

HALLIBURTON

iCem[®] Service

CONFLUENCE DJ LLC-EBUS

For: Johnny Musso and Justin Gale

Date: Monday, December 14, 2020

Silverton 5-2-4L

5.5" Production Casing Cement Job

Job Date: Saturday, December 12, 2020

Sincerely,

Thomas Haas and Crew

Legal Notice

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1.0 Cementing Job Summary

1.1 Executive Summary

Halliburton appreciates the opportunity to perform the cementing services on the **SILVERTON 5-2-4L** well - **PRODUCTION CASING CEMENT 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.

40 bbls Diesel Spacer and 130 bbls of 12 ppg Tuned Prime Spacer was pumped ahead of 569.8 bbls of 14.4 ppg ElastiCem Cement to isolate the production casing section. Cement volume was based on 0% excess on the open hole section. Based on 25 bbls of spacer returned to surface, **estimated top of cement is calculated to be ~2,320'**.

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 Rockies Cement Engineering Team.

1.2 Job Overview

Job Times

	Date	Time	Time Zone
Requested Time On Location:	12-12-20	07:00	MST
Called Out Time:	12-12-20	02:00	MST
Arrived On Location At:	12-12-20	07:00	MST
Job Started At:	12-12-20	12:05	MST
Job Completed At:	12-12-20	15:08	MST
Departed Location At:	12-12-20	16:30	MST

		Units	Description
1	Surface temperature at time of job	°F	15
2	Mud Type (OBM, WBM, SBM, Water, Brine)	-	OBM
3	Actual mud density	lb/gal	10.5
4	Actual mud Plastic Viscosity (PV)	cp	-
5	Actual mud Yield Point (YP)	lb _r /100ft ²	-
6	Actual mud 30 min gel strength	lb _r /100ft ²	-
7	Time circulated before job	HH:MM	-
8	Mud volume circulated	bbls	-
9	Rate at which well was circulated	bpm	-
10	Pipe movement during hole circulation	Y/N	-
11	Rig pressure while circulating	psi	-
12	Time from end mud circulation to start of job	HH:MM	-
13	Pipe movement during cementing	Y/N	Y – rotate casing while cementing 20 RPM
14	Calculated displacement	bbls	352
15	Job displaced by	Rig/HES	HES
16	Annular flow before job	Y/N	N
17	Annular flow after job	Y/N	N
18	Length of rat hole	ft	14'
19	Units of gas detected while circulating	units	-
20	Was lost circulation experienced at any time?	Y/N	N

1.3 Water Field Test

Item	Recorded Value	Units	Max Acceptable Limit	Potential Problems in Exceeding Limit
pH	6	-	6.0-8.0	Chemicals in the water can cause severe retardation
Chlorides	0	ppm	3000 ppm	Can shorten thickening time of cement
Temperature	65	°F	50-80 °F	High temps will accelerate; Low temps may risk freezing in cold weather

1.4 Actual Pump Schedule

Description	Stage No.	Density (ppg)	Rate (bbl/min)	Yield (ft ³ /sack)	Water Req. (gal/sack)	Volume (bbl)	Bulk Cement (sacks)
Diesel Spacer	1	8.5				40.0	
Tuned Prime Spacer	2	12.0	7.0			130.0	
ElastiCem Cement	3	14.4	8.0	1.701	7.265	569.8	1882.0
Top Plug/Start Displacement							
Water + MMCR	4-1	8.33	10.0			20.0	
Water + BE-3S + CLA-Web	4-2	8.33	4.0 - 8.0			332.0	

2.0 Real-Time Job Summary

2.1 Job Event Log

Type	Seq. No.	Activity	Graph Label	Date	Time	DS Pump Press (psi)	DH Density (ppg)	Comb Pump Rate (bbl/min)	Pump Stg Tot (bbl)	Comments
Event	1	Call Out	Call Out	2020-12-12	02:00:00					CREW CALLED OUT AT 02:00 12/12/2020, REQUESTED ON LOCATION 08:00 12/12/20. CREW PICKED UP CEMENT, CHEMICALS (10 GAL MMCR, 40 GAL D-AIR, 10 GAL CLA-WEB, 3 LBS BE-3), 100 LBS SUGAR, FROM FORT LUPTON, CO. BULK 660: 11273333/11764054, PUMP ELITE: 12644845/11645460.
Event	2	Pre-Convoy Safety Meeting	Pre-Convoy Safety Meeting	2020-12-12	05:45:00					DISCUSSED ROUTES, HAZARDS, AND COMMUNICATION WITH CREW
Event	3	Crew Leave Yard	Crew Leave Yard	2020-12-12	06:00:00					STARTED JOURNEY MANAGEMENT.
Event	4	Arrive At Loc	Arrive At Loc	2020-12-12	07:00:00					END JOURNEY MANAGEMENT. MEET WITH CO. MAN TO DISCUSS JOB; SURFACE CASING: 9.625" 36# @ 1588', CASING: 5.5" 20# @ 16508', 50' SHOE JOINT, 8.5" OPEN HOLE, TVD @ 6685', 10.5 PPG WELL FLUID, FRESH WATER DISPLACEMENT.
Event	5	Pre-Rig Up Safety Meeting	Pre-Rig Up Safety Meeting	2020-12-12	08:00:00					HAZARD HUNT. DISCUSSED POSSIBLE HAZARDS ASSOCIATED WITH LOCATION, RIG UP AND WEATHER.

Event	6	Rig-Up Equipment	Rig-Up Equipment	2020-12-12	08:10:00					CREW STAGED EQUIPMENT AND RIGGED UP BULK, IRON, AND WATER HOSES TO PERFORM JOB.
Event	7	Pre-Job Safety Meeting	Pre-Job Safety Meeting	2020-12-12	11:30:00	2.00	0.07	0.00	11.60	MEETING WITH HALLIBURTON AND RIG PERSONNEL. COMMUNICATED POTENTIAL SAFETY HAZARDS AND JOB DETAILS.
Event	8	Start Job	Start Job	2020-12-12	12:05:56	1.00	8.41	0.00	0.00	START JOB DATA RECORDING.
Event	9	Test Lines	Test Lines	2020-12-12	12:07:20	271.00	8.54	0.00	1.10	PRESSURE TESTED IRON TO 4600 PSI. KICKOUTS SET @ 500 PSI, KICKED OUT @ 400 PSI, 5TH GEAR STALL OUT @ 1800 PSI.
Event	10	Pump Spacer 1	Pump Spacer 1	2020-12-12	12:14:49	255.00	8.44	0.00	1.10	PUMP 130 BBLs OF TUNED PRIME SPACER @ 12 LB/GAL, DENSITY VERIFIED BY PRESSURIZED MUD SCALES. ADDED 30 GAL D-AIR TO SPACER.
Event	11	Pump Cement	Pump Cement	2020-12-12	12:38:36	470.00	14.14	6.00	2.40	PUMP 1882 SKS OF ELASTICEM @ 14.4 LB/GAL, 1.7 YIELD, 7.62 GAL/SK 569.8 BBLs, TOC @ 2320, DENSITY VERIFIED BY PRESSURIZED MUD SCALES.
Event	12	Other	Line Out Pumps	2020-12-12	12:43:25	800.00	14.10	8.80	35.60	PUMPS SHOWING CAVITATION, SLOW RATE ON ONE SIDE, INCREASE RATE ON OTHER. PRESSURE LINED OUT.
Event	13	Shutdown	Shutdown	2020-12-12	13:53:10	45.00	0.92	0.00	617.50	SHUTDOWN TO CLEAN PUMPS AND LINES, AND DROP TOP PLUG.
Event	14	Drop Top Plug	Drop Top Plug	2020-12-12	14:00:57	21.00	0.71	0.00	629.10	PLUG LEFT COMMANDER HEAD, VERIFIED BY COMPANY.

Event	15	Pump Displacement	Pump Displacement	2020-12-12	14:01:28	-13.00	0.11	0.00	0.00	BEGIN CALCULATED DISPLACEMENT OF 365 BBLs WITH FRESH WATER, 10 GAL MMCR IN FIRST 20 BBL, 3 LBS BE-3 AND 10 GAL CLA-WEB THROUGH OUT.
Event	16	Bump Plug	Bump Plug	2020-12-12	15:02:16	3091.00	8.38	0.00	365.90	PLUG BUMPED AT 352 BBL INTO DISPLACEMENT, FINAL CIRCULATING PRESSURE OF 2650 PSI. 25 BBL OF SPACER TO SURFACE.
Event	17	Other	Casing Test	2020-12-12	15:02:56	3099.00	8.38	0.00	365.90	5 MIN CASING TEST AT 3200 PSI.
Event	18	Check Floats	Check Floats	2020-12-12	15:06:48	3167.00	8.36	0.00	365.90	RELEASED PRESSURE BACK TO THE TRUCK, FLOATS HELD, 4.25 BBL TO SURFACE.
Event	19	End Job	End Job	2020-12-12	15:08:12	-42.00	8.31	0.00	365.90	END JOB DATA RECORDING.
Event	20	Pre-Rig Down Safety Meeting	Pre-Rig Down Safety Meeting	2020-12-12	15:10:55	-52.00	8.28	0.00	0.00	DISCUSSED POSSIBLE HAZARDS ASSOCIATED WITH WEATHER, LOCATION AND RIGGING DOWN IRON AND HOSES.
Event	21	Rig-Down Completed	Rig-Down Completed	2020-12-12	16:10:00					ALL HALLIBURTON ITEMS WERE STOWED FOR TRAVEL.
Event	22	Pre-Convoy Safety Meeting	Pre-Convoy Safety Meeting	2020-12-12	16:20:00					DISCUSSED ROUTES HAZARDS AND COMMUNICATION WITH CREW.
Event	23	Crew Leave Location	Crew Leave Location	2020-12-12	16:30:00					THANK YOU FOR USING HALLIBURTON - THOMAS HAAS AND CREW.

3.0 Attachments

3.1 Real Time iCem Job Chart

