



Terra Energy Partners

Well Name: FEDERAL #PA 33-13

API #: 05-045-24194

Job Type: Surface

Date Job Completed: 8/6/2020

Quote #: QUO-46138

Execution #: EXC-26407



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	Jeff Hernandez	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)	TVD (ft)	EXCESS (%)	GRADE	THREAD
Open Hole	13.50	0.00	0.00	1,136.00	1,060.00	16.00		
Casing	8.92	9.63	36.00	1,139.00	1,060.00		J-55	ST&C

HARDWARE

Bottom Plug Used?	No	Tool Type	Float Collar
Top Plug Used?	Yes	Tool Depth (ft)	1,139.00
Top Plug Provided By	Non BJ	Max Casing Pressure - Rated (psi)	3575.00
Top Plug Size	9.625	Max Casing Pressure - Operated (psi)	2840.00
Centralizers Used	Yes	Pipe Movement	None
Centralizers Quantity	8.00	Job Pumped Through	Manifold
Centralizers Type	Bow	Top Connection Thread	8 rd
Landing Collar Depth (ft)	1,056	Top Connection Size	9.625

CIRCULATION PRIOR TO JOB

Well Circulated By	Rig	YP Mud In	16
Circulation Prior to Job	Yes	Solids Present at End of Circulation	No
Circulation Time (min)	60.00	10 sec SGS	6
Circulation Rate (bpm)	10.00	10 min SGS	16
Circulation Volume (bbls)	600.00	30 min SGS	23
Lost Circulation Prior to Cement Job	No	Flare Prior to / during the Cement Job	No
Mud Density In (ppg)	9.20	Gas Present	No
PV Mud In	18		

TEMPERATURE

Ambient Temperature (°F)	86.00	Slurry Cement Temperature (°F)	82.00
Mix Water Temperature (°F)	80.00	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	Displacement	8.3000			0.00			0.0000	81.6000

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

TREATMENT SUMMARY

TIME	FLUID	RATE (bpm)	FLUID VOL (bbls)	PIPE PRESS (psi)	ANNULUS PRESS (psi)	COMMENTS
8/6/2020 1:48:00 PM	Water	5.00	20.00	345.00		
8/6/2020 1:55:00 PM	BJCem S100	8.00	50.50	845.00		
8/6/2020 2:06:00 PM	BJCem S100	8.00	64.00	754.00		
8/6/2020 2:15:00 PM	Displacement	10.00	81.60	945.00		

MIN / MAX / AVG PRESSURE AND RATES

	MIN	MAX	AVG
Pressure (psi)	345.00	945.00	722.25
Rate (bpm)	5.00	10.00	7.75

DISPLACEMENT AND END OF JOB SUMMARY

Displaced By	BJ	Amt of Cement Returned / Reversed	44.00
Calculated Displacement Vol (bbls)	85.00	Method Used to Verify Returns	Visual
Actual Displacement Vol (bbls)	85.00	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	1.00
Bump Plug Pressure (psi)	1750.00	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 - Jeff Hernandez

SEQ	START DATE / TIME	EVENT	DENSITY (ppg)	PUMP RATE (bpm)	PUMP VOL (bbls)	PIPE PRESSURE (psi)	COMMENTS
1	08/06/2020 09:30	Callout					Call out for surface job
2	08/06/2020 10:00	Depart for Location					Leave Rifle yard for location
3	08/06/2020 10:30	Arrive on Location					Arrive on location
4	08/06/2020 11:00	Spot Units					Spotted all truck for job
5	08/06/2020 11:15	Rig Up					Held a rig up meeting rig up iron
6	08/06/2020 12:30	Rig					Waiting on rig to run casing
7	08/06/2020 13:40	STEACS Briefing					Held safety meeting with rig crew
8	08/06/2020 13:48	Pump Spacer	8.3400	5.00	20.00	345.00	Pump spacer water
9	08/06/2020 13:54	Pump Lead Cement	12.3000	8.00	50.00	645.00	Pump Lead Cement
10	08/06/2020 13:58	Pump Tail Cement	12.8000	8.00	64.00	745.00	Pump Tail Cement
11	08/06/2020 14:15	Drop Top Plug					Drop top plug
12	08/06/2020 14:16	Pump Displacement	8.3400	10.00	0.00	345.00	Pump Displacement
13	08/06/2020 14:16	Pump Displacement	8.3400	10.00	75.00	845.00	Pump Displacement got cement back to surface after 40 bbl gone
14	08/06/2020 14:27	Pump Displacement	8.3400	2.50	84.00	1350.00	Bump plug from 550 to 1350 psi
15	08/06/2020 14:30	Check Floats					Bled back .5 bbl
16	08/06/2020 14:35	Rig Down					Held rig down meeting rig down iron
17	08/06/2020 15:30	Leave Location					Leave location for rifle yard

