

HALLIBURTON

iCem[®] Service

HIGHLANDS NATURAL RESOURCES-EBUS

Buckskin 5-64 15-16-1BHZ Production

Job Date: Thursday, May 24, 2018

Sincerely,

Ryan Keeran

Legal Notice

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1.0 Cementing Job Summary

1.1 Executive Summary

Halliburton appreciates the opportunity to perform the cementing services on the Buckskin 5-64 15-16-1BHZ cement production casing job. A pre-job safety meeting was held before the job where details of the job were discussed, potential safety hazards were reviewed, and environmental compliance procedures were outlined.

Returns were lost 300bbls into displacement.

With 10 bbls of Tuned Spacer III to surface very rough calculations show top of lead cement at ~2,000ft and top of tail cement at 7,523ft

Halliburton maintains a continuous quality improvement process and appreciates any comments or suggestions that you may have. Halliburton again thanks you for the opportunity to perform service work on this well. We hope to be your solutions provider for future projects.

Respectfully,

Halliburton Fort Lupton

The Road to Excellence Starts with Safety

Sold To #: 378724		Ship To #: 3863324		Quote #: 0022441128		Sales Order #: 0904850424					
Customer: HIGHLANDS NATURAL RESOURCES-EBUS				Customer Rep: Johnny Musso							
Well Name: BUCKSKIN			Well #: 5-64 15-16-1BHZ			API/UWI #: 05-005-07343-00					
Field: WILDCAT		City (SAP): AURORA		County/Parish: ARAPAHOE		State: COLORADO					
Legal Description: NE SE-15-5S-64W-2380FSL-440FEL											
Contractor: TRUE DRLG				Rig/Platform Name/Num: TRUE 33							
Job BOM: 7523 7523											
Well Type: HORIZONTAL OIL											
Sales Person: HALAMERICA\HB41307				Srv Supervisor: Nicholas Roles							
Job											
Formation Name											
Formation Depth (MD)		Top		Bottom							
Form Type					BHST						
Job depth MD		17994ft			Job Depth TVD						
Water Depth					Wk Ht Above Floor						
Perforation Depth (MD)		From		To							
Well Data											
Description	New / Used	Size in	ID in	Weight lbm/ft	Thread	Grade	Top MD ft	Bottom MD ft	Top TVD ft	Bottom TVD ft	
Casing		9.625	8.921	36	LTC	J-55	0	2100		2100	
Casing		5.5	4.778	20	GB CD	P-110	0	17994		7760	
Open Hole Section			8.5				2100	17997	2100	7760	
Tools and Accessories											
Type	Size in	Qty	Make	Depth ft		Type	Size in	Qty	Make		
Guide Shoe	5.5			17994		Top Plug	5.5	1			
Float Shoe	5.5					Bottom Plug	5.5				
Float Collar	5.5			17967		SSR plug set	5.5				
	5.5					Plug Container	5.5	1	HES		
	5.5					Centralizers	5.5	184	Matrix		
Fluid Data											
Stage/Plug #: 1											
Fluid #	Stage Type	Fluid Name			Qty	Qty UoM	Mixing Density lbm/gal	Yield ft³/sack	Mix Fluid Gal	Rate bbl/min	Total Mix Fluid Gal
1	Tuned Spacer III	Tuned Spacer III			60	bbl	12	3.16		4	
176.58 lbm/bbl		BARITE, BULK (100003681)									
35.35 gal/bbl		FRESH WATER									

0.60 gal/bbl		DUAL SPACER SURFACTANT B, 5 GAL PAIL (100003665)							
0.60 gal/bbl		MUSOL A, 330 GAL TOTE - (790828)							
Fluid #	Stage Type	Fluid Name	Qty	Qty UoM	Mixing Density lbm/gal	Yield ft3/sack	Mix Fluid Gal	Rate bbl/min	Total Mix Fluid Gal
2	ElastiCem (Cap)	ELASTICEM (TM) SYSTEM	370	sack	13.2	1.57		6	7.53
0.90 %		SCR-100 (100003749)							
Fluid #	Stage Type	Fluid Name	Qty	Qty UoM	Mixing Density lbm/gal	Yield ft3/sack	Mix Fluid Gal	Rate bbl/min	Total Mix Fluid Gal
3	ElastiCem (Super CBL)	ELASTICEM (TM) SYSTEM	700	sack	13.2	1.57		6	7.54
0.45 %		SCR-100 (100003749)							
0.10 %		SUPER CBL, 50 LB PAIL (100003668)							
Fluid #	Stage Type	Fluid Name	Qty	Qty UoM	Mixing Density lbm/gal	Yield ft3/sack	Mix Fluid Gal	Rate bbl/min	Total Mix Fluid Gal
4	NeoCem	NeoCem TM	1425	sack	13.2	2.04		6	9.75
9.75 Gal		FRESH WATER							
0.08 %		SCR-100 (100003749)							
Fluid #	Stage Type	Fluid Name	Qty	Qty UoM	Mixing Density lbm/gal	Yield ft3/sack	Mix Fluid Gal	Rate bbl/min	Total Mix Fluid Gal
5	MMCR Displacement	MMCR Displacement	40	bbl	8.4			8	
0.50 gal/bbl		MICRO MATRIX CEMENT RETARDER, 5 GAL PAIL (100003781)							
Fluid #	Stage Type	Fluid Name	Qty	Qty UoM	Mixing Density lbm/gal	Yield ft3/sack	Mix Fluid Gal	Rate bbl/min	Total Mix Fluid Gal
6	Displacement Fluid	Displacement Fluid	359	bbl	8.4			8	
Cement Left In Pipe	Amount	23 ft			Reason			Shoe Joint	

Mix Water:	pH 6	Mix Water Chloride:	0 ppm	Mix Water Temperature:	61 °F
Cement Temperature:	64 °F °C	Plug Displaced by:	8.33 lb/gal kg/m3	Disp. Temperature:	61 °F °C
Plug Bumped?	Yes	Bump Pressure:	2930 psi MPa	Floats Held?	Yes
Cement Returns:	0 bbl m3	Returns Density:	## lb/gal kg/m3	Returns Temperature:	## °F °C
Comment Got 10bbls spacer to surface. Estimated-TOL#2-2200', TOT-7523'					

2.0 Real-Time Job Summary

2.1 Job Event Log

Type	Seq. No.	Activity	Graph Label	Date	Time	Source	DH Density (ppg)	Comb Pump Rate (bbl/min)	DS Pump Press (psi)	Pump Stg Tot (bbl)	Comments
Event	1	Call Out	Call Out	5/23/2018	11:30:00	USER					Called out by Service Coordinator for O/L at 1530
Event	2	Depart Yard Safety Meeting	Depart Yard Safety Meeting	5/23/2018	13:15:00	USER					Held meeting with all personnel in convoy to discuss directions and hazards associated with drive, all fit to drive.
Event	3	Depart from Service Center or Other Site	Depart from Service Center or Other Site	5/23/2018	13:30:00	USER					Journey Management prior to departure
Event	4	Arrive at Location from Service Center	Arrive at Location from Service Center	5/23/2018	14:30:00	USER					Upon arrival met with company man to discuss job details and calculations, performed hazard hunt and site assessment.
Event	5	Pre-Rig Up Safety Meeting	Pre-Rig Up Safety Meeting	5/23/2018	15:00:00	USER					Discussed rigging up hazards and procedure according to HMS.
Event	6	Other	Other	5/23/2018	16:00:00	USER					Water test- PH-6, Chlor-0, Temp-85.
Event	7	Safety Meeting - Pre Job	Safety Meeting - Pre Job	5/23/2018	21:00:00	USER					Held safety meeting with all job associated personnel to discuss job procedure, hazards and stop work authority.
Event	8	Start Job	Start Job	5/23/2018	22:28:14	COM4	8.43	0.00	-7.00	0.00	TD-17997', TP-17994' 5.5" 20#, FC-17967', TVD-7760', SURF-2100' 9.625" 36#, OH-8.5" MUD-9.6#

Event	9	Test Lines	Test Lines	5/23/2018	22:31:33	COM4	8.33	0.00	42.00	5.90	Pumped 5bbbls fresh water to fill lines, closed 2" lo torc, performed 500psi k/o function test, followed with 5th gear stall at 1980psi, proceeded to bring pressure to 5000psi, pressure stabilized and held with no leaks.
Event	10	Pump Spacer 1	Pump Spacer 1	5/23/2018	22:42:36	COM4	8.49	3.20	159.00	6.80	Pumped 60bbbls Tuned Spacer III 12# 3.16y 19.3g/s with 35g Musol A, 35g Dual Spacer B and 10g D-Air at 4bpm 150psi.
Event	11	Pump Lead Cement	Pump Lead Cement	5/23/2018	23:00:02	COM4	11.38	3.20	34.00	0.00	Pumped 370sks or 103.5bbbls Elasticem w/o CBL 13.2# 1.57y 7.53g/s at 8bpm 500psi.
Event	12	Check Weight	Check Weight	5/23/2018	23:02:00	COM4	13.08	3.90	145.00	7.70	Weight verified with pressurized mud scales.
Event	13	Pump Lead Cement	Pump Lead Cement	5/23/2018	23:22:11	COM4	12.88	1.60	34.00	0.00	Pumped 700sks or 196bbbls Elasticem w/CBL 13.2# 1.57y 7.54g/s at 6bpm 310psi.
Event	14	Check Weight	Check Weight	5/23/2018	23:26:48	COM4	13.20	3.30	117.00	14.00	Weight verified with pressurized mud scales.
Event	15	Check Weight	Check Weight	5/23/2018	23:30:55	COM4	13.20	6.00	331.00	37.90	Weight verified with pressurized mud scales.
Event	16	Check Weight	Check Weight	5/23/2018	23:40:31	COM4	13.19	6.00	319.00	95.70	Weight verified with pressurized mud scales.
Event	17	Check Weight	Check Weight	5/23/2018	23:56:04	COM4	13.14	6.00	312.00	189.30	Weight verified with pressurized mud scales.
Event	18	Pump Tail Cement	Pump Tail Cement	5/23/2018	23:58:26	COM4	13.10	4.20	170.00	0.00	
Event	19	Check Weight	Check Weight	5/24/2018	00:05:29	COM4	13.10	6.00	411.00	40.30	Weight verified with pressurized mud scales.

Event	20	Check Weight	Check Weight	5/24/2018	00:09:03	COM4	13.15	6.00	425.00	61.80	Weight verified with pressurized mud scales.
Event	21	Check Weight	Check Weight	5/24/2018	00:26:06	COM4	13.18	5.90	409.00	162.40	Weight verified with pressurized mud scales.
Event	22	Check Weight	Check Weight	5/24/2018	00:46:56	COM4	13.19	6.00	409.00	285.20	Weight verified with pressurized mud scales.
Event	23	Check Weight	Check Weight	5/24/2018	00:59:27	COM4	13.18	6.00	411.00	360.40	Weight verified with pressurized mud scales.
Event	24	Check Weight	Check Weight	5/24/2018	01:10:51	COM4	13.18	6.00	414.00	428.90	Weight verified with pressurized mud scales.
Event	25	Shutdown	Shutdown	5/24/2018	01:28:17	COM4	13.23	0.00	80.00	520.60	Shutdown, rig blew air through lines to pits, followed with 5bbls fresh water through pumps and lines.
Event	26	Drop Top Plug	Drop Top Plug	5/24/2018	01:39:09	COM4	8.01	0.00	3.00	538.30	Dropped by HES Supervisor, witnessed by company man and tool hand.
Event	27	Pump Displacement	Pump Displacement	5/24/2018	01:39:12	COM4	8.01	0.00	2.00	0.00	Pumped 389bbls fresh water with 20g MMCR in first 40bbls with 5g clay-web and 3# BE-6 throughout.
Event	28	Pump Displacement	Pump Displacement	5/24/2018	01:56:54	COM4	8.05	8.10	2111.00	0.10	Pumped 389bbls fresh water with 20g MMCR in first 40bbls with 5g clay-web and 3# BE-6 throughout. At about 300bbls away we lost returns, once spacer got thick it stopped completely
Event	29	Bump Plug	Bump Plug	5/24/2018	02:43:01	COM4	8.12	0.00	2956.00	401.10	Slowed down to 4bpm at 375bbls away, final circulating pressure- 2380psi, Bump pressure- 2930psi.

Event	30	Check Floats	Check Floats	5/24/2018	02:47:27	USER	8.10	0.00	3079.00	401.10	Released pressure and got 4bbls fresh water to truck, floats held.
Event	31	End Job	End Job	5/24/2018	02:49:45	COM4	8.04	0.00	-5.00	0.00	Got 10bbls spacer to surface. Estimated-TOL#2-2200', TOT-7523'
Event	32	Safety Meeting - Pre Rig-Down	Safety Meeting - Pre Rig-Down	5/24/2018	02:55:00	USER	8.03	0.00	-4.00	0.00	All HSE present. Discussed red zone areas and trapped pressure hazards. Watch for suspended loads and rig down procedures, including hand placement, lifting techniques, and swing radius.
Event	33	Pre-Convoy Safety Meeting	Pre-Convoy Safety Meeting	5/24/2018	04:45:00	USER					All HSE present and fit to drive. Aware of directions and hazards.
Event	34	Depart Location for Service Center or Other Site	Depart Location for Service Center or Other Site	5/24/2018	05:00:00	USER					Pre journey management prior to departure.

3.0 Job Chart

3.1 Job Chart

