HALLIBURTON

iCem® Service

NOBLE ENERGY INC-EBUS

Ft. Lupton District, Colorado

Foose State A17-675 Surface

Job Date: Tuesday, October 24, 2023

Sincerely,

Meghan Van Zyl

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

1.1 Executive Summary

Halliburton appreciates the opportunity to perform the cementing services on the **Foose State A17-675 – Surface.** 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 20 bbls of cement were returned to surface. Final pumping pressure was 600psi, followed by a 30-min casing test where floats held bringing 1.5bbl back to the truck.

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 Rockies Cement Team

1.2 Job Overview

Job Details	
API #:	05-123-52157
City, County:	Kersey, Weld
SO#:	908931231

Job Times		
	Date (mm/dd/yyyy)	**Time (hh:mm)**
Requested Time On Location:	10/24/2023	12:00
Called Out Time:	10/24/2023	6:00
Arrived On Location:	10/24/2023	6:00
Job Started:	10/24/2023	13:53
Job Completed:	10/24/2023	16:10
Departed Location:	10/24/2023	17:00

	Description	Units	Value
1	Surface temperature at the time of the job	degree F	55
2	Mud type (OBM, WBM, Synthetic, Water, Brine)	-	WBM
3	Mud density	ppg	8.4
4	Casing set depth (shoe)	ft	1961
5	TVD	ft	1961
6	Float collar depth	ft	1914
7	Length of rate hole	ft	11
8	Previous casing shoe depth	ft	80
9	Pre-job mud circulation time	hh:mm	00:30
10	Pre-job mud circulation rate	bpm	10

11	Pre-job mud circulation volume	bbls	200
12	Mud circulation pressure at start of cement	psi	50
13	Annual flow before the start of job	Y/N	Y
14	Pipe movement during cement job	Y/N	N
15	Calculated displacement	bbls	147.9
16	Job displaced by	Rig/HES	HES
17	Estimated returns % during job	%	100
18	Fluid returns to surface	Spacer/Cement, bbls	30/20
19	Final circulation pressure, rate prior to plug bump	psi @ bpm	600
20	Number of Centralizers	-	
21	Number of bottom plugs	-	
22	Number of trucks used preparing/during job	-	5
23	Add hours? If Yes, put #	Y/N and hours	N
24	NPT? If Yes, put #	Y/N and hours	N

1.3 Water Field Test

	Recorded Value	Unit	Acceptable Limit	Potential Problems if Values Exceed the Limit
pH	7		6.0 - 8.0	Chemicals in water can cause severe retardation
Temperature	65	F	60 - 80 F	Can can pre-mature setting of cement
Chlorides	200	ppm	3000 ppm	Can shorten thickening time

1.4 Actual Pump Schedule

	Density (ppg)	Volume (bbls)	Yield (ft3/sk)	Water Requirement (gal/sk)	Bulk Sacks (sks)	Total Water (gals)
Spacer Fluid	8.33	30				
Lead Cement	13.5	177	1.78	9.51	561	5335
Tail Cement	14.8	27	1.40	6.70	110	737
Top Plug	1					
Displacement Fluid	8.33	147.9				

2.0 Real-Time Job Summary

2.1 Job Event Log

Seq. No.	Activity	Date	Time	Comments
1	Arrive At Loc	10/24/2023	06:00:00	Crew arrived on location at 0600 hrs. Meet with costumer TD 1971', 13.5 OH, TP 1961' 9.625' 36#, FC 1914', TVD 1961', P/C 80' 16', WBM WEIGHT 8.4 PPG.
2	Call Out	10/24/2023	06:00:00	Crew called out at 0600 on 10/24/2023 for a requested-on location time of 1200 on 10/24/2023.
3	Safety Meeting - Pre Rig-Up	10/24/2023	11:00:00	Discuss hazards around rig up area.
4	Rig-Up Completed	10/24/2023	11:30:00	Rig up completed.
5	Safety Meeting - Pre Job	10/24/2023	13:00:00	Pre job safety meeting discussed all hazards prior to job and reviewed job procedure.
6	Start Job	10/24/2023	13:53:17	Start recording data.
7	Test Lines	10/24/2023	13:55:43	Pressure tested HES lines to 3600 psi.
8	Pump Spacer 1	10/24/2023	13:58:46	Pumped 30 bbls of green dye spacer.
9	Pump Lead Cement	10/24/2023	14:16:43	Pumped 177 bbls (561 sks) of SwiftCem Lead cement @13.5ppg/1.78ft3/9.51gal/sack. Mix gallons was 737 gallons. Average rate was 7.5 bpm with 500 psi on the line. TOLC= 0'.
10	Check Weight	10/24/2023	14:19:14	Weight verified by mud scales.
11	Check Weight	10/24/2023	14:25:55	Weight verified by mud scales.
12	Pump Tail Cement	10/24/2023	14:48:11	Pumped 27 bbls (110 sks) of Tail cement @14.8ppg/1.40ft3/6.70gal/sack. Mix gallons was 737 gallons. Average rate was 3 bpm with 250 psi on the line. TOTC= 1661'.
13	Check Weight	10/24/2023	14:51:59	Weight verified by mud scales.
14	Shutdown	10/24/2023	14:57:52	Shutdown to drop top plug.

15	Drop Top Plug	10/24/2023	15:03:45	Top plug verified by DSR.
16	Pump Displacement	10/24/2023	15:03:48	Pumped 147.9 bbls of freshwater displacement.
17	Bump Plug	10/24/2023	15:35:22	FCP@2bpm was 600 psi bumped up to 1100 psi.
18	Other	10/24/2023	15:38:51	Starting pressure was 2608 psi.
19	Other	10/24/2023	16:03:50	2630 psi @25 minutes.
20	Other	10/24/2023	16:08:51	2635 psi @ 30 minutes.
21	Other	10/24/2023	16:09:25	1.5 bbls back floats holding.
22	End Job	10/24/2023	16:10:17	Stop recording data. Washed cellar pump with 10 bbls of freshwater.
23	Safety Meeting - Pre Rig-Down	10/24/2023	16:30:00	Discuss blow down and any new hazards that could have come up during job.
24	Rig-Down Completed	10/24/2023	17:00:00	Rig down completed.

3.0 Attachments

3.1 Real Time iCem Job Chart