

Table of Contents

1.0 Cementing Job Summary 4

 1.1 Executive Summary4

 1.2 Job Event Log7

2.0 Attachments..... 11

 2.1 Job Chart.....11

1.0 Cementing Job Summary

1.1 Executive Summary

Halliburton appreciates the opportunity to perform the cementing services on the **Mab 15-7HZ** 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 Fort Lupton

The Road to Excellence Starts with Safety

Sold To #: 300466		Ship To #: 3932203		Quote #: 0022568783		Sales Order #: 0905631829					
Customer: ANADARKO PETROLEUM CORP-EBUS				Customer Rep:							
Well Name: MAB			Well #: 15-7HZ		API/UWI #: 05-123-49248-00						
Field: WATTENBERG		City (SAP): IONE		County/Parish: WELD		State: COLORADO					
Legal Description: SW SE-15-1N-66W-578FSL-2171FEL											
Contractor:				Rig/Platform Name/Num: Akita 522							
Job BOM: 7523 7523											
Well Type: HORIZONTAL GAS											
Sales Person: HALAMERICA\HX41066				Srvc Supervisor: Prince Perez							
Job											
Formation Name											
Formation Depth (MD)		Top		Bottom							
Form Type				BHST							
Job depth MD		18337ft		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		J-55	0	1861	0	1861	
Casing		5.5	4.892	17	LTC	HCP110	0	18337	0	7491	
Open Hole Section			7.875				1861	18347	1861	7491	
Tools and Accessories											
Type	Size in	Qty	Make	Depth ft		Type	Size in	Qty	Make		
Guide Shoe	5.5	1		18,337		Top Plug	5.5	1	WF		
Float Shoe	5.5					Bottom Plug	5.5	1	WF		
Float Collar	5.5	1		18,327		SSR plug set	5.5				
Insert Float	5.5					Plug Container	5.5	1	HES		
Stage Tool	5.5					Centralizers	5.5	399			
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	Spacer	SBM FDP-C1337-18 CEMENT SPACER SYS			80	bbl	10.5	6.14	39.4	5	2,882

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	Lead	GASSTOP (TM) SYSTEM	640	sack	13.2	1.56	7.71	5	4,934		
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	Tail	ECONOCHEM (TM) SYSTEM	1,120	sack	13.5	1.68	7.99	8	8,949		
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	Displacement	Biocide Water and MMCR	20	bbl	8.34						
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	Biocide Water	405.2	bbl	8.34						
Cement Left In Pipe		Amount	0 ft		Reason			Wet Shoe			
Mix Water:		pH 6	Mix Water Chloride:			<300 ppm		Mix Water Temperature:		59 °F	
Cement Temperature:		## °F		Plug Displaced by:			## lb/gal		Disp. Temperature:		59 °F
Plug Bumped?		Yes		Bump Pressure:			2,017 psi		Floats Held?		Yes
Cement Returns:		0 bbl		Returns Density:			9.5 lb/gal		Returns Temperature:		## °F
Comment											
Pumped 80 bbls of FDP Spacer with 60 gallons of Musol A, 60 gallons of Dual B, 20 gallons of DAir, .8 of a gallon of biocide.											
Pumped 177.8 bbls of Gasstop Cement with 1,600 gallons of Latex mix water and DAir throughout.											
Pumped 335.1 bbls of Econocem.											
Pumped 425.2 bbls of fresh water displacement with MMCR in the first 20 bbls and biocide throughout.											
Pumped a 3 bbl wet shoe.											
3 bbls back on the floats.											

Real-Time Job Summary

1.2 Job Event Log

Type	Seq. No.	Activity	Graph Label	Date	Time	Source	Comments
Event	1	Call Out	Call Out	4/18/2019	12:00:00	USER	CREW CALLED OUT AT 12:00, REQUESTED ON LOCATION 18:00. CREW PICKED UP CEMENT, CHEMICALS, AND PLUG CONTAINER FROM FT. LUPTON, CO. BULK 660, 11023106, 12649238, AND PUMP 11189145.
Event	2	Pre-Convoy Safety Meeting	Pre-Convoy Safety Meeting	4/18/2019	16:50:00	USER	CREW DISCUSSED ROUTES, HAZARDS, AND COMMUNICATION WITH CREW.
Event	3	Crew Leave Shop	Crew Leave Shop	4/18/2019	17:00:00	USER	STARTED JOURNEY MANAGEMENT.
Event	4	Arrive at Location from Service Center	Arrive at Location from Service Center	4/18/2019	17:10:00	USER	END JOURNEY MANAGEMENT. MEET WITH CO. MAN TO DISCUSS JOB; SURFACE CASING- 9/58" 36 LB/FT @ 1,861', 5.5" CASING: 17 LB/FT TOTAL 18,337', 7 7/8" HOLE, TD 18,347', 10' SHOE TRAC, TVD- 7,491'. PUMP FRESH WATER DISPLACEMENT. CASING LANDED @ 19:00 4/18/2019.

Event	5	Safety Meeting - Assessment of Location	Safety Meeting - Assessment of Location	4/18/2019	17:20:00	USER	HAZARD HUNT. DISCUSSED POSSIBLE HAZARDS ASSOCIATED WITH LOCATION, RIG UP AND WEATHER.
Event	6	Rig-Up Equipment	Rig-Up Equipment	4/18/2019	17:30:00	USER	RIG UP BULK AND MIXING EQUIPMENT.
Event	7	Rig-Up Completed	Rig-Up Completed	4/18/2019	20:50:00	USER	
Event	8	Pre-Job Safety Meeting	Pre-Job Safety Meeting	4/18/2019	21:00:00	USER	MEETING WITH HALLIBURTON AND RIG PERSONNEL. COMMUNICATED POTENTIAL SAFETY HAZARDS AND JOB DETAILS.
Event	9	Start Job	Start Job	4/18/2019	21:23:57	COM4	BEGIN RECORDING JOB DATA.
Event	10	Test Lines	Test Lines	4/18/2019	21:28:03	COM4	PRESSURE TESTED IRON TO 6,500 PSI. KICKOUTS SET @ 500 PSI, KICKED OUT @ 450 PSI, 5TH GEAR STALL OUT @ 1,850 PSI. 6,500 PRESSURE TEST KICKED OUT @ 6,500 PSI
Event	11	Pump Spacer 1	Pump Spacer 1	4/18/2019	21:31:45	COM4	PUMP 80 BBLS OF FDP SPACER @ 10.5 LB/GAL, 6.14 CUFT/SK, 39.4 GALL/SK. 20 GALS D-AIR, 60 GALLONS OF DUAL B, 60 GALLONS OF MUSOL A. HOS CALCULATED @ 1,670.2' WITH TOS CALCULATED @ 111'. DENSITY VERIFIED BY PRESSURIZED MUD SCALES. PUMP RATE 5 BBLS/MIN @ 510 PSI.
Event	12	Pump Lead Cement	Pump Lead Cement	4/18/2019	21:49:45	COM4	PUMPED 640 SKS OF GASSTOP @ 13.2 LB/GAL, 1.56 FT3/SK, 7.71 GAL/SK. 177.82 BBLS. HOL CALCULATED @ 5,710.8', TOL CALCULATED @ 1,781.2'. DENSITY VERIFIED BY PRESSURIZED MUD SCALES. PUMP RATE 5 BBLS/MIN @ 650 PSI
Event	13	Pump Tail Cement	Pump Tail Cement	4/18/2019	22:26:11	COM4	PUMP 1,120 SKS OF ECONOCHEM @ 13.5 LB/GAL, 1.68 FT3/SK, 7.99 GAL/SK, 335.11 BBLS. HOT CALCULATED @ 10,845', TOT CALCULATED @ 7,492'. DENSITY VERIFIED BY PRESSURIZED MUD SCALES. PUMP RATE 8 BBLS/MIN @ 800 PSI.
Event	14	Shutdown	Shutdown	4/18/2019	23:16:24	COM4	SHUTDOWN TO WASH LINES.

Event	15	Drop Top Plug	Drop Top Plug	4/18/2019	23:28:32	COM4	PLUG LEFT CONTAINER, VERIFIED BY CO. MAN.
Event	16	Pump Displacement	Pump Displacement	4/18/2019	23:28:37	COM4	BEGIN CALCULATED DISPLACEMENT OF 425.2 BBLS WITH FRESH WATER. MMCR IN THE FIRST 20 BBLS AND BIOCIDES THROUGHOUT. PUMP RATE 8 BPM @ 3,100 PSI. CAUGHT CEMENT @ 50 BBLS INTO DISPLACEMENT. NO SPACER TO SURFACE. SLOW RATE TO 3 BPM @ 400 BBLS INTO DISPLACEMENT.
Event	17	Bump Plug	Bump Plug	4/19/2019	00:32:32	COM4	PLUG BUMPED AT CALCULATED DISPLACEMENT. 2,017 PSI PRESSURED 500 PSI OVER BUMP.
Event	18	Test Lines	Test Lines	4/19/2019	00:56:41	COM4	10 MINUTE CASING TEST.
Event	19	Shift Tool - Lower	Shift Tool - Lower	4/19/2019	01:09:16	USER	SHEARED @ 5,050 PSI FOLLOWED BY A 3 BBL WETS SHOE.
Event	20	Check Floats	Check Floats	4/19/2019	01:10:59	USER	RELEASED PRESSURE, FLOATS HELD, 2.5 BBLS BACK.
Event	21	End Job	End Job	4/19/2019	01:11:53	COM4	STOP RECORDING JOB DATA.
Event	22	Post-Job Safety Meeting (Pre Rig-Down)	Post-Job Safety Meeting (Pre Rig-Down)	4/19/2019	01:15:00	USER	DISCUSSED POSSIBLE HAZARDS ASSOCIATED WITH WEATHER, LOCATION AND RIGGING DOWN IRON AND HOSES.
Event	23	Rig-Down Equipment	Rig-Down Equipment	4/19/2019	01:25:00	USER	RIG DOWN BULK AND MIXING EQUIPMENT.
Event	24	Rig-Down Completed	Rig-Down Completed	4/19/2019	02:25:00	USER	
Event	25	Pre-Convoy Safety Meeting	Pre-Convoy Safety Meeting	4/19/2019	02:35:00	USER	CREW DISCUSSED ROUTES, HAZARDS, AND COMMUNICATION WITH CREW.

Event	26	Crew Leave Location	Crew Leave Location	4/19/2019	02:45:00	USER	THANK YOU FOR USING HALLIBURTON – PRINCE PEREZ AND CREW.
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2.0 Attachments

2.1 Job Chart

