SAF-RC-189
100N Field Remediation –
Soil Full Protocol
FINAL VALIDATION PACKAGE

COMPLETE COPY OF FINAL VALIDATION PACKAGE TO:

Kathy Wendt H4-21

COMMENTS:

SDG JP0801 SAF-RC-189

Sample Location: 100-N-104

Date: 2 June 2014
To: Washington Closure Hanford Inc. (technical representative)
From: ELR Consulting
Project: 100N Field Remediation – Soil Full Protocol - Waste Site 100-N-104
Subject: Wet Chemistry - Data Package No. JP0801-TAL

INTRODUCTION

This memo presents the results of data validation on Data Package No. JP0801 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
J1TLC4	5/16/14	Soil	C	See note 1
J1TLC5	5/16/14	Soil	C	See note 1
J1TLC6	5/16/14	Soil	C	See note 1
J1TLC7	5/16/14	Soil	C	See note 1
J1TLC8	5/16/14	Soil	C	See note 1
J1TLC9	5/16/14	Soil	C	See note 1
J1TLD0	5/16/14	Soil	C	See note 1
J1TLD1	5/16/14	Soil	C	See note 1
J1TLD2	5/16/14	Soil	C	See note 1
J1TLD3	5/16/14	Soil	C	See note 1
J1TLD4	5/16/14	Soil	C	See note 1
J1TLD5	5/16/14	Soil	C	See note 1
J1TLD6	5/16/14	Soil	C	See note 1

1 – Chromium VI by 7196A.

Data validation was conducted in accordance with the Washington Closure Hanford (WCH) validation statement of work and the 100-N Area Sampling and Analysis Plan for CERCLA Waste Sites (DOE/RL-2005-92, Rev. 0, October 2006). 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 30 days for chromium VI.

If holding times are exceeded, but not by greater than two times the limit, all associated sample results are qualified as estimates and flagged "J" for detects and "UJ" for non-detects. If holding times are exceeded by greater than two times the limit, all associated detectable sample results are qualified as estimates and flagged "J" and all non-detects are rejected and flagged "UR".

All holding times were acceptable.

- **Method Blanks**

Method Blanks

Method blank analyses are performed to determine the extent of laboratory contamination introduced through sampling, sample preparation and analysis. At least one acceptable method blank analysis must be conducted for every 20 samples. No contaminants should be present in the method blank. All blank results must fall below the contract required detection limit (CRQL) to be acceptable.

All method blank results were acceptable.

Field Blanks

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.

All 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 (J1TLC7/J1TLD6) 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 required quantitation limits (RQLs) to ensure that laboratory detection levels meet the required criteria. All analytes met the RQL.

- **Completeness**

Data package JP0801 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-2005-92, Rev. 0, 100-N *Area Sampling and Analysis Plan for CERCLA Waste Sites*, U.S. Department of Energy, October 2006.

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

WET CHEMISTRY DATA QUALIFICATION SUMMARY*

SDG: JP0801	REVIEWER: ELR	Project: 100-N-104	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: 27-May-14

Report No. : 60351

SDG No: JP0801

Batch	Client Id Work Order	Parameter	Result +- Uncertainty (2s)	Qual	Units	Tracer Yield	MDL	CRDL	RPD
4140023	SRTOT_SEP_PRECIP_GPC								
	J1TLD4								
	M3R7J4AC	STRONTIUM	6.88E-02 +- 1.1E-01	U	pCi/g	97%	2.32E-01		
	J1TLD5								
	M3R7K1AC	STRONTIUM	6.39E-02 +- 1.1E-01	U	pCi/g	96%	2.27E-01		
	J1TLD6								
	M3R7L1AC	STRONTIUM	9.19E-02 +- 1.2E-01	U	pCi/g	93%	2.56E-01		
4140060	7196_CR6								
	J1TLC4								
	M3R671AA	HEXCHROME	4.04E-01 +- 0.0E+00		mg/kg	N/A	1.55E-01	1.55E-01	
	M3R671AG	HEXCHROME	2.82E-01 +- 0.0E+00		mg/kg	N/A	1.55E-01	1.55E-01	35.6
	J1TLC5								
	M3R681AA	HEXCHROME	1.99E-01 +- 0.0E+00		mg/kg	N/A	1.55E-01	1.55E-01	
	J1TLC6								
	M3R691AA	HEXCHROME	1.55E-01 +- 0.0E+00	U	mg/kg	N/A	1.55E-01	1.55E-01	
	J1TLC7								
	M3R7A1AA	HEXCHROME	2.82E-01 +- 0.0E+00		mg/kg	N/A	1.55E-01	1.55E-01	
	J1TLC8								
	M3R7C1AA	HEXCHROME	1.55E-01 +- 0.0E+00	U	mg/kg	N/A	1.55E-01	1.55E-01	
	J1TLC9								
	M3R7D1AA	HEXCHROME	1.55E-01 +- 0.0E+00	U	mg/kg	N/A	1.55E-01	1.55E-01	
	J1TLD0								
	M3R7E1AA	HEXCHROME	2.39E-01 +- 0.0E+00		mg/kg	N/A	1.55E-01	1.55E-01	
	J1TLD1								
	M3R7F1AA	HEXCHROME	1.55E-01 +- 0.0E+00	U	mg/kg	N/A	1.55E-01	1.55E-01	
	J1TLD2								
	M3R7G1AA	HEXCHROME	3.23E-01 +- 0.0E+00		mg/kg	N/A	1.55E-01	1.55E-01	
	J1TLD3								
	M3R7H1AA	HEXCHROME	1.76E-01 +- 0.0E+00		mg/kg	N/A	1.55E-01	1.55E-01	
	J1TLD4								
	M3R7J1AA	HEXCHROME	1.55E-01 +- 0.0E+00	U	mg/kg	N/A	1.55E-01	1.55E-01	
	J1TLD5								
	M3R7K1AA	HEXCHROME	1.55E-01 +- 0.0E+00	U	mg/kg	N/A	1.55E-01	1.55E-01	
	J1TLD6								
	M3R7L1AA	HEXCHROME	2.58E-01 +- 0.0E+00		mg/kg	N/A	1.55E-01	1.55E-01	

No. of Results: 140

5/31/14

TestAmerica Inc

rptTALRchSaSummary2 V5.3.2
A2002

RPD - Relative Percent Difference.

U Qual - Analyzed for but not detected above limiting criteria. Limit criteria is less than the Mdc/Mda/Mdl, Total Uncert, CRDL, 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

May 27, 2014

Attention: Joan Kessner

SAF Number	:	RC-189
Date SDG Closed	:	May 19, 2014
Number of Samples	:	Thirteen (13)
Sample Type	:	Soil
SDG Number	:	JP0801
Data Deliverable	:	7– Day / Summary

CASE NARRATIVE

I. Introduction

On May 19, 2014, 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
J1TLC4	M3R67	SOIL	5/19/14
J1TLC5	M3R68	SOIL	5/19/14
J1TLC6	M3R69	SOIL	5/19/14
J1TLC7	M3R7A	SOIL	5/19/14
J1TLC8	M3R7C	SOIL	5/19/14
J1TLC9	M3R7D	SOIL	5/19/14
J1TLD0	M3R7E	SOIL	5/19/14
J1TLD1	M3R7F	SOIL	5/19/14
J1TLD2	M3R7G	SOIL	5/19/14
J1TLD3	M3R7H	SOIL	5/19/14
J1TLD4	M3R7J	SOIL	5/19/14
J1TLD5	M3R7K	SOIL	5/19/14
J1TLD6	M3R7L	SOIL	5/19/14

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:

Gas Proportional Counting
Strontium-90 by method RL-GPC-010
Gamma Spectroscopy
Gamma Spec by method RL-GAM-001
Chemical Analysis
Hexavalent Chromium by EPA method 7196A

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

Gas Proportional Counting
Strontium-90 by method RL-GPC-010:
The LCS, batch blank, samples and sample duplicate (J1TLC5) results are within contractual requirements.

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, samples and sample duplicate (J1TLC4) results are within contractual requirements.

Chemical Analysis
Hexavalent Chromium by EPA method 7196A
The LCS, batch blank, samples, sample duplicate (J1TLC4) and sample matrix spike (J1TLC4) 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

Washington Closure Hanford

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

RC-189-292

Collector: Q. Stowe	Company Contact: Joan Kessner	Telephone No.: 375-4688	Project Coordinator: KESSNER, JH
Price Code:	Data Turnaround: 7 day		
Project Designation: 100N Field Remediation	Sampling Location: 100-N-104 (verification)		SAF No.: RC-189
Ice Chest No.: N/A	Field Logbook No.: EL-1652-34 12 DWS 5/19/14	COA: 01N1042000	Method of Shipment: Local Delivery
Shipped To: TestAmerica Richland	Offsite Property No.: N/A		Bill of Lading/Air Bill No.: N/A

Other Labs Shipped To: TestAmerica Denver

POSSIBLE SAMPLE HAZARDS/REMARKS: N/A

Special Handling and/or Storage: ool 4C

Preservation	Cool 4C	None	None								
Type of Container	G/P	G/P	G/P								
No. of Container(s)	1	1	1								
Volume	125mL	1000mL	60mL								
Sample Analysis	Chromium Hex - 7196	See Item (2) in Special Instructions	Strontium-89,90 – Total Sr								

Sample No.	Matrix	Sample Date	Sample Time										
J1TLC4 M3R67	SOIL	5-16-14	1057	x	x	x							
J1TLC5 M3R68	SOIL	5-16-14	1106	x	x	x							
J1TLC6 M3R69	SOIL	5-16-14	1036	x	x	x							
J1TLC7 M3R7A	SOIL	5-16-14	1048	x	x	x							
J1TLC8 M3R7C	SOIL	5-16-14	1101	x	x	x							

CHAIN OF POSSESSION

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
Quincy Stowe	5-16-14 1141	DWSHEA	5/16/14 1141
DWSHEA	5/16/14 1307	Fridge 3A 1060 Battelle	5/16/14 1307
Fridge 3A 1060 Battelle	5/19/14 0820	DWSHEA	5/19/14 0820
DWSHEA	5/19/14 0823	SM Sexton	5/19/14 0823
SM Sexton	5/19/14 1340	J. Bock	TALS 5-19-14 1340

Sign/Print Names

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

WCH-EE-011

SPECIAL INSTRUCTIONS

(2) Gamma Spec (Client List) (Americium-241, Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155, Radium-226)

J4E190421

Due 5-27-14

REVIEWED BY K. Woodward DATE 5/19/14

JP0801

J4E190421

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	RC-189-292	Page 2 of 3

Collector: Q. Stowe	Company Contact: Joan Kessner	Telephone No.: 375-4688	Project Coordinator: KESSNER, JH
Price Code	Data Turnaround: 7day		
Project Designation: 100N Field Remediation	Sampling Location: 100-N-104 (verification)		SAF No.: RC-189
Ice Chest No.: N/A	Field Logbook No.: EL-1652-1/12 DWSHEA 5/19/14	COA: 01N1042000	Method of Shipment: Local Delivery
Shipped To: TestAmerica Richland	Offsite Property No.: N/A		Bill of Lading/Air Bill No.: N/A

Other Labs Shipped To: TestAmerica Denver

POSSIBLE SAMPLE HAZARDS/REMARKS
N/A

Special Handling and/or Storage
cool 4C

Preservation	Cool 4C	None	None								
Type of Container	G/P	G/P	G/P								
No. of Container(s)	1	1	1								
Volume	125mL	1000mL	60mL								
Sample Analysis	Chromium Hex - 7196	See item (2) in Special Instructions	Stronticum-89,90 – Total Sr								

Sample No.	Matrix	Sample Date	Sample Time										
J1TLC9 m3RND	SOIL	5-16-14	1017	X	X	X							
J1TLD0 m3RNE	SOIL	5-16-14	1021	X	X	X							
J1TLD1 m3RNF	SOIL	5-16-14	1033	X	X	X							
J1TLD2 m3RNG	SOIL	5-16-14	1043	X	X	X							
J1TLD3 m3RNH	SOIL	5-16-14	1005	X	X	X							

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
Quincy Stowe	5-16-14 1141	DWSHEA DWSHEA	5/16/14 1141
DWSHEA DWSHEA	5/16/14 1307	Fridge 3A	5/16/14 1307
Fridge 3A	5/19/14 0820	DWSHEA DWSHEA	5/19/14 0820
DWSHEA DWSHEA	5/19/14 0823	SM Sexton	5/19/14 0823
SM Sexton	5/19/14 1340	J Bock TAR	5-19-14 1340

FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

SPECIAL INSTRUCTIONS
(2) Gamma Spec (Client List) {Americium-241, Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155, Radium-226}

J4E190421

Due 5-27-14

REVIEWED BY K. [illegible] DATE 5/19/14

JP0801

WCH-EE-011

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	RC-189-292	Page 3 of 3

Collector: Q. Stowe	Company Contact: Joan Kessner	Telephone No.: 375-4688	Project Coordinator: KESSNER, JH
Project Designation: 100N Field Remediation	Sampling Location: 100-N-104 (verification)		SAF No.: RC-189
Ice Chest No.	Field Logbook No.: EL-1652-1/12 DWShea 5/17/14	COA: 01N1042000	Method of Shipment: Local Delivery
Shipped To: TestAmerica Richland	Offsite Property No.		Bill of Lading/Air Bill No.

Price Code:

Data Turnaround: 7day

Other Labs Shipped To: TestAmerica Denver

POSSIBLE SAMPLE HAZARDS/REMARKS: N/A

Special Handling and/or Storage: ool 4C

Preservation	Cool 4C	None	None								
Type of Container	G/P	G/P	G/P								
No. of Container(s)	1	1	1								
Volume	125mL	1000mL	60mL								
Sample Analysis	Chromium Hex - 7196	See Item (2) in Special Instructions	Strontium-89,90 -- Total Sr								

Sample No.	Matrix	Sample Date	Sample Time										
J1TLD4 M3RN7J	SOIL	5-16-14	1011	X	X	X							
J1TLD5 M3RN7K	SOIL	5-16-14	1026	X	X	X							
J1TLD6 M3RN7L	SOIL	5-16-14	1048	X	X	X							

CHAIN OF POSSESSION	Sign/Print Names
Relinquished By/Removed From: Quincy Stowe, Date/Time: 5-16-14 1141	Received By/Stored In: DWShea DWSHEA, Date/Time: 5/16/14 1141
Relinquished By/Removed From: DWShea DWSHEA, Date/Time: 5/16/14 1307	Received By/Stored In: 1062 Bridge 3A, Date/Time: 5/16/14 1307
Relinquished By/Removed From: Bridge 3A 1062, Date/Time: 5/19/14 0820	Received By/Stored In: DWShea DWSHEA, Date/Time: 5/19/14 0820
Relinquished By/Removed From: DWShea DWSHEA, Date/Time: 5/19/14 0823	Received By/Stored In: SM Sexton, Date/Time: 5/19/14 0823
Relinquished By/Removed From: SM Sexton, Date/Time: 5/19/14 1340	Received By/Stored In: J. Cook, Date/Time: 1340
Relinquished By/Removed From:	Received By/Stored In:
Relinquished By/Removed From:	Received By/Stored In:

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

SPECIAL INSTRUCTIONS

(2) Gamma Spec (Client List) {Americium-241, Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155, Radium-226}

J4E190421
Due 5-27-14

JP0801

REVIEWED BY K. Woodwell DATE 5/19/14

WCH-EE-011

Appendix 5

Data Validation Supporting Documentation

GENERAL CHEMISTRY ANALYSIS DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
PROJECT:	100-N-104		DATA PACKAGE:	JP0801	
VALIDATOR:	ELR	LAB: TAC		DATE: 5/31/14	
			SDG:	JP0801	

ANALYSES PERFORMED					
Anions/IC	TOC	TOX	TPH-418.1	Oil and Grease	Alkalinity
Ammonia	BOD/COD	Chloride	Chromium-VI	pH	NO_3/NO_2
Sulfate	TDS	TKN	~~Phosphate~~		

SAMPLES/MATRIX				
J1TLC4	J1TLC5	J1TLC6	J1TLC7	J1TLC8
J1TLC9	J1TLD0	J1TLD1	J1TLD2	J1TLD3
J1TLD4	J1TLD5	J1TLD6		
				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

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:

GENERAL CHEMISTRY 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)

Spike samples analyzed? ..... Yes No N/A

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

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

Spike 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: no PA

GENERAL CHEMISTRY 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. HOLDING TIMES (all levels)

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

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

Comments: _____

GENERAL CHEMISTRY ANALYSIS DATA VALIDATION CHECKLIST

7. 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

QC Results Summary

Date: 27-May-14

TestAmerica Inc TARL

Ordered by Method, Batch No, QC Type,.

Report No. : 60351

SDG No.: JP0801

Batch Work Order	Parameter	Result +- Uncertainty (2s)	Qual	Units	Tracer Yield	LCS Recovery	Bias	MDL
GAMMA_GS								
4140022 BLANK QC,								
M3TAK1AA	AMERICIUM 241	-6.03E-03 +- 1.0E-02	U	pCi/g				1.70E-02
	CO-60	6.89E-04 +- 8.6E-03	U	pCi/g				1.66E-02
	CS-137	-1.27E-03 +- 8.7E-03	U	pCi/g				1.53E-02
	EU-152	1.07E-02 +- 2.1E-02	U	pCi/g				3.73E-02
	EU-154	-8.42E-04 +- 2.4E-02	U	pCi/g				4.58E-02
	EU-155	-5.23E-03 +- 1.6E-02	U	pCi/g				2.59E-02
	K-40	-1.12E+00 +- 2.6E-01	U	pCi/g				4.49E-01
	RA-226	2.67E-02 +- 3.2E-02	U	pCi/g				2.73E-02
4140022 LCS,								
M3TAK1AC	CS-137	9.91E-01 +- 1.4E-01		pCi/g		98%	0.0	4.42E-02
	RA-226	1.00E+00 +- 1.7E-01		pCi/g		88%	-0.1	7.20E-02
SRTOT_SEP_PRECIP_GPC								
4140023 BLANK QC,								
M3TAL1AA	STRONTIUM	2.23E-02 +- 1.0E-01	U	pCi/g	98%			2.38E-01
4140023 LCS,								
M3TAL1AC	STRONTIUM	2.85E+00 +- 8.0E-01		pCi/g	93%	83%	-0.2	2.48E-01
7196_CR6								
4140060 MATRIX SPIKE, J1TLC4								
M3R671AF	HEXCHROME	2.65E+01 +- 0.0E+00		mg/kg	N/A	86%	-0.1	1.55E-01
4140060 LCS,								
M3TDG1AC	HEXCHROME	1.88E+01 +- 0.0E+00		mg/kg	N/A	94%	-0.1	1.55E-01
4140060 BLANK QC,								
M3TDG1AA	HEXCHROME	1.55E-01 +- 0.0E+00	U	mg/kg	N/A			1.55E-01

No. of Results: 15

TestAmerica Inc

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Bias - (Result/Expected)-1 as defined by ANSI N13.30.

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

Date: 2 June 2014
To: Washington Closure Hanford Inc. (technical representative)
From: ELR Consulting
Project: 100N Field Remediation – Soil Full Protocol - Waste Site 100-N-104
Subject: Radiochemistry - Data Package No. JP0801-TAL

INTRODUCTION

This memo presents the results of data validation on Data Package No. JP0801 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
J1TLC4	5/16/14	Soil	C	See note 1
J1TLC5	5/16/14	Soil	C	See note 1
J1TLC6	5/16/14	Soil	C	See note 1
J1TLC7	5/16/14	Soil	C	See note 1
J1TLC8	5/16/14	Soil	C	See note 1
J1TLC9	5/16/14	Soil	C	See note 1
J1TLD0	5/16/14	Soil	C	See note 1
J1TLD1	5/16/14	Soil	C	See note 1
J1TLD2	5/16/14	Soil	C	See note 1
J1TLD3	5/16/14	Soil	C	See note 1
J1TLD4	5/16/14	Soil	C	See note 1
J1TLD5	5/16/14	Soil	C	See note 1
J1TLD6	5/16/14	Soil	C	See note 1

1 – Gamma spectroscopy and total strontium.

Data validation was conducted in accordance with the Washington Closure Hanford (WCH) validation statement of work and the 100-N Area Sampling and Analysis Plan for CERCLA Waste Sites (DOE/RL-2005-92, Rev. 0, October 2006). 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 equipment 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 20%, and tracer recoveries of greater than 115% for detected results.

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 (J1TLC7/J1TLD6) 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. All analytes met the RQL.

- **Completeness**

Data package No. JP0801 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-2005-92, Rev. 0, 100-N *Area Sampling and Analysis Plan for CERCLA Waste Sites*, U.S. Department of Energy, October 2006.

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: JP0801	REVIEWER: ELR	Project: 100-N-104	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

Date: 27-May-14

TestAmerica Inc TARL

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

Report No. : 60351 — 5/31/14 — **SDG No:** JP0801

Batch	Client Id / Work Order	Parameter	Result +- Uncertainty (2s)	Qual	Units	Tracer Yield	MDL	CRDL	RPD
4140022 GAMMA_GS									
J1TLC4									
	M3R671AD	AMERICIUM 241	-1.19E-03 +- 1.3E-02	U	pCi/g		2.21E-02		
		CO-60	-3.06E-03 +- 1.1E-02	U	pCi/g		1.90E-02	5.00E-02	
		CS-137	5.31E-03 +- 1.1E-02	U	pCi/g		1.85E-02	1.00E-01	
		EU-152	-5.37E-03 +- 2.6E-02	U	pCi/g		4.13E-02	1.00E-01	
		EU-154	9.21E-03 +- 3.7E-02	U	pCi/g		6.73E-02	1.00E-01	
		EU-155	3.12E-02 +- 2.7E-02	U	pCi/g		3.21E-02	1.00E-01	
		K-40	1.07E+01 +- 1.3E+00		pCi/g		1.70E-01		
		RA-226	3.77E-01 +- 6.7E-02		pCi/g		3.42E-02		
J1TLC4 DUP									
	M3R671AE	AMERICIUM 241	1.20E-02 +- 6.0E-02	U	pCi/g		1.00E-01		244.1
		CO-60	5.52E-03 +- 1.8E-02	U	pCi/g		3.34E-02	5.00E-02	695.3
		CS-137	-3.77E-03 +- 1.9E-02	U	pCi/g		3.20E-02	1.00E-01	1177.6
		EU-152	1.30E-02 +- 5.2E-02	U	pCi/g		8.35E-02	1.00E-01	482.0
		EU-154	6.50E-03 +- 6.1E-02	U	pCi/g		1.08E-01	1.00E-01	34.4
		EU-155	-6.90E-03 +- 4.7E-02	U	pCi/g		7.96E-02	1.00E-01	313.3
		K-40	1.10E+01 +- 1.5E+00		pCi/g		2.36E-01		2.9
		RA-226	3.94E-01 +- 9.2E-02	U	pCi/g		1.18E-01		4.5
J1TLC5									
	M3R681AD	AMERICIUM 241	-1.99E-02 +- 1.9E-02	U	pCi/g		3.02E-02		
		CO-60	-5.45E-03 +- 1.5E-02	U	pCi/g		2.55E-02	5.00E-02	
		CS-137	4.00E-02 +- 1.6E-02		pCi/g		2.06E-02	1.00E-01	
		EU-152	3.68E-02 +- 2.8E-02	U	pCi/g		5.01E-02	1.00E-01	
		EU-154	-6.72E-05 +- 4.3E-02	U	pCi/g		7.65E-02	1.00E-01	
		EU-155	2.20E-02 +- 2.6E-02	U	pCi/g		4.61E-02	1.00E-01	
		K-40	1.41E+01 +- 1.7E+00		pCi/g		2.01E-01		
		RA-226	4.77E-01 +- 7.9E-02		pCi/g		3.75E-02		
J1TLC6									
	M3R691AD	AMERICIUM 241	6.44E-03 +- 1.7E-02	U	pCi/g		2.84E-02		
		CO-60	7.85E-02 +- 2.5E-02		pCi/g		2.20E-02	5.00E-02	
		CS-137	9.87E-02 +- 2.6E-02		pCi/g		2.04E-02	1.00E-01	
		EU-152	5.31E-03 +- 2.5E-02	U	pCi/g		4.36E-02	1.00E-01	
		EU-154	-2.71E-02 +- 4.0E-02	U	pCi/g		6.68E-02	1.00E-01	
		EU-155	2.55E-02 +- 2.6E-02	U	pCi/g		4.39E-02	1.00E-01	
		K-40	1.01E+01 +- 1.2E+00		pCi/g		1.78E-01		
		RA-226	3.75E-01 +- 7.1E-02		pCi/g		3.36E-02		
J1TLC7									
	M3R7A1AD	AMERICIUM 241	-3.35E-02 +- 6.5E-02	U	pCi/g		1.09E-01		

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RPD - Relative Percent Difference.

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

Sample Results Summary

Date: 27-May-14

TestAmerica Inc TARL

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

Report No. : 60351 5/31/14 SDG No: JP0801

Batch	Client Id Work Order	Parameter	Result +- Uncertainty (2s)	Qual	Units	Tracer Yield	MDL	CRDL	RPD
4140022 GAMMA_GS									
J1TLC7									
	M3R7A1AD	CO-60	3.33E-02 +- 1.7E-02	U	pCi/g		3.28E-02	5.00E-02	
		CS-137	5.09E-02 +- 2.9E-02		pCi/g		2.48E-02	1.00E-01	
		EU-152	-9.98E-02 +- 1.1E-01	U	pCi/g		7.20E-02	1.00E-01	
		EU-154	-3.07E-02 +- 4.6E-02	U	pCi/g		7.58E-02	1.00E-01	
		EU-155	-1.54E-02 +- 5.0E-02	U	pCi/g		8.26E-02	1.00E-01	
		K-40	1.01E+01 +- 1.3E+00		pCi/g		1.78E-01		
		RA-226	3.06E-01 +- 6.5E-02		pCi/g		4.72E-02		
J1TLC8									
	M3R7C1AD	AMERICIUM 241	-4.52E-02 +- 8.4E-02	U	pCi/g		1.39E-01		
		CO-60	6.25E-03 +- 1.5E-02	U	pCi/g		2.68E-02	5.00E-02	
		CS-137	4.22E-02 +- 1.6E-02		pCi/g		2.18E-02	1.00E-01	
		EU-152	9.37E-03 +- 3.3E-02	U	pCi/g		5.69E-02	1.00E-01	
		EU-154	-5.25E-02 +- 4.8E-02	U	pCi/g		7.48E-02	1.00E-01	
		EU-155	1.76E-03 +- 3.6E-02	U	pCi/g		6.17E-02	1.00E-01	
		K-40	1.24E+01 +- 1.6E+00		pCi/g		1.72E-01		
		RA-226	3.89E-01 +- 7.9E-02		pCi/g		3.99E-02		
J1TLC9									
	M3R7D1AD	AMERICIUM 241	-8.98E-03 +- 2.0E-02	U	pCi/g		3.45E-02		
		CO-60	-3.81E-03 +- 1.3E-02	U	pCi/g		2.25E-02	5.00E-02	
		CS-137	3.49E-02 +- 2.0E-02		pCi/g		2.58E-02	1.00E-01	
		EU-152	-2.61E-02 +- 3.5E-02	U	pCi/g		5.48E-02	1.00E-01	
		EU-154	-1.56E-02 +- 4.1E-02	U	pCi/g		6.86E-02	1.00E-01	
		EU-155	8.87E-03 +- 3.4E-02	U	pCi/g		5.52E-02	1.00E-01	
		K-40	1.01E+01 +- 1.2E+00		pCi/g		1.89E-01		
		RA-226	3.38E-01 +- 6.5E-02		pCi/g		3.87E-02		
J1TLD0									
	M3R7E1AD	AMERICIUM 241	1.09E-02 +- 1.4E-02	U	pCi/g		2.42E-02		
		CO-60	-5.00E-03 +- 1.2E-02	U	pCi/g		2.02E-02	5.00E-02	
		CS-137	2.67E-02 +- 1.7E-02		pCi/g		1.92E-02	1.00E-01	
		EU-152	-1.99E-02 +- 3.0E-02	U	pCi/g		4.06E-02	1.00E-01	
		EU-154	2.36E-02 +- 4.0E-02	U	pCi/g		7.37E-02	1.00E-01	
		EU-155	2.02E-02 +- 2.4E-02	U	pCi/g		3.44E-02	1.00E-01	
		K-40	1.27E+01 +- 1.5E+00		pCi/g		1.73E-01		
		RA-226	3.74E-01 +- 7.1E-02		pCi/g		3.33E-02		
J1TLD1									
	M3R7F1AD	AMERICIUM 241	-1.24E-02 +- 1.8E-02	U	pCi/g		2.89E-02		
		CO-60	5.24E-03 +- 1.3E-02	U	pCi/g		2.34E-02	5.00E-02	

TestAmerica Inc

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RPD - Relative Percent Difference.

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

Sample Results Summary

TestAmerica Inc TARL

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

Date: 27-May-14

Report No. : 60351

5/31/14

SDG No: JP0801

Batch	Client Id Work Order	Parameter	Result +- Uncertainty (2s)	Qual	Units	Tracer Yield	MDL	CRDL	RPD
4140022 GAMMA_GS									
J1TLD1									
	M3R7F1AD	CS-137	-4.62E-03 +- 1.4E-02	U	pCi/g		2.20E-02	1.00E-01	
		EU-152	-1.10E-02 +- 2.7E-02	U	pCi/g		4.48E-02	1.00E-01	
		EU-154	-1.51E-02 +- 4.2E-02	U	pCi/g		7.18E-02	1.00E-01	
		EU-155	5.43E-02 +- 4.0E-02		pCi/g		4.12E-02	1.00E-01	
		K-40	1.22E+01 +- 1.5E+00		pCi/g		1.74E-01		
		RA-226	4.70E-01 +- 7.6E-02		pCi/g		3.43E-02		
J1TLD2									
	M3R7G1AD	AMERICIUM 241	-3.76E-03 +- 1.9E-02	U	pCi/g		3.08E-02		
		CO-60	1.37E-02 +- 1.3E-02	U	pCi/g		2.57E-02	5.00E-02	
		CS-137	1.39E-02 +- 1.4E-02	U	pCi/g		2.44E-02	1.00E-01	
		EU-152	-1.55E-02 +- 2.7E-02	U	pCi/g		4.58E-02	1.00E-01	
		EU-154	-2.45E-02 +- 4.3E-02	U	pCi/g		7.23E-02	1.00E-01	
		EU-155	4.46E-02 +- 2.8E-02	U	pCi/g		4.82E-02	1.00E-01	
		K-40	1.24E+01 +- 1.5E+00		pCi/g		1.60E-01		
		RA-226	3.98E-01 +- 8.2E-02		pCi/g		3.67E-02		
J1TLD3									
	M3R7H1AD	AMERICIUM 241	5.34E-02 +- 8.5E-02	U	pCi/g		1.48E-01		
		CO-60	-1.71E-02 +- 1.5E-02	U	pCi/g		2.30E-02	5.00E-02	
		CS-137	6.46E-03 +- 1.4E-02	U	pCi/g		2.37E-02	1.00E-01	
		EU-152	5.71E-03 +- 3.4E-02	U	pCi/g		5.71E-02	1.00E-01	
		EU-154	3.60E-02 +- 4.2E-02	U	pCi/g		7.83E-02	1.00E-01	
		EU-155	3.26E-02 +- 3.5E-02	U	pCi/g		6.20E-02	1.00E-01	
		K-40	1.01E+01 +- 1.3E+00		pCi/g		2.13E-01		
		RA-226	2.99E-01 +- 7.0E-02		pCi/g		3.89E-02		
J1TLD4									
	M3R7J1AD	AMERICIUM 241	7.10E-03 +- 2.2E-02	U	pCi/g		3.88E-02		
		CO-60	-6.24E-03 +- 1.4E-02	U	pCi/g		2.43E-02	5.00E-02	
		CS-137	-1.84E-03 +- 1.5E-02	U	pCi/g		2.55E-02	1.00E-01	
		EU-152	-4.74E-02 +- 3.8E-02	U	pCi/g		5.52E-02	1.00E-01	
		EU-154	1.56E-03 +- 4.9E-02	U	pCi/g		8.54E-02	1.00E-01	
		EU-155	1.80E-02 +- 3.6E-02	U	pCi/g		5.87E-02	1.00E-01	
		K-40	1.32E+01 +- 1.6E+00		pCi/g		2.06E-01		
		RA-226	3.14E-01 +- 6.5E-02		pCi/g		4.17E-02		
J1TLD5									
	M3R7K1AD	AMERICIUM 241	1.94E-02 +- 2.0E-02	U	pCi/g		2.43E-02		
		CO-60	1.49E-03 +- 1.2E-02	U	pCi/g		2.12E-02	5.00E-02	
		CS-137	1.57E-02 +- 1.8E-02	U	pCi/g		2.10E-02	1.00E-01	

TestAmerica Inc

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RPD - Relative Percent Difference.

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

Sample Results Summary

Date: 27-May-14

TestAmerica Inc TARL

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

Report No. : 60351 5/31/14 **SDG No:** JP0801

Batch	Client Id Work Order	Parameter	Result +- Uncertainty (2s)	Qual	Units	Tracer Yield	MDL	CRDL	RPD
4140022 GAMMA_GS									
J1TLD5									
	M3R7K1AD	EU-152	-2.39E-02 +- 2.7E-02	U	pCi/g		4.12E-02	1.00E-01	
		EU-154	-1.77E-02 +- 4.3E-02	U	pCi/g		7.36E-02	1.00E-01	
		EU-155	6.78E-02 +- 4.4E-02		pCi/g		3.57E-02	1.00E-01	
		K-40	1.39E+01 +- 1.6E+00		pCi/g		1.56E-01		
		RA-226	4.54E-01 +- 7.4E-02		pCi/g		3.38E-02		
J1TLD6									
	M3R7L1AD	AMERICIUM 241	2.13E-03 +- 1.4E-02	U	pCi/g		2.28E-02		
		CO-60	4.13E-02 +- 2.1E-02	U	pCi/g		3.14E-02	5.00E-02	
		CS-137	8.23E-02 +- 2.2E-02		pCi/g		1.88E-02	1.00E-01	
		EU-152	6.40E-03 +- 2.5E-02	U	pCi/g		4.29E-02	1.00E-01	
		EU-154	2.93E-03 +- 3.7E-02	U	pCi/g		6.62E-02	1.00E-01	
		EU-155	3.63E-02 +- 2.1E-02	U	pCi/g		3.84E-02	1.00E-01	
		K-40	8.28E+00 +- 1.0E+00		pCi/g		1.77E-01		
		RA-226	2.92E-01 +- 5.2E-02		pCi/g		2.98E-02		
4140023 SRTOT_SEP_PRECIP_GPC									
J1TLC4									
	M3R671AC	STRONTIUM	-1.44E-02 +- 9.2E-02	U	pCi/g	100%	2.23E-01		
J1TLC5									
	M3R681AC	STRONTIUM	7.44E-02 +- 1.1E-01	U	pCi/g	100%	2.44E-01		
J1TLC5 DUP									
	M3R681AE	STRONTIUM	3.54E-02 +- 1.1E-01	U	pCi/g	95%	2.41E-01		71.0
J1TLC6									
	M3R691AC	STRONTIUM	3.51E-02 +- 1.2E-01	U	pCi/g	88%	2.69E-01		
J1TLC7									
	M3R7A1AC	STRONTIUM	1.19E-01 +- 1.3E-01	U	pCi/g	93%	2.57E-01		
J1TLC8									
	M3R7C1AC	STRONTIUM	3.69E-02 +- 1.1E-01	U	pCi/g	92%	2.38E-01		
J1TLC9									
	M3R7D1AC	STRONTIUM	8.80E-02 +- 1.1E-01	U	pCi/g	100%	2.22E-01		
J1TLD0									
	M3R7E1AC	STRONTIUM	1.12E-01 +- 1.2E-01	U	pCi/g	98%	2.42E-01		
J1TLD1									
	M3R7F1AC	STRONTIUM	1.08E-01 +- 1.2E-01	U	pCi/g	96%	2.46E-01		
J1TLD2									
	M3R7G1AC	STRONTIUM	2.40E-02 +- 1.0E-01	U	pCi/g	100%	2.32E-01		
J1TLD3									
	M3R7H1AC	STRONTIUM	-1.11E-02 +- 9.9E-02	U	pCi/g	100%	2.38E-01		

TestAmerica Inc

rptTALRchSaSummary2 V5.3.2
A2002

RPD - Relative Percent Difference.

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

Sample Results Summary

TestAmerica Inc TARL

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

Date: 27-May-14

Report No. : 60351

5/31/14

SDG No: JP0801

Batch	Client Id Work Order	Parameter	Result +- Uncertainty (2s)	Qual	Units	Tracer Yield	MDL	CRDL	RPD
4140023 SRTOT_SEP_PRECIP_GPC									
	J1TLD4								
	M3R7J1AC	STRONTIUM	6.88E-02 +- 1.1E-01	U	pCi/g	97%	2.32E-01		
	J1TLD5								
	M3R7K1AC	STRONTIUM	6.39E-02 +- 1.1E-01	U	pCi/g	96%	2.27E-01		
	J1TLD6								
	M3R7L1AC	STRONTIUM	9.19E-02 +- 1.2E-01	U	pCi/g	93%	2.56E-01		
4140060 7196_CR6									
	J1TLC4								
	M3R671AA	HEXCHROME	4.04E-01 +- 0.0E+00		mg/kg	N/A	1.55E-01	1.55E-01	
	M3R671AG	HEXCHROME	2.82E-01 +- 0.0E+00		mg/kg	N/A	1.55E-01	1.55E-01	35.6
	J1TLC5								
	M3R681AA	HEXCHROME	1.99E-01 +- 0.0E+00		mg/kg	N/A	1.55E-01	1.55E-01	
	J1TLC6								
	M3R691AA	HEXCHROME	1.55E-01 +- 0.0E+00	U	mg/kg	N/A	1.55E-01	1.55E-01	
	J1TLC7								
	M3R7A1AA	HEXCHROME	2.82E-01 +- 0.0E+00		mg/kg	N/A	1.55E-01	1.55E-01	
	J1TLC8								
	M3R7C1AA	HEXCHROME	1.55E-01 +- 0.0E+00	U	mg/kg	N/A	1.55E-01	1.55E-01	
	J1TLC9								
	M3R7D1AA	HEXCHROME	1.55E-01 +- 0.0E+00	U	mg/kg	N/A	1.55E-01	1.55E-01	
	J1TLD0								
	M3R7E1AA	HEXCHROME	2.39E-01 +- 0.0E+00		mg/kg	N/A	1.55E-01	1.55E-01	
	J1TLD1								
	M3R7F1AA	HEXCHROME	1.55E-01 +- 0.0E+00	U	mg/kg	N/A	1.55E-01	1.55E-01	
	J1TLD2								
	M3R7G1AA	HEXCHROME	3.23E-01 +- 0.0E+00		mg/kg	N/A	1.55E-01	1.55E-01	
	J1TLD3								
	M3R7H1AA	HEXCHROME	1.76E-01 +- 0.0E+00		mg/kg	N/A	1.55E-01	1.55E-01	
	J1TLD4								
	M3R7J1AA	HEXCHROME	1.55E-01 +- 0.0E+00	U	mg/kg	N/A	1.55E-01	1.55E-01	
	J1TLD5								
	M3R7K1AA	HEXCHROME	1.55E-01 +- 0.0E+00	U	mg/kg	N/A	1.55E-01	1.55E-01	
	J1TLD6								
	M3R7L1AA	HEXCHROME	2.58E-01 +- 0.0E+00		mg/kg	N/A	1.55E-01	1.55E-01	

No. of Results: 140

TestAmerica Inc

rptTALRchSaSummary2 V5.3.2 A2002

RPD - Relative Percent Difference.

U Qual - Analyzed for but not detected above limiting criteria. Limit criteria is less than the Mdc/Mda/Mdl, Total Uncert, CRDL, 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

May 27, 2014

Attention: Joan Kessner

SAF Number	:	RC-189
Date SDG Closed	:	May 19, 2014
Number of Samples	:	Thirteen (13)
Sample Type	:	Soil
SDG Number	:	JP0801
Data Deliverable	:	7– Day / Summary

CASE NARRATIVE

I. Introduction

On May 19, 2014, 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
J1TLC4	M3R67	SOIL	5/19/14
J1TLC5	M3R68	SOIL	5/19/14
J1TLC6	M3R69	SOIL	5/19/14
J1TLC7	M3R7A	SOIL	5/19/14
J1TLC8	M3R7C	SOIL	5/19/14
J1TLC9	M3R7D	SOIL	5/19/14
J1TLD0	M3R7E	SOIL	5/19/14
J1TLD1	M3R7F	SOIL	5/19/14
J1TLD2	M3R7G	SOIL	5/19/14
J1TLD3	M3R7H	SOIL	5/19/14
J1TLD4	M3R7J	SOIL	5/19/14
J1TLD5	M3R7K	SOIL	5/19/14
J1TLD6	M3R7L	SOIL	5/19/14

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:

Gas Proportional Counting
Strontium-90 by method RL-GPC-010
Gamma Spectroscopy
Gamma Spec by method RL-GAM-001
Chemical Analysis
Hexavalent Chromium by EPA method 7196A

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

Gas Proportional Counting
Strontium-90 by method RL-GPC-010:
The LCS, batch blank, samples and sample duplicate (J1TLC5) results are within contractual requirements.

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, samples and sample duplicate (J1TLC4) results are within contractual requirements.

Chemical Analysis
Hexavalent Chromium by EPA method 7196A
The LCS, batch blank, samples, sample duplicate (J1TLC4) and sample matrix spike (J1TLC4) 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

Washington Closure Hanford

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

RC-189-292

Collector: Q. Stowe	Company Contact: Joan Kessner	Telephone No.: 375-4688	Project Coordinator: KESSNER, JH
Price Code:	Data Turnaround: 7 day		
Project Designation: 100N Field Remediation	Sampling Location: 100-N-104 (verification)		SAF No.: RC-189
Ice Chest No.: N/A	Field Logbook No.: EL-1652-34 12 WS 5/19/14	COA: 01N1042000	Method of Shipment: Local Delivery
Shipped To: TestAmerica Richland	Offsite Property No.: N/A		Bill of Lading/Air Bill No.: N/A
Other Labs Shipped To: TestAmerica Denver			

POSSIBLE SAMPLE HAZARDS/REMARKS

N/A

Special Handling and/or Storage

cool 4C

Preservation	Cool 4C	None	None								
Type of Container	G/P	G/P	G/P								
No. of Container(s)	1	1	1								
Volume	125mL	1000mL	60mL								
Sample Analysis	Chromium Hex -7196	See Item (2) in Special Instructions	Strontium-89,90 – Total Sr								

Sample No.	Matrix	Sample Date	Sample Time										
J1TLC4 M3R67	SOIL	5-16-14	1057	x	x	x							
J1TLC5 M3R68	SOIL	5-16-14	1106	x	x	x							
J1TLC6 M3R69	SOIL	5-16-14	1036	x	x	x							
J1TLC7 M3R7A	SOIL	5-16-14	1048	x	x	x							
J1TLC8 M3R7C	SOIL	5-16-14	1101	x	x	x							

CHAIN OF POSSESSION

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
Quincy Stowe	5-16-14 1141	DWShea DWSHEA	5/16/14 1141
DWShea DWSHEA	5/16/14 1307	Fridge 3A 1060 Bldg 6	5/16/14 1307
Fridge 5A 1060 Bldg 6	5/19/14 0820	DWShea DWSHEA	5/19/14 0820
DWShea DWSHEA	5/19/14 0823	SM Sexton	5/19/14 0823
SM Sexton	5/19/14 1340	J. Bock TAL	5-19-14 1340

Sign/Print Names

SPECIAL INSTRUCTIONS

(2) Gamma Spec (Client List) {Americium-241, Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155, Radium-226}

J4E190421

Due 5-27-14

REVIEWED BY K. Woodward DATE 5/19/14

JP0801

J4E190421

FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

WCH-EE-011

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	RC-189-292	Page 2 of 3

Collector: Q. Stowe	Company Contact: Joan Kessner	Telephone No.: 375-4688	Project Coordinator: KESSNER, JH
Price Code	Data Turnaround: 7day		
Project Designation: 100N Field Remediation	Sampling Location: 100-N-104 (verification)		SAF No.: RC-189
Ice Chest No.: N/A	Field Logbook No.: DWSHEA 5/19/14 EL-1652-1/12	COA: 01N1042000	Method of Shipment: Local Delivery
Shipped To: TestAmerica Richland	Offsite Property No.: N/A		Bill of Lading/Air Bill No.: N/A

Other Labs Shipped To: TestAmerica Denver

Preservation	Cool 4C	None	None								
Type of Container	G/P	G/P	G/P								
No. of Container(s)	1	1	1								
Volume	125mL	1000mL	60mL								
Sample Analysis	Chromium Hex - 7196	See Item (2) in Special Instructions	Stronfium-89,90 – Total Sr								

POSSIBLE SAMPLE HAZARDS/REMARKS

N/A

Special Handling and/or Storage

ool 4C

Sample No.	Matrix	Sample Date	Sample Time										
J1TLC9 m3RND	SOIL	5-16-14	1017	x	x	x							
J1TLD0 m3RNE	SOIL	5-16-14	1021	x	x	x							
J1TLD1 m3RNF	SOIL	5-16-14	1033	x	x	x							
J1TLD2 m3RNG	SOIL	5-16-14	1043	x	x	x							
J1TLD3 m3RNH	SOIL	5-16-14	1005	x	x	x							

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

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
Quincy Stowe	5-16-14 1141	DWSHEA DWSHEA	5/16/14 1141
DWSHEA DWSHEA	5/16/14 1307	Fridge 3A	5/16/14 1307
Fridge 3A	5/19/14 0820	DWSHEA DWSHEA	5/19/14 0820
DWSHEA DWSHEA	5/19/14 0823	SM Sexton	5/19/14 0823
SM Sexton	5/19/14 1340	J. Bock	TAKS 5-14 1340

FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

SPECIAL INSTRUCTIONS

(2) Gamma Spec (Client List) {Americium-241, Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155, Radium-226}

J4E190421

Due 5-27-14

REVIEWED BY K. Wood DATE 5/19/14

JP0801

WCH-EE-011

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	RC-189-292	Page 3 of 3

Collector: Q. Stowe	Company Contact: Joan Kessner	Telephone No.: 375-4688	Project Coordinator: KESSNER, JH
Price Code	Data Turnaround: 7day		
Project Designation: 100N Field Remediation	Sampling Location: 100-N-104 (verification)		SAF No.: RC-189
Ice Chest No.	Field Logbook No.: EL-1652-1/12 DWShea 5/17/14	COA: 01N1042000	Method of Shipment: Local Delivery
Shipped To: TestAmerica Richland	Offsite Property No.		Bill of Lading/Air Bill No.

Other Labs Shipped To: TestAmerica Denver

POSSIBLE SAMPLE HAZARDS/REMARKS: N/A

Special Handling and/or Storage: ool 4C

Preservation	Cool 4C	None	None									
Type of Container	G/P	G/P	G/P									
No. of Container(s)	1	1	1									
Volume	125mL	1000mL	60mL									
Sample Analysis	Chromium Hex - 7196	See Item (2) in Special Instructions	Strontium-89,90 – Total Sr									

Sample No.	Matrix	Sample Date	Sample Time										
J1TLD4 M3RN7J	SOIL	5-16-14	1011	X	X	X							
J1TLD5 M3RN7K	SOIL	5-16-14	1026	X	X	X							
J1TLD6 M3RN7L	SOIL	5-16-14	1048	X	X	X							

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

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
Quincy Stowe	5-16-14 1141	DWShea DWSHEA	5/16/14 1141
DWShea DWSHEA	5/16/14 1307	Bridge 3A 1060	5/16/14 1307
Bridge 3A 1060	5/19/14 0820	DWShea DWSHEA	5/19/14 0820
DWShea DWSHEA	5/19/14 0823	SM Sexton	5/19/14 0823
SM Sexton	5/19/14 1340	J. Lock	5/19/14 1340

FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

SPECIAL INSTRUCTIONS

(2) Gamma Spec (Client List) (Americium-241, Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155, Radium-226)

J4E190421
Due 5-27-14

JP0801

REVIEWED BY K. Woodward DATE 5/19/14

WCH-EE-011

Appendix 5

Data Validation Supporting Documentation

APPENDIX A

RADIOCHEMICAL DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
PROJECT:	100-N-104		DATA PACKAGE:	JP0801	
VALIDATOR:	ELR	LAB: TAL		DATE: 5/31/14	
			SDG:	JP0801	

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

SAMPLES/MATRIX				
JITLC4	JITLC5	JITLC6	JITLC7	JITLC8
JITLC9	JITLD0	JITLD1	JITLD2	JITLD3
JITLD4	JITLD5	JITLD6		
				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: no FS or PAs

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:

Appendix 6

Additional Documentation Requested by Client

QC Results Summary
TestAmerica Inc TARL

Ordered by Method, Batch No, QC Type,.

Date: 27-May-14

Report No. : 60351

SDG No.: JP0801

Batch Work Order	Parameter	Result +- Uncertainty (2s)	Qual	Units	Tracer Yield	LCS Recovery	Bias	MDL
GAMMA_GS								
4140022 BLANK QC,								
M3TAK1AA	AMERICIUM 241	-6.03E-03 +- 1.0E-02	U	pCi/g				1.70E-02
	CO-60	6.89E-04 +- 8.6E-03	U	pCi/g				1.65E-02
	CS-137	-1.27E-03 +- 8.7E-03	U	pCi/g				1.53E-02
	EU-152	1.07E-02 +- 2.1E-02	U	pCi/g				3.73E-02
	EU-154	-8.42E-04 +- 2.4E-02	U	pCi/g				4.56E-02
	EU-155	-5.23E-03 +- 1.6E-02	U	pCi/g				2.59E-02
	K-40	-1.12E+00 +- 2.6E-01	U	pCi/g				4.49E-01
	RA-226	2.67E-02 +- 3.2E-02	U	pCi/g				2.73E-02
4140022 LCS,								
M3TAK1AC	CS-137	9.91E-01 +- 1.4E-01		pCi/g		98%	0.0	4.42E-02
	RA-226	1.00E+00 +- 1.7E-01		pCi/g		88%	-0.1	7.20E-02
SRTOT_SEP_PRECIP_GPC								
4140023 BLANK QC,								
M3TAL1AA	STRONTIUM	2.23E-02 +- 1.0E-01	U	pCi/g	98%			2.38E-01
4140023 LCS,								
M3TAL1AC	STRONTIUM	2.85E+00 +- 8.0E-01		pCi/g	93%	83%	-0.2	2.48E-01
7196_CR6								
4140060 MATRIX SPIKE, J1TLC4								
M3R871AF	HEXCHROME	2.65E+01 +- 0.0E+00		mg/kg	N/A	86%	-0.1	1.55E-01
4140060 LCS,								
M3TDG1AC	HEXCHROME	1.88E+01 +- 0.0E+00		mg/kg	N/A	94%	-0.1	1.55E-01
4140060 BLANK QC,								
M3TDG1AA	HEXCHROME	1.55E-01 +- 0.0E+00	U	mg/kg	N/A			1.55E-01

No. of Results: 15

TestAmerica Inc
rptSTLRchQcSummary V5.3.2 A2002

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

Date: 2 June 2014
To: Washington Closure Hanford Inc. (technical representative)
From: ELR Consulting
Project: 100N Field Remediation – Soil Full Protocol - Waste Site 100-N-104
Subject: Inorganics - Data Package No. JP0801-TAL

INTRODUCTION

This memo presents the results of data validation on Data Package No. JP0801 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
J1TLC4	5/16/14	Soil	C	See note 1
J1TLC5	5/16/14	Soil	C	See note 1
J1TLC6	5/16/14	Soil	C	See note 1
J1TLC7	5/16/14	Soil	C	See note 1
J1TLC8	5/16/14	Soil	C	See note 1
J1TLC9	5/16/14	Soil	C	See note 1
J1TLD0	5/16/14	Soil	C	See note 1
J1TLD1	5/16/14	Soil	C	See note 1
J1TLD2	5/16/14	Soil	C	See note 1
J1TLD3	5/16/14	Soil	C	See note 1
J1TLD4	5/16/14	Soil	C	See note 1
J1TLD5	5/16/14	Soil	C	See note 1
J1TLD6	5/16/14	Soil	C	See note 1
J1TLD7	5/16/14	Soil	C	See note 1

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

Data validation was conducted in accordance with the Washington Closure Hanford (WCH) validation statement of work and the 100-N Area Sampling and Analysis Plan for CERCLA Waste Sites (DOE/RL-2005-92, Rev. 0, October 2006). 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 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

One field blank (J1TLD7) was submitted for analysis. Eleven analytes were detected in the field blank. Under the WCH statement of work, no qualification is required.

- **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 75% to 125%. 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 74% and a sample result less than the IDL are qualified "UJ". Samples with a recovery of greater than 125% or less than 74% and a sample result greater than the IDL are qualified as estimates and flagged "J". Finally, for samples with a recovery greater than 125% and a sample result less than the IDL, no qualification is required.

Due to matrix spike recoveries outside QC limits, all antimony (55%) and silicon (22%) results were qualified as estimates and flagged "J".

Due to an LCS recovery outside QC limits, all silicon (19%) 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 (J1TLC7/J1TLD6) were 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. JP0801 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 (55%) and silicon (22%) results were qualified as estimates and flagged "J".

- Due to an LCS recovery outside QC limits, all silicon (19%) 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-2005-92, Rev. 0, 100-N *Area Sampling and Analysis Plan for CERCLA Waste Sites*, U.S. Department of Energy, October 2006.

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

INORGANICS DATA QUALIFICATION SUMMARY*

SDG: JP0801	**REVIEWER: ELR**	**Project: 100-N-104**	**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: 280-55620-1
Sdg Number: JP0801

Client Sample ID: J1TLC4

Lab Sample ID: 280-55620-1
Client Matrix: Solid
% Moisture: 2.8

Date Sampled: 05/16/2014 1057
Date Received: 05/20/2014 0940

6010B Metals (ICP)

Analysis Method:	6010B	Analysis Batch:	280-226977	Instrument ID:	MT_025
Prep Method:	3050B	Prep Batch:	280-226665	Lab File ID:	25A3052114.asc
Dilution:	1.0			Initial Weight/Volume:	1.00 g
Analysis Date:	05/22/2014 0204			Final Weight/Volume:	100 mL
Prep Date:	05/21/2014 0825				

5/31/14

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Aluminum		6430		1.6	5.1
Antimony		0.39	U J	0.39	0.62
Arsenic		2.5		0.68	1.0
Barium		52.5		0.078	0.51
Beryllium		0.31		0.034	0.21
Boron		1.0	U N	1.0	2.1
Cadmium		0.042	U	0.042	0.21
Calcium		5190	X	14.5	51.4
Chromium		7.7		0.060	0.21
Cobalt		8.4	X	0.10	1.0
Copper		17.4		0.22	1.0
Iron		23100	X	3.9	5.1
Lead		3.5		0.28	0.51
Magnesium		4700		3.8	20.6
Manganese		325		0.10	1.0
Molybdenum		0.33	B	0.27	2.1
Nickel		9.8	X	0.13	4.1
Potassium		1100		42.2	309
Selenium		0.88	U	0.88	1.0
Silicon		264	J	5.8	10.3
Silver		0.16	U	0.16	0.21
Sodium		285		60.7	123
Vanadium		59.3		0.097	2.1
Zinc		44.2	X	0.41	1.0

7471A Mercury (CVAA)

Analysis Method:	7471A	Analysis Batch:	280-227155	Instrument ID:	MT_033
Prep Method:	7471A	Prep Batch:	280-226961	Lab File ID:	140522baa.txt
Dilution:	1.0			Initial Weight/Volume:	.58 g
Analysis Date:	05/22/2014 2044			Final Weight/Volume:	50 mL
Prep Date:	05/22/2014 1230				

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

Client: Washington Closure Hanford

Job Number: 280-55620-1
Sdg Number: JP0801

Client Sample ID: J1TLC5

Lab Sample ID: 280-55620-2
Client Matrix: Solid
% Moisture: 3.4

Date Sampled: 05/16/2014 1106
Date Received: 05/20/2014 0940

6010B Metals (ICP)

Analysis Method:	6010B	Analysis Batch:	280-226977	Instrument ID:	MT_025
Prep Method:	3050B	Prep Batch:	280-226665	Lab File ID:	25A3052114.asc
Dilution:	1.0			Initial Weight/Volume:	1.04 g
Analysis Date:	05/22/2014 0213			Final Weight/Volume:	100 mL
Prep Date:	05/21/2014 0825				

5/31/14

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Aluminum		6470		1.5	5.0
Antimony		0.38	U J	0.38	0.60
Arsenic		2.3		0.66	1.0
Barium		54.1		0.076	0.50
Beryllium		0.26		0.033	0.20
Boron		0.99	B	0.98	2.0
Cadmium		0.053	B	0.041	0.20
Calcium		6750	X	14.0	49.8
Chromium		10.6		0.058	0.20
Cobalt		6.3	X	0.10	1.0
Copper		17.7		0.22	1.0
Iron		17500	X	3.8	5.0
Lead		6.3		0.27	0.50
Magnesium		4440		3.7	19.9
Manganese		267		0.10	1.0
Molybdenum		0.28	B	0.26	2.0
Nickel		11.2	X	0.12	4.0
Potassium		1150		40.8	299
Selenium		0.86	U	0.86	1.0
Silicon		342	J	5.6	10
Silver		0.16	U	0.16	0.20
Sodium		305		58.7	119
Vanadium		44.9		0.094	2.0
Zinc		41.5	X	0.40	1.0

7471A Mercury (CVAA)

Analysis Method:	7471A	Analysis Batch:	280-227155	Instrument ID:	MT_033
Prep Method:	7471A	Prep Batch:	280-226961	Lab File ID:	140522baa.txt
Dilution:	1.0			Initial Weight/Volume:	.56 g
Analysis Date:	05/22/2014 2051			Final Weight/Volume:	50 mL
Prep Date:	05/22/2014 1230				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Mercury		0.0084	B	0.0061	0.019

Client: Washington Closure Hanford

Job Number: 280-55620-1
Sdg Number: JP0801

Client Sample ID: J1TLC6

Lab Sample ID: 280-55620-3
Client Matrix: Solid
% Moisture: 1.9

Date Sampled: 05/16/2014 1036
Date Received: 05/20/2014 0940

6010B Metals (ICP)

Analysis Method:	6010B	Analysis Batch:	280-226977	Instrument ID:	MT_025
Prep Method:	3050B	Prep Batch:	280-226665	Lab File ID:	25A3052114.asc
Dilution:	1.0			Initial Weight/Volume:	1.03 g
Analysis Date:	05/22/2014 0215			Final Weight/Volume:	100 mL
Prep Date:	05/21/2014 0825				

5/31/14

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Aluminum		5510		1.5	5.0
Antimony		0.38	U J	0.38	0.59
Arsenic		2.2		0.65	0.99
Barium		69.7		0.075	0.50
Beryllium		0.28		0.033	0.20
Boron		0.97	U	0.97	2.0
Cadmium		0.051	B	0.041	0.20
Calcium		5480	X	14.0	49.5
Chromium		7.0		0.057	0.20
Cobalt		8.1	X	0.099	0.99
Copper		19.0		0.21	0.99
Iron		21800	X	3.8	5.0
Lead		4.4		0.27	0.50
Magnesium		4210		3.7	19.8
Manganese		336		0.099	0.99
Molybdenum		0.26	U	0.26	2.0
Nickel		9.1	X	0.12	4.0
Potassium		836		40.6	297
Selenium		0.85	U J	0.85	0.99
Silicon		230		5.6	9.9
Silver		0.16	U	0.16	0.20
Sodium		238		58.4	119
Vanadium		52.7		0.093	2.0
Zinc		53.4	X	0.39	0.99

7471A Mercury (CVAA)

Analysis Method:	7471A	Analysis Batch:	280-227155	Instrument ID:	MT_033
Prep Method:	7471A	Prep Batch:	280-226961	Lab File ID:	140522baa.txt
Dilution:	1.0			Initial Weight/Volume:	.68 g
Analysis Date:	05/22/2014 2054			Final Weight/Volume:	50 mL
Prep Date:	05/22/2014 1230				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Mercury		0.0068	B	0.0050	0.015

Client: Washington Closure Hanford

Job Number: 280-55620-1
Sdg Number: JP0801

Client Sample ID: J1TLC7

Lab Sample ID: 280-55620-4
Client Matrix: Solid
% Moisture: 2.9

Date Sampled: 05/16/2014 1048
Date Received: 05/20/2014 0940

6010B Metals (ICP)

Analysis Method:	6010B	Analysis Batch:	280-226977	Instrument ID:	MT_025
Prep Method:	3050B	Prep Batch:	280-226665	Lab File ID:	25A3052114.asc
Dilution:	1.0			Initial Weight/Volume:	1.18 g
Analysis Date:	05/22/2014 0218			Final Weight/Volume:	100 mL
Prep Date:	05/21/2014 0825				

5/31/14

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Aluminum		4840		1.4	4.4
Antimony		0.33	U J	0.33	0.52
Arsenic		1.8		0.58	0.87
Barium		79.1		0.066	0.44
Beryllium		0.26		0.029	0.17
Boron		0.86	U	0.86	1.7
Cadmium		0.036	U	0.036	0.17
Calcium		4710	X	12.3	43.6
Chromium		5.6		0.051	0.17
Cobalt		9.0	X	0.087	0.87
Copper		19.2		0.19	0.87
Iron		25400	X	3.3	4.4
Lead		3.1		0.24	0.44
Magnesium		4730		3.2	17.5
Manganese		345		0.087	0.87
Molybdenum		0.24	B	0.23	1.7
Nickel		8.9	X	0.11	3.5
Potassium		591		35.8	262
Selenium		0.75	U J	0.75	0.87
Silicon		175		4.9	8.7
Silver		0.14	U	0.14	0.17
Sodium		259		51.5	105
Vanadium		70.4		0.082	1.7
Zinc		48.9	X	0.35	0.87

7471A Mercury (CVAA)

Analysis Method:	7471A	Analysis Batch:	280-227155	Instrument ID:	MT_033
Prep Method:	7471A	Prep Batch:	280-226961	Lab File ID:	140522baa.txt
Dilution:	1.0			Initial Weight/Volume:	.70 g
Analysis Date:	05/22/2014 2056			Final Weight/Volume:	50 mL
Prep Date:	05/22/2014 1230				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Mercury		0.0049	U	0.0049	0.015

Client: Washington Closure Hanford

Job Number: 280-55620-1
Sdg Number: JP0801

Client Sample ID: J1TLC8

Lab Sample ID: 280-55620-5
Client Matrix: Solid
% Moisture: 1.9

Date Sampled: 05/16/2014 1101
Date Received: 05/20/2014 0940

6010B Metals (ICP)

Analysis Method:	6010B	Analysis Batch:	280-226977	Instrument ID:	MT_025
Prep Method:	3050B	Prep Batch:	280-226665	Lab File ID:	25A3052114.asc
Dilution:	1.0			Initial Weight/Volume:	1.13 g
Analysis Date:	05/22/2014 0229			Final Weight/Volume:	100 mL
Prep Date:	05/21/2014 0825				

5/31/14

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Aluminum		4770		1.4	4.5
Antimony		0.34	U J	0.34	0.54
Arsenic		1.9		0.60	0.90
Barium		48.2		0.069	0.45
Beryllium		0.23		0.030	0.18
Boron		0.88	U	0.88	1.8
Cadmium		0.037	U	0.037	0.18
Calcium		5290	X	12.7	45.1
Chromium		7.8		0.052	0.18
Cobalt		6.8	X	0.090	0.90
Copper		18.5		0.20	0.90
Iron		19300	X	3.4	4.5
Lead		4.1		0.24	0.45
Magnesium		3910		3.3	18.0
Manganese		267		0.090	0.90
Molybdenum		0.30	B	0.23	1.8
Nickel		9.3	X	0.11	3.6
Potassium		747		37.0	271
Selenium		0.78	U	0.78	0.90
Silicon		229	J	5.1	9.0
Silver		0.14	U	0.14	0.18
Sodium		215		53.2	108
Vanadium		49.4		0.085	1.8
Zinc		41.7	X	0.36	0.90

7471A Mercury (CVAA)

Analysis Method:	7471A	Analysis Batch:	280-227155	Instrument ID:	MT_033
Prep Method:	7471A	Prep Batch:	280-226961	Lab File ID:	140522baa.txt
Dilution:	1.0			Initial Weight/Volume:	.64 g
Analysis Date:	05/22/2014 2058			Final Weight/Volume:	50 mL
Prep Date:	05/22/2014 1230				

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

Client: Washington Closure Hanford

Job Number: 280-55620-1
Sdg Number: JP0801

Client Sample ID: J1TLC9

Lab Sample ID: 280-55620-6
Client Matrix: Solid
% Moisture: 4.9

Date Sampled: 05/16/2014 1017
Date Received: 05/20/2014 0940

6010B Metals (ICP)

Analysis Method:	6010B	Analysis Batch:	280-226977	Instrument ID:	MT_025
Prep Method:	3050B	Prep Batch:	280-226665	Lab File ID:	25A3052114.asc
Dilution:	1.0			Initial Weight/Volume:	1.16 g
Analysis Date:	05/22/2014 0231			Final Weight/Volume:	100 mL
Prep Date:	05/21/2014 0825				

5/31/14

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Aluminum		4660		1.4	4.5
Antimony		0.34	U J	0.34	0.54
Arsenic		1.4		0.60	0.91
Barium		48.9		0.069	0.45
Beryllium		0.23		0.030	0.18
Boron		0.89	U	0.89	1.8
Cadmium		0.037	U	0.037	0.18
Calcium		5820	X	12.8	45.3
Chromium		5.7		0.053	0.18
Cobalt		6.8	X	0.091	0.91
Copper		16.0		0.20	0.91
Iron		19300	X	3.4	4.5
Lead		4.1		0.24	0.45
Magnesium		3810		3.4	18.1
Manganese		254		0.091	0.91
Molybdenum		0.24	U	0.24	1.8
Nickel		8.3	X	0.11	3.6
Potassium		803		37.2	272
Selenium		0.78	U	0.78	0.91
Silicon		201	J	5.1	9.1
Silver		0.15	U	0.15	0.18
Sodium		252		53.5	109
Vanadium		49.2		0.085	1.8
Zinc		39.9	X	0.36	0.91

7471A Mercury (CVAA)

Analysis Method:	7471A	Analysis Batch:	280-227155	Instrument ID:	MT_033
Prep Method:	7471A	Prep Batch:	280-226961	Lab File ID:	140522baa.txt
Dilution:	1.0			Initial Weight/Volume:	.54 g
Analysis Date:	05/22/2014 2105			Final Weight/Volume:	50 mL
Prep Date:	05/22/2014 1230				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Mercury		0.0065	U	0.0065	0.020

Client: Washington Closure Hanford

Job Number: 280-55620-1
Sdg Number: JP0801

Client Sample ID: J1TLD0

Lab Sample ID: 280-55620-7
Client Matrix: Solid
% Moisture: 2.5

Date Sampled: 05/16/2014 1021
Date Received: 05/20/2014 0940

6010B Metals (ICP)

Analysis Method:	6010B	Analysis Batch:	280-226977	Instrument ID:	MT_025
Prep Method:	3050B	Prep Batch:	280-226665	Lab File ID:	25A3052114.asc
Dilution:	1.0			Initial Weight/Volume:	1.10 g
Analysis Date:	05/22/2014 0234			Final Weight/Volume:	100 mL
Prep Date:	05/21/2014 0825				

5/31/14

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Aluminum		6320		1.4	4.7
Antimony		0.35	U J	0.35	0.56
Arsenic		1.7		0.62	0.93
Barium		54.9		0.071	0.47
Beryllium		0.25		0.031	0.19
Boron		0.91	U	0.91	1.9
Cadmium		0.038	U	0.038	0.19
Calcium		3630	X	13.1	46.6
Chromium		12.1		0.054	0.19
Cobalt		6.5	X	0.093	0.93
Copper		16.9		0.20	0.93
Iron		16400	X	3.5	4.7
Lead		3.5		0.25	0.47
Magnesium		4210		3.4	18.6
Manganese		266		0.093	0.93
Molybdenum		0.24	U	0.24	1.9
Nickel		14.4	X	0.11	3.7
Potassium		1010		38.2	280
Selenium		0.80	U J	0.80	0.93
Silicon		199		5.3	9.3
Silver		0.15	U	0.15	0.19
Sodium		269		55.0	112
Vanadium		41.8		0.088	1.9
Zinc		38.8	X	0.37	0.93

7471A Mercury (CVAA)

Analysis Method:	7471A	Analysis Batch:	280-227155	Instrument ID:	MT_033
Prep Method:	7471A	Prep Batch:	280-226961	Lab File ID:	140522baa.txt
Dilution:	1.0			Initial Weight/Volume:	.60 g
Analysis Date:	05/22/2014 2108			Final Weight/Volume:	50 mL
Prep Date:	05/22/2014 1230				

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

Client: Washington Closure Hanford

Job Number: 280-55620-1
Sdg Number: JP0801

Client Sample ID: J1TLD1

Lab Sample ID: 280-55620-8
Client Matrix: Solid
% Moisture: 2.9

Date Sampled: 05/16/2014 1033
Date Received: 05/20/2014 0940

6010B Metals (ICP)

Analysis Method:	6010B	Analysis Batch:	280-226977	Instrument ID:	MT_025
Prep Method:	3050B	Prep Batch:	280-226665	Lab File ID:	25A3052114.asc
Dilution:	1.0			Initial Weight/Volume:	1.09 g
Analysis Date:	05/22/2014 0236			Final Weight/Volume:	100 mL
Prep Date:	05/21/2014 0825				

5/31/14

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Aluminum		6540		1.5	4.7
Antimony		0.36	U J	0.36	0.57
Arsenic		2.5		0.62	0.94
Barium		62.4		0.072	0.47
Beryllium		0.31		0.031	0.19
Boron		0.93	U	0.93	1.9
Cadmium		0.039	U	0.039	0.19
Calcium		4220	X	13.3	47.2
Chromium		9.9		0.055	0.19
Cobalt		7.5	X	0.094	0.94
Copper		17.9		0.20	0.94
Iron		19900	X	3.6	4.7
Lead		3.9		0.26	0.47
Magnesium		4150		3.5	18.9
Manganese		289		0.094	0.94
Molybdenum		0.25	U	0.25	1.9
Nickel		11.2	X	0.12	3.8
Potassium		1060		38.7	283
Selenium		0.81	U	0.81	0.94
Silicon		254	J	5.3	9.4
Silver		0.15	U	0.15	0.19
Sodium		216		55.7	113
Vanadium		46.4		0.089	1.9
Zinc		41.5	X	0.38	0.94

7471A Mercury (CVAA)

Analysis Method:	7471A	Analysis Batch:	280-227155	Instrument ID:	MT_033
Prep Method:	7471A	Prep Batch:	280-226961	Lab File ID:	140522baa.txt
Dilution:	1.0			Initial Weight/Volume:	.63 g
Analysis Date:	05/22/2014 2110			Final Weight/Volume:	50 mL
Prep Date:	05/22/2014 1230				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Mercury		0.0054	U	0.0054	0.017

Client: Washington Closure Hanford

Job Number: 280-55620-1
Sdg Number: JP0801

Client Sample ID: J1TLD2

Lab Sample ID: 280-55620-9
Client Matrix: Solid
% Moisture: 2.6

Date Sampled: 05/16/2014 1043
Date Received: 05/20/2014 0940

6010B Metals (ICP)

Analysis Method:	6010B	Analysis Batch:	280-226977	Instrument ID:	MT_025
Prep Method:	3050B	Prep Batch:	280-226665	Lab File ID:	25A3052114.asc
Dilution:	1.0			Initial Weight/Volume:	1.10 g
Analysis Date:	05/22/2014 0238			Final Weight/Volume:	100 mL
Prep Date:	05/21/2014 0825				

M 5/31/14

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Aluminum		6400		1.4	4.7
Antimony		0.35	U J	0.35	0.56
Arsenic		2.1		0.62	0.93
Barium		53.4		0.071	0.47
Beryllium		0.28		0.031	0.19
Boron		0.91	U	0.91	1.9
Cadmium		0.038	U	0.038	0.19
Calcium		5040	X	13.2	46.7
Chromium		78.2		0.054	0.19
Cobalt		6.6	X	0.093	0.93
Copper		18.9		0.20	0.93
Iron		18000	X	3.5	4.7
Lead		6.5		0.25	0.47
Magnesium		4380		3.5	18.7
Manganese		278		0.093	0.93
Molybdenum		0.24	U	0.24	1.9
Nickel		12.0	X	0.11	3.7
Potassium		1110		38.3	280
Selenium		0.80	U	0.80	0.93
Silicon		269	J	5.3	9.3
Silver		0.15	U	0.15	0.19
Sodium		219		55.1	112
Vanadium		46.4		0.088	1.9
Zinc		43.7	X	0.37	0.93

7471A Mercury (CVAA)

Analysis Method:	7471A	Analysis Batch:	280-227155	Instrument ID:	MT_033
Prep Method:	7471A	Prep Batch:	280-226961	Lab File ID:	140522baa.txt
Dilution:	1.0			Initial Weight/Volume:	.56 g
Analysis Date:	05/22/2014 2112			Final Weight/Volume:	50 mL
Prep Date:	05/22/2014 1230				

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

Client: Washington Closure Hanford

Job Number: 280-55620-1
Sdg Number: JP0801

Client Sample ID: J1TLD3

Lab Sample ID: 280-55620-10
Client Matrix: Solid
% Moisture: 1.6

Date Sampled: 05/16/2014 1005
Date Received: 05/20/2014 0940

6010B Metals (ICP)

Analysis Method:	6010B	Analysis Batch:	280-226977	Instrument ID:	MT_025
Prep Method:	3050B	Prep Batch:	280-226665	Lab File ID:	25A3052114.asc
Dilution:	1.0			Initial Weight/Volume:	1.17 g
Analysis Date:	05/22/2014 0240			Final Weight/Volume:	100 mL
Prep Date:	05/21/2014 0825				

5/31/14

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Aluminum		4470		1.3	4.3
Antimony		0.33	U J	0.33	0.52
Arsenic		1.6		0.57	0.87
Barium		41.8		0.066	0.43
Beryllium		0.24		0.029	0.17
Boron		0.85	U	0.85	1.7
Cadmium		0.036	U	0.036	0.17
Calcium		5300	X	12.2	43.4
Chromium		5.8		0.050	0.17
Cobalt		8.1	X	0.087	0.87
Copper		17.0		0.19	0.87
Iron		22700	X	3.3	4.3
Lead		2.6		0.23	0.43
Magnesium		4300		3.2	17.4
Manganese		287		0.087	0.87
Molybdenum		0.24	B	0.23	1.7
Nickel		8.2	X	0.11	3.5
Potassium		679		35.6	261
Selenium		0.75	U	0.75	0.87
Silicon		193	J	4.9	8.7
Silver		0.14	U	0.14	0.17
Sodium		254		51.3	104
Vanadium		60.6		0.082	1.7
Zinc		40.9	X	0.35	0.87

7471A Mercury (CVAA)

Analysis Method:	7471A	Analysis Batch:	280-227155	Instrument ID:	MT_033
Prep Method:	7471A	Prep Batch:	280-226961	Lab File ID:	140522baa.txt
Dilution:	1.0			Initial Weight/Volume:	.55 g
Analysis Date:	05/22/2014 2114			Final Weight/Volume:	50 mL
Prep Date:	05/22/2014 1230				

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

Client: Washington Closure Hanford

Job Number: 280-55620-1
Sdg Number: JP0801

Client Sample ID: J1TLD4

Lab Sample ID: 280-55620-11
Client Matrix: Solid
% Moisture: 1.8

Date Sampled: 05/16/2014 1011
Date Received: 05/20/2014 0940

6010B Metals (ICP)

Analysis Method:	6010B	Analysis Batch:	280-226977	Instrument ID:	MT_025
Prep Method:	3050B	Prep Batch:	280-226665	Lab File ID:	25A3052114.asc
Dilution:	1.0			Initial Weight/Volume:	1.19 g
Analysis Date:	05/22/2014 0242			Final Weight/Volume:	100 mL
Prep Date:	05/21/2014 0825				

5/31/14

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Aluminum		6400		1.3	4.3
Antimony		0.33	U J	0.33	0.51
Arsenic		2.1		0.56	0.86
Barium		47.4		0.065	0.43
Beryllium		0.25		0.028	0.17
Boron		0.84	U	0.84	1.7
Cadmium		0.035	U	0.035	0.17
Calcium		3720	X	12.1	42.8
Chromium		13.0		0.050	0.17
Cobalt		5.5	X	0.086	0.86
Copper		16.0		0.19	0.86
Iron		16100	X	3.3	4.3
Lead		4.8		0.23	0.43
Magnesium		4690		3.2	17.1
Manganese		246		0.086	0.86
Molybdenum		0.22	U	0.22	1.7
Nickel		14.1	X	0.11	3.4
Potassium		783		35.1	257
Selenium		0.74	U	0.74	0.86
Silicon		195	J	4.8	8.6
Silver		0.14	U	0.14	0.17
Sodium		171		50.5	103
Vanadium		36.5		0.080	1.7
Zinc		34.6	X	0.34	0.86

7471A Mercury (CVAA)

Analysis Method:	7471A	Analysis Batch:	280-227155	Instrument ID:	MT_033
Prep Method:	7471A	Prep Batch:	280-226961	Lab File ID:	140522baa.txt
Dilution:	1.0			Initial Weight/Volume:	.66 g
Analysis Date:	05/22/2014 2117			Final Weight/Volume:	50 mL
Prep Date:	05/22/2014 1230				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Mercury		0.0051	U	0.0051	0.016

Client: Washington Closure Hanford

Job Number: 280-55620-1
Sdg Number: JP0801

Client Sample ID: J1TLD5

Lab Sample ID: 280-55620-12
Client Matrix: Solid
% Moisture: 1.8

Date Sampled: 05/16/2014 1026
Date Received: 05/20/2014 0940

6010B Metals (ICP)

Analysis Method:	6010B	Analysis Batch:	280-226977	Instrument ID:	MT_025
Prep Method:	3050B	Prep Batch:	280-226665	Lab File ID:	25A3052114.asc
Dilution:	1.0			Initial Weight/Volume:	1.15 g
Analysis Date:	05/22/2014 0245			Final Weight/Volume:	100 mL
Prep Date:	05/21/2014 0825				

5/31/14

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Aluminum		6290		1.4	4.4
Antimony		0.34	U J	0.34	0.53
Arsenic		2.1		0.58	0.89
Barium		48.9		0.067	0.44
Beryllium		0.28		0.029	0.18
Boron		0.87	U	0.87	1.8
Cadmium		0.036	U	0.036	0.18
Calcium		6270	X	12.5	44.3
Chromium		10.9		0.051	0.18
Cobalt		6.9	X	0.089	0.89
Copper		18.3		0.19	0.89
Iron		18500	X	3.4	4.4
Lead		5.4		0.24	0.44
Magnesium		4460		3.3	17.7
Manganese		282		0.089	0.89
Molybdenum		0.23	U	0.23	1.8
Nickel		11.3	X	0.11	3.5
Potassium		1010		36.3	266
Selenium		0.76	U	0.76	0.89
Silicon		274	J	5.0	8.9
Silver		0.14	U	0.14	0.18
Sodium		229		52.3	106
Vanadium		46.1		0.083	1.8
Zinc		42.9	X	0.35	0.89

7471A Mercury (CVAA)

Analysis Method:	7471A	Analysis Batch:	280-227155	Instrument ID:	MT_033
Prep Method:	7471A	Prep Batch:	280-226961	Lab File ID:	140522baa.txt
Dilution:	1.0			Initial Weight/Volume:	.54 g
Analysis Date:	05/22/2014 2119			Final Weight/Volume:	50 mL
Prep Date:	05/22/2014 1230				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Mercury		0.0063	U	0.0063	0.019

Client: Washington Closure Hanford

Job Number: 280-55620-1
Sdg Number: JP0801

Client Sample ID: J1TLD6

Lab Sample ID: 280-55620-13
Client Matrix: Solid
% Moisture: 2.2

Date Sampled: 05/16/2014 1048
Date Received: 05/20/2014 0940

6010B Metals (ICP)

Analysis Method:	6010B	Analysis Batch:	280-226977	Instrument ID:	MT_025
Prep Method:	3050B	Prep Batch:	280-226665	Lab File ID:	25A3052114.asc
Dilution:	1.0			Initial Weight/Volume:	1.05 g
Analysis Date:	05/22/2014 0247			Final Weight/Volume:	100 mL
Prep Date:	05/21/2014 0825				

5/31/14

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Aluminum		4240		1.5	4.9
Antimony		0.37	U J	0.37	0.58
Arsenic		1.4		0.64	0.97
Barium		59.5		0.074	0.49
Beryllium		0.22		0.032	0.19
Boron		0.95	U	0.95	1.9
Cadmium		0.040	U	0.040	0.19
Calcium		4620	X	13.7	48.7
Chromium		4.1		0.056	0.19
Cobalt		8.4	X	0.097	0.97
Copper		17.5		0.21	0.97
Iron		22600	X	3.7	4.9
Lead		2.6		0.26	0.49
Magnesium		4080		3.6	19.5
Manganese		287		0.097	0.97
Molybdenum		0.25	U	0.25	1.9
Nickel		8.0	X	0.12	3.9
Potassium		499		39.9	292
Selenium		0.84	U	0.84	0.97
Silicon		194	J	5.5	9.7
Silver		0.16	U	0.16	0.19
Sodium		263		57.4	117
Vanadium		56.5		0.092	1.9
Zinc		43.4	X	0.39	0.97

7471A Mercury (CVAA)

Analysis Method:	7471A	Analysis Batch:	280-227155	Instrument ID:	MT_033
Prep Method:	7471A	Prep Batch:	280-226961	Lab File ID:	140522baa.txt
Dilution:	1.0			Initial Weight/Volume:	.56 g
Analysis Date:	05/22/2014 2121			Final Weight/Volume:	50 mL
Prep Date:	05/22/2014 1230				

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

Client: Washington Closure Hanford

Job Number: 280-55620-1
Sdg Number: JP0801

Client Sample ID: J1TLD7

Lab Sample ID: 280-55620-14
Client Matrix: Solid
% Moisture: 0.1

Date Sampled: 05/16/2014 1002
Date Received: 05/20/2014 0940

6010B Metals (ICP)

Analysis Method:	6010B	Analysis Batch:	280-226977	Instrument ID:	MT_025
Prep Method:	3050B	Prep Batch:	280-226665	Lab File ID:	25A3052114.asc
Dilution:	1.0			Initial Weight/Volume:	1.17 g
Analysis Date:	05/22/2014 0249			Final Weight/Volume:	100 mL
Prep Date:	05/21/2014 0825				

5/31/14

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Aluminum		98.5		1.3	4.3
Antimony		0.33	U J	0.33	0.51
Arsenic		0.56	U	0.56	0.86
Barium		1.1		0.065	0.43
Beryllium		0.028	U	0.028	0.17
Boron		0.84	U	0.84	1.7
Cadmium		0.035	U	0.035	0.17
Calcium		21.9	B X	12.1	42.8
Chromium		0.12	B	0.050	0.17
Cobalt		0.086	U X	0.086	0.86
Copper		0.19	U	0.19	0.86
Iron		138	X	3.3	4.3
Lead		0.23	U	0.23	0.43
Magnesium		11.8	B	3.2	17.1
Manganese		3.1		0.086	0.86
Molybdenum		0.22	U	0.22	1.7
Nickel		0.12	B X	0.11	3.4
Potassium		35.1	U	35.1	257
Selenium		0.74	U J	0.74	0.86
Silicon		100	J	4.8	8.6
Silver		0.14	U	0.14	0.17
Sodium		50.5	U	50.5	103
Vanadium		0.24	B	0.080	1.7
Zinc		0.49	B X	0.34	0.86

7471A Mercury (CVAA)

Analysis Method:	7471A	Analysis Batch:	280-227155	Instrument ID:	MT_033
Prep Method:	7471A	Prep Batch:	280-226961	Lab File ID:	140522baa.txt
Dilution:	1.0			Initial Weight/Volume:	.55 g
Analysis Date:	05/22/2014 2124			Final Weight/Volume:	50 mL
Prep Date:	05/22/2014 1230				

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

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

CASE NARRATIVE

Client: Washington Closure Hanford

Project: WASHINGTON CLOSURE HANFORD

Report Number: 280-55620-1

SDG #: JP0801
SAF#: RC-189

Date SDG Closed: May 20, 2014
Data Deliverable: 7 Day / Summary

CLIENT ID	LAB ID	ANALYSES REQUESTED	ANALYSES PERFORMED
J1TLC4	280-55620-1	6010/7471	6010B/7471A
J1TLC5	280-55620-2	6010/7471	6010B/7471A
J1TLC6	280-55620-3	6010/7471	6010B/7471A
J1TLC7	280-55620-4	6010/7471	6010B/7471A
J1TLC8	280-55620-5	6010/7471	6010B/7471A
J1TLC9	280-55620-6	6010/7471	6010B/7471A
J1TLD0	280-55620-7	6010/7471	6010B/7471A
J1TLD1	280-55620-8	6010/7471	6010B/7471A
J1TLD2	280-55620-9	6010/7471	6010B/7471A
J1TLD3	280-55620-10	6010/7471	6010B/7471A
J1TLD4	280-55620-11	6010/7471	6010B/7471A
J1TLD5	280-55620-12	6010/7471	6010B/7471A
J1TLD6	280-55620-13	6010/7471	6010B/7471A
J1TLD7	280-55620-14	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 5/20/2014 9:40 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 4.1° C.

TOTAL METALS - SW846 6010B/7471A
Serial dilution of a digestate in batch 280-226665 indicates that physical and chemical interferences are present for Calcium, Cobalt, Iron, Nickel and Zinc. Results have been flagged with an "X".

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 J1TLC4; therefore, control limits are not applicable.

Boron was recovered outside the control limits in the Matrix Spike performed on sample J1TLC4, and the associated sample result has been flagged "N". There is no indication that the analytical system was operating out of control, and method accuracy has been verified by the acceptable LCS analysis data; therefore, corrective action is deemed unnecessary.

No other anomalies were encountered.

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	RC-189-292	Page 1 of 3

Collector: Q. Stowe	Company Contact: Joan Kessner	Telephone No.: 375-4688	Project Coordinator: KESSNER, JH
Price Code	Data Turnaround: 7 day		
Project Designation: 100N Field Remediation	Sampling Location: 100-N-104 (verification)		SAF No.: RC-189
Ice Chest No.: WCH-11-067	Field Logbook No.: DWSHEA 5/19/14 EL-1652-~~11~~ 12	COA: 01N1042000	Method of Shipment: Commercial Carrier / FED EX
Shipped To: TestAmerica Denver	Offsite Property No.: A131143		Bill of Lading/Air Bill No.: See OSPC

Other Labs Shipped To: TestAmerica Richland

POSSIBLE SAMPLE HAZARDS/REMARKS
N/A

Special Handling and/or Storage
ool 4C

Preservation	Cool 4C											
Type of Container	G/P											
No. of Container(s)	1											
Volume	250mL											
Sample Analysis	See item (1) in Special Instructions											

Sample No.	Matrix	Sample Date	Sample Time										
J1TLC4	SOIL	5-16-14	1057	X									
J1TLC5	SOIL	5-16-14	1106	X									
J1TLC6	SOIL	5-16-14	1036	X									
J1TLC7	SOIL	5-16-14	1048	X									
J1TLC8	SOIL	5-16-14	1101	X									

CHAIN OF POSSESSION	Sign/Print Names	Date/Time
Relinquished By/Removed From: Quincy Stowe	Received By/Stored In: DWSHEA DWSHEA	5-16-14 1141
Relinquished By/Removed From: DWSHEA DWSHEA	Received By/Stored In: Fridge 3A 1060 Battelle	5/16/14 1307
Relinquished By/Removed From: Fridge 3A 1060 Battelle	Received By/Stored In: DWSHEA DWSHEA	5/19/14 1005
Relinquished By/Removed From: DWSHEA DWSHEA	Received By/Stored In: Fed EX	5/19/14 1024
Relinquished By/Removed From:	Received By/Stored In:	5-20-14 9:10
Relinquished By/Removed From:	Received By/Stored In:	
Relinquished By/Removed From:	Received By/Stored In:	

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)

3.6 IKH ts
MY 5/20/14

REVIEWED BY SMS
DATE 5/19/14

JP0801

WCH-EE-011

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	RC-189-292	Page 2 of 3

Collector: Q. Stowe	Company Contact: Joan Kessner	Telephone No.: 375-4688	Project Coordinator: KESSNER, JH
Price Code:	Data Turnaround: 7 day		
Project Designation: 100N Field Remediation	Sampling Location: 100-N-104 (verification)		SAF No.: RC-189
Ice Chest No.: WCH-11-067	Field Logbook No.: EL-1652-1/12 JWShea 5/19/14	COA: 01N1042000	Method of Shipment: Commercial Carrier / FED EX
Shipped To: TestAmerica Denver	Offsite Property No.: A131143		Bill of Lading/Air Bill No.: See OSPC

Other Labs Shipped To: TestAmerica Richland

POSSIBLE SAMPLE HAZARDS/REMARKS
N/A

Special Handling and/or Storage
ool 4C

Preservation	Cool 4C											
Type of Container	G/P											
No. of Container(s)	1											
Volume	250mL											
Sample Analysis	See Item (1) in Special Instructions											

Sample No.	Matrix	Sample Date	Sample Time										
J1TLC9	SOIL	5-16-14	1017	X									
J1TLD0	SOIL	5-16-14	QS 5-16-14 1021	X									
J1TLD1	SOIL	5-16-14	1033	X									
J1TLD2	SOIL	5-16-14	1043	X									
J1TLD3	SOIL	5-16-14	1005	X									

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
Quincy Stowe	5-16-14 1141	JWShea DWSHEA	5/16/14 1141
JWShea DWSHEA	5/16/14 1307	Fridge 3A 1060 Battelle	5/16/14 1307
Fridge 3A 1060 Battelle	5/19/14 1005	JWShea DWSHEA	5/19/14 1005
JWShea DWSHEA	5/19/14 1024	Fed Ex	
		[illegible]	5-20-14 9:40

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 SMS
DATE 5/15/14

JP0801

WCH-EE-011

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	RC-189-292	Page 3 of 3

Collector: Q. Stowe	Company Contact: Joan Kessner	Telephone No.: 375-4688	Project Coordinator: KESSNER, JH
Price Code:	Data Turnaround: 7 day		
Project Designation: 100N Field Remediation	Sampling Location: 100-N-104 (verification)		SAF No.: RC-189
Ice Chest No.: WCH-11-067	Field Logbook No.: DWShea 5/19/14 EL-1652-X12	COA: 01N1042000	Method of Shipment: Commercial Carrier / FED EX
Shipped To: TestAmerica Denver	Offsite Property No.: A131143		Bill of Lading/Air Bill No.: See OSPC

Other Labs Shipped To: TestAmerica Richland

POSSIBLE SAMPLE HAZARDS/REMARKS
N/A

Special Handling and/or Storage
ool 4C

Preservation	Cool 4C											
Type of Container	G/P											
No. of Container(s)	1											
Volume	250mL											
Sample Analysis	See Item (1) in Special Instructions											

Sample No.	Matrix	Sample Date	Sample Time										
J1TLD4	SOIL	5-16-14	1011	X									
J1TLD5	SOIL	5-16-14	1026	X									
J1TLD6	SOIL	5-16-14	1048	X									
J1TLD7	SOIL	5-16-14	1002	X									

CHAIN OF POSSESSION	Sign/Print Names
Relinquished By/Removed From: Quincy Stowe, Date/Time: 5-16-14 1141	Received By/Stored In: DWShea DWSHEA, Date/Time: 5/16/14 1141
Relinquished By/Removed From: DWShea DWSHEA 5/16/14 1307	Received By/Stored In: Fridge 3A 1060 Battelle, Date/Time: 5/16/14 1307
Relinquished By/Removed From: Fridge 3A 1060 Battelle 5/19/14 1005	Received By/Stored In: DWShea DWSHEA, Date/Time: 5/19/14 1005
Relinquished By/Removed From: DWShea DWSHEA 5/19/14 1024	Received By/Stored In: Fed EX
Relinquished By/Removed From:	Received By/Stored In: [signature], Date/Time: 5/20/14 940
Relinquished By/Removed From:	Received By/Stored In:
Relinquished By/Removed From:	Received By/Stored In:
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 SMS DATE 5/19/14

JP0801

WCH-EE-011

Appendix 5

Data Validation Supporting Documentation

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
PROJECT: 100-N-804			DATA PACKAGE: JP0801		
VALIDATOR: ELR		LAB: TAL		DATE: 5/31/14	
			SDG: JP0801		
ANALYSES PERFORMED					
SW-846/ICP	SW-846/GFAA	SW-846/Hg	SW-846 Cyanide		
SAMPLES/MATRIX					
JITLC4	JITLC5	JITLC6	JITLC7	JITLC8	
JITLC9	JITLD0	JITLD1	JITLD2	JITLD3	
JITLD4	JITLD5	JITLD6	JITLD7		
				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:

FB – 11 detects

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 (19%) – Jall

MC – antimony (55%) silicon (22%) – Jall

no RA

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: 280-55620-1
Sdg Number: JP0801

Method Blank - Batch: 280-226665

Method: 6010B
Preparation: 3050B

Lab Sample ID:	MB 280-226665/1-A	Analysis Batch:	280-226977	Instrument ID:	MT_025
Client Matrix:	Solid	Prep Batch:	280-226665	Lab File ID:	25A3052114.asc
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	1 g
Analysis Date:	05/22/2014 0200	Units:	mg/Kg	Final Weight/Volume:	100 mL
Prep Date:	05/21/2014 0825				
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
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	14.1	U	14.1	50.0
Chromium	0.058	U	0.058	0.20
Cobalt	0.10	U	0.10	1.0
Copper	0.22	U	0.22	1.0
Iron	3.8	U	3.8	5.0
Lead	0.27	U	0.27	0.50
Magnesium	3.7	U	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
Silicon	5.7	U	5.7	10.0
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: 280-55620-1
Sdg Number: JP0801

Lab Control Sample - Batch: 280-226665

Method: 6010B
Preparation: 3050B

Lab Sample ID:	LCS 280-226665/2-A	Analysis Batch:	280-226977	Instrument ID:	MT_025
Client Matrix:	Solid	Prep Batch:	280-226665	Lab File ID:	25A3052114.asc
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	1 g
Analysis Date:	05/22/2014 0202	Units:	mg/Kg	Final Weight/Volume:	100 mL
Prep Date:	05/21/2014 0825				
Leach Date:	N/A				

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
Aluminum	200	185.3	93	82 - 116	
Antimony	50.0	47.36	95	82 - 110	
Arsenic	100	96.15	96	85 - 110	
Barium	200	185.4	93	87 - 112	
Beryllium	5.00	4.64	93	84 - 114	
Boron	100	92.33	92	80 - 120	
Cadmium	10.0	9.71	97	87 - 110	
Calcium	5000	4616	92	82 - 114	
Chromium	20.0	19.93	100	84 - 114	
Cobalt	50.0	48.59	97	87 - 110	
Copper	25.0	23.83	95	88 - 110	
Iron	100	93.16	93	87 - 120	
Lead	50.0	47.98	96	86 - 110	
Magnesium	5000	4848	97	90 - 110	
Manganese	50.0	47.71	95	88 - 110	
Molybdenum	100	96.47	96	86 - 110	
Nickel	50.0	48.56	97	87 - 110	
Potassium	5000	4753	95	89 - 110	
Selenium	200	183.9	92	83 - 110	
Silicon	1000	186.5	19	10 - 70	
Silver	5.00	4.74	95	87 - 114	
Sodium	5000	5044	101	90 - 112	
Vanadium	50.0	48.81	98	88 - 110	
Zinc	50.0	47.55	95	76 - 114	

Client: Washington Closure Hanford

Job Number: 280-55620-1
Sdg Number: JP0801

Matrix Spike - Batch: 280-226665

Method: 6010B
Preparation: 3050B

Lab Sample ID:	280-55620-1	Analysis Batch:	280-226977	Instrument ID:	MT_025
Client Matrix:	Solid	Prep Batch:	280-226665	Lab File ID:	25A3052114.asc
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	1.15 g
Analysis Date:	05/22/2014 0211	Units:	mg/Kg	Final Weight/Volume:	100 mL
Prep Date:	05/21/2014 0825				
Leach Date:	N/A				

Analyte	Sample Result/Qual		Spike Amount	Result	% Rec.	Limit	Qual
Aluminum	6430		179	7461	575	50 - 200	4
Antimony	0.39	U	44.7	24.73	55	20 - 200	
Arsenic	2.5		89.5	74.41	80	76 - 111	
Barium	52.5		179	200.3	83	52 - 159	
Beryllium	0.31		4.47	3.84	79	72 - 105	
Boron	1.0	U	89.5	68.50	77	80 - 120	N
Cadmium	0.042	U	8.95	7.41	83	40 - 130	
Calcium	5190		4470	10230	113	43 - 165	
Chromium	7.7		17.9	21.84	79	70 - 200	
Cobalt	8.4		44.7	43.59	79	72 - 106	
Copper	17.4		22.4	38.05	93	37 - 187	
Iron	23100		89.5	23560	477	70 - 200	4
Lead	3.5		44.7	37.90	77	70 - 200	
Magnesium	4700		4470	8388	82	64 - 145	
Manganese	325		44.7	358.3	75	40 - 200	4
Molybdenum	0.33	B	89.5	72.20	80	75 - 103	
Nickel	9.8		44.7	44.81	78	61 - 126	
Potassium	1100		4470	4890	85	56 - 172	
Selenium	0.88	U	179	137.9	77	76 - 104	
Silicon	264		895	464.0	22	20 - 200	
Silver	0.16	U	4.47	3.67	82	75 - 141	
Sodium	285		4470	4462	93	78 - 111	
Vanadium	59.3		44.7	102.6	97	50 - 169	
Zinc	44.2		44.7	76.82	73	70 - 200	

Client: Washington Closure Hanford

Job Number: 280-55620-1
Sdg Number: JP0801

Duplicate - Batch: 280-226665

Method: 6010B
Preparation: 3050B

Lab Sample ID:	280-55620-1	Analysis Batch:	280-226977	Instrument ID:	MT_025
Client Matrix:	Solid	Prep Batch:	280-226665	Lab File ID:	25A3052114.asc
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	1.08 g
Analysis Date:	05/22/2014 0209	Units:	mg/Kg	Final Weight/Volume:	100 mL
Prep Date:	05/21/2014 0825				
Leach Date:	N/A				

Analyte	Sample Result/Qual		Result	RPD	Limit	Qual
Aluminum	6430		6311	2	40	
Antimony	0.39	U	0.36	NC	40	U
Arsenic	2.5		2.12	18	30	
Barium	52.5		62.81	18	30	
Beryllium	0.31		0.279	12	30	
Boron	1.0	U	0.93	NC	30	U
Cadmium	0.042	U	0.039	NC	30	U
Calcium	5190		5500	6	30	
Chromium	7.7		6.72	14	40	
Cobalt	8.4		8.52	2	30	
Copper	17.4		19.05	9	30	
Iron	23100		22510	3	40	
Lead	3.5		3.93	10	40	
Magnesium	4700		4251	10	30	
Manganese	325		300.7	8	40	
Molybdenum	0.33	B	0.25	NC	30	U
Nickel	9.8		9.71	1	30	
Potassium	1100		996.8	10	40	
Selenium	0.88	U	0.82	NC	30	U
Silicon	264		235.1	12	40	
Silver	0.16	U	0.15	NC	30	U
Sodium	285		345.1	19	30	
Vanadium	59.3		57.97	2	30	
Zinc	44.2		43.19	2	40	

Client: Washington Closure Hanford

Job Number: 280-55620-1
Sdg Number: JP0801

Method Blank - Batch: 280-226961

Method: 7471A
Preparation: 7471A

Lab Sample ID:	MB 280-226961/1-A	Analysis Batch:	280-227155	Instrument ID:	MT_033
Client Matrix:	Solid	Prep Batch:	280-226961	Lab File ID:	140522baa.txt
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	.6 g
Analysis Date:	05/22/2014 2030	Units:	mg/Kg	Final Weight/Volume:	50 mL
Prep Date:	05/22/2014 1230				
Leach Date:	N/A				

Analyte	Result	Qual	MDL	RL
Mercury	0.0055	U	0.0055	0.017

Lab Control Sample - Batch: 280-226961

Method: 7471A
Preparation: 7471A

Lab Sample ID:	LCS 280-226961/2-A	Analysis Batch:	280-227155	Instrument ID:	MT_033
Client Matrix:	Solid	Prep Batch:	280-226961	Lab File ID:	140522baa.txt
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	.6 g
Analysis Date:	05/22/2014 2032	Units:	mg/Kg	Final Weight/Volume:	50 mL
Prep Date:	05/22/2014 1230				
Leach Date:	N/A				

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
Mercury	0.417	0.391	94	87 - 111	

Matrix Spike - Batch: 280-226961

Method: 7471A
Preparation: 7471A

Lab Sample ID:	280-55620-1	Analysis Batch:	280-227155	Instrument ID:	MT_033
Client Matrix:	Solid	Prep Batch:	280-226961	Lab File ID:	140522baa.txt
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	.61 g
Analysis Date:	05/22/2014 2049	Units:	mg/Kg	Final Weight/Volume:	50 mL
Prep Date:	05/22/2014 1230				
Leach Date:	N/A				

Analyte	Sample Result/Qual		Spike Amount	Result	% Rec.	Limit	Qual
Mercury	0.0059	U	0.422	0.414	98	87 - 111	

Quality Control Results

Client: Washington Closure Hanford

Job Number: 280-55620-1
Sdg Number: JP0801

Duplicate - Batch: 280-226961

Method: 7471A
Preparation: 7471A

Lab Sample ID:	280-55620-1	Analysis Batch:	280-227155	Instrument ID:	MT_033
Client Matrix:	Solid	Prep Batch:	280-226961	Lab File ID:	140522baa.txt
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	.57 g
Analysis Date:	05/22/2014 2047	Units:	mg/Kg	Final Weight/Volume:	50 mL
Prep Date:	05/22/2014 1230				
Leach Date:	N/A				

Analyte	Sample Result/Qual		Result	RPD	Limit	Qual
Mercury	0.0059	U	0.0060	NC	20	U