

HALLIBURTON

iCem[®] Service

TERRA ENERGY PARTNERS

Rock Springs District, Colorado

For: H&P 318

Date: Tuesday, February 25, 2020

Federal RWF 524-1 Production

API# 05-045-24278

Job Date: Tuesday, February 25, 2020

Sincerely,

Rock Springs Engineering

Legal Notice

Disclaimer:

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1.0 Cementing Job Summary

1.1 Executive Summary

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
Called Out	2/25/20	630	MST
On Location	2/25/20	1200	MST
Job Started	2/25/20	1710	MST
Job Completed	2/25/20	1905	MST
Departed Location	2/25/20	2000	MST

1.2 Job Overview

		Units	Description
1	Surface temperature at time of job	°F	32
2	Mud type (OBM, WBM, SBM, Water, Brine)	lb/gal	wbm
3	Actual mud density	lb/gal	12.9
4	Time circulated before job	HH:MM	01:30
5	Mud volume circulated	Bbls	855
6	Rate at which well was circulated	Bpm	9.5
7	Pipe movement during hole circulation	Y/N	y
8	Rig pressure while circulating	Psi	965
9	Time from end mud circulation to start of job	HH:MM	00:45
10	Pipe movement during cementing	Y/N	y
11	Calculated displacement	Bbls	145
12	Job displaced by	Rig/HES	hes
13	Annular flow before job	Y/N	n
14	Annular flow after job	Y/N	n
15	Length of rat hole	Ft	7
16	Units of gas detected while circulating	Units	0
17	Was lost circulation experienced at any time ?	Y/N	n

1.3 Planned Pumping Schedule

Description	Stage No.	Density (ppg)	Rate (bbl/min)	Yield (ft ³ /sack)	Water Req. (gal/sack)	Volume (bbl)	Bulk Cement (sacks)	Duration (min)
10 lb/gal Base Production Mud	1	10.00	8.00			0.00		0.00
Water	2	8.33	6.00			10.00		1.67
Mud Flush	3	8.40	6.00			20.00		3.33
ThermaCem TEP Deep Tail (2591582/1)	4	13.30	8.00	1.7943	8.498	399.48	1250.00	49.93
Top Plug/Start Displacement								
Water - 0.1 gal/bbl MMCR, 0.1 gal/bbl BE-6	5	8.40	10.00			10.00		1.00
Water - 0.1 gal/bbl BE-6	6	8.40	10.00			20.00		2.00
Water	7-1	8.33	10.00			95.00		9.50
Water	7-2	8.33	4.00			21.10		5.27
Total:						575.58		72.71

1.4 Water Analysis Report

CEMENT MIX WATER REQUIREMENTS

Item	Recorded Test Value	Units	Max. Acceptable Limit	Potential Problems in Exceeding Limit
pH	6.9	----	6.0 - 8.0	Chemicals in the water can cause severe retardation
Chlorides	<200	ppm	3000 ppm	Can shorten thickening time of cement
Temperature	62	°F	50-80 °F	High temps will accelerate; Low temps may risk freezing in cold weather

2.0 Real-Time Job Summary

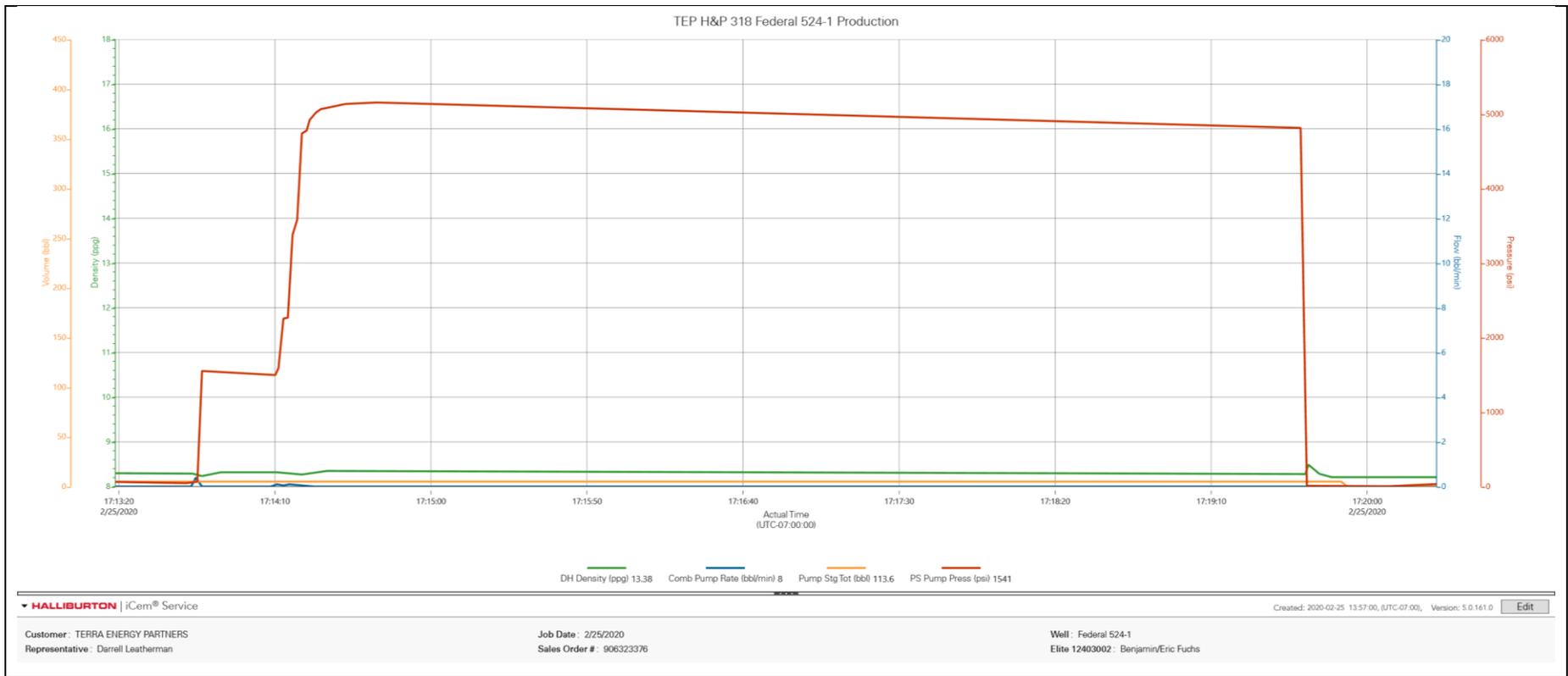
2.1 Job Event Log

Type	Seq. No.	Graph Label	Date	Time	Source	DH Density (ppg)	Comb Pump Rate (bbl/min)	Pump Stg Tot (bbl)	PS Pump Press (psi)	Comments
Event	1	Call Out	2/25/2020	06:30:00	USER					
Event	2	Pre Journey	2/25/2020	08:15:00	USER					Discuss all travel related safety issues with crew
Event	3	Leave Yard	2/25/2020	08:30:00	USER					Stage in Parachute until 5:30. Small location.
Event	4	Arrive at Job	2/25/2020	12:00:00	USER					Meet with customer Darrell Leatherman and get numbers. 4.5" 11.5 lb casing set at 9384', 8.75" hole at 9391', 12.9 ppg WBM in the hole, 9.625" 36 lb Surface set at 1045', 37' Shoe Joint. Rig circulated @9.5 bbl/min with ~965 psi for ~1.5 hrs. Mud properties: PV 12@120, YP 12, Gels 6/22/32. Water Test: pH 6.9, Temp 62, Cl <200. Rig was running casing when we arrived on location.
Event	5	Site Assement	2/25/2020	12:05:00	USER					Identify and discuss all hazards with the crew
Event	6	Spot Equipment	2/25/2020	12:10:00	USER					Use spotters and radios.
Event	7	Pre Rig Up	2/25/2020	12:20:00	USER					Discuss all rig up related safety issues with crew
Event	8	Rig Up	2/25/2020	12:30:00	USER					
Event	9	Other	2/25/2020	14:01:18	USER					
Event	10	Resume	2/25/2020	14:01:20	USER					
Event	11	Pre Job	2/25/2020	16:40:00	USER					Discuss all job related safety issues and pump schedule with customer, crew, and rig crew.
Event	12	Start Job	2/25/2020	17:10:00	USER	8.48	0.00	23.10	9.00	
Event	13	Fill Lines	2/25/2020	17:11:14	USER	8.54	1.10	0.30	438.00	5 bbls water
Event	14	Pressure Test	2/25/2020	17:14:55	USER	8.34	0.00	5.00	5143.00	Low and high pressure tests
Event	15	Pump Spacer 1	2/25/2020	17:23:00	USER	8.19	1.30	0.00	59.00	10 bbls water

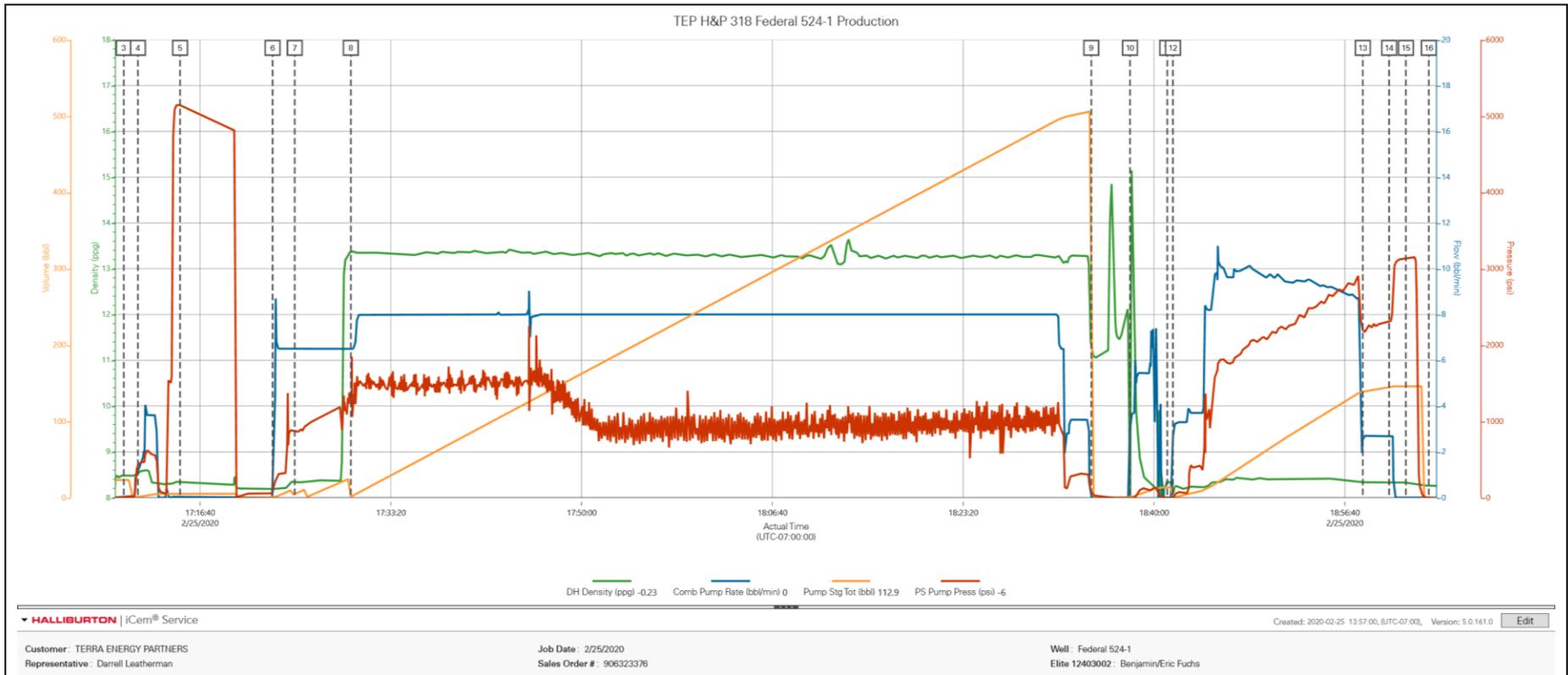
Event	16	Pump Mud Flush	2/25/2020	17:24:56	USER	8.33	6.50	4.90	871.00	20 bbls Mud Flush 8.4 ppg
Event	17	Pump Cement	2/25/2020	17:29:50	USER	13.39	6.50	1.10	1334.00	399 bbls cement 13.3 ppg, 1.79 cuft/sk, 8.5 gal/sk 1250 sks. 253 bbls water needed.
Event	18	Shutdown	2/25/2020	18:34:31	USER	11.25	0.00	506.00	72.00	Shutdown to drop plug
Event	19	Clean Lines	2/25/2020	18:37:54	USER	7.14	3.00	0.20	-6.00	Wash lines to the pit.
Event	20	Drop Plug	2/25/2020	18:41:09	USER	8.36	0.00	13.50	-4.00	Customer to witness and verify.
Event	21	Pump Displacement	2/25/2020	18:41:39	USER	8.16	2.70	0.10	-6.00	145 bbls total. 10 bbls MMCR water, 30 bbls BE-6 water. KCl sacks throughout.
Event	22	Slow Rate	2/25/2020	18:58:14	USER	8.33	2.60	138.80	2200.00	Last 10 bbls
Event	23	Bump Plug	2/25/2020	19:00:32	USER	8.34	2.70	144.90	2291.00	FCP 2300 psi. Go 500 psi over final circulating psi. No cement to surface.
Event	24	Check Floats	2/25/2020	19:02:00	USER	8.33	0.00	145.90	3138.00	Floats held. 1.5 bbls back
Event	25	End Job	2/25/2020	19:04:00	USER					
Event	26	Total Fluid Volumes	2/25/2020	19:04:10	USER					Spacer: 30 Primary: 399 Displacement: 145.
Event	27	Items to return	2/25/2020	19:04:30	USER					100 lbs sugar, 1 gal MMCR, 5 gal D-Air
Event	28	Pre Rig Down	2/25/2020	19:10:00	USER					Discuss all rig down related safety issues with crew
Event	29	Rig Down	2/25/2020	19:15:00	USER					
Event	30	End Job	2/25/2020	19:25:46	COM4					
Event	31	Pre Journey	2/25/2020	19:45:00	USER					Discuss all travel related safety issues with crew
Event	32	Leave Job	2/25/2020	20:00:00	USER					Thank you for your business! Benjamin Fuchs and crew.

3.0 Attachments

3.1 Pressure Test.png



3.2 Job Chart.png



3.3 Job Chart No Events.png

