

Radial Cement Bond Gamma Ray Casing Collar Log

Company	Kerr-McGee Oil & Gas Onshore, L.P.				
Well	Buffalo 13N-15HZ				
Field	Wattenberg				
County	Weld				
State	Colorado				
Company	Company	Kerr-McGee Oil & Gas Onshore, L.P.			
Well	Well	Buffalo 13N-15HZ			
Field	Field	Wattenberg			
County	County	Weld	State	Colorado	
Location:	API # : 05-123-36461		Other Services Gauge Ring MIT		
SEC 15 TWP 1N RGE 68W			Elevation		
Permanent Datum	Ground Level	Elevation	K.B. 5159'		
Log Measured From	Kelly Bushing	20 FT	D.F. 5158'		
Drilling Measured From	Kelly Bushing		G.L. 5139'		

Date	11-AUG-2015
Run Number	Two
Depth Driller	12,290 FT
Depth Logger	7,720 FT
Bottom Logged Interval	7,714 FT
Top Log Interval	Surface
Open Hole Size	8.750"
Type Fluid	Water
Density / Viscosity	8.34 lbm/gal
Max. Recorded Temp.	238°F
Estimated Cement Top	Surface
Time Well Ready	ROA
Time Logger on Bottom	1:45 P.M.
Equipment Number	HD-0119
Location	Ft. Lupton, CO
Recorded By	A. Olmsted
Witnessed By	Steve Vigil

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	1,322 FT		
Intermediate #1	7	26	HCP 110 LTC	Surface	8,150 FT		
Intermediate #2							
Liner	4 1/2	11.6	P-110 LTC/DOX	7,115 FT	12,290 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.

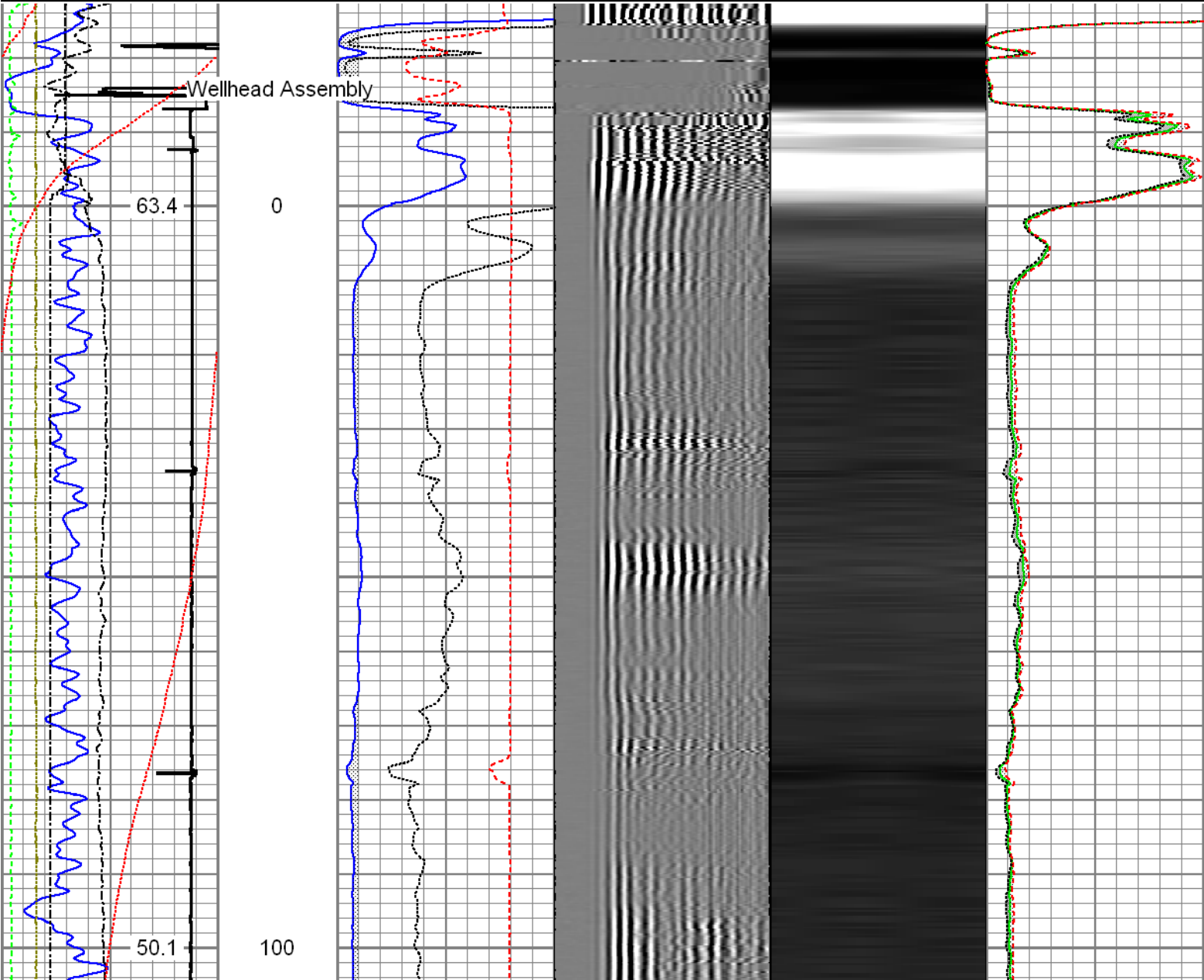
Comments

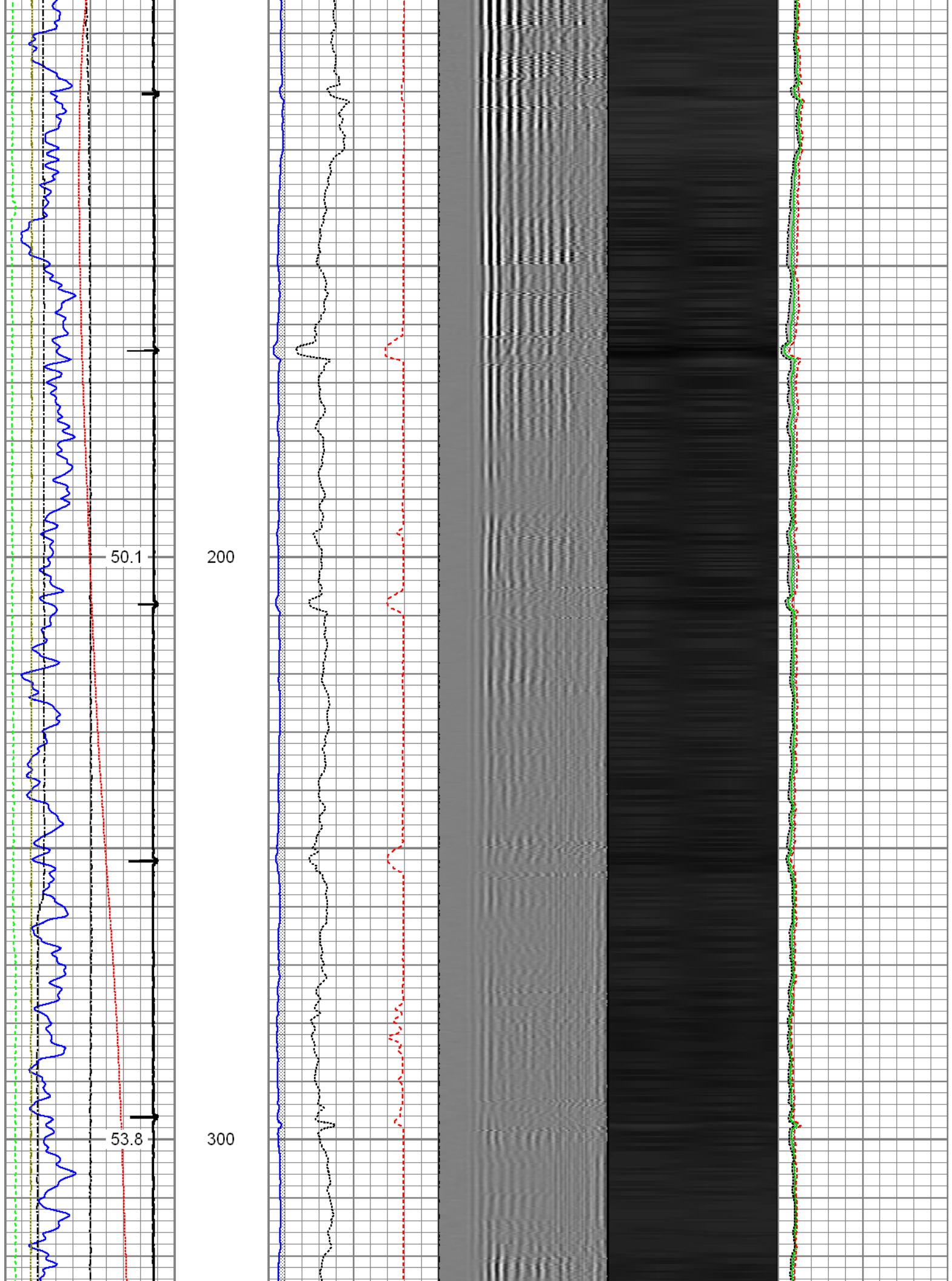
Log ran as per customer request
Depth referenced to casing tally reported liner top at 7,115 FT
Adjusted -38 FT to correlate to liner top
Gauge Ring/Junk Basket ran to 7,720 FT
Log ran from as deep as possible in heel to surface
Log ran with 2800 PSI surface induced pressure
Logging tools were clean and free of debris upon completion of operations

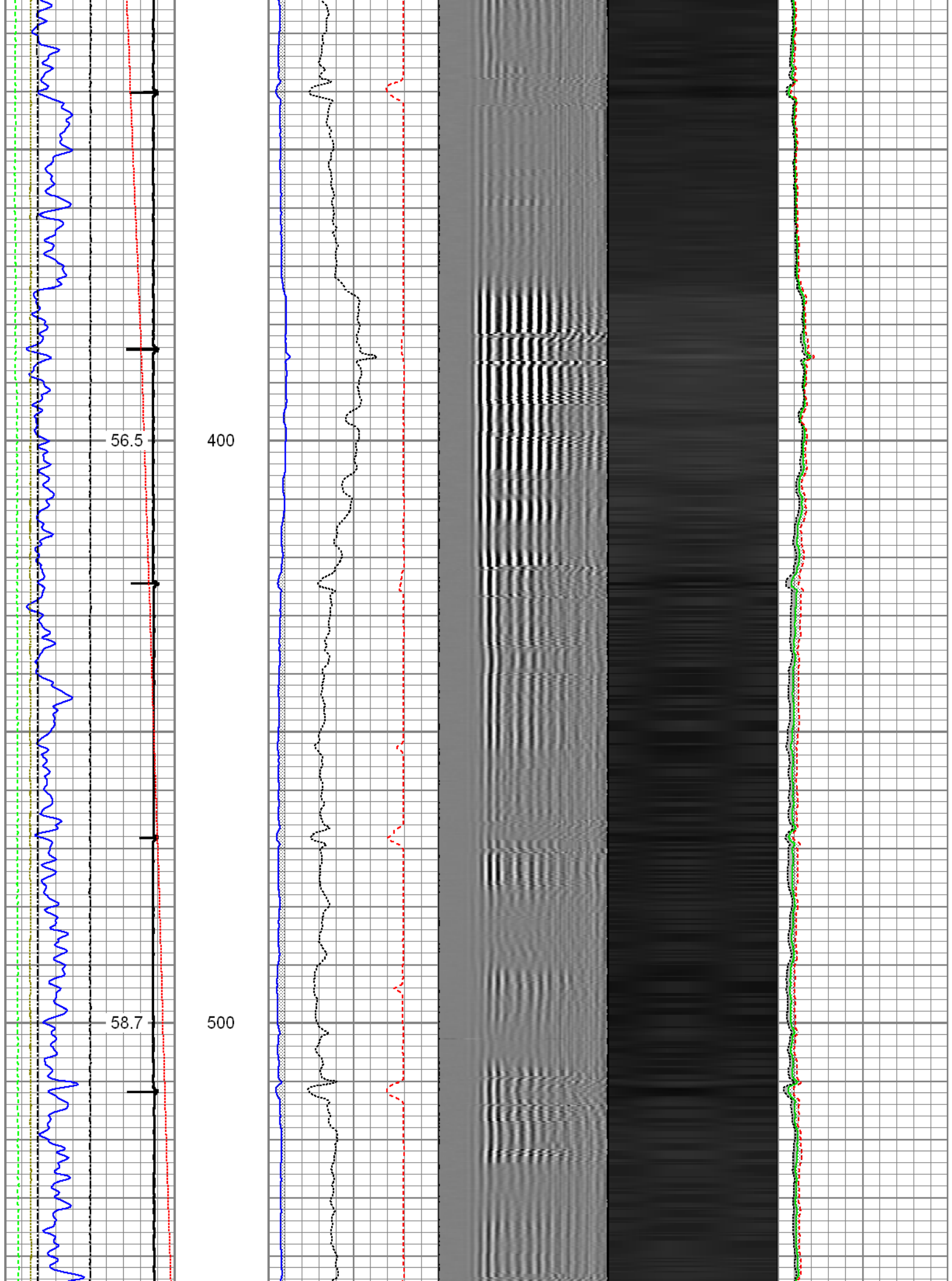
Thank you for choosing FMC Technologies Completion Services, Inc.!!

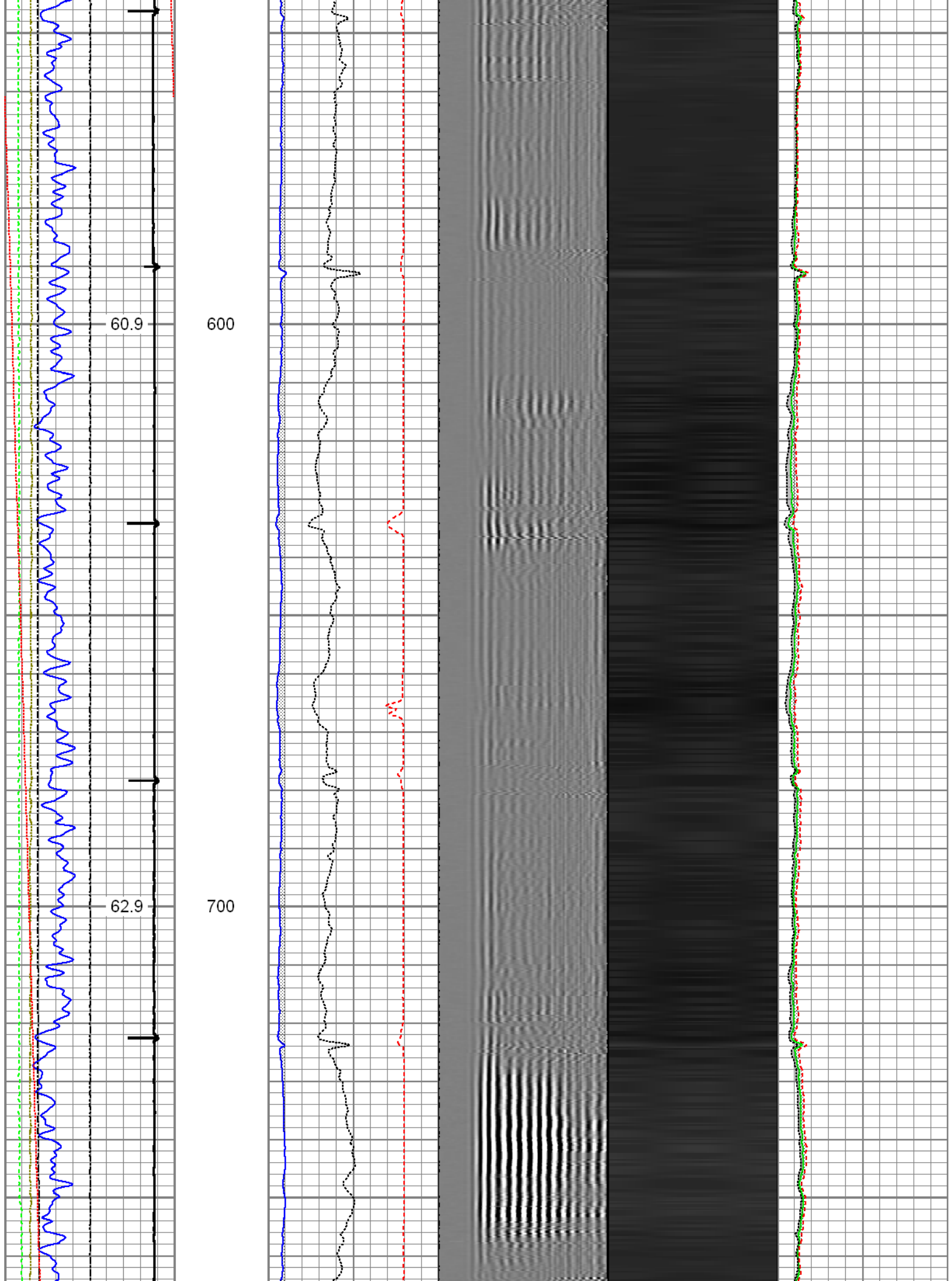
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Dataset Pathname: pass5
Presentation Format: rbt4_mit
Dataset Creation: Tue Aug 11 13:45:45 2015 by Log 7.0 B1
Charted by: Depth in Feet scaled 1:240

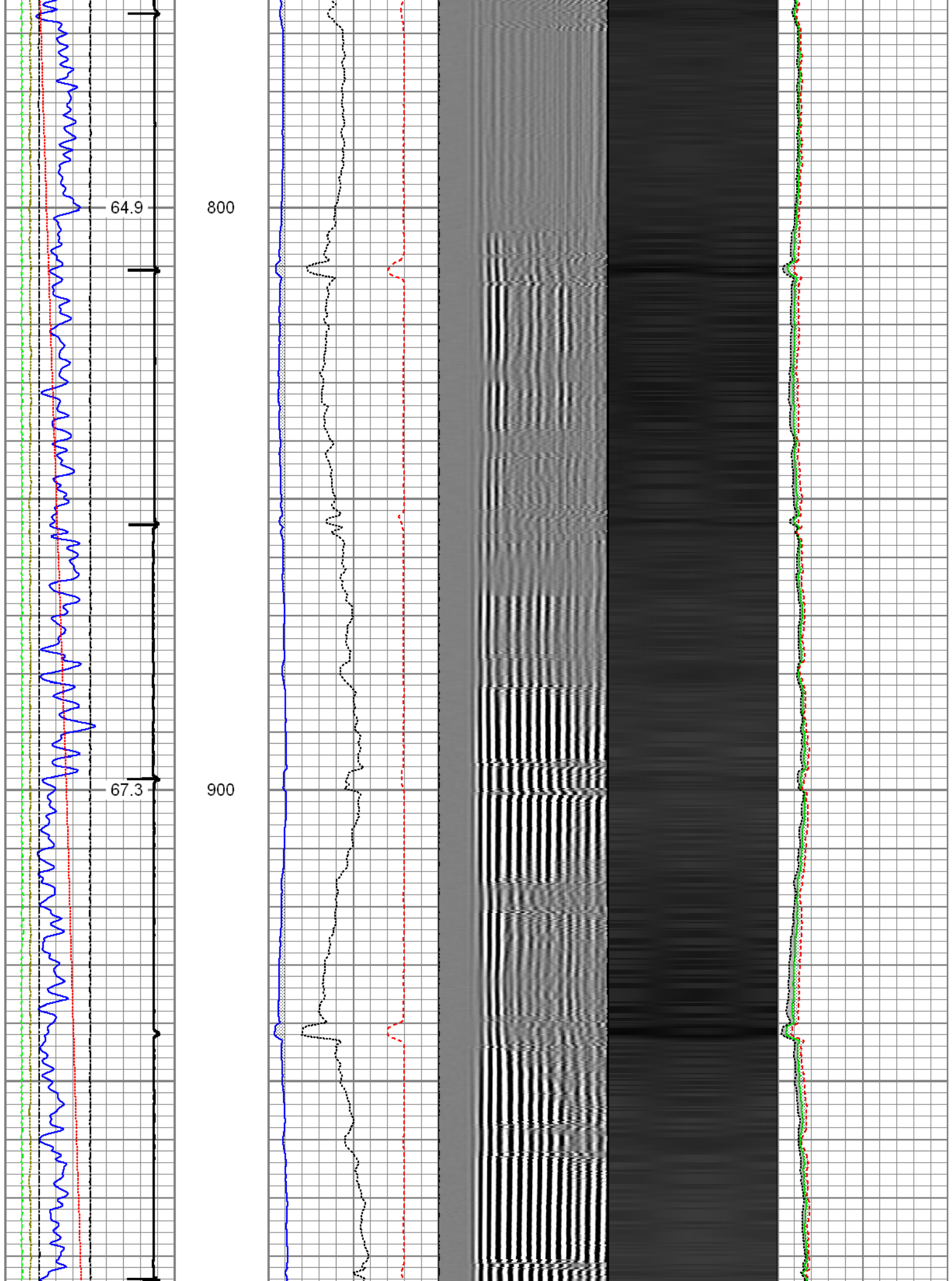
Gamma Ray	3' Amplitude	5' Variable Density Log	Sector Map	Average Amplitude
0 (GAPI) 120	0 (mV) 100	200 1200		0 100
Casing Collar Locator	3' Amplitude x 5			Minimum Amplitude
Line Speed	0 (mV) 20			0 100
-100 (ft/min) 100	3' Travel Time			Maximum Amplitude
Line Tension	650 (usec) 150			0 100
0 (lb) 2000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

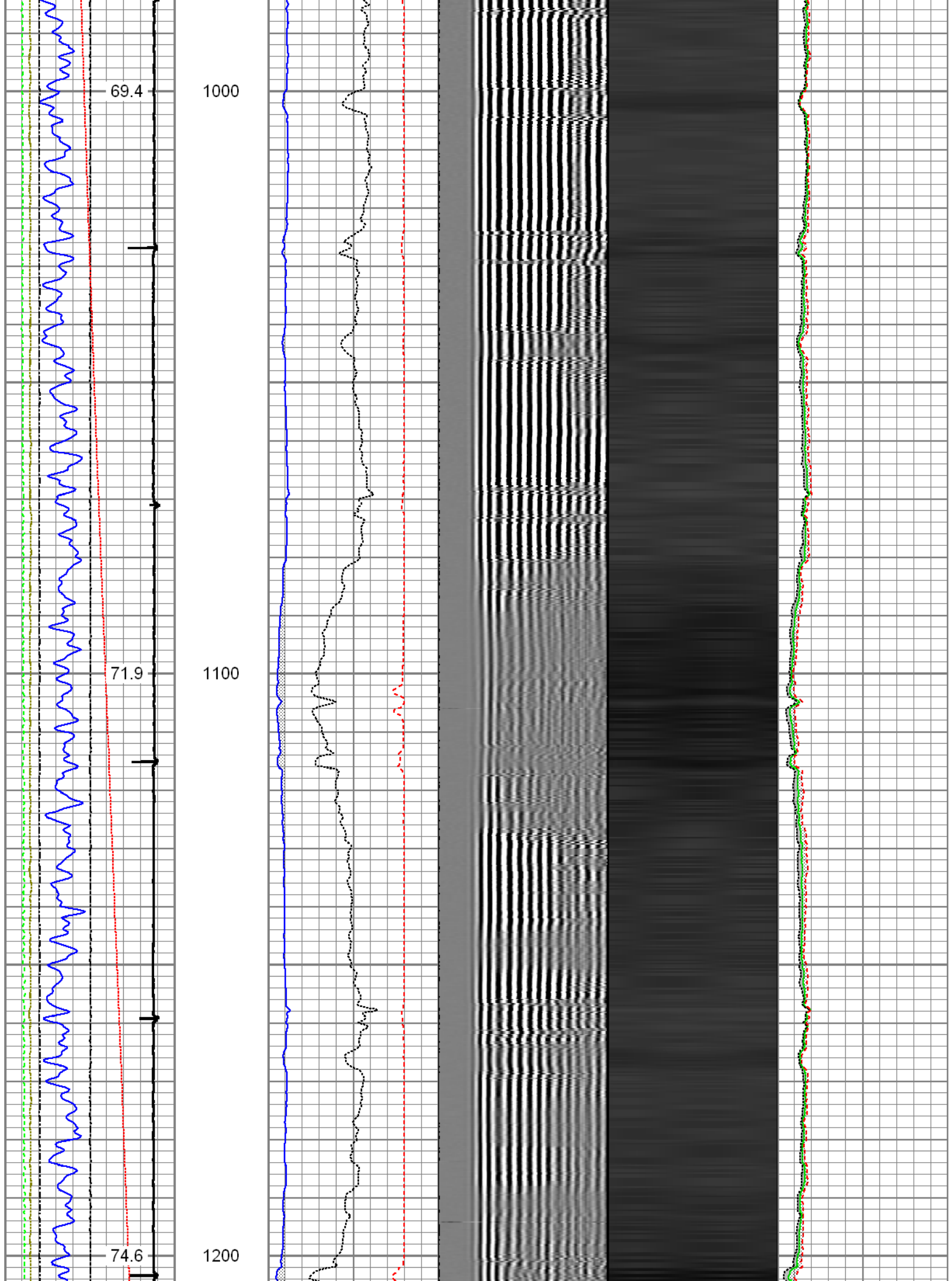


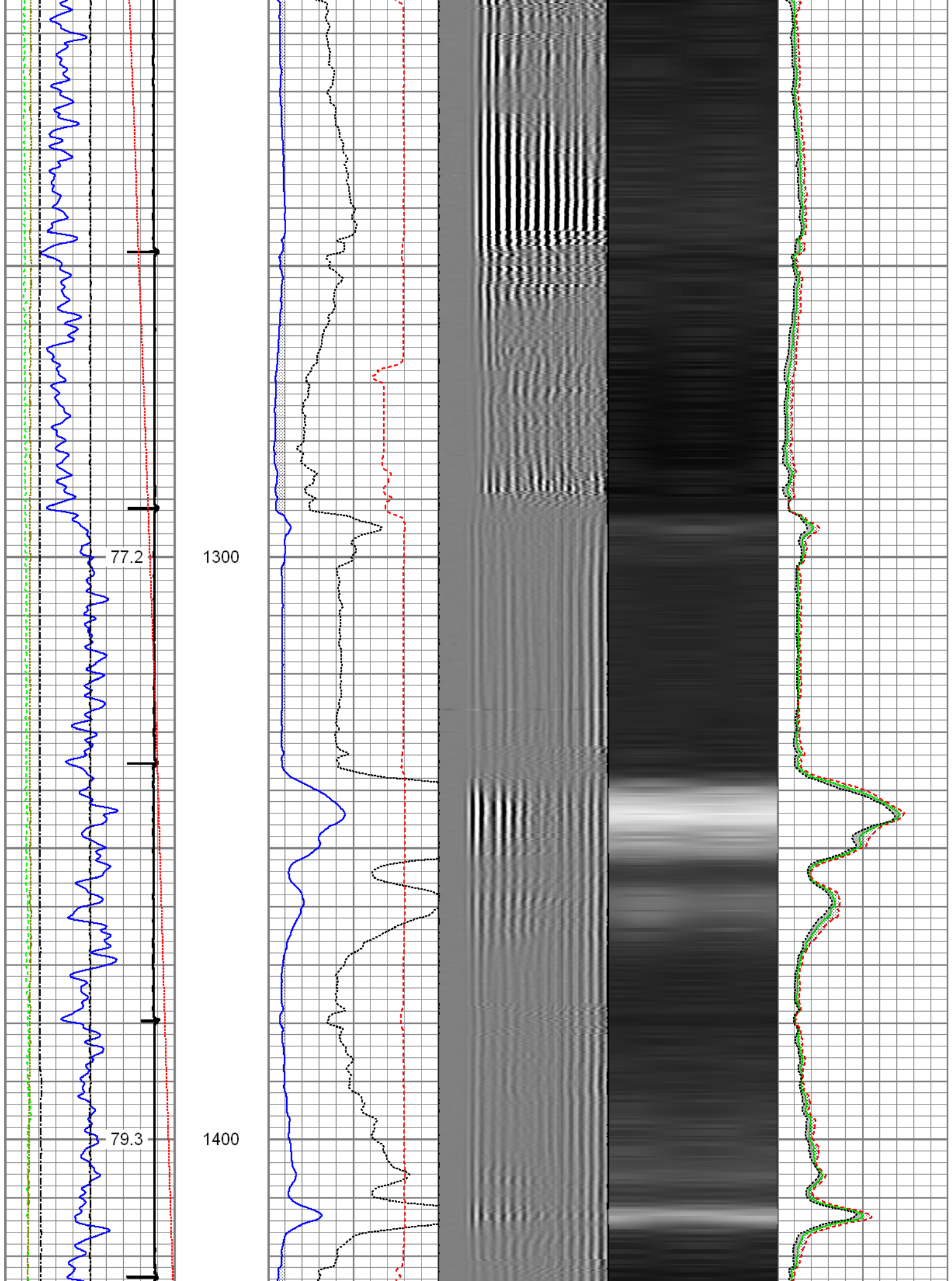


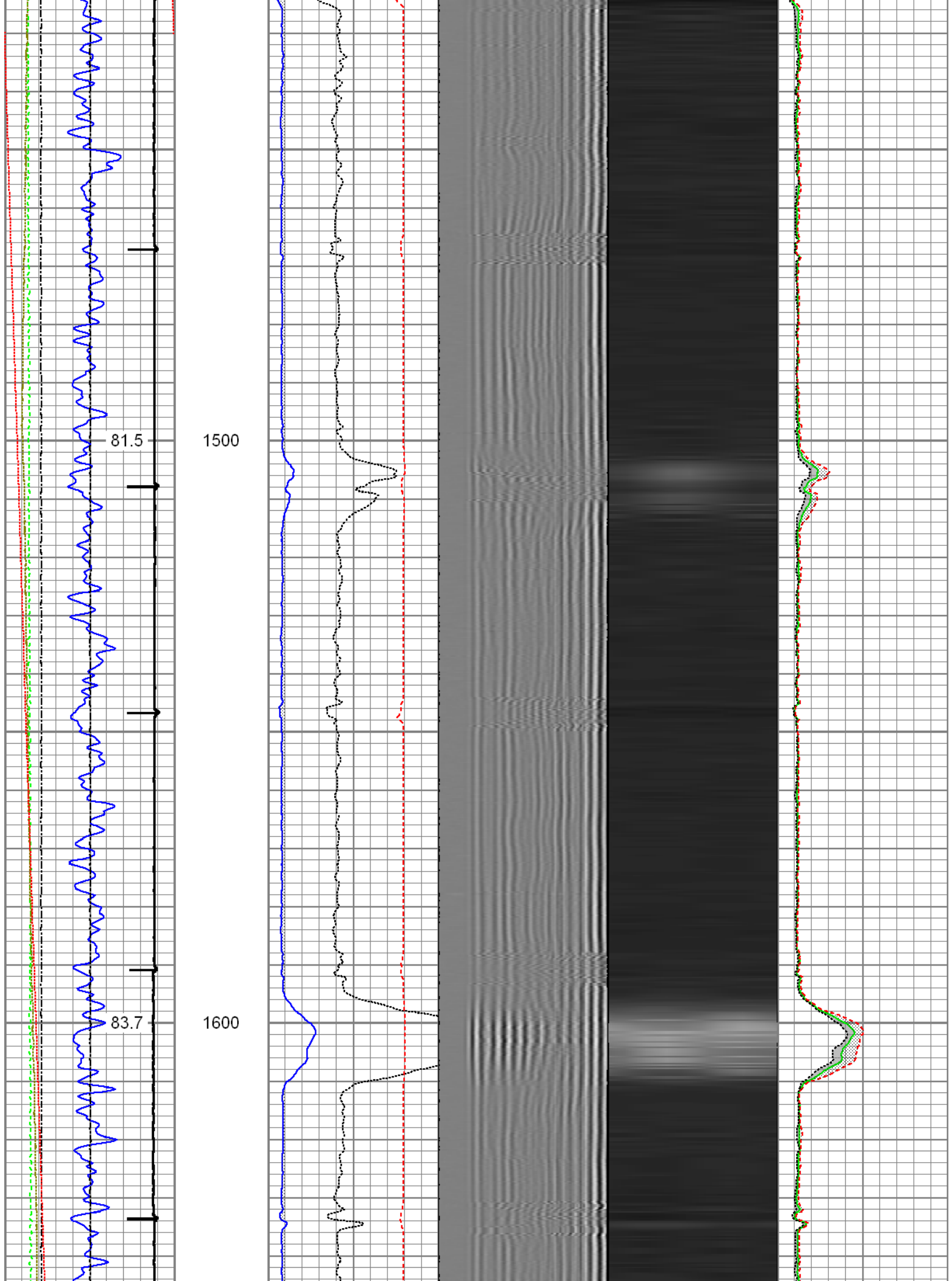


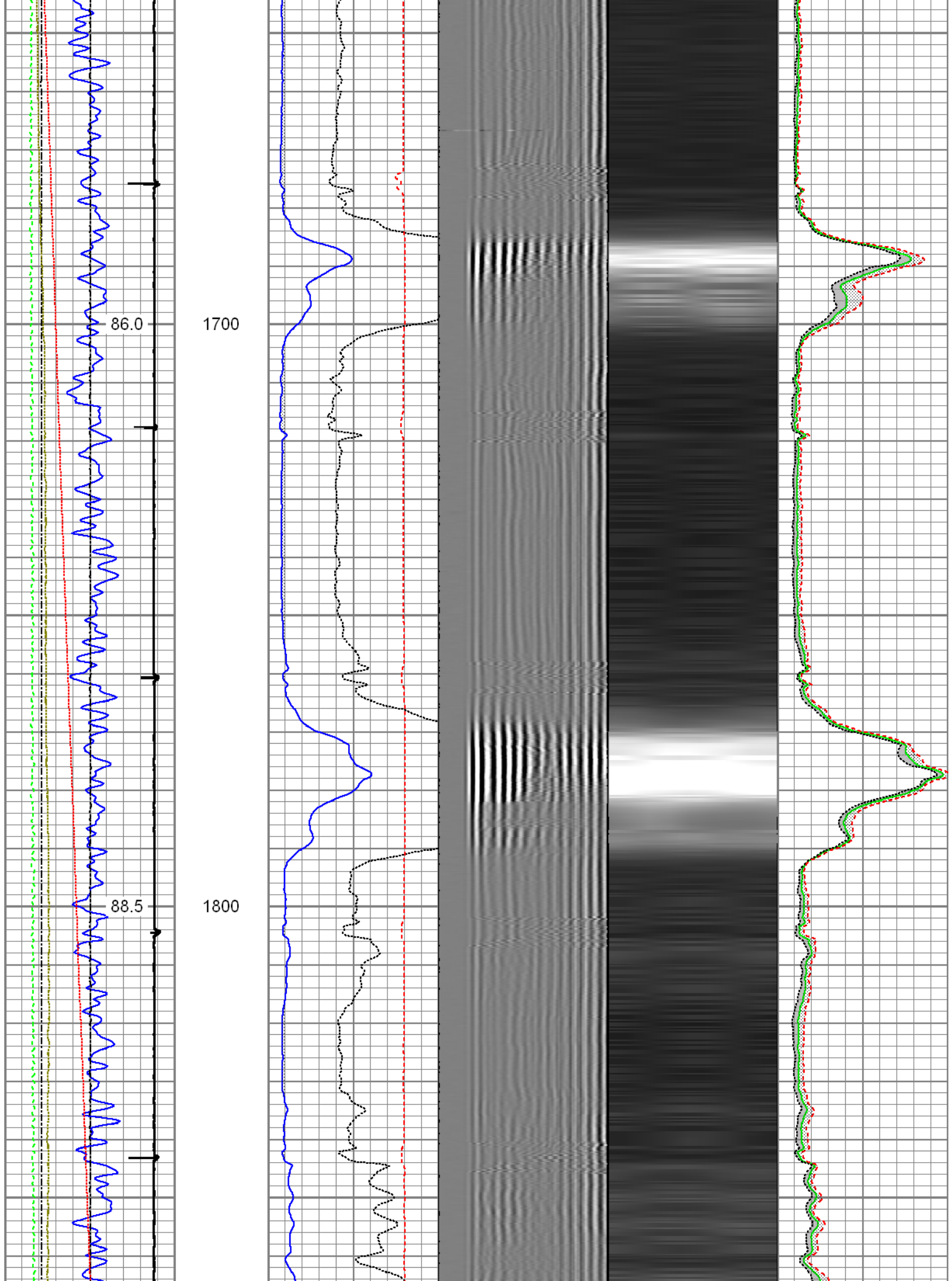


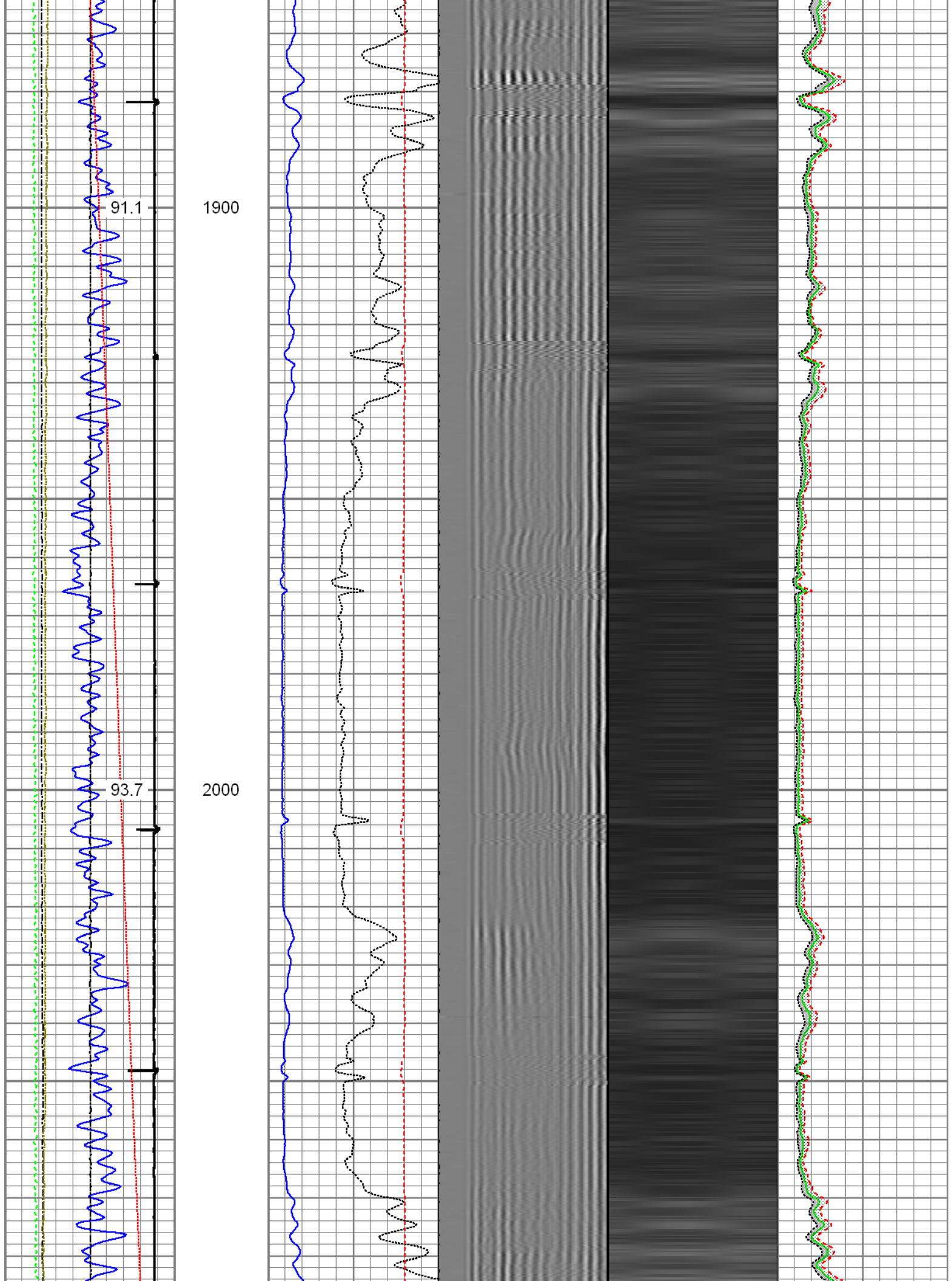


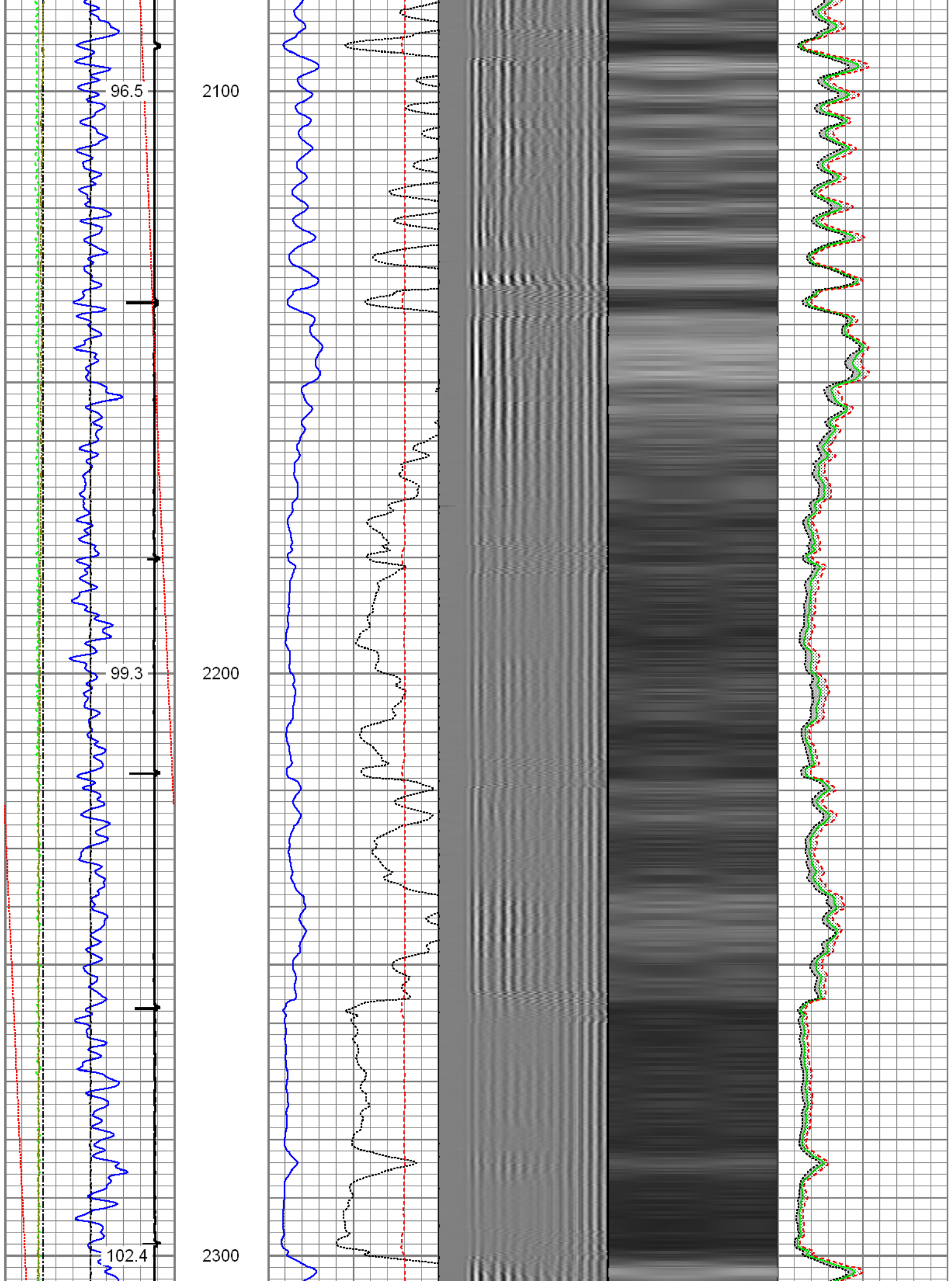


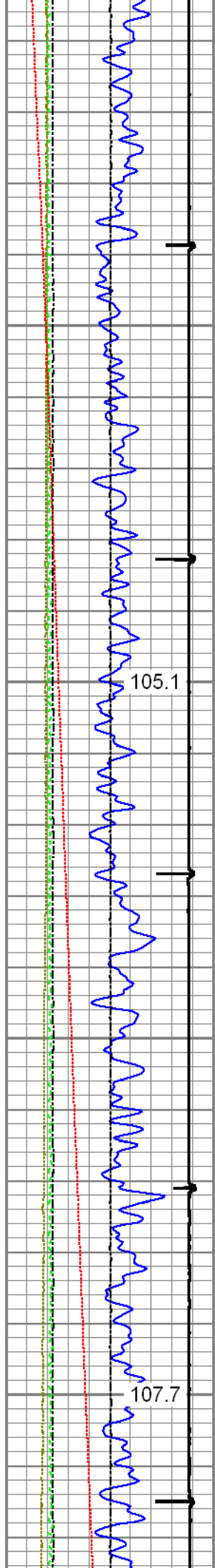






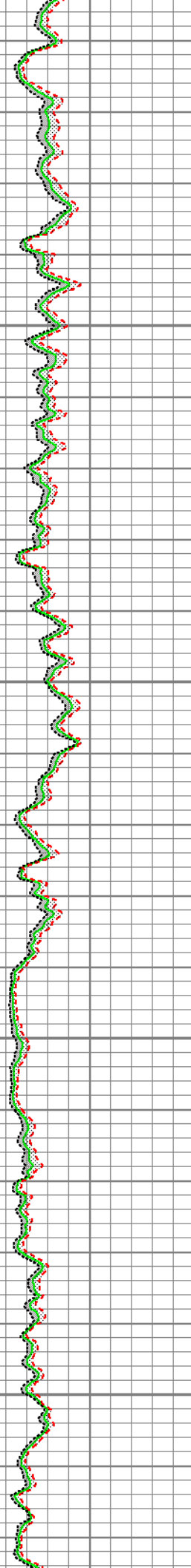
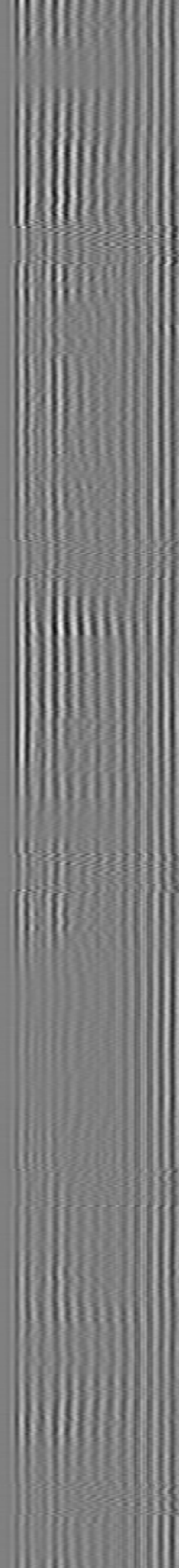
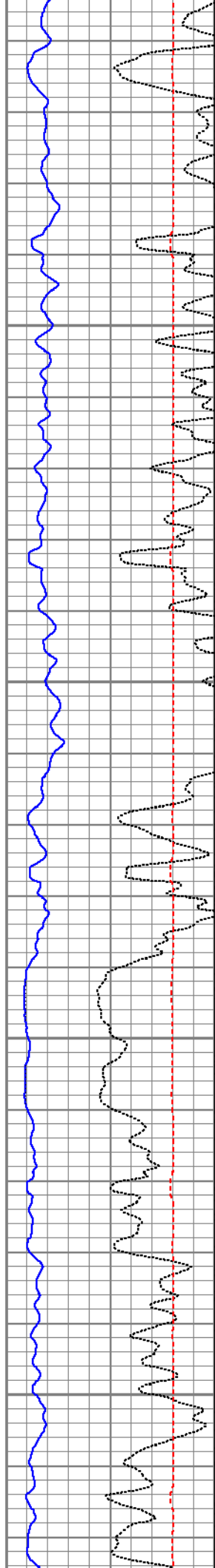


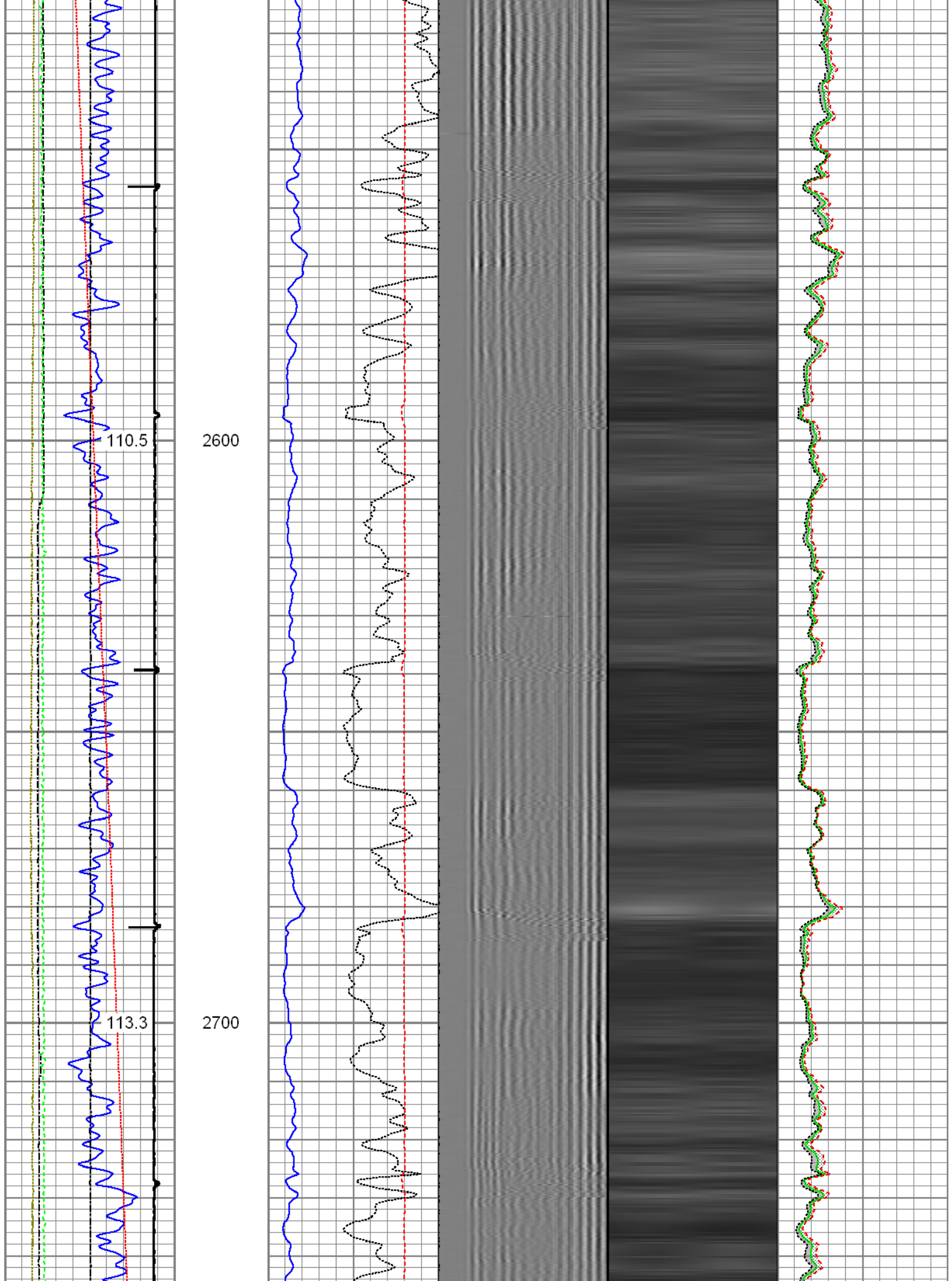


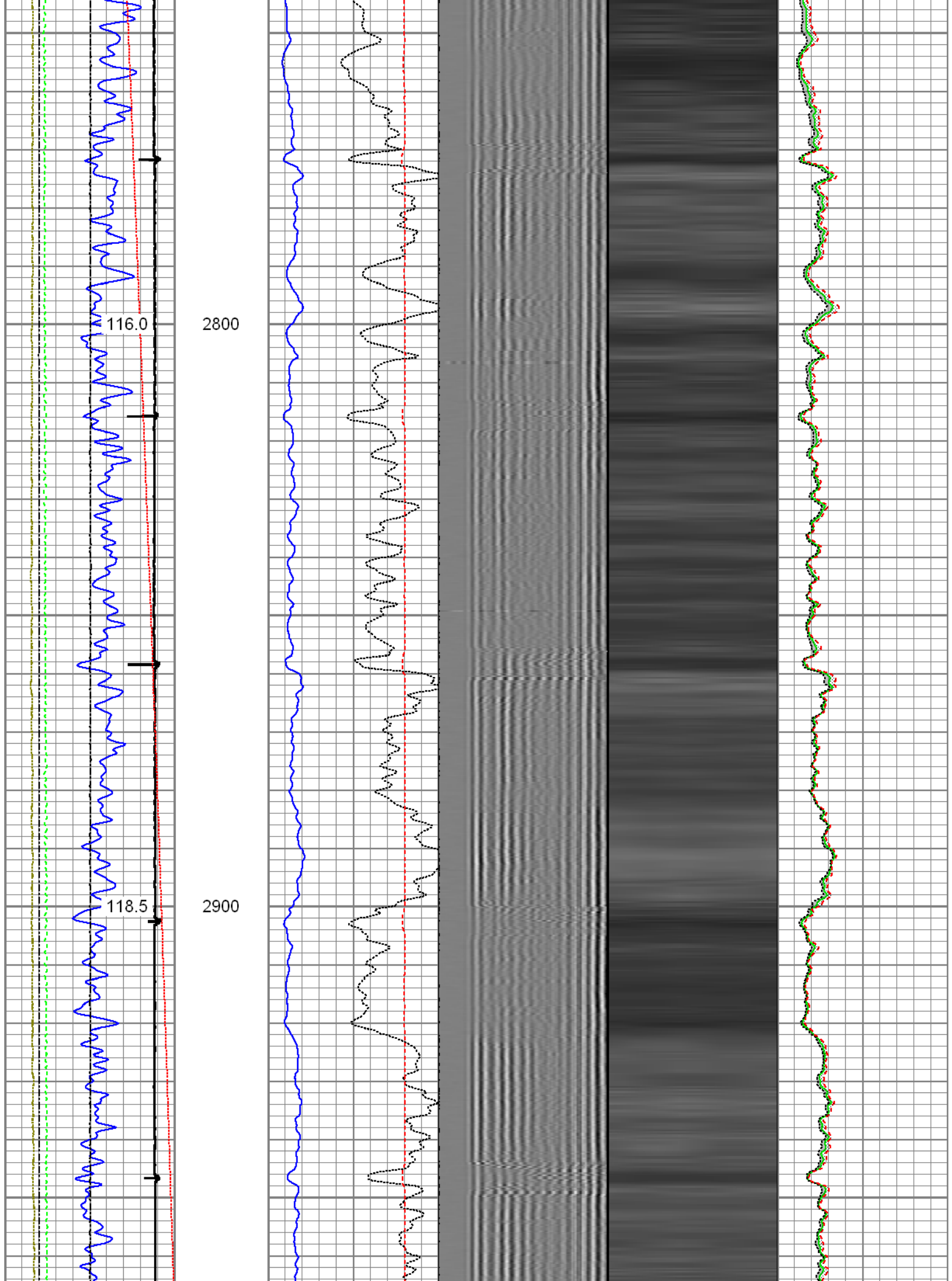


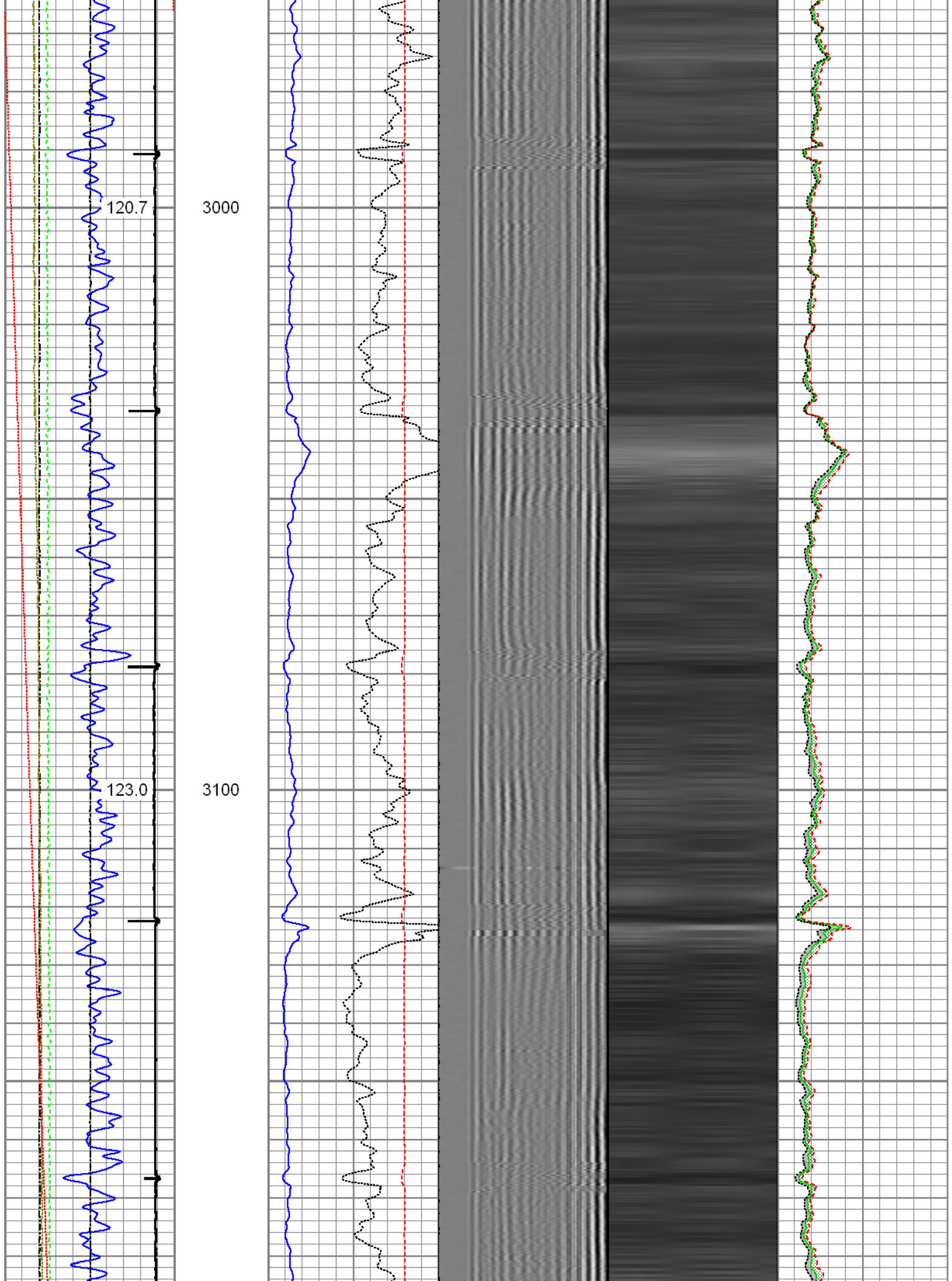
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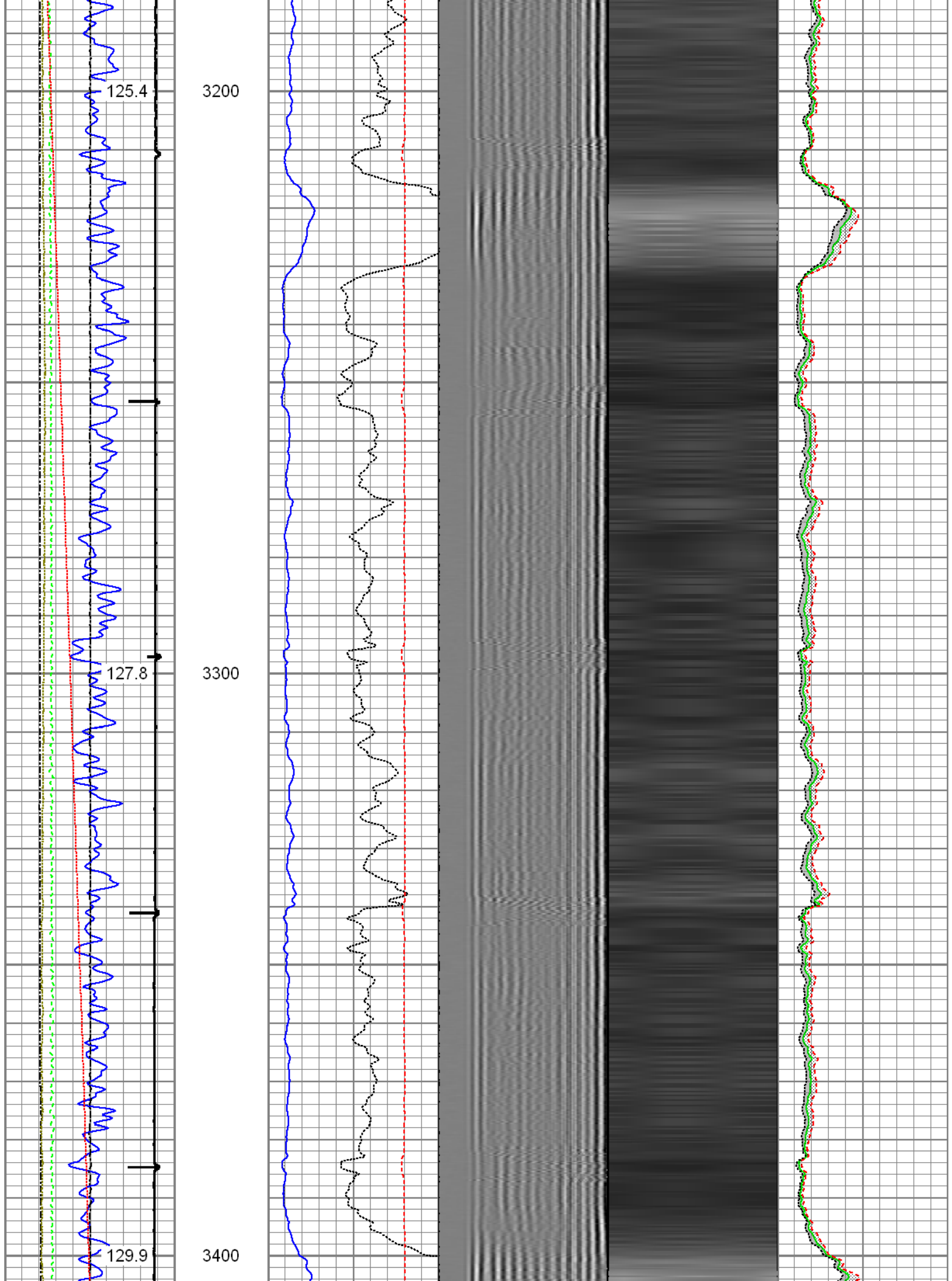
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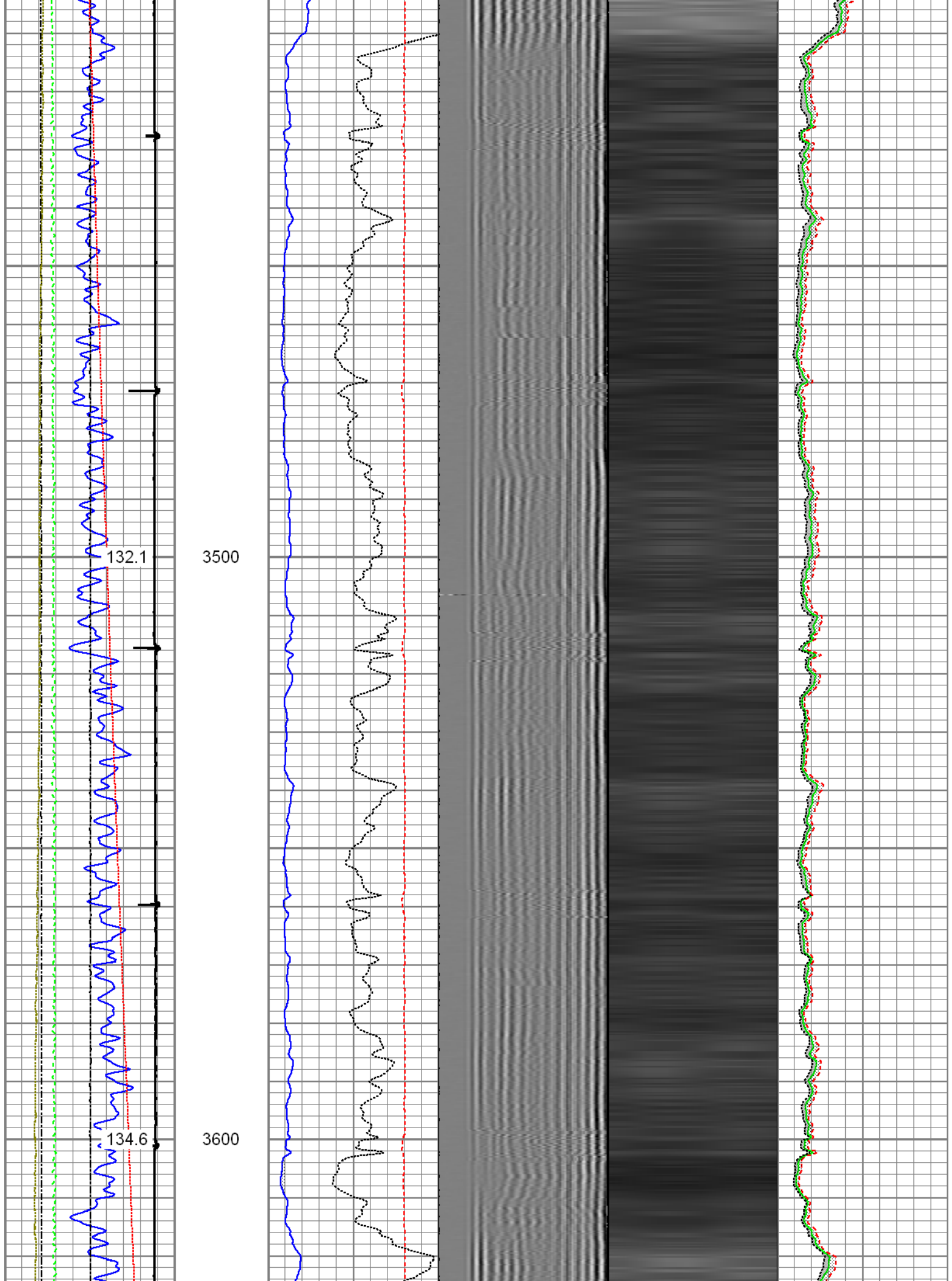


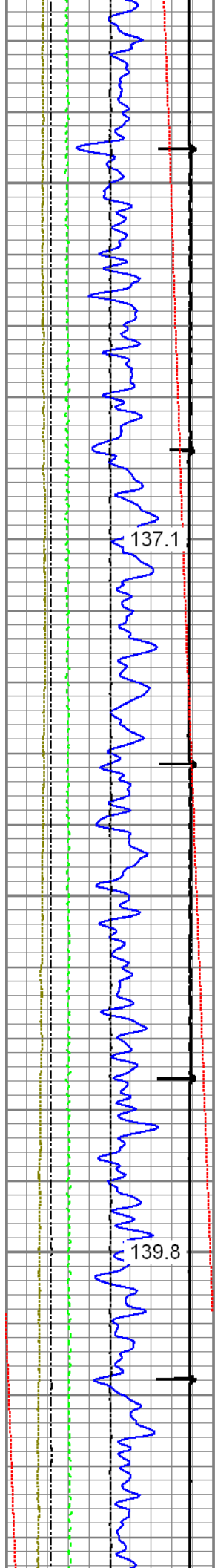






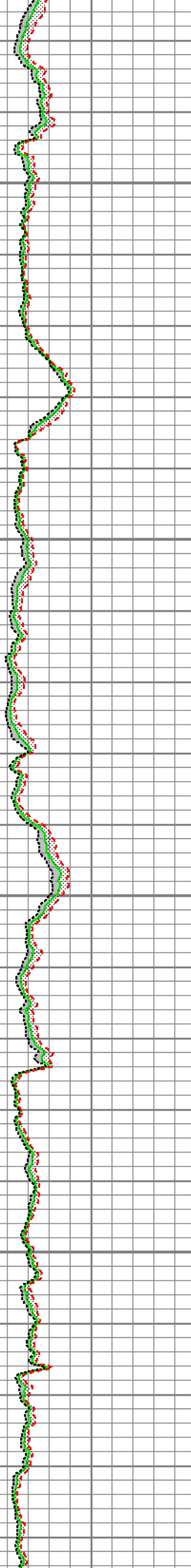
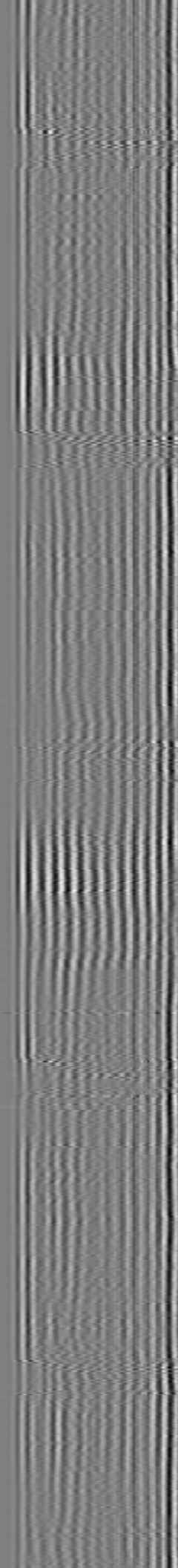
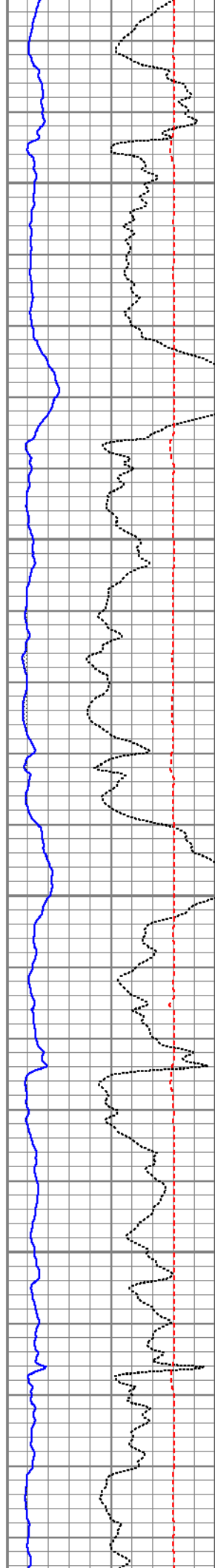


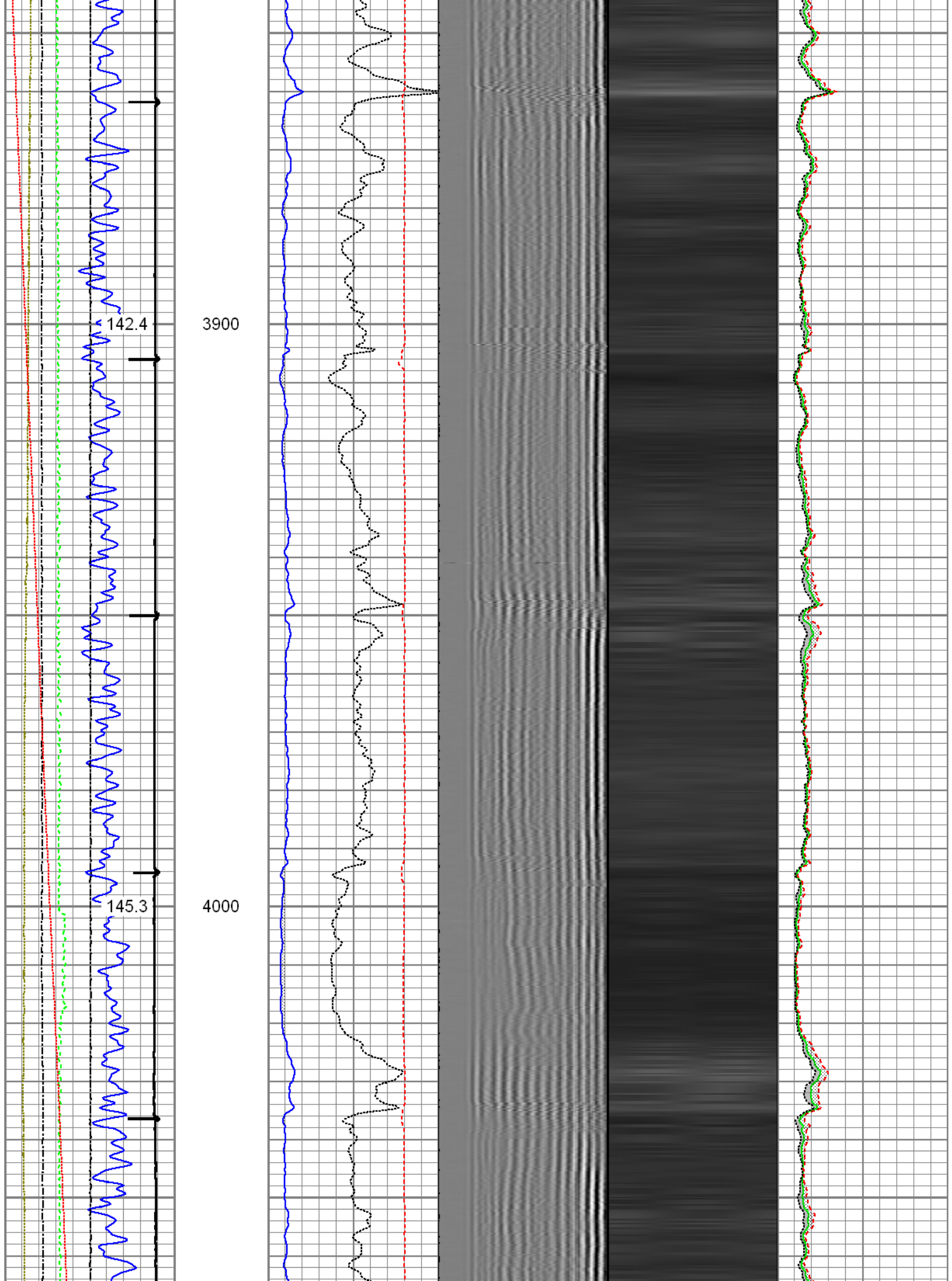


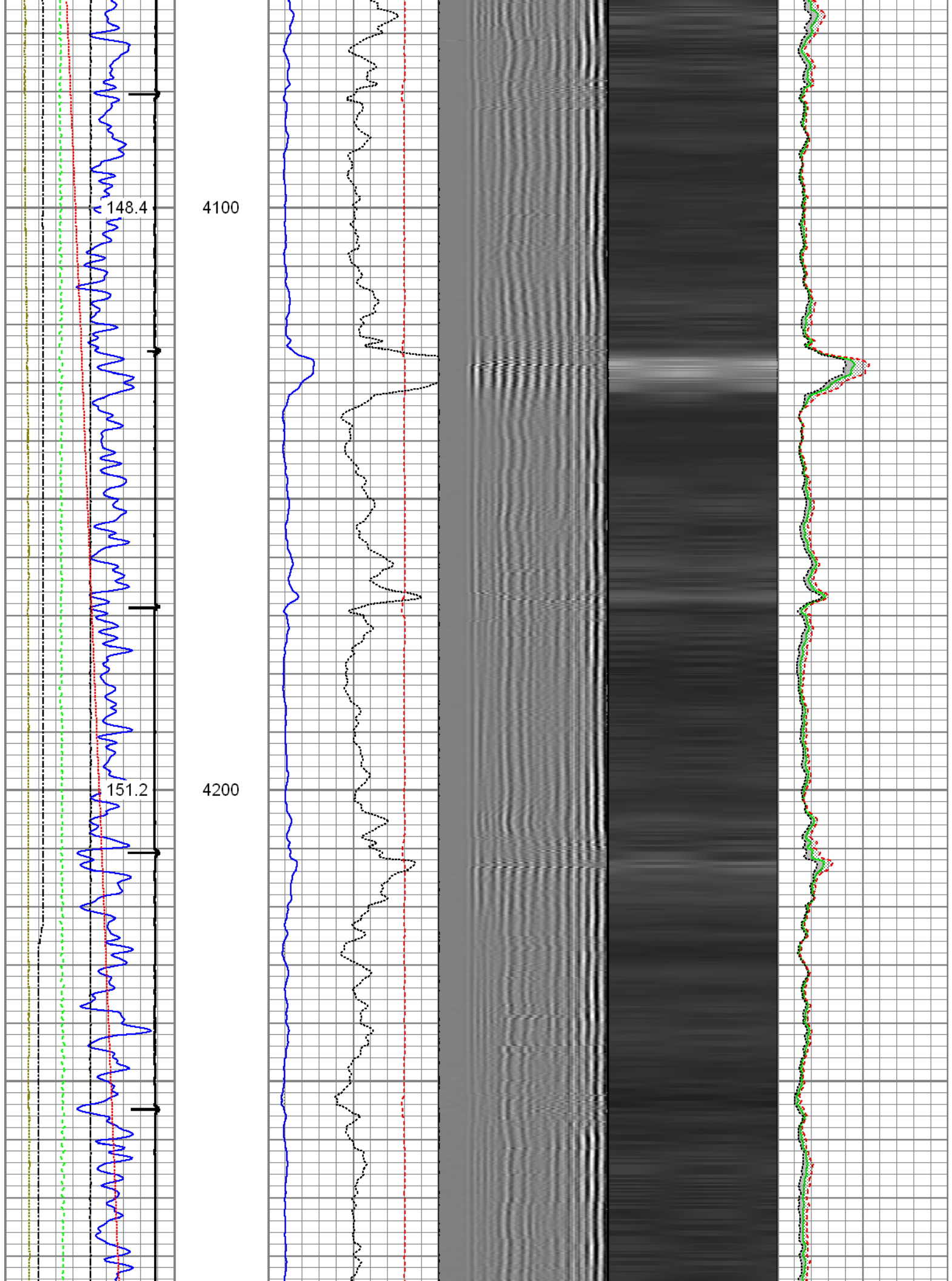


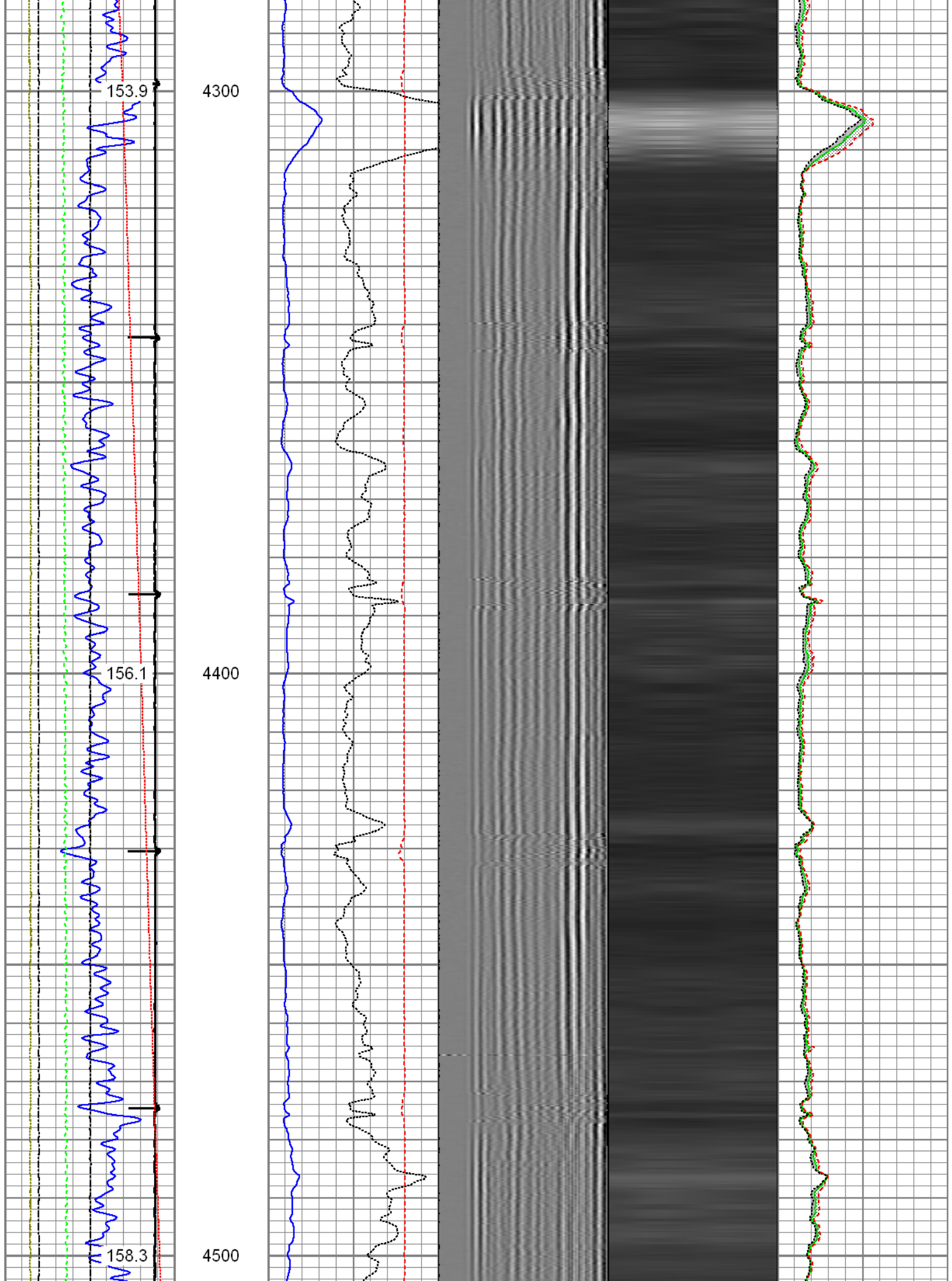
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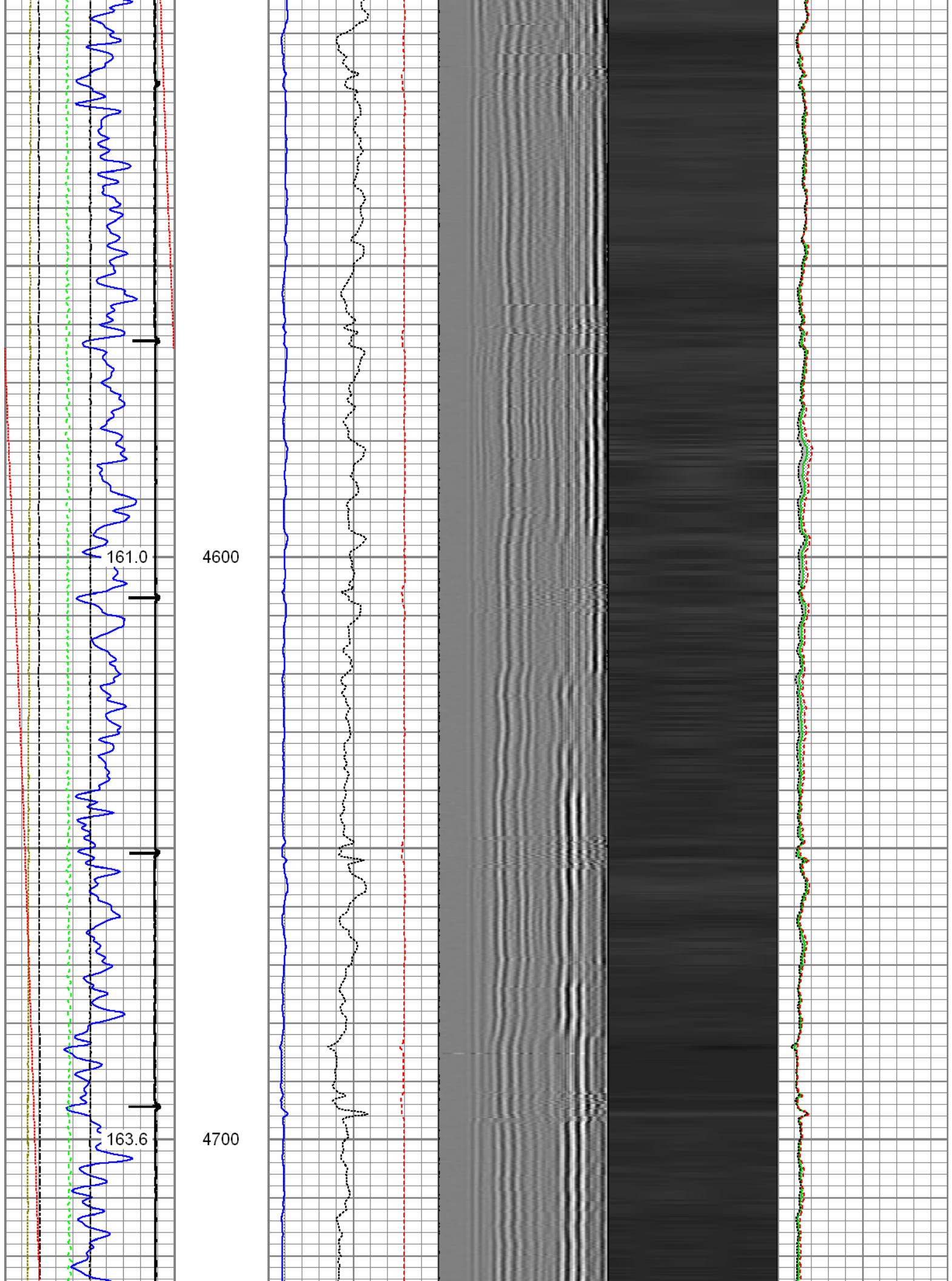
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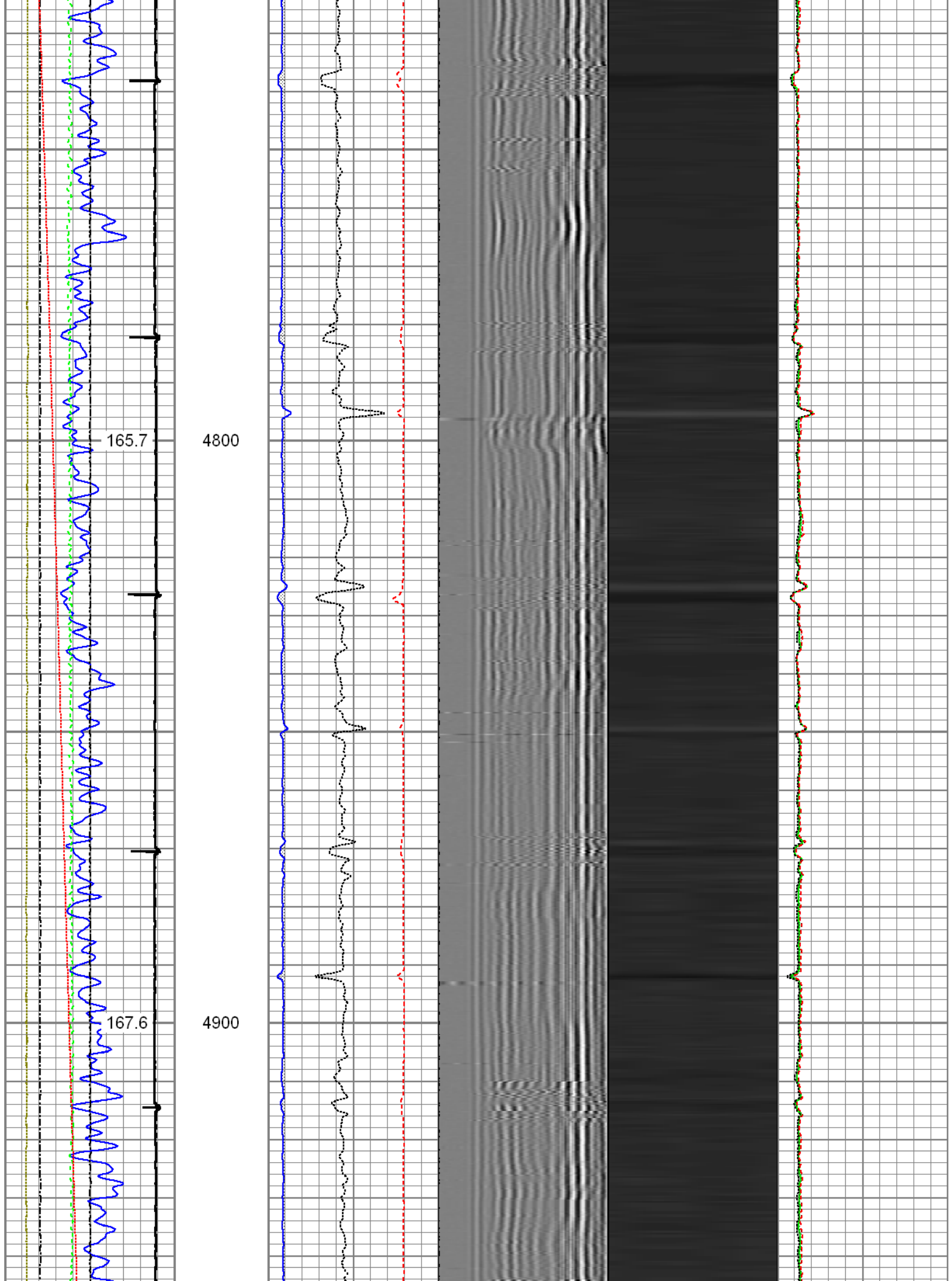


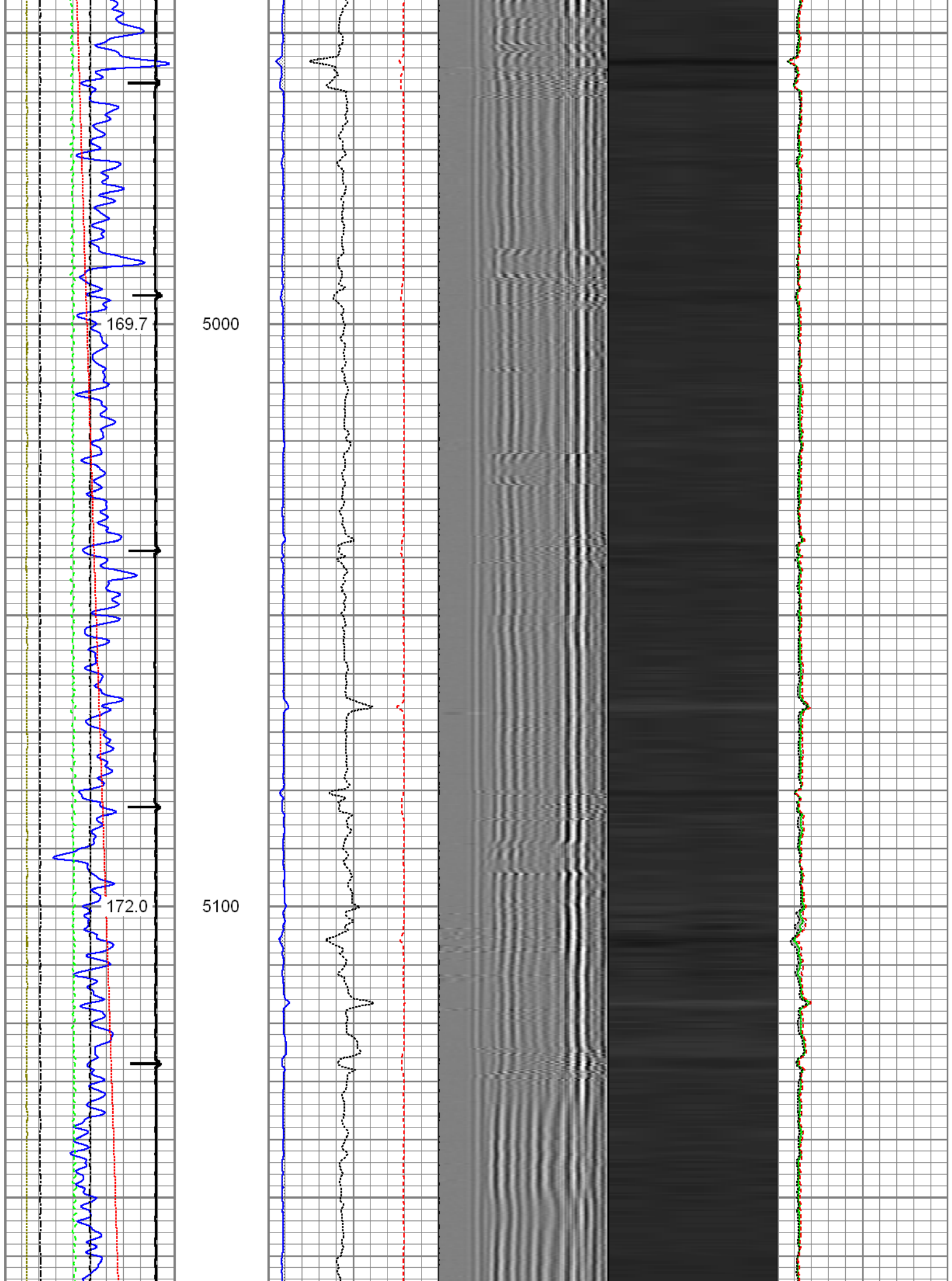


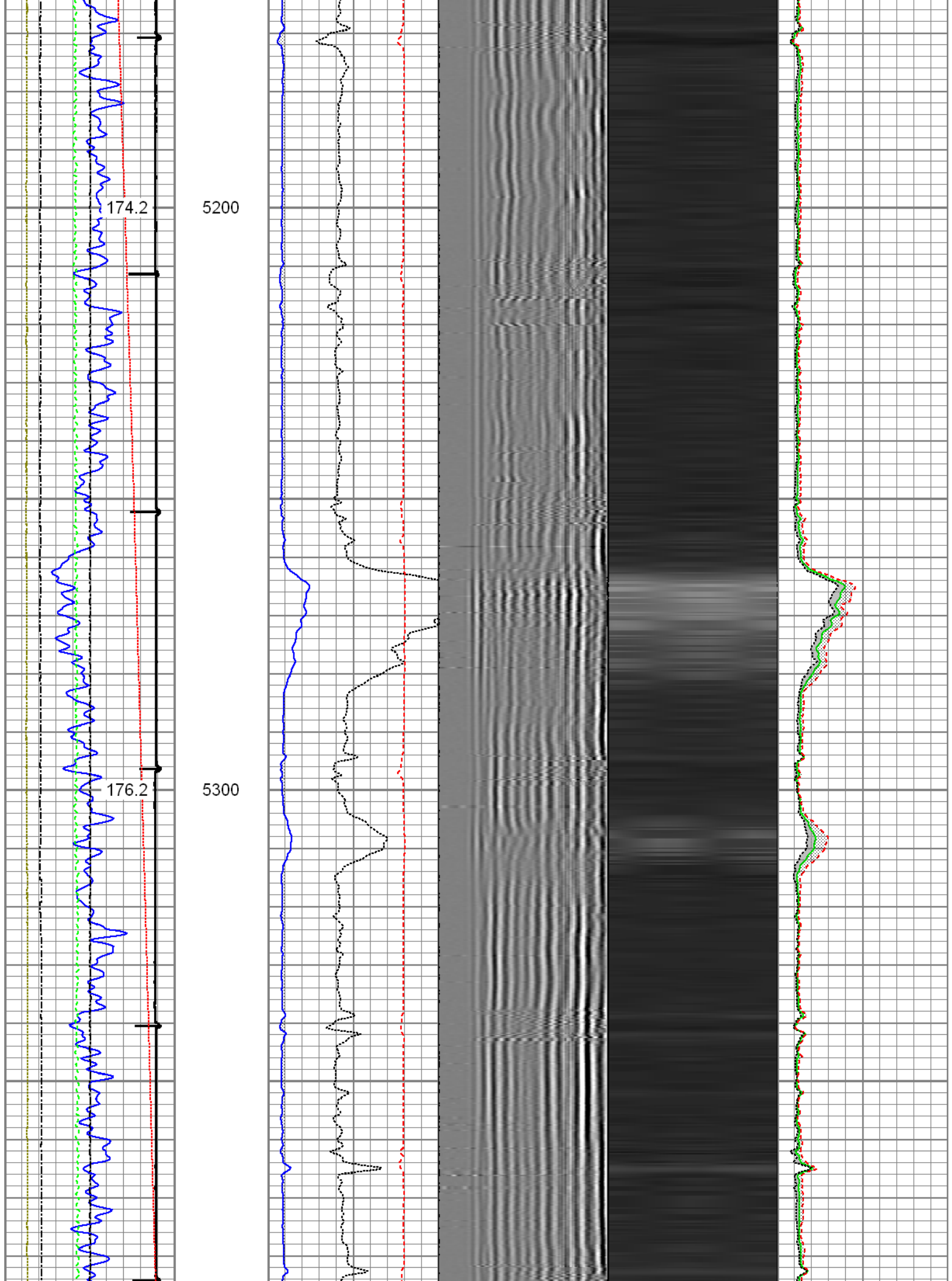


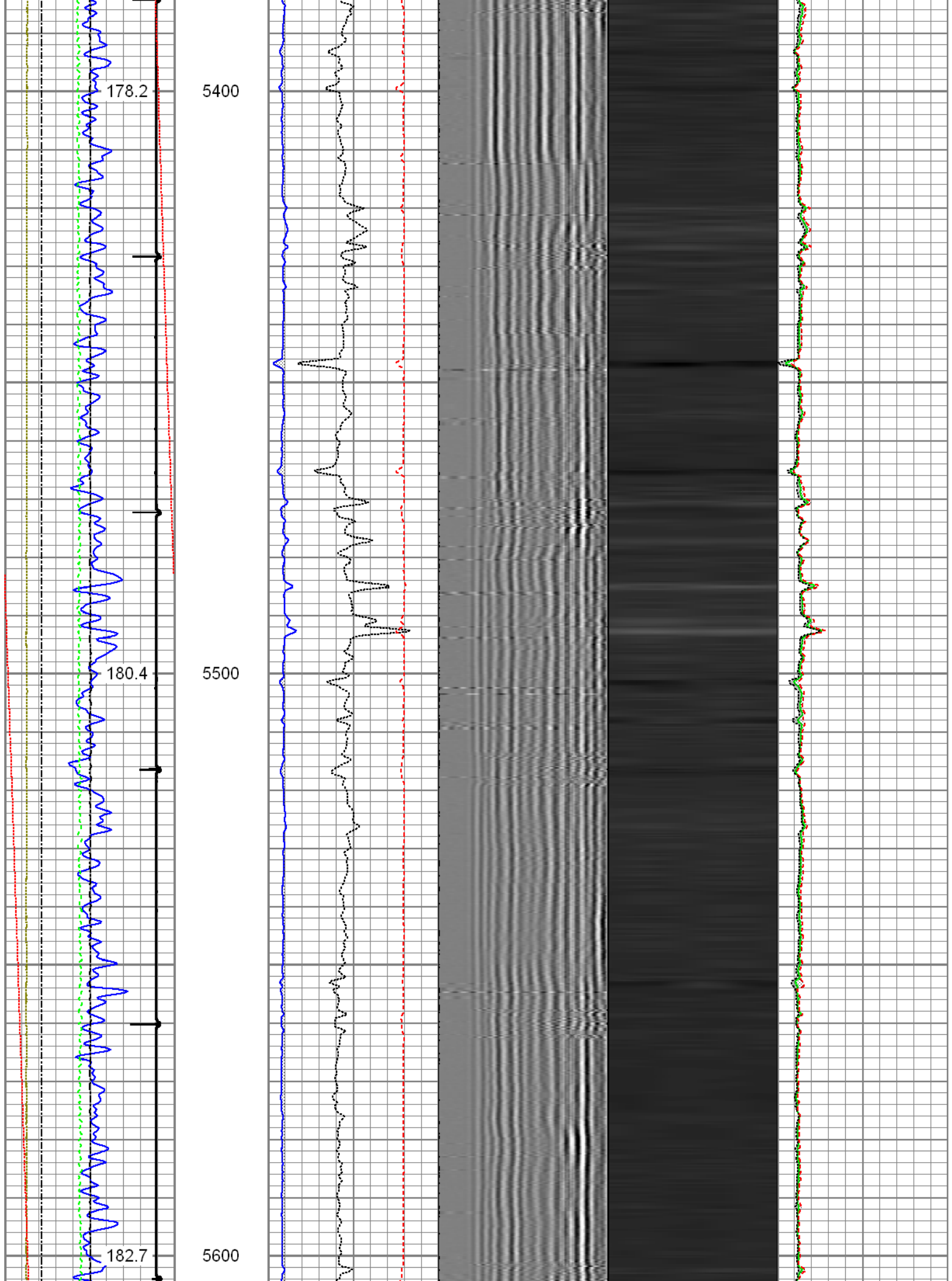


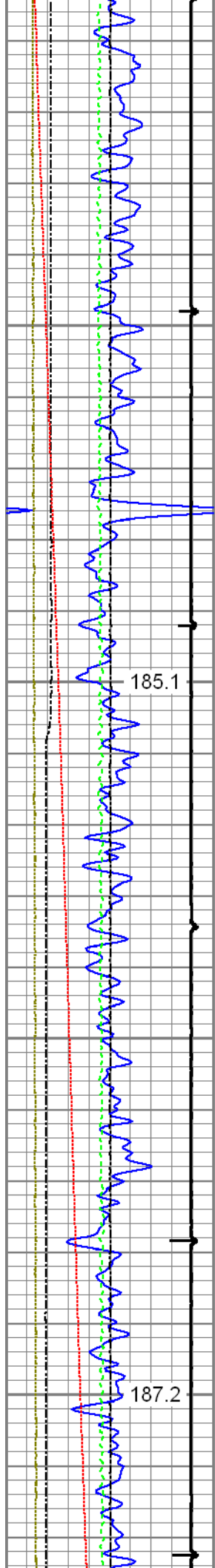






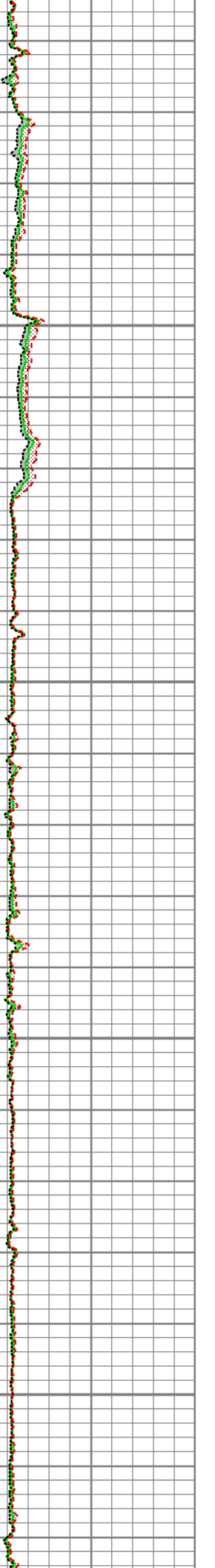
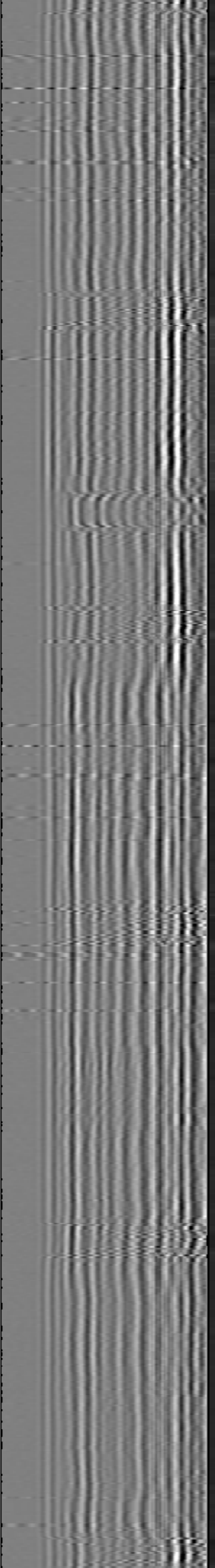
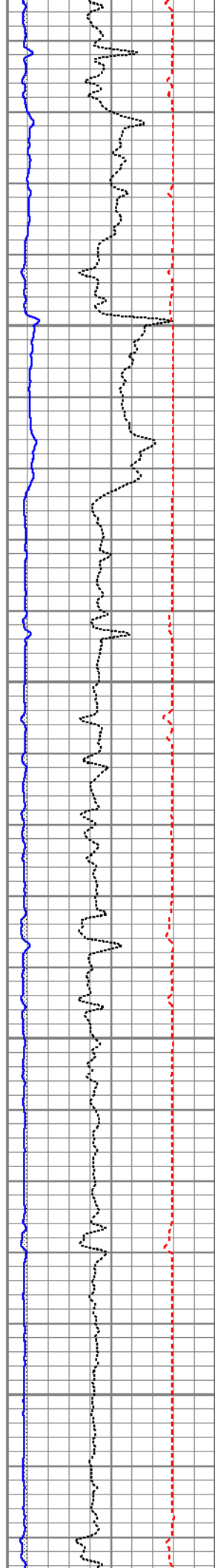


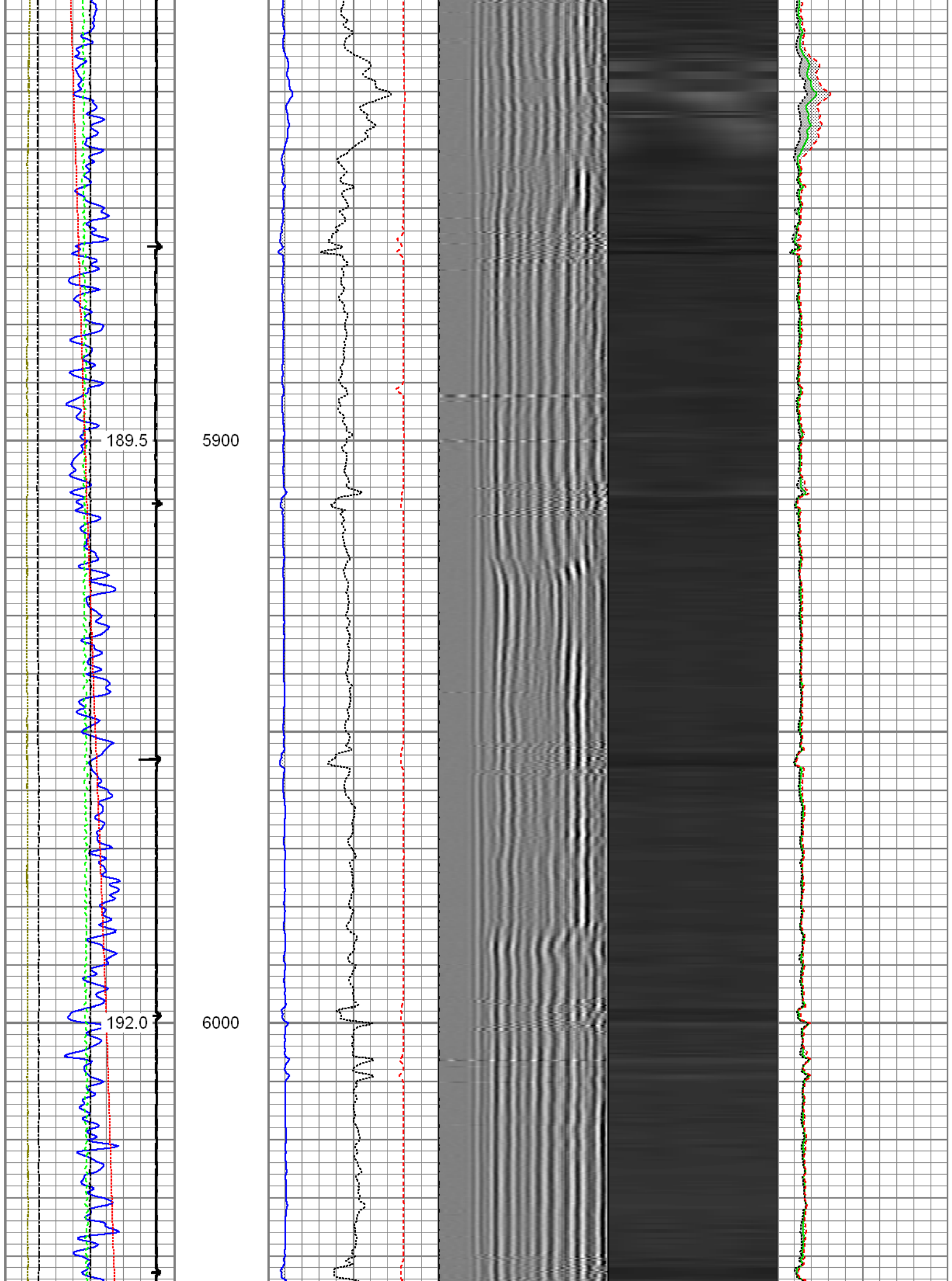


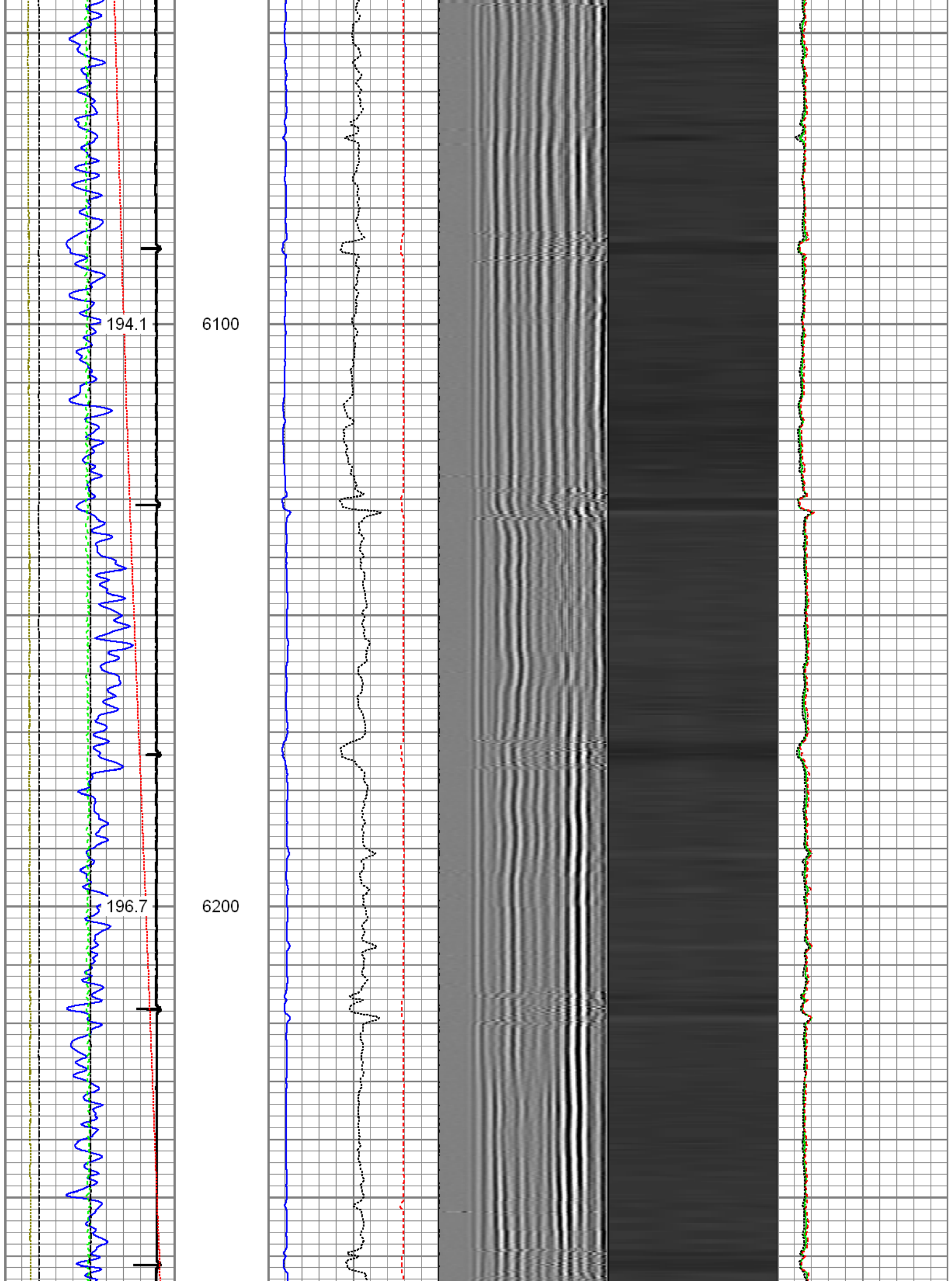


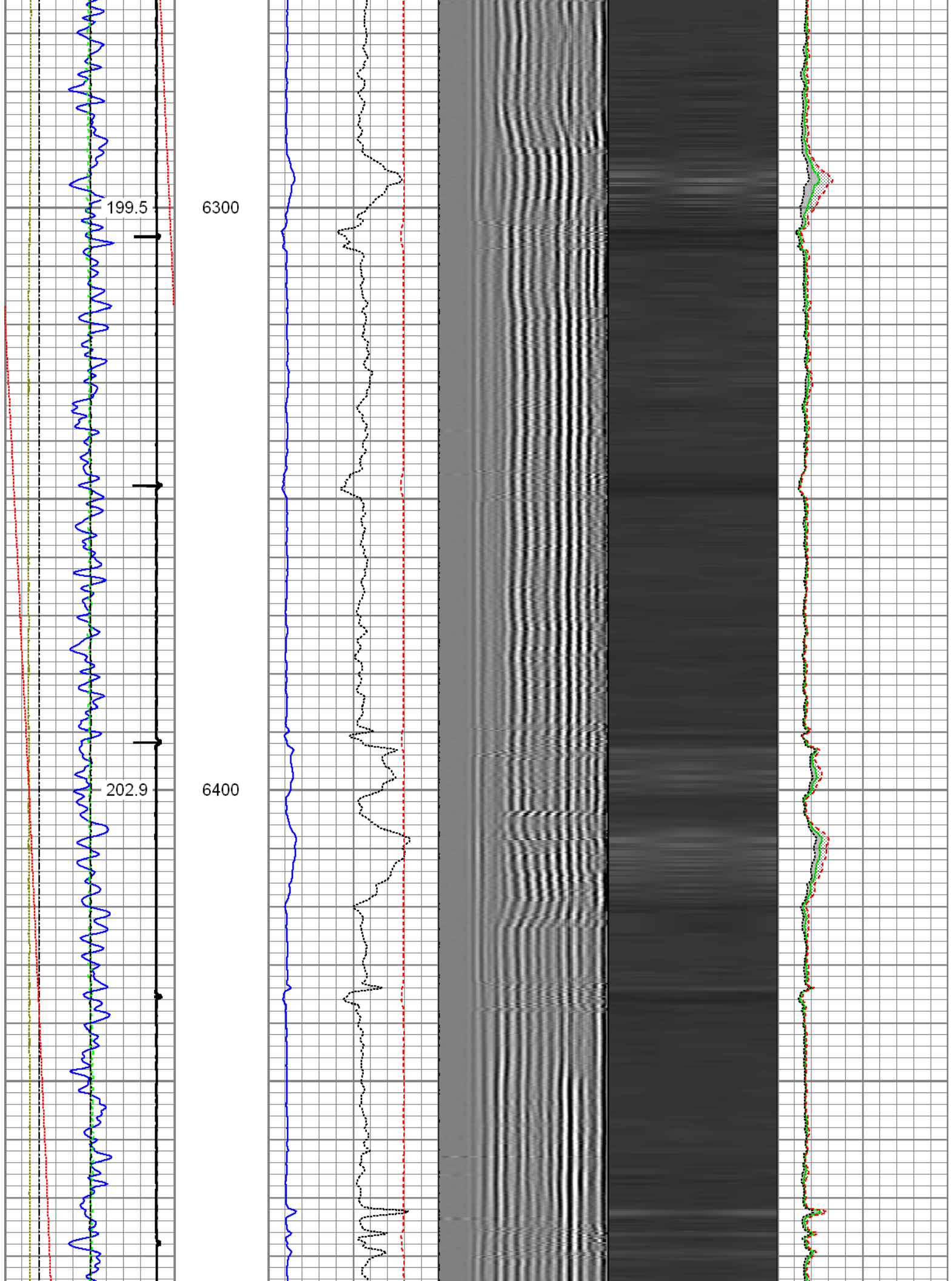
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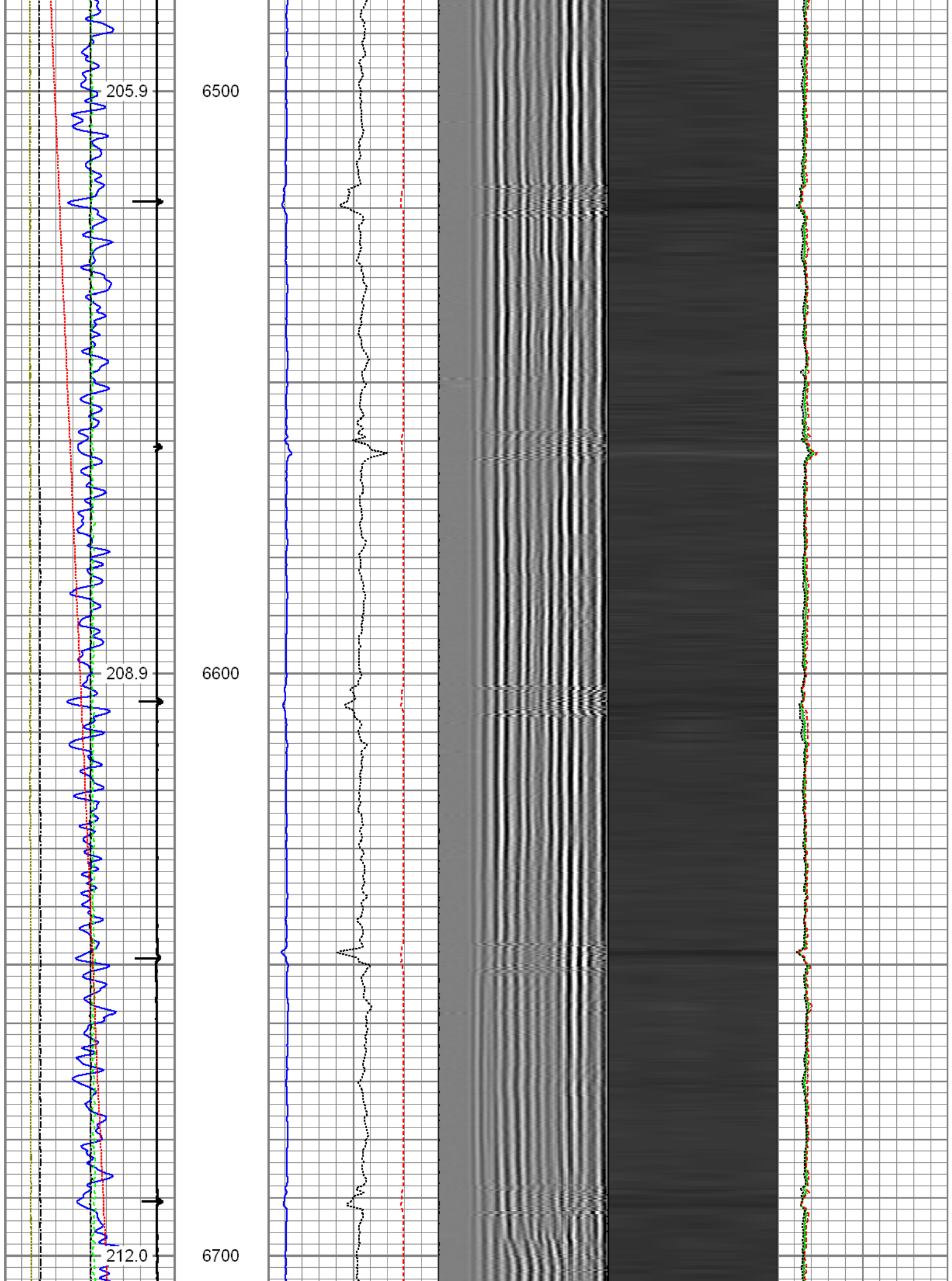
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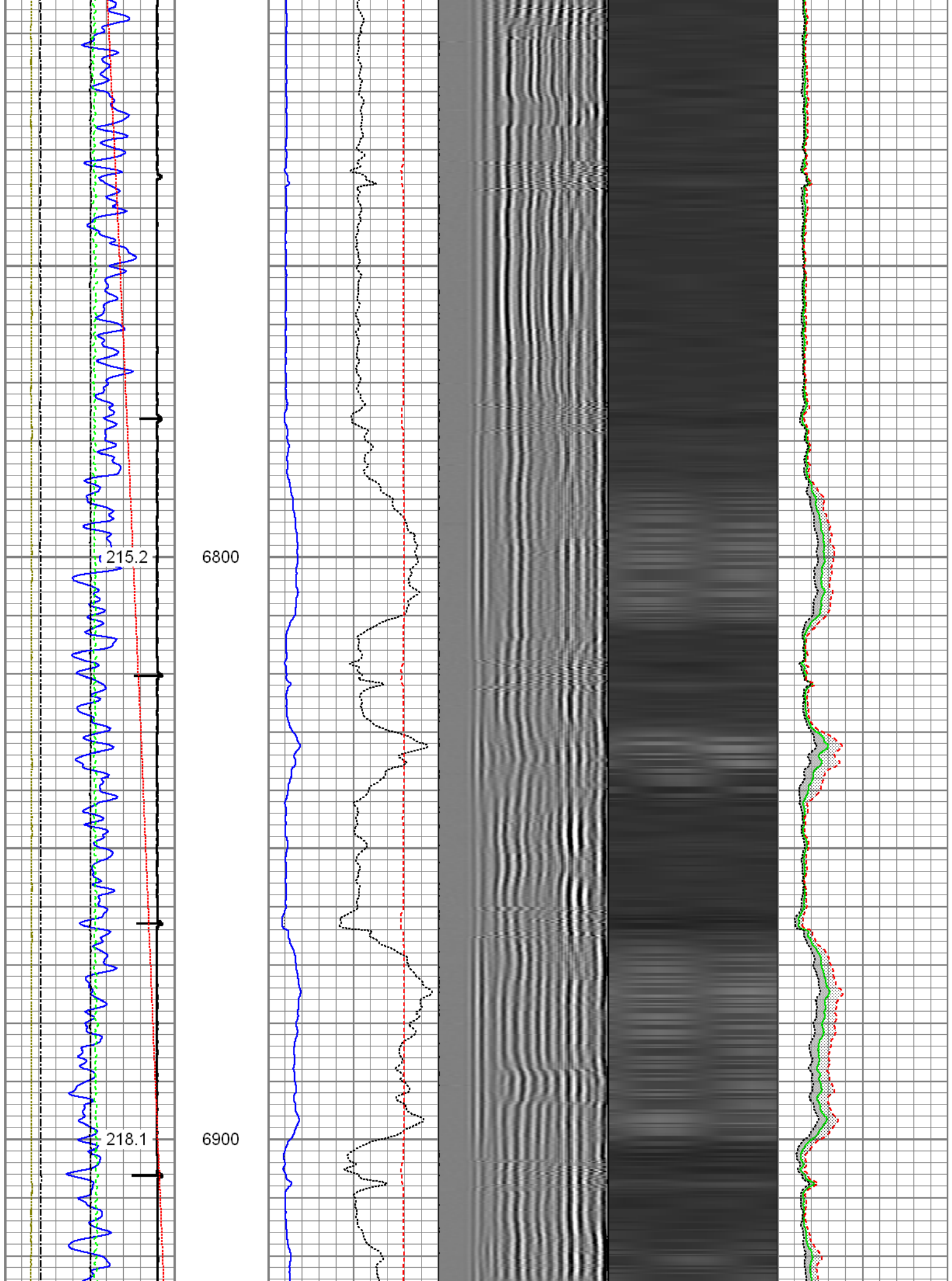


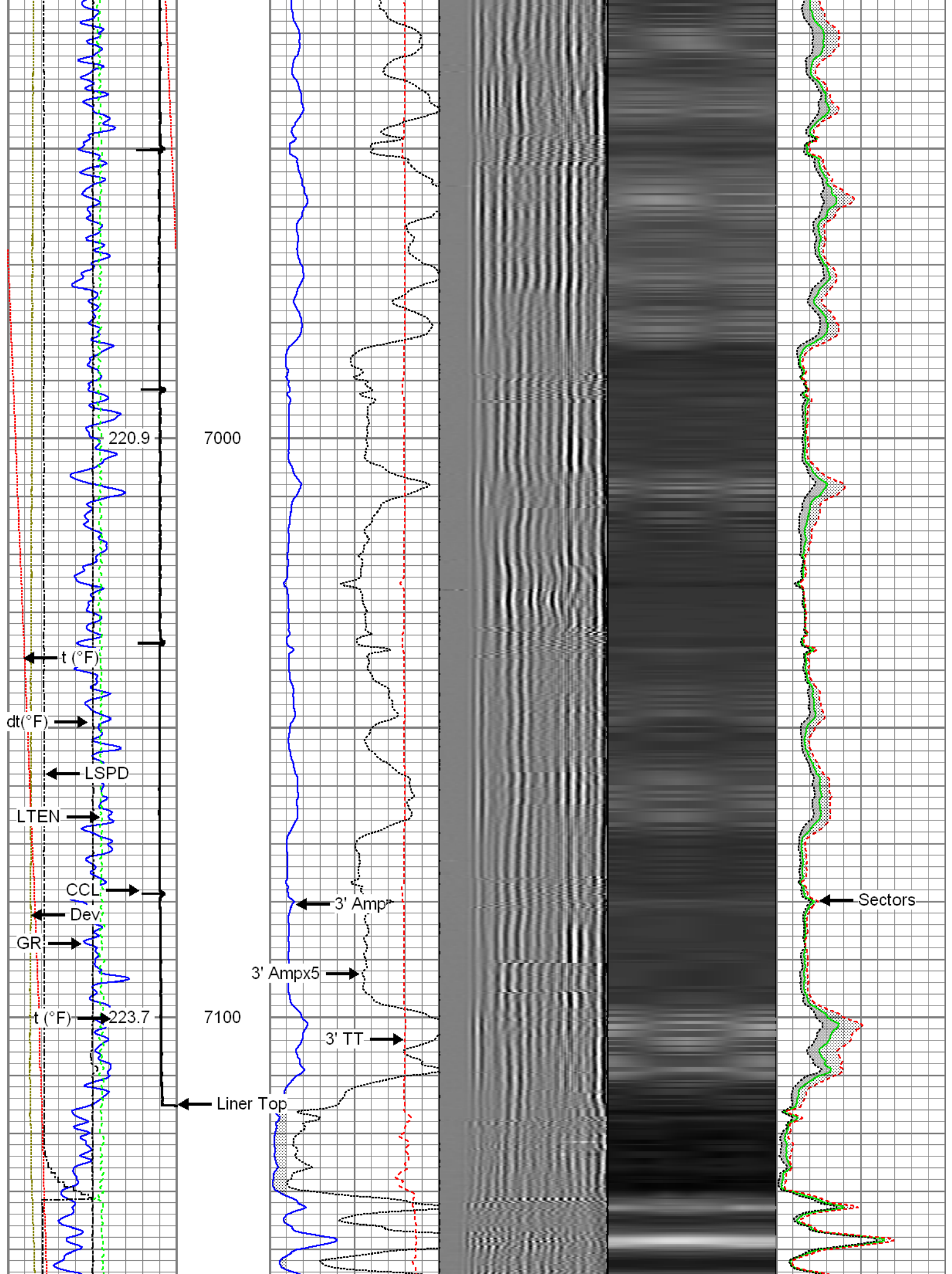


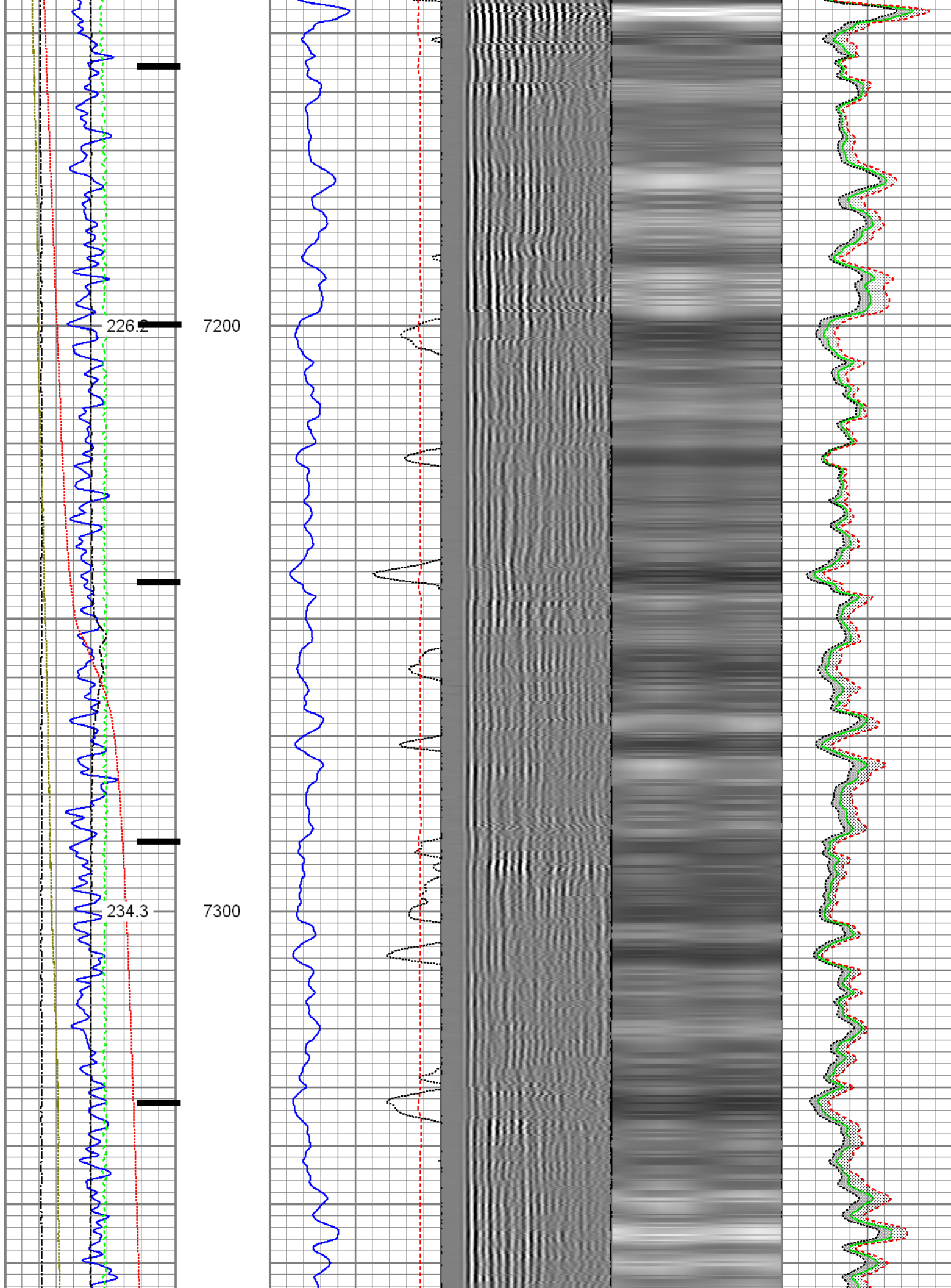


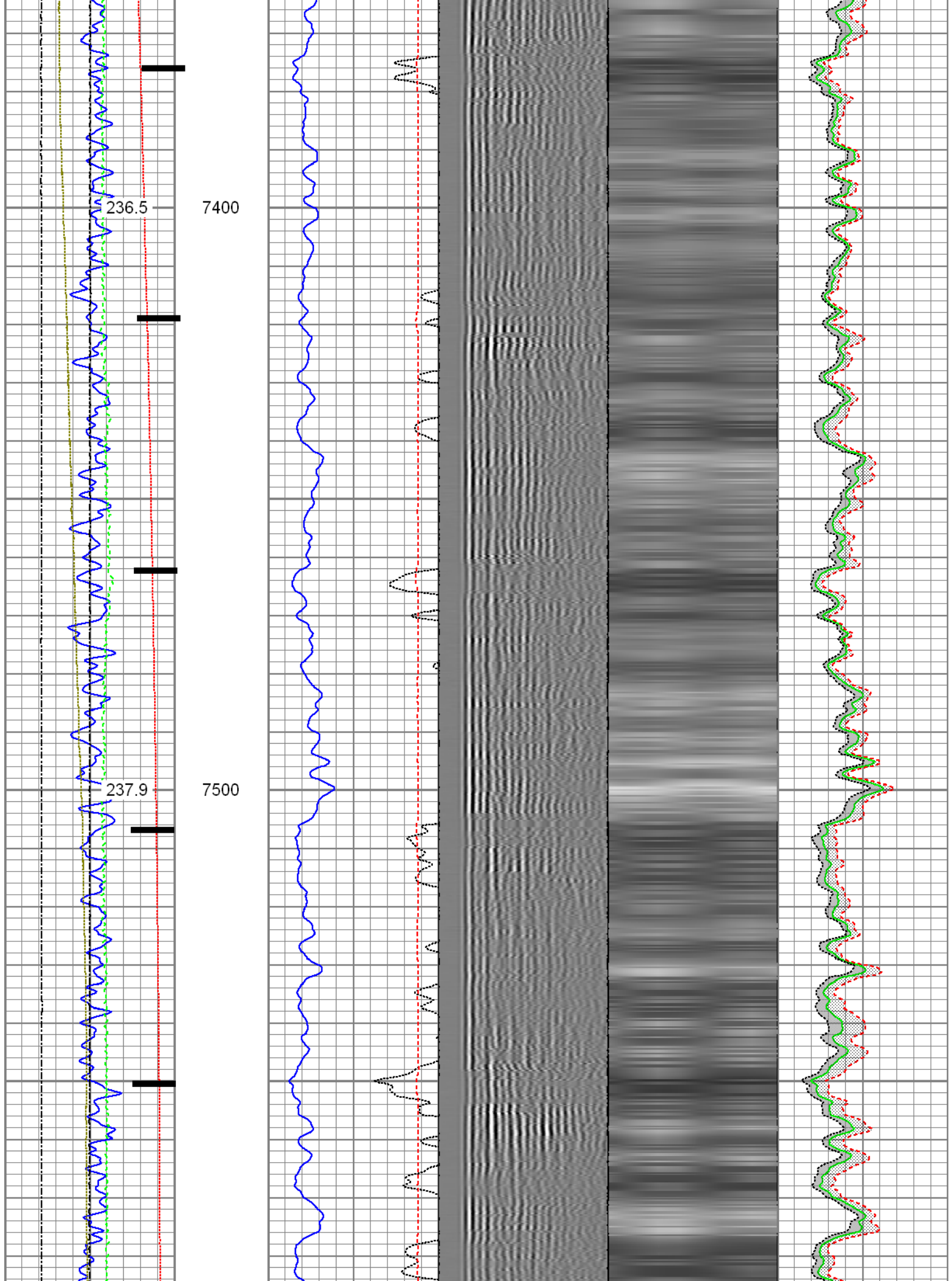


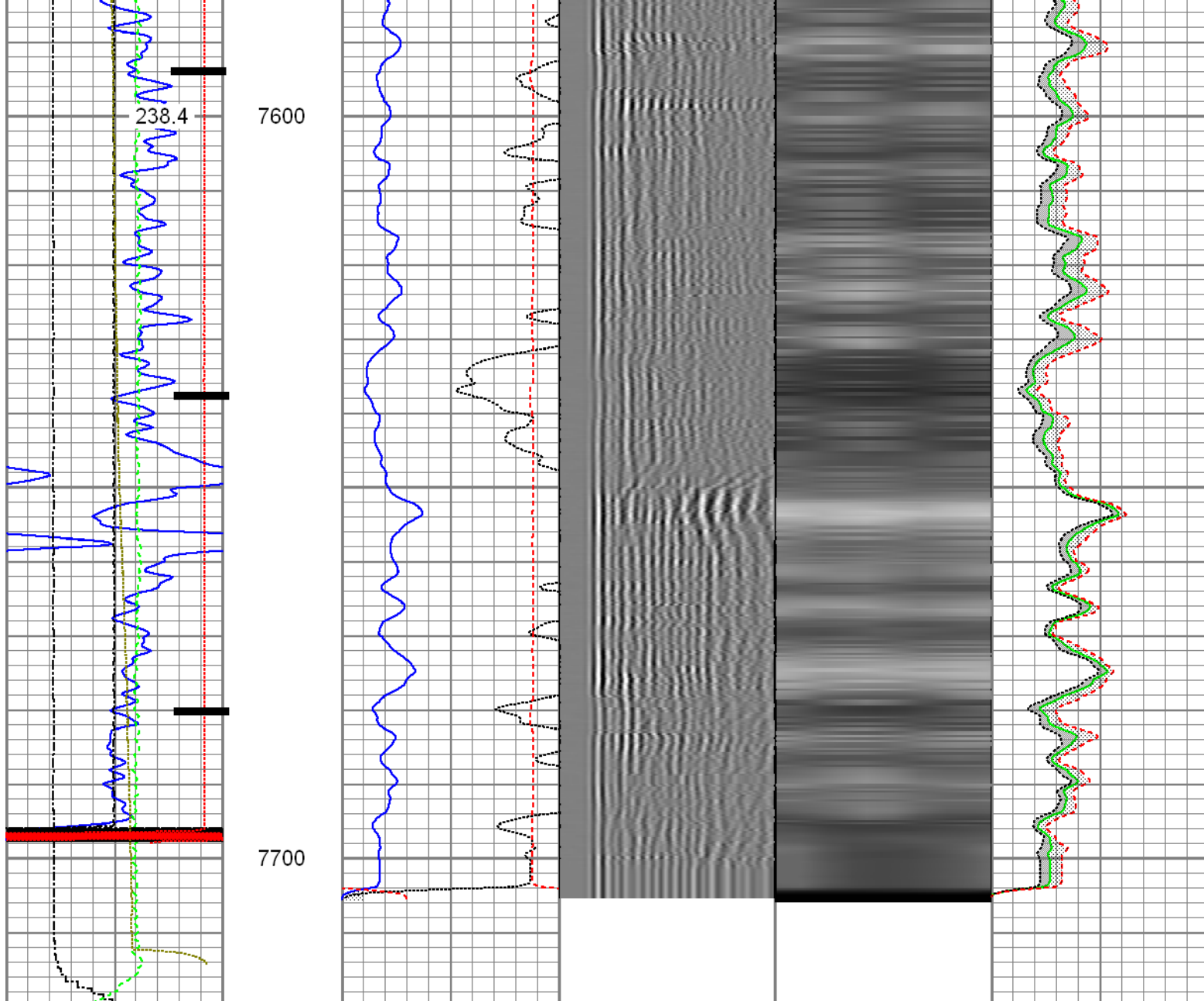








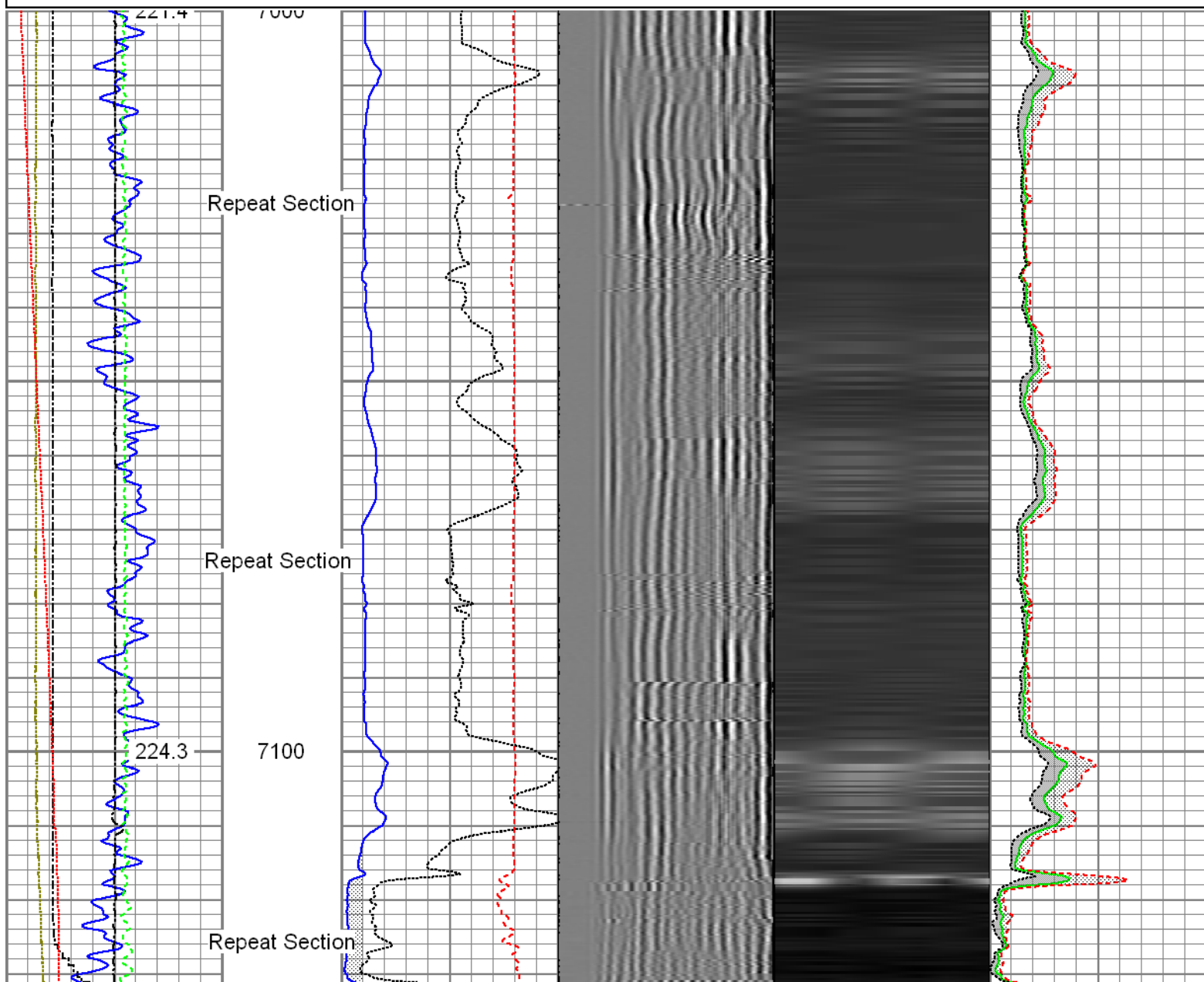


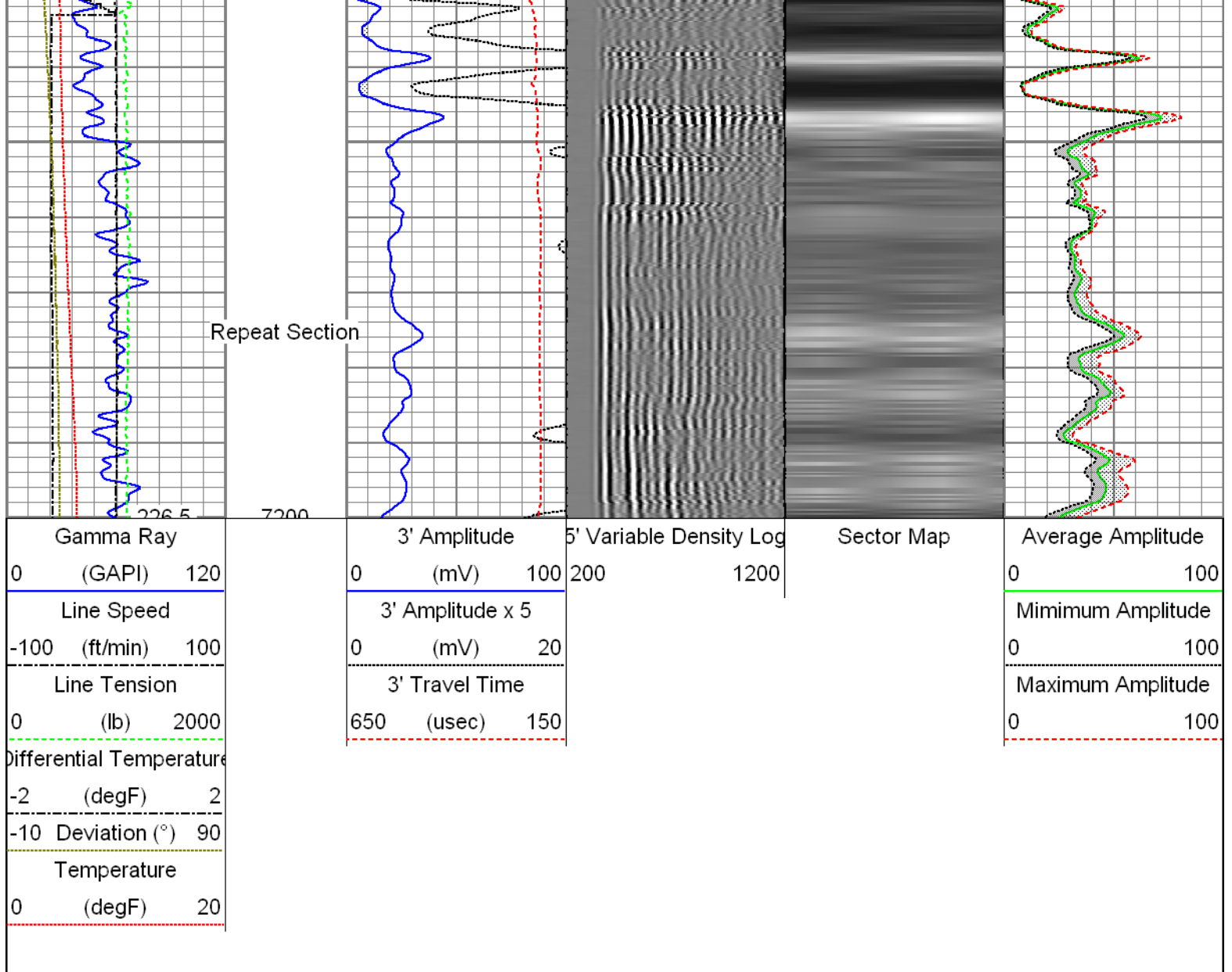


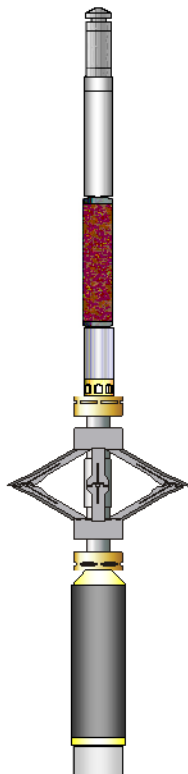
Gamma Ray 0 (GAPI) 120	3' Amplitude 0 (mV) 100	5' Variable Density Log 200 1200	Sector Map	Average Amplitude 0 100
Casing Collar Locator	3' Amplitude x 5 0 (mV) 20			Minimum Amplitude 0 100
Line Speed -100 (ft/min) 100	3' Travel Time 650 (usec) 150			Maximum Amplitude 0 100
Line Tension 0 (lb) 2000	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

Database File: 0512336461_anadarko_buffalo 13n-15hz_08-11-15_mit_rbl.db
 Dataset Pathname: pass2
 Presentation Format: rbt4_mit
 Dataset Creation: Tue Aug 11 13:27:59 2015 by Log 7.0 B1
 Charted by: Depth in Feet scaled 1:240

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 (lb)	3' Travel Time (usec)			Maximum Amplitude
0 2000	650 150			0 100
Differential Temperature (degF)				
-2 2				
Deviation (°)				
-10 90				
Temperature (degF)				
0 20				





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 (218874) 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-DSSRAC (080) 2-3/4" DSS 5 Arm Roller Centralizer	2.55	2.75	32.00

Tool Name	Tool Length (ft)	Tool Weight (lb)	Tool O.D. (in)
WV3FT	15.42		
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		
WV5FT	14.42		
MIT	5.41		
TSTAMP	0.00		
UW_RBT-UW_RBT_004 (1066) Sondex Ultrawire 3-1/8" Radial Bond Tool	9.47	3.13	140.00
UW_PRC-DSSRAC (083) 2-3/4" DSS 5 Arm Roller Centralizer	2.55	2.75	32.00
UW_MIT-UW_MIT40_042 (10020664) 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
UW_BUL-UW_BUL_006 (218707) Sondex Ultrawire Bullnose Terminator	0.22	1.69	1.20

Dataset:
Total Length:
Total Weight:
O.D.

0512336461_Anadarko_Buffalo 13N-15HZ_08-11-15_MIT_RBL.db: field/well/run1/pass5
28.09 ft
324.50 lb
3.13 in

Finger Calibration Report

Performed:

Tue Aug 11 12:53:21 2015

Ring size: (in)	4	Sens	5	Sens	6	Sens	7
Finger 01:	1152	356.0	1508	377.0	1885	386.0	2271
Finger 02:	1161	364.0	1525	384.0	1909	390.0	2299
Finger 03:	1107	357.0	1464	381.0	1845	393.0	2238
Finger 04:	1113	373.0	1486	397.0	1883	405.0	2288
Finger 05:	1095	368.0	1463	390.0	1853	401.0	2254
Finger 06:	1123	368.0	1491	382.0	1873	387.0	2260
Finger 07:	1028	384.0	1412	408.0	1820	424.0	2244
Finger 08:	1083	371.0	1454	388.0	1842	406.0	2248
Finger 09:	1042	384.0	1426	394.0	1820	415.0	2235
Finger 10:	962	383.0	1345	410.0	1755	439.0	2194
Finger 11:	1047	379.0	1426	378.0	1804	395.0	2199
Finger 12:	1019	386.0	1405	391.0	1796	414.0	2210
Finger 13:	991	381.0	1372	382.0	1754	410.0	2164
Finger 14:	967	382.0	1349	385.0	1734	413.0	2147
Finger 15:	1029	388.0	1417	365.0	1782	390.0	2172
Finger 16:	980	389.0	1369	378.0	1747	408.0	2155
Finger 17:	984	395.0	1379	382.0	1761	409.0	2170
Finger 18:	933	391.0	1324	389.0	1713	431.0	2144
Finger 19:	940	389.0	1329	386.0	1715	419.0	2134
Finger 20:	979	395.0	1374	389.0	1763	418.0	2181
Finger 21:	999	387.0	1386	378.0	1764	409.0	2173
Finger 22:	1002	398.0	1400	384.0	1784	413.0	2197
Finger 23:	1115	382.0	1497	352.0	1849	377.0	2226
Finger 24:	977	389.0	1366	390.0	1756	421.0	2177
Finger 25:	961	387.0	1348	391.0	1739	424.0	2163
Finger 26:	1035	391.0	1426	384.0	1810	411.0	2221
Finger 27:	1070	391.0	1461	389.0	1850	416.0	2266
Finger 28:	1057	386.0	1443	389.0	1832	416.0	2248
Finger 29:	1004	382.0	1386	392.0	1778	425.0	2203
Finger 30:	1111	378.0	1489	381.0	1870	405.0	2275
Finger 31:	1113	375.0	1488	385.0	1873	405.0	2278
Finger 32:	1155	368.0	1523	372.0	1895	390.0	2285
Finger 33:	1165	372.0	1537	375.0	1912	392.0	2304
Finger 34:	1126	375.0	1501	392.0	1893	411.0	2304
Finger 35:	1145	369.0	1514	392.0	1906	409.0	2315
Finger 36:	1164	357.0	1521	376.0	1897	391.0	2288
Finger 37:	1125	372.0	1497	398.0	1895	412.0	2307
Finger 38:	1086	377.0	1463	410.0	1873	426.0	2299
Finger 39:	1110	369.0	1479	395.0	1874	409.0	2283
Finger 40:	1141	368.0	1509	387.0	1896	398.0	2294

Segmented Cement Bond Log Calibration Report

Serial Number: 1066
Tool Model: UW_RBT_004

Calibration Casing Diameter: 7.000 in
Calibration Depth: -13.041 ft

Master Calibration, performed Tue Aug 11 12:51:11 2015:

	Raw (v)		Calibrated (mv)		Results	
	Zero	Cal	Zero	Cal	Gain	Offset
3FT	0.005	0.693	0.800	62.165	89.230	0.370
5FT	-0.001	0.653	0.800	62.165	93.811	0.910
S1	0.005	0.666	0.000	100.000	151.357	-0.739
S2	0.004	0.677	0.000	100.000	148.505	0.511

S2	0.004	0.677	0.000	100.000	148.565	-0.544
S3	0.004	0.686	0.000	100.000	146.503	-0.562
S4	0.004	0.701	0.000	100.000	143.335	-0.525
S5	0.004	0.705	0.000	100.000	142.634	-0.540
S6	0.004	0.712	0.000	100.000	141.101	-0.517
S7	0.004	0.715	0.000	100.000	140.686	-0.563
S8	0.004	0.688	0.000	100.000	146.364	-0.638

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: Kerr-McGee Oil & Gas Onshore, L.P.
 Well: Buffalo 13N-15HZ
 Field: Wattenberg
 County: Weld
 State: Colorado