



Terra Energy Partners

Well Name: FEDERAL PA 34-23

API #: 05-045-24303

Job Type: Production

Date Job Completed: 9/19/2020

Quote #: QUO-47106

Execution #: EXC-26824



Terra Energy Partners

Attention: Mr. Lynn Cass | (970) 263-2716 | LCass@terraep.com

Terra Energy Partners | 4828 Loop Central Dr., Suite 900 | Houston, TX 77081

Dear Mr. Cass,

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,

Zen Keith
Field Engineer | (307) 757-7178 | zen.keith@bjsservices.com

Field Office 28730 US-6, Rifle, CO 81650
Phone: (970) 632-2412

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

BJ Cementing Treatment Report

SERVICE SUPERVISOR	Francisco Castillo	FORMATION	
CLIENT FIELD REPRESENTATIVE	Steve Bumgarner	RIG	H&P 318
DISTRICT	Rifle, CO	COUNTY	GARFIELD
SERVICE	Cementing	STATE / PROVINCE	CO

WELL GEOMETRY

TYPE	ID (in)	OD (in)	WEIGHT (lb/ft)	MD (ft)	EXCESS (%)	GRADE	THREAD
Previous Casing	8.92	9.63	36.00	1,135.00		J-55	ST&C
Open Hole	8.75			8,689.00	45.00		
Casing	4.00	4.50	11.60	8,682.84		P-110	BTC

HARDWARE

Bottom Plug Used?	No	Tool Type	Float Collar
Top Plug Used?	Yes	Tool Depth (ft)	8,652.10
Top Plug Provided By	Non BJ	Max Casing Pressure - Rated (psi)	10690.00
Top Plug Size	4.500	Max Casing Pressure - Operated (psi)	8552.00
Centralizers Used	No	Pipe Movement	Reciprocation
Centralizers Type	Bow	Job Pumped Through	Manifold
Landing Collar Depth (ft)	8,652	Top Connection Thread	BUTTRESS
		Top Connection Size	4.5

CIRCULATION PRIOR TO JOB

Well Circulated By	Rig	YP Mud In	20
Circulation Prior to Job	Yes	Solids Present at End of Circulation	No
Circulation Time (min)	120.00	10 sec SGS	7
Circulation Rate (bpm)	10.00	10 min SGS	34
Circulation Volume (bbls)	1200.00	30 min SGS	52
Lost Circulation Prior to Cement Job	No	Flare Prior to / during the Cement Job	Yes
Mud Density In (ppg)	12.90	Gas Present	No
PV Mud In	25		

TEMPERATURE

Ambient Temperature (°F)	71.00	Slurry Cement Temperature (°F)	71.00
Mix Water Temperature (°F)	67.00		

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	Water	8.3000			3,891.00				10.0000
Spacer	Mud Flush	8.4000			4,112.00				20.0000
Spacer	Water	8.3000			6,244.00				10.0000
Tail Slurry	Primary Cement	14.2000	1.7223	8.08	4,073.00	4,746.00	1230	2118.0000	377.1000
Displacement	Displacement	8.3000			0.00			0.0000	135.0000

FLUID TYPE	FLUID NAME	COMPONENT	CONCENTRATION	UOM
Spacer	Mud Flush	MUD REMOVAL, SAPP	10.0000	PPB
Spacer	Mud Flush	SPACER SURFACTANT, SS-201	0.5000	GPB
Tail Slurry	Primary Cement	IntegraGuard GW-86	0.1000	BWOB
Tail Slurry	Primary Cement	RETARDER, R-3	0.3000	BWOB
Tail Slurry	Primary Cement	SAND, S-8, Silica Flour, 200 Mesh	27.0000	BWOB
Tail Slurry	Primary Cement	CEMENT, FLY ASH (POZZOLAN)	20.0000	PCT
Tail Slurry	Primary Cement	CEMENT, CLASS G	80.0000	PCT
Tail Slurry	Primary Cement	IntegraSeal POLI	0.2500	LBS/SK
Tail Slurry	Primary Cement	FLUID LOSS, FL-66	0.4000	BWOB
Tail Slurry	Primary Cement	FOAM PREVENTER, FP-24	0.3000	BWOB

TREATMENT SUMMARY

TIME	FLUID	RATE (bpm)	FLUID VOL (bbls)	PIPE PRESS (psi)	ANNULUS PRESS (psi)	COMMENTS
9/19/2020 8:11:00 PM	Water	8.00	10.00	1907.00		
9/19/2020 8:13:00 PM	Mud Flush	8.00	20.00	1919.00		
9/19/2020 8:14:00 PM	Water	8.00	10.00	1927.00		
9/19/2020 8:17:00 PM	Primary Cement	7.00	377.10	1351.00		
9/19/2020 9:33:00 PM	Displacement	9.50	134.00	3371.00		

MIN / MAX / AVG PRESSURE AND RATES

	MIN	MAX	AVG
Pressure (psi)	1351.00	3371.00	2095.00
Rate (bpm)	7.00	9.50	8.10

DISPLACEMENT AND END OF JOB SUMMARY

Displaced By	BJ	Amt of Cement Returned / Reversed	0.00
Calculated Displacement Vol (bbls)	134.00	Method Used to Verify Returns	Visual
Actual Displacement Vol (bbls)	134.00	Amt of Spacer to Surface	0.00
Did Float Hold?	Yes	Pressure Left on Casing (psi)	0.00
Bump Plug	Yes	Amt Bled Back After Job	1.50
Bump Plug Pressure (psi)	4031.00	Total Volume Pumped (bbls)	551.00
Were Returns Planned at Surface	No	Top Out Cement Spotted	No
Cement Returns During Job	None	Lost Circulation During Cement Job	No



BJ Cementing Event Log

Long String - Rifle, CO - Francisco Castillo

SEQ	START DATE / TIME	EVENT	DENSITY (ppg)	PUMP RATE (bpm)	PUMP VOL (bbls)	PIPE PRESSURE (psi)	COMMENTS
1	09/19/2020 15:00	Callout					ON LOCATION AT 18:00 HRS
2	09/19/2020 16:30	Depart for Location					LEAVE THE YARD
3	09/19/2020 17:00	Arrive on Location					ON LOCATION, RIG RUNNING CASING
4	09/19/2020 19:00	Rig Up					RIG UP MEETING, RIG UP
5	09/19/2020 19:49	STEACS Briefing					PRE-JOB SAFETY MEETING
6	09/19/2020 20:09	Pressure Test				5100.00	PRESSURE TEST LINES
7	09/19/2020 20:11	Pump Spacer	8.3400	8.00	10.00	1907.00	WATER SPACER
8	09/19/2020 20:13	Pump Spacer	8.4000	8.00	20.00	1919.00	MUD FLUSH SPACER
9	09/19/2020 20:14	Pump Spacer	8.3400	8.00	10.00	1927.00	WATER SPACER
10	09/19/2020 20:17	Pumping Cement	14.2000	7.00	50.00	2763.00	1230 SKS / 377 BBLs AT 14.2 PPG, 1.72 YLD, 8.08 GPS
11	09/19/2020 20:23	Pumping Cement	14.2000	7.00	50.00	1317.00	100 BBLs CEMENT PUMPED
12	09/19/2020 20:30	Pumping Cement	14.2000	7.00	50.00	1254.00	150 BBLs CEMENT PUMPED
13	09/19/2020 20:37	Pumping Cement	14.2000	7.00	50.00	1367.00	200 BBLs CEMENT PUMPED
14	09/19/2020 20:43	Pumping Cement	14.2000	7.00	50.00	1351.00	250 BBLs CEMENT PUMPED
15	09/19/2020 20:50	Pumping Cement	14.2000	7.00	50.00	1303.00	300 BBLs CEMENT PUMPED
16	09/19/2020 21:05	Pumping Cement	14.2000	7.00	77.00	1303.00	377 BBLs CEMENT PUMPED
17	09/19/2020 21:22	End Pumping					SHUTDOWN, WASH LINES, DROP PLUG
18	09/19/2020 21:33	Pump Displacement	8.3400	9.50	50.00	2494.00	DISPLACEMENT KCL
19	09/19/2020 21:39	Pump Displacement	8.3400	8.50	74.00	2494.00	124 BBLs DISPLACEMENT

Client: Terra Energy Partners, LLC

Well Name / API: FEDERAL #PA 34-23 / 05-045-24303

Well MD: 8689

Quote #: QUO-47106-POM4D2

Plan #: ORD-26824-L2W2T0

Execution #: EXC-26824-L2W2T002



SEQ	START DATE / TIME	EVENT	DENSITY (ppg)	PUMP RATE (bpm)	PUMP VOL (bbls)	PIPE PRESSURE (psi)	COMMENTS
20	09/19/2020 21:48	Pump Displacement	8.3400	3.00	10.00	3175.00	SLOW RATE
21	09/19/2020 21:53	Land Plug					LAND PLUG, FULL RETURNS
22	09/19/2020 21:58	Check Floats					FLOATS HELD, 1.5 BBLS FLOW BACK
23	09/19/2020 22:15	Rig Down					RIG DOWN MEETING, RIG DOWN
24	09/19/2020 23:00	Leave Location					LEAVE LOCATION



TERRA PA 34-23 PRODUCTION

