

HALLIBURTON

iCem[®] Service

TERRA ENERGY PARTNERS-EBUS

Rock Springs District, CO

For: Steven Bumgarner

Date: Thursday, January 16, 2020

Federal RWF 332-12

4 ½" Production Casing

Post Job Report

Job Date: Thursday, January 16, 2020

Sincerely,

Zachary Crutchman

Legal Notice

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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	1/16/2020	0500	MST
On Location	1/16/2020	1400	MST
Job Started	1/16/2020	1900	MST
Job Completed	1/16/2020	2100	MST
Departed Location	1/16/2020	2200	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	12.7
4	Time circulated before job	HH:MM	00:60
5	Mud volume circulated	Bbls	650
6	Rate at which well was circulated	Bpm	11
7	Pipe movement during hole circulation	Y/N	Y
8	Rig pressure while circulating	Psi	1080
9	Time from end mud circulation to start of job	HH:MM	00:15
10	Pipe movement during cementing	Y/N	Y
11	Calculated displacement	Bbls	137.5
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	10
16	Units of gas detected while circulating	Units	3,200
17	Was lost circulation experienced at any time ?	Y/N	N

1.3 Planned Pump 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	391.49	1225.00	48.94
Top Plug/Start Displacement								
Water	5-1	8.33	10.00			109.35		10.94
Water	5-2	8.33	4.00			30.00		7.50
Total:						560.84		72.37

*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

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	DS Pump Press (psi)	DH Density (ppg)	Comb Pump Rate (bbl/min)	Pump Stg Tot (bbl)	Comments
Event	1	Call Out	1/16/2020	05:00:00	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	1/16/2020	08:30:00	USER					ALL HAZARDS ASSOCIATED WITH DRIVING TO LOCATION DISCUSSED AMONG CREW MEMBERS
Event	3	Crew Leave Yard	1/16/2020	08:50:00	USER					
Event	4	Arrive At Location	1/16/2020	14:00:00	USER					RIG WAS RUNNING CASING UPON HES ARRIVAL
Event	5	Assessment Of Location Safety Meeting	1/16/2020	14:05:00	USER					WITH ALL HES PERSONNEL
Event	6	Spot Equipment	1/16/2020	14:15:00	USER					SPOT EQUIPMENT
Event	7	Pre-Rig Up Safety Meeting	1/16/2020	14:30:00	USER					ALL HAZARDS ASSOCIATED WITH RIG UP DISCUSSED AMONG THE CREW
Event	8	Rig-Up Equipment	1/16/2020	14:40:00	USER					1-ELITE RCM PUMP TRUCK, 2-1,700 FT3 SILOS, 1-660 FT3 BULK TRUCK, 1-IRON TRUCK
Event	9	Rig-Up Completed	1/16/2020	15:30:00	USER					RIG UP COMPLETED WAITED FOR RIG TO FINISH RUNNING CASING
Event	10	Check Weight	1/16/2020	15:31:00	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	1/16/2020	18:30:00	USER	0.00	0.00	0.00	0.00	ALL HAZARDS ASSOCIATED WITH PUMPING THE JOB DISCUSSED AMONG ALL MEMEBRS ON LOCATION.
Event	12	Start Job	1/16/2020	18:54:00	USER	20.00	8.51	0.00	0.00	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	1/16/2020	18:58:13	USER	946.00	8.31	0.00	5.00	SET KICKOUTS TO 500 PSI FOR LOW TEST TO ENSURE KICKOUTS FUNCTIONING PROPERLY. BROUGHT PRESSURE UP TO 6,600 PSI FOR HIGH TEST.

Event	14	Pump Water	1/16/2020	19:08:09	USER	660.00	8.25	3.00	0.50	PUMP 10 BBL H2O SPACER. PUMPED AT 4 BPM WITH 700 PSI.
Event	15	Pump Mud Flush III Spacer	1/16/2020	19:09:37	USER	618.00	8.26	3.90	6.10	PUMP 20 BBL MUD FLUSH III SPACER. PUMPED AT 4 BPM WITH 650 PSI. USED 80 LBS MUD FLUSH III FOR SPACER.
Event	16	Pump Primary Cement	1/16/2020	19:15:17	USER	855.00	12.64	6.20	0.90	PUMP 390.5 BBL THERMACEM CEMENT. 1225 SKS AT 13.3 PPG, 1.79 FT3/SK, 8.5 GAL/SK. PUMPED AT 8 BPM WITH 750 PSI.
Event	17	Shutdown	1/16/2020	19:35:08	USER	1043.00	13.30	8.00	159.50	WHILE RECIPROCATING THE PIPE OUR QUICK LATCH BECAME LOOSE AND STARTED TO LEAK. SHUTDOWN TO FIX THE LEAK
Event	18	Resume Pumping	1/16/2020	19:40:56	USER	111.00	13.08	4.00	171.50	LEAK WAS CORRECTED AND PUMPING RESUMED
Event	19	Shutdown	1/16/2020	20:01:27	USER	953.00	13.24	8.00	335.60	WHILE RECIPROCATING THE PIPE OUR QUICK LATCH BECAME LOOSE AND STARTED TO LEAK. SHUTDOWN TO FIX THE LEAK
Event	20	Resume Pumping	1/16/2020	20:05:29	USER	542.00	13.19	6.60	340.10	LEAK WAS CORRECTED AND PUMPING RESUMED
Event	21	Shutdown	1/16/2020	20:16:41	USER	255.00	13.25	1.30	419.20	SHUTDOWN TO CLEAN PUMPS AND LINES AND DROP TOP PLUG.
Event	22	Clean Lines	1/16/2020	20:19:46	USER	0.00	28.78	1.80	0.10	WASH PUMPS AND LINES TO THE CELLAR
Event	23	Drop Top Plug	1/16/2020	20:26:45	USER	28.00	7.94	0.00	0.00	DROP HES TOP PLUG. PLUG LAUNCHED. WITNESSED BY CUSTOMER REP.
Event	24	Pump KCL H2O Displacement	1/16/2020	20:27:47	USER	617.00	8.03	10.10	3.40	PUMP 127.5 BBL KCL H2O DISPLACEMENT. PUMPED AT 10 BPM WITH 2,000 PSI.
Event	25	Slow Rate	1/16/2020	20:40:26	USER	2172.00	8.07	4.60	128.60	SLOW RATE TO 4 BPM 10 BBL PRIOR TO CALCULATED DISPLACEMENT.
Event	26	Bump Plug	1/16/2020	20:42:42	USER	3063.00	8.06	0.00	137.40	PLUG BUMPED AT 4 BPM. FCP-2,500 PSI. BROUGHT PRESSURE UP TO 3,180 PSI. TOTAL DISPLACEMENT-137.5 BBL
Event	27	Check Floats	1/16/2020	20:46:09	USER	3259.00	8.03	0.00	137.40	FLOATS HOLDING. RETURNED 1.5 BBL FLUID TO TRUCK.
Event	28	End Job	1/16/2020	20:51:00	USER	211.00	7.92	10.00	157.30	PIPE WAS RECIPRICATED DURING JOB. GOOD CIRCULATION THROUGHOUT JOB.
Event	29	Pre-Rig Down Safety Meeting	1/16/2020	20:52:00	USER	62.00	7.94	0.00	158.60	ALL HAZARDS ASSOCIATED WITH RIG DOWN DISCUSSED AMONG THE CREW
Event	30	Rig-Down Equipment	1/16/2020	21:00:00	USER	47.00	-0.40	0.00	191.20	
Event	31	Rig-Down Completed	1/16/2020	21:40:00	USER					

Event	32	Pre-Convoy Safety Meeting	1/16/2020	21:41:00	USER	ALL HAZARDS ASSOCIATED WITH DRIVING FROM LOCATION DISCUSSED AMONG CREW MEMBERS
Event	33	Crew Leave Location	1/16/2020	21:50:00	USER	
Event	34	Well Info	1/16/2020	21:51:00	USER	TD-8,910', TP-8,902.44' SET AT 8,900' SHOE-31.33', HOLE-8 3/4", MUD- 12.5 PPG WBM, CSG-4 1/2" 11.6 LB/FT P-110, PREV CSG SET AT 1,042' 9 5/8" 36 LB/FT
Event	35	Rig Info	1/16/2020	21:52:00	USER	RIG ON BOTTOM AT 1700. CIRCULATED AT 11 BPM WITH 1,080 PSI. 650 BBL CIRCULATED. GAS- 3,200 UNITS
Event	36	Job Info	1/16/2020	21:53:00	USER	CALCULATED TOP OF CEMENT - 1,770.2'. USED 80 LBS MUD FLUSH III, AND 10 GALLONS D-AIR FOR JOB. USED HES TOP PLUG. USED 2 GALLON MMCR. USED 3 POUNDS BE-6. 100 POUNDS OF SUGAR RETURNED TO THE BULK PLANT.
Event	37	Comment	1/16/2020	21:54:00	USER	THANK YOU FOR USING HALLIBURTON CEMENT DEPARTMENT. ZACHARY CRUTCHMAN AND CREW.

3.0 Attachments

3.1 TEP Federal RWF 332-12- With Events .png



3.2 TEP Federal RWF 332-12- Without Events.png

