

HALLIBURTON

iCem[®] Service

TERRA ENERGY PARTNERS-EBUS

Rock Springs District, CO

For: H&P 318

Date: Friday, October 25, 2019

Puckett GM 344-8 Production

Garfield, Puckett

API 05-045-24092

Job Date: Thursday, October 24, 2019

Sincerely,

Rock Springs Engineering

Legal Notice

Disclaimer:

All information in this report is provided subject to the terms and conditions which govern the services provided by Halliburton. Halliburton personnel use their best efforts in gathering information and their best judgment in interpreting it, but any interpretation, research, analysis or recommendation furnished by Halliburton are opinions based upon inferences from measurements and empirical relationships and assumptions, which inferences and empirical relationships and assumptions are not infallible, and with respect to which professionals in the industry may differ. iCem 3D Displacement results are used to understand how fluids intermix during a cement job. Simulation and 3D displacement results are not intended as and should not be used as a replacement for bond logs in determining top of cement. Current 3D model calculations are known to model more volume than the input volume for standard cases due to known calculation improvements required. For rotational cases, the modeled volume will be impacted by the same calculations impacting the standard cases, as well as additional constraints imposed to make the calculation time required operationally feasible. Therefore, until further notice, 3D displacement results should not be used for replacement of a bond log, or used as an identifier of top of cement. HALLIBURTON IS UNABLE TO GUARANTEE THE ACCURACY OF ANY CHART INTERPRETATION, RESEARCH ANALYSIS, OR JOB RECOMMENDATION and any interpretation or recommendation is not for use of or reliance upon by any third party. The customer has full responsibility for any of its decisions which are based on the information provided in this report.

Table of Contents

1.0 Cementing Job Summary 4

 1.1 Executive Summary4

 1.2 Job Overview5

 1.3 Water Analysis Report6

2.0 Real-Time Job Summary 7

 2.1 Job Event Log7

3.0 Attachments..... 10

 3.1 TEP Puckett GM 344-8 Production - With Events.png10

 3.2 TEP Pucket GM 344-8 Production - Without Events.png11

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	10/24/2019	0330	MST
On Location	10/24/2019	1400	MST
Job Started	10/24/2019	2030	MST
Job Completed	10/24/2019	2200	MST
Departed Location	10/25/2019	0020	MST

1.2 Job Overview

		Units	Description
1	Surface temperature at time of job	°F	30
2	Mud type (OBM, WBM, SBM, Water, Brine)	-	wbm
3	Actual mud density	lb/gal	9.8
4	Time circulated before job	HH:MM	00:37
5	Mud volume circulated	Bbls	410
6	Rate at which well was circulated	Bpm	11
7	Pipe movement during hole circulation	Y/N	Y
8	Rig pressure while circulating	Psi	250
9	Time from end mud circulation to start of job	HH:MM	00:20
10	Pipe movement during cementing	Y/N	Y
11	Calculated displacement	Bbls	115.72
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	350
17	Was lost circulation experienced at any time ?	Y/N	N

1.3 Water Analysis Report

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	70	°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

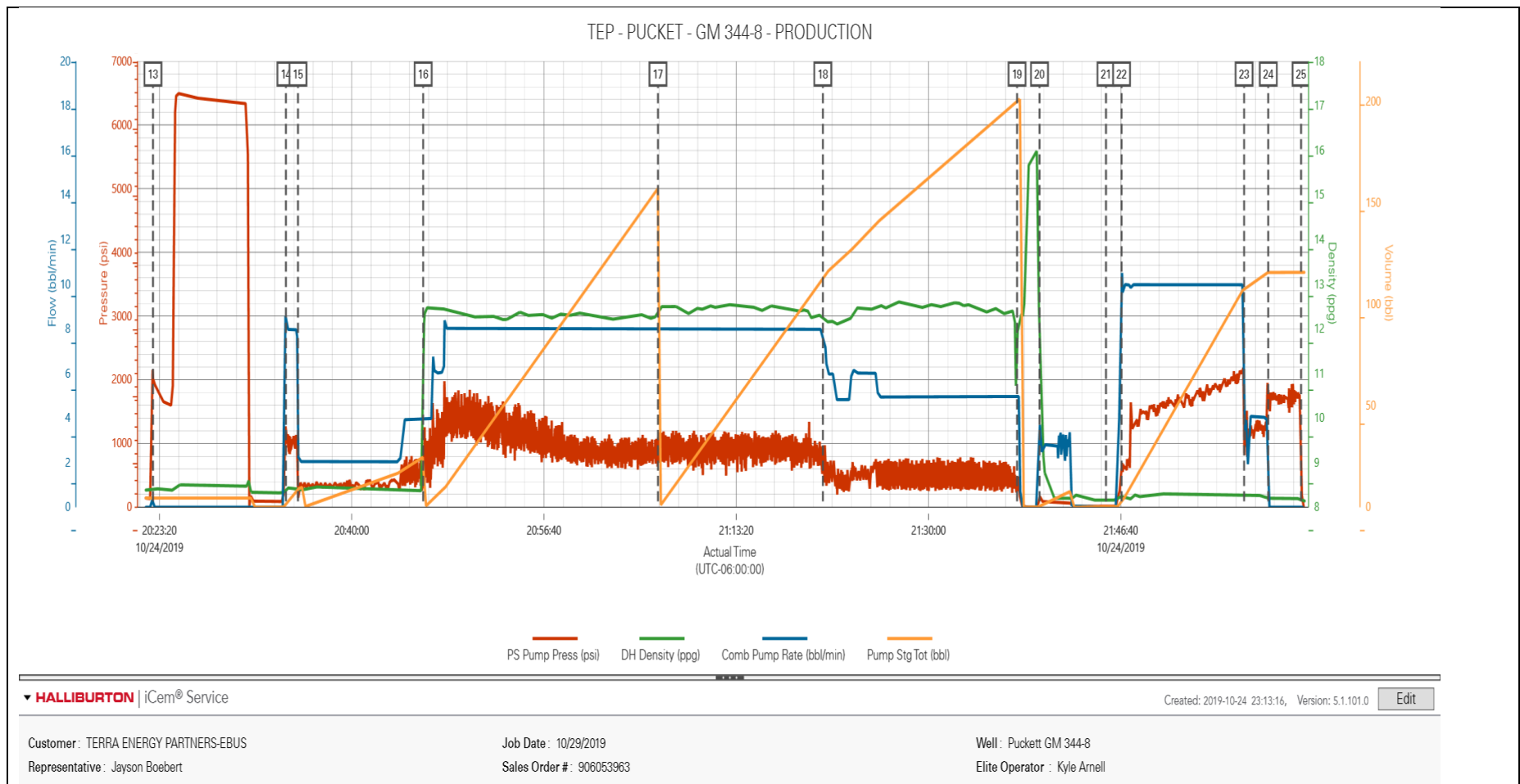
Type	Seq. No.	Graph Label	Date	Time	Source	PS Pump Press (psi)	DH Density (ppg)	Comb Pump Rate (bbl/min)	Pump Stg Tot (bbl)	Comments
Event	1	Call Out	10/24/2019	03:30:00	USER					CREW CALLED OUT TO H&P 318 FOR TERRA ENERGY PRODUCTION JOB. REQUESTED ON LOCATION AT 15:00.
Event	2	Pre-Convoy Safety Meeting	10/24/2019	03:45:00	USER					ALL HAZARDS ASSOCIATED WITH DRIVING TO LOCATION DISCUSSED AMONG CREW MEMBERS
Event	3	Crew Leave Yard	10/24/2019	03:50:00	USER					
Event	4	Arrive At Location	10/24/2019	14:00:00	USER					RIG WAS RUNNING CASING UPON HES ARRIVAL
Event	5	Assessment Of Location Safety Meeting	10/24/2019	16:30:00	USER					WITH ALL HES PERSONNEL
Event	6	Spot Equipment	10/24/2019	16:40:00	USER					SPOT EQUIPMENT
Event	7	Pre-Rig Up Safety Meeting	10/24/2019	16:50:00	USER					ALL HAZARDS ASSOCIATED WITH RIG UP DISCUSSED AMONG THE CREW
Event	8	Rig-Up Equipment	10/24/2019	17:00:00	USER					1-ELITE RCM PUMP TRUCK, 2-1,700 FT3 SILOS, 1-660 FT3 BULK TRUCK, 1-IRON TRUCK
Event	9	Rig-Up Completed	10/24/2019	17:30:00	USER					RIG UP COMPLETED WAITED FOR RIG TO FINISH RUNNING CASING
Event	10	Check Weight	10/24/2019	17:31:00	USER					PRESSURIZED MUD SCALES CALIBRATED USING FRESH WATER PRIOR TO JOB. ALL FLUID DENSITIES VERIFIED USING PRSSURIZED MUD SCALES THROUGHOUT JOB
Event	11	Pre-Job Safety Meeting	10/24/2019	19:30:00	USER					ALL HAZARDS ASSOCIATED WITH PUMPING THE JOB DISCUSSED AMONG ALL MEMEBRS ON LOCATION.
Event	12	Start Job	10/24/2019	20:20:00	USER					WE HAD ISSUES WITH THE COLLAR ON THE CASING PUP JOINT LEAKING. WE HAD TO TAKE OUR CEMENT HEAD OFF AND TIGHTEN THE COLLAR ON THE PUP JOINT.
Event	13	Pressure Test	10/24/2019	20:22:47	USER	2014.99	8.38	0.00	4.55	SET KICKOUTS TO 500 PSI FOR LOW TEST TO ENSURE KICKOUTS FUNCTIONING PROPERLY. BROUGHT PRESSURE UP TO 6,600 PSI FOR HIGH TEST.

Event	20	Pump Water	10/24/2019	20:34:18	USER	1103.72	8.42	8.03	1.02	PUMP 10 BBL H2O SPACER. PUMPED AT 8 BPM WITH 1,100 PSI.
Event	21	Pump Mud Flush III Spacer	10/24/2019	20:35:21	USER	167.14	8.43	2.30	9.18	PUMP 20 BBL MUD FLUSH III SPACER. PUMPED AT 5 BPM WITH 550 PSI. USED 80 LBS MUD FLUSH III FOR SPACER.
Event	55	Pump Lead Cement	10/24/2019	20:46:12	USER	523.40	11.15	3.94	24.83	PUMP 145 BBL NEOCEM LEAD CEMENT. 370 SKS AT 12.3 PPG, 2.2 FT3/SK, 11.39 GAL/SK. PUMPED AT 8 BPM WITH 1,400 PSI.
Event	117	Pump Tail Cement	10/24/2019	21:06:33	USER	818.72	12.39	8.00	157.34	PUMP 191.7 BBL NEOCEM TAIL CEMENT. 515 SKS AT 12.5 PPG, 2.09 FT3/SK, 10.6 GAL/SK. PUMPED AT 8 BPM WITH 900 PSI.
Event	241	Slow Rate	10/24/2019	21:20:51	USER	814.97	12.27	7.46	113.42	SLOW RATE TO 5 BPM DUE TO CEMENT DELIVERY ISSUES.
Event	347	Shutdown	10/24/2019	21:37:41	USER	306.83	11.79	5.03	200.36	SHUTDOWN TO CLEAN PUMPS AND LINES AND DROP TOP PLUG.
Event	349	Clean Lines	10/24/2019	21:39:38	USER	135.27	12.09	3.52	0.45	WASH PUMPS AND LINES TO THE CELLAR
Event	351	Drop Top Plug	10/24/2019	21:45:23	USER	11.52	8.16	0.00	0.00	DROP HES TOP PLUG. PLUG LAUNCHED. WITNESSED BY CUSTOMER REP.
Event	352	Pump KCL H2O Displacement	10/24/2019	21:46:44	USER	564.65	8.24	8.91	2.33	PUMP 105.72 BBL KCL H2O DISPLACEMENT. PUMPED AT 10 BPM WITH 2,000 PSI.
Event	353	Slow Rate	10/24/2019	21:57:22	USER	1393.41	8.30	5.70	108.25	SLOW RATE TO 4 BPM 10 BBL PRIOR TO CALCULATED DISPLACEMENT.
Event	354	Bump Plug	10/24/2019	21:59:27	USER	1849.98	8.20	0.00	115.87	PLUG BUMPED AT 4 BPM. FCP-1,250 PSI. BROUGHT PRESSURE UP TO 1,750 PSI. TOTAL DISPLACEMENT-115.72 BBL
Event	355	Check Floats	10/24/2019	22:02:18	USER	1068.10	8.19	0.00	115.87	FLOATS HOLDING. RETURNED 1 BBL FLUID TO TRUCK.
Event	356	End Job	10/24/2019	22:05:00	USER					PIPE WAS RECIPRICATED DURING JOB. GOOD CIRCULATION THROUGHOUT JOB.
Event	357	Pre-Rig Down Safety Meeting	10/24/2019	22:10:00	USER					ALL HAZARDS ASSOCIATED WITH RIG DOWN DISCUSSED AMONG THE CREW
Event	358	Rig-Down Equipment	10/24/2019	22:20:00	USER					
Event	359	Rig-Down Completed	10/24/2019	23:30:00	USER					
Event	360	Pre-Convoy Safety Meeting	10/24/2019	23:40:00	USER					ALL HAZARDS ASSOCIATED WITH DRIVING FROM LOCATION DISCUSSED AMONG CREW MEMBERS
Event	361	Crew Leave Location	10/24/2019	23:50:00	USER					

Event	362	Well Info	10/24/2019	23:51:00	USER	TD-7,503', TP-7,496.39' SHOE-30.64', HOLE-8 3/4", MUD- 9.8 PPG WBM, CSG-4 1/2" 11.6 LB/FT P-110, PREV CSG SET AT 1,015' 9 5/8" 36 LB/FT
Event	363	Rig Info	10/24/2019	23:52:00	USER	RIG ON BOTTOM AT 18:10. CIRCULATED AT 11 BPM WITH 250 PSI. 410 BBL CIRCULATED. GAS- 350 UNITS
Event	364	Job Info	10/24/2019	23:53:00	USER	CALCULATED TOP OF TAIL CEMENT-4,000.41'. CALCULATED TOP OF LEAD CEMENT-1,349.59'. USED 80 LBS MUD FLUSH III, AND 5 GALLONS D-AIR FOR JOB. USED HES TOP PLUG. USED 1 GALLON MMCR. USED 3 POUNDS BE-6. USED 90 POUNDS OF WELLLIFE 1094. 90 POUNDS OF WELL LIFE 1094, 5 GALLONS OF D-AIR , AND 100 POUNDS OF SUGAR RETURNED TO THE BULK PLANT.
Event	365	Comment	10/24/2019	23:54:00	USER	THANK YOU FOR USING HALLIBURTON CEMENT DEPARTMENT. ZACHARY CRUTCHMAN AND CREW.

3.0 Attachments

3.1 TEP Puckett GM 344-8 Production - With Events.png



3.2 TEP Pucket GM 344-8 Production - Without Events.png

