



Terra Energy Partners

Well Name: FEDERAL #PA 334-13

API #: 05-045-24203

Job Type: Production

Date Job Completed: 6/22/2020

Quote #: QUO-45828

Execution #: EXC-26279



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@bjservices.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	Paul Linn III	FORMATION	
CLIENT FIELD REPRESENTATIVE	Darrell Leatherman	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)	TVD (ft)	EXCESS (%)	GRADE	THREAD
Casing	4.00	4.50	11.60	9,830.00	9,476.00		P-110	LT&C
Previous Casing	8.92	9.63	36.00	1,136.00	1,065.00		J-55	ST&C
Open Hole	8.75	0.00	0.00	9,837.00	9,476.00	45.00		

HARDWARE

Bottom Plug Used?	No	Tool Type	Float Collar
Top Plug Used?	Yes	Tool Depth (ft)	9,800.00
Top Plug Provided By	Non BJ	Pipe Movement	Reciprocation
Top Plug Size	4.500	Job Pumped Through	Manifold
Centralizers Used	Yes	Top Connection Thread	8 RND
Centralizers Quantity	30.00	Top Connection Size	4.5
Centralizers Type	Bow		
Landing Collar Depth (ft)	9,837		

CIRCULATION PRIOR TO JOB

Well Circulated By	Rig	Gas Present	Yes
Circulation Prior to Job	Yes	Gas Units	1853
Circulation Time (min)	90.00		
Circulation Rate (bpm)	11.00		
Circulation Volume (bbls)	990.00		
Lost Circulation Prior to Cement Job	No		
Mud Density In (ppg)	10.00		
Mud Density Out (ppg)	10.00		

TEMPERATURE

Ambient Temperature (°F)	68.00	Slurry Cement Temperature (°F)	77.80
Mix Water Temperature (°F)	68.50	Flow Line Temperature (°F)	

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			5,736.00				10.0000
Spacer	Mud Flush	8.4000			5,554.00				20.0000
Spacer	Water	8.3000			5,866.00				10.0000
Lead Slurry	BJCem P100.3.02R	12.7000	1.9801	11.09	5,919.00	1,024.00	231	457.0000	81.2000
Tail Slurry	BJCem P70.6.01R	13.5000	1.8305	9.11	6,943.00	2,947.00	720	1317.0000	234.4000
Displacement	Displacement	8.3000			0.00			0.0000	153.0000

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
Lead Slurry	BJCem P100.3.02R	CEMENT, ASTM TYPE III	100.0000	PCT
Lead Slurry	BJCem P100.3.02R	IntegraGuard GW-86	0.1000	BWOB
Lead Slurry	BJCem P100.3.02R	IntegraSeal POLI	0.2500	LBS/SK
Lead Slurry	BJCem P100.3.02R	FLUID LOSS, FL-66	0.5000	BWOB
Lead Slurry	BJCem P100.3.02R	FOAM PREVENTER, FP-25	0.3000	BWOB
Lead Slurry	BJCem P100.3.02R	DISPERSANT, CD-31	0.1000	BWOB
Lead Slurry	BJCem P100.3.02R	RETARDER, R-3	0.4000	BWOB
Tail Slurry	BJCem P70.6.01R	FLUID LOSS, FL-24	0.4000	BWOB
Tail Slurry	BJCem P70.6.01R	CEMENT, FLY ASH (POZZOLAN)	20.0000	PCT
Tail Slurry	BJCem P70.6.01R	FOAM PREVENTER, FP-25	0.3000	BWOB
Tail Slurry	BJCem P70.6.01R	BONDING AGENT, BA-90	10.0000	PCT
Tail Slurry	BJCem P70.6.01R	SAND, S-8, Silica Flour, 200 Mesh	25.0000	BWOB
Tail Slurry	BJCem P70.6.01R	RETARDER, R-3	0.4000	BWOB
Tail Slurry	BJCem P70.6.01R	IntegraSeal POLI	0.2500	LBS/SK
Tail Slurry	BJCem P70.6.01R	EXTENDER, BENTONITE	6.0000	BWOB
Tail Slurry	BJCem P70.6.01R	CEMENT, CLASS G	70.0000	PCT

TREATMENT SUMMARY

Client: Terra Energy Partners, LLC

Well: FEDERAL #PA 334-13

Well API: 05-045-24203

Start Date: 6/21/2020

End Date: 6/21/2020

Field Ticket #: FT-26279-P9C4W20202-17682



TIME	FLUID	RATE (bpm)	FLUID VOL (bbls)	PIPE PRESS (psi)
6/22/2020 1:07:00 AM	Water	4.00	10.00	470.00
6/22/2020 1:13:00 AM	Mud Flush	4.00	20.00	552.00
6/22/2020 1:16:00 AM	Water	4.00	10.00	646.00
6/22/2020 1:21:00 AM	BJCem P100.3.02R	4.00	82.00	856.00
6/22/2020 1:34:00 AM	BJCem P70.6.01R	7.00	234.40	973.00
6/22/2020 2:19:00 AM	Displacement	10.00	152.00	713.00

MIN / MAX / AVG PRESSURE AND RATES

	MIN	MAX	AVG
Pressure (psi)	316.00	3021.00	1234.00
Rate (bpm)	2.00	10.00	7.00

DISPLACEMENT AND END OF JOB SUMMARY

Displaced By	BJ	Amt of Cement Returned / Reversed	0.00
Calculated Displacement Vol (bbls)	151.90	Method Used to Verify Returns	Visual
Actual Displacement Vol (bbls)	152.00	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)	2581.00	Total Volume Pumped (bbls)	533.00
Were Returns Planned at Surface	Yes	Top Out Cement Spotted	No
Cement Returns During Job	Full	Lost Circulation During Cement Job	No

BJ Cementing Event Log

Long String - Rifle, CO - Paul Linn III

SEQ	START DATE / TIME	EVENT	DENSITY (ppg)	PUMP RATE (bpm)	PUMP VOL (bbls)	PIPE PRESSURE (psi)	COMMENTS
1	06/21/2020 09:00	Callout					Call Out, on location time of 18:00 06/21/2020
2	06/21/2020 16:05	STEACS Briefing					Pre-Convoy STEACS Briefing with all BJ Services cement crew
3	06/21/2020 16:18	Depart for Location					Depart from Rifle yard for H&P 318
4	06/21/2020 17:09	Arrive on Location					Arrive on location, rig was running casing
5	06/21/2020 17:11	Client					Wait on rig to finish running casing and circulate
6	06/21/2020 23:30	Spot Units					Did a site assessment and spotted in all equipment
7	06/21/2020 23:41	STEACS Briefing					Pre-Rig Up STEACS Briefing with all BJ Services cement crew
8	06/21/2020 23:58	Rig Up					Rig up all ground equipment
9	06/22/2020 00:42	STEACS Briefing					Pre-Job STEACS Briefing with rig crew, company man, and all BJ Services cement crew
10	06/22/2020 00:51	Rig Up					Load plug in plug container (witnessed by company man), stab plug container, and hook up lines
11	06/22/2020 01:00	Prime Up	8.4000	2.00	5.00	316.00	Fill lines with 5 bbls of fresh water
12	06/22/2020 01:03	Pressure Test				5230.00	Pressure test to 5230 psi
13	06/22/2020 01:07	Pump Spacer	8.4000	4.00	10.00	470.00	Pump Fresh Water
14	06/22/2020 01:08	Pump Spacer	8.5000	4.00	20.00	552.00	Pump Mud Flush
15	06/22/2020 01:14	Pump Spacer	8.4000	4.50	10.00	646.00	Pump Fresh Water
16	06/22/2020 01:21	Pump Lead Cement	12.7000	4.00	5.00	856.00	Pump Lead Cement @ 12.7 ppg 231 sks 1.98 cuft/sk 11.09 gals/sk. For a total of 81.46 bbls of Lead cement requiring 61 bbls of mix water, weight verified with mud scale
17	06/22/2020 01:23	Pump Lead Cement	12.7000	7.00	15.00	1338.00	Pump Lead Cement
18	06/22/2020 01:28	Pump Lead Cement	12.7000	7.00	50.00	1234.00	Pump Lead Cement

Client: Terra Energy Partners, LLC

Well Name / API: FEDERAL #PA 334-13 / 05-045-24203

Well MD: 9837

Quote #: QUO-45828-Q7S3P8

Plan #: ORD-26279-P9C4W2

Execution #: EXC-26279-P9C4W202



SEQ	START DATE / TIME	EVENT	DENSITY (ppg)	PUMP RATE (bpm)	PUMP VOL (bbls)	PIPE PRESSURE (psi)	COMMENTS
19	06/22/2020 01:33	Pump Lead Cement	12.7000	7.00	85.00	905.00	Finished pumping Lead Cement with 85 bbls away
20	06/22/2020 01:34	Pump Tail Cement	13.5000	7.00	5.00	973.00	Pump Tail Cement @ 13.5 ppg 720 sks 1.83 cuft/sk 9.11 gals/sk. For a total of 234.66 bbls of Tail cement requiring 156.17 bbls of mix water, weight verified with mud scale
21	06/22/2020 01:37	Pump Tail Cement	13.5000	6.00	20.00	883.00	Pump Tail Cement
22	06/22/2020 01:40	Pump Tail Cement	13.5000	7.00	40.00	1231.00	Pump Tail Cement
23	06/22/2020 01:42	Pump Tail Cement	13.5000	8.00	50.00	1407.00	Pump Tail Cement
24	06/22/2020 01:47	Pump Tail Cement	13.5000	8.00	100.00	1464.00	Pump Tail Cement
25	06/22/2020 01:54	Pump Tail Cement	13.5000	8.00	150.00	1240.00	Pump Tail Cement
26	06/22/2020 02:00	Pump Tail Cement	13.5000	7.00	205.00	1119.00	Pump Tail Cement
27	06/22/2020 02:10	Pump Tail Cement	13.5000	5.50	256.00	734.00	Finished pumping Tail Cement with 256 bbls away
28	06/22/2020 02:12	Wash Pumps and Lines					Wash pump & lines to 3-sided tank
29	06/22/2020 02:18	Drop Top Plug					Drop plug, verified by company man
30	06/22/2020 02:19	Pump Displacement	8.4000	10.00	10.00	713.00	Pump Fresh water Displacement
31	06/22/2020 02:23	Pump Displacement	8.4000	10.00	50.00	1559.00	Pump Fresh water Displacement
32	06/22/2020 02:30	Pump Displacement	8.4000	10.00	100.00	2325.00	Pump Fresh water Displacement
33	06/22/2020 02:34	Pump Displacement	8.4000	10.00	140.00	3021.00	Pump Fresh water Displacement
34	06/22/2020 02:39	Pump Displacement	8.4000	4.00	152.00	2581.00	Pump Fresh water Displacement
35	06/22/2020 02:40	Land Plug				2981.00	Land plug @ 2581 psi took to 2981 psi
36	06/22/2020 02:42	Check Floats					Check floats, floats held 1 1/2 bbls back
37	06/22/2020 02:45	Wash Pumps and Lines					Wash pump & lines to 3-sided tank
38	06/22/2020 02:53	STEACS Briefing					Pre-Rig Down STEACS Briefing with rig crew, and all BJ Services cement crew
39	06/22/2020 03:02	Rig Down					Rig down all equipment
40	06/22/2020 03:51	STEACS Briefing					Pre-Convoy STEACS Briefing with all BJ Services cement crew
41	06/22/2020 04:00	Leave Location					Depart from location for Rifle yard. Thank you for using BJ Services, Andrew Linn, and crew

