RELIANCE OILFIELD SERVICES

Radial Cement Bond Gamma Ray Casing Collar Log

Company	TEP Rocky Mountain LLC
Well	Ware SR 23-12
Field	Rulison
County	Garfield
State	Colorado

Company TEP Rocky Mountain LLC
Well Ware SR 23-12
Field Rulison
County Garfield State Colorado

Location: API # : 05-045-23439
1818' FSL & 2296' FWL NESW
SEC 12 TWP 7S RGE 94W

Other Services

Permanent Datum	Ground Level	Elevation	7479'
Log Measured From	Kelly Bushing	24 FT	
Drilling Measured From	Kelly Bushing		

Elevation
K.B. 7503'
D.F. 7502'
G.L. 7479'

Date	08-DEC-2017		
Run Number	One		
Depth Driller	9591 FT		
Depth Logger	9522 FT		
Bottom Logged Interval	9517 FT		
Top Log Interval	Surface		
Open Hole Size	8.750"		
Type Fluid	Fresh Water		
Density / Viscosity	8.34 lb/gal		
Max. Recorded Temp.	250°F		
Estimated Cement Top	See Log		
Time Well Ready	ROA		
Time Logger on Bottom	14:25		
Equipment Number	HD-359		
Location	Grand Junction, CO		
Recorded By	Z. Fisher		
Witnessed By	D. Welsh		

	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	1141 FT
Intermediate #1	4 1/2	11.6	P-110	Surface	9548 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 as per customer request
Depth referenced to Kelly Bushing at 24 FT
Marker Joint logged at 5583 FT - 5698 FT
Log ran from 9522 FT to Surface
Recorded with 0 PSI Surface Induced Pressure

Thank you for choosing Reliance Oilfield Services, LLC!!

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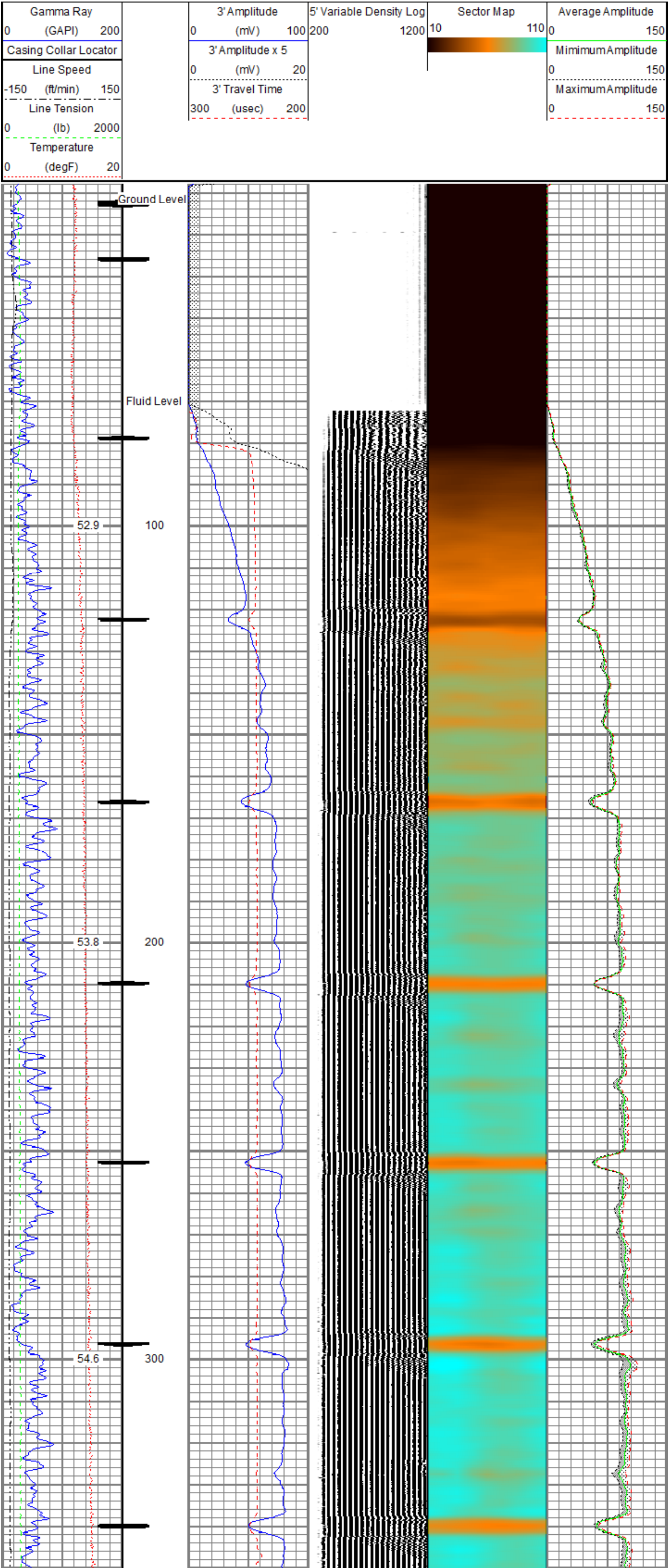
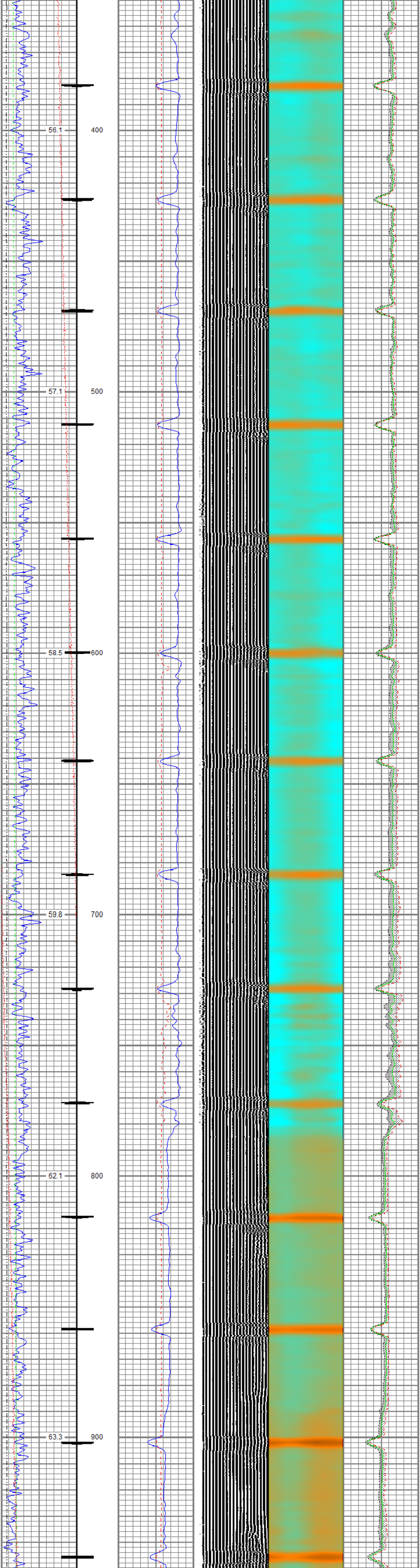
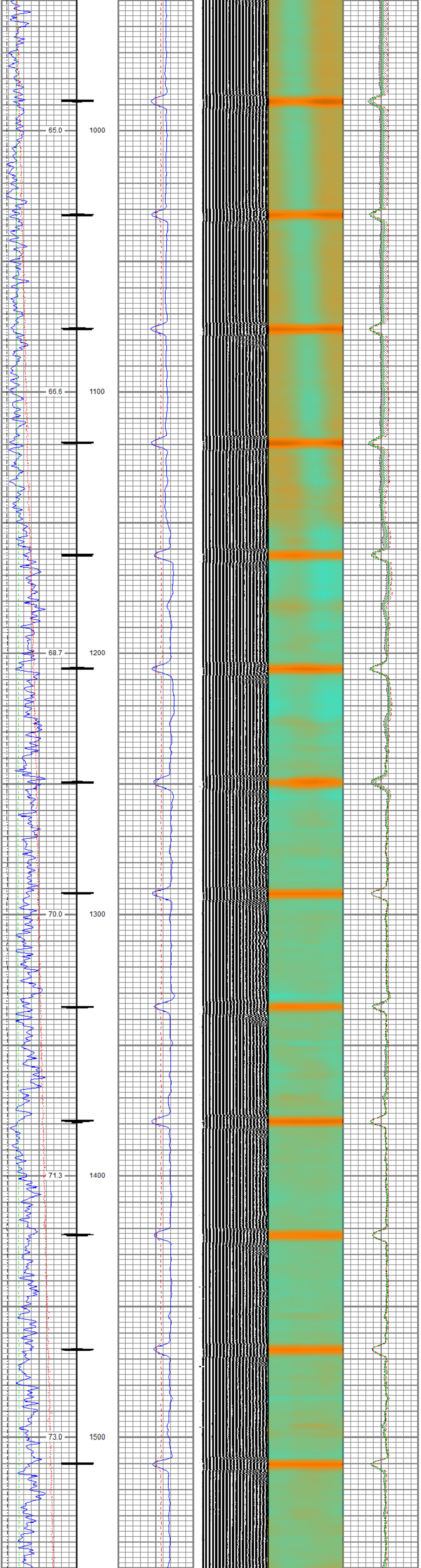
Main Pass

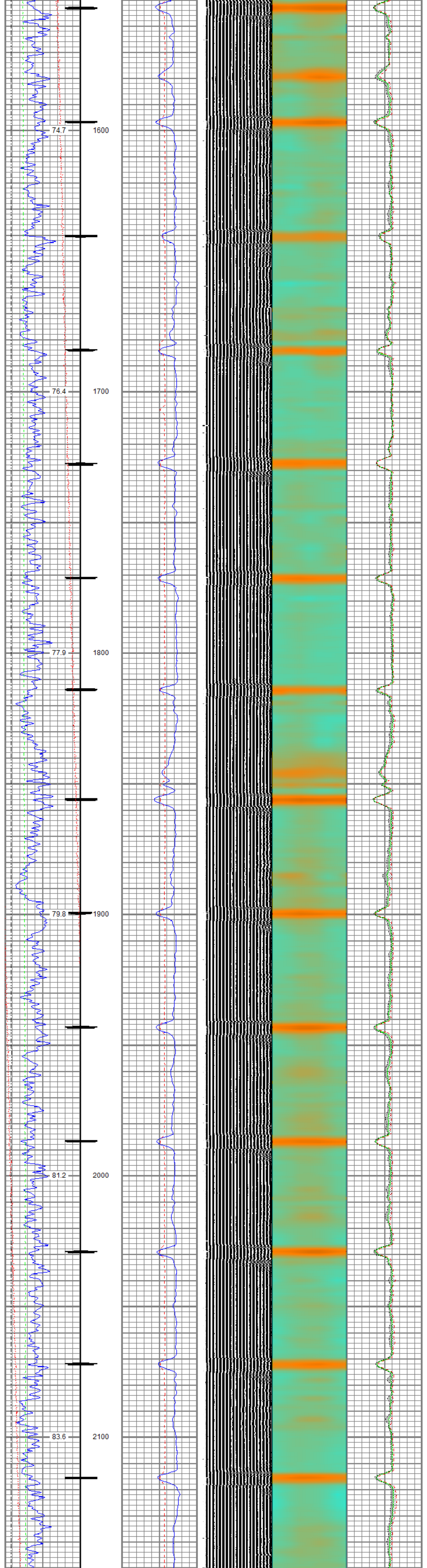
Recorded with 0 PSI Surface Induced Pressure

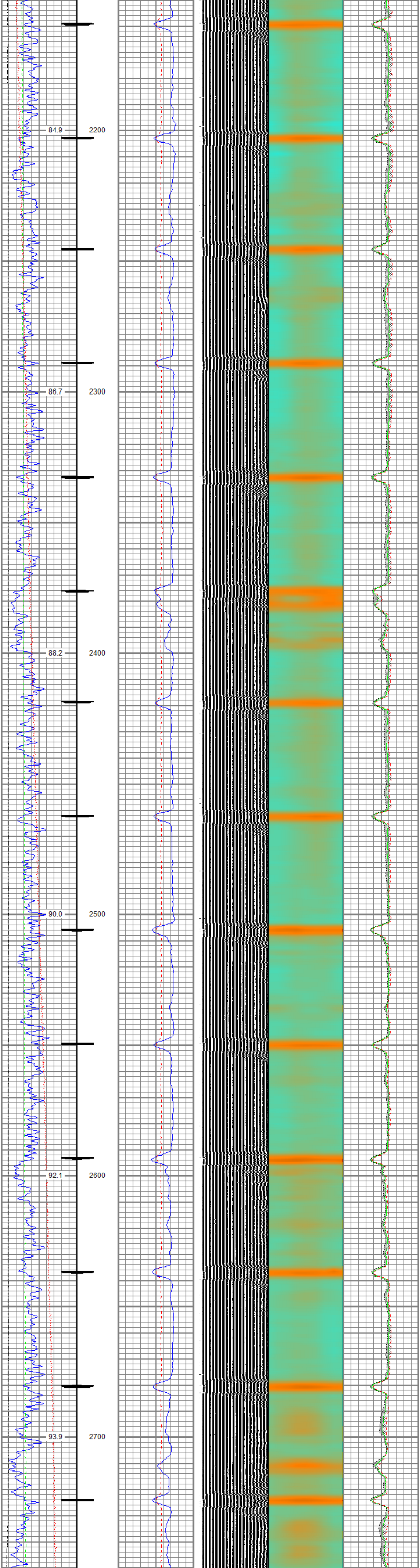
Database File	tep_ware sr 23-12_rbl_12-08-17\tep_ware sr 23-12_rbl_12-08-17.db
Dataset Pathname	main
Presentation Format	ros_rbt004_tep
Dataset Creation	Fri Dec 08 13:59:08 2017
Charted by	Depth in Feet scaled 1:240

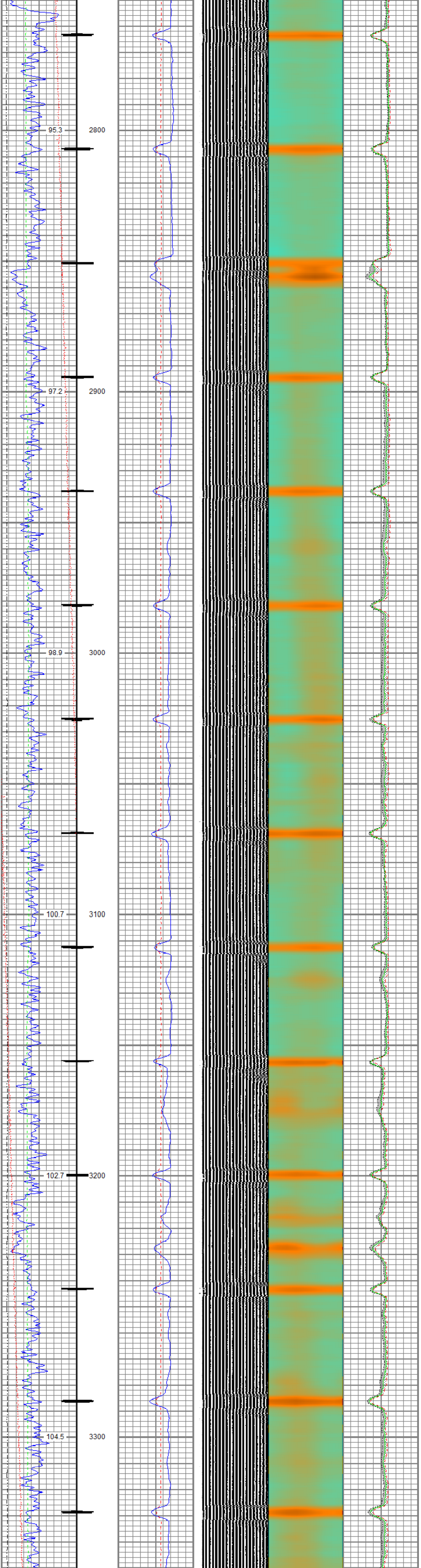


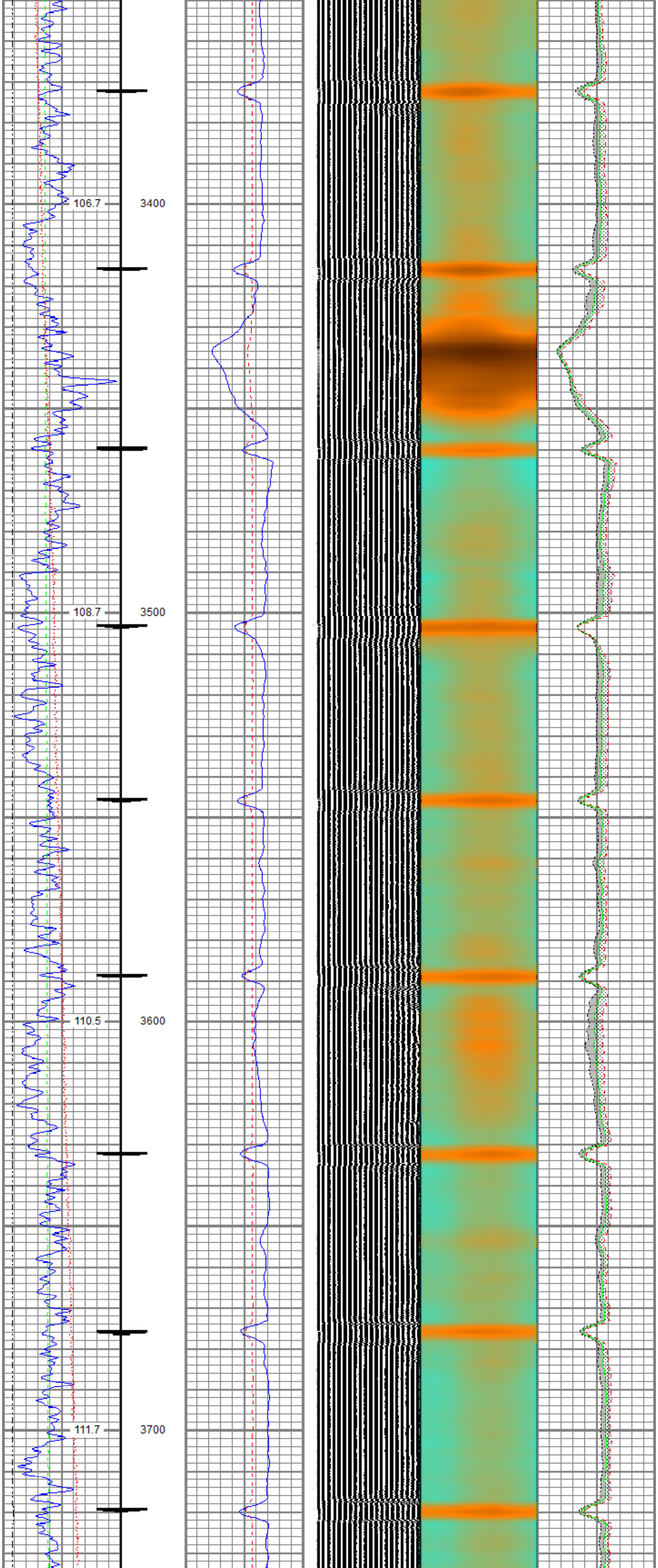


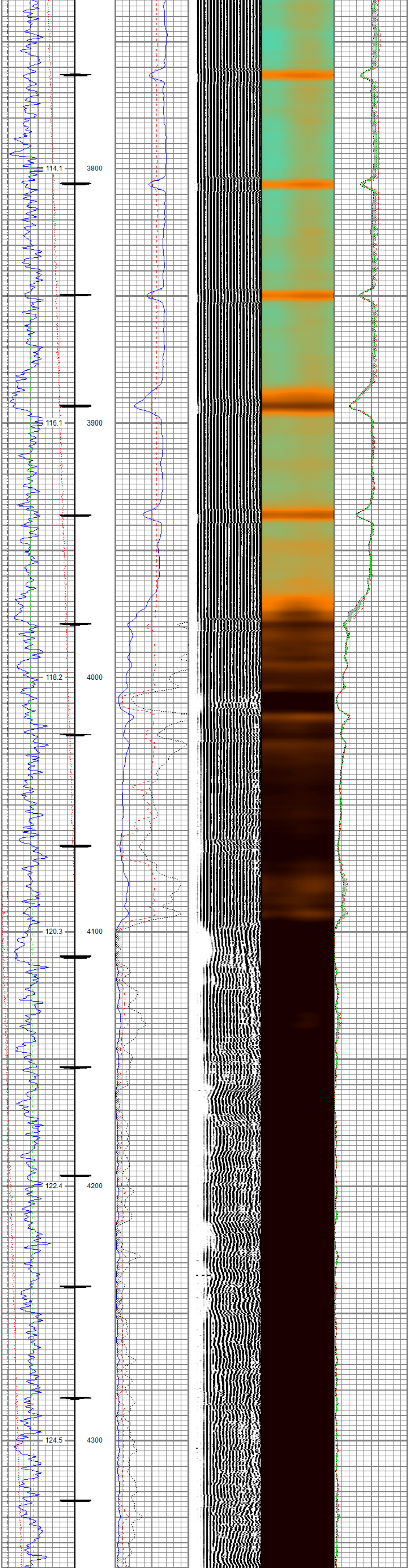








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116.1
3900
118.2
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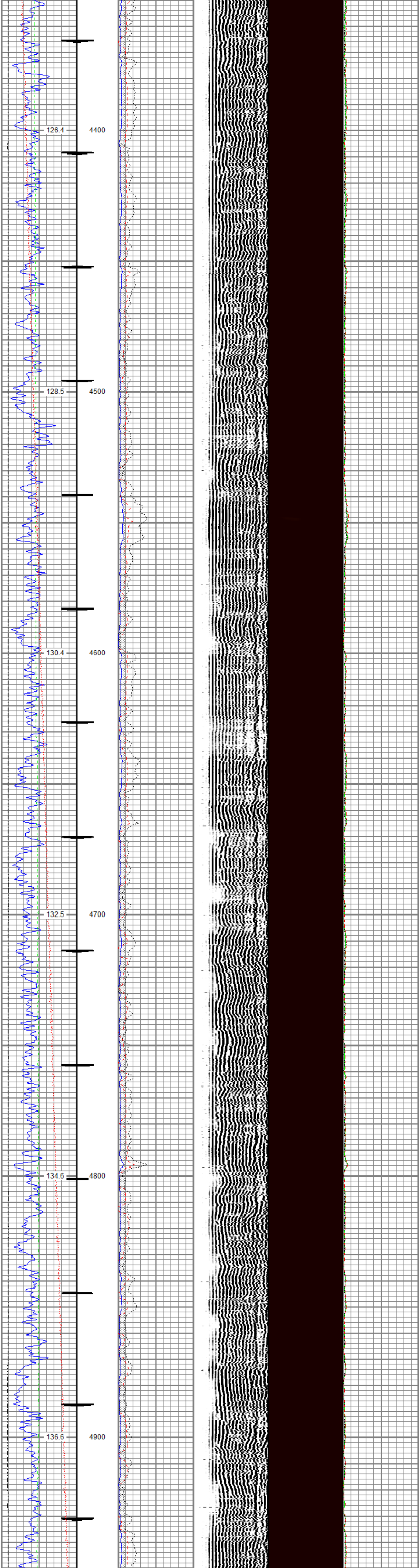
120.3
4100
122.4
4200
124.5
4300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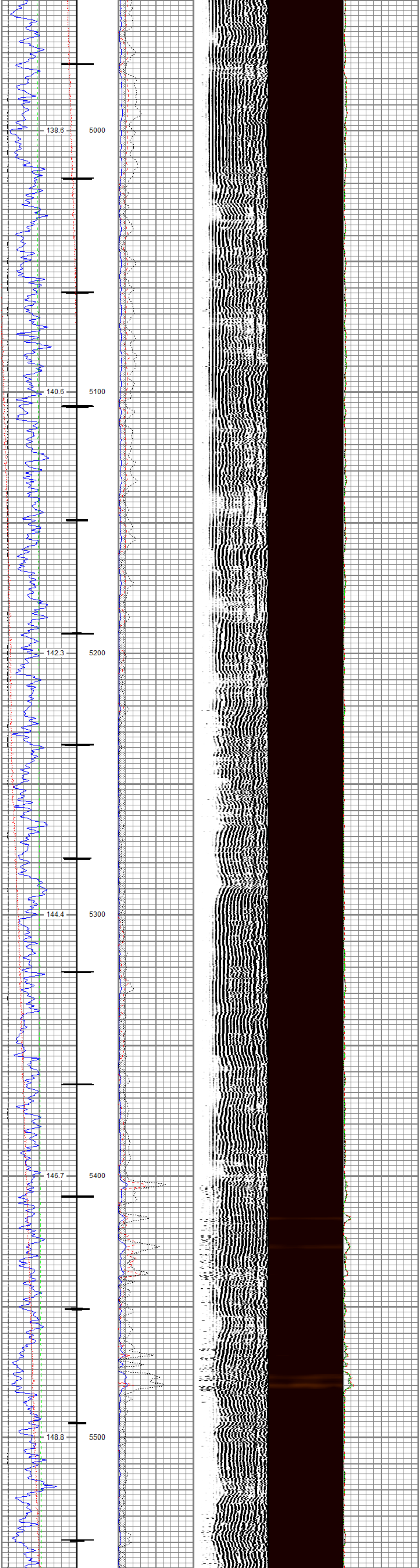
128.5
4500
130.4
4600
132.5
4700
134.6
4800
136.6
4900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5000
140.6
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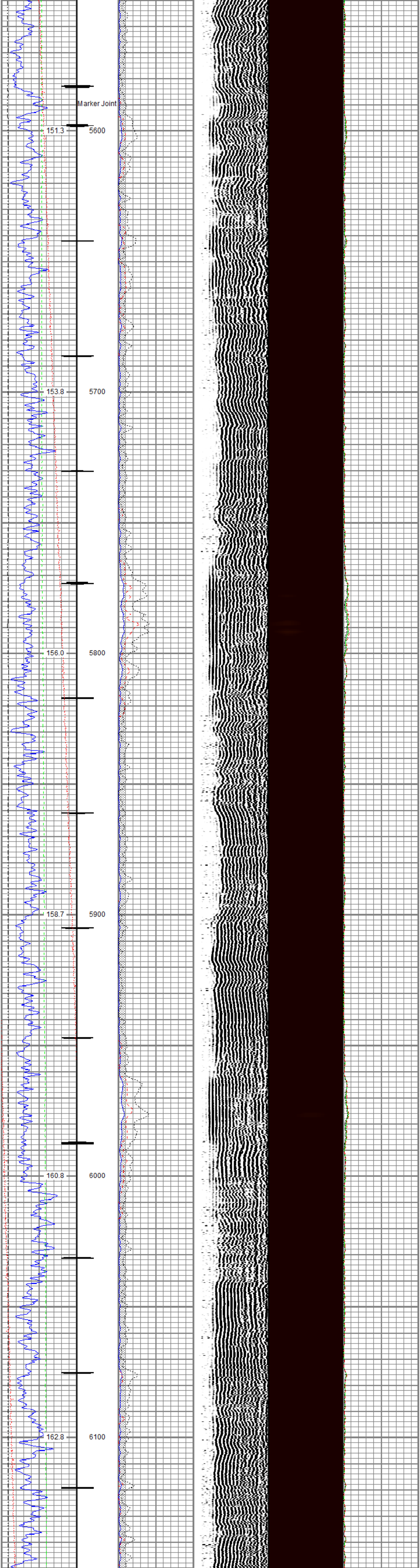
142.3
5200
144.4
5300
146.7
5400
148.8
5500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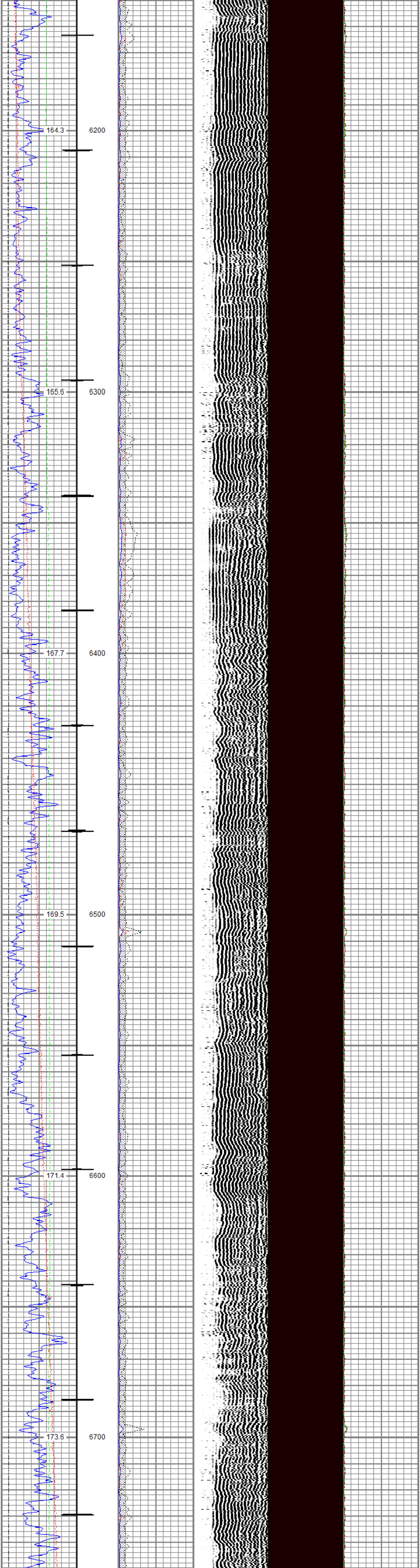
5900
160.8
6000
162.8
6100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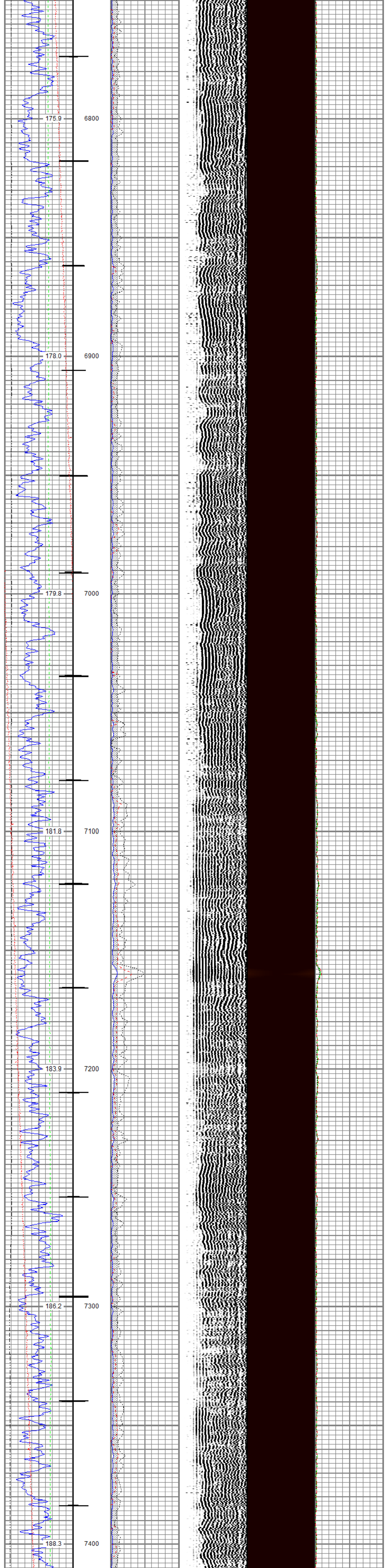
171.4
6600
173.6
6700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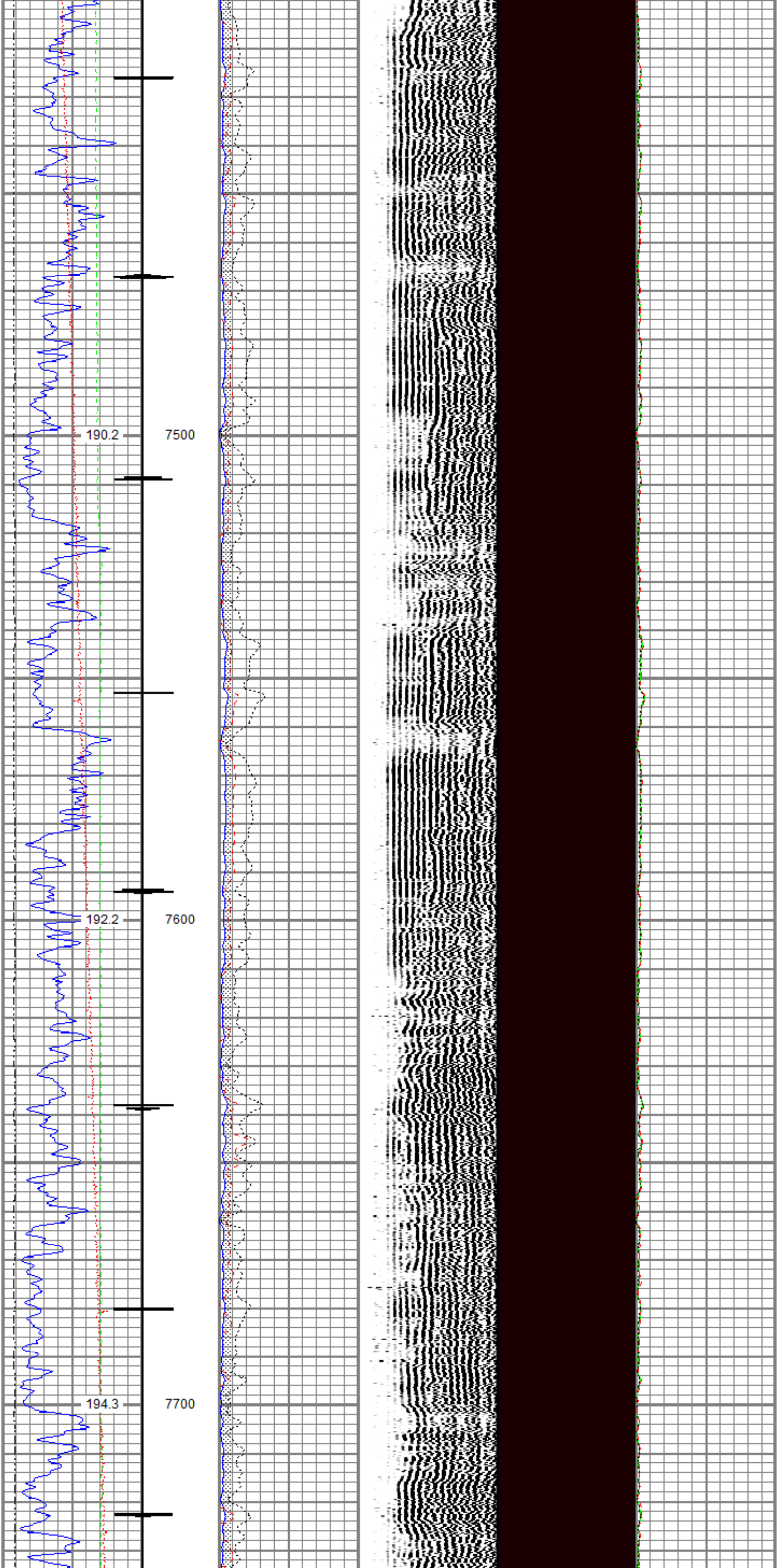
7400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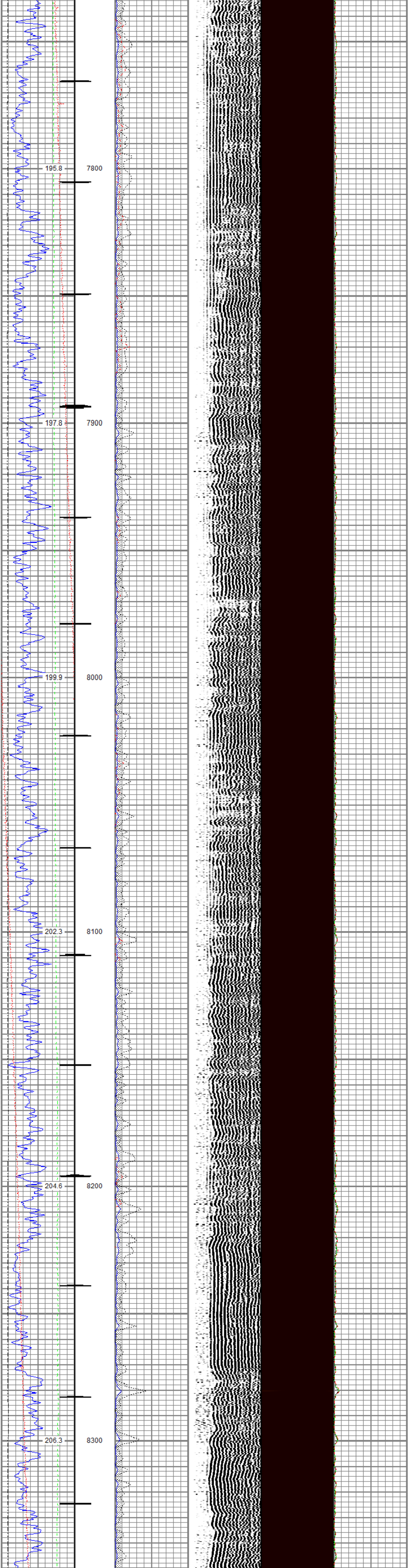
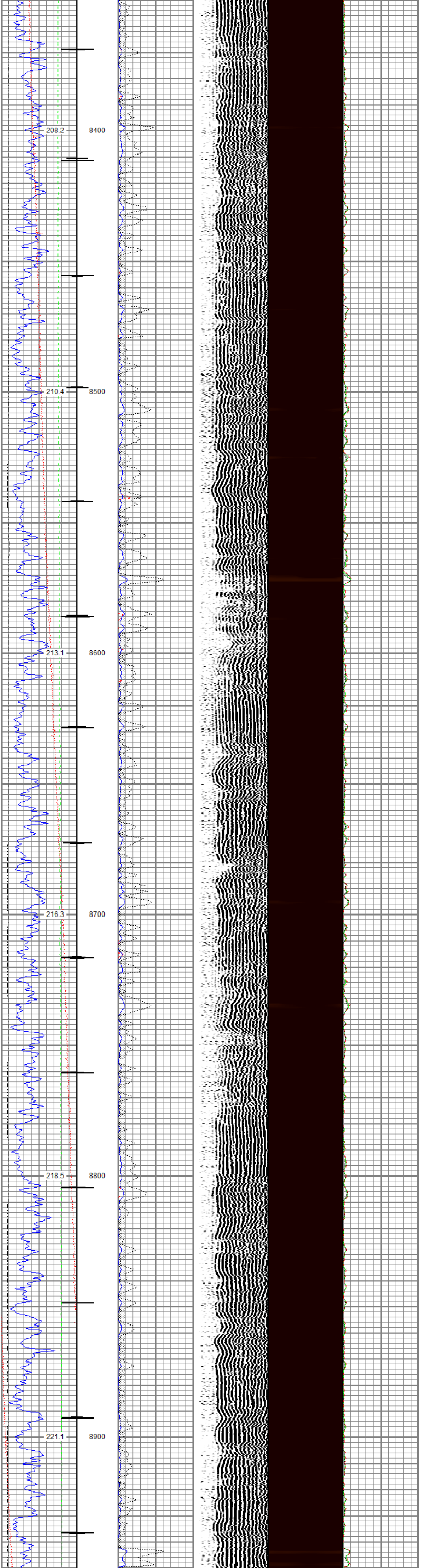
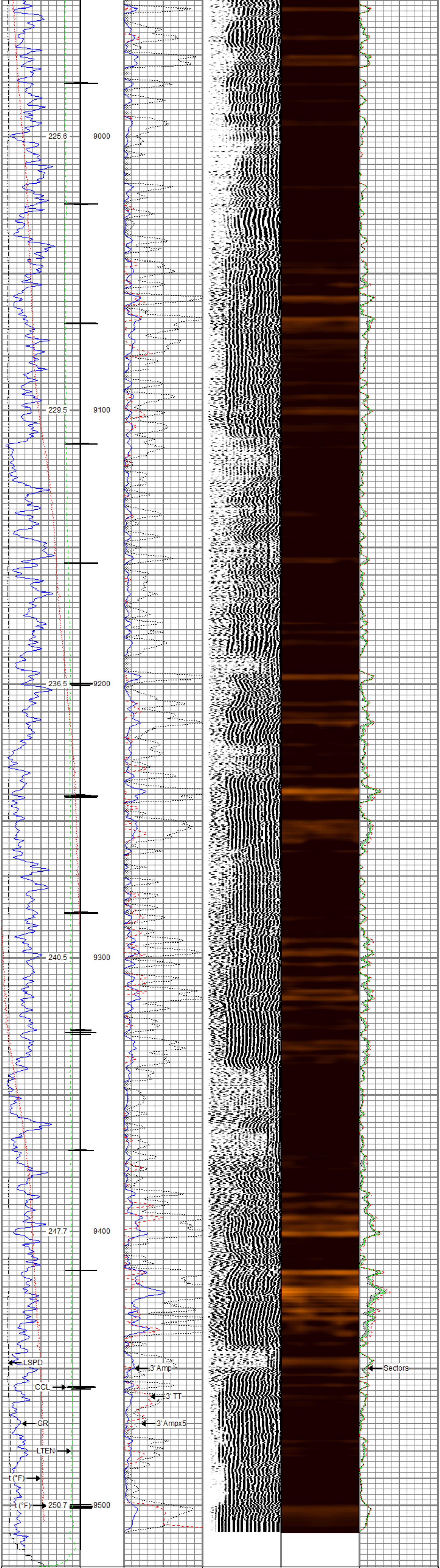
194.3
7700







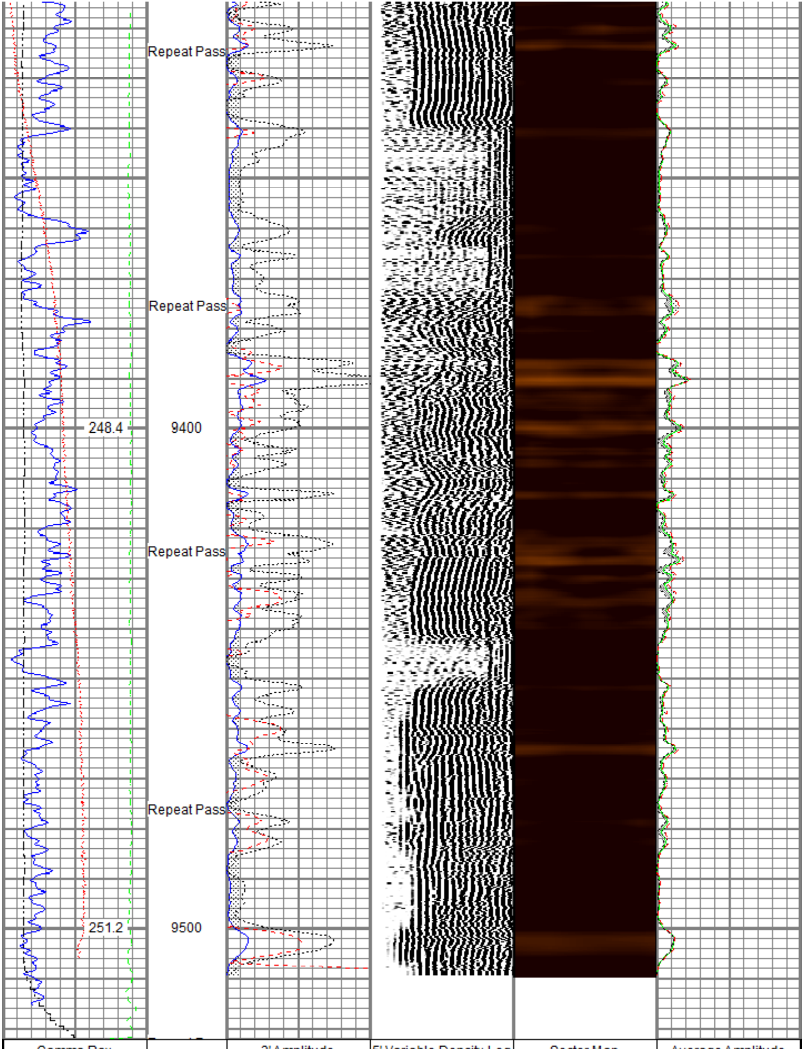
Gamma Ray	3' Amplitude	5' Variable Density Log	Sector Map	Average Amplitude
0 (GAPI) 200	0 (mV) 100	200 1200	10 110	0 150
Casing Collar Locator	3' Amplitude x 5			Mimimum Amplitude
	0 (mV) 20			0 150
Line Speed	3' Travel Time			Maximum Amplitude
-150 (ft/min) 150	300 (usec) 200			0 150
Line Tension	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

Repeat Pass

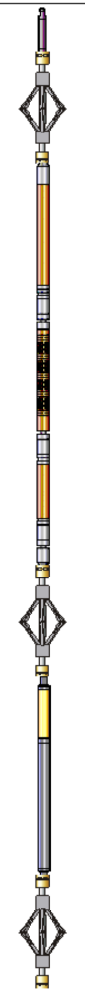
Recorded with 0 PSI Surface Induced Pressure

Database File	tep_ware sr 23-12_rbl_12-08-17\tep_ware sr 23-12_rbl_12-08-17.db
Dataset Pathname	Repeat
Presentation Format	ros_rbt004_tep
Dataset Creation	Fri Dec 08 13:55:54 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			MimimumAmplitude
-150 (ft/min) 150		0 (mV) 20			0 150
Line Tension		3' Travel Time			MaximumAmplitude
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			MimimumAmplitude
-150 (ft/min) 150		0 (mV) 20			0 150
Line Tension		3' Travel Time			MaximumAmplitude
0 (lb) 2000		300 (usec) 200			0 150
Temperature					
0 (degF) 20					

Sensor	Offset (ft)	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
HeadVolt	18.84					
Temp	16.05					
			Probe_RADII-C-P_RBT_2750 (101013) Probe 2-3/4" Sector Cement Bond Tool with Temperature Probe	9.19	2.75	105.00
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					
			DSS_RAC-RAC_5-Arm 5 Arm 2-3/4" Roller Centralizer	2.55	2.75	32.00
DCCL	6.18					
CCL	6.18					
GR	4.96		Probe_GR_CCL-P_CGR_2750_S (FW1 Probe 2-3/4" Digital CCL / Gamma Ray Combined	304.548)	2.75	55.00
			DSS_RAC-RAC_5-Arm 5 Arm 2-3/4" Roller Centralizer	2.55	2.75	32.00

Dataset:	tep_ware sr 23-12_rbl_12-08-17.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 23-12_rbl_12-08-17\tep_ware sr 23-12_rbl_12-08-17.db
Dataset Pathname	main
Dataset Creation	Fri Dec 08 13:59:08 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:	31.410	ft

Master Calibration, performed Fri Dec 08 09:23:28 2017:

	Raw (v)		Calibrated (mv)		Results	
	Zero	Cal	Zero	Cal	Gain	Offset
3'	-0.005	0.763	0.000	81.196	105.707	0.515
CAL	0.759	0.748				
5'	-0.003	0.687	0.000	81.196	117.625	0.382
SUM						
S1	-0.005	0.752	0.000	100.000	132.180	0.629
S2	-0.005	0.755	0.000	100.000	131.641	0.654
S3	-0.006	0.742	0.000	100.000	133.699	0.774
S4	-0.004	0.759	0.000	100.000	131.020	0.549
S5	-0.005	0.752	0.000	100.000	132.148	0.600
S6	-0.004	0.758	0.000	100.000	131.110	0.578
S7	-0.006	0.750	0.000	100.000	132.340	0.785
S8	-0.004	0.767	0.000	100.000	129.647	0.516

Internal Reference Calibration, performed (Not Performed):

	Raw (v)		Calibrated (v)		Results	
	Zero	Cal	Zero	Cal	Gain	Offset
CAL	0.000	0.000	0.759	0.748	1.000	0.000

Air Zero Calibration, performed Fri Dec 08 09:23:52 2017:

	Raw (v)	Calibrated (v)	Results
	Zero	Zero	Offset
3'	-0.005	0.000	-0.000
5'	-0.003	0.000	-0.001
SUM			
S1	-0.005	0.000	-0.000
S2	-0.005	0.000	-0.000
S3	-0.006	0.000	0.000
S4	-0.004	0.000	-0.000
S5	-0.004	0.000	-0.001
S6	-0.004	0.000	-0.000
S7	-0.005	0.000	-0.001
S8	-0.004	0.000	-0.000

Company	TEP Rocky Mountain LLC
Well	Ware SR 23-12
Field	Rulison
County	Garfield
State	Colorado