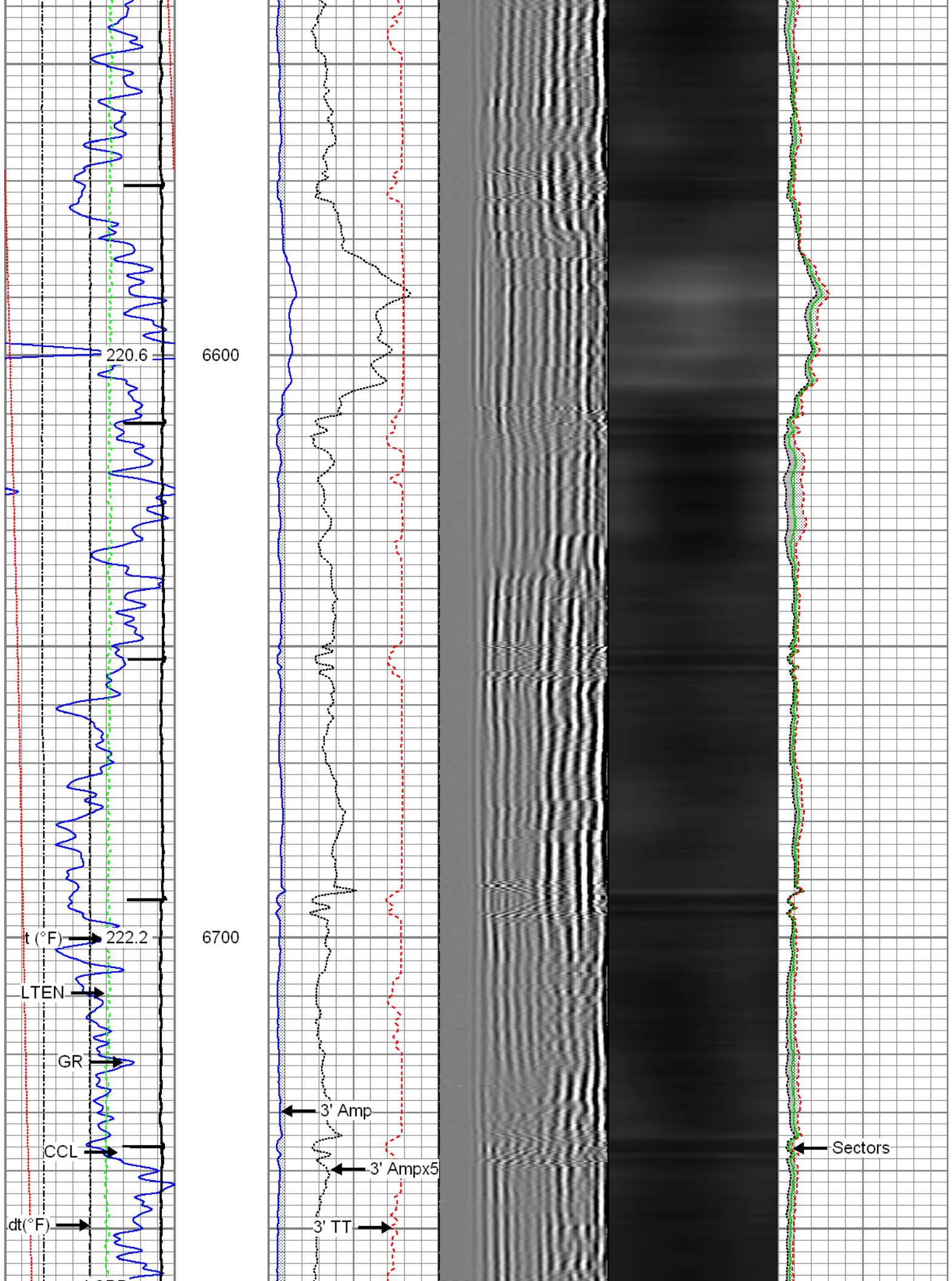


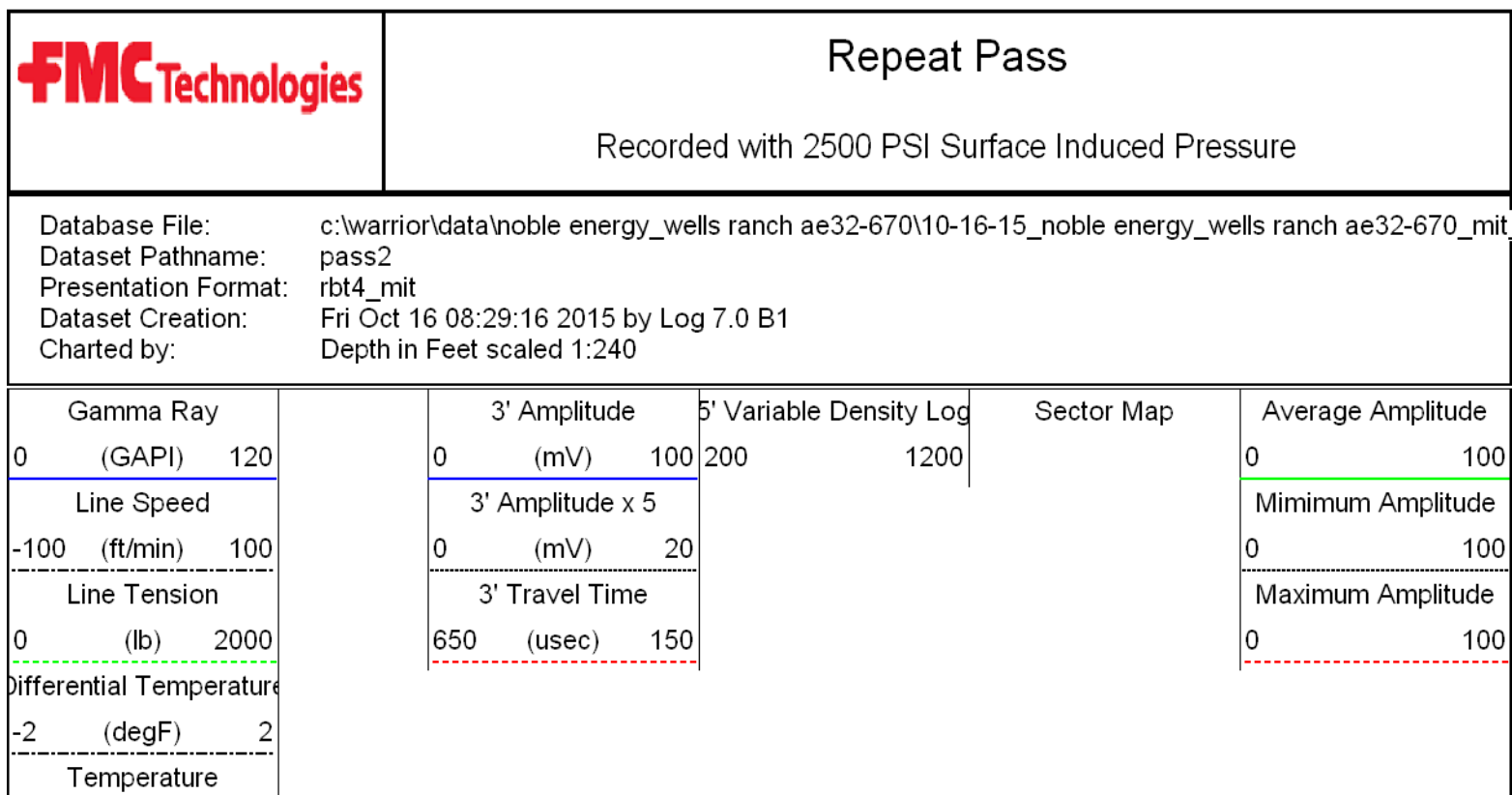
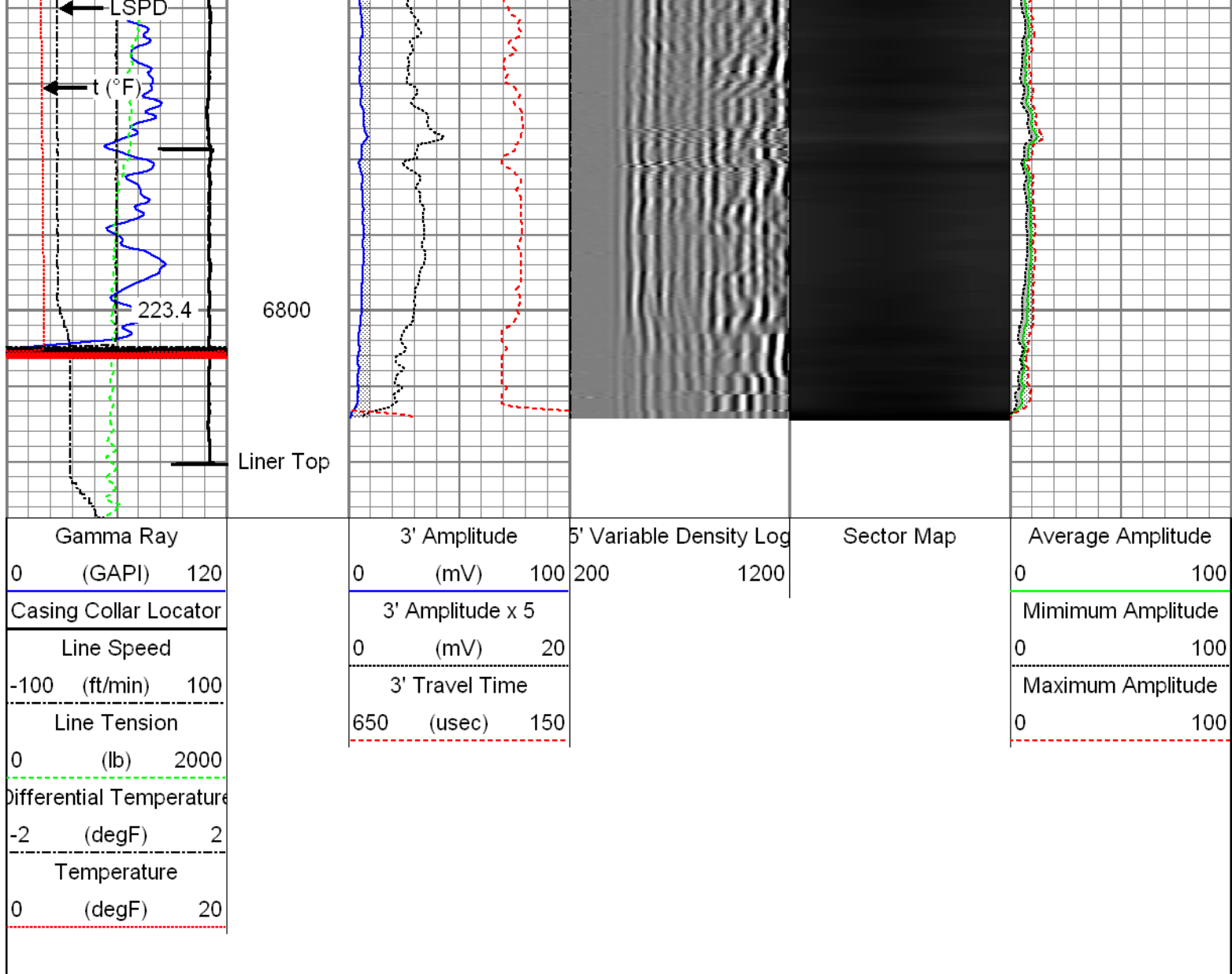




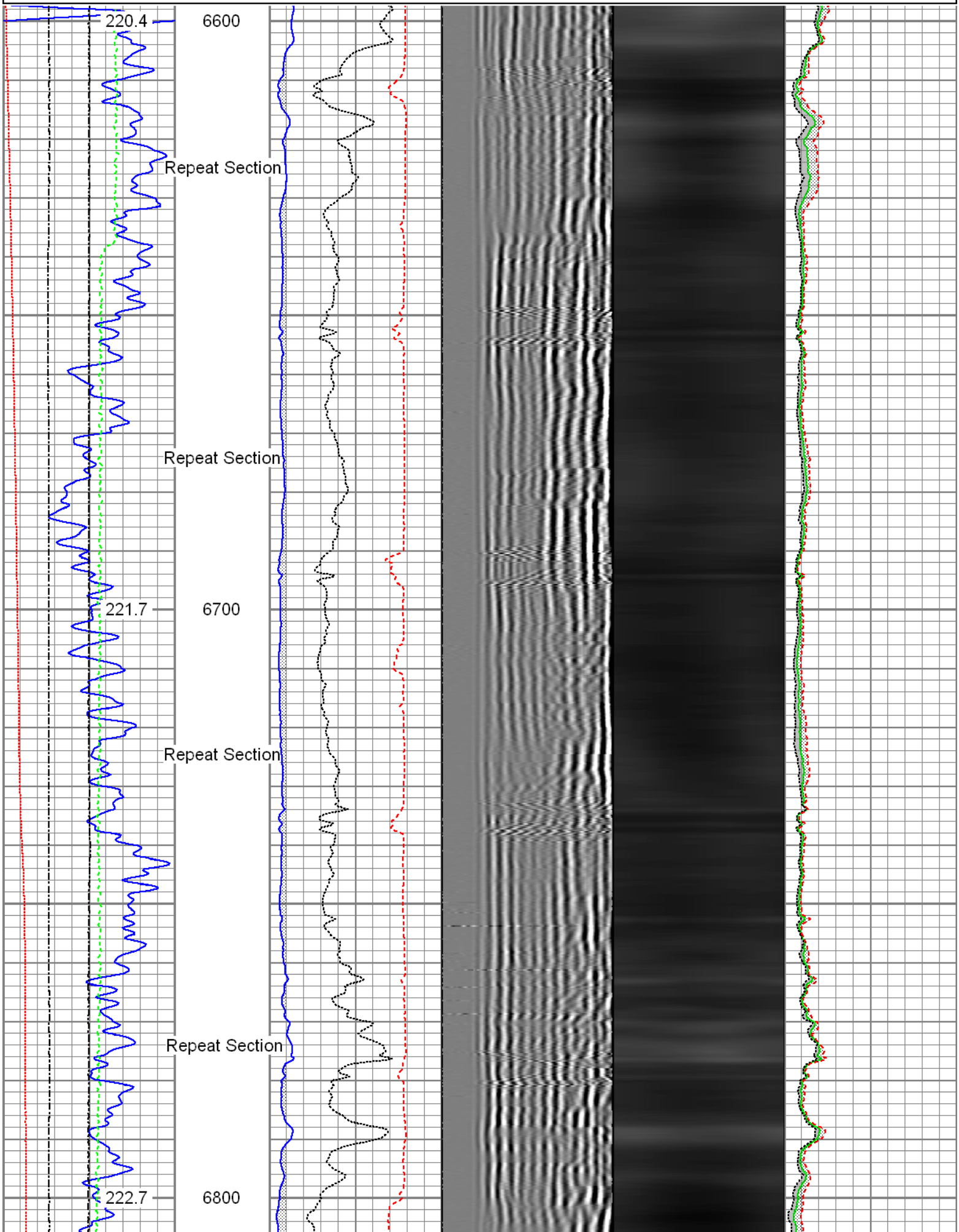


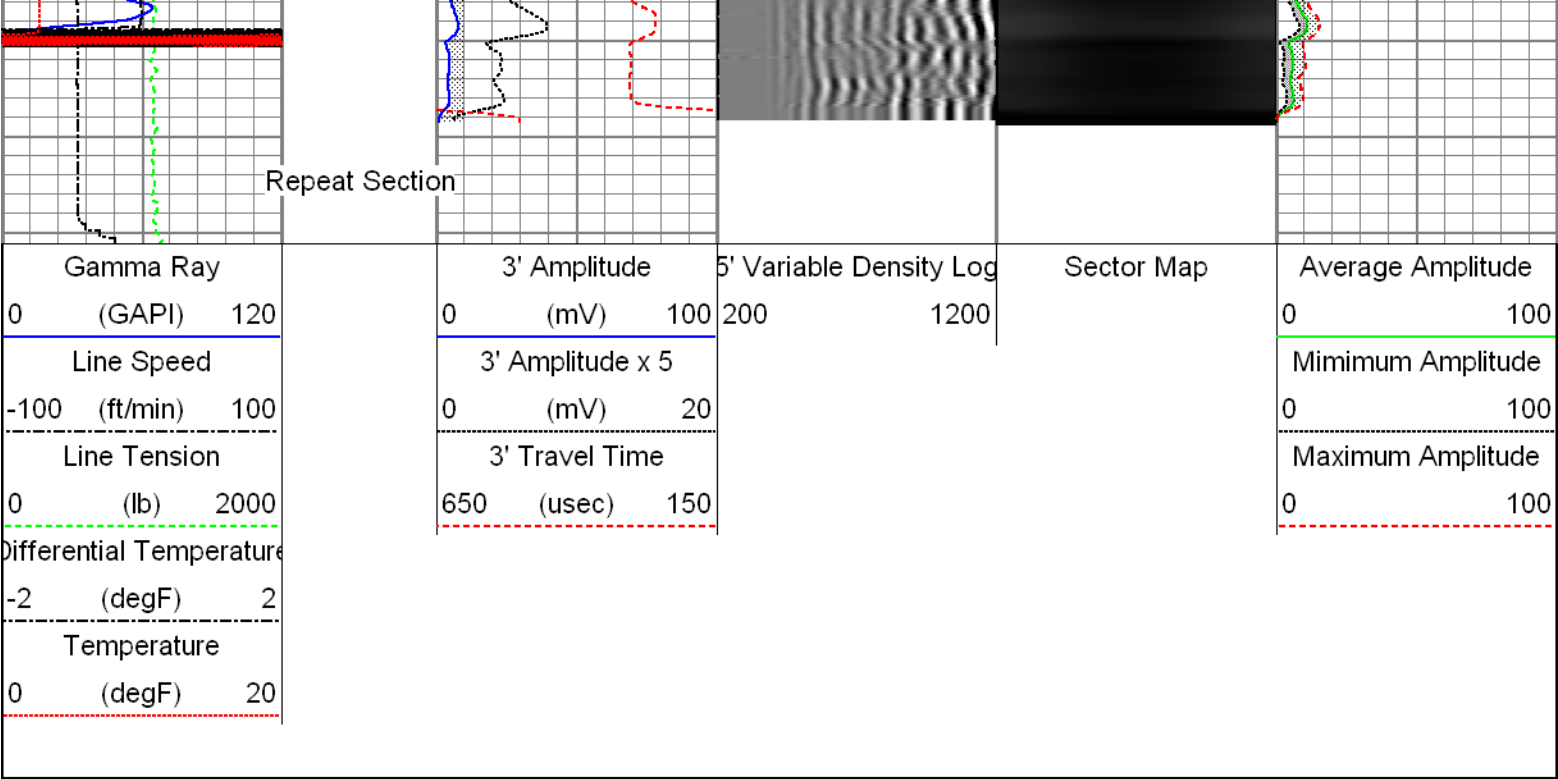




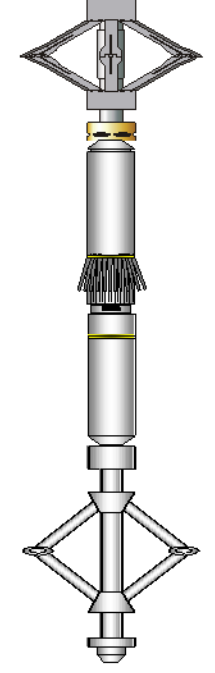


0 (degF) 20





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 (215017) Sondex Adapter - GO Box to Sondex Pin	0.21	1.69	1.00	
			UW_XTU-UW_XTU_002 (218874) 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	
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	
WV3FT	15.42			UW_RBT-UW_RBT_004 (1063) 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						
CBLROT	15.42						

WVF5FT	14.42		UW_PRC-DSSRAC (081) 2-3/4" DSS 5 Arm Roller Centralizer	2.55	2.75	32.00
MIT	5.41		UW_MIT-UW_MIT40_027 (218950) 40 Multifinger Imaging Tool	4.54	2.75	61.10
			UW_PRC #3 -UW_PRC_057 (1037) Sondex 2-3/4" 4-Arm Production Roller Centraliser	2.98	2.75	32.00
TSTAMP	0.00		UW_BUL-UW_BUL_006 (10019616) Sondex Ultrawire Bullnose Terminator	0.22	1.69	1.20
Dataset: 10-16-15_Noble Energy_Wells Ranch AE32-670_MIT_RBL.db: field/well/run1/pass7 Total Length: 28.09 ft Total Weight: 324.50 lb O.D. 3.13 in						

Calibration Report			
Database File:	c:\warrior\data\noble energy_wells ranch ae32-670\10-16-15_noble energy_wells ranch ae32-670_mit_r		
Dataset Pathname:	pass3		
Dataset Creation:	Fri Oct 16 08:39:21 2015 by Log 7.0 B1		
Multi-finger Imaging Tool Calibration Report			
Serial Number:	218950		
Number of Fingers:	40		
Tool Model:	UW_MIT40_027		
Inclinometer Calibration Report			
Performed:	Fri, Oct, 10 10:41:51 2008		
Calibration Angle:	45		
	Inc X	Inc Y	
Vertical:	1996	1975	
Finger 1 up:	2238	2226	
Finger 31 up:	1760	2216	
Finger 21 up:	1769	1745	
Finger 11 up:	2250	1738	
Sensitivity ratio:	1.00023		
X-axis angle:	314.283		
Deviation const.:	339.139		

Finger Calibration Report							
Performed:				Fri Oct 16 07:37:04 2015			
Ring size:	4	5	6	7			
(in)							
	Sens	Sens	Sens				
Finger 01:	1439 270.0	1709 290.0	1999 304.0	2303			
Finger 02:	1502 250.0	1752 257.0	2009 267.0	2276			
Finger 03:	1421 273.0	1694 291.0	1985 307.0	2292			
Finger 04:	1448 273.0	1721 287.0	2008 301.0	2309			
Finger 05:	1485 263.0	1748 278.0	2026 287.0	2313			
Finger 06:	1418 275.0	1693 294.0	1987 309.0	2296			
Finger 07:	1439 273.0	1712 292.0	2004 305.0	2309			
Finger 08:	1439 271.0	1710 287.0	1997 299.0	2296			


Finger 09:	1423	284.0	1707	294.0	2001	306.0	2307
Finger 10:	1450	265.0	1715	283.0	1998	291.0	2289
Finger 11:	1435	276.0	1711	292.0	2003	302.0	2305
Finger 12:	1389	280.0	1669	294.0	1963	311.0	2274
Finger 13:	1482	264.0	1746	271.0	2017	276.0	2293
Finger 14:	1428	268.0	1696	282.0	1978	292.0	2270
Finger 15:	1416	285.0	1701	292.0	1993	302.0	2295
Finger 16:	1424	281.0	1705	284.0	1989	298.0	2287
Finger 17:	1421	291.0	1712	297.0	2009	306.0	2315
Finger 18:	1368	279.0	1647	283.0	1930	292.0	2222
Finger 19:	1417	288.0	1705	286.0	1991	299.0	2290
Finger 20:	1422	285.0	1707	289.0	1996	298.0	2294
Finger 21:	1372	299.0	1671	302.0	1973	312.0	2285
Finger 22:	1399	280.0	1679	279.0	1958	288.0	2246
Finger 23:	1397	288.0	1685	286.0	1971	294.0	2265
Finger 24:	1428	288.0	1716	281.0	1997	284.0	2281
Finger 25:	1347	287.0	1634	281.0	1915	290.0	2205
Finger 26:	1331	294.0	1625	289.0	1914	298.0	2212
Finger 27:	1422	291.0	1713	280.0	1993	288.0	2281
Finger 28:	1410	297.0	1707	291.0	1998	298.0	2296
Finger 29:	1460	280.0	1740	271.0	2011	279.0	2290
Finger 30:	1369	298.0	1667	289.0	1956	306.0	2262
Finger 31:	1399	305.0	1704	292.0	1996	304.0	2300
Finger 32:	1463	281.0	1744	274.0	2018	281.0	2299
Finger 33:	1418	299.0	1717	295.0	2012	304.0	2316
Finger 34:	1427	286.0	1713	290.0	2003	304.0	2307
Finger 35:	1475	266.0	1741	264.0	2005	275.0	2280
Finger 36:	1464	272.0	1736	278.0	2014	292.0	2306
Finger 37:	1370	278.0	1648	278.0	1926	292.0	2218
Finger 38:	1514	251.0	1765	257.0	2022	270.0	2292
Finger 39:	1441	271.0	1712	282.0	1994	287.0	2281
Finger 40:	1404	284.0	1688	298.0	1986	313.0	2299

Segmented Cement Bond Log Calibration Report						
Serial Number:		1063				
Tool Model:		UW_RBT_004				
Calibration Casing Diameter:		7.000	in			
Calibration Depth:		-94.955	ft			
Master Calibration, performed Fri Oct 16 07:35:10 2015:						
	Raw (v)		Calibrated (mv)		Results	
	Zero	Cal	Zero	Cal	Gain	Offset
3FT	-0.003	0.740	1.000	62.165	82.270	1.278
5FT	-0.006	0.828	1.000	62.165	73.361	1.448
S1	-0.004	0.716	0.000	100.000	138.876	0.509
S2	-0.004	0.743	0.000	100.000	133.933	0.490
S3	-0.004	0.749	0.000	100.000	132.802	0.486
S4	-0.004	0.768	0.000	100.000	129.584	0.486
S5	-0.003	0.759	0.000	100.000	131.297	0.397
S6	-0.003	0.743	0.000	100.000	134.027	0.407
S7	-0.003	0.721	0.000	100.000	138.078	0.408
S8	-0.003	0.702	0.000	100.000	141.797	0.402

Temperature Calibration Report		
	Serial Number:	10025097
	Tool Model:	UW_PRT_016
	Performed:	Wed Feb 11 13:44:44 2015
Point #	Reading	Reference

1	13053.00	cps	68.00	degF
2	18014.00	cps	104.00	degF
3	29668.00	cps	176.00	degF
4	41181.00	cps	248.00	degF
5	52983.00	cps	320.00	degF
6	58931.00	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	Noble Energy Inc.
	Well	Wells Ranch AE32-670
	Field	Wattenberg
	County	Weld
	State	Colorado