



P.O. Box 1653
Durango, Colorado 81302
(970) 764-7356
www.cottonwoodconsulting.com

June 3, 2022

Jim Applegate
142 Shepherd Drive
Durango, CO 81303

**RE: Bondad Fire Station Preplug
Water Well Sampling Results
4040 Hwy 550 Durango, CO 81303**

Dear Mr. Applegate,

Cottonwood Consulting LLC is pleased to provide you with the results of water well sampling conducted at your property on April 29, 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 Fire Station - Animas Fire Dept 4/29/2022
COGCC Facility ID: 702990
Operator: COGCC
Gas Well: Bryce 1-X

CO DWR Permit: 47716
Depth: 146 ft
Static Water Level: 34 ft
Yield: 3.5 gpm

Parameter	Results	EPA Standard	Units
Dissolved Gases			
Methane	3.4	-	mg/L
δ 13C	-42.94	-	‰
δ D	-136.2	-	‰
Bacteria Analysis			
E coli	Absent	Absent	-
Total Coliform	Absent	Absent	-
Iron-Related Bacteria	High Aggressivity	-	-
Slime-Forming Bacteria	Medium Aggressivity	-	-
Sulfate-Reducing Bacteria	Low Aggressivity	-	-
General Chemistry			
Alkalinity, Bicarbonate	460	-	mg/L
Alkalinity, Carbonate	<10.0	-	mg/L
Alkalinity, Total	460	-	mg/L
Chloride	65.9	250	mg/L
Conductivity at 25°C	1060	-	uS/cm
Fluoride	0.351	2.0 and 4.0*	mg/L
Nitrate/ Nitrite, as dissolved Nitrogen	<0.020	Nitrate=10 Nitrite-1*	mg/L
pH	7.72	6.5-8.5	pH Units
Sodium Adsorption Ratio	9.82	-	-
Total Dissolved Solids	675	500	mg/L
Sulfate	12.6	250	mg/L
Metals Analysis			
Calcium	30.9	-	mg/L
Hardness, as CaCO ₃	84.1	-	mg/L
Iron	<0.050	0.3	mg/L
Magnesium	1.70	-	mg/L
Potassium	1.05	-	mg/L
Sodium	207	-	mg/L
Manganese	0.0608	0.05	mg/L
Selenium	<0.0010	0.05*	mg/L
Field Data and Stabilized Parameters			
pH	7.64	6.5-8.5	pH Units
Conductivity	1090	-	uS/cm
Temperature	15.7	-	°C
Hydrogen Sulfide	0.1-0.3	-	mg/L
Total Volume Purged	264	-	gallons

Field Notes:

Sample for COGCC's plugging of the Bryce 1-X. Firehouse is not currently occupied, but was recently. Water was clear, no tint, bacterial odor, no bubbles, black flake 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

Lab #: 827236 Job #: 50858 IS-107464 Co. Job#:
 Sample Name: Bondad Fire Station - Animas Fire Dept. Preplug Co. Lab#:
 Company: Cottonwood Consulting, LLC
 API/Well:
 Container: Isoflask & VOA
 Field/Site Name: Bryce (OWP) #1-X
 Location:
 Formation/Depth:
 Sampling Point: 702990
 Date Sampled: 4/29/2022 13:19 Date Received: 5/03/2022 Date Reported: 5/31/2022

Component	Chemical mol. %	$\delta^{13}\text{C}$ ‰	δD ‰	$\delta^{18}\text{O}$ ‰	Dissolved gas cc/L	Dissolved gas ppm
Carbon Monoxide -----	nd					
Helium -----	na					
Hydrogen -----	nd					
Argon -----	1.08					
Oxygen + Argon -----	na					
Nitrogen -----	73.42					
Carbon Dioxide -----	5.09					
Methane -----	17.52	-42.94	-136.2		5.0	3.4
Ethane -----	0.0627				0.020	0.025
Ethylene -----	nd					
Propane -----	0.0009				0.00027	0.00050
Propylene -----	nd					
Iso-butane -----	nd					
N-butane -----	nd					
Iso-pentane -----	nd					
N-pentane -----	nd					
Hexanes + -----	nd					
Water -----			-93.3	-11.94		
Dissolved Inorganic Carbon -		-13.3				
Vacuum Distilled? -----	No					

Remarks:

Analysis is of gas extracted from water by headspace equilibration. Analysis has been corrected for helium added to create headspace. Helium dilution factor = 0.78

*Addition of helium negates the ability to detect native helium and may negate the ability to detect hydrogen.
 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. Isotopic composition of oxygen is relative to VSMOW, except for carbon dioxide which is relative to VPDB. 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: 05/13/22 16:38
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**Bondad Fire Station - Animas Fire Dept Preplug
FAC ID: 702990 CC ID: 042922-EM2**

2204357-01 (Ground Water)

Analyte	Result	RL	MDL	Units	Dilution	Analyzed	Method	Notes	Analyst
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Microbiology

Total Coliform	Absent			No Unit	1	04/29/22 15:30	SM9223B Colilert		LLG
E. Coli	Absent			No Unit	1	04/29/22 15:30	SM9223B Colilert		LLG

General Chemistry

Alkalinity, Bicarbonate as CaCO3*	460	10.0	2.27	mg/L	5	05/09/22 10:15	2320 B		VJW
Alkalinity, Carbonate as CaCO3*	<10.0	10.0	2.27	mg/L	5	05/09/22 10:15	2320 B		VJW
Alkalinity, Hydroxide as CaCO3*	<10.0	10.0	2.27	mg/L	5	05/09/22 10:15	2320 B		VJW
Alkalinity, Total as CaCO3*	460	10.0	2.27	mg/L	5	05/09/22 10:15	2320 B		VJW
Chloride*	65.9	2.00	0.0608	mg/L	2	05/12/22 10:07	EPA300.0		AES
Conductivity*	1060	1.00		umho/cm @ 25.0°C	1	04/29/22 16:20	2510 B		VJW
Fluoride*	0.351	0.100	0.00971	mg/L	1	05/11/22 21:48	EPA300.0		AES
Nitrate/Nitrite as N*	<0.020	0.020	0.012	mg/L as N	1	05/12/22 10:37	EPA353.2		AES
pH*	7.72			pH Units	1	04/29/22 16:20	EPA150.1		VJW
pH Temperature, degrees C	19.8			pH Units	1	04/29/22 16:20	EPA150.1		VJW
SAR	9.82			No Unit	1	05/10/22 20:21	Calculation		AES
Total Dissolved Solids*	675	10.0		mg/L	1	05/04/22 16:50	EPA160.1		VJW
Sulfate*	12.6	1.00	0.124	mg/L	1	05/11/22 21:48	EPA300.0		AES

Total Recoverable Metals by ICP (E200.7)

Calcium*	30.9	0.100	0.038	mg/L	1	05/10/22 20:21	EPA200.7		AES
Hardness as CaCO3	84.1	0.662	0.218	mg/L	1	05/10/22 20:21	2340 B		AES
Iron*	<0.050	0.050	0.038	mg/L	1	05/10/22 20:21	EPA200.7		AES
Magnesium*	1.70	0.100	0.030	mg/L	1	05/10/22 20:21	EPA200.7		AES
Potassium*	1.05	1.00	0.178	mg/L	1	05/10/22 20:21	EPA200.7		AES
Sodium*	207	1.00	0.076	mg/L	1	05/10/22 20:21	EPA200.7		AES

Total Recoverable Metals by ICPMS (E200.8)

Manganese*	0.0608	0.0020	0.0002	mg/L	1	05/09/22 15:11	EPA200.8		AES
Selenium*	<0.0010	0.0010	0.0007	mg/L	1	05/09/22 15:11	EPA200.8		AES

Green Analytical Laboratories

Debbie Zufelt, Reports Manager

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Other

Iron-Related Bacteria	High			CFU/mL	1	04/29/22 17:00	Lab Procedure		LLG
	Aggressivity								
Slime-Forming Bacteria	Med			CFU/mL	1	04/29/22 17:00	Lab Procedure		LLG
	Aggressivity								
Sulfate-Reducing Bacteria	Low			CFU/mL	1	04/29/22 17:00	Lab Procedure		LLG
	Aggressivity								
Cation/Anion Balance	-2.81								

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