



# Great Western Operating Company, LLC

Schaefer LD 13-032HC

API # 05-001-10254

## Production

02/02/2019

Quote #: 26372

Execution #: 15226



# Great Western Operating Company, LLC

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

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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](mailto: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

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# BJ Cementing Treatment Report

SERVICE SUPERVISOR	Edgar Rodriguez	SERVICE	Cementing
CLIENT FIELD REPRESENTATIVE	Jason Haines	COUNTY	ADAMS
DISTRICT	Cheyenne, WY	STATE / PROVINCE	CO

## WELL GEOMETRY

TYPE	OD (in)	ID (in)	WEIGHT (lb/ft)	MD (ft)	TVD (ft)	EXCESS (%)
Open Hole		8.50		4,100.00	4,100.00	0.00
Casing	5.50	4.89	17.00	18,218.00	7,751.00	
Previous Casing	9.63	8.92	36.00	1,784.00	1,784.00	
Open Hole	0.00	8.50	0.00	18,218.00	7,751.00	5.00

## HARDWARE

Bottom Plug Used?	No	Landing Collar Depth (ft)	18,208
Top Plug Used?	Yes	Max Casing Pressure - Rated (psi)	6390.00
Top Plug Provided By	Non BJ	Max Casing Pressure - Operated (psi)	3500.00
Top Plug Size	5.500	Pipe Movement	None
Centralizers Used	Yes	Job Pumped Through	Manifold
Centralizers Quantity	116.00	Top Connection Thread	BTC
Centralizers Type	Rigid	Top Connection Size	5.5

## CIRCULATION PRIOR TO JOB

Well Circulated By	Rig	PV Mud Out	26
Circulation Prior to Job	Yes	YP Mud In	8
Circulation Time (min)	210.00	YP Mud Out	8
Circulation Rate (bpm)	10.50	Solids Present at End of Circulation	No
Circulation Volume (bbls)	2600.00	10 sec SGS	5
Lost Circulation Prior to Cement Job	No	10 min SGS	6
Mud Density In (ppg)	10.50	30 min SGS	7
Mud Density Out (ppg)	10.50	Flare Prior to / during the Cement Job	No
PV Mud In	26	Gas Present	No

## TEMPERATURE

Ambient Temperature (°F)	55.00	Slurry Cement Temperature (°F)	65.00
Mix Water Temperature (°F)	65.00	Flow Line Temperature (°F)	65.00

## FLUID DETAILS

FLUID TYPE	FLUID NAME	DENSITY (ppg)	YIELD (Cu Ft/sk)	H <sub>2</sub> O REQ (gals/sk)	VOL (sk)	VOL (Cu Ft)	VOL (bbls)
Spacer / Pre Flush / Flush	IntegraGuard EZ Spacer	12.5000					50.0000
Spacer / Pre Flush / Flush	IntegraGuard EZ Spacer	12.5000					90.0000
Spacer / Pre Flush / Flush	IntegraGuard EZ Spacer	12.5000					50.0000
Tail Slurry	BJCem P50.6.02C	14.5000	1.4462	6.45	2365	3421.0000	609.3000
Displacement 1	Retarded Water	8.3337				0.0000	20.0000
Displacement Final	3% KCl	8.3300				0.0000	404.5000

FLUID TYPE	FLUID NAME	COMPONENT	CONCENTRATION	UOM
Spacer / Pre Flush / Flush	IntegraGuard EZ Spacer	SPACER SURFACTANT, SS-267	0.7000	GPB
Spacer / Pre Flush / Flush	IntegraGuard EZ Spacer	SAND, S-8, Silica Flour, 200 Mesh	282.2600	PPB
Spacer / Pre Flush / Flush	IntegraGuard EZ Spacer	IntegraGuard GW-86	0.6000	PPB
Spacer / Pre Flush / Flush	IntegraGuard EZ Spacer	SPACER SURFACTANT, SS-247	0.7000	GPB
Spacer / Pre Flush / Flush	IntegraGuard EZ Spacer	SAND, S-8, Silica Flour, 200 Mesh	282.2600	PPB
Spacer / Pre Flush / Flush	IntegraGuard EZ Spacer	IntegraGuard GW-86	0.6000	PPB
Spacer / Pre Flush / Flush	IntegraGuard EZ Spacer	SAND, S-8, Silica Flour, 200 Mesh	281.1400	PPB
Spacer / Pre Flush / Flush	IntegraGuard EZ Spacer	SPACER SURFACTANT, SS-247	0.7000	GPB
Spacer / Pre Flush / Flush	IntegraGuard EZ Spacer	SPACER SURFACTANT, SS-267	0.7000	GPB
Spacer / Pre Flush / Flush	IntegraGuard EZ Spacer	IntegraGuard GW-86	0.6000	PPB
Tail Slurry	BJCem P50.6.02C	FOAM PREVENTER, FP-25	0.3000	BWOB
Tail Slurry	BJCem P50.6.02C	FLUID LOSS, FL-24	0.5000	BWOB
Tail Slurry	BJCem P50.6.02C	SAND, S-8, Silica Flour, 200 Mesh	20.0000	BWOB
Tail Slurry	BJCem P50.6.02C	CEMENT, CLASS G	50.0000	PCT
Tail Slurry	BJCem P50.6.02C	Flyash (Rockies)	50.0000	PCT
Tail Slurry	BJCem P50.6.02C	RETARDER, SR-20	0.8000	BWOB
Tail Slurry	BJCem P50.6.02C	IntegraGuard GW-86	0.0500	BWOB

## DISPLACEMENT AND END OF JOB SUMMARY

Displaced By	BJ	Amt of Cement Returned / Reversed	0.00
Calculated Displacement Vol (bbls)	422.00	Method Used to Verify Returns	Visual
Actual Displacement Vol (bbls)	422.00	Amt of Spacer to Surface	43.00
Did Float Hold?	Yes	Pressure Left on Casing (psi)	3700.00
Bump Plug	Yes	Amt Bled Back After Job	0.00
Bump Plug Pressure (psi)	3500.00	Total Volume Pumped (bbls)	1221.00
Were Returns Planned at Surface	No	Top Out Cement Spotted	No
Cement Returns During Job	No	Lost Circulation During Cement Job	No

## CEMENT PLUG

Bottom Plug?	No	Wiper Balls Used?	Yes
Wiper Ball Quantity	1	Plug Catcher	No

# BJ Cementing Event Log

Long String - Cheyenne, WY - Edgar Rodriguez

SEQ	START DATE / TIME	EVENT	DENSITY (ppg)	PUMP RATE (bpm)	PUMP VOL (bbls)	PIPE PRESSURE (psi)	COMMENTS
1	02/02/2019 04:00	Depart for Location					DEPART YARD FOR LOCATION
2	02/02/2019 06:00	Arrive on Location					ARRIVE ON LOCATION / GET NUMBERS FROM CUSTOMER REP
3	02/02/2019 06:00	STEACS Briefing					STEACS BRIEFING
4	02/02/2019 06:15	Spot Units					SPOT EQUIPMENT
5	02/02/2019 06:35	STEACS Briefing					STEACS BRIEFING
6	02/02/2019 06:50	Rig Up					RIG UP SILOS / WATER / IRON ON GROUND
7	02/02/2019 07:50	Rig					RIG RUNNING CASING
8	02/02/2019 10:25	Rig					CASING ON BOTTOM / RIG CIRCULATING WITH CR TOOL
9	02/02/2019 10:55	STEACS Briefing					JOB STEACS BRIEFING
10	02/02/2019 11:15	Rig					RIG CIRCULATING WITH CR TOOL
11	02/02/2019 13:20	Rig					RIG DONE CIRCULATING / RIGGING DOWN CR TOOL
12	02/02/2019 13:30	Rig Up					STAB CMT HEAD / RIG UP FLOOR / WASH LINE
13	02/02/2019 13:54	Other (See comment)	8.3300		3.00	300.00	LOAD LINES
14	02/02/2019 13:56	Pressure Test	8.3300			6000.00	PRESSURE TEST LINES
15	02/02/2019 14:02	Pump Spacer	12.5000	4.00	50.00	250.00	50 BBLS INTEGRAGUARD SPACER WITH SURFACTANTS
16	02/02/2019 14:14	Pump Spacer	12.5000	6.50	90.00	250.00	90 BBLS INTEGRAGUARD SPACER WITHOUT SURFACTANTS
17	02/02/2019 14:35	Pump Spacer	12.5000	7.00	50.00	250.00	50 BBLS INTEGRAGUARD SPACER WITH SURFACTANTS
18	02/02/2019 14:50	Pumping Cement	14.5000	8.00	609.00	780.00	2365 SKS 50/50 POZ CLASS G CMT (609 BBLS @14.5) 3292' CALCULATED TOP OF CEMENT
19	02/02/2019 16:19	End Pumping					SHUTDOWN
20	02/02/2019 16:19	Wash Pumps and Lines					WASH LINES
21	02/02/2019 16:30	Drop Top Plug					DROP PLUG AND WIPER BALL

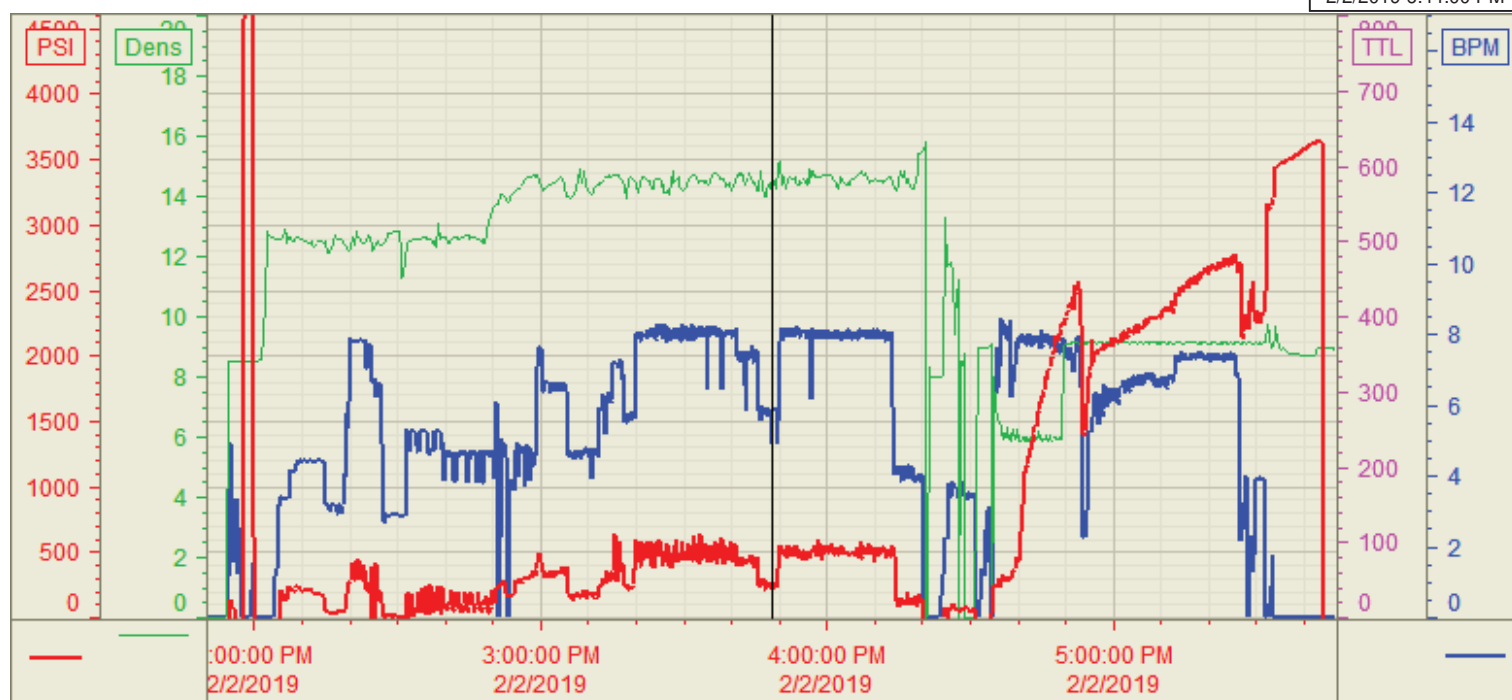
22	02/02/2019 16:33	Pump Displacement	8.4000	8.00		500.00	DISPLACEMENT WITH RETARDER
23	02/02/2019 16:36	Pump Displacement	8.4000	8.00	20.00	500.00	DISPLACEMENT WITH KCL WATER
24	02/02/2019 16:36	Pump Displacement	8.4000	8.00	55.00	1200.00	DISPLACEMENT REACHED CMT
25	02/02/2019 16:40	Other (See comment)	8.4000	8.00	200.00	2300.00	PASSENGER ENGINE SHUTOFF / SLOWED PUMPING TO 2 BPM
26	02/02/2019 16:52	Pump Displacement	8.4000	6.00	210.00	2300.00	PUMPING DISPLACEMENT AT 6 BPM
27	02/02/2019 16:54	Pump Displacement	8.4000	7.50	310.00	2400.00	PUMPING DISPLACEMENT AT 7.5 BPM
28	02/02/2019 17:18	Pump Displacement	8.4000	7.50	365.00	2400.00	SPACER OUT AT 365 BBLS GONE / 47 BBLS OF SPACER TO THE PIT
29	02/02/2019 17:25	Pump Displacement	8.4000	3.00	400.00	2500.00	SLOW RATE TO BUMP PLUG
30	02/02/2019 17:30	Land Plug	8.4000	3.00	422.00	3500.00	BUMP PLUG AT 2500 PSI AND TOOK OVER TO 3500 PSI
31	02/02/2019 17:30	Check Floats					FLOATS HOLDING FOR 3 MINUTES
32	02/02/2019 17:33	Other (See comment)					CLOSE IN MANIFOLD ON HEAD WITH 3700 PSI AND RIG WILL MONITOR
33	02/02/2019 17:37	End Pumping					END JOB / FULL RETURNS ENTIRE JOB / 57 BBLS OF SPACER TO THE PIT
34	02/02/2019 17:40	STEACS Briefing					STEACS BRIEFING
35	02/02/2019 17:50	Rig Down					RIG DOWN
36	02/02/2019 18:50	Filling Out Ticket					FINISHING PAPERWORK
37	02/02/2019 19:25	Leave Location					CREW LEAVE LOCATION

Customer: GREAT WESTERN  
Well Number: 13-032HC  
Lease Info: SCHAEFER LD



Print Date/Time

2/2/2019 6:44:00 PM



	Name	Y value	X value/time stamp	Tag name Y
1	PS - Press (PSI)	221.4	2/2/2019 3:48:24 PM	Cementer\PS_DISCHARGE_PRESS_DIAL
2	Den - Density (PPG)	14.33 i.	2/2/2019 3:48:29 PM i.	Cementer\DENSITY_ACTUAL_RATE
3	Flow Rate (BBLs)	4.91	2/2/2019 3:48:26 PM	Cementer\Flow_Combined
4				
5				

Source: Control1 6:43:56 PM