



Caerus

Well Name: Fed 24A-14-496

API #: 05-045-24173

Job Type: Surface

Date Job Completed: 8/7/2019

Quote #: QUO-34879

Execution #: EXC-20225



Caerus

Attention: Mr. Steve Schmitz | (720) 880-6412 | sschmitz@caerusoilandgas.com

Caerus | 1001 17th Street, Suite 1600 | Denver, CO 80202

Dear Mr. Schmitz,

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 III | (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

Stage 1 - Cementing Treatment Report

SERVICE SUPERVISOR	Paul Linn III	FORMATION	
CLIENT FIELD REPRESENTATIVE	Kim Gritz	RIG	H&P 329
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	19.50	20.00	52.73	130.00			
Open Hole	14.75			2,500.00	100.00		
Open Hole	14.75			3,025.00			
Casing	8.92	9.63	36.00	3,004.80		J-55	LTC

HARDWARE

Bottom Plug Used?	No	Tool Type	Float Collar
Top Plug Used?	Yes	Tool Depth (ft)	2,959.90
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	10.00	Top Connection Size	9.625
Centralizers Type	Bow		
Landing Collar Depth (ft)	2,960		

Client: Caerus Operating LLC

Well: FED #24A-14-496

Well API: 05-045-24173

Start Date: 8/7/2019

End Date: 8/7/2019

Field Ticket #: FT-20225-Q1P2L40202-92316



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)	60.00	Gas Present	No
Circulation Rate (bpm)	4.00		
Circulation Volume (bbls)	240.00		
Lost Circulation Prior to Cement Job	No		
Mud Density In (ppg)	8.80		
Mud Density Out (ppg)	8.80		

TEMPERATURE

Ambient Temperature (°F)	74.00	Slurry Cement Temperature (°F)	77.40
Mix Water Temperature (°F)	68.80	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	8.3300			1,071.00				40.0000
Lead Slurry	BJCem S100.3.01D	12.0000	2.4838	14.46	1,400.00	1,100.00	604	1498.0000	266.8000
Tail Slurry	BJCem S100.3.01D	12.5000	2.2478	12.48	2,500.00	500.00	160	358.0000	63.7000
Displacement	Displacement	8.3300			0.00			0.0000	228.8000

FLUID TYPE	FLUID NAME	COMPONENT	CONCENTRATION	UOM
Lead Slurry	BJCem S100.3.01D	CEMENT, ASTM TYPE III	100.0000	PCT
Lead Slurry	BJCem S100.3.01D	IntegraSeal PHENO	3.0000	LBS/SK
Lead Slurry	BJCem S100.3.01D	FOAM PREVENTER, FP-25	0.3000	BWOB
Lead Slurry	BJCem S100.3.01D	CEMENT EXTENDER, GYPSUM, A-10	5.0000	BWOB
Lead Slurry	BJCem S100.3.01D	Cement Additive, Sodium Metasilicate A-2	0.2000	LBS/SK
Lead Slurry	BJCem S100.3.01D	IntegraSeal POLI	0.1300	LBS/SK
Tail Slurry	BJCem S100.3.01D	FOAM PREVENTER, FP-25	0.3000	BWOB
Tail Slurry	BJCem S100.3.01D	ACCELERATOR, SALT, CHLORIDE, CALCIUM, A-7P, PELLETS	2.0000	LBS/SK
Tail Slurry	BJCem S100.3.01D	CEMENT EXTENDER, GYPSUM, A-10	5.0000	BWOB
Tail Slurry	BJCem S100.3.01D	CEMENT, ASTM TYPE III	100.0000	PCT
Tail Slurry	BJCem S100.3.01D	IntegraSeal PHENO	3.0000	LBS/SK
Tail Slurry	BJCem S100.3.01D	IntegraSeal POLI	0.1300	LBS/SK
Tail Slurry	BJCem S100.3.01D	Cement Additive, Sodium Metasilicate A-2	2.0000	LBS/SK

Client: Caerus Operating LLC

Well: FED #24A-14-496

Well 05-045-24173
API:

Start 8/7/2019
Date:

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Date:

Field Ticket FT-20225-Q1P2L40202-
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TIME	FLUID	RATE (bpm)	FLUID VOL (bbls)	PIPE PRESS (psi)
8/7/2019 10:07:00 AM	Water	5.00	40.00	146.00
8/7/2019 10:14:00 AM	BJCem S100.3.01D	5.00	266.80	203.00
8/7/2019 11:16:00 AM	BJCem S100.3.01D	6.00	63.70	295.00
8/7/2019 11:36:00 AM	Displacement	5.00	228.80	91.00

MIN / MAX / AVG PRESSURE AND RATES

	MIN	MAX	AVG
Pressure (psi)	28.00	161.00	522.00
Rate (bpm)	2.00	7.00	5.00

DISPLACEMENT AND END OF JOB SUMMARY

Displaced By	BJ	Amt of Cement Returned / Reversed	30.00
Calculated Displacement Vol (bbls)	228.80	Method Used to Verify Returns	Visual
Actual Displacement Vol (bbls)	228.00	Amt of Spacer to Surface	40.00
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)	411.00	Total Volume Pumped (bbls)	610.00
Were Returns Planned at Surface	Yes	Top Out Cement Spotted	No
Cement Returns During Job	Partial	Lost Circulation During Cement Job	No

Client: Caerus Operating LLC

Well: FED #24A-14-496

Well 05-045-24173

API:

Start 8/7/2019

Date:

End 8/7/2019

Date:

Field Ticket FT-20225-Q1P2L40202-

#: 92316



Stage 2 - Cementing Treatment Report

SERVICE SUPERVISOR	Paul Linn III	FORMATION	
CLIENT FIELD REPRESENTATIVE	Kim Gritz	RIG	H&P 329
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	19.50	20.00	52.73	130.00			
Open Hole	14.75			1,408.00	50.00		
Casing	8.92	9.63	36.00	1,408.00		J-55	LTC

HARDWARE

Bottom Plug Used?	No	Tool Type	DV Tool
Top Plug Used?	Yes	Tool Depth (ft)	1,408.10
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	10.00	Top Connection Size	9.625
Centralizers Type	Bow		
Landing Collar Depth (ft)	1,408		

Client: Caerus Operating LLC

Well: FED #24A-14-496

Well API: 05-045-24173

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End Date: 8/7/2019

Field Ticket #: FT-20225-Q1P2L40202-92316



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)	90.00	Gas Present	No
Circulation Rate (bpm)	3.00		
Circulation Volume (bbls)	270.00		
Lost Circulation Prior to Cement Job	No		
Mud Density In (ppg)	8.40		
Mud Density Out (ppg)	8.40		

TEMPERATURE

Ambient Temperature (°F)	91.60	Slurry Cement Temperature (°F)	77.40
Mix Water Temperature (°F)	68.80	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	8.3300			1,236.00				40.0000
Lead Slurry	BJCem S100.3.01D	12.0000	2.5298	14.86	0.00	1,400.00	594	1501.0000	267.3000
Displacement	Displacement	8.3300			0.00			0.0000	108.2000

FLUID TYPE	FLUID NAME	COMPONENT	CONCENTRATION	UOM
Lead Slurry	BJCem S100.3.01D	Cement Additive, Sodium Metasilicate A-2	2.0000	LBS/SK
Lead Slurry	BJCem S100.3.01D	CEMENT, ASTM TYPE III	100.0000	PCT
Lead Slurry	BJCem S100.3.01D	FOAM PREVENTER, FP-25	0.3000	BWOB
Lead Slurry	BJCem S100.3.01D	ACCELERATOR, SALT, CHLORIDE, CALCIUM, A-7P, PELLETS	2.0000	LBS/SK
Lead Slurry	BJCem S100.3.01D	IntegraSeal POLI	0.1300	LBS/SK
Lead Slurry	BJCem S100.3.01D	CEMENT EXTENDER, GYPSUM, A-10	5.0000	BWOB

TIME	FLUID	RATE (bpm)	FLUID VOL (bbls)	PIPE PRESS (psi)
8/7/2019 2:26:00 PM	Water	5.00	40.00	118.00
8/7/2019 2:34:00 PM	BJCem S100.3.01D	5.00	267.30	127.00
8/7/2019 3:30:00 PM	Displacement	5.00	108.20	108.00

Client: Caerus Operating LLC

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Date:

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MIN / MAX / AVG PRESSURE AND RATES

	MIN	MAX	AVG
Pressure (psi)	108.00	396.00	242.00
Rate (bpm)			

DISPLACEMENT AND END OF JOB SUMMARY

Displaced By	BJ	Amt of Cement Returned / Reversed	125.00
Calculated Displacement Vol (bbls)	108.86	Method Used to Verify Returns	Visual
Actual Displacement Vol (bbls)	108.00	Amt of Spacer to Surface	40.00
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)	301.00	Total Volume Pumped (bbls)	426.00
Were Returns Planned at Surface	Yes	Top Out Cement Spotted	Yes
Cement Returns During Job	Full	Lost Circulation During Cement Job	No

Client: Caerus Operating LLC

Well: FED #24A-14-496

Well 05-045-24173

API:

Start 8/7/2019

Date:

End 8/7/2019

Date:

Field Ticket FT-20225-Q1P2L40202-

#: 92316



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	08/07/2019 01:00	Callout					Call out on location time of 06:00 on 8/7/19
2	08/07/2019 03:01	STEACS Briefing					Pre-Convoy STEACS Briefing with all BJ Services cement crew
3	08/07/2019 03:17	Depart for Location					Depart from Rifle yard for H&P 329
4	08/07/2019 04:53	Arrive on Location					Arrive on location. Rig was running casing
5	08/07/2019 05:00	Spot Units					Did a site assessment, conducted a ROC Drill, and spotted in equipment
6	08/07/2019 05:11	STEACS Briefing					Pre-Rig Up STEACS Briefing with all BJ Services cement crew
7	08/07/2019 05:26	Rig Up					Rig up all ground equipment
8	08/07/2019 06:29	Client					Wait on rig to finish running casing and circulate
9	08/07/2019 09:34	STEACS Briefing					Pre-Job STEACS Briefing with rig crew, company man, tool hand, and all BJ Services cement crew
10	08/07/2019 09:47	Rig Up					Stab plug container, and hook up lines
11	08/07/2019 10:00	Prime Up	8.4000	2.00	5.00	38.00	Filled lines with 5 bbls of fresh water
12	08/07/2019 10:03	Pressure Test				2908.00	Pressure tested to 2908 psi, pressure held
13	08/07/2019 10:07	Pump Spacer	8.4000	5.00	40.00	153.00	Pump Fresh water spacer
14	08/07/2019 10:15	Pump Lead Cement	12.0000	5.00	5.00	203.00	Pump Lead Cement 12 ppg 604 sks 2.48 cuft/sk 14.46 gals/sk for a total of 266.78 bbls of Lead cement requiring 207.95 bbls of mix water. Weight verified with mud scales
15	08/07/2019 10:27	Pump Lead Cement	12.0000	3.50	50.00	72.00	Pump Lead Cement
16	08/07/2019 10:41	Pump Lead Cement	12.0000	3.50	100.00	67.00	Pump Lead Cement

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Client: Caerus Operating LLC

Well: FED #24A-14-496

Well API:05-045-24173

Plan #: ORD-20225-Q1P2L4

Execution #: EXC-20225-Q1P2L402

Quote #: QUO-34879-S7B7C2



SEQ	START DATE / TIME	EVENT	DENSITY (ppg)	PUMP RATE (bpm)	PUMP VOL (bbls)	PIPE PRESSURE (psi)	COMMENTS
17	08/07/2019 10:43	Pump Lead Cement	12.0000	5.50	110.00	208.00	Pump Lead Cement
18	08/07/2019 10:51	Pump Lead Cement	12.0000	6.00	150.00	340.00	Pump Lead Cement
19	08/07/2019 10:59	Pump Lead Cement	12.0000	6.00	200.00	334.00	Pump Lead Cement
20	08/07/2019 11:10	Pump Lead Cement	12.0000	4.00	250.00	161.00	Pump Lead Cement
21	08/07/2019 11:15	Pump Lead Cement	12.0000	4.50	274.00	123.00	Finished pumping Lead Cement with 274 bbls away
22	08/07/2019 11:17	Pump Tail Cement	12.5000	6.00	5.00	295.00	Pump Tail Cement 12.5 ppg 160 sks 2.25 cuft/sk 12.48 gals/sk for a total of 64.12 bbls of Tail cement requiring 47.52 bbls of mix water. Weight verified with mud scale
23	08/07/2019 11:24	Pump Tail Cement	12.5000	6.00	50.00	495.00	Pump Tail Cement
24	08/07/2019 11:26	Pump Tail Cement	12.5000	5.00	68.00	108.00	Finished pumping Tail Cement with 68 bbls away
25	08/07/2019 11:30	Drop Top Plug					Took off cap and dropped plug
26	08/07/2019 11:36	Pump Displacement	8.4000	5.00	10.00	91.00	Pump Fresh water displacement
27	08/07/2019 11:42	Pump Displacement	8.4000	7.00	50.00	173.00	Pump Fresh water displacement
28	08/07/2019 11:49	Pump Displacement	8.4000	4.50	100.00	45.00	Pump Fresh water displacement
29	08/07/2019 11:58	Pump Displacement	8.4000	7.00	150.00	263.00	Pump Fresh water displacement
30	08/07/2019 12:05	Pump Displacement	8.4000	7.00	200.00	488.00	Pump Fresh water displacement
31	08/07/2019 12:07	Pump Displacement	8.4000	7.00	218.00	522.00	Pump Fresh water displacement
32	08/07/2019 12:11	Pump Displacement	8.4000	3.50	228.00	411.00	Pump Fresh water displacement
33	08/07/2019 12:13	Land Plug				952.00	Landed the plug at 411 psi took to 952 psi
34	08/07/2019 12:14	Check Floats					Check floats, floats held 1 bbl back
35	08/07/2019 12:17	Other (See comment)	8.5000	1.00	10.00	167.00	Pump 10 bbls of sugar water down parasite sting
36	08/07/2019 12:26	Drop Opening Plug					Drop opening plug, and pre-load closing plug in plug container
37	08/07/2019 12:38	Other (See comment)				824.00	Open dv tool with 824 psi
38	08/07/2019 12:39	Circulate Well	8.4000	2.50	15.00	53.00	Pump 15 bbls to establish circulation
39	08/07/2019 12:45	Client					wait for rig to circulate
40	08/07/2019 14:19	STEACS Briefing					Pre-Job STEACS Briefing with rig crew, company man, tool hand, and all BJ Services cement crew

SEQ	START DATE / TIME	EVENT	DENSITY (ppg)	PUMP RATE (bpm)	PUMP VOL (bbls)	PIPE PRESSURE (psi)	COMMENTS
41	08/07/2019 14:26	Pump Spacer	8.4000	5.00	40.00	118.00	Pump 40 bbls Fresh water spacer
42	08/07/2019 14:33	Pump Lead Cement	12.0000	5.00	5.00	127.00	Pump Lead Cement 12 ppg 594 sks 2.53 cuft/sk 14.86 gals/sk for a total of 267.65 bbls of Tail cement requiring 210.16 bbls of mix water. Weight verified with mud scale
43	08/07/2019 14:41	Pump Lead Cement	12.0000	6.00	50.00	261.00	Pump Lead Cement
44	08/07/2019 14:51	Pump Lead Cement	12.0000	6.00	100.00	366.00	Pump Lead Cement
45	08/07/2019 15:00	Pump Lead Cement	12.0000	6.00	150.00	396.00	Pump Lead Cement
46	08/07/2019 15:07	Pump Lead Cement	12.0000	6.00	200.00	373.00	Pump Lead Cement
47	08/07/2019 15:15	Pump Lead Cement	12.0000	5.00	250.00	290.00	Pump Lead Cement
48	08/07/2019 15:21	Pump Lead Cement	12.0000	4.50	278.00	251.00	Finished pumping Lead Cement with 278 bbls away
49	08/07/2019 15:26	Pump Lead Cement	12.0000	1.50	2.00	87.00	Pump 2 bbls of Lead Cement down last parasite string
50	08/07/2019 15:28	Drop Top Plug					Drop Plug
51	08/07/2019 15:30	Pump Displacement	8.4000	5.00	10.00	108.00	Pump Fresh water displacement
52	08/07/2019 15:38	Pump Displacement	8.4000	5.00	50.00	206.00	Pump Fresh water displacement
53	08/07/2019 15:47	Pump Displacement	8.4000	5.00	95.00	297.00	Pump Fresh water displacement
54	08/07/2019 15:51	Pump Displacement	8.4000	3.50	106.00	301.00	Pump Fresh water displacement
55	08/07/2019 15:52	Land Plug				1808.00	Landed the plug @ 301 psi took to 1808 psi
56	08/07/2019 15:57	Check Floats					Check floats, floats held 1 bbl back
57	08/07/2019 16:05	Wash Pumps and Lines					Wash pumps and lines into cellar
58	08/07/2019 16:24	Rig Down					Rig down cement head
59	08/07/2019 16:35	Client					Wait for rig to nipple up to start top out
60	08/07/2019 17:49	STEACS Briefing					Pre-Job STEACS Briefing with company man and all BJ Services cement crew
61	08/07/2019 18:00	Pumping Cement	12.5000	1.50	7.00	87.00	Pump Top out cement 12.5 ppg 18 sks 2.25 cuft/sk 12.48 gals/sk for a total of 7.21 bbls of top out
62	08/07/2019 18:05	Cement Back-to-Surface					Cement to surface
63	08/07/2019 18:06	Other (See comment)					Shutdown for 15 mins to see if cement would fall

SEQ	START DATE / TIME	EVENT	DENSITY (ppg)	PUMP RATE (bpm)	PUMP VOL (bbls)	PIPE PRESSURE (psi)	COMMENTS
64	08/07/2019 18:16	Wash Pumps and Lines					Wash pumps and lines into 3-sided tank
65	08/07/2019 18:27	STEACS Briefing					Pre-Rig Down STEACS Briefing with all BJ Services cement crew
66	08/07/2019 18:39	Rig Down					Rig down all equipment
67	08/07/2019 19:47	STEACS Briefing					Pre-Convoy STEACS Briefing with all BJ Services cement crew
68	08/07/2019 20:00	Leave Location					Depart from location for Rifle yard. Thank you for using BJ Services, Andrew Linn, and crew







