



Terra Energy Partners

Well Name: FEDERAL PA 323-23

API #: 05-045-24304

Job Type: Surface

Date Job Completed: 8/29/2020

Quote #: QUO-46935

Execution #: EXC-26742



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	Craig Borstede	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			1,136.00	16.00		
Casing	8.92	9.63	36.00	1,129.58		J-55	ST&C

HARDWARE

Bottom Plug Used?	No	Tool Type	Float Collar
Top Plug Used?	Yes	Tool Depth (ft)	1,081.43
Top Plug Provided By	Non BJ	Pipe Movement	None
Top Plug Size	9.625	Job Pumped Through	Manifold
Centralizers Used	Yes	Top Connection Thread	8 RND
Centralizers Quantity	9.00	Top Connection Size	9.625
Centralizers Type	Bow		
Landing Collar Depth (ft)	1,130		

CIRCULATION PRIOR TO JOB

Well Circulated By	Rig
Circulation Prior to Job	Yes
Circulation Time (min)	30.00
Circulation Rate (bpm)	10.00
Circulation Volume (bbls)	300.00
Lost Circulation Prior to Cement Job	No
Mud Density In (ppg)	9.40
Mud Density Out (ppg)	9.40

TEMPERATURE

Ambient Temperature (°F)	64.00
Mix Water Temperature (°F)	63.30

Slurry Cement Temperature (°F)	72.80
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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	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 EXTENDER, GYPSUM, A-10	5.0000	BWOB
Lead Slurry	BJCem S100	IntegraSeal POLI	0.2500	LBS/SK
Lead Slurry	BJCem S100	FOAM PREVENTER, FP-25	0.3000	BWOB
Lead Slurry	BJCem S100	CEMENT, ASTM TYPE III	100.0000	PCT
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	IntegraSeal POLI	0.2500	LBS/SK
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

TREATMENT SUMMARY

TIME	FLUID	RATE (bpm)	FLUID VOL (bbls)	PIPE PRESS (psi)
8/29/2020 5:22:00 AM	Water	5.00	20.00	306.00
8/29/2020 5:30:00 AM	BJCem S100	8.00	50.50	864.00
8/29/2020 5:35:00 AM	BJCem S100	8.00	64.00	916.00
8/29/2020 5:46:00 AM	Displacement	10.00	83.59	753.00

MIN / MAX / AVG PRESSURE AND RATES

	MIN	MAX	AVG
Pressure (psi)	92.00	1064.00	864.00
Rate (bpm)	2.00	10.00	8.00

DISPLACEMENT AND END OF JOB SUMMARY

Displaced By	BJ	Amt of Cement Returned / Reversed	23.00
Calculated Displacement Vol (bbls)	83.59	Method Used to Verify Returns	Visual
Actual Displacement Vol (bbls)	83.50	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)	316.00	Top Out Cement Spotted	No
Were Returns Planned at Surface	Yes	Lost Circulation During Cement Job	No
Cement Returns During Job	Full		

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	08/28/2020 20:00	Callout					Call out, on location time of 02:30 08/29/2020
2	08/29/2020 00:08	STEACS Briefing					Pre-Convoy STEACS Briefing with all BJ Services cement crew
3	08/29/2020 00:21	Leave Location					Depart from Rifle yard for H&P 318
4	08/29/2020 01:00	Arrive on Location					Arrive on location, rig was pulling drill pipe
5	08/29/2020 01:09	Spot Units					Did a site assessment and spotted in all equipment
6	08/29/2020 01:17	STEACS Briefing					Pre-Rig Up STEACS Briefing with all BJ Services cement crew
7	08/29/2020 01:24	Rig Up					Rig up all equipment
8	08/29/2020 02:19	Client					Wait on rig to finish running casing, and circulate
9	08/29/2020 04:51	STEACS Briefing					Pre-Job STEACS Briefing with rig crew, company man, and all BJ Services cement crew
10	08/29/2020 05:04	Rig Up					Load plug in plug container (verified by company man), stab plug container, and hook up lines
11	08/29/2020 05:15	Prime Up	8.4000	2.00	5.00	92.00	Fill lines with fresh water
12	08/29/2020 05:19	Pressure Test				4720.00	Pressure test to 4720 psi
13	08/29/2020 05:22	Pump Spacer	8.4000	5.00	20.00	306.00	Pump Water spacer
14	08/29/2020 05:29	Pump Lead Cement	12.3000	8.00	5.00	864.00	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	08/29/2020 05:34	Pump Lead Cement	12.3000	7.00	51.00	664.00	Finished pumping Lead Cement with 51 bbls away
16	08/29/2020 05:35	Pump Tail Cement	12.8000	8.00	5.00	916.00	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 of mix water, weight verified with mud scale

Client: Terra Energy Partners, LLC

Well Name / API: FEDERAL #PA 323-23 / 05-045-24304

Well MD: 1136

Quote #: QUO-46935-C5Z6R8

Plan #: ORD-26742-X7N6D1

Execution #: EXC-26742-X7N6D102



SEQ	START DATE / TIME	EVENT	DENSITY (ppg)	PUMP RATE (bpm)	PUMP VOL (bbls)	PIPE PRESSURE (psi)	COMMENTS
17	08/29/2020 05:39	Pump Tail Cement	12.8000	8.00	50.00	904.00	Pump Tail Cement
18	08/29/2020 05:42	Pump Tail Cement	12.8000	6.00	64.00	475.00	Finished pumping Tail Cement with 64 bbls away
19	08/29/2020 05:44	Drop Top Plug					Drop plug, verified by company man
20	08/29/2020 05:46	Pump Displacement	8.4000	10.00	10.00	753.00	Pump Fresh Water Displacement
21	08/29/2020 05:54	Pump Displacement	8.4000	10.00	70.00	1064.00	Pump Fresh Water Displacement
22	08/29/2020 05:58	Pump Displacement	8.4000	2.00	83.50	316.00	Pump Fresh Water Displacement
23	08/29/2020 05:58	Land Plug				1009.00	Landed the plug @ 316 psi took to 1009 psi
24	08/29/2020 06:00	Check Floats					Check floats, floats held 1/2 bbl back
25	08/29/2020 06:03	STEACS Briefing					Pre-Rig Down STEACS Briefing with rig crew
26	08/29/2020 06:12	Rig Down					Rig Down rig floor
27	08/29/2020 06:15	Wash Pumps and Lines					Wash pumps & lines to pit
28	08/29/2020 06:21	STEACS Briefing					Pre-Rig Down STEACS Briefing with all BJ Services cement crew
29	08/29/2020 06:30	Rig Down					Rig Down all equipment
30	08/29/2020 07:08	STEACS Briefing					Pre-Convoy STEACS Briefing with all BJ Services cement crew
31	08/29/2020 07:30	Leave Location					Depart from location for Rifle yard. Thank you for using BJ Services, Andrew Linn, and crew

