HALLIBURTON

iCem® Service

NOBLE ENERGY INC-EBUS

Ft. Lupton District, Colorado

Foose State A17-627 Production

Job Date: Saturday, November 04, 2023

Sincerely,

Meghan Van Zyl

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 **Foose State A17-627 – Production**. 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.

Job was pumped per design with an average cement density of 13.16 ppg at 4.88 bbl/min. Cement was displaced with 20 bbl. of treated water with retarder and 385 bbl. of treated freshwater displacement. Plug was landed at 2,450 psi and pressured up to 2,950 psi. Approximately 44 bbl. of spacer was returned to surface indicating a top of cement around 1020'.

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 #:	05-123-52162
City, County:	Kersey, Weld
SO#:	908954254

Job Times		
	Date (mm/dd/yyyy)	**Time (hh:mm)**
Requested Time On Location:	11/04/2023	00:00
Called Out Time:	11/03/2023	18:00
Arrived On Location:	11/03/2023	23:00
Job Started:	11/04/2023	3:17
Job Completed:	11/04/2023	8:56
Departed Location:	11/04/2023	11:00

	Description	Units	Value
1	Surface temperature at the time of the job	degree F	44
2	Mud type (OBM, WBM, Synthetic, Water, Brine)	-	OBM
3	Mud density	ppg	10.7
4	Casing set depth (shoe)	ft	17474
5	TVD	ft	6774
6	Float collar depth	ft	17466
7	Length of rate hole	ft	10
8	Previous casing shoe depth	ft	1911
9	Pre-job mud circulation time	hh:mm	2:00
10	Pre-job mud circulation rate	bpm	10

11	Pre-job mud circulation volume	bbls	912
12	Mud circulation pressure at start of cement	psi	100
13	Annual flow before the start of job	Y/N	Y
14	Pipe movement during cement job	Y/N	N
15	Calculated displacement	bbls	405
16	Job displaced by	Rig/HES	HES
17	Estimated returns % during job	%	100
18	Fluid returns to surface	Spacer/Cement, bbls	44
19	Final circulation pressure, rate prior to plug bump	psi @ bpm	2450
20	Number of Centralizers	-	210
21	Number of bottom plugs	-	2
22	Number of trucks used preparing/during job	-	4
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	12	120	2.26	13.8	294	4114
Cap Cement	13.2	40	1.59	7.98	140	1117
Lead Cement	13.2	216	1.66	7.82	732	5724
Tail Cement	13.2	422	1.98	9.51	1199	11402
Top Plug	1					
Displacement Fluid	8.33	405				

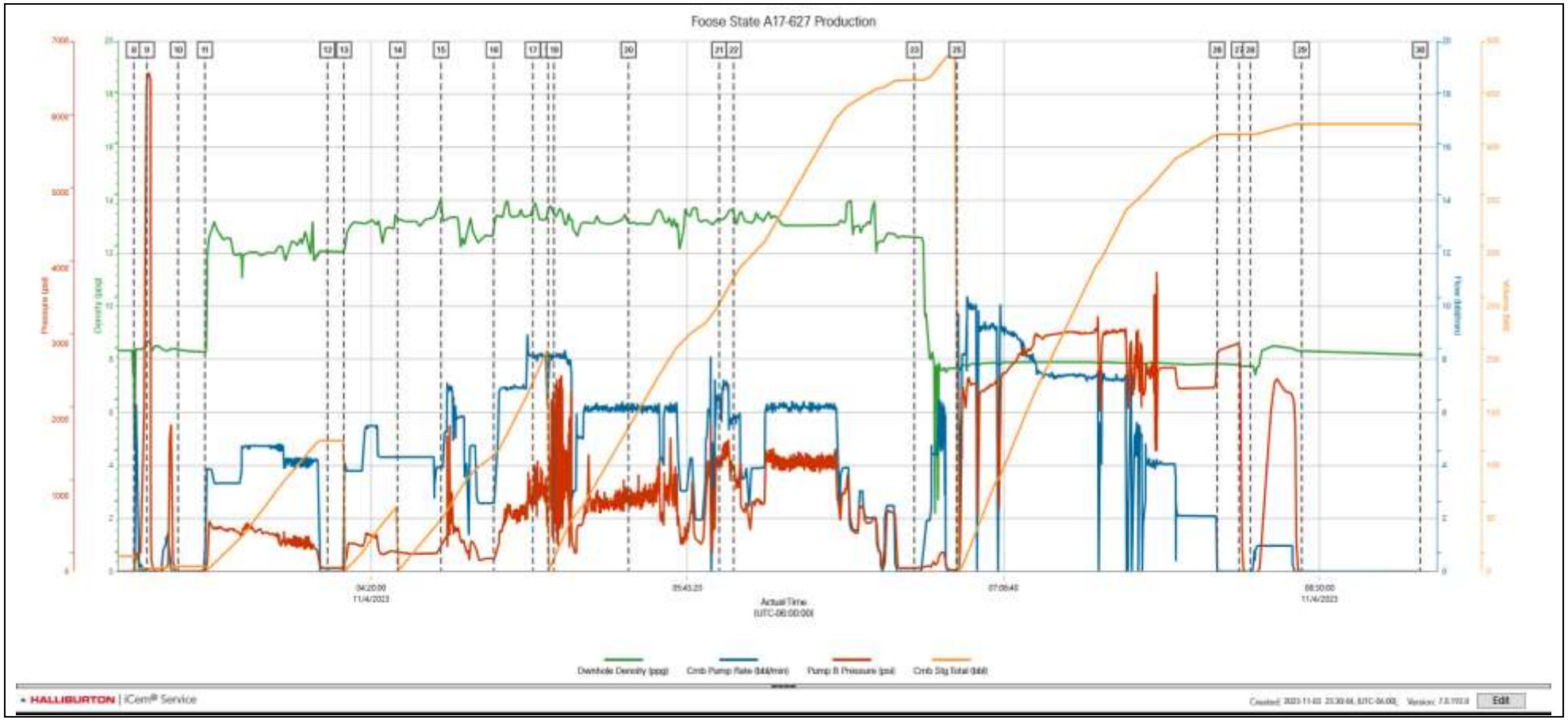
2.0 Real-Time Job Summary

2.1 Job Event Log

Seq. No.	Activity	Date	Time	Comments
1	Call Out	11/3/2023	18:00:00	Crew called out at 1800 on 11/3/2023 for a requested-on location time of 0000 on 11/4/2023.
2	Safety Meeting	11/3/2023	21:45:00	Pre convoy safety meeting discussed route to location and hazards of driving.
3	Crew Leave Yard	11/3/2023	22:00:00	Crew Leaves yard in convoy at 2200 hrs.
4	Arrive At Loc	11/3/2023	23:00:00	Crew arrived on location at 2300 hrs. Meet with costumer TD 17484', 8.5 OH, TP 17473' 5.5' 17#, FC 17466', TVD 6774', P/C 1911' 9.625 36#, OBM WEIGHT 10.7 PPG.
5	Safety Meeting - Pre Rig-Up	11/3/2023	23:30:00	Discuss hazards around rig up area.
6	Rig-Up Completed	11/4/2023	01:00:00	Rig up completed.
7	Safety Meeting - Pre Job	11/4/2023	03:00:00	Pre job safety meeting discussed all hazards prior to job and reviewed job procedure.
8	Start Job	11/4/2023	03:17:25	Start recording data.
9	Test Lines	11/4/2023	03:20:50	Pressure tested HES lines to 6500 psi and rig IBOP to 1800 psi, both good tests.
10	Drop Bottom Plug	11/4/2023	03:29:05	1st bottom plug verified by DSR.
11	Pump Spacer 1	11/4/2023	03:36:10	Pumped 120 bbls (294.00 sks) of Tuned Prime Spacer @12ppg/2.29ft3/14.04gal/sack. Mix gallons was 4130 gallons. Average rate was 3bpm with 350 psi.
12	Drop Bottom Plug	11/4/2023	04:08:29	2nd bottom plug verified by DSR.
13	Pump Cap Cement	11/4/2023	04:12:47	Pumped 40 bbls (140.00 sks) of EconoCem Cap cement @13.2ppg/1.59ft3/7.98gal/sack. Mix gallons was 1117 gallons. Average rate was 6bpm with 580 psi. TOCC =1020'.

14	Pump Lead Cement	11/4/2023	04:26:55	Pumped 216 bbls (732.00 sks) of ElastiCem Lead cement @13.2ppg/1.66ft3/7.82gal/sack. Mix gallons was 5724 gallons. Average rate was 6 bpm with 800 psi on the line. TOLC= 1846'.
15	Check Weight	11/4/2023	04:38:23	Cement very aerated even with d-air added all scales checked before recalibrating downhole.
16	Check Weight	11/4/2023	04:52:17	Weight verified by mud scales.
17	Check Weight	11/4/2023	05:02:35	Weight verified by mud scales.
18	Pump Tail Cement	11/4/2023	05:06:39	Pumped 422 bbls (1199.00 sks) of NeoCem Tail cement @13.2ppg/1.98ft3/9.51gal/sack. Mix gallons was 11402 gallons. Average rate was 6bpm with 850 psi on the line. TOTC= 7140'.
19	Check Weight	11/4/2023	05:08:10	Weight verified by mud scales.
20	Check Weight	11/4/2023	05:27:49	Weight verified by mud scales.
21	Other	11/4/2023	05:51:45	Kicked out due to kick outs set to low.
22	Check Weight	11/4/2023	05:55:32	Weight verified by mud scales.
23	Clean Lines	11/4/2023	06:43:08	Washed pumps & lines with 25 bbls of freshwater.
24	Drop Top Plug	11/4/2023	06:54:18	Top plug verified by DSR.
25	Pump Displacement	11/4/2023	06:54:21	Pumped 405 bbls of freshwater displacement with 10 gallons of MMCR in first 20 bbls. Bellacide & MC MX 820-6 threw out the rest of displacement.
26	Bump Plug	11/4/2023	08:03:00	FCP @2bpm was 2450 psi, bumped up to 2950 psi.
27	Other	11/4/2023	08:08:44	5.5 bbls back to pump truck, floats holding.
28	Other	11/4/2023	08:11:44	No visible burst top pressure was at 2580 psi and pumped additional 4 bbls.
29	Other	11/4/2023	08:25:17	4.5 bbls back begin 30 minutes inflow test.
30	End Job	11/4/2023	08:56:30	.5 bbl gained after 30 minutes. Washed rig stack with 10 bbls of freshwater. Stop recording data.
31	Safety Meeting - Pre Rig-Down	11/4/2023	09:30:00	Discuss blow down and any new hazards that could have come up during job.

32	Rig-Down Completed	11/4/2023	10:50:00	Rig down completed.
33	Pre-Convoy Safety Meeting	11/4/2023	10:55:00	Fit for duty check and check road conditions.
34	Crew Leave Location	11/4/2023	11:00:00	Crew departs location. Thank you for using Halliburton

3.0 Attachments

3.1 Real Time iCem Job Chart