

HALLIBURTON

iCem[®] Service

NOBLE ENERGY INC-EBUS

United States of America, COLORADO

Date: Wednesday, November 22, 2017

Waste Management Y23-712 Production

Job Date: Monday, November 20, 2017

Sincerely,

Adam McKay

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1.0 Cementing Job Summary

1.1 Executive Summary

Halliburton appreciates the opportunity to perform the cementing services on the **Waste Management Y23-712** 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]

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Cementing Job Summary

The Road to Excellence Starts with Safety

Sold To #: 345242		Ship To #: 3800307		Quote #:		Sales Order #: 0904436850				
Customer: NOBLE ENERGY INC - EBUS				Customer Rep: Chris Ewing						
Well Name: WASTE MANAGEMENT		Well #: Y23-712		API/UWI #: 05-123-44840-00						
Field: WATTENBERG		City (SAP): KEENESBURG		County/Parish: WELD		State: COLORADO				
Legal Description: NE NE-11-2N-64W-787FNL-756FEL										
Contractor: H & P DRLG				Rig/Platform Name/Num: H & P 517						
Job BOM: 7523 7523										
Well Type: HORIZONTAL OIL										
Sales Person: HALAMERICA\HB70026				Srv Supervisor: Steve Cardos						
Job										
Formation Name										
Formation Depth (MD)		Top		Bottom						
Form Type				BHST		230 degF				
Job depth MD		19595 ft		Job Depth TVD		7000'				
Water Depth				Wk Ht Above Floor		4'				
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	2029	0	2029
Casing	0	5.5	4.778	20	BUTTRESS	P-110	0	19595	0	7000
Open Hole Section			8.5				2029	19916	2029	7000
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 w/ Chems	Tuned Spacer III	80	bbl	11.5	3.78	23.5	4	2793	
34.70 gal/bbl		FRESH WATER								
0.60 gal/bbl		DUAL SPACER SURFACTANT B, 5 GAL PAIL (100003665)								
149.34 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 ft ³ /sack	Mix Fluid Gal	Rate bbl/min	Total Mix Fluid Gal	
2	ElastiCem Cap	ELASTICEM (TM) SYSTEM	150	sack	13.2	1.57	7.53	6	1130	
0.80 %		SCR-100 (100003749)								
7.53 Gal		FRESH WATER								

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Cementing Job Summary

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	577	sack	13.2	1.6	7.69	6	4437
0.35 %		SCR-100 (100003749)							
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	1486	sack	13.2	2.041	9.75	6	14489
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	441	bbl	8.33			6	
Cement Left In Pipe		Amount	50'		Reason			Shoe Joint	
Mix Water:		pH 6	Mix Water Chloride:		<300 ppm		Mix Water Temperature:		68 °F
Cement Temperature:			Plug Displaced by:		8.33 lb/gal		Disp. Temperature:		55 °F
Plug Bumped?		Yes	Bump Pressure:		2389 psi		Floats Held?		Yes
Cement Returns:			Returns Density:				Returns Temperature:		
Comment Plug bumped @2389 psi. Floats held received 4.75 Bbls back to the truck. Nothing returned to surface.									

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2.0 Real-Time Job Summary

2.1 Job Event Log

Type	Seq. No.	Activity	Graph Label	Date	Time	Source	Comb Pump Rate (bbl/min)	DS Pump Press (psi)	Recirc Density (ppg)	Comments
Event	1	Call Out	Call Out	11/19/2017	19:30:00	USER				CREW CALLED OUT AT 19:30 11/19/2017, REQUESTED ON LOCATION 00:30 11/20/2017. CREW PICKED UP CEMENT, CHEMICALS (50 GAL MUSOL A, 50 GAL DUAL SPACER B, 20 GAL D-AIR, 10 GAL MMCR), 100 LBS SUGAR, PLUG CONTAINER AND MANIFOLD FROM FORT LUPTON, CO. BULK 660: 11027125/10867908, BULK 660: 12350112/11527037, BULK 660: 11764052/11027111 PUMP ELITE 1136089/11189145.
Event	2	Pre-Convoy Safety Meeting	Pre-Convoy Safety Meeting	11/19/2017	22:45:00	USER				DISCUSSED ROUTES, HAZARDS, AND COMMUNICATION WITH CREW.
Event	3	Crew Leave Yard	Crew Leave Yard	11/19/2017	23:00:00	USER				STARTED JOURNEY MANAGEMENT.
Event	4	Arrive at Location from Service Center	Arrive at Location from Service Center	11/19/2017	23:30:00	USER				END JOURNEY MANAGEMENT. MEET WITH CO. MAN TO DISCUSS JOB; SURFACE CASING: 9.625" 36# J-55 @ 2029', 5.5" CASING: 20# @ 19595', 50.7' SHOE JOINT, 8.5" OPEN HOLE, TVD @ 7000', 9.3 PPG WELL FLUID, FRESH WATER DISPLACEMENT.
Event	5	Pre-Rig Up Safety Meeting	Pre-Rig Up Safety Meeting	11/20/2017	07:45:00	USER				HAZARD HUNT. DISCUSSED POSSIBLE HAZARDS ASSOCIATED WITH LOCATION, RIG UP AND WEATHER.
Event	6	Rig-Up Equipment	Rig-Up Equipment	11/20/2017	08:00:00	USER				CREW STAGED EQUIPMENT AND RIGGED UP BULK, IRON, AND WATER HOSES TO PERFORM JOB.
Event	7	Pre-Job Safety Meeting	Pre-Job Safety Meeting	11/20/2017	13:00:00	USER				MEETING WITH HALLIBURTON AND RIG PERSONNEL. COMMUNICATED POTENTIAL SAFETY HAZARDS AND JOB DETAILS.
Event	22	Start Job	Start Job	11/20/2017	16:02:00	COM5				START RECORDING JOB DATA.
Event	23	Drop Bottom Plug	Drop Bottom Plug	11/20/2017	16:08:35	USER				PLUG LEFT LANDING JOINT, VERIFIED BY CO.MAN.
Event	28	Pressure Test	Pressure Test	11/20/2017	16:16:41	USER		4488.21		PRESSURE TESTED IRON TO 4500 PSI. KICKOUTS SET @ 500 PSI, KICKED OUT @ 1100 PSI, 5TH GEAR STALL OUT @ 1780 PSI.
Event	39	Pump Spacer 1	Pump Tuned Spacer	11/20/2017	16:21:56	USER	2.91	203.36	11.25	PUMP 80 BBLS OF TUNED SPACER @ 11.5 LB/GAL, ADDED 50 GAL MUSOL A, 50 GAL DUAL SPACER B, 20 GAL D-AIR, DENSITY VERIFIED BY PRESSURIZED MUD SCALES.

Event	51	Drop Bottom Plug	Drop Bottom Plug	11/20/2017	16:39:06	USER				PLUG LEFT LANDING JOINT, VERIFIED BY CO.MAN.
Event	56	Pump Cement	Pump Cap Cement	11/20/2017	16:44:18	USER	3.94	228.52	13.29	PUMP 150 SKS OF ELASTICEM @ 13.2 LB/GAL, 1.57 YIELD, 7.53 GAL/SK, 42 BBLS, CALCULATED TOC @ 1439', DENSITY VERIFIED BY PRESSURIZED MUD SCALES.
Event	64	Pump Lead Cement	Pump Lead Cement	11/20/2017	16:50:26	USER	5.95	385.97	13.20	PUMP 577 SKS OF ELASTICEM @ 13.2 LB/GAL, 1.57 YIELD, 7.53 GAL/SK, 164 BBLS, CALCULATED TOL @ 2365', DENSITY VERIFIED BY PRESSURIZED MUD SCALES.
Event	107	Pump Tail Cement	Pump Tail Cement	11/20/2017	17:17:32	USER	5.96	357.09	13.15	PUMP 1486 SKS OF NEOCEM @ 13.2 LB/GAL, 2.04 YIELD, 9.75 GAL/SK, 540 BBLS, CALCULATED TOT @ 6384', DENSITY VERIFIED BY PRESSURIZED MUD SCALES.
Event	171	Shutdown	Shutdown	11/20/2017	18:50:17	USER				SHUTDOWN TO WASH PUMPS/LINES AND DROP TOP PLUG.
Event	178	Drop Top Plug	Drop Top Plug	11/20/2017	19:04:09	USER				PLUG LEFT LANDING JOINT, VERIFIED BY CO. MAN.
Event	179	Pump Displacement	Pump Fresh Water Displacement	11/20/2017	19:06:56	USER	6.01	194.04	8.33	BEGIN CALCULATED DISPLACEMENT OF 433 BBLS WITH FRESH WATER. MMCR & BIOCIDES ADDED TO 1ST 20 BBLS, BIOCIDES ADDED THROUGH REST OF DISPLACEMENT.
Event	182	Bump Plug	Bump Plug	11/20/2017	20:11:55	USER	2.97	1849.66	8.62	PLUG BUMPED AT CALCULATED DISPLACEMENT. PRESSURED 500 PSI OVER FINAL CIRCULATING PRESSURE OF 1889 PSI. NO SPACER TO SURFACE.
Event	186	Shutdown	Shutdown	11/20/2017	20:16:56	USER				SHUTDOWN FOR 5 MINUTE @ 2389 PSI.
Event	187	Check Floats	Check Floats	11/20/2017	20:23:36	USER				RELEASED PRESSURE, FLOATS HELD, 4.75 BBLS BACK.
Event	188	Pre-Rig Down Safety Meeting	Pre-Rig Down Safety Meeting	11/20/2017	22:30:00	USER				DISCUSSED POSSIBLE HAZARDS ASSOCIATED WITH WEATHER, LOCATION AND RIGGING DOWN IRON AND HOSES.
Event	189	Rig-Down Completed	Rig-Down Completed	11/20/2017	22:45:00	USER				ALL HALLIBURTON ITEMS WERE STOWED FOR TRAVEL, AND LOCATION WAS CLEAN.
Event	190	Pre-Convoy Safety Meeting	Pre-Convoy Safety Meeting	11/20/2017	23:00:00	USER				DISCUSSED ROUTES HAZARDS AND COMMUNICATION WITH CREW.
Event	191	Crew Leave Location	Crew Leave Location	11/20/2017	23:45:00	USER				THANK YOU FOR USING HALLIBURTON - BRYAN KRAFT AND CREW.

3.0 Attachments

3.1 Waste Management Y23-712-Custom Results.png



