

HALLIBURTON

iCem[®] Service

PDC ENERGY-EBUS

J Clark 7N Production

Sincerely,
Meghan Jacobs

Legal Notice

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Table of Contents

1.0 Cementing Job Summary 4

 1.1 Executive Summary4

2.0 Real-Time Job Summary 9

 2.1 Job Event Log9

3.0 Attachments..... 11

 3.1 J Clark 7N Production – Job Chart with Events.....11

 3.2 J Clark 7N Production – Job Chart without Events12

 3.3 J Clark 7N Production – Recalculation of ECDs during Job13

 3.4 J Clark 7N Production – Comparison of Design ECDs and Recalculated ECDs14

1.0 Cementing Job Summary

1.1 Executive Summary

Halliburton appreciates the opportunity to perform the cementing services on the **J Clark 7N** 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 16bbbls of MudFlush Spacer 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 [Ft. Lupton]

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Cementing Job Summary

The Road to Excellence Starts with Safety

Sold To #: 304535	Ship To #: 3870497	Quote #:	Sales Order #: 0905029871							
Customer: PDC ENERGY-EBUS		Customer Rep: Chris McMullen								
Well Name: J CLARK	Well #: 7N	API/UWI #: 05-123-46692-00								
Field: WATTENBERG	City (SAP): GREELEY	County/Parish: WELD	State: COLORADO							
Legal Description: NW NE-14-5N-65W-550FNL-2084FEL										
Contractor: ENSIGN DRLG		Rig/Platform Name/Num: ENSIGN 152								
Job BOM: 7523 7523										
Well Type: HORIZONTAL OIL										
Sales Person: HALAMERICA\HX38199		Srv Supervisor: Kendall Broom - H194727								
Job										
Formation Name										
Formation Depth (MD)	Top	Bottom								
Form Type	BHST									
Job depth MD	12245ft	Job Depth TVD								
Water Depth		Wk Ht Above Floor								
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	1677		
Casing		5.5	4.778	20			0	12238		
Open Hole Section			8.5				1677	6881		
Open Hole Section			8.5				6881	12271		
Tools and Accessories										
Type	Size in	Qty	Make	Depth ft	Type	Size in	Qty	Make		
Guide Shoe	5.5				Top Plug	5.5		HES		
Float Shoe	5.5			12245	Bottom Plug	5.5		HES		
Float Collar	5.5				SSR plug set	5.5		HES		
Insert Float	5.5				Plug Container	5.5	1	HES		
Stage Tool	5.5				Centralizers	5.5		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	Mud Flush III (Powder)	Mud Flush III	50	bbl	8.4					
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	

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Cementing Job Summary

2	11.1 lb/gal Tuned Spacer III	Tuned Spacer III	100	bbl	11.1	4.5			
Fluid #	Stage Type	Fluid Name	Qty	Qty UoM	Mixing Density lbm/gal	Yield ft3/sack	Mix Fluid Gal	Rate bbl/mi n	Total Mix Fluid Gal
3	ElastiCem	ELASTICEM (TM) SYSTEM	815	sack	15.6	1.18		5	5.15
Fluid #	Stage Type	Fluid Name	Qty	Qty UoM	Mixing Density lbm/gal	Yield ft3/sack	Mix Fluid Gal	Rate bbl/mi n	Total Mix Fluid Gal
4	ElastiCem	ELASTICEM (TM) SYSTEM	787	sack	14.4	1.7		8	7.3
Fluid #	Stage Type	Fluid Name	Qty	Qty UoM	Mixing Density lbm/gal	Yield ft3/sack	Mix Fluid Gal	Rate bbl/mi n	Total Mix Fluid Gal
5	MMCR Displacement	MMCR Displacement	30	bbl	8.34				
Fluid #	Stage Type	Fluid Name	Qty	Qty UoM	Mixing Density lbm/gal	Yield ft3/sack	Mix Fluid Gal	Rate bbl/mi n	Total Mix Fluid Gal
6	Displacement fluid	Water	240	bbl	8.34				
Cement Left In Pipe		Amount	34 ft		Reason			Shoe Joint	
Mix Water:		pH 7	Mix Water Chloride:0 ppm		Mix Water Temperature:			78 °F °C	
Plug Bumped?		Yes			Floats Held?			Yes	
Cement Returns:		0							
Comment Bumped plug, burst shoe, pumped a 5 bbl wet shoe, got 1.5 bbls back on the truck									

2.0 Real-Time Job Summary

2.1 Job Event Log

Type	Seq. No.	Activity	Graph Label	Date	Time	Source	Comb Pump Rate (bbl/min)	DH Density (ppg)	DS Pump Press (psi)	Comments
Event	1	Call Out	Call Out	7/31/2018	19:00:00	USER				Called crew out to be on location at 0200
Event	2	Depart Shop for Location	Depart Shop for Location	7/31/2018	22:30:00	USER				Held a safety meeting before leaving for location
Event	3	Arrive At Loc	Arrive At Loc	7/31/2018	23:30:00	USER				Arrive at location and met with the company man
Event	4	Rig-up Lines	Rig-up Lines	7/31/2018	23:50:00	USER				Held a hazard hunt before spotting in trucks and rigging up
Event	5	Safety Meeting	Safety Meeting	8/1/2018	05:30:00	USER	0.00	8.44	29.00	Held a safety meeting with the rig to discuss the operation and safety
Event	6	Start Job	Start Job	8/1/2018	06:01:54	COM5	0.00	8.47	-5.00	Filled lines with 3 bbls water
Event	7	Test Lines	Test Lines	8/1/2018	06:06:54	COM5	0.00	8.47	-5.00	Tested lines to 4500 psi with a 500 psi kick out and a 5th gear stall
Event	8	Pump Spacer 1	Pump Spacer 1	8/1/2018	06:17:19	COM5	0.00	8.08	33.00	Pumped 50 bbls Mud Flush. Dropped the plug at 40 bbls away. Pumped at 4 bpm and 550 psi.
Event	9	Pump Spacer 1	Pump Spacer 1	8/1/2018	06:34:50	COM5	4.00	11.35	769.00	Pumped 100 bbls Tuned Spacer. 11.1#, 4.5 yield, 29.4 gal/sks.
Event	10	Check Weight	Check Weight	8/1/2018	06:38:07	COM5	5.10	11.11	808.00	Verified weight with the pressurized scale.
Event	11	Pump Lead Cement	Pump Lead Cement	8/1/2018	06:50:43	COM5	8.00	15.89	1149.00	Pumped 171.27 bbls Elasticem. 815 sks, 15.6#, 1.18 yield, 5.15 gal/sks. Pumped at 7 bpm and 500-1200 psi. Calculated TOLC is at 2200ft.
Event	12	Check Weight	Check Weight	8/1/2018	06:55:23	COM5	6.10	15.59	1062.00	Verified weight with pressurized scale.
Event	13	Pump Tail Cement	Pump Tail Cement	8/1/2018	07:15:53	COM5	7.00	14.39	606.00	Pumped 238 bbls Elasticem. 787 sks, 14.4#, 1.7 yield, 7.3 gal/sks. Pumped at 7 bpm and 618 psi. Calculated TOTC 6398ft.
Event	14	Check Weight	Check Weight	8/1/2018	07:17:31	COM5	7.00	14.42	515.00	Verified weight with the pressurized scale.

Event	15	Check Weight	Check Weight	8/1/2018	07:46:53	COM5	7.00	14.32	810.00	Verified weight with pressurized scales
Event	16	Shutdown	Shutdown	8/1/2018	07:57:03	COM5	0.00	13.75	-8.00	Shut down blew lines down with rig air. and washed up cement head and lines.
Event	17	Drop Top Plug	Drop Top Plug	8/1/2018	08:04:35	COM5	0.00	7.56	-9.00	Dropped top plug loaded and verified by Weatherford and company man.
Event	18	Pump Displacement	Pump Displacement	8/1/2018	08:05:06	COM5	0.00	7.46	-13.00	Pumped 270 bbls displacement. First 30 bb ls had MMCR and Biocide. The balance had Biocide and KCL added on the fly. Got Mud Flush back to surface. Pumped 8 bpm until 200 bbls away.
Event	19	Shutdown	Shutdown	8/1/2018	08:55:19	COM5	0.00	8.34	1434.00	At 254 bbls away the rig took a gas hit, forcing us to shut down. Company man Vaughn Staples and Chris McMullen shut down the operation and made calls for a moc. We then proceeded after being down for 9 min. and the rig controlled the rams. We came on at 1 bpm then to 2 bpm.
Event	20	Bump Plug	Bump Plug	8/1/2018	09:03:54	COM5	0.00	8.38	2910.00	We bumped the plug at 2bpm and 2450 psi. we pressured up the well and burst the shoe at 3795 psi. and pumped a 5 bbl wet shoe. Checked floats and got 1.5 bbls back on the truck. We are leaving the cement head and manifold on the well until the cement sets up.
Event	21	End Job	End Job	8/1/2018	09:34:51	COM5				
Event	22	Rig Down Lines	Rig Down Lines	8/1/2018	09:40:00	USER				Held a safety meeting before rigging down the lines
Event	23	Depart Location	Depart Location	8/1/2018	10:15:00	USER				Held a safety huddle before leaving location