

HALLIBURTON

iCem[®] Service

CYNOSURE ENERGY LLC - EBUS

For: Kevin O'Connell

Date: Wednesday, September 02, 2015

SHAVETAIL FEDERAL 28-44

Production

Job Date: Thursday, August 27, 2015

Sincerely,

Vernal Cement PSL

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Table of Contents

1.0	Cementing Job Summary	4
1.1	Executive Summary	4
1.2	Planned Pumping Schedule	5
1.3	Water Field Test.....	6
2.0	Real-Time Job Summary	7
2.1	Job Event Log	7
3.0	Attachments.....	10
3.1	Pressure Test.png	10
3.2	Spacer and Cement.png.....	11
3.3	Displacement.png	12
3.4	Job Chart.png.....	13

1.0 Cementing Job Summary

1.1 Executive Summary

Halliburton appreciates the opportunity to perform the cementing services on the **Shavetail Federal 28-44** 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.

1. **Quality of circulation before and during the job was full**
2. **The final circulating pressure was 1997 psi**
3. **40 bbls of Spacer and 70 bbls of Cement was returned to surface**
4. **A flare was not present during the job**

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 Vernal

Job Times

	Date	Time	Time Zone
Requested Time On Location:	8-26-15	1000	MTN
Called Out Time:	8-26-15	0400	MTN
Arrived On Location At:	8-26-15	1000	MTN
Job Started At:	8-26-15	1240	MTN
Job Completed At:	8-26-15	1431	MTN
Departed Location At:	8-26-15	1610	MTN

1.2 Planned Pumping Schedule

<u>CAPSTAR 314</u>						
Pre-Planned Job Procedure Single Stage Production						
EVENT	EVENT	VOLUME	SACKS	WEIGHT	YIELD	GAL/ SK
1	Start Job		Density Over Rate			
	Fill Lines	2				
6	Test Lines	5000				
9	Tuned Spacer III	40	40	10	8.86	60
13	Lead Cement	122.0	250	11.5	2.74	16.75
15	Tail Cement	139.8	665	15.6	1.18	5.19
	Shutdown/Clean lines					
22	Displacement	72.6		Mud Wt.	9.7	
1085	Slow Rate	63		Casing	4.5	11.6
	Release Psi / Job Over	2500 PSI			4.5	
26	Bump Plug	1652		Disp Fluid	8.4	
	Check Floats	+ 500 PSI		Surface @	529	
2	End Job					

1.3 Water Field Test

Item	Recorded 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	200	ppm	3000 ppm	Can shorten thickening time of cement
Sulfates	<200	ppm	1500 ppm	Will greatly decrease the strength of cement
Total Hardness		ppm	500 ppm	High concentrations will accelerate the set of the cement
Calcium	100	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	200	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	67	°F	50-80 °F	High temps will accelerate; Low temps may risk freezing in cold weather

2.0 Real-Time Job Summary

2.1 Job Event Log

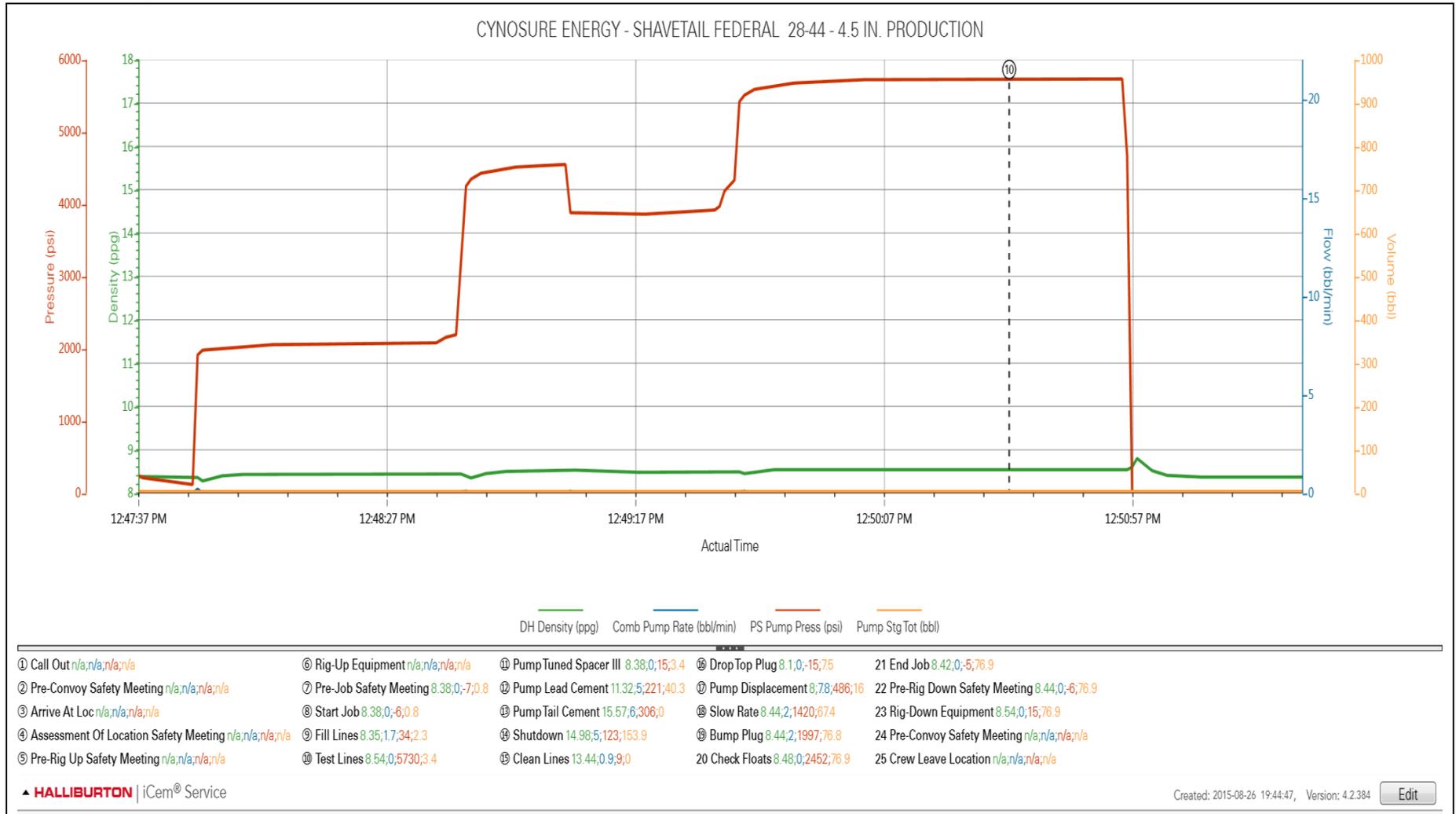
Type	Seq. No.	Activity	Graph Label	Date	Time	Source	DH Density <i>(ppg)</i>	Comb Pump Rate <i>(bbl/min)</i>	PS Pump Press <i>(psi)</i>	Pump Stg Tot <i>(bbl)</i>	Comments
Event	1	Call Out	Call Out	8/27/2015	04:00:00	USER					
Event	2	Pre-Convoy Safety Meeting	Pre-Convoy Safety Meeting	8/27/2015	06:00:00	USER					WITH HES, 1 F-550 PICKUP, 1 ELITE CEMENTING UNIT, BULK TRUCKS DISPATCHED FROM VERNAL, UT
Event	3	Arrive At Loc	Arrive At Loc	8/27/2015	10:00:00	USER					RIG ON BOTTOM CIRCULATING, UPON HES ARRIVAL, ALL EQUIPMENT ON LOCATION
Event	4	Assessment Of Location Safety Meeting	Assessment Of Location Safety Meeting	8/27/2015	10:20:00	USER					WITH HES
Event	5	Pre-Rig Up Safety Meeting	Pre-Rig Up Safety Meeting	8/27/2015	10:30:00	USER					WITH HES
Event	6	Rig-Up Equipment	Rig-Up Equipment	8/27/2015	10:40:00	USER					1 LINE RAN TO THE FLOOR, 1 LINE RAN TO THE PIT, WASH-UP MANIFOLD BUILT ON THE GROUND, 1 4.5 IN QUICKLATCH PLUG CONTAINER
Event	7	Pre-Job Safety Meeting	Pre-Job Safety Meeting	8/27/2015	12:15:00	USER	8.38	0.00	-7.00	0.8	WITH HES, CYNOSURE, AND CAPSTAR 314
Event	8	Start Job	Start Job	8/27/2015	12:40:13	USER	8.38	0.00	-6.00	0.8	TD 4730FT, TP 4719 FT, CSG 4.5 IN 11.6 LB/FT I-80, SHOE 36.90 FT, HOLE 7.875 IN, SURFACE

											SET AT 529 FT, 8.625 IN 24 LB/FT J-55, RIG CIRCULATING AT 6.5 BBL/MIN, 231 PSI
Event	9	Prime Pumps	Fill Lines	8/27/2015	12:44:06	USER	8.35	1.70	34.00	2.3	FRESH WATER
Event	10	Test Lines	Test Lines	8/27/2015	12:50:32	COM8	8.54	0.00	5730.00	3.4	LOW TEST AT 2412 PSI, HIGH TEST AT 5522 PSI, PRESSURE HOLDING
Event	11	Pump Spacer 1	Pump Tuned Spacer III	8/27/2015	12:56:01	COM8	8.38	0.00	15.00	3.4	MIXED AT 10.0 LB/GAL, 40 BBL, 8.86 FT3/SK, 60.8 GAL/SK, DENSITY VERIFIED USING PRESSURIZED MUD SCALES
Event	12	Pump Lead Cement	Pump Lead Cement	8/27/2015	13:06:16	COM8	11.32	5.00	221.00	40.3	MIXED AT 11.5 LB/GAL, 250 SKS, 2.75 FT3/SK, 16.75 GAL/SK, DENSITY VERIFIED USING PRESSURIZED MUD SCALES
Event	13	Pump Tail Cement	Pump Tail Cement	8/27/2015	13:32:58	COM8	15.57	6.00	306.00	0.0	MIXED AT 15.6 LB/GAL, 665 SKS, 1.18 GAL/SK, 5.19 FT3/SK, DENSITY VERIFIED USING PRESSURIZED MUD SCALES
Event	14	Shutdown	Shutdown	8/27/2015	14:01:46	USER	14.98	5.00	123.00	153.9	
Event	15	Clean Lines	Clean Lines	8/27/2015	14:03:11	USER	13.44	0.90	9.00	0.0	WASHED PUMPS AND LINES TO THE RESERVE PIT
Event	16	Drop Top Plug	Drop Top Plug	8/27/2015	14:06:25	USER	8.10	0.00	-15.00	7.5	PLUG LAUNCHED
Event	17	Pump Displacement	Pump Displacement	8/27/2015	14:10:38	COM8	8.00	7.80	486.00	16.0	FRESH WATER WITH 10 GAL CLA-WEB, 15 GAL OILPERM FMM-1 ADDED

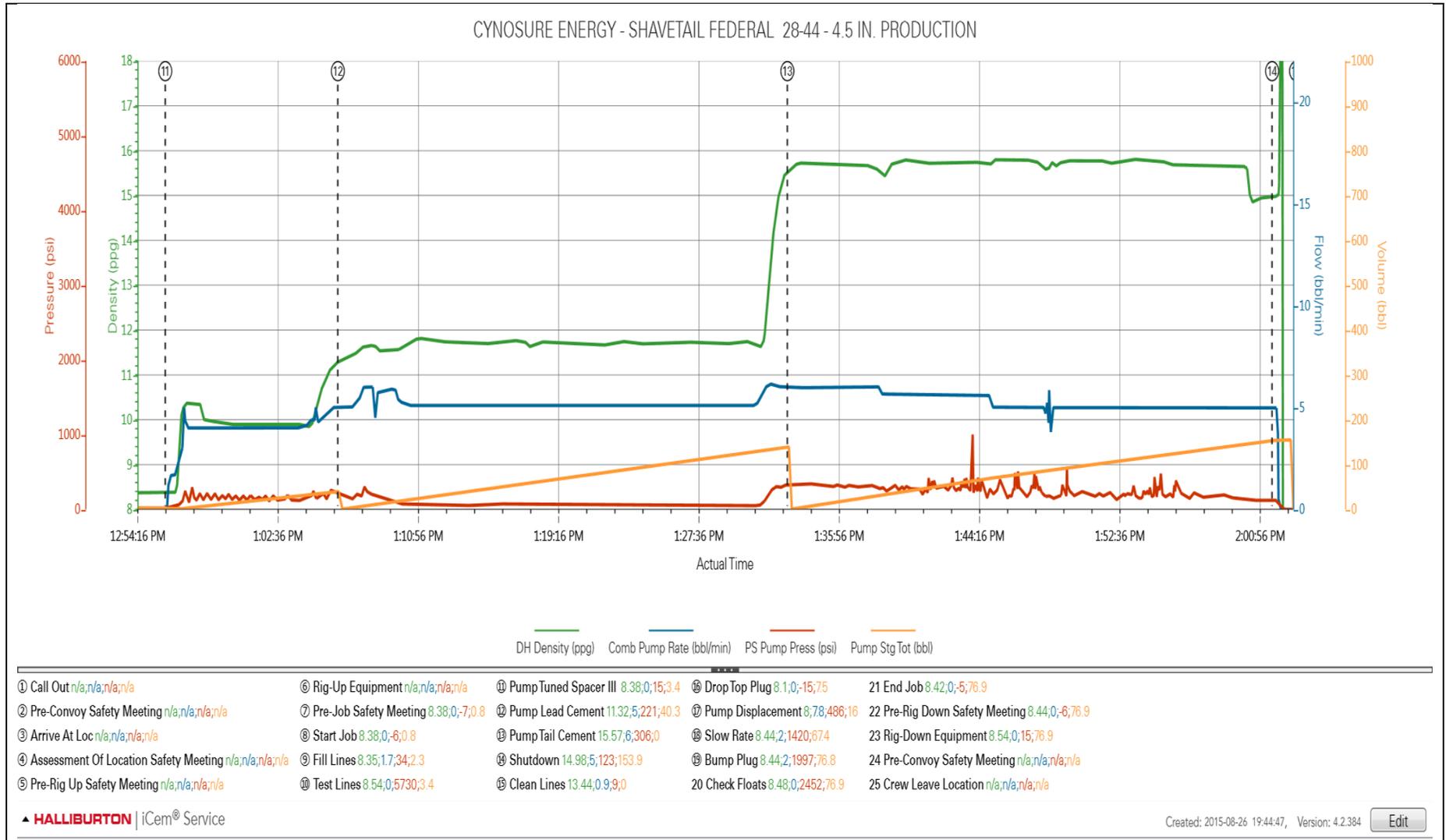
Event	18	Slow Rate	Slow Rate	8/27/2015	14:18:22	USER	8.44	2.00	1420.00	67.4	SLOWED AT 63 BBL AWAY
Event	19	Bump Plug	Bump Plug	8/27/2015	14:23:02	COM8	8.44	2.00	1997.00	76.8	PLUG BUMPED AT CALCULATED DISPLACEMENT
Event	20	Check Floats	Check Floats	8/27/2015	14:27:50	USER	8.48	0.00	2452.00	76.9	FLOATS HOLDING, 1 BBL RETURNED TO THE TRUCK
Event	21	End Job	End Job	8/27/2015	14:31:11	USER	8.42	0.00	-5.00	76.9	GOOD CIRCULATION, PIPE WAS STATIC, RIG USED 120 LBS SUGAR, NO ADD HOURS CHARGED
Event	22	Pre-Rig Down Safety Meeting	Pre-Rig Down Safety Meeting	8/27/2015	14:40:00	USER	8.44	0.00	-6.00	76.9	WITH HES
Event	23	Rig-Down Equipment	Rig-Down Equipment	8/27/2015	14:50:00	USER	8.54	0.00	15.00	76.9	
Event	24	Pre-Convoy Safety Meeting	Pre-Convoy Safety Meeting	8/27/2015	16:00:00	USER					WITH HES
Event	25	Crew Leave Location	Crew Leave Location	8/27/2015	16:10:00	USER					THANKS FOR USING HALLIBURTON, JOHN KEANE AND CREW

3.0 Attachments

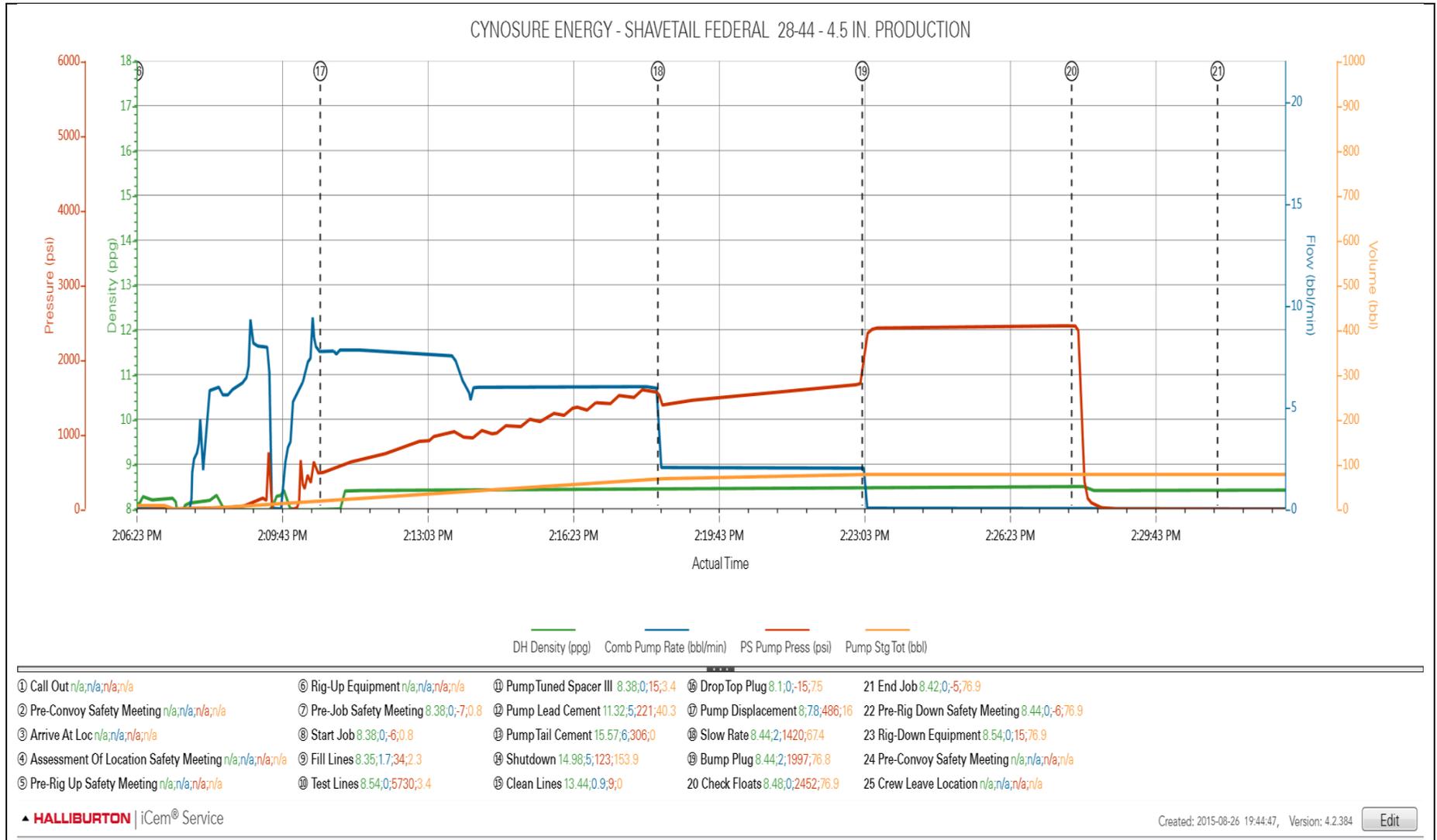
3.1 Pressure Test.png



3.2 Spacer and Cement.png



3.3 Displacement.png



3.4 Job Chart.png

