

HALLIBURTON

iCem[®] Service

NOBLE ENERGY INC-EBUS

Date: Friday, November 10, 2017

Waste Management Y23-768 Production

Job Date: Thursday, November 02, 2017

Sincerely,

Adam McKay

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 **Waste Management Y23-768** 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 #: 3800198	Quote #:	Sales Order #: 0904400569
Customer: NOBLE ENERGY INC - EBUS		Customer Rep:	
Well Name: WASTE MANAGEMENT		Well #: Y23-768	API/UWI #: 05-123-44845-00
Field: WATTENBERG	City (SAP): KEENESBURG	County/Parish: WELD	State: COLORADO
Legal Description: NW NW-11-2N-64W-787FNL-991FWL			
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: Nicholas Peterson	
Job			

Formation Name			
Formation Depth (MD)	Top	Bottom	
Form Type		BHST	230 degF
Job depth MD	19,813'	Job Depth TVD	6,917
Water Depth		Wk Ht Above Floor	5'
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
Casing		9.625	8.921	36		J-55	0	2045	0
Casing	0	5.5	4.778	20	BUTTRESS	P-110	0	19791	0
Open Hole Section			8.5				0	19813	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 w/ Chems	Tuned Spacer III	80	bbl	11.5	3.78	23.5	4	1,880
	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)							
	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	8	1,129
	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 ft ³ /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	7.5	4,437
0.35 %		SCR-100 (100003749)							
7.69 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	1476	sack	13.2	2.04	9.75	7.5	14,391
9.75 Gal		FRESH WATER							
0.08 %		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	Displacement	Displacement	438	bbl	8.33			7.5	
Cement Left In Pipe Amount 1 BBLS Reason Shoe Joint									
Mix Water: pH 7.0		Mix Water Chloride: 0 ppm		Mix Water Temperature: 75 °F					
Cement Temperature: °F		Plug Displaced by: 8.33 lb/gal		Disp. Temperature: 75 °F					
Plug Bumped? YES		Bump Pressure: 2,461 psi		Floats Held? Yes					
Cement Returns: 0		Returns Density: ## lb/gal		Returns Temperature: ## °F					
Comment:									

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2.0 Real-Time Job Summary

2.1 Job Event Log

Type	Seq. No.	Activity	Graph Label	Date	Time	Source	DH Density (ppg)	Comb Pump Rate (bbl/min)	PS Pump Press (psi)	Comments
Event	1	Call Out	Call Out	11/2/2017	09:00:00	USER				CREW CALLED OUT AT 09:00, REQUESTED ON LOCATION 14:30. CREW PICKED UP CEMENT, CHEMICALS, AND PLUG CONTAINER FROM FT. LUPTON, CO. BULK 660 10025030, Bulk 660 11633846, Bulk BL 102478062 AND PUMP 11189145.
Event	2	Pre-Convoy Safety Meeting	Pre-Convoy Safety Meeting	11/2/2017	13:00:00	USER				CREW DISCUSSED ROUTES, HAZARDS, AND COMMUNICATION WITH CREW.
Event	3	Crew Leave Yard	Depart Shop for Location	11/2/2017	13:15:00	USER				STARTED JOURNEY MANAGEMENT.
Event	4	Arrive At Loc	Arrive At Loc	11/2/2017	14:16:00	USER				END JOURNEY MANAGEMENT. MEET WITH CO. MAN TO DISCUSS JOB; SURFACE CASING- 9.625" 36 LB/FT @ 2,045', 5.5" CASING: 20 LB/FT TOTAL 19,791', 8.5" HOLE, TD 19,813', 42 SHOE TRAC, TVD- 6,917'. PUMP FRESH WATER DISPLACEMENT WITH MMCR. CASING LANDED @ 00:10 11/03/2017. RIG CIRCULATED 1 BOTTOMS UP.
Event	5	Pre-Rig Up Safety Meeting	Pre-Rig Up Safety Meeting	11/2/2017	14:20:00	USER				HAZARD HUNT. DISCUSSED POSSIBLE HAZARDS ASSOCIATED WITH LOCATION, RIG UP, AND WEATHER
Event	6	Rig-Up Equipment	Rig-Up Equipment	11/2/2017	14:30:00	USER				CREW STAGED EQUIPMENT AND RIGGED UP BULK, IRON AND WATER HOSES TO PERFORM JOB.
Event	7	Rig-Up Completed	Rig-Up Completed	11/2/2017	16:00:00	USER				WAITED ON RIG TO FINISH RUNNING CASING.
Event	8	Pre-Job Safety Meeting	Pre-Job Safety Meeting	11/3/2017	01:30:00	USER				SAFETY MEETING WITH HALLIBURTON, AND RIG PERSONNEL. CREW COMMUNICATED POTENTIAL SAFETY HAZARDS, AND JOB DETAILS.
Event	9	Start Job	Start Job	11/3/2017	02:06:00	COM5				BEGIN RECORDING JOB DATA.
Event	10	Drop Bottom Plug	Drop Bottom Plug	11/3/2017	02:06:41	USER				DROP BOTTOM PLUG, VERIFIED BY CO. MAN.
Event	11	Test Lines	Test Lines	11/3/2017	02:11:49	COM5	8.74		3906.00	PRESSURE TESTED IRON TO 4,000 PSI. KICKOUTS SET @ 500 PSI, KICKED OUT @ 980 PSI, 5TH GEAR STALL OUT @ 1,754 PSI.
Event	12	Pump Spacer 1	Pump Spacer 1	11/3/2017	02:20:29	COM5	11.71	2.30	339.00	PUMP 80 BBLs OF TUNED SPACER @ 11.5 LB/GAL, 20 GALLONS D-AIR. CALCULATED TOS @ 3' DENSITY VERIFIED BY PRESSURIZED MUD SCALES.

Event	13	Shutdown	Shutdown	11/3/2017	02:41:58	COM5				BATCH UP CEMENT WHILE DROPPING BOTTOM PLUG
Event	14	Drop Plug	Drop Bottom Plug	11/3/2017	02:43:31	COM5				DROP BOTTOM PLUG, VERIFIED BY CO. MAN.
Event	15	Pump Cement	Pump Cement	11/3/2017	02:45:29	COM5	13.35	3.40	193.00	PUMPED 150 SKS OF ELASTICEM WITH CBL @ 13.2 LB/GAL, 1.57 FT3/SK, 7.53 GAL/SK. 41.79 BBLS, HOL CALCULATED @ 959', TOL CALCULATED @ 1,672'. DENSITY VERIFIED BY PRESSURIZED MUD SCALES.
Event	16	Pump Lead Cement	Pump Lead Cement	11/3/2017	02:53:07	COM5	13.32	7.90	698.00	PUMPED 577 SKS OF ELASTICEM @ 13.2 LB/GAL, 1.60 FT3/SK, 7.69 GAL/SK. 164.42 BBLS, HOL CALCULATED @ 4,029.91, TOL CALCULATED @ 2,632'. DENSITY VERIFIED BY PRESSURIZED MUD SCALES.
Event	17	Pump Tail Cement	Pump Tail Cement	11/3/2017	03:14:33	COM5	13.16	7.40	876.00	PUMP 1,476 SKS OF NEOCEM @ 13.2 LB/GAL, 2.04 FT3/SK, 9.75 GAL/SK, 536.26 BBLS. HOT CALCULATED @ 13,128.48', TOT CALCULATED @ 6,662.52.DENSITY VERIFIED BY PRESSURIZED MUD SCALES.
Event	18	Shutdown	Shutdown	11/3/2017	04:32:21	COM5				SHUT DOWN TO WASH UP PUMPS AND LINES
Event	19	Drop Top Plug	Drop Top Plug	11/3/2017	04:40:42	COM5				DROP TOP PLUG, VERIFIED BY CO. MAN.
Event	20	Pump Displacement	Pump Displacement	11/3/2017	04:43:35	COM5	8.05	7.10	321.00	BEGIN CALCULATED DISPLACEMENT OF 438.47 BBLS WITH FRESH WATER. PUMPED THE FIRST 20 BBLS WITH MMCR, PUMP RATE 7.5 BPM 1,861 PSI. PUMPED UNTIL 350 BBLS AWAY WITH BIOCIDES.
Event	21	Slow Rate	Slow Rate	11/3/2017	05:45:58	USER	8.10	2.70	1939.00	SLOWED RATE @ 410 BBLS AWAY 2 BBLS/MIN @ 1830 PSI.
Event	22	Bump Plug	Bump Plug	11/3/2017	05:57:02	COM5	8.10	2.20	1842.00	PLUG BUMPED AT CALCULATED DISPLACEMENT. BUMPED @ 2,461 PSI PRESSURED 500 PSI OVER BUMP.
Event	23	End Job	End Job	11/3/2017	06:04:33	COM5				STOP RECORDING JOB DATA.
Event	24	Pre-Rig Down Safety Meeting	Pre-Rig Down Safety Meeting	11/3/2017	06:30:00	USER				DISCUSSED POSSIBLE HAZARDS ASSOCIATED WITH WEATHER, LOCATION AND RIGGING DOWN IRON AND HOSES.
Event	25	Rig-Down Equipment	Rig-Down Equipment	11/3/2017	06:45:00	USER				CREW STARTED RIGGING DOWN EQUIPMENT
Event	26	Rig-Down Completed	Rig-Down Completed	11/3/2017	08:00:00	USER				ALL HALLIBURTON ITEMS WERE STOWED FOR TRAVEL, AND LOCATION WAS CLEAN.
Event	27	Pre-Convoy Safety Meeting	Pre-Convoy Safety Meeting	11/3/2017	08:30:00	USER				CREW DISCUSSED ROUTES HAZARDS AND COMMUNICATION WITH CREW.
Event	28	Crew Leave Location	Crew Leave Location	11/3/2017	09:00:00	USER				THANK YOU FOR USING HALLIBURTON – NICK PETERSON AND CREW.

Attachments

2.2 Noble Waste Management Y23-768 Production-Custom Results.png



