

# HALLIBURTON

iCem<sup>®</sup> Service

## **TERRA ENERGY PARTNERS**

**For: Darrell Leathernam**

Date: Tuesday, January 07, 2020

**Federal RWF 423-18**

9 5/8" Surface Casing

Post Job Report

Job Date: Tuesday, December 03, 2019

Sincerely,

**KC Smith**

## 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	12/3/19	9:00	MST
On Location	12/3/19	11:30	MST
Job Started	12/3/19	15:40	MST
Job Complete	12/3/19	16:30	MST
Depart Location	12/3/19	17:35	MST

## 1.2 Job Overview

		Units	Description
1	Surface temperature at time of job	°F	NA
2	Mud type (OBM, WBM, SBM, Water, Brine)	lb/gal	WBM
3	Actual mud density	lb/gal	9.6
4	Time circulated before job	HH:MM	NA
5	Mud volume circulated	Bbls	NA
6	Rate at which well was circulated	Bpm	NA
7	Pipe movement during hole circulation	Y/N	N
8	Rig pressure while circulating	Psi	NA
9	Time from end mud circulation to start of job	HH:MM	NA
10	Pipe movement during cementing	Y/N	N
11	Calculated displacement	Bbls	77.4
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	N
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)
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>

\*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	NA	----	6.0 - 8.0	Chemicals in the water can cause severe retardation
Chlorides	NA	ppm	3000 ppm	Can shorten thickening time of cement
Temperature	NA	°F	50-80 °F	High temps will accelerate; Low temps may risk freezing in cold weather

## 2.0 Real-Time Job Summary

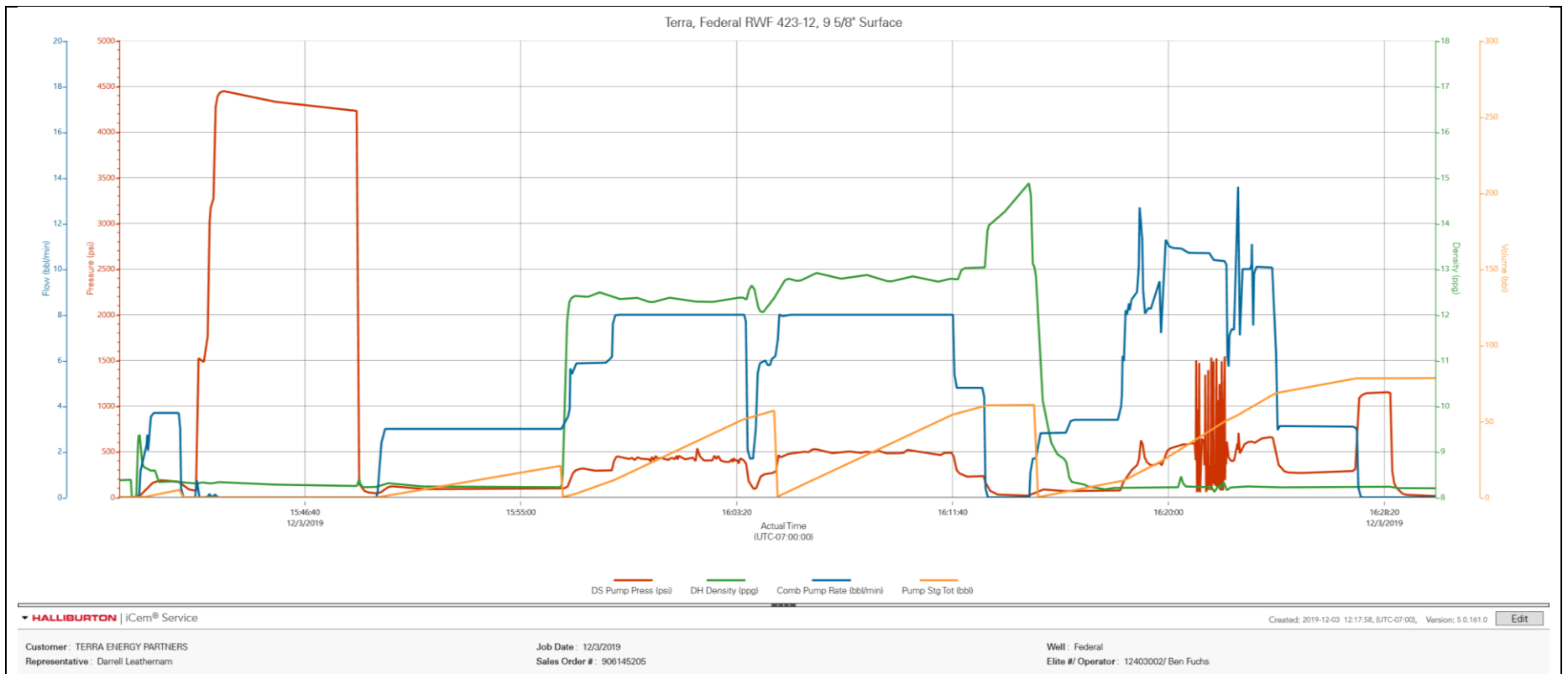
### 2.1 Job Event Log

Type	Seq. No.	Graph Label	Date	Time	Source	DS 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	12/3/2019	09:00:00	USER					HES CREW CALLED OUT, REQUESTED ON LOCATION AT 12:00 ON 12/3/19.
Event	2	Depart Yard Safety Meeting	12/3/2019	10:55:00	USER					HES CREW DISCUSSES THE HAZARDS OF DRIVING TO LOCATION. FOCUS WAS ON ANIMALS IN THE ROADWAY.
Event	3	Depart from Service Center or Other Site	12/3/2019	11:00:00	USER					HES CREW DEPARTS STAGED LOCATION FOR RIG SITE
Event	4	Arrive at Location from Service Center	12/3/2019	11:30:00	USER					HES CREW ARRIVES AT LOCATION. RIG RUNNING CASING
Event	5	Assessment Of Location Safety Meeting	12/3/2019	11:35:00	USER					HES CREW CONDUCTS A JSA AND DISCUSSES THE HAZARDS OF RIGGING UP
Event	6	WELL INFORMATION	12/3/2019	11:40:00	USER					HOLE DEPTH __1052__, TOTAL PIPE __1045.5'__, CASING_9 5/8"__36#,__SHOE JOINT__44.5'__HOLE SIZE__13 1/2"__MW__9.6__
Event	7	Spot Equipment	12/3/2019	11:45:00	USER					CREW SAFELY SPOTTED THE EQUIPMENT INTO POSITION
Event	8	Rig-Up Equipment	12/3/2019	12:00:00	USER					RIGGED UP IRON AND HOSES
Event	9	Rig-Up Completed	12/3/2019	12:15:00	USER					RIG UP COMPLETED. WAITING ON RIG TO FINISH RUNNING CASING
Event	10	Pre-Job Safety Meeting	12/3/2019	15:00:00	USER	2.00	0.00	0.00	0.00	HES CREW AND RIG CREW DISCUSSES THE HAZARDS OF PUMPING THE JOB. FOCUSED ON HAND PLACEMENT, LINE OF FIRE, POSITION OF FOOTING, AND KEEPING YOUR EYES ON THE PATH.
Event	11	Start Job	12/3/2019	15:40:00	USER	-1.00	7.83	0.00	0.00	START JOB, RIG HAS GOOD CIRCULATION. FILLED LINES WITH 5 BBLS OF FRESH WATER
Event	12	Pressure Test	12/3/2019	15:42:32	USER	1533.00	8.27	0.00	0.00	500 PSI KICKOUT TEST
Event	13	Pressure Test	12/3/2019	15:43:15	USER	4356.00	8.32	0.00	0.10	3500 PSI PRESSURE TEST
Event	14	Pump Fresh Water	12/3/2019	15:49:28	USER	43.00	8.23	0.20	0.00	PUMP 20 BBLS FRESH WATER

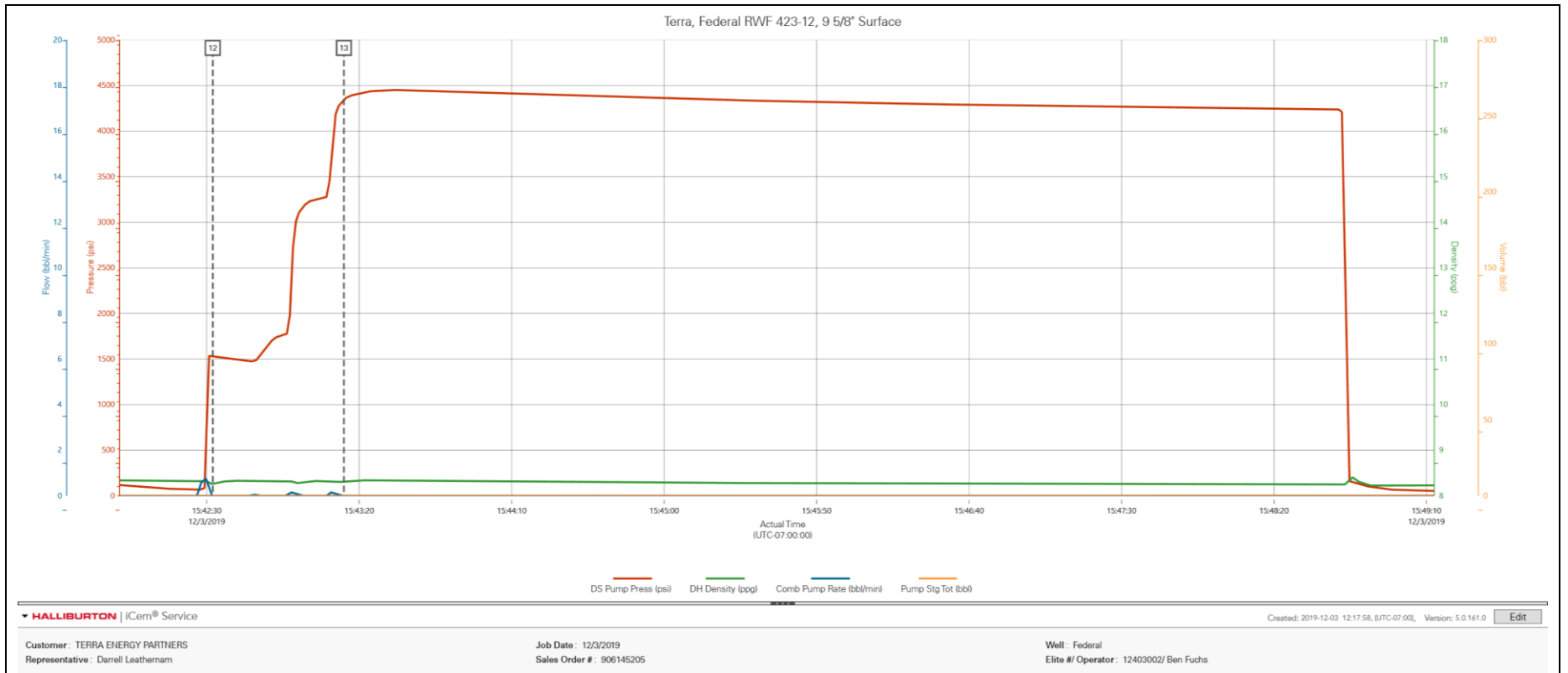
Event	15	Pump Lead Cement	12/3/2019	15:56:35	USER	94.00	8.29	3.00	0.10	PUMP 53 BBLs (125 SKS) VARICEM AT 12.3 PPG, 2.38 FT3/SK, 13.74 GAL/SK AT 8 BPM
Event	16	Pump Tail Cement	12/3/2019	16:04:52	USER	289.00	12.47	6.20	0.30	PUMP 56 BBLs (150 SKS) VARICEM AT 12.8 PPG, 2.11 FT3/SK, 11.74 GAL/SK AT 8 BPM
Event	17	Shutdown	12/3/2019	16:12:58	USER	138.00	13.48	0.00	60.50	SHUTDOWN
Event	18	Drop Top Plug	12/3/2019	16:14:09	USER	21.00	14.58	0.00	60.50	DROP HALLIBURTON TOP PLUG. CUSTOMER THERE TO WITNESS. WASH PUMPS AND LINES O TOP OF THE PLUG
Event	19	Pump Displacement	12/3/2019	16:14:39	USER	19.00	14.91	0.50	60.50	PUMP FRESH WATER DISPLACEMENT 77.4 BBLs
Event	20	Slow Rate	12/3/2019	16:24:01	USER	664.00	8.24	10.00	67.50	SLOW RATE LAST 10 BBLs TO 4 BPM
Event	21	Bump Plug	12/3/2019	16:27:13	USER	333.00	8.22	3.10	78.20	BUMP PLUG, FINAL CIRCULATING PRESSURE 300 PSI AND PRESSURED UP TO 1100 PSI, 10 BBLs OF CEMENT BACK TO SURFACE
Event	22	Check Floats	12/3/2019	16:28:34	USER	1136.00	8.23	0.00	78.40	CHECK FLOATS, 1/2 BBL BACK TO HES PUMP
Event	23	End Job	12/3/2019	16:30:00	USER	15.00	8.20	0.00	78.40	END JOB
Event	24	Pre-Rig Down Safety Meeting	12/3/2019	16:35:00	USER	9.00	-0.16	0.00	78.40	HES CREW DISCUSS THE HAZARDS OF RIGGING DOWN
Event	25	Rig-Down Equipment	12/3/2019	16:40:00	USER	7.00	-0.18	0.00	78.40	HES CREW RIG DOWN EQUIPMENT AND LINES
Event	26	Rig-Down Completed	12/3/2019	17:25:00	USER					RIG DOWN COMPLETE
Event	27	ITEMS RETURNED	12/3/2019	17:26:00	USER					ITEMS RETURNED: 100 # SUGAR
Event	28	Pre-Convoy Safety Meeting	12/3/2019	17:27:00	USER					HES CREW DISCUSS THE HAZARDS OF DRIVING
Event	29	Depart Location for Service Center or Other Site	12/3/2019	17:30:00	USER					HES CREW DEPARTS LOCATION
Event	30	Job Complete	12/3/2019	17:35:00	USER					JOB COMPLETE, 10 BBLs OF CEMENT TO SURFACE. THANK YOU FOR CHOOSING HALLIBURTON CEMENT DEPARTMENT - KC SMITH AND CREW

## 3.0 Attachments

### 3.1 Job Log without Events.png



### 3.2 Pressure Test.png



3.3 Job Log with Events.png

