

HALLIBURTON

iCem[®] Service

PDC ENERGY-EBUS

For: Chris McMullen

Date: Friday, September 07, 2018

PDC J Clark 4N

Job Date: Wednesday, August 15, 2018

Sincerely,

Nick Peterson

Legal Notice

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1.0 Cementing Job Summary

1.1 Executive Summary

Halliburton appreciates the opportunity to perform the cementing services on the cement 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

Sold To #: 304535		Ship To #: 3870545		Quote #: 0022477436		Sales Order #: 0905060355					
Customer: PDC ENERGY-EBUS				Customer Rep: Chris McMullen							
Well Name: J CLARK			Well #: 4N		API/UWI #: 05-123-46687-00						
Field: WATTENBERG		City (SAP): GREELEY		County/Parish: WELD		State: COLORADO					
Legal Description: NW NE-14-5N-65W-550FNL-2204FEL											
Contractor: ENSIGN DRLG				Rig/Platform Name/Num: ENSIGN 152							
Job BOM: 7523 7523											
Well Type: HORIZONTAL OIL											
Sales Person: HALAMERICA\HX38199				Srv Supervisor: Nicholas Peterson							
Job											
Formation Name											
Formation Depth (MD)		Top				Bottom					
Form Type						BHST					
Job depth MD		12,302'		Job Depth TVD		6,788'					
Water Depth				Wk Ht Above Floor		6'					
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	
Casing		9.625	8.921	36			0	1675			
Casing	0	5.5	4.778	20			0	12302		0	
Open Hole Section			8.5				1675	6788		0	
Open Hole Section			8.5				6788	12302	0	0	
Tools and Accessories											
Type	Size in	Qty	Make	Depth ft		Type	Size in	Qty	Make		
Float Shoe	5.5	1	Weath	12,302		Top Plug	5.5	1	Weath		
Float Collar	5.5	1	Weath			Bottom Plug	5.5	1	Weath		
Float Collar	5.5	1	Weath	12,263							
						Plug Container	5.5	1	HES		
						Centralizers	5.5	184	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	Spacer	Tuned Spacer III			150	bbl	11.1	4.5	29.4	8	5,502

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	HALCEM (TM) SYSTEM	815	sack	15.6	1.18	5.15	8	4,197	
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	Tail	ELASTICEM (TM) SYSTEM	808	sack	14.4	1.7	7.3	8	5,898	
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	MMCR Displacement	MMCR Displacement	20	bbl	8.34			5		
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	Displacement	Fresh Water	252	bbl	8.34			5		
Cement Left In Pipe		Amount	0 ft		Reason			Shoe Joint		
Mix Water:		pH 7.0	Mix Water Chloride:			0 ppm		Mix Water Temperature:		64 °F
Cement Temperature:		°F	Plug Displaced by:			8.33 lb/gal		Disp. Temperature:		64 °F
Plug Bumped?		Yes	Bump Pressure:			2,461 psi		Floats Held?		Yes
Cement Returns:		0 bbls	Returns Density:			11.1 lb/gal		Returns Temperature:		°F
Comment: Pumped 150 bbls Tuned Spacer, 172 bbls Lead, 245 bbls Tail, and 272 bbls Displacement. Spacer to surface @ 220 bbls away 52 bbls spacer 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)	PS Pump Press (psi)	Pump Stg Tot (bbl)	Comments
Event	1	Call Out	Call Out	8/14/2018	10:00:00	USER					CREW CALLED OUT AT 10:00, REQUESTED ON LOCATION 16:00. CREW PICKED UP CEMENT, CHEMICALS, AND PLUG CONTAINER FROM FT. LUPTON, CO. BULK 660 11398319, AND PUMP 11189145.
Event	2	Pre-Convoy Safety Meeting	Pre-Convoy Safety Meeting	8/14/2018	13:45:00	USER					DISCUSSED ROUTES, HAZARDS, AND COMMUNICATION WITH CREW.
Event	3	Crew Leave Yard	Crew Leave Yard	8/14/2018	14:00:00	USER					STARTED JOURNEY MANAGEMENT.
Event	4	Arrive at Location from Service Center	Arrive at Location	8/14/2018	15:00:00	USER					END JOURNEY MANAGEMENT. MEET WITH CO. MAN TO DISCUSS JOB; SURFACE CASING- 9.625" 36 LB/FT @ 1,675', 5.5" CASING: 20 LB/FT TOTAL 12,302', 8.5" HOLE, TD 12,297', 34' SHOE TRAC, TVD- 6,788'. PUMP FRESH WATER DISPLACEMENT WITH MMCR FIRST 20 BBLs. CASING LANDED @ 17:30 08/14/2018. RIG CIRCULATED 3 BOTTOMS UP.
Event	5	Pre-Rig Up Safety Meeting	Pre-Rig Up Safety Meeting	8/14/2018	15:30:00	USER					HAZARD HUNT. DISCUSSED POSSIBLE HAZARDS

											ASSOCIATED WITH LOCATION, RIG UP AND WEATHER.
Event	6	Rig-Up Equipment	Rig-Up Equipment	8/14/2018	15:45:00	USER					CREW STAGED EQUIPMENT AND RIGGED UP BULK, IRON, AND WATER HOSES TO PERFORM JOB.
Event	7	Rig-Up Completed	Rig-Up Completed	8/14/2018	17:30:00	USER					WAITED ON RIG TO FINISH CIRCULATING.
Event	8	Safety Meeting - Pre Job	Safety Meeting - Pre Job	8/14/2018	20:30:00	USER	8.08	0.00	-11.00	39.60	MEETING WITH HALLIBURTON AND RIG PERSONNEL. COMMUNICATED POTENTIAL SAFETY HAZARDS AND JOB DETAILS.
Event	9	Start Job	Start Job	8/14/2018	20:56:18	COM5					BEGIN RECORDING JOB DATA.
Event	10	Test Lines	Test Lines	8/14/2018	20:59:43	COM5	8.13	0.00	233.00	2.90	PRESSURE TESTED IRON TO 4,800 PSI. KICKOUTS SET @ 500 PSI, KICKED OUT @ 543 PSI, 5TH GEAR STALL OUT @ 2,788 PSI.
Event	11	Drop Bottom Plug	Drop Bottom Plug	8/14/2018	21:05:23	COM5	8.10	0.00	0.00	2.90	PLUG LEFT CONTAINER, VERIFIED BY CO. MAN.
Event	12	Pump Spacer 1	Pump Spacer 1	8/14/2018	21:05:54	COM5	8.10	0.00	-8.00	0.00	PUMP 120 BBLS OF TUNED SPACER @ 11.1 LB/GAL, 5 GALLONS D-AIR. DENSITY VERIFIED BY PRESSURIZED MUD SCALES. HOS CALCULATED @ 2,107.88' TOS CALCULATED @ SURFACE. PUMP RATE 8 BBLS/MIN @ 740 PSI.
Event	13	Pump Lead Cement	Pump Lead Cement	8/14/2018	21:26:30	COM5					PUMPED 815 SKS OF HALCEM @ 15.6 LB/GAL, 1.18 FT3/SK, 5.15 GAL/SK. 171.28 BBLS, HOL

											CALCULATED @ 4,198.03', TOL CALCULATED @ 2,107.88'. DENSITY VERIFIED BY PRESSURIZED MUD SCALES. PUMP RATE 8 BBLs/MIN 670 PSI.
Event	14	Pump Tail Cement	Pump Tail Cement	8/14/2018	21:52:07	COM5					PUMP 808 SKS OF ELASTICEM @ 14.4 LB/GAL, 1.7 FT3/SK, 7.3 GAL/SK, 244.64 BBLs. HOT CALCULATED @ 5,996.07', TOT CALCULATED @ 6,305.92'. DENSITY VERIFIED BY PRESSURIZED MUD SCALES. PUMP RATE 8 BBLs/MIN @ 645 PSI.
Event	15	Clean Lines	Clean Lines	8/14/2018	22:28:04	COM5					SHUTDOWN TO HAVE RIG BLOW DOWN STAND PIPE AND WASH PUMPS AND LINES.
Event	16	Drop Top Plug	Drop Top Plug	8/14/2018	22:43:16	COM5					PLUG LEFT CONTAINER, VERIFIED BY CO. MAN.
Event	17	Pump Displacement	Pump Displacement	8/14/2018	22:44:52	COM5	8.47	0.00	11.00	20.40	BEGIN CALCULATED DISPLACEMENT OF 272 BBLs WITH FRESH WATER. PUMPED THE FIRST 30 BBLs WITH MMCR, PUMPED 200 BBLs WITH BIOCIDES, AND STACLEAR. HAD ISSUES GETTING WATER WITH THE BOOST PUMP. HAD TO SLOW RATE AND CONTINUE DISPLACEMENT @ 5 BBLs/MIN.
Event	18	Bump Plug	Bump Plug	8/14/2018	23:40:34	COM5	8.43	2.90	2471.00	282.70	PLUG BUMPED AT CALCULATED DISPLACEMENT. 2,460 PSI PRESSURED 500 PSI OVER BUMP.

Event	19	Shift Tool - Lower	Shift Tool - Lower	8/14/2018	23:42:29	USER	8.52	2.00	3802.00	284.60	SHIFTED TOOL @ 4,064 PSI, FOLLOWED BY 5 BBL WET SHOE.
Event	20	Check Floats	Check Floats	8/14/2018	23:44:47	USER	8.39	0.00	315.00	0.00	FLOATS HELD 2 BBLS BACK.
Event	21	End Job	End Job	8/14/2018	23:46:36	COM5	8.37	0.00	-4.00	0.00	STOP RECORDING JOB DATA.
Event	22	Pre-Rig Down Safety Meeting	Pre-Rig Down Safety Meeting	8/15/2018	00:00:00	USER					DISCUSSED POSSIBLE HAZARDS ASSOCIATED WITH WEATHER, LOCATION AND RIGGING DOWN IRON AND HOSES.
Event	23	Rig-Down Equipment	Rig-Down Equipment	8/15/2018	00:15:00	USER					RIG DOWN BULK AND MIXING EQUIPMENT.
Event	24	Rig-Down Completed	Rig-Down Completed	8/15/2018	01:30:00	USER					ALL HALLIBURTON ITEMS WERE STOWED FOR TRAVEL, AND LOCATION WAS CLEAN.
Event	25	Pre-Convoy Safety Meeting	Pre-Convoy Safety Meeting	8/15/2018	01:45:00	USER					DISCUSSED ROUTES HAZARDS AND COMMUNICATION WITH CREW.
Event	26	Depart Location	Depart Location	8/15/2018	02:00:00	USER					THANK YOU FOR USING HALLIBURTON - NICK PETERSON AND CREW.