

HALLIBURTON

Cementing Job Summary

The Road to Excellence Starts with Safety

Sold To #: 345242	Ship To #: 3730157	Quote #:	Sales Order #: 0904147012							
Customer: NOBLE ENERGY INC - EBUS		Customer Rep: Tim Simkins								
Well Name: RATTLESNAKE FEDERAL	Well #: LC10-770	API/UWI #: 05-123-42979-00								
Field: WILDCAT	City (SAP): RAYMER	County/Parish: WELD	State: COLORADO							
Legal Description: NW NW-22-9N-59W-400FNL-1274FWL										
Contractor: Noble		Rig/Platform Name/Num: H&P 524								
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	17193ft	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	1940	0	1940
Casing	0	5.5	4.778	20		P-110	0	17193	0	0
Open Hole Section			8.5				1940	17204	0	0
Fluid Data										
Stage/Plug #: 1										
Fluid #	Stage Type	Fluid Name	Qty	Qty UoM	Mixing Density lbm/gal	Yield ft ³ /sack	Mix Fluid Gal	Rate bbl/min	Total Mix Fluid Gal	
1	11.5 lb/gal Tuned Spacer III	Tuned Spacer III	80	bbl	11.5	3.84		5		
34.60 gal/bbl		FRESH WATER								
0.60 gal/bbl		DUAL SPACER SURFACTANT B, 5 GAL PAIL (100003665)								
0.60 gal/bbl		MUSOL A, 330 GAL TOTE - (790828)								
145.18 lbm/bbl		BARITE, BULK (100003681)								
Fluid #	Stage Type	Fluid Name	Qty	Qty UoM	Mixing Density lbm/gal	Yield ft ³ /sack	Mix Fluid Gal	Rate bbl/min	Total Mix Fluid Gal	
2	ElastiCem	ELASTICEM (TM) SYSTEM	150	sack	13.2	1.57		6	7.54	
7.54 Gal		FRESH WATER								
0.25 %		SCR-100 (100003749)								

HALLIBURTON

Cementing Job Summary

Fluid #	Stage Type	Fluid Name	Qty	Qty UoM	Mixing Density lbm/gal	Yield ft ³ /sack	Mix Fluid Gal	Rate bbl/min	Total Mix Fluid Gal
3	ElastiCem w/ SCBL	ELASTICEM (TM) SYSTEM	465	sack	13.2	1.6		6	7.69
0.20 %		SCR-100 (100003749)							
7.68 Gal		FRESH WATER							
Fluid #	Stage Type	Fluid Name	Qty	Qty UoM	Mixing Density lbm/gal	Yield ft ³ /sack	Mix Fluid Gal	Rate bbl/min	Total Mix Fluid Gal
4	NeoCem NT1	NeoCem TM	1282	sack	13.2	2.04		5	9.75
9.71 Gal		FRESH WATER							
0.05 %		SCR-100 (100003749)							
Fluid #	Stage Type	Fluid Name	Qty	Qty UoM	Mixing Density lbm/gal	Yield ft ³ /sack	Mix Fluid Gal	Rate bbl/min	Total Mix Fluid Gal
5	MMCR Displacement	MMCR Displacement	20	bbl	8.33				
0.50 gal/bbl		MICRO MATRIX CEMENT RETARDER, 5 GAL PAIL (100003781)							
Fluid #	Stage Type	Fluid Name	Qty	Qty UoM	Mixing Density lbm/gal	Yield ft ³ /sack	Mix Fluid Gal	Rate bbl/min	Total Mix Fluid Gal
6	Displacement	Displacement	358.89	bbl	8.33				
Comment . Bumped plug at calculated displacement. Final life pressure was 1613psi, took 500 over and held for 5 mins. After 5 mins pressure was 2270psi. Checked floats, floats were good. Got 4bbbls of water 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)	DS Pump Press (psi)	Comb Pump Rate (bbl/min)	Comments
Event	1	Call Out	Call Out	7/8/2017	16:30:00	USER				Called out at 4:30pm On location time 10:30
Event	2	Arrive At Loc	Arrive At Loc	7/8/2017	22:15:00	USER				Arrived on location. JSA and Hazard hunt with HES crew
Event	3	Start Job	Start Job	7/9/2017	00:47:28	COM4				TD 17204' TP 17193.6' FC 17144.4' 5 1/2 20#CSG 8 1/2 OPH 9 5/8 surf CSG 1939.8' Estimated Top of Tail Cement 5804' Estimated Top of Lead 2 Cement 2556' Estimated Top of Lead Cement 1591' Estimated to get 3.7bbls of spacer to surface.
Event	4	Test Lines	Test Lines	7/9/2017	00:51:09	COM4	8.49		3391.00	Perform 500psi kick out test. Kick outs worked. Re set kick outs to 4000psi and perform 5th gear stall out test. Brought pressure up to 4000psi and held.
Event	5	Drop Bottom Plug	Drop Bottom Plug	7/9/2017	01:00:43	USER				Plug loaded and dropped by company rep.
Event	6	Pump Spacer 1	Pump Spacer 1	7/9/2017	01:03:01	COM4	11.72	61.00	2.00	Pump 80bbls of 11.5ppg 3.84yield Tuned Spacer with 50 gallons of Musol A and Dual surf B additives. Added surfactants on the fly.
Event	7	Check Weight	Check Weight	7/9/2017	01:04:08	COM4				Weight verified by pressurized scales.
Event	8	Drop Bottom Plug	Drop Bottom Plug	7/9/2017	01:27:24	USER	11.28	41.00	0.00	Plug loaded and dropped by company rep.
Event	9	Check Weight	Check Weight	7/9/2017	01:31:04	COM4	11.26	13.00	0.00	Weight verified by pressurized scales.
Event	10	Pump Lead Cement	Pump Lead Cement	7/9/2017	01:31:31	COM4	13.48	206.00	4.30	Pump 41.94 bbls (150sks) 13.2ppg 1.57 yield Lead Cement. Pumped at 8bbl/min 500psi.
Event	11	Pump Cement	Pump Cement	7/9/2017	01:37:50	COM4	13.01	451.66	7.90	Pump 132.5bbls (465sks) 13.2ppg 1.6yield Lead Cement 2. Pumped at 8bbl/min 550psi.
Event	12	Check Weight	Check Weight	7/9/2017	01:37:59	COM4	13.38	513.00	7.90	Weight verified by pressurized scales.
Event	13	Check Weight	Check Weight	7/9/2017	01:45:21	COM4	13.32	505.00	8.00	Weight verified by pressurized scales.
Event	14	Pump Tail Cement	Pump Tail Cement	7/9/2017	01:55:33	COM4	13.20	674.28	8.10	Pump 465.7bbls (1282sks) 13.2ppg 2.04yield Tail Cement. Pumped at 8bbl/min 720psi.
Event	15	Check Weight	Check Weight	7/9/2017	01:55:44	COM4	13.19	676.00	8.10	Weight verified by pressurized scales.

Event	16	Check Weight	Check Weight	7/9/2017	02:20:37	COM4	13.22	723.12	8.04	Weight verified by pressurized scales.
Event	17	Shutdown	Shutdown	7/9/2017	02:59:32	COM4				Shutdown and clean pumps and lines.
Event	18	Drop Top Plug	Drop Top Plug	7/9/2017	03:13:34	COM4				Plug loaded and dropped by Company Rep.
Event	19	Other	Other	7/9/2017	03:20:58	USER				Started displacement but rig and our valves were not aligned. Shutdown and started displacement.
Event	20	Pump Displacement	Pump Displacement	7/9/2017	03:24:14	COM4	8.36	426.00	9.90	Pump 378.8bbls of H2O. First 20bbls with MMCR then 358 with Biocide. Pumped at 10bbls/min, slowed rate with pressure increase.
Event	21	Bump Plug	Bump Plug	7/9/2017	04:11:25	COM4	8.39	1613.00	3.00	Bumped plug as calculated. Final lift pressure was 1613psi took 500 over and held for 5 mins.
Event	22	Check Floats	Check Floats	7/9/2017	04:17:27	USER				After 5 mins pressure was at 2270psi. Opened release line to check floats, after 4bbls to the truck floats held.
Event	23	End Job	End Job	7/9/2017	04:24:08	COM4				Thank you Steve Markovich and Crew.