



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

Lab Control ID: 22M02357

Received: Jul 19, 2022

Reported: Aug 09, 2022

Purchase Order No.

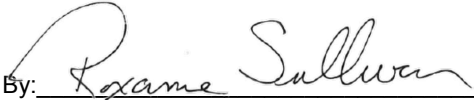
None Received

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*

By:   
Roxanne Sullivan  
Analytical Laboratories Director

Customer ID: 20040H

Account ID: Z01034

**ANALYTICAL REPORT**

Stuart Nielson  
 Colorado Analytical Laboratories, Inc.

|                           |              |             |  |                           |                            |               |                                 |                |
|---------------------------|--------------|-------------|--|---------------------------|----------------------------|---------------|---------------------------------|----------------|
| <b>Lab Sample ID</b>      |              |             | 22M02357-001                                       |                           |                            |               |                                 |                |
| <b>Customer Sample ID</b> |              |             | 220719018-01 - SR-07<br>sampled on 07/18/22 @ 1000 |                           |                            |               |                                 |                |
| <b>Parameter</b>          | <b>Units</b> | <b>Code</b> | <b>Result</b>                                      | <b>Precision*<br/>+/-</b> | <b>Detection<br/>Limit</b> | <b>Method</b> | <b>Analysis<br/>Date / Time</b> | <b>Analyst</b> |
| Gross Alpha               | pCi/L        | T           | 0.6  | 1.4                       | 0.1                        | SM 7110 B     | 7/30/22 @ 1717                  | AS             |
| Gross Beta                | pCi/L        | T           | <2.7   | 2.3                       | 2.7                        | SM 7110 B     | 7/30/22 @ 1717                  | AS             |
| Radium-226                | pCi/L        | T           | NR   | -                         | -                          | SM 7500-Ra B  | -                               | -              |
| Radium-228                | pCi/L        | T           | NR   | -                         | -                          | EPA Ra-05     | -                               | -              |

NR - Not Requested - Analysis not requested on this sample.

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

Customer ID: 20040H

Account ID: Z01034

**ANALYTICAL REPORT**

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 Colorado Analytical Laboratories, Inc.

|                           |              |             |   |                           |                            |               |                                 |                |
|---------------------------|--------------|-------------|---|---------------------------|----------------------------|---------------|---------------------------------|----------------|
| <b>Lab Sample ID</b>      |              |             | 22M02357-002  |                           |                            |               |                                 |                |
| <b>Customer Sample ID</b> |              |             | 220719018-01A - SR-07<br>sampled on 07/18/22 @ 1000 |                           |                            |               |                                 |                |
| <b>Parameter</b>          | <b>Units</b> | <b>Code</b> | <b>Result</b>                                       | <b>Precision*<br/>+/-</b> | <b>Detection<br/>Limit</b> | <b>Method</b> | <b>Analysis<br/>Date / Time</b> | <b>Analyst</b> |
| 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  | 0.1                       | 0.2                        | SM 7500-Ra B  | 7/28/22 @ 1310                  | KT             |
| Radium-228                | pCi/L        | T           | 1.7   | 0.7                       | 0.2                        | EPA Ra-05     | 7/27/22 @ 1003                  | JR             |

NR - Not Requested - Analysis not requested on this sample.

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

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|                           |              |             |  |                           |                            |               |                                 |                |
|---------------------------|--------------|-------------|--|---------------------------|----------------------------|---------------|---------------------------------|----------------|
| <b>Lab Sample ID</b>      |              |             | 22M02357-003                                       |                           |                            |               |                                 |                |
| <b>Customer Sample ID</b> |              |             | 220719018-02 - SR-05<br>sampled on 07/18/22 @ 1305 |                           |                            |               |                                 |                |
| <b>Parameter</b>          | <b>Units</b> | <b>Code</b> | <b>Result</b>                                      | <b>Precision*<br/>+/-</b> | <b>Detection<br/>Limit</b> | <b>Method</b> | <b>Analysis<br/>Date / Time</b> | <b>Analyst</b> |
| Gross Alpha               | pCi/L        | T           | <0.1   | 1.1                       | 0.1                        | SM 7110 B     | 7/30/22 @ 1718                  | AS             |
| Gross Beta                | pCi/L        | T           | <2.8   | 2.4                       | 2.8                        | SM 7110 B     | 7/30/22 @ 1718                  | AS             |
| Radium-226                | pCi/L        | T           | NR   | -                         | -                          | SM 7500-Ra B  | -                               | -              |
| Radium-228                | pCi/L        | T           | NR   | -                         | -                          | EPA Ra-05     | -                               | -              |

NR - Not Requested - Analysis not requested on this sample.

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

Customer ID: 20040H

Account ID: Z01034

**ANALYTICAL REPORT**

Stuart Nielson  
 Colorado Analytical Laboratories, Inc.

|                           |              |             |   |                           |                            |               |                                 |                |
|---------------------------|--------------|-------------|---|---------------------------|----------------------------|---------------|---------------------------------|----------------|
| <b>Lab Sample ID</b>      |              |             | 22M02357-004  |                           |                            |               |                                 |                |
| <b>Customer Sample ID</b> |              |             | 220719018-02A - SR-05<br>sampled on 07/18/22 @ 1305 |                           |                            |               |                                 |                |
| <b>Parameter</b>          | <b>Units</b> | <b>Code</b> | <b>Result</b>                                       | <b>Precision*<br/>+/-</b> | <b>Detection<br/>Limit</b> | <b>Method</b> | <b>Analysis<br/>Date / Time</b> | <b>Analyst</b> |
| 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  | 7/28/22 @ 1315                  | KT             |
| Radium-228                | pCi/L        | T           | 1.5   | 0.7                       | 0.2                        | EPA Ra-05     | 7/27/22 @ 1006                  | JR             |

NR - Not Requested - Analysis not requested on this sample.

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

**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\*

$$\text{Calculation: } \frac{(45.5) - (1.000) - (0.9) - (0.200)}{57.4} \times 100 = 79\%$$

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>22M02312</u> | <u>22M02373</u> |
| <u>22M02352</u> | <u>22M02374</u> |
| <u>22M02387</u> | <u>22M02375</u> |
| <u>22M02388</u> | <u>22M02385</u> |
| <u>22M02357</u> | _____           |
| <u>22M02390</u> | _____           |
| <u>22M02367</u> | _____           |
| <u>22M02368</u> | _____           |
| <u>22M02369</u> | _____           |
| <u>22M02372</u> | _____           |

Evaluator:

*Roxanne Sullivan* \_\_\_\_\_

08/03/2022

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\*

$$\text{Calculation: } \frac{(39.8) (1.000) - (0.2) (0.200)}{44} \times 100 = 90\%$$

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:

\*\*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>22M02312</u> | <u>22M02373</u> |
| <u>22M02352</u> | <u>22M02374</u> |
| <u>22M02387</u> | <u>22M02375</u> |
| <u>22M02388</u> | <u>22M02385</u> |
| <u>22M02357</u> | _____           |
| <u>22M02390</u> | _____           |
| <u>22M02367</u> | _____           |
| <u>22M02368</u> | _____           |
| <u>22M02369</u> | _____           |
| <u>22M02372</u> | _____           |

Evaluator:

*Rosanne Sullivan* \_\_\_\_\_

08/03/2022

Date

**Batch QC Summary Form**

Analyte: Radium-226

Control Standard/LFB: ID: C1-002 pCi/mL: 23 (use 2 diluted)

Spike Solution: ID: C1-002 pCi/mL: 23 (use 2 mL)

Spike Recovery Calculation: Sample: 22M02369-02c

$$\text{Calculation: } \frac{(43.6) (1.000) - (0.0) (1.000)}{46} \times 100 = 95\%$$

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:

|                 |                 |
|-----------------|-----------------|
| <u>22M02344</u> | <u>22M02376</u> |
| <u>22M02345</u> | <u>22M02383</u> |
| <u>22M02356</u> | <u>22M02384</u> |
| <u>22M02357</u> | <u>22M02385</u> |
| <u>22M02367</u> | <u>22M02410</u> |
| <u>22M02368</u> | <u>22M02411</u> |
| <u>22M02369</u> | <u>22M02412</u> |
| <u>22M02373</u> | <u>22M02413</u> |
| <u>22M02374</u> | _____           |
| <u>22M02375</u> | _____           |

Evaluator:

 \_\_\_\_\_

08/04/2022

Date



**Batch QC Summary Form**

Analyte: Radium-228

Control Standard/LFB: ID: C6-003 pCi/mL: 13.2 (use 5 diluted)

Spike Solution: ID: C6-003 pCi/mL: 13.2 (use 5 mL)

Spike Recovery Calculation: Sample: 22M02357-4d

$$\text{Calculation: } \frac{(67.0) (1.000) - (1.5) (1.000)}{66} \times 100 = 99\%$$

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:

22M02342 \_\_\_\_\_  
22M02344 \_\_\_\_\_  
22M02345 \_\_\_\_\_  
22M02356 \_\_\_\_\_  
22M02357 \_\_\_\_\_  
22M02367 \_\_\_\_\_  
22M02368 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

Evaluator:  
 \_\_\_\_\_



Ship To: Hazen Research  
 Preserved: Y (N)  
 HNO3 Lot #: N/A  
 Date Preserved: N/A

22 M02357

|  |   |                                     |  |
|--|---|-------------------------------------|--|
| <b>Report To Information</b><br>Company Name: Colorado Analytical Laboratory<br>Report To: Stuart Nielson<br>E-Mail: stuartnielson@coloradolab.com<br>Address:<br>10411 Heinz Way<br>Commerce City, CO. 80640<br>Phone: 303-655-2313 | <b>Bill To Information (if different from report to)</b><br>Project Name: | <b>CAL TASK</b><br>220719018<br>EMN | Compliance Samples: Yes <input type="checkbox"/> No <input checked="" type="checkbox"/><br>Submit Data to CDPHE: Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> |
|--|---|-------------------------------------|--|

**Tests Requested**

| Sample Date/Time | Sample ID             | Matrix           | Radium 228 (Sub) | Gross Alpha/Beta (Sub) | Radium 226 (Sub) | Container Type       |
|------------------|-----------------------|------------------|------------------|------------------------|------------------|----------------------|
| 7/18/22 10:54 AM | 220719018-01 - SR-07  | Water - Drinking | X                | X                      | X                | 1L - Unpreserved     |
| 7/18/22 10:54 AM | 220719018-01A - SR-07 | Water - Drinking | X                | X                      | X                | 4 - 1L - Unpreserved |
| 7/18/22 10:54 AM | 220719018-02 - SR-05  | Water - Drinking | X                | X                      | X                | 1L - Unpreserved     |
| 7/18/22 10:54 AM | 220719018-02A - SR-05 | Water - Drinking | X                | X                      | X                | 4 - 1L - Unpreserved |

*Calcium times corrected per client email 7-28-22*

*Preserved: (HOS) 7/19/22 15:40 AB  
 Pres v. 7/21/22 07:15 AB*

Comment: 220719018-01 - 10 DAY RUSH PLEASE FOR ALL ANALYSIS. (01,01A,02,02A)

*FedEx  
 5909 4713 0498*

|                              |                           |                              |             |
|------------------------------|---------------------------|------------------------------|-------------|
| Relinquished by: (Signature) | Date: Time: 7/19/22 14:40 | Relinquished by: (Signature) | Date: Time: |
| Received by: (Signature)     | Date: Time:               | Received by: (Signature)     | Date: Time: |