

HALLIBURTON

iCem[®] Service

EXTRACTION OIL & GAS

AD FED Library 20W-25-17 Production

Sincerely,
Meghan Jacobs

Legal Notice

Disclaimer:

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1.0 Cementing Job Summary

1.1 Executive Summary

Halliburton appreciates the opportunity to perform the cementing services on the **AD Fed Library 20W-25-17** 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.

Approximately 50 bbls of cement were returned to surface.

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 #: 369404		Ship To #: 3809213		Quote #:		Sales Order #: 0905881508	
Customer: EXTRACTION OIL & GAS-EBUS				Customer Rep: Hans Cary			
Well Name: AD FED LIBRARY			Well #: 20W-25-17			API/UWI #: 05-123-45033-00	
Field: WATTENBERG		City (SAP): GREELEY		County/Parish: WELD		State: COLORADO	
Legal Description: NW SW-21-5N-65W-1852FSL-367FWL							
Contractor: ENSIGN DRLG				Rig/Platform Name/Num: ENSIGN 147			
Job BOM: 7523 7523							
Well Type: HORIZONTAL OIL							
Sales Person: HALAMERICA\HX38199				Srvc Supervisor: Nicholas Cummins			

Job

Formation Name			
Formation Depth (MD)		Top 1611ft	Bottom 19702ft
Form Type		BHST	
Job depth MD		19692ft	Job Depth TVD 6934ft
Water Depth		Wk Ht Above Floor 4ft	
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	0	9.625	8.921	36			0	1611	0	1611
Casing	0	5.5	4.892	17			0	19692	0	6934
Open Hole Section			8.375				1611	7551	1611	6890
Open Hole Section			8.5				7551	19702	0	0

Tools and Accessories

Type	Size in	Qty	Make	Depth ft	Type	Size in	Qty	Make
Guide Shoe	5.5				Top Plug	5.5	1	HES
Float Shoe	5.5	1	HES	19692	Bottom Plug	5.5	1	HES
Float Collar	5.5	1	HES	19681	SSR plug set	5.5		
Insert Float	5.5				Plug Container	5.5	1	HES
Stage Tool	5.5				Centralizers	5.5		

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	FDP-C1337-18	SBM FDP-C1337-18 CEMENT SPACER SYS	50	bbl	12.5	2.74	16.6	8	1710
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	585	sack	13.2	1.58	7.92	8	4610
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	GasStop	ELASTICEM (TM) SYSTEM	615	sack	13.2	1.58	7.88	8	4664
5.23 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	13.2# ElastiCem	ELASTICEM (TM) SYSTEM	1960	sack	13.2	1.59	9.89	8	15464
7.70 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	MMCR Displacement	MMCR Displacement	20	bbl	8.33			8	
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 ft3/sack	Mix Fluid Gal	Rate bbl/min	Total Mix Fluid Gal
6	Displacement	Displacement	336	bbl	8.33			8	
Cement Left In Pipe		Amount	0 ft			Reason		Shoe Joint	
Mix Water:		pH 7	Mix Water Chloride: <400 ppm			Mix Water Temperature: 75 °F			
Cement Temperature:		N/A	Plug Displaced by: 8.33 lb/gal			Disp. Temperature: 75°F			
Plug Bumped?:		Yes	Bump Pressure: 2600 psi			Floats Held? Yes			
Cement Returns:		50 bbl	Returns Density: N/A			Returns Temperature: N/A			

Comment

50 bbls Spacer
166 bbls Cap cement
174 bbls Latex cement
555 bbls Tail cement
457 bbls displacement first 20 bbls MMCR
Plug bumped
Disc Burst 3,133 psi
Floats held
Estimated 50 bbls of spacer to surface
Estimated 50 bbls of cap cement to surface
Estimated top of Latex Cement 2,351'
Estimated top of Tail Cement 6,218'

2.0 Real-Time Job Summary

2.1 Job Event Log

Type	Seq. No.	Activity	Graph Label	Date	Time	Source	DS Pump Press (psi)	DH Density (ppg)	Comb Pump Rate (bbl/min)	Comments
Event	1	Call Out	Call Out	8/4/2019	12:00:00	USER				The crew was called out on 8/4/19 at 1200. The customer requested HES on location at 1900 on 8/4/19.
Event	2	Depart from Service Center or Other Site	Depart from Service Center or Other Site	8/4/2019	16:00:00	USER				The crew held a pre journey safety meeting discussing the route and potential hazards while driving The supervisor called in a journey. The crew departed service center.
Event	3	Arrive at Location from Service Center	Arrive at Location from Service Center	8/4/2019	16:49:00	USER				The crew arrived on location safely. The rig was still running casing. The supervisor met with the Company man and received numbers. TD 19,702', TP 19,692' 5 1/2" 17# P-110, FC 19,681', PC 1,611' 9 5/8" 36# J-55, TVD 6,934', OH 8 3/4" 1,611'-7,551', 8 1/2 7,551'-19,702', Mud 10.9 ppg.
Event	4	Assessment Of Location Safety Meeting	Assessment Of Location Safety Meeting	8/4/2019	16:50:00	USER				Crew discussed all potential hazards on location.
Event	5	Pre-Rig Up Safety Meeting	Pre-Rig Up Safety Meeting	8/4/2019	17:00:00	USER				Crew held a safety meeting discussing the rig up procedure. Also all potential hazards associated with rigging up all HES equipment and lines.
Event	6	Rig-Up Equipment	Rig-Up Equipment	8/4/2019	17:10:00	USER				The crew rigged up all HES equipment and lines.
Event	7	Rig-Up Completed	Rig-Up Completed	8/4/2019	18:30:00	USER				Rig up completed, no one got hurt.
Event	8	Safety Meeting - Pre Job	Safety Meeting - Pre Job	8/5/2019	01:30:00	USER	0.00	8.36	0.00	The crew and all personal involved with cement job discussed all potential hazards associated with job. Followed by the job procedure to ensure everyone understood the plan of action
Event	9	Start Job	Start Job	8/5/2019	02:05:49	COM1	-1.00	8.36	0.00	Started recording data from Elite 11189151.
Event	10	Drop Bottom Plug	Drop Bottom Plug	8/5/2019	02:21:00	COM1	-3.00	8.15	0.00	Company man witnessed plug leave container.

Event	11	Other	Fill Lines	8/5/2019	02:21:04	COM1	-3.00	8.29	0.00	Filled lines with 3 bbls of water at 3 bpm, pressure was at 500.
Event	12	Test Lines	Test Lines	8/5/2019	02:22:51	COM1	339.00	8.36	0.00	Pressured tested all HES lines to 4,700 psi. The pressure test passed.
Event	13	Pump Spacer 1	Pump Spacer 1	8/5/2019	02:31:46	COM1	55.00	8.48	0.00	Pumped 50 bbls of spacer a 6 bpm. 12.5 ppg 2.74 yield 16.6 gal/sk. Verified density using pressurized scales.
Event	14	Pump Cap Cement	Pump Cap Cement	8/5/2019	02:40:22	COM1	538.00	12.29	4.80	Pumped 166 bbls (585sks) of Cap Cement at 8 bpm, pressure was at 747 psi. 13.2 ppg 1.58 yield 7.88 gal/sk. Verified density using pressurized scales.
Event	15	Pump Lead Cement	Pump Lead Cement	8/5/2019	03:07:40	COM1	648.00	13.23	8.10	Pumped 174 bbls (615 sks) of Lead cement with latex at 8 bpm, pressure was at 630 psi. 13.2 ppg 1.58 yield 7.88 gal/sk. Verified density using pressurized scales.
Event	16	Pump Tail Cement	Pump Tail Cement	8/5/2019	03:27:44	COM1	591.00	13.30	6.80	Pumped 555 bbls (1960 sks) of Tail cement at 8 bpm, pressure was at 606 psi. 13.2 ppg 1.59 yield 7.89 gal/sk. Verified density using pressurized scales.
Event	17	Check Weight	Check Weight	8/5/2019	04:07:18	COM1	823.00	13.23	8.00	
Event	18	Shutdown	Shutdown	8/5/2019	04:53:24	COM1	0.00	24.10	0.00	Shutdown and blew air from rig floor to wash up tank. The washed pumps and lines from Elite to wash up tank.
Event	19	Drop Top Plug	Drop Top Plug	8/5/2019	04:58:31	COM1	0.00	7.93	0.00	Verified by company man.
Event	20	Pump Displacement	Pump Displacement	8/5/2019	04:58:34	COM1	-1.00	7.93	0.00	Pumped the calculated displacement of 457 bbls with MMCR in the first 20 bbls.
Event	21	Bump Plug	Bump Plug	8/5/2019	06:15:59	COM1	2744.00	7.96	0.00	We bumped the plug, final circulating pressure was 2,330 psi. We brought pressure up to 2630 psi and shutdown.
Event	22	Other	Burst Disk	8/5/2019	06:18:04	COM1	3112.00	7.93	1.90	Brought pressure up to 3133 to burst the top plug disk.
Event	23	End Job	End Job	8/5/2019	06:22:18	COM1	-4.00	7.95	0.00	Cement job complete. Estimated top 50 bbls of spacer to surface. Estimated top of latex cement 2,351'. Estimated top of Tail cement 6218'.
Event	24	Pre-Rig Down Safety Meeting	Pre-Rig Down Safety Meeting	8/5/2019	06:23:00	USER	-4.00	7.95	0.00	Crew held a safety meeting discussing the rig down procedure. Also all potential hazards associated with rigging down all HES equipment and lines.
Event	25	Rig-Down Equipment	Rig-Down Equipment	8/5/2019	06:33:00	USER	-3.00	7.95	0.00	The crew rigged down all HES equipment and lines.

Event	26	Rig-Down Completed	Rig-Down Completed	8/5/2019	07:50:00	USER	Rig down completed no one got hurt.
Event	27	Pre-Convoy Safety Meeting	Pre-Convoy Safety Meeting	8/5/2019	08:00:00	USER	The crew held a pre journey safety meeting discussing the route and potential hazards while driving The supervisor called in a journey.
Event	28	Depart Location for Service Center or Other Site	Depart Location for Service Center or Other Site	8/5/2019	08:10:00	USER	Nick Cummins and crew would like to thank you for your business, and choosing Halliburton Cement! Please feel free to call if you have any questions.

3.0 Attachments

3.1 AD FED Library 20W-25-17 Production – Job chart

