

# HALLIBURTON

iCem<sup>®</sup> Service

## **FOUNDATION ENERGY MGMT**

Date: Friday, June 27, 2014

### **GreenWildcat 1-10 2 stage production**

FOUNDATION ENERGY GREEN WILDCAT 1-10

Sincerely,  
**KEN BROOM**

Table of Contents

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1.1	Executive Summary	3
1.2	Planned Pumping Schedule	4
1.3	Job Overview	7
1.4	Job Event Log	8
2.0	Custom Graphs	10
2.1	Custom Graph	10
3.0	Appendix	11

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**1.1 Executive Summary**

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Halliburton appreciates the opportunity to perform the cementing services on the **Green Wildcat 1-10 cement 2 Stage** 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.

According to the iCem chart the pressure reading drops when they start the event **Pump Displacement**. We had issues pulling the chart from the truck but the density and rate read correctly.

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>	6/11/2014	09:00:00	MT
<b>On Location</b>	6/11/2014	14:00:00	MT
<b>Job Started</b>	6/11/2014	15:38:40	MT
<b>Job Completed</b>	6/12/2014	00:47:39	MT
<b>Departed Location</b>	6/12/2014	01:30:00	MT

**1.2 Planned Pumping Schedule**

<i>The Road to Excellence Starts with Safety</i>					
Sold To #: <b>360766</b>		Ship To #: <b>3142025</b>		Primary Sales Order #: <b>0901422918</b>	
Customer: <b>FOUNDATION ENERGY MGMT</b>			Job Purpose: <b>392189 CMT MULTIPLE STAGES BOM</b>		
Well Name: <b>GREEN</b>			Well #: <b>1-10</b>	API/UWI #: <b>05-123-35755-00</b>	
Field: <b>WILDCAT</b>		City: <b>NEW RAYMER</b>		Country/Parish: <b>WELD</b>	State/Prov: <b>COLORADO</b>
Legal Description:					
Rig Name & Number / Phone Number: <b>Excel # 3 / 970-630-4243</b>				Location: <b>LAND</b>	
myCem id# :		Job Criticality Status: <b>GREEN</b>		iFacts Request id #:	
<b>Contacts</b>					
Type	Name		Email		Phone
<b>Company Man</b>					
<b>Account Rep</b>	<b>Adam McKay</b>		<b>Adam.McKay@halliburton.com</b>		<b>+17204750054</b>
<b>Service Coordinator</b>	<b>Ryan Wyckoff</b>		<b>Ryan.Wyckoff@halliburton.com</b>		<b>+17205386044</b>
<i>PPE, Safety Huddles, JSA's, HOC &amp; Near Miss Reporting, BBP Observations</i>					
Distance/Mileage(1 way)		<b>80 mile</b>		Distance/Mileage(1 way) <b>80 mile</b>	
Srvcs:				Mtls:	
				Rqstd Job Start Date/Time: <b>06/10/2014</b>	
<b>HSE Information</b>					
H2S Present:		<b>Unknown</b>		CO2 Present: <b>Unknown</b>	
<b>Drive Safely. Lights On for Safety. Wear Seat Belts. Observe all HES / Customer Safety Policies.</b>					
Directions:					
Go North on Hwy 85 to Hwy 14, Take Hwy 14 East to CR 105, South on CR 105 to CR 86, Turn East - 2 miles to the entrance of location (on the south side of the road), follow road 3/4 miles to location. There are Rig signs to follow.					
<b>Instruction</b>					
<b>Job Info / Well Data</b>					
Job Depth (MD) ft	Job Depth (TVD) ft	Well Fluid Type	Well Fluid Weight lbm/gal	Displacement Fluid	Displ Fluid Weight lbm/gal
<b>7100</b>				<b>Water</b>	<b>8.33</b>
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	600				
5-1/2" Production Casing	5.5	15.5	4.95			0	7100			45	
7-7/8" Open Hole			7.875			600	7100				
Multi stage cementer							5000				

**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 ft <sup>3</sup> /sack	Water Req Gal/sack	Rate bbl/min	Total Mix Fluid Gal/sack	Surface Bat Mixing Time
	11 lb/gal Tuned Spacer III		40	bbl	11	6.69	36.7			

19.55 lbm/bbl Barite

Facts Test id #

Fluid #	Fluid Name	Package/SBM/Material Name	Rqstd Del Qty	UOM	Density lbm/gal	Yield ft <sup>3</sup> /sack	Water Req Gal/sack	Rate bbl/min	Total Mix Fluid Gal/sack	Surface Bat Mixing Time hr
	FracCem	FRACCEM (TM) SYSTEM	215	sack	13.5	1.81	8.52	4	8.52	

Facts 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	Water		167.9	bbl	8.33					

**if** Facts 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
	11 lb/gal Tuned Spacer III		40	bbl	11	6.69	36.7			

19.55 lbm/bbl Barite

Facts 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
	EconoCem	ECONOCEM (TM) SYSTEM	520	sack	12.7	1.89	9.97	4	9.97	

Facts 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
	Premium G	HALCEM (TM) SYSTEM	50	sack	15.8	1.15	4.96	4	4.96	

Facts 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
	Water		119	bbl	8.33					

Facts 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
	<b>FRESH WATER</b>	<b>22250.0</b>	<b>Gal</b>	
Casing Equipment				
Inventory Materials				

**1.3 Job Overview**

		Units	Description
<b>1</b>	Surface temperature at time of job	°F	68
<b>2</b>	Mud type (OBM, WBM, SBM, Water, Brine)	-	Water
<b>3</b>	Actual mud density	lb/gal	
<b>4</b>	Time circulated before job	HH:MM	
<b>5</b>	Mud volume circulated	Bbls	
<b>6</b>	Rate at which well was circulated	Bpm	
<b>7</b>	Pipe movement during hole circulation	Y/N	N
<b>8</b>	Rig pressure while circulating	Psi	
<b>9</b>	Time from end mud circulation to start of job	HH:MM	
<b>10</b>	Pipe movement during cementing	Y/N	N
<b>11</b>	Calculated displacement	Bbls	171.5 1 <sup>st</sup> , 120 2 <sup>nd</sup>
<b>12</b>	Job displaced by	Rig/HES	HES
<b>13</b>	Annular before job)?	Y/N	
<b>14</b>	Annular flow after job	Y/N	Y
<b>15</b>	Length of rat hole	Ft	
<b>16</b>	Units of gas detected while circulating	Units	
<b>17</b>	Was lost circulation experienced at any time ?	Y/N	N

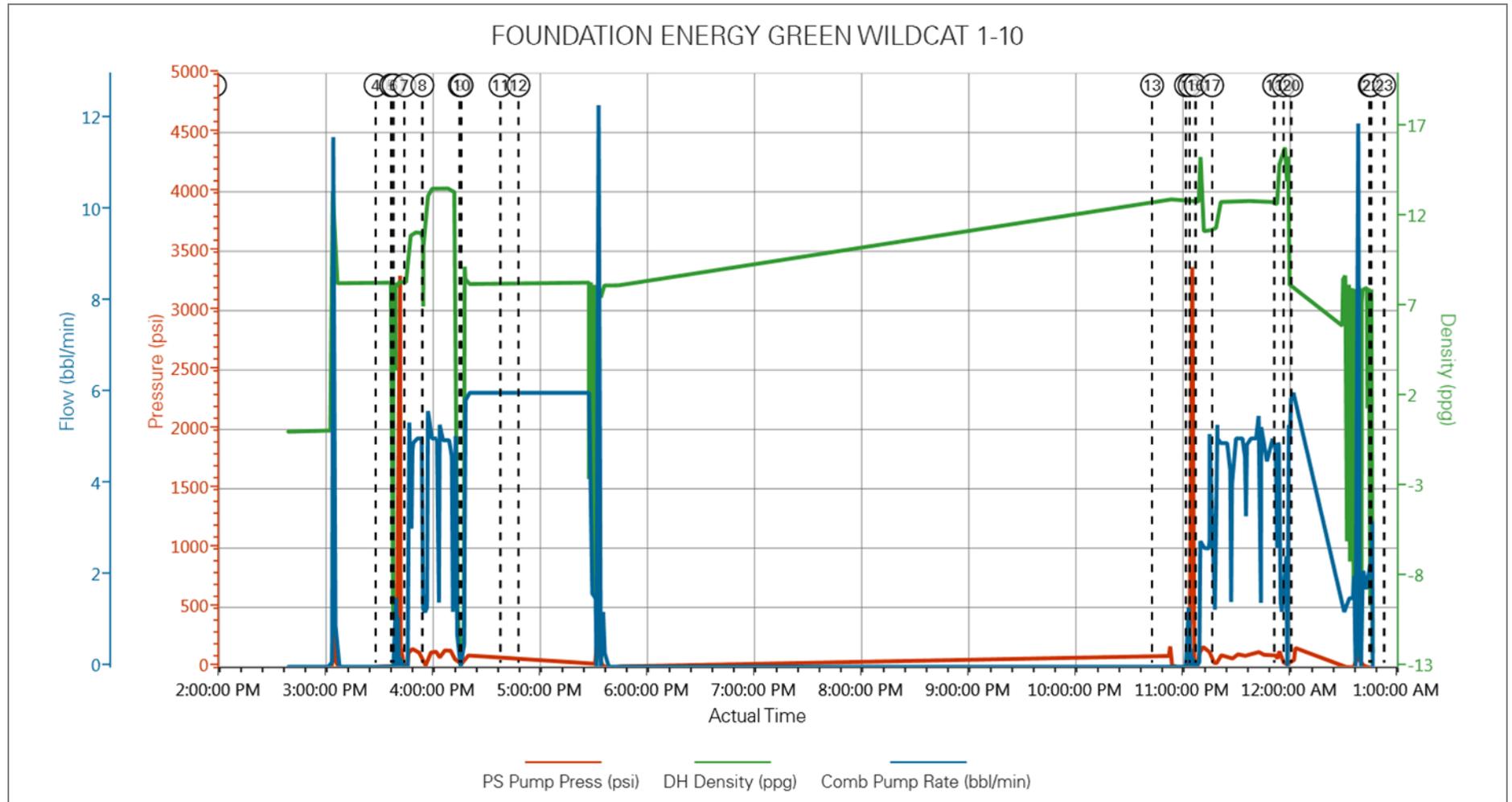
**1.4 Job Event Log**

Type	Seq. No.	Activity	Graph Label	Date	Time	Source	Pass-Side Pump Pressure (psi)	Downhole Density (ppg)	Combined Pump Rate (bbl/min)	Comment
Event	1	Call Out	Call Out	6/11/2014	09:00:00	USER				Called out crew for 2 stage production
Event	2	Depart from Service Center or Other Site	Depart from Service Center or Other Site	6/11/2014	12:00:00	USER				Held safety meeting before departing for location
Event	3	Arrive At Loc	Arrive At Loc	6/11/2014	14:00:00	USER				Held hazard hunt and met with company man before rigging up
Event	4	Safety Meeting	Safety Meeting	6/11/2014	15:30:00	USER	-1.00	8.42	0.00	Held safety meeting with crew to discuss saety and job procedure
Event	5	Start Job	Start Job	6/11/2014	15:38:40	COM4	4.00	8.38	0.00	Start job and fill lines for testing
Event	6	Test Lines	Test Lines	6/11/2014	15:40:02	COM4	30.00	8.41	0.00	Test lines to 3500 psi
Event	7	Pump Spacer 1	Pump Spacer 1	6/11/2014	15:46:12	COM4	138.00	8.78	2.70	Pumped 40 bbls spacer 11# 6.69 yield 36.7 gal/sks
Event	8	Pump Lead Cement	Pump Lead Cement	6/11/2014	15:56:10	COM4	6.00	12.28	1.20	Pumped 69.3 bbls fraccem 215 sks 13.5# 1.81yield 8.52 gal\sks
Event	9	Drop Top Plug	Drop Top Plug	6/11/2014	16:17:11	COM4	24.00	-11.97	0.00	Dropped plug witnessed by company man
Event	10	Pump Displacement	Pump Displacement	6/11/2014	16:18:08	COM4	98.00	8.44	5.80	Pumped 171 bbls fresh water
Event	11	Pressure Up	Pressure Up	6/11/2014	16:40:00	USER				Pressured up to open tool, opened at 500 psi
Event	12	End Job	End Job	6/11/2014	16:50:00	COM4				End first stage wait for second stage
Event	13	Safety Meeting	Safety Meeting	6/11/2014	22:45:00	USER				Safety meeting with rig crew to discuss operations and safety during the job
Event	14	Start Job	Start Job	6/11/2014	23:04:00	COM4	157.00	12.95	1.30	Filled lines with 1 bbl water
Event	15	Test Lines	Test Lines	6/11/2014	23:06:00	USER	2953.00	13.11	0.00	Pressured up and tested lines

Event	16	Pump Spacer 1	Pump Spacer 1	6/11/2014	23:09:19	COM4	9.00	12.82	1.30	Pumped 40bbls Spacer#11 6.69 yield 36.7 gal/sks
Event	17	Pump Lead Cement	Pump Lead Cement	6/11/2014	23:18:36	COM4	19.00	11.44	1.30	Pumped 175bbls lead cement
Event	18	Pump Tail Cement	Pump Tail Cement	6/11/2014	23:53:22	COM4				Pumped 10.24 bbls tail cement
Event	19	Drop Top Plug	Drop Top Plug	6/11/2014	23:58:36	COM4				Dropped plug preloaded witnessed by company man
Event	20	Pump Displacement	Pump Displacement	6/12/2014	00:02:57	COM4	150.00	8.07	6.00	Pumped 120 bbls displacement
Event	21	Bump Plug	Bump Plug	6/12/2014	00:46:52	USER				Bumped plug
Event	22	Pressure Up	Pressure Up	6/12/2014	00:47:39	USER				Pressured up on and held lines
Event	23	Safety Meeting - Pre Rig-Down	Safety Meeting - Pre Rig- Down	6/12/2014	00:55:00	USER				Held safety huddle befoer leaving the location
Event	24	Depart Location	Depart Location	6/12/2014	01:30:00	USER				left location

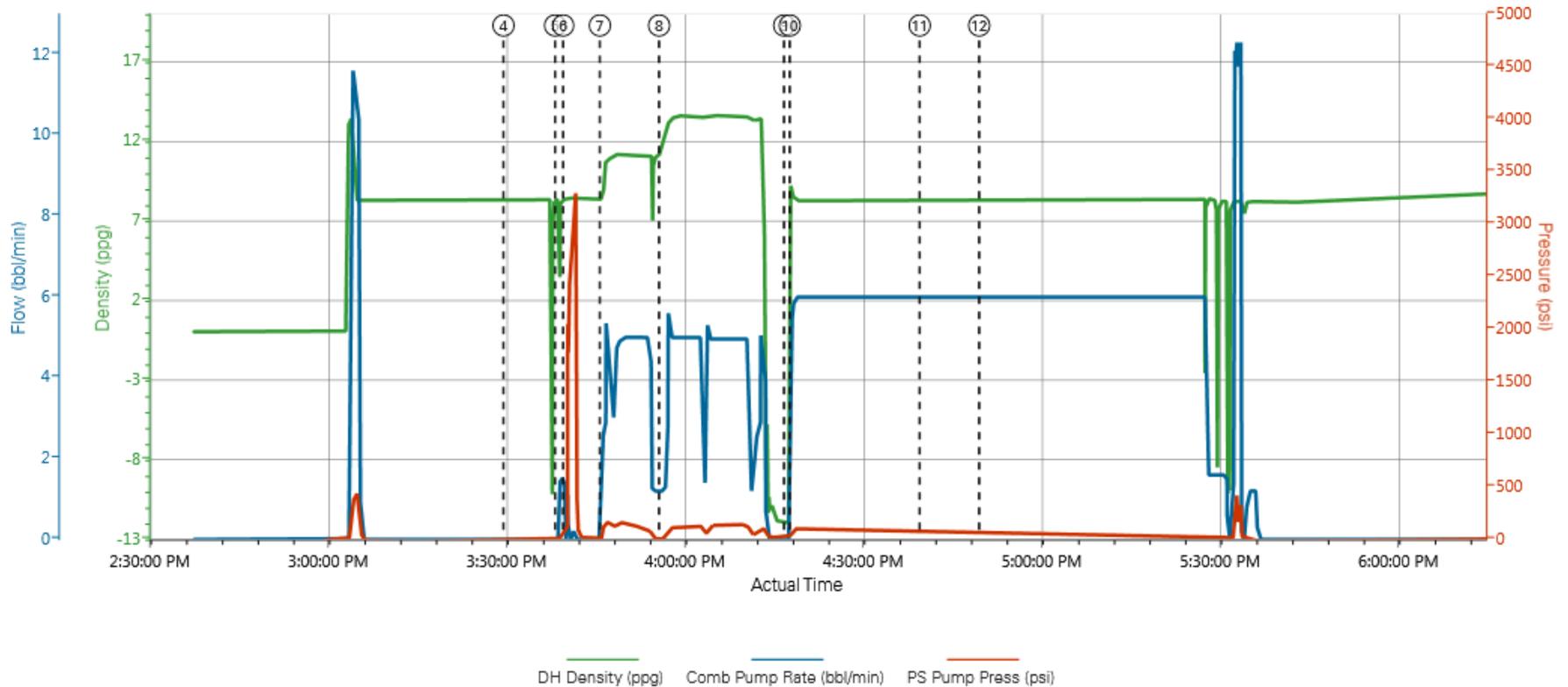
2.0 Custom Graphs

2.1 Custom Graph



3.0 Appendix

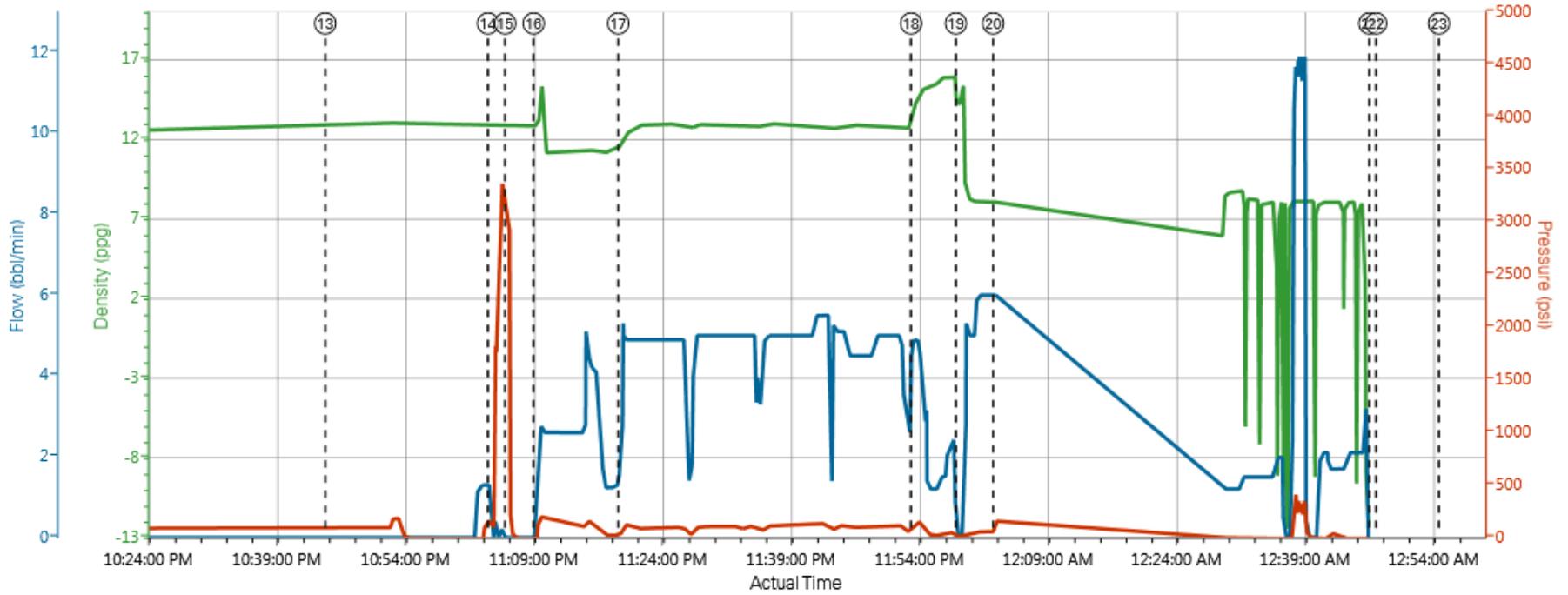
FOUNDATION ENERGY GREEN WILDCAT 1-10



- ③ Arrive At Loc n/a;n/a;n/a    ⑤ Start Job 8.38;0;4    ⑦ Pump Spacer 1 8.78;2.7;138    ⑨ Drop Top Plug -11.97;0;24    ⑪ Pressure Up 8.36;6;92    ⑬ Safety Meeting 13.12;0;54.35    ⑮ Test Line
- Site n/a;n/a;n/a    ④ Safety Meeting 8.42;0;-1    ⑥ Test Lines 8.41;0;30    ⑧ Pump Lead Cement 12.28;1.2;6    ⑩ Pump Displacement 8.44;5.8;98    ⑫ End Job 8.36;6;92    ⑭ Start Job 12.95;1.3;157    ⑯ Pump S

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FOUNDATION ENERGY GREEN WILDCAT 1-10



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

Pressure Up 8.36;6.92 13 Safety Meeting 13.12;0;54.35 15 Test Lines 13.11;0;2953 17 Pump Lead Cement 11.83;2.6;52 19 Drop Top Plug 14.28;0;4.37 21 Bump Plug n/a;n/a;n/a 23 Safety Meeting - Pre  
 End Job 8.36;6.92 14 Start Job 12.95;1.3;157 16 Pump Spacer 11.82;1.3;9 18 Pump Tail Cement 14.07;4.9;130.26 20 Pump Displacement 8.07;6;150 22 Pressure Up n/a;n/a;n/a 24 Depart Location n/a;