RELIANCE
OILFIELD SERVICES

Pulsed Neutron Gamma Ray Casing Collar Log

Company	Caerus Piceance LLC
Well	FED 15D-13-496
Field	Grand Valley
County	Garfield
State	Colorado

Company Caerus Piceance LLC
Well FED 15D-13-496
Field Grand Valley
County Garfield State Colorado
Location: API # : 05-045-24174
SEC 24 TWP 4S RGE 96W
Other Services RBL

Permanent Datum	Ground Level	Elevation	8128'
Log Measured From	Kelly Bushing		30 FT
Drilling Measured From	Kelly Bushing		

Elevation
K.B. 8158'
D.F. ---
G.L. 8128'

Date	19-FEB-2020
Run Number	One
Depth Driller	12590 FT
Depth Logger	12529 FT
Bottom Logged Interval	12529 FT
Top Log Interval	7054 FT
Open Hole Size	8.750"
Type Fluid	Water
Density / Viscosity	8.34 lb/gal
Max. Recorded Temp.	---
Estimated Cement Top	---
Time Well Ready	ROA
Time Logger on Bottom	---
Equipment Number	HD-0359
Location	Grand Junction, CO
Recorded By	James 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	2981 FT
Intermediate #1	4 1/2	11.6	P-110	Surface	12566 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 19-FEB-2020
Log ran from 12529 FT to 7054 FT
Pulsed Neutron Data logged with the Hunter RAS Tool
RBL Gamma Ray Displayed for Correlation Purposes

Thank you for choosing Reliance Oilfield Services, LLC!!

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Main Pass

Database File	e:\data\caerus\fed 15d-13-496\caerus_fed 15d-13-496_pn_02-19-20.db
Dataset Pathname	runSHIFTED/merge1
Presentation Format	ros_pdn_hunter_caerus
Dataset Creation	Mon Mar 02 15:01:48 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
0	GR RBL (GAPI)	150

4	RNF2	0
60	SIGMA (cu)	0
4.5	RNFI	-1
1	PN Porosity (Sandstone)	0

	FIS2	
0	(cps)	45000
	NIS2	
0	(cps	100000

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
0	GR RBL (GAPI)	150

4	RNF2	0
60	SIGMA (cu)	0
4.5	RNFI	-1
1	PN Porosity (Sandstone)	0

	FIS2	
0	(cps)	45000
	NIS2	
0	(cps	100000

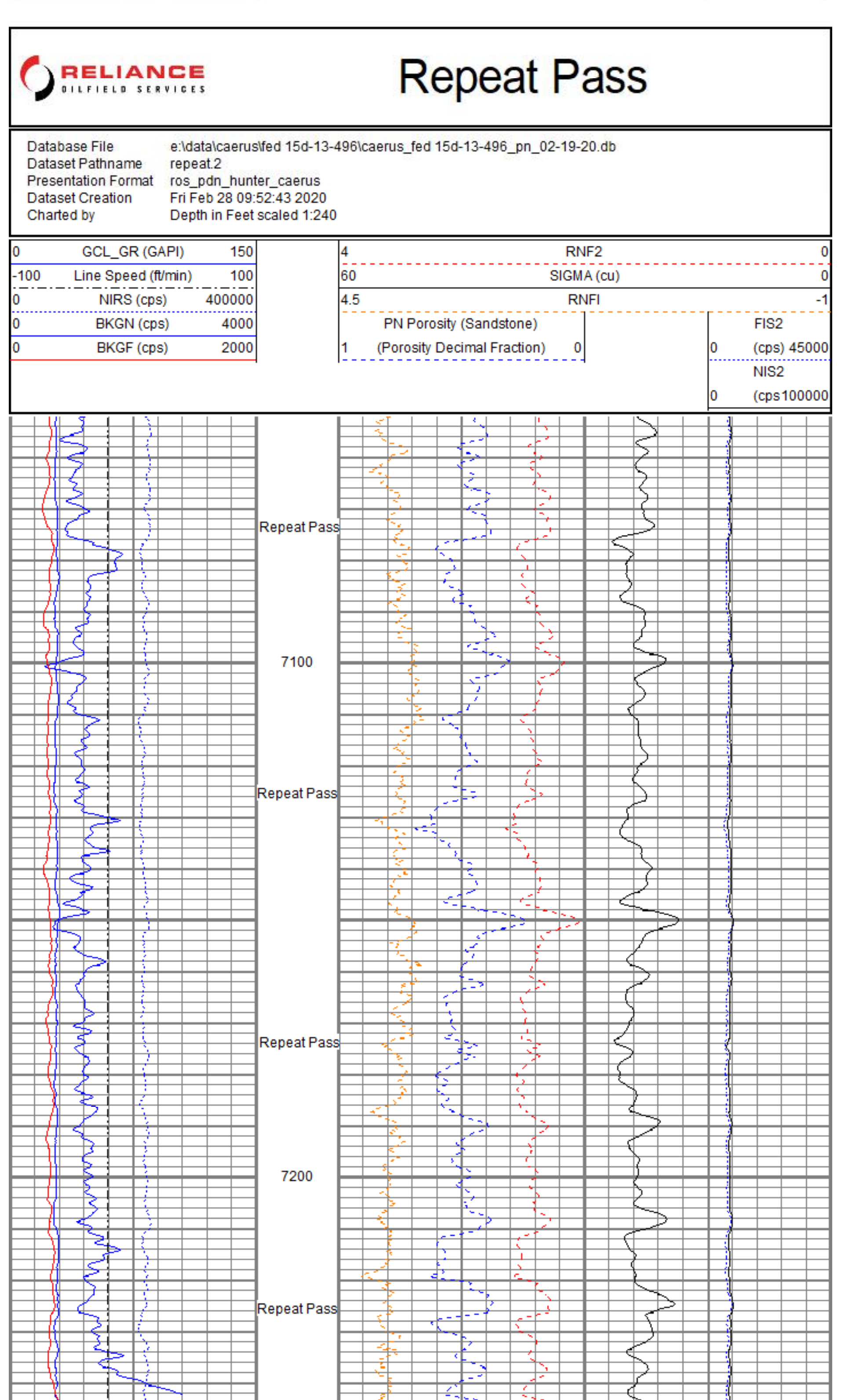
Repeat Pass

Database File	e:\data\caerus\fed 15d-13-496\caerus_fed 15d-13-496_pn_02-19-20.db
Dataset Pathname	repeat.2
Presentation Format	ros_pdn_hunter_caerus
Dataset Creation	Fri Feb 28 09:52:43 2020
Charted by	Depth in Feet scaled 1:240

0	GCL_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
	PN Porosity (Sandstone)	
1	(Porosity Decimal Fraction)	0

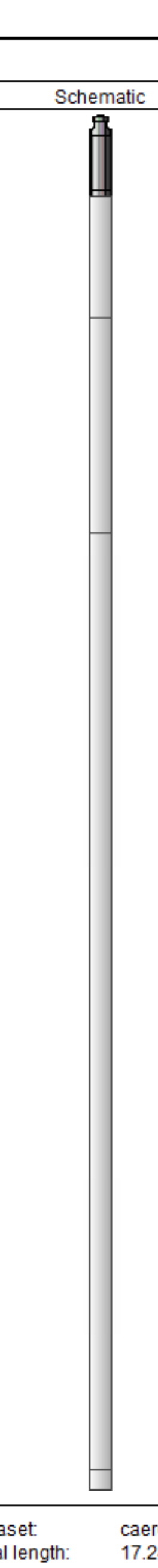
	FIS2	
0	(cps)	45000
	NIS2	
0	(cps	100000



0	GCL_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
	PN Porosity (Sandstone)	
1	(Porosity Decimal Fraction)	0

	FIS2	
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
TCUTEMP TCUVOLT GCL_CCL	14.69 14.69 13.97		HWS_TCU-001 (000279) HWS Telemetry Control Unit	1.52	1.69	7.80
GCL_GR	12.50		HWS_GCL-001 (001681) HWS Gamma Ray Collar Locator (1.6875")	2.69	1.69	13.40
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:	caerus_fed 15d-13-496_pn_02-19-20.db: field/well/run1/main1.2
Total length:	17.24 ft
Total weight:	83.41 lb
O.D.:	1.69 in

Calibration Report

Database File	e:\data\caerus\fed 15d-13-496\caerus_fed 15d-13-496_pn_02-19-20.db
Dataset Pathname	main1.2
Dataset Creation	Fri Feb 28 10:02:32 2020

RAS Calibration Report

Calibration Date: Fri Aug 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	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	2.04	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:	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