

# HALLIBURTON

iCem<sup>®</sup> Service

## **ENSIGN UNITED STATES DRILLING**

Date: Saturday, July 12, 2014

### **SRC Kiehn C-4NHZ**

Ensign United States Drilling SRC KIEHN #C-4NHZ

Sincerely,  
**Matt Bulinski**

## Table of Contents

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1.1	Executive Summary	3
1.2	Cementing Job Summary	4
1.3	Planned Pumping Schedule	6
1.4	Job Overview	7
1.5	Water Field Test	9
1.6	Job Event Log	10
2.0	Custom Graphs	12
2.1	Custom Graph	12
3.0	Appendix	13

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**1.1 Executive Summary**

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Halliburton appreciates the opportunity to perform the cementing services on the **SRC KIEHN #C-4NHZ** 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.

**Overall Job went very smooth. Crew was on time when they arrived on location. The rig circulated 1hr before cement job. Very good returns throughout the whole job and 15bbbls cement to surface which held. Final circulating pressure was 225psi.**

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>	7/12	10:00	MT
<b>On Location</b>	7/12	14:30	MT
<b>Job Started</b>	7/12	18:17	MT
<b>Job Completed</b>	7/12	19:17	MT
<b>Departed Location</b>	7/12	20:30	MT

## 1.2 Cementing Job Summary

Sold To #: 301256		Ship To #: 3542584		Quote #:		Sales Order #: 0901502664				
Customer: ENSIGN UNITED STATES DRILLING				Customer Rep: Daniel Batchelor						
Well Name: SRC KIEHN			Well #: C-4NHZ			API/UWI #: 05-123-39715-00				
Field: WATTENBERG		City (SAP): JOHNSTOWN		County/Parish: WELD		State: COLORADO				
Legal Description: SW SE-4-4N-68W-201FSL-1718FEL										
Contractor:				Rig/Platform Name/Num: Ensign 131						
Job BOM: 7521										
Well Type: HORIZONTAL OIL										
Sales Person: HALAMERICA\HX38199				Srvc Supervisor: Matthew Bulinski						
Job										
Formation Name										
Formation Depth (MD)		Top			Bottom					
Form Type		BHST								
Job depth MD		554ft			Job Depth TVD					
Water Depth		Wk Ht Above Floor								
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
Open Hole Section			13.5				0	576	0	576
Casing		9.625	8.921	38			0	554		554
Fluid Data										
Stage/Plug #: 1										
Fluid #	Stage Type	Fluid Name	Qty	Qty UoM	Mixing Density lbm/gal	Yield ft <sup>3</sup> /sack	Mix Fluid Gal	Rate bbl/min	Total Mix Fluid Gal	
1	Mud Flush III (Powder)	Mud Flush III	12	bbl	8.4			2.5	504	
42 gal/bbl		FRESH WATER								
Fluid #	Stage Type	Fluid Name	Qty	Qty UoM	Mixing Density lbm/gal	Yield ft <sup>3</sup> /sack	Mix Fluid Gal	Rate bbl/min	Total Mix Fluid Gal	
2	SwiftCem B2	SWIFTCEM (TM) SYSTEM	200	sack	13.4	1.79	9.48	4.5	1896	
94 lbm		TYPE I / II CEMENT, BULK (101439798)								
9.48 Gal		FRESH WATER								
Fluid #	Stage Type	Fluid Name	Qty	Qty UoM	Mixing Density lbm/gal	Yield ft <sup>3</sup> /sack	Mix Fluid Gal	Rate bbl/min	Total Mix Fluid Gal	
3	Displacement	Displacement	39.8	bbl	8.33			4.5	1671.6	
Cement Left In Pipe		Amount	40ft			Reason		Shoe Joint		

**Comment** Job went very smooth with returns the whole time and 15bbbs cmt to surface

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## Summary Report

**Crew:** \_\_\_\_\_  
**Job Start Date:** 7/12/2014

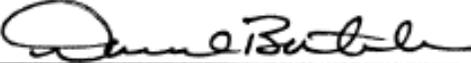
**Sales Order #:** 0901502664  
**WO #:** 0901502664  
**PO/AFE #:** 404294

**Customer:** ENSIGN UNITED STATES DRILLING  
**UWI / API Number:** 05-123-39715-00  
**Well Name:** SRC KIEHN  
**Well No:** C-4NHZ

**Field:** WATTENBERG  
**County/Parish:** WELD  
**State:** COLORADO  
**Latitude:** 40.335811  
**Longitude:** -105.005066  
**Sect / Twn / Rng:** 4/4/68

**Job Type:** CMT SURFACE CASING BOM  
**Service Supervisor:** Matthew Bulinski  
**Cust Rep Name:** Daniel Batchelor  
**Cust Rep Phone #:**

**Remarks:**

<i>The Information Stated Herein Is Correct</i>	Customer Representative Signature 	Date 7-12-14
	Customer Representative Printed Name	

## **1.3 Planned Pumping Schedule**

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- 1. Fill Lines with Water**
  - a. Density = 8.33
  - b. Volume = 2bbls
- 2. Pressure Test Lines to 3500psi**
- 3. Pump Fresh Water Spacer**
  - a. Density = 8.33 lb/gal
  - b. Volume = 10 bbl
  - c. Rate = 2 bpm
- 4. Pump Mud Flush Spacer**
  - a. Density = 8.4 lb/gal
  - b. Volume = 12 bbl
  - c. Rate = 2.5 bpm
- 5. Pump Fresh Water Spacer**
  - a. Density = 8.33 lb/gal
  - b. Volume = 10 bbl
  - c. Rate = 3.5 bpm
- 6. Pump Swiftcem (Lead)**
  - a. Density = 13.4
  - b. Yield = 1.79
  - c. Water Requirement = 9.48
  - d. Volume = 200 sks (63.8 bbls)
  - e. Rate = X bpm
- 7. Drop Top Plug**
- 8. Start Displacement**
- 9. Pump Displacement Water**
  - a. Density = 8.33 lb/gal
  - b. Volume = 40 bbls
  - c. Rate = 3.5 bpm
10. Land Plug – Anticipated Final Circulation Pressure 225 psi

**Calculated Total Displacement = 40 bbls**

## 1.4 Job Overview

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		Units	Description
1	Surface temperature at time of job	°F	75
2	Mud type (OBM, WBM, SBM, Water, Brine)	-	WBM
3	Actual mud density	lb/gal	9
4	Time circulated before job	HH:MM	1hr
5	Mud volume circulated	Bbls	
6	Rate at which well was circulated	Bpm	
7	Pipe movement during hole circulation	Y/N	N
8	Rig pressure while circulating	Psi	
9	Time from end mud circulation to start of job	HH:MM	5mins
10	Pipe movement during cementing	Y/N	
11	Calculated displacement	Bbls	39.8
12	Job displaced by	Rig/HES	HES
13	Annular before job)?	Y/N	N
14	Annular flow after job	Y/N	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	N



## 1.5 Water Field Test

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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	38	ppm	3000 ppm	Can shorten thickening time of cement
Sulfates	Less 200	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	0	ppm	300 ppm	High concentrations will accelerate the set of the cement
Temperature	70	°F	50-80 °F	High temps will accelerate; Low temps may risk freezing in cold weather

**Submitted Respectfully by:** \_\_\_\_\_ **Matt Bulinski** \_\_\_\_\_

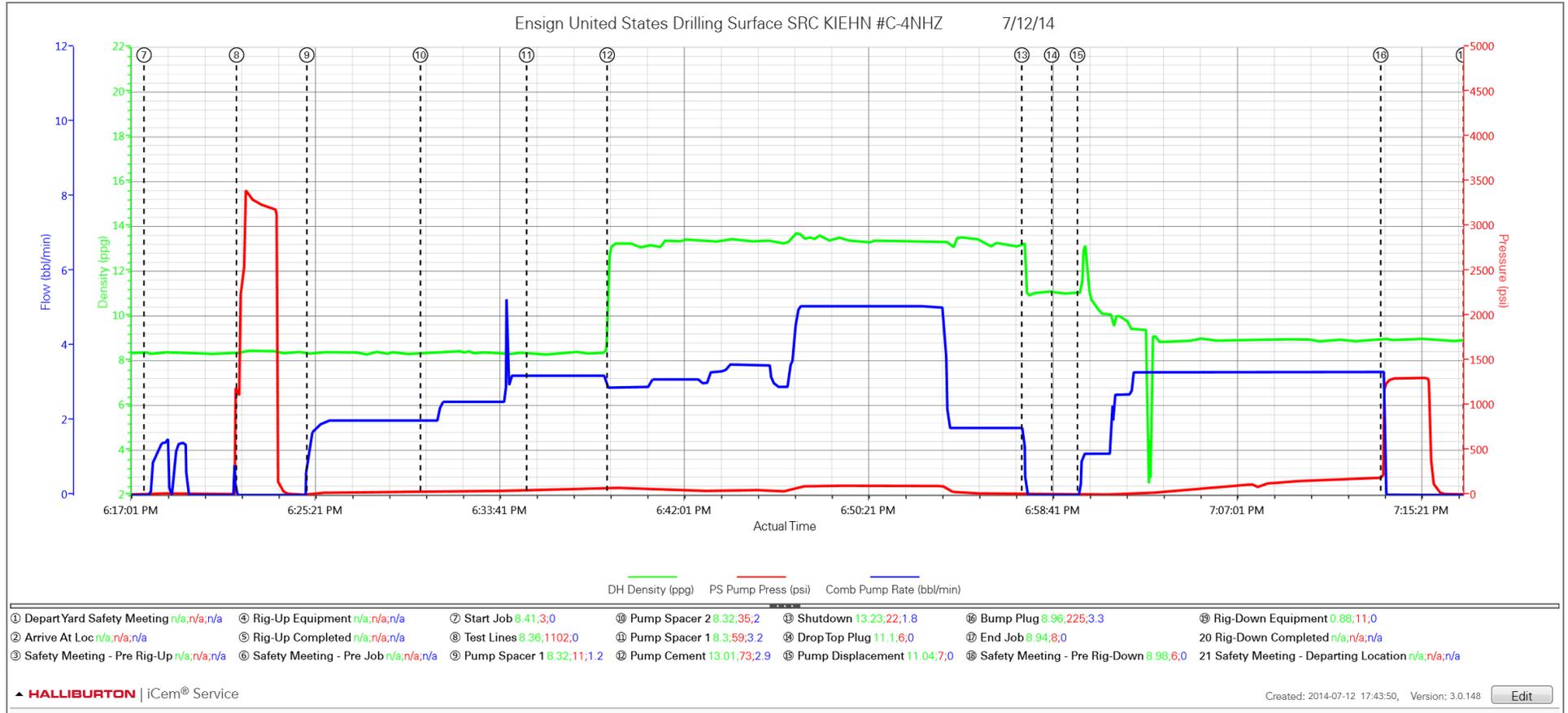
## 1.6 Job Event Log

Type	Seq. No.	Activity	Graph Label	Date	Time	Source	DH Density (ppg)	PS Pump Press (psi)	Comb Pump Rate (bbl/min)	Comment
Event	1	Depart Yard Safety Meeting	Depart Yard Safety Meeting	7/12/2014	13:00:00	USER				JSA on Job Materials, Pre-tripping trucks, and driving to Location
Event	2	Arrive At Loc	Arrive At Loc	7/12/2014	14:30:00	USER				Arrived 2hrs early and rig is last stick of DP. Finished running Csg at 17:15 and circulated 1hr before job
Event	3	Safety Meeting - Pre Rig-Up	Safety Meeting - Pre Rig-Up	7/12/2014	17:00:00	USER				JSA on Hazard Hunt, rigging up bulk trucks, and iron to rig
Event	4	Rig-Up Equipment	Rig-Up Equipment	7/12/2014	17:15:00	USER				
Event	5	Rig-Up Completed	Rig-Up Completed	7/12/2014	17:44:44	USER				
Event	6	Safety Meeting - Pre Job	Safety Meeting - Pre Job	7/12/2014	17:45:00	USER				JSA with Company Man, Rig hands, and HES hands on Pump schedule
Event	7	Start Job	Start Job	7/12/2014	18:17:43	COM5	8.41	3.00	0.00	
Event	8	Test Lines	Test Lines	7/12/2014	18:21:53	COM5	8.36	1102.00	0.00	3500psi Pressure Test Lines to rig floor
Event	9	Pump Spacer 1	Pump Spacer 1	7/12/2014	18:25:04	COM5	8.32	11.00	1.20	10bbls H2O spacer Pumped at Avg. 2bbl/min with 36psi
Event	10	Pump Spacer 2	Pump Spacer 2	7/12/2014	18:30:12	COM5	8.32	35.00	2.00	12bbls Mud Flush spacer Pumped at Avg. 2.5bbl/min with 40psi
Event	11	Pump Spacer 1	Pump Spacer 1	7/12/2014	18:35:00	COM5	8.30	59.00	3.20	10bbls H2O spacer Pumped at Avg. 3.5bbl/min with 55psi
Event	12	Pump Cement	Pump Cement	7/12/2014	18:38:39	COM5	12.67	73.00	2.90	200sks Swiftcem, 13.4ppg, 1.79yield, 9.48gal/sk, Mixed with rig water and # verify by pressurized mud scales 3x's... Pumped at Avg. 4.5bbl/min with 100psi

Event	13	Shutdown	Shutdown	7/12/2014	18:57:23	COM5	13.23	22.00	1.80	
Event	14	Drop Top Plug	Drop Top Plug	7/12/2014	18:58:44	COM5	11.10	6.00	0.00	Pre-Loaded
Event	15	Pump Displacement	Pump Displacement	7/12/2014	18:59:54	COM5	11.04	7.00	0.00	40bbls H2O displacment.. Good returns throughout.. Pumped at Avg. 3.5bbl/min with 15bbls cmt to surface
Event	16	Bump Plug	Bump Plug	7/12/2014	19:13:36	COM5	8.96	225.00	3.30	Plug landed at 225psi and brought to 1209psi for 1min... Floats held
Event	17	End Job	End Job	7/12/2014	19:17:21	COM5	8.93	8.00	0.00	
Event	18	Safety Meeting - Pre Rig-Down	Safety Meeting - Pre Rig- Down	7/12/2014	19:18:00	USER	8.98	6.00	0.00	JSA on rigging down bulk trucks and iron from rig
Event	19	Rig-Down Equipment	Rig-Down Equipment	7/12/2014	19:25:00	USER	0.88	11.00	0.00	
Event	20	Rig-Down Completed	Rig-Down Completed	7/12/2014	20:15:00	USER				
Event	21	Safety Meeting - Departing Location	Safety Meeting - Departing Location	7/12/2014	20:30:00	USER				JSA on Location clean up, pre-tripping trucks, and driving back to Brighton Yard.

## 2.0 Custom Graphs

### 2.1 Custom Graph



3.0 Appendix

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