Company	TEP Rocky Mountain LLC
Well	Federal RWF 14-17
Field	Grand Valley
County	Garfield
State	Colorado

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Pulsed Neutron Gamma Ray Casing Collar Log

Company	TEP Rocky Mountain LLC		
Well	Federal RWF 14-17		
Field	Grand Valley		
County	Garfield	State	Colorado
Location:	API # : 05-045-24033		Other Services
	SEC 17 TWP 6S RGE 94W		RBL
Permanent Datum	Ground Level	Elevation 6175'	Elevation
Log Measured From	Kelly Bushing	24 FT	K.B. 6199
			D.F. ---
Drilling Measured From	Kelly Bushing		G.L. 6175'

Date	18-Aug-2019
Run Number	Two
Depth Driller	9035 FT
Depth Logger	9003 FT
Bottom Logged Interval	8998 FT
Top Log Interval	4743 FT
Open Hole Size	8.750"
Type Fluid	Fresh Water
Density / Viscosity	8.34 lb/gal
Max. Recorded Temp.	---
Estimated Cement Top	---
Time Well Ready	---
Time Logger on Bottom	---
Equipment Number	---
Location	Grand Junction, CO
Recorded By	Z Fisher
Witnessed By	---

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	36	J-55	Surface	1104 FT
Intermediate #1	4 1/2	11.6	P-110	Surface	8995 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 Reliance Bond Log dated 18-AUG-2019 (POST DRILL OUT LOG)
Log ran from 8998 FT to 4743 FT
Pulsed Neutron Data logged with the Hunter RAS Tool

Thank you for choosing Reliance Oilfield Services, LLC!!

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Main Pass

Database File	terra_rwf 14-17_rcbl_8-18-19_post drill-out\terra_rwf 14-17_pn_8-18-2019.db
Dataset Pathname	PNSHIFTED/merge1
Presentation Format	ros_pdn_hunter
Dataset Creation	Fri Aug 23 09:23:45 2019
Charted by	Depth in Feet scaled 1:240

0 GR (GAPI) 50
Casing Collar Locator
-100 Line Speed (ft/min) 100
0 NIRS (cps) 400000
0 BKGN (cps) 4000
0 BKGF (cps) 2000

4 RNF2 0
60 SIGMA (cu) 0
4.5 RNFI 0

FIS2
0 (cps) 45000
NIS2
0 (cps100000

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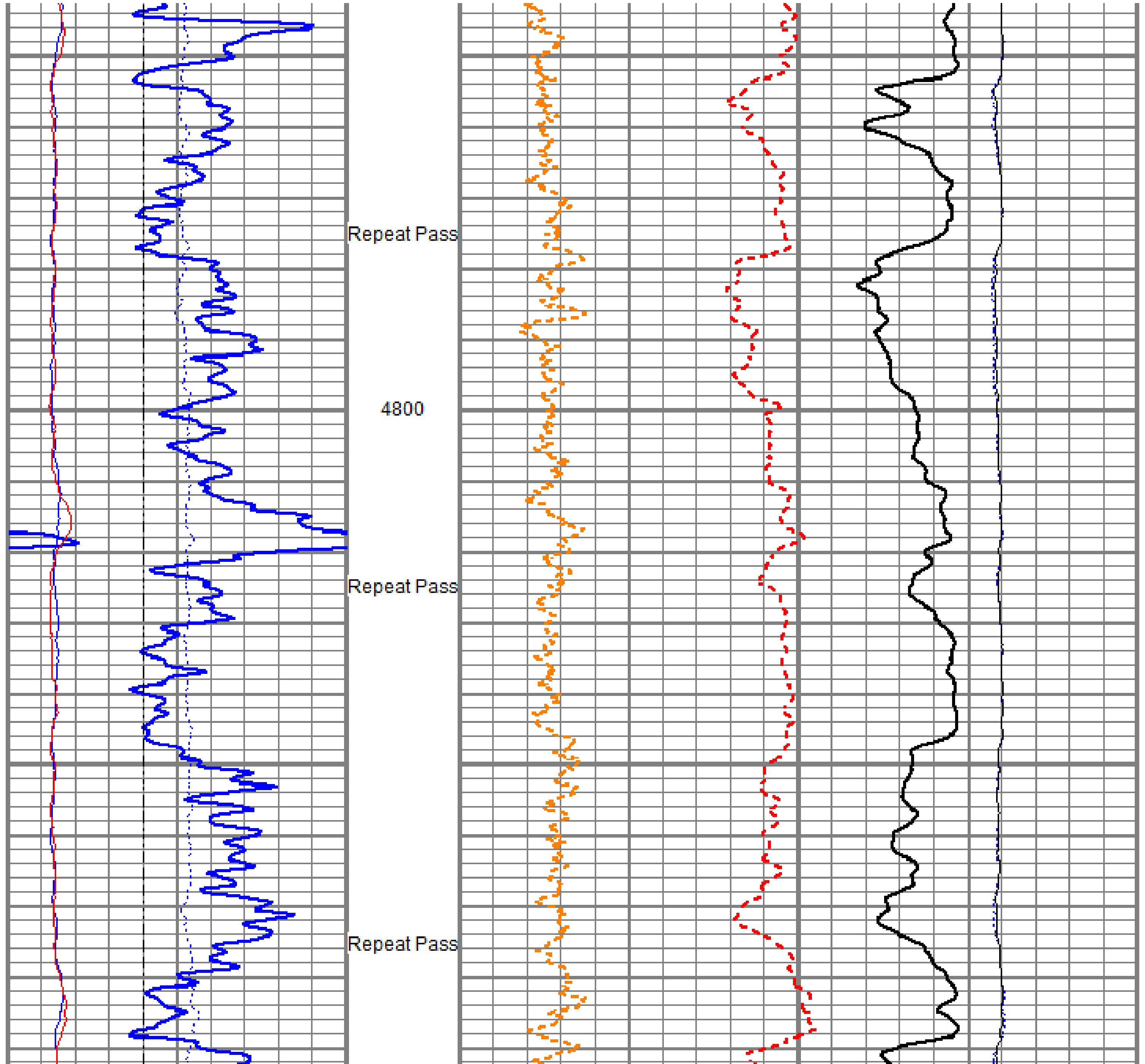
Repeat Pass

Database File	terra_rwf 14-17_rcbl_8-18-19_post drill-out\terra_rwf 14-17_pn_8-18-2019.db
Dataset Pathname	repeat.2
Presentation Format	ros_pdn_hunter
Dataset Creation	Wed Aug 21 08:07:10 2019
Charted by	Depth in Feet scaled 1:240

0 Gamma Ray (GAPI) 50
-100 Line Speed (ft/min) 100
0 NIRS (cps) 400000
0 BKGN (cps) 4000
0 BKGF (cps) 2000

4 RNF2 0
60 SIGMA (cu) 0
4.5 RNFI 0

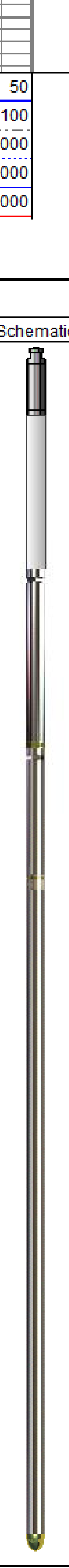
FIS2
0 (cps) 45000
NIS2
0 (cps100000



0 Gamma Ray (GAPI) 50
-100 Line Speed (ft/min) 100
0 NIRS (cps) 400000
0 BKGN (cps) 4000
0 BKGF (cps) 2000

4 RNF2 0
60 SIGMA (cu) 0
4.5 RNFI 0

FIS2
0 (cps) 45000
NIS2
0 (cps100000

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
			HWS_TCU-002 (001704) HWS Telemetry Control Unit (TCU002)	2.30	1.69	10.87
TCUTEMP TCUVOLT GCL_CCL	14.69 14.69 13.97					
			HWS_GCL-001 (001475) HWS Gamma Ray Collar Locator (1.6875")	2.69	1.69	13.40
GCL_GR	12.50					
Long Far Near Anci	6.25 6.25 6.25 6.25		HWS_RAS-RAS002 (003040) Hunter Well Science Pulsed Neutron Tool	11.75	1.69	55.82
			HWS_TBN-001 (001725) HWS Terminator Bull Nose (1.6875")	0.25	1.69	0.99

Dataset: terra_rwf 14-17_pn_8-18-2019.db: field/well/run1/main1.2
Total length: 18.02 ft
Total weight: 86.48 lb
O.D.: 1.69 in

Calibration Report

Database File	c:\programdata\warrior\data\terra_rwf 14-17_rcbl_8-18-19_post drill-out\terra_rwf 14-17_pn_8-18-2019.db
Dataset Pathname	main1.2
Dataset Creation	Wed Aug 21 08:06:06 2019

RAS Calibration Report

Calibration Date: Sun Aug 18 09:29:54 2019

Meas #: 003040

Water Tank

Description	Curve	Standard	Mean	Dev
Sigma Near	SIGN	23.1	24.1	0.18
Sigma Far	SIGF	22.8	23.5	0.20
Ratio Near-Long Capture	RNL2	5.79	7.46	0.05
Ratio Near-Long Burst	RNLB	6.49	7.81	0.04
Ratio Near-Far Capture	RNF2	1.85	2.03	0.01
Ratio Near-Far Burst	RNFB	2.03	2.19	0.01
Spectral Hydrogen Index	HIS2	12.84	13.86	0.22
Carbon-Oxygen Ratio	CORS	1.34	1.85	0.07
Ratio Burst-Capture Near	RNBC	1.46	1.68	0.01
Ratio Burst-Capture Far	RFBC	1.50	1.61	0.01

Hydrocarbon Tank

Description	Curve	Standard	Mean	Dev
Sigma Near	SIGN	25.7	27.8	0.27
Sigma Far	SIGF	25.1	26.1	0.23
Ratio Near-Long Capture	RNL2	1.78	3.38	0.02
Ratio Near-Long Burst	RNLB	2.57	5.01	0.02
Ratio Near-Far Capture	RNF2	0.98	1.32	0.01
Ratio Near-Far Burst	RNFB	1.30	1.68	0.01
Spectral Hydrogen Index	HIS2	16.68	19.26	0.36
Carbon-Oxygen Ratio	CORS	1.51	2.05	0.06
Ratio Burst-Capture Near	RNBC	2.23	2.37	0.02
Ratio Burst-Capture Far	RFBC	2.09	2.09	0.02

Gamma Ray Calibration Report

Serial Number:	001475	
Tool Model:	001	
Performed:	Fri Oct 19 14:55:00 2018	
Calibrator Value:	1.0	GAPI
Background Reading:	0.0	
Calibrator Reading:	1.0	
Sensitivity:	1.0000	GAPI/

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