

# HALLIBURTON

iCem<sup>®</sup> Service

## **AXIS EXPLORATION**

**Jamaso 4-65 5-6-10 Production**

Sincerely,  
**Meghan Jacobs**

## Legal Notice

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### Disclaimer:

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Table of Contents

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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    Jamaso 4-65 5-6-10 Production – Job Chart.....10

## 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 **Jamaso 4-65 5-6-10** 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.

**Approximately 52 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> 3891769		<b>Quote #:</b>		<b>Sales Order #:</b> 0905841586				
<b>Customer:</b> AXIS EXPLORATION				<b>Customer Rep:</b> JUSTIN						
<b>Well Name:</b> JAMASO 4-65			<b>Well #:</b> 5-6-10		<b>API/UWI #:</b> 05-005-07375-00					
<b>Field:</b> WILDCAT		<b>City (SAP):</b> AURORA		<b>County/Parish:</b> ARAPAHOE		<b>State:</b> COLORADO				
<b>Legal Description:</b> SW NW-4-4S-65W-2449FNL-1211FWL										
<b>Contractor:</b> PATTERSON-UTI ENERGY				<b>Rig/Platform Name/Num:</b> PATTERSON 340						
<b>Job BOM:</b> 7523 7523										
<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>		18194ft			<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	0	9.625	8.921	36			0	2679	0	0
Casing	0	5.5	4.892	17	BTC	P-110	0	18194	0	0
Open Hole Section			8.75				2679	18214	0	8039
<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>	
<b>Guide Shoe</b>	5.5	1		18194		<b>Top Plug</b>	5.5	1		
						<b>Bottom Plug</b>	5.5	0		
<b>Float Collar</b>	5.5	1		18184						
						<b>Plug Container</b>	5.5	1	HES	
						<b>Centralizers</b>	5.5			
<b>Fluid Data</b>										
<b>Stage/Plug #:</b> 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	SPACER	SBM FDP-C1337-18 CEMENT SPACER SYS	5	bbl	12.5	2.74	16.6	5	1,700	
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	CAP CEMENT	ELASTICEM (TM) SYSTEM	612	sack	13.2	1.57	7.66	8	4,687	
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	LEAD LATEX CEMENT	ELASTICEM (TM) SYSTEM	615	sack	13.2	1.56	7.69	8	4,729	
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	TAIL CEMENT	ELASTICEM (TM) SYSTEM	1,698	sack	13.12	1.56	7.65	8	12,989	
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	22	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	
6	Displacement	Displacement	402	bbl	8.33			8		
Cement Left In Pipe		Amount	0 ft		Reason			WET SHOE		
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:			2,366 psi		Floats Held?		Yes
Cement Returns:		52 bbl	Returns Density:			N/A		Returns Temperature:		N/A
Comment PUMPED 50 BBLS OF SPACER FOLLOWED BY 171 BBLS OF CAP CEMENT FOLLOWED BY 171 BBLS OF LEAD CEMENT MIXED WITH LATEX FOLLOWED BY 472 BBLS OF TAIL CEMENT. DROPPED THE TOP PLUG AND DISPLACED WITH 422 BBLS OF FRESH WATER WITH 10 GAL OF MMCR IN THE FIRST 20 BBLS. BUMPED THE PLUG AT CALCULATED DISPLACEMENT WHILE PUMPING 3 BBL/MIN AT 2,366 PSI AND THEN PRESSURED UP TO 3,601 PSI TO OPEN THE WET SHOE AND PUMPED A 5 BBL WET SHOE. RELEASED PRESSURE TO CHECK FLOATS. FLOATS HELD. 3 BBLS BACK TO THE TRUCK.										

## 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)	Comments
Event	1	Call Out	Call Out	7/20/2019	00:00:01	USER				CREW CALLED OUT AT 00:00, REQUESTED ON LOCATION 03:30. CREW PICKED UP CEMENT, CHEMICALS, AND PLUG CONTAINER FROM FT. LUPTON, CO. BULK 660 10866493, BULK 660 10025027, SOFTSIDE 12051670 AND PUMP 11189145.
Event	2	Pre-Convoy Safety Meeting	Pre-Convoy Safety Meeting	7/20/2019	01:45:00	USER				CREW DISCUSSED ROUTES, HAZARDS, AND COMMUNICATION WITH CREW.
Event	3	Crew Leave Yard	Crew Leave Yard	7/20/2019	02:00:00	USER				STARTED JOURNEY MANAGEMENT.
Event	4	Arrive at Location from Service Center	Arrive at Location from Service Center	7/20/2019	03:00:00	USER				END JOURNEY MANAGEMENT. MEET WITH CO. MAN TO DISCUSS JOB; SURFACE CASING- 9.625" 36 LB/FT @ 2,679, 5.5" CASING: 17 LB/FT TOTAL 18,194', 8.5" HOLE, TD 18,214', SHOE TRAC- 10', TVD- 8,039'. PUMP FRESH WATER DISPLACEMENT 422 BBLs. CASING LANDED @ 06:00 07/20/2019. RIG CIRCULATED BOTTOMS UP AT 489GPM 1,430 PSI.
Event	5	Pre-Rig Up Safety Meeting	Pre-Rig Up Safety Meeting	7/20/2019	03:33:00	USER				HAZARD HUNT. DISCUSSED POSSIBLE HAZARDS ASSOCIATED WITH LOCATION, RIG UP, AND WEATHER.
Event	6	Rig-Up Equipment	Rig-Up Equipment	7/20/2019	03:45:00	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	7/20/2019	07:45:00	USER	8.32	0.00	-1.00	SAFETY MEETING WITH HALLIBURTON, AND RIG PERSONNEL. CREW COMMUNICATED POTENTIAL SAFETY HAZARDS, AND JOB DETAILS.
Event	8	Start Job	Start Job	7/20/2019	08:16:59	COM5	8.33	0.00	19.00	BEGIN RECORDING JOB DATA.
Event	9	Test Lines	Test Lines	7/20/2019	08:18:54	COM5	8.33	0.00	110.00	PRESSURE TESTED IRON TO 5,000 PSI. KICKOUTS SET @ 500 PSI, KICKED OUT @ 900 PSI, 5TH GEAR STALL OUT @ 2,100 PSI.

Event	10	Pump Spacer 1	Pump Spacer 1	7/20/2019	08:23:48	COM5	8.33	0.00	24.00	PUMP 50 BBLS OF FDP SPACER @ 12.5 LB/GAL, 2.74 FT3/SK, 16.6 GAL/SK 10 GALLONS D-AIR. DENSITY VERIFIED BY PRESSURIZED MUD SCALES. PUMP RATE 5 BBLS/MIN @ 440 PSI.
Event	11	Check Weight	Check Weight	7/20/2019	08:30:06	COM5	12.41	4.20	216.00	DENSITY VERIFIED BY PRESSURIZED MUD SCALES.
Event	12	Pump Lead Cement	Pump Lead Cement	7/20/2019	08:31:23	COM5	12.42	4.20	186.00	PUMPED 612 SKS OF ELASTICEM @ 13.2 LB/GAL, 1.57 FT3/SK, 7.66 GAL/SK. 171 BBLS, TOL @ SURFACE. DENSITY VERIFIED BY PRESSURIZED MUD SCALES. PUMP RATE 8 BBLS/MIN @ 480 PSI.
Event	13	Check Weight	Check Weight	7/20/2019	08:33:34	COM5	13.23	7.90	658.00	DENSITY VERIFIED BY PRESSURIZED MUD SCALES.
Event	14	Check Weight	Check Weight	7/20/2019	08:43:23	COM5	13.23	8.00	598.00	DENSITY VERIFIED BY PRESSURIZED MUD SCALES.
Event	15	Pump Cement	Pump Cement	7/20/2019	08:55:07	COM5	13.08	8.00	602.00	PUMPED 615 SKS OF GASTOP @ 13.2 LB/GAL, 1.56 FT3/SK, 7.69 GAL/SK. 171 BBLS, 1,538 GALLONS OF LATEX, TOL @ 2,473.36'. DENSITY VERIFIED BY PRESSURIZED MUD SCALES. PUMP RATE 8 BBLS/MIN @ 440 PSI.
Event	16	Check Weight	Check Weight	7/20/2019	08:55:57	COM5	13.09	8.00	645.00	DENSITY VERIFIED BY PRESSURIZED MUD SCALES.
Event	17	Check Weight	Check Weight	7/20/2019	09:00:13	COM5	13.23	8.00	786.00	DENSITY VERIFIED BY PRESSURIZED MUD SCALES.
Event	18	Pump Tail Cement	Pump Tail Cement	7/20/2019	09:17:01	COM5	13.16	8.00	638.00	PUMP 1,698 SKS OF ELASTACEM @ 13.2 LB/GAL, 1.56 FT3/SK, 7.69 GAL/SK, 471 BBLS. TOT CALCULATED @ 6,632. DENSITY VERIFIED BY PRESSURIZED MUD SCALES. PUMP RATE 8 BBLS/MIN @ 450 PSI.
Event	19	Check Weight	Check Weight	7/20/2019	09:17:49	COM5	13.15	8.00	624.00	DENSITY VERIFIED BY PRESSURIZED MUD SCALES.
Event	20	Check Weight	Check Weight	7/20/2019	09:55:07	COM5	13.14	8.00	650.00	DENSITY VERIFIED BY PRESSURIZED MUD SCALES.
Event	21	Shutdown	Shutdown	7/20/2019	10:28:57	COM5	8.11	0.00	15.00	SHUTDOWN TO WASH LINES.
Event	22	Drop Top Plug	Drop Top Plug	7/20/2019	10:29:01	COM5	8.12	0.00	15.00	PLUG LEFT CONTAINER, VERIFIED BY CO. MAN.
Event	23	Pump Displacement	Pump Displacement	7/20/2019	10:29:04	COM5	8.11	0.00	15.00	BEGIN CALCULATED DISPLACEMENT OF 422 BBLS WITH FRESH WATER. 320 BBLS INTO DISPLACEMENT SPACER BACK TO SURFACE.
Event	24	Displ Reached Cement	Displ Reached Cement	7/20/2019	10:35:29	COM5	7.90	10.60	488.00	BEGIN CALCULATED DISPLACEMENT OF 422 BBLS WITH FRESH WATER. 320 BBLS INTO DISPLACEMENT SPACER BACK TO SURFACE.



Event	25	Bump Plug	Bump Plug	7/20/2019	11:32:53	COM5	8.38	0.00	2691.00	PLUG BUMPED AT CALCULATED DISPLACEMENT. 2,366 PSI PRESSURED UP 500 PSI OVER FINAL CIRCULATING PRESSURE.
Event	26	Pressure Up Well	Pressure Up Well	7/20/2019	11:33:18	COM5	8.38	0.00	2723.00	PRESSURED UP TO 3,601 PSI TO SHIFT THE OPEN THE PLUG AND THEN PUMPED A 5 BBL WET SHOE
Event	27	Other	Other	7/20/2019	11:35:40	COM5	8.36	0.00	2197.00	RELEASED PRESSURE, FLOATS HELD, 3 BBLS BACK.
Event	28	End Job	End Job	7/20/2019	11:37:02	COM5	8.33	0.00	25.00	STOP RECORDING JOB DATA.
Event	29	Pre-Rig Down Safety Meeting	Pre-Rig Down Safety Meeting	7/20/2019	11:45:00	USER				DISCUSSED POSSIBLE HAZARDS ASSOCIATED WITH WEATHER, LOCATION AND RIGGING DOWN IRON AND HOSES.
Event	30	Rig-Down Completed	Rig-Down Completed	7/20/2019	13:50:00	USER				ALL HALLIBURTON ITEMS WERE STOWED FOR TRAVEL, AND LOCATION WAS CLEAN.
Event	31	Safety Meeting - Departing Location	Safety Meeting - Departing Location	7/20/2019	14:00:00	USER				CREW DISCUSSED ROUTES HAZARDS AND COMMUNICATION WITH CREW.
Event	32	Crew Leave Location	Crew Leave Location	7/20/2019	14:10:00	USER				THANK YOU FOR USING HALLIBURTON – NICK KORNAFEL AND CREW.

## 3.0 Attachments

### 3.1 Jamaso 4-65 5-6-10 Production – Job Chart

