

HALLIBURTON

iCem[®] Service

NOBLE ENERGY INC-EBUS

Date: Friday, October 19, 2018

Wells Ranch BB09-626 Production

Job Date: Saturday, October 06, 2018

Sincerely,

Steve Markovich

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 **Wells Ranch BB09-626** 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]

The Road to Excellence Starts with Safety

Sold To #: 345242		Ship To #: 3805793		Quote #:		Sales Order #: 0905174576					
Customer: NOBLE ENERGY INC-EBUS				Customer Rep: Dave England							
Well Name: WELLS RANCH			Well #: BB09-626		API/UWI #: 05-123-44953-00						
Field: WATTENBERG		City (SAP): GILL		County/Parish: WELD		State: COLORADO					
Legal Description: SW SW-11-5N-63W-962FSL-235FWL											
Contractor: H & P DRLG				Rig/Platform Name/Num: H & P 321							
Job BOM: 7523 7523											
Well Type: HORIZONTAL OIL											
Sales Person: HALAMERICA\HB70026				Srv Supervisor: Steven Markovich							
Job											
Formation Name											
Formation Depth (MD)		Top		Bottom							
Form Type				BHST		230 degF					
Job depth MD		16968ft		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	0	9.625	8.921	36			0	1931	0	0	
Casing	0	5.5	4.778	20			0	16968	0	0	
Open Hole Section			8.5				2415	6734	0	0	
Open Hole Section			8.5				6734	16983	0	0	
Tools and Accessories											
Type	Size in	Qty	Make	Depth ft		Type	Size in	Qty	Make		
Guide Shoe	5.5			16968		Top Plug	5.5		HES		
Float Shoe	5.5					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	11.5 lb/gal Tuned Spacer III w/ Chems	Tuned Spacer III			120	bbl	11.5	3.78	23.5		

0.60 gal/bbl		MUSOL(R) A, 5 GAL PAIL (100064220)							
34.70 gal/bbl		FRESH WATER							
0.60 gal/bbl		DUAL SPACER SURFACTANT B, 5 GAL PAIL (100003665)							
147.42 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	ElastiCem	ELASTICEM (TM) SYSTEM	140	sack	13.2	1.68		6	8.04
8.04 Gal		FRESH WATER							
0.95 %		SCR-100 (100003749)							
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	ElastiCem w/ SCBL	ELASTICEM (TM) SYSTEM	449	sack	13.2	1.68		6	8.06
0.50 %		SCR-100 (100003749)							
8.06 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
4	NeoCem NT1	NeoCem TM	1152	sack	13.2	2.04		6	9.75
9.75 Gal		FRESH WATER							
0.08 %		SCR-100 (100003749)							
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	Displacement	373	bbl	8.33				
Cement Left In Pipe		Amount	47.4 ft		Reason			Shoe Joint	
Mix Water:		pH 6.5	Mix Water Chloride: 00 ppm			Mix Water Temperature:		50.5 °F °C	
Comment Spacer to surface at 355bbls away bringing 18bbls of spacer to surface. Bumped plug at 373bbls away, final lift pressure was 2041psi. Took pressure 500psi over and held for 5 mins. After 5 mins pressure was 2728psi. After 4.5bbls back floats held. Estimated Top of Tail Cement 3734' Estimated Top of Lead Cement 3442' Estimated Top of Cap Cement 2415'.									

2.0 Real-Time Job Summary

2.1 Job Event Log

Type	Seq. No.	Activity	Graph Label	Date	Time	Source	DH Density (ppg)	DS Pump Press (psi)	Comb Pump Rate (bbl/min)	Comments
Event	1	Call Out	Call Out	10/6/2018	08:00:00	USER				Job called out at 0800 with an on location time of 1430
Event	2	Crew Leave Yard	Crew Leave Yard	10/6/2018	12:40:00	USER				JSA with HES crew on directions and road hazards on the way to location
Event	3	Arrive At Loc	Arrive At Loc	10/6/2018	14:00:00	USER				Arrived on location, rig was still running casing approx 2500' Rig was washing down each joint.
Event	4	Assessment Of Location Safety Meeting	Assessment Of Location Safety Meeting	10/6/2018	14:15:00	USER				JSA and hazard hunt with HES crew
Event	5	Start Job	Start Job	10/7/2018	00:32:18	COM4				TD 16983' TP 16967.8' FC 16920.4' 5 1/2" Production Casing, 8 1/2" Open Hole, 9 5/8" 36# Surface Casing set at 1931', TVD 6570', Mud# 9.6 heavy.
Event	6	Test Lines	Test Lines	10/7/2018	00:36:02	COM4	8.82	5014.00		Set kick outs to 500psi and check low pressure kick outs, then bring pressure up to 4800psi and hold. Then test the rig IBOP to 2500psi and hold.
Event	7	Drop Bottom Plug	Drop Bottom Plug	10/7/2018	00:53:00	USER				Plug loaded into the casing and pushed down with the CRT in front of the company rep.
Event	8	Pump Spacer 1	Pump Spacer 1	10/7/2018	00:53:57	COM4	11.76	379.00	3.90	Pump 120bbs of 11.5ppg 3.78yield Tuned Spacer III. Added 75 gallons of Musol A and Dual Spacer B on the fly. Pumped at 5bbl/min 380psi.
Event	9	Drop Bottom Plug	Drop Bottom Plug	10/7/2018	01:24:25	COM4				Plug loaded into the casing and pushed down with the CRT in front of the company rep.
Event	10	Pump Lead Cement	Pump Lead Cement	10/7/2018	01:24:32	COM4	13.27	343.00	6.00	Pump 41.89bbls (140sks) of 13.2ppg 1.68yield Cap Cement. Pumped at 8bbl/min 600psi.
Event	11	Pump Lead Cement	Pump Lead Cement	10/7/2018	01:30:30	COM4	13.27	524.00	7.90	Pump 134bbls (449sks) of 13.2ppg 1.68yield Lead Cement. Pumped at 8bbl/min 620psi
Event	12	Check Weight	Check Weight	10/7/2018	01:32:11	COM4	13.37	547.00	8.00	Weight verified by pressurized scales.

Event	13	Pump Tail Cement	Pump Tail Cement	10/7/2018	01:54:44	COM4	13.23	521.00	8.00	Pump 418bbls (1152sks) of 13.2ppg 2.04yield Tail Cement. Pumped at 8bbl/min 580psi.
Event	14	Check Weight	Check Weight	10/7/2018	01:57:27	COM4	13.23	706.00	8.00	Weight verified by pressurized scales.
Event	15	Check Weight	Check Weight	10/7/2018	02:17:32	COM4	13.20	674.00	8.00	Weight verified by Pressurized scales.
Event	16	Shutdown	Shutdown	10/7/2018	02:57:45	USER				Shutdown and clean pumps and lines
Event	17	Drop Top Plug	Drop Top Plug	10/7/2018	03:11:13	COM4				
Event	18	Pump Displacement	Pump Displacement	10/7/2018	03:11:18	COM4	8.38	445.00	10.00	Pump 373bbls of H2O. First 20bbls with MMCR then 353bbls with biocide. Pumped at 10bbl/min slowed rate with pressure increase. Spacer to surface at 355bbls away bringing 18bbls to surface.
Event	19	Bump Plug	Bump Plug	10/7/2018	04:01:56	COM4	8.36	2041.00	4.90	Bumped plug at 373bbls away. Final lift pressure was 2041psi. Took pressure 500psi over and held for 5 mins. After 5 mins pressure was 2728psi. Opened release line and after 4.5bbls back floats held.
Event	20	End Job	End Job	10/7/2018	04:07:36	COM4	8.29	-43.00	0.00	Thank you Steve Markovich and crew.

3.0 Attachments

3.1 Noble Wells Ranch BB09-626 Production-Custom Results.png

