



Radial Cement Bond
Gamma Ray
Casing Collar Log

Company	Noble Energy Inc.			Company	Noble Energy Inc.		
Well	70 Ranch State BB18-655			Well	70 Ranch State BB18-655		
Field	Wattenberg			Field	Wattenberg		
County	Weld			County	Weld		
State	Colorado			State	Colorado		
Location:				API # : 05-123-41534			
SEC 17 TWP 5N RGE 63W				Other Services			
				MIT			
Permanent Datum	Ground Level		Elevation	4668'	Elevation		
Log Measured From	Kelly Bushing		30 FT	K.B. 4698'			
Drilling Measured From	Kelly Bushing		D.F. 4697'				
			G.L. 4668'				

Date	28-AUG-2015		
Run Number	One		
Depth Driller	16232 FT		
Depth Logger	6817 FT		
Bottom Logged Interval	6812 FT		
Top Log Interval	Surface		
Open Hole Size	8.750"		
Type Fluid	Water		
Density / Viscosity	8.34 lbm/gal		
Max. Recorded Temp.	226°F		
Estimated Cement Top	90 FT		
Time Well Ready	ROA		
Time Logger on Bottom	12:30		
Equipment Number	HD-0119		
Location	Fort Lupton, CO		
Recorded By	Zach Fisher		
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	748.7 FT		
Intermediate #1	7	26	P-110IC	30 FT	6900.2 FT		
Intermediate #2							
Liner	4 1/2	11.6	P-110IC	6798.8 FT	16232 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 as per customer request
Log ran from 6817 FT to surface
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 Completion Services, Inc.!!



Main Pass

Recorded with 2500 PSI Surface Induced Pressure.

Database File:08-28-15_noble energy_70 ranch state bb18-655_mit_rbl.db

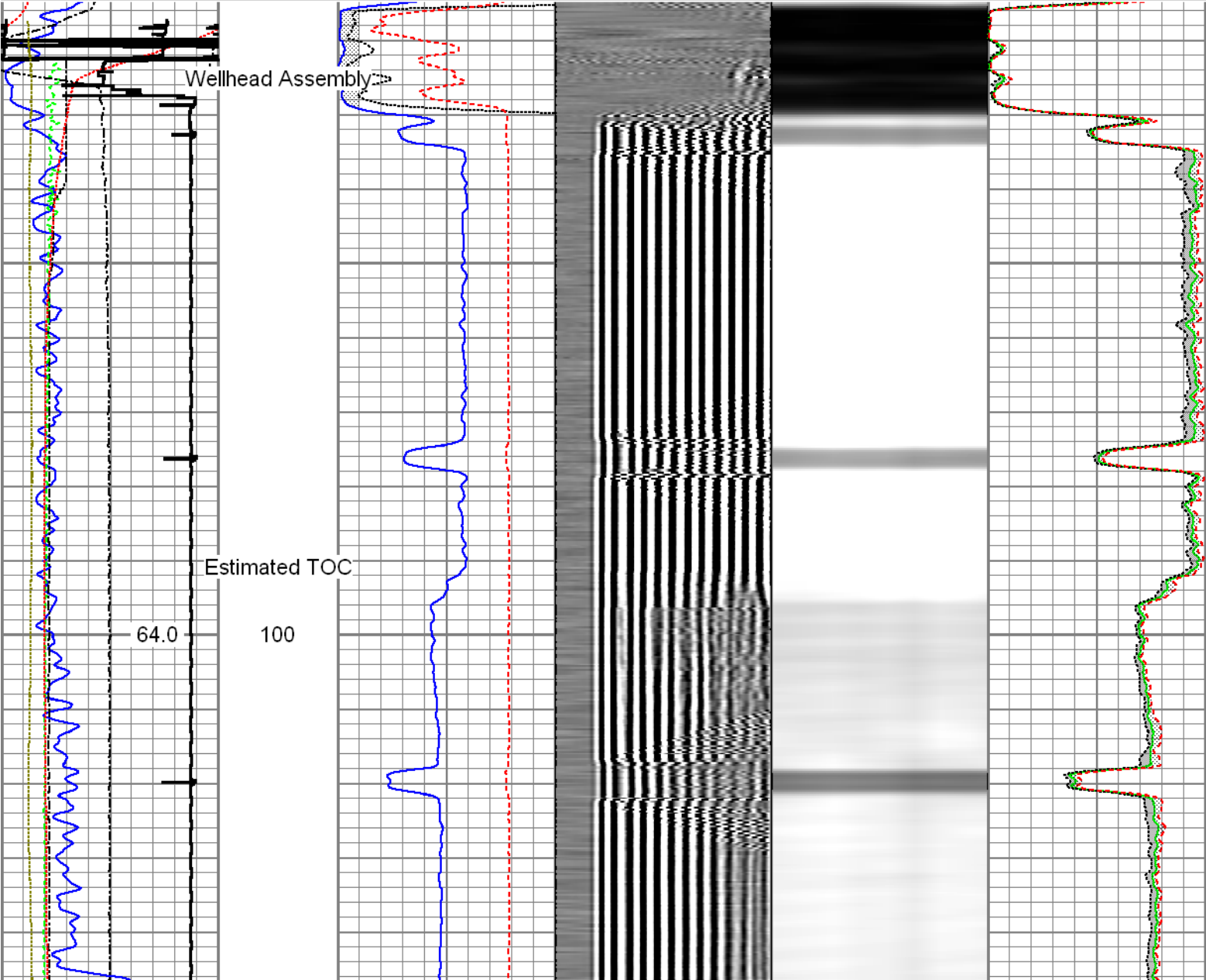
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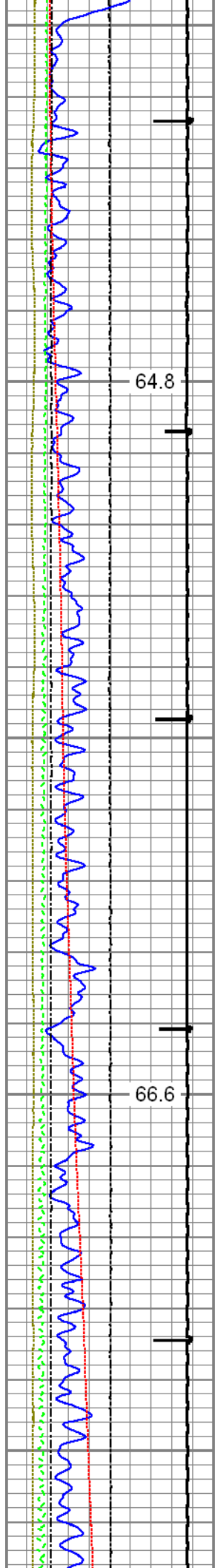
Presentation Format:rbt4_mit

Dataset Creation:Fri Aug 28 14:32:02 2015 by Calc 7.0 B1

Charted by:Depth in Feet scaled 1:240

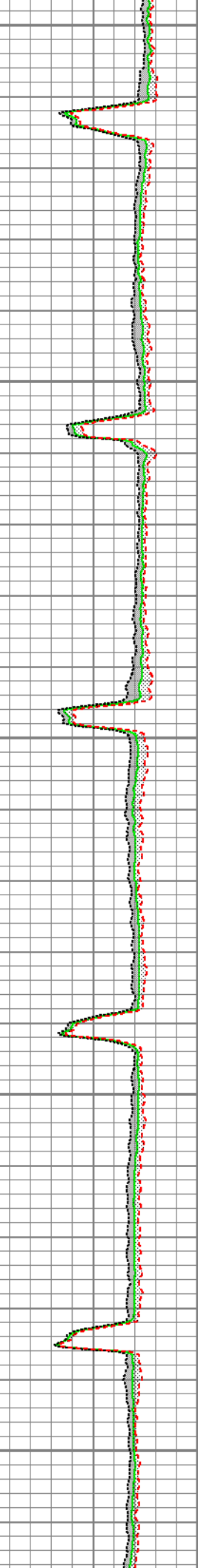
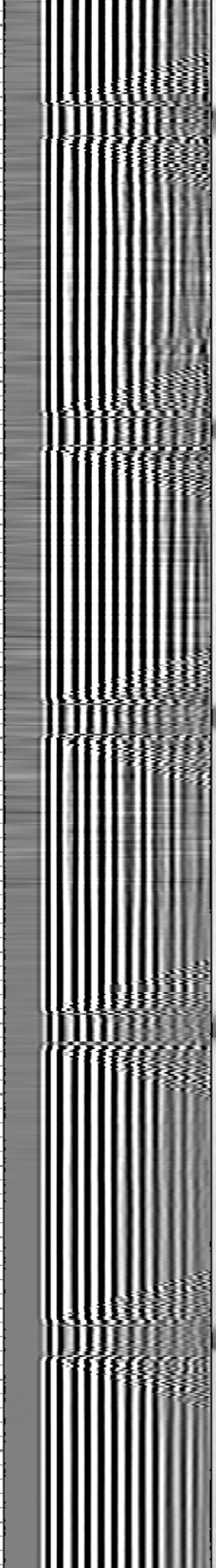
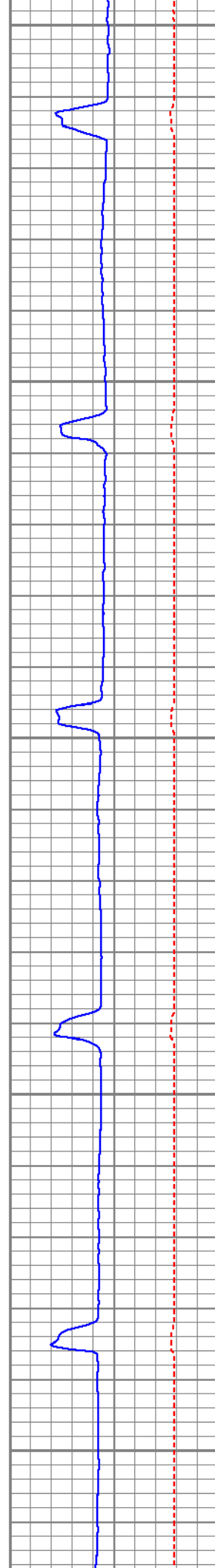
Gamma Ray		3' Amplitude	5' Variable Density Log	Sector Map	Average Amplitude
0 (GAPI) 120		0 (mV) 100	200 1200		0 100
Line Speed		3' Amplitude x 5			Mimimum Amplitude
-100 (ft/min) 100		0 (mV) 20			0 100
Line Tension		3' Travel Time			Maximum Amplitude
0 (lb) 2000		650 (usec) 150			0 100
Differential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

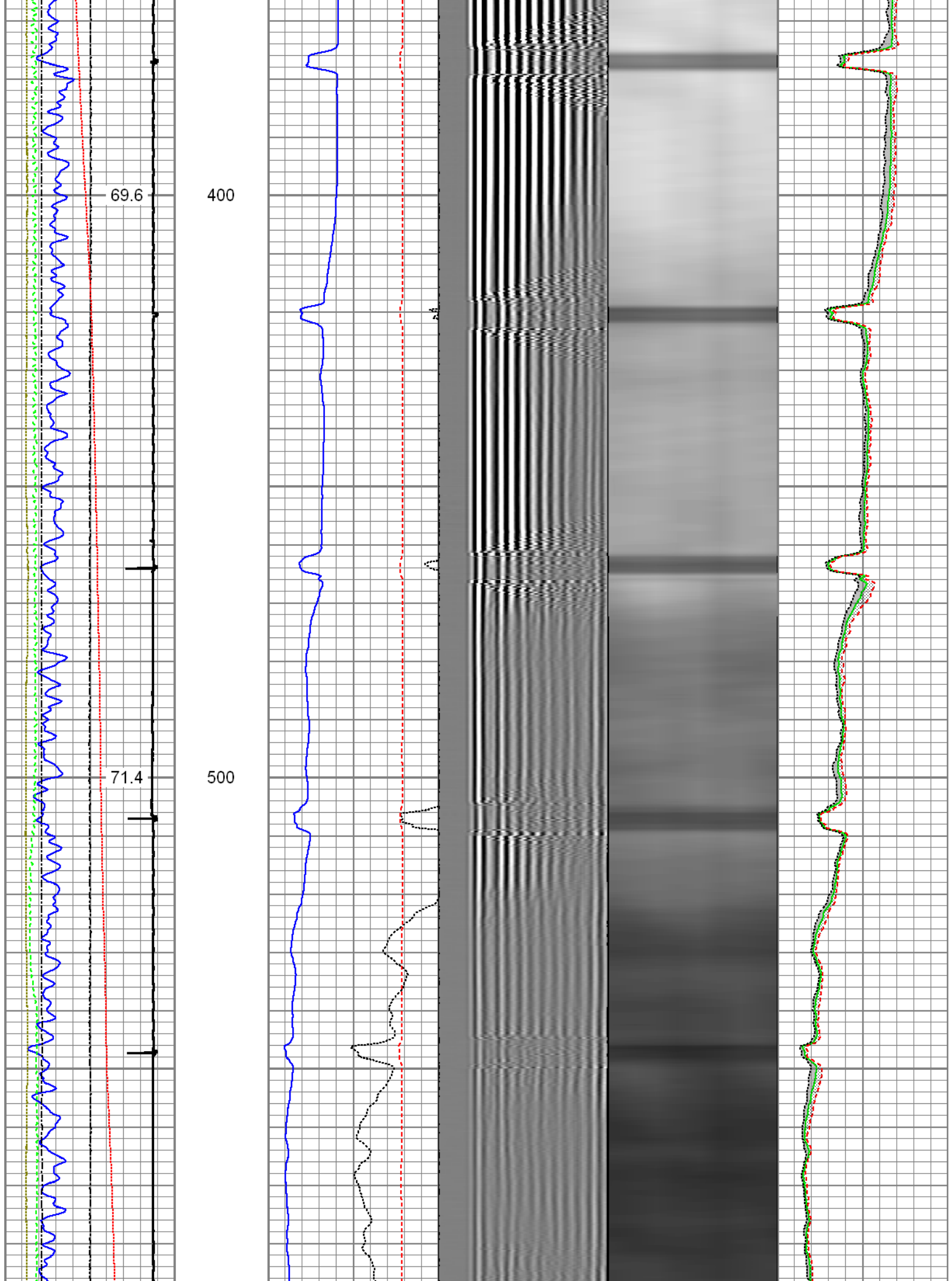


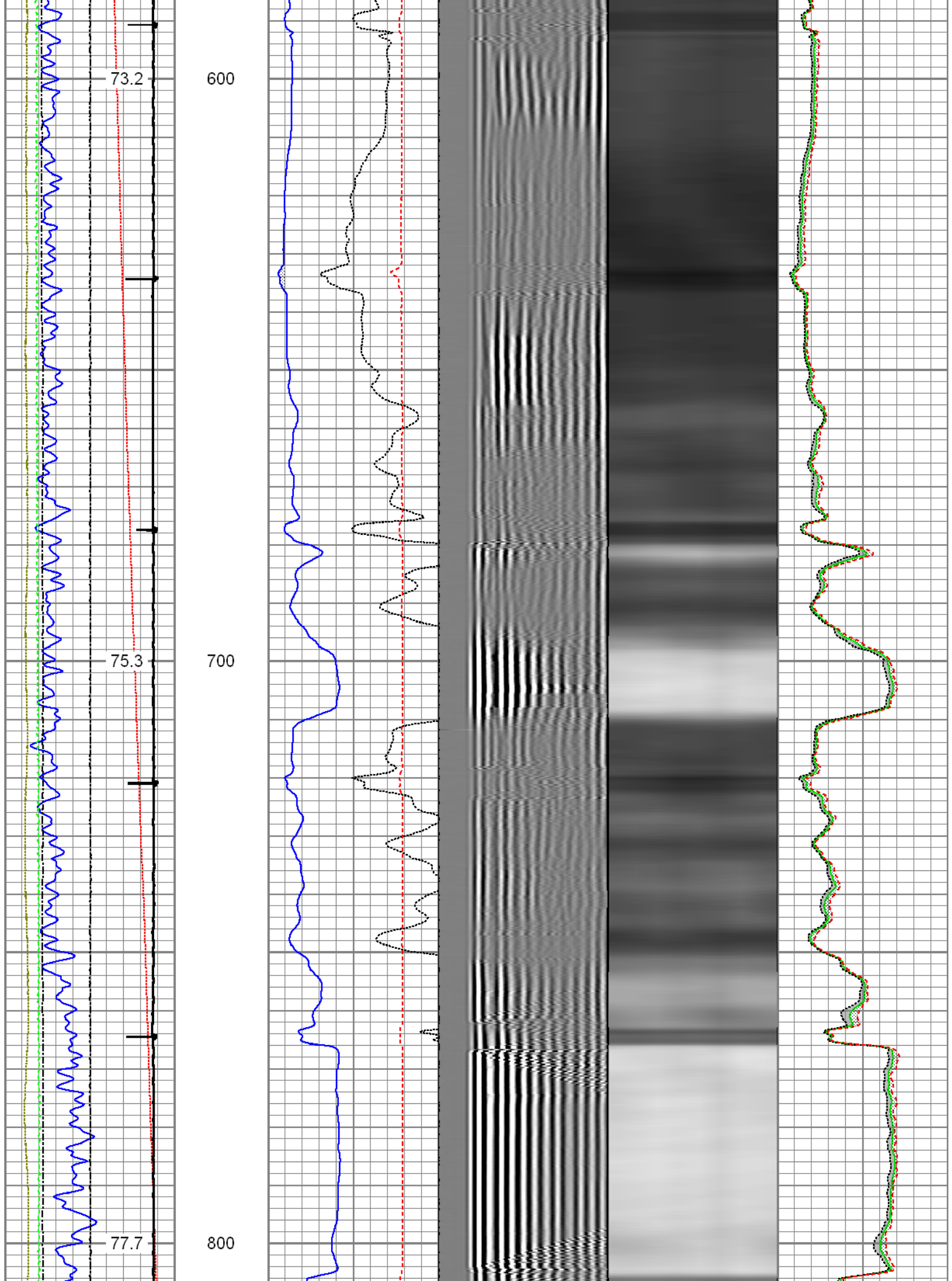


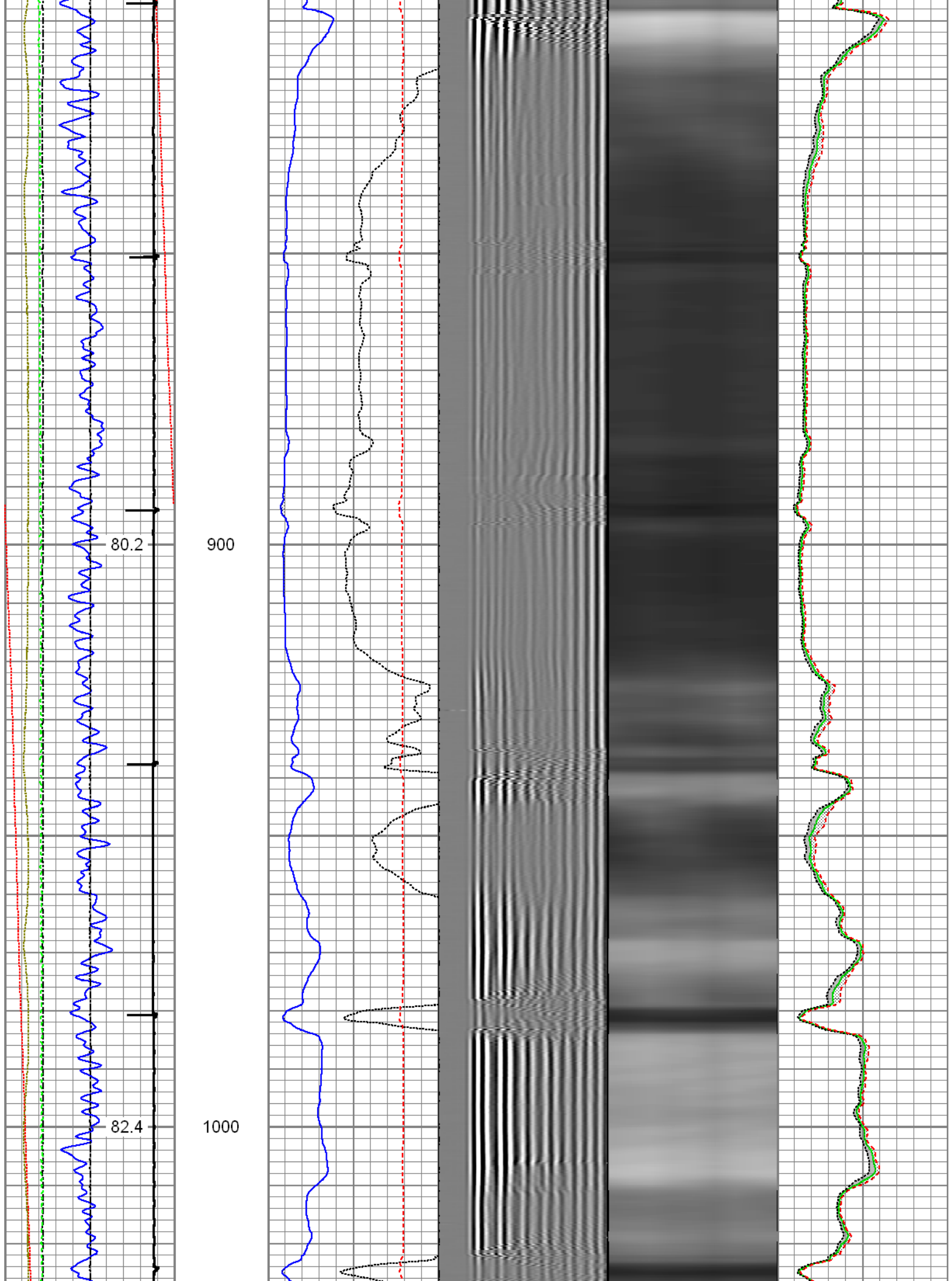
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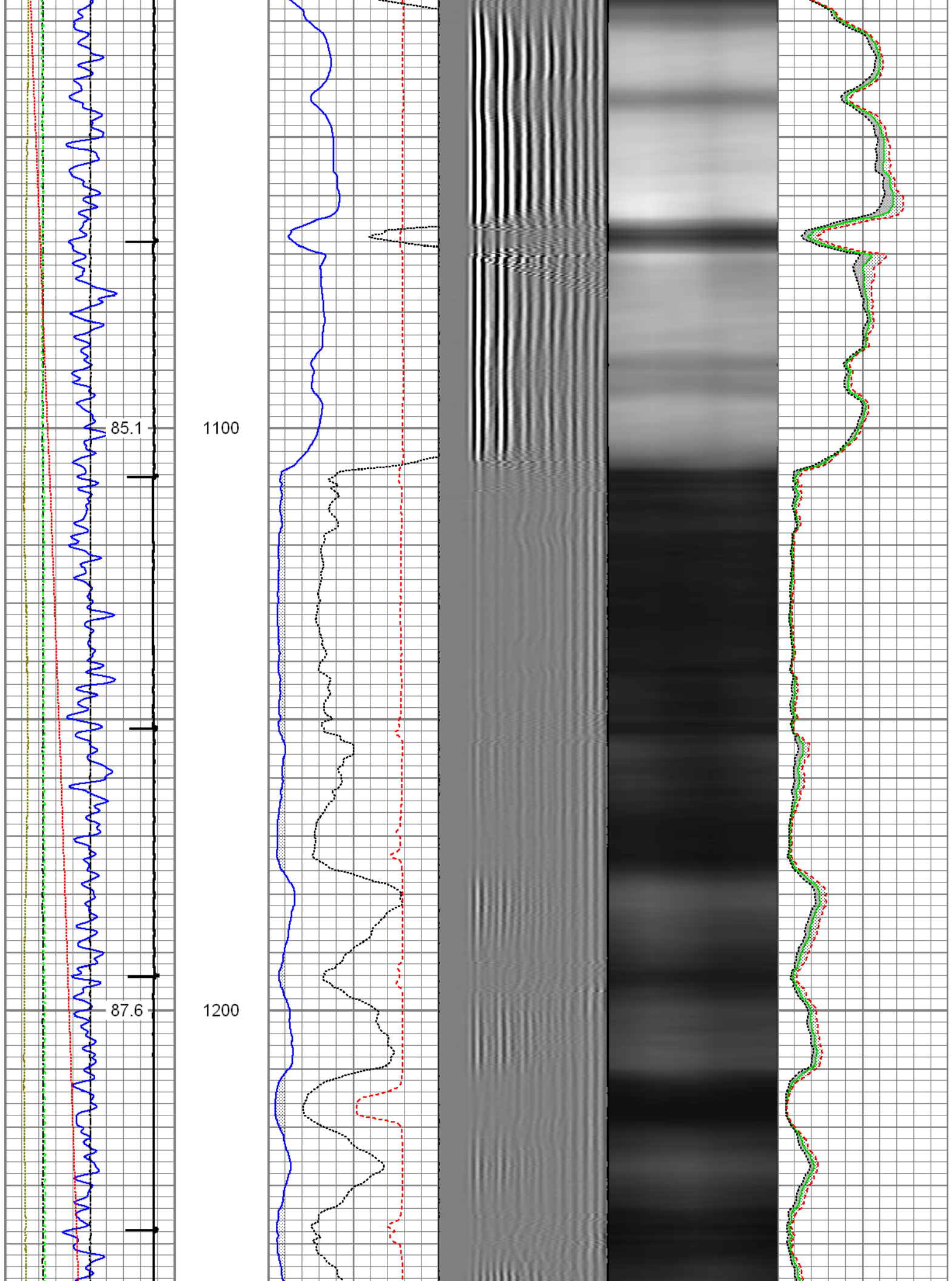
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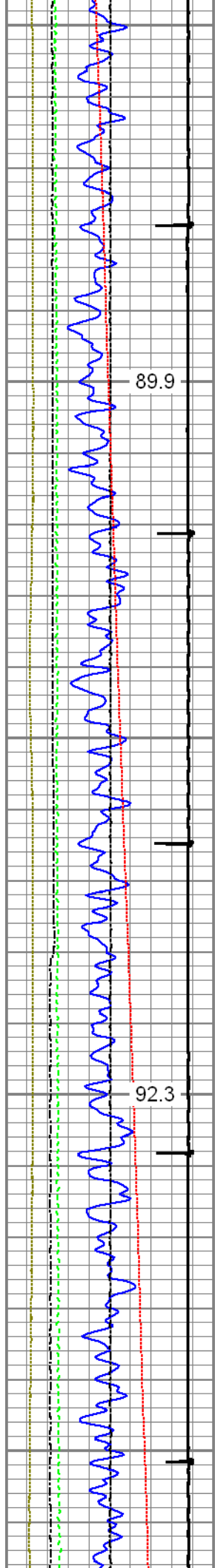






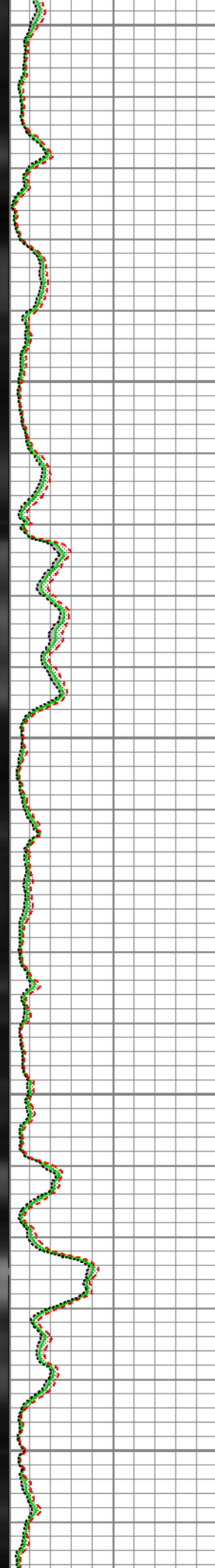
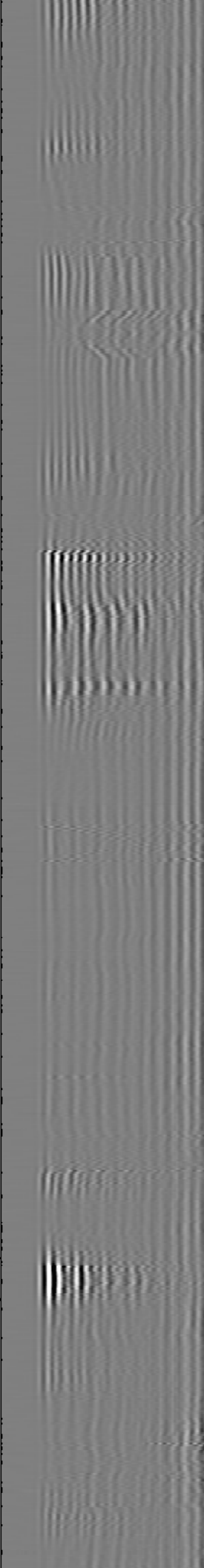
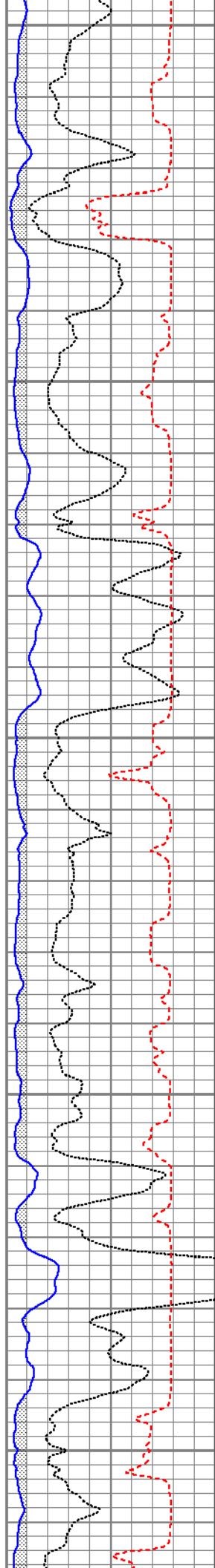


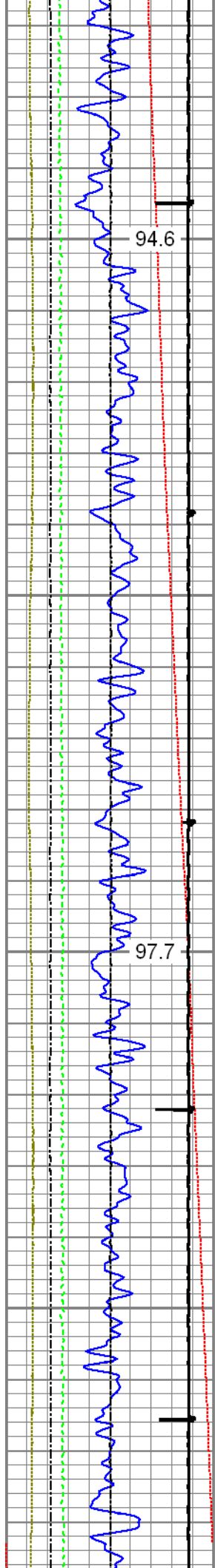




1300

1400



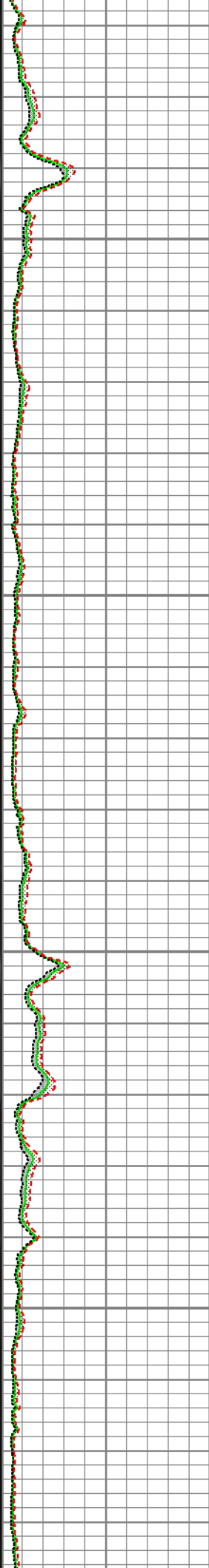
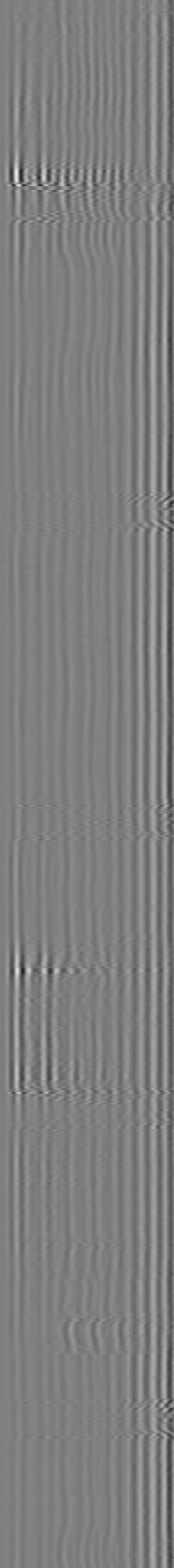
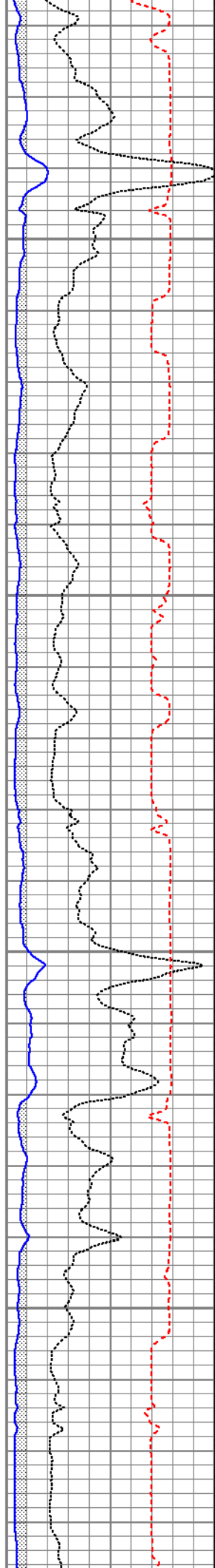


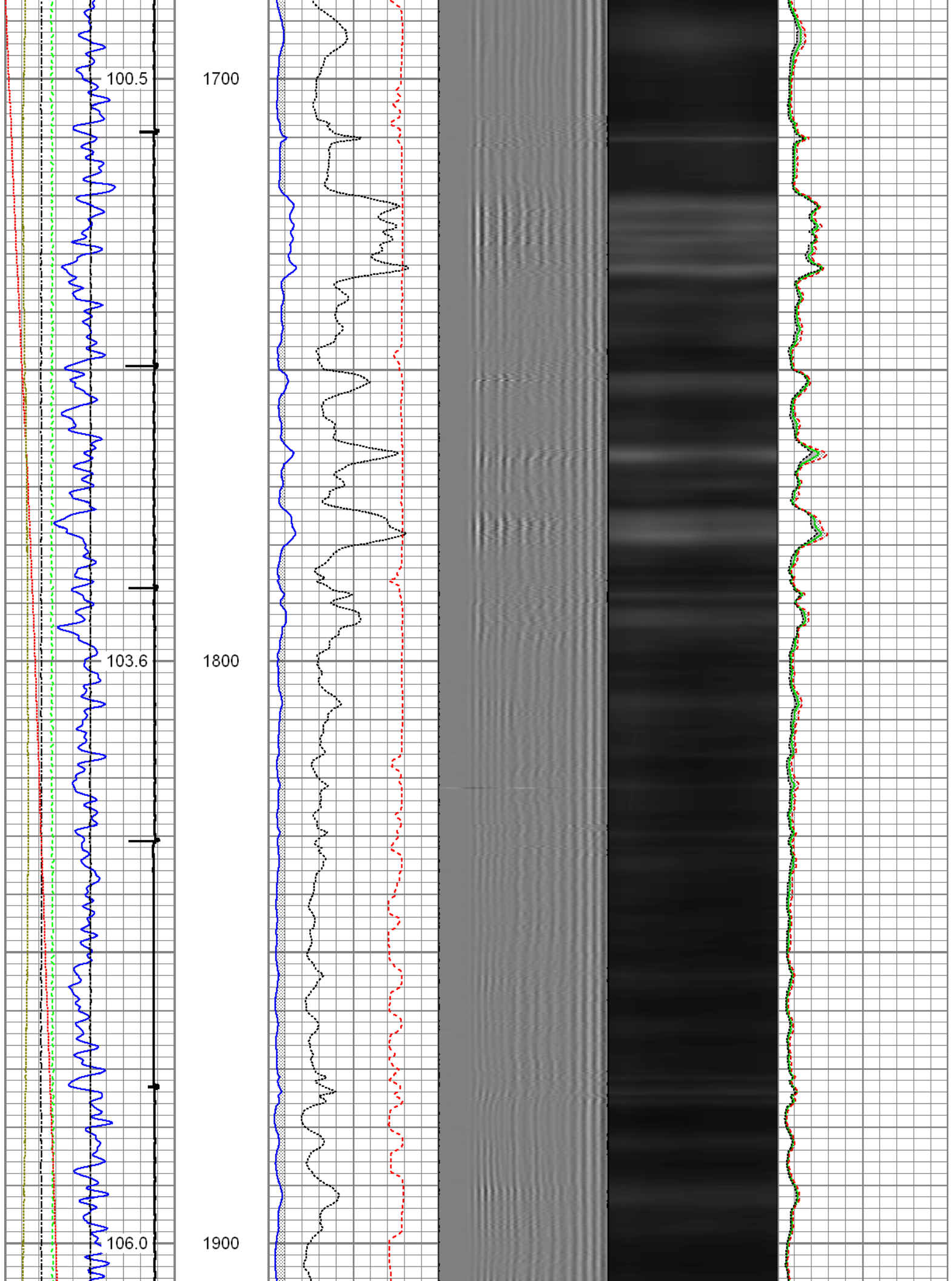
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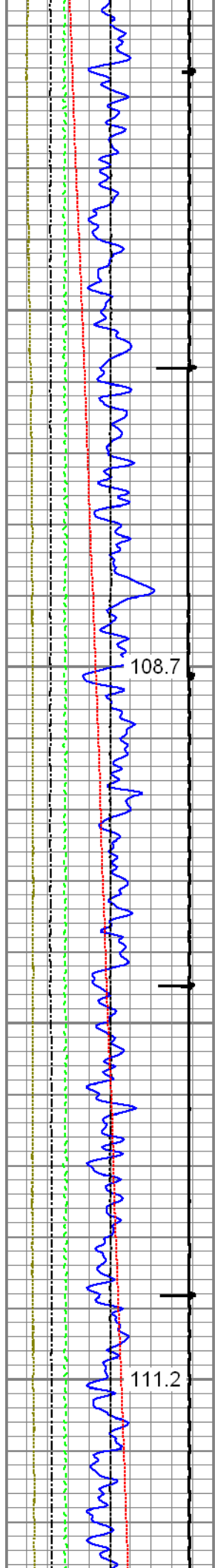
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97.7

1600

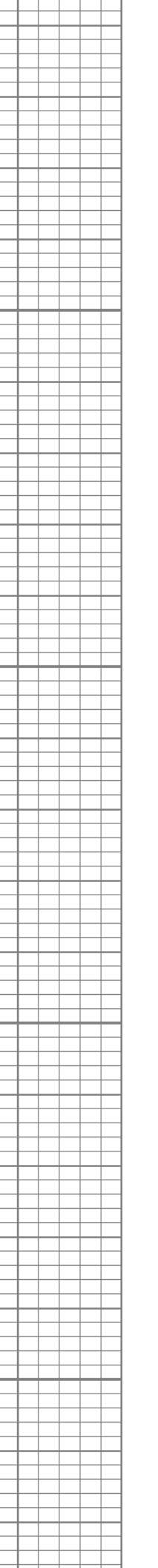
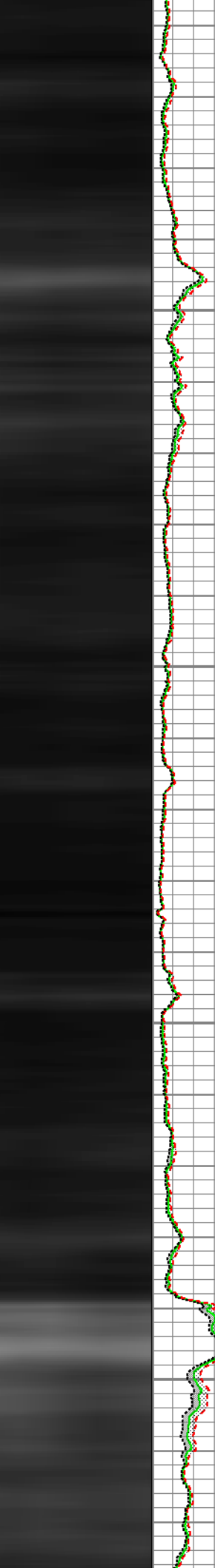
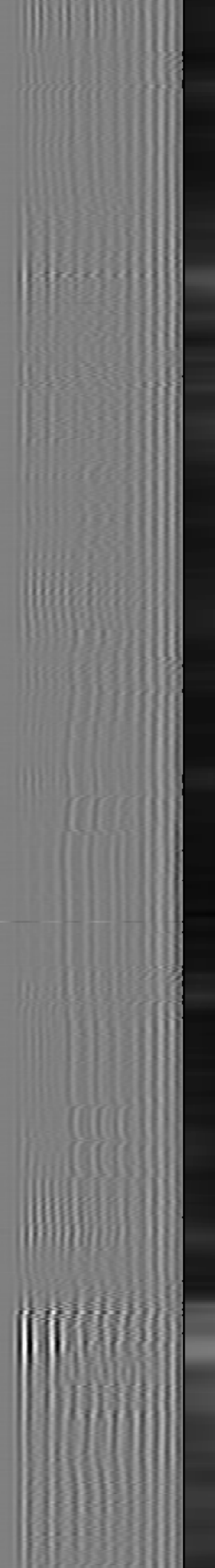
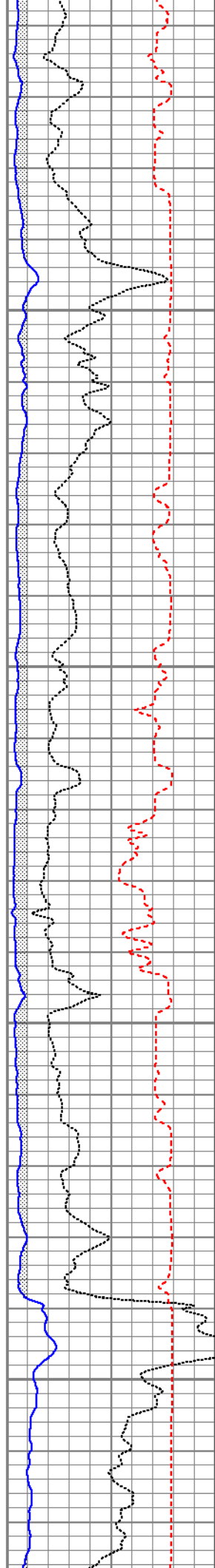


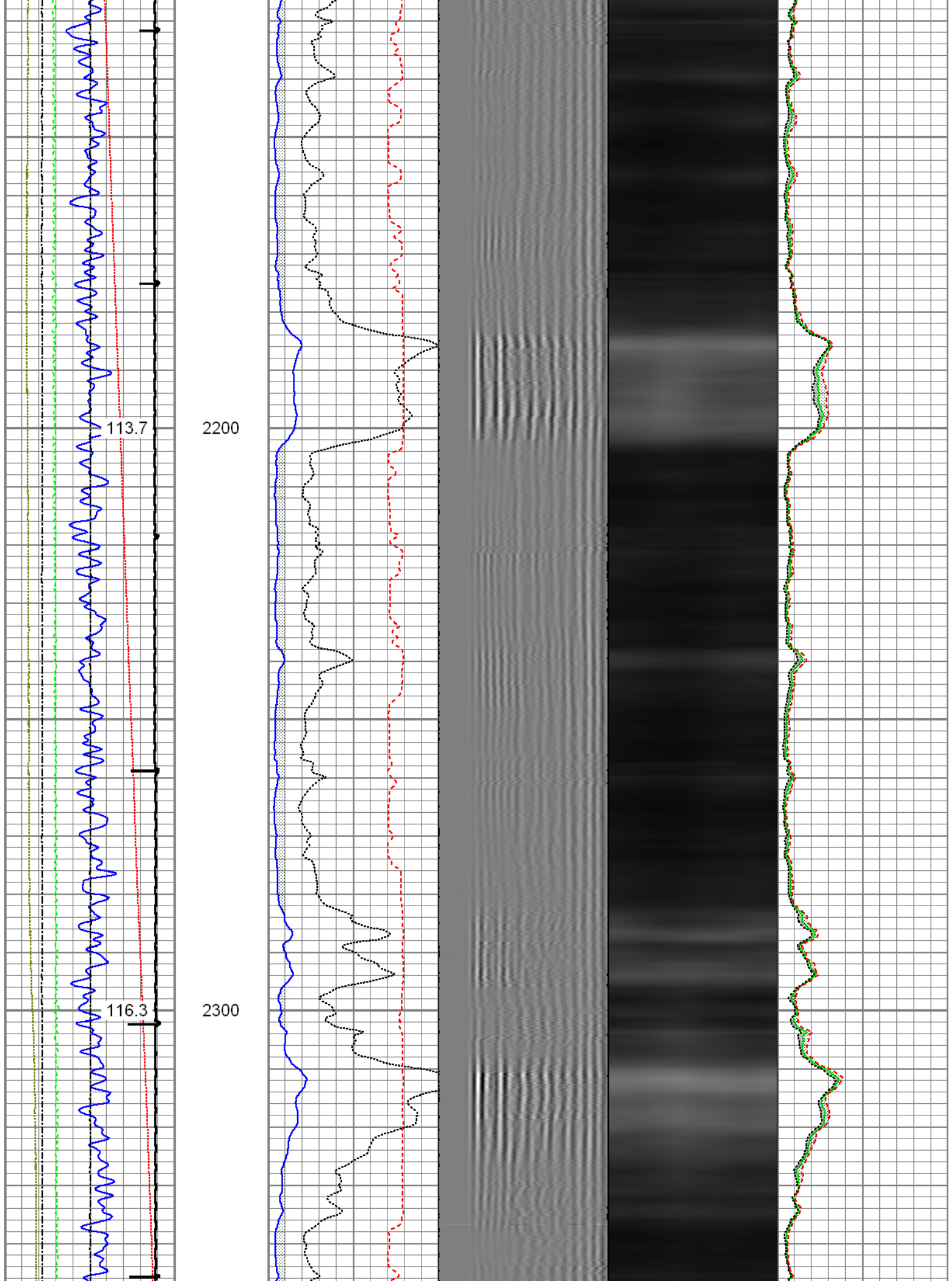


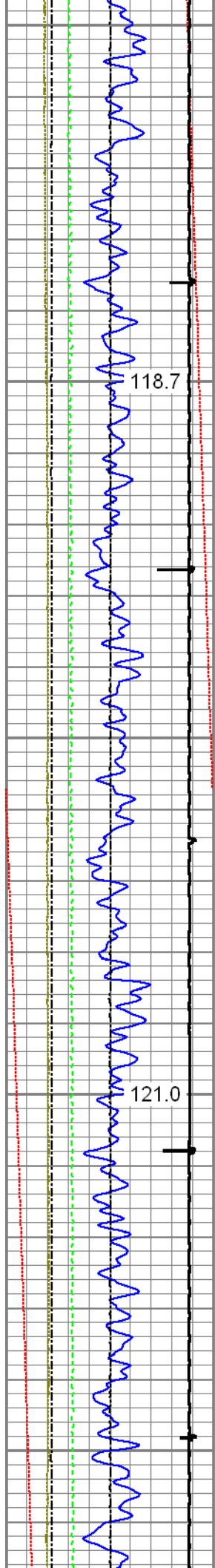


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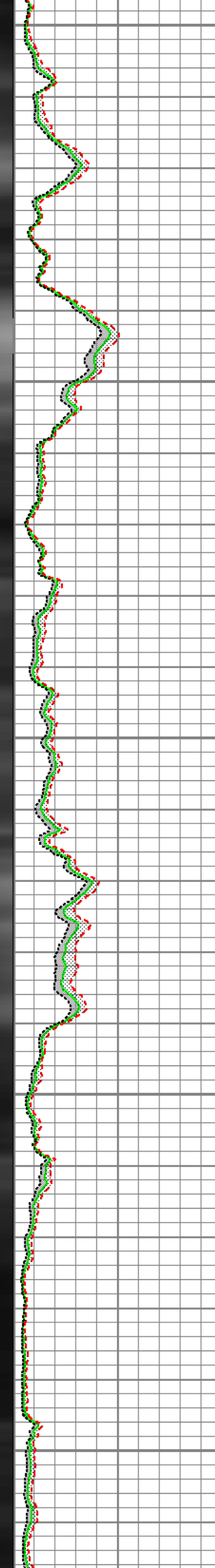
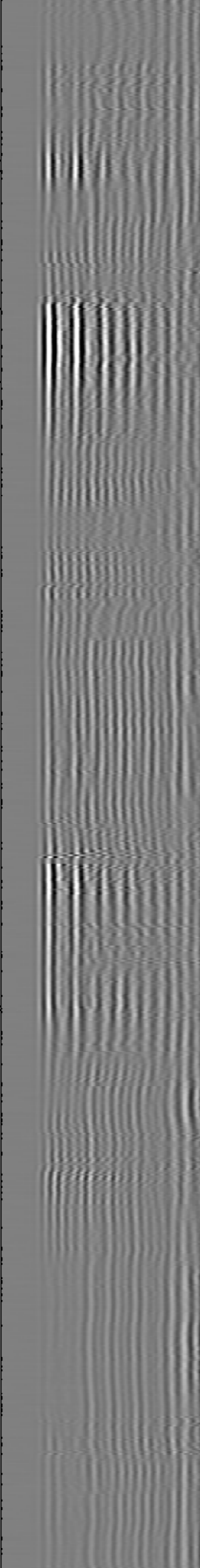
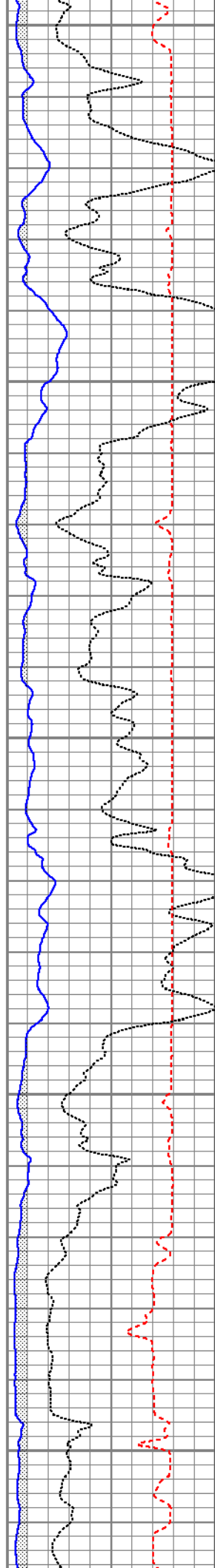


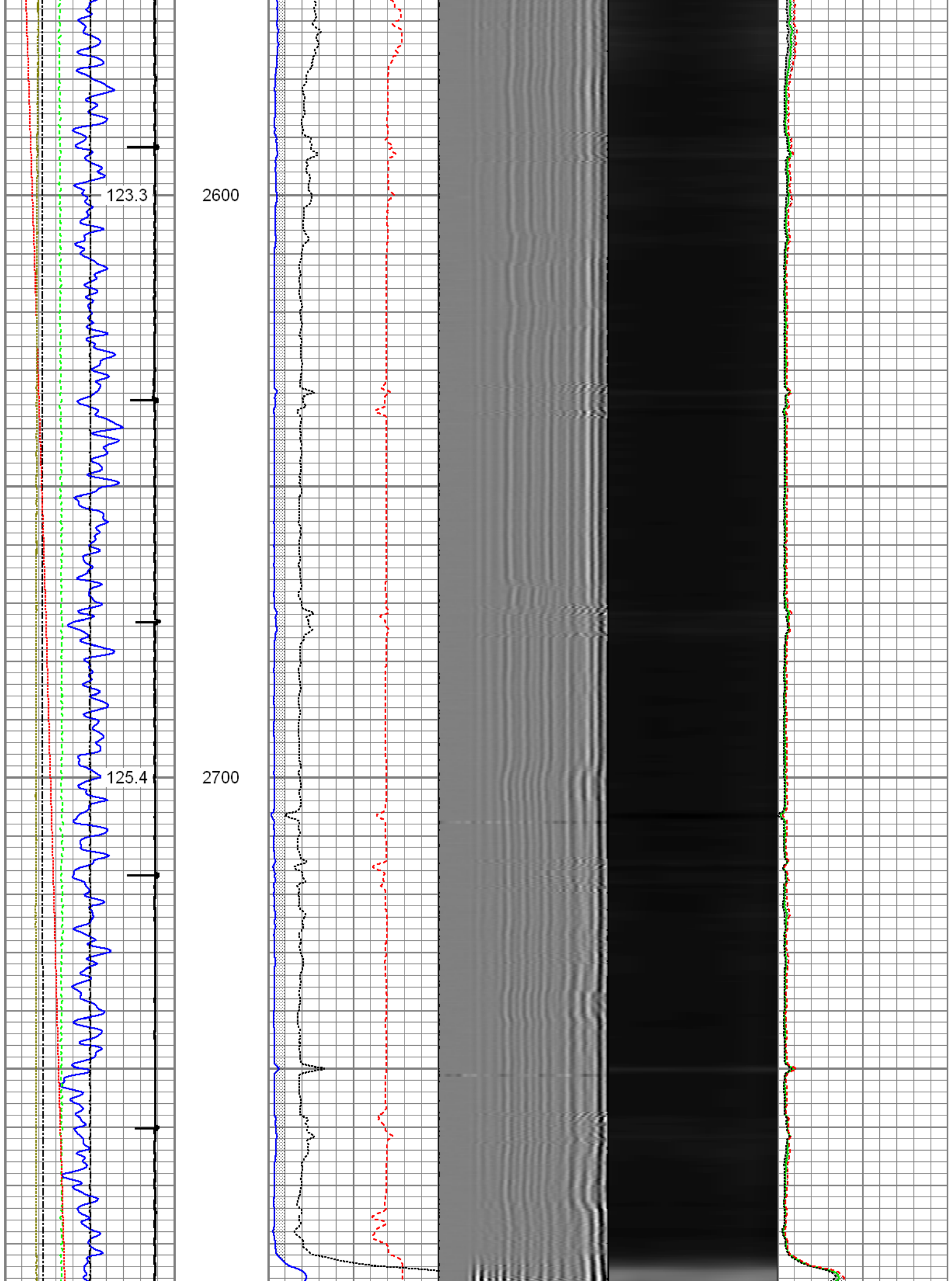
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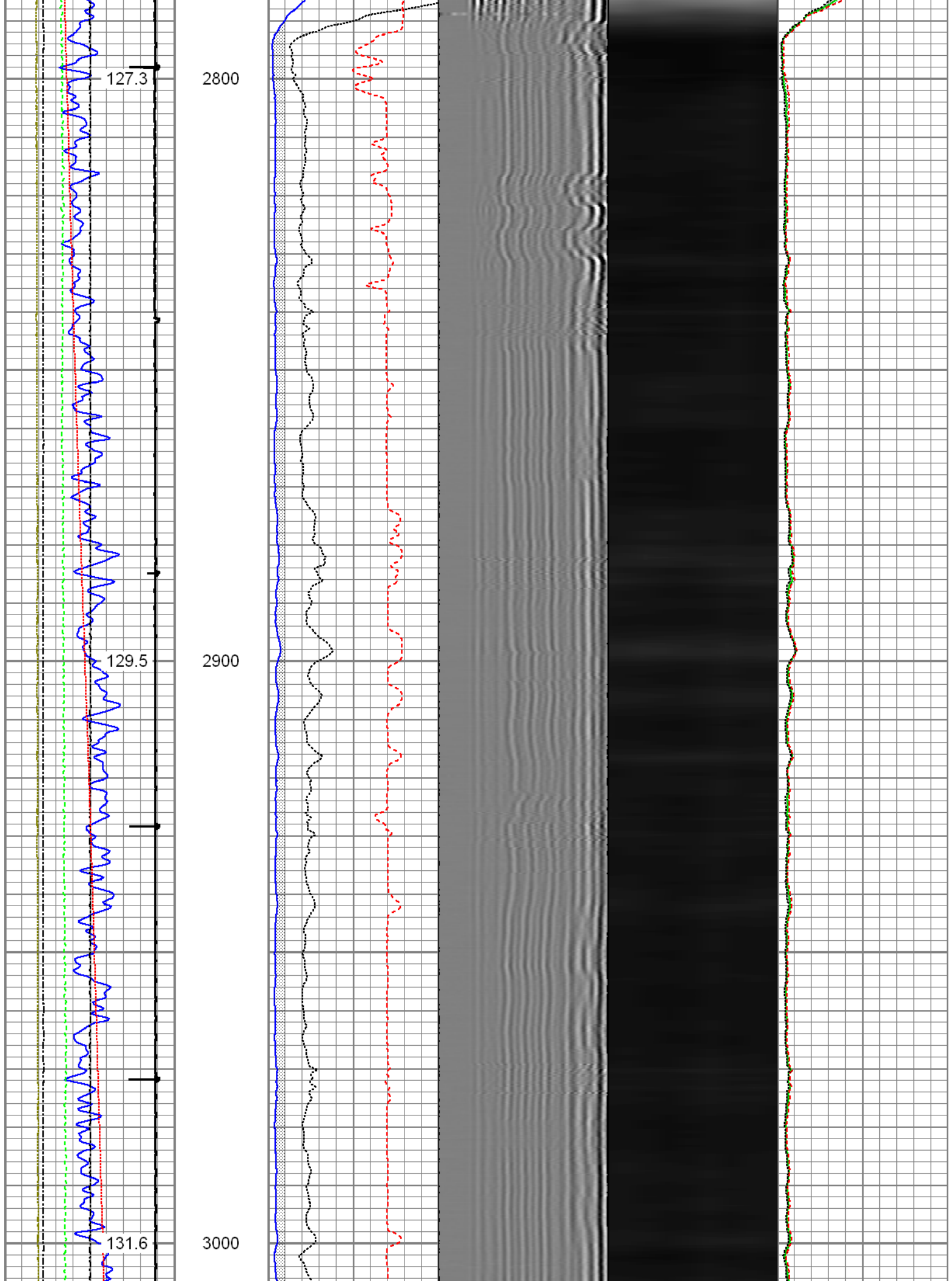
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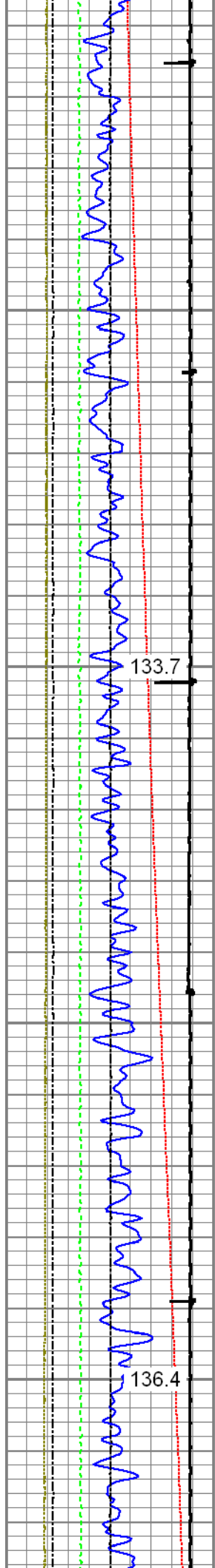
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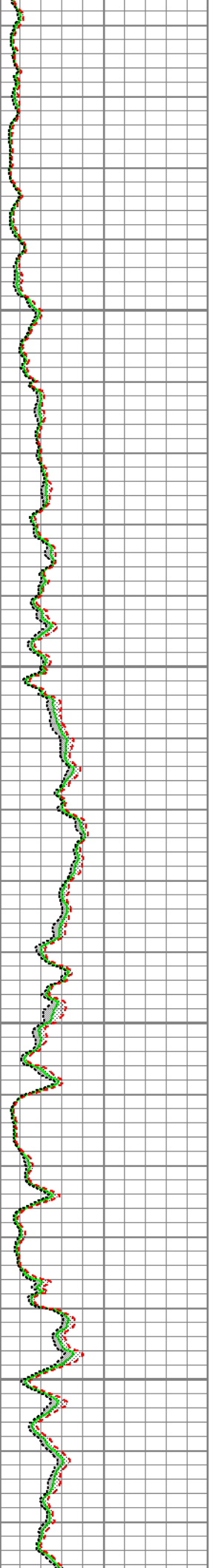
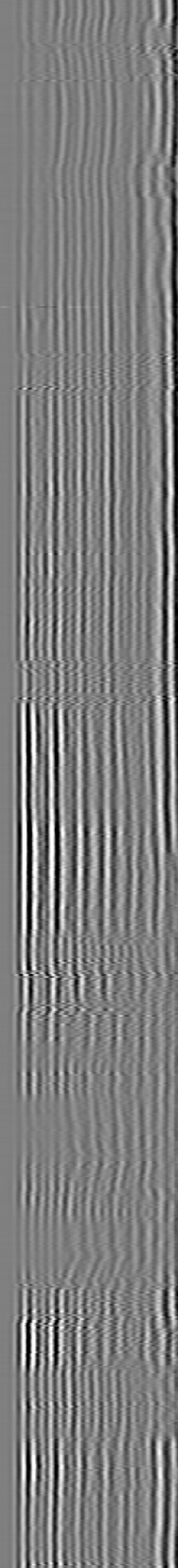
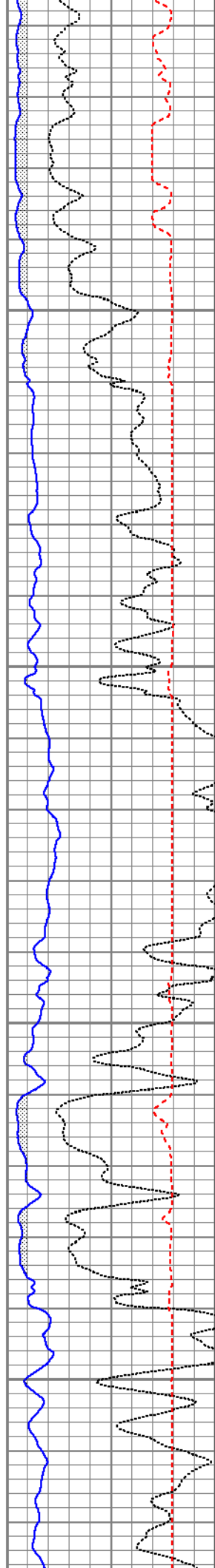


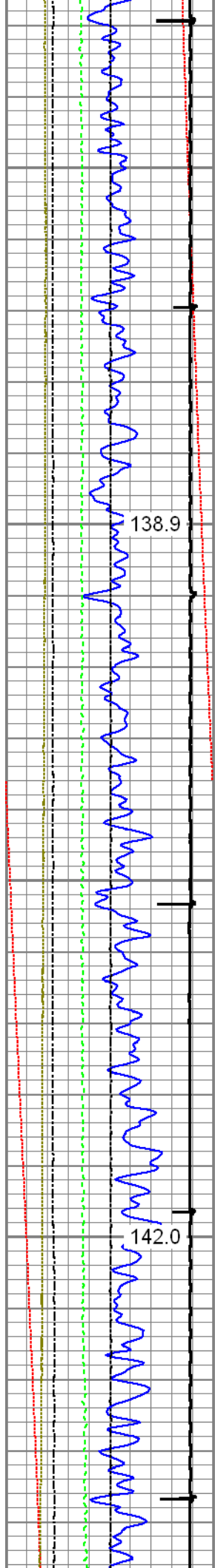




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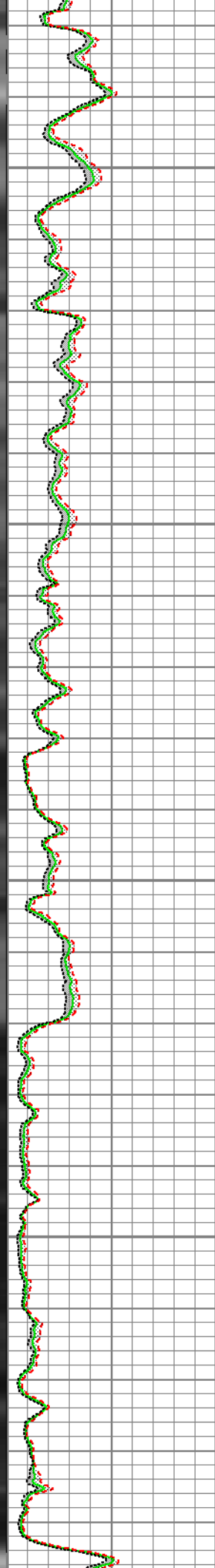
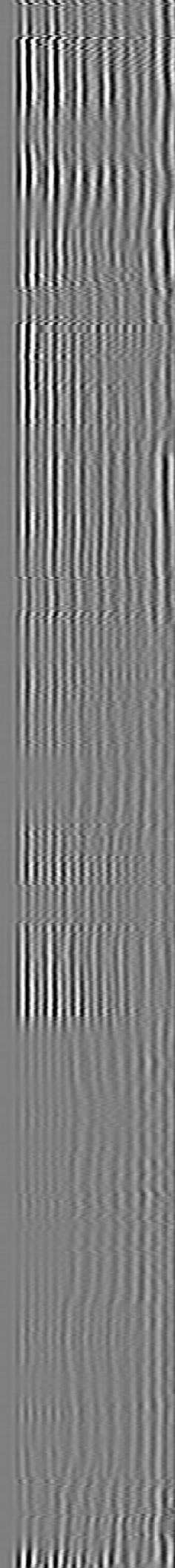
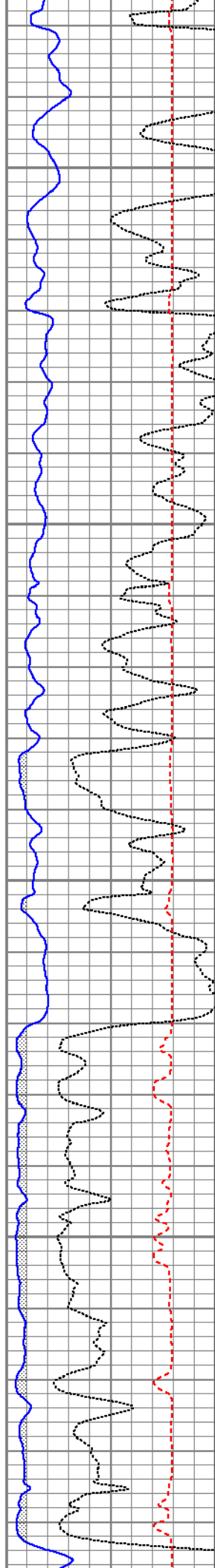
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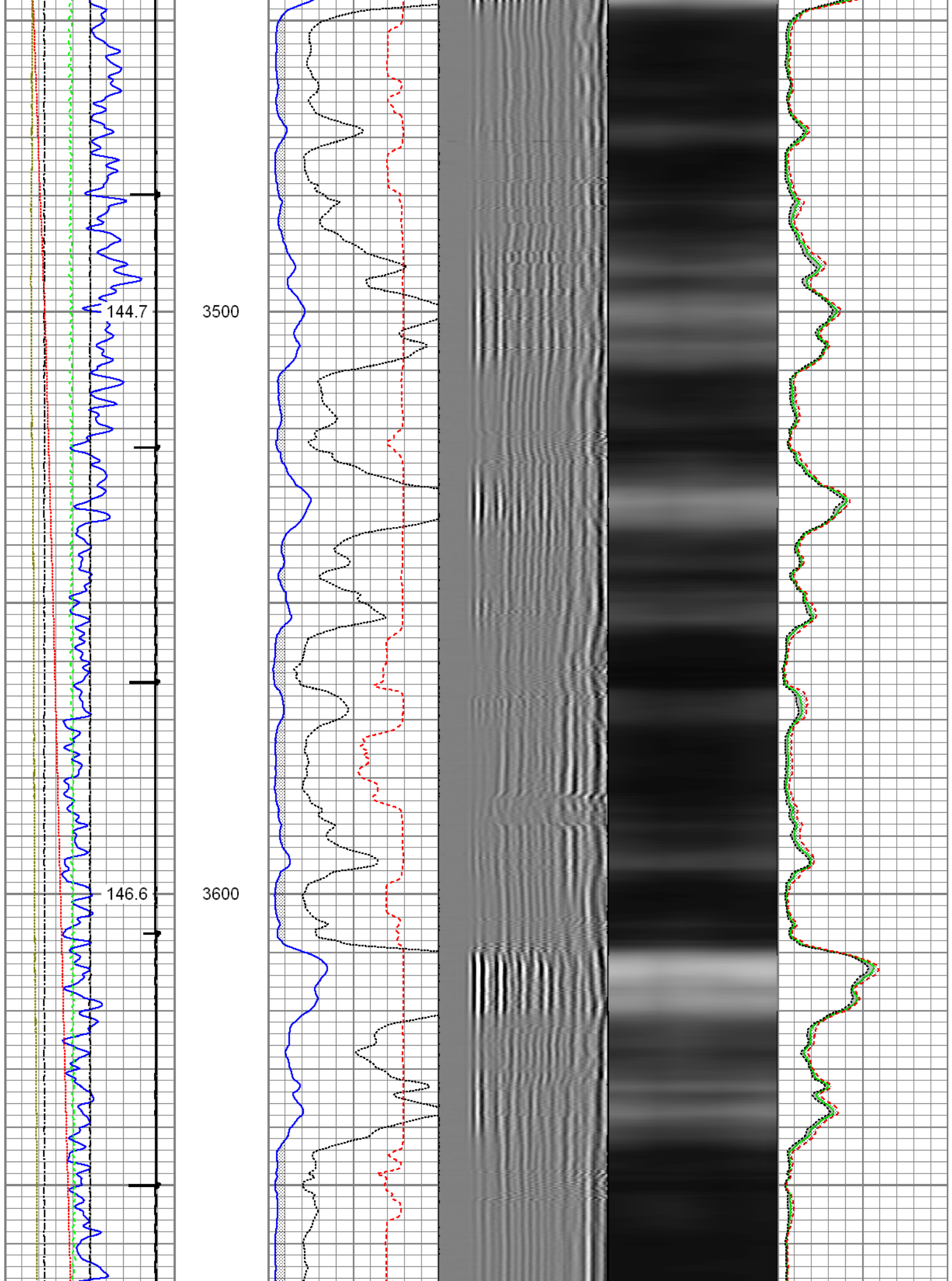


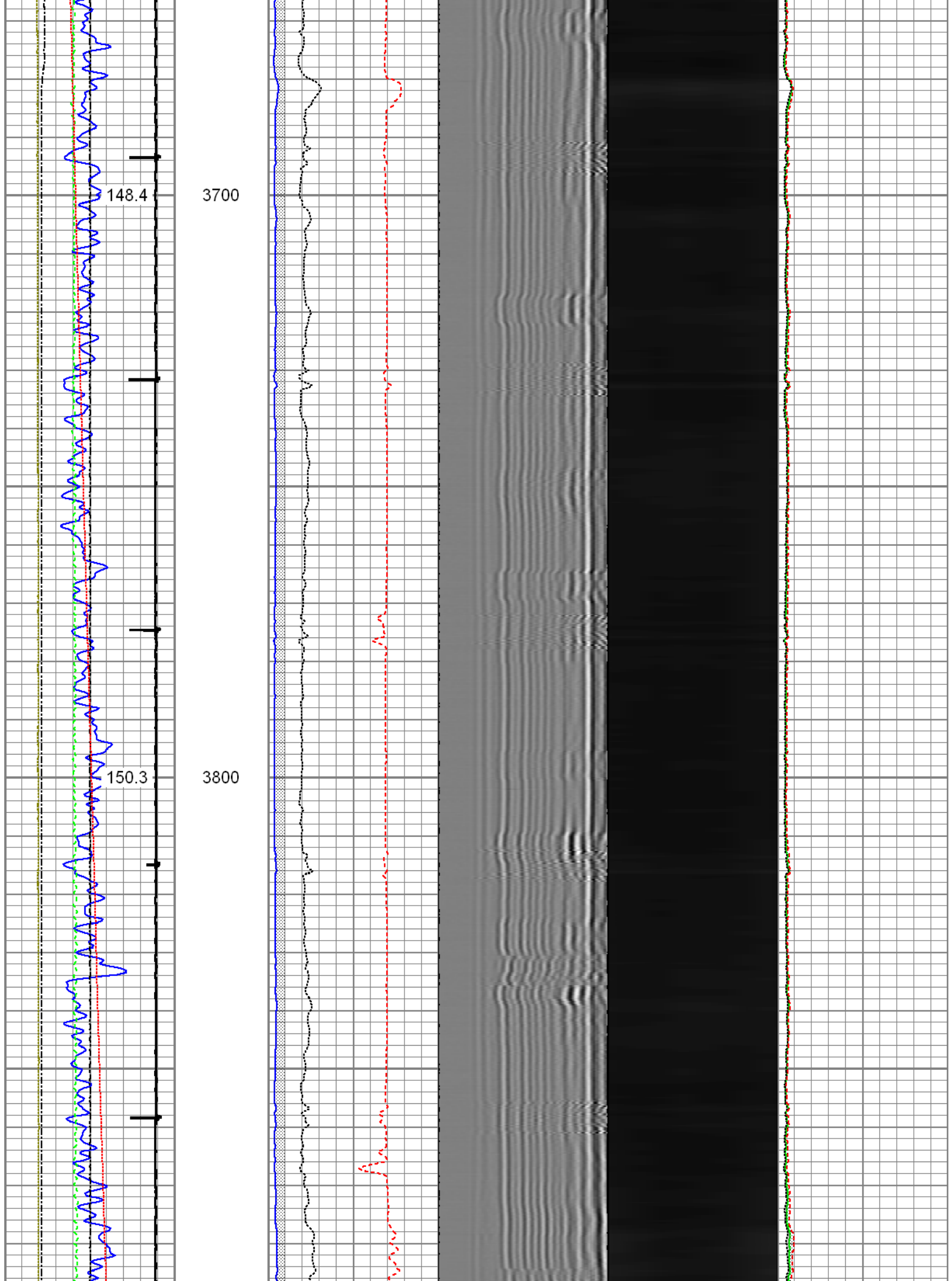


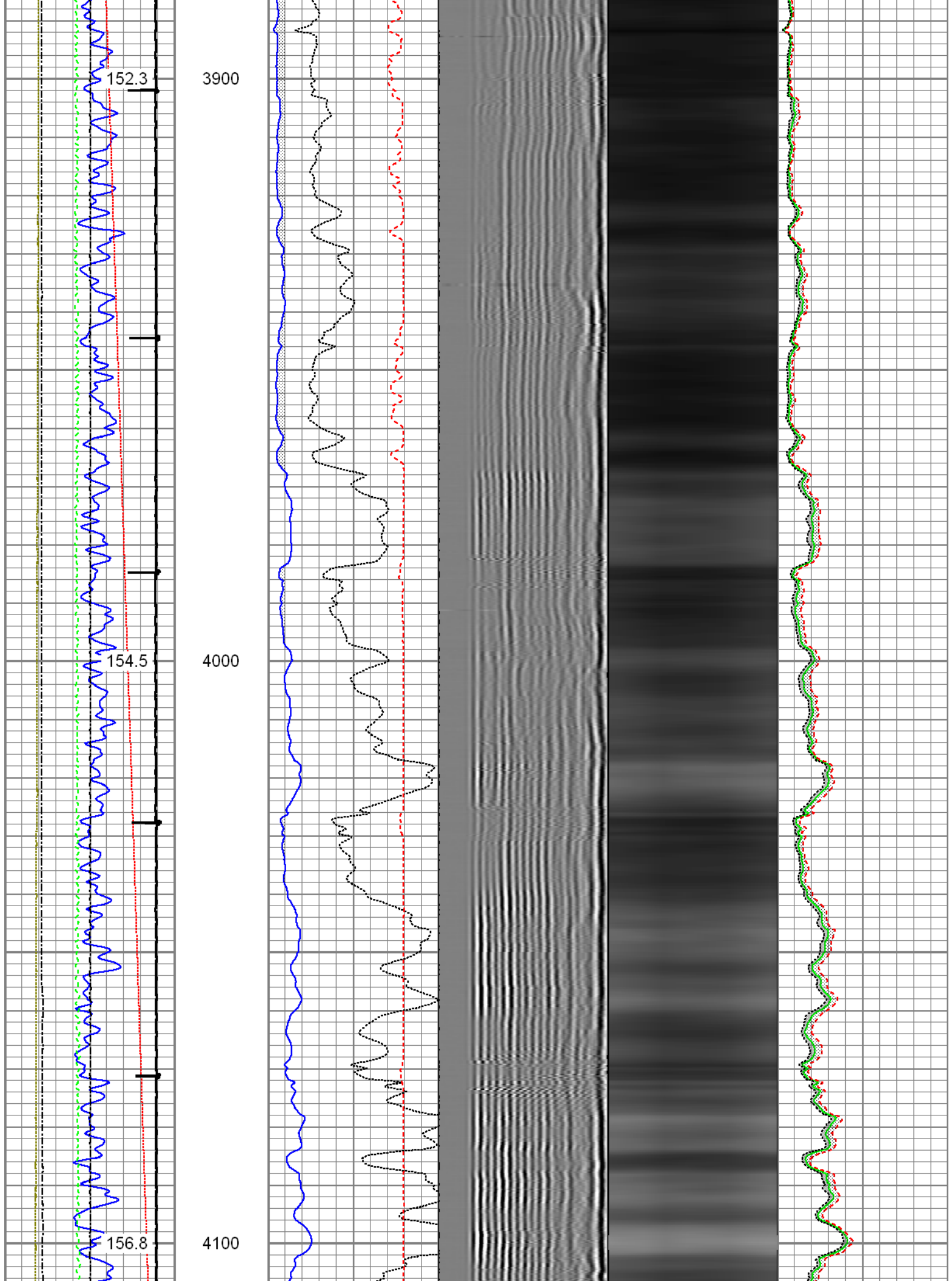
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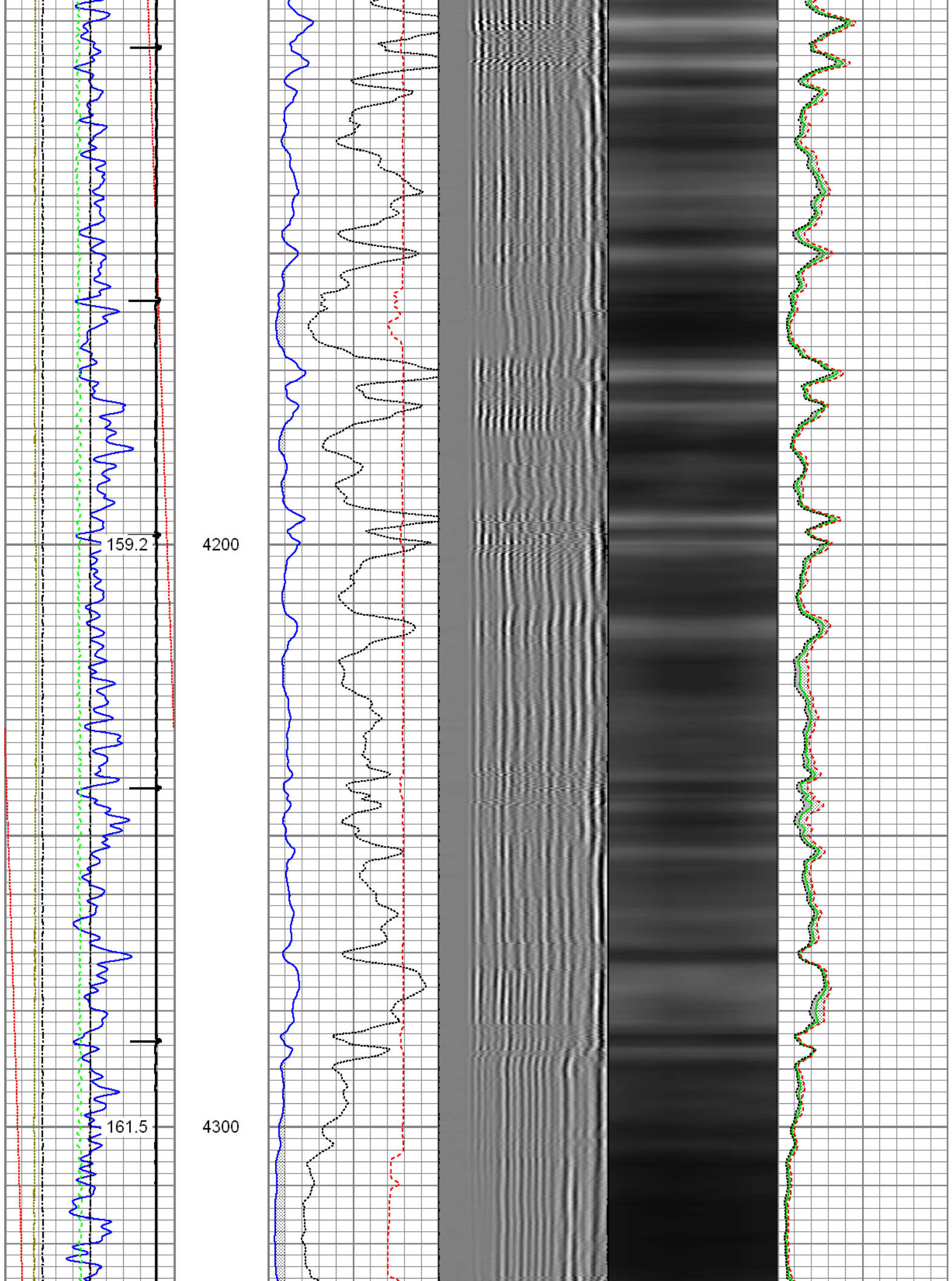
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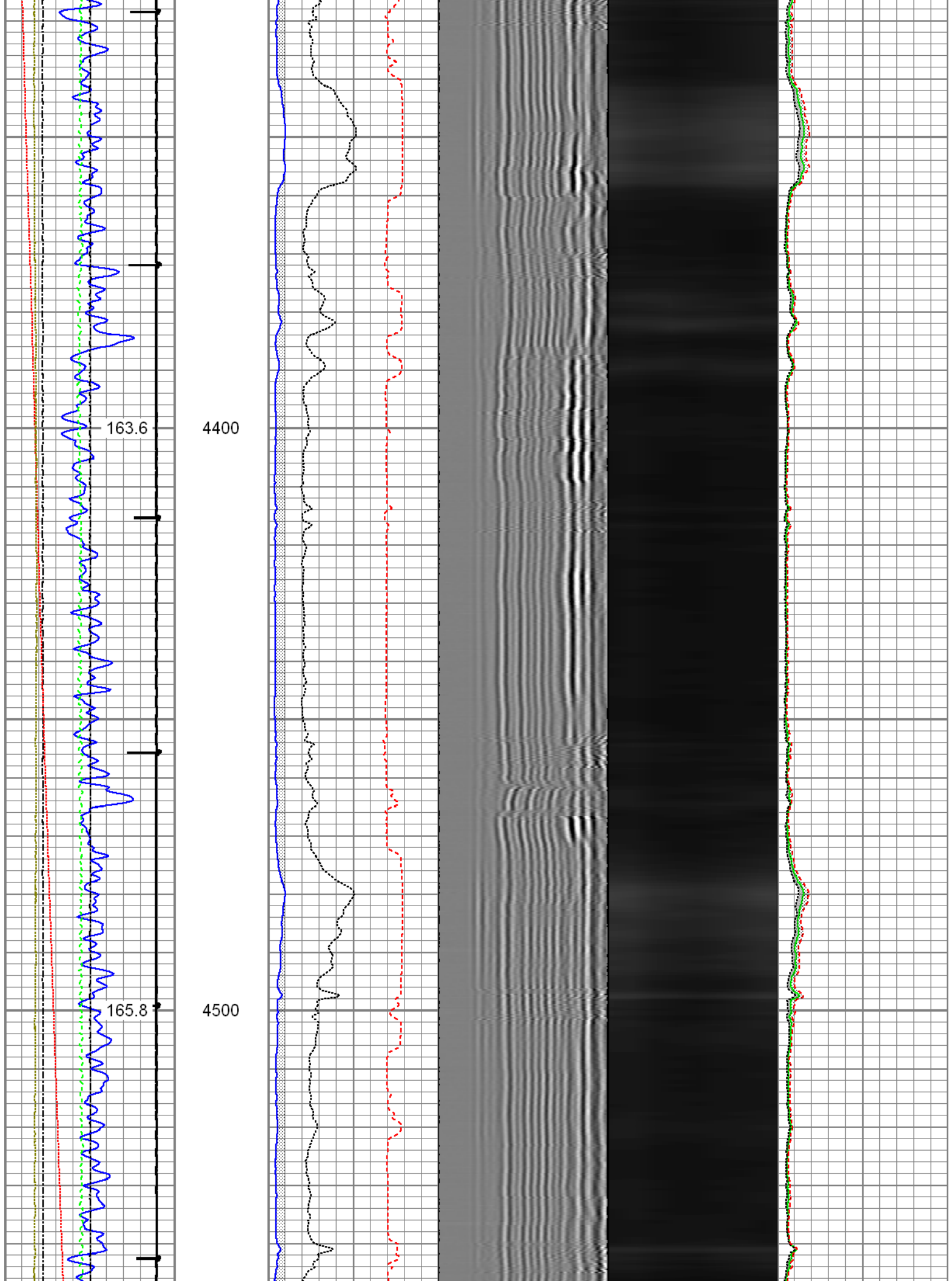


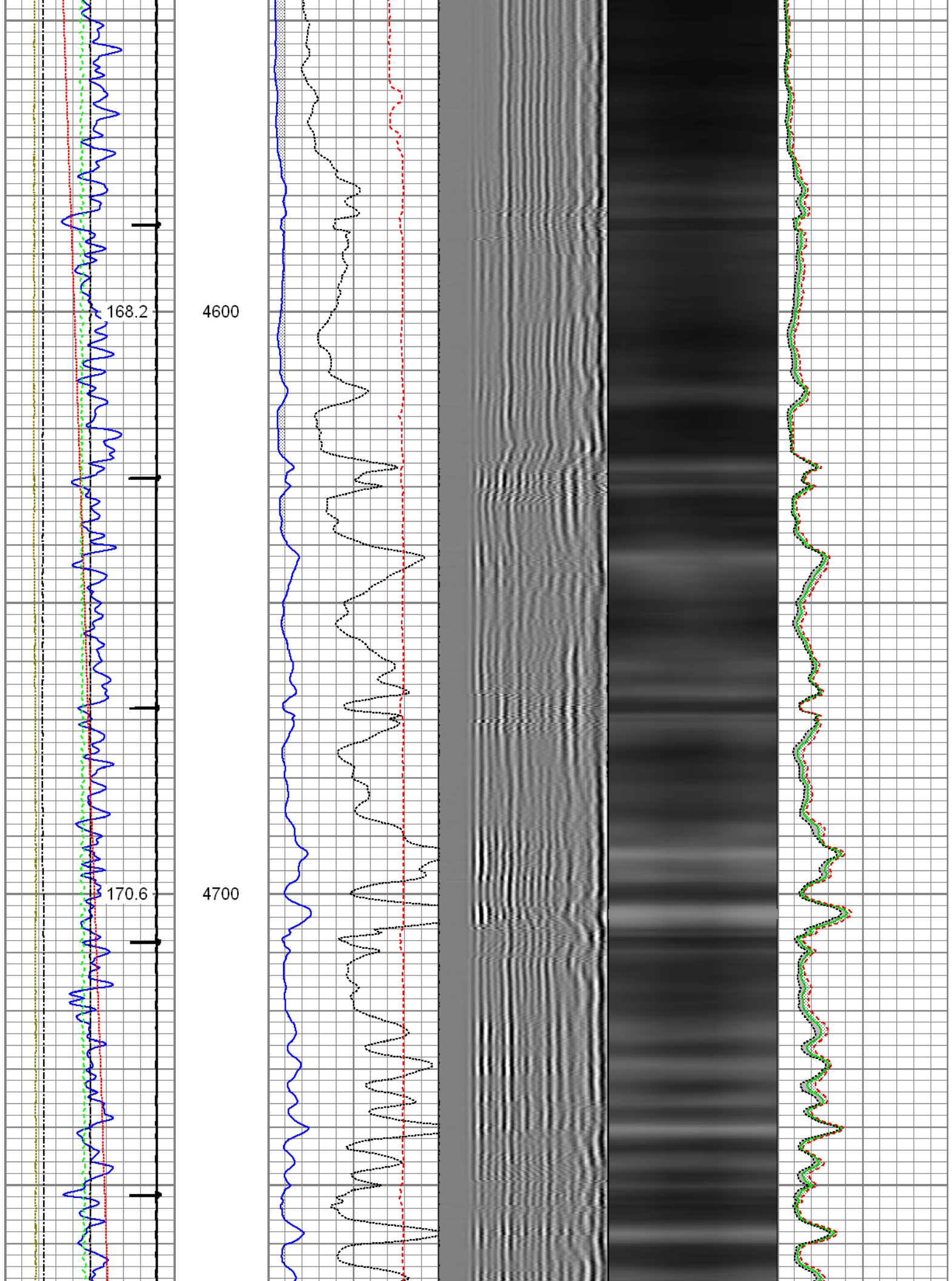


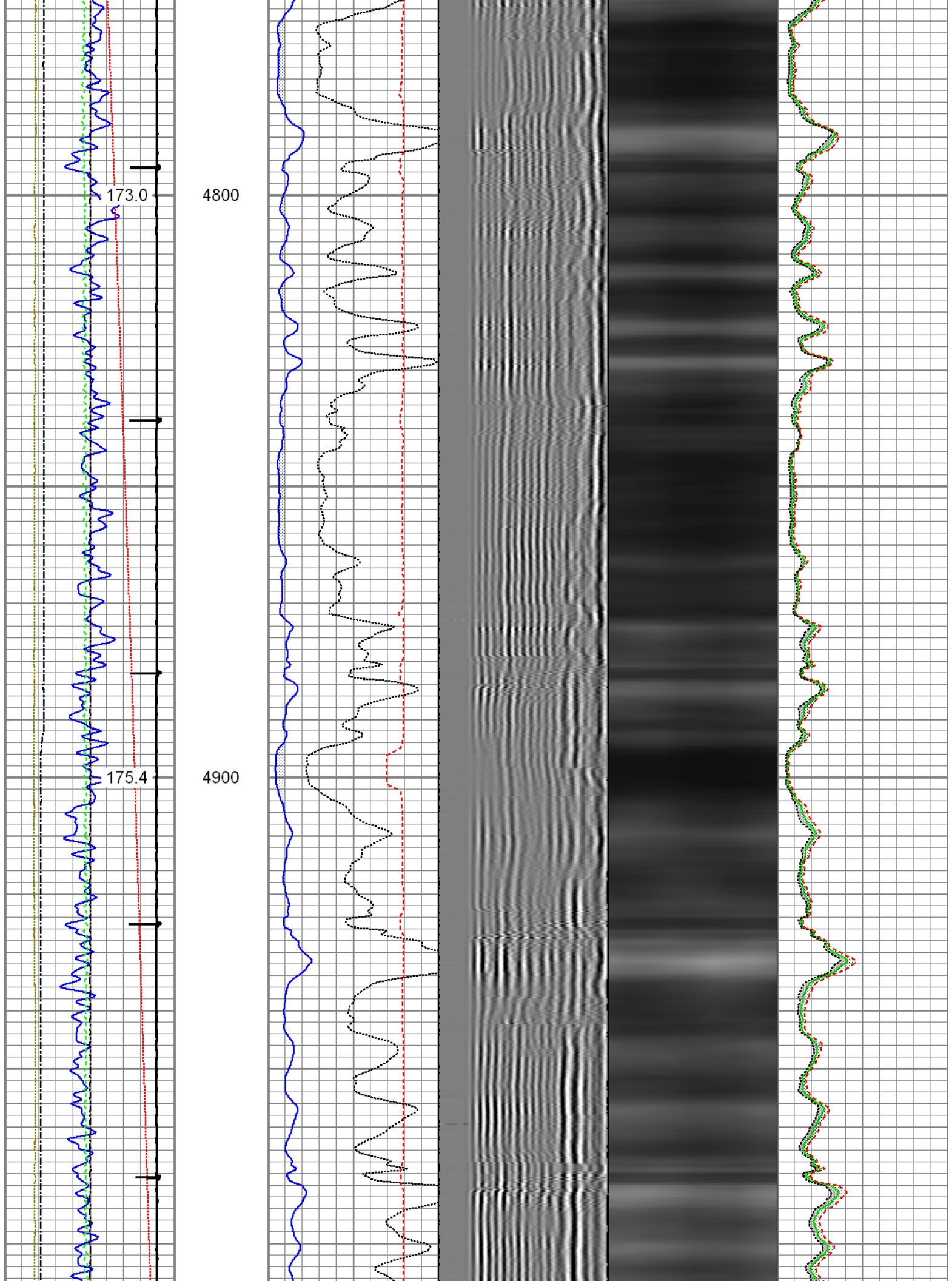


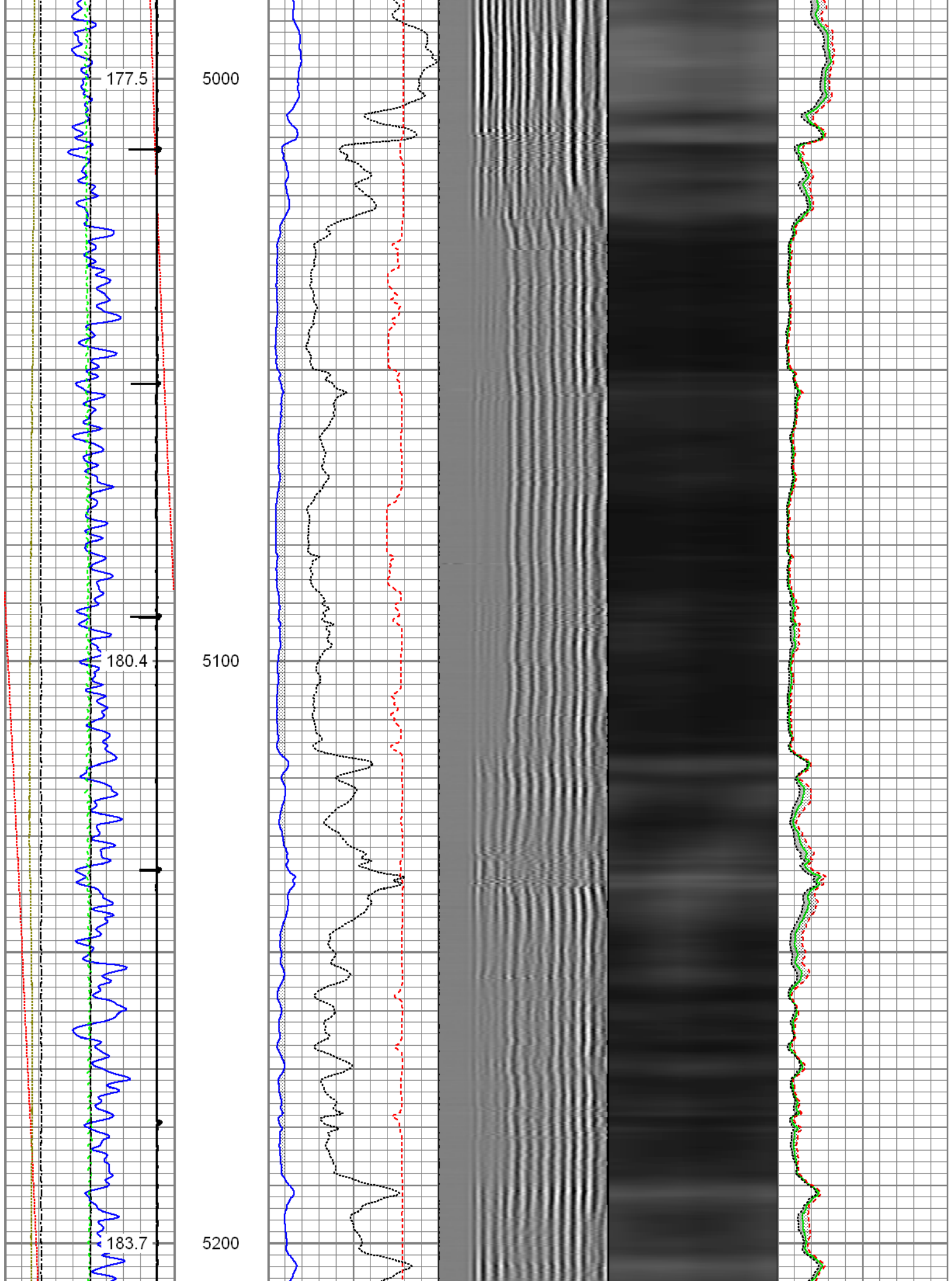


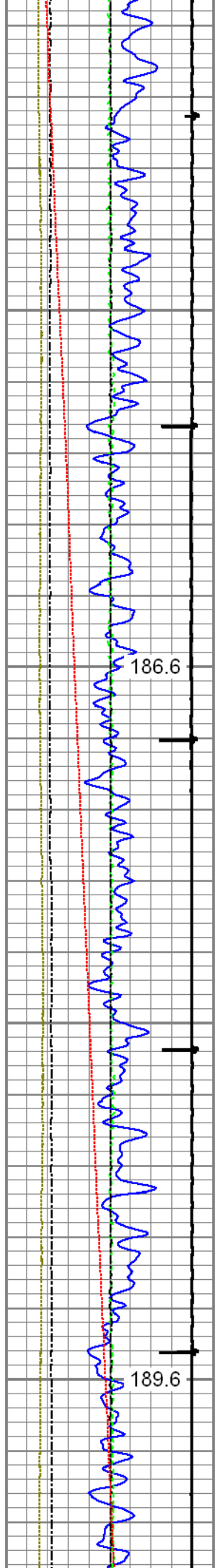






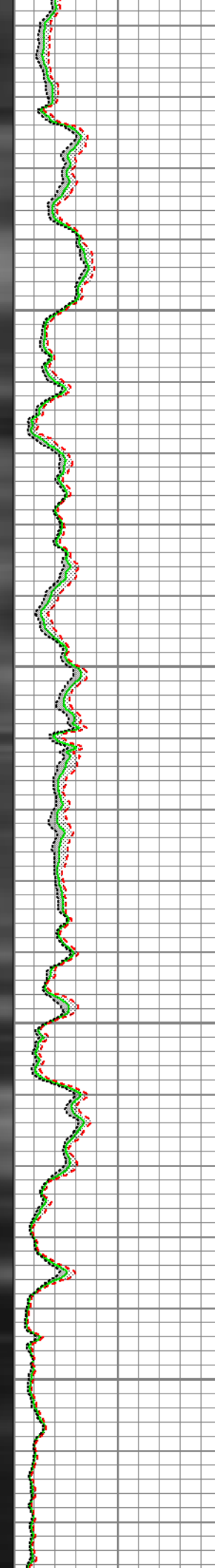
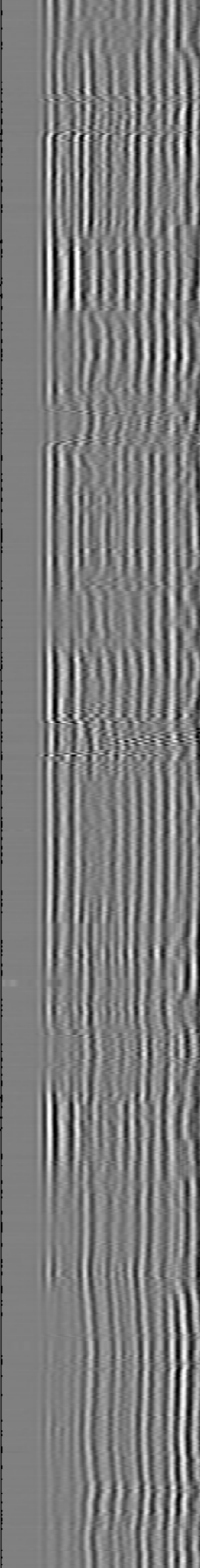
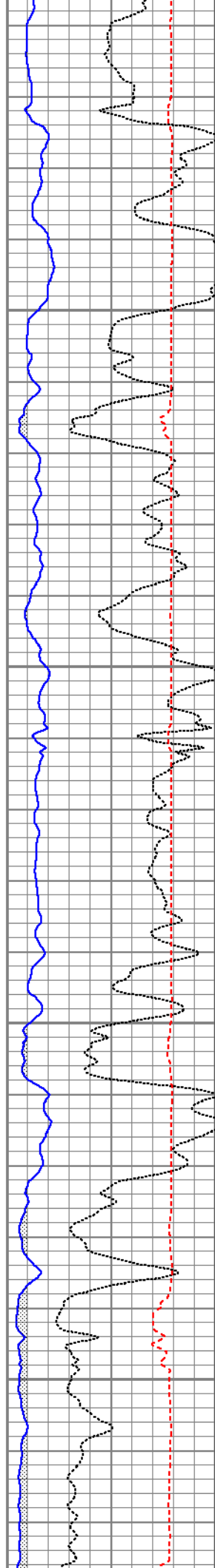


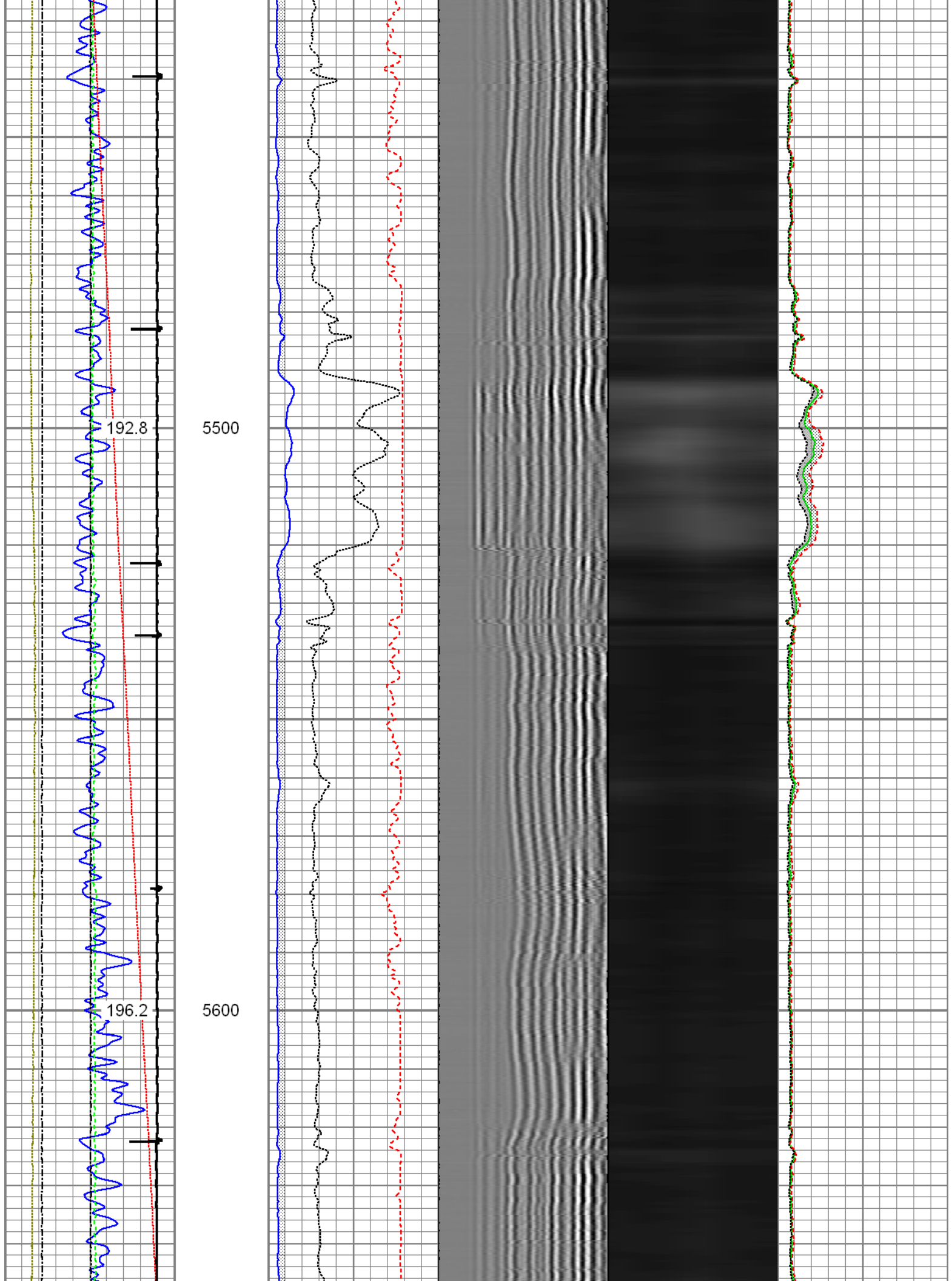


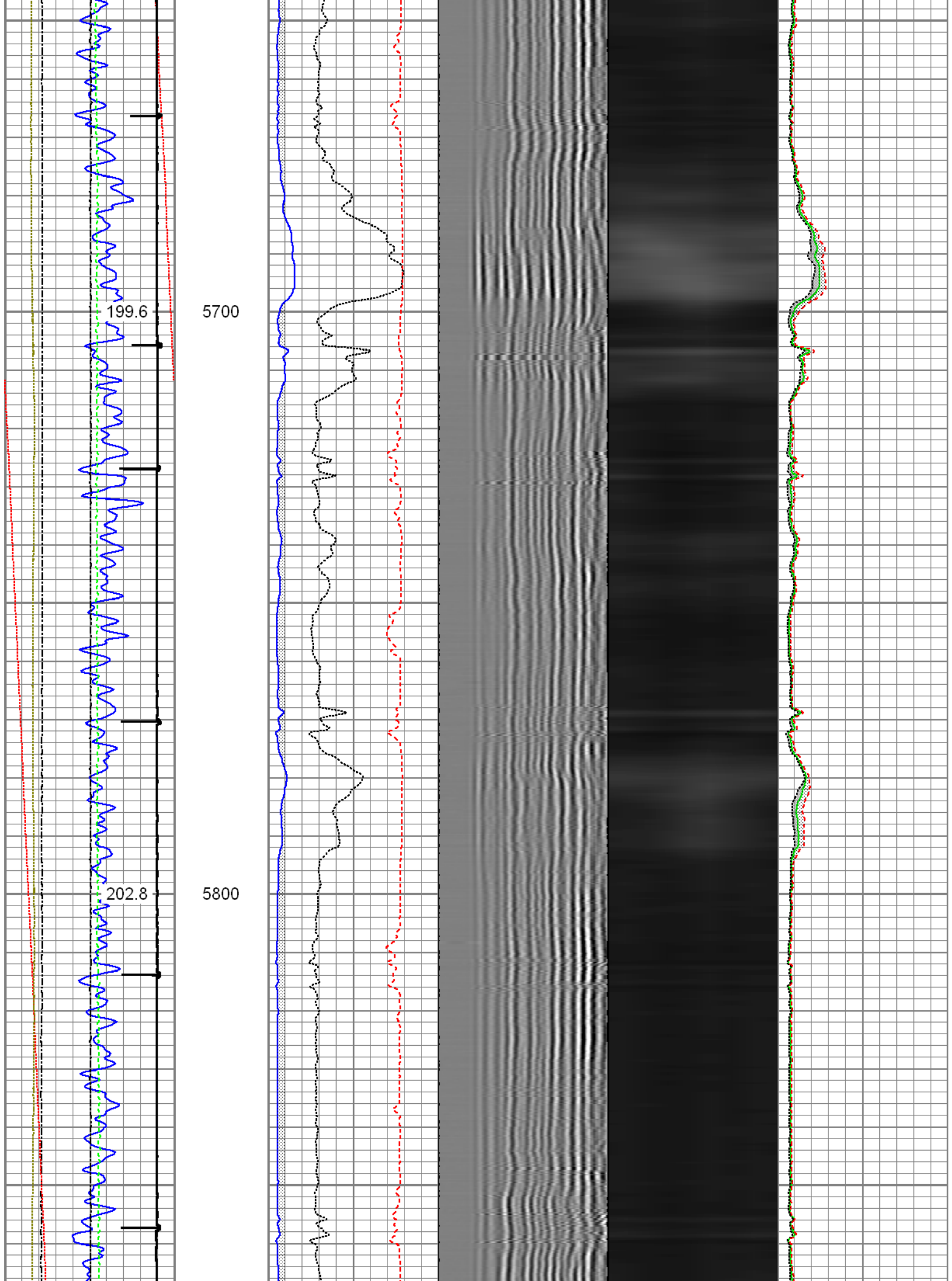


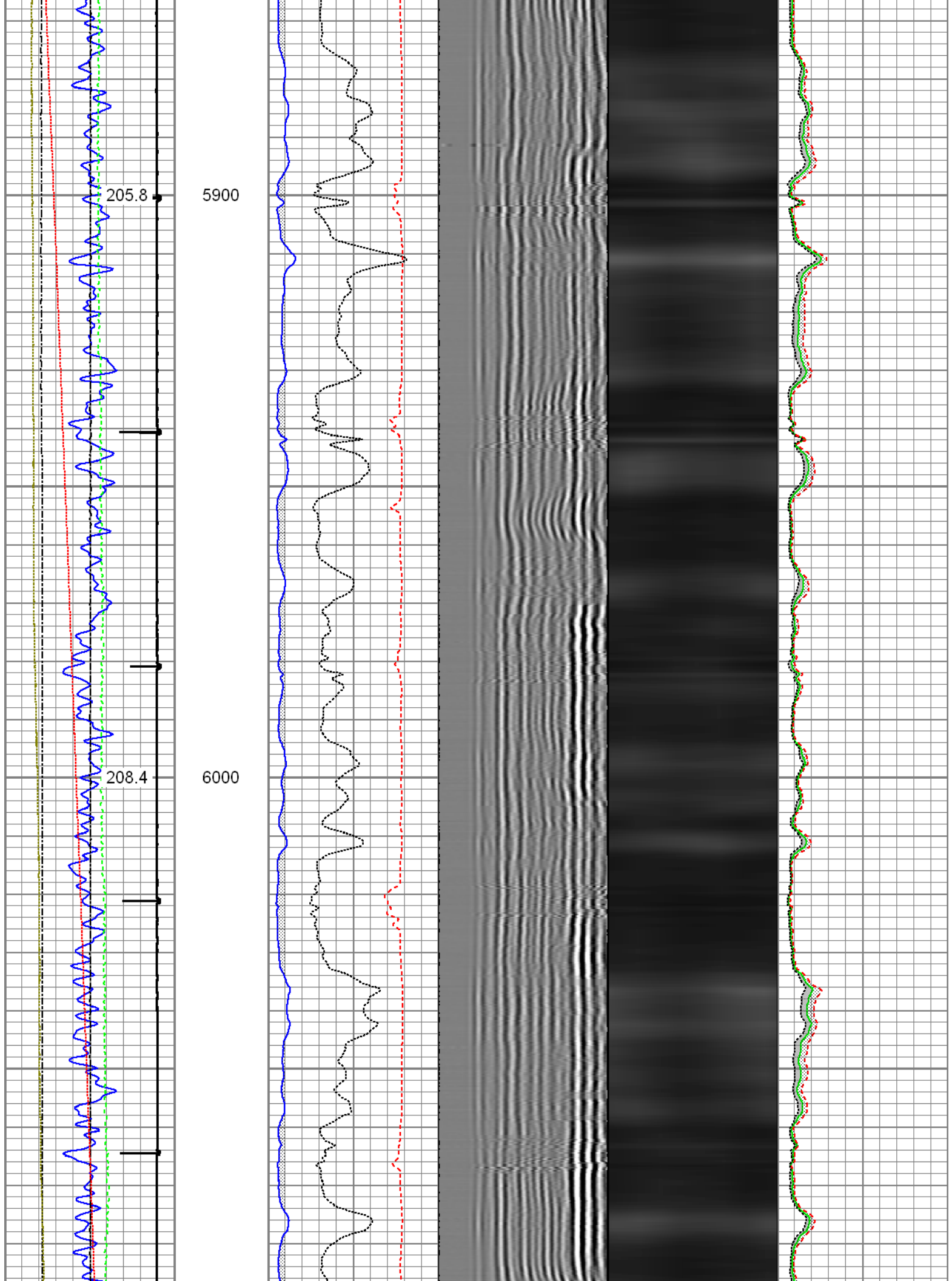
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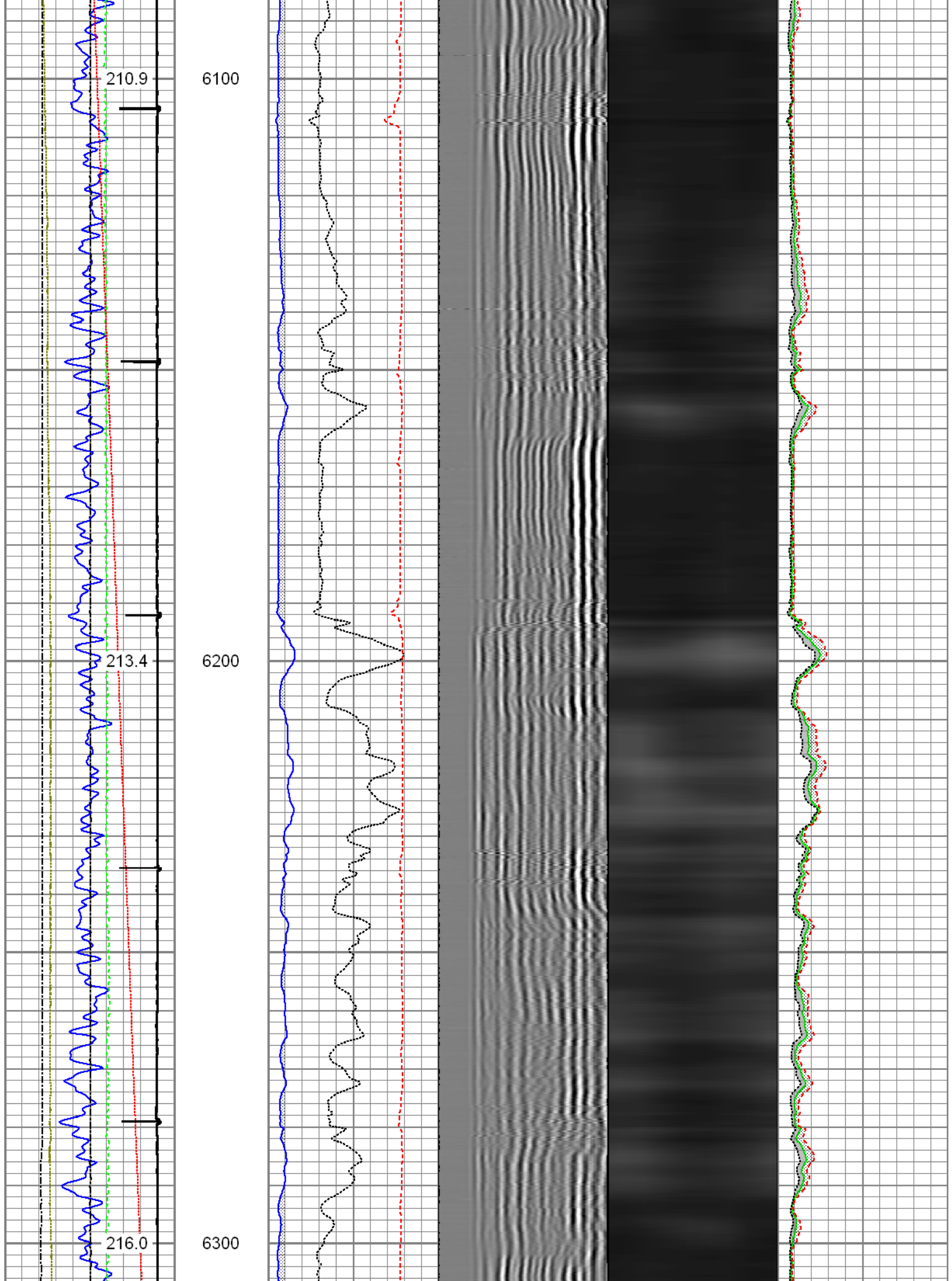
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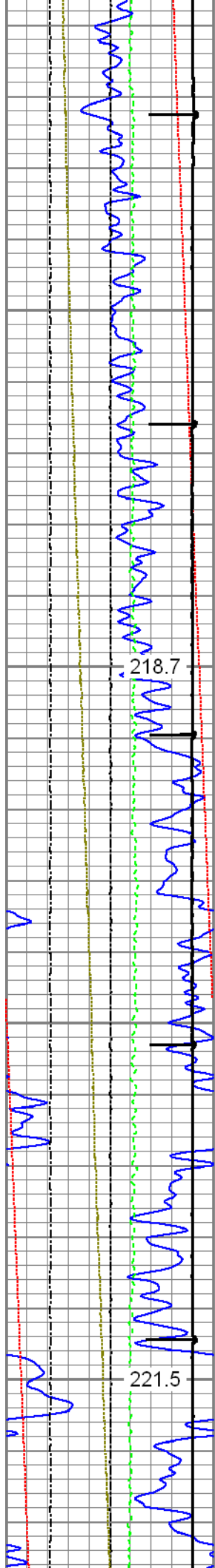










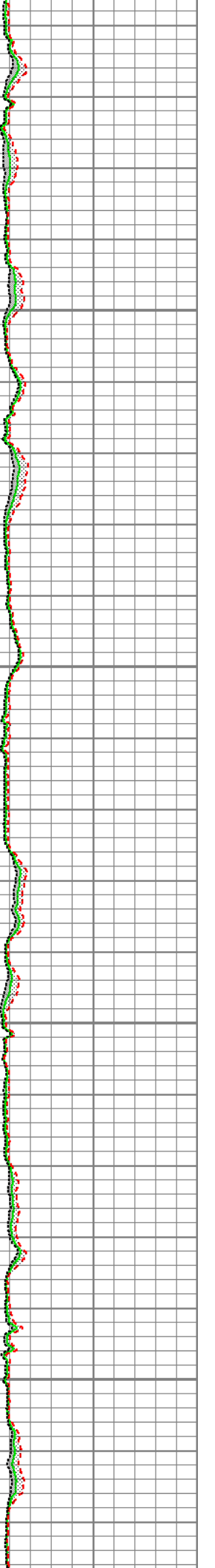
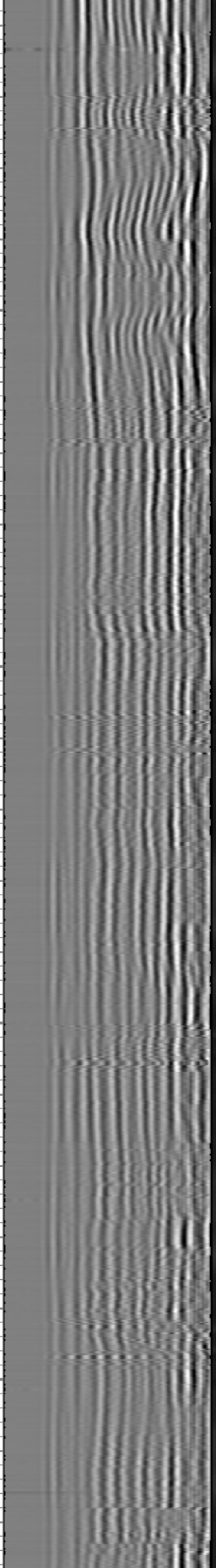
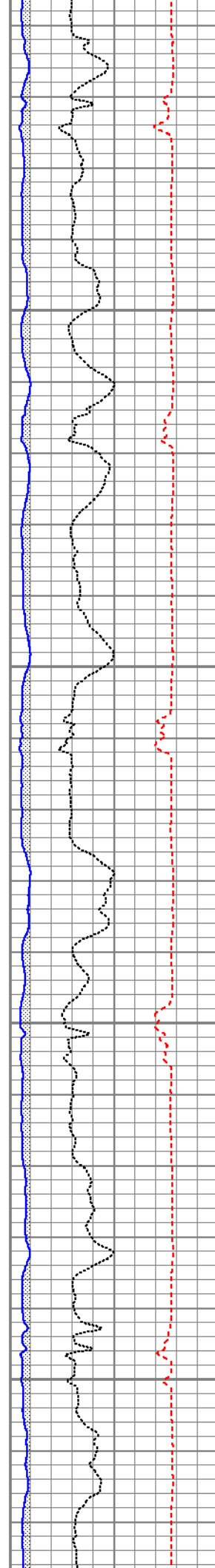


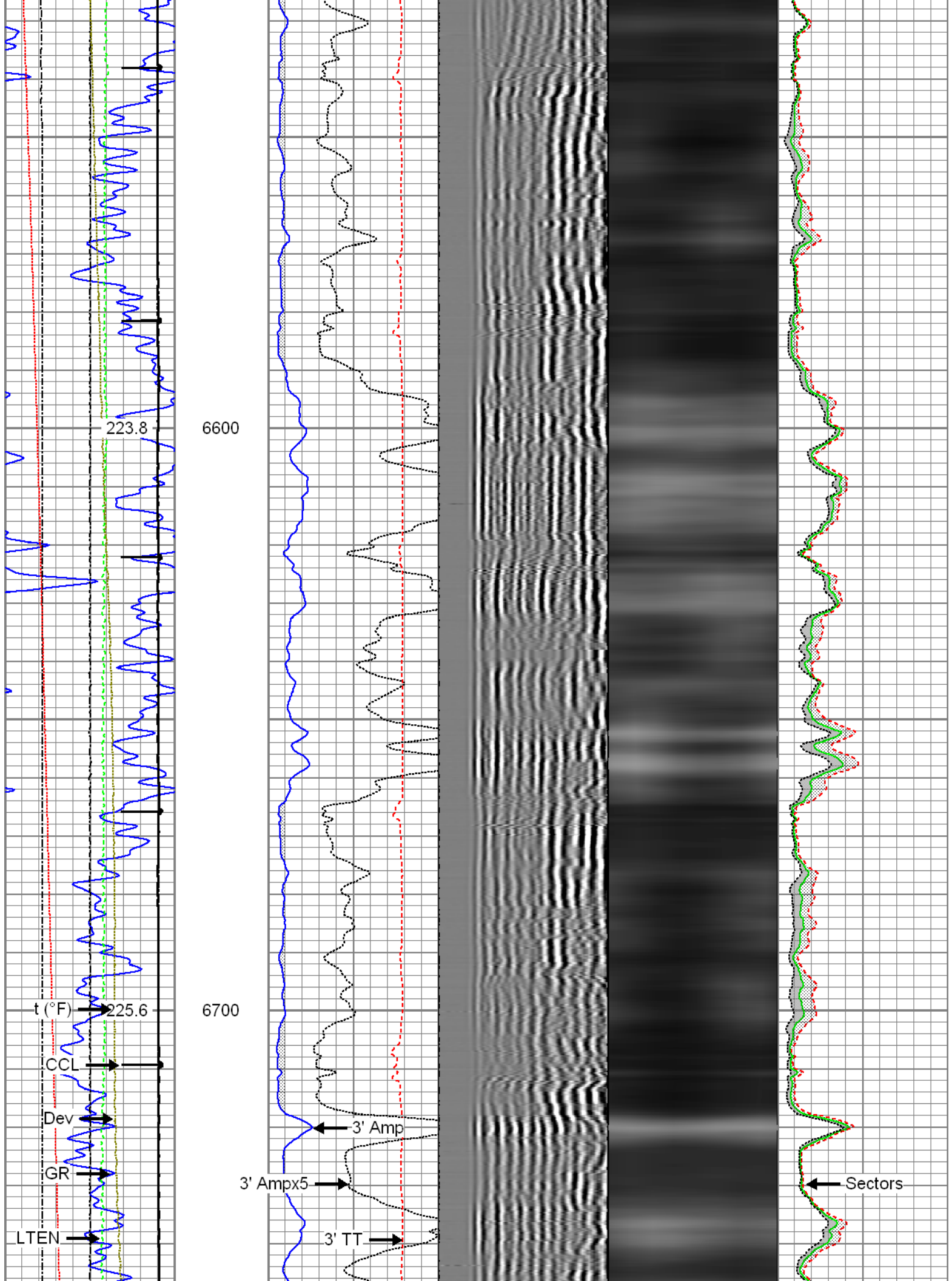
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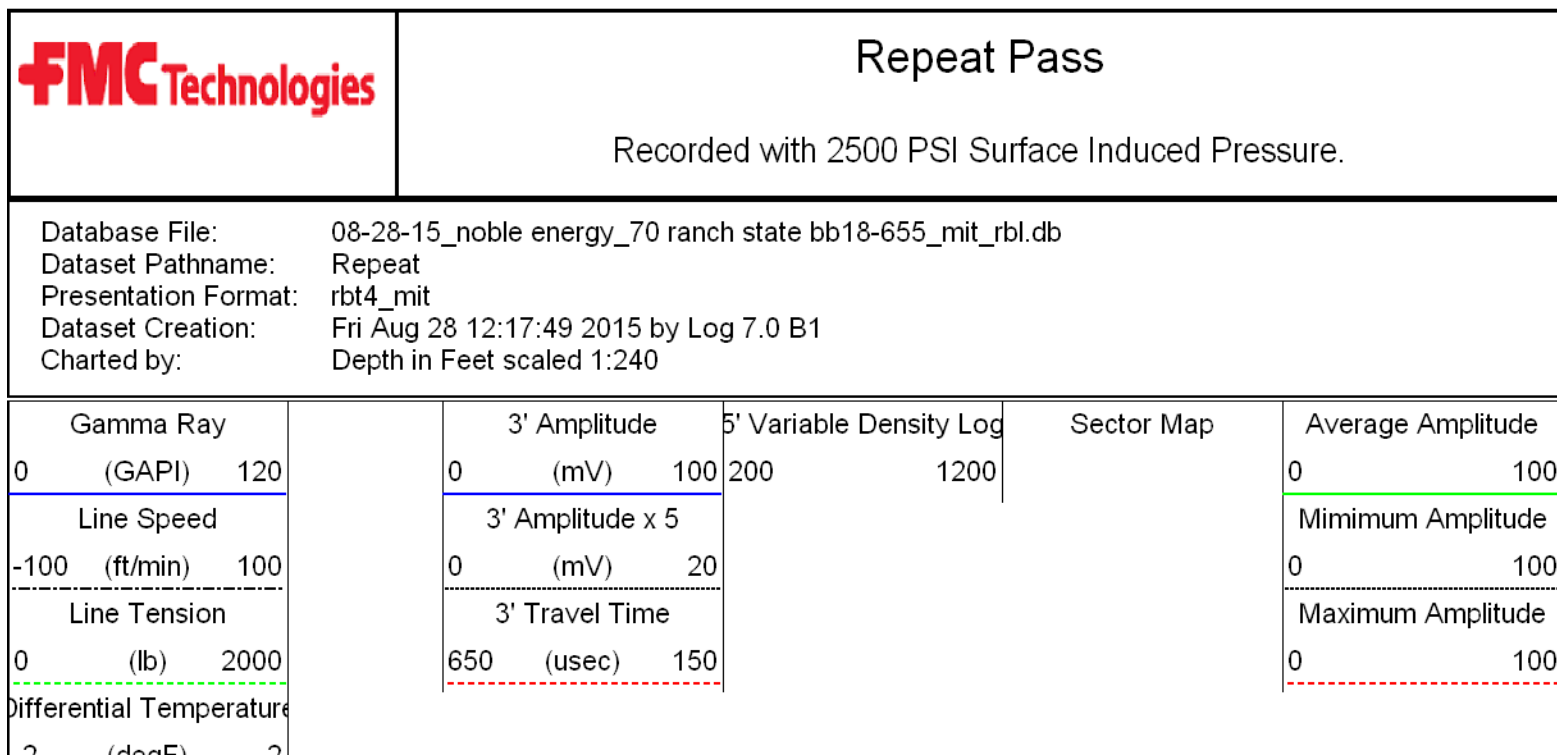
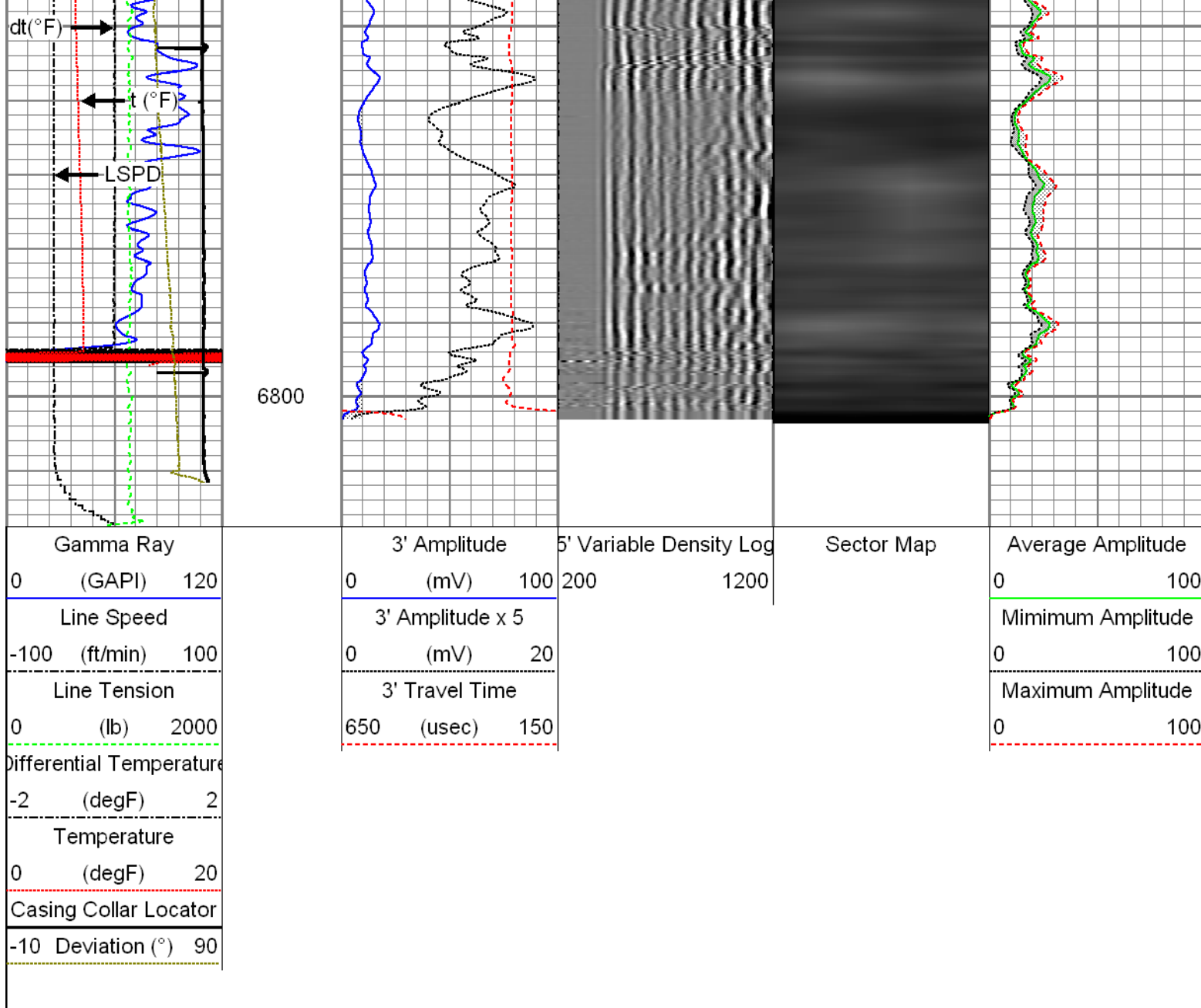
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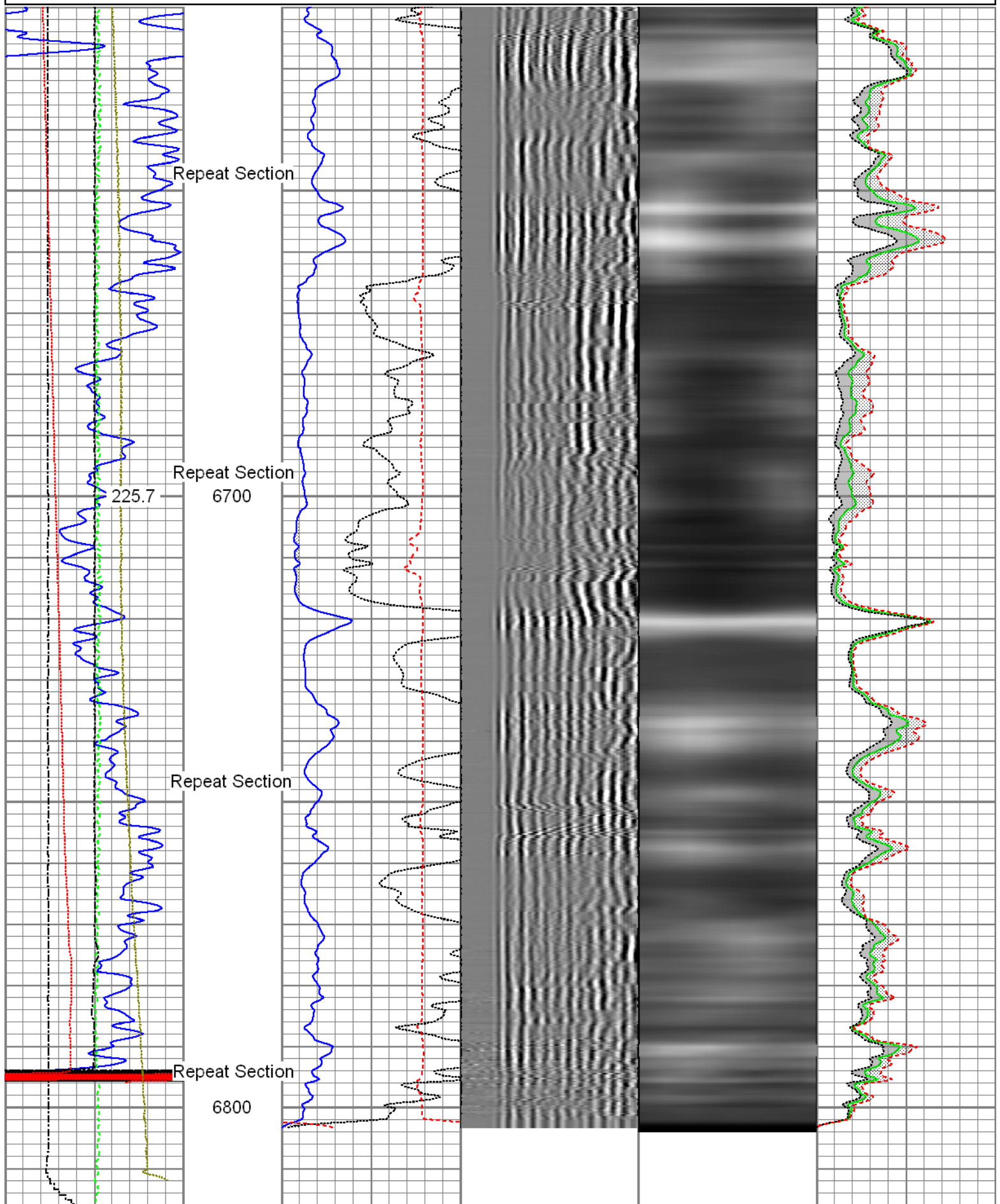
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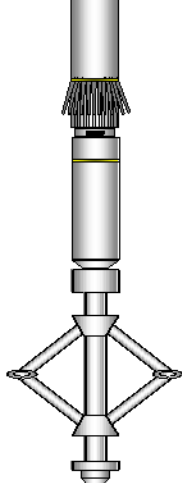


-2	(degF)	2
Temperature		
0	(degF)	20
-10	Deviation (°)	90



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 (10019371) 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 #3 -DSSRAC (082) 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 (080) 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_042 (10012912) 40 Multifinger Imaging Tool	4.54	2.75	61.10
			UW_PRC #4 -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 (031422) Sondex Ultrawire Bullnose Terminator	0.22	1.69	1.20
Dataset:		08-28-15_Noble Energy_70 Ranch State BB18-655_MIT_RBL.db: field/well/run1/Main.1				
Total Length:		28.09 ft				
Total Weight:		324.50 lb				
O.D.		3.13 in				

Calibration Report			
Database File:	08-28-15_noble energy_70 ranch state bb18-655_mit_rbl.db		
Dataset Pathname:	Repeat		
Dataset Creation:	Fri Aug 28 12:17:49 2015 by Log 7.0 B1		
Multi-finger Imaging Tool Calibration Report			
Serial Number:	10012912		
Number of Fingers:	40		
Tool Model:	UW_MIT40_042		
Inclinometer Calibration Report			
Performed:	Mon Jul 15 09:39:36 2013		
Calibration Angle:	45		
	Inc X	Inc Y	
Vertical:	1968	1974	
Finger 1 up:	1740	1744	
Finger 31 up:	2215	1741	
Finger 21 up:	2205	2224	
Finger 11 up:	1731	2217	
Sensitivity ratio:	0.992868		
X-axis angle:	134.307		
Deviation const.:	335.589		

Finger Calibration Report						
Performed:			Fri Aug 28 11:21:01 2015			
Ring size:	4	5	6	7		
(in)						
	Sens	Sens	Sens	Sens		
Finger 01:	1042 370.0	1412 390.0	1802 407.0	2209		
Finger 02:	1166 379.0	1545 389.0	1934 400.0	2334		
Finger 03:	1041 389.0	1430 410.0	1840 428.0	2268		
Finger 04:	1096 381.0	1477 398.0	1875 417.0	2292		
Finger 05:	1108 391.0	1499 404.0	1903 416.0	2319		
Finger 06:	1093 406.0	1499 404.0	1903 414.0	2317		
Finger 07:	1041 389.0	1430 405.0	1835 414.0	2249		
Finger 08:	1123 390.0	1513 404.0	1917 414.0	2331		
Finger 09:	1074 395.0	1469 403.0	1872 408.0	2280		
Finger 10:	1065 388.0	1453 401.0	1854 409.0	2263		
Finger 11:	1161 399.0	1560 407.0	1967 408.0	2375		
Finger 12:	1060 383.0	1443 400.0	1843 407.0	2250		
Finger 13:	1089 383.0	1472 396.0	1868 397.0	2265		
Finger 14:	1070 390.0	1460 406.0	1866 409.0	2275		

Finger 14:	1070	390.0	1480	406.0	1868	409.0	2275
Finger 15:	1024	394.0	1418	420.0	1838	423.0	2261
Finger 16:	1053	394.0	1447	422.0	1869	426.0	2295
Finger 17:	949	370.0	1319	403.0	1722	421.0	2143
Finger 18:	1080	376.0	1456	399.0	1855	401.0	2256
Finger 19:	1068	382.0	1450	409.0	1859	411.0	2270
Finger 20:	1026	379.0	1405	415.0	1820	424.0	2244
Finger 21:	1030	385.0	1415	414.0	1829	414.0	2243
Finger 22:	1003	384.0	1387	418.0	1805	427.0	2232
Finger 23:	1006	387.0	1393	426.0	1819	439.0	2258
Finger 24:	1050	382.0	1432	406.0	1838	404.0	2242
Finger 25:	978	382.0	1360	422.0	1782	437.0	2219
Finger 26:	1108	370.0	1478	393.0	1871	400.0	2271
Finger 27:	1042	377.0	1419	411.0	1830	421.0	2251
Finger 28:	1093	368.0	1461	398.0	1859	421.0	2280
Finger 29:	1000	379.0	1379	415.0	1794	431.0	2225
Finger 30:	1036	377.0	1413	405.0	1818	424.0	2242
Finger 31:	1092	383.0	1475	397.0	1872	412.0	2284
Finger 32:	1023	385.0	1408	411.0	1819	431.0	2250
Finger 33:	1175	373.0	1548	384.0	1932	387.0	2319
Finger 34:	1050	362.0	1412	391.0	1803	415.0	2218
Finger 35:	1041	384.0	1425	421.0	1846	433.0	2279
Finger 36:	1036	378.0	1414	405.0	1819	428.0	2247
Finger 37:	1122	382.0	1504	395.0	1899	411.0	2310
Finger 38:	1151	375.0	1526	388.0	1914	397.0	2311
Finger 39:	1170	368.0	1538	385.0	1923	397.0	2320
Finger 40:	1073	380.0	1453	400.0	1853	416.0	2269

Segmented Cement Bond Log Calibration Report

Serial Number:	10022773
Tool Model:	UW_RBT_004
Calibration Casing Diameter:	7.000 in
Calibration Depth:	486.699 ft


Master Calibration, performed Fri Aug 28 08:07:08 2015:							
	Raw (v)		Calibrated (mv)		Results		
	Zero	Cal	Zero	Cal	Gain	Offset	
3FT	0.002	0.565	0.800	62.200	109.182	0.533	
5FT	-0.001	0.490	0.800	62.200	124.908	0.952	
S1	0.002	0.534	0.000	100.000	188.180	-0.459	
S2	0.001	0.538	0.000	100.000	186.449	-0.228	
S3	0.002	0.526	0.000	100.000	191.045	-0.466	
S4	0.002	0.529	0.000	100.000	189.415	-0.294	
S5	0.002	0.564	0.000	100.000	178.149	-0.435	
S6	0.001	0.575	0.000	100.000	174.280	-0.213	
S7	0.002	0.572	0.000	100.000	175.591	-0.422	
S8	0.002	0.553	0.000	100.000	181.235	-0.303	

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			52222.00	cps	320.00 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:	10019371			
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	70 Ranch State BB18-655
	Field	Wattenberg
	County	Weld
	State	Colorado