FMC Technologies

Radial Cement Bond
Gamma Ray
Casing Collar Log

Company	Noble Energy Inc.
Well	Moser H34-769
Field	Wattenberg
County	Weld
State	Colorado

Company Noble Energy Inc.
Well Moser H34-769
Field Wattenberg
County Weld State Colorado
Location: API # : 05-123-40731
SEC 22 TWP 3N RGE 65W

Permanent Datum	Ground Level	Elevation	4812'	Other Services
Log Measured From	Kelly Bushing	24 FT		MIT
Drilling Measured From	Kelly Bushing			CNL

Elevation
K.B. 4836'
D.F. 4835'
G.L. 4812'

Date	22-Dec-2015
Run Number	One
Depth Driller	16650 FT
Depth Logger	4365 FT
Bottom Logged Interval	4364 FT
Top Log Interval	Surface
Open Hole Size	8.750"
Type Fluid	Water
Density / Viscosity	8.34 lbm/gal
Max. Recorded Temp.	168°F
Estimated Cement Top	66 FT
Time Well Ready	ROA
Time Logger on Bottom	11:20
Equipment Number	HD-0343
Location	Fort Lupton, CO
Recorded By	Sam Hopper
Witnessed By	Bill Mansfield

Borehole Record

Run Number	Bit	From	To

Tubing Record

Size	Weight	From	To

Casing Record

	Size (in)	Wgt (lbs/Ft)	Grade	Top	Bottom
Surface Casing	9 5/8	36	J-55	24 FT	805 FT
Intermediate #1	7	26	P-110 IC	24 FT	7377 FT
Intermediate #2					
Liner	4 1/2	11.6	P-110 IC	4374.1 FT	13723 FT

<<< Fold Here >>>

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
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.

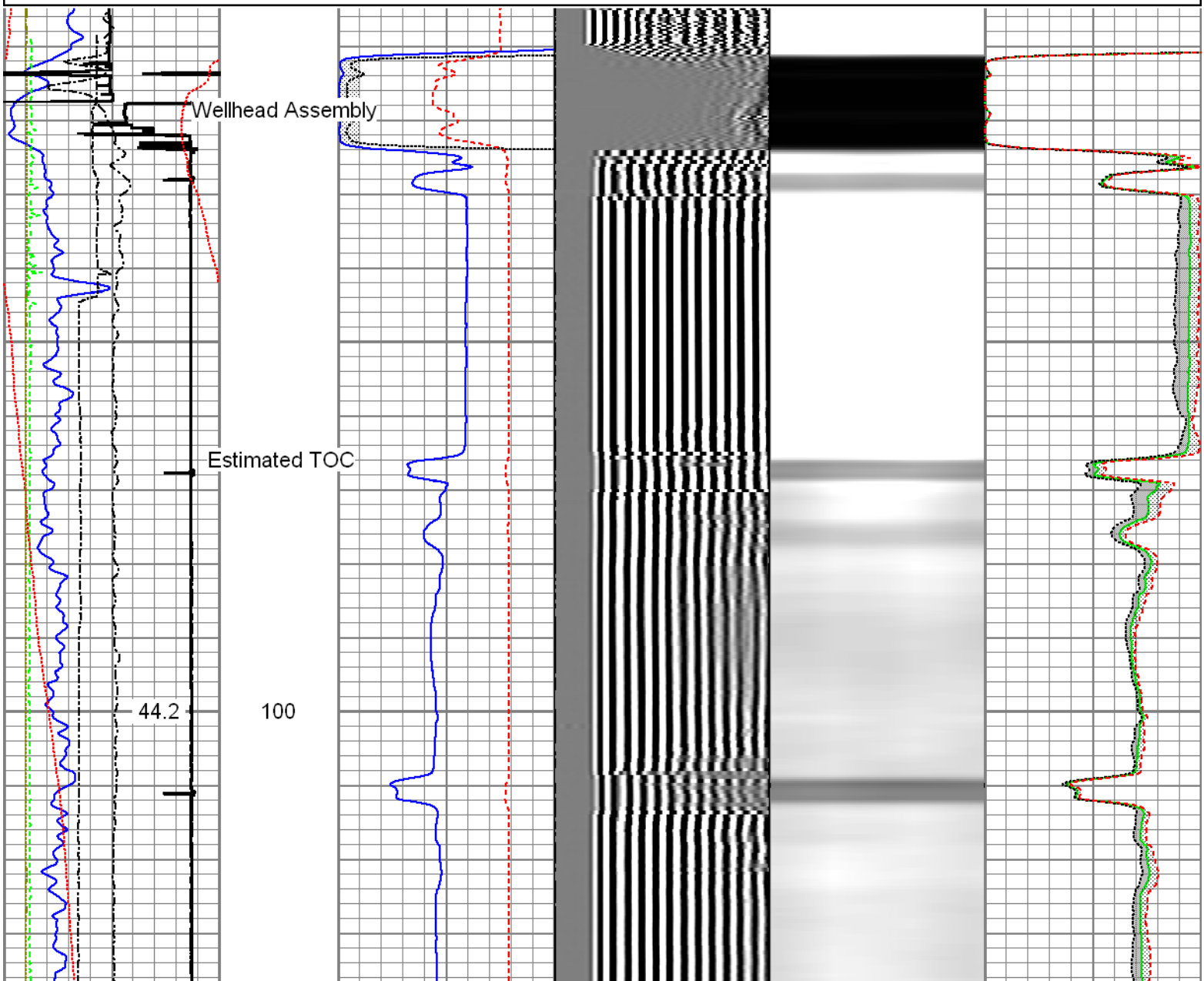
FMC Technologies

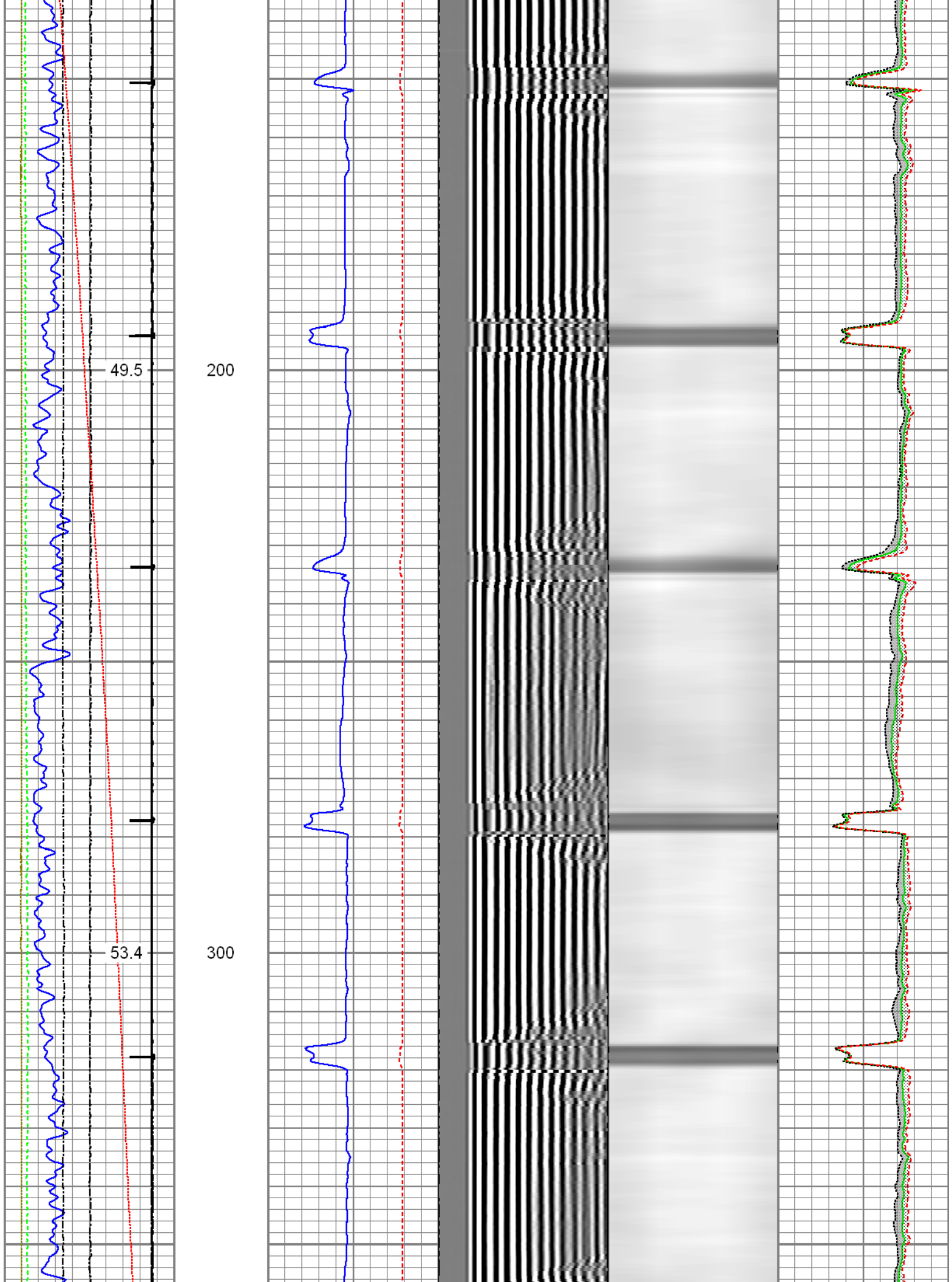
Main Pass

Recorded With 2500 PSI Surface Induced Pressure

Database File: 12-22-15_noble_moser h34-769_mit_rbl_cnl.db
Dataset Pathname: pass6.1
Presentation Format: rbt4_mit
Dataset Creation: Tue Dec 22 16:19:43 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
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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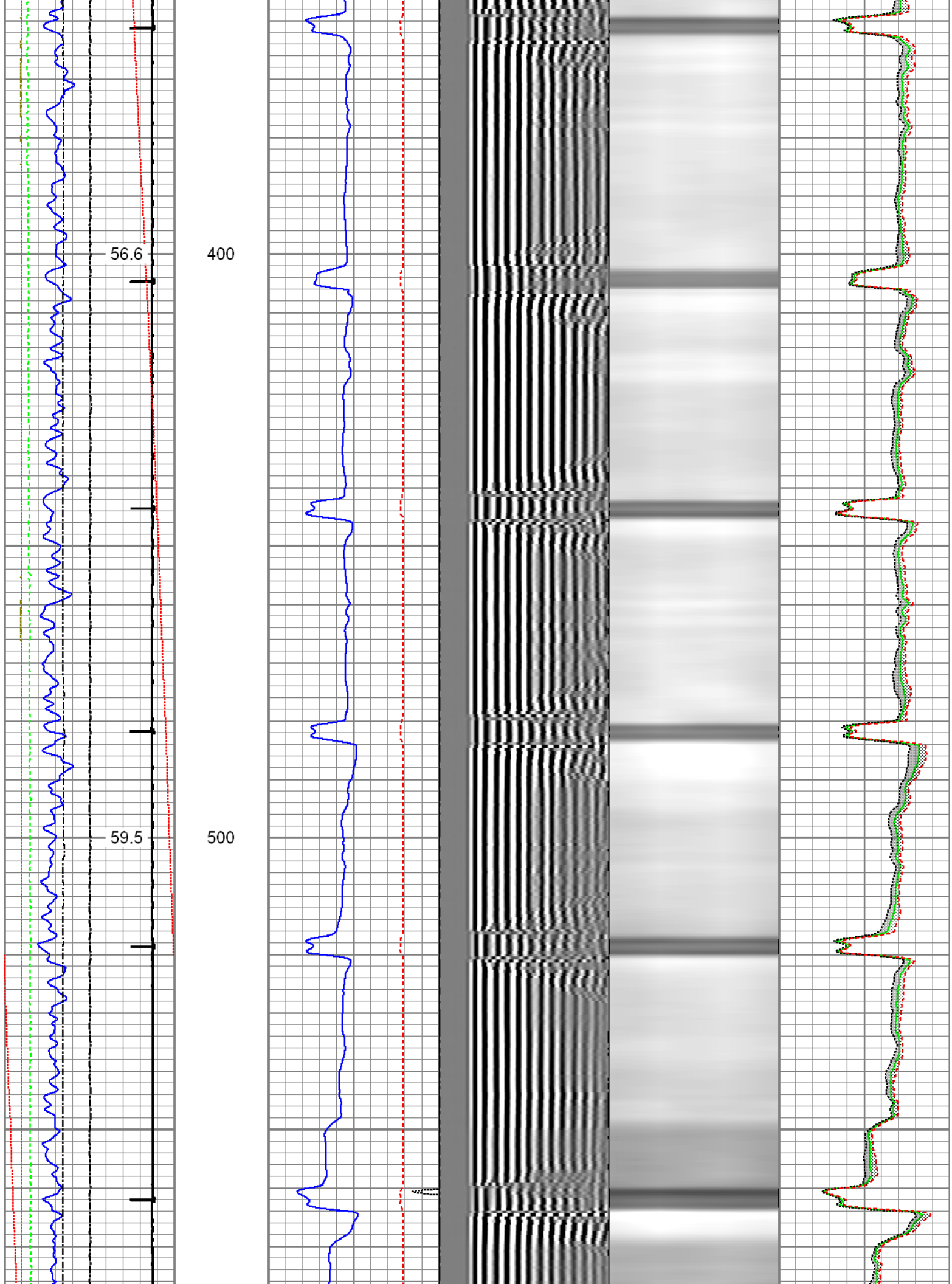
200
53.4
300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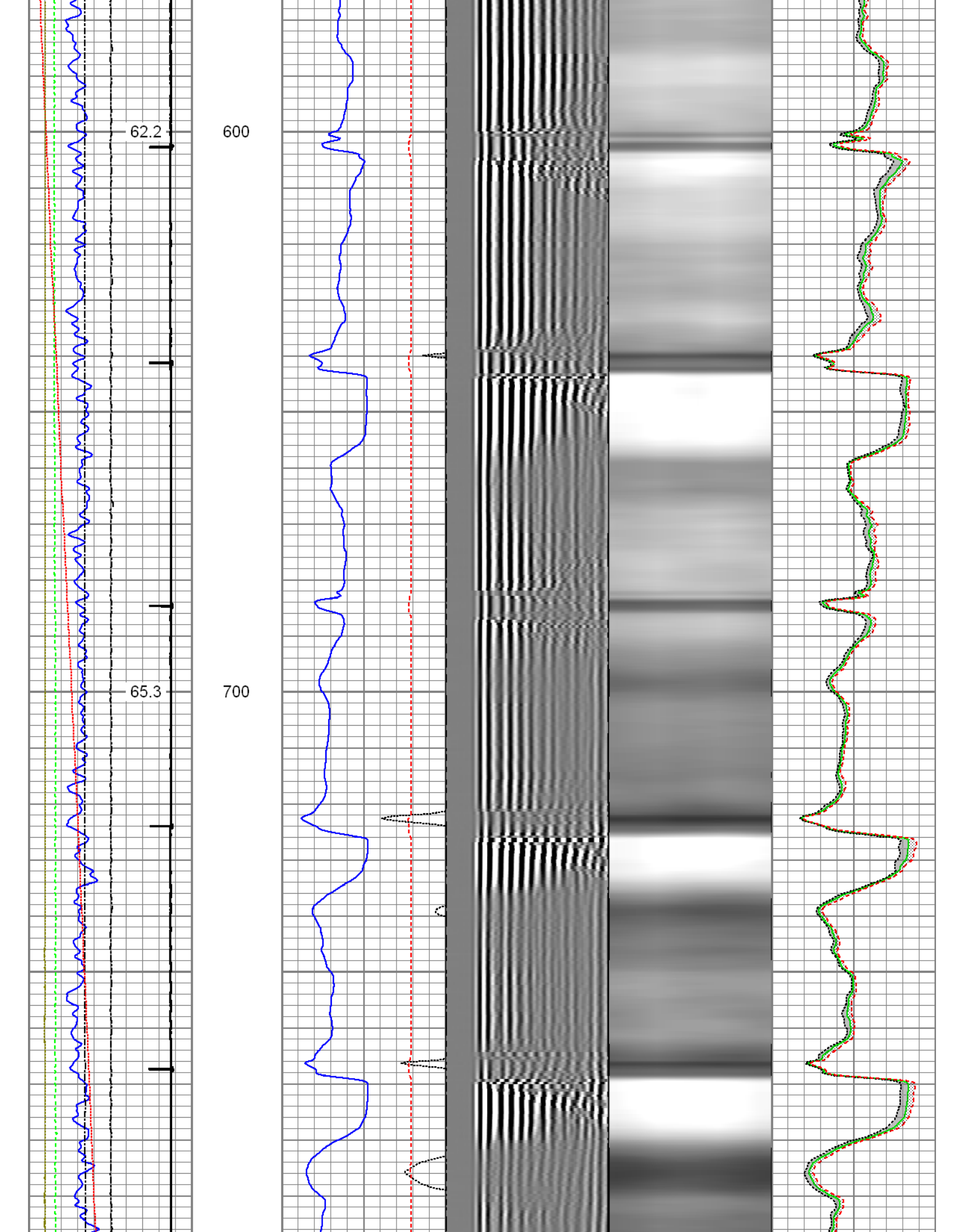
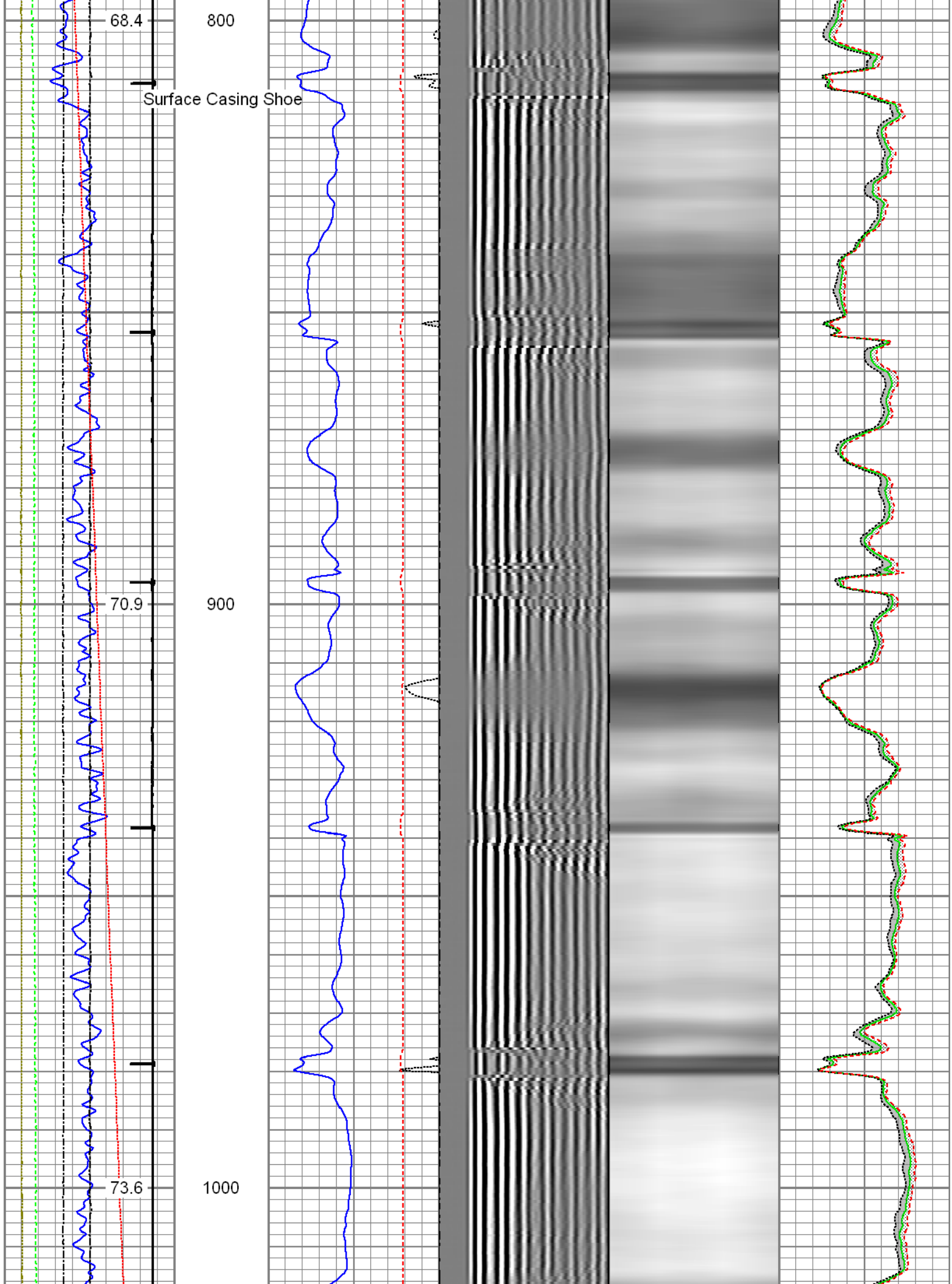
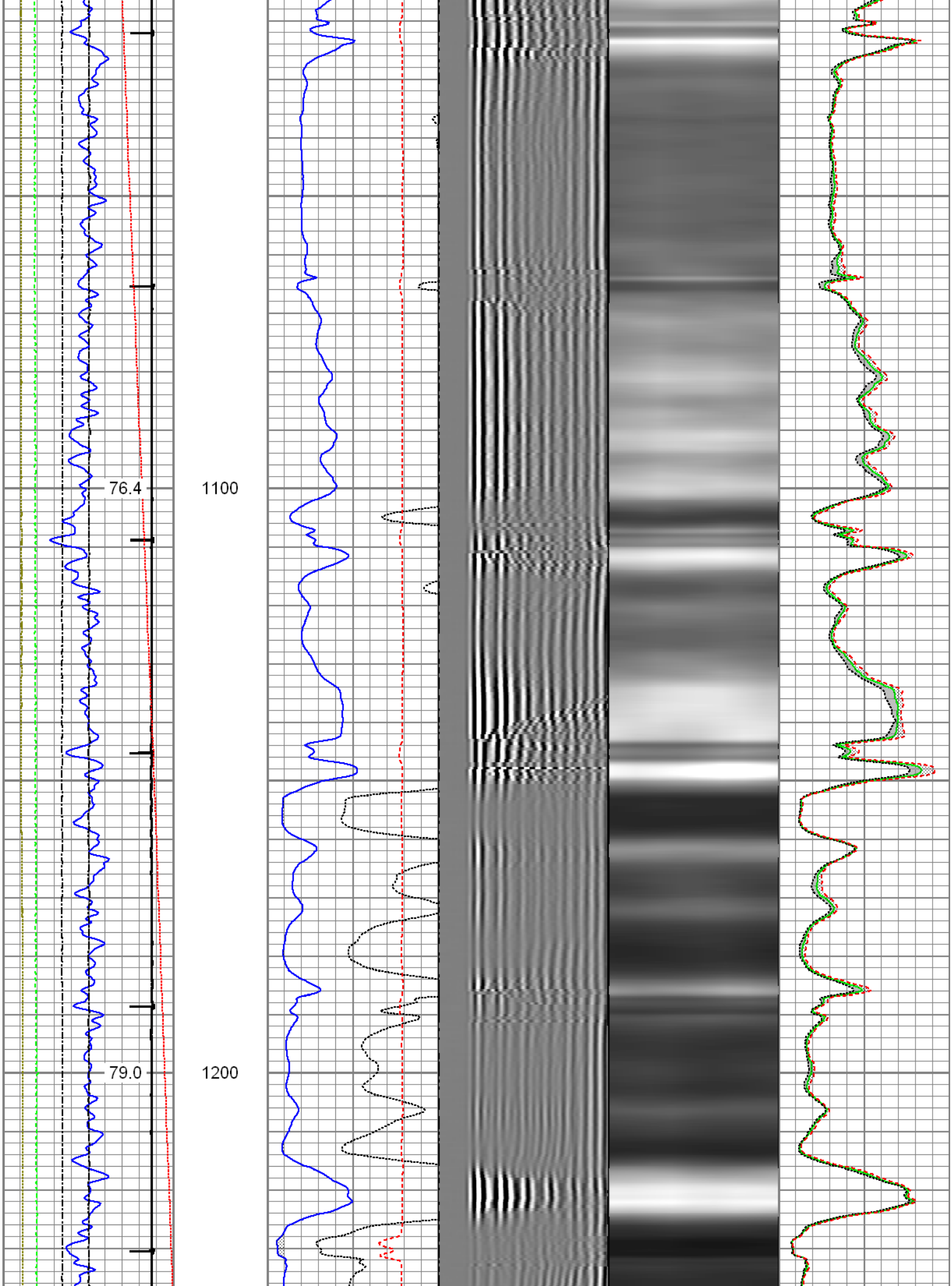
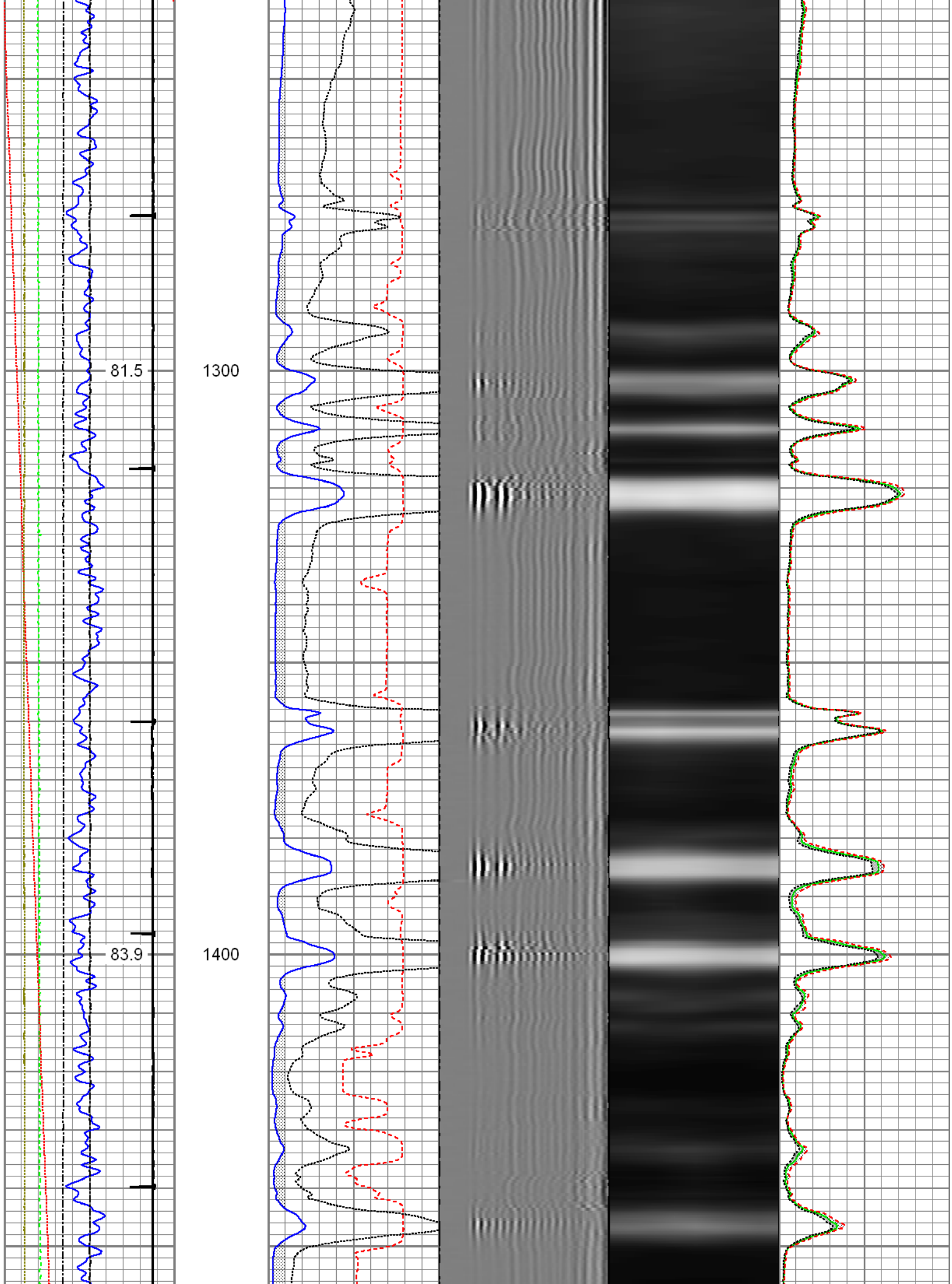
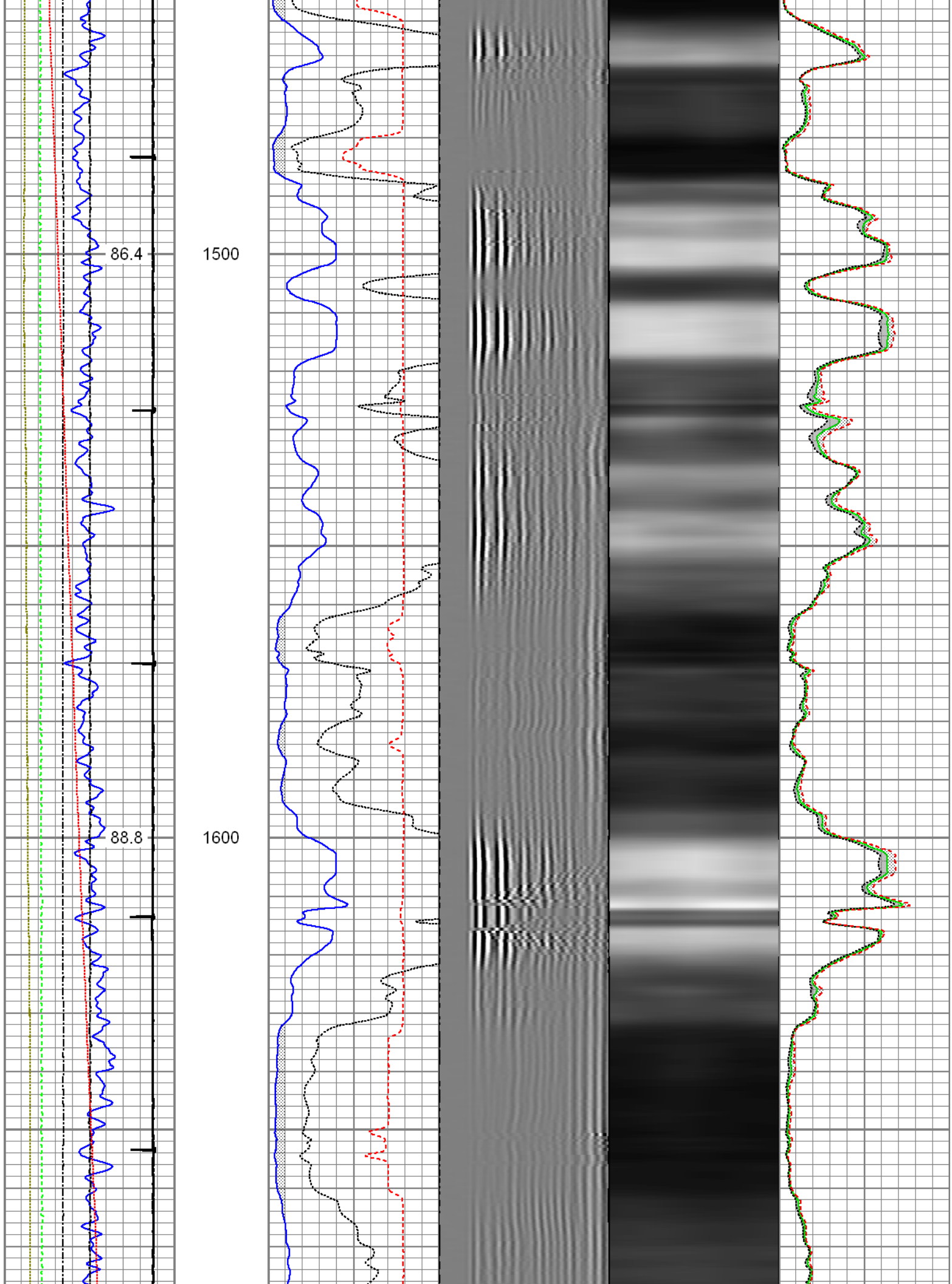
400
59.5
500

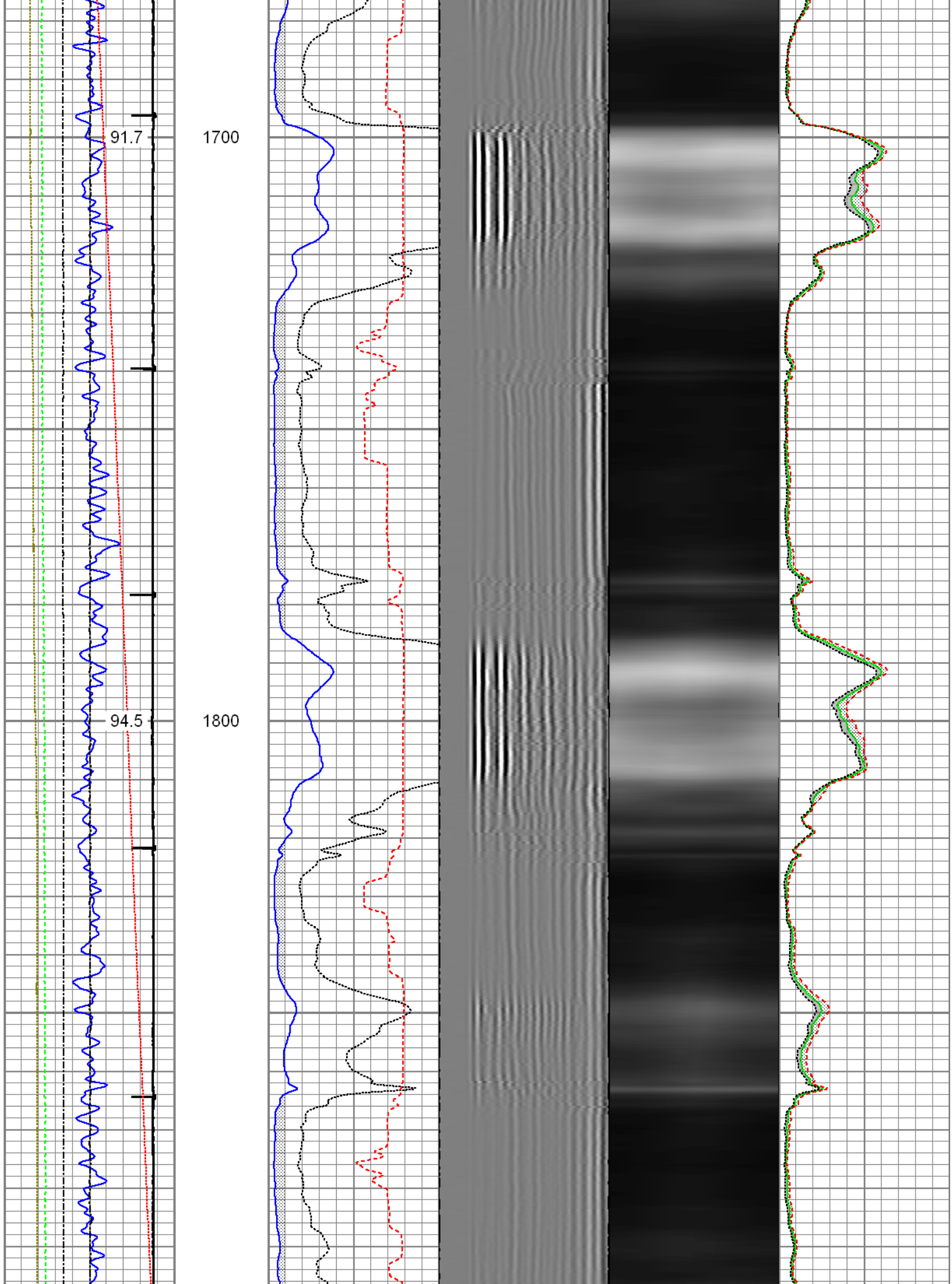

62.2
600
65.3
700

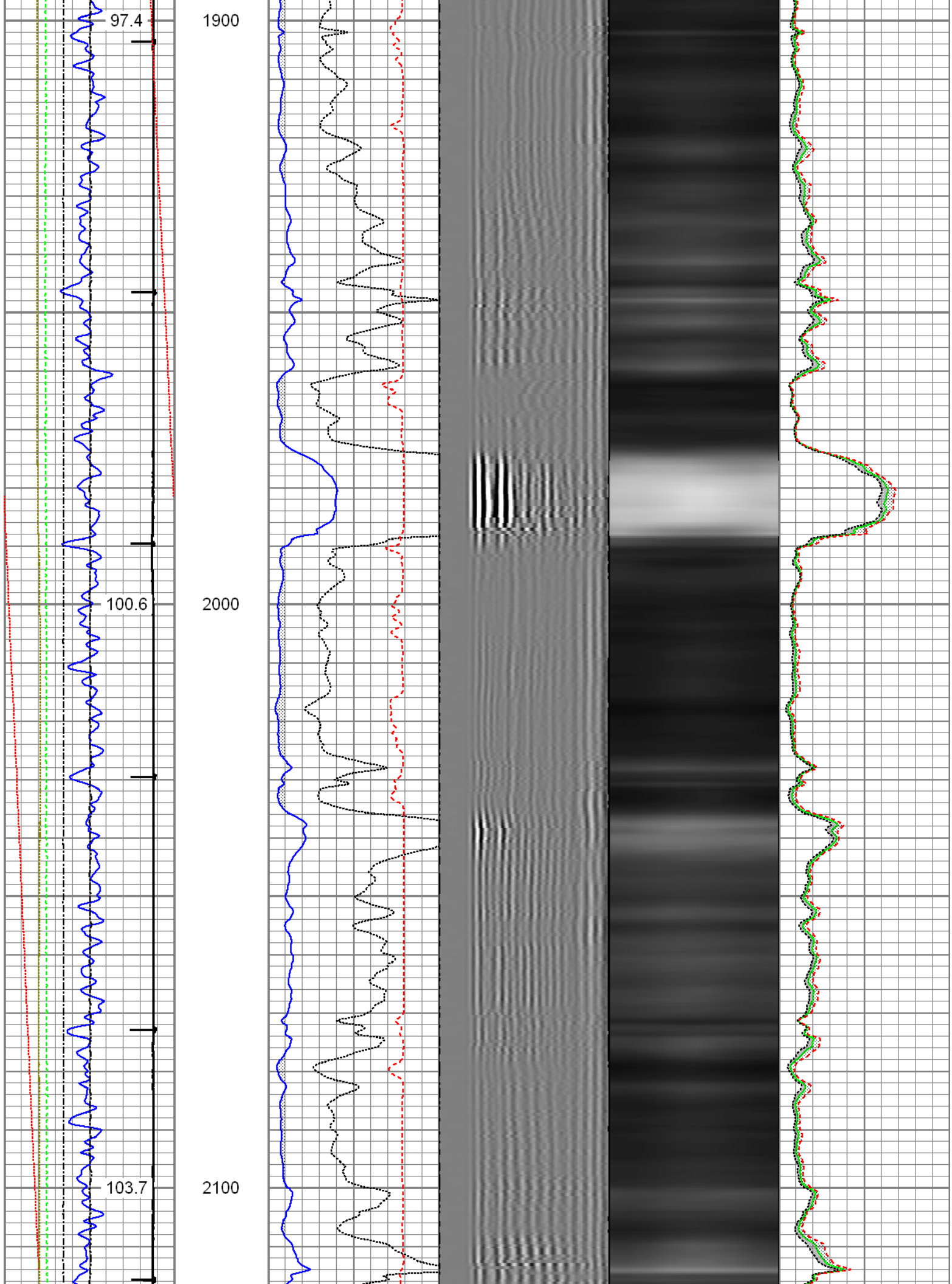

68.4
800
Surface Casing Shoe
70.9
900
73.6
1000

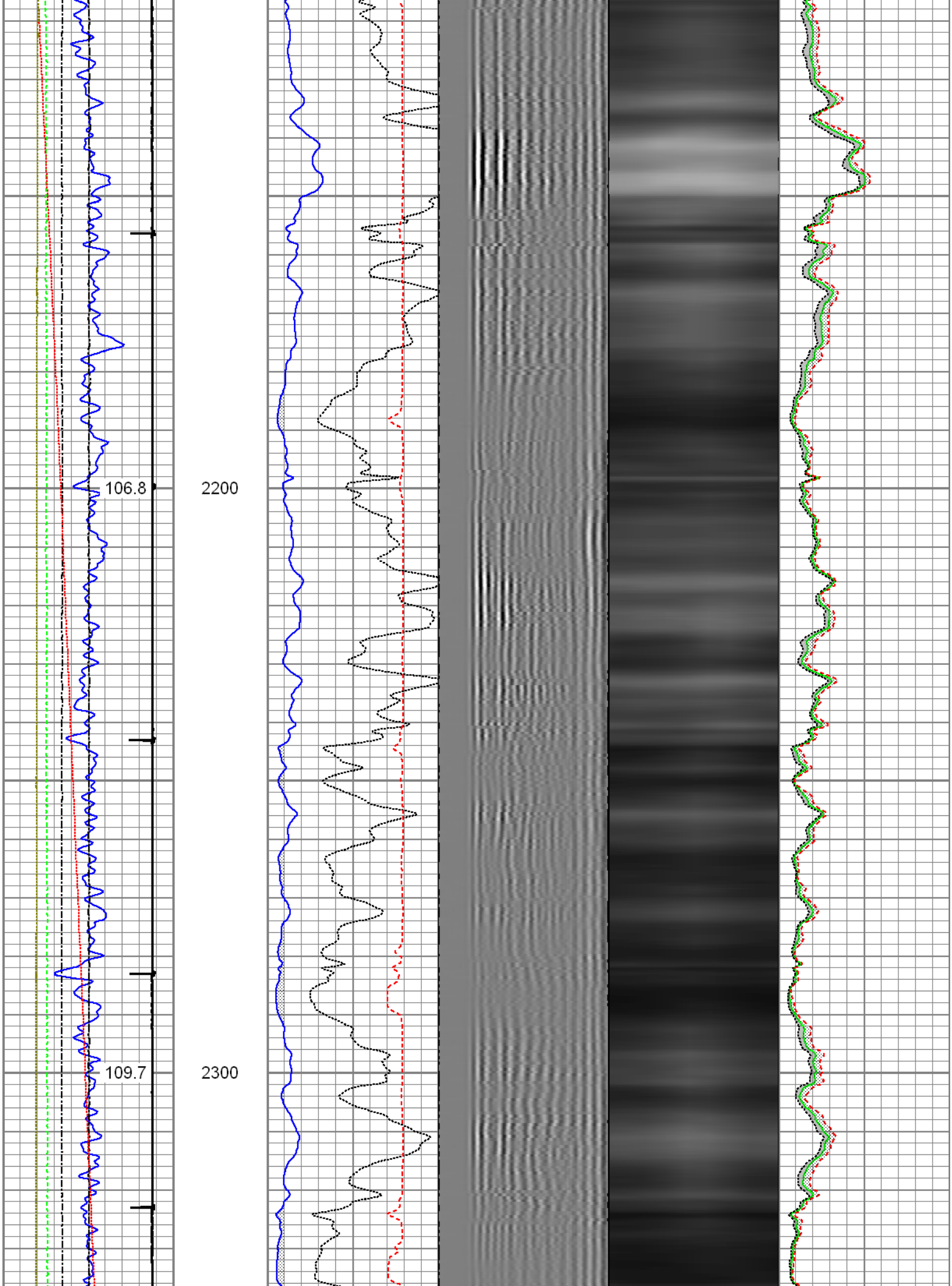

76.4
1100
79.0
1200

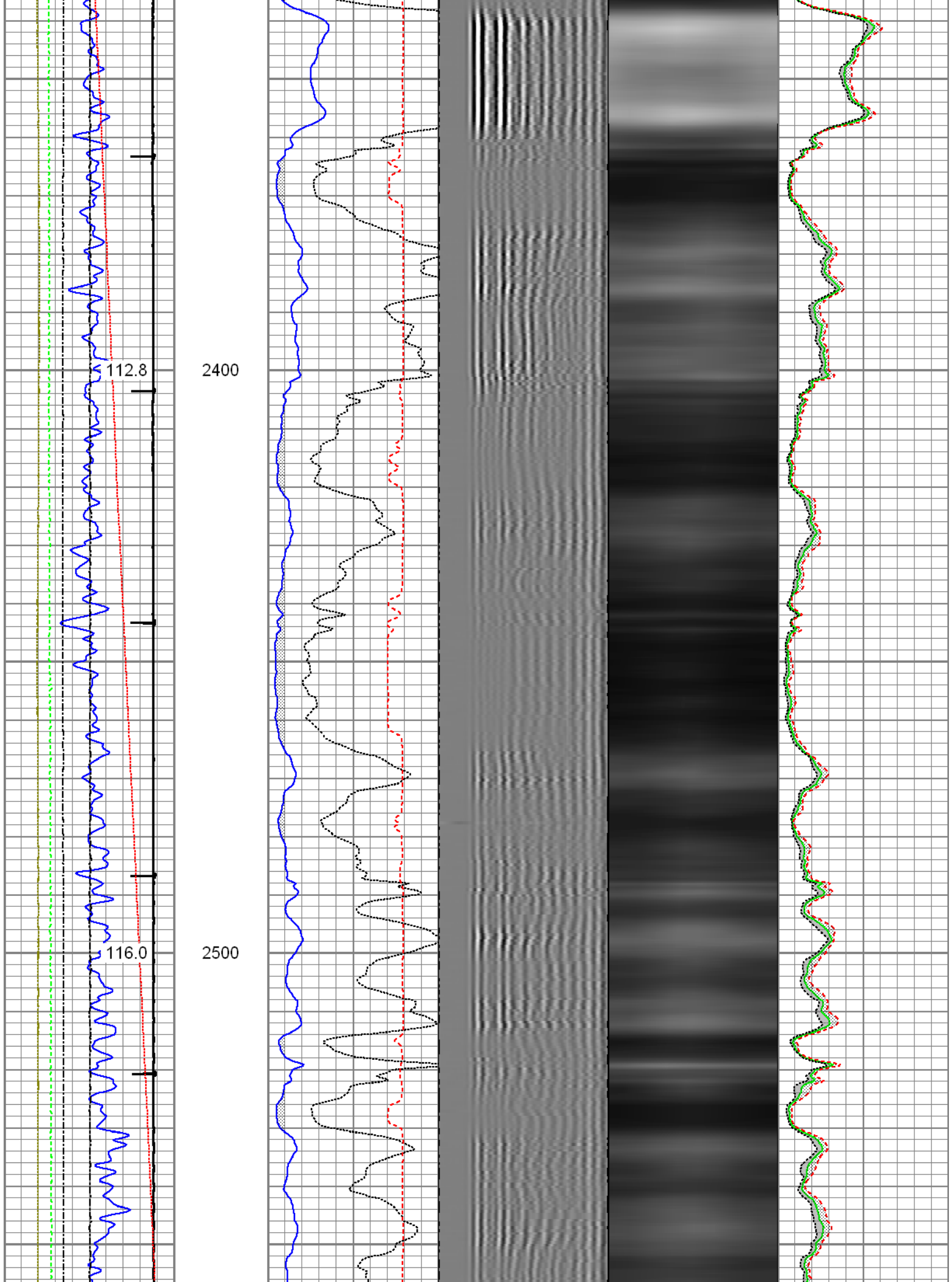

81.5
1300
83.9
1400

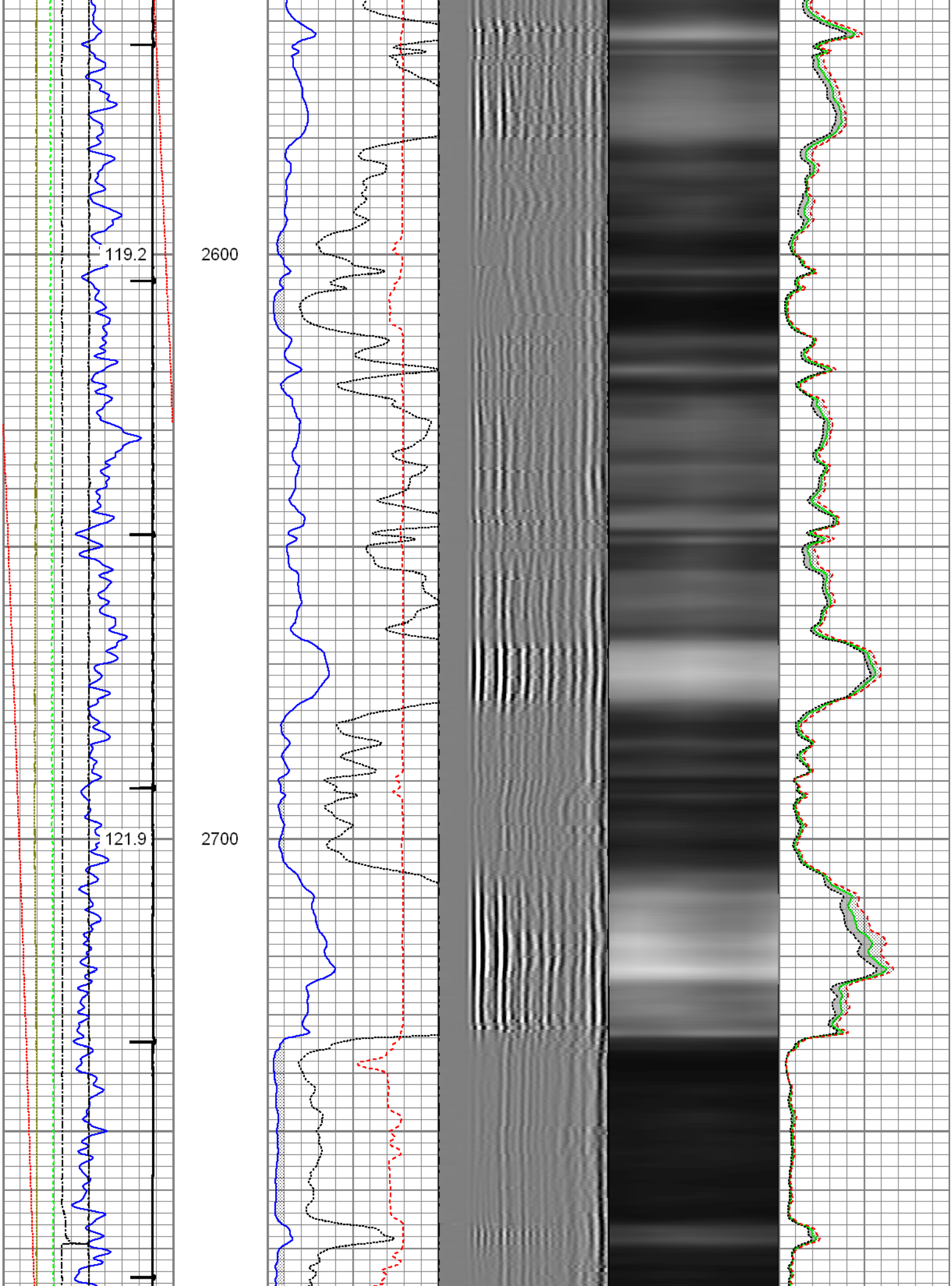

86.4
1500
88.8
1600

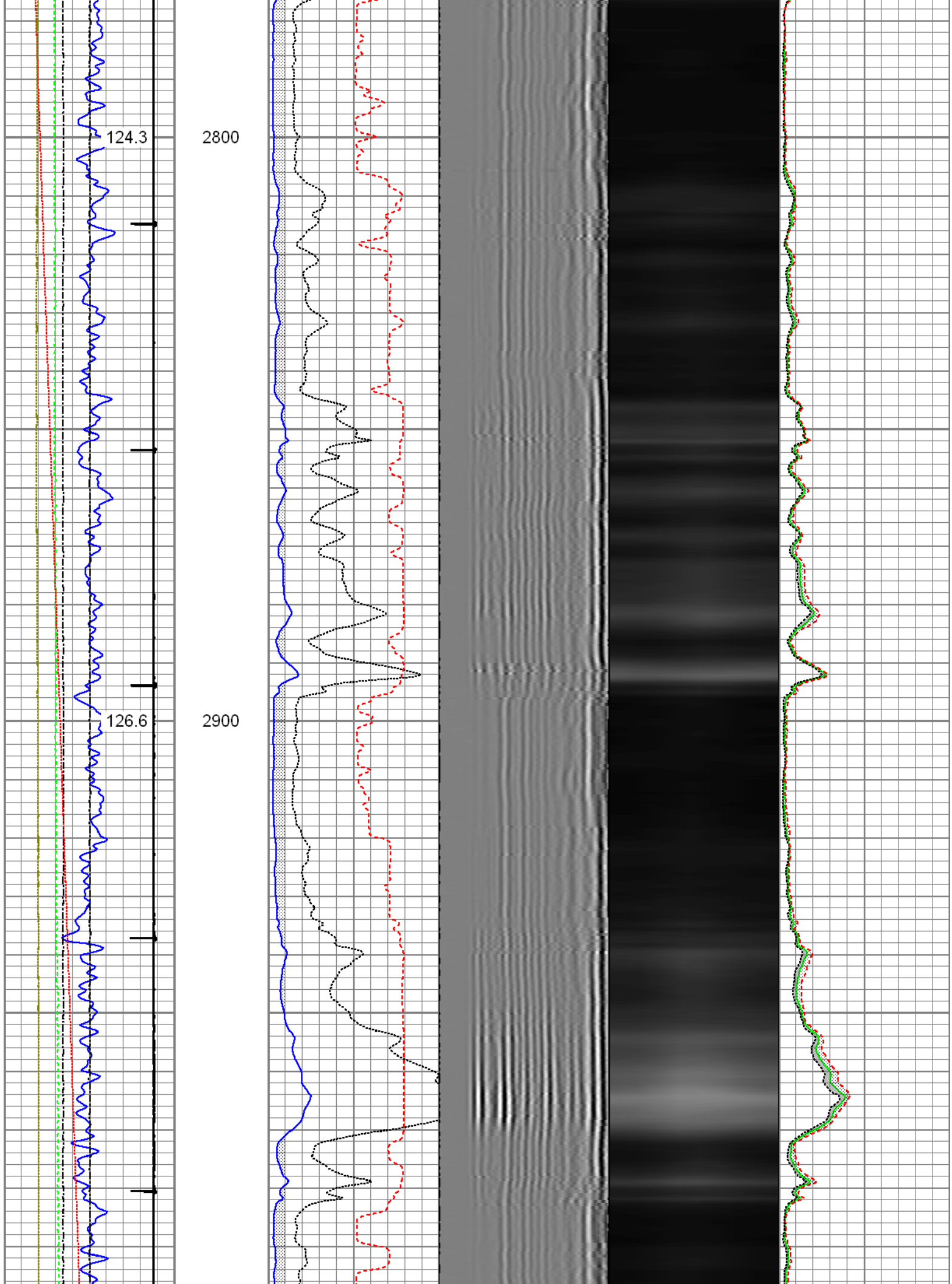

91.7
1700
94.5
1800

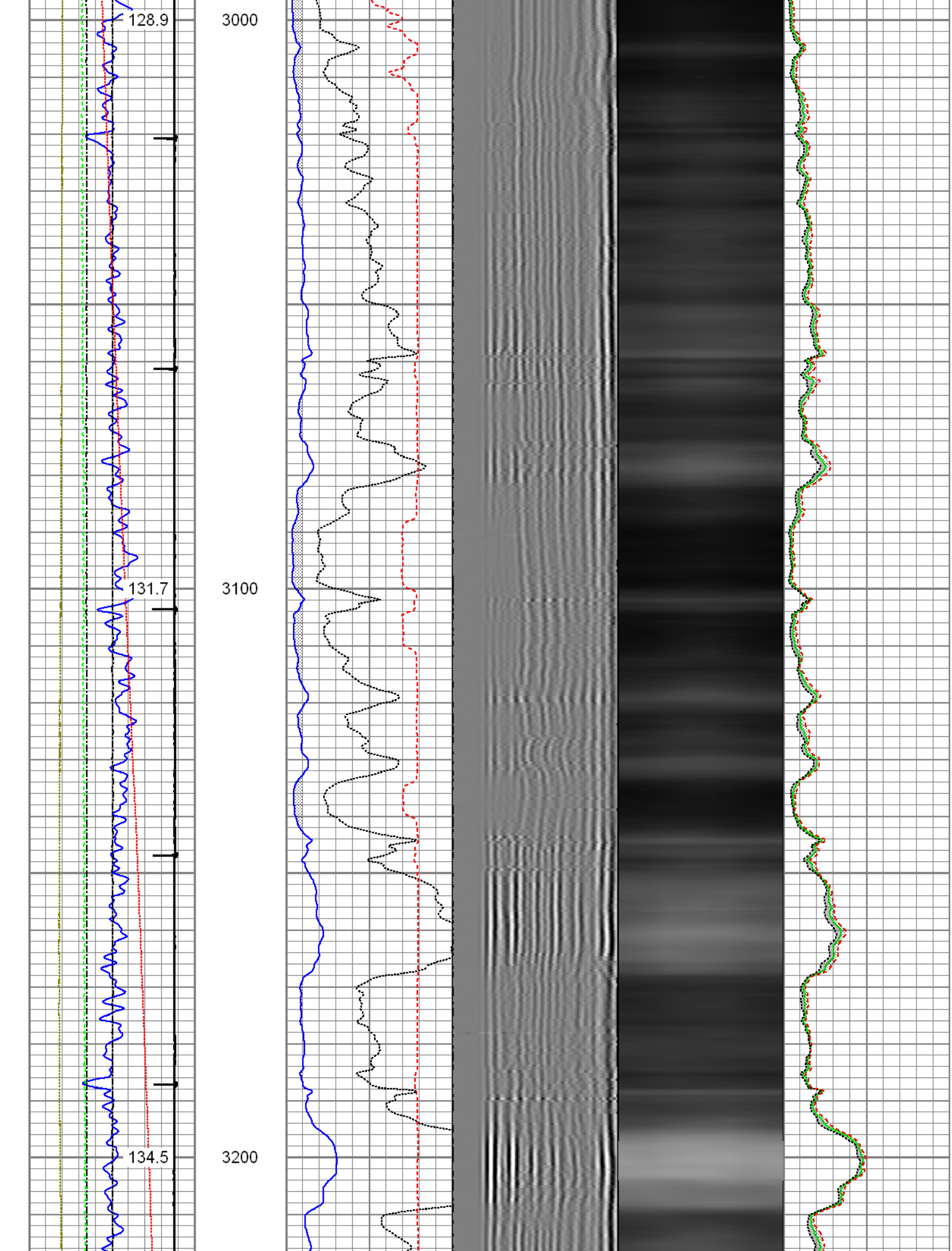

97.4
1900
100.6
2000
103.7
2100

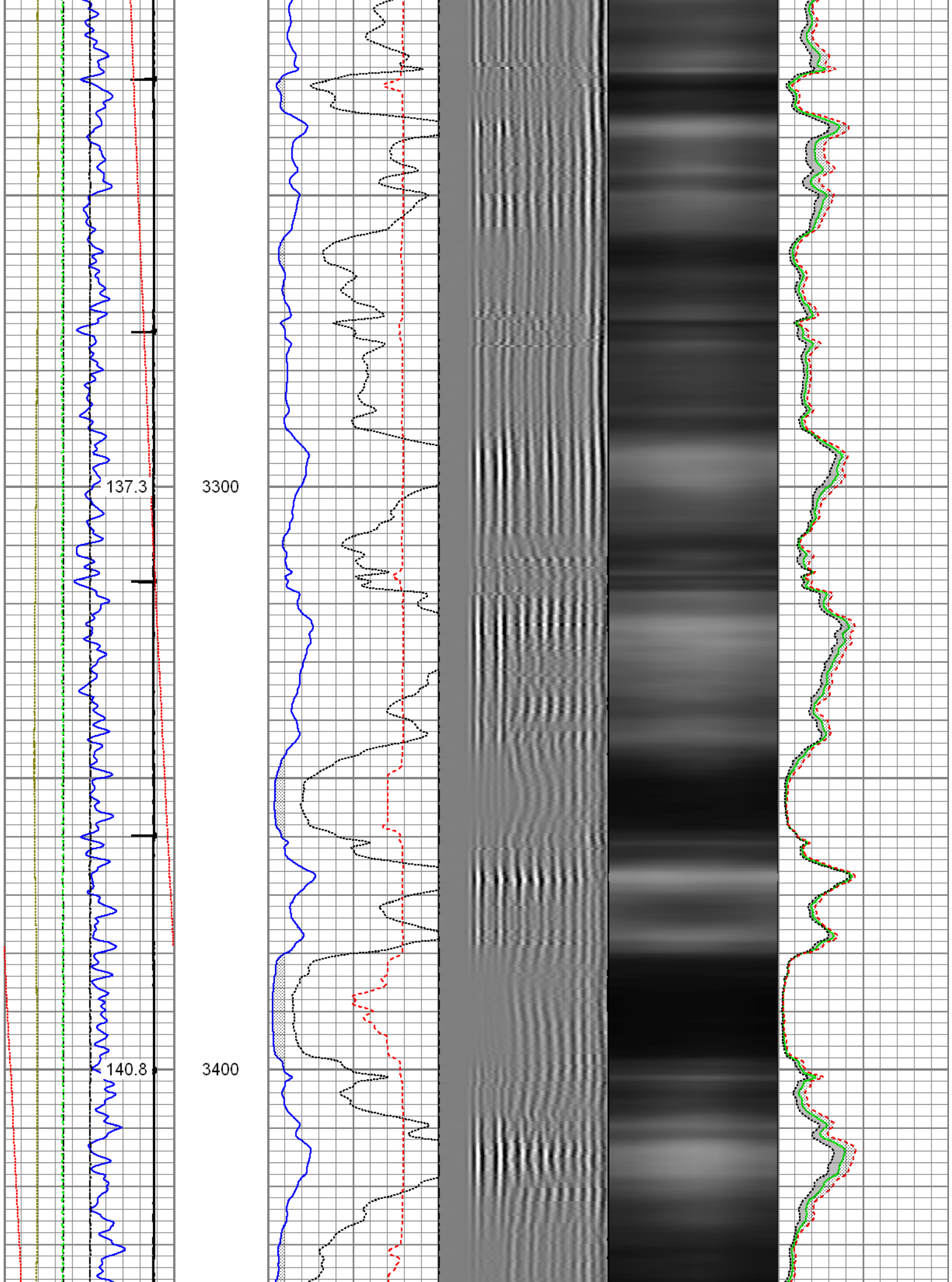

106.8
2200
109.7
2300

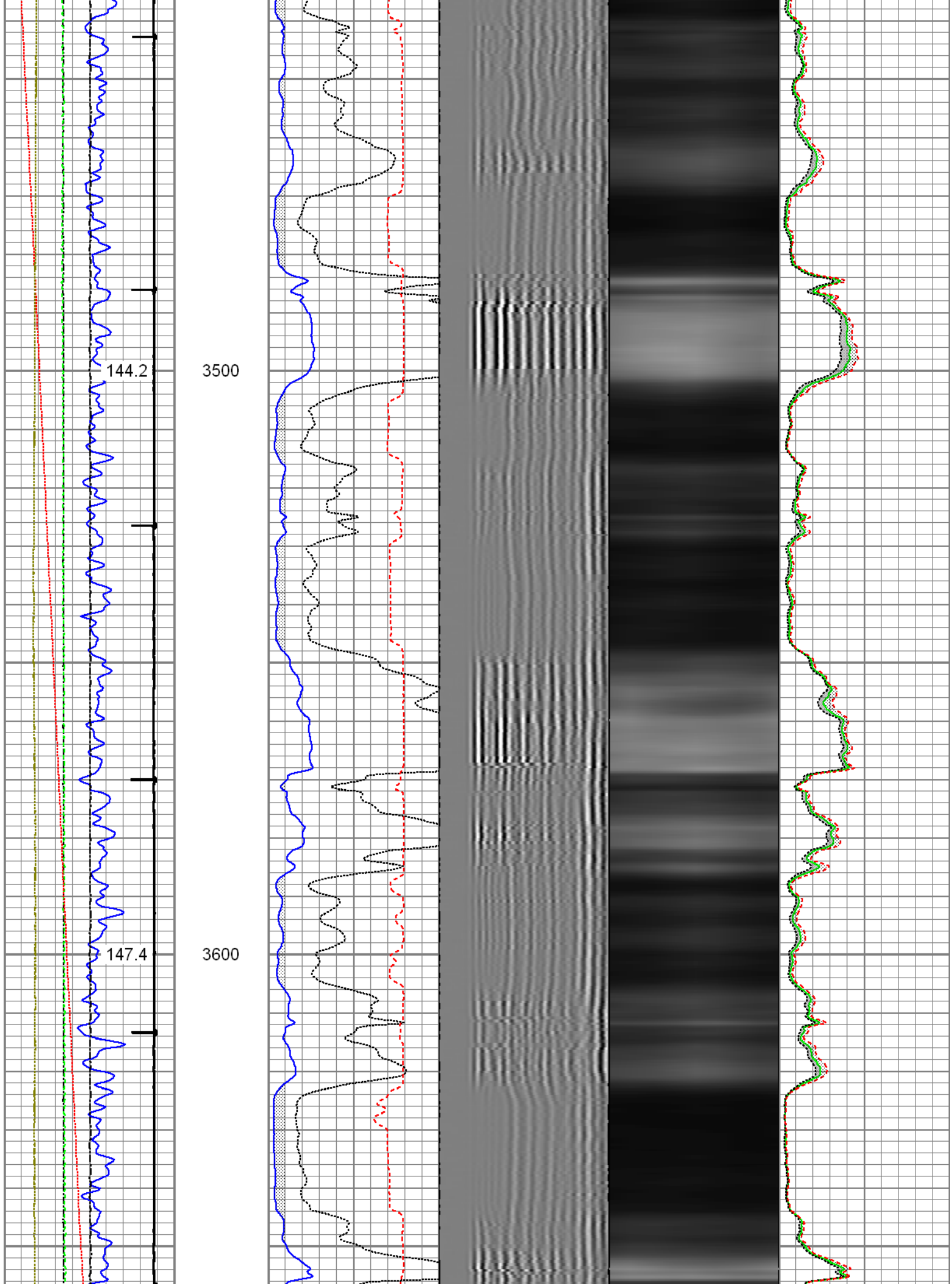

112.8
2400
116.0
2500

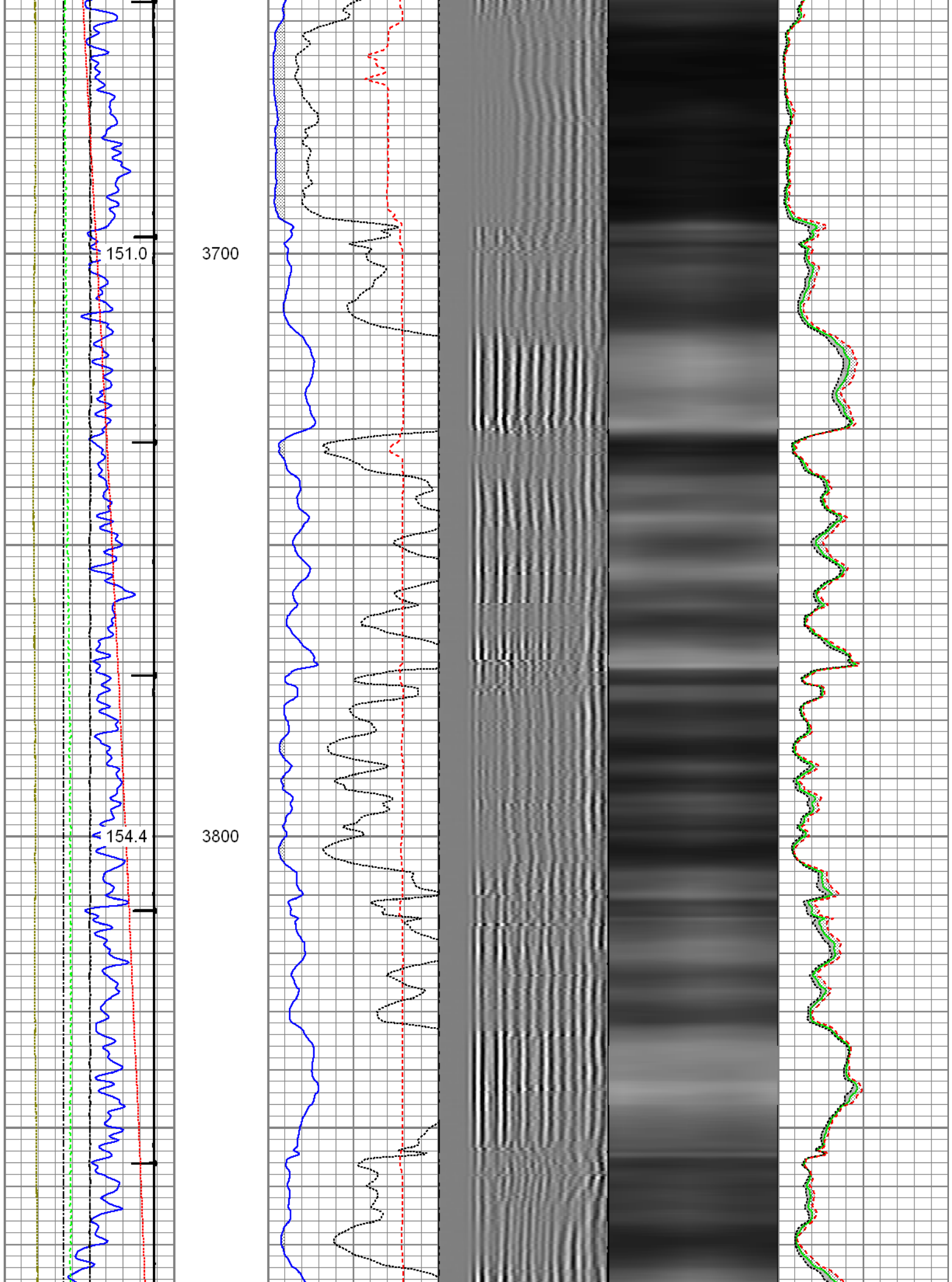

119.2
2600
121.9
2700


124.3
2800
126.6
2900


128.9
3000
131.7
3100
134.5
3200


137.3
3300
140.8
3400


144.2
3500
147.4
3600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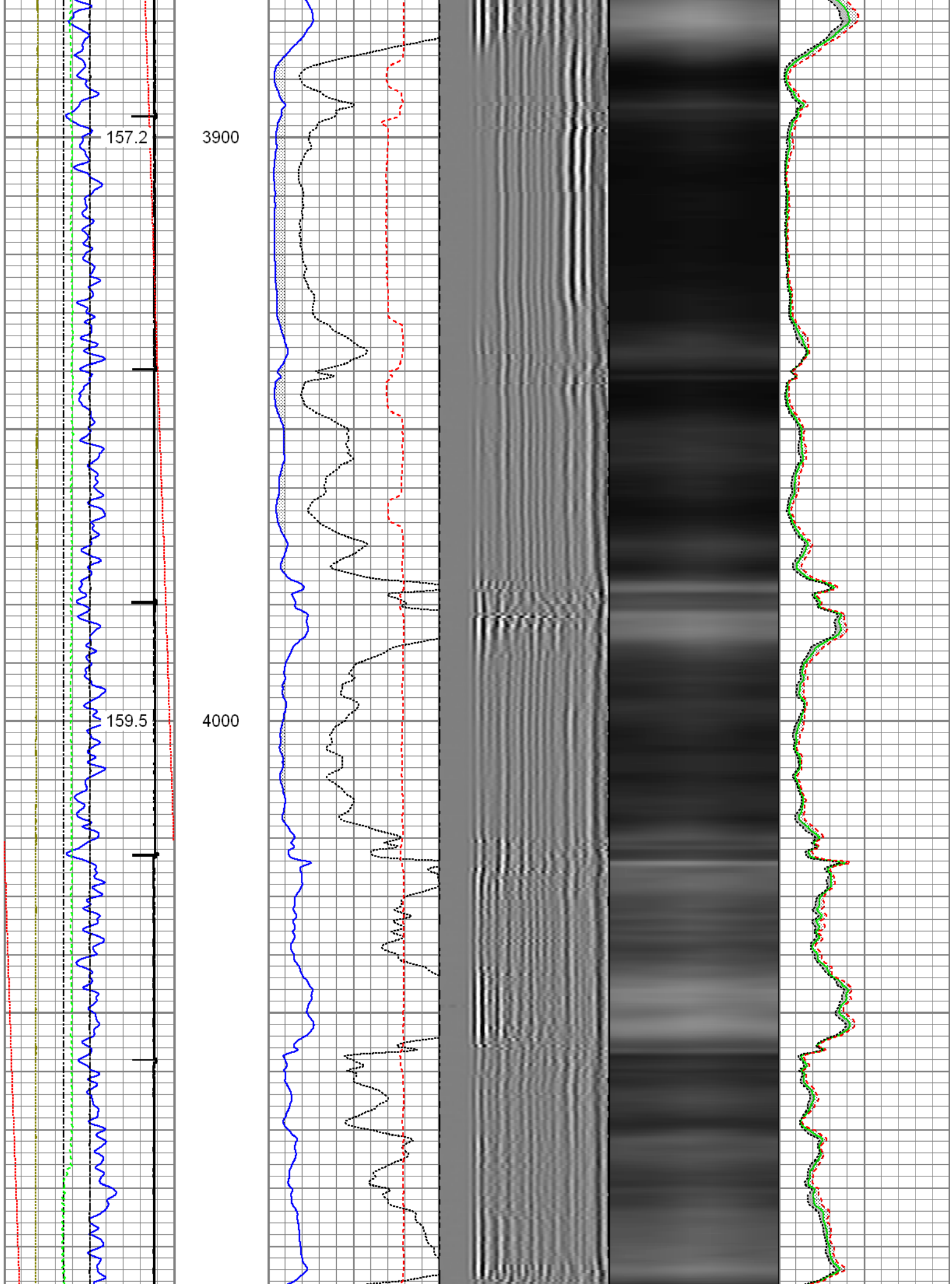
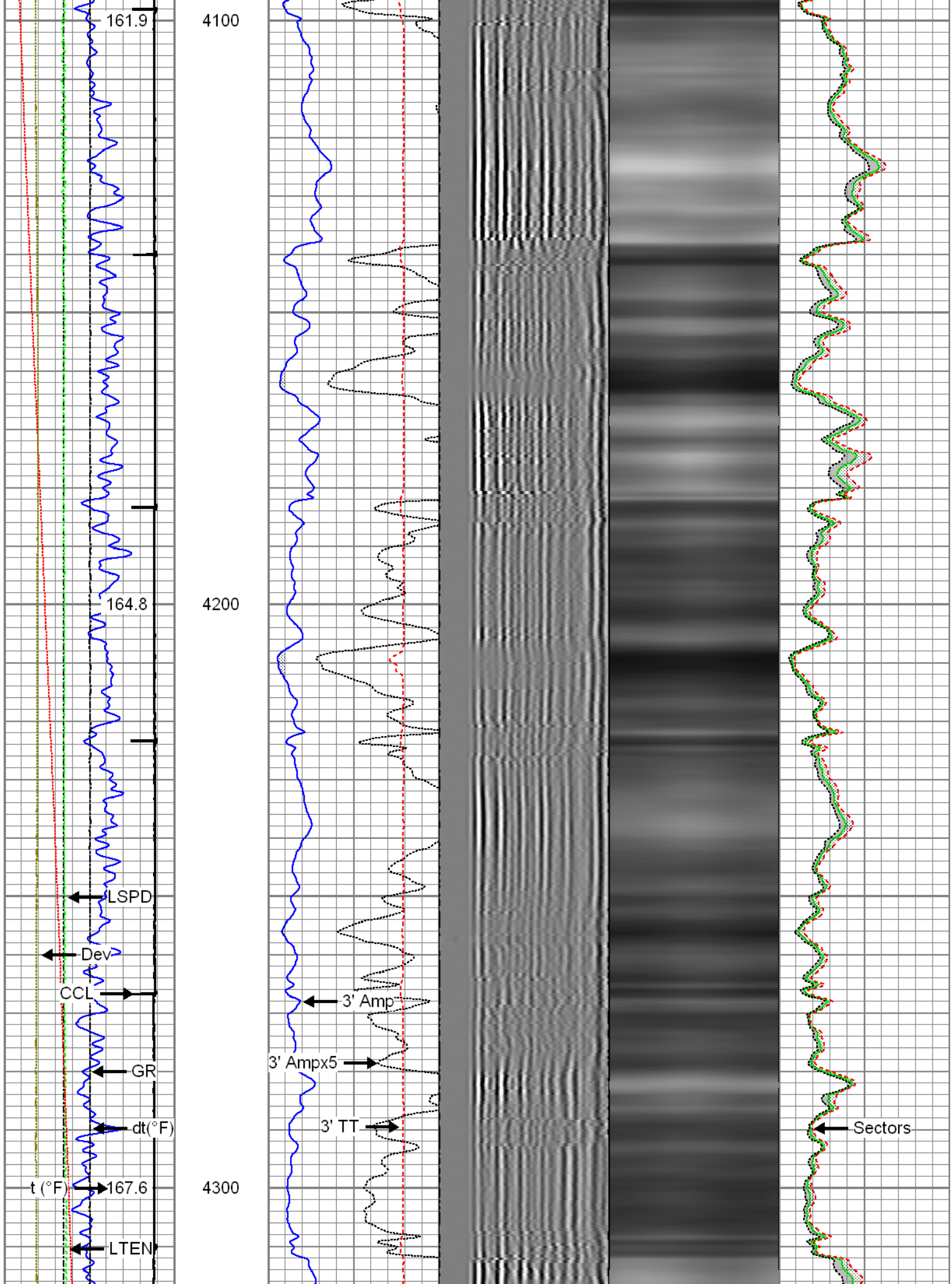
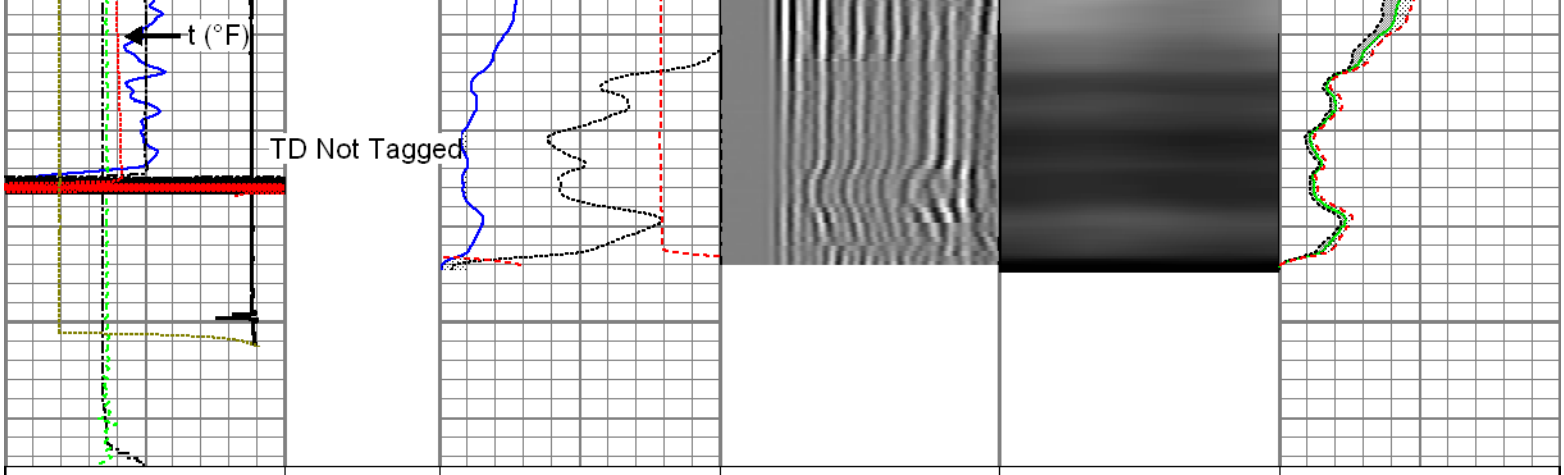
3700
154.4
3800


157.2
3900
159.5
4000


161.9
4100
164.8
4200
LSPD
Dev
CCL
GR
dt(°F)
t (°F)
167.6
4300
LTEN
3' Amp
3' Ampx5
3' TT
Sectors



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							

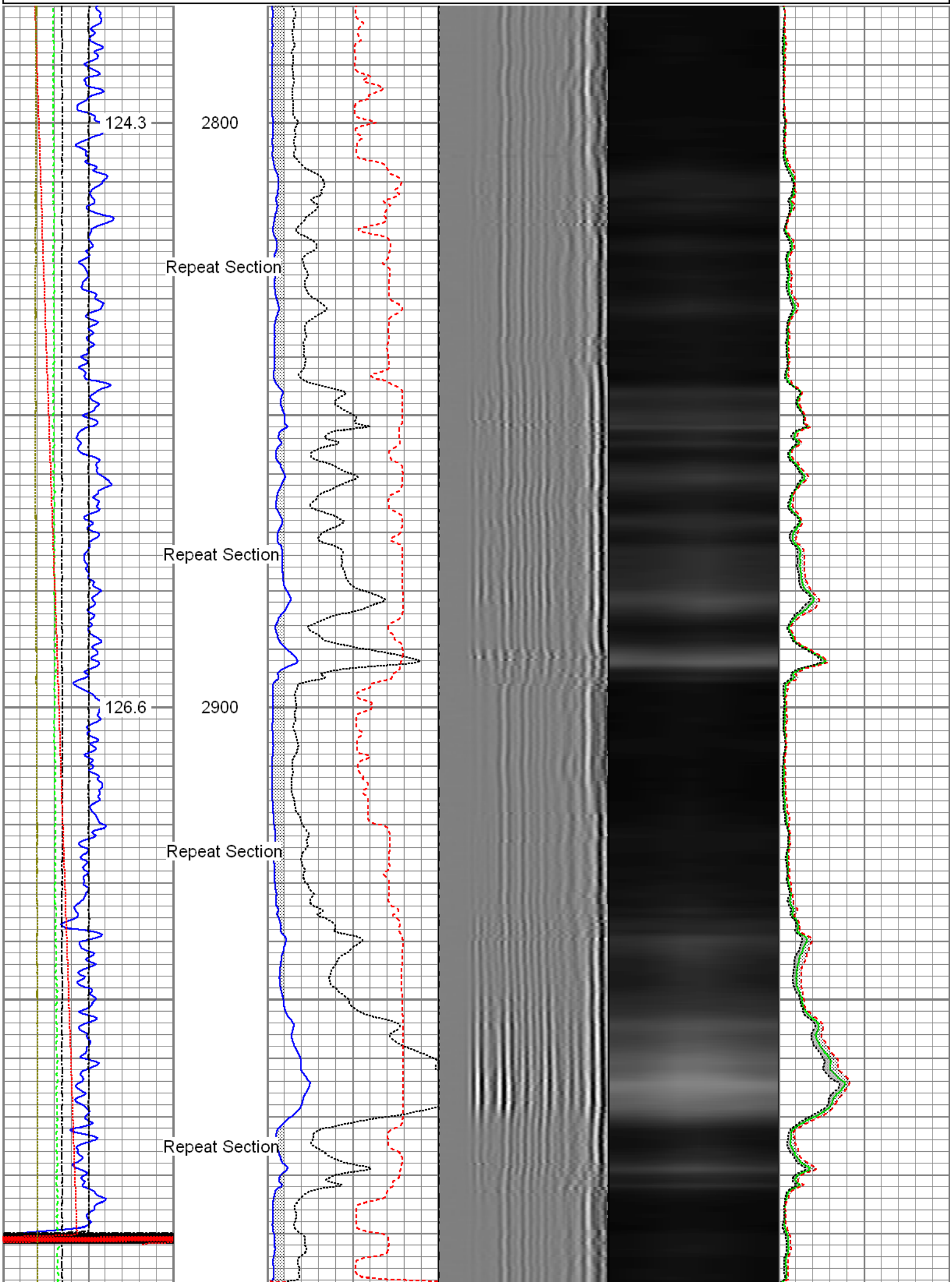
FMC Technologies

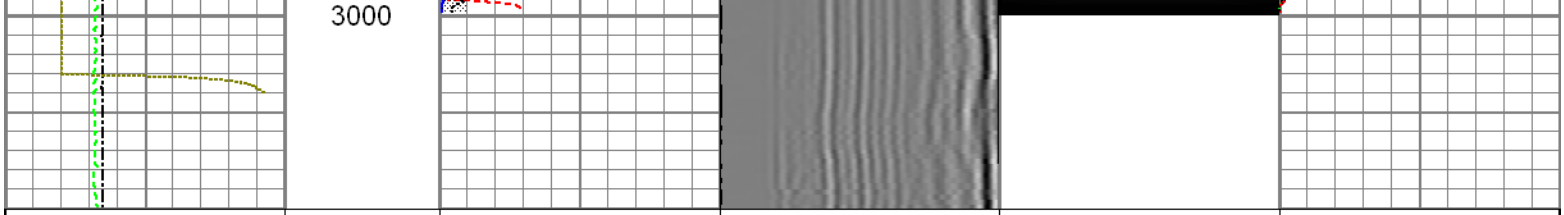
Repeat Section

Recorded With 2500 PSI Surface Induced Pressure

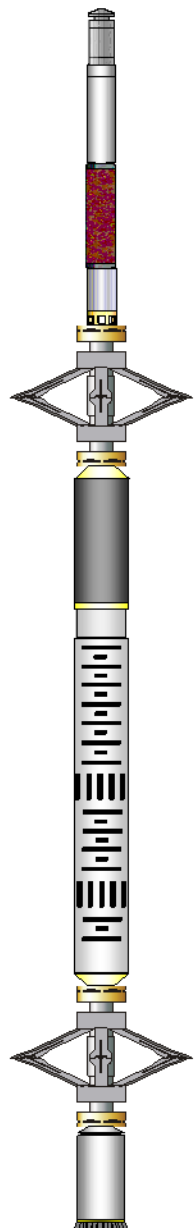
Database File:	12-22-15_noble_moser h34-769_mit_rbl_cnl.db
Dataset Pathname:	pass4.1
Presentation Format:	rbt4_mit
Dataset Creation:	Tue Dec 22 16:28:04 2015 by Calc 7.0 B1
Charted by:	Depth in Feet scaled 1:240

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							
-10	Deviation (°)	90							

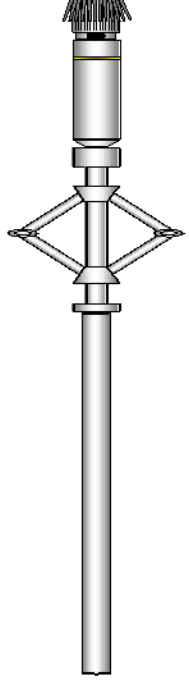

124.3
2800
Repeat Section
Repeat Section
126.6
2900
Repeat Section
Repeat Section



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				
-10 Deviation (°) 90				

Sensor	Offset (ft)	Schematic	Description	Len (ft)	OD (in)	Wt (lb)
			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
GR	30.24		UW_PGR-UW_PGR_020 (211727) Production Gamma Ray	1.93	1.69	9.50
TEMP	28.84		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
WVF3FT	21.81					
WVFS1	21.81					
WVFS2	21.81					
WVFS3	21.81					
WVFS4	21.81					
WVFS5	21.81					
WVFS6	21.81					
WVFS7	21.81					
WVFS8	21.81					
CBLTEMP	21.81		UW_RBT-UW_RBT_004 (10013454) Sondex Ultrawire 3-1/8" Radial Bond Tool	9.47	3.13	140.00
CBLROT	21.81					
WVF5FT	20.81					
			UW_PRC-DSSRAC (082) 2-3/4" DSS 5 Arm Roller Centralizer	2.55	2.75	32.00

MIT	11.80	UW_MIT-UW_MIT40_027 (218950) 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
		CNL-007 (1005) Compensated Neutron Logging Tool	6.61	1.69	30.00
CNLSC	1.53				
CNSSC	1.12				
TSTAMP	0.00				



Dataset:	12-22-15_Noble_Moser H34-769_MIT_RBL_CNL.db: field/well/run1/pass6.1
Total Length:	34.48 ft
Total Weight:	353.30 lb
O.D.	3.13 in

Calibration Report

Database File: 12-22-15_noble_moser h34-769_mit_rbl_cnl.db
Dataset Pathname: pass6.1
Dataset Creation: Tue Dec 22 16:19:43 2015 by Calc 7.0 B1

Compensated Neutron Calibration Report

Serial Number:	1005	
Tool Model:	007	
Master Calibration	Tue Jun 03 09:29:29 2014	
Detector	Readings	
Short Space	240.87	cps
Long Space	303.55	cps
	Measured	Reference
Ratio	0.8150	Sleeve: 1.0000
CNRAT Gain K	1.0271	

Before Survey

Detector	Readings	
Short Space		cps
Long Space		cps
	Measured	Reference
Ratio		

After Survey

Detector	Readings	
Short Space		cps
Long Space		cps

	Measured	Reference	Ratio

Multi-finger Imaging Tool Calibration Report

Serial Number:	218950
Number of Fingers:	40
Tool Model:	UW_MIT40_027

Inclinometer Calibration Report

Performed:	Fri, Oct, 10 10:41:51 2008
Calibration Angle:	45

	Inc X	Inc Y
Vertical:	1996	1975
Finger 1 up:	2238	2226
Finger 31 up:	1760	2216
Finger 21 up:	1769	1745
Finger 11 up:	2250	1738

Sensitivity ratio:	1.00023
X-axis angle:	314.283
Deviation const.:	339.139

Finger Calibration Report

Performed: Tue Dec 22 08:35:31 2015

Ring size:	4		5		6		7
(in)		Sens		Sens		Sens	
Finger 01:	1470	268.0	1738	292.0	2030	300.0	2330
Finger 02:	1526	245.0	1771	262.0	2033	264.0	2297
Finger 03:	1446	273.0	1719	295.0	2014	299.0	2313
Finger 04:	1478	272.0	1750	293.0	2043	288.0	2331
Finger 05:	1505	265.0	1770	284.0	2054	273.0	2327
Finger 06:	1429	278.0	1707	302.0	2009	298.0	2307
Finger 07:	1442	276.0	1718	296.0	2014	297.0	2311
Finger 08:	1425	280.0	1705	294.0	1999	287.0	2286
Finger 09:	1435	284.0	1719	299.0	2018	290.0	2308
Finger 10:	1439	275.0	1714	285.0	1999	278.0	2277
Finger 11:	1433	286.0	1719	297.0	2016	291.0	2307
Finger 12:	1371	294.0	1665	306.0	1971	292.0	2263
Finger 13:	1470	268.0	1738	277.0	2015	262.0	2277
Finger 14:	1417	270.0	1687	287.0	1974	285.0	2259
Finger 15:	1409	288.0	1697	295.0	1992	298.0	2290
Finger 16:	1422	279.0	1701	291.0	1992	291.0	2283
Finger 17:	1412	290.0	1702	299.0	2001	302.0	2303
Finger 18:	1371	278.0	1649	287.0	1936	294.0	2230
Finger 19:	1411	286.0	1697	289.0	1986	297.0	2283
Finger 20:	1411	279.0	1690	287.0	1977	302.0	2279
Finger 21:	1392	293.0	1685	301.0	1986	316.0	2302
Finger 22:	1426	269.0	1695	280.0	1975	294.0	2269
Finger 23:	1399	270.0	1669	283.0	1952	301.0	2253
Finger 24:	1444	273.0	1717	279.0	1996	295.0	2291
Finger 25:	1383	271.0	1654	280.0	1934	301.0	2235
Finger 26:	1403	279.0	1682	289.0	1971	313.0	2284
Finger 27:	1457	269.0	1726	278.0	2004	300.0	2304
Finger 28:	1448	281.0	1729	288.0	2017	315.0	2332
Finger 29:	1503	263.0	1766	269.0	2035	291.0	2326
Finger 30:	1405	276.0	1681	288.0	1969	318.0	2287
Finger 31:	1431	280.0	1711	292.0	2003	317.0	2320
Finger 32:	1478	260.0	1738	271.0	2009	291.0	2300
Finger 33:	1443	281.0	1724	299.0	2023	318.0	2341
Finger 34:	1451	275.0	1726	293.0	2019	316.0	2335
Finger 35:	1500	253.0	1753	266.0	2019	285.0	2304
Finger 36:	1520	260.0	1780	280.0	2060	297.0	2357
Finger 37:	1483	272.0	1755	291.0	2046	307.0	2353
Finger 38:	1563	247.0	1810	261.0	2071	275.0	2346

Finger 38:	1563	247.0	1810	261.0	2071	275.0	2346
Finger 39:	1477	265.0	1742	285.0	2027	290.0	2317
Finger 40:	1438	278.0	1716	303.0	2019	314.0	2333

Segmented Cement Bond Log Calibration Report

Serial Number:	10013454	
Tool Model:	UW_RBT_004	
Calibration Casing Diameter:	7.000	in
Calibration Depth:	358.833	ft

Master Calibration, performed Tue Dec 22 16:18:46 2015:

	Raw (v)		Calibrated (mv)		Results	
	Zero	Cal	Zero	Cal	Gain	Offset
3FT	-0.002	0.723	0.800	62.165	84.692	0.966
5FT	-0.004	0.790	0.800	62.165	77.329	1.093
S1	-0.002	0.755	0.000	100.000	132.136	0.240
S2	-0.003	0.774	0.000	100.000	128.648	0.411
S3	-0.003	0.752	0.000	100.000	132.389	0.462
S4	-0.003	0.724	0.000	100.000	137.450	0.435
S5	-0.002	0.724	0.000	100.000	137.790	0.267
S6	-0.003	0.723	0.000	100.000	137.806	0.429
S7	-0.002	0.707	0.000	100.000	141.058	0.333
S8	-0.003	0.726	0.000	100.000	137.273	0.380

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	Noble Energy Inc.
Well	Moser H34-769

Well	Mosel 1154-7B3
Field	Wattenberg
County	Weld
State	Colorado