



Radial Cement Bond  
Gamma Ray  
Casing Collar Log

Company Whiting Oil & Gas Corporation		Company Whiting Oil & Gas Corporation	
Well Razor Federal 12F-1308B		Well Razor Federal 12F-1308B	
Field Wildcat		Field Wildcat	
County Weld		County Weld	
State Colorado		State Colorado	
Location:		API #: 05-123-38712	
SEC 12 TWP 10N RGE 58W		Other Services	
Permanent Datum		Ground Level	
Log Measured From Kelly Bushing		Elevation 4937'	
Drilling Measured From Kelly Bushing		Elevation K.B. 4958' D.F. 4957' G.L. 4937'	
Date		16-Dec-2015	
Run Number		One	
Depth Driller		13836 FT	
Depth Logger		5600 FT	
Bottom Logged Interval		5600 FT	
Top Log Interval		Surface	
Open Hole Size		8.750"	
Type Fluid		Water	
Density / Viscosity		8.34 lbs/gal	
Max. Recorded Temp.		214°F	
Estimated Cement Top		52 FT	
Time Well Ready		ROA	
Time Logger on Bottom		13:15	
Equipment Number		HD-0343	
Location		Fort Lupton, CO	
Recorded By		Robert Fogarty	
Witnessed By		K. Lewis	
Borehole Record			
Tubing Record			
Run Number		Bit	
From		To	
Size		Weight	
From		To	
Casing Record		Size (in)	
Surface Casing		Wgt (lbs/ft)	
Intermediate #1		Grade	
Intermediate #2		Top	
Liner		Bottom	
4 1/2		11.6	
HCP-110		5259 FT	
13836 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 per customer request  
Depth referenced to Casing Tally reported Liner Top at 5259 FT  
Adjusted Log +.3 FT to correlate to Liner Top  
Log ran from as deep as possible to surface  
Recorded with 1500 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.

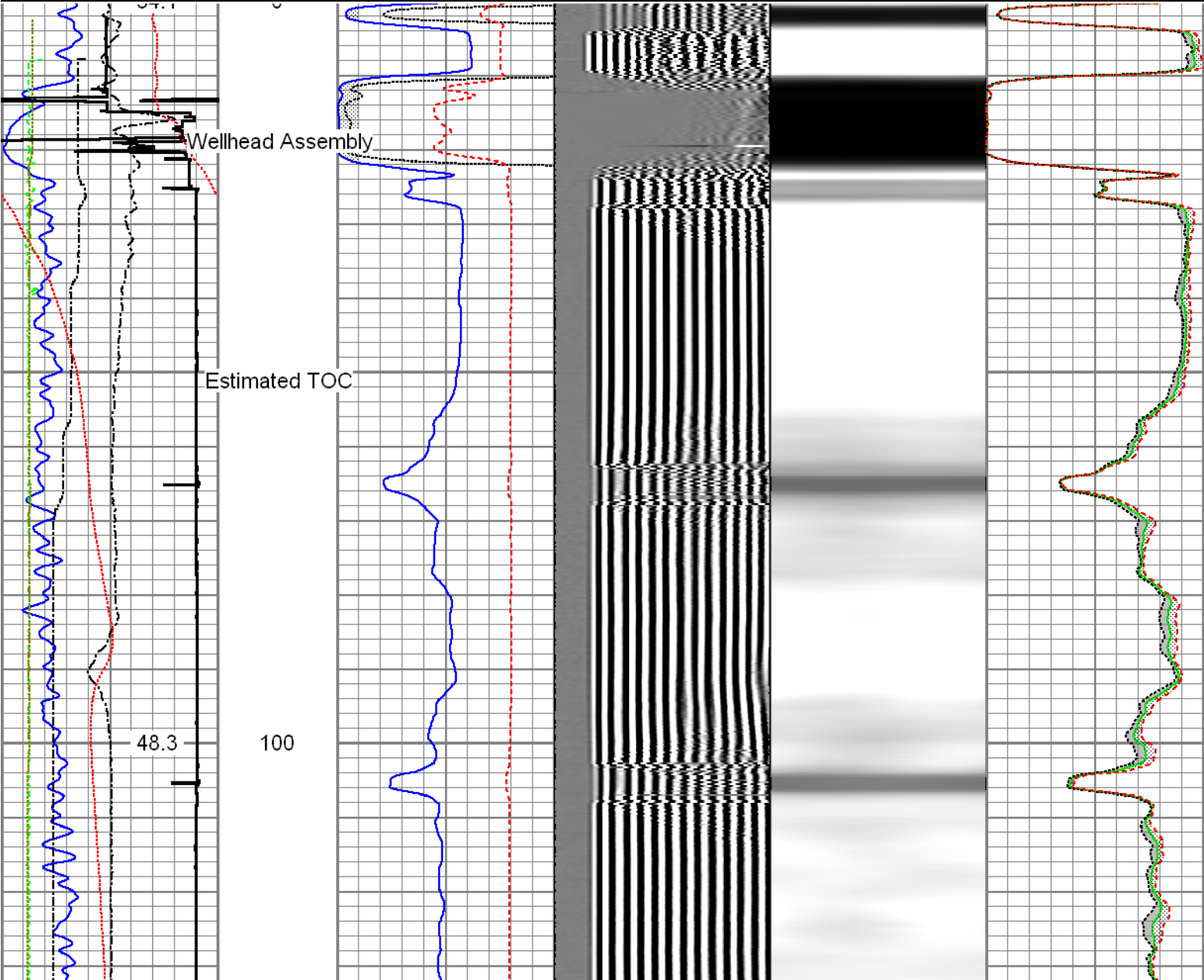


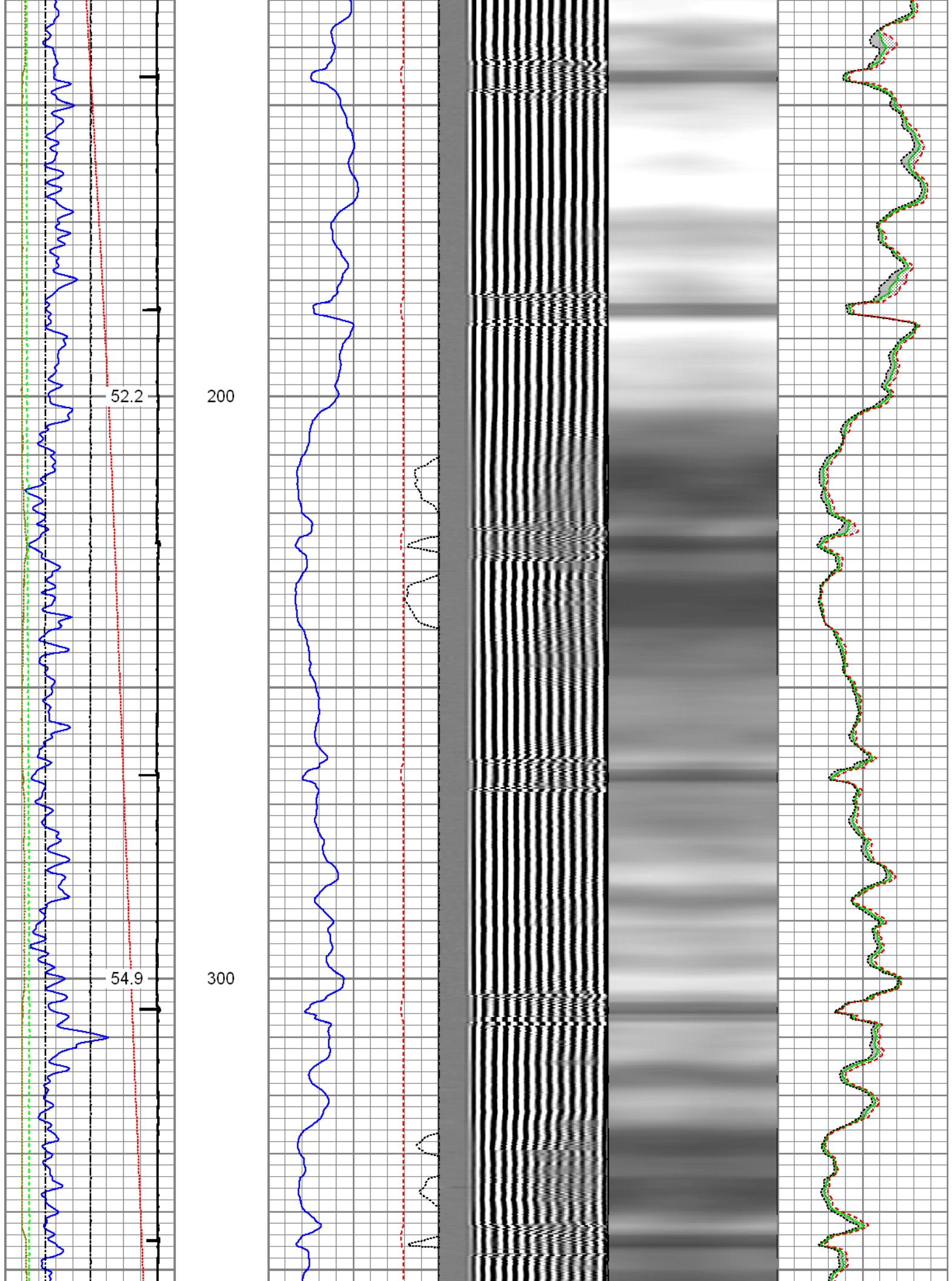
Main Pass

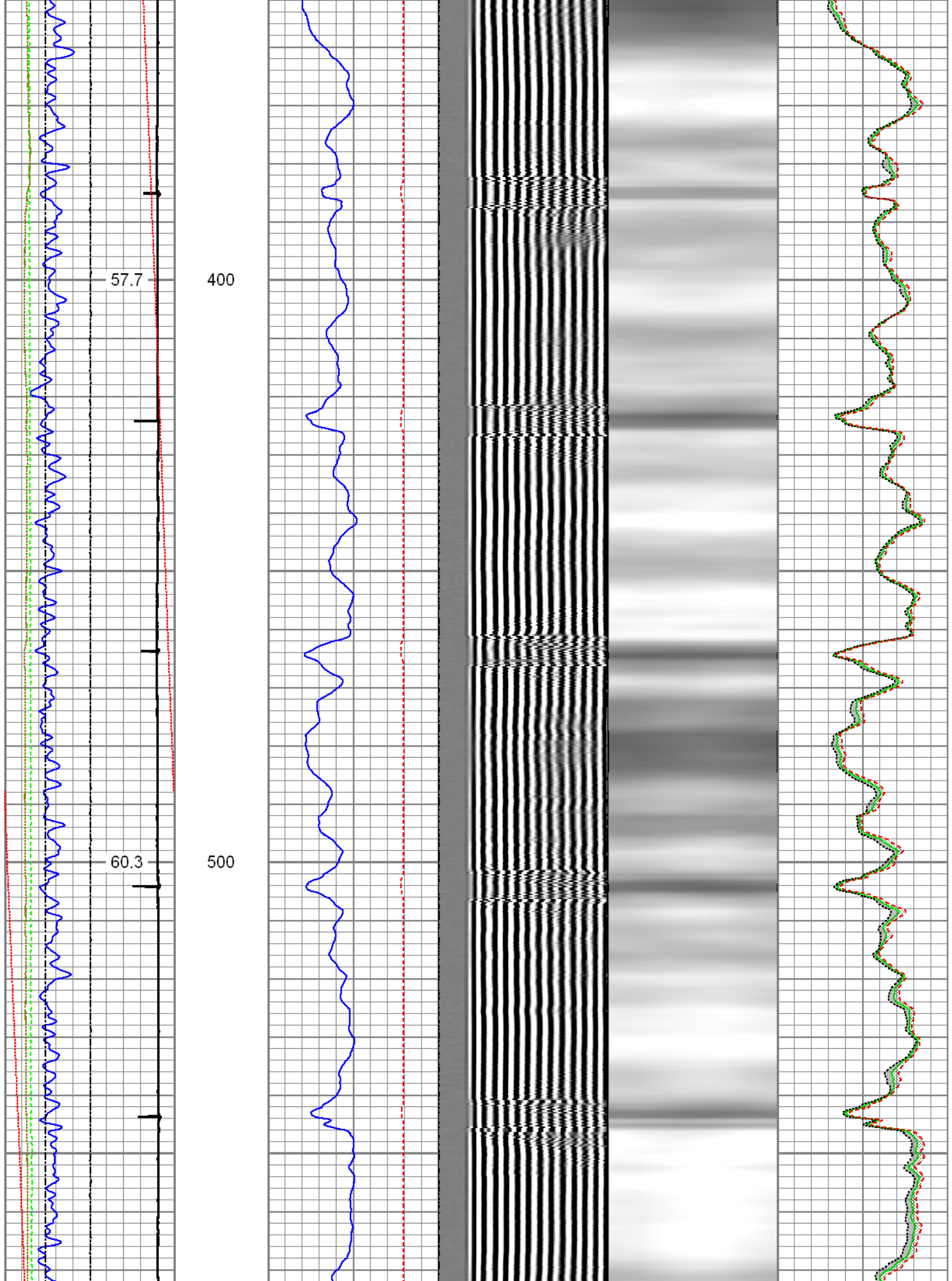
Recorded with 1500 PSI Surface Induced Pressure

Database File: 12-16-15\_whiting\_razor federal 12f-1308b\_mit\_rbl.db  
Dataset Pathname: pass11  
Presentation Format: rbt4\_mit  
Dataset Creation: Wed Dec 16 13:00:31 2015 by Log 7.0 B1  
Charted by: Depth in Feet scaled 1:240

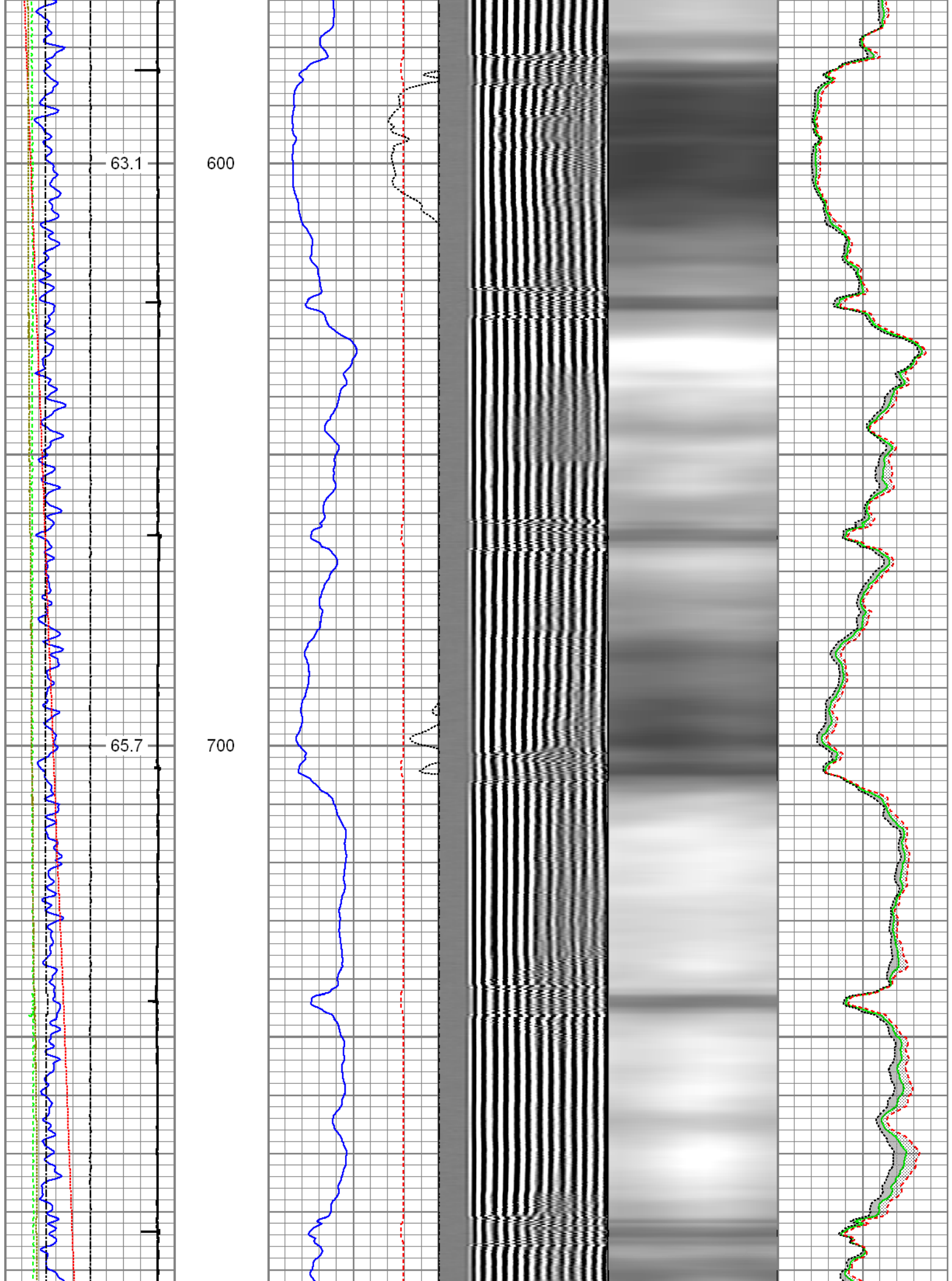
Gamma Ray	3' Amplitude	5' Variable Density Log	Sector Map	Average Amplitude
0 (GAPI) 120	0 (mV) 100	200 1200		0 100
Casing Collar Locator	3' Amplitude x 5			Mimimum Amplitude
Line Speed	0 (mV) 20			0 100
-100 (ft/min) 100	3' Travel Time			Maximum Amplitude
Line Tension	650 (usec) 150			0 100
0 (lb) 2000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

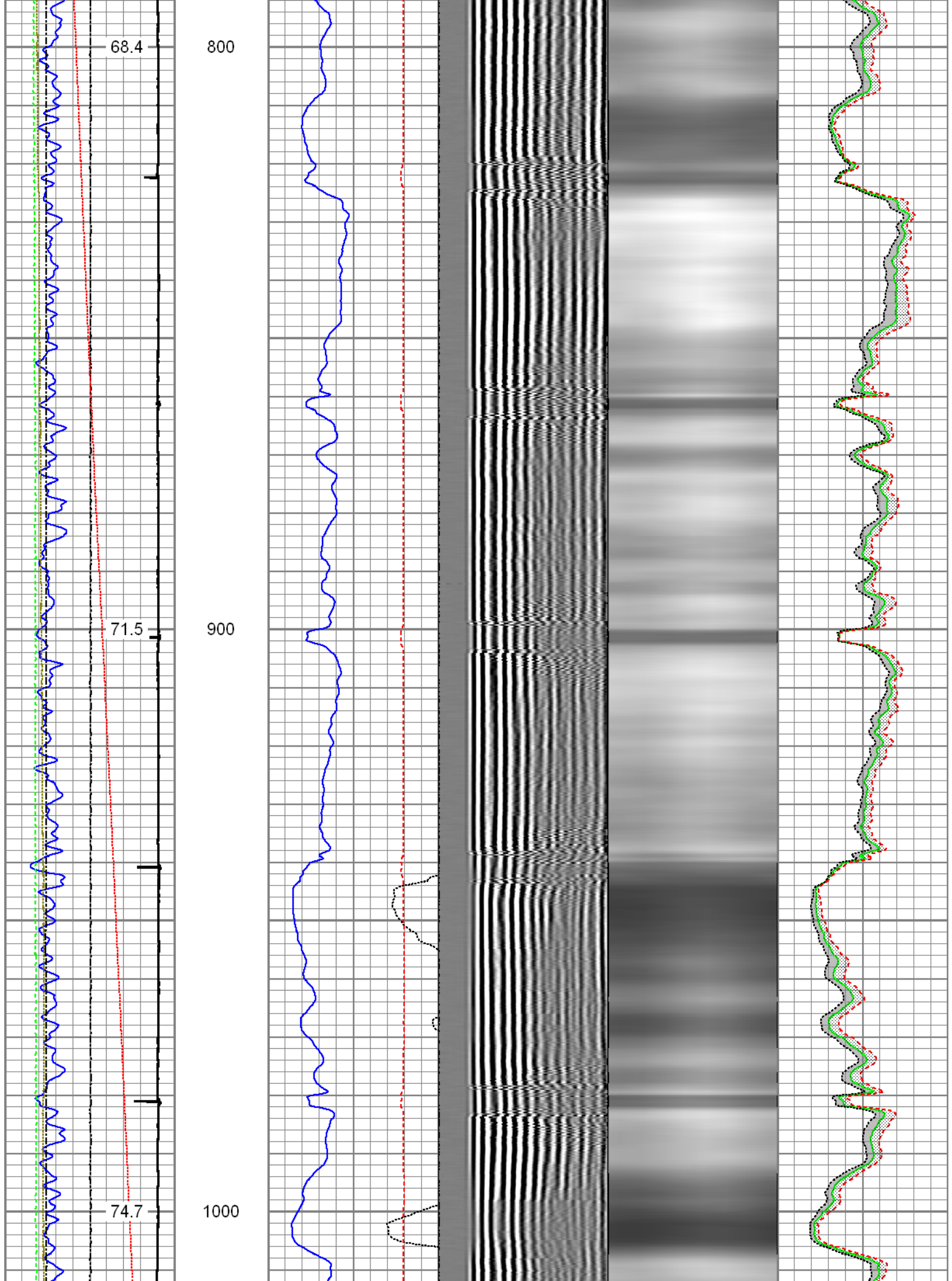


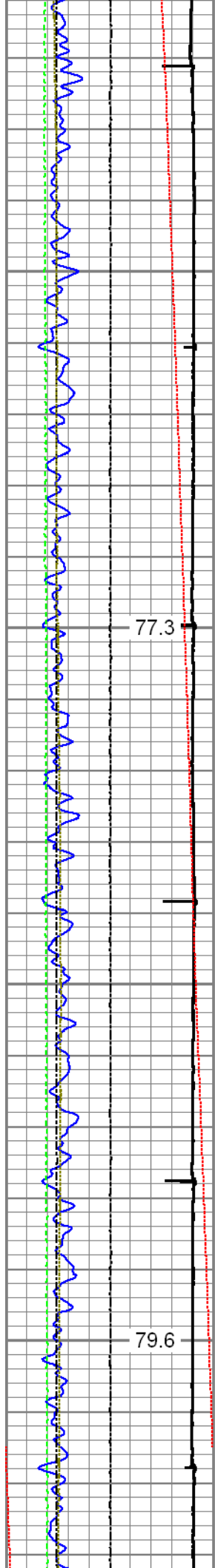










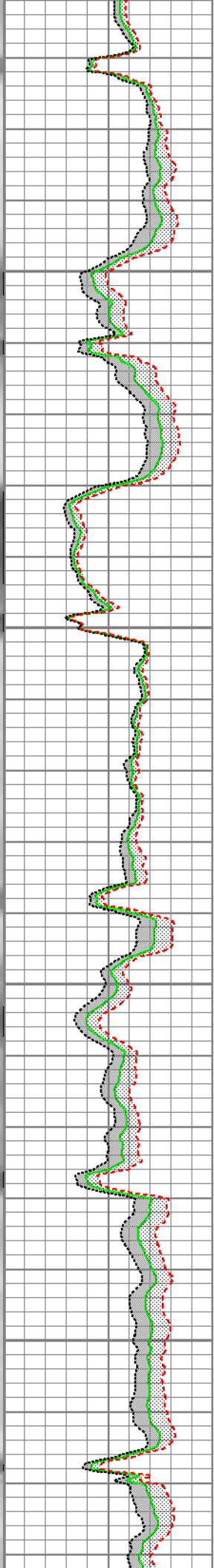
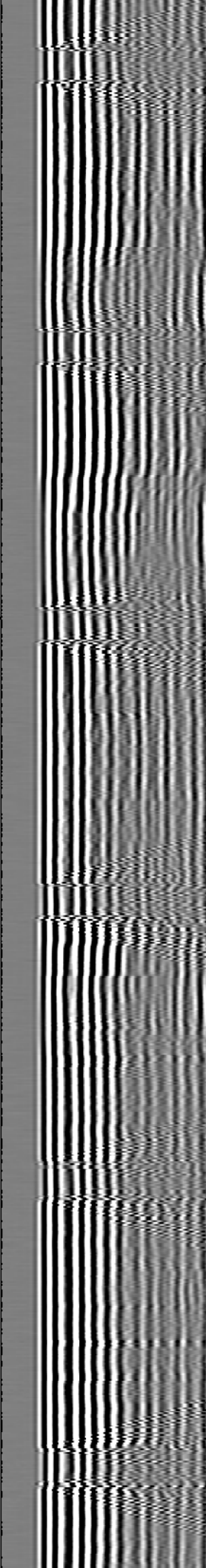
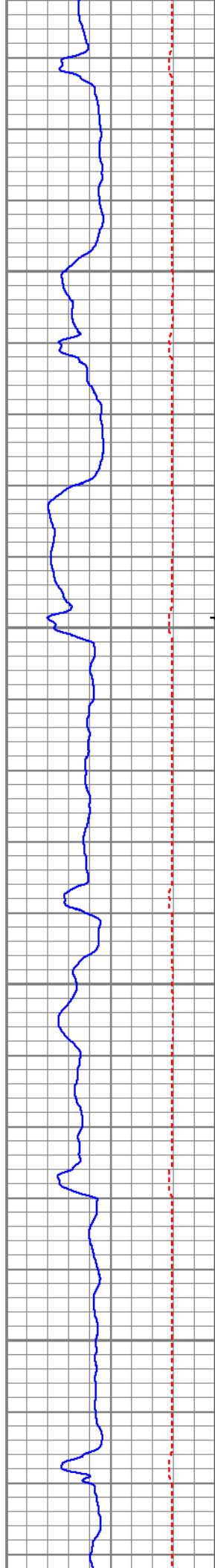


77.3

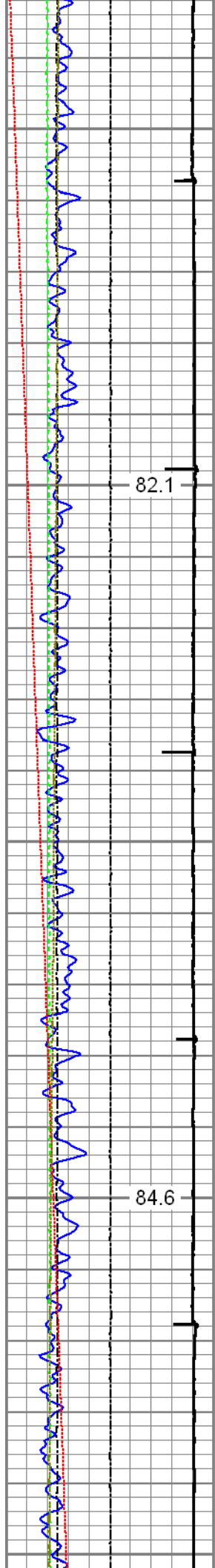
1100

79.6

1200

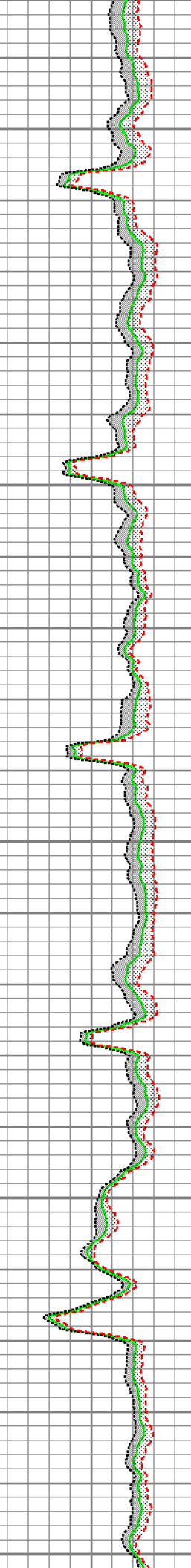
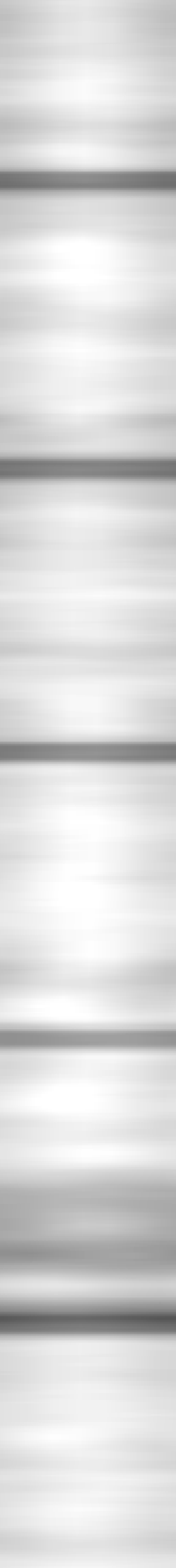
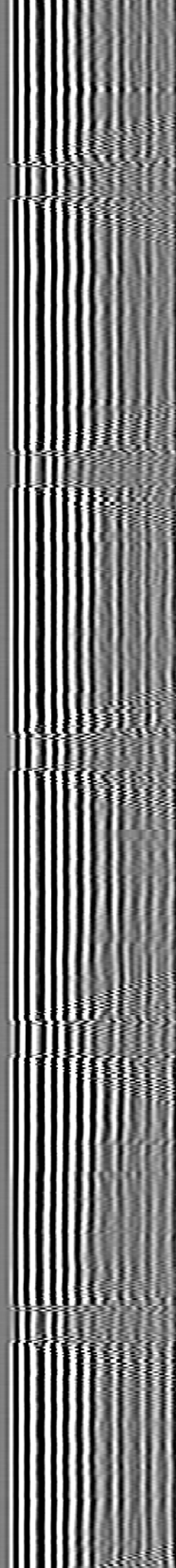
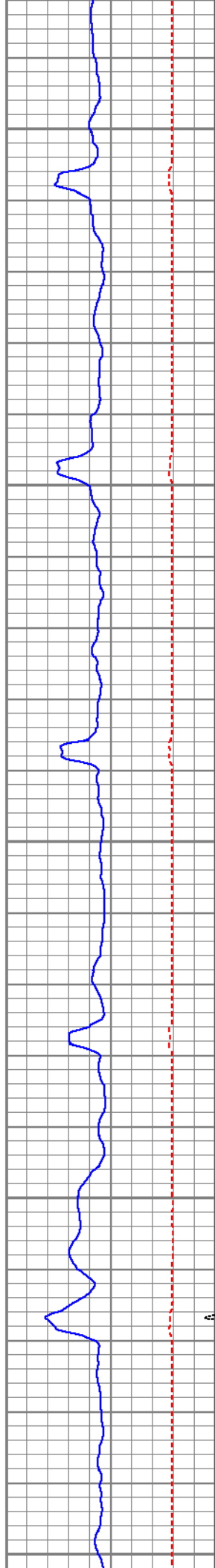




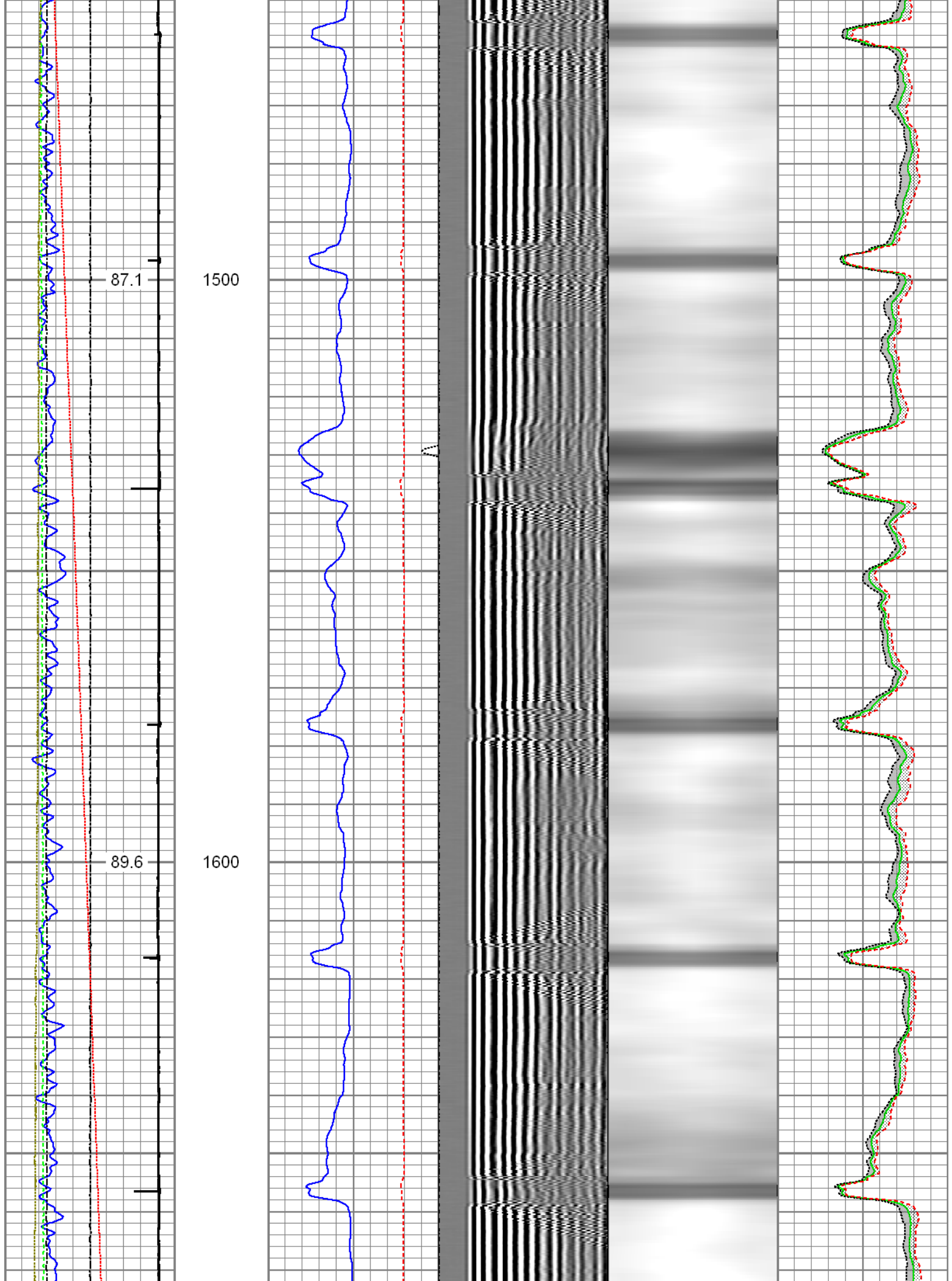


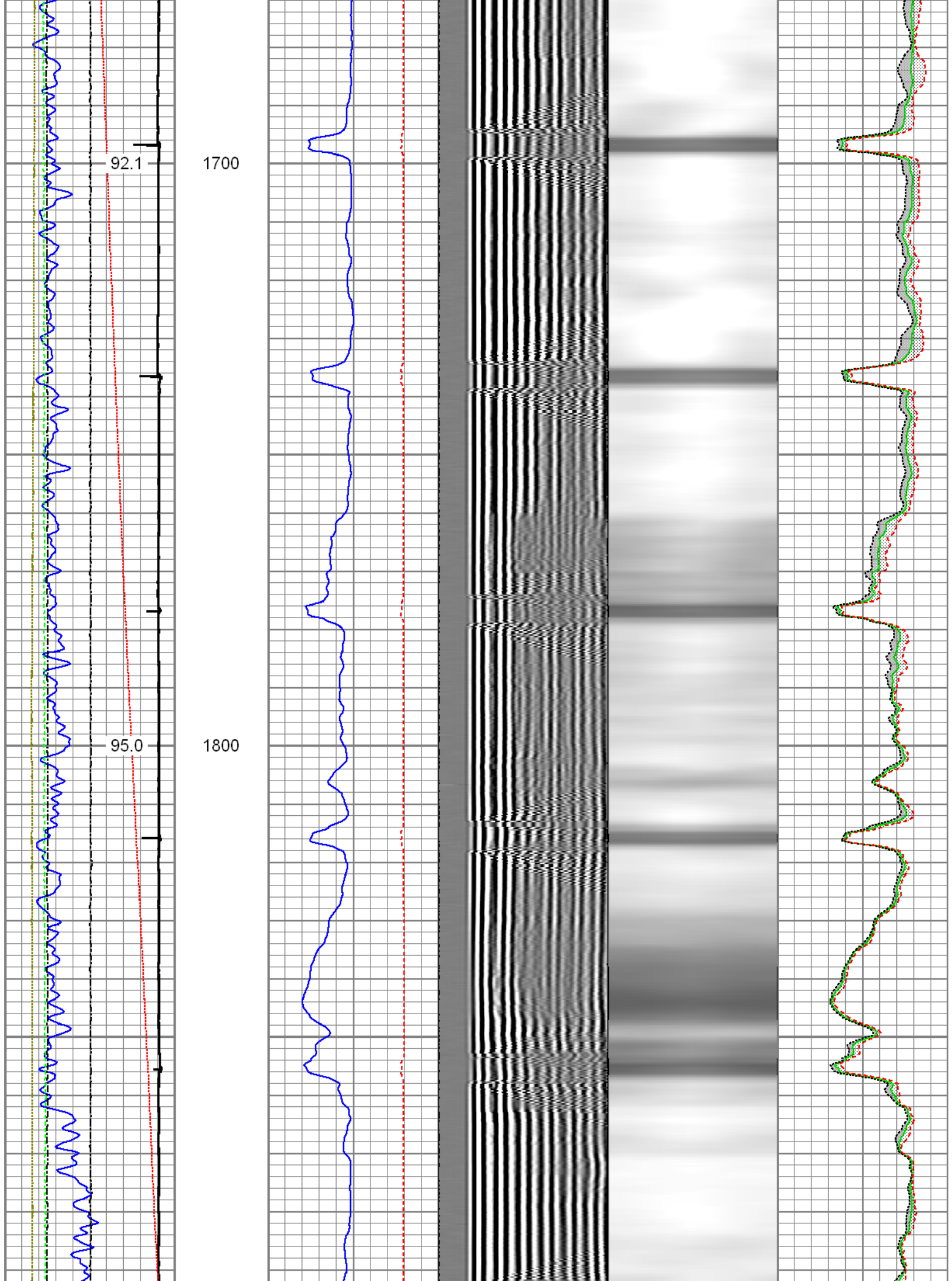
1300

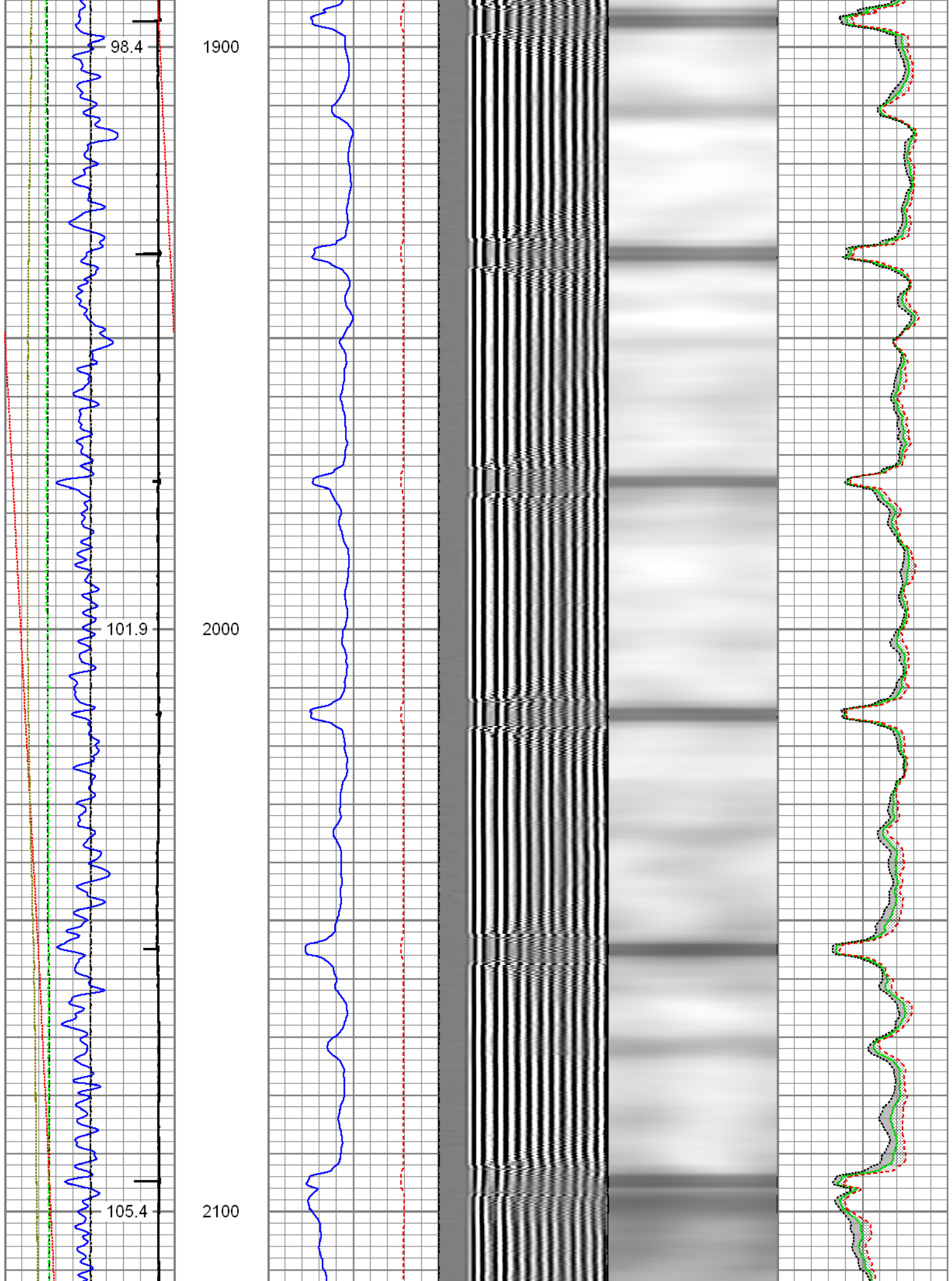
1400

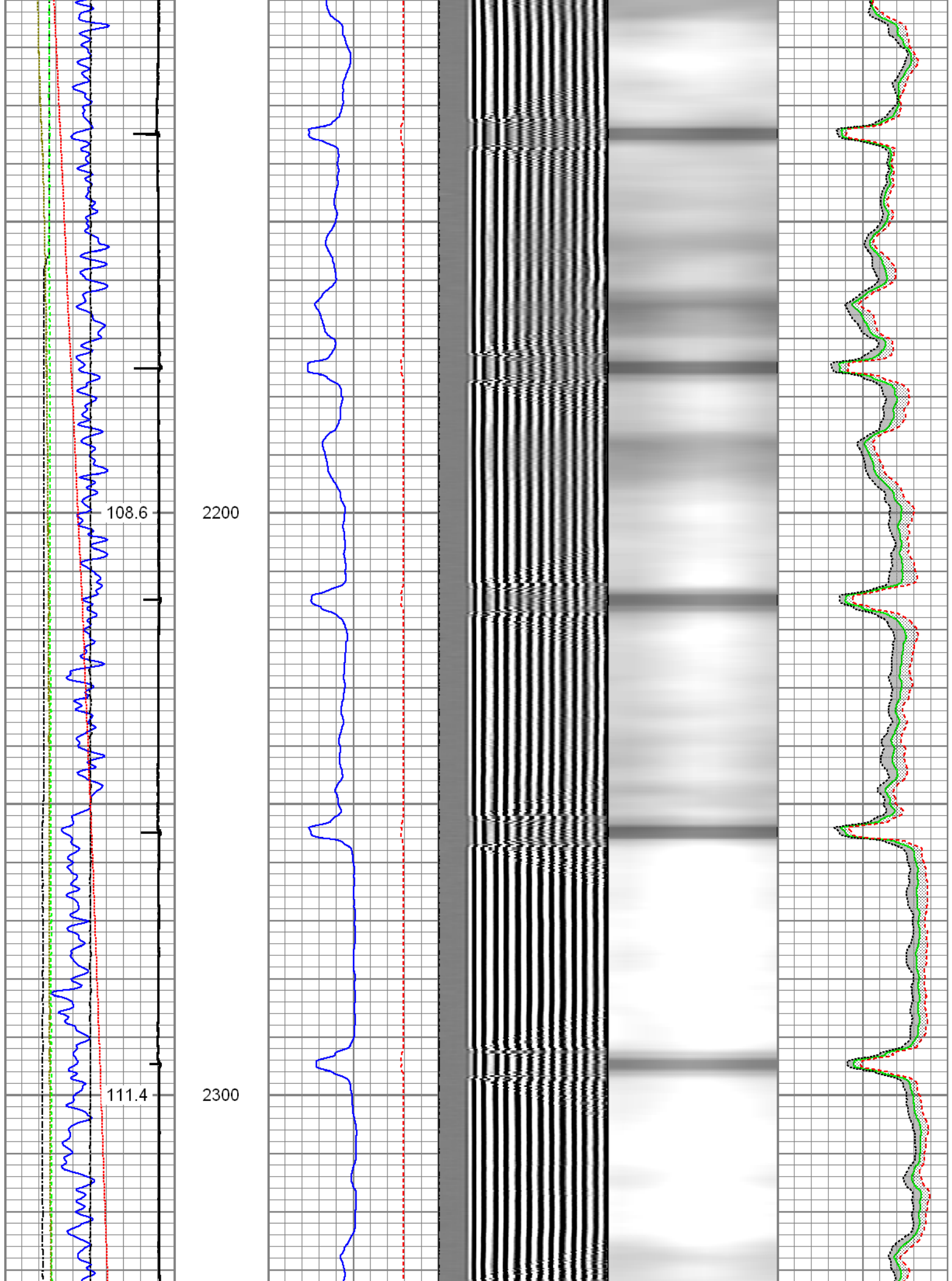




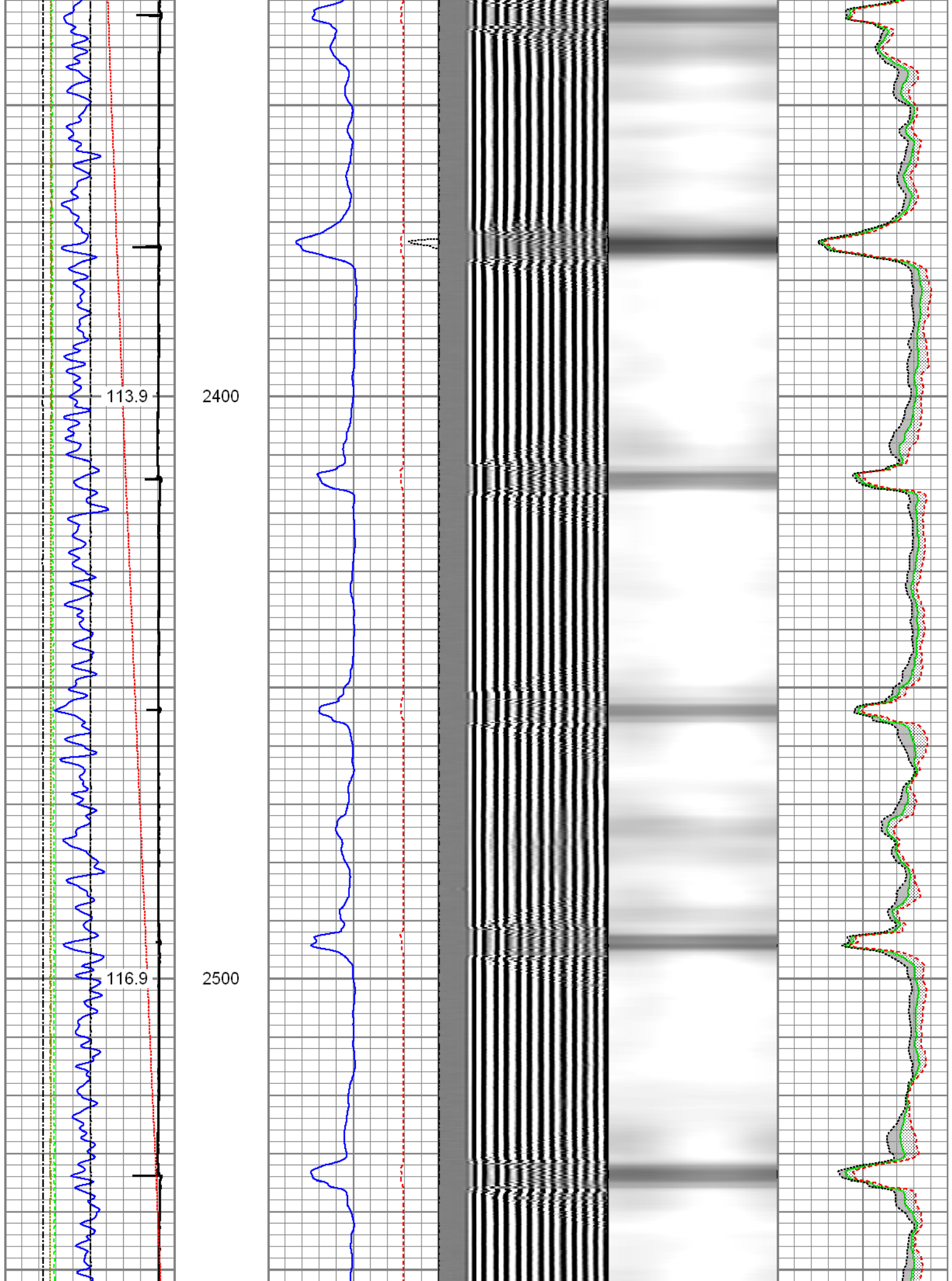


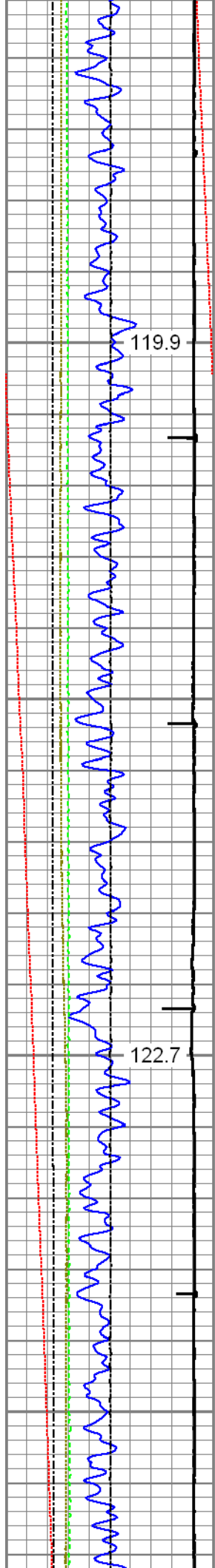






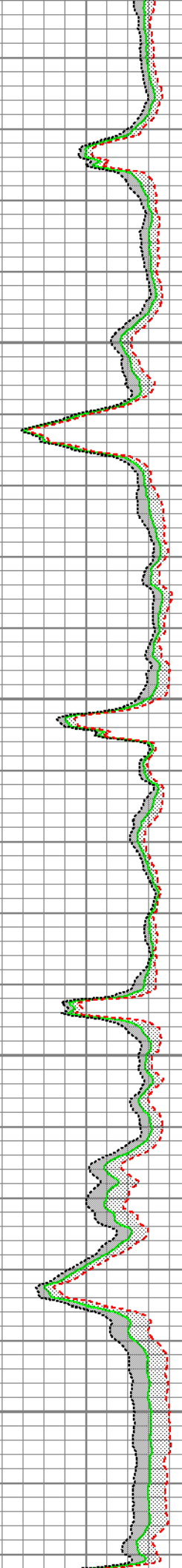
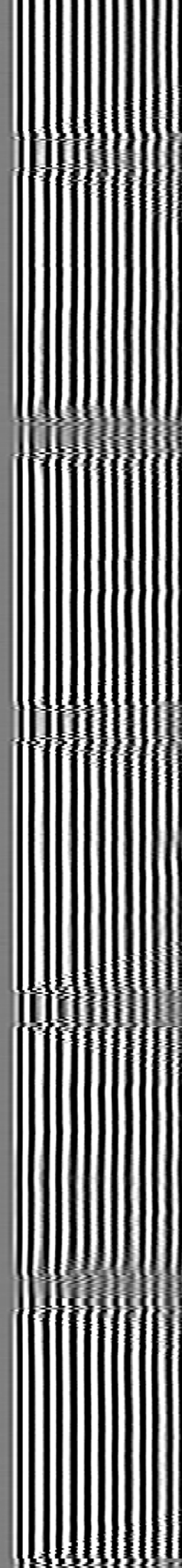
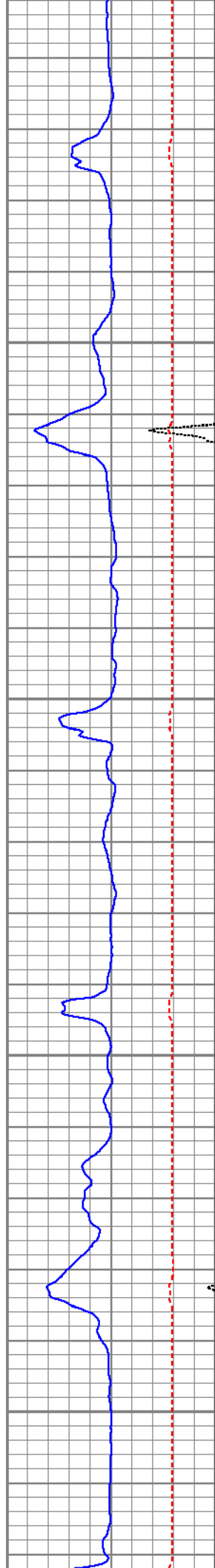


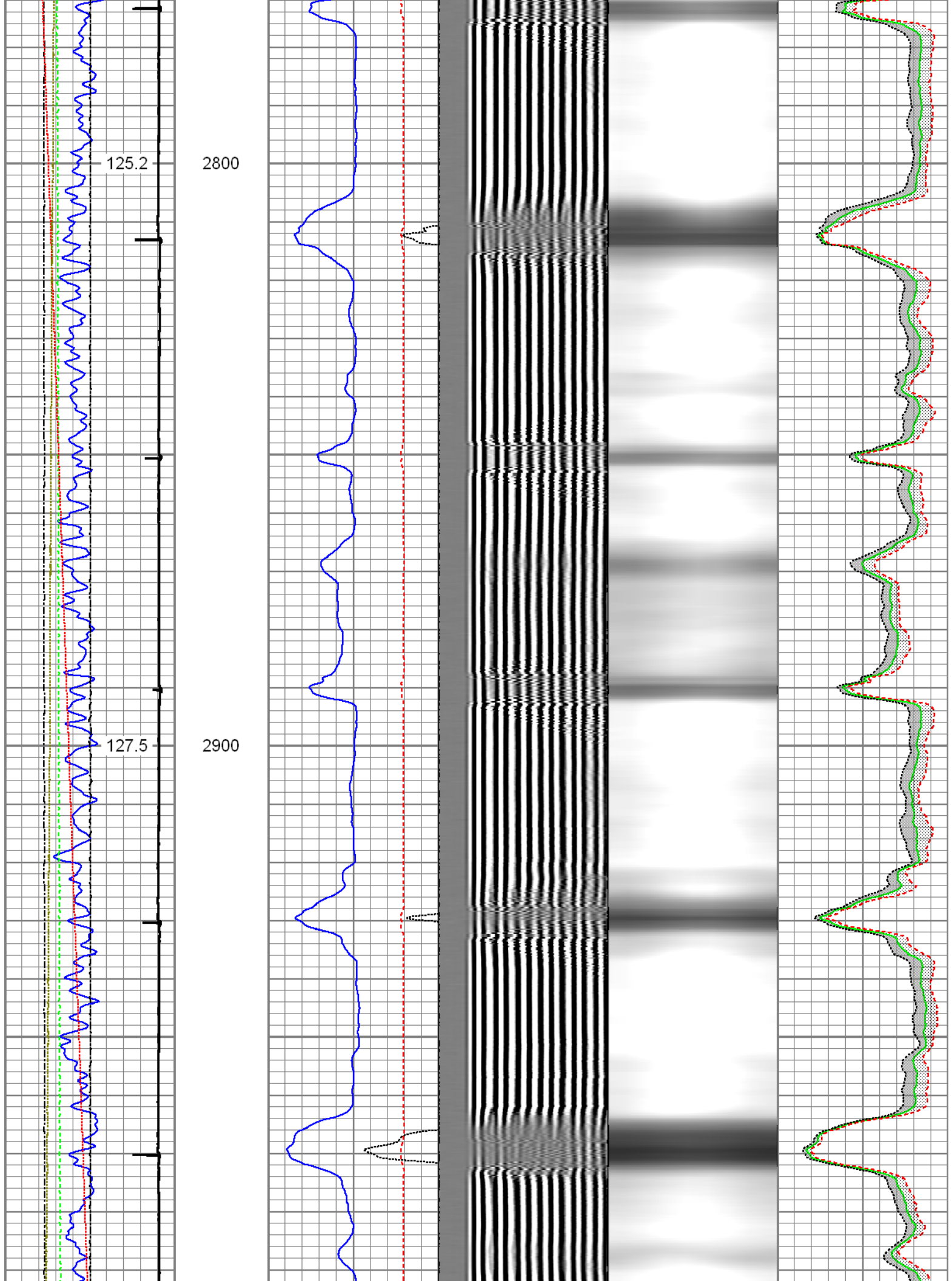


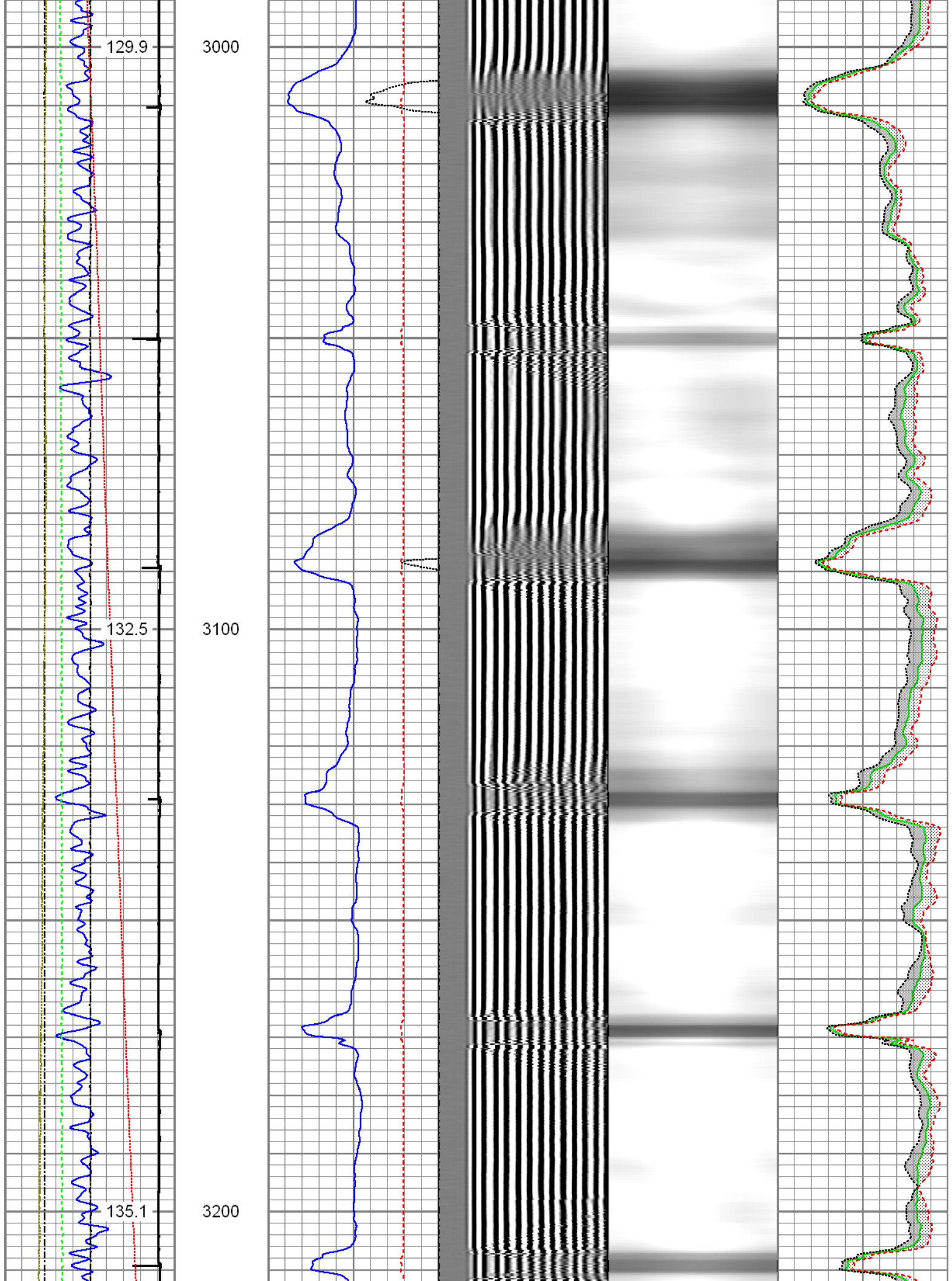


2600

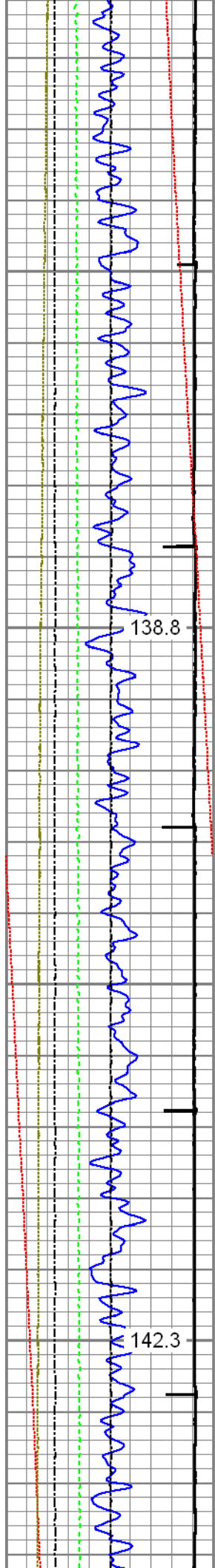
2700





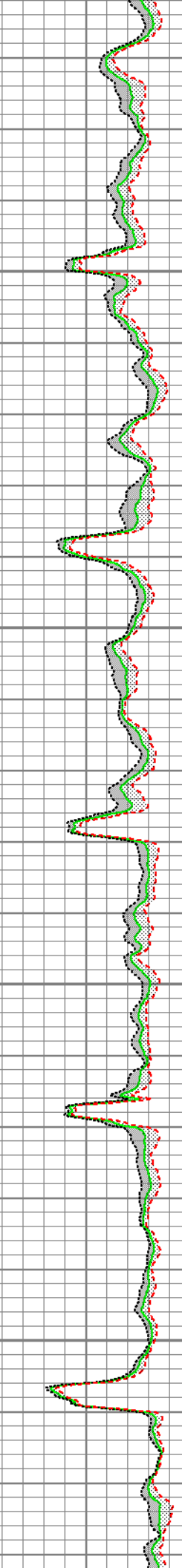
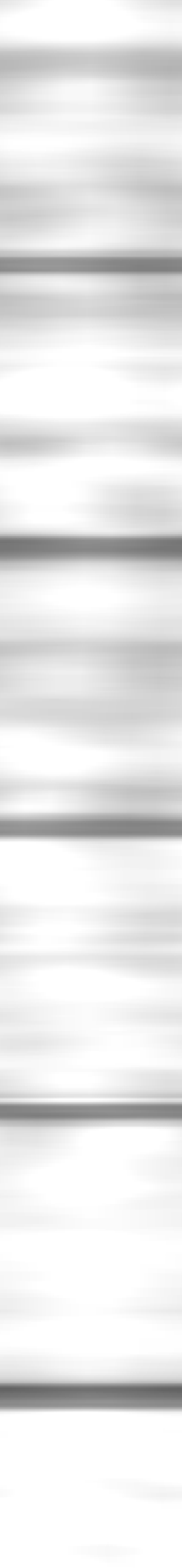
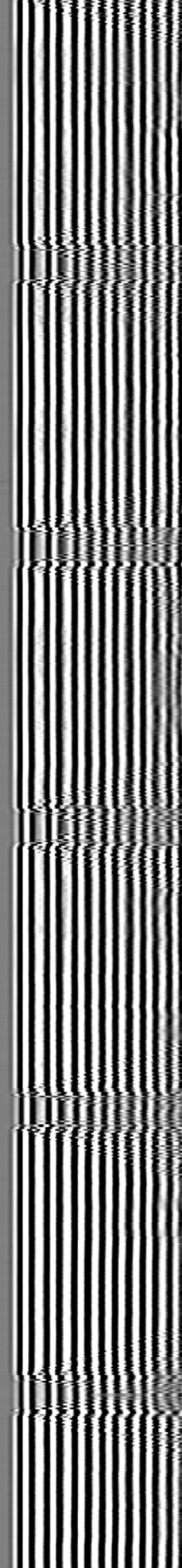
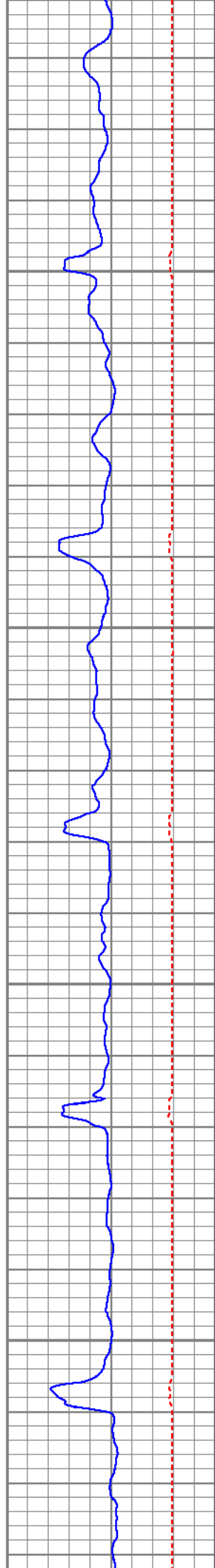


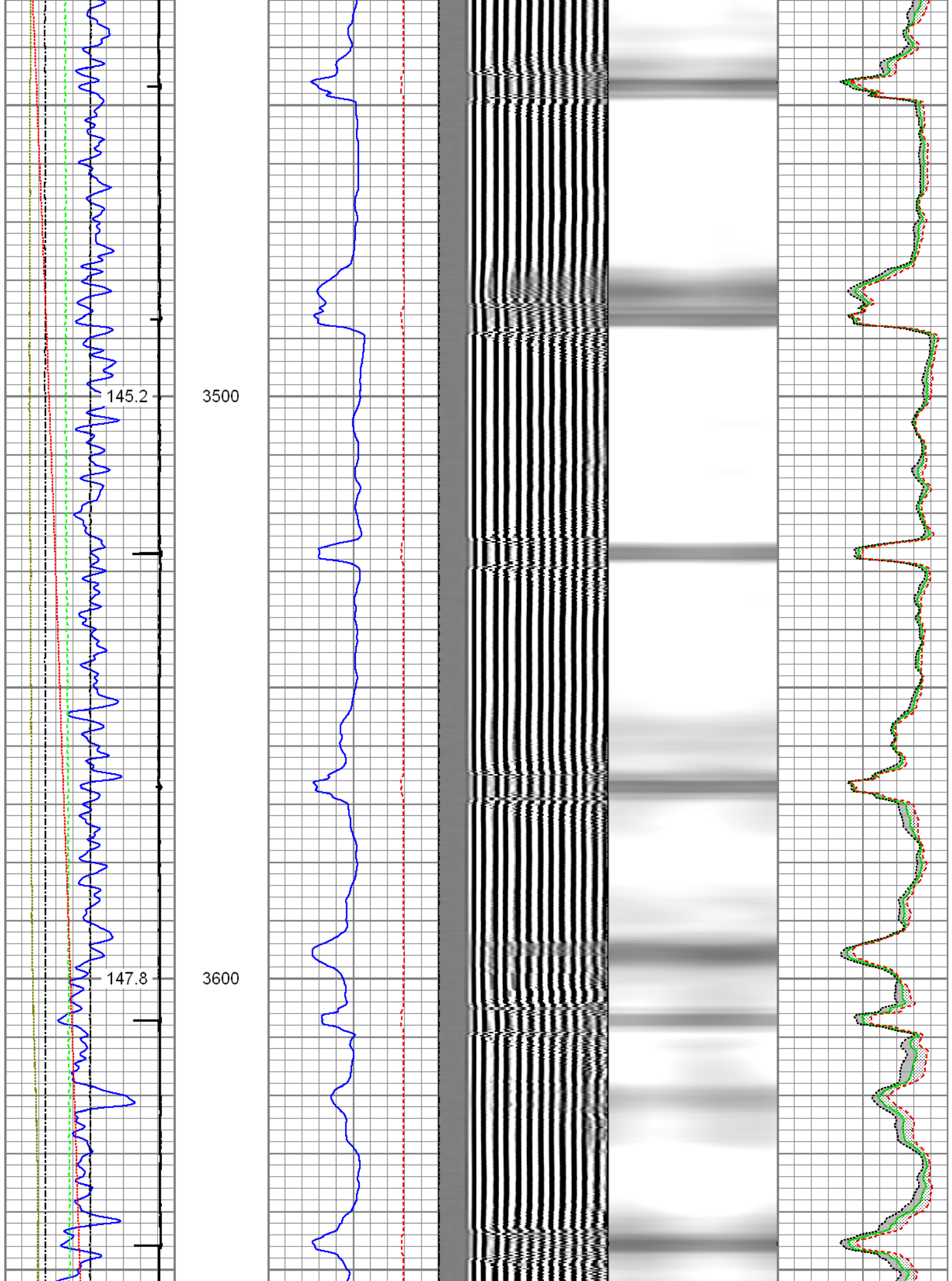


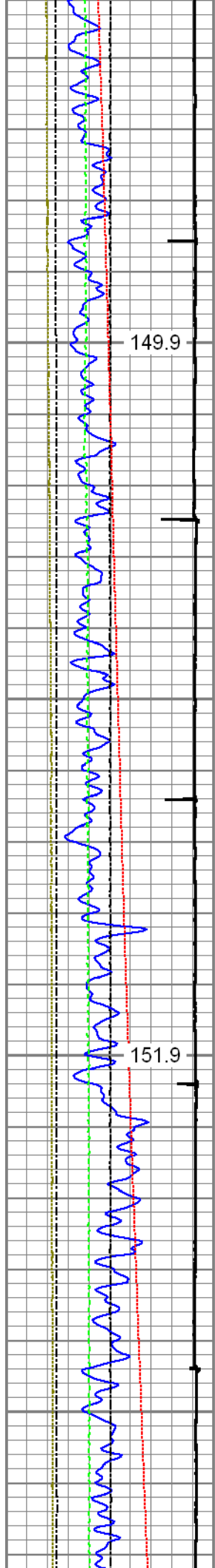


3300

3400





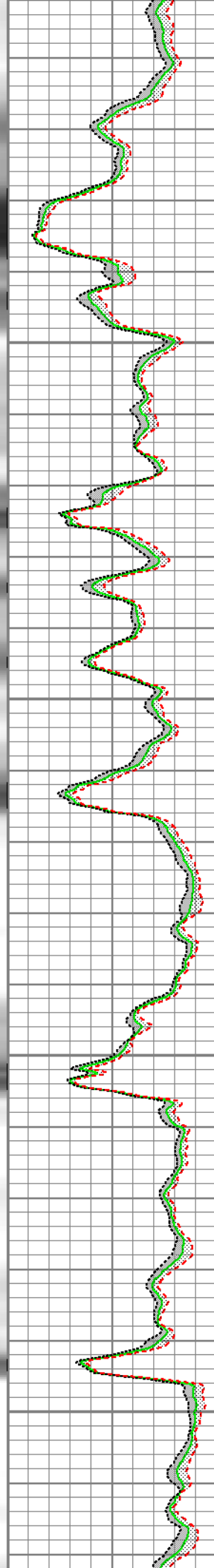
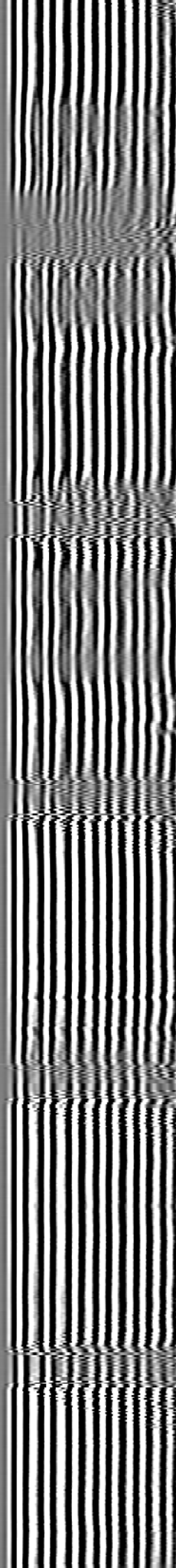
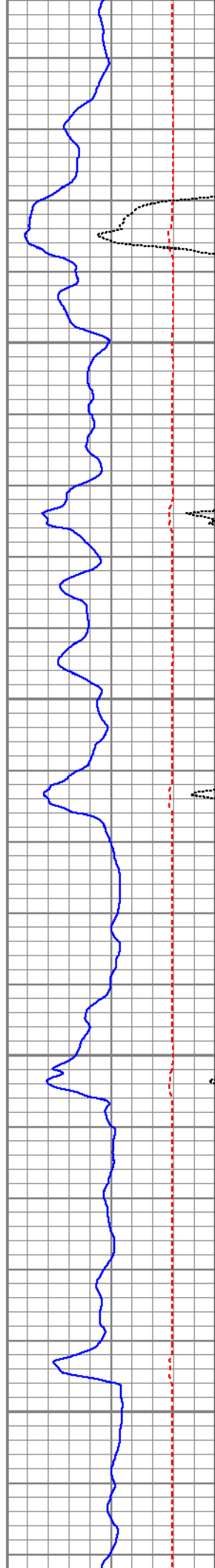


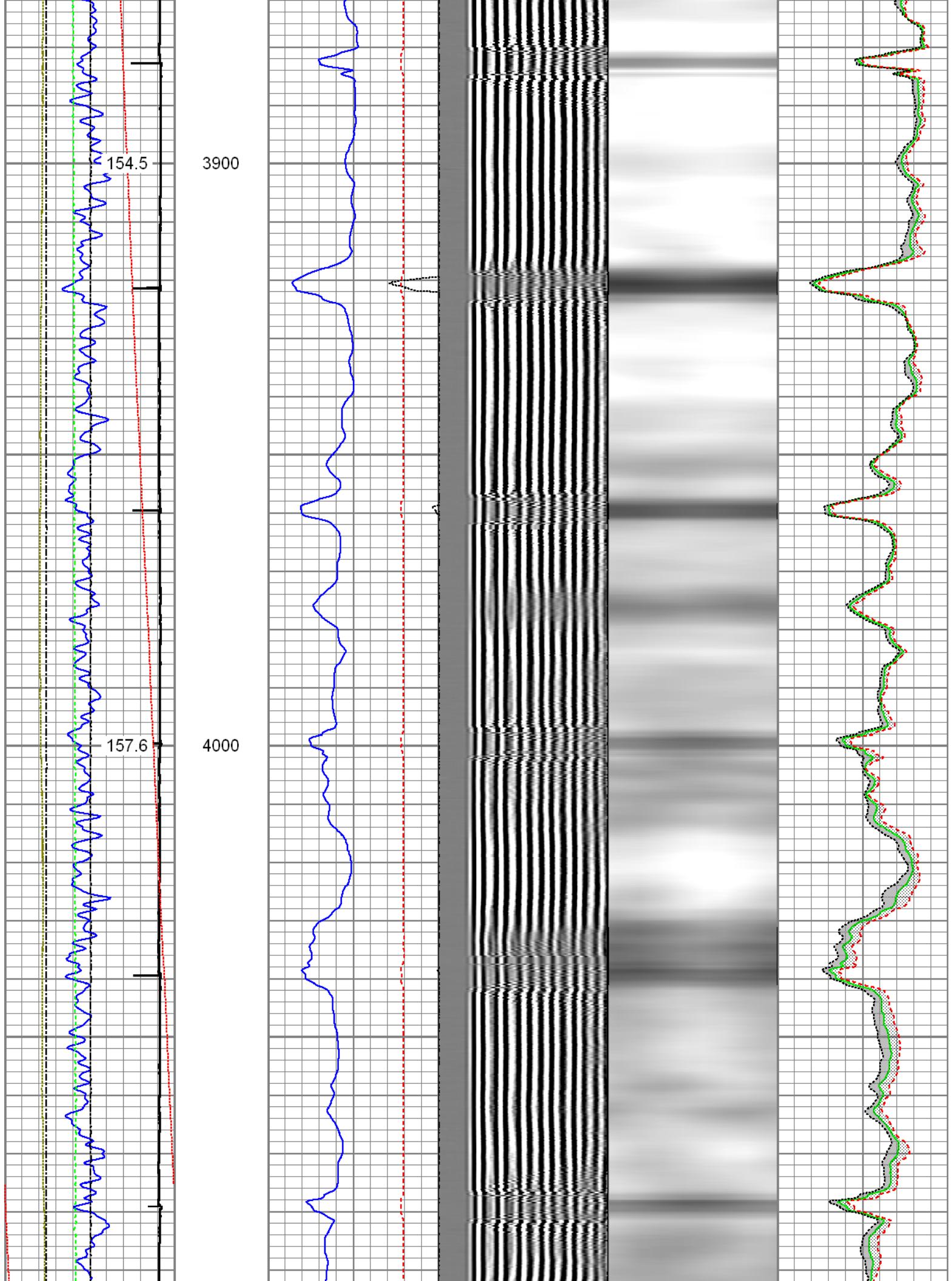
149.9

151.9

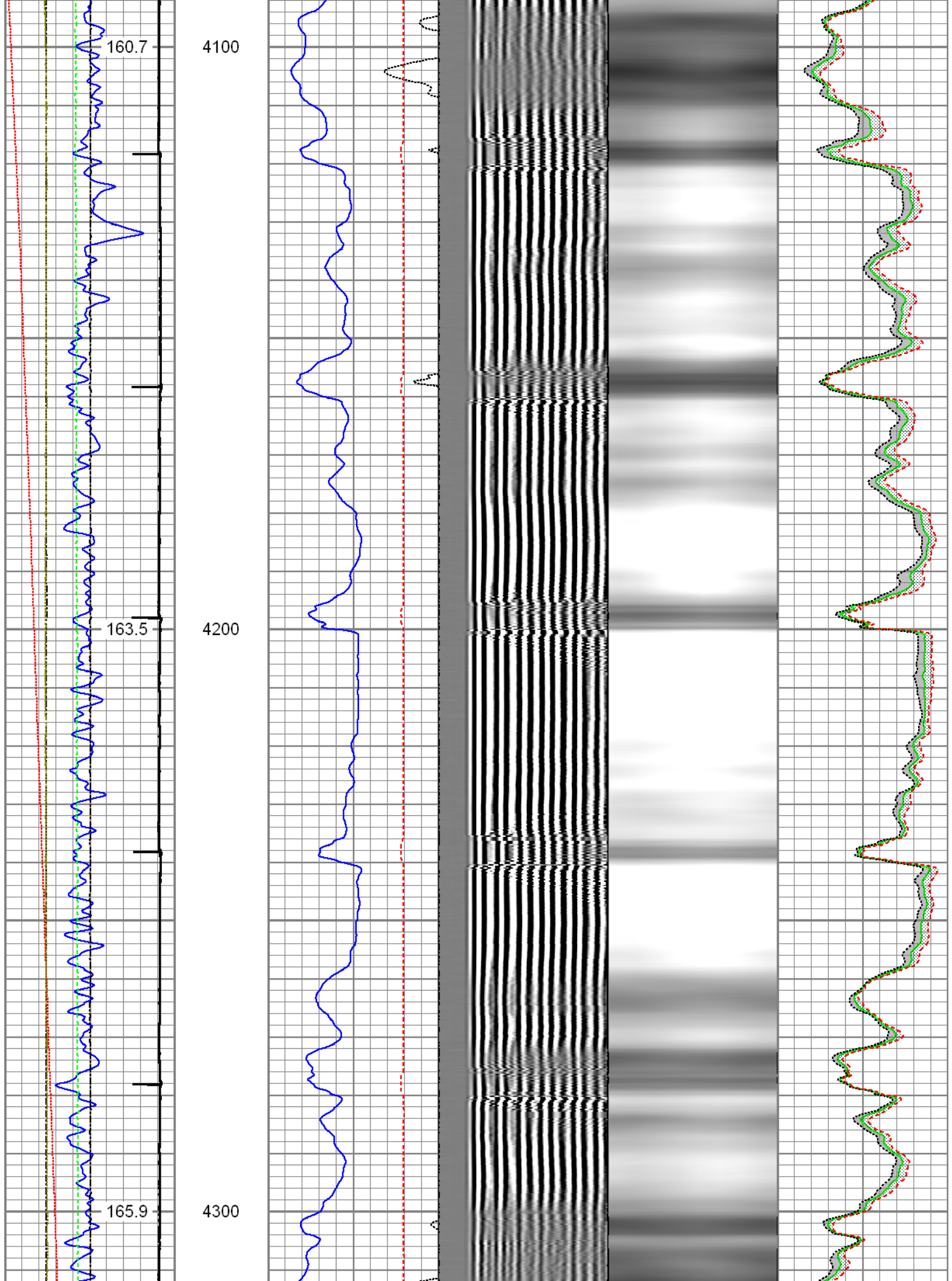
3700

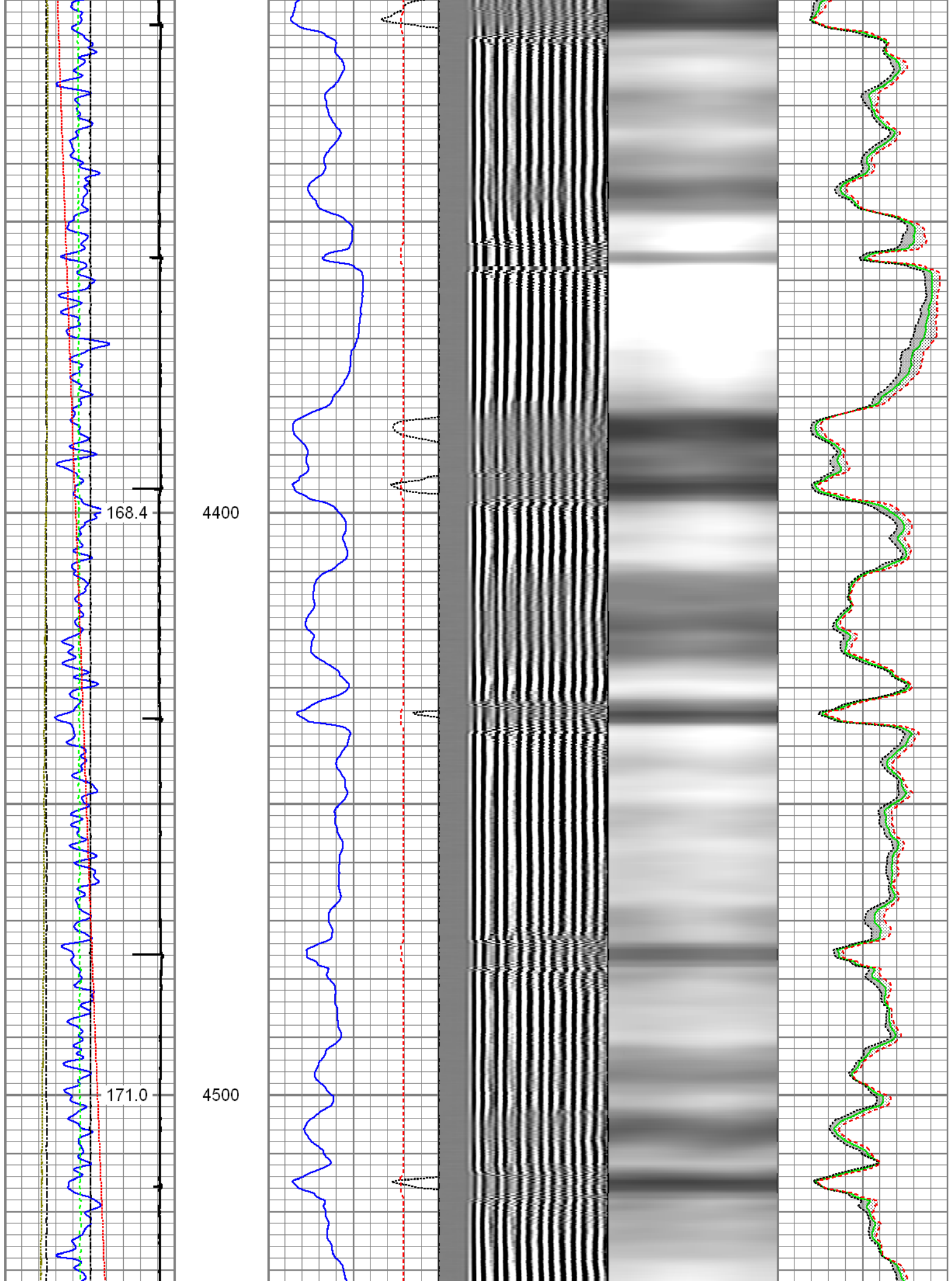
3800

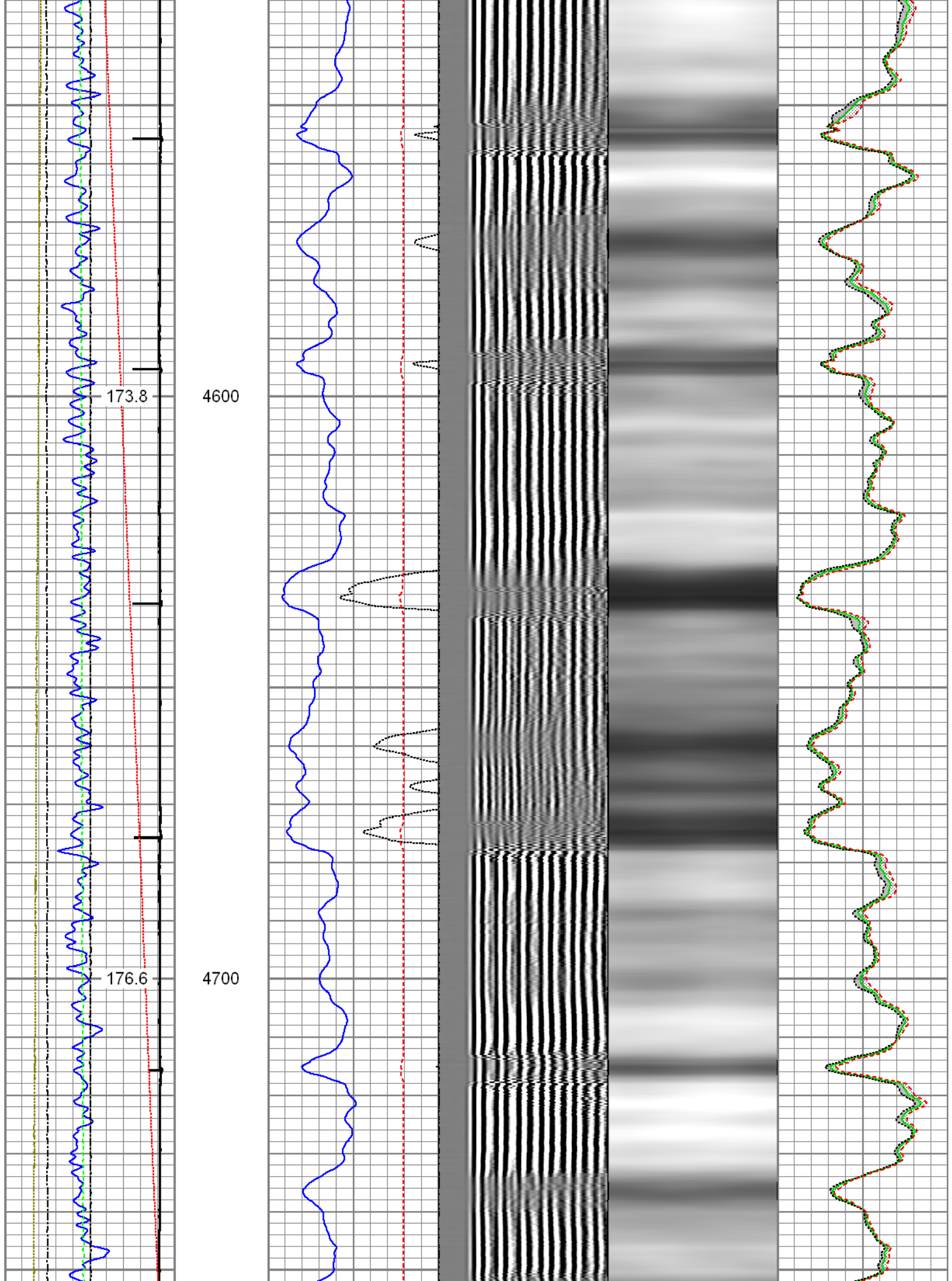




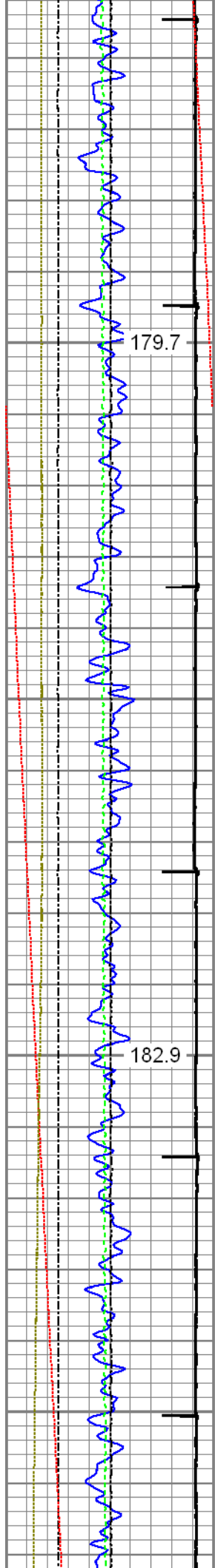






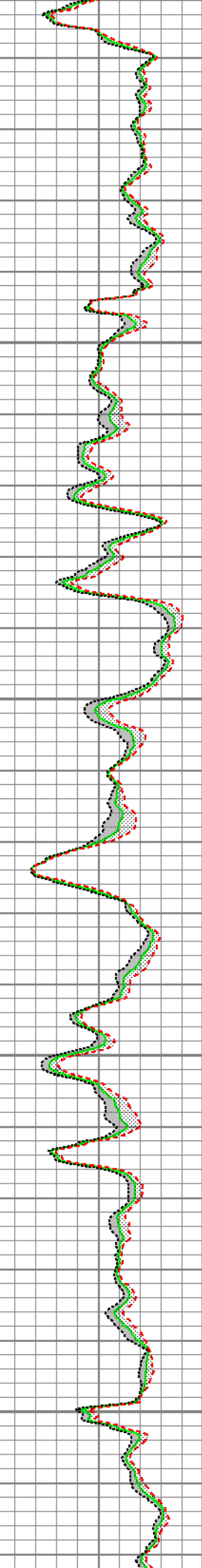
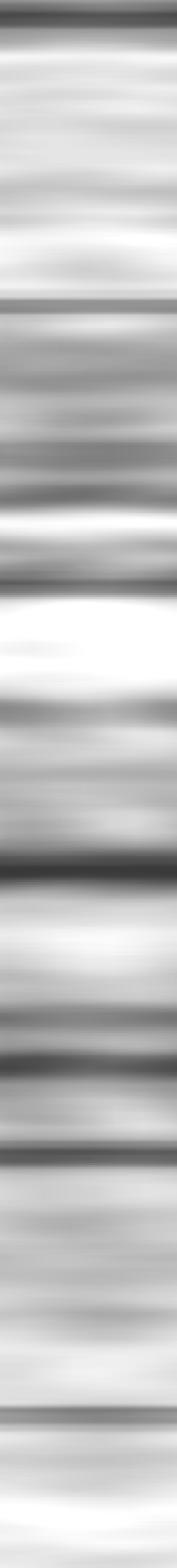
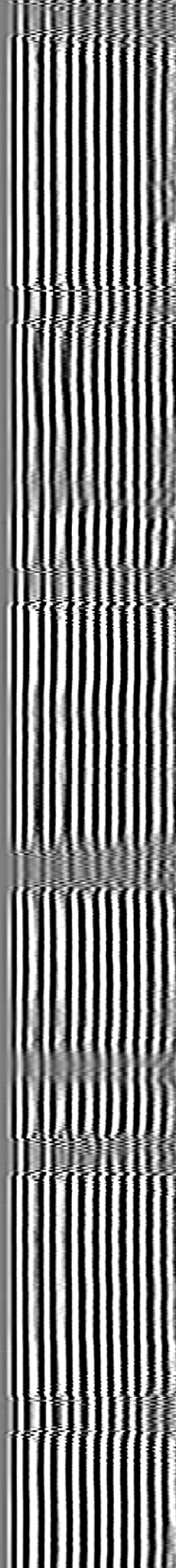
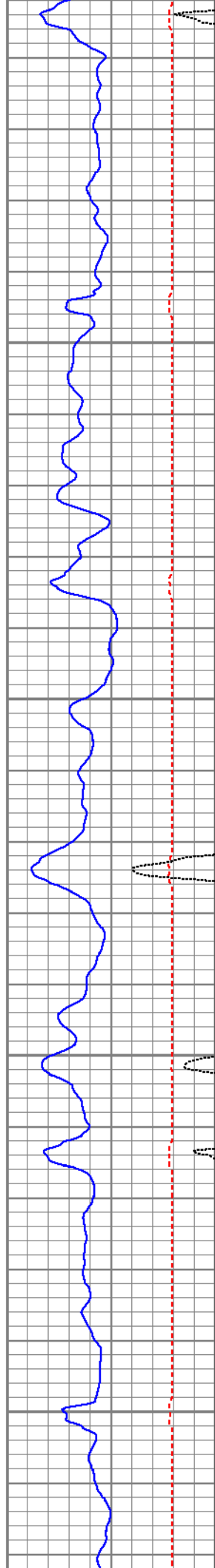




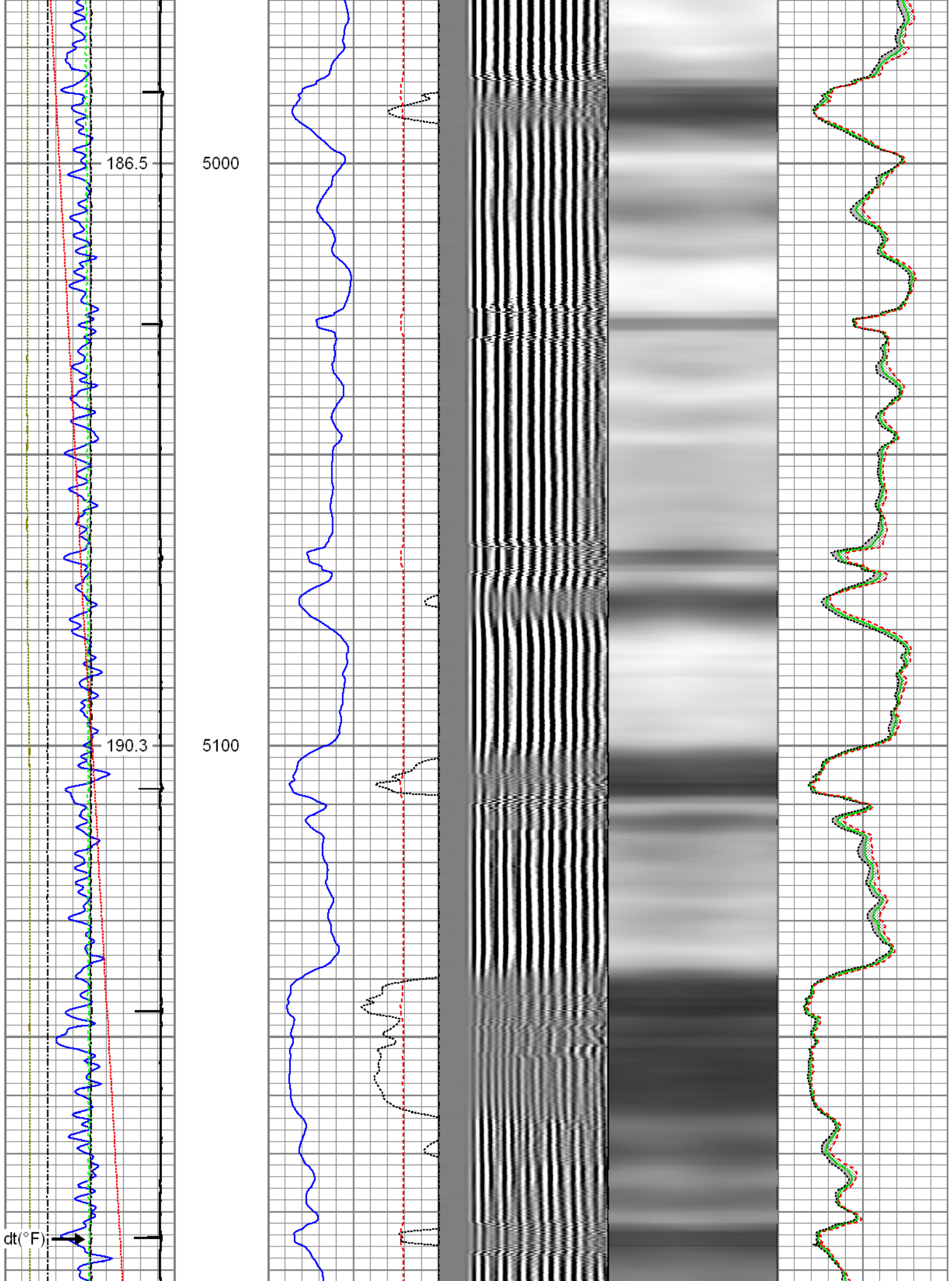


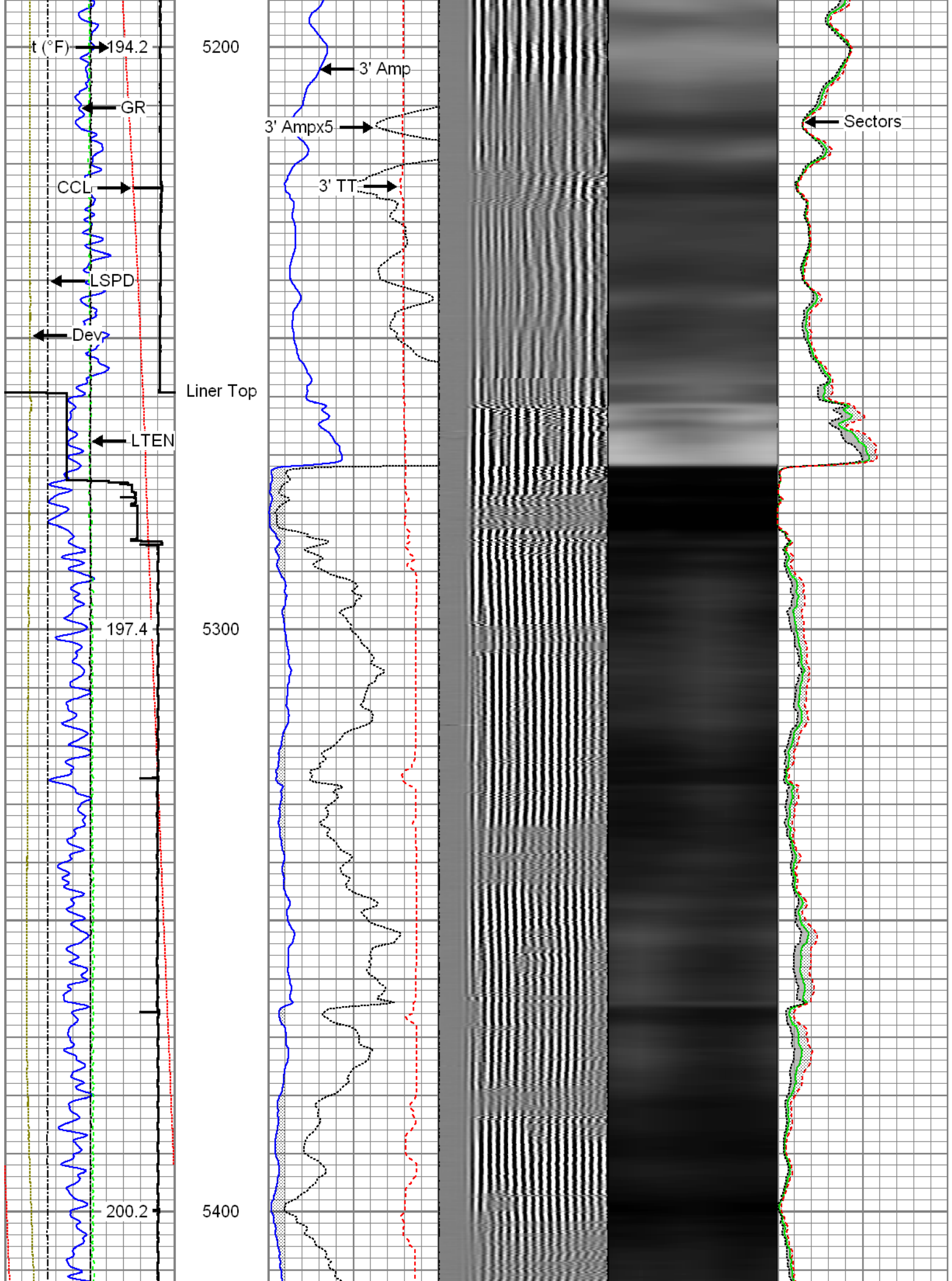
4800

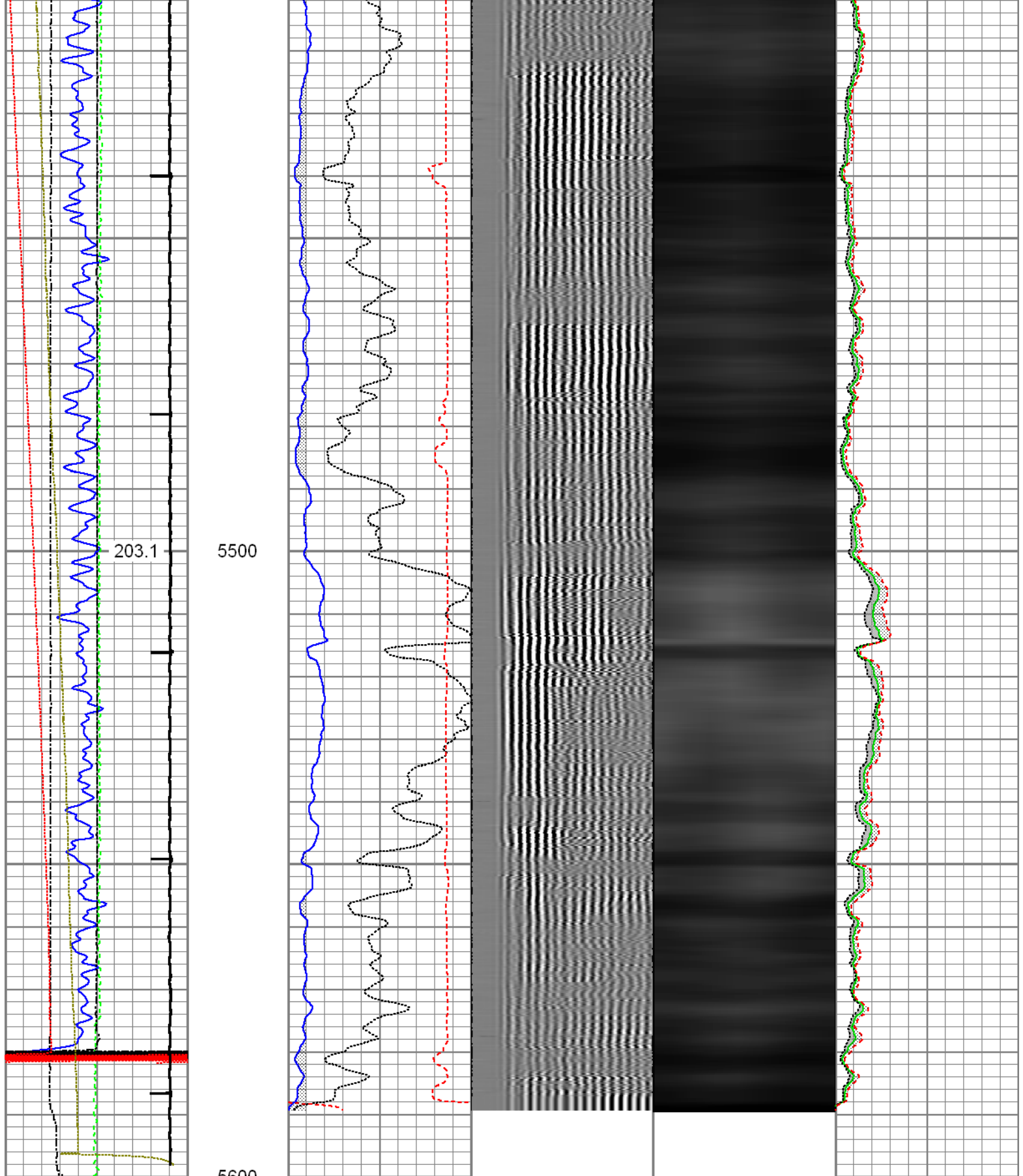
4900












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				

0	(lb)	2000
Differential Temperature		
-2	(degF)	2
Temperature		
0	(degF)	20
-10	Deviation (°)	90

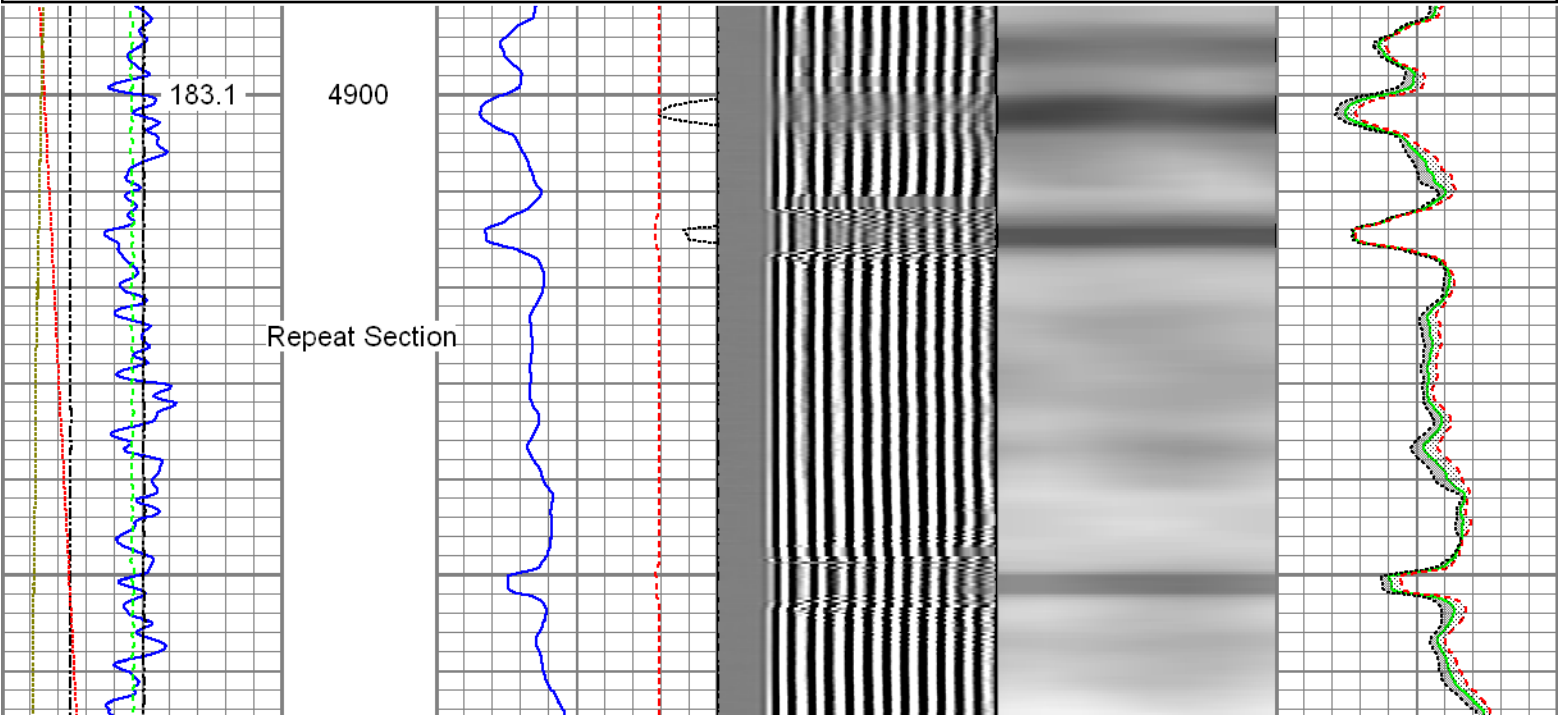


# Repeat Pass

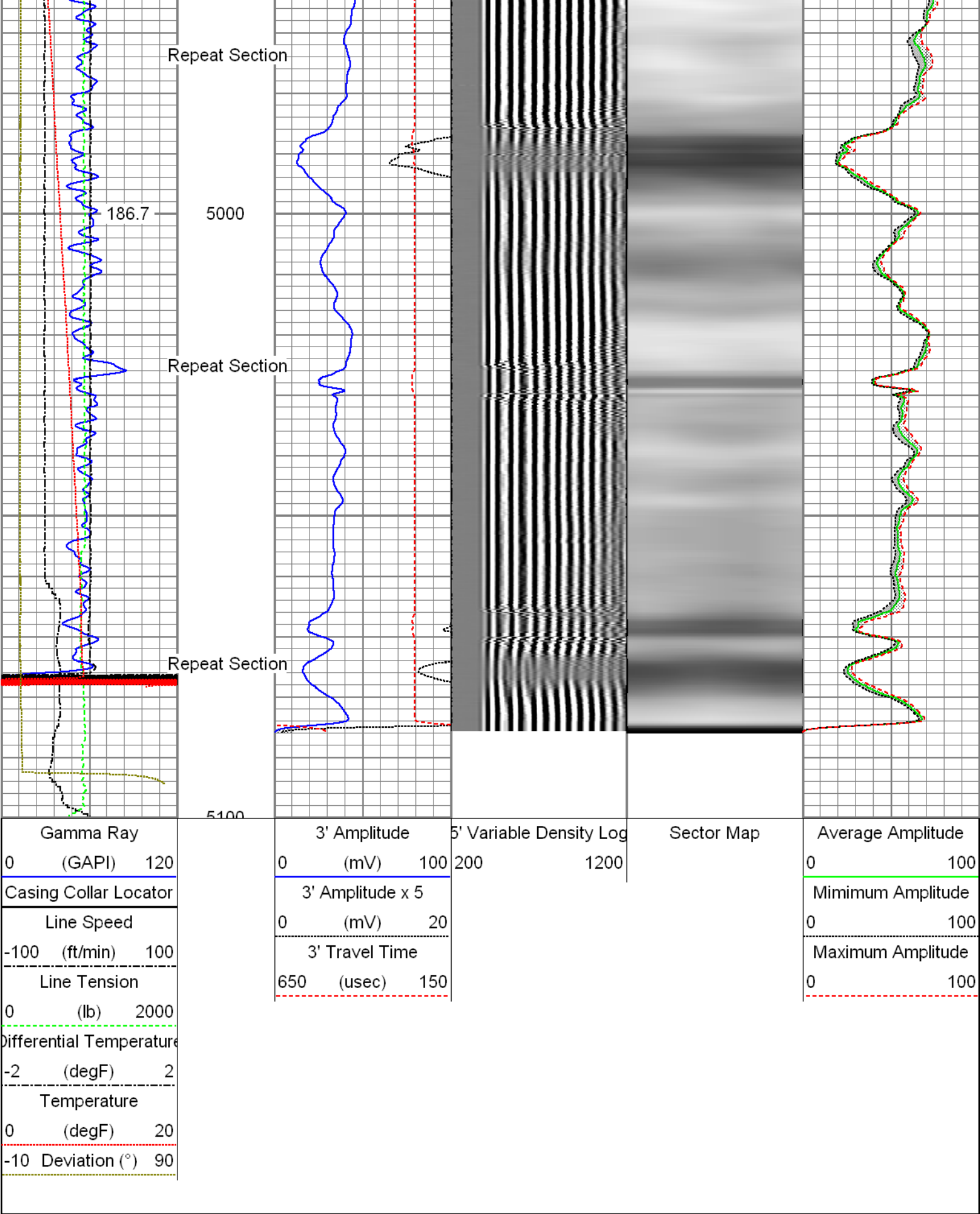
Recorded with 1500 PSI Surface Induced Pressure

Database File: 12-16-15\_whiting\_razor federal 12f-1308b\_mit\_rbl.db  
Dataset Pathname: pass9  
Presentation Format: rbt4\_mit  
Dataset Creation: Wed Dec 16 12:46:15 2015 by Log 7.0 B1  
Charted by: Depth in Feet scaled 1:240

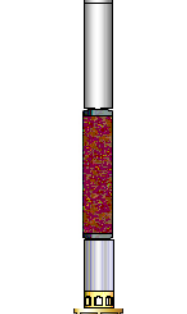
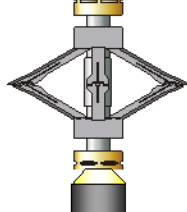
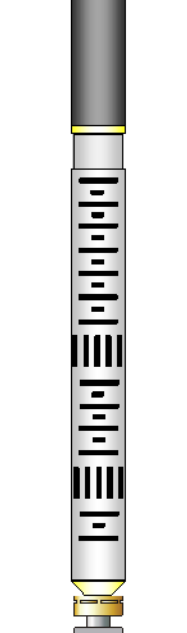
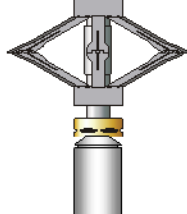
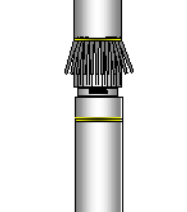
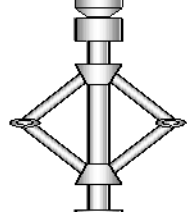
<div>Gamma Ray</div> <div>0 (GAPI) 120</div> <div>Casing Collar Locator</div> <div>Line Speed</div> <div>-100 (ft/min) 100</div> <div>Line Tension</div> <div>0 (lb) 2000</div> <div>Differential Temperature</div> <div>-2 (degF) 2</div> <div>Temperature</div> <div>0 (degF) 20</div> <div>-10 Deviation (°)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







Sensor	Offset (ft)	Schematic	Description	Len (ft)	OD (in)	Wt (lb)
			T_CH14375_1_GO Titan 1-7/16" Assembled Electric Cable Head with 415' 1/2" M	1.03	1.44	4.00

GR	23.85		1" Fishing Neck	0.21	1.69	1.00
			UW_AGS-UW_AGS_001 (215017) Sondex Adapter - GO Box to Sondex Pin			
			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 (10025100) Platinum Resistance Thermometer	1.04	1.69	5.20
			UW_PRC #4 -DSSRAC (081) 2-3/4" DSS 5 Arm Roller Centralizer	2.55	2.75	32.00
WV3FT	15.42		UW_RBT-UW_RBT_004 (10013454) 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					
WV5FT	14.42		UW_MIT-UW_MIT40_027 (218949) 40 Multifinger Imaging Tool	4.54	2.75	61.10
MIT	5.41					
			UW_PRC-UW_PRC_057 (1102) Sondex 2-3/4" 4-Arm Production Roller Centraliser	2.98	2.75	32.00
TSTAMP	0.00		UW_BUL-UW_BUL_006 (031422) Sondex Ultrawire Bullnose Terminator	0.22	1.69	1.20
Dataset: 12-16-15_Whiting_Razor Federal 12F-1308B_MIT_RBL.db: field/well/run1/pass11						
Total Length: 28.09 ft						
Total Weight: 324.50 lb						
O.D. 3.13 in						

### Calibration Report

Database File: 12-16-15\_Whiting\_Razor Federal 12F-1308B\_MIT\_RBL.db

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

Finger Calibration Report

Performed: Wed Dec 16 12:14:48 2015

Ring size:	4		5		6		7
(in)		Sens		Sens		Sens	
Finger 01:	1416	278.0	1694	297.0	1991	300.0	2291
Finger 02:	1473	270.0	1743	287.0	2030	291.0	2321
Finger 03:	1708	276.0	1984	280.0	2264	275.0	2539
Finger 04:	1679	272.0	1951	277.0	2228	272.0	2500
Finger 05:	1565	257.0	1822	269.0	2091	272.0	2363
Finger 06:	1547	253.0	1800	260.0	2060	265.0	2325
Finger 07:	1384	276.0	1660	286.0	1946	295.0	2241
Finger 08:	1557	252.0	1809	261.0	2070	269.0	2339
Finger 09:	1439	264.0	1703	282.0	1985	291.0	2276
Finger 10:	1487	262.0	1749	272.0	2021	278.0	2299
Finger 11:	1490	258.0	1748	268.0	2016	275.0	2291
Finger 12:	1333	280.0	1613	296.0	1909	309.0	2218
Finger 13:	1608	277.0	1885	285.0	2170	289.0	2459
Finger 14:	1449	284.0	1733	295.0	2028	307.0	2335
Finger 15:	1541	259.0	1800	270.0	2070	283.0	2353
Finger 16:	1399	281.0	1680	295.0	1975	314.0	2289
Finger 17:	1632	273.0	1905	279.0	2184	288.0	2472
Finger 18:	1413	294.0	1707	306.0	2013	330.0	2343
Finger 19:	1645	259.0	1904	256.0	2160	267.0	2427
Finger 20:	1540	265.0	1805	276.0	2081	295.0	2376
Finger 21:	1595	251.0	1846	262.0	2108	271.0	2379
Finger 22:	1566	274.0	1840	284.0	2124	301.0	2425
Finger 23:	1366	276.0	1642	291.0	1933	310.0	2243
Finger 24:	1691	261.0	1952	269.0	2221	284.0	2505
Finger 25:	1386	292.0	1678	311.0	1989	333.0	2322
Finger 26:	1526	290.0	1816	296.0	2112	322.0	2434
Finger 27:	1450	269.0	1719	269.0	1988	294.0	2282
Finger 28:	1638	280.0	1918	282.0	2200	304.0	2504
Finger 29:	1474	274.0	1748	287.0	2035	303.0	2338
Finger 30:	1436	277.0	1713	288.0	2001	310.0	2311
Finger 31:	1527	268.0	1795	277.0	2072	291.0	2363
Finger 32:	1348	260.0	1608	282.0	1890	296.0	2186
Finger 33:	1630	295.0	1925	313.0	2238	316.0	2554
Finger 34:	1549	268.0	1817	276.0	2093	285.0	2378
Finger 35:	1444	262.0	1706	282.0	1988	292.0	2280
Finger 36:	1599	273.0	1872	291.0	2163	290.0	2453
Finger 37:	1606	271.0	1877	285.0	2162	287.0	2449
Finger 38:	1511	269.0	1780	290.0	2070	290.0	2360

Finger 39:	1473	277.0	1750	296.0	2046	300.0	2346
Finger 40:	1613	281.0	1894	297.0	2191	295.0	2486

### Segmented Cement Bond Log Calibration Report

Serial Number:	10013454
Tool Model:	UW_RBT_004
Calibration Casing Diameter:	7.000 in
Calibration Depth:	21.926 ft

Master Calibration, performed Wed Dec 16 12:16:09 2015:

	Raw (v)		Calibrated (mv)		Results	
	Zero	Cal	Zero	Cal	Gain	Offset
3FT	0.001	0.780	0.800	62.165	78.752	0.707
5FT	-0.002	0.746	0.800	62.165	81.990	1.000
S1	0.001	0.759	0.000	100.000	132.021	-0.161
S2	0.000	0.784	0.000	100.000	127.590	0.000
S3	0.000	0.795	0.000	100.000	125.847	-0.040
S4	0.000	0.804	0.000	100.000	124.308	0.000
S5	0.001	0.792	0.000	100.000	126.414	-0.154
S6	0.000	0.773	0.000	100.000	129.389	0.000
S7	0.000	0.748	0.000	100.000	133.667	-0.028
S8	0.000	0.745	0.000	100.000	134.236	-0.031

### 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
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	Whiting Oil & Gas Corporation
Well	Razor Federal 12F-1308B



