RELIANCE OILFIELD SERVICES

Radial Cement Bond Gamma Ray Casing Collar Log

Company	Kerr-McGee Oil & Gas Onshore, L.P.
Well	Puma Fed 5S-35HZ
Field	Wattenberg
County	Weld
State	Colorado

Company Kerr-McGee Oil & Gas Onshore, L.P.
Well Puma Fed 5S-35HZ
Field Wattenberg
County Weld
State Colorado

Location: API # : 05-123-42565

SEC 23 TWP 1N RGE 67W

Other Services: Gauge Ring

Permanent Datum	Ground Level	Elevation	4991'
Log Measured From	Kelly Bushing	32 FT	
Drilling Measured From	Kelly Bushing		

Elevation
K.B. 5023'
D.F. ---
G.L. 4991'

Date	14-May-2017		
Run Number	Two		
Depth Driller	10445 FT		
Depth Logger	4952 FT		
Bottom Logged Interval	4948 FT		
Top Log Interval	Surface		
Open Hole Size	8.50"		
Type Fluid	Water		
Density / Viscosity	8.34 lb/gal		
Max. Recorded Temp.	164°F		
Estimated Cement Top	See Log		
Time Well Ready	ROA		
Time Logger on Bottom	13:57 PM		
Equipment Number	HD-0343		
Location	Fort Lupton, CO		
Recorded By	J. Fresquez		
Witnessed By	B. Jolly		

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	1854 FT
Intermediate #1	5 1/2	17	HC P110	Surface	10436 FT
Intermediate #2					
Liner					

<<< 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 Marker Joint at 4217 FT
Adjusted +1 FT to correlate with Marker Joint
Gauge Ring/Junk Basket ran to 4990 FT with no debris
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 any debris upon completion of operations

Thank you for choosing Reliance Oilfield Services, LLC!!

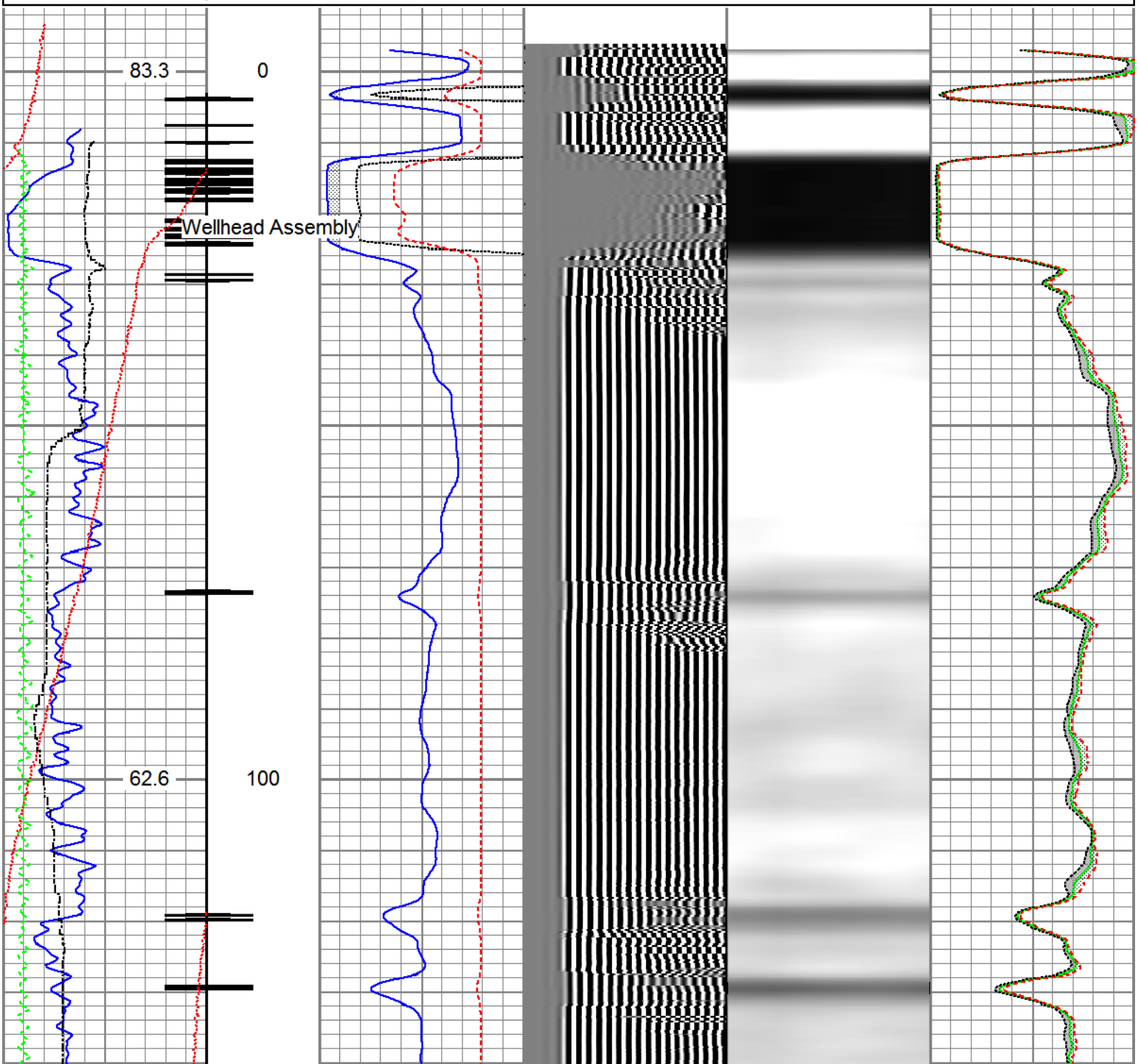
Main Pass

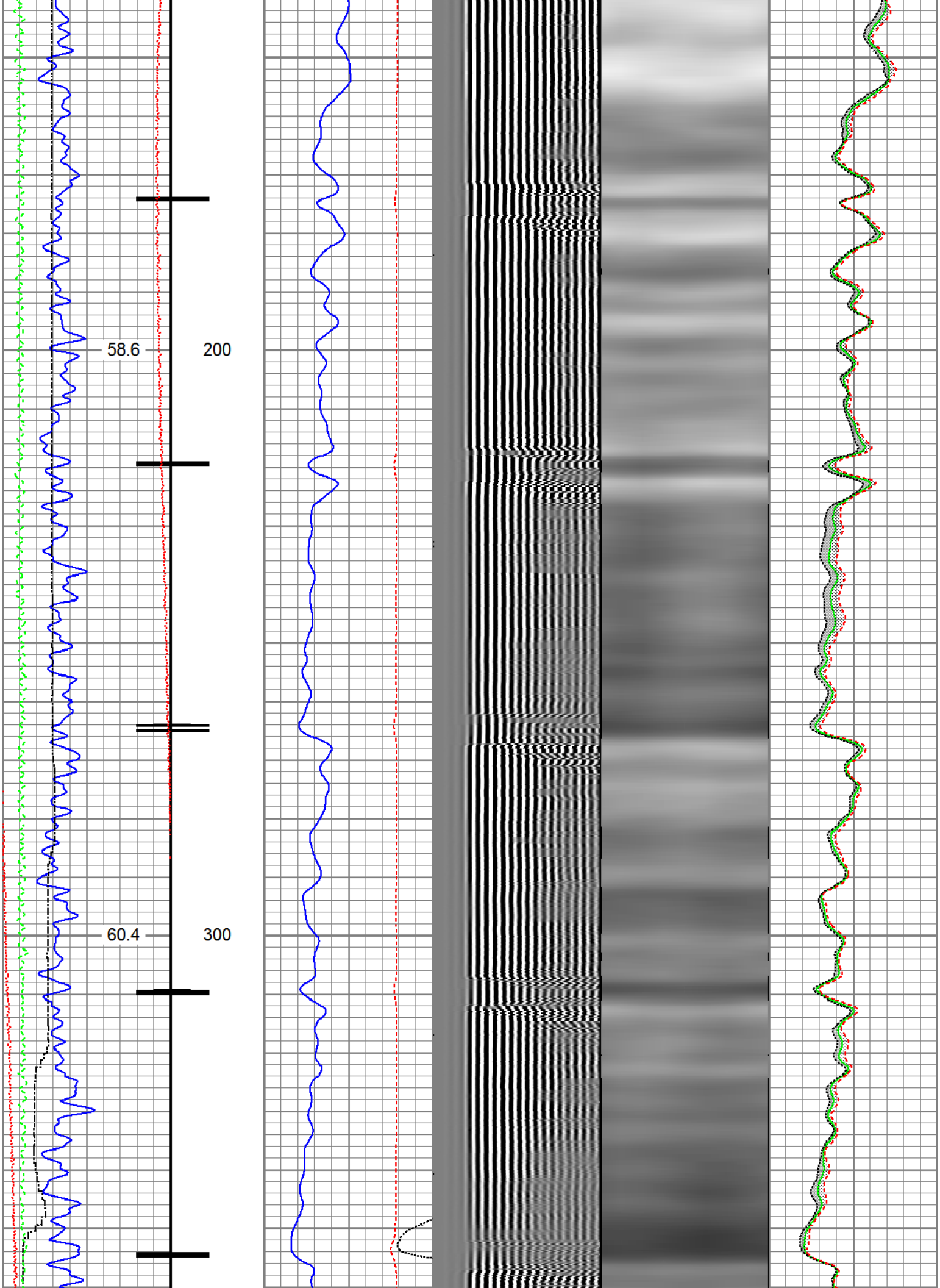
Recorded With 2800 PSI of Surface Induced Pressure

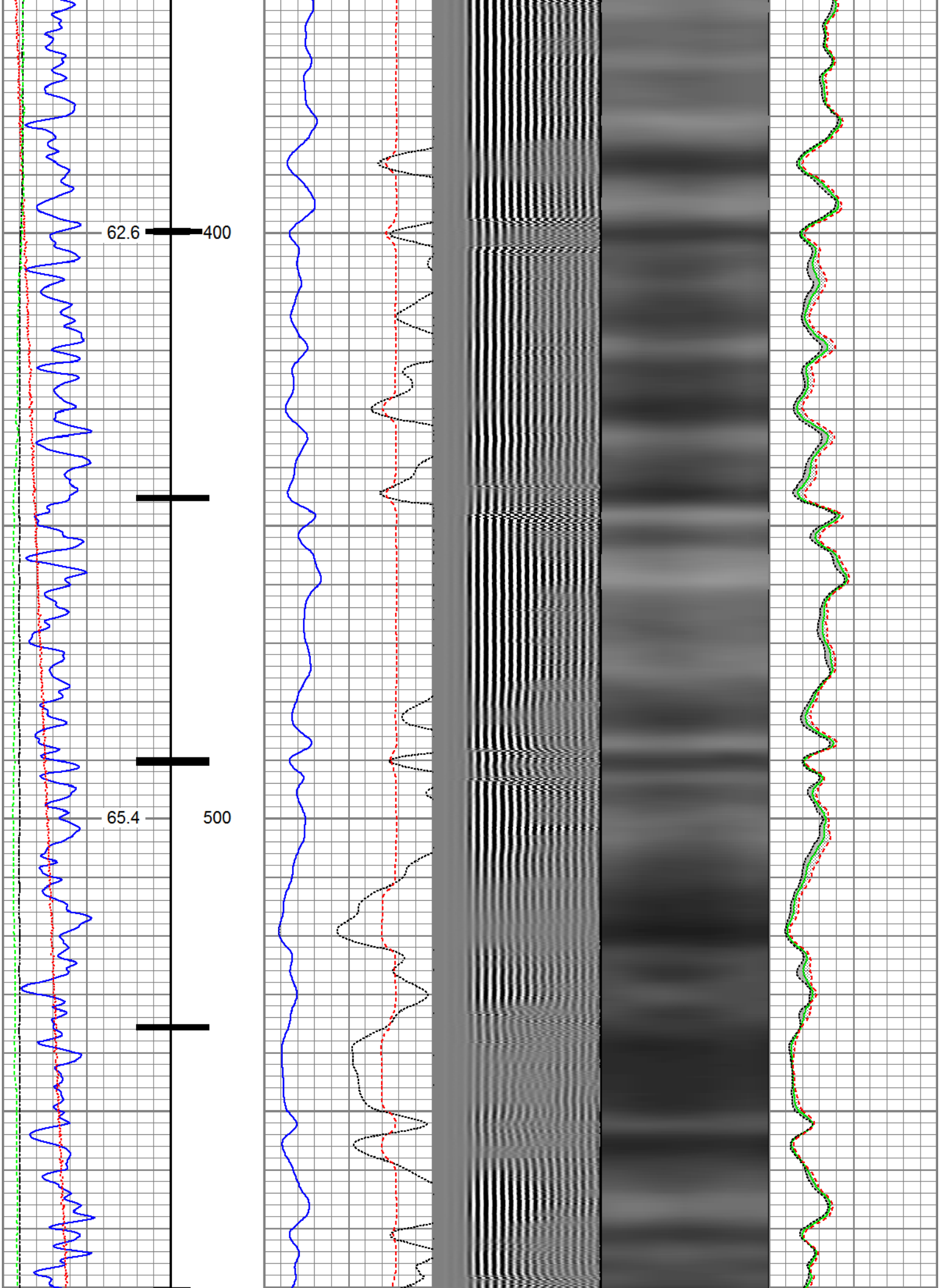
RELIANCE OILFIELD SERVICES

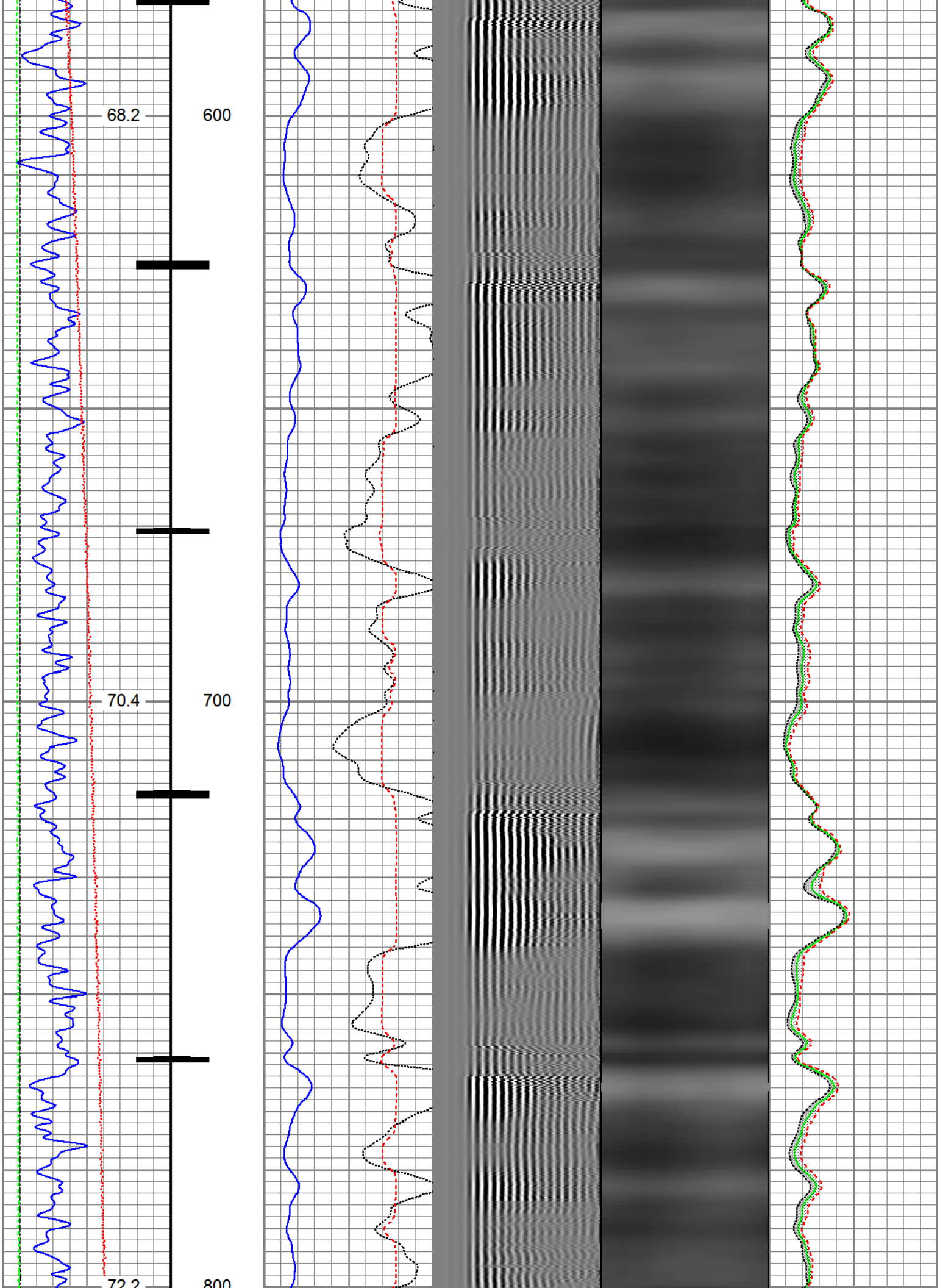
Database File	anadarko_puma fed 5s-35hz_14-may-2017_rbl\processed_0512342565_anadarko_puma fed 5s-35h
Dataset Pathname	pass6
Presentation Format	ros_radii
Dataset Creation	Sun May 14 13:57:26 2017
Charted by	Depth in Feet scaled 1:240

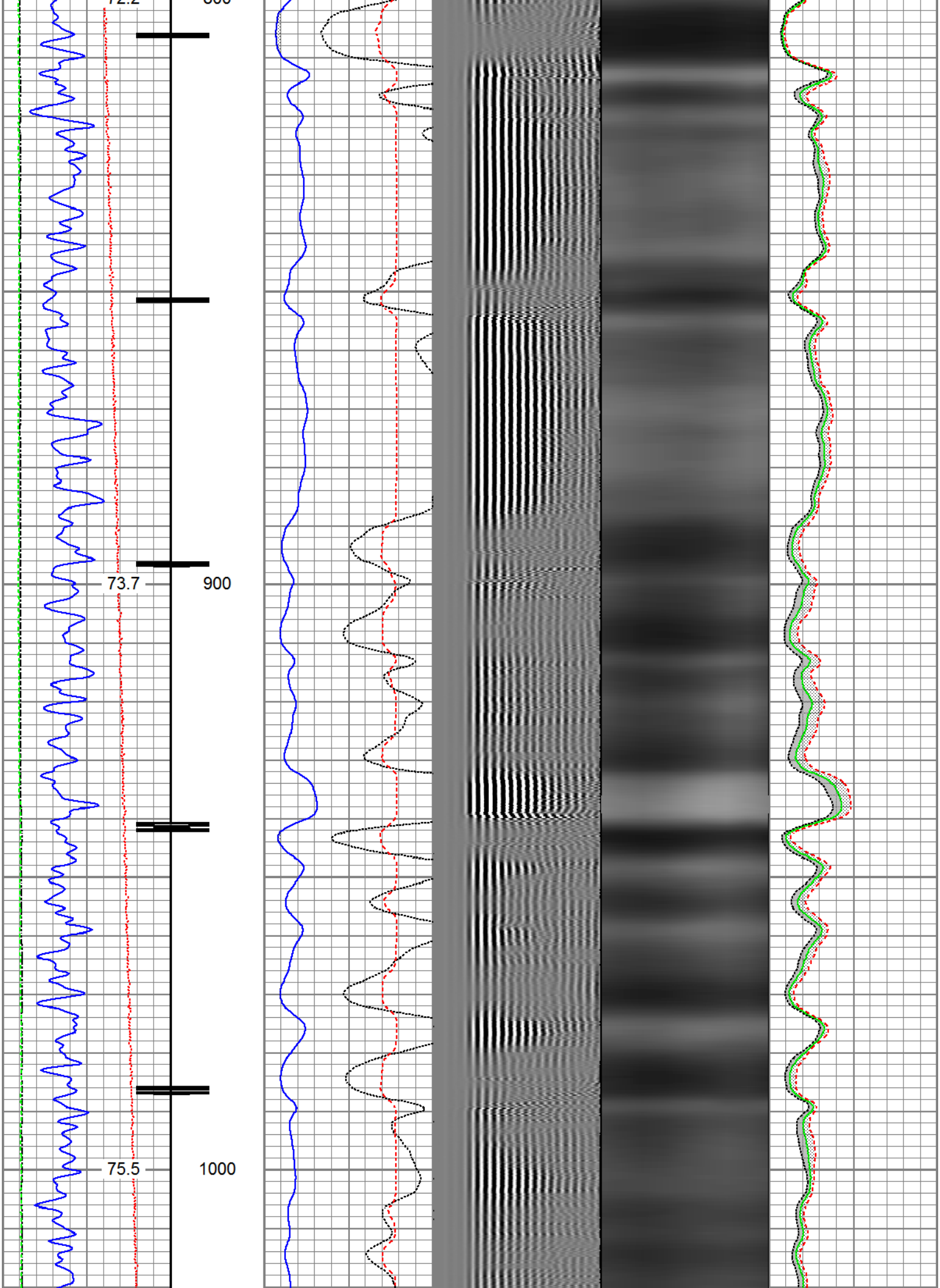
Gamma Ray	3' Amplitude	5' Variable Density Log	Sector Map	Average Amplitude
0 (GAPI) 120	0 (mV) 100	200 1200		0 100
Casing Collar Locator	*3' Amplitude x 5*			*Mimimum Amplitude*
	0 (mV) 20			*0 100*
Temperature	*3' Travel Time*			*Maximum Amplitude*
0 (degF) 20	*650 (usec) 150*			*0 100*
Line Speed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

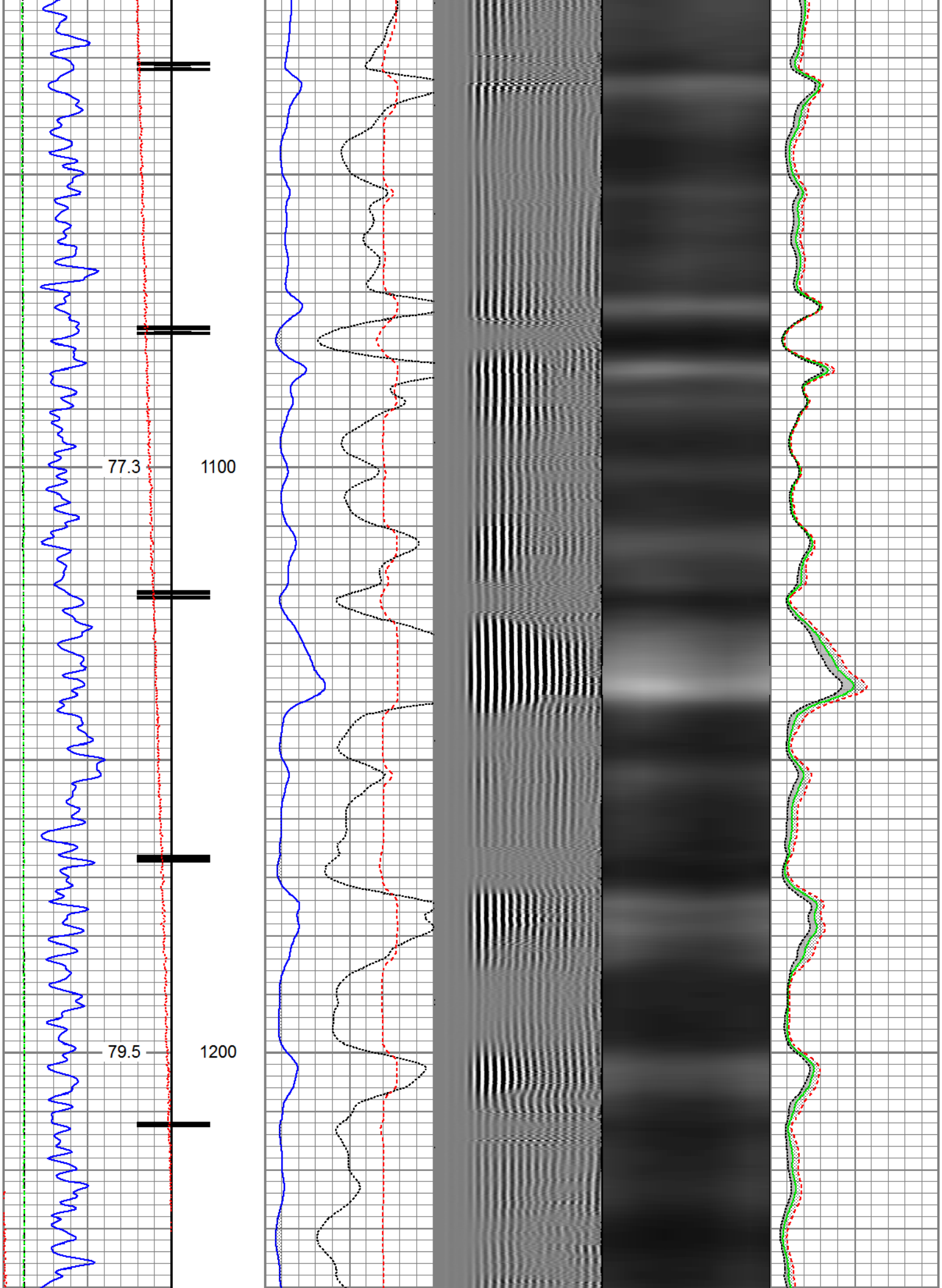


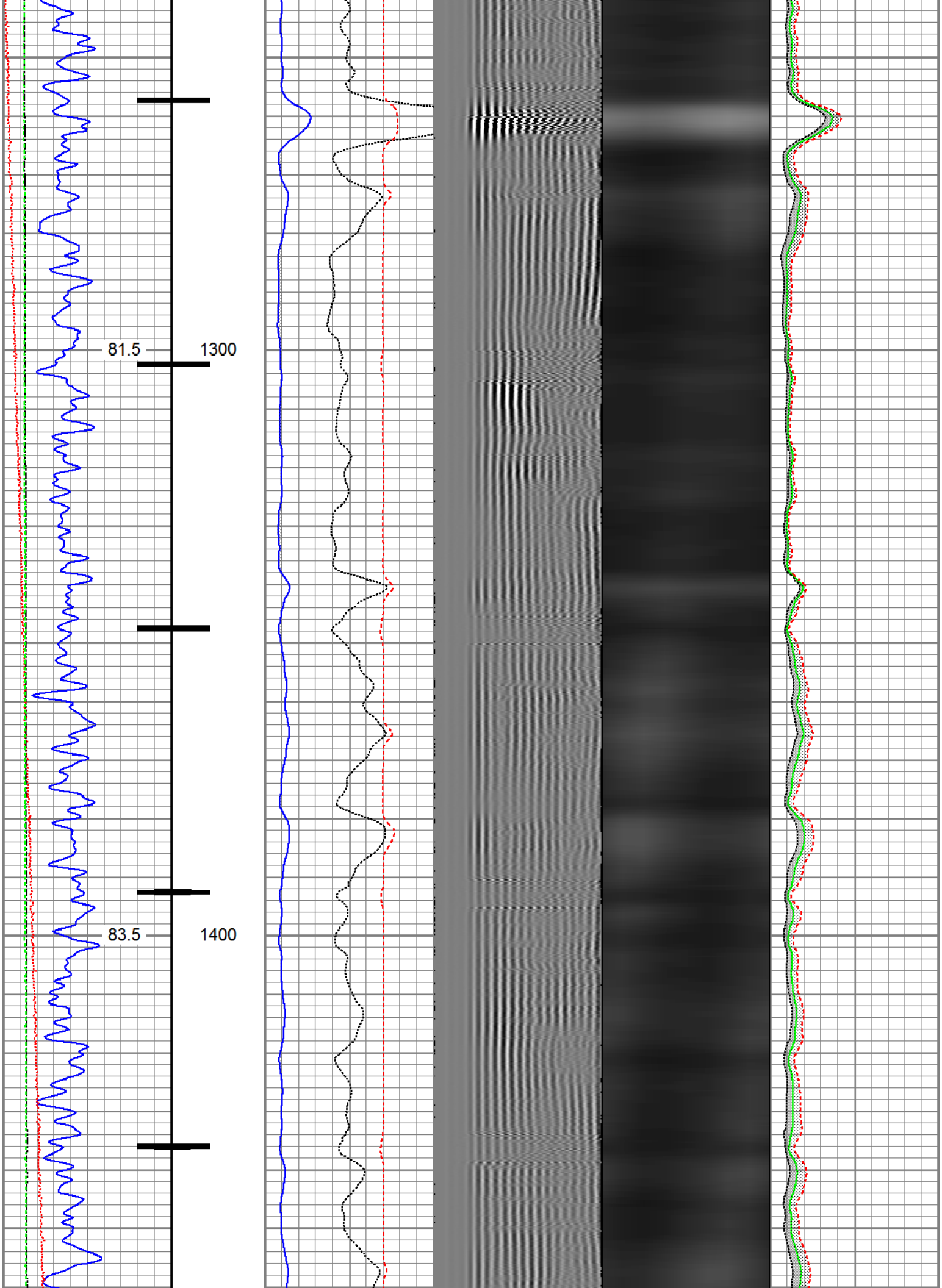

58.6
200
60.4
300

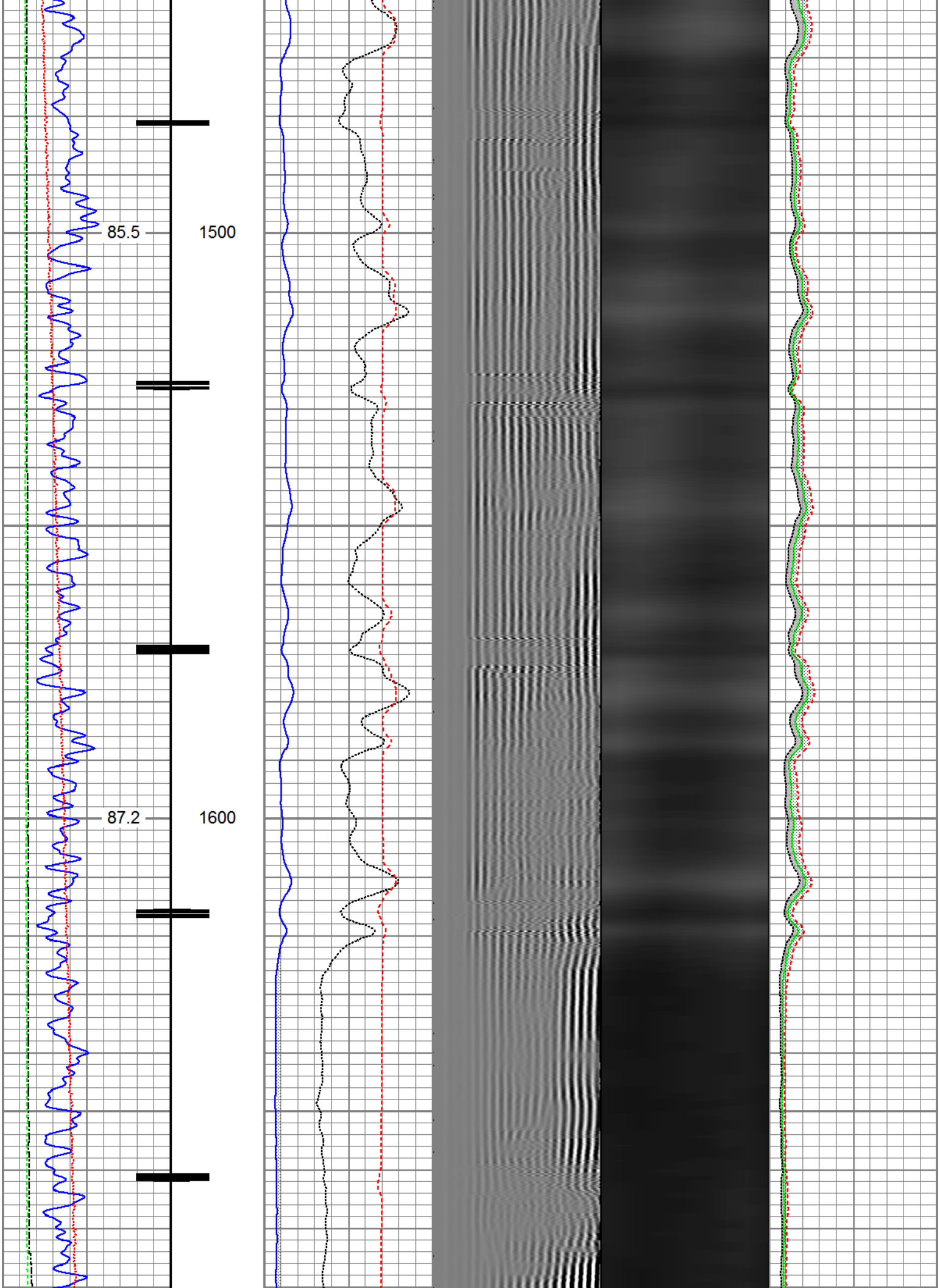

62.6
400
65.4
500

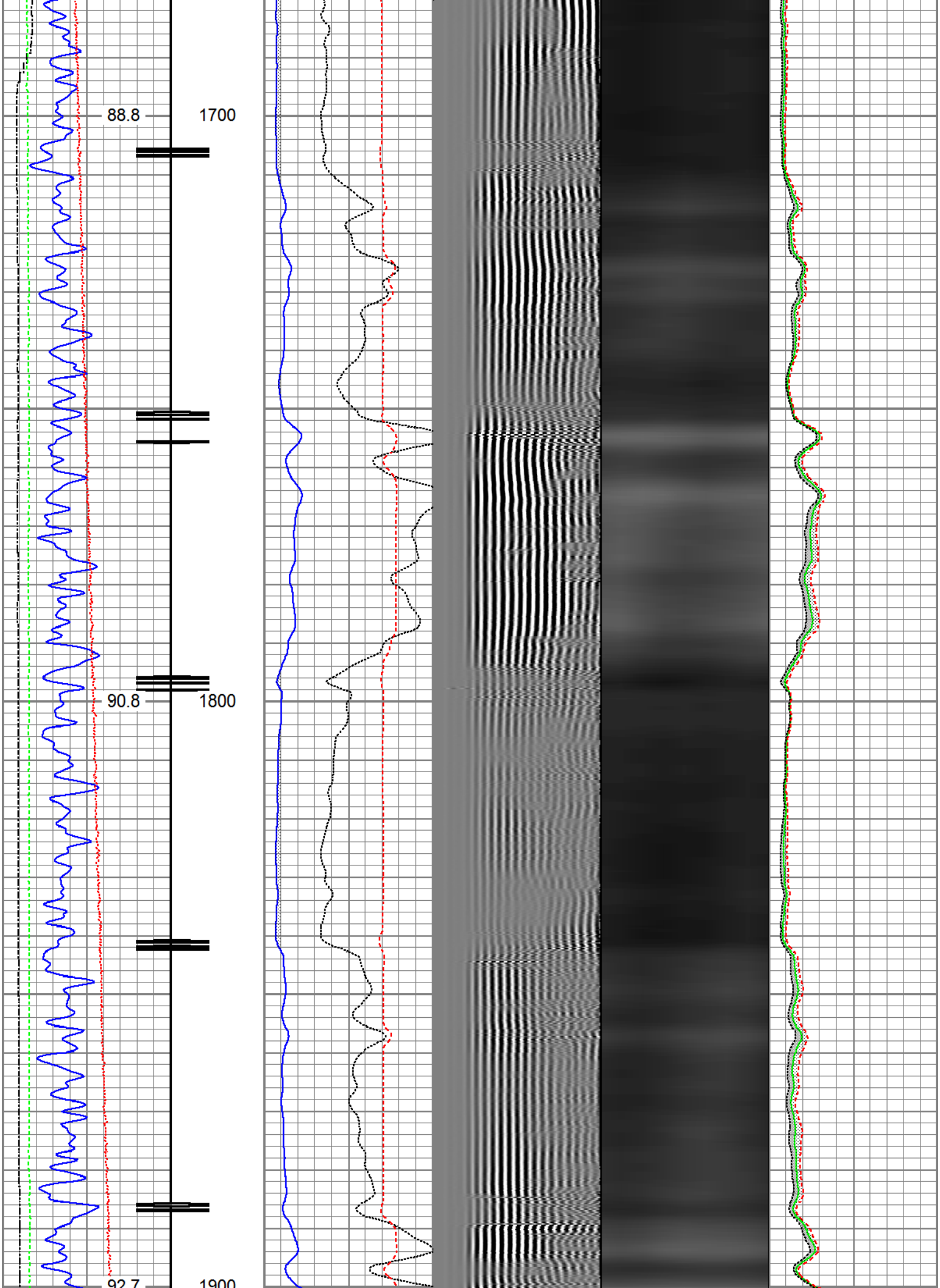

68.2
600
70.4
700
72.2
800

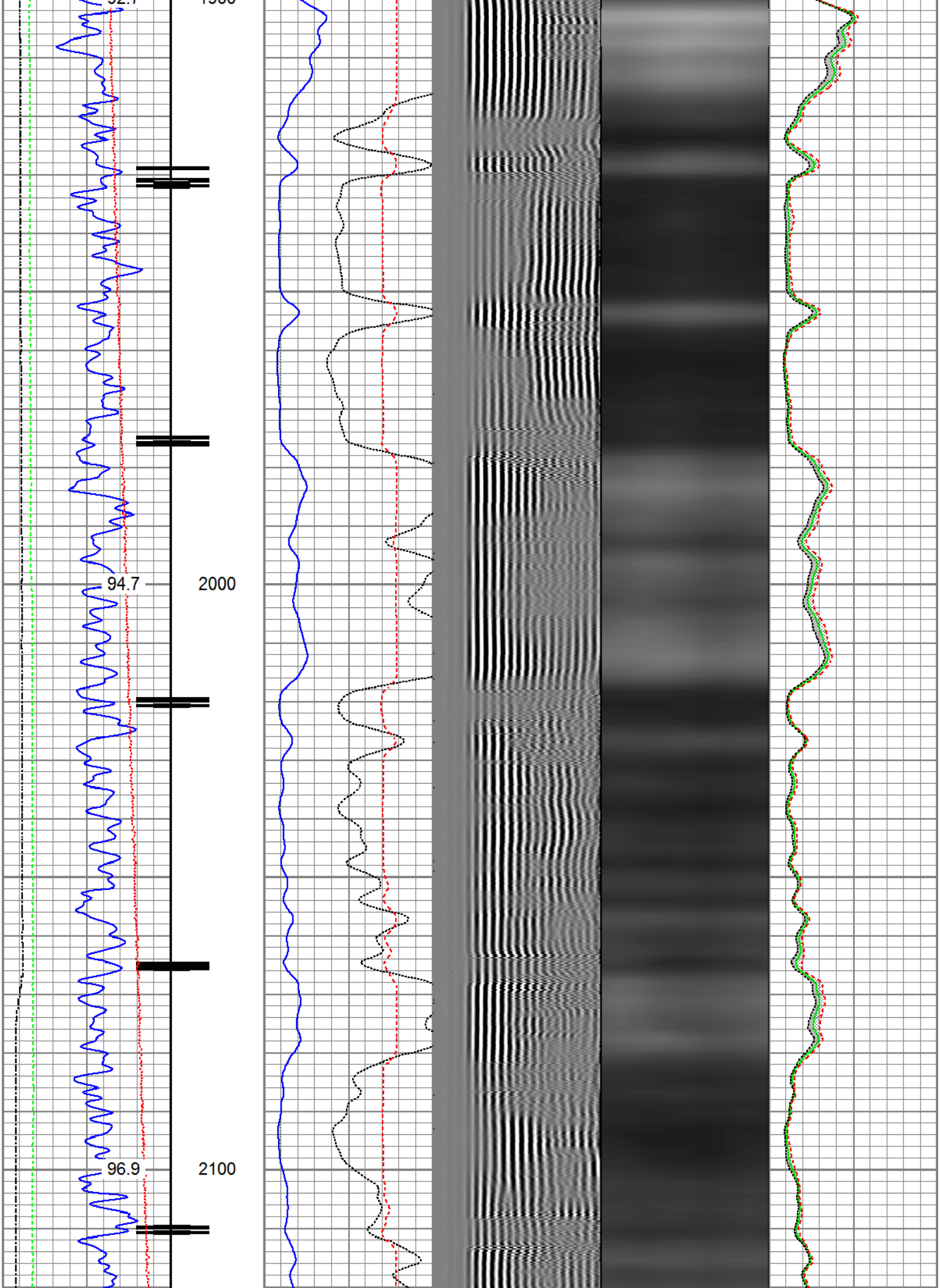

73.7
900
75.5
1000

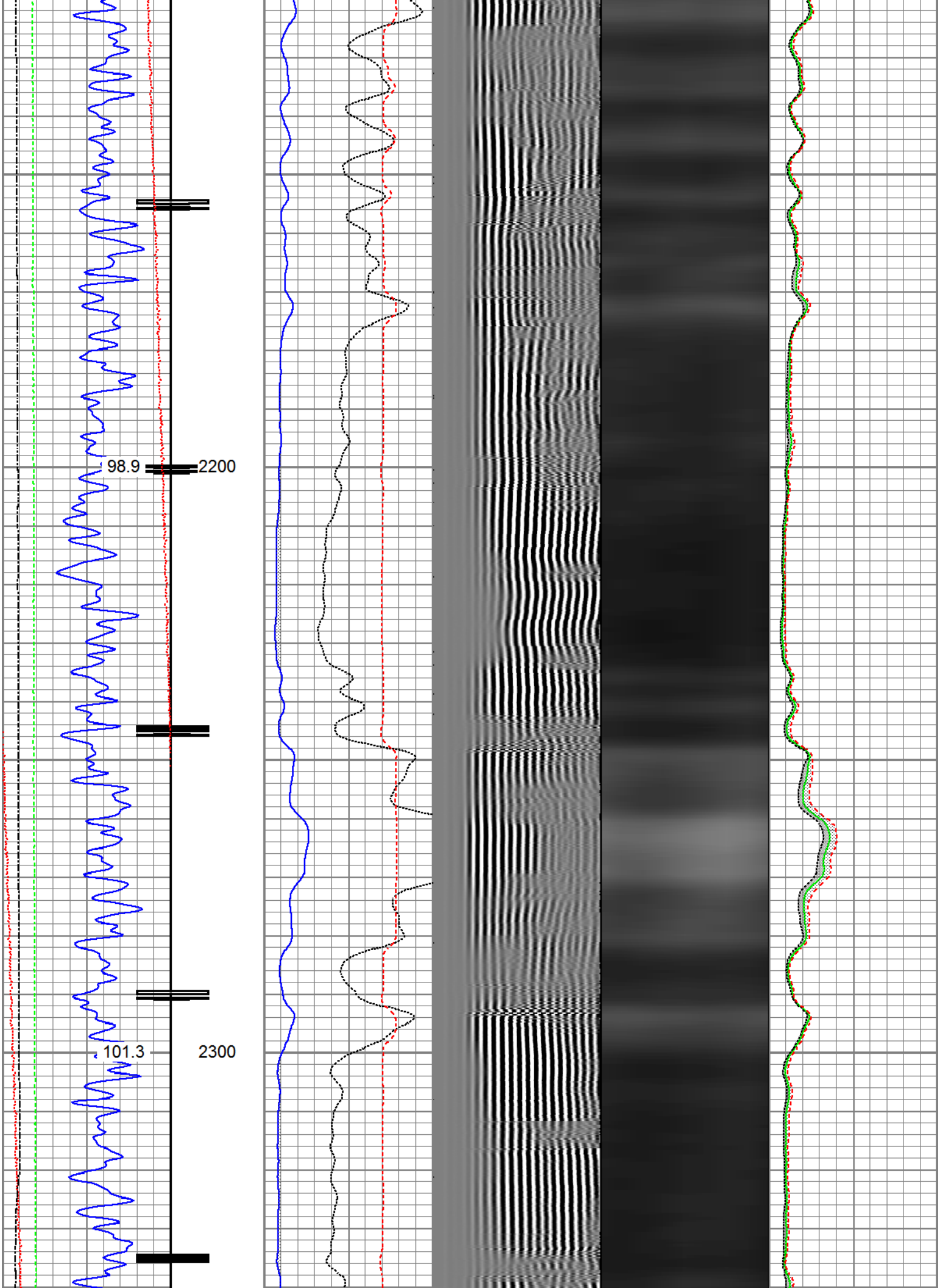

77.3
1100
79.5
1200

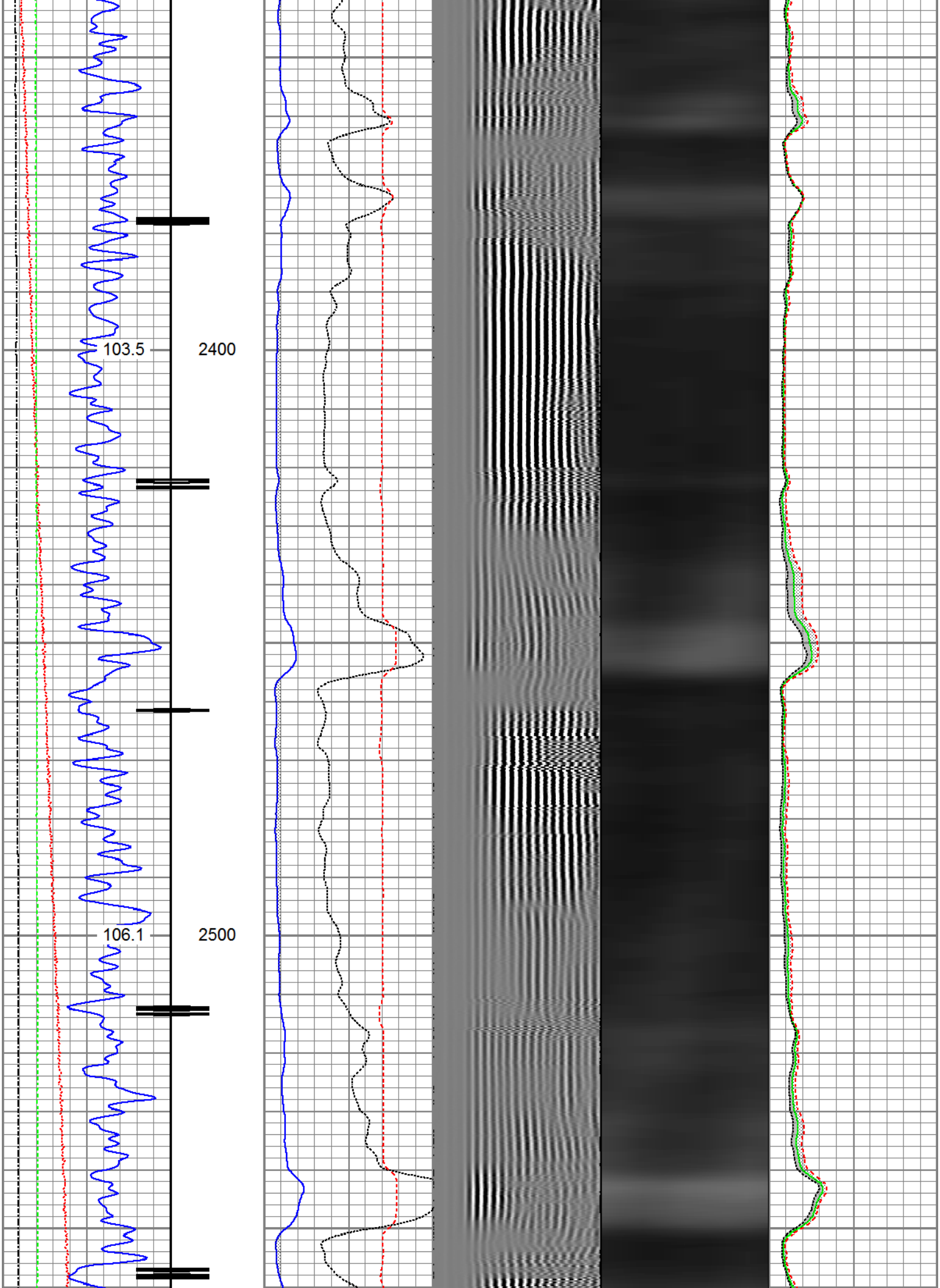

81.5
1300
83.5
1400

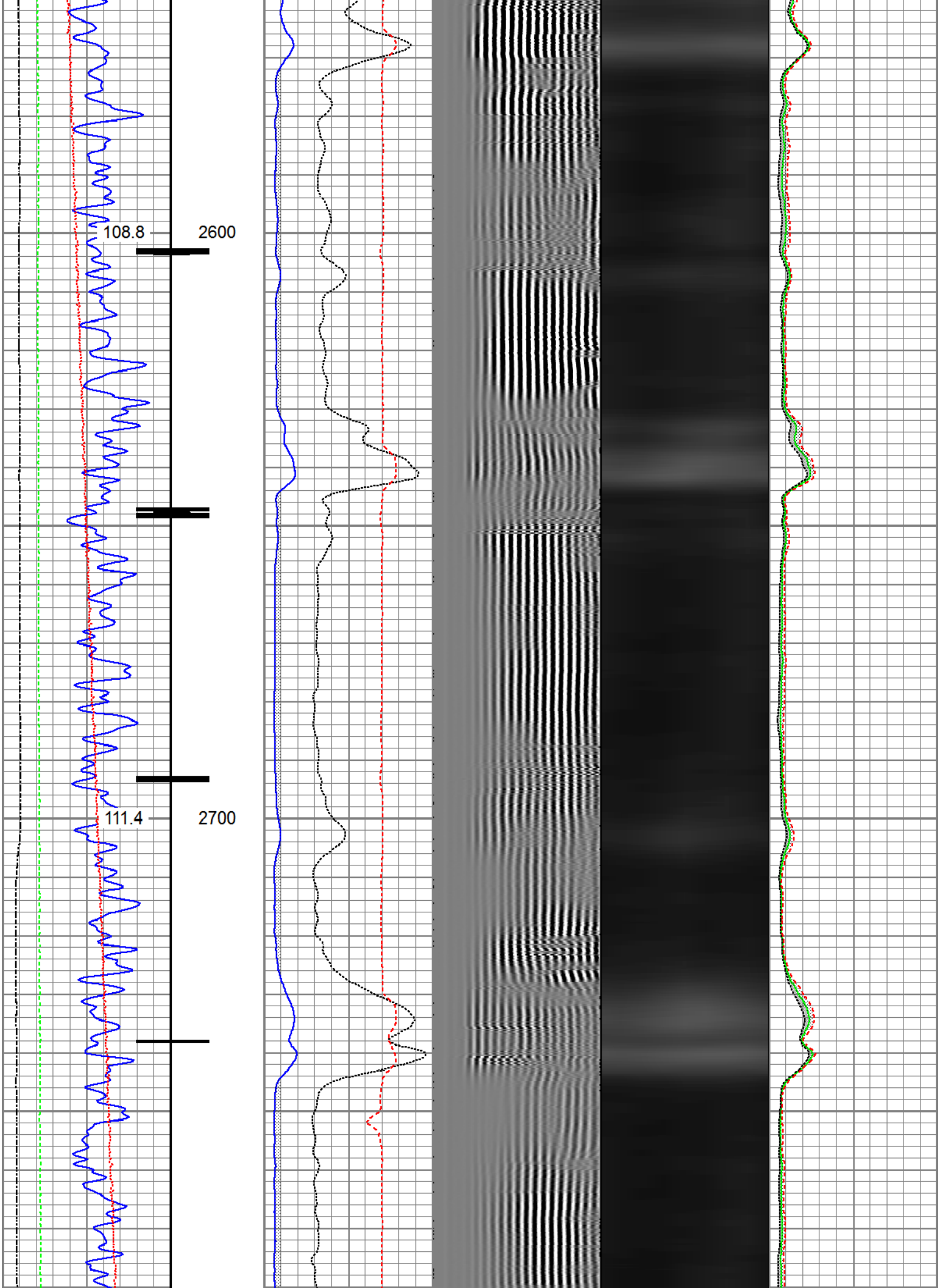

85.5
1500
87.2
1600

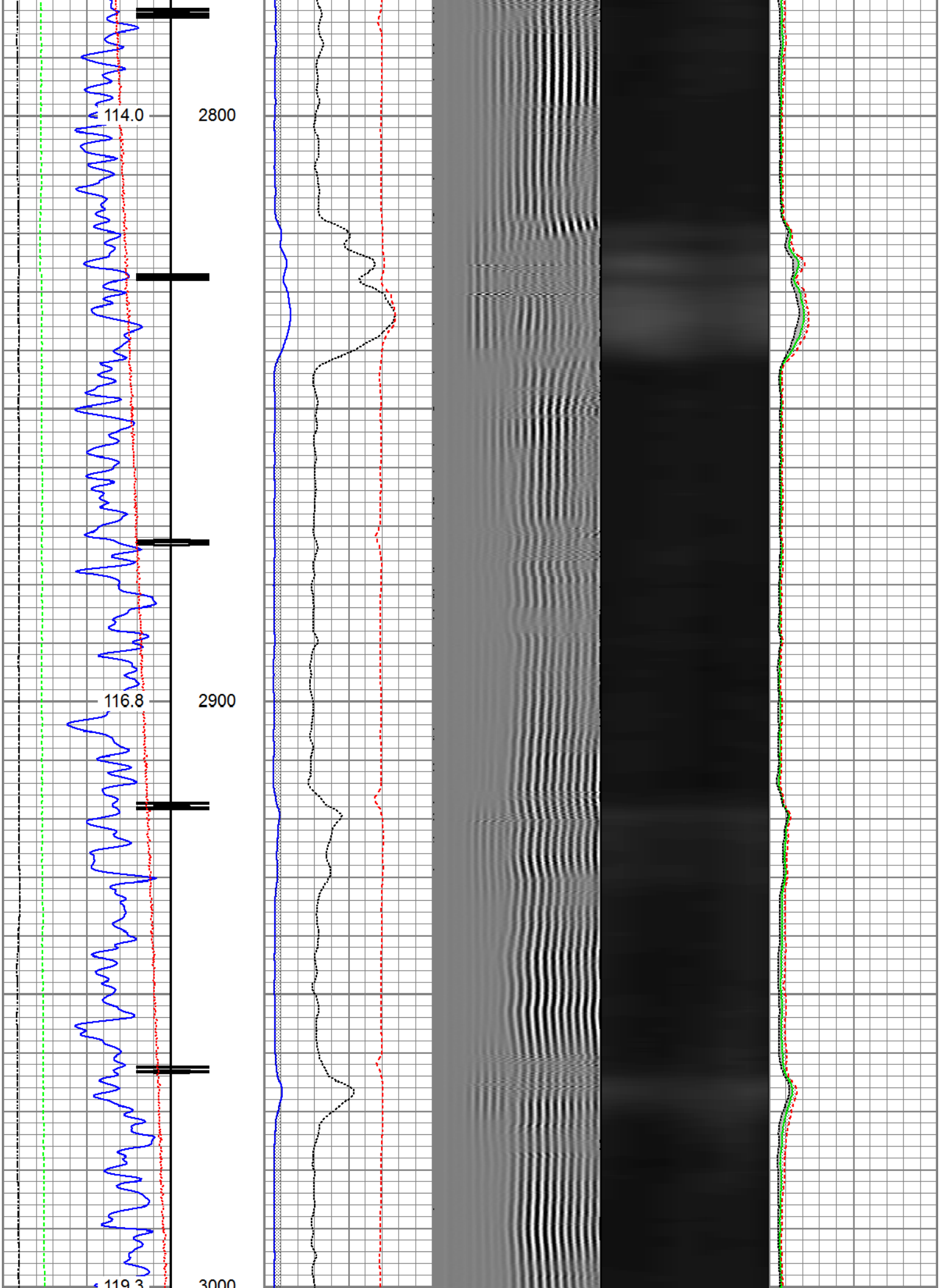

88.8
1700
90.8
1800
92.7
1900

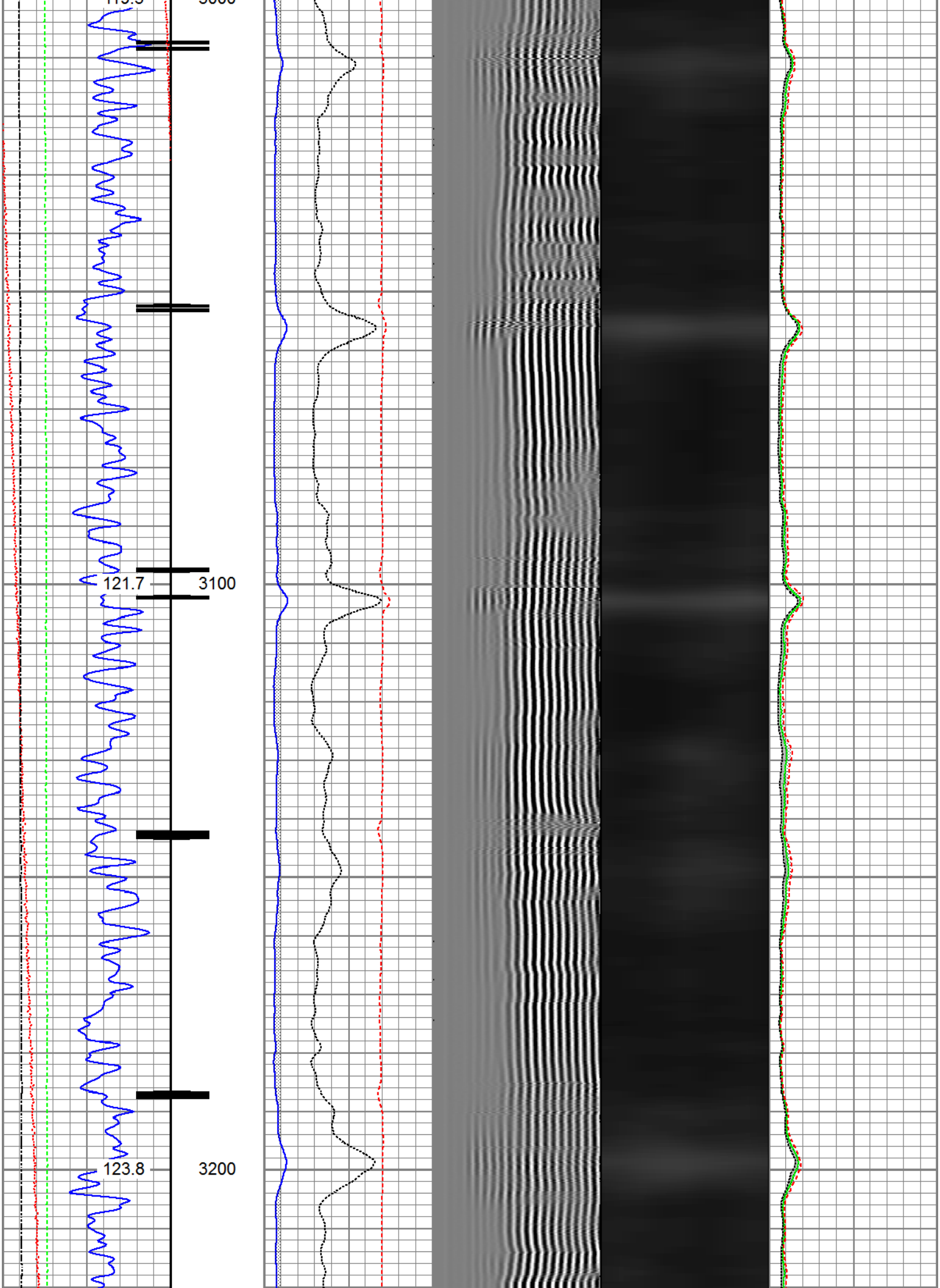

94.7
2000
96.9
2100

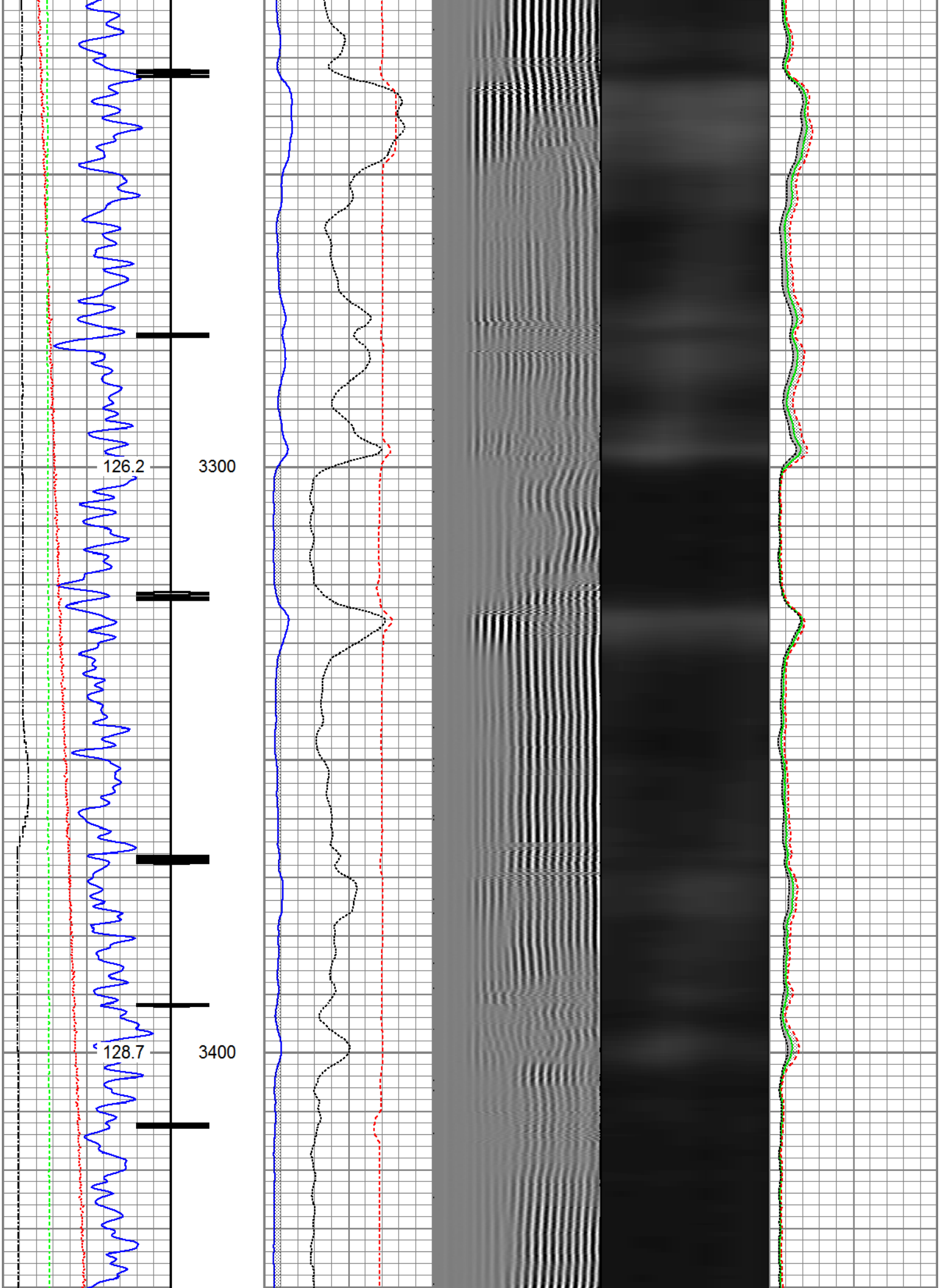

98.9
2200
101.3
2300

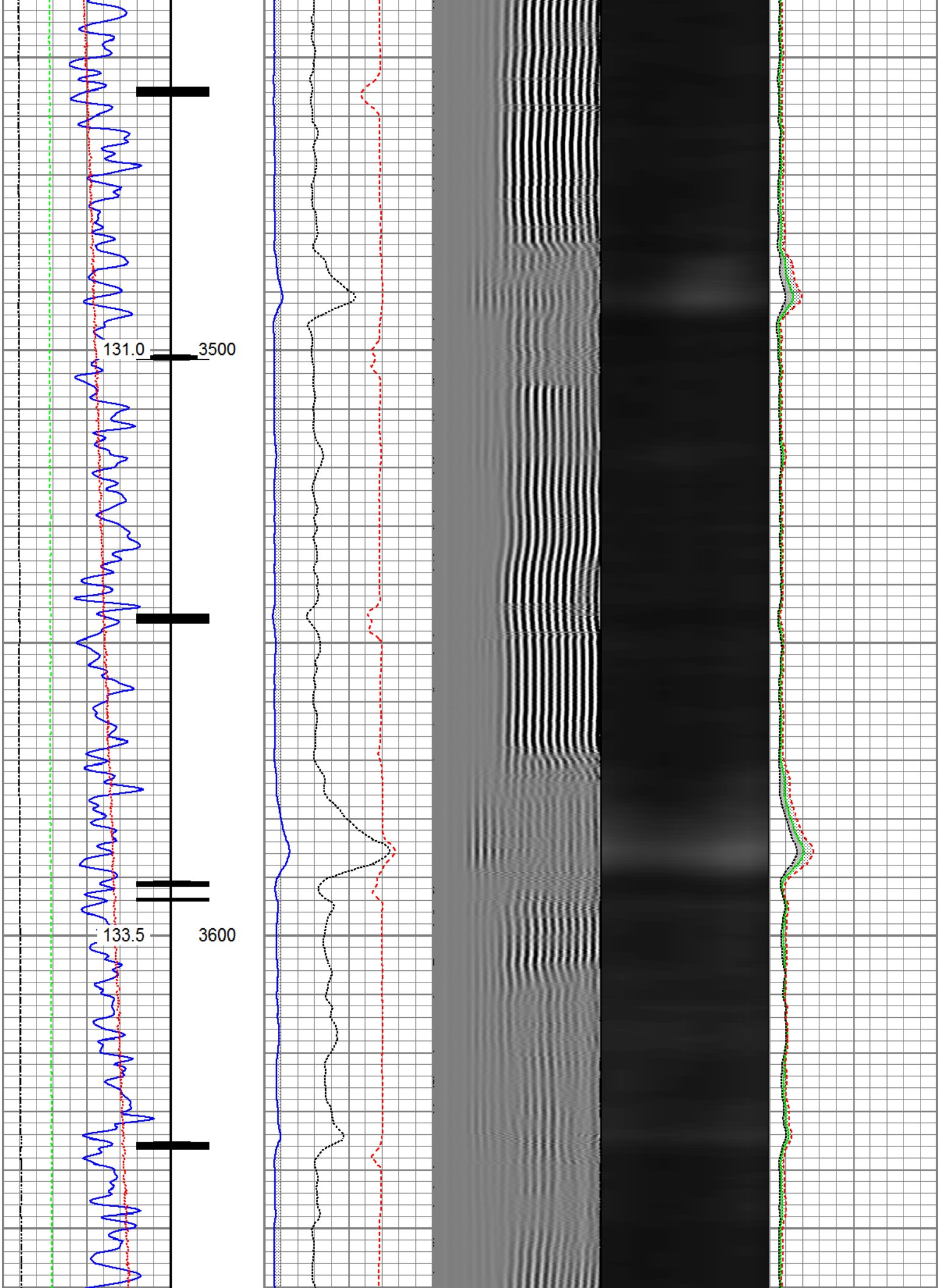

103.5
2400
106.1
2500

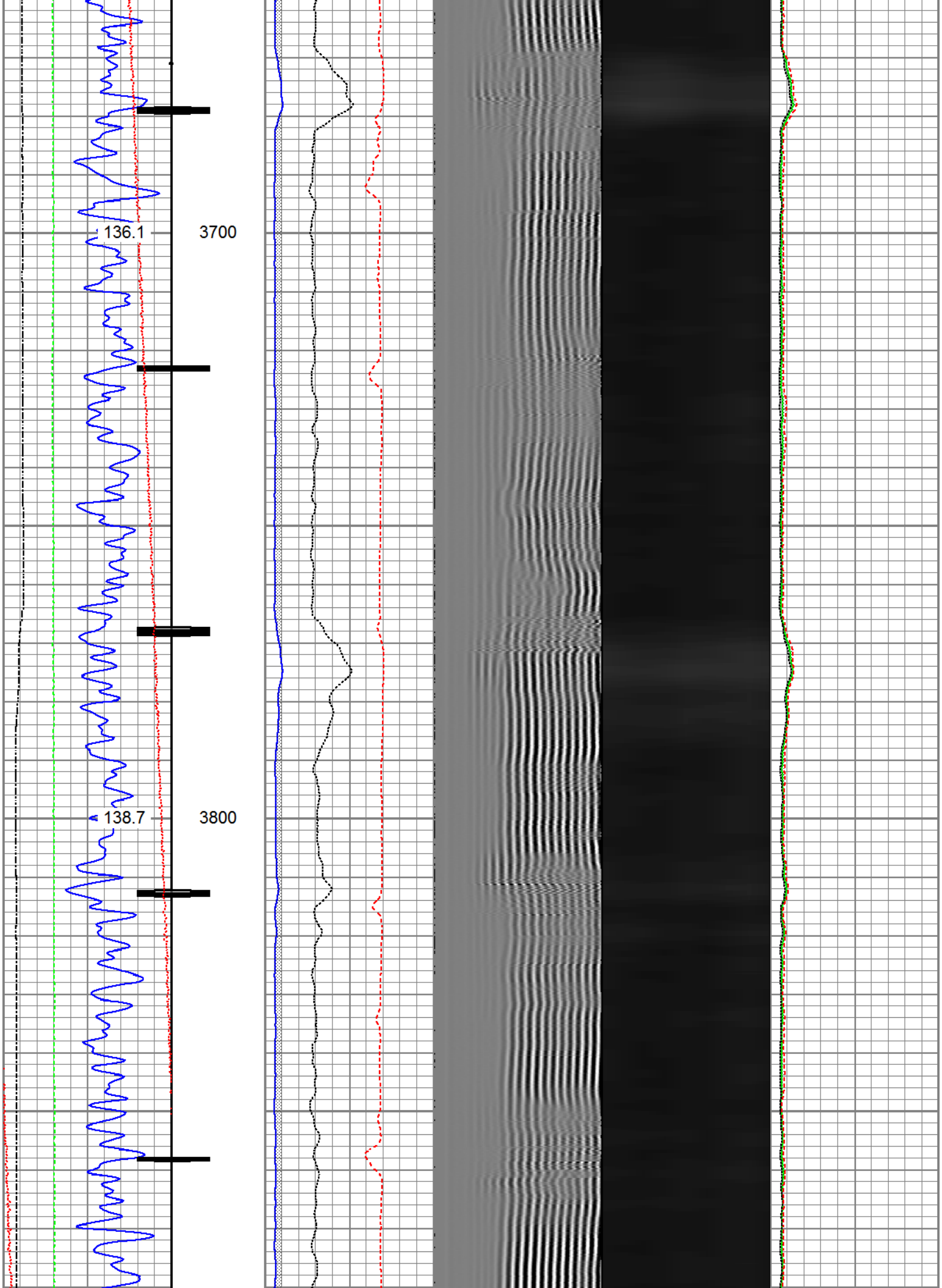

108.8
2600
111.4
2700

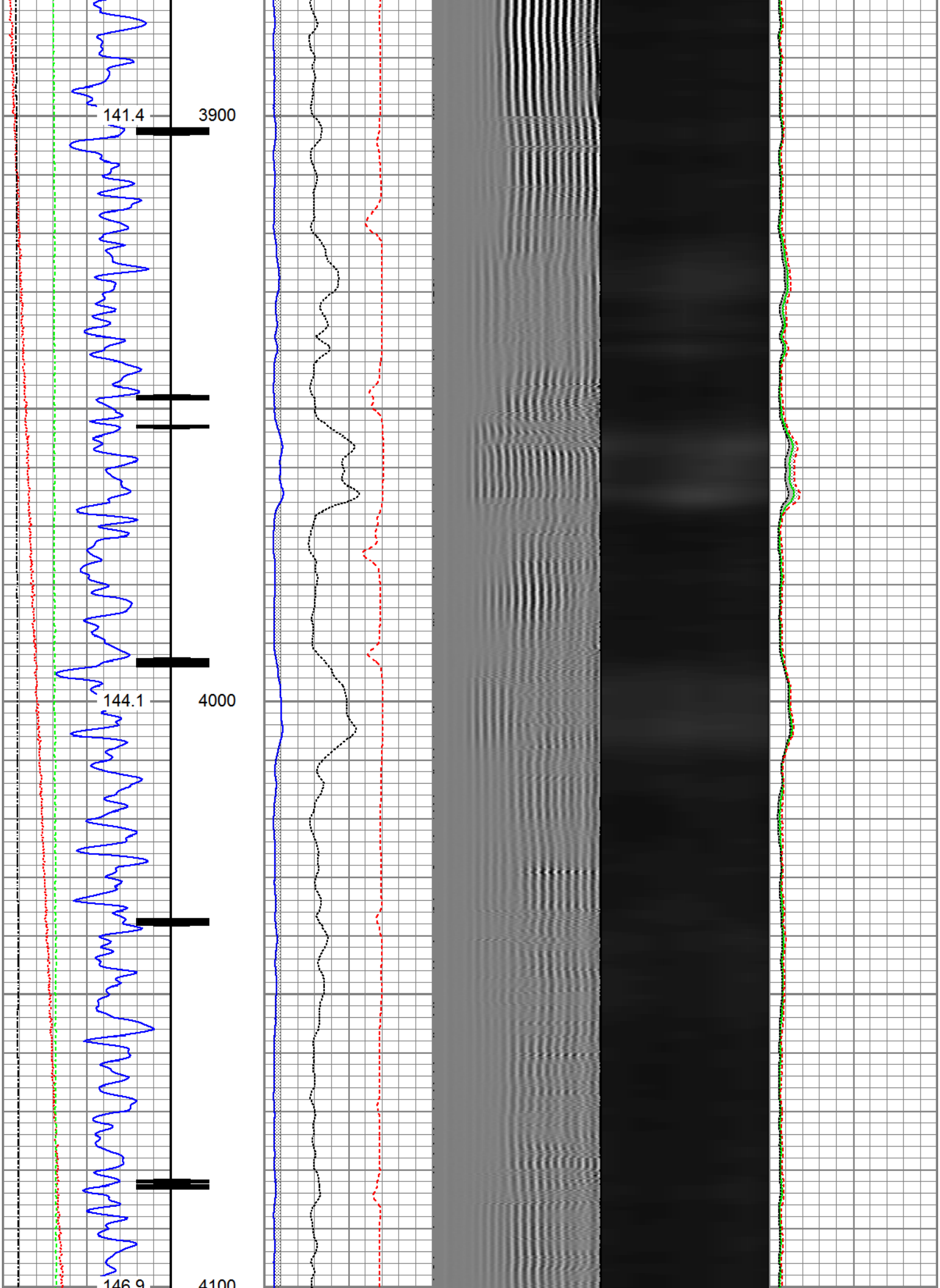

114.0
2800
116.8
2900
119.3
3000

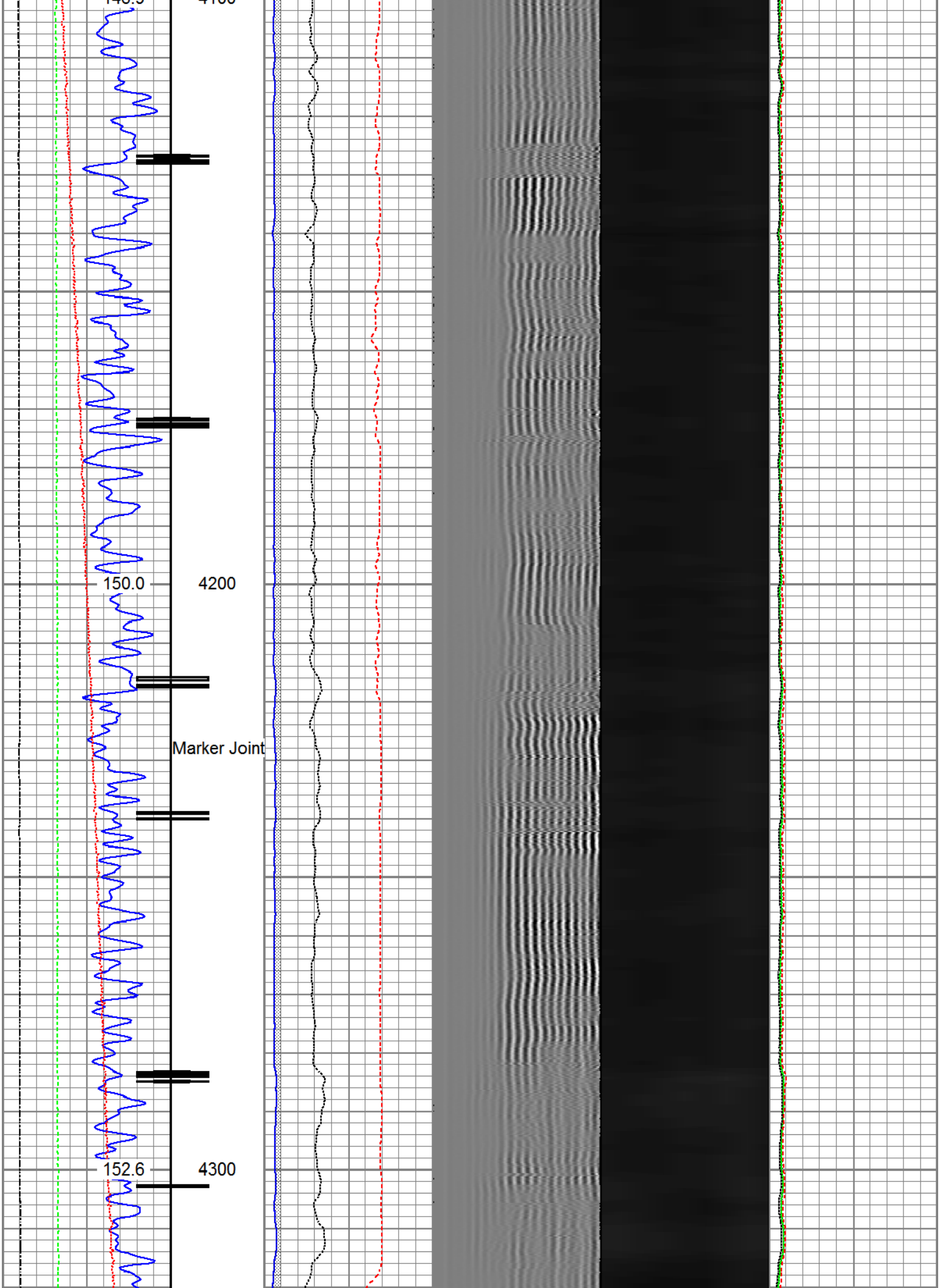

121.7
3100
123.8
3200

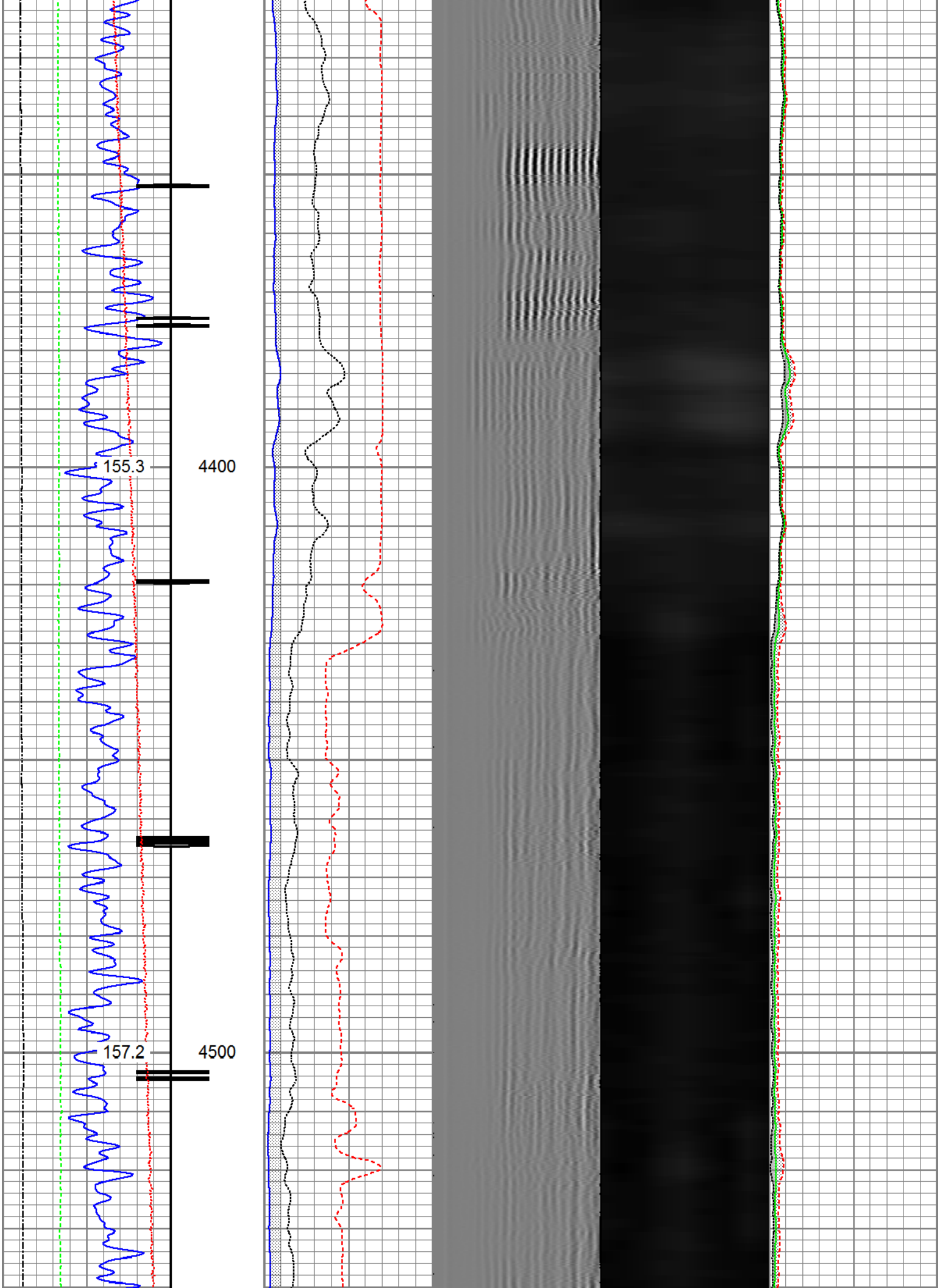

126.2
3300
128.7
3400

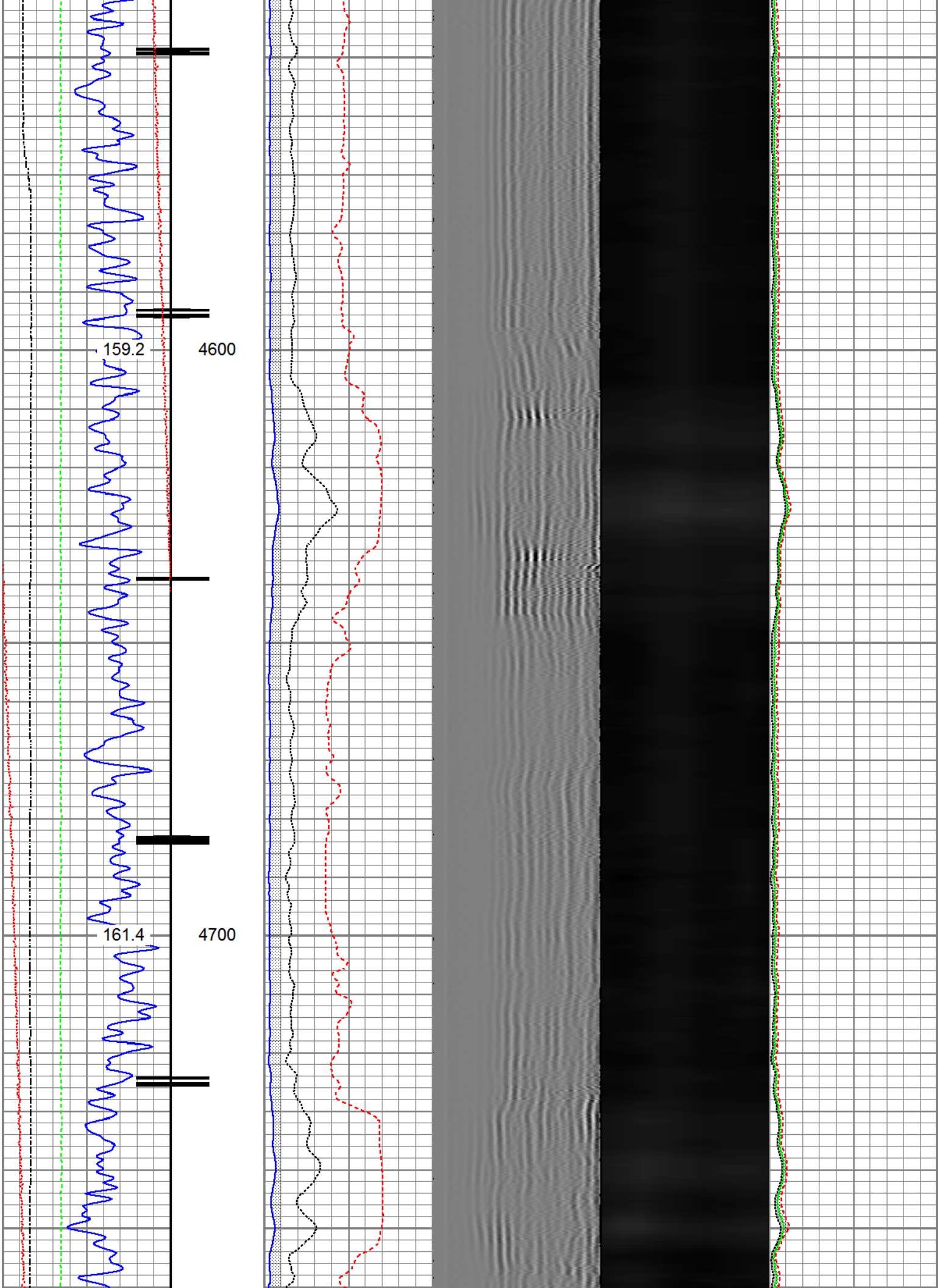

131.0
3500
133.5
3600

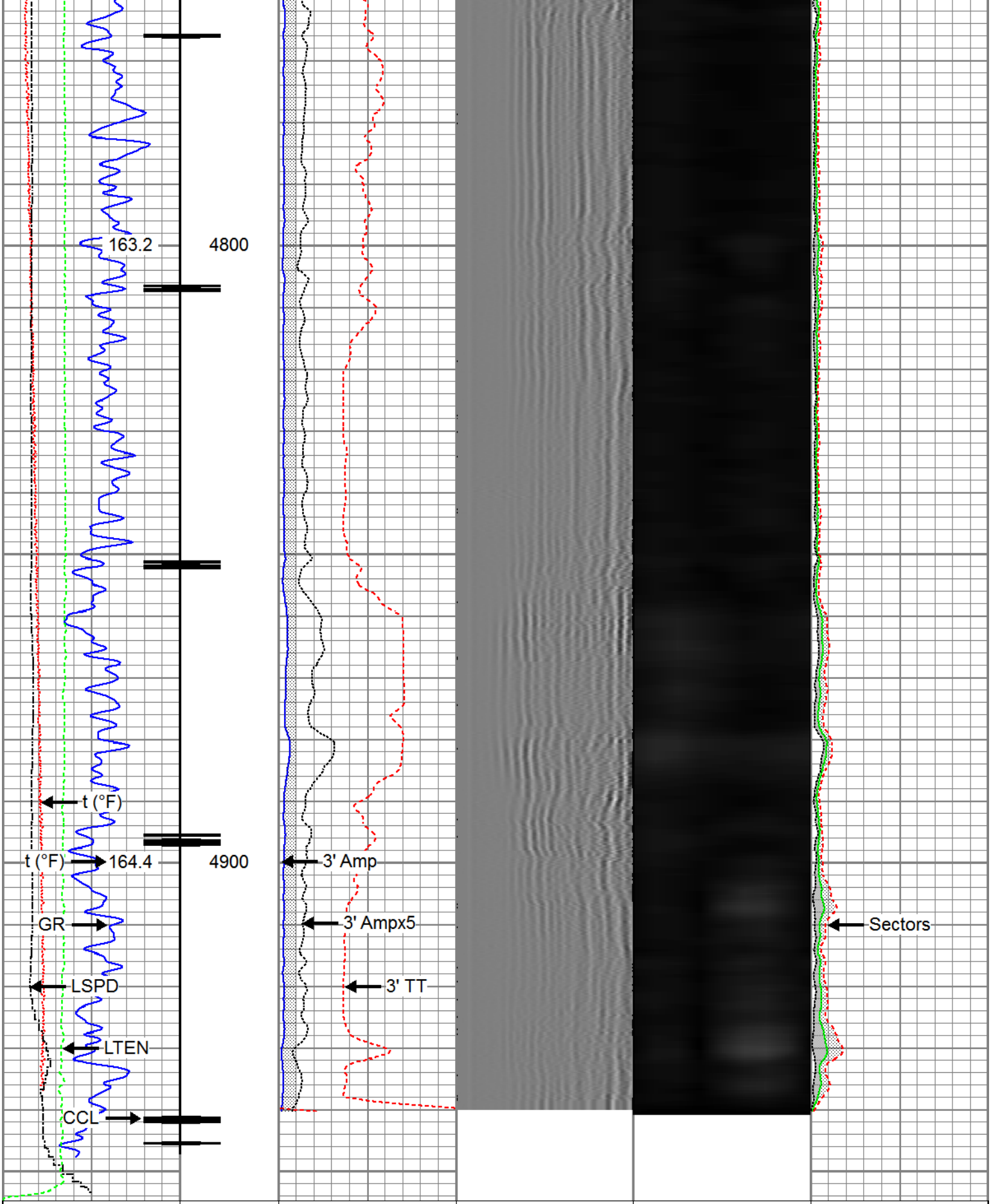

136.1
3700
138.7
3800


141.4
3900
144.1
4000
146.9
4100


150.0
4200
Marker Joint
152.6
4300


155.3
4400
157.2
4500


159.2
4600
161.4
4700



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*
	0 (mV) 20			*0 100*
Temperature	*3' Travel Time*			*Maximum Amplitude*

0 (degF) 20	650 (usec) 150	0 100
Line Speed		
-150 (ft/min) 150		
Line Tension		
0 (lb) 2000		

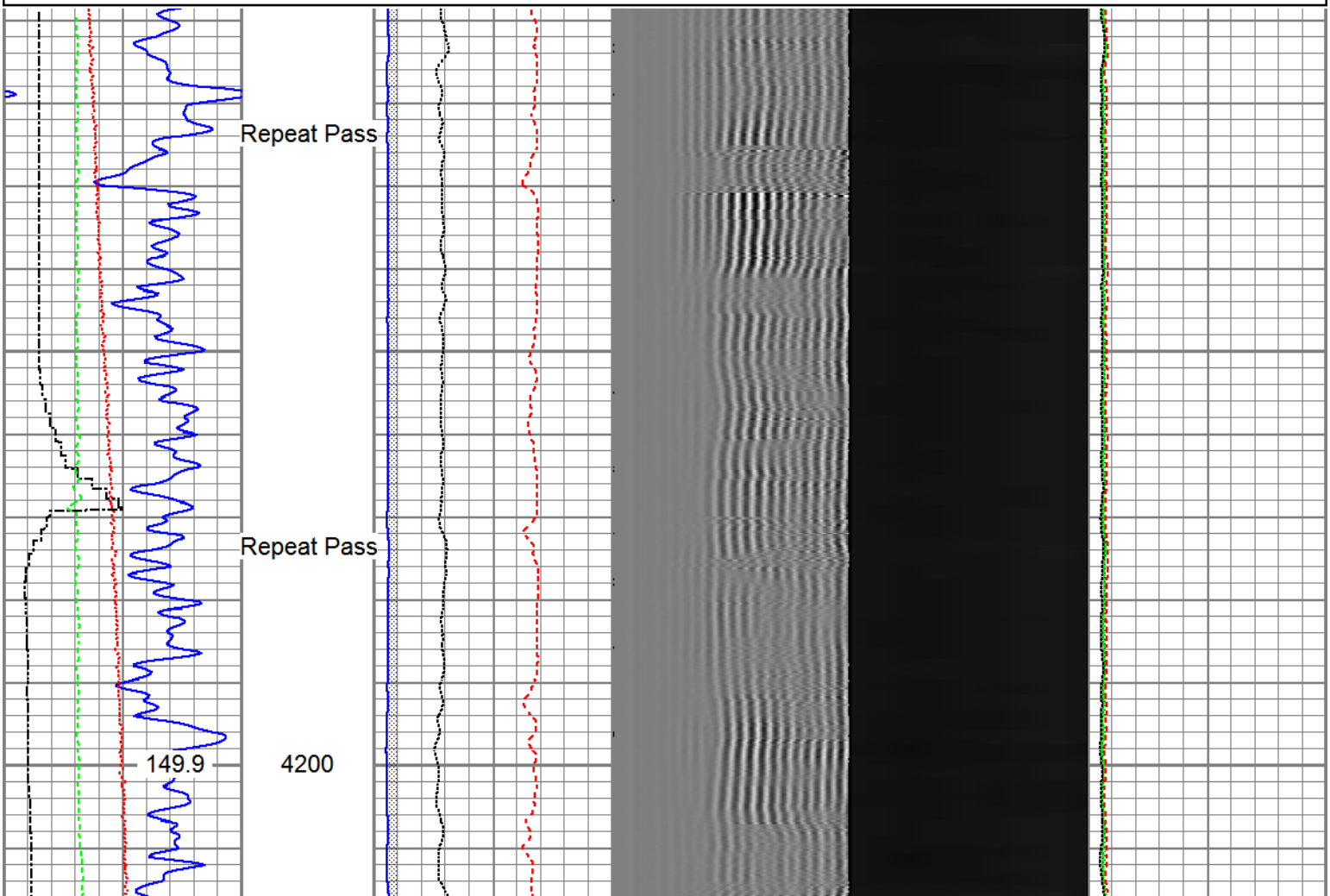
RELIANCE OILFIELD SERVICES

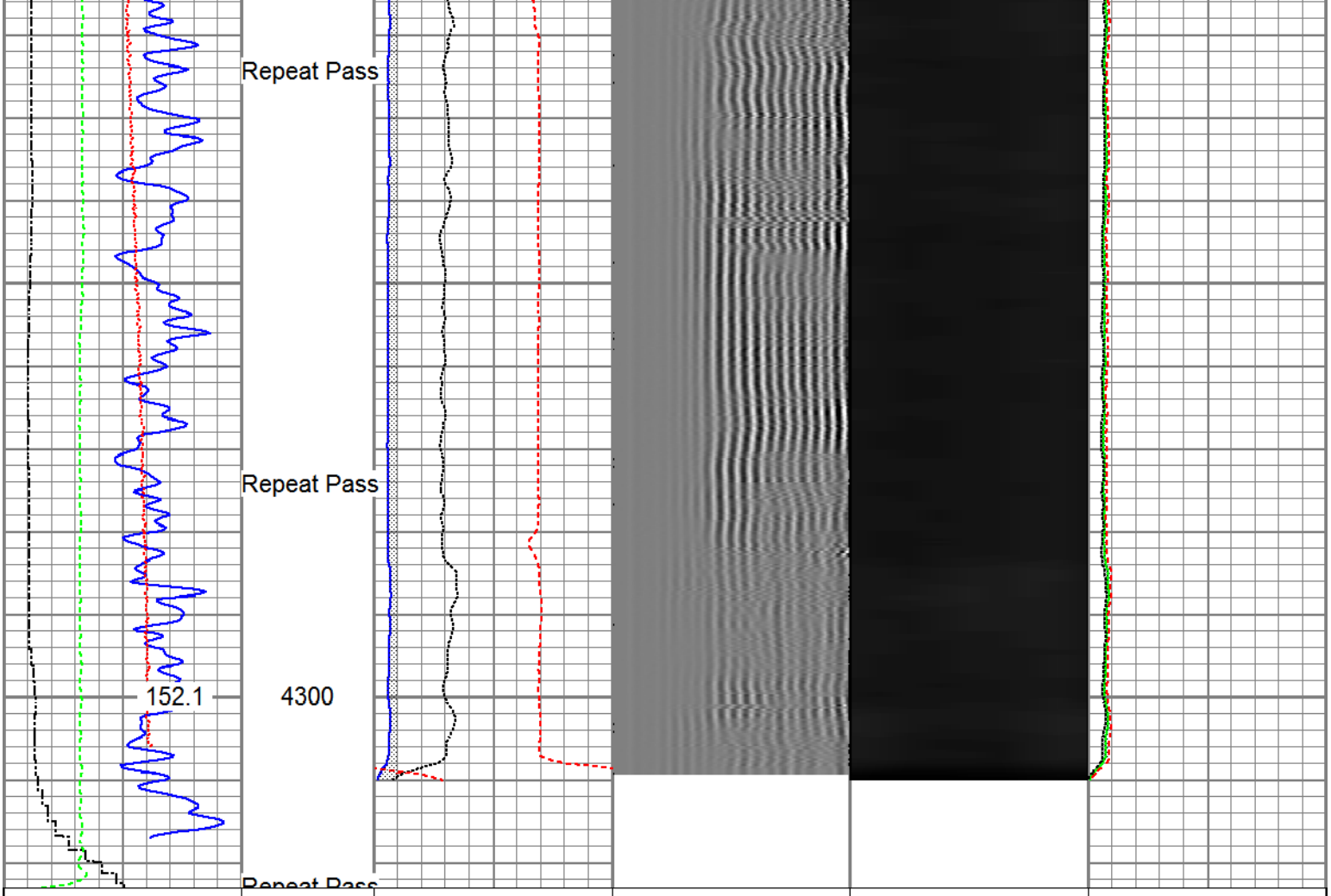
Repeat Pass

Recorded With 2800 PSI of Surface Induced Pressure

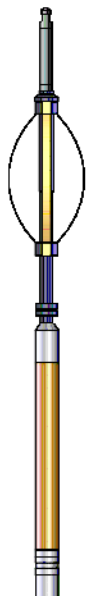
Database File	anadarko_puma fed 5s-35hz_14-may-2017_rbl\processed_0512342565_anadarko_puma fed 5s-35l
Dataset Pathname	pass4
Presentation Format	ros_radii
Dataset Creation	Sun May 14 13:49:35 2017
Charted by	Depth in Feet scaled 1:240

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





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

Sensor	Offset (ft)	Schematic	Description	Length (ft)	O.D. (in)	Weight (lb)
			Titan_Electric_Cable_Heads-Titan_1-11/16" Electric Cable Head with 1" Fishing Neck	1.03	1.69	5.40
			Probe_ELine_BowSpring_Centralizer-P_EBS Probe 2-3/4" Electric Inline Bowspring Centralizer	2.8875	2.75	20.00
HeadVolt	19.54					
Temp	16.75					

WVFS8	14.58	Probe_RADII-C-P_RBT_2750 (FW1302-0029.19 Probe 2-3/4" Sector Cement Bond Tool with Temperature Probe	2.75	105.00
WVFS7	14.58			
WVFS6	14.58			
WVFS5	14.58			
WVFS4	14.58			
WVFS3	14.58			
WVFS2	14.58			
WVFS1	14.58			
WVFCAL	14.58			
WVF3FT	14.58			
WVF5FT	13.58			
HEADVOLT	10.33			
		Probe_ELine_BowSpring_Centralizer-P_EBS2.8875 Probe 2-3/4" Electric Inline Bowspring Centralizer	2.75	20.00
DCCL	6.51			
CCL	6.51			
		Probe_GR_CCL-P_CGR_2750_S (FW1212-4.57) Probe 2-3/4" Digital CCL / Gamma Ray Combined	2.75	55.00
GR	3.77			
		Probe_ELine_BowSpring_Centralizer-P_EBS2.8875 Probe 2-3/4" Electric Inline Bowspring Centralizer	2.75	20.00

Dataset:	PROCESSED_0512342565_Anadarko_Puma Fed 5S-35HZ_05-14-17_RBL.db: field/well/run1/pass6
Total length:	23.43 ft
Total weight:	225.40 lb
O.D.:	2.75 in

Calibration Report

Database File	C:\ProgramData\Warrior\Data\Anadarko_Puma Fed 5S-35HZ_14-MAY-2017_RBL\PROCESSED_05
Dataset Pathname	pass6
Dataset Creation	Sun May 14 13:57:26 2017

Gamma Ray Calibration Report

Serial Number:	FW1212-026	
Tool Model:	P_CGR_2750_S	
Performed:	Mon Aug 15 10:19:05 2016	
Calibrator Value:	1.0	GAPI
Background Reading:	0.0	cps
Calibrator Reading:	1.6	cps
Sensitivity:	0.6000	GAPI/cps

Segmented Cement Bond Log Calibration Report

Serial Number:	FW1302-002	
Tool Model:	P_RBT_2750	
Calibration Casing Diameter:	5.500	in
Calibration Depth:	45.102	ft

Master Calibration, performed (Derived):

	Raw (v)		Calibrated (mv)		Results	
	Zero	Cal	Zero	Cal	Gain	Offset
3'	-0.006	0.728	0.800	71.921	96.867	1.399
CAL	0.002	0.821				
5'	-0.002	0.575	0.800	71.921	123.181	1.074
SUM						
S1	-0.006	0.735	0.000	100.000	134.913	0.860
S2	0.000	0.738	0.000	100.000	135.583	-0.065
S3	0.002	0.730	0.000	100.000	137.309	-0.270
S4	0.000	0.710	0.000	100.000	140.934	-0.050
S5	-0.004	0.713	0.000	100.000	139.523	0.533
S6	-0.003	0.720	0.000	100.000	138.178	0.480
S7	-0.008	0.728	0.000	100.000	135.978	1.050
S8	-0.009	0.741	0.000	100.000	133.221	1.223

Internal Reference Calibration, performed Wed Aug 03 10:40:08 2016:

	Raw (v)		Calibrated (v)		Results	
	Zero	Cal	Zero	Cal	Gain	Offset
CAL	0.000	0.000	0.002	0.821	1.000	0.000

Air Zero Calibration, performed Sat May 13 09:53:02 2017:

	Raw (v)	Calibrated (v)	Results
	Zero	Zero	Offset
3'	0.001	0.000	0.000
5'	0.001	0.000	-0.000
SUM			
S1	0.001	0.000	-0.001
S2	0.000	0.000	0.000
S3	0.001	0.000	0.001
S4	0.002	0.000	-0.000
S5	0.001	0.000	-0.000
S6	0.001	0.000	-0.000
S7	0.001	0.000	0.000
S8	0.001	0.000	0.000

RELIANCE DILFIELD SERVICES

Company	Kerr-McGee Oil & Gas Onshore, L.P.
Well	Puma Fed 5S-35HZ
Field	Wattenberg
County	Weld
State	Colorado