



**Radial Cement Bond
Gamma Ray
Casing Collar Log**

Company Kerr-McGee Oil & Gas Onshore, L.P.
Well Harkis 3
Field Wattenberg
County Weld **State** Colorado

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Location: SEC 2 TWP 2N RGE 65W
 API #: 05-123-10443
 Permanent Datum Ground Level Elevation 4843'
 Log Measured From Kelly Bushing Elevation 10 FT
 Drilling Measured From Kelly Bushing
 Other Services: ---
 K.B. 4853'
 D.F. ---
 G.L. 4843'

Date	16-JUL-2020						
Run Number	One						
Depth Driller	7797 FT						
Depth Logger	3977 FT						
Bottom Logged Interval	3962 FT						
Top Log Interval	Surface						
Open Hole Size	---						
Type Fluid	Water						
Density / Viscosity	8.34 lb/gal						
Max. Recorded Temp.	155°F						
E. estimated Cement Top	See Log						
Time Well Ready	ROA						
Time Logger on Bottom	8:00						
E. equipment Number	HD-0343						
Location	Platteville, CO						
Recorded By	Robert Fogarty						
Witnessed By	Dale James						
Borehole Record							
Run Number	Bit	From	To	Size	Weight	From	To
Casing Record	Size (in)	Wgt (lbs/ft)	Grade	Top	Bottom		
Surface Casing	8 5/8	24	---	Surface	232 FT		
Intermediate #1	4 1/2	11.6	---	Surface	7779 FT		
Intermediate #2							
Inner							

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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 referenced to Kelly Bushing at 10 FT
Adjusted 0 FT to correlate with Kelly Bushing
Log ran with 0 PSI Surface Induced Pressure
Logging tools were clean and free of debris upon completion of operations

Thank you for choosing Reliance Oilfield Services, LLC!!

Main Pass

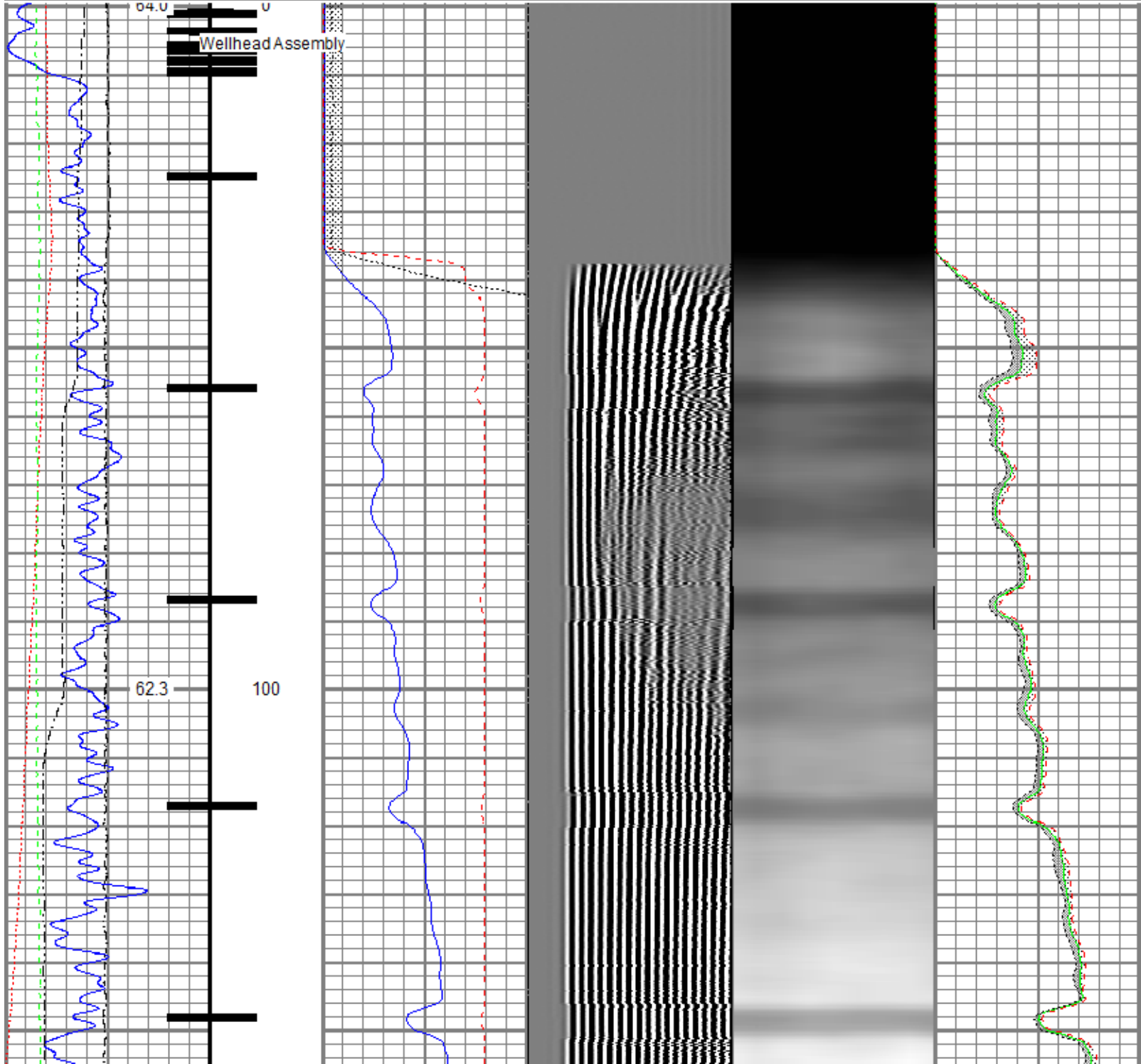


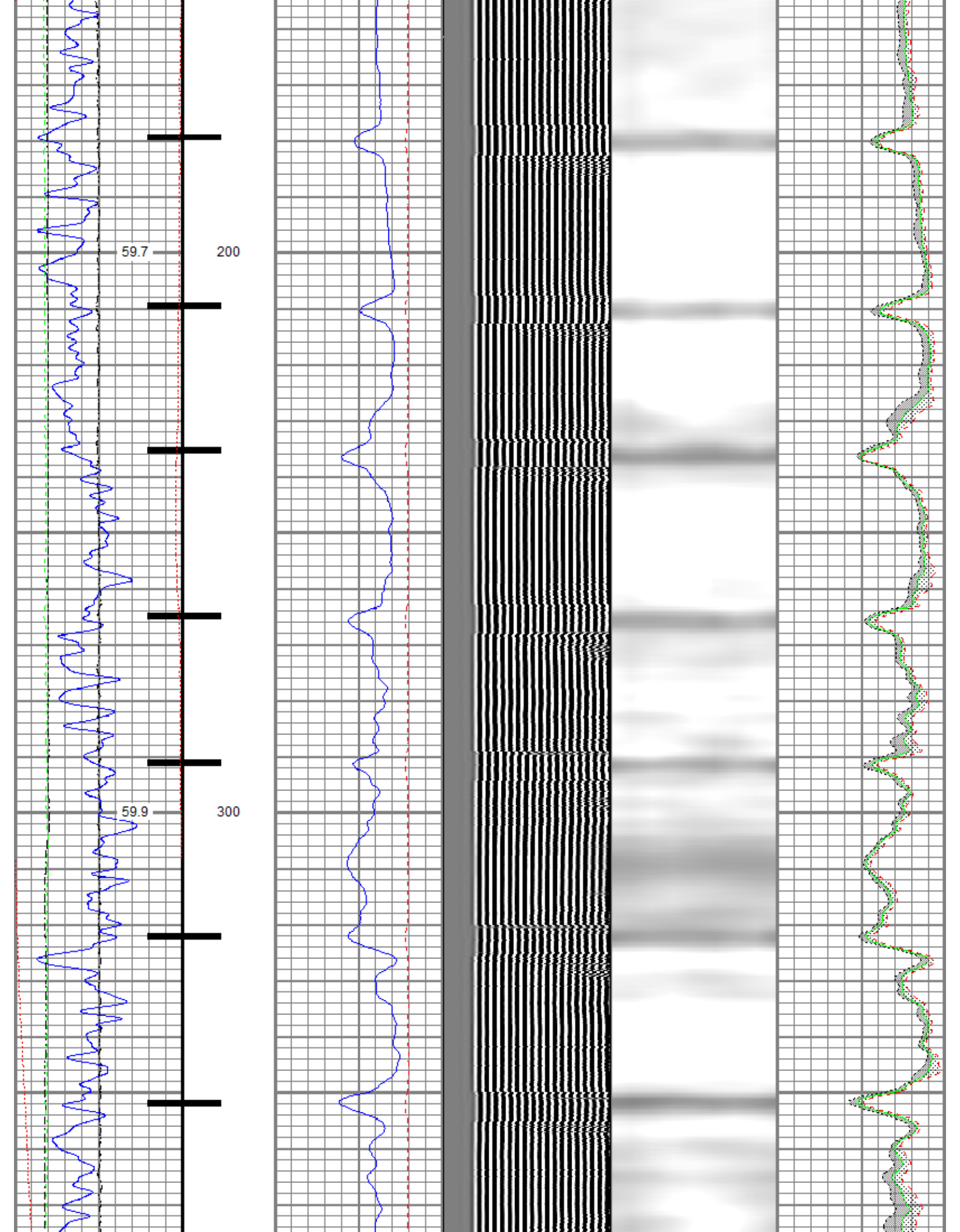
Recorded With 0 PSI Surface Induced Pressure

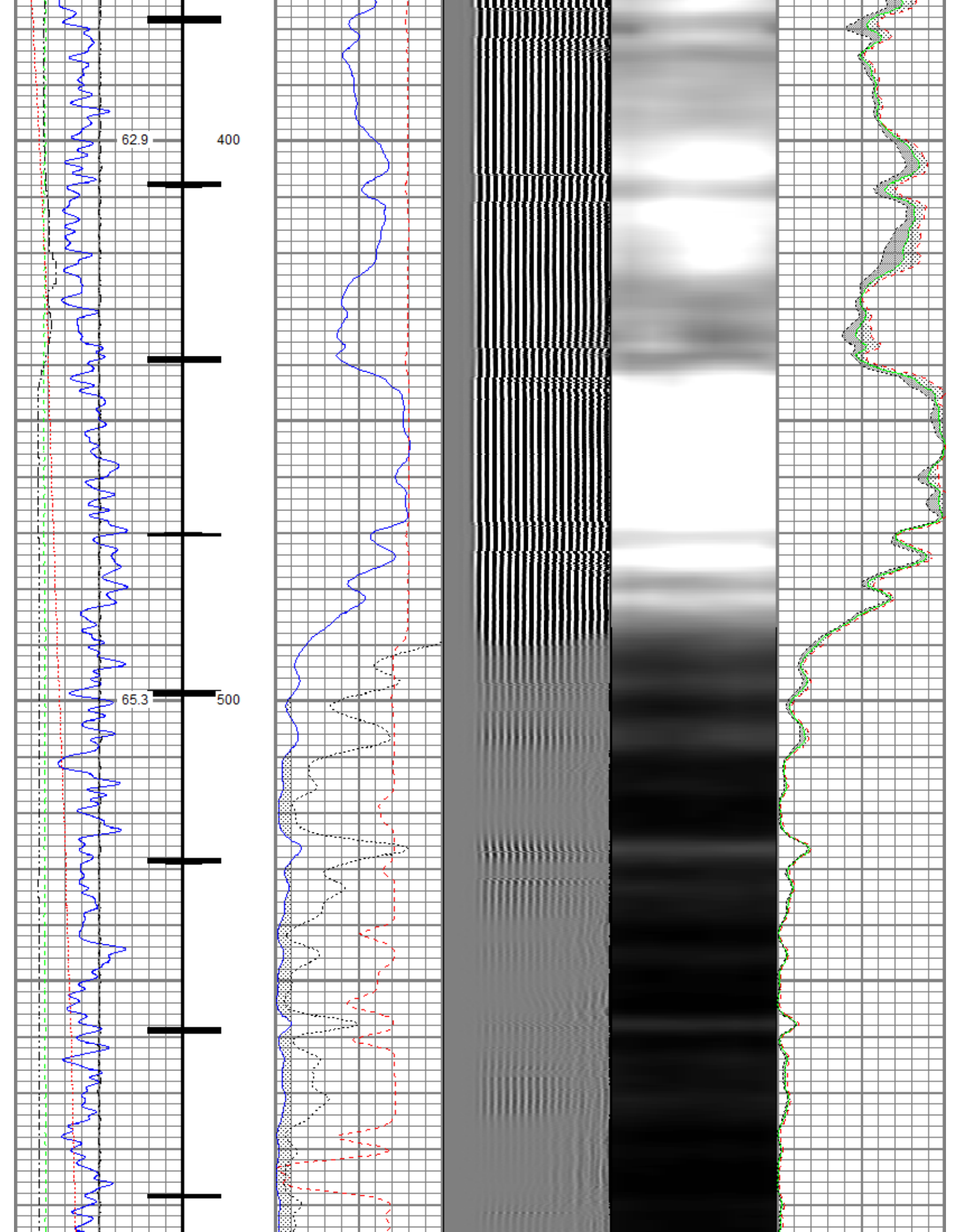
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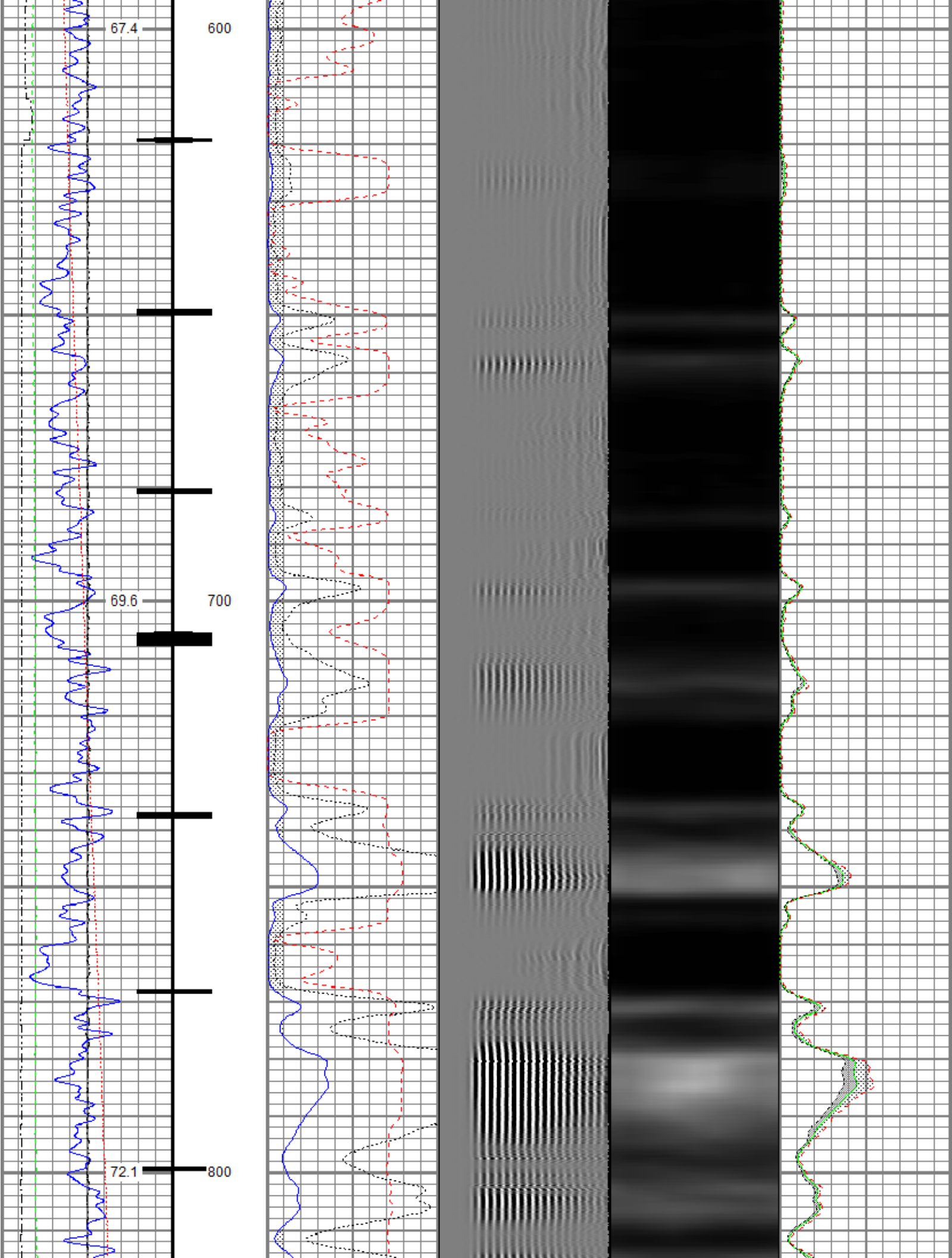
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 Dataset Pathname RBL/12.4
 Presentation Format ros_radrii
 Dataset Creation Fri Jul 17 10:53:44 2020
 Charted by Depth in Feet scaled 1:240

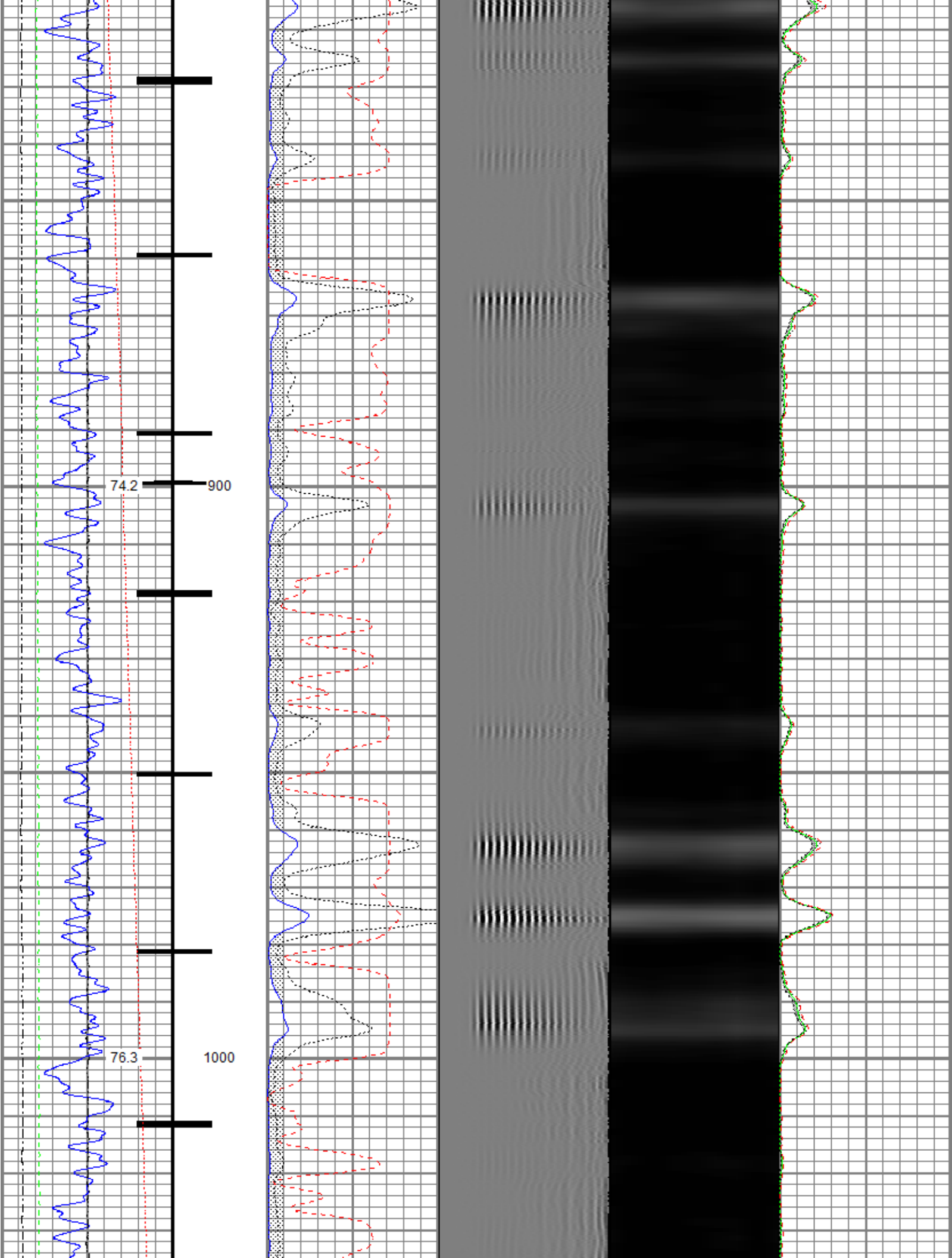
Gamma Ray (GAPI) 120	0 3' Amplitude (mV) 100	5' Variable Density Log (usec) 1200	Sector Map	0 Average Amplitude 100
Casing Collar Locator	0 3' Amplitude x 5 (mV) 20			Minimum Amplitude
0 Temperature (degF) 20	0 3' Travel Time (mV) 20			0 100
Line Speed (ft/min) 150	650 3' Travel Time (usec) 150			Maximum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

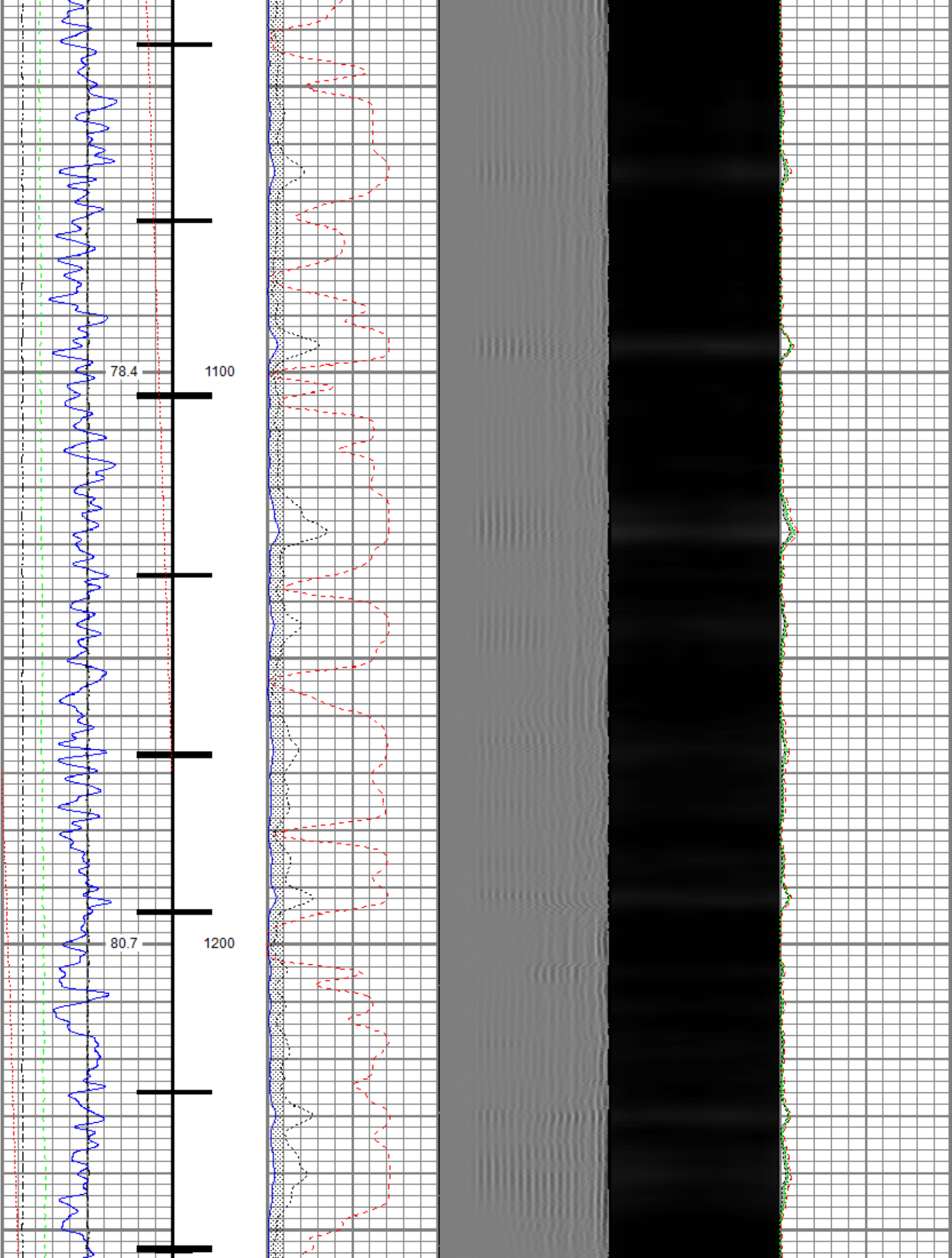


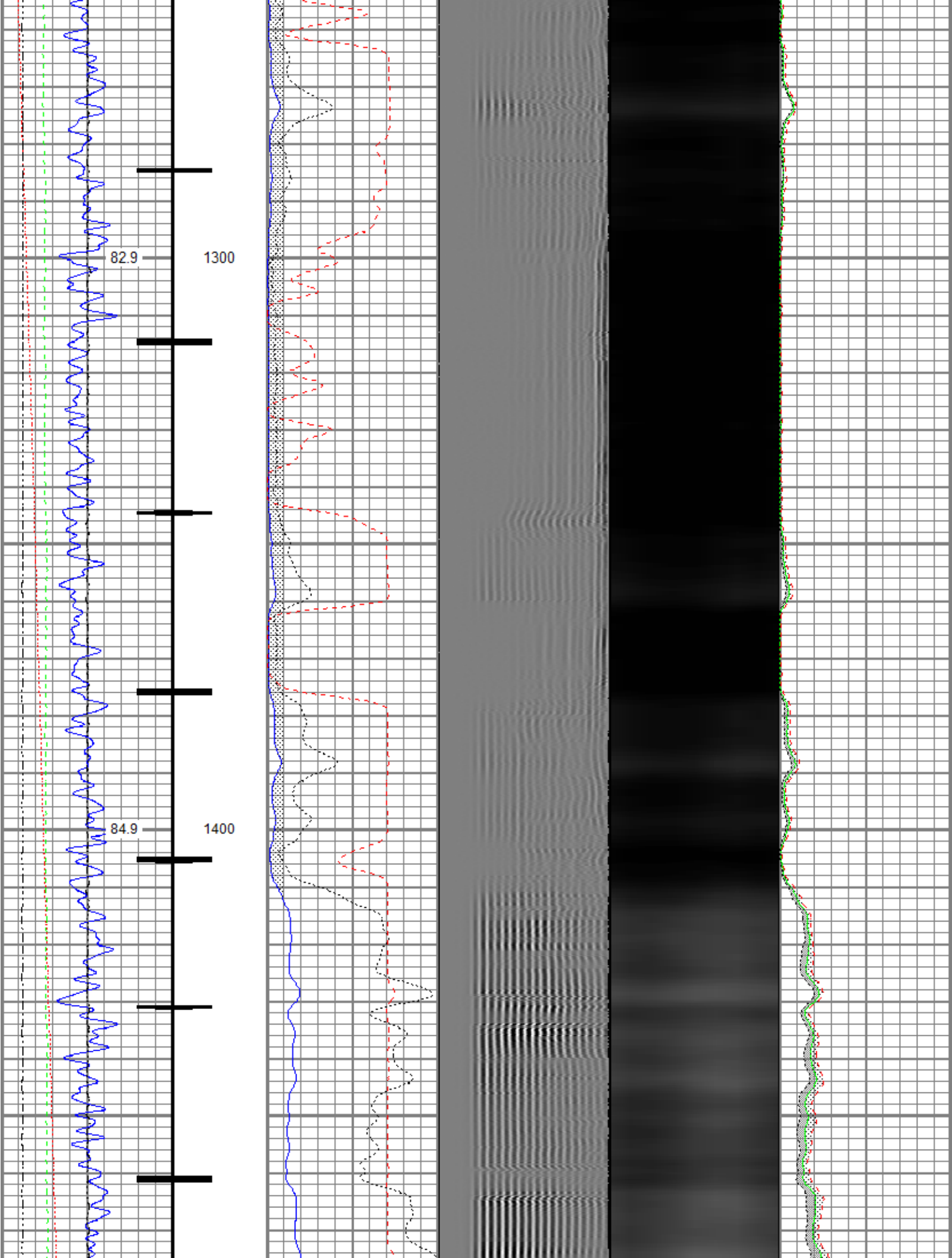


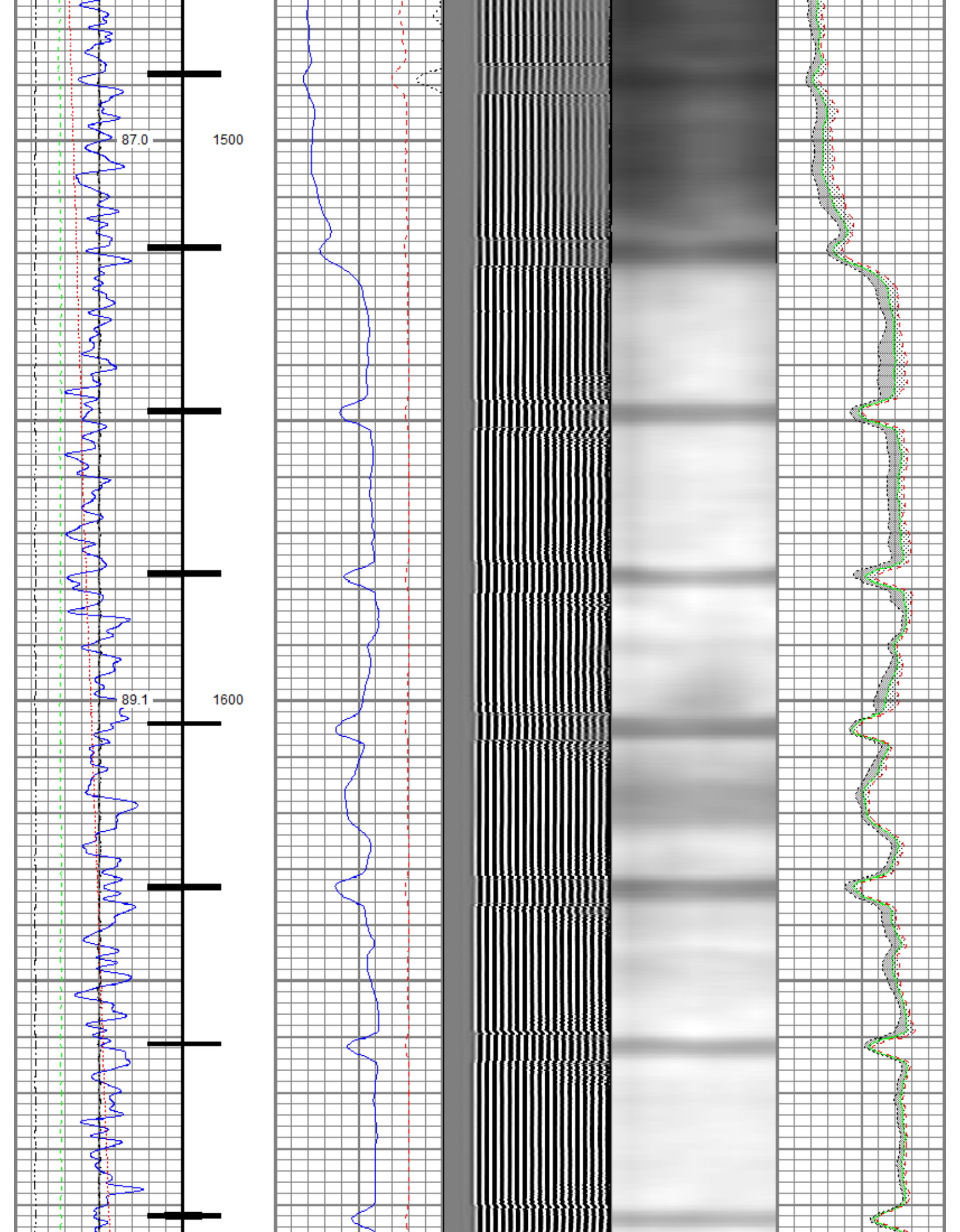


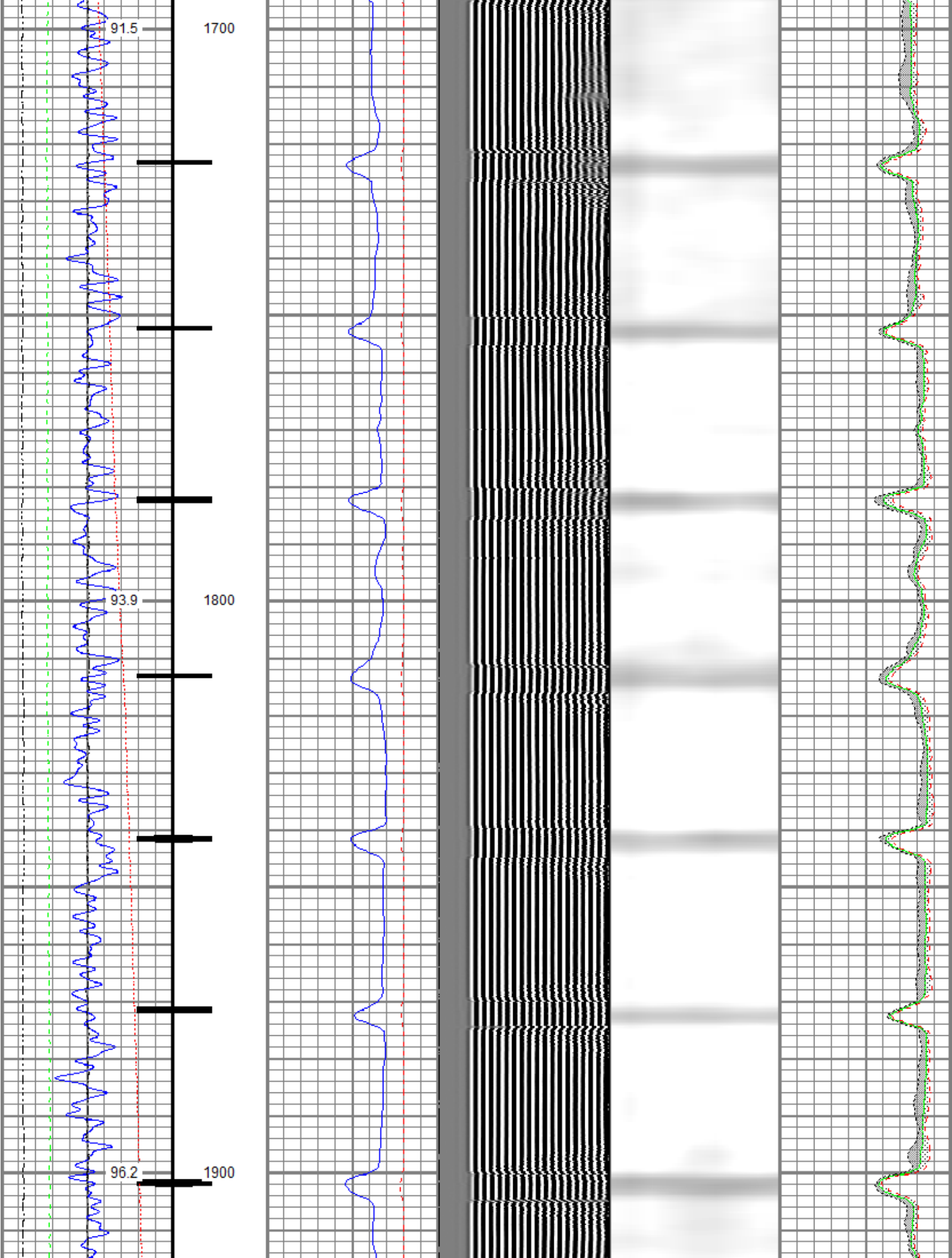


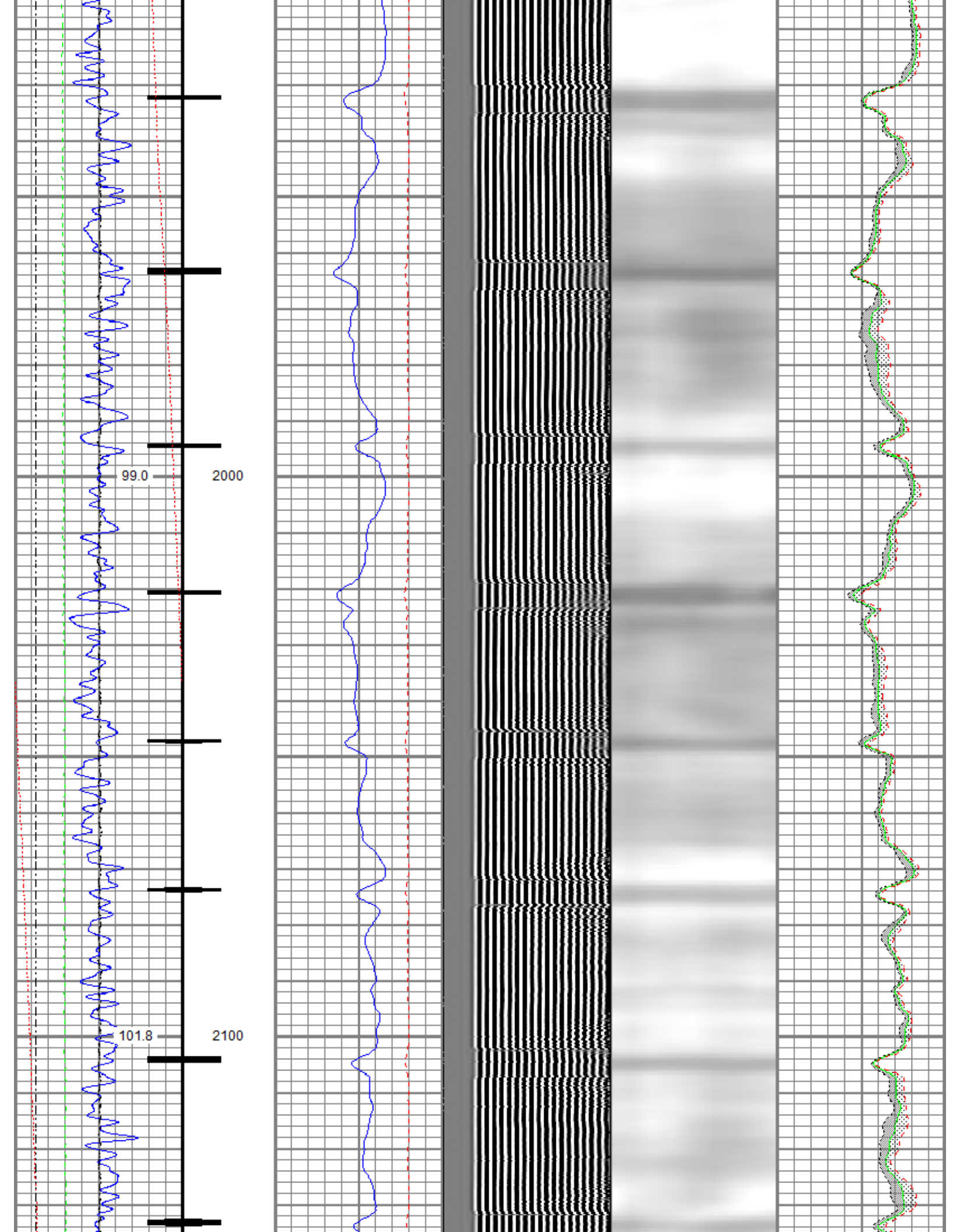


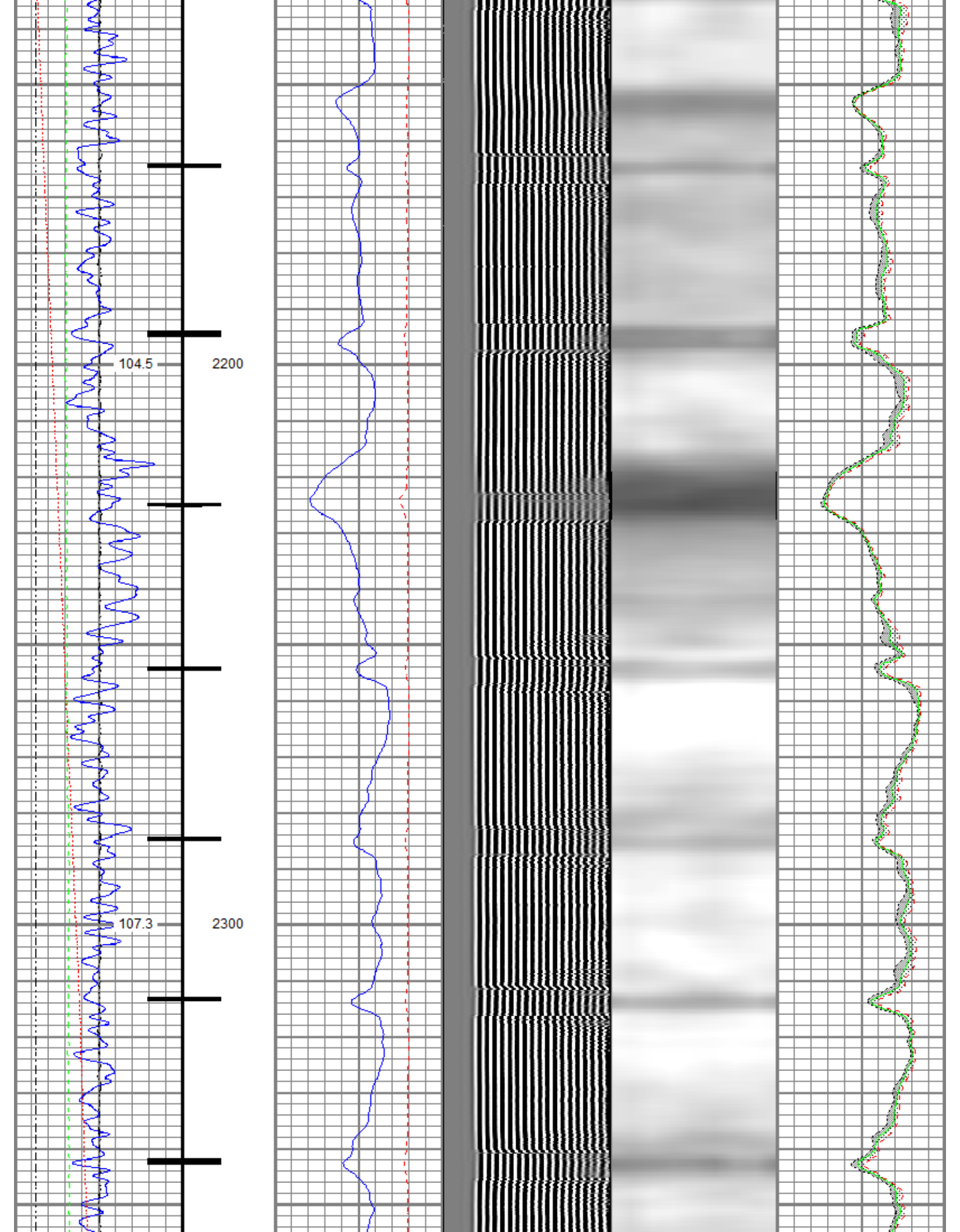


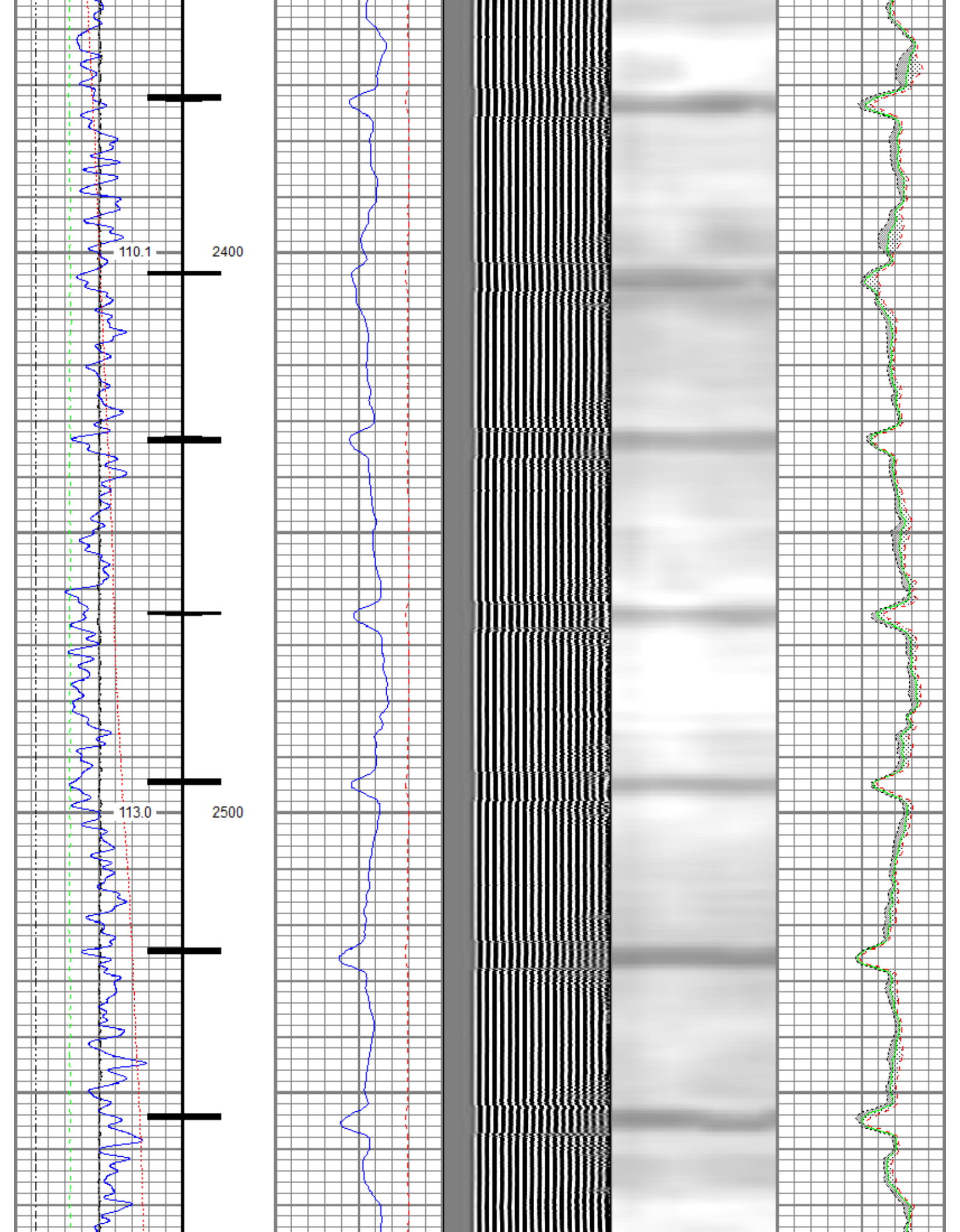


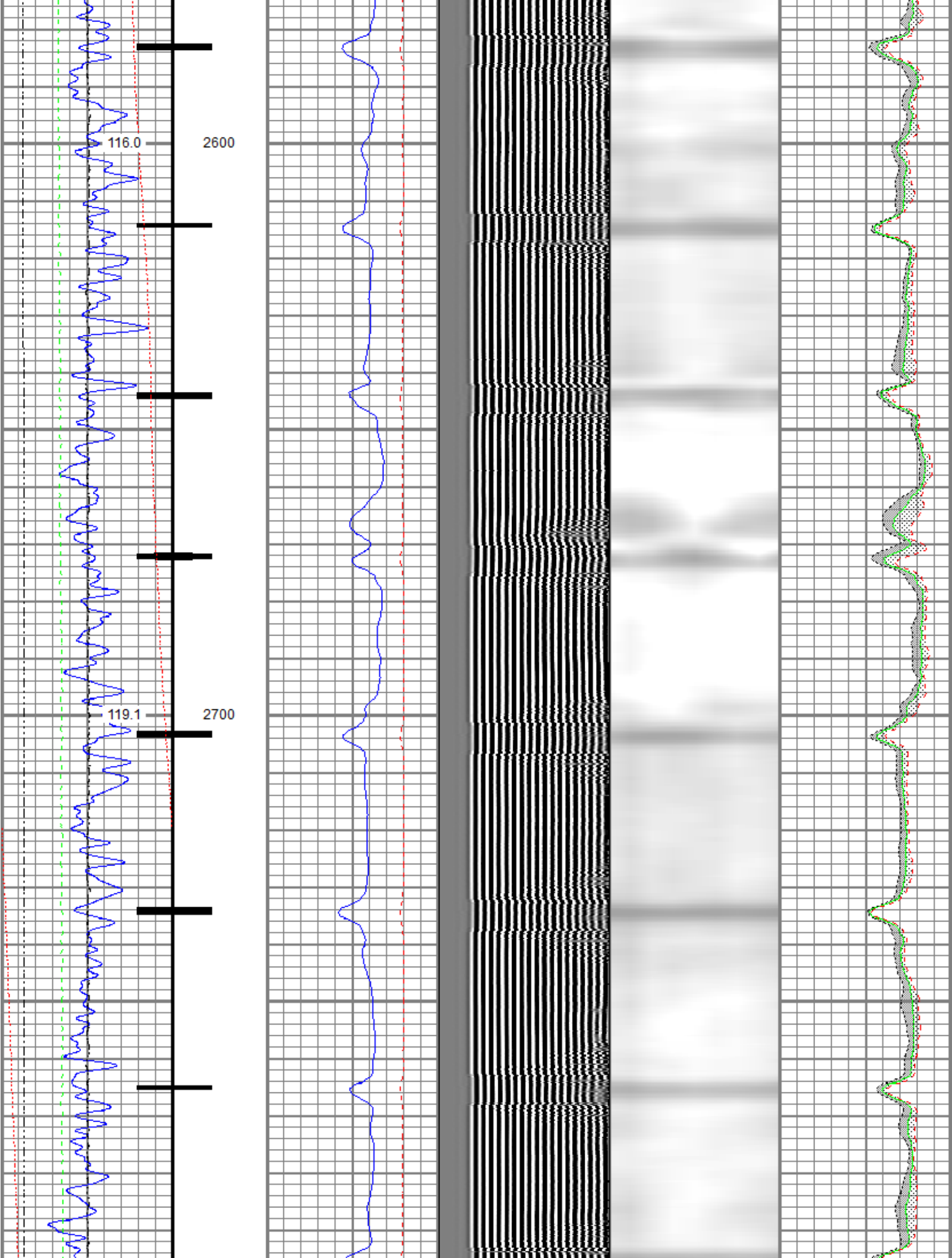








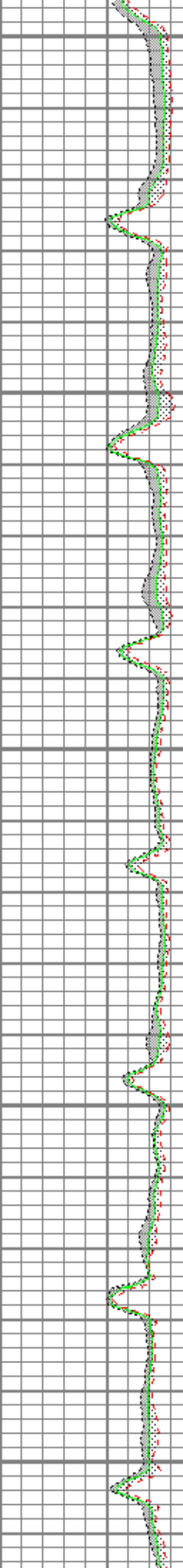
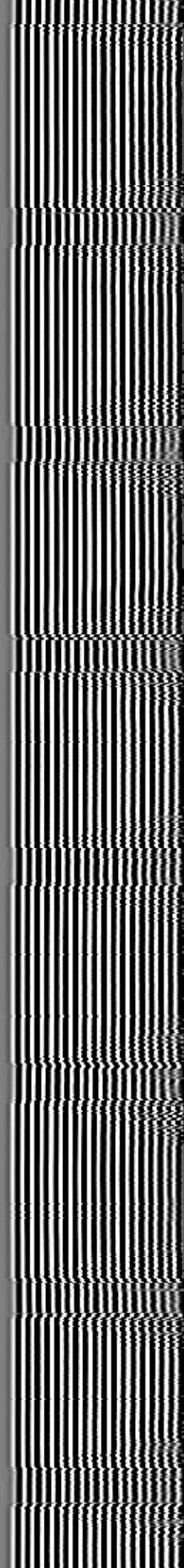
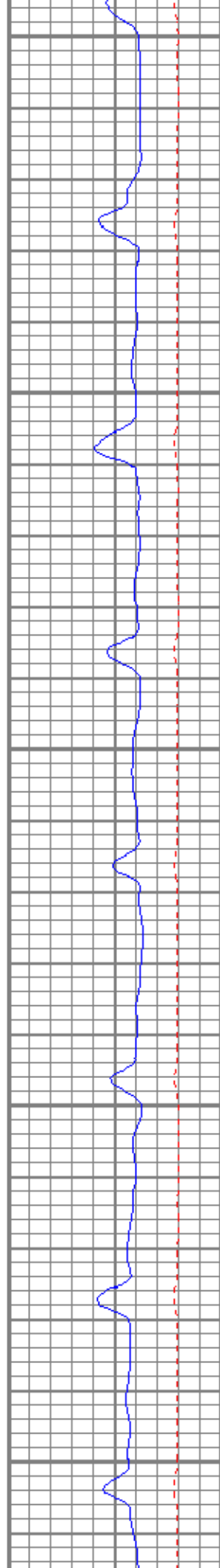
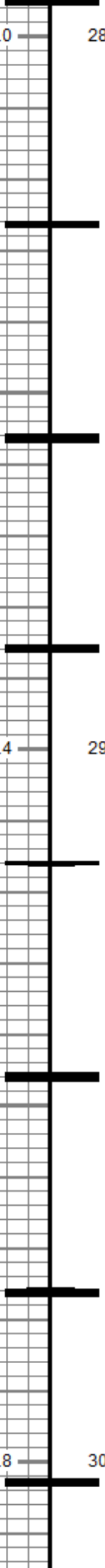
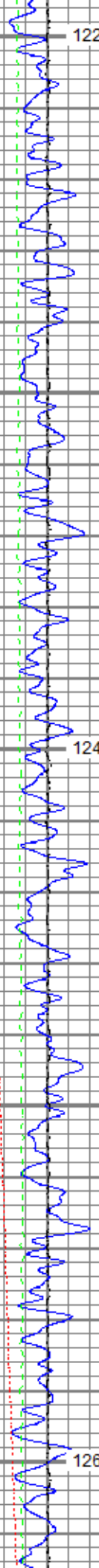


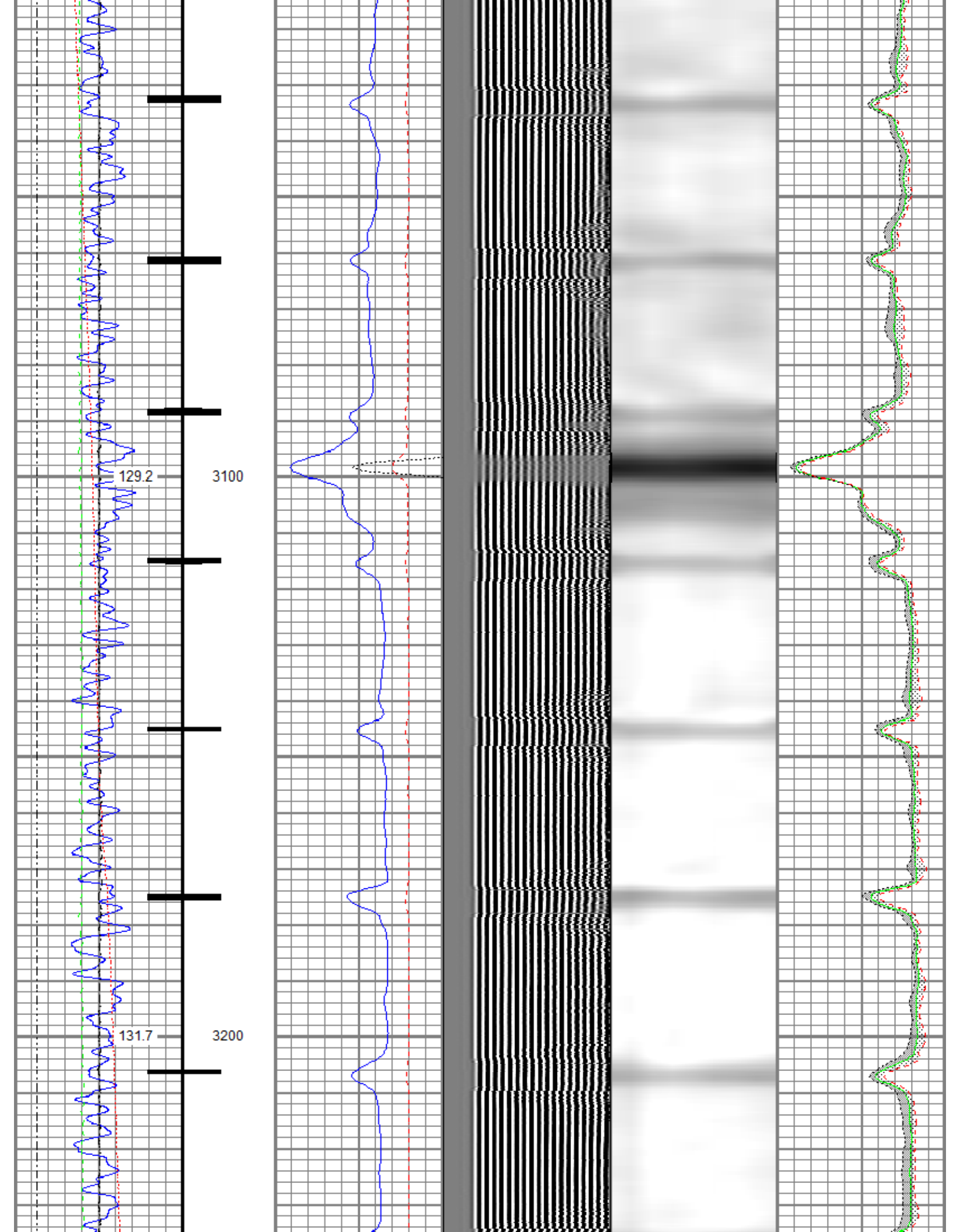


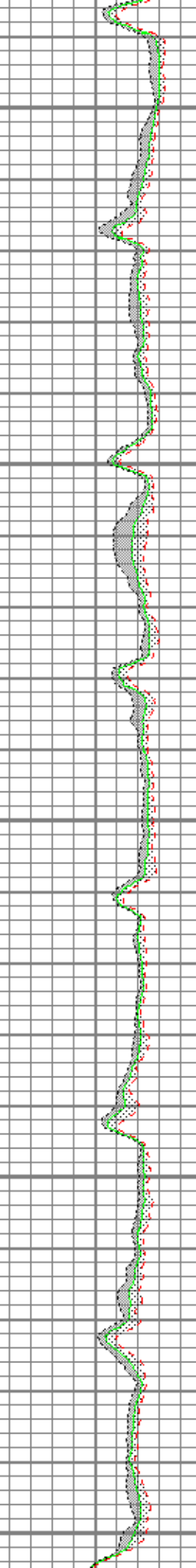
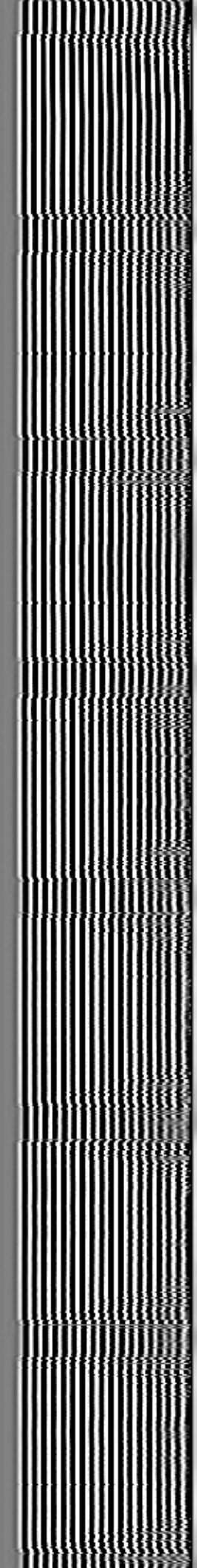
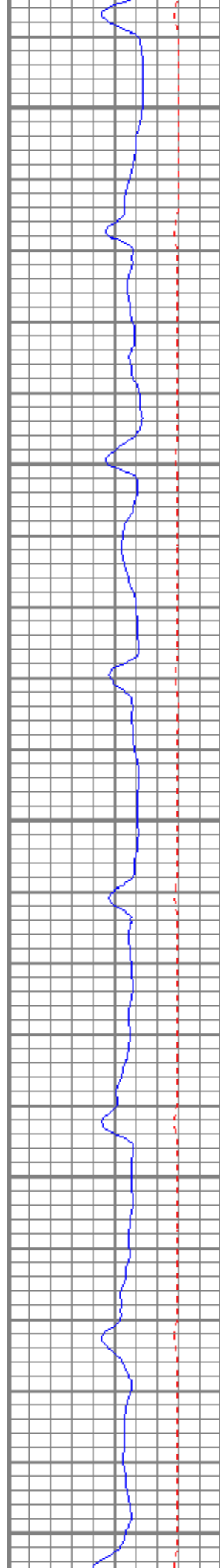
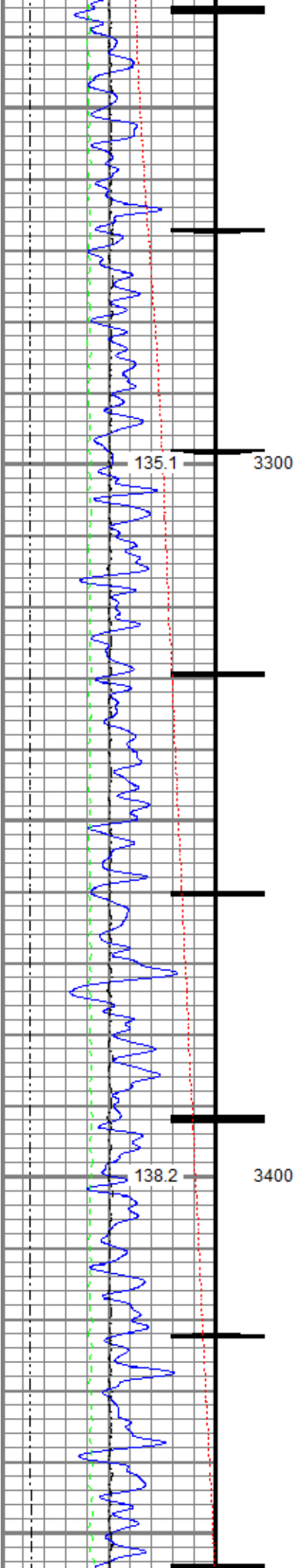
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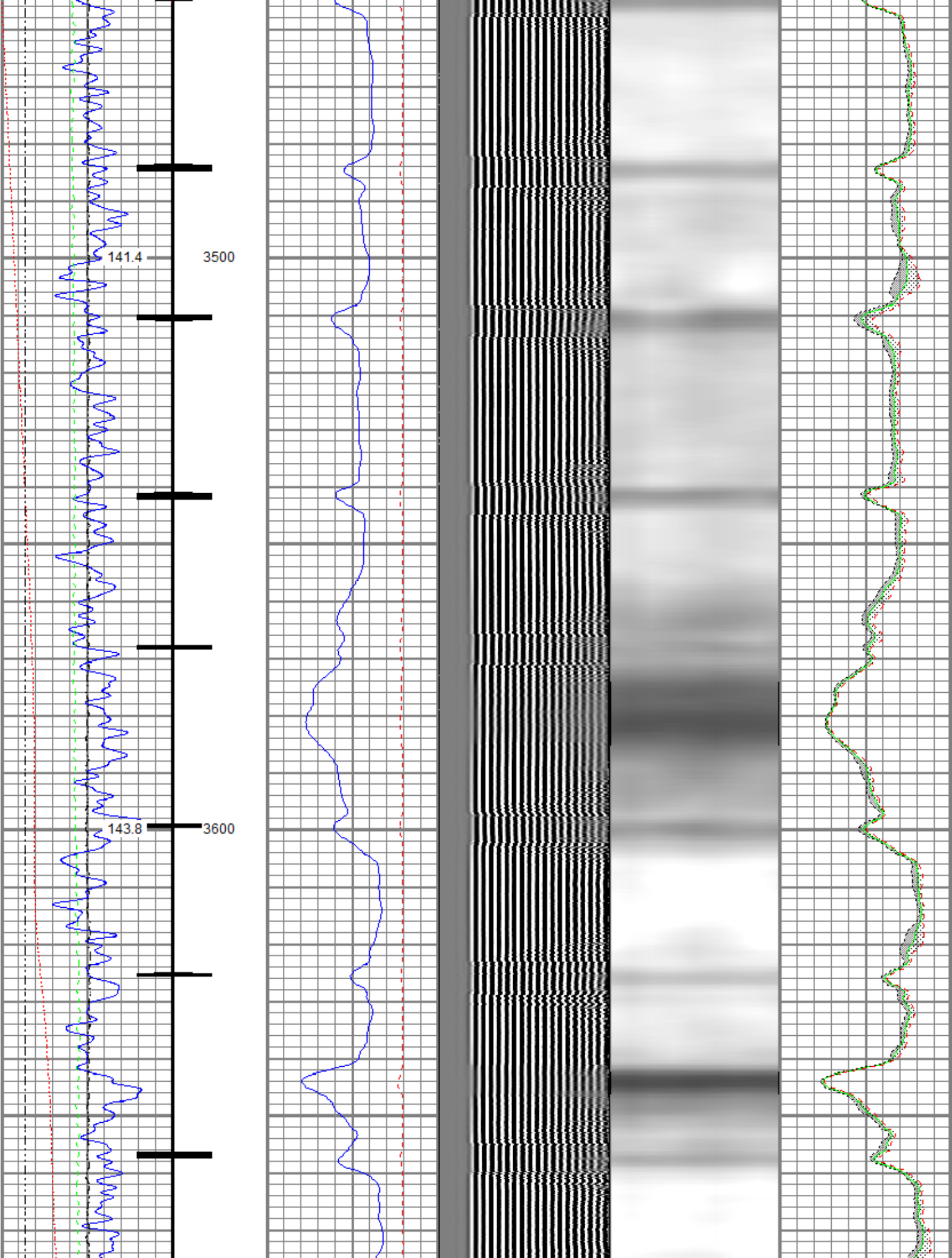
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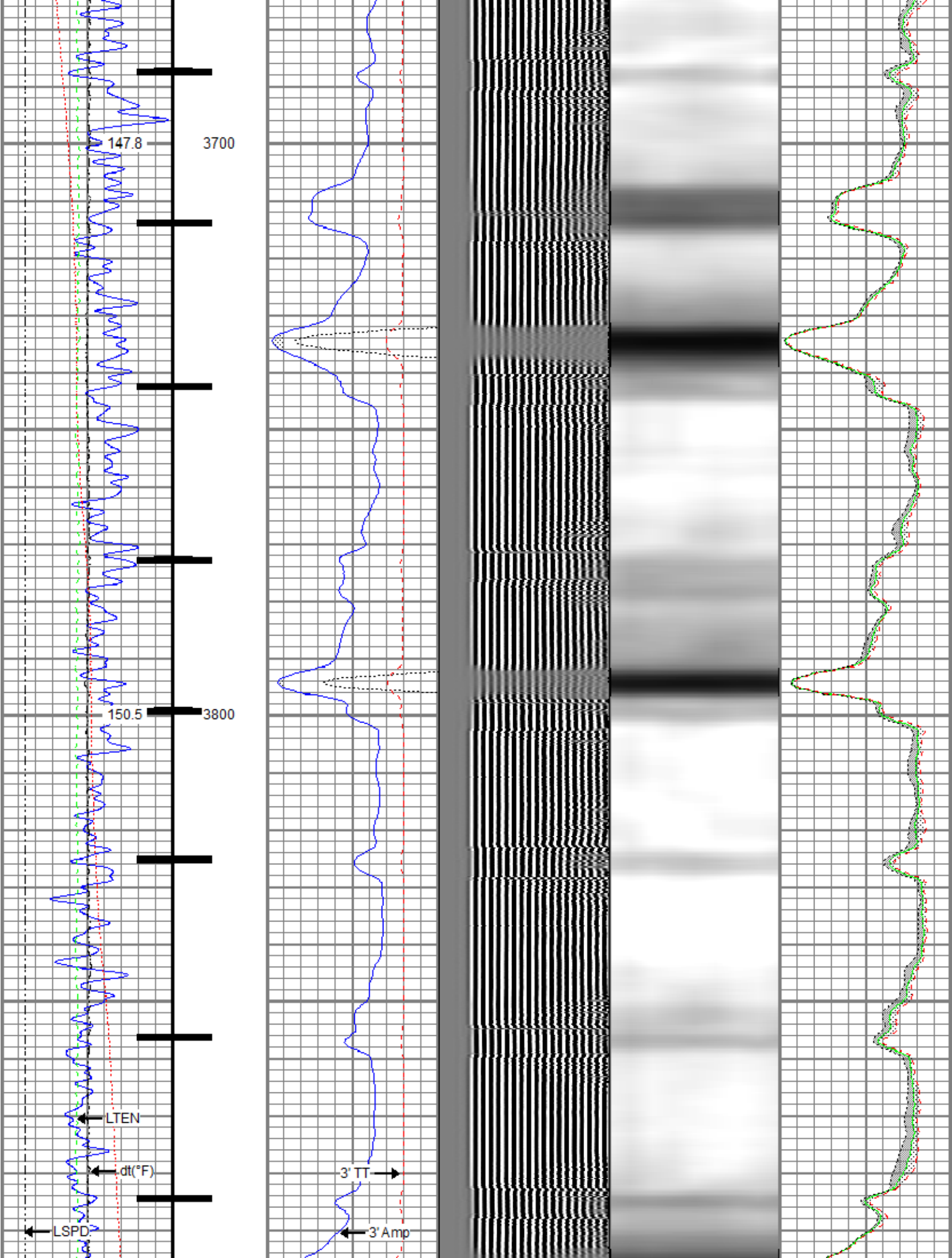
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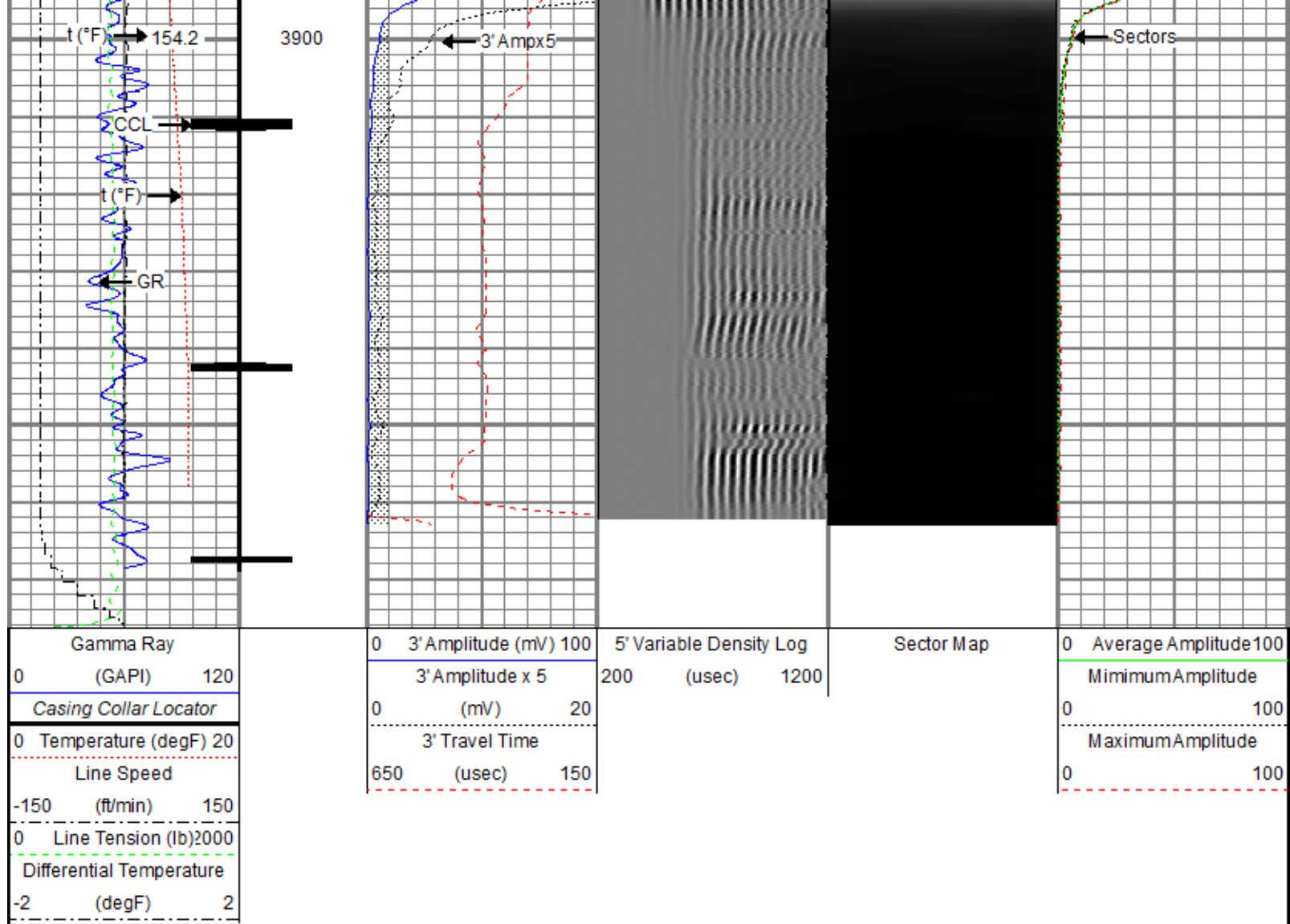








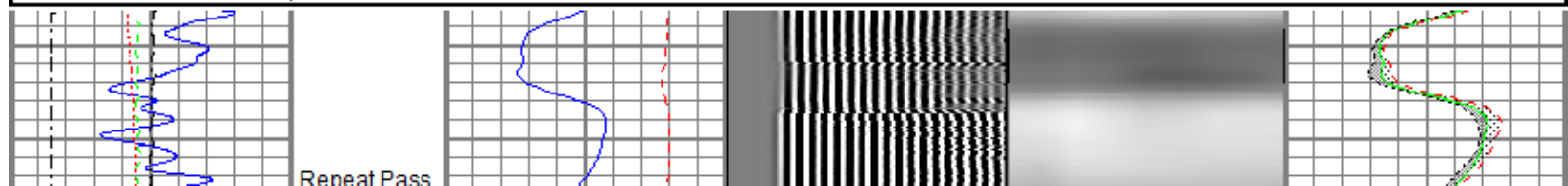
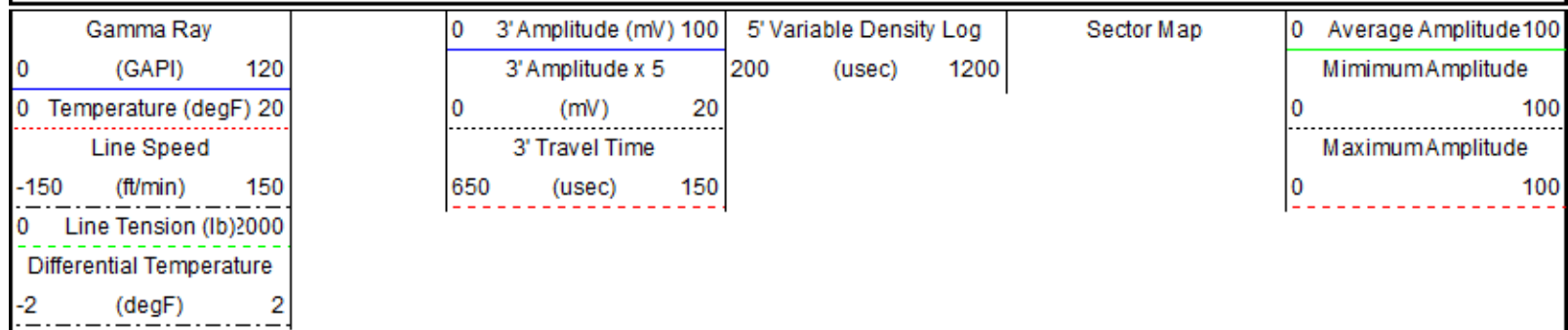




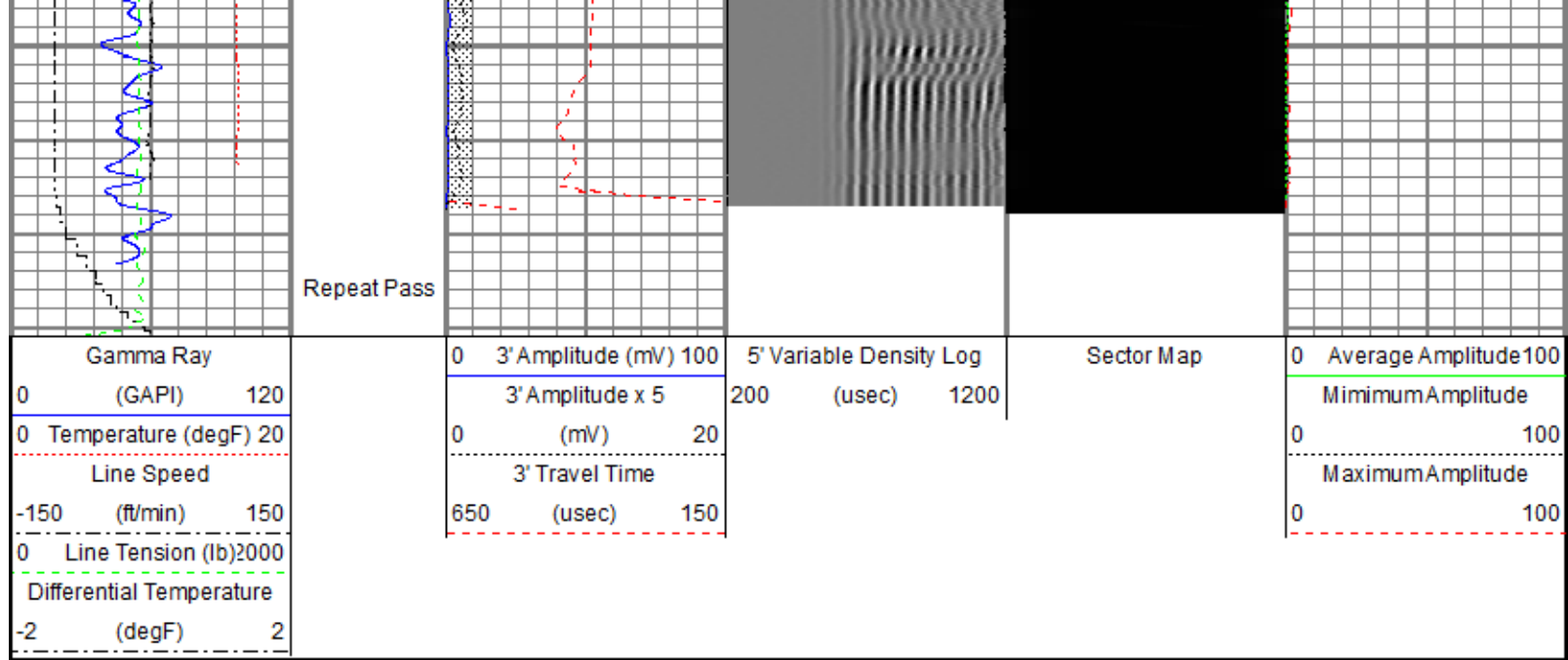
Repeat Pass

Recorded With 0 PSI Surface Induced Pressure

Database File harkis 3\0512310443_oxy_harkis 3_rbl_07-16-20.db
 Dataset Pathname RBL\11.3
 Presentation Format ros_radil
 Dataset Creation Fri Jul 17 11:00:46 2020
 Charted by Depth in Feet scaled 1:240



Repeat Pass



Sensor	Offset (ft)	Schematic	Description	Length (ft)	O.D. (in)	Weight (lb)
			Titan CHD-14375 GO Titan 1-7/16" Assembled Electric Cable Head with 1" Fishing Neck	1.03	1.44	3.60
			Probe CENT-2750 Probe 2-3/4" Electric Inline Bowspring Centralizer	2.88	2.75	20.00
TEMP	17.04		Probe Radii-2750 RBT (120855) Probe 2-3/4" Radial Cement Bond Tool with Integral Temperature Sub	9.39	2.75	105.00
WVFS8	14.81					
WVFS7	14.81					
WVFS6	14.81					
WVFS5	14.81					
WVFS4	14.81					
WVFS3	14.81					
WVFS2	14.81					
WVFS1	14.81					
WVFCAL	14.81					
WVF3FT	14.81					
WVF5FT	13.81					
			Probe CENT-2750 Probe 2-3/4" Electric Inline Bowspring Centralizer	2.88	2.75	20.00

CCL\$2	6.80		Probe GR-CCL-2750 6PB (FW1810-001) Probe 2-3/4" rev.1 Digital Scintillation Gamma Ray/CCL Combined with 6 Pin Bottom for CNT	4.80	2.75	55.00
CCL\$1	6.80					
GR	5.46					
LOCTIM	0.00					
UTCTIM	0.00	Probe CENT-2750 Probe 2-3/4" Electric Inline Bowspring Centralizer	2.88	2.75	20.00	

Dataset: 0512310443_oxy_harkis 3_rbl_07-16-20.db: field/well/RBL/12.4
 Total length: 23.86 ft
 Total weight: 223.60 lb
 O.D.: 2.75 in

Calibration Report	
Database File	c:\programdata\warrior\data\harkis 3\0512310443_oxy_harkis 3_rbl_07-16-20.db
Dataset Pathname	RBL/12.4
Dataset Creation	Fri Jul 17 10:53:44 2020

Gamma Ray Calibration Report		
Serial Number:	FW1810-001	
Tool Model:	2750 6PB	
Performed:	Tue Dec 03 09:24:53 2019	
Calibrator Value:	637.0	GAPI
Background Reading:	100.1	cps
Calibrator Reading:	1264.5	cps
Sensitivity:	0.5471	GAPI/cps

Segmented Cement Bond Log Calibration Report		
Serial Number:	120855	
Tool Model:	2750 RBT	
Calibration Casing Diameter:	4.500	in
Calibration Depth:	404.582	ft

Master Calibration, performed (Derived):						
	Raw (v)		Calibrated (mv)		Results	
	Zero	Cal	Zero	Cal	Gain	Offset
3'	0.006	0.509	0.800	81.196	159.887	-0.160
CAL	0.710	0.710				
5'	0.008	0.509	0.800	81.196	160.428	-0.463
SUM						
S1	-0.002	0.483	0.000	100.000	206.189	0.385
S2	0.007	0.514	0.000	100.000	196.971	-1.335
S3	0.008	0.521	0.000	100.000	194.754	-1.519
S4	0.007	0.539	0.000	100.000	187.802	-1.268
S5	0.007	0.538	0.000	100.000	188.410	-1.286
S6	0.008	0.514	0.000	100.000	197.631	-1.625
S7	0.008	0.483	0.000	100.000	210.337	-1.609
S8	0.007	0.466	0.000	100.000	217.920	-1.596

Internal Reference Calibration, performed (Not Performed):

	Raw (v)		Calibrated (v)		Results	
	Zero	Cal	Zero	Cal	Gain	Offset
CAL	0.000	0.000	0.710	0.710	1.000	0.000

Air Zero Calibration, performed Thu Jul 16 07:30:51 2020:

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

Temperature Calibration Report

Serial Number: 120855
 Tool Model: 2750 RBT
 Performed: Wed Dec 18 13:34:18 2019

	Reference	Reading
Low Reference:	100.00 degF	112.30 degF
High Reference:	350.00 degF	394.75 degF

Gain: 0.89
 Offset: 0.60
 Delta Spacing: 1



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