**Legend**

Sample Locations

N

0 10 20 40 60 80 Feet

**Weston Solutions, Inc.**

In association with
Scientific and Environmental Associates, Inc.,
Avatar Environmental, LLC, Environmental Compliance Consultants,
On-Site Environmental, Inc., and Sovereign Consulting, Inc.

DATE MODIFIED: 6/27/2017

**Figure 4:**
**Test Pit Sample Location Map**

738 UPPER MOUNTAIN ROAD
LEWISTON, NEW YORK

U.S. ENVIRONMENTAL PROTECTION AGENCY
REMOVAL SUPPORT TEAM 3
CONTRACT # EP-S2-14-01

| | |
|---|---|
| GIS ANALYST: | P. BUSTER |
| EPA OSC: | E. DALY |
| RST SPM: | B. NWOSU |
| FILENAME: | 170428_Figure_4_TP_Map.mxd |

**Table 1: Soil Sample Collection and Test Pit Geological Log Table**
**738 Upper Mountain Road Site**
**Lewiston, Niagara County, New York**
**November 18, 2016**

| Sampling Date | Sampling Location | RST 3 Sample Number | Sampling Depth Intervals (inches) | Sample Type | Analyses | Test Pit Depth Intervals (inches) | Test Pit Geological Log |
|---|---|---|---|---|---|---|---|
| 11/18/2016 | UMR001-S001 | UMR001-S001-0006-01 | 0-6 | Field Sample | Gamma Spectroscopy<br>Isotopic Uranium<br>Isotopic Thorium | 0 - 1 | Moist dark brown silty fine SAND, little fine to medium gravel, trace organic (roots). |
| | | UMR001-S001-0612-01* | 6 - 12 | Field Sample | | 1 - 8 | Moist dark brown silty fine SAND, little fine to medium gravel, little clay, trace roots. |
| | | UMR001-S001-0612-02 | 6 - 12 | Field Duplicate | | | |
| | | UMR001-S001-1218-01 | 12 - 18 | Field Sample | | 8 - 18 | Moist brown silty CLAY. |
| | | UMR001-S001-1824-01 | 18 - 24 | Field Sample | | 18 - 24 | Brown silty stiff CLAY. |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |

***Notes:***

RST 3 - Removal Support Team 3

*Matrix Spike/Matrix Spike Duplicate Sample

# Table 2: Preliminary Soil Analytical and Screening Results Summary Table - Radioisotopes
## 738 Upper Mountain Road Site
## Upper Mountain Road, Lewiston, New York
## November 18, 2016

| | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | RST 3 Sample No. | | UMR001-S001-0006-01 | | | | | UMR001-S001-0612-01 | | | | | UMR001-S001-0612-02 | | | | | UMR001-S001-1218-01 | | | | | UMR001-S001-1824-01 | | | | |
| | Sample Depth (inches) | | 0-6 | | | | | 6-12 | | | | | 6-12 | | | | | 12-18 | | | | | 18-24 | | | | |
| | Sample Matrix | | Soil | | | | | Soil | | | | | Soil | | | | | Soil | | | | | Soil | | | | |
| | Sample Date | | 11/18/2016 | | | | | 11/18/2016 | | | | | 11/18/2016 | | | | | 11/18/2016 | | | | | 11/18/2016 | | | | |
| | Data Type | | Laboratory Analysis | | | HPGe Screening | | Laboratory Analysis | | | HPGe Screening | | Laboratory Analysis | | | HPGe Screening | | Laboratory Analysis | | | HPGe Screening | | Laboratory Analysis | | | HPGe Screening | |
| | Sample Result | | Value (pCi/g) | Qualifier | Total Uncertainty | Value (pCi/g) | Total Uncertainty | Value (pCi/g) | Qualifier | Total Uncertainty | Value (pCi/g) | Total Uncertainty | Value (pCi/g) | Qualifier | Total Uncertainty | Value (pCi/g) | Total Uncertainty | Value (pCi/g) | Qualifier | Total Uncertainty | Value (pCi/g) | Total Uncertainty | Value (pCi/g) | Qualifier | Total Uncertainty | Value (pCi/g) | Total Uncertainty |
| **Radioisotope** | **Analytical Method** | **[1]EPA SSAL** | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Actinium-228 (Ac-228) | NA | | NA | | NA | 0.657 | 0.047 | NA | | NA | 0.960 | 0.048 | NA | | NA | 0.877 | 0.054 | NA | | NA | 0.896 | 0.045 | NA | | NA | 1.057 | 0.054 |
| Bismuth-212 (Bi-212) | EPA 901.1 | | 2.423 | | 1.802 | 0.939 | 0.183 | 1.070 | | 1.083 | 1.183 | 0.202 | 2.492 | | 1.305 | 1.096 | 0.192 | 0.000 | | 1.761 | 0.937 | 0.211 | 1.763 | | 2.337 | 1.333 | 0.246 |
| Cesium-137 (Cs-137) | EPA 901.1 | | 0.489 | | 0.159 | 0.157 | 0.012 | 0.299 | | 0.095 | 0.059 | 0.014 | 0.072 | | 0.112 | 0.077 | 0.017 | 0.000 | | 0.027 | NA | NA | -0.0030 | | 0.148 | NA | NA |
| Lead-212 (Pb-212) | EPA 901.1 | | 1.228 | | 0.326 | 0.707 | 0.037 | 1.425 | | 0.323 | 0.943 | 0.046 | 1.628 | | 0.307 | 0.958 | 0.047 | 1.605 | | 0.358 | 0.914 | 0.044 | 1.541 | | 0.333 | 1.062 | 0.048 |
| Potassium-40 (K-40) | EPA 901.1 | | 17.298 | | 3.990 | 10.992 | 0.483 | 17.073 | | 4.240 | 15.906 | 0.637 | 21.129 | | 3.507 | 14.751 | 0.606 | 29.001 | | 5.508 | 18.677 | 0.686 | 27.280 | | 4.720 | 21.703 | 0.767 |
| Protactinium-234M | EPA 901.1 | | 0.000 | | 4.030 | NA | NA | 13.308 | | 7.356 | NA | NA | 2.622 | | 12.084 | NA | NA | 8.501 | | 14.801 | NA | NA | 2.305 | | 15.326 | NA | NA |
| Radium-226* (Ra-226) | EPA 901.1 | | 1.326 | | 0.371 | 1.536 | 0.305 | 1.353 | | 0.322 | 1.561 | 0.353 | 1.122 | | 0.280 | 1.994 | 0.407 | 1.252 | | 0.361 | 2.248 | 0.351 | 1.516 | | 0.334 | 1.619 | 0.323 |
| Radium-228 (Ra-228) | EPA 901.1 | | 1.248 | | 0.564 | NA | NA | 1.922 | | 0.484 | NA | NA | 1.241 | | 0.339 | NA | NA | 2.567 | | 0.629 | NA | NA | 1.546 | | 0.394 | NA | NA |
| Thallium-208 (Tl-208) | EPA 901.1 | | 0.387 | | 0.214 | 0.224 | 0.020 | 0.551 | | 0.177 | 0.329 | 0.024 | 0.561 | | 0.145 | 0.307 | 0.0253 | 0.400 | | 0.268 | 0.342 | 0.022 | 0.728 | | 0.182 | 0.338 | 0.024 |
| Thorium-228 (Th-228) | EPA 901.1 | | 2.974 | | 5.663 | NA | NA | 1.060 | | 11.237 | NA | NA | 5.170 | | 8.934 | NA | NA | 4.039 | | 7.337 | NA | NA | 2.949 | | 11.117 | NA | NA |
| Thorium-234 (Th-234) | EPA 901.1 | | 0.509 | | 2.833 | 0.692 | 0.193 | 3.583 | | 3.207 | NA | NA | 2.398 | | 2.263 | 1.853 | 0.260 | 3.483 | | 2.714 | NA | NA | 2.952 | | 1.438 | 1.716 | 0.236 |
| Uranium-235 (U-235) | EPA 901.1 | | 0.000 | | 0.665 | NA | NA | 0.000 | | 0.574 | NA | NA | 0.703 | | 1.141 | NA | NA | 0.51 | | 0.605 | NA | NA | 0.000 | | 0.732 | NA | NA |
| Thorium-228 (Th-228) | HSL-300 | | 1.22 | | 0.367 | NA | NA | 1.260 | | 0.380 | NA | NA | 1.49 | | 0.514 | NA | NA | 1.510 | | 0.411 | NA | NA | 1.23 | | 0.385 | NA | NA |
| Thorium-230 (Th-230) | HSL-300 | | 1.31 | | 0.364 | NA | NA | 0.892 | | 0.289 | NA | NA | 0.976 | | 0.363 | NA | NA | 0.999 | | 0.305 | NA | NA | 1.34 | | 0.379 | NA | NA |
| Thorium-232 (Th-232) | HSL-300 | | 0.668 | | 0.237 | NA | NA | 0.861 | | 0.281 | NA | NA | 1.14 | | 0.394 | NA | NA | 1.08 | | 0.316 | NA | NA | 1.59 | | 0.422 | NA | NA |
| U-233/234 | HSL-300 | | 0.823 | | 0.239 | NA | NA | 0.697 | | 0.236 | NA | NA | 0.935 | | 0.313 | NA | NA | 1.23 | | 0.319 | NA | NA | 1.37 | | 0.347 | NA | NA |
| U-235/236 | HSL-300 | | 0.095 | | 0.081 | NA | NA | 0.019 | | 0.073 | NA | NA | -0.006 | | 0.091 | NA | NA | 0.081 | | 0.08 | NA | NA | 0.070 | | 0.083 | NA | NA |
| Uranium-238 (U-238) | HSL-300 | | 0.709 | | 0.216 | NA | NA | 0.960 | | 0.287 | NA | NA | 0.841 | | 0.285 | NA | NA | 0.991 | | 0.275 | NA | NA | 1.3 | | 0.333 | NA | NA |

**Notes:**
RST 3 - Removal Support Team 3.
No. - Number, NA - Not applicable.
Radium-226* analyzed via 21 days ingrowth.
Screening data collected using High Purity Germanium (HPGe) detector.
pCi/g - picocuries per gram
[1]U.S. Environmental Protection Agency (EPA) Site-Specific Action Level (SSAL) values are presented in pCi/g.
**Values in red equal or exceed the EPA SSAL for the respective radioisotope.**

Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

February 10, 2017

Smita Sumbaly
Weston Solutions, Inc
1090 King Georges Post Road
Edison, NJ 08837

RE: Project: Case#: 416
Pace Project No.: 30204854

Dear Smita Sumbaly:
Enclosed are the analytical results for sample(s) received by the laboratory on December 08, 2016. 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

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**REPORT OF LABORATORY ANALYSIS**

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## CERTIFICATIONS

Project: Case#: 416
Pace Project No.: 30204854

**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

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## SAMPLE SUMMARY

Project: Case#: 416
Pace Project No.: 30204854

| Lab ID | Sample ID | Matrix | Date Collected | Date Received |
|---|---|---|---|---|
| 30204854001 | UMR001-S001-0006-01 | Solid | 11/18/16 09:58 | 12/08/16 10:20 |
| 30204854002 | UMR001-S001-0612-01 | Solid | 11/18/16 09:55 | 12/08/16 10:20 |
| 30204854003 | UMR001-S001-0612-01 | Solid | 11/18/16 09:55 | 12/08/16 10:20 |
| 30204854004 | UMR001-S001-0612-02 | Solid | 11/18/16 09:55 | 12/08/16 10:20 |
| 30204854005 | UMR001-S001-1218-01 | Solid | 11/18/16 09:50 | 12/08/16 10:20 |
| 30204854006 | UMR001-S001-1824-01 | Solid | 11/18/16 09:45 | 12/08/16 10:20 |
| 30204854007 | UMR001-S002-0006-01 | Solid | 11/18/16 10:40 | 12/08/16 10:20 |
| 30204854008 | UMR001-S002-0612-01 | Solid | 11/18/16 10:38 | 12/08/16 10:20 |
| 30204854009 | UMR001-S002-1218-01 | Solid | 11/18/16 10:35 | 12/08/16 10:20 |
| 30204854010 | UMR001-S002-1824-01 | Solid | 11/18/16 10:30 | 12/08/16 10:20 |
| 30204854011 | UMR001-S003-0006-01 | Solid | 11/18/16 11:25 | 12/08/16 10:20 |
| 30204854012 | UMR001-S003-0612-01 | Solid | 11/18/16 11:22 | 12/08/16 10:20 |
| 30204854013 | UMR001-S003-1218-01 | Solid | 11/18/16 11:18 | 12/08/16 10:20 |
| 30204854014 | UMR001-S003-1824-01 | Solid | 11/18/16 11:15 | 12/08/16 10:20 |
| 30204854015 | UMR001-S004-0006-01 | Solid | 11/18/16 12:30 | 12/08/16 10:20 |
| 30204854016 | UMR001-S004-0612-01 | Solid | 11/18/16 12:25 | 12/08/16 10:20 |
| 30204854017 | UMR001-S004-1218-01 | Solid | 11/18/16 12:22 | 12/08/16 10:20 |
| 30204854018 | UMR001-S004-1824-01 | Solid | 11/18/16 12:20 | 12/08/16 10:20 |

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# SAMPLE ANALYTE COUNT

Project: Case#: 416
Pace Project No.: 30204854

| Lab ID | Sample ID | Method | Analysts | Analytes Reported |
|---|---|---|---|---|
| 30204854001 | UMR001-S001-0006-01 | HSL-300 | LAL | 6 |
| 30204854002 | UMR001-S001-0612-01 | HSL-300 | LAL | 6 |
| 30204854003 | UMR001-S001-0612-01 | HSL-300 | LAL | 3 |
| 30204854004 | UMR001-S001-0612-02 | HSL-300 | LAL | 3 |
| 30204854005 | UMR001-S001-1218-01 | HSL-300 | LAL | 6 |
| 30204854006 | UMR001-S001-1824-01 | HSL-300 | LAL | 6 |
| 30204854007 | UMR001-S002-0006-01 | HSL-300 | LAL | 6 |
| 30204854008 | UMR001-S002-0612-01 | HSL-300 | LAL | 6 |
| 30204854009 | UMR001-S002-1218-01 | HSL-300 | LAL | 6 |
| 30204854010 | UMR001-S002-1824-01 | HSL-300 | LAL | 6 |
| 30204854011 | UMR001-S003-0006-01 | HSL-300 | LAL | 6 |
| 30204854012 | UMR001-S003-0612-01 | HSL-300 | LAL | 6 |
| 30204854013 | UMR001-S003-1218-01 | HSL-300 | LAL | 6 |
| 30204854014 | UMR001-S003-1824-01 | HSL-300 | LAL | 6 |
| 30204854015 | UMR001-S004-0006-01 | HSL-300 | LAL | 6 |
| 30204854016 | UMR001-S004-0612-01 | HSL-300 | LAL | 6 |
| 30204854017 | UMR001-S004-1218-01 | HSL-300 | LAL | 6 |
| 30204854018 | UMR001-S004-1824-01 | HSL-300 | LAL | 6 |

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# PROJECT NARRATIVE

Project: Case#: 416
Pace Project No.: 30204854

**Method:** **HSL-300**
**Description:** HSL300(AS) Actinides
**Client:** Weston Solutions, Inc. (NJ)
**Date:** February 10, 2017

**General Information:**
18 samples were analyzed for HSL-300. 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:**

Analyte Comments:

QC Batch: 248114

1c: The alpha spectroscopy spectrum for this analyte extended outside of the established region of interest for analysis. Results may be considered biased low. The high activity of the sample contributed to the spectral resolution issue. The spectrum did not overlap with any other identified regions.

- UMR001-S004-0006-01 (Lab ID: 30204854015)
  - Thorium-228
  - Thorium-230
  - Thorium-232
- UMR001-S004-0612-01 (Lab ID: 30204854016)
  - Thorium-228
  - Thorium-230
  - Thorium-232
- UMR001-S004-1218-01 (Lab ID: 30204854017)
  - Thorium-228
  - Thorium-230
  - Thorium-232
- UMR001-S004-1824-01 (Lab ID: 30204854018)
  - Thorium-228
  - Thorium-230
  - Thorium-232

N2: The lab does not hold NELAC/TNI accreditation for this parameter.

- BLANK (Lab ID: 1220308)
  - Thorium-228
  - Thorium-230
  - Thorium-232
  - U-233/234

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# PROJECT NARRATIVE

Project: Case#: 416
Pace Project No.: 30204854

**Method:** **HSL-300**
**Description:** HSL300(AS) Actinides
**Client:** Weston Solutions, Inc. (NJ)
**Date:** February 10, 2017

Analyte Comments:

QC Batch: 248114

N2: The lab does not hold NELAC/TNI accreditation for this parameter.

- BLANK (Lab ID: 1220308)
  - Uranium-238
  - U-235/236
- UMR001-S001-0006-01 (Lab ID: 30204854001)
  - Thorium-228
  - Thorium-230
  - Thorium-232
  - U-233/234
  - Uranium-238
  - U-235/236
- UMR001-S001-0612-01 (Lab ID: 30204854002)
  - Thorium-228
  - Thorium-230
  - Thorium-232
  - U-233/234
  - Uranium-238
  - U-235/236
- UMR001-S001-0612-01 (Lab ID: 30204854003)
  - Thorium-230
  - U-233/234
  - Uranium-238
- UMR001-S001-0612-02 (Lab ID: 30204854004)
  - Thorium-230
  - U-233/234
  - Uranium-238
- UMR001-S001-1218-01 (Lab ID: 30204854005)
  - Thorium-228
  - Thorium-230
  - Thorium-232
  - U-233/234
  - Uranium-238
  - U-235/236
- UMR001-S001-1824-01 (Lab ID: 30204854006)
  - Thorium-228
  - Thorium-230
  - Thorium-232
  - U-233/234
  - Uranium-238
  - U-235/236
- UMR001-S002-0006-01 (Lab ID: 30204854007)
  - Thorium-228
  - Thorium-230
  - Thorium-232

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# PROJECT NARRATIVE

Project: Case#: 416
Pace Project No.: 30204854

**Method:** **HSL-300**
**Description:** HSL300(AS) Actinides
**Client:** Weston Solutions, Inc. (NJ)
**Date:** February 10, 2017

Analyte Comments:

QC Batch: 248114

N2: The lab does not hold NELAC/TNI accreditation for this parameter.

- UMR001-S002-0006-01 (Lab ID: 30204854007)
  - U-233/234
  - Uranium-238
  - U-235/236
- UMR001-S002-0612-01 (Lab ID: 30204854008)
  - Thorium-228
  - Thorium-230
  - Thorium-232
  - U-233/234
  - Uranium-238
  - U-235/236
- UMR001-S002-1218-01 (Lab ID: 30204854009)
  - Thorium-228
  - Thorium-230
  - Thorium-232
  - U-233/234
  - Uranium-238
  - U-235/236
- UMR001-S002-1824-01 (Lab ID: 30204854010)
  - Thorium-228
  - Thorium-230
  - Thorium-232
  - U-233/234
  - Uranium-238
  - U-235/236
- UMR001-S003-0006-01 (Lab ID: 30204854011)
  - Thorium-228
  - Thorium-230
  - Thorium-232
  - U-233/234
  - Uranium-238
  - U-235/236
- UMR001-S003-0612-01 (Lab ID: 30204854012)
  - Thorium-228
  - Thorium-230
  - Thorium-232
  - U-233/234
  - Uranium-238
  - U-235/236
- UMR001-S003-1218-01 (Lab ID: 30204854013)
  - Thorium-228
  - Thorium-230
  - Thorium-232

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(724)850-5600

# PROJECT NARRATIVE

Project: Case#: 416
Pace Project No.: 30204854

**Method:** **HSL-300**
**Description:** HSL300(AS) Actinides
**Client:** Weston Solutions, Inc. (NJ)
**Date:** February 10, 2017

Analyte Comments:

QC Batch: 248114

N2: The lab does not hold NELAC/TNI accreditation for this parameter.

- UMR001-S003-1218-01 (Lab ID: 30204854013)
  - U-233/234
  - Uranium-238
  - U-235/236
- UMR001-S003-1824-01 (Lab ID: 30204854014)
  - Thorium-228
  - Thorium-230
  - Thorium-232
  - U-233/234
  - Uranium-238
  - U-235/236
- UMR001-S004-0006-01 (Lab ID: 30204854015)
  - Thorium-228
  - Thorium-230
  - Thorium-232
  - U-233/234
  - Uranium-238
  - U-235/236
- UMR001-S004-0612-01 (Lab ID: 30204854016)
  - Thorium-228
  - Thorium-230
  - Thorium-232
  - U-233/234
  - Uranium-238
  - U-235/236
- UMR001-S004-1218-01 (Lab ID: 30204854017)
  - Thorium-228
  - Thorium-230
  - Thorium-232
  - U-233/234
  - Uranium-238
  - U-235/236
- UMR001-S004-1824-01 (Lab ID: 30204854018)
  - Thorium-228
  - Thorium-230
  - Thorium-232
  - U-233/234
  - Uranium-238
  - U-235/236

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

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1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

# ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: Case#: 416
Pace Project No.: 30204854

**Sample: UMR001-S001-0006-01** **Lab ID: 30204854001** Collected: 11/18/16 09:58 Received: 12/08/16 10:20 Matrix: Solid
PWS: Site ID: Sample Type:

***Results reported on a "dry-weight" basis***

| Parameters | Method | Act ± Unc (MDC) Carr Trac | Units | Analyzed | CAS No. | Qual |
|---|---|---|---|---|---|---|
| Thorium-228 | HSL-300 | **1.22 ± 0.367 (0.254) C:NA T:78%** | pCi/g | 02/08/17 11:14 | 14274-82-9 | N2 |
| Thorium-230 | HSL-300 | **1.31 ± 0.364 (0.136) C:NA T:78%** | pCi/g | 02/08/17 11:14 | 14269-63-7 | N2 |
| Thorium-232 | HSL-300 | **0.668 ± 0.237 (0.087) C:NA T:78%** | pCi/g | 02/08/17 11:14 | 7440-29-1 | N2 |
| U-233/234 | HSL-300 | **0.823 ± 0.239 (0.116) C:NA T:108%** | pCi/g | 02/07/17 15:12 | | N2 |
| U-235/236 | HSL-300 | **0.095 ± 0.081 (0.082) C:NA T:108%** | pCi/g | 02/07/17 15:12 | | N2 |
| Uranium-238 | HSL-300 | **0.709 ± 0.216 (0.092) C:NA T:108%** | pCi/g | 02/07/17 15:12 | | N2 |

**Sample: UMR001-S001-0612-01** **Lab ID: 30204854002** Collected: 11/18/16 09:55 Received: 12/08/16 10:20 Matrix: Solid
PWS: Site ID: Sample Type:

***Results reported on a "dry-weight" basis***
Comments: • One jar arrived broken.

| Parameters | Method | Act ± Unc (MDC) Carr Trac | Units | Analyzed | CAS No. | Qual |
|---|---|---|---|---|---|---|
| Thorium-228 | HSL-300 | **1.26 ± 0.380 (0.259) C:NA T:79%** | pCi/g | 02/08/17 11:14 | 14274-82-9 | N2 |
| Thorium-230 | HSL-300 | **0.892 ± 0.289 (0.129) C:NA T:79%** | pCi/g | 02/08/17 11:14 | 14269-63-7 | N2 |
| Thorium-232 | HSL-300 | **0.861 ± 0.281 (0.091) C:NA T:79%** | pCi/g | 02/08/17 11:14 | 7440-29-1 | N2 |
| U-233/234 | HSL-300 | **0.697 ± 0.236 (0.148) C:NA T:93%** | pCi/g | 02/07/17 15:12 | | N2 |
| U-235/236 | HSL-300 | **0.019 ± 0.073 (0.153) C:NA T:93%** | pCi/g | 02/07/17 15:12 | | N2 |
| Uranium-238 | HSL-300 | **0.960 ± 0.287 (0.157) C:NA T:93%** | pCi/g | 02/07/17 15:12 | | N2 |

**Sample: UMR001-S001-0612-01** **Lab ID: 30204854003** Collected: 11/18/16 09:55 Received: 12/08/16 10:20 Matrix: Solid
PWS: Site ID: Sample Type:

***Results reported on a "dry-weight" basis***

| Parameters | Method | Act ± Unc (MDC) Carr Trac | Units | Analyzed | CAS No. | Qual |
|---|---|---|---|---|---|---|
| Thorium-230 | HSL-300 | **91 %REC +/- NA (NA) C:NA T:NA** | pCi/g | 02/08/17 11:14 | 14269-63-7 | N2 |
| U-233/234 | HSL-300 | **98 %REC +/- NA (NA) C:NA T:NA** | pCi/g | 02/07/17 15:12 | | N2 |
| Uranium-238 | HSL-300 | **90 %REC +/- NA (NA) C:NA T:NA** | pCi/g | 02/07/17 15:12 | | N2 |

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# ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: Case#: 416
Pace Project No.: 30204854

**Sample: UMR001-S001-0612-02** **Lab ID: 30204854004** Collected: 11/18/16 09:55 Received: 12/08/16 10:20 Matrix: Solid
PWS: Site ID: Sample Type:

***Results reported on a "dry-weight" basis***

| Parameters | Method | Act ± Unc (MDC) Carr Trac | Units | Analyzed | CAS No. | Qual |
|---|---|---|---|---|---|---|
| Thorium-230 | HSL-300 | **95 %REC 4.3 RPD +/- NA (NA) C:NA T:NA** | pCi/g | 02/08/17 11:14 | 14269-63-7 | N2 |
| U-233/234 | HSL-300 | **94 %REC 4.3 RPD +/- NA (NA) C:NA T:NA** | pCi/g | 02/07/17 15:12 | | N2 |
| Uranium-238 | HSL-300 | **91 %REC 1.1 RPD +/- NA (NA) C:NA T:NA** | pCi/g | 02/07/17 15:12 | | N2 |

**Sample: UMR001-S001-1218-01** **Lab ID: 30204854005** Collected: 11/18/16 09:50 Received: 12/08/16 10:20 Matrix: Solid
PWS: Site ID: Sample Type:

***Results reported on a "dry-weight" basis***

| Parameters | Method | Act ± Unc (MDC) Carr Trac | Units | Analyzed | CAS No. | Qual |
|---|---|---|---|---|---|---|
| Thorium-228 | HSL-300 | **1.51 ± 0.411 (0.198) C:NA T:79%** | pCi/g | 02/08/17 11:14 | 14274-82-9 | N2 |
| Thorium-230 | HSL-300 | **0.999 ± 0.305 (0.165) C:NA T:79%** | pCi/g | 02/08/17 11:14 | 14269-63-7 | N2 |
| Thorium-232 | HSL-300 | **1.08 ± 0.316 (0.046) C:NA T:79%** | pCi/g | 02/08/17 11:14 | 7440-29-1 | N2 |
| U-233/234 | HSL-300 | **1.23 ± 0.319 (0.138) C:NA T:97%** | pCi/g | 02/07/17 15:12 | | N2 |
| U-235/236 | HSL-300 | **0.081 ± 0.080 (0.106) C:NA T:97%** | pCi/g | 02/07/17 15:12 | | N2 |
| Uranium-238 | HSL-300 | **0.991 ± 0.275 (0.081) C:NA T:97%** | pCi/g | 02/07/17 15:12 | | N2 |

**Sample: UMR001-S001-1824-01** **Lab ID: 30204854006** Collected: 11/18/16 09:45 Received: 12/08/16 10:20 Matrix: Solid
PWS: Site ID: Sample Type:

***Results reported on a "dry-weight" basis***

| Parameters | Method | Act ± Unc (MDC) Carr Trac | Units | Analyzed | CAS No. | Qual |
|---|---|---|---|---|---|---|
| Thorium-228 | HSL-300 | **1.23 ± 0.385 (0.312) C:NA T:69%** | pCi/g | 02/08/17 11:14 | 14274-82-9 | N2 |
| Thorium-230 | HSL-300 | **1.34 ± 0.379 (0.146) C:NA T:69%** | pCi/g | 02/08/17 11:14 | 14269-63-7 | N2 |
| Thorium-232 | HSL-300 | **1.59 ± 0.422 (0.093) C:NA T:69%** | pCi/g | 02/08/17 11:14 | 7440-29-1 | N2 |
| U-233/234 | HSL-300 | **1.37 ± 0.347 (0.121) C:NA T:92%** | pCi/g | 02/07/17 15:12 | | N2 |
| U-235/236 | HSL-300 | **0.070 ± 0.083 (0.143) C:NA T:92%** | pCi/g | 02/07/17 15:12 | | N2 |
| Uranium-238 | HSL-300 | **1.30 ± 0.333 (0.083) C:NA T:92%** | pCi/g | 02/07/17 15:12 | | N2 |

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# QUALITY CONTROL - RADIOCHEMISTRY

Project: Case#: 416
Pace Project No.: 30204854

QC Batch: 248114 Analysis Method: HSL-300
QC Batch Method: HSL-300 Analysis Description: HSL300(AS) Actinides
Associated Lab Samples: 30204854001, 30204854002, 30204854003, 30204854004, 30204854005, 30204854006, 30204854007, 30204854008, 30204854009, 30204854010, 30204854011, 30204854012, 30204854013

METHOD BLANK: 1220308 Matrix: Solid
Associated Lab Samples: 30204854001, 30204854002, 30204854003, 30204854004, 30204854005, 30204854006, 30204854007, 30204854008, 30204854009, 30204854010, 30204854011, 30204854012, 30204854013, 30204854014, 30204854015, 30204854016, 30204854017, 30204854018

| Parameter | Act ± Unc (MDC) Carr Trac | Units | Analyzed | Qualifiers |
|---|---|---|---|---|
| Thorium-228 | 0.078 ± 0.100 (0.196) C:NA T:87% | pCi/g | 02/08/17 11:14 | N2 |
| Thorium-230 | -0.010 ± 0.055 (0.135) C:NA T:87% | pCi/g | 02/08/17 11:14 | N2 |
| Thorium-232 | 0.000 ± 0.055 (0.042) C:NA T:87% | pCi/g | 02/08/17 11:14 | N2 |
| U-233/234 | 0.070 ± 0.076 (0.135) C:NA T:103% | pCi/g | 02/07/17 15:12 | N2 |
| U-235/236 | -0.004 ± 0.061 (0.085) C:NA T:103% | pCi/g | 02/07/17 15:12 | N2 |
| Uranium-238 | 0.043 ± 0.053 (0.087) C:NA T:103% | pCi/g | 02/07/17 15:12 | N2 |

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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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# QUALIFIERS

Project: Case#: 416
Pace Project No.: 30204854

## 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.

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## ANALYTE QUALIFIERS

| | |
|---|---|
| 1c | The alpha spectroscopy spectrum for this analyte extended outside of the established region of interest for analysis. Results may be considered biased low. The high activity of the sample contributed to the spectral resolution issue. The spectrum did not overlap with any other identified regions. |
| N2 | The lab does not hold NELAC/TNI accreditation for this parameter. |



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January 18, 2017

Smita Sumbaly
Weston Solutions, Inc
1090 King Georges Post Road
Edison, NJ 08837

RE: Project: Case #416
Pace Project No.: 30207556

Dear Smita Sumbaly:
Enclosed are the analytical results for sample(s) received by the laboratory on December 08, 2016. 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 A. Ferris

Carin Ferris
carin.ferris@pacelabs.com
Project Manager

Enclosures

**REPORT OF LABORATORY ANALYSIS**

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## CERTIFICATIONS

Project: Case #416
Pace Project No.: 30207556

**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



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## SAMPLE SUMMARY

Project: Case #416
Pace Project No.: 30207556

| Lab ID | Sample ID | Matrix | Date Collected | Date Received |
|---|---|---|---|---|
| 30207556001 | UMR001-S001-0006-01 | Solid | 11/18/16 09:58 | 12/08/16 10:20 |
| 30207556002 | UMR001-S001-0612-01 | Solid | 11/18/16 09:55 | 12/08/16 10:20 |
| 30207556003 | UMR001-S001-0612-02 | Solid | 11/18/16 09:55 | 12/08/16 10:20 |
| 30207556004 | UMR001-S001-1218-01 | Solid | 11/18/16 09:50 | 12/08/16 10:20 |
| 30207556005 | UMR001-S001-1824-01 | Solid | 11/18/16 09:45 | 12/08/16 10:20 |
| 30207556006 | UMR001-S002-0006-01 | Solid | 11/18/16 10:40 | 12/08/16 10:20 |
| 30207556007 | UMR001-S002-0612-01 | Solid | 11/18/16 10:38 | 12/08/16 10:20 |
| 30207556008 | UMR001-S002-1218-01 | Solid | 11/18/16 10:35 | 12/08/16 10:20 |
| 30207556009 | UMR001-S002-1824-01 | Solid | 11/18/16 10:30 | 12/08/16 10:20 |
| 30207556010 | UMR001-S003-0006-01 | Solid | 11/18/16 11:25 | 12/08/16 10:20 |
| 30207556011 | UMR001-S003-0612-01 | Solid | 11/18/16 11:22 | 12/08/16 10:20 |
| 30207556012 | UMR001-S003-1218-01 | Solid | 11/18/16 11:18 | 12/08/16 10:20 |
| 30207556013 | UMR001-S003-1824-01 | Solid | 11/18/16 11:15 | 12/08/16 10:20 |
| 30207556014 | UMR001-S004-0006-01 | Solid | 11/18/16 12:30 | 12/08/16 10:20 |
| 30207556015 | UMR001-S004-0612-01 | Solid | 11/18/16 12:25 | 12/08/16 10:20 |
| 30207556016 | UMR001-S004-1218-01 | Solid | 11/18/16 12:22 | 12/08/16 10:20 |
| 30207556017 | UMR001-S004-1824-01 | Solid | 11/18/16 12:20 | 12/08/16 10:20 |



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# SAMPLE ANALYTE COUNT

Project: Case #416
Pace Project No.: 30207556

| Lab ID | Sample ID | Method | Analysts | Analytes Reported |
|---|---|---|---|---|
| 30207556001 | UMR001-S001-0006-01 | EPA 901.1 | MAH | 13 |
| 30207556002 | UMR001-S001-0612-01 | EPA 901.1 | MAH | 13 |
| 30207556003 | UMR001-S001-0612-02 | EPA 901.1 | MAH | 13 |
| 30207556004 | UMR001-S001-1218-01 | EPA 901.1 | MAH | 13 |
| 30207556005 | UMR001-S001-1824-01 | EPA 901.1 | MAH | 13 |
| 30207556006 | UMR001-S002-0006-01 | EPA 901.1 | MAH | 13 |
| 30207556007 | UMR001-S002-0612-01 | EPA 901.1 | MAH | 13 |
| 30207556008 | UMR001-S002-1218-01 | EPA 901.1 | MAH | 13 |
| 30207556009 | UMR001-S002-1824-01 | EPA 901.1 | MAH | 13 |
| 30207556010 | UMR001-S003-0006-01 | EPA 901.1 | MAH | 13 |
| 30207556011 | UMR001-S003-0612-01 | EPA 901.1 | MAH | 13 |
| 30207556012 | UMR001-S003-1218-01 | EPA 901.1 | MAH | 13 |
| 30207556013 | UMR001-S003-1824-01 | EPA 901.1 | MAH | 13 |
| 30207556014 | UMR001-S004-0006-01 | EPA 901.1 | MAH | 13 |
| 30207556015 | UMR001-S004-0612-01 | EPA 901.1 | MAH | 13 |
| 30207556016 | UMR001-S004-1218-01 | EPA 901.1 | MAH | 13 |
| 30207556017 | UMR001-S004-1824-01 | EPA 901.1 | MAH | 13 |



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# PROJECT NARRATIVE

Project: Case #416
Pace Project No.: 30207556

**Date:** January 18, 2017

The reported results are on an "as-received" basis. Following the client's specifications, samples were analyzed directly in the containers received. The dimensions of the sampling containers were different than those Pace uses for gamma spectroscopy calibration purposes. The results reported should be construed as estimated due to geometric differences between the sample sources and Pace's 8-ounce can gamma geometry.



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# PROJECT NARRATIVE

Project: Case #416
Pace Project No.: 30207556

**Method:** **EPA 901.1**
**Description:** 901.1 Gamma Spec
**Client:** Weston Solutions, Inc. (NJ)
**Date:** January 18, 2017

**General Information:**
17 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:**

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



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# ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: Case #416
Pace Project No.: 30207556

**Sample: UMR001-S001-0006-01** **Lab ID: 30207556001** Collected: 11/18/16 09:58 Received: 12/08/16 10:20 Matrix: Solid
PWS: Site ID: Sample Type:

***Results reported on a "wet-weight" basis***

| Parameters | Method | Act ± Unc (MDC) Carr Trac | Units | Analyzed | CAS No. | Qual |
|---|---|---|---|---|---|---|
| Bismuth-212 | EPA 901.1 | **0.536 ± 1.108 (1.243)** **C:NA T:NA** | pCi/g | 01/16/17 13:43 | 14913-49-6 | |
| Bismuth-214 | EPA 901.1 | **0.636 ± 0.170 (0.078)** **C:NA T:NA** | pCi/g | 01/16/17 13:43 | 14733-03-0 | |
| Cesium-137 | EPA 901.1 | **0.208 ± 0.077 (0.052)** **C:NA T:NA** | pCi/g | 01/16/17 13:43 | 10045-97-3 | |
| Lead-212 | EPA 901.1 | **0.539 ± 0.134 (0.107)** **C:NA T:NA** | pCi/g | 01/16/17 13:43 | 15092-94-1 | |
| Lead-214 | EPA 901.1 | **0.591 ± 0.176 (0.130)** **C:NA T:NA** | pCi/g | 01/16/17 13:43 | 15067-28-4 | |
| Potassium-40 | EPA 901.1 | **8.479 ± 1.853 (0.692)** **C:NA T:NA** | pCi/g | 01/16/17 13:43 | 13966-00-2 | |
| Protactinium-234M | EPA 901.1 | **0.000 ± 1.689 (13.700)** **C:NA T:NA** | pCi/g | 01/16/17 13:43 | 15100-28-4 | |
| Radium-226 | EPA 901.1 | **1.166 ± 1.386 (1.665)** **C:NA T:NA** | pCi/g | 01/16/17 13:43 | 13982-63-3 | RA |
| Radium-228 | EPA 901.1 | **0.550 ± 0.289 (0.263)** **C:NA T:NA** | pCi/g | 01/16/17 13:43 | 15262-20-1 | |
| Thallium-208 | EPA 901.1 | **0.210 ± 0.069 (0.043)** **C:NA T:NA** | pCi/g | 01/16/17 13:43 | 14913-50-9 | |
| Thorium-228 | EPA 901.1 | **2.286 ± 3.627 (4.548)** **C:NA T:NA** | pCi/g | 01/16/17 13:43 | 14274-82-9 | |
| Thorium-234 | EPA 901.1 | **0.954 ± 0.891 (1.651)** **C:NA T:NA** | pCi/g | 01/16/17 13:43 | 15065-10-8 | |
| Uranium-235 | EPA 901.1 | **0.156 ± 0.335 (0.420)** **C:NA T:NA** | pCi/g | 01/16/17 13:43 | 15117-96-1 | |

**Sample: UMR001-S001-0612-01** **Lab ID: 30207556002** Collected: 11/18/16 09:55 Received: 12/08/16 10:20 Matrix: Solid
PWS: Site ID: Sample Type:

***Results reported on a "wet-weight" basis***
Comments: • One jar arrived broken.

| Parameters | Method | Act ± Unc (MDC) Carr Trac | Units | Analyzed | CAS No. | Qual |
|---|---|---|---|---|---|---|
| Bismuth-212 | EPA 901.1 | **1.989 ± 0.741 (0.487)** **C:NA T:NA** | pCi/g | 01/16/17 13:59 | 14913-49-6 | |
| Bismuth-214 | EPA 901.1 | **0.604 ± 0.177 (0.118)** **C:NA T:NA** | pCi/g | 01/16/17 13:59 | 14733-03-0 | |
| Cesium-137 | EPA 901.1 | **0.026 ± 0.077 (0.081)** **C:NA T:NA** | pCi/g | 01/16/17 13:59 | 10045-97-3 | |
| Lead-212 | EPA 901.1 | **0.697 ± 0.147 (0.115)** **C:NA T:NA** | pCi/g | 01/16/17 13:59 | 15092-94-1 | |
| Lead-214 | EPA 901.1 | **0.610 ± 0.168 (0.131)** **C:NA T:NA** | pCi/g | 01/16/17 13:59 | 15067-28-4 | |
| Potassium-40 | EPA 901.1 | **12.505 ± 2.084 (0.358)** **C:NA T:NA** | pCi/g | 01/16/17 13:59 | 13966-00-2 | |
| Protactinium-234M | EPA 901.1 | **0.047 ± 7.763 (8.037)** **C:NA T:NA** | pCi/g | 01/16/17 13:59 | 15100-28-4 | |
| Radium-226 | EPA 901.1 | **0.008 ± 1.359 (1.671)** **C:NA T:NA** | pCi/g | 01/16/17 13:59 | 13982-63-3 | RA |
| Radium-228 | EPA 901.1 | **0.725 ± 0.225 (0.145)** **C:NA T:NA** | pCi/g | 01/16/17 13:59 | 15262-20-1 | |
| Thallium-208 | EPA 901.1 | **0.243 ± 0.089 (0.076)** **C:NA T:NA** | pCi/g | 01/16/17 13:59 | 14913-50-9 | |



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Greensburg, PA 15601
(724)850-5600

# ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: Case #416
Pace Project No.: 30207556

**Sample: UMR001-S001-0612-01** **Lab ID: 30207556002** Collected: 11/18/16 09:55 Received: 12/08/16 10:20 Matrix: Solid
PWS: Site ID: Sample Type:

***Results reported on a "wet-weight" basis***
Comments: • One jar arrived broken.

| Parameters | Method | Act ± Unc (MDC) Carr Trac | Units | Analyzed | CAS No. | Qual |
|---|---|---|---|---|---|---|
| Thorium-228 | EPA 901.1 | **0.000 ± 2.339 (7.192) C:NA T:NA** | pCi/g | 01/16/17 13:59 | 14274-82-9 | |
| Thorium-234 | EPA 901.1 | **0.000 ± 1.539 (3.240) C:NA T:NA** | pCi/g | 01/16/17 13:59 | 15065-10-8 | |
| Uranium-235 | EPA 901.1 | **0.123 ± 0.377 (0.452) C:NA T:NA** | pCi/g | 01/16/17 13:59 | 15117-96-1 | |

**Sample: UMR001-S001-0612-02** **Lab ID: 30207556003** Collected: 11/18/16 09:55 Received: 12/08/16 10:20 Matrix: Solid
PWS: Site ID: Sample Type:

***Results reported on a "wet-weight" basis***

| Parameters | Method | Act ± Unc (MDC) Carr Trac | Units | Analyzed | CAS No. | Qual |
|---|---|---|---|---|---|---|
| Bismuth-212 | EPA 901.1 | **0.989 ± 1.410 (1.525) C:NA T:NA** | pCi/g | 01/16/17 14:00 | 14913-49-6 | |
| Bismuth-214 | EPA 901.1 | **0.760 ± 0.204 (0.118) C:NA T:NA** | pCi/g | 01/16/17 14:00 | 14733-03-0 | |
| Cesium-137 | EPA 901.1 | **0.041 ± 0.087 (0.100) C:NA T:NA** | pCi/g | 01/16/17 14:00 | 10045-97-3 | |
| Lead-212 | EPA 901.1 | **0.518 ± 0.158 (0.182) C:NA T:NA** | pCi/g | 01/16/17 14:00 | 15092-94-1 | |
| Lead-214 | EPA 901.1 | **0.677 ± 0.193 (0.149) C:NA T:NA** | pCi/g | 01/16/17 14:00 | 15067-28-4 | |
| Potassium-40 | EPA 901.1 | **12.581 ± 2.494 (0.750) C:NA T:NA** | pCi/g | 01/16/17 14:00 | 13966-00-2 | |
| Protactinium-234M | EPA 901.1 | **0.000 ± 3.664 (13.190) C:NA T:NA** | pCi/g | 01/16/17 14:00 | 15100-28-4 | |
| Radium-226 | EPA 901.1 | **2.492 ± 1.249 (1.261) C:NA T:NA** | pCi/g | 01/16/17 14:00 | 13982-63-3 | RA |
| Radium-228 | EPA 901.1 | **0.841 ± 0.315 (0.411) C:NA T:NA** | pCi/g | 01/16/17 14:00 | 15262-20-1 | |
| Thallium-208 | EPA 901.1 | **0.324 ± 0.101 (0.074) C:NA T:NA** | pCi/g | 01/16/17 14:00 | 14913-50-9 | |
| Thorium-228 | EPA 901.1 | **2.690 ± 3.082 (4.983) C:NA T:NA** | pCi/g | 01/16/17 14:00 | 14274-82-9 | |
| Thorium-234 | EPA 901.1 | **1.094 ± 1.261 (1.838) C:NA T:NA** | pCi/g | 01/16/17 14:00 | 15065-10-8 | |
| Uranium-235 | EPA 901.1 | **0.046 ± 0.447 (0.567) C:NA T:NA** | pCi/g | 01/16/17 14:00 | 15117-96-1 | |

**Sample: UMR001-S001-1218-01** **Lab ID: 30207556004** Collected: 11/18/16 09:50 Received: 12/08/16 10:20 Matrix: Solid
PWS: Site ID: Sample Type:

***Results reported on a "wet-weight" basis***

| Parameters | Method | Act ± Unc (MDC) Carr Trac | Units | Analyzed | CAS No. | Qual |
|---|---|---|---|---|---|---|
| Bismuth-212 | EPA 901.1 | **0.870 ± 0.579 (0.841) C:NA T:NA** | pCi/g | 01/16/17 14:19 | 14913-49-6 | |
| Bismuth-214 | EPA 901.1 | **0.549 ± 0.138 (0.128) C:NA T:NA** | pCi/g | 01/16/17 14:19 | 14733-03-0 | |
| Cesium-137 | EPA 901.1 | **0.000 ± 0.009 (0.069) C:NA T:NA** | pCi/g | 01/16/17 14:19 | 10045-97-3 | |

## REPORT OF LABORATORY ANALYSIS

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Greensburg, PA 15601
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# ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: Case #416
Pace Project No.: 30207556

**Sample: UMR001-S001-1218-01** **Lab ID: 30207556004** Collected: 11/18/16 09:50 Received: 12/08/16 10:20 Matrix: Solid
PWS: Site ID: Sample Type:

***Results reported on a "wet-weight" basis***

| Parameters | Method | Act ± Unc (MDC) Carr Trac | Units | Analyzed | CAS No. | Qual |
|---|---|---|---|---|---|---|
| Lead-212 | EPA 901.1 | **0.708 ± 0.148 (0.125) C:NA T:NA** | pCi/g | 01/16/17 14:19 | 15092-94-1 | |
| Lead-214 | EPA 901.1 | **0.701 ± 0.175 (0.111) C:NA T:NA** | pCi/g | 01/16/17 14:19 | 15067-28-4 | |
| Potassium-40 | EPA 901.1 | **14.836 ± 2.457 (0.722) C:NA T:NA** | pCi/g | 01/16/17 14:19 | 13966-00-2 | |
| Protactinium-234M | EPA 901.1 | **0.000 ± 3.040 (7.907) C:NA T:NA** | pCi/g | 01/16/17 14:19 | 15100-28-4 | |
| Radium-226 | EPA 901.1 | **3.006 ± 1.331 (1.253) C:NA T:NA** | pCi/g | 01/16/17 14:19 | 13982-63-3 | RA |
| Radium-228 | EPA 901.1 | **0.648 ± 0.285 (0.274) C:NA T:NA** | pCi/g | 01/16/17 14:19 | 15262-20-1 | |
| Thallium-208 | EPA 901.1 | **0.279 ± 0.069 (0.041) C:NA T:NA** | pCi/g | 01/16/17 14:19 | 14913-50-9 | |
| Thorium-228 | EPA 901.1 | **0.000 ± 2.831 (6.028) C:NA T:NA** | pCi/g | 01/16/17 14:19 | 14274-82-9 | |
| Thorium-234 | EPA 901.1 | **0.694 ± 0.863 (2.716) C:NA T:NA** | pCi/g | 01/16/17 14:19 | 15065-10-8 | |
| Uranium-235 | EPA 901.1 | **0.000 ± 0.177 (0.478) C:NA T:NA** | pCi/g | 01/16/17 14:19 | 15117-96-1 | |

**Sample: UMR001-S001-1824-01** **Lab ID: 30207556005** Collected: 11/18/16 09:45 Received: 12/08/16 10:20 Matrix: Solid
PWS: Site ID: Sample Type:

***Results reported on a "wet-weight" basis***

| Parameters | Method | Act ± Unc (MDC) Carr Trac | Units | Analyzed | CAS No. | Qual |
|---|---|---|---|---|---|---|
| Bismuth-212 | EPA 901.1 | **0.087 ± 1.540 (1.730) C:NA T:NA** | pCi/g | 01/16/17 14:20 | 14913-49-6 | |
| Bismuth-214 | EPA 901.1 | **0.603 ± 0.160 (0.093) C:NA T:NA** | pCi/g | 01/16/17 14:20 | 14733-03-0 | |
| Cesium-137 | EPA 901.1 | **0.016 ± 0.086 (0.100) C:NA T:NA** | pCi/g | 01/16/17 14:20 | 10045-97-3 | |
| Lead-212 | EPA 901.1 | **0.766 ± 0.166 (0.128) C:NA T:NA** | pCi/g | 01/16/17 14:20 | 15092-94-1 | |
| Lead-214 | EPA 901.1 | **0.957 ± 0.203 (0.087) C:NA T:NA** | pCi/g | 01/16/17 14:20 | 15067-28-4 | |
| Potassium-40 | EPA 901.1 | **17.198 ± 3.008 (0.626) C:NA T:NA** | pCi/g | 01/16/17 14:20 | 13966-00-2 | |
| Protactinium-234M | EPA 901.1 | **0.000 ± 3.418 (11.000) C:NA T:NA** | pCi/g | 01/16/17 14:20 | 15100-28-4 | |
| Radium-226 | EPA 901.1 | **2.747 ± 1.266 (1.296) C:NA T:NA** | pCi/g | 01/16/17 14:20 | 13982-63-3 | RA |
| Radium-228 | EPA 901.1 | **1.213 ± 0.328 (0.153) C:NA T:NA** | pCi/g | 01/16/17 14:20 | 15262-20-1 | |
| Thallium-208 | EPA 901.1 | **0.337 ± 0.095 (0.058) C:NA T:NA** | pCi/g | 01/16/17 14:20 | 14913-50-9 | |
| Thorium-228 | EPA 901.1 | **3.518 ± 5.003 (5.417) C:NA T:NA** | pCi/g | 01/16/17 14:20 | 14274-82-9 | |
| Thorium-234 | EPA 901.1 | **0.982 ± 0.993 (1.806) C:NA T:NA** | pCi/g | 01/16/17 14:20 | 15065-10-8 | |
| Uranium-235 | EPA 901.1 | **0.046 ± 0.359 (0.456) C:NA T:NA** | pCi/g | 01/16/17 14:20 | 15117-96-1 | |



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Greensburg, PA 15601
(724)850-5600

# QUALITY CONTROL - RADIOCHEMISTRY

Project: Case #416
Pace Project No.: 30207556

QC Batch: 246223 Analysis Method: EPA 901.1
QC Batch Method: EPA 901.1 Analysis Description: 901.1 Gamma Spec
Associated Lab Samples: 30207556001, 30207556002, 30207556003, 30207556004, 30207556005, 30207556006, 30207556007, 30207556008, 30207556009, 30207556010, 30207556011, 30207556012, 30207556013, 30207556014, 30207556015, 30207556016, 30207556017

METHOD BLANK: 1210975 Matrix: Solid
Associated Lab Samples: 30207556001, 30207556002, 30207556003, 30207556004, 30207556005, 30207556006, 30207556007, 30207556008, 30207556009, 30207556010, 30207556011, 30207556012, 30207556013, 30207556014, 30207556015, 30207556016, 30207556017

| Parameter | Act ± Unc (MDC) Carr Trac | Units | Analyzed | Qualifiers |
|---|---|---|---|---|
| Bismuth-212 | 0.073 ± 0.837 (0.948) C:NA T:NA | pCi/g | 01/16/17 13:23 | |
| Bismuth-214 | 0.098 ± 0.085 (0.138) C:NA T:NA | pCi/g | 01/16/17 13:23 | |
| Cesium-137 | 0.000 ± 0.008 (0.100) C:NA T:NA | pCi/g | 01/16/17 13:23 | |
| Lead-212 | 0.012 ± 0.089 (0.114) C:NA T:NA | pCi/g | 01/16/17 13:23 | |
| Lead-214 | 0.000 ± 0.070 (0.165) C:NA T:NA | pCi/g | 01/16/17 13:23 | |
| Potassium-40 | 0.141 ± 0.321 (0.578) C:NA T:NA | pCi/g | 01/16/17 13:23 | |
| Protactinium-234M | 0.000 ± 1.470 (7.512) C:NA T:NA | pCi/g | 01/16/17 13:23 | |
| Radium-226 | 0.182 ± 1.067 (1.443) C:NA T:NA | pCi/g | 01/16/17 13:23 | RA |
| Radium-228 | 0.000 ± 0.116 (0.455) C:NA T:NA | pCi/g | 01/16/17 13:23 | |
| Thallium-208 | 0.030 ± 0.047 (0.061) C:NA T:NA | pCi/g | 01/16/17 13:23 | |
| Thorium-228 | 0.201 ± 3.021 (4.205) C:NA T:NA | pCi/g | 01/16/17 13:23 | |
| Thorium-234 | 1.138 ± 1.460 (1.878) C:NA T:NA | pCi/g | 01/16/17 13:23 | |
| Uranium-235 | 0.029 ± 0.366 (0.463) C:NA T:NA | pCi/g | 01/16/17 13:23 | |

**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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Greensburg, PA 15601
(724)850-5600

# QUALIFIERS

Project: Case #416
Pace Project No.: 30207556

## 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.

## WORKORDER QUALIFIERS

WO: 30207556

[1] The reported results are on an "as-received" basis. Following the client's specifications, samples were analyzed directly in the containers received. The dimensions of the sampling containers were different than those Pace uses for gamma spectroscopy calibration purposes. The results reported should be construed as estimated due to geometric differences between the sample sources and Pace's 8-ounce can gamma geometry.

## ANALYTE QUALIFIERS

RA The reported Ra-226 results were determined using a direct gamma emission (186 keV) shared by both Ra-226 and naturally-occurring U-235. The reported Ra-226 results were determined assuming the shared energy peak is attributable exclusively to Ra-226. Reported results for Ra-226 may be biased high if U-235 is present in the sample.



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30207556



**Weston Solutions, Inc.**
DateShipped: 12/7/2016
CarrierName: FedEx
AirbillNo: 7778 8428 0670

**CHAIN OF CUSTODY RECORD**
Case #: 416
Contact Name: Peter Lisichenko
Contact Phone: 603-512-4350

**No: 2-120716-091830-0001**
Cooler #:
Lab: PACE Analytical Services
Lab Phone: 724-850-5600

| Lab # | Sample # | Location | Analyses | Matrix | Collected | Sample Time | Numb Cont | Container | Preservative | Lab QC |
|---|---|---|---|---|---|---|---|---|---|---|
| | UMR001-S001-0006-01 | UMR001-S001 | Isotopic Thorium | Soil | 11/18/2016 | 09:58 | 1 | 8 oz glass | 4 C | N |
| | UMR001-S001-0006-01 | UMR001-S001 | Isotopic Uranium | Soil | 11/18/2016 | 09:58 | 1 | 8 oz glass | 4 C | N |
| | UMR001-S001-0006-01 | UMR001-S001 | Gamma Spec (modified) | Soil | 11/18/2016 | 09:58 | 1 | 16 oz | 4 C | N |
| | UMR001-S001-0612-01 | UMR001-S001 | Isotopic Thorium | Soil | 11/18/2016 | 09:55 | 2 | 8 oz glass | 4 C | Y |
| | UMR001-S001-0612-01 | UMR001-S001 | Isotopic Uranium | Soil | 11/18/2016 | 09:55 | 2 | 8 oz glass | 4 C | Y |
| | UMR001-S001-0612-01 | UMR001-S001 | Gamma Spec (modified) | Soil | 11/18/2016 | 09:55 | 2 | 16 oz | 4 C | Y |
| | UMR001-S001-0612-02 | UMR001-S001 | Isotopic Thorium | Soil | 11/18/2016 | 09:55 | 1 | 8 oz glass | 4 C | N |
| | UMR001-S001-0612-02 | UMR001-S001 | Isotopic Uranium | Soil | 11/18/2016 | 09:55 | 1 | 8 oz glass | 4 C | N |
| | UMR001-S001-0612-02 | UMR001-S001 | Gamma Spec (modified) | Soil | 11/18/2016 | 09:55 | 1 | 16 oz | 4 C | N |
| | UMR001-S001-1218-01 | UMR001-S001 | Isotopic Thorium | Soil | 11/18/2016 | 09:50 | 1 | 8 oz glass | 4 C | N |
| | UMR001-S001-1218-01 | UMR001-S001 | Isotopic Uranium | Soil | 11/18/2016 | 09:50 | 1 | 8 oz glass | 4 C | N |
| | UMR001-S001-1218-01 | UMR001-S001 | Gamma Spec (modified) | Soil | 11/18/2016 | 09:50 | 1 | 16 oz | 4 C | N |
| | UMR001-S001-1824-01 | UMR001-S001 | Isotopic Thorium | Soil | 11/18/2016 | 09:45 | 1 | 8 oz glass | 4 C | N |
| | UMR001-S001-1824-01 | UMR001-S001 | Isotopic Uranium | Soil | 11/18/2016 | 09:45 | 1 | 8 oz glass | 4 C | N |
| | UMR001-S001-1824-01 | UMR001-S001 | Gamma Spec (modified) | Soil | 11/18/2016 | 09:45 | 1 | 16 oz | 4 C | N |
| | UMR001-S002-0006-01 | UMR001-S002 | Isotopic Thorium | Soil | 11/18/2016 | 10:40 | 1 | 8 oz glass | 4 C | N |
| | UMR001-S002-0006-01 | UMR001-S002 | Isotopic Uranium | Soil | 11/18/2016 | 10:40 | 1 | 8 oz glass | 4 C | N |
| | UMR001-S002-0006-01 | UMR001-S002 | Gamma Spec (modified) | Soil | 11/18/2016 | 10:40 | 1 | 16 oz | 4 C | N |
| | UMR001-S002-0612-01 | UMR001-S002 | Isotopic Thorium | Soil | 11/18/2016 | 10:38 | 1 | 8 oz glass | 4 C | N |

001 002 003 004 005 006

OAF 1/10/17

001 002 003 004 005 006 007 008

Special Instructions: Gamma Spec: K-40, Tl-208, Bi-212, Bi-214, Pb-212, Pb-214, Ra-226, Ra-228, Th-234, U-235, & Cs-137.
Standard TAT, RFP# 416, PO# 0093240
All materials in the sample, including rock fragments and soil, must be analyzed.

**SAMPLES TRANSFERRED FROM**
**CHAIN OF CUSTODY #**

| Items/Reason | Relinquished by (Signature and Organization) | Date/Time | Received by (Signature and Organization) | Date/Time | Sample Condition Upon Receipt |
|---|---|---|---|---|---|
| ALL SAMPLES ALL ANALYSIS | Peter Lisichenko (WESTON) | 12/7/16 1700 | Ashley Hoce / Pace | 12-8-16 1020 | |
| | | | | | |
| | | | | | |
| | | | | | |

WO#:30207556
30207556

WO#:30204854
30204854
OAF 1/10/17

30207556 ~~30204854~~

CAF 1/10/17



**Weston Solutions, Inc.**
DateShipped: 12/7/2016
CarrierName: FedEx
AirbillNo: 7778 8428 0670

**CHAIN OF CUSTODY RECORD**
Case #: 416
Contact Name: Peter Lisichenko
Contact Phone: 603-512-4350

**No: 2-120716-091830-0001**
Cooler #:
Lab: PACE Analytical Services
Lab Phone: 724-850-5600

CAF 1/10/17

| Lab # | Sample # | Location | Analyses | Matrix | Collected | Sample Time | Numb Cont | Container | Preservative | Lab QC |
|---|---|---|---|---|---|---|---|---|---|---|
| | UMR001-S002-0612-01 | UMR001-S002 | Isotopic Uranium | Soil | 11/18/2016 | 10:38 | 1 | 8 oz glass | 4 C | N |
| | UMR001-S002-0612-01 | UMR001-S002 | Gamma Spec (modified) | Soil | 11/18/2016 | 10:38 | 1 | 16 oz | 4 C | N |
| | UMR001-S002-1218-01 | UMR001-S002 | Isotopic Thorium | Soil | 11/18/2016 | 10:35 | 1 | 8 oz glass | 4 C | N |
| | UMR001-S002-1218-01 | UMR001-S002 | Isotopic Uranium | Soil | 11/18/2016 | 10:35 | 1 | 8 oz glass | 4 C | N |
| | UMR001-S002-1218-01 | UMR001-S002 | Gamma Spec (modified) | Soil | 11/18/2016 | 10:35 | 1 | 16 oz | 4 C | N |
| | UMR001-S002-1824-01 | UMR001-S002 | Isotopic Thorium | Soil | 11/18/2016 | 10:30 | 1 | 8 oz glass | 4 C | N |
| | UMR001-S002-1824-01 | UMR001-S002 | Isotopic Uranium | Soil | 11/18/2016 | 10:30 | 1 | 8 oz glass | 4 C | N |
| | UMR001-S002-1824-01 | UMR001-S002 | Gamma Spec (modified) | Soil | 11/18/2016 | 10:30 | 1 | 16 oz | 4 C | N |
| | UMR001-S003-0006-01 | UMR001-S003 | Isotopic Thorium | Soil | 11/18/2016 | 11:25 | 1 | 8 oz glass | 4 C | N |
| | UMR001-S003-0006-01 | UMR001-S003 | Isotopic Uranium | Soil | 11/18/2016 | 11:25 | 1 | 8 oz glass | 4 C | N |
| | UMR001-S003-0006-01 | UMR001-S003 | Gamma Spec (modified) | Soil | 11/18/2016 | 11:25 | 1 | 16 oz | 4 C | N |
| | UMR001-S003-0612-01 | UMR001-S003 | Isotopic Thorium | Soil | 11/18/2016 | 11:22 | 1 | 8 oz glass | 4 C | N |
| | UMR001-S003-0612-01 | UMR001-S003 | Isotopic Uranium | Soil | 11/18/2016 | 11:22 | 1 | 8 oz glass | 4 C | N |
| | UMR001-S003-0612-01 | UMR001-S003 | Gamma Spec (modified) | Soil | 11/18/2016 | 11:22 | 1 | 16 oz | 4 C | N |
| | UMR001-S003-1218-01 | UMR001-S003 | Isotopic Thorium | Soil | 11/18/2016 | 11:18 | 1 | 8 oz glass | 4 C | N |
| | UMR001-S003-1218-01 | UMR001-S003 | Isotopic Uranium | Soil | 11/18/2016 | 11:18 | 1 | 8 oz glass | 4 C | N |
| | UMR001-S003-1218-01 | UMR001-S003 | Gamma Spec (modified) | Soil | 11/18/2016 | 11:18 | 1 | 16 oz | 4 C | N |
| | UMR001-S003-1824-01 | UMR001-S003 | Isotopic Thorium | Soil | 11/18/2016 | 11:15 | 1 | 8 oz glass | 4 C | N |
| | UMR001-S003-1824-01 | UMR001-S003 | Isotopic Uranium | Soil | 11/18/2016 | 11:15 | 1 | 8 oz glass | 4 C | N |

007 008 009 010 011 012

008 009 010 011 012 013 014

Special Instructions: Gamma Spec: K-40, Tl-208, Bi-212, Bi-214, Pb-212, Pb-214, Ra-226, Ra-228, Th-234, U-235, & Cs-137.
Standard TAT, RFP# 416, PO# 0093240
All materials in the sample, including rock fragments and soil, must be analyzed.

**SAMPLES TRANSFERRED FROM**

**CHAIN OF CUSTODY #**

| Items/Reason | Relinquished by (Signature and Organization) | Date/Time | Received by (Signature and Organization) | Date/Time | Sample Condition Upon Receipt |
|---|---|---|---|---|---|
| ALL SAMPLES ALL ANALYSIS | [signature] (WESTON) | 12/7/16 1700 HRS | [signature] / Pace | 12-8-16/1020 | |
| | | | | | |
| | | | | | |
| | | | | | |

30207556 ~~30204854~~ CAF 1/10/17



**Weston Solutions, Inc.**
DateShipped: 12/7/2016
CarrierName: FedEx
AirbillNo: 7778 8428 0670

**CHAIN OF CUSTODY RECORD**
Case #: 416
Contact Name: Peter Lisichenko
Contact Phone: 603-512-4350

**No: 2-120716-091830-0001**
Cooler #:
Lab: PACE Analytical Services
Lab Phone: 724-850-5600

CAF 1/10/17

| | Lab # | Sample # | Location | Analyses | Matrix | Collected | Sample Time | Numb Cont | Container | Preservative | Lab QC | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 013 | | UMR001-S003-1824-01 | UMR001-S003 | Gamma Spec (modified) | Soil | 11/18/2016 | 11:15 | 1 | 16 oz | 4 C | N | 014 |
| | | UMR001-S004-0006-01 | UMR001-S004 | Isotopic Thorium | Soil | 11/18/2016 | 12:30 | 1 | 8 oz glass | 4 C | N | |
| 014 | | UMR001-S004-0006-01 | UMR001-S004 | Isotopic Uranium | Soil | 11/18/2016 | 12:30 | 1 | 8 oz glass | 4 C | N | 015 |
| | | UMR001-S004-0006-01 | UMR001-S004 | Gamma Spec (modified) | Soil | 11/18/2016 | 12:30 | 1 | 16 oz | 4 C | N | |
| | | UMR001-S004-0612-01 | UMR001-S004 | Isotopic Thorium | Soil | 11/18/2016 | 12:25 | 1 | 8 oz glass | 4 C | N | |
| 015 | | UMR001-S004-0612-01 | UMR001-S004 | Isotopic Uranium | Soil | 11/18/2016 | 12:25 | 1 | 8 oz glass | 4 C | N | 016 |
| | | UMR001-S004-0612-01 | UMR001-S004 | Gamma Spec (modified) | Soil | 11/18/2016 | 12:25 | 1 | 16 oz | 4 C | N | |
| | | UMR001-S004-1218-01 | UMR001-S004 | Isotopic Thorium | Soil | 11/18/2016 | 12:22 | 1 | 8 oz glass | 4 C | N | |
| 016 | | UMR001-S004-1218-01 | UMR001-S004 | Isotopic Uranium | Soil | 11/18/2016 | 12:22 | 1 | 8 oz glass | 4 C | N | 017 |
| | | UMR001-S004-1218-01 | UMR001-S004 | Gamma Spec (modified) | Soil | 11/18/2016 | 12:22 | 1 | 16 oz | 4 C | N | |
| | | UMR001-S004-1824-01 | UMR001-S004 | Isotopic Thorium | Soil | 11/18/2016 | 12:20 | 1 | 8 oz glass | 4 C | N | |
| 017 | | UMR001-S004-1824-01 | UMR001-S004 | Isotopic Uranium | Soil | 11/18/2016 | 12:20 | 1 | 8 oz glass | 4 C | N | 018 |
| | | UMR001-S004-1824-01 | UMR001-S004 | Gamma Spec (modified) | Soil | 11/18/2016 | 12:20 | 1 | 16 oz | 4 C | N | |

Special Instructions: Gamma Spec: K-40, Tl-208, Bi-212, Bi-214, Pb-212, Pb-214, Ra-226, Ra-228, Th-234, U-235, & Cs-137.
Standard TAT, RFP# 416, PO# 0093240
All materials in the sample, including rock fragments and soil, must be analyzed.

**SAMPLES TRANSFERRED FROM**
**CHAIN OF CUSTODY #**

| Items/Reason | Relinquished by (Signature and Organization) | Date/Time | Received by (Signature and Organization) | Date/Time | Sample Condition Upon Receipt |
|---|---|---|---|---|---|
| ALL SAMPLES ALL ANALYSES | (WESTON) | 12/7/16 1700 HRS | Ashley Rose / Pace | 12-8-16/1020 | |
| | | | | | |
| | | | | | |
| | | | | | |



ED_013146_00000087-00029

CAF V10/17

# Sample Condition Upon Receipt Pittsburgh

~~30204854~~

Pace Analytical

Client Name: Weston

Project # 30207556

Courier: ☑ Fed Ex ☐ UPS ☐ USPS ☐ Client ☐ Commercial ☐ Pace Other _____

Tracking #: 7778 8428 0670

Custody Seal on Cooler/Box Present: ☑ yes ☐ no Seals intact: ☑ yes ☐ no

Thermometer Used 7 Type of Ice: (Wet) Blue None

Cooler Temperature Observed Temp 6.1, 4.8 °C Correction Factor: -0.2 °C Final Temp: 5.9, 4.6 °C

Temp should be above freezing to 6°C

Date and Initials of person examining contents: KH 12-9-16

| Comments: | Yes | No | N/A | |
|---|---|---|---|---|
| Chain of Custody Present: | ✓ | | | 1. |
| Chain of Custody Filled Out: | ✓ | | | 2. |
| Chain of Custody Relinquished: | ✓ | | | 3. |
| Sampler Name & Signature on COC: | | ✓ | | 4. |
| Sample Labels match COC: -Includes date/time/ID/Analysis Matrix: SL | ✓ | | | 5. |
| Samples Arrived within Hold Time: | ✓ | | | 6. |
| Short Hold Time Analysis (<72hr remaining): | | ✓ | | 7. |
| Rush Turn Around Time Requested: | | ✓ | | 8. |
| Sufficient Volume: | ✓ | | | 9. |
| Correct Containers Used: | ✓ | | | 10. |
| -Pace Containers Used: | | ✓ | | |
| Containers Intact: | | ✓ | | 11. Cracked lid on BP2U in sample 002 |
| Filtered volume received for Dissolved tests | | | ✓ | 12. |
| All containers needing preservation have been checked. | | | ✓ | 13. |
| All containers needing preservation are found to be in compliance with EPA recommendation. | | | ✓ | |
| exceptions: VOA, coliform, TOC, D&G, Phenolics | | | | Initial when completed KH / Date/time of preservation / Lot # of added preservative |
| Headspace in VOA Vials ( >6mm): | | | ✓ | 14. |
| Trip Blank Present: | | | ✓ | 15. |
| Trip Blank Custody Seals Present | | | ✓ | |
| Rad Aqueous Samples Screened > 0.5 mrem/hr | | | ✓ | Initial when completed: KH Date: 12-9-16 |

Client Notification/ Resolution:

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

Comments/ Resolution: one jgfu in sample arrived broken. Transferred sample to a new jgfu.

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.