

# Radial Cement Bond Gamma Ray Casing Collar Log

Company Kerr-McGee Oil & Gas Onshore, L.P.  
Well Reynolds Cattle 31C-23HZ  
Field Wattenberg  
County Weld  
State Colorado

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Location: API #: 05-123-39133  
SHL: 620' FNL & 155' FEL NENE  
Lat/Long: 40.217216/-104.961383  
SEC 23 TWP 3N RGE 68W  
Permanent Datum Ground Level Elevation 4932'  
Log Measured From Kelly Bushing 16 FT  
Drilling Measured From Kelly Bushing  
Other Services  
Gauge Ring  
MIT  
Elevation  
K.B. 4948'  
D.F. ---  
G.L. 4932'

Date	27-July-2014
Run Number	One
Depth Driller	12637 FT
Depth Logger	Not Tagged
Bottom Logged Interval	6860 FT
Top Log Interval	Surface
Open Hole Size	8.75"
Type Fluid	Water
Density / Viscosity	8.34 lbm/gal
Max. Recorded Temp.	211°F
Estimated Cement Top	40 FT
Time Well Ready	ROA
Time Logger on Bottom	13:00
Equipment Number	HD-0119
Location	Fort Lupton, CO
Recorded By	D. Shannon
Witnessed By	Trevor Daniel

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 LTC	Surface	1353 FT
Intermediate #1	7"	26	P-110 LTC	Surface	7728 FT
Intermediate #2					
Liner	4 1/2"	11.6	P-110 LT&C/DOX	6795 FT	12622 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

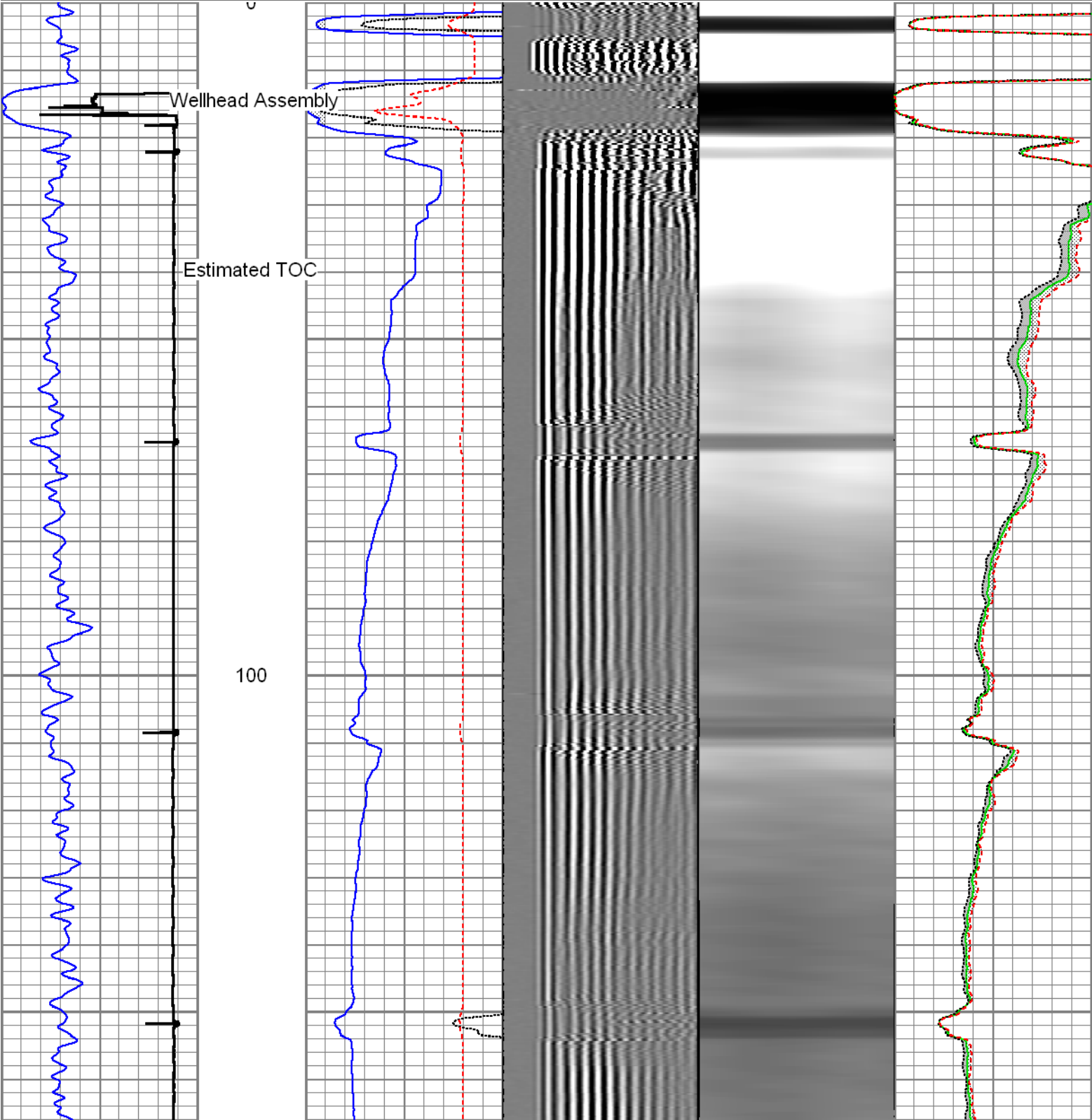
Log ran as per Customer request.  
Depth reference to Casing Tally reported Liner Top at 6795 Ft.  
Adjusted log -0- FT from KB zero to correlate with Liner Top.

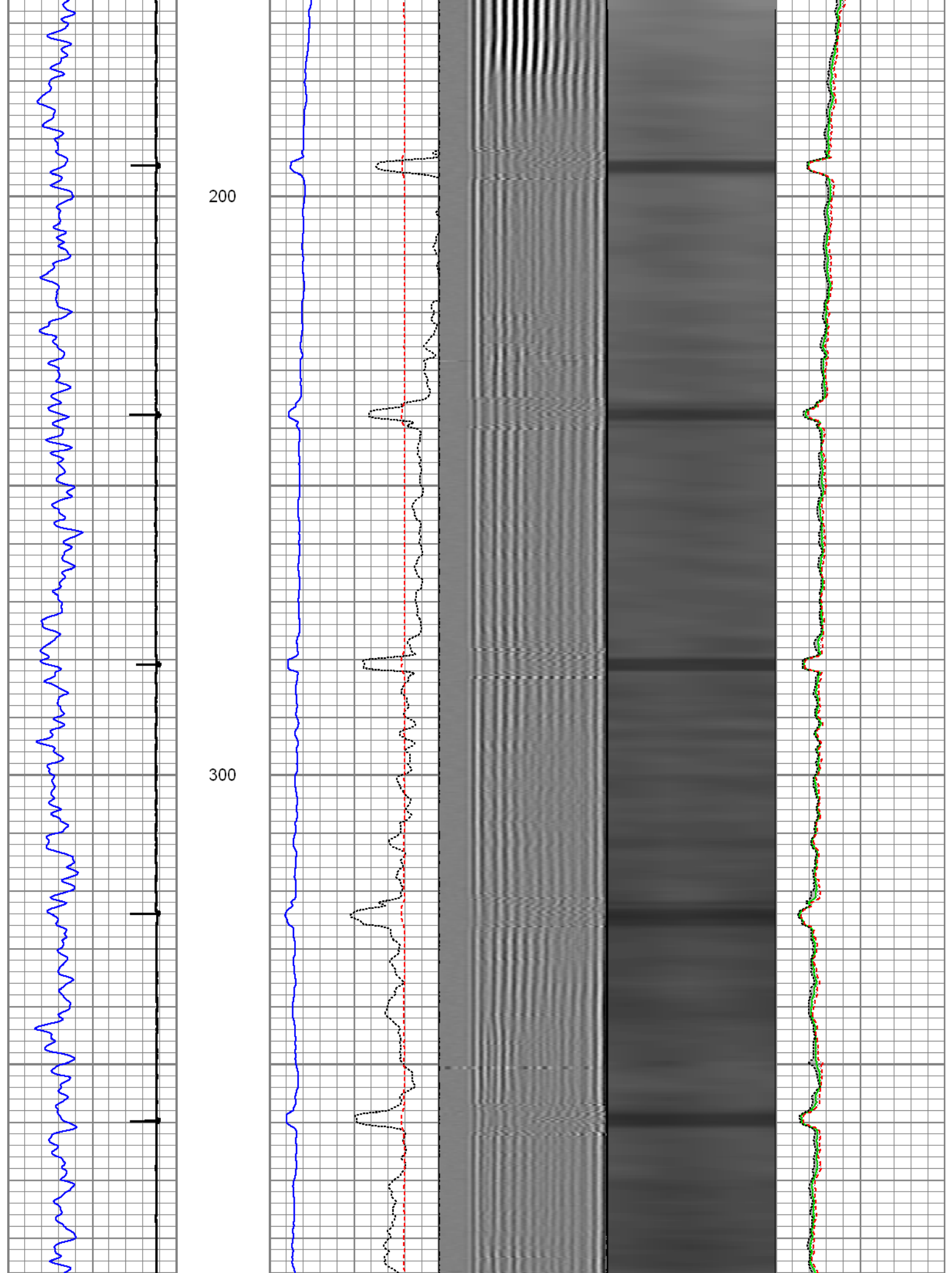
Log ran from below liner top to surface.  
Log ran with 2800 PSI surface induced pressure.

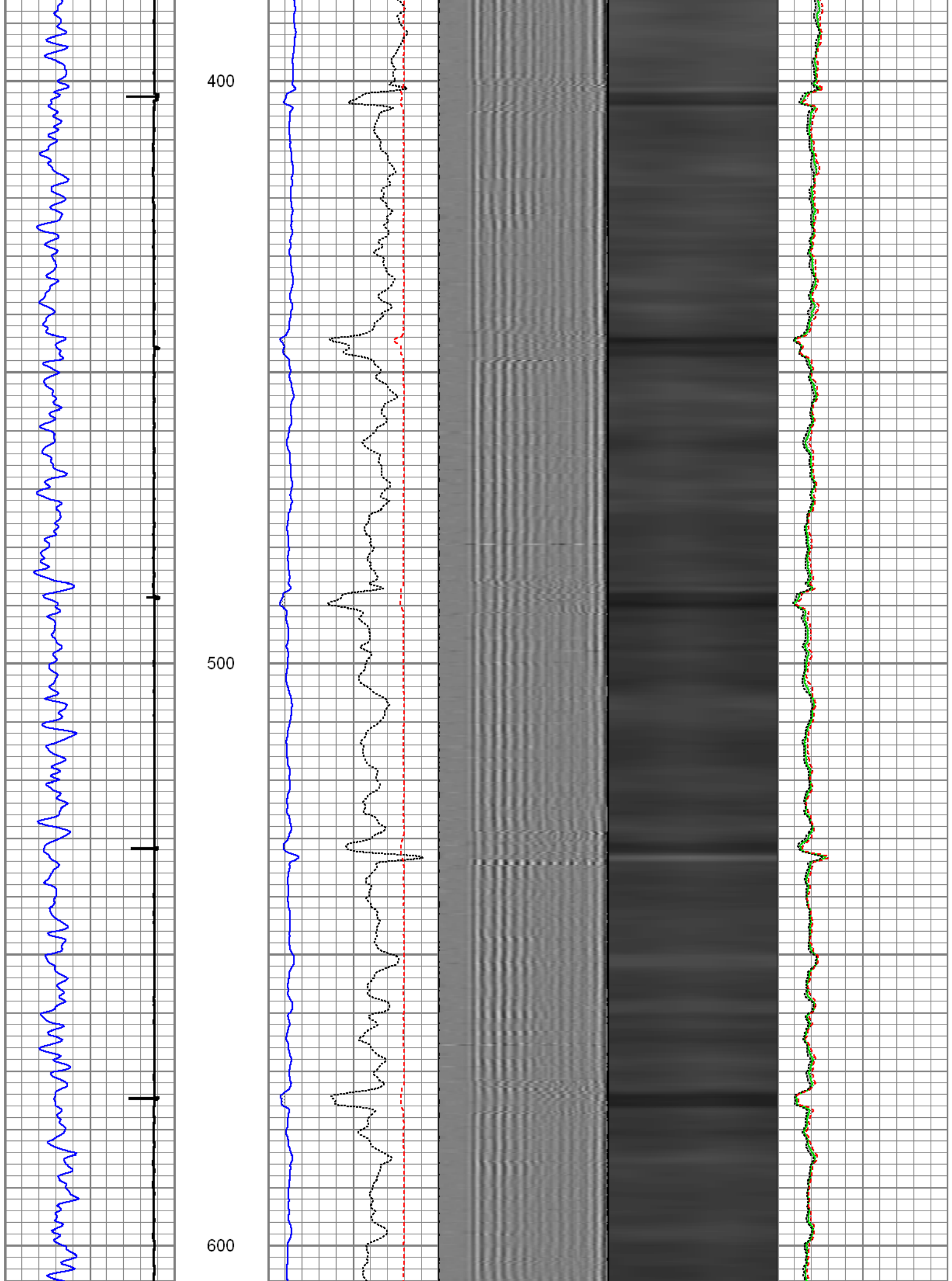
Thank you for choosing FMC Technologies Completion Services, Inc.!!

Database File: 0512339133\_anadarko\_reynolds cattle 31c-23hz\_07-27-14\_mit\_rbl.db  
Dataset Pathname: main1  
Presentation Format: rbt004  
Dataset Creation: Sun Jul 27 12:58:20 2014 by Log SCH 111116  
Charted by: Depth in Feet scaled 1:240

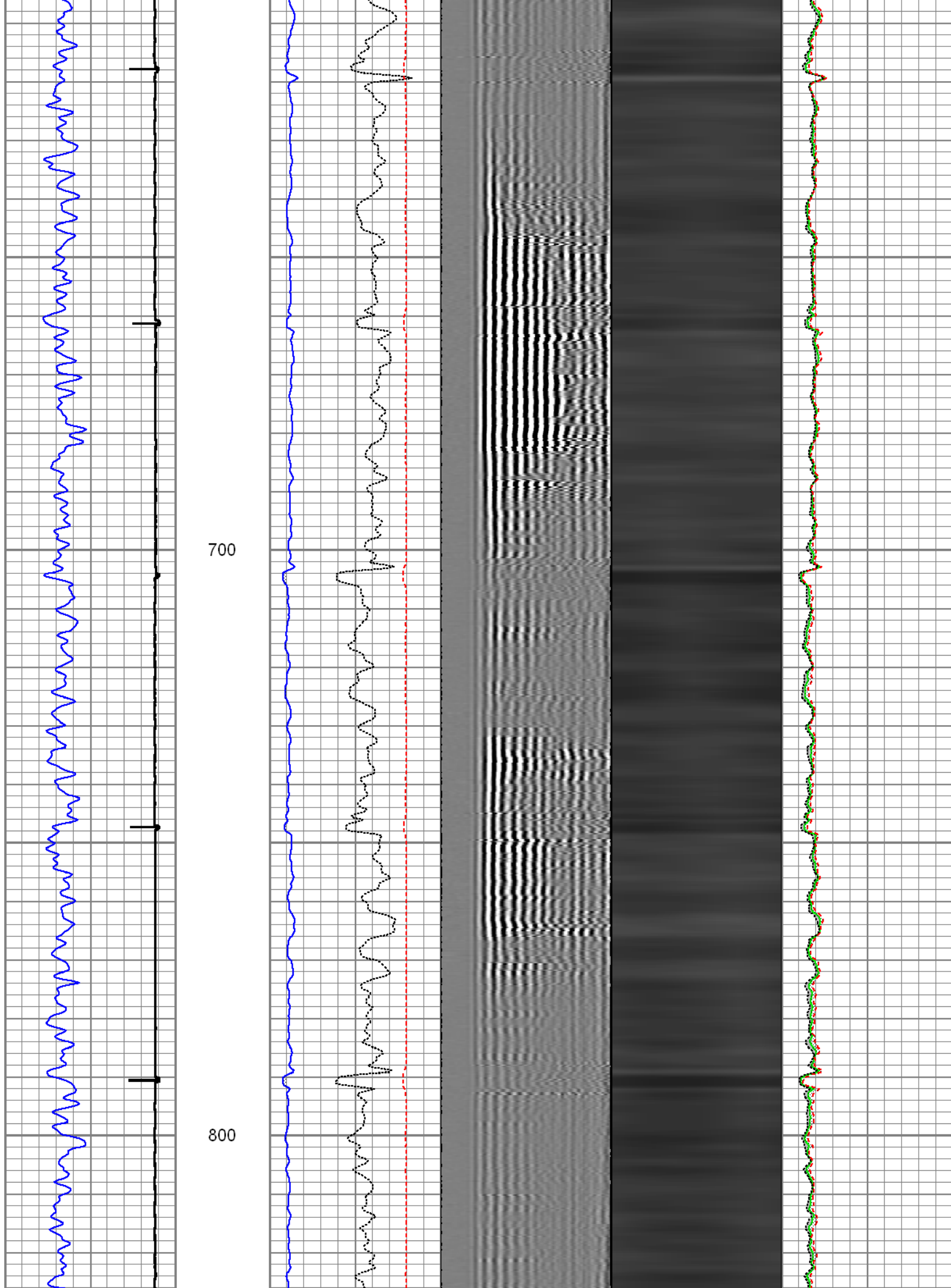
Gamma Ray	3' Amplitude	5' Variable Density Log	Sector Map	Average Amplitude
0 (GAPI) 120	0 (mV) 100	200 1200		0 100
Casing Collar Locator	3' Amplitude x 5			Minimum Amplitude
	0 (mV) 20			0 100
	3' Travel Time			Maximum Amplitude
	650 (usec) 150			0 100

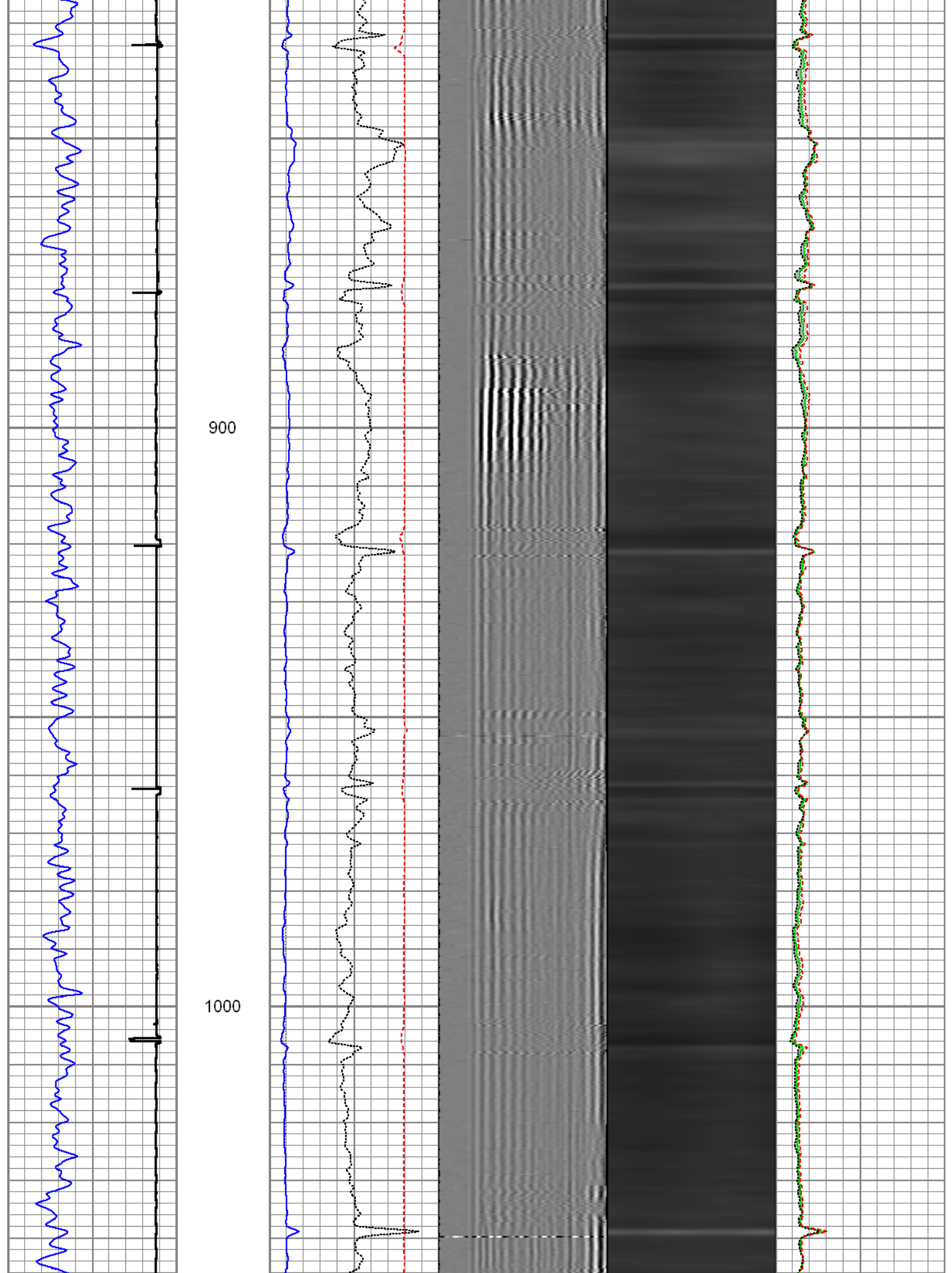


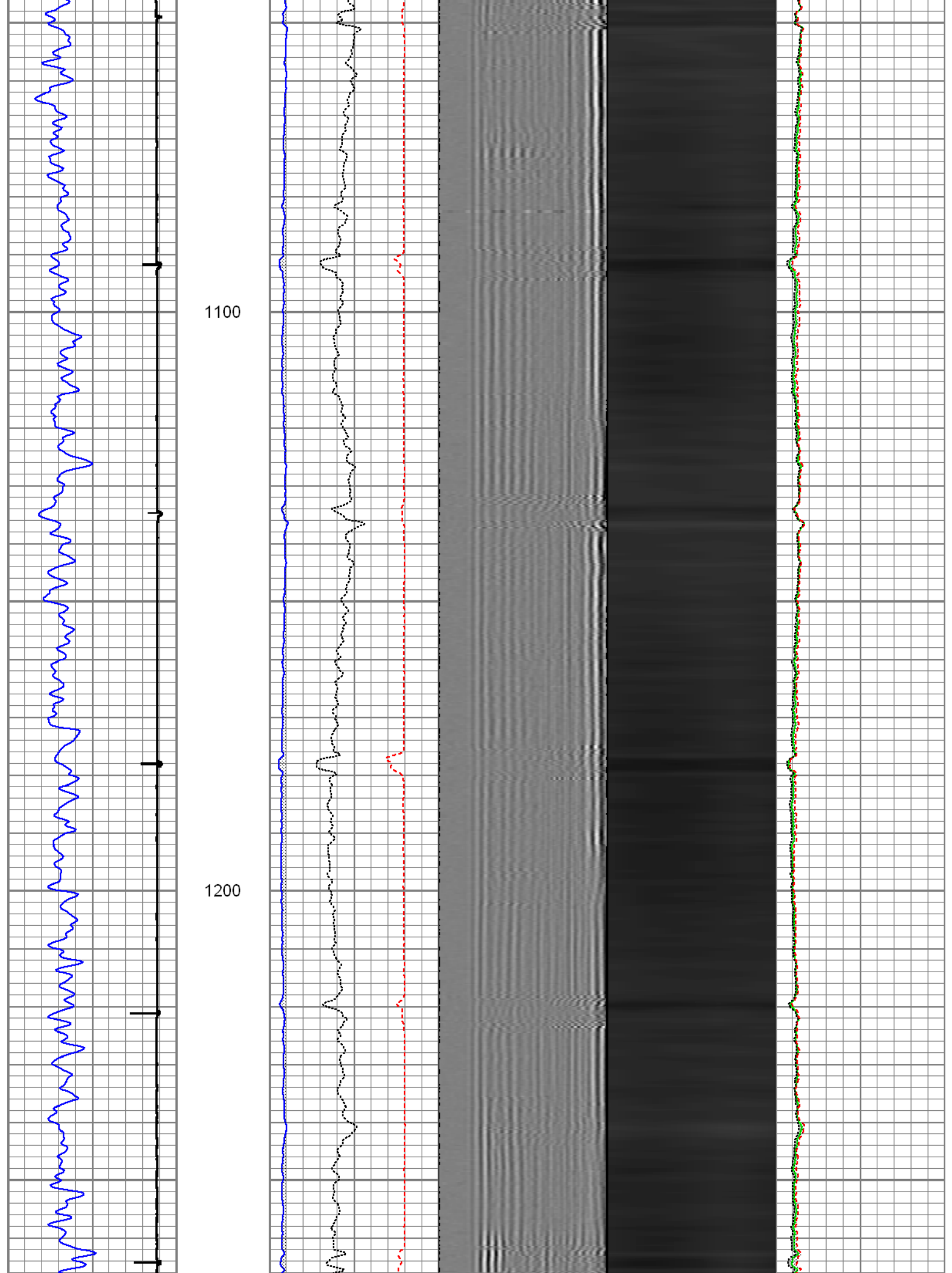


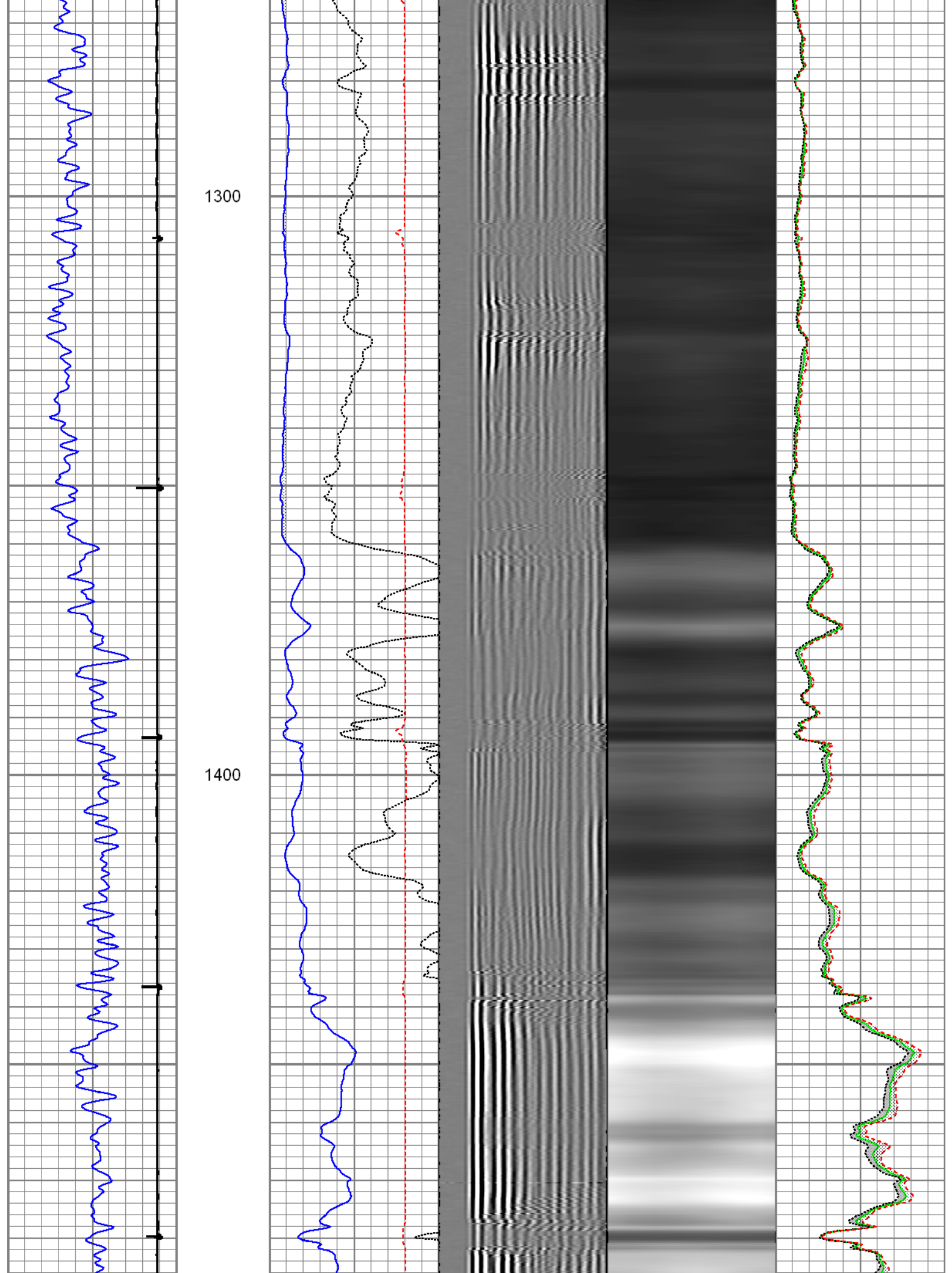


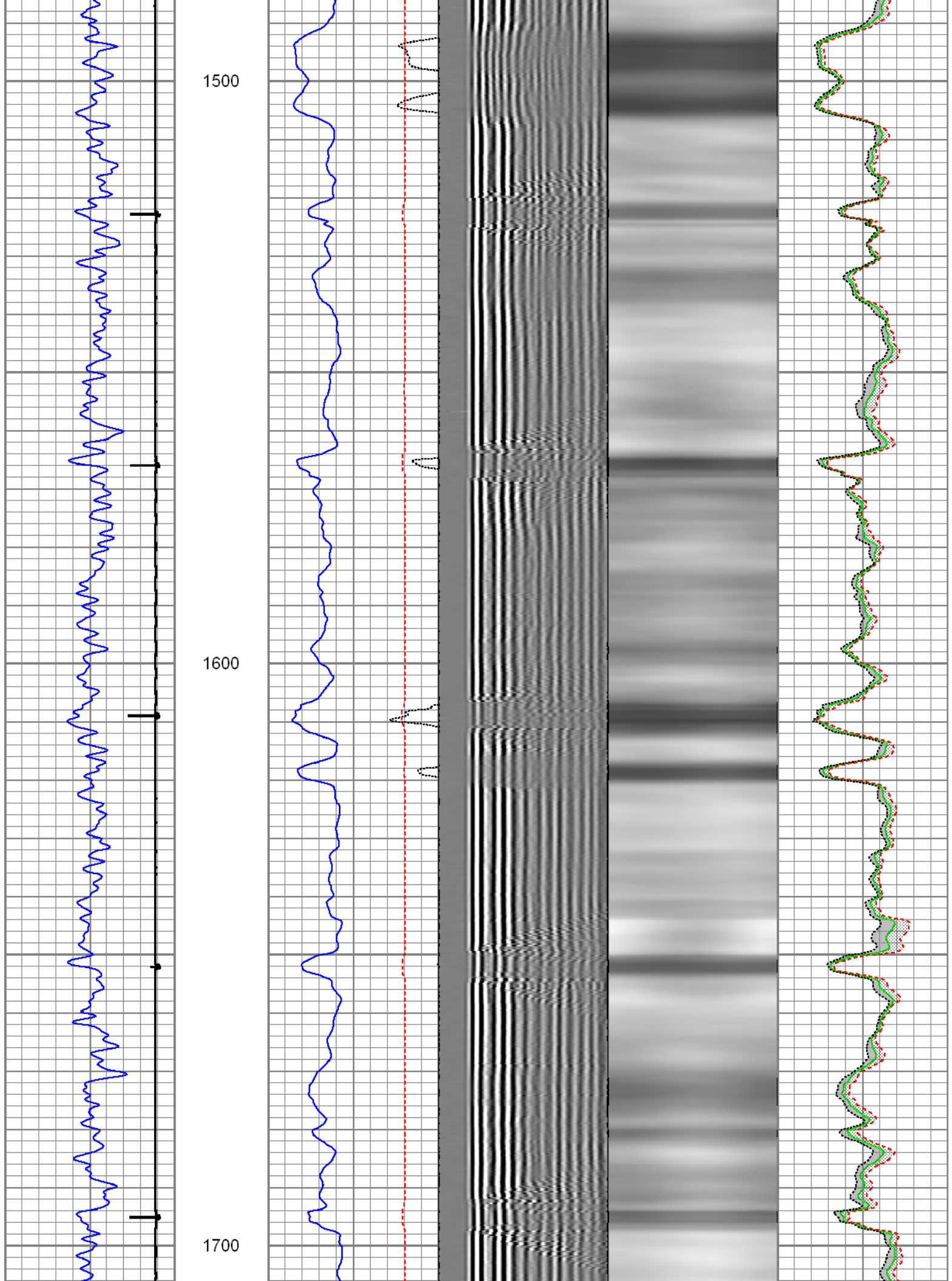




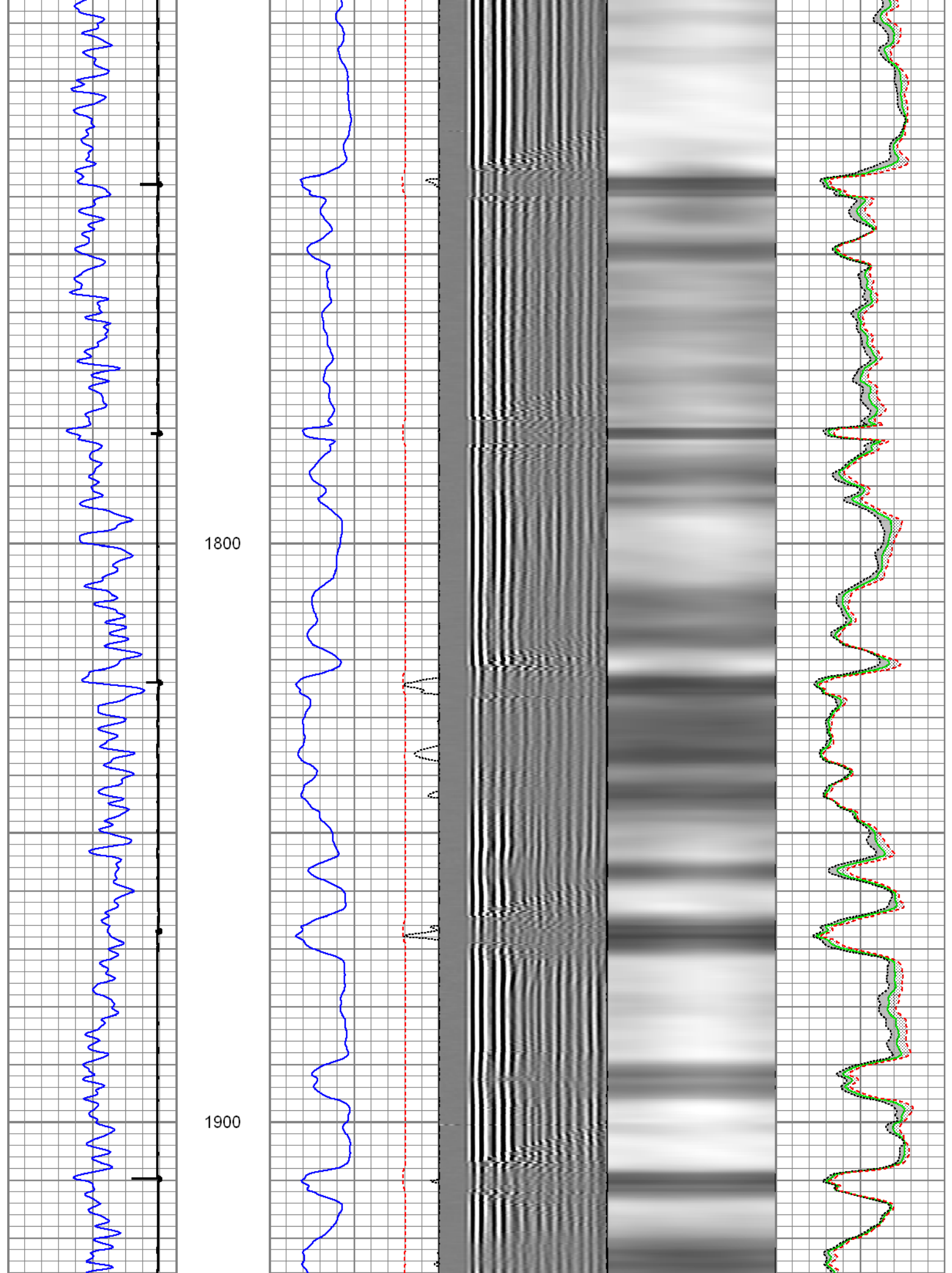


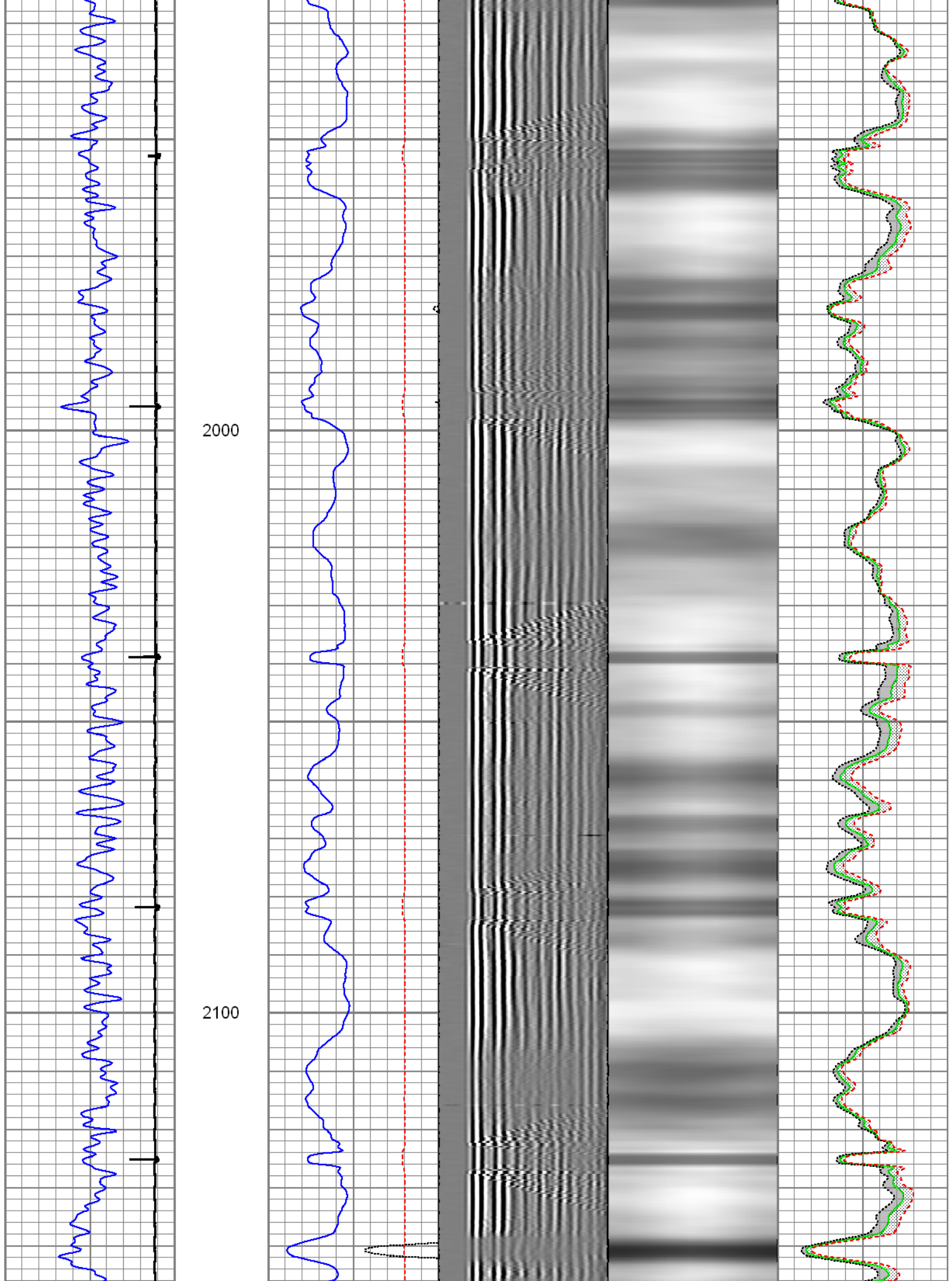






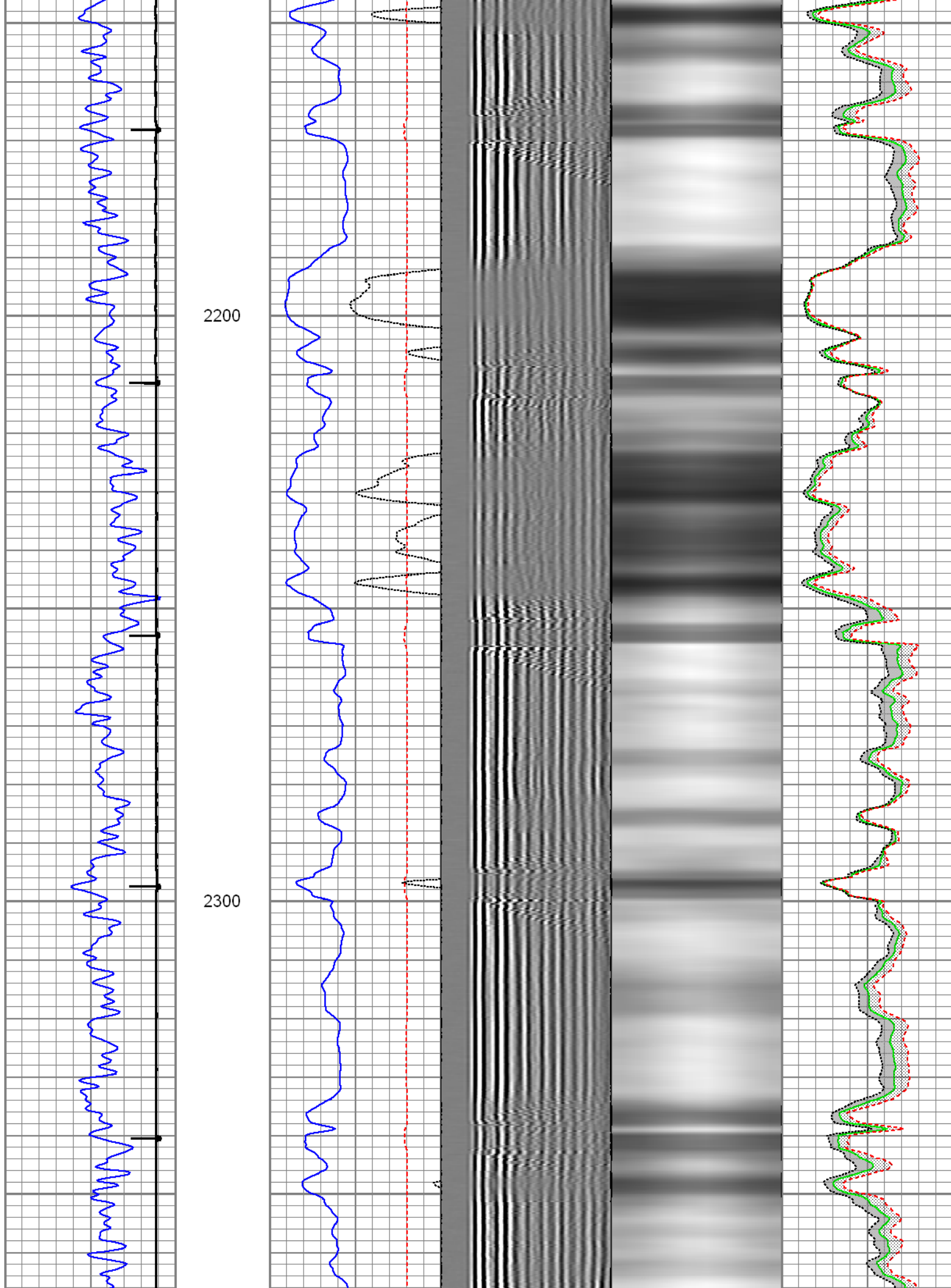


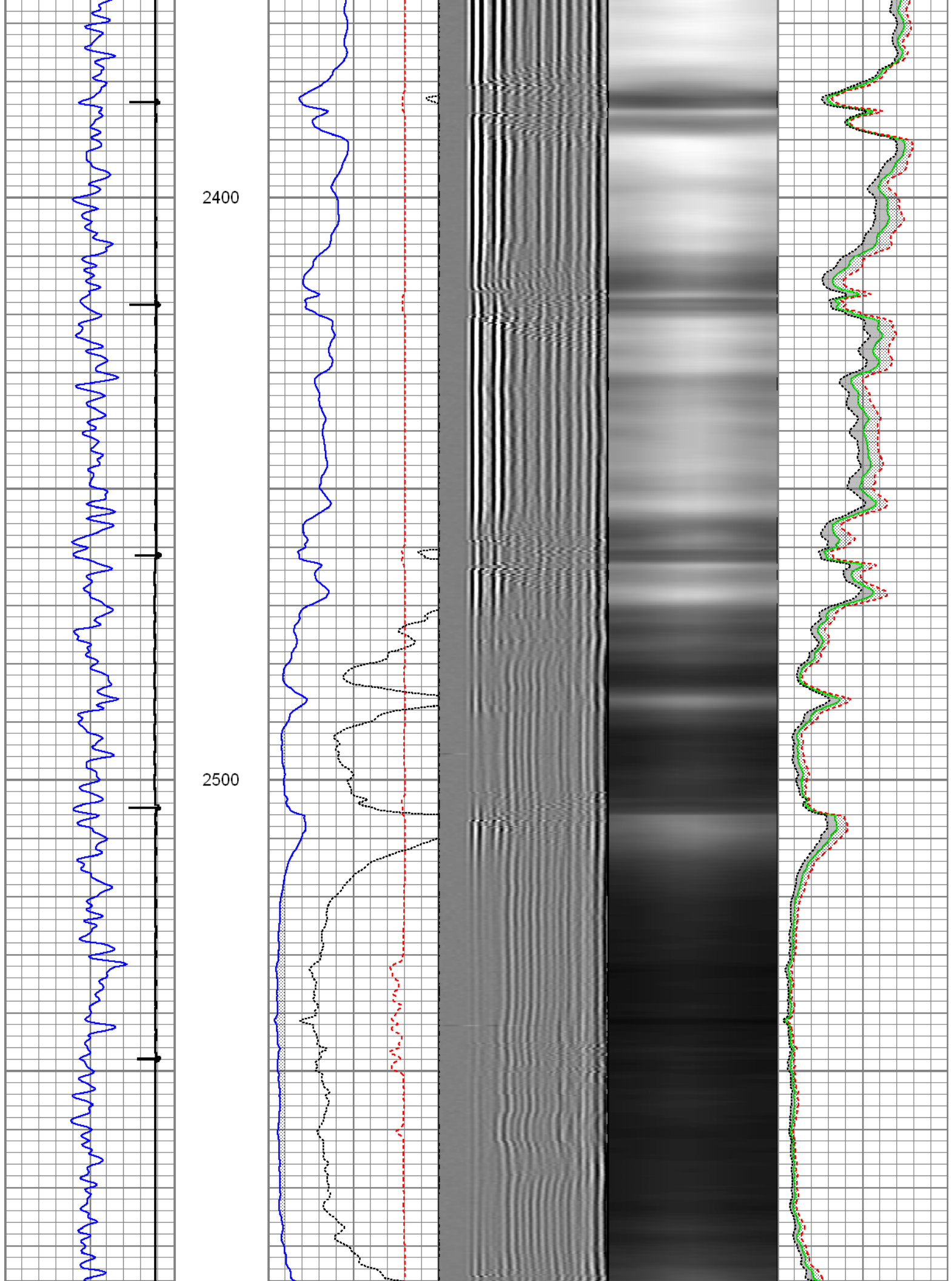




2200

2300



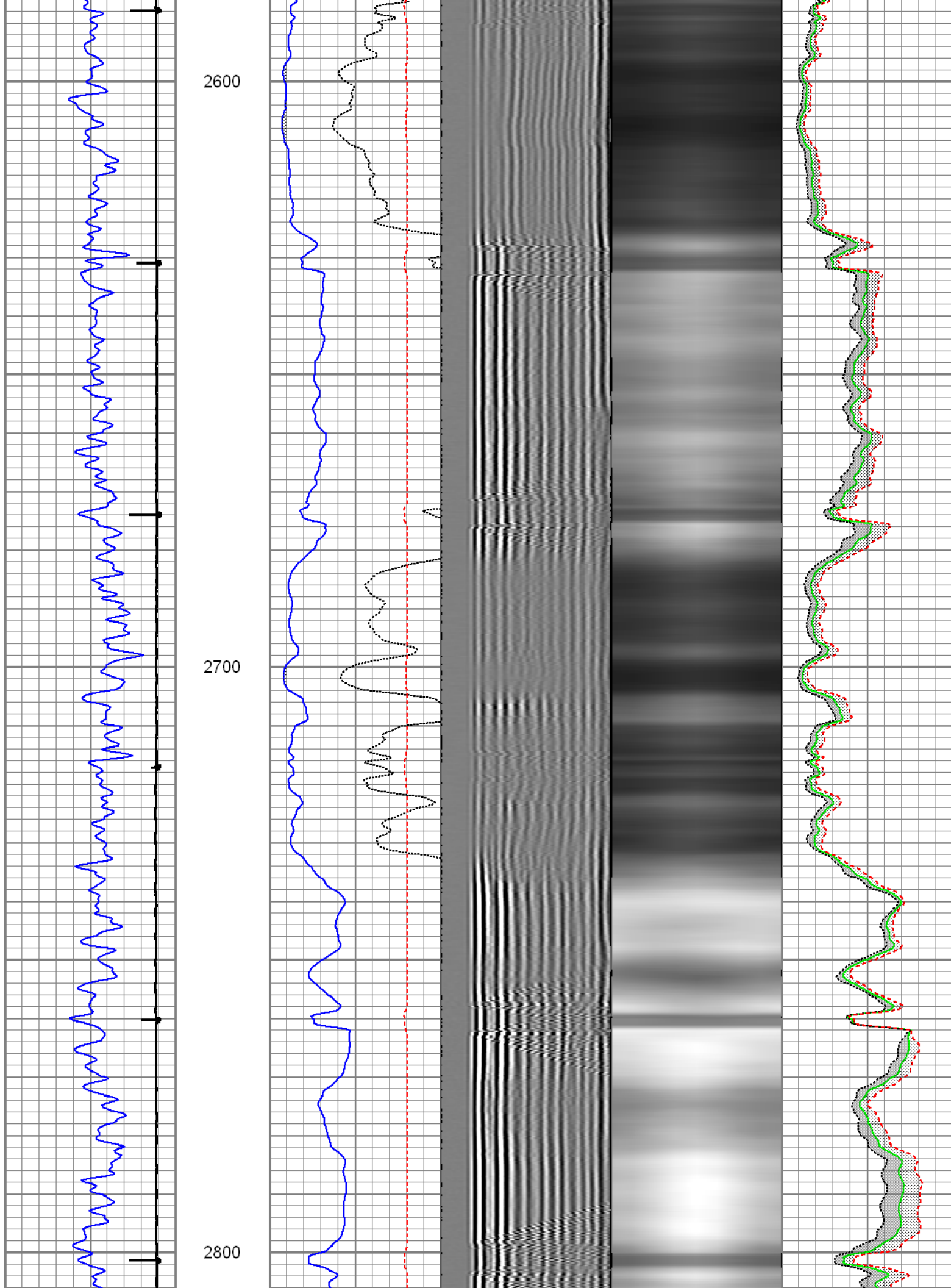




2600

2700

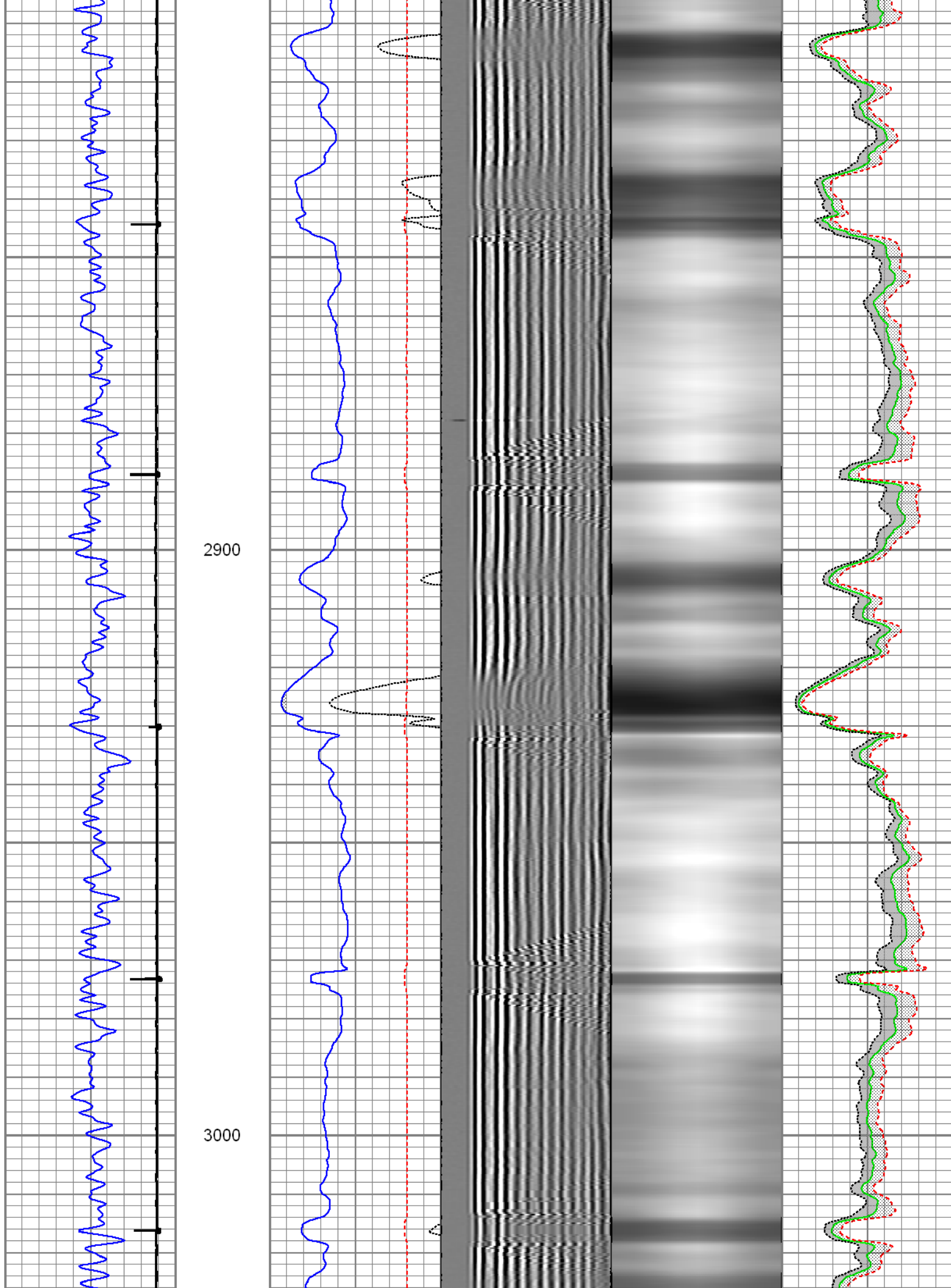
2800





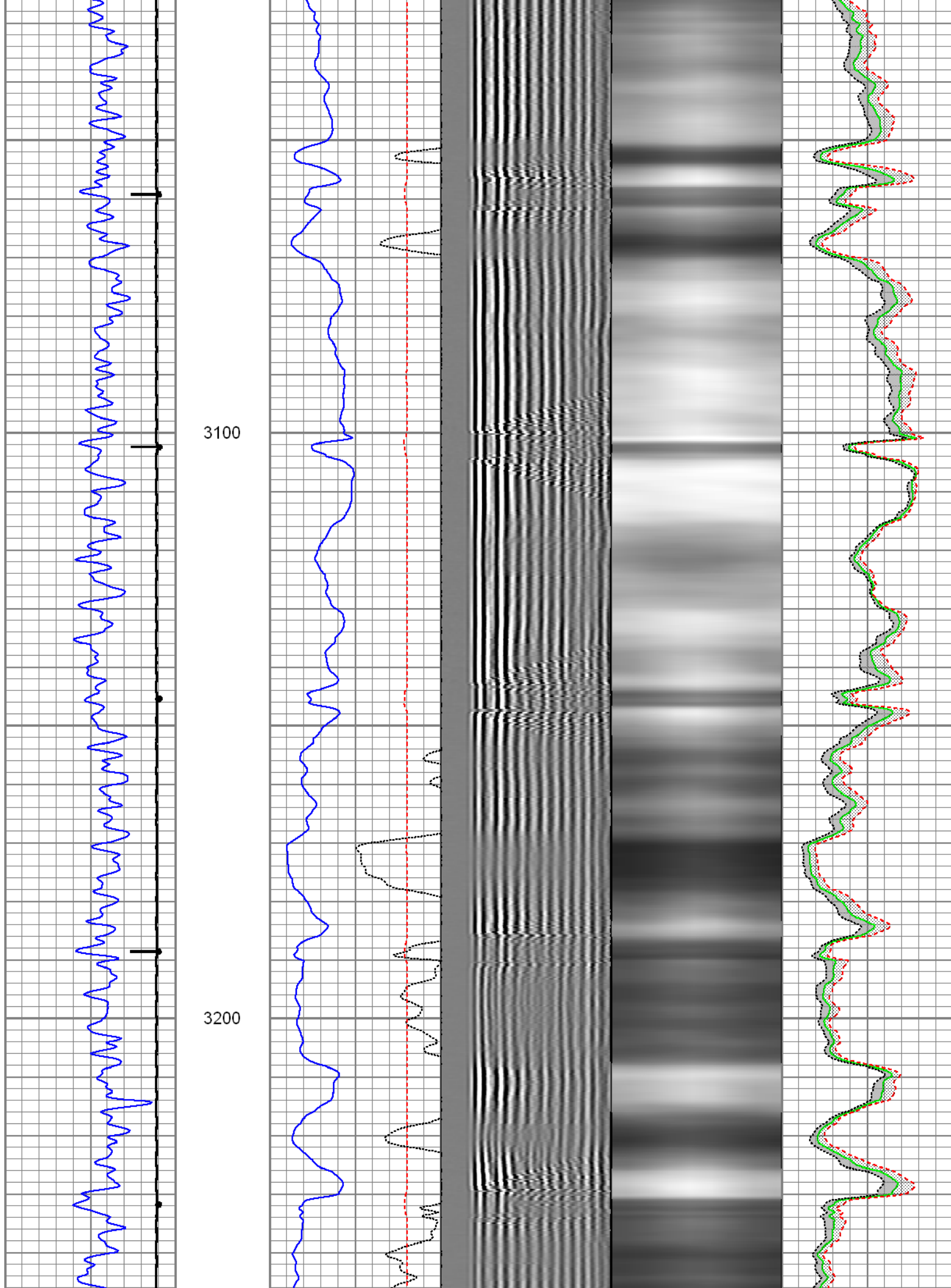
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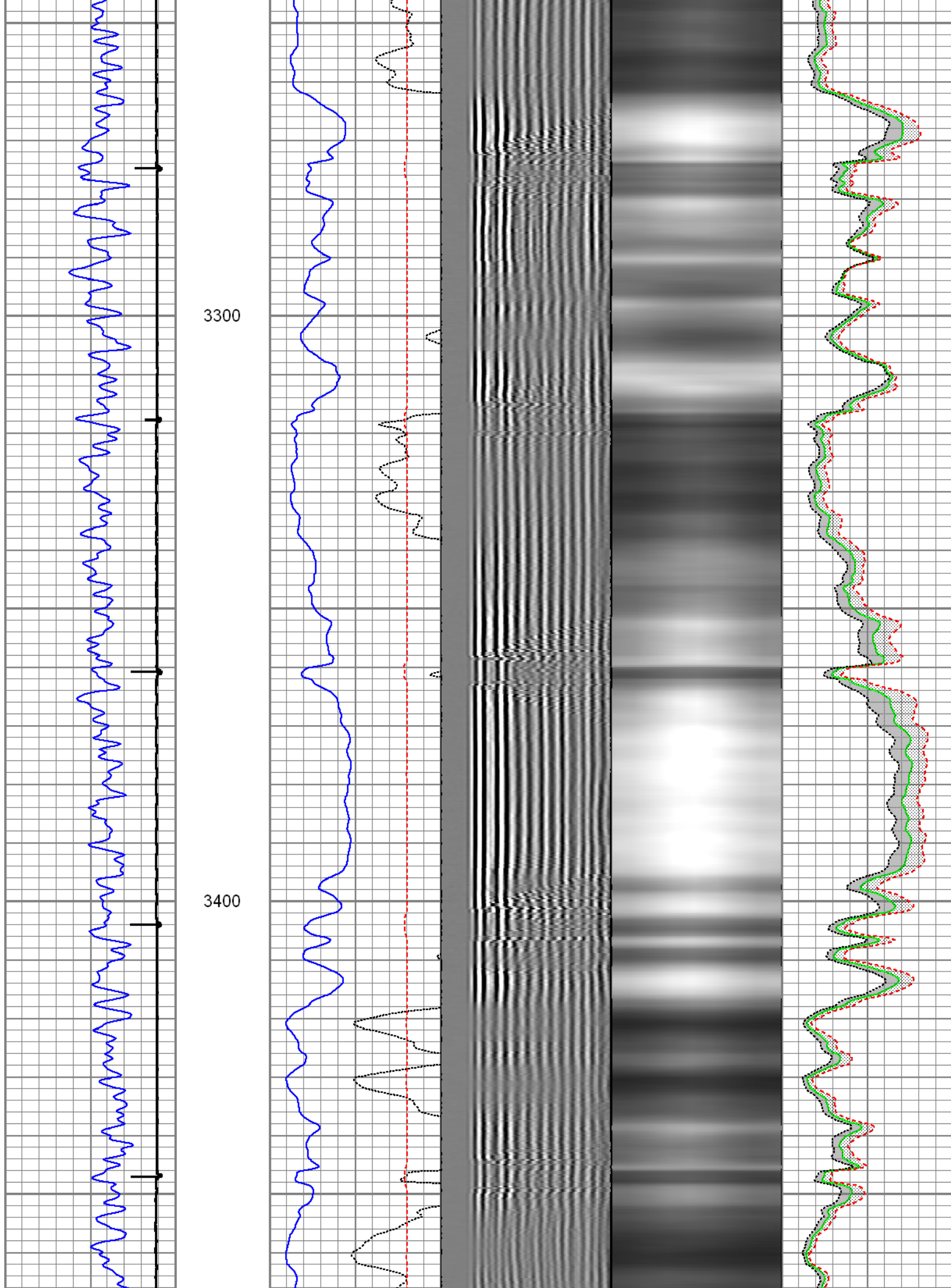
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3200



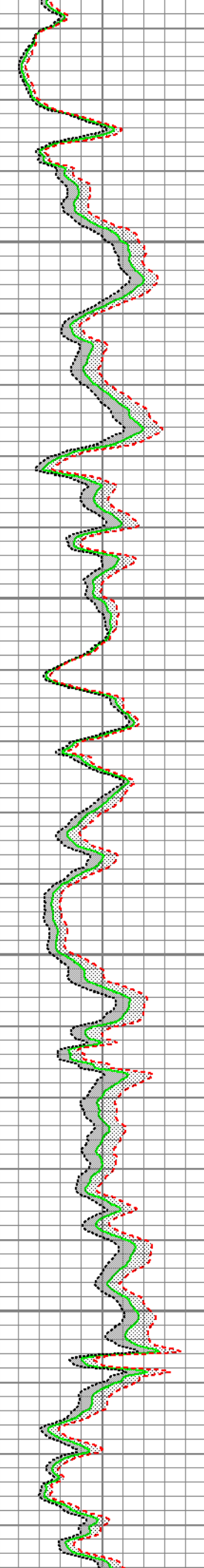
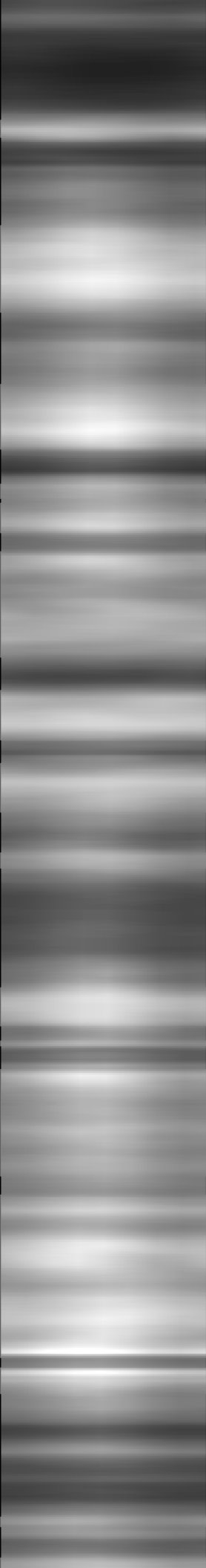
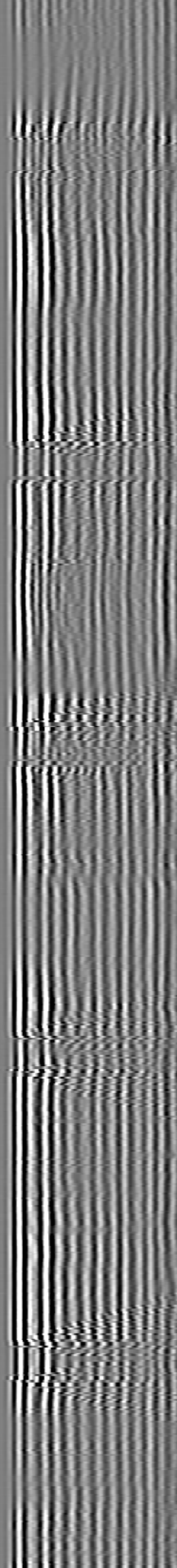
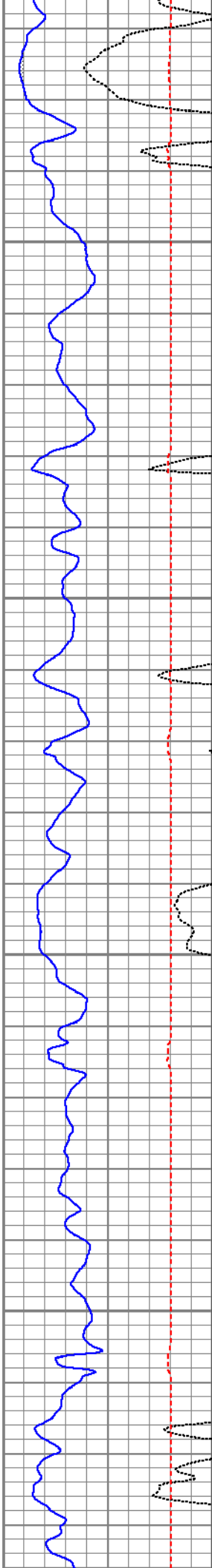
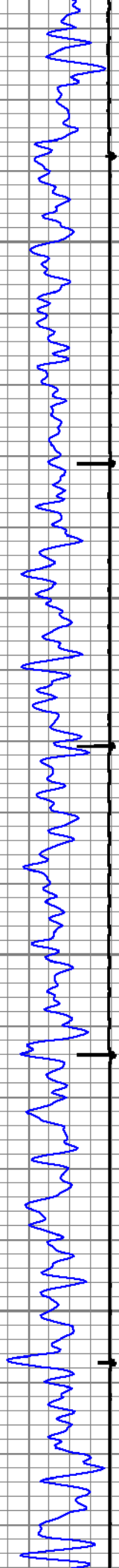
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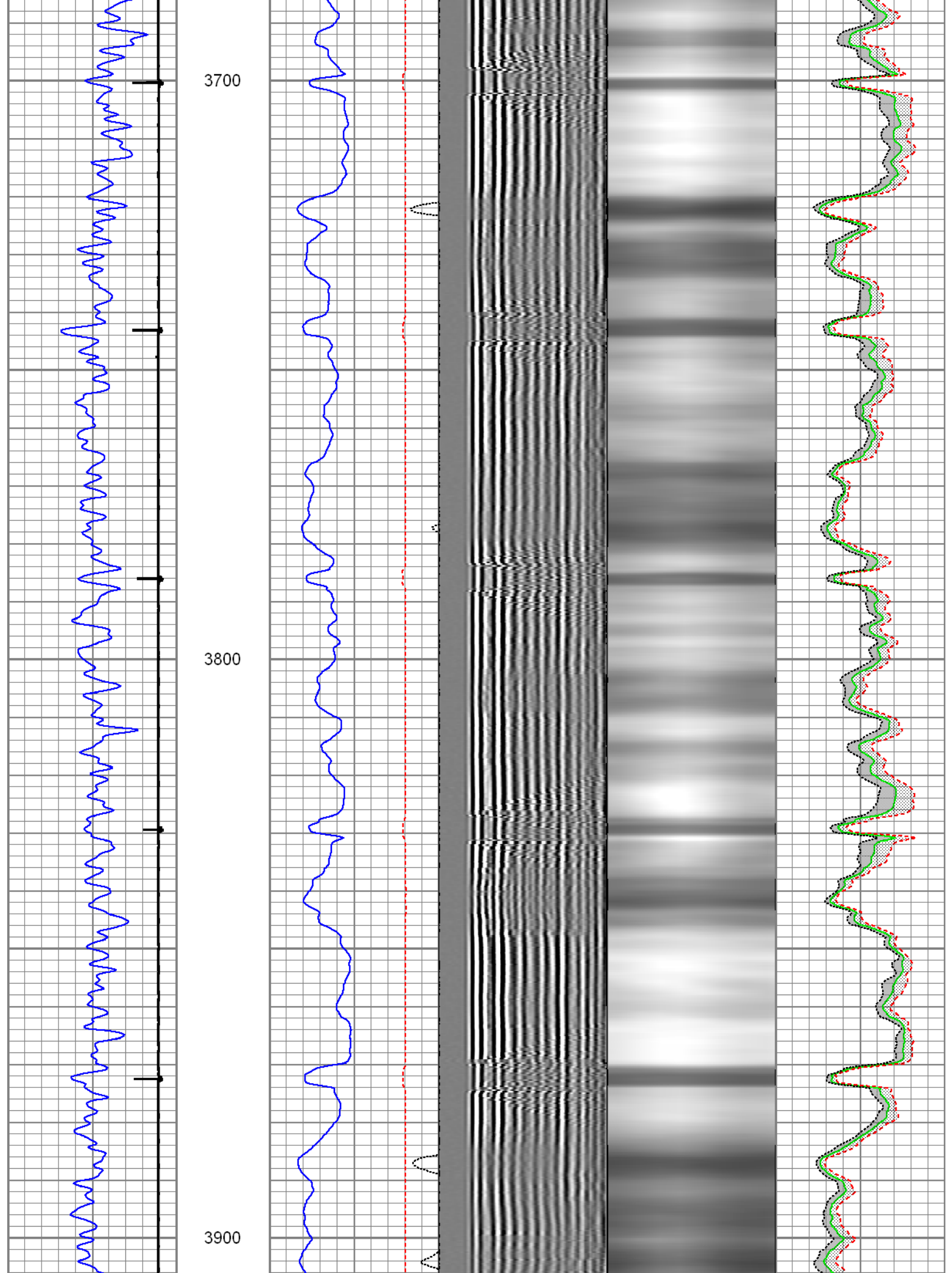


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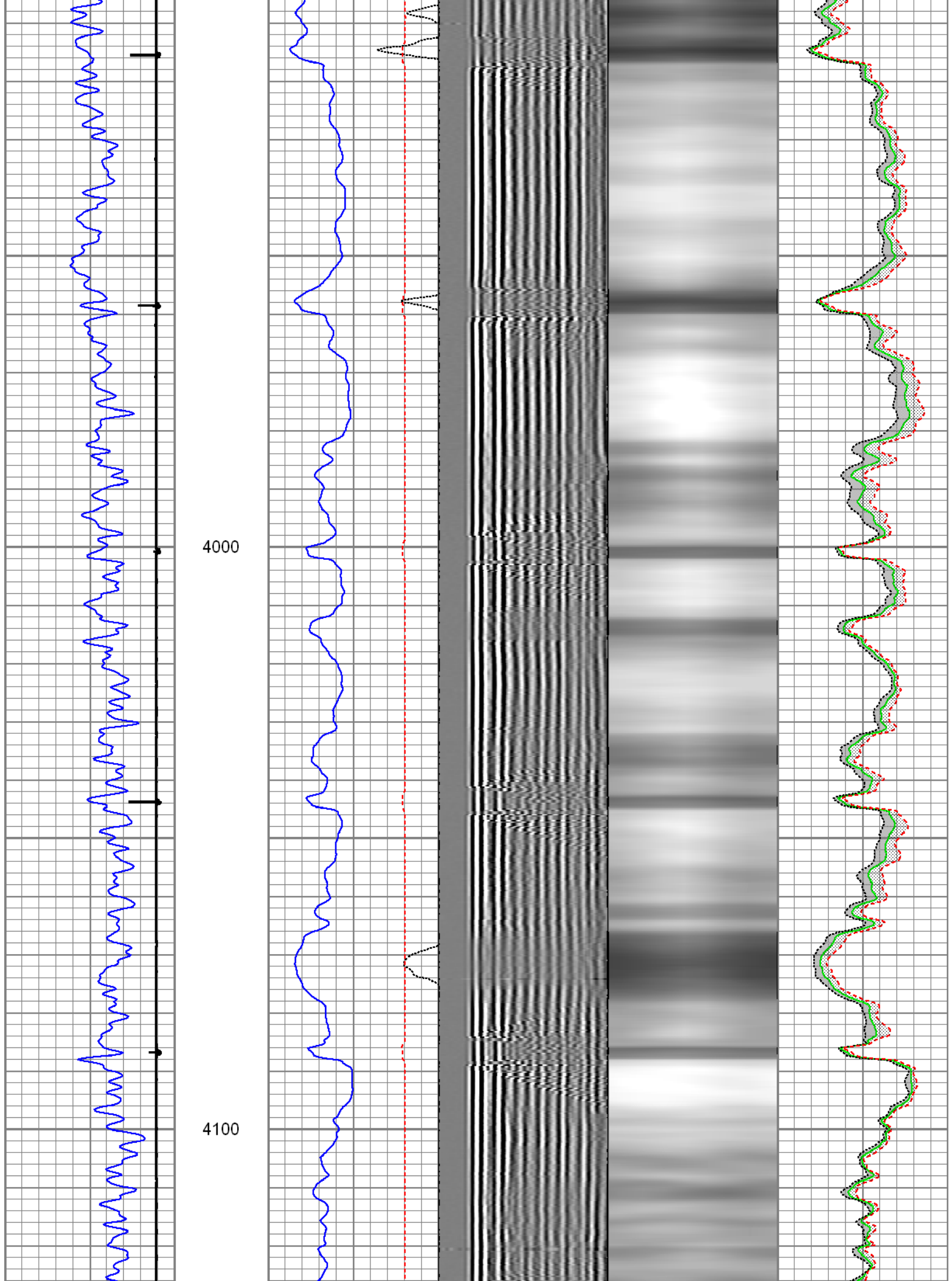
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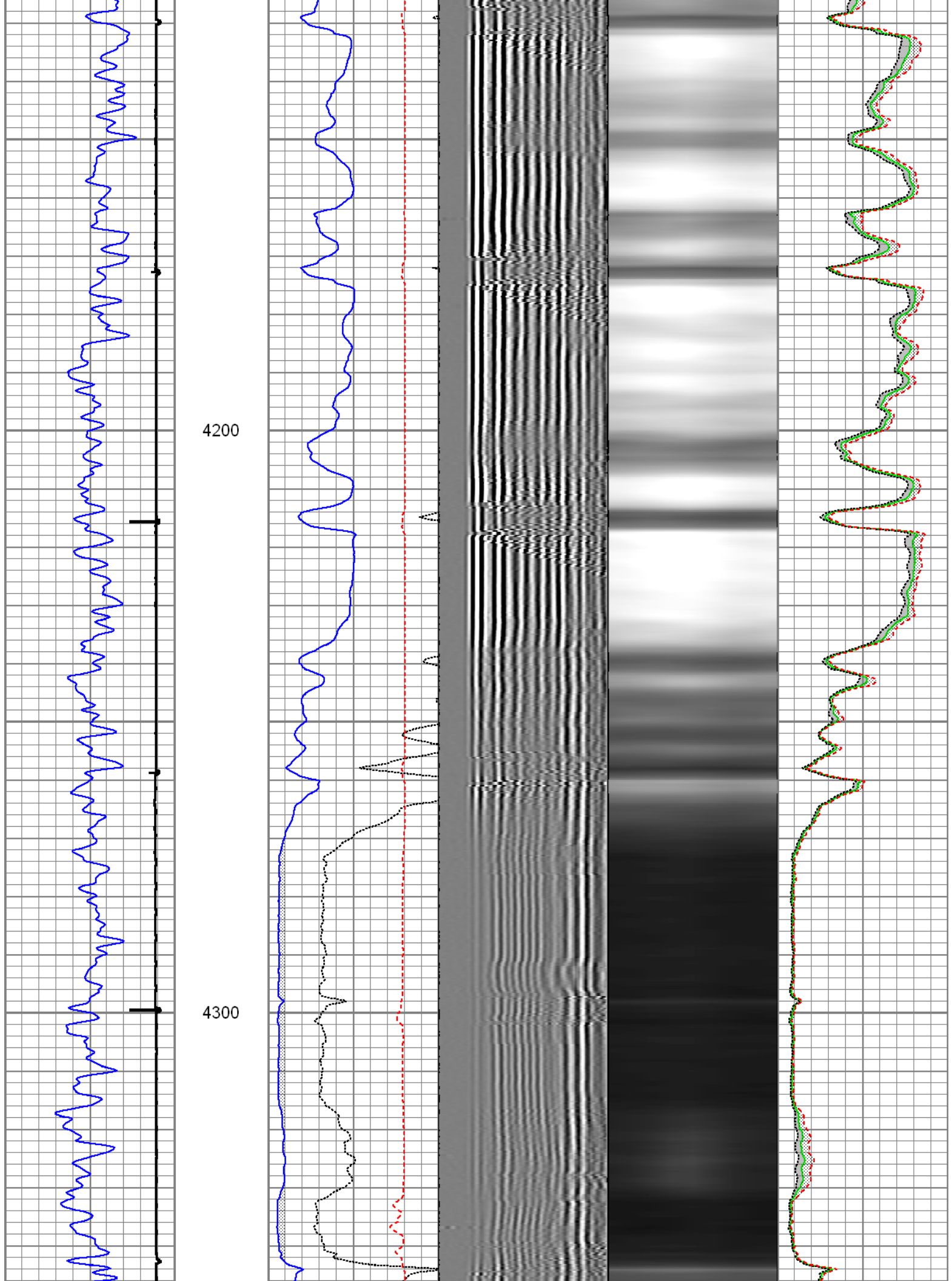


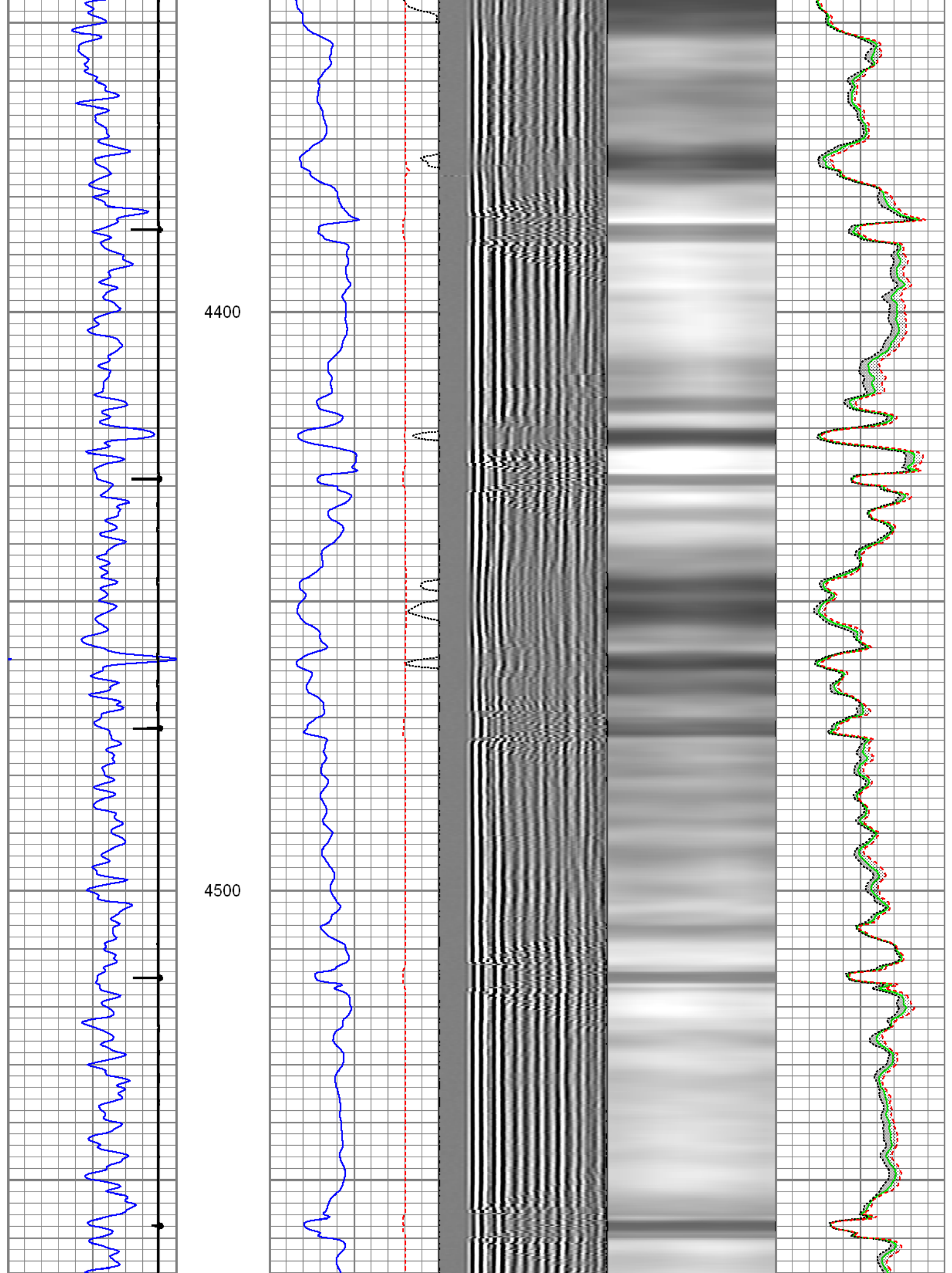






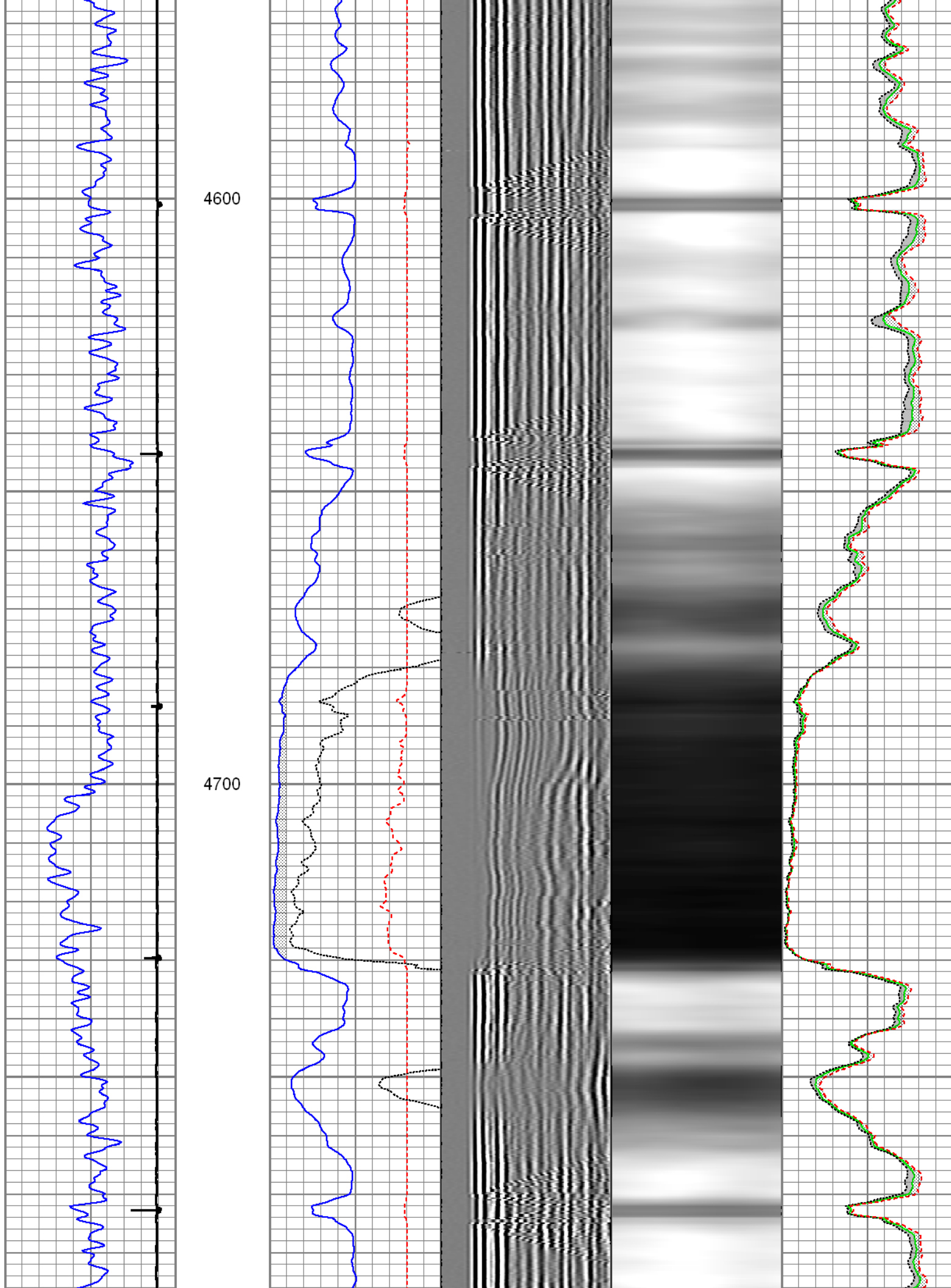






4600

4700

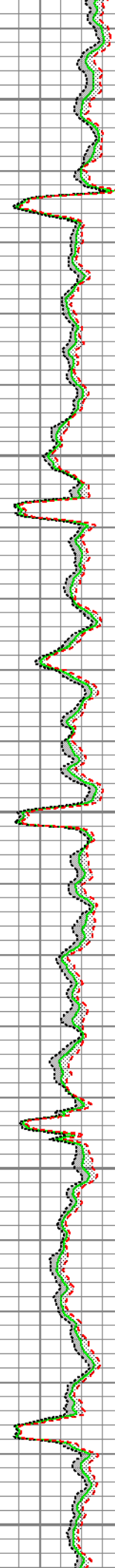
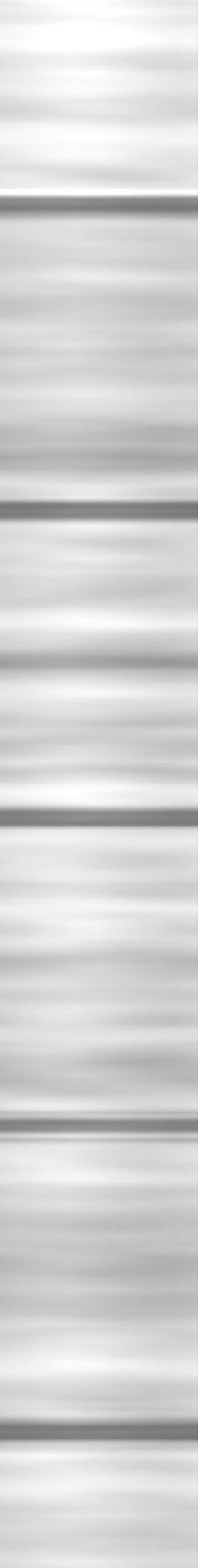
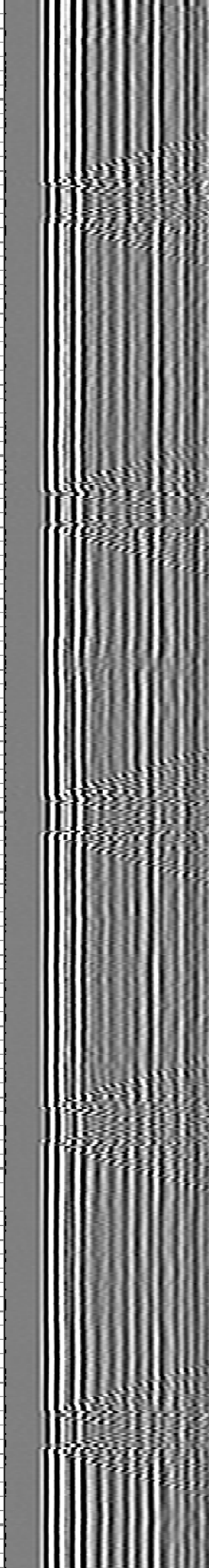




4800

4900

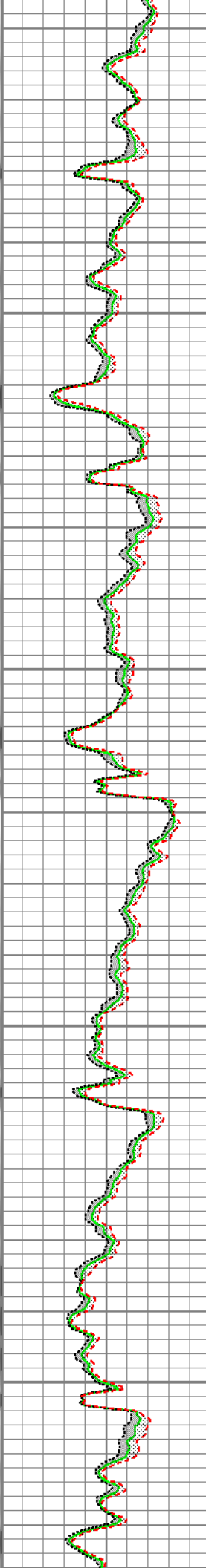
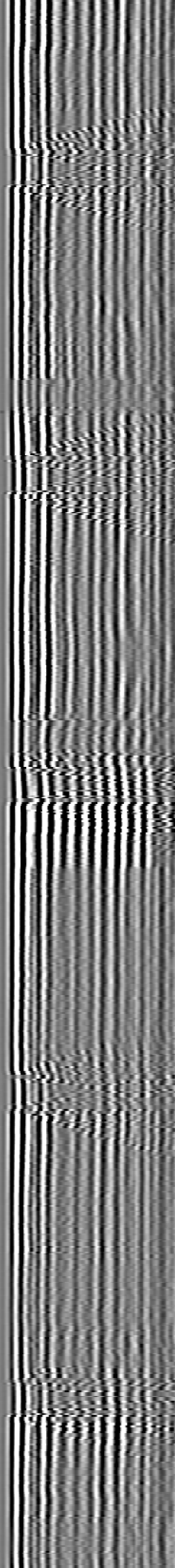
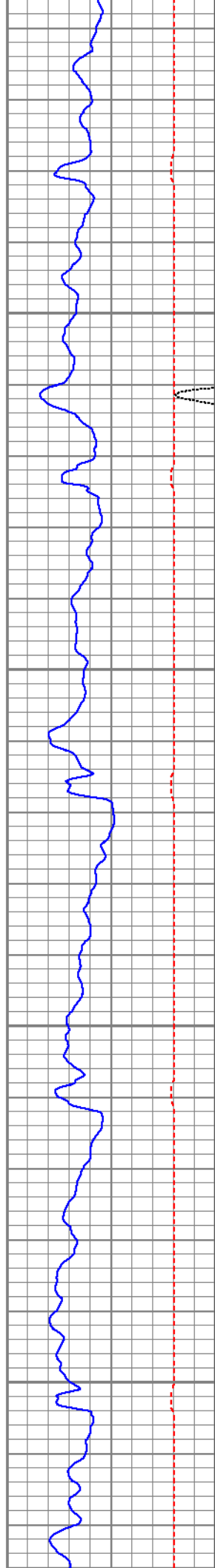
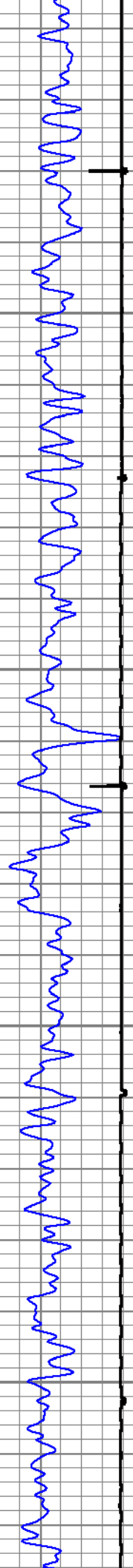
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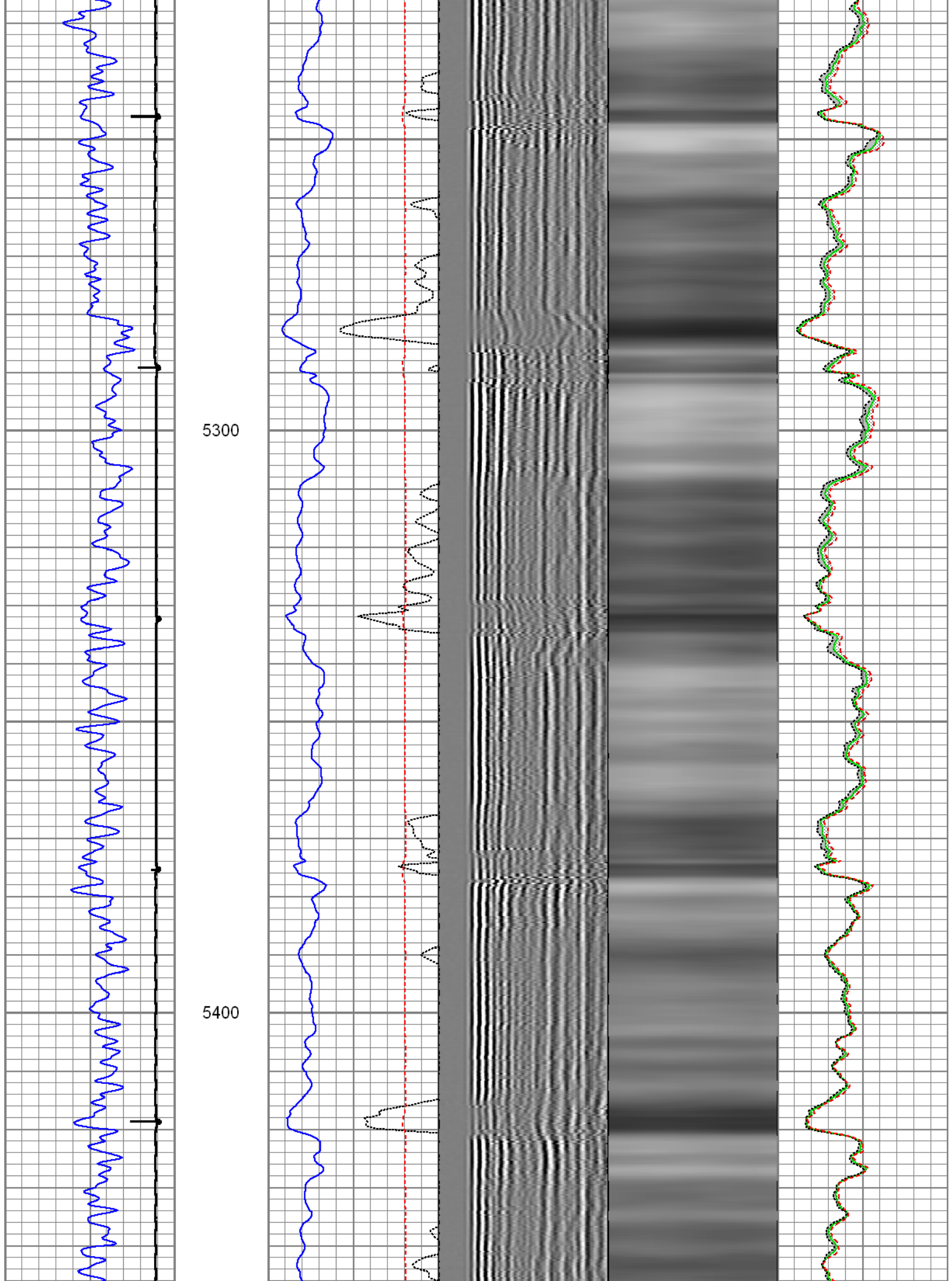


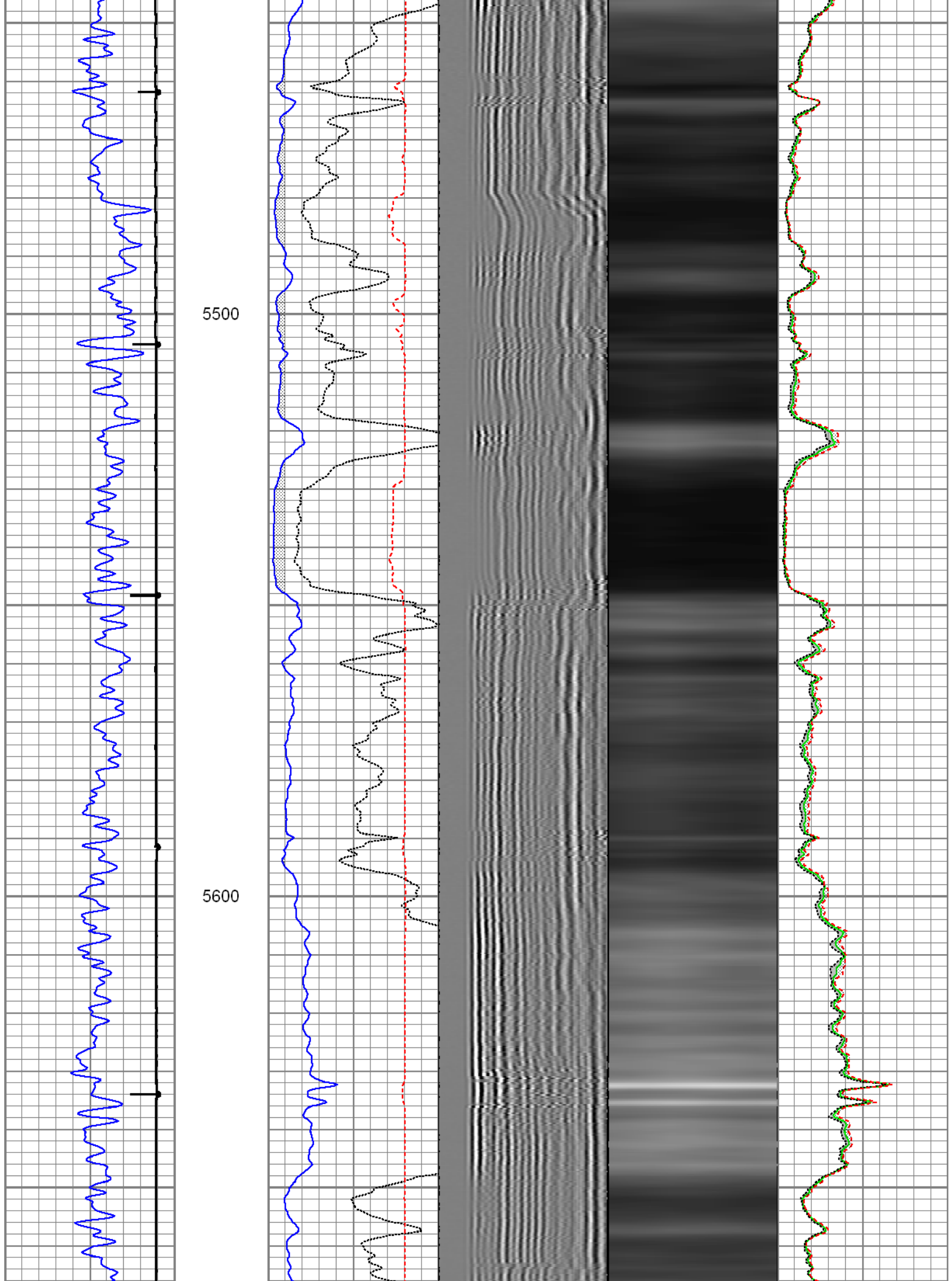


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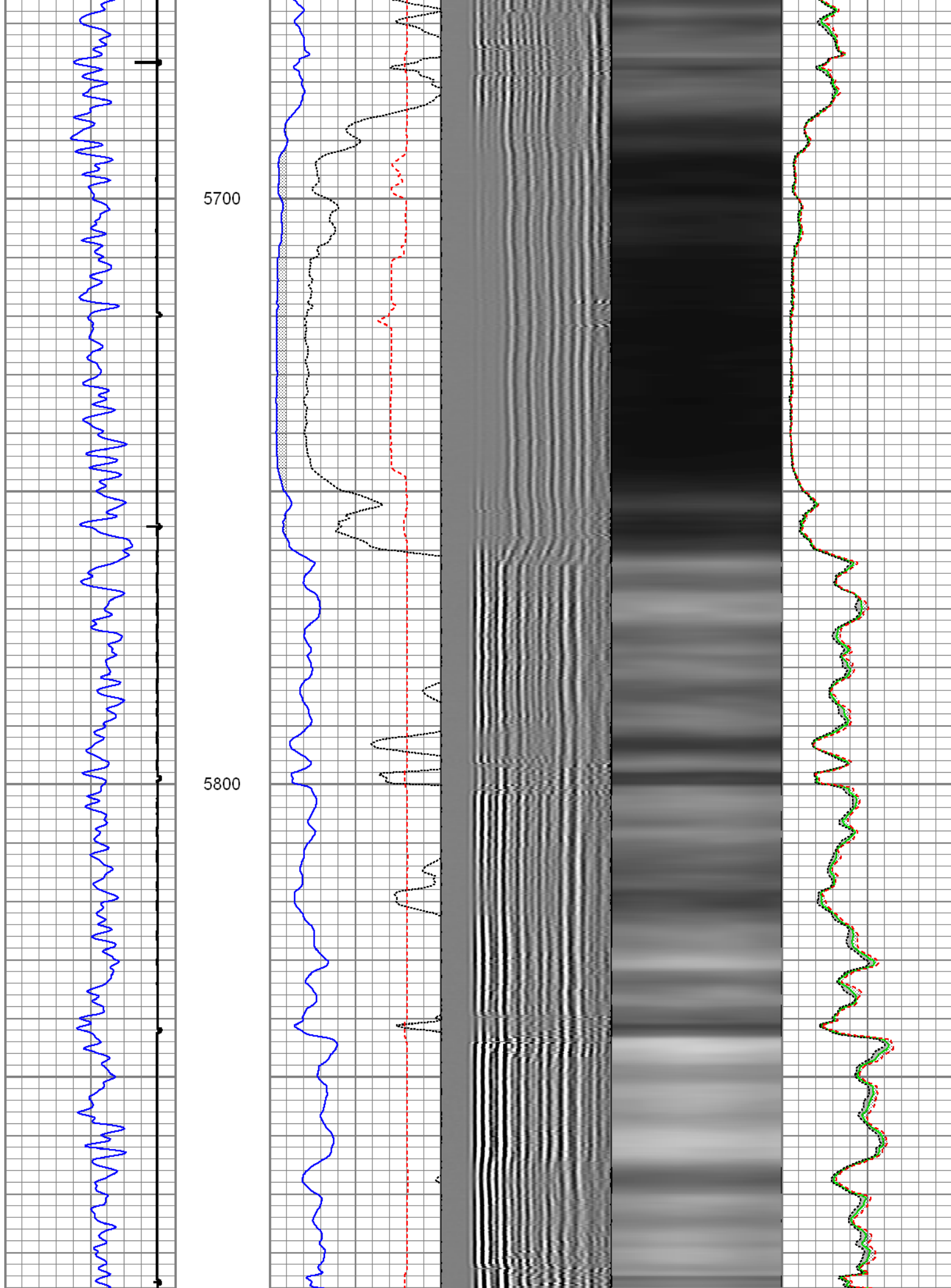






5700

5800

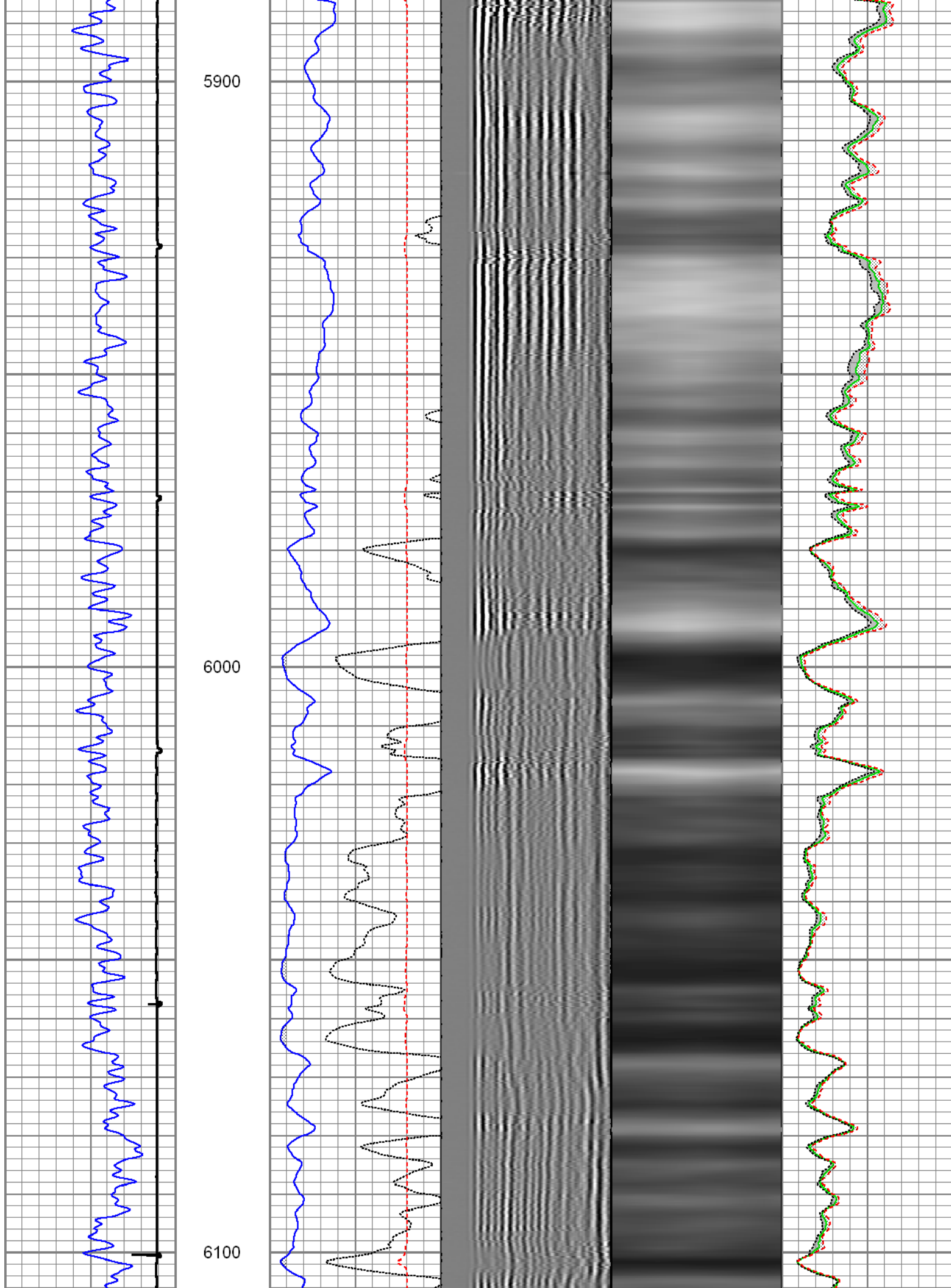


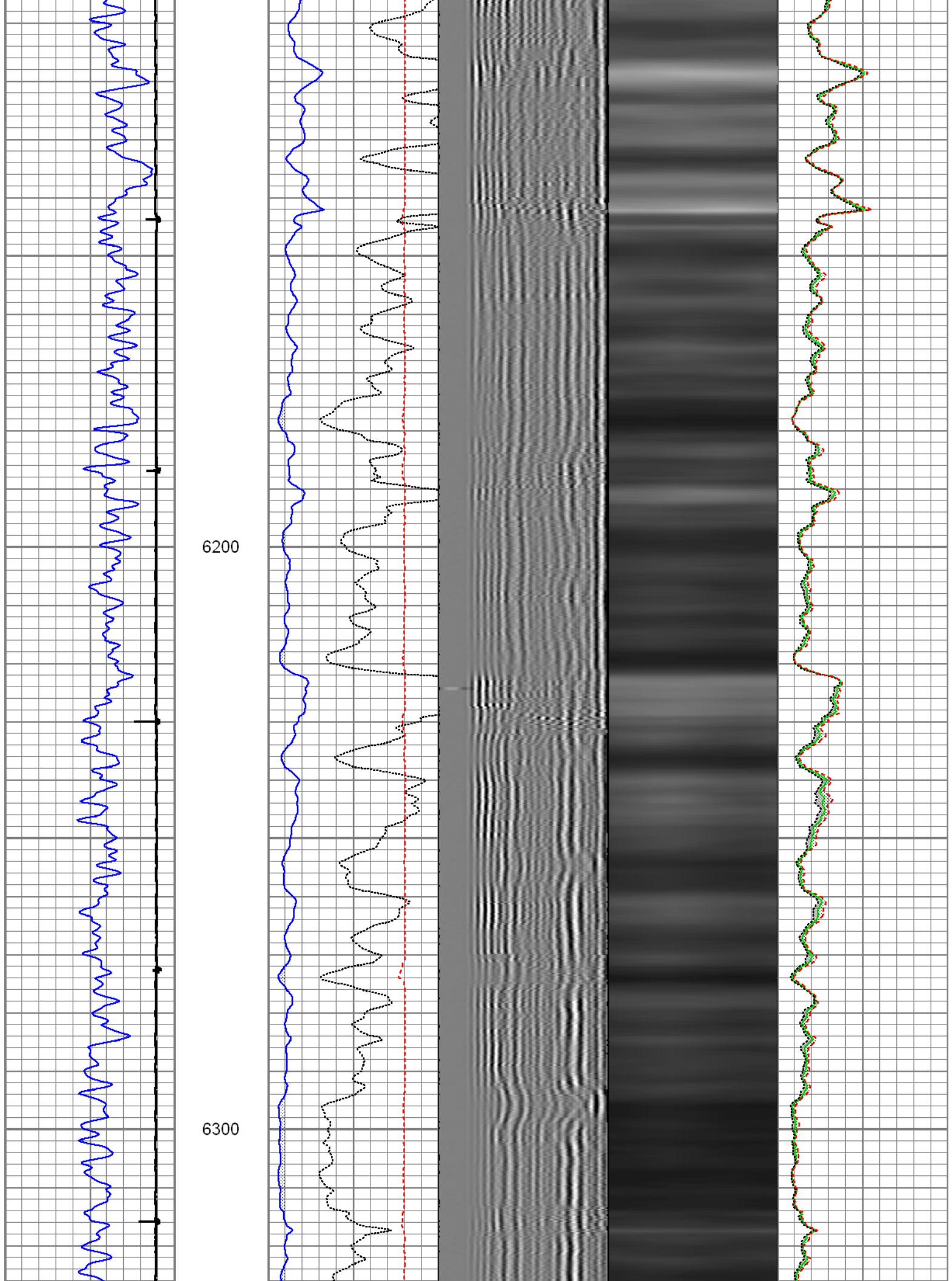


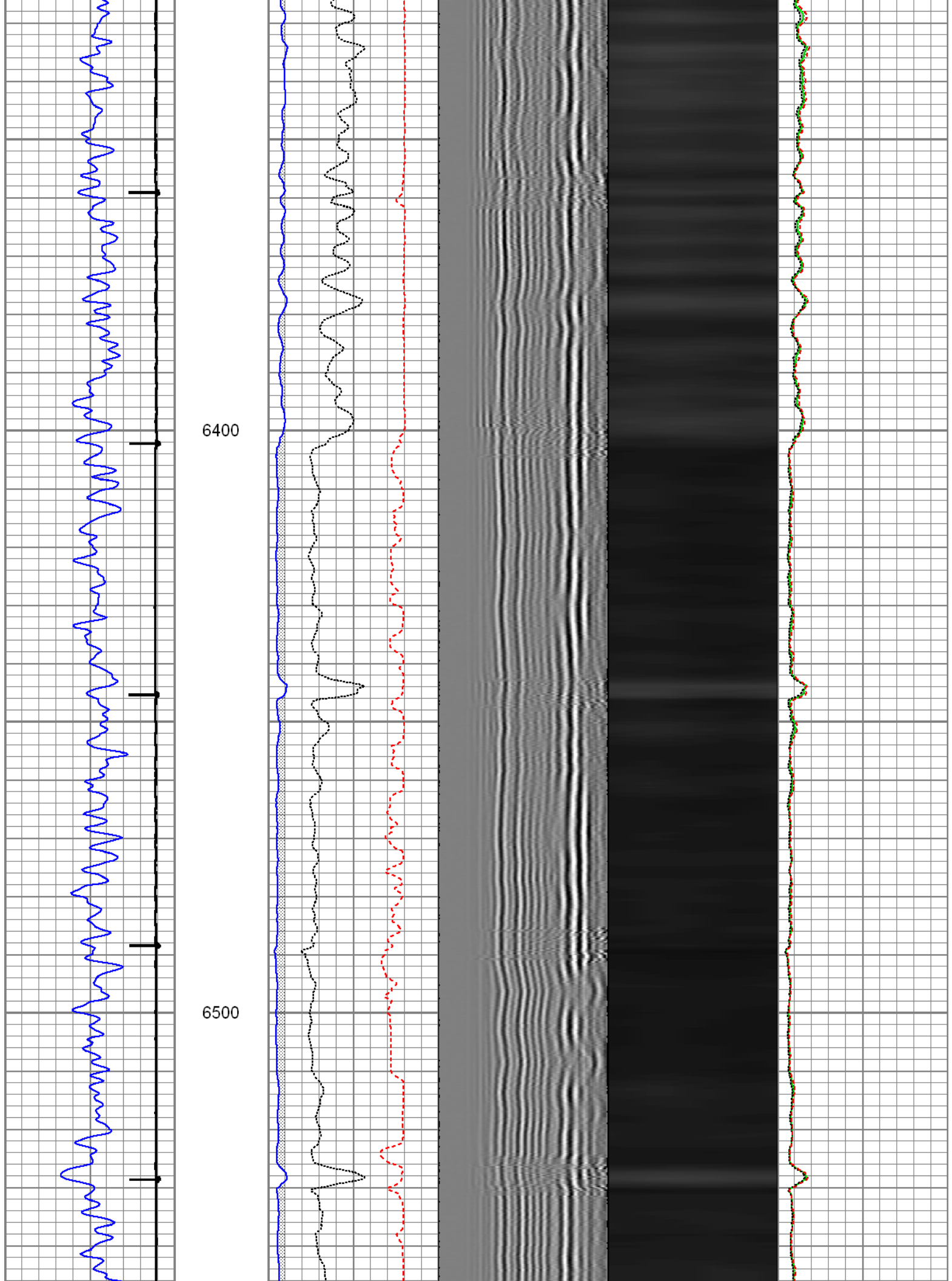
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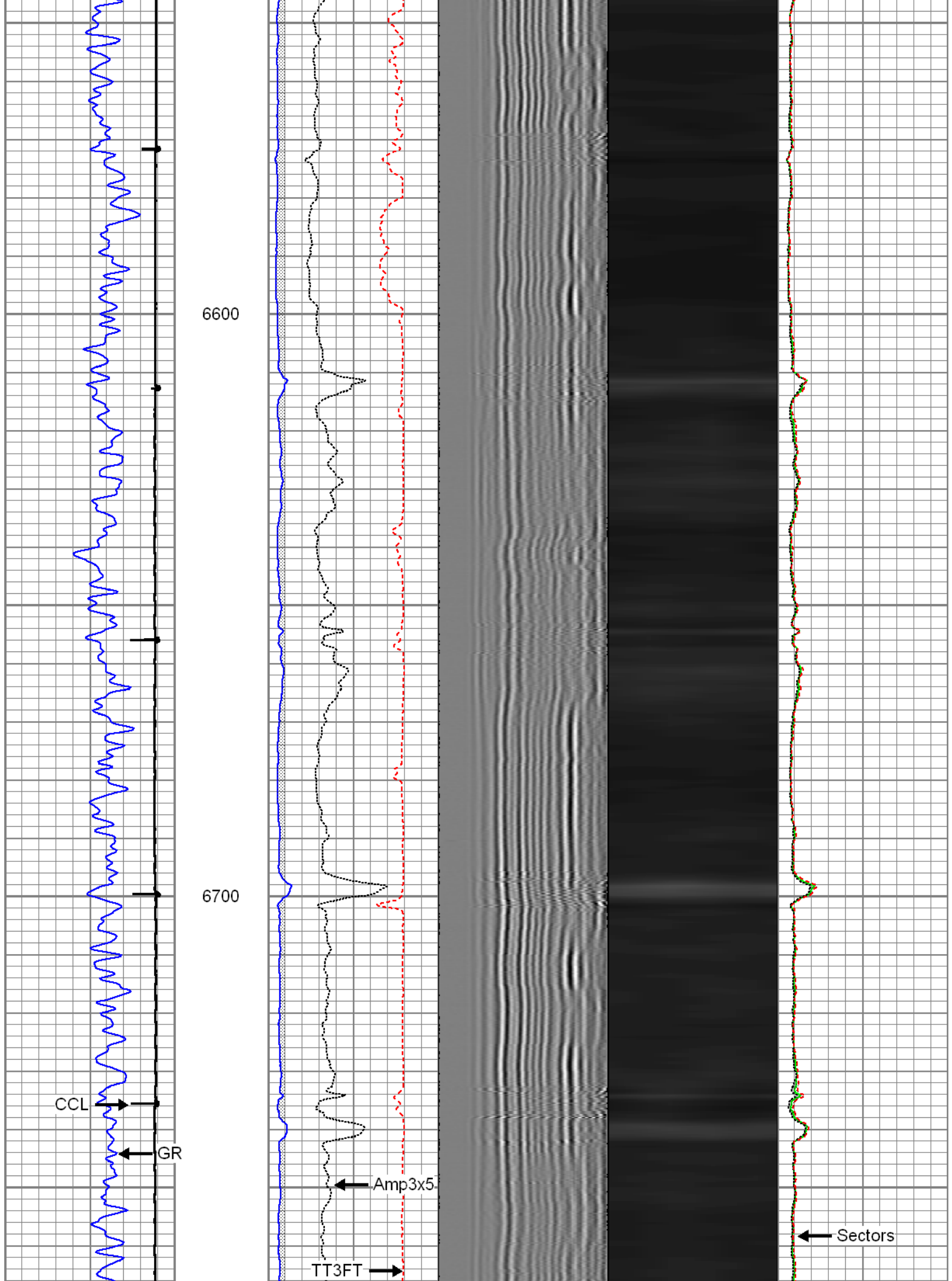
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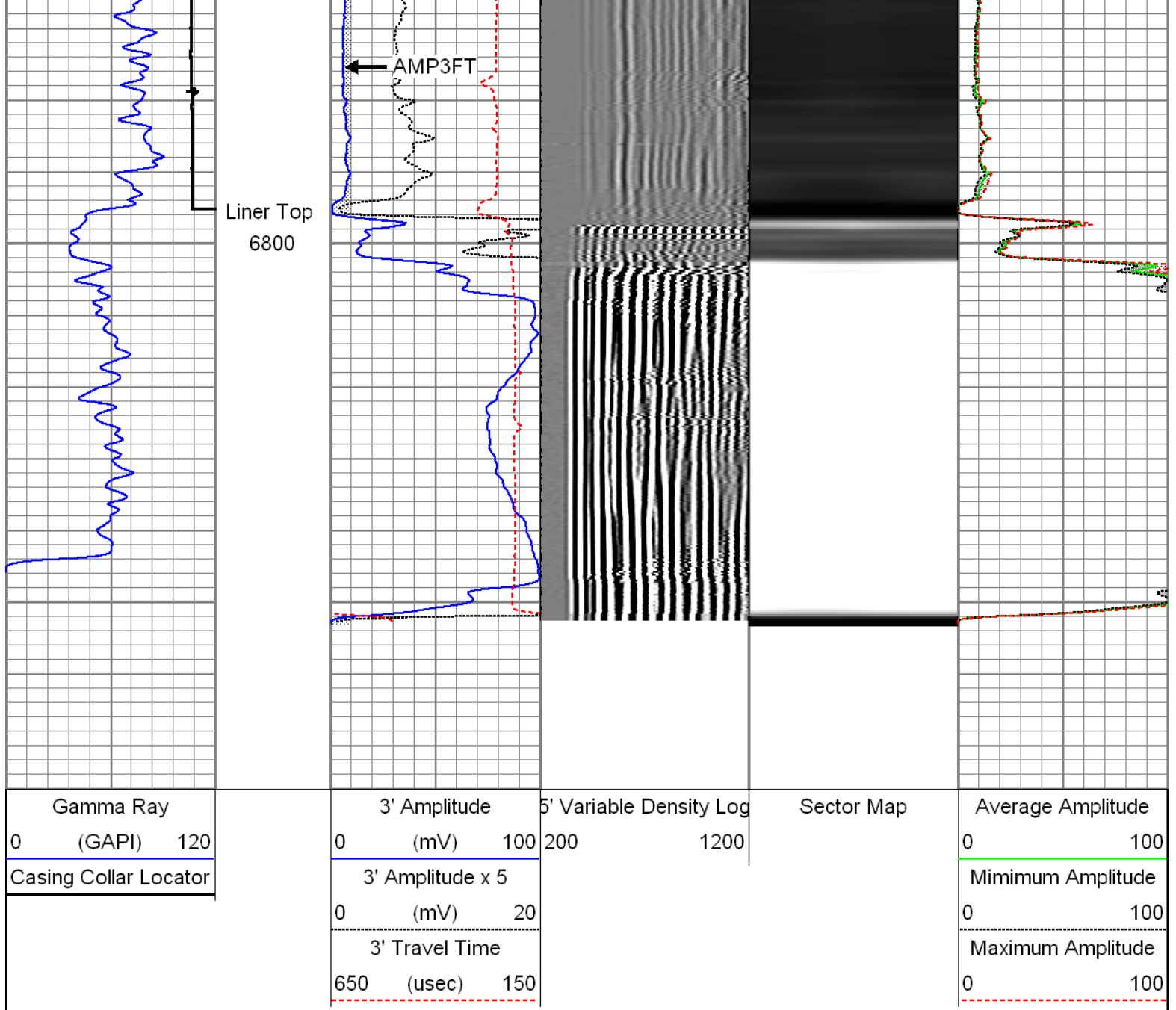








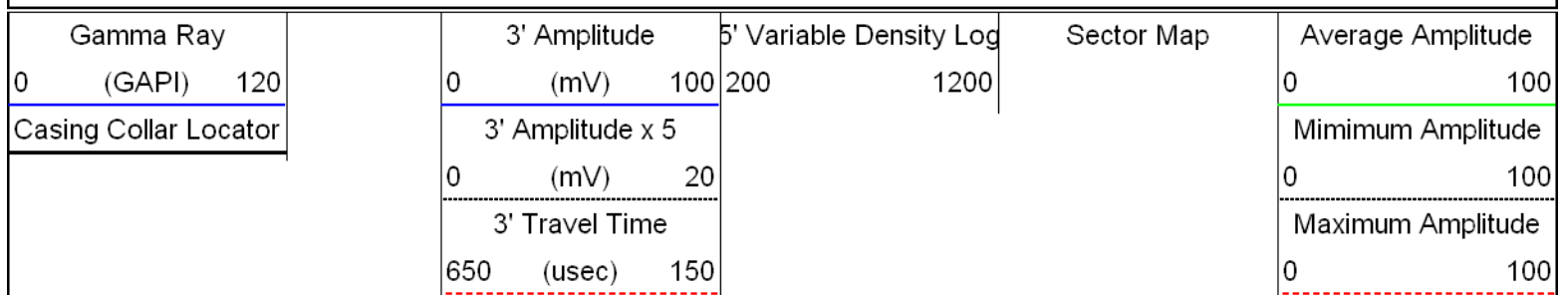


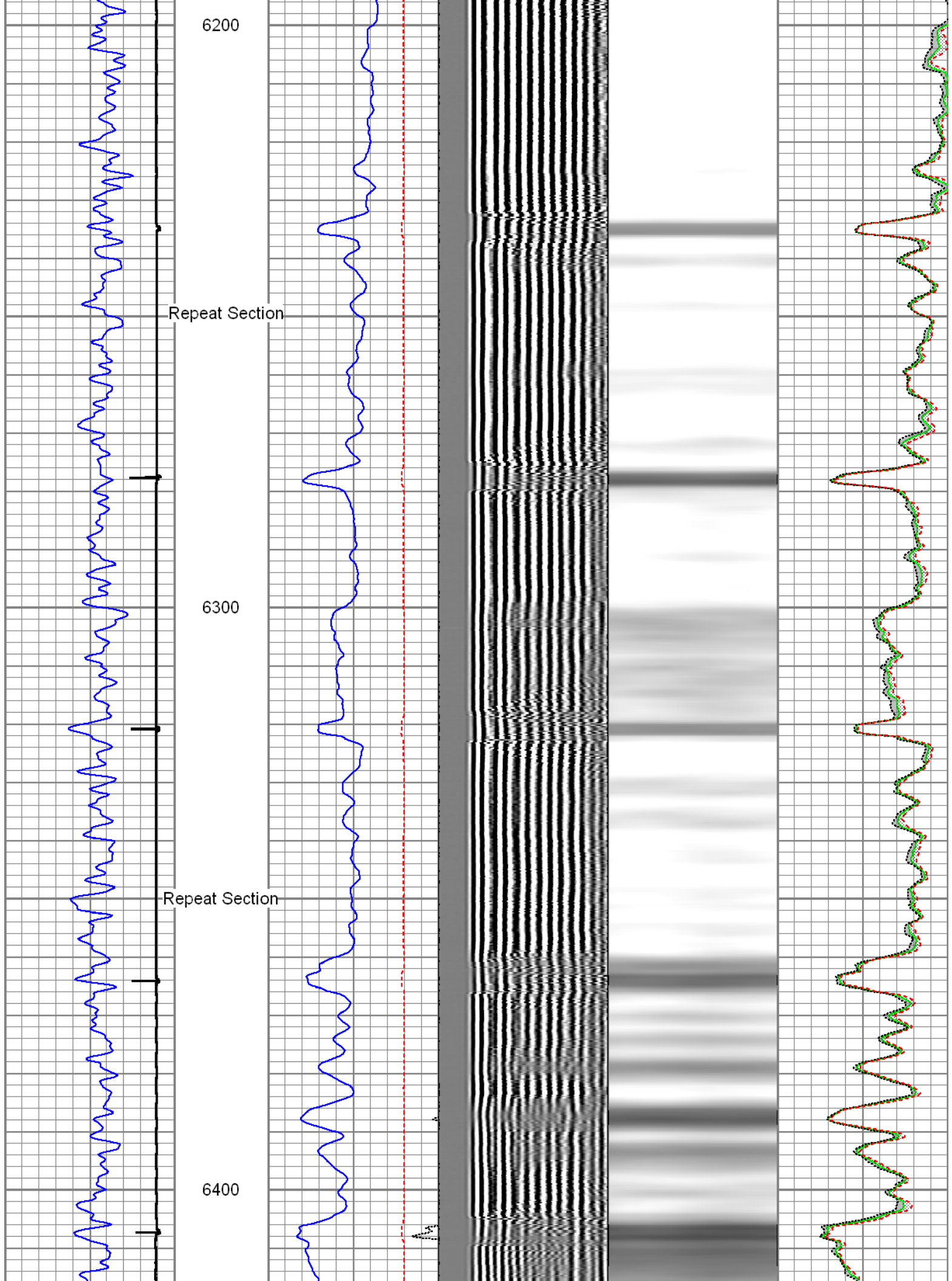


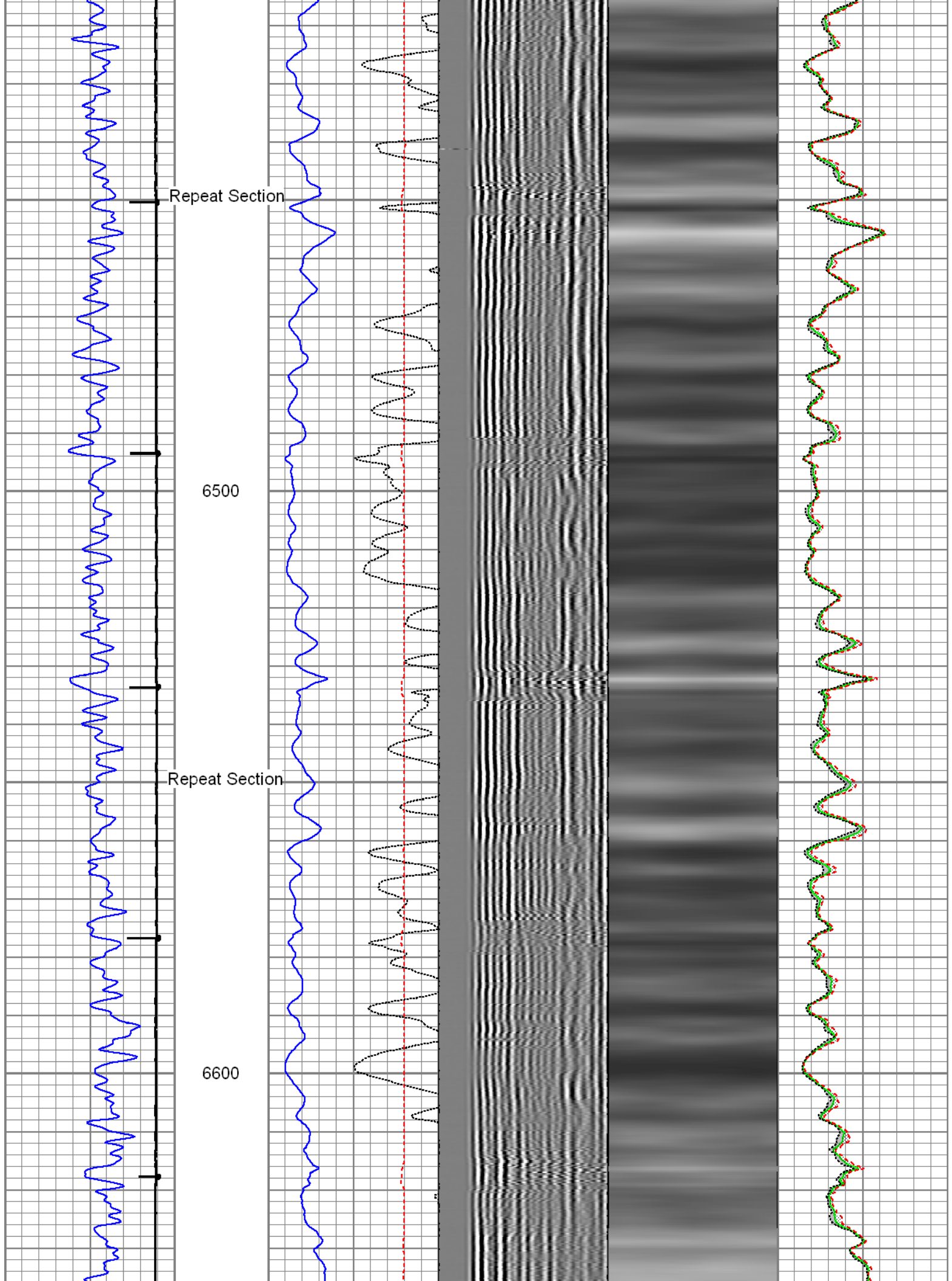
## Repeat Pass

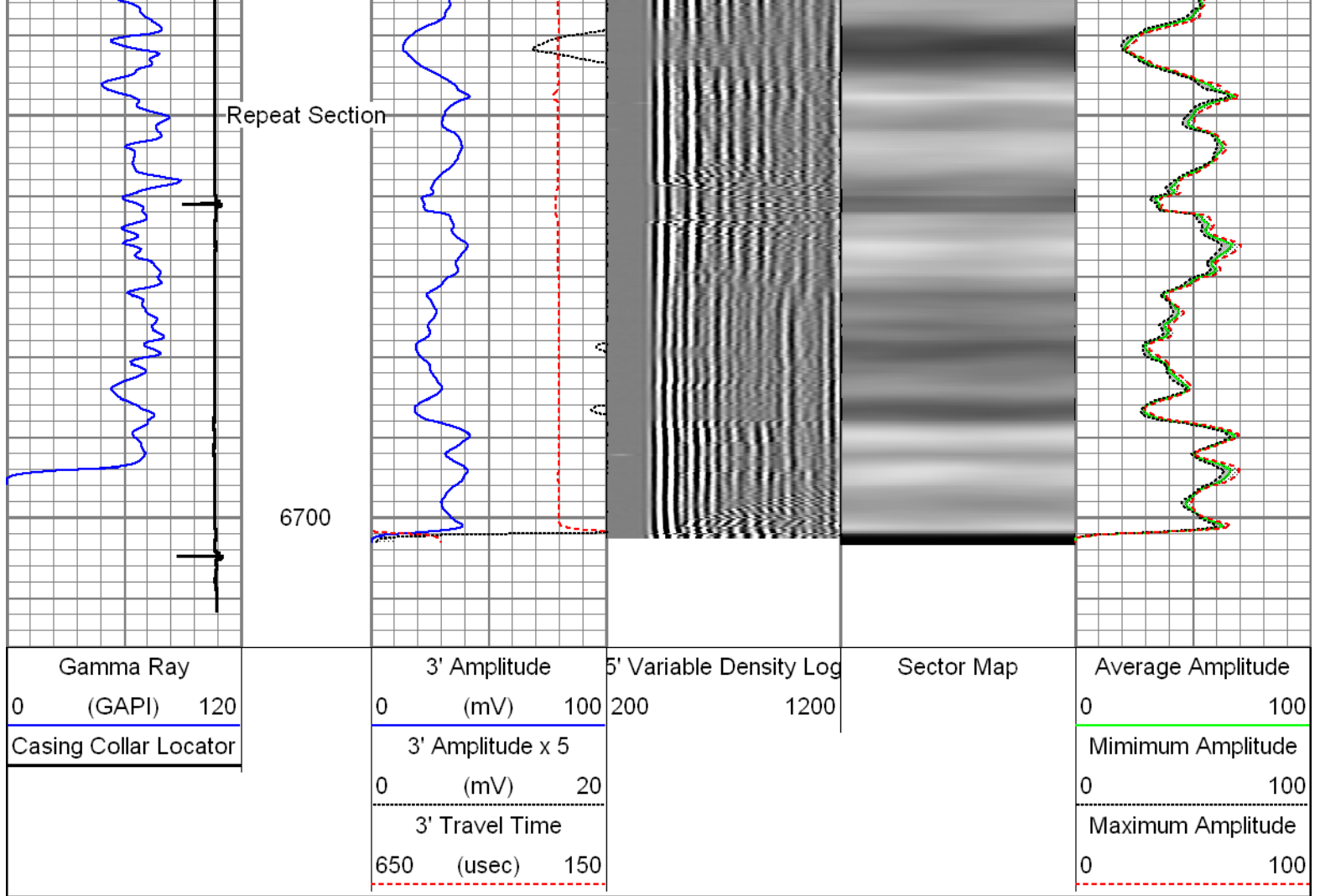
Recorded with 2800 Psi surface induced pressure

Database File: 0512339133\_anadarko\_reynolds cattle 31c-23hz\_07-27-14\_mit\_rbl.db  
 Dataset Pathname: repeat2  
 Presentation Format: rbt4\_mit  
 Dataset Creation: Sun Jul 27 12:38:48 2014 by Log SCH 111116  
 Charted by: Depth in Feet scaled 1:240



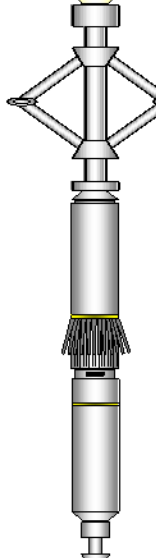






Sensor	Offset (ft)	Schematic	Description	Len (ft)	OD (in)	Wt (lb)
GR	21.75		T_CH14375_1_GO Titan 1-7/16" Assembled Electric Cable Head with 1" Fishing Neck	1.03	1.44	4.00
			UW_AGS-UW_AGS_001 (215017) Sondex Adapter - GO Box to Sondex Pin	0.21	1.69	1.00
			UW_XTU-UW_XTU_002 (10010519) Crossover Ultrawire 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 (081) 2-3/4" DSS 5 Arm Roller Centralizer	2.55	2.75	32.00
WVF3FT WVFS1 WVFS2	14.36 14.36 14.36		UW_RBT-UW_RBT_004 (1066) Sondex Ultrawire 3-1/8" Radial Bond Tool	9.47	3.13	140.00



Tool Joint	Depth (ft)	Tool Joint Diagram	Tool Joint Description	Length (ft)	Weight (lb)	O.D. (in)
WVFS3	14.36					
WVFS4	14.36					
WVFS5	14.36					
WVFS6	14.36					
WVFS7	14.36					
WVFS8	14.36					
CBLTEMP	14.36					
CBLROT	14.36					
WVF5FT	13.36					
			UW_PRC-DSSRAC (080) 2-3/4" DSS 5 Arm Roller Centralizer	2.55	2.75	32.00
MIT	4.35		UW_MIT-UW_MIT40_027 (218950) 40 Multifinger Imaging Tool	4.54	2.75	61.10
			UW_PRC #3 -UW_PRC_001 (219087) Sondex 1-11/16" 3-Arm Production Roller Centraliser	1.92	1.69	7.00
TSTAMP	0.00		UW_BUL-UW_BUL_006 (218707) Sondex Ultrawire Bullnose Terminator	0.22	1.69	1.20
Dataset: 0512339133_Anadarko_Reynolds Cattle 31C-23HZ_07-27-14_MIT_RBL.db: field/well/run1/main1 Total Length: 25.99 ft Total Weight: 294.30 lb O.D. 3.13 in						


Finger Calibration Report				
Performed:		Sun Jul 27 11:44:47 2014		
Ring size:	4	5	6	7

(in)	Sens		Sens		Sens		
Finger 01:	1470	337.0	1807	223.0	2030	295.0	2325
Finger 02:	1572	311.0	1883	191.0	2074	257.0	2331
Finger 03:	1442	416.0	1858	152.0	2010	298.0	2308
Finger 04:	1465	349.0	1814	222.0	2036	290.0	2326
Finger 05:	1496	334.0	1830	212.0	2042	282.0	2324
Finger 06:	1437	345.0	1782	230.0	2012	302.0	2314
Finger 07:	1440	334.0	1774	233.0	2007	302.0	2309
Finger 08:	1464	327.0	1791	236.0	2027	294.0	2321
Finger 09:	1450	325.0	1775	249.0	2024	304.0	2328
Finger 10:	1476	307.0	1783	251.0	2034	294.0	2328
Finger 11:	1443	279.0	1722	291.0	2013	302.0	2315
Finger 12:	1424	297.0	1721	287.0	2008	311.0	2319
Finger 13:	1524	265.0	1789	272.0	2061	280.0	2341
Finger 14:	1461	263.0	1724	297.0	2021	301.0	2322
Finger 15:	1451	261.0	1712	320.0	2032	311.0	2343
Finger 16:	1469	245.0	1714	324.0	2038	304.0	2342
Finger 17:	1442	237.0	1679	342.0	2021	311.0	2332
Finger 18:	1473	250.0	1723	305.0	2028	297.0	2325
Finger 19:	1469	214.0	1683	354.0	2037	302.0	2339
Finger 20:	1460	206.0	1666	359.0	2025	307.0	2332
Finger 21:	1433	208.0	1641	382.0	2023	318.0	2341
Finger 22:	1464	192.0	1656	356.0	2012	294.0	2306
Finger 23:	1466	193.0	1659	367.0	2026	301.0	2327
Finger 24:	1468	192.0	1660	366.0	2026	294.0	2320
Finger 25:	1446	194.0	1640	369.0	2009	298.0	2307
Finger 26:	1446	199.0	1645	370.0	2015	301.0	2316
Finger 27:	1481	198.0	1679	354.0	2033	289.0	2322
Finger 28:	1465	214.0	1679	351.0	2030	294.0	2324
Finger 29:	1530	206.0	1736	326.0	2062	277.0	2339
Finger 30:	1435	225.0	1660	336.0	1996	301.0	2297
Finger 31:	1451	239.0	1690	333.0	2023	299.0	2322
Finger 32:	1512	237.0	1749	299.0	2048	276.0	2324
Finger 33:	1455	305.0	1760	267.0	2027	301.0	2328
Finger 34:	1441	269.0	1710	294.0	2004	299.0	2303
Finger 35:	1507	260.0	1767	257.0	2024	271.0	2295
Finger 36:	1493	280.0	1773	259.0	2032	286.0	2318
Finger 37:	1462	304.0	1766	260.0	2026	295.0	2321
Finger 38:	1530	281.0	1811	227.0	2038	266.0	2304
Finger 39:	1486	365.0	1851	182.0	2033	282.0	2315
Finger 40:	1425	338.0	1763	242.0	2005	303.0	2308

Segmented Cement Bond Log Calibration Report							
Serial Number:				1066			
Tool Model:				UW_RBT_004			
Calibration Casing Diameter:				5.500	in		
Calibration Depth:				10.754	ft		

Master Calibration, performed Sun Jul 27 08:14:15 2014:							
	Raw (v)		Calibrated (mv)		Results		
	Zero	Cal	Zero	Cal	Gain	Offset	
3FT	0.003	0.825	0.800	71.921	86.580	0.525	
5FT	-0.002	0.821	0.800	71.921	86.348	1.011	
S1	0.004	0.766	0.000	100.000	131.077	-0.464	
S2	0.002	0.798	0.000	100.000	125.641	-0.245	
S3	0.002	0.831	0.000	100.000	120.750	-0.296	
S4	0.002	0.859	0.000	100.000	116.699	-0.208	
S5	0.003	0.862	0.000	100.000	116.518	-0.384	
S6	0.002	0.852	0.000	100.000	117.766	-0.288	
S7	0.004	0.830	0.000	100.000	121.019	-0.439	

S8	0.004	0.789	0.000	100.000	127.370	-0.471
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	Kerr-McGee Oil & Gas Onshore, L.P.
	Well	Reynolds Cattle 31C-23HZ
	Field	Wattenberg
	County	Weld
	State	Colorado