



Terra Energy Partners

Well Name: FEDERAL #PA 33-13

API #: 05-045-24194

Job Type: Production

Date Job Completed: 8/12/2020

Quote #: QUO-46144

Execution #: EXC-26410



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)	EXCESS (%)	GRADE	THREAD
Previous Casing	8.92	9.63	36.00	1,100.00		J-55	ST&C
Open Hole	8.75			10,121.00	45.00		
Casing	4.00	4.50	11.60	10,121.00		P-110	LT&C

HARDWARE

Bottom Plug Used?	No	Tool Type	Float Collar
Top Plug Used?	Yes	Tool Depth (ft)	10,115.00
Top Plug Provided By	Non BJ	Max Casing Pressure - Rated (psi)	12445.00
Top Plug Size	4.500	Max Casing Pressure - Operated (psi)	10645.00
Centralizers Used	Yes	Pipe Movement	Reciprocation
Centralizers Quantity	45.00	Job Pumped Through	Manifold
Centralizers Type	Rigid	Top Connection Thread	BTC
Landing Collar Depth (ft)	10,077	Top Connection Size	4.5

CIRCULATION PRIOR TO JOB

Well Circulated By	Rig	YP Mud In	17
Circulation Prior to Job	Yes	Solids Present at End of Circulation	No
Circulation Time (min)	120.00	10 sec SGS	6
Circulation Rate (bpm)	10.00	10 min SGS	16
Circulation Volume (bbls)	1200.00	30 min SGS	32
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)	85.00
Mix Water Temperature (°F)	86.00

Slurry Cement Temperature (°F) 85.00

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			5,942.00				10.0000
Spacer	Mud Flush	8.4000			5,554.00				20.0000
Spacer	Water	8.3000			5,968.00				10.0000
Lead Slurry	BJCem P100.3.02R	12.7000	1.9801	11.09	6,150.00	1,024.00	231	457.0000	81.2000
Tail Slurry	BJCem P70.6.01R	13.5000	1.8305	9.11	7,174.00	2,947.00	720	1317.0000	234.4000
Displacement	Displacement	8.3000			0.00			0.0000	156.6000

FLUID TYPE	FLUID NAME	COMPONENT	CONCENTRATION	UOM
Spacer	Mud Flush	SPACER SURFACTANT, SS-201	0.5000	GPB
Spacer	Mud Flush	MUD REMOVAL, SAPP	10.0000	PPB
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	FOAM PREVENTER, FP-25	0.3000	BWOB
Lead Slurry	BJCem P100.3.02R	IntegraSeal POLI	0.2500	LBS/SK
Lead Slurry	BJCem P100.3.02R	RETARDER, R-3	0.4000	BWOB
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
Tail Slurry	BJCem P70.6.01R	CEMENT, CLASS G	70.0000	PCT
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	IntegraSeal POLI	0.2500	LBS/SK
Tail Slurry	BJCem P70.6.01R	BONDING AGENT, BA-90	10.0000	PCT
Tail Slurry	BJCem P70.6.01R	FLUID LOSS, FL-24	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	EXTENDER, BENTONITE	6.0000	BWOB
Tail Slurry	BJCem P70.6.01R	RETARDER, R-3	0.4000	BWOB

TREATMENT SUMMARY

TIME	FLUID	RATE (bpm)	FLUID VOL (bbls)	PIPE PRESS (psi)	ANNULUS PRESS (psi)	COMMENTS
8/12/2020 3:20:00 AM	Water	8.00	10.00	1844.00		
8/12/2020 3:25:00 AM	Mud Flush	8.00	20.00	1745.00		
8/12/2020 3:30:00 AM	Water	8.00	10.00	1645.00		
8/12/2020 3:34:00 AM	BJCem P100.3.02R	8.00	81.20	2346.00		
8/12/2020 3:43:00 AM	BJCem P70.6.01R	8.00	234.40	1685.00		
8/12/2020 4:23:00 AM	Displacement	9.50	156.60	3500.00		

MIN / MAX / AVG PRESSURE AND RATES

	MIN	MAX	AVG
Pressure (psi)	1645.00	3500.00	2127.50
Rate (bpm)	8.00	9.50	8.25

DISPLACEMENT AND END OF JOB SUMMARY

Displaced By	BJ	Amt of Cement Returned / Reversed	0.00
Calculated Displacement Vol (bbls)	155.00	Method Used to Verify Returns	Visual
Actual Displacement Vol (bbls)	155.00	Amt of Spacer to Surface	0.00
Did Float Hold?	Yes	Pressure Left on Casing (psi)	0.00
Bump Plug	No	Amt Bled Back After Job	1.50
Bump Plug Pressure (psi)		Total Volume Pumped (bbls)	510.00
Were Returns Planned at Surface	No	Top Out Cement Spotted	No
Cement Returns During Job	Full	Lost Circulation During Cement Job	No

BJ Cementing Event Log

Long String - Rifle, CO - Jeff Hernandez

SEQ	START DATE / TIME	EVENT	DENSITY (ppg)	PUMP RATE (bpm)	PUMP VOL (bbls)	PIPE PRESSURE (psi)	COMMENTS
1	08/11/2020 15:00	Callout					Callout for Terra Long string On location @ 1800
2	08/11/2020 15:00	Depart for Location					Leave for location
3	08/11/2020 16:00	Arrive on Location					Arrive on location rig still running casing
4	08/11/2020 17:00	Spot Units					Spotted all truck for job
5	08/11/2020 17:15	Rig Up					Rig up iron for the job
6	08/11/2020 18:30	Rig					Waiting on rig to finished running casing
7	08/12/2020 03:15	STEACS Briefing					Had safety meeting with rig crew in dog house
8	08/12/2020 03:20	Pump Spacer	8.3400	8.00	10.00	1845.00	Pump spacer water
9	08/12/2020 03:22	Pressure Test				5000.00	Test lines to 5000 psi
10	08/12/2020 03:25	Pump Spacer	8.4500	5.00	20.00	1745.00	Pump mud flush
11	08/12/2020 03:30	Pump Spacer	8.3400	5.00	10.00	1800.00	Pump spacer water
12	08/12/2020 03:34	Pump Lead Cement	12.7000	8.00	50.00	2236.00	Pump lead cement
13	08/12/2020 03:40	Pump Lead Cement	12.7000	8.00	81.00	2345.00	Pump Lead cement
14	08/12/2020 03:43	Pump Tail Cement	13.5000	8.00	50.00	1845.00	Pump Tail Cement
15	08/12/2020 03:48	Pump Tail Cement	13.5000	8.00	100.00	1462.00	Pump Tail Cement
16	08/12/2020 03:55	Pump Tail Cement	13.5000	8.00	150.00	1350.00	Pump Tail Cement
17	08/12/2020 04:01	Pump Tail Cement	13.5000	8.00	200.00	1350.00	Pump Tail Cement
18	08/12/2020 04:08	Pump Tail Cement	13.5000	8.00	234.00	1145.00	Pump Tail Cement
19	08/12/2020 04:11	Wash Pumps and Lines					Wash pumps and lines

Client: Terra Energy Partners, LLC

Well Name / API: FEDERAL #PA 33-13 / 05-045-24194

Well MD: 10121

Quote #: QUO-46144-H4S8L3

Plan #: ORD-26410-R2N9Y8

Execution #: EXC-26410-R2N9Y802



SEQ	START DATE / TIME	EVENT	DENSITY (ppg)	PUMP RATE (bpm)	PUMP VOL (bbls)	PIPE PRESSURE (psi)	COMMENTS
20	08/12/2020 04:22	Drop Top Plug					Drop top plug
21	08/12/2020 04:23	Pump Displacement	8.4500	10.00	50.00	2188.00	Pump Displacement
22	08/12/2020 04:28	Pump Displacement	8.4500	10.00	100.00	3088.00	Pump Displacement
23	08/12/2020 04:34	Pump Displacement	8.4500	10.00	150.00	2900.00	Pump Displacement
24	08/12/2020 04:40	Pump Displacement	8.4500	10.00	155.00	3900.00	Bump plug from 2900 to 3900 psi
25	08/12/2020 04:41	Check Floats					Check float bled back 1.5 bbl
26	08/12/2020 04:56	Rig Down					Held a rig down meeting rig down iron
27	08/12/2020 05:50	Leave Location					Leave location for yard



Terra PA 33-13 8.12.20

