HALLIBURTON

Cementing Job Summary

The Road to Excellence Starts with Safety

Sold To #: 345242	**Ship To #:** 3783324	**Quote #:**	**Sales Order #:** 0904161581
Customer: NOBLE ENERGY INC - EBUS		**Customer Rep:** John Drahota	
Well Name: WELLS RANCH	**Well #:** AF07-651		**API/UWI #:** 05-123-44248-00
Field: WATTENBERG	**City (SAP):** KERSEY	**County/Parish:** WELD	**State:** COLORADO
Legal Description: SE NE-8-5N-62W-2350FNL-175FEL			
Contractor: H & P DRLG		**Rig/Platform Name/Num:** H & P 517	
Job BOM: 7523 7523			
Well Type: HORIZONTAL OIL			
Sales Person: HALAMERICA\HB70026		**Srvc Supervisor:** Bryce Muir	

Job

Formation Name				
Formation Depth (MD)	**Top**		**Bottom**	
Form Type			**BHST**	
Job depth MD	15924ft		**Job Depth TVD**	6475 ft
Water Depth			**Wk Ht Above Floor**	3
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	1938	0	0
Casing	0	5.5	4.778	20	BUTTRESS	P-110	0	15924	0	0
Open Hole Section			8.5				0	15940	0	6475
Open Hole Section			8.5				0	15940	0	0

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	80	bbl	11.5	3.78	23.5		
35.10 gal/bbl		FRESH WATER							
0.60 gal/bbl		DUAL SPACER SURFACTANT B, 5 GAL PAIL (100003665)							
147.42 lbm/bbl		BARITE, BULK (100003681)							
0.60 gal/bbl		MUSOL A, 330 GAL TOTE - (790828)							

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	150	sack	13.2	1.57	7.53	6	7.53
7.52 Gal		FRESH WATER							

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3	ElastiCem w/ SCBL	ELASTICEM (TM) SYSTEM	494	sack	13.2	1.6	7.69	6	7.69
7.69 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	1084	sack	13.2	2.04	9.75	6	9.75
9.75 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
5	Displacement	Displacement	353	bbl	8.33				

Cement Left In Pipe	Amount	49ft	Reason	Shoe Joint

Comment: WE arrived on location at 0300 hours. Spotted in equipment and started to rig up. After rig was finished running casing they circulated the well. We then had our safety meeting with the rig crew. Right after the safety meeting we hooked up Halliburton lines to pump cement. A bottom plug was load directly into the casing prior to the job starting. We then filled lines, pressure tested, and pumped 80 bbls of tuned spacer. We shutdown to load another bottom plug into the casing. Plug was loaded by company rep and witnessed by Halliburton rep. We then pumped 42 bbls of first lead, 140 bbls of second lead, and 394 bbls of our tail cement. Shutdown washed pumps and line and loaded the top plug into the casing. Pumped 20 bbls of MMCR displacement followed by 333 bbls of fresh water displacement with aldacide g added. Landed the plug at 2149 psi and pressured up to 2638 psi and held for 5 minutes. Checked floats and they held. We got 4.5 bbls of fresh water back to the RCM.

2.0 Real-Time Job Summary

2.1 Job Event Log

Type	Seq. No.	Activity	Graph Label	Date	Time	Source	PS Pump Press (psi)	DH Density (ppg)	Comb Pump Rate (bbl/min)	Comments
Event	1	Call Out	Call Out	7/15/2017	21:00:00	USER				Crew called out to perform cement job. Load up all required equipment for the job.
Event	2	Depart Yard Safety Meeting	Depart Yard Safety Meeting	7/16/2017	01:00:00	USER				Discuss hazards associated with driving trucks to location. Discuss convoy order and safest route of travel.
Event	3	Depart from Service Center or Other Site	Depart from Service Center or Other Site	7/16/2017	01:10:00	USER				
Event	4	Arrive at Location from Service Center	Arrive at Location from Service Center	7/16/2017	03:00:00	USER				Sign in and identify the best way to spot equipment for rig.
Event	5	Pre-Rig Up Safety Meeting	Pre-Rig Up Safety Meeting	7/16/2017	03:10:00	USER				Discuss hazards associated with rigging up and packing iron on location.
Event	6	Rig-Up Equipment	Rig-Up Equipment	7/16/2017	03:20:00	USER				
Event	7	Other	Rig Circulate	7/16/2017	04:00:00	USER				Rig circulated well after getting casing on bottom.
Event	8	Pre-Job Safety Meeting	Pre-Job Safety Meeting	7/16/2017	05:00:00	USER				Discuss HES safety and job procedures with rig crew and Company Rep. Identify muster areas, fire extinguishers, and closest hospital.
Event	9	Rig-Up Equipment	Rig-Up Equipment	7/16/2017	05:14:00	USER				Rig up our hoses to the rigs standpipe. Get lines lined out for pumping cement job.
Event	10	Drop Bottom Plug	Drop Bottom Plug	7/16/2017	05:16:00	USER				Company man loaded directly into the case a 5.5'' bottom plug. Verified by Bryce Muir.
Event	11	Start Job	Start Job	7/16/2017	05:19:02	COM6				
Event	12	Other	Other	7/16/2017	05:19:39	COM6				Pump 3 bbls of fresh water to fill pumps and lines.
Event	13	Test Lines	Test Lines	7/16/2017	05:22:41	COM6	4860.33	8.45		Conduct a low pressure kickout function test to 500 psi. Kickouts functioning properly. Immediately increased pressure to our high pressure test. We tested our lines to 4700 psi. Held for a few minutes to monitor pressure loss.

Event	14	Pump Spacer 1	Pump Spacer 1	7/16/2017	05:29:33	COM6	443.30	11.55	3.00	Pumped 80 bbls of Tuned Spacer. Pumped spacer at 11.5 #/gal 3.78 cuft/sk 23.5 gal/sk. We added the spacer additives on the fly as we were pumping downhole. Pumped at 3 bpm at 370 psi.
Event	15	Shutdown	Shutdown	7/16/2017	05:51:03	COM6				
Event	16	Drop Plug	Drop Plug	7/16/2017	05:54:31	COM6				Company man loaded another 5.5'' bottom plug after we pumped spacer. Verified by Bryce Muir.
Event	17	Pump Lead Cement	Pump Lead Cement	7/16/2017	05:57:22	COM6	474.30	13.43	4.90	Pump 42 bbls of 1st Lead Cement. 150 sacks at 13.2 #/gal 1.57 cuft/sk 7.53 gal/sk. Pumped at 6 bpm at 700 psi.
Event	18	Check Weight	Check Weight	7/16/2017	05:58:06	COM6	397.30	13.16	4.30	1st Lead Cement weight verifed by pressurized mud balance.
Event	19	Pump Cement	Pump Cement	7/16/2017	06:05:14	COM6	536.30	13.43	4.80	Pumped 140 bbls of 2nd Lead Cement. 494 sacks at 13.2 #/gal 1.60 cuft/sk 7.69 gal/sk. We pumped lead at 8 bpm at 901 psi.
Event	20	Check Weight	Check Weight	7/16/2017	06:08:00	USER	610.30	13.34	5.90	2nd Lead Cement weight verified by pressurized mud balance.
Event	21	Pump Tail Cement	Pump Tail Cement	7/16/2017	06:24:31	COM6	739.30	13.26	6.00	Pump 394 bbls of Tail Cement. 1084 sacks at 13.2 #/gal 2.04 cuft/sk 9.75 gal/sk. We started out pumping Tail Cement at 8 bpm, but we had to slow to 6.5 bpm due to pump cavitating.
Event	22	Check Weight	Check Weight	7/16/2017	06:25:00	USER	843.30	13.33	6.60	Tail Cement weight verified by pressurized mud balance.
Event	23	Shutdown	Shutdown	7/16/2017	07:23:20	COM6				Blow lines back to the wash up tank. Wash up pumps and lines before displacement.
Event	24	Drop Top Plug	Drop Top Plug	7/16/2017	07:36:00	USER				Drop 5.5'' top plug. Plug loaded by Company Rep and witnessed by Bryce Muir.
Event	25	Pump Displacement	Pump Displacement	7/16/2017	07:40:57	COM6	504.30	7.69	8.00	Pump 353 bbls of fresh water displacement. The first 20 bbls of displacement we added MMCR to each tank. The remaining 333 bbls of displacement we added Aldacide G to each tank.
Event	26	Displ Reached Cement	Displ Reached Cement	7/16/2017	07:45:00	USER				After pumping 30 bbls of displacement the plug caught up with the cement and we started to see higher lift pressure.
Event	27	Bump Plug	Bump Plug	7/16/2017	08:34:00	COM6	2149.30	7.74	0.00	Landed plug at 2149 psi and pressured up on the plug 500 psi over final circulating pressure. Pressured up to 2637 psi. We held pressure on the casing for five minutes monitoring the pressure.
Event	28	Check Floats	Check Floats	7/16/2017	08:40:00	USER				Floats held. We got 4.5 bbls back to the RCM. During the entire job we had great circulation. We didn't see any spacer or cement to surface.

Event	29	End Job	End Job	7/16/2017	08:42:21	COM6	Job completed safely by Bryce Muir and Crew. Thank you and stay safe.
Event	30	Pre-Rig Down Safety Meeting	Pre-Rig Down Safety Meeting	7/16/2017	08:50:00	USER	Discuss hazards associated with rigging down iron. Discussed heat related issues and emphasized on the importance of hydrating.
Event	31	Rig-Down Equipment	Rig-Down Equipment	7/16/2017	09:10:00	USER	
Event	32	Pre-Convoy Safety Meeting	Pre-Convoy Safety Meeting	7/16/2017	10:30:00	USER	Discussed hazards associated with driving truck back to the service center. Talked about driver fatigue and what to do if too tired to drive.
Event	33	Depart Location for Service Center or Other Site	Depart Location for Service Center or Other Site	7/16/2017	10:45:00	USER	