RELIANCE OILFIELD SERVICES

Radial Cement Bond
Gamma Ray
Casing Collar Log

Company TEP Rocky Mountain LLC
Well Federal GM 323-4
Field Grand Valley
County Garfield State Colorado
Location: API # : 05-045-23506
SEC 5 TWP 7S RGE 96W

Other Services
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Permanent Datum	Ground Level	Elevation	5977'
Log Measured From	Kelly Bushing	24 FT	
Drilling Measured From	Kelly Bushing		

Elevation
K.B. 6001'
D.F. 6000'
G.L. 5977'

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County Garfield
State Colorado

Date	29-OCT-2017	
Run Number	One	
Depth Driller	7785 FT	
Depth Logger	7708 FT	
Bottom Logged Interval	7703 FT	
Top Log Interval	Surface	
Open Hole Size	8.750"	
Type Fluid	Fresh Water	
Density / Viscosity	8.34 lb/gal	
Max. Recorded Temp.	196°F	
Estimated Cement Top	See Log	
Time Well Ready	ROA	
Time Logger on Bottom	7:30	
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 (in)	Weight (lb/ft)	From	To

Casing Record	Size (in)	Wgt (lb/ft)	Grade	Top	Bottom
Surface Casing	9 5/8	32.3	H-40	Surface	1268 FT
Intermediate #1	4 1/2	11.6	P-110	Surface	7744 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 cut pipe
Marker Joint logged at 5105 FT- 5128 FT
Log ran from 7708 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 323-4_rbl_10-29-17\processed_tep_federal gm 323-4_rbl_10-29-17.db
Dataset Pathname	Main
Presentation Format	ros_rbt004_tep
Dataset Creation	Sun Oct 29 07:32:50 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
Casing Collar Locator		3' Amplitude x 5			MimimumAmplitude
Line Speed		0 (mV) 20			0 150
-150 (ft/min) 150		3' Travel Time			MaximumAmplitude
Line Tension		300 (usec) 200			0 150
0 (lb) 2000					
Temperature					
0 (degF) 200					

122.2
3800
123.7
3900
125.2
4000
126.7
4100
128.0
4200
129.7
4300
131.6
4400
133.0
4500
134.9
4600
137.1
4700
138.5
4800
139.8
4900
141.5
5000
143.0
5100
Marker Joint
144.8
5200
146.6
5300
148.1
5400
149.5
5500
151.4
5600
152.9
5700
154.5
5800
156.3
5900
158.2
6000
160.2
6100
161.9
6200
163.0
6300
165.8
6400
168.0
6500
170.1
6600
170.8
6700
173.8
6800
175.5
6900
178.5
7000
181.2
7100
183.9
7200
187.2
7300
190.8
7400
193.9
7500
t (°F)
196.1
7600
CCL
GR
t (°F)
LSPD
LTEN
3' Amp
3' Ampx5
3' TT
Sectors
7700
Gamma Ray
0
(GAPI)
200
3' Amplitude
0
(mV)
100
5' Variable Density Log
200
1200
Sector Map
10
110
Average Amplitude
0
150

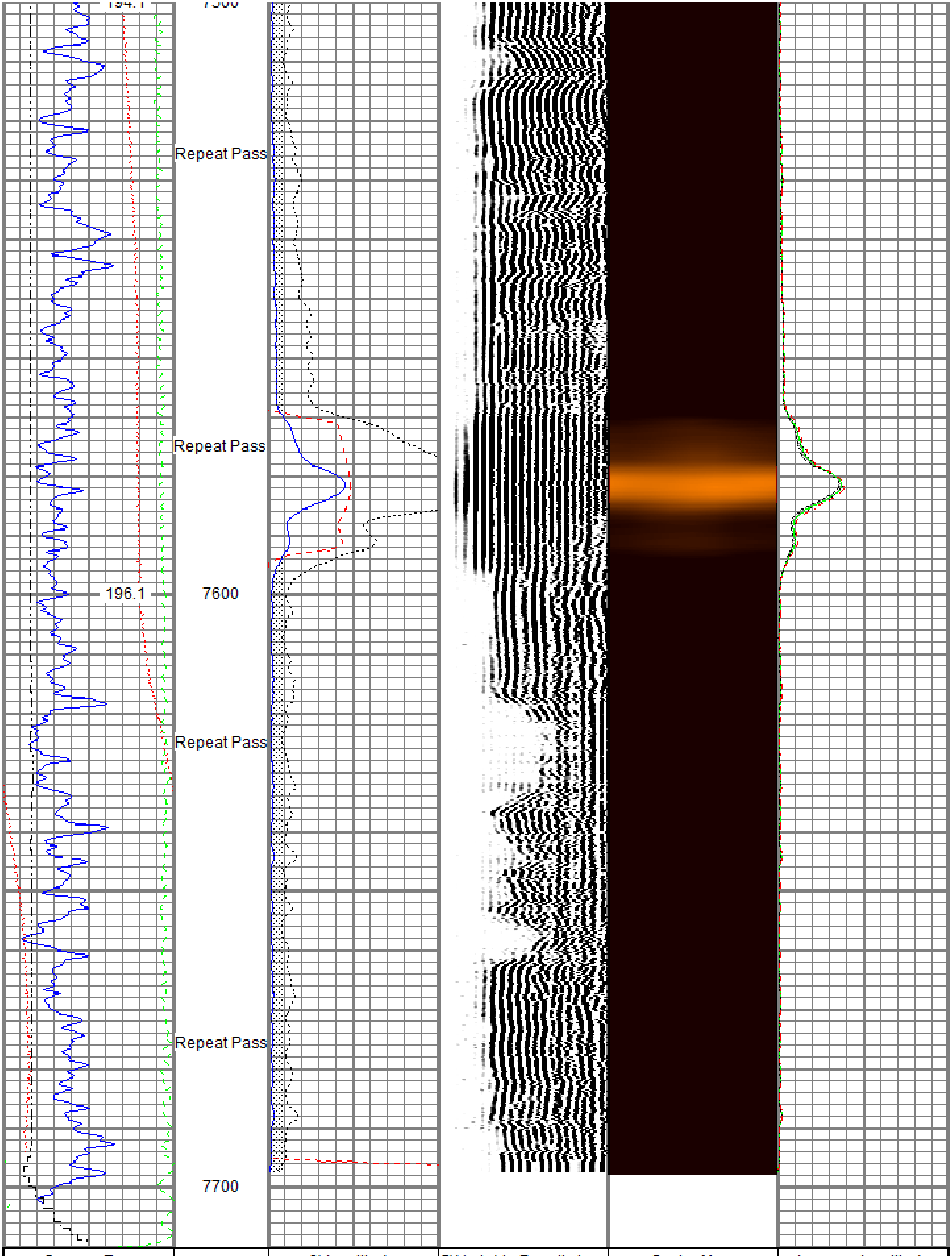
Casing Collar Locator		3' Amplitude x 5			Mimimum Amplitude
Line Speed		0 (mV) 20			0 150
-150 (ft/min) 150		3' Travel Time			Maximum Amplitude
Line Tension		300 (usec) 200			0 150
0 (lb) 2000					
Temperature					
0 (degF) 20					

Repeat Pass

Recorded with 0 PSI Surface Induced Pressure

Database File	tep_federal gm 323-4_rbl_10-29-17\processed_tep_federal gm 323-4_rbl_10-29-17.db
Dataset Pathname	Repeat
Presentation Format	ros_rbt004_tep
Dataset Creation	Sun Oct 29 07:29:38 2017
Charted by	Depth in Feet scaled 1:240

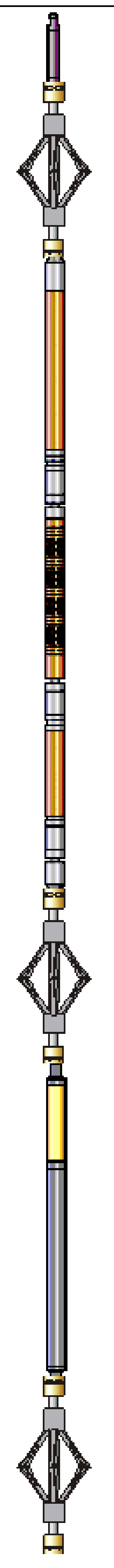
Gamma Ray		3' Amplitude	5' Variable Density Log	Sector Map	Average Amplitude
0 (GAPI) 200		0 (mV) 100	200 1200	10 110	0 150
Line Speed		3' Amplitude x 5			Mimimum Amplitude
-150 (ft/min) 150		0 (mV) 20			0 150
Line Tension		3' Travel Time			Maximum Amplitude
0 (lb) 2000		300 (usec) 200			0 150
Temperature					
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_1-11/11.03 Electric Cable Head with 1" Fishing Neck		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 (FW1305-099.19 Probe 2-3/4" Sector Cement Bond Tool with Temperature Probe		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 (FW1214.541) 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_Federal GM 323-4_RBL_10-29-17.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 323-4_RBL_10-29-17\PROCESSED_TEP_Federal GM 323-
Dataset Pathname	Main
Dataset Creation	Sun Oct 29 07:32:50 2017

Gamma Ray Calibration Report

Serial Number:	FW1211-081	
Tool Model:	P_CGR_2750_S	
Performed:	Sat Feb 06 11:31:52 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:	FW1305-098	
Tool Model:	P_RBT_2750	
Calibration Casing Diameter:	4.500	in
Calibration Depth:	32.746	ft

Master Calibration, performed Sun Oct 29 06:58:07 2017:

	Raw (v)		Calibrated (mv)		Results	
	Zero	Cal	Zero	Cal	Gain	Offset
3'	-0.002	0.852	0.800	81.196	94.152	1.023
CAL	0.755	0.829				
5'	0.001	0.697	0.800	81.196	115.407	0.741
SUM						
S1	-0.008	0.871	0.000	100.000	113.779	0.904
S2	-0.005	0.907	0.000	100.000	109.658	0.542
S3	-0.006	0.913	0.000	100.000	108.799	0.622
S4	-0.006	0.896	0.000	100.000	110.854	0.624
S5	-0.006	0.867	0.000	100.000	114.617	0.652
S6	-0.006	0.840	0.000	100.000	118.238	0.677
S7	-0.006	0.824	0.000	100.000	120.511	0.728
S8	-0.005	0.823	0.000	100.000	120.655	0.655

Internal Reference Calibration, performed Fri May 05 10:29:14 2017:

	Raw (v)		Calibrated (v)		Results	
	Zero	Cal	Zero	Cal	Gain	Offset
CAL	0.000	0.000	0.755	0.829	1.000	0.000

Air Zero Calibration, performed Sun Oct 29 06:56:42 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

Company	TEP Rocky Mountain LLC
Well	Federal GM 323-4
Field	Grand Valley
County	Garfield
State	Colorado