

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: 160-6936-2

Client Project/Site: NORM Sampling

For:

AMEC Environment & Infrastructure, Inc.
800 North Bell Avenue, Suite 200
Pittsburgh, Pennsylvania 15106

Attn: Mark Gannon

Rhonda Ridenhower

Authorized for release by:
6/30/2014 4:47:42 PM

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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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Case Narrative

Client: AMEC Environment & Infrastructure, Inc.
Project/Site: NORM Sampling

TestAmerica Job ID: 160-6936-2

Job ID: 160-6936-2

Laboratory: TestAmerica St. Louis

Narrative

CASE NARRATIVE

Client: AMEC Environment & Infrastructure, Inc.

Project: NORM Sampling

Report Number: 160-6936-2

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 06/04/2014; the samples arrived in good condition, properly preserved and on ice. The temperature of the coolers at receipt was 4.2 C. The analysis were determined by the client after the samples had arrived. As such, the volatile solids and total solids were performed by another lab after determining the rad content of the samples. As such, the hold time for these analysis is seven days which was missed by one day due to the radioactive nature of the samples.

TCLP VOLATILE ORGANIC COMPOUNDS (GC-MS)

Samples ARM-MMC-S01-0614 (160-6936-1), ARM-MMC-S02-0614 (160-6936-2) and ARM-MMC-S03-0614 (160-6936-3) were analyzed for TCLP volatile organic compounds (GC-MS) in accordance with EPA SW846 Method 1311/8260C. The samples were leached on 06/09/2014 and analyzed on 06/10/2014 and 06/11/2014.

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

TCLP SEMIVOLATILE ORGANIC COMPOUNDS (GC-MS)

Samples ARM-MMC-S01-0614 (160-6936-1), ARM-MMC-S02-0614 (160-6936-2) and ARM-MMC-S03-0614 (160-6936-3) were analyzed for

Case Narrative

Client: AMEC Environment & Infrastructure, Inc.
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Laboratory: TestAmerica St. Louis (Continued)

TCLP semivolatile organic compounds (GC-MS) in accordance with EPA SW-846 Methods 1311 / 8270D. The samples were leached on 06/11/2014, and prepared and analyzed on 06/13/2014.

The matrix spike / matrix spike duplicate (MS/MSD) precision for batch 126771 was outside control limits for Pyridine. Sample matrix interference and/or non-homogeneity are suspected. (160-6936-1 MS), (160-6936-1 MSD)

Six surrogates are used for this analysis. CLP methodology allows one acid and/or one base neutral of these surrogates to be outside acceptance criteria without performing re-extraction/re-analysis. The following QC sample contained an allowable number of surrogate compounds outside limits: (160-6936-1 MSD). These results have been reported and qualified.

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

TCLP METALS (ICP)

Samples ARM-MMC-S01-0614 (160-6936-1), ARM-MMC-S02-0614 (160-6936-2) and ARM-MMC-S03-0614 (160-6936-3) were analyzed for TCLP metals (ICP) in accordance with EPA SW-846 Method 1311/6010C. The samples were leached on 06/11/2014, prepared on 06/12/2014 and analyzed on 06/13/2014.

Barium, Copper and Zinc were detected in method blank LB 160-126314/1-B at levels that were above the method detection limit but below the reporting limit. The values should be considered estimates, and have been flagged. 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.

Due to the high concentration of barium the matrix spike / matrix spike duplicate (MS/MSD) could not be evaluated for accuracy and precision. The associated laboratory control sample (LCS) met acceptance criteria. (160-6936-1 MS), (160-6936-1 MSD)

The following sample(s) was diluted due to the presence of manganese which interferes with chromium and selenium:
ARM-MMC-S02-0614 (160-6936-2). Elevated reporting limits (RLs) are provided.

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

TCLP MERCURY

Samples ARM-MMC-S01-0614 (160-6936-1), ARM-MMC-S02-0614 (160-6936-2) and ARM-MMC-S03-0614 (160-6936-3) were analyzed for TCLP mercury in accordance with EPA SW-846 Methods 1311/7470A. The samples were leached on 06/11/2014, and prepared and analyzed on 06/16/2014.

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

IGNITABILITY, PENSKEY-MARTENS CLOSED CUP METHOD

Samples ARM-MMC-S01-0614 (160-6936-1), ARM-MMC-S02-0614 (160-6936-2) and ARM-MMC-S03-0614 (160-6936-3) were analyzed for Ignitability, Penskey-Martens Closed Cup Method in accordance with EPA SW-846 Method 1010. The samples were analyzed on 06/12/2014.

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

TOTAL VOLATILE SOLIDS

Samples ARM-MMC-S01-0614 (160-6936-1), ARM-MMC-S02-0614 (160-6936-2) and ARM-MMC-S03-0614 (160-6936-3) were analyzed for total volatile solids in accordance with EPA Method 160.4. The samples were analyzed on 06/11/2014.

The sample duplicate (MS/MSD/DUP) precision for batch 229837 was outside control limits. Sample non-homogeneity is suspected.

The following sample(s) was received with insufficient time to set up a RAD zone. As such, the laboratory had insufficient time remaining to perform the analysis within holding time: (160-6936-1 DU), ARM-MMC-S01-0614 (160-6936-1), ARM-MMC-S02-0614 (160-6936-2), ARM-MMC-S03-0614 (160-6936-3).

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

Case Narrative

Client: AMEC Environment & Infrastructure, Inc.
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Job ID: 160-6936-2 (Continued)

Laboratory: TestAmerica St. Louis (Continued)

1664A

Samples ARM-MMC-S01-0614 (160-6936-1), ARM-MMC-S02-0614 (160-6936-2) and ARM-MMC-S03-0614 (160-6936-3) were analyzed for 1664A in accordance with EPA Method 1664A. The samples were prepared and analyzed on 06/30/2014.

Oil & Grease was detected in method blank MB 160-129025/1-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 in the Definitions/Glossary page.

CYANIDE, TOTAL AND/OR AMENABLE

Samples ARM-MMC-S01-0614 (160-6936-1), ARM-MMC-S02-0614 (160-6936-2) and ARM-MMC-S03-0614 (160-6936-3) were analyzed for Cyanide, Total and/or Amenable in accordance with EPA SW-846 Method 9012B. The samples were prepared on 06/11/2014 and analyzed on 06/12/2014.

The matrix spike (MS) performed on the following sample was outside control limits in Cyanide batch 126590: (160-6936-1 MS). Sample matrix interference is suspected, because the associated laboratory control sample (LCS) recovery was within acceptance limits.

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

REACTIVE SULFIDE

Samples ARM-MMC-S01-0614 (160-6936-1), ARM-MMC-S02-0614 (160-6936-2) and ARM-MMC-S03-0614 (160-6936-3) were analyzed for reactive sulfide in accordance with EPA SW-846 Method 7.3.4. The samples were prepared on 06/19/2014 and analyzed on 06/27/2014.

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

PH

Samples ARM-MMC-S01-0614 (160-6936-1), ARM-MMC-S02-0614 (160-6936-2) and ARM-MMC-S03-0614 (160-6936-3) were analyzed for pH in accordance with EPA SW-846 Method 9045D. The samples were prepared on 06/16/2014 and analyzed on 06/17/2014.

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

PAINT FILTER

Samples ARM-MMC-S01-0614 (160-6936-1), ARM-MMC-S02-0614 (160-6936-2) and ARM-MMC-S03-0614 (160-6936-3) were analyzed for Paint Filter in accordance with EPA SW-846 Method 9095B. The samples were analyzed on 06/26/2014.

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

PERCENT SOLIDS

Samples ARM-MMC-S01-0614 (160-6936-1), ARM-MMC-S02-0614 (160-6936-2) and ARM-MMC-S03-0614 (160-6936-3) were analyzed for percent solids in accordance with EPA Method 160.3 MOD. The samples were analyzed on 06/07/2014.

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

TOTAL SOLIDS

Samples ARM-MMC-S01-0614 (160-6936-1), ARM-MMC-S02-0614 (160-6936-2) and ARM-MMC-S03-0614 (160-6936-3) were analyzed for total solids in accordance with SM 2540B. The samples were analyzed on 06/11/2014.

The following sample(s) was received with insufficient time to set up a RAD zone. As such, the laboratory had insufficient time remaining to perform the analysis within holding time: (160-6936-1 DU), ARM-MMC-S01-0614 (160-6936-1), ARM-MMC-S02-0614 (160-6936-2), ARM-MMC-S03-0614 (160-6936-3). The analysis was performed within 2x hold.

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 ARM-MMC-S01-0614 (160-6936-1), ARM-MMC-S02-0614 (160-6936-2) and ARM-MMC-S03-0614 (160-6936-3) were analyzed for

Case Narrative

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Laboratory: TestAmerica St. Louis (Continued)


Radium-226 by gamma spec (21 day ingrowth) in accordance with EPA 901.1. The samples were dried on 06/04/2014, prepared on 06/06/2014 and analyzed on 06/27/2014.

The detection goal for radium-226 analyzed by gamma spectroscopy was not met for the following samples due to high activity: (160-6936-1 DU), ARM-MMC-S01-0614 (160-6936-1), ARM-MMC-S02-0614 (160-6936-2), ARM-MMC-S03-0614 (160-6936-3). Analytical results are reported with the detection limit achieved.

The RER was outside of the acceptance limits of 1 for cobalt-60. Both the sample and duplicate activity were less than the MDC. (160-6936-1 DU), (LCS 160-126246/2-A), (MB 160-126246/1-A), ARM-MMC-S01-0614 (160-6936-1), ARM-MMC-S02-0614 (160-6936-2), ARM-MMC-S03-0614 (160-6936-3)

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

Regulatory Program: DW NPDES RCRA Other:

Company Name: Amecc E & T, Inc. Address: 860 W. Bell Ave. Suite 200 City/State/Zip: Carnegie, PA 15106 Phone: 412-279-6661 Fax:		Client Contact Project Name: Range Resources Site: MMC Returned P.O.#		Project Manager: Mark Gannon Tel/Fax: 412-279-6661 Analysis Turnaround Time <input checked="" type="checkbox"/> CALENDAR DAYS <input type="checkbox"/> WORKING DAYS TAT if different from Below:		Site Contact: Sean Coadie Lab Contact: Rhonda Peden Carrier: Fedex Date: 6-3-14		COC No.: 1 of 1 COCs Sampler: For Lab Use Only: Walk-in Client: Lab Sampling: Job / SDG No.:					
Sample Identification ARM-MMC-S01-0614 ARM-MMC-S02-0614 ARM-MMC-S03-0614		Sample Date 6-3-14 6-3-14 6-3-14		Sample Time 1000 1030 1100		Sample Type (C=Comp, G=Grab) GC SOLID GC SOLID C SAND		Matrix SOLID SOLID SAND		# of Cont. 3 3 3		Sample Specific Notes: Please call Mark Gannon for Chemical Analysis specifics 412-279-6661	
Filtered Sample (Y/N) N N N		Perform MS/MSD (Y/N) N N N		Chemical Analysis Notes 9011-Ra (21 day) 9011-Ra (3 day)		Barcode 		160-6936 Chain of Custody		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			
Relinquished by: Sean Coadie Date/Time: 6-3-14/1530		Relinquished by: Amecc Date/Time: 6-3-14/1530		Relinquished by: Jeri Clarke Date/Time: 6-4-14 0945		Relinquished by: TA STL Date/Time: 6-4-14 0945		Relinquished by: _____ Date/Time: _____		Relinquished by: _____ Date/Time: _____			



Login Sample Receipt Checklist

Client: AMEC Environment & Infrastructure, Inc.

Job Number: 160-6936-2

Login Number: 6936

List Source: TestAmerica St. Louis

List Number: 1

Creator: Clarke, Jill C

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.	True	
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?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time.	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	
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	



Login Sample Receipt Checklist

Client: AMEC Environment & Infrastructure, Inc.

Job Number: 160-6936-2

Login Number: 6936
List Number: 2
Creator: Knauf, James R

List Source: TestAmerica Denver
List Creation: 06/10/14 02:06 PM

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.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
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?	False	FIELD LEFT BLANK
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time.	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.	False	
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: AMEC Environment & Infrastructure, Inc.
Project/Site: NORM Sampling

TestAmerica Job ID: 160-6936-2

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

GC/MS Semi VOA

Qualifier	Qualifier Description
X	Surrogate is outside control limits
F2	MS/MSD RPD exceeds control limits
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

Metals

Qualifier	Qualifier Description
B	Compound was found in the blank and sample.
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
4	MS, MSD: The analyte present in the original sample is greater than 4 times the matrix spike concentration; therefore, control limits are not applicable.

General Chemistry

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
B	Compound was found in the blank and sample.
H	Sample was prepped or analyzed beyond the specified holding time
F3	Duplicate RPD exceeds the control limit
F1	MS and/or MSD Recovery exceeds the control limits

Rad

Qualifier	Qualifier Description
U	Result is less than the sample detection limit.

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: AMEC Environment & Infrastructure, Inc.
Project/Site: NORM Sampling

TestAmerica Job ID: 160-6936-2

Method	Method Description	Protocol	Laboratory
8260C	Volatile Organic Compounds by GC/MS	SW846	TAL SL
8270D	Semivolatile Organic Compounds (GC/MS)	SW846	TAL SL
6010C	Metals (ICP)	SW846	TAL SL
7470A	Mercury (CVAA)	SW846	TAL SL
1010A	Ignitability, Pensky-Martens Closed Cup Method	SW846	TAL SL
1664A	HEM and SGT-HEM	1664A	TAL SL
2540G	Percent Volatile Solids	SM20	TAL DEN
9012B	Cyanide, Total and/or Amenable	SW846	TAL SL
9034	Sulfide, Reactive	SW846	TAL SL
9045D	pH	SW846	TAL SL
9095B	Paint Filter	SW846	TAL SL
Moisture	Percent Moisture	EPA	TAL SL
SM 2540B	Solids, Total	SM	TAL DEN
901.1	Radium-226 & Other Gamma Emitters (GS)	EPA	TAL SL

Protocol References:

1664A = EPA-821-98-002

EPA = US Environmental Protection Agency

SM = "Standard Methods For The Examination Of Water And Wastewater",

SM20 = "Standard Methods For The Examination Of Water And Wastewater", 20th Edition."

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL DEN = TestAmerica Denver, 4955 Yarrow Street, Arvada, CO 80002, TEL (303)736-0100

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

Sample Summary

Client: AMEC Environment & Infrastructure, Inc.
Project/Site: NORM Sampling

TestAmerica Job ID: 160-6936-2

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
160-6936-1	ARM-MMC-S01-0614	Solid	06/03/14 10:00	06/04/14 13:30
160-6936-2	ARM-MMC-S02-0614	Solid	06/03/14 10:30	06/04/14 13:30
160-6936-3	ARM-MMC-S03-0614	Solid	06/03/14 11:00	06/04/14 13:30

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Client Sample Results

Client: AMEC Environment & Infrastructure, Inc.
Project/Site: NORM Sampling

TestAmerica Job ID: 160-6936-2

Client Sample ID: ARM-MMC-S01-0614

Lab Sample ID: 160-6936-1

Date Collected: 06/03/14 10:00

Matrix: Solid

Date Received: 06/04/14 13:30

Method: 8260C - Volatile Organic Compounds by GC/MS - TCLP

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	ND		0.050	0.0037	mg/L			06/10/14 23:53	1
1,2-Dichloroethane	ND		0.050	0.0037	mg/L			06/10/14 23:53	1
2-Butanone (MEK)	ND		0.050	0.0039	mg/L			06/10/14 23:53	1
Benzene	0.028	J	0.050	0.0025	mg/L			06/10/14 23:53	1
Carbon tetrachloride	ND		0.050	0.0036	mg/L			06/10/14 23:53	1
Chlorobenzene	ND		0.050	0.0038	mg/L			06/10/14 23:53	1
Chloroform	ND		0.050	0.00092	mg/L			06/10/14 23:53	1
Tetrachloroethene	ND		0.050	0.0028	mg/L			06/10/14 23:53	1
Trichloroethene	ND		0.050	0.0029	mg/L			06/10/14 23:53	1
Vinyl chloride	ND		0.10	0.0043	mg/L			06/10/14 23:53	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	100		84 - 120					06/10/14 23:53	1
1,2-Dichloroethane-d4 (Surr)	91		83 - 117					06/10/14 23:53	1
Toluene-d8 (Surr)	99		85 - 115					06/10/14 23:53	1
Dibromofluoromethane (Surr)	93		85 - 115					06/10/14 23:53	1

Method: 8270D - Semivolatile Organic Compounds (GC/MS) - TCLP

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dichlorobenzene	ND		0.050	0.0050	mg/L		06/13/14 11:38	06/13/14 16:43	1
2,4-Dinitrotoluene	ND		0.050	0.0050	mg/L		06/13/14 11:38	06/13/14 16:43	1
Hexachlorobenzene	ND		0.050	0.0050	mg/L		06/13/14 11:38	06/13/14 16:43	1
Hexachlorobutadiene	ND		0.050	0.0050	mg/L		06/13/14 11:38	06/13/14 16:43	1
Hexachloroethane	ND		0.050	0.0050	mg/L		06/13/14 11:38	06/13/14 16:43	1
2-Methylphenol	ND		0.050	0.010	mg/L		06/13/14 11:38	06/13/14 16:43	1
3 & 4 Methylphenol	ND		0.10	0.0050	mg/L		06/13/14 11:38	06/13/14 16:43	1
Nitrobenzene	ND		0.050	0.0050	mg/L		06/13/14 11:38	06/13/14 16:43	1
Pentachlorophenol	ND		0.25	0.010	mg/L		06/13/14 11:38	06/13/14 16:43	1
Pyridine	ND		0.10	0.025	mg/L		06/13/14 11:38	06/13/14 16:43	1
2,4,5-Trichlorophenol	ND		0.050	0.010	mg/L		06/13/14 11:38	06/13/14 16:43	1
2,4,6-Trichlorophenol	ND		0.050	0.010	mg/L		06/13/14 11:38	06/13/14 16:43	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
2,4,6-Tribromophenol (Surr)	95		49 - 100				06/13/14 11:38	06/13/14 16:43	1
Nitrobenzene-d5 (Surr)	79		51 - 98				06/13/14 11:38	06/13/14 16:43	1
Phenol-d5 (Surr)	67		37 - 95				06/13/14 11:38	06/13/14 16:43	1
Terphenyl-d14 (Surr)	78		60 - 113				06/13/14 11:38	06/13/14 16:43	1
2-Fluorobiphenyl (Surr)	76		45 - 94				06/13/14 11:38	06/13/14 16:43	1
2-Fluorophenol (Surr)	71		46 - 92				06/13/14 11:38	06/13/14 16:43	1

Method: 6010C - Metals (ICP) - TCLP

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		0.50	0.0045	mg/L		06/12/14 15:00	06/13/14 12:01	1
Barium	15	B	0.13	0.0053	mg/L		06/12/14 15:00	06/13/14 12:01	1
Cadmium	ND		0.013	0.00084	mg/L		06/12/14 15:00	06/13/14 12:01	1
Chromium	ND		0.025	0.0084	mg/L		06/12/14 15:00	06/13/14 12:01	1
Lead	0.0085	J	0.25	0.0015	mg/L		06/12/14 15:00	06/13/14 12:01	1
Selenium	ND		0.50	0.0052	mg/L		06/12/14 15:00	06/13/14 12:01	1
Silver	ND		0.025	0.0025	mg/L		06/12/14 15:00	06/13/14 12:01	1
Copper	ND		63	5.3	ug/L		06/12/14 15:00	06/13/14 12:01	1

TestAmerica St. Louis

Client Sample Results

Client: AMEC Environment & Infrastructure, Inc.
Project/Site: NORM Sampling

TestAmerica Job ID: 160-6936-2

Client Sample ID: ARM-MMC-S01-0614

Lab Sample ID: 160-6936-1

Date Collected: 06/03/14 10:00

Matrix: Solid

Date Received: 06/04/14 13:30

Method: 6010C - Metals (ICP) - TCLP (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Nickel	12	J	100	6.4	ug/L		06/12/14 15:00	06/13/14 12:01	1
Zinc	220	B	50	21	ug/L		06/12/14 15:00	06/13/14 12:01	1

Method: 7470A - Mercury (CVAA) - TCLP

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.0010	0.000079	mg/L		06/16/14 12:38	06/16/14 14:07	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Oil & Grease	6900	B	1800	380	mg/Kg	☼	06/30/14 09:14	06/30/14 09:39	1
Cyanide, Total	0.99	J	4.3	0.96	mg/Kg	☼	06/11/14 12:25	06/12/14 15:10	1
Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Flashpoint	>60		1.00	1.00	Degrees C			06/12/14 10:04	1
Total Volatile Solids	8.8	H	1.0	1.0	%			06/11/14 23:59	1
Sulfide, Reactive	ND		22	22	mg/Kg		06/19/14 13:21	06/27/14 11:20	1
pH	6.70		0.103	0.103	SU		06/16/14 11:22	06/17/14 07:55	1
Free Liquid	FAIL		0.10	0.10	NONE			06/26/14 18:15	1
Total Solids	22	H B	0.42	0.42	%			06/11/14 18:30	1

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

Analyte	Result	Qualifier	Count	Total	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
			Uncert.	Uncert.						
			(2σ+/-)	(2σ+/-)						
Actinium-227	0.576	U	1.05	1.06		16.8	pCi/g	06/06/14 14:38	06/27/14 12:45	1
Actinium-228	91.7		5.36	10.8		5.07	pCi/g	06/06/14 14:38	06/27/14 12:45	1
Bismuth-212	45.6		9.70	10.8		14.0	pCi/g	06/06/14 14:38	06/27/14 12:45	1
Bismuth-214	314		5.76	33.1		2.96	pCi/g	06/06/14 14:38	06/27/14 12:45	1
Lead-210	18.9	U	20.3	20.5		27.5	pCi/g	06/06/14 14:38	06/27/14 12:45	1
Lead-212	41.6		1.76	5.66		2.05	pCi/g	06/06/14 14:38	06/27/14 12:45	1
Lead-214	322		5.36	33.9		3.28	pCi/g	06/06/14 14:38	06/27/14 12:45	1
Potassium-40	21.3		11.4	11.6		11.7	pCi/g	06/06/14 14:38	06/27/14 12:45	1
Protactinium-231	-25.8	U	23.4	23.6		38.4	pCi/g	06/06/14 14:38	06/27/14 12:45	1
Radium-226	314		5.76	33.1	1.00	2.96	pCi/g	06/06/14 14:38	06/27/14 12:45	1
Radium-228	91.7		5.36	10.8		5.07	pCi/g	06/06/14 14:38	06/27/14 12:45	1
Thallium-208	14.3		1.40	2.04		1.28	pCi/g	06/06/14 14:38	06/27/14 12:45	1
Thorium-232	91.7		5.36	10.8		5.07	pCi/g	06/06/14 14:38	06/27/14 12:45	1
Thorium-234	-6.31	U	27.1	27.1		30.1	pCi/g	06/06/14 14:38	06/27/14 12:45	1
Uranium-235	1.56	U	3.70	3.71		8.19	pCi/g	06/06/14 14:38	06/27/14 12:45	1
Uranium-238	-6.31	U	27.1	27.1		30.1	pCi/g	06/06/14 14:38	06/27/14 12:45	1

Client Sample ID: ARM-MMC-S02-0614

Lab Sample ID: 160-6936-2

Date Collected: 06/03/14 10:30

Matrix: Solid

Date Received: 06/04/14 13:30

Method: 8260C - Volatile Organic Compounds by GC/MS - TCLP

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	ND		0.050	0.0037	mg/L			06/11/14 00:18	1
1,2-Dichloroethane	ND		0.050	0.0037	mg/L			06/11/14 00:18	1
2-Butanone (MEK)	ND		0.050	0.0039	mg/L			06/11/14 00:18	1
Benzene	0.026	J	0.050	0.0025	mg/L			06/11/14 00:18	1

TestAmerica St. Louis

Client Sample Results

Client: AMEC Environment & Infrastructure, Inc.
Project/Site: NORM Sampling

TestAmerica Job ID: 160-6936-2

Client Sample ID: ARM-MMC-S02-0614

Lab Sample ID: 160-6936-2

Date Collected: 06/03/14 10:30

Matrix: Solid

Date Received: 06/04/14 13:30

Method: 8260C - Volatile Organic Compounds by GC/MS - TCLP (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Carbon tetrachloride	ND		0.050	0.0036	mg/L			06/11/14 00:18	1
Chlorobenzene	ND		0.050	0.0038	mg/L			06/11/14 00:18	1
Chloroform	ND		0.050	0.00092	mg/L			06/11/14 00:18	1
Tetrachloroethene	ND		0.050	0.0028	mg/L			06/11/14 00:18	1
Trichloroethene	ND		0.050	0.0029	mg/L			06/11/14 00:18	1
Vinyl chloride	ND		0.10	0.0043	mg/L			06/11/14 00:18	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	105		84 - 120		06/11/14 00:18	1
1,2-Dichloroethane-d4 (Surr)	97		83 - 117		06/11/14 00:18	1
Toluene-d8 (Surr)	103		85 - 115		06/11/14 00:18	1
Dibromofluoromethane (Surr)	99		85 - 115		06/11/14 00:18	1

Method: 8270D - Semivolatile Organic Compounds (GC/MS) - TCLP

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dichlorobenzene	ND		0.050	0.0050	mg/L		06/13/14 11:38	06/13/14 18:19	1
2,4-Dinitrotoluene	ND		0.050	0.0050	mg/L		06/13/14 11:38	06/13/14 18:19	1
Hexachlorobenzene	ND		0.050	0.0050	mg/L		06/13/14 11:38	06/13/14 18:19	1
Hexachlorobutadiene	ND		0.050	0.0050	mg/L		06/13/14 11:38	06/13/14 18:19	1
Hexachloroethane	ND		0.050	0.0050	mg/L		06/13/14 11:38	06/13/14 18:19	1
2-Methylphenol	ND		0.050	0.010	mg/L		06/13/14 11:38	06/13/14 18:19	1
3 & 4 Methylphenol	ND		0.10	0.0050	mg/L		06/13/14 11:38	06/13/14 18:19	1
Nitrobenzene	ND		0.050	0.0050	mg/L		06/13/14 11:38	06/13/14 18:19	1
Pentachlorophenol	ND		0.25	0.010	mg/L		06/13/14 11:38	06/13/14 18:19	1
Pyridine	ND		0.10	0.025	mg/L		06/13/14 11:38	06/13/14 18:19	1
2,4,5-Trichlorophenol	ND		0.050	0.010	mg/L		06/13/14 11:38	06/13/14 18:19	1
2,4,6-Trichlorophenol	ND		0.050	0.010	mg/L		06/13/14 11:38	06/13/14 18:19	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
2,4,6-Tribromophenol (Surr)	99		49 - 100	06/13/14 11:38	06/13/14 18:19	1
Nitrobenzene-d5 (Surr)	81		51 - 98	06/13/14 11:38	06/13/14 18:19	1
Phenol-d5 (Surr)	71		37 - 95	06/13/14 11:38	06/13/14 18:19	1
Terphenyl-d14 (Surr)	82		60 - 113	06/13/14 11:38	06/13/14 18:19	1
2-Fluorobiphenyl (Surr)	79		45 - 94	06/13/14 11:38	06/13/14 18:19	1
2-Fluorophenol (Surr)	73		46 - 92	06/13/14 11:38	06/13/14 18:19	1

Method: 6010C - Metals (ICP) - TCLP

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		0.50	0.0045	mg/L		06/12/14 15:00	06/13/14 12:18	1
Barium	12	B	0.13	0.0053	mg/L		06/12/14 15:00	06/13/14 12:18	1
Cadmium	0.0013	J	0.013	0.00084	mg/L		06/12/14 15:00	06/13/14 12:18	1
Chromium	ND		0.050	0.017	mg/L		06/12/14 15:00	06/13/14 13:15	2
Lead	0.011	J	0.25	0.0015	mg/L		06/12/14 15:00	06/13/14 12:18	1
Selenium	0.013	J	1.0	0.010	mg/L		06/12/14 15:00	06/13/14 13:15	2
Silver	0.0060	J	0.025	0.0025	mg/L		06/12/14 15:00	06/13/14 12:18	1
Copper	ND		63	5.3	ug/L		06/12/14 15:00	06/13/14 12:18	1
Nickel	20	J	100	6.4	ug/L		06/12/14 15:00	06/13/14 12:18	1
Zinc	560	B	50	21	ug/L		06/12/14 15:00	06/13/14 12:18	1

TestAmerica St. Louis

Client Sample Results

Client: AMEC Environment & Infrastructure, Inc.
Project/Site: NORM Sampling

TestAmerica Job ID: 160-6936-2

Client Sample ID: ARM-MMC-S02-0614

Lab Sample ID: 160-6936-2

Date Collected: 06/03/14 10:30

Matrix: Solid

Date Received: 06/04/14 13:30

Method: 7470A - Mercury (CVAA) - TCLP

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.0010	0.000079	mg/L		06/16/14 12:38	06/16/14 14:15	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Oil & Grease	16000	B	2800	600	mg/Kg	☼	06/30/14 09:14	06/30/14 09:39	1
Cyanide, Total	2.1	J	6.8	1.5	mg/Kg	☼	06/11/14 12:25	06/12/14 15:20	1
Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Flashpoint	>60		1.00	1.00	Degrees C			06/12/14 10:04	1
Total Volatile Solids	1.6	H	1.1	1.1	%			06/11/14 23:59	1
Sulfide, Reactive	ND		22	22	mg/Kg		06/19/14 13:21	06/27/14 11:20	1
pH	6.55		0.0985	0.0985	SU		06/16/14 11:22	06/17/14 07:55	1
Free Liquid	FAIL		0.10	0.10	NONE			06/26/14 18:15	1
Total Solids	8.3	H B	0.43	0.43	%			06/11/14 18:30	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
Actinium-227	-2.00	U	12.3	12.3		20.3	pCi/g	06/06/14 14:38	06/27/14 13:40	1
Actinium-228	222		6.50	23.6		5.98	pCi/g	06/06/14 14:38	06/27/14 13:40	1
Bismuth-212	176		17.7	25.4		17.6	pCi/g	06/06/14 14:38	06/27/14 13:40	1
Bismuth-214	901		6.90	93.8		3.03	pCi/g	06/06/14 14:38	06/27/14 13:40	1
Lead-210	15.7	U	28.3	28.4		46.8	pCi/g	06/06/14 14:38	06/27/14 13:40	1
Lead-212	181		2.49	23.5		2.50	pCi/g	06/06/14 14:38	06/27/14 13:40	1
Lead-214	993		6.05	103		3.01	pCi/g	06/06/14 14:38	06/27/14 13:40	1
Potassium-40	28.7		15.8	16.1		15.7	pCi/g	06/06/14 14:38	06/27/14 13:40	1
Protactinium-231	-67.1	U	31.1	31.9		50.7	pCi/g	06/06/14 14:38	06/27/14 13:40	1
Radium-226	901		6.90	93.8	1.00	3.03	pCi/g	06/06/14 14:38	06/27/14 13:40	1
Radium-228	222		6.50	23.6		5.98	pCi/g	06/06/14 14:38	06/27/14 13:40	1
Thallium-208	57.7		1.42	6.15		1.39	pCi/g	06/06/14 14:38	06/27/14 13:40	1
Thorium-232	222		6.50	23.6		5.98	pCi/g	06/06/14 14:38	06/27/14 13:40	1
Thorium-234	-6.09	U	36.2	36.2		35.8	pCi/g	06/06/14 14:38	06/27/14 13:40	1
Uranium-235	-1.82	U	7.13	7.13		10.9	pCi/g	06/06/14 14:38	06/27/14 13:40	1
Uranium-238	-6.09	U	36.2	36.2		35.8	pCi/g	06/06/14 14:38	06/27/14 13:40	1

Client Sample ID: ARM-MMC-S03-0614

Lab Sample ID: 160-6936-3

Date Collected: 06/03/14 11:00

Matrix: Solid

Date Received: 06/04/14 13:30

Method: 8260C - Volatile Organic Compounds by GC/MS - TCLP

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	ND		0.050	0.0037	mg/L			06/11/14 00:43	1
1,2-Dichloroethane	ND		0.050	0.0037	mg/L			06/11/14 00:43	1
2-Butanone (MEK)	ND		0.050	0.0039	mg/L			06/11/14 00:43	1
Benzene	0.040	J	0.050	0.0025	mg/L			06/11/14 00:43	1
Carbon tetrachloride	ND		0.050	0.0036	mg/L			06/11/14 00:43	1
Chlorobenzene	ND		0.050	0.0038	mg/L			06/11/14 00:43	1
Chloroform	ND		0.050	0.00092	mg/L			06/11/14 00:43	1
Tetrachloroethene	0.0033	J	0.050	0.0028	mg/L			06/11/14 00:43	1
Trichloroethene	ND		0.050	0.0029	mg/L			06/11/14 00:43	1

TestAmerica St. Louis

Client Sample Results

Client: AMEC Environment & Infrastructure, Inc.
Project/Site: NORM Sampling

TestAmerica Job ID: 160-6936-2

Client Sample ID: ARM-MMC-S03-0614

Lab Sample ID: 160-6936-3

Date Collected: 06/03/14 11:00

Matrix: Solid

Date Received: 06/04/14 13:30

Method: 8260C - Volatile Organic Compounds by GC/MS - TCLP (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Vinyl chloride	ND		0.10	0.0043	mg/L			06/11/14 00:43	1
Surrogate									
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	103		84 - 120					06/11/14 00:43	1
1,2-Dichloroethane-d4 (Surr)	96		83 - 117					06/11/14 00:43	1
Toluene-d8 (Surr)	101		85 - 115					06/11/14 00:43	1
Dibromofluoromethane (Surr)	97		85 - 115					06/11/14 00:43	1

Method: 8270D - Semivolatile Organic Compounds (GC/MS) - TCLP

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dichlorobenzene	ND		0.050	0.0050	mg/L		06/13/14 11:38	06/13/14 18:51	1
2,4-Dinitrotoluene	ND		0.050	0.0050	mg/L		06/13/14 11:38	06/13/14 18:51	1
Hexachlorobenzene	ND		0.050	0.0050	mg/L		06/13/14 11:38	06/13/14 18:51	1
Hexachlorobutadiene	ND		0.050	0.0050	mg/L		06/13/14 11:38	06/13/14 18:51	1
Hexachloroethane	ND		0.050	0.0050	mg/L		06/13/14 11:38	06/13/14 18:51	1
2-Methylphenol	ND		0.050	0.010	mg/L		06/13/14 11:38	06/13/14 18:51	1
3 & 4 Methylphenol	0.097	J	0.10	0.0050	mg/L		06/13/14 11:38	06/13/14 18:51	1
Nitrobenzene	ND		0.050	0.0050	mg/L		06/13/14 11:38	06/13/14 18:51	1
Pentachlorophenol	ND		0.25	0.010	mg/L		06/13/14 11:38	06/13/14 18:51	1
Pyridine	ND		0.10	0.025	mg/L		06/13/14 11:38	06/13/14 18:51	1
2,4,5-Trichlorophenol	ND		0.050	0.010	mg/L		06/13/14 11:38	06/13/14 18:51	1
2,4,6-Trichlorophenol	ND		0.050	0.010	mg/L		06/13/14 11:38	06/13/14 18:51	1
Surrogate									
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
2,4,6-Tribromophenol (Surr)	99		49 - 100				06/13/14 11:38	06/13/14 18:51	1
Nitrobenzene-d5 (Surr)	86		51 - 98				06/13/14 11:38	06/13/14 18:51	1
Phenol-d5 (Surr)	76		37 - 95				06/13/14 11:38	06/13/14 18:51	1
Terphenyl-d14 (Surr)	82		60 - 113				06/13/14 11:38	06/13/14 18:51	1
2-Fluorobiphenyl (Surr)	82		45 - 94				06/13/14 11:38	06/13/14 18:51	1
2-Fluorophenol (Surr)	79		46 - 92				06/13/14 11:38	06/13/14 18:51	1

Method: 6010C - Metals (ICP) - TCLP

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		0.50	0.0045	mg/L		06/12/14 15:00	06/13/14 12:22	1
Barium	15	B	0.13	0.0053	mg/L		06/12/14 15:00	06/13/14 12:22	1
Cadmium	ND		0.013	0.00084	mg/L		06/12/14 15:00	06/13/14 12:22	1
Chromium	ND		0.025	0.0084	mg/L		06/12/14 15:00	06/13/14 12:22	1
Lead	0.0070	J	0.25	0.0015	mg/L		06/12/14 15:00	06/13/14 12:22	1
Selenium	ND		0.50	0.0052	mg/L		06/12/14 15:00	06/13/14 12:22	1
Silver	ND		0.025	0.0025	mg/L		06/12/14 15:00	06/13/14 12:22	1
Copper	ND		63	5.3	ug/L		06/12/14 15:00	06/13/14 12:22	1
Nickel	35	J	100	6.4	ug/L		06/12/14 15:00	06/13/14 12:22	1
Zinc	250	B	50	21	ug/L		06/12/14 15:00	06/13/14 12:22	1

Method: 7470A - Mercury (CVAA) - TCLP

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.0010	0.000079	mg/L		06/16/14 12:38	06/16/14 14:18	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Oil & Grease	22000	B	1800	390	mg/Kg	☼	06/30/14 09:14	06/30/14 09:39	1

TestAmerica St. Louis

Client Sample Results

Client: AMEC Environment & Infrastructure, Inc.
Project/Site: NORM Sampling

TestAmerica Job ID: 160-6936-2

Client Sample ID: ARM-MMC-S03-0614

Lab Sample ID: 160-6936-3

Date Collected: 06/03/14 11:00

Matrix: Solid

Date Received: 06/04/14 13:30

Percent Solids: 10.9

General Chemistry (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cyanide, Total	1.1	J	4.6	1.0	mg/Kg	☼	06/11/14 12:25	06/12/14 15:23	1
Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Flashpoint	>60		1.00	1.00	Degrees C			06/12/14 10:04	1
Total Volatile Solids	8.3	H	1.2	1.2	%			06/11/14 23:59	1
Sulfide, Reactive	ND		22	22	mg/Kg		06/19/14 13:22	06/27/14 11:20	1
pH	6.42		0.0966	0.0966	SU		06/16/14 11:22	06/17/14 07:55	1
Free Liquid	FAIL		0.10	0.10	NONE			06/26/14 18:15	1
Total Solids	34	H B	0.49	0.49	%			06/11/14 18:30	1

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

Analyte	Result	Qualifier	Count	Total	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
			Uncert.	Uncert.						
			(2σ+/-)	(2σ+/-)						
Actinium-227	5.58	U	8.16	8.20		31.5	pCi/g	06/06/14 14:38	06/27/14 13:37	1
Actinium-228	226		8.10	24.4		9.89	pCi/g	06/06/14 14:38	06/27/14 13:37	1
Bismuth-212	160		24.9	30.0		25.3	pCi/g	06/06/14 14:38	06/27/14 13:37	1
Bismuth-214	810		10.5	84.8		6.58	pCi/g	06/06/14 14:38	06/27/14 13:37	1
Lead-210	13.8	U	33.1	33.1		54.7	pCi/g	06/06/14 14:38	06/27/14 13:37	1
Lead-212	155		3.28	20.3		3.70	pCi/g	06/06/14 14:38	06/27/14 13:37	1
Lead-214	806		9.08	84.2		6.54	pCi/g	06/06/14 14:38	06/27/14 13:37	1
Potassium-40	-1.95	U	15.0	15.0		25.1	pCi/g	06/06/14 14:38	06/27/14 13:37	1
Protactinium-231	75.6		25.1	26.4		37.5	pCi/g	06/06/14 14:38	06/27/14 13:37	1
Radium-226	810		10.5	84.8	1.00	6.58	pCi/g	06/06/14 14:38	06/27/14 13:37	1
Radium-228	226		8.10	24.4		9.89	pCi/g	06/06/14 14:38	06/27/14 13:37	1
Thallium-208	54.1		2.66	6.21		2.43	pCi/g	06/06/14 14:38	06/27/14 13:37	1
Thorium-232	226		8.10	24.4		9.89	pCi/g	06/06/14 14:38	06/27/14 13:37	1
Thorium-234	14.7	U	24.8	24.8		40.9	pCi/g	06/06/14 14:38	06/27/14 13:37	1
Uranium-235	3.79	U	8.38	8.39		13.8	pCi/g	06/06/14 14:38	06/27/14 13:37	1
Uranium-238	14.7	U	24.8	24.8		40.9	pCi/g	06/06/14 14:38	06/27/14 13:37	1

QC Sample Results

Client: AMEC Environment & Infrastructure, Inc.
Project/Site: NORM Sampling

TestAmerica Job ID: 160-6936-2

Method: 8260C - Volatile Organic Compounds by GC/MS

Lab Sample ID: LCS 160-126263/4-A

Matrix: Solid

Analysis Batch: 126263

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	0.500	0.490		mg/L		98	79 - 117
1,2-Dichloroethane	0.500	0.461		mg/L		92	80 - 115
2-Butanone (MEK)	0.500	0.444		mg/L		89	64 - 117
Benzene	0.500	0.478		mg/L		96	85 - 115
Carbon tetrachloride	0.500	0.481		mg/L		96	79 - 119
Chlorobenzene	0.500	0.498		mg/L		100	85 - 115
Chloroform	0.500	0.473		mg/L		95	85 - 115
Tetrachloroethene	0.500	0.506		mg/L		101	79 - 116
Trichloroethene	0.500	0.472		mg/L		94	85 - 115
Vinyl chloride	0.500	0.461		mg/L		92	72 - 136

Surrogate	LCS %Recovery	LCS Qualifier	Limits
4-Bromofluorobenzene (Surr)	98		84 - 120
1,2-Dichloroethane-d4 (Surr)	92		83 - 117
Toluene-d8 (Surr)	101		85 - 115
Dibromofluoromethane (Surr)	95		85 - 115

Lab Sample ID: LB 160-125876/1-A

Matrix: Solid

Analysis Batch: 126263

Client Sample ID: Method Blank

Prep Type: TCLP

Analyte	LB Result	LB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	ND		0.050	0.0037	mg/L			06/10/14 23:29	1
1,2-Dichloroethane	ND		0.050	0.0037	mg/L			06/10/14 23:29	1
2-Butanone (MEK)	ND		0.050	0.0039	mg/L			06/10/14 23:29	1
Benzene	ND		0.050	0.0025	mg/L			06/10/14 23:29	1
Carbon tetrachloride	ND		0.050	0.0036	mg/L			06/10/14 23:29	1
Chlorobenzene	ND		0.050	0.0038	mg/L			06/10/14 23:29	1
Chloroform	ND		0.050	0.00092	mg/L			06/10/14 23:29	1
Tetrachloroethene	ND		0.050	0.0028	mg/L			06/10/14 23:29	1
Trichloroethene	ND		0.050	0.0029	mg/L			06/10/14 23:29	1
Vinyl chloride	ND		0.10	0.0043	mg/L			06/10/14 23:29	1

Surrogate	LB %Recovery	LB Qualifier	Limits	Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	102		84 - 120		06/10/14 23:29	1
1,2-Dichloroethane-d4 (Surr)	92		83 - 117		06/10/14 23:29	1
Toluene-d8 (Surr)	99		85 - 115		06/10/14 23:29	1
Dibromofluoromethane (Surr)	95		85 - 115		06/10/14 23:29	1

Lab Sample ID: 160-6936-1 MS

Matrix: Solid

Analysis Batch: 126263

Client Sample ID: ARM-MMC-S01-0614

Prep Type: TCLP

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	ND		0.500	0.491		mg/L		98	80 - 115
1,2-Dichloroethane	ND		0.500	0.484		mg/L		97	85 - 115
2-Butanone (MEK)	ND		0.500	0.548		mg/L		110	67 - 117

TestAmerica St. Louis

QC Sample Results

Client: AMEC Environment & Infrastructure, Inc.
Project/Site: NORM Sampling

TestAmerica Job ID: 160-6936-2

Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Lab Sample ID: 160-6936-1 MS

Matrix: Solid

Analysis Batch: 126263

Client Sample ID: ARM-MMC-S01-0614

Prep Type: TCLP

Analyte	Sample	Sample	Spike Added	MS	MS	Unit	D	%Rec	%Rec. Limits
	Result	Qualifier		Result	Qualifier				
Benzene	0.028	J	0.500	0.530		mg/L		100	85 - 115
Carbon tetrachloride	ND		0.500	0.488		mg/L		98	79 - 117
Chlorobenzene	ND		0.500	0.513		mg/L		103	85 - 115
Chloroform	ND		0.500	0.495		mg/L		99	85 - 115
Tetrachloroethene	ND		0.500	0.529		mg/L		106	82 - 115
Trichloroethene	ND		0.500	0.493		mg/L		99	84 - 115
Vinyl chloride	ND		0.500	0.486		mg/L		97	75 - 132
MS MS									
Surrogate	%Recovery	Qualifier	Limits						
4-Bromofluorobenzene (Surr)	99		84 - 120						
1,2-Dichloroethane-d4 (Surr)	94		83 - 117						
Toluene-d8 (Surr)	102		85 - 115						
Dibromofluoromethane (Surr)	97		85 - 115						

Lab Sample ID: 160-6936-1 MSD

Matrix: Solid

Analysis Batch: 126263

Client Sample ID: ARM-MMC-S01-0614

Prep Type: TCLP

Analyte	Sample	Sample	Spike Added	MSD	MSD	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
	Result	Qualifier		Result	Qualifier						
1,1-Dichloroethene	ND		0.500	0.493		mg/L		99	80 - 115	0	20
1,2-Dichloroethane	ND		0.500	0.473		mg/L		95	85 - 115	2	20
2-Butanone (MEK)	ND		0.500	0.526		mg/L		105	67 - 117	4	20
Benzene	0.028	J	0.500	0.514		mg/L		97	85 - 115	3	20
Carbon tetrachloride	ND		0.500	0.472		mg/L		94	79 - 117	3	20
Chlorobenzene	ND		0.500	0.504		mg/L		101	85 - 115	2	20
Chloroform	ND		0.500	0.482		mg/L		96	85 - 115	3	20
Tetrachloroethene	ND		0.500	0.504		mg/L		101	82 - 115	5	20
Trichloroethene	ND		0.500	0.481		mg/L		96	84 - 115	3	20
Vinyl chloride	ND		0.500	0.463		mg/L		93	75 - 132	5	20
MSD MSD											
Surrogate	%Recovery	Qualifier	Limits								
4-Bromofluorobenzene (Surr)	99		84 - 120								
1,2-Dichloroethane-d4 (Surr)	91		83 - 117								
Toluene-d8 (Surr)	102		85 - 115								
Dibromofluoromethane (Surr)	97		85 - 115								

Method: 8270D - Semivolatile Organic Compounds (GC/MS)

Lab Sample ID: LCS 160-126771/2-A

Matrix: Solid

Analysis Batch: 126999

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Prep Batch: 126771

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
2,4-Dinitrotoluene	1.00	0.834		mg/L		83	51 - 90
Hexachlorobenzene	1.00	0.849		mg/L		85	52 - 93
Hexachlorobutadiene	1.00	0.659		mg/L		66	37 - 92

TestAmerica St. Louis

QC Sample Results

Client: AMEC Environment & Infrastructure, Inc.
Project/Site: NORM Sampling

TestAmerica Job ID: 160-6936-2

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCS 160-126771/2-A

Matrix: Solid

Analysis Batch: 126999

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Prep Batch: 126771

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Hexachloroethane	1.00	0.645		mg/L		65	36 - 95
2-Methylphenol	1.00	0.844		mg/L		84	51 - 100
3 & 4 Methylphenol	2.00	1.69		mg/L		84	46 - 95
Nitrobenzene	1.00	0.765		mg/L		77	51 - 93
Pentachlorophenol	1.00	0.905		mg/L		91	41 - 96
Pyridine	1.00	0.654		mg/L		65	10 - 80
2,4,5-Trichlorophenol	1.00	0.913		mg/L		91	49 - 96
2,4,6-Trichlorophenol	1.00	0.865		mg/L		87	48 - 93

Surrogate	LCS %Recovery	LCS Qualifier	Limits
2,4,6-Tribromophenol (Surr)	97		49 - 100
Nitrobenzene-d5 (Surr)	77		51 - 98
Phenol-d5 (Surr)	71		37 - 95
Terphenyl-d14 (Surr)	82		60 - 113
2-Fluorobiphenyl (Surr)	77		45 - 94
2-Fluorophenol (Surr)	73		46 - 92

Lab Sample ID: LB 160-126314/1-C

Matrix: Solid

Analysis Batch: 126999

Client Sample ID: Method Blank

Prep Type: TCLP

Prep Batch: 126771

Analyte	LB Result	LB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dichlorobenzene	ND		0.050	0.0050	mg/L		06/13/14 11:38	06/13/14 15:39	1
2,4-Dinitrotoluene	ND		0.050	0.0050	mg/L		06/13/14 11:38	06/13/14 15:39	1
Hexachlorobenzene	ND		0.050	0.0050	mg/L		06/13/14 11:38	06/13/14 15:39	1
Hexachlorobutadiene	ND		0.050	0.0050	mg/L		06/13/14 11:38	06/13/14 15:39	1
Hexachloroethane	ND		0.050	0.0050	mg/L		06/13/14 11:38	06/13/14 15:39	1
2-Methylphenol	ND		0.050	0.010	mg/L		06/13/14 11:38	06/13/14 15:39	1
3 & 4 Methylphenol	ND		0.10	0.0050	mg/L		06/13/14 11:38	06/13/14 15:39	1
Nitrobenzene	ND		0.050	0.0050	mg/L		06/13/14 11:38	06/13/14 15:39	1
Pentachlorophenol	ND		0.25	0.010	mg/L		06/13/14 11:38	06/13/14 15:39	1
Pyridine	ND		0.10	0.025	mg/L		06/13/14 11:38	06/13/14 15:39	1
2,4,5-Trichlorophenol	ND		0.050	0.010	mg/L		06/13/14 11:38	06/13/14 15:39	1
2,4,6-Trichlorophenol	ND		0.050	0.010	mg/L		06/13/14 11:38	06/13/14 15:39	1

Surrogate	LB %Recovery	LB Qualifier	Limits	Prepared	Analyzed	Dil Fac
2,4,6-Tribromophenol (Surr)	100		49 - 100	06/13/14 11:38	06/13/14 15:39	1
Nitrobenzene-d5 (Surr)	87		51 - 98	06/13/14 11:38	06/13/14 15:39	1
Phenol-d5 (Surr)	72		37 - 95	06/13/14 11:38	06/13/14 15:39	1
Terphenyl-d14 (Surr)	86		60 - 113	06/13/14 11:38	06/13/14 15:39	1
2-Fluorobiphenyl (Surr)	83		45 - 94	06/13/14 11:38	06/13/14 15:39	1
2-Fluorophenol (Surr)	77		46 - 92	06/13/14 11:38	06/13/14 15:39	1

TestAmerica St. Louis

QC Sample Results

Client: AMEC Environment & Infrastructure, Inc.
Project/Site: NORM Sampling

TestAmerica Job ID: 160-6936-2

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 160-6936-1 MS

Matrix: Solid

Analysis Batch: 126999

Client Sample ID: ARM-MMC-S01-0614

Prep Type: TCLP

Prep Batch: 126771

Analyte	Sample	Sample	Spike	MS	MS	Unit	D	%Rec	%Rec.
	Result	Qualifier		Result	Qualifier				
1,4-Dichlorobenzene	ND		1.00	0.753		mg/L		75	46 - 88
2,4-Dinitrotoluene	ND		1.00	0.838		mg/L		84	52 - 97
Hexachlorobenzene	ND		1.00	0.829		mg/L		83	56 - 90
Hexachlorobutadiene	ND		1.00	0.724		mg/L		72	43 - 92
Hexachloroethane	ND		1.00	0.724		mg/L		72	44 - 91
2-Methylphenol	ND		1.00	0.900		mg/L		90	55 - 97
3 & 4 Methylphenol	ND		2.00	1.78		mg/L		89	46 - 94
Nitrobenzene	ND		1.00	0.830		mg/L		83	53 - 97
Pentachlorophenol	ND		1.00	0.910		mg/L		91	39 - 103
Pyridine	ND		1.00	0.530		mg/L		53	10 - 82
2,4,5-Trichlorophenol	ND		1.00	0.908		mg/L		91	52 - 98
2,4,6-Trichlorophenol	ND		1.00	0.888		mg/L		89	52 - 94

Surrogate	MS	MS	Limits
	%Recovery	Qualifier	
2,4,6-Tribromophenol (Surr)	95		49 - 100
Nitrobenzene-d5 (Surr)	84		51 - 98
Phenol-d5 (Surr)	77		37 - 95
Terphenyl-d14 (Surr)	81		60 - 113
2-Fluorobiphenyl (Surr)	78		45 - 94
2-Fluorophenol (Surr)	78		46 - 92

Lab Sample ID: 160-6936-1 MSD

Matrix: Solid

Analysis Batch: 126999

Client Sample ID: ARM-MMC-S01-0614

Prep Type: TCLP

Prep Batch: 126771

Analyte	Sample	Sample	Spike	MSD	MSD	Unit	D	%Rec	%Rec.	RPD	RPD
	Result	Qualifier		Result	Qualifier						
1,4-Dichlorobenzene	ND		1.00	0.749		mg/L		75	46 - 88	1	20
2,4-Dinitrotoluene	ND		1.00	0.852		mg/L		85	52 - 97	2	20
Hexachlorobenzene	ND		1.00	0.858		mg/L		86	56 - 90	4	20
Hexachlorobutadiene	ND		1.00	0.718		mg/L		72	43 - 92	1	20
Hexachloroethane	ND		1.00	0.719		mg/L		72	44 - 91	1	20
2-Methylphenol	ND		1.00	0.888		mg/L		89	55 - 97	1	20
3 & 4 Methylphenol	ND		2.00	1.78		mg/L		89	46 - 94	0	20
Nitrobenzene	ND		1.00	0.800		mg/L		80	53 - 97	4	20
Pentachlorophenol	ND		1.00	0.964		mg/L		96	39 - 103	6	20
Pyridine	ND		1.00	0.399	F2	mg/L		40	10 - 82	28	20
2,4,5-Trichlorophenol	ND		1.00	0.954		mg/L		95	52 - 98	5	20
2,4,6-Trichlorophenol	ND		1.00	0.907		mg/L		91	52 - 94	2	20

Surrogate	MSD	MSD	Limits
	%Recovery	Qualifier	
2,4,6-Tribromophenol (Surr)	102	X	49 - 100
Nitrobenzene-d5 (Surr)	81		51 - 98
Phenol-d5 (Surr)	75		37 - 95
Terphenyl-d14 (Surr)	83		60 - 113
2-Fluorobiphenyl (Surr)	79		45 - 94
2-Fluorophenol (Surr)	77		46 - 92

TestAmerica St. Louis

QC Sample Results

Client: AMEC Environment & Infrastructure, Inc.
Project/Site: NORM Sampling

TestAmerica Job ID: 160-6936-2

Method: 6010C - Metals (ICP)

Lab Sample ID: LCS 160-126581/2-A

Matrix: Solid

Analysis Batch: 126798

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Prep Batch: 126581

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Arsenic	2.50	2.40		mg/L		96	80 - 120
Barium	2.50	2.55		mg/L		102	80 - 120
Cadmium	2.50	2.34		mg/L		94	80 - 120
Chromium	2.50	2.39		mg/L		96	80 - 120
Lead	2.50	2.32		mg/L		93	80 - 120
Selenium	1.25	1.24		mg/L		99	80 - 120
Silver	0.500	0.499		mg/L		100	80 - 120
Copper	2500	2410		ug/L		96	80 - 120
Nickel	2500	2350		ug/L		94	80 - 120
Zinc	2500	2450		ug/L		98	80 - 120

Lab Sample ID: LB 160-126314/1-B

Matrix: Solid

Analysis Batch: 126798

Client Sample ID: Method Blank

Prep Type: TCLP

Prep Batch: 126581

Analyte	LB Result	LB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		0.50	0.0045	mg/L		06/12/14 15:00	06/13/14 11:42	1
Barium	0.0548	J	0.13	0.0053	mg/L		06/12/14 15:00	06/13/14 11:42	1
Cadmium	ND		0.013	0.00084	mg/L		06/12/14 15:00	06/13/14 11:42	1
Chromium	ND		0.025	0.0084	mg/L		06/12/14 15:00	06/13/14 11:42	1
Lead	ND		0.25	0.0015	mg/L		06/12/14 15:00	06/13/14 11:42	1
Selenium	ND		0.50	0.0052	mg/L		06/12/14 15:00	06/13/14 11:42	1
Silver	ND		0.025	0.0025	mg/L		06/12/14 15:00	06/13/14 11:42	1
Copper	5.75	J	63	5.3	ug/L		06/12/14 15:00	06/13/14 11:42	1
Nickel	ND		100	6.4	ug/L		06/12/14 15:00	06/13/14 11:42	1
Zinc	23.3	J	50	21	ug/L		06/12/14 15:00	06/13/14 11:42	1

Lab Sample ID: 160-6936-1 MS

Matrix: Solid

Analysis Batch: 126798

Client Sample ID: ARM-MMC-S01-0614

Prep Type: TCLP

Prep Batch: 126581

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Arsenic	ND		2.50	2.36		mg/L		94	75 - 125
Barium	15	B	2.50	17.3	4	mg/L		76	75 - 125
Cadmium	ND		2.50	2.32		mg/L		93	75 - 125
Chromium	ND		2.50	2.25		mg/L		90	75 - 125
Lead	0.0085	J	2.50	2.17		mg/L		87	75 - 125
Selenium	ND		1.25	1.21		mg/L		97	75 - 125
Silver	ND		0.500	0.413		mg/L		83	75 - 125
Copper	ND		2500	2340		ug/L		93	75 - 125
Nickel	12	J	2500	2230		ug/L		89	75 - 125
Zinc	220	B	2500	2550		ug/L		93	75 - 125

Lab Sample ID: 160-6936-1 MSD

Matrix: Solid

Analysis Batch: 126798

Client Sample ID: ARM-MMC-S01-0614

Prep Type: TCLP

Prep Batch: 126581

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Arsenic	ND		2.50	2.34		mg/L		94	75 - 125	1	20

TestAmerica St. Louis

QC Sample Results

Client: AMEC Environment & Infrastructure, Inc.
Project/Site: NORM Sampling

TestAmerica Job ID: 160-6936-2

Method: 6010C - Metals (ICP) (Continued)

Lab Sample ID: 160-6936-1 MSD

Matrix: Solid

Analysis Batch: 126798

Client Sample ID: ARM-MMC-S01-0614

Prep Type: TCLP

Prep Batch: 126581

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD		Unit	D	%Rec	%Rec.		RPD	Limit
				Result	Qualifier				Limits	RPD		
Barium	15	B	2.50	17.2	4	mg/L		69	75 - 125	1	20	
Cadmium	ND		2.50	2.32		mg/L		93	75 - 125	0	20	
Chromium	ND		2.50	2.27		mg/L		91	75 - 125	1	20	
Lead	0.0085	J	2.50	2.18		mg/L		87	75 - 125	0	20	
Selenium	ND		1.25	1.20		mg/L		96	75 - 125	1	20	
Silver	ND		0.500	0.503		mg/L		101	75 - 125	20	20	
Copper	ND		2500	2320		ug/L		93	75 - 125	1	20	
Nickel	12	J	2500	2240		ug/L		89	75 - 125	0	20	
Zinc	220	B	2500	2540		ug/L		93	75 - 125	0	20	

Method: 7470A - Mercury (CVAA)

Lab Sample ID: LCS 160-126990/2-A

Matrix: Solid

Analysis Batch: 127048

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Prep Batch: 126990

Analyte	Spike Added	LCS		Unit	D	%Rec	%Rec.	
		Result	Qualifier				Limits	RPD
Mercury	0.0250	0.0264		mg/L		106	80 - 120	

Lab Sample ID: LB 160-126314/1-D

Matrix: Solid

Analysis Batch: 127048

Client Sample ID: Method Blank

Prep Type: TCLP

Prep Batch: 126990

Analyte	LB LB		RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
	Result	Qualifier							
Mercury	ND		0.0010	0.000079	mg/L		06/16/14 12:38	06/16/14 13:59	1

Lab Sample ID: 160-6936-1 MS

Matrix: Solid

Analysis Batch: 127048

Client Sample ID: ARM-MMC-S01-0614

Prep Type: TCLP

Prep Batch: 126990

Analyte	Sample Result	Sample Qualifier	Spike Added	MS		Unit	D	%Rec	%Rec.	
				Result	Qualifier				Limits	RPD
Mercury	ND		0.0250	0.0278		mg/L		111	70 - 130	

Lab Sample ID: 160-6936-1 MSD

Matrix: Solid

Analysis Batch: 127048

Client Sample ID: ARM-MMC-S01-0614

Prep Type: TCLP

Prep Batch: 126990

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD		Unit	D	%Rec	%Rec.		RPD	Limit
				Result	Qualifier				Limits	RPD		
Mercury	ND		0.0250	0.0270		mg/L		108	70 - 130	3	20	

Method: 1010A - Ignitability, Pensky-Martens Closed Cup Method

Lab Sample ID: MB 160-126533/1

Matrix: Solid

Analysis Batch: 126533

Client Sample ID: Method Blank

Prep Type: Total/NA

Analyte	MB MB		RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
	Result	Qualifier							
Flashpoint	>60		1.00	1.00	Degrees C			06/12/14 10:04	1

TestAmerica St. Louis

QC Sample Results

Client: AMEC Environment & Infrastructure, Inc.
Project/Site: NORM Sampling

TestAmerica Job ID: 160-6936-2

Method: 1010A - Ignitability, Pensky-Martens Closed Cup Method (Continued)

Lab Sample ID: LCS 160-126533/2

Matrix: Solid

Analysis Batch: 126533

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Flashpoint	25.0	25.00		Degrees C		100	95.9 - 104

Method: 1664A - HEM and SGT-HEM

Lab Sample ID: MB 160-129025/1-A

Matrix: Solid

Analysis Batch: 129030

Client Sample ID: Method Blank

Prep Type: Total/NA

Prep Batch: 129025

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Oil & Grease	46.7	J	200	43	mg/Kg		06/30/14 09:14	06/30/14 09:39	1

Lab Sample ID: LCS 160-129025/2-A

Matrix: Solid

Analysis Batch: 129030

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Prep Batch: 129025

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Oil & Grease	2680	1620		mg/Kg		61	58 - 103

Lab Sample ID: 160-6936-1 MS

Matrix: Solid

Analysis Batch: 129030

Client Sample ID: ARM-MMC-S01-0614

Prep Type: Total/NA

Prep Batch: 129025

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Oil & Grease	6900	B	23800	25700		mg/Kg	☼	79	58 - 103

Lab Sample ID: 160-6936-1 DU

Matrix: Solid

Analysis Batch: 129030

Client Sample ID: ARM-MMC-S01-0614

Prep Type: Total/NA

Prep Batch: 129025

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	Limit
Oil & Grease	6900	B	8440		mg/Kg	☼	20	34

Method: 2540G - Percent Volatile Solids

Lab Sample ID: MB 280-229837/1

Matrix: Solid

Analysis Batch: 229837

Client Sample ID: Method Blank

Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Total Volatile Solids	ND		Infinity	Infinity	%			06/11/14 23:59	1

Lab Sample ID: 160-6936-1 DU

Matrix: Solid

Analysis Batch: 229837

Client Sample ID: ARM-MMC-S01-0614

Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	Limit
Total Volatile Solids	8.8	H	4.57	F3	%		64	20

TestAmerica St. Louis

QC Sample Results

Client: AMEC Environment & Infrastructure, Inc.
Project/Site: NORM Sampling

TestAmerica Job ID: 160-6936-2

Method: 9012B - Cyanide, Total and/or Amenable

Lab Sample ID: MB 160-126330/24-A
Matrix: Solid
Analysis Batch: 126590

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 126330

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cyanide, Total	ND		0.50	0.11	mg/Kg		06/11/14 12:25	06/12/14 14:26	1

Lab Sample ID: HLCS 160-126330/26-A
Matrix: Solid
Analysis Batch: 126590

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 126330

Analyte	Spike Added	HLCS Result	HLCS Qualifier	Unit	D	%Rec	%Rec. Limits
Cyanide, Total	4.80	4.53		mg/Kg		94	85 - 115

Lab Sample ID: LCS 160-126330/25-A
Matrix: Solid
Analysis Batch: 126590

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 126330

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Cyanide, Total	2.40	2.21		mg/Kg		92	85 - 115

Lab Sample ID: 160-6936-1 MS
Matrix: Solid
Analysis Batch: 126590

Client Sample ID: ARM-MMC-S01-0614
Prep Type: Total/NA
Prep Batch: 126330

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Cyanide, Total	0.99	J	21.3	7.45	F1	mg/Kg	☼	30	60 - 130

Lab Sample ID: 160-6936-1 DU
Matrix: Solid
Analysis Batch: 126590

Client Sample ID: ARM-MMC-S01-0614
Prep Type: Total/NA
Prep Batch: 126330

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Cyanide, Total	0.99	J	1.02	J	mg/Kg	☼	3	30

Method: 9034 - Sulfide, Reactive

Lab Sample ID: MB 160-127655/1-A
Matrix: Solid
Analysis Batch: 128829

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 127655

Analyte	MB Result	MB Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfide, Reactive	ND		22	22	mg/Kg		06/19/14 13:21	06/27/14 11:20	1

Lab Sample ID: LCS 160-127655/2-A
Matrix: Solid
Analysis Batch: 128829

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 127655

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Sulfide, Reactive	200	172		mg/Kg		86	71 - 150

TestAmerica St. Louis

QC Sample Results

Client: AMEC Environment & Infrastructure, Inc.
Project/Site: NORM Sampling

TestAmerica Job ID: 160-6936-2

Method: 9034 - Sulfide, Reactive (Continued)

Lab Sample ID: 160-6936-1 MS
Matrix: Solid
Analysis Batch: 128829

Client Sample ID: ARM-MMC-S01-0614
Prep Type: Total/NA
Prep Batch: 127655

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Sulfide, Reactive	ND		200	182		mg/Kg		91	50 - 150

Lab Sample ID: 160-6936-1 DU
Matrix: Solid
Analysis Batch: 128829

Client Sample ID: ARM-MMC-S01-0614
Prep Type: Total/NA
Prep Batch: 127655

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Sulfide, Reactive	ND		ND		mg/Kg		NC	20

Method: 9045D - pH

Lab Sample ID: LCS 160-127052/5
Matrix: Solid
Analysis Batch: 127052

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
pH	7.00	7.030		SU		100	99.0 - 101.0

Method: 9095B - Paint Filter

Lab Sample ID: 160-6936-1 DU
Matrix: Solid
Analysis Batch: 128774

Client Sample ID: ARM-MMC-S01-0614
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Free Liquid	FAIL		FAIL		NONE		NC	

Method: SM 2540B - Solids, Total

Lab Sample ID: MB 280-229795/1
Matrix: Solid
Analysis Batch: 229795

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

Analyte	MB Result	MB Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Total Solids	Infinity		Infinity	Infinity	%			06/11/14 18:30	1

Lab Sample ID: 160-6936-1 DU
Matrix: Solid
Analysis Batch: 229795

Client Sample ID: ARM-MMC-S01-0614
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Total Solids	22	H B	23.1		%		6	10

TestAmerica St. Louis

QC Sample Results

Client: AMEC Environment & Infrastructure, Inc.
Project/Site: NORM Sampling

TestAmerica Job ID: 160-6936-2

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

Lab Sample ID: MB 160-126246/1-A

Matrix: Solid

Analysis Batch: 128799

Client Sample ID: Method Blank

Prep Type: Total/NA

Prep Batch: 126246

Analyte	MB	MB	Count	Total	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
	Result	Qualifier	Uncert.	Uncert.						
Actinium-227	0.05888	U	0.170	0.170		0.312	pCi/g	06/06/14 14:38	06/27/14 12:45	1
Actinium-228	0.04450	U	0.110	0.110		0.121	pCi/g	06/06/14 14:38	06/27/14 12:45	1
Bismuth-212	-0.008259	U	0.447	0.447		0.877	pCi/g	06/06/14 14:38	06/27/14 12:45	1
Bismuth-214	-0.03767	U	0.221	0.222		0.186	pCi/g	06/06/14 14:38	06/27/14 12:45	1
Lead-210	0.8404	U	1.19	1.19		2.16	pCi/g	06/06/14 14:38	06/27/14 12:45	1
Lead-212	-0.05029	U	1.44	1.44		0.119	pCi/g	06/06/14 14:38	06/27/14 12:45	1
Lead-214	-0.08972	U	1.13	1.13		0.170	pCi/g	06/06/14 14:38	06/27/14 12:45	1
Potassium-40	-0.08421	U	1.27	1.27		1.19	pCi/g	06/06/14 14:38	06/27/14 12:45	1
Protactinium-231	0.3389	U	0.796	0.797		1.40	pCi/g	06/06/14 14:38	06/27/14 12:45	1
Radium-226	-0.03767	U	0.221	0.222	1.00	0.186	pCi/g	06/06/14 14:38	06/27/14 12:45	1
Radium-228	0.04450	U	0.110	0.110		0.121	pCi/g	06/06/14 14:38	06/27/14 12:45	1
Thallium-208	-0.01608	U	0.102	0.102		0.0837	pCi/g	06/06/14 14:38	06/27/14 12:45	1
Thorium-232	0.04450	U	0.110	0.110		0.121	pCi/g	06/06/14 14:38	06/27/14 12:45	1
Thorium-234	-0.05045	U	0.754	0.754		1.50	pCi/g	06/06/14 14:38	06/27/14 12:45	1
Uranium-235	0.06573	U	0.138	0.138		0.329	pCi/g	06/06/14 14:38	06/27/14 12:45	1
Uranium-238	-0.05045	U	0.754	0.754		1.50	pCi/g	06/06/14 14:38	06/27/14 12:45	1

Lab Sample ID: LCS 160-126246/2-A

Matrix: Solid

Analysis Batch: 128798

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Prep Batch: 126246

Analyte	Spike Added	LCS Result	LCS Qual	Total	RL	MDC	Unit	%Rec	%Rec. Limits
				Uncert. (2σ+/-)					
Americium-241	97.4	95.65		10.0		1.09	pCi/g	98	87 - 116
Cesium-137	31.0	29.59		3.14		0.237	pCi/g	95	87 - 120
Cobalt-60	22.1	21.30		2.18		0.134	pCi/g	96	87 - 115

Lab Sample ID: 160-6936-1 DU

Matrix: Solid

Analysis Batch: 128796

Client Sample ID: ARM-MMC-S01-0614

Prep Type: Total/NA

Prep Batch: 126246

Analyte	Sample Result	Sample Qual	DU Result	DU Qual	Total	RL	MDC	Unit	RER	RER Limit
					Uncert. (2σ+/-)					
Actinium-227	0.576	U	1.816	U	3.82		10.9	pCi/g	0.25	1
Actinium-228	91.7		86.36		9.21		2.90	pCi/g	0.27	1
Bismuth-212	45.6		47.92		11.9		10.5	pCi/g	0.10	1
Bismuth-214	314		306.7		32.1		1.71	pCi/g	0.11	1
Lead-210	18.9	U	9.434	U	14.0		18.9	pCi/g	0.28	1
Lead-212	41.6		40.66		5.38		1.25	pCi/g	0.08	1
Lead-214	322		331.1		34.5		2.05	pCi/g	0.13	1
Potassium-40	21.3		26.44		7.71		7.19	pCi/g	0.27	1
Protactinium-231	-25.8	U	-16.61	U	15.3		24.9	pCi/g	0.24	1
Radium-226	314		306.7		32.1	1.00	1.71	pCi/g	0.11	1
Radium-228	91.7		86.36		9.21		2.90	pCi/g	0.27	1
Thallium-208	14.3		13.26		1.77		0.999	pCi/g	0.27	1
Thorium-232	91.7		86.36		9.21		2.90	pCi/g	0.27	1
Thorium-234	-6.31	U	0.7479	U	6.09		18.0	pCi/g	0.21	1

TestAmerica St. Louis

QC Sample Results

Client: AMEC Environment & Infrastructure, Inc.
 Project/Site: NORM Sampling

TestAmerica Job ID: 160-6936-2

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

Lab Sample ID: 160-6936-1 DU

Matrix: Solid

Analysis Batch: 128796

Client Sample ID: ARM-MMC-S01-0614

Prep Type: Total/NA

Prep Batch: 126246

Analyte	Sample Result	Sample Qual	DU		Total Uncert. (2σ+/-)	RL	MDC	Unit	RER	RER Limit
			Result	Qual						
Uranium-235	1.56	U	0.4618	U	1.94		3.22	pCi/g	0.19	1
Uranium-238	-6.31	U	0.7479	U	6.09		18.0	pCi/g	0.21	1



QC Association Summary

Client: AMEC Environment & Infrastructure, Inc.
Project/Site: NORM Sampling

TestAmerica Job ID: 160-6936-2

GC/MS VOA

Leach Batch: 125876

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-6936-1	ARM-MMC-S01-0614	TCLP	Solid	1311	
160-6936-1 MS	ARM-MMC-S01-0614	TCLP	Solid	1311	
160-6936-1 MSD	ARM-MMC-S01-0614	TCLP	Solid	1311	
160-6936-2	ARM-MMC-S02-0614	TCLP	Solid	1311	
160-6936-3	ARM-MMC-S03-0614	TCLP	Solid	1311	
LB 160-125876/1-A	Method Blank	TCLP	Solid	1311	

Analysis Batch: 126263

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-6936-1	ARM-MMC-S01-0614	TCLP	Solid	8260C	125876
160-6936-1 MS	ARM-MMC-S01-0614	TCLP	Solid	8260C	125876
160-6936-1 MSD	ARM-MMC-S01-0614	TCLP	Solid	8260C	125876
160-6936-2	ARM-MMC-S02-0614	TCLP	Solid	8260C	125876
160-6936-3	ARM-MMC-S03-0614	TCLP	Solid	8260C	125876
LB 160-125876/1-A	Method Blank	TCLP	Solid	8260C	125876
LCS 160-126263/4-A	Lab Control Sample	Total/NA	Solid	8260C	

GC/MS Semi VOA

Leach Batch: 126314

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-6936-1	ARM-MMC-S01-0614	TCLP	Solid	1311	
160-6936-1 MS	ARM-MMC-S01-0614	TCLP	Solid	1311	
160-6936-1 MSD	ARM-MMC-S01-0614	TCLP	Solid	1311	
160-6936-2	ARM-MMC-S02-0614	TCLP	Solid	1311	
160-6936-3	ARM-MMC-S03-0614	TCLP	Solid	1311	
LB 160-126314/1-C	Method Blank	TCLP	Solid	1311	

Prep Batch: 126771

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-6936-1	ARM-MMC-S01-0614	TCLP	Solid	3510C	126314
160-6936-1 MS	ARM-MMC-S01-0614	TCLP	Solid	3510C	126314
160-6936-1 MSD	ARM-MMC-S01-0614	TCLP	Solid	3510C	126314
160-6936-2	ARM-MMC-S02-0614	TCLP	Solid	3510C	126314
160-6936-3	ARM-MMC-S03-0614	TCLP	Solid	3510C	126314
LB 160-126314/1-C	Method Blank	TCLP	Solid	3510C	126314
LCS 160-126771/2-A	Lab Control Sample	Total/NA	Solid	3510C	

Analysis Batch: 126999

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-6936-1	ARM-MMC-S01-0614	TCLP	Solid	8270D	126771
160-6936-1 MS	ARM-MMC-S01-0614	TCLP	Solid	8270D	126771
160-6936-1 MSD	ARM-MMC-S01-0614	TCLP	Solid	8270D	126771
160-6936-2	ARM-MMC-S02-0614	TCLP	Solid	8270D	126771
160-6936-3	ARM-MMC-S03-0614	TCLP	Solid	8270D	126771
LB 160-126314/1-C	Method Blank	TCLP	Solid	8270D	126771
LCS 160-126771/2-A	Lab Control Sample	Total/NA	Solid	8270D	126771

TestAmerica St. Louis

QC Association Summary

Client: AMEC Environment & Infrastructure, Inc.
Project/Site: NORM Sampling

TestAmerica Job ID: 160-6936-2

Metals

Leach Batch: 126314

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-6936-1	ARM-MMC-S01-0614	TCLP	Solid	1311	
160-6936-1 MS	ARM-MMC-S01-0614	TCLP	Solid	1311	
160-6936-1 MSD	ARM-MMC-S01-0614	TCLP	Solid	1311	
160-6936-2	ARM-MMC-S02-0614	TCLP	Solid	1311	
160-6936-3	ARM-MMC-S03-0614	TCLP	Solid	1311	
LB 160-126314/1-B	Method Blank	TCLP	Solid	1311	
LB 160-126314/1-D	Method Blank	TCLP	Solid	1311	

Prep Batch: 126581

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-6936-1	ARM-MMC-S01-0614	TCLP	Solid	3010A	126314
160-6936-1 MS	ARM-MMC-S01-0614	TCLP	Solid	3010A	126314
160-6936-1 MSD	ARM-MMC-S01-0614	TCLP	Solid	3010A	126314
160-6936-2	ARM-MMC-S02-0614	TCLP	Solid	3010A	126314
160-6936-3	ARM-MMC-S03-0614	TCLP	Solid	3010A	126314
LB 160-126314/1-B	Method Blank	TCLP	Solid	3010A	126314
LCS 160-126581/2-A	Lab Control Sample	Total/NA	Solid	3010A	

Analysis Batch: 126798

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-6936-1	ARM-MMC-S01-0614	TCLP	Solid	6010C	126581
160-6936-1 MS	ARM-MMC-S01-0614	TCLP	Solid	6010C	126581
160-6936-1 MSD	ARM-MMC-S01-0614	TCLP	Solid	6010C	126581
160-6936-2	ARM-MMC-S02-0614	TCLP	Solid	6010C	126581
160-6936-2	ARM-MMC-S02-0614	TCLP	Solid	6010C	126581
160-6936-3	ARM-MMC-S03-0614	TCLP	Solid	6010C	126581
LB 160-126314/1-B	Method Blank	TCLP	Solid	6010C	126581
LCS 160-126581/2-A	Lab Control Sample	Total/NA	Solid	6010C	126581

Prep Batch: 126990

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-6936-1	ARM-MMC-S01-0614	TCLP	Solid	7470A	126314
160-6936-1 MS	ARM-MMC-S01-0614	TCLP	Solid	7470A	126314
160-6936-1 MSD	ARM-MMC-S01-0614	TCLP	Solid	7470A	126314
160-6936-2	ARM-MMC-S02-0614	TCLP	Solid	7470A	126314
160-6936-3	ARM-MMC-S03-0614	TCLP	Solid	7470A	126314
LB 160-126314/1-D	Method Blank	TCLP	Solid	7470A	126314
LCS 160-126990/2-A	Lab Control Sample	Total/NA	Solid	7470A	

Analysis Batch: 127048

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-6936-1	ARM-MMC-S01-0614	TCLP	Solid	7470A	126990
160-6936-1 MS	ARM-MMC-S01-0614	TCLP	Solid	7470A	126990
160-6936-1 MSD	ARM-MMC-S01-0614	TCLP	Solid	7470A	126990
160-6936-2	ARM-MMC-S02-0614	TCLP	Solid	7470A	126990
160-6936-3	ARM-MMC-S03-0614	TCLP	Solid	7470A	126990
LB 160-126314/1-D	Method Blank	TCLP	Solid	7470A	126990
LCS 160-126990/2-A	Lab Control Sample	Total/NA	Solid	7470A	126990

TestAmerica St. Louis

QC Association Summary

Client: AMEC Environment & Infrastructure, Inc.
Project/Site: NORM Sampling

TestAmerica Job ID: 160-6936-2

General Chemistry

Analysis Batch: 125749

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-6936-1	ARM-MMC-S01-0614	Total/NA	Solid	Moisture	
160-6936-2	ARM-MMC-S02-0614	Total/NA	Solid	Moisture	
160-6936-3	ARM-MMC-S03-0614	Total/NA	Solid	Moisture	

Prep Batch: 126330

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-6936-1	ARM-MMC-S01-0614	Total/NA	Solid	9010C	
160-6936-1 DU	ARM-MMC-S01-0614	Total/NA	Solid	9010C	
160-6936-1 MS	ARM-MMC-S01-0614	Total/NA	Solid	9010C	
160-6936-2	ARM-MMC-S02-0614	Total/NA	Solid	9010C	
160-6936-3	ARM-MMC-S03-0614	Total/NA	Solid	9010C	
HLCS 160-126330/26-A	Lab Control Sample	Total/NA	Solid	9010C	
LCS 160-126330/25-A	Lab Control Sample	Total/NA	Solid	9010C	
MB 160-126330/24-A	Method Blank	Total/NA	Solid	9010C	

Analysis Batch: 126533

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-6936-1	ARM-MMC-S01-0614	Total/NA	Solid	1010A	
160-6936-2	ARM-MMC-S02-0614	Total/NA	Solid	1010A	
160-6936-3	ARM-MMC-S03-0614	Total/NA	Solid	1010A	
LCS 160-126533/2	Lab Control Sample	Total/NA	Solid	1010A	
MB 160-126533/1	Method Blank	Total/NA	Solid	1010A	

Analysis Batch: 126590

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-6936-1	ARM-MMC-S01-0614	Total/NA	Solid	9012B	126330
160-6936-1 DU	ARM-MMC-S01-0614	Total/NA	Solid	9012B	126330
160-6936-1 MS	ARM-MMC-S01-0614	Total/NA	Solid	9012B	126330
160-6936-2	ARM-MMC-S02-0614	Total/NA	Solid	9012B	126330
160-6936-3	ARM-MMC-S03-0614	Total/NA	Solid	9012B	126330
HLCS 160-126330/26-A	Lab Control Sample	Total/NA	Solid	9012B	126330
LCS 160-126330/25-A	Lab Control Sample	Total/NA	Solid	9012B	126330
MB 160-126330/24-A	Method Blank	Total/NA	Solid	9012B	126330

Prep Batch: 126973

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-6936-1	ARM-MMC-S01-0614	Total/NA	Solid	DILeach_Prep	
160-6936-2	ARM-MMC-S02-0614	Total/NA	Solid	DILeach_Prep	
160-6936-3	ARM-MMC-S03-0614	Total/NA	Solid	DILeach_Prep	

Analysis Batch: 127052

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-6936-1	ARM-MMC-S01-0614	Total/NA	Solid	9045D	126973
160-6936-2	ARM-MMC-S02-0614	Total/NA	Solid	9045D	126973
160-6936-3	ARM-MMC-S03-0614	Total/NA	Solid	9045D	126973
LCS 160-127052/5	Lab Control Sample	Total/NA	Solid	9045D	

Prep Batch: 127655

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-6936-1	ARM-MMC-S01-0614	Total/NA	Solid	7.3.4	
160-6936-1 DU	ARM-MMC-S01-0614	Total/NA	Solid	7.3.4	

TestAmerica St. Louis

QC Association Summary

Client: AMEC Environment & Infrastructure, Inc.
Project/Site: NORM Sampling

TestAmerica Job ID: 160-6936-2

General Chemistry (Continued)

Prep Batch: 127655 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-6936-1 MS	ARM-MMC-S01-0614	Total/NA	Solid	7.3.4	
160-6936-2	ARM-MMC-S02-0614	Total/NA	Solid	7.3.4	
160-6936-3	ARM-MMC-S03-0614	Total/NA	Solid	7.3.4	
LCS 160-127655/2-A	Lab Control Sample	Total/NA	Solid	7.3.4	
MB 160-127655/1-A	Method Blank	Total/NA	Solid	7.3.4	

Analysis Batch: 128774

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-6936-1	ARM-MMC-S01-0614	Total/NA	Solid	9095B	
160-6936-1 DU	ARM-MMC-S01-0614	Total/NA	Solid	9095B	
160-6936-2	ARM-MMC-S02-0614	Total/NA	Solid	9095B	
160-6936-3	ARM-MMC-S03-0614	Total/NA	Solid	9095B	

Analysis Batch: 128829

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-6936-1	ARM-MMC-S01-0614	Total/NA	Solid	9034	127655
160-6936-1 DU	ARM-MMC-S01-0614	Total/NA	Solid	9034	127655
160-6936-1 MS	ARM-MMC-S01-0614	Total/NA	Solid	9034	127655
160-6936-2	ARM-MMC-S02-0614	Total/NA	Solid	9034	127655
160-6936-3	ARM-MMC-S03-0614	Total/NA	Solid	9034	127655
LCS 160-127655/2-A	Lab Control Sample	Total/NA	Solid	9034	127655
MB 160-127655/1-A	Method Blank	Total/NA	Solid	9034	127655

Prep Batch: 129025

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-6936-1	ARM-MMC-S01-0614	Total/NA	Solid	1664A	
160-6936-1 DU	ARM-MMC-S01-0614	Total/NA	Solid	1664A	
160-6936-1 MS	ARM-MMC-S01-0614	Total/NA	Solid	1664A	
160-6936-2	ARM-MMC-S02-0614	Total/NA	Solid	1664A	
160-6936-3	ARM-MMC-S03-0614	Total/NA	Solid	1664A	
LCS 160-129025/2-A	Lab Control Sample	Total/NA	Solid	1664A	
MB 160-129025/1-A	Method Blank	Total/NA	Solid	1664A	

Analysis Batch: 129030

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-6936-1	ARM-MMC-S01-0614	Total/NA	Solid	1664A	129025
160-6936-1 DU	ARM-MMC-S01-0614	Total/NA	Solid	1664A	129025
160-6936-1 MS	ARM-MMC-S01-0614	Total/NA	Solid	1664A	129025
160-6936-2	ARM-MMC-S02-0614	Total/NA	Solid	1664A	129025
160-6936-3	ARM-MMC-S03-0614	Total/NA	Solid	1664A	129025
LCS 160-129025/2-A	Lab Control Sample	Total/NA	Solid	1664A	129025
MB 160-129025/1-A	Method Blank	Total/NA	Solid	1664A	129025

Analysis Batch: 229795

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-6936-1	ARM-MMC-S01-0614	Total/NA	Solid	SM 2540B	
160-6936-1 DU	ARM-MMC-S01-0614	Total/NA	Solid	SM 2540B	
160-6936-2	ARM-MMC-S02-0614	Total/NA	Solid	SM 2540B	
160-6936-3	ARM-MMC-S03-0614	Total/NA	Solid	SM 2540B	
MB 280-229795/1	Method Blank	Total/NA	Solid	SM 2540B	

TestAmerica St. Louis

QC Association Summary

Client: AMEC Environment & Infrastructure, Inc.
 Project/Site: NORM Sampling

TestAmerica Job ID: 160-6936-2

General Chemistry (Continued)

Analysis Batch: 229837

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-6936-1	ARM-MMC-S01-0614	Total/NA	Solid	2540G	
160-6936-1 DU	ARM-MMC-S01-0614	Total/NA	Solid	2540G	
160-6936-2	ARM-MMC-S02-0614	Total/NA	Solid	2540G	
160-6936-3	ARM-MMC-S03-0614	Total/NA	Solid	2540G	
MB 280-229837/1	Method Blank	Total/NA	Solid	2540G	

Rad

Leach Batch: 125340

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-6936-1	ARM-MMC-S01-0614	Total/NA	Solid	Dry and Grind	
160-6936-1 DU	ARM-MMC-S01-0614	Total/NA	Solid	Dry and Grind	
160-6936-2	ARM-MMC-S02-0614	Total/NA	Solid	Dry and Grind	
160-6936-3	ARM-MMC-S03-0614	Total/NA	Solid	Dry and Grind	

Prep Batch: 126246

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-6936-1	ARM-MMC-S01-0614	Total/NA	Solid	Fill_Geo-21	125340
160-6936-1 DU	ARM-MMC-S01-0614	Total/NA	Solid	Fill_Geo-21	125340
160-6936-2	ARM-MMC-S02-0614	Total/NA	Solid	Fill_Geo-21	125340
160-6936-3	ARM-MMC-S03-0614	Total/NA	Solid	Fill_Geo-21	125340
LCS 160-126246/2-A	Lab Control Sample	Total/NA	Solid	Fill_Geo-21	
MB 160-126246/1-A	Method Blank	Total/NA	Solid	Fill_Geo-21	

Surrogate Summary

Client: AMEC Environment & Infrastructure, Inc.
Project/Site: NORM Sampling

TestAmerica Job ID: 160-6936-2

Method: 8260C - Volatile Organic Compounds by GC/MS

Matrix: Solid

Prep Type: Total/NA

Lab Sample ID	Client Sample ID	Percent Surrogate Recovery (Acceptance Limits)			
		BFB (84-120)	12DCE (83-117)	TOL (85-115)	DBFM (85-115)
LCS 160-126263/4-A	Lab Control Sample	98	92	101	95
Surrogate Legend					
BFB = 4-Bromofluorobenzene (Surr)					
12DCE = 1,2-Dichloroethane-d4 (Surr)					
TOL = Toluene-d8 (Surr)					
DBFM = Dibromofluoromethane (Surr)					

Method: 8260C - Volatile Organic Compounds by GC/MS

Matrix: Solid

Prep Type: TCLP

Lab Sample ID	Client Sample ID	Percent Surrogate Recovery (Acceptance Limits)			
		BFB (84-120)	12DCE (83-117)	TOL (85-115)	DBFM (85-115)
160-6936-1	ARM-MMC-S01-0614	100	91	99	93
160-6936-1 MS	ARM-MMC-S01-0614	99	94	102	97
160-6936-1 MSD	ARM-MMC-S01-0614	99	91	102	97
160-6936-2	ARM-MMC-S02-0614	105	97	103	99
160-6936-3	ARM-MMC-S03-0614	103	96	101	97
LB 160-125876/1-A	Method Blank	102	92	99	95
Surrogate Legend					
BFB = 4-Bromofluorobenzene (Surr)					
12DCE = 1,2-Dichloroethane-d4 (Surr)					
TOL = Toluene-d8 (Surr)					
DBFM = Dibromofluoromethane (Surr)					

Method: 8270D - Semivolatile Organic Compounds (GC/MS)

Matrix: Solid

Prep Type: Total/NA

Lab Sample ID	Client Sample ID	Percent Surrogate Recovery (Acceptance Limits)					
		TBP (49-100)	NBZ (51-98)	PHL (37-95)	TPH (60-113)	FBP (45-94)	2FP (46-92)
LCS 160-126771/2-A	Lab Control Sample	97	77	71	82	77	73
Surrogate Legend							
TBP = 2,4,6-Tribromophenol (Surr)							
NBZ = Nitrobenzene-d5 (Surr)							
PHL = Phenol-d5 (Surr)							
TPH = Terphenyl-d14 (Surr)							
FBP = 2-Fluorobiphenyl (Surr)							
2FP = 2-Fluorophenol (Surr)							

Method: 8270D - Semivolatile Organic Compounds (GC/MS)

Matrix: Solid

Prep Type: TCLP

Lab Sample ID	Client Sample ID	Percent Surrogate Recovery (Acceptance Limits)					
		TBP (49-100)	NBZ (51-98)	PHL (37-95)	TPH (60-113)	FBP (45-94)	2FP (46-92)
160-6936-1	ARM-MMC-S01-0614	95	79	67	78	76	71

TestAmerica St. Louis

Surrogate Summary

Client: AMEC Environment & Infrastructure, Inc.
Project/Site: NORM Sampling

TestAmerica Job ID: 160-6936-2

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Matrix: Solid

Prep Type: TCLP

Lab Sample ID	Client Sample ID	Percent Surrogate Recovery (Acceptance Limits)					
		TBP (49-100)	NBZ (51-98)	PHL (37-95)	TPH (60-113)	FBP (45-94)	2FP (46-92)
160-6936-1 MS	ARM-MMC-S01-0614	95	84	77	81	78	78
160-6936-1 MSD	ARM-MMC-S01-0614	102 X	81	75	83	79	77
160-6936-2	ARM-MMC-S02-0614	99	81	71	82	79	73
160-6936-3	ARM-MMC-S03-0614	99	86	76	82	82	79
LB 160-126314/1-C	Method Blank	100	87	72	86	83	77

Surrogate Legend

TBP = 2,4,6-Tribromophenol (Surr)

NBZ = Nitrobenzene-d5 (Surr)

PHL = Phenol-d5 (Surr)

TPH = Terphenyl-d14 (Surr)

FBP = 2-Fluorobiphenyl (Surr)

2FP = 2-Fluorophenol (Surr)