

HALLIBURTON

iCem® Service

NOBLE ENERGY INC-EBUS

Ft. Lupton District, COLORADO

Booth C35-745 Production

Job Date: Wednesday, January 25, 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 **Booth C35-745 - 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 13.23 ppg at 7.86 bbl/min. Cement was displaced with 20 bbl. of treated water with retarder and 440 bbl. of treated freshwater displacement. Plug was landed at 2,500 psi and bumped to 2,900 psi. Pressure was bled off and 5.5 bbl. of fluid was returned to the truck. Approximately 72 bbl. of spacer was returned to surface indicating a top of cement around 986'.

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 #:	05-123-48924-00
City, County:	Kersey, Co

Job Times		
	Date (mm/dd/yyyy)	Time (hh:mm)
Requested Time On Location:	1-25-23	09:30
Called Out Time:	1-25-23	02:30
Arrived On Location:	1-25-23	07:00
Job Started:	1-25-23	10:49
Job Completed:	1-25-23	15:17
Departed Location:	1-25-23	17:00

	Description	Units	Value
1	Surface temperature at the time of the job	degree F	25
2	Mud type (OBM, WBM, Synthetic, Water, Brine)	-	OBM
3	Mud density	ppg	10.2
4	Casing set depth (shoe)	ft	19862
5	TVD	ft	6726
6	Float collar depth	ft	19854
7	Length of rate hole	ft	10
8	Previous casing shoe depth	ft	1962
9	Pre-job mud circulation time	hh:mm	2
10	Pre-job mud circulation rate	bpm	10
11	Pre-job mud circulation volume	bbls	1247

12	Mud circulation pressure at start of cement	psi	1200
13	Annual flow before the start of job	Y/N	Y
14	Pipe movement during cement job	Y/N	N
15	Calculated displacement	bbls	460
16	Job displaced by	Rig/HES	HES
17	Estimated returns % during job	%	100
18	Fluid returns to surface	Spacer/Cement, bbls	72
19	Final circulation pressure, rate prior to plug bump	psi @ bpm	2500
20	Number of Centralizers	-	250
21	Number of bottom plugs	-	3

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	68	F	60 - 80 F	Can can pre-mature setting of cement
Chlorides	0	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	11.5	120	3.88	24.45	174	4254
Cap Cement	13.2	39.6	1.59	8.07	140	1129
Lead Cement	13.2	207.7	1.68	8.1	694	5621
Tail Cement	13.2	529.8	2.05	9.81	1451	14234
Top Plug						
Displacement Fluid	8.33	460				

2.0 Real-Time Job Summary

2.1 Job Event Log

Seq No.	Activity	Date	Time	Dwnhole Density (ppg)	Cmb Pump Rate (bbl/min)	Pump A Pressure (psi)	Cmb Stg Total (bbl)	Comments
1	Call Out	1/25/2023	02:30:00					CREW CALLED OUT, REQUESTED ON LOCATION @ 08:30
2	Depart Yard Safety Meeting	1/25/2023	05:45:00					PRE JOURNEY SAFETY MEETING WITH ALL HES PERSONNEL, DISCUSS ROUTE AND HAZARDS ASSOCIATED WITH THE JOURNEY
3	Crew Leave Yard	1/25/2023	06:00:00					ALL HES EMPLOYEES IN ROUTE TO LOCATION
4	Arrive at Location from Service Center	1/25/2023	07:00:00					CREW ON LOCATION, RECIEVED NUMBERS FROM CO REP, TD 19871, TP 19861, SJ 19.6, CSG 5.5 17#, PREV CSG 9 5/8 36# @ 1962, HOLE 8.5, MUD 10.2, TVD 6726, 250 CENTRALIZERS, WATER TEST, TEMP 68, PH 7, CHLORIDES 0
5	Assessment Of Location Safety Meeting	1/25/2023	07:15:00					ASSESSMENT OF LOCATION SAFETY MEETING WITH ALL HES EE'S TO DISCUSS SITE SPECIFIC HAZARDS
6	Safety Meeting - Pre Rig-Up	1/25/2023	07:30:00					PRE RIG UP SAFETY MEETING WITH ALL HES EE'S TO DISCUSS HAZARDS BEFORE RIGGING UP
7	Safety Meeting - Pre Job	1/25/2023	09:00:00	-1.18	0.00	-23.33	0.00	PRE JOB SAFETY MEETING WITH ALL HES EE'S, RIG HANDS AND CO REP TO DISCUSS HAZARDS DURING JOB
8	Start Job	1/25/2023	10:48:49	8.32	0.00	-15.18	0.00	START RECORDING DATA
9	Drop Bottom Plug	1/25/2023	10:49:37	2.54	1.29	4.28	0.04	LAUNCH BOTTOM PLUG
10	Test Lines	1/25/2023	10:51:34	8.28	0.00	314.85	3.20	TEST LINES TO 5890 PSI, TEST IBOP TO 1850 PSI

11	Pump Spacer 1	1/25/2023	11:03:30	8.82	0.00	14.76	0.00	PUMP 120 BBLS TUNED PRIME SPACER 11.5 PPG, 6 BPM 900 PSI
12	Drop Bottom Plug	1/25/2023	11:24:05	11.96	0.00	63.68	119.84	LAUNCH BOTTOM PLUG
13	Pump Cap Cement	1/25/2023	11:26:43	11.93	0.00	53.82	0.00	MIX AND PUMP 140 SKS 39.6 BBLS CAP CEMENT 13.2 PPG, 1.59 FT3/SK, 8.07 GAL/SK, 1129 MIX GAL, 5 BPM 850 PSI, CALCULATED TOCC 986
14	Pump Lead Cement	1/25/2023	11:37:17	13.03	2.60	136.51	1.74	MIX AND PUMP 694 SKS 207.7 BBLS LEAD CEMENT 13.2 PPG, 1.68 FT3/SK, 8.1 GAL/SK, 5621 MIX GAL, 9 BPM 1000 PSI, CALCULATED TOLC 1812
15	Pump Tail Cement	1/25/2023	12:04:09	13.03	8.75	930.56	0.07	MIX AND PUMP 1451 SKS 529.8 BBLS TAIL CEMENT 13.2 PPG, 2.05 FT3/SK, 9.81 GAL/SK, 14234 MIX GAL 9 BPM 1700 PSI, CALCULATED TOTC 6876
16	Shutdown	1/25/2023	13:10:31	13.05	0.00	309.94	550.13	SHUTDOWN, WASH PUMPS AND LINES TO TANK, PUMP DYE AND MMCR WATER TO TANK
17	Drop Bottom Plug	1/25/2023	13:29:39	7.38	0.00	31.57	567.81	LAUNCH BOTTOM PLUG, PUMP 3 BBLS FRESH WATER W/MMCR AND DYE
18	Drop Top Plug	1/25/2023	13:33:31	7.40	0.00	32.70	570.94	LAUNCH TOP PLUG
19	Pump Displacement	1/25/2023	13:33:33	7.40	0.00	32.54	0.00	PUMP 460 BBLS TREATED WATER DISPLACEMENT, FIRST 20 BBLS W/MMCR, 15 GAL MCMX AND 25 GAL BELLACIDE THROUGHOUT, 10 BPM 3080 PSI, RECEIVED 72 BBLS SPACER TO SURFACE, FULL RETURNS THROUGHOUT JOB
20	Bump Plug	1/25/2023	14:30:22	7.79	0.00	2712.03	449.18	BUMP BOTTOM PLUG AT 2300 PSI TOOK TO 2700 PSI
21	Check Floats	1/25/2023	14:35:37	7.78	0.00	2821.21	449.18	CHECK FLOATS, FLOATS HELD TOOK 5.5 BBLS BACK
22	Bump Plug	1/25/2023	14:42:55	7.83	0.00	2847.57	457.92	BURST BOTTOM PLUG AT 3680 PSI, BUMP TOP PLUG AT 2500 PSI TOOK TO 2900 PSI
23	Check Floats	1/25/2023	14:46:59	7.81	0.00	2960.51	457.92	CHECK FLOATS, TOOK 5.5 BBLS BACK TO TRUCK

24	Other	1/25/2023	14:47:49	7.58	0.00	308.27	0.00	30 MIN FLOW CHECK, TOOK .5 BBL BACK
25	End Job	1/25/2023	15:17:13	7.34	0.00	1.64	0.00	STOP RECORDING DATA, USED 1062 BBLs FRESH WATER FOR JOB
26	Safety Meeting - Pre Rig-Down	1/25/2023	15:19:00					PRE RIG DOWN SAFETY MEETING WITH ALL HES EE'S TO DISCUSS HAZARDS ASSOCIATED WITH RIGGING DOWN
27	Depart Location Safety Meeting	1/25/2023	16:30:00					PRE DEPARTURE SAFETY MEETING WITH ALL HES EE'S TO DISCUSS ROUTES AND HAZARDS ASSOCIATED WITH THE JOURNEY
28	Crew Leave Location	1/25/2023	17:00:00					THANK YOU FOR USING HALLIBURTON, KYLE BATH AND CREW.

3.0 Attachments

3.1 Real Time iCem Job Chart

