Radial Cement Bond
Gamma Ray
Casing Collar Log

RELIANCE OILFIELD SERVICES

Company TEP Rocky Mountain LLC
Well Federal GM 43-10
Field Grand Valley
County Garfield
State Colorado

Company	TEP Rocky Mountain LLC
Well	Federal GM 43-10
Field	Grand Valley
County	Garfield
State	Colorado
Location:	API # : 05-045-22674 2015' FNL & 1954' FWL SENW SEC 10 TWP 7S RGE 96W
Other Services	PDN
Permanent Datum	Ground Level Elevation 6148'
Log Measured From	Kelly Bushing 24 FT
Drilling Measured From	Kelly Bushing
Elevation	K.B. 6172' D.F. 6171' G.L. 6148'

Date	15-OCT-2017
Run Number	One
Depth Driller	7632 FT
Depth Logger	7524 FT
Bottom Logged Interval	7524 FT
Top Log Interval	Surface
Open Hole Size	8.750"
Type Fluid	Fresh Water
Density / Viscosity	8.34 lb/gal
Max. Recorded Temp.	197°F
Estimated Cement Top	See Log
Time Well Ready	ROA
Time Logger on Bottom	15:50
Equipment Number	HD-359
Location	Grand Junction, CO
Recorded By	A. Ellsworth
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	1000 FT
Intermediate #1	4 1/2	11.6	P-110	Surface	7589 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
Ground Level 1 FT below the top of cut pipe
Marker Joint logged at 3566 FT - 3588 FT
Log ran from 7524 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_federal gm 43-10_rbl_10-15-17\processed_tep_federal gm 43-10_rbl_10-15-17.db
Dataset Pathname	main
Presentation Format	ros_rbt004_tep
Dataset Creation	Sun Oct 15 14:59:58 2017
Charted by	Depth in Feet scaled 1:240

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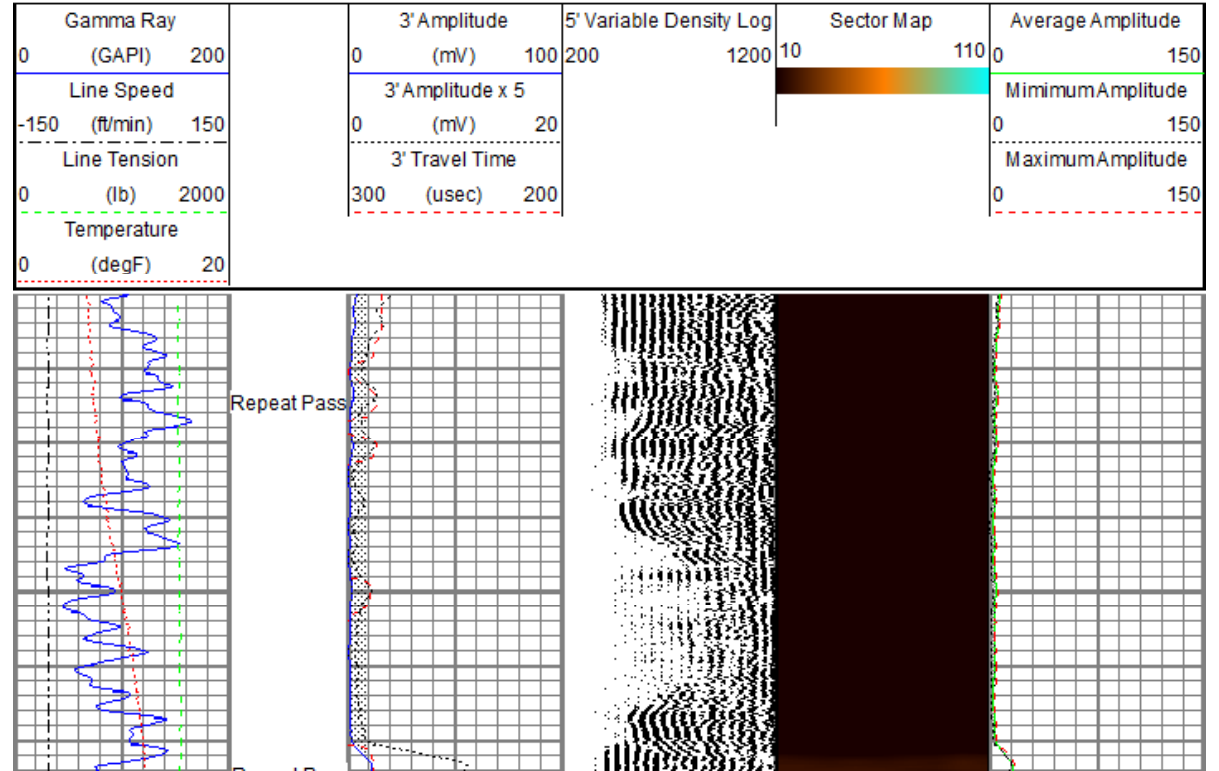
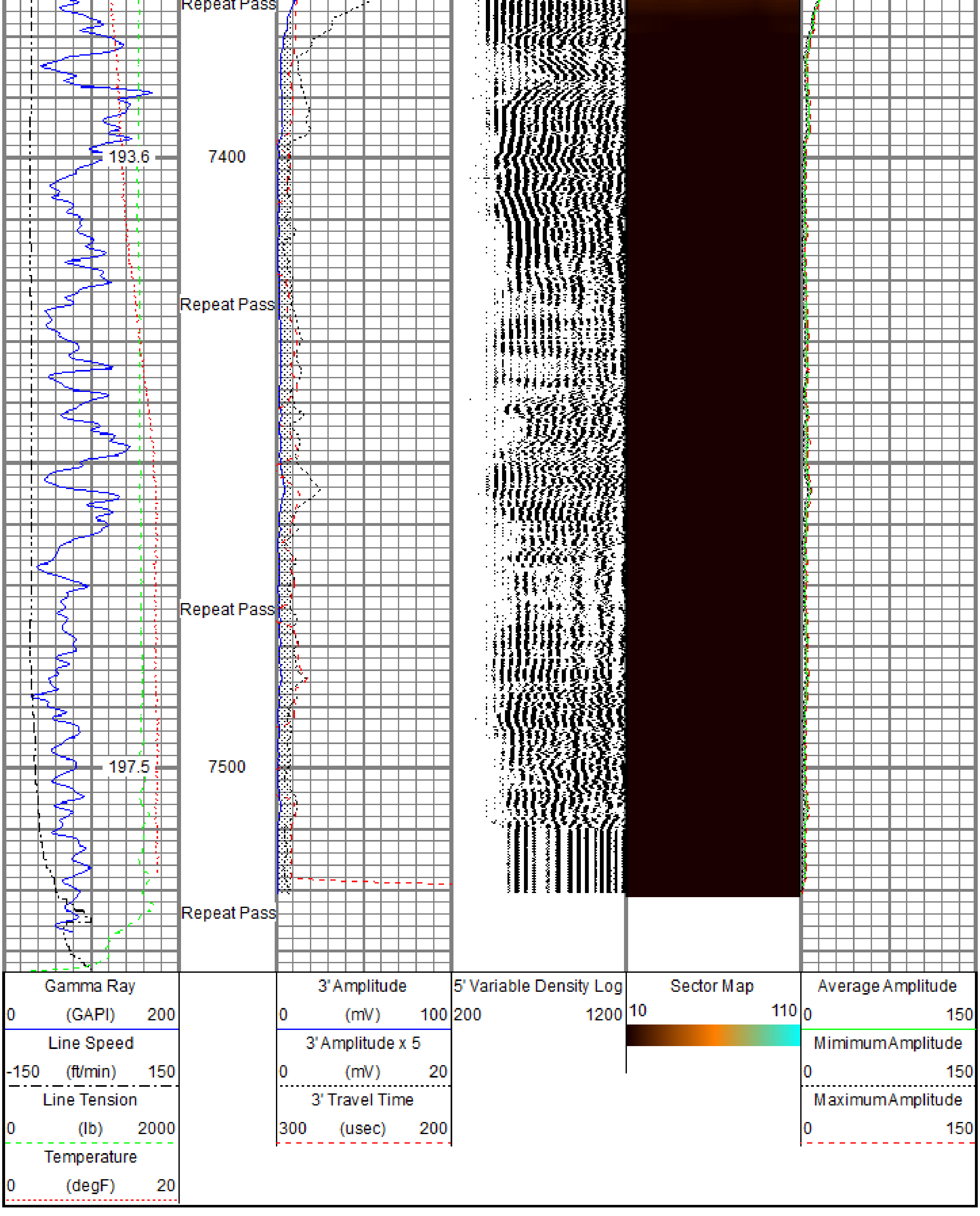
Repeat Pass

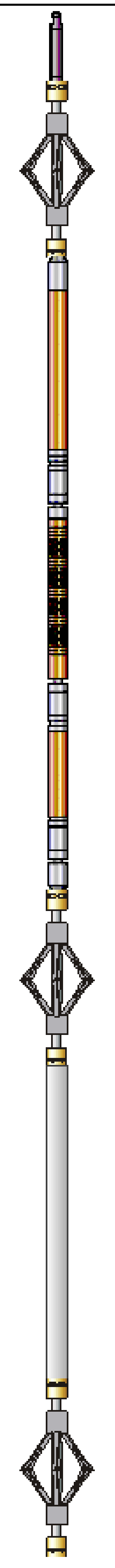
Recorded With 0 PSI Surface Induced Pressure

Database File	tep_federal gm 43-10_rbl_10-15-17\processed_tep_federal gm 43-10_rbl_10-15-17.db
Dataset Pathname	repeat
Presentation Format	ros_rbt004_tep
Dataset Creation	Sun Oct 15 14:54:46 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				





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 (FW1311-01 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
CCL	6.18					
			Probe_GR-CCL_ANL-P_CGR_2750_ANL Probe 2.75" Analog 4 Channel Pulse CCL / Gamma Ray Combined	4.54I305-(	2.75	55.00
GR	3.44					
			DSS_RAC-RAC_5-Arm 5 Arm 2-3/4" Roller Centralizer	2.55	2.75	32.00

Dataset:	PROCESSED_TEP_Federal GM 43-10_RBL_10-15-17.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_Federal GM 43-10_RBL_10-15-17\PROCESSED_TEP_Federal GM 43-1
Dataset Pathname	main
Dataset Creation	Sun Oct 15 14:59:58 2017

Gamma Ray Calibration Report

Serial Number:	FW1305-083	
Tool Model:	P_CGR_2750_ANL	
Performed:	(Not Performed)	
Calibrator Value:	1.0	GAPI
Background Reading:	0.0	cps
Calibrator Reading:	1.0	cps
Sensitivity:	1.0000	GAPI/cps

Segmented Cement Bond Log Calibration Report

Serial Number:	FW1311-014	
Tool Model:	P_RBT_2750	
Calibration Casing Diameter:	4.500	in
Calibration Depth:	423.425	ft

Master Calibration, performed Sun Oct 15 10:29:12 2017:

	Raw (v)		Calibrated (mv)		Results	
	Zero	Cal	Zero	Cal	Gain	Offset
3'	-0.005	0.577	0.800	81.196	137.962	1.541
CAL	-0.006	0.767				
5'	-0.001	0.590	0.800	81.196	135.957	0.989
SUM						
S1	-0.008	0.567	0.000	100.000	174.065	1.360
S2	-0.004	0.611	0.000	100.000	162.562	0.697
S3	-0.005	0.643	0.000	100.000	154.409	0.748
S4	-0.005	0.648	0.000	100.000	153.187	0.757
S5	-0.005	0.617	0.000	100.000	160.725	0.795
S6	-0.005	0.587	0.000	100.000	168.883	0.837
S7	-0.005	0.554	0.000	100.000	178.951	0.915
S8	-0.005	0.544	0.000	100.000	182.328	0.859

Internal Reference Calibration, performed (Not Performed):

	Raw (v)		Calibrated (v)		Results	
	Zero	Cal	Zero	Cal	Gain	Offset
CAL	0.000	0.000	-0.006	0.767	1.000	0.000

Air Zero Calibration, performed Sun Oct 15 07:47:39 2017:

	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

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County	Garfield
State	Colorado