

# HALLIBURTON

iCem<sup>®</sup> Service

## **EXTRACTION OIL & GAS**

Date: Wednesday, June 12, 2019

### **Livingston S19-25-10N Surface**

Job Date: Tuesday, June 11, 2019

Sincerely,  
**Bryce Hinsch**

## 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..... 10

    3.1    Extraction Livingston S19-25-10N Surface Chart.....10

## 1.0 Cementing Job Summary

---

### 1.1 Executive Summary

---

Halliburton appreciates the opportunity to perform the cementing services on the **Livingston S19-25-10N** 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 18 bbls 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**

*The Road to Excellence Starts with Safety*

<b>Sold To #:</b> 369404		<b>Ship To #:</b> 3883697		<b>Quote #:</b>		<b>Sales Order #:</b> 0905754723					
<b>Customer:</b> EXTRACTION OIL & GAS -						<b>Customer Rep:</b> PAUL JEVNEY					
<b>Well Name:</b> LIVINGSTON				<b>Well #:</b> S19-25-10N		<b>API/UWI #:</b> 05-014-20748-00					
<b>Field:</b> WATTENBERG		<b>City (SAP):</b> BROOMFIELD		<b>County/Parish:</b> BROOMFIELD		<b>State:</b> COLORADO					
<b>Legal Description:</b> NW SE-7-1S-68W-2331FSL-1366FEL											
<b>Contractor:</b>				<b>Rig/Platform Name/Num:</b> CARTEL 15							
<b>Job BOM:</b> 7521 7521											
<b>Well Type:</b> HORIZONTAL OIL											
<b>Sales Person:</b> HALAMERICA\HX38199				<b>Srv Supervisor:</b> Nikolaus Kornafel							
<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>		1622ft		<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			0	1622		0	
Open Hole Section			13.5				0	1624		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	1		1622		Top Plug	9.625	1	HES		
Float Shoe	9.625						9.625				
Float Collar	9.625	1		1579			9.625				
Insert Float	9.625					Plug Container	9.625	1	HES		
Stage Tool	9.625					Centralizers	9.625				
<b>Fluid Data</b>											
<b>Stage/Plug #:</b> 1											
<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	Red Dye Spacer	Red Dye Spacer			10	bbl	8.33			4	

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	Lead Cement	SWIFTCEM (TM) SYSTEM	525	sack	13.5	1.74	9.2	8	4,830
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	Fresh Water	Fresh Water	122	bbl	8.33				
Cement Left In Pipe		Amount	ft		Reason			Shoe Joint	
Mix Water:	pH 7	Mix Water Chloride:	0 ppm			Mix Water Temperature:	69 °F		
Cement Temperature:	N/A	Plug Displaced by:	8.33 lb/gal			Disp. Temperature:	69 °F		
Plug Bumped?	Yes	Bump Pressure:	900 psi			Floats Held?	Yes		
Cement Returns:	18 bbl	Returns Density:	N/A			Returns Temperature:	N/A		
Comment PUMPED 10 BBLS OF RED DYE SPACER FOLLOWED BY 163 BBLS OF LEAD CEMENT. DROPPED THE TOP PLUG AND DISPLACED WITH 122 BBLS OF FRESH WATER. CHECKED FLOATS FLOATS HELD, 1 BBLS BACK TO THE TRUCK. 18 BBLS OF CEMENT TO SURFACE									

## 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	6/10/2019	17:30:00	USER					CREW CALLED OUT AT 17:30, REQUESTED ON LOCATION 20:30. CREW PICKED UP CEMENT, CHEMICALS, AND PLUG CONTAINER FROM FT. LUPTON, CO. BULK 660 10867431, AND PUMP 11360070.
Event	2	Pre-Convoy Safety Meeting	Pre-Convoy Safety Meeting	6/10/2019	17:45:00	USER					CREW DISCUSSED ROUTES, HAZARDS, AND COMMUNICATION WITH CREW.
Event	3	Crew Leave Yard	Crew Leave Yard	6/10/2019	18:00:00	USER					STARTED JOURNEY MANAGEMENT.
Event	4	Arrive at Location from Service Center	Arrive at Location from Service Center	6/10/2019	18:30:00	USER					END JOURNEY MANAGEMENT. MEET WITH CO. MAN TO DISCUSS JOB; SURFACE CASING- 9.625" 36 LB/FT @ 1,622. TOTAL DEPTH 1,635', 13.5" HOLE, SHOE TRAC- 45', '. PUMP FRESH WATER DISPLACEMENT 122 BBLS. CASING LANDED @ 22:00 06/10/2019. RIG CIRCULATED BOTTOMS UP.
Event	5	Pre-Rig Up Safety Meeting	Pre-Rig Up Safety Meeting	6/10/2019	18:45:00	USER					HAZARD HUNT. DISCUSSED POSSIBLE HAZARDS ASSOCIATED WITH

											LOCATION, RIG UP, AND WEATHER.
Event	6	Rig-Up Equipment	Rig-Up Equipment	6/10/2019	19:00:00	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	6/10/2019	21:30:00	USER					SAFETY MEETING WITH HALLIBURTON, AND RIG PERSONNEL. CREW COMMUNICATED POTENTIAL SAFETY HAZARDS, AND JOB DETAILS.
Event	8	Start Job	Start Job	6/10/2019	22:08:32	COM5	8.41	0.00	51.00	5.10	BEGIN RECORDING JOB DATA.
Event	9	Test Lines	Pause	6/10/2019	22:30:00	USER	8.28	1.70	-2.00	3.60	PRESSURE TESTED IRON TO 3,000 PSI. KICKOUTS SET @ 500 PSI, KICKED OUT @ 900 PSI, 5TH GEAR STALL OUT @ 2,100 PSI.
Event	10	Pump Spacer 1	Pump Spacer 1	6/10/2019	22:54:08	COM5	8.17	0.00	8.00	0.00	PUMPED 10 BBBLS OF WATER SPACER WITH RED DYE.
Event	11	Pump Cement	Pump Cement	6/10/2019	22:58:29	COM5	8.12	3.70	90.00	10.70	PUMPED 525 SKS OF SWIFCEM LEAD CEMENT @ 13.5 LB/GAL, 1.74 FT3/SK, 9.2 GAL/SK. 163 BBLS, TOP OF CEMENT @ SURFACE. DENSITY VERIFIED BY PRESSURIZED MUD SCALES. PUMP RATE 7 BBLS/MIN @ 230 PSI.
Event	12	Check Weight	Check Weight	6/10/2019	23:03:26	COM5	13.24	8.00	294.00	22.00	DENSITY VERIFIED BY PRESSURIZED MUD SCALES.
Event	13	Check Weight	Check Weight	6/10/2019	23:05:57	COM5	13.52	8.00	319.00	42.10	DENSITY VERIFIED BY PRESSURIZED MUD SCALES.



Event	14	Check Weight	Check Weight	6/10/2019	23:13:21	COM5	13.53	8.00	326.00	101.30	DENSITY VERIFIED BY PRESSURIZED MUD SCALES.
Event	15	Shutdown	Shutdown	6/10/2019	23:21:45	COM5	8.78	0.00	73.00	159.90	SHUTDOWN TO WASH LINES
Event	16	Drop Top Plug	Drop Top Plug	6/10/2019	23:23:42	COM5	3.38	0.00	5.00	159.90	TOP PLUG DROPPED BY HES SUPERVISOR, WITNESSED BY COMPANY MAN
Event	17	Pump Displacement	Pump Displacement	6/10/2019	23:23:45	COM5	3.39	0.00	5.00	159.90	BEGIN CALCULATED DISPLACEMENT OF 122 BBLS WITH FRESH WATER.
Event	18	Bump Plug	Bump Plug	6/10/2019	23:43:13	COM5	8.17	0.00	912.00	117.20	BUMPED PLUG AND BROUGHT PRESSURE TO 1,000 PSI AND HELD FOR 2 MINUTES
Event	19	Other	Other	6/10/2019	23:44:32	COM5	8.14	0.00	32.00	117.20	CHECKED FLOATS, FLOATS HELD, 1 BBL BACK TO THE TRUCK. STOP RECORDING JOB DATA. 18 BBLS OF CEMENT TO SURFACE.
Event	20	End Job	End Job	6/10/2019	23:44:52	COM5	8.15	0.00	1.00	0.00	END RECORDING JOB DATA
Event	21	Pre-Rig Down Safety Meeting	Pre-Rig Down Safety Meeting	6/10/2019	23:50:00	USER					DISCUSSED POSSIBLE HAZARDS ASSOCIATED WITH WEATHER, LOCATION AND RIGGING DOWN IRON AND HOSES.
Event	22	Rig-Down Completed	Rig-Down Completed	6/11/2019	01:00:00	USER					ALL HALLIBURTON ITEMS WERE STOWED FOR TRAVEL, AND LOCATION WAS CLEAN.
Event	23	Safety Meeting - Departing Location	Safety Meeting - Departing Location	6/11/2019	01:30:00	USER					CREW DISCUSSED ROUTES HAZARDS AND COMMUNICATION WITH CREW.

## 3.0 Attachments

### 3.1 Extraction Livingston S19-25-10N Surface Chart

