



P.O. Box 1653  
Durango, Colorado 81302  
(970) 764-7356  
[www.cottonwoodconsulting.com](http://www.cottonwoodconsulting.com)

June 16, 2022

Elizabeth and Seth Smith  
4036 Hwy 550  
Durango, CO 81303

**RE: Bondad South Well- Smith Preplu  
Water Well Sampling Results  
4036 Hwy 550 Durango, CO 81303**

Dear Mrs. & Mr. Smith,

Cottonwood Consulting LLC is pleased to provide you with the results of water well sampling conducted at your property on May 13, 2022. The sampling was conducted prior to the plugging and abandonment of the nearby Bryce (OWP) #1-X orphan oil and gas well.

Please find a table summarizing the results and the associated laboratory analytical reports enclosed in this packet. The table summarizing your results also provides recommended levels from the Environmental Protection Agency (EPA) for comparison purposes.

Should you have any questions, please do not hesitate to contact me at 970-764-7356. We appreciate your participation in the water monitoring program.

Sincerely,

A handwritten signature in black ink that reads "Kyle D. Siesser". The signature is written in a cursive style with a clear, legible font.

Kyle Siesser, P.G.  
Cottonwood Consulting, LLC

**Bondad South Well - Smith 5/13/2022**  
**COGCC Facility ID: 706209**  
**Operator: COGCC**  
**Gas Well: Bryce (OWP) #1-X**

**CO DWR Permit: 231382**  
**Depth: -**  
**Static Water Level: -**  
**Yield: -**

Parameter	Results	EPA Standard	Units
<b>Dissolved Gases</b>			
Methane	20	-	mg/L
δ 13C	-47.05	-	‰
δ D	-183.6	-	‰
<b>Bacteria Analysis</b>			
E coli	Absent	Absent	-
Total Coliform	Absent	Absent	-
Iron-Related Bacteria	Medium Aggressivity	-	-
Slime-Forming Bacteria	Medium Aggressivity	-	-
Sulfate-Reducing Bacteria	Low Aggressivity	-	-
<b>General Chemistry</b>			
Alkalinity, Bicarbonate	355	-	mg/L
Alkalinity, Carbonate	<10.0	-	mg/L
Alkalinity, Total	355	-	mg/L
Chloride	321	250	mg/L
Conductivity at 25°C	1790	-	uS/cm
Fluoride	2.38	2.0 and 4.0*	mg/L
Nitrate/ Nitrite, as dissolved Nitrogen	0.050	Nitrate=10 Nitrite-1*	mg/L
pH	7.40	6.5-8.5	pH Units
Sodium Adsorption Ratio	12.6	-	-
Total Dissolved Solids	865	500	mg/L
Sulfate	15.3	250	mg/L
<b>Metals Analysis</b>			
Calcium	43.4	-	mg/L
Hardness, as CaCO <sub>3</sub>	115	-	mg/L
Iron	0.303	0.3	mg/L
Magnesium	1.53	-	mg/L
Potassium	<2.00	-	mg/L
Sodium	309	-	mg/L
Manganese	0.244	0.05	mg/L
Selenium	0.0030	0.05*	mg/L
<b>Field Data and Stabilized Parameters</b>			
pH	7.34	6.5-8.5	pH Units
Conductivity	1702	-	uS/cm
Temperature	12.9	-	°C
Hydrogen Sulfide	<0.1	-	mg/L
Total Volume Purged	120	-	gallons

**Field Notes:**

Sample for COGCC's plugging of the Bryce 1-X. Met Seth on-site. Sample from frost free along driveway. Water was clear, grey tint, bacterial odor, effervescent bubbles, fine brown sediment.

mg/L- milligrams per Liter; °C- degrees Centigrade; uS/cm- Microsiemens per Centimeter  
 EPA standards are Secondary Standards unless otherwise noted; \*- EPA Primary Standard

## Isotech Gas Data

Job 51021

Project Bryce (OWP) #1-X

CoreTrac IS-107464

Isotech Lab No.	Sample Name	Sample Date	Sample Time	Field Name	Sampling Point	Methane, dissolved		Ethane, dissolved		Propane, dissolved		Comments
						cc/L	ppm	cc/L	ppm	cc/L	ppm	
828743	Bondad South Well - Smith Preplug	5/13/2022	7:51	Bryce (OWP) #1-X	706209	29	20	0.096	0.12	0.0001	0.0003	dissolved gas ppm = dissolved gas mg/L

Lab #: 828743 Job #: 51021 IS-107464 Co. Job#:  
Sample Name: Bondad South Well - Smith Preplug Co. Lab#:  
Company: Cottonwood Consulting, LLC  
API/Well:  
Container: Isoflask & VOA  
Field/Site Name: Bryce (OWP) #1-X  
Location:  
Formation:  
Sampling Point: 706209  
Date Sampled: 5/13/2022 7:51 Date Received: 5/17/2022 Date Reported: 6/14/2022

Component	Chemical mol. %	$\delta^{13}\text{C}$ ‰	$\delta\text{D}$ ‰	$\delta^{15}\text{N}$ ‰
Carbon Monoxide -----	nd			
Helium -----	na			
Hydrogen -----	nd			
Argon -----	0.566			
Oxygen + Argon -----	na			
Nitrogen -----	32.19			
Carbon Dioxide -----	6.05			
Methane -----	57.26	-47.05	-183.6	
Ethane -----	0.177			
Ethylene -----	nd			
Propane -----	nd			
Propylene -----	nd			
Iso-butane -----	nd			
N-butane -----	nd			
Iso-pentane -----	nd			
N-pentane -----	nd			
Hexanes + -----	0.0005			
Total BTU/cu.ft. dry @ 60deg F & 14.73psia, calculated:	583			
Specific gravity, calculated:	0.772			

Remarks: dissolved gas ppm = dissolved gas mg/L

nd = not detected. na = not analyzed. Isotopic composition of hydrogen is relative to VSMOW. Isotopic composition of carbon is relative to VPDB. All gas component carbon isotope values are reported on a scale defined by a two point calibration of LSVEC and NBS 19. Calculations for BTU and specific gravity per ASTM D3588. Chemical compositions are normalized to 100%. Mol. % is approximately equal to vol. %.



Cottonwood Consulting PO Box 1653 Durango CO, 81302	Project: Rule 608 Project Name / Number: Bryce (OWP) #1-X Project Manager: Kyle Siesser	Reported: 05/26/22 13:13
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**Bondad South Well - Smith Preplug  
FAC ID: 706209 CC ID: 051322-EM1**

**2205185-01 (Ground Water)**

Analyte	Result	RL	MDL	Units	Dilution	Analyzed	Method	Notes	Analyst
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**Microbiology**

Total Coliform	Absent			No Unit	1	05/13/22 12:15	SM9223B Colilert		LLG
E. Coli	Absent			No Unit	1	05/13/22 12:15	SM9223B Colilert		LLG

**General Chemistry**

Alkalinity, Bicarbonate as CaCO3*	355	10.0	2.27	mg/L	5	05/24/22 13:20	2320 B		VJW
Alkalinity, Carbonate as CaCO3*	<10.0	10.0	2.27	mg/L	5	05/24/22 13:20	2320 B		VJW
Alkalinity, Hydroxide as CaCO3*	<10.0	10.0	2.27	mg/L	5	05/24/22 13:20	2320 B		VJW
Alkalinity, Total as CaCO3*	355	10.0	2.27	mg/L	5	05/24/22 13:20	2320 B		VJW
Chloride*	321	20.0	0.608	mg/L	20	05/24/22 10:33	EPA300.0		AES
Conductivity*	1790	1.00		umho/cm @ 25.0°C	1	05/13/22 14:35	2510 B		VJW
Fluoride*	2.38	0.200	0.0194	mg/L	2	05/23/22 16:54	EPA300.0		AES
Nitrate/Nitrite as N*	0.050	0.020	0.012	mg/L as N	1	05/19/22 16:23	EPA353.2		AES
pH*	7.40			pH Units	1	05/13/22 14:35	EPA150.1		VJW
pH Temperature, degrees C	22.8			pH Units	1	05/13/22 14:35	EPA150.1		VJW
SAR	12.6			No Unit	1	05/24/22 16:58	Calculation		AES
Total Dissolved Solids*	865	10.0		mg/L	1	05/18/22 16:30	EPA160.1		VJW
Sulfate*	15.3	2.00	0.248	mg/L	2	05/23/22 16:54	EPA300.0		AES

**Total Recoverable Metals by ICP (E200.7)**

Calcium*	43.4	0.200	0.077	mg/L	2	05/24/22 16:58	EPA200.7		AES
Hardness as CaCO3	115	1.32	0.436	mg/L	2	05/24/22 16:58	2340 B		AES
Iron*	0.303	0.100	0.075	mg/L	2	05/24/22 16:58	EPA200.7		AES
Magnesium*	1.53	0.200	0.059	mg/L	2	05/24/22 16:58	EPA200.7		AES
Potassium*	<2.00	2.00	0.355	mg/L	2	05/24/22 16:58	EPA200.7		AES
Sodium*	309	2.00	0.152	mg/L	2	05/24/22 16:58	EPA200.7		AES

**Total Recoverable Metals by ICPMS (E200.8)**

Manganese*	0.244	0.0020	0.0002	mg/L	1	05/25/22 12:43	EPA200.8		AES
Selenium*	0.0030	0.0010	0.0007	mg/L	1	05/25/22 12:43	EPA200.8		AES

Green Analytical Laboratories

Brenna Kampf, Project Manager

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Cottonwood Consulting	Project: Rule 608	
PO Box 1653	Project Name / Number: Bryce (OWP) #1-X	<b>Reported:</b>
Durango CO, 81302	Project Manager: Kyle Siesser	05/26/22 13:13

**Bondad South Well - Smith Preplug  
FAC ID: 706209 CC ID: 051322-EM1**

**2205185-01 (Ground Water)**

Analyte	Result	RL	MDL	Units	Dilution	Analyzed	Method	Notes	Analyst
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**Other**

<b>Iron-Related Bacteria</b>	Medium			CFU/mL	1	05/13/22 17:00	Lab Procedure		LLG
	Aggressivity								
<b>Slime-Forming Bacteria</b>	Medium			CFU/mL	1	05/13/22 17:00	Lab Procedure		LLG
	Aggressivity								
<b>Sulfate-Reducing Bacteria</b>	Low			CFU/mL	1	05/13/22 17:00	Lab Procedure		LLG
	Aggressivity								

Green Analytical Laboratories

Brenna Kampf, Project Manager

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