RELIANCE OILFIELD SERVICES

Radial Cement Bond
Gamma Ray
Casing Collar Log

Company	TEP Rocky Mountain LLC
Well	Federal GM 311-10
Field	Grand Valley
County	Garfield
State	Colorado

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Well Federal GM 311-10
Field Grand Valley
County Garfield State Colorado

Location: API # : 05-045-22672
2114' FNL 1901' FWL
SEC 10 TWP 7S RGE 96W

Other Services
PDN

			Elevation
Permanent Datum	Ground Level	Elevation 6148'	K.B. 6172'
Log Measured From	Kelly Bushing	24 FT	D.F. 6171'
Drilling Measured From	Kelly Bushing		G.L. 6148'

Date	August 10, 2017
Run Number	One
Depth Driller	7417 FT
Depth Logger	7374 FT
Bottom Logged Interval	7365 FT
Top Log Interval	Surface
Open Hole Size	8.750"
Type Fluid	Fresh Water
Density / Viscosity	8.34 lb/gal
Max. Recorded Temp.	204°F
Estimated Cement Top	See Log
Time Well Ready	ROA
Time Logger on Bottom	16:30
Equipment Number	HD-0359
Location	Grand Junction
Recorded By	Z.Fisher
Witnessed By	Justin Skalla

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	1029 FT
Intermediate #1	4 1/2	11.6	P-110	Surface	7405 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 recorded from 3346-3367 FT
Log ran from 7365 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_311-10_august 10-2017_rcbl2\processed_tep_federal gm 311-10_rbl_08-10-17.db
Dataset Pathname	Main.1
Presentation Format	ros_rbt004_tep
Dataset Creation	Fri Aug 11 10:17:50 2017
Charted by	Depth in Feet scaled 1:240

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

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

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Repeat Pass

Recorded with 0 PSI Surface Induced Pressure

Database File	tep_federal gm_311-10_august 10-2017_rcbl2\processed_tep_federal gm 311-10_rbl_08-10-17.db
Dataset Pathname	Repeat.1
Presentation Format	ros_rbt004_tep
Dataset Creation	Fri Aug 11 10:26:00 2017
Charted by	Depth in Feet scaled 1:240

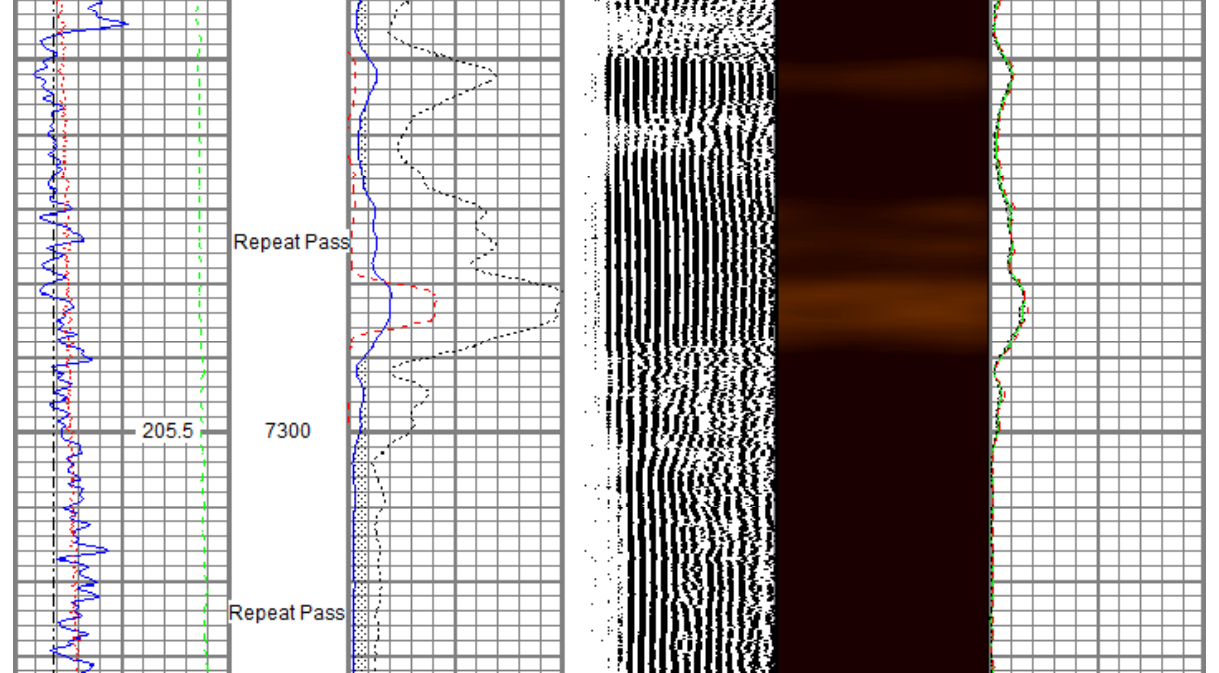
Gamma Ray
0 (GAPI) 200
Line Speed
-150 (ft/min) 150
Line Tension
0 (lb) 2000
Temperature
0 (degF) 20

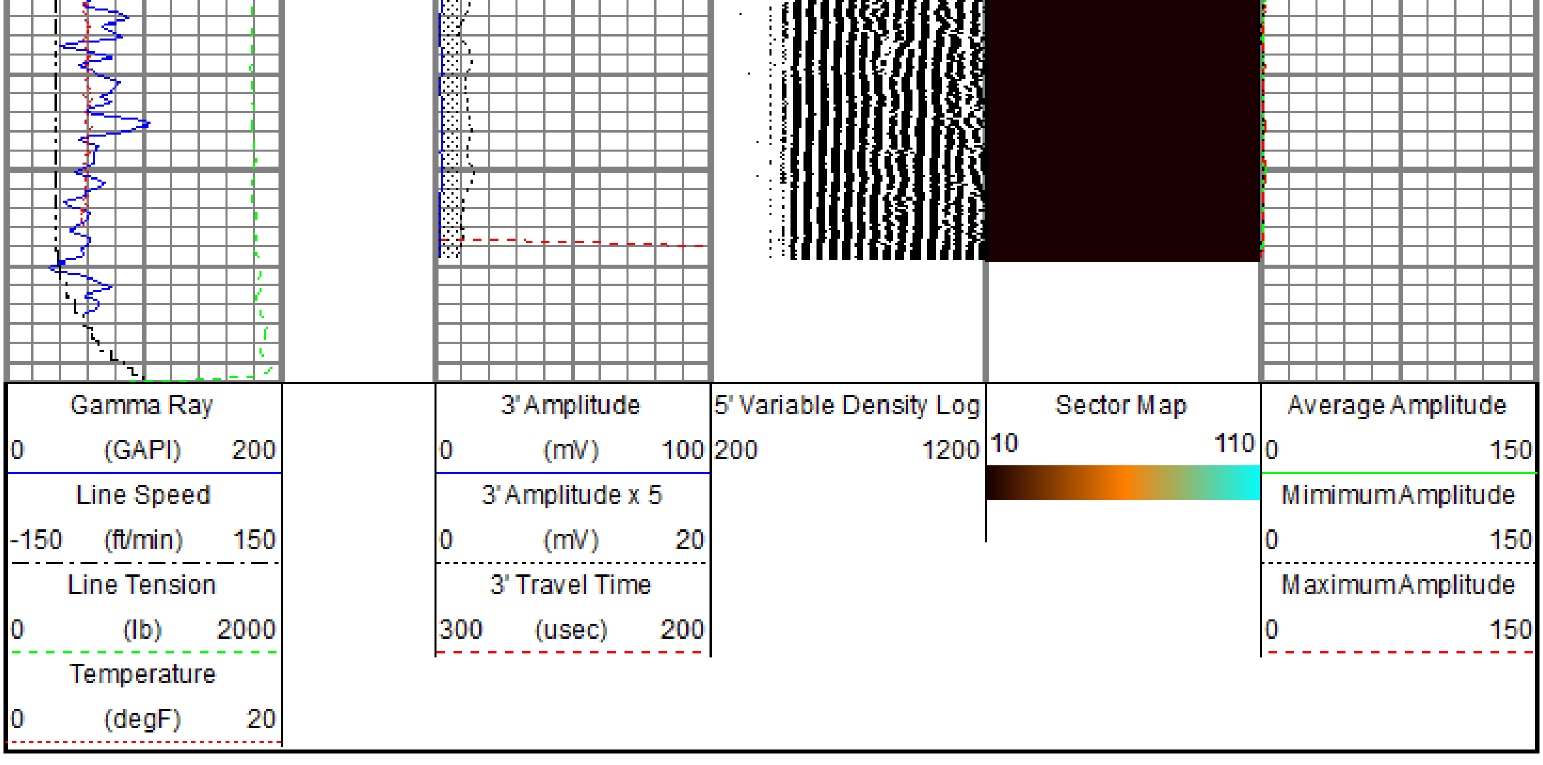
3' Amplitude
0 (mV) 100
3' Amplitude x 5
0 (mV) 20
3' Travel Time
300 (usec) 200

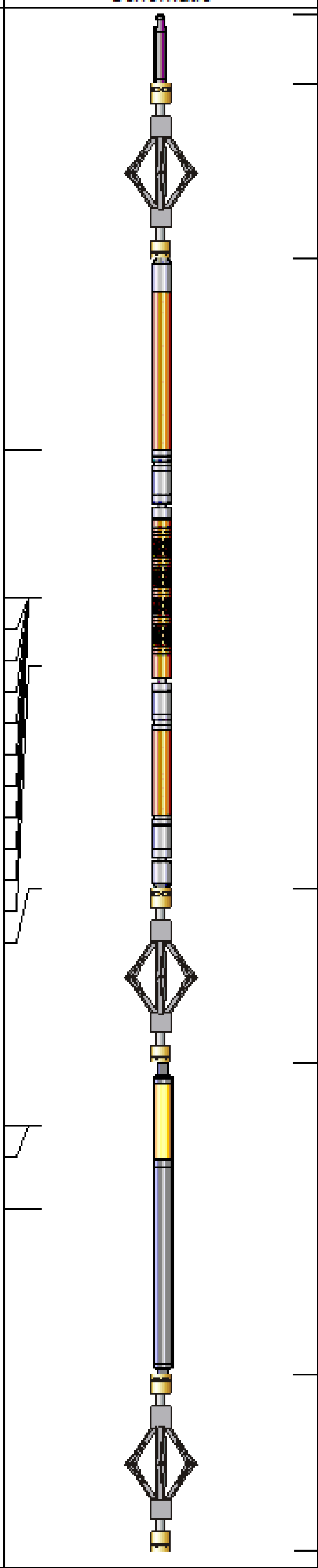
5' Variable Density Log
200 1200

Sector Map
10 110

Average Amplitude
0 150
Mimimum Amplitude
0 150
Maximum Amplitude
0 150







Sensor	Offset (ft)
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

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
Probe_RADII-C-P_RBT_2750 (FW1305-0 Probe 2-3/4" Sector Cement Bond Tool with Temperature Probe	9.19	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 (FW1 Probe 2-3/4" Digital CCL / Gamma Ray Combined	214.541)	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 311-10_rbl_08-10-17.db: field/well/run1/Main.1
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_311-10_august 10-2017_rcbl2\processed_tep_federal gm 311-
Dataset Pathname	Main.1
Dataset Creation	Fri Aug 11 10:17:50 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:	-1.634	ft

Master Calibration, performed (Derived):

	Raw (v)		Calibrated (mv)		Results	
	Zero	Cal	Zero	Cal	Gain	Offset
3'	-0.007	0.671	0.800	81.196	118.694	1.598
CAL	0.746	0.749				
5'	-0.001	0.543	0.800	81.196	147.656	1.021
SUM						
S1	-0.008	0.674	0.000	100.000	146.665	1.125
S2	-0.006	0.690	0.000	100.000	143.750	0.831
S3	-0.006	0.714	0.000	100.000	138.814	0.840
S4	-0.006	0.710	0.000	100.000	139.785	0.797
S5	-0.006	0.685	0.000	100.000	144.689	0.880
S6	-0.006	0.668	0.000	100.000	148.275	0.879
S7	-0.006	0.645	0.000	100.000	153.566	0.895
S8	-0.006	0.643	0.000	100.000	154.286	0.853

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	0.746	0.749	1.000	0.000

Air Zero Calibration, performed Thu Aug 10 16:00:34 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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Well	Federal GM 311-10
Field	Grand Valley
County	Garfield
State	Colorado