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 Isotopic Uranium 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

PRELIMINARY

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

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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Greensburg, PA 15601
(724)850-5600

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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Greensburg, PA 15601
(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

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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1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(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.

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

PRELIMINARY

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.

PRELIMINARY

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

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	

REPORT OF LABORATORY ANALYSIS

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Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
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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Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
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

CAF 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
CAF 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
014		UMR001-S004-0006-01	UMR001-S004	Isotopic Thorium	Soil	11/18/2016	12:30	1	8 oz glass	4 C	N	015
		UMR001-S004-0006-01	UMR001-S004	Isotopic Uranium	Soil	11/18/2016	12:30	1	8 oz glass	4 C	N	
		UMR001-S004-0006-01	UMR001-S004	Gamma Spec (modified)	Soil	11/18/2016	12:30	1	16 oz	4 C	N	
015		UMR001-S004-0612-01	UMR001-S004	Isotopic Thorium	Soil	11/18/2016	12:25	1	8 oz glass	4 C	N	016
		UMR001-S004-0612-01	UMR001-S004	Isotopic Uranium	Soil	11/18/2016	12:25	1	8 oz glass	4 C	N	
		UMR001-S004-0612-01	UMR001-S004	Gamma Spec (modified)	Soil	11/18/2016	12:25	1	16 oz	4 C	N	
016		UMR001-S004-1218-01	UMR001-S004	Isotopic Thorium	Soil	11/18/2016	12:22	1	8 oz glass	4 C	N	017
		UMR001-S004-1218-01	UMR001-S004	Isotopic Uranium	Soil	11/18/2016	12:22	1	8 oz glass	4 C	N	
		UMR001-S004-1218-01	UMR001-S004	Gamma Spec (modified)	Soil	11/18/2016	12:22	1	16 oz	4 C	N	
017		UMR001-S004-1824-01	UMR001-S004	Isotopic Thorium	Soil	11/18/2016	12:20	1	8 oz glass	4 C	N	018
		UMR001-S004-1824-01	UMR001-S004	Isotopic Uranium	Soil	11/18/2016	12:20	1	8 oz glass	4 C	N	
		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 ANALYSIS	(WESTON)	12/7/16 1700 HRS	Ashley Rose / Pace	12-8-16/1020	

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.