



Terra Energy Partners

Well Name: FEDERAL #PA 21-24

API #: 05-045-24202

Job Type: Surface

Date Job Completed: 5/27/2020

Quote #: QUO-45396

Execution #: EXC-26132



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	Douglas Diaz	FORMATION	
CLIENT FIELD REPRESENTATIVE		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
Open Hole	13.50	0.00	0.00	1,136.00	16.00		
Casing	8.92	9.63	36.00	1,126.00		J-55	ST&C

HARDWARE

Bottom Plug Used?	No	Tool Type	Float Collar
Top Plug Used?	Yes	Tool Depth (ft)	1,085.00
Top Plug Provided By	Non BJ	Max Casing Pressure - Rated (psi)	3520.00
Top Plug Size	9.630	Max Casing Pressure - Operated (psi)	2816.00
Centralizers Used	Yes	Pipe Movement	None
Centralizers Type	Bow	Job Pumped Through	Manifold
Landing Collar Depth (ft)	1,085	Top Connection Thread	8 RND
		Top Connection Size	9.63

CIRCULATION PRIOR TO JOB

Well Circulated By	Rig	Solids Present at End of Circulation	No
Circulation Prior to Job	Yes	Flare Prior to / during the Cement Job	No
Circulation Time (min)	35.00	Gas Present	No
Circulation Rate (bpm)	11.00		
Circulation Volume (bbls)	385.00		
Lost Circulation Prior to Cement Job	No		

TEMPERATURE

Ambient Temperature (°F)	72.00	Slurry Cement Temperature (°F)	73.00
Mix Water Temperature (°F)	61.00	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			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 Final	Displacement	8.3000			0.00			0.0000	81.6000

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

TREATMENT SUMMARY

TIME	FLUID	RATE (bpm)	FLUID VOL (bbls)	PIPE PRESS (psi)	ANNULUS PRESS (psi)	COMMENTS
5/27/2020 10:59:00 AM	Water	6.00	20.00	433.00		
5/27/2020 11:01:00 AM	BJCem S100	6.00	51.00	630.00		
5/27/2020 11:09:00 AM	BJCem S100	6.00	64.00	630.00		
5/27/2020 11:24:00 AM	Displacement	10.00	84.00	1296.00		

MIN / MAX / AVG PRESSURE AND RATES

	MIN	MAX	AVG
Pressure (psi)	433.00	1296.00	747.25
Rate (bpm)	6.00	10.00	7.00

DISPLACEMENT AND END OF JOB SUMMARY

Displaced By	BJ	Amt of Cement Returned / Reversed	18.00
Calculated Displacement Vol (bbls)	84.00	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)	1198.00	Total Volume Pumped (bbls)	219.00
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 - Douglas Diaz

SEQ	START DATE / TIME	EVENT	DENSITY (ppg)	PUMP RATE (bpm)	PUMP VOL (bbls)	PIPE PRESSURE (psi)	COMMENTS
1	05/27/2020 05:00	Callout					Yard call 0500 on location 0700
2	05/27/2020 06:33	Depart for Location					Leave Rifle shop for location
3	05/27/2020 06:57	Arrive on Location					Arrive on location, rig rigging up casing crew
4	05/27/2020 06:57	Rig					Waiting for location to clear up to spot
5	05/27/2020 07:30	Spot Units					Spot in all equipment
6	05/27/2020 07:45	Rig Up					Pre rig up safety meeting, rig in all equipment and lines to the stand pipe
7	05/27/2020 08:00	Rig					Waiting on rig to finish casing and circulate
8	05/27/2020 10:30	STEACS Briefing					Pre job safety meeting with company man and rig crew
9	05/27/2020 10:40	Rig					Rig ended circulation, circulated 35 mins @ 11 BBLs/min total of 385 BBLs
10	05/27/2020 10:40	Rig					Waiting on rig to lay down CRT
11	05/27/2020 10:45	Rig Up					Rig up cement head and lines on the floor
12	05/27/2020 10:52	Prime Up	8.3400	5.00	10.00	266.00	Prime up pump and lines, returns
13	05/27/2020 10:56	Pressure Test				3000.00	Pressure test
14	05/27/2020 10:59	Pump Spacer	8.3400	6.00	10.00	433.00	Pumping fresh water spacer
15	05/27/2020 11:01	Pump Lead Cement	12.3000	6.00	0.00	433.00	Pumping Lead cement
16	05/27/2020 11:01	Pump Lead Cement	12.3000	6.00	51.00	630.00	Pumping Lead cement
17	05/27/2020 11:09	Pump Tail Cement	12.8000	6.00	0.00	630.00	Pumping Tail cement
18	05/27/2020 11:09	Pump Tail Cement	12.8000	3.00	64.00	219.00	Pumping Tail cement
19	05/27/2020 11:23	Drop Top Plug					Dropped top plug verified by company man

Client: Terra Energy Partners, LLC

Well Name / API: FEDERAL #PA 21-24 / 05-045-24202

Well MD: 1100

Quote #: QUO-45396-W4D0N5

Plan #: ORD-26132-W0H8H2

Execution #: EXC-26132-W0H8H202



SEQ	START DATE / TIME	EVENT	DENSITY (ppg)	PUMP RATE (bpm)	PUMP VOL (bbls)	PIPE PRESSURE (psi)	COMMENTS
20	05/27/2020 11:24	Pump Displacement	8.3400	7.00	0.00	733.00	Pumping fresh water displacement
21	05/27/2020 11:24	Pump Displacement	8.3400	10.00	50.00	1187.00	Pumping fresh water displacement
22	05/27/2020 11:31	Pump Displacement	8.3400	10.00	84.00	512.00	Pumping fresh water displacement, cement returns @ 66 BBLs pumped, 18 BBLs cement to surface
23	05/27/2020 11:38	Land Plug				1198.00	Land plug, FCP 512 PSI bumped to 1198 PSI
24	05/27/2020 11:38	Check Floats					Bled pressure, floats held .5 BBL bled back
25	05/27/2020 11:40	Rig Down					Pre rig down safety meeting, rigged down cement head and lines on rig floor
26	05/27/2020 11:45	Wash Pumps and Lines					Wash pump and lines to high wall tank
27	05/27/2020 12:00	Rig Down					Rig down all lines and equipment
28	05/27/2020 12:20	Leave Location					Leave location for Rifle shop

