

HALLIBURTON

iCem[®] Service

PDC ENERGY EBUS

Jacobucci 32K-403

Production

Job Date: Wednesday, May 04, 2016

Sincerely,
Derek Trier

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1.0 Cementing Job Summary

1.1 Executive Summary

Halliburton appreciates the opportunity to perform the cementing services on the **Jacobucci 32K-403** 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.

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]

Job Times

	Date	Time	Time Zone
Called Out Time:	5/03/2016	1800	MTN
Arrived On Location At:		2200	
Job Started At:	5/04/2016	1239	
Job Completed At:		1657	
Departed Location At:		1830	

Sold To #: 304535		Ship To #: 3649797		Quote #:		Sales Order #: 0903260621					
Customer: PDC ENERGY - EBUS				Customer Rep: Dean Haighte							
Well Name: JACOBUCCI			Well #: 32K-403		API/UWI #: 05-123-41169-00						
Field: SPINDLE		City (SAP): DACONO		County/Parish: WELD		State: COLORADO					
Legal Description: NW SW-32-1N-67W-2347FSL-1068FWL											
Contractor: ENSIGN DRLG				Rig/Platform Name/Num: ENSIGN 121							
Job BOM: 7523											
Well Type: HORIZONTAL OIL											
Sales Person: HALAMERICA\HB71271				Srv Supervisor: Nathaniel Moore							
Job											
Formation Name											
Formation Depth (MD)		Top		Bottom							
Form Type				BHST							
Job depth MD		13981ft		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	LTC	J-55	0	1830			
Casing		5.5	4.778	20		P-110	0	13976			
Open Hole Section			8.5				1830	13981			
Tools and Accessories											
Type	Size in	Qty	Make	Depth ft		Type	Size in	Qty	Make		
Guide Shoe	5.5			13976		Top Plug	5.5	1	Team		
Float Shoe	5.5			13959.7		Bottom Plug	5.5		HES		
Float Collar	5.5					SSR plug set	5.5		HES		
Insert Float	5.5					Plug Container	5.5		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			40	bbl	8.4			6	
42 gal/bbl		FRESH WATER									

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	ElastiCem	ELASTICEM (TM) SYSTEM	1137	sack	13.2	1.57		6	7.49
7.49 Gal		FRESH WATER							
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	EconoCem	ECONOCHEM (TM) SYSTEM	2040	sack	13.5	1.65		4	7.87
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	Water	Water Displacement	308	bbl	8.33				
Cement Left In Pipe		Amount	16 ft		Reason			Shoe Joint	

2.0 Real-Time Job Summary

2.1 Job Event Log

Type	Seq. No.	Activity	Graph Label	Date	Time	Source	Pass-Side Pump Pressure (psi)	Downhole Density (ppg)	Combined Pump Rate (bbl/min)	Comments
Event	1	Call Out	Call Out	5/3/2016	18:00:00	USER				Verify equipment and materials
Event	2	Depart Yard Safety Meeting	Depart Yard Safety Meeting	5/3/2016	21:00:00	USER				Journey management conducted with crew
Event	3	Assessment Of Location Safety Meeting	Assessment Of Location Safety Meeting	5/3/2016	22:00:00	USER				Rig still running casing.
Event	4	Other	Other	5/3/2016	22:05:00	USER				TD 13981' 8.5" open hole. 13976' 5.5" 20# P-110 casing. Float collar @ 13959.7'. Surface 1833' 9.625" 36#. Mud weight 9.3 ppg. Rig will pump pill with dye once casing is on bottom to determine hole volume and adjust cement volume accordingly. Customer rep: Dean Haighte. Production manager: Tony Abarientos
Event	5	Pre-Rig Up Safety Meeting	Pre-Rig Up Safety Meeting	5/3/2016	22:10:00	USER				Spot in equipment and rig up
Event	6	Other	Casing on bottom	5/4/2016	08:00:00	USER				Rig filling casing then will establish circulation and pump pill to determine hole volume
Event	7	Other	Other	5/4/2016	11:00:00	USER				Rig circulated pill to surface. Determined that cement volume on location wasn't adequate for job. Ordered 280 sks tail at 1200 to be delivered to location. Had to send drivers to pick it up.
Event	8	Pre-Job Safety Meeting	Pre-Job Safety Meeting	5/4/2016	11:45:00	USER				Discuss job procedure with rig and HES crew.
Event	9	Start Job	Start Job	5/4/2016	12:39:03	COM1				Extra cement being loaded to leave the yard by 1300. Advised company rep to wait for cement to be loaded and in transit before starting job. PDC rep wanted to start job anyways and mix at a slower rate until cement arrived. Filled lines with 3 bbl water
Event	10	Test Lines	Test Lines	5/4/2016	12:44:47	COM1	4840.00	8.32	0.00	Tested lines to 4800 psi.
Event	11	Pump Spacer 1	Pump Mud flush III	5/4/2016	12:50:46	COM1	118.00	8.27	0.00	40 bbl of mud flush with red dye in the last 10 bbl.

Event	12	Pump Lead Cement	Pump Lead Cement	5/4/2016	13:11:55	COM1	516.00	13.11	2.40	1137 sks/318 bbl 1.57 ft3/sk 7.49 gal/sk. Pumped first 20 bbl at 13 ppg to increase total volume at customer request.
Event	13	Check Weight	Check weight lead	5/4/2016	13:16:06	COM1	493.00	13.07	5.00	13 ppg verified with pressurized mud scale
Event	14	Other	Cement arrived on location	5/4/2016	13:53:00	USER	98.00	13.21	5.20	Had pumped first 250 bbl lead at 5 bpm to allow time for cement to arrive. Picked up rate to 7.5 bpm for remainder of cement.
Event	15	Check Weight	Check weight lead	5/4/2016	13:55:21	COM1	221.00	13.19	7.50	13.2 ppg
Event	16	Pump Tail Cement	Pump Tail Cement	5/4/2016	14:11:59	COM1	173.00	13.49	6.00	2040 sks/600 bbl 13.5 ppg 1.65 ft3/sk 7.87 gal/sk
Event	17	Check Weight	Check weight tail	5/4/2016	14:13:35	COM1	205.00	13.52	6.70	13.5 ppg
Event	18	Check Weight	Check weight tail	5/4/2016	14:20:31	COM1	288.00	13.57	8.00	13.5 ppg
Event	19	Check Weight	Check weight	5/4/2016	15:00:50	COM1	309.00	13.52	8.00	13.5 ppg
Event	20	Check Weight	Check weight	5/4/2016	15:22:44	COM1	302.00	13.51	8.00	13.5 ppg
Event	21	Shutdown	Shutdown	5/4/2016	15:36:15	COM1				
Event	22	Clean Lines	Clean Lines	5/4/2016	15:38:43	COM1				
Event	23	Drop Top Plug	Drop Top Plug	5/4/2016	15:43:47	COM1				Dropped Team latchdown plug. Verified by team hand and customer rep
Event	24	Pump Displacement	Pump Displacement	5/4/2016	15:43:50	COM1				308 bbl water
Event	25	Other	Cement to surface	5/4/2016	16:05:31	COM1				150 bbl into displacement. Called 40 bbl mud flush and 150 bbl cement to surface total
Event	26	Bump Plug	Bump Plug	5/4/2016	16:40:38	COM1				2330 psi final circulating pressur. Pressured up to 2680 psi.
Event	27	Pressure Up Well	Pressure Up Well	5/4/2016	16:41:04	COM1				Pressure test casing for 15 minutes. Pressure increased 200 psi during test
Event	28	Pre-Rig Down Safety Meeting	Pre-Rig Down Safety Meeting	5/4/2016	16:45:00	USER	2738.00	8.27	0.00	Safety meeting with HES crew
Event	29	End Job	End Job	5/4/2016	16:57:56	COM1				
Event	30	Depart Location Safety Meeting	Depart Location Safety Meeting	5/4/2016	18:30:00	USER				Journey management conducted with crew