

# HALLIBURTON

iCem<sup>®</sup> Service

## **TERRA ENERGY PARTNERS-EBUS**

Rock Springs District, COLORADO

**For: DARRELL LEATHERMAN**

Date: Tuesday, January 28, 2020

## **FEDERAL RWF 324-1**

4 ½" Production Casing

Post Job Report

Job Date: Tuesday, January 28, 2020

Sincerely,

**DUANE PUGMIRE**

## 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
Called Out	1/27/2020	07:00	MST
On Location	1/27/2020	19:00	MST
Job Started	1/28/2020	02:03	MST
Job Complete	1/28/2020	04:34	MST
Depart Location	1/28/2020	05:30	MST

## 1.2 Job Overview

		Units	Description
1	Surface temperature at time of job	°F	29
2	Mud type (OBM, WBM, SBM, Water, Brine)	lb/gal	WBM
3	Actual mud density	lb/gal	13
4	Time circulated before job	HH:MM	1:45
5	Mud volume circulated	Bbls	600
6	Rate at which well was circulated	Bpm	10
7	Pipe movement during hole circulation	Y/N	Y
8	Rig pressure while circulating	Psi	1300
9	Time from end mud circulation to start of job	HH:MM	00:10
10	Pipe movement during cementing	Y/N	Y
11	Calculated displacement	Bbls	150.7
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	8
16	Units of gas detected while circulating	Units	45
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 <sup>3</sup> /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	404.27	1265.00	50.53
Top Plug/Start Displacement								
Water	5-1	8.33	10.00			109.35		10.94
Water	5-2	8.33	4.00			42.55		10.64
Total:						586.17		77.11

\*Pump schedule may include additional rows for displacement if "Automatic Rate Adjustment" was enabled and ECDs approached the fracture gradient.

1.4 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	7	----	6.0 - 8.0	Chemicals in the water can cause severe retardation
Chlorides	0	ppm	3000 ppm	Can shorten thickening time of cement
Temperature	82	°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

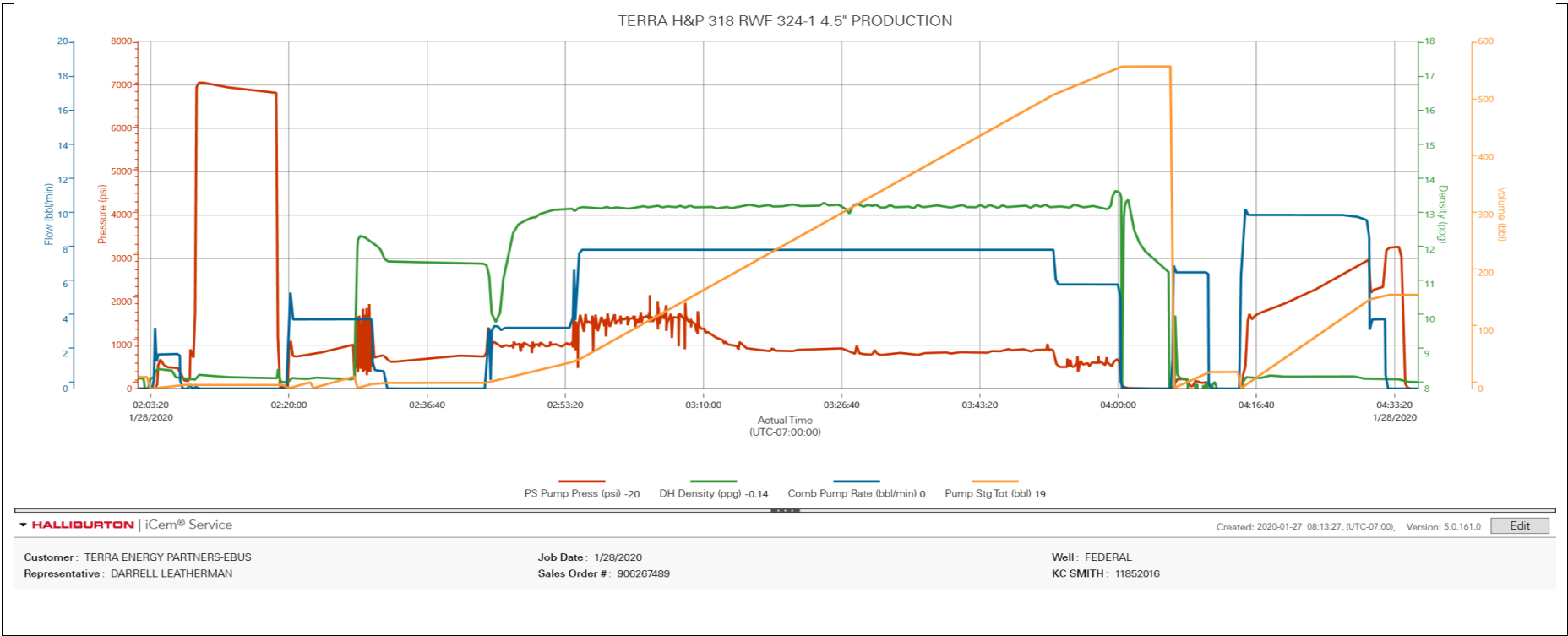
Type	Seq. No.	Graph Label	Date	Time	Source	PS Pump Press (psi)	DH Density (ppg)	Comb Pump Rate (bbl/min)	Pump Stg Tot (bbl)	Comments
Event	1	Call Out	1/27/2020	07:30:00	USER					CALLED OUT FOR TERRA PRODUCTION ON LOCATION AT 19:00
Event	2	Pre-Convoy Safety Meeting	1/27/2020	10:15:00	USER					HALLIBURTON CEMENT CREW DISCUSSED THE HAZARDS OF DRIVING AND THE DIRECTIONS TO LOCATION
Event	3	Crew Leave Yard	1/27/2020	10:30:00	USER					
Event	4	Arrive At Loc	1/27/2020	19:00:00	USER					STILL RUNNING CASING. TD= 9759, TP 4.5", 9751' 11.6# P-110. HOLE= 8.75", CENT= 30, MUD= 13#, SHOE= 31.6'
Event	5	Assessment Of Location Safety Meeting	1/27/2020	19:10:00	USER					HALLIBURTON CEMENT CREW DISCUSSED THE HAZARDS OF THE LOCATION.
Event	6	Pre-Rig Up Safety Meeting	1/27/2020	19:20:00	USER					HALLIBURTON CEMENT CREW DISCUSSED THE HAZARDS OF RIGGING UP THE EQUIPMENT.
Event	7	Rig-Up Equipment	1/27/2020	22:00:00	USER					
Event	8	Pre-Job Safety Meeting	1/28/2020	01:30:00	USER	2.00	0.00	0.00	0.00	HALLIBURTON CEMENT CREW, RIG CREW AND COMPANY REP. DISCUSSED THE HAZARDS OF THE JOB AND THE JOB PROCEEDURE.
Event	9	Pump Water	1/28/2020	02:03:00	USER	-8.00	7.86	0.00	0.00	PUMP 5 BBLS OF WATER TO FILL PUMPS AND LINES.
Event	10	Shutdown	1/28/2020	02:07:00	USER	290.00	8.30	0.00	6.30	
Event	11	Pressure Test	1/28/2020	02:09:00	USER	7033.00	8.41	0.00	6.30	PRESSURE TESTED HES LINES: 500 PSI LOW KICK OUT, 7000 PSI FOR HIGH PRESSURE.
Event	12	Pump H2O Spacer	1/28/2020	02:19:36	COM4	18.00	8.18	0.00	0.00	PUMP 10 BBLS OF H2O SPACER
Event	13	Pump Mud Flush Spacer	1/28/2020	02:22:40	COM4	788.00	8.28	4.00	11.40	PUMP 20 BBLS OF MUDFLUSH SPACER
Event	14	Pump ThermoCem Cement	1/28/2020	02:28:00	COM4	1372.00	8.63	4.00	0.00	PUM; 1265 SACKS OF THERMACEM AT 13.3 PPG., 1.79 YLD., 8.5 GAL/ SACK. AT 8 BPM
Event	15	Check Weight	1/28/2020	02:29:00	USER	959.00	12.39	4.00	4.00	CHECKED WEIGHT ON TAIL CEMENT- GOOD

Event	16	Shutdown	1/28/2020	02:31:28	USER	774.00	11.77	1.00	9.80	DUE TO PACKED OFF BULK HOSE.
Event	17	Resume	1/28/2020	02:44:12	USER	1320.00	10.90	3.50	10.90	RESUME PUMPING CEMENT
Event	18	Check Weight	1/28/2020	02:47:51	USER	1037.00	12.76	3.50	23.50	CHECKED WEIGHT ON LEAD CEMENT- GOOD
Event	19	Check Weight	1/28/2020	02:50:00	USER	1011.00	12.95	3.50	31.10	CHECKED WEIGHT ON TUNED SPACER- GOOD
Event	20	Check Weight	1/28/2020	03:14:37	USER	1007.00	13.24	8.00	207.30	CHECKED WEIGHT ON FRESH WATER- GOOD
Event	21	Check Weight	1/28/2020	03:31:14	USER	773.00	13.21	8.00	340.20	CHECKED WEIGHT ON LEAD CEMENT- GOOD
Event	22	Check Weight	1/28/2020	03:51:52	USER	906.00	13.19	8.00	505.30	CHECK WEITH ON TUNED SPACER - GOOD
Event	23	Shutdown	1/28/2020	04:00:00	USER	677.00	13.68	6.00	555.10	
Event	24	Clean Lines	1/28/2020	04:07:33	USER	223.00	8.29	6.70	6.40	
Event	25	Drop Top Plug	1/28/2020	04:11:55	USER	-11.00	7.98	0.00	28.80	COMPANY REP. WITNESSED THE PLUG DROP
Event	26	Pump Displacement	1/28/2020	04:14:33	COM4	-24.00	-0.14	0.00	0.00	PUMPED 130 BBLS OF KCL AT 10 BPM
Event	27	Slow Rate	1/28/2020	04:30:00	USER	2963.00	8.29	9.70	151.50	HALLIBURTON PUMPED 20.7 BBLS OF H2O. FOR A TOTAL OF 150.7 BBLS OF DISPLACEMENT.
Event	28	BUMP PLUG	1/28/2020	04:32:00	USER	2349.00	8.27	4.00	161.10	BUMP PLUG AT 2350 PSI WENT 500 PSI OVER FINAL CIRCULATING PRESSURE
Event	29	Check Floats	1/28/2020	04:34:00	USER	3275.00	8.27	0.00	162.00	FLOATS HELD WITH 7 BBLS BACK TO HALLIBURTON PUMP.
Event	30	End Job	1/28/2020	04:36:00	USER	-8.00	8.18	0.00	162.00	RETURNS THROUGHOUT JOB GOT 152 BBLS OF LEAD CEMENT AND 40 BBLS OF TUNED SPACER BACK TO SURFACE.
Event	31	Pre-Rig Down Safety Meeting	1/28/2020	04:39:00	USER	-9.00	8.17	0.00	162.00	HALLIBURTON CEMENT CREW DISCUSSED THE HAZARDS OF RIGGING DOWN THE EQUIPMENT
Event	32	Rig-Down Equipment	1/28/2020	04:45:00	USER	-25.00	-0.14	0.00	19.00	
Event	33	Pre-Convoy Safety Meeting	1/28/2020	05:25:00	USER					HALLIBURTON CEMENT CREW DISCUSSES THE HAZARDS OF DRIVING.
Event	34	Crew Leave Location	1/28/2020	05:30:00	USER					
Event	35	Job Complete	1/28/2020	05:30:01	USER					NO ACCIDENTS, NO INCIDENTS. THANKS FROM THE ROCK SPRINGS HALLIBURTON CEMENT CREW.



3.0 Attachments

3.1 CHART WITHOUT EVENTS.png



3.2 CHART WITH EVENTS.png

