RELIANCE OILFIELD SERVICES

Radial Cement Bond Gamma Ray Casing Collar Log

Company	TEP Rocky Mountain LLC
Well	Ware SR 524-12
Field	Rulison
County	Garfield
State	Colorado

Company TEP Rocky Mountain LLC

Well Ware SR 524-12

Field Rulison

County Garfield State Colorado

Location: API # : 05-045-23446

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	17-FEB-2018
Run Number	One
Depth Driller	9761 FT
Depth Logger	9690 FT
Bottom Logged Interval	9680 FT
Top Log Interval	Surface
Open Hole Size	8.750"
Type Fluid	Water
Density / Viscosity	8.34 lb/gal
Max. Recorded Temp.	247°F
Estimated Cement Top	See Log
Time Well Ready	ROA
Time Logger on Bottom	12:30
Equipment Number	HD-0359
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	1139 FT
Intermediate #1	4 1/2	11.6	P-110	Surface	9721 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 from 6149-6170 FT
Log ran from 9680 FT to Surface
Recorded with 0 PSI Surface Induced Pressure

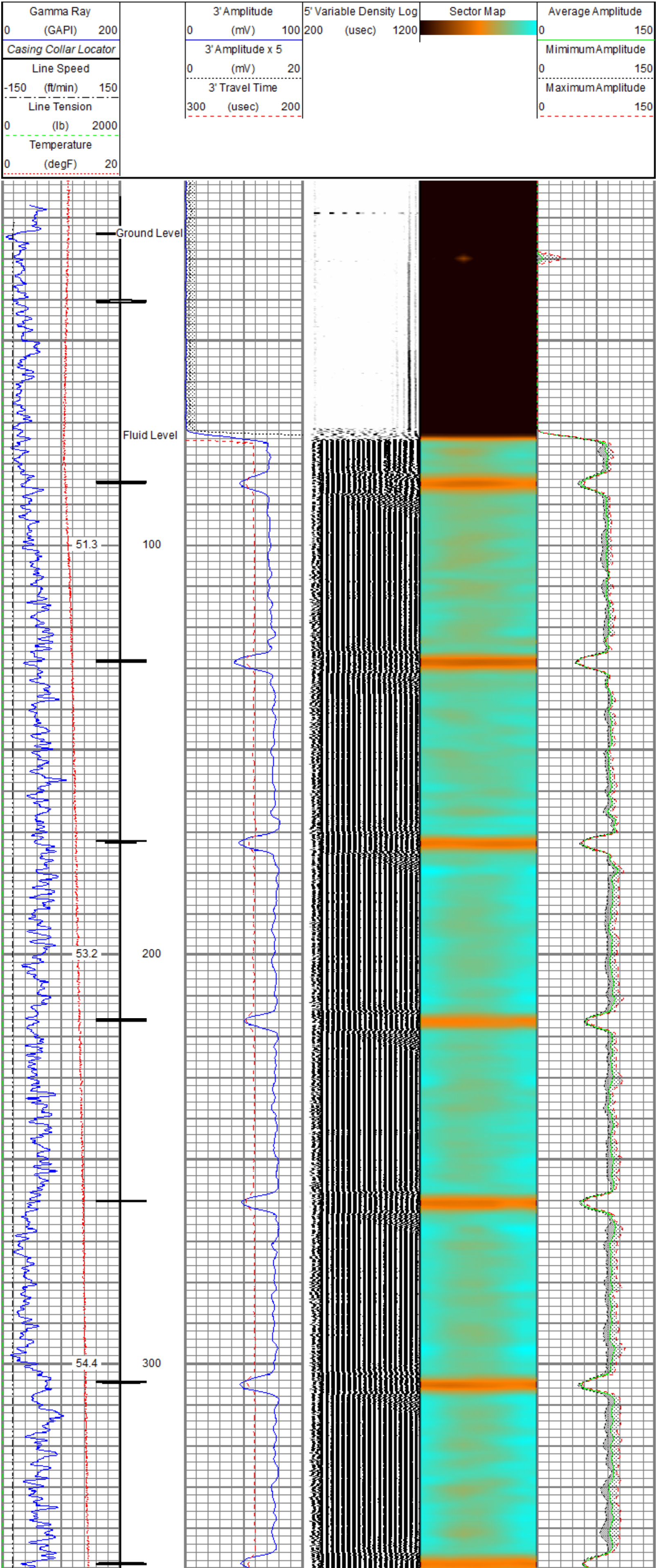
Thank you for choosing Reliance Oilfield Services, LLC!!

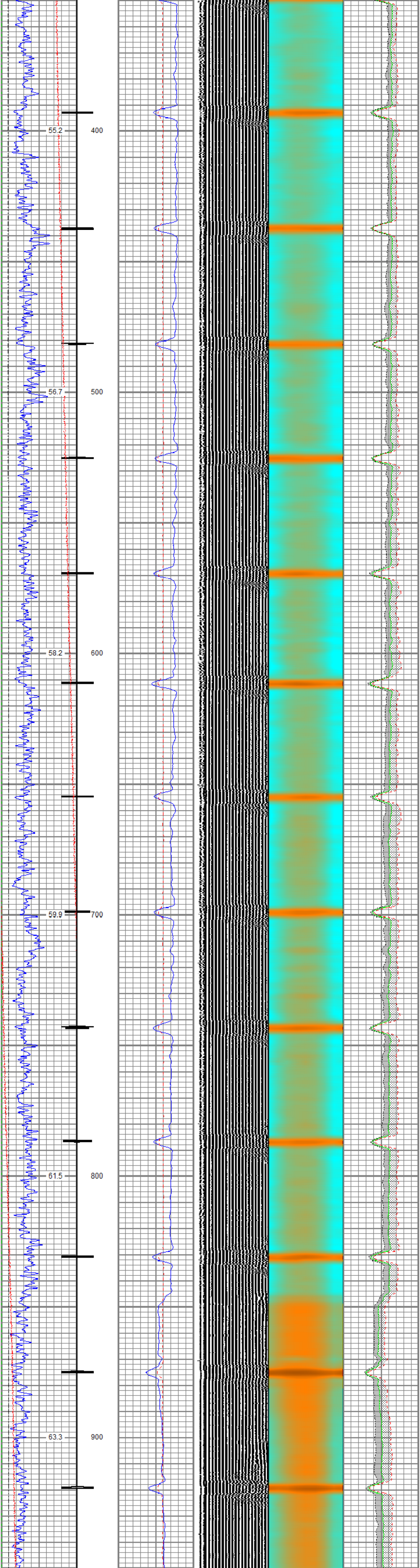
RELIANCE OILFIELD SERVICES

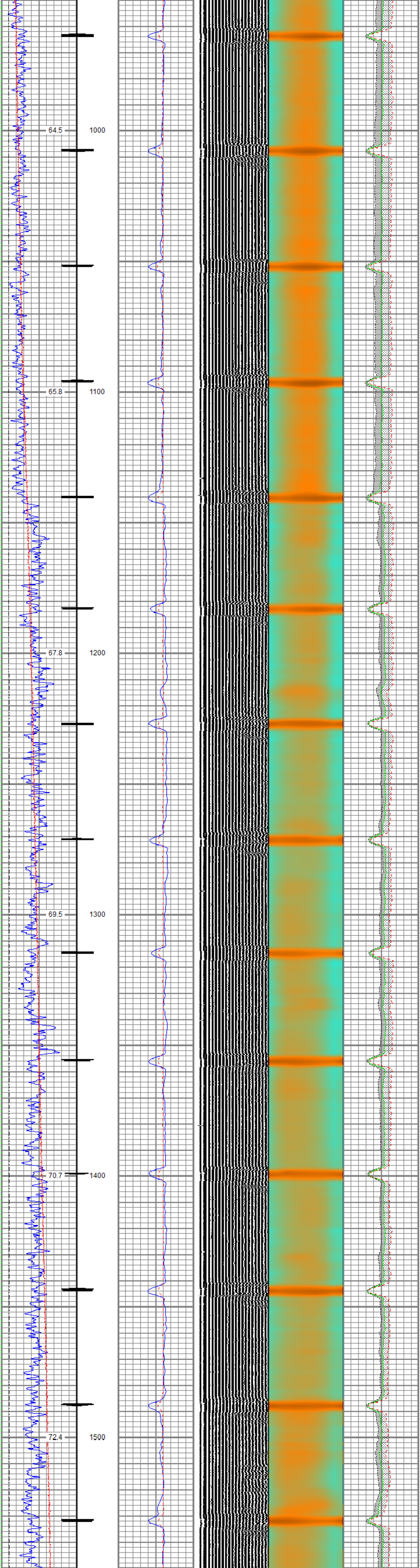
Main Pass

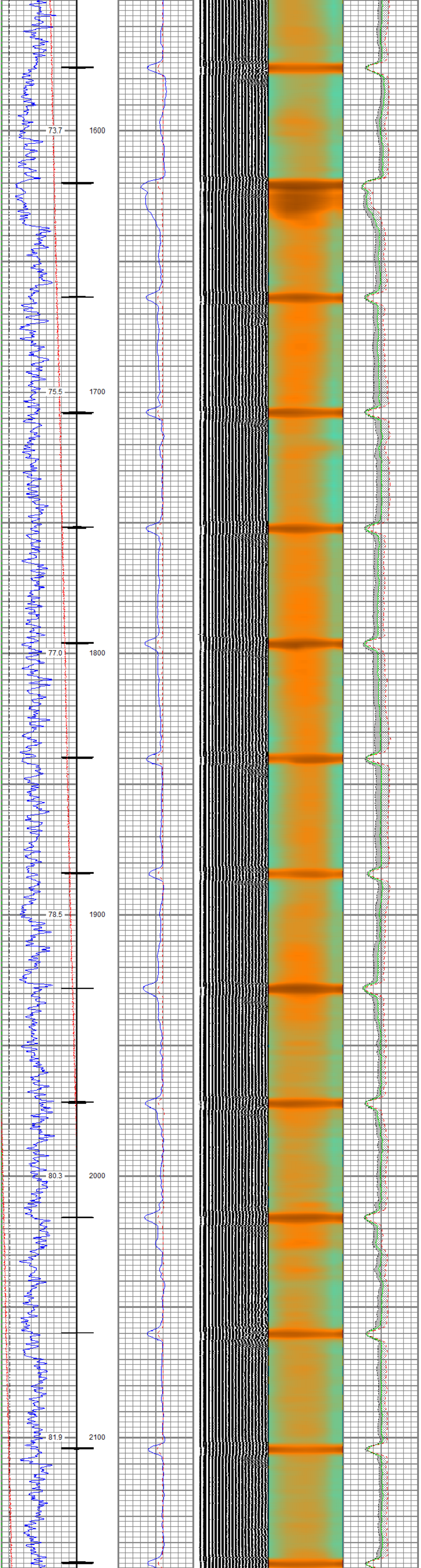
Recorded with 0 PSI Surface Induced Pressure

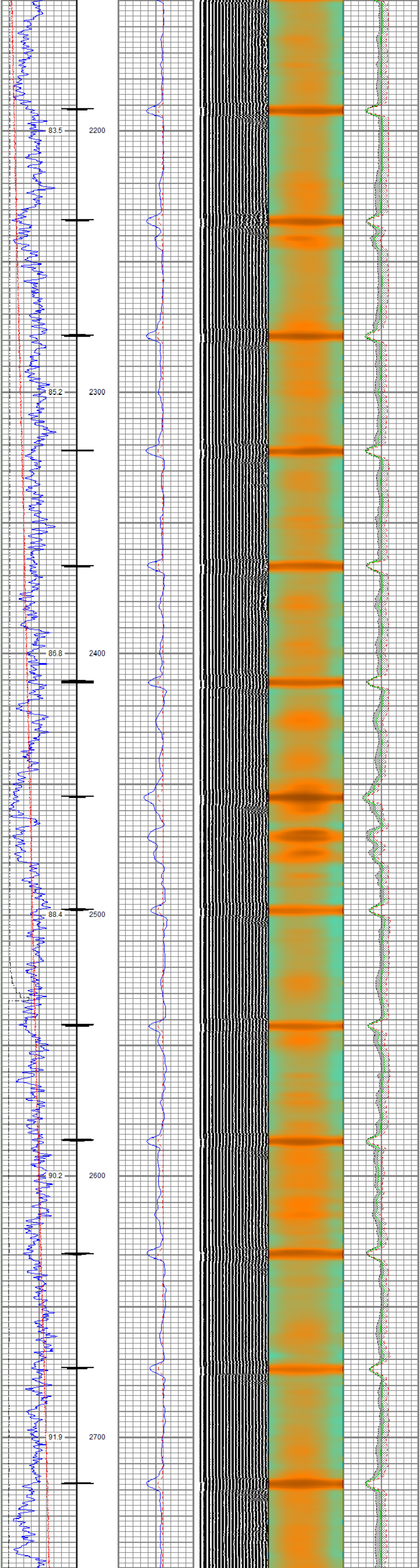
Database File	tep\sr 524-12\processed_tep_ware sr 524-12_rbl_02-17-18.db
Dataset Pathname	main
Presentation Format	ros_rbt004_tep
Dataset Creation	Sat Feb 17 12:57:06 2018
Charted by	Depth in Feet scaled 1:240

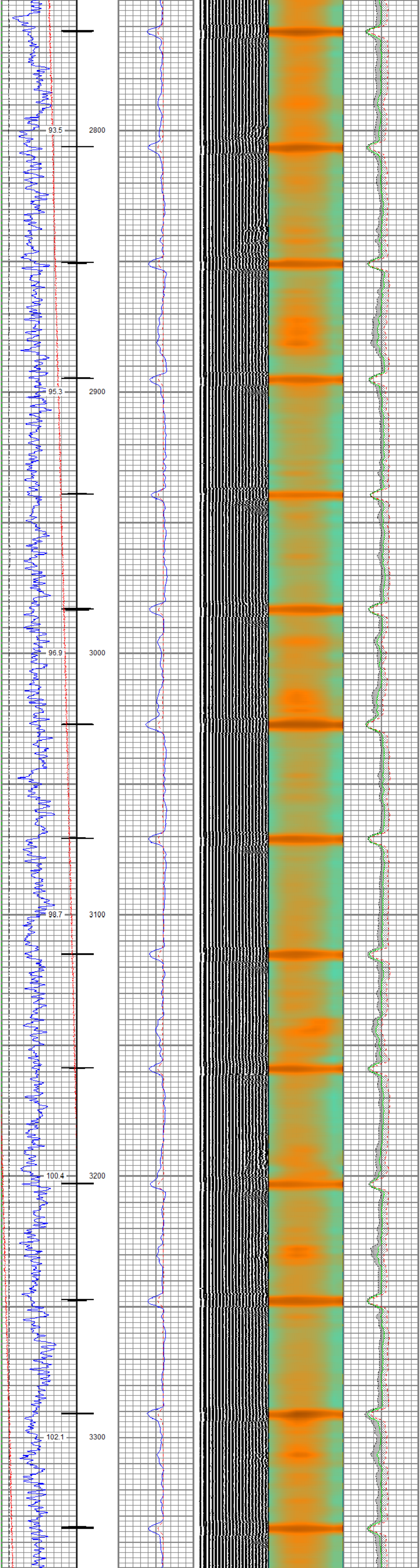


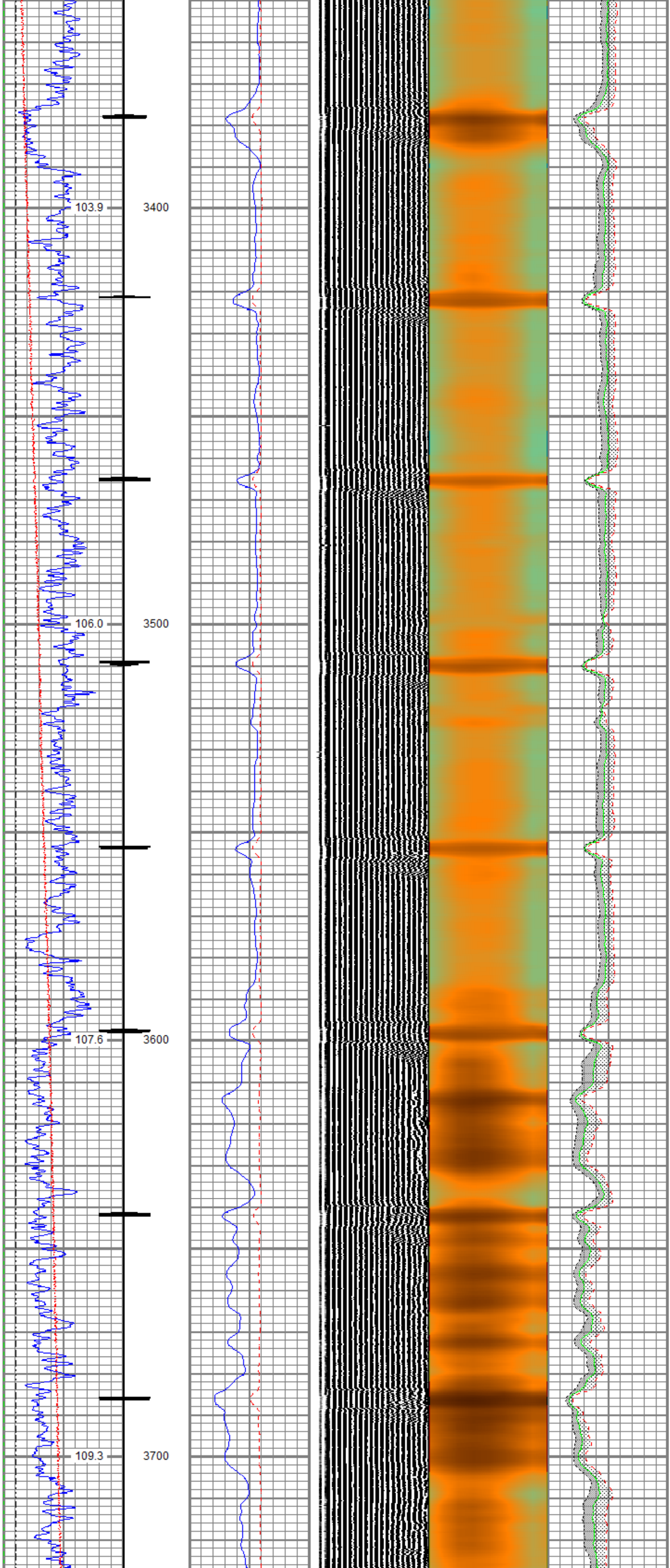


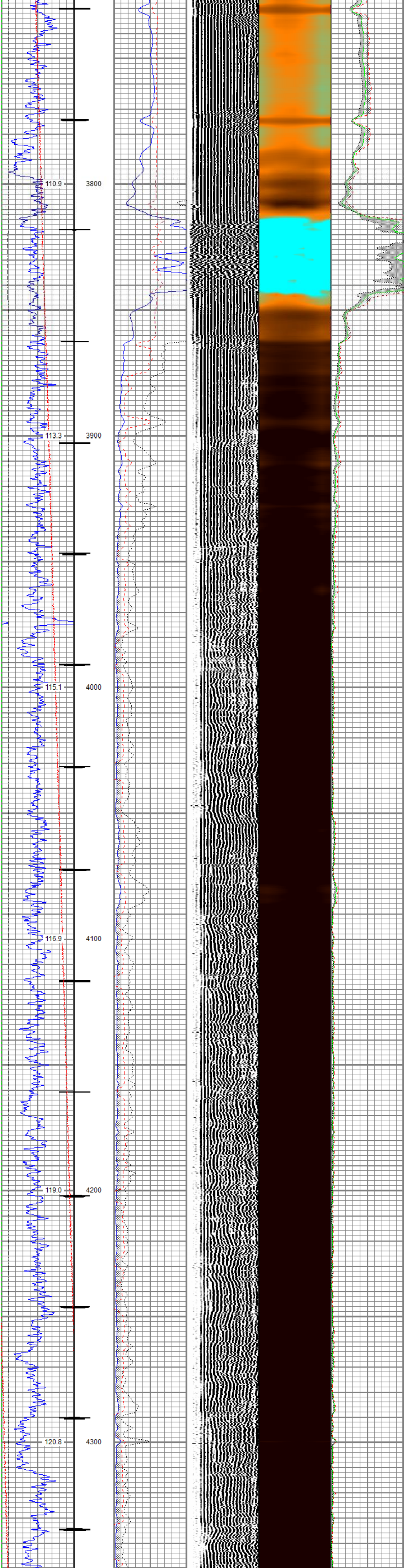








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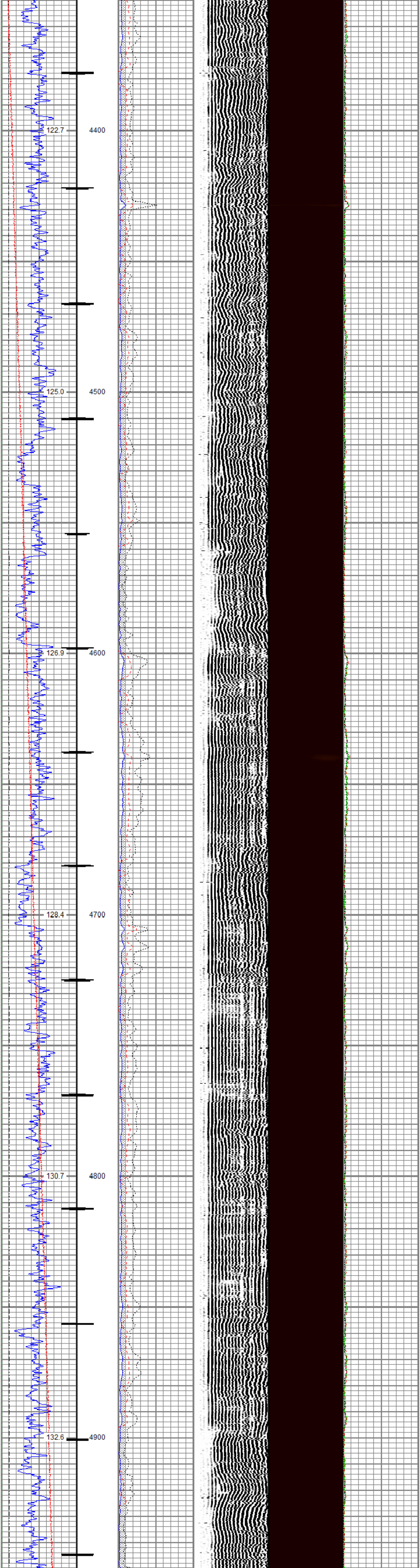
113.3
3900
115.1
4000
116.9
4100
119.0
4200
120.8
4300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130.7
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132.6
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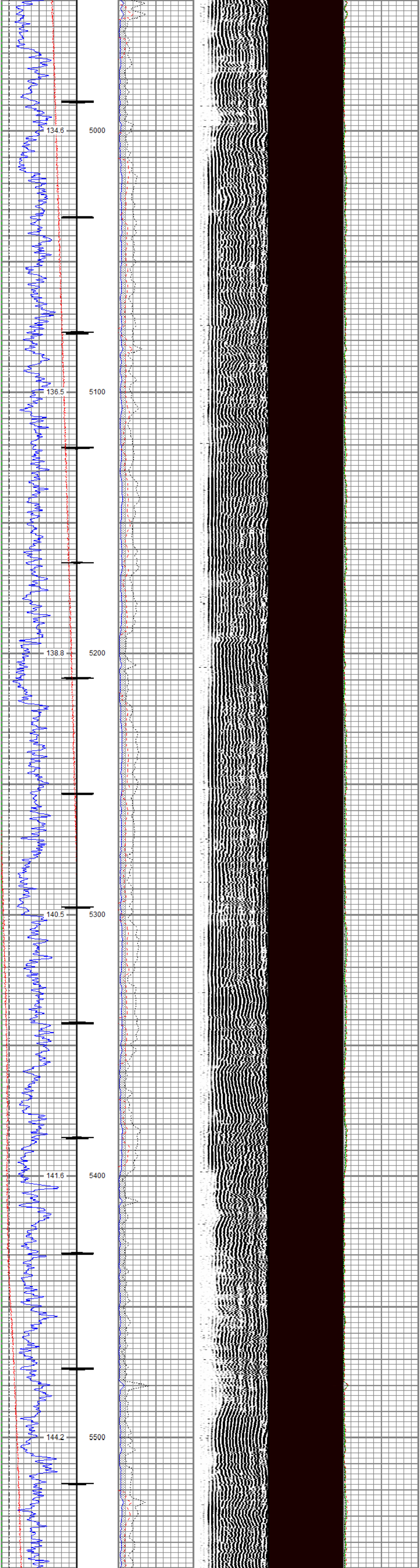
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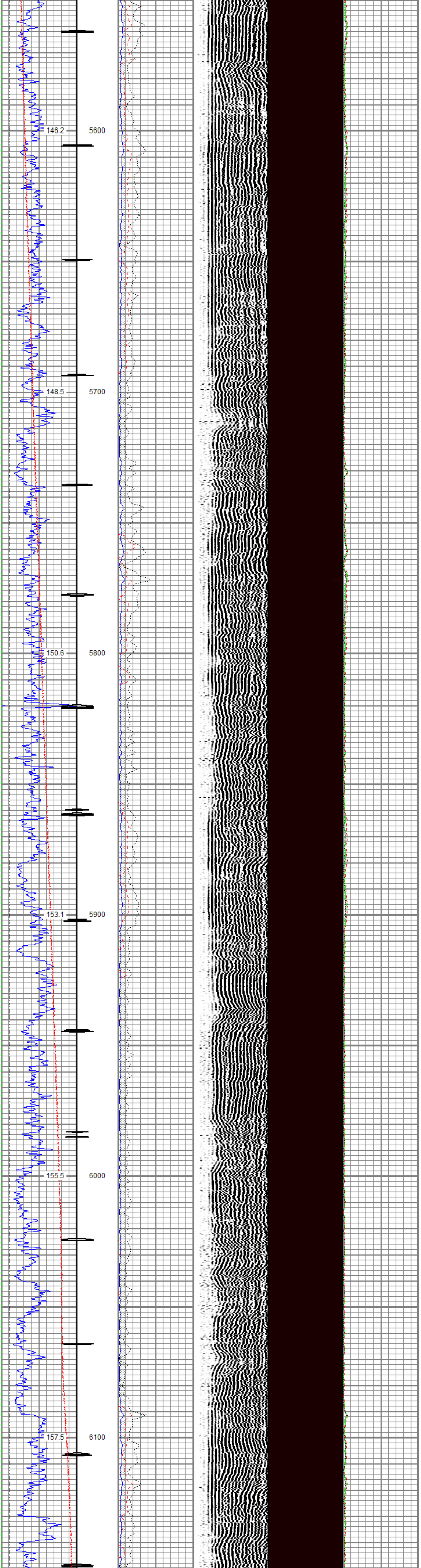
5400
144.2
5500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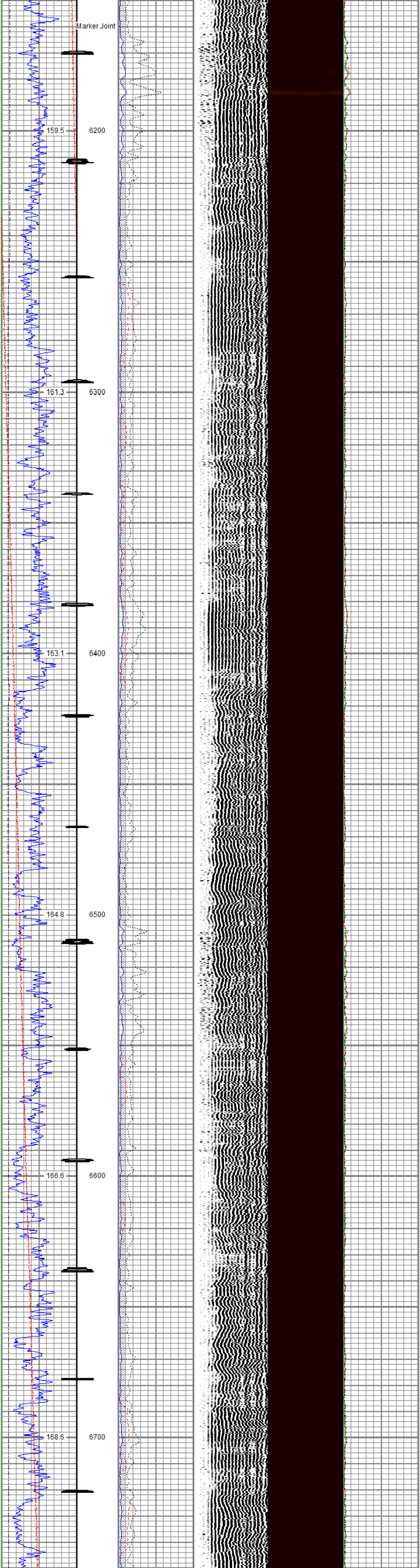
155.5
6000
157.5
6100


Marker Joint
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6400
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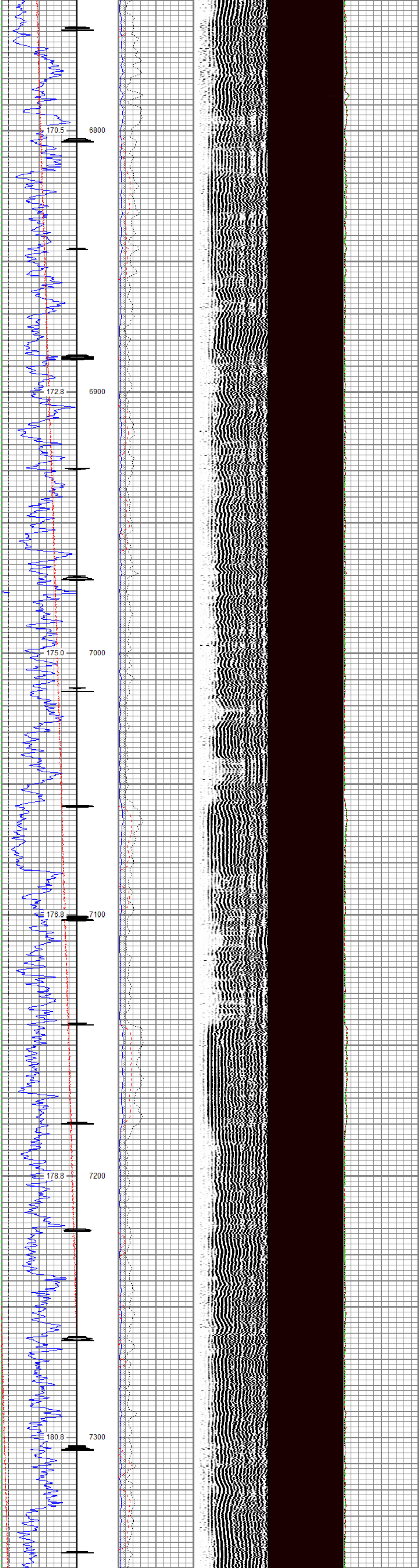
6500
166.6
6600
168.6
6700



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180.8
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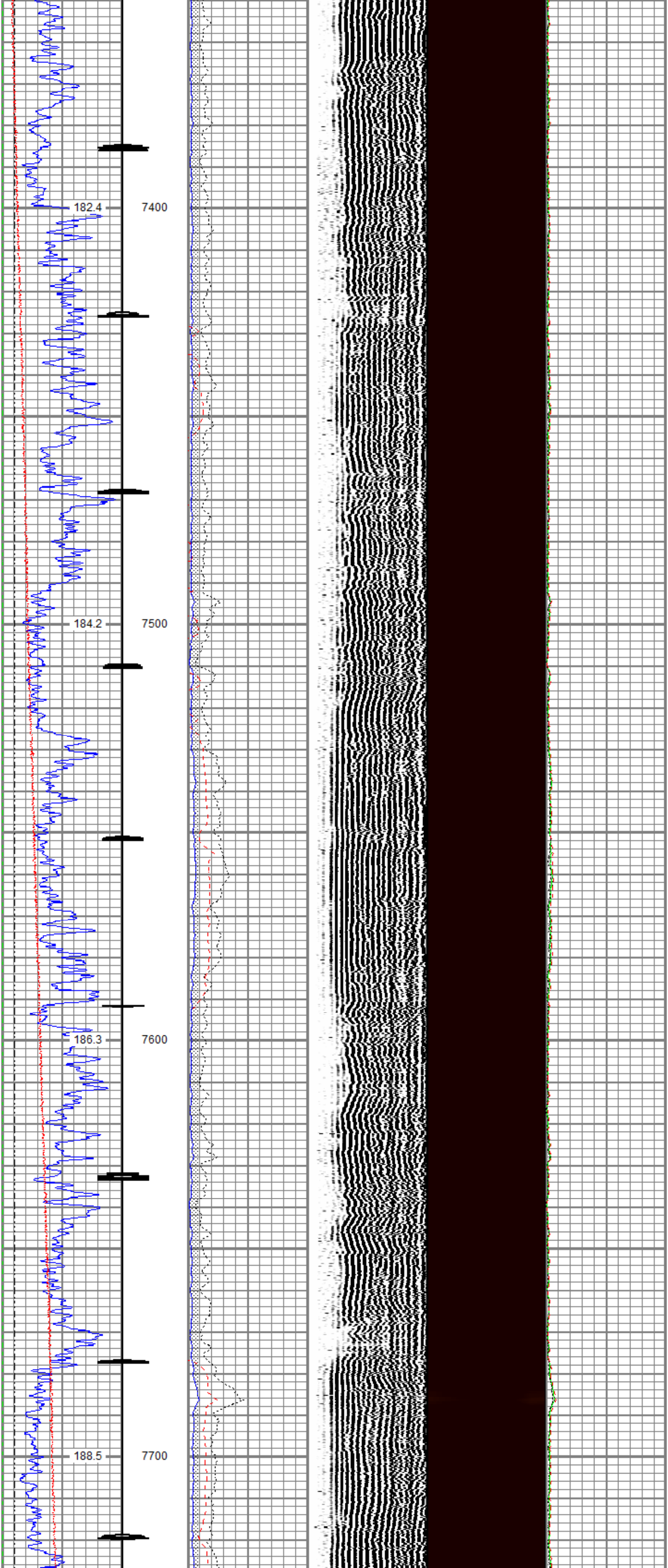
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188.5
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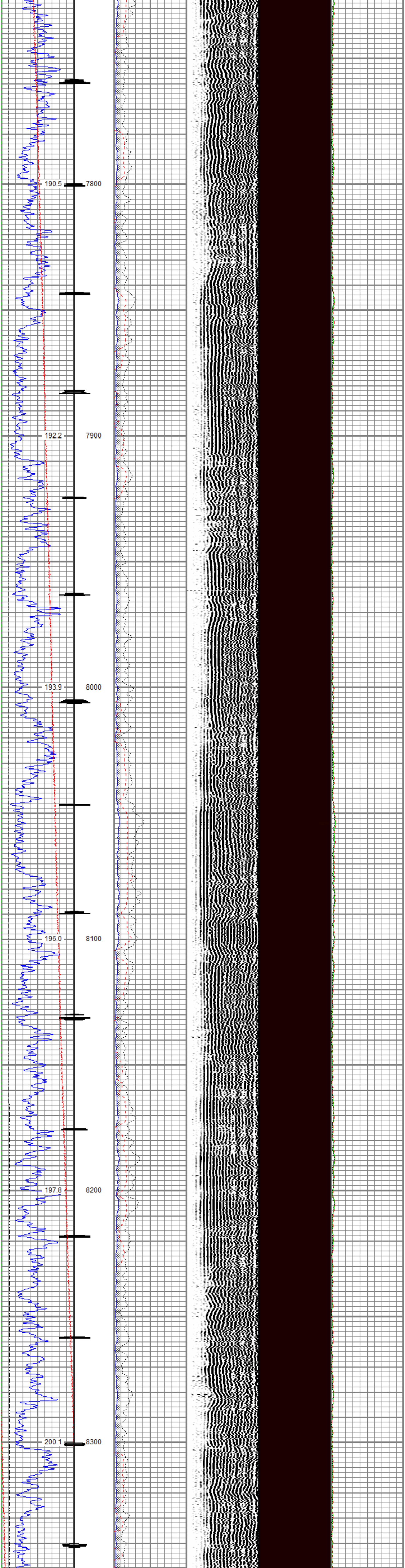

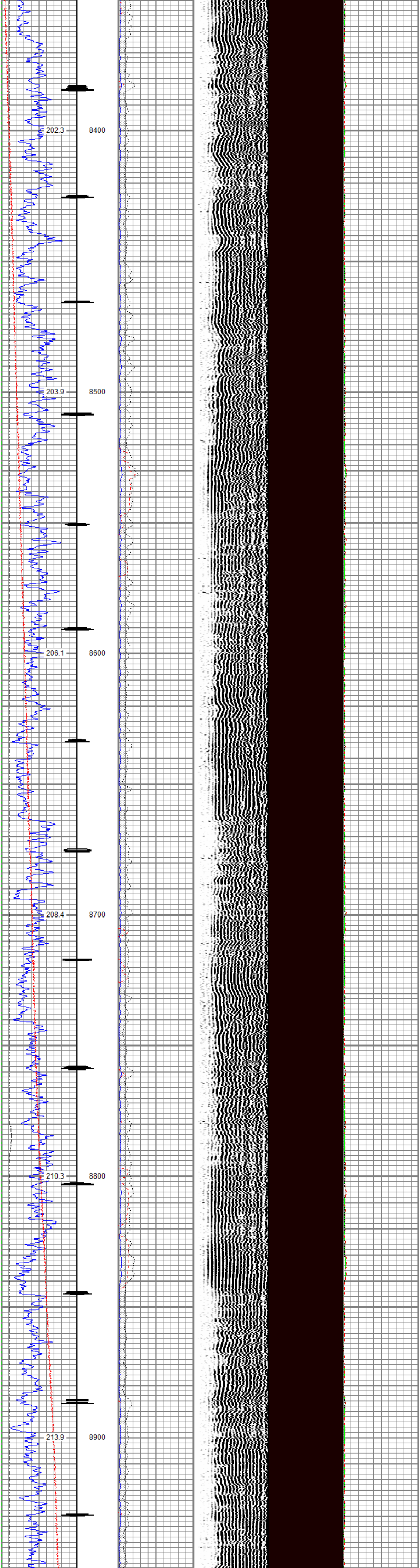

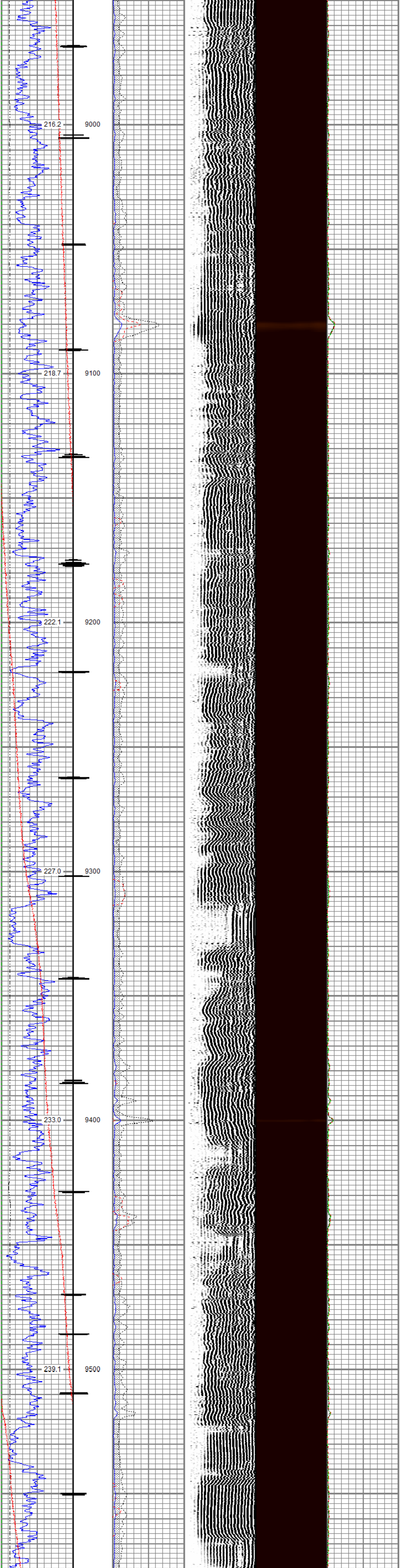

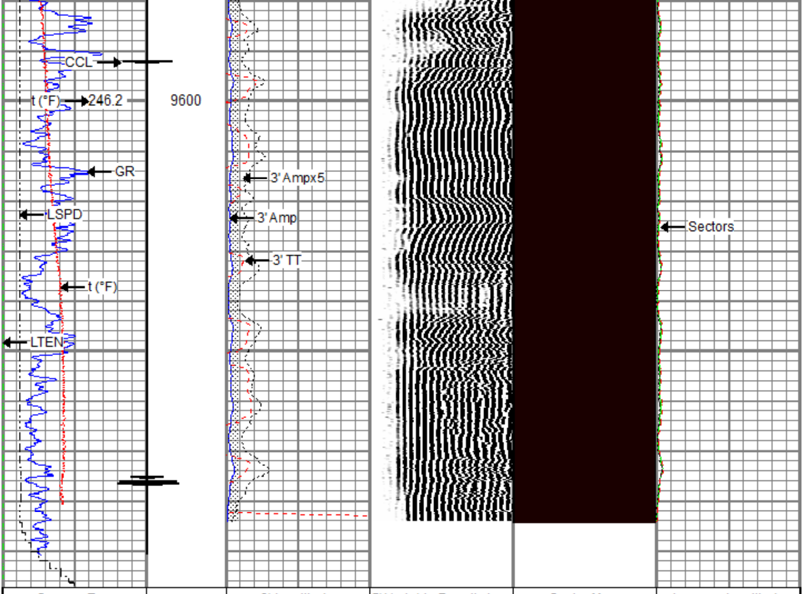

Gamma Ray		3' Amplitude	5' Variable Density Log	Sector Map	Average Amplitude
0 (GAPI) 200 *Casing Collar Locator* Line Speed -150 (ft/min) 150 Line Tension 0 (lb) 2000 Temperature 0 (degF) 20		0 (mV) 100 3' Amplitude x 5 0 (mV) 20 3' Travel Time 300 (usec) 200	200 (usec) 1200		0 150 Mimimum Amplitude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

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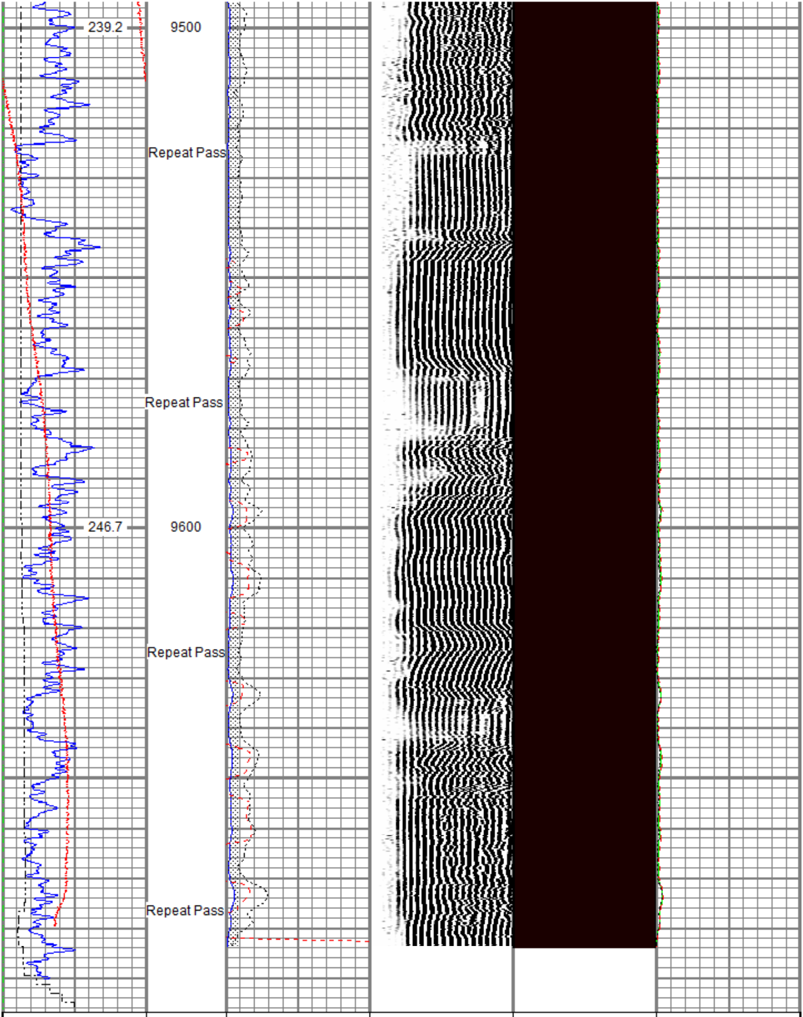
Repeat Pass

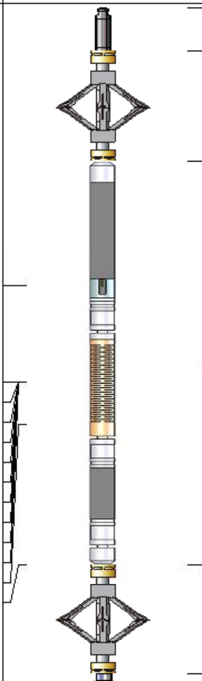
Recorded with 0 PSI Surface Induced Pressure

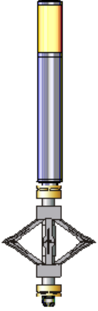
Database File	tep\sr 524-12\processed_tep_ware sr 524-12_rbl_02-17-18.db
Dataset Pathname	repeat
Presentation Format	ros_rbt004_tep
Dataset Creation	Sat Feb 17 12:53:58 2018
Charted by	Depth in Feet scaled 1:240

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



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

Sensor	Offset (ft)	Schematic	Description	Length (ft)	O.D. (in)	Weight (lb
			Titan CHD-16875 GO Titan 1-11/16" Assembled Electric Cable Head w/ 1" Fishing Neck	1.03	1.69	5.40
			DSS RAC-2750 5A GO DSS 2-3/4" Roller 5 Arm Centralizer w/ GO Ends	2.55	2.75	32.00
TEMP	16.33					
			Probe Radii-2750 RBT (FW1305-098) Probe 2-3/4" Radial Cement Bond Tool with Integral Temperature Sub	9.39	2.75	105.00
WVFS8	14.10					
WVFS7	14.10					
WVFS6	14.10					
WVFS5	14.10					
WVFS4	14.10					
WVFS3	14.10					
WVFS2	14.10					
WVFS1	14.10					
WVFCAL	14.10					
WVF3FT	14.10					
WVF5FT	13.10					
HEADVOLT	9.85					
			DSS RAC-2750 5A GO DSS 2-3/4" Roller 5 Arm Centralizer w/ GO Ends	2.55	2.75	32.00



CCL$2	6.42				
CCL$1	6.42				
GR	5.18	Probe GR-CCL-2750 GOB (FW1307-038) Probe 2-3/4" rev.2 Digital Scintillation Gamma Ray/CCL Combined	4.51	2.75	55.00
		DSS RAC-2750 5A GO DSS 2-3/4" Roller 5 Arm Centralizer w/ GO Ends	2.55	2.75	32.00
		GO BN-14375 GO 1 7/16" Bull Nose with Go Box Top	0.25	1.44	1.00

Dataset:	PROCESSED_TEP_Ware SR 524-12_RBL_02-17-18.db: field/well/run1/main
Total length:	22.82 ft
Total weight:	262.40 lb
O.D.:	2.75 in

Calibration Report

Database File	C:\ProgramData\Warrior\Data\TEP\SR 524-12\PROCESSED_TEP_Ware SR 524-12_RBL_02-17-18.db
Dataset Pathname	main
Dataset Creation	Sat Feb 17 12:57:06 2018

Gamma Ray Calibration Report

Serial Number:	FW1307-038	
Tool Model:	2750 GOB	
Performed:	Sun Nov 12 12:44:12 2017	
Calibrator Value:	637.0	GAPI
Background Reading:	113.2	cps
Calibrator Reading:	1022.4	cps
Sensitivity:	0.7007	GAPI/cps

Segmented Cement Bond Log Calibration Report

Serial Number:	FW1305-098	
Tool Model:	2750 RBT	
Calibration Casing Diameter:	4.500	in
Calibration Depth:	113.296	ft

Master Calibration, performed Sat Feb 17 08:27:46 2018:

	Raw (v)		Calibrated (mv)		Results	
	Zero	Cal	Zero	Cal	Gain	Offset
3'	0.000	0.857	0.800	81.196	93.850	0.754
CAL	0.756	0.727				
5'	0.000	0.722	0.800	81.196	111.335	0.774
SUM						
S1	-0.008	0.756	0.000	100.000	130.800	1.087
S2	-0.004	0.799	0.000	100.000	124.544	0.509
S3	-0.005	0.886	0.000	100.000	112.287	0.535
S4	-0.004	0.995	0.000	100.000	100.116	0.402
S5	-0.004	1.018	0.000	100.000	97.855	0.410
S6	-0.004	0.945	0.000	100.000	105.277	0.473
S7	-0.005	0.859	0.000	100.000	115.809	0.557
S8	-0.004	0.786	0.000	100.000	126.592	0.525

Internal Reference Calibration, performed (Not Performed):

	Raw (v)		Calibrated (v)		Results	
	Zero	Cal	Zero	Cal	Gain	Offset
CAL	0.000	0.000	0.756	0.727	1.000	0.000

Air Zero Calibration, performed Sat Feb 17 06:03:26 2018:

	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:	FW1305-098	
Tool Model:	2750 RBT	
Performed:	Sun Nov 12 13:43:57 2017	
	Reference	Reading
Low Reference:	100.00 degF	109.43 degF
High Reference:	350.00 degF	405.87 degF
Gain:	0.84	
Offset:	7.72	
Delta Spacing	1	

RELIANCE OILFIELD SERVICES

Company	TEP Rocky Mountain LLC
Well	Ware SR 524-12
Field	Rulison
County	Garfield
State	Colorado