

EXHIBIT N



ON-SITE TECHNICAL SERVICES, INC

72 Railroad Avenue
Wellsville, New York 14895

Phone: (585) 593-1824
Fax: (585) 593-7471

April 5, 2017

Mr. Mark Domagala
NYSDEC – Region 8
Division of Solid and Hazardous Materials
6274 East Avon-Lima Road
Avon, New York 14414

Re: Chemung County Landfill Elmira, New York – First Quarter 2017 Leachate Radiological Test Results

Dear Mark:

On behalf of Chemung County Landfill, the purpose of this letter is to present results of the leachate radiological sampling conducted at the Chemung County Landfill during January 2017 and historic radiological results for comparison. Leachate sampling and radionuclide analysis is required as detailed in Appendix F of the Environmental Monitoring Plan (EMP). On January 11, 2017, a sample was collected from each of: 1) the combined facility leachate in the leachate pond; 2) combined primary leachate from Cell I through III; 3) Cell IV primary leachate; and 4) Cell V primary leachate in accordance with the EMP sampling schedule. This was the first sampling of newly operational Cell V. Samples were sent to ALS Environmental in Rochester, New York for analysis. Attached Table 1 presents the field parameters and radionuclide results for samples collected from the above referenced locations from January 2015 through January 2017. Also attached are the January 2017 field sampling forms, laboratory analytical report and a CD providing an electronic copy of this letter report.

Please call Andrea Kuntz at 585-797-4501 or me at 585-593-1824 if you have any questions.

Sincerely,

Jonathan E. Brandes, P.G.
Senior Geologist

cc: Andrea Kuntz, Casella Waste Systems Inc. (email)
Tom Kump, Chemung County (hard copy)
Yasmin Guevara, NYSDEC (email)
Richard Clarkson, NYSDEC (email)
Timothy Rice, NYSDEC (email)

Attachments

On-Site Technical Services, Inc.

Groundwater Suppression, Leachate, Surface Water, Sediment, Residential Water

Project: Chemung County Landfill - Elmira, New York

Date: 11/11/17

Sampling Location: Leachate Pond Sample ID: LP-0117 Arrival Time: 1115

Primary Leachate

Weather Conditions

Temp: 46 ° F () Sunny (X) Partly Cloudy () Cloudy () Light Rain () Hvy. Rain () Snow

Wind Conditions: light

Location Type

() Groundwater Depression (X) Leachate () Surface Water () Sediment () Res. Water () Other _____

Flow and Depth Information (as appropriate)

Depth: NA Estimated Flow: NA

Comments: _____

Field Parameters (as appropriate)

Meter: YSI 556 (sn: D0E2511AP), Hach 2100P (sn: 0506012410) Field Parameters tested in: cup

| Time | pH | Conductivity (us/cm) | Turbidity (ntu) | D.O. (mg/L) | Temp. (°C) | ORP (mV) |
|-------|-------------|-------------------------|--------------------|----------------|---------------|--------------|
| _____ | <u>7.85</u> | <u>6135</u> | <u>23.3</u> | <u>NA</u> | <u>5.6</u> | <u>100.4</u> |

Sample Information

Sample Type: (X) Grab () Composite

Location Description/Condition: Leachate Pond truck loading area from truck load (3rd load of day)

Sample Collection Equipment/Method: 5 gallon Bucket Sample Time: 1130

Sample Description (clarity/color): clear, very light Amber

Sample Odor: (Y) (N) explain: Leachate

Other Observations / Comments: _____

Analysis Requested: Expanded & RAD Number of Containers: 17 = EOP

Sampling Completion: Time 1215 Date 11/11/17 Samplers J. Brodes 10 = RAD

On-Site Technical Services, Inc.

Groundwater Suppression, Leachate, Surface Water, Sediment, Residential Water

Project: Chemung County Landfill - Elmira, New York

Date: 1/11/17

Sampling Location: Cells 1-3 Primary Leachate Sample ID: C1-3 Leach-0117 Arrival Time: 1020

Weather Conditions

Temp. 42 ° F Sunny Partly Cloudy Cloudy Light Rain Hvy. Rain Snow

Wind Conditions: light

Location Type

Groundwater Depression Leachate Surface Water Sediment Res. Water Other _____

Flow and Depth Information (as appropriate)

Depth: NA Estimated Flow: 5 gpm

Comments: _____

Field Parameters (as appropriate)

Meter: YSI 556 (sn: 06E2511A8), Hach 2100P (sn: 0506021410) Field Parameters tested in: Cup

| Time | pH | Conductivity (us/cm) | Turbidity (ntu) | D.O. (mg/L) | Temp. (°C) | ORP (mV) |
|------|-------------|-------------------------|--------------------|----------------|---------------|-------------|
| | <u>7.69</u> | <u>18010</u> | <u>10.1</u> | <u>NA</u> | <u>14.50</u> | <u>67.8</u> |

Sample Information

Sample Type: Grab Composite

Location Description/Condition: Leachate Pond cells 1 thru 3 inlet pipe

Sample Collection Equipment/Method: 5 gallon Bucket Sample Time: 1030

Sample Description (clarity/color): clear, medium Amber

Sample Odor: (Y) (N) explain: Leachate

Other Observations / Comments: _____

Analysis Requested: BAO Number of Containers: 10

Sampling Completion: Time 1045 Date 1/11/17 Samplers J. Budas

On-Site Technical Services, Inc.

Groundwater Suppression, Leachate, Surface Water, Sediment, Residential Water

Project: Chemung County Landfill - Elmira, New York

Date: 1/11/17

Sampling Location: Cell 4 Primary Leach Sample ID: C4 Leach-0117 Arrival Time: 1020

Weather Conditions

Temp. 42° F (X) Sunny () Partly Cloudy () Cloudy () Light Rain () Hvy. Rain () Snow

Wind Conditions: light

Location Type

() Groundwater Depression (X) Leachate () Surface Water () Sediment () Res. Water () Other

Flow and Depth Information (as appropriate)

Depth: NA Estimated Flow: 15 gpm

Comments:

Field Parameters (as appropriate)

Meter: YSI 556 (sn: 04E2511AP), Hach 2100P (sn: 050002410) Field Parameters tested in: Cup

| Time | pH | Conductivity (us/cm) | Turbidity (ntu) | D.O. (mg/L) | Temp. (°C) | ORP (mV) |
|------|------|----------------------|-----------------|-------------|------------|----------|
| | 7.75 | 21467 | 16.2 | NA | 17.25 | 82.4 |

Sample Information

Sample Type: (X) Grab () Composite

Location Description/Condition: Leachate Pond Cell 4 inlet pipe

Sample Collection Equipment/Method: 5 gallon Bucket Sample Time: 1050

Sample Description (clarity/color): clear, light Amber

Sample Odor: (Y) (N) explain: Leachate

Other Observations / Comments:

Analysis Requested: RAP Number of Containers: 10

Sampling Completion: Time 1111 Date 1/11/17 Samplers J. B. Jones

On-Site Technical Services, Inc.

Groundwater Depression, Leachate, Surface Water, Sediment, Residential Water

Project: Chemung County Landfill - Elmira, New York

Date: 1/11/17

Sampling Location: C5 Primary Leach Sample ID: C5Leach-0117 Arrival Time: 0914

Weather Conditions

Temp. 39 ° F Sunny Partly Cloudy Cloudy Light Rain Hvy. Rain Snow

Wind Conditions: light

Location Type

Groundwater Depression Leachate Surface Water Sediment Res. Water Other _____

Flow and Depth Information (as appropriate)

Depth: 34" Estimated Flow: 5 gpm

Comments: manually activate pump

Field Parameters (as appropriate)

Meter: YSI 556 (sn: 06E2511AP), Hach 2100P (sn: 0506012410) Field Parameters tested in: cap

| Time | pH | Conductivity (us/cm) | Turbidity (ntu) | D.O. (mg/L) | Temp. (°C) | ORP (mV) |
|------|-------------|----------------------|-----------------|-------------|-------------|-------------|
| | <u>6.29</u> | <u>2107</u> | <u>12.3</u> | <u>NA</u> | <u>6.29</u> | <u>78.6</u> |

Sample Information

Sample Type: Grab Composite

Location Description/Condition: Cell 5 Riser House primary sample port

Sample Collection Equipment/Method: 5 gallon bucket Sample Time: 0920

Sample Description (clarity/color): mostly clear

Sample Odor: (Y) (N) explain: very mild leachate odor

Other Observations / Comments: _____

Analysis Requested: RAD Number of Containers: 10

Sampling Completion: Time 0940 Date 1/11/17 Samplers J. Bruder



February 14, 2017

Service Request No:R1700331

Ms. Andrea Kuntz
Casella Waste Systems
Ontario County Landfill
1879 Routes 5 & 20
Stanley, NY 14561

Laboratory Results for: Chemung County Landfill-Leachate RAD

Dear Ms.Kuntz,

Enclosed are the results of the sample(s) submitted to our laboratory January 11, 2017
For your reference, these analyses have been assigned our service request number **R1700331**.

All analyses were performed according to our laboratory's quality assurance program. The test results meet requirements of the NELAP standards except as noted in the case narrative report. All results are intended to be considered in their entirety, and ALS Environmental is not responsible for use of less than the complete report. Results apply only to the items submitted to the laboratory for analysis and individual items (samples) analyzed, as listed in the report. The measurement uncertainty of the results included in this report is within that expected when using the prescribed method(s) for analysis of these samples, and represented by Laboratory Control Sample control limits. Any events, such as QC failures, which may add to the uncertainty are explained in the report narrative.

Please contact me if you have any questions. My extension is 7472. You may also contact me via email at Janice.Jaeger@alsglobal.com.

Respectfully submitted,

ALS Group USA, Corp. dba ALS Environmental

Janice Jaeger
Project Manager

CC: Jon Brandes

ADDRESS 1565 Jefferson Road, Building 300, Suite 360, Rochester, NY 14623
PHONE +1 585 288 5380 | **FAX** +1 585 288 8475
ALS Group USA, Corp.
dba ALS Environmental



Narrative Documents

ALS Environmental—Rochester Laboratory
1565 Jefferson Road, Building 300, Suite 360, Rochester, NY 14623
Phone (585) 288-5380 Fax (585) 288-8475
www.alsglobal.com



Client: Casella Waste Systems
Project: Chemung County Landfill-Leachate RAD
Sample Matrix: Water

Service Request: R1700331
Date Received: 1/11/17

CASE NARRATIVE

All analyses were performed consistent with the quality assurance program of ALS Environmental. This report contains analytical results for samples designated for Tier II data deliverables, including results of QC samples analyzed from this delivery group. Analytical procedures performed by the lab are validated in accordance with NELAC standards. Any parameters that are not included in the lab's NELAC accreditation are identified on a "Non-Certified Analytes" report in the Miscellaneous Forms Section of this report. Individual analytical results requiring further explanation are flagged with qualifiers and/or discussed below. The flags are explained in the Report Qualifiers and Definitions page in the Miscellaneous Forms section of this report.

Sample Receipt

Eight water samples were received for analysis at ALS Environmental on 01/11/2017. Any discrepancies noted upon initial sample inspection are noted on the cooler receipt and preservation form included in this data package. The samples were received in good condition and consistent with the accompanying chain of custody form. Samples are refrigerated at $\leq 6^{\circ}\text{C}$ upon receipt at the lab except for aqueous samples designated for metals analyses, which are stored at room temperature.

Subcontracted Analytical Parameters:

One or more samples were subcontracted to another laboratory for testing. The certified analytical report from the subcontractor has been included in its entirety at the end of this report and includes the name and address of the subcontracted laboratory.

Approved by  Date 2/14/2017



Sample Receipt Information

ALS Environmental—Rochester Laboratory
1565 Jefferson Road, Building 300, Suite 360, Rochester, NY 14623
Phone (585) 288-5380 Fax (585) 288-8475
www.alsglobal.com

Client: Casella Waste Systems
Project: Chemung County Landfill-Leachate RAD

Service Request:R1700331

SAMPLE CROSS-REFERENCE

| <u>SAMPLE #</u> | <u>CLIENT SAMPLE ID</u> | <u>DATE</u> | <u>TIME</u> |
|-----------------|--------------------------|-------------|-------------|
| R1700331-001 | LP-0117 | 1/11/2017 | 1130 |
| R1700331-002 | LP-0117 Dissolved | 1/11/2017 | 1130 |
| R1700331-003 | C5Leach-0117 | 1/11/2017 | 0920 |
| R1700331-004 | C5Leach-0117 Dissolved | 1/11/2017 | 0920 |
| R1700331-005 | C1-3Leach-0117 | 1/11/2017 | 1030 |
| R1700331-006 | C1-3Leach-0117 Dissolved | 1/11/2017 | 1030 |
| R1700331-007 | C4Leach-0117 | 1/11/2017 | 1050 |
| R1700331-008 | C4Leach-0117 Dissolved | 1/11/2017 | 1050 |



ALS-Environmental
1565 Jefferson Rd, Bldg 300, Suite 360
Rochester, NY 14623
585.288.5380

Client: **Casella/On-Site**
1488 County Rt 60
Elmira, NY 14901

Project Manager: **Andrea Kuntz/Jon Brandes**

CHAIN of CUSTODY

Page 1 of 1

Project: **Chemung Landfill - Leachate RAD**

Telephone No. 585-593-1824 Fax No. 585-593-7471

Method of Shipment
Sampler Delivered

Special Detection Limit / Reporting
PDF to Andrea and On-Site, and EDD to On-Site.

Sample I.D.

| Lab Sample No. | No. of Containers | Matrix | | | | Prsv. | | Sampling Date | Sampling Time | Total: Gamma Spec (901.1), Ra-226 (903.1), Ra-228 (904.0) (HNO3) | Total: Uranium (908.0) (HNO3) | Dissolved: Gamma Spec (901.1), Ra-226 (903.1), Ra-228 (904.0) | Dissolved: Uranium (908.0) | | | | | | Turn Around Time (working days) | |
|-----------------|-------------------|--------|-------|-----|-------|-------|----|---------------|---------------|--|-------------------------------|---|----------------------------|--|--|--|--|--|---------------------------------|--|
| | | Soil | Water | Air | Other | Yes | No | | | | | | | | | | | | | |
| 1P-0117 | 10 | X | | | | X | X | 11/11/17 | 1130 | X | X | X | X | | | | | | | |
| C5 Leach-0117 | 10 | X | | | | X | X | | 0920 | X | X | X | X | | | | | | | |
| C7-3 Leach-0117 | 10 | X | | | | X | X | | 1030 | X | X | X | X | | | | | | | |
| C4 Leach-0117 | 10 | X | | | | X | X | | 1058 | X | X | X | X | | | | | | | |

Note: Dissolved analysis requires lab filtering

Sample Received Intact: Yes No Temperature received: Ice No ice

Relinquished by: **Jonathan E Brandes**
Date: 1/11/17 Time: 1707

Relinquished by: _____ Date: _____ Time: _____

Relinquished by: _____ Date: _____ Time: _____

Relinquished by: _____ Date: _____ Time: _____

Received by (Sign & Print Name): _____

Received by: _____

Received by: _____

Received by laboratory: **ALS** Date: 1/11/17 Time: 1707

Lab Work No.

R1700331
Casella Waste Systems
Chemung County Landfill-Leachate RAD

5



Cooler Receipt and Preservation Check Form

R1700331

5

Casella Waste Systems
Chemung County Landfill-Leachate RAD



Project/Client Chemung LF Folder Number R17-331

Cooler received on 1/11/17 by: @/CW

COURIER: ALS UPS FEDEX VELOCITY CLIENT

| | | |
|---|--|--|
| 1 | Were Custody seals on outside of cooler? | Y <input checked="" type="radio"/> N <input type="radio"/> |
| 2 | Custody papers properly completed (ink, signed)? | <input checked="" type="radio"/> Y <input type="radio"/> N |
| 3 | Did all bottles arrive in good condition (unbroken)? | <input checked="" type="radio"/> Y <input type="radio"/> N |
| 4 | Circle: <u>Wet Ice</u> Dry Ice Gel packs present? | <input checked="" type="radio"/> Y <input type="radio"/> N |

| | | |
|----|--|---|
| 5a | Perchlorate samples have required headspace? | Y N <input checked="" type="radio"/> NA |
| 5b | Did <u>VOA</u> vials <u>Alk</u> or <u>Sulfide</u> have sig* bubbles? | <input checked="" type="radio"/> Y <input type="radio"/> N NA |
| 6 | Where did the bottles originate? | <u>ALS/ROO</u> CLIENT |
| 7 | Soil VOA received as: Bulk Encore 5035set | <input checked="" type="radio"/> NA |

8. Temperature Readings Date: 1/11/17 Time: 1710 ID: IR#7 IR#8 From: Temp Blank Sample Bottle

| | | | | | | | | |
|-------------------------------|--|--|-----|-----|-----|-----|-----|-----|
| Observed Temp (°C) | <u>5.5</u> | <u>4.3</u> | | | | | | |
| Correction Factor (°C) | <u>+0.9</u> | <u>→</u> | | | | | | |
| Corrected Temp (°C) | <u>6.4°</u> | <u>5.2°</u> | | | | | | |
| Temp from: Type of bottle | <u>cent tube</u> | <u>→</u> | | | | | | |
| Within 0-6°C? | Y <input checked="" type="radio"/> N <input type="radio"/> | <input checked="" type="radio"/> Y <input type="radio"/> N | Y N | Y N | Y N | Y N | Y N | Y N |
| If <0°C, were samples frozen? | Y N | Y N | Y N | Y N | Y N | Y N | Y N | Y N |

If out of Temperature, note packing/ice condition: _____ Ice melted _____ Poorly Packed _____ Same Day Rule
& Client Approval to Run Samples: _____ Standing Approval _____ Client aware at drop-off _____ Client notified by: _____

All samples held in storage location: R-002 by @ on 1/11/17 at 1723
5035 samples placed in storage location: _____ by _____ on _____ at _____

Cooler Breakdown: Date: 1/12/17 Time: 1311 by: D/W

- 9. Were all bottle labels complete (i.e. analysis, preservation, etc.)? YES NO
- 10. Did all bottle labels and tags agree with custody papers? YES NO
- 11. Were correct containers used for the tests indicated? YES NO
- 12. Were 5035 vials acceptable (no extra labels, not leaking)? YES NO
- 13. Air Samples: Cassettes / Tubes Intact _____ Canisters Pressurized _____ Tedlar® Bags Inflated N/A

| pH | Lot of test paper | Reagent | Preserved? | | Lot Received | Exp | Sample ID | Vol. Added | Lot Added | Final pH |
|-----------------------|-------------------|---|------------|----|--|--------------|-----------|------------|-----------|----------|
| | | | Yes | No | | | | | | |
| ≥12 | | NaOH | | | | | | | | |
| ≤2 | | HNO ₃ | | | <u>B0526156H</u> | <u>10/17</u> | | | | |
| ≤2 | | H ₂ SO ₄ | | | | | | | | |
| <4 | | NaHSO ₄ | | | | | | | | |
| Residual Chlorine (-) | | For CN Phenol and 522 | | | If +, contact PM to add Na ₂ S ₂ O ₃ (CN), ascorbic (phenol). | | | | | |
| | | Na ₂ S ₂ O ₃ | - | - | | | | | | |
| | | ZnAcetate | - | - | | | | | | |
| | | HCl | ** | ** | | | | | | |

**Not to be tested before analysis – pH tested and recorded by VOAs on a separate worksheet

Bottle lot numbers: 112616-2452
Explain all Discrepancies/ Other Comments:

| | |
|-------|------------|
| CLRES | BULK |
| DO | FLDT |
| HPROD | HGFB |
| HTR | LL3541 |
| PH | <u>803</u> |
| SO3 | MARRS |
| ALS | REV |

Labels secondary reviewed by: _____
PC Secondary Review: JMS 1/13/17

*significant air bubbles: VOA > 5-6 mm : WC > 1 in. diameter



Cooler Receipt and Preservation Check Form

Project/Client Chemung LF Folder Number _____

Cooler received on 1/11/17 by: PC/CW COURIER: ALS UPS FEDEX VELOCITY CLIENT

| | | |
|---|--|--|
| 1 | Were Custody seals on outside of cooler? | Y <input checked="" type="radio"/> N <input type="radio"/> |
| 2 | Custody papers properly completed (ink, signed)? | Y <input checked="" type="radio"/> N <input type="radio"/> |
| 3 | Did all bottles arrive in good condition (unbroken)? | Y <input checked="" type="radio"/> N <input type="radio"/> |
| 4 | Circle: <u>Wet Ice</u> Dry Ice Gel packs present? | Y <input checked="" type="radio"/> N <input type="radio"/> |

| | | |
|----|---|---|
| 5a | Perchlorate samples have required headspace? | Y N NA |
| 5b | Did <u>VOA</u> vials, <u>Alk</u> or <u>Sulfide</u> have sig* bubbles? | Y <input checked="" type="radio"/> N NA |
| 6 | Where did the bottles originate? | <u>ALS/ROC</u> CLIENT |
| 7 | Soil VOA received as: Bulk Encore 5035set | <u>NA</u> |

8. Temperature Readings Date: 1/11/17 Time: 1710 ID: IR#7 IR#8 From: Temp/Blank Sample Bottle

| | | | | | | | |
|-------------------------------|--|--|--|--|--|--|--|
| Observed Temp (°C) | <u>7.9</u> | <u>6.3</u> | <u>3.0</u> | <u>2.9</u> | <u>6.9</u> | <u>4.6</u> | <u>5.2</u> |
| Correction Factor (°C) | <u>+0.9</u> | | | | | | |
| Corrected Temp (°C) | <u>8.8°</u> | <u>7.2</u> | <u>3.9</u> | <u>3.8</u> | <u>7.7</u> | <u>5.5</u> | <u>6.1</u> |
| Temp from: Type of bottle | <u>cont. tube</u> | | | | | | |
| Within 0-6°C? | Y <input checked="" type="radio"/> N <input type="radio"/> | Y <input checked="" type="radio"/> N <input type="radio"/> | Y <input checked="" type="radio"/> N <input type="radio"/> | Y <input checked="" type="radio"/> N <input type="radio"/> | Y <input checked="" type="radio"/> N <input type="radio"/> | Y <input checked="" type="radio"/> N <input type="radio"/> | Y <input checked="" type="radio"/> N <input type="radio"/> |
| If <0°C, were samples frozen? | Y N | Y N | Y N | Y N | Y N | Y N | Y N |

If out of Temperature, note packing/ice condition: _____ Ice melted Poorly Packed Same Day Rule
& Client Approval to Run Samples: _____ Standing Approval Client aware at drop-off Client notified by: _____

All samples held in storage location: 2002 by PC on 1/11/17 at 1723
5035 samples placed in storage location: _____ by _____ on _____ at _____

Cooler Breakdown: Date: _____ Time: _____ by: _____

- 9. Were all bottle labels complete (i.e. analysis, preservation, etc.)? YES NO
- 10. Did all bottle labels and tags agree with custody papers? YES NO
- 11. Were correct containers used for the tests indicated? YES NO
- 12. Were 5035 vials acceptable (no extra labels, not leaking)? YES NO N/A
- 13. Air Samples: Cassettes / Tubes Intact Canisters Pressurized Tedlar® Bags Inflated N/A

| pH | Lot of test paper | Reagent | Preserved? | | Lot Received | Exp | Sample ID | Vol. Added | Lot Added | Final pH |
|-----------------------|-------------------|---|------------|----|--|-----|-----------|------------|-----------|----------|
| | | | Yes | No | | | | | | |
| ≥12 | | NaOH | | | | | | | | |
| ≤2 | | HNO ₃ | | | | | | | | |
| ≤2 | | H ₂ SO ₄ | | | | | | | | |
| <4 | | NaHSO ₄ | | | | | | | | |
| Residual Chlorine (-) | | For CN Phenol and 522 | | | If +, contact PM to add Na ₂ S ₂ O ₃ (CN), ascorbic (phenol). | | | | | |
| | | Na ₂ S ₂ O ₃ | - | - | | | | | | |
| | | Zn Acetate | - | - | | | | | | |
| | | HCl | ** | ** | | | | | | |

**Not to be tested before analysis – pH tested and recorded by VOAs on a separate worksheet

Bottle lot numbers: _____
Explain all Discrepancies/ Other Comments: _____

see 1st page

| | |
|-------|--------|
| CLRES | BULK |
| DO | FLDT |
| HPROD | HGFB |
| HTR | LL3541 |
| PH | SUB |
| SO3 | MARRS |
| ALS | REV |

Labels secondary reviewed by: _____
PC Secondary Review: _____

*significant air bubbles: VOA > 5-6 mm : WC > 1 in. diameter



Miscellaneous Forms

ALS Environmental—Rochester Laboratory
1565 Jefferson Road, Building 300, Suite 360, Rochester, NY 14623
Phone (585) 288-5380 Fax (585) 288-8475
www.alsglobal.com

REPORT QUALIFIERS AND DEFINITIONS

| | |
|---|--|
| <p>U Analyte was analyzed for but not detected. The sample quantitation limit has been corrected for dilution and for percent moisture, unless otherwise noted in the case narrative.</p> <p>J Estimated value due to either being a Tentatively Identified Compound (TIC) or that the concentration is between the MRL and the MDL. Concentrations are not verified within the linear range of the calibration. For DoD: concentration >40% difference between two GC columns (pesticides/Aroclors).</p> <p>B Analyte was also detected in the associated method blank at a concentration that may have contributed to the sample result.</p> <p>E Inorganics- Concentration is estimated due to the serial dilution was outside control limits.</p> <p>E Organics- Concentration has exceeded the calibration range for that specific analysis.</p> <p>D Concentration is a result of a dilution, typically a secondary analysis of the sample due to exceeding the calibration range or that a surrogate has been diluted out of the sample and cannot be assessed.</p> <p>* Indicates that a quality control parameter has exceeded laboratory limits. Under the "Notes" column of the Form I, this qualifier denotes analysis was performed out of Holding Time.</p> <p>H Analysis was performed out of hold time for tests that have an "immediate" hold time criteria.</p> <p># Spike was diluted out.</p> | <p>+ Correlation coefficient for MSA is <0.995.</p> <p>N Inorganics- Matrix spike recovery was outside laboratory limits.</p> <p>N Organics- Presumptive evidence of a compound (reported as a TIC) based on the MS library search.</p> <p>S Concentration has been determined using Method of Standard Additions (MSA).</p> <p>W Post-Digestion Spike recovery is outside control limits and the sample absorbance is <50% of the spike absorbance.</p> <p>P Concentration >40% (25% for CLP) difference between the two GC columns.</p> <p>C Confirmed by GC/MS</p> <p>Q DoD reports: indicates a pesticide/Aroclor is not confirmed ($\times 100\%$ Difference between two GC columns).</p> <p>X See Case Narrative for discussion.</p> <p>MRL Method Reporting Limit. Also known as:</p> <p>LOQ Limit of Quantitation (LOQ) The lowest concentration at which the method analyte may be reliably quantified under the method conditions.</p> <p>MDL Method Detection Limit. A statistical value derived from a study designed to provide the lowest concentration that will be detected 99% of the time. Values between the MDL and MRL are estimated (see J qualifier).</p> <p>LOD Limit of Detection. A value at or above the MDL which has been verified to be detectable.</p> <p>ND Non-Detect. Analyte was not detected at the concentration listed. Same as U qualifier.</p> |
|---|--|



Rochester Lab ID # for State Certifications¹

| | | |
|-------------------------|-----------------------|-------------------------|
| Connecticut ID # PH0556 | Maine ID #NY0032 | New Hampshire ID # |
| Delaware Accredited | Nebraska Accredited | 294100 A/B |
| DoD ELAP #65817 | New Jersey ID # NY004 | Pennsylvania ID# 68-786 |
| Florida ID # E87674 | New York ID # 10145 | Rhode Island ID # 158 |
| Illinois ID #200047 | North Carolina #676 | Virginia #460167 |

¹ Analyses were performed according to our laboratory's NELAP-approved quality assurance program and any applicable state or agency requirements. The test results meet requirements of the current NELAP/TNI standards or state or agency requirements, where applicable, except as noted in the case narrative. Since not all analyte/method/matrix combinations are offered for state/NELAC accreditation, this report may contain results which are not accredited. For a specific list of accredited analytes, contact the laboratory or go to <http://www.alsglobal.com/en/Our-Services/Life-Sciences/Environmental/Downloads/North-America-Downloads>

ALS Laboratory Group

Acronyms

| | |
|------------|--|
| ASTM | American Society for Testing and Materials |
| A2LA | American Association for Laboratory Accreditation |
| CARB | California Air Resources Board |
| CAS Number | Chemical Abstract Service registry Number |
| CFC | Chlorofluorocarbon |
| CFU | Colony-Forming Unit |
| DEC | Department of Environmental Conservation |
| DEQ | Department of Environmental Quality |
| DHS | Department of Health Services |
| DOE | Department of Ecology |
| DOH | Department of Health |
| EPA | U. S. Environmental Protection Agency |
| ELAP | Environmental Laboratory Accreditation Program |
| GC | Gas Chromatography |
| GC/MS | Gas Chromatography/Mass Spectrometry |
| LUFT | Leaking Underground Fuel Tank |
| M | Modified |
| MCL | Maximum Contaminant Level is the highest permissible concentration of a substance allowed in drinking water as established by the USEPA. |
| MDL | Method Detection Limit |
| MPN | Most Probable Number |
| MRL | Method Reporting Limit |
| NA | Not Applicable |
| NC | Not Calculated |
| NCASI | National Council of the Paper Industry for Air and Stream Improvement |
| ND | Not Detected |
| NIOSH | National Institute for Occupational Safety and Health |
| PQL | Practical Quantitation Limit |
| RCRA | Resource Conservation and Recovery Act |
| SIM | Selected Ion Monitoring |
| TPH | Total Petroleum Hydrocarbons |
| tr | Trace level is the concentration of an analyte that is less than the PQL but greater than or equal to the MDL. |



INORGANIC PREPARATION METHODS

The preparation methods associated with this report are found in these tables unless discussed in the case narrative.

Water/Liquid Matrix

| Analytical Method | Preparation Method |
|-------------------------------|--------------------|
| 200.7 | 200.2 |
| 200.8 | 200.2 |
| 6010C | 3005A/3010A |
| 6020A | ILM05.3 |
| 9014 Cyanide Reactivity | SW846 Ch7, 7.3.4.2 |
| 9034 Sulfide Reactivity | SW846 Ch7, 7.3.4.2 |
| 9034 Sulfide Acid Soluble | 9030B |
| 9056A Bomb (Halogens) | 5050A |
| 9066 Manual Distillation | 9065 |
| SM 4500-CN-E Residual Cyanide | SM 4500-CN-G |
| SM 4500-CN-E WAD Cyanide | SM 4500-CN-I |

Solid/Soil/Non-Aqueous Matrix

| Analytical Method | Preparation Method |
|--|--------------------|
| 6010C | 3050B |
| 6020A | 3050B |
| 6010C TCLP (1311) extract | 3005A/3010A |
| 6010 SPLP (1312) extract | 3005A/3010A |
| 7196A | 3060A |
| 7199 | 3060A |
| 9056A Halogens/Halides | 5050 |
| 300.0 Anions/ 350.1/ 353.2/ SM 2320B/ SM 5210B/ 9056A Anions | DI extraction |

For analytical methods not listed, the preparation method is the same as the analytical method reference.



Subcontracted Analytical Parameters

ALS Environmental—Rochester Laboratory
1565 Jefferson Road, Building 300, Suite 360, Rochester, NY 14623
Phone (585) 288-5380 Fax (585) 288-8475
www.alsglobal.com

February 14, 2017

Ms. Janice Jaeger
ALS Environmental Columbia
1565 Jefferson Road
Building 300
Rochester, NY 14623

RE: Project: R1700331
Pace Project No.: 30207961

Dear Ms. Jaeger:

Enclosed are the analytical results for sample(s) received by the laboratory on January 13, 2017. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Carin Ferris
carin.ferris@pacelabs.com
Project Manager

Enclosures



REPORT OF LABORATORY ANALYSIS

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CERTIFICATIONS

Project: R1700331

Pace Project No.: 30207961

Pennsylvania Certification IDs

1638 Roseytown Rd Suites 2,3&4, Greensburg, PA 15601

L-A-B DOD-ELAP Accreditation #: L2417

Alabama Certification #: 41590

Arizona Certification #: AZ0734

Arkansas Certification

California Certification #: 04222CA

Colorado Certification

Connecticut Certification #: PH-0694

Delaware Certification

Florida/TNI Certification #: E87683

Georgia Certification #: C040

Guam Certification

Hawaii Certification

Idaho Certification

Illinois Certification

Indiana Certification

Iowa Certification #: 391

Kansas/TNI Certification #: E-10358

Kentucky Certification #: 90133

Louisiana DHH/TNI Certification #: LA140008

Louisiana DEQ/TNI Certification #: 4086

Maine Certification #: PA00091

Maryland Certification #: 308

Massachusetts Certification #: M-PA1457

Michigan/PADEP Certification

Missouri Certification #: 235

Montana Certification #: Cert 0082

Nebraska Certification #: NE-05-29-14

Nevada Certification #: PA014572015-1

New Hampshire/TNI Certification #: 2976

New Jersey/TNI Certification #: PA 051

New Mexico Certification #: PA01457

New York/TNI Certification #: 10888

North Carolina Certification #: 42706

North Dakota Certification #: R-190

Oregon/TNI Certification #: PA200002

Pennsylvania/TNI Certification #: 65-00282

Puerto Rico Certification #: PA01457

Rhode Island Certification #: 65-00282

South Dakota Certification

Tennessee Certification #: TN2867

Texas/TNI Certification #: T104704188-14-8

Utah/TNI Certification #: PA014572015-5

USDA Soil Permit #: P330-14-00213

Vermont Dept. of Health: ID# VT-0282

Virgin Island/PADEP Certification

Virginia/VELAP Certification #: 460198

Washington Certification #: C868

West Virginia DEP Certification #: 143

West Virginia DHHR Certification #: 9964C

Wisconsin Certification

Wyoming Certification #: 8TMS-L

REPORT OF LABORATORY ANALYSIS

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SAMPLE SUMMARY

Project: R1700331

Pace Project No.: 30207961

| Lab ID | Sample ID | Matrix | Date Collected | Date Received |
|-------------|------------------------|--------|----------------|----------------|
| 30207961001 | LP-0117 | Water | 01/11/17 11:30 | 01/13/17 09:40 |
| 30207961002 | LP-0117 Dissolved | Water | 01/11/17 11:30 | 01/13/17 09:40 |
| 30207961003 | C5Leach-0117 | Water | 01/11/17 09:20 | 01/13/17 09:40 |
| 30207961004 | C5Leach-0117 Dissolved | Water | 01/11/17 09:20 | 01/13/17 09:40 |
| 30207961005 | C3Leach-0117 | Water | 01/11/17 10:30 | 01/13/17 09:40 |
| 30207961006 | C3Leach-0117 Dissolved | Water | 01/11/17 10:30 | 01/13/17 09:40 |
| 30207961007 | C4Leach-0117 | Water | 01/11/17 10:50 | 01/13/17 09:40 |
| 30207961008 | C4Leach-0117 Dissolved | Water | 01/11/17 10:50 | 01/13/17 09:40 |

REPORT OF LABORATORY ANALYSIS

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SAMPLE ANALYTE COUNT

Project: R1700331
Pace Project No.: 30207961

| Lab ID | Sample ID | Method | Analysts | Analytes Reported |
|-------------|------------------------|---------------|----------|-------------------|
| 30207961001 | LP-0117 | EPA 901.1 | MAH | 13 |
| | | EPA 903.1 | WRR | 1 |
| | | EPA 904.0 | JLW | 1 |
| | | ASTM D5174-97 | NEG | 1 |
| 30207961002 | LP-0117 Dissolved | EPA 901.1 | MAH | 13 |
| | | EPA 903.1 | WRR | 1 |
| | | EPA 904.0 | JLW | 1 |
| | | ASTM D5174-97 | NEG | 1 |
| 30207961003 | C5Leach-0117 | EPA 901.1 | MAH | 13 |
| | | EPA 903.1 | WRR | 1 |
| | | EPA 904.0 | JLW | 1 |
| | | ASTM D5174-97 | NEG | 1 |
| 30207961004 | C5Leach-0117 Dissolved | EPA 901.1 | MAH | 13 |
| | | EPA 903.1 | WRR | 1 |
| | | EPA 904.0 | JLW | 1 |
| | | ASTM D5174-97 | NEG | 1 |
| 30207961005 | C3Leach-0117 | EPA 901.1 | MAH | 13 |
| | | EPA 903.1 | WRR | 1 |
| | | EPA 904.0 | JLW | 1 |
| | | ASTM D5174-97 | NEG | 1 |
| 30207961006 | C3Leach-0117 Dissolved | EPA 901.1 | MAH | 13 |
| | | EPA 903.1 | WRR | 1 |
| | | EPA 904.0 | JLW | 1 |
| | | ASTM D5174-97 | NEG | 1 |
| 30207961007 | C4Leach-0117 | EPA 901.1 | MAH | 13 |
| | | EPA 903.1 | WRR | 1 |
| | | EPA 904.0 | JLW | 1 |
| | | ASTM D5174-97 | NEG | 1 |
| 30207961008 | C4Leach-0117 Dissolved | EPA 901.1 | MAH | 13 |
| | | EPA 903.1 | WRR | 1 |
| | | EPA 904.0 | JLW | 1 |
| | | ASTM D5174-97 | NEG | 1 |

REPORT OF LABORATORY ANALYSIS

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PROJECT NARRATIVE

Project: R1700331
Pace Project No.: 30207961

Method: EPA 901.1
Description: 901.1 Gamma Spec
Client: ALS Environmental Columbia
Date: February 14, 2017

General Information:

8 samples were analyzed for EPA 901.1. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:

The samples were analyzed within the method required hold times with any exceptions noted below.

Method Blank:

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:

All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Additional Comments:

REPORT OF LABORATORY ANALYSIS

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PROJECT NARRATIVE

Project: R1700331

Pace Project No.: 30207961

Method: EPA 903.1

Description: 903.1 Radium 226

Client: ALS Environmental Columbia

Date: February 14, 2017

General Information:

4 samples were analyzed for EPA 903.1. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:

The samples were analyzed within the method required hold times with any exceptions noted below.

Method Blank:

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:

All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: R1700331
Pace Project No.: 30207961

Method: EPA 903.1
Description: 903.1 Radium 226, Dissolved
Client: ALS Environmental Columbia
Date: February 14, 2017

General Information:

4 samples were analyzed for EPA 903.1. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:

The samples were analyzed within the method required hold times with any exceptions noted below.

Method Blank:

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:

All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Additional Comments:

REPORT OF LABORATORY ANALYSIS

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PROJECT NARRATIVE

Project: R1700331
Pace Project No.: 30207961

Method: EPA 904.0
Description: 904.0 Radium 228
Client: ALS Environmental Columbia
Date: February 14, 2017

General Information:

4 samples were analyzed for EPA 904.0. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:

The samples were analyzed within the method required hold times with any exceptions noted below.

Method Blank:

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:

All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Additional Comments:

REPORT OF LABORATORY ANALYSIS

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PROJECT NARRATIVE

Project: R1700331
Pace Project No.: 30207961

Method: EPA 904.0
Description: 904.0 Radium 228, Dissolved
Client: ALS Environmental Columbia
Date: February 14, 2017

General Information:

4 samples were analyzed for EPA 904.0. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:

The samples were analyzed within the method required hold times with any exceptions noted below.

Method Blank:

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:

All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Additional Comments:

REPORT OF LABORATORY ANALYSIS

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PROJECT NARRATIVE

Project: R1700331

Pace Project No.: 30207961

Method: ASTM D5174-97

Description: D517497 Total Uranium KPA

Client: ALS Environmental Columbia

Date: February 14, 2017

General Information:

8 samples were analyzed for ASTM D5174-97. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:

The samples were analyzed within the method required hold times with any exceptions noted below.

Method Blank:

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:

All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Additional Comments:

This data package has been reviewed for quality and completeness and is approved for release.

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: R1700331
Pace Project No.: 30207961

Sample: LP-0117 **Lab ID: 30207961001** Collected: 01/11/17 11:30 Received: 01/13/17 09:40 Matrix: Water
PWS: Site ID: Sample Type:

Comments: • Upon receipt at the laboratory, 3 mls of nitric acid were added to the sample to meet the sample preservation requirement of pH <2 for radiochemistry analysis.
• The sampler's name and signature were not listed on the COC.
• The preservative type is not listed on the COC.

| Parameters | Method | Act ± Unc (MDC) Carr Trac | Units | Analyzed | CAS No. | Qual |
|---------------|---------------|--|-------|----------------|------------|------|
| Actinium-228 | EPA 901.1 | 0.000 ± 19.832 (47.100) C:NA T:NA | pCi/L | 01/31/17 12:13 | 14331-83-0 | |
| Bismuth-212 | EPA 901.1 | -35.196 ± 142.410 (150.600) C:NA T:NA | pCi/L | 01/31/17 12:13 | 14913-49-6 | |
| Bismuth-214 | EPA 901.1 | 95.057 ± 23.152 (17.700) C:NA T:NA | pCi/L | 01/31/17 12:13 | 14733-03-0 | |
| Cesium-134 | EPA 901.1 | 0.000 ± 2.772 (8.419) C:NA T:NA | pCi/L | 01/31/17 12:13 | 13967-70-9 | |
| Cesium-137 | EPA 901.1 | 0.000 ± 4.598 (10.280) C:NA T:NA | pCi/L | 01/31/17 12:13 | 10045-97-3 | |
| Lead-212 | EPA 901.1 | 27.294 ± 21.496 (17.850) C:NA T:NA | pCi/L | 01/31/17 12:13 | 15092-94-1 | |
| Lead-214 | EPA 901.1 | 90.508 ± 20.736 (16.480) C:NA T:NA | pCi/L | 01/31/17 12:13 | 15067-28-4 | |
| Potassium-40 | EPA 901.1 | 139.450 ± 91.152 (83.740) C:NA T:NA | pCi/L | 01/31/17 12:13 | 13966-00-2 | |
| Radium-226 | EPA 901.1 | 0.000 ± 103.770 (197.700) C:NA T:NA | pCi/L | 01/31/17 12:13 | 13982-63-3 | |
| Radium-228 | EPA 901.1 | 0.000 ± 19.832 (47.100) C:NA T:NA | pCi/L | 01/31/17 12:13 | 15262-20-1 | |
| Thallium-208 | EPA 901.1 | 3.551 ± 5.730 (9.951) C:NA T:NA | pCi/L | 01/31/17 12:13 | 14913-50-9 | |
| Thorium-232 | EPA 901.1 | 1472.100 ± 10570.000 (12980.000) C:NA T:NA | pCi/L | 01/31/17 12:13 | 7440-29-1 | |
| Thorium-234 | EPA 901.1 | 244.040 ± 556.100 (692.900) C:NA T:NA | pCi/L | 01/31/17 12:13 | 15065-10-8 | |
| Radium-226 | EPA 903.1 | 1.23 ± 0.974 (1.32) C:NA T:45% | pCi/L | 02/01/17 22:07 | 13982-63-3 | |
| Radium-228 | EPA 904.0 | 1.57 ± 1.02 (1.92) C:53% T:78% | pCi/L | 02/10/17 11:42 | 15262-20-1 | |
| Total Uranium | ASTM D5174-97 | 0.213 ± 0.004 (0.385) C:NA T:NA | ug/L | 02/14/17 06:57 | 7440-61-1 | |

Sample: LP-0117 Dissolved **Lab ID: 30207961002** Collected: 01/11/17 11:30 Received: 01/13/17 09:40 Matrix: Water
PWS: Site ID: Sample Type:

Comments: • The sampler's name and signature were not listed on the COC.
• The preservative type is not listed on the COC.

| Parameters | Method | Act ± Unc (MDC) Carr Trac | Units | Analyzed | CAS No. | Qual |
|--------------|-----------|--|-------|----------------|------------|------|
| Actinium-228 | EPA 901.1 | 7.329 ± 17.168 (18.070) C:NA T:NA | pCi/L | 02/01/17 09:49 | 14331-83-0 | |
| Bismuth-212 | EPA 901.1 | 16.137 ± 65.062 (70.470) C:NA T:NA | pCi/L | 02/01/17 09:49 | 14913-49-6 | |
| Bismuth-214 | EPA 901.1 | 161.350 ± 24.393 (12.780) C:NA T:NA | pCi/L | 02/01/17 09:49 | 14733-03-0 | |
| Cesium-134 | EPA 901.1 | 0.000 ± 1.605 (5.754) C:NA T:NA | pCi/L | 02/01/17 09:49 | 13967-70-9 | |
| Cesium-137 | EPA 901.1 | 0.000 ± 1.962 (6.327) C:NA T:NA | pCi/L | 02/01/17 09:49 | 10045-97-3 | |

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: R1700331
Pace Project No.: 30207961

Sample: LP-0117 Dissolved **Lab ID: 30207961002** Collected: 01/11/17 11:30 Received: 01/13/17 09:40 Matrix: Water
PWS: Site ID: Sample Type:

Comments: • The sampler's name and signature were not listed on the COC.
• The preservative type is not listed on the COC.

| Parameters | Method | Act ± Unc (MDC) Carr Trac | Units | Analyzed | CAS No. | Qual |
|-----------------------|---------------|--|-------|----------------|------------|------|
| Lead-212 | EPA 901.1 | 35.583 ± 31.545 (11.990) C:NA T:NA | pCi/L | 02/01/17 09:49 | 15092-94-1 | |
| Lead-214 | EPA 901.1 | 174.730 ± 24.750 (11.800) C:NA T:NA | pCi/L | 02/01/17 09:49 | 15067-28-4 | |
| Potassium-40 | EPA 901.1 | 207.090 ± 59.111 (47.940) C:NA T:NA | pCi/L | 02/01/17 09:49 | 13966-00-2 | |
| Radium-226 | EPA 901.1 | 0.000 ± 87.971 (165.000) C:NA T:NA | pCi/L | 02/01/17 09:49 | 13982-63-3 | |
| Radium-228 | EPA 901.1 | 7.329 ± 17.168 (18.070) C:NA T:NA | pCi/L | 02/01/17 09:49 | 15262-20-1 | |
| Thallium-208 | EPA 901.1 | 1.614 ± 4.944 (5.683) C:NA T:NA | pCi/L | 02/01/17 09:49 | 14913-50-9 | |
| Thorium-232 | EPA 901.1 | 0.000 ± 4864.800 (11080.000) C:NA T:NA | pCi/L | 02/01/17 09:49 | 7440-29-1 | |
| Thorium-234 | EPA 901.1 | 0.000 ± 280.190 (602.500) C:NA T:NA | pCi/L | 02/01/17 09:49 | 15065-10-8 | |
| Radium-226, Dissolved | EPA 903.1 | 1.02 ± 0.565 (0.503) C:NA T:86% | pCi/L | 02/01/17 12:06 | 13982-63-3 | |
| Radium-228, Dissolved | EPA 904.0 | 0.432 ± 0.518 (1.09) C:60% T:84% | pCi/L | 02/02/17 13:40 | 15262-20-1 | |
| Total Uranium | ASTM D5174-97 | 0.349 ± 0.007 (0.385) C:NA T:NA | ug/L | 02/14/17 06:59 | 7440-61-1 | |

Sample: C5Leach-0117 **Lab ID: 30207961003** Collected: 01/11/17 09:20 Received: 01/13/17 09:40 Matrix: Water
PWS: Site ID: Sample Type:

Comments: • The sampler's name and signature were not listed on the COC.
• The preservative type is not listed on the COC.

| Parameters | Method | Act ± Unc (MDC) Carr Trac | Units | Analyzed | CAS No. | Qual |
|--------------|-----------|--|-------|----------------|------------|------|
| Actinium-228 | EPA 901.1 | 0.000 ± 15.416 (37.910) C:NA T:NA | pCi/L | 01/31/17 13:54 | 14331-83-0 | |
| Bismuth-212 | EPA 901.1 | -37.313 ± 115.720 (122.900) C:NA T:NA | pCi/L | 01/31/17 13:54 | 14913-49-6 | |
| Bismuth-214 | EPA 901.1 | 1121.800 ± 125.350 (19.200) C:NA T:NA | pCi/L | 01/31/17 13:54 | 14733-03-0 | |
| Cesium-134 | EPA 901.1 | 0.000 ± 2.244 (11.500) C:NA T:NA | pCi/L | 01/31/17 13:54 | 13967-70-9 | |
| Cesium-137 | EPA 901.1 | 0.000 ± 3.445 (9.266) C:NA T:NA | pCi/L | 01/31/17 13:54 | 10045-97-3 | |
| Lead-212 | EPA 901.1 | 271.250 ± 56.691 (21.800) C:NA T:NA | pCi/L | 01/31/17 13:54 | 15092-94-1 | |
| Lead-214 | EPA 901.1 | 1178.100 ± 131.730 (22.720) C:NA T:NA | pCi/L | 01/31/17 13:54 | 15067-28-4 | |
| Potassium-40 | EPA 901.1 | 52.752 ± 89.716 (86.700) C:NA T:NA | pCi/L | 01/31/17 13:54 | 13966-00-2 | |
| Radium-226 | EPA 901.1 | 0.000 ± 73.104 (286.900) C:NA T:NA | pCi/L | 01/31/17 13:54 | 13982-63-3 | |
| Radium-228 | EPA 901.1 | 0.000 ± 15.416 (37.910) C:NA T:NA | pCi/L | 01/31/17 13:54 | 15262-20-1 | |
| Thallium-208 | EPA 901.1 | 0.000 ± 8.289 (10.490) C:NA T:NA | pCi/L | 01/31/17 13:54 | 14913-50-9 | |

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: R1700331
Pace Project No.: 30207961

Sample: C5Leach-0117 **Lab ID: 30207961003** Collected: 01/11/17 09:20 Received: 01/13/17 09:40 Matrix: Water
PWS: Site ID: Sample Type:

Comments: • The sampler's name and signature were not listed on the COC.
• The preservative type is not listed on the COC.

| Parameters | Method | Act ± Unc (MDC) Carr Trac | Units | Analyzed | CAS No. | Qual |
|---------------|---------------|---|-------|----------------|------------|------|
| Thorium-232 | EPA 901.1 | 0.000 ± 8315.100 (18160.000) C:NA T:NA | pCi/L | 01/31/17 13:54 | 7440-29-1 | |
| Thorium-234 | EPA 901.1 | 46.817 ± 778.480 (972.100) C:NA T:NA | pCi/L | 01/31/17 13:54 | 15065-10-8 | |
| Radium-226 | EPA 903.1 | 0.509 ± 0.399 (0.469) C:NA T:90% | pCi/L | 02/01/17 22:07 | 13982-63-3 | |
| Radium-228 | EPA 904.0 | 1.43 ± 0.708 (1.19) C:52% T:58% | pCi/L | 02/02/17 13:00 | 15262-20-1 | |
| Total Uranium | ASTM D5174-97 | 1.42 ± 0.028 (0.385) C:NA T:NA | ug/L | 02/14/17 07:02 | 7440-61-1 | |

Sample: C5Leach-0117 Dissolved **Lab ID: 30207961004** Collected: 01/11/17 09:20 Received: 01/13/17 09:40 Matrix: Water
PWS: Site ID: Sample Type:

Comments: • The sampler's name and signature were not listed on the COC.
• The preservative type is not listed on the COC.

| Parameters | Method | Act ± Unc (MDC) Carr Trac | Units | Analyzed | CAS No. | Qual |
|-----------------------|---------------|---|-------|----------------|------------|------|
| Actinium-228 | EPA 901.1 | 36.128 ± 41.448 (44.400) C:NA T:NA | pCi/L | 02/02/17 10:02 | 14331-83-0 | |
| Bismuth-212 | EPA 901.1 | 0.000 ± 78.817 (174.000) C:NA T:NA | pCi/L | 02/02/17 10:02 | 14913-49-6 | |
| Bismuth-214 | EPA 901.1 | 822.270 ± 99.895 (26.510) C:NA T:NA | pCi/L | 02/02/17 10:02 | 14733-03-0 | |
| Cesium-134 | EPA 901.1 | 1.864 ± 11.105 (12.460) C:NA T:NA | pCi/L | 02/02/17 10:02 | 13967-70-9 | |
| Cesium-137 | EPA 901.1 | 0.000 ± 4.127 (13.150) C:NA T:NA | pCi/L | 02/02/17 10:02 | 10045-97-3 | |
| Lead-212 | EPA 901.1 | 206.720 ± 44.087 (26.520) C:NA T:NA | pCi/L | 02/02/17 10:02 | 15092-94-1 | |
| Lead-214 | EPA 901.1 | 836.520 ± 99.625 (27.440) C:NA T:NA | pCi/L | 02/02/17 10:02 | 15067-28-4 | |
| Potassium-40 | EPA 901.1 | 0.000 ± 73.963 (180.000) C:NA T:NA | pCi/L | 02/02/17 10:02 | 13966-00-2 | |
| Radium-226 | EPA 901.1 | 0.000 ± 206.960 (342.100) C:NA T:NA | pCi/L | 02/02/17 10:02 | 13982-63-3 | |
| Radium-228 | EPA 901.1 | 36.128 ± 41.448 (44.400) C:NA T:NA | pCi/L | 02/02/17 10:02 | 15262-20-1 | |
| Thallium-208 | EPA 901.1 | 0.000 ± 6.658 (16.280) C:NA T:NA | pCi/L | 02/02/17 10:02 | 14913-50-9 | |
| Thorium-232 | EPA 901.1 | 4694.600 ± 7038.500 (8446.000) C:NA T:NA | pCi/L | 02/02/17 10:02 | 7440-29-1 | |
| Thorium-234 | EPA 901.1 | 0.000 ± 184.240 (526.600) C:NA T:NA | pCi/L | 02/02/17 10:02 | 15065-10-8 | |
| Radium-226, Dissolved | EPA 903.1 | 0.626 ± 0.497 (0.646) C:NA T:84% | pCi/L | 02/01/17 12:22 | 13982-63-3 | |
| Radium-228, Dissolved | EPA 904.0 | 0.502 ± 0.555 (1.16) C:63% T:67% | pCi/L | 02/02/17 13:40 | 15262-20-1 | |
| Total Uranium | ASTM D5174-97 | 2.08 ± 0.042 (0.385) C:NA T:NA | ug/L | 02/14/17 07:04 | 7440-61-1 | |

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: R1700331
Pace Project No.: 30207961

Sample: C3Leach-0117 **Lab ID: 30207961005** Collected: 01/11/17 10:30 Received: 01/13/17 09:40 Matrix: Water
PWS: Site ID: Sample Type:

Comments: • Upon receipt at the laboratory, 15 mls of nitric acid were added to the sample to meet the sample preservation requirement of pH <2 for radiochemistry analysis.
• The sampler's name and signature were not listed on the COC.
• The preservative type is not listed on the COC.

| Parameters | Method | Act ± Unc (MDC) Carr Trac | Units | Analyzed | CAS No. | Qual |
|---------------|---------------|--|-------|----------------|------------|------|
| Actinium-228 | EPA 901.1 | 0.000 ± 22.207 (51.270) C:NA T:NA | pCi/L | 02/01/17 09:50 | 14331-83-0 | |
| Bismuth-212 | EPA 901.1 | 75.318 ± 111.410 (122.200) C:NA T:NA | pCi/L | 02/01/17 09:50 | 14913-49-6 | |
| Bismuth-214 | EPA 901.1 | 181.150 ± 33.129 (19.260) C:NA T:NA | pCi/L | 02/01/17 09:50 | 14733-03-0 | |
| Cesium-134 | EPA 901.1 | 0.000 ± 3.184 (11.330) C:NA T:NA | pCi/L | 02/01/17 09:50 | 13967-70-9 | |
| Cesium-137 | EPA 901.1 | 0.000 ± 1.153 (10.300) C:NA T:NA | pCi/L | 02/01/17 09:50 | 10045-97-3 | |
| Lead-212 | EPA 901.1 | 35.567 ± 16.631 (22.380) C:NA T:NA | pCi/L | 02/01/17 09:50 | 15092-94-1 | |
| Lead-214 | EPA 901.1 | 201.720 ± 35.310 (21.740) C:NA T:NA | pCi/L | 02/01/17 09:50 | 15067-28-4 | |
| Potassium-40 | EPA 901.1 | 681.730 ± 156.460 (112.200) C:NA T:NA | pCi/L | 02/01/17 09:50 | 13966-00-2 | |
| Radium-226 | EPA 901.1 | 7.320 ± 192.700 (249.100) C:NA T:NA | pCi/L | 02/01/17 09:50 | 13982-63-3 | |
| Radium-228 | EPA 901.1 | 0.000 ± 22.207 (51.270) C:NA T:NA | pCi/L | 02/01/17 09:50 | 15262-20-1 | |
| Thallium-208 | EPA 901.1 | 0.000 ± 5.192 (14.180) C:NA T:NA | pCi/L | 02/01/17 09:50 | 14913-50-9 | |
| Thorium-232 | EPA 901.1 | 1751.600 ± 5279.100 (6465.000) C:NA T:NA | pCi/L | 02/01/17 09:50 | 7440-29-1 | |
| Thorium-234 | EPA 901.1 | 30.408 ± 295.820 (370.400) C:NA T:NA | pCi/L | 02/01/17 09:50 | 15065-10-8 | |
| Radium-226 | EPA 903.1 | 3.37 ± 1.71 (1.65) C:NA T:31% | pCi/L | 02/01/17 22:07 | 13982-63-3 | |
| Radium-228 | EPA 904.0 | 7.60 ± 2.49 (3.41) C:35% T:67% | pCi/L | 02/10/17 11:42 | 15262-20-1 | |
| Total Uranium | ASTM D5174-97 | 0.157 ± 0.003 (0.385) C:NA T:NA | ug/L | 02/14/17 07:07 | 7440-61-1 | |

Sample: C3Leach-0117 Dissolved **Lab ID: 30207961006** Collected: 01/11/17 10:30 Received: 01/13/17 09:40 Matrix: Water
PWS: Site ID: Sample Type:

Comments: • The sampler's name and signature were not listed on the COC.
• The preservative type is not listed on the COC.

| Parameters | Method | Act ± Unc (MDC) Carr Trac | Units | Analyzed | CAS No. | Qual |
|--------------|-----------|--|-------|----------------|------------|------|
| Actinium-228 | EPA 901.1 | 10.180 ± 27.577 (27.680) C:NA T:NA | pCi/L | 02/03/17 09:10 | 14331-83-0 | |
| Bismuth-212 | EPA 901.1 | 28.289 ± 82.623 (87.700) C:NA T:NA | pCi/L | 02/03/17 09:10 | 14913-49-6 | |
| Bismuth-214 | EPA 901.1 | 903.390 ± 100.400 (14.670) C:NA T:NA | pCi/L | 02/03/17 09:10 | 14733-03-0 | |
| Cesium-134 | EPA 901.1 | 0.000 ± 1.344 (9.660) C:NA T:NA | pCi/L | 02/03/17 09:10 | 13967-70-9 | |
| Cesium-137 | EPA 901.1 | 0.000 ± 3.015 (8.107) C:NA T:NA | pCi/L | 02/03/17 09:10 | 10045-97-3 | |

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: R1700331
Pace Project No.: 30207961

Sample: C3Leach-0117 Dissolved **Lab ID: 30207961006** Collected: 01/11/17 10:30 Received: 01/13/17 09:40 Matrix: Water
PWS: Site ID: Sample Type:

Comments: • The sampler's name and signature were not listed on the COC.
• The preservative type is not listed on the COC.

| Parameters | Method | Act ± Unc (MDC) Carr Trac | Units | Analyzed | CAS No. | Qual |
|-----------------------|---------------|--|-------|----------------|------------|------|
| Lead-212 | EPA 901.1 | 210.730 ± 44.821 (17.140) C:NA T:NA | pCi/L | 02/03/17 09:10 | 15092-94-1 | |
| Lead-214 | EPA 901.1 | 939.840 ± 104.490 (18.040) C:NA T:NA | pCi/L | 02/03/17 09:10 | 15067-28-4 | |
| Potassium-40 | EPA 901.1 | 714.700 ± 130.360 (75.970) C:NA T:NA | pCi/L | 02/03/17 09:10 | 13966-00-2 | |
| Radium-226 | EPA 901.1 | 70.104 ± 171.590 (208.200) C:NA T:NA | pCi/L | 02/03/17 09:10 | 13982-63-3 | |
| Radium-228 | EPA 901.1 | 10.180 ± 27.577 (27.680) C:NA T:NA | pCi/L | 02/03/17 09:10 | 15262-20-1 | |
| Thallium-208 | EPA 901.1 | 0.000 ± 5.903 (8.908) C:NA T:NA | pCi/L | 02/03/17 09:10 | 14913-50-9 | |
| Thorium-232 | EPA 901.1 | 0.000 ± 6046.900 (15080.000) C:NA T:NA | pCi/L | 02/03/17 09:10 | 7440-29-1 | |
| Thorium-234 | EPA 901.1 | 0.000 ± 225.390 (838.300) C:NA T:NA | pCi/L | 02/03/17 09:10 | 15065-10-8 | |
| Radium-226, Dissolved | EPA 903.1 | 2.71 ± 1.07 (0.911) C:NA T:77% | pCi/L | 02/01/17 12:22 | 13982-63-3 | |
| Radium-228, Dissolved | EPA 904.0 | 6.49 ± 3.44 (6.23) C:29% T:32% | pCi/L | 02/02/17 13:05 | 15262-20-1 | |
| Total Uranium | ASTM D5174-97 | 0.164 ± 0.003 (0.385) C:NA T:NA | ug/L | 02/14/17 07:09 | 7440-61-1 | |

Sample: C4Leach-0117 **Lab ID: 30207961007** Collected: 01/11/17 10:50 Received: 01/13/17 09:40 Matrix: Water
PWS: Site ID: Sample Type:

Comments: • Upon receipt at the laboratory, 3 mls of nitric acid were added to the sample to meet the sample preservation requirement of pH <2 for radiochemistry analysis.
• The sampler's name and signature were not listed on the COC.
• The preservative type is not listed on the COC.

| Parameters | Method | Act ± Unc (MDC) Carr Trac | Units | Analyzed | CAS No. | Qual |
|--------------|-----------|---|-------|----------------|------------|------|
| Actinium-228 | EPA 901.1 | 7.922 ± 24.467 (25.400) C:NA T:NA | pCi/L | 02/01/17 15:16 | 14331-83-0 | |
| Bismuth-212 | EPA 901.1 | -6.695 ± 71.139 (78.240) C:NA T:NA | pCi/L | 02/01/17 15:16 | 14913-49-6 | |
| Bismuth-214 | EPA 901.1 | 295.850 ± 39.015 (14.540) C:NA T:NA | pCi/L | 02/01/17 15:16 | 14733-03-0 | |
| Cesium-134 | EPA 901.1 | 0.000 ± 2.361 (8.428) C:NA T:NA | pCi/L | 02/01/17 15:16 | 13967-70-9 | |
| Cesium-137 | EPA 901.1 | 0.000 ± 2.066 (6.787) C:NA T:NA | pCi/L | 02/01/17 15:16 | 10045-97-3 | |
| Lead-212 | EPA 901.1 | 61.698 ± 34.623 (14.060) C:NA T:NA | pCi/L | 02/01/17 15:16 | 15092-94-1 | |
| Lead-214 | EPA 901.1 | 327.890 ± 42.738 (16.340) C:NA T:NA | pCi/L | 02/01/17 15:16 | 15067-28-4 | |
| Potassium-40 | EPA 901.1 | 657.680 ± 119.830 (66.280) C:NA T:NA | pCi/L | 02/01/17 15:16 | 13966-00-2 | |
| Radium-226 | EPA 901.1 | 0.000 ± 79.632 (192.300) C:NA T:NA | pCi/L | 02/01/17 15:16 | 13982-63-3 | |
| Radium-228 | EPA 901.1 | 7.922 ± 24.467 (25.400) C:NA T:NA | pCi/L | 02/01/17 15:16 | 15262-20-1 | |

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: R1700331
Pace Project No.: 30207961

Sample: C4Leach-0117 **Lab ID: 30207961007** Collected: 01/11/17 10:50 Received: 01/13/17 09:40 Matrix: Water
PWS: Site ID: Sample Type:

Comments: • Upon receipt at the laboratory, 3 mls of nitric acid were added to the sample to meet the sample preservation requirement of pH <2 for radiochemistry analysis.
• The sampler's name and signature were not listed on the COC.
• The preservative type is not listed on the COC.

| Parameters | Method | Act ± Unc (MDC) Carr Trac | Units | Analyzed | CAS No. | Qual |
|---------------|---------------|---|-------|----------------|------------|------|
| Thallium-208 | EPA 901.1 | 0.000 ± 1.940 (7.754) C:NA T:NA | pCi/L | 02/01/17 15:16 | 14913-50-9 | |
| Thorium-232 | EPA 901.1 | 0.000 ± 4993.400 (11830.000) C:NA T:NA | pCi/L | 02/01/17 15:16 | 7440-29-1 | |
| Thorium-234 | EPA 901.1 | 85.346 ± 103.910 (689.300) C:NA T:NA | pCi/L | 02/01/17 15:16 | 15065-10-8 | |
| Radium-226 | EPA 903.1 | 2.05 ± 2.03 (3.08) C:NA T:22% | pCi/L | 02/01/17 22:07 | 13982-63-3 | |
| Radium-228 | EPA 904.0 | 8.59 ± 2.26 (2.48) C:62% T:60% | pCi/L | 02/10/17 11:42 | 15262-20-1 | |
| Total Uranium | ASTM D5174-97 | 0.274 ± 0.005 (0.385) C:NA T:NA | ug/L | 02/14/17 07:11 | 7440-61-1 | |

Sample: C4Leach-0117 Dissolved **Lab ID: 30207961008** Collected: 01/11/17 10:50 Received: 01/13/17 09:40 Matrix: Water
PWS: Site ID: Sample Type:

Comments: • The sampler's name and signature were not listed on the COC.
• The preservative type is not listed on the COC.

| Parameters | Method | Act ± Unc (MDC) Carr Trac | Units | Analyzed | CAS No. | Qual |
|-----------------------|-----------|---|-------|----------------|------------|------|
| Actinium-228 | EPA 901.1 | 47.601 ± 22.389 (21.200) C:NA T:NA | pCi/L | 02/03/17 09:10 | 14331-83-0 | |
| Bismuth-212 | EPA 901.1 | 0.000 ± 64.471 (156.900) C:NA T:NA | pCi/L | 02/03/17 09:10 | 14913-49-6 | |
| Bismuth-214 | EPA 901.1 | 419.240 ± 54.878 (20.510) C:NA T:NA | pCi/L | 02/03/17 09:10 | 14733-03-0 | |
| Cesium-134 | EPA 901.1 | 0.000 ± 5.095 (10.810) C:NA T:NA | pCi/L | 02/03/17 09:10 | 13967-70-9 | |
| Cesium-137 | EPA 901.1 | 0.000 ± 2.385 (12.580) C:NA T:NA | pCi/L | 02/03/17 09:10 | 10045-97-3 | |
| Lead-212 | EPA 901.1 | 113.030 ± 29.478 (21.930) C:NA T:NA | pCi/L | 02/03/17 09:10 | 15092-94-1 | |
| Lead-214 | EPA 901.1 | 453.510 ± 57.749 (21.990) C:NA T:NA | pCi/L | 02/03/17 09:10 | 15067-28-4 | |
| Potassium-40 | EPA 901.1 | 583.310 ± 146.910 (126.300) C:NA T:NA | pCi/L | 02/03/17 09:10 | 13966-00-2 | |
| Radium-226 | EPA 901.1 | 0.000 ± 162.780 (277.300) C:NA T:NA | pCi/L | 02/03/17 09:10 | 13982-63-3 | |
| Radium-228 | EPA 901.1 | 47.601 ± 22.389 (21.200) C:NA T:NA | pCi/L | 02/03/17 09:10 | 15262-20-1 | |
| Thallium-208 | EPA 901.1 | 3.302 ± 10.705 (12.380) C:NA T:NA | pCi/L | 02/03/17 09:10 | 14913-50-9 | |
| Thorium-232 | EPA 901.1 | 3836.600 ± 5752.100 (6903.000) C:NA T:NA | pCi/L | 02/03/17 09:10 | 7440-29-1 | |
| Thorium-234 | EPA 901.1 | 3.481 ± 331.010 (405.700) C:NA T:NA | pCi/L | 02/03/17 09:10 | 15065-10-8 | |
| Radium-226, Dissolved | EPA 903.1 | 4.40 ± 1.20 (0.499) C:NA T:85% | pCi/L | 02/01/17 12:22 | 13982-63-3 | |

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: R1700331

Pace Project No.: 30207961

Sample: C4Leach-0117 Dissolved **Lab ID: 30207961008** Collected: 01/11/17 10:50 Received: 01/13/17 09:40 Matrix: Water
PWS: Site ID: Sample Type:

Comments: • The sampler's name and signature were not listed on the COC.
• The preservative type is not listed on the COC.

| Parameters | Method | Act ± Unc (MDC) Carr Trac | Units | Analyzed | CAS No. | Qual |
|-----------------------|---------------|--|-------|----------------|------------|------|
| Radium-228, Dissolved | EPA 904.0 | 5.17 ± 1.34 (1.31) C:71% T:52% | pCi/L | 02/02/17 13:05 | 15262-20-1 | |
| Total Uranium | ASTM D5174-97 | 0.162 ± 0.003 (0.385) C:NA T:NA | ug/L | 02/14/17 07:14 | 7440-61-1 | |

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QUALITY CONTROL - RADIOCHEMISTRY

Project: R1700331
Pace Project No.: 30207961

QC Batch: 247548 Analysis Method: EPA 901.1
QC Batch Method: EPA 901.1 Analysis Description: 901.1 Gamma Spec
Associated Lab Samples: 30207961001, 30207961002, 30207961003

METHOD BLANK: 1217343 Matrix: Water
Associated Lab Samples: 30207961001, 30207961002, 30207961003

| Parameter | Act ± Unc (MDC) Carr Trac | Units | Analyzed | Qualifiers |
|--------------|--|-------|----------------|------------|
| Actinium-228 | 0.000 ± 8.992 (21.300) C:NA T:NA | pCi/L | 01/27/17 10:54 | |
| Bismuth-212 | 37.966 ± 40.658 (39.930) C:NA T:NA | pCi/L | 01/27/17 10:54 | |
| Bismuth-214 | 8.366 ± 11.469 (11.440) C:NA T:NA | pCi/L | 01/27/17 10:54 | |
| Cesium-134 | 0.000 ± 0.945 (5.514) C:NA T:NA | pCi/L | 01/27/17 10:54 | |
| Cesium-137 | -1.014 ± 4.532 (4.986) C:NA T:NA | pCi/L | 01/27/17 10:54 | |
| Lead-212 | 9.097 ± 17.851 (8.586) C:NA T:NA | pCi/L | 01/27/17 10:54 | |
| Lead-214 | 11.414 ± 10.112 (10.840) C:NA T:NA | pCi/L | 01/27/17 10:54 | |
| Potassium-40 | 0.000 ± 9.473 (68.940) C:NA T:NA | pCi/L | 01/27/17 10:54 | |
| Radium-226 | 0.000 ± 46.406 (115.800) C:NA T:NA | pCi/L | 01/27/17 10:54 | |
| Radium-228 | 0.000 ± 8.992 (21.300) C:NA T:NA | pCi/L | 01/27/17 10:54 | |
| Thallium-208 | 5.075 ± 5.068 (4.683) C:NA T:NA | pCi/L | 01/27/17 10:54 | |
| Thorium-232 | 4504.200 ± 5086.300 (6109.000) C:NA T:NA | pCi/L | 01/27/17 10:54 | |
| Thorium-234 | 98.642 ± 296.570 (382.500) C:NA T:NA | pCi/L | 01/27/17 10:54 | |

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

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QUALITY CONTROL - RADIOCHEMISTRY

Project: R1700331

Pace Project No.: 30207961

QC Batch: 247265

Analysis Method: EPA 904.0

QC Batch Method: EPA 904.0

Analysis Description: 904.0 Radium 228

Associated Lab Samples: 30207961003

METHOD BLANK: 1216052

Matrix: Water

Associated Lab Samples: 30207961003

| Parameter | Act ± Unc (MDC) Carr Trac | Units | Analyzed | Qualifiers |
|------------|------------------------------------|-------|----------------|------------|
| Radium-228 | 0.0209 ± 0.409 (0.933) C:47% T:76% | pCi/L | 02/02/17 13:00 | |

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QUALITY CONTROL - RADIOCHEMISTRY

Project: R1700331
Pace Project No.: 30207961

QC Batch: 247999 Analysis Method: EPA 901.1
QC Batch Method: EPA 901.1 Analysis Description: 901.1 Gamma Spec
Associated Lab Samples: 30207961004, 30207961005, 30207961006, 30207961007, 30207961008

METHOD BLANK: 1219796 Matrix: Water
Associated Lab Samples: 30207961004, 30207961005, 30207961006, 30207961007, 30207961008

| Parameter | Act ± Unc (MDC) Carr Trac | Units | Analyzed | Qualifiers |
|--------------|---|-------|----------------|------------|
| Actinium-228 | 7.940 ± 11.699 (17.100) C:NA T:NA | pCi/L | 01/31/17 17:12 | |
| Bismuth-212 | 61.869 ± 50.772 (53.840) C:NA T:NA | pCi/L | 01/31/17 17:12 | |
| Bismuth-214 | 0.000 ± 6.933 (14.130) C:NA T:NA | pCi/L | 01/31/17 17:12 | |
| Cesium-134 | 0.000 ± 3.011 (6.248) C:NA T:NA | pCi/L | 01/31/17 17:12 | |
| Cesium-137 | 0.349 ± 3.952 (4.339) C:NA T:NA | pCi/L | 01/31/17 17:12 | |
| Lead-212 | 0.000 ± 8.841 (8.442) C:NA T:NA | pCi/L | 01/31/17 17:12 | |
| Lead-214 | 0.000 ± 4.580 (10.810) C:NA T:NA | pCi/L | 01/31/17 17:12 | |
| Potassium-40 | 0.000 ± 26.231 (62.860) C:NA T:NA | pCi/L | 01/31/17 17:12 | |
| Radium-226 | 0.000 ± 62.516 (130.500) C:NA T:NA | pCi/L | 01/31/17 17:12 | |
| Radium-228 | 7.940 ± 11.699 (17.100) C:NA T:NA | pCi/L | 01/31/17 17:12 | |
| Thallium-208 | 0.000 ± 1.568 (4.991) C:NA T:NA | pCi/L | 01/31/17 17:12 | |
| Thorium-232 | 1840.800 ± 6001.700 (7506.000) C:NA T:NA | pCi/L | 01/31/17 17:12 | |
| Thorium-234 | 80.193 ± 328.990 (423.000) C:NA T:NA | pCi/L | 01/31/17 17:12 | |

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QUALITY CONTROL - RADIOCHEMISTRY

Project: R1700331
Pace Project No.: 30207961

QC Batch: 247263 Analysis Method: EPA 903.1
QC Batch Method: EPA 903.1 Analysis Description: 903.1 Radium-226
Associated Lab Samples: 30207961001, 30207961003, 30207961005, 30207961007

METHOD BLANK: 1216051 Matrix: Water
Associated Lab Samples: 30207961001, 30207961003, 30207961005, 30207961007

| Parameter | Act ± Unc (MDC) Carr Trac | Units | Analyzed | Qualifiers |
|------------|-----------------------------------|-------|----------------|------------|
| Radium-226 | -0.117 ± 0.281 (0.701) C:NA T:96% | pCi/L | 02/01/17 20:39 | |

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL - RADIOCHEMISTRY

Project: R1700331

Pace Project No.: 30207961

| | | | |
|-------------------------|--|-----------------------|-----------------------------|
| QC Batch: | 247392 | Analysis Method: | EPA 904.0 |
| QC Batch Method: | EPA 904.0 | Analysis Description: | 904.0 Radium 228, Dissolved |
| Associated Lab Samples: | 30207961002, 30207961004, 30207961006, 30207961008 | | |

| | | | |
|-------------------------|--|---------|-------|
| METHOD BLANK: | 1216576 | Matrix: | Water |
| Associated Lab Samples: | 30207961002, 30207961004, 30207961006, 30207961008 | | |

| Parameter | Act ± Unc (MDC) Carr Trac | Units | Analyzed | Qualifiers |
|-----------------------|------------------------------------|-------|----------------|------------|
| Radium-228, Dissolved | 0.0620 ± 0.316 (0.727) C:64% T:86% | pCi/L | 02/02/17 13:00 | |

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL - RADIOCHEMISTRY

Project: R1700331

Pace Project No.: 30207961

QC Batch: 247391

Analysis Method: EPA 903.1

QC Batch Method: EPA 903.1

Analysis Description: 903.1 Radium-226, Dissolved

Associated Lab Samples: 30207961002, 30207961004, 30207961006, 30207961008

METHOD BLANK: 1216575

Matrix: Water

Associated Lab Samples: 30207961002, 30207961004, 30207961006, 30207961008

| Parameter | Act ± Unc (MDC) Carr Trac | Units | Analyzed | Qualifiers |
|-----------------------|-----------------------------------|-------|----------------|------------|
| Radium-226, Dissolved | 0.0689 ± 0.314 (0.639) C:NA T:82% | pCi/L | 02/01/17 12:06 | |

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

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QUALITY CONTROL - RADIOCHEMISTRY

Project: R1700331

Pace Project No.: 30207961

| | | | |
|-------------------------|--|-----------------------|----------------------------|
| QC Batch: | 247601 | Analysis Method: | ASTM D5174-97 |
| QC Batch Method: | ASTM D5174-97 | Analysis Description: | D5174.97 Total Uranium KPA |
| Associated Lab Samples: | 30207961001, 30207961002, 30207961003, 30207961004, 30207961005, 30207961006, 30207961007, 30207961008 | | |

| | | | |
|-------------------------|--|---------|-------|
| METHOD BLANK: | 1217700 | Matrix: | Water |
| Associated Lab Samples: | 30207961001, 30207961002, 30207961003, 30207961004, 30207961005, 30207961006, 30207961007, 30207961008 | | |

| Parameter | Act ± Unc (MDC) Carr Trac | Units | Analyzed | Qualifiers |
|---------------|---------------------------------|-------|----------------|------------|
| Total Uranium | 0.067 ± 0.004 (0.193) C:NA T:NA | ug/L | 02/01/17 16:42 | |

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL - RADIOCHEMISTRY

Project: R1700331

Pace Project No.: 30207961

QC Batch: 248478

Analysis Method: EPA 904.0

QC Batch Method: EPA 904.0

Analysis Description: 904.0 Radium 228

Associated Lab Samples: 30207961001, 30207961005, 30207961007

METHOD BLANK: 1222237

Matrix: Water

Associated Lab Samples: 30207961001, 30207961005, 30207961007

| Parameter | Act ± Unc (MDC) Carr Trac | Units | Analyzed | Qualifiers |
|------------|-----------------------------------|-------|----------------|------------|
| Radium-228 | 0.254 ± 0.417 (0.906) C:68% T:76% | pCi/L | 02/10/17 11:42 | |

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

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QUALIFIERS

Project: R1700331
Pace Project No.: 30207961

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Act - Activity

Unc - Uncertainty: SDWA = 1.96 sigma count uncertainty, all other matrices = Expanded Uncertainty (95% confidence interval).

Gamma Spec = Expanded Uncertainty (95.4% Confidence Interval)

(MDC) - Minimum Detectable Concentration

Trac - Tracer Recovery (%)

Carr - Carrier Recovery (%)

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

REPORT OF LABORATORY ANALYSIS

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ALS Environmental Chain of Custody

1565 Jefferson Rd, Building 300 • Rochester, NY 14623 • 585-288-5380 • FAX 585-288-8475

ALS Contact: Janice Jaeger

Project Number: R1700331
 Project Manager: Janice Jaeger
 QAP: LAB QAP

| Lab Code | Sample ID | # of Cont. | Matrix | Sample | | Lab ID | Gamma Spec 901.1 | Nat U 908.0 | Radium 226 903.1 | Radium 228 904.0 |
|--------------|------------------------|------------|--------|---------|------|---------|------------------|-------------|------------------|------------------|
| | | | | Date | Time | | | | | |
| R1700331-001 | LP-0117 | 5 | Water | 1/11/17 | 1130 | Pace PA | X | X | X | X |
| R1700331-002 | LP-0117 Dissolved | | Water | 1/11/17 | 1130 | Pace PA | X | X | X | X |
| R1700331-003 | C5Leach-0117 | | Water | 1/11/17 | 0920 | Pace PA | X | X | X | X |
| R1700331-004 | C5Leach-0117 Dissolved | | Water | 1/11/17 | 0920 | Pace PA | X | X | X | X |
| R1700331-005 | C1Leach-0117 | | Water | 1/11/17 | 1030 | Pace PA | X | X | X | X |
| R1700331-006 | C1Leach-0117 Dissolved | | Water | 1/11/17 | 1030 | Pace PA | X | X | X | X |
| R1700331-007 | C4Leach-0117 | | Water | 1/11/17 | 1050 | Pace PA | X | X | X | X |
| R1700331-008 | C4Leach-0117 Dissolved | | Water | 1/11/17 | 1050 | Pace PA | X | X | X | X |

WO#: 30207961



Sample Requires In-Lab Filtering
 Sample Requires In-Lab Filtering
 Sample Requires In-Lab Filtering

R1700331-002,4,6,8
 R1700331-002,4,6,8
 R1700331-002,4,6,8

Test Comments
 Gamma Spec - 901.1
 Radium 226 - 903.1
 Radium 228 - 904.0

of 42

| | | | |
|--|---|--|---------------------|
| Special Instructions/Comments | Turnaround Requirements | Report Requirements | Invoice Information |
| | RUSH (Surcharges Apply) PLEASE CIRCLE WORK DAYS 1 2 3 4 5 STANDARD Requested FAX Date: _____ Requested Report Date: 01/20/17 | I. Results Only II. Results + QC Summaries III. Results + QC and Calibration Summaries IV. Data Validation Report with Raw Data PQL/MDL/J <u>N</u> EDD <u>Y</u> | |
| NPDES H - Test is On Hold P - Test is Authorized for Prep Only | Received By: <i>Michael J. ...</i> 1-15-17 Airbill Number: 940 | | |

ALS Environmental Chain of Custody

1565 Jefferson Rd, Building 300 • Rochester, NY 14623 • 585-288-5380 • FAX 585-288-8475

ALS Contact: Janice Jaeger

Project Number: R1700331
Project Manager: Janice Jaeger
QAP: LAB QAP

Test Comments
 Nat U - 908.0

Sample Requires In-Lab Filtering

Folder Comments:

Gamma Isotope list-Rad 226&228, Actinium 228, Bismuth 212&214, Cesium 134&137, Lead 212&214, Potassium 40, Thallium 208, Thorium 232&234

| | | | |
|---|--|--|--|
| <p>Special Instructions/Comments</p> <p>H - Test is On Hold P - Test is Authorized for Prep Only</p> <p>NPDES</p> | <p>Turnaround Requirements</p> <p>_____ RUSH (Surcharges Apply)</p> <p>PLEASE CIRCLE WORK DAYS 1 2 3 4 5</p> <p>_____ STANDARD</p> <p>Requested FAX Date: _____</p> <p>Requested Report Date: 01/20/17</p> | <p>Report Requirements</p> <p>_____ I. Results Only</p> <p>_____ II. Results + QC Summaries</p> <p>_____ III. Results + QC and Calibration Summaries</p> <p>_____ IV. Data Validation Report with Raw Data</p> <p>PQL/MDL/ J N Y EDD Y Y</p> | <p>Invoice Information</p> <p>PO# 58R1700331</p> <p>Bill to _____</p> |
|---|--|--|--|

Relinquished By: *Janice Jaeger* Received By: _____
 1/21/17 1328

Airbill Number: _____

Sample Condition Upon Receipt Pittsburgh



Client Name: ALS Env.

Project # 30207961

Courier: Fed Ex UPS USPS Client Commercial Pace Other _____

Tracking #: 6826 8017 9989

Custody Seal on Cooler/Box Present: yes no Seals Intact: yes no

Thermometer Used _____ Type of Ice: Wet Blue None

Cooler Temperature Observed Temp N/A °C Correction Factor: _____ °C Final Temp: _____ °C
Temp should be above freezing to 6°C

Date and Initials of person examining contents: ML 1-13-17

| Comments: | Yes | No | N/A | |
|--|-------------------------------------|-------------------------------------|-------------------------------------|--|
| Chain of Custody Present: | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | 1. |
| Chain of Custody Filled Out: | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | 2. |
| Chain of Custody Relinquished: | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | 3. |
| Sampler Name & Signature on COC: | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | 4. |
| Sample Labels match COC: | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | 5. |
| -Includes date/time/ID Matrix: <u>Lt</u> | | | | |
| Samples Arrived within Hold Time: | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 6. |
| Short Hold Time Analysis (<72hr remaining): | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | 7. |
| Rush Turn Around Time Requested: | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | 8. |
| Sufficient Volume: | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 9. |
| Correct Containers Used: | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 10. |
| -Pace Containers Used: | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | |
| Containers Intact: | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 11. |
| Orthophosphate field filtered | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | 12. |
| Organic Samples checked for dechlorination: | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | 13. |
| Filtered volume received for Dissolved tests | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | 14. |
| All containers have been checked for preservation. | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 15. <u>added 3 ML HNO₃ to samples 1 + 7</u> |
| All containers needing preservation are found to be in compliance with EPA recommendation. | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <u>added 15 ML HNO₃ to sample 5</u> |
| exceptions: VOA, coliform, TOC, O&G, Phenolics | | | | Initial when completed: <u>ML</u> Date/time of preservation: <u>1-13-17 1640</u> |
| | | | | Lot # of added preservative: <u>DL17-0059</u> |
| Headspace in VOA Vials (>6mm): | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | 16. |
| Trip Blank Present: | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | 17. |
| Trip Blank Custody Seals Present | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | |
| Rad Aqueous Samples Screened > 0.5 mrem/hr | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Initial when completed: <u>ML</u> Date: <u>1-13-17</u> |

Client Notification/ Resolution:

Person Contacted: _____ Date/Time: _____ Contacted By: _____

Comments/ Resolution: _____

A check in this box indicates that additional information has been stored in ereports.

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers)

*PM review is documented electronically in LIMS. When the Project Manager closes the SRF Review schedule in LIMS. The review is in the Status section of the Workorder Edit Screen.