HALLIBURTON

iCem® Service

TERRA ENERGY PARTNERS-EBUS

Rock Springs District, COLORADO

For: H&P 318

Date: Tuesday, October 15, 2019

GM 314-8

GARFIELD, GRAND VALLEY
API # 05-045024093
Job Date: Tuesday, October 15, 2019

Sincerely,

DUANE PUGMIRE

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.

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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	10/14/2019	17:00	MST
On Location	10/15/2019	03:00	MST
Job Started	10/15/2019	08:05	MST
Job Complete	10/15/2019	10:00	MST
Depart Location	10/15/2019	11:00	MST

1.2 Job Overview

		Units	Description
1	Surface temperature at time of job	°F	45
2	Mud type (OBM, WBM, SBM, Water, Brine)	lb/gal	WBM
3	Actual mud density	lb/gal	9.67
4	Time circulated before job	HH:MM	1:00
5	Mud volume circulated	Bbls	645
6	Rate at which well was circulated	Bpm	10.7
7	Pipe movement during hole circulation	Y/N	N
8	Rig pressure while circulating	Psi	892
9	Time from end mud circulation to start of job	HH:MM	00:10
10	Pipe movement during cementing	Y/N	N
11	Calculated displacement	Bbls	105.8
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	6
16	Units of gas detected while circulating	Units	3000
17	Was lost circulation experienced at any time ?	Y/N	N

Lost Circulation Details

1.3 Squeeze Job Information

		Units	Description
1	Was the well full prior to cementing?	Y/N	
2	Injection Rate #1 & Pressure	psi/bpm	
3	Injection Rate #2 & Pressure	psi/bpm	
4	Injection Rate #3 & Pressure	psi/bpm	
5	Initial ISIP	psi	
6	Density of fluid used for Initial ISIP	lb/gal	
7	Final ISIP	psi	
8	Density of displacement fluid	lb/gal	

1.4 Plug Job Information

		Units	Description
1	Density of well fluid exiting well prior to job	lb/gal	
2	Density of well fluid entering well prior to job	lb/gal	
3	Was the well full prior to cementing?	Y/N	

4	How many joints of workstring pulled wet?	# Joints	
5	Depth of workstring for circulation after the plug?	ft	
6	Calculated Plug Height (workstring out)	ft	

1.5 Planned Pumping Schedule

1.6 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	68	°F	50-80 °F	High temps will accelerate; Low temps may risk freezing in cold weather

2.0 Real-Time Job Summary

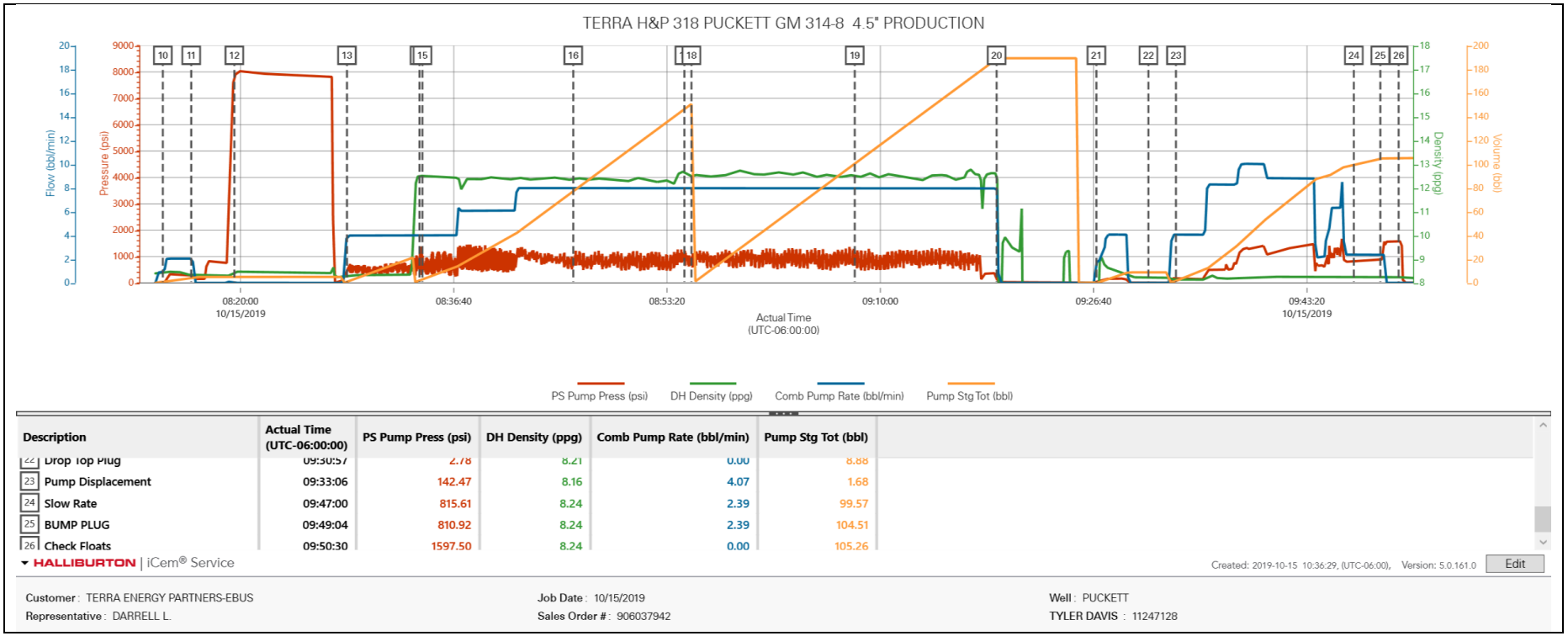
2.1 Job Event Log

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	10/14/2019	17:00:00	USER					CALLED OUT FOR TERRA PRODUCTION ON LOCATION AT 3:00
Event	2	Pre-Convoy Safety Meeting	10/14/2019	17:55:00	USER					HALLIBURTON CEMENT CREW DISCUSSED THE HAZARDS OF DRIVING AND THE DIRECTIONS TO LOCATION
Event	3	Crew Leave Yard	10/14/2019	18:00:00	USER					
Event	4	Arrive At Loc	10/15/2019	03:00:00	USER					STILL RUNNING CASING. TD= 6860, TP 4.5", 6852.9' 11.6#. HOLE= 8.75", CENT= 25, MUD= 9.67#, SHOE= 31.8'
Event	5	Assessment Of Location Safety Meeting	10/15/2019	03:10:00	USER					HALLIBURTON CEMENT CREW DISCUSSED THE HAZARDS OF THE LOCATION.
Event	6	Pre-Rig Up Safety Meeting	10/15/2019	03:20:00	USER					HALLIBURTON CEMENT CREW DISCUSSED THE HAZARDS OF RIGGING UP THE EQUIPMENT.
Event	7	Rig-Up Equipment	10/15/2019	03:30:00	USER					
Event	8	Pre-Job Safety Meeting	10/15/2019	07:45:00	USER					HALLIBURTON CEMENT CREW, RIG CREW AND COMPANY REP. DISCUSSED THE HAZARDS OF THE JOB AND THE JOB PROCEEDURE.
Event	9	Start Job	10/15/2019	08:00:00	USER					
Event	10	Pump Water	10/15/2019	08:13:56	USER	12.16	8.44	0.93	0.36	PUMP 5 BBLS OF WATER TO FILL PUMPS AND LINES.
Event	13	Shutdown	10/15/2019	08:16:09	USER	312.16	8.34	2.06	4.72	
Event	18	Pressure Test	10/15/2019	08:19:31	USER	7844.16	8.46	0.02	5.06	PRESSURE TESTED HES LINES: 500 PSI LOW KICK OUT, 8000 PSI FOR HIGH PRESSURE.
Event	28	Pump MUDFLUSH Spacer 1	10/15/2019	08:28:19	USER	587.79	8.29	3.86	0.75	PUMPED 20 BBLS OF MUDFLUSH SPACER AT 4 BPM. ESTIMATED TOP OF MUDFLUSH AT 912.4'
Event	34	Pump Lead Cement	10/15/2019	08:33:59	USER	1009.67	12.51	4.00	2.03	PUMP 340 SACKS OF NEOCEM LEAD CEMENT AT 12.3 PPG., 2.21 YLD., 11.58 GAL/ SACK 8 BPM. EST. TOP OF LEAD CEMENT AT 1272.5'.

Event	35	Check Weight	10/15/2019	08:34:13	USER	794.05	12.51	3.99	2.96	
Event	51	Check Weight	10/15/2019	08:46:00	USER	725.61	12.37	7.98	77.17	
Event	64	Pump Tail Cement	10/15/2019	08:54:41	USER	1117.49	12.70	7.96	146.33	PUMP 460 SACKS OF NEOCEM TAIL CEMENT AT 12.5 PPG., 2.1 YLD., 10.79 GAL/ SACK AT 8 BPM. ESTIMATED TOP OF TAIL AT : 3718.5'
Event	65	Check Weight	10/15/2019	08:55:14	USER	903.74	12.49	7.96	150.71	
Event	84	Check Weight	10/15/2019	09:08:00	USER	839.98	12.52	7.97	100.47	
Event	110	Shutdown	10/15/2019	09:19:05	USER	123.72	12.63	8.02	188.70	
Event	145	Clean Lines	10/15/2019	09:26:53	USER	20.60	-0.11	1.77	0.15	
Event	146	Drop Top Plug	10/15/2019	09:30:57	USER	2.78	8.21	0.00	8.88	COMPANY REP. WITNESSED THE PLUG DROP
Event	148	Pump Displacement	10/15/2019	09:33:06	USER	142.47	8.16	4.07	1.68	PUMPED 85 BBLS OF KCL AT 10 BPM
Event	149	Slow Rate	10/15/2019	09:47:00	USER	815.61	8.24	2.39	99.57	HALLIBURTON PUMPED 20.8 BBLS OF KCL. FOR A TOTAL OF 105.8 BBLS OF DISPLACEMENT.
Event	150	BUMP PLUG	10/15/2019	09:49:04	USER	810.92	8.24	2.39	104.51	BUMP PLUG AT 3860 PSI WENT 500 PSI OVER FINAL CIRCULATING PRESSURE
Event	151	Check Floats	10/15/2019	09:50:30	USER	1597.50	8.24	0.00	105.26	FLOATS HELD WITH .5 BBLS BACK TO HES PUMP
Event	155	End Job	10/15/2019	10:00:00	USER	6.53	8.18	0.00	105.26	FULL RETURNS THROUGHOUT JOB
Event	156	Pre-Rig Down Safety Meeting	10/15/2019	10:02:00	USER					HALLIBURTON CEMENT CREW DISCUSSED THE HAZARDS OF RIGGING DOWN THE EQUIPMENT
Event	157	Rig-Down Equipment	10/15/2019	10:05:00	USER					
Event	158	Pre-Convoy Safety Meeting	10/15/2019	10:55:00	USER					HALLIBURTON CEMENT CREW DISCUSSES THE HAZARDS OF DRIVING.
Event	159	Crew Leave Location	10/15/2019	11:00:00	USER					
Event	160	Job Complete	10/15/2019	11:00:01	USER					NO ACCIDENTS, NO INCIDENTS. THANKS FROM THE ROCK SPRINGS HALLIBURTON CEMENT CREW.

3.0 Attachments

3.1 CHART WITH EVENTS.png



Description	Actual Time (UTC-06:00:00)	PS Pump Press (psi)	DH Density (ppg)	Comb Pump Rate (bbl/min)	Pump Stg Tot (bbl)
22 Drop Top Plug	09:30:57	2.78	8.21	0.00	8.88
23 Pump Displacement	09:33:06	142.47	8.16	4.07	1.68
24 Slow Rate	09:47:00	815.61	8.24	2.39	99.57
25 BUMP PLUG	09:49:04	810.92	8.24	2.39	104.51
26 Check Floats	09:50:30	1597.50	8.24	0.00	105.26

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Customer: TERRA ENERGY PARTNERS-EBUS
Representative: DARRELL L.

Job Date: 10/15/2019
Sales Order #: 906037942

Well: PUCKETT
TYLER DAVIS: 11247128