



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

Company Kerr-McGee Oil & Gas Onshore, L.P.

Well Vogl 23-36

Field Wattenberg

County Weld **State** Colorado

Location: API #: 0512331106

SEC 36 TWP 3N RGE 68W

Permanent Datum Ground Level **Elevation** 4817'

Log Measured From Ground Level **Elevation** 4817 FT

Drilling Measured From Kelly Bushing

Other Services
None

Elevation
K.B. 4832 FT
D.F. ---
G.L. 4817 FT

Date 27-MAR-2019

Run Number ONE

Depth Driller 8240

Depth Logger 1405 FT

Bottom Logged Interval 1400 FT

Top Log Interval Surface

Open Hole Size ---

Type Fluid Water

Density / Viscosity 8.34 lb/gal

Max Recorded Temp. 77°F

Estimated Cement Top See Log

Time Well Ready ROA

Time Logger on Bottom 12:49

Equipment Number HD-325

Location Platteville, CO

Recorded By J.Morrison

Witnessed By Demesio Gomez

Run Number	Borehole Record			Tubing Record		
	Bit	From	To	Size	Weight	To
Casing Record						
Surface Casing	8.62	23.00		WC-50		Top
Intermediate #1	4.50	11.60		M-75		Bottom
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 15 FT
Shop calibrations preformed on the RBL Tool on 26-MAR-2019
GOBO indicates 80% Bond Index for 4.5-inch casing (16.24 mV)
Log ran with 0 PSI surface induced pressure
AFE#-2145012
Logging tools were clean and free of debris upon completion of operations

Thank you for choosing Reliance Oilfield Services, LLC!!

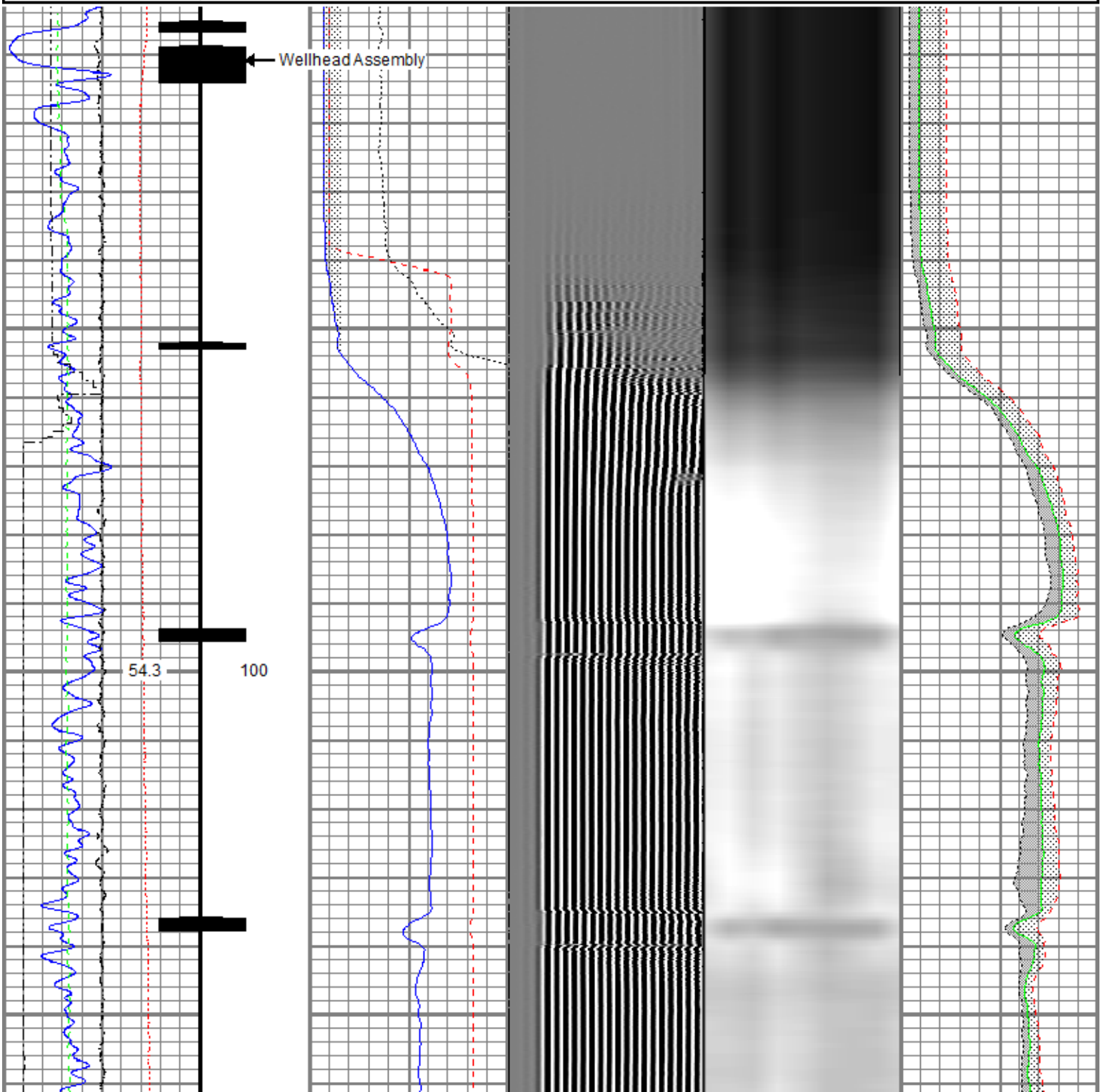


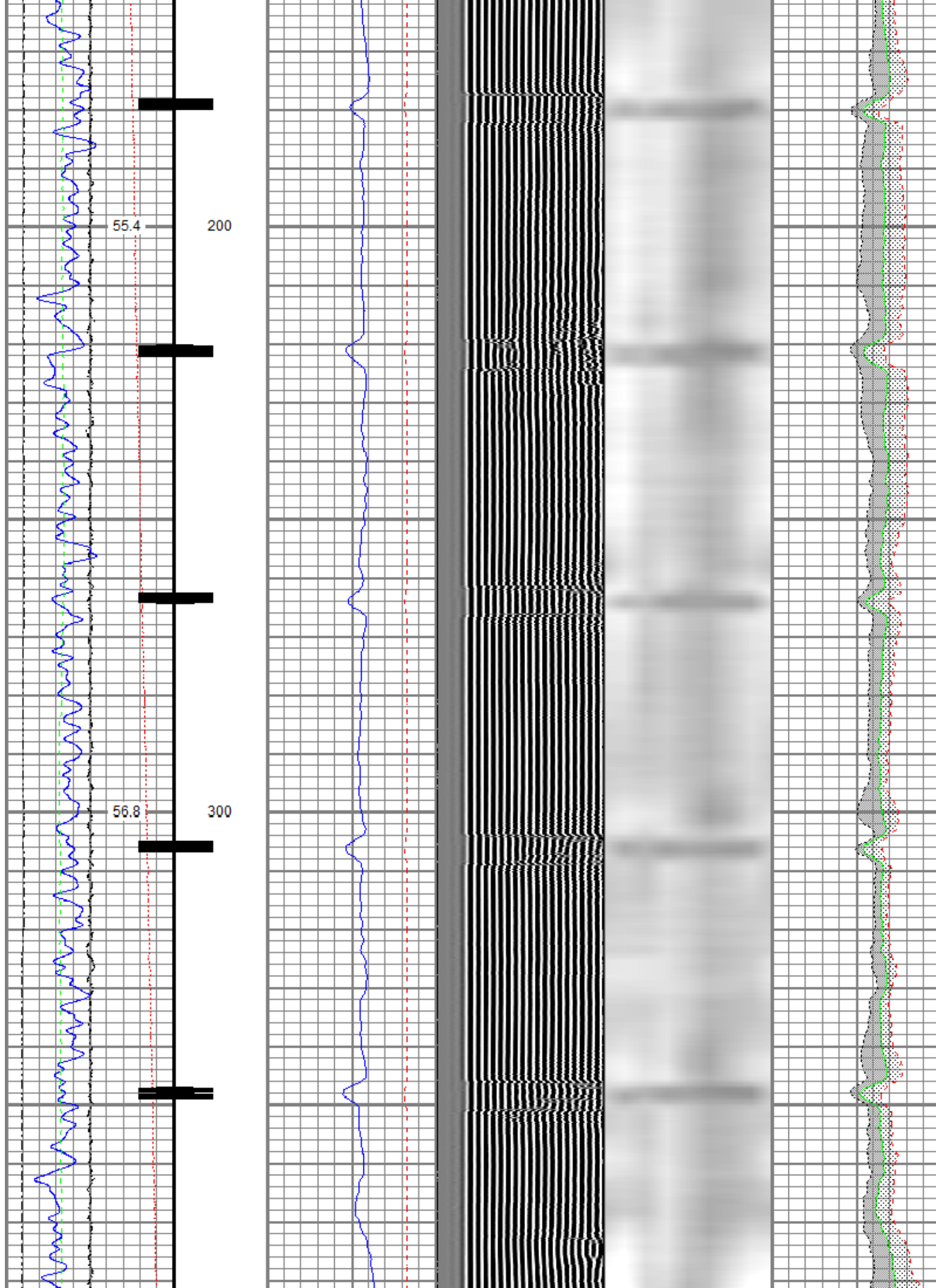
Main Pass

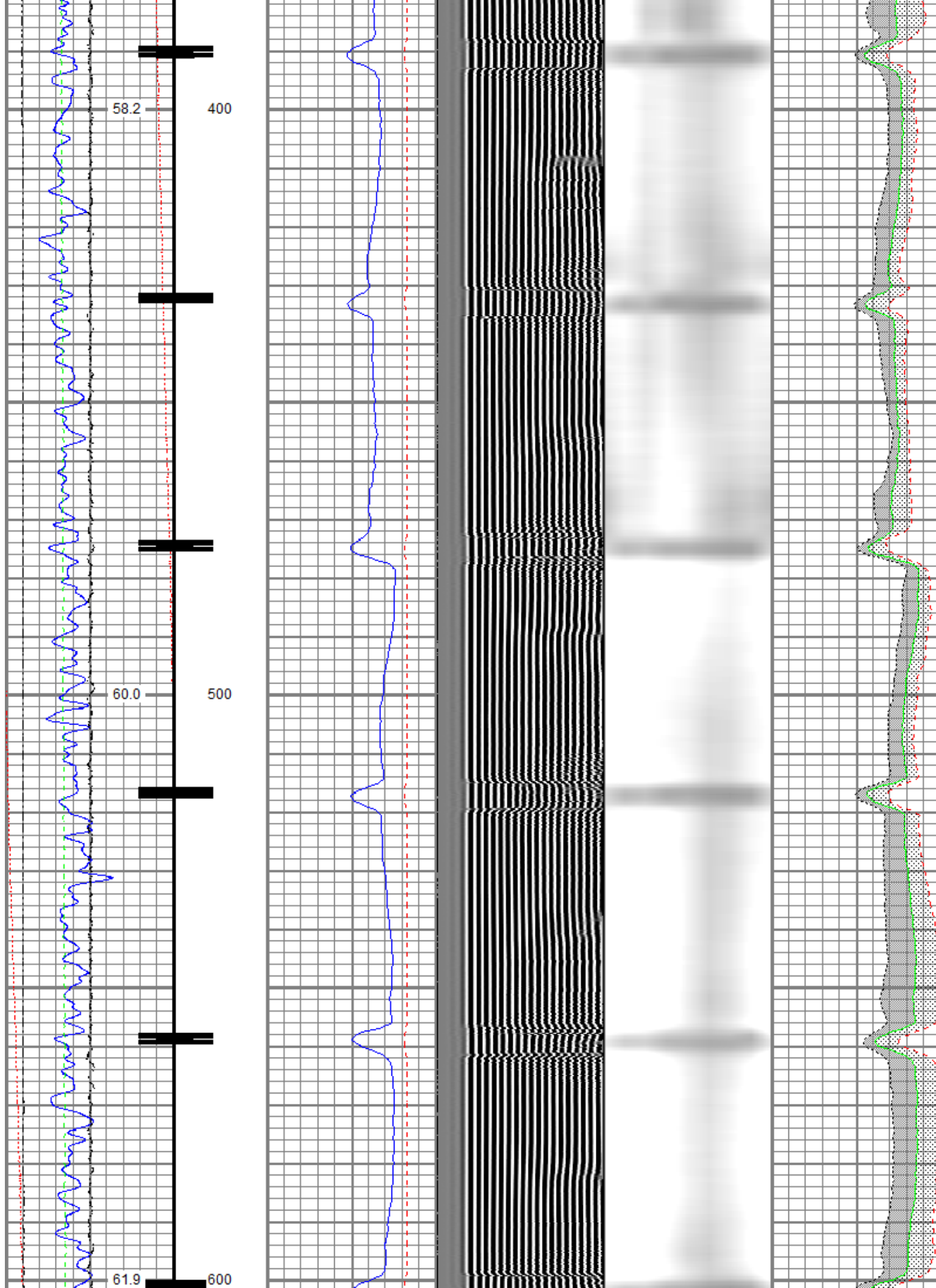
Recorded with 0 PSI Surface Induced Pressure

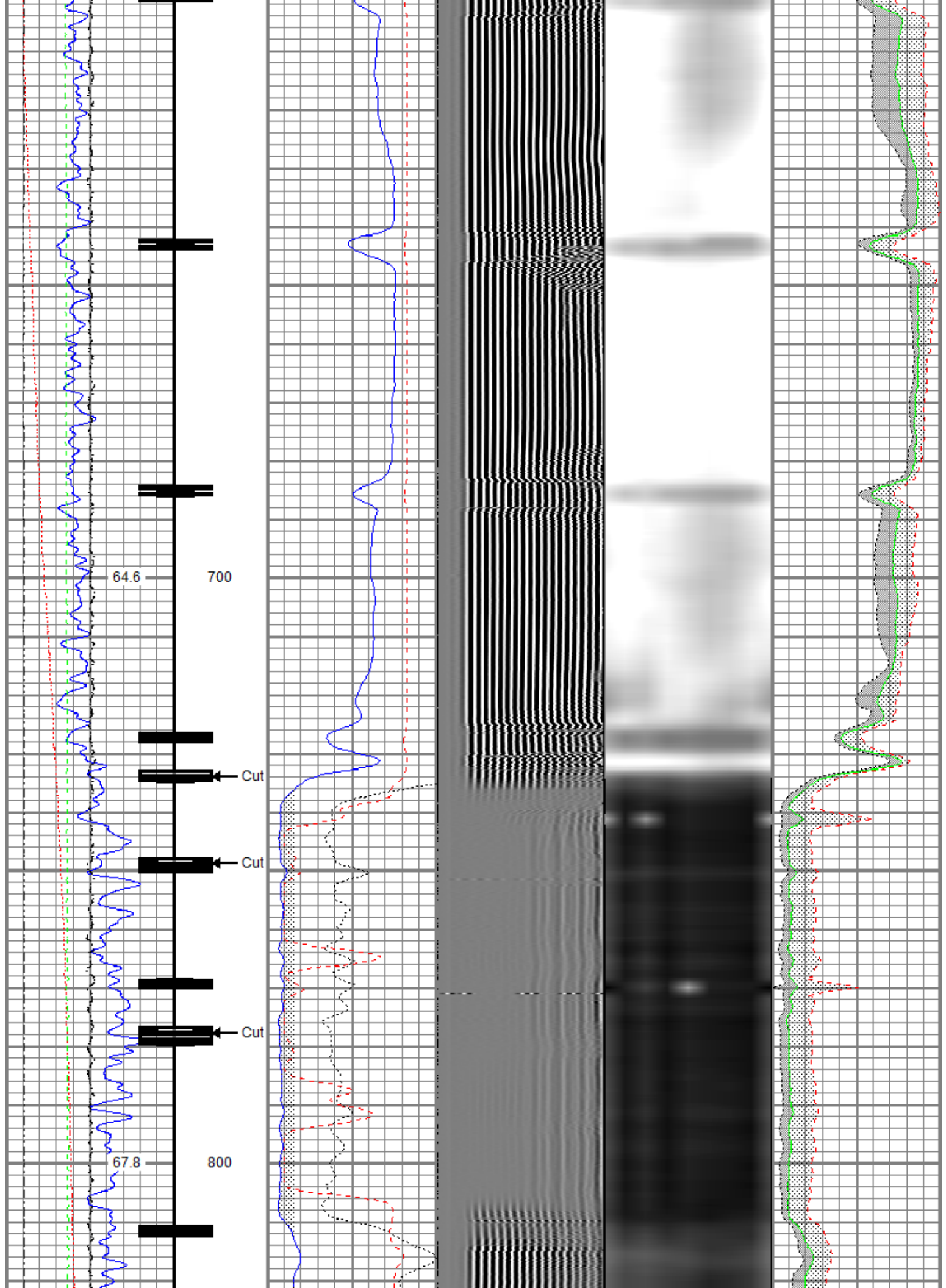
Database File anadarko_vogl_23_36_rcbl.db
 Dataset Pathname Main.1
 Presentation Format ros_radri_anadarko_vert_gobo_45
 Dataset Creation Wed Mar 27 13:09:01 2019
 Charted by Depth in Feet scaled 1:240

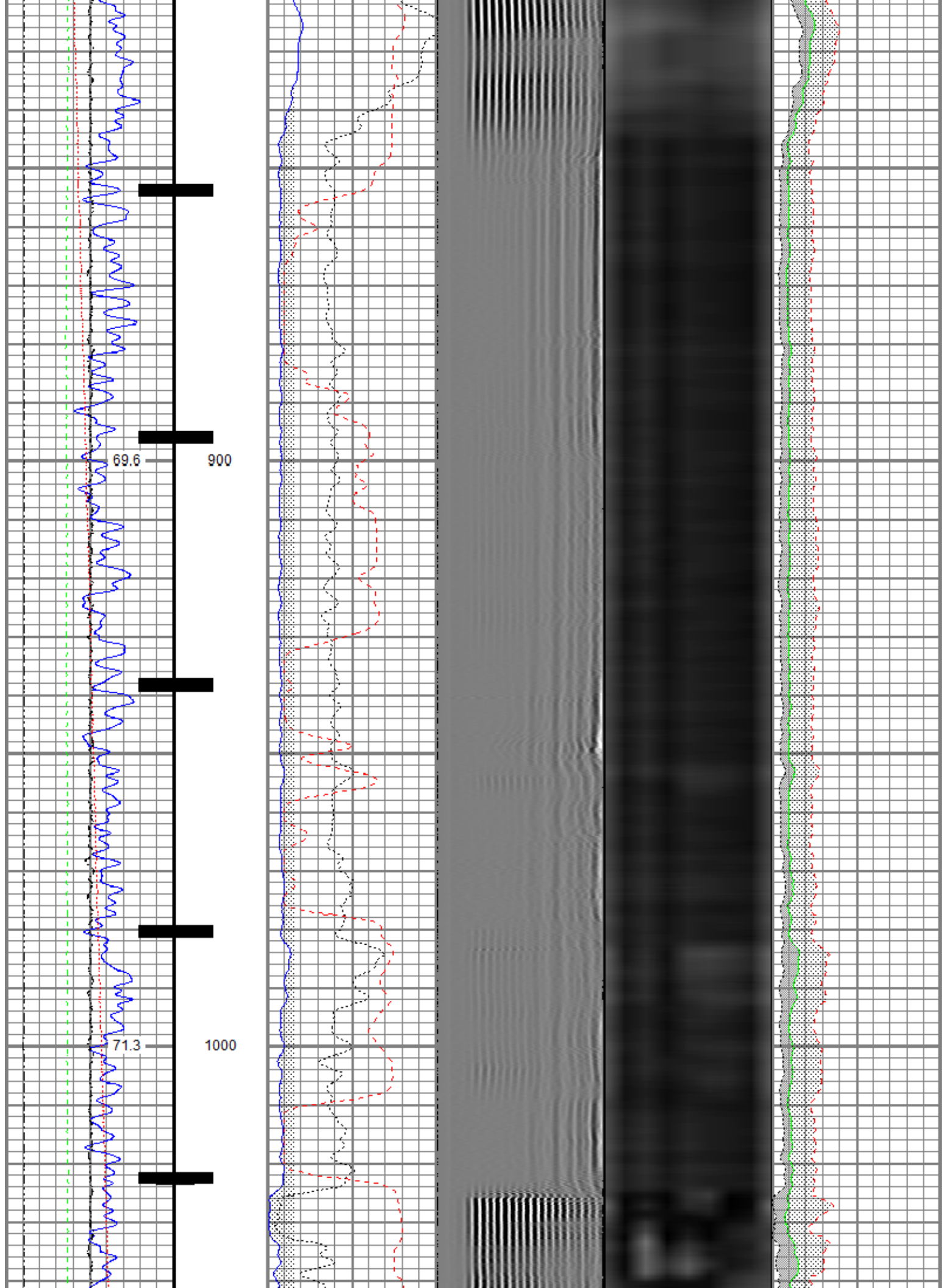
Gamma Ray (GAPI) 120	0 3' Amplitude (mV) 100	5' Variable Density Log 200 (usec) 1200	Sector Map	Average Amplitude 0 100
Temperature (degF) 20	0 3' Amplitude x 5 (mV) 20			Minimum Amplitude 0 100
Line Speed (ft/min) 150	650 3' Travel Time (usec) 150			Maximum Amplitude 0 100
Line Tension (lb) 000				
Differential Temperature (degF) 2				
Casing Collar Locator				

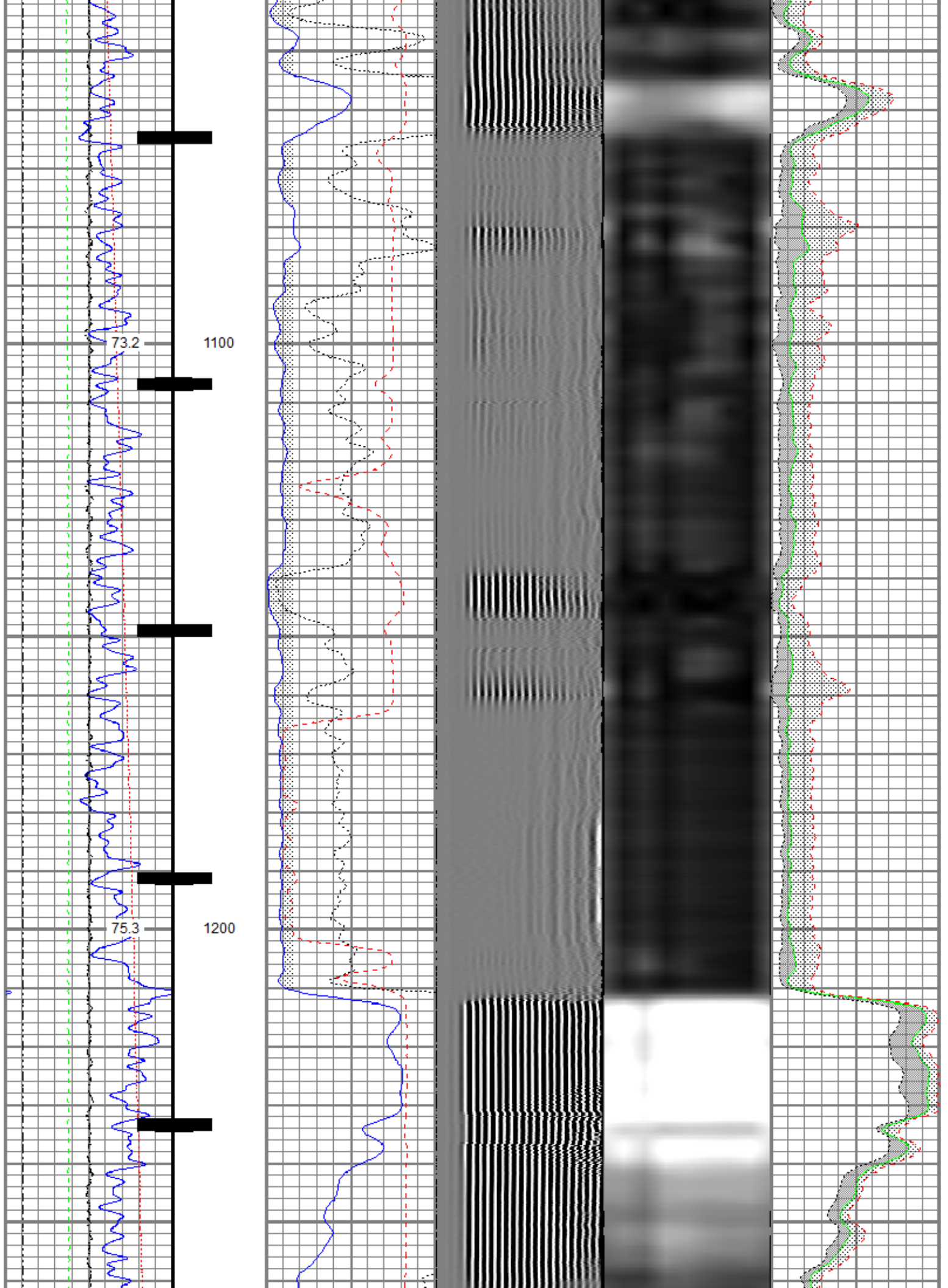


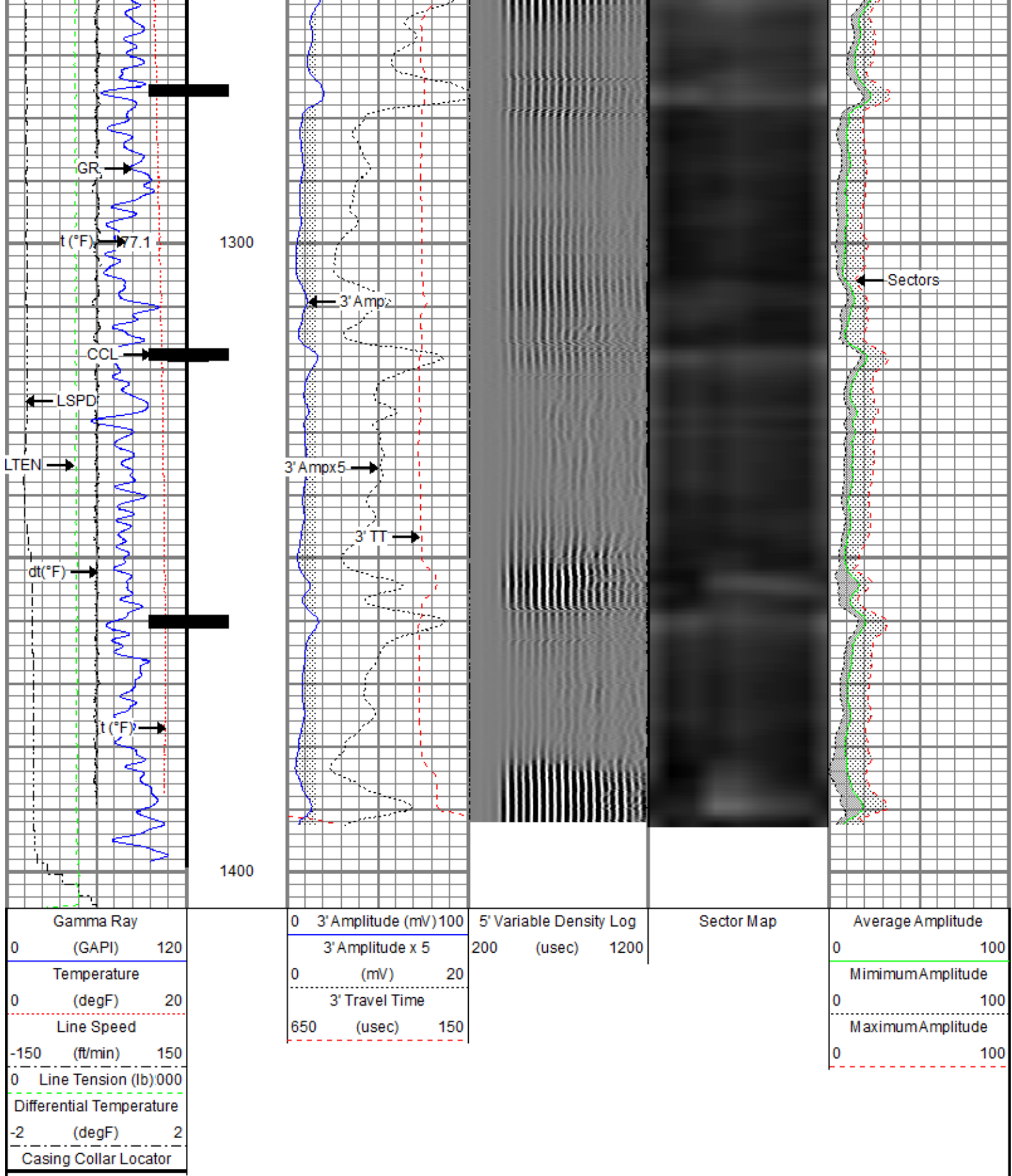










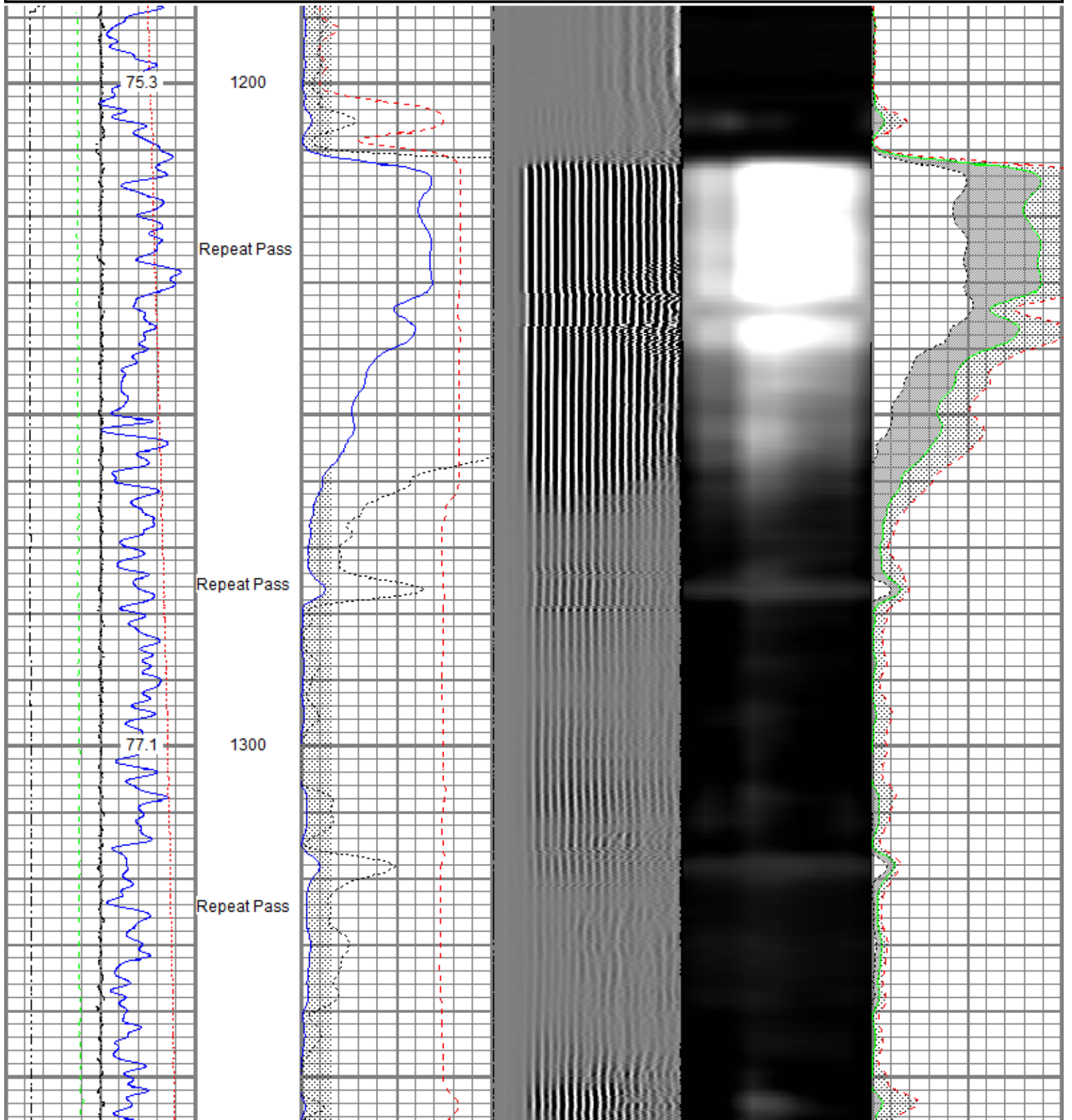


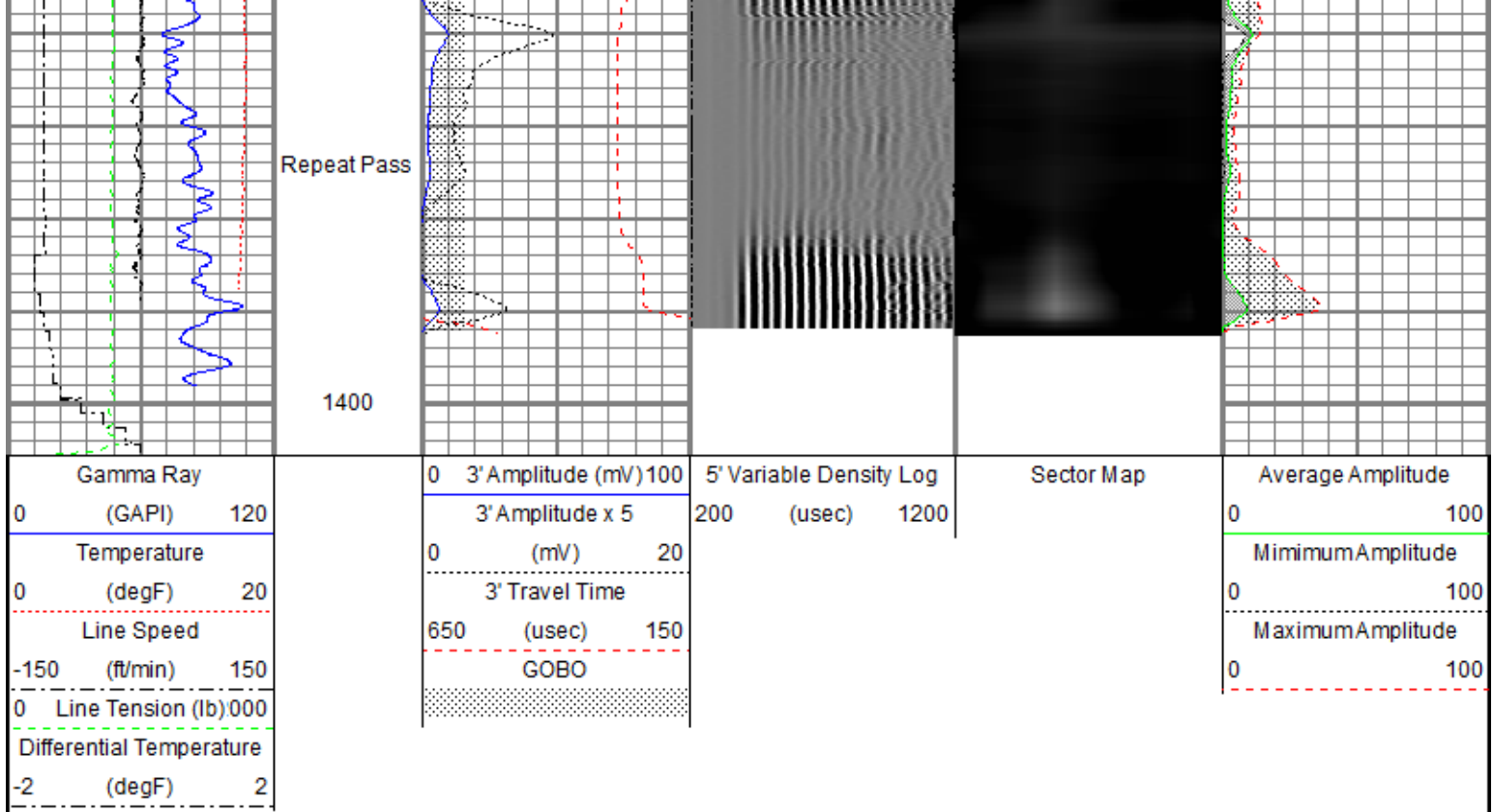
Repeat Pass

Recorded with 0 PSI Surface Induced Pressure

Database File anadarko_vogl_23_36_rcbl.db
 Dataset Pathname Repeat

Gamma Ray (GAPI) 120	0 3' Amplitude (mV) 100	5' Variable Density Log 200 (usec) 1200	Sector Map	Average Amplitude 0 100
Temperature (degF) 20	3' Amplitude x 5 (mV) 20			Minimum Amplitude 0 100
Line Speed (ft/min) 150	3' Travel Time (usec) 150			Maximum Amplitude 0 100
Line Tension (lb) 000	GOBO			
Differential Temperature (degF) 2				





Sensor	Offset (ft)	Schematic	Description	Length (ft)	O.D. (in)	Weight (lb)
			Titan CHD-14375 GO Titan 1-7/16" Assembled Electric Cable Head w/ 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	16.75		Probe Radii-2750 RBT (FW1302-001) Probe 2-3/4" Radial Cement Bond Tool with Integral Temperature Sub	9.39	2.75	105.00
WVFS8	14.52					
WVFS7	14.52					
WVFS6	14.52					
WVFS5	14.52					
WVFS4	14.52					
WVFS3	14.52					
WVFS2	14.52					
WVFS1	14.52					
WVFCAL	14.52					
WVF3FT	14.52					
WVF5FT	13.52					

			Probe CENT-2750 Probe 2-3/4" Electric Inline Bowspring Centralizer	2.88	2.75	20.00
CCL\$2	6.51					
CCL\$1	6.51					
GR	5.26		Probe GR-CCL-2750 GOB (FW1212-026) Probe 2-3/4" rev.2 Digital Scintillation Gamma Ray/CCL Combined with GO Bottom	4.51	2.75	55.00
			Probe CENT-2750 Probe 2-3/4" Electric Inline Bowspring Centralizer	2.88	2.75	20.00
Dataset: anadarko_vogl_23_36_rcbl.db: field/well/run1/Main.1 Total length: 23.57 ft Total weight: 223.60 lb O.D.: 2.75 in						

Calibration Report	
Database File	anadarko_vogl_23_36_rcbl.db
Dataset Pathname	Main.1
Dataset Creation	Wed Mar 27 13:09:01 2019

Gamma Ray Calibration Report	
Serial Number:	FW1212-026
Tool Model:	2750 GOB
Performed:	Mon Oct 01 11:32:38 2018
Calibrator Value:	637.0 GAPI
Background Reading:	113.7 cps
Calibrator Reading:	1029.1 cps
Sensitivity:	0.6959 GAPI/cps

Segmented Cement Bond Log Calibration Report	
Serial Number:	FW1302-001
Tool Model:	2750 RBT
Calibration Casing Diameter:	4.500 in
Calibration Depth:	168.479 ft

Master Calibration, performed (Derived):						
	Raw (v)		Calibrated (mv)		Results	
	Zero	Cal	Zero	Cal	Gain	Offset
3'	-0.043	0.595	0.800	81.196	126.031	6.251
CAL	0.761	0.756				
5'	-0.037	0.613	0.800	81.196	123.598	5.391
SUM						
S1	-0.149	0.525	0.000	100.000	148.367	22.090
S2	-0.030	0.545	0.000	100.000	173.867	5.188
S3	-0.065	0.569	0.000	100.000	157.700	10.317

S4	-0.030	0.668	0.000	100.000	143.360	4.267
S5	-0.073	0.766	0.000	100.000	119.261	8.652
S6	-0.060	0.807	0.000	100.000	115.353	6.876
S7	-0.045	0.760	0.000	100.000	124.271	5.608
S8	-0.024	0.654	0.000	100.000	147.550	3.560

Internal Reference Calibration, performed (Not Performed):

	Raw (v)		Calibrated (v)		Results	
	Zero	Cal	Zero	Cal	Gain	Offset
CAL	0.000	0.000	0.761	0.756	1.000	0.000

Air Zero Calibration, performed Wed Mar 27 12:27:28 2019:

	Raw (v)		Calibrated (v)		Results
	Zero		Zero		Offset
3'	0.006		0.000		0.000
5'	0.011		0.000		0.000
SUM					
S1	0.006		0.000		-0.000
S2	0.007		0.000		-0.000
S3	0.007		0.000		0.000
S4	0.007		0.000		-0.000
S5	0.007		0.000		0.000
S6	0.007		0.000		-0.000
S7	0.008		0.000		-0.000
S8	0.008		0.000		-0.001

Temperature Calibration Report

Serial Number: FW1302-001
Tool Model: 2750 RBT
Performed: Mon Oct 01 11:32:14 2018

	Reference	Reading
Low Reference:	100.00 degF	107.47 degF
High Reference:	350.00 degF	404.08 degF

Gain: 0.84
Offset: 9.42
Delta Spacing: 1



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Field Wattenberg
County Weld
State Colorado