



# Caerus

**Well Name: Fed 24B-14-496**

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**API #: 05-045-24181**

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**Job Type: Surface**

Date Job Completed: 8/19/2019

**Quote #:** QUO-35274

**Execution #:** EXC-20526



# Caerus

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

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

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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](mailto: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

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# Stage 1 - Cementing Treatment Report

<b>SERVICE SUPERVISOR</b>	Paul Linn III	<b>FORMATION</b>	
<b>CLIENT FIELD REPRESENTATIVE</b>	Beaude Oaks	<b>RIG</b>	H&P 329
<b>DISTRICT</b>	Rifle, CO	<b>COUNTY</b>	GARFIELD
<b>SERVICE</b>	Cementing	<b>STATE / PROVINCE</b>	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			3,048.00			
Casing	8.92	9.63	36.00	3,024.00		J-55	LTC

## HARDWARE

<b>Bottom Plug Used?</b>	No	<b>Tool Type</b>	Float Collar
<b>Top Plug Used?</b>	Yes	<b>Tool Depth (ft)</b>	2,984.20
<b>Top Plug Provided By</b>	Non BJ	<b>Pipe Movement</b>	None
<b>Top Plug Size</b>	9.625	<b>Job Pumped Through</b>	Manifold
<b>Centralizers Used</b>	Yes	<b>Top Connection Thread</b>	8 RND
<b>Centralizers Quantity</b>	10.00	<b>Top Connection Size</b>	9.625
<b>Centralizers Type</b>	Bow		
<b>Landing Collar Depth (ft)</b>	3,024		

Client: Caerus Operating LLC

Well: FED #24B-14-496

Well API: 05-045-24181

Start Date: 8/18/2019

End Date: 8/19/2019

Field Ticket #: FT-20526-G9N2K40202-55637



## CIRCULATION PRIOR TO JOB

Well Circulated By	Rig	YP Mud In	9
Circulation Prior to Job	Yes	Solids Present at End of Circulation	No
Circulation Time (min)	120.00	10 sec SGS	4
Circulation Rate (bpm)	5.95	10 min SGS	15
Circulation Volume (bbls)	714.00	30 min SGS	24
Lost Circulation Prior to Cement Job	No	Flare Prior to / during the Cement Job	No
Mud Density In (ppg)	9.20	Gas Present	No
Mud Density Out (ppg)	9.20		
PV Mud In	13		

## TEMPERATURE

Ambient Temperature (°F)	56.00	Slurry Cement Temperature (°F)	79.40
Mix Water Temperature (°F)	66.80	Flow Line Temperature (°F)	

## FLUID DETAILS

FLUID TYPE	FLUID NAME	DENSITY (ppg)	YIELD (Cu Ft/sk)	H <sub>2</sub> 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 EXTENDER, GYPSUM, A-10	5.0000	BWOB
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 Additive, Sodium Metasilicate A-2	0.2000	LBS/SK
Lead Slurry	BJCem S100.3.01D	CEMENT, ASTM TYPE III	100.0000	PCT
Lead Slurry	BJCem S100.3.01D	IntegraSeal POLI	0.1300	LBS/SK
Tail Slurry	BJCem S100.3.01D	CEMENT EXTENDER, GYPSUM, A-10	5.0000	BWOB
Tail Slurry	BJCem S100.3.01D	Cement Additive, Sodium Metasilicate A-2	2.0000	LBS/SK
Tail Slurry	BJCem S100.3.01D	ACCELERATOR, SALT, CHLORIDE, CALCIUM, A-7P, PELLETS	2.0000	LBS/SK
Tail Slurry	BJCem S100.3.01D	CEMENT, ASTM TYPE III	100.0000	PCT
Tail Slurry	BJCem S100.3.01D	FOAM PREVENTER, FP-25	0.3000	BWOB
Tail Slurry	BJCem S100.3.01D	IntegraSeal POLI	0.1300	LBS/SK
Tail Slurry	BJCem S100.3.01D	IntegraSeal PHENO	3.0000	LBS/SK

Client: Caerus Operating LLC

Well: FED #24B-14-496

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Start Date: 8/18/2019

End Date: 8/19/2019

Field Ticket #: FT-20526-G9N2K40202-55637



TIME	FLUID	RATE (bpm)	FLUID VOL (bbls)	PIPE PRESS (psi)
8/19/2019 3:49:00 AM	Water	5.00	40.00	135.00
8/19/2019 3:58:00 AM	BJCem S100.3.01D	6.00	266.80	321.00
8/19/2019 4:49:00 AM	BJCem S100.3.01D	5.50	63.70	281.00
8/19/2019 5:08:00 AM	Displacement	5.50	230.50	147.00

### MIN / MAX / AVG PRESSURE AND RATES

	MIN	MAX	AVG
Pressure (psi)	114.00	1181.00	236.00
Rate (bpm)	2.00	8.50	5.00

### DISPLACEMENT AND END OF JOB SUMMARY

Displaced By	BJ	Amt of Cement Returned / Reversed	65.00
Calculated Displacement Vol (bbls)	230.68	Method Used to Verify Returns	Visual
Actual Displacement Vol (bbls)	230.00	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	0.50
Bump Plug Pressure (psi)	849.00	Total Volume Pumped (bbls)	600.00
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 #24B-14-496

Well 05-045-24181

API:

Start 8/18/2019

End 8/19/2019

Field Ticket FT-20526-G9N2K40202-

Date:

Date:

#: 55637



# Stage 2 - Cementing Treatment Report

<b>SERVICE SUPERVISOR</b>	Paul Linn III	<b>FORMATION</b>	
<b>CLIENT FIELD REPRESENTATIVE</b>	Beaude Oaks	<b>RIG</b>	H&P 329
<b>DISTRICT</b>	Rifle, CO	<b>COUNTY</b>	GARFIELD
<b>SERVICE</b>	Cementing	<b>STATE / PROVINCE</b>	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			1,422.60	50.00		
Casing	8.92	9.63	36.00	1,422.60		J-55	LTC

## HARDWARE

<b>Bottom Plug Used?</b>	No	<b>Tool Type</b>	DV Tool
<b>Top Plug Used?</b>	Yes	<b>Tool Depth (ft)</b>	1,422.60
<b>Top Plug Provided By</b>	Non BJ	<b>Pipe Movement</b>	None
<b>Top Plug Size</b>	9.625	<b>Job Pumped Through</b>	Manifold
<b>Centralizers Used</b>	Yes	<b>Top Connection Thread</b>	8 RND
<b>Centralizers Quantity</b>	10.00	<b>Top Connection Size</b>	9.625
<b>Centralizers Type</b>	Bow		
<b>Landing Collar Depth (ft)</b>	1,423		

Client: Caerus Operating LLC

Well: FED #24B-14-496

Well API: 05-045-24181

Start Date: 8/19/2019

End Date: 8/19/2019

Field Ticket #: FT-20526-G9N2K40202-55637



## 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)	120.00	Gas Present	No
Circulation Rate (bpm)	3.00		
Circulation Volume (bbls)	360.00		
Lost Circulation Prior to Cement Job	No		
Mud Density In (ppg)	9.20		
Mud Density Out (ppg)	9.20		

## TEMPERATURE

Ambient Temperature (°F)	73.00	Slurry Cement Temperature (°F)	79.40
Mix Water Temperature (°F)	66.80	Flow Line Temperature (°F)	

## FLUID DETAILS

FLUID TYPE	FLUID NAME	DENSITY (ppg)	YIELD (Cu Ft/sk)	H <sub>2</sub> O REQ (gals/sk)	PLN TOP FLD (ft)	LENGTH (ft)	VOL (sk)	VOL (Cu Ft)	VOL (bbls)
Spacer / Pre Flush / Flush	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 Final	Displacement	8.3300			0.00			0.0000	108.2000

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

TIME	FLUID	RATE (bpm)	FLUID VOL (bbls)	PIPE PRESS (psi)
8/19/2019 8:46:00 AM	Water	5.50	40.00	203.00
8/19/2019 8:55:00 AM	BJCem S100.3.01D	5.50	267.65	277.00
8/19/2019 9:41:00 AM	Displacement	7.50	109.97	343.00

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**MIN / MAX / AVG PRESSURE AND RATES**

	MIN	MAX	AVG
Pressure (psi)	191.00	731.00	367.00
Rate (bpm)	3.50	8.50	6.50

**DISPLACEMENT AND END OF JOB SUMMARY**

Displaced By	BJ	Amt of Cement Returned / Reversed	25.00
Calculated Displacement Vol (bbls)	109.97	Method Used to Verify Returns	Visual
Actual Displacement Vol (bbls)	109.00	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)	505.00	Total Volume Pumped (bbls)	417.00
Were Returns Planned at Surface	Yes	Top Out Cement Spotted	Yes
Cement Returns During Job	Partial	Lost Circulation During Cement Job	No

Client: Caerus Operating LLC

Well: FED #24B-14-496

Well 05-045-24181

Start Date: 8/19/2019

End Date: 8/19/2019

Field Ticket #: FT-20526-G9N2K40202-55637



# 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	08/18/2019 16:00	Callout					Call out. On location time of 00:00 8/19/19
2	08/18/2019 19:47	STEACS Briefing					Pre-Convoy STEACS Briefing with all BJ Services cement crew
3	08/18/2019 20:05	Depart for Location					Depart from Rifle yard for H&P 329
4	08/18/2019 22:11	Arrive on Location					Arrive on location. Rig was running casing
5	08/18/2019 22:22	Spot Units					Did a site assessment, and spotted trucks
6	08/18/2019 22:38	STEACS Briefing					Pre-Rig Up STEACS Briefing with all BJ Services cement crew
7	08/18/2019 22:47	Rig Up					Rig up all ground equipment
8	08/18/2019 23:47	Client					Wait on rig to finish running casing and circulate
9	08/19/2019 03:19	STEACS Briefing					Pre-Job STEACS Briefing with rig crew, tool hand, company man, and all BJ Services cement crew
10	08/19/2019 03:32	Rig Up					Stab plug container, and hook up lines
11	08/19/2019 03:43	Prime Up	8.4000	2.00	5.00	158.00	Fill lines with 5 bbls of fresh water
12	08/19/2019 03:46	Pressure Test				3382.00	Pressure test to 3382 psi
13	08/19/2019 03:49	Pump Spacer	8.4000	5.00	40.00	135.00	Fresh water spacer 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 by mud scale
14	08/19/2019 03:58	Pump Lead Cement	12.0000	6.00	5.00	321.00	Pump Lead Cement
15	08/19/2019 04:07	Pump Lead Cement	12.0000	5.50	50.00	373.00	Pump Lead Cement



SEQ	START DATE / TIME	EVENT	DENSITY (ppg)	PUMP RATE (bpm)	PUMP VOL (bbls)	PIPE PRESSURE (psi)	COMMENTS
16	08/19/2019 04:16	Pump Lead Cement	12.0000	5.00	100.00	218.00	Pump Lead Cement
17	08/19/2019 04:27	Pump Lead Cement	12.0000	5.00	150.00	226.00	Pump Lead Cement
18	08/19/2019 04:36	Pump Lead Cement	12.0000	5.00	200.00	213.00	Pump Lead Cement
19	08/19/2019 04:44	Pump Lead Cement	12.0000	5.00	250.00	241.00	Pump Lead Cement
20	08/19/2019 04:47	Pump Lead Cement	12.0000	5.00	260.00	223.00	Finished pumping Lead Cement with 260 bbls away
21	08/19/2019 04:49	Pump Tail Cement	12.5000	5.50	5.00	281.00	Pump Tail Cement
22	08/19/2019 04:58	Pump Tail Cement	12.5000	4.00	50.00	170.00	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 47.54 bbls of mix water. Weight verified by mud scales
23	08/19/2019 05:00	Pump Tail Cement	12.5000	4.00	58.00	168.00	Finished pumping Tail Cement with 58 bbls away
24	08/19/2019 05:06	Drop Top Plug					Drop plug, verified by tool hand, and company man
25	08/19/2019 05:08	Pump Displacement	8.4000	5.50	20.00	192.00	Pump fresh water displacement
26	08/19/2019 05:12	Pump Displacement	8.4000	8.50	30.00	386.00	Pump fresh water displacement
27	08/19/2019 05:14	Pump Displacement	8.4000	8.50	50.00	452.00	Pump fresh water displacement
28	08/19/2019 05:21	Pump Displacement	8.4000	4.50	100.00	322.00	Pump fresh water displacement
29	08/19/2019 05:30	Pump Displacement	8.4000	8.00	150.00	809.00	Pump fresh water displacement
30	08/19/2019 05:36	Pump Displacement	8.4000	8.00	220.00	1181.00	Pump fresh water displacement
31	08/19/2019 05:39	Pump Displacement	8.4000	3.00	230.00	849.00	Pump fresh water displacement
32	08/19/2019 05:41	Land Plug				1441.00	Landed the plug @ 849 psi took to 1441 psi. Pressure bleed off due to leaking crossover connection
33	08/19/2019 05:44	Check Floats					Check floats, floats held 1/2 bbl back
34	08/19/2019 05:50	Other (See comment)					Got return @ 40 bbls into Tail cement, Lost returns 90 bbls into Displacement, Gained returns 170 bbls into Displacement and keep until landed the plug
35	08/19/2019 05:50	Other (See comment)	8.4000	1.00	10.00	104.00	Pump sugar water on parasite sting
36	08/19/2019 05:59	Drop Opening Plug					Drop opening plug, and loaded closing plug in plug container, verified by company man and tool hand
37	08/19/2019 06:11	Other (See comment)				1251.00	Tried opening tool didn't open
38	08/19/2019 06:19	Other (See comment)				1690.00	Opened tool with 1690 psi



SEQ	START DATE / TIME	EVENT	DENSITY (ppg)	PUMP RATE (bpm)	PUMP VOL (bbls)	PIPE PRESSURE (psi)	COMMENTS
39	08/19/2019 06:20	Circulate Well	8.4000	4.50	20.00	453.00	Establish circulation on the well and handed over to the rig
40	08/19/2019 06:26	Cement Back-to-Surface					Rig circulated 65 bbls of cement to surface
41	08/19/2019 06:26	Client					Wait on rig to circulate
42	08/19/2019 08:34	STEACS Briefing					Pre-Job STEACS Briefing with rig crew, tool hand, company man, and all BJ Services cement crew
43	08/19/2019 08:46	Pump Spacer	8.4000	5.50	40.00	203.00	Pump Fresh water spacer
44	08/19/2019 08:55	Pump Tail Cement	12.0000	5.50	5.00	277.00	Pump Tail 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 scales
45	08/19/2019 08:56	Pump Tail Cement	12.0000	6.50	10.00	402.00	Pump Tail Cement
46	08/19/2019 09:02	Pump Tail Cement	12.0000	6.50	50.00	360.00	Pump Tail Cement
47	08/19/2019 09:10	Pump Tail Cement	12.0000	6.50	100.00	367.00	Pump Tail Cement
48	08/19/2019 09:17	Pump Tail Cement	12.0000	6.50	150.00	354.00	Pump Tail Cement
49	08/19/2019 09:24	Pump Tail Cement	12.0000	6.50	200.00	453.00	Pump Tail Cement
50	08/19/2019 09:29	Pump Tail Cement	12.0000	5.00	225.00	211.00	Pump Tail Cement
51	08/19/2019 09:33	Pump Tail Cement	12.0000	5.00	250.00	219.00	Pump Tail Cement
52	08/19/2019 09:37	Pump Tail Cement	12.0000	5.00	268.00	189.00	Finished pumping Tail Cement 268 bbls away
53	08/19/2019 09:39	Drop Closing Plug					Dropped closing plug, verified by company man and tool hand
54	08/19/2019 09:41	Cement Back-to-Surface					25 bbls of cement to surface
55	08/19/2019 09:41	Pump Displacement	8.4000	8.50	50.00	538.00	Pump Fresh water displacement
56	08/19/2019 09:47	Pump Displacement	8.4000	8.50	99.00	731.00	Pump Fresh water displacement
57	08/19/2019 09:53	Pump Displacement	8.4000	4.00	109.00	505.00	Pump Fresh water displacement
58	08/19/2019 09:55	Land Plug				2155.00	Land the plug @505 psi took to 2155 psi
59	08/19/2019 09:59	Check Floats					Check floats, Floats held 1 bbl back
60	08/19/2019 10:05	Rig Down					Rig down plug container
61	08/19/2019 10:21	Client					Wait on rig to hook up bop

SEQ	START DATE / TIME	EVENT	DENSITY (ppg)	PUMP RATE (bpm)	PUMP VOL (bbls)	PIPE PRESSURE (psi)	COMMENTS
62	08/19/2019 12:30	Prime Up	8.4000	2.00	1.00	122.00	Make sure lines were clear
63	08/19/2019 12:33	Pumping Cement	12.5000	2.00	17.00	118.00	Pump Top Out Cement 12.5 ppg 50 sks 2.25 cuft/sk 12.48 gals/sk for a total of 20.04 bbls of Top Out cement
64	08/19/2019 12:44	Cement Back-to-Surface					Cement to surface, cement fell back
65	08/19/2019 12:52	Pumping Cement	12.5000	2.00	2.00	138.00	Pump Top Out Cement
66	08/19/2019 13:00	Cement Back-to-Surface					Cement to surface, cement stayed at surface
67	08/19/2019 13:05	Wash Pumps and Lines					Wash pumps and lines into cellar
68	08/19/2019 13:19	STEACS Briefing					Pre-Rig Down STEACS Briefing with all BJ Services cement crew
69	08/19/2019 13:30	Rig Down					Rig down all equipment
70	08/19/2019 14:24	STEACS Briefing					Pre-Convoy STEACS Briefing with all BJ Services cement crew
71	08/19/2019 14:38	Leave Location					Leave location for Rifle yard. Thank you for using BJ Services, Andrew Linn, and crew.





