

HALLIBURTON

iCem[®] Service

Encana Oil & Gas (USA) INC. - EBUS

For: Randy

Date: Wednesday, September 10, 2014

Encana Vogl-McCoy 2E-5-H-F267

Vogl-McCoy 2E-5H-F267

Sincerely,
Sheldon Cotts

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1.1 Executive Summary

Halliburton appreciates the opportunity to perform the cementing services on the **Vogl-McCoy 2E-5H-F267** cement **Production** 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
Requested Time On Location	6/5/14	20:00	MST
Call Out	6/5/14	15:00	MST
On Location	6/5/14	18:00	MST
Job Started	6/5/14	22:06	MST
Job Completed	6/6/14	00:10	MST
Depart Location	6/6/14	01:30	MST

1.2 Cementing Job Summary

HALLIBURTON

Cementing Job Summary

The Road to Excellence Starts with Safety

Sold To #: 340078		Ship To #: 3191321		Quote #:		Sales Order #: 0901396029				
Customer: ENCANA OIL & GAS (USA) INC. - EBUS				Customer Rep:						
Well Name: VOGL-MCCOY			Well #: 2E-5 H-F267			API/UWI #: 05-123-37780-00				
Field: WATTENBERG		City (SAP): FIRESTONE		County/Parish: WELD		State: COLORADO				
Legal Description: SE NW-5-2N-67W-2597FNL-2343FWL										
Contractor:				Rig/Platform Name/Num: H&P 278						
Job BOM: 7523										
Well Type: HORIZONTAL OIL										
Sales Person: HALAMERICA\HB50180				Srvc Supervisor: Kc Smith						
Job										
Formation Name										
Formation Depth (MD)		Top			Bottom					
Form Type					BHST					
Job depth MD		14740ft			Job Depth TVD					
Water Depth					Wk Ht Above Floor			40		
Perforation Depth (MD)		From			To					
Well Data										
Description	New / Used	Size in	ID in	Weight lbm/ft	Thread	Grade	Top MD ft	Bottom MD ft	Top TVD ft	Bottom TVD ft
Casing		7	6.368	23		N-80	0	7360	0	7100
Casing		4.5	3.92	13.5		P-110	0	11600	0	7100
Open Hole Section			6.125				7500	11600		
Tools and Accessories										
Type	Size in	Qty	Make	Depth ft	Type	Size in	Qty	Make		
Guide Shoe	4.5				Top Plug	4.5	1	BlackHawk		
Float Shoe	4.5	1		14722	Bottom Plug	4.5		HES		
Float Collar	4.5	1		14719	SSR plug set	4.5		HES		
Insert Float	4.5				Plug Container	4.5		BlackHawk		
Stage Tool	4.5				Centralizers	4.5		HES		
Miscellaneous Materials										
Gelling Agt		Conc		Surfactant		Conc		Acid Type	Qty	Conc
Treatment Fid		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 /sack	Mix Fluid Gal	Rate bbl/min	Total Mix Fluid Gal	
1	13 lb/gal Tuned Spacer III	Tuned Spacer III	30	bbl	13	8.93	33.9	4		
235.92 lbm/bbl		BARITE, BULK (100003681)								
24.20 gal/bbl		FRESH WATER								

Fluid #	Stage Type	Fluid Name	Qty	Qty UoM	Mixing Density lbm/gal	Yield ft ³ /sack	Mix Fluid Gal	Rate bbl/mi n	Total Mix Fluid Gal
2	Expandacem B2	EXPANDACEM (TM) SYSTEM	540	sack	13.8	1.67		6	7.7
7.70 Gal		FRESH WATER							
Fluid #	Stage Type	Fluid Name	Qty	Qty UoM	Mixing Density lbm/gal	Yield ft ³ /sack	Mix Fluid Gal	Rate bbl/mi n	Total Mix Fluid Gal
3	Fresh Water	Fresh Water	219	bbl	9.8			219	
Cement Left In Pipe		Amount	ft	Reason			Shoe Joint		
Comment									

1.3 Job Event Log

Type	Seq. No.	Activity	Graph Label	Date	Time	Source	PS Pump Press (psi)	DH Density (ppg)	Comb Pump Rate (bbl/min)	Comment
Event	1	Call Out	Call Out	6/5/2014	15:00:00	USER				Crew called out for job. Requested on location at 20:00.
Event	2	Depart from Service Center or Other Site	Depart from Service Center or Other Site	6/5/2014	17:30:00	USER				Crew had a pre-journey safety meeting, entered into journey management, and departed for location.
Event	3	Arrive at Location from Service Center	Arrive at Location from Service Center	6/5/2014	18:00:00	USER				Crew arrived safely on location, ended journey management and conducted a site assesment.
Event	4	Comment	Comment	6/5/2014	18:10:00	USER				Crew spotted the equipment into position.
Event	5	Rig-Up Equipment	Rig-Up Equipment	6/5/2014	18:15:00	USER				Crew conducted a pre-rig up safety meeting and began rigging up the lines and equipment.
Event	6	Comment	Comment	6/5/2014	20:00:00	USER	1.00	0.48	0.00	Had to wait for the rig to rig up the Blackhawk head and finish rigging down the casing crew.
Event	7	Pre-Job Safety Meeting	Pre-Job Safety Meeting	6/5/2014	21:30:00	USER	6.00	8.33	0.00	Crew met with the rig crew, company man, Halliburton tool hand, and the Blackhawk tool hands to go over the job procedure and cover the safety procedures associated with the job.
Event	8	Rig-Up Completed	Rig-Up Completed	6/5/2014	21:45:00	USER	7.00	8.32	0.00	Crew finished rigging up the lines on the floor, primed the RCM, and did all of the final preparations prior to pumping the job.

Event	9	Test Lines	Test Lines	6/5/2014	21:58:29	COM1	5458.00	8.45	0.00	Tested lines to 5458 psi.
Event	10	Test Lines	End Pressure Test	6/5/2014	22:00:39	USER	5367.00	8.53	0.00	Bled Pressure Off.
Event	11	Pump Spacer 1	Pump Spacer 1	6/5/2014	22:06:53	COM1	340.00	12.96	1.00	Pumped 30 bbls of Tuned Spacer at 13#.
Event	12	Shutdown	Shutdown	6/5/2014	22:16:08	USER	56.00	13.32	0.00	Shutdown to Mix up Cement.
Event	13	Pump Cement	Pump Cement	6/5/2014	22:19:58	COM1	152.00	13.32	4.60	Pumped 540 sks(160 bbls) of ExpandaCem @ 13.8 lb/gal, 1.67 Yield, 7.7 gal/sk.
Event	14	Shutdown	Shutdown	6/5/2014	23:00:30	USER	213.00	13.57	1.60	Shutdown.
Event	15	Other	Washed the Pumps and Lines	6/5/2014	23:05:06	COM1	3.00	12.22	0.00	Washed the pumps and lines into the Wise Transport.
Event	16	Pump Displacement	Pump Displacement	6/5/2014	23:09:42	COM1	7.00	-0.10	0.10	Pumped 219.3 bbls of Fresh Water Displacement.
Event	17	Comment	Comment	6/5/2014	23:17:53	USER	235.00	9.65	0.90	Caught something in the pump and it set off our Kick outs. Shutdown briefly to check pump. Continued pumping and whatever it was worked its way out.
Event	18	Slow Rate	Slow Rate	6/5/2014	23:49:56	USER	2154.00	9.62	6.00	Slowed our rate to 3 bpm to land the plug.
Event	19	Bump Plug	Bump Plug	6/5/2014	23:51:23	COM1	1451.00	9.65	3.00	Bumped the plug at 219 bbls away.
Event	20	Check Floats	Check Floats	6/5/2014	23:56:48	USER	2584.00	9.69	0.00	Checked floats, Floats held 1 1/2 bbls back.
Event	21	End Job	End Job	6/6/2014	00:10:00	COM1	111.00	9.64	1.10	Job Complete.
Event	22	Rig-Down Equipment	Rig-Down Equipment	6/6/2014	00:15:00	USER	4.00	9.59	0.00	Crew conducted a pre-rig down safety meeting and started rigging down.
Event	23	Rig-Down Completed	Rig-Down Completed	6/6/2014	01:15:00	USER				Lines and Equipment all rigged down and equipment prepared to go back to the yard.
Event	24	Depart Location for	Depart Location for	6/6/2014	01:30:00	USER				Crew departed for Yard.

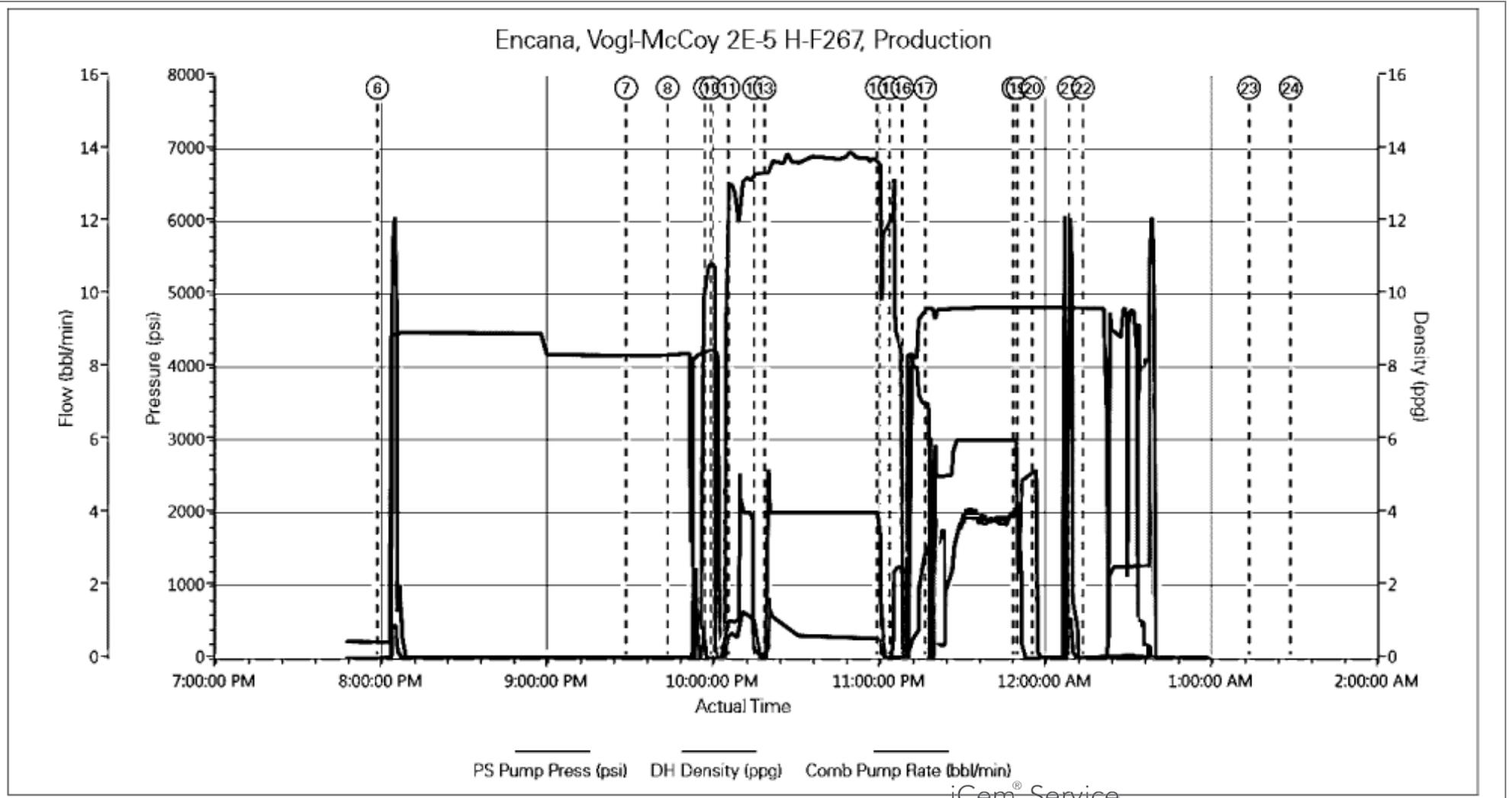
1.4 Planned Pumping Schedule

1. **Fill Lines with Water**
 - a. Density = 8.33 lb/gal
 - b. Volume = 2 bbls
2. **Pressure Test Lines to 5458psi**
3. **Drop Bottom Plug**
4. **Pump Tuned Spacer III**
 - a. Density = 13 lb/gal
 - b. Volume = 30 bbl
 - c. Rate = 4 bpm
5. **Drop Bottom Plug**
6. **Pump ExpandaCem (Primary)**
 - a. Density = 13.8 lb/gal
 - b. Yield = 1.67 ft³/sk
 - c. Water Requirement = 7.7 gal/sk
 - d. Volume = 540 sks (160 bbls)
 - e. Rate = 4 bpm
7. **Drop Top Plug**
8. **Start Displacement**
9. **Pump Displacement Water**
 - a. Density = 9.8 lb/gal
 - b. Volume = 219.3 bbls
 - c. Rate = 6.0 bpm
10. Land Plug – Anticipated Final Circulation Pressure 1451 psi

1.5 Field Water Test

Item	Recorded Test Value	Units	Max. Acceptable Limit	Potential Problems in Exceeding Limit
pH	6	----	6.0 - 8.0	Chemicals in the water can cause severe retardation
Chlorides	>400	ppm	3000 ppm	Can shorten thickening time of cement
Sulfates	15	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	68.9	°F	50-80 °F	High temps will accelerate; Low temps may risk freezing in cold weather

2.0 Custom Graph



Insert Planned Pump Schedule from Proposal or actual Job Procedure built for job