

# Radial Cement Bond Gamma Ray Casing Collar Log

Company	Whiting Oil & Gas Corporation	Company	Whiting Oil & Gas Corporation
Well	Razor 11H-0215A	Well	Razor 11H-0215A
Field	Wildcat	Field	Wildcat
County	Weld	County	Weld
State	Colorado	State	Colorado
Location:	API #: 05-123-38598		
Permanent Datum	SEC 11 TWP 10N RGE 58W	Ground Level	Elevation 4954'
Log Measured From	Kelly Bushing	Drilling Measured From	Kelly Bushing
			Elevation K.B. 4975' D.F. --- G.L. 4954'

Date	18-APR-2015
Run Number	Three
Depth Driller	12751 FT
Depth Logger	5320 FT
Bottom Logged Interval	5240 FT
Top Log Interval	Surface
Open Hole Size	8.750"
Type Fluid	Water
Density / Viscosity	8.34 lb/gal
Max. Recorded Temp.	187°F
Estimated Cement Top	2748 FT
Time Well Ready	ROA
Time Logger on Bottom	1:43 PM
Equipment Number	HD-0324
Location	Ft Lupton, CO
Recorded By	R. Fogarty
Witnessed By	Gary Chandler

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	1855 FT		
Intermediate #1	7	29	P-110	Surface	6312 FT		
Intermediate #2							
Liner	4 1/2	11.6	P-110	5198 FT	12751 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.

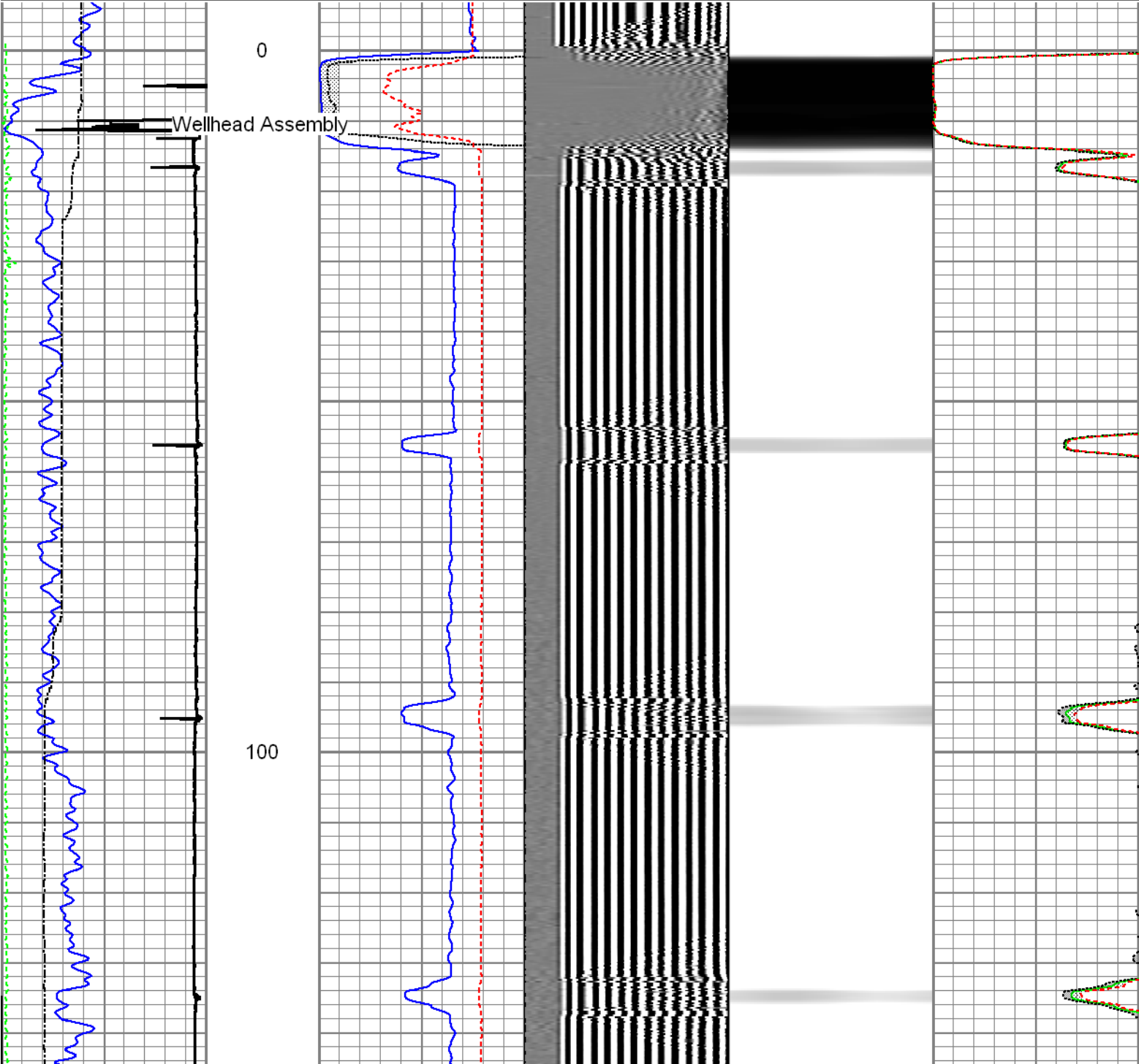
## Comments

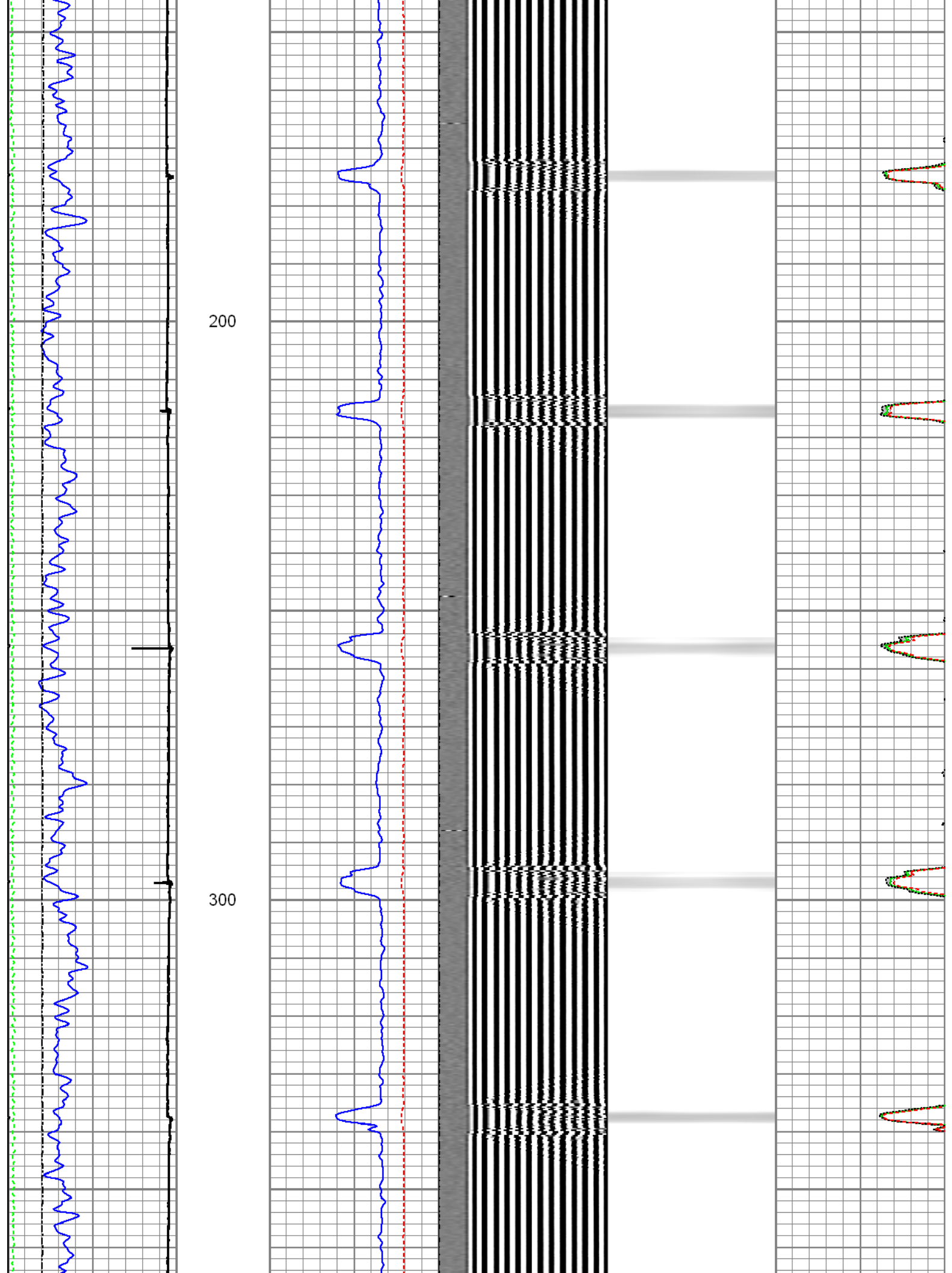
Log ran as per customer request.  
 All wireline depths measured from KB zero at 21 FT.  
 Depth referenced to casing tally reported liner top at 5198 FT.  
 Adjusted log -9 FT from KB zero to correlate with liner top.  
 Log ran from just below liner top to surface.  
 Log ran with 1500 PSI surface induced pressure.

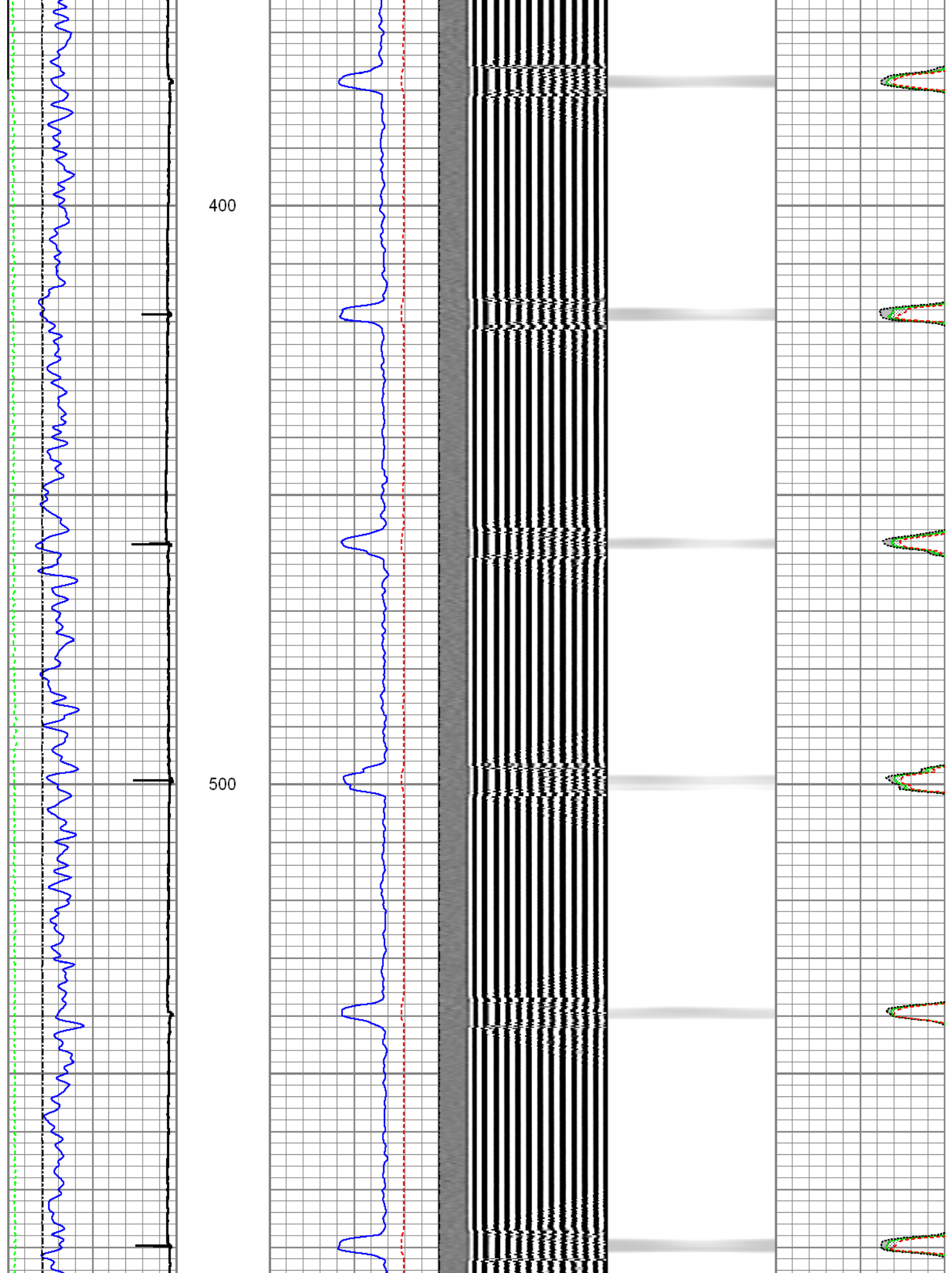
Thank you for choosing FMC Technologies Completion Services, Inc.!!

Database File: 04-18-15\_whiting\_razor 11h-0215a\_mit\_rbl.db  
Dataset Pathname: pass11  
Presentation Format: rbt4\_mit  
Dataset Creation: Sat Apr 18 13:54:53 2015 by Log 7.0 B1  
Charted by: Depth in Feet scaled 1:240

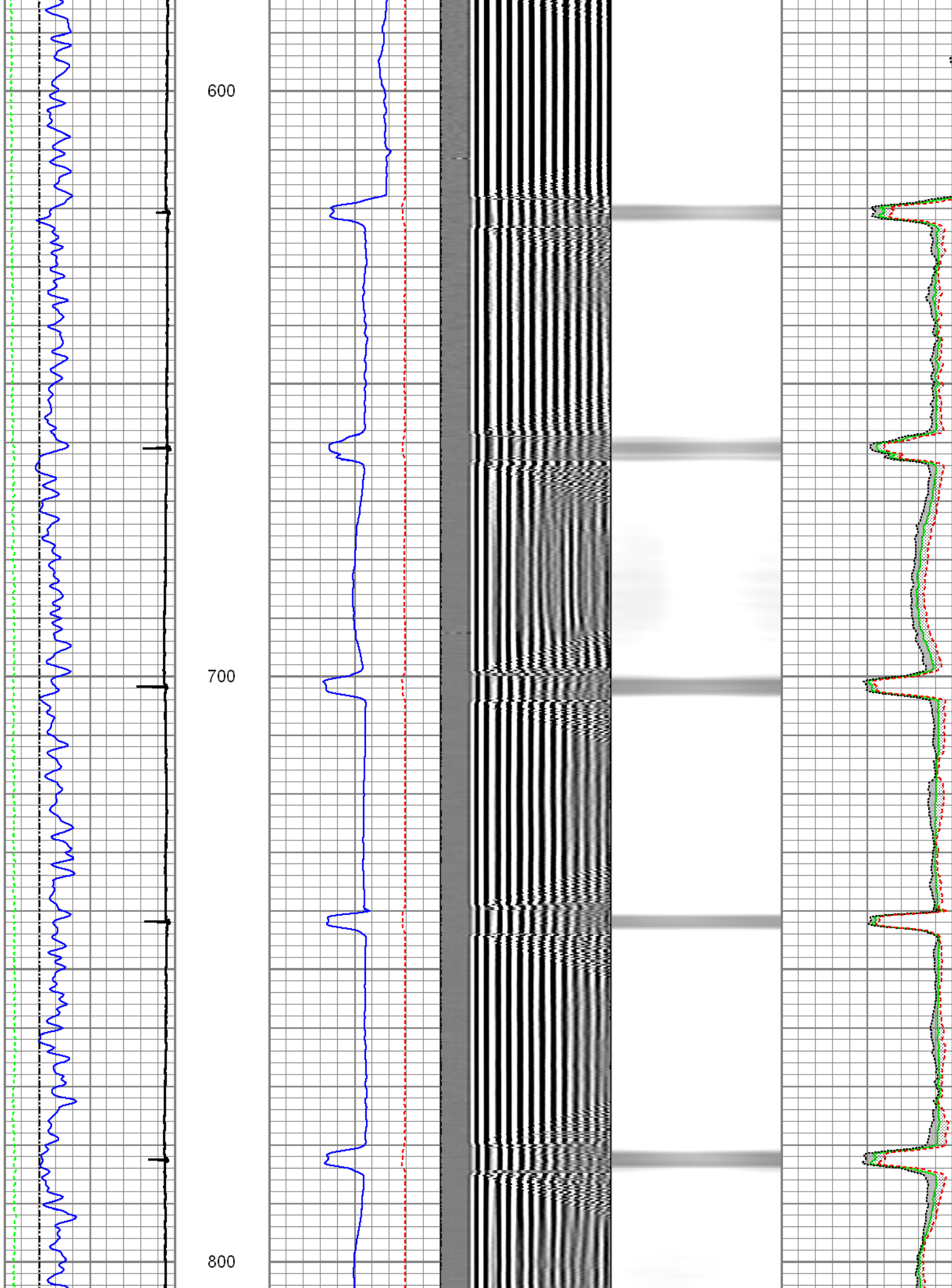
Gamma Ray	3' Amplitude	5' Variable Density Log	Sector Map	Average Amplitude
0 (GAPI) 120	0 (mV) 100	200 1200		0 100
Line Speed	3' Amplitude x 5			Mimimum Amplitude
-100 (ft/min) 100	0 (mV) 20			0 100
Line Tension	3' Travel Time			Maximum Amplitude
0 (lb) 2000	650 (usec) 150			0 100
Casing Collar Locator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

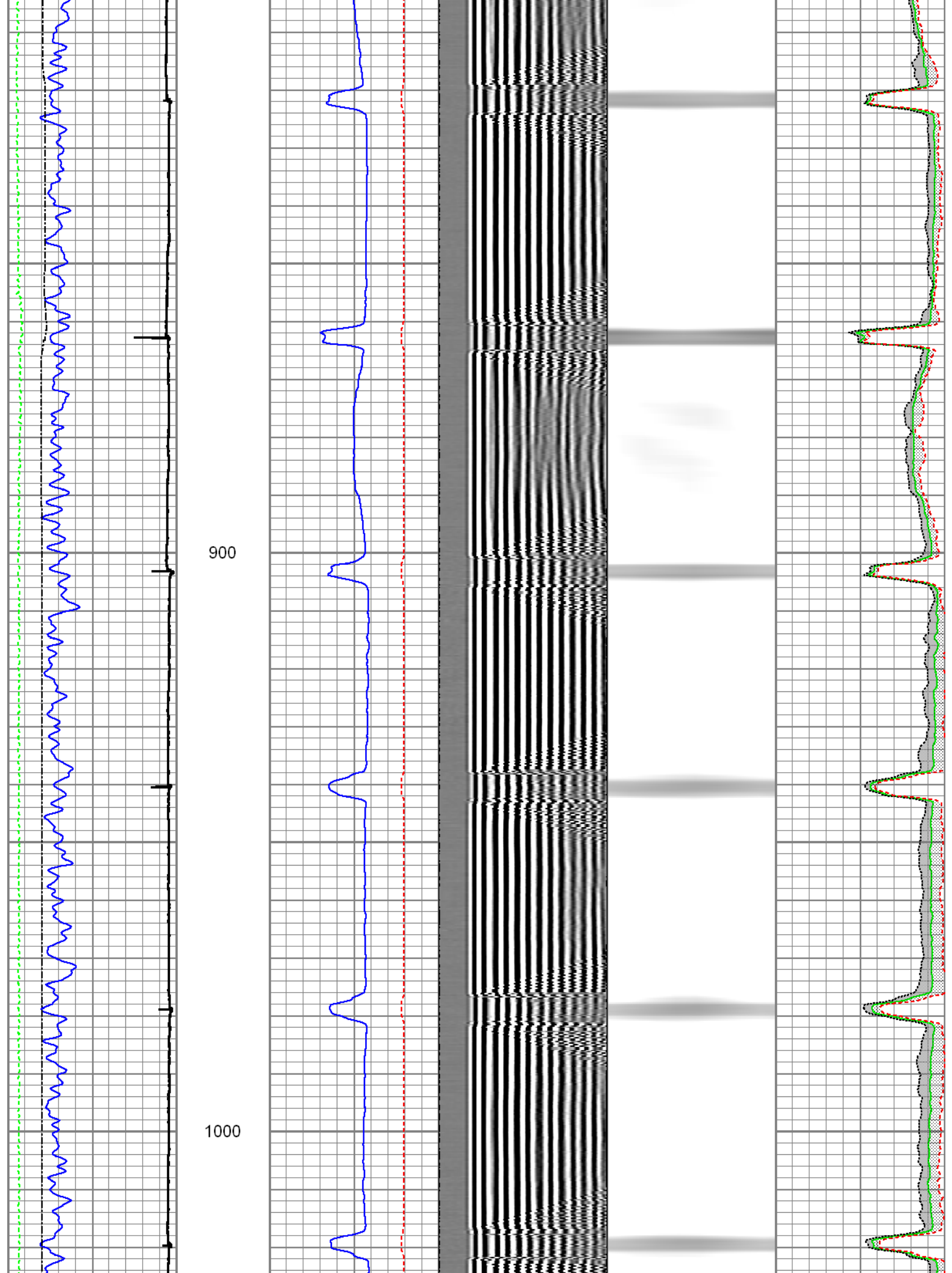


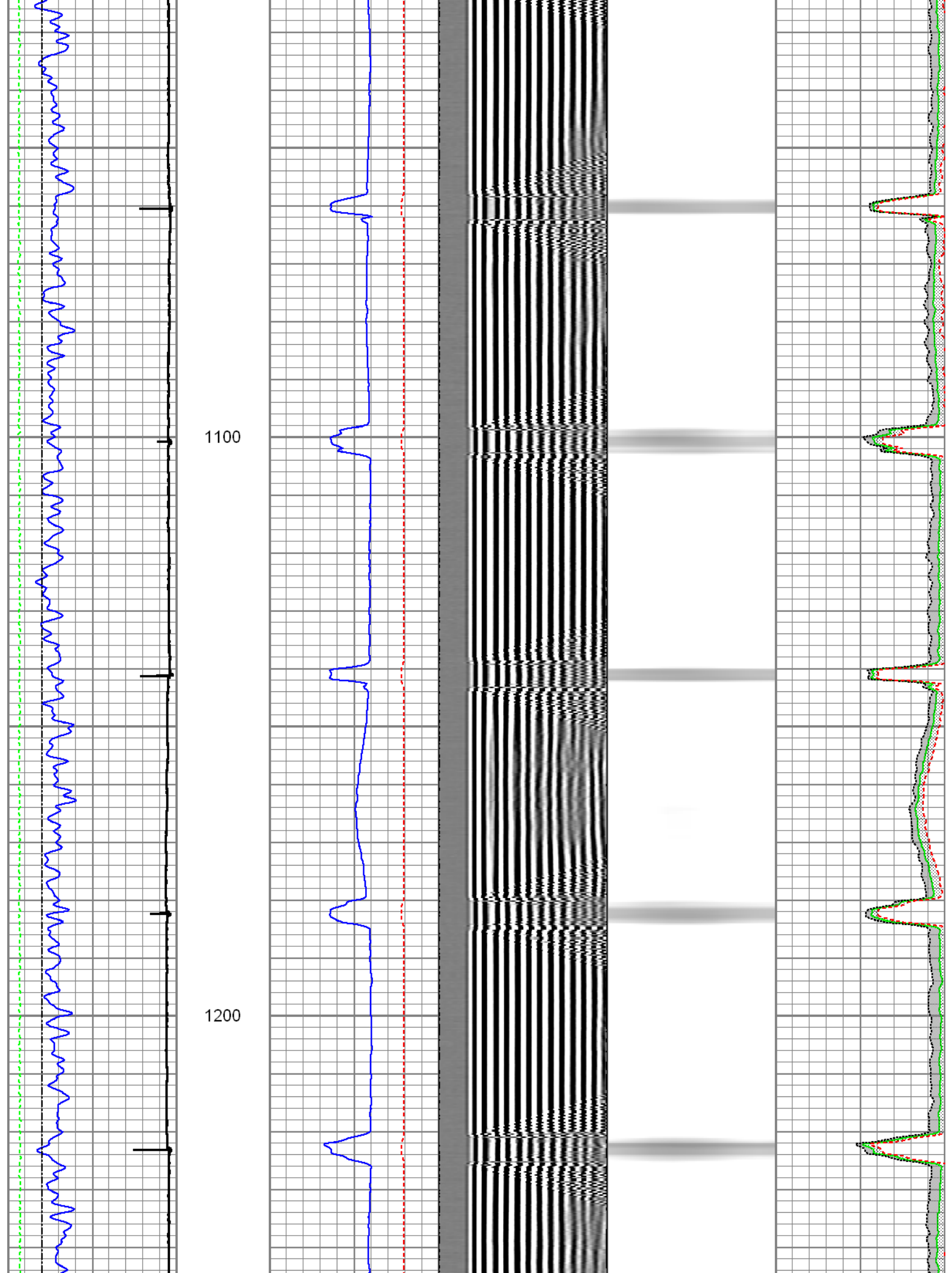


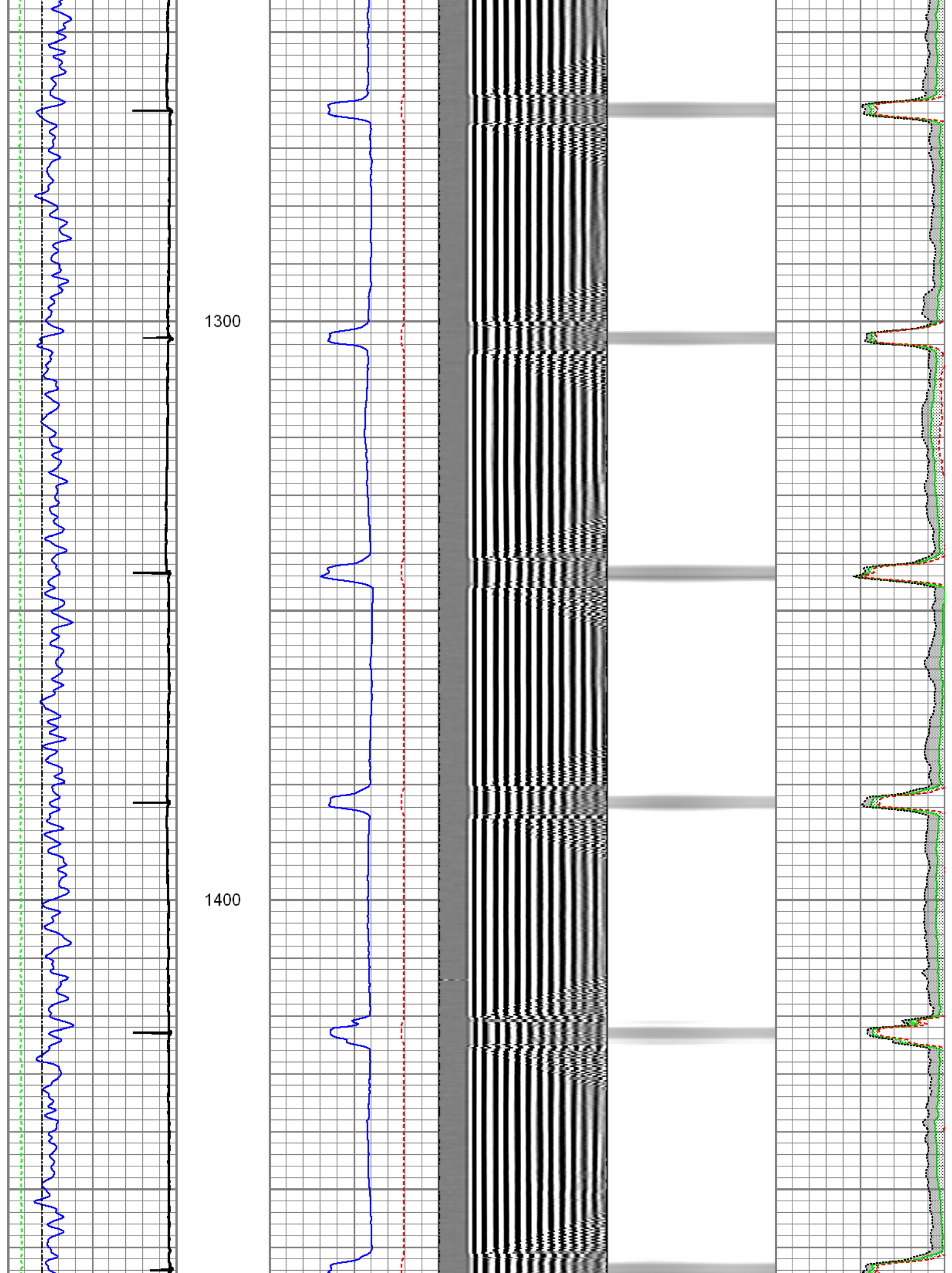




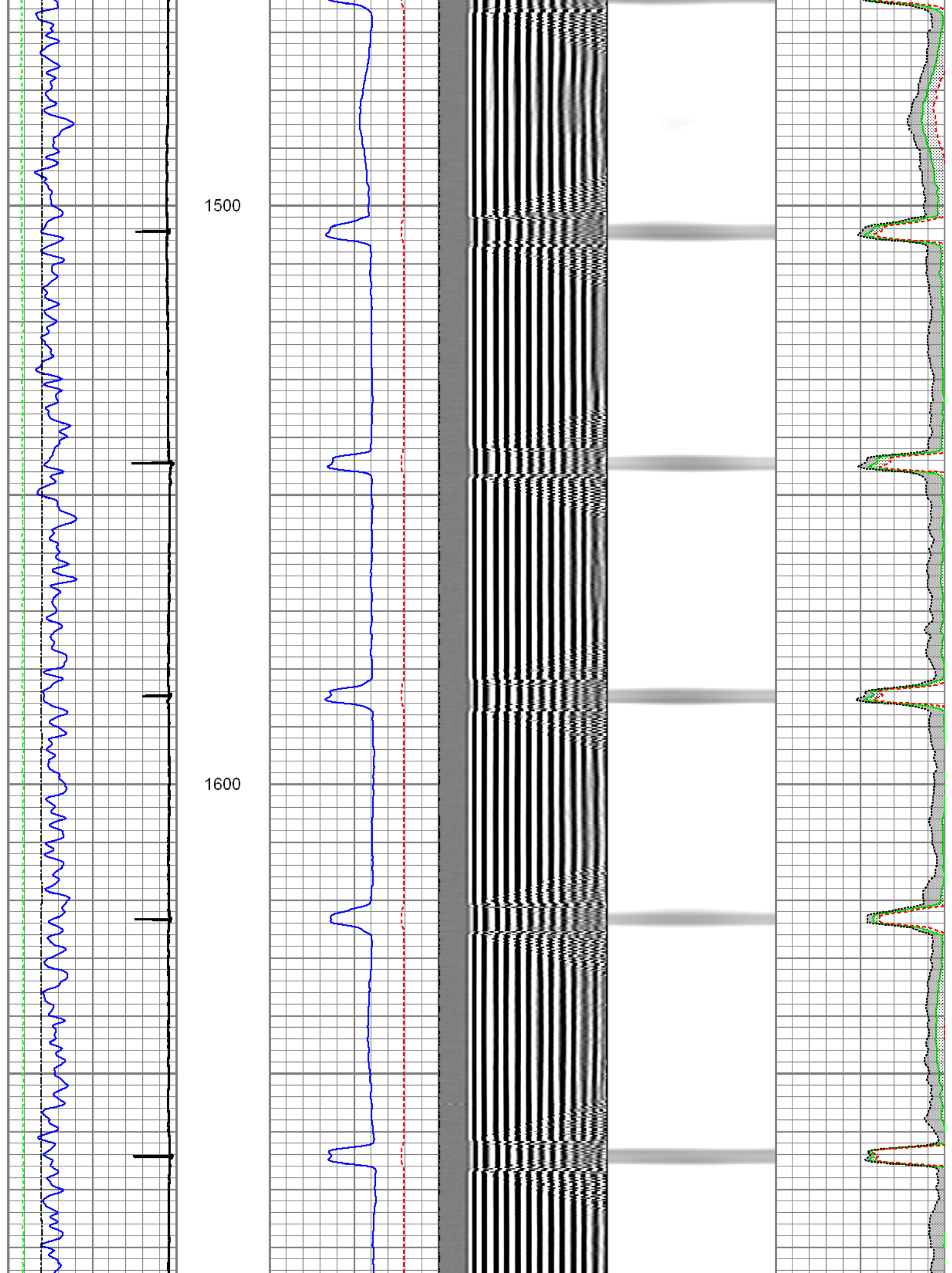




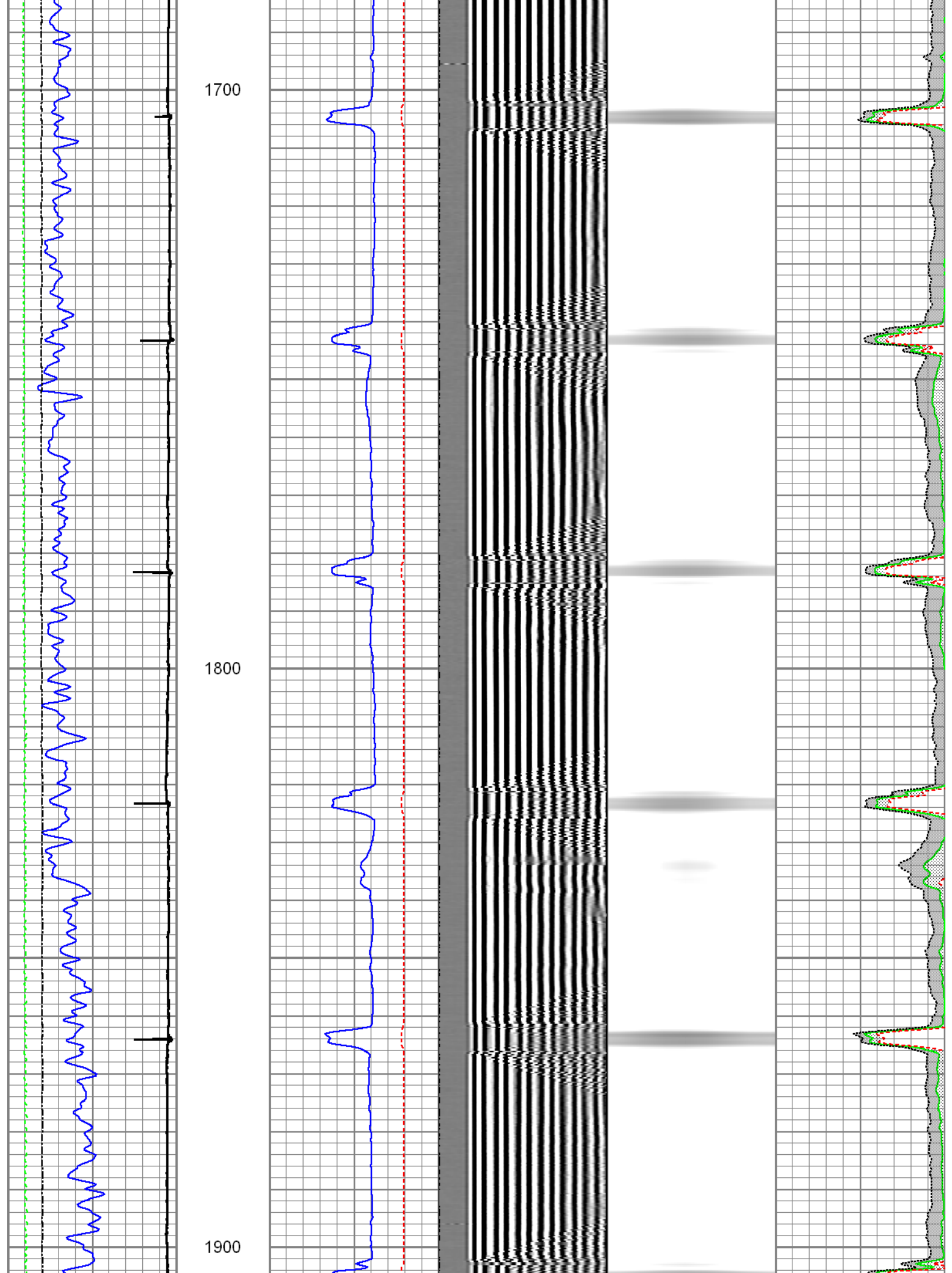


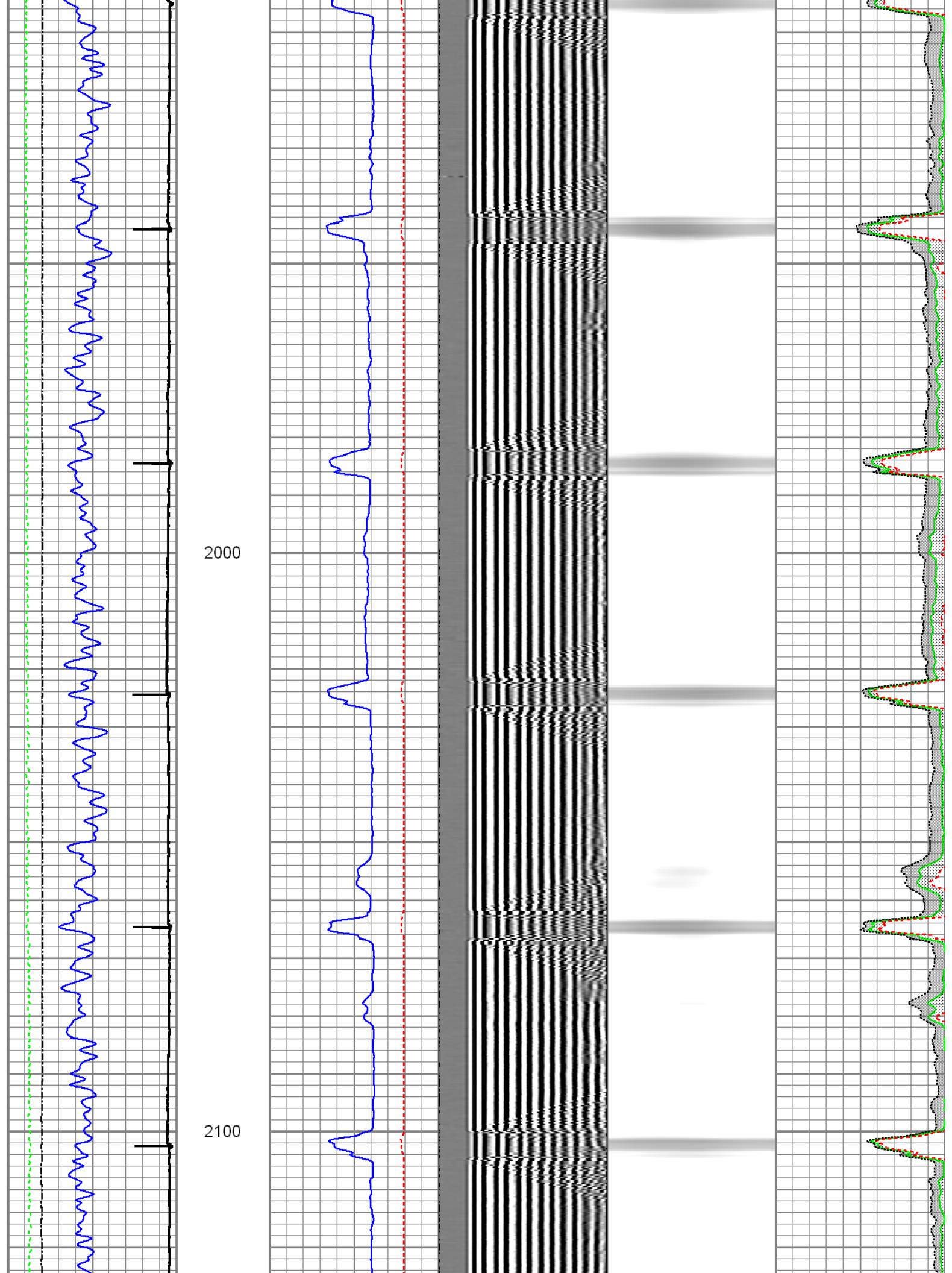


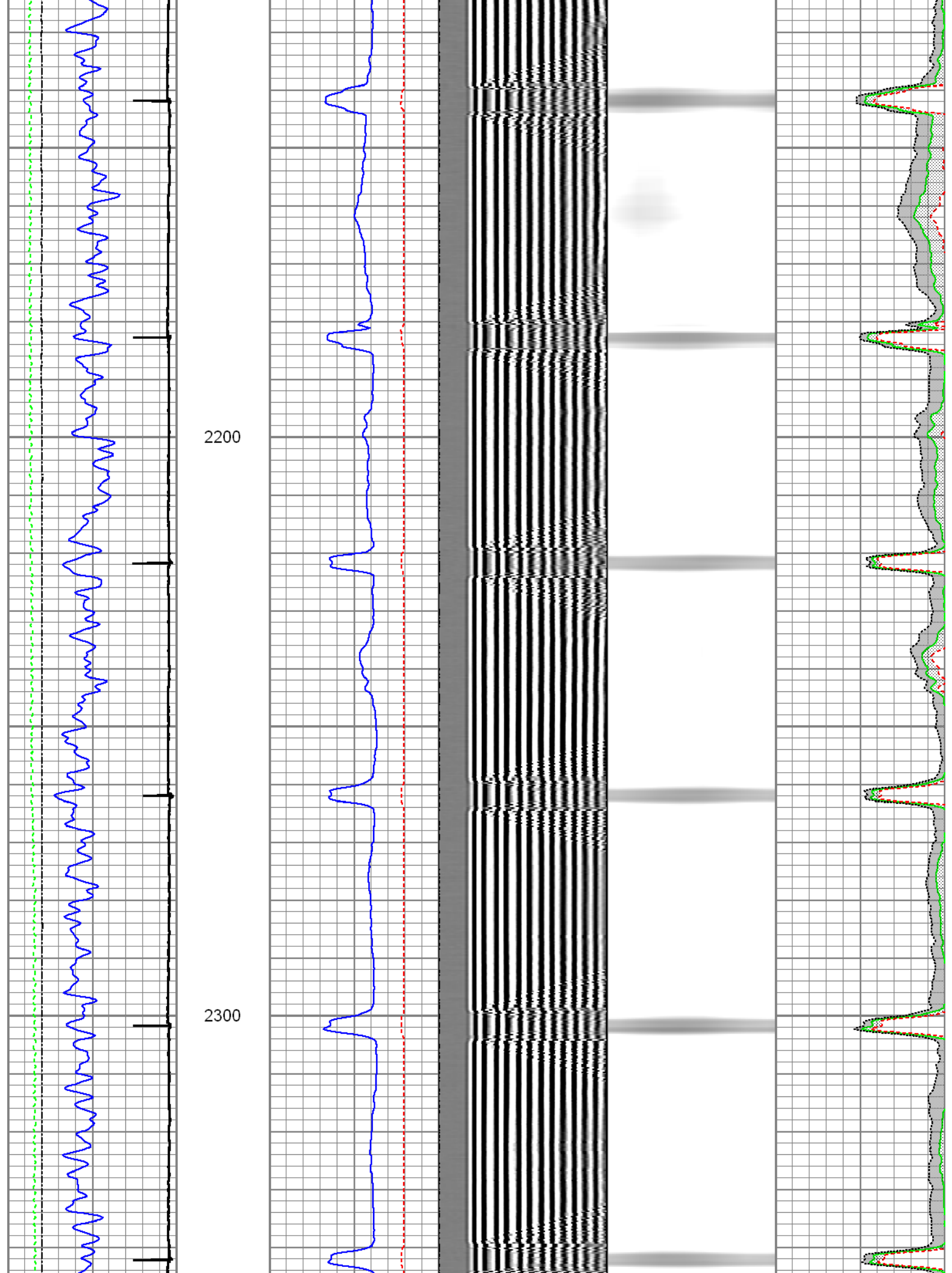


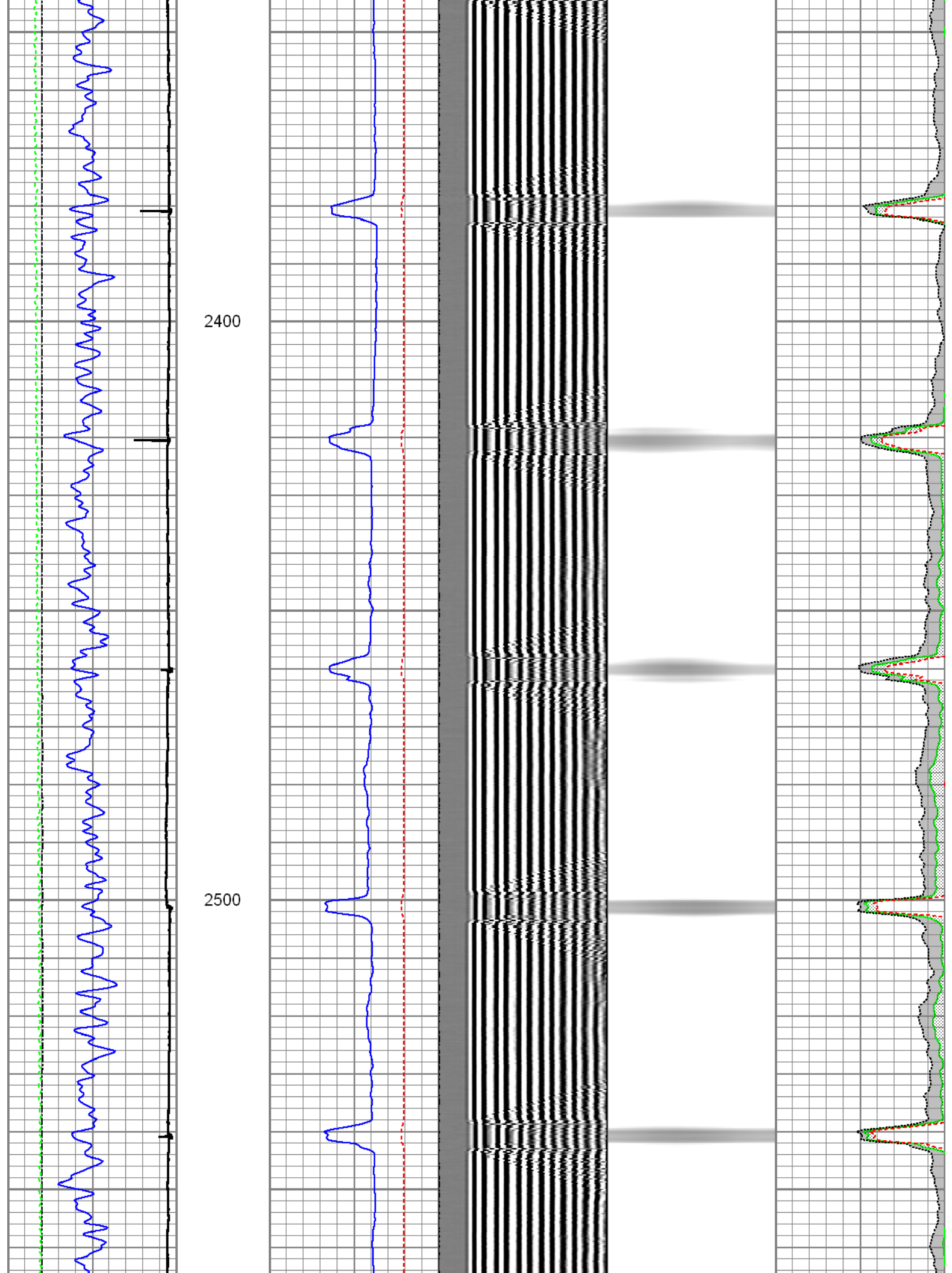




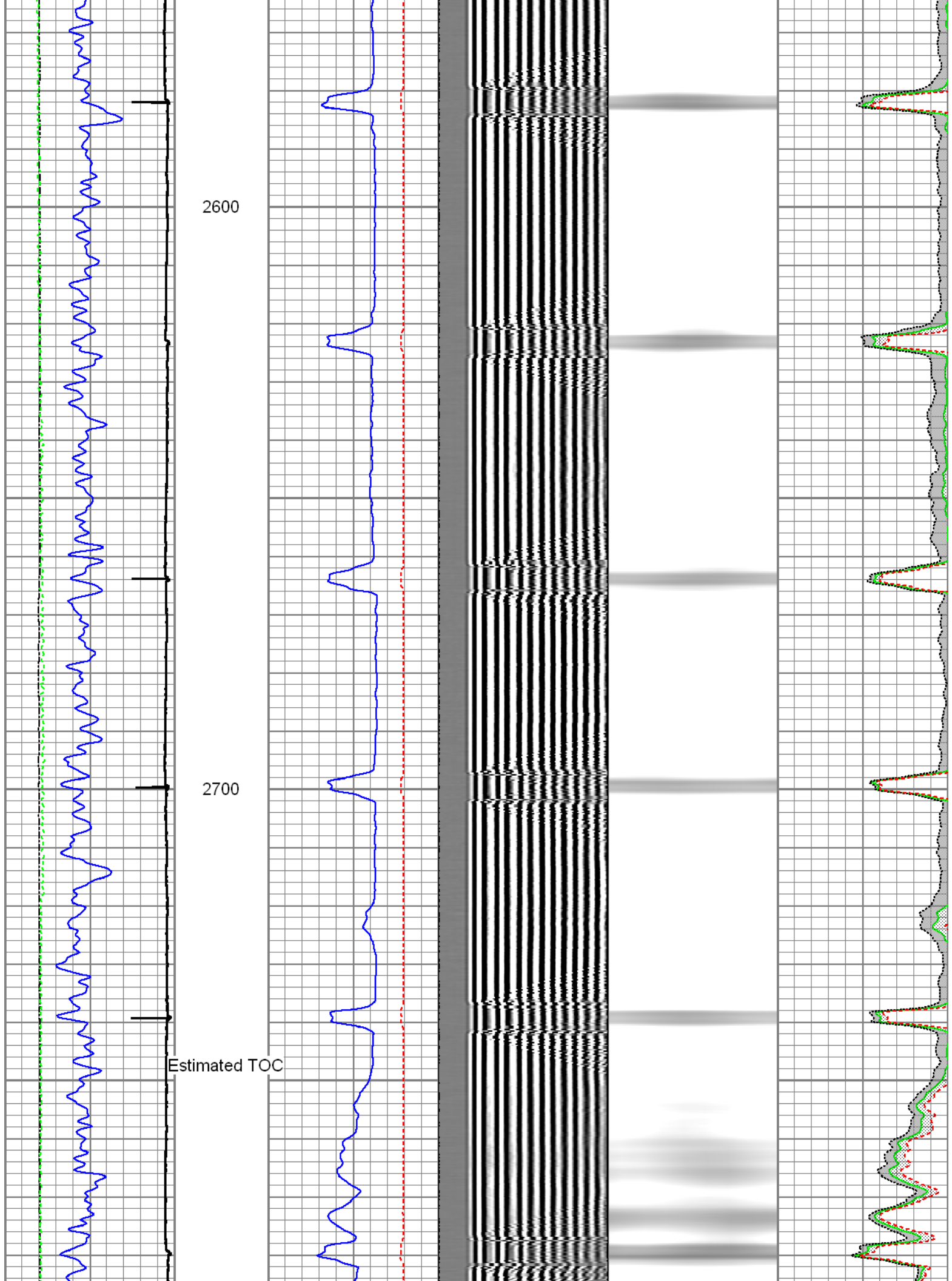










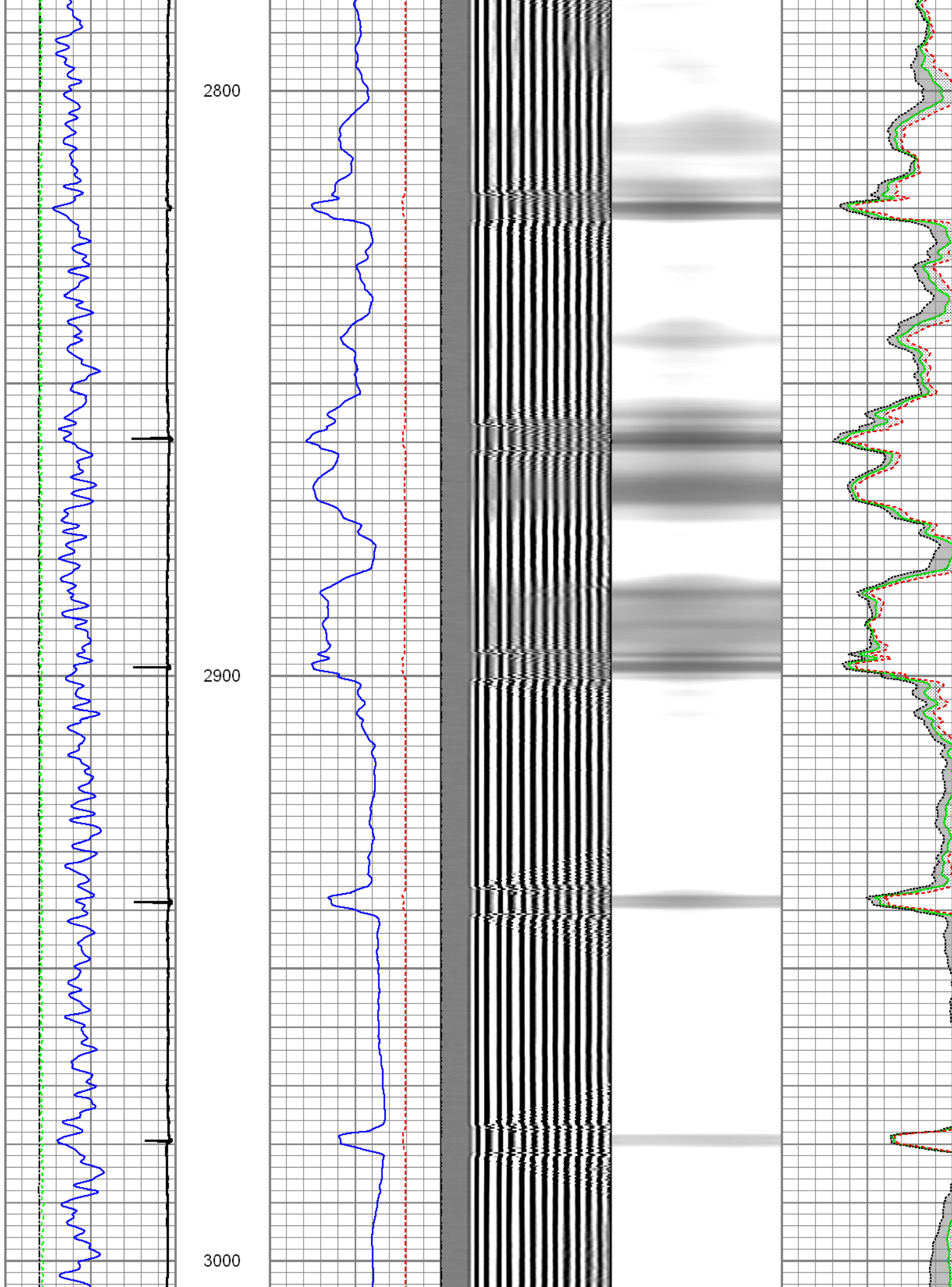




2800

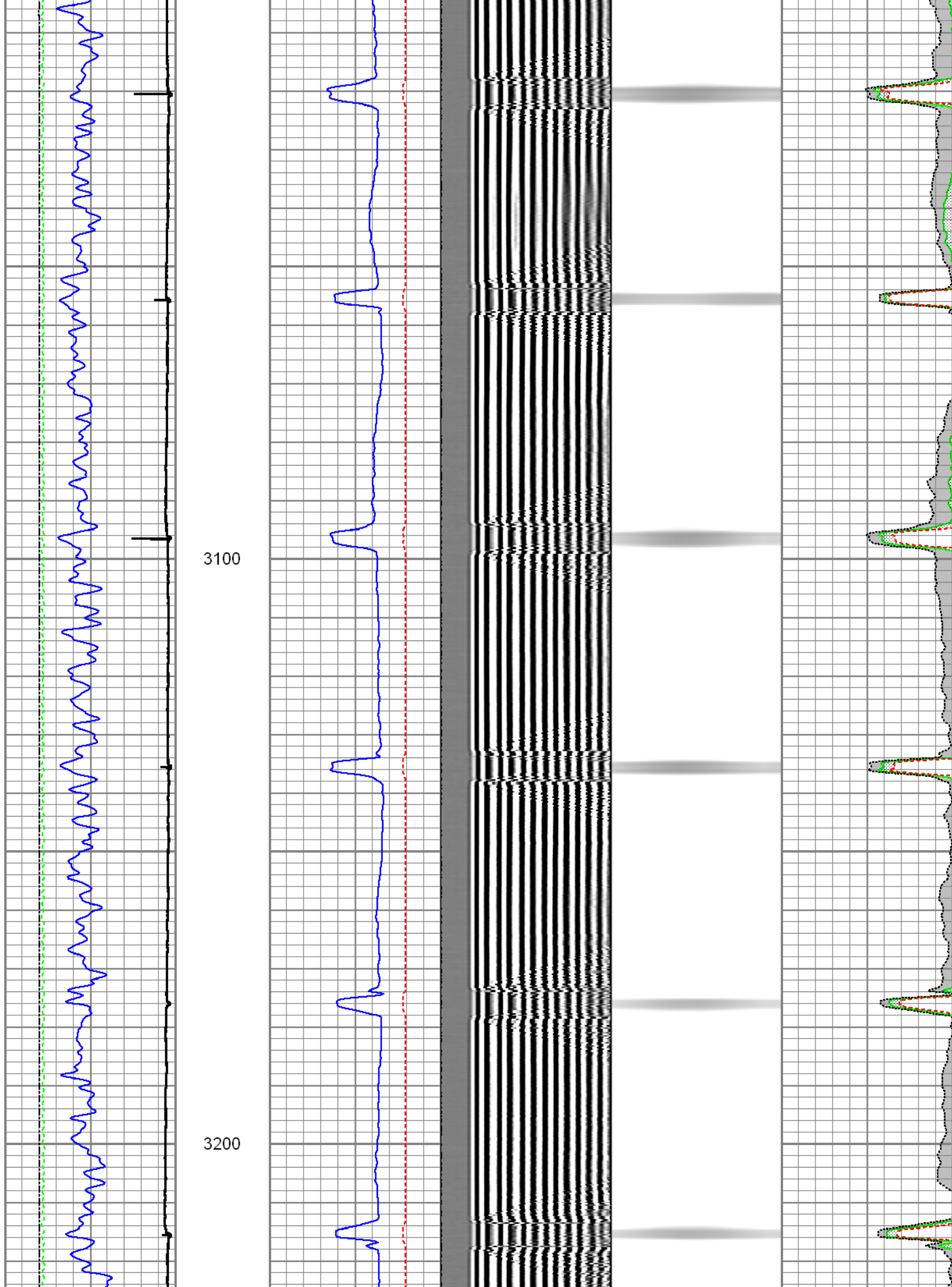
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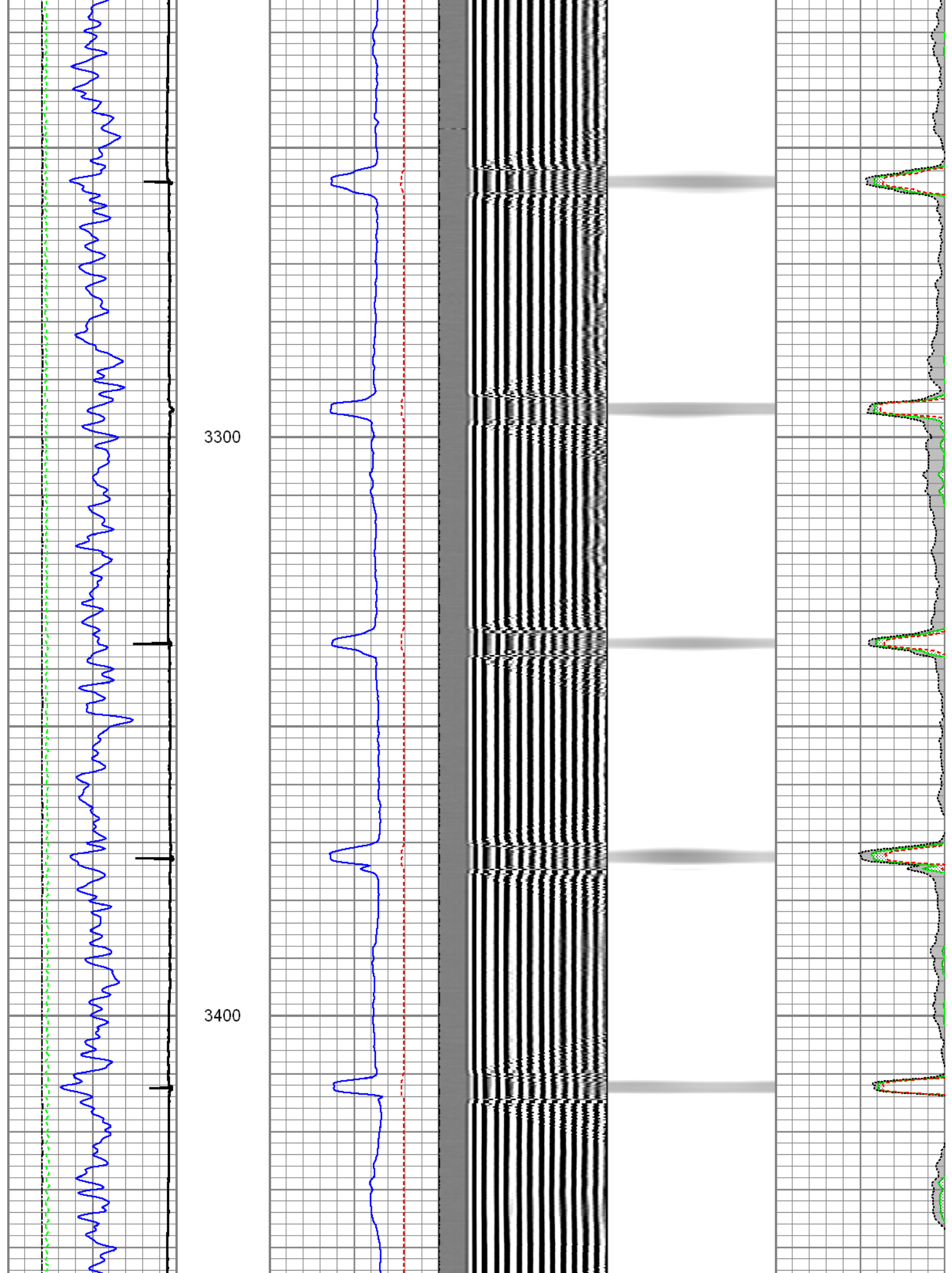
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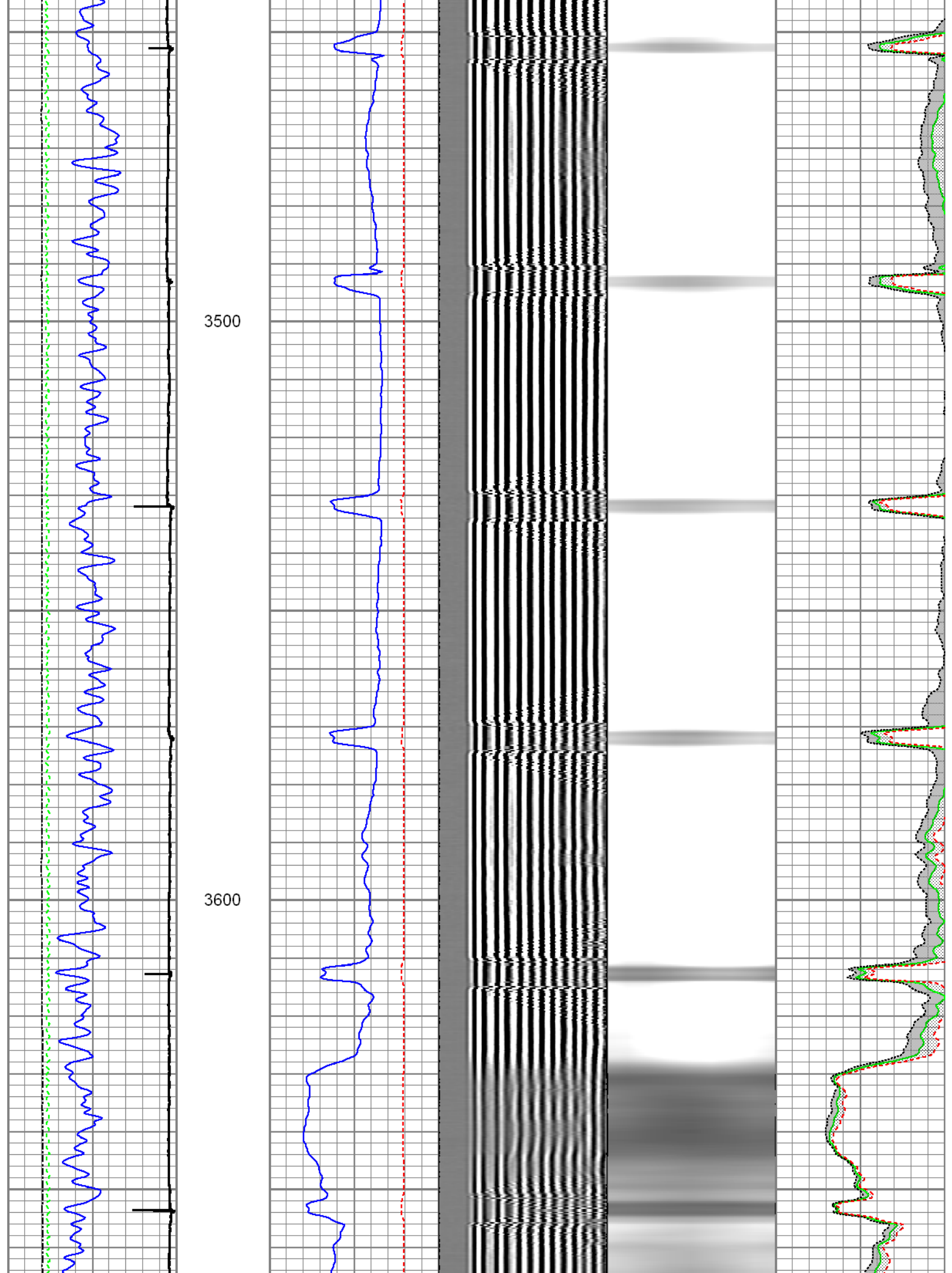


3100

3200



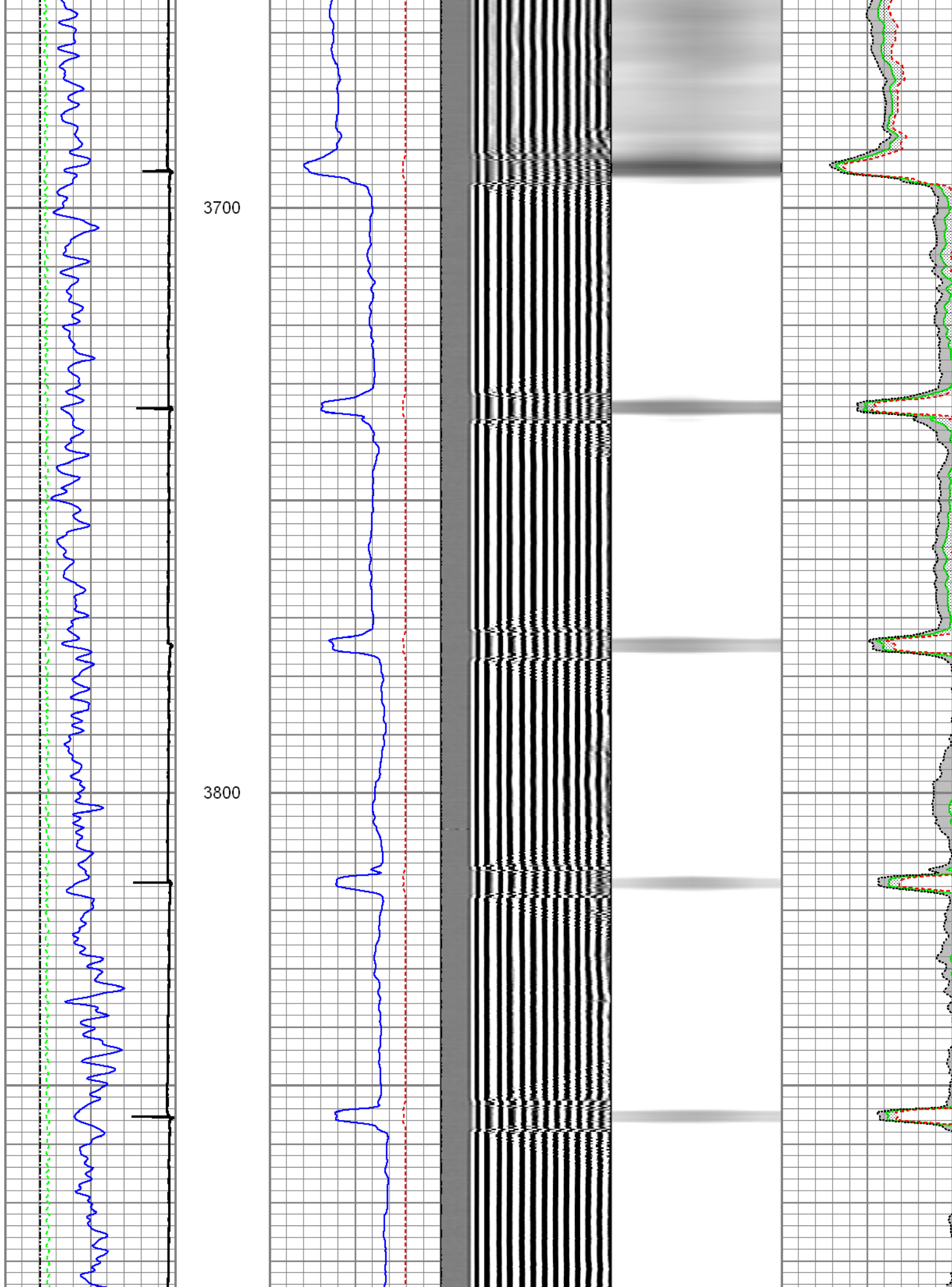






3700

3800

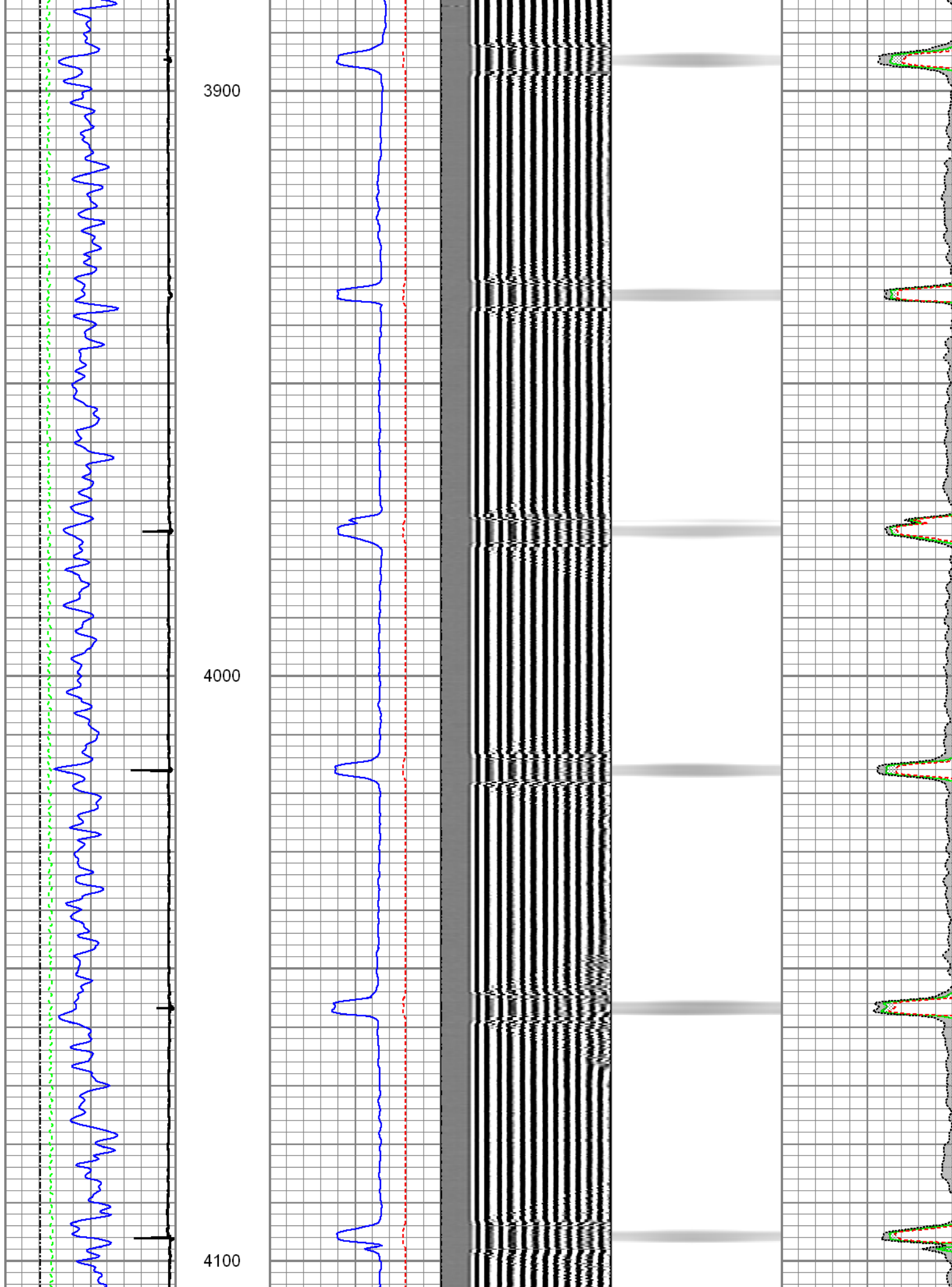


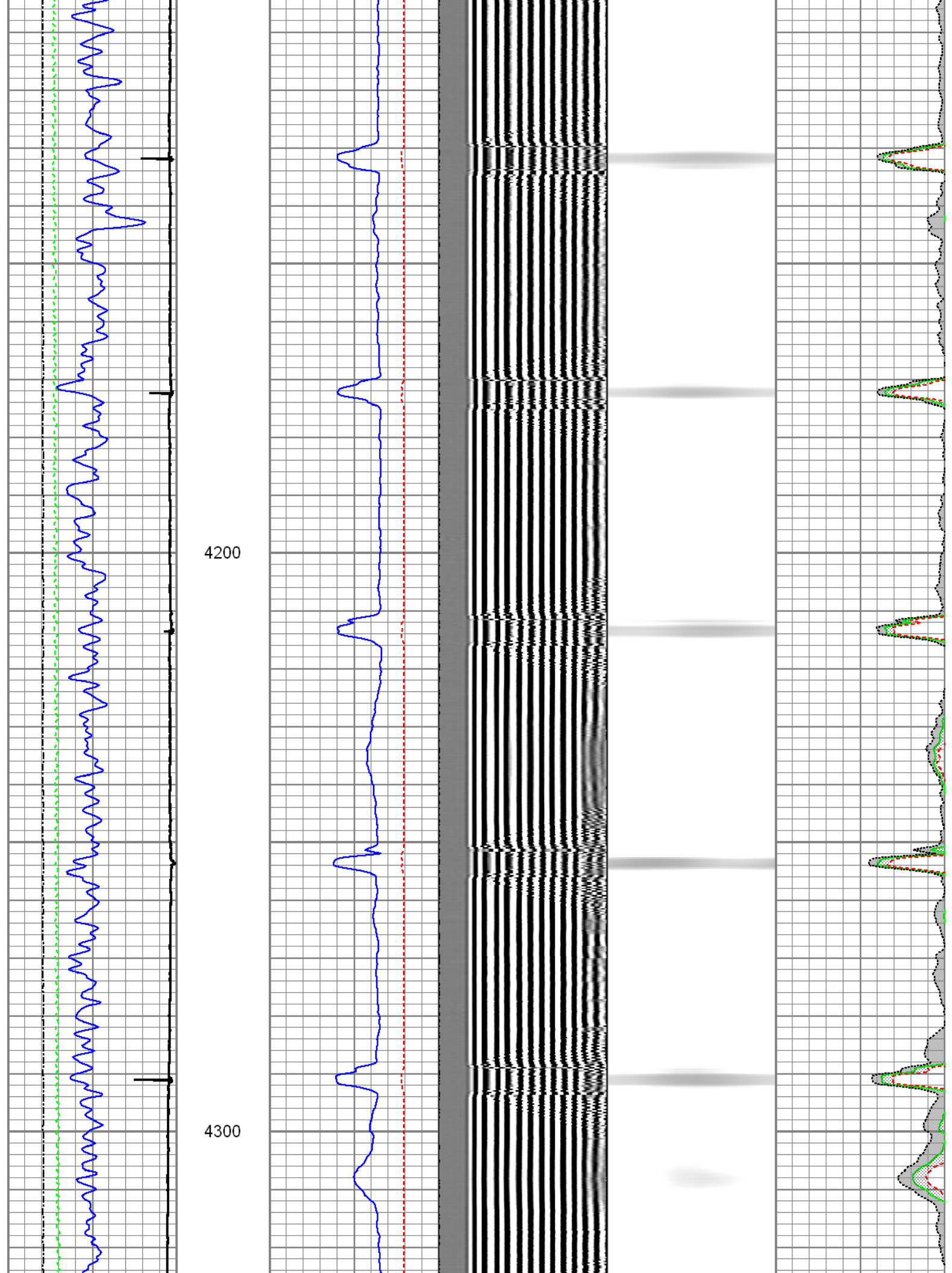


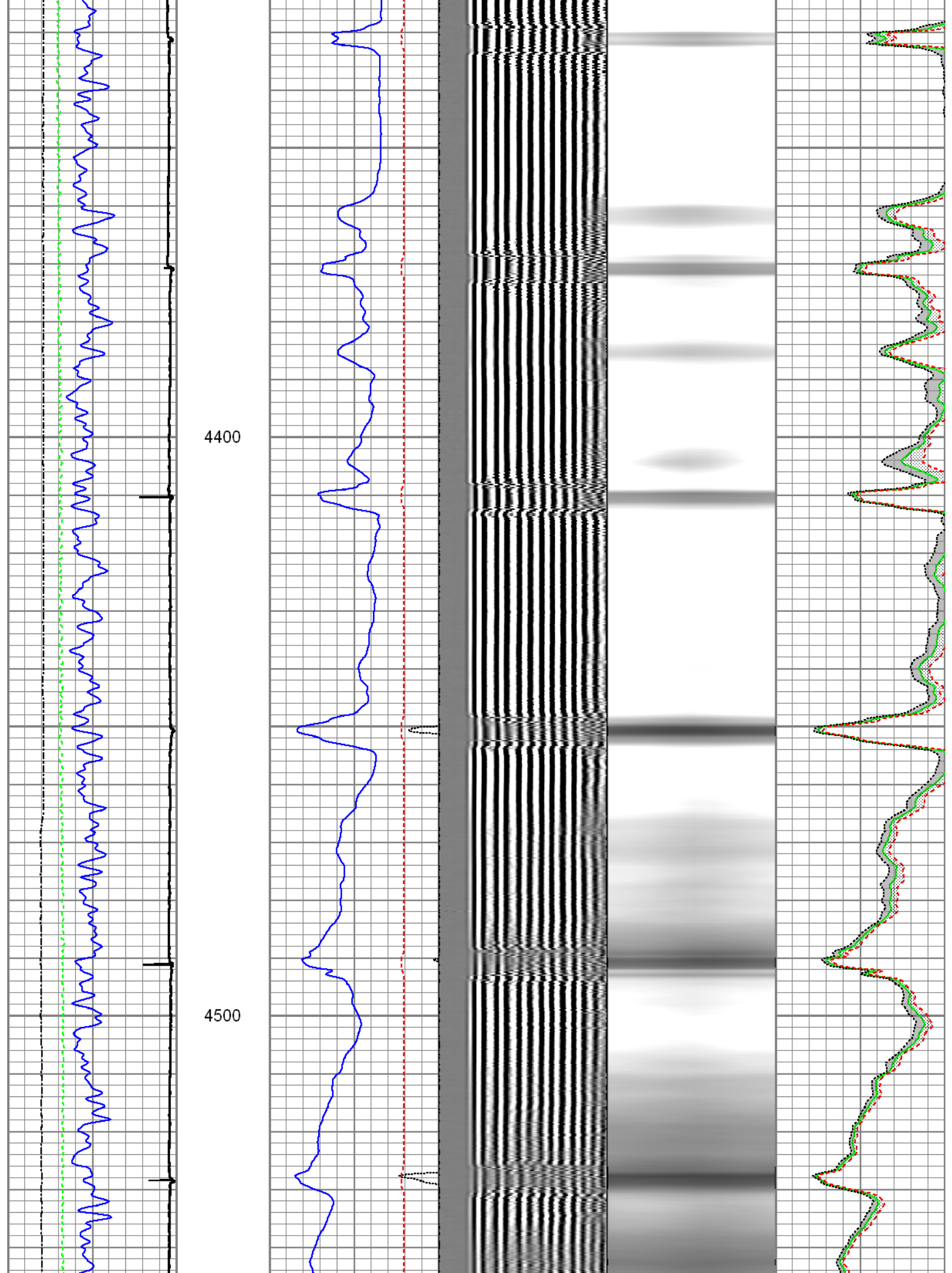
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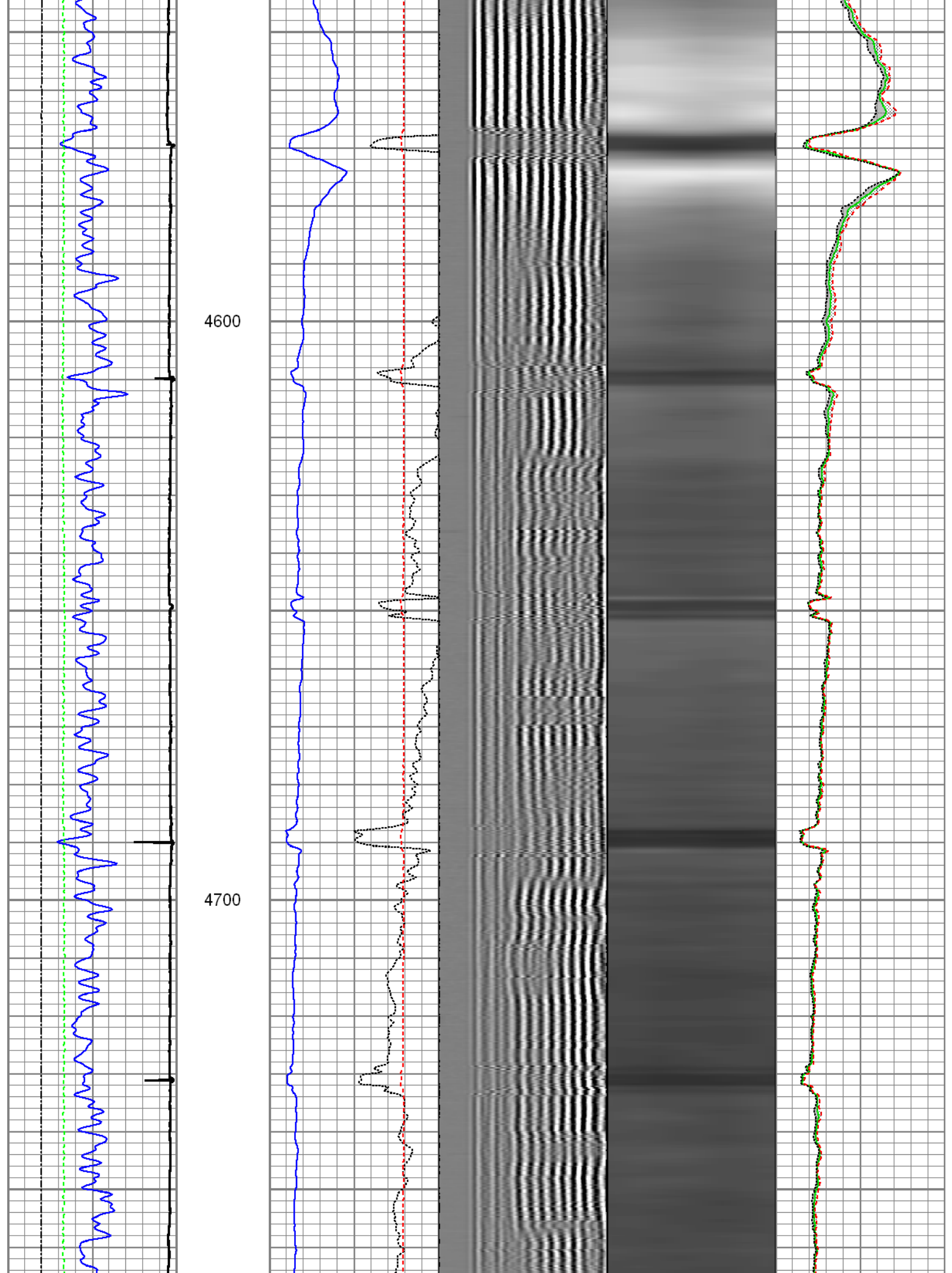
4000

4100

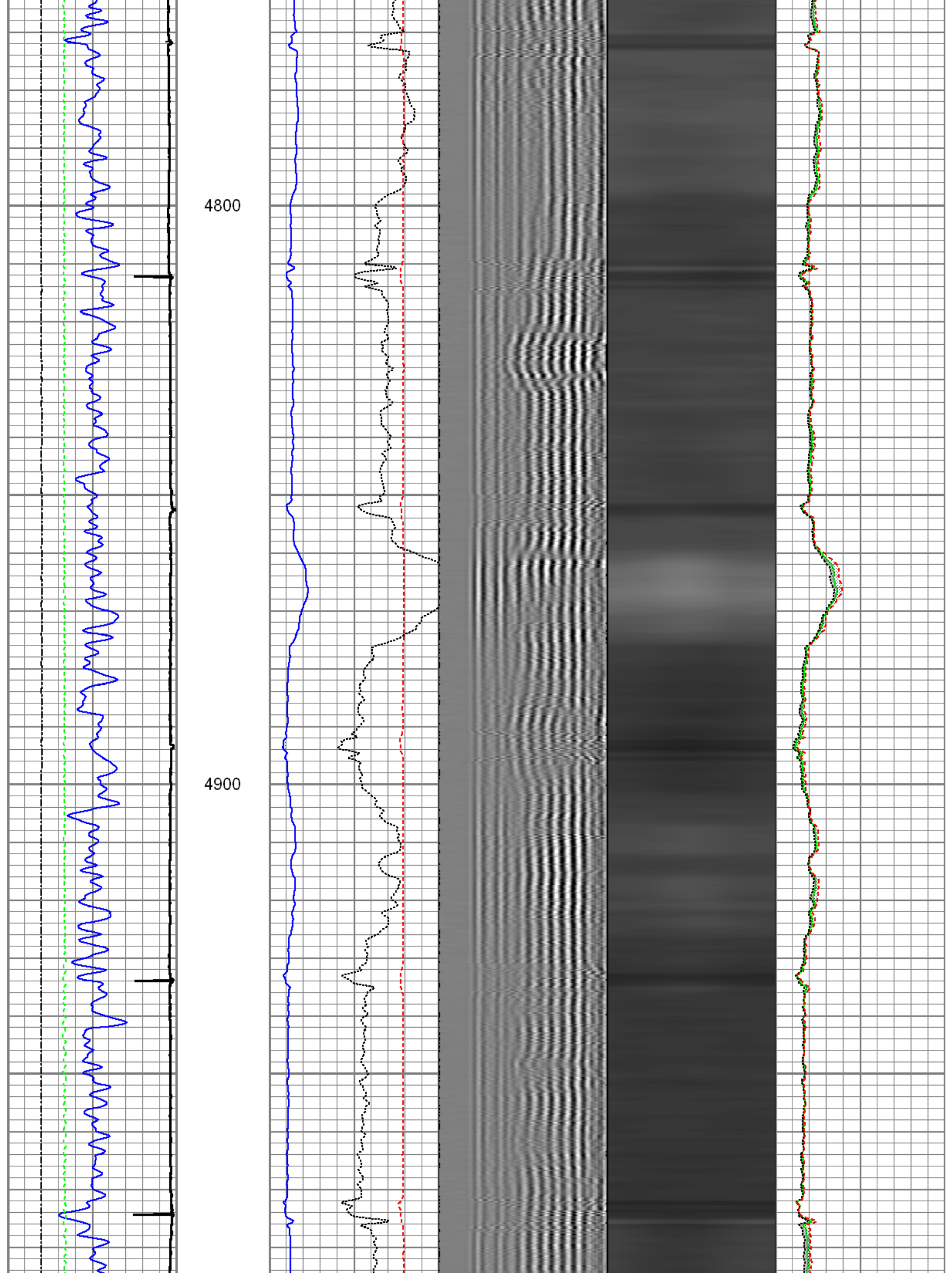














5000

5100

5200

LSPD

GR

LTEN

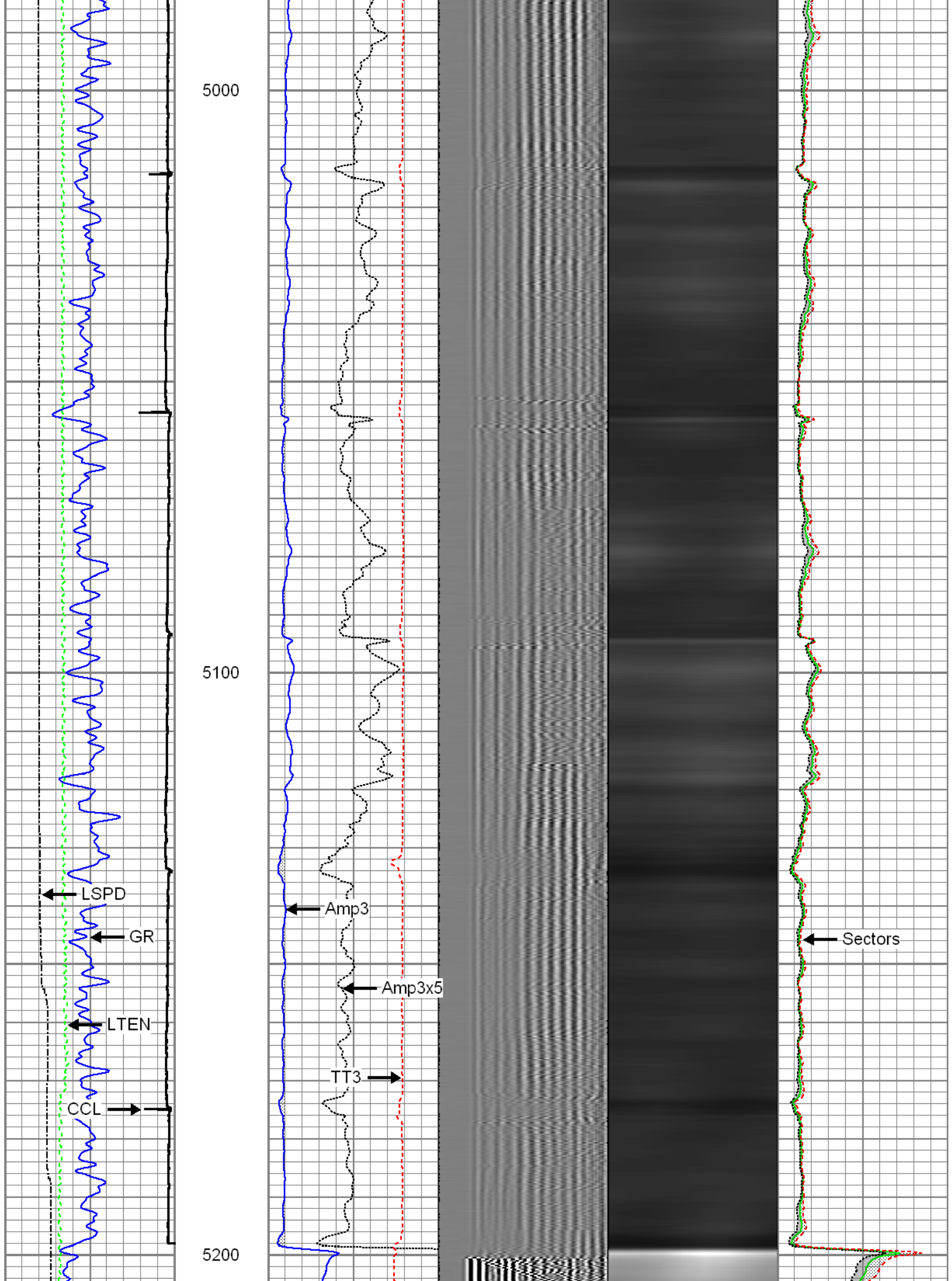
CCL

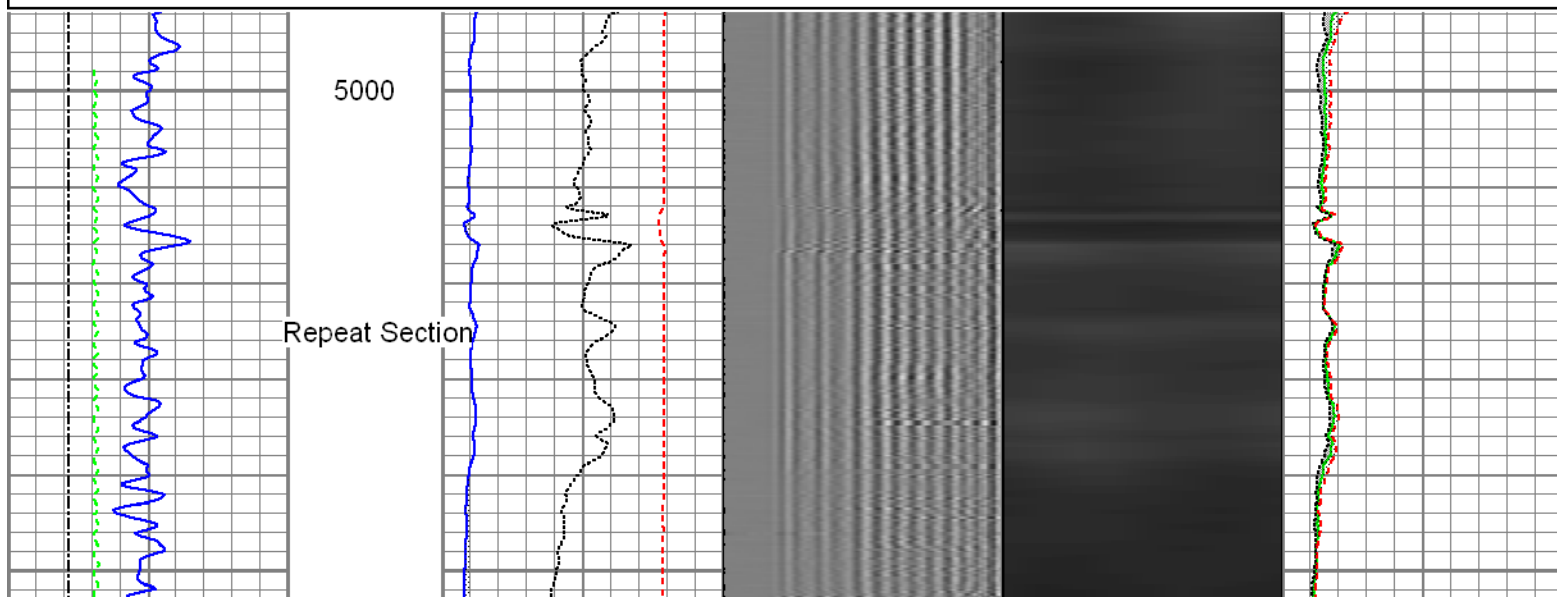
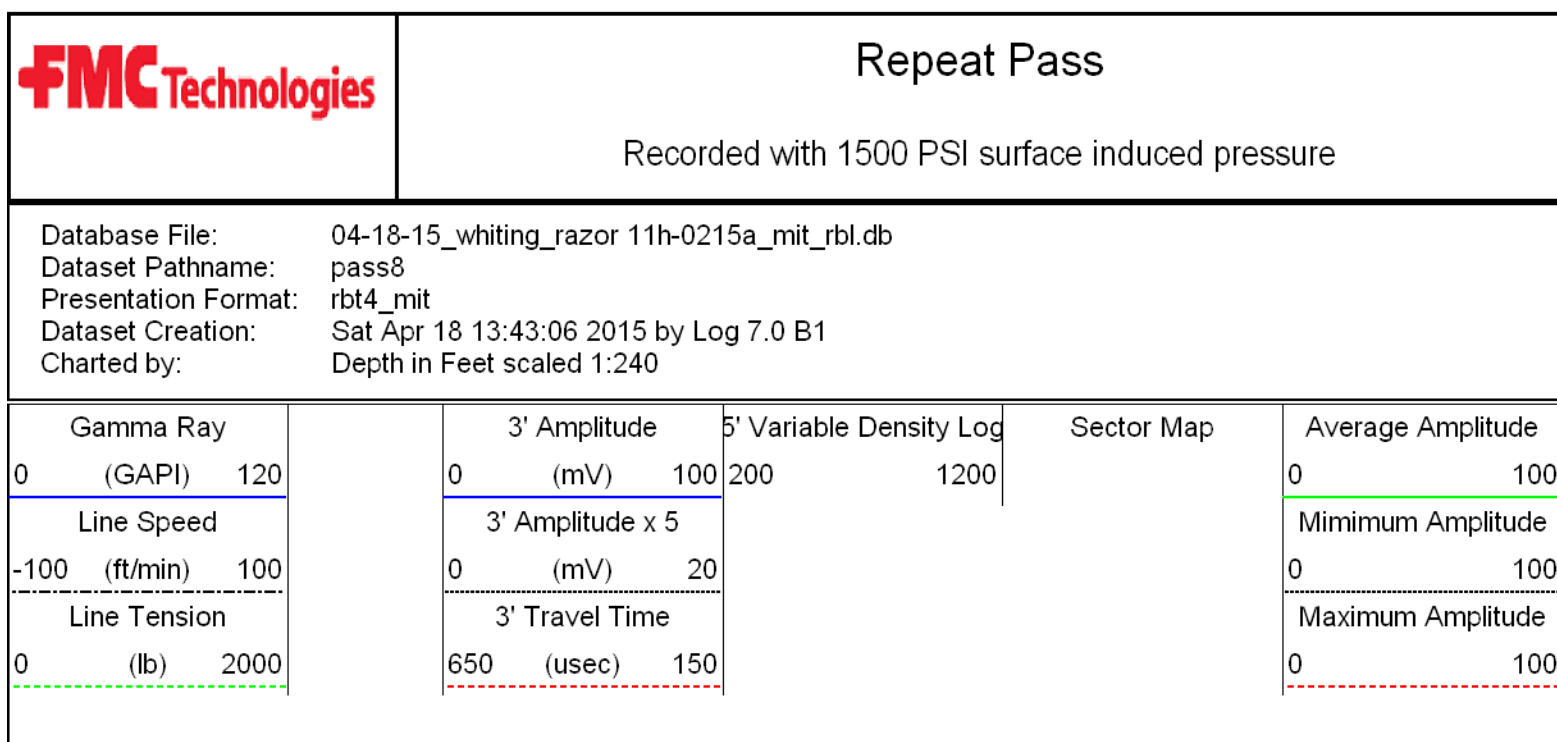
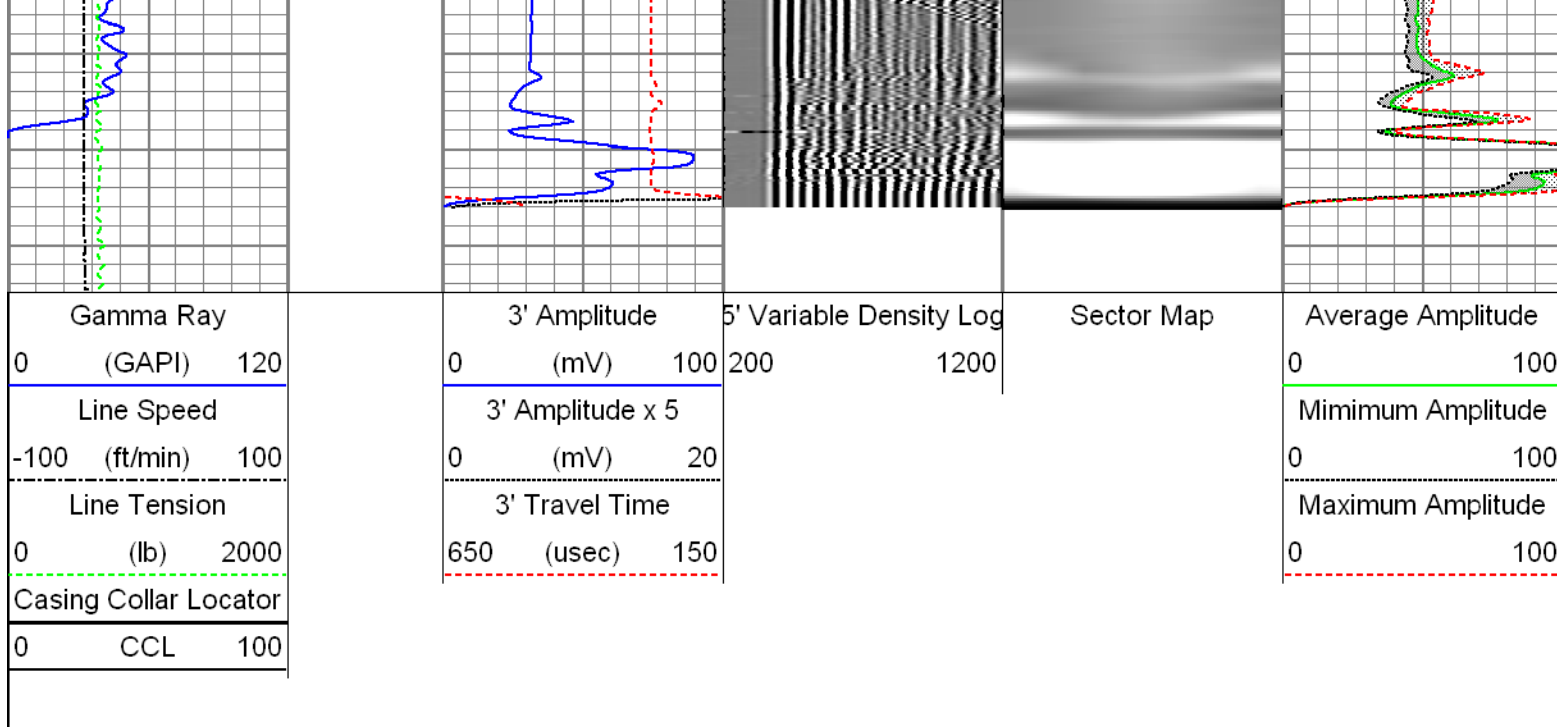
Amp3

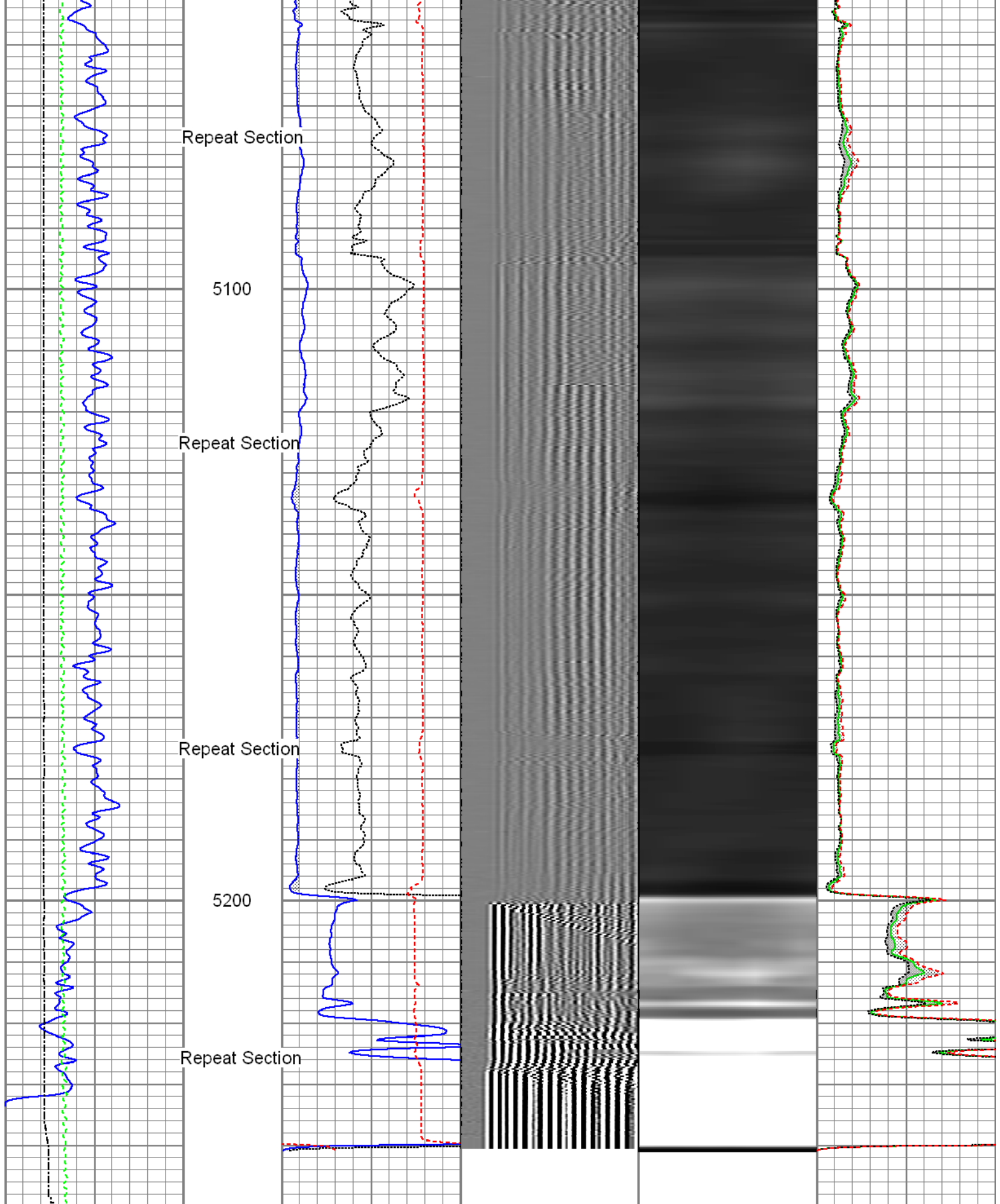
Amp3x5

TT3

Sectors

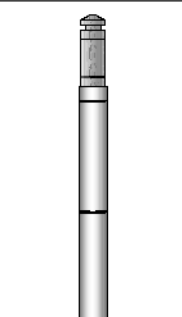
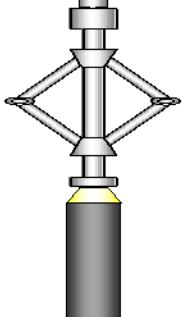
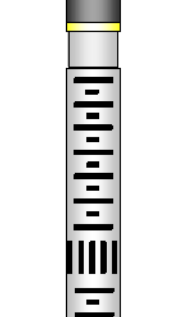






Gamma Ray (GAPI)	3' Amplitude (mV)	5' Variable Density Log	Sector Map	Average Amplitude
0 120	0 100	200 1200		0 100
Line Speed (ft/min)	3' Amplitude x 5 (mV)			Minimum Amplitude
-100 100	0 20			0 100
Line Tension	3' Travel Time			Maximum Amplitude

0	(lb)	2000	650	(usec)	150	0	100
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Sensor	Offset (ft)	Schematic	Description	Len (ft)	OD (in)	Wt (lb)
GR	22.81		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 (211461) 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
			UW_PRC #4 -DSSRAC (080) 2-3/4" DSS 5 Arm Roller Centralizer	2.55	2.75	32.00
WVFS3FT	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					
CBLROT	15.42					
WVF5FT	14.42					
MIT	5.41		UW_PRC-DSSRAC (082) 2-3/4" DSS 5 Arm Roller Centralizer	2.55	2.75	32.00
			UW_MIT-UW_MIT40_042 (10014703) 40 Multifinger Imaging Tool	4.54	2.75	61.10
			UW_PRC #3 -UW_PRC_057 (1038) 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
TSTAMP	0.00					



Dataset: 04-18-15\_whiting\_razor 11h-0215a\_mit\_rbl.db: field/well/run1/pass11  
Total Length: 27.05 ft  
Total Weight: 319.30 lb  
O.D. 3.13 in

#### Calibration Report

Database File: 04-18-15\_whiting\_razor 11h-0215a\_mit\_rbl.db  
Dataset Pathname: pass11  
Dataset Creation: Sat Apr 18 13:54:53 2015 by Log 7.0 B1

#### Multi-finger Imaging Tool Calibration Report

Serial Number: 10014703  
Number of Fingers: 40  
Tool Model: UW\_MIT40\_042

#### Inclinometer Calibration Report

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

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

#### Finger Calibration Report

Performed: Sat Apr 18 12:57:52 2015

Ring size:	4		5		6		7
(in)		Sens		Sens		Sens	
Finger 01:	1097	387.0	1484	383.0	1867	401.0	2268
Finger 02:	1045	391.0	1436	401.0	1837	425.0	2262
Finger 03:	1060	386.0	1446	388.0	1834	412.0	2246
Finger 04:	1021	397.0	1418	409.0	1827	433.0	2260
Finger 05:	1049	382.0	1431	386.0	1817	403.0	2220
Finger 06:	1031	390.0	1421	396.0	1817	419.0	2236
Finger 07:	1036	390.0	1426	389.0	1815	413.0	2228
Finger 08:	1031	399.0	1430	404.0	1834	429.0	2263
Finger 09:	1080	395.0	1475	390.0	1865	402.0	2267
Finger 10:	1022	383.0	1405	387.0	1792	408.0	2200
Finger 11:	1047	403.0	1450	399.0	1849	421.0	2270
Finger 12:	1122	390.0	1512	372.0	1884	385.0	2269
Finger 13:	1052	383.0	1435	389.0	1824	417.0	2241
Finger 14:	1031	398.0	1429	404.0	1833	430.0	2263
Finger 15:	1008	397.0	1405	408.0	1813	438.0	2251
Finger 16:	1033	388.0	1421	394.0	1815	428.0	2243
Finger 17:	1100	390.0	1490	387.0	1877	403.0	2280
Finger 18:	1074	374.0	1448	377.0	1825	400.0	2225
Finger 19:	1068	389.0	1457	394.0	1851	412.0	2263
Finger 20:	979	382.0	1361	401.0	1762	430.0	2192
Finger 21:	1056	381.0	1437	388.0	1825	414.0	2239
Finger 22:	1077	389.0	1466	395.0	1861	416.0	2277
Finger 23:	1085	384.0	1469	389.0	1858	411.0	2269
Finger 24:	1094	359.0	1453	368.0	1821	388.0	2209
Finger 25:	1080	389.0	1469	402.0	1871	416.0	2287
Finger 26:	1027	372.0	1399	387.0	1786	413.0	2199
Finger 27:	1181	391.0	1572	393.0	1965	407.0	2372
Finger 28:	1053	361.0	1414	377.0	1791	404.0	2195
Finger 29:	1024	371.0	1392	389.0	1782	416.0	2199

Finger 29:	1021	371.0	1392	390.0	1782	416.0	2198
Finger 30:	991	376.0	1367	401.0	1768	406.0	2174
Finger 31:	1199	402.0	1601	403.0	2004	419.0	2423
Finger 32:	973	369.0	1342	377.0	1719	401.0	2120
Finger 33:	1072	392.0	1464	405.0	1869	429.0	2298
Finger 34:	974	370.0	1344	386.0	1730	411.0	2141
Finger 35:	1127	400.0	1527	408.0	1935	418.0	2353
Finger 36:	1036	364.0	1400	370.0	1770	393.0	2163
Finger 37:	1128	402.0	1530	404.0	1934	420.0	2354
Finger 38:	1073	375.0	1448	380.0	1828	402.0	2230
Finger 39:	1043	362.0	1405	368.0	1773	389.0	2162
Finger 40:	958	384.0	1342	407.0	1749	433.0	2182

### Segmented Cement Bond Log Calibration Report

Serial Number:	10022773
Tool Model:	UW_RBT_004
Calibration Casing Diameter:	7.000 in
Calibration Depth:	129.763 ft

Master Calibration, performed Sat Apr 18 13:18:41 2015:

	Raw (v)		Calibrated (mv)		Results	
	Zero	Cal	Zero	Cal	Gain	Offset
3FT	0.002	0.741	0.800	62.165	83.136	0.597
5FT	-0.001	0.772	0.800	62.165	79.337	0.897
S1	0.002	0.708	0.000	100.000	141.780	-0.346
S2	0.001	0.744	0.000	100.000	134.545	-0.164
S3	0.002	0.735	0.000	100.000	136.511	-0.303
S4	0.001	0.722	0.000	100.000	138.876	-0.203
S5	0.002	0.731	0.000	100.000	137.172	-0.335
S6	0.001	0.710	0.000	100.000	141.013	-0.172
S7	0.002	0.704	0.000	100.000	142.334	-0.271
S8	0.001	0.703	0.000	100.000	142.604	-0.185

### 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	Whiting Oil & Gas Corporation
Well	Razor 11H-0215A
Field	Wildcat
County	Weld
State	Colorado