SAF-RC-107
100-H Remaining Sites Burial Grounds – Soil Full Protocol
FINAL VALIDATION PACKAGE

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Kathy Wendt H4-21

COMMENTS:

SDG JP0887 SAF-RC-107

Waste Site: 100-H-59:1

.Date: 26 January 2015
To: Washington Closure Hanford Inc. (technical representative)
From: ELR Consulting
Project: 100-H Remaining Sites Burial Grounds – Soil Full Protocol - Waste Site 100-H-59:1
Subject: Inorganic - Data Package No. JP0887-TAL

INTRODUCTION

This memo presents the results of data validation on Data Package No. JP0887 prepared by TestAmerica Laboratories (TAL). A list of samples validated along with the analyses reported and the method of analysis is provided in the following table.

Sample ID	Sample Date	Media	Validation	Analyte
J1V2P7	1/5/15	Soil	C	See note 1
J1V2P8	1/5/15	Soil	C	See note 1
J1V2P9	1/5/15	Soil	C	See note 1
J1V2R0	1/5/15	Soil	C	See note 1
J1V2R1	1/5/15	Soil	C	See note 1
J1V2R2	1/5/15	Soil	C	See note 1
J1V2R3	1/5/15	Soil	C	See note 1
J1V2R4	1/5/15	Soil	C	See note 1
J1V2R5	1/5/15	Soil	C	See note 1
J1V2R6	1/5/15	Soil	C	See note 1
J1V2R7	1/5/15	Soil	C	See note 1
J1V2R8	1/5/15	Soil	C	See note 1
J1V2R9	1/5/15	Soil	C	See note 1

1 - ICP metals (6010B) and mercury (7471A).

Data validation was conducted in accordance with the Washington Closure Hanford (WCH) validation statement of work and the 100 Area Remedial Action Sampling and Analysis Plan (DOE/RL-96-22, September 2009). Appendices 1 through 6 provide the following information as indicated below:

Appendix 1. Glossary of Data Reporting Qualifiers
Appendix 2. Summary of Data Qualification
Appendix 3. Annotated Laboratory Reports
Appendix 4. Laboratory Narrative and Chain-of-Custody Documentation
Appendix 5. Data Validation Supporting Documentation
Appendix 6. Additional Documentation Requested by Client

DATA QUALITY PARAMETERS

- **Holding Times**

Analytical holding times for metals are assessed to ascertain whether the holding time requirements were met by the laboratory. The holding time requirements are as follows: Soil samples must be analyzed within 28 days for mercury and 6 months for ICP metals.

All holding times were acceptable.

- **Preparation (Method) Blanks**

Preparation Blanks

At least one preparation blank, consisting of deionized distilled water processed through each sample preparation and analysis procedure, must be prepared and analyzed with every sample delivery group. In the case of positive blank results, samples with digestate concentrations less than five times the preparation blank value have had their associated values qualified as non-detected and flagged "UJ". Samples with concentrations of greater than five times the highest blank concentration do not require qualification.

In the case of negative blank results, if the absolute value exceeds the contract required detection limit (CRDL), all nondetects are rejected and flagged "UR" and all detects that are less than ten times the absolute value of the associated preparation blank result are qualified as estimates and flagged "J". If the absolute value of the negative preparation blank is greater than the instrument detection limit (IDL) and less than or equal to the CRDL, all nondetects are qualified as estimates and flagged "UJ" and all detects less than ten times the absolute value of the blank are qualified as estimates and flagged "J". If the sample results are greater than ten times the absolute value of the preparation blank, no qualification is necessary.

All preparation blank results were acceptable.

Field (Equipment) Blank

No field blanks were submitted for analysis.

- **Accuracy**

Matrix Spike and Laboratory Control Sample

Matrix spike (MS) and laboratory control sample (LCS) analyses are used to assess the analytical accuracy of the reported data. The matrix spike is used to assess the effect of the matrix on the ability to accurately quantify sample concentrations. Recoveries must fall within the range of 70% to 130%. Samples with a recovery of less than 30%

and a sample result below the IDL are rejected and flagged "UR". Samples with a recovery of 30% to 69% and a sample result less than the IDL are qualified "UJ". Samples with a recovery of greater than 130% or less than 70% and a sample result greater than the IDL are qualified as estimates and flagged "J". Finally, for samples with a recovery greater than 130% and a sample result less than the IDL, no qualification is required.

Due to matrix spike recoveries outside QC limits, all antimony (53%) and silicon (11%) results were qualified as estimates and flagged "J".

Due to an LCS recovery outside QC limits (9%), all silicon results were qualified as estimates and flagged "J".

All other accuracy results were acceptable

- **Precision**

Laboratory Duplicate Samples

Analytical precision is expressed by the relative percent differences (RPD) between the recoveries of matrix spike duplicate (MSD) analyses performed on a sample in the analytical batch. Precision may alternatively be assessed using unspiked duplicate analyses performed on a sample in the analytical batch. If both sample and replicate activities (concentrations) are greater than five times the CRDL and the RPD is less than 30%, no qualification is required. If either activity (concentration) is less than five times the CRDL, the RPD control limit is less than or equal to two times the CRDL. If the RPD is outside the applicable control limit, associated results are qualified as estimated detects or estimated non-detects.

All laboratory duplicate results were acceptable.

Field Duplicate

One set of field duplicates (J1V2R6/J1V2R9) was submitted for analysis. Field duplicates are compared using the same criteria as for laboratory duplicates. All field duplicate results were acceptable.

- **Analytical Detection Levels**

Reported analytical detection levels are compared against the 100 Area RQLs to ensure that laboratory detection levels meet the required criteria. All results met the RQL.

- **Completeness**

Data package No. JP0887 was submitted for validation and verified for completeness. Completeness is based on the percentage of data determined to be valid (i.e., not rejected). The completion percentage was 100%.

MAJOR DEFICIENCIES

None found.

MINOR DEFICIENCIES

The following minor deficiencies were noted:

- Due to matrix spike recoveries outside QC limits, all antimony (53%) and silicon (11%) results were qualified as estimates and flagged "J".

- Due to an LCS recovery outside QC limits (9%), all silicon results were qualified as estimates and flagged "J".

Data flagged "J" indicates that the associated concentration is an estimate, but under the WCH statement of work, the data may be usable for decision-making purposes. All other validated results are considered accurate within the standard error associated with the methods.

REFERENCES

Washington Closure Hanford Contract #S00W307A00 (March 2008), *Data Validation Services*, March 2008.

DOE/RL-96-22, Rev. 5, *100 Area Remedial Action Sampling and Analysis Plan*, U.S. Department of Energy, September 2009.

Appendix 1

Glossary of Data Reporting Qualifiers

Qualifiers which may be applied by data validators in compliance with WCH validation SOW are as follows:

U - Indicates the compound or analyte was analyzed for and not detected in the sample. The value reported is the sample quantitation limit corrected for sample dilution and moisture content by the laboratory.

UJ - Indicates the compound or analyte was analyzed for and not detected in the sample. Due to a minor QC deficiency identified during the data validation, the associated quantitation limit is an estimate.

J - Indicates the compound or analyte was analyzed for and detected. Due to a minor QC deficiency identified during the data validation, the associated concentration is an estimate, but the data are usable for decision-making purposes.

BJ - Applied to inorganic analyses only. Indicates the analyte concentration was greater than the IDL but less than the CRDL and is considered an estimated value.

R - Indicates the compound or analyte was analyzed for, detected, and due to an identified major QC deficiency, the data are unusable.

UR - Indicates the compound or analyte was analyzed for and not detected in the sample. Additionally, the data is unusable due to an identified major QC deficiency.

NJ - Indicates presumptive evidence of a compound at an estimated value. The data may not be valid for some specific applications (i.e., usable for decision-making purposes).

N - Indicates presumptive evidence of a compound. The data may not be valid for some specific applications (i.e., usable for decision-making purposes).

Appendix 2

Summary of Data Qualification

INORGANIC DATA QUALIFICATION SUMMARY*

SDG: JP0887	**REVIEWER: ELR**	**Project: 100-H-59:1**	**PAGE_1_OF_1**
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
Antimony Silicon	J	All	MS recovery
Silicon	J	All	LCS recovery

* - The Qualified Data Summary Table includes laboratory applied "U" qualifiers not specifically identified here. The laboratory applied "U" qualifiers are included to minimize misinterpretation of results contained in the table.

Appendix 3

Annotated Laboratory Reports

Client: Washington Closure Hanford

Job Number: 280-64146-1
Sdg Number: JP0887

Client Sample ID: **J1V2P7**

Lab Sample ID: 280-64146-1
Client Matrix: Solid
% Moisture: 6.7

1/23/15

Date Sampled: 01/05/2015 1044
Date Received: 01/07/2015 1130

6010B Metals (ICP)

Analysis Method:	6010B	Analysis Batch:	280-259634	Instrument ID:	MT_026
Prep Method:	3050B	Prep Batch:	280-259404	Lab File ID:	26a010815d.asc
Dilution:	1.0			Initial Weight/Volume:	1.15 g
Analysis Date:	01/08/2015 1915			Final Weight/Volume:	100 mL
Prep Date:	01/08/2015 0830				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Aluminum		8230		1.4	4.7
Antimony		0.35	U J	0.35	0.56
Silicon		315	N J	5.3	9.3

Analysis Method:	6010B	Analysis Batch:	280-259811	Instrument ID:	MT_026
Prep Method:	3050B	Prep Batch:	280-259404	Lab File ID:	26a010915.asc
Dilution:	1.0			Initial Weight/Volume:	1.15 g
Analysis Date:	01/09/2015 1401			Final Weight/Volume:	100 mL
Prep Date:	01/08/2015 0830				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Arsenic		4.0		0.62	0.93
Barium		69.7		0.071	0.47
Beryllium		0.031	U	0.031	0.19
Boron		1.5	B	0.91	1.9
Cadmium		0.15	B	0.038	0.19
Calcium		4700		13.1	46.6
Chromium		10.4		0.054	0.19
Cobalt		6.6	X	0.093	0.93
Copper		13.9	X	0.20	0.93
Iron		19500		3.5	4.7
Lead		7.2		0.25	0.47
Magnesium		4340		3.4	18.6
Manganese		307		0.093	0.93
Molybdenum		0.24	U	0.24	1.9
Nickel		10.5	X	0.11	3.7
Potassium		1450		38.2	280
Selenium		0.80	U	0.80	0.93
Silver		0.15	U	0.15	0.19
Sodium		206		55.0	112
Vanadium		47.1		0.088	1.9
Zinc		40.5		0.37	0.93

7471A Mercury (CVAA)

Analysis Method:	7471A	Analysis Batch:	280-259819	Instrument ID:	MT_033
Prep Method:	7471A	Prep Batch:	280-259403	Lab File ID:	150109aa.txt
Dilution:	1.0			Initial Weight/Volume:	0.63 g
Analysis Date:	01/09/2015 1316			Final Weight/Volume:	50 mL
Prep Date:	01/09/2015 1015				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Mercury		0.0062	B	0.0056	0.017

Client: Washington Closure Hanford

Job Number: 280-64146-1
Sdg Number: JP0887

Client Sample ID: **J1V2P8**

Lab Sample ID: 280-64146-2
Client Matrix: Solid

% Moisture: 6.3

1/25/15

Date Sampled: 01/05/2015 1040
Date Received: 01/07/2015 1130

6010B Metals (ICP)

Analysis Method:	6010B	Analysis Batch:	280-259634	Instrument ID:	MT_026
Prep Method:	3050B	Prep Batch:	280-259404	Lab File ID:	26a010815d.asc
Dilution:	1.0			Initial Weight/Volume:	1.05 g
Analysis Date:	01/08/2015 1925			Final Weight/Volume:	100 mL
Prep Date:	01/08/2015 0830				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Aluminum		8430		1.6	5.1
Antimony		0.39	U J	0.39	0.61
Silicon		301	N J	5.8	10.2

Analysis Method:	6010B	Analysis Batch:	280-259811	Instrument ID:	MT_026
Prep Method:	3050B	Prep Batch:	280-259404	Lab File ID:	26a010915.asc
Dilution:	1.0			Initial Weight/Volume:	1.05 g
Analysis Date:	01/09/2015 1411			Final Weight/Volume:	100 mL
Prep Date:	01/08/2015 0830				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Arsenic		4.8		0.67	1.0
Barium		69.2		0.077	0.51
Beryllium		0.034	U	0.034	0.20
Boron		1.5	B	1.0	2.0
Cadmium		0.16	B	0.042	0.20
Calcium		5170		14.3	50.8
Chromium		10.9		0.059	0.20
Cobalt		7.2	X	0.10	1.0
Copper		15.4	X	0.22	1.0
Iron		19800		3.9	5.1
Lead		9.9		0.27	0.51
Magnesium		4620		3.8	20.3
Manganese		309		0.10	1.0
Molybdenum		0.26	U	0.26	2.0
Nickel		11.3	X	0.13	4.1
Potassium		1310		41.7	305
Selenium		0.87	U	0.87	1.0
Silver		0.16	U	0.16	0.20
Sodium		218		60.0	122
Vanadium		46.9		0.096	2.0
Zinc		41.9		0.40	1.0

7471A Mercury (CVAA)

Analysis Method:	7471A	Analysis Batch:	280-259819	Instrument ID:	MT_033
Prep Method:	7471A	Prep Batch:	280-259403	Lab File ID:	150109aa.txt
Dilution:	1.0			Initial Weight/Volume:	0.68 g
Analysis Date:	01/09/2015 1319			Final Weight/Volume:	50 mL
Prep Date:	01/09/2015 1015				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Mercury		0.0052	U	0.0052	0.016

Client: Washington Closure Hanford

Job Number: 280-64146-1
Sdg Number: JP0887

Client Sample ID: J1V2P9

Lab Sample ID: 280-64146-3
Client Matrix: Solid

% Moisture: 8.4

1/23/15

Date Sampled: 01/05/2015 1051
Date Received: 01/07/2015 1130

6010B Metals (ICP)

Analysis Method:	6010B	Analysis Batch:	280-259634	Instrument ID:	MT_026
Prep Method:	3050B	Prep Batch:	280-259404	Lab File ID:	26a010815d.asc
Dilution:	1.0			Initial Weight/Volume:	1.10 g
Analysis Date:	01/08/2015 1928			Final Weight/Volume:	100 mL
Prep Date:	01/08/2015 0830				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Aluminum		9970		1.5	5.0
Antimony		0.38	U J	0.38	0.60
Silicon		395	N J	5.6	9.9

Analysis Method:	6010B	Analysis Batch:	280-259811	Instrument ID:	MT_026
Prep Method:	3050B	Prep Batch:	280-259404	Lab File ID:	26a010915.asc
Dilution:	1.0			Initial Weight/Volume:	1.10 g
Analysis Date:	01/09/2015 1414			Final Weight/Volume:	100 mL
Prep Date:	01/08/2015 0830				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Arsenic		5.1		0.66	0.99
Barium		83.3		0.075	0.50
Beryllium		0.033	U	0.033	0.20
Boron		1.4	B	0.97	2.0
Cadmium		0.17	B	0.041	0.20
Calcium		4380		14.0	49.6
Chromium		12.4		0.058	0.20
Cobalt		7.8	X	0.099	0.99
Copper		16.0	X	0.22	0.99
Iron		21400		3.8	5.0
Lead		8.6		0.27	0.50
Magnesium		4840		3.7	19.9
Manganese		350		0.099	0.99
Molybdenum		0.26	U	0.26	2.0
Nickel		12.5	X	0.12	4.0
Potassium		1590		40.7	298
Selenium		0.85	U	0.85	0.99
Silver		0.16	U	0.16	0.20
Sodium		209		58.6	119
Vanadium		48.5		0.093	2.0
Zinc		44.9		0.40	0.99

7471A Mercury (CVAA)

Analysis Method:	7471A	Analysis Batch:	280-259819	Instrument ID:	MT_033
Prep Method:	7471A	Prep Batch:	280-259403	Lab File ID:	150109aa.txt
Dilution:	1.0			Initial Weight/Volume:	0.60 g
Analysis Date:	01/09/2015 1321			Final Weight/Volume:	50 mL
Prep Date:	01/09/2015 1015				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Mercury		0.0078	B	0.0060	0.019

Client: Washington Closure Hanford

Job Number: 280-64146-1
Sdg Number: JP0887

Client Sample ID: **J1V2R0**

Lab Sample ID: 280-64146-4
Client Matrix: Solid
% Moisture: 6.7

Date Sampled: 01/05/2015 1028
Date Received: 01/07/2015 1130

6010B Metals (ICP)

Analysis Method:	6010B	Analysis Batch:	280-259634	Instrument ID:	MT_026
Prep Method:	3050B	Prep Batch:	280-259404	Lab File ID:	26a010815d.asc
Dilution:	1.0			Initial Weight/Volume:	1.13 g
Analysis Date:	01/08/2015 1930			Final Weight/Volume:	100 mL
Prep Date:	01/08/2015 0830				

1/29/15

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Aluminum		8350		1.5	4.7
Antimony		0.36	U J	0.36	0.57
Silicon		334	N J	5.4	9.5

Analysis Method:	6010B	Analysis Batch:	280-259811	Instrument ID:	MT_026
Prep Method:	3050B	Prep Batch:	280-259404	Lab File ID:	26a010915.asc
Dilution:	1.0			Initial Weight/Volume:	1.13 g
Analysis Date:	01/09/2015 1417			Final Weight/Volume:	100 mL
Prep Date:	01/08/2015 0830				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Arsenic		7.7		0.63	0.95
Barium		70.4		0.072	0.47
Beryllium		0.031	U	0.031	0.19
Boron		2.2		0.93	1.9
Cadmium		0.14	B	0.039	0.19
Calcium		4940		13.4	47.4
Chromium		11.3		0.055	0.19
Cobalt		6.3	X	0.095	0.95
Copper		16.0	X	0.21	0.95
Iron		18100		3.6	4.7
Lead		33.7		0.26	0.47
Magnesium		4210		3.5	19.0
Manganese		302		0.095	0.95
Molybdenum		0.25	U	0.25	1.9
Nickel		10.6	X	0.12	3.8
Potassium		1550		38.9	284
Selenium		0.82	U	0.82	0.95
Silver		0.15	U	0.15	0.19
Sodium		207		55.9	114
Vanadium		43.0		0.089	1.9
Zinc		41.8		0.38	0.95

7471A Mercury (CVAA)

Analysis Method:	7471A	Analysis Batch:	280-259819	Instrument ID:	MT_033
Prep Method:	7471A	Prep Batch:	280-259403	Lab File ID:	150109aa.txt
Dilution:	1.0			Initial Weight/Volume:	0.69 g
Analysis Date:	01/09/2015 1323			Final Weight/Volume:	50 mL
Prep Date:	01/09/2015 1015				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Mercury		0.0068	B	0.0052	0.016

Client: Washington Closure Hanford

Job Number: 280-64146-1
Sdg Number: JP0887

Client Sample ID: J1V2R1

Lab Sample ID: 280-64146-5
Client Matrix: Solid
% Moisture: 4.5

1/25/15

Date Sampled: 01/05/2015 1034
Date Received: 01/07/2015 1130

6010B Metals (ICP)

Analysis Method:	6010B	Analysis Batch:	280-259634	Instrument ID:	MT_026
Prep Method:	3050B	Prep Batch:	280-259404	Lab File ID:	26a010815d.asc
Dilution:	1.0			Initial Weight/Volume:	1.02 g
Analysis Date:	01/08/2015 1933			Final Weight/Volume:	100 mL
Prep Date:	01/08/2015 0830				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Aluminum		8680		1.6	5.1
Antimony		0.39	U J	0.39	0.62
Silicon		416	N J	5.8	10.3

Analysis Method:	6010B	Analysis Batch:	280-259811	Instrument ID:	MT_026
Prep Method:	*3050B*	*Prep Batch:*	*280-259404*	*Lab File ID:*	*26a010915.asc*
Dilution:	1.0			Initial Weight/Volume:	1.02 g
Analysis Date:	01/09/2015 1419			Final Weight/Volume:	100 mL
Prep Date:	01/08/2015 0830				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Arsenic		4.4		0.68	1.0
Barium		68.6		0.078	0.51
Beryllium		0.034	U	0.034	0.21
Boron		1.4	B	1.0	2.1
Cadmium		0.14	B	0.042	0.21
Calcium		5440		14.5	51.3
Chromium		10.4		0.060	0.21
Cobalt		7.2	X	0.10	1.0
Copper		15.6	X	0.22	1.0
Iron		20400		3.9	5.1
Lead		5.5		0.28	0.51
Magnesium		4570		3.8	20.5
Manganese		316		0.10	1.0
Molybdenum		0.27	U	0.27	2.1
Nickel		10.6	X	0.13	4.1
Potassium		1470		42.1	308
Selenium		0.88	U	0.88	1.0
Silver		0.16	U	0.16	0.21
Sodium		205		60.6	123
Vanadium		51.4		0.097	2.1
Zinc		41.9		0.41	1.0

7471A Mercury (CVAA)

Analysis Method:	7471A	Analysis Batch:	280-259819	Instrument ID:	MT_033
Prep Method:	7471A	Prep Batch:	280-259403	Lab File ID:	150109aa.txt
Dilution:	1.0			Initial Weight/Volume:	0.62 g
Analysis Date:	01/09/2015 1326			Final Weight/Volume:	50 mL
Prep Date:	01/09/2015 1015				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Mercury		0.0063	B	0.0056	0.017

Client: Washington Closure Hanford

Job Number: 280-64146-1
Sdg Number: JP0887

Client Sample ID: J1V2R2

Lab Sample ID: 280-64146-6
Client Matrix: Solid

% Moisture: 5.9

1/25/15

Date Sampled: 01/05/2015 1010
Date Received: 01/07/2015 1130

6010B Metals (ICP)

Analysis Method:	6010B	Analysis Batch:	280-259634	Instrument ID:	MT_026
Prep Method:	3050B	Prep Batch:	280-259404	Lab File ID:	26a010815d.asc
Dilution:	1.0			Initial Weight/Volume:	1.15 g
Analysis Date:	01/08/2015 1946			Final Weight/Volume:	100 mL
Prep Date:	01/08/2015 0830				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Aluminum		7920		1.4	4.6
Antimony		0.35	U J	0.35	0.55
Silicon		360	N J	5.2	9.2
Zinc		39.3		0.37	0.92

Analysis Method:	6010B	Analysis Batch:	280-259811	Instrument ID:	MT_026
Prep Method:	3050B	Prep Batch:	280-259404	Lab File ID:	26a010915.asc
Dilution:	1.0			Initial Weight/Volume:	1.15 g
Analysis Date:	01/09/2015 1435			Final Weight/Volume:	100 mL
Prep Date:	01/08/2015 0830				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Arsenic		14.0		0.61	0.92
Barium		71.7		0.070	0.46
Beryllium		0.030	U	0.030	0.18
Boron		2.9		0.91	1.8
Cadmium		0.15	B	0.038	0.18
Calcium		3930		13.0	46.2
Chromium		11.7		0.054	0.18
Cobalt		6.2	X	0.092	0.92
Copper		11.8	X	0.20	0.92
Iron		17300		3.5	4.6
Lead		66.1		0.25	0.46
Magnesium		4120		3.4	18.5
Manganese		288		0.092	0.92
Molybdenum		0.24	U	0.24	1.8
Nickel		10.7	X	0.11	3.7
Potassium		1480		37.9	277
Selenium		0.79	U	0.79	0.92
Silver		0.15	U	0.15	0.18
Sodium		192		54.5	111
Vanadium		40.9		0.087	1.8

7471A Mercury (CVAA)

Analysis Method:	7471A	Analysis Batch:	280-259819	Instrument ID:	MT_033
Prep Method:	7471A	Prep Batch:	280-259403	Lab File ID:	150109aa.txt
Dilution:	1.0			Initial Weight/Volume:	0.62 g
Analysis Date:	01/09/2015 1328			Final Weight/Volume:	50 mL
Prep Date:	01/09/2015 1015				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Mercury		0.0057	U	0.0057	0.017

Client: Washington Closure Hanford

Job Number: 280-64146-1
Sdg Number: JP0887

Client Sample ID: J1V2R3

Lab Sample ID: 280-64146-7
Client Matrix: Solid
% Moisture: 8.5

1/25/15

Date Sampled: 01/05/2015 1016
Date Received: 01/07/2015 1130

6010B Metals (ICP)

Analysis Method:	6010B	Analysis Batch:	280-259634	Instrument ID:	MT_026
Prep Method:	3050B	Prep Batch:	280-259404	Lab File ID:	26a010815d.asc
Dilution:	1.0			Initial Weight/Volume:	1.18 g
Analysis Date:	01/08/2015 1949			Final Weight/Volume:	100 mL
Prep Date:	01/08/2015 0830				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Aluminum		9460		1.4	4.6
Antimony		0.35	U J	0.35	0.56
Silicon		408	N J	5.2	9.3
Zinc		42.2		0.37	0.93

Analysis Method:	6010B	Analysis Batch:	280-259811	Instrument ID:	MT_026
Prep Method:	3050B	Prep Batch:	280-259404	Lab File ID:	26a010915.asc
Dilution:	1.0			Initial Weight/Volume:	1.18 g
Analysis Date:	01/09/2015 1438			Final Weight/Volume:	100 mL
Prep Date:	01/08/2015 0830				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Arsenic		5.2		0.61	0.93
Barium		72.2		0.070	0.46
Beryllium		0.031	U	0.031	0.19
Boron		2.0		0.91	1.9
Cadmium		0.18	B	0.038	0.19
Calcium		4340		13.1	46.3
Chromium		11.3		0.054	0.19
Cobalt		7.3	X	0.093	0.93
Copper		14.3	X	0.20	0.93
Iron		20500		3.5	4.6
Lead		9.2		0.25	0.46
Magnesium		4520		3.4	18.5
Manganese		340		0.093	0.93
Molybdenum		0.24	U	0.24	1.9
Nickel		11.0	X	0.11	3.7
Potassium		1880		38.0	278
Selenium		0.80	U	0.80	0.93
Silver		0.15	U	0.15	0.19
Sodium		183		54.7	111
Vanadium		47.2		0.087	1.9

7471A Mercury (CVAA)

Analysis Method:	7471A	Analysis Batch:	280-259819	Instrument ID:	MT_033
Prep Method:	7471A	Prep Batch:	280-259403	Lab File ID:	150109aa.txt
Dilution:	1.0			Initial Weight/Volume:	0.62 g
Analysis Date:	01/09/2015 1335			Final Weight/Volume:	50 mL
Prep Date:	01/09/2015 1015				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Mercury		0.0059	B	0.0059	0.018

Client: Washington Closure Hanford

Job Number: 280-64146-1
Sdg Number: JP0887

Client Sample ID: J1V2R4

Lab Sample ID: 280-64146-8
Client Matrix: Solid
% Moisture: 9.9

Date Sampled: 01/05/2015 1023
Date Received: 01/07/2015 1130

6010B Metals (ICP)

Analysis Method:	6010B	Analysis Batch:	280-259634	Instrument ID:	MT_026
Prep Method:	3050B	Prep Batch:	280-259404	Lab File ID:	26a010815d.asc
Dilution:	1.0			Initial Weight/Volume:	1.10 g
Analysis Date:	01/08/2015 1951			Final Weight/Volume:	100 mL
Prep Date:	01/08/2015 0830				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Aluminum		10900		1.6	5.0
Antimony		0.38	U J	0.38	0.61
Silicon		381	N J	5.7	10.1
Zinc		46.1		0.40	1.0

Analysis Method:	6010B	Analysis Batch:	280-259811	Instrument ID:	MT_026
Prep Method:	3050B	Prep Batch:	280-259404	Lab File ID:	26a010915.asc
Dilution:	1.0			Initial Weight/Volume:	1.10 g
Analysis Date:	01/09/2015 1440			Final Weight/Volume:	100 mL
Prep Date:	01/08/2015 0830				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Arsenic		12.4		0.67	1.0
Barium		91.7		0.077	0.50
Beryllium		0.049	B	0.033	0.20
Boron		1.7	B	0.99	2.0
Cadmium		0.19	B	0.041	0.20
Calcium		4290		14.2	50.5
Chromium		15.6		0.059	0.20
Cobalt		8.3	X	0.10	1.0
Copper		17.0	X	0.22	1.0
Iron		24000		3.8	5.0
Lead		8.9		0.27	0.50
Magnesium		4880		3.7	20.2
Manganese		387		0.10	1.0
Molybdenum		0.33	B	0.26	2.0
Nickel		12.4	X	0.12	4.0
Potassium		1990		41.4	303
Selenium		0.87	U	0.87	1.0
Silver		0.16	U	0.16	0.20
Sodium		244		59.6	121
Vanadium		56.1		0.095	2.0

7471A Mercury (CVAA)

Analysis Method:	7471A	Analysis Batch:	280-259819	Instrument ID:	MT_033
Prep Method:	7471A	Prep Batch:	280-259403	Lab File ID:	150109aa.txt
Dilution:	1.0			Initial Weight/Volume:	0.61 g
Analysis Date:	01/09/2015 1337			Final Weight/Volume:	50 mL
Prep Date:	01/09/2015 1015				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Mercury		0.0060	U	0.0060	0.019

Client: Washington Closure Hanford

Job Number: 280-64146-1
Sdg Number: JP0887

Client Sample ID: J1V2R5

Lab Sample ID: 280-64146-9
Client Matrix: Solid

% Moisture: 9.7

1/29/15

Date Sampled: 01/05/2015 0943
Date Received: 01/07/2015 1130

6010B Metals (ICP)

Analysis Method:	6010B	Analysis Batch:	280-259634	Instrument ID:	MT_026
Prep Method:	3050B	Prep Batch:	280-259404	Lab File ID:	26a010815d.asc
Dilution:	1.0			Initial Weight/Volume:	1.04 g
Analysis Date:	01/08/2015 1954			Final Weight/Volume:	100 mL
Prep Date:	01/08/2015 0830				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Aluminum		9250		1.7	5.3
Antimony		0.40	U J	0.40	0.64
Silicon		409	N J	6.0	10.6
Zinc		40.1		0.42	1.1

Analysis Method:	6010B	Analysis Batch:	280-259811	Instrument ID:	MT_026
Prep Method:	3050B	Prep Batch:	280-259404	Lab File ID:	26a010915.asc
Dilution:	1.0			Initial Weight/Volume:	1.04 g
Analysis Date:	01/09/2015 1443			Final Weight/Volume:	100 mL
Prep Date:	01/08/2015 0830				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Arsenic		6.3		0.70	1.1
Barium		75.1		0.081	0.53
Beryllium		0.035	U	0.035	0.21
Boron		1.7	B	1.0	2.1
Cadmium		0.16	B	0.044	0.21
Calcium		5780		15.0	53.2
Chromium		11.8		0.062	0.21
Cobalt		7.2	X	0.11	1.1
Copper		13.3	X	0.23	1.1
Iron		19200		4.0	5.3
Lead		23.4		0.29	0.53
Magnesium		4620		3.9	21.3
Manganese		343		0.11	1.1
Molybdenum		0.28	U	0.28	2.1
Nickel		11.4	X	0.13	4.3
Potassium		1420		43.7	319
Selenium		0.92	U	0.92	1.1
Silver		0.17	U	0.17	0.21
Sodium		216		62.8	128
Vanadium		43.2		0.10	2.1

7471A Mercury (CVAA)

Analysis Method:	7471A	Analysis Batch:	280-259819	Instrument ID:	MT_033
Prep Method:	7471A	Prep Batch:	280-259403	Lab File ID:	150109aa.txt
Dilution:	1.0			Initial Weight/Volume:	0.66 g
Analysis Date:	01/09/2015 1344			Final Weight/Volume:	50 mL
Prep Date:	01/09/2015 1015				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Mercury		0.0068	B	0.0056	0.017

Client: Washington Closure Hanford

Job Number: 280-64146-1
Sdg Number: JP0887

Client Sample ID: J1V2R6

Lab Sample ID: 280-64146-10
Client Matrix: Solid

% Moisture: 8.4

V 1/25/15

Date Sampled: 01/05/2015 0936
Date Received: 01/07/2015 1130

6010B Metals (ICP)

Analysis Method:	6010B	Analysis Batch:	280-259634	Instrument ID:	MT_026
Prep Method:	3050B	Prep Batch:	280-259404	Lab File ID:	26a010815d.asc
Dilution:	1.0			Initial Weight/Volume:	1.18 g
Analysis Date:	01/08/2015 1956			Final Weight/Volume:	100 mL
Prep Date:	01/08/2015 0830				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Aluminum		9520		1.4	4.6
Antimony		0.35	U J	0.35	0.56
Silicon		349	N J	5.2	9.3
Zinc		41.5		0.37	0.93

Analysis Method:	6010B	Analysis Batch:	280-259811	Instrument ID:	MT_026
Prep Method:	3050B	Prep Batch:	280-259404	Lab File ID:	26a010915.asc
Dilution:	1.0			Initial Weight/Volume:	1.18 g
Analysis Date:	01/09/2015 1445			Final Weight/Volume:	100 mL
Prep Date:	01/08/2015 0830				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Arsenic		6.1		0.61	0.93
Barium		72.7		0.070	0.46
Beryllium		0.031	U	0.031	0.19
Boron		2.2		0.91	1.9
Cadmium		0.17	B	0.038	0.19
Calcium		6820		13.0	46.3
Chromium		12.7		0.054	0.19
Cobalt		7.4	X	0.093	0.93
Copper		14.9	X	0.20	0.93
Iron		20200		3.5	4.6
Lead		9.5		0.25	0.46
Magnesium		5100		3.4	18.5
Manganese		328		0.093	0.93
Molybdenum		0.24	U	0.24	1.9
Nickel		11.8	X	0.11	3.7
Potassium		1530		37.9	278
Selenium		0.80	U	0.80	0.93
Silver		0.15	U	0.15	0.19
Sodium		234		54.6	111
Vanadium		46.6		0.087	1.9

7471A Mercury (CVAA)

Analysis Method:	7471A	Analysis Batch:	280-259819	Instrument ID:	MT_033
Prep Method:	7471A	Prep Batch:	280-259403	Lab File ID:	150109aa.txt
Dilution:	1.0			Initial Weight/Volume:	0.68 g
Analysis Date:	01/09/2015 1346			Final Weight/Volume:	50 mL
Prep Date:	01/09/2015 1015				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Mercury		0.0075	B	0.0053	0.016

Client: Washington Closure Hanford

Job Number: 280-64146-1
Sdg Number: JP0887

Client Sample ID: J1V2R7

Lab Sample ID: 280-64146-11
Client Matrix: Solid
% Moisture: 10.7

1/25/15

Date Sampled: 01/05/2015 0927
Date Received: 01/07/2015 1130

6010B Metals (ICP)

Analysis Method:	6010B	Analysis Batch:	280-259634	Instrument ID:	MT_026
Prep Method:	3050B	Prep Batch:	280-259404	Lab File ID:	26a010815d.asc
Dilution:	1.0			Initial Weight/Volume:	1.16 g
Analysis Date:	01/08/2015 1959			Final Weight/Volume:	100 mL
Prep Date:	01/08/2015 0830				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Aluminum		8040		1.5	4.8
Antimony		0.37	U J	0.37	0.58
Silicon		384	N J	5.5	9.7
Zinc		34.5		0.38	0.97

Analysis Method:	6010B	Analysis Batch:	280-259811	Instrument ID:	MT_026
Prep Method:	3050B	Prep Batch:	280-259404	Lab File ID:	26a010915.asc
Dilution:	1.0			Initial Weight/Volume:	1.16 g
Analysis Date:	01/09/2015 1448			Final Weight/Volume:	100 mL
Prep Date:	01/08/2015 0830				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Arsenic		4.4		0.64	0.97
Barium		61.6		0.073	0.48
Beryllium		0.033	B	0.032	0.19
Boron		1.8	B	0.95	1.9
Cadmium		0.14	B	0.040	0.19
Calcium		4870		13.6	48.3
Chromium		10.5		0.056	0.19
Cobalt		6.0	X	0.097	0.97
Copper		12.0	X	0.21	0.97
Iron		16200		3.7	4.8
Lead		13.3		0.26	0.48
Magnesium		3980		3.6	19.3
Manganese		275		0.097	0.97
Molybdenum		0.25	U	0.25	1.9
Nickel		9.9	X	0.12	3.9
Potassium		1390		39.6	290
Selenium		0.83	U	0.83	0.97
Silver		0.15	U	0.15	0.19
Sodium		175		57.0	116
Vanadium		35.9		0.091	1.9

7471A Mercury (CVAA)

Analysis Method:	7471A	Analysis Batch:	280-259819	Instrument ID:	MT_033
Prep Method:	7471A	Prep Batch:	280-259403	Lab File ID:	150109aa.txt
Dilution:	1.0			Initial Weight/Volume:	0.65 g
Analysis Date:	01/09/2015 1349			Final Weight/Volume:	50 mL
Prep Date:	01/09/2015 1015				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Mercury		0.0071	B	0.0057	0.018

Client: Washington Closure Hanford

Job Number: 280-64146-1
Sdg Number: JP0887

Client Sample ID: J1V2R8

Lab Sample ID: 280-64146-12
Client Matrix: Solid
% Moisture: 10.8

Date Sampled: 01/05/2015 0920
Date Received: 01/07/2015 1130

6010B Metals (ICP)

Analysis Method:	6010B	Analysis Batch:	280-259634	Instrument ID:	MT_026
Prep Method:	3050B	Prep Batch:	280-259404	Lab File ID:	26a010815d.asc
Dilution:	1.0			Initial Weight/Volume:	1.06 g
Analysis Date:	01/08/2015 2001			Final Weight/Volume:	100 mL
Prep Date:	01/08/2015 0830				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Aluminum		10500		1.6	5.3
Antimony		0.40	U J	0.40	0.63
Silicon		412	N J	6.0	10.6
Zinc		44.0		0.42	1.1

Analysis Method:	6010B	Analysis Batch:	280-259811	Instrument ID:	MT_026
Prep Method:	3050B	Prep Batch:	280-259404	Lab File ID:	26a010915.asc
Dilution:	1.0			Initial Weight/Volume:	1.06 g
Analysis Date:	01/09/2015 1451			Final Weight/Volume:	100 mL
Prep Date:	01/08/2015 0830				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Arsenic		6.6		0.70	1.1
Barium		103		0.080	0.53
Beryllium		0.035	U	0.035	0.21
Boron		5.4		1.0	2.1
Cadmium		0.15	B	0.043	0.21
Calcium		8020		14.9	52.9
Chromium		12.8		0.061	0.21
Cobalt		7.9	X	0.11	1.1
Copper		15.8	X	0.23	1.1
Iron		22100		4.0	5.3
Lead		12.4		0.29	0.53
Magnesium		5460		3.9	21.2
Manganese		359		0.11	1.1
Molybdenum		0.28	U	0.28	2.1
Nickel		13.2	X	0.13	4.2
Potassium		1510		43.4	317
Selenium		0.91	U	0.91	1.1
Silver		0.17	U	0.17	0.21
Sodium		302		62.4	127
Vanadium		51.4		0.099	2.1

7471A Mercury (CVAA)

Analysis Method:	7471A	Analysis Batch:	280-259819	Instrument ID:	MT_033
Prep Method:	7471A	Prep Batch:	280-259403	Lab File ID:	150109aa.txt
Dilution:	1.0			Initial Weight/Volume:	0.61 g
Analysis Date:	01/09/2015 1351			Final Weight/Volume:	50 mL
Prep Date:	01/09/2015 1015				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Mercury		0.0085	B	0.0061	0.019

Client: Washington Closure Hanford

Job Number: 280-64146-1
Sdg Number: JP0887

Client Sample ID: J1V2R9

Lab Sample ID: 280-64146-13
Client Matrix: Solid

% Moisture: 8.5

1/25/15

Date Sampled: 01/05/2015 0936
Date Received: 01/07/2015 1130

6010B Metals (ICP)

Analysis Method:	6010B	Analysis Batch:	280-259634	Instrument ID:	MT_026
Prep Method:	3050B	Prep Batch:	280-259404	Lab File ID:	26a010815d.asc
Dilution:	1.0			Initial Weight/Volume:	1.10 g
Analysis Date:	01/08/2015 2004			Final Weight/Volume:	100 mL
Prep Date:	01/08/2015 0830				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Aluminum		8270		1.5	5.0
Antimony		0.38	U J	0.38	0.60
Silicon		372	N J	5.6	9.9
Zinc		34.8		0.40	0.99

Analysis Method:	6010B	Analysis Batch:	280-259811	Instrument ID:	MT_026
Prep Method:	3050B	Prep Batch:	280-259404	Lab File ID:	26a010915.asc
Dilution:	1.0			Initial Weight/Volume:	1.10 g
Analysis Date:	01/09/2015 1453			Final Weight/Volume:	100 mL
Prep Date:	01/08/2015 0830				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Arsenic		5.7		0.66	0.99
Barium		62.6		0.075	0.50
Beryllium		0.033	U	0.033	0.20
Boron		2.0		0.97	2.0
Cadmium		0.13	B	0.041	0.20
Calcium		6100		14.0	49.7
Chromium		10.4		0.058	0.20
Cobalt		6.1	X	0.099	0.99
Copper		13.5	X	0.22	0.99
Iron		16900		3.8	5.0
Lead		8.3		0.27	0.50
Magnesium		4280		3.7	19.9
Manganese		276		0.099	0.99
Molybdenum		0.26	U	0.26	2.0
Nickel		10.2	X	0.12	4.0
Potassium		1340		40.7	298
Selenium		0.85	U	0.85	0.99
Silver		0.16	U	0.16	0.20
Sodium		206		58.6	119
Vanadium		38.7		0.093	2.0

7471A Mercury (CVAA)

Analysis Method:	7471A	Analysis Batch:	280-259819	Instrument ID:	MT_033
Prep Method:	7471A	Prep Batch:	280-259403	Lab File ID:	150109aa.txt
Dilution:	1.0			Initial Weight/Volume:	0.68 g
Analysis Date:	01/09/2015 1353			Final Weight/Volume:	50 mL
Prep Date:	01/09/2015 1015				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Mercury		0.0071	B	0.0053	0.016

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

CASE NARRATIVE

Client: Washington Closure Hanford

Project: WASHINGTON CLOSURE HANFORD

Job Number: 280-64146-1

SDG #: JP0887
SAF#: RC-107

Date SDG Closed: January 7, 2015
Data Deliverable: 7 Day / Summary

CLIENT ID	LAB ID	ANALYSES REQUESTED	ANALYSES PERFORMED
J1V2P7	280-64146-1	6010/7471	6010B/7471A
J1V2P8	280-64146-2	6010/7471	6010B/7471A
J1V2P9	280-64146-3	6010/7471	6010B/7471A
J1V2R0	280-64146-4	6010/7471	6010B/7471A
J1V2R1	280-64146-5	6010/7471	6010B/7471A
J1V2R2	280-64146-6	6010/7471	6010B/7471A
J1V2R3	280-64146-7	6010/7471	6010B/7471A
J1V2R4	280-64146-8	6010/7471	6010B/7471A
J1V2R5	280-64146-9	6010/7471	6010B/7471A
J1V2R6	280-64146-10	6010/7471	6010B/7471A
J1V2R7	280-64146-11	6010/7471	6010B/7471A
J1V2R8	280-64146-12	6010/7471	6010B/7471A
J1V2R9	280-64146-13	6010/7471	6010B/7471A

I certify that this data package is in compliance with the SOW, both technically and for completeness, for other than the conditions detailed in this Case Narrative. Release of the data contained in this hard copy data package has been authorized by the Laboratory Manager or a designee, as verified by the signature on the Report Cover.

With 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. All laboratory quality control samples analyzed in conjunction with the samples in this project were within established control limits, with any exceptions noted. Calculations are performed before rounding to avoid round-off errors in calculated results.

This report includes reporting limits (RLs) less than TestAmerica Denver's practical quantitation limits. These reporting limits are being used specifically at the client's request to meet the needs of this project. Please note that data are not normally reported to these levels without qualification, since they are inherently less reliable and potentially less defensible than required by the current NELAC standards.

The results, RLs and MDLs included in this report have been adjusted for dry weight, as appropriate.

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

RECEIPT
The samples were received on 1/7/2015 11:30 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 1.4° C.

TOTAL METALS - SW846 6010B/7471A
Serial dilution of a digestate in batch 280-259404 indicates that physical and chemical interferences are present for Cobalt, Copper and Nickel. Results have been flagged with an "X".

Low levels of Calcium, Copper and Magnesium are present in the method blank associated with batch 280-259404. Because the concentrations in the method blank are not present at levels greater than half the reporting limit, corrective action is deemed unnecessary.

Silicon was recovered outside the control limits, biased low, in the LCS associated with batch 280-259404 and in the Matrix Spike performed on sample J1V2P7 in batch 280-259404. The associated sample results have been flagged "N". Silicon has been identified as a poor performing element when analyzed using this method and has a history of reacting inconsistently; therefore, corrective action is not initiated. Data are reported as is.

It can be noted that the sample amount was greater than four times the spike amount for Aluminum, Iron and Manganese in the Matrix Spike performed on sample J1V2P7; therefore, control limits are not applicable.

No other anomalies were encountered.

Washington Closure Hanford

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

RC-107-125

Collector: H. Weber	Company Contact: Joan Kessner	Telephone No.: 375-4688	Project Coordinator: KESSNER, JH
Project Designation: 100-H Field Remediation	Sampling Location: 100-H-59:1, Verification, EXC		SAF No.: RC-107
Ice Chest No.: RCC-07-011	Field Logbook No.: EL-1627-~~08~~ 09 DWS 1/5/15	COA: 010H592000	Method of Shipment: Commercial Carrier - fed Ex
Shipped To: TestAmerica Denver	Offsite Property No.: A131290		Bill of Lading/Air Bill No.: See OSPC

Price Code: 8B

Data Turnaround: 7 days

Other Labs Shipped To: TestAmerica Richland

Preservation	Cool 4C
Type of Container	G/P
No. of Container(s)	1
Volume	500mL
Sample Analysis	See item (1) in Special Instructions

POSSIBLE SAMPLE HAZARDS/REMARKS

None

Special Handling and/or Storage

None

280-64146 Chain of Custody

Sample No.	Matrix	Sample Date	Sample Time	
J1V2P7	SOIL	1/5/15	1044	✓
J1V2P8	SOIL	1/5/15	1040	✓
J1V2P9	SOIL	1/5/15	1051	✓
J1V2R0	SOIL	1/5/15	1028	✓
J1V2R1	SOIL	1/5/15	1034	✓

CHAIN OF POSSESSION — **Sign/Print Names**

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
Heather Weber [signature]	01/05/15 ~~01/05/15~~ 1102	WCH Dwshea Dwshea	1/5/15 1102
Dwshea Dwshea	1/5/15 1610	C. Bingham [signature]	1-5-15 1610
C Bingham [signature]	1-5-15 1625	1060 Battelle fridge #1A	1-5-15 1625
1060 Battelle fridge #1A	1-6-15 0740	C. Bingham [signature]	1-6-15 0740
C. Bingham [signature] WCH	1-6-15 0800	fed Ex	
		[signature]	1180 07Jan15

FINAL SAMPLE DISPOSITION — Disposal Method — Disposed By — Date/Time

SPECIAL INSTRUCTIONS

(1) ICP Metals - 6010TR (Close-out List) {Aluminum, Antimony, Arsenic, Barium, Beryllium, Boron, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Magnesium, Manganese, Molybdenum, Nickel, Potassium, Selenium, Silicon, Silver, Sodium, Vanadium, Zinc}; Mercury - 7471 - (CV)

0.9 IRS to 0.5 07Jan15
Transferred by [initials]

REVIEWED BY KW DATE 1/6/14

JP0887

WCH-EE-011

Washington Closure Hanford

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

RC-107-125

Collector: H. Weber	Company Contact: Joan Kessner	Telephone No.: 375-4688	Project Coordinator: KESSNER, JH
Project Designation: 100-H Field Remediation	Sampling Location: 100-H-59:1, Verification, EXC		SAF No.: RC-107
Ice Chest No.: RCC-07-011	Field Logbook No.: DWS EL-1627-~~08~~ 09 1/5/15	COA: 010H592000	Method of Shipment: Commercial Carrier - fed Ex
Shipped To: TestAmerica Denver	Offsite Property No.: A131290		Bill of Lading/Air Bill No.: See OSPC

Price Code: 8B

Data Turnaround: 7 days

Other Labs Shipped To: TestAmerica Richland

Preservation	Cool 4C
Type of Container	G/P
No. of Container(s)	1
Volume	500mL
Sample Analysis	See item (1) in Special Instructions

POSSIBLE SAMPLE HAZARDS/REMARKS

None

Special Handling and/or Storage

None

Sample No.	Matrix	Sample Date	Sample Time	
J1V2R2	SOIL	1/5/15	1010	✓
J1V2R3	SOIL	1/5/15	1016	✓
J1V2R4	SOIL	1/5/15	1023	✓
J1V2R5	SOIL	1/5/15	0943	✓
J1V2R6	SOIL	1/5/15	0936	✓

CHAIN OF POSSESSION — **Sign/Print Names**

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
Heather Weber [signature]	1/5/15 1102	DWSHEA (WCH)	1/5/15 1102
DWSHEA	1/5/15 1610	C. Bingham [signature]	1-5-15 1610
C. Bingham [signature]	1-5-15 1625	1060 Battelle, fridge #1A	1-5-15 1625
1060 Battelle, fridge #1A	1-6-15 0740	C. Bingham [signature]	1-6-15 0740
C. Bingham [signature] WCH	1-6-15 0800	fed Ex	
		[signature]	1130 07 Jan 15

FINAL SAMPLE DISPOSITION — Disposal Method — Disposed By — Date/Time

SPECIAL INSTRUCTIONS

(1) ICP Metals - 6010TR (Close-out List) {Aluminum, Antimony, Arsenic, Barium, Beryllium, Boron, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Magnesium, Manganese, Molybdenum, Nickel, Potassium, Selenium, Silicon, Silver, Sodium, Vanadium, Zinc}; Mercury - 7471 - (CV)

REVIEWED BY KW DATE 1/6/15

JP0887

WCH-EE-011

Washington Closure Hanford

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

RC-107-125

Collector: H. Weber	Company Contact: Joan Kessner	Telephone No.: 375-4688	Project Coordinator: KESSNER, JH
Project Designation: 100-H Field Remediation	Sampling Location: 100-H-59:1, Verification, EXC		SAF No.: RC-107
Ice Chest No.: RCC-07-011	Field Logbook No.: DWS 1/5/15 EL-1627-~~08~~09	COA: 010H592000	Method of Shipment: Commercial Carrier - fed Ex
Shipped To: TestAmerica Denver	Offsite Property No.: A131290		Bill of Lading/Air Bill No.: See OSPC

Price Code: 8B

Data Turnaround: 7 days

Other Labs Shipped To: TestAmerica Richland

Preservation	Cool 4C
Type of Container	G/P
No. of Container(s)	1
Volume	500mL
Sample Analysis	See item (1) in Special Instructions

POSSIBLE SAMPLE HAZARDS/REMARKS

None

Special Handling and/or Storage

None

Sample No.	Matrix	Sample Date	Sample Time										
J1V2R7	SOIL	1/5/15	0927	✓									
J1V2R8	SOIL	1/5/15	0920	✓									
J1V2R9	SOIL	1/5/15	0936	✓									

CHAIN OF POSSESSION — **Sign/Print Names**

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
Heather Weber / [signature]	1/5/15 1102	Dwshea DWSHEA	1/5/15 1102
Dwshea DWSHEA	1/5/15 1610	C. Bingham [signature]	1-5-15 1610
C. Bingham [signature]	1-5-15 1625	1060 Battelle, fridge #1A	1-5-15 1625
1060 Battelle, fridge #1A	1-6-15 0740	C. Bingham [signature]	1-6-15 0740
C. Bingham [signature] WCH	1-6-15 0800	fed Ex	
		[signature]	1130 07Jan5

FINAL SAMPLE DISPOSITION — Disposal Method — Disposed By — Date/Time

SPECIAL INSTRUCTIONS

(1) ICP Metals - 6010TR (Close-out List) {Aluminum, Antimony, Arsenic, Barium, Beryllium, Boron, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Magnesium, Manganese, Molybdenum, Nickel, Potassium, Selenium, Silicon, Silver, Sodium, Vanadium, Zinc}; Mercury - 7471 - (CV)

REVIEWED BY KW DATE 1/16/15

JP0887

WCH-EE-011

Appendix 5

Data Validation Supporting Documentation

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E

PROJECT:	100-H-SS:1	DATA PACKAGE:	JP0887
VALIDATOR:	ECR	LAB: TAL	DATE: 1/25/15
		SDG:	JP0887

ANALYSES PERFORMED					
SW-846/ICP	SW-846/GFAA	SW-846/Hg	SW-846 Cyanide		

SAMPLES/MATRIX				
J1V2P7	J1V2P8	J1V2P9	J1V2R0	J1V2R1
J1V2R2	J1V2R3	J1V2R4	J1V2R5	J1V2R6
J1V2R7	J1V2R8	J1V2R9		
				Soil

1. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE

Technical verification documentation present? ..... Yes (No) N/A

Comments:

2. INSTRUMENT PERFORMANCE AND CALIBRATIONS (Levels D and E)

Initial calibrations performed on all instruments? ..... Yes No N/A

Initial calibrations acceptable? ..... Yes No N/A

ICP interference checks acceptable? ..... Yes No N/A

ICV and CCV checks performed on all instruments? ..... Yes No N/A

ICV and CCV checks acceptable? ..... Yes No N/A

Standards traceable? ..... Yes No N/A

Standards expired? ..... Yes No N/A

Calculation check acceptable? ..... Yes No N/A

Comments:

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

3. BLANKS (Levels B, C, D, and E)

ICB and CCB checks performed for all applicable analyses? (Levels D, E) ..... Yes No N/A

ICB and CCB results acceptable? (Levels D, E) ..... Yes No N/A

Laboratory blanks analyzed? ..... Yes No N/A

Laboratory blank results acceptable? ..... Yes No N/A

Field blanks analyzed? (Levels C, D, E) ..... Yes No N/A

Field blank results acceptable? (Levels C, D, E) ..... Yes No N/A

Transcription/calculation errors? (Levels D, E) ..... Yes No N/A

Comments: no FB

4. ACCURACY (Levels C, D, and E)

MS/MSD samples analyzed? ..... Yes No N/A

MS/MSD results acceptable? ..... Yes No N/A

MS/MSD standards NIST traceable? (Levels D, E) ..... Yes No N/A

MS/MSD standards expired? (Levels D, E) ..... Yes No N/A

LCS/BSS samples analyzed? ..... Yes No N/A

LCS/BSS results acceptable? ..... Yes No N/A

Standards traceable? (Levels D, E) ..... Yes No N/A

Standards expired? (Levels D, E) ..... Yes No N/A

Transcription/calculation errors? (Levels D, E) ..... Yes No N/A

Performance audit sample(s) analyzed? ..... Yes No N/A

Performance audit sample results acceptable? ..... Yes No N/A

Comments: LCS- Silicon (9%) - Jad

MS- antimony (53%) + silicon (11%) - Jad

no PAS

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

5. PRECISION (Levels C, D, and E)

Duplicate RPD values acceptable? ..... Yes No N/A

Duplicate results acceptable? ..... Yes No N/A

MS/MSD standards NIST traceable? (Levels D, E) ..... Yes No N/A

MS/MSD standards expired? (Levels D, E) ..... Yes No N/A

Field duplicate RPD values acceptable? ..... Yes No N/A

Field split RPD values acceptable? ..... Yes No N/A

Transcription/calculation errors? (Levels D, E) ..... Yes No N/A

Comments: _____

6. ICP QUALITY CONTROL (Levels D and E)

ICP serial dilution samples analyzed? ..... Yes No N/A

ICP serial dilution %D values acceptable? ..... Yes No N/A

ICP post digestion spike required? ..... Yes No N/A

ICP post digestion spike values acceptable? ..... Yes No N/A

Standards traceable? ..... Yes No N/A

Standards expired? ..... Yes No N/A

Transcription/calculation errors? ..... Yes No N/A

Comments: _____

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

7. FURNACE AA QUALITY CONTROL (Levels D and E)

Duplicate injections performed as required? ..... Yes No N/A

Duplicate injection %RSD values acceptable? ..... Yes No N/A

Analytical spikes performed as required? ..... Yes No N/A

Analytical spike recoveries acceptable? ..... Yes No N/A

Standards traceable? ..... Yes No N/A

Standards expired? ..... Yes No N/A

MSA performed as required? ..... Yes No N/A

MSA results acceptable? ..... Yes No N/A

Transcription/calculation errors? ..... Yes No N/A

Comments:_____

8. HOLDING TIMES (all levels)

Samples properly preserved? ..... Yes No N/A

Sample holding times acceptable? ..... Yes No N/A

Comments:_____

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

9. RESULT QUANTITATION AND DETECTION LIMITS (all levels)

Results reported for all requested analyses? ..... Yes No N/A

Results supported in the raw data? (Levels D, E) ..... Yes No N/A

Samples properly prepared? (Levels D, E) ..... Yes No N/A

Detection limits meet RDL? ..... Yes No N/A

Transcription/calculation errors? (Levels D, E) ..... Yes No N/A

Comments:

Appendix 6

Additional Documentation Requested by Client

Client: Washington Closure Hanford

Job Number: 280-64146-1
Sdg Number: JP0887

Method Blank - Batch: 280-259404

Method: 6010B
Preparation: 3050B

Lab Sample ID:	MB 280-259404/1-A	Analysis Batch:	280-259634	Instrument ID:	MT_026
Client Matrix:	Solid	Prep Batch:	280-259404	Lab File ID:	26a010815d.asc
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	1.00 g
Analysis Date:	01/08/2015 1910	Units:	mg/Kg	Final Weight/Volume:	100 mL
Prep Date:	01/08/2015 0830				
Leach Date:	N/A				

Analyte	Result	Qual	MDL	RL
Aluminum	1.6	U	1.6	5.0
Antimony	0.38	U	0.38	0.60
Silicon	5.7	U	5.7	10.0

Method Blank - Batch: 280-259404

Method: 6010B
Preparation: 3050B

Lab Sample ID:	MB 280-259404/1-A	Analysis Batch:	280-259811	Instrument ID:	MT_026
Client Matrix:	Solid	Prep Batch:	280-259404	Lab File ID:	26a010915.asc
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	1.00 g
Analysis Date:	01/09/2015 1356	Units:	mg/Kg	Final Weight/Volume:	100 mL
Prep Date:	01/08/2015 0830				
Leach Date:	N/A				

Analyte	Result	Qual	MDL	RL
Arsenic	0.66	U	0.66	1.0
Barium	0.076	U	0.076	0.50
Beryllium	0.033	U	0.033	0.20
Boron	0.98	U	0.98	2.0
Cadmium	0.041	U	0.041	0.20
Calcium	18.78	B	14.1	50.0
Chromium	0.058	U	0.058	0.20
Cobalt	0.10	U	0.10	1.0
Copper	0.296	B	0.22	1.0
Iron	3.8	U	3.8	5.0
Lead	0.27	U	0.27	0.50
Magnesium	5.29	B	3.7	20.0
Manganese	0.10	U	0.10	1.0
Molybdenum	0.26	U	0.26	2.0
Nickel	0.12	U	0.12	4.0
Potassium	41.0	U	41.0	300
Selenium	0.86	U	0.86	1.0
Silver	0.16	U	0.16	0.20
Sodium	59.0	U	59.0	120
Vanadium	0.094	U	0.094	2.0
Zinc	0.40	U	0.40	1.0

Client: Washington Closure Hanford

Job Number: 280-64146-1
Sdg Number: JP0887

Lab Control Sample - Batch: 280-259404

Method: 6010B
Preparation: 3050B

Lab Sample ID:	LCS 280-259404/2-A	Analysis Batch:	280-259634	Instrument ID:	MT_026
Client Matrix:	Solid	Prep Batch:	280-259404	Lab File ID:	26a010815d.asc
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	1.00 g
Analysis Date:	01/08/2015 1913	Units:	mg/Kg	Final Weight/Volume:	100 mL
Prep Date:	01/08/2015 0830				
Leach Date:	N/A				

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
Aluminum	200	192.6	96	82 - 116	
Antimony	50.0	49.22	98	82 - 110	
Silicon	1000	86.65	9	10 - 70	N

Lab Control Sample - Batch: 280-259404

Method: 6010B
Preparation: 3050B

Lab Sample ID:	LCS 280-259404/2-A	Analysis Batch:	280-259811	Instrument ID:	MT_026
Client Matrix:	Solid	Prep Batch:	280-259404	Lab File ID:	26a010915.asc
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	1.00 g
Analysis Date:	01/09/2015 1358	Units:	mg/Kg	Final Weight/Volume:	100 mL
Prep Date:	01/08/2015 0830				
Leach Date:	N/A				

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
Arsenic	100	96.08	96	85 - 110	
Barium	200	195.6	98	87 - 112	
Beryllium	5.00	4.88	98	84 - 114	
Boron	100	94.11	94	80 - 120	
Cadmium	10.0	9.65	96	87 - 110	
Calcium	5000	4907	98	82 - 114	
Chromium	20.0	19.65	98	84 - 114	
Cobalt	50.0	48.88	98	87 - 110	
Copper	25.0	24.66	99	88 - 110	
Iron	100	103.2	103	87 - 120	
Lead	50.0	48.43	97	86 - 110	
Magnesium	5000	4937	99	90 - 110	
Manganese	50.0	50.06	100	88 - 110	
Molybdenum	100	97.71	98	86 - 110	
Nickel	50.0	48.35	97	87 - 110	
Potassium	5000	4962	99	89 - 110	
Selenium	200	189.0	94	83 - 110	
Silver	5.00	5.15	103	87 - 114	
Sodium	5000	4999	100	90 - 112	
Vanadium	50.0	50.46	101	88 - 110	
Zinc	50.0	49.89	100	76 - 114	

Client: Washington Closure Hanford

Job Number: 280-64146-1
Sdg Number: JP0887

Matrix Spike - Batch: 280-259404

Method: 6010B
Preparation: 3050B

Lab Sample ID:	280-64146-1	Analysis Batch:	280-259634	Instrument ID:	MT_026
Client Matrix:	Solid	Prep Batch:	280-259404	Lab File ID:	26a010815d.asc
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	1.13 g
Analysis Date:	01/08/2015 1923	Units:	mg/Kg	Final Weight/Volume:	100 mL
Prep Date:	01/08/2015 0830				
Leach Date:	N/A				

Analyte	Sample Result/Qual		Spike Amount	Result	% Rec.	Limit	Qual
Aluminum	8230		190	10200	1040	50 - 200	4
Antimony	0.35	U	47.4	25.05	53	20 - 200	
Silicon	315		949	423.3	11	20 - 200	N

Matrix Spike - Batch: 280-259404

Method: 6010B
Preparation: 3050B

Lab Sample ID:	280-64146-1	Analysis Batch:	280-259811	Instrument ID:	MT_026
Client Matrix:	Solid	Prep Batch:	280-259404	Lab File ID:	26a010915.asc
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	1.13 g
Analysis Date:	01/09/2015 1409	Units:	mg/Kg	Final Weight/Volume:	100 mL
Prep Date:	01/08/2015 0830				
Leach Date:	N/A				

Analyte	Sample Result/Qual		Spike Amount	Result	% Rec.	Limit	Qual
Arsenic	4.0		94.9	86.46	87	76 - 111	
Barium	69.7		190	247.5	94	52 - 159	
Beryllium	0.031	U	4.74	4.16	88	72 - 105	
Boron	1.5	B	94.9	79.63	82	80 - 120	
Cadmium	0.15	B	9.49	8.53	88	40 - 130	
Calcium	4700		4740	10470	122	43 - 165	
Chromium	10.4		19.0	28.27	94	70 - 200	
Cobalt	6.6		47.4	48.55	88	72 - 106	
Copper	13.9		23.7	35.33	91	37 - 187	
Iron	19500		94.9	20440	999	70 - 200	4
Lead	7.2		47.4	47.39	85	70 - 200	
Magnesium	4340		4740	9331	105	64 - 145	
Manganese	307		47.4	368.7	130	40 - 200	4
Molybdenum	0.24	U	94.9	82.34	87	75 - 103	
Nickel	10.5		47.4	51.81	87	61 - 126	
Potassium	1450		4740	5892	94	56 - 172	
Selenium	0.80	U	190	158.9	84	76 - 104	
Silver	0.15	U	4.74	4.48	95	75 - 141	
Sodium	206		4740	4728	95	78 - 111	
Vanadium	47.1		47.4	96.70	105	50 - 169	
Zinc	40.5		47.4	83.64	91	70 - 200	

Client: Washington Closure Hanford

Job Number: 280-64146-1
Sdg Number: JP0887

Duplicate - Batch: 280-259404

Method: 6010B
Preparation: 3050B

Lab Sample ID:	280-64146-1	Analysis Batch:	280-259634	Instrument ID:	MT_026
Client Matrix:	Solid	Prep Batch:	280-259404	Lab File ID:	26a010815d.asc
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	1.09 g
Analysis Date:	01/08/2015 1920	Units:	mg/Kg	Final Weight/Volume:	100 mL
Prep Date:	01/08/2015 0830				
Leach Date:	N/A				

Analyte	Sample Result/Qual		Result	RPD	Limit	Qual
Aluminum	8230		8499	3	40	
Antimony	0.35	U	0.37	NC	40	U
Silicon	315		322.4	2	40	N

Duplicate - Batch: 280-259404

Method: 6010B
Preparation: 3050B

Lab Sample ID:	280-64146-1	Analysis Batch:	280-259811	Instrument ID:	MT_026
Client Matrix:	Solid	Prep Batch:	280-259404	Lab File ID:	26a010915.asc
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	1.09 g
Analysis Date:	01/09/2015 1406	Units:	mg/Kg	Final Weight/Volume:	100 mL
Prep Date:	01/08/2015 0830				
Leach Date:	N/A				

Analyte	Sample Result/Qual		Result	RPD	Limit	Qual
Arsenic	4.0		3.81	5	30	
Barium	69.7		65.87	6	30	
Beryllium	0.031	U	0.032	NC	30	U
Boron	1.5	B	1.30	14	30	B
Cadmium	0.15	B	0.135	8	30	B
Calcium	4700		4767	1	30	
Chromium	10.4		11.08	7	40	
Cobalt	6.6		6.80	3	30	
Copper	13.9		14.95	7	30	
Iron	19500		19360	0.7	40	
Lead	7.2		7.13	0.5	40	
Magnesium	4340		4475	3	30	
Manganese	307		300.4	2	40	
Molybdenum	0.24	U	0.26	NC	30	U
Nickel	10.5		11.39	8	30	
Potassium	1450		1397	4	40	
Selenium	0.80	U	0.85	NC	30	U
Silver	0.15	U	0.16	NC	30	U
Sodium	206		207.2	0.7	30	
Vanadium	47.1		47.04	0.08	30	
Zinc	40.5		40.11	0.9	40	

Client: Washington Closure Hanford

Job Number: 280-64146-1
Sdg Number: JP0887

Method Blank - Batch: 280-259403

Method: 7471A
Preparation: 7471A

Lab Sample ID:	MB 280-259403/1-A	Analysis Batch:	280-259819	Instrument ID:	MT_033
Client Matrix:	Solid	Prep Batch:	280-259403	Lab File ID:	150109aa.txt
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	0.6 g
Analysis Date:	01/09/2015 1312	Units:	mg/Kg	Final Weight/Volume:	50 mL
Prep Date:	01/09/2015 1015				
Leach Date:	N/A				

Analyte	Result	Qual	MDL	RL
Mercury	0.0055	U	0.0055	0.017

Lab Control Sample - Batch: 280-259403

Method: 7471A
Preparation: 7471A

Lab Sample ID:	LCS 280-259403/2-A	Analysis Batch:	280-259819	Instrument ID:	MT_033
Client Matrix:	Solid	Prep Batch:	280-259403	Lab File ID:	150109aa.txt
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	0.6 g
Analysis Date:	01/09/2015 1314	Units:	mg/Kg	Final Weight/Volume:	50 mL
Prep Date:	01/09/2015 1015				
Leach Date:	N/A				

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
Mercury	0.417	0.436	105	87 - 111	

Matrix Spike - Batch: 280-259403

Method: 7471A
Preparation: 7471A

Lab Sample ID:	280-64146-8	Analysis Batch:	280-259819	Instrument ID:	MT_033
Client Matrix:	Solid	Prep Batch:	280-259403	Lab File ID:	150109aa.txt
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	0.61 g
Analysis Date:	01/09/2015 1342	Units:	mg/Kg	Final Weight/Volume:	50 mL
Prep Date:	01/09/2015 1015				
Leach Date:	N/A				

Analyte	Sample Result/Qual		Spike Amount	Result	% Rec.	Limit	Qual
Mercury	0.0060	U	0.455	0.487	107	87 - 111	

Client: Washington Closure Hanford

Job Number: 280-64146-1
Sdg Number: JP0887

Duplicate - Batch: 280-259403

Method: 7471A
Preparation: 7471A

Lab Sample ID:	280-64146-8	Analysis Batch:	280-259819	Instrument ID:	MT_033
Client Matrix:	Solid	Prep Batch:	280-259403	Lab File ID:	150109aa.txt
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	0.65 g
Analysis Date:	01/09/2015 1339	Units:	mg/Kg	Final Weight/Volume:	50 mL
Prep Date:	01/09/2015 1015				
Leach Date:	N/A				

Analyte	Sample Result/Qual		Result	RPD	Limit	Qual
Mercury	0.0060	U	0.0057	NC	20	U

.Date: 26 January 2015
To: Washington Closure Hanford Inc. (technical representative)
From: ELR Consulting
Project: 100-H Remaining Sites Burial Grounds – Soil Full Protocol - Waste Site 100-H-59:1
Subject: Radiochemistry - Data Package No. JP0887-TAL

INTRODUCTION

This memo presents the results of data validation on Data Package No. JP0887 prepared by TestAmerica Laboratories (TAL). A list of samples validated along with the analyses reported and the method of analysis is provided in the following table.

Sample ID	Sample Date	Media	Validation	Analyte
J1V2P7	1/5/15	Soil	C	See note 1
J1V2P8	1/5/15	Soil	C	See note 1
J1V2P9	1/5/15	Soil	C	See note 1
J1V2R0	1/5/15	Soil	C	See note 1
J1V2R1	1/5/15	Soil	C	See note 1
J1V2R2	1/5/15	Soil	C	See note 1
J1V2R3	1/5/15	Soil	C	See note 1
J1V2R4	1/5/15	Soil	C	See note 1
J1V2R5	1/5/15	Soil	C	See note 1
J1V2R6	1/5/15	Soil	C	See note 1
J1V2R7	1/5/15	Soil	C	See note 1
J1V2R8	1/5/15	Soil	C	See note 1
J1V2R9	1/5/15	Soil	C	See note 1

1 – Gamma spectroscopy.

Data validation was conducted in accordance with the Washington Closure Hanford (WCH) validation statement of work and the 100 Area Remedial Action Sampling and Analysis Plan (DOE/RL-96-22, September 2009). Appendices 1 through 6 provide the following information as indicated below:

Appendix 1. Glossary of Data Reporting Qualifiers
Appendix 2. Summary of Data Qualification
Appendix 3. Annotated Laboratory Reports
Appendix 4. Laboratory Narrative and Chain-of-Custody Documentation
Appendix 5. Data Validation Supporting Documentation
Appendix 6. Additional Data Requested by Client

DATA QUALITY PARAMETERS

- **Holding Times**

Holding times are calculated from Chain-of-Custody forms to determine the validity of the results. The maximum holding time for radiochemical analysis is 6 months.

All holding times were acceptable.

- **Preparation (Method) Blanks**

Laboratory Blanks

Blank samples are analyzed to determine if positive results are due to laboratory reagent, sample container, or detector contamination. If blank analysis results indicate the presence of an analyte above the minimum detectable activity (MDA), the following qualifiers are applied: All positive sample results less than five times the highest blank concentration are qualified as estimates and flagged "J"; sample results below the MDA are qualified as undetected and flagged "U"; sample results above the MDA and greater than five times the highest blank concentration are not qualified.

All laboratory blank results were acceptable.

Field (Equipment) Blank

No field blanks were submitted for analysis.

- **Accuracy**

Accuracy is evaluated from laboratory control sample (LCS) or blank spike sample (BSS) batch samples and spiked samples from the analytical batch. Measured activities are compared to the known added amounts. The acceptable LCS or BSS and matrix spike (MS) recovery range is 70-130%. In addition, samples may be spiked with a radiochemical tracer to assist in isolating the radioisotope of interest with the yield of the tracer being used in calculating sample activity. The acceptable range for tracer recovery is 20% to 105%. Spike sample results outside the above ranges result in associated sample results being qualified as estimates, or not qualified, depending on the activity of the individual sample. Results are rejected for LCS/BSS recoveries of less than 30% and tracer recoveries of less than 5%.

All accuracy results were acceptable.

- **Laboratory Duplicates**

Analytical precision is expressed by the relative percent differences (RPD) between the recoveries of duplicate matrix spike analyses performed on a sample in the analytical batch. Precision may alternatively be assessed using unspiked duplicate analyses performed on a sample in the analytical batch. If both sample and replicate activities (concentrations) are greater than five times the contract required detection limit (CRDL) and the RPD is less than 30%, no qualification is required. If either activity (concentration) is less than five times the CRDL, the RPD control limit is less than or equal to two times the CRDL. If the RPD is outside the applicable control limit, associated results are qualified as estimated detects or estimated non-detects.

All duplicate results were acceptable.

Field Duplicates

One set of field duplicates (J1V2R6/J1V2R9) were submitted for analysis. Field duplicates are compared using the same criteria as for laboratory duplicates. All field duplicate results were acceptable.

- **Detection Levels**

Reported analytical detection levels for undetected analytes are compared against the remaining waste sites RQLs to ensure that laboratory detection levels meet the required criteria. Thirteen analytes exceeded the RQL. Under the WCH statement of work, no qualification is required. All other analytes met the RQL.

- **Completeness**

Data package No. JP0887 was submitted for validation and verified for completeness. Completeness is based on the percentage of data determined to be valid (i.e., not rejected). The completion percentage was 100%.

MAJOR DEFICIENCIES

None found.

MINOR DEFICIENCIES

None found,

REFERENCES

Washington Closure Hanford Contract #S00W307A00 (March 2008), *Data Validation Services*.

DOE/RL-96-22, Rev. 5, *100 Area Remedial Action Sampling and Analysis Plan*, U.S. Department of Energy, September 2009.

Appendix 1

Glossary of Data Reporting Qualifiers

Qualifiers which may be applied by data validators in compliance with the WCH statement of work are as follows:

U - Indicates the compound or analyte was analyzed for and not detected above the minimum detectable activity (MDA) in the sample. The value reported is the sample result corrected for sample dilution and moisture content by the laboratory. The data is usable for decision making purposes.

UJ - Indicates the compound or analyte was analyzed for and not detected at concentrations above the minimum detectable activity (MDA) in the sample. *Due to a minor QC deficiency identified during the data validation, the* associated quantitation limit is an estimate, but is usable for decision making purposes.

J - Indicates the compound or analyte was analyzed for and detected. Due to a minor QC deficiency identified during the data validation, the associated concentration is an estimate, but the data are usable for decision-making purposes.

R - Indicates the compound or analyte was analyzed for, detected, and due to an identified major QC deficiency, the data are unusable.

UR - Indicates the compound or analyte was analyzed for and not detected in the sample. Additionally, the data is unusable due to an identified major QC deficiency.

Appendix 2

Summary of Data Qualification

RADIOCHEMISTRY DATA QUALIFICATION SUMMARY*

SDG: JP0887	REVIEWER: ELR	Project: 100-H-59:1	PAGE 1 OF 1
COMMENTS: No qualifiers assigned			

* - The Qualified Data Summary Table includes laboratory applied "U" qualifiers not specifically identified here. The laboratory applied "U" qualifiers are included to minimize misinterpretation of results contained in the table.

Appendix 3

Annotated Laboratory Reports

Sample Results Summary
TestAmerica Inc TARL

Ordered by Method, Batch No., Client Sample ID.

Date: 08-Jan-15

Report No. : 64151

SDG No: JP0887

Batch	Client Id Work Order	Parameter	Result +- Uncertainty (2s)	Qual	Units	Tracer Yield	MDL	CRDL	RPD
5007024 GAMMA_GS									
J1V2P7									
	M5V6F1AA	AG-108M	-4.92E-04 +- 8.5E-03	U	pCi/g		1.46E-02		
		AMERICIUM 241	-1.12E-02 +- 1.7E-02	U	pCi/g		2.83E-02		
		BA-133	5.98E-03 +- 1.2E-02	U	pCi/g		1.91E-02		
		CO-60	-4.10E-03 +- 1.4E-02	U	pCi/g		2.19E-02	5.00E-02	
		CS-137	4.10E-03 +- 1.3E-02	U	pCi/g		2.20E-02	1.00E-01	
		EU-152	-2.79E-02 +- 2.6E-02	U	pCi/g		4.11E-02	1.00E-01	
		EU-154	-1.88E-02 +- 4.3E-02	U	pCi/g		7.18E-02	1.00E-01	
		EU-155	3.80E-02 +- 2.5E-02	U	pCi/g		4.30E-02	1.00E-01	
		K-40	1.31E+01 +- 1.5E+00		pCi/g		1.86E-01		
J1V2P7 DUP									
	M5V6F1AC	AG-108M	-7.58E-04 +- 8.0E-03	U	pCi/g		1.39E-02		-42.5
		AMERICIUM 241	6.35E-05 +- 1.6E-02	U	pCi/g		2.70E-02		-202.3
		BA-133	4.22E-03 +- 1.2E-02	U	pCi/g		1.81E-02		34.6
		CO-60	5.25E-03 +- 1.3E-02	U	pCi/g		2.45E-02	5.00E-02	1615.3
		CS-137	1.06E-03 +- 1.2E-02	U	pCi/g		2.10E-02	1.00E-01	117.5
		EU-152	2.24E-02 +- 2.5E-02	U	pCi/g		4.35E-02	1.00E-01	-1843.7
		EU-154	-8.30E-03 +- 4.5E-02	U	pCi/g		7.82E-02	1.00E-01	-77.4
		EU-155	4.29E-02 +- 3.1E-02		pCi/g		3.67E-02	1.00E-01	12.1
		K-40	1.29E+01 +- 1.5E+00		pCi/g		1.63E-01		1.5
J1V2P8									
	M5V6H1AA	AG-108M	-1.99E-03 +- 9.2E-03	U	pCi/g		1.58E-02		
		AMERICIUM 241	8.90E-03 +- 1.7E-02	U	pCi/g		2.86E-02		
		BA-133	-3.81E-03 +- 1.4E-02	U	pCi/g		2.04E-02		
		CO-60	3.04E-03 +- 1.4E-02	U	pCi/g		2.61E-02	5.00E-02	
		CS-137	1.83E-02 +- 1.4E-02	U	pCi/g		2.62E-02	1.00E-01	
		EU-152	4.23E-03 +- 2.8E-02	U	pCi/g		4.81E-02	1.00E-01	
		EU-154	2.72E-02 +- 4.7E-02	U	pCi/g		8.70E-02	1.00E-01	
		EU-155	3.90E-02 +- 2.6E-02	U	pCi/g		4.51E-02	1.00E-01	
		K-40	1.33E+01 +- 1.6E+00		pCi/g		1.85E-01		
J1V2P9									
	M5V6J1AA	AG-108M	-4.03E-03 +- 1.0E-02	U	pCi/g		1.69E-02		
		AMERICIUM 241	-2.78E-03 +- 2.1E-02	U	pCi/g		3.56E-02		
		BA-133	-5.49E-03 +- 1.4E-02	U	pCi/g		2.17E-02		
		CO-60	6.56E-03 +- 1.4E-02	U	pCi/g		2.53E-02	5.00E-02	
		CS-137	2.75E-03 +- 1.4E-02	U	pCi/g		2.47E-02	1.00E-01	
		EU-152	-2.16E-02 +- 3.3E-02	U	pCi/g		5.25E-02	1.00E-01	
		EU-154	2.19E-02 +- 5.0E-02	U	pCi/g		9.12E-02	1.00E-01	

TestAmerica Inc

rptTALRchSaSummary2 V5.3.6.4 A2002

RPD - Relative Percent Difference.

U Qual - Analyzed for but not detected above limiting criteria, Mdc/Mda/Mdl, Total Uncert, RDL or not identified by gamma scan software.

Sample Results Summary

TestAmerica Inc TARL

Ordered by Method, Batch No., Client Sample ID.

1/26/15

Date: 08-Jan-15

Report No. : 64151

SDG No: JP0887

Batch	Client Id Work Order	Parameter	Result +- Uncertainty (2s)	Qual	Units	Tracer Yield	MDL	CRDL	RPD
5007024 GAMMA_GS									
J1V2P9									
	M5V6J1AA	EU-155	4.40E-02 +- 3.1E-02	U	pCi/g		5.24E-02	1.00E-01	
		K-40	1.36E+01 +- 1.6E+00		pCi/g		1.93E-01		
J1V2R0									
	M5V6K1AA	AG-108M	1.78E-03 +- 1.4E-02	U	pCi/g		2.50E-02		
		AMERICIUM 241	-9.75E-02 +- 9.2E-02	U	pCi/g		1.49E-01		
		BA-133	1.05E-01 +- 3.0E-02	U	pCi/g		4.54E-02		
		CO-60	3.50E-03 +- 1.7E-02	U	pCi/g		3.04E-02	5.00E-02	
		CS-137	6.35E-02 +- 2.1E-02	U	pCi/g		3.84E-02	1.00E-01	
		EU-152	4.07E-02 +- 1.3E-01	U	pCi/g		8.37E-02	1.00E-01	
		EU-154	2.99E-02 +- 5.8E-02	U	pCi/g		1.03E-01	1.00E-01	
		EU-155	4.28E-02 +- 6.5E-02	U	pCi/g		1.09E-01	1.00E-01	
		K-40	1.43E+01 +- 1.8E+00		pCi/g		2.57E-01		
J1V2R1									
	M5V6N1AA	AG-108M	2.61E-03 +- 1.6E-02	U	pCi/g		2.71E-02		
		AMERICIUM 241	-1.59E-02 +- 7.1E-02	U	pCi/g		1.16E-01		
		BA-133	-1.48E-03 +- 2.5E-02	U	pCi/g		3.68E-02		
		CO-60	-5.45E-03 +- 2.1E-02	U	pCi/g		3.61E-02	5.00E-02	
		CS-137	-1.43E-02 +- 2.0E-02	U	pCi/g		3.23E-02	1.00E-01	
		EU-152	-5.20E-02 +- 5.3E-02	U	pCi/g		8.32E-02	1.00E-01	
		EU-154	-7.17E-02 +- 6.7E-02	U	pCi/g		1.05E-01	1.00E-01	
		EU-155	4.48E-02 +- 5.4E-02	U	pCi/g		9.18E-02	1.00E-01	
		K-40	1.35E+01 +- 1.8E+00		pCi/g		2.69E-01		
J1V2R2									
	M5V6Q1AA	AG-108M	6.88E-04 +- 9.7E-03	U	pCi/g		1.61E-02		
		AMERICIUM 241	-6.04E-03 +- 1.9E-02	U	pCi/g		3.28E-02		
		BA-133	-8.74E-03 +- 1.4E-02	U	pCi/g		2.04E-02		
		CO-60	-1.16E-02 +- 1.4E-02	U	pCi/g		2.29E-02	5.00E-02	
		CS-137	4.87E-02 +- 2.7E-02		pCi/g		2.37E-02	1.00E-01	
		EU-152	-1.54E-02 +- 3.1E-02	U	pCi/g		4.98E-02	1.00E-01	
		EU-154	3.19E-02 +- 4.6E-02	U	pCi/g		8.43E-02	1.00E-01	
		EU-155	3.57E-02 +- 3.0E-02	U	pCi/g		4.99E-02	1.00E-01	
		K-40	1.45E+01 +- 1.7E+00		pCi/g		1.87E-01		
J1V2R3									
	M5V6R1AA	AG-108M	1.27E-02 +- 1.1E-02	U	pCi/g		1.50E-02		
		AMERICIUM 241	1.99E-02 +- 2.0E-02	U	pCi/g		3.11E-02		
		BA-133	3.89E-03 +- 1.3E-02	U	pCi/g		2.07E-02		
		CO-60	3.61E-03 +- 1.4E-02	U	pCi/g		2.53E-02	5.00E-02	

TestAmerica Inc

rptTALRchSaSummary2 V6.3.6.4 A2002

RPD - Relative Percent Difference.

U Qual - Analyzed for but not detected above limiting criteria, Mdc/Mda/Mdl, Total Uncert, RDL or not identified by gamma scan software.

Sample Results Summary

TestAmerica Inc TARL

Ordered by Method, Batch No., Client Sample ID.

1/26/15

Date: 08-Jan-15

Report No. : 64151

SDG No: JP0887

Batch	Client Id Work Order	Parameter	Result +- Uncertainty (2s)	Qual	Units	Tracer Yield	MDL	CRDL	RPD
5007024 GAMMA_GS									
J1V2R3									
	M5V6R1AA	CS-137	6.17E-02 +- 2.3E-02		pCi/g		2.17E-02	1.00E-01	
		EU-152	-8.56E-03 +- 2.9E-02	U	pCi/g		4.81E-02	1.00E-01	
		EU-154	2.47E-03 +- 4.8E-02	U	pCi/g		8.29E-02	1.00E-01	
		EU-155	5.53E-02 +- 4.1E-02		pCi/g		4.32E-02	1.00E-01	
		K-40	1.35E+01 +- 1.6E+00		pCi/g		2.35E-01		
J1V2R4									
	M5V6T1AA	AG-108M	-8.10E-03 +- 1.6E-02	U	pCi/g		2.63E-02		
		AMERICIUM 241	-7.75E-03 +- 9.7E-02	U	pCi/g		1.61E-01		
		BA-133	1.26E-01 +- 3.3E-02	U	pCi/g		4.90E-02		
		CO-60	-1.01E-02 +- 1.7E-02	U	pCi/g		2.85E-02	5.00E-02	
		CS-137	1.11E-02 +- 1.8E-02	U	pCi/g		3.21E-02	1.00E-01	
		EU-152	4.69E-02 +- 1.4E-01	U	pCi/g		8.88E-02	1.00E-01	
		EU-154	-7.18E-02 +- 6.1E-02	U	pCi/g		9.69E-02	1.00E-01	
		EU-155	-3.12E-03 +- 6.8E-02	U	pCi/g		1.12E-01	1.00E-01	
		K-40	1.41E+01 +- 1.8E+00		pCi/g		2.32E-01		
J1V2R5									
	M5V6V1AA	AG-108M	-3.67E-04 +- 1.7E-02	U	pCi/g		2.90E-02		
		AMERICIUM 241	1.26E-03 +- 7.5E-02	U	pCi/g		1.23E-01		
		BA-133	-5.93E-03 +- 2.6E-02	U	pCi/g		3.82E-02		
		CO-60	-9.83E-03 +- 2.0E-02	U	pCi/g		3.35E-02	5.00E-02	
		CS-137	-2.05E-02 +- 2.2E-02	U	pCi/g		3.48E-02	1.00E-01	
		EU-152	-1.88E-02 +- 5.9E-02	U	pCi/g		9.23E-02	1.00E-01	
		EU-154	5.16E-03 +- 6.9E-02	U	pCi/g		1.22E-01	1.00E-01	
		EU-155	4.86E-02 +- 5.6E-02	U	pCi/g		9.52E-02	1.00E-01	
		K-40	1.49E+01 +- 2.0E+00		pCi/g		3.32E-01		
J1V2R6									
	M5V6W1AA	AG-108M	-3.83E-03 +- 1.6E-02	U	pCi/g		2.76E-02		
		AMERICIUM 241	-8.77E-02 +- 9.8E-02	U	pCi/g		1.59E-01		
		BA-133	1.22E-01 +- 3.3E-02	U	pCi/g		4.97E-02		
		CO-60	1.49E-02 +- 1.8E-02	U	pCi/g		3.32E-02	5.00E-02	
		CS-137	-7.92E-03 +- 1.9E-02	U	pCi/g		3.24E-02	1.00E-01	
		EU-152	-8.67E-02 +- 1.6E-01	U	pCi/g		8.80E-02	1.00E-01	
		EU-154	-1.84E-02 +- 5.8E-02	U	pCi/g		9.88E-02	1.00E-01	
		EU-155	2.57E-02 +- 6.7E-02	U	pCi/g		1.13E-01	1.00E-01	
		K-40	1.44E+01 +- 1.8E+00		pCi/g		2.80E-01		
J1V2R7									
	M5V6X1AA	AG-108M	-3.87E-04 +- 1.8E-02	U	pCi/g		3.14E-02		

TestAmerica Inc

rptTALRchSaSummary2 V5.3.6.4 A2002

RPD - Relative Percent Difference.

U Qual - Analyzed for but not detected above limiting criteria, Mdc/Mda/Mdl, Total Uncert, RDL or not identified by gamma scan software.

Sample Results Summary
TestAmerica Inc TARL

Ordered by Method, Batch No., Client Sample ID.

1/20/15

Date: 08-Jan-15

Report No. : 64151

SDG No: JP0887

Batch	Client Id / Work Order	Parameter	Result +- Uncertainty (2s)	Qual	Units	Tracer Yield	MDL	CRDL	RPD
5007024 GAMMA_GS									
	J1V2R7								
	M5V6X1AA	AMERICIUM 241	3.34E-02 +- 8.8E-02	U	pCi/g		1.43E-01		
		BA-133	3.38E-02 +- 3.0E-02	U	pCi/g		4.76E-02		
		CO-60	-3.52E-03 +- 2.2E-02	U	pCi/g		3.91E-02	5.00E-02	
		CS-137	7.79E-02 +- 3.5E-02		pCi/g		4.01E-02	1.00E-01	
		EU-152	-2.78E-02 +- 7.2E-02	U	pCi/g		1.04E-01	1.00E-01	
		EU-154	-1.89E-02 +- 7.8E-02	U	pCi/g		1.34E-01	1.00E-01	
		EU-155	6.57E-02 +- 6.5E-02	U	pCi/g		1.11E-01	1.00E-01	
		K-40	1.49E+01 +- 2.0E+00		pCi/g		3.31E-01		
	J1V2R8								
	M5V601AA	AG-108M	-2.44E-03 +- 1.9E-02	U	pCi/g		3.15E-02		
		AMERICIUM 241	2.10E-02 +- 7.4E-02	U	pCi/g		1.27E-01		
		BA-133	-5.00E-03 +- 3.2E-02	U	pCi/g		4.66E-02		
		CO-60	-8.04E-03 +- 2.6E-02	U	pCi/g		4.47E-02	5.00E-02	
		CS-137	-5.37E-03 +- 2.6E-02	U	pCi/g		4.26E-02	1.00E-01	
		EU-152	-5.93E-04 +- 6.9E-02	U	pCi/g		1.16E-01	1.00E-01	
		EU-154	-3.71E-04 +- 8.7E-02	U	pCi/g		1.53E-01	1.00E-01	
		EU-155	5.65E-02 +- 7.3E-02	U	pCi/g		1.21E-01	1.00E-01	
		K-40	1.40E+01 +- 1.9E+00		pCi/g		3.52E-01		
	J1V2R9								
	M5V611AA	AG-108M	-1.58E-02 +- 1.6E-02	U	pCi/g		2.56E-02		
		AMERICIUM 241	-1.48E-02 +- 1.0E-01	U	pCi/g		1.65E-01		
		BA-133	1.33E-01 +- 3.4E-02	U	pCi/g		5.02E-02		
		CO-60	-6.13E-03 +- 1.7E-02	U	pCi/g		2.90E-02	5.00E-02	
		CS-137	-4.01E-03 +- 2.0E-02	U	pCi/g		3.32E-02	1.00E-01	
		EU-152	5.07E-02 +- 1.4E-01	U	pCi/g		8.90E-02	1.00E-01	
		EU-154	-7.79E-03 +- 5.4E-02	U	pCi/g		9.27E-02	1.00E-01	
		EU-155	-1.63E-02 +- 6.9E-02	U	pCi/g		1.14E-01	1.00E-01	
		K-40	1.34E+01 +- 1.7E+00		pCi/g		2.57E-01		

No. of Results: 126

TestAmerica Inc

rptTALRchSaSummary2 V5.3.6.4
A2002

RPD - Relative Percent Difference.

U Qual - Analyzed for but not detected above limiting criteria, Mdc/Mda/Mdl, Total Uncert, RDL or not identified by gamma scan software.

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

Certificate of Analysis

Washington Hanford Closure
2620 Fermi Avenue
Richland, WA 99354

January 8, 2015

Attention: Joan Kessner

SAF Number	:	RC-107
Date SDG Closed	:	January 6, 2015
Number of Samples	:	Thirteen (13)
Sample Type	:	Soil
SDG Number	:	JP0887
Data Deliverable	:	7– Day / Summary

CASE NARRATIVE

I. Introduction

On January 6, 2015, thirteen soil samples were received at TestAmerica for radiochemical analysis. Upon receipt, the samples were assigned the following laboratory ID number to correspond with the Washington Closure Hanford (WCH) specific ID:

WCH ID#	TARL ID#	MATRIX	DATE OF RECEIPT
J1V2P7	M5V6F	SOIL	1/06/15
J1V2P8	M5V6H	SOIL	1/06/15
J1V2P9	M5V6J	SOIL	1/06/15
J1V2R0	M5V6K	SOIL	1/06/15
J1V2R1	M5V6N	SOIL	1/06/15
J1V2R2	M5V6Q	SOIL	1/06/15
J1V2R3	M5V6R	SOIL	1/06/15
J1V2R4	M5V6T	SOIL	1/06/15
J1V2R5	M5V6V	SOIL	1/06/15
J1V2R6	M5V6W	SOIL	1/06/15
J1V2R7	M5V6X	SOIL	1/06/15
J1V2R8	M5V60	SOIL	1/06/15
J1V2R9	M5V61	SOIL	1/06/15

II. Sample Receipt

The samples were received in good condition and no anomalies were noted during check-in.

III. Analytical Results/Methodology

The analytical results for this report are presented by laboratory sample ID. Each set of data includes sample identification information, analytical results and the appropriate associated statistical errors.

The requested analyses were:

Gamma Spectroscopy
Gamma Spec by method RL-GAM-001

IV. Quality Control

The analytical results for each analysis performed includes a minimum of one laboratory control sample (LCS), one method (reagent) blank, and one duplicate sample analysis. Any exceptions have been noted in the "Comments" section.

QC and sample results are reported in the same units.

V. Comments

Gamma Spectroscopy
Gamma Spec by method RL-GAM-001:
The CRDL was not met for some of the analytes. Except as noted, the LCS, batch blank, sample and sample duplicate (J1V2P7) results are within contractual requirements.

I certify that this Certificate of Analysis is in compliance with the SOW, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hard copy data package has been authorized by the Laboratory Manager, or a designee as verified by the following signature.

Reviewed and approved:

Rhonda Wagar
Project Manager

TestAmerica Laboratories, Inc.

Washington Closure Hanford — CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

RC-107-125

Collector: H. Weber	Company Contact: Joan Kessner	Telephone No.: 375-4688	Project Coordinator: KESSNER, JH
Price Code: 8B	Data Turnaround: 7 days		
Project Designation: 100-H Field Remediation	Sampling Location: 100-H-59:1, Verification, EXC		SAF No.: RC-107
Ice Chest No.: AFS-04-121	Field Logbook No.: DWS EL-1627-0809 1/5/15	COA: 010H592000	Method of Shipment: Local Delivery ~~fed EX~~ 1-5-15 CMB
Shipped To: TestAmerica Richland	Offsite Property No.: NA		Bill of Lading/Air Bill No.: NA

Other Labs Shipped To: TestAmerica Denver

POSSIBLE SAMPLE HAZARDS/REMARKS
None

Special Handling and/or Storage
None

Preservation	None										
Type of Container	G/P										
No. of Container(s)	1										
Volume	1000mL										
Sample Analysis	See item (2) in Special Instructions										

Sample No.	Matrix	Sample Date	Sample Time									
J1V2P7 MSV6F	SOIL	1/5/15	1044	✓								
J1V2P8 MSV6H	SOIL	1/5/15	1040	✓								
J1V2P9 MSV6J	SOIL	1/5/15	1051	✓								
J1V2R0 MSV6K	SOIL	1/5/15	1058	✓								
J1V2R1 MSV6N	SOIL	1/5/15	1034	✓								

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
Heather Weber	1/5/15 1102	Dusher Dwshea (WCH)	1/5/15 1102
Dusher Dwshea	1/5/15 1610	C. Bingham	1-5-15 1610
C. Bingham	1-5-15 1625	1060 Battelle, fridge #1A	1-5-15 1625
1060 Battelle, fridge #1A	1-6-15 0740	C. Bingham	1-6-15 0740
C. Bingham WCH	1-6-15 1315	J. Bock, TARL	1-6-15 1315

FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

WCH-EE-011

SPECIAL INSTRUCTIONS

(2) Gamma Spec (Client List) {Americium-241, Barium-133, Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155, Silver-108 metastable}

J5A060436

J5A060436

Due 1-13-15

REVIEWED BY KW DATE 1/6/15

Sub:

JP0887

TestAmerica Laboratories, Inc.

Washington Closure Hanford

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

RC-107-125

Collector: H. Weber	Company Contact: Joan Kessner	Telephone No.: 375-4688	Project Coordinator: KESSNER, JH
Price Code: 8B	Data Turnaround: 7 days		
Project Designation: 100-H Field Remediation	Sampling Location: 100-H-59:1, Verification, EXC		SAF No.: RC-107
Ice Chest No.: AFS-04-121	Field Logbook No.: DMS EL-1627-08/09 1/5/15	COA: 010H592000	Method of Shipment: Local Delivery
Shipped To: TestAmerica Richland	Offsite Property No.: NA		Bill of Lading/Air Bill No.: NA

Other Labs Shipped To: TestAmerica Denver

POSSIBLE SAMPLE HAZARDS/REMARKS
None

Special Handling and/or Storage
None

Preservation	None										
Type of Container	G/P										
No. of Container(s)	1										
Volume	1000mL										
Sample Analysis	See item (2) in Special Instructions										

Sample No.	Matrix	Sample Date	Sample Time									
J1V2R2 mSV6Q	SOIL	1/5/15	1010	✓								
J1V2R3 mSV6R	SOIL	1/5/15	1016	✓								
J1V2R4 mSV6T	SOIL	1/5/15	1023	✓								
J1V2R5 mSV6V	SOIL	1/5/15	0943	✓								
J1V2R6 mSV6W	SOIL	1/5/15	0936	✓								

CHAIN OF POSSESSION

Sign/Print Names

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
Heather Weber	1/5/15 1102	(WCH) Joshua Joshua	1/5/15 1102
Joshua Joshua	1/5/15 1610	C. Bingham	1-5-15 1610
C. Bingham	1-5-15 1625	1060 Battelle, Fridge #1A	1-5-15 1625
1060 Battelle, Fridge #1A	1-6-15 0740	C. Bingham	1-6-15 0740
C. Bingham WCH	1-6-15 1315	J. Bock, TARL	1-6-15 1315

FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

SPECIAL INSTRUCTIONS

(2) Gamma Spec (Client List) (Americium-241, Barium-133, Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155, Silver-108 metastable)

JSA 060436
Due 1-13-15

REVIEWED BY KW
DATE 1/16/15

JP0887

WCH-EE-011

Washington Closure Hanford — CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

RC-107-125

Collector: Hilweber	Company Contact: Joan Kessner	Telephone No.: 375-4688	Project Coordinator: KESSNER, JH
Price Code: 8B	Data Turnaround: 7 days		
Project Designation: 100-H Field Remediation	Sampling Location: 100-H-59:1, Verification, EXC		SAF No.: RC-107
Ice Chest No.: AFS-04-121	Field Logbook No.: DWS EL-1627-0609 1/5/15	COA: 010H592000	Method of Shipment: Local Delivery
Shipped To: TestAmerica Richland	Offsite Property No.: NA		Bill of Lading/Air Bill No.: NA

Other Labs Shipped To: TestAmerica Denver

POSSIBLE SAMPLE HAZARDS/REMARKS
None

Special Handling and/or Storage
None

Preservation	None										
Type of Container	G/P										
No. of Container(s)	1										
Volume	1000mL										
Sample Analysis	See item (2) in Special Instructions										

Sample No.	Matrix	Sample Date	Sample Time										
J1V2R7 MSV6X	SOIL	1/5/15	0727	✓									
J1V2R8 MSV60	SOIL	1/5/15	0920	✓									
J1V2R9 MSV61	SOIL	1/5/15	0936	✓									

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
Heather Weber	1/5/15 1102	(WCH) DWSHEA	1/5/15 1102
DWSHEA	1/5/15 1610	C. Bingham	1-5-15 1610
C. Bingham	1-5-15 1625	1060 Battelle, fridge #14	1-5-15 1625
1060 Battelle, fridge #14	1-6-15 0740	C. Bingham	1-6-15 0740
C. Bingham WCH	1-6-15 1315	J. Bock, TARL	1-6-15 1315

FINAL SAMPLE DISPOSITION — Disposal Method: | Disposed By: | Date/Time:

SPECIAL INSTRUCTIONS
(2) Gamma Spec (Client List) (Americium-241, Barium-133, Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155, Silver-108 metastable)

JSA060436
Due 1-13-15

REVIEWED BY KW DATE 1/6/15

JP0887

WCH-EE-011

Appendix 5

Data Validation Supporting Documentation

APPENDIX A

RADIOCHEMICAL DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
PROJECT:	100-H-55:1		DATA PACKAGE:	JP0887	
VALIDATOR:	ELR	LAB: TAL		DATE: 1/25/18	
			SDG:	JP0887	

ANALYSES PERFORMED

☐ Gross Alpha/Beta	☐ Strontium-90	☐ Technetium-99	☐ Alpha Spectroscopy	☒ Gamma Spectroscopy	
☐ Total Uranium	☐ Radium-22	☐ Tritium			

SAMPLES/MATRIX

J1V2P7	J1V2P8	J1V2P9	J1V2R0	J1V2R1
J1V2R2	J1V2R3	J1V2R4	J1V2R5	J1V2R6
J1V2R7	J1V2R8	J1V2R9		
				Soil

1. Completeness ..... ☐ N/A

Technical verification forms present? ..... Yes No N/A

Comments: _____

2. Initial Calibration (Levels D, E) ..... ☒ N/A

Instruments/detectors calibrated? ..... Yes No N/A

Initial calibration acceptable? ..... Yes No N/A

Standards NIST traceable? ..... Yes No N/A

Standards Expired? ..... Yes No N/A

Calculation check acceptable? ..... Yes No N/A

Comments: _____

3. Continuing Calibration (Levels D, E) ☒ N/A

Calibration checked within required frequency? ..... Yes No N/A

Calibration check acceptable? ..... Yes No N/A

Calibration check standards traceable? ..... Yes No N/A

Calibration check standards expired? ..... Yes No N/A

Calculation check acceptable? ..... Yes No N/A

Comments: _____

_____

_____

_____

_____

4. Background Counts (Levels D, E) ..... ☒ N/A

Background Counts checked within required frequency? ..... Yes No N/A

Background Counts acceptable? ..... Yes No N/A

Calculation check acceptable? ..... Yes No N/A

Comments: _____

_____

_____

_____

_____

5. Blanks (Levels B, C, D, E) ..... ☐ N/A

Method blank analyzed within required frequency? ..... Yes No N/A

Method blank results acceptable? ..... Yes No N/A

Analytes detected in method blank? ..... Yes No N/A

Field blank(s) analyzed? ..... Yes No N/A

Field blank results acceptable? ..... Yes No N/A

Analytes detected in field blank(s)? ..... Yes No N/A

Transcription/Calculation Errors? (Levels D, E) ..... Yes No N/A

Comments: no FB

6. Laboratory Control Samples or Blank Spike Samples (Levels C, D, E) ..... ☐ N/A

LCS /BSS analyzed within required frequency? ..... Yes No N/A

LCS/BSS recoveries acceptable? ..... Yes No N/A

LCS/BSS traceable? (Levels D,E) ..... Yes No N/A

LCS/BSS expired? (Levels D,E) ..... Yes No N/A

LCS/BSS levels correct? (Levels D,E) ..... Yes No N/A

Transcription/Calculation Errors? (Levels D, E) ..... Yes No N/A

Comments:

7. Chemical Carrier Recovery (Levels C, D, E) ..... ☒ N/A

Chemical carrier added? ..... Yes No N/A

Chemical recovery acceptable? ..... Yes No N/A

Chemical carrier traceable? (Levels D, E) ..... Yes No N/A

Chemical carrier expired? (Levels D, E) ..... Yes No N/A

Transcription/Calculation errors? (Levels D, E) ..... Yes No N/A

Comments: _____

_____

_____

_____

_____

8. Tracer Recovery (Levels C, D, E) ..... ☒ N/A

Tracer added? ..... Yes No N/A

Tracer recovery acceptable? ..... Yes No N/A

Tracer traceable? (Levels D, E) ..... Yes No N/A

Tracer expired? (Levels D, E) ..... Yes No N/A

Transcription/Calculation errors? (Levels D, E) ..... Yes No N/A

Comments: _____

_____

_____

_____

_____

9. Matrix Spikes (Levels C, D, E) ..... ☒ N/A

Matrix spike analyzed? ..... Yes No N/A

Spike recoveries acceptable? ..... Yes No N/A

Spike source traceable? (Levels D, E) ..... Yes No N/A

Spike source expired? Levels D, E) ..... Yes No N/A

Transcription/Calculation Errors? (Levels D, E) ..... Yes No N/A

Comments: _____

_____

_____

_____

_____

10. Duplicates (Levels C, D, E) ..... ☐ N/A

Duplicates Analyzed at required frequency? ..... Yes No N/A

RPD Values Acceptable? ..... Yes No N/A

Transcription/Calculation Errors? (Levels D, E) ..... Yes No N/A

Comments: _____

11. Field QC Samples (Levels C, D E) ..... ☐ N/A

Field duplicate sample(s) analyzed? ..... Yes No N/A

Field duplicate RPD values acceptable? ..... Yes No N/A

Field split sample(s) analyzed? ..... Yes No N/A

Field split RPD values acceptable? ..... Yes No N/A

Performance audit sample(s) analyzed? ..... Yes No N/A

Performance audit sample results acceptable? ..... Yes No N/A

Comments: _____

12. Holding Times (All levels)

Are sample holding times acceptable? ..... Yes No N/A

Comments: _____

13. Results and Detection Limits (All Levels) ..... ☐ N/A

Results reported for all required sample analyses? ..... Yes No N/A

Results supported in raw data?(Levels D, E) ..... Yes No N/A

Results Acceptable? (Levels D, E) ..... Yes No N/A

Transcription/Calculation errors? (Levels D, E) ..... Yes No N/A

MDA's meet required detection limits? ..... Yes No N/A

Transcription/calculation errors? (Levels D, E) ..... Yes No N/A

Comments: RPD - ~~IIII~~ ~~IIII~~ III

Appendix 6

Additional Documentation Requested by Client

QC Results Summary

TestAmerica Inc TARL

Ordered by Method, Batch No, QC Type,.

Date: 08-Jan-15

Report No. : 64151

SDG No.: JP0887

Batch Work Order	Parameter	Result +- Uncertainty (2s)	Qual	Units	Tracer Yield	LCS Recovery	Bias	MDL
GAMMA_GS								
5007024 BLANK QC,								
M5WDM1AA	AG-108M	7.82E-04 +- 1.0E-02	U	pCi/g				1.48E-02
	AMERICIUM 241	3.00E-03 +- 6.9E-02	U	pCi/g				1.16E-01
	BA-133	-9.79E-03 +- 1.5E-02	U	pCi/g				1.99E-02
	CO-60	-9.89E-04 +- 1.1E-02	U	pCi/g				1.91E-02
	CS-137	1.26E-02 +- 1.0E-02	U	pCi/g				1.99E-02
	EU-152	3.01E-02 +- 2.9E-02	U	pCi/g				5.26E-02
	EU-154	5.15E-03 +- 3.5E-02	U	pCi/g				6.37E-02
	EU-155	2.79E-03 +- 2.9E-02	U	pCi/g				5.03E-02
	K-40	-3.58E-01 +- 3.5E-01	U	pCi/g				7.28E-01
5007024 LCS,								
M5WDM1AC	CS-137	9.68E-01 +- 1.2E-01		pCi/g		97%	0.0	2.88E-02
	RA-226	8.85E-01 +- 1.2E-01		pCi/g		78%	-0.2	4.15E-02
	RA-228	5.45E-01 +- 1.2E-01		pCi/g		91%	-0.1	8.59E-02
	U-238	9.81E-01 +- 1.2E-01		pCi/g		82%	-0.2	3.95E-02

No. of Results: 13

TestAmerica Inc
rptSTLRchQcSummary V6.3.6.4
A2002

Bias - (Result/Expected)-1 as defined by ANSI N13.30.
U Qual - Analyzed for but not detected above limiting criteria, Mdc/Mda/Mdl, Total Uncert, RDL or not identified by gamma scan software.