

# HALLIBURTON

iCem<sup>®</sup> Service

**NOBLE ENERGY INC-EBUS**

Ft. Lupton District, CO

**Gig-Em State Y9-772 Production**

Job Date: Wednesday, February 22, 2023

Sincerely,

**Meghan Van Zyl**

## Legal Notice

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### Disclaimer:

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## 1.0 Cementing Job Summary

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### 1.1 Executive Summary

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Halliburton appreciates the opportunity to perform the cementing services on the **Gig-Em State Y9-772 - 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 13.00 ppg at 5.57 bbl/min. Cement was displaced with 20 bbl. of treated water with retarder and 385 bbl. of treated freshwater displacement. Plug was landed at 2,300 psi and bumped to 2,800 psi. Pressure was bled off and 6 bbl. of fluid was returned to the truck. Approximately 75 bbl. of spacer was returned to surface indicating a top of cement around 983'.

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 #:	05-123-51733
City, County:	Keenesburg, Weld

Job Times		
	Date (mm/dd/yyyy)	Time (hh:mm)
Requested Time On Location:	2/22/2023	09:00
Called Out Time:	2/22/2023	03:30
Arrived On Location:	2/22/2023	08:45
Job Started:	2/22/2023	15:07
Job Completed:	2/22/2023	20:40
Departed Location:	2/22/2023	22:45

	Description	Units	Value
1	Surface temperature at the time of the job	degree F	3
2	Mud type (OBM, WBM, Synthetic, Water, Brine)	-	obm
3	Mud density	ppg	10
4	Casing set depth (shoe)	ft	17493.9
5	TVD	ft	6981
6	Float collar depth	ft	17486.9
7	Length of rate hole	ft	10.1
8	Previous casing shoe depth	ft	2060
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	1134

12	Mud circulation pressure at start of cement	psi	1010
13	Annual flow before the start of job	Y/N	Y
14	Pipe movement during cement job	Y/N	Y
15	Calculated displacement	bbls	405.7
16	Job displaced by	Rig/HES	HES
17	Estimated returns % during job	%	100
18	Fluid returns to surface	Spacer/Cement, bbls	75/0
19	Final circulation pressure, rate prior to plug bump	psi @ bpm	2300
20	Number of Centralizers	-	216
21	Number of bottom plugs	-	3

### 1.3 Water Field Test

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	Recorded Value	Unit	Acceptable Limit	Potential Problems if Values Exceed the Limit
<b>pH</b>	7		6.0 - 8.0	Chemicals in water can cause severe retardation
<b>Temperature</b>	72	F	60 - 80 F	Can can pre-mature setting of cement
<b>Chlorides</b>	200	ppm	3000 ppm	Can shorten thickening time

### 1.4 Actual Pump Schedule

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	Density (ppg)	Volume (bbls)	Yield (ft3/sk)	Water Requirement (gal/sk)	Bulk Sacks (sks)	Total Water (gals)
<b>Spacer Fluid</b>	11.5	120	3.88	24.45		4246
<b>Cap Cement</b>	13.2	39.64	1.59	8.07	140	1130
<b>Lead Cement</b>	13.2	228.89	1.68	8.1	765	6197
<b>Tail Cement</b>	13.2	412.93	2.05	9.83	1131	1131
<b>Top Plug</b>						
<b>Displacement Fluid</b>	8.33	451.7				

## 2.0 Real-Time Job Summary

### 2.1 Job Event Log

Seq No.	Activity	Date	Time	Comments
1	Call Out	2/22/2023	03:30:00	CREW CALLED OUT 2/22/2023 0330 HRS. REQUESTED ON LOCATION 2/22/23 0900 HRS.
2	Pre-Convoy Safety Meeting	2/22/2023	07:30:00	DISCUSS ROUTE AND HAZARDS OF DRIVING
3	Crew Leave Yard	2/22/2023	07:45:00	CREW LEAVES YARD
4	Arrive At Loc	2/22/2023	08:45:00	ARRIVE AT LOCATION. MEET WITH CUSTOMER. TD 17504', 17# P-110 SHOE 17493.9', F/C 17486.9', 8.5" HOLE, TVD 6981', PC 36# J-55 2060', OBM 10 PPG, RAT HOLE 10.1', WATER 72 DEGREES, PH7, CHLORIDES LESS 200 PPM
5	Pre-Rig Up Safety Meeting	2/22/2023	09:00:00	DISCUSS RIG-UP AND ANY HAZARDS THAT MAY EXIST
6	Rig-Up Equipment	2/22/2023	09:05:00	RIG-UP EQUIPMENT
7	Pre-Job Safety Meeting	2/22/2023	14:45:00	DISCUSS JOB PROCEDURES AND HAZARDS OF JOB, PRESSURE AND HAZARDS OF HES EQUIPMENT. RIG CIRCULATES SURFACE TO SURFACE. 10 BPM/1010 PSI
8	Start Job	2/22/2023	14:48:24	
9	Start Job	2/22/2023	15:07:17	BEGIN RECORDING DATA
10	Test Lines	2/22/2023	15:17:16	TEST HES LINES 5500 PSI
11	Test Lines	2/22/2023	15:19:36	TEST RIG MANUAL VALVE 1800 PSI
12	Drop Bottom Plug	2/22/2023	15:27:24	CITADEL 1000 PSI BOTTOM PLUG BY DAVE

13	Pump Spacer 1	2/22/2023	15:28:39	120 BBLS TUNED PRIME SPACER, 11.5 PPG, 3.88 YIELD, 24.45 GAL/SACK. MIX D-AIR ON FLY
14	Shutdown	2/22/2023	16:07:29	SHUTDOWN
15	Drop Bottom Plug	2/22/2023	16:10:30	CITADEL 1000 PSI BOTTOM PLUG BY DAVE
16	Pump Cap Cement	2/22/2023	16:14:04	140 SACKS SBMCEM CAP CEMENT. 39.64 BBLS, 13.2 PPG, 1.59 YIELD, 8.07 GAL/SACK. TOCC=983' PRE-JOB CALCULATIONS
17	Shutdown	2/22/2023	16:20:54	SHUTDOWN TO FIX DELIVERY ISSUES
18	Shutdown	2/22/2023	16:28:36	SHUTDOWN
19	Shutdown	2/22/2023	16:34:58	SHUTDOWN
20	Shutdown	2/22/2023	16:42:03	SHUTDOWN
21	Pump Lead Cement	2/22/2023	16:45:29	765 SACKS SBM CEM LEAD CEMENT. 228.89 BBLS. 13.2 PPG, 1.68 YIELD, 8.1 GAL/SACK. TOLC=1810' PRE-JOB CALCULATIONS
22	Shutdown	2/22/2023	16:48:10	SHUTDOWN
23	Shutdown	2/22/2023	16:58:42	SHUTDOWN
24	Pump Tail Cement	2/22/2023	17:35:43	1131 SACKS NEOCEM TAIL CEMENT. 412.92 BBLS. 13.2 PPG, 2.05 YIELD, 9.83 GAL/SACK. TOTC=6981' PRE-JOB CALCULATIONS
25	Shutdown	2/22/2023	18:25:27	SHUTDOWN
26	Clean Lines	2/22/2023	18:31:53	CLEAN PUMPS AND LINES, APROX 25 BBLS CLEAR WATER AND 4 BBLS DYE MMCR WATER TO GET GREEN DYE VISUAL AT WASH UP TANK
27	Shutdown	2/22/2023	18:44:46	SHUTDOWN, RIG CLOSES IBOP
28	Drop Bottom Plug	2/22/2023	18:47:19	CITADEL 1500 PSI BOTTIOM PLUG BY RICKY
29	Pump Spacer 2	2/22/2023	18:48:23	PUMP 3 BBLS MMCR WATER FOR WET SHOE
30	Shutdown	2/22/2023	18:49:36	SHUTDOWN

31	Drop Top Plug	2/22/2023	18:51:15	CITADEL 3000 PSI TOP PLUG BY RICKY
32	Pump Displacement	2/22/2023	18:52:49	405.7 BBLS DISPLACEMENT. 1ST 16 BBLS HAS MMCR. REMAINING DISPLACEMENT HAS 10 GALLONS MCMX 820-6 AND 20 GALLONS BELLACIDE 300W.
33	Slow Rate	2/22/2023	19:38:52	SLOW RATE 2 BPM AT 380 BBLS
34	Bump Plug	2/22/2023	19:44:51	FCP 2300 PSI/2 BPM., BUMP PRESSURE 2800 PSI. APPROX 75 BBLS SPACER TO SURFACE
35	Check Floats	2/22/2023	19:50:21	FLOATS HOLD/5 BBLS BACK
36	Pressure Up Well	2/22/2023	19:55:41	PRESSURE UP WELL TO RUPTURE DISC.
37	Other	2/22/2023	20:01:18	DISC RUPTURES 3688 PSI/1 BPM. PUMP 3 BBL WET SHOE
38	Bump Plug	2/22/2023	20:04:10	FCP 2150 PSI/1 BPM, BUMP PRESSURE 2750 PSI
39	Check Floats	2/22/2023	20:09:46	FLOATS HOLD/5 BBL BACK
40	Other	2/22/2023	20:11:55	START 30 MINUTE IN-FLOW TEST
41	Other	2/22/2023	20:38:58	END IN-FLOW TEST/.5 BBL BACK
42	End Job	2/22/2023	20:40:14	STOP RECORDING DATA. FLUSH RIG STACK. USED 100 LBS SUGAR. USED 35 GALLONS D-AIR TOTAL JOB
43	Pre-Rig Down Safety Meeting	2/22/2023	21:00:00	DISCUSS HAZARDS OF RIG-DOWN AND ANY OTHER HAZARDS THAT MAY EXIST
44	Rig-Down Equipment	2/22/2023	21:05:00	RIG-DOWN EQUIPMENT
45	Rig-Down Completed	2/22/2023	22:30:00	RIG-DOWN COMPLETED
46	Crew Leave Location	2/22/2023	22:45:00	CREW DEPARTS LOCATION. THANK YOU FOR CHOOSING HALLIBURTON.

3.0 Attachments

3.1 Real Time iCem Job Chart

