

# HALLIBURTON

iCem<sup>®</sup> Service

## **ENSIGN UNITED STATES DRILLING**

**For: Ron Genty**

Date: Saturday, November 01, 2014

**Ensign SRC GIES T-15-22CHZ**

Intermediate

Sincerely,  
**Ken Broom**

Table of Contents

1.1	Executive Summary	3
1.2	Cementing Job Summary	4
1.3	Planned Pumping Schedule	6
1.4	Water Field Test	8
1.5	Job Event Log	9
2.0	Custom Graphs	11
2.1	Custom Graph	11

## 1.1 Executive Summary

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Halliburton appreciates the opportunity to perform the cementing services on the **SRC GIES T-15-22CHZ** 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 [Fort Lupton]

**Job Times**

	Date	Time	Time Zone
<b>Called Out</b>	10/31/14	1000	
<b>On Location</b>	10/31/14	1430	
<b>Job Started</b>	10/31/14	2044	
<b>Job Completed</b>	10/31/14	2332	
<b>Departed Location</b>	11/1/14	1230	

## 1.2 Cementing Job Summary

<b>Sold To #:</b> 301256		<b>Ship To #:</b> 3563501		<b>Quote #:</b>		<b>Sales Order #:</b> 0901781391				
<b>Customer:</b> ENSIGN UNITED STATES DRILLING				<b>Customer Rep:</b> Ron Genty						
<b>Well Name:</b> SRC GIES			<b>Well #:</b> T-15-22CHZ		<b>API/UWI #:</b> 05-123-40017-00					
<b>Field:</b> WATTENBERG	<b>City (SAP):</b> EATON	<b>County/Parish:</b> WELD			<b>State:</b> COLORADO					
<b>Legal Description:</b> SE SE-15-7N-65W-272FSL-1107FEL										
<b>Contractor:</b>				<b>Rig/Platform Name/Num:</b> ENSIGN 134						
<b>Job BOM:</b> 7522										
<b>Well Type:</b> HORIZONTAL OIL										
<b>Sales Person:</b> HALAMERICA\HB21661				<b>Srv Supervisor:</b> Kendall Broom						
<b>Job</b>										
<b>Formation Name</b>										
<b>Formation Depth (MD)</b>	<b>Top</b>		<b>Bottom</b>							
<b>Form Type</b>			<b>BHST</b>							
<b>Job depth MD</b>	7662ft		<b>Job Depth TVD</b>							
<b>Water Depth</b>			<b>Wk Ht Above Floor</b>							
<b>Perforation Depth (MD)</b>			<b>To</b>							
<b>Well Data</b>										
	<b>New / Used</b>	<b>Size in</b>	<b>ID in</b>	<b>Weight lbm/ft</b>	<b>Thread</b>	<b>Grade</b>	<b>Top MD ft</b>	<b>Bottom MD ft</b>	<b>Top TVD ft</b>	<b>Bottom TVD ft</b>
Casing		9.625	8.921	36			0	657	0	657
Casing		7	6.276	26	BTC		0	7652	0	7102
Open Hole Section			8.75				657	7662	657	7102
<b>Tools and Accessories</b>										
<b>Type</b>	<b>Size in</b>	<b>Qty</b>	<b>Make</b>	<b>Depth ft</b>		<b>Type</b>	<b>Size in</b>	<b>Qty</b>	<b>Make</b>	
Guide Shoe	7	1				Top Plug	7			
Float Shoe	7	1		7652		Bottom Plug	7			
Float Collar	7	1				SSR plug set	7			
Insert Float	7	1				Plug Container	7			
	7	1				Centralizers	7			
<b>Fluid Data</b>										
<b>Stage/Plug #: 1</b>										

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	CLEANSPACER III	CLEANSPACER III	40	bbl	10.5	3.86	24.2	4	
35.10 gal/bbl									
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	EconoCem B2	ECONOCEM (TM) SYSTEM	480	sack	12.5	1.89		6	10.23
10.23 Gal									
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	FracCem	FRACCEN (TM) SYSTEM	238	sack	13.5	1.74		6	8.27
8.27 Gal									
3 lbm		D, 50 LB SK (100012223)							
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
4	Displacement	Displacement	290.5	bbl	9				
ft In Pipe		Amount	46 ft						
Comment									

**1.3 Planned Pumping Schedule**

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- 1. Fill Lines with Water**
  - a. Density = 8.33
  - b. Volume = 2
- 2. Pressure Test Lines to 4000psi**
- 3. Pump X Spacer**
  - a. Density = 8.33 lb/gal
  - b. Volume = 10 bbl
  - c. Rate = 3 bpm
- 4. Pump X Spacer**
  - a. Density = 10.5 lb/gal
  - b. Volume = 40 bbl
  - c. Rate = 5 bpm
- 5. Pump X Spacer**
  - a. Density = 8.33 lb/gal
  - b. Volume = 10 bbl
  - c. Rate = 3 bpm
- 6. Drop Bottom Plug**
- 7. Pump X (Lead)**
  - a. Density = 12.5
  - b. Yield = 1.89
  - c. Water Requirement = 10.23
  - d. Volume = 480 sks (X bbls)
  - e. Rate = 6 bpm
- 8. Pump X (Tail)**
  - a. Density = 13.5
  - b. Yield = 1.74
  - c. Water Requirement = 8.27
  - d. Volume = 238 sks (X bbls)
  - e. Rate = 6 bpm
- 9. Drop Top Plug**
- 10. Start Displacement**
- 11. Pump Displacement Water**
  - a. Density = 9.8 lb/gal
  - b. Volume = 290.5 bbls
  - c. Rate = 6 bpm
- 12. Land Plug – Anticipated Final Circulation Pressure 2200 psi**

**Calculated Total Displacement = 290.5 bbls**



**1.4 Water Field Test**

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Item	Recorded Test Value	Units	Max. Acceptable Limit	Potential Problems in Exceeding Limit
pH	7	----	6.0 - 8.0	Chemicals in the water can cause severe retardation
Chlorides	500	ppm	3000 ppm	Can shorten thickening time of cement
Sulfates	200	ppm	1500 ppm	Will greatly decrease the strength of cement
Total Hardness	425	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	61	°F	50-80 °F	High temps will accelerate; Low temps may risk freezing in cold weather

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



## 1.5 Job Event Log

Type	Seq. No.	Activity	Graph Label	Date	Time	Source	Downhole Density (ppg)	Pass-Side Pump Pressure (psi)	Combined Pump Rate (bbl/min)	Pump Stage Total (bbl)	Comment
Event	1	Call Out	Call Out	10/31/2014	10:00:00	USER					Called crew out to be on location at 1400
Event	2	Depart Shop for Location	Depart Shop for Location	10/31/2014	13:00:00	USER					Held safety huddle before leaving for location
Event	3	Arrive At Loc	Arrive At Loc	10/31/2014	14:30:00	USER					Arrived at location and met with company man. rig still had 3000 ft to go
Event	4	Rig-up Lines	Rig-up Lines	10/31/2014	18:30:00	USER					Had a hazard hunt before spotting trucks and rigging up lines
Event	5	Safety Meeting	Safety Meeting	10/31/2014	20:30:00	USER	8.32	14.00	0.00	12.2	Held safety meeting to discuss the operation and safety
Event	6	Start Job	Start Job	10/31/2014	20:44:25	COM4	8.31	1.00	0.00	12.2	Filled lines with 2 bbl water
Event	7	Test Lines	Test Lines	10/31/2014	20:49:09	COM4	8.39	20.00	0.00	14.2	Tested lines to 4000 psi
Event	8	Pump Spacer 1	Pump Spacer 1	10/31/2014	20:57:23	COM4	8.35	3.00	0.00	0.0	Pumped 10 bbl water
Event	9	Pump Spacer 2	Pump Spacer 2	10/31/2014	21:04:07	COM4	8.39	21.00	0.00	10.2	Pumped 40 bbls clean Spacer # 10.5
Event	10	Pump Spacer 1	Pump Spacer 1	10/31/2014	21:16:58	COM4	8.77	14.00	0.00	37.3	Pumped 10 bbl water with red dye
Event	11	Drop Bottom Plug	Drop Bottom Plug	10/31/2014	21:25:00	USER	8.18	4.00	0.00	10.1	Dropped plug preloaded witnessed by company man
Event	12	Pump Lead Cement	Pump Lead Cement	10/31/2014	21:27:30	COM4	8.17	4.00	0.00	0.0	Pumped 161.57 bbl #12.5 1.89 yield, 10.23 gal/sks
Event	13	Pump Tail Cement	Pump Tail Cement	10/31/2014	21:58:41	COM4	13.35	34.00	2.30	160.5	Pumped 73.8 bbl #13.5. 1.74 yield, 8.27 gal/sks
Event	14	Drop Top Plug	Drop Top Plug	10/31/2014	22:20:00	COM4	10.25	27.00	1.90	4.3	Dropped top plug preloaded witnessed by company man
Event	15	Pump Displacement	Pump Displacement	10/31/2014	22:21:00	COM4	8.79	15.00	1.90	6.2	Pumped 290.5 bbl mud

Event	16	Bump Plug	Bump Plug	10/31/2014	23:22:33	COM4	8.13	2358.00	0.00	297.7	Bumped plug at 2200 psi held for 10 minutes and checked floats
Event	17	End Job	End Job	10/31/2014	23:32:41	COM4	8.23	15.00	0.00	297.7	
Event	18	Rig Down Lines	Rig Down Lines	10/31/2014	23:35:00	USER	8.21	15.00	0.00	297.7	Held a safety meeting before rigging down lines
Event	19	Depart Location	Depart Location	11/1/2014	12:30:00	USER					Held a safety huddle before leaving location

## 2.0 Custom Graphs

### 2.1 Custom Graph



