



Great Western Operating Company, LLC

Schaefer LD 13-032HN

API # 05-001-10255

Production

02/16/2019

Quote #: 27077

Execution #: 15675



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,
Gage Putnam
Field Engineer II | (307) 365-8254 | Gage.Putnam@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	Zachary Hyde	FORMATION	
CLIENT FIELD REPRESENTATIVE	JW	RIG	PD 460
DISTRICT	Cheyenne, WY	COUNTY	ADAMS
SERVICE	Cementing	STATE / PROVINCE	CO

WELL GEOMETRY

TYPE	OD (in)	ID (in)	WEIGHT (lb/ft)	MD (ft)	TVD (ft)	EXCESS (%)
Open Hole	0.00	8.50	0.00	18,011.00	7,499.00	5.00
Previous Casing	9.63	8.92	36.00	1,788.00	1,788.00	
Casing	5.50	4.89	17.00	18,011.00	7,499.00	

HARDWARE

Bottom Plug Used?	No	Landing Collar Depth (ft)	18,000
Top Plug Used?	Yes	Max Casing Pressure - Rated (psi)	10,640.00
Top Plug Provided By	Non BJ	Max Casing Pressure - Operated (psi)	5,500.00
Top Plug Size	5.500	Pipe Movement	None
Centralizers Used	Yes	Job Pumped Through	No Manifold
Centralizers Quantity	112.00	Top Connection Thread	BTC
Centralizers Type	Rigid	Top Connection Size	5.5

CIRCULATION PRIOR TO JOB

Well Circulated By	Rig	YP Mud In	8
Circulation Prior to Job	Yes	Solids Present at End of Circulation	No
Circulation Time (min)	180.00	10 sec SGS	8
Circulation Rate (bpm)	8.00	10 min SGS	9
Circulation Volume (bbls)	1440.00	30 min SGS	11
Lost Circulation Prior to Cement Job	No	Flare Prior to / during the Cement Job	No
Mud Density In (ppg)	11.00	Gas Present	No
PV Mud In	32	Gas Units	0.00

TEMPERATURE

Ambient Temperature (°F)	28.00	Slurry Cement Temperature (°F)	70.00
Mix Water Temperature (°F)	70.00	Flow Line Temperature (°F)	140.00

FLUID DETAILS

FLUID TYPE	FLUID NAME	DENSITY (ppg)	YIELD (Cu Ft/sk)	H ₂ 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					190.0000
Spacer / Pre Flush / Flush	IntegraGuard EZ Spacer	12.5000					50.0000
Tail Slurry	BJCem P50.6.02C	14.5000	1.4462	6.45	2340	3390.0000	603.7000
Displacement 1	Retarded Water	8.3337				0.0000	20.0000
Displacement Final	3% KCl	8.3300				0.0000	397.000

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	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	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	282.2600	PPB
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
Spacer / Pre Flush / Flush	IntegraGuard EZ Spacer	SPACER SURFACTANT, SS-247	0.7000	GPB
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	Flyash (Rockies)	50.0000	PCT
Tail Slurry	BJCem P50.6.02C	RETARDER, SR-20	0.8000	BWOB
Tail Slurry	BJCem P50.6.02C	CEMENT, CLASS G	50.0000	PCT
Tail Slurry	BJCem P50.6.02C	SAND, S-8, Silica Flour, 200 Mesh	20.0000	BWOB
Tail Slurry	BJCem P50.6.02C	FLUID LOSS, FL-24	0.5000	BWOB

DISPLACEMENT AND END OF JOB SUMMARY

Displaced By	BJ	Amt of Cement Returned / Reversed	0.00
Calculated Displacement Vol (bbls)	417.00	Method Used to Verify Returns	Visual
Actual Displacement Vol (bbls)	417.00	Amt of Spacer to Surface	46.00
Did Float Hold?	Yes	Pressure Left on Casing (psi)	3800.00
Bump Plug	Yes	Amt Bled Back After Job	0.00
Bump Plug Pressure (psi)	3800.00	Total Volume Pumped (bbls)	1210.00
Were Returns Planned at Surface	No	Top Out Cement Spotted	No
Cement Returns During Job	No	Lost Circulation During Cement Job	No



BJ Cementing Event Log

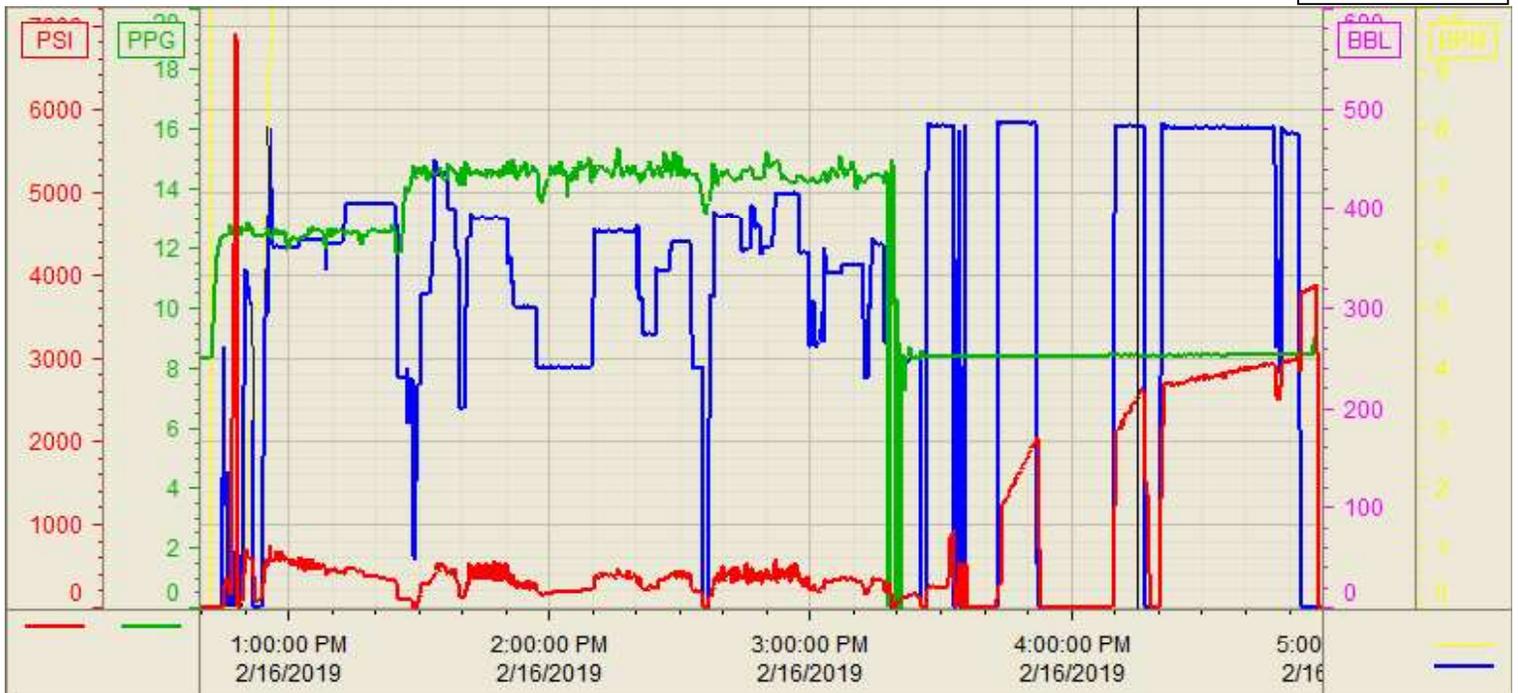
Long String - Cheyenne, WY - Zachary Hyde

SEQ	START DATE / TIME	EVENT	DENSITY (ppg)	PUMP RATE (bpm)	PUMP VOL (bbls)	PIPE PRESSURE (psi)	COMMENTS
1	02/16/2019 02:38	Callout					Crew gets called out requested time 730 2/16/19
2	02/16/2019 03:00	Arrive on Location					Crew arrives on location
3	02/16/2019 06:00	Spot Units					Crew spots units
4	02/16/2019 06:15	Rig Up					Crew rigs up iron and hoses needed for job
5	02/16/2019 07:30	Rig					Crew waits for rig to finish running casing and to circulate
6	02/16/2019 12:30	STEACS Briefing					Crew has a briefing with rig crew and company man discussing the job
7	02/16/2019 12:46	Prime Up	12.5000	3.00	3.00	300.00	Filled lines with spacer
8	02/16/2019 12:48	Pressure Test					Pressure tested pump and lines to 5500 psi
9	02/16/2019 12:51	Pump Spacer	12.5000	6.00	50.00	800.00	Pumped 50 bbls of Spacer at 12.5 ppg with surfactant
10	02/16/2019 13:02	Pump Spacer	12.5000	6.00	90.00	800.00	Pumped 90 bbls of Spacer at 12.5 ppg without surfactant
11	02/16/2019 13:16	Pump Spacer	12.5000	7.00	50.00	400.00	Pumped 50 bbls of Spacer at 12.5 ppg with surfactant
12	02/16/2019 13:20	Pump Tail Cement	14.5000	6.00	603.00	500.00	Pumped 603 bbls of Tail cement at 14.5 ppg (2340sk, 1.44yld, 6.45gal/sk) Had a few delivery issues on Tail cement
13	02/16/2019 15:23	End Pumping					Shutdown
14	02/16/2019 15:23	Wash Pumps and Lines					Washed pump and lines to pit
15	02/16/2019 15:28	Drop Top Plug					Dropped top plug
16	02/16/2019 15:28	Pump Displacement	8.3300	8.00	20.00	800.00	First 20 bbls of displacement was fresh water and retarder
17	02/16/2019 15:32	Other (See comment)					Had to shutdown because the cement head cap was leaking. Rig the head down and put the swage on. We were shutdown for 20 minutes
18	02/16/2019 15:32	Pump Displacement	8.4000	8.00	377.00	2800.00	Pumped 377 bbls of KCL Displacement
19	02/16/2019 16:30	Spacer Back-to-Surface					Got 46 bbls of Spacer to surface
20	02/16/2019 16:30	Pump Displacement	8.3300	3.00	20.00	2800.00	Slowed rate the last 20 bbls to 3 bpm to land the plug
21	02/16/2019 16:45	Land Plug					Landed plug went 1000 psi over FCP. FCP was 2800 brought it up to 3800 psi
22	02/16/2019 16:53	Other (See comment)					Shut in the the casing with 3800 psi
23	02/16/2019 16:53	Rig Down					Crew rigs down iron and hoses

Customer: Great Western
 Well Number: 13-032HN
 Lease Info: Schaefer LD



Print Date/Time
 2/16/2019 6:36:14 PM



	Name	Y value	X value/time stamp	Tag name Y
1	DS - Press (PSI)	2534.9	2/16/2019 4:15:16 PM	CementerDS_DISCHARGE_PRESS_DIAL
2	Recirc - Density (PPG)	8.43	2/16/2019 4:15:16 PM	CementerDENSITY_ACTUAL_RATE
3	DS - Flow Total (BBLs)	180.00	2/16/2019 4:15:19 PM	CementerDS_FLOW_TOTAL
4	Combined Rate	8.03	2/16/2019 4:15:14 PM	CementerFlow_Combined
5				

Source: Control1 6:36:09 PM