

HALLIBURTON

iCem[®] Service

PDC ENERGY-EBUS

Date: Thursday, August 03, 2017

Josephine 19N-314 Production

Job Date: Wednesday, July 26, 2017

Sincerely,

Julia Nichols

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1.0 Cementing Job Summary

1.1 Executive Summary

Halliburton appreciates the opportunity to perform the cementing services on the **Josephine 19N-314** 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 85 barrels 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 [Ft. Lupton]

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Cementing Job Summary

The Road to Excellence Starts with Safety

Sold To #: 304535	Ship To #: 3797061	Quote #:	Sales Order #: 0904185190							
Customer: PDC ENERGY-EBUS		Customer Rep: Dean Heights								
Well Name: JOSEPHINE	Well #: 19N-314	API/UWI #: 05-123-44678-00								
Field: WATTENBERG	City (SAP): KERSEY	County/Parish: WELD	State: COLORADO							
Legal Description: SW NE-19-5N-64W-1759FNL-2150FEL										
Contractor: ENSIGN DRLG		Rig/Platform Name/Num: ENSIGN 158								
Job BOM: 7523 7523										
Well Type: HORIZONTAL OIL										
Sales Person: HALAMERICA\H139013		Srvc Supervisor: Bryan Kraft								
Job										
Formation Name										
Formation Depth (MD)	Top	Bottom								
Form Type	BHST									
Job depth MD	12843ft	Job Depth TVD	6725ft							
Water Depth		Wk Ht Above Floor	4ft							
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		J-55	0	1655	0	1655
Casing		5.5	4.778	20		HCP110	0	12843	0	6725
Open Hole Section			8.5				1655	12849	1655	6725
Tools and Accessories										
Type	Size in	Qty	Make	Depth ft		Type	Size in	Qty	Make	
Guide Shoe						Top Plug	5.5	1	WF	
Float Shoe	5.5	1	WF	12843		Bottom Plug				
Float Collar	5.5	1	WF	12811		SSR plug set				
Insert Float						Plug Container	5.5	1	HES	
Stage Tool						Centralizers				

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Cementing Job Summary

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	50	bbl	12	3.16	20	6	1777	
35.20 gal/bbl		FRESH WATER								
176.58 lbm/bbl		BARITE, BULK (100003681)								
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	Cement	ELASTICEM (TM) SYSTEM	2175	sack	13.2	1.57	7.53	8	16378	
7.53 Gal		FRESH WATER								
61.10 lbm		TYPE I / II CEMENT, BULK (101439798)								
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	Displacement	FRESH WATER	285	bbl	8.33			8	11970	
Cement Left In Pipe		Amount	0 ft		Reason			Wet Shoe		
Mix Water:		pH 7.0	Mix Water Chloride:			<100 ppm		Mix Water Temperature:		61 °F
Cement Temperature:		N/A	Plug Displaced by:			8.3 lb/gal Fresh Water		Disp. Temperature:		61 °F
Plug Bumped?		Yes	Bump Pressure:			2166 psi		Floats Held?		Yes
Cement Returns:		85 bbl	Returns Density:			N/A		Returns Temperature:		N/A
Comment Plug bumped @ calculated displacement @ 2166 PSI, shutdown @ 2616 PSI. Sleeved shifted @ 4084 PSI and pumped a 5 BBL wet shoe. Floats held, received 2 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	7/25/2017	22:00:00	USER				CREW CALLED OUT AT 22:00 7/25/2017, REQUESTED ON LOCATION 4:00 7/26/2017. CREW PICKED UP CEMENT, 100 LBS OF SUGAR, AND PLUG CONTAINER FROM FORT LUPTON, CO. BULK 660: 11562544/11633846, BULK 660 BACKUP AIR: 111562546/11023106, PUMP 11644701/11645460.
Event	2	Pre-Convoy Safety Meeting	Pre-Convoy Safety Meeting	7/26/2017	01:45:00	USER				DISCUSSED ROUTES, HAZARDS, AND COMMUNICATION WITH CREW.
Event	3	Crew Leave Yard	Crew Leave Yard	7/26/2017	02:00:00	USER				STARTED JOURNEY MANAGEMENT.
Event	4	Arrive at Location from Service Center	Arrive at Location	7/26/2017	03:00:00	USER				END JOURNEY MANAGEMENT. MEET WITH CO. MAN TO DISCUSS JOB; SURFACE CASING: 36# 9.625" @ 1655', CASING: 5.5" 20# @ 12843', 31.66' SHOE JOINT, 8.5" OPEN HOLE, TVD @ 1655', 9.9 PPG WELL FLUID, FRESH WATER DISPLACEMENT. CASING LANDED @ 5:45 7/26/2017.
Event	5	Pre-Rig Up Safety Meeting	Pre-Rig Up Safety Meeting	7/26/2017	05:00:00	USER				HAZARD HUNT. DISCUSSED POSSIBLE HAZARDS ASSOCIATED WITH LOCATION, RIG UP AND WEATHER.
Event	6	Rig-Up Equipment	Rig-Up Equipment	7/26/2017	05:15:00	USER				CREW STAGED EQUIPMENT AND RIGGED UP BULK, IRON, AND WATER HOSES TO PERFORM JOB.
Event	7	Safety Meeting - Pre Job	Safety Meeting - Pre Job	7/26/2017	07:30:00	USER				MEETING WITH HALLIBURTON AND RIG PERSONNEL. COMMUNICATED POTENTIAL SAFETY HAZARDS AND JOB DETAILS.
Event	8	Other	Other	7/26/2017	08:35:41	USER	10.71	3.60	544.00	CHART BECAME DISCONNECTED BEFORE START JOB. RESTARTED RECORDING IN ICEM AND BEGAN RECORDING PART WAYS THROUGH TUNED SPACER.
Event	9	Pump Spacer	Pump Tuned Spacer @ 12.0 ppg	7/26/2017	08:37:13	USER	12.40	6.20	661.00	PUMP 50 BBLS OF TUNED SPACER @ 12.0 LB/GAL, 1.57 YIELD, 20 GAL/SKS, DENSITY VERIFIED BY PRESSURIZED MUD SCALES.

Event	10	Pump Cement	Pump Cement @ 13.2 ppg	7/26/2017	08:44:29	COM5	13.50	6.00	518.00	PUMP 2175 SKS OF ELASTICEM @ 13.2 LB/GAL, 1.57 YIELD, 7.53 GAL/SK, 608 BBLS, TOC @ SURFACE', DENSITY VERIFIED BY PRESSURIZED MUD SCALES.
Event	11	Shutdown	Shutdown	7/26/2017	10:14:35	USER	12.89	0.00	145.00	SHUTDOWN TO WASH PUMPS AND LINES/ DROP TOP PLUG.
Event	12	Clean Lines	Clean Lines	7/26/2017	10:22:55	USER	3.32	0.00	4.00	WASH UP PUMPS AND LINES CLEAR OF CEMENT.
Event	13	Drop Top Plug	Drop Top Plug	7/26/2017	10:32:36	COM5	8.04	0.00	9.00	PLUG LEFT CONTAINER, VERIFIED BY TOOL HAND.
Event	14	Pump Displacement	Pump Fresh Water Displacement	7/26/2017	10:33:39	COM5	8.05	2.60	32.00	BEGIN CALCULATED DISPLACEMENT OF 285 BBLS WITH FRESH WATER.
Event	15	Shutdown	Shutdown	7/26/2017	10:38:00	USER	7.96	0.00	379.00	SHUTDOWN DUE TO RIG HAVING TO SWITH RETURNS FROM GOING THROUGH THEIR CHOKE TO THE FLOW LINE. RESUMED DISPLACEMENT ONCE RIG WAS SET UP.
Event	16	Shutdown	Shutdown	7/26/2017	11:00:32	USER	8.35	0.00	1680.00	SHUTDOWN DUE TO PUMPS ELECTRONIC KICKOUTS. RESET KICKOUTS AND RESUMED PUMPING @ 6 BPM.
Event	17	Cement Returns to Surface	Cement Returns to Surface	7/26/2017	11:09:14	USER	8.38	6.00	2410.00	CEMENT TO SURFACE @ 200 BBLS INTO DISPLACEMENT. TOTAL 85 BBLS OF CEMENT TO SURFACE.
Event	18	Bump Plug	Bump Plug	7/26/2017	11:24:34	USER	8.37	4.20	2166.00	PLUG BUMPED AT CALCULATED DISPLACEMENT. PRESSURED 600 PSI OVER FINAL CIRCULATING PRESSURE OF 2166 PSI.
Event	19	Shutdown	Shutdown	7/26/2017	11:24:42	USER	8.37	0.00	2616.00	SHUTDOWN FOR 5 MINUTES @ 2616 PSI.
Event	20	Pressure Up	Shift Sleeve	7/26/2017	11:32:39	USER	8.50	1.40	4013.00	PRESSURE UP TO SHIFT SLEEVE. SLEEVE OPENED @ 4084 PSI.
Event	21	Pump Displacement	Pump Wet Shoe	7/26/2017	11:33:00	USER	8.41	2.10	2002.00	PUMP 5 BBLS FRESH WATER FOR A WET SHOE.
Event	22	Check Floats	Check Floats	7/26/2017	11:35:07	USER	8.36	0.00	1751.00	RELEASED PRESSURE, FLOATS HELD, 2 BBLS BACK.
Event	23	End Job	End Job	7/26/2017	11:36:41	COM5				STOP RECORDING JOB DATA.
Event	24	Pre-Rig Down Safety Meeting	Pre-Rig Down Safety Meeting	7/26/2017	11:45:00	USER	8.36	0.00	4.00	DISCUSSED POSSIBLE HAZARDS ASSOCIATED WITH WEATHER, LOCATION AND RIGGING DOWN IRON AND HOSES.
Event	25	Rig-Down Completed	Rig-Down Completed	7/26/2017	13:00:00	USER				ALL HALLIBURTON ITEMS WERE STOWED FOR TRAVEL, AND LOCATION WAS CLEAN.
Event	26	Pre-Convoy Safety	Pre-Convoy Safety	7/26/2017	13:15:00	USER				DISCUSSED ROUTES HAZARDS AND COMMUNICATION

		Meeting	Meeting				WITH CREW.
Event	27	Depart Location	Depart Location	7/26/2017	13:30:00	USER	THANK YOU FOR USING HALLIBURTON - BRYAN KRAFT AND CREW.