RELIANCE OILFIELD SERVICES

Radial Cement Bond
Gamma Ray
Casing Collar Log

Company TEP Rocky Mountain LLC
Well Ware SR 13-12
Field Rulison
County Garfield
State Colorado

Company TEP Rocky Mountain LLC
Well Ware SR 13-12
Field Rulison
County Garfield State Colorado
Location: API # : 05-045-23454
1804' FSL & 2290' FWL NESW
SEC 12 TWP 7S RGE 94W

Other Services

Permanent Datum	Ground Level	Elevation 7479'	Elevation K.B. 7503' D.F. 7502' G.L. 7479'
Log Measured From	Kelly Bushing	24 FT	
Drilling Measured From	Kelly Bushing		

Date	14-DEC-2017		
Run Number	One		
Depth Driller	9870 FT		
Depth Logger	9804 FT		
Bottom Logged Interval	9804 FT		
Top Log Interval	Surface		
Open Hole Size	8.750"		
Type Fluid	Fresh Water		
Density / Viscosity	8.34 lb/gal		
Max. Recorded Temp.	249°F		
Estimated Cement Top	See Log		
Time Well Ready	ROA		
Time Logger on Bottom	00:50		
Equipment Number	HD-0359		
Location	Grand Junction, CO		
Recorded By	A. Ellsworth		
Witnessed By	---		

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	32.3	H-40	Surface	1131 FT
Intermediate #1	4 1/2	11.6	P-110	Surface	9830 FT
Intermediate #2					
Liner					

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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 per customer request
Depth referenced to Kelly Bushing at 24 FT
Marker joint logged from 6012 FT to 6033 FT
Log ran from 9804 FT to Surface
Recorded with 0 PSI Surface Induced Pressure

Thank you for choosing Reliance Oilfield Services, LLC!!

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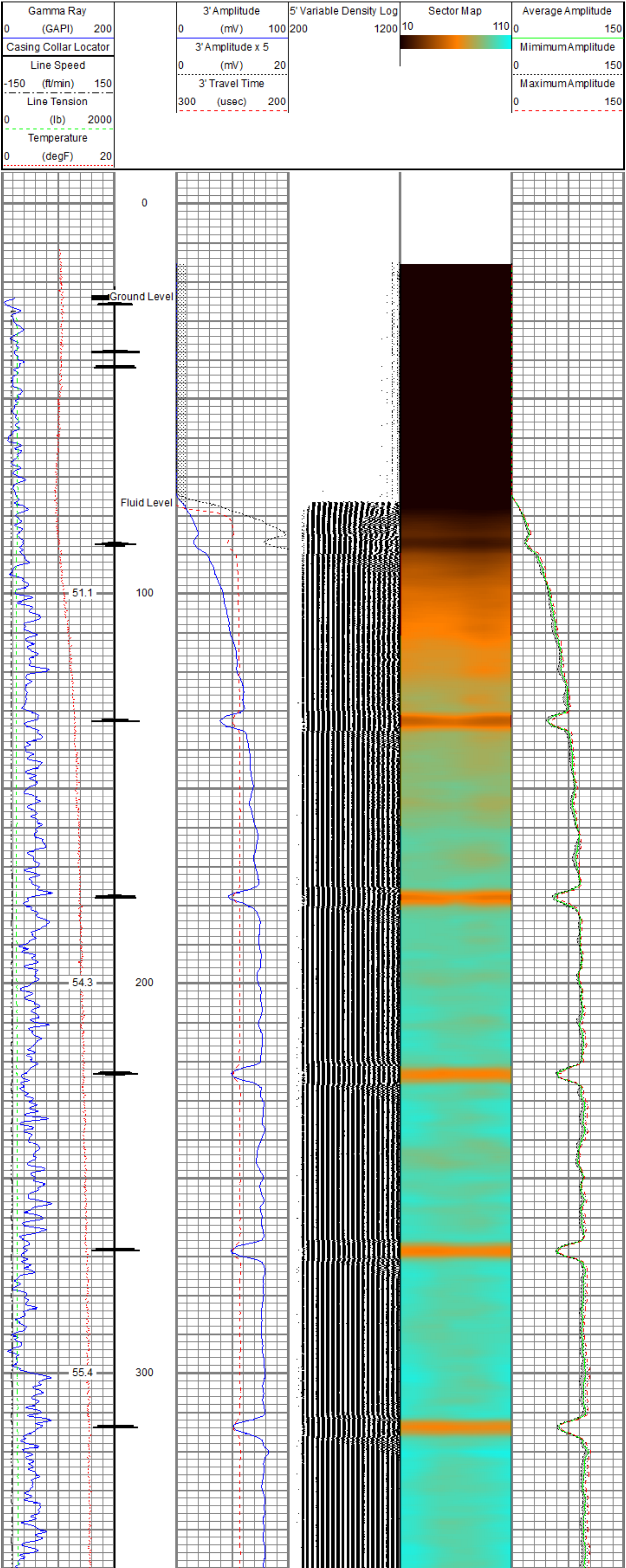
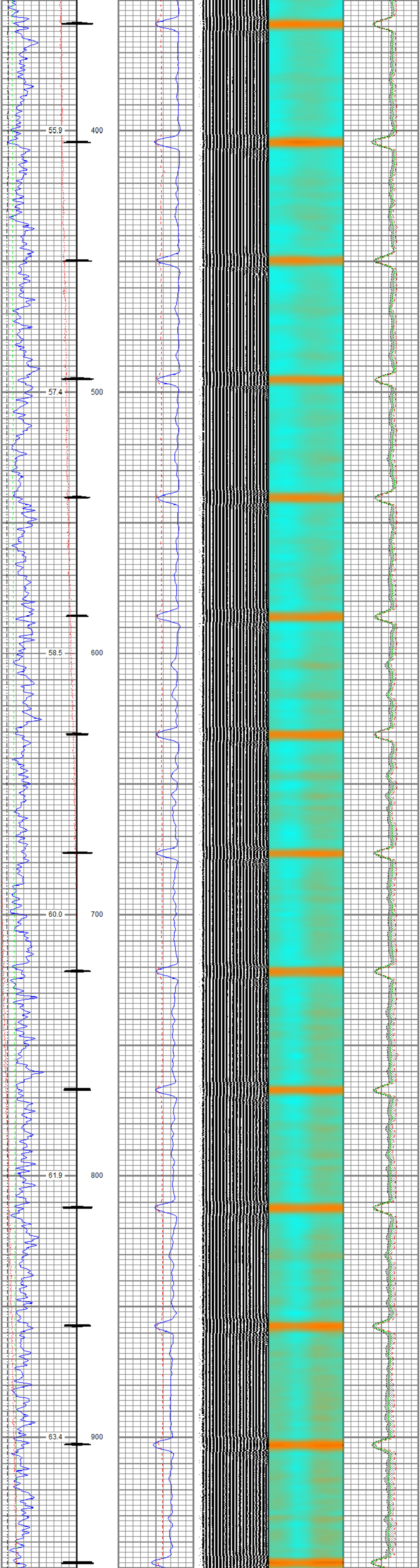
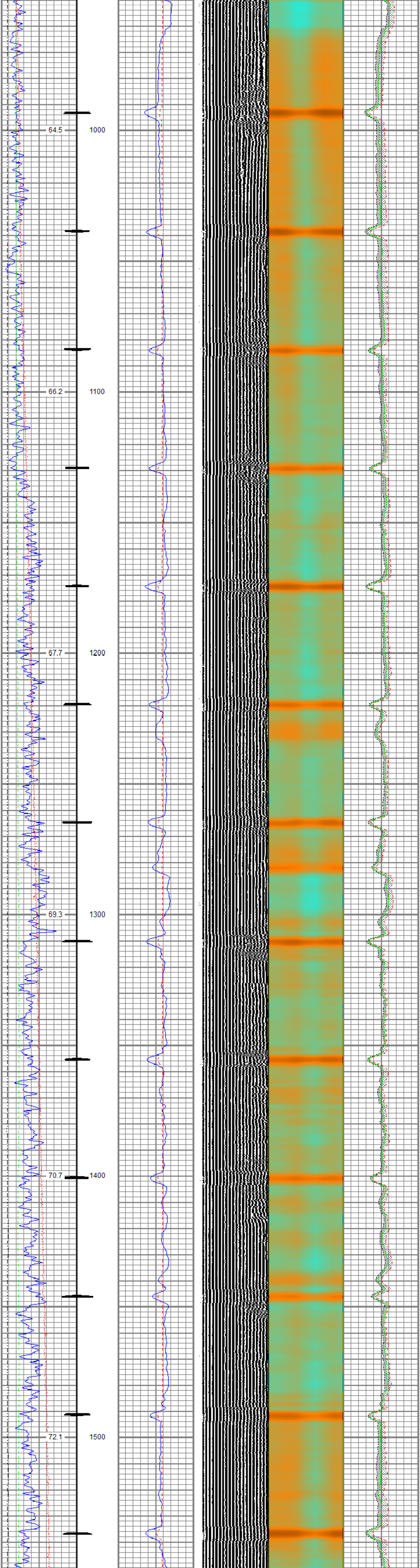
Main Pass

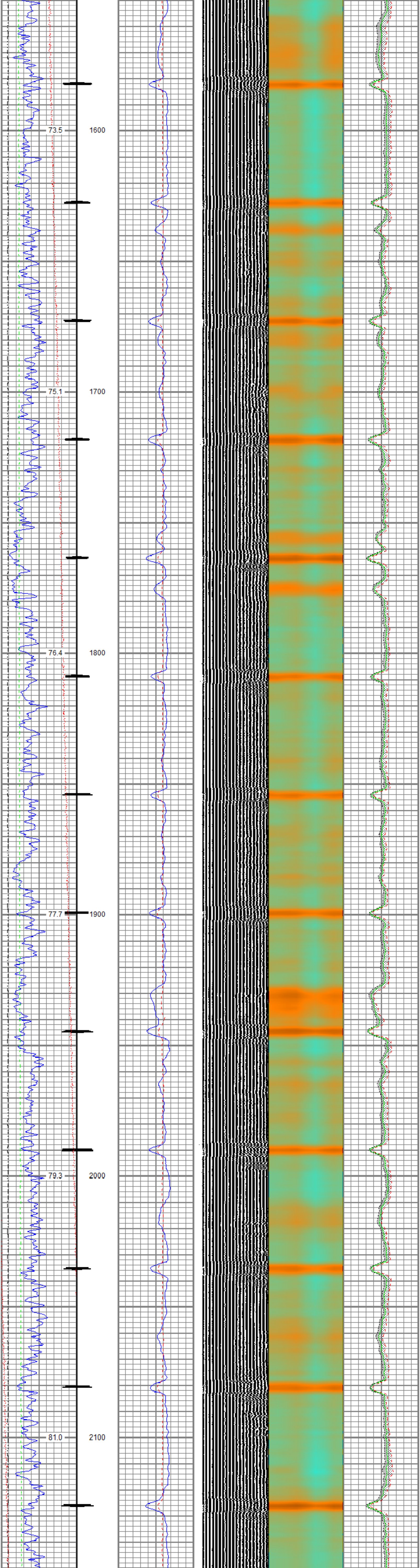
Recorded with 0 PSI Surface Induced Pressure

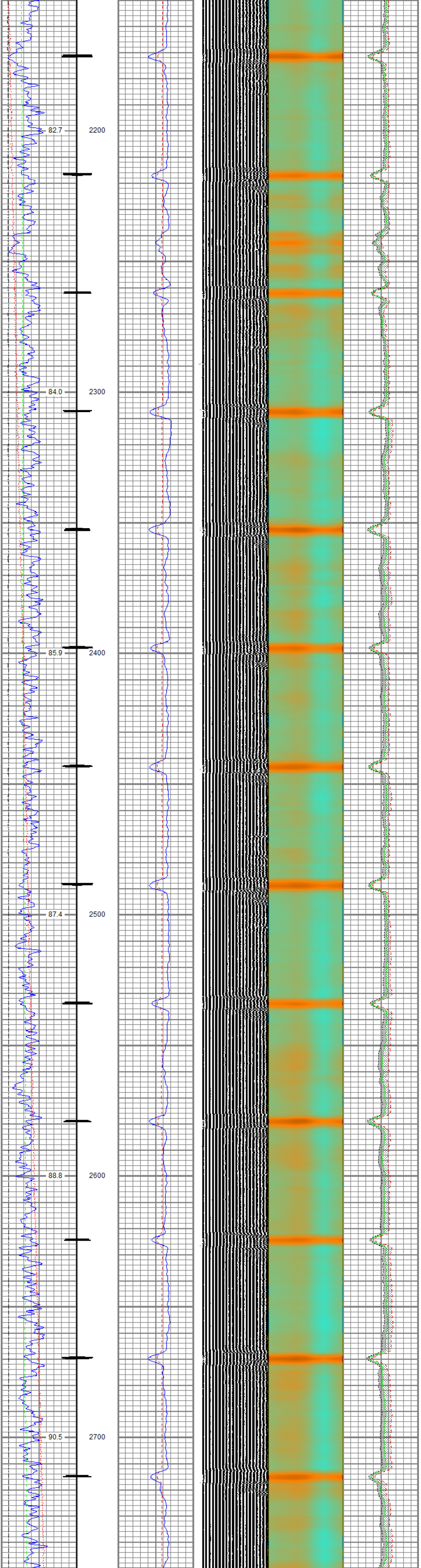
Database File	tep_ware sr 13-12_rbl_12-14-17\processed_tep_ware sr 13-12_rbl_12-14-17.db
Dataset Pathname	main
Presentation Format	ros_rbt004_tep
Dataset Creation	Fri Dec 15 00:48:28 2017
Charted by	Depth in Feet scaled 1:240

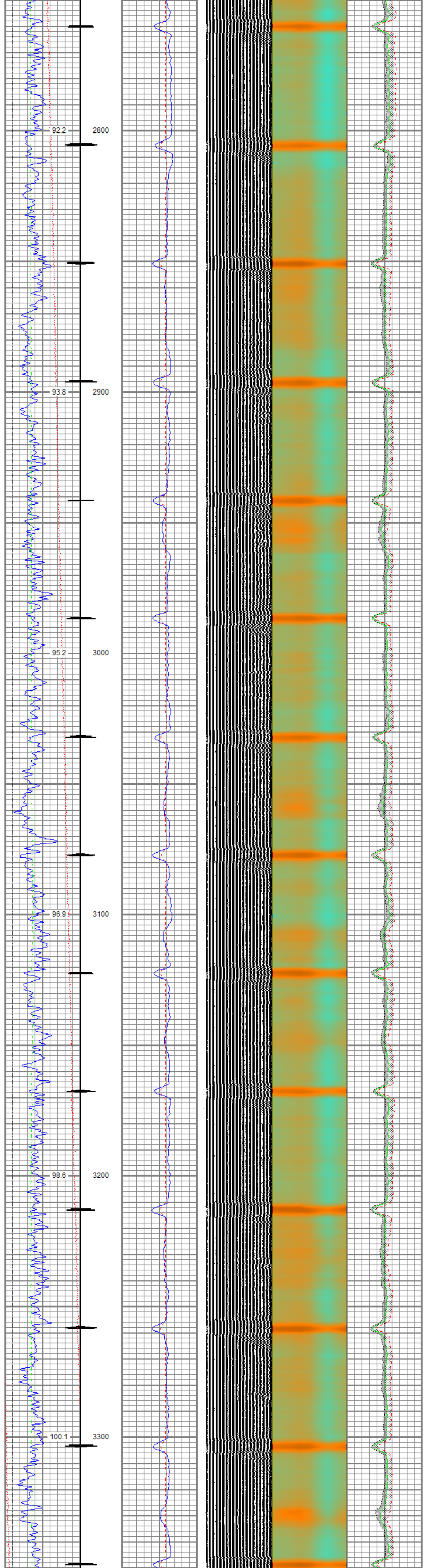


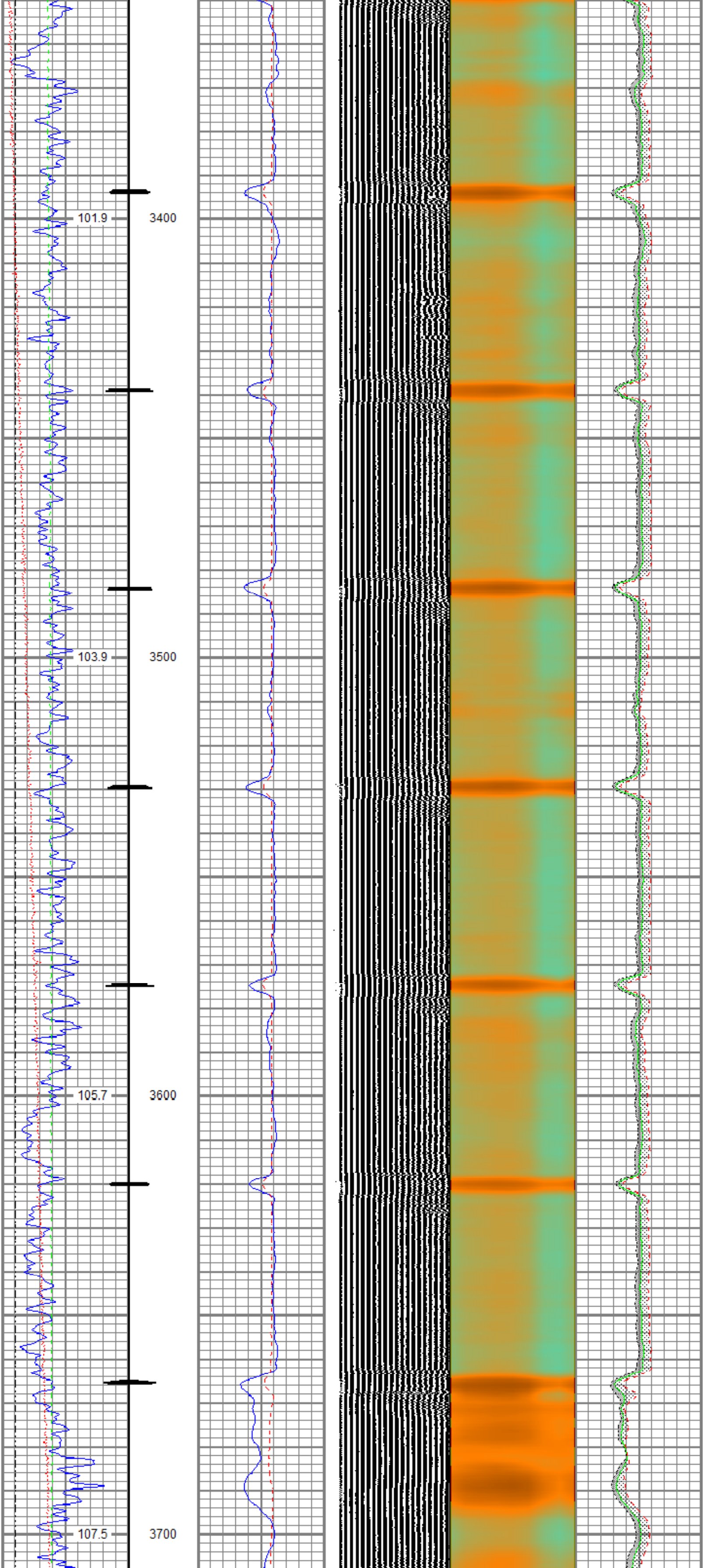


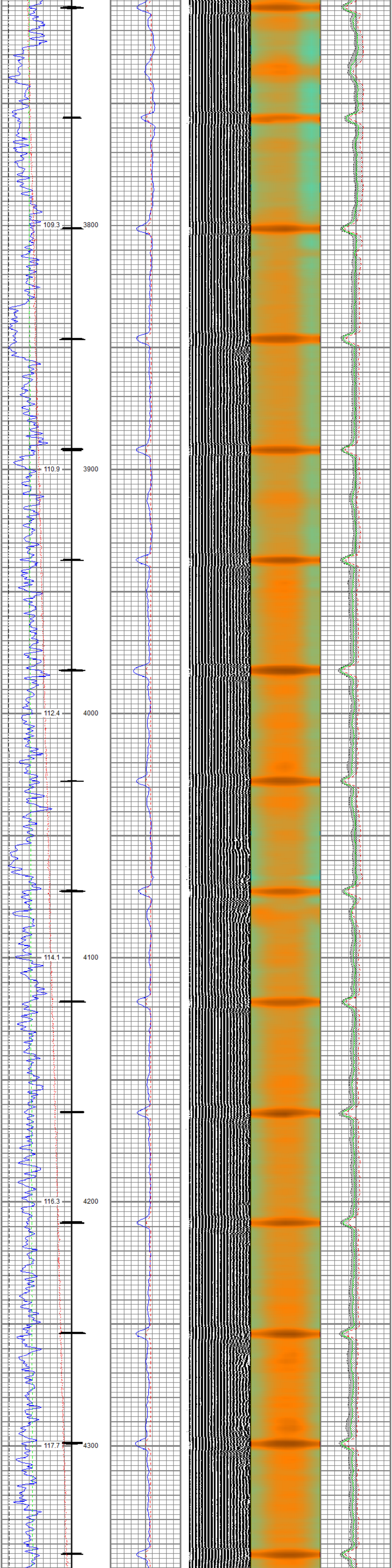








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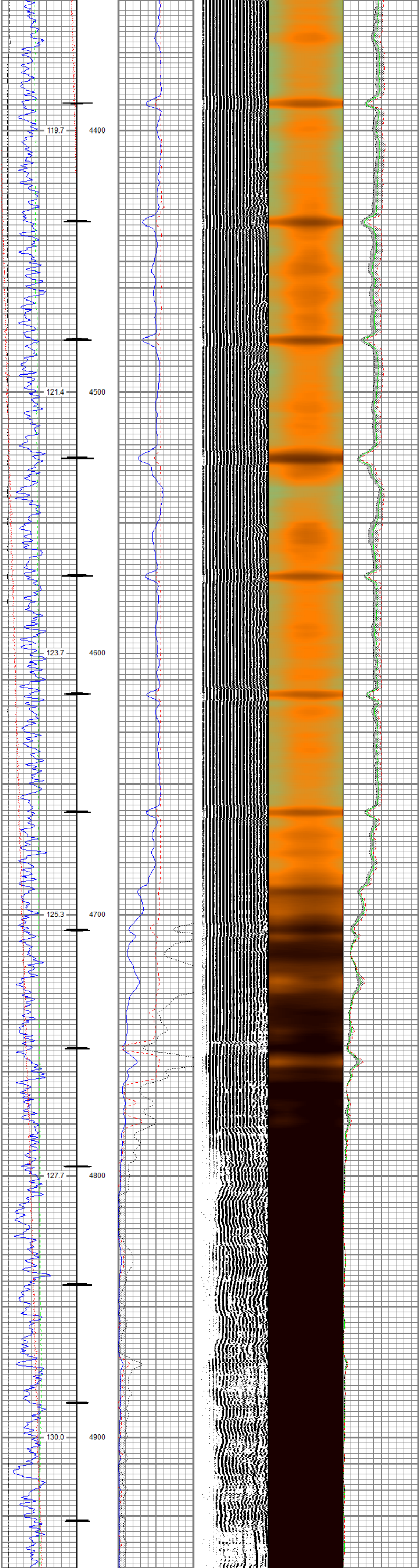
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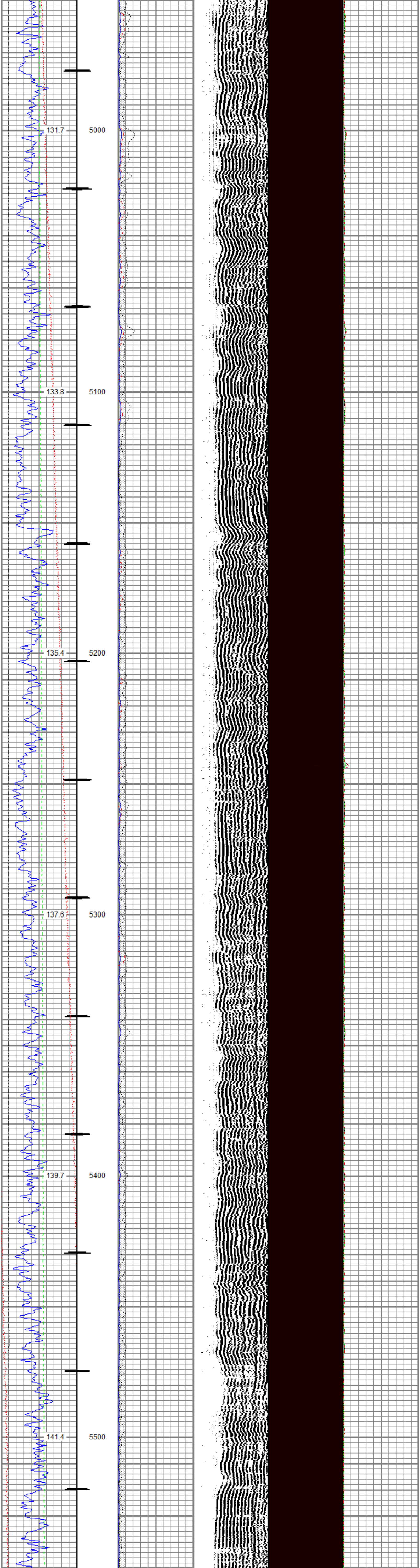
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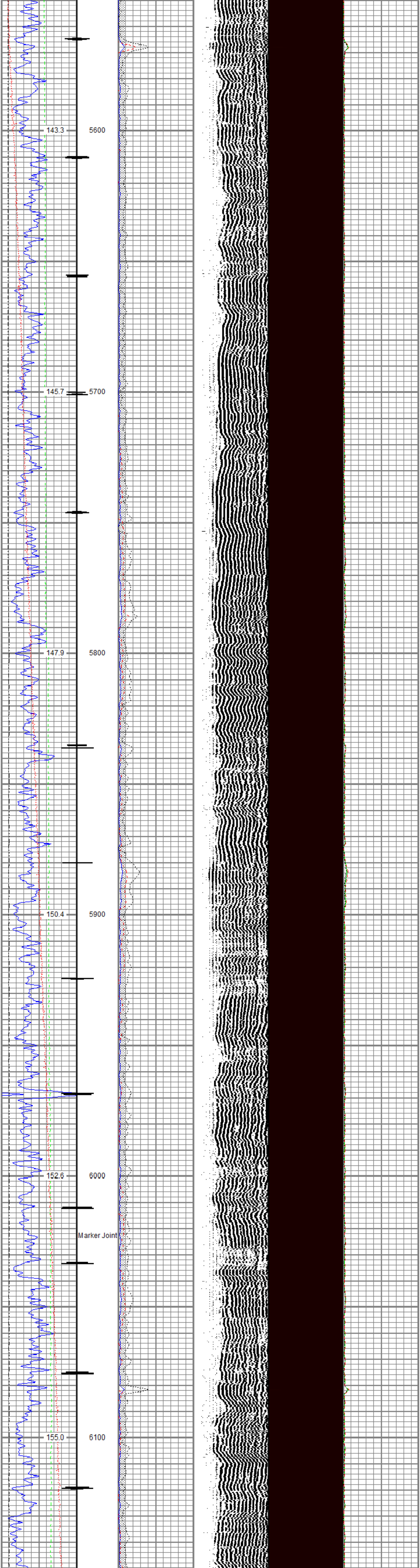
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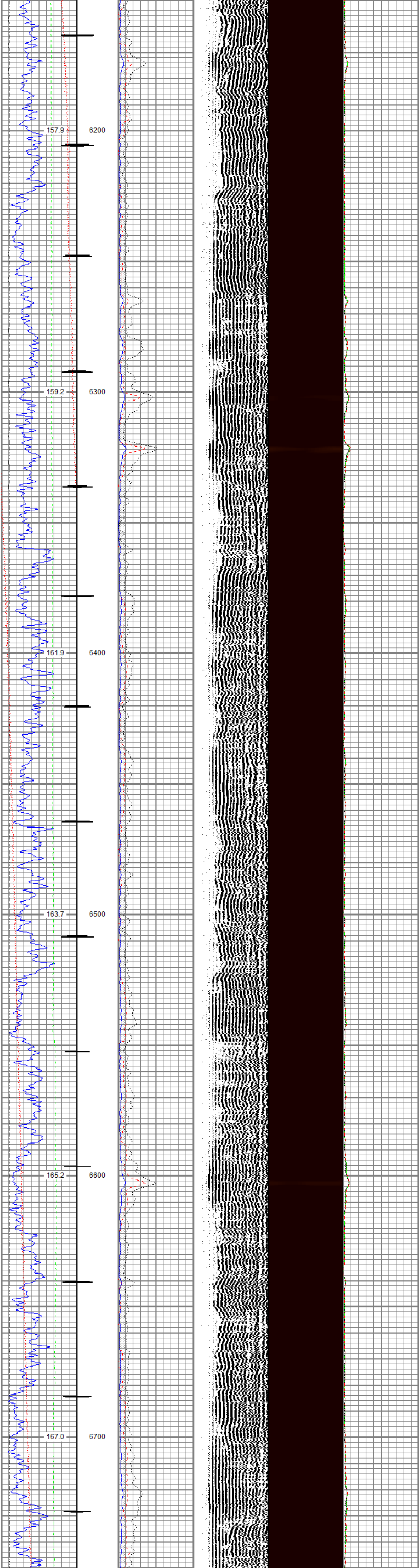

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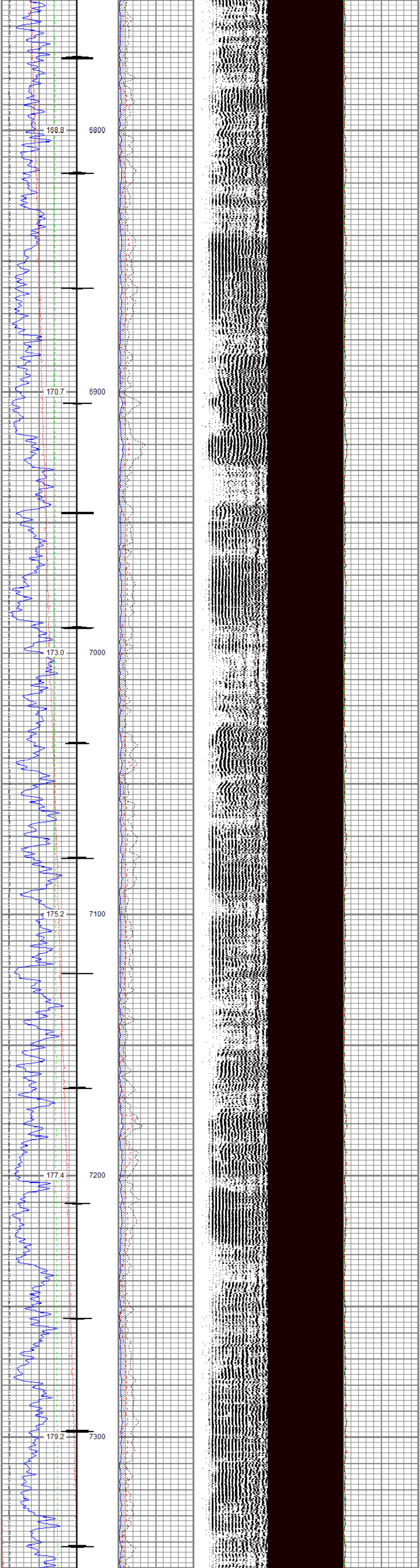
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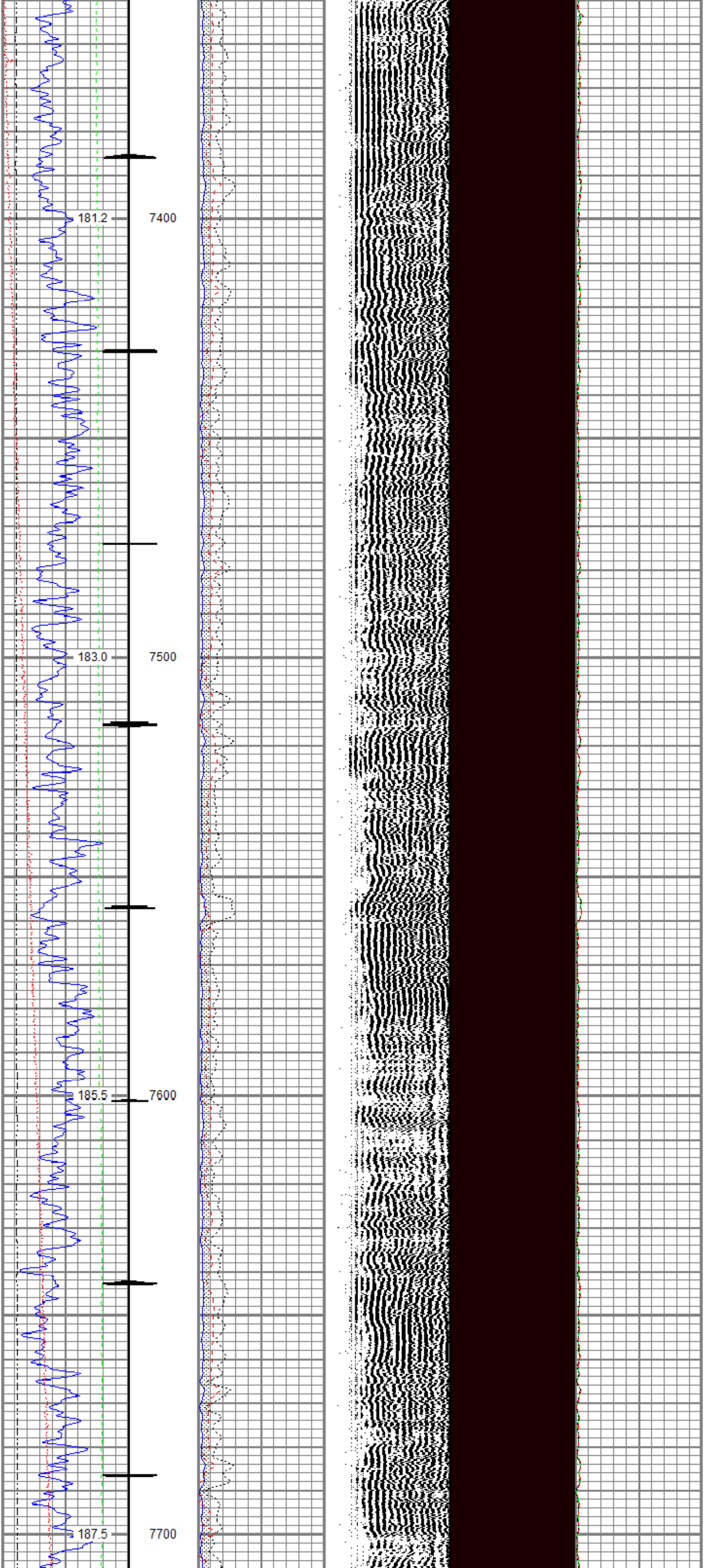
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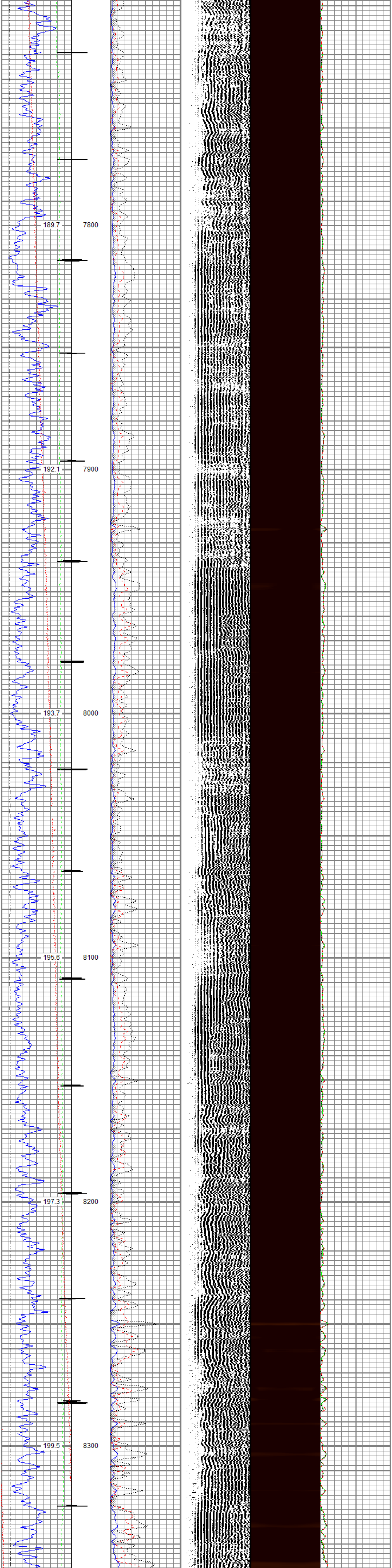

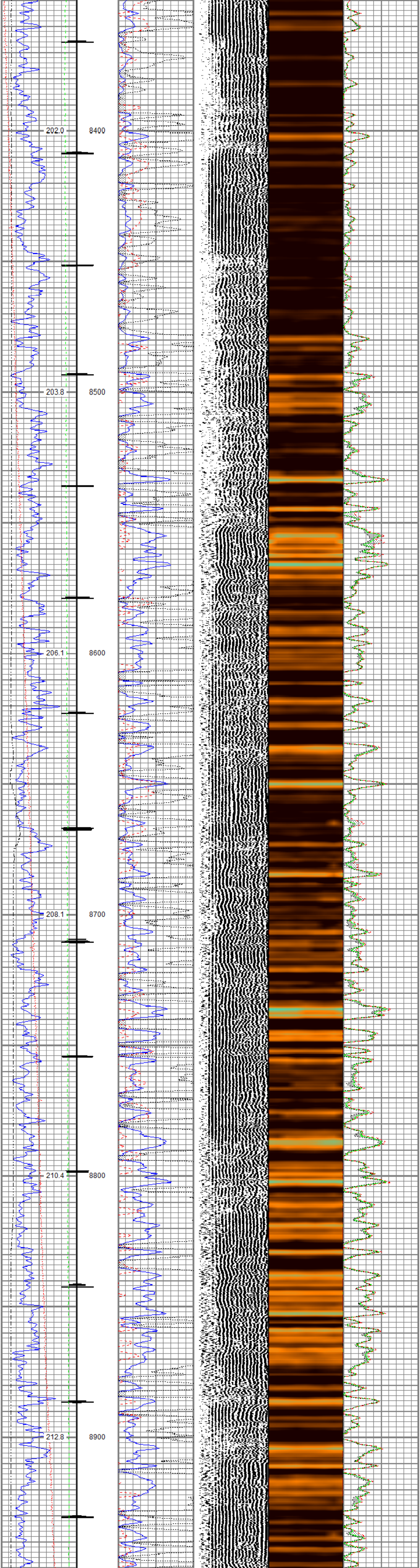

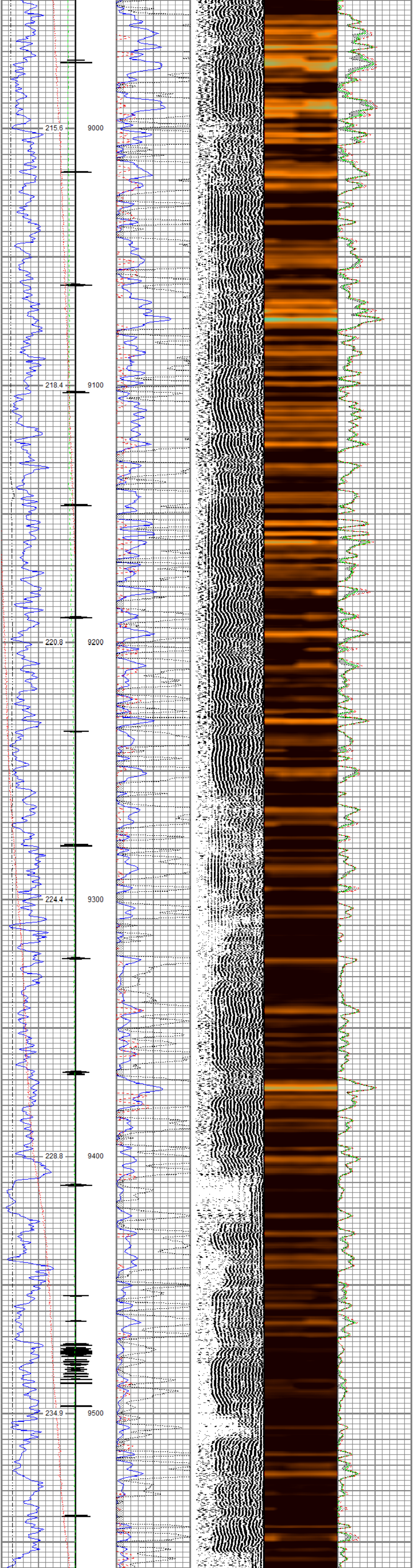

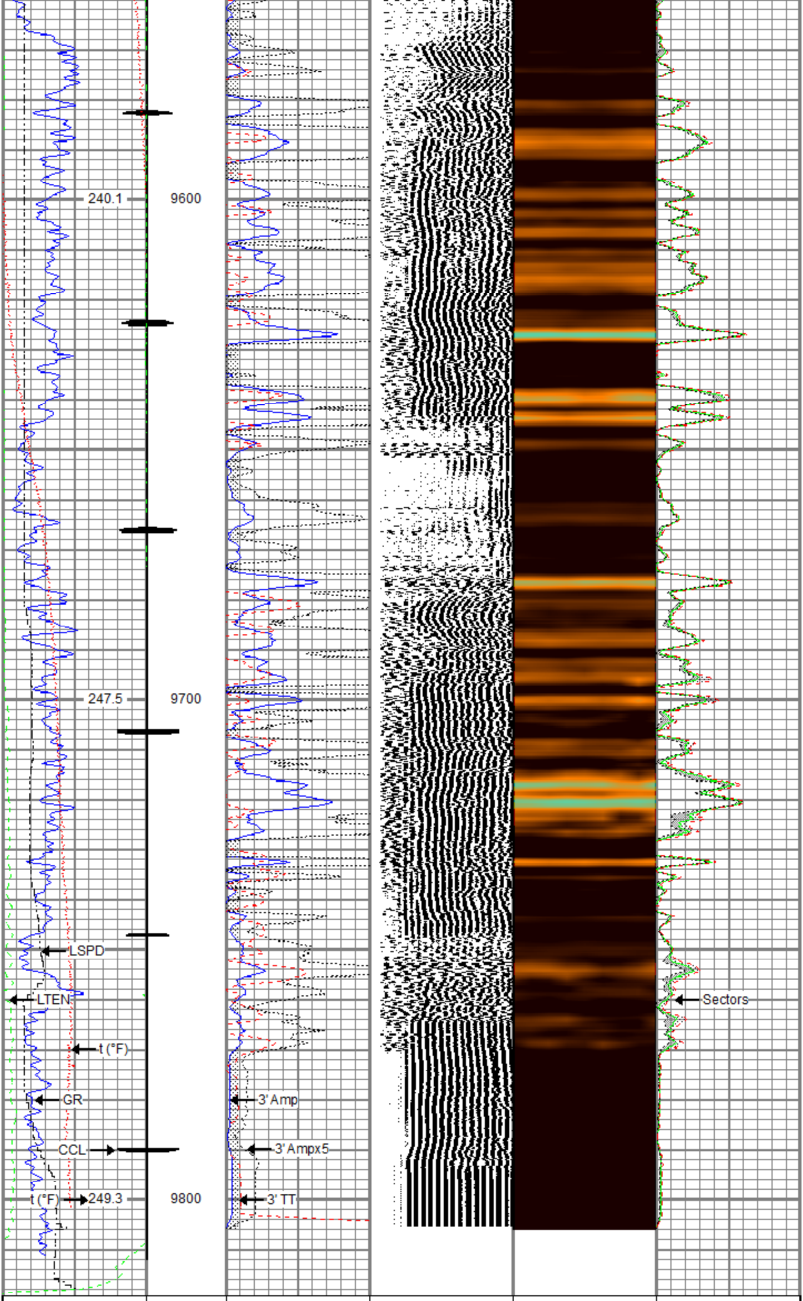

Gamma Ray	3' Amplitude	5' Variable Density Log	Sector Map	Average Amplitude
0 (GAPI) 200	0 (mV) 100	200 1200	10 110	0 150
Casing Collar Locator	3' Amplitude x 5			Mimimum Amplitude
Line Speed	0 (mV) 20			0 150
-150 (ft/min) 150	3' Travel Time			Maximum Amplitude
Line Tension	300 (usec) 200			0 150
0 (lb) 2000				
Temperature				
0 (degF) 20				

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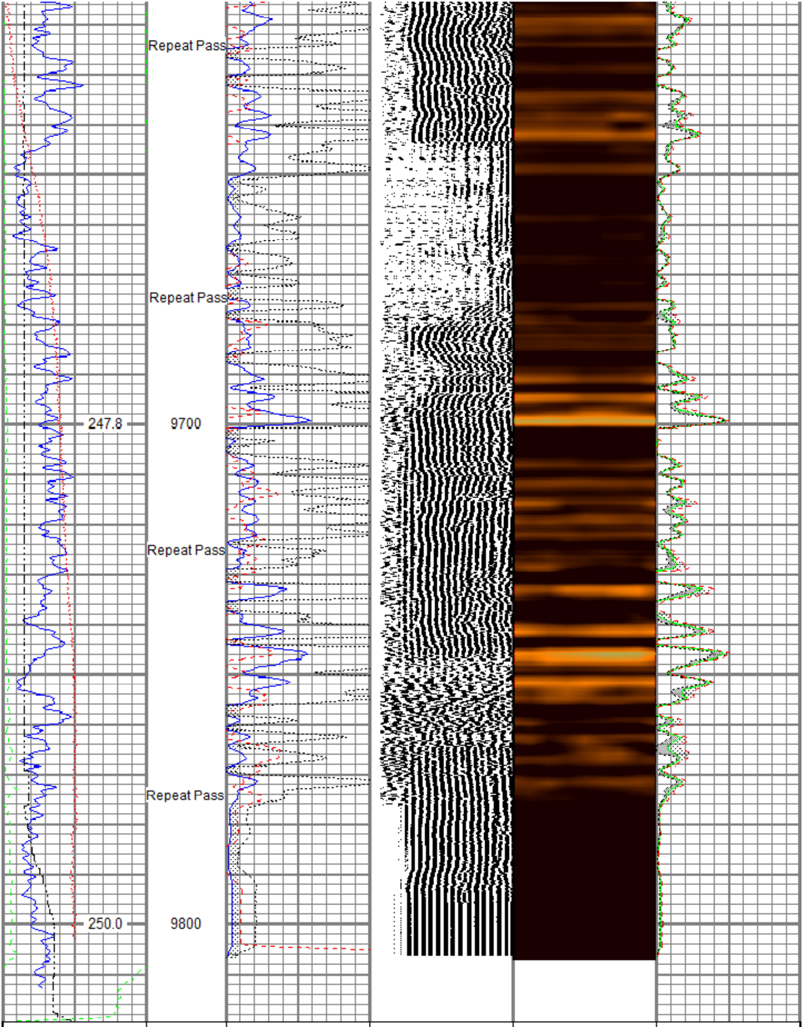
Repeat Pass

Recorded with 0 PSI Surface Induced Pressure

Database File	tep_ware sr 13-12_rbl_12-14-17\processed_tep_ware sr 13-12_rbl_12-14-17.db
Dataset Pathname	repeat
Presentation Format	ros_rbt004_tep
Dataset Creation	Fri Dec 15 00:44:29 2017
Charted by	Depth in Feet scaled 1:240

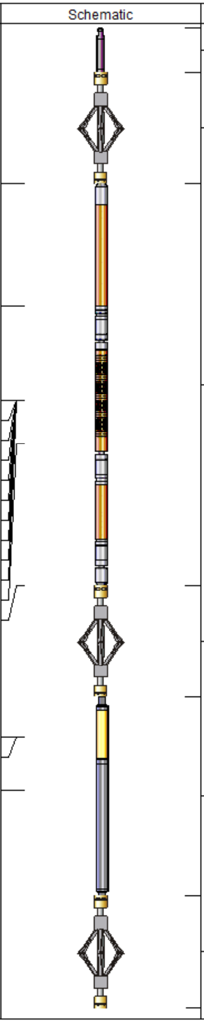
Gamma Ray	3' Amplitude	5' Variable Density Log	Sector Map	Average Amplitude
0 (GAPI) 200	0 (mV) 100	200 1200	10 110	0 150
Line Speed	3' Amplitude x 5			Mimimum Amplitude
-150 (ft/min) 150	0 (mV) 20			0 150
Line Tension	3' Travel Time			Maximum Amplitude
0 (lb) 2000	300 (usec) 200			0 150
Temperature				
0 (degF) 20				



Gamma Ray	3' Amplitude	5' Variable Density Log	Sector Map	Average Amplitude
0 (GAPI) 200	0 (mV) 100	200 1200	10 110	0 150
Line Speed	3' Amplitude x 5			Mimimum Amplitude
-150 (ft/min) 150	0 (mV) 20			0 150
Line Tension	3' Travel Time			Maximum Amplitude
0 (lb) 2000	300 (usec) 200			0 150
Temperature				
0 (degF) 20				

Sensor	Offset (ft)
HeadVolt	18.84
Temp	16.05
WVFS8	13.88
WVFS7	13.88
WVFS6	13.88
WVFS5	13.88
WVFS4	13.88
WVFS3	13.88
WVFS2	13.88
WVFS1	13.88
WVFCAL	13.88
WVF3FT	13.88
WVF5FT	12.88
HEADVOLT	9.63
DCCL	6.18
CCL	6.18
GR	4.96

Schematic



Description	Length (ft)	O.D. (in)	Weight (lb)
Titan_Electric_Cable_Heads-Titan_1-11/1 Electric Cable Head with 1" Fishing Neck	1.03	1.69	5.40
DSS_RAC-RAC_5-Arm 5 Arm 2-3/4" Roller Centralizer	2.55	2.75	32.00
Probe_RADII-C-P_RBT_2750 (101013) Probe 2-3/4" Sector Cement Bond Tool with Temperature Probe	9.19	2.75	105.00
DSS_RAC-RAC_5-Arm 5 Arm 2-3/4" Roller Centralizer	2.55	2.75	32.00
Probe_GR_CCL-P_CGR_2750_S (FW1304.548) Probe 2-3/4" Digital CCL / Gamma Ray Combined		2.75	55.00
DSS_RAC-RAC_5-Arm 5 Arm 2-3/4" Roller Centralizer	2.55	2.75	32.00

Dataset:	PROCESSED_TEP_Ware SR 13-12_RBL_12-14-17.db: field/well/run1/main
Total length:	22.40 ft
Total weight:	261.40 lb
O.D.:	2.75 in

Calibration Report

Database File	C:\ProgramData\Warrior\Data\TEP_Ware SR 13-12_RBL_12-14-17\PROCESSED_TEP_Ware SR 13-12_RB
Dataset Pathname	main
Dataset Creation	Fri Dec 15 00:48:28 2017

Gamma Ray Calibration Report

Serial Number:	FW1307-038	
Tool Model:	P_CGR_2750_S	
Performed:	Sat Feb 06 11:43:09 2016	
Calibrator Value:	1.0	GAPI
Background Reading:	0.0	cps
Calibrator Reading:	1.6	cps
Sensitivity:	0.6061	GAPI/cps

Segmented Cement Bond Log Calibration Report

Serial Number:	101013	
Tool Model:	P_RBT_2750	
Calibration Casing Diameter:	4.500	in
Calibration Depth:	33.252	ft

Master Calibration, performed Fri Dec 15 00:12:38 2017:

	Raw (v)		Calibrated (mv)		Results	
	Zero	Cal	Zero	Cal	Gain	Offset
3'	-0.005	0.768	0.000	81.196	105.012	0.551
CAL	-0.006	0.753				
5'	-0.002	0.689	0.000	81.196	117.455	0.219
SUM						
S1	-0.005	0.755	0.000	100.000	131.624	0.622
S2	-0.005	0.759	0.000	100.000	130.963	0.654
S3	-0.006	0.745	0.000	100.000	133.078	0.817
S4	-0.004	0.763	0.000	100.000	130.357	0.533
S5	-0.004	0.756	0.000	100.000	131.499	0.547
S6	-0.005	0.761	0.000	100.000	130.504	0.631
S7	-0.006	0.754	0.000	100.000	131.662	0.789
S8	-0.005	0.772	0.000	100.000	128.813	0.583

Internal Reference Calibration, performed (Not Performed):

	Raw (v)		Calibrated (v)		Results	
	Zero	Cal	Zero	Cal	Gain	Offset
CAL	0.000	0.000	-0.006	0.753	1.000	0.000

Air Zero Calibration, performed Fri Dec 15 00:12:56 2017:

	Raw (v)	Calibrated (v)	Results
	Zero	Zero	Offset
3'	-0.005	0.000	-0.000
5'	-0.002	0.000	0.000
SUM			
S1	-0.004	0.000	-0.000
S2	-0.005	0.000	-0.000
S3	-0.006	0.000	-0.001
S4	-0.004	0.000	0.000
S5	-0.004	0.000	-0.000
S6	-0.005	0.000	-0.000
S7	-0.006	0.000	-0.000
S8	-0.004	0.000	-0.001

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Company	TEP Rocky Mountain LLC
Well	Ware SR 13-12
Field	Rulison
County	Garfield
State	Colorado