

HALLIBURTON

iCem[®] Service

NOBLE ENERGY INC-EBUS

Ft. Lupton District, Colorado

Gig-Em State Y9-740 Production

Job Date: Wednesday, March 15, 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 **Gig-Em State Y9-740 - 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 13.24 ppg at 7.96 bbl/min. Cement was displaced with 20 bbl. of treated water with retarder and 384 bbl. of treated freshwater displacement. Plug was landed at 2,360 psi and bumped to 2,860 psi. Pressure was bled off and 5.5 bbl. of fluid was returned to the truck. Approximately 67 bbl. of spacer was returned to surface indicating a top of cement around 1106'.

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 #:	05-123-51837
City, County:	Keensburg, Weld

Job Times		
	Date (mm/dd/yyyy)	Time (hh:mm)
Requested Time On Location:	03/15/2023	19:00
Called Out Time:	03/15/2023	13:00
Arrived On Location:	03/15/2023	18:00
Job Started:	03/15/2023	20:52
Job Completed:	03/16/2023	1:32
Departed Location:	03/16/2023	3:20

	Description	Units	Value
1	Surface temperature at the time of the job	degree F	37
2	Mud type (OBM, WBM, Synthetic, Water, Brine)	-	OBM
3	Mud density	ppg	10.6
4	Casing set depth (shoe)	ft	17,422
5	TVD	ft	6,974
6	Float collar depth	ft	17,414
7	Length of rate hole	ft	13
8	Previous casing shoe depth	ft	2,051
9	Pre-job mud circulation time	hh:mm	02:30
10	Pre-job mud circulation rate	bpm	10

11	Pre-job mud circulation volume	bbls	850
12	Mud circulation pressure at start of cement	psi	800
13	Annual flow before the start of job	Y/N	Yes
14	Pipe movement during cement job	Y/N	Yes
15	Calculated displacement	bbls	404
16	Job displaced by	Rig/HES	HES
17	Estimated returns % during job	%	100
18	Fluid returns to surface	Spacer/Cement, bbls	67 spacer
19	Final circulation pressure, rate prior to plug bump	psi @ bpm	2350
20	Number of Centralizers	-	215
21	Number of bottom plugs	-	2

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	70	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	11.5	120	3.88	24.45		4246
Cap Cement	13.2	39.4	1.59	8.07	140	1129
Lead Cement	13.2	225	1.68	8.1	752	6091
Tail Cement	13.2	408	2.05	9.83	1118	10984
Top Plug	1					
Displacement Fluid	8.33	404				

2.0 Real-Time Job Summary

2.1 Job Event Log

Seq No.	Activity	Date	Time	Comments
1	Call Out	3/15/2023	13:00:00	Crew called out at 1300 on 3/15/2023 for a requested-on location time of 1900 on 3/15/2023.
2	Safety Meeting	3/15/2023	16:55:00	Pre convoy safety meeting discussed route to location and hazards of driving during rainstorm.
3	Crew Leave Yard	3/15/2023	17:00:00	Crew Leaves yard in convoy at 1700 hrs.
4	Arrive At Loc	3/15/2023	18:00:00	Crew arrived on location at 1800 hrs. Meet with costumer TD 17434', 8.5 OH, TP 17421 5.5' 17#, FC 17414', TVD 6974', P/C 2051' 9.625 36#, OBM WEIGHT 10.6 PPG.
5	Safety Meeting - Pre Rig-Up	3/15/2023	18:10:00	Discuss hazards around rig up area.
6	Rig-Up Completed	3/15/2023	19:30:00	Rig up completed.
7	Safety Meeting - Pre Job	3/15/2023	20:30:00	Pre job safety meeting discussed all hazards prior to job and reviewed job procedure.
8	Start Job	3/15/2023	20:54:30	Start recording data.
9	Test Lines	3/15/2023	20:56:01	Pressure tested HES lines to 6,000 psi, electronic kick outs working. Tested CRT to 1800 psi.
10	Drop Bottom Plug	3/15/2023	21:00:42	1st bottom plug verified by DSR.
11	Pump Spacer 1	3/15/2023	21:23:29	Pumped 120 bbls of Tuned prime spacer @11.5ppg, 3.88ft3, 24.45gal/sack. Pre calculated Mix gallons was 4,246 gal. Average rate was 6 bpm with 500 psi on the line.
12	Shutdown	3/15/2023	21:45:55	Shutdown to drop 2nd bottom plug.

13	Drop Bottom Plug	3/15/2023	21:49:28	2nd bottom plug verified by DSR.
14	Pump Cap Cement	3/15/2023	21:49:53	Pumped 39 bbls (140 sk) of EconoCem Cap cement @13.2ppg, 1.59ft3, 8.07 gal/sack. Pre calculated mix gallons was 1,129 gal. Average rate was 5 bpm with 550 psi on the line. HOCC=1,920', TOCC= 1,106'.
15	Check Weight	3/15/2023	21:51:43	Weight verified by Mud Scales.
16	Pump Lead Cement	3/15/2023	21:56:54	Pumped 225 bbls (752 sk) of ElastiCem Lead cement @13.2ppg, 1.68ft3, 8.1 gal/sack. Pre calculated mix gallons was 6,091 gal. Average rate was 9 bpm with 700 psi on the line. HLC=7,434', TOLC= 1,920'.
17	Check Weight	3/15/2023	22:00:15	Weight verified by mud scales.
18	Pump Tail Cement	3/15/2023	22:24:23	Pumped 408 bbls (1118 sk) of NeoCem Tail cement @13.2ppg, 2.05ft3, 9.83 gal/sack. Pre calculated mix gallons was 10,984 gal. Average rate was 8.5 bpm with 1700 psi on the line. HOTC=10,000', TOTC= 7,434'.
19	Check Weight	3/15/2023	22:25:30	Weight verified by mud scales.
20	Shutdown	3/15/2023	23:19:52	Shutdown swap to wash up pit.
21	Clean Lines	3/15/2023	23:25:00	Washed pumps and lines with 25 bbls of fresh water.
22	Drop Top Plug	3/15/2023	23:38:28	Top plug verified by DSR.
23	Pump Displacement	3/15/2023	23:38:33	Pumped 404 bbls of freshwater displacement, first 20 bbls with 10 gal of MMCR added & 20 gal of bellacide 300W, 10 gal of MC MX 820-6 added threw out displacement.
24	Bump Plug	3/16/2023	00:44:55	FCP @2BPM WAS 2360 PSI BUMPED UP TO 2860 PSI.
25	Check Floats	3/16/2023	00:52:28	6 BBLs back to pump truck. floats are holding. 67 bbls of spacer to surface.
26	Other	3/16/2023	00:53:51	Pressure up to burst plug. Plug burst @ 4250 psi @2bpm. Pumped 5 bbls after plug burst.
27	Other	3/16/2023	01:01:26	4.5 bbls back Begin 30-minute inflow test.

28	End Job	3/16/2023	01:32:54	Stop recording data. .5 bbl gained after 30-minute inflow test.
29	Safety Meeting - Pre Rig-Down	3/16/2023	02:00:00	Discuss blow down and any new hazards that could have come up during job.
30	Rig-Down Completed	3/16/2023	03:10:00	Rig down completed.
31	Pre-Convoy Safety Meeting	3/16/2023	03:15:00	Fit for duty check and check road conditions.
32	Crew Leave Location	3/16/2023	03:20:00	Crew departs location. Thank you for using Halliburton.

3.0 Attachments

3.1 Real Time iCem Job Chart

