

HALLIBURTON

iCem[®] Service

EXTRACTION OIL & GAS-EBUS

Livingston S19-25-15N Surface

Sincerely,
Meghan Jacobs

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	Livingston S19-25-15N Surface – Job Chart.....	9

1.0 Cementing Job Summary

1.1 Executive Summary

Halliburton appreciates the opportunity to perform the cementing services on the **Livingston S19-25-15N** 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 20 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

Sold To #: 369404		Ship To #: 9007664		Quote #:		Sales Order #: 0906070010					
Customer: EXTRACTION OIL & GAS -					Customer Rep: MANNY						
Well Name: LIVINGSTON			Well #: S19-25-15N			API/UWI #: 05-014-20847-00					
Field: WATTENBERG		City (SAP): BROOMFIELD		County/Parish: BROOMFIELD			State: COLORADO				
Legal Description: NE SE-7-1S-68W-2331FSL-1276FEL											
Contractor: PATTERSON-UTI ENERGY					Rig/Platform Name/Num: PATTERSON 901						
Job BOM: 7521 7521											
Well Type: HORIZONTAL OIL											
Sales Person: HALAMERICA\HX38199					Srv Supervisor: Lance Carpenter						
Job											
Formation Name											
Formation Depth (MD)		Top			Bottom						
Form Type					BHST						
Job depth MD		1636ft			Job Depth TVD		1636				
Water Depth					Wk Ht Above Floor		3				
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	
Open hole		13.5					0	1645	0	1636	
Casing		9.625		36			0	1636	0	1636	
Tools and Accessories											
Type	Size in	Qty	Make	Depth ft		Type	Size in	Qty	Make		
Guide Shoe	9.625			1636		Top Plug	9.625	1	HES		
Float Shoe	9.625					Bottom Plug	9.625		HES		
Float Collar	9.625			1594		SSR plug set	9.625		HES		
Insert Float	9.625					Plug Container	9.625	1	HES		
Stage Tool	9.625					Centralizers	9.625		HES		
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	Red Dye Spacer	Red Dye Spacer			10	bbl	8.33				

Fluid #	Stage Type	Fluid Name	Qty	Qty UoM	Mixing Density lbm/gal	Yield ft ³ /sack	Mix Fluid Gal	Rate bbl/min	Total Mix Fluid Gal
2	SwiftCem	SWIFTCEM (TM) SYSTEM	550	sack	13.5	1.74		5	9.17

Fluid #	Stage Type	Fluid Name	Qty	Qty UoM	Mixing Density lbm/gal	Yield ft ³ /sack	Mix Fluid Gal	Rate bbl/min	Total Mix Fluid Gal
3	Fresh Water	Fresh Water	123	bbl	8.33				

Cement Left In Pipe	Amount	Reason	Shoe Joint
Mix Water:	pH 7	Mix Water Chloride: 400 ppm	Mix Water Temperature: 56 °F
Cement Temperature:	## °F °C	Plug Displaced by: 8.4 lb/gal Water	Disp. Temperature: ## °F °C
Plug Bumped?	Yes	Bump Pressure: 490 psi	Floats Held? Yes
Cement Returns:	20 bbl	Returns Density: ## lb/gal kg/m ³	Returns Temperature: ## °F °C

Comment

JOB PUMPED AS DESIGNED. WATER ON THIS ONE WAS AN ISSUE AND RAN OUT TWICE BUT FINISHED WITHOUT INCIDENT. NO ACCIDENT, INJURY OR SPILL. DOWNHOLE DENSITY NOT READING CORRECTLY BUT ALL CEMENT VERIFIED WITH PRESSURIZED MUD BALANCE AND CONFIRMED WITH MIX WATER. DROPPED TOP PLUG AFTER CEMENT. ALL SPACER TO SURFACE AND 20 BBL CEMENT TO SURFACE. FINAL CIRCULATING PRESSURE 2BPM AT 490 PSI. TOOK TO 900 PSI. CHECKED FLOATS, FLOATS HELD ½ BBL BACK.

TOP OF CEMENT – SURFACE WITH 20 BBL BACK

ALL SPACER TO SURFACE

2.0 Real-Time Job Summary

2.1 Job Event Log

Type	Seq. No.	Activity	Graph Label	Date	Time	Source	PS Pump Press <i>(psi)</i>	DH Density <i>(ppg)</i>	Comb Pump Rate <i>(bbl/min)</i>	Comments
Event	1	Check Floats	Comment	10/31/2019	06:00:00	USER				CREW STAYED FROM LAST JOB. REQUESTED BACK 0600
Event	2	Casing on Bottom	Casing on Bottom	10/31/2019	10:15:00	USER				CASING ON BOTTOM. RIG DOWN CASING CREW AND RIG UP HES PLUG CONTAINER AND LINES TO CIRCULATED
Event	3	Safety Meeting	Safety Meeting	10/31/2019	10:30:00	USER				CREW, RIG CREW AND CUSTOMER REP HAVE PRE JOB SAFETY MEETING DISCUSSING MUSTER AREAS, RED ZONES, SLIPS TRIPS FALLS, CONTINGENCIES, HAZARDS AND THE JOB PROCEEDURE
Event	4	Start Job	Start Job	10/31/2019	10:48:57	COM6	37.00	6.85	0.90	START JOB
Event	5	Circulate Well	Circulate Well	10/31/2019	10:54:48	USER	37.00	6.42	0.00	CIRCULATE WELL. HAD ONE FROZEN VALVE AND HAD TO RELOCATE WATER LINE BEFORE CIRCULATING. 5 BPM AT 200 PSI
Event	6	Test Lines	Test Lines	10/31/2019	11:13:21	COM6	3184.00	6.81	0.00	PRESSURE TEST HES LINES TO 3000 PSI. HELD FOR A FEW MINUTES. GOOD TEST
Event	7	Pump Spacer 1	Pump Spacer 1	10/31/2019	11:16:41	COM6	92.00	6.76	0.00	PUMP 10 BBL RED DYE SPACER
Event	8	Pressure Up Well	Pressure Up Well	10/31/2019	11:30:13	COM6	445.00	10.63	7.10	PUMP 170 BBL SWIFTCEM 13.5# 1.74 YIELD 9.17 GAL 550 SACKS
Event	9	Comment	Comment	10/31/2019	11:51:14	USER	24.00	1.02	6.80	RAN OUT OF WATER. HAD TO MOVE TO ANOTHER TANK
Event	10	Shutdown	Shutdown	10/31/2019	12:15:37	USER				SHUTDOWN
Event	11	Drop Top Plug	Drop Top Plug	10/31/2019	12:18:26	USER				DROP TOP PLUG

Event	12	Pump Displacement	Pump Displacement	10/31/2019	12:19:28	USER				PUMP 123 BBL WATER DISPLACEMENT
Event	13	Comment	Comment	10/31/2019	12:38:46	USER	407.00	6.81	0.00	RAN OUT OF WATER AGAIN AND MOVED TO ANOTHER TANK
Event	14	Bump Plug	Bump Plug	10/31/2019	12:49:06	USER				BUMP PLUG. FINAL CIRCULATING PRESSURE 490 PSI AT 2 BPM
Event	15	Check Floats	Check Floats	10/31/2019	12:49:44	USER				CHECK FLOATS, FLOATS HELD, 1/2 BBL BACK
Event	16	Depart Location	Depart Location	10/31/2019	15:00:00	USER				CREW IS RIGGED DOWN AND READY TO DEPART. CREW HAS JOURNEY MANAGEMENT SAFETY MEETING DISCUSSING ROUTE, CONVOY ORDER, HOURS OF SERVICE, COMMUNICATION, AND DEPART FROM LOCATION

3.0 Attachments

3.1 Livingston S19-25-15N Surface – Job Chart

