

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

TestAmerica Laboratories, Inc.

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
Tel: (314)298-8566

TestAmerica Job ID: 160-17284-1

Client Project/Site: Blue Ridge Landfill

For:

Commonwealth of Kentucky
130 Eagle Nest Drive
Paducah, Kentucky 42003

Attn: Gaye Brewer

Rhonda Ridenhower

Authorized for release by:
6/13/2016 10:06:41 AM

Rhonda Ridenhower, Manager of Project Management
(314)298-8566
rhonda.ridenhower@testamericainc.com

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This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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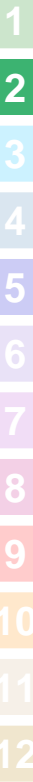


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Case Narrative

Client: Commonwealth of Kentucky
Project/Site: Blue Ridge Landfill

TestAmerica Job ID: 160-17284-1

Job ID: 160-17284-1

Laboratory: TestAmerica St. Louis

Narrative

CASE NARRATIVE

Client: Commonwealth of Kentucky

Project: Blue Ridge Landfill

Report Number: 160-17284-1

With the exceptions noted as flags or footnotes, standard analytical protocols were followed in the analysis of the samples and no problems were encountered or anomalies observed. In addition all laboratory quality control samples were within established control limits, with any exceptions noted below. Each sample was analyzed to achieve the lowest possible reporting limit within the constraints of the method. In some cases, due to interference or analytes present at high concentrations, samples were diluted. For diluted samples, the reporting limits are adjusted relative to the dilution required.

TestAmerica St. Louis attests to the validity of the laboratory data generated by TestAmerica facilities reported herein. All analyses performed by TestAmerica facilities were done using established laboratory SOPs that incorporate QA/QC procedures described in the application methods. TestAmerica's operations groups have reviewed the data for compliance with the laboratory QA/QC plan, and data have been found to be compliant with laboratory protocols unless otherwise noted below.

The test results in this report meet all NELAP requirements for parameters for which accreditation is required or available. Any exceptions to NELAP requirements are noted in this report. Pursuant to NELAP, this report may not be reproduced, except in full, without the written approval of the laboratory.

Calculations are performed before rounding to avoid round-off errors in calculated results.

All holding times were met and proper preservation noted for the methods performed on these samples, unless otherwise detailed in the individual sections below.

All solid sample results for Chemistry analyses are reported on an "as received" basis unless otherwise indicated by the presence of a % solids value in the method header. All soil/sediment sample results for radiochemistry analyses are based upon sample as dried and disaggregated with the exception of tritium, carbon-14, and iodine-129 by gamma spectroscopy unless requested as wet weight by the client."

This laboratory report is confidential and is intended for the sole use of TestAmerica and its client.

RECEIPT

The samples were received on 05/06/2016; the samples arrived in good condition, properly preserved and on ice. The temperatures of the 6 coolers at receipt time were 20.0° C, 20.0° C, 20.0° C, 20.0° C, 20.0° C and 22.0° C.

Receipt Exceptions: Samples ADS BRL-LT-LIQ and Leachate Effluent received with pH at 7. Added nitric. lot 832829 and pH remains at 7 for all sample bottles.

2XLP for MW-17R received with pH at 7. Added nitric, lot 832829 and pH is now below 2 for both bottles.

GROSS ALPHA AND GROSS BETA RADIOACTIVITY-Solids

Samples #7 FILTER CAKE (160-17284-12), ADS BRL-LT-SL (160-17284-16), POND 3 SEDIMENT (160-17284-20), POND 3 SEDIMENT DUP (160-17284-22), DRY BRANCH CREEK UPSTREAM SED (160-17284-24), DRY BRANCH CREEK DOWNSTREAM SED (160-17284-26), DRY BRANCH CREEK DOWNSTREAM SED DUP (160-17284-27), POND 4 SEDIMENT (160-17284-30), POND 4 SED SILT FENCE (160-17284-31), SED POND 1 SEDIMENT (160-17284-33) and POND 2 SEDIMENT (160-17284-38) were analyzed for Gross Alpha and Gross Beta Radioactivity in accordance with EPA 900.0. The samples were dried on 05/09/2016, prepared on 05/16/2016 and

Case Narrative

Client: Commonwealth of Kentucky
Project/Site: Blue Ridge Landfill

TestAmerica Job ID: 160-17284-1

Job ID: 160-17284-1 (Continued)

Laboratory: TestAmerica St. Louis (Continued)

analyzed on 05/17/2016.

Gross Beta was detected in method blank MB 160-251280/1-A at a level exceeding the reporting limit. If the associated sample reported a result above the MDL and/or RL, the result has been flagged. Refer to the QC report for details.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

GROSS ALPHA AND GROSS BETA RADIOACTIVITY-Waters

Samples MW-17R-AKGWA 8003-8393 (160-17284-1), MW-10-AKGWA 8001-0201 (160-17284-2), MW-13-AKGWA 8001-2025 (160-17284-3), MW-15R-AKGWA 8003-3579 (160-17284-4), MW-7-AKGWA 8001-0205 (160-17284-5), #1 UV EFFLUENT CHANNEL 37 DEGREES 42.086' (160-17284-6), #3 WWTP INFLUENT (160-17284-8), DRY BRANCH CREEK DOWNSTREAM DUP (160-17284-13), POND 3 ABOVE OUTFALL (160-17284-14), ADS BRL-LT-LIQ (160-17284-15), ADS BRL UNDERDRAIN (160-17284-17), POND 3 (160-17284-18), POND 3 OUTFALL (160-17284-19), POND 3 DUP (160-17284-21), DRY BRANCH CREEK UPSTREAM (160-17284-23), DRY BRANCH CREEK DOWNSTREAM (160-17284-25), OUTFALL 004 (160-17284-28), POND 4 (160-17284-29), SED POND 1 (160-17284-32), OUTFALL 001 (160-17284-34), LEACHATE EFFLEUNT (160-17284-35), POND 2 (160-17284-36) and POND 2 OUTFALL (160-17284-37) were analyzed for Gross Alpha and Gross Beta Radioactivity in accordance with USEPA Method 900.0. The samples were prepared on 06/03/2016 and analyzed on 06/09/2016.

Prep Batch 254725

The gross alpha and gross beta detection goals were not met for the following samples due to a reduction of the sample size attributed to high residual mass: LEACHATE EFFLEUNT (160-17284-35) and POND 2 (160-17284-36). Analytical results are reported with the detection limit achieved.

The gross alpha detection goal was not met for the following samples due to a reduction of the sample size attributed to high residual mass: POND 2 OUTFALL (160-17284-37) and (160-17627-B-1-B DU). Analytical results are reported with the detection limit achieved.

Prep Batch 254724

The gross alpha and gross beta detection goals were not met for the following samples due to a reduction of the sample size attributed to high residual mass: MW-17R-AKGWA 8003-8393 (160-17284-1), MW-10-AKGWA 8001-0201 (160-17284-2), MW-13-AKGWA 8001-2025 (160-17284-3), MW-15R-AKGWA 8003-3579 (160-17284-4), MW-7-AKGWA 8001-0205 (160-17284-5), #3 WWTP INFLUENT (160-17284-8), POND 3 ABOVE OUTFALL (160-17284-14), ADS BRL-LT-LIQ (160-17284-15), ADS BRL UNDERDRAIN (160-17284-17), POND 3 (160-17284-18), POND 3 OUTFALL (160-17284-19) and POND 3 DUP (160-17284-21). Analytical results are reported with the detection limit achieved.

The gross alpha detection goal was not met for the following samples due to a reduction of the sample size attributed to high residual mass: OUTFALL 004 (160-17284-28), POND 4 (160-17284-29), SED POND 1 (160-17284-32) and OUTFALL 001 (160-17284-34). Analytical results are reported with the detection limit achieved.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

RADIUM-226 BY GAMMA SPEC (21 DAY INGROWTH)

Samples #5 FILTER CAKE (160-17284-10), #6 FILTER CAKE (160-17284-11), ADS BRL-LT-SL (160-17284-16), POND 3 SEDIMENT (160-17284-20), POND 3 SEDIMENT DUP (160-17284-22), DRY BRANCH CREEK UPSTREAM SED (160-17284-24), DRY BRANCH CREEK DOWNSTREAM SED (160-17284-26), DRY BRANCH CREEK DOWNSTREAM SED DUP (160-17284-27), POND 4 SEDIMENT (160-17284-30), POND 4 SED SILT FENCE (160-17284-31), SED POND 1 SEDIMENT (160-17284-33) and POND 2 SEDIMENT (160-17284-38) were analyzed for Radium-226 by gamma spec (21 day ingrowth) in accordance with EPA 901.1. The samples were dried on 05/09/2016, prepared on 05/12/2016 and analyzed on 06/02/2016.

Batch 250875

Insufficient samples were provided for the following samples to fill a tuna can geometry calibrated for Ra-226 analysis by gamma spectroscopy: #5 FILTER CAKE (160-17284-10) and #6 FILTER CAKE (160-17284-11). The use of a different geometry could potentially bias the results low due to the loss of radon into the headspace of the container. Samples were placed in a 25mL geometry instead.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Case Narrative

Client: Commonwealth of Kentucky
Project/Site: Blue Ridge Landfill

TestAmerica Job ID: 160-17284-1

Job ID: 160-17284-1 (Continued)

Laboratory: TestAmerica St. Louis (Continued)

RADIUM-226 (GFPC)

Samples MW-17R-AGGWA 8003-8393 (160-17284-1), MW-10-AGGWA 8001-0201 (160-17284-2), MW-13-AGGWA 8001-2025 (160-17284-3), MW-15R-AGGWA 8003-3579 (160-17284-4), MW-7-AGGWA 8001-0205 (160-17284-5), #2 UV EFFLUENT CHANNEL83 DEGREES 58.917 (160-17284-7), #4 WWTP INFLUENT (160-17284-9), DRY BRANCH CREEK DOWNSTREAM DUP (160-17284-13), POND 3 ABOVE OUTFALL (160-17284-14), ADS BRL-LT-LIQ (160-17284-15), ADS BRL UNDERDRAIN (160-17284-17), POND 3 (160-17284-18), POND 3 OUTFALL (160-17284-19), POND 3 DUP (160-17284-21), DRY BRANCH CREEK UPSTREAM (160-17284-23), DRY BRANCH CREEK DOWNSTREAM (160-17284-25), OUTFALL 004 (160-17284-28), POND 4 (160-17284-29), SED POND 1 (160-17284-32), OUTFALL 001 (160-17284-34), LEACHATE EFFLEUNT (160-17284-35), POND 2 (160-17284-36) and POND 2 OUTFALL (160-17284-37) were analyzed for Radium-226 (GFPC) in accordance with EPA Method 903.0. The samples were prepared on 05/10/2016 and 05/17/2016 and analyzed on 06/01/2016, 06/02/2016 and 06/10/2016.

Prep Batch 250365

The Laboratory Control Sample (LCS) spike recovery (140%) associated with the following samples is outside the upper QC limit of 137% indicating a potential positive bias for that analyte : POND 2 (160-17284-36), POND 2 OUTFALL (160-17284-37), (LCS 160-250356/2-A), (LCSD 160-250356/3-A). This analyte was not observed above the requested limit in the associated samples; therefore the sample data was not adversely affected by this excursion. The data have been qualified and reported.

Prep Batch 251589

A deviation from the Standard Operating Procedure (SOP) occurred in preparation of the following samples: ADS BRL-LT-LIQ (160-17284-15) and LEACHATE EFFLEUNT (160-17284-35). The samples were deep brown to black in coloring with some sediment. Initial preparation of the samples left little to no barium sulfate following the analysis. Per instructions from the Technical Director, the samples were re-prepared at a reduced aliquot, cooked to dryness, muffled, and wet ashed to remove all organics interfering with normal preparation. This was successful, and the samples behaved normally through the rest of the analysis. To avoid matrix interference with homogeneity, a laboratory control sample/ laboratory control sample duplicate (LCS/LCSD) were prepared instead of a sample duplicate (DUP).

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

RADIUM-228 (GFPC)

Samples MW-17R-AGGWA 8003-8393 (160-17284-1), MW-10-AGGWA 8001-0201 (160-17284-2), MW-13-AGGWA 8001-2025 (160-17284-3), MW-15R-AGGWA 8003-3579 (160-17284-4), MW-7-AGGWA 8001-0205 (160-17284-5), #2 UV EFFLUENT CHANNEL83 DEGREES 58.917 (160-17284-7), #4 WWTP INFLUENT (160-17284-9), DRY BRANCH CREEK DOWNSTREAM DUP (160-17284-13), POND 3 ABOVE OUTFALL (160-17284-14), ADS BRL-LT-LIQ (160-17284-15), ADS BRL UNDERDRAIN (160-17284-17), POND 3 (160-17284-18), POND 3 OUTFALL (160-17284-19), POND 3 DUP (160-17284-21), DRY BRANCH CREEK UPSTREAM (160-17284-23), DRY BRANCH CREEK DOWNSTREAM (160-17284-25), OUTFALL 004 (160-17284-28), POND 4 (160-17284-29), SED POND 1 (160-17284-32), OUTFALL 001 (160-17284-34), LEACHATE EFFLEUNT (160-17284-35), POND 2 (160-17284-36) and POND 2 OUTFALL (160-17284-37) were analyzed for Radium-228 (GFPC) in accordance with EPA 904. The samples were prepared on 05/10/2016 and 05/19/2016 and analyzed on 05/17/2016 and 05/27/2016.

Prep Batch 250391

The radium-228 MDC (2.19) did not meet the requested limit (1.00 pCi/L). However, the activity is well above the MDC achieved. In addition, the barium recovery was low (40.7%) potentially increasing the MDC.#4 WWTP INFLUENT (160-17284-9)

Prep Batch 232055

A deviation from the Standard Operating Procedure (SOP) occurred in preparation of the following samples: ADS BRL-LT-LIQ (160-17284-15) and LEACHATE EFFLEUNT (160-17284-35). The samples were deep brown to black in coloring with some sediment. Initial preparation of the samples left little to no barium sulfate following the analysis. Per instructions from the Technical Director, the samples were re-prepared at a reduced aliquot, cooked to dryness, muffled, and wet ashed to remove all organics interfering with normal preparation. This was successful, and the samples behaved normally through the rest of the analysis. To avoid matrix interference with homogeneity, a laboratory control sample/ laboratory control sample duplicate (LCS/LCSD) were prepared instead of a sample duplicate (DUP).

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

St. Louis
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TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Chain of Custody Record

TestAmerica Laboratories, Inc.

Client Contact Div. of Waste Mat. 130 Eads West Dr. Paducah, Ky 42003 270-898-8468 Phone FAX		Project Manager: Gage Brewer Tel/Fax: 270 898-8468 Analysis Turnaround Time Calendar (C) of Work Days (W) TAT: if different from Below <u>30</u> <input type="checkbox"/> 2 weeks <input type="checkbox"/> 1 week <input type="checkbox"/> 2 days <input type="checkbox"/> 1 day		Site Contact: Gary Brewer Lab Contact: R. Ridenhower Date: 5-5-16 Carrier: FedEx		COC No: _____ Job No. _____ of _____ COCs SDG No. _____							
Sample Identification MW-17R AKGWA 8003-8393 MW-10 AKGWA 8001-0201 MW-13 AKGWA 8001-2025 MW-15R AKGWA 8003-3579 MW-7 AKGWA 8001-0205		Sample Date 5/3/16 10:45 5/3/16 11:33 5/3/16 14:46 5/11/16 15:45 5/3/16 16:55		Sample Time G G G G G		Sample Type W W W W W		Matrix 		# of Cont. 2 2 2 2 2		Sample Specific Notes: 	
Preservation Used: 1= Ice, 2= HCl; 3= H2SO4; 4= HNO3; 5= NaOH; 6= Other <u>1, 2, 4, 5</u> Possible Hazard Identification <input type="checkbox"/> Non-Hazard <input type="checkbox"/> Flammable <input type="checkbox"/> Skin Irritant <input type="checkbox"/> Poison B <input type="checkbox"/> Unlabeled <input checked="" type="checkbox"/>													
Special Instructions/OC Requirements & Comments: Re 2261228 - gamma spec method EPA 903.0 and 904.0 Master Agreement CK AN 0076? ABT waters - Method EPA 900.0 CORNERSTONE ENV													
Relinquished by: John May		Company: KYDWM		Date/Time: 5/3/16 17:12		Received by: Robert Stellan		Company: KYDWM		Date/Time: 5/3/16 17:12			
Relinquished by: Robert Stellan		Company: KYDWM		Date/Time: 5/3/16 17:40		Received by: Gage Brewer		Company: KYDWM		Date/Time: 5/3/16 17:40			
Relinquished by: Gage Brewer		Company: KYDWM		Date/Time: 5/5/16 13:00		Received by: Gage Brewer		Company: TA		Date/Time: 5/16/16 08:00			



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Chain of Custody Record

TestAmerica Laboratories, Inc.

Client Contact Ky Div. of Waste Mgt. 130 Eagle Nest Dr. Paducah, Ky 42003 270 878-8468 Phone FAX		Project Manager: Gaye Brewer Tel/Fax: 270-892-8468 Analysis Turnaround Time Calendar (C) or Work Days (W) <input type="checkbox"/> 2 weeks <input type="checkbox"/> 1 week <input type="checkbox"/> 2 days <input type="checkbox"/> 1 day TAT if different from Below		Site Contact: Same Lab Contact: R. Ridenhower Date: 5-5-16 Carrier: FedEx COC No. 1 of 1 COCs Job No. SDG No.	
Sample Identification	Sample Date	Sample Time	Sample Type	Matrix	# of Cont.
#1 UV Effluent Channel 37°42086'	5/3/16	11:05AM	water	G	1
#2 UV Effluent Channel 37°5797'	5/3/16	11:05AM	water	G	1
#3 WWP Influent	5/3/16	11:45AM	water	G	1
#4 WWP Influent	5/3/16	11:45AM	water	G	1
#5 Filter Cake	5/3/16	12:00PM	solid	C	1
#6 Filter Cake	5/3/16	12:00PM	solid	C	1
#7 Filter Cake	5/3/16	12:10PM	solid	C	1
Preservation Used: 1= Ice, 2= HCl; 3= H2SO4; 4= HNO3; 5= NaOH; 6= Other Possible Hazard Identification <input type="checkbox"/> Non-Hazard <input type="checkbox"/> Flammable <input type="checkbox"/> Skin Irritant <input type="checkbox"/> Poison B <input type="checkbox"/> Unknown <input checked="" type="checkbox"/>					
Special Instructions/OC Requirements & Comments: Ra 226/228 on Soils Gamma Spec Method EPA 9011 Ra 226/228 on waters - GFPC Method 9030 and 9040 ABI EPA Method 900.0 Relinquished by: Rep J. Thomas Relinquished by: Gaye Brewer Relinquished by:					
Sample Disposal (A fee may be assessed if samples are retained longer than 1 month) <input type="checkbox"/> Return To Client <input checked="" type="checkbox"/> Disposal By Lab <input type="checkbox"/> Archive For _____ Months 44					
Master agreement method CKPN 0064? CKPN 0076?					
Received by: Rep J. Thomas Date/Time: 5/3/16 1:00		Received by: Gaye Brewer Date/Time: 5/3/16 1310 hr		Company: KYDWM Date/Time: 5/5/16 1300	
Received by:		Received by:		Company: KYDWM Date/Time:	
Received by:		Received by:		Company: KYDWM Date/Time:	

Chain of Custody Record

TestAmerica Laboratories, Inc.

St. Louis
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phone 314.298.8566 fax 314.298.8757

Client Contact Ky Div. of Waste Mgt. 130 Eagle Nest Dr. Paducah, Ky 42003 270 898-8468 Phone FAX		Project Manager: <i>Gaye Brown</i> Tel/Fax: 270-898-8468 Analysis Turnaround Time: <i>30g</i> Calendar (C) or Work Days (W) <i>30g</i> TAT if different from Below <i>30</i> <input type="checkbox"/> 2 weeks <input type="checkbox"/> 1 week <input type="checkbox"/> 2 days <input type="checkbox"/> 1 day		Site Contact: <i>Same</i> Lab Contact: R. Ridenhower Date: <i>5-5-16</i> Carrier: FedEx Job No. <i>2</i> of <i>3</i> COCs SDG No.	
Sample Identification Any Branch Creek Downstream Sub-Dip. Pond 3 Above Outfall		Sample Date 5-3-16 1835 5-3-16 1705	Sample Type G G	Matrix W W	# of Cont. 2 2
Preservation Used: 1= Ice, 2= HCl; 3= H2SO4; 4= HNO3; 5= NaOH; 6= Other Possible Hazard Identification <input type="checkbox"/> Non-Hazard <input type="checkbox"/> Flammable <input type="checkbox"/> Skin Irritant <input checked="" type="checkbox"/> Unknown <input type="checkbox"/> Poison B					
Special Instructions/QC Requirements & Comments: RA 2261228 on water G.F.P.C method EPA 903.0 and 904.0 Master Agreement Method CKPA0076? ABT Method EPA 900.0					
Relinquished by: <i>Gaye Brown</i>		Company: KYDWM Date/Time: 5/16/16 1300		Received by: <i>B. J.</i>	
Relinquished by:		Company:		Date/Time:	
Relinquished by:		Company:		Date/Time:	



St. Louis

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Earth City, MO 63045

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TestAmerica Laboratories, Inc.

Chain of Custody Record

Client Contact
 Project Manager: Gary Brewer Site Contact: Gary Brewer Date: 5-3-16
 Tel/Fax: 270-898-8468 Lab Contact: R. Ridenhower Carrier: FedEx
 Analysis Turnaround Time: 30 Calendar () or Work Days (W)
 TAT if different from Below: 30
 2 weeks 1 week 2 days 1 day

Project Name: ADS Blue Ridge Land Fill
Site: Blue Ridge Land fill
P O #

Sample Identification

Sample Date	Sample Time	Sample Type	Matrix	# of Cont.
5/3/16	11:00	liquid		2
5/3/16	11:20	sludge		3
5/3/16	3:00	liquid		2

Sample Specific Notes:
 ADS BRL-LT-LIA
 ADS BRL-LT-SL
 AD BRL-LT-LELF

Preservation Used: 1= Ice, 2= HCl; 3= H2SO4; 4= HNO3; 5= NaOH; 6= Other 2

Possible Hazard Identification
 Non-Hazard Flammable Skin Irritant Unknown

Special Instructions/QC Requirements & Comments:
 Re 226/228 on soils - Gamma spec Method EPA 901.1 or EML HASL Dec GA-01-R g.
 Re 226/228 on waters - GFC Method EPA 9030 and 9040 or SW846 935 and 936 g.
 ABT waters and soils Method EPA 900.0 or SW846 9310 g.

Relinquished by: Jeff Well
Relinquished by: Gary Brewer
Relinquished by: Gary Brewer

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
 Return To Client Disposal By Lab Archive For _____ Months

Date/Time: 5/3/16 3:15
Date/Time: 5/5/16 1300
Date/Time: 5/13/16 3:25pm
Date/Time: 5/16/16 09:00

Company: KYDWM
Company: TA
Company: TA



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Chain of Custody Record



TestAmerica Laboratories, Inc.

Project Manager: <u>Gene Brewer</u>		Site Contact: <u>Some</u>		Date: <u>5-5-16</u>		COC No: _____	
Tel/Fax: <u>270 898-8468</u>		Lab Contact: <u>R. Ridenhower</u>		Carrier: <u>FedEx</u>		Job No. of <u>2</u> COGS	
Analysis Turnaround Time		Calendar (C) of Work Days (W)		TAT if different from Below		SDG No.	
<input type="checkbox"/> 2 weeks <input type="checkbox"/> 1 week <input type="checkbox"/> 2 days <input type="checkbox"/> 1 day		<input type="checkbox"/> 30 <input type="checkbox"/> 30 <input type="checkbox"/> 30 <input type="checkbox"/> 30		<input type="checkbox"/> 30 <input type="checkbox"/> 30 <input type="checkbox"/> 30 <input type="checkbox"/> 30		Sample Specific Notes:	
Sample Identification	Sample Date	Sample Time	Sample Type	Matrix	# of Cont.	Filtered Sample	Sample Specific Notes
<u>Landfill Underchain 4B</u>							
<u>ADS BRL Underchain</u>	<u>5-3-16</u>	<u>1620</u>	<u>G</u>	<u>W</u>	<u>2</u>		
<u>Pond 3</u>	<u>5-3-16</u>	<u>1620</u>	<u>G</u>	<u>W</u>	<u>2</u>		
<u>Pond 3 Outfall</u>	<u>5-3-16</u>	<u>1650</u>	<u>G</u>	<u>W</u>	<u>2</u>		
<u>Pond 3 Sediment</u>	<u>5-3-16</u>	<u>1600</u>	<u>G</u>	<u>Sed</u>	<u>3</u>		
<u>Pond 3 Dup</u>	<u>5-3-16</u>	<u>1620</u>	<u>G</u>	<u>W</u>	<u>2</u>		
<u>Pond 3 Sediment Dup</u>	<u>5-3-16</u>	<u>1600</u>	<u>G</u>	<u>C</u>	<u>3</u>		
<u>Dry Branch Creek Upstream</u>	<u>5-3-16</u>	<u>1753</u>	<u>G</u>	<u>W</u>	<u>2</u>		
<u>" " " Sed</u>	<u>5-3-16</u>	<u>1758</u>	<u>C</u>	<u>Sed</u>	<u>3</u>		
<u>" " " Downstream</u>	<u>5-3-16</u>	<u>1835</u>	<u>G</u>	<u>W</u>	<u>2</u>		
<u>" " " " Sed</u>	<u>5-3-16</u>	<u>1855</u>	<u>C</u>	<u>Sed</u>	<u>3</u>		
<u>" " " " Dup</u>	<u>5-3-16</u>	<u>1855</u>	<u>C</u>	<u>Sed</u>	<u>3</u>		
Preservation Used: 1= Ice, 2= HCl; 3= H2SO4; 4= HNO3; 5= NaOH; 6= Other		Possible Hazard Identification		<input type="checkbox"/> Non-Hazard <input type="checkbox"/> Flammable <input type="checkbox"/> Skin Irritant <input type="checkbox"/> Poison B <input checked="" type="checkbox"/> Unknown		<input type="checkbox"/> Return To Client <input checked="" type="checkbox"/> Disposal By Lab <input type="checkbox"/> Archive For _____ Months	
Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)							
Special Instructions/OC Requirements & Comments: <u>Re 226/228 on Soils - Gamma Spec Method EPA 901.1 Master Agreement Method CKPN0064 ?</u> <u>Re 226/228 on Water GFPC Method EPA 903.0 and 9040 " " " " LKPN 0076 ?</u> <u>AST Water & Soil Method EPA 900.0</u>							
Relinquished by: <u>Gene Brewer</u>		Company: <u>KYDWM</u>		Date/Time: <u>5/5/16 1300</u>		Received by: _____	
Relinquished by: _____		Company: _____		Date/Time: _____		Received by: _____	
Relinquished by: _____		Company: _____		Date/Time: _____		Received by: _____	



St. Louis

13715 Rider Trail North

Earth City, MO 63045

phone 314.298.8566 fax 314.298.8757



TestAmerica Laboratories, Inc.

Chain of Custody Record

Project Manager: <u>Gene Brewer</u>		Site Contact: <u>Same</u>		Date: <u>5-5-16</u>		COC No. _____	
Tel/Fax: <u>310 898 8468</u>		Lab Contact: <u>R. Ridenhower</u>		Carrier: <u>FedEx</u>		Job No. _____	
Analysis Turnaround Time Calendar (C) of Work Days (W) _____ TAT if different from Below: <u>30</u>		2 weeks _____ 1 week _____ 2 days _____ 1 day _____		SDG No. _____		Sample Specific Notes:	
Sample Date	Sample Time	Sample Type	Matrix	# of Cont.	Sample Identification	Sample Specific Notes	
5-3-16	1115	W	W	2	Outfall 004		
5-3-16	1130	G	W	2	Pond 4		
5-3-16	1210	G/C Sed	W	3	Pond 4 Sediment		
5-3-16	1145	G/C Sed	W	3	Pond 4 Sed Silt fence		
5-3-16	1410	G	W	2	Sed Pond 1		
5-3-16	1430	G/C Sed	W	3	Sed Pond 1 Sediment		
5-3-16	1445	G	W	2	Outfall 001		
5-3-16	1500	G	W	2	Leachate Effluent		
5-3-16	3:40	G	W	2	Pond 2		
5-3-16	1600	G	W	2	Pond 2 Outfall		
5-3-16	3:45	C	Sed	3	Pond 2 Sediment		
5-3-16	3:40	W	W	2	Pond 2 Dup #B		
5-3-16	4:44	-	-	-			

Preservation Used: 1= Ice, 2= HCl; 3= H2SO4; 4= HNO3; 5= NaOH; 6= Other

Possible Hazard Identification
 Non-Hazard Flammable Skin Irritant Unknown Poison B Unknown

Special Instructions/QC Requirements & Comments:
Ra 226/228 on Soils Gamma Spec Method EPA 9011
Ra 226/228 on Waters GTFM Method EPA 9030 and 9040
ABT waters & soils Method EPA 900.0
Master Agreement Method CMAA 0064 ?
CXPN2076 ?

Relinquished by: Gene Brewer Date/Time: 5/5/16 1300
 Relinquished by: _____ Date/Time: _____
 Relinquished by: _____ Date/Time: _____

Received by: TA Date/Time: 5/6/16 0910
 Received by: _____ Date/Time: _____
 Received by: _____ Date/Time: _____

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
 Return To Client Disposal By Lab Archive For _____ Months



Login Sample Receipt Checklist

Client: Commonwealth of Kentucky

Job Number: 160-17284-1

Login Number: 17284

List Source: TestAmerica St. Louis

List Number: 1

Creator: Daniels, Brian J

Question	Answer	Comment
Radioactivity wasn't checked or is <=/ background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	N/A	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	N/A	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	Samples -1, -15, and -35 were received unpreserved. Nitric acid was added to adjust pH. Sample -1 is now < 2 SU but samples -15 and -35 were unsuccessfully adjusted and remain at 7.
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	N/A	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Definitions/Glossary

Client: Commonwealth of Kentucky
Project/Site: Blue Ridge Landfill

TestAmerica Job ID: 160-17284-1

Qualifiers

Rad

Qualifier	Qualifier Description
G	The Sample MDC is greater than the requested RL.
U	Result is less than the sample detection limit.
*	LCS or LCSD is outside acceptance limits.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
α	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains no Free Liquid
DER	Duplicate error ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision level concentration
MDA	Minimum detectable activity
EDL	Estimated Detection Limit
MDC	Minimum detectable concentration
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative error ratio
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

Method Summary

Client: Commonwealth of Kentucky
Project/Site: Blue Ridge Landfill

TestAmerica Job ID: 160-17284-1

Method	Method Description	Protocol	Laboratory
900.0	Gross Alpha and Gross Beta Radioactivity	EPA	TAL SL
901.1	Radium-226 & Other Gamma Emitters (GS)	EPA	TAL SL
903.0	Radium-226 (GFPC)	EPA	TAL SL
904.0	Radium-228 (GFPC)	EPA	TAL SL

Protocol References:

EPA = US Environmental Protection Agency

Laboratory References:

TAL SL = TestAmerica St. Louis, 13715 Rider Trail North, Earth City, MO 63045, TEL (314)298-8566



Sample Summary

Client: Commonwealth of Kentucky
Project/Site: Blue Ridge Landfill

TestAmerica Job ID: 160-17284-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
160-17284-1	MW-17R-AKGWA 8003-8393	Water	05/03/16 10:45	05/06/16 09:10
160-17284-2	MW-10-AKGWA 8001-0201	Water	05/03/16 11:33	05/06/16 09:10
160-17284-3	MW-13-AKGWA 8001-2025	Water	05/03/16 14:46	05/06/16 09:10
160-17284-4	MW-15R-AKGWA 8003-3579	Water	05/03/16 15:45	05/06/16 09:10
160-17284-5	MW-7-AKGWA 8001-0205	Water	05/03/16 16:55	05/06/16 09:10
160-17284-6	#1 UV EFFLUENT CHANNEL 37 DEGREES 42.086'	Water	05/03/16 11:05	05/06/16 09:10
160-17284-7	#2 UV EFFLUENT CHANNEL 83 DEGREES 58.917	Water	05/03/16 11:05	05/06/16 09:10
160-17284-8	#3 WWTP INFLUENT	Water	05/03/16 11:45	05/06/16 09:10
160-17284-9	#4 WWTP INFLUENT	Water	05/03/16 11:45	05/06/16 09:10
160-17284-10	#5 FILTER CAKE	Solid	05/03/16 12:10	05/06/16 09:10
160-17284-11	#6 FILTER CAKE	Solid	05/03/16 12:10	05/06/16 09:10
160-17284-12	#7 FILTER CAKE	Solid	05/03/16 12:10	05/06/16 09:10
160-17284-13	DRY BRANCH CREEK DOWNSTREAM DUP	Water	05/03/16 18:35	05/06/16 09:10
160-17284-14	POND 3 ABOVE OUTFALL	Water	05/03/16 17:25	05/06/16 09:10
160-17284-15	ADS BRL-LT-LIQ	Water	05/03/16 11:10	05/06/16 09:10
160-17284-16	ADS BRL-LT-SL	Solid	05/03/16 11:20	05/06/16 09:10
160-17284-17	ADS BRL UNDERDRAIN	Water	05/03/16 16:20	05/06/16 09:10
160-17284-18	POND 3	Water	05/03/16 16:20	05/06/16 09:10
160-17284-19	POND 3 OUTFALL	Water	05/03/16 16:50	05/06/16 09:10
160-17284-20	POND 3 SEDIMENT	Solid	05/03/16 16:00	05/06/16 09:10
160-17284-21	POND 3 DUP	Water	05/03/16 16:20	05/06/16 09:10
160-17284-22	POND 3 SEDIMENT DUP	Solid	05/03/16 16:00	05/06/16 09:10
160-17284-23	DRY BRANCH CREEK UPSTREAM	Water	05/03/16 17:53	05/06/16 09:10
160-17284-24	DRY BRANCH CREEK UPSTREAM SED	Solid	05/03/16 17:58	05/06/16 09:10
160-17284-25	DRY BRANCH CREEK DOWNSTREAM	Water	05/03/16 18:35	05/06/16 09:10
160-17284-26	DRY BRANCH CREEK DOWNSTREAM SED	Solid	05/03/16 18:55	05/06/16 09:10
160-17284-27	DRY BRANCH CREEK DOWNSTREAM SED DUP	Solid	05/03/16 18:55	05/06/16 09:10
160-17284-28	OUTFALL 004	Water	05/03/16 11:15	05/06/16 09:10
160-17284-29	POND 4	Water	05/03/16 11:30	05/06/16 09:10
160-17284-30	POND 4 SEDIMENT	Solid	05/03/16 12:10	05/06/16 09:10
160-17284-31	POND 4 SED SILT FENCE	Solid	05/03/16 11:45	05/06/16 09:10
160-17284-32	SED POND 1	Water	05/03/16 14:10	05/06/16 09:10
160-17284-33	SED POND 1 SEDIMENT	Solid	05/03/16 14:30	05/06/16 09:10
160-17284-34	OUTFALL 001	Water	05/03/16 14:45	05/06/16 09:10
160-17284-35	LEACHATE EFFLEUNT	Water	05/03/16 15:00	05/06/16 09:10
160-17284-36	POND 2	Water	05/03/16 15:40	05/06/16 09:10
160-17284-37	POND 2 OUTFALL	Water	05/03/16 16:00	05/06/16 09:10
160-17284-38	POND 2 SEDIMENT	Solid	05/03/16 15:45	05/06/16 09:10

Client Sample Results

Client: Commonwealth of Kentucky
Project/Site: Blue Ridge Landfill

TestAmerica Job ID: 160-17284-1

Client Sample ID: MW-17R-AKGWA 8003-8393

Lab Sample ID: 160-17284-1

Date Collected: 05/03/16 10:45

Matrix: Water

Date Received: 05/06/16 09:10

Method: 900.0 - Gross Alpha and Gross Beta Radioactivity

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Gross Alpha	5.09	U G	8.34	8.36	3.00	14.4	pCi/L	06/03/16 09:53	06/09/16 07:58	1
Gross Beta	9.31	G	4.87	4.96	4.00	7.28	pCi/L	06/03/16 09:53	06/09/16 07:58	1

Method: 903.0 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	3.87		0.247	0.427	1.00	0.0620	pCi/L	05/10/16 15:18	06/01/16 07:33	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	85.5		40 - 110					05/10/16 15:18	06/01/16 07:33	1

Method: 904.0 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.513		0.310	0.313	1.00	0.476	pCi/L	05/10/16 17:22	05/17/16 17:56	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	85.5		40 - 110					05/10/16 17:22	05/17/16 17:56	1
Y Carrier	88.6		40 - 110					05/10/16 17:22	05/17/16 17:56	1

Client Sample Results

Client: Commonwealth of Kentucky
Project/Site: Blue Ridge Landfill

TestAmerica Job ID: 160-17284-1

Client Sample ID: MW-10-ACGWA 8001-0201

Lab Sample ID: 160-17284-2

Date Collected: 05/03/16 11:33

Matrix: Water

Date Received: 05/06/16 09:10

Method: 900.0 - Gross Alpha and Gross Beta Radioactivity

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Gross Alpha	8.00	U G	6.42	6.49	3.00	9.37	pCi/L	06/03/16 09:53	06/09/16 07:58	1
Gross Beta	5.97	G	3.86	3.91	4.00	5.77	pCi/L	06/03/16 09:53	06/09/16 07:58	1

Method: 903.0 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	3.58		0.250	0.408	1.00	0.0679	pCi/L	05/10/16 15:18	06/01/16 07:34	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	74.9		40 - 110					05/10/16 15:18	06/01/16 07:34	1

Method: 904.0 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.446		0.288	0.291	1.00	0.440	pCi/L	05/10/16 17:22	05/17/16 17:56	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	74.9		40 - 110					05/10/16 17:22	05/17/16 17:56	1
Y Carrier	87.1		40 - 110					05/10/16 17:22	05/17/16 17:56	1

Client Sample Results

Client: Commonwealth of Kentucky
Project/Site: Blue Ridge Landfill

TestAmerica Job ID: 160-17284-1

Client Sample ID: MW-13-AGWA 8001-2025

Lab Sample ID: 160-17284-3

Date Collected: 05/03/16 14:46

Matrix: Water

Date Received: 05/06/16 09:10

Method: 900.0 - Gross Alpha and Gross Beta Radioactivity

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Gross Alpha	88.6	G	46.5	47.6	3.00	57.0	pCi/L	06/03/16 09:53	06/09/16 07:58	1
Gross Beta	36.0	G	21.3	21.6	4.00	30.5	pCi/L	06/03/16 09:53	06/09/16 07:58	1

Method: 903.0 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	1.29		0.140	0.181	1.00	0.0652	pCi/L	05/10/16 15:18	06/01/16 07:34	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	100		40 - 110					05/10/16 15:18	06/01/16 07:34	1

Method: 904.0 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.114	U	0.207	0.207	1.00	0.352	pCi/L	05/10/16 17:22	05/17/16 17:57	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	100		40 - 110					05/10/16 17:22	05/17/16 17:57	1
Y Carrier	86.4		40 - 110					05/10/16 17:22	05/17/16 17:57	1

Client Sample Results

Client: Commonwealth of Kentucky
 Project/Site: Blue Ridge Landfill

TestAmerica Job ID: 160-17284-1

Client Sample ID: MW-15R-AKGWA 8003-3579

Lab Sample ID: 160-17284-4

Date Collected: 05/03/16 15:45

Matrix: Water

Date Received: 05/06/16 09:10

Method: 900.0 - Gross Alpha and Gross Beta Radioactivity

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Gross Alpha	21.7	G	9.66	9.97	3.00	10.8	pCi/L	06/03/16 09:53	06/09/16 07:59	1
Gross Beta	11.6	G	4.64	4.79	4.00	6.19	pCi/L	06/03/16 09:53	06/09/16 07:59	1

Method: 903.0 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.580		0.0994	0.112	1.00	0.0555	pCi/L	05/10/16 15:18	06/01/16 07:34	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	79.5		40 - 110					05/10/16 15:18	06/01/16 07:34	1

Method: 904.0 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.289	U	0.267	0.269	1.00	0.430	pCi/L	05/10/16 17:22	05/17/16 17:57	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	79.5		40 - 110					05/10/16 17:22	05/17/16 17:57	1
Y Carrier	87.1		40 - 110					05/10/16 17:22	05/17/16 17:57	1

Client Sample Results

Client: Commonwealth of Kentucky
Project/Site: Blue Ridge Landfill

TestAmerica Job ID: 160-17284-1

Client Sample ID: MW-7-AKGWA 8001-0205

Lab Sample ID: 160-17284-5

Date Collected: 05/03/16 16:55

Matrix: Water

Date Received: 05/06/16 09:10

Method: 900.0 - Gross Alpha and Gross Beta Radioactivity

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Gross Alpha	7.33	U G	10.9	11.0	3.00	18.5	pCi/L	06/03/16 09:53	06/09/16 07:59	1
Gross Beta	7.43	G	4.81	4.87	4.00	7.28	pCi/L	06/03/16 09:53	06/09/16 07:59	1

Method: 903.0 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	2.96		0.215	0.342	1.00	0.0595	pCi/L	05/10/16 15:18	06/01/16 07:34	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	84.9		40 - 110					05/10/16 15:18	06/01/16 07:34	1

Method: 904.0 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.189	U	0.263	0.264	1.00	0.440	pCi/L	05/10/16 17:22	05/17/16 17:57	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	84.9		40 - 110					05/10/16 17:22	05/17/16 17:57	1
Y Carrier	84.5		40 - 110					05/10/16 17:22	05/17/16 17:57	1

Client Sample Results

Client: Commonwealth of Kentucky
 Project/Site: Blue Ridge Landfill

TestAmerica Job ID: 160-17284-1

**Client Sample ID: #1 UV EFFLUENT CHANNEL 37 DEGREES
 42.086'**

Lab Sample ID: 160-17284-6

Date Collected: 05/03/16 11:05

Matrix: Water

Date Received: 05/06/16 09:10

Method: 900.0 - Gross Alpha and Gross Beta Radioactivity

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Gross Alpha	1.41	U	1.63	1.64	3.00	2.65	pCi/L	06/03/16 09:53	06/09/16 07:59	1
Gross Beta	7.23		1.40	1.58	4.00	1.48	pCi/L	06/03/16 09:53	06/09/16 07:59	1

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- 2
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- 11
- 12

Client Sample Results

Client: Commonwealth of Kentucky
Project/Site: Blue Ridge Landfill

TestAmerica Job ID: 160-17284-1

**Client Sample ID: #2 UV EFFLUENT CHANNEL83 DEGREES
58.917**

Lab Sample ID: 160-17284-7

Date Collected: 05/03/16 11:05

Matrix: Water

Date Received: 05/06/16 09:10

Method: 903.0 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.127		0.0837	0.0845	1.00	0.114	pCi/L	05/10/16 15:18	06/01/16 07:34	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	82.1		40 - 110					05/10/16 15:18	06/01/16 07:34	1

Method: 904.0 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	-0.406	U	0.416	0.418	1.00	0.830	pCi/L	05/10/16 17:22	05/17/16 17:57	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	82.1		40 - 110					05/10/16 17:22	05/17/16 17:57	1
Y Carrier	89.3		40 - 110					05/10/16 17:22	05/17/16 17:57	1

Client Sample Results

Client: Commonwealth of Kentucky
 Project/Site: Blue Ridge Landfill

TestAmerica Job ID: 160-17284-1

Client Sample ID: #3 WWTP INFLUENT

Lab Sample ID: 160-17284-8

Date Collected: 05/03/16 11:45

Matrix: Water

Date Received: 05/06/16 09:10

Method: 900.0 - Gross Alpha and Gross Beta Radioactivity

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Gross Alpha	42.7	G	14.5	15.3	3.00	14.5	pCi/L	06/03/16 09:53	06/09/16 08:00	1
Gross Beta	46.3	G	8.72	9.87	4.00	8.94	pCi/L	06/03/16 09:53	06/09/16 08:00	1

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- 12

Client Sample Results

Client: Commonwealth of Kentucky
 Project/Site: Blue Ridge Landfill

TestAmerica Job ID: 160-17284-1

Client Sample ID: #4 WWTP INFLUENT

Lab Sample ID: 160-17284-9

Date Collected: 05/03/16 11:45

Matrix: Water

Date Received: 05/06/16 09:10

Method: 903.0 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	2.56		0.409	0.469	1.00	0.297	pCi/L	05/10/16 15:18	06/01/16 07:34	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	40.7		40 - 110					05/10/16 15:18	06/01/16 07:34	1

Method: 904.0 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	3.22	G	1.49	1.52	1.00	2.19	pCi/L	05/10/16 17:22	05/17/16 17:57	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	40.7		40 - 110					05/10/16 17:22	05/17/16 17:57	1
Y Carrier	80.7		40 - 110					05/10/16 17:22	05/17/16 17:57	1

Client Sample Results

Client: Commonwealth of Kentucky
 Project/Site: Blue Ridge Landfill

TestAmerica Job ID: 160-17284-1

Client Sample ID: #5 FILTER CAKE

Lab Sample ID: 160-17284-10

Date Collected: 05/03/16 12:10

Matrix: Solid

Date Received: 05/06/16 09:10

Method: 901.1 - Radium-226 & Other Gamma Emitters (GS)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.885		0.221	0.237	1.00	0.190	pCi/g	05/12/16 12:24	06/02/16 09:22	1
Radium-228	0.936		0.351	0.363		0.426	pCi/g	05/12/16 12:24	06/02/16 09:22	1

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Client Sample Results

Client: Commonwealth of Kentucky
Project/Site: Blue Ridge Landfill

TestAmerica Job ID: 160-17284-1

Client Sample ID: #6 FILTER CAKE

Lab Sample ID: 160-17284-11

Date Collected: 05/03/16 12:10

Matrix: Solid

Date Received: 05/06/16 09:10

Method: 901.1 - Radium-226 & Other Gamma Emitters (GS)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.000	U	0.262	0.262	1.00	0.808	pCi/g	05/12/16 12:24	06/02/16 11:46	1
Radium-228	0.585	U	0.495	0.499		0.663	pCi/g	05/12/16 12:24	06/02/16 11:46	1

Client Sample Results

Client: Commonwealth of Kentucky
 Project/Site: Blue Ridge Landfill

TestAmerica Job ID: 160-17284-1

Client Sample ID: #7 FILTER CAKE

Lab Sample ID: 160-17284-12

Date Collected: 05/03/16 12:10

Matrix: Solid

Date Received: 05/06/16 09:10

Method: 900.0 - Gross Alpha and Gross Beta Radioactivity

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Gross Alpha	14.9		5.96	6.20	10.0	7.38	pCi/g	05/16/16 15:33	05/17/16 17:46	1
Gross Beta	19.0		4.10	4.52	10.0	4.83	pCi/g	05/16/16 15:33	05/17/16 17:46	1

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Client Sample Results

Client: Commonwealth of Kentucky
 Project/Site: Blue Ridge Landfill

TestAmerica Job ID: 160-17284-1

Client Sample ID: DRY BRANCH CREEK DOWNSTREAM DUP

Lab Sample ID: 160-17284-13

Date Collected: 05/03/16 18:35

Matrix: Water

Date Received: 05/06/16 09:10

Method: 900.0 - Gross Alpha and Gross Beta Radioactivity

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Gross Alpha	2.89		1.59	1.63	3.00	2.03	pCi/L	06/03/16 09:53	06/09/16 08:00	1
Gross Beta	1.61		0.742	0.759	4.00	1.03	pCi/L	06/03/16 09:53	06/09/16 08:00	1

Method: 903.0 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.0844		0.0482	0.0488	1.00	0.0633	pCi/L	05/10/16 15:18	06/01/16 07:34	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	80.6		40 - 110					05/10/16 15:18	06/01/16 07:34	1

Method: 904.0 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.226	U	0.278	0.279	1.00	0.461	pCi/L	05/10/16 17:22	05/17/16 17:58	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	80.6		40 - 110					05/10/16 17:22	05/17/16 17:58	1
Y Carrier	89.3		40 - 110					05/10/16 17:22	05/17/16 17:58	1

Client Sample Results

Client: Commonwealth of Kentucky
Project/Site: Blue Ridge Landfill

TestAmerica Job ID: 160-17284-1

Client Sample ID: POND 3 ABOVE OUTFALL

Lab Sample ID: 160-17284-14

Date Collected: 05/03/16 17:25

Matrix: Water

Date Received: 05/06/16 09:10

Method: 900.0 - Gross Alpha and Gross Beta Radioactivity

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Gross Alpha	26.8	G	10.7	11.2	3.00	13.5	pCi/L	06/03/16 09:53	06/09/16 08:01	1
Gross Beta	22.9	G	5.26	5.73	4.00	6.02	pCi/L	06/03/16 09:53	06/09/16 08:01	1

Method: 903.0 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	1.65		0.166	0.222	1.00	0.0623	pCi/L	05/10/16 15:18	06/01/16 07:34	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	82.9		40 - 110					05/10/16 15:18	06/01/16 07:34	1

Method: 904.0 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.384	U	0.272	0.274	1.00	0.424	pCi/L	05/10/16 17:22	05/17/16 17:58	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	82.9		40 - 110					05/10/16 17:22	05/17/16 17:58	1
Y Carrier	90.1		40 - 110					05/10/16 17:22	05/17/16 17:58	1

Client Sample Results

Client: Commonwealth of Kentucky
Project/Site: Blue Ridge Landfill

TestAmerica Job ID: 160-17284-1

Client Sample ID: ADS BRL-LT-LIQ

Lab Sample ID: 160-17284-15

Date Collected: 05/03/16 11:10

Matrix: Water

Date Received: 05/06/16 09:10

Method: 900.0 - Gross Alpha and Gross Beta Radioactivity

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Gross Alpha	54.1	U G	38.8	39.3	3.00	54.4	pCi/L	06/03/16 09:53	06/09/16 08:01	1
Gross Beta	480	G	45.4	66.1	4.00	30.9	pCi/L	06/03/16 09:53	06/09/16 08:01	1

Method: 903.0 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	3.33		0.326	0.443	1.00	0.123	pCi/L	05/17/16 15:37	06/10/16 06:55	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	87.7		40 - 110					05/17/16 15:37	06/10/16 06:55	1

Method: 904.0 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	1.74		0.590	0.611	1.00	0.784	pCi/L	05/19/16 14:12	05/27/16 12:06	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	87.7		40 - 110					05/19/16 14:12	05/27/16 12:06	1
Y Carrier	83.4		40 - 110					05/19/16 14:12	05/27/16 12:06	1

Client Sample Results

Client: Commonwealth of Kentucky
 Project/Site: Blue Ridge Landfill

TestAmerica Job ID: 160-17284-1

Client Sample ID: ADS BRL-LT-SL

Lab Sample ID: 160-17284-16

Date Collected: 05/03/16 11:20

Matrix: Solid

Date Received: 05/06/16 09:10

Method: 900.0 - Gross Alpha and Gross Beta Radioactivity

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Gross Alpha	28.9		6.31	7.12	10.0	4.95	pCi/g	05/16/16 15:33	05/17/16 17:46	1
Gross Beta	27.4		3.50	4.44	10.0	3.19	pCi/g	05/16/16 15:33	05/17/16 17:46	1

Method: 901.1 - Radium-226 & Other Gamma Emitters (GS)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	4.47		0.610	0.767	1.00	0.289	pCi/g	05/12/16 12:24	06/02/16 08:29	1
Radium-228	2.28		0.568	0.614		0.310	pCi/g	05/12/16 12:24	06/02/16 08:29	1



Client Sample Results

Client: Commonwealth of Kentucky
Project/Site: Blue Ridge Landfill

TestAmerica Job ID: 160-17284-1

Client Sample ID: ADS BRL UNDERDRAIN

Lab Sample ID: 160-17284-17

Date Collected: 05/03/16 16:20

Matrix: Water

Date Received: 05/06/16 09:10

Method: 900.0 - Gross Alpha and Gross Beta Radioactivity

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Gross Alpha	-2.75	U G	24.4	24.4	3.00	46.7	pCi/L	06/03/16 09:53	06/09/16 08:02	1
Gross Beta	27.0	G	11.7	12.0	4.00	16.8	pCi/L	06/03/16 09:53	06/09/16 08:02	1

Method: 903.0 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.751		0.110	0.129	1.00	0.0589	pCi/L	05/10/16 15:18	06/01/16 18:12	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	93.7		40 - 110					05/10/16 15:18	06/01/16 18:12	1

Method: 904.0 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.506		0.265	0.269	1.00	0.392	pCi/L	05/10/16 17:22	05/17/16 17:58	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	93.7		40 - 110					05/10/16 17:22	05/17/16 17:58	1
Y Carrier	85.6		40 - 110					05/10/16 17:22	05/17/16 17:58	1

Client Sample Results

Client: Commonwealth of Kentucky
Project/Site: Blue Ridge Landfill

TestAmerica Job ID: 160-17284-1

Client Sample ID: POND 3

Lab Sample ID: 160-17284-18

Date Collected: 05/03/16 16:20

Matrix: Water

Date Received: 05/06/16 09:10

Method: 900.0 - Gross Alpha and Gross Beta Radioactivity

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Gross Alpha	10.6	U G	7.94	8.03	3.00	11.9	pCi/L	06/03/16 09:53	06/09/16 08:02	1
Gross Beta	26.5	G	5.02	5.67	4.00	5.40	pCi/L	06/03/16 09:53	06/09/16 08:02	1

Method: 903.0 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.754		0.127	0.144	1.00	0.0991	pCi/L	05/10/16 15:18	06/01/16 18:12	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	76.9		40 - 110					05/10/16 15:18	06/01/16 18:12	1

Method: 904.0 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.353	U	0.288	0.290	1.00	0.456	pCi/L	05/10/16 17:22	05/17/16 17:59	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	76.9		40 - 110					05/10/16 17:22	05/17/16 17:59	1
Y Carrier	89.7		40 - 110					05/10/16 17:22	05/17/16 17:59	1

Client Sample Results

Client: Commonwealth of Kentucky
Project/Site: Blue Ridge Landfill

TestAmerica Job ID: 160-17284-1

Client Sample ID: POND 3 OUTFALL

Lab Sample ID: 160-17284-19

Date Collected: 05/03/16 16:50

Matrix: Water

Date Received: 05/06/16 09:10

Method: 900.0 - Gross Alpha and Gross Beta Radioactivity

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Gross Alpha	8.69	U G	7.14	7.21	3.00	10.9	pCi/L	06/03/16 09:53	06/09/16 08:02	1
Gross Beta	29.7	G	5.15	5.95	4.00	5.32	pCi/L	06/03/16 09:53	06/09/16 08:02	1

Method: 903.0 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.634		0.114	0.127	1.00	0.0925	pCi/L	05/10/16 15:18	06/01/16 18:12	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	80.6		40 - 110					05/10/16 15:18	06/01/16 18:12	1

Method: 904.0 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.485		0.305	0.308	1.00	0.469	pCi/L	05/10/16 17:22	05/17/16 17:59	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	80.6		40 - 110					05/10/16 17:22	05/17/16 17:59	1
Y Carrier	89.7		40 - 110					05/10/16 17:22	05/17/16 17:59	1

Client Sample Results

Client: Commonwealth of Kentucky
 Project/Site: Blue Ridge Landfill

TestAmerica Job ID: 160-17284-1

Client Sample ID: POND 3 SEDIMENT

Lab Sample ID: 160-17284-20

Date Collected: 05/03/16 16:00

Matrix: Solid

Date Received: 05/06/16 09:10

Method: 900.0 - Gross Alpha and Gross Beta Radioactivity

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Gross Alpha	30.9		6.31	7.23	10.0	4.49	pCi/g	05/16/16 15:33	05/17/16 17:47	1
Gross Beta	37.8		3.63	5.24	10.0	2.77	pCi/g	05/16/16 15:33	05/17/16 17:47	1

Method: 901.1 - Radium-226 & Other Gamma Emitters (GS)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	3.38		0.500	0.611	1.00	0.295	pCi/g	05/12/16 12:24	06/02/16 08:28	1
Radium-228	2.41		0.429	0.495		0.262	pCi/g	05/12/16 12:24	06/02/16 08:28	1

Client Sample Results

Client: Commonwealth of Kentucky
Project/Site: Blue Ridge Landfill

TestAmerica Job ID: 160-17284-1

Client Sample ID: POND 3 DUP

Lab Sample ID: 160-17284-21

Date Collected: 05/03/16 16:20

Matrix: Water

Date Received: 05/06/16 09:10

Method: 900.0 - Gross Alpha and Gross Beta Radioactivity

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Gross Alpha	10.7	U G	8.45	8.54	3.00	12.9	pCi/L	06/03/16 09:53	06/09/16 08:02	1
Gross Beta	23.8	G	4.99	5.53	4.00	5.66	pCi/L	06/03/16 09:53	06/09/16 08:02	1

Method: 903.0 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.735		0.112	0.130	1.00	0.0788	pCi/L	05/10/16 15:18	06/01/16 12:22	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	86.0		40 - 110					05/10/16 15:18	06/01/16 12:22	1

Method: 904.0 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.383	U	0.286	0.289	1.00	0.452	pCi/L	05/10/16 17:22	05/17/16 18:00	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	86.0		40 - 110					05/10/16 17:22	05/17/16 18:00	1
Y Carrier	90.1		40 - 110					05/10/16 17:22	05/17/16 18:00	1

Client Sample Results

Client: Commonwealth of Kentucky
 Project/Site: Blue Ridge Landfill

TestAmerica Job ID: 160-17284-1

Client Sample ID: POND 3 SEDIMENT DUP

Lab Sample ID: 160-17284-22

Date Collected: 05/03/16 16:00

Matrix: Solid

Date Received: 05/06/16 09:10

Method: 900.0 - Gross Alpha and Gross Beta Radioactivity

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Gross Alpha	40.5		7.44	8.76	10.0	4.87	pCi/g	05/16/16 15:33	05/17/16 17:47	1
Gross Beta	40.6		4.36	5.96	10.0	3.82	pCi/g	05/16/16 15:33	05/17/16 17:47	1

Method: 901.1 - Radium-226 & Other Gamma Emitters (GS)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	3.45		0.462	0.585	1.00	0.328	pCi/g	05/12/16 12:24	06/02/16 08:29	1
Radium-228	1.79		0.469	0.503		0.402	pCi/g	05/12/16 12:24	06/02/16 08:29	1

Client Sample Results

Client: Commonwealth of Kentucky
Project/Site: Blue Ridge Landfill

TestAmerica Job ID: 160-17284-1

Client Sample ID: DRY BRANCH CREEK UPSTREAM

Lab Sample ID: 160-17284-23

Date Collected: 05/03/16 17:53

Matrix: Water

Date Received: 05/06/16 09:10

Method: 900.0 - Gross Alpha and Gross Beta Radioactivity

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Gross Alpha	1.21	U	1.47	1.48	3.00	2.42	pCi/L	06/03/16 09:53	06/09/16 08:02	1
Gross Beta	2.35		0.864	0.895	4.00	1.14	pCi/L	06/03/16 09:53	06/09/16 08:02	1

Method: 903.0 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.0618	U	0.0504	0.0507	1.00	0.0773	pCi/L	05/10/16 15:18	06/01/16 12:23	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	83.5		40 - 110					05/10/16 15:18	06/01/16 12:23	1

Method: 904.0 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.268	U	0.267	0.268	1.00	0.433	pCi/L	05/10/16 17:22	05/17/16 18:00	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	83.5		40 - 110					05/10/16 17:22	05/17/16 18:00	1
Y Carrier	88.6		40 - 110					05/10/16 17:22	05/17/16 18:00	1

Client Sample Results

Client: Commonwealth of Kentucky
 Project/Site: Blue Ridge Landfill

TestAmerica Job ID: 160-17284-1

Client Sample ID: DRY BRANCH CREEK UPSTREAM SED

Lab Sample ID: 160-17284-24

Date Collected: 05/03/16 17:58

Matrix: Solid

Date Received: 05/06/16 09:10

Method: 900.0 - Gross Alpha and Gross Beta Radioactivity

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Gross Alpha	29.8		7.74	8.45	10.0	7.17	pCi/g	05/16/16 15:33	05/17/16 17:47	1
Gross Beta	31.7		5.24	6.12	10.0	5.40	pCi/g	05/16/16 15:33	05/17/16 17:47	1

Method: 901.1 - Radium-226 & Other Gamma Emitters (GS)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	2.00		0.250	0.325	1.00	0.173	pCi/g	05/12/16 12:24	06/02/16 08:59	1
Radium-228	1.35		0.219	0.258		0.206	pCi/g	05/12/16 12:24	06/02/16 08:59	1

Client Sample Results

Client: Commonwealth of Kentucky
Project/Site: Blue Ridge Landfill

TestAmerica Job ID: 160-17284-1

Client Sample ID: DRY BRANCH CREEK DOWNSTREAM

Lab Sample ID: 160-17284-25

Date Collected: 05/03/16 18:35

Matrix: Water

Date Received: 05/06/16 09:10

Method: 900.0 - Gross Alpha and Gross Beta Radioactivity

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Gross Alpha	1.93	U	1.81	1.83	3.00	2.81	pCi/L	06/03/16 09:53	06/09/16 08:02	1
Gross Beta	1.74		0.704	0.726	4.00	0.960	pCi/L	06/03/16 09:53	06/09/16 08:02	1

Method: 903.0 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.106		0.0556	0.0564	1.00	0.0741	pCi/L	05/10/16 15:18	06/01/16 12:24	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	80.9		40 - 110					05/10/16 15:18	06/01/16 12:24	1

Method: 904.0 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.0635	U	0.231	0.231	1.00	0.404	pCi/L	05/10/16 17:22	05/17/16 18:01	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	80.9		40 - 110					05/10/16 17:22	05/17/16 18:01	1
Y Carrier	95.0		40 - 110					05/10/16 17:22	05/17/16 18:01	1

Client Sample Results

Client: Commonwealth of Kentucky
 Project/Site: Blue Ridge Landfill

TestAmerica Job ID: 160-17284-1

Client Sample ID: DRY BRANCH CREEK DOWNSTREAM SED

Lab Sample ID: 160-17284-26

Date Collected: 05/03/16 18:55

Matrix: Solid

Date Received: 05/06/16 09:10

Method: 900.0 - Gross Alpha and Gross Beta Radioactivity

Analyte	Result	Qualifier	Count	Total	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
			Uncert. (2σ+/-)	Uncert. (2σ+/-)						
Gross Alpha	30.0		6.17	7.05	10.0	4.03	pCi/g	05/16/16 15:33	05/17/16 17:47	1
Gross Beta	33.3		3.85	5.09	10.0	3.20	pCi/g	05/16/16 15:33	05/17/16 17:47	1

Method: 901.1 - Radium-226 & Other Gamma Emitters (GS)

Analyte	Result	Qualifier	Count	Total	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
			Uncert. (2σ+/-)	Uncert. (2σ+/-)						
Radium-226	2.80		0.247	0.382	1.00	0.128	pCi/g	05/12/16 12:24	06/02/16 09:02	1
Radium-228	1.30		0.226	0.262		0.185	pCi/g	05/12/16 12:24	06/02/16 09:02	1

Client Sample Results

Client: Commonwealth of Kentucky
 Project/Site: Blue Ridge Landfill

TestAmerica Job ID: 160-17284-1

**Client Sample ID: DRY BRANCH CREEK DOWNSTREAM SED
 DUP**

Lab Sample ID: 160-17284-27

Date Collected: 05/03/16 18:55

Matrix: Solid

Date Received: 05/06/16 09:10

Method: 900.0 - Gross Alpha and Gross Beta Radioactivity

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Gross Alpha	41.5		7.53	8.89	10.0	4.80	pCi/g	05/16/16 15:33	05/17/16 17:47	1
Gross Beta	28.7		3.98	4.91	10.0	3.67	pCi/g	05/16/16 15:33	05/17/16 17:47	1

Method: 901.1 - Radium-226 & Other Gamma Emitters (GS)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	3.32		0.357	0.497	1.00	0.178	pCi/g	05/12/16 12:24	06/02/16 09:24	1
Radium-228	1.32		0.279	0.310		0.276	pCi/g	05/12/16 12:24	06/02/16 09:24	1

Client Sample Results

Client: Commonwealth of Kentucky
 Project/Site: Blue Ridge Landfill

TestAmerica Job ID: 160-17284-1

Client Sample ID: OUTFALL 004

Lab Sample ID: 160-17284-28

Date Collected: 05/03/16 11:15

Matrix: Water

Date Received: 05/06/16 09:10

Method: 900.0 - Gross Alpha and Gross Beta Radioactivity

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Gross Alpha	6.58	G	3.51	3.59	3.00	4.12	pCi/L	06/03/16 09:53	06/09/16 08:02	1
Gross Beta	4.50		1.97	2.02	4.00	2.72	pCi/L	06/03/16 09:53	06/09/16 08:02	1

Method: 903.0 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.251		0.0751	0.0784	1.00	0.0811	pCi/L	05/10/16 15:18	06/01/16 12:24	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	84.3		40 - 110					05/10/16 15:18	06/01/16 12:24	1

Method: 904.0 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.0587	U	0.198	0.198	1.00	0.349	pCi/L	05/10/16 17:22	05/17/16 18:01	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	84.3		40 - 110					05/10/16 17:22	05/17/16 18:01	1
Y Carrier	90.5		40 - 110					05/10/16 17:22	05/17/16 18:01	1

Client Sample Results

Client: Commonwealth of Kentucky
Project/Site: Blue Ridge Landfill

TestAmerica Job ID: 160-17284-1

Client Sample ID: POND 4

Lab Sample ID: 160-17284-29

Date Collected: 05/03/16 11:30

Matrix: Water

Date Received: 05/06/16 09:10

Method: 900.0 - Gross Alpha and Gross Beta Radioactivity

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Gross Alpha	4.43	G	2.83	2.87	3.00	4.06	pCi/L	06/03/16 09:53	06/09/16 08:03	1
Gross Beta	6.93		1.69	1.83	4.00	2.05	pCi/L	06/03/16 09:53	06/09/16 08:03	1

Method: 903.0 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.164		0.0681	0.0697	1.00	0.0794	pCi/L	05/10/16 15:18	06/01/16 12:24	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	65.5		40 - 110					05/10/16 15:18	06/01/16 12:24	1

Method: 904.0 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.0500	U	0.276	0.276	1.00	0.490	pCi/L	05/10/16 17:22	05/17/16 18:01	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	65.5		40 - 110					05/10/16 17:22	05/17/16 18:01	1
Y Carrier	93.5		40 - 110					05/10/16 17:22	05/17/16 18:01	1

Client Sample Results

Client: Commonwealth of Kentucky
 Project/Site: Blue Ridge Landfill

TestAmerica Job ID: 160-17284-1

Client Sample ID: POND 4 SEDIMENT

Lab Sample ID: 160-17284-30

Date Collected: 05/03/16 12:10

Matrix: Solid

Date Received: 05/06/16 09:10

Method: 900.0 - Gross Alpha and Gross Beta Radioactivity

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Gross Alpha	36.3		7.29	8.38	10.0	4.75	pCi/g	05/16/16 15:33	05/17/16 17:48	1
Gross Beta	36.5		4.68	5.94	10.0	4.15	pCi/g	05/16/16 15:33	05/17/16 17:48	1

Method: 901.1 - Radium-226 & Other Gamma Emitters (GS)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	3.37		0.422	0.548	1.00	0.267	pCi/g	05/12/16 12:24	06/02/16 09:25	1
Radium-228	2.08		0.416	0.467		0.485	pCi/g	05/12/16 12:24	06/02/16 09:25	1

Client Sample Results

Client: Commonwealth of Kentucky
 Project/Site: Blue Ridge Landfill

TestAmerica Job ID: 160-17284-1

Client Sample ID: POND 4 SED SILT FENCE

Lab Sample ID: 160-17284-31

Date Collected: 05/03/16 11:45

Matrix: Solid

Date Received: 05/06/16 09:10

Method: 900.0 - Gross Alpha and Gross Beta Radioactivity

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Gross Alpha	35.8		8.35	9.30	10.0	7.86	pCi/g	05/16/16 15:33	05/17/16 17:49	1
Gross Beta	32.6		5.06	6.02	10.0	5.09	pCi/g	05/16/16 15:33	05/17/16 17:49	1

Method: 901.1 - Radium-226 & Other Gamma Emitters (GS)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	3.41		0.392	0.528	1.00	0.231	pCi/g	05/12/16 12:24	06/02/16 09:40	1
Radium-228	1.90		0.423	0.465		0.241	pCi/g	05/12/16 12:24	06/02/16 09:40	1



Client Sample Results

Client: Commonwealth of Kentucky
 Project/Site: Blue Ridge Landfill

TestAmerica Job ID: 160-17284-1

Client Sample ID: SED POND 1

Lab Sample ID: 160-17284-32

Date Collected: 05/03/16 14:10

Matrix: Water

Date Received: 05/06/16 09:10

Method: 900.0 - Gross Alpha and Gross Beta Radioactivity

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Gross Alpha	5.67	U G	4.02	4.07	3.00	5.94	pCi/L	06/03/16 09:53	06/09/16 08:03	1
Gross Beta	8.00		2.41	2.54	4.00	3.15	pCi/L	06/03/16 09:53	06/09/16 08:03	1

Method: 903.0 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.294		0.0706	0.0754	1.00	0.0568	pCi/L	05/10/16 15:18	06/01/16 12:24	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	96.9		40 - 110					05/10/16 15:18	06/01/16 12:24	1

Method: 904.0 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.240	U	0.213	0.215	1.00	0.341	pCi/L	05/10/16 17:22	05/17/16 18:02	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	96.9		40 - 110					05/10/16 17:22	05/17/16 18:02	1
Y Carrier	91.2		40 - 110					05/10/16 17:22	05/17/16 18:02	1

Client Sample Results

Client: Commonwealth of Kentucky
 Project/Site: Blue Ridge Landfill

TestAmerica Job ID: 160-17284-1

Client Sample ID: SED POND 1 SEDIMENT

Lab Sample ID: 160-17284-33

Date Collected: 05/03/16 14:30

Matrix: Solid

Date Received: 05/06/16 09:10

Method: 900.0 - Gross Alpha and Gross Beta Radioactivity

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Gross Alpha	26.6		6.34	7.03	10.0	5.08	pCi/g	05/16/16 15:33	05/17/16 17:49	1
Gross Beta	30.7		4.13	5.15	10.0	3.72	pCi/g	05/16/16 15:33	05/17/16 17:49	1

Method: 901.1 - Radium-226 & Other Gamma Emitters (GS)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	2.27		0.363	0.433	1.00	0.262	pCi/g	05/12/16 12:24	06/02/16 09:41	1
Radium-228	1.33		0.332	0.359		0.157	pCi/g	05/12/16 12:24	06/02/16 09:41	1



Client Sample Results

Client: Commonwealth of Kentucky
Project/Site: Blue Ridge Landfill

TestAmerica Job ID: 160-17284-1

Client Sample ID: OUTFALL 001

Lab Sample ID: 160-17284-34

Date Collected: 05/03/16 14:45

Matrix: Water

Date Received: 05/06/16 09:10

Method: 900.0 - Gross Alpha and Gross Beta Radioactivity

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Gross Alpha	1.82	U G	2.83	2.84	3.00	4.84	pCi/L	06/03/16 09:53	06/09/16 08:03	1
Gross Beta	7.02		1.81	1.94	4.00	2.27	pCi/L	06/03/16 09:53	06/09/16 08:03	1

Method: 903.0 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.305		0.0796	0.0842	1.00	0.0680	pCi/L	05/10/16 15:18	06/01/16 12:24	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	74.6		40 - 110					05/10/16 15:18	06/01/16 12:24	1

Method: 904.0 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	-0.250	U	0.278	0.279	1.00	0.535	pCi/L	05/10/16 17:22	05/17/16 17:45	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	74.5		40 - 110					05/10/16 17:22	05/17/16 17:45	1
Y Carrier	87.1		40 - 110					05/10/16 17:22	05/17/16 17:45	1

Client Sample Results

Client: Commonwealth of Kentucky
 Project/Site: Blue Ridge Landfill

TestAmerica Job ID: 160-17284-1

Client Sample ID: LEACHATE EFFLEUNT

Lab Sample ID: 160-17284-35

Date Collected: 05/03/16 15:00

Matrix: Water

Date Received: 05/06/16 09:10

Method: 900.0 - Gross Alpha and Gross Beta Radioactivity

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Gross Alpha	10.0	U G	41.6	41.6	3.00	77.6	pCi/L	06/03/16 09:53	06/09/16 08:14	1
Gross Beta	521	G	53.3	74.6	4.00	43.8	pCi/L	06/03/16 09:53	06/09/16 08:14	1

Method: 903.0 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	3.74		0.356	0.490	1.00	0.144	pCi/L	05/17/16 15:37	06/10/16 06:55	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	88.0		40 - 110					05/17/16 15:37	06/10/16 06:55	1

Method: 904.0 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	1.21		0.525	0.537	1.00	0.745	pCi/L	05/19/16 14:12	05/27/16 12:06	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	88.0		40 - 110					05/19/16 14:12	05/27/16 12:06	1
Y Carrier	87.9		40 - 110					05/19/16 14:12	05/27/16 12:06	1

Client Sample Results

Client: Commonwealth of Kentucky
Project/Site: Blue Ridge Landfill

TestAmerica Job ID: 160-17284-1

Client Sample ID: POND 2

Lab Sample ID: 160-17284-36

Date Collected: 05/03/16 15:40

Matrix: Water

Date Received: 05/06/16 09:10

Method: 900.0 - Gross Alpha and Gross Beta Radioactivity

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Gross Alpha	18.4	G	8.08	8.35	3.00	9.64	pCi/L	06/03/16 09:53	06/09/16 08:15	1
Gross Beta	17.0	G	4.11	4.45	4.00	4.89	pCi/L	06/03/16 09:53	06/09/16 08:15	1

Method: 903.0 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.370	*	0.0828	0.0893	1.00	0.0568	pCi/L	05/10/16 12:13	06/02/16 13:52	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	82.6		40 - 110					05/10/16 12:13	06/02/16 13:52	1

Method: 904.0 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.0952	U	0.226	0.226	1.00	0.389	pCi/L	05/10/16 12:21	05/17/16 12:48	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	82.6		40 - 110					05/10/16 12:21	05/17/16 12:48	1
Y Carrier	92.3		40 - 110					05/10/16 12:21	05/17/16 12:48	1

Client Sample Results

Client: Commonwealth of Kentucky
Project/Site: Blue Ridge Landfill

TestAmerica Job ID: 160-17284-1

Client Sample ID: POND 2 OUTFALL

Lab Sample ID: 160-17284-37

Date Collected: 05/03/16 16:00

Matrix: Water

Date Received: 05/06/16 09:10

Method: 900.0 - Gross Alpha and Gross Beta Radioactivity

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Gross Alpha	1.67	U G	2.75	2.75	3.00	4.80	pCi/L	06/03/16 09:53	06/09/16 08:15	1
Gross Beta	4.18		2.00	2.04	4.00	2.88	pCi/L	06/03/16 09:53	06/09/16 08:15	1

Method: 903.0 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.0740	U *	0.0590	0.0594	1.00	0.0904	pCi/L	05/10/16 12:13	06/02/16 13:52	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	78.9		40 - 110					05/10/16 12:13	06/02/16 13:52	1

Method: 904.0 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	-0.181	U	0.173	0.174	1.00	0.360	pCi/L	05/10/16 12:21	05/17/16 12:48	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	78.9		40 - 110					05/10/16 12:21	05/17/16 12:48	1
Y Carrier	89.7		40 - 110					05/10/16 12:21	05/17/16 12:48	1

Client Sample Results

Client: Commonwealth of Kentucky
 Project/Site: Blue Ridge Landfill

TestAmerica Job ID: 160-17284-1

Client Sample ID: POND 2 SEDIMENT

Lab Sample ID: 160-17284-38

Date Collected: 05/03/16 15:45

Matrix: Solid

Date Received: 05/06/16 09:10

Method: 900.0 - Gross Alpha and Gross Beta Radioactivity

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Gross Alpha	39.1		7.39	8.63	10.0	4.84	pCi/g	05/16/16 15:33	05/17/16 17:50	1
Gross Beta	39.7		4.52	6.01	10.0	3.61	pCi/g	05/16/16 15:33	05/17/16 17:50	1

Method: 901.1 - Radium-226 & Other Gamma Emitters (GS)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	4.75		0.509	0.709	1.00	0.272	pCi/g	05/12/16 12:24	06/02/16 10:03	1
Radium-228	1.46		0.430	0.455		0.324	pCi/g	05/12/16 12:24	06/02/16 10:03	1

QC Sample Results

Client: Commonwealth of Kentucky
Project/Site: Blue Ridge Landfill

TestAmerica Job ID: 160-17284-1

Method: 900.0 - Gross Alpha and Gross Beta Radioactivity

Lab Sample ID: MB 160-251280/1-A
Matrix: Solid
Analysis Batch: 251461

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 251280

Analyte	MB MB		Count	Total	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
	Result	Qualifier	Uncert. (2σ+/-)	Uncert. (2σ+/-)						
Gross Alpha	0.4183	U	3.26	3.26	10.0	6.13	pCi/g	05/16/16 15:33	05/17/16 17:46	1
Gross Beta	4.357		2.29	2.33	10.0	3.41	pCi/g	05/16/16 15:33	05/17/16 17:46	1

Lab Sample ID: LCS 160-251280/2-A
Matrix: Solid
Analysis Batch: 251461

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 251280

Analyte	Spike Added	LCS Result	LCS Qual	Total	RL	MDC	Unit	%Rec	%Rec. Limits
				Uncert. (2σ+/-)					
Gross Alpha	27.1	17.39		5.32	10.0	4.93	pCi/g	64	44 - 140
Gross Beta	26.8	23.11		3.60	10.0	2.44	pCi/g	86	38 - 130

Lab Sample ID: MB 160-254724/1-A
Matrix: Water
Analysis Batch: 255830

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 254724

Analyte	MB MB		Count	Total	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
	Result	Qualifier	Uncert. (2σ+/-)	Uncert. (2σ+/-)						
Gross Alpha	-0.4251	U	0.340	0.343	3.00	0.890	pCi/L	06/03/16 09:53	06/09/16 07:58	1
Gross Beta	-0.04452	U	0.491	0.491	4.00	0.899	pCi/L	06/03/16 09:53	06/09/16 07:58	1

Lab Sample ID: LCS 160-254724/2-A
Matrix: Water
Analysis Batch: 255830

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 254724

Analyte	Spike Added	LCS Result	LCS Qual	Total	RL	MDC	Unit	%Rec	%Rec. Limits
				Uncert. (2σ+/-)					
Gross Alpha	50.0	43.08		6.45	3.00	1.25	pCi/L	86	73 - 133

Lab Sample ID: LCSB 160-254724/3-A
Matrix: Water
Analysis Batch: 255830

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 254724

Analyte	Spike Added	LCSB Result	LCSB Qual	Total	RL	MDC	Unit	%Rec	%Rec. Limits
				Uncert. (2σ+/-)					
Gross Beta	92.7	89.61		9.49	4.00	0.893	pCi/L	97	75 - 125

Lab Sample ID: 160-17284-13 MS
Matrix: Water
Analysis Batch: 255830

Client Sample ID: DRY BRANCH CREEK DOWNSTREAM DUP
Prep Type: Total/NA
Prep Batch: 254724

Analyte	Sample Result	Sample Qual	Spike Added	MS Result	MS Qual	Total	RL	MDC	Unit	%Rec	%Rec. Limits
						Uncert. (2σ+/-)					
Gross Alpha	2.89		50.0	47.53		7.19	3.00	1.79	pCi/L	89	60 - 140

TestAmerica St. Louis

QC Sample Results

Client: Commonwealth of Kentucky
Project/Site: Blue Ridge Landfill

TestAmerica Job ID: 160-17284-1

Method: 900.0 - Gross Alpha and Gross Beta Radioactivity (Continued)

Lab Sample ID: 160-17284-13 MSBT
Matrix: Water
Analysis Batch: 255830

Client Sample ID: DRY BRANCH CREEK DOWNSTREAM DUP
Prep Type: Total/NA
Prep Batch: 254724

Analyte	Sample	Sample	Spike Added	MSBT	MSBT	Total	RL	MDC	Unit	%Rec	%Rec. Limits
	Result	Qual		Result	Qual	Uncert. (2σ+/-)					
Gross Beta	1.61		92.7	91.68		9.71	4.00	1.06	pCi/L	97	60 - 140

Lab Sample ID: 160-17284-13 DU
Matrix: Water
Analysis Batch: 255830

Client Sample ID: DRY BRANCH CREEK DOWNSTREAM DUP
Prep Type: Total/NA
Prep Batch: 254724

Analyte	Sample	Sample	DU	DU	Total	RL	MDC	Unit	RER	RER Limit
	Result	Qual		Result	Qual					
Gross Alpha	2.89		1.710		1.18	3.00	1.62	pCi/L	0.42	1
Gross Beta	1.61		1.864		0.804	4.00	1.11	pCi/L	0.16	1

Lab Sample ID: MB 160-254725/1-A
Matrix: Water
Analysis Batch: 255829

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 254725

Analyte	MB	MB	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
	Result	Qualifier								
Gross Alpha	0.0000	U	0.572	0.572	3.00	1.09	pCi/L	06/03/16 09:53	06/09/16 08:14	1
Gross Beta	0.5397	U	0.591	0.594	4.00	0.970	pCi/L	06/03/16 09:53	06/09/16 08:14	1

Lab Sample ID: LCS 160-254725/2-A
Matrix: Water
Analysis Batch: 255829

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 254725

Analyte	Spike Added	LCS Result	LCS Qual	Total	RL	MDC	Unit	%Rec	%Rec. Limits
				Uncert. (2σ+/-)					
Gross Alpha	50.0	44.65		6.54	3.00	1.60	pCi/L	89	73 - 133

Lab Sample ID: LCSB 160-254725/3-A
Matrix: Water
Analysis Batch: 255829

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 254725

Analyte	Spike Added	LCSB Result	LCSB Qual	Total	RL	MDC	Unit	%Rec	%Rec. Limits
				Uncert. (2σ+/-)					
Gross Beta	92.7	90.43		9.57	4.00	0.860	pCi/L	98	75 - 125

Method: 901.1 - Radium-226 & Other Gamma Emitters (GS)

Lab Sample ID: MB 160-250875/1-A
Matrix: Solid
Analysis Batch: 254484

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 250875

Analyte	MB	MB	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
	Result	Qualifier								
Radium-226	-0.04844	U	0.0837	0.0839	1.00	0.361	pCi/g	05/12/16 12:24	06/02/16 08:21	1
Radium-228	0.06554	U	0.151	0.151		0.219	pCi/g	05/12/16 12:24	06/02/16 08:21	1

TestAmerica St. Louis

QC Sample Results

Client: Commonwealth of Kentucky
Project/Site: Blue Ridge Landfill

TestAmerica Job ID: 160-17284-1

Method: 901.1 - Radium-226 & Other Gamma Emitters (GS) (Continued)

Lab Sample ID: LCS 160-250875/2-A
Matrix: Solid
Analysis Batch: 254482

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 250875

Analyte	Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits
Americium-241	97.1	94.14		9.87		0.990	pCi/g	97	87 - 116
Cesium-137	29.7	27.87		2.95		0.165	pCi/g	94	87 - 120
Cobalt-60	17.2	15.68		1.62		0.123	pCi/g	91	87 - 115

Lab Sample ID: 160-17284-16 DU
Matrix: Solid
Analysis Batch: 254534

Client Sample ID: ADS BRL-LT-SL
Prep Type: Total/NA
Prep Batch: 250875

Analyte	Sample Result	Sample Qual	DU Result	DU Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	RER	RER Limit
Radium-226	4.47		4.833		0.880	1.00	0.429	pCi/g	0.22	1
Radium-228	2.28		1.870		0.724		0.754	pCi/g	0.31	1

Method: 903.0 - Radium-226 (GFPC)

Lab Sample ID: MB 160-250356/1-A
Matrix: Water
Analysis Batch: 254506

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 250356

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.03937	U	0.0407	0.0408	1.00	0.0647	pCi/L	05/10/16 12:13	06/02/16 13:52	1
Carrier	MB %Yield	MB Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	86.9		40 - 110					05/10/16 12:13	06/02/16 13:52	1

Lab Sample ID: LCS 160-250356/2-A
Matrix: Water
Analysis Batch: 254506

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 250356

Analyte	Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits
Radium-226	11.2	15.66	*	1.50	1.00	0.0641	pCi/L	140	68 - 137
Carrier	LCS %Yield	LCS Qualifier	Limits						
Ba Carrier	81.8		40 - 110						

Lab Sample ID: LCSD 160-250356/3-A
Matrix: Water
Analysis Batch: 254506

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 250356

Analyte	Spike Added	LCSD Result	LCSD Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits	RER	RER Limit
Radium-226	11.2	15.04		1.44	1.00	0.0920	pCi/L	135	68 - 137	0.21	1

TestAmerica St. Louis

QC Sample Results

Client: Commonwealth of Kentucky
Project/Site: Blue Ridge Landfill

TestAmerica Job ID: 160-17284-1

Method: 903.0 - Radium-226 (GFPC) (Continued)

Lab Sample ID: LCSD 160-250356/3-A
Matrix: Water
Analysis Batch: 254506

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 250356

	LCSD	LCSD	
Carrier	%Yield	Qualifier	Limits
Ba Carrier	80.1		40 - 110

Lab Sample ID: MB 160-250373/1-A
Matrix: Water
Analysis Batch: 254107

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 250373

Analyte	MB MB		Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac	
	Result	Qualifier									
Radium-226	-0.01042	U	0.0341	0.0341	1.00	0.0708	pCi/L	05/10/16 15:18	06/01/16 07:33	1	
Carrier	%Yield	Qualifier	Limits						Prepared	Analyzed	Dil Fac
Ba Carrier	86.3		40 - 110						05/10/16 15:18	06/01/16 07:33	1

Lab Sample ID: LCS 160-250373/2-A
Matrix: Water
Analysis Batch: 254107

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 250373

Analyte	Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits	
									%Rec	Limits
Radium-226	11.2	14.68		1.40	1.00	0.0799	pCi/L	132	68 - 137	
Carrier	%Yield	Qualifier	Limits							
Ba Carrier	86.3		40 - 110							

Lab Sample ID: LCSD 160-250373/3-A
Matrix: Water
Analysis Batch: 254107

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 250373

Analyte	Spike Added	LCSD Result	LCSD Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits		RER	Limit
									%Rec	Limits	RER	Limit
Radium-226	11.2	14.73		1.41	1.00	0.0669	pCi/L	132	68 - 137	0.02	1	
Carrier	%Yield	Qualifier	Limits									
Ba Carrier	82.9		40 - 110									

Lab Sample ID: MB 160-251589/1-A
Matrix: Water
Analysis Batch: 255926

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 251589

Analyte	MB MB		Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac	
	Result	Qualifier									
Radium-226	0.1529		0.0923	0.0933	1.00	0.126	pCi/L	05/17/16 15:37	06/10/16 06:55	1	
Carrier	%Yield	Qualifier	Limits						Prepared	Analyzed	Dil Fac
Ba Carrier	92.9		40 - 110						05/17/16 15:37	06/10/16 06:55	1

TestAmerica St. Louis

QC Sample Results

Client: Commonwealth of Kentucky
Project/Site: Blue Ridge Landfill

TestAmerica Job ID: 160-17284-1

Method: 903.0 - Radium-226 (GFPC) (Continued)

Lab Sample ID: LCS 160-251589/2-A
Matrix: Water
Analysis Batch: 255926

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 251589

Analyte	Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits	
Radium-226	22.3	26.98		2.59	1.00	0.119	pCi/L	121	68 - 137	
Carrier	%Yield	LCS Qualifier	Limits							
Ba Carrier	93.4		40 - 110							

Lab Sample ID: LCSD 160-251589/3-A
Matrix: Water
Analysis Batch: 255926

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 251589

Analyte	Spike Added	LCSD Result	LCSD Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits	RER	RER Limit
Radium-226	22.3	27.85		2.67	1.00	0.129	pCi/L	125	68 - 137	0.16	1
Carrier	%Yield	LCSD Qualifier	Limits								
Ba Carrier	92.3		40 - 110								

Method: 904.0 - Radium-228 (GFPC)

Lab Sample ID: MB 160-250357/1-A
Matrix: Water
Analysis Batch: 251458

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 250357

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	-0.03018	U	0.226	0.226	1.00	0.409	pCi/L	05/10/16 12:21	05/17/16 12:47	1
Carrier	%Yield	MB Qualifier	Limits							
Ba Carrier	86.9		40 - 110							
Y Carrier	91.6		40 - 110							

Lab Sample ID: LCS 160-250357/2-A
Matrix: Water
Analysis Batch: 251458

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 250357

Analyte	Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits
Radium-228	15.2	19.12		2.01	1.00	0.450	pCi/L	126	56 - 140
Carrier	%Yield	LCS Qualifier	Limits						
Ba Carrier	81.8		40 - 110						
Y Carrier	91.2		40 - 110						

TestAmerica St. Louis

QC Sample Results

Client: Commonwealth of Kentucky
Project/Site: Blue Ridge Landfill

TestAmerica Job ID: 160-17284-1

Method: 904.0 - Radium-228 (GFPC) (Continued)

Lab Sample ID: LCSD 160-250357/3-A
Matrix: Water
Analysis Batch: 251458

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 250357

Analyte	Spike Added	LCSD Result	LCSD Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits	RER	RER Limit
Radium-228	15.2	18.90		1.99	1.00	0.415	pCi/L	125	56 - 140	0.06	1
Carrier		LCSD %Yield	LCSD Qualifier	Limits							
Ba Carrier		80.1		40 - 110							
Y Carrier		92.3		40 - 110							

Lab Sample ID: MB 160-250391/1-A
Matrix: Water
Analysis Batch: 251458

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 250391

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.01843	U	0.224	0.224	1.00	0.400	pCi/L	05/10/16 17:22	05/17/16 17:56	1
Carrier		MB %Yield	MB Qualifier	Limits				Prepared	Analyzed	Dil Fac
Ba Carrier		86.3		40 - 110				05/10/16 17:22	05/17/16 17:56	1
Y Carrier		88.6		40 - 110				05/10/16 17:22	05/17/16 17:56	1

Lab Sample ID: LCS 160-250391/2-A
Matrix: Water
Analysis Batch: 251458

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 250391

Analyte	Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits	RER	RER Limit
Radium-228	15.2	17.86		1.89	1.00	0.404	pCi/L	118	56 - 140		
Carrier		LCS %Yield	LCS Qualifier	Limits							
Ba Carrier		86.3		40 - 110							
Y Carrier		89.7		40 - 110							

Lab Sample ID: LCSD 160-250391/3-A
Matrix: Water
Analysis Batch: 251458

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 250391

Analyte	Spike Added	LCSD Result	LCSD Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits	RER	RER Limit
Radium-228	15.2	17.46		1.86	1.00	0.395	pCi/L	115	56 - 140	0.11	1
Carrier		LCSD %Yield	LCSD Qualifier	Limits							
Ba Carrier		82.9		40 - 110							
Y Carrier		89.0		40 - 110							

TestAmerica St. Louis

QC Sample Results

Client: Commonwealth of Kentucky
Project/Site: Blue Ridge Landfill

TestAmerica Job ID: 160-17284-1

Method: 904.0 - Radium-228 (GFPC) (Continued)

Lab Sample ID: MB 160-252055/1-A
Matrix: Water
Analysis Batch: 253649

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 252055

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	-0.003885	U	0.446	0.446	1.00	0.793	pCi/L	05/19/16 14:12	05/27/16 12:05	1

Carrier	MB %Yield	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
Ba Carrier	92.9		40 - 110	05/19/16 14:12	05/27/16 12:05	1
Y Carrier	93.1		40 - 110	05/19/16 14:12	05/27/16 12:05	1

Lab Sample ID: LCS 160-252055/2-A
Matrix: Water
Analysis Batch: 253649

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 252055

Analyte	Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits
Radium-228	30.2	35.83		3.73	1.00	0.752	pCi/L	119	56 - 140

Carrier	LCS %Yield	LCS Qualifier	Limits
Ba Carrier	93.4		40 - 110
Y Carrier	91.6		40 - 110

Lab Sample ID: LCSD 160-252055/3-A
Matrix: Water
Analysis Batch: 253649

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 252055

Analyte	Spike Added	LCSD Result	LCSD Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits	RER	RER Limit
Radium-228	30.2	41.85		4.29	1.00	0.700	pCi/L	139	56 - 140	0.75	1

Carrier	LCSD %Yield	LCSD Qualifier	Limits
Ba Carrier	92.3		40 - 110
Y Carrier	87.9		40 - 110

QC Association Summary

Client: Commonwealth of Kentucky
Project/Site: Blue Ridge Landfill

TestAmerica Job ID: 160-17284-1

Rad

Leach Batch: 250107

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-17284-10	#5 FILTER CAKE	Total/NA	Solid	Dry and Grind	
160-17284-11	#6 FILTER CAKE	Total/NA	Solid	Dry and Grind	
160-17284-12	#7 FILTER CAKE	Total/NA	Solid	Dry and Grind	
160-17284-16	ADS BRL-LT-SL	Total/NA	Solid	Dry and Grind	
160-17284-16 DU	ADS BRL-LT-SL	Total/NA	Solid	Dry and Grind	
160-17284-20	POND 3 SEDIMENT	Total/NA	Solid	Dry and Grind	
160-17284-22	POND 3 SEDIMENT DUP	Total/NA	Solid	Dry and Grind	
160-17284-24	DRY BRANCH CREEK UPSTREAM SED	Total/NA	Solid	Dry and Grind	
160-17284-26	DRY BRANCH CREEK DOWNSTREAM SED	Total/NA	Solid	Dry and Grind	
160-17284-27	DRY BRANCH CREEK DOWNSTREAM SED DU	Total/NA	Solid	Dry and Grind	
160-17284-30	POND 4 SEDIMENT	Total/NA	Solid	Dry and Grind	
160-17284-31	POND 4 SED SILT FENCE	Total/NA	Solid	Dry and Grind	
160-17284-33	SED POND 1 SEDIMENT	Total/NA	Solid	Dry and Grind	
160-17284-38	POND 2 SEDIMENT	Total/NA	Solid	Dry and Grind	

Prep Batch: 250356

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-17284-36	POND 2	Total/NA	Water	PrecSep-21	
160-17284-37	POND 2 OUTFALL	Total/NA	Water	PrecSep-21	
LCS 160-250356/2-A	Lab Control Sample	Total/NA	Water	PrecSep-21	
LCSD 160-250356/3-A	Lab Control Sample Dup	Total/NA	Water	PrecSep-21	
MB 160-250356/1-A	Method Blank	Total/NA	Water	PrecSep-21	

Prep Batch: 250357

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-17284-36	POND 2	Total/NA	Water	PrecSep_0	
160-17284-37	POND 2 OUTFALL	Total/NA	Water	PrecSep_0	
LCS 160-250357/2-A	Lab Control Sample	Total/NA	Water	PrecSep_0	
LCSD 160-250357/3-A	Lab Control Sample Dup	Total/NA	Water	PrecSep_0	
MB 160-250357/1-A	Method Blank	Total/NA	Water	PrecSep_0	

Prep Batch: 250373

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-17284-1	MW-17R-AGGWA 8003-8393	Total/NA	Water	PrecSep-21	
160-17284-2	MW-10-AGGWA 8001-0201	Total/NA	Water	PrecSep-21	
160-17284-3	MW-13-AGGWA 8001-2025	Total/NA	Water	PrecSep-21	
160-17284-4	MW-15R-AGGWA 8003-3579	Total/NA	Water	PrecSep-21	
160-17284-5	MW-7-AGGWA 8001-0205	Total/NA	Water	PrecSep-21	
160-17284-7	#2 UV EFFLUENT CHANNEL83 DEGREES 58.9	Total/NA	Water	PrecSep-21	
160-17284-9	#4 WWTP INFLUENT	Total/NA	Water	PrecSep-21	
160-17284-13	DRY BRANCH CREEK DOWNSTREAM DUP	Total/NA	Water	PrecSep-21	
160-17284-14	POND 3 ABOVE OUTFALL	Total/NA	Water	PrecSep-21	
160-17284-17	ADS BRL UNDERDRAIN	Total/NA	Water	PrecSep-21	
160-17284-18	POND 3	Total/NA	Water	PrecSep-21	
160-17284-19	POND 3 OUTFALL	Total/NA	Water	PrecSep-21	
160-17284-21	POND 3 DUP	Total/NA	Water	PrecSep-21	
160-17284-23	DRY BRANCH CREEK UPSTREAM	Total/NA	Water	PrecSep-21	
160-17284-25	DRY BRANCH CREEK DOWNSTREAM	Total/NA	Water	PrecSep-21	
160-17284-28	OUTFALL 004	Total/NA	Water	PrecSep-21	
160-17284-29	POND 4	Total/NA	Water	PrecSep-21	
160-17284-32	SED POND 1	Total/NA	Water	PrecSep-21	

TestAmerica St. Louis

QC Association Summary

Client: Commonwealth of Kentucky
Project/Site: Blue Ridge Landfill

TestAmerica Job ID: 160-17284-1

Rad (Continued)

Prep Batch: 250373 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-17284-34	OUTFALL 001	Total/NA	Water	PrecSep-21	
LCS 160-250373/2-A	Lab Control Sample	Total/NA	Water	PrecSep-21	
LCSD 160-250373/3-A	Lab Control Sample Dup	Total/NA	Water	PrecSep-21	
MB 160-250373/1-A	Method Blank	Total/NA	Water	PrecSep-21	

Prep Batch: 250391

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-17284-1	MW-17R-ACGWA 8003-8393	Total/NA	Water	PrecSep_0	
160-17284-2	MW-10-ACGWA 8001-0201	Total/NA	Water	PrecSep_0	
160-17284-3	MW-13-ACGWA 8001-2025	Total/NA	Water	PrecSep_0	
160-17284-4	MW-15R-ACGWA 8003-3579	Total/NA	Water	PrecSep_0	
160-17284-5	MW-7-ACGWA 8001-0205	Total/NA	Water	PrecSep_0	
160-17284-7	#2 UV EFFLUENT CHANNEL83 DEGREES 58.9	Total/NA	Water	PrecSep_0	
160-17284-9	#4 WWTP INFLUENT	Total/NA	Water	PrecSep_0	
160-17284-13	DRY BRANCH CREEK DOWNSTREAM DUP	Total/NA	Water	PrecSep_0	
160-17284-14	POND 3 ABOVE OUTFALL	Total/NA	Water	PrecSep_0	
160-17284-17	ADS BRL UNDERDRAIN	Total/NA	Water	PrecSep_0	
160-17284-18	POND 3	Total/NA	Water	PrecSep_0	
160-17284-19	POND 3 OUTFALL	Total/NA	Water	PrecSep_0	
160-17284-21	POND 3 DUP	Total/NA	Water	PrecSep_0	
160-17284-23	DRY BRANCH CREEK UPSTREAM	Total/NA	Water	PrecSep_0	
160-17284-25	DRY BRANCH CREEK DOWNSTREAM	Total/NA	Water	PrecSep_0	
160-17284-28	OUTFALL 004	Total/NA	Water	PrecSep_0	
160-17284-29	POND 4	Total/NA	Water	PrecSep_0	
160-17284-32	SED POND 1	Total/NA	Water	PrecSep_0	
160-17284-34	OUTFALL 001	Total/NA	Water	PrecSep_0	
LCS 160-250391/2-A	Lab Control Sample	Total/NA	Water	PrecSep_0	
LCSD 160-250391/3-A	Lab Control Sample Dup	Total/NA	Water	PrecSep_0	
MB 160-250391/1-A	Method Blank	Total/NA	Water	PrecSep_0	

Prep Batch: 250875

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-17284-10	#5 FILTER CAKE	Total/NA	Solid	Fill_Geo-21	250107
160-17284-11	#6 FILTER CAKE	Total/NA	Solid	Fill_Geo-21	250107
160-17284-16	ADS BRL-LT-SL	Total/NA	Solid	Fill_Geo-21	250107
160-17284-16 DU	ADS BRL-LT-SL	Total/NA	Solid	Fill_Geo-21	250107
160-17284-20	POND 3 SEDIMENT	Total/NA	Solid	Fill_Geo-21	250107
160-17284-22	POND 3 SEDIMENT DUP	Total/NA	Solid	Fill_Geo-21	250107
160-17284-24	DRY BRANCH CREEK UPSTREAM SED	Total/NA	Solid	Fill_Geo-21	250107
160-17284-26	DRY BRANCH CREEK DOWNSTREAM SED	Total/NA	Solid	Fill_Geo-21	250107
160-17284-27	DRY BRANCH CREEK DOWNSTREAM SED DU	Total/NA	Solid	Fill_Geo-21	250107
160-17284-30	POND 4 SEDIMENT	Total/NA	Solid	Fill_Geo-21	250107
160-17284-31	POND 4 SED SILT FENCE	Total/NA	Solid	Fill_Geo-21	250107
160-17284-33	SED POND 1 SEDIMENT	Total/NA	Solid	Fill_Geo-21	250107
160-17284-38	POND 2 SEDIMENT	Total/NA	Solid	Fill_Geo-21	250107
LCS 160-250875/2-A	Lab Control Sample	Total/NA	Solid	Fill_Geo-21	
MB 160-250875/1-A	Method Blank	Total/NA	Solid	Fill_Geo-21	

Prep Batch: 251280

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-17284-12	#7 FILTER CAKE	Total/NA	Solid	Thin_Layer	250107

TestAmerica St. Louis

QC Association Summary

Client: Commonwealth of Kentucky
Project/Site: Blue Ridge Landfill

TestAmerica Job ID: 160-17284-1

Rad (Continued)

Prep Batch: 251280 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-17284-16	ADS BRL-LT-SL	Total/NA	Solid	Thin_Layer	250107
160-17284-20	POND 3 SEDIMENT	Total/NA	Solid	Thin_Layer	250107
160-17284-22	POND 3 SEDIMENT DUP	Total/NA	Solid	Thin_Layer	250107
160-17284-24	DRY BRANCH CREEK UPSTREAM SED	Total/NA	Solid	Thin_Layer	250107
160-17284-26	DRY BRANCH CREEK DOWNSTREAM SED	Total/NA	Solid	Thin_Layer	250107
160-17284-27	DRY BRANCH CREEK DOWNSTREAM SED DU	Total/NA	Solid	Thin_Layer	250107
160-17284-30	POND 4 SEDIMENT	Total/NA	Solid	Thin_Layer	250107
160-17284-31	POND 4 SED SILT FENCE	Total/NA	Solid	Thin_Layer	250107
160-17284-33	SED POND 1 SEDIMENT	Total/NA	Solid	Thin_Layer	250107
160-17284-38	POND 2 SEDIMENT	Total/NA	Solid	Thin_Layer	250107
LCS 160-251280/2-A	Lab Control Sample	Total/NA	Solid	Thin_Layer	
MB 160-251280/1-A	Method Blank	Total/NA	Solid	Thin_Layer	

Prep Batch: 251589

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-17284-15	ADS BRL-LT-LIQ	Total/NA	Water	PrecSep-21	
160-17284-35	LEACHATE EFFLEUNT	Total/NA	Water	PrecSep-21	
LCS 160-251589/2-A	Lab Control Sample	Total/NA	Water	PrecSep-21	
LCSD 160-251589/3-A	Lab Control Sample Dup	Total/NA	Water	PrecSep-21	
MB 160-251589/1-A	Method Blank	Total/NA	Water	PrecSep-21	

Prep Batch: 252055

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-17284-15	ADS BRL-LT-LIQ	Total/NA	Water	PrecSep_0	
160-17284-35	LEACHATE EFFLEUNT	Total/NA	Water	PrecSep_0	
LCS 160-252055/2-A	Lab Control Sample	Total/NA	Water	PrecSep_0	
LCSD 160-252055/3-A	Lab Control Sample Dup	Total/NA	Water	PrecSep_0	
MB 160-252055/1-A	Method Blank	Total/NA	Water	PrecSep_0	

Prep Batch: 254724

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-17284-1	MW-17R-AGGWA 8003-8393	Total/NA	Water	Evaporation	
160-17284-2	MW-10-AGGWA 8001-0201	Total/NA	Water	Evaporation	
160-17284-3	MW-13-AGGWA 8001-2025	Total/NA	Water	Evaporation	
160-17284-4	MW-15R-AGGWA 8003-3579	Total/NA	Water	Evaporation	
160-17284-5	MW-7-AGGWA 8001-0205	Total/NA	Water	Evaporation	
160-17284-6	#1 UV EFFLUENT CHANNEL 37 DEGREES 42.0	Total/NA	Water	Evaporation	
160-17284-8	#3 WWTP INFLUENT	Total/NA	Water	Evaporation	
160-17284-13	DRY BRANCH CREEK DOWNSTREAM DUP	Total/NA	Water	Evaporation	
160-17284-13 DU	DRY BRANCH CREEK DOWNSTREAM DUP	Total/NA	Water	Evaporation	
160-17284-13 MS	DRY BRANCH CREEK DOWNSTREAM DUP	Total/NA	Water	Evaporation	
160-17284-13 MSBT	DRY BRANCH CREEK DOWNSTREAM DUP	Total/NA	Water	Evaporation	
160-17284-14	POND 3 ABOVE OUTFALL	Total/NA	Water	Evaporation	
160-17284-15	ADS BRL-LT-LIQ	Total/NA	Water	Evaporation	
160-17284-17	ADS BRL UNDERDRAIN	Total/NA	Water	Evaporation	
160-17284-18	POND 3	Total/NA	Water	Evaporation	
160-17284-19	POND 3 OUTFALL	Total/NA	Water	Evaporation	
160-17284-21	POND 3 DUP	Total/NA	Water	Evaporation	
160-17284-23	DRY BRANCH CREEK UPSTREAM	Total/NA	Water	Evaporation	
160-17284-25	DRY BRANCH CREEK DOWNSTREAM	Total/NA	Water	Evaporation	
160-17284-28	OUTFALL 004	Total/NA	Water	Evaporation	

TestAmerica St. Louis

QC Association Summary

Client: Commonwealth of Kentucky
 Project/Site: Blue Ridge Landfill

TestAmerica Job ID: 160-17284-1

Rad (Continued)

Prep Batch: 254724 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-17284-29	POND 4	Total/NA	Water	Evaporation	
160-17284-32	SED POND 1	Total/NA	Water	Evaporation	
160-17284-34	OUTFALL 001	Total/NA	Water	Evaporation	
LCS 160-254724/2-A	Lab Control Sample	Total/NA	Water	Evaporation	
LCSB 160-254724/3-A	Lab Control Sample	Total/NA	Water	Evaporation	
MB 160-254724/1-A	Method Blank	Total/NA	Water	Evaporation	

Prep Batch: 254725

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-17284-35	LEACHATE EFFLEUNT	Total/NA	Water	Evaporation	
160-17284-36	POND 2	Total/NA	Water	Evaporation	
160-17284-37	POND 2 OUTFALL	Total/NA	Water	Evaporation	
LCS 160-254725/2-A	Lab Control Sample	Total/NA	Water	Evaporation	
LCSB 160-254725/3-A	Lab Control Sample	Total/NA	Water	Evaporation	
MB 160-254725/1-A	Method Blank	Total/NA	Water	Evaporation	



Tracer/Carrier Summary

Client: Commonwealth of Kentucky
 Project/Site: Blue Ridge Landfill

TestAmerica Job ID: 160-17284-1

Method: 903.0 - Radium-226 (GFPC)

Matrix: Water

Prep Type: Total/NA

Lab Sample ID	Client Sample ID	Percent Yield (Acceptance Limits)	
		Ba (40-110)	Y (40-110)
160-17284-1	MW-17R-ACGWA 8003-8393	85.5	
160-17284-2	MW-10-ACGWA 8001-0201	74.9	
160-17284-3	MW-13-ACGWA 8001-2025	100	
160-17284-4	MW-15R-ACGWA 8003-3579	79.5	
160-17284-5	MW-7-ACGWA 8001-0205	84.9	
160-17284-7	#2 UV EFFLUENT CHANNEL83	82.1	
160-17284-9	DEGREES 58.917		
160-17284-13	#4 WWTP INFLUENT	40.7	
160-17284-14	DRY BRANCH CREEK	80.6	
160-17284-15	DOWNSTREAM DUP		
160-17284-17	POND 3 ABOVE OUTFALL	82.9	
160-17284-18	ADS BRL-LT-LIQ	87.7	
160-17284-19	ADS BRL UNDERDRAIN	93.7	
160-17284-21	POND 3	76.9	
160-17284-23	POND 3 OUTFALL	80.6	
160-17284-25	POND 3 DUP	86.0	
160-17284-28	DRY BRANCH CREEK	83.5	
160-17284-29	UPSTREAM		
160-17284-32	DRY BRANCH CREEK	80.9	
160-17284-34	DOWNSTREAM		
160-17284-36	OUTFALL 004	84.3	
160-17284-37	POND 4	65.5	
LCS 160-250356/2-A	SED POND 1	96.9	
LCS 160-250373/2-A	OUTFALL 001	74.6	
LCS 160-251589/2-A	LEACHATE EFFLEUNT	88.0	
LCS 160-250356/3-A	POND 2	82.6	
LCS 160-250373/3-A	POND 2 OUTFALL	78.9	
LCS 160-251589/3-A	Lab Control Sample	81.8	
LCSD 160-250356/1-A	Lab Control Sample	86.3	
LCSD 160-250373/1-A	Lab Control Sample	93.4	
LCSD 160-250356/3-A	Lab Control Sample Dup	80.1	
LCSD 160-250373/3-A	Lab Control Sample Dup	82.9	
LCSD 160-251589/3-A	Lab Control Sample Dup	92.3	
MB 160-250356/1-A	Method Blank	86.9	
MB 160-250373/1-A	Method Blank	86.3	
MB 160-251589/1-A	Method Blank	92.9	

Tracer/Carrier Legend

Ba = Ba Carrier

Method: 904.0 - Radium-228 (GFPC)

Matrix: Water

Prep Type: Total/NA

Lab Sample ID	Client Sample ID	Percent Yield (Acceptance Limits)	
		Ba (40-110)	Y (40-110)
160-17284-1	MW-17R-ACGWA 8003-8393	85.5	88.6
160-17284-2	MW-10-ACGWA 8001-0201	74.9	87.1
160-17284-3	MW-13-ACGWA 8001-2025	100	86.4
160-17284-4	MW-15R-ACGWA 8003-3579	79.5	87.1

TestAmerica St. Louis

Tracer/Carrier Summary

Client: Commonwealth of Kentucky
 Project/Site: Blue Ridge Landfill

TestAmerica Job ID: 160-17284-1

Method: 904.0 - Radium-228 (GFPC) (Continued)

Matrix: Water

Prep Type: Total/NA

Lab Sample ID	Client Sample ID	Percent Yield (Acceptance Limits)	
		Ba (40-110)	Y (40-110)
160-17284-5	MW-7-AKGWA 8001-0205	84.9	84.5
160-17284-7	#2 UV EFFLUENT CHANNEL83	82.1	89.3
160-17284-9	DEGREES 58.917		
160-17284-13	#4 WWTP INFLUENT	40.7	80.7
160-17284-14	DRY BRANCH CREEK	80.6	89.3
160-17284-15	DOWNSTREAM DUP		
160-17284-17	POND 3 ABOVE OUTFALL	82.9	90.1
160-17284-18	ADS BRL-LT-LIQ	87.7	83.4
160-17284-19	ADS BRL UNDERDRAIN	93.7	85.6
160-17284-21	POND 3	76.9	89.7
160-17284-23	POND 3 OUTFALL	80.6	89.7
160-17284-25	POND 3 DUP	86.0	90.1
160-17284-28	DRY BRANCH CREEK	83.5	88.6
160-17284-29	UPSTREAM		
160-17284-32	DRY BRANCH CREEK	80.9	95.0
160-17284-34	DOWNSTREAM		
160-17284-35	OUTFALL 004	84.3	90.5
160-17284-36	POND 4	65.5	93.5
160-17284-37	SED POND 1	96.9	91.2
LCS 160-250357/2-A	OUTFALL 001	74.5	87.1
LCS 160-250391/2-A	LEACHATE EFFLEUNT	88.0	87.9
LCS 160-252055/2-A	POND 2	82.6	92.3
LCSD 160-250357/3-A	POND 2 OUTFALL	78.9	89.7
LCSD 160-250391/3-A	Lab Control Sample	81.8	91.2
LCSD 160-252055/3-A	Lab Control Sample	86.3	89.7
MB 160-250357/1-A	Lab Control Sample Dup	93.4	91.6
MB 160-250391/1-A	Lab Control Sample Dup	80.1	92.3
MB 160-252055/1-A	Lab Control Sample Dup	82.9	89.0
	Lab Control Sample Dup	92.3	87.9
	Method Blank	86.9	91.6
	Method Blank	86.3	88.6
	Method Blank	92.9	93.1

Tracer/Carrier Legend

Ba = Ba Carrier

Y = Y Carrier