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30 November 2021

Kevin Fredrickson  
Hilcorp  
382 Road 3100  
Aztec, NM 87410  
RE: Rule 609 Modified

Enclosed are the results of analyses for samples received by the laboratory on 11/08/21 12:50. The data to follow was performed, in whole or in part, by a subcontract laboratory with an additional report attached.

If you need any further assistance, please feel free to contact me.

Sincerely,

A handwritten signature in black ink that reads 'Debbie Zufelt'.

Debbie Zufelt  
Reports Manager

All accredited analytes contained in this report are denoted by an asterisk (\*). For a complete list of accredited analytes please do not hesitate to contact us via any of the contact information contained in this report. All of our certifications can be viewed at <http://greenanalytical.com/certifications/>

Green Analytical Laboratories is NELAP accredited through the Texas Commission on Environmental Quality. Accreditation applies to drinking water and non-potable water matrices for trace metals and a variety of inorganic parameters. Green Analytical Laboratories is also accredited through the Colorado Department of Public Health and Environment and EPA region 8 for trace metals, Cyanide, Fluoride, Nitrate, and Nitrite in drinking water. TNI Certificate Number: T104704514-21-12

Our affiliate laboratory, Cardinal Laboratories, is also NELAP accredited through the Texas Commission on Environmental Quality for a variety of organic constituents in drinking water, non-potable water and solid matrices. Cardinal is also accredited for regulated VOCs, TTHM, and HAA-5 in drinking water through the Colorado Department of Public Health and Environment and EPA region 8. TNI Certificate Number: T104704398-21-14



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Hilcorp  
382 Road 3100  
Aztec NM, 87410

Project: Rule 609 Modified  
Project Name / Number: [none]  
Project Manager: Kevin Fredrickson

**Reported:**  
11/30/21 14:19

#### ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received	Notes
Cinder Gulch SWD	2111132-01	Water	11/08/21 09:00	11/08/21 12:50	
Argenta Ute SWD	2111132-02	Water	11/08/21 11:00	11/08/21 12:50	
DCS SWD	2111132-03	Water	11/08/21 12:00	11/08/21 12:50	

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382 Road 3100  
Aztec NM, 87410

Project: Rule 609 Modified  
Project Name / Number: [none]  
Project Manager: Kevin Fredrickson

Reported:  
11/30/21 14:19

**Cinder Gulch SWD****211132-01 (Produced Water)**

Analyte	Result	RL	MDL	Units	Dilution	Analyzed	Method	Notes	Analyst
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**General Chemistry**

Alkalinity, Bicarbonate as CaCO <sub>3</sub> *	3740	10.0	4.53	mg/L	10	11/17/21 13:45	2320 B		VJW
Alkalinity, Carbonate as CaCO <sub>3</sub> *	160	10.0		mg/L	10	11/17/21 13:45	2320 B		VJW
Alkalinity, Hydroxide as CaCO <sub>3</sub> *	<10.0	10.0		mg/L	10	11/17/21 13:45	2320 B		VJW
Alkalinity, Total as CaCO <sub>3</sub> *	3900	10.0	4.53	mg/L	10	11/17/21 13:45	2320 B		VJW
Bromide	<10.0	10.0	3.09	mg/L	100	11/19/21 00:49	EPA300.0		JDA
Chloride*	688	100	4.22	mg/L	100	11/19/21 00:49	EPA300.0		JDA
Conductivity*	8600	1.00		umho/cm @ 25.0°C	1	11/09/21 13:30	2510 B		VJW
Fluoride*	<10.0	10.0	0.971	mg/L	100	11/19/21 00:49	EPA300.0		JDA
Nitrate/Nitrite as N*	<0.100	0.100	0.031	mg/L as N	5	11/10/21 09:32	EPA353.2		DTR
pH*	7.83			pH Units	1	11/09/21 13:30	EPA150.1		VJW
pH Temperature, degrees C	20.2			pH Units	1	11/09/21 13:30	EPA150.1		VJW
Phosphorus, Total	2.81	0.250	0.0819	mg P/L	5	11/15/21 14:37	EPA365.1		DTR
Total Dissolved Solids*	5590	20.0		mg/L	2	11/09/21 12:56	EPA160.1		VJW
Total Suspended Solids*	33.8	2.50		mg/L	1	11/09/21 16:50	2540 D		VJW
Sulfate*	41.1	100	15.2	mg/L	100	11/19/21 00:49	EPA300.0	Ja	JDA

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

Boron	<3.00	3.00	1.44	mg/L	10	11/16/21 17:01	EPA200.7		JDA
Calcium*	11.8	1.00	0.494	mg/L	10	11/16/21 17:01	EPA200.7		JDA
Iron*	8.00	0.500	0.167	mg/L	10	11/16/21 17:01	EPA200.7		JDA
Magnesium*	4.85	1.00	0.568	mg/L	10	11/16/21 17:01	EPA200.7		JDA
Potassium*	14.7	10.0	1.83	mg/L	10	11/16/21 17:01	EPA200.7		JDA
Sodium*	1990	10.0	3.22	mg/L	10	11/16/21 17:01	EPA200.7		JDA
Strontium*	3.41	1.00	0.095	mg/L	10	11/16/21 17:01	EPA200.7		JDA

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

Barium*	7.10	0.0500	0.0046	mg/L	100	11/12/21 13:29	EPA200.8		AES
Manganese*	0.232	0.0200	0.0012	mg/L	10	11/12/21 13:01	EPA200.8		AES
Selenium*	<0.0100	0.0100	0.0049	mg/L	10	11/12/21 13:01	EPA200.8		AES

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Hilcorp  
382 Road 3100  
Aztec NM, 87410

Project: Rule 609 Modified  
Project Name / Number: [none]  
Project Manager: Kevin Fredrickson

Reported:  
11/30/21 14:19

**Cinder Gulch SWD****211132-01 (Produced Water)**

Analyte	Result	RL	MDL	Units	Dilution	Analyzed	Method	Notes	Analyst
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**Subcontracted -- Cardinal Laboratories 101 East Marland Hobbs, NM 88240****Petroleum Hydrocarbons by GC FID**

GRO C6-C10*	23.7	1.00	0.295	mg/L	0.1	11/11/21 13:54	8015B		MS
DRO >C10-C28*	12.6	1.00	0.670	mg/L	0.1	11/11/21 13:54	8015B		MS
EXT DRO >C28-C36	5.75	1.00	0.670	mg/L	0.1	11/11/21 13:54	8015B		MS
Surrogate: 1-Chlorooctane			99.8 %	44.9-146		11/11/21 13:54	8015B		MS
Surrogate: 1-Chlorooctadecane			104 %	39.8-162		11/11/21 13:54	8015B		MS

**VOLATILES BY GC/MS**

Benzene*	2.53	0.250	0.044	mg/L	500	11/16/21 12:41	8260B		MS
Toluene*	5.26	0.250	0.033	mg/L	500	11/16/21 12:41	8260B		MS
Ethylbenzene*	0.165	0.250	0.044	mg/L	500	11/16/21 12:41	8260B	J	MS
m+p - Xylene*	1.47	0.500	0.233	mg/L	500	11/16/21 12:41	8260B		MS
o-Xylene*	0.371	0.250	0.033	mg/L	500	11/16/21 12:41	8260B		MS
Total Xylenes*	1.84	0.750	0.266	mg/L	500	11/16/21 12:41	8260B		MS
Naphthalene*	0.079	0.250	0.018	mg/L	500	11/16/21 12:41	8260B	J	MS
Surrogate: Dibromofluoromethane			101 %	82.4-141		11/16/21 12:41	8260B		MS
Surrogate: Toluene-d8			101 %	87.1-110		11/16/21 12:41	8260B		MS
Surrogate: 4-Bromofluorobenzene			96.4 %	76.4-114		11/16/21 12:41	8260B		MS

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Project Manager: Kevin Fredrickson

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**Argenta Ute SWD****211132-02 (Produced Water)**

Analyte	Result	RL	MDL	Units	Dilution	Analyzed	Method	Notes	Analyst
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**General Chemistry**

Alkalinity, Bicarbonate as CaCO <sub>3</sub> *	3400	10.0	4.53	mg/L	20	11/19/21 15:35	2320 B		VJW
Alkalinity, Carbonate as CaCO <sub>3</sub> *	280	10.0		mg/L	20	11/19/21 15:35	2320 B		VJW
Alkalinity, Hydroxide as CaCO <sub>3</sub> *	<10.0	10.0		mg/L	20	11/19/21 15:35	2320 B		VJW
Alkalinity, Total as CaCO <sub>3</sub> *	3680	10.0	4.53	mg/L	20	11/19/21 15:35	2320 B		VJW
Bromide	<2.00	2.00	0.618	mg/L	20	11/19/21 01:10	EPA300.0		JDA
Chloride*	<20.0	20.0	0.845	mg/L	20	11/19/21 01:10	EPA300.0		JDA
Conductivity*	1810	1.00		umho/cm @ 25.0°C	1	11/09/21 13:30	2510 B		VJW
Fluoride*	2.74	2.00	0.194	mg/L	20	11/19/21 01:10	EPA300.0		JDA
Nitrate/Nitrite as N*	<0.020	0.020	0.006	mg/L as N	1	11/10/21 09:33	EPA353.2		DTR
pH*	7.67			pH Units	1	11/09/21 13:30	EPA150.1		VJW
pH Temperature, degrees C	20.6			pH Units	1	11/09/21 13:30	EPA150.1		VJW
Phosphorus, Total	0.508	0.0500	0.0164	mg P/L	1	11/15/21 14:38	EPA365.1		DTR
Total Dissolved Solids*	1150	10.0		mg/L	1	11/09/21 12:58	EPA160.1		VJW
Total Suspended Solids*	41.0	2.50		mg/L	1	11/09/21 16:50	2540 D		VJW
Sulfate*	<3.05	20.0	3.05	mg/L	20	11/19/21 01:10	EPA300.0		JDA

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

Boron	<0.600	0.600	0.288	mg/L	2	11/16/21 17:04	EPA200.7		JDA
Calcium*	5.36	0.200	0.099	mg/L	2	11/16/21 17:04	EPA200.7		JDA
Iron*	8.74	0.100	0.033	mg/L	2	11/16/21 17:04	EPA200.7		JDA
Magnesium*	1.19	0.200	0.114	mg/L	2	11/16/21 17:04	EPA200.7		JDA
Potassium*	9.88	2.00	0.366	mg/L	2	11/16/21 17:03	EPA200.7		JDA
Sodium*	411	2.00	0.644	mg/L	2	11/16/21 17:03	EPA200.7		JDA
Strontium*	0.451	0.200	0.019	mg/L	2	11/16/21 17:03	EPA200.7		JDA

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

Barium*	0.797	0.0010	0.00009	mg/L	2	11/12/21 13:02	EPA200.8		AES
Manganese*	0.0685	0.0040	0.0002	mg/L	2	11/12/21 13:02	EPA200.8		AES
Selenium*	<0.0020	0.0020	0.0010	mg/L	2	11/12/21 13:02	EPA200.8		AES

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Project Manager: Kevin Fredrickson

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11/30/21 14:19

**Argenta Ute SWD****211132-02 (Produced Water)**

Analyte	Result	RL	MDL	Units	Dilution	Analyzed	Method	Notes	Analyst
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**Subcontracted -- Cardinal Laboratories 101 East Marland Hobbs, NM 88240****Petroleum Hydrocarbons by GC FID**

GRO C6-C10*	<1.00	1.00	0.295	mg/L	0.1	11/11/21 14:16	8015B		MS
DRO >C10-C28*	<1.00	1.00	0.670	mg/L	0.1	11/11/21 14:16	8015B		MS
EXT DRO >C28-C36	<1.00	1.00	0.670	mg/L	0.1	11/11/21 14:16	8015B		MS
Surrogate: 1-Chlorooctane			99.4 %	44.9-146		11/11/21 14:16	8015B		MS
Surrogate: 1-Chlorooctadecane			101 %	39.8-162		11/11/21 14:16	8015B		MS

**VOLATILES BY GC/MS**

Benzene*	0.020	0.0005	0.00009	mg/L	1	11/16/21 11:41	8260B		MS
Toluene*	0.015	0.0005	0.00007	mg/L	1	11/16/21 11:41	8260B		MS
Ethylbenzene*	0.004	0.0005	0.00009	mg/L	1	11/16/21 11:41	8260B		MS
m+p - Xylene*	0.011	0.001	0.0005	mg/L	1	11/16/21 11:41	8260B		MS
o-Xylene*	0.008	0.0005	0.00007	mg/L	1	11/16/21 11:41	8260B		MS
Total Xylenes*	0.019	0.002	0.0005	mg/L	1	11/16/21 11:41	8260B		MS
Naphthalene*	0.001	0.0005	0.00004	mg/L	1	11/16/21 11:41	8260B		MS
Surrogate: Dibromofluoromethane			101 %	82.4-141		11/16/21 11:41	8260B		MS
Surrogate: Toluene-d8			100 %	87.1-110		11/16/21 11:41	8260B		MS
Surrogate: 4-Bromofluorobenzene			100 %	76.4-114		11/16/21 11:41	8260B		MS

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382 Road 3100  
Aztec NM, 87410

Project: Rule 609 Modified  
Project Name / Number: [none]  
Project Manager: Kevin Fredrickson

Reported:  
11/30/21 14:19

**DCS SWD****211132-03 (Produced Water)**

Analyte	Result	RL	MDL	Units	Dilution	Analyzed	Method	Notes	Analyst
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**General Chemistry**

Alkalinity, Bicarbonate as CaCO <sub>3</sub> *	1120	10.0	4.53	mg/L	20	11/19/21 15:35	2320 B		VJW
Alkalinity, Carbonate as CaCO <sub>3</sub> *	<10.0	10.0		mg/L	20	11/19/21 15:35	2320 B		VJW
Alkalinity, Hydroxide as CaCO <sub>3</sub> *	<10.0	10.0		mg/L	20	11/19/21 15:35	2320 B		VJW
Alkalinity, Total as CaCO <sub>3</sub> *	1120	10.0	4.53	mg/L	20	11/19/21 15:35	2320 B		VJW
Bromide	<2.00	2.00	0.618	mg/L	20	11/19/21 01:30	EPA300.0		JDA
Chloride*	111	20.0	0.845	mg/L	20	11/19/21 01:30	EPA300.0		JDA
Conductivity*	2020	1.00		umho/cm @ 25.0°C	1	11/09/21 13:30	2510 B		VJW
Fluoride*	<2.00	2.00	0.194	mg/L	20	11/19/21 01:30	EPA300.0		JDA
Nitrate/Nitrite as N*	<0.020	0.020	0.006	mg/L as N	1	11/10/21 09:34	EPA353.2		DTR
pH*	7.84			pH Units	1	11/09/21 13:30	EPA150.1		VJW
pH Temperature, degrees C	21.9			pH Units	1	11/09/21 13:30	EPA150.1		VJW
Phosphorus, Total	0.453	0.0500	0.0164	mg P/L	1	11/15/21 14:38	EPA365.1		DTR
Total Dissolved Solids*	1280	10.0		mg/L	1	11/09/21 13:00	EPA160.1		VJW
Total Suspended Solids*	14.0	2.50		mg/L	1	11/09/21 16:50	2540 D		VJW
Sulfate*	<3.05	20.0	3.05	mg/L	20	11/19/21 01:30	EPA300.0		JDA

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

Boron	<0.600	0.600	0.288	mg/L	2	11/16/21 17:07	EPA200.7		JDA
Calcium*	4.62	0.200	0.099	mg/L	2	11/16/21 17:07	EPA200.7		JDA
Iron*	3.05	0.100	0.033	mg/L	2	11/16/21 17:07	EPA200.7		JDA
Magnesium*	0.801	0.200	0.114	mg/L	2	11/16/21 17:07	EPA200.7		JDA
Potassium*	4.74	2.00	0.366	mg/L	2	11/16/21 17:07	EPA200.7		JDA
Sodium*	444	2.00	0.644	mg/L	2	11/16/21 17:07	EPA200.7		JDA
Strontium*	0.612	0.200	0.019	mg/L	2	11/16/21 17:07	EPA200.7		JDA

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

Barium*	1.41	0.0100	0.0009	mg/L	20	11/12/21 13:30	EPA200.8		AES
Manganese*	0.0329	0.0040	0.0002	mg/L	2	11/12/21 13:04	EPA200.8		AES
Selenium*	<0.0020	0.0020	0.0010	mg/L	2	11/12/21 13:04	EPA200.8		AES

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Project Manager: Kevin Fredrickson

Reported:  
11/30/21 14:19

**DCS SWD****211132-03 (Produced Water)**

Analyte	Result	RL	MDL	Units	Dilution	Analyzed	Method	Notes	Analyst
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**Subcontracted -- Cardinal Laboratories 101 East Marland Hobbs, NM 88240****Petroleum Hydrocarbons by GC FID**

GRO C6-C10*	<1.00	1.00	0.295	mg/L	0.1	11/11/21 14:38	8015B		MS
DRO >C10-C28*	<1.00	1.00	0.670	mg/L	0.1	11/11/21 14:38	8015B		MS
EXT DRO >C28-C36	<1.00	1.00	0.670	mg/L	0.1	11/11/21 14:38	8015B		MS
Surrogate: 1-Chlorooctane			91.8 %	44.9-146		11/11/21 14:38	8015B		MS
Surrogate: 1-Chlorooctadecane			97.1 %	39.8-162		11/11/21 14:38	8015B		MS

**VOLATILES BY GC/MS**

Benzene*	<0.00009	0.0005	0.00009	mg/L	1	11/16/21 12:01	8260B		MS
Toluene*	0.002	0.0005	0.00007	mg/L	1	11/16/21 12:01	8260B		MS
Ethylbenzene*	<0.00009	0.0005	0.00009	mg/L	1	11/16/21 12:01	8260B		MS
m+p - Xylene*	0.001	0.001	0.0005	mg/L	1	11/16/21 12:01	8260B		MS
o-Xylene*	0.0006	0.0005	0.00007	mg/L	1	11/16/21 12:01	8260B		MS
Total Xylenes*	0.002	0.002	0.0005	mg/L	1	11/16/21 12:01	8260B		MS
Naphthalene*	<0.00004	0.0005	0.00004	mg/L	1	11/16/21 12:01	8260B		MS
Surrogate: Dibromofluoromethane			101 %	82.4-141		11/16/21 12:01	8260B		MS
Surrogate: Toluene-d8			98.6 %	87.1-110		11/16/21 12:01	8260B		MS
Surrogate: 4-Bromofluorobenzene			95.3 %	76.4-114		11/16/21 12:01	8260B		MS

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Project: Rule 609 Modified  
Project Name / Number: [none]  
Project Manager: Kevin Fredrickson

Reported:  
11/30/21 14:19

### General Chemistry - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
<b>Batch B212737 - Lachat</b>										
<b>Blank (B212737-BLK1)</b>				Prepared: 11/08/21 Analyzed: 11/10/21						
Nitrate/Nitrite as N	ND	0.020	mg/L as N							
<b>LCS (B212737-BS1)</b>				Prepared: 11/08/21 Analyzed: 11/10/21						
Nitrate/Nitrite as N	1.04	0.020	mg/L as N	1.00		104	90-110			
<b>LCS Dup (B212737-BSD1)</b>				Prepared: 11/08/21 Analyzed: 11/10/21						
Nitrate/Nitrite as N	1.04	0.020	mg/L as N	1.00		104	90-110	0.202	20	
<b>Batch B212745 - General Prep - Wet Chem</b>										
<b>Blank (B212745-BLK1)</b>				Prepared & Analyzed: 11/09/21						
Total Dissolved Solids	ND	10.0	mg/L							
<b>Duplicate (B212745-DUP1)</b>				Source: 2111080-01 Prepared & Analyzed: 11/09/21						
Total Dissolved Solids	2540	10.0	mg/L		2560			0.590	20	
<b>Reference (B212745-SRM1)</b>				Prepared & Analyzed: 11/09/21						
Total Dissolved Solids	390	10.0	mg/L	400		97.5	85-115			
<b>Batch B212747 - General Prep - Wet Chem</b>										
<b>Blank (B212747-BLK1)</b>				Prepared & Analyzed: 11/09/21						
Total Suspended Solids	ND	2.50	mg/L							
<b>Duplicate (B212747-DUP1)</b>				Source: 2111106-01 Prepared & Analyzed: 11/09/21						
Total Suspended Solids	123	2.50	mg/L		123			0.00	20	
<b>Reference (B212747-SRM1)</b>				Prepared & Analyzed: 11/09/21						
Total Suspended Solids	106	2.50	mg/L	100		106	85-115			
<b>Batch B212756 - General Prep - Wet Chem</b>										
<b>Duplicate (B212756-DUP1)</b>				Source: 2111132-01 Prepared & Analyzed: 11/09/21						
Conductivity	8600	1.00	umho/cm @ 25.0°C		8600			0.00	20	
<b>Reference (B212756-SRM1)</b>				Prepared & Analyzed: 11/09/21						
Conductivity	1050	1.00	umho/cm @ 25.0°C	1000		105	90-110			
<b>Batch B212757 - General Prep - Wet Chem</b>										

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382 Road 3100  
Aztec NM, 87410

Project: Rule 609 Modified  
Project Name / Number: [none]  
Project Manager: Kevin Fredrickson

Reported:  
11/30/21 14:19

**General Chemistry - Quality Control  
(Continued)**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch B212757 - General Prep - Wet Chem (Continued)**

<b>Duplicate (B212757-DUP1)</b>		<b>Source: 2111132-01</b>		Prepared & Analyzed: 11/09/21						
pH	7.92		pH Units		7.83			1.14	20	
pH Temperature, degrees C	20.6		pH Units		20.2			1.96	200	

<b>Reference (B212757-SRM1)</b>		Prepared & Analyzed: 11/09/21								
pH	6.98		pH Units	7.00		99.7	98.57-101.42			

**Batch B212780 - Lachat**

<b>Blank (B212780-BLK1)</b>		Prepared: 11/12/21 Analyzed: 11/15/21								
Phosphorus, Total	ND	0.0500	mg P/L							

<b>LCS (B212780-BS1)</b>		Prepared: 11/12/21 Analyzed: 11/15/21								
Phosphorus, Total	2.56	0.0500	mg P/L	2.50		102	90-110			

<b>LCS Dup (B212780-BSD1)</b>		Prepared: 11/12/21 Analyzed: 11/15/21								
Phosphorus, Total	2.58	0.0500	mg P/L	2.50		103	90-110	0.666	20	

**Batch B212811 - IC- Ion Chromatograph**

<b>Blank (B212811-BLK1)</b>		Prepared: 11/15/21 Analyzed: 11/18/21								
Bromide	ND	0.100	mg/L							
Chloride	ND	1.00	mg/L							
Fluoride	ND	0.100	mg/L							
Sulfate	ND	1.00	mg/L							

<b>LCS (B212811-BS1)</b>		Prepared: 11/15/21 Analyzed: 11/18/21								
Bromide	2.49	0.100	mg/L	2.50		99.6	90-110			
Chloride	24.1	1.00	mg/L	25.0		96.3	90-110			
Fluoride	2.38	0.100	mg/L	2.50		95.0	90-110			
Sulfate	23.2	1.00	mg/L	25.0		92.6	90-110			

<b>LCS Dup (B212811-BSD1)</b>		Prepared: 11/15/21 Analyzed: 11/18/21								
Bromide	2.55	0.100	mg/L	2.50		102	90-110	2.22	20	
Chloride	24.6	1.00	mg/L	25.0		98.4	90-110	2.21	20	
Fluoride	2.44	0.100	mg/L	2.50		97.7	90-110	2.74	20	
Sulfate	23.7	1.00	mg/L	25.0		94.9	90-110	2.49	20	

**Batch B212823 - General Prep - Wet Chem**

<b>Blank (B212823-BLK1)</b>		Prepared: 11/16/21 Analyzed: 11/17/21								
Alkalinity, Bicarbonate as CaCO <sub>3</sub>	ND	10.0	mg/L							
Alkalinity, Carbonate as CaCO <sub>3</sub>	ND	10.0	mg/L							
Alkalinity, Hydroxide as CaCO <sub>3</sub>	ND	10.0	mg/L							

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Project Name / Number: [none]  
Project Manager: Kevin Fredrickson

Reported:  
11/30/21 14:19

**General Chemistry - Quality Control  
(Continued)**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch B212823 - General Prep - Wet Chem (Continued)**

**Blank (B212823-BLK1) (Continued)**

Prepared: 11/16/21 Analyzed: 11/17/21

Alkalinity, Total as CaCO <sub>3</sub>	ND	10.0	mg/L						
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**LCS (B212823-BS1)**

Prepared: 11/16/21 Analyzed: 11/17/21

Alkalinity, Bicarbonate as CaCO <sub>3</sub>	104	10.0	mg/L	100		104	85-115		
Alkalinity, Carbonate as CaCO <sub>3</sub>	ND	10.0	mg/L				85-115		
Alkalinity, Hydroxide as CaCO <sub>3</sub>	ND	10.0	mg/L				85-115		
Alkalinity, Total as CaCO <sub>3</sub>	104	10.0	mg/L	100		104	85-115		

**LCS Dup (B212823-BSD1)**

Prepared: 11/16/21 Analyzed: 11/17/21

Alkalinity, Bicarbonate as CaCO <sub>3</sub>	102	10.0	mg/L	100		102	85-115	1.94	20
Alkalinity, Carbonate as CaCO <sub>3</sub>	ND	10.0	mg/L				85-115		20
Alkalinity, Hydroxide as CaCO <sub>3</sub>	ND	10.0	mg/L				85-115		20
Alkalinity, Total as CaCO <sub>3</sub>	102	10.0	mg/L	100		102	85-115	1.94	20

**Batch B212840 - General Prep - Wet Chem**

**Blank (B212840-BLK1)**

Prepared: 11/18/21 Analyzed: 11/19/21

Alkalinity, Bicarbonate as CaCO <sub>3</sub>	ND	10.0	mg/L						
Alkalinity, Carbonate as CaCO <sub>3</sub>	ND	10.0	mg/L						
Alkalinity, Hydroxide as CaCO <sub>3</sub>	ND	10.0	mg/L						
Alkalinity, Total as CaCO <sub>3</sub>	ND	10.0	mg/L						

**LCS (B212840-BS1)**

Prepared: 11/18/21 Analyzed: 11/19/21

Alkalinity, Bicarbonate as CaCO <sub>3</sub>	104	10.0	mg/L	100		104	85-115		
Alkalinity, Carbonate as CaCO <sub>3</sub>	ND	10.0	mg/L				85-115		
Alkalinity, Hydroxide as CaCO <sub>3</sub>	ND	10.0	mg/L				85-115		
Alkalinity, Total as CaCO <sub>3</sub>	104	10.0	mg/L	100		104	85-115		

**LCS Dup (B212840-BSD1)**

Prepared: 11/18/21 Analyzed: 11/19/21

Alkalinity, Bicarbonate as CaCO <sub>3</sub>	103	10.0	mg/L	100		103	85-115	0.966	20
Alkalinity, Carbonate as CaCO <sub>3</sub>	ND	10.0	mg/L				85-115		20
Alkalinity, Hydroxide as CaCO <sub>3</sub>	ND	10.0	mg/L				85-115		20
Alkalinity, Total as CaCO <sub>3</sub>	103	10.0	mg/L	100		103	85-115	0.966	20

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Project: Rule 609 Modified  
Project Name / Number: [none]  
Project Manager: Kevin Fredrickson

Reported:  
11/30/21 14:19

### Total Recoverable Metals by ICP (E200.7) - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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#### Batch B212767 - Total Rec. 200.7/200.8/200.2

##### Blank (B212767-BLK1)

Prepared: 11/11/21 Analyzed: 11/15/21

Boron	ND	0.300	mg/L
Calcium	ND	0.100	mg/L
Iron	ND	0.050	mg/L
Magnesium	ND	0.100	mg/L
Potassium	ND	1.00	mg/L
Sodium	ND	1.00	mg/L
Strontium	ND	0.100	mg/L

##### LCS (B212767-BS1)

Prepared: 11/11/21 Analyzed: 11/15/21

Boron	1.95	0.300	mg/L	2.00	97.3	85-115
Calcium	1.91	0.100	mg/L	2.00	95.7	85-115
Iron	1.88	0.050	mg/L	2.00	94.0	85-115
Magnesium	9.95	0.100	mg/L	10.0	99.5	85-115
Potassium	3.86	1.00	mg/L	4.00	96.4	85-115
Sodium	1.57	1.00	mg/L	1.62	96.7	85-115
Strontium	1.91	0.100	mg/L	2.00	95.6	85-115

##### LCS Dup (B212767-BSD1)

Prepared: 11/11/21 Analyzed: 11/15/21

Boron	1.91	0.300	mg/L	2.00	95.7	85-115	1.65	20
Calcium	1.87	0.100	mg/L	2.00	93.7	85-115	2.10	20
Iron	1.87	0.050	mg/L	2.00	93.7	85-115	0.376	20
Magnesium	9.72	0.100	mg/L	10.0	97.2	85-115	2.29	20
Potassium	3.90	1.00	mg/L	4.00	97.5	85-115	1.12	20
Sodium	1.51	1.00	mg/L	1.62	93.1	85-115	3.79	20
Strontium	1.93	0.100	mg/L	2.00	96.6	85-115	1.01	20

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Project Name / Number: [none]  
Project Manager: Kevin Fredrickson

Reported:  
11/30/21 14:19

### Total Recoverable Metals by ICPMS (E200.8) - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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#### Batch B212768 - Total Rec. 200.7/200.8/200.2

##### Blank (B212768-BLK1)

Prepared: 11/11/21 Analyzed: 11/12/21

Barium	ND	0.0005	mg/L							
Manganese	ND	0.0020	mg/L							
Selenium	ND	0.0010	mg/L							

##### LCS (B212768-BS1)

Prepared: 11/11/21 Analyzed: 11/12/21

Barium	0.0493	0.0005	mg/L	0.0500		98.6	85-115			
Manganese	0.0501	0.0020	mg/L	0.0500		100	85-115			
Selenium	0.251	0.0010	mg/L	0.250		100	85-115			

##### LCS Dup (B212768-BSD1)

Prepared: 11/11/21 Analyzed: 11/12/21

Barium	0.0494	0.0005	mg/L	0.0500		98.7	85-115	0.114	20	
Manganese	0.0504	0.0020	mg/L	0.0500		101	85-115	0.630	20	
Selenium	0.247	0.0010	mg/L	0.250		99.0	85-115	1.47	20	

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Project: Rule 609 Modified  
Project Name / Number: [none]  
Project Manager: Kevin Fredrickson

Reported:  
11/30/21 14:19

### Petroleum Hydrocarbons by GC FID - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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#### Batch 1111102 - General Prep - Organics

##### Blank (1111102-BLK1)

Prepared & Analyzed: 11/11/21

Surrogate: 1-Chlorooctadecane	3.72		mg/L	5.00		74.3	39.8-162			
Surrogate: 1-Chlorooctane	3.75		mg/L	5.00		75.0	44.9-146			
DRO >C10-C28	ND	1.00	mg/L							
EXT DRO >C28-C36	ND	1.00	mg/L							
GRO C6-C10	ND	1.00	mg/L							

##### LCS (1111102-BS1)

Prepared & Analyzed: 11/11/21

Surrogate: 1-Chlorooctadecane	4.25		mg/L	5.00		84.9	39.8-162			
Surrogate: 1-Chlorooctane	4.12		mg/L	5.00		82.3	44.9-146			
DRO >C10-C28	44.5	1.00	mg/L	50.0		88.9	70-121			
GRO C6-C10	44.4	1.00	mg/L	50.0		88.9	72.4-116			

##### LCS Dup (1111102-BSD1)

Prepared & Analyzed: 11/11/21

Surrogate: 1-Chlorooctadecane	3.99		mg/L	5.00		79.8	39.8-162			
Surrogate: 1-Chlorooctane	4.04		mg/L	5.00		80.8	44.9-146			
DRO >C10-C28	45.8	1.00	mg/L	50.0		91.5	70-121	2.89	24.8	
GRO C6-C10	45.5	1.00	mg/L	50.0		91.0	72.4-116	2.35	8.73	

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Project: Rule 609 Modified  
Project Name / Number: [none]  
Project Manager: Kevin Fredrickson

Reported:  
11/30/21 14:19

### VOLATILES BY GC/MS - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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#### Batch 1111515 - Volatiles

##### Blank (1111515-BLK1)

Prepared & Analyzed: 11/15/21

Surrogate: 4-Bromofluorobenzene	0.0232		mg/L	0.0250		92.9	76.4-114			
Benzene	ND	0.0005	mg/L							
Surrogate: Dibromofluoromethane	0.0256		mg/L	0.0250		103	82.4-141			
Ethylbenzene	ND	0.0005	mg/L							
m+p - Xylene	ND	0.001	mg/L							
Naphthalene	ND	0.0005	mg/L							
o-Xylene	ND	0.0005	mg/L							
Toluene	ND	0.0005	mg/L							
Surrogate: Toluene-d8	0.0254		mg/L	0.0250		102	87.1-110			
Total Xylenes	ND	0.002	mg/L							

##### LCS (1111515-BS1)

Prepared & Analyzed: 11/15/21

Surrogate: 4-Bromofluorobenzene	0.0256		mg/L	0.0250		103	76.4-114			
Benzene	0.021	0.0005	mg/L	0.0200		104	85.9-114			
Surrogate: Dibromofluoromethane	0.0254		mg/L	0.0250		102	82.4-141			
Ethylbenzene	0.021	0.0005	mg/L	0.0200		106	81.8-127			
m+p - Xylene	0.042	0.001	mg/L	0.0400		106	72.4-134			
Naphthalene	0.017	0.0005	mg/L	0.0200		82.9	59.3-140			
o-Xylene	0.020	0.0005	mg/L	0.0200		101	76.2-135			
Toluene	0.020	0.0005	mg/L	0.0200		102	78.8-121			
Surrogate: Toluene-d8	0.0254		mg/L	0.0250		102	87.1-110			
Total Xylenes	0.063	0.002	mg/L	0.0600		104	74.3-134			

##### LCS Dup (1111515-BS1)

Prepared & Analyzed: 11/15/21

Surrogate: 4-Bromofluorobenzene	0.0256		mg/L	0.0250		102	76.4-114			
Benzene	0.020	0.0005	mg/L	0.0200		102	85.9-114	1.80	4.16	
Surrogate: Dibromofluoromethane	0.0254		mg/L	0.0250		102	82.4-141			
Ethylbenzene	0.021	0.0005	mg/L	0.0200		106	81.8-127	0.0470	4.83	
m+p - Xylene	0.042	0.001	mg/L	0.0400		105	72.4-134	0.355	5.77	
Naphthalene	0.017	0.0005	mg/L	0.0200		85.7	59.3-140	3.32	33.5	
o-Xylene	0.021	0.0005	mg/L	0.0200		103	76.2-135	1.86	6.29	
Toluene	0.020	0.0005	mg/L	0.0200		102	78.8-121	0.246	5.67	
Surrogate: Toluene-d8	0.0258		mg/L	0.0250		103	87.1-110			
Total Xylenes	0.063	0.002	mg/L	0.0600		105	74.3-134	0.367	5.83	

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Aztec NM, 87410

Project: Rule 609 Modified  
Project Name / Number: [none]  
Project Manager: Kevin Fredrickson

Reported:  
11/30/21 14:19

### Notes and Definitions

Ja	Estimated concentration. Analyte concentration between MDL and RL.
J	Detected but below the Reporting Limit; therefore, result is an estimated concentration (CLP J-Flag).
DET	Analyte DETECTED
ND	Analyte NOT DETECTED at or above the reporting limit
NR	Not Reported
dry	Sample results reported on a dry weight basis *Results reported on as received basis unless designated as dry.
RPD	Relative Percent Difference
LCS	Laboratory Control Sample (Blank Spike)
RL	Report Limit
MDL	Method Detection Limit

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FORM-006  
COC - Revision 6.0

## CHAIN-OF-CUSTODY AND ANALYSIS REQUEST

[illegible]

## Deb Zufelt

**From:** Kevin Fredrickson <kfredrickson@hilcorp.com>  
**Sent:** Thursday, November 4, 2021 11:58 AM  
**To:** Deb Zufelt  
**Cc:** Clara Cardoza  
**Subject:** COGCC requirement on the water along with the BTEX

- (1) The water sample will be analyzed for the following:
- A. pH;
  - B. Specific conductance;
  - C. Total dissolved and suspended solids (TDS and TSS);
  - D. Alkalinity (total, bicarbonate, and carbonate as  $\text{CaCO}_3$ );
  - E. Major anions (bromide, chloride, fluoride, sulfate, nitrate and nitrite as N, and phosphorus);
  - F. Major cations (calcium, iron, magnesium, manganese, potassium, and sodium);
  - G. Other elements (barium, boron, selenium, and strontium);
  - H. Naphthalene;
  - I. Total petroleum hydrocarbons ("TPH") as total volatile hydrocarbons ( $\text{C}_6$  to  $\text{C}_{10}$ ) and total extractable hydrocarbons ( $\text{C}_{10}$  to  $\text{C}_{30}$ );
  - J. BTEX compounds (benzene, toluene, ethylbenzene, and xylenes); and

As of January 15, 2021

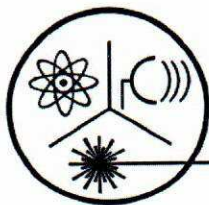
K. Radium ( $^{226}\text{Ra}$  and  $^{228}\text{Ra}$ ).

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## Radiation Safety Engineering, Inc.

3245 N. WASHINGTON ST. • CHANDLER, ARIZONA 85225-1121  
Website: [www.radsafe.com](http://www.radsafe.com)

(480) 897-9459  
FAX (480) 892-5446

### Radiochemical Activity in Water (pCi/L)

Green Analytical Laboratories  
75 Suttle St.  
Durango, CO 81303

Sampling Date: November 08, 2021  
Sample Received: November 15, 2021  
Analysis Completed: November 30, 2021

Sample ID	Radium 226 Activity Method GammaRay HPGE (pCi/L)	Radium 228 Activity Method GammaRay HPGE (pCi/L)	Total Radium (pCi/L)
2111-132-01	1.9 ± 0.2	< 0.6	1.9 ± 0.2

Date of Analysis	11/19/2021	11/19/2021	11/19/2021
------------------	------------	------------	------------

Alex Myers, Ph.D.

11/30/2021

Date

Laboratory License Number AZ0462

Arizona Department of Environmental Quality  
**Drinking Water Radionuclides-Adjusted Gross Alpha, Radium 226 & 228, Uranium Analysis Report**  
 \*\*\*Samples To Be Taken At Entry Point Into Distribution System (EPDS) Only\*\*\*

PWS ID#: AZ04 \_\_\_\_\_ PWS Name: \_\_\_\_\_

November 8, 2021 9:00 (24 hour clock) \_\_\_\_\_

Sample Date Sample Time Owner/Contact Person \_\_\_\_\_

Owner/Contact Fax Number \_\_\_\_\_ Owner/Contact Phone Number \_\_\_\_\_

Sample Collection Point

☐ EPDS # \_\_\_\_\_

**Compliance Sample Type:**

☐ Reduced Monitoring Date Q1 collected: \_\_\_\_\_  
☐ Quarterly Date Q2 collected: \_\_\_\_\_  
☐ Composite of four quarterly samples Date Q3 collected: \_\_\_\_\_  
 Date Q4 collected: \_\_\_\_\_

**\*\*\*RADIOCHEMICAL ANALYSIS\*\*\***

>>>To be filled out by laboratory personnel<<<

**\*\*\*Combined Uranium must be reported in micrograms per liter\*\*\***

Analysis Method	MCL	Reporting Limit	Contaminant Name	Cont. Code	Analyses Run Date	Result	Exceed MCL
	15 pCi/L		Adjusted Gross Alpha	4000	_____	_____	_____
600/00-02		3 pCi/L	Gross Alpha	4002	_____	_____	_____
7500 - Rn			Radon	4004	_____	_____	_____
ASTM D6239	30 µg/L	1 µg/L	Combined Uranium	4006	_____	_____ µg/L	_____
			Uranium 234	4007	_____	_____	_____
			Uranium 235	4008	_____	_____	_____
			Uranium 238	4009	_____	_____	_____
	5 pCi/L	1 pCi/L	Combined Radium (226,228)	4010	11/19/2021	1.9 ± 0.2	_____
GammaRay HPGE		1 pCi/L	Radium 226	4020	11/19/2021	1.9 ± 0.2	_____
GammaRay HPGE		1 pCi/L	Radium 228	4030	11/19/2021	< 0.6	_____

**\*\*\*LABORATORY INFORMATION\*\*\***

>>>To be filled out by laboratory personnel<<<

Specimen Number: RSE67758 \_\_\_\_\_

Lab ID Number: AZ0462 \_\_\_\_\_

Lab Name: Radiation Safety Engineering, Inc. \_\_\_\_\_

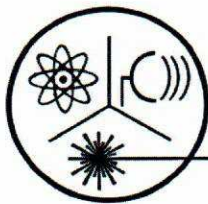
Printed Name and Phone Number of Laboratory Contact: Robert L. Metzger, Ph.D., C.H.P. (480) 897-9459 \_\_\_\_\_

Comments: 2111-132-01 \_\_\_\_\_

Authorized Signature:                      \_\_\_\_\_

Date Public Water System Notified: \_\_\_\_\_

DWAR 6: 11/2007



## Radiation Safety Engineering, Inc.

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Website: [www.radsafe.com](http://www.radsafe.com)

(480) 897-9459  
FAX (480) 892-5446

### Radiochemical Activity in Water (pCi/L)

Green Analytical Laboratories  
75 Suttle St.  
Durango, CO 81303

Sampling Date: November 08, 2021  
Sample Received: November 15, 2021  
Analysis Completed: November 30, 2021

Sample ID	Radium 226 Activity Method GammaRay HPGE (pCi/L)	Radium 228 Activity Method GammaRay HPGE (pCi/L)	Total Radium (pCi/L)
2111-132-02	< 0.4	< 0.6	< 0.6

Date of Analysis	11/19/2021	11/19/2021	11/19/2021
------------------	------------	------------	------------

Alex Myers, Ph.D.

11/30/2021

Date

Laboratory License Number AZ0462



Arizona Department of Environmental Quality  
**Drinking Water Radionuclides-Adjusted Gross Alpha, Radium 226 & 228, Uranium Analysis Report**  
\*\*\*Samples To Be Taken At Entry Point Into Distribution System (EPDS) Only\*\*\*

PWS ID#: AZ04 \_\_\_\_\_

PWS Name: \_\_\_\_\_

November 8, 2021 11:00 (24 hour clock)

Sample Date Sample Time

Owner/Contact Person

Owner/Contact Fax Number

Owner/Contact Phone Number

Sample Collection Point

☐ EPDS # \_\_\_\_\_

**Compliance Sample Type:**

- ☐ Reduced Monitoring
- ☐ Quarterly
- ☐ Composite of four quarterly samples

Date Q1 collected: \_\_\_\_\_

Date Q2 collected: \_\_\_\_\_

Date Q3 collected: \_\_\_\_\_

Date Q4 collected: \_\_\_\_\_

**\*\*\*RADIOCHEMICAL ANALYSIS\*\*\***

>>>To be filled out by laboratory personnel<<<

**\*\*\*Combined Uranium must be reported in micrograms per liter\*\*\***

Analysis Method	MCL	Reporting Limit	Contaminant Name	Cont. Code	Analyses Run Date	Result	Exceed MCL
	15 pCi/L		Adjusted Gross Alpha	4000			
600/00-02		3 pCi/L	Gross Alpha	4002			
7500 - Rn			Radon	4004			
ASTM D6239	30 µg/L	1 µg/L	Combined Uranium	4006		µg/L	
			Uranium 234	4007			
			Uranium 235	4008			
			Uranium 238	4009			
	5 pCi/L	1 pCi/L	Combined Radium (226,228)	4010	11/19/2021	< 0.6	
GammaRay HPGE		1 pCi/L	Radium 226	4020	11/19/2021	< 0.4	
GammaRay HPGE		1 pCi/L	Radium 228	4030	11/19/2021	< 0.6	

**\*\*\*LABORATORY INFORMATION\*\*\***

>>>To be filled out by laboratory personnel<<<

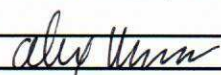
Specimen Number: RSE67759

Lab ID Number: AZ0462

Lab Name: Radiation Safety Engineering, Inc.

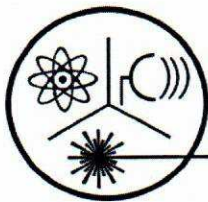
Printed Name and Phone Number of Laboratory Contact: Robert L. Metzger, Ph.D., C.H.P. (480) 897-9459

Comments: 2111-132-02

Authorized Signature: 

Date Public Water System Notified: \_\_\_\_\_

DWAR 6: 11/2007



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Website: [www.radsafe.com](http://www.radsafe.com)

(480) 897-9459  
FAX (480) 892-5446

### Radiochemical Activity in Water (pCi/L)

Green Analytical Laboratories  
75 Suttle St.  
Durango, CO 81303

Sampling Date: November 08, 2021  
Sample Received: November 15, 2021  
Analysis Completed: November 30, 2021

Sample ID	Radium 226 Activity Method GammaRay HPGE (pCi/L)	Radium 228 Activity Method GammaRay HPGE (pCi/L)	Total Radium (pCi/L)
2111-132-03	< 0.4	< 0.6	< 0.6

Date of Analysis	11/19/2021	11/19/2021	11/19/2021
------------------	------------	------------	------------

Alex Myers, Ph.D.

11/30/2021

Date

Laboratory License Number AZ0462



Arizona Department of Environmental Quality  
**Drinking Water Radionuclides-Adjusted Gross Alpha, Radium 226 & 228, Uranium Analysis Report**  
\*\*\*Samples To Be Taken At Entry Point Into Distribution System (EPDS) Only\*\*\*

PWS ID#: AZ04 \_\_\_\_\_

PWS Name: \_\_\_\_\_

November 8, 2021 12:00 (24 hour clock)

Sample Date Sample Time

Owner/Contact Person

Owner/Contact Fax Number

Owner/Contact Phone Number

Sample Collection Point

☐ EPDS # \_\_\_\_\_

**Compliance Sample Type:**

☐ Reduced Monitoring

Date Q1 collected: \_\_\_\_\_

☐ Quarterly

Date Q2 collected: \_\_\_\_\_

☐ Composite of four quarterly samples

Date Q3 collected: \_\_\_\_\_

Date Q4 collected: \_\_\_\_\_

**\*\*\*RADIOCHEMICAL ANALYSIS\*\*\***

>>>To be filled out by laboratory personnel<<<

**\*\*\*Combined Uranium must be reported in micrograms per liter\*\*\***

Analysis Method	MCL	Reporting Limit	Contaminant Name	Cont. Code	Analyses Run Date	Result	Exceed MCL
	15 pCi/L		Adjusted Gross Alpha	4000			
600/00-02		3 pCi/L	Gross Alpha	4002			
7500 - Rn			Radon	4004			
ASTM D6239	30 µg/L	1 µg/L	Combined Uranium	4006		µg/L	
			Uranium 234	4007			
			Uranium 235	4008			
			Uranium 238	4009			
	5 pCi/L	1 pCi/L	Combined Radium (226,228)	4010	11/19/2021	< 0.6	
GammaRay HPGE		1 pCi/L	Radium 226	4020	11/19/2021	< 0.4	
GammaRay HPGE		1 pCi/L	Radium 228	4030	11/19/2021	< 0.6	

**\*\*\*LABORATORY INFORMATION\*\*\***

>>>To be filled out by laboratory personnel<<<

Specimen Number: RSE67760

Lab ID Number: AZ0462

Lab Name: Radiation Safety Engineering, Inc.

Printed Name and Phone Number of Laboratory Contact: Robert L. Metzger, Ph.D., C.H.P. (480) 897-9459

Comments: 2111-132-03

Authorized Signature: 

Date Public Water System Notified: \_\_\_\_\_

DWAR 6: 11/2007





## CHAIN-OF-CUSTODY AND ANALYSIS REQUEST

(970) 247-4220

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[illegible]