

HALLIBURTON

iCem[®] Service

WHITING OIL & GAS CORP - EBUS

For:

Date: Monday, March 30, 2015

WHITING ALAN #1 PLUG

WHITING ALAN #1 PLUG

Job Date: Thursday, March 19, 2015

Sincerely,

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1.0 Cementing Job Summary

1.1 Executive Summary

Halliburton appreciates the opportunity to perform the cementing services on the **Whiting Oil & Gas Alan #1** cement **Plug to abandon** 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 (24hr)
Callout:	3/19/2015	600
On Location:	3/19/2015	1100
Job Started:	3/19/2015	1500
Job Completed:	3/21/2015	1700
Departed Location:	3/21/2015	1800

1.2 Planned Pumping Schedule

Stage/ Plug #	Fluid #	Fluid Type	Fluid Name	Surface Density lbm/gal	Avg Rate bbl/min	Surface Volume
1	1	Spacer	TS III	8.33	4	
1	2	Cement Slurry	Lead Cement	15.8	3	290 sacks
1	3	Water	Displacement	8.33	4	
1	4	Mud	Displacement	8.9	4	22 bbl.

HALLIBURTON

<i>The Road to Excellence Starts with Safety</i>																							
Sold To #: 366960			Ship To #: 3653747			Primary Sales Order #: 0902241541																	
Customer: WHITING OIL & GAS CORP - EBUS						Job Purpose: 7528 CMT PLUG TO ABANDON BOM																	
Well Name: Alan			Well #: #1			API/UWI #:																	
Field:			City: NEW RAYMER			Country/Parish: WELD			State/Prov: COLORADO														
Legal Description:																							
Rig Name & Number / Phone Number: Workover / 307-677-6729									Location: LAND														
myCem id# :			Job Criticality Status: GREEN			iFacts Request id #:																	
Contacts																							
<table border="1"> <thead> <tr> <th>Type</th> <th>Name</th> <th>Email</th> <th>Phone</th> </tr> </thead> <tbody> <tr> <td>Account Rep</td> <td>Matt Evans</td> <td>Matt.Evans@Halliburton.com</td> <td>+13038994779</td> </tr> <tr> <td>Service Coordinator</td> <td>Nicholas Wilson</td> <td>Nicholas.Wilson@halliburton.com</td> <td>+13037203334</td> </tr> </tbody> </table>												Type	Name	Email	Phone	Account Rep	Matt Evans	Matt.Evans@Halliburton.com	+13038994779	Service Coordinator	Nicholas Wilson	Nicholas.Wilson@halliburton.com	+13037203334
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Account Rep	Matt Evans	Matt.Evans@Halliburton.com	+13038994779																				
Service Coordinator	Nicholas Wilson	Nicholas.Wilson@halliburton.com	+13037203334																				
PPE, Safety Huddles, JSA's, HOC & Near Miss Reporting, BBP Observations																							
Distance/Mileage(1 way)			105 mile			Distance/Mileage(1 way) Mtls:			105 mile														
Srvcs:						Rqstd Job Start Date/Time:			03/17/2015														
HSE Information																							
H2S Present:			Unknown			CO2 Present:			Unknown														
Drive Safely. Lights On for Safety. Wear Seat Belts. Observe all HES / Customer Safety Policies.																							
Directions: CR 129 & 14 turn onto CR 116 and go past the Whiting Gas Plant, Go past the Gas plant to the Old White Barn and Turn Left (North), go 1 mile to location																							
Instruction																							
Bring 18.8# of HR-5 and 18.8# of CFR-3 to mix on the Fly to the First Plug, 100# of Sugar and Tubing Sweges																							
General Equipment																							
3rd Party / Inventory Items																							
SAP Number		Description				Quantity		UoM		Pricing Enabled													
100008028		CHEM, SUGAR, GRANULATED, 50LB BAG				100		LB		Yes													
Job Info / Well Data																							
Job Depth (MD) ft		Job Depth (TVD) ft		Well Fluid Type		Well Fluid Weight lbm/gal		Displacement Fluid		Displ Fluid Weight lbm/gal													
5725				Fresh Water		8.33		Fresh Water		8.33													
BHST degF		BHCT degF		Log Temp degF				Time Since Circ Stopped HH:MM:SS															
Job Tubulars/Tools																							
Description	Size in	Weight lbm/ft	ID in	Thread	Grade	Top MD ft	Btm MD ft	Top TVD ft	Btm TVD ft	Shoe Jnt ft	% Excess												

8 5/8" Surface Casing	8.625	24	8.097			0	70				
7 7/8" Open Hole			7.875			70	5725				
2 7/8" Tubing	2.875	6.5	2.441			0	5725				
Plug 2							2000				
Plug 3							1000				
Plug 4							200				

Mud conditioning plan

The condition of the drilling fluid is one of the most important variables in achieving a cement barrier. Prior to cementing, circulate the mud at the planned highest displacement rate for the cement job for at least 2 bottoms-up until the well is clean, mud is free of gas and pump pressures have stabilized.

Materials

Stage/Plug #: 1

Fluid #	Fluid Name	Package/SBM/Material Name	Rqstd Del Qty	UOM	Density lbm/gal	Yield ft3/sack	Water Req Gal/sack	Rate bbl/min	Total Mix Fluid Gal/sack	Surface Batch Mixing Time
1	Fresh Water		18	bbl	8.33					

Fluid Loss

iFacts Test id #

Fluid #	Fluid Name	Package/SBM/Material Name	Rqstd Del Qty	UOM	Density lbm/gal	Yield ft3/sack	Water Req Gal/sack	Rate bbl/min	Total Mix Fluid Gal/sack	Surface Batch Mixing Time hr
2	G Cement	Premium Cement	100	sack	15.8	1.15	4.97	5	4.97	

94 lbm Premium Cement Pre-Mix Dry

0.20 % CFR-3 Mix-On-Fly to Slurry

0.20 % HR-5 Mix-On-Fly to Slurry

4.97 Gal FRESH WATER Mix-On-Fly to Slurry

iFacts Test id # 2226827

Fluid #	Fluid Name	Package/SBM/Material Name	Rqstd Del Qty	UOM	Density lbm/gal	Yield ft3/sack	Water Req Gal/sack	Rate bbl/min	Total Mix Fluid Gal/sack	Surface Batch Mixing Time
3	Fresh Water		2	bbl	8.33					

Fluid Loss

iFacts Test id #

Stage/Plug #: 2

Fluid #	Fluid Name	Package/SBM/Material Name	Rqstd Del Qty	UOM	Density lbm/gal	Yield ft3/sack	Water Req Gal/sack	Rate bbl/min	Total Mix Fluid Gal/sack	Surface Batch Mixing Time
1	Fresh Water		18	bbl	8.33					
Fluid Loss										
iFacts Test id #										
Fluid #	Fluid Name	Package/SBM/Material Name	Rqstd Del Qty	UOM	Density lbm/gal	Yield ft3/sack	Water Req Gal/sack	Rate bbl/min	Total Mix Fluid Gal/sack	Surface Batch Mixing Time hr
2	G Cement	Premium Cement	90	sack	15.8	1.15	5	5	5	
94 lbm		Premium Cement Pre-Mix Dry								
5 Gal		FRESH WATER Mix-On-Fly to Slurry								
iFacts Test id #										
Fluid #	Fluid Name	Package/SBM/Material Name	Rqstd Del Qty	UOM	Density lbm/gal	Yield ft3/sack	Water Req Gal/sack	Rate bbl/min	Total Mix Fluid Gal/sack	Surface Batch Mixing Time
3	Fresh Water		2	bbl	8.33					
Fluid Loss										
iFacts Test id #										
Stage/Plug #: 3										
Fluid #	Fluid Name	Package/SBM/Material Name	Rqstd Del Qty	UOM	Density lbm/gal	Yield ft3/sack	Water Req Gal/sack	Rate bbl/min	Total Mix Fluid Gal/sack	Surface Batch Mixing Time
1	Fresh Water		18	bbl	8.33					
Fluid Loss										
iFacts Test id #										
Fluid #	Fluid Name	Package/SBM/Material Name	Rqstd Del Qty	UOM	Density lbm/gal	Yield ft3/sack	Water Req Gal/sack	Rate bbl/min	Total Mix Fluid Gal/sack	Surface Batch Mixing Time hr
2	G Cement	Premium Cement	40	sack	15.8	1.15	5	5	5	
94 lbm		Premium Cement Pre-Mix Dry								
5 Gal		FRESH WATER Mix-On-Fly to Slurry								
iFacts Test id #										
Fluid #	Fluid Name	Package/SBM/Material Name	Rqstd Del Qty	UOM	Density lbm/gal	Yield ft3/sack	Water Req Gal/sack	Rate bbl/min	Total Mix Fluid Gal/sack	Surface Batch

	Material Name	Del Qty		lbm/gal	sack	Gal/sack	bbl/min	Fluid Gal/sack	Mixing Time	
3	Fresh Water	2	bbl	8.33						
Fluid Loss										
iFacts Test id #										
Stage/Plug #: 4										
Fluid #	Fluid Name	Package/SBM/Material Name	Rqstd Del Qty	UOM	Density lbm/gal	Yield ft3/sack	Water Req Gal/sack	Rate bbl/min	Total Mix Fluid Gal/sack	Surface Batch Mixing Time
1	Fresh Water		0	bbl	8.33					
Fluid Loss										
iFacts Test id #										
Fluid #	Fluid Name	Package/SBM/Material Name	Rqstd Del Qty	UOM	Density lbm/gal	Yield ft3/sack	Water Req Gal/sack	Rate bbl/min	Total Mix Fluid Gal/sack	Surface Batch Mixing Time hr
2	G Cement	Premium Cement	60	sack	15.8	1.15	5	5	5	
94 lbm		Premium Cement Pre-Mix Dry								
5 Gal		FRESH WATER Mix-On-Fly to Slurry								
iFacts Test id #										
Fluid #	Fluid Name	Package/SBM/Material Name	Rqstd Del Qty	UOM	Density lbm/gal	Yield ft3/sack	Water Req Gal/sack	Rate bbl/min	Total Mix Fluid Gal/sack	Surface Batch Mixing Time
3	Fresh Water		0	bbl	8.33					
Fluid Loss										
iFacts Test id #										
Caution: Displacement quantities and densities are estimates ONLY! Do not use them for the actual job.										
Packaged Materials										
SAP #	Material	Qty	UOM	Comments						
100003653	CFR-3	18.8	lbm							
100005050	HR-5	18.8	lbm							
	FRESH WATER	1447	Gal							
Casing Equipment										

Pre-Job Customer Review Risk Assessment for Call Sheet:

The following risks must be reviewed and discussed with the Customer Representative before the job. If all of the steps of the listed Mitigation Plans or Contingency Plans cannot be followed, conducting a Management of Change (reference ST-GL-HAL-HMS-712) invoking your Stop Work Authority (reference ST-GL-HAL-HSE-0612) may be appropriate. Contact the Halliburton office to discuss how to resolve any issues, including whether Contingency Plans can be applied or whether you should exercise your Stop Work Authority so that any changes can be managed with the Customer.

Reminder: You are empowered to exercise Stop Work Authority any time (reference ST-GL-HAL-HSE-0612), even before contacting the Halliburton office.

Note: This pre-job customer review risk assessment does not replace the need to complete and review the job specific JSA's.

1.3 Job Overview

Job OverView			
		Units	Description
1	Surface temperature at time of job	°F	50
2	Mud type (OBM, WBM, SBM, Water, Brine)	-	WBM
3	Actual mud density	lb/gal	9.4
4	Time circulated before job	HH:MM	100
5	Mud volume circulated	bbls	240
6	Rate at which well was circulated	bpm	4
7	Pipe movement during circulation	Y/N	N
8	Rig pressure while circulating	psi	80
9	Time from end mud circulation to start of job	HH:MM	8
10	Pipe movement during cementing	Y/N	N
11	Calculated displacement	bbls	NA
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	0
17	Was lost circulation experienced at any time?	Y/N	N

1.4 Water Field Test

Cement Mix Water Requirements

Item	Recorded Test Value	Max Acceptable Limin	Potential Problems in Exceeding Limit
pH	7	5 to 8.5	Chemicals in water can cause severe retardation
Chlorides	0	3000 mg/L	Can accelerate the set time on cement 1% ~ 4800 mg/L
Sulfates	<200	1500 mg/L	Will greatly decrease its strength to the point where it may not set up at all
Total Hardness or Alkalinity	12	500 mg/L	Will retard cement and decrease its strength (only occurs @ pH ≥ 8.3)
Calcium		500 mg/L	High concentrations will accelerate the set of cement
Bicarbonates		1000 mg/L	Will greatly decrease its strength to the point where it may not set up at all
Iron	0	300 mg/L	High concentrations will accelerate the set of cement
Potassium		5000 ppm	High concentrations will accelerate the set of cement
Water Temp	60	50F to 80F	High temps will accelerate; Low temps may risk freezing in cold weather

Notes:

1. High concentrations of Carbonates and Bicarbonates may also cause slurry gelation in some situations
2. If the water's pH is greater than or equal to 8, avoid using it since Magnesium may be present (there are not field test strips for Magnesium)

Submitted Respectfully by:

2.0 Real-Time Job Summary

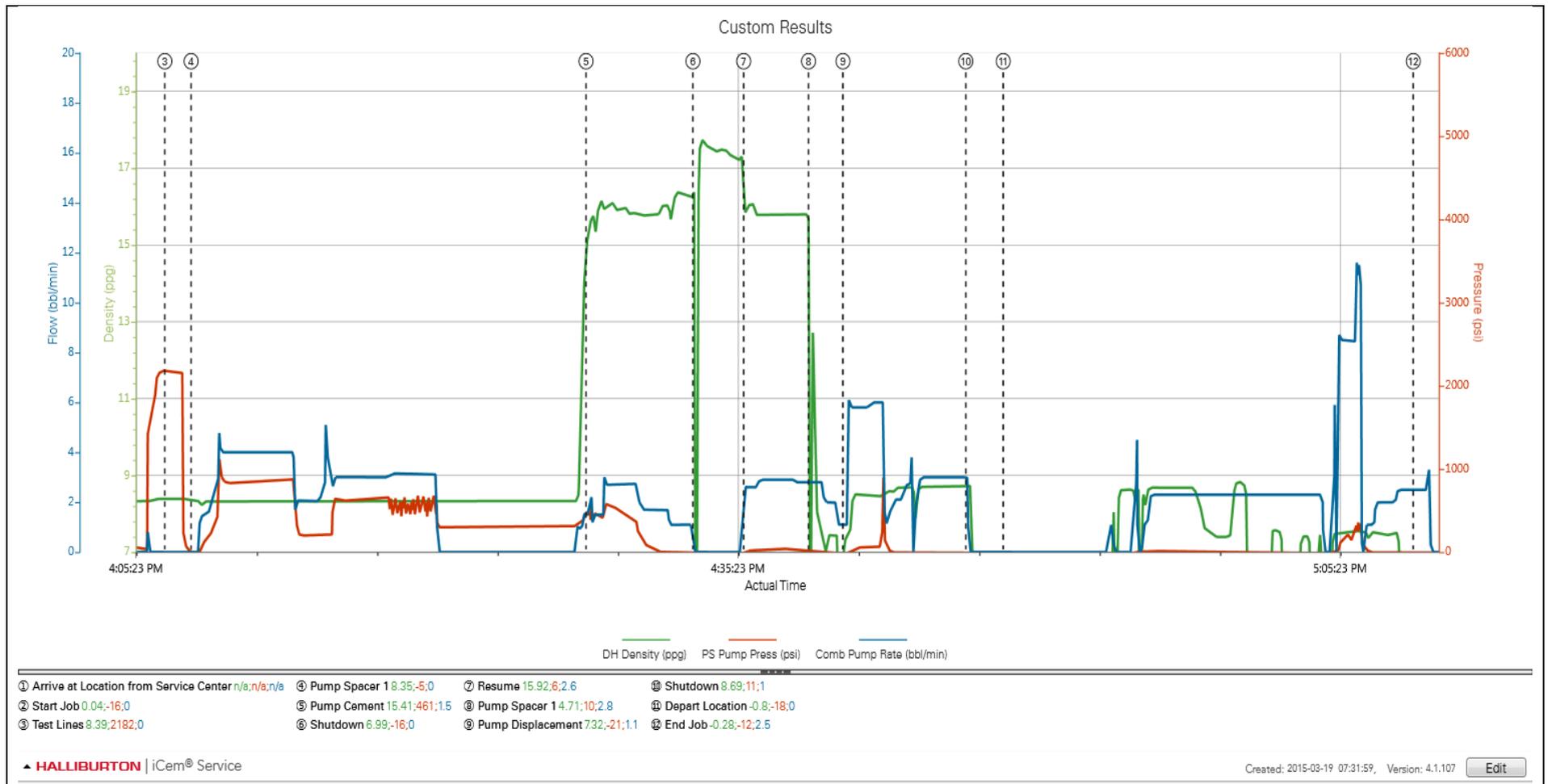
2.1 Job Event Log

Type	Seq. No.	Activity	Graph Label	Date	Time	Source	Comb Pump Rate (bbl/min)	DH Density (ppg)	PS Pump Press (psi)	Comments
Event	1	Arrive at Location from Service Center	Arrive at Location from Service Center	3/19/2015	10:30:00	USER				ARRIVE AT LOCATION. WIRELINE RIGGING UP TO LOG. PERFORM PRE JOB SAFETY MEETING AND SITE ASSESSMENT WITH CREW.
Event	2	Start Job	Start Job	3/19/2015	16:04:07	COM4	0.00	0.04	-16.00	HELD PRE JOB SAFETY MEETING WITH ALL PRESENT PERSONELL.
Event	3	Test Lines	Test Lines	3/19/2015	16:06:55	COM4	0.00	8.39	2182.00	PRESSURE TEST LINES TO 2000 PSI.
Event	4	Pump Spacer 1	Pump Spacer 1	3/19/2015	16:08:13	COM4	0.00	8.35	-5.00	PUMP 30 BBLS FRESH WATER.
Event	5	Pump Cement	Pump Cement	3/19/2015	16:27:54	COM4	1.50	15.41	461.00	PUMP 20 BBLS (100 SKS) G CEMENT WITH 19 LBS CFR 3 AND 19 LBS HR5 ADDED TO MIX WATER.
Event	6	Shutdown	Shutdown	3/19/2015	16:33:14	USER	0.00	6.99	-16.00	SHUT DOWN TO GAIN PRESSURE ON BULK TRUCK.
Event	7	Resume	Resume	3/19/2015	16:35:46	USER	2.60	15.92	6.00	CONTINUE PUMPING CEMENT.
Event	8	Pump Spacer 1	Pump Spacer 1	3/19/2015	16:38:59	COM4	2.80	4.71	10.00	PUMP 3.5 BBLS FRESH WATER BEHIND.
Event	9	Pump Displacement	Pump Displacement	3/19/2015	16:40:42	COM4	1.10	7.32	-21.00	PUMP 22 BBLS MUD DISPLACEMENT TO BALANCE.
Event	10	Shutdown	Shutdown	3/19/2015	16:46:50	USER	1.00	8.69	11.00	SHUTDPOWN RELEASE PRESSURE.

Event	11	Depart Location	Depart Location	3/19/2015	16:48:42	USER	0.00	-0.80	-18.00	JOURNEY MGMNT PRIOR TO LEAVING. REQUESTED BACK AT 0900 HRS 3-20-15.
Event	12	End Job	End Job	3/19/2015	17:09:08	COM4	2.50	-0.28	-12.00	PERFORM PRE RIG DOWN SAFETY MEETING PRIOR TO RIGGING DOWN LINES.

3.0 Attachments

3.1 WHITING ALAN #1 PLUG-Custom Results.png

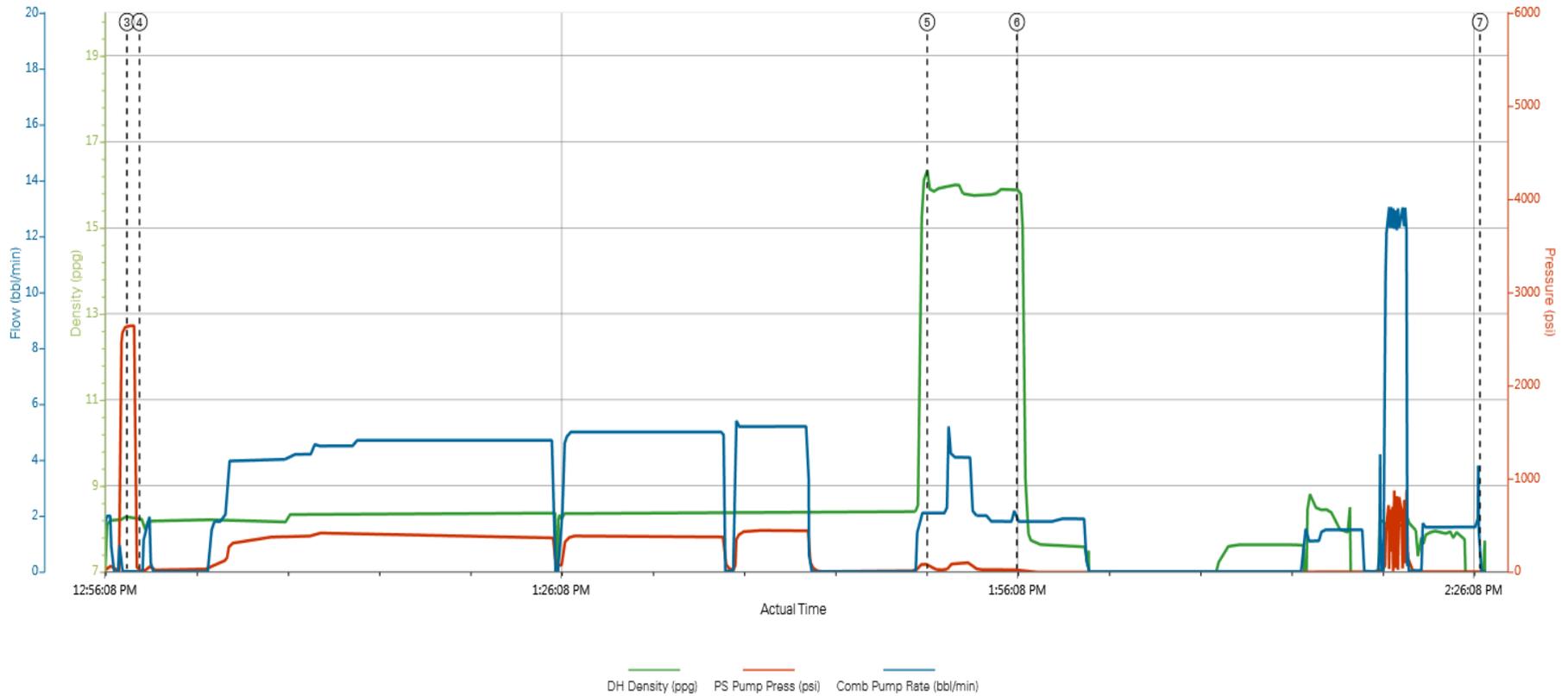


4.0 Real-Time Job Summary

Type	Seq. No.	Activity	Graph Label	Date	Time	Source	Comb Pump Rate (bbl/min)	DH Density (ppg)	PS Pump Press (psi)	Comments
Event	1	Arrive at Location from Service Center	Arrive at Location from Service Center	3/20/2015	08:30:00	USER				ARRIVE AT LOCATION. RIG RUNNING IN TO TAG PREVIOUS PLUG. TGGED PLUG AT 5460 @ 0900.
Event	2	Start Job	Start Job	3/20/2015	12:55:39	COM4	0.00	8.43	-1.00	TUBING PULLED TO 2000'. PERFORM PRE JOB SAFETY MEETING WITH ALL PRESENT PERSONELL PRIOR TO JOB
Event	3	Test Lines	Test Lines	3/20/2015	12:57:43	COM4	0.00	8.28	2640.00	TEST LINES TO 2500 PSI
Event	4	Pump Spacer 1	Pump Spacer 1	3/20/2015	12:58:32	COM4	0.00	8.23	2.00	PUMP 178 BBLS FRESH WATER TO DISPLACE MUD FROM HOLE.
Event	5	Pump Cement	Pump Cement	3/20/2015	13:50:20	COM4	2.10	15.96	57.00	PUMP 18 BBLS (90 SKS) G CEMENT MIXED AT 15.8 PPG USING SUPPLIED WATER. DENSITY VERIFIED BY SCALE.
Event	6	Pump Displacement	Pump Displacement	3/20/2015	13:56:15	COM4	1.80	15.89	18.00	PUMP 8 BBLS DISPLACEMENT TO BALANCE.
Event	7	End Job	End Job	3/20/2015	14:26:42	COM4	0.00	7.09	-1.00	PERFORM PRE RIG DOWN SAFETY MEETING PRIOR TO RIGGING DOWN LINES.
Event	8	Depart Location	Depart Location	3/20/2015	15:00:00	USER				JOURNEY MGMNT BEFORE LEAVING

4.1 WHITING ALAN #1 PLUG 2-Custom Results.png

Custom Results



- ① Arrive at Location from Service Center n/a;n/a;n/a
- ② Start Job 8.43;-1;0
- ③ Test Lines 8.28;2640;0
- ④ Pump Spacer 18.23;2;0
- ⑤ Pump Cement 15.96;57;2.1
- ⑥ Pump Displacement 15.89;18;1.8
- ⑦ End Job 7.09;-1;0
- ⑧ Depart Location n/a;n/a;n/a

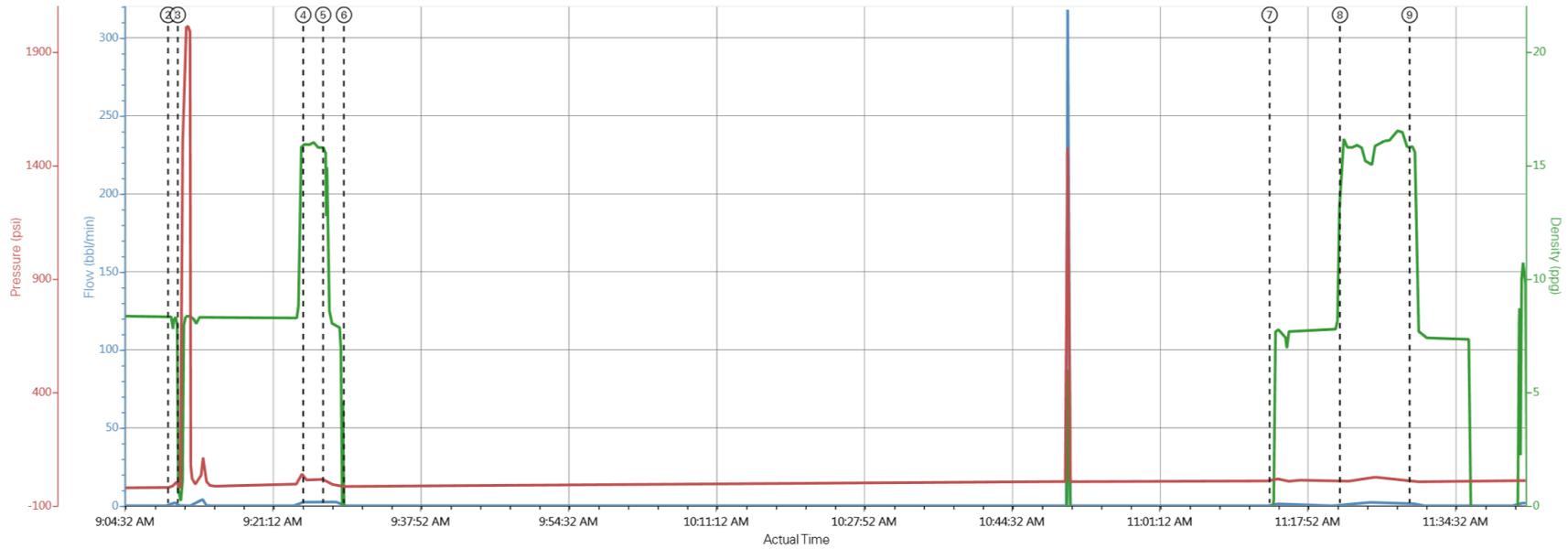
5.0 Real-Time Job Summary

5.1 Job Event Log

Type	Seq. No.	Activity	Graph Label	Date	Time	Source	Comb Pump Rate (bbl/min)	DH Density (ppg)	PS Pump Press (psi)	Comments
Event	1	Arrive at Location from Service Center	Arrive at Location from Service Center	3/21/2015	08:30:00	USER				ARRIVE AT LOCATION. RIG TRIPPING OUT TO 1000 FT. PERFORM SITE ASSESSMENT WITH CREW.
Event	2	Start Job	Start Job	3/21/2015	09:09:39	COM4	0.00	8.33	-19.00	PERFORM PRE JOB SAFETY MEETING WITH ALL PERSONELL PRIOR TO JOB.
Event	3	Test Lines	Test Lines	3/21/2015	09:10:45	COM4	0.00	0.20	-23.00	PRESSURE TEST LINES TO 2000 PSI.
Event	4	Pump Cement	Pump Cement	3/21/2015	09:24:53	COM4	2.30	15.87	12.00	TUBING SET AT 1000' PUMP 8 BBLs (40 SKS) G CEMENT MIXED AT 15.8 PPG USING SUPPLIED WATER. DENSITY VERIFIED BY SCALE.
Event	5	Pump Displacement	Pump Displacement	3/21/2015	09:27:08	COM4	2.40	15.21	10.00	PUMP 3.5 BBLs DISPLACEMENT TO BA,LANCE.
Event	6	Shutdown	Shutdown	3/21/2015	09:29:28	USER	0.00	-0.42	-14.00	SHUTDOWN. RIG PULLS OUT OF HOLE. NIPPLES DOWN BOP AND RAN TUBING INTO 190 FT.
Event	7	Pump Spacer 1	Pump Spacer 1	3/21/2015	11:13:50	COM4	0.00	-0.50	9.00	PUMP 5 BBLs WATER TO FILL HOLE AND BREAK CIRCULATION

Event	8	Pump Cement	Pump Cement	3/21/2015	11:21:46	COM4	1.10	15.63	9.00	PUMP 12 BBLS (60 SKS) G CEMENT MIXED AT 15.8 PPG USING SUPPLIED WATER. DENSITY VERIFIED BY SCALE.
Event	9	Pump Displacement	Pump Displacement	3/21/2015	11:29:37	COM4	1.30	15.83	11.00	PUMP 1/2 BBLS TO CLEAR LINES.
Event	10	End Job	End Job	3/21/2015	11:52:54	COM4	0.00	-0.88	11.00	PERFORM PRE RIG DOWN SAFETY MEETING PRIOR TO RIGGING DOWN LINES.
Event	11	Depart Location	Depart Location	3/21/2015	13:00:00	USER				JOURNEY MGMNT PRIOR TO LEAVING.

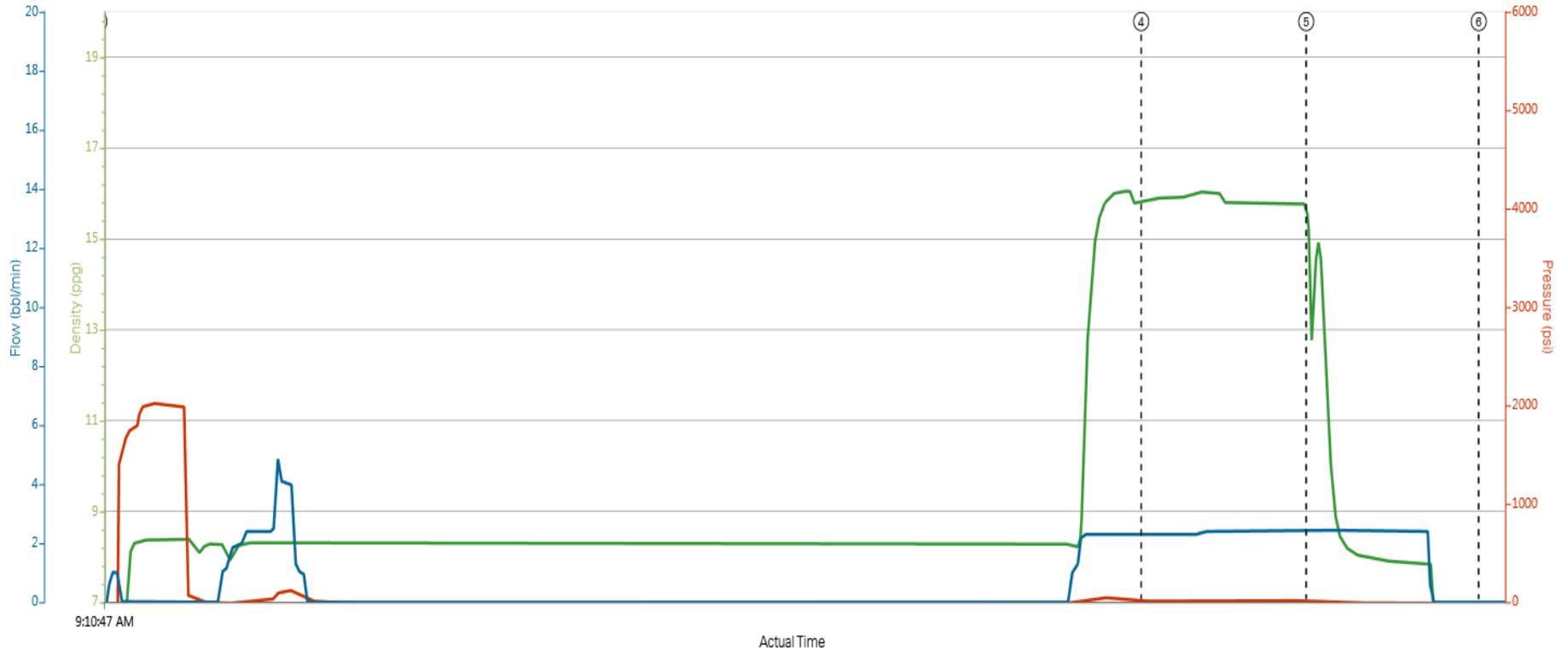
WHITING ALAN #1 PLUG 3 & 4



Comb Pump Rate (bbl/min) DH Density (ppg) PS Pump Press (psi)

- ① Arrive at Location from Service Center n/a,n/a,n/a ④ Pump Cement 2.3;15.87;12 ⑦ Pump Spacer 1 0;-0.5;9 ⑩ End Job 0;-0.88;11
- ② Start Job 0;8.33;-19 ⑤ Pump Displacement 2.4;15.21;10 ⑧ Pump Cement 1.1;15.63;9 ⑪ Depart Location n/a,n/a,n/a
- ③ Test Lines 0;0.2;-23 ⑥ Shutdown 0;-0.42;-14 ⑨ Pump Displacement 1.3;15.83;11

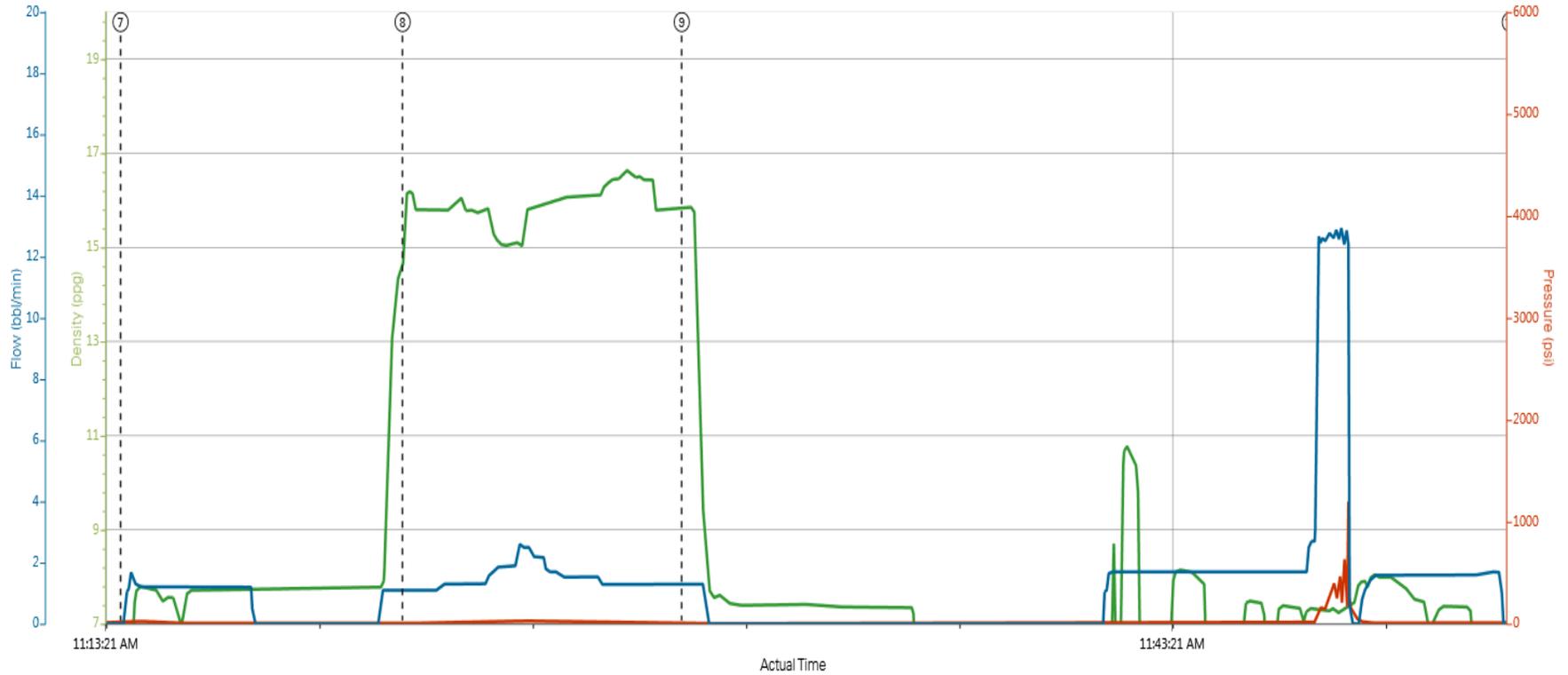
Custom Results



DH Density (ppg) PS Pump Press (psi) Comb Pump Rate (bbl/min)

- ① Arrive at Location from Service Center n/a;n/a;n/a
- ② Start Job 8.33;-19;0
- ③ Test Lines 0.2;-23;0
- ④ Pump Cement 15.87;12;2.3
- ⑤ Pump Displacement 15.21;10;2.4
- ⑥ Shutdown -0.42;-14;0
- ⑦ Pump Spacer 1 -0.5;9;0
- ⑧ Pump Cement 15.63;9;1.1
- ⑨ Pump Displacement 15.83;11;1.3
- ⑩ End Job -0.88;11;0
- ⑪ Depart Location n/a;n/a;n/a

Custom Results



DH Density (ppg) PS Pump Press (psi) Comb Pump Rate (bbl/min)

- ① Arrive at Location from Service Center n/a;n/a;n/a
- ② Start Job 8.33;-19;0
- ③ Test Lines 0.2;-23;0
- ④ Pump Cement 15.87;12;2.3
- ⑤ Pump Displacement 15.21;10;2.4
- ⑥ Shutdown -0.42;-14;0
- ⑦ Pump Spacer 1-0.5;9;0
- ⑧ Pump Cement 15.63;9;1.1
- ⑨ Pump Displacement 15.83;11;1.3
- ⑩ End Job -0.88;11;0
- ⑪ Depart Location n/a;n/a;n/a