

HALLIBURTON

iCem[®] Service

ENCANA OIL & GAS (USA) INC. - EBUS

For:

Date: Thursday, July 17, 2014

Vogl-Geist 2E-5H-F267

Case 1

Sincerely,

Sebastian Estensoro

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1.1 Executive Summary

Halliburton appreciates the opportunity to perform the cementing services on the **Vogl-Giest 2E-5H-F267** cement **Intermediate** 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

	Date	Time	Time Zone
Called Out	4/4/14	1230	MST
On Location	4/4/14	1630	MST
Job Started	4/4/14	2255	MST
Job Completed	4/5/14	0244	MST
Departed Location	4/5/14	0420	MST

1.2 Cementing Job Summary

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Cementing Job Summary

The Road to Excellence Starts with Safety

Sold To #: 340078		Ship To #: 3191323		Quote #:		Sales Order #: 901236306							
Customer: ENCANA OIL & GAS (USA) INC. - EBUS				Customer Rep: 278, HP									
Well Name: Vogl-Geist		Well #: #2E-5H-F267		API/UWI #: 05-123-37778									
Field: WATTENBERG		City (SAP): FIRESTONE		County/Parish: Weld		State: Colorado							
Lat: N 40.168 deg. OR N 40 deg. 10 min. 5.196 secs.				Long: W 104.915 deg. OR W -105 deg. 5 min. 5.928 secs.									
Contractor: H & P		Rig/Platform Name/Num: 278											
Job Purpose: Cement Intermediate Casing													
Well Type: Development Well				Job Type: Cement Intermediate Casing									
Sales Person: CORMIER, ALLISON		Srvc Supervisor: BIRCHELL, DEVIN		MBU ID Emp #: 466993									
Job Personnel													
HES Emp Name	Exp Hrs	Emp #	HES Emp Name	Exp Hrs	Emp #	HES Emp Name	Exp Hrs	Emp #					
BIRCHELL, DEVIN	11.5	466993	GLEESON, JAY	11.5	560216	GRIFFITHS, ZACHARY	11.5	551430					
Ray			Christophe			Sakae							
HUTCHINSON, MICHAEL	11.5	563588	MILLER, GEOFFREY	11.5	460232	ONUORAH, THEODORE	11.5	546822					
			Alan										
Equipment													
HES Unit #	Distance-1 way	HES Unit #	Distance-1 way	HES Unit #	Distance-1 way	HES Unit #	Distance-1 way						
10248062C	15 mile	10867419C	15 mile	11338223	15 mile	11526488	15 mile						
11527041C	15 mile	11542778	15 mile	12010171	15 mile								
Job Hours													
Date	On Location Hours	Operating Hours	Date	On Location Hours	Operating Hours	Date	On Location Hours	Operating Hours					
TOTAL								Total is the sum of each column separately					
Job				Job Times									
Formation Name				Date	Time	Time Zone							
Formation Depth (MD)	Top	Bottom		Called Out	04 - Apr - 2014	12:30	MST						
Form Type	BHST			On Location	04 - Apr - 2014	16:30	MST						
Job depth MD	7720. ft	Job Depth TVD	7318. ft	Job Started	04 - Apr - 2014	22:55	MST						
Water Depth	Wk Ht Above Floor			4. ft	Job Completed	05 - Apr - 2014	02:44						
Perforation Depth (MD)	From	To		Departed Loc	05 - Apr - 2014	04:20	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		
Sales/Rental/3rd Party (HES)													
Description						Qty	Qty uom	Depth	Supplier				
SUGAR, GRANULATED, IMPERIAL						100	LB						
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 ³ /sk	Mix Fluid Gal/sk	Rate bbl/min	Total Mix Fluid Gal/sk		

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Cementing Job Summary

Stage/Plug #: 1										
Fluid #	Stage Type	Fluid Name	Qty	Qty uom	Mixing Density lbm/gal	Yield ft ³ /sk	Mix Fluid Gal/sk	Rate bbl/min	Total Mix Fluid Gal/sk	
1	WATER SPACER			bbl	8.34	.0	.0	.0		
2	TUNED SPACER III	TUNED SPACER III - SBM (483826)	40	bbl	10.	5.86	38.0	.0		
	38 gal/bbl	FRESH WATER								
	61.01 lbm/bbl	BARITE, BULK (100003681)								
3	TUNED LIGHT (TM) B1	TUNED LIGHT (TM) SYSTEM (452984)	282	sacks	10.	2.32	8.73		8.73	
	8.73 Gal	FRESH WATER								
4	VariCem B1	VARICEM (TM) CEMENT (452009)	327	sacks	13.	1.95	9.83		9.83	
	9.83 Gal	FRESH WATER								
5	DISPLACEMENT		292	bbl	8.4			.0		
Calculated Values			Pressures			Volumes				
Displacement		Shut In: Instant		Lost Returns		Cement Slurry		Pad		
Top Of Cement		5 Min		Cement Returns		Actual Displacement		Treatment		
Frac Gradient		15 Min		Spacers		38		Load and Breakdown		Total Job
Rates										
Circulating		Mixing		Displacement			Avg. Job			
Cement Left In Pipe		Amount	0 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 <i>Randy Burke</i>						

1.3 Planned Pumping Schedule

- 1. Fill Lines with Water**
 - a. Density = 8.33ppg
 - b. Volume = 2bbl
- 2. Pressure Test Lines to 4760psi**
- 3. Pump Tuned Spacer**
 - a. Density = 11.5 lb/gal
 - b. Volume = 40 bbl
 - c. Rate = 5 bpm
- 4. Drop Bottom Plug**
- 5. Pump Tuned Light (Lead)**
 - a. Density = 10
 - b. Yield = 2.32
 - c. Water Requirement = 8.73
 - d. Volume = 282 sks (116 bbls)
 - e. Rate = 3 bpm
- 6. Pump VariCem (Tail)**
 - a. Density = 13
 - b. Yield = 1.95
 - c. Water Requirement = 9.83
 - d. Volume = 327 sks (113 bbls)
 - e. Rate = 5 bpm
- 7. Drop Top Plug**
- 8. Start Displacement**
- 9. Pump Displacement Water**
 - a. Density = 11 lb/gal
 - b. Volume = 262 bbls
 - c. Rate = 6 bpm
10. Land Plug – Anticipated Final Circulation Pressure 150 psi

Calculated Total Displacement = 262 bbls

1.4 Job Overview

		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

HALLIBURTON***Cementing Job Log****The Road to Excellence Starts with Safety*

Sold To #: 340078	Ship To #: 3191323	Quote #:	Sales Order #: 901236306
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Well Name: Vogl-Geist	Well #: #2E-5H-F267	API/UWI #: 05-123-37778	
Field: WATTENBERG	City (SAP): FIRESTONE	County/Parish: Weld	State: Colorado
Legal Description:			
Lat: N 40.168 deg. OR N 40 deg. 10 min. 5.196 secs.		Long: W 104.915 deg. OR W -105 deg. 5 min. 5.928 secs.	
Contractor: H & P		Rig/Platform Name/Num: 278	
Job Purpose: Cement Intermediate Casing			Ticket Amount:
Well Type: Development Well		Job Type: Cement Intermediate Casing	
Sales Person: CORMIER, ALLISON		Srvc Supervisor: BIRCHELL, DEVIN	MBU ID Emp #: 466993

Activity Description	Date/Time	Cht #	Rate bbl/min	Volume bbl		Pressure psig		Comments
				Stage	Total	Tubing	Casing	
Call Out	04/04/2014 12:30							Called out for Encana Oil&Gas Vogl-Geist 2E-5H-F267 Intermediate
Pre-Convoy Safety Meeting	04/04/2014 15:45							Discuss road and weather conditions, fatigue and following distance
Depart from Service Center or Other Site	04/04/2014 16:00							Call journey management, Depart for location
Arrive At Loc	04/04/2014 16:30							Close journey, talk with company rep on volumes, rates, and depth, rig still running casing
Pre-Rig Up Safety Meeting	04/04/2014 16:45							Discussed rig up, line of fire, slips, and pinch points
Rig-Up Equipment	04/04/2014 16:50							Rig up ground line, and suction hoses
Wait on Customer or Customer Sub-Contractor Equip	04/04/2014 18:00							Wait for rig crew to finish running casing
Casing on Bottom	04/04/2014 20:30							Casing on bottom rig will circulate until HES is rigged up
Pre-Job Safety Meeting	04/04/2014 21:55							Discuss pump schedule, procedure, high pressure iron, and emergency plan
Other	04/04/2014 22:15							Stop circulating rig crew blew out top drive, rigged up cement head and tied into stand pipe
Other	04/04/2014 22:53							filled lines to pressure test pump and lines

Sold To #: 340078

Ship To #: 3191323

Quote #:

Sales Order #: 901236306

SUMMIT Version: 7.3.0127

Saturday, April 05, 2014 03:30:00

HALLIBURTON***Cementing Job Log***

Activity Description	Date/Time	Cht #	Rate bbl/ min	Volume bbl		Pressure psig		Comments
				Stage	Total	Tubing	Casing	
Pressure Test	04/04/2014 22:55							Pressure test pump and lines to 4760 psi held for 3 minutes
Pump Spacer	04/04/2014 22:57		5	40	40		510.0	Pump 40 bbls Tuned Spacer III at 11.5 ppg
Drop Bottom Plug	04/04/2014 23:06							Dropped first bottom plug
Pump Lead Cement	04/04/2014 23:06		3	116	156		476.0	Pump Tuned Light lead cement at 10 ppg Y: 2.32ft ³ /sk W: 8.73gal/sk (282sks)
Slow Rate	04/05/2014 00:17		2					Slowed rate to swap pods from lead to tail
Drop Bottom Plug	04/05/2014 00:18							Dropped second bottom plug
Pump Tail Cement	04/05/2014 00:20		5	113	269		392.0	Pump tail cement at 13 ppg Y: 1.95ft ³ /sk W: 9.83gal/sk (327sks)
Shutdown	04/05/2014 00:53							Shutdown to drop top plug
Drop Top Plug	04/05/2014 00:54							Dropped top plug, washed pump and lines on plug
Pump Displacement - Start	04/05/2014 00:55							Pump displacement 10 bbls water 262 bbls mud 20 bbls water
Pump Displacement	04/05/2014 00:58		10	10	279		18.0	Begin pumping rig mud
Returns To Surface	04/05/2014 01:02		10	20	289		697.0	Returns seen at surface with 20 bbls displacement away
Displ Reached Cmnt	04/05/2014 01:23		6	170	439		710.0	displacement reached cement with 170 bbls away
Spacer Returns to Surface	04/05/2014 01:38		6	256	525		1390.0	With 256 bbls displacement away spacer returns to surface (40 bbls)
Bump Plug	04/05/2014 01:51		3	293	562		1150.0	Bumped plug with 293 bbls with 1150 psi took pressure to 1643 psi
Check Floats	04/05/2014 01:56							Checked floats, floats held with 1 bbls back to truck
Pressure Up	04/05/2014 02:04						2555.0	Pressure up casing to 2500 psi and hold for 30 minutes

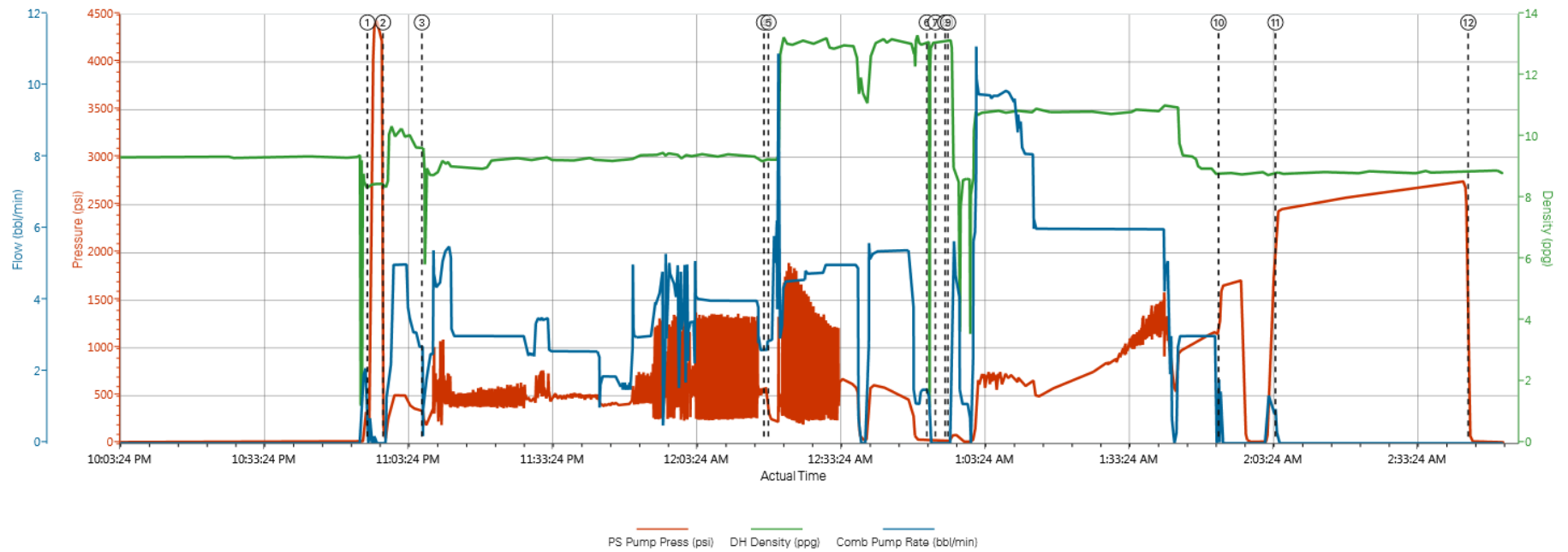
HALLIBURTON***Cementing Job Log***

Activity Description	Date/Time	Cht #	Rate bb/ min	Volume bbl		Pressure psig		Comments
				Stage	Total	Tubing	Casing	
Release Casing Pressure	04/05/2014 02:44							Released pressure ready for rig down
Pre-Rig Down Safety Meeting	04/05/2014 02:50							Discussed trapped pressure, slips, trips, falls, and overhead loads
Rig-Down Equipment	04/05/2014 02:55							Begin rigging down all iron and suction hoses
Pre-Convoy Safety Meeting	04/05/2014 04:10							Discussed fatigue, wildlife, weather, and journey management
Depart Location for Service Center or Other Site	04/05/2014 04:20							Depart for Halliburton Service Center

2.0 Custom Graphs

2.1 Custom Graph

Custom Results



- | | | | |
|----------------------------|---------------------------------|----------------------------------|---------------------------|
| ① Test Lines 1514;8.41;0.1 | ④ Drop Bottom Plug 591;9.24;2.7 | ⑦ Clean Lines 23;13.11;0 | ⑩ Bump Plug 1591;8.76;0 |
| ② Pump Spacer 143;8.36;0 | ⑤ Pump Tail Cement 251;9.27;2.9 | ⑧ Drop Top Plug 23;13.14;0 | ⑪ Casing Test 2433;8.83;0 |
| ③ Pump Cement 176;9.65;1.1 | ⑥ Shutdown 34;1.1;0 | ⑨ Pump Displacement 25;13.18;1.2 | ⑫ End Job 44.34;8.88;0 |

3.0 Appendix
