



Radial Cement Bond
Gamma Ray
Casing Collar Log

Company Noble Energy Inc.		Company Noble Energy Inc.					
Well Ann LC34-765		Well Ann LC34-765					
Field Wildcat		Field Wildcat					
County Weld		County Weld					
State Colorado		State Colorado					
Location:		API #: 05-123-40639					
SEC 34 TWP 9N RGE 59W		MIT					
Permanent Datum		Ground Level					
Log Measured From Kelly Bushing		Elevation 4827'					
Drilling Measured From Kelly Bushing		Elevation K.B. 4851' D.F. 4850' G.L. 4827'					
Date 08-Jan-2016							
Run Number One							
Depth Driller 10000 FT							
Depth Logger 6270 FT							
Bottom Logged Interval 6266 FT							
Top Log Interval Surface							
Open Hole Size 8.750"							
Type Fluid Water							
Density / Viscosity 8.34 lbm/gal							
Max. Recorded Temp. 219°F							
Estimated Cement Top 2466 FT							
Time Well Ready ROA							
Time Logger on Bottom 9:20 AM							
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	635 FT		
Intermediate #1	7	26	P-110 IC	24 FT	6377 FT		
Intermediate #2							
Liner	4 1/2	11.6	P-110 IC	6267 FT	9990 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 5130 FT - 5152 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.



Main Pass

Recorded With 2500 PSI Surface Induced Pressure

Database File: x:\logs_for_processing\logs to be reviewed\01-08-16_noble_ann lc34-765_mit_rbl\processed_01-08-16_noble_ann lc34-765_mit_rbl\pass11.1

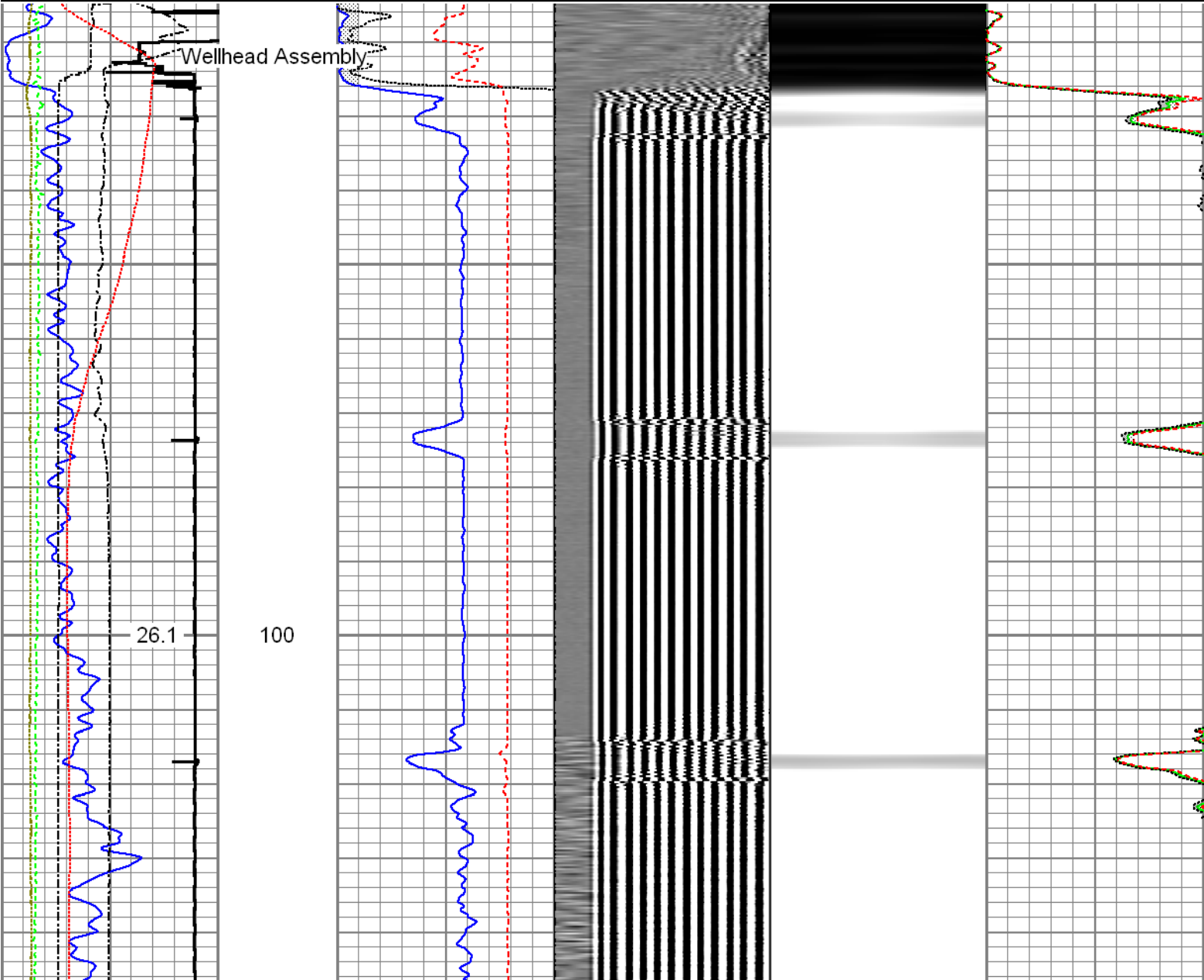
Dataset Pathname: pass11.1

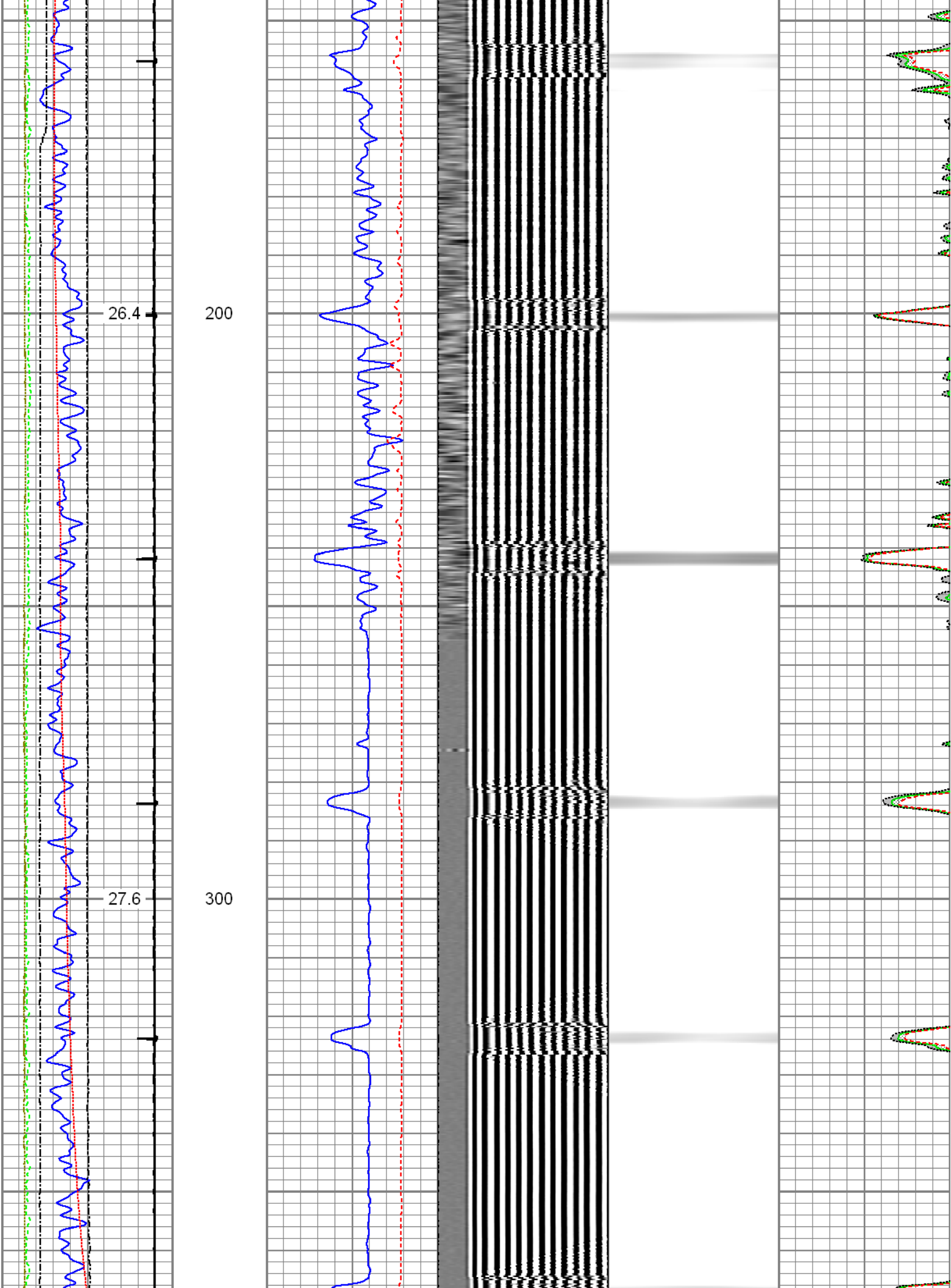
Presentation Format: rbt4_mit

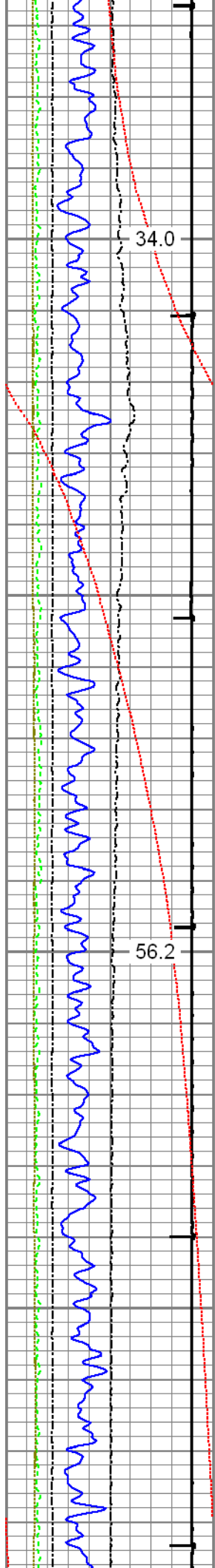
Dataset Creation: Fri Jan 08 12:27:49 2016 by Calc 7.0 B1

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				

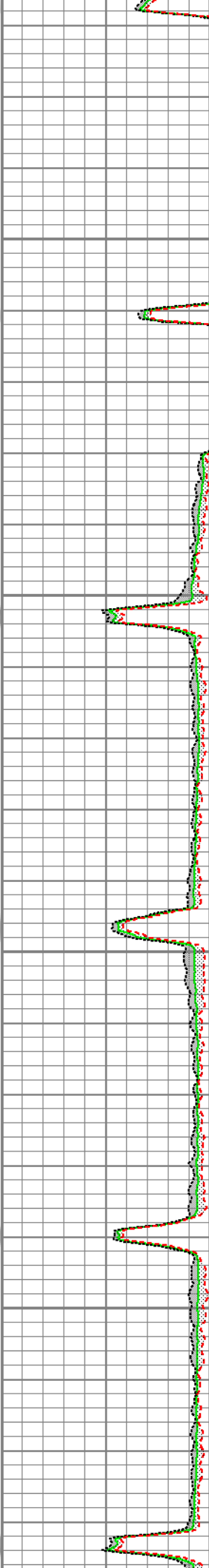
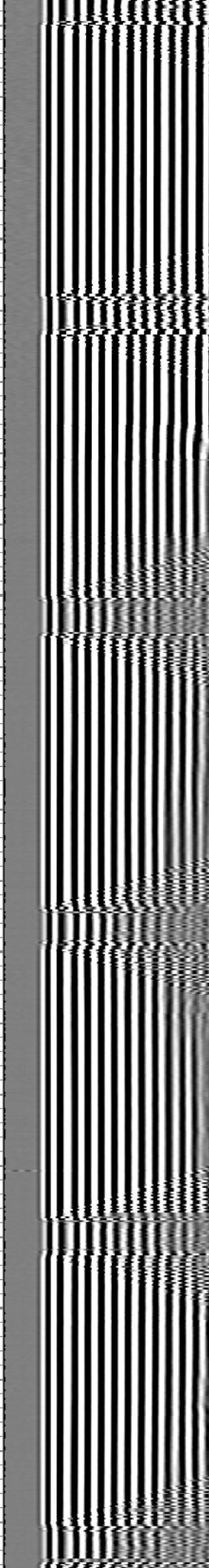
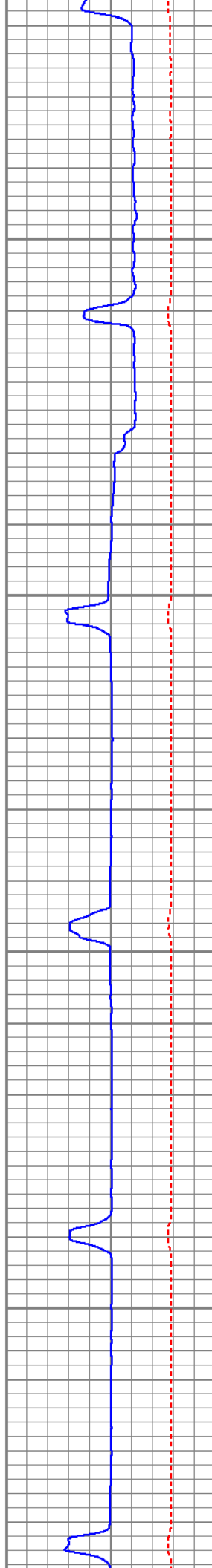


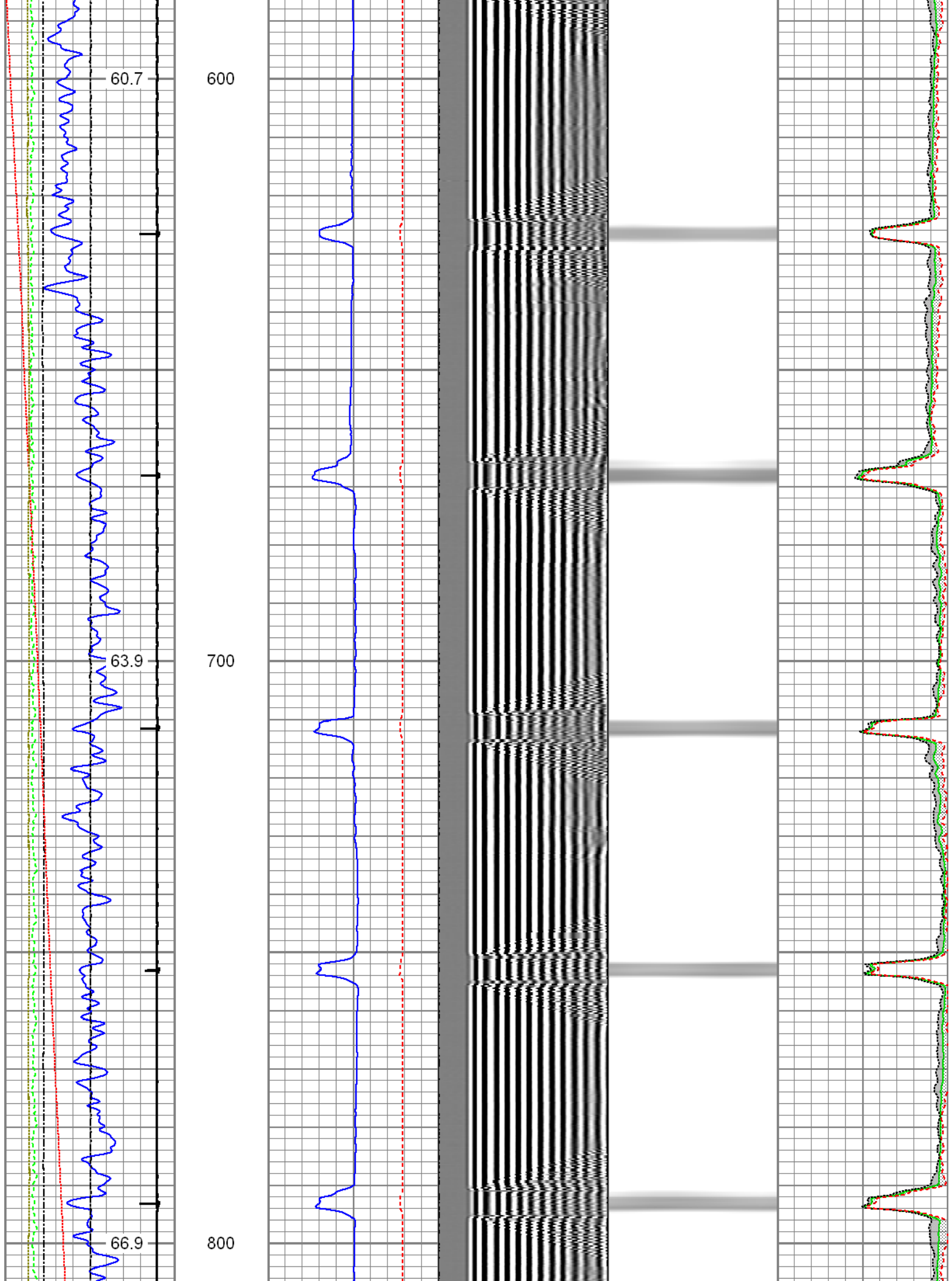


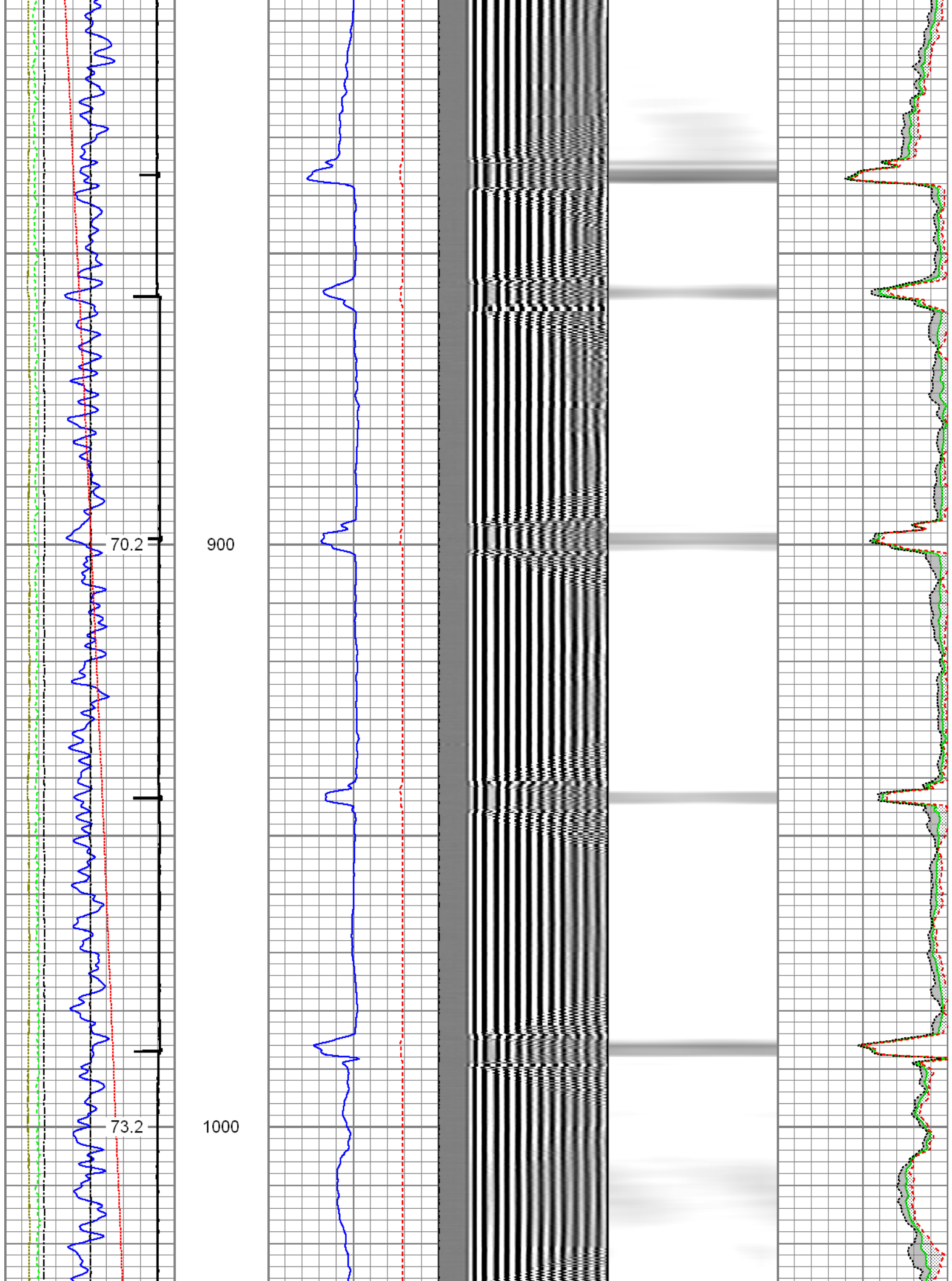


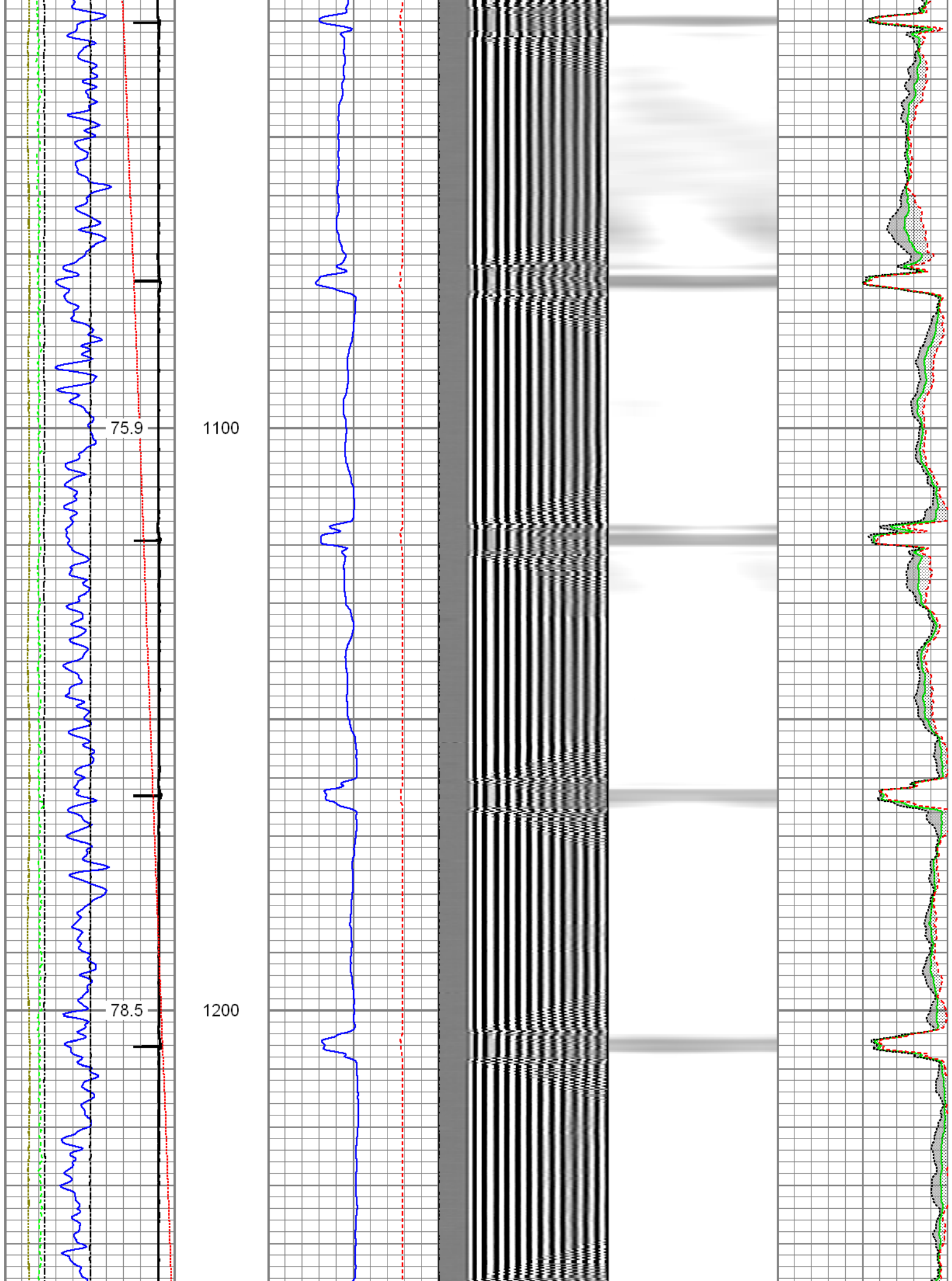
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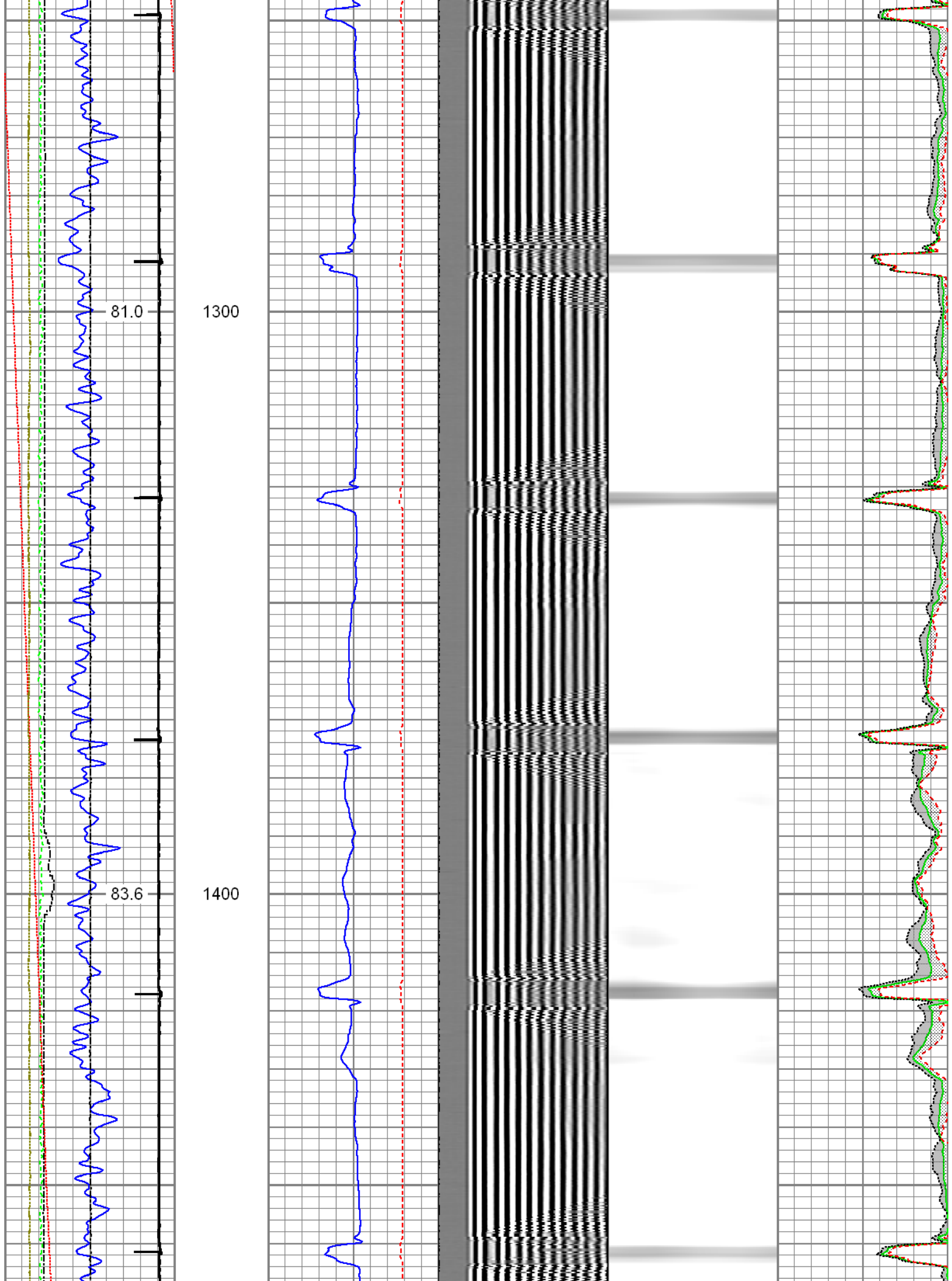
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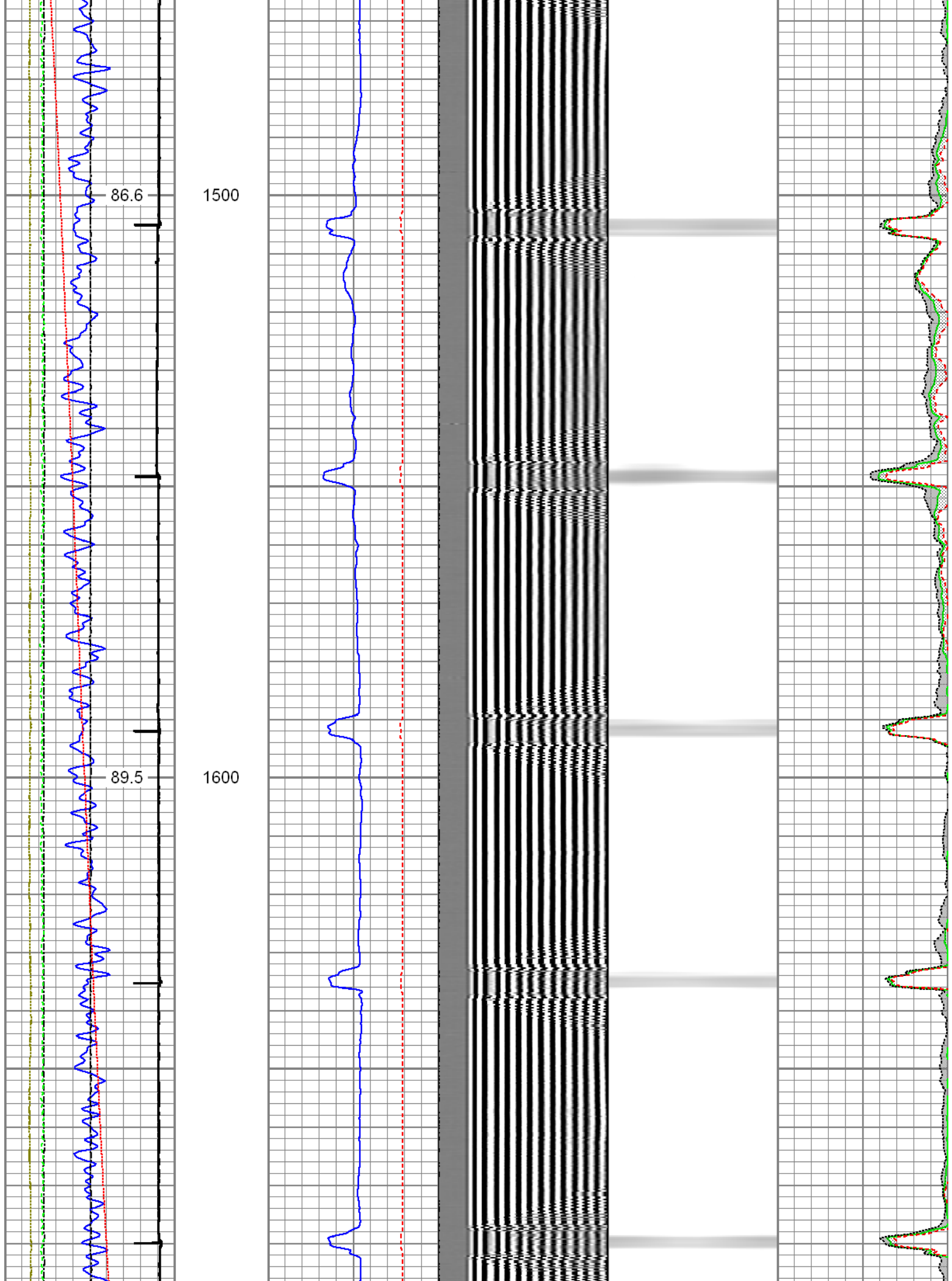


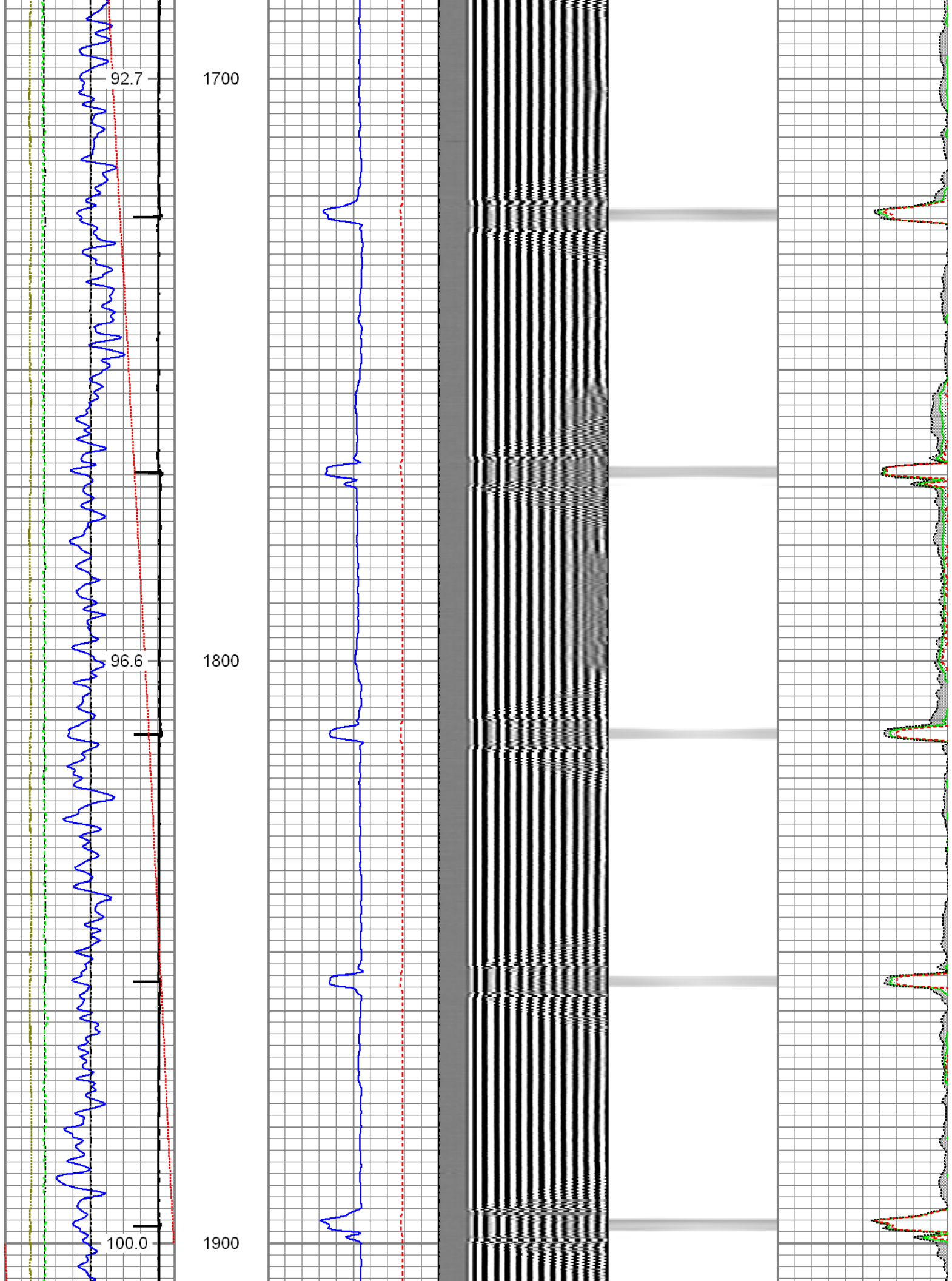


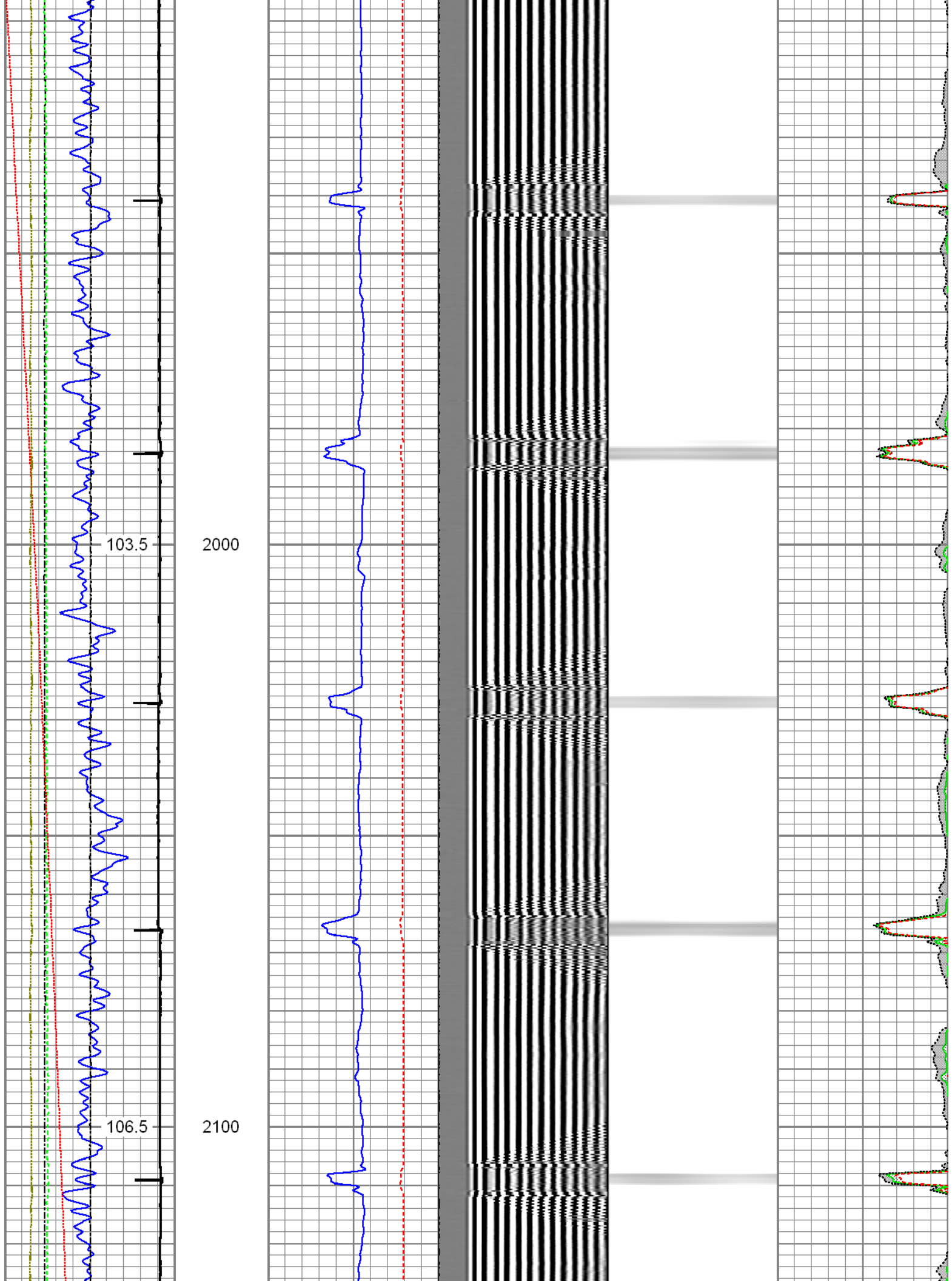


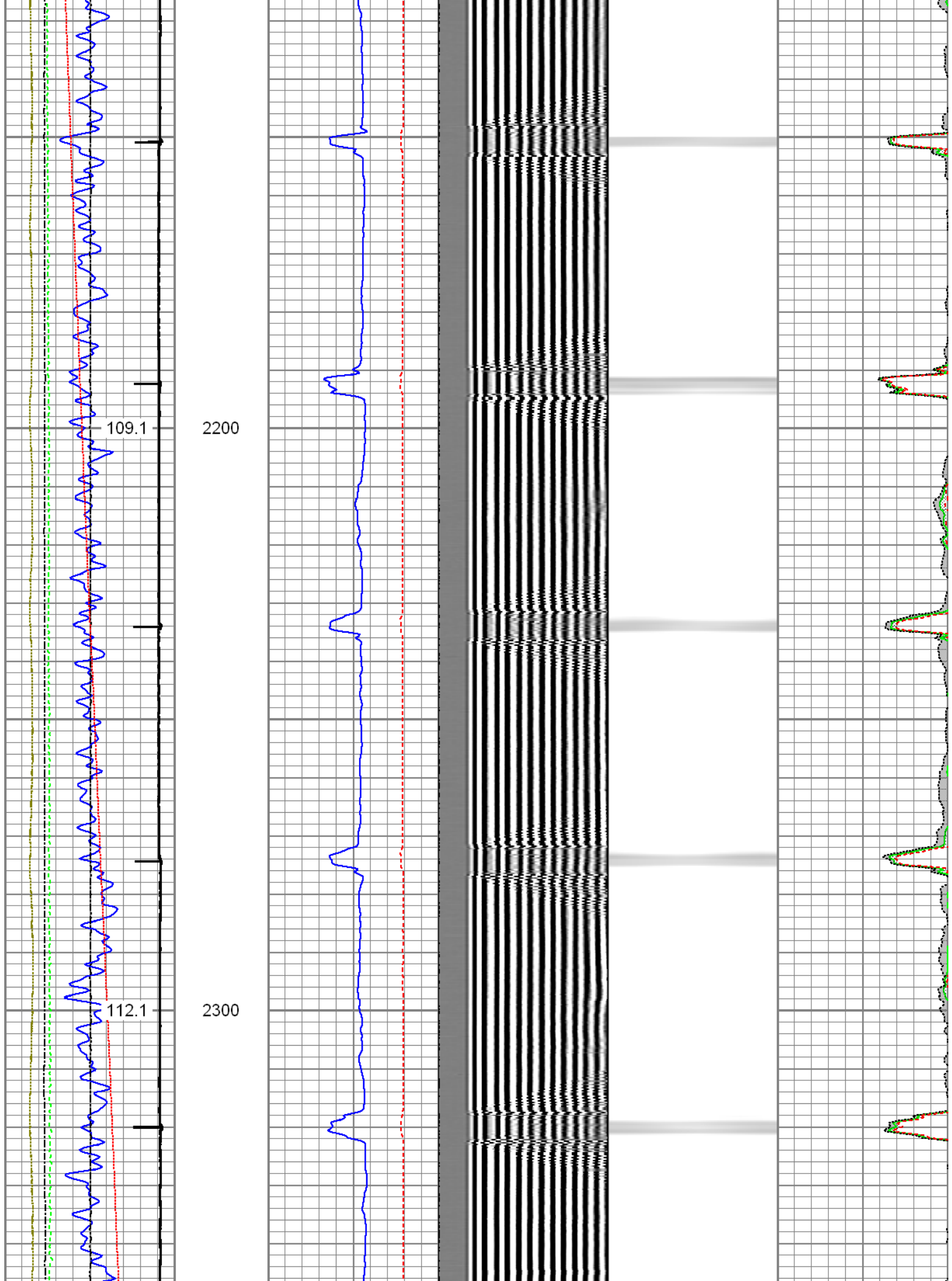


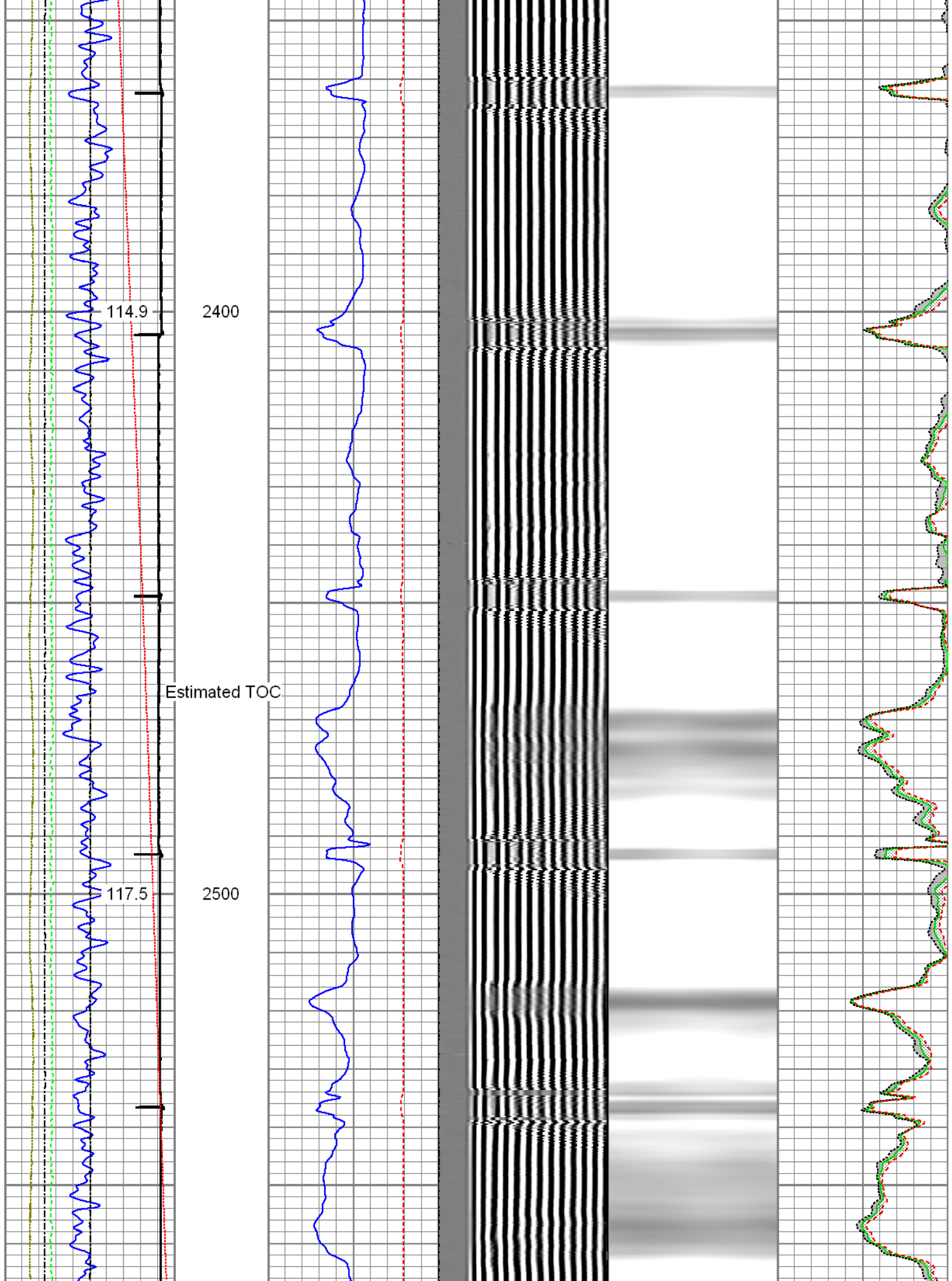


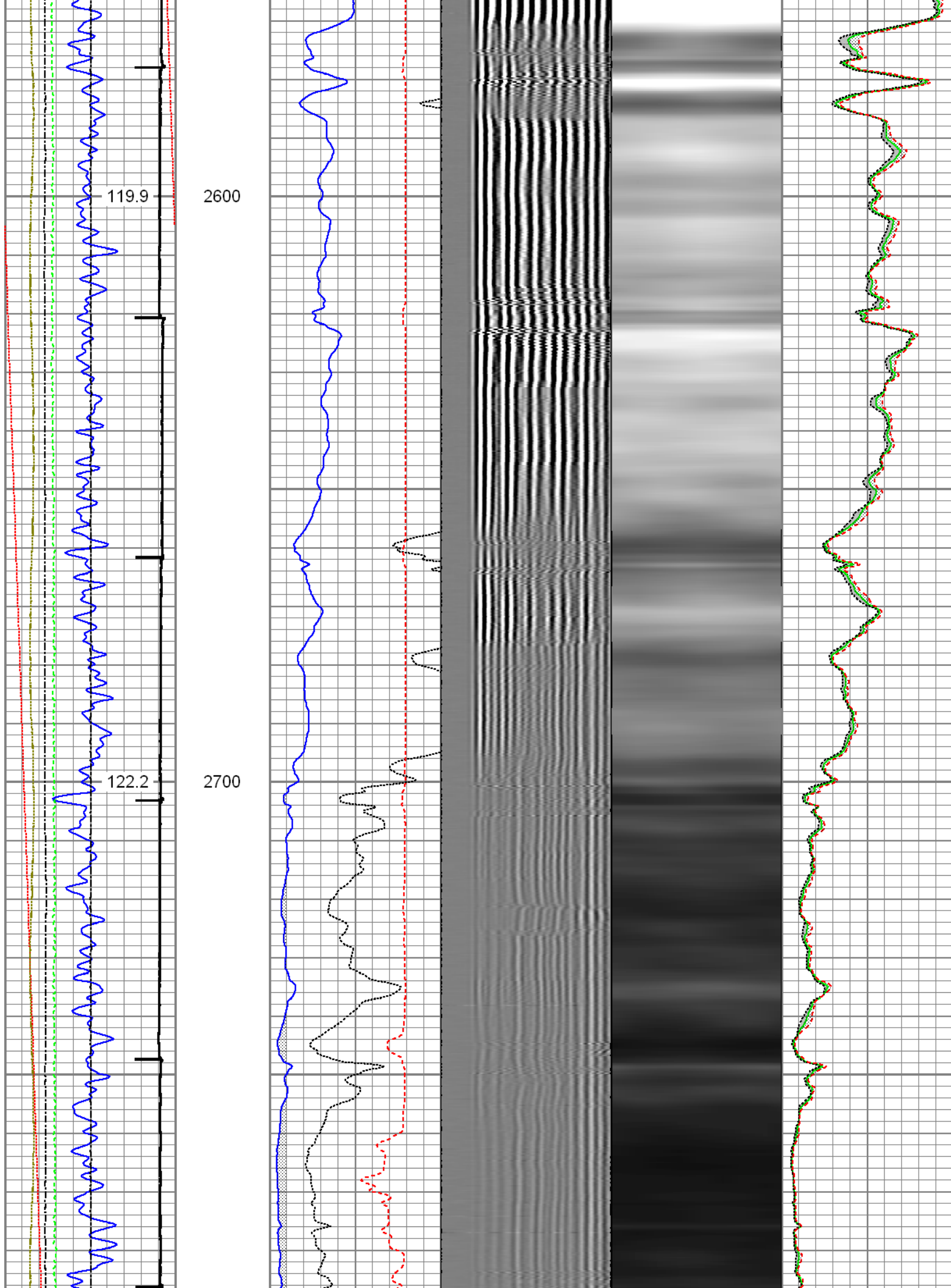


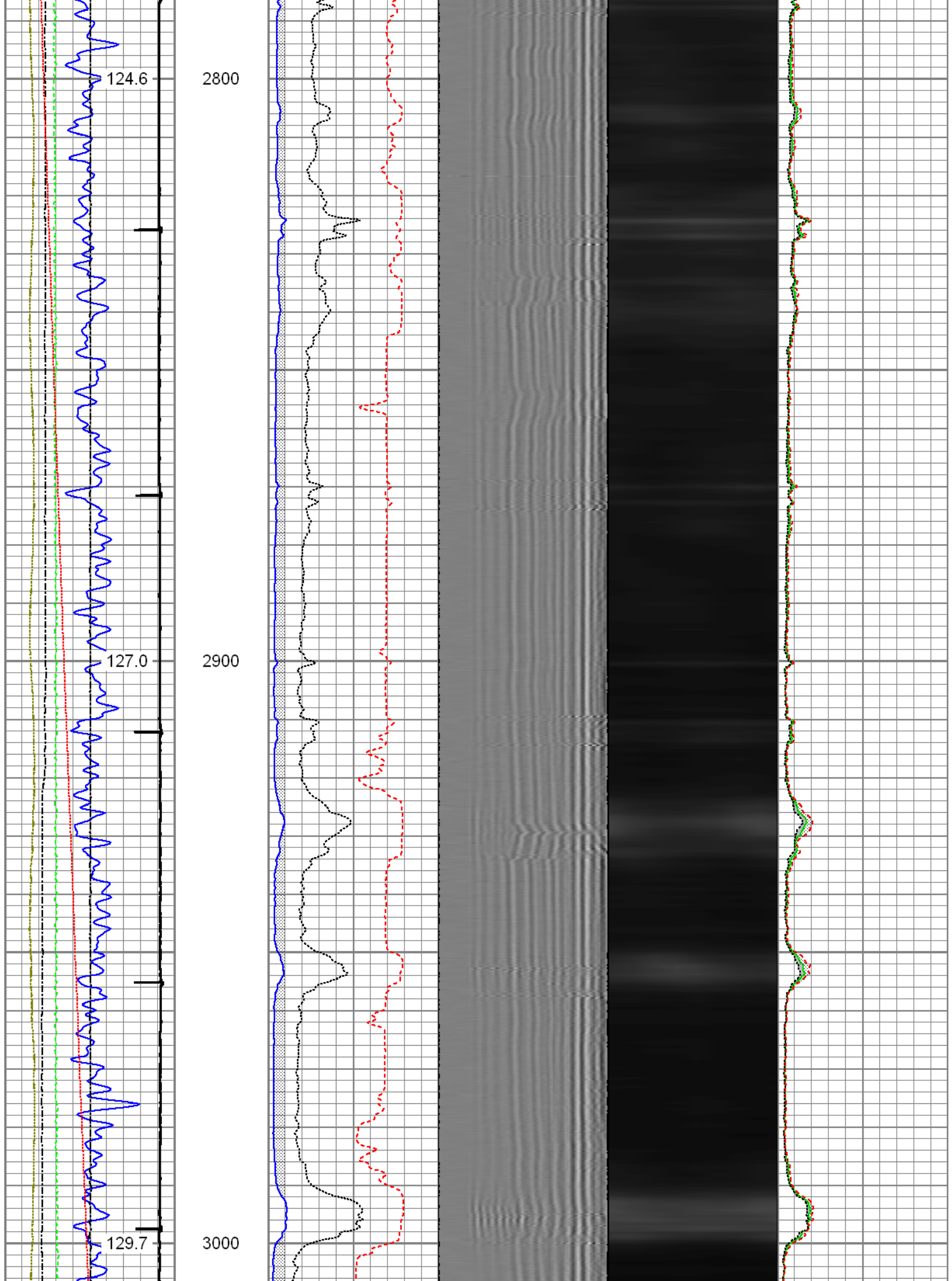


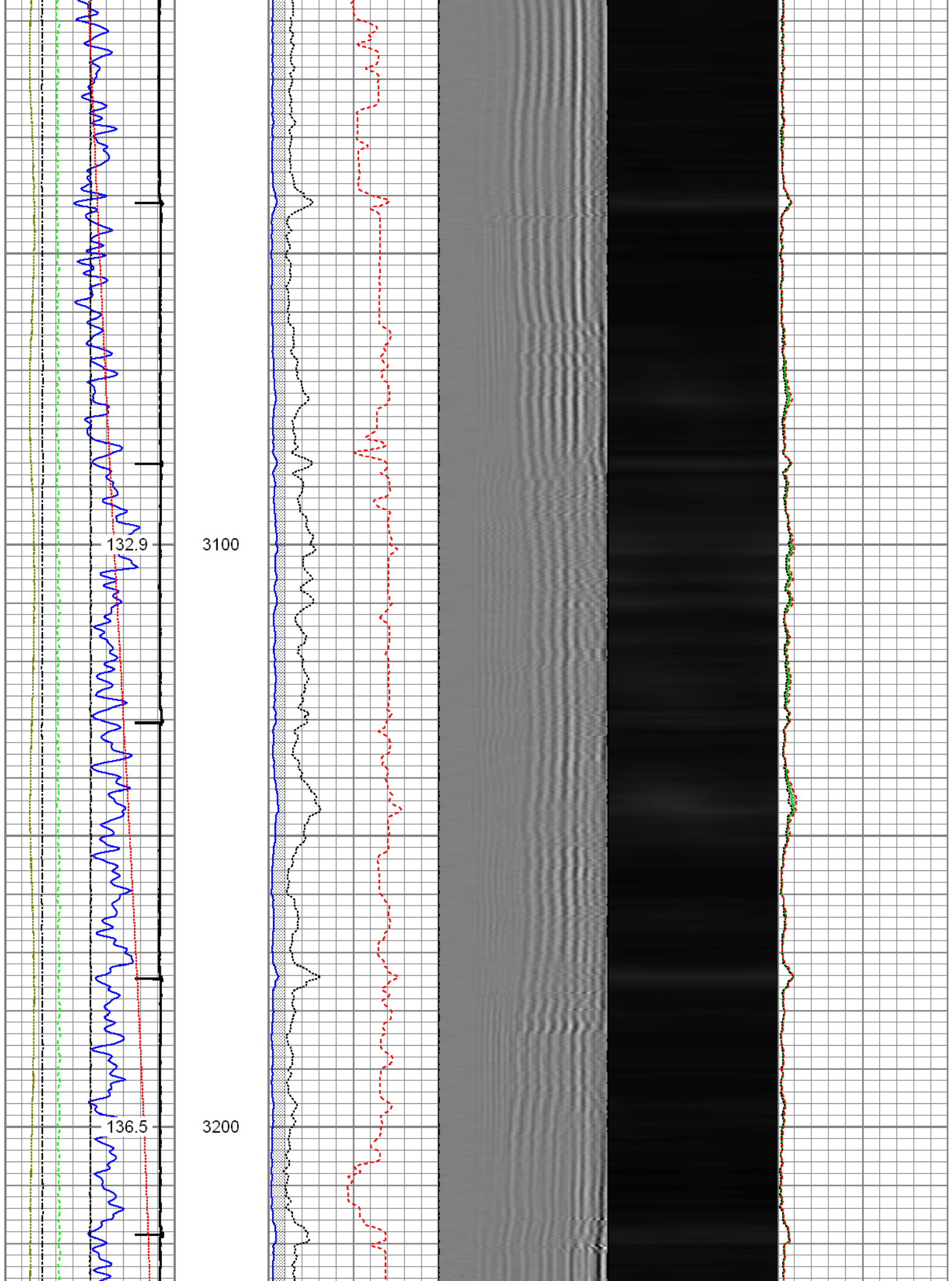


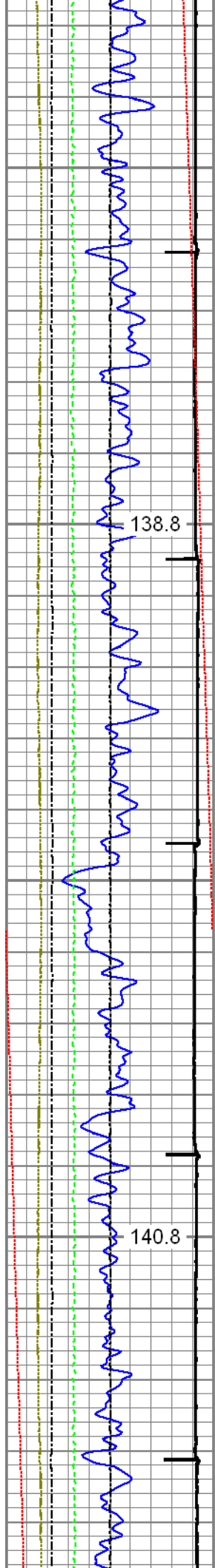






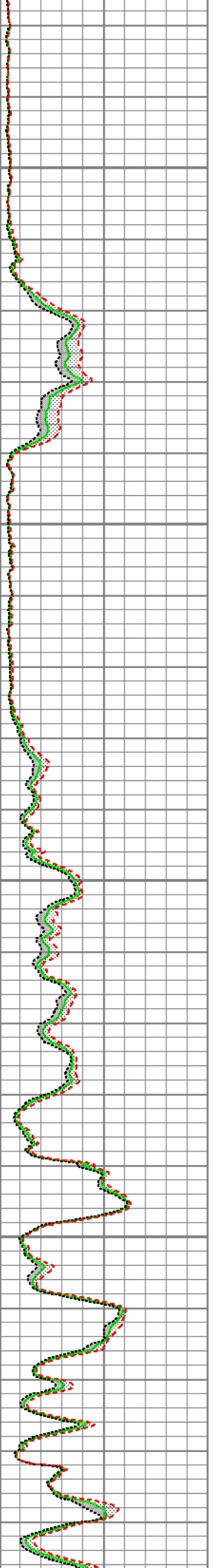
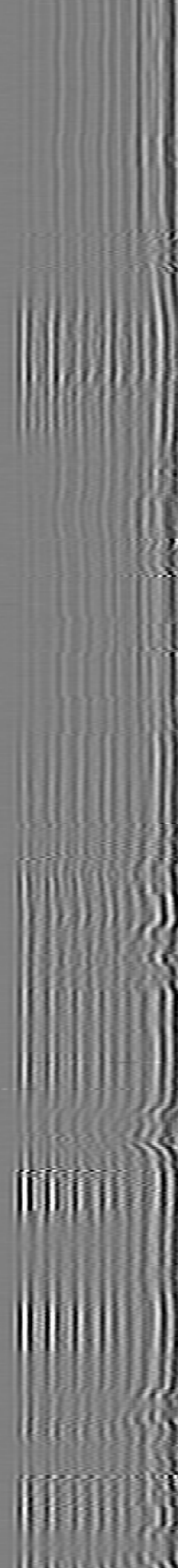
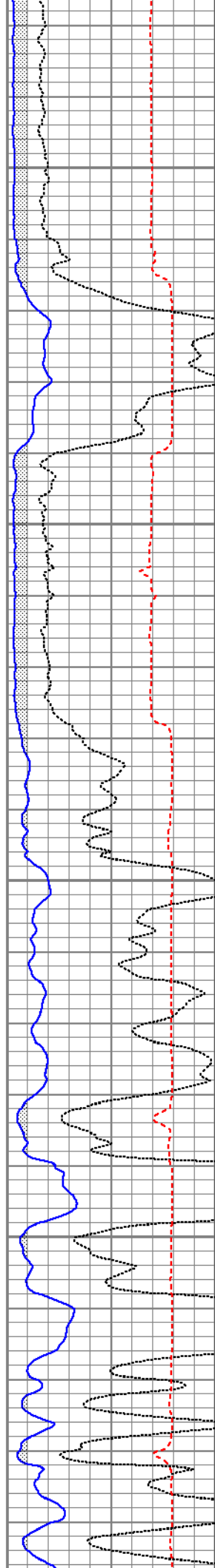


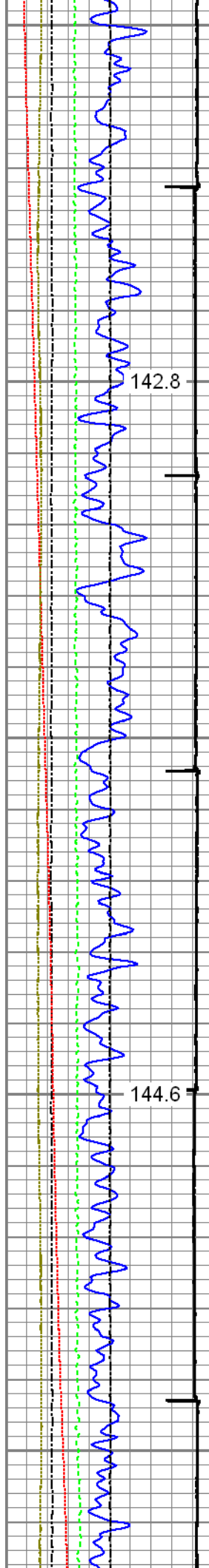




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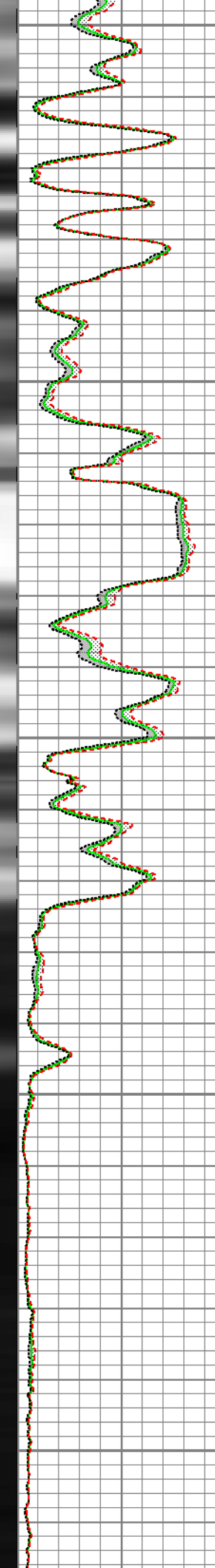
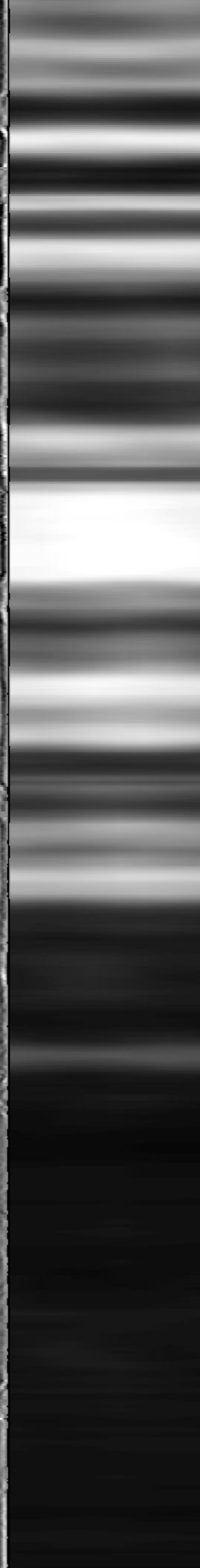
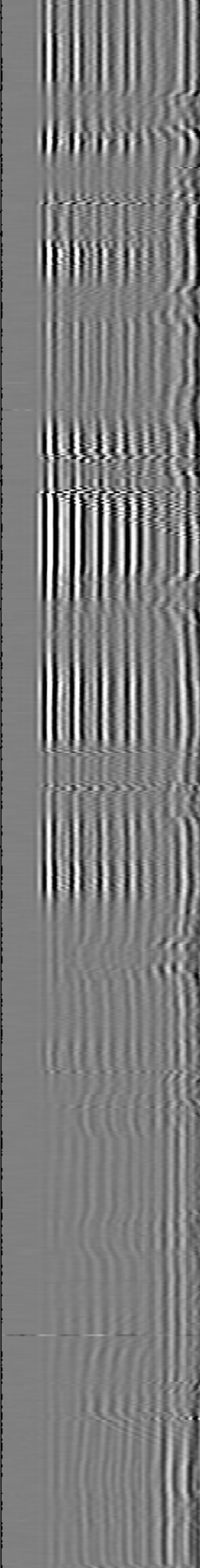
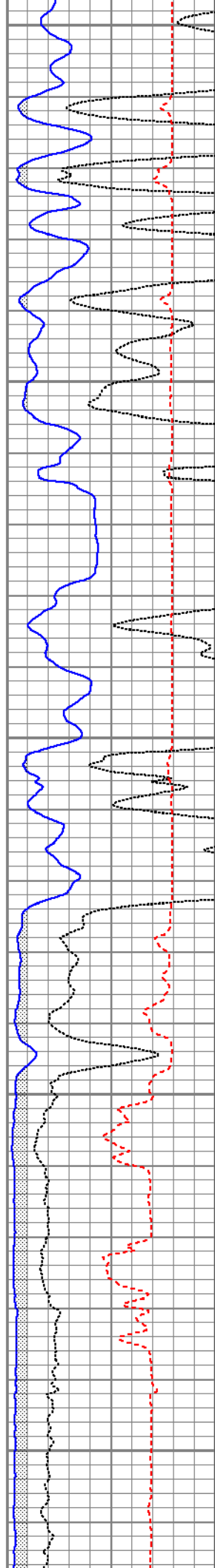
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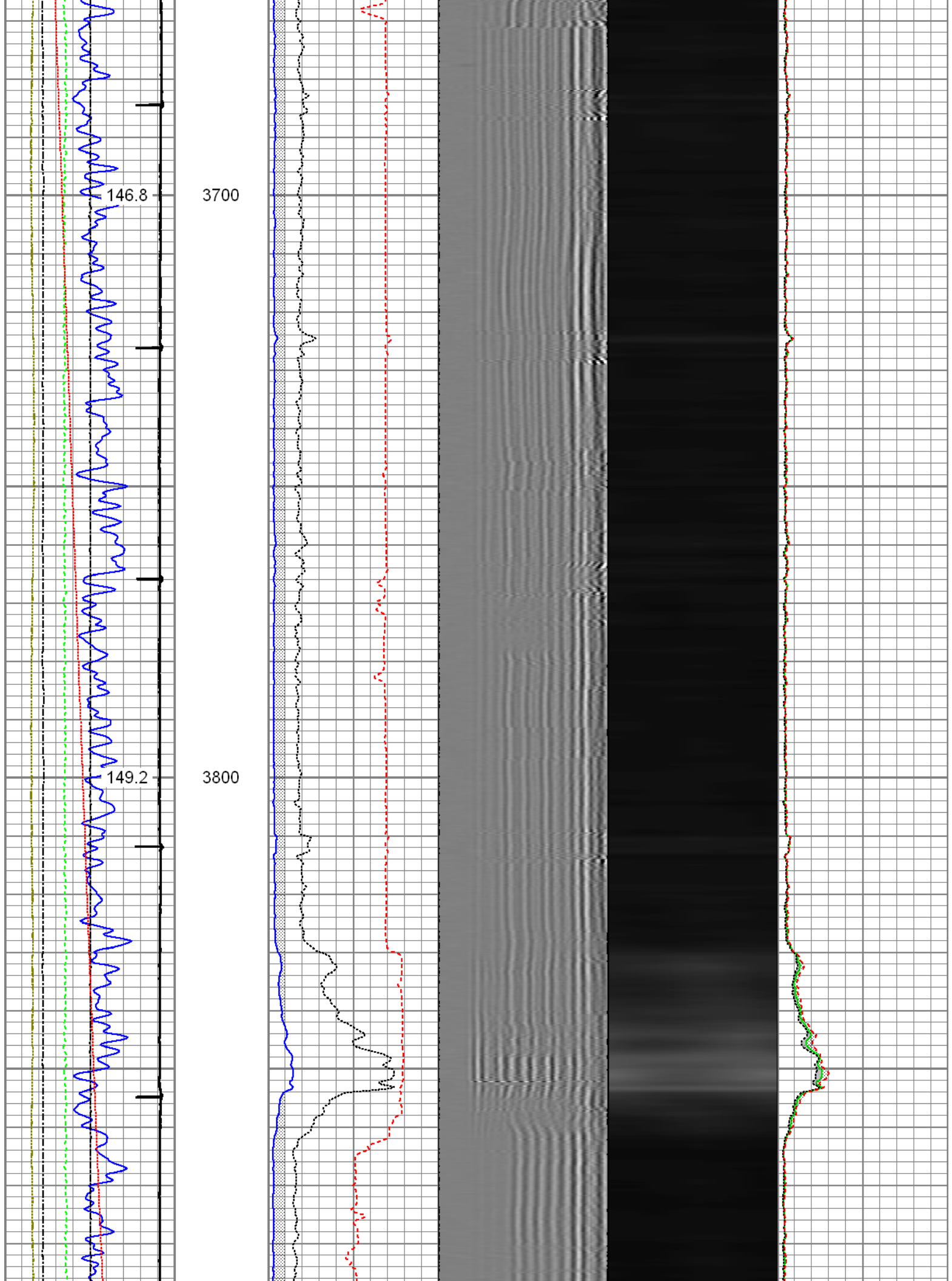


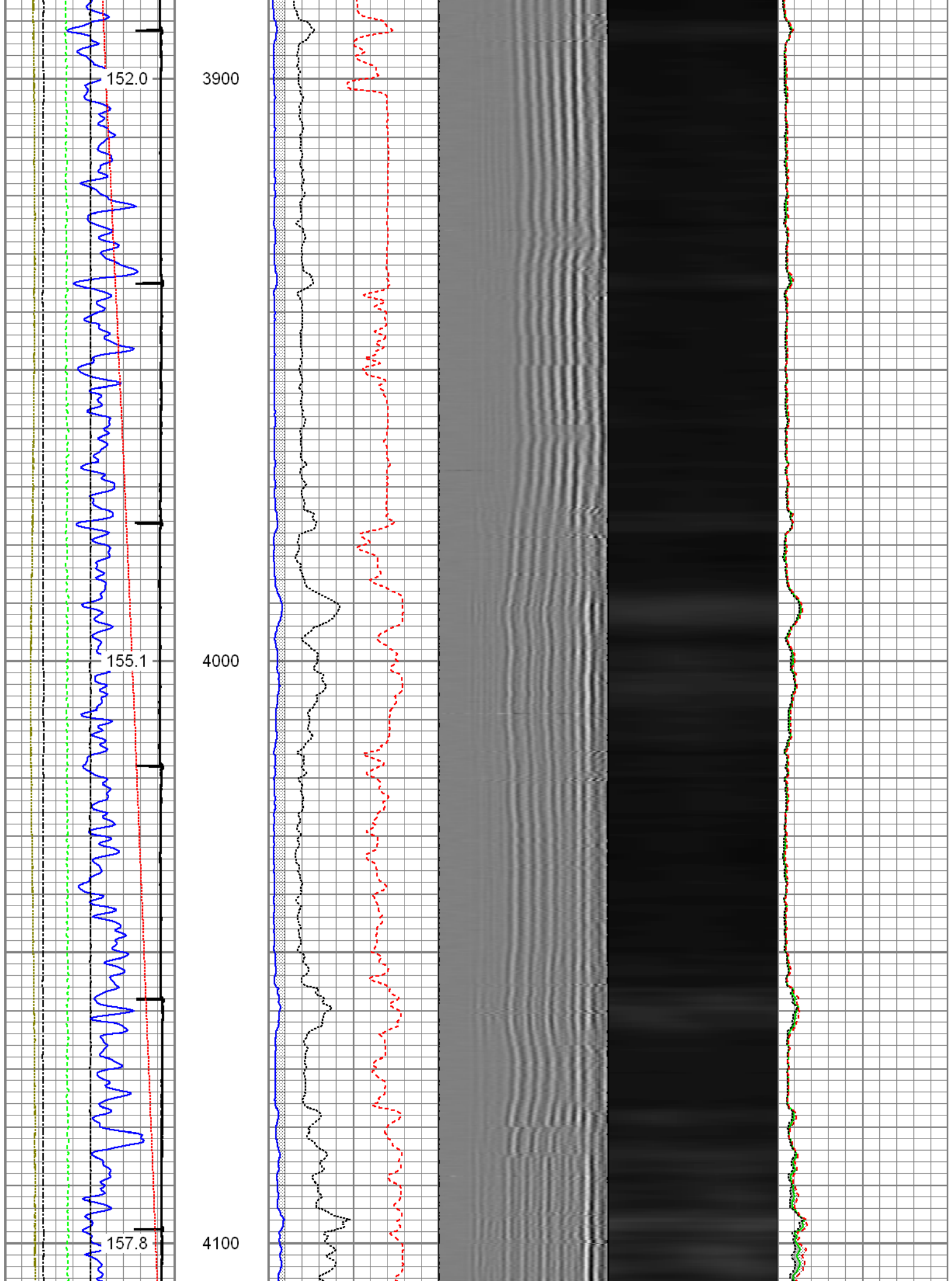


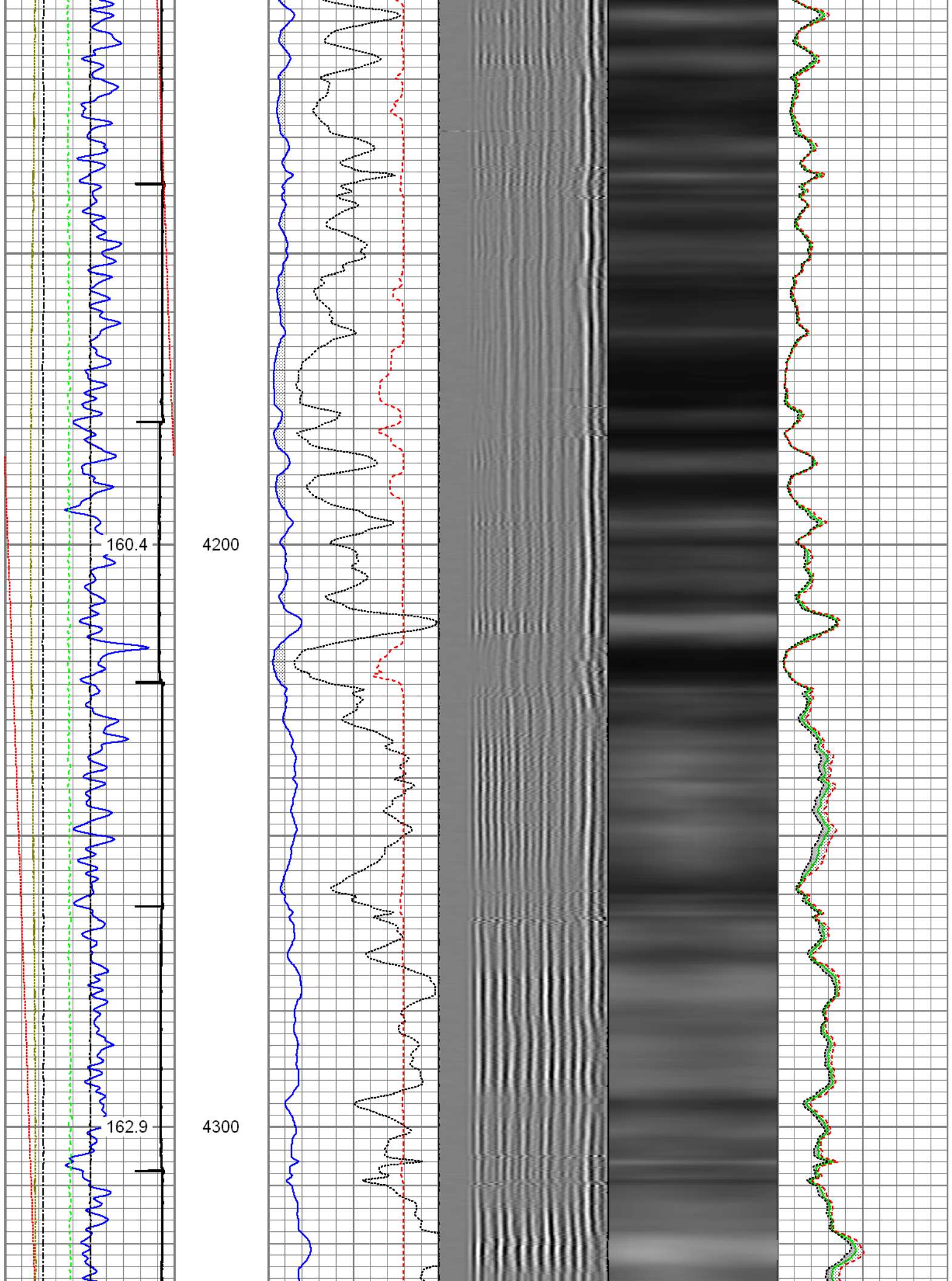
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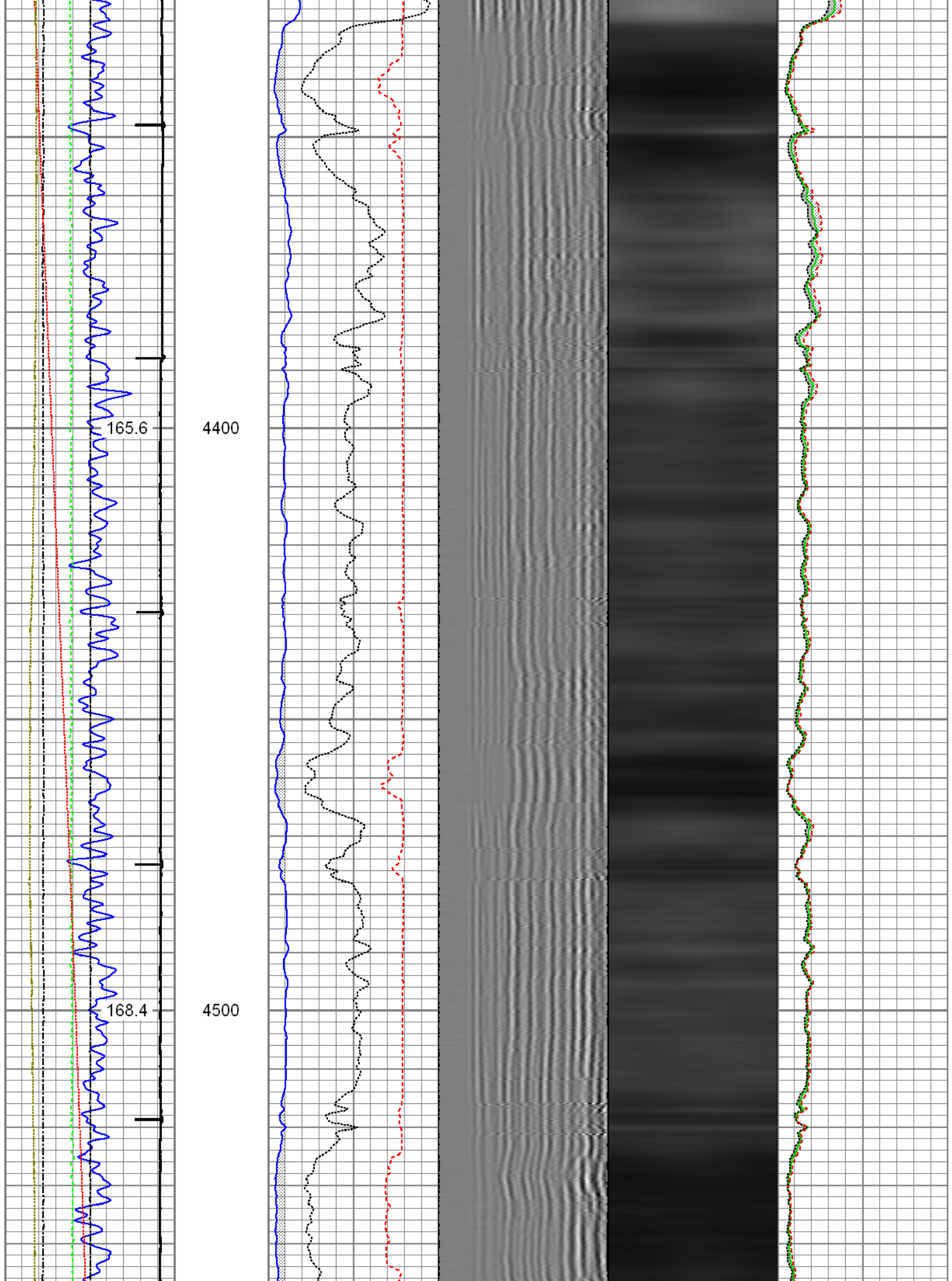
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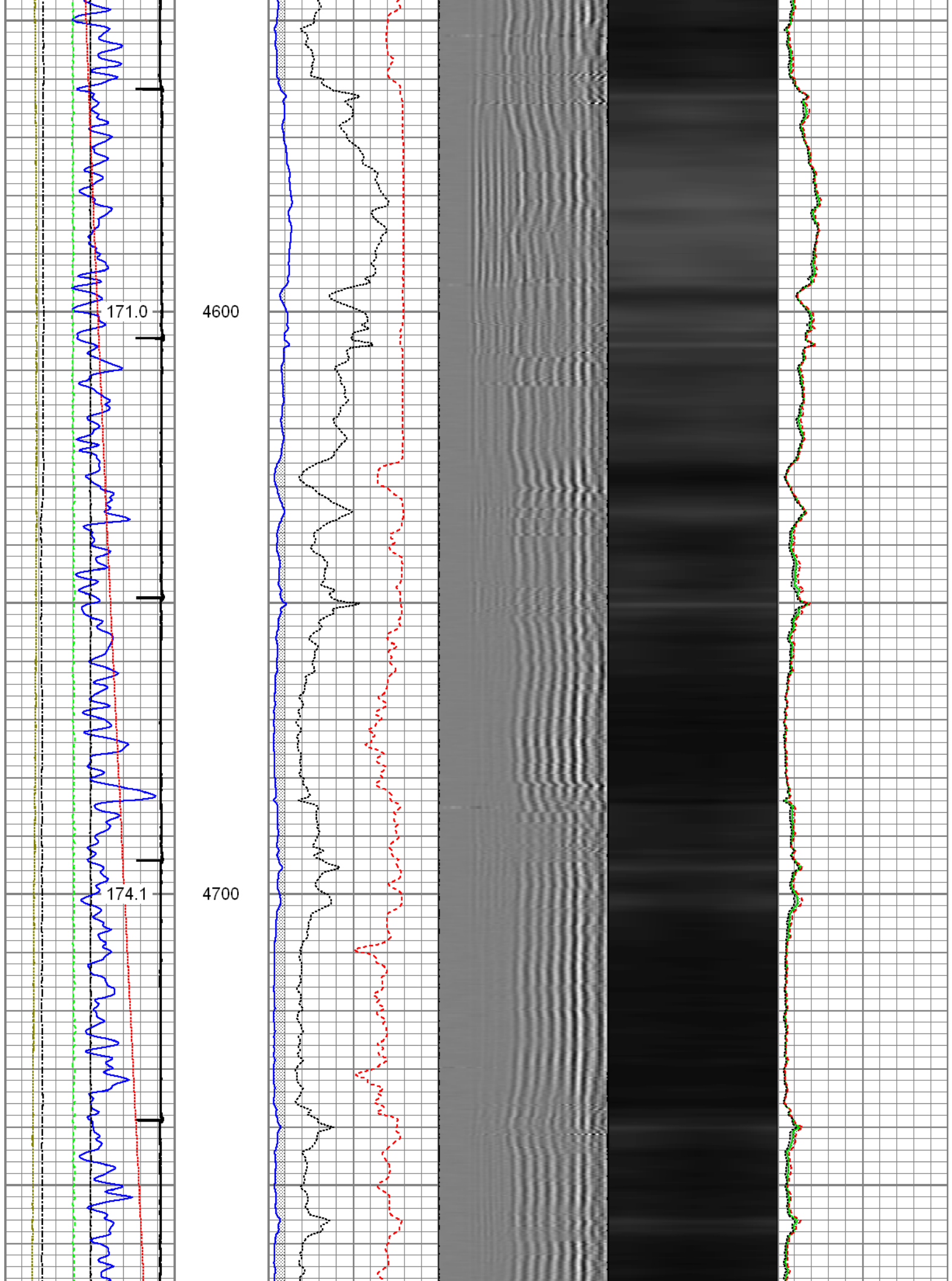


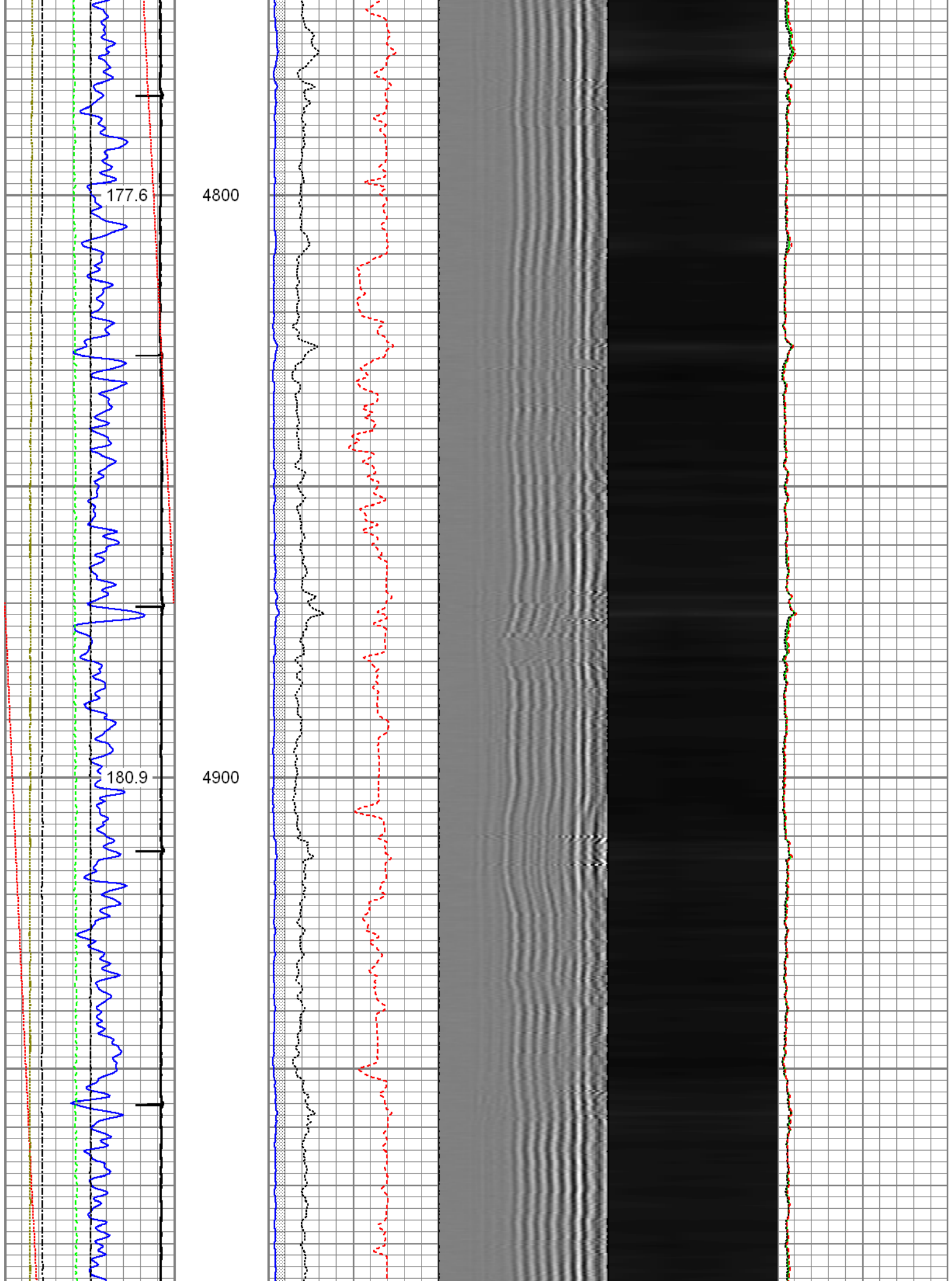


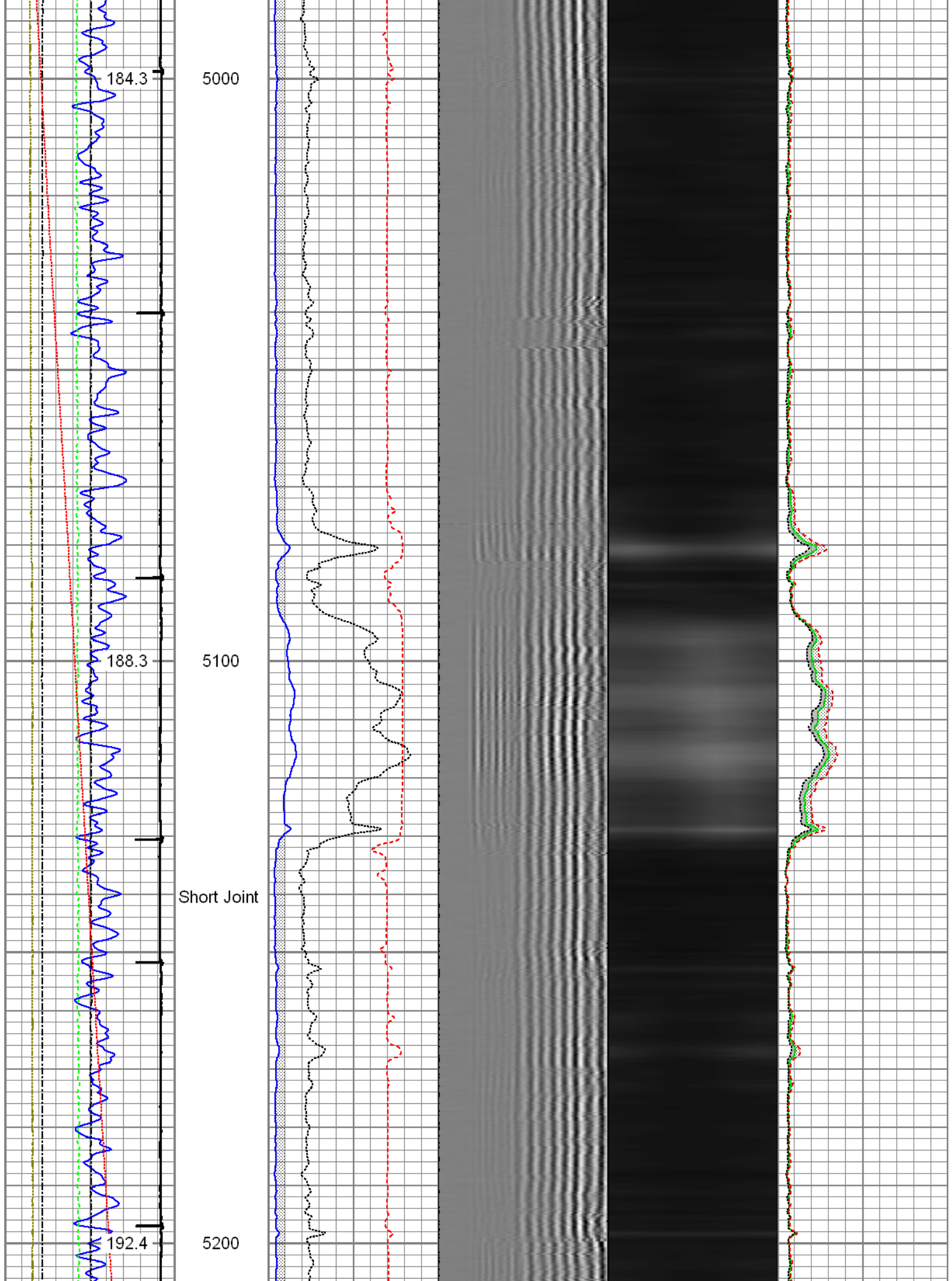


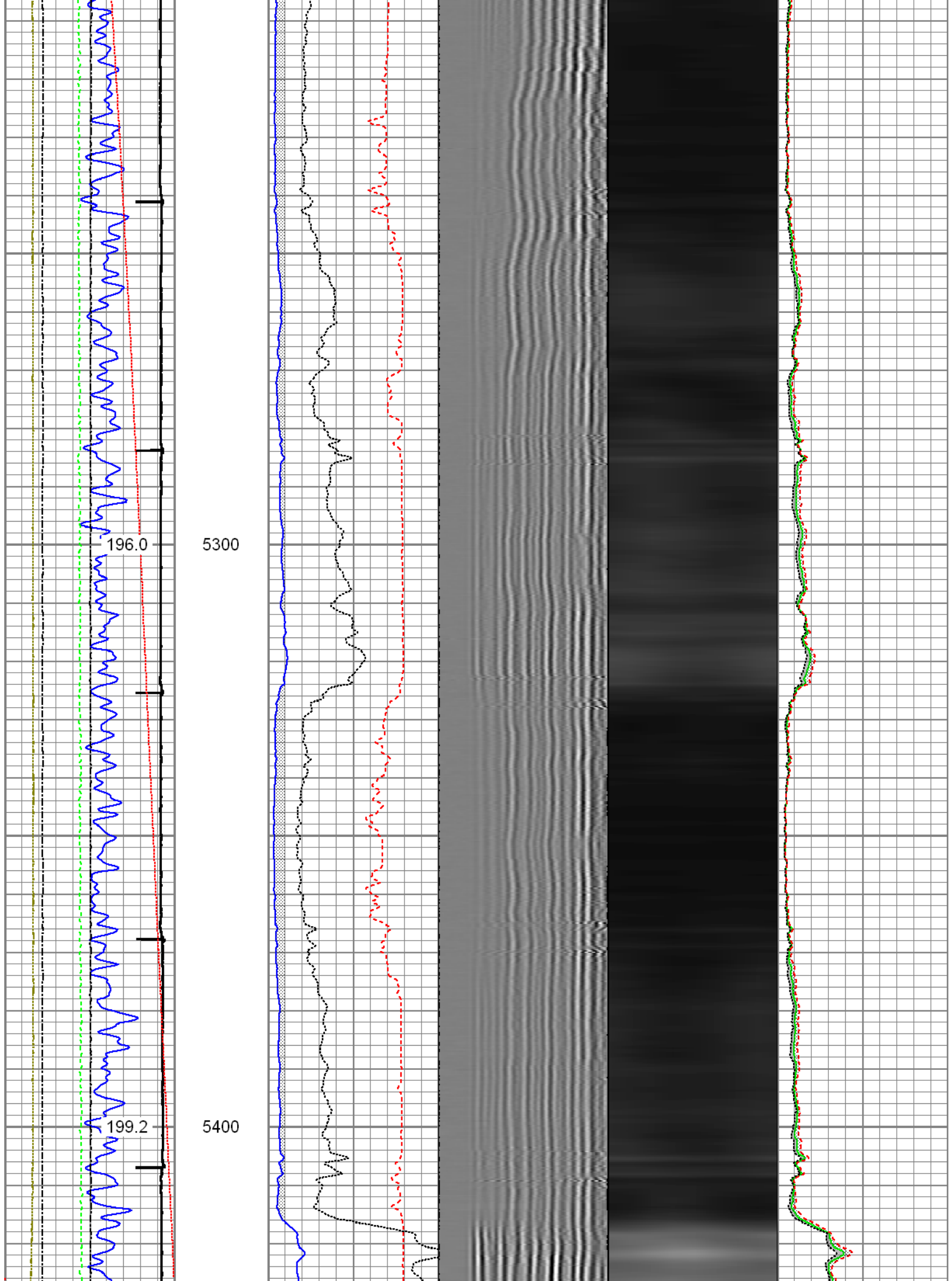


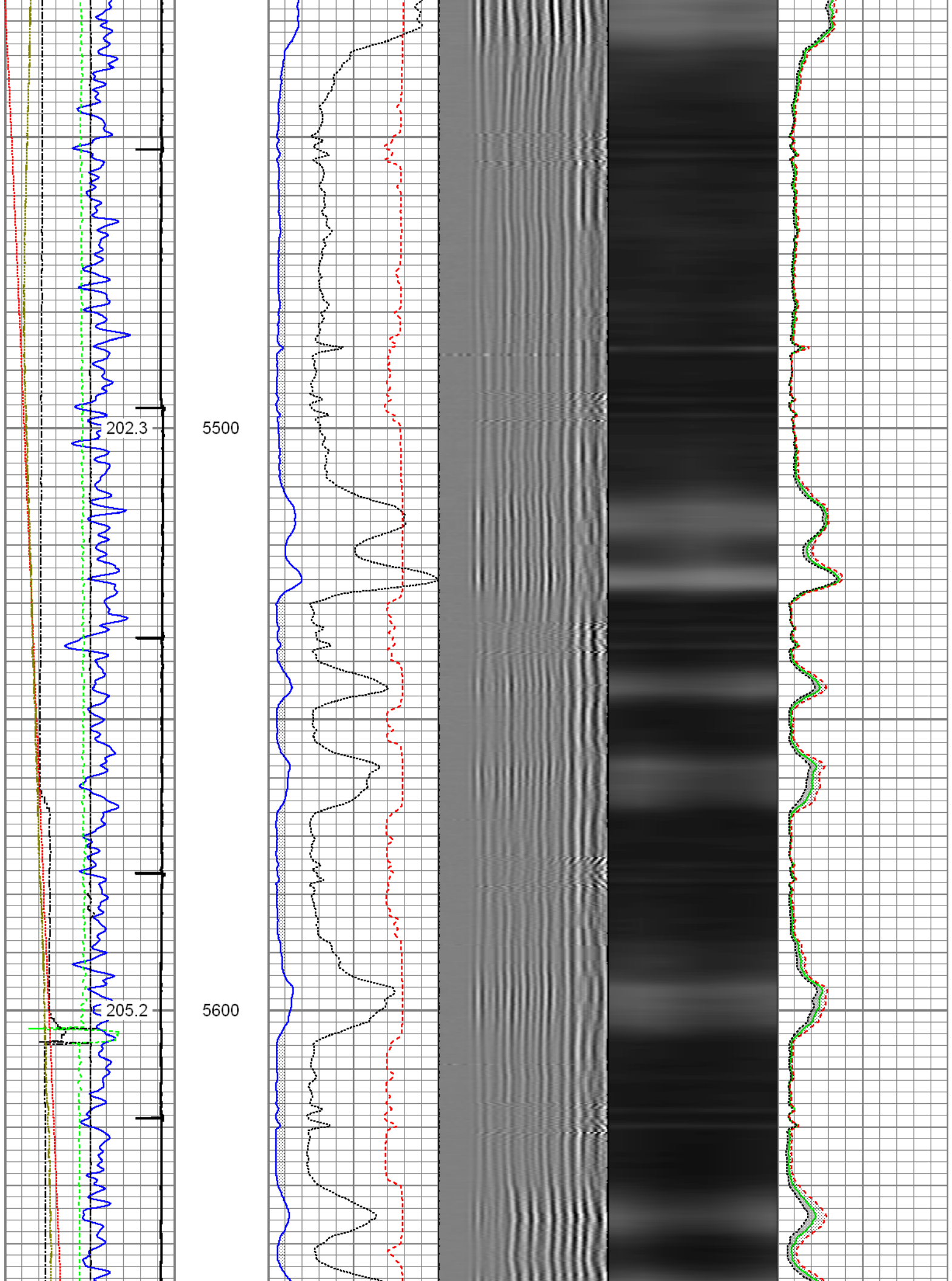


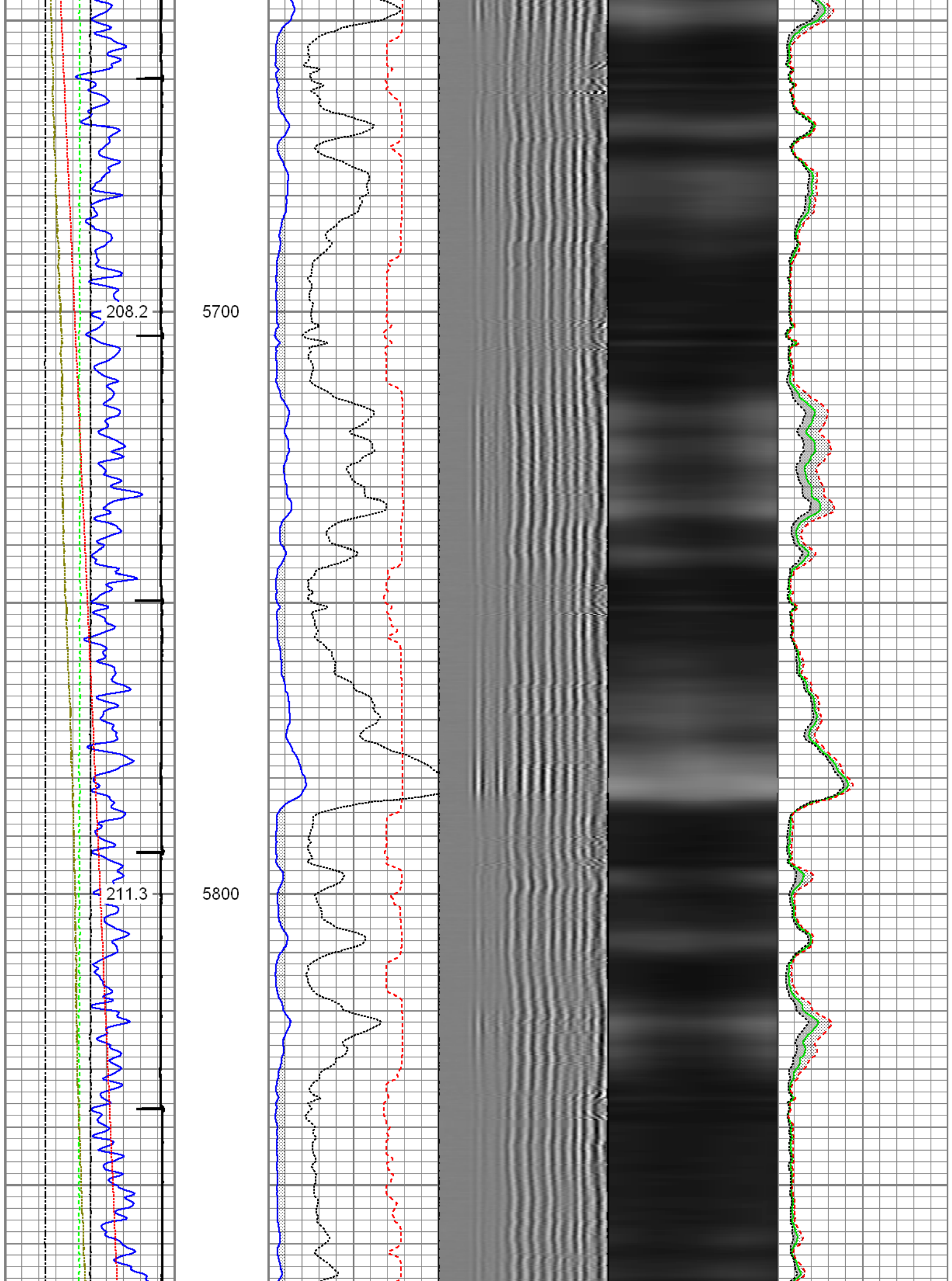


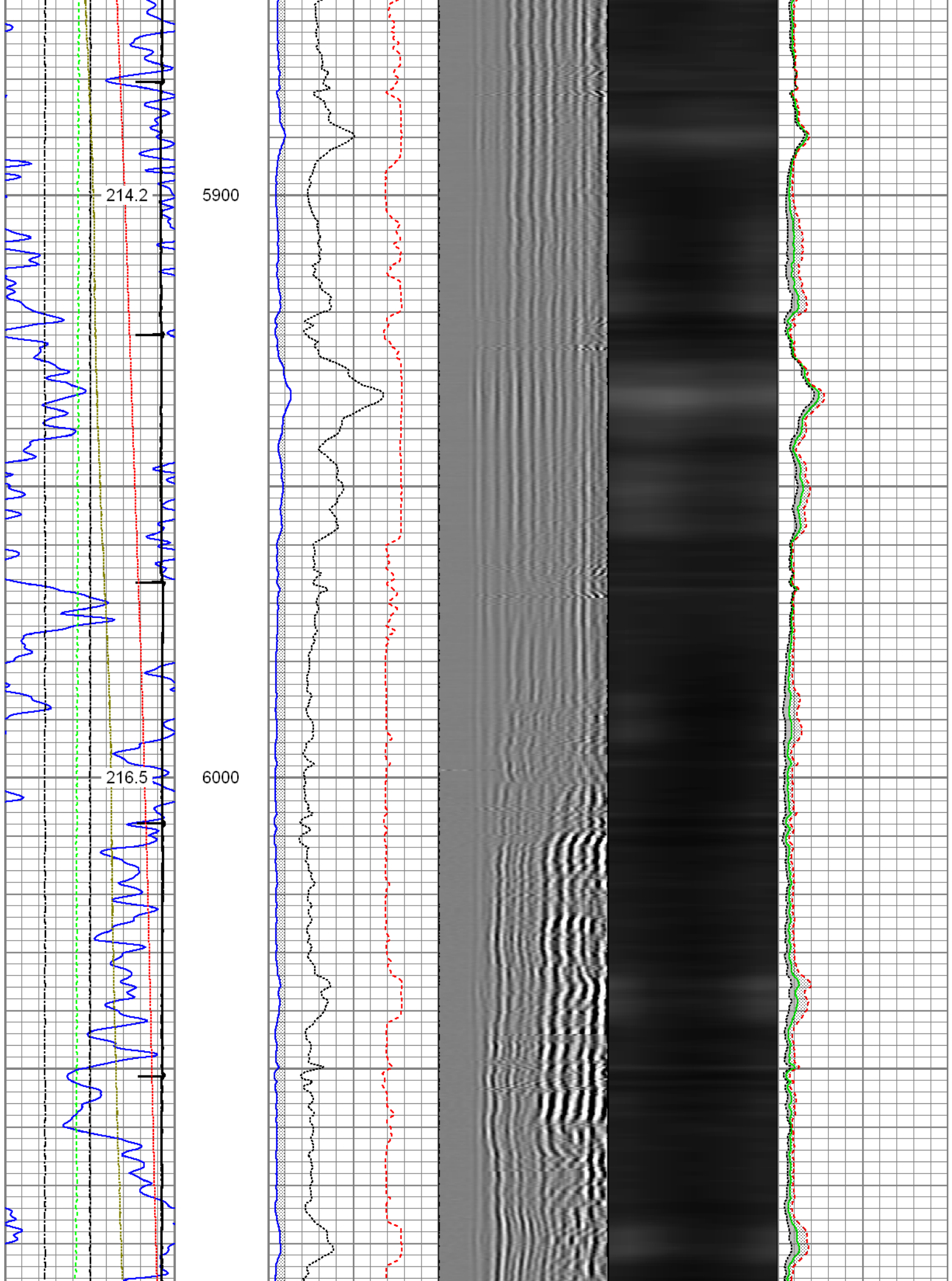


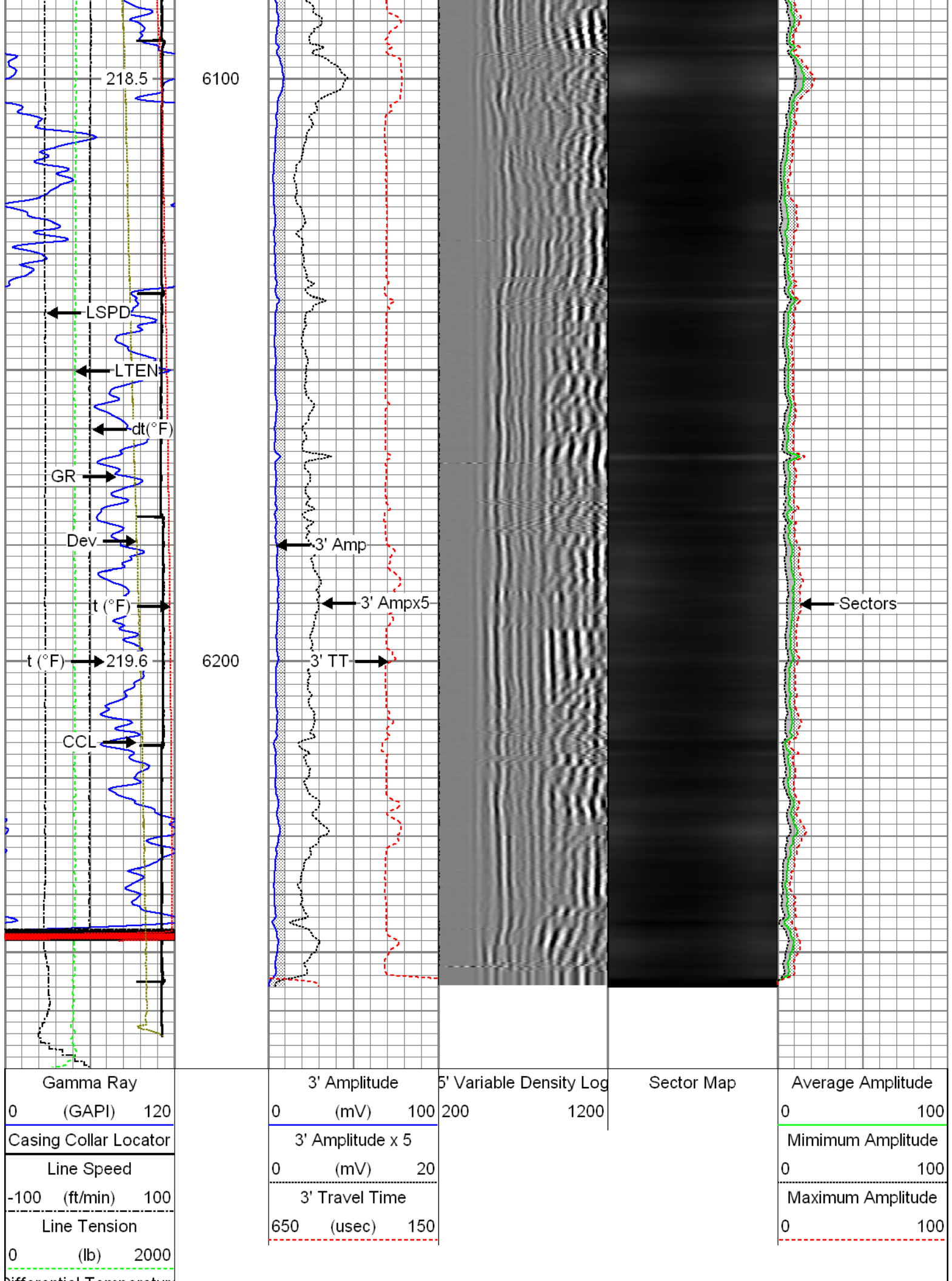












-2	(degF)	2
Temperature		
0	(degF)	20
-10	Deviation (°)	90



Repeat Pass

Recorded With 2500 PSI Surface Induced Pressure

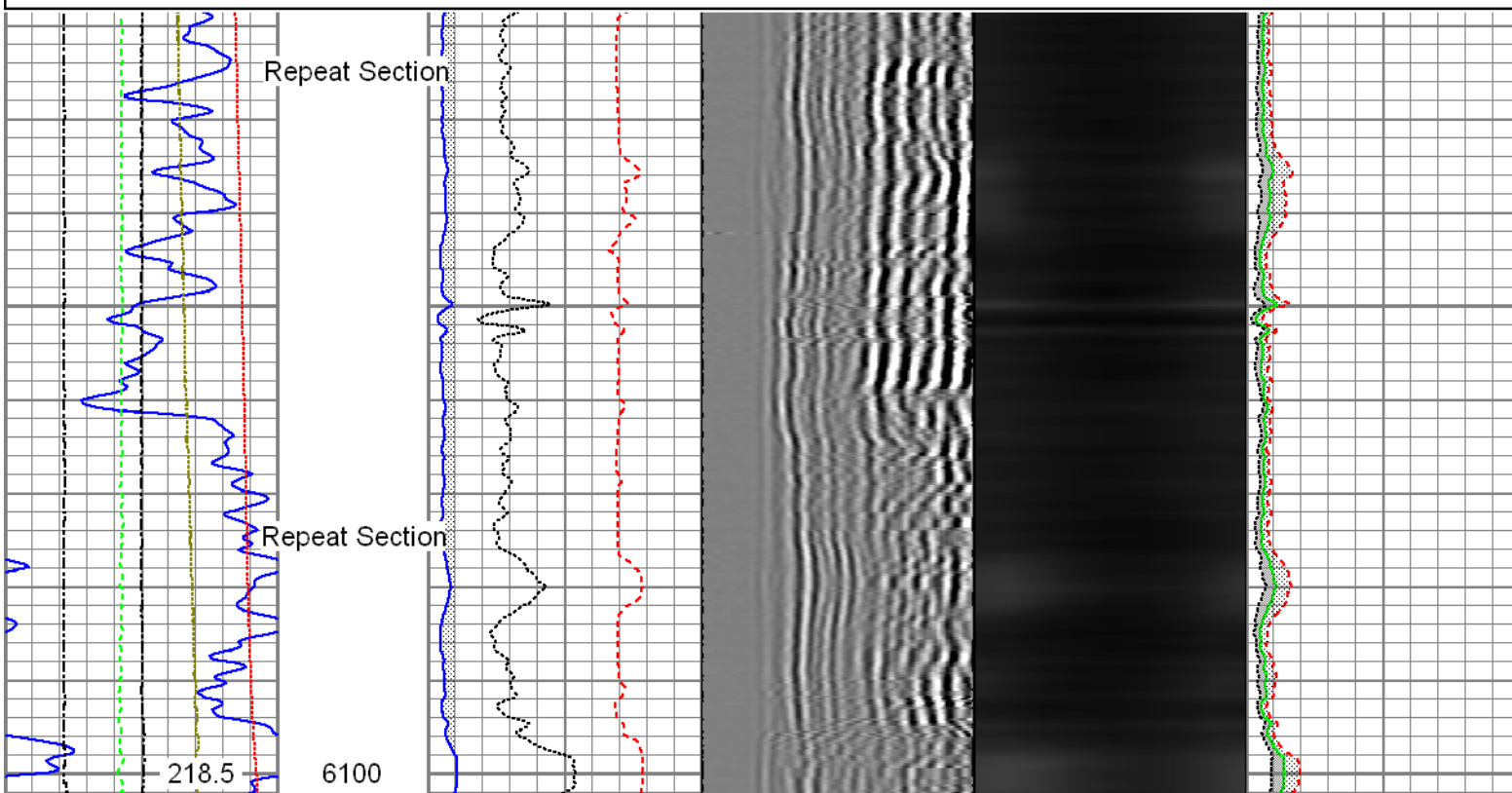
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Dataset Pathname: pass10
Presentation Format: rbt4_mit
Dataset Creation: Fri Jan 08 09:24:46 2016 by Log 7.0 B1
Charted by: Depth in Feet scaled 1:240

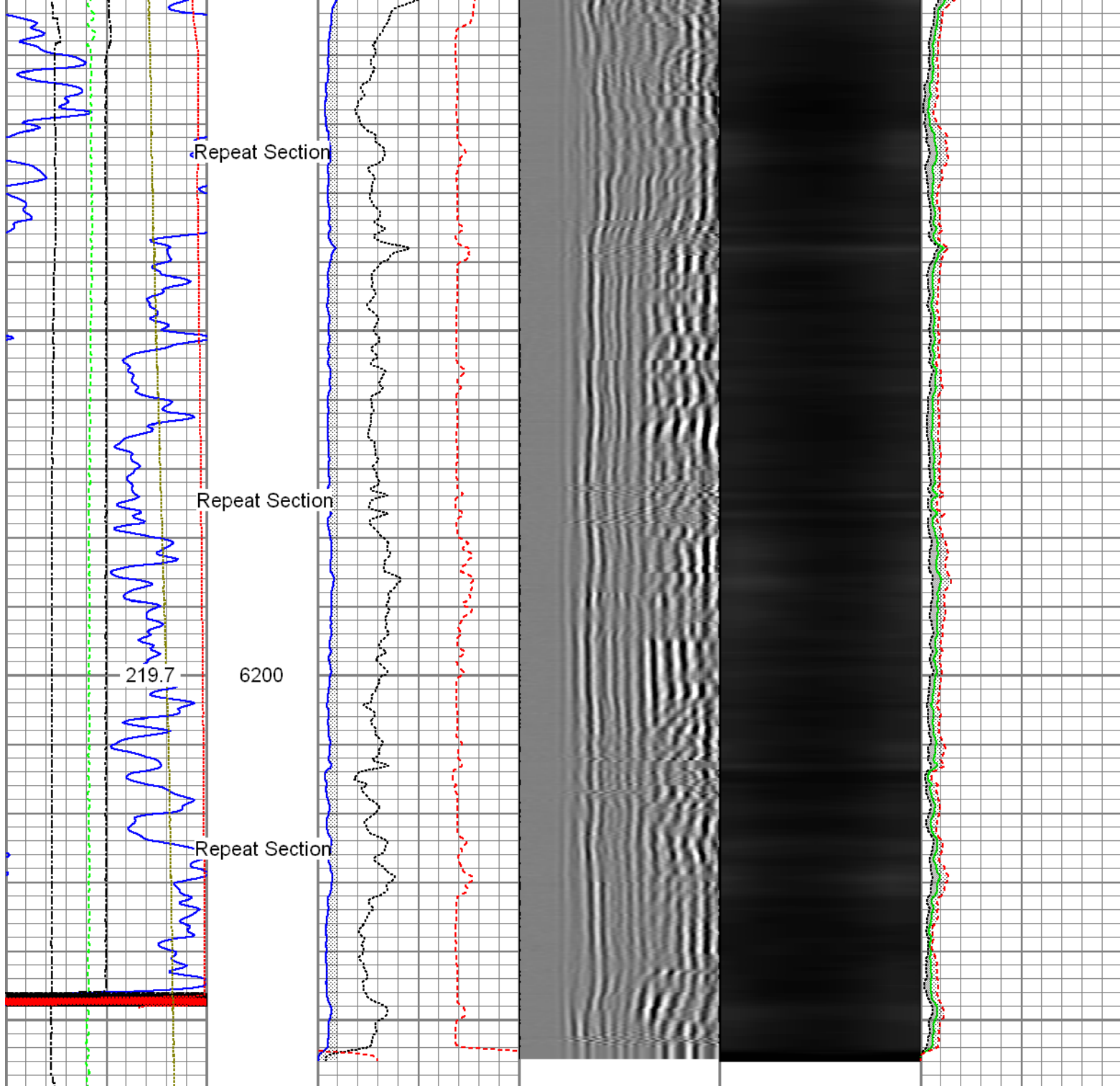
Gamma Ray			3' Amplitude		5' Variable Density Log	Sector Map	Average Amplitude				
0	(GAPI)	120	0	(mV)			100	200	1200	0	100
Line Speed			3' Amplitude x 5				Minimum Amplitude				
-100	(ft/min)	100	0	(mV)			20	0			
Line Tension			3' Travel Time		Maximum Amplitude						
0	(lb)	2000	650	(usec)	150	0			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

Differential Temperature		
-2	(degF)	2

Temperature		
0	(degF)	20

-10	Deviation (°)	90





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		
TEMP	22.45		UW_PRT-UW_PRT_016 (10025097) 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		
WVFS3FT WVFS1 WVFS2 WVFS3 WVFS4 WVFS5 WVFS6 WVFS7 WVFS8 CBLTEMP CBLROT WVFS5FT	15.42 15.42 15.42 15.42 15.42 15.42 15.42 15.42 15.42 15.42 15.42 14.42		UW_RBT-UW_RBT_004 (10022773) Sondex Ultrawire 3-1/8" Radial Bond Tool	9.47	3.13	140.00		
			UW_PRC-DSSRAC (082) 2-3/4" DSS 5 Arm Roller Centralizer	2.55	2.75	32.00		
			MIT	5.41	UW_MIT-UW_MIT40_027 (218949) 40 Multifinger Imaging Tool	4.54	2.75	61.10
					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: PROCESSED_01-08-16_Noble_Ann LC34-765_RBL.db: field/well/run1/pass11.1
 Total Length: 28.09 ft
 Total Weight: 324.50 lb

Calibration Report

Database File: X:\Logs_For_Processing\Logs to be reviewed\01-08-16_Noble_Ann LC34-765_MIT_RBL\PROCESSED
 Dataset Pathname: pass11.1
 Dataset Creation: Fri Jan 08 12:27:49 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
Sensitivity ratio:	1.0062		
X-axis angle:	131.534		
Deviation const.:	331.322		

Finger Calibration Report

Performed: Fri Jan 08 07:53:49 2016

Ring size:	4		5		6		7
(in)		Sens		Sens		Sens	
Finger 01:	1409	282.0	1691	298.0	1989	310.0	2299
Finger 02:	1468	275.0	1743	290.0	2033	300.0	2333
Finger 03:	1705	276.0	1981	283.0	2264	285.0	2549
Finger 04:	1673	276.0	1949	278.0	2227	280.0	2507
Finger 05:	1555	262.0	1817	271.0	2088	278.0	2366
Finger 06:	1541	255.0	1796	261.0	2057	271.0	2328
Finger 07:	1386	275.0	1661	289.0	1950	300.0	2250
Finger 08:	1549	262.0	1811	261.0	2072	271.0	2343
Finger 09:	1436	268.0	1704	284.0	1988	293.0	2281
Finger 10:	1500	264.0	1764	271.0	2035	281.0	2316
Finger 11:	1497	260.0	1757	268.0	2025	276.0	2301
Finger 12:	1340	280.0	1620	295.0	1915	311.0	2226
Finger 13:	1632	279.0	1911	283.0	2194	284.0	2478
Finger 14:	1477	285.0	1762	295.0	2057	303.0	2360
Finger 15:	1567	262.0	1829	267.0	2096	281.0	2377
Finger 16:	1425	283.0	1708	294.0	2002	306.0	2308
Finger 17:	1637	270.0	1907	275.0	2182	283.0	2465
Finger 18:	1421	291.0	1712	303.0	2015	321.0	2336
Finger 19:	1651	257.0	1908	255.0	2163	259.0	2422
Finger 20:	1542	266.0	1808	274.0	2082	287.0	2369
Finger 21:	1600	252.0	1852	259.0	2111	267.0	2378
Finger 22:	1572	274.0	1846	282.0	2128	292.0	2420
Finger 23:	1367	278.0	1645	289.0	1934	305.0	2239
Finger 24:	1691	261.0	1952	268.0	2220	281.0	2501
Finger 25:	1390	293.0	1683	311.0	1994	320.0	2314
Finger 26:	1539	283.0	1822	301.0	2123	310.0	2433
Finger 27:	1467	256.0	1723	275.0	1998	280.0	2278
Finger 28:	1650	271.0	1921	289.0	2210	294.0	2504
Finger 29:	1486	270.0	1756	291.0	2047	298.0	2345
Finger 30:	1458	267.0	1725	292.0	2017	303.0	2320
Finger 31:	1534	265.0	1799	280.0	2079	292.0	2371
Finger 32:	1352	262.0	1614	283.0	1897	298.0	2195
Finger 33:	1630	301.0	1931	313.0	2244	317.0	2561

Finger 33:	1533	268.0	1817	282.0	2211	288.0	2387
Finger 34:	1549	268.0	1706	286.0	1992	297.0	2289
Finger 35:	1440	266.0	1706	286.0	1992	297.0	2289
Finger 36:	1598	277.0	1875	292.0	2167	295.0	2462
Finger 37:	1606	273.0	1879	287.0	2166	294.0	2460
Finger 38:	1510	273.0	1783	290.0	2073	298.0	2371
Finger 39:	1466	281.0	1747	297.0	2044	287.0	2331
Finger 40:	1598	282.0	1880	277.0	2157	284.0	2441

Segmented Cement Bond Log Calibration Report

Serial Number:	10022773
Tool Model:	UW_RBT_004
Calibration Casing Diameter:	7.000 in
Calibration Depth:	1985.460 ft

Master Calibration, performed Fri Jan 08 08:27:29 2016:

	Raw (v)		Calibrated (mv)		Results	
	Zero	Cal	Zero	Cal	Gain	Offset
3FT	0.002	0.620	1.000	62.165	79.091	0.842
5FT	-0.001	0.621	1.000	62.165	98.323	1.124
S1	0.001	0.602	0.000	100.000	148.475	-0.224
S2	0.000	0.627	0.000	100.000	144.565	-0.045
S3	0.002	0.616	0.000	100.000	150.927	-0.248
S4	0.001	0.601	0.000	100.000	158.730	-0.198
S5	0.001	0.604	0.000	100.000	158.915	-0.202
S6	0.001	0.591	0.000	100.000	159.328	-0.207
S7	0.002	0.591	0.000	100.000	155.251	-0.259
S8	0.001	0.597	0.000	100.000	150.285	-0.236

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 LC34-765
Field	Wildcat
County	Weld
State	Colorado