RELIANCE OILFIELD SERVICES

Pulsed Neutron Gamma Ray Casing Collar Log

Company TEP Rocky Mountain LLC
Well Federal PA 422-24
Field Parachute
County Garfield
State Colorado

Company	TEP Rocky Mountain LLC
Well	Federal PA 422-24
Field	Parachute
County	Garfield
State	Colorado
Location:	API # : 05-045-23894
	SEC 24 TWP 6S RGE 95W
Other Services	RBL

Permanent Datum	Ground Level	Elevation 5371'	Elevation
Log Measured From	Kelly Bushing	24 FT	K.B. 5395'
Drilling Measured From	Kelly Bushing		D.F. ---
			G.L. 5371'

Date	04-OCT-2019
Run Number	One
Depth Driller	9139 FT
Depth Logger	9098 FT
Bottom Logged Interval	9092 FT
Top Log Interval	4895 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-0331
Location	Grand Junction, CO
Recorded By	A. Ellsworth
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	1138 FT
Intermediate #1	4 1/2	11.6	P-110	Surface	9097 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 04-OCT-2019
Log ran from 9092 FT to 4895 FT
Pulsed Neutron Data logged with the Hunter RAS Tool

Thank you for choosing Reliance Oilfield Services, LLC!!

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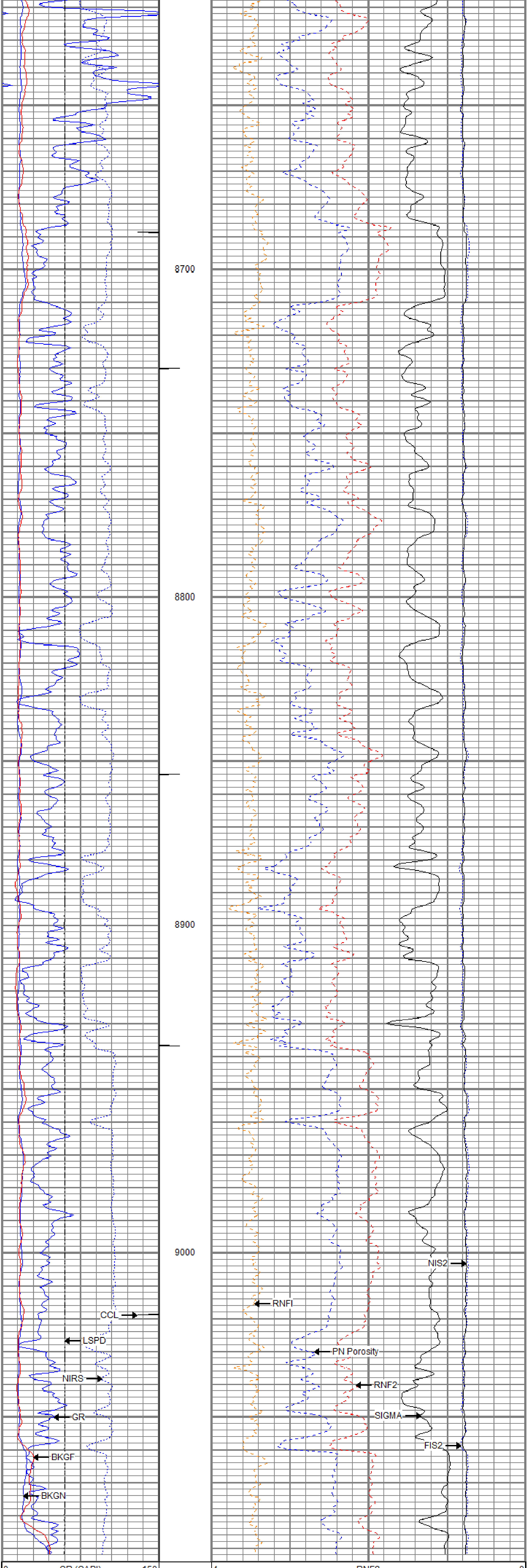
Main Pass

Database File c:\techlog-projects\tep\federal pa 422-24\processed_tep_federal pa 422-24_pn_10-04-19.db
Dataset Pathname SHIFTED.1/merge1
Presentation Format ros_pdn_hunter
Dataset Creation Wed Oct 09 13:45:29 2019
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) (pu)	0

	FIS2	
0	(cps)	45000
	NIS2	
0	(cps	100000



0 GR (GAPI) 150	4 RNF2 0	
PN Casing Collar Locator	60 SIGMA (cu) 0	
-100 Line Speed (ft/min) 100	4.5 RNFI -1	
0 NIRS (cps) 400000	1 PN Porosity (Sandstone) (pu) 0	FIS2 0 (cps) 45000
0 BKGN (cps) 4000		NIS2 0 (cps100000
0 BKGF (cps) 2000		

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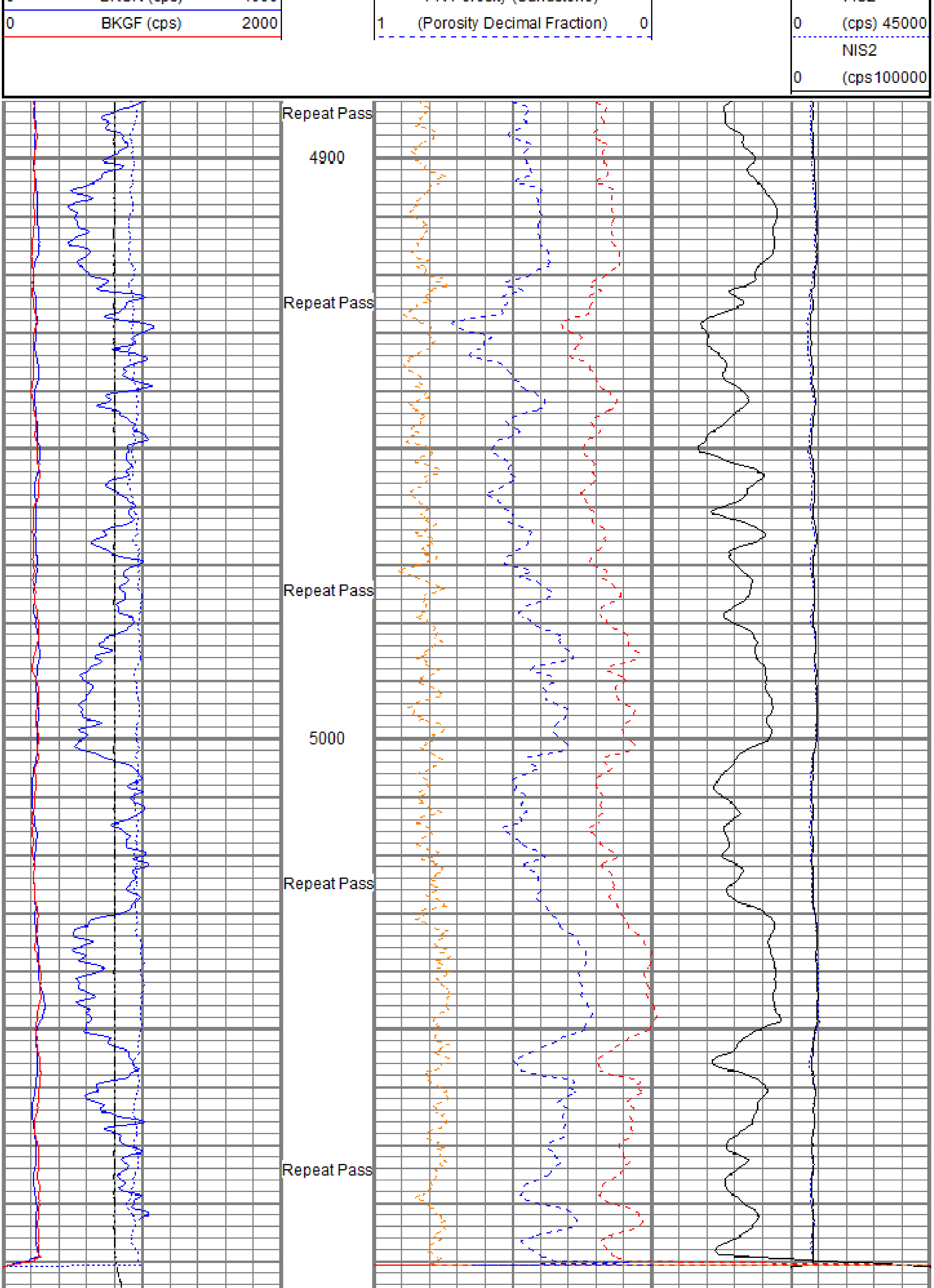
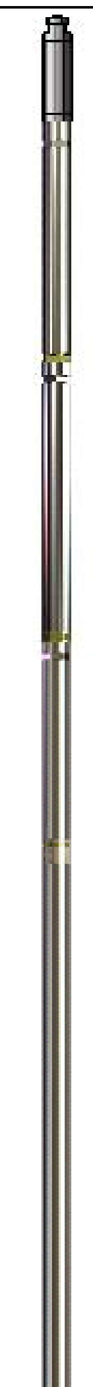
Repeat Pass

Database File c:\techlog-projects\tep\federal pa 422-24\processed_tep_federal pa 422-24_pn_10-04-19.db
Dataset Pathname repeat.2
Presentation Format ros_pdn_hunter
Dataset Creation Fri Oct 04 10:24:24 2019
Charted by Depth in Feet scaled 1:240

0 GR (GAPI) 150	4 RNF2 0	
-100 Line Speed (ft/min) 100	60 SIGMA (cu) 0	
0 NIRS (cps) 400000	4.5 RNFI -1	
0 BKGN (cps) 4000	PN Porosity (Sandstone)	FIS2 0 (cps) 45000
0 BKGF (cps) 2000	1 (Porosity Decimal Fraction) 0	NIS2 0 (cps100000



0 GR (GAPI) 150	4 RNF2 0	
-100 Line Speed (ft/min) 100	60 SIGMA (cu) 0	
0 NIRS (cps) 400000	4.5 RNFI -1	
0 BKGN (cps) 4000	PN Porosity (Sandstone)	FIS2 0 (cps) 45000
0 BKGF (cps) 2000	1 (Porosity Decimal Fraction) 0	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 (001705) HWS Telemetry Control Unit (TCU002)	2.30	1.69	10.87
TCUTEMP	14.69					
TCUVOLT	14.69					
GCL_CCL	13.97					
			HWS_GCL-001 (001681) HWS Gamma Ray Collar Locator (1.6875")	2.69	1.69	13.40
GCL_GR	12.50					
Long	6.25					
Far	6.25					
Near	6.25					
Anci	6.25					
			HWS_RAS-RAS002 (003041) 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: processed_tep_federal pa 422-24_pn_10-04-19.db: field/well/run1/Main.2
Total length: 18.02 ft
Total weight: 86.48 lb
O.D.: 1.69 in

Calibration Report

Database File c:\techlog-projects\tep\federal pa 422-24\processed_tep_federal pa 422-24_pn_10-04-19.db
Dataset Pathname Main.2
Dataset Creation Fri Oct 04 10:41:37 2019

RAS Calibration Report

Calibration Date: Fri Sep 26 16:26 2019

Meas #: 003041

Water Tank

Description	Curve	Standard	Mean	Dev
Sigma Near	SIGN	23.1	24.1	0.26
Sigma Far	SIGF	22.8	23.6	0.28
Ratio Near-Long Capture	RNL2	5.79	6.28	0.04
Ratio Near-Long Burst	RNLB	6.49	6.57	0.04
Ratio Near-Far Capture	RNF2	1.85	2.00	0.01
Ratio Near-Far Burst	RNFB	2.03	2.18	0.01
Spectral Hydrogen Index	HIS2	12.84	13.21	0.19
Carbon-Oxygen Ratio	CORS	1.34	1.30	0.05
Ratio Burst-Capture Near	RNBC	1.46	1.82	0.02
Ratio Burst-Capture Far	RFBC	1.50	1.74	0.02

Hydrocarbon Tank

Description	Curve	Standard	Mean	Dev
Sigma Near	SIGN	25.7	26.6	0.37
Sigma Far	SIGF	25.1	26.1	0.37
Ratio Near-Long Capture	RNL2	1.78	2.84	0.02
Ratio Near-Long Burst	RNLB	2.57	4.17	0.02
Ratio Near-Far Capture	RNF2	0.98	1.30	0.01
Ratio Near-Far Burst	RNFB	1.30	1.65	0.01
Spectral Hydrogen Index	HIS2	16.68	18.12	0.28
Carbon-Oxygen Ratio	CORS	1.51	1.54	0.05
Ratio Burst-Capture Near	RNBC	2.23	2.57	0.02
Ratio Burst-Capture Far	RFBC	2.09	2.25	0.02

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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