

# HALLIBURTON

iCem<sup>®</sup> Service

**ENCANA OIL & GAS (USA) INC. - EBUS**

**For: MARK**

Date: Saturday, July 19, 2014

**FREDERIKSEN 1E-28H-A368 Surface**

FREDERIKSEN 1E-28H-A368

Sincerely,

**CHRISTOPHER PICKELL**

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## **1.1 Executive Summary**

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Halliburton appreciates the opportunity to perform the cementing services on the **Frederiksen 1E-28H-A368** cement **Surface** casing job. 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.

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 Brighton**

**Job Times**

	<b>Date</b>	<b>Time</b>	<b>Time Zone</b>
<b>Called Out</b>			MST
<b>On Location</b>			MST
<b>Job Started</b>	3/5/14	0055	MST
<b>Job Completed</b>	3/5/14	0201	MST
<b>Departed Location</b>			MST

## 1.2 Cementing Job Summary

**HALLIBURTON**

## Cementing Job Summary

*The Road to Excellence Starts with Safety*

Sold To #: 340078	Ship To #: 3125712	Quote #:	Sales Order #: 901168453
Customer: ENCANA OIL & GAS (USA) INC. - EBUS		Customer Rep: Elrod, Dennis	
Well Name: Frederiksen	Well #: 1E-28H-A368	API/UWI #: 05-123-37665	
Field: WATTENBERG	City (SAP): LONGMONT	County/Parish: Weld	State: Colorado
Contractor: Ensign Drilling		Rig/Platform Name/Num: Ensign 135	
Job Purpose: Cement Surface Casing			
Well Type: Development Well		Job Type: Cement Surface Casing	
Sales Person: GREGORY, JON		Srv Supervisor: PICKELL, CHRISTOPHER	MBU ID Emp #: 396838

Job Personnel								
HES Emp Name	Exp Hrs	Emp #	HES Emp Name	Exp Hrs	Emp #	HES Emp Name	Exp Hrs	Emp #
MYRE, JAMES	7.5	549859	PICKELL, CHRISTOPHER Lee	7.5	396838	SIMMONS, KEATON J	7.5	524850

Equipment							
HES Unit #	Distance-1 way	HES Unit #	Distance-1 way	HES Unit #	Distance-1 way	HES Unit #	Distance-1 way
10857012C	22 mile	41605597	22 mile	11667703C	22 mile	5707C	22 mile

Job Hours								
Date	On Location Hours	Operating Hours	Date	On Location Hours	Operating Hours	Date	On Location Hours	Operating Hours
3/4/14	4.5	0	3/5/14	3	3			
TOTAL		Total is the sum of each column separately						

Job				Job Times			
Formation Name	Formation Depth (MD)	Top	Bottom	Called Out	Date	Time	Time Zone
Form Type			BHST	On Location	04 - Mar - 2014	16:00	MST
Job depth MD	856. ft		Job Depth TVD	05 - Mar - 2014	19:30	00:55	MST
Water Depth			Wk Ht Above Floor	05 - Mar - 2014	02:01	02:01	MST
Perforation Depth (MD)	From		To	Departed Loc	05 - Mar - 2014	03:00	MST

Well Data											
Description	New / Used	Max pressure psig	Size in	ID in	Weight lbm/ft	Thread	Grade	Top MD ft	Bottom MD ft	Top TVD ft	Bottom TVD ft
open hole				12.25					856.		
Surface casing	Unknown		9.625	8.921	36.		J-55		844.5		

Tools and Accessories													
Type	Size	Qty	Make	Depth	Type	Size	Qty	Make	Depth	Type	Size	Qty	Make
Guide Shoe					Packer					Top Plug			
Float Shoe					Bridge Plug					Bottom Plug			
Float Collar					Retainer					SSR plug set			
Insert Float										Plug Container			
Stage Tool										Centralizers			

Miscellaneous Materials													
Gelling Agt		Conc		Surfactant		Conc		Acid Type		Qty		Conc	%
Treatment Fld		Conc		Inhibitor		Conc		Sand Type		Size		Qty	

Fluid Data									
Stage/Plug #: 1									
Fluid #	Stage Type	Fluid Name	Qty	Qty uom	Mixing Density lbm/gal	Yield ft <sup>3</sup> /sk	Mix Fluid Gal/sk	Rate bbl/min	Total Mix Fluid Gal/sk

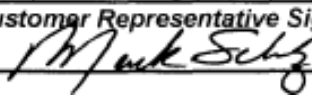
Stage/Plug #: 1									
Fluid #	Stage Type	Fluid Name	Qty	Qty uom	Mixing Density uom	Yield uom	Mix Fluid uom	Rate uom	Total Mix Fluid uom

Summit Version: 7.3.0124

Wednesday, March 05, 2014 02:21:00

**HALLIBURTON**

## Cementing Job Summary

Stage/Plug #: 1									
Fluid #	Stage Type	Fluid Name	Qty	Qty uom	Mixing Density lbm/gal	Yield ft <sup>3</sup> /sk	Mix Fluid Gal/sk	Rate bbl/min	Total Mix Fluid Gal/sk
1	WATER SPACER		30.00	bbl	8.34	.0	.0	.0	
2	SWIFTCEM	SWIFTCEM (TM) SYSTEM (452990)	290.0	sacks	14.2	1.54	7.66		7.66
7.66 Gal		FRESH WATER							
Calculated Values		Pressures		Volumes					
Displacement	62.3 BBL	Shut In: Instant		Lost Returns	0 BBL	Cement Slurry	79.5 BBL	Pad	
Top Of Cement	0 FT	5 Min		Cement Returns	23 BBL	Actual Displacement	62.3 BBL	Treatment	
Frac Gradient		15 Min		Spacers	30 BBL	Load and Breakdown		Total Job	
<b>Rates</b>									
Circulating		Mixing	5	Displacement	5	Avg. Job	5		
Cement Left In Pipe	Amount	37.55 ft	Reason	Shoe Joint					
Frac Ring # 1 @	ID	Frac ring # 2 @	ID	Frac Ring # 3 @	ID	Frac Ring # 4 @	ID		
The Information Stated Herein Is Correct				Customer Representative Signature 					

### **1.3 Planned Pumping Schedule**

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- 1. Fill Lines with Water**
  - a. Density = 8.33ppg
  - b. Volume = 2bbl
- 2. Pressure Test Lines to 2500psi**
- 3. Pump Water Spacer**
  - a. Density = 8.33 lb/gal
  - b. Volume = 30 bbl
  - c. Rate = 5 bpm
- 4. Pump SwiftCem (Lead)**
  - a. Density = 14.2
  - b. Yield = 1.54
  - c. Water Requirement = 7.66
  - d. Volume = 290 sks (80 bbls)
  - e. Rate = 5 bpm
- 5. Drop Top Plug**
- 6. Start Displacement**
- 7. Pump Displacement Water**
  - a. Density = 8.33 lb/gal
  - b. Volume = 62.3 bbls
  - c. Rate = 5 bpm
- 8. Calculated Total Displacement = 62.3 bbls**

## 1.4 Job Overview

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		Units	Description
1	Surface temperature at time of job	°F	
2	Mud type (OBM, WBM, SBM, Water, Brine)	-	
3	Actual mud density	lb/gal	
4	Time circulated before job	HH:MM	
5	Mud volume circulated	Bbls	
6	Rate at which well was circulated	Bpm	
7	Pipe movement during hole circulation	Y/N	
8	Rig pressure while circulating	Psi	
9	Time from end mud circulation to start of job	HH:MM	
10	Pipe movement during cementing	Y/N	
11	Calculated displacement	Bbls	
12	Job displaced by	Rig/HES	
13	Annular before job)?	Y/N	
14	Annular flow after job	Y/N	
15	Length of rat hole	Ft	
16	Units of gas detected while circulating	Units	
17	Was lost circulation experienced at any time ?	Y/N	

## 1.5 Water Field Test

Item	Recorded Test Value	Units	Max. Acceptable Limit	Potential Problems in Exceeding Limit
pH		----	6.0 - 8.0	Chemicals in the water can cause severe retardation
Chlorides		ppm	3000 ppm	Can shorten thickening time of cement
Sulfates		ppm	1500 ppm	Will greatly decrease the strength of cement
Total Hardness		ppm	500 mg/L	High concentrations will accelerate the set of the cement
Calcium		ppm	500 ppm	High concentrations will accelerate the set of the cement
Total Alkalinity		ppm	1000 ppm	Cement is greatly retarded to the point where it may not set up at all (typically occurs @ pH ≥ 8.3).
Bicarbonates		ppm	1000 ppm	Cement is greatly retarded to the point where it may not set up at all
Potassium		ppm	5000 ppm	High concentrations will shorten the pump time of cement (indicates the presence of chlorides, therefore if Potassium levels are measured as high, so should the chlorides)
Iron		ppm	300 ppm	High concentrations will accelerate the set of the cement
Temperature		°F	50-80 °F	High temps will accelerate; Low temps may risk freezing in cold weather

**Submitted Respectfully by:** \_\_\_\_\_

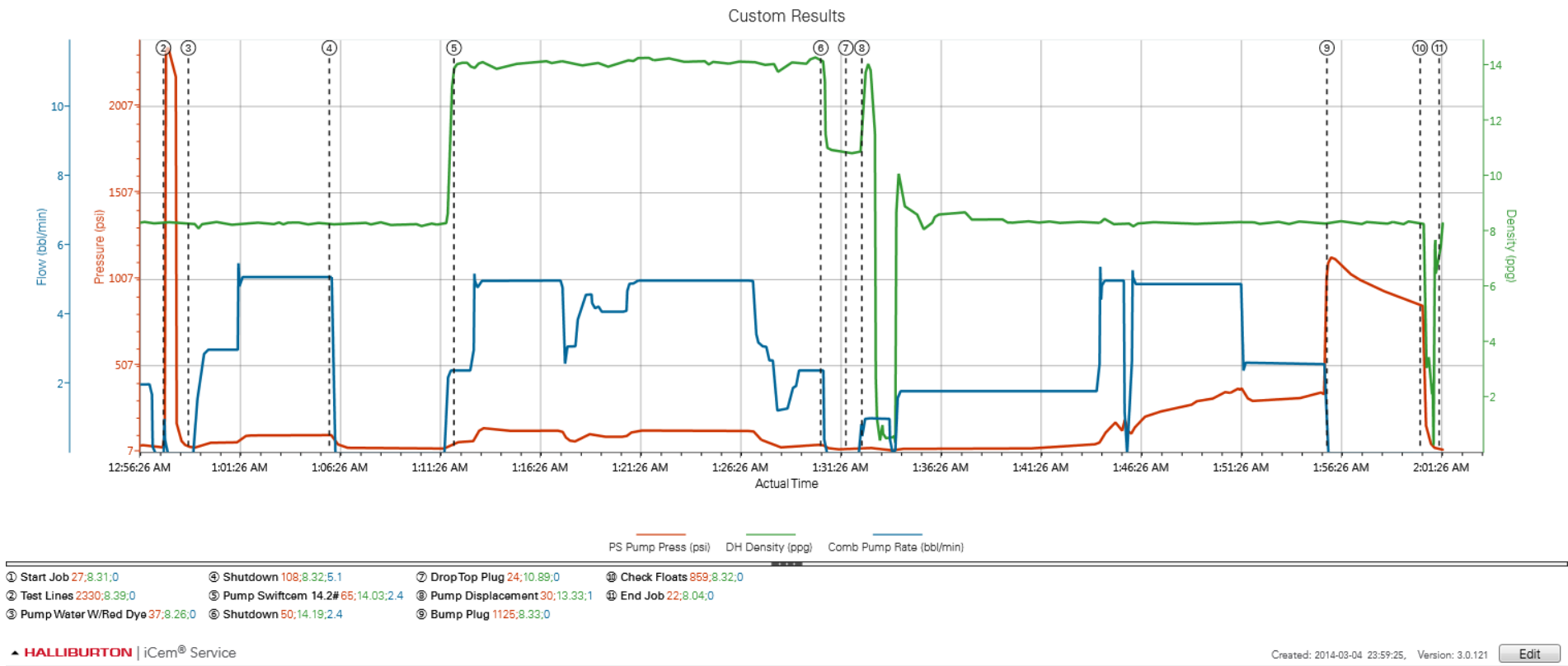


## 1.6 Job Event Log

Type	Seq. No.	Activity	Graph Label	Date	Time	Source	DH Density (ppg)	PS Pump Press (psi)	Comb Pump Rate (bbl/min)	Comment
Event	1	Start Job	Start Job	3/5/2014	00:55:28	COM5	8.31	27.00	0.00	
Event	2	Test Lines	Test Lines	3/5/2014	00:57:44	COM5	8.39	2330.00	0.00	
Event	3	Pump Spacer 1	Pump Water W/Red Dye	3/5/2014	00:58:58	COM5	8.26	37.00	5.00	
Event	4	Shutdown	Shutdown	3/5/2014	01:06:01	USER	8.32	108.00	0.00	
Event	5	Pump Cement	Pump Swiftcem 14.2#	3/5/2014	01:12:14	COM5	14.20	65.00	5.00	
Event	6	Shutdown	Shutdown	3/5/2014	01:30:33	COM5	14.20	50.00	2.40	
Event	7	Drop Top Plug	Drop Top Plug	3/5/2014	01:31:48	USER	14.20	24.00	0.00	
Event	8	Pump Displacement	Pump Displacement	3/5/2014	01:32:36	COM5	8.33	30.00	5.00	
Event	9	Bump Plug	Bump Plug	3/5/2014	01:55:49	COM5	8.33	1125.00	0.00	
Event	10	Other	Check Floats	3/5/2014	02:00:29	COM5	8.32	859.00	0.00	
Event	11	End Job	End Job	3/5/2014	02:01:26	COM5	8.04	22.00	0.00	

2.0 Custom Graphs

2.1 Custom Graph



### 3.0 Appendix

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