



Great Western Operating Company, LLC

Rio LC 12-376HC

API # 05-001-10458

Surface

March 22, 2020

Quote #: QUO-43370-Q7Z7T9

Execution #: EXC-25338-S7M4W602



Great Western Operating Company, LLC

Great Western Operating Company, LLC | 1801 Broadway, Suite 500 | Denver, CO 80202

Dear Great Western Operating Company, LLC,

Thank you for the opportunity to provide cementing services on this well. BJ Services strives to achieve complete customer satisfaction. If you have any questions regarding the services or data provided, please contact BJ Services at any time.

Sincerely,
Jason Creel
Field Engineer I | (307) 256-0306 | Jason.Creel@BJServices.com

Field Office
1716 East Allison Rd., Cheyenne WY. 82007 | (307) 638-5585

Sales Office
999 18th St. Suite 1200, Denver, CO. 80202 | (281) 408-2361

BJ Cementing Treatment Report

SERVICE SUPERVISOR	Eric Dewit	RIG	White Mountain
CLIENT FIELD REPRESENTATIVE	Shane	COUNTY	ADAMS
DISTRICT	Cheyenne, WY	STATE / PROVINCE	CO
SERVICE	Cementing		

WELL GEOMETRY

TYPE	ID (in)	OD (in)	WEIGHT (lb/ft)	MD (ft)	TVD (ft)	EXCESS (%)	GRADE	THREAD
Open Hole	13.50	0.00	0.00	2,019.00	2,019.00	30.00		
Casing	8.92	9.63	36.00	2,019.00	2,019.00		J-55	LTC

HARDWARE

Bottom Plug Used?	No	Tool Type	Float Collar
Top Plug Used?	Yes	Tool Depth (ft)	1,974.20
Top Plug Provided By	Non BJ	Max Casing Pressure - Rated (psi)	2,720.00
Top Plug Size	9.625	Max Casing Pressure - Operated (psi)	1,600.00
Centralizers Used	Yes	Pipe Movement	None
Centralizers Quantity	19.00	Job Pumped Through	Manifold
Centralizers Type	Bow	Top Connection Thread	LTC
Landing Collar Depth (ft)	1,974.20	Top Connection Size	9.625

CIRCULATION PRIOR TO JOB

Well Circulated By	Rig	Mud Density In (ppg)	8.40
Circulation Prior to Job	Yes	Mud Density Out (ppg)	8.40
Circulation Time (min)	30.00	Solids Present at End of Circulation	No
Circulation Rate (bpm)	5.00	Flare Prior to / during the Cement Job	No
Circulation Volume (bbls)	150.00	Gas Present	No
Lost Circulation Prior to Cement Job	No		

TEMPERATURE

Ambient Temperature (°F)	45.00	Slurry Cement Temperature (°F)	56.00
Mix Water Temperature (°F)	55.00		

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Start Date: 3/22/2020

End Date: 3/22/2020

FLUID DETAILS

FLUID TYPE	FLUID NAME	DENSITY (ppg)	YIELD (Cu Ft/sk)	H ₂ O REQ (gals/sk)	PLN TOP FLD (ft)	LENGTH (ft)	VOL (sk)	VOL (Cu Ft)	VOL (bbls)
Spacer / Pre Flush / Flush	Water	8.3300			0.00				20.0000
Tail Slurry	BJCem S100.3.XC	14.5000	1.3902	6.81	0.00	2,000.00	930	1293.0000	230.3000
Displacement Final	Water	8.3300			0.00			0.0000	151.4000

FLUID TYPE	FLUID NAME	COMPONENT	CONCENTRATION	UOM
Tail Slurry	BJCem S100.3.XC	CEMENT, ASTM TYPE III	100.0000	PCT

DISPLACEMENT AND END OF JOB SUMMARY

Displaced By	BJ	Amt of Cement Returned / Reversed	42.00
Calculated Displacement Vol (bbls)	152.00	Method Used to Verify Returns	Visual
Actual Displacement Vol (bbls)	152.00	Amt of Spacer to Surface	20.00
Did Float Hold?	Yes	Pressure Left on Casing (psi)	0.00
Bump Plug	Yes	Amt Bled Back After Job	0.50
Bump Plug Pressure (psi)	1,559.00	Total Volume Pumped (bbls)	404.00
Were Returns Planned at Surface	Yes	Top Out Cement Spotted	No
Cement Returns During Job	Yes	Lost Circulation During Cement Job	No

BJ Cementing Event Log

Surface - Cheyenne, WY - Eric Dewit

SEQ	START DATE / TIME	EVENT	DENSITY (ppg)	PUMP RATE (bpm)	PUMP VOL (bbls)	PIPE PRESSURE (psi)	COMMENTS
1	03/22/2020 05:30	Callout					Customer calls with on location for 11:30 am on 03/22/2020.
2	03/22/2020 08:00	Depart for Location					Crew departs for location.
3	03/22/2020 09:30	Arrive on Location					Crew arrives on location. Rig is running casing.
4	03/22/2020 09:40	STEACS Briefing					Pre rig up safety meeting.
5	03/22/2020 09:50	Spot Units					Spotted unit.
6	03/22/2020 10:00	Rig Up					
7	03/22/2020 10:45	Rig					Waiting on rig to finish running casing and circulate.
8	03/22/2020 12:20	STEACS Briefing					Pre-job safety meeting with Bj crew, Rig crew, and Company man
9	03/22/2020 12:33	Rig Up					Rig up cement head
10	03/22/2020 12:41	Other (See comment)	8.3400	4.00	5.00	503.00	Load pumps and lines
11	03/22/2020 12:45	Pressure Test	8.3400	0.00	0.00	3195.00	Test pumps, and lines
12	03/22/2020 12:47	Pump Spacer	8.3400	4.10	15.00	246.00	Pump 15 more bbls of fresh water ahead, for a total of 20 bbls of fresh water
13	03/22/2020 12:52	Pumping Cement	14.5000	5.00	202.00	149.00	Pump 815 sks out of Silo 664
14	03/22/2020 13:30	Pumping Cement	14.5000	5.00	28.00	83.00	Pumped the last 115 sks out of the rear pod of CTF-202 in order to hold density
15	03/22/2020 13:40	Drop Top Plug					Drop top plug
16	03/22/2020 13:43	Pump Displacement	8.3400	7.60	0.00	35.00	Send plug, start fresh water displacement + Biocide (provided by customer)
17	03/22/2020 13:48	Pump Displacement	8.3400	7.40	37.00	139.00	Catch up to cement
18	03/22/2020 13:50	Pump Displacement	8.3400	7.40	50.00	230.00	50 bbls into displacement
19	03/22/2020 13:57	Pump Displacement	8.3400	7.40	100.00	611.00	100 bbls into displacement
20	03/22/2020 13:58	Cement Back-to-Surface	8.3400	7.40	110.00	692.00	Getting good cement to surface (42 back)
21	03/22/2020 14:02	Pump Displacement	8.3400	2.80	135.00	645.00	Drop rate to land the plug
22	03/22/2020 14:08	Land Plug	8.3400	2.80	152.00	1559.00	Land plug, FCP was 724, hold for a 30 min casing test
23	03/22/2020 14:18	Pressure Test	8.3400	0.00	0.00	1581.00	Pressure 10 min into test

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Plan #: ORD-25338-S7M4W6

Execution #: EXC-25338-S7M4W602

24	03/22/2020 14:28	Pressure Test	8.3400	0.00	0.00	1587.00	Pressure 20 min into test
25	03/22/2020 14:38	Check Floats	8.3400	0.00	0.00	1597.00	Floats held (.5 bbls back) Final pressure on the casing test was 1597
26	03/22/2020 14:40	STEACS Briefing					Pre-rig down safety meeting
27	03/22/2020 14:50	Rig Down					Rig everything down
28	03/22/2020 15:20	Leave Location					Leave location, to travel back to the yard

Great Western - Rio LC 12-376HC - Surface

