



# Great Western Operating Company, LLC

Ottesen LE 06-370HN

API # 05-123-48288

## Production

12/20/2018

Quote #: 24424

Execution #: 14093



# 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	Wesley Bell	RIG	PD 466
DISTRICT	Cheyenne, WY	COUNTY	WELD
SERVICE	Cementing	STATE / PROVINCE	CO

## WELL GEOMETRY

TYPE	OD (in)	ID (in)	WEIGHT (lb/ft)	MD (ft)	TVD (ft)	EXCESS (%)
Casing	5.50	4.89	17.00	18,231.00	7,524.00	
Previous Casing	9.63	8.92	36.00	1,897.00	1,754.00	
Open Hole	0.00	8.50	0.00	18,231.00	7,524.00	5.00
Open Hole		8.50		6,700.00	6,700.00	0.00

## HARDWARE

Top Plug Used?	Yes	Tool Type	Float Collar
Top Plug Provided By	Non BJ	Tool Depth (ft)	18,222.01
Top Plug Size	5.500	Max Casing Pressure - Rated (psi)	10640.00
Centralizers Used	Yes	Max Casing Pressure - Operated (psi)	3200.00
Centralizers Quantity	32.00	Pipe Movement	None
Centralizers Type	Rigid	Job Pumped Through	No Manifold
Landing Collar Depth (ft)	18,222	Top Connection Thread	BTC
		Top Connection Size	5.5

## CIRCULATION PRIOR TO JOB

Well Circulated By	Rig	PV Mud Out	17
Circulation Prior to Job	No	YP Mud In	8
Circulation Time (min)	180.00	YP Mud Out	8
Circulation Rate (bpm)	10.00	Solids Present at End of Circulation	No
Circulation Volume (bbls)	1800.00	10 sec SGS	6
Lost Circulation Prior to Cement Job	No	10 min SGS	9
Mud Density In (ppg)	10.50	Flare Prior to / during the Cement Job	No
Mud Density Out (ppg)	10.50	Gas Present	No
PV Mud In	17		

## TEMPERATURE

Ambient Temperature (°F)	45.00	Slurry Cement Temperature (°F)	60.00
Mix Water Temperature (°F)	60.00		

## 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					205.0000
Spacer / Pre Flush / Flush	IntegraGuard EZ Spacer	12.5000					50.0000
Tail Slurry	BJCem P50.6.02C	14.5000	1.4462	6.45	1894	2740.0000	487.8000
Displacement 1	Retarded Water	8.3337				0.0000	20.0000
Displacement Final	3% KCl	8.3300				0.0000	402.0000

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

## 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)	415.00	Amt of Spacer to Surface	55.00
Did Float Hold?	Yes	Pressure Left on Casing (psi)	3300.00
Bump Plug	Yes	Amt Bled Back After Job	0.00
Bump Plug Pressure (psi)	3200.00	Total Volume Pumped (bbls)	1216.00
Were Returns Planned at Surface	Yes	Top Out Cement Spotted	No
Cement Returns During Job	None	Lost Circulation During Cement Job	No

# BJ Cementing Event Log

Long String - Cheyenne, WY - Wesley Bell

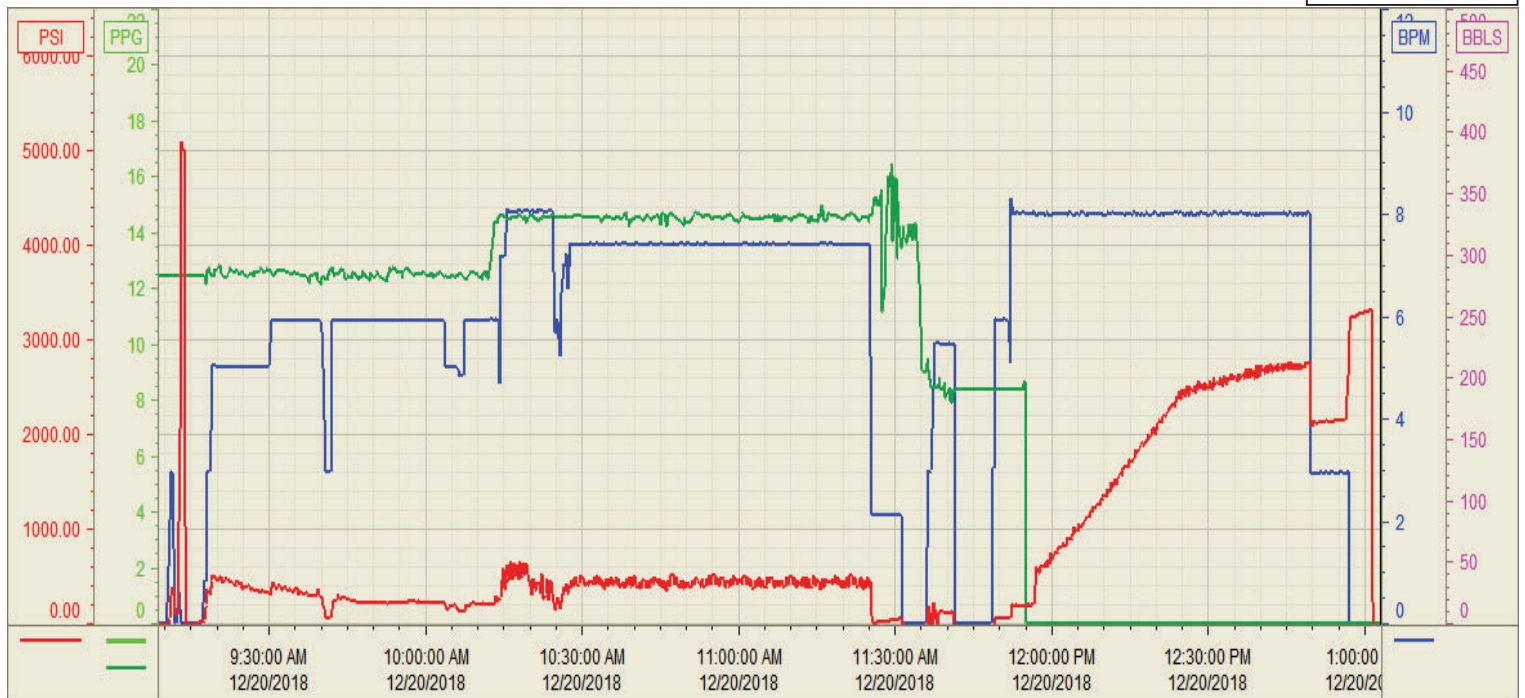
SEQ	START DATE / TIME	EVENT	DENSITY (ppg)	PUMP RATE (bpm)	PUMP VOL (bbls)	PIPE PRESSURE (psi)	COMMENTS
1	12/20/2018 05:50	Arrive on Location					Arrive on location, requested time was 06:00
2	12/20/2018 05:55	Rig Up					Spot and rig in all BJ equipment
3	12/20/2018 08:30	STEACS Briefing					Hold STEACS briefing with rig crew and pump crew. Review job hazards and job procedures.
4	12/20/2018 09:22	Pressure Test	12.5000	3.00	3.00	5100.00	pressure test lines with spacer, good test.
5	12/20/2018 09:27	Pump Spacer	12.5000	6.00	305.00	350.00	Pump 305bbls of Spacer, first and last 50bbls with surfactant.
6	12/20/2018 10:33	Pumping Cement	14.5000	7.50	487.80	650.00	Pump 487.8bbls of Tail cement at 14.ppg, 1894sks, Y: 1.4462, WR6.45.
7	12/20/2018 11:41	Wash Pumps and Lines	8.3400	0.00	0.00	0.00	Finish mixing, wash pumps and lines, load plugs. Start displacement.
8	12/20/2018 12:15	Pump Displacement	8.5000	8.00	100.00	1300.00	100bbls of displacement away with KCL, first 20bbls with retarder
9	12/20/2018 12:29	Pump Displacement	8.5000	8.00	100.00	2100.00	200bbls of displacement away with KCL
10	12/20/2018 12:44	Pumping Cement	8.5000	8.00	100.00	2400.00	300bbls of displacement away with KCL
11	12/20/2018 12:52	Pump Displacement	8.5000	8.00	60.00	2500.00	360bbls of displacement away, Spacer to surface. 55bbls back to surface.
12	12/20/2018 13:07	Land Plug	8.5000	3.00	55.00	2200.00	422bbls away, land plug, bump pressure to 3200psi.
13	12/20/2018 13:10	Close Wellhead	8.5000	0.00	0.00	3300.00	Shut in well with head on.
14	12/20/2018 13:12	Rig Down					Rig out all BJ equipment
15	12/20/2018 14:45	Leave Location					

Customer: Great Western  
Well Number: LE O6-370HN  
Lease Info: Ottesen



Print Date/Time

12/20/2018 1:44:10 PM



	Name	Y value	X value/time stamp	Tag name Y
1	DS - Press (PSI)	-34.7 i.	12/20/2018 1:03:00 PM i.	CementenDS_DISCHARGE_PRESS_DIAL
2	DH - Density (PPG)	-29.63	12/20/2018 1:03:03 PM	CementenDENSITY2_ACTUAL_RATE
3	Recirc - Density (PPG)	0.01	12/20/2018 1:03:03 PM	CementenDENSITY_ACTUAL_RATE
4	Combined Rate (BPM)	0.00	12/20/2018 1:03:03 PM	CementenFlow_Combined
5				
6				

Source: Control1 1:44:02 PM