



Terra Energy Partners

Well Name: STRAIT BOTTOM RANCH SG 12-22

API #: 05-045-24011

Job Type: Production

Date Job Completed: 3/16/2020

Quote #: QUO-43518

Execution #: EXC-25234



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,

Devon Hanson
Field Engineer | (701) 590-5946 | devon.hanson@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	Steven Bumgarner	RIG	H&P 318
DISTRICT	Rifle, CO	COUNTY	GARFIELD
SERVICE	Cementing	STATE / PROVINCE	CO

WELL GEOMETRY

TYPE	ID (in)	OD (in)	WEIGHT (lbs/ft)	MD (ft)	TVD (ft)	EXCESS (%)	GRADE	THREAD
Previous Casing	9.00	9.63	32.30	1,003.00	946.00		H-40	
Open Hole	8.75	0.00	0.00	6,439.00	5,884.00	100.00		
Casing	4.00	4.50	11.60	6,432.66	5,884.00		P-110	

HARDWARE

Bottom Plug Used?	No	Tool Type	Float Collar
Top Plug Used?	Yes	Tool Depth (ft)	6,398.24
Top Plug Provided By	Non BJ	Pipe Movement	Reciprocation
Top Plug Size	4.500	Job Pumped Through	Manifold
Centralizers Used	No	Top Connection Thread	8 RND
Landing Collar Depth (ft)	6,433	Top Connection Size	4.5

CIRCULATION PRIOR TO JOB

Well Circulated By	Rig	Flare Prior to / during the Cement Job	No
Circulation Prior to Job	Yes	Gas Present	No
Circulation Time (min)	75.00	Solids Present at End of Circulation	No
Circulation Rate (bpm)	10.75	Mud Density In (ppg)	9.70
Circulation Volume (bbls)	806.25	Mud Density Out (ppg)	9.70
Lost Circulation Prior to Cement Job	No		

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Well: STRAIT BOTTOM RANCH
SG 12-22

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Start Date: 3/16/2020

End Date: 3/16/2020

Field Ticket #: FT-25234-R9K8F20201-133040199



TEMPERATURE

Ambient Temperature (°F)	52.00	Slurry Cement Temperature (°F)	88.30
Mix Water Temperature (°F)	72.30		

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 / Pre Flush / Flush	Water	8.30			0.00				10.00
Spacer / Pre Flush / Flush	Mud Flush	8.40			0.00				20.00
Spacer / Pre Flush / Flush	Water	8.30			0.00				5.00
Spacer / Pre Flush / Flush	A-3L Flush	10.80			0.00				40.00
Spacer / Pre Flush / Flush	Water	8.30			0.00				20.00
Top-Out / Scavenger Slurry	Scavenger	11.00	3.0951	19.21		0.00	182	562.00	100.10
Tail Slurry	Tail Cement	12.50	2.1127	12.04	3,161.00	3,277.00	955	2,017.00	359.20
Displacement Final	Displacement	8.30			0.00			0.00	99.40

FLUID TYPE	FLUID NAME	COMPONENT	CONCENTRATION	UOM
Spacer / Pre Flush / Flush	Mud Flush	SPACER SURFACTANT, SS-201	0.5000	GPB
Spacer / Pre Flush / Flush	Mud Flush	MUD REMOVAL, SAPP	10.0000	PPB
Spacer / Pre Flush / Flush	A-3L Flush	SILICATE, SODIUM, A-3L	31.5000	GPB
Top-Out / Scavenger Slurry	Scavenger	EXTENDER, BENTONITE	8.0000	BWOB
Top-Out / Scavenger Slurry	Scavenger	Cement Additive, Sodium Metasilicate A-2	0.2000	BWOB
Top-Out / Scavenger Slurry	Scavenger	CEMENT, ASTM TYPE III	65.0000	PCT
Top-Out / Scavenger Slurry	Scavenger	CEMENT, FLY ASH (POZZOLAN)	35.0000	PCT
Top-Out / Scavenger Slurry	Scavenger	FOAM PREVENTER, FP-25	0.3000	BWOB
Tail Slurry	Tail Cement	Cement Additive, Sodium Metasilicate A-2	0.3000	BWOB
Tail Slurry	Tail Cement	FLUID LOSS, FL-66	0.7000	BWOB
Tail Slurry	Tail Cement	CEMENT EXTENDER, GYPSUM, A-10	2.0000	BWOB
Tail Slurry	Tail Cement	FOAM PREVENTER, FP-25	0.3000	BWOB
Tail Slurry	Tail Cement	CEMENT, ASTM TYPE III	100.0000	PCT

TREATMENT SUMMARY

TIME	FLUID	RATE (bpm)	FLUID VOL. (bbls)	PIPE PRESSURE (psi)
3/16/2020 9:02 PM	Water	5.00	10.00	1,030.00
3/16/2020 9:03 PM	Mud Flush	5.00	20.00	1,056.00
3/16/2020 9:07 PM	Water	5.00	5.00	1,093.00
3/16/2020 9:08 PM	A-3L Flush	5.00	40.00	1,207.00
3/16/2020 9:23 PM	Water	5.00	20.00	707.00
3/16/2020 9:27 PM	Scavenger	6.50	100.10	753.00
3/16/2020 9:42 PM	Tail Cement	8.00	359.20	1,224.00
3/16/2020 10:37 PM	Displacement	10.00	99.40	1,117.00

MIN / MAX / AVG PRESSURE AND RATES

	MIN	MAX	AVG
Pressure (psi)	618.00	2,516.00	1,224.00
Rate (bpm)	2.00	10.00	8.00

DISPLACEMENT AND END OF JOB SUMMARY

Displaced By	BJ	Amt of Cement Returned / Reversed	0.00
Calculated Displacement Vol (bbls)	99.17	Method Used to Verify Returns	Visual
Actual Displacement Vol (bbls)	99.00	Amt of Spacer to Surface	0.00
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)	1,267.00	Total Volume Pumped (bbls)	530.00
Were Returns Planned at Surface	Yes	Top Out Cement Spotted	No
Cement Returns During Job	Partial	Lost Circulation During Cement Job	No

BJ Cementing Event Log

Long String - Rifle, CO - Paul Linn III

SEQ	START DATE / TIME	EVENT	DENSITY (ppg)	PUMP RATE (bpm)	PUMP VOL (bbls)	PIPE PRESSURE (psi)	COMMENTS
1	03/16/2020 10:30	Callout					Call out on location time of 21:00 3/16/19
2	03/16/2020 14:38	STEACS Briefing					Pre-Convoy STEACS Briefing with all BJ Services cement crew
3	03/16/2020 15:03	Depart for Location					Depart from Rifle yard for H&P 318
4	03/16/2020 16:38	Arrive on Location					Arrive on location, rig was running casing
5	03/16/2020 16:44	Spot Units					did a site assessment and spotted in equipment
6	03/16/2020 16:57	STEACS Briefing					Pre-Rig up STEACS Briefing with all BJ Services cement crew
7	03/16/2020 17:08	Rig Up					Rig up all ground equipment
8	03/16/2020 19:19	Client					wait on rig to finish running casing and circulate
9	03/16/2020 20:18	STEACS Briefing					Pre-Job STEACS Briefing with rig crew, company man, and all BJ Services cement crew
10	03/16/2020 20:38	Rig Up					Load plug in plug container verified by company man, stab plug container, hook up lines
11	03/16/2020 20:55	Prime Up	8.4000	2.00	5.00	618.00	Fill lines with 5 bbls of fresh water
12	03/16/2020 20:59	Pressure Test				5210.00	Pressure test to 5210 psi
13	03/16/2020 21:02	Pump Spacer	8.4000	5.00	10.00	1030.00	Pump Fresh Water Spacer
14	03/16/2020 21:03	Pump Spacer	8.5000	5.00	20.00	1056.00	Pump Mud Flush
15	03/16/2020 21:07	Pump Spacer	8.4000	5.00	5.00	1093.00	Pump Fresh Water Spacer
16	03/16/2020 21:08	Pump Spacer	9.8000	5.00	40.00	1207.00	Pump Sodium Silicate Spacer
17	03/16/2020 21:22	Pump Spacer	8.4000	5.00	20.00	707.00	Pump Fresh Water Spacer

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Well MD: 6438



Quote #: QUO-43518-N3Y9T3

Plan #: ORD-25234-R9K8F2

Execution #: EXC-25234-R9K8F202

SEQ	START DATE / TIME	EVENT	DENSITY (ppg)	PUMP RATE (bpm)	PUMP VOL (bbls)	PIPE PRESSURE (psi)	COMMENTS
18	03/16/2020 21:27	Pump Spacer	11.0000	6.50	10.00	753.00	Pump Scavenger Cement @ 11 ppg 182 sks 3.1 cuft/sk 19.21 gals/sk. For a total of 100.48 bbls of Scavenger requiring 83.24 bbls of mix water, weight verified with mud scale
19	03/16/2020 21:30	Pump Spacer	11.0000	8.00	25.00	1346.00	Pump Scavenger Cement
20	03/16/2020 21:31	Pump Spacer	11.0000	8.00	50.00	1140.00	Pump Scavenger Cement
21	03/16/2020 21:34	Pump Spacer	11.0000	7.00	98.00	1002.00	Finished pumping Scavenger Cement with 98 bbls away
22	03/16/2020 21:41	Pump Tail Cement	12.5000	8.00	5.00	1224.00	Pump Tail Cement @ 12.5 ppg 955 sks 2.11 cuft/sk 12.04 gals/sk. For a total of 358.88 bbls of Tail cement requiring 273.77 bbls of mix water, weight verified with mud scale
23	03/16/2020 21:47	Pump Tail Cement	12.5000	8.00	50.00	1376.00	Pump Tail Cement
24	03/16/2020 21:53	Pump Tail Cement	12.5000	8.00	100.00	1356.00	Pump Tail Cement
25	03/16/2020 21:58	Pump Tail Cement	12.5000	8.00	150.00	1360.00	Pump Tail Cement
26	03/16/2020 22:05	Pump Tail Cement	12.5000	8.00	200.00	1336.00	Pump Tail Cement
27	03/16/2020 22:11	Pump Tail Cement	12.5000	8.00	250.00	1310.00	Pump Tail Cement
28	03/16/2020 22:18	Pump Tail Cement	12.5000	6.50	300.00	861.00	Pump Tail Cement
29	03/16/2020 22:26	Pump Tail Cement	12.5000	6.50	345.00	845.00	Finished pumping Tail Cement with 345 bbls away
30	03/16/2020 22:30	Wash Pumps and Lines					Wash pumps and lines to pit
31	03/16/2020 22:35	Drop Top Plug					Drop plug verified by company man
32	03/16/2020 22:37	Pump Displacement	8.5000	10.00	10.00	1117.00	Pump KCL Displacement
33	03/16/2020 22:42	Pump Displacement	8.5000	10.00	50.00	1945.00	Pump KCL Displacement
34	03/16/2020 22:46	Pump Displacement	8.5000	10.00	89.00	2516.00	Pump KCL Displacement
35	03/16/2020 22:49	Pump Displacement	8.5000	3.50	99.00	1267.00	Pump KCL Displacement
36	03/16/2020 22:50	Land Plug				3045.00	Land plug @ 1267 psi took to 3045 psi
37	03/16/2020 22:52	Check Floats					Check float, floats held 1 bbl back
38	03/16/2020 22:57	STEACS Briefing					Pre-Rig Down STEACS Briefing with rig crew
39	03/16/2020 23:04	Rig Down					Rig down rig floor
40	03/16/2020 23:11	Wash Pumps and Lines					Wash pumps and lines to pit
41	03/16/2020 23:31	STEACS Briefing					Pre-Rig Down STEACS Briefing with all BJ Services cement crew

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SEQ	START DATE / TIME	EVENT	DENSITY (ppg)	PUMP RATE (bpm)	PUMP VOL (bbls)	PIPE PRESSURE (psi)	COMMENTS
42	03/16/2020 23:39	Rig Down					Rig down all equipment
43	03/16/2020 23:58	STEACS Briefing					Pre-Convoy STEACS Briefing with all BJ Services cement crew
44	03/17/2020 00:07	Leave Location					Depart from location for Rifle yard. Thank you for using BJ Services, Andrew Linn, and crew.



