

# HALLIBURTON

iCem<sup>®</sup> Service

## **TERRA ENERGY PARTNERS**

Rock Springs District, Colorado

### **For: H&P 318**

Date: Wednesday, February 26, 2020

### **Federal RWF 431-12 Surface**

API # 05-045-24274

Job Date: Wednesday, February 26, 2020

Sincerely,

**Rock Springs Engineering**

## Legal Notice

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### Disclaimer:

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## 1.0 Cementing Job Summary

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### 1.1 Executive Summary

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Halliburton appreciates the opportunity to perform the cementing services for this cementing services 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, Rock Springs

#### Job Times

	Date	Time	Time Zone
<b>Called Out</b>	02/26/2020	0400	MST
<b>On Location</b>	02/26/2020	1000	MST
<b>Job Started</b>	02/26/2020	1341	MST
<b>Job Completed</b>	02/26/2020	1423	MST
<b>Departed Location</b>	02/26/2020	1530	MST

## 1.2 Planned Pumping Schedule

Description	Stage No.	Density (ppg)	Rate (bbl/min)	Yield (ft <sup>3</sup> /sack)	Water Req. (gal/sack)	Volume (bbl)	Bulk Cement (sacks)	Duration (min)
TEP Surface Mud	1	8.40	4.00			0.00		0.00
Fresh Water Spacer	2	8.33	8.00			20.00		2.50
VariCem GJ1 Lead Q3 2018 2500622/1	3	12.30	8.00	2.3787	13.772	52.96	125.00	6.62
VariCem GJ1 Tail Q3 2018 2500623/1	4	12.80	8.00	2.1124	11.779	56.44	150.00	7.05
Top Plug/Start Displacement								
Fresh Water Displacement	5-1	8.33	10.00			55.50		5.55
Fresh Water Displacement	5-2	8.33	2.00			20.00		10.00
<b>Total:</b>						<b>204.90</b>		<b>31.72</b>

1.3 Water Analysis Report

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**CEMENT MIX WATER REQUIREMENTS**

Item	Recorded Test Value	Units	Max. Acceptable Limit	Potential Problems in Exceeding Limit
pH	6.5	----	6.0 - 8.0	Chemicals in the water can cause severe retardation
Chlorides	<200	ppm	3000 ppm	Can shorten thickening time of cement
Temperature	78	°F	50-80 °F	High temps will accelerate; Low temps may risk freezing in cold weather

## 2.0 Real-Time Job Summary

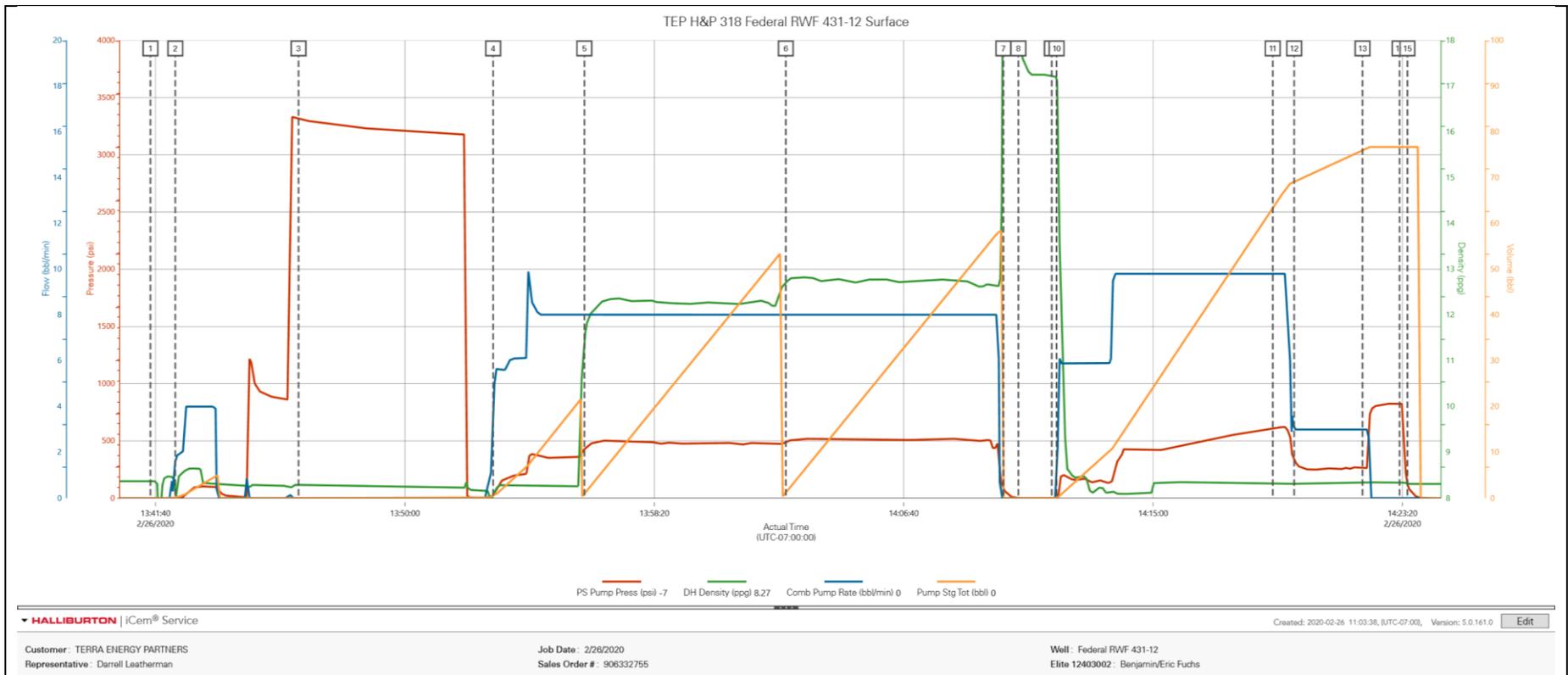
### 2.1 Job Event Log

Type	Seq. No.	Graph Label	Date	Time	Source	PS Pump Press <i>(psi)</i>	DH Density <i>(ppg)</i>	Comb Pump Rate <i>(bbl/min)</i>	Pump Stg Tot <i>(bbl)</i>	Comments
Event	1	Call Out	2/26/2020	04:00:00	USER					
Event	2	Pre Journey	2/26/2020	09:15:00	USER					Discuss all travel related safety issues with crew
Event	3	Leave Staging Area	2/26/2020	09:30:00	USER					
Event	4	Arrive at Job	2/26/2020	10:00:00	USER					Meet with customer Darrell Leatherman and get numbers. 9.625" 36 lb casing set at 1045', 13.5" hole at 1052', 9.5 ppg WBM in the hole, 18" Conductor set at 100', 44' Shoe Joint. Mud properties: PV 17@120, YP 15, Gels 6/16/50. Water Test: pH 6.5, Temp 78, Cl <200. Rig was running casing when we arrived on location.
Event	5	Site Assement	2/26/2020	10:05:00	USER					Identify and discuss all hazards with the crew
Event	6	Spot Equipment	2/26/2020	10:10:00	USER					Use spotters and radios
Event	7	Pre Rig Up	2/26/2020	10:15:00	USER					Discuss all rig up related safety issues with crew
Event	8	Rig Up	2/26/2020	10:30:00	USER					
Event	9	Pre Job	2/26/2020	13:00:00	USER	-7.00	8.43	0.00	0.00	Discuss all job related safety issues and pump schedule with customer, crew, and rig crew.
Event	10	Start Job	2/26/2020	13:41:30	USER	-7.00	8.37	0.00	0.00	
Event	11	Fill Lines	2/26/2020	13:42:20	USER	-7.00	8.10	1.60	0.10	5 bbls water
Event	12	Pressure Test	2/26/2020	13:46:27	USER	3314.00	8.29	0.00	0.10	Low and high pressure tests
Event	13	Pump Water	2/26/2020	13:52:57	USER	24.00	8.07	3.40	0.40	20 bbls
Event	14	Pump Lead Cement	2/26/2020	13:56:00	USER	427.00	11.42	8.00	0.90	53 bbls lead cement 12.3 ppg, 2.38 cuft/sk, 13.74 gal/sk 125 sks. 41 bbls water needed.
Event	15	Pump Tail Cement	2/26/2020	14:02:44	USER	492.00	12.71	8.00	1.20	57 bbls cement 12.8 ppg, 2.11 cuft/sk, 11.74 gal/sk, 150 sks. 42 bbls water needed.

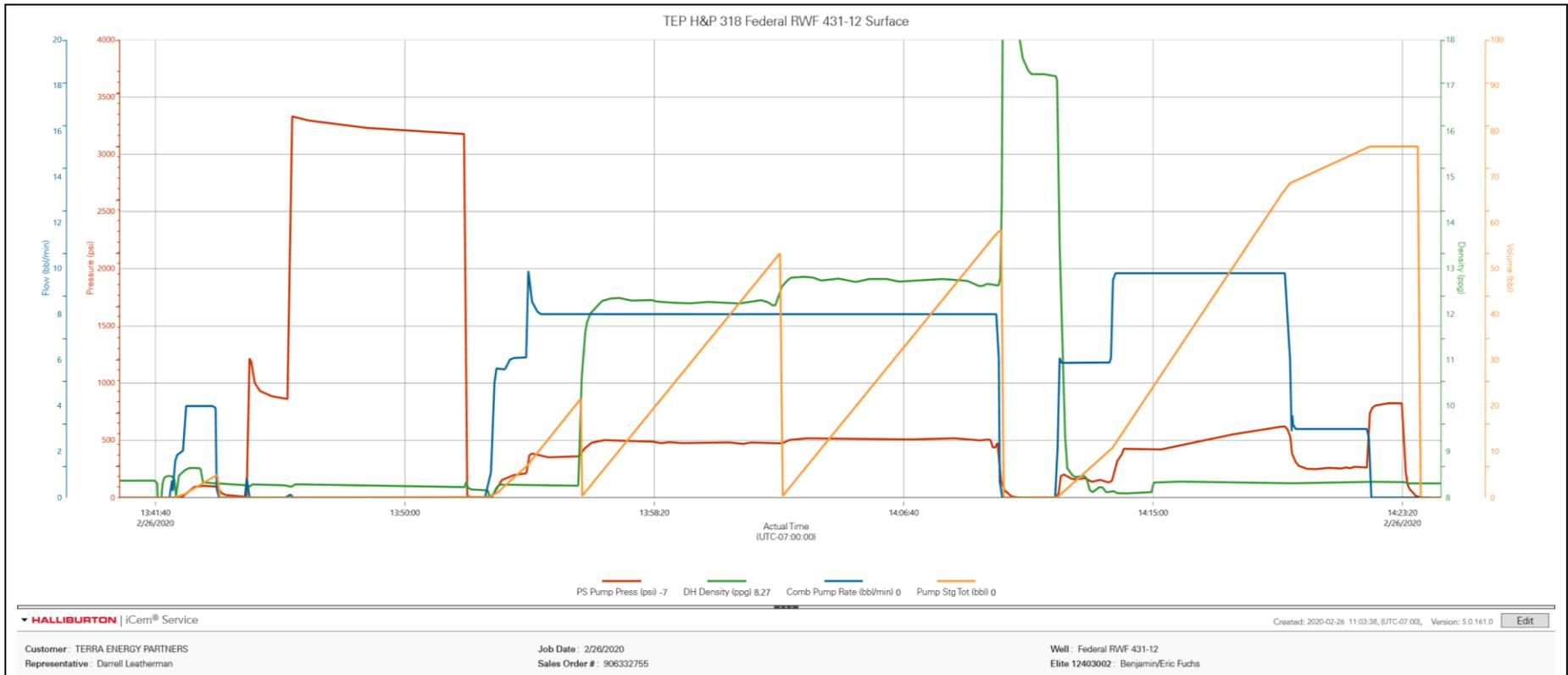
Event	16	Shutdown	2/26/2020	14:10:00	USER	86.00	20.99	0.00	0.00	Shutdown to drop plug
Event	17	Clean Lines	2/26/2020	14:10:30	USER	-2.00	18.21	0.00	0.00	Wash up on top of the plug.
Event	18	Drop Top Plug	2/26/2020	14:11:37	USER	-7.00	17.20	0.00	0.00	Customer to witness and verify.
Event	19	Pump Displacement	2/26/2020	14:11:47	USER	-6.00	17.20	1.20	0.00	78 bbls Water 8.33 ppg
Event	20	Cement Returns to Surface	2/26/2020	14:19:00	USER	608.00	8.33	9.80	63.30	40 bbls of cement to surface.
Event	21	Slow Rate	2/26/2020	14:19:43	USER	341.00	8.32	3.00	69.20	Last 10 bbls
Event	22	Bump Plug	2/26/2020	14:22:00	USER	274.00	8.33	3.00	76.10	222 psi differential, 442 psi to lift pipe,
Event	23	Check Floats	2/26/2020	14:23:14	USER	824.00	8.34	0.00	76.70	Floats held. .5 bbls back
Event	24	End Job	2/26/2020	14:23:30	USER	122.00	8.31	0.00	76.70	
Event	25	Total Fluid Volumes	2/26/2020	14:25:00	USER	-7.00	8.31	0.00	0.00	Spacer: 20 Lead: 53 Tail: 57 Displacement: 78
Event	26	Items to return	2/26/2020	14:26:00	USER	-7.00	8.30	0.00	0.00	100 lbs sugar
Event	27	Pre Rig Down	2/26/2020	14:30:00	USER	-7.00	8.25	0.00	0.00	Discuss all rig up related safety issues with crew
Event	28	Rig Down	2/26/2020	14:45:00	USER					
Event	29	Pre Journey	2/26/2020	15:15:00	USER					Discuss all travel related safety issues with crew
Event	30	Leave Job	2/26/2020	15:30:00	USER					Thank you for your business! Benjamin Fuchs and crew.

## 3.0 Attachments

### 3.1 Job Chart.png



3.2 Job Chart No Events.png



3.3 Pressure Test.png

