

Radial Cement Bond Gamma Ray Casing Collar Log

Company	Noble Energy Inc.	Company	Noble Energy Inc.
Well	Ann LC34-755	Well	Ann LC34-755
Field	Wildcat	Field	Wildcat
County	Weld	County	Weld
State	Colorado	State	Colorado
Location:	API # : 05-123-40634	Other Services	MIT
Permanent Datum	SEC 34 TWP 9N RGE 59W	Elevation	
Log Measured From	Ground Level	Elevation	4828'
Drilling Measured From	Kelly Bushing	Elevation	4851'
	Kelly Bushing	Elevation	4828'

Date	08-Jan-2016
Run Number	One
Depth Driller	9863 FT
Depth Logger	6210 FT
Bottom Logged Interval	6205 FT
Top Log Interval	Surface
Open Hole Size	8.750"
Type Fluid	Water
Density / Viscosity	8.34 lbm/gal
Max. Recorded Temp.	216°F
Estimated Cement Top	870 FT
Time Well Ready	ROA
Time Logger on Bottom	12:45 PM
Equipment Number	HD-0343
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	24 FT	643 FT		
Intermediate #1	7	26	P-110 IC	24 FT	6336 FT		
Intermediate #2							
Liner	4 1/2	11.6	P-110 IC	6223 FT	9853 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 Kelly Bushing at 24 FT
Log ran from 10 FT above Liner Top to surface
Short Joints recorded at 5062 FT - 5082 FT
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 Surface Integrated Services.

Database File: x:\Vogs_for_processing\logs to be reviewed\01-08-16_noble_ann lc34-755_mit_rb\01-08-16_noble_ar

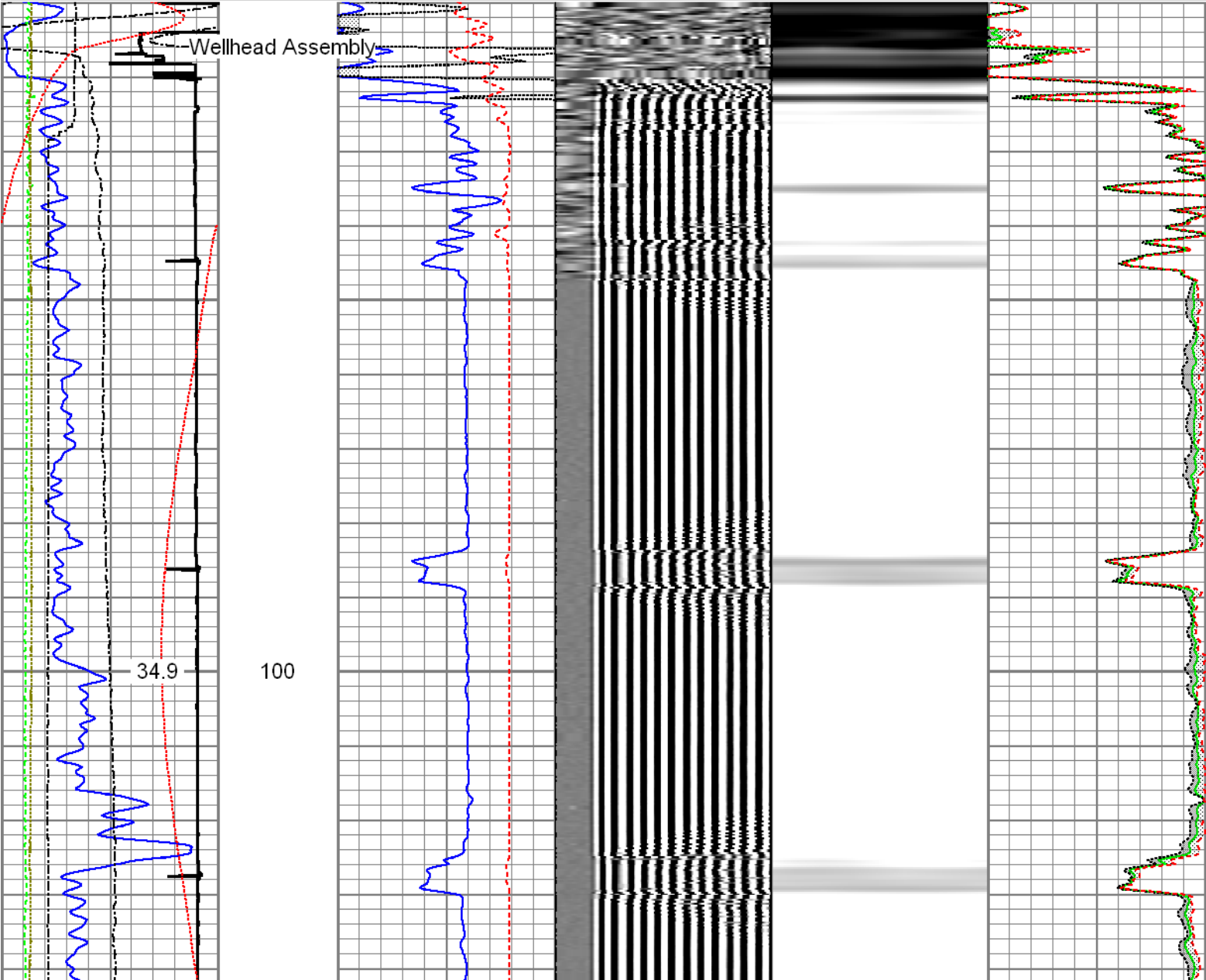
Dataset Pathname: pass4.1

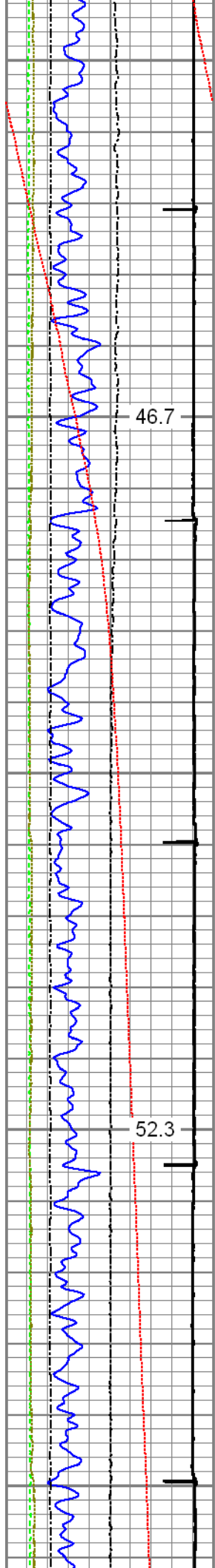
Presentation Format: rbt4_mit

Dataset Creation: Fri Jan 08 15:05:37 2016 by Calc 7.0 B1

Charted by: Depth in Feet scaled 1:240

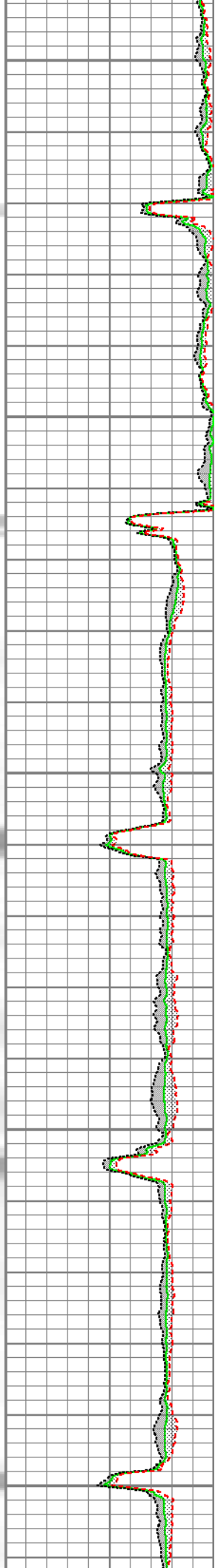
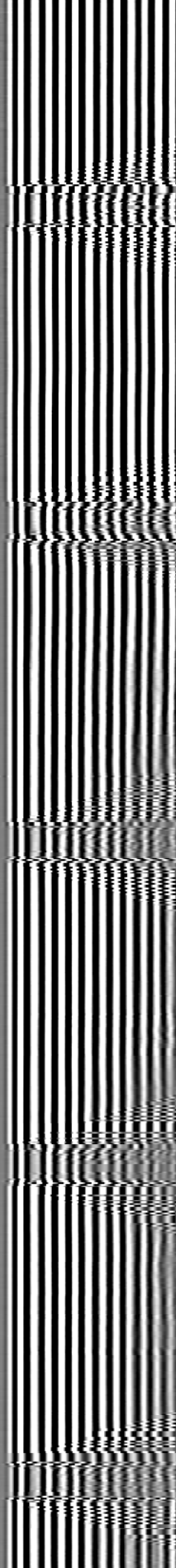
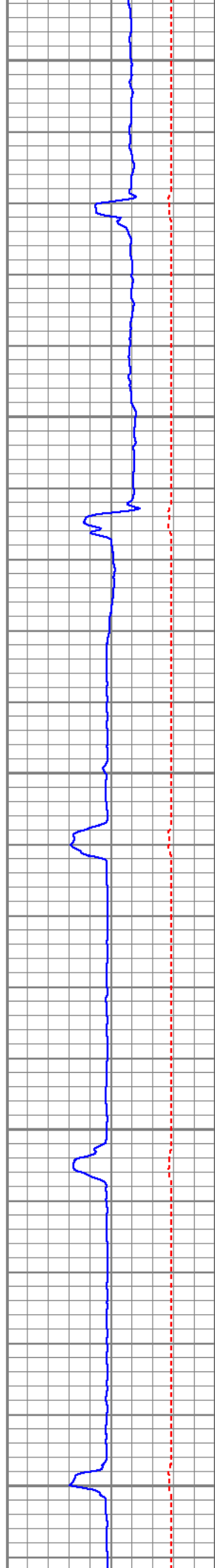
Gamma Ray	3' Amplitude	5' Variable Density Log	Sector Map	Average Amplitude
0 (GAPI) 120	0 (mV) 100	200 1200		0 100
Casing Collar Locator	3' Amplitude x 5			Mimimum Amplitude
Line Speed	0 (mV) 20			0 100
-100 (ft/min) 100	3' Travel Time			Maximum Amplitude
Line Tension	650 (usec) 150			0 100
0 (lb) 2000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

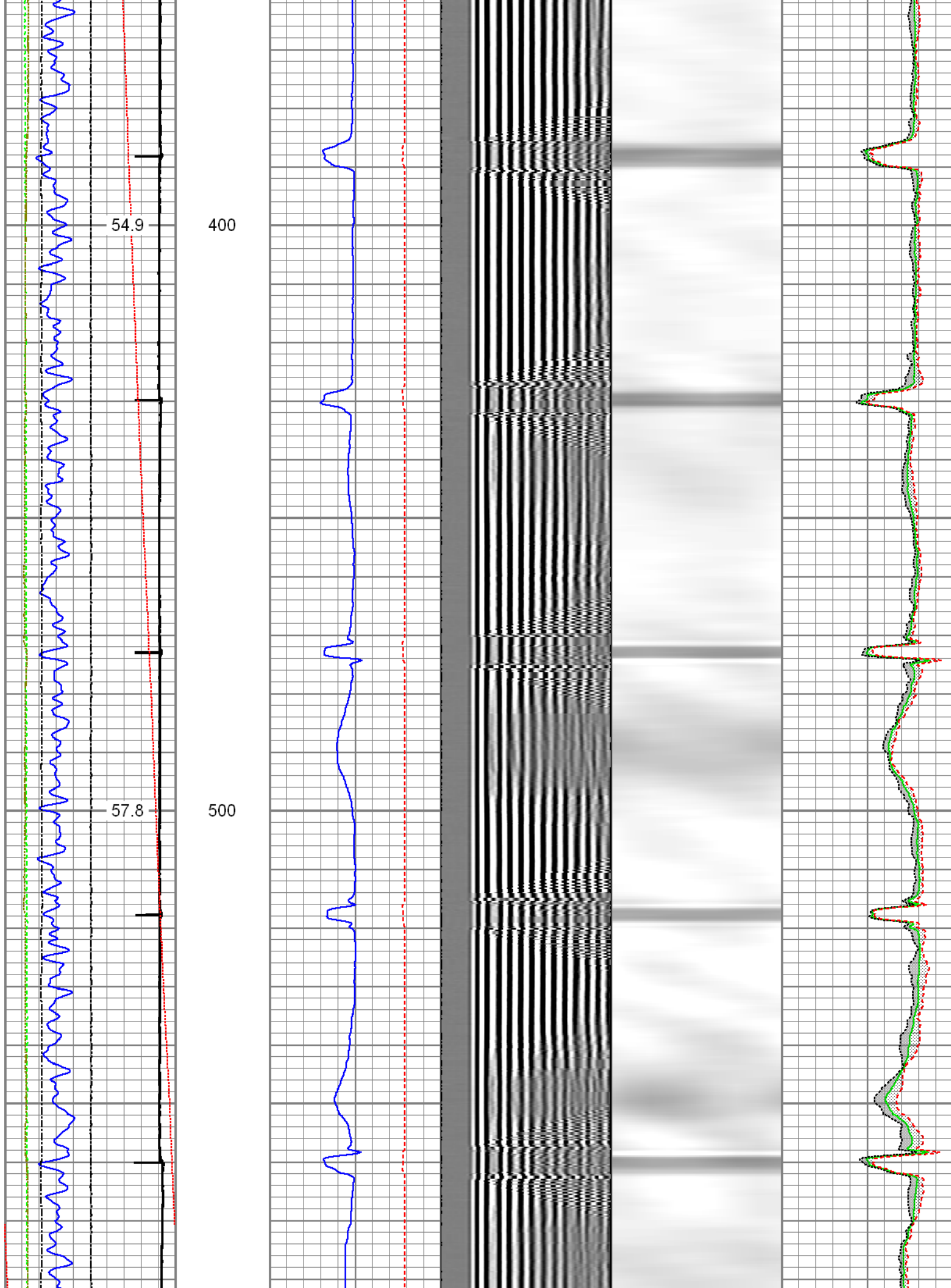


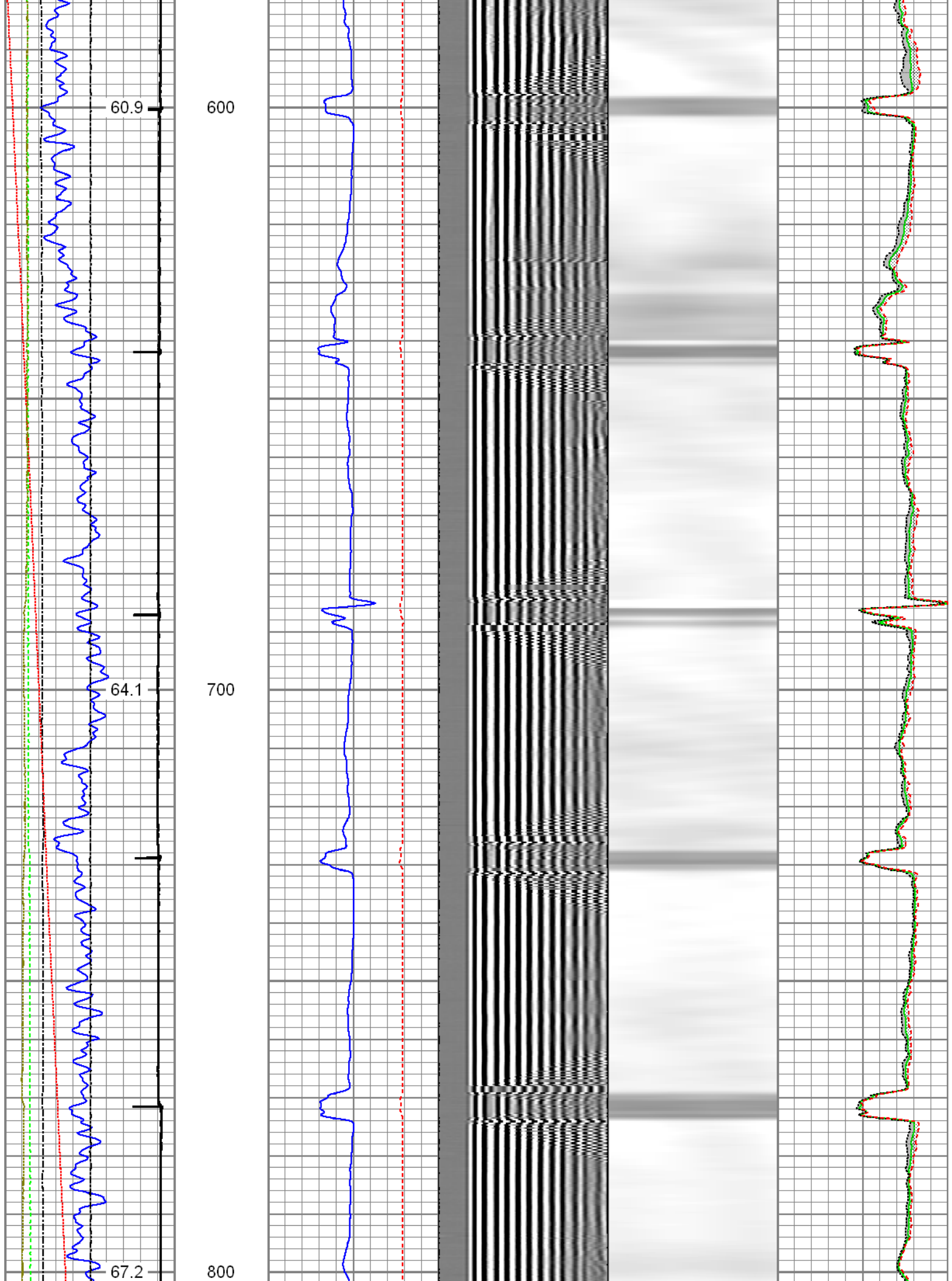


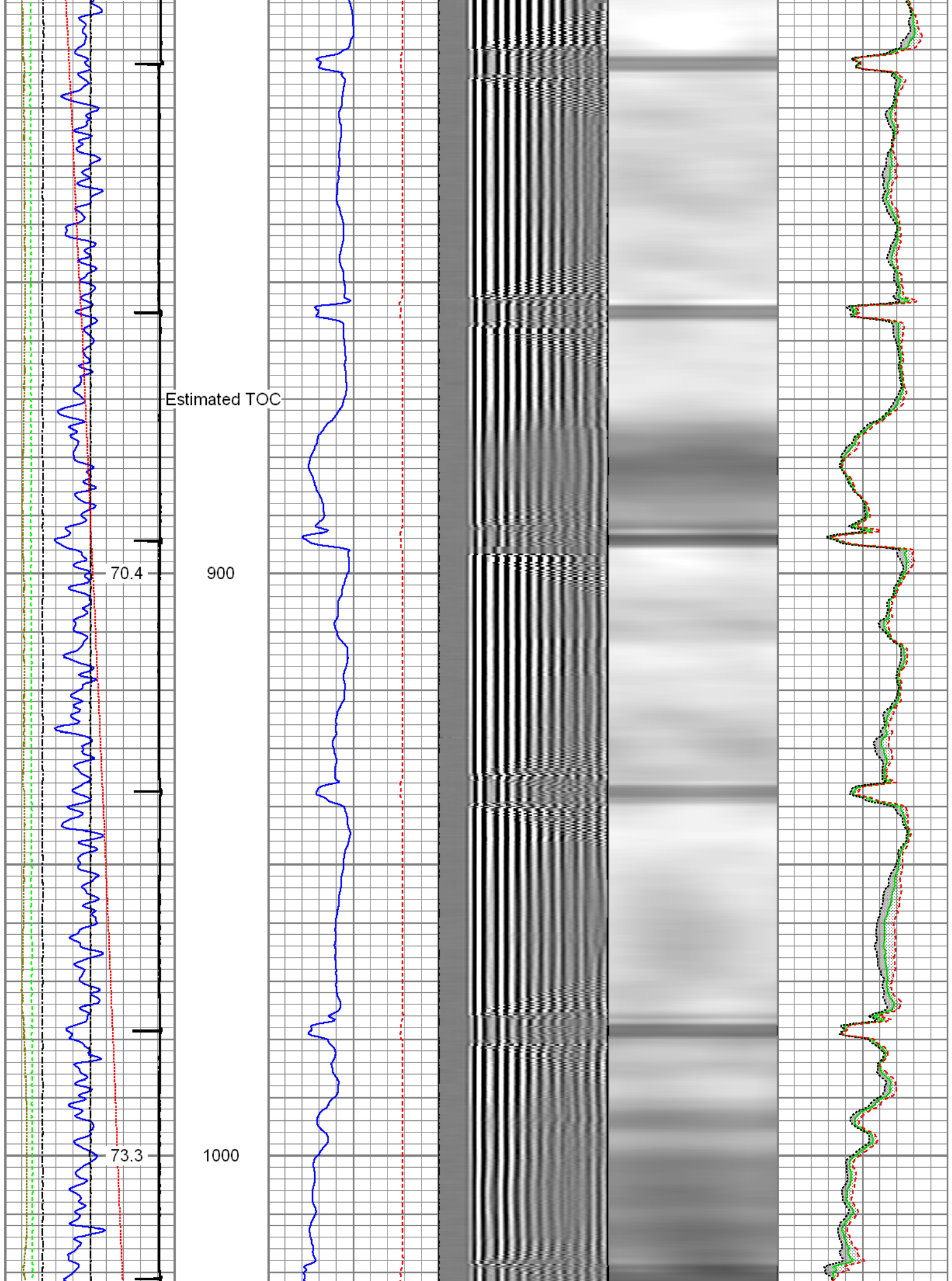
200

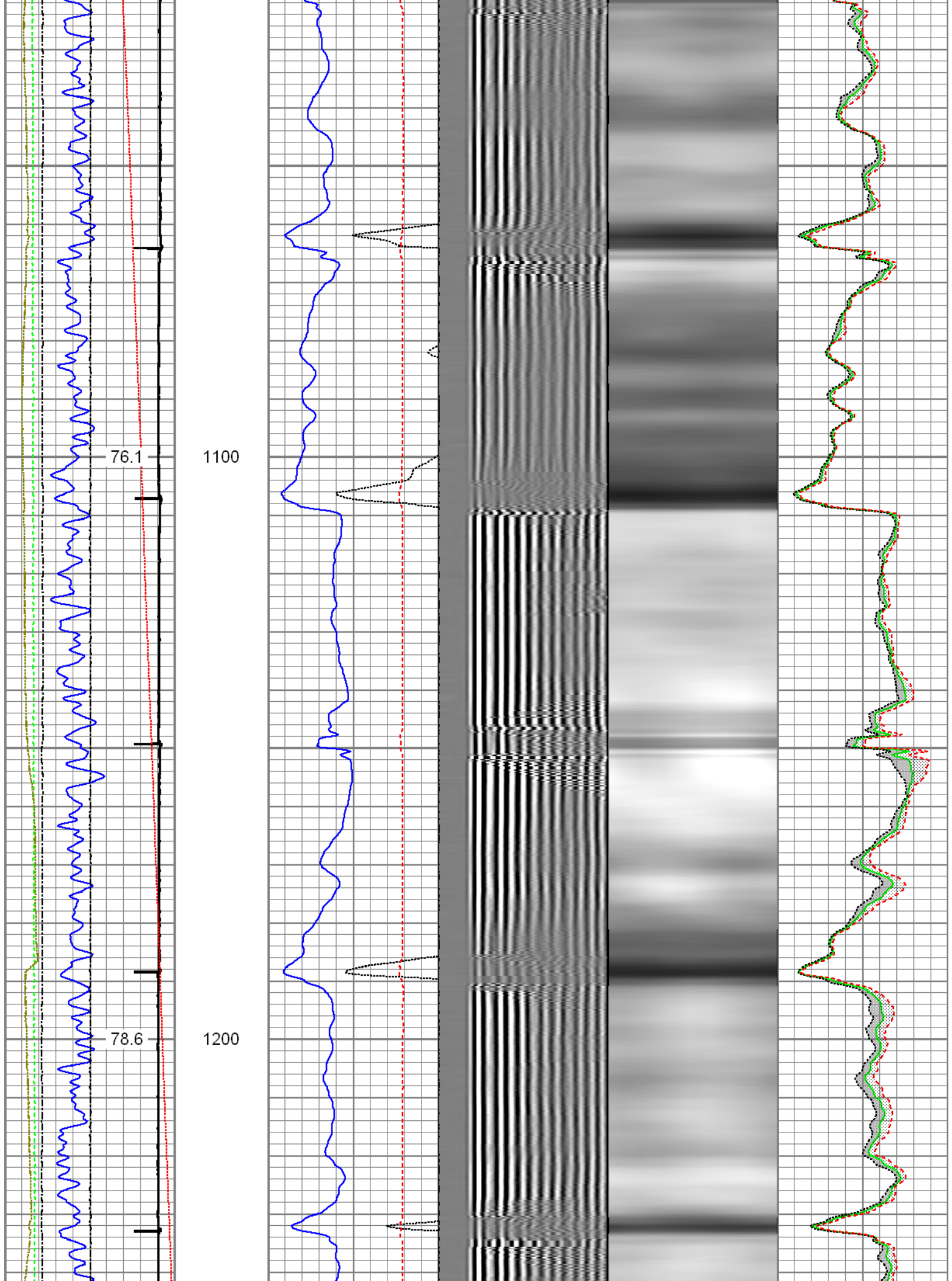
300

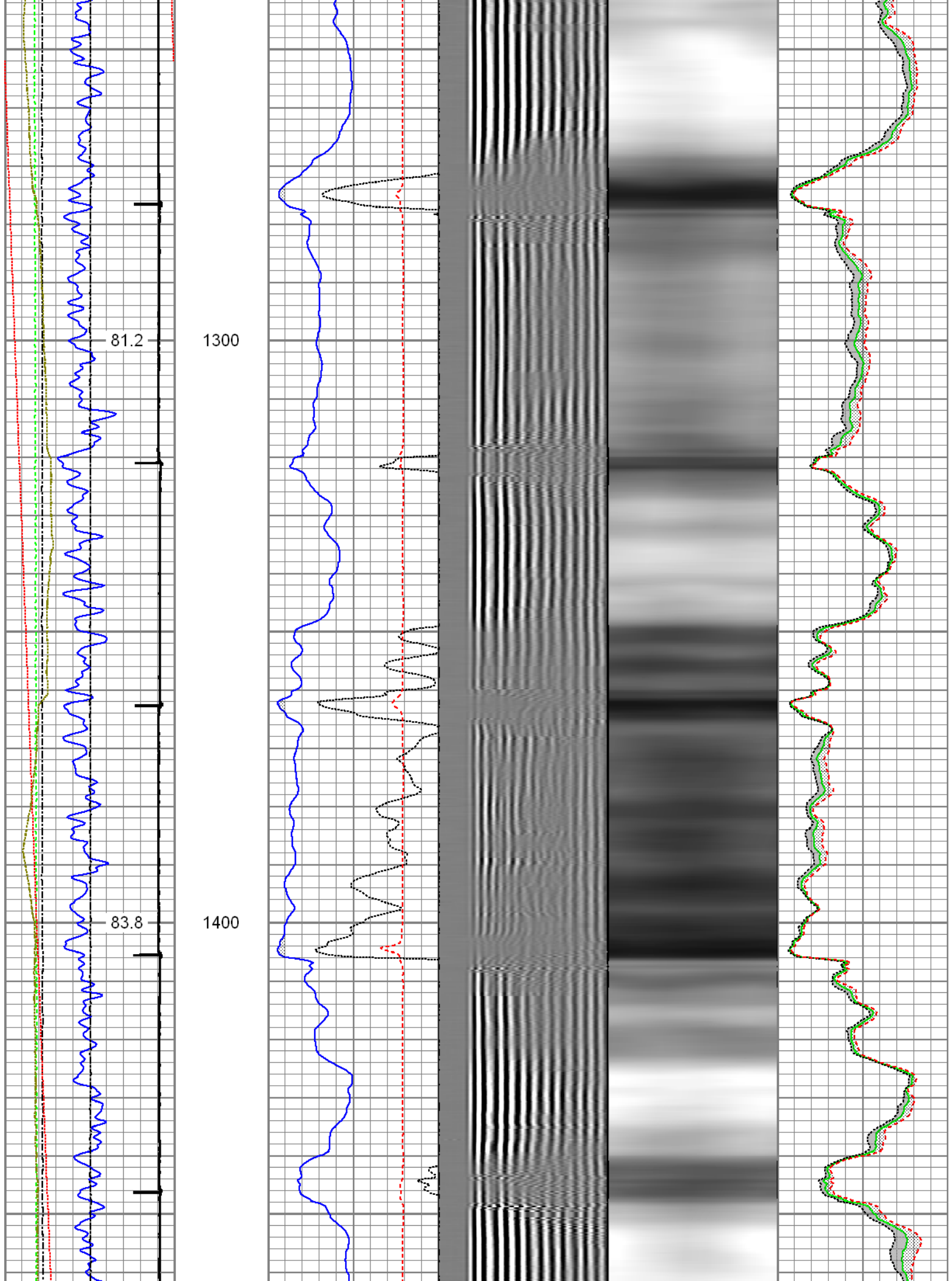


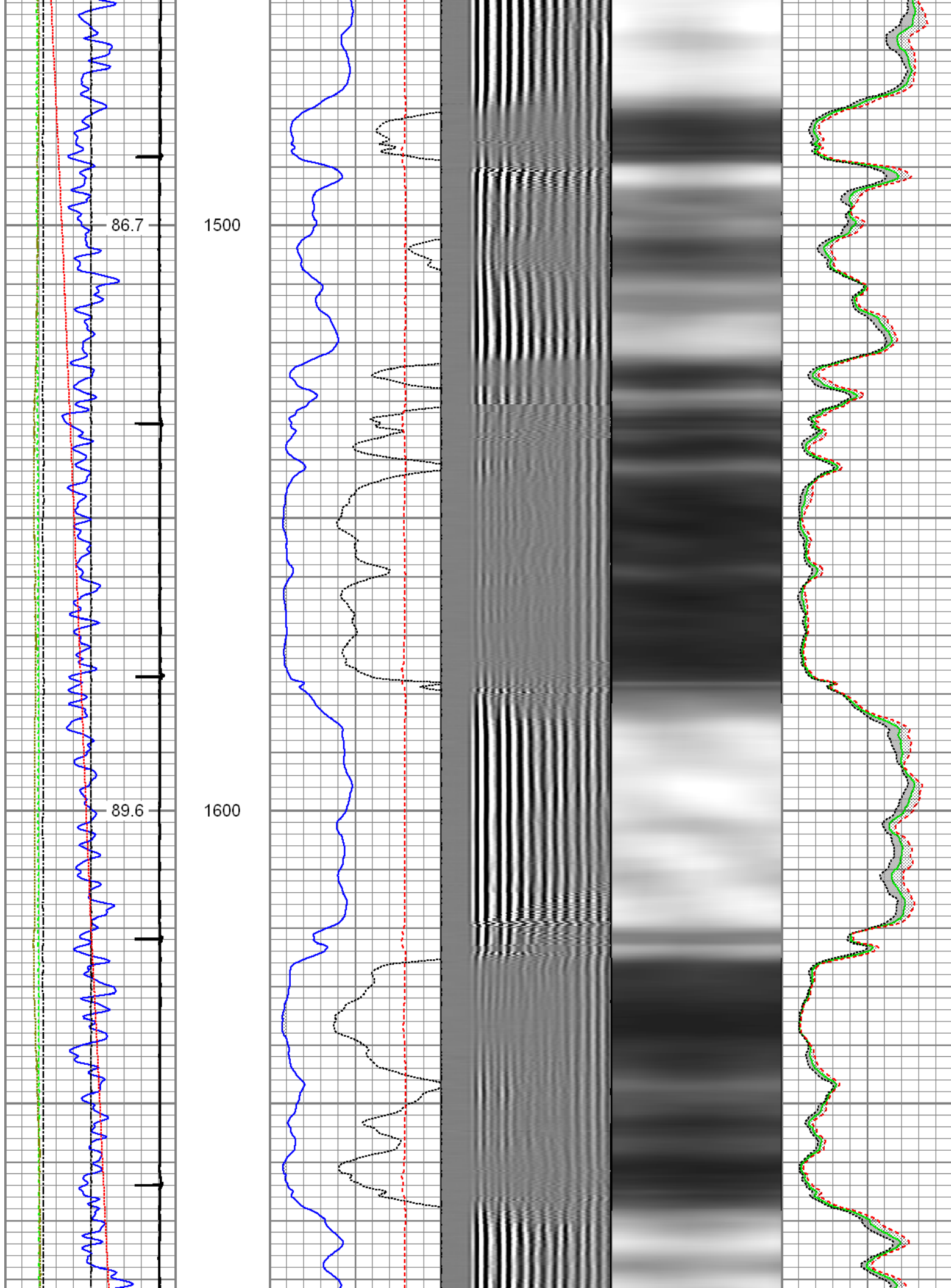


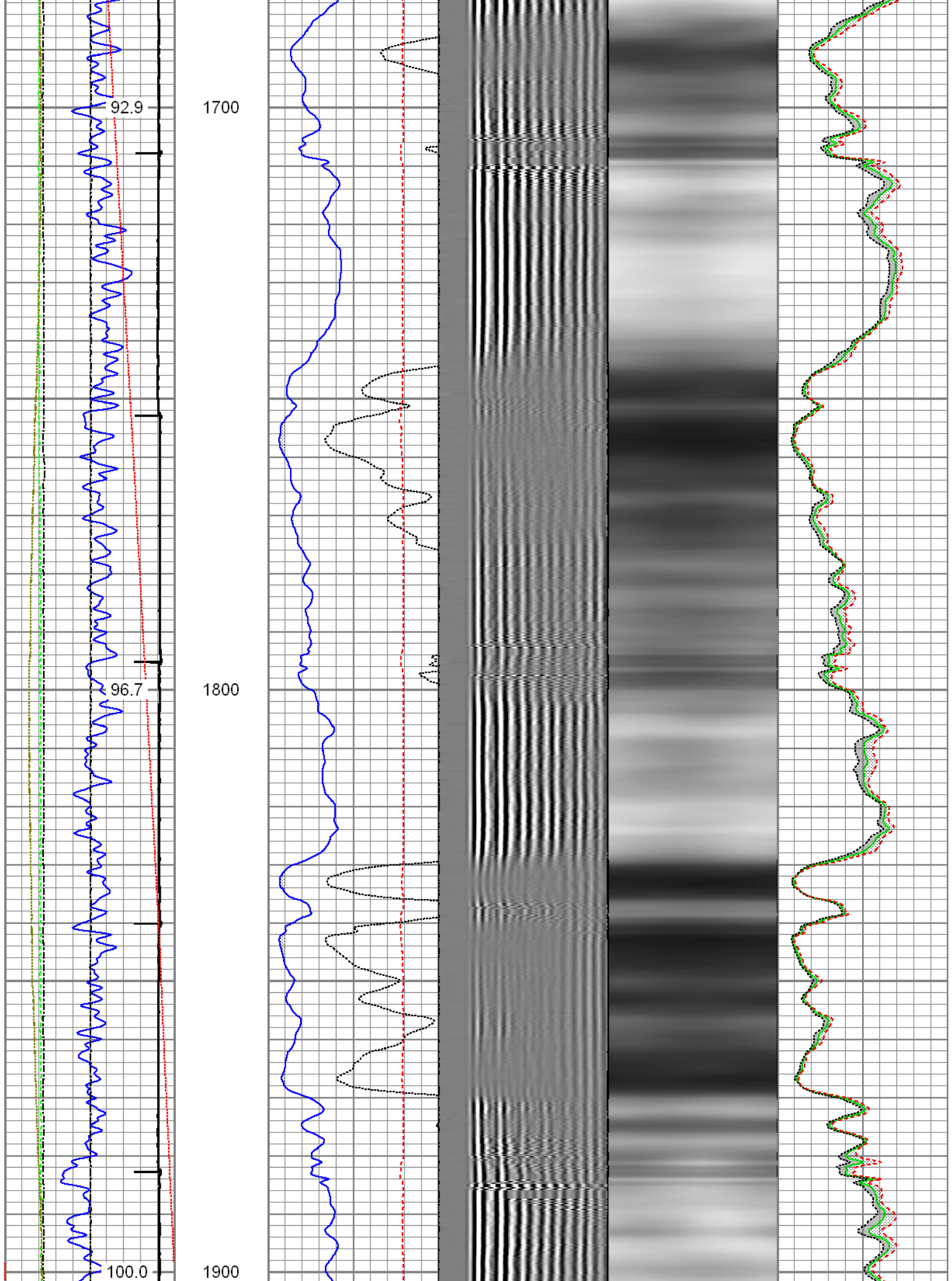


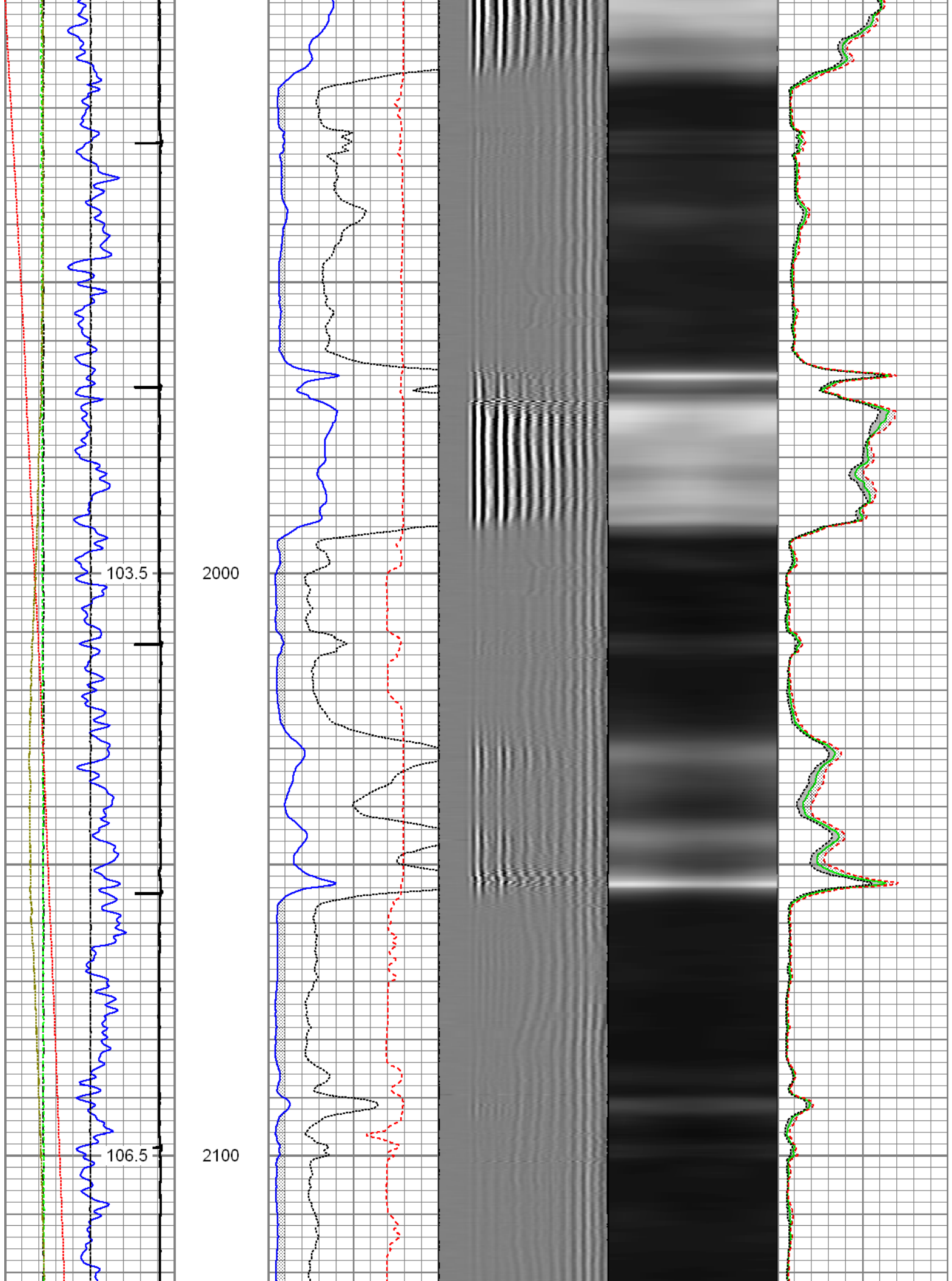


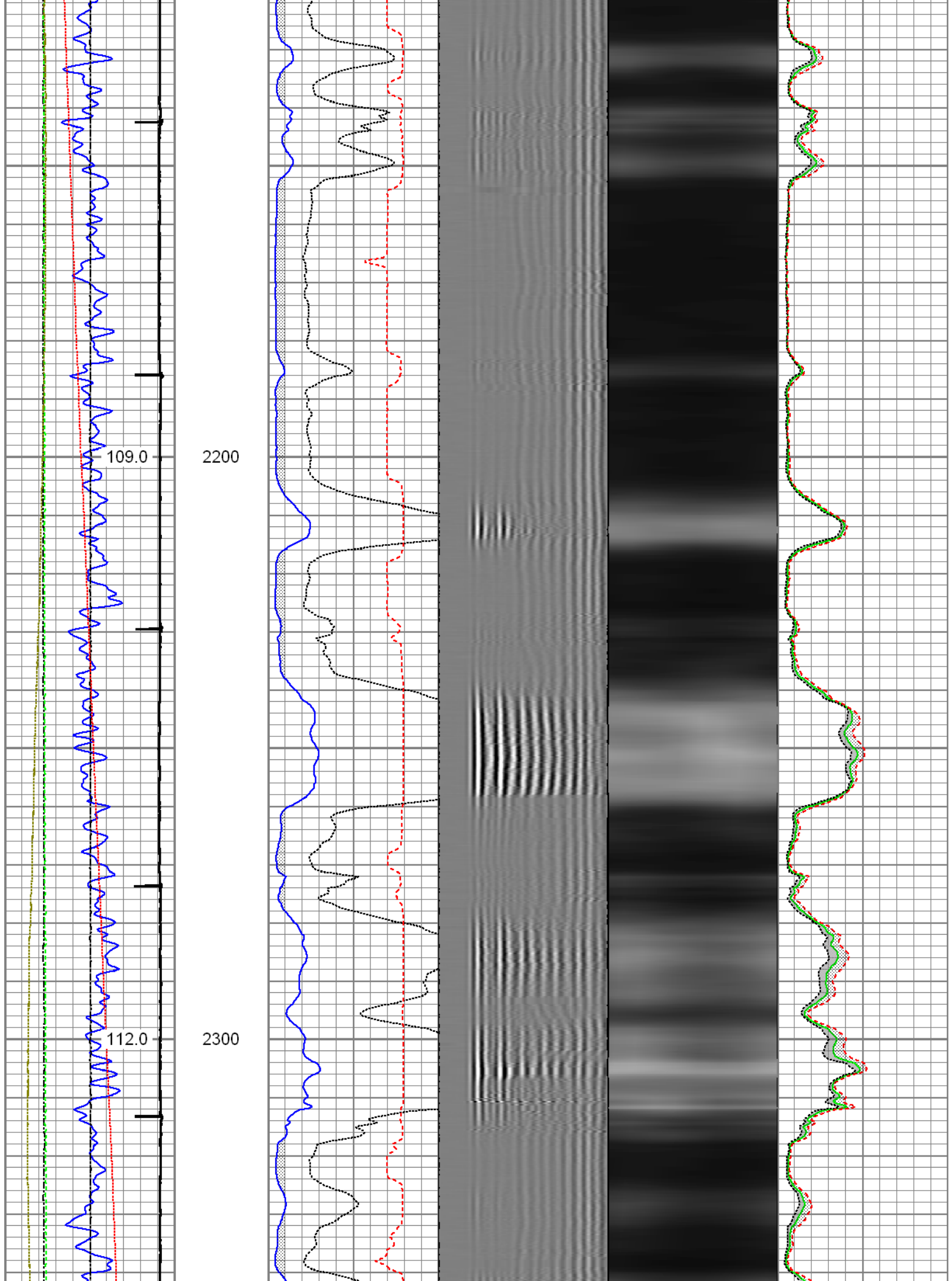


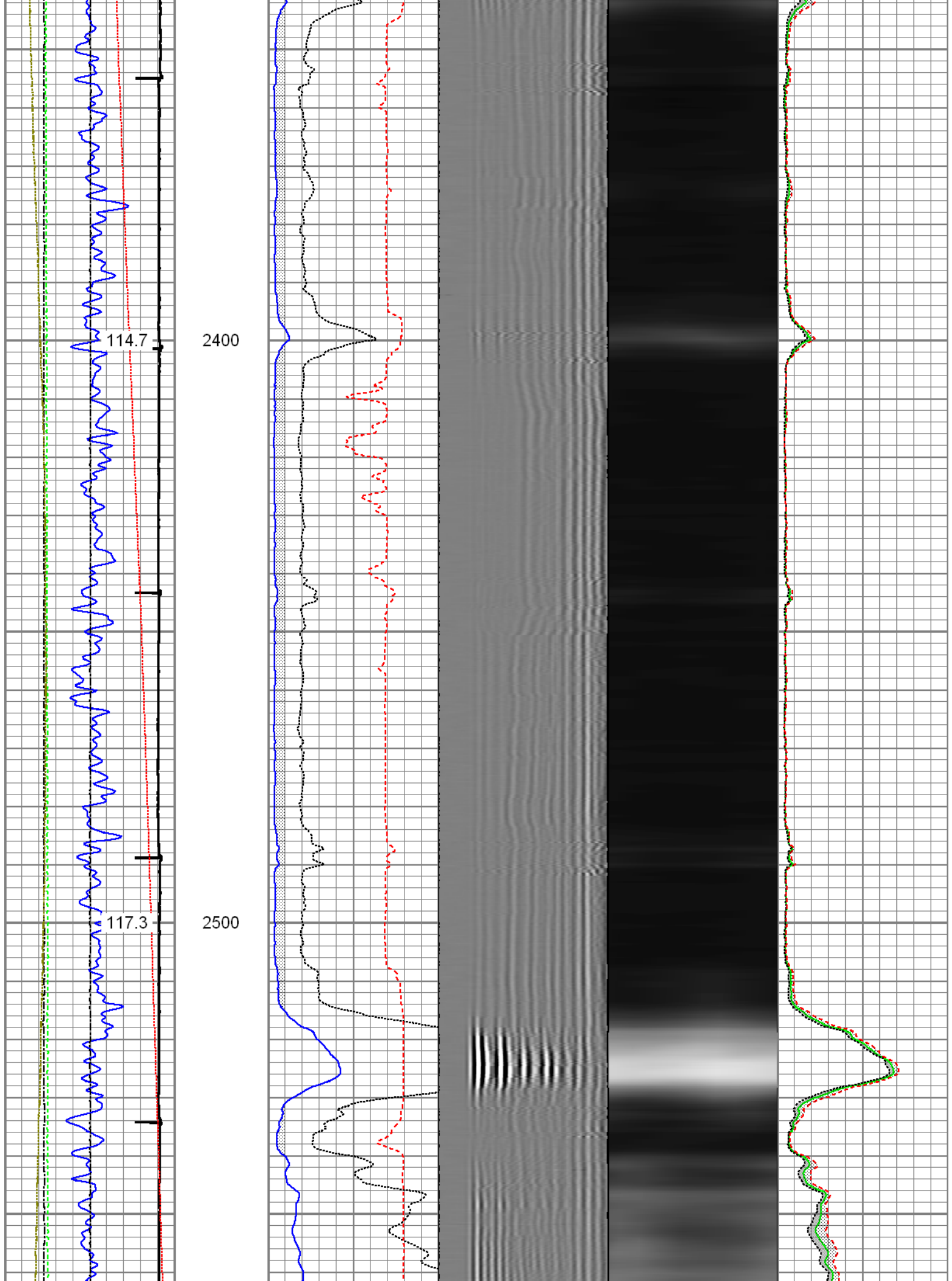


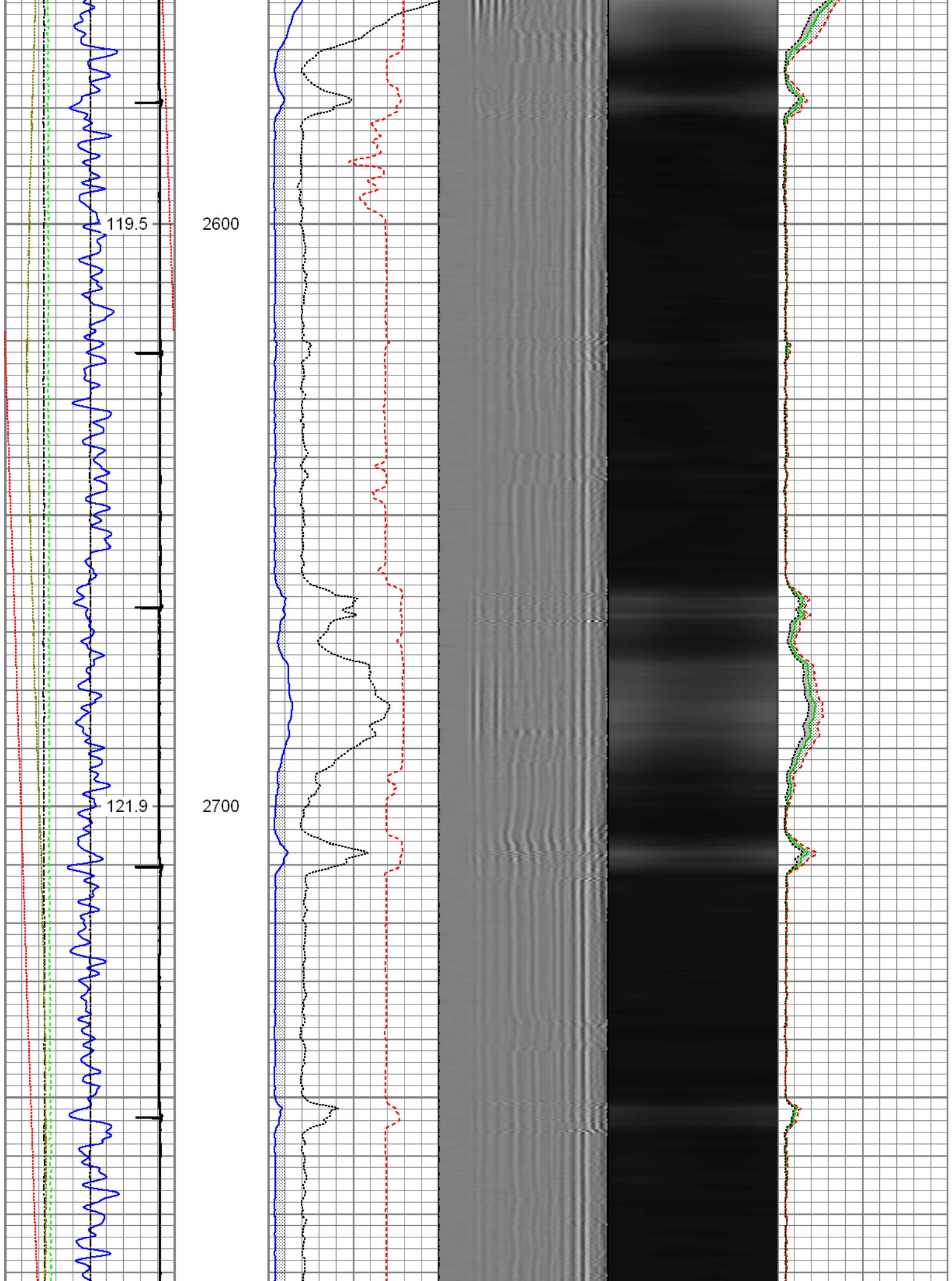


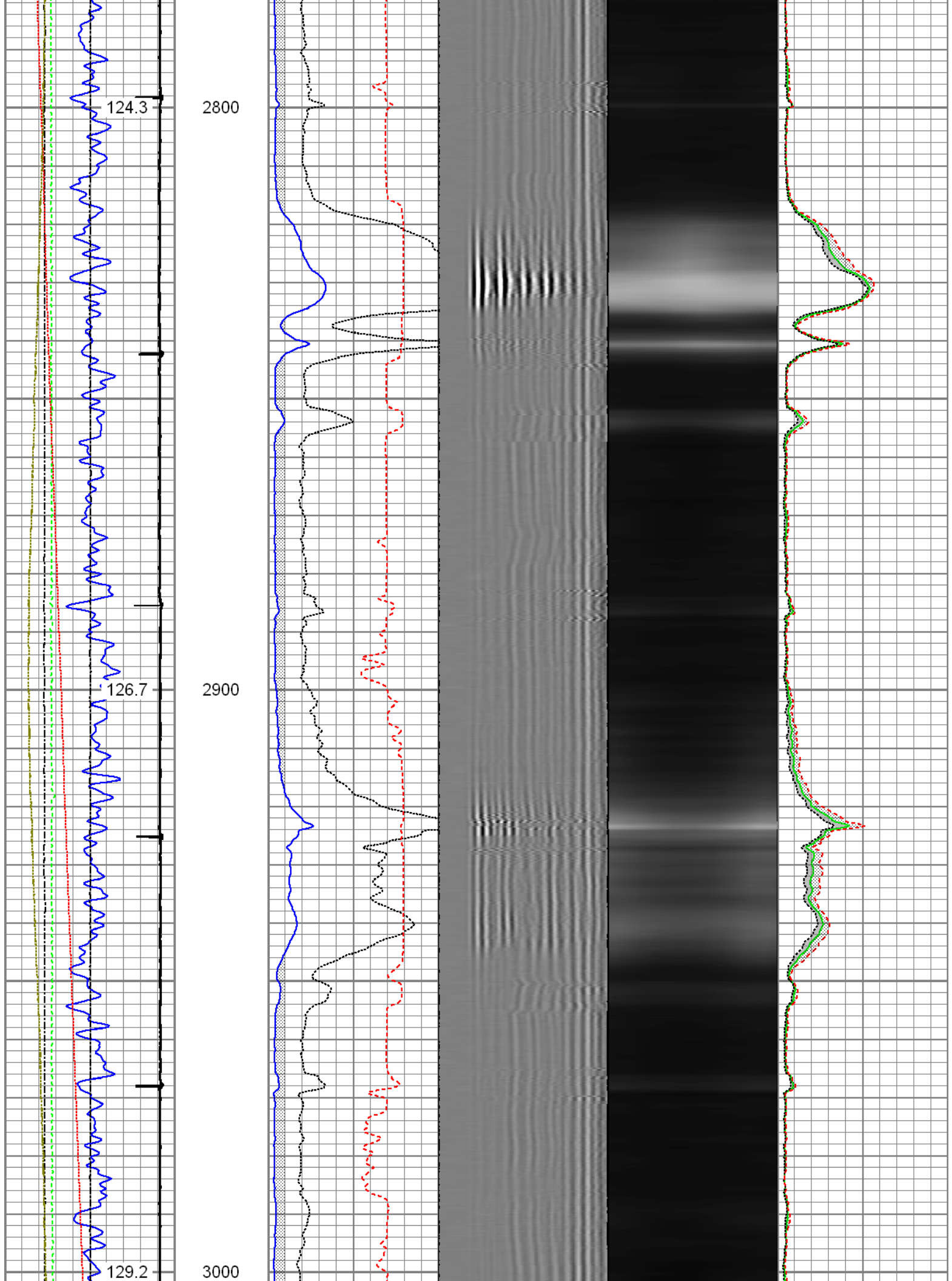


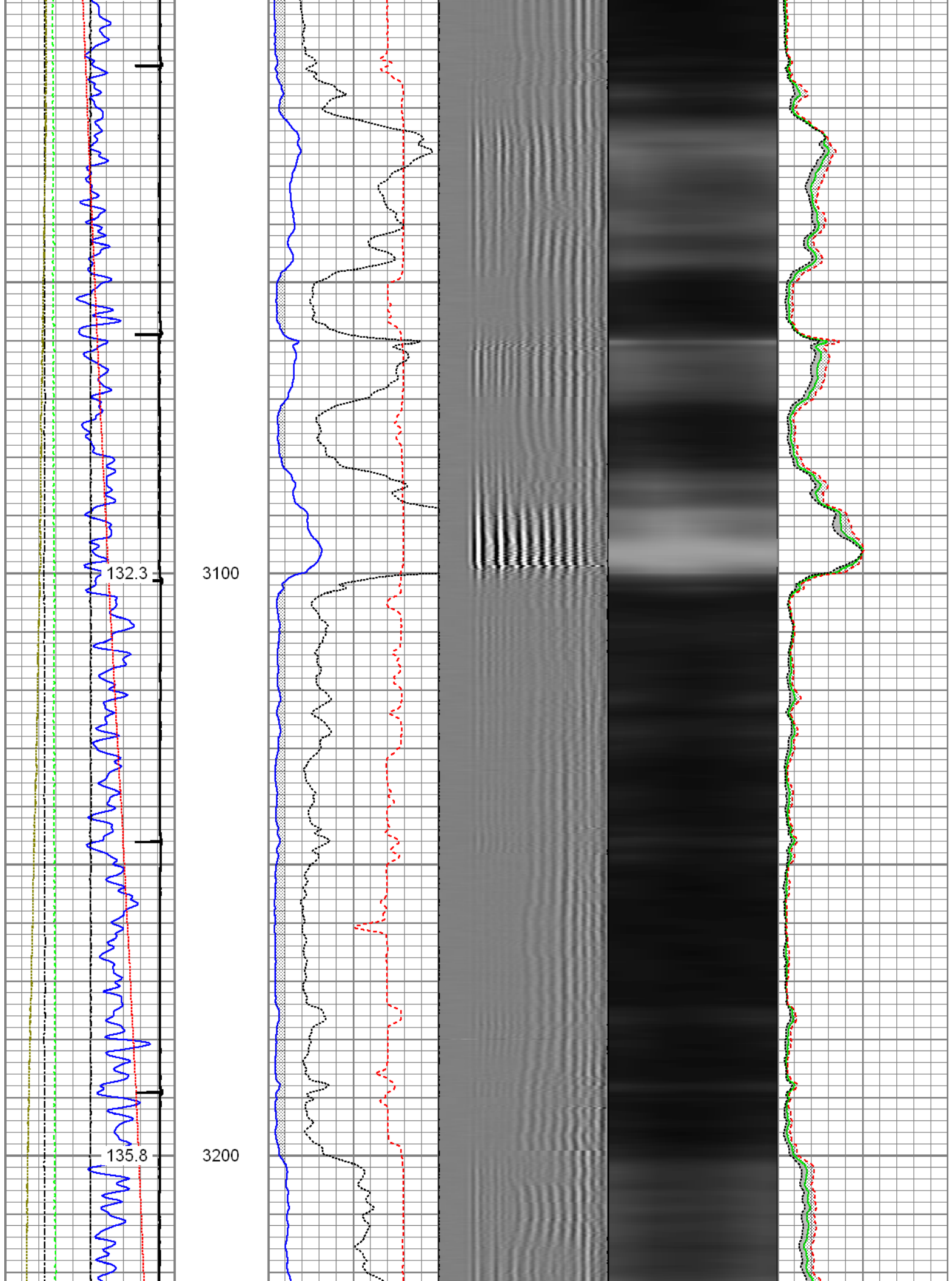


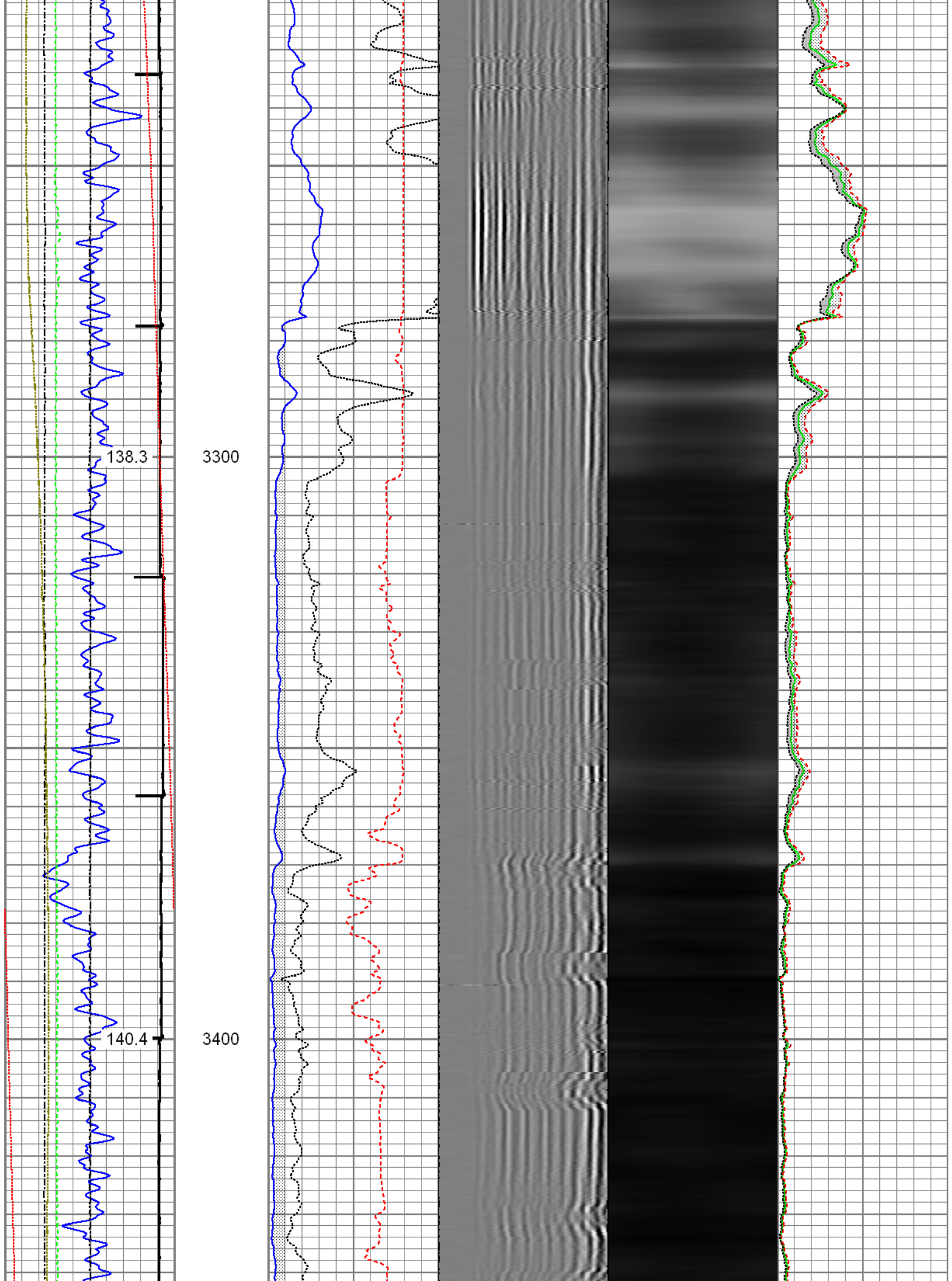


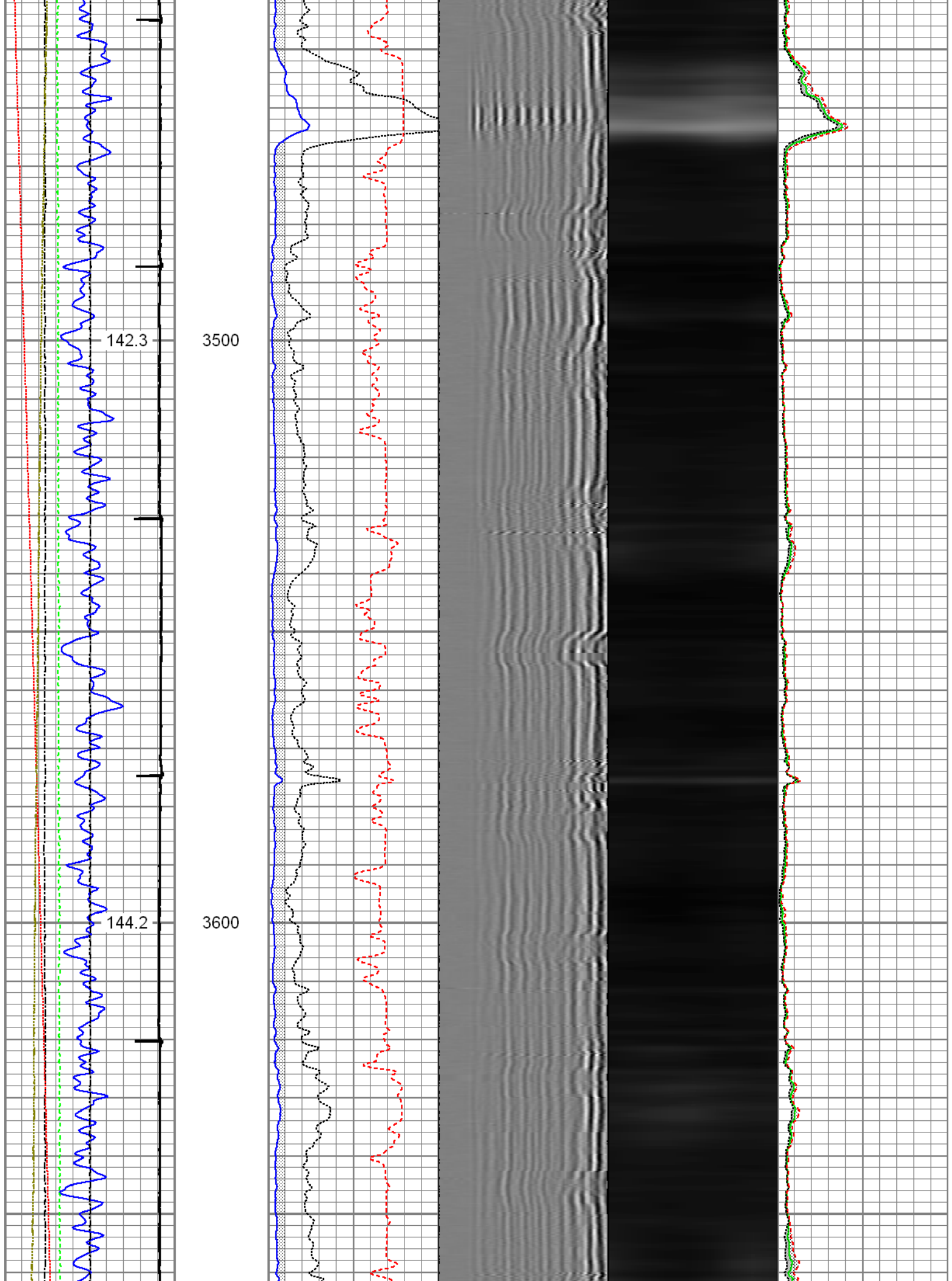


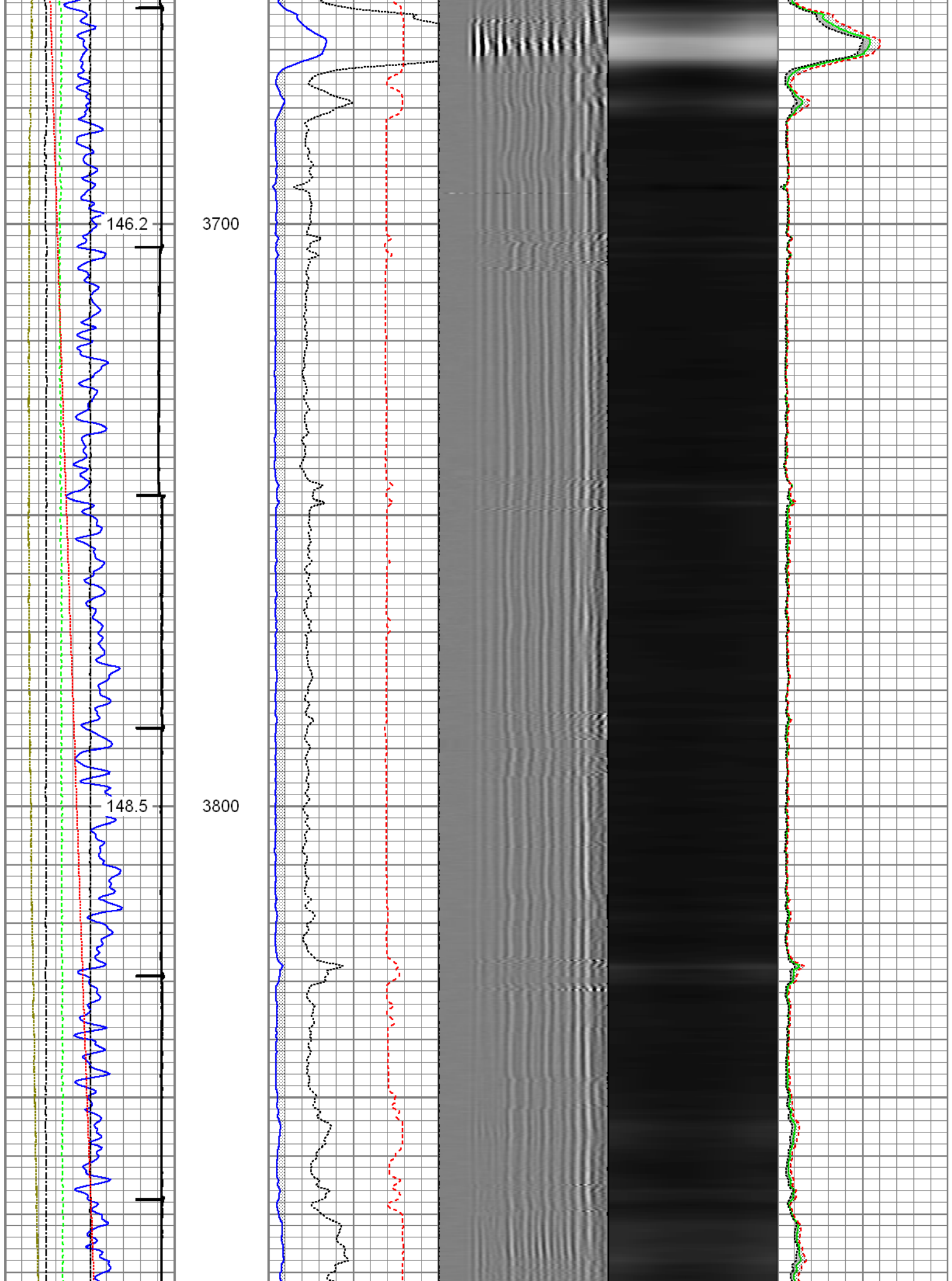


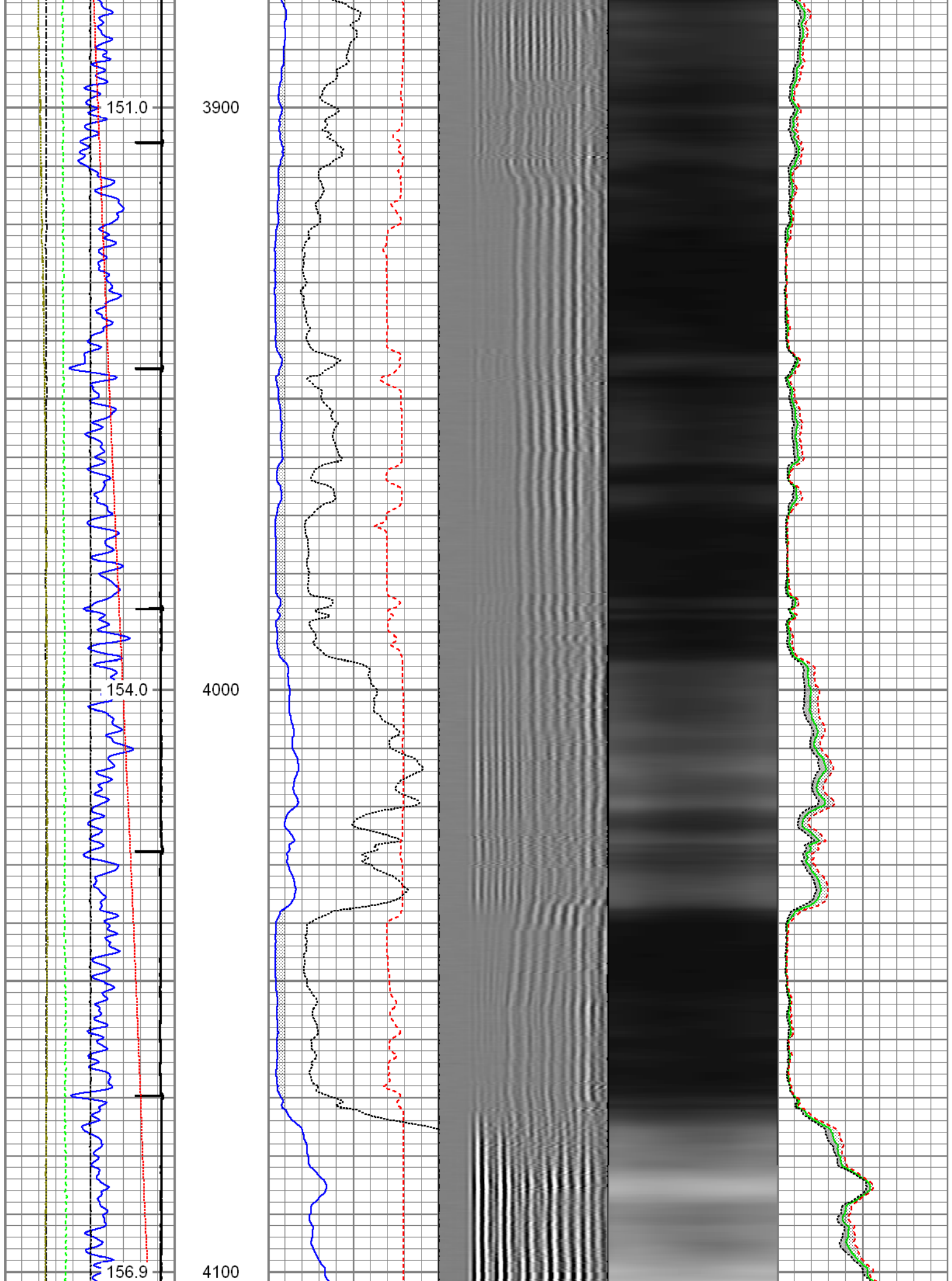


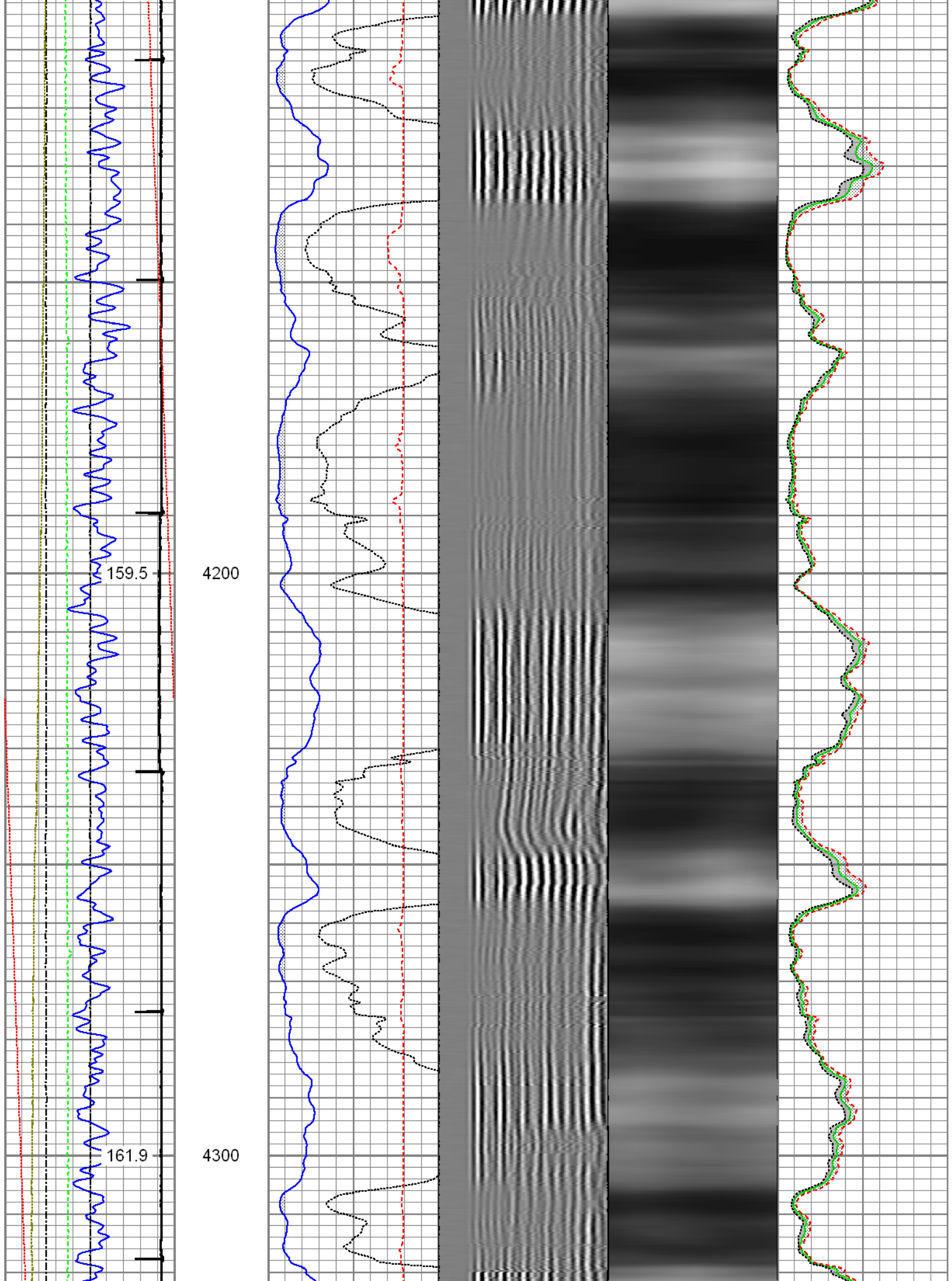


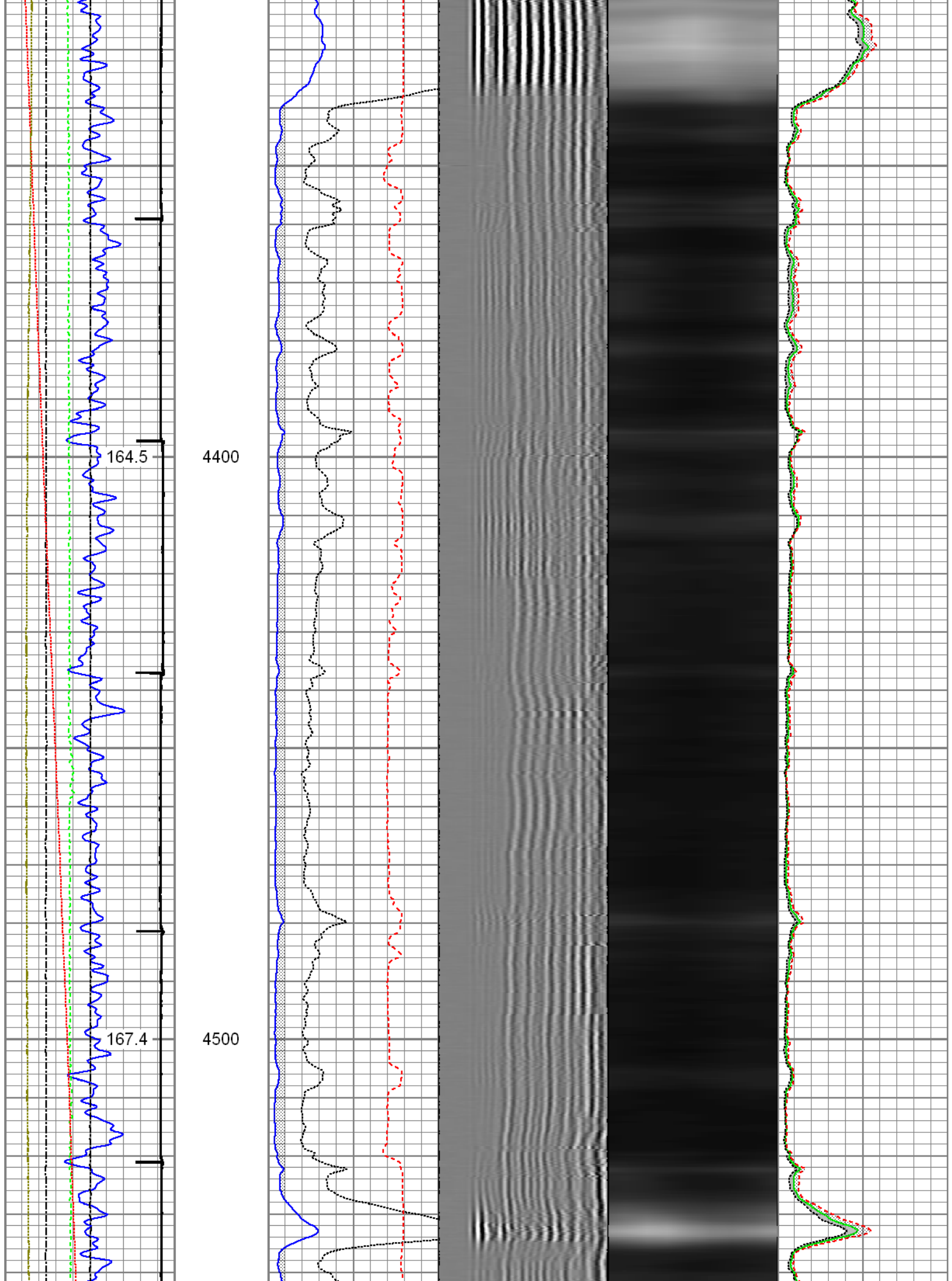


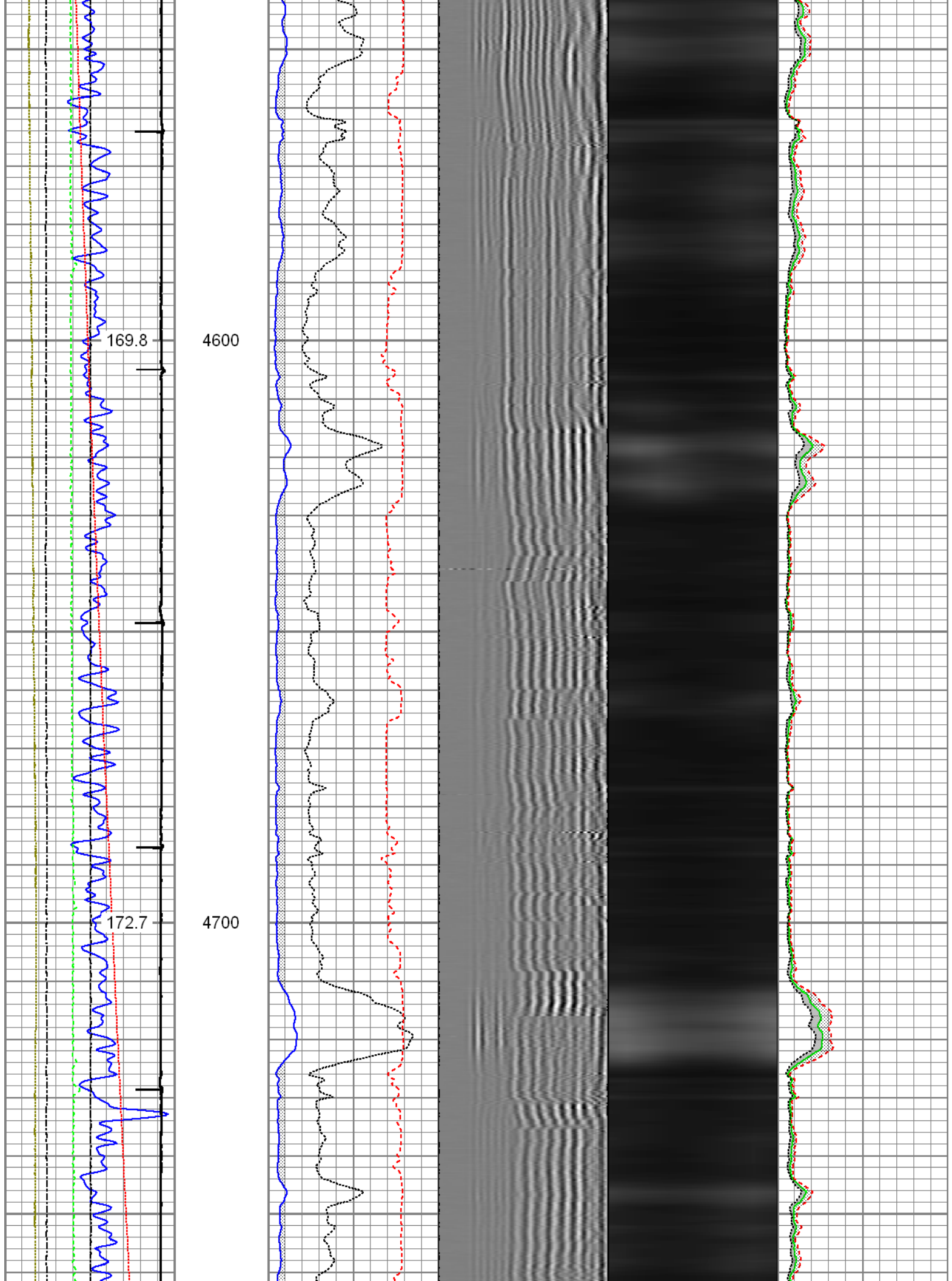


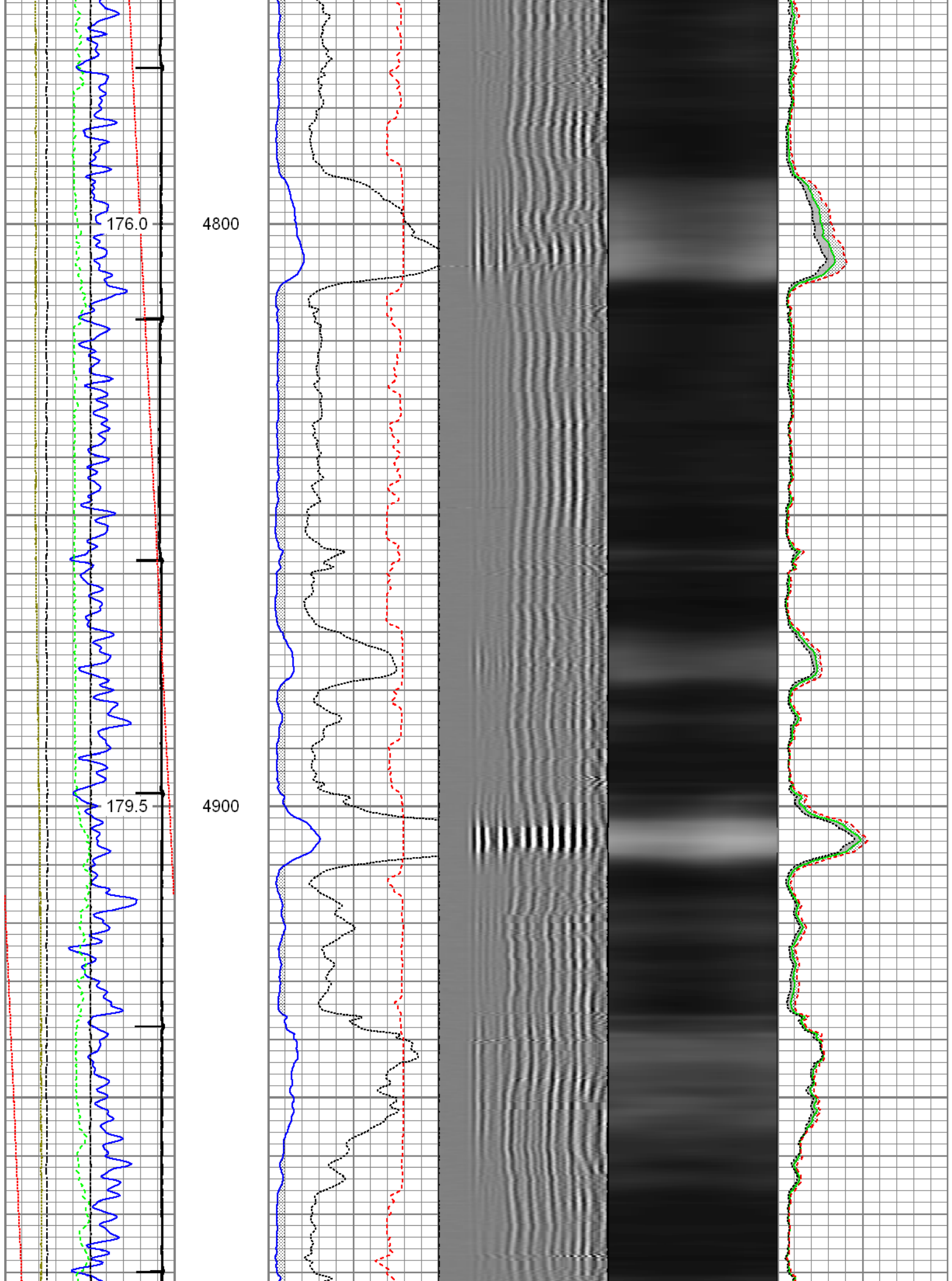


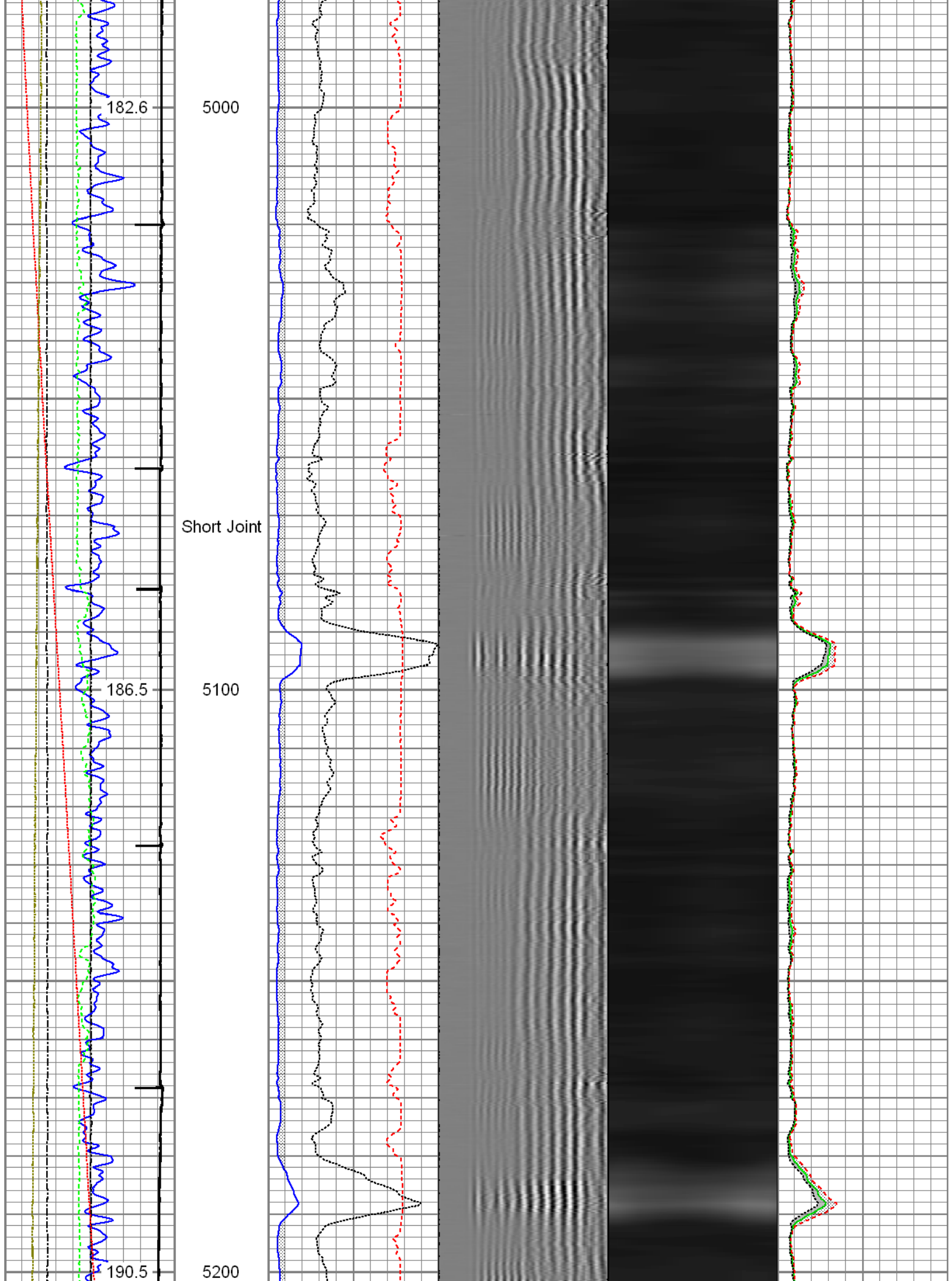


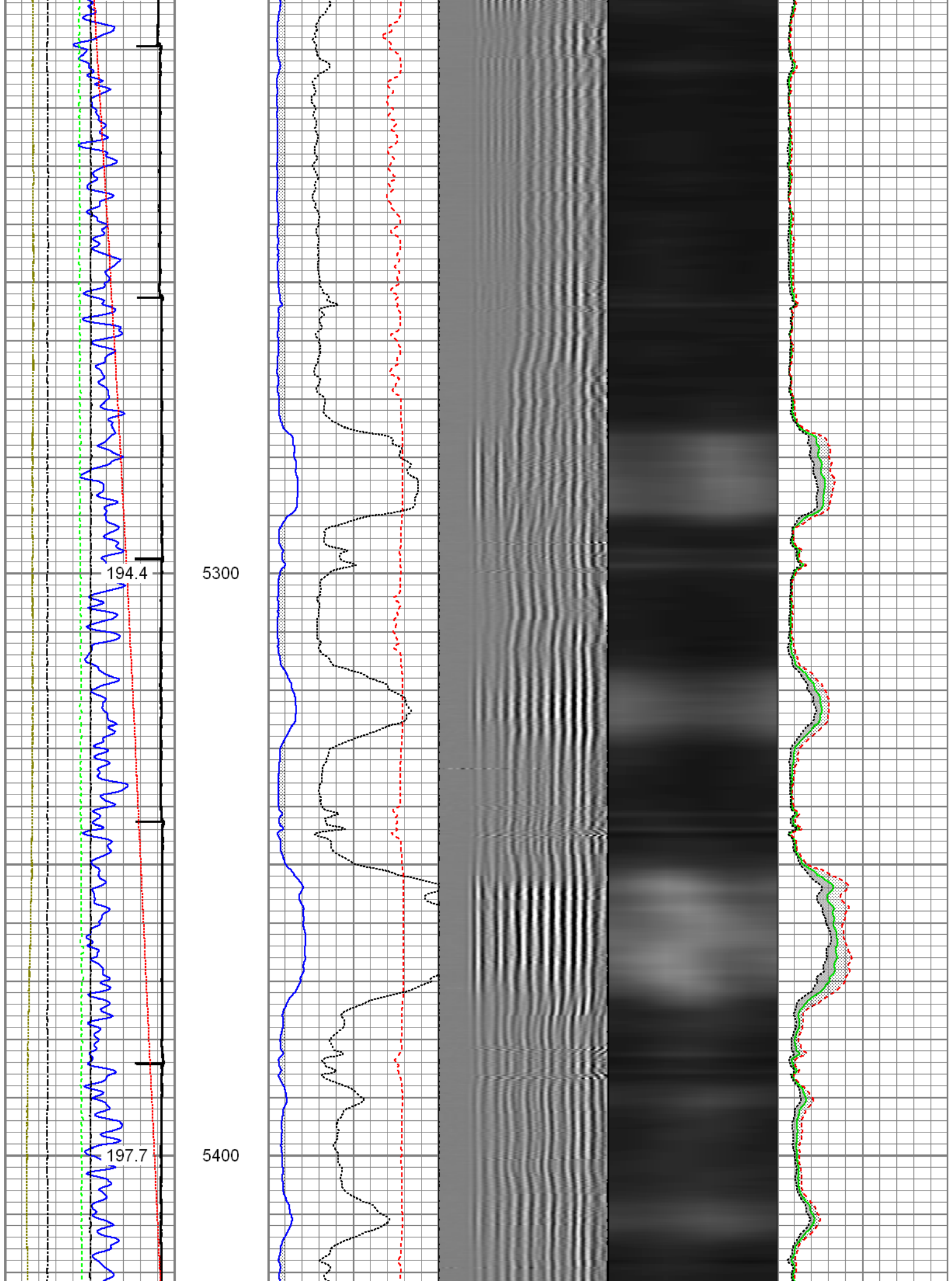


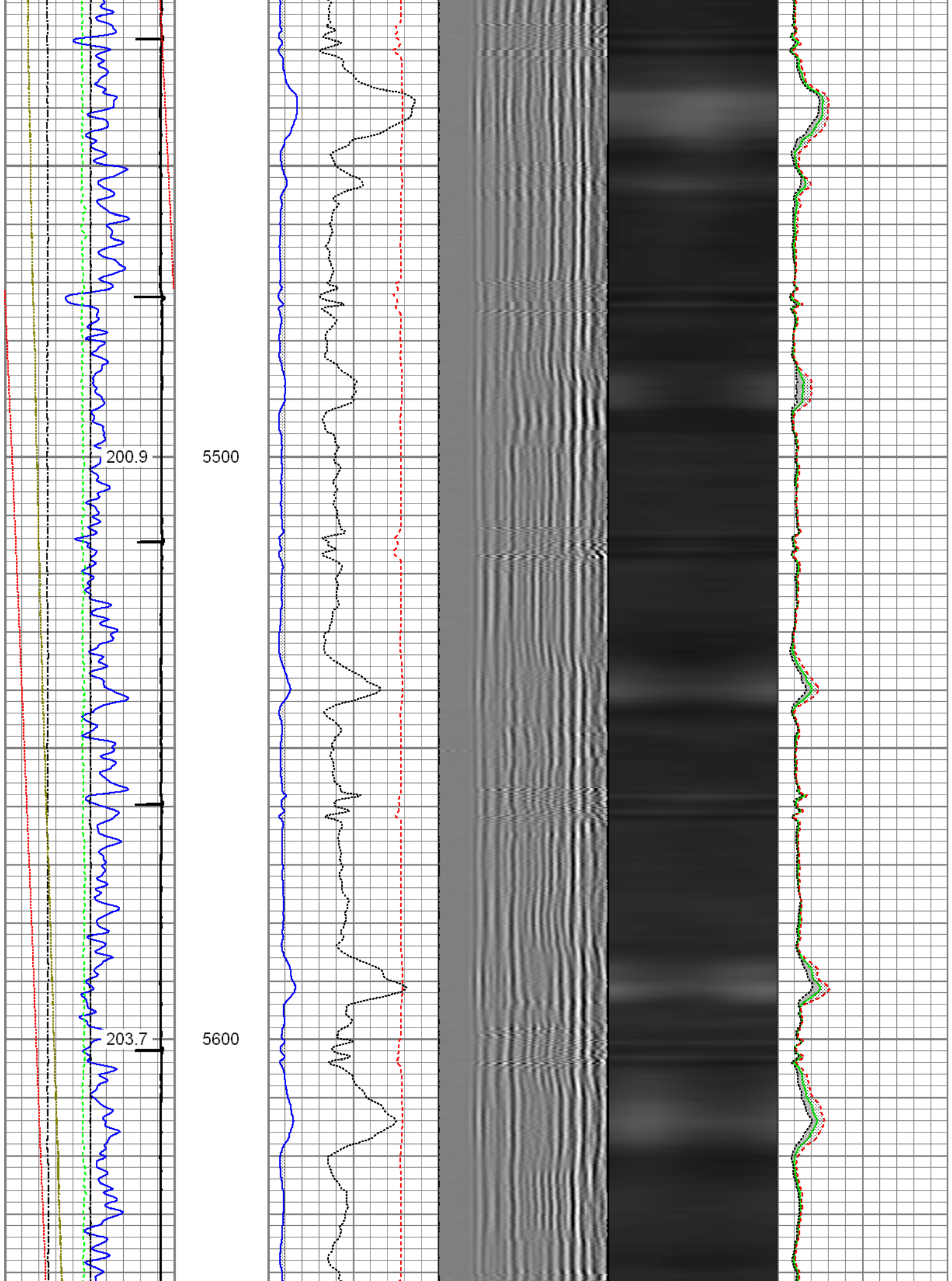


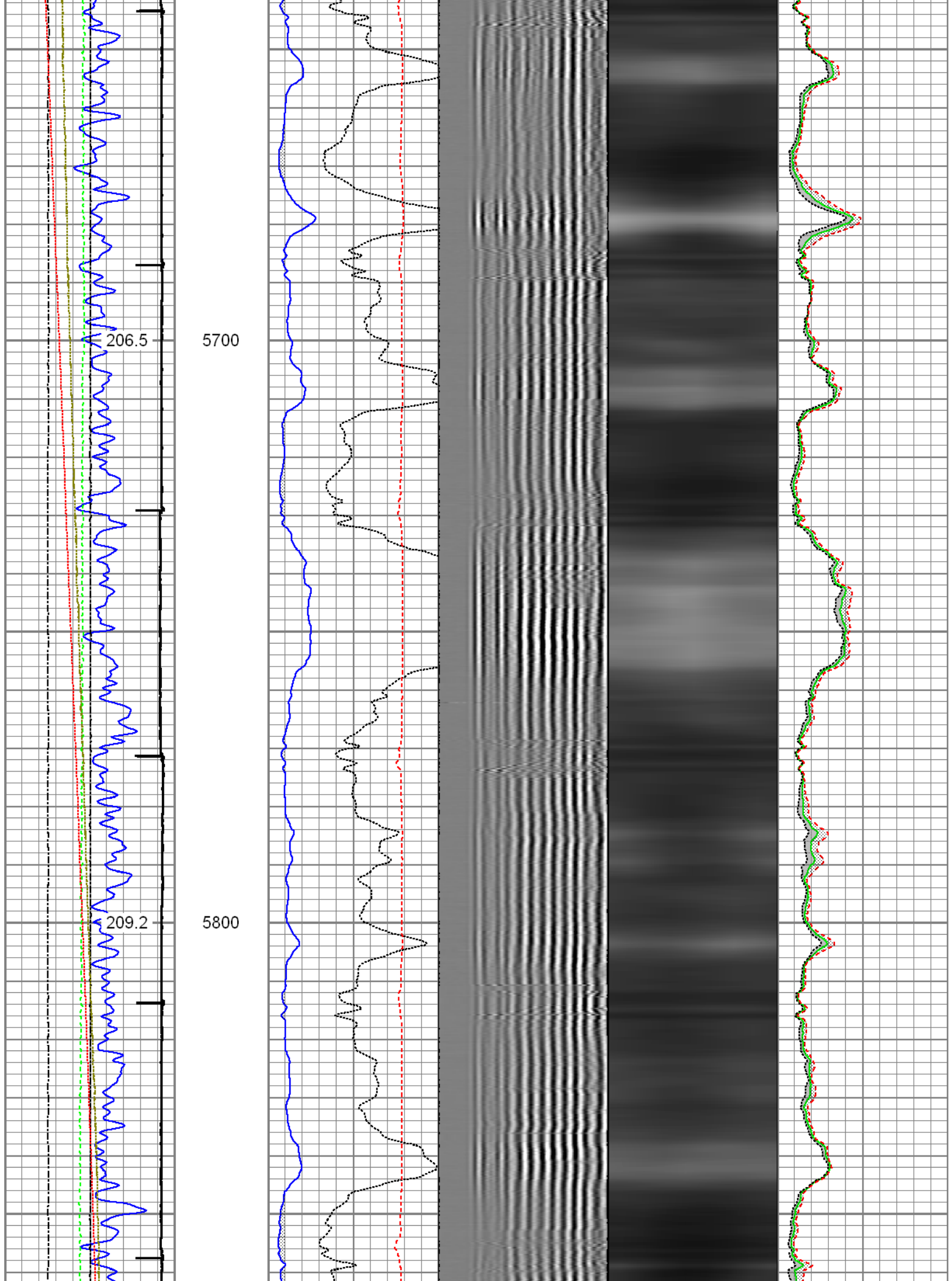


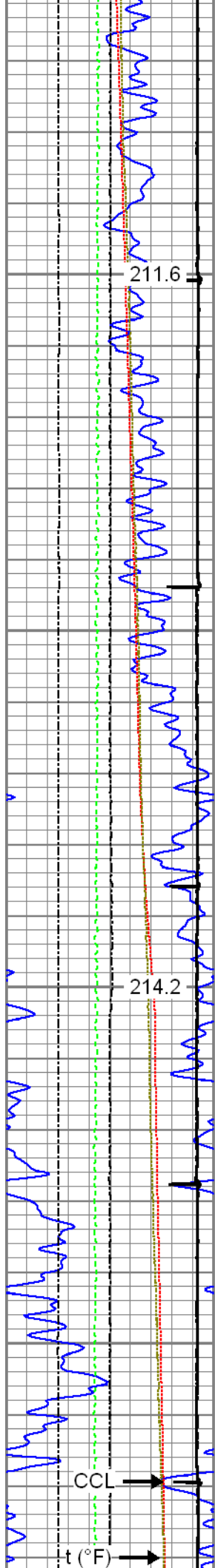










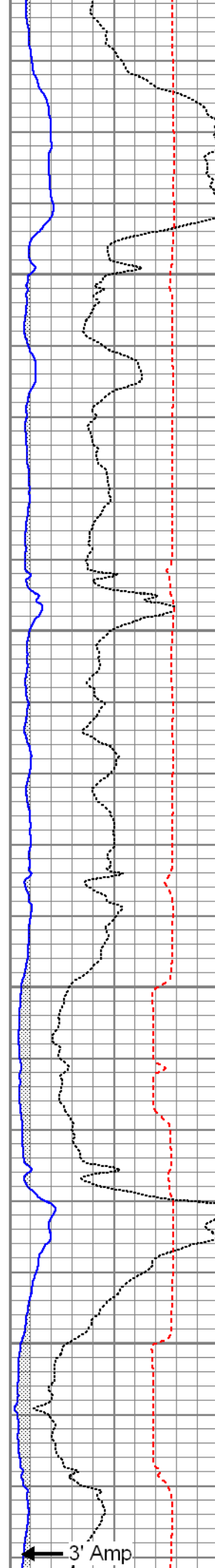


211.6

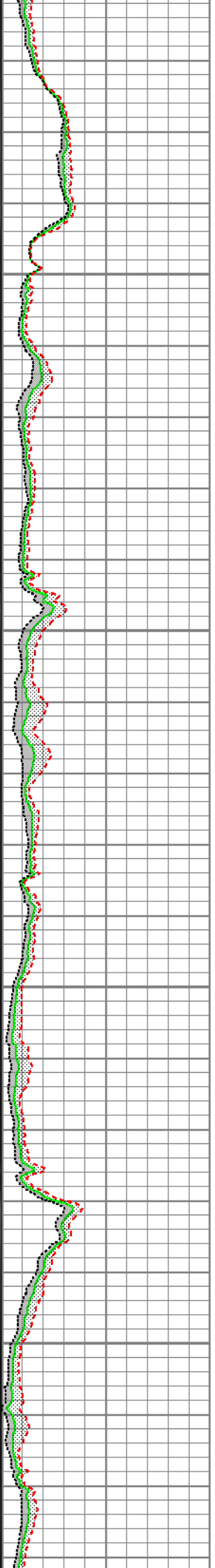
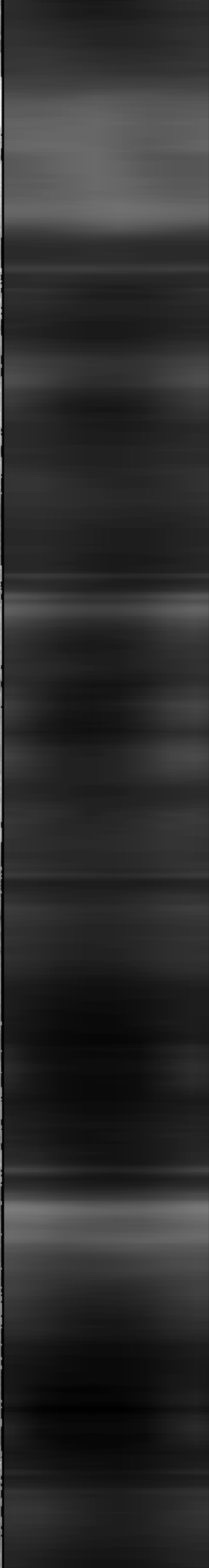
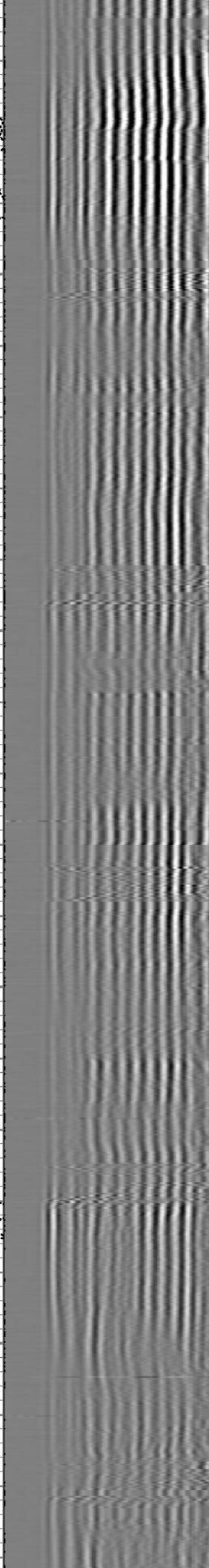
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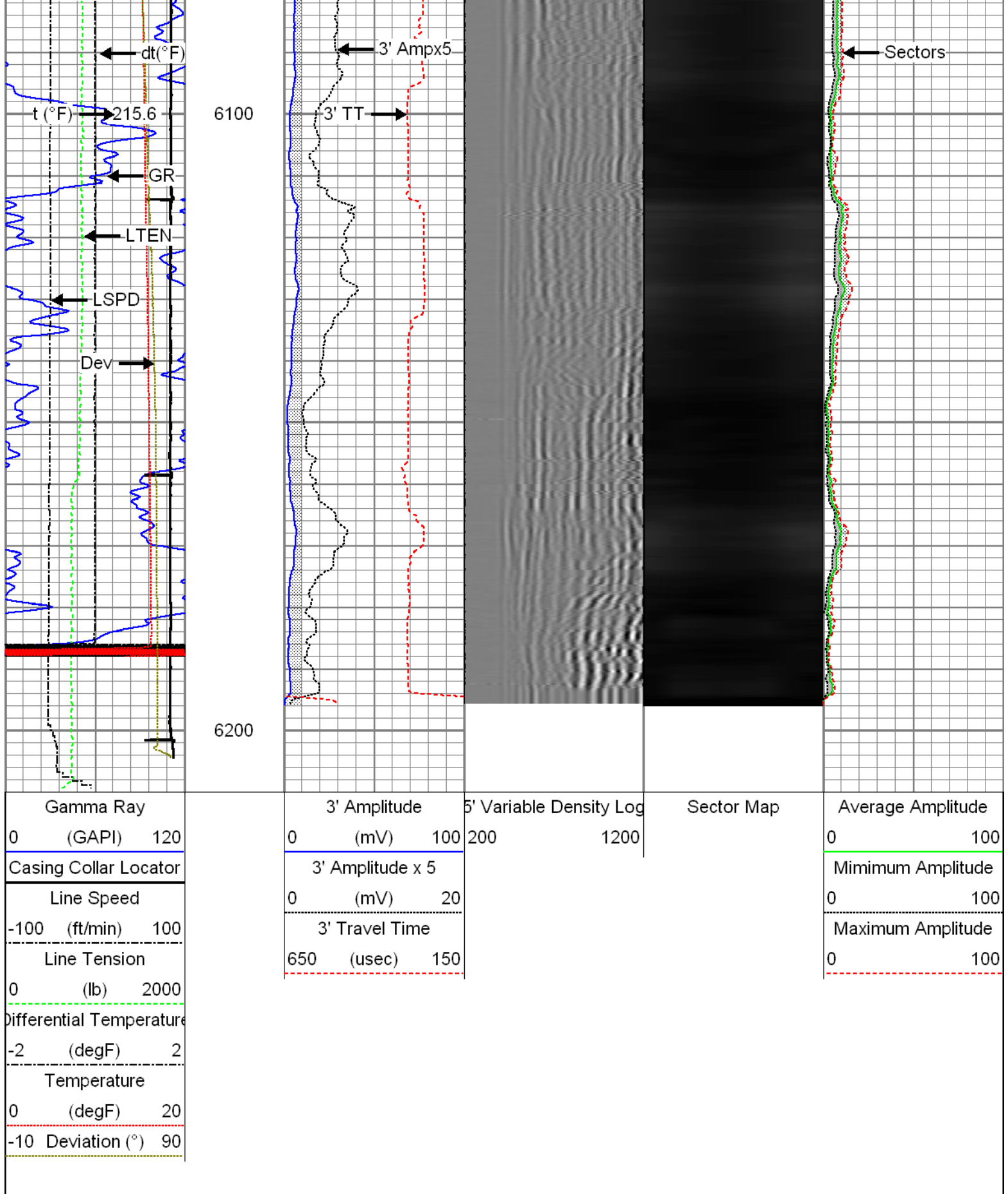
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6000



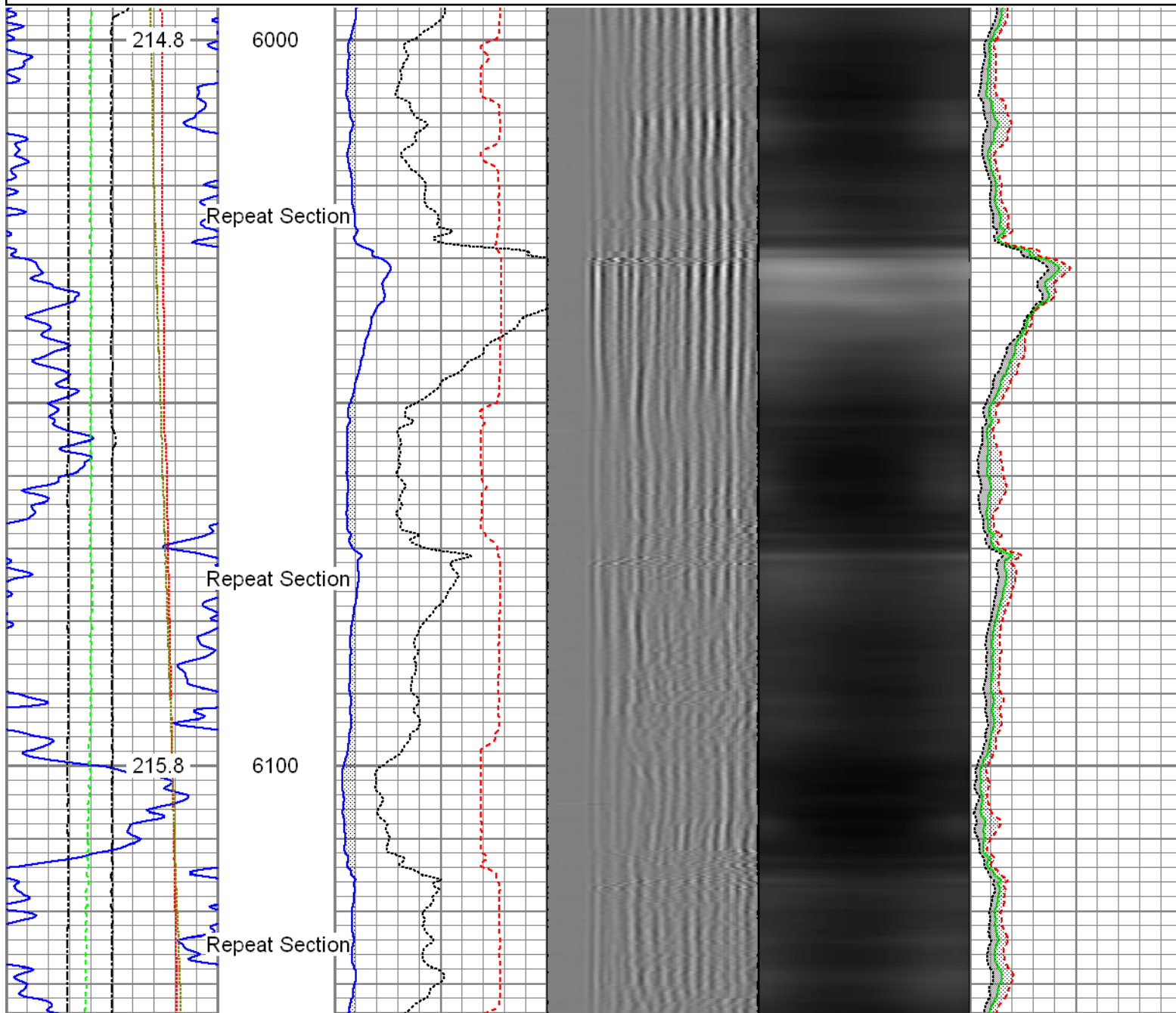
3' Amp

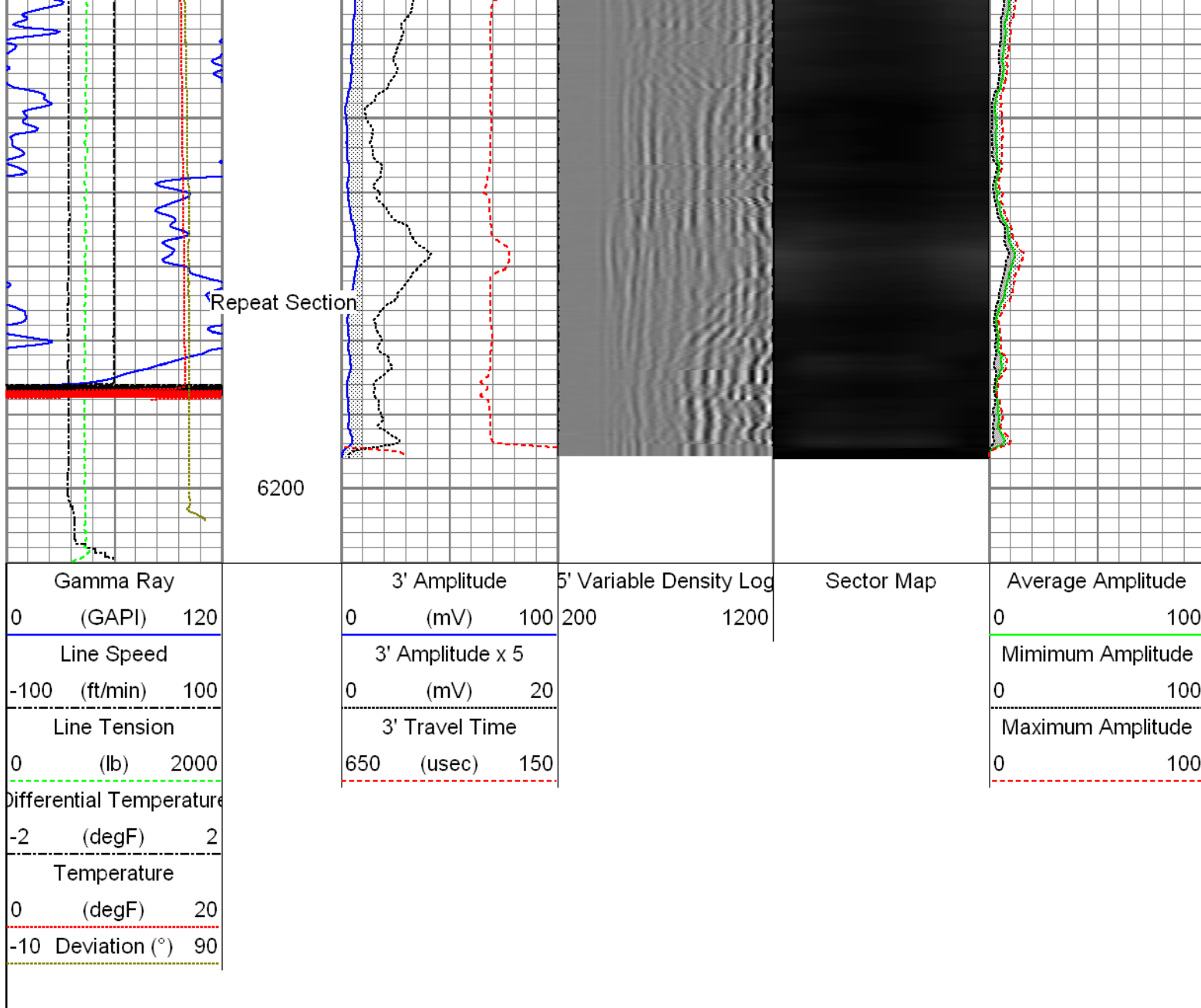


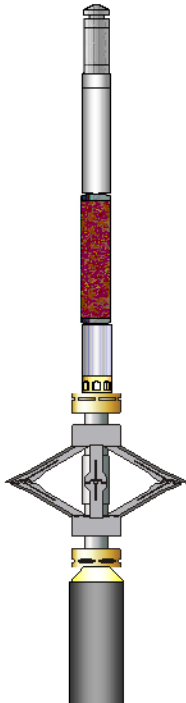


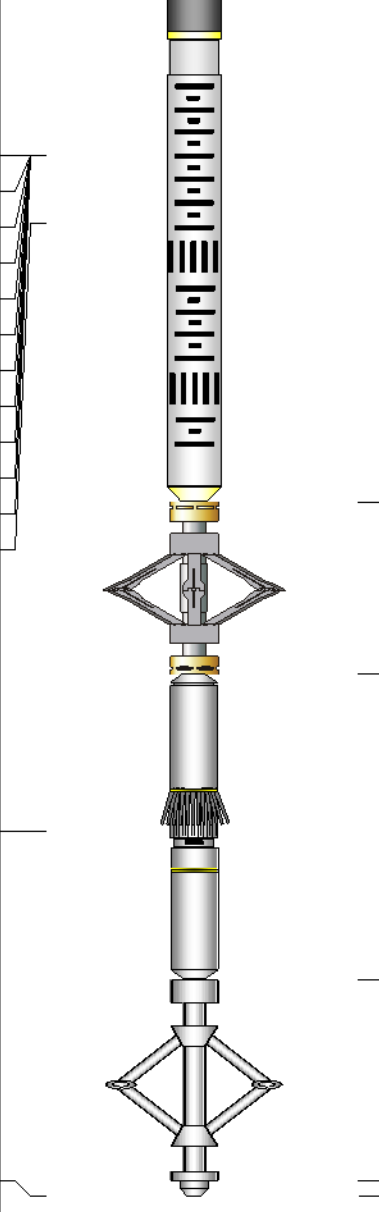
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Dataset Pathname: pass3
Presentation Format: rbt4_mit
Dataset Creation: Fri Jan 08 12:36:19 2016 by Log 7.0 B1
Charted by: Depth in Feet scaled 1:240

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





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 (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
			UW_PRT-UW_PRT_016 (10025097) Platinum Resistance Thermometer	1.04	1.69	5.20
TEMP	22.45		UW_PRC #4 -DSSRAC (081) 2-3/4" DSS 5 Arm Roller Centralizer	2.55	2.75	32.00

WVF3FT	15.42		UW_RBT-UW_RBT_004 (10022773) 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 (082) 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_027 (218949) 40 Multifinger Imaging Tool	4.54	2.75	61.10
TSTAMP	0.00		UW_PRC-UW_PRC_057 (1102) Sondex 2-3/4" 4-Arm Production Roller Centraliser	2.98	2.75	32.00
			UW_BUL-UW_BUL_006 (031422) Sondex Ultrawire Bullnose Terminator	0.22	1.69	1.20
Dataset: 01-08-16_Noble_Ann LC34-755_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\01-08-16_Noble_Ann LC34-755_MIT_RBL\01-08-16_N		
Dataset Pathname:	pass4.1		
Dataset Creation:	Fri Jan 08 15:05:37 2016 by Calc 7.0 B1		
Multi-finger Imaging Tool Calibration Report			
Serial Number:	218949		
Number of Fingers:	40		
Tool Model:	UW_MIT40_027		
Inclinometer Calibration Report			
Performed:	Mon, Oct, 06 14:03:04 2008		
Calibration Angle:	45		
	Inc X	Inc Y	
Vertical:	1996	1984	
Finger 1 up:	1780	1738	
Finger 31 up:	2235	1756	
Finger 21 up:	2216	2228	
Finger 11 up:	1736	2196	
Quality Index:	1.0000		

Sensitivity ratio: 1.0062
X-axis angle: 131.534
Deviation const.: 331.322

Finger Calibration Report
Performed: Fri Jan 08 11:50:27 2016

Ring size: (in)	4	Sens	5	Sens	6	Sens	7
Finger 01:	1403	283.0	1686	299.0	1985	310.0	2295
Finger 02:	1462	274.0	1736	289.0	2025	300.0	2325
Finger 03:	1697	277.0	1974	284.0	2258	287.0	2545
Finger 04:	1669	275.0	1944	280.0	2224	281.0	2505
Finger 05:	1552	261.0	1813	271.0	2084	283.0	2367
Finger 06:	1532	260.0	1792	266.0	2058	272.0	2330
Finger 07:	1376	281.0	1657	289.0	1946	301.0	2247
Finger 08:	1548	259.0	1807	265.0	2072	274.0	2346
Finger 09:	1430	271.0	1701	285.0	1986	297.0	2283
Finger 10:	1496	267.0	1763	277.0	2040	280.0	2320
Finger 11:	1501	261.0	1762	271.0	2033	276.0	2309
Finger 12:	1337	281.0	1618	300.0	1918	311.0	2229
Finger 13:	1632	282.0	1914	288.0	2202	284.0	2486
Finger 14:	1476	286.0	1762	300.0	2062	307.0	2369
Finger 15:	1566	263.0	1829	272.0	2101	282.0	2383
Finger 16:	1425	284.0	1709	298.0	2007	308.0	2315
Finger 17:	1637	270.0	1907	278.0	2185	283.0	2468
Finger 18:	1419	294.0	1713	307.0	2020	320.0	2340
Finger 19:	1653	257.0	1910	258.0	2168	260.0	2428
Finger 20:	1546	265.0	1811	275.0	2086	288.0	2374
Finger 21:	1607	252.0	1859	254.0	2113	266.0	2379
Finger 22:	1573	275.0	1848	281.0	2129	293.0	2422
Finger 23:	1375	274.0	1649	290.0	1939	302.0	2241
Finger 24:	1701	260.0	1961	267.0	2228	276.0	2504
Finger 25:	1399	289.0	1688	307.0	1995	324.0	2319
Finger 26:	1536	289.0	1825	297.0	2122	312.0	2434
Finger 27:	1463	262.0	1725	271.0	1996	282.0	2278
Finger 28:	1644	283.0	1927	281.0	2208	292.0	2500
Finger 29:	1480	280.0	1760	285.0	2045	298.0	2343
Finger 30:	1453	276.0	1729	287.0	2016	308.0	2324
Finger 31:	1530	269.0	1799	278.0	2077	290.0	2367
Finger 32:	1348	261.0	1609	281.0	1890	297.0	2187
Finger 33:	1628	300.0	1928	311.0	2239	319.0	2558
Finger 34:	1544	270.0	1814	280.0	2094	286.0	2380
Finger 35:	1441	265.0	1706	281.0	1987	298.0	2285
Finger 36:	1596	275.0	1871	288.0	2159	295.0	2454
Finger 37:	1605	273.0	1878	281.0	2159	295.0	2454
Finger 38:	1507	272.0	1779	287.0	2066	298.0	2364
Finger 39:	1466	278.0	1744	297.0	2041	308.0	2349
Finger 40:	1605	284.0	1889	298.0	2187	305.0	2492

Segmented Cement Bond Log Calibration Report

Serial Number: 10022773
Tool Model: UW_RBT_004

Calibration Casing Diameter: 7.000 in
Calibration Depth: 219.825 ft

Master Calibration, performed Fri Jan 08 12:04:00 2016:

	Raw (v)		Calibrated (mv)		Results	
	Zero	Cal	Zero	Cal	Gain	Offset
3FT	0.002	0.615	1.000	62.165	80.354	0.756

5FT	-0.001	0.665	1.000	62.165	91.789	1.112
S1	0.002	0.568	0.000	100.000	133.233	-0.438
S2	0.000	0.602	0.000	100.000	128.614	-0.057
S3	0.002	0.613	0.000	100.000	131.791	-0.258
S4	0.001	0.617	0.000	100.000	136.022	-0.180
S5	0.002	0.629	0.000	100.000	135.478	-0.298
S6	0.001	0.610	0.000	100.000	136.206	-0.201
S7	0.002	0.580	0.000	100.000	135.567	-0.359
S8	0.002	0.566	0.000	100.000	135.047	-0.298

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: 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: Noble Energy Inc.
 Well: Ann LC34-755
 Field: Wildcat
 County: Weld
 State: Colorado