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OILFIELD SERVICES

Pulsed Neutron Gamma Ray Casing Collar Log

Company TEP Rocky Mountain LLC
Well Federal RWF 332-12
Field Rulison
County Garfield
State Colorado

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Field Rulison
County Garfield State Colorado
Location: API # : 05-045-24284
SEC 12 TWP 6S RGE 94W

Other Services
RBL

Permanent Datum Ground Level Elevation 5466.8'
Log Measured From Kelly Bushing 24 FT
Drilling Measured From Kelly Bushing

Elevation
K.B. 5490.8'
D.F. 5489.8'
G.L. 5466.8'

Date	14-FEB-2020	
Run Number	One	
Depth Driller	8910 FT	
Depth Logger	8846 FT	
Bottom Logged Interval	8840 FT	
Top Log Interval	4555 FT	
Open Hole Size	8.750"	
Type Fluid	Water	
Density / Viscosity	8.34 lb/gal	
Max. Recorded Temp.	--	
Estimated Cement Top	--	
Time Well Ready	--	
Time Logger on Bottom	--	
Equipment Number	HD-0359	
Location	Grand Junction, CO	
Recorded By	J. Donnelly	
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	1041 FT
Intermediate #1	4 1/2	11.6	P-110	Surface	8869 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 14-FEB-2020
Log ran from 8840 FT to 4555 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	tep\tep_federal rwf 332-12_pn_02-14-20\processed_tep_federal rwf 332-12_pn_02-14-20.db
Dataset Pathname	run/merge3
Presentation Format	ros_pdn_hunter
Dataset Creation	Fri Feb 21 15:32:10 2020
Charted by	Depth in Feet scaled 1:240

0	GR (GAPI)	150
	PN 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	-1
1	PN Porosity (Sandstone)	0

	FIS2	
0	(cps)	45000
	NIS2	
0	(cps	100000

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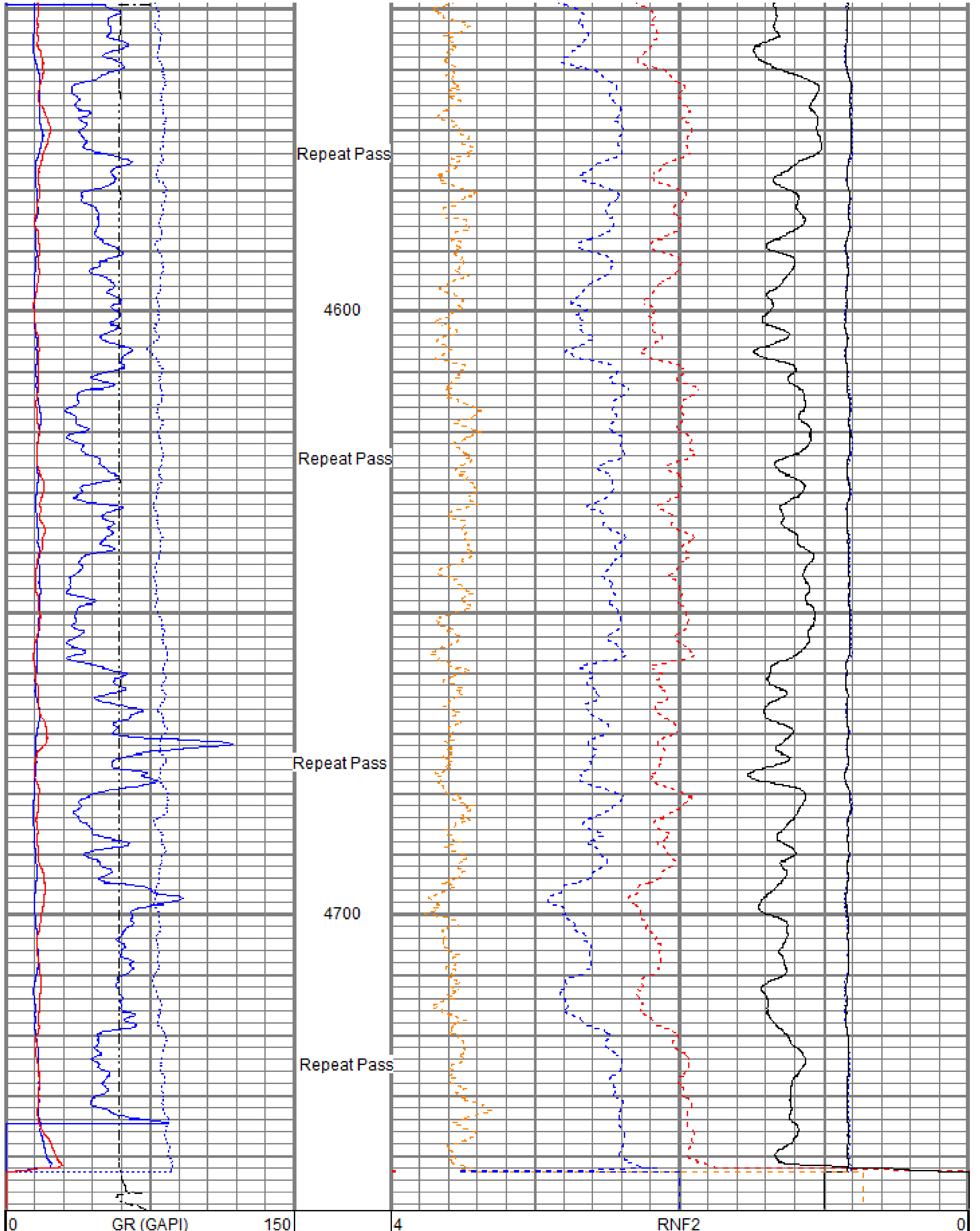
Repeat Pass

Database File	tep\tep_federal rwf 332-12_pn_02-14-20\processed_tep_federal rwf 332-12_pn_02-14-20.db
Dataset Pathname	run/merge2
Presentation Format	ros_pdn_hunter
Dataset Creation	Fri Feb 21 12:44:06 2020
Charted by	Depth in Feet scaled 1:240

0	GR (GAPI)	150
-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	-1
1	PN Porosity (Sandstone)	0

	FIS2	
0	(cps)	45000
	NIS2	
0	(cps	100000



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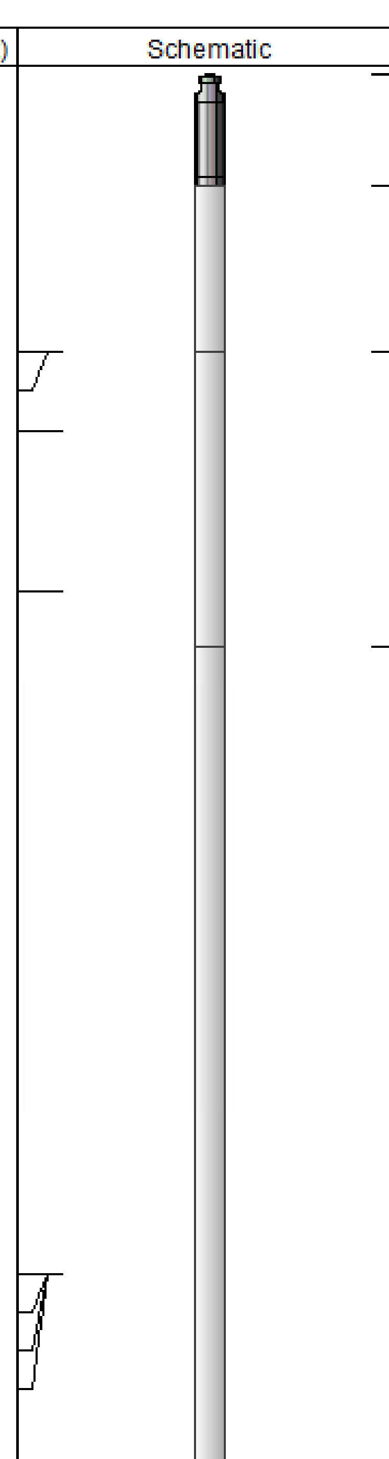
0	(cps)	45000
	NIS2	
0	(cps	100000

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-001 (000279) HWS Telemetry Control Unit	1.52	1.69	7.80
TCUTEMP TCUVOLT GCL_CCL	14.69 14.69 13.97					
			HWS_GCL-001 (001681) 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
LOCTIM UTCTIM	0.00 0.00		HWS_TBN-001 (001724) HWS Terminator Bull Nose (1.6875")	0.25	1.69	0.99

Dataset:	processed_tep_federal rwf 332-12_pn_02-14-20.db: field/well/run1/TOOL STRING
Total length:	17.24 ft
Total weight:	83.41 lb
O.D.:	1.69 in

Calibration Report

Database File	c:\programdata\warrior\data\tep\tep_federal rwf 332-12_pn_02-14-20\processed_tep_federal rwf 332-12_pn_
Dataset Pathname	Main.1
Dataset Creation	Sat Feb 15 17:15:56 2020

RAS Calibration Report

Calibration Date: Sat Sep 16 14:23 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	7.82	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	N/A
Sigma Far	SIGF	25.1	26.1	N/A
Ratio Near-Long Capture	RNL2	1.78	3.38	N/A
Ratio Near-Long Burst	RNLB	2.57	5.01	N/A
Ratio Near-Far Capture	RNF2	0.98	1.32	N/A
Ratio Near-Far Burst	RNFB	1.30	1.68	N/A
Spectral Hydrogen Index	HIS2	16.68	19.26	N/A
Carbon-Oxygen Ratio	CORS	1.51	2.04	N/A
Ratio Burst-Capture Near	RNBC	2.23	2.37	N/A
Ratio Burst-Capture Far	RFBC	2.09	2.09	N/A

Gamma Ray Calibration Report

Serial Number:	001681	
Tool Model:	001	
Performed:	(Not Performed)	
Calibrator Value:	1.0	GAPI
Background Reading:	0.0	
Calibrator Reading:	1.0	
Sensitivity:	1.0000	GAPI/

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State	Colorado