

# HALLIBURTON

iCem<sup>®</sup> Service

## **Highlands Natural Resources**

**For: HNR**

### **Citadel 5-64 15-16-1CHZ Surface**

Job Date: Wednesday, May 02, 2018

Sincerely,  
**Ryan Keeran**

## Legal Notice

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### Disclaimer:

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## 1.0 Cementing Job Summary

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### 1.1 Executive Summary

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Halliburton appreciates the opportunity to perform the cementing services on the **Citadel 5-64 15-16-1CHZ** cement surface 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.

72 bbls of cement was circulated to surface

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*

<b>Sold To #:</b> 378724		<b>Ship To #:</b> 3791374		<b>Quote #:</b> 0022436259		<b>Sales Order #:</b> 0904821403					
<b>Customer:</b> HIGHLANDS NATURAL RESOURCES-EBUS				<b>Customer Rep:</b> Mark Stoner							
<b>Well Name:</b> CITADEL			<b>Well #:</b> 5-64 15-16-1CHZ			<b>API/UWI #:</b> 05-005-07266-00					
<b>Field:</b> WILDCAT		<b>City (SAP):</b> AURORA		<b>County/Parish:</b> ARAPAHOE		<b>State:</b> COLORADO					
<b>Legal Description:</b> NE SE-15-5S-64W-2160FSL-440FEL											
<b>Contractor:</b> TRUE DRLG				<b>Rig/Platform Name/Num:</b> TRUE 33							
<b>Job BOM:</b> 7521 7521											
<b>Well Type:</b> HORIZONTAL OIL											
<b>Sales Person:</b> HALAMERICA\HB41307				<b>Srv Supervisor:</b> Adam Covington							
<b>Job</b>											
<b>Formation Name</b>											
<b>Formation Depth (MD)</b>		<b>Top</b>		<b>Bottom</b>							
<b>Form Type</b>					<b>BHST</b>						
<b>Job depth MD</b>		2142ft			<b>Job Depth TVD</b>						
<b>Water Depth</b>					<b>Wk Ht Above Floor</b>						
<b>Perforation Depth (MD)</b>		<b>From</b>		<b>To</b>							
<b>Well Data</b>											
<b>Description</b>	<b>New / Used</b>	<b>Size in</b>	<b>ID in</b>	<b>Weight lbm/ft</b>	<b>Thread</b>	<b>Grade</b>	<b>Top MD ft</b>	<b>Bottom MD ft</b>	<b>Top TVD ft</b>	<b>Bottom TVD ft</b>	
Casing		9.625	8.921	36	LTC	J-55	0	2142		0	
Open Hole Section			13.5				0	2152		0	
<b>Tools and Accessories</b>											
<b>Type</b>	<b>Size in</b>	<b>Qty</b>	<b>Make</b>	<b>Depth ft</b>		<b>Type</b>	<b>Size in</b>	<b>Qty</b>	<b>Make</b>		
Guide Shoe	9.625			2142		Top Plug	9.625	1	HES		
Float Shoe	9.625					Bottom Plug	9.625		HES		
Float Collar	9.625					SSR plug set	9.625		HES		
Insert Float	9.625					Plug Container	9.625		HES		
Stage Tool	9.625					Centralizers	9.625	1	HES		
<b>Fluid Data</b>											
<b>Stage/Plug #: 1</b>											
<b>Fluid #</b>	<b>Stage Type</b>	<b>Fluid Name</b>			<b>Qty</b>	<b>Qty UoM</b>	<b>Mixing Density lbm/gal</b>	<b>Yield ft3/sack</b>	<b>Mix Fluid Gal</b>	<b>Rate bbl/min</b>	<b>Total Mix Fluid Gal</b>
1	Fresh Water Spacer	Fresh Water Spacer			20	bbl	8.33			3	

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	SwiftCem	SWIFTCEM (TM) SYSTEM	330	sack	12	2.53		7	14.65
3 %		CAL-SEAL 60, 50 LB BAG (101217146)							
0.30 %		VERSASET, 55 LB SK (101376573)							
3 %		ECONOLITE (100001580)							
14.65 Gal		FRESH WATER							
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	SwiftCem	SWIFTCEM (TM) SYSTEM	440	sack	13.5	1.76		8	9.02
9.02 Gal		FRESH WATER							
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	Displacement	Displacement	162	bbl	8.33			8	
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	Premium G Cement	HALCEM (TM) SYSTEM	0	sack	15.8	1.16		0	5.01
5.01 Gal		FRESH WATER							
Cement Left In Pipe		Amount	46 ft		Reason			Shoe Joint	
Comment 72 bbls of cement to surface. Estimated top of tail 873 ft.									

## 2.0 Real-Time Job Summary

## 2.1 Job Event Log

Type	Seq. No.	Activity	Graph Label	Date	Time	Source	PS Pump Press (psi)	DH Density (ppg)	Comb Pump Rate (bbl/min)	Comb Pump Total (bbl)	Comments
Event	1	Call Out	Call Out	5/1/2018	12:30:00	USER					CALLED OUT BY SERVICE COORDINATOR FOR O/L AT 1800
Event	2	Pre-Convoy Safety Meeting	Depart Shop for Location	5/1/2018	16:20:00	USER					HELD MEETING WITH ALL PERSONNEL IN CONVOY TO DISCUSS DIRECTIONS AND HAZARDS ASSOCIATED WITH DRIVING, ALL FIT TO DRIVE.
Event	3	Depart Shop for Location	Depart Shop for Location	5/1/2018	16:30:00	USER					JOURNEY MANAGEMENT PRIOR TO DEPARTURE
Event	4	Arrive At Loc	Arrive At Loc	5/1/2018	17:30:00	USER					UPON ARRIVAL MET WITH COMPANY MAN TO DISCUSS JOB DETAILS AND CALCULATIONS, PERFORMED HAZARD HUNT AND SITE ASSESSMENT.
Event	5	Safety Meeting - Pre Rig-Up	Safety Meeting - Pre Rig-Up	5/1/2018	22:30:00	USER					DISCUSSED RIGGING UP HAZARDS AND PROCEDURE ACCORDING TO HMS.
Event	6	Safety Meeting - Pre Job	Safety Meeting - Pre Job	5/2/2018	00:45:00	USER	61.00	8.47	0.00	9.60	HELD SAFETY MEETING WITH ALL JOB ASSOCIATED PERSONNEL TO DISCUSS JOB PROCEDURE, HAZARDS AND STOP WORK AUTHORITY. Water test-PH-6, Chlor-0, Temp-65. Cement temp-70.

Event	7	Start Job	Start Job	5/2/2018	02:10:13	COM4	62.00	8.45	0.00	12.70	FILLED LINES WITH 3 BBLS OF FRESH WATER. 1.5 BPM, 30 PSI.
Event	8	Test Lines	Test Lines	5/2/2018	02:18:25	COM4	2785.00	8.67	0.00	3.00	TESTED LINES TO 3000 PSI, AFTER PERFORMING A 500 KICKOUT TEST AND A 5TH GEAR STALL. HAD A LEAK, FIXED IT AND TESTED AGAIN. HELD. NO LEAKS.
Event	9	Pump Spacer 1	Pump Spacer 1	5/2/2018	02:22:53	COM4	12.00	8.55	0.00	3.00	PUMPED 10 BBLS OF DYE SPACER AT 3 BPM 30 PSI. FULL RETURNS.
Event	10	Pump Spacer 2	Pump Spacer 2	5/2/2018	02:29:58	COM4	39.00	8.67	2.30	14.30	PUMPED 10 BBLS OF FRESH WATER AT 3 BPM 40 PSI.
Event	11	Pump Lead Cement	Pump Lead Cement	5/2/2018	02:34:03	COM4	55.00	8.61	3.00	24.40	PUMPED 149 BBLS (330 SKS) OF 12#, 2.53y, 14.65wr AT 7 BPM 55 PSI. FULL RETURNS.
Event	12	Check Weight	Check Weight	5/2/2018	02:47:46	COM4	167.00	11.92	7.00	93.70	CHECKED WEIGHT USING PRESSURIZED MUD SCALES. WEIGHED UP AT 12#
Event	13	Check Weight	Check Weight	5/2/2018	02:49:46	COM4	169.00	11.92	7.00	107.70	CHECKED WEIGHT USING PRESSURIZED MUD SCALES. WEIGHED UP AT 12#
Event	14	Pump Tail Cement	Pump Tail Cement	5/2/2018	03:00:50	COM4	231.00	13.22	7.00	185.00	PUMPED 138 BBLS (440 SKS) OF 13.5#, 1.76y, 9.02 wr. AT 8 BPM 290 PSI. FULL RETURNS.
Event	15	Check Weight	Check Weight	5/2/2018	03:00:59	COM4	230.00	13.32	7.00	186.00	CHECKED WEIGHT USING PRESSURIZED MUD SCALES. WEIGHED UP AT 13.5#
Event	16	Shutdown	Shutdown	5/2/2018	03:20:31	COM4	110.00	13.52	0.00	333.00	SHUTDOWN TO WASH TUB AND GET READY TO WASH UP ON PLUG.



Event	17	Drop Top Plug	Drop Top Plug	5/2/2018	03:26:04	COM4	15.00	14.27	0.00	333.00	ADAM COVINGTON DROPPED 9 5/8" HALLIBURTON TOP PLUG. CO. MAN WITNESSED.
Event	18	Pump Displacement	Pump Displacement	5/2/2018	03:26:06	COM4	15.00	14.27	0.00	333.00	PUMPED 162 BBLS OF (BIOCIDE) WATER DISPLACEMENT. AT 8 BPM 145 PSI TO START. HAD FULL RETURNS AND HAD 72 BBLS OF CEMENT TO SURFACE.
Event	19	Bump Plug	Bump Plug	5/2/2018	03:53:07	COM4	1082.00	7.50	0.00	502.40	BUMPED HALLIBURTON 9 5/8" PLUG GOING 3 BPM. FCP 680 PSI. TOOK TO 1150 PSI. HELD TO PERFORM A CASING TEST.
Event	20	Other	Other	5/2/2018	04:00:31	COM4	1082.00	7.51	0.00	502.40	bled pressure back to check floats. floats held. 2 BBLS back to the truck.
Event	21	End Job	End Job	5/2/2018	04:15:02	COM4	4.00	-0.97	0.00	502.40	ESTIMATED TOP OF TAIL IS AT 873 FT. 72 BBLS BACK TO SURFACE.
Event	22	Pre-Rig Down Safety Meeting	Pre-Rig Down Safety Meeting	5/2/2018	04:25:00	USER	20.00	6.29	2.60	21.30	DISCUSSED RIGGING DOWN HAZARDS AND PROCEDURE ACCORDING TO HMS.
Event	23	Pre-Convoy Safety Meeting	Pre-Convoy Safety Meeting	5/2/2018	05:45:00	USER					HELD MEETING WITH ALL HES EMPLOYEES IN CONVOY TO DISCUSS DIRECTIONS AND HAZARDS ASSOCIATED WITH DRIVING, ALL FIT TO DRIVE.
Event	24	Depart Location	Depart Location	5/2/2018	06:00:00	USER					PRE JOURNEY MANAGEMENT PRIOR TO DEPARTURE.

## 3.0 Job Chart

### 3.1 Job Chart

