



Hazen Research, Inc.
4601 Indiana Street
Golden, CO 80403 USA
Tel: (303) 279-4501
Fax: (303) 278-1528

Lab Control ID: 22M02921

Received: Oct 06, 2022

Reported: Oct 14, 2022

Purchase Order No.

None Received

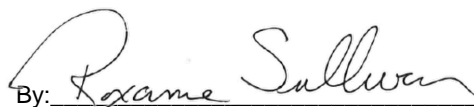
Customer ID: 20040H

Account ID: Z01034

Stuart Nielson
Colorado Analytical Laboratories, Inc.
10411 Heinz Way
Commerce City, CO 80640

ANALYTICAL REPORT

*Report may only be copied in its entirety.
Results reported herein relate only to discrete samples
submitted by the client. Hazen Research, Inc. does not warrant
that the results are representative of anything other than the
samples that were received in the laboratory*

By: 

Roxanne Sullivan
Analytical Laboratories Director

Customer ID: 20040H
 Account ID: Z01034

ANALYTICAL REPORT

Stuart Nielson
 Colorado Analytical Laboratories, Inc.

Lab Sample ID			22M02921-001					
Customer Sample ID			221005131-01 - SR-07 sampled on 10/04/22 @ 0900					
Parameter	Units	Code	Result	Precision* +/-	Detection Limit	Method	Analysis Date / Time	Analyst
Gross Alpha	pCi/L	T	1.6	1.7	0.1	SM 7110 B	10/9/22 @ 1341	AS
Gross Beta	pCi/L	T	<2.5	2.1	2.5	SM 7110 B	10/9/22 @ 1341	AS
Radium-226	pCi/L	T	NR	-	-	SM 7500-Ra B	-	-
Radium-228	pCi/L	T	NR	-	-	EPA Ra-05	-	-

Certification ID's: CO/EPA CO00008

*Variability of the radioactive decay process (counting error) at the 95% confidence level, 1.96 sigma.

Codes: (T) = Total (D) = Dissolved (S) = Suspended (R) = Total Residual (AR) = As Received < = Less Than



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ANALYTICAL REPORT

Stuart Nielson
 Colorado Analytical Laboratories, Inc.

Lab Sample ID			22M02921-002					
Customer Sample ID			221005131-01A - SR-07 sampled on 10/04/22 @ 0900					
Parameter	Units	Code	Result	Precision* +/-	Detection Limit	Method	Analysis Date / Time	Analyst
Gross Alpha	pCi/L	T	NR	-	-	SM 7110 B	-	-
Gross Beta	pCi/L	T	NR	-	-	SM 7110 B	-	-
Radium-226	pCi/L	T	0.3	0.2	0.2	SM 7500-Ra B	10/9/22 @ 1413	AS
Radium-228	pCi/L	T	1.5	0.8	0.2	EPA Ra-05	10/10/22 @ 0810	JR

Certification ID's: CO/EPA CO00008

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Codes: (T) = Total (D) = Dissolved (S) = Suspended (R) = Total Residual (AR) = As Received < = Less Than

Customer ID: 20040H
 Account ID: Z01034

ANALYTICAL REPORT

Stuart Nielson
 Colorado Analytical Laboratories, Inc.

Lab Sample ID			22M02921-003					
Customer Sample ID			221005131-02 - SR-05 sampled on 10/04/22 @ 1145					
Parameter	Units	Code	Result	Precision* +/-	Detection Limit	Method	Analysis Date / Time	Analyst
Gross Alpha	pCi/L	T	2.3	1.9	0.1	SM 7110 B	10/9/22 @ 1342	AS
Gross Beta	pCi/L	T	<2.6	2.2	2.6	SM 7110 B	10/9/22 @ 1342	AS
Radium-226	pCi/L	T	NR	-	-	SM 7500-Ra B	-	-
Radium-228	pCi/L	T	NR	-	-	EPA Ra-05	-	-

Certification ID's: CO/EPA CO00008

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ANALYTICAL REPORT

Stuart Nielson
 Colorado Analytical Laboratories, Inc.

Lab Sample ID			22M02921-004					
Customer Sample ID			221005131-02A - SR-05 sampled on 10/04/22 @ 1145					
Parameter	Units	Code	Result	Precision* +/-	Detection Limit	Method	Analysis Date / Time	Analyst
Gross Alpha	pCi/L	T	NR	-	-	SM 7110 B	-	-
Gross Beta	pCi/L	T	NR	-	-	SM 7110 B	-	-
Radium-226	pCi/L	T	0.2	0.2	0.2	SM 7500-Ra B	10/9/22 @ 1415	AS
Radium-228	pCi/L	T	2.2	0.8	0.2	EPA Ra-05	10/10/22 @ 0816	JR

Certification ID's: CO/EPA CO00008

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Codes: (T) = Total (D) = Dissolved (S) = Suspended (R) = Total Residual (AR) = As Received < = Less Than

Batch QC Summary Form

Analyte: Gross Alpha

Control Standard/LFB: ID: C-11a_001 pCi/mL: 57.4 (use 1 diluted)

Spike Solution: ID: C-11a_001 pCi/mL: 57.4 (use 1 mL)

Spike Recovery Calculation: Sample: Tap*

$$\text{Calculation: } \frac{(44.4) (1.000) - (1.6) (0.200)}{57.4} \times 100 = 77\%$$

Batch QC Evaluation:

Parameter	Criteria	Pass	Fail	N/A
Control Std./LFB	+/- 30 %	x		
Spike Recovery	70 - 130 %	x		
Blank	< or = 3 x Uncertainty	x		
Duplicate 1	95% confidence interval overlap	x		
Duplicate 2 *	95% confidence interval overlap	x		

* Required for batch size greater than 10 samples.

Conclusions:

 x Batch QC Passes**
 Batch QC Fails
 Batch QC Passes, with exceptions**:

Reruns Required: _____

Narrative:

**All QC data provided in this section of the report met the acceptance criteria specified in the analytical methods and procedures. State Maximum Contamination Levels (MCLs) are not evaluated in this report.

Batch Listing by Lab Control Number:

<u>22M02841</u>	<u>22M02871</u>
<u>22M02842</u>	<u>22M02873</u>
<u>22M02846</u>	<u>22M02874</u>
<u>22M02860</u>	_____
<u>22M02864</u>	_____
<u>22M02865</u>	_____
<u>22M02867</u>	_____
<u>22M02880</u>	_____
<u>22M02921</u>	_____
<u>22M02868</u>	_____

Evaluator:

Rosanne Sullivan _____

10/11/2022

Date

Batch QC Summary Form

Analyte: Gross Beta

Control Standard/LFB: ID: C-11a_001 pCi/mL: 44 (use 1 diluted)

Spike Solution: ID: C-11a_001 pCi/mL: 44 (use 1 mL)

Spike Recovery Calculation: Sample: Tap*

$$\text{Calculation: } \frac{(39.9) - (1.000) - (1.9) - (0.200)}{44} \times 100 = 90\%$$

Batch QC Evaluation:

Parameter	Criteria	Pass	Fail	N/A
Control Std./LFB	+/- 20 %	x		
Spike Recovery	80 - 120 %	x		
Blank	< or = 3 x Uncertainty	x		
Duplicate 1	95% confidence interval overlap	x		
Duplicate 2 *	95% confidence interval overlap	x		

* Required for batch size greater than 10 samples.

Conclusions:

 x Batch QC Passes**
 Batch QC Fails
 Batch QC Passes, with exceptions**:

Reruns Required: _____

Narrative:

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Batch Listing by Lab Control Number:

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<u>22M02846</u>	<u>22M02874</u>
<u>22M02860</u>	_____
<u>22M02864</u>	_____
<u>22M02865</u>	_____
<u>22M02867</u>	_____
<u>22M02880</u>	_____
<u>22M02921</u>	_____
<u>22M02868</u>	_____

Evaluator:

Rosanne Sullivan _____

10/11/2022

Date

Batch QC Summary Form

Analyte: Radium-226

Control Standard/LFB: ID: C-1_002 pCi/mL: 23 (use 2 diluted)

Spike Solution: ID: C-1_002 pCi/mL: 23 (use 2 mL)

Spike Recovery Calculation: Sample: 22M02869-1a

$$\text{Calculation: } \frac{(58.8) - (0.800)}{46} - \frac{(3.7) - (0.800)}{46} \times 100 = 96\%$$

Batch QC Evaluation:

Parameter	Criteria	Pass	Fail	N/A
Control Std./LFB	+/- 20 %	x		
Spike Recovery	80 - 120 %	x		
Blank	< or = 3 x Uncertainty	x		
Duplicate 1	95% confidence interval overlap	x		
Duplicate 2 *	95% confidence interval overlap			xx

* Required for batch size greater than 10 samples.

Conclusions:

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 Batch QC Fails
 Batch QC Passes, with exceptions**:

Reruns Required: _____

Narrative:

**All QC data provided in this section of the report met the acceptance criteria specified in the analytical methods and procedures. State Maximum Contamination Levels (MCLs) are not evaluated in this report.

Batch Listing by Lab Control Number:

22M02869 _____
22M02873 _____
22M02921 _____
22M02867 _____
22M02874 _____
22M02875 _____
22M02886 _____
22M02891 _____

Evaluator:

Michelle Stringer _____

10/12/2022

Date

Batch QC Summary Form

Analyte: Radium-228

Control Standard/LFB: ID: C6-003 pCi/mL: 12.9 (use 5 diluted)

Spike Solution: ID: C6-003 pCi/mL: 12.9 (use 5 mL)

Spike Recovery Calculation: Sample: 22M02921-2d

$$\text{Calculation: } \frac{(66.0) (1.000) - (1.5) (1.000)}{64.5} \times 100 = 100\%$$

Batch QC Evaluation:

Parameter	Criteria	Pass	Fail	N/A
Control Std./LFB	+/- 20 %	x		
Spike Recovery	80 - 120 %	x		
Blank	< or = 3 x Uncertainty	x		
Duplicate 1	95% confidence interval overlap	x		
Duplicate 2 *	95% confidence interval overlap			x

* Required for batch size greater than 10 samples.

Conclusions:

 x Batch QC Passes**
 Batch QC Fails
 Batch QC Passes, with exceptions**:

Reruns Required: _____

Narrative:

**All QC data provided in this section of the report met the acceptance criteria specified in the analytical methods and procedures. State Maximum Contamination Levels (MCLs) are not evaluated in this report.

Batch Listing by Lab Control Number:

22M02874 _____
22M02875 _____
22M02886 _____
22M02892 _____
22M02893 _____
22M02894 _____
22M02921 _____

Evaluator:

Michelle Stringer _____

10/13/2022

Date



LABORATORIES, INC.

Ship To: Hazen-Research

Preserved: Y (N)

HNO3 Lot #: N/A

Date Preserved: N/A

22M02921

Report To Information Company Name: <u>Colorado Analytical Laboratory</u> Report To: <u>Stuart Nielson</u> E-Mail: <u>stuartnielson@coloradolab.com</u>	Bill To Information (if different from report to) Address: <u>10411 Heinz Way</u> <u>Commerce City, CO 80640</u> Phone: <u>303-659-2313</u>	Project Name Compliance Samples: Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Submit Data to CDPHE: Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
Address: <u>10411 Heinz Way</u> <u>Commerce City, CO 80640</u> Phone: <u>303-659-2313</u>		CAL TASK <u>221005131</u> <u>JML</u>

Tests Requested

Radium 228 (Sub)
 Gross Alpha/Beta (Sub)
 Radium 226 (Sub)

Sample Date/Time	Sample ID	Matrix
10/4/22 9:00 AM	221005131-01 - SR-07	Water - Drinking
10/4/22 9:00 AM	221005131-01A - SR-07	Water - Drinking
10/4/22 11:45 AM	221005131-02 - SR-05	Water - Drinking
10/4/22 11:45 AM	221005131-02A - SR-05	Water - Drinking

Comment: 221005131-01 - 10 DAY RUSH PLEASE FOR ALL ANALYSIS. (01, 01A, 02 & 02A)

Tests Requested	10/4/22	10/6/22	10/16/22	10/27/22
Radium 228 (Sub)				
Gross Alpha/Beta (Sub)	X	X	X	X
Radium 226 (Sub)	X	X	X	X

Container Type	10/4/22	10/6/22	10/16/22	10/27/22
1L - Unpreserved				
4 - 1L - Unpreserved				
1L - Unpreserved				
4 - 1L - Unpreserved				

Missing one of the bottles KT 10/27/22

Fedex: 6046 8204 2645
 PHV: 16 hours KT to 10/7/22 1445
 pres'd: (AOT) 10/6/22 1615 LR per ACS

Relinquished by: <u>Adama</u>	Date: <u>10/6/22</u>	Time: <u>1000</u>
Relinquished by: (Signature)	Date: _____	Time: _____
Relinquished by: _____	Date: _____	Time: _____
Relinquished by: <u>Joe Riddle</u>	Date: <u>10/6/22</u>	Time: <u>1600</u>
Relinquished by: (Signature)	Date: _____	Time: _____