



# Terra Energy Partners

Well Name: FEDERAL PA 14-23

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API #: 05-045-24301

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Job Type: Surface

Date Job Completed: 9/12/2020

Quote #: QUO-47066

Execution #: EXC-26810



# 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

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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

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# BJ Cementing Treatment Report

<b>SERVICE SUPERVISOR</b>	Paul Linn III	<b>FORMATION</b>	
<b>CLIENT FIELD REPRESENTATIVE</b>	Garrett Wade	<b>RIG</b>	H&P 318
<b>DISTRICT</b>	Rifle, CO	<b>COUNTY</b>	GARFIELD
<b>SERVICE</b>	Cementing	<b>STATE / PROVINCE</b>	CO

## WELL GEOMETRY

TYPE	ID (in)	OD (in)	WEIGHT (lb/ft)	MD (ft)	TVD (ft)	EXCESS (%)	GRADE	THREAD
Open Hole	13.50			1,134.00	1,060.00	16.00		
Casing	8.92	9.63	36.00	1,128.00	1,060.00		J-55	ST&C

## HARDWARE

<b>Bottom Plug Used?</b>	No	<b>Tool Type</b>	Float Collar
<b>Top Plug Used?</b>	Yes	<b>Tool Depth (ft)</b>	1,083.50
<b>Top Plug Provided By</b>	Non BJ	<b>Pipe Movement</b>	None
<b>Top Plug Size</b>	9.625	<b>Job Pumped Through</b>	Manifold
<b>Centralizers Used</b>	Yes	<b>Top Connection Thread</b>	8 RND
<b>Centralizers Quantity</b>	9.00	<b>Top Connection Size</b>	9.625
<b>Centralizers Type</b>	Bow		
<b>Landing Collar Depth (ft)</b>	1,128		

## CIRCULATION PRIOR TO JOB

<b>Well Circulated By</b>	Rig
<b>Circulation Prior to Job</b>	Yes
<b>Circulation Time (min)</b>	30.00
<b>Circulation Rate (bpm)</b>	10.75
<b>Circulation Volume (bbls)</b>	322.50
<b>Lost Circulation Prior to Cement Job</b>	No
<b>Mud Density In (ppg)</b>	9.70
<b>Mud Density Out (ppg)</b>	9.70

## TEMPERATURE

Ambient Temperature (°F)	49.00	Slurry Cement Temperature (°F)	64.80
Mix Water Temperature (°F)	53.30		

## FLUID DETAILS

FLUID TYPE	FLUID NAME	DENSITY (ppg)	YIELD (Cu Ft/sk)	H <sub>2</sub> O REQ (gals/sk)	PLN TOP FLD (ft)	LENGTH (ft)	VOL (sk)	VOL (Cu Ft)	VOL (bbls)
Spacer	Water	8.3000			0.00				20.0000
Lead Slurry	BJCem S100	12.3000	2.3392	13.42	0.00	500.00	122	284.0000	50.5000
Tail Slurry	BJCem S100	12.8000	2.0771	11.46	500.00	600.00	173	360.0000	64.0000
Displacement	Displacement	8.3000			0.00			0.0000	81.6000

FLUID TYPE	FLUID NAME	COMPONENT	CONCENTRATION	UOM
Lead Slurry	BJCem S100	FOAM PREVENTER, FP-25	0.3000	BWOB
Lead Slurry	BJCem S100	CEMENT EXTENDER, GYPSUM, A-10	5.0000	BWOB
Lead Slurry	BJCem S100	Cement Additive, Sodium Metasilicate A-2	2.0000	LBS/SK
Lead Slurry	BJCem S100	IntegraSeal POLI	0.2500	LBS/SK
Lead Slurry	BJCem S100	ACCELERATOR, SALT, CHLORIDE, CALCIUM, A-7P, PELLETS	2.0000	LBS/SK
Lead Slurry	BJCem S100	CEMENT, ASTM TYPE III	100.0000	PCT
Tail Slurry	BJCem S100	Cement Additive, Sodium Metasilicate A-2	2.0000	LBS/SK
Tail Slurry	BJCem S100	ACCELERATOR, SALT, CHLORIDE, CALCIUM, A-7P, PELLETS	2.0000	LBS/SK
Tail Slurry	BJCem S100	FOAM PREVENTER, FP-25	0.3000	BWOB
Tail Slurry	BJCem S100	CEMENT, ASTM TYPE III	100.0000	PCT
Tail Slurry	BJCem S100	IntegraSeal POLI	0.2500	LBS/SK
Tail Slurry	BJCem S100	CEMENT EXTENDER, GYPSUM, A-10	5.0000	BWOB

## TREATMENT SUMMARY

TIME	FLUID	RATE (bpm)	FLUID VOL (bbls)	PIPE PRESS (psi)
9/12/2020 10:25:00 AM	Water	5.00	20.00	268.00
9/12/2020 10:30:00 AM	BJCem S100	8.00	50.50	556.00
9/12/2020 10:44:00 AM	BJCem S100	8.00	64.00	548.00
9/12/2020 11:00:00 AM	Displacement	10.00	83.75	620.00

## MIN / MAX / AVG PRESSURE AND RATES

	MIN	MAX	AVG
Pressure (psi)	77.00	1038.00	556.00
Rate (bpm)	2.00	10.00	8.00

## DISPLACEMENT AND END OF JOB SUMMARY

Displaced By	BJ	Amt of Cement Returned / Reversed	25.00
Calculated Displacement Vol (bbls)	83.75	Method Used to Verify Returns	Visual
Actual Displacement Vol (bbls)	84.00	Amt of Spacer to Surface	20.00
Did Float Hold?	Yes	Pressure Left on Casing (psi)	0.00
Bump Plug	Yes	Amt Bled Back After Job	0.50
Bump Plug Pressure (psi)	356.00	Total Volume Pumped (bbls)	209.00
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

Surface - Rifle, CO - Paul Linn III

SEQ	START DATE / TIME	EVENT	DENSITY (ppg)	PUMP RATE (bpm)	PUMP VOL (bbls)	PIPE PRESSURE (psi)	COMMENTS
1	09/12/2020 02:30	Callout					Callout, on location time of 07:00 9/12/2020
2	09/12/2020 04:46	STEACS Briefing					Pre-Convoy STEACS Briefing with all BJ Services cement crew
3	09/12/2020 05:00	Depart for Location					Depart from Rifle yard for H&P 318
4	09/12/2020 05:41	Arrive on Location					Arrive on location, rig was drilling
5	09/12/2020 05:50	Spot Units					Did a site assessment and spotted in equipment
6	09/12/2020 06:00	STEACS Briefing					Pre-Rig Up STEACS Briefing with all BJ Services cement crew
7	09/12/2020 06:10	Rig Up					Rig up all equipment
8	09/12/2020 07:00	Client					Wait on rig to finish drilling, pull drill pipe, and run casing
9	09/12/2020 09:55	STEACS Briefing					Pre-Job STEACS Briefing with rig crew, company man, and all BJ Services cement crew
10	09/12/2020 10:09	Rig Up					Load plug in plug container (verified by company man), stab plug container, and hook up lines
11	09/12/2020 10:21	Prime Up	8.4000	2.00	5.00	77.00	Fill lines with 5 bbls of fresh water
12	09/12/2020 10:25	Pressure Test				4318.00	Pressure test to 4318 psi
13	09/12/2020 10:30	Pump Spacer	8.4000	5.00	20.00	268.00	Pump Water Spacer
14	09/12/2020 10:34	Pump Lead Cement	12.3000	8.00	5.00	556.00	Pump Lead Cement @ 12.3 ppg 122 sks 2.34 cuft/sk 13.42 gals/sk. For a total of 50.84 bbls of Lead Cement requiring 38.98 bbls of mix water, Weight verified with mud scale
15	09/12/2020 10:38	Pump Lead Cement	12.3000	8.00	50.00	523.00	Pump Lead Cement
16	09/12/2020 10:42	Pump Lead Cement	12.3000	5.00	76.00	297.00	Finish pumping Lead Cement with 76 bbls away
17	09/12/2020 10:42	Pump Tail Cement	12.8000	8.00	5.00	548.00	Pump Tail Cement @ 12.8 ppg 173 sks 2.08 cuft/sk 11.46 gals/sk. For a total of 64.09 bbls of Tail Cement requiring 47.2 bbls or mix water, Weight verified with mud scale

Client: Terra Energy Partners, LLC

Well Name / API: FEDERAL #PA 14-23 / 05-045-24301

Well MD: 1134

Quote #: QUO-47066-J5R8M7

Plan #: ORD-26810-D4W9D8

Execution #: EXC-26810-D4W9D802



SEQ	START DATE / TIME	EVENT	DENSITY (ppg)	PUMP RATE (bpm)	PUMP VOL (bbls)	PIPE PRESSURE (psi)	COMMENTS
18	09/12/2020 10:49	Pump Tail Cement	12.8000	8.00	50.00	663.00	Pump Tail Cement
19	09/12/2020 10:55	Pump Tail Cement	12.8000	5.00	86.00	352.00	Finished pumping Tail Cement with 86 bbls away
20	09/12/2020 10:56	Drop Top Plug					Drop plug verified by company man
21	09/12/2020 10:58	Pump Displacement	8.4000	10.00	10.00	620.00	Pump Fresh water Displacement
22	09/12/2020 11:04	Pump Displacement	8.4000	10.00	50.00	1019.00	Pump Fresh water Displacement
23	09/12/2020 11:06	Pump Displacement	8.4000	10.00	73.00	1044.00	Pump Fresh water Displacement
24	09/12/2020 11:10	Cement Back-to-Surface					25 bbls of cement to surface
25	09/12/2020 11:10	Pump Displacement	8.4000	2.00	84.00	356.00	Pump Fresh water Displacement
26	09/12/2020 11:11	Land Plug				1060.00	Landed the plug @ 356 psi took to 1060 psi
27	09/12/2020 11:14	Check Floats					Check floats, floats held 1/2 bbl back
28	09/12/2020 11:17	STEACS Briefing					Pre-Rig Down STEACS Briefing with rig crew
29	09/12/2020 11:21	Rig Down					Rig down rig floor
30	09/12/2020 11:28	Wash Pumps and Lines					Wash pumps & lines to pit
31	09/12/2020 11:33	STEACS Briefing					Pre-Rig Down STEACS Briefing with all BJ Services cement crew
32	09/12/2020 11:41	Rig Down					Rig Down all equipment
33	09/12/2020 12:30	STEACS Briefing					Pre-Convoy STEACS Briefing with all BJ Services cement crew
34	09/12/2020 12:44	Leave Location					Depart from location for Rifle yard. Thank you for using BJ Services, Andrew Linn, and crew

