

# HALLIBURTON

iCem® Service

## **NOBLE ENERGY INC-EBUS**

**Guttersen Federal State YY05-755 Production**

Job Date: Tuesday, October 03, 2023

Sincerely,

**Meghan Van Zyl**

## Legal Notice

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Table of Contents

---

Cementing Job Summary ..... 4

    Executive Summary ..... 4

    Job Overview ..... 5

    Water Field Test ..... 7

    Actual Pump Schedule ..... 7

Real-Time Job Summary ..... 8

    Job Event Log ..... 8

Attachments ..... 11

    Real Time iCem Job Chart ..... 11

## 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 **Guttersen Federal State YY05-755 – 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 13.19 ppg at 3.8 bbl/min. Cement was displaced with 20 bbl. of treated water with retarder and 381 bbl. of treated freshwater displacement. Plug was landed at 2,500 psi and bumped to 3,000 psi. Pressure was bled off and 4 bbls. of fluid was returned to the truck. With 30 bbls of spacer returning to surface, the estimated TOC is 823’.

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 #:	05-123-48644-00
City, County:	ROGGEN, WELD
SO#:	908892717

Job Times		
	Date (mm/dd/yyyy)	Time (hh:mm)
Requested Time On Location:	10/2/23	20:00
Called Out Time:	10/2/23	14:00
Arrived On Location:	10/2/23	20:00
Job Started:	10/2/23	23:15
Job Completed:	10/3/23	5:00
Departed Location:	10/3/23	6:00

	Description	Units	Value
1	Surface temperature at the time of the job	degree F	50
2	Mud type (OBM, WBM, Synthetic, Water, Brine)	-	OBM
3	Mud density	ppg	10.3
4	Casing set depth (shoe)	ft	17293.5
5	TVD	ft	6751
6	Float collar depth	ft	17273.9
7	Length of rate hole	ft	13.5
8	Previous casing shoe depth	ft	1924
9	Pre-job mud circulation time	hh:mm	2:00
10	Pre-job mud circulation rate	bpm	12

11	Pre-job mud circulation volume	bbls	1400
12	Mud circulation pressure at start of cement	psi	1500
13	Annual flow before the start of job	Y/N	N
14	Pipe movement during cement job	Y/N	Y
15	Calculated displacement	bbls	401
16	Job displaced by	Rig/HES	HES
17	Estimated returns % during job	%	100
18	Fluid returns to surface	Spacer/Cement, bbls	SPACER, 30 BBLS
19	Final circulation pressure, rate prior to plug bump	psi @ bpm	2500 PSI @ 1BPM
20	Number of Centralizers	-	209
21	Number of bottom plugs	-	2
22	Number of trucks used preparing/during job	-	3
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
<b>pH</b>	6		6.0 - 8.0	Chemicals in water can cause severe retardation
<b>Temperature</b>	60	F	60 - 80 F	Can can pre-mature setting of cement
<b>Chlorides</b>	100	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)
<b>Spacer Fluid</b>	12	120	2.31	14.2	292	
<b>Cap Cement</b>	13.2	40	1.59	7.58	140	
<b>Lead Cement</b>	13.2	216	1.66	7.82	731	
<b>Tail Cement</b>	13.2	416	2.04	9.84	1145	
<b>Top Plug</b>						
<b>Displacement Fluid</b>	8.4	401				

## 2.0 Real-Time Job Summary

### 2.1 Job Event Log

Seq No.	Activity	Date	Time	Comments
1	Summit Crew Notified Date/Time	10/2/2023	14:00:35	Crew called out for CHEVRON Production
2	Pre-Convoy Safety Meeting	10/2/2023	17:15:36	Discussed route and possible hazards
3	Depart Location for Service Center or Other Site	10/2/2023	17:30:37	Depart yard w/ 1 pump, 2 660, 1 pickups and 4 personnel.
4	Arrive at Location from Service Center	10/2/2023	20:00:40	Requested on location @ 2000
5	Safety Meeting - Assessment of Location	10/2/2023	20:15:41	Discussed location and possible hazards. Water test: Temp - 50, Chlorides - 0, PH - 6, Sulfates - <200. 8 1/2 TD @ 17307'. Production casing set @ 17293.5'. 5.5" 17# P110 - ST - 19.56' .0232 bbl/ft. CSG/OH - .0408 bbl/ft. CSG/CSG - .0479 bbl/ft 9 5/8" 36# HCL80 set @ 1924'. Mud Weight - 10.3ppg
6	Safety Meeting - Pre Rig-Up	10/2/2023	20:30:45	Discussed rig up and possible hazards.
7	Rig-up Lines	10/2/2023	20:45:46	Rig up equipment
8	Casing on Bottom	10/2/2023	21:00:47	
9	Circulate Well	10/2/2023	21:15:49	Rig circulating well 12 bpm @ 1500 psi
10	Safety Meeting - Pre Job	10/2/2023	23:00:55	Discussed job and possible hazards with everyone on location.
11	Start Job	10/2/2023	23:14:26	
12	Pump Spacer 1	10/2/2023	23:20:58	Pumped 3 bbls of FW
13	Pressure Test	10/2/2023	23:23:59	Test lines to 6500 psi. Test IBOP to 1800 psi

14	Drop Bottom Plug	10/2/2023	23:28:13	
15	Pump Spacer 1	10/2/2023	23:29:20	Pumped 120 bbls of 12 ppg of Tuned Spacer. 2.31 cuft/sk and 14.14 gal/sk. Verified weight with pressurized mud scales.
16	Check Weight	10/2/2023	23:36:05	
17	Check Weight	10/2/2023	23:44:34	
18	Drop Bottom Plug	10/2/2023	23:53:31	
19	Pump Cap Cement	10/2/2023	23:56:33	Pumped 40 bbls of 13.2 ppg Econocem. 140 sks, 1.59 cuft/sk, and 7.58 gal/sk. Verified weight with pressurized mud scales. Estimated TOC @ 863.31'
20	Check Weight	10/2/2023	23:58:46	
21	Pump Lead Cement	10/3/2023	00:04:51	Pumped 216 bbls of 13.2 ppg Isobond cmt. 731 sks, 1.66 cuft/sk, and 7.82 gal/sk. Verified weight with pressurized mud scales. Estimated TOC @ 1730.67'
22	Check Weight	10/3/2023	00:18:00	
23	Check Weight	10/3/2023	00:32:52	
24	Pump Tail Cement	10/3/2023	00:42:59	Pumped 416 bbls of 13.2 ppg Neocem. 1145 sks, 2.04 cuft/sk, and 9.84 gal/sk. Verified weight with pressurized mud scales. Estimated TOC @ 7354.78'
25	Check Weight	10/3/2023	00:50:15	
26	Check Weight	10/3/2023	01:04:48	
27	Check Weight	10/3/2023	02:29:09	
28	Check Weight	10/3/2023	02:43:38	
29	Check Weight	10/3/2023	02:52:37	
30	Shutdown	10/3/2023	03:17:10	
31	Drop Top Plug	10/3/2023	03:25:11	3rd party rupture plug

32	Pump Displacement	10/3/2023	03:26:19	Pumped 460.5 bbls of displacement. First 20 bbl w/ MMCR and 440.5 bblsw/ MX 820-6 & BELLACIDE
33	Bump Plug	10/3/2023	04:16:13	Bump plug from 2500 - 3000 psi
34	Bump Plug	10/3/2023	04:25:23	Bump plug to rupture.
35	Other	10/3/2023	04:29:35	Plug rupture @ 2560 psi. Pumped 8 bbls and shutdown.
36	Check Floats	10/3/2023	04:34:29	Floats are good. Got 4 bbls back.
37	Release Casing Pressure	10/3/2023	04:35:25	Release pressure and monitor for 30 minutes influx test. Got 1/2 bbl back.
38	End Job	10/3/2023	05:05:35	Got 30 bbls of spacer to surface. Had issues mixing throughout tail cement.
39	Pre-Rig Down Safety Meeting	10/3/2023	05:33:38	
40	Depart Location Safety Meeting	10/3/2023	05:41:37	
41	Rig-Down Equipment	10/3/2023	05:52:27	
42	Depart Location	10/3/2023	06:01:00	Thank you for using Halliburton cement. Andrew Glover and crew.

3.0 Attachments

3.1 Real Time iCem Job Chart

