

# HALLIBURTON

iCem<sup>®</sup> Service

## **EXTRACTION OIL & GAS**

Date: Thursday, June 14, 2018

## **VT LDS 4-16-18 Surface**

Job Date: Monday, May 28, 2018

Sincerely,

**Julia Nichols**

## Legal Notice

---

### Disclaimer:

All information in this report is provided subject to the terms and conditions which govern the services provided by Halliburton. Halliburton personnel use their best efforts in gathering information and their best judgment in interpreting it, but any interpretation, research, analysis or recommendation furnished by Halliburton are opinions based upon inferences from measurements and empirical relationships and assumptions, which inferences and empirical relationships and assumptions are not infallible, and with respect to which professionals in the industry may differ. iCem 3D Displacement results are used to understand how fluids intermix during a cement job. Simulation and 3D displacement results are not intended as and should not be used as a replacement for bond logs in determining top of cement. Current 3D model calculations are known to model more volume than the input volume for standard cases due to known calculation improvements required. For rotational cases, the modeled volume will be impacted by the same calculations impacting the standard cases, as well as additional constraints imposed to make the calculation time required operationally feasible. Therefore, until further notice, 3D displacement results should not be used for replacement of a bond log, or used as an identifier of top of cement. HALLIBURTON IS UNABLE TO GUARANTEE THE ACCURACY OF ANY CHART INTERPRETATION, RESEARCH ANALYSIS, OR JOB RECOMMENDATION and any interpretation or recommendation is not for use of or reliance upon by any third party. The customer has full responsibility for any of its decisions which are based on the information provided in this report.

## Table of Contents

---

1.0	Cementing Job Summary .....	4
1.1	Executive Summary .....	4
2.0	Real-Time Job Summary .....	7
2.1	Job Event Log .....	7
3.0	Attachments.....	9
3.1	Custom Results – Job Chart with Events .....	9
3.2	Custom Results – Job Chart without Events.....	10

## 1.0 Cementing Job Summary

---

### 1.1 Executive Summary

---

Halliburton appreciates the opportunity to perform the cementing services on the **VT LDS 4-16-18 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.

**Approximately 65 barrels of cement were returned 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]**

**HALLIBURTON**

*Cementing Job Summary*

*The Road to Excellence Starts with Safety*

Sold To #: 389404		Ship To #: 3787027		Quote #:		Sales Order #: 0904877835					
Customer: EXTRACTION OIL & GAS -				Customer Rep: Sean McIntyre							
Well Name: VT-LDS			Well #: 4-16-18			API/UWI #: 05-123-44420-00					
Field: WATTENBERG		City (SAP): GREELEY		County/Parish: WELD		State: COLORADO					
Legal Description: SW NW-15-5N-65W-1898FNL-531FWL											
Contractor: Shawn McIntyre					Rig/Platform Name/Num: Cartel 11						
Job BOM: 7521 7521											
Well Type: HORIZONTAL OIL											
Sales Person: HALAMERICA\HX38199					Srvc Supervisor: Thomas Haas						
<b>Job</b>											
Formation Name											
Formation Depth (MD)		Top			Bottom						
Form Type											
BHST											
Job depth MD		1604ft			Job Depth TVD		1604				
Water Depth											
Wk Ht Above Floor											
Perforation Depth (MD)		From			To						
<b>Well Data</b>											
Description	New / Used	Size in	ID in	Weight lbm/ft	Thread	Grade	Top MD ft	Bottom MD ft	Top TVD ft	Bottom TVD ft	
Open Hole Section			13.5				0	1605	0	1605	
Casing	0	9.625	8.921	36	8 RD	J-55	0	1604	0	1604	
<b>Tools and Accessories</b>											
Type	Size in	Qty	Make	Depth ft		Type	Size in	Qty	Make		
Guide Shoe	9.625					Top Plug	9.625	1	HES		
Float Shoe	9.625	1		1604		Bottom Plug	9.625				
Float Collar	9.625	1		1562		SSR plug set	9.625				
Insert Float	9.625					Plug Container	9.625	1	HES		
Stage Tool	9.625					Centralizers	9.625				
<b>Fluid Data</b>											
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	Red Dye Spacer	Red Dye Spacer			50	bbl	8.33				2100
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			675	sack	13.5	1.74	9.2	5	6210
9.20 Gal		FRESH WATER									

**HALLIBURTON**

*Cementing Job Summary*

Fluid #	Stage Type	Fluid Name	Qty	Qty UoM	Mixing Density lbm/gal	Yield ft <sup>3</sup> /sack	Mix Fluid Gal	Rate bbl/min	Total Mix Fluid Gal	
3	Fresh Water	Fresh Water	125	bbl	8.33				5250	
<b>Cement Left In Pipe</b>										
<b>Amount</b>		44 ft			<b>Reason</b>			Shoe Joint		
<b>Mix Water:</b>		pH 7		<b>Mix Water Chloride:</b>		<300 ppm		<b>Mix Water Temperature:</b>		77 °F
<b>Cement Temperature:</b>		N/A		<b>Plug Displaced by:</b>		8.33 lb/gal F.W.		<b>Disp. Temperature:</b>		N/A
<b>Plug Bumped?</b>		Yes		<b>Bump Pressure:</b>		485 psi		<b>Floats Held?</b>		Yes
<b>Cement Returns:</b>		## bbl		<b>Returns Density:</b>		N/A		<b>Returns Temperature:</b>		N/A
<b>Comment</b> Plug bumped at calculated displacement, final circulating psi of 485, held 5 min casing test at 1200 psi, released pressure back to the truck floats held received 1 bbl back to truck. 65 bbl cmt to surface.										

## 2.0 Real-Time Job Summary

### 2.1 Job Event Log

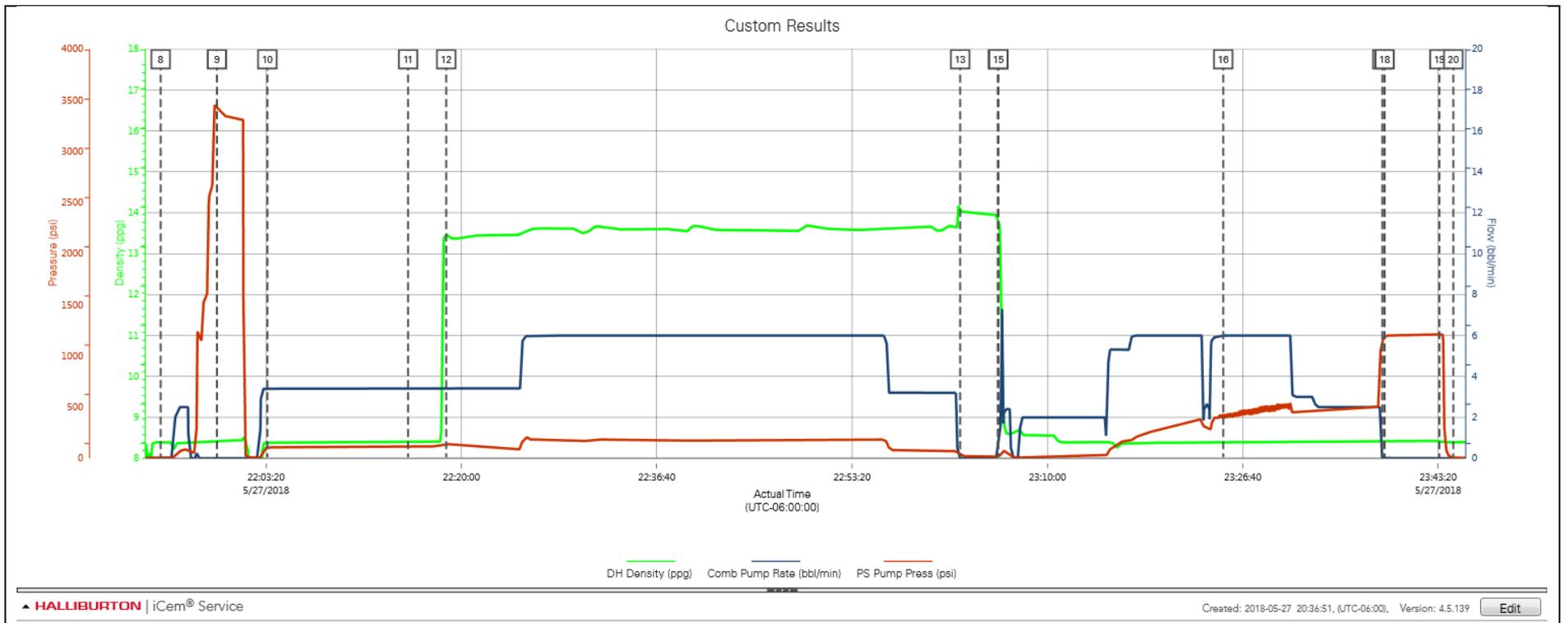
Type	Seq. No.	Activity	Graph Label	Date	Time	Source	DH Density <i>(ppg)</i>	Comb Pump Rate <i>(bbl/min)</i>	PS Pump Press <i>(psi)</i>	Comments
Event	1	Call Out	Call Out	5/27/2018	12:00:00	USER				CREW CALLED OUT AT 12:00 5/27/2018, REQUESTED ON LOCATION 17:00 5/27/2018. CREW PICKED UP CEMENT, 100 LBS SUGAR, AND PLUG CONTAINER FROM FORT LUPTON, CO. BULK 660: 12350112/10866484 Bulk 660: 12154546/10991603 PUMP RED TIGER: 11542778
Event	2	Pre-Convoy Safety Meeting	Pre-Convoy Safety Meeting	5/27/2018	15:45:00	USER				DISCUSSED ROUTES, HAZARDS, AND COMMUNICATION WITH CREW
Event	3	Crew Leave Yard	Crew Leave Yard	5/27/2018	16:00:00	USER				STARTED JOURNEY MANAGEMENT.
Event	4	Arrive At Loc	Arrive At Loc	5/27/2018	17:00:00	USER				END JOURNEY MANAGEMENT. MEET WITH CO. MAN TO DISCUSS JOB; SURFACE CASING: 36# 9.625" J-55 @ 1657', 42' SHOE JOINT, 13.5" OPEN HOLE, 9.0 PPG WELL FLUID, FRESH WATER DISPLACEMENT.
Event	5	Pre-Rig Up Safety Meeting	Pre-Rig Up Safety Meeting	5/27/2018	18:00:00	USER				HAZARD HUNT. DISCUSSED POSSIBLE HAZARDS ASSOCIATED WITH LOCATION, RIG UP AND WEATHER.
Event	6	Rig-Up Equipment	Rig-Up Equipment	5/27/2018	18:15:00	USER				CREW STAGED EQUIPMENT AND RIGGED UP BULK, IRON, AND WATER HOSES TO PERFORM JOB.
Event	7	Pre-Job Safety Meeting	Pre-Job Safety Meeting	5/27/2018	21:00:00	USER	8.38	0.00	4.00	MEETING WITH HALLIBURTON AND RIG PERSONNEL. COMMUNICATED POTENTIAL SAFETY HAZARDS AND JOB DETAILS.
Event	8	Start Job	Start Job	5/27/2018	21:54:20	COM4	8.40	0.00	2.00	BEGIN JOB DATA RECORDING.
Event	9	Test Lines	Test Lines	5/27/2018	21:59:09	COM4	8.44	0.00	3420.00	PRESSURE TESTED IRON TO 3500 PSI. KICKOUTS SET @ 500 PSI, KICKED OUT @ 1250 PSI, 5TH GEAR STALL OUT @1600 PSI.
Event	10	Pump Spacer 1	Pump Spacer 1	5/27/2018	22:03:27	COM4	8.39	3.40	106.00	PUMP 40 BBL FRESH WATER SPACER.
Event	11	Pump Spacer 2	Pump Spacer 2	5/27/2018	22:15:27	COM4	8.40	3.40	118.00	PUMP 10 BBL FRESH WATER WITH RED DYE.
Event	12	Pump Cement	Pump Cement	5/27/2018	22:18:42	COM4	13.48	3.40	140.00	PUMP 675 SKS OF SWIFTCEM @ 13.5 LB/GAL, 1.74 YIELD, 9.2 GAL/SK, 209 BBLs, TOL @ SURFACE, DENSITY VERIFIED BY

PRESSURIZED MUD SCALES.

Event	13	Shutdown	Shutdown	5/27/2018	23:02:33	COM4	14.03	0.00	30.00	SHUTDOWN TO DROP TOP PLUG.
Event	14	Drop Top Plug	Drop Top Plug	5/27/2018	23:05:46	COM4	13.94	0.80	20.00	PLUG LEFT PLUG CONTAINER.
Event	15	Pump Displacement	Pump Displacement	5/27/2018	23:05:49	COM4	13.81	1.10	22.00	BEGIN CALCULATED DISPLACEMENT.
Event	16	Cement Returns to Surface	Cement Returns to Surface	5/27/2018	23:25:00	USER	8.39	6.00	377.00	CEMENT RETURNS TO SURFACE 60 BBL INTO DISPLACEMENT. 65 BBL BACK TO SURFACE.
Event	17	Bump Plug	Bump Plug	5/27/2018	23:38:34	COM4	8.43	0.00	1154.00	PLUG BUMPED AT CALCULATED DISPLACEMENT OF 125 BBL.
Event	18	Other	Casing Test	5/27/2018	23:38:46	COM4	8.42	0.00	1190.00	5 MIN CASING TEST AT 1200 PSI.
Event	19	Other	Check Floats	5/27/2018	23:43:26	COM4	8.43	0.00	1211.00	RELEASE PRESSURE, RECIVED 1 BBL BACK TO TRUCK.
Event	20	End Job	End Job	5/27/2018	23:44:38	COM4	8.39	0.00	4.00	STOP JOB DATA RECORDING.
Event	21	Pre-Rig Down Safety Meeting	Pre-Rig Down Safety Meeting	5/28/2018	00:00:00	USER	3.49	0.00	1.00	DISCUSSED POSSIBLE HAZARDS ASSOCIATED WITH WEATHER, LOCATION AND RIGGING DOWN IRON AND HOSES.
Event	22	Rig-Down Completed	Rig-Down Completed	5/28/2018	00:30:00	USER				ALL HALLIBURTON ITEMS WERE STOWED FOR TRAVEL.
Event	23	Pre-Convoy Safety Meeting	Pre-Convoy Safety Meeting	5/28/2018	00:45:00	USER				DISCUSSED ROUTES HAZARDS AND COMMUNICATION WITH CREW.
Event	24	Crew Leave Location	Crew Leave Location	5/28/2018	01:00:00	USER				THANK YOU FOR USING HALLIBURTON - THOMAS HAAS AND CREW.

3.0 Attachments

3.1 Custom Results – Job Chart with Events



3.2 Custom Results – Job Chart without Events

