



Terra Energy Partners

Well Name: FEDERAL #PA 524-13

API #: 05-045-24198

Job Type: Production

Date Job Completed: 5/26/2020

Quote #: QUO-45393

Execution #: EXC-26146



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	Garrett Wade	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	1,137.00		J-55	ST&C
Open Hole	8.75			9,881.00	45.00		
Casing	4.00	4.50	11.60	9,871.00		P-110	LT&C

HARDWARE

Bottom Plug Used?	No	Tool Type	Float Collar
Top Plug Used?	Yes	Tool Depth (ft)	9,840.00
Top Plug Provided By	Non BJ	Pipe Movement	Reciprocation
Top Plug Size	4.500	Job Pumped Through	Manifold
Centralizers Used	No	Top Connection Thread	8 RND
Landing Collar Depth (ft)	9,871	Top Connection Size	4.5

CIRCULATION PRIOR TO JOB

Well Circulated By	Rig
Circulation Prior to Job	Yes
Circulation Time (min)	60.00
Circulation Rate (bpm)	10.00
Circulation Volume (bbls)	600.00
Lost Circulation Prior to Cement Job	No
Mud Density In (ppg)	10.40
Mud Density Out (ppg)	10.40

TEMPERATURE

Ambient Temperature (°F)	59.00	Slurry Cement Temperature (°F)	78.10
Mix Water Temperature (°F)	63.30	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			5,931.00				10.0000
Spacer	Mud Flush	8.4000			5,896.00				20.0000
Spacer	Water	8.3000			5,807.00				10.0000
Lead Slurry	BJCem P100.3.02R	12.7000	1.9801	11.09	5,989.00	1,024.00	231	457.0000	81.2000
Tail Slurry	BJCem P70.6.01R	13.5000	1.8305	9.11	7,013.00	2,947.00	720	1317.0000	234.4000
Displacement	Displacement	8.3000			0.00			0.0000	154.1000

FLUID TYPE	FLUID NAME	COMPONENT	CONCENTRATION	UOM
Spacer / Pre Flush / Flush	Mud Flush	MUD REMOVAL, SAPP	10.0000	PPB
Spacer / Pre Flush / Flush	Mud Flush	SPACER SURFACTANT, SS-201	0.5000	GPB
Lead Slurry	BJCem P100.3.02R	IntegraGuard GW-86	0.1000	BWOB
Lead Slurry	BJCem P100.3.02R	DISPERSANT, CD-31	0.1000	BWOB
Lead Slurry	BJCem P100.3.02R	FLUID LOSS, FL-66	0.5000	BWOB
Lead Slurry	BJCem P100.3.02R	RETARDER, R-3	0.4000	BWOB
Lead Slurry	BJCem P100.3.02R	IntegraSeal POLI	0.2500	LBS/SK
Lead Slurry	BJCem P100.3.02R	CEMENT, ASTM TYPE III	100.0000	PCT
Lead Slurry	BJCem P100.3.02R	FOAM PREVENTER, FP-25	0.3000	BWOB
Tail Slurry	BJCem P70.6.01R	FOAM PREVENTER, FP-25	0.3000	BWOB
Tail Slurry	BJCem P70.6.01R	IntegraSeal POLI	0.2500	LBS/SK
Tail Slurry	BJCem P70.6.01R	CEMENT, CLASS G	70.0000	PCT
Tail Slurry	BJCem P70.6.01R	FLUID LOSS, FL-24	0.4000	BWOB
Tail Slurry	BJCem P70.6.01R	RETARDER, R-3	0.4000	BWOB
Tail Slurry	BJCem P70.6.01R	SAND, S-8, Silica Flour, 200 Mesh	25.0000	BWOB
Tail Slurry	BJCem P70.6.01R	CEMENT, FLY ASH (POZZOLAN)	20.0000	PCT
Tail Slurry	BJCem P70.6.01R	EXTENDER, BENTONITE	6.0000	BWOB
Tail Slurry	BJCem P70.6.01R	BONDING AGENT, BA-90	10.0000	PCT

TREATMENT SUMMARY

Client: Terra Energy Partners, LLC

Well: FEDERAL #PA 524-13

Well API: 05-045-24198

Start Date: 5/25/2020

End Date: 5/26/2020

Field Ticket #: FT-26146-J4F3R00202-82836



TIME	FLUID	RATE (bpm)	FLUID VOL (bbls)	PIPE PRESS (psi)
5/26/2020 10:09:00 AM	Water	5.00	10.00	770.00
5/26/2020 10:14:00 AM	Mud Flush	5.00	20.00	921.00
5/26/2020 10:17:00 AM	Water	5.00	10.00	998.00
5/26/2020 10:18:00 AM	BJCem P100.3.02R	5.00	81.20	1308.00
5/26/2020 10:36:00 AM	BJCem P70.6.01R	6.50	234.40	1211.00
5/26/2020 11:17:00 AM	Displacement	10.00	12.53	835.00

MIN / MAX / AVG PRESSURE AND RATES

	MIN	MAX	AVG
Pressure (psi)	654	3905	1117
Rate (bpm)	2.00	10	6

DISPLACEMENT AND END OF JOB SUMMARY

Displaced By	BJ	Amt of Cement Returned / Reversed	0.00
Calculated Displacement Vol (bbls)	152.52	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)	835.00	Total Volume Pumped (bbls)	521.00
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	05/25/2020 19:30	Callout					Call out. on location time of 03:30 on 5/26/2020
2	05/25/2020 22:00	STEACS Briefing					Pre-Convoy STEACS Briefing with all BJ Services cement crew
3	05/25/2020 22:22	Depart for Location					Depart from Rifle yard for H&P 318
4	05/25/2020 23:39	Arrive on Location					Arrive on location, rig was pulling drill pipe
5	05/25/2020 23:45	Client					Wait on rig to start running casing to spot in
6	05/26/2020 06:52	Spot Units					Did a site assessment and spotted in all equipment
7	05/26/2020 07:09	STEACS Briefing					Pre-Rig Up STEACS Briefing with all BJ Services cement crew
8	05/26/2020 07:26	Rig Up					Rig up all ground equipment
9	05/26/2020 08:44	Client					Wait on rig to circulate
10	05/26/2020 09:30	STEACS Briefing					Pre-Job STEACS Briefing with rig crew, company man, and all BJ Services cement crew
11	05/26/2020 09:43	Rig Up					Load plug in plug container (verified by company man), stab plug container, and hook up lines
12	05/26/2020 10:00	Prime Up	8.4000	2.00	5.00	654.00	Fill lines with fresh water
13	05/26/2020 10:04	Pressure Test				5180.00	Pressure test to 5180 psi
14	05/26/2020 10:09	Pump Spacer	8.4000	5.00	10.00	862.00	Pump Water Spacer
15	05/26/2020 10:12	Pump Spacer	8.5500	5.00	20.00	921.00	Pump Mud Flush
16	05/26/2020 10:16	Pump Spacer	8.4000	5.00	10.00	998.00	Pump Water Spacer
17	05/26/2020 10:18	Pump Lead Cement	12.7000	5.00	5.00	1308.00	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
18	05/26/2020 10:19	Pump Lead Cement	12.7000	7.50	10.00	2048.00	Pump Lead Cement

Client: Terra Energy Partners, LLC

Well Name / API: FEDERAL #PA 524-13 / 05-045-24198

Well MD: 9881

Quote #: QUO-45393-G9S2T4

Plan #: ORD-26146-J4F3R0

Execution #: EXC-26146-J4F3R002



SEQ	START DATE / TIME	EVENT	DENSITY (ppg)	PUMP RATE (bpm)	PUMP VOL (bbls)	PIPE PRESSURE (psi)	COMMENTS
19	05/26/2020 10:23	Pump Lead Cement	12.7000	6.50	45.00	1619.00	Pump Lead Cement
20	05/26/2020 10:34	Pump Lead Cement	12.7000	6.00	112.00	915.00	Finished pumping Lead Cement with 112 bbls away
21	05/26/2020 10:36	Pump Tail Cement	13.5000	6.50	5.00	1211.00	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 scales
22	05/26/2020 10:45	Pump Tail Cement	13.5000	7.00	50.00	1222.00	Pump Tail Cement
23	05/26/2020 10:51	Pump Tail Cement	13.5000	7.00	100.00	1287.00	Pump Tail Cement
24	05/26/2020 10:58	Pump Tail Cement	13.5000	6.00	150.00	972.00	Pump Tail Cement
25	05/26/2020 11:10	Pump Tail Cement	13.5000	4.00	216.00	667.00	Finished pumping Tail Cement with 216 bbls away
26	05/26/2020 11:12	Wash Pumps and Lines					Wash pumps & lines to 3-sided tank
27	05/26/2020 11:14	Drop Top Plug					Drop plug, verified by company man
28	05/26/2020 11:17	Pump Displacement	8.4000	10.00	10.00	835.00	Pump Fresh Water Displacement
29	05/26/2020 11:22	Pump Displacement	8.4000	10.00	50.00	2081.00	Pump Fresh Water Displacement
30	05/26/2020 11:27	Pump Displacement	8.4000	10.00	100.00	3088.00	Pump Fresh Water Displacement
31	05/26/2020 11:30	Pump Displacement	8.4000	10.00	140.00	3894.00	Pump Fresh Water Displacement
32	05/26/2020 11:33	Pump Displacement	8.4000	4.00	153.00	2608.00	Pump Fresh Water Displacement
33	05/26/2020 11:34	Land Plug				3699.00	Land the plug @ 2608 psi took to 3699 psi
34	05/26/2020 11:36	Check Floats					Check floats, floats held 1 1/2 bbls back
35	05/26/2020 11:41	STEACS Briefing					Pre-Rig Down STEACS Briefing with rig crew
36	05/26/2020 11:50	Rig Down					Rig down rig floor
37	05/26/2020 12:00	Wash Pumps and Lines					Wash pumps & lines to 3-sided tank
38	05/26/2020 12:11	STEACS Briefing					Pre-Rig Down STEACS Briefing with all BJ Services cement crew
39	05/26/2020 12:22	Rig Down					Rig down all equipment
40	05/26/2020 13:05	STEACS Briefing					Pre-Convoy STEACS Briefing with all BJ Services cement crew
41	05/26/2020 13:15	Leave Location					Depart from location for Rifle yard, Thank you for using BJ services, Andrew Linn, and crew



Terra FED PA 524-13 Production

