

HALLIBURTON

iCem[®] Service

NOBLE ENERGY INC-EBUS

Date: Monday, September 10, 2018

Emmy State H25-777 Production

Job Date: Sunday, August 26, 2018

Sincerely,

Adam McKay

Legal Notice

Disclaimer:

All information in this report is provided subject to the terms and conditions which govern the services provided by Halliburton. Halliburton personnel use their best efforts in gathering information and their best judgment in interpreting it, but any interpretation, research, analysis or recommendation furnished by Halliburton are opinions based upon inferences from measurements and empirical relationships and assumptions, which inferences and empirical relationships and assumptions are not infallible, and with respect to which professionals in the industry may differ. iCem 3D Displacement results are used to understand how fluids intermix during a cement job. Simulation and 3D displacement results are not intended as and should not be used as a replacement for bond logs in determining top of cement. Current 3D model calculations are known to model more volume than the input volume for standard cases due to known calculation improvements required. For rotational cases, the modeled volume will be impacted by the same calculations impacting the standard cases, as well as additional constraints imposed to make the calculation time required operationally feasible. Therefore, until further notice, 3D displacement results should not be used for replacement of a bond log, or used as an identifier of top of cement. HALLIBURTON IS UNABLE TO GUARANTEE THE ACCURACY OF ANY CHART INTERPRETATION, RESEARCH ANALYSIS, OR JOB RECOMMENDATION and any interpretation or recommendation is not for use of or reliance upon by any third party. The customer has full responsibility for any of its decisions which are based on the information provided in this report.

Table of Contents

1.0	Cementing Job Summary	4
1.1	Executive Summary	4
2.0	Real-Time Job Summary	7
2.1	Job Event Log	7
3.0	Attachments.....	10
3.1	Emmy State H25-777-Custom Results.png	10

1.0 Cementing Job Summary

1.1 Executive Summary

Halliburton appreciates the opportunity to perform the cementing services on the **Emmy State H25-777** 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]

The Road to Excellence Starts with Safety

Sold To #: 345242		Ship To #: 3883592		Quote #:		Sales Order #: 0905085600	
Customer: NOBLE ENERGY INC-EBUS				Customer Rep: Chris Ewing			
Well Name: EMMY STATE			Well #: H25-777		API/UWI #: 05-123-46978-00		
Field: WATTENBERG		City (SAP): KEENESBURG		County/Parish: WELD		State: COLORADO	
Legal Description: SW SW-25-3N-65W-285FSL-1185FWL							
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: Adam Covington			
Job							

Formation Name			
Formation Depth (MD)	Top		Bottom
Form Type		BHST	230 degF
Job depth MD	17422ft	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	1959	0	0
Casing		5.5	4.778	20			0	17422	0	7005
Open Hole Section			8.5				2456	6589	0	0
Open Hole Section			8.5				6589	17422	0	7005

Tools and Accessories									
Type	Size in	Qty	Make	Depth ft		Type	Size in	Qty	Make
Guide Shoe	5.5			17422		Top Plug	5.5	1	HES
Float Shoe	5.5					Bottom Plug	5.5	2	HES
Float Collar	5.5					SSR plug set	5.5		HES
Insert Float	5.5					Plug Container	5.5	1	HES
Stage Tool	5.5					Centralizers	5.5		HES

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	11.5 lb/gal Tuned Spacer III	Tuned Spacer III	120	bbl	11.5	3.78		5	

36.09 gal/bbl		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
2	ElastiCem	ELASTICEM (TM) SYSTEM	140	sack	13.2	1.68		8	8.04
8.06 Gal		FRESH WATER							
0.95 %		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
3	ElastiCem w/ SCBL	ELASTICEM (TM) SYSTEM	424	sack	13.2	1.68		8	8.06
0.50 %		SCR-100 (100003749)							
8.06 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	1216	sack	13.2	2.04		8	9.75
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	385	bbl	8.33			10	
Cement Left In Pipe		Amount	45 ft		Reason			Shoe Joint	
<p>Comment TD-8.5" 17444' TP-5.5" 17422' FC-17377' SC-9 5/8" 36# 1959'. ESTIMATED TOT 6589', TOL2 3,481', TOL1 2,456'. 4 BBLs OF SPACER BACK TO SURFACE. WATER, 70 DEGREES, PH 7, SUL 0, CHLORIDES 0. CHECKED FLOATS. GOT 4.5 BBLs BACK TO THE TRUCK, INDICATING THAT THE FLOATS HELD. BUMPED PLUG. FCP- 1880 PSI. BUMP- 2412 PSI. 500 PSI OVER HELD FOR 5 MINUTES.</p>									

2.0 Real-Time Job Summary

2.1 Job Event Log

Type	Seq. No.	Activity	Graph Label	Date	Time	Source	DS Pump Press <i>(psi)</i>	DH Density <i>(ppg)</i>	Comb Pump Rate <i>(bbl/min)</i>	Comments
Event	1	Call Out	Call Out	8/26/2018	09:30:00	USER				CALLED OUT BY SERVICE COORDINATOR FOR O/L AT 1530
Event	2	Pre-Convoy Safety Meeting	Pre-Convoy Safety Meeting	8/26/2018	14:20:00	USER				HELD MEETING WITH ALL HES EMPLOYEES IN CONVOY TO DISCUSS DIRECTIONS AND HAZARDS ASSOCIATED WITH DRIVING, ALL FIT TO DRIVE.
Event	3	Depart Shop for Location	Depart Shop for Location	8/26/2018	14:30:00	USER				HELD MEETING WITH ALL PERSONNEL IN CONVOY TO DISCUSS DIRECTIONS AND HAZARDS ASSOCIATED WITH DRIVING, ALL FIT TO DRIVE.
Event	4	Arrive At Loc	Arrive At Loc	8/26/2018	15:00:00	USER				UPON ARRIVAL MET WITH COMPANY MAN TO DISCUSS JOB DETAILS AND CALCULATIONS, PERFORMED HAZARD HUNT AND SITE ASSESSMENT.
Event	5	Safety Meeting - Pre Rig-Up	Safety Meeting - Pre Rig-Up	8/26/2018	15:10:00	USER				DISCUSSED RIGGING UP HAZARDS AND PROCEDURE ACCORDING TO HMS.
Event	6	Safety Meeting - Pre Job	Safety Meeting - Pre Job	8/26/2018	19:25:00	USER				HELD SAFETY MEETING WITH ALL JOB ASSOCIATED PERSONNEL TO DISCUSS JOB PROCEDURE, HAZARDS AND STOP WORK AUTHORITY. Water test- PH-6, Chlor-0, Temp-65. Cement temp-70.
Event	7	Drop Bottom Plug	Drop Bottom Plug	8/26/2018	19:50:00	USER				CO. MAN DROPPED 1ST HALLIBURTON 5.5" BOTTOM PLUG. ADAM COVINGTON WITNESSED.
Event	8	Start Job	Start Job	8/26/2018	19:52:01	COM4				FILLED LINES WITH 3 BBLS OF FRESH WATER. 2 BPM, 97 PSI. FULL RETURNS.
Event	9	Test Lines	Test Lines	8/26/2018	20:02:39	COM4	3016.00	8.49		PRESSURE TESTED RIGS LINE TO 3,000 PSI. HELD TO MAKE SURE THERE WAS NO LEAKS. THEN PRESSURE TEST OUR IRON TO 4500 PSI. AFTER PERFORMING A 500 PSI KICKOUT TEST AND A 5TH GEAR STALL HELD FOR A COUPLE MINUTES. BLED BACK. NO LEAKS.
Event	10	Pump Spacer 1	Pump Spacer 1	8/26/2018	20:14:14	COM4	280.00	11.84	2.60	PUMPED 120 BBLS OF 11.5#, 3.78y, 23.5wr. TUNED SPACER III WITH 70 GALLONS OF MUSOL A, 70 GALLONS OF DUAL SPACER B AND 20 GALLONS OF D-AIR MIXED INTO A TOTE, USED A PUMP TO PUMP IT OUT OF TOTE INTO DOWN HOLE SIDE OF MIX TUB.

Event	11	Check Weight	Check Weight	8/26/2018	20:15:49	COM4	242.00	11.66	3.10	USED PRESSURIZED MUD SCALES TO WEIGH UP SPACER. SPACER WEIGHED UP AT 11.5#
Event	12	Check Weight	Check Weight	8/26/2018	20:34:12	COM4	253.00	11.60	5.50	USED PRESSURIZED MUD SCALES TO WEIGH UP CEMENT. CEMENT WEIGHED UP AT 13.2#
Event	13	Shutdown	Shutdown	8/26/2018	20:41:01	COM4				SHUTDOWN AFTER SPACER TO DROP PLUG AND MIX UP LEAD 1
Event	14	Drop Plug	Drop Plug	8/26/2018	20:42:42	COM4				CO. MAN DROPPED 2ND HALLIBURTON 5.5" BOTTOM PLUG. ADAM COVINGTON WITNESSED.
Event	15	Check Weight	Check Weight	8/26/2018	20:46:09	COM4	20.00	11.55	0.00	
Event	16	Pump Lead Cement	Pump Lead Cement	8/26/2018	20:47:58	COM4	702.00	13.16	8.00	PUMPED 41.8 BBLS (140 SKS) OF 13.2#, 1.68y, 8.04wr, ELASTICEM CAP CEMENT AT 8 BPM, 740 PSI. FULL RETURNS.
Event	17	Pump Cement	Pump Cement	8/26/2018	20:56:42	COM4	32.00	13.44	0.00	PUMPED 126.8 BBLS (424 SKS) OF 13.2#, 1.68y, 8.06wr, ELASTICEM 2ND CEMENT AT 8 BPM, 390 PSI. FULL RETURNS.
Event	18	Check Weight	Check Weight	8/26/2018	20:59:13	COM4	685.00	13.14	8.00	USED PRESSURIZED MUD SCALES TO WEIGH UP CEMENT. CEMENT WEIGHED UP AT 13.2#
Event	19	Check Weight	Check Weight	8/26/2018	21:05:37	COM4	773.00	13.29	8.00	USED PRESSURIZED MUD SCALES TO WEIGH UP CEMENT. CEMENT WEIGHED UP AT 13.2#
Event	20	Pump Tail Cement	Pump Tail Cement	8/26/2018	21:15:29	COM4	822.00	13.16	8.00	PUMPED 442 BBLS (1216 SKS) OF 13.2#, 2.04y, 9.75wr, NEOCEM TAIL CEMENT AT BPM, PSI. FULL RETURNS.
Event	21	Check Weight	Check Weight	8/26/2018	21:17:26	COM4	880.00	13.17	8.00	USED PRESSURIZED MUD SCALES TO WEIGH UP CEMENT. CEMENT WEIGHED UP AT 13.2#
Event	22	Shutdown	Shutdown	8/26/2018	22:15:09	COM4				SHUTDOWN TO WASH PUMPS AND LINES.
Event	23	Drop Top Plug	Drop Top Plug	8/26/2018	22:29:42	COM4				CO. MAN DROPPED HALLIBURTON 5.5" TOP PLUG. ADAM COVINGTON WITNESSED.
Event	24	Pump Displacement	Pump Displacement	8/26/2018	22:29:45	COM4	481.00	8.32	10.00	PUMPED 385 BBLS OF ALDECIDE WATER DISPLACEMENT, WITH THE FIRST 20 BBLS HAVING MMCR IN IT. THE REST HAVING THE ALDECIDE. 10 BPM 430 PSI.
Event	25	Displ Reached Cement	Displ Reached Cement	8/26/2018	22:35:09	COM4	571.00	8.33	10.00	DISPLACEMENT REACHED CEMENT AT 39 BBLS AWAY.
Event	26	Bump Plug	Bump Plug	8/26/2018	23:14:04	COM4	1861.00	8.38	3.10	BUMPED PLUG. FCP- 1880 PSI. BUMP- 2412 PSI. 500 PSI OVER HELD FOR 5 MINUTES.
Event	27	Check Floats	Check Floats	8/26/2018	23:21:37	USER				CHECKED FLOATS. GOT 4.5 BBLS BACK TO THE TRUCK, INDICATING THAT THE FLOATS HELD.

Event	28	End Job	End Job	8/26/2018	23:23:59	COM4	TD-8.5" 17444' TP-5.5" 17422' FC-17377' SC-9 5/8" 36# 1959'. ESTIMATED TOT 6589', TOL2 3,481', TOL1 2,456'. 4 BBLS OF SPACER BACK TO SURFACE. WATER, 70 DEGREES, PH 7, SUL 0, CHLORIDES 0.
Event	29	Safety Meeting - Pre Rig-Down	Pre-Rig Down Safety Meeting	8/26/2018	23:30:00	USER	DISCUSSED RIGGING DOWN HAZARDS AND PROCEDURE ACCORDING TO HMS.
Event	30	Pre-Convoy Safety Meeting	Pre-Convoy Safety Meeting	8/27/2018	00:50:00	USER	HELD MEETING WITH ALL HES EMPLOYEES IN CONVOY TO DISCUSS DIRECTIONS AND HAZARDS ASSOCIATED WITH DRIVING, ALL FIT TO DRIVE.
Event	31	Depart Location	Depart Location	8/27/2018	01:00:00	USER	PRE JOURNEY MANAGEMENT PRIOR TO DEPARTURE.

3.0 Attachments

3.1 Emmy State H25-777-Custom Results.png

