

# HALLIBURTON

iCem<sup>®</sup> Service

## **NOBLE ENERGY INC - EBUS**

**Borys C22-755 Production**

Job Date: Wednesday, September 06, 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 **Borys C22-755 - 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 13.14 ppg at 7.60 bbl/min. Cement was displaced with 20 bbl. of treated water with retarder and 435 bbl. of treated freshwater displacement. Plug was landed at 2,500 psi and pressured up to 3,000 psi. Approximately 65 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 #:	05-123-48907
City, County:	Kersey, Weld
SO#:	908840017

Job Times		
	Date (mm/dd/yyyy)	Time (hh:mm)
Requested Time On Location:	09/05/2023	23:00
Called Out Time:	09/05/2023	16:00
Arrived On Location:	09/05/2023	22:30
Job Started:	09/06/2023	2:06
Job Completed:	09/06/2023	7:06
Departed Location:	09/06/2023	8:30

	Description	Units	Value
1	Surface temperature at the time of the job	degree F	62
2	Mud type (OBM, WBM, Synthetic, Water, Brine)	-	OBM
3	Mud density	ppg	10.1
4	Casing set depth (shoe)	ft	19645.2
5	TVD	ft	6634
6	Float collar depth	ft	16938.2
7	Length of rate hole	ft	16
8	Previous casing shoe depth	ft	1921
9	Pre-job mud circulation time	hh:mm	1.25
10	Pre-job mud circulation rate	bpm	8

11	Pre-job mud circulation volume	bbls	600
12	Mud circulation pressure at start of cement	psi	1200
13	Annual flow before the start of job	Y/N	No
14	Pipe movement during cement job	Y/N	No
15	Calculated displacement	bbls	455.6
16	Job displaced by	Rig/HES	HES
17	Estimated returns % during job	%	100
18	Fluid returns to surface	Spacer/Cement, bbls	65
19	Final circulation pressure, rate prior to plug bump	psi @ bpm	2500 @ 2
20	Number of Centralizers	-	238
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>	7		6.0 - 8.0	Chemicals in water can cause severe retardation
<b>Temperature</b>	62	F	60 - 80 F	Can can pre-mature setting of cement
<b>Chlorides</b>	290	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				
<b>Cap Cement</b>	13.2	38.9	1.56	7.79	140	1091
<b>Lead Cement</b>	13.2	208.1	1.65	7.82	708	5537
<b>Tail Cement</b>	13.2	519.4	1.98	9.51	1473	14008
<b>Top Plug</b>	1					
<b>Displacement Fluid</b>	8.33	455.6				

2.0 Real-Time Job Summary

2.1 Job Event Log

Seq No.	Activity	Date	Time	Comments
1	Call Out	9/5/2023	16:00:38	NOBLE ENERGY BORYS #CC22-755 5 1/2" PRODUCTION CASING JOB - On location 09/05/23 @ 23:00 PM
2	Safety Meeting - Service Center or other Site	9/5/2023	17:45:39	Review Journey Management And Route With Crew Members
3	Depart from Service Center or Other Site	9/5/2023	18:00:41	Depart From Yard
4	Arrive At Loc	9/5/2023	22:30:42	Talk To Company Man ( ) : TD = 19,661', TP = 19,645.2', ST = 7', OH = 8.1/2", CSG = 5 1/2" 17#, Previous Casing 9 5/8" 36# Set @ 1,921', WF = OBM @ 10.1#, Test Water = pH - 7, Chlorides - < 290 ppm, 62 F
5	Safety Meeting - Assessment of Location	9/5/2023	22:40:44	Spot Equipment
6	Safety Meeting - Pre Rig-Up	9/5/2023	22:50:49	Review JSA With Crew Members
7	Rig-Up Equipment	9/5/2023	23:00:50	Rig Up Iron And Hoses Needed For Job
8	Rig-Up Completed	9/6/2023	00:00:51	Rigged Up All Iron And Hoses Needed For CMT Job With No Issues Or Incidents.
9	Safety Meeting - Pre Job	9/6/2023	01:30:58	Review Job Procedure And JSA With Rig Hands, Co. Man, And HES Members
10	Rig-Up Equipment	9/6/2023	01:45:53	Rigged Up Rig Floor To Pump Truck To Start Cmt Job.
11	Start Job	9/6/2023	02:06:47	Start Job
12	Test Lines	9/6/2023	02:29:49	Performed A 500 Kick Out Test On Both Pumps Then Tested Lines To 6,500 psi, Good Test.

13	Drop Bottom Plug	9/6/2023	02:48:50	Dropped Bottom Plug
14	Pump Spacer 1	9/6/2023	02:49:51	Pumped Spacer 120 bbls Of Tunes Prime @ 12 PPG @6.5 BPM With 710 psi, Good Returns. HOS=2,504' TOS=0'.
15	Drop Bottom Plug	9/6/2023	03:15:39	Dropped 2nd Bottom Plug
16	Pump Cap Cement	9/6/2023	03:16:27	Pumped 38.9 bbls Of Cap Cement 140 Sacks With A Yield Of 1.56 And A Water Requirement Of 7.79 Gals/Sack. 8 BPM With 675 psi, Good Returns. HOLC=812' TOLC=1,020'.
17	Pump Lead Cement	9/6/2023	03:23:57	Pumped 208.1 bbls Of Lead Cement 708 Sacks 13.2 PPG With A Yield Of 1.1.65 And A Water Requirement Of 7.82 Gals/Sack. 8.5 BPM With 600 psi, Good Returns. HOLC=5,087' TOLC=1,832'.
18	Pump Tail Cement	9/6/2023	03:50:17	Pumped 254.5 bbls Of Tail Cement 1,473 Sacks With A Yield Of 1.98 And A Water Requirement Of 9.51 Gals/Sack. 8.5 BPM With 1,550 psi, Good Returns. HOTC=12,726' TOTC=6,919'.
19	Clean Lines	9/6/2023	05:00:57	Washed Pumps And Lines To Open Top Tank
20	Drop Top Plug	9/6/2023	05:08:56	Dropped Top Plug
21	Pump Displacement	9/6/2023	05:11:31	Pump Displacement 455.6 bbls Of Treated Water, First 20 bbls Of MMCR Followed By 435 bbls Of Biocide Treated Water
22	Pump Displacement	9/6/2023	05:23:30	100 bbls Gone Into Displacement 9 BPM With 3,200 psi, Good Returns.
23	Pump Displacement	9/6/2023	05:35:15	200 bbls Gone Into Displacement 8 BPM With 3,450 psi, Good Returns.
24	Pump Displacement	9/6/2023	05:48:14	300 bbls Gone Into Displacement 7 BPM With 3,210 psi, Good Returns. @ 390 BBLS Into Displacement We Got Spacer Back Total Spacer To Surface 65 BBLS.
25	Pump Displacement	9/6/2023	06:02:44	400 bbls Gone Into Displacement 7 BPM With 3,250 psi, Good Returns.
26	Bump Plug	9/6/2023	06:16:02	Bumped Plug With Calculated Displacement And Put 500 psi Over Final Circulating Pressure. Pressure Climbed From 2,500 To 3,000 psi.
27	Bleed Casing	9/6/2023	06:22:00	Bled Pressure Back To Zero And Got 6.5 bbls Back
28	Check Floats	9/6/2023	06:23:01	Floats Held Good.

29	Pressure Up Well	9/6/2023	06:24:21	Pumped 6.5 bbls @1 BPM To Burst Plug, Plug Bersted With 2,700 psi Then Pumped 4 BBLS Over
30	Other	9/6/2023	06:34:51	Bled Pressure Back To Zero And Got 4.5 bbls Back Floats Held Good.
31	Monitor Pressure	9/6/2023	06:36:08	In Flow Test For 30 Minutes Got .5 BBLS Back.
32	End Job	9/6/2023	07:08:15	End Job.
33	Safety Meeting - Pre Rig-Down	9/6/2023	07:20:12	Review JSA With HES Crew Members
34	Rig-Down Equipment	9/6/2023	07:30:10	Rig Down Iron, Plug Container, And Hoses Used On Job
35	Rig-Down Completed	9/6/2023	08:20:08	All Equipment Rigged Down With No Issues Or Incidents
36	Safety Meeting - Departing Location	9/6/2023	08:25:11	Review Journey Management And Route With Crew Members
37	Depart Location	9/6/2023	08:30:03	Depart location.

3.0 Attachments

3.1 Real Time iCem Job Chart

