

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 JP0808 SAF-RC-189

Sample Location: 100-N-84:6

Date: 12 June 2014
 To: Washington Closure Hanford Inc. (technical representative)
 From: ELR Consulting
 Project: 100N Field Remediation – Soil Full Protocol - Waste Site 100-N-84:6
 Subject: Wet Chemistry - Data Package No. JP0808-TAL

INTRODUCTION

This memo presents the results of data validation on Data Package No. JP0808 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
J1TR30	5/21/14	Soil	C	See note 1
J1TR31	5/21/14	Soil	C	See note 1
J1TR32	5/21/14	Soil	C	See note 1
J1TR33	5/21/14	Soil	C	See note 1
J1TR34	5/21/14	Soil	C	See note 1
J1TR35	5/21/14	Soil	C	See note 1
J1TR36	5/21/14	Soil	C	See note 1
J1TR37	5/21/14	Soil	C	See note 1
J1TR38	5/21/14	Soil	C	See note 1
J1TR42	5/21/14	Soil	C	See note 1
J1TR44	5/21/14	Soil	C	See note 1

1 – Chromium VI by 7196A & IC anions by 9056M.

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; 28 days for chloride, fluoride, bromide, sulfate; 48 hours for nitrate, nitrite and orthophosphate.

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".

Due to the holding time being exceeded by greater than twice the limit, all undetected nitrate, nitrite and orthophosphate results were qualified as rejected and flagged "UR".

Due to the holding time being exceeded by greater than twice the limit, all detected nitrate, nitrite and orthophosphate results were qualified as estimates and flagged "J".

All other 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 (J1TR30/J1TR42) 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 JP0808 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 65%.

MAJOR DEFICIENCIES

The following major deficiency was noted:

- Due to the holding time being exceeded by greater than twice the limit, all undetected nitrate, nitrite and orthophosphate results were qualified as rejected and flagged "UR".

Rejected data is unusable and should not be reported.

MINOR DEFICIENCIES

The following minor deficiencies were noted:

- Due to the holding time being exceeded by greater than twice the limit, all detected nitrate, nitrite and orthophosphate 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*.

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: JP0808	REVIEWER: ELR	Project: 100-N-84:6	PAGE 1 OF 1
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
Nitrate	J	All (except J1TR35)	Hold time
Nitrate	UR	J1TR35	Hold time
Nitrite	UR	(all except J1TR30 & J1TR42)	Hold time
Nitrite	J	J1TR30, J1TR42	Hold time
Orthophosphate	UR	All (except J1TR31, J1TR36, J1TR38)	Hold time
Orthophosphate	J	J1TR31, J1TR36 J1TR38	Hold time

* - 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

Analytical Data

Client: Washington Closure Hanford

Job Number: 280-55787-1
Sdg Number: JP0808

General Chemistry

5/6/14

Client Sample ID: J1TR30

Lab Sample ID: 280-55787-1

Client Matrix: Solid

% Moisture: 1.4

Date Sampled: 05/21/2014 1329

Date Received: 05/23/2014 0945

Analyte	Result	Qual	Units	MDL	RL	Dil	Method
Chloride-Soluble	4.9		mg/Kg	1.9	4.8	1.0	9056M
	Analysis Batch: 280-227453			Analysis Date: 05/27/2014 2219			DryWt Corrected: Y
Nitrate as N-Soluble	4.1	J	mg/Kg	0.30	2.4	1.0	9056M
	Analysis Batch: 280-227452			Analysis Date: 05/27/2014 2219			DryWt Corrected: Y
Bromide-Soluble	0.38	U	mg/Kg	0.38	1.9	1.0	9056M
	Analysis Batch: 280-227453			Analysis Date: 05/27/2014 2219			DryWt Corrected: Y
Nitrite as N-Soluble	0.54	B J	mg/Kg	0.32	2.4	1.0	9056M
	Analysis Batch: 280-227452			Analysis Date: 05/27/2014 2219			DryWt Corrected: Y
Orthophosphate as P-Soluble	1.2	U N R	mg/Kg	1.2	4.8	1.0	9056M
	Analysis Batch: 280-227452			Analysis Date: 05/27/2014 2219			DryWt Corrected: Y
Sulfate-Soluble	18.1		mg/Kg	1.6	4.8	1.0	9056M
	Analysis Batch: 280-227453			Analysis Date: 05/27/2014 2219			DryWt Corrected: Y
Fluoride-Soluble	0.79	U N	mg/Kg	0.79	4.8	1.0	9056M
	Analysis Batch: 280-227453			Analysis Date: 05/27/2014 2219			DryWt Corrected: Y
Analyte	Result	Qual	Units	RL	RL	Dil	Method
Percent Moisture	1.4		%	0.10	0.10	1.0	D-2216
	Analysis Batch: 280-227630			Analysis Date: 05/28/2014 1308			DryWt Corrected: N

Analytical Data

Client: Washington Closure Hanford

Job Number: 280-55787-1
Sdg Number: JP0808

General Chemistry

Client Sample ID: J1TR31

Lab Sample ID: 280-55787-2

Client Matrix: Solid

% Moisture: 1.1

Handwritten signature

Date Sampled: 05/21/2014 1336
Date Received: 05/23/2014 0945

Analyte	Result	Qual	Units	MDL	RL	Dil	Method
Chloride-Soluble	4.0	B	mg/Kg	1.9	4.8	1.0	9056M
	Analysis Batch: 280-227453		Analysis Date: 05/27/2014 2339				DryWT Corrected: Y
Nitrate as N-Soluble	1.9	B	mg/Kg	0.30	2.4	1.0	9056M
	Analysis Batch: 280-227452		Analysis Date: 05/27/2014 2339				DryWT Corrected: Y
Bromide-Soluble	0.38	U	mg/Kg	0.38	1.9	1.0	9056M
	Analysis Batch: 280-227453		Analysis Date: 05/27/2014 2339				DryWT Corrected: Y
Nitrite as N-Soluble	0.32	U	mg/Kg	0.32	2.4	1.0	9056M
	Analysis Batch: 280-227452		Analysis Date: 05/27/2014 2339				DryWT Corrected: Y
Orthophosphate as P-Soluble	1.9	B	mg/Kg	1.2	4.8	1.0	9056M
	Analysis Batch: 280-227452		Analysis Date: 05/27/2014 2339				DryWT Corrected: Y
Sulfate-Soluble	14.1		mg/Kg	1.6	4.8	1.0	9056M
	Analysis Batch: 280-227453		Analysis Date: 05/27/2014 2339				DryWT Corrected: Y
Fluoride-Soluble	1.1	B	mg/Kg	0.79	4.8	1.0	9056M
	Analysis Batch: 280-227453		Analysis Date: 05/27/2014 2339				DryWT Corrected: Y
Analyte	Result	Qual	Units	RL	RL	Dil	Method
Percent Moisture	1.1		%	0.10	0.10	1.0	D-2218
	Analysis Batch: 280-227630		Analysis Date: 05/28/2014 1308				DryWT Corrected: N

Analytical Data

Client: Washington Closure Hanford

Job Number: 280-55787-1
Sdg Number: JP0808

General Chemistry

Client Sample ID: J1TR32

V. C. Kelly

Lab Sample ID: 280-55787-3

Date Sampled: 05/21/2014 1254

Client Matrix: Solid

% Moisture: 2.0

Date Received: 05/23/2014 0945

Analyte	Result	Qual	Units	MDL	RL	Dil	Method
Chloride-Soluble	37.6		mg/Kg	1.9	4.7	1.0	9056M
	Analysis Batch: 280-227453			Analysis Date: 05/27/2014 2354			DryWt Corrected: Y
Nitrate as N-Soluble	13.8	J	mg/Kg	0.30	2.4	1.0	9056M
	Analysis Batch: 280-227452			Analysis Date: 05/27/2014 2354			DryWt Corrected: Y
Bromide-Soluble	0.37	U	mg/Kg	0.37	1.9	1.0	9056M
	Analysis Batch: 280-227453			Analysis Date: 05/27/2014 2354			DryWt Corrected: Y
Nitrite as N-Soluble	0.32	U R	mg/Kg	0.32	2.4	1.0	9056M
	Analysis Batch: 280-227452			Analysis Date: 05/27/2014 2354			DryWt Corrected: Y
Orthophosphate as P-Soluble	1.2	U R	mg/Kg	1.2	4.7	1.0	9056M
	Analysis Batch: 280-227452			Analysis Date: 05/27/2014 2354			DryWt Corrected: Y
Sulfate-Soluble	251		mg/Kg	1.6	4.7	1.0	9056M
	Analysis Batch: 280-227453			Analysis Date: 05/27/2014 2354			DryWt Corrected: Y
Fluoride-Soluble	0.77	U	mg/Kg	0.77	4.7	1.0	9056M
	Analysis Batch: 280-227453			Analysis Date: 05/27/2014 2354			DryWt Corrected: Y
Analyte	Result	Qual	Units	RL	RL	Dil	Method
Percent Moisture	2.0		%	0.10	0.10	1.0	D-2216
	Analysis Batch: 280-227630			Analysis Date: 05/28/2014 1308			DryWt Corrected: N

Analytical Data

Client: Washington Closure Hanford

Job Number: 280-55787-1
Sdg Number: JP0808

General Chemistry

Client Sample ID: J1TR33

Lab Sample ID: 280-55787-4

Client Matrix: Solid

% Moisture: 1.2

M 6/11/14

Date Sampled: 05/21/2014 1311

Date Received: 05/23/2014 0945

Analyte	Result	Qual	Units	MDL	RL	Dil	Method
Chloride-Soluble	3.3	B	mg/Kg	1.9	4.8	1.0	9056M
	Analysis Batch: 280-227453		Analysis Date: 05/28/2014 0010				DryWt Corrected: Y
Nitrate as N-Soluble	0.89	B	mg/Kg	0.30	2.4	1.0	9056M
	Analysis Batch: 280-227452		Analysis Date: 05/28/2014 0010				DryWt Corrected: Y
Bromide-Soluble	0.37	U	mg/Kg	0.37	1.9	1.0	9056M
	Analysis Batch: 280-227453		Analysis Date: 05/28/2014 0010				DryWt Corrected: Y
Nitrite as N-Soluble	0.32	U	mg/Kg	0.32	2.4	1.0	9056M
	Analysis Batch: 280-227452		Analysis Date: 05/28/2014 0010				DryWt Corrected: Y
Orthophosphate as P-Soluble	1.2	U	mg/Kg	1.2	4.8	1.0	9056M
	Analysis Batch: 280-227452		Analysis Date: 05/28/2014 0010				DryWt Corrected: Y
Sulfate-Soluble	7.2		mg/Kg	1.6	4.8	1.0	9056M
	Analysis Batch: 280-227453		Analysis Date: 05/28/2014 0010				DryWt Corrected: Y
Fluoride-Soluble	0.78	U	mg/Kg	0.78	4.8	1.0	9056M
	Analysis Batch: 280-227453		Analysis Date: 05/28/2014 0010				DryWt Corrected: Y
Analyte	Result	Qual	Units	RL	RL	Dil	Method
Percent Moisture	1.2		%	0.10	0.10	1.0	D-2216
	Analysis Batch: 280-227630		Analysis Date: 05/28/2014 1308				DryWt Corrected: N

Analytical Data

Client: Washington Closure Hanford

Job Number: 280-55787-1
Sdg Number: JP0808

General Chemistry

Client Sample ID: J1TR34

Lab Sample ID: 280-55787-5

Client Matrix: Solid

% Moisture: 1.9

Collective

Date Sampled: 05/21/2014 1315

Date Received: 05/23/2014 0945

Analyte	Result	Qual	Units	MDL	RL	Dil	Method
Chloride-Soluble	10.7		mg/Kg	1.9	4.7	1.0	9056M
	Analysis Batch: 280-227453			Analysis Date: 05/28/2014 0026			DryWt Corrected: Y
Nitrate as N-Soluble	3.5	J	mg/Kg	0.30	2.4	1.0	9056M
	Analysis Batch: 280-227452			Analysis Date: 05/28/2014 0026			DryWt Corrected: Y
Bromide-Soluble	0.37	U	mg/Kg	0.37	1.9	1.0	9056M
	Analysis Batch: 280-227453			Analysis Date: 05/28/2014 0026			DryWt Corrected: Y
Nitrite as N-Soluble	0.32	U R	mg/Kg	0.32	2.4	1.0	9056M
	Analysis Batch: 280-227452			Analysis Date: 05/28/2014 0026			DryWt Corrected: Y
Orthophosphate as P-Soluble	1.2	U R	mg/Kg	1.2	4.7	1.0	9056M
	Analysis Batch: 280-227452			Analysis Date: 05/28/2014 0026			DryWt Corrected: Y
Sulfate-Soluble	53.5		mg/Kg	1.6	4.7	1.0	9056M
	Analysis Batch: 280-227453			Analysis Date: 05/28/2014 0026			DryWt Corrected: Y
Fluoride-Soluble	0.78	U	mg/Kg	0.78	4.7	1.0	9056M
	Analysis Batch: 280-227453			Analysis Date: 05/28/2014 0026			DryWt Corrected: Y
Analyte	Result	Qual	Units	RL	RL	Dil	Method
Percent Moisture	1.9		%	0.10	0.10	1.0	D-2218
	Analysis Batch: 280-227630			Analysis Date: 05/28/2014 1308			DryWt Corrected: N

Analytical Data

Client: Washington Closure Hanford

Job Number: 280-55787-1

Sdg Number: JP0808

General Chemistry

Client Sample ID: J1TR35

Lab Sample ID: 280-55787-8

Client Matrix: Solid

% Moisture: 1.7

Handwritten: ✓
6/11/14

Date Sampled: 05/21/2014 1204

Date Received: 05/23/2014 0945

Analyte	Result	Qual	Units	MDL	RL	Dil	Method
Chloride-Soluble	4.3	B	mg/Kg	1.9	4.7	1.0	9056M
	Analysis Batch: 280-227453			Analysis Date: 05/28/2014 0042			DryWt Corrected: Y
Nitrate as N-Soluble	0.29	U R	mg/Kg	0.29	2.3	1.0	9056M
	Analysis Batch: 280-227452			Analysis Date: 05/28/2014 0042			DryWt Corrected: Y
Bromide-Soluble	0.36	U	mg/Kg	0.36	1.9	1.0	9056M
	Analysis Batch: 280-227453			Analysis Date: 05/28/2014 0042			DryWt Corrected: Y
Nitrite as N-Soluble	0.31	U R	mg/Kg	0.31	2.3	1.0	9056M
	Analysis Batch: 280-227452			Analysis Date: 05/28/2014 0042			DryWt Corrected: Y
Orthophosphate as P-Soluble	1.2	U R	mg/Kg	1.2	4.7	1.0	9056M
	Analysis Batch: 280-227452			Analysis Date: 05/28/2014 0042			DryWt Corrected: Y
Sulfate-Soluble	4.7		mg/Kg	1.6	4.7	1.0	9056M
	Analysis Batch: 280-227453			Analysis Date: 05/28/2014 0042			DryWt Corrected: Y
Fluoride-Soluble	0.77	U	mg/Kg	0.77	4.7	1.0	9056M
	Analysis Batch: 280-227453			Analysis Date: 05/28/2014 0042			DryWt Corrected: Y

Analyte	Result	Qual	Units	RL	RL	Dil	Method
Percent Moisture	1.7		%	0.10	0.10	1.0	D-2216
	Analysis Batch: 280-227630			Analysis Date: 05/28/2014 1308			DryWt Corrected: N

Analytical Data

Client: Washington Closure Hanford

Job Number: 280-55787-1
Sdg Number: JP0808

General Chemistry

Client Sample ID: J1TR36

Lab Sample ID: 280-55787-7

Client Matrix: Solid

% Moisture: 1.9

Handwritten: 6/11/14

Date Sampled: 05/21/2014 1242

Date Received: 05/23/2014 0945

Analyte	Result	Qual	Units	MDL	RL	Dil	Method
Chloride-Soluble	18.3		mg/Kg	1.9	4.8	1.0	9056M
	Analysis Batch: 280-227453			Analysis Date: 05/28/2014 0057			DryWt Corrected: Y
Nitrate as N-Soluble	1.6	B	mg/Kg	0.30	2.4	1.0	9056M
	Analysis Batch: 280-227452			Analysis Date: 05/28/2014 0057			DryWt Corrected: Y
Bromide-Soluble	0.38	U	mg/Kg	0.38	1.9	1.0	9056M
	Analysis Batch: 280-227453			Analysis Date: 05/28/2014 0057			DryWt Corrected: Y
Nitrite as N-Soluble	0.33	U	mg/Kg	0.33	2.4	1.0	9056M
	Analysis Batch: 280-227452			Analysis Date: 05/28/2014 0057			DryWt Corrected: Y
Orthophosphate as P-Soluble	1.4	B	mg/Kg	1.2	4.8	1.0	9056M
	Analysis Batch: 280-227452			Analysis Date: 05/28/2014 0057			DryWt Corrected: Y
Sulfate-Soluble	8.4		mg/Kg	1.6	4.8	1.0	9056M
	Analysis Batch: 280-227453			Analysis Date: 05/28/2014 0057			DryWt Corrected: Y
Fluoride-Soluble	1.0	B	mg/Kg	0.79	4.8	1.0	9056M
	Analysis Batch: 280-227453			Analysis Date: 05/28/2014 0057			DryWt Corrected: Y
Analyte	Result	Qual	Units	RL	RL	Dil	Method
Percent Moisture	1.9		%	0.10	0.10	1.0	D-2218
	Analysis Batch: 280-227630			Analysis Date: 05/28/2014 1308			DryWt Corrected: N

Analytical Data

Client: Washington Closure Hanford

Job Number: 280-55787-1
Sdg Number: JP0808

General Chemistry

Client Sample ID: J1TR37

Lab Sample ID: 280-55787-8

Client Matrix: Solid

% Moisture: 0.8

Handwritten: 5/21/14

Date Sampled: 05/21/2014 1414

Date Received: 05/23/2014 0945

Analyte	Result	Qual	Units	MDL	RL	Dil	Method
Chloride-Soluble	2.8	B	mg/Kg	1.9	4.7	1.0	9056M
	Analysis Batch: 280-227453		Analysis Date: 05/28/2014 0113				DryWt Corrected: Y
Nitrate as N-Soluble	1.0	B <i>J</i>	mg/Kg	0.29	2.3	1.0	9056M
	Analysis Batch: 280-227452		Analysis Date: 05/28/2014 0113				DryWt Corrected: Y
Bromide-Soluble	0.36	U	mg/Kg	0.36	1.9	1.0	9056M
	Analysis Batch: 280-227453		Analysis Date: 05/28/2014 0113				DryWt Corrected: Y
Nitrite as N-Soluble	0.31	U <i>R</i>	mg/Kg	0.31	2.3	1.0	9056M
	Analysis Batch: 280-227452		Analysis Date: 05/28/2014 0113				DryWt Corrected: Y
Orthophosphate as P-Soluble	1.2	U <i>R</i>	mg/Kg	1.2	4.7	1.0	9056M
	Analysis Batch: 280-227452		Analysis Date: 05/28/2014 0113				DryWt Corrected: Y
Sulfate-Soluble	5.5		mg/Kg	1.6	4.7	1.0	9056M
	Analysis Batch: 280-227453		Analysis Date: 05/28/2014 0113				DryWt Corrected: Y
Fluoride-Soluble	0.88	B	mg/Kg	0.76	4.7	1.0	9056M
	Analysis Batch: 280-227453		Analysis Date: 05/28/2014 0113				DryWt Corrected: Y

Analyte	Result	Qual	Units	RL	RL	Dil	Method
Percent Moisture	0.83		%	0.10	0.10	1.0	D-2216
	Analysis Batch: 280-227630		Analysis Date: 05/28/2014 1308				DryWt Corrected: N

Analytical Data

Client: Washington Closure Hanford

Job Number: 280-55787-1
Sdg Number: JP0808

General Chemistry

Client Sample ID: J1TR38

Lab Sample ID: 280-55787-9

Client Matrix: Solid

% Moisture: 2.0

Handwritten: ✓ 6/11/14

Date Sampled: 05/21/2014 1409

Date Received: 05/23/2014 0945

Analyte	Result	Qual	Units	MDL	RL	Dil	Method
Chloride-Soluble	30.8		mg/Kg	1.9	4.7	1.0	9056M
	Analysis Batch: 280-227453		Analysis Date: 05/28/2014 0129				DryWt Corrected: Y
Nitrate as N-Soluble	1.3	B J	mg/Kg	0.29	2.3	1.0	9056M
	Analysis Batch: 280-227452		Analysis Date: 05/28/2014 0129				DryWt Corrected: Y
Bromide-Soluble	0.36	U	mg/Kg	0.36	1.9	1.0	9056M
	Analysis Batch: 280-227453		Analysis Date: 05/28/2014 0129				DryWt Corrected: Y
Nitrite as N-Soluble	0.31	U R	mg/Kg	0.31	2.3	1.0	9056M
	Analysis Batch: 280-227452		Analysis Date: 05/28/2014 0129				DryWt Corrected: Y
Orthophosphate as P-Soluble	1.2	B J	mg/Kg	1.2	4.7	1.0	9056M
	Analysis Batch: 280-227452		Analysis Date: 05/28/2014 0129				DryWt Corrected: Y
Sulfate-Soluble	18.9		mg/Kg	1.6	4.7	1.0	9056M
	Analysis Batch: 280-227453		Analysis Date: 05/28/2014 0129				DryWt Corrected: Y
Fluoride-Soluble	1.3	B	mg/Kg	0.76	4.7	1.0	9056M
	Analysis Batch: 280-227453		Analysis Date: 05/28/2014 0129				DryWt Corrected: Y
Analyte	Result	Qual	Units	RL	RL	Dil	Method
Percent Moisture	2.0		%	0.10	0.10	1.0	D-2216
	Analysis Batch: 280-227630		Analysis Date: 05/28/2014 1308				DryWt Corrected: N

Analytical Data

Client: Washington Closure Hanford

Job Number: 280-55787-1
Sdg Number: JP0808

General Chemistry

Client Sample ID: J1TR42

Lab Sample ID: 280-55787-10

Client Matrix: Solid

% Moisture: 1.0

Handwritten: 5/21/14

Date Sampled: 05/21/2014 1329

Date Received: 05/23/2014 0945

Analyte	Result	Qual	Units	MDL	RL	Dil	Method
Chloride-Soluble	5.0		mg/Kg	1.9	4.7	1.0	9056M
	Analysis Batch: 280-227453		Analysis Date: 05/28/2014 0145				DryWt Corrected: Y
Nitrate as N-Soluble	4.3	J	mg/Kg	0.29	2.3	1.0	9056M
	Analysis Batch: 280-227452		Analysis Date: 05/28/2014 0145				DryWt Corrected: Y
Bromide-Soluble	0.36	U	mg/Kg	0.36	1.9	1.0	9056M
	Analysis Batch: 280-227453		Analysis Date: 05/28/2014 0145				DryWt Corrected: Y
Nitrite as N-Soluble	0.52	B S	mg/Kg	0.31	2.3	1.0	9056M
	Analysis Batch: 280-227452		Analysis Date: 05/28/2014 0145				DryWt Corrected: Y
Orthophosphate as P-Soluble	1.2	U R	mg/Kg	1.2	4.7	1.0	9056M
	Analysis Batch: 280-227452		Analysis Date: 05/28/2014 0145				DryWt Corrected: Y
Sulfate-Soluble	19.2		mg/Kg	1.6	4.7	1.0	9056M
	Analysis Batch: 280-227453		Analysis Date: 05/28/2014 0145				DryWt Corrected: Y
Fluoride-Soluble	0.76	U	mg/Kg	0.76	4.7	1.0	9056M
	Analysis Batch: 280-227453		Analysis Date: 05/28/2014 0145				DryWt Corrected: Y
Analyte	Result	Qual	Units	RL	RL	Dil	Method
Percent Moisture	0.99		%	0.10	0.10	1.0	D-2216
	Analysis Batch: 280-227630		Analysis Date: 05/28/2014 1308				DryWt Corrected: N

Analytical Data

Client: Washington Closure Hanford

Job Number: 280-55787-1
Sdg Number: JP0808

General Chemistry

Client Sample ID: J1TR44

Handwritten: 6/11/14

Lab Sample ID: 280-55787-12

Date Sampled: 05/21/2014 1259

Client Matrix: Solid

% Moisture: 1.4

Date Received: 05/23/2014 0945

Analyte	Result	Qual	Units	MDL	RL	Dil	Method
Chloride-Soluble	4.9		mg/Kg	1.9	4.7	1.0	9056M
	Analysis Batch: 280-227453	Analysis Date: 05/28/2014 0201					DryWt Corrected: Y
Nitrate as N-Soluble	1.7	B J	mg/Kg	0.29	2.3	1.0	9056M
	Analysis Batch: 280-227452	Analysis Date: 05/28/2014 0201					DryWt Corrected: Y
Bromide-Soluble	0.37	U	mg/Kg	0.37	1.9	1.0	9056M
	Analysis Batch: 280-227453	Analysis Date: 05/28/2014 0201					DryWt Corrected: Y
Nitrite as N-Soluble	0.31	U R	mg/Kg	0.31	2.3	1.0	9056M
	Analysis Batch: 280-227452	Analysis Date: 05/28/2014 0201					DryWt Corrected: Y
Orthophosphate as P-Soluble	1.2	U N R	mg/Kg	1.2	4.7	1.0	9056M
	Analysis Batch: 280-227452	Analysis Date: 05/28/2014 0201					DryWt Corrected: Y
Sulfate-Soluble	138		mg/Kg	1.6	4.7	1.0	9056M
	Analysis Batch: 280-227453	Analysis Date: 05/28/2014 0201					DryWt Corrected: Y
Fluoride-Soluble	0.77	U N	mg/Kg	0.77	4.7	1.0	9056M
	Analysis Batch: 280-227453	Analysis Date: 05/28/2014 0201					DryWt Corrected: Y
Analyte	Result	Qual	Units	RL	RL	Dil	Method
Percent Moisture	1.4		%	0.10	0.10	1.0	D-2216
	Analysis Batch: 280-227630	Analysis Date: 05/28/2014 1308					DryWt Corrected: N

Sample Results Summary

Date: 30-May-14

TestAmerica Inc TARL

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

Report No. : 60424

SDG No: JP0808

Client Id	Batch	Work Order	Parameter	Result +/- Uncertainty (2s)	Qual	Units	Tracer Yield	MDL	CRDL	RPD
4147032 7198_CR6										
J1TR30			M3VMG1AA HEXCHROME	4.30E-01 +/- 0.0E+00		mg/kg	N/A	1.55E-01	1.55E-01	
J1TR31			M3VMH1AA HEXCHROME	1.55E-01 +/- 0.0E+00	U	mg/kg	N/A	1.55E-01	1.55E-01	
J1TR32			M3VMJ1AA HEXCHROME	2.81E-01 +/- 0.0E+00		mg/kg	N/A	1.55E-01	1.55E-01	
J1TR33			M3VMK1AA HEXCHROME	1.98E-01 +/- 0.0E+00		mg/kg	N/A	1.55E-01	1.55E-01	
J1TR34			M3VML1AA HEXCHROME	2.43E-01 +/- 0.0E+00		mg/kg	N/A	1.55E-01	1.55E-01	
J1TR35			M3VMM1AA HEXCHROME	2.21E-01 +/- 0.0E+00		mg/kg	N/A	1.55E-01	1.55E-01	
J1TR36			M3VMN1AA HEXCHROME	1.56E-01 +/- 0.0E+00	U	mg/kg	N/A	1.55E-01	1.55E-01	
J1TR37			M3VMP1AA HEXCHROME	1.77E-01 +/- 0.0E+00		mg/kg	N/A	1.55E-01	1.55E-01	
J1TR38			M3VMQ1AA HEXCHROME	1.55E-01 +/- 0.0E+00	U	mg/kg	N/A	1.55E-01	1.55E-01	
J1TR42			M3VMR1AA HEXCHROME	3.20E-01 +/- 0.0E+00		mg/kg	N/A	1.55E-01	1.55E-01	
J1TR44			M3VL91AA HEXCHROME	3.23E-01 +/- 0.0E+00		mg/kg	N/A	1.55E-01	1.55E-01	
			M3VL91AD HEXCHROME	3.84E-01 +/- 0.0E+00		mg/kg	N/A	1.55E-01	1.55E-01	17.3
No. of Results:			12							

Handwritten signature and date: 6/11/14

TestAmerica Inc RPD - Relative Percent Difference.
 rptTALRchSaSummary2 V5.3.2 U Qual - Analyzed for but not detected above limiting criteria. Limit criteria is less than the Mdc/Mda/Mdi, Total Uncert, CRDL, RDI, or not identified by gamma scan software.
 A2002

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

CASE NARRATIVE

Client: Washington Closure Hanford

Project: WASHINGTON CLOSURE HANFORD

Report Number: 280-55787-1

SDG #: JP0808

SAF#: RC-189

Date SDG Closed: May 23, 2014
Data Deliverable: 7 Day / Summary

<u>CLIENT ID</u>	<u>LAB ID</u>	<u>ANALYSES REQUESTED</u>	<u>ANALYSES PERFORMED</u>
J1TR30	280-55787-1	6010/7471/9056M/8082	6010B/7471A/9056M/8082
J1TR31	280-55787-2	6010/7471/9056M/8082	6010B/7471A/9056M/8082
J1TR32	280-55787-3	6010/7471/9056M/8082	6010B/7471A/9056M/8082
J1TR33	280-55787-4	6010/7471/9056M/8082	6010B/7471A/9056M/8082
J1TR34	280-55787-5	6010/7471/9056M/8082	6010B/7471A/9056M/8082
J1TR35	280-55787-6	6010/7471/9056M/8082	6010B/7471A/9056M/8082
J1TR36	280-55787-7	6010/7471/9056M/8082	6010B/7471A/9056M/8082
J1TR37	280-55787-8	6010/7471/9056M/8082	6010B/7471A/9056M/8082
J1TR38	280-55787-9	6010/7471/9056M/8082	6010B/7471A/9056M/8082
J1TR42	280-55787-10	6010/7471/9056M/8082	6010B/7471A/9056M/8082
J1TR43	280-55787-11	6010/7471	6010B/7471A
J1TR44	280-55787-12	6010/7471/9056M/8082	6010B/7471A/9056M/8082

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 5/23/2014 9:45 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperatures of the 3 coolers at receipt time were 1.1° C, 2.9° C and 3.1° C.

GC SEMIVOLATILES - SW846 8082 - PCBs

The laboratory noted that a Sulfuric Acid clean-up was performed on the samples presented in this report to reduce matrix interferences.

Samples J1TR30, J1TR32, J1TR33, J1TR37 and J1TR42 contained a combination of Aroclor 1254 and Aroclor 1260 with insufficient separation to quantify individually. The samples have been quantified and reported as the predominant Aroclor.

No other anomalies were encountered.

TOTAL METALS - SW846 6010B/7471A

Serial dilution of a digestate in batch 280-227289 indicates that physical and chemical interferences are present for Cobalt, Nickel and Silicon. Results have been flagged with an "X".

Each sample is analyzed to achieve the lowest possible reporting limits within the constraints of the methods. Samples J1TR33, J1TR35 and J1TR44 required a 5X dilution prior to the analysis of Antimony, Beryllium, Cobalt, Copper, Lead, Silicon and Vanadium to minimize the interference caused by Titanium concentrations greater than the linear range. The reporting limits have been adjusted relative to the dilution required.

Low levels of Barium and Chromium are present in the method blank associated with batch 280-227289. Because the concentrations in the method blank are not present at levels greater than half the reporting limit, corrective action is deemed unnecessary.

Silicon is present in the method blank associated with batch 280-227289 at 7.23 mg/kg, which is greater than half the project specific reporting limit (PSRL) of 10 mg/kg. TestAmerica's practical quantitation limit (PQL) for Silicon is 50 mg/kg. The laboratory cannot maintain system cleanliness at this low level; therefore, corrective action is not initiated. It can be noted that the concentration found in the method blank is less than half of the laboratory standard PQL, and with the exception of 'blank' sample J1TR43, the associated sample amounts are twenty times greater than the method blank concentration.

Cadmium was recovered outside the control limits, biased high, in the LCS associated with batch 280-227289, and the associated sample results have been flagged "N". This is an indicator that data may be biased high. As Cadmium is not present at a level greater than the reporting limit in the associated samples, corrective action is deemed unnecessary.

It can be noted that the sample amount was greater than four times the spike amount for Aluminum, Copper, Iron and Manganese in the Matrix Spike performed on sample J1TR30; therefore, control limits are not applicable.

The Matrix Spike performed on sample J1TR30 exhibited percent recoveries outside the control limits for Silicon and Zinc, and the associated sample results have 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.

The duplicate analysis of sample J1TR30 exhibited RPD data outside the control limits for Cadmium and Copper, and the associated sample results have been flagged "M". 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.

GENERAL CHEMISTRY - SW846 9056M - ANIONS

The Matrix Spikes performed on samples J1TR30 and J1TR44 exhibited percent recoveries outside the control limits for Orthophosphate as P and Fluoride, and the associated sample results have been flagged "N". There is no indication that the analytical systems were 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-189-307	Page 1 of 3
Collector <i>A. Stone</i>	Company Contact Joan Kessner	Telephone No. 375-4688	Project Coordinator KESSNER, JH		Price Code	Data Turnaround <i>7 days</i>		
Project Designation 100N Field Remediation	Sampling Location 100-N-84:8, Verification	SAF No. RC-189						
Ice Chest No. <i>RC-08-027, RC-67-002, 004</i> <i>RC-08-027, 002, 004 SMS 5-22-14</i>	Field Logbook No. EL-1652-12	COA 01N8462000	Method of Shipment Commercial Carrier		Bill of Lading/Air Bill No. <i>See OSPC</i>			
Shipped To TestAmerica Denver	Offsite Property No. <i>A13148</i>							
Other Labs Shipped To TestAmerica Richland	Preservation	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C		
	Type of Container	GP	GP	ag	G	ag		
POSSIBLE SAMPLE HAZARDS/REMARKS <i>potentially radioactive</i>	No. of Container(s)	1	1	1	1	1		
	Volume	250mL	250mL	250mL	125mL	250mL		
Special Handling and/or Storage	Sample Analysis	See item (1) in Special Instructions	IC Anions - 9055 Modified Method	PCBs - 5062	TPH-Diesel Range - WTPHD+	PAHs - 8310		
			<i>5/20/14</i>					
<i>Page 6</i>	Sample No.	Matrix	Sample Date	Sample Time				
	J1TR30	SOIL	5-21-14	1329	X	X	X	
	J1TR31	SOIL	5-21-14	1336	X	X	X	
	J1TR32	SOIL	5-21-14	1254	X	X	X	
	J1TR33	SOIL	5-21-14	1311	X	X	X	
	J1TR34	SOIL	5-21-14	1315	X	X	X	
CHAIN OF POSSESSION			Sign/Print Names		SPECIAL INSTRUCTIONS			
Relinquished By/Removed From <i>Quincy Stone</i>	Date/Time <i>5-21-14 1442</i>	Received By/Stored In <i>DWShea</i>	Date/Time <i>5/21/14 1442</i>	(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)				
Relinquished By/Removed From <i>DWShea</i>	Date/Time <i>5/21/14 1644</i>	Received By/Stored In <i>Fridge 3C</i>	Date/Time <i>5/21/14 1644</i>	<i>2.8, 2.6, 0.8</i>				
Relinquished By/Removed From <i>Fridge 3C</i>	Date/Time <i>5/22/14 0840</i>	Received By/Stored In <i>DWShea</i>	Date/Time <i>5/22/14 0840</i>	<i>1R570.3</i>				
Relinquished By/Removed From <i>DWShea</i>	Date/Time <i>5/22/14 0851</i>	Received By/Stored In <i>Feed EX</i>	Date/Time <i>5/23/14 9:45</i>	<i>5/23/14</i>				
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time	<i>50.</i>				
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time					
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time					
FINAL SAMPLE DISPOSITION	Dispose Method	Disposed By	Date/Time					



JP0808

25

Washington Closure Hanford		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST					RC-189-307		Page 3 of 3		
Collector <i>R. Stone</i>		Company Contact Joan Kessner		Telephone No. 375-4688		Project Coordinator KESSNER, JH		Price Code		Data Turnaround <i>7 days</i>	
Project Designation 100N Field Remediation		Sampling Location 100-N-84-6, Verification				SAF No. RC-189					
Ice Chest No. <i>RC-08-027, RC-07-002, 004</i> <i>RC-07-027, 002, 004 SMS-1244</i>		Field Logbook No. EL-1652-12		COA 01N8462000		Method of Shipment Commercial Carrier					
Shipped To TestAmerica Denver		Offsite Property No. <i>A131148</i>				Bill of Lading/Air Bill No. <i>See OSC</i>					
Other Labs Shipped To TestAmerica Richland		Preservation		Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C			
		Type of Container		GP	GP	aG	G	aG			
POSSIBLE SAMPLE HAZARDS/REMARKS <i>potentially radioactive</i>		No. of Container(s)		1	1	1		1			
		Volume		250mL	250mL	250mL	125mL	250mL			
		Sample Analysis		See Item (1) in Special Instructions	IC Anions - 8088 Modified; HCB/PCB- 8088 <i>5/20/14</i>	PCBs - 8082	TPH-Diesel Range - WTPH-D +	PAHs - 8310			
Special Handling and/or Storage											
page		Sample No.	Matrix	Sample Date	Sample Time						
6		J1TR40	SOIL	<i>3005</i>	<i>5/21/14</i>						
7		J1TR41	SOIL								
7		J1TR42	SOIL	5-21-14	1329	x	x	x			
8		J1TR43	SOIL	5-21-14	1406	x	<i>0W 5/21/14</i>	x			
CHAIN OF POSSESSION				Sign/Print Names				SPECIAL INSTRUCTIONS			
Relinquished By/Removed From		Date/Time		Received By/Stored In		Date/Time		(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)			
<i>R. Stone</i>		<i>5-21-14</i>		<i>DWSHEA</i>		<i>5/21/14 1442</i>					
<i>DWSHEA</i>		<i>7/1/14 1644</i>		<i>Fridge 3C</i>		<i>7/1/14 1644</i>					
<i>Fridge 3C</i>		<i>7/22/14 0840</i>		<i>DWSHEA</i>		<i>7/2/14 0840</i>					
<i>DWSHEA</i>		<i>5/21/14 0851</i>		<i>Fred EX</i>							
<i>DWSHEA</i>		<i>5/21/14 0945</i>		<i>C. A.</i>		<i>5/21/14 0945</i>					
Relinquished By/Removed From		Date/Time		Received By/Stored In		Date/Time		JPO808 			
Relinquished By/Removed From		Date/Time		Received By/Stored In		Date/Time					
Relinquished By/Removed From		Date/Time		Received By/Stored In		Date/Time					
FINAL SAMPLE DISPOSITION		Disposal Method		Disposed By		Date/Time					

Certificate of Analysis

Washington Hanford Closure
 2620 Fermi Avenue
 Richland, WA 99354

May 30, 2014

Attention: Joan Kessner

SAF Number	:	RC-189
Date SDG Closed	:	May 22, 2014
Number of Samples	:	Eleven (11)
Sample Type	:	Soil
SDG Number	:	JP0808
Data Deliverable	:	7-Day / Summary

CASE NARRATIVE

I. Introduction

On May 22, 2014, eleven soil samples were received at TestAmerica for chemistry analysis. Upon receipt, the samples were assigned the following laboratory ID numbers to correspond with the Washington Closure Hanford (WCH) specific ID:

<u>WCH ID#</u>	<u>TARL ID#</u>	<u>MATRIX</u>	<u>DATE OF RECEIPT</u>
J1TR30	M3VMG	SOIL	5/22/14
J1TR31	M3VMH	SOIL	5/22/14
J1TR32	M3VMJ	SOIL	5/22/14
J1TR33	M3VMK	SOIL	5/22/14
J1TR34	M3VML	SOIL	5/22/14
J1TR35	M3VMM	SOIL	5/22/14
J1TR36	M3VMN	SOIL	5/22/14
J1TR37	M3VMP	SOIL	5/22/14
J1TR38	M3VMQ	SOIL	5/22/14
J1TR42	M3VMR	SOIL	5/22/14
J1TR44	M3VL9	SOIL	5/22/14

II. Sample Receipt

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

Washington Closure Hanford
May 30, 2014

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 analysis was:

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

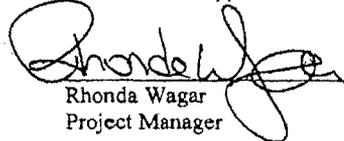
Chemical Analysis

Hexavalent Chromium by EPA method 7196A:

The LCS, batch blank, samples, sample duplicate (J1TR44) and sample matrix spike (J1TR44) 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-189-307	Page 1 of 3
Collector <i>D Stone</i>		Company Contact Joan Kessner		Telephone No. 375-4688		Project Coordinator KESSNER, JH	Price Code
Project Designation 100N Field Remediation		Sampling Location 100-N-84.6, Verification		SAF No. RC-189		Data Turnaround <i>7 days</i>	
Ice Chest No. <i>N/A</i>		Field Logbook No. EL-1652-12		COA 01N8462000			Method of Shipment Local Delivery
Shipped To TestAmerica Richland		Offsite Property No. <i>NA DWS 5/22/14</i>		Bill of Lading/Air Bill No. <i>OSPC NA DWS 5/22/14</i>			
Other Labs Shipped To TestAmerica Denver		Preservation	Cool 4C				
		Type of Container	GP				
POSSIBLE SAMPLE HAZARDS/REMARKS <i>potentially radioactive</i>		No. of Container(s)	1				
		Volume	125mL				
Special Handling and/or Storage		Sample Analysis	Chromium Hex - 7199				
Sample No.	Matrix	Sample Date	Sample Time				
J1TR30	<i>m3VM6</i>	<i>5-21-14</i>	<i>1329</i>	<i>X</i>			
J1TR31	<i>m3VMH</i>	<i>5-21-14</i>	<i>1336</i>	<i>X</i>			
J1TR32	<i>m3VMJ</i>	<i>5-21-14</i>	<i>1254</i>	<i>X</i>			
J1TR33	<i>m3VMK</i>	<i>5-21-14</i>	<i>1311</i>	<i>X</i>			
J1TR34	<i>m3VML</i>	<i>5-21-14</i>	<i>1315</i>	<i>X</i>			
CHAIN OF POSSESSION			Sign/Print Names		SPECIAL INSTRUCTIONS		
Relinquished By/Removed From <i>D Stone</i>		Date/Time <i>5-21-14 1442</i>	Received By/Stored In <i>DWSHA</i>		Date/Time <i>5/22/14 1442</i>	<p><i>J4E23042V</i></p> <p><i>DWSHA</i></p> <p>JP0808</p> <div style="border: 1px solid black; border-radius: 50%; padding: 10px; display: inline-block; text-align: center;"> <p>REVIEWED BY <i>Kessner</i> DATE <i>5/22/14</i></p> </div>	
Relinquished By/Removed From <i>DWSHA</i>		Date/Time <i>5/22/14 1644</i>	Received By/Stored In <i>Fridge 3C</i>		Date/Time <i>5/22/14 1644</i>		
Relinquished By/Removed From <i>Fridge 3C</i>		Date/Time <i>5/22/14 0840</i>	Received By/Stored In <i>DWSHA</i>		Date/Time <i>5/22/14 0840</i>		
Relinquished By/Removed From <i>DWSHA</i>		Date/Time <i>5/22/14 1551</i>	Received By/Stored In <i>SM Special</i>		Date/Time <i>5/22/14 1551</i>		
Relinquished By/Removed From <i>SM Special</i>		Date/Time <i>5/22/14 1605</i>	Received By/Stored In <i>S. Hill</i>		Date/Time <i>5-22-14 1605</i>		
Relinquished By/Removed From		Date/Time	Received By/Stored In		Date/Time		
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time				

Washington Closure Hanford		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST				RC-189-307	Page 2 of 3
Collector <i>D. Stone</i>	Company Contact Joan Kessner	Telephone No. 375-4688	Project Coordinator KESSNER, JH	Price Code	Data Turnaround <i>7 days</i>		
Project Designation 100N Field Remediation	Sampling Location 100-N-84:6, Verification	SAF No. RC-189					
Ice Chest No. <i>N/A</i>	Field Logbook No. EL-1652-12	COA 01N8462000	Method of Shipment Local Delivery				
Shipped To TestAmerica Richland	Offsite Property No. <i>N/A DWS 5/20/14</i>	Bill of Lading/Air Bill No. <i>ESPE NA DWS 5/20/14</i>					
Other Labs Shipped To TestAmerica Denver	Preservation	Cool 4C					
	Type of Container	GP					
POSSIBLE SAMPLE HAZARDS/REMARKS <i>potentially radioactive</i>	No. of Container(s)	1					
	Volume	125mL					
Special Handling and/or Storage	Sample Analysis	Chromium Hex -7196					
Sample No.	Matrix	Sample Date	Sample Time				
J1TR35 <i>m3Vmm</i>	SOIL	<i>5-21-14</i>	<i>1204</i>	<i>X</i>			
J1TR36 <i>m3Vmn</i>	SOIL	<i>5-21-14</i>	<i>1242</i>	<i>X</i>			
J1TR37 <i>m3Vmp</i>	SOIL	<i>5-21-14</i>	<i>1414</i>	<i>X</i>			
J1TR38 <i>m3Vmq</i>	SOIL	<i>5-21-14</i>	<i>1409</i>	<i>X</i>			
J1TR39	SOIL	<i>DWSHA 5/21/14</i>					
CHAIN OF POSSESSION		Sign/Print Names		SPECIAL INSTRUCTIONS			
Relinquished By/Removed From <i>Quincy Stone</i>	Date/Time <i>5-21-14</i>	Received By/Stored In <i>DWSHA DWSHA</i>	Date/Time <i>5/21/14 1442</i>	<p><i>J4E23012V</i></p> <p><i>Due 533-14</i></p> <p><i>JPO808</i></p> <div style="border: 1px solid black; border-radius: 50%; padding: 10px; display: inline-block;"> <p>REVIEWED BY <i>K...</i> DATE <i>5/22/14</i></p> </div>			
Relinquished By/Removed From <i>DWSHA DWSHA</i>	Date/Time <i>5/21/14 1644</i>	Received By/Stored In <i>Fridge 3C Battelle</i>	Date/Time <i>5/21/14 1644</i>				
Relinquished By/Removed From <i>Fridge 3C Battelle</i>	Date/Time <i>5/21/14 0840</i>	Received By/Stored In <i>DWSHA DWSHA</i>	Date/Time <i>5/21/14 0840</i>				
Relinquished By/Removed From <i>DWSHA DWSHA</i>	Date/Time <i>5/22/14 1551</i>	Received By/Stored In <i>SM Sexton</i>	Date/Time <i>5/22/14</i>				
Relinquished By/Removed From <i>SM Sexton</i>	Date/Time <i>5/22/14</i>	Received By/Stored In <i>J. Beck</i>	Date/Time <i>5-22-14 1605</i>				
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time				
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time				

Washington Closure Hanford		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST				RC-189-307	Page 3 of 3
Collector <i>Q. Stone</i>	Company Contact Joan Kessner	Telephone No. 375-4688	Project Coordinator KESSNER, JH	Price Code	Data Turnaround <i>7 days</i>		
Project Designation 100N Field Remediation	Sampling Location 100-N-84.6, Verification	SAF No. RC-189					
Ice Chest No. <i>N/A</i>	Field Logbook No. EL-1652-12	COA 01N8462000	Method of Shipment Local Delivery				
Shipped To TestAmerica Richland	Offsite Property No. <i>N/A DWS Frohm</i>	Bill of Lading/Air Bill No. <i>See OSPC NA DWS 5/20/14</i>					
Other Labs Shipped To TestAmerica Denver	Preservation Cool 4C						
POSSIBLE SAMPLE HAZARDS/REMARKS <i>potentially radioactive</i>	Type of Container GP						
	No. of Container(s) 1						
	Volume 125mL						
Special Handling and/or Storage	Sample Analysis Chromium Hex - 7196						
Sample No.	Matrix	Sample Date	Sample Time				
J1TR40	SOIL	<i>7/20/14</i>					
J1TR44	SOIL	<i>5/21/14</i>					
J1TR42 M3VM2	SOIL	<i>5-21-14</i>	<i>1329</i>	<i>X</i>			
CHAIN OF POSSESSION			Sign/Print Names		SPECIAL INSTRUCTIONS		
Relinquished By/Removed From <i>Q. Stone</i>	Date/Time <i>5-21-14</i>	Received By/Stored In <i>DWShea DWSHEA</i>	Date/Time <i>5/21/14</i>	<i>1442</i>	<i>JHE23042P</i> <i>Dec 530-14</i> <i>5/22-14</i> <i>5/22/14</i> <i>JPO808</i>		
Relinquished By/Removed From <i>DWShea DWSHEA</i>	Date/Time <i>5/21/14 1644</i>	Received By/Stored In <i>Fridge 3C isabelle</i>	Date/Time <i>5/21/14</i>	<i>1644</i>			
Relinquished By/Removed From <i>Fridge 3C isabelle</i>	Date/Time <i>5/22/14 0840</i>	Received By/Stored In <i>DWShea DWSHEA</i>	Date/Time <i>5/22/14</i>	<i>0840</i>			
Relinquished By/Removed From <i>DWShea DWSHEA</i>	Date/Time <i>5/22/14 1557</i>	Received By/Stored In <i>SM SERIAL</i>	Date/Time <i>5/22/14</i>	<i>1557</i>			
Relinquished By/Removed From <i>SM SERIAL</i>	Date/Time <i>5/22/14 1605</i>	Received By/Stored In <i>J. Beck</i>	Date/Time <i>5/22/14</i>	<i>1605</i>			
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time				
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time				



Washington Closure Hanford		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST					RC-189-308	Page 1 of 1	
Collector <i>D. Stone</i>		Company Contact Joan Kessner		Telephone No. 375-4688		Project Coordinator KESSNER, JH			
Project Designation 100N Field Remediation		Sampling Location 100-N-84-6, Verification, focused				Price Code			
Ice Chest No. <i>NIA</i>		Field Logbook No. EL-1652-12		COA 01N8462000		Data Turnaround <i>7 days</i>			
Shipped To TestAmerica Richland		Offsite Property No. <i>NIA</i>				Method of Shipment Local Delivery			
Other Labs Shipped To TestAmerica Denver		Preservation		Cool 4C					
POSSIBLE SAMPLE HAZARDS/REMARKS <i>Potentially radioactive</i>		Type of Container		GP					
		No. of Container(s)		1					
		Volume		125mL					
Special Handling and/or Storage		Sample Analysis		Chromium Hex - 7196					
		BRI of Lading/Air Bill No. <i>See OSPE SMS 5-22-14</i>							
Sample No.	Matrix	Sample Date	Sample Time						
<i>J1TR44 M3VLA</i>	SOIL	<i>5-21-14</i>	<i>1259</i>	<i>X</i>					
CHAIN OF POSSESSION				Sign/Print Names		SPECIAL INSTRUCTIONS <i>J4E230428</i> <i>Due 5-22-14</i> <div style="border: 1px solid black; border-radius: 50%; padding: 5px; display: inline-block;"> REVIEWED BY <i>[Signature]</i> DATE <i>5/22/14</i> </div> <i>JPO808</i>			
Relinquished By/Removed From <i>Princy Stone</i>		Date/Time <i>5-21-14</i>		Received By/Stored In <i>Mushka Duvsteva</i>				Date/Time <i>5/21/14 1442</i>	
Relinquished By/Removed From <i>Mushka Duvsteva</i>		Date/Time <i>5/21/14 1644</i>		Received By/Stored In <i>Fridge 3C Bettle</i>				Date/Time <i>5/21/14 1644</i>	
Relinquished By/Removed From <i>Fridge 3C Bettle</i>		Date/Time <i>5/22/14 0840</i>		Received By/Stored In <i>Mushka Duvsteva</i>				Date/Time <i>5/22/14 0840</i>	
Relinquished By/Removed From <i>Mushka Duvsteva</i>		Date/Time <i>5/22/14 1557</i>		Received By/Stored In <i>SM Serrano</i>				Date/Time <i>5/22/14</i>	
Relinquished By/Removed From <i>SM Serrano</i>		Date/Time <i>5/22/14 1605</i>		Received By/Stored In <i>J. Kessner</i>				Date/Time <i>5-22-14 1605</i>	
Relinquished By/Removed From		Date/Time		Received By/Stored In				Date/Time	
Relinquished By/Removed From		Date/Time		Received By/Stored In				Date/Time	
FINAL SAMPLE DISPOSITION		Disposed Method		Disposed By		Date/Time			



Appendix 5
Data Validation Supporting Documentation

GENERAL CHEMISTRY ANALYSIS DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
PROJECT:	100-N-84-6		DATA PACKAGE: JP0808		
VALIDATOR:	ELR	LAB:	TAL	DATE: 6/6/14	
			SDG:	JP0808	
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					
J1TR30		J1TR31		J1TR32	
J1TR34		J1TR35		J1TR36	
J1TR38		J1TR42		J1TR44	

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
Spike 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 DR

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: 72x - J/UR nitrate/nitrite - order

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

Quality Control Results

Client: Washington Closure Hanford

Job Number: 280-55787-1
Sdg Number: JP0808

Method Blank - Batch: 280-227452

Method: 9056M
Preparation: N/A

Lab Sample ID: MB 280-227485/2-A
Client Matrix: Solid
Dilution: 1.0
Analysis Date: 05/27/2014 2204
Prep Date: N/A
Leach Date: 05/27/2014 1641

Analysis Batch: 280-227452
Prep Batch: N/A
Leach Batch: 280-227485
Units: mg/Kg

Instrument ID: WC_IonChrom10
Lab File ID: Info 2_DENPC179_Anions
Initial Weight/Volume: 5 mL
Final Weight/Volume: 5 mL

Analyte	Result	Qual	MDL	RL
Nitrate as N-Soluble	0.31	U	0.31	2.5
Nitrite as N-Soluble	0.33	U	0.33	2.5
Orthophosphate as P-Soluble	1.2	U	1.2	4.9

Lab Control Sample - Batch: 280-227452

Method: 9056M
Preparation: N/A

Lab Sample ID: LCS 280-227485/1-A
Client Matrix: Solid
Dilution: 1.0
Analysis Date: 05/27/2014 2148
Prep Date: N/A
Leach Date: 05/27/2014 1641

Analysis Batch: 280-227452
Prep Batch: N/A
Leach Batch: 280-227485
Units: mg/Kg

Instrument ID: WC_IonChrom10
Lab File ID: Info 2_DENPC179_Anions
Initial Weight/Volume: 5 mL
Final Weight/Volume: 5 mL

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
Nitrate as N-Soluble	48.9	46.56	99	90 - 110	
Nitrite as N-Soluble	46.9	48.33	103	90 - 110	
Orthophosphate as P-Soluble	46.9	45.66	97	90 - 110	

Quality Control Results

Client: Washington Closure Hanford

Job Number: 280-55787-1
Sdg Number: JP0808

Matrix Spike - Batch: 280-227452

Method: 9056M
Preparation: N/A

Lab Sample ID: 280-55787-1
Client Matrix: Solid
Dilution: 1.0
Analysis Date: 05/27/2014 2251
Prep Date: N/A
Leach Date: 05/27/2014 1642

Analysis Batch: 280-227452
Prep Batch: N/A
Leach Batch: 280-227485
Units: mg/Kg

Instrument ID: WC_IonChrom10
Lab File ID: Info 2_DENPC179_Anions
Initial Weight/Volume: 5 mL
Final Weight/Volume: 5 mL
5 uL

Analyte	Sample Result/Qual	Spike Amount	Result	% Rec.	Limit	Qual
Nitrate as N-Soluble	4.1	46.7	50.41	99	80 - 120	
Nitrite as N-Soluble	0.54 B	46.7	47.90	101	80 - 120	
Orthophosphate as P-Soluble	1.2 U	46.8	34.51	74	80 - 120	N

Matrix Spike - Batch: 280-227452

Method: 9056M
Preparation: N/A

Lab Sample ID: 280-55787-12
Client Matrix: Solid
Dilution: 1.0
Analysis Date: 05/28/2014 0304
Prep Date: N/A
Leach Date: 05/27/2014 1732

Analysis Batch: 280-227452
Prep Batch: N/A
Leach Batch: 280-227485
Units: mg/Kg

Instrument ID: WC_IonChrom10
Lab File ID: Info 2_DENPC179_Anions
Initial Weight/Volume: 5 mL
Final Weight/Volume: 5 mL
5 uL

Analyte	Sample Result/Qual	Spike Amount	Result	% Rec.	Limit	Qual
Nitrate as N-Soluble	1.7 B	49.4	52.45	103	80 - 120	
Nitrite as N-Soluble	0.31 U	49.4	52.95	107	80 - 120	
Orthophosphate as P-Soluble	1.2 U	49.4	34.67	70	80 - 120	N

Quality Control Results

Client: Washington Closure Hanford

Job Number: 280-55787-1
Sdg Number: JP0808

Duplicate - Batch: 280-227452

Method: 9056M
Preparation: N/A

Lab Sample ID: 280-55787-1
Client Matrix: Solid
Dilution: 1.0
Analysis Date: 05/27/2014 2235
Prep Date: N/A
Leach Date: 05/27/2014 1842

Analysis Batch: 280-227452
Prep Batch: N/A
Leach Batch: 280-227485
Units: mg/Kg

Instrument ID: WC_IonChrom10
Lab File ID: Info 2_DENPC179_Anions
Initial Weight/Volume: 5 mL
Final Weight/Volume: 5 mL
5 uL

Analyte	Sample Result/Qual	Result	RPD	Limit	Qual
Nitrate as N-Soluble	4.1	4.08	2	15	
Nitrite as N-Soluble	0.54 B	0.512	6	15	B
Orthophosphate as P-Soluble	1.2 U	1.2	NC	15	U

Duplicate - Batch: 280-227452

Method: 9056M
Preparation: N/A

Lab Sample ID: 280-55787-12
Client Matrix: Solid
Dilution: 1.0
Analysis Date: 05/28/2014 0248
Prep Date: N/A
Leach Date: 05/27/2014 1732

Analysis Batch: 280-227452
Prep Batch: N/A
Leach Batch: 280-227485
Units: mg/Kg

Instrument ID: WC_IonChrom10
Lab File ID: Info 2_DENPC179_Anions
Initial Weight/Volume: 5 mL
Final Weight/Volume: 5 mL
5 uL

Analyte	Sample Result/Qual	Result	RPD	Limit	Qual
Nitrate as N-Soluble	1.7 B	1.71	1	15	B
Nitrite as N-Soluble	0.31 U	0.32	NC	15	U
Orthophosphate as P-Soluble	1.2 U	1.2	NC	15	U

Quality Control Results

Client: Washington Closure Hanford

Job Number: 280-55787-1
Sdg Number: JP0808

Method Blank - Batch: 280-227453

Method: 9056M
Preparation: N/A

Lab Sample ID:	MB 280-227485/2-A	Analysis Batch:	280-227453	Instrument ID:	WC_IonChrom10
Client Matrix:	Solid	Prep Batch:	N/A	Lab File ID:	Info 2_DENPC179_Anions
Dilution:	1.0	Leach Batch:	280-227485	Initial Weight/Volume:	5 mL
Analysis Date:	05/27/2014 2204	Units:	mg/Kg	Final Weight/Volume:	5 mL
Prep Date:	N/A				
Leach Date:	05/27/2014 1641				

Analyte	Result	Qual	MDL	RL
Chloride-Soluble	2.0	U	2.0	4.9
Bromide-Soluble	0.39	U	0.39	2.0
Sulfate-Soluble	1.7	U	1.7	4.9
Fluoride-Soluble	0.81	U	0.81	4.9

Method Reporting Limit Check - Batch: 280-227453

Method: 9056M
Preparation: N/A

Lab Sample ID:	MRL 280-227453/3	Analysis Batch:	280-227453	Instrument ID:	WC_IonChrom10
Client Matrix:	Water	Prep Batch:	N/A	Lab File ID:	Info 2_DENPC179_Anions
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	5 mL
Analysis Date:	05/27/2014 1520	Units:	mg/L	Final Weight/Volume:	5 mL
Prep Date:	N/A				
Leach Date:	N/A				

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
Chloride-Soluble	1.00	1.02	102	50 - 150	B
Bromide-Soluble	0.200	0.207	104	50 - 150	B
Sulfate-Soluble	1.00	1.14	114	50 - 150	B
Fluoride-Soluble	0.200	0.193	97	50 - 150	B

Lab Control Sample - Batch: 280-227453

Method: 9056M
Preparation: N/A

Lab Sample ID:	LCS 280-227485/1-A	Analysis Batch:	280-227453	Instrument ID:	WC_IonChrom10
Client Matrix:	Solid	Prep Batch:	N/A	Lab File ID:	Info 2_DENPC179_Anions
Dilution:	1.0	Leach Batch:	280-227485	Initial Weight/Volume:	5 mL
Analysis Date:	05/27/2014 2148	Units:	mg/Kg	Final Weight/Volume:	5 mL
Prep Date:	N/A				
Leach Date:	05/27/2014 1641				

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
Chloride-Soluble	235	234.6	100	90 - 110	
Bromide-Soluble	46.9	46.25	99	90 - 110	
Sulfate-Soluble	235	236.0	101	90 - 110	
Fluoride-Soluble	46.9	45.07	96	90 - 110	

Quality Control Results

Client: Washington Closure Hanford

Job Number: 280-55787-1
Sdg Number: JP0808

Matrix Spike - Batch: 280-227453

Method: 9056M
Preparation: N/A

Lab Sample ID: 280-55787-1
Client Matrix: Solid
Dilution: 1.0
Analysis Date: 05/27/2014 2251
Prep Date: N/A
Leach Date: 05/27/2014 1642

Analysis Batch: 280-227453
Prep Batch: N/A
Leach Batch: 280-227485
Units: mg/Kg

Instrument ID: WC_IonChrom10
Lab File ID: Info 2_DENPC179_Anions
Initial Weight/Volume: 5 mL
Final Weight/Volume: 5 uL

Analyte	Sample Result/Qual	Spike Amount	Result	% Rec.	Limit	Qual
Chloride-Soluble	4.9	234	235.6	99	80 - 120	
Bromide-Soluble	0.38 U	46.7	48.91	105	80 - 120	
Sulfate-Soluble	18.1	234	244.9	97	80 - 120	
Fluoride-Soluble	0.79 U	46.7	33.61	72	80 - 120	N

Matrix Spike - Batch: 280-227453

Method: 9056M
Preparation: N/A

Lab Sample ID: 280-55787-12
Client Matrix: Solid
Dilution: 1.0
Analysis Date: 05/28/2014 0304
Prep Date: N/A
Leach Date: 05/27/2014 1732

Analysis Batch: 280-227453
Prep Batch: N/A
Leach Batch: 280-227485
Units: mg/Kg

Instrument ID: WC_IonChrom10
Lab File ID: Info 2_DENPC179_Anions
Initial Weight/Volume: 5 mL
Final Weight/Volume: 5 mL

Analyte	Sample Result/Qual	Spike Amount	Result	% Rec.	Limit	Qual
Chloride-Soluble	4.9	247	260.2	103	80 - 120	
Bromide-Soluble	0.37 U	49.4	54.04	109	80 - 120	
Sulfate-Soluble	138	247	402.8	107	80 - 120	
Fluoride-Soluble	0.77 U	49.4	37.72	76	80 - 120	N

Quality Control Results

Client: Washington Closure Hanford

Job Number: 280-55787-1
Sdg Number: JP0808

Duplicate - Batch: 280-227453

Method: 9056M
Preparation: N/A

Lab Sample ID: 280-55787-1
Client Matrix: Solid
Dilution: 1.0
Analysis Date: 05/27/2014 2235
Prep Date: N/A
Leach Date: 05/27/2014 1642

Analysis Batch: 280-227453
Prep Batch: N/A
Leach Batch: 280-227485
Units: mg/Kg

Instrument ID: WC_IonChrom10
Lab File ID: Info 2_DENPC179_Anions
Initial Weight/Volume: 5 mL
Final Weight/Volume: 5 mL
5 uL

Analyte	Sample Result/Qual	Result	RPD	Limit	Qual
Chloride-Soluble	4.9	4.94	0.4	10	
Bromide-Soluble	0.38 U	0.37	NC	10	U
Sulfate-Soluble	18.1	17.95	0.7	10	
Fluoride-Soluble	0.79 U	0.78	NC	10	U

Duplicate - Batch: 280-227453

Method: 9056M
Preparation: N/A

Lab Sample ID: 280-55787-12
Client Matrix: Solid
Dilution: 1.0
Analysis Date: 05/28/2014 0248
Prep Date: N/A
Leach Date: 05/27/2014 1732

Analysis Batch: 280-227453
Prep Batch: N/A
Leach Batch: 280-227485
Units: mg/Kg

Instrument ID: WC_IonChrom10
Lab File ID: Info 2_DENPC179_Anions
Initial Weight/Volume: 5 mL
Final Weight/Volume: 5 mL
5 uL

Analyte	Sample Result/Qual	Result	RPD	Limit	Qual
Chloride-Soluble	4.9	4.97	0.5	10	
Bromide-Soluble	0.37 U	0.37	NC	10	U
Sulfate-Soluble	138	139.0	0.5	10	
Fluoride-Soluble	0.77 U	0.77	NC	10	U

QC Results Summary
TestAmerica Inc TARL
 Ordered by Method, Batch No, QC Type,.

Date: 30-May-14

Report No. : 60424

SDG No.: JP0808

Batch	Work Order	Parameter	Result +- Uncertainty (2s)	Qual	Units	Tracer Yield	LCS Recovery	Bias	MDL
7196_CR6	4147032	MATRIX SPIKE, J1TR44							
	M3VL91AC	HEXCHROME	2.74E+01 +- 0.0E+00		mg/kg	N/A	90%	-0.1	1.55E-01
	4147032	LCS,							
	M3V4G1AC	HEXCHROME	1.93E+01 +- 0.0E+00		mg/kg	N/A	97%	0.0	1.55E-01
	4147032	BLANK QC,							
	M3V4G1AA	HEXCHROME	1.55E-01 +- 0.0E+00	U	mg/kg	N/A			1.55E-01
No. of Results: 3									

TestAmerica Inc Bias - (Result/Expected)-1 as defined by ANSI N13.30.
 rptSTLRchQcSummary V5.3.2 A2002 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: 12 June 2014
 To: Washington Closure Hanford Inc. (technical representative)
 From: ELR Consulting
 Project: 100N Field Remediation – Soil Full Protocol - Waste Site 100-N-84:6
 Subject: Inorganics - Data Package No. JP0808-TAL

INTRODUCTION

This memo presents the results of data validation on Data Package No. JP0808 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
J1TR30	5/21/14	Soil	C	See note 1
J1TR31	5/21/14	Soil	C	See note 1
J1TR32	5/21/14	Soil	C	See note 1
J1TR33	5/21/14	Soil	C	See note 1
J1TR34	5/21/14	Soil	C	See note 1
J1TR35	5/21/14	Soil	C	See note 1
J1TR36	5/21/14	Soil	C	See note 1
J1TR37	5/21/14	Soil	C	See note 1
J1TR38	5/21/14	Soil	C	See note 1
J1TR42	5/21/14	Soil	C	See note 1
J1TR43	5/21/14	Soil	C	See note 1
J1TR44	5/21/14	Soil	C	See note 1

1 - ICP metals (6010B) and 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 and 28 days for mercury.

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.

Due to method blank contamination, the chromium result in sample J1TR43 was qualified as undetected and flagged "UJ".

All other preparation blank results were acceptable.

Field (Equipment) Blank

One field blank (J1TR43) was submitted for analysis. Thirteen analytes exceeded the RQL. 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 (61%), silicon (19%) and zinc (65%) results were qualified as estimates and flagged "J".

Due to an LCS recovery outside QC limits, all silicon (20%) 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.

Due to RPDs outside QC limits, all cadmium (176%), chromium (33%) and copper (174%) results were qualified as estimates and flagged "J".

All other laboratory duplicate results were acceptable.

Field Duplicate

One set of field duplicates (J1TR30/J1TR42) were submitted for analysis. Field duplicates are compared using the same criteria as for laboratory duplicates. The RPD for copper (176%) was outside QC limits. Under WCH statement of work, no qualification is required. All other 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. JP0808 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 method blank contamination, the chromium result in sample J1TR43 was qualified as undetected and flagged "UJ".
- Due to matrix spike recoveries outside QC limits, all antimony (61%), silicon (19%) and zinc (65%) results were qualified as estimates and flagged "J".
- Due to an LCS recovery outside QC limits, all silicon (20%) results were qualified as estimates and flagged "J".
- Due to RPDs outside QC limits, all cadmium (176%), chromium (33%) and copper (174%) 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

METALS DATA QUALIFICATION SUMMARY*

SDG: JP0808	REVIEWER: ELR	Project: 100-N-84:6	PAGE <u>1</u> OF <u>1</u>
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
Chromium	UJ	J1TR43	Method blank contamination
Antimony Silicon Zinc	J	All	MS recovery
Silicon	J	All	LCS recovery
Cadmium Chromium Copper	J	All	RPD

* - 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

Analytical Data

Client: Washington Closure Hanford

Job Number: 280-55787-1
Sdg Number: JP0808

Client Sample ID: J1TR30

Lab Sample ID: 280-55787-1
Client Matrix: Solid

% Moisture: 1.4

Date Sampled: 05/21/2014 1329
Date Received: 05/23/2014 0945

6010B Metals (ICP)

Analysis Method:	6010B	Analysis Batch:	280-227794	Instrument ID:	MT_026
Prep Method:	3050B	Prep Batch:	280-227289	Lab File ID:	26A052814B.asc
Dilution:	1.0			Initial Weight/Volume:	1.03 g
Analysis Date:	05/28/2014 1519			Final Weight/Volume:	100 mL
Prep Date:	05/27/2014 1230				

M. Miller

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Aluminum		7260		1.5	4.9
Antimony		0.37	U J	0.37	0.59
Arsenic		3.3		0.65	0.98
Barium		68.4		0.075	0.49
Beryllium		0.033	U	0.033	0.20
Boron		1.4	B	0.97	2.0
Cadmium		0.13	B N M J	0.040	0.20
Calcium		9350		13.9	49.2
Chromium		21.1	J	0.057	0.20
Cobalt		7.5	X	0.098	0.98
Copper		386	M J	0.21	0.98
Iron		18100		3.7	4.9
Lead		10.8		0.27	0.49
Magnesium		4770		3.6	19.7
Manganese		294		0.098	0.98
Molybdenum		0.26	U	0.26	2.0
Nickel		11.6	X	0.12	3.9
Potassium		1310		40.4	295
Selenium		0.85	U	0.85	0.98
Silicon		298	X N J	5.6	9.8
Silver		0.16	U	0.16	0.20
Sodium		436		58.1	118
Vanadium		39.2		0.093	2.0
Zinc		102	N J	0.39	0.98

7471A Mercury (CVAA)

Analysis Method:	7471A	Analysis Batch:	280-227591	Instrument ID:	MT_033
Prep Method:	7471A	Prep Batch:	280-227407	Lab File ID:	N/A
Dilution:	1.0			Initial Weight/Volume:	0.61 g
Analysis Date:	05/27/2014 1734			Final Weight/Volume:	50 mL
Prep Date:	05/27/2014 1300				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Mercury		0.0090	B	0.0055	0.017

Analytical Data

Client: Washington Closure Hanford

Job Number: 280-55787-1
Sdg Number: JP0808

Client Sample ID: J1TR31

Lab Sample ID: 280-55787-2
Client Matrix: Solid

% Moisture: 1.1

Date Sampled: 05/21/2014 1336
Date Received: 05/23/2014 0945

6010B Metals (ICP)

Analysis Method:	6010B	Analysis Batch:	280-227794	Instrument ID:	MT_026
Prep Method:	3050B	Prep Batch:	280-227289	Lab File ID:	26A052814B.asc
Dilution:	1.0			Initial Weight/Volume:	1.00 g
Analysis Date:	05/28/2014 1528			Final Weight/Volume:	100 mL
Prep Date:	05/27/2014 1230				

Handwritten signature/initials

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Aluminum		8890		1.8	5.1
Antimony		0.38	U J	0.38	0.61
Arsenic		3.5		0.67	1.0
Barium		77.4		0.077	0.51
Beryllium		0.033	U	0.033	0.20
Boron		1.7	B	0.99	2.0
Cadmium		0.14	B N J	0.041	0.20
Calcium		4690		14.3	50.8
Chromium		13.2	J	0.059	0.20
Cobalt		9.2	X	0.10	1.0
Copper		16.6	J	0.22	1.0
Iron		22700		3.8	5.1
Lead		7.0		0.27	0.51
Magnesium		4470		3.7	20.2
Manganese		358		0.10	1.0
Molybdenum		0.26	U	0.26	2.0
Nickel		11.4	X	0.12	4.0
Potassium		1670		41.5	303
Selenium		0.87	U	0.87	1.0
Silicon		412	X J	5.7	10.1
Silver		0.16	U	0.16	0.20
Sodium		271		59.7	121
Vanadium		51.5		0.095	2.0
Zinc		48.5	J	0.40	1.0

7471A Mercury (CVAA)

Analysis Method:	7471A	Analysis Batch:	280-227591	Instrument ID:	MT_033
Prep Method:	7471A	Prep Batch:	280-227407	Lab File ID:	N/A
Dilution:	1.0			Initial Weight/Volume:	0.66 g
Analysis Date:	05/27/2014 1745			Final Weight/Volume:	50 mL
Prep Date:	05/27/2014 1300				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Mercury		0.0099	B	0.0051	0.016

Analytical Data

Client: Washington Closure Hanford

Job Number: 280-55787-1
Sdg Number: JP0808

Client Sample ID: J1TR32

Lab Sample ID: 280-55787-3
Client Matrix: Solid

% Moisture: 2.0

Date Sampled: 05/21/2014 1254
Date Received: 05/23/2014 0945

6010B Metals (ICP)

Analysis Method: 6010B Analysis Batch: 280-227794 Instrument ID: MT_026
Prep Method: 3050B Prep Batch: 280-227289 Lab File ID: 26A052814B.asc
Dilution: 1.0
Analysis Date: 05/28/2014 1531 *W. U. H. H. H. H.* Initial Weight/Volume: 1.03 g
Prep Date: 05/27/2014 1230 Final Weight/Volume: 100 mL

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Aluminum		6740		1.5	5.0
Antimony		0.38	U J	0.38	0.59
Arsenic		2.5		0.65	0.99
Barium		65.7		0.075	0.50
Beryllium		0.033	U	0.033	0.20
Boron		1.2	B	0.97	2.0
Cadmium		0.15	B N J	0.041	0.20
Calcium		6570		14.0	49.5
Chromium		11.8	J	0.057	0.20
Cobalt		8.9	X J	0.099	0.99
Copper		15.0	J	0.21	0.99
Iron		22000		3.8	5.0
Lead		9.2		0.27	0.50
Magnesium		4390		3.7	19.8
Manganese		311		0.099	0.99
Molybdenum		0.26	U	0.26	2.0
Nickel		11.2	X	0.12	4.0
Potassium		1130		40.6	297
Selenium		0.85	U	0.85	0.99
Silicon		295	X J	5.6	9.9
Silver		0.16	U	0.16	0.20
Sodium		586		58.4	119
Vanadium		50.5		0.093	2.0
Zinc		46.9	J	0.39	0.99

7471A Mercury (CVAA)

Analysis Method: 7471A Analysis Batch: 280-227591 Instrument ID: MT_033
Prep Method: 7471A Prep Batch: 280-227407 Lab File ID: N/A
Dilution: 1.0
Analysis Date: 05/27/2014 1748 Initial Weight/Volume: 0.70 g
Prep Date: 05/27/2014 1300 Final Weight/Volume: 50 mL

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Mercury		0.035		0.0048	0.015

Analytical Data

Client: Washington Closure Hanford

Job Number: 280-55787-1
Sdg Number: JP0808

Client Sample ID: J1TR33

Lab Sample ID: 280-55787-4
Client Matrix: Solid

% Moisture: 1.2

Date Sampled: 05/21/2014 1311
Date Received: 05/23/2014 0945

6010B Metals (ICP)

Analysis Method:	6010B	Analysis Batch:	280-227794	Instrument ID:	MT_026
Prep Method:	3050B	Prep Batch:	280-227289	Lab File ID:	26A052814B.asc
Dilution:	1.0			Initial Weight/Volume:	1.01 g
Analysis Date:	05/28/2014 1534			Final Weight/Volume:	100 mL
Prep Date:	05/27/2014 1230				

R 6/11/14

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Aluminum		6750		1.6	5.0
Arsenic		2.8		0.66	1.0
Barium		61.9		0.076	0.50
Boron		0.98	U	0.98	2.0
Cadmium		0.085	BN J	0.041	0.20
Calcium		6500		14.1	50.1
Chromium		7.6	J	0.058	0.20
Iron		29400		3.8	5.0
Magnesium		5340		3.7	20.1
Manganese		383		0.10	1.0
Molybdenum		0.26	U	0.26	2.0
Nickel		10.5	X	0.12	4.0
Potassium		1060		41.1	301
Selenium		0.86	U	0.86	1.0
Silver		0.16	U	0.16	0.20
Sodium		391		59.2	120
Zinc		53.8	J	0.40	1.0

Analysis Method:	6010B	Analysis Batch:	280-228120	Instrument ID:	MT_026
Prep Method:	3050B	Prep Batch:	280-227289	Lab File ID:	26a053014a.asc
Dilution:	5.0			Initial Weight/Volume:	1.01 g
Analysis Date:	05/30/2014 1818			Final Weight/Volume:	100 mL
Prep Date:	05/27/2014 1230				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Antimony		1.9	U J	1.9	3.0
Beryllium		0.17	U	0.17	1.0
Cobalt		12.8	X J	0.50	5.0
Copper		21.6	J	1.1	5.0
Lead		8.3		1.4	2.5
Silicon		245	X J	28.4	50.1
Vanadium		82.7		0.47	10.0

7471A Mercury (CVAA)

Analysis Method:	7471A	Analysis Batch:	280-227591	Instrument ID:	MT_033
Prep Method:	7471A	Prep Batch:	280-227407	Lab File ID:	N/A
Dilution:	1.0			Initial Weight/Volume:	0.63 g
Analysis Date:	05/27/2014 1750			Final Weight/Volume:	50 mL
Prep Date:	05/27/2014 1300				

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

Analytical Data

Client: Washington Closure Hanford

Job Number: 280-55787-1
Sdg Number: JP0808

Client Sample ID: J1TR34

Lab Sample ID: 280-55787-5
Client Matrix: Solid

% Moisture: 1.9

Date Sampled: 05/21/2014 1315
Date Received: 05/23/2014 0945

6010B Metals (ICP)

Analysis Method:	6010B	Analysis Batch:	280-227794	Instrument ID:	MT_026
Prep Method:	3050B	Prep Batch:	280-227289	Lab File ID:	26A052814B.asc
Dilution:	1.0			Initial Weight/Volume:	1.03 g
Analysis Date:	05/28/2014 1536			Final Weight/Volume:	100 mL
Prep Date:	05/27/2014 1230				

Handwritten: 6/11/14

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Aluminum		6670		1.5	4.9
Antimony		0.38	U J	0.38	0.59
Arsenic		2.9		0.65	0.99
Barium		68.9		0.075	0.49
Beryllium		0.033	U	0.033	0.20
Boron		0.97	U	0.97	2.0
Cadmium		0.11	B N J	0.041	0.20
Calcium		5180		14.0	49.5
Chromium		9.0	J J	0.057	0.20
Cobalt		8.6	X J	0.099	0.99
Copper		15.4	J	0.21	0.99
Iron		20300		3.8	4.9
Lead		5.7		0.27	0.49
Magnesium		4700		3.7	19.8
Manganese		298		0.099	0.99
Molybdenum		0.26	U	0.26	2.0
Nickel		12.4	X	0.12	4.0
Potassium		1120		40.6	297
Selenium		0.85	U	0.85	0.99
Silicon		193	X J	5.6	9.9
Silver		0.16	U	0.16	0.20
Sodium		274		58.4	119
Vanadium		46.0	J	0.093	2.0
Zinc		41.5	J	0.39	0.99

7471A Mercury (CVAA)

Analysis Method:	7471A	Analysis Batch:	280-227591	Instrument ID:	MT_033
Prep Method:	7471A	Prep Batch:	280-227407	Lab File ID:	N/A
Dilution:	1.0			Initial Weight/Volume:	0.63 g
Analysis Date:	05/27/2014 1752			Final Weight/Volume:	50 mL
Prep Date:	05/27/2014 1300				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Mercury		0.0087	B	0.0054	0.017

Analytical Data

Client: Washington Closure Hanford

Job Number: 280-55787-1
Sdg Number: JP0808

Client Sample ID: J1TR35

Lab Sample ID: 280-55787-6
Client Matrix: Solid

% Moisture: 1.7

Date Sampled: 05/21/2014 1204
Date Received: 05/23/2014 0945

6010B Metals (ICP)

Analysis Method: 6010B Analysis Batch: 280-227794 Instrument ID: MT_026
Prep Method: 3050B Prep Batch: 280-227289 Lab File ID: 26A052814B.asc
Dilution: 1.0
Analysis Date: 05/28/2014 1549
Prep Date: 05/27/2014 1230

W 6/11/14

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Aluminum		4790		1.5	5.0
Arsenic		2.5		0.66	1.0
Barium		46.8		0.076	0.50
Boron		0.98	U	0.98	2.0
Cadmium		0.092	B N J	0.041	0.20
Calcium		5360	J	14.1	49.9
Chromium		4.4		0.058	0.20
Iron		28000		3.8	5.0
Magnesium		4670		3.7	19.9
Manganese		328		0.10	1.0
Molybdenum		0.26	U	0.26	2.0
Nickel		8.3	X	0.12	4.0
Potassium		714		40.9	299
Selenium		0.86	U	0.86	1.0
Silver		0.16	U	0.16	0.20
Sodium		265		58.8	120
Zinc		48.3	J	0.40	1.0

Analysis Method: 6010B Analysis Batch: 280-228120 Instrument ID: MT_026
Prep Method: 3050B Prep Batch: 280-227289 Lab File ID: 26a053014a.asc
Dilution: 5.0
Analysis Date: 05/30/2014 1821
Prep Date: 05/27/2014 1230

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Antimony		1.9	U J	1.9	3.0
Beryllium		0.16	U	0.16	1.0
Cobalt		11.8	X	0.50	5.0
Copper		17.3	J	1.1	5.0
Lead		5.2		1.3	2.5
Silicon		392	X J	28.2	49.9
Vanadium		77.8		0.47	10

7471A Mercury (CVAA)

Analysis Method: 7471A Analysis Batch: 280-227591 Instrument ID: MT_033
Prep Method: 7471A Prep Batch: 280-227407 Lab File ID: N/A
Dilution: 1.0
Analysis Date: 05/27/2014 1755
Prep Date: 05/27/2014 1300

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Mercury		0.0069	B	0.0055	0.017

Analytical Data

Client: Washington Closure Hanford

Job Number: 280-55787-1
Sdg Number: JP0808

Client Sample ID: J1TR36

Lab Sample ID: 280-55787-7

Date Sampled: 05/21/2014 1242

Client Matrix: Solid

% Moisture: 1.9

Date Received: 05/23/2014 0945

6010B Metals (ICP)

Analysis Method: 6010B
Prep Method: 3050B
Dilution: 1.0
Analysis Date: 05/28/2014 1551
Prep Date: 05/27/2014 1230

Analysis Batch: 280-227794
Prep Batch: 280-227289

Instrument ID: MT_026
Lab File ID: 26A052814B.asc
Initial Weight/Volume: 1.08 g
Final Weight/Volume: 100 mL

Handwritten: 6/11/14

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Aluminum		6880		1.5	4.7
Antimony		0.36	U J	0.36	0.57
Arsenic		2.3		0.62	0.94
Barium		55.2		0.072	0.47
Beryllium		0.031	U	0.031	0.19
Boron		0.92	U	0.92	1.9
Cadmium		0.15	BN J	0.039	0.19
Calcium		3790		13.3	47.2
Chromium		9.2	J	0.055	0.19
Cobalt		8.7	X	0.094	0.94
Copper		13.8	J	0.20	0.94
Iron		20100		3.6	4.7
Lead		5.8		0.25	0.47
Magnesium		3970		3.5	18.9
Manganese		297		0.094	0.94
Molybdenum		0.25	U	0.25	1.9
Nickel		10.7	X	0.12	3.8
Potassium		1160		38.7	283
Selenium		0.81	U	0.81	0.94
Silicon		286	X J	5.3	9.4
Silver		0.15	U	0.15	0.19
Sodium		699		55.7	113
Vanadium		49.2		0.089	1.9
Zinc		56.5	J	0.38	0.94

7471A Mercury (CVAA)

Analysis Method: 7471A
Prep Method: 7471A
Dilution: 1.0
Analysis Date: 05/27/2014 1757
Prep Date: 05/27/2014 1300

Analysis Batch: 280-227591
Prep Batch: 280-227407

Instrument ID: MT_033
Lab File ID: N/A
Initial Weight/Volume: 0.63 g
Final Weight/Volume: 50 mL

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Mercury		0.054		0.0054	0.016

Analytical Data

Client: Washington Closure Hanford

Job Number: 280-55787-1
Sdg Number: JP0808

Client Sample ID: J1TR37

Lab Sample ID: 280-55787-8
Client Matrix: Solid

% Moisture: 0.8

Date Sampled: 05/21/2014 1414
Date Received: 05/23/2014 0945

6010B Metals (ICP)

Analysis Method: 6010B
Prep Method: 3050B
Dilution: 1.0
Analysis Date: 05/28/2014 1554
Prep Date: 05/27/2014 1230

Analysis Batch: 280-227794
Prep Batch: 280-227289

Instrument ID: MT_026
Lab File ID: 26A052814B.asc
Initial Weight/Volume: 1.09 g
Final Weight/Volume: 100 mL

W 6/11/14

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Aluminum		4910		1.4	4.6
Antimony		0.35	U J	0.35	0.56
Arsenic		2.0		0.61	0.93
Barium		70.4		0.070	0.46
Beryllium		0.031	U	0.031	0.19
Boron		0.91	U	0.91	1.9
Cadmium		0.082	BN J	0.038	0.19
Calcium		6940		13.0	46.3
Chromium		6.1	J	0.054	0.19
Cobalt		9.1	X J	0.093	0.93
Copper		13.4	J	0.20	0.93
Iron		22500		3.5	4.6
Lead		3.9		0.25	0.46
Magnesium		4030		3.4	18.5
Manganese		356		0.093	0.93
Molybdenum		0.24	U	0.24	1.9
Nickel		8.4	X	0.11	3.7
Potassium		799		37.9	278
Selenium		0.80	U	0.80	0.93
Silicon		171	X J	5.2	9.3
Silver		0.15	U	0.15	0.19
Sodium		292		54.6	111
Vanadium		56.2		0.087	1.9
Zinc		42.3	J	0.37	0.93

7471A Mercury (CVAA)

Analysis Method: 7471A
Prep Method: 7471A
Dilution: 1.0
Analysis Date: 05/27/2014 1759
Prep Date: 05/27/2014 1300

Analysis Batch: 280-227591
Prep Batch: 280-227407

Instrument ID: MT_033
Lab File ID: N/A
Initial Weight/Volume: 0.69 g
Final Weight/Volume: 50 mL

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Mercury		0.0056	B	0.0048	0.015

Analytical Data

Client: Washington Closure Hanford

Job Number: 280-55787-1
Sdg Number: JP0808

Client Sample ID: J1TR38

Lab Sample ID: 280-55787-9
Client Matrix: Solid

% Moisture: 2.0

Date Sampled: 05/21/2014 1409
Date Received: 05/23/2014 0945

6010B Metals (ICP)

Analysis Method:	6010B	Analysis Batch:	280-227794	Instrument ID:	MT_026
Prep Method:	3050B	Prep Batch:	280-227289	Lab File ID:	26A052814B.asc
Dilution:	1.0			Initial Weight/Volume:	1.03 g
Analysis Date:	05/28/2014 1556			Final Weight/Volume:	100 mL
Prep Date:	05/27/2014 1230				

W 6/11/14

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Aluminum		8540		1.5	5.0
Antimony		0.38	U J	0.38	0.59
Arsenic		3.2		0.65	0.99
Barium		76.7		0.075	0.50
Beryllium		0.033	U	0.033	0.20
Boron		1.4	B	0.97	2.0
Cadmium		0.13	B N J	0.041	0.20
Calcium		6050		14.0	49.6
Chromium		11.0	J	0.057	0.20
Cobalt		9.2	X J	0.099	0.99
Copper		15.8	J	0.22	0.99
Iron		22800		3.8	5.0
Lead		6.6		0.27	0.50
Magnesium		4580		3.7	19.8
Manganese		361		0.099	0.99
Molybdenum		0.26	U	0.26	2.0
Nickel		12.2	X	0.12	4.0
Potassium		1690		40.6	297
Selenium		0.85	U	0.85	0.99
Silicon		338	X J	5.6	9.9
Silver		0.16	U	0.16	0.20
Sodium		406		58.5	119
Vanadium		51.0		0.093	2.0
Zinc		82.2	J	0.39	0.99

7471A Mercury (CVAA)

Analysis Method:	7471A	Analysis Batch:	280-227591	Instrument ID:	MT_033
Prep Method:	7471A	Prep Batch:	280-227407	Lab File ID:	N/A
Dilution:	1.0			Initial Weight/Volume:	0.60 g
Analysis Date:	05/27/2014 1801			Final Weight/Volume:	50 mL
Prep Date:	05/27/2014 1300				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Mercury		0.010	B	0.0056	0.017

Analytical Data

Client: Washington Closure Hanford

Job Number: 280-55787-1
Sdg Number: JP0808

Client Sample ID: J1TR42

Lab Sample ID: 280-55787-10
Client Matrix: Solid

% Moisture: 1.0

Date Sampled: 05/21/2014 1329
Date Received: 05/23/2014 0945

6010B Metals (ICP)

Analysis Method:	6010B	Analysis Batch:	280-227794	Instrument ID:	MT_026
Prep Method:	3050B	Prep Batch:	280-227289	Lab File ID:	26A052814B.asc
Dilution:	1.0			Initial Weight/Volume:	1.02 g
Analysis Date:	05/28/2014 1559			Final Weight/Volume:	100 mL
Prep Date:	05/27/2014 1230				

U 6/11/14

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Aluminum		7110		1.5	5.0
Antimony		0.38	U J	0.38	0.59
Arsenic		2.6		0.65	0.99
Barium		66.6		0.075	0.50
Beryllium		0.033	U	0.033	0.20
Boron		0.97	B	0.97	2.0
Cadmium		0.15	B N J	0.041	0.20
Calcium		9530		14.0	49.5
Chromium		26.7	J	0.057	0.20
Cobalt		7.6	X	0.099	0.99
Copper		24.3	J	0.21	0.99
Iron		19100		3.8	5.0
Lead		10.5		0.27	0.50
Magnesium		4800		3.7	19.8
Manganese		300		0.099	0.99
Molybdenum		0.26	U	0.26	2.0
Nickel		11.4	X	0.12	4.0
Potassium		1280		40.6	297
Selenium		0.85	U J	0.85	0.99
Silicon		273	X J	5.6	9.9
Silver		0.16	U	0.16	0.20
Sodium		429		58.4	119
Vanadium		41.0		0.093	2.0
Zinc		132	J	0.39	0.99

7471A Mercury (CVAA)

Analysis Method:	7471A	Analysis Batch:	280-227591	Instrument ID:	MT_033
Prep Method:	7471A	Prep Batch:	280-227407	Lab File ID:	N/A
Dilution:	1.0			Initial Weight/Volume:	0.61 g
Analysis Date:	05/27/2014 1808			Final Weight/Volume:	50 mL
Prep Date:	05/27/2014 1300				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Mercury		0.0074	B	0.0055	0.017

Analytical Data

Client: Washington Closure Hanford

Job Number: 280-55787-1
Sdg Number: JP0808

Client Sample ID: J1TR43

Lab Sample ID: 280-55787-11
Client Matrix: Solid

% Moisture: 0.0

Date Sampled: 05/21/2014 1406
Date Received: 05/23/2014 0945

6010B Metals (ICP)

Analysis Method: 6010B
Prep Method: 3050B
Dilution: 1.0
Analysis Date: 05/28/2014 1601
Prep Date: 05/27/2014 1230

Analysis Batch: 280-227794
Prep Batch: 280-227289

Instrument ID: MT_026
Lab File ID: 26A052814B.asc
Initial Weight/Volume: 1.15 g
Final Weight/Volume: 100 mL

V. J. J. J.

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Aluminum		91.4		1.3	4.3
Antimony		0.33	U J	0.33	0.52
Arsenic		0.57	U	0.57	0.87
Barium		1.1		0.066	0.43
Beryllium		0.029	U	0.029	0.17
Boron		0.85	U	0.85	1.7
Cadmium		0.036	U N J	0.036	0.17
Calcium		23.4	B	12.3	43.5
Chromium		0.12	B C U J	0.050	0.17
Cobalt		0.087	U X	0.087	0.87
Copper		0.26	B J	0.19	0.87
Iron		139		3.3	4.3
Lead		0.28	B	0.23	0.43
Magnesium		11.8	B	3.2	17.4
Manganese		2.5		0.087	0.87
Molybdenum		0.23	U	0.23	1.7
Nickel		0.12	B X	0.11	3.5
Potassium		36.2	B	35.7	261
Selenium		0.75	U	0.75	0.87
Silicon		75.1	X J	4.9	8.7
Silver		0.14	U	0.14	0.17
Sodium		51.3	U	51.3	104
Vanadium		0.15	B	0.082	1.7
Zinc		0.56	B J	0.35	0.87

7471A Mercury (CVAA)

Analysis Method: 7471A
Prep Method: 7471A
Dilution: 1.0
Analysis Date: 05/27/2014 1811
Prep Date: 05/27/2014 1300

Analysis Batch: 280-227591
Prep Batch: 280-227407

Instrument ID: MT_033
Lab File ID: N/A
Initial Weight/Volume: 0.66 g
Final Weight/Volume: 50 mL

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

Analytical Data

Client: Washington Closure Hanford

Job Number: 280-55787-1
Sdg Number: JP0808

Client Sample ID: J1TR44

Lab Sample ID: 280-55787-12
Client Matrix: Solid

% Moisture: 1.4

Date Sampled: 05/21/2014 1259
Date Received: 05/23/2014 0945

6010B Metals (ICP)

Analysis Method: 6010B
Prep Method: 3050B
Dilution: 1.0
Analysis Date: 05/28/2014 1604
Prep Date: 05/27/2014 1230

Analysis Batch: 280-227794
Prep Batch: 280-227289

Instrument ID: MT_026
Lab File ID: 26A052814B.asc
Initial Weight/Volume: 1.00 g
Final Weight/Volume: 100 mL

Metals

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Aluminum		12500		1.6	5.1
Arsenic		1.2		0.67	1.0
Barium		194		0.077	0.51
Boron		0.99	U	0.99	2.0
Cadmium		0.066	B N J	0.042	0.20
Calcium		8240		14.3	50.7
Chromium		4.9	J	0.059	0.20
Iron		35100		3.9	5.1
Magnesium		5110		3.8	20.3
Manganese		579		0.10	1.0
Molybdenum		0.32	B	0.26	2.0
Nickel		8.4	X	0.12	4.1
Potassium		2090		41.6	304
Selenium		0.87	U	0.87	1.0
Silver		0.16	U	0.16	0.20
Sodium		4370		59.8	122
Zinc		64.3	J	0.40	1.0

Analysis Method: 6010B
Prep Method: 3050B
Dilution: 5.0
Analysis Date: 05/30/2014 1823
Prep Date: 05/27/2014 1230

Analysis Batch: 280-228120
Prep Batch: 280-227289

Instrument ID: MT_026
Lab File ID: 26a053014a.asc
Initial Weight/Volume: 1.00 g
Final Weight/Volume: 100 mL

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Antimony		1.9	U J	1.9	3.0
Beryllium		0.17	U	0.17	1.0
Cobalt		15.3	X J	0.51	5.1
Copper		24.6	J	1.1	5.1
Lead		9.7		1.4	2.5
Silicon		270	X J	28.7	50.7
Vanadium		104		0.48	10.1

7471A Mercury (CVAA)

Analysis Method: 7471A
Prep Method: 7471A
Dilution: 1.0
Analysis Date: 05/27/2014 1813
Prep Date: 05/27/2014 1300

Analysis Batch: 280-227591
Prep Batch: 280-227407

Instrument ID: MT_033
Lab File ID: N/A
Initial Weight/Volume: 0.66 g
Final Weight/Volume: 50 mL

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Mercury		0.018		0.0051	0.018

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

CASE NARRATIVE

Client: Washington Closure Hanford

Project: WASHINGTON CLOSURE HANFORD

Report Number: 280-55787-1

SDG #: JP0808

SAF#: RC-189

Date SDG Closed: May 23, 2014

Data Deliverable: 7 Day / Summary

<u>CLIENT ID</u>	<u>LAB ID</u>	<u>ANALYSES REQUESTED</u>	<u>ANALYSES PERFORMED</u>
J1TR30	280-55787-1	6010/7471/9056M/8082	6010B/7471A/9056M/8082
J1TR31	280-55787-2	6010/7471/9056M/8082	6010B/7471A/9056M/8082
J1TR32	280-55787-3	6010/7471/9056M/8082	6010B/7471A/9056M/8082
J1TR33	280-55787-4	6010/7471/9056M/8082	6010B/7471A/9056M/8082
J1TR34	280-55787-5	6010/7471/9056M/8082	6010B/7471A/9056M/8082
J1TR35	280-55787-6	6010/7471/9056M/8082	6010B/7471A/9056M/8082
J1TR36	280-55787-7	6010/7471/9056M/8082	6010B/7471A/9056M/8082
J1TR37	280-55787-8	6010/7471/9056M/8082	6010B/7471A/9056M/8082
J1TR38	280-55787-9	6010/7471/9056M/8082	6010B/7471A/9056M/8082
J1TR42	280-55787-10	6010/7471/9056M/8082	6010B/7471A/9056M/8082
J1TR43	280-55787-11	6010/7471	6010B/7471A
J1TR44	280-55787-12	6010/7471/9056M/8082	6010B/7471A/9056M/8082

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 5/23/2014 9:45 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperatures of the 3 coolers at receipt time were 1.1° C, 2.9° C and 3.1° C.

GC SEMIVOLATILES - SW846 8082 - PCBs

The laboratory noted that a Sulfuric Acid clean-up was performed on the samples presented in this report to reduce matrix interferences.

Samples J1TR30, J1TR32, J1TR33, J1TR37 and J1TR42 contained a combination of Aroclor 1254 and Aroclor 1260 with insufficient separation to quantify individually. The samples have been quantified and reported as the predominant Aroclor.

No other anomalies were encountered.

TOTAL METALS - SW846 6010B/7471A

Serial dilution of a digestate in batch 280-227289 indicates that physical and chemical interferences are present for Cobalt, Nickel and Silicon. Results have been flagged with an "X".

Each sample is analyzed to achieve the lowest possible reporting limits within the constraints of the methods. Samples J1TR33, J1TR35 and J1TR44 required a 5X dilution prior to the analysis of Antimony, Beryllium, Cobalt, Copper, Lead, Silicon and Vanadium to minimize the interference caused by Titanium concentrations greater than the linear range. The reporting limits have been adjusted relative to the dilution required.

Low levels of Barium and Chromium are present in the method blank associated with batch 280-227289. Because the concentrations in the method blank are not present at levels greater than half the reporting limit, corrective action is deemed unnecessary.

Silicon is present in the method blank associated with batch 280-227289 at 7.23 mg/kg, which is greater than half the project specific reporting limit (PSRL) of 10 mg/kg. TestAmerica's practical quantitation limit (PQL) for Silicon is 50 mg/kg. The laboratory cannot maintain system cleanliness at this low level; therefore, corrective action is not initiated. It can be noted that the concentration found in the method blank is less than half of the laboratory standard PQL, and with the exception of 'blank' sample J1TR43, the associated sample amounts are twenty times greater than the method blank concentration.

Cadmium was recovered outside the control limits, biased high, in the LCS associated with batch 280-227289, and the associated sample results have been flagged "N". This is an indicator that data may be biased high. As Cadmium is not present at a level greater than the reporting limit in the associated samples, corrective action is deemed unnecessary.

It can be noted that the sample amount was greater than four times the spike amount for Aluminum, Copper, Iron and Manganese in the Matrix Spike performed on sample J1TR30; therefore, control limits are not applicable.

The Matrix Spike performed on sample J1TR30 exhibited percent recoveries outside the control limits for Silicon and Zinc, and the associated sample results have 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.

The duplicate analysis of sample J1TR30 exhibited RPD data outside the control limits for Cadmium and Copper, and the associated sample results have been flagged "M". 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.

GENERAL CHEMISTRY - SW846 9056M - ANIONS

The Matrix Spikes performed on samples J1TR30 and J1TR44 exhibited percent recoveries outside the control limits for Orthophosphate as P and Fluoride, and the associated sample results have been flagged "N". There is no indication that the analytical systems were 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-189-307		Page 1 of 3		
Collector <i>R. Stow</i>		Company Contact Joan Kessner		Telephone No. 375-4688		Project Coordinator KESSNER, JH		Price Code		Data Turnaround <i>7 days</i>	
Project Designation 100N Field Remediation		Sampling Location 100-N-84.6, Verification				SAF No. RC-189					
Ice Chest No. <i>RC-08-027, RC-07-002, 004</i> <i>RC-08-027, 002, 004 SWS 5-22-14</i>		Field Logbook No. EL-1652-12		COA 01N8462000		Method of Shipment Commercial Carrier					
Shipped To TestAmerica Denver		Offsite Property No. <i>A13148</i>				Bill of Lading/Air Bill No. <i>See OSPC</i>					
Other Labs Shipped To TestAmerica Richland		Preservation		Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C			
		Type of Container		GP	GP	gG	G	gG			
POSSIBLE SAMPLE HAZARDS/REMARKS <i>potentially radioactive</i>		No. of Container(s)		1	1	1	1	1			
		Volume		250mL	250mL	250mL	125mL	250mL			
Special Handling and/or Storage		Sample Analysis		See Item (1) in Special Instructions	IC Arsenic - 9000 Modified; HCL/NO ₃ - 9000 Modified; <i>DATE: 5/20/14</i>	PCBs - 6082	TPH-Diesel Range - WTPH-D+	PAHs - 8310			
page		Sample No.	Matrix	Sample Date	Sample Time						
		J1TR30	SOIL	5-21-14	1329	X	X	X			
		J1TR31	SOIL	5-21-14	1336	X	X	X			
		J1TR32	SOIL	5-21-14	1254	X	X	X			
		J1TR33	SOIL	5-21-14	1311	X	X	X			
		J1TR34	SOIL	5-21-14	1315	X	X	X			
CHAIN OF POSSESSION				Sign/Print Names				SPECIAL INSTRUCTIONS			
Relinquished By/Removed From		Date/Time		Received By/Stored In		Date/Time		(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)			
<i>Arlene Stow</i>		<i>5-21-14 1442</i>		<i>DWShea DWSHEA</i>		<i>5/21/14 1442</i>					
<i>DWShea DWSHEA</i>		<i>5/21/14 1644</i>		<i>Bridge 3C Barilla</i>		<i>5/21/14 1644</i>					
<i>Bridge 3C Barilla</i>		<i>5/22/14 0840</i>		<i>DWShea DWSHEA</i>		<i>7/22/14 0840</i>					
<i>DWShea DWSHEA</i>		<i>7/22/14 0851</i>		<i>Feed EX</i>							
				<i>Feed EX</i>		<i>5/23/14 9:45</i>					
Relinquished By/Removed From		Date/Time		Received By/Stored In		Date/Time		<i>2.8, 2.6, 0.8</i> <i>1R570.3</i> <i>5/23/14</i> <i>SW.</i> JP0808			
Relinquished By/Removed From		Date/Time		Received By/Stored In		Date/Time					
Relinquished By/Removed From		Date/Time		Received By/Stored In		Date/Time					
Relinquished By/Removed From		Date/Time		Received By/Stored In		Date/Time					
FINAL SAMPLE DISPOSITION		Disposal Method		Disposed By		Date/Time					

WCH-EE-011

Washington Closure Hanford		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST					RC-189-307	Page 2 of 3
Collector <i>R. Stone</i>	Company Contact Joan Kessner	Telephone No. 375-4688	Project Coordinator KESSNER, JH	Price Code	Data Turnaround <i>7 days</i>			
Project Designation 100N Field Remediation	Sampling Location 100-N-84:6, Verification	SAF No. RC-189						
Ice Chest No. <i>RCC-07-027, RCC-07-002, 004</i> <i>RCC-07-027, 002, 004 BWS 5-22-14</i>	Field Logbook No. EL-1652-12	COA 01N8462000	Method of Shipment Commercial Carrier					
Shipped To TestAmerica Denver	Offsite Property No. <i>A131148</i>	Bill of Lading/Air Bill No. <i>See OSPC</i>						
Other Labs Shipped To TestAmerica Richland	Preservation	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C		
	Type of Container	G/P	G/P	#G	G	#G		
POSSIBLE SAMPLE HAZARDS/REMARKS <i>potentially radioactive</i>	No. of Container(s)	1	1	1	1	1		
	Volume	250mL	250mL	250mL	125mL	250mL		
Special Handling and/or Storage	Sample Analysis	See item (1) in Special Instructions	IC Anions - NO2/NO3 - 3662; pH 16.42 <i>BWS 5/21/14</i>	PCBs - 8062	TPH-Diesel Range - WTPH-D +	PAHs - 8310		
<i>See</i>	Sample No.	Matrix	Sample Date	Sample Time				
	J1TR35	SOIL	5-21-14	1204	X	X	X	
	J1TR36	SOIL	5-21-14	1242	X	X	X	
	J1TR37	SOIL	5-21-14	1414	X	X	X	
	J1TR38	SOIL	5-21-14	1409	X	X	X	
	J1TR39	SOIL	<i>MJS 5/21/14</i>					
CHAIN OF POSSESSION				Sign/Print Names				
Relinquished By/Removed From <i>Raney Stone</i>	Date/Time 5-21-14	Received By/Stored In <i>Moshea DWSHEA</i>	Date/Time 5/21/14 1442					
Relinquished By/Removed From <i>Moshea DWSHEA</i>	Date/Time 5/21/14 1644	Received By/Stored In <i>Fritze 3C</i>	Date/Time 5/21/14 1644					
Relinquished By/Removed From <i>Fritze 3C</i>	Date/Time 5/22/14 0840	Received By/Stored In <i>Moshea DWSHEA</i>	Date/Time 5/22/14 0840					
Relinquished By/Removed From <i>Moshea DWSHEA</i>	Date/Time 5/22/14 0851	Received By/Stored In <i>Feed Ex</i>	Date/Time					
Relinquished By/Removed From	Date/Time	Received By/Stored In <i>cc</i>	Date/Time 5/22/14 9:45					
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time					
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time					
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)

JPO808



26

Washington Closure Hanford		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST					RC-189-308	Page 1 of 1
Collector <i>Q. Stone</i>	Company Contact Joan Kessner	Telephone No. 375-4688	Project Coordinator KESSNER, JH	Price Code	Data Turnaround <i>7 days</i>			
Project Designation 100N Field Remediation <i>8MS 5-22-14</i>	Sampling Location 100-N-84.6, Verification, focused	SAF No. RC-189	Method of Shipment Commercial Carrier					
Ice Chest No. <i>8MS 5-22-14 RLC-08-027, RLC-07-002, RLC-07, RLC-07-027, 002, 004, 004</i>	Field Logbook No. EL-1652-12	COA 01N8462000	Bill of Lading/Air Bill No. <i>See OSPC</i>					
Shipped To <i>TADL DWS 5/21/14</i> TestAmerica Denver <i>CEL DWS 5/21/14</i>	Offsite Property No. <i>A131148</i>							
Other Labs Shipped To TestAmerica Richland <i>MA TADL DWS 5/21/14</i> <i>DWS 5/21/14</i>	Preservation	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool	
	Type of Container	GP	GP	eG	G	eG	GP	
POSSIBLE SAMPLE HAZARDS/REMARKS <i>Potentially radioactive</i>	No. of Container(s)	1	1	1	1	1	1	
	Volume	250ml	250ml	250ml	125ml	250ml	125ml	
Special Handling and/or Storage	Sample Analysis	See Item (1) in Special Instructions	IC Anions - <i>NO2/NO3</i>	PCBs - 8082	TPH-Diesel Range - WTPH-D +	PAHs - 8310	<i>Cr-6 7196</i>	
Page	Sample No.	Matrix	Sample Date	Sample Time				
1	PTTR44	SOIL	5-21-14	1259	X	X	X	
2								
7								
4								
CHAIN OF POSSESSION			Sign/Print Names			SPECIAL INSTRUCTIONS		
Relinquished By/Removed From <i>Quincy Stone</i>	Date/Time <i>5-21-14 1442</i>	Received By/Stored In <i>DWSHA DWSHA</i>	Date/Time <i>5/21/14 1442</i>	(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)				
Relinquished By/Removed From <i>DWSHA DWSHA</i>	Date/Time <i>5/21/14 1644</i>	Received By/Stored In <i>Fridge 3C Bobile</i>	Date/Time <i>5/21/14 1644</i>					
Relinquished By/Removed From <i>Fridge 3C Bobile</i>	Date/Time <i>5/22/14 0840</i>	Received By/Stored In <i>DWSHA DWSHA</i>	Date/Time <i>5/22/14 0840</i>					
Relinquished By/Removed From <i>DWSHA DWSHA</i>	Date/Time <i>5/22/14 0851</i>	Received By/Stored In <i>Fred Ex</i>	Date/Time <i>5/22/14 0851</i>					
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time					
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time					
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time	REVIEWED BY <i>SMS</i> DATE <i>5/22/14</i>				
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time					
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time	<i>JP0808</i>				
WCH-EE-011								

Washington Closure Hanford		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST					RC-189-307		Page 3 of 3		
Collector <i>A Stone</i>		Company Contact Joan Kessner		Telephone No. 375-4688		Project Coordinator KESSNER, JH		Price Code		Data Turnaround <i>7 days</i>	
Project Designation 100N Field Remediation		Sampling Location 100-N-84-6, Verification			SAF No. RC-189						
Ice Chest No. <i>RC-05-027, RC-07, 002, 004</i> <i>RC-07-027, 002, 004 SSS-1214</i>		Field Logbook No. EL-1652-12		COA 01N8462000		Method of Shipment Commercial Carrier		Bill of Lading/Air Bill No. <i>See OSPA</i>			
Shipped To TestAmerica Denver		Offsite Property No. <i>A131148</i>									
Other Labs Shipped To TestAmerica Richland		Preservation		Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C			
		Type of Container		GP	GP	aG	G	aG			
POSSIBLE SAMPLE HAZARDS/REMARKS <i>potentially radioactive</i>		No. of Container(s)		1	1	1	1	1			
		Volume		250mL	250mL	250mL	125mL	250mL			
Special Handling and/or Storage		Sample Analysis		See Item (1) in Special Instructions	IC Anions - NO3, NO2, NH4	PCBs - 8002	TPH-Diesel Range - WTPH-D+	PAHs - 8310			
page		Sample No.		Matrix	Sample Date	Sample Time					
		J1TR40		SOIL	<i>5/21/14</i>	<i>1329</i>					
		J1TR41		SOIL							
		J1TR42		SOIL	5-21-14	1329	x	x	x		
		J1TR43		SOIL	5-21-14	1406	x	<i>5/21/14</i>			
CHAIN OF POSSESSION				Sign/Print Names				SPECIAL INSTRUCTIONS			
Relinquished By/Removed From		Date/Time		Received By/Stored In		Date/Time		(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)			
<i>Quincy Stone</i>		<i>5-21-14</i>		<i>Wesley DWSHEA</i>		<i>5/21/14 1442</i>					
<i>Wesley DWSHEA</i>		<i>7/1/14 1644</i>		<i>Fridge 3C Babello</i>		<i>7/1/14 1644</i>					
<i>Fridge 3C Babello</i>		<i>7/2/14 0840</i>		<i>Wesley DWSHEA</i>		<i>7/2/14 0840</i>					
<i>Wesley DWSHEA</i>		<i>7/2/14 0851</i>		<i>Red EX</i>							
<i>Wesley DWSHEA</i>		<i>5/23/14 9145</i>									
Relinquished By/Removed From		Date/Time		Received By/Stored In		Date/Time		JPO808			
Relinquished By/Removed From		Date/Time		Received By/Stored In		Date/Time					
Relinquished By/Removed From		Date/Time		Received By/Stored In		Date/Time					
FINAL SAMPLE DISPOSITION		Disposal Method		Disposed By		Date/Time					
WCH-EE-011											

Appendix 5
Data Validation Supporting Documentation

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
PROJECT:	100-N-8416		DATA PACKAGE: JP0808		
VALIDATOR:	ELR	LAB:	TAL	DATE: 6/10/14	
			SDG: JP0808		
ANALYSES PERFORMED					
SW-846/ICP	SW-846/GFAA	SW-846/Hg	SW-846 Cyanide		
SAMPLES/MATRIX					
J1TR30	J1TR31	J1TR32	J1TR33		
J1TR34	J1TR35	J1TR36	J1TR37		
J1TR38	J1TR42	J1TR43	J1TR44		
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?..... No 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: Chromium - 05 43

FD-13 defects

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 - silica (20%) - July
MS - antimony (61%) silicon (19%) zinc (65%) - July

NO PAJ

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: Cadmium (176%) Chromium (33%)
Copper (174%) - I all

FD - copper (176%)

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

Quality Control Results

Client: Washington Closure Hanford

Job Number: 280-55787-1
Sdg Number: JP0808

Method Blank - Batch: 280-227289

**Method: 6010B
Preparation: 3050B**

Lab Sample ID: MB 280-227289/1-A
Client Matrix: Solid
Dilution: 1.0
Analysis Date: 05/28/2014 1514
Prep Date: 05/27/2014 1230
Leach Date: N/A

Analysis Batch: 280-227794
Prep Batch: 280-227289
Leach Batch: N/A
Units: mg/Kg

Instrument ID: MT_026
Lab File ID: 26A052814B.asc
Initial Weight/Volume: 1 g
Final Weight/Volume: 100 mL

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	0.129	B	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	0.0670	B	0.058	0.20
Cobalt	0.10	U	0.10	1.0
Copper	0.22	U	0.22	1.0
Copper	3.8	U	3.8	5.0
Iron	0.27	U	0.27	0.50
Lead	3.7	U	3.7	20.0
Magnesium	0.10	U	0.10	1.0
Manganese	0.26	U	0.26	2.0
Molybdenum	0.12	U	0.12	4.0
Nickel	41.0	U	41.0	300
Potassium	0.86	U	0.86	1.0
Selenium	7.23	B	5.7	10.0
Silicon	0.16	U	0.16	0.20
Silver	59.0	U	59.0	120
Sodium	0.094	U	0.094	2.0
Vanadium	0.40	U	0.40	1.0
Zinc				

Quality Control Results

Client: Washington Closure Hanford

Job Number: 280-55787-1
Sdg Number: JP0808

Lab Control Sample - Batch: 280-227289

Method: 6010B
Preparation: 3050B

Lab Sample ID:	LCS 280-227289/2-A	Analysis Batch:	280-227794	Instrument ID:	MT_026
Client Matrix:	Solid	Prep Batch:	280-227289	Lab File ID:	28A052814B.asc
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	1 g
Analysis Date:	05/28/2014 1516	Units:	mg/Kg	Final Weight/Volume:	100 mL
Prep Date:	05/27/2014 1230				
Leach Date:	N/A				

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
Aluminum	200	199.4	100	82 - 116	
Antimony	50.0	51.29	103	82 - 110	
Arsenic	100	98.49	98	85 - 110	
Barium	200	209.2	105	87 - 112	
Beryllium	5.00	5.02	100	84 - 114	
Boron	100	99.29	99	80 - 120	
Cadmium	10.0	11.21	112	87 - 110	N
Calcium	5000	5022	100	82 - 114	
Chromium	20.0	20.62	103	84 - 114	
Chromium	50.0	50.37	101	87 - 110	
Cobalt	50.0	50.37	101	87 - 110	
Copper	25.0	26.43	106	88 - 110	
Copper	100	105.3	105	87 - 120	
Iron	50.0	49.52	99	86 - 110	
Lead	50.0	49.52	99	90 - 110	
Magnesium	5000	4962	99	88 - 110	
Magnesium	50.0	50.22	100	88 - 110	
Manganese	50.0	50.22	100	88 - 110	
Manganese	100	103.5	104	88 - 110	
Molybdenum	50.0	50.16	100	87 - 110	
Nickel	50.0	50.16	100	87 - 110	
Potassium	5000	5157	103	89 - 110	
Potassium	200	198.4	99	83 - 110	
Selenium	1000	205.0	20	10 - 70	
Silicon	5.00	5.09	102	87 - 114	
Silver	5000	5192	104	90 - 112	
Sodium	50.0	51.19	102	88 - 110	
Vanadium	50.0	49.36	99	76 - 114	
Zinc	50.0	49.36	99	76 - 114	

Quality Control Results

Client: Washington Closure Hanford

Job Number: 280-55787-1
Sdg Number: JP0808

Matrix Spike - Batch: 280-227289

**Method: 6010B
Preparation: 3050B**

Lab Sample ID: 280-55787-1
Client Matrix: Solid
Dilution: 1.0
Analysis Date: 05/28/2014 1526
Prep Date: 05/27/2014 1230
Leach Date: N/A

Analysis Batch: 280-227794
Prep Batch: 280-227289
Leach Batch: N/A
Units: mg/Kg

Instrument ID: MT_026
Lab File ID: 26A052814B.asc
Initial Weight/Volume: 1.06 g
Final Weight/Volume: 100 mL

Analyte	Sample Result/Qual	Spike Amount	Result	% Rec.	Limit	Qual
Aluminum	7260	191	8364	579	50 - 200	4
Antimony	0.37 U	47.8	29.02	61	20 - 200	
Arsenic	3.3	95.7	87.11	88	76 - 111	
Barium	68.4	191	244.3	92	52 - 159	
Beryllium	0.033 U	4.78	4.16	87	72 - 105	
Boron	1.4 B	95.7	83.32	86	80 - 120	
Cadmium	0.13 B	9.57	9.71	100	40 - 130	
Calcium	9350	4780	13560	88	43 - 165	
Chromium	21.1	19.1	37.63	86	70 - 200	
Cobalt	7.5	47.8	50.03	89	72 - 106	
Copper	386	23.9	44.93	-1425	37 - 187	4
Iron	18100	95.7	18940	829	70 - 200	4
Lead	10.8	47.8	49.25	80	70 - 200	
Magnesium	4770	4780	9040	89	64 - 145	
Manganese	294	47.8	333.0	82	40 - 200	4
Molybdenum	0.26 U	95.7	85.60	89	75 - 103	
Nickel	11.6	47.8	52.80	86	61 - 126	
Potassium	1310	4780	5862	95	56 - 172	
Selenium	0.85 U	191	168.5	88	76 - 104	
Silicon	298	957	477.7	19	20 - 200	N
Silver	0.16 U	4.78	4.44	93	75 - 141	
Sodium	436	4780	5163	99	78 - 111	
Vanadium	39.2	47.8	89.46	105	50 - 169	
Zinc	102	47.8	133.3	65	70 - 200	N

Quality Control Results

Client: Washington Closure Hanford

Job Number: 280-55787-1
Sdg Number: JP0808

Duplicate - Batch: 280-227289

**Method: 6010B
Preparation: 3050B**

Lab Sample ID: 280-55787-1
Client Matrix: Solid
Dilution: 1.0
Analysis Date: 05/28/2014 1524
Prep Date: 05/27/2014 1230
Leach Date: N/A

Analysis Batch: 280-227794
Prep Batch: 280-227289
Leach Batch: N/A
Units: mg/Kg

Instrument ID: MT_026
Lab File ID: 26A052814B.asc
Initial Weight/Volume: 1.17 g
Final Weight/Volume: 100 mL

Analyte	Sample Result/Qual	Result	RPD	Limit	Qual
Aluminum	7260	7113	2	40	
Antimony	0.37 U	0.33	NC	40	U
Arsenic	3.3	2.48	29	30	
Barium	68.4	70.11	2	30	
Beryllium	0.033 U	0.029	NC	30	U
Boron	1.4 B	1.21	15	30	B
Cadmium	0.13 B	2.06	176	30	N M
Calcium	9350	9528	2	30	
Chromium	21.1	29.38	33	40	
Cobalt	7.5	7.61	2	30	
Copper	386	26.44	174	30	M
Iron	18100	18400	1	40	
Lead	10.8	10.42	3	40	
Magnesium	4770	4701	1	30	
Manganese	294	292.7	0.4	40	
Molybdenum	0.26 U	0.23	NC	30	U
Nickel	11.6	11.53	0.9	30	
Potassium	1310	1238	6	40	
Selenium	0.85 U	0.75	NC	30	U
Silicon	298	277.4	7	40	
Silver	0.16 U	0.14	NC	30	U
Sodium	436	530.9	20	30	
Vanadium	39.2	40.15	2	30	
Zinc	102	121.5	17	40	

Quality Control Results

Client: Washington Closure Hanford

Job Number: 280-55787-1
Sdg Number: JP0808

Method Blank - Batch: 280-227407

Method: 7471A
Preparation: 7471A

Lab Sample ID: MB 280-227407/1-A
Client Matrix: Solid
Dilution: 1.0
Analysis Date: 05/27/2014 1729
Prep Date: 05/27/2014 1300
Leach Date: N/A

Analysis Batch: 280-227591
Prep Batch: 280-227407
Leach Batch: N/A
Units: mg/Kg

Instrument ID: MT_033
Lab File ID: N/A
Initial Weight/Volume: .6 g
Final Weight/Volume: 50 mL

Analyte	Result	Qual	MDL	RL
Mercury	0.0055	U	0.0055	0.017

Lab Control Sample - Batch: 280-227407

Method: 7471A
Preparation: 7471A

Lab Sample ID: LCS 280-227407/2-A
Client Matrix: Solid
Dilution: 1.0
Analysis Date: 05/27/2014 1732
Prep Date: 05/27/2014 1300
Leach Date: N/A

Analysis Batch: 280-227591
Prep Batch: 280-227407
Leach Batch: N/A
Units: mg/Kg

Instrument ID: MT_033
Lab File ID: N/A
Initial Weight/Volume: .6 g
Final Weight/Volume: 50 mL

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

Matrix Spike - Batch: 280-227407

Method: 7471A
Preparation: 7471A

Lab Sample ID: 280-55787-1
Client Matrix: Solid
Dilution: 1.0
Analysis Date: 05/27/2014 1743
Prep Date: 05/27/2014 1300
Leach Date: N/A

Analysis Batch: 280-227591
Prep Batch: 280-227407
Leach Batch: N/A
Units: mg/Kg

Instrument ID: MT_033
Lab File ID: N/A
Initial Weight/Volume: 0.57 g
Final Weight/Volume: 50 mL

Analyte	Sample Result/Qual	Spike Amount	Result	% Rec.	Limit	Qual
Mercury	0.0090 B	0.445	0.440	97	87 - 111	

Quality Control Results

Client: Washington Closure Hanford

Job Number: 280-55787-1
Sdg Number: JP0808

Duplicate - Batch: 280-227407

Method: 7471A
Preparation: 7471A

Lab Sample ID: 280-55787-1
Client Matrix: Solid
Dilution: 1.0
Analysis Date: 05/27/2014 1741
Prep Date: 05/27/2014 1300
Leach Date: N/A

Analysis Batch: 280-227591
Prep Batch: 280-227407
Leach Batch: N/A
Units: mg/Kg

Instrument ID: MT_033
Lab File ID: N/A
Initial Weight/Volume: 0.69 g
Final Weight/Volume: 50 mL

Analyte	Sample Result/Qual	Result	RPD	Limit	Qual
Mercury	0.0090 B	0.00801	11	20	B

Date: 12 June 2014
 To: Washington Closure Hanford Inc. (technical representative)
 From: ELR Consulting
 Project: 100N Field Remediation – Soil Full Protocol - Waste Site 100-N-84:6
 Subject: PCB - Data Package No. JP0808-TAL

INTRODUCTION

This memo presents the results of data validation on Data Package No. JP0808 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
J1TR30	5/21/14	Soil	C	See note 1
J1TR31	5/21/14	Soil	C	See note 1
J1TR32	5/21/14	Soil	C	See note 1
J1TR33	5/21/14	Soil	C	See note 1
J1TR34	5/21/14	Soil	C	See note 1
J1TR35	5/21/14	Soil	C	See note 1
J1TR36	5/21/14	Soil	C	See note 1
J1TR37	5/21/14	Soil	C	See note 1
J1TR38	5/21/14	Soil	C	See note 1
J1TR42	5/21/14	Soil	C	See note 1
J1TR44	5/21/14	Soil	C	See note 1

1 – PCBs by 8082.

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 OBJECTIVES

Holding Times

Holding times are not applicable for PCB analysis.

Method Blank

Method blank analyses are performed to determine the extent of laboratory contamination introduced through sampling, sample preparation or analysis. At least one method blank analysis must be conducted for every 20 samples. Method blanks should not contain target compounds at a concentration greater than required quantitation limit (RQL). If target compounds are present, sample results less than five times the blank concentration are qualified as undetected and flagged "U". If the sample result is less than five times the blank concentration and less than RQL, the result is qualified as undetected and elevated to the RQL.

All method blank results were acceptable.

Field Blanks

No field blanks were submitted for analysis.

Accuracy

Matrix Spike & 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 50% to 150%. If spike recoveries are outside control limits, detected sample results less than five times the spike concentration are qualified as estimates and flagged "J". Non-detected sample results with spike recoveries outside control limits are qualified as estimates and flagged "UJ". Sample results greater than five times the spike concentration require no qualification.

All accuracy results were acceptable.

Surrogate Recovery

The analysis of surrogate compounds provides a measure of performance for individual samples. Matrix-specific surrogate compound recovery control windows have been established by the laboratory. When a surrogate compound recovery is outside the control window, all positively identified target compounds associated with the unacceptable surrogate recoveries are qualified as estimates and flagged "J". Non-detected compounds with surrogate recoveries less than the lower control limit are qualified as having an estimated detection limit and flagged "UJ". Non-detected compounds with surrogate recoveries above the upper control limit require no qualification.

All surrogate results were acceptable.

Precision

Matrix Spike/Matrix Spike Duplicate Samples

Matrix spike/matrix spike duplicate results provide matrix-specific information on the precision of the method for specific target compound classes. Precision is expressed as the relative percent difference (RPD) between the recoveries of duplicate matrix spike analyses performed on a sample. For soil samples, results must be within RPD limits of plus/minus 30%. If RPD values are out of specification and the sample concentration is less than five times the spike concentration, all associated detected sample results are qualified as estimates and flagged "J". If RPD values are out of specification and the sample concentration is greater than five times the spike concentration, no qualification is required.

All precision results were acceptable.

Field Duplicate Samples

One set of field duplicates (J1TR30/J1TR42) 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. JP0808 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*, 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 the procedures herein 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 quantitation limit is an estimate.
- 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

PCB DATA QUALIFICATION SUMMARY*

SDG: JP0808	REVIEWER: ELR	Project: 100-N-84:6	PAGE <u>1</u> OF <u>1</u>
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

Analytical Data

Client: Washington Closure Hanford

Job Number: 280-55787-1
Sdg Number: JP0808

Client Sample ID: J1TR32

Lab Sample ID: 280-55787-3
Client Matrix: Solid

% Moisture: 2.0

Date Sampled: 05/21/2014 1254
Date Received: 05/23/2014 0945

8082 Polychlorinated Biphenyls (PCBs) by Gas Chromatography

Analysis Method: 8082 Analysis Batch: 280-227569 Instrument ID: SGC_W
Prep Method: 3550C Prep Batch: 280-227270 Initial Weight/Volume: 30.7 g
Dilution: 1.0 Final Weight/Volume: 5 mL
Analysis Date: 05/28/2014 1423 Injection Volume: 1 uL
Prep Date: 05/23/2014 1855 Result Type: PRIMARY

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
Aroclor 1016		2.8	U	2.8	10
Aroclor 1221		8.0	U	8.0	16
Aroclor 1232		2.0	U	2.0	10
Aroclor 1242		4.6	U	4.6	10
Aroclor 1248		4.6	U	4.6	10
Aroclor 1254		58		2.6	10
Aroclor 1260		2.6	U	2.6	10

Surrogate	%Rec	Qualifier	Acceptance Limits
Decachlorobiphenyl	77		59 - 130
Tetrachloro-m-xylene	82		53 - 128

W
6/11/14

Analytical Data

Client: Washington Closure Hanford

Job Number: 280-55787-1
Sdg Number: JP0808

Client Sample ID: J1TR33

Lab Sample ID: 280-55787-4

Date Sampled: 05/21/2014 1311

Client Matrix: Solid

% Moisture: 1.2

Date Received: 05/23/2014 0945

8082 Polychlorinated Biphenyls (PCBs) by Gas Chromatography

Analysis Method:	8082	Analysis Batch:	280-227569	Instrument ID:	SGC_W
Prep Method:	3550C	Prep Batch:	280-227270	Initial Weight/Volume:	30.0 g
Dilution:	1.0			Final Weight/Volume:	5 mL
Analysis Date:	05/28/2014 1447			Injection Volume:	1 uL
Prep Date:	05/23/2014 1855			Result Type:	PRIMARY

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
Aroclor 1016		2.8	U	2.8	10
Aroclor 1221		8.1	U	8.1	17
Aroclor 1232		2.0	U	2.0	10
Aroclor 1242		4.7	U	4.7	10
Aroclor 1248		4.7	U	4.7	10
Aroclor 1254		4.3	J	2.6	10
Aroclor 1260		2.6	U	2.6	10

Surrogate	%Rec	Qualifier	Acceptance Limits
Decachlorobiphenyl	96		59 - 130
Tetrachloro-m-xylene	95		53 - 128

Handwritten signature and date: 6/11/14

Analytical Data

Client: Washington Closure Hanford

Job Number: 280-55787-1
Sdg Number: JP0808

Client Sample ID: J1TR34

Lab Sample ID: 280-55787-5
Client Matrix: Solid

% Moisture: 1.9

Date Sampled: 05/21/2014 1315
Date Received: 05/23/2014 0945

8082 Polychlorinated Biphenyls (PCBs) by Gas Chromatography

Analysis Method:	8082	Analysis Batch:	280-227569	Instrument ID:	SGC_W
Prep Method:	3550C	Prep Batch:	280-227270	Initial Weight/Volume:	30.6 g
Dilution:	1.0			Final Weight/Volume:	5 mL
Analysis Date:	05/28/2014 1510			Injection Volume:	1 uL
Prep Date:	05/23/2014 1855			Result Type:	PRIMARY

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
Aroclor 1018		2.8	U	2.8	10
Aroclor 1221		8.0	U	8.0	16
Aroclor 1232		2.0	U	2.0	10
Aroclor 1242		4.7	U	4.7	10
Aroclor 1248		4.7	U	4.7	10
Aroclor 1254		2.6	U	2.6	10
Aroclor 1260		2.6	U	2.6	10

Surrogate	%Rec	Qualifier	Acceptance Limits
Decachlorobiphenyl	99		59 - 130
Tetrachloro-m-xylene	96		53 - 128

Handwritten signature and date: 05/21/14

Analytical Data

Client: Washington Closure Hanford

Job Number: 280-55787-1
Sdg Number: JP0808

Client Sample ID: J1TR35

Lab Sample ID: 280-55787-6
Client Matrix: Solid

% Moisture: 1.7

Date Sampled: 05/21/2014 1204
Date Received: 05/23/2014 0945

8082 Polychlorinated Biphenyls (PCBs) by Gas Chromatography

Analysis Method:	8082	Analysis Batch:	280-227569	Instrument ID:	SGC_W
Prep Method:	3550C	Prep Batch:	280-227270	Initial Weight/Volume:	31.1 g
Dilution:	1.0			Final Weight/Volume:	5 mL
Analysis Date:	05/28/2014 1534			Injection Volume:	1 uL
Prep Date:	05/23/2014 1855			Result Type:	PRIMARY

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
Aroclor 1016		2.7	U	2.7	9.8
Aroclor 1221		7.9	U	7.9	16
Aroclor 1232		2.0	U	2.0	9.8
Aroclor 1242		4.6	U	4.6	9.8
Aroclor 1248		4.6	U	4.6	9.8
Aroclor 1254		2.6	U	2.6	9.8
Aroclor 1260		2.6	U	2.6	9.8

Surrogate	%Rec	Qualifier	Acceptance Limits
Decachlorobiphenyl	98		59 - 130
Tetrachloro-m-xylene	94		53 - 128

Handwritten signature/initials

Analytical Data

Client: Washington Closure Hanford

Job Number: 280-55787-1
Sdg Number: JP0808

Client Sample ID: J1TR36

Lab Sample ID: 280-55787-7
Client Matrix: Solid

% Moisture: 1.9

Date Sampled: 05/21/2014 1242
Date Received: 05/23/2014 0945

8082 Polychlorinated Biphenyls (PCBs) by Gas Chromatography

Analysis Method:	8082	Analysis Batch:	280-227569	Instrument ID:	SGC_W
Prep Method:	3550C	Prep Batch:	280-227270	Initial Weight/Volume:	30.4 g
Dilution:	1.0			Final Weight/Volume:	5 mL
Analysis Date:	05/28/2014 1557			Injection Volume:	1 uL
Prep Date:	05/23/2014 1855			Result Type:	PRIMARY

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
Aroclor 1016		2.8	U	2.8	10
Aroclor 1221		8.1	U	8.1	17
Aroclor 1232		2.0	U	2.0	10
Aroclor 1242		4.7	U	4.7	10
Aroclor 1248		4.7	U	4.7	10
Aroclor 1254		2.6	U	2.6	10
Aroclor 1260		2.6	U	2.6	10

Surrogate	%Rec	Qualifier	Acceptance Limits
Decachlorobiphenyl	100		59 - 130
Tetrachloro-m-xylene	97		53 - 128

Handwritten signature

Analytical Data

Client: Washington Closure Hanford

Job Number: 280-55787-1

Sdg Number: JP0808

Client Sample ID: J1TR37

Lab Sample ID: 280-55787-8

Date Sampled: 05/21/2014 1414

Client Matrix: Solid

% Moisture: 0.8

Date Received: 05/23/2014 0945

8082 Polychlorinated Biphenyls (PCBs) by Gas Chromatography

Analysis Method:	8082	Analysis Batch:	280-227569	Instrument ID:	SGC_W
Prep Method:	3550C	Prep Batch:	280-227270	Initial Weight/Volume:	31.8 g
Dilution:	1.0			Final Weight/Volume:	5 mL
Analysis Date:	05/28/2014 1621			Injection Volume:	1 uL
Prep Date:	05/23/2014 1855			Result Type:	PRIMARY

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
Aroclor 1016		2.6	U	2.6	9.5
Aroclor 1221		7.6	U	7.6	16
Aroclor 1232		1.9	U	1.9	9.5
Aroclor 1242		4.4	U	4.4	9.5
Aroclor 1248		4.4	U	4.4	9.5
Aroclor 1254		2.5	U	2.5	9.5
Aroclor 1260		4.6	J	2.5	9.5

Surrogate	%Rec	Qualifier	Acceptance Limits
Decachlorobiphenyl	102		59 - 130
Tetrachloro-m-xylene	96		53 - 128

Handwritten signature

Analytical Data

Client: Washington Closure Hanford

Job Number: 280-55787-1
Sdg Number: JP0808

Client Sample ID: J1TR38

Lab Sample ID: 280-55787-9

Date Sampled: 05/21/2014 1409

Client Matrix: Solid

% Moisture: 2.0

Date Received: 05/23/2014 0945

8082 Polychlorinated Biphenyls (PCBs) by Gas Chromatography

Analysis Method:	8082	Analysis Batch:	280-227569	Instrument ID:	SGC_W
Prep Method:	3550C	Prep Batch:	280-227270	Initial Weight/Volume:	30.4 g
Dilution:	1.0			Final Weight/Volume:	5 mL
Analysis Date:	05/28/2014 1708			Injection Volume:	1 uL
Prep Date:	05/23/2014 1855			Result Type:	PRIMARY

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
Aroclor 1016		2.8	U	2.8	10
Aroclor 1221		8.1	U	8.1	17
Aroclor 1232		2.0	U	2.0	10
Aroclor 1242		4.7	U	4.7	10
Aroclor 1248		4.7	U	4.7	10
Aroclor 1254		2.6	U	2.6	10
Aroclor 1260		2.6	U	2.6	10

Surrogate	%Rec	Qualifier	Acceptance Limits
Decachlorobiphenyl	92		59 - 130
Tetrachloro-m-xylene	100		53 - 128

Handwritten signature/initials

Analytical Data

Client: Washington Closure Hanford

Job Number: 280-55787-1
Sdg Number: JP0808

Client Sample ID: J1TR42

Lab Sample ID: 280-55787-10
Client Matrix: Solid

% Moisture: 1.0

Date Sampled: 05/21/2014 1329
Date Received: 05/23/2014 0945

8082 Polychlorinated Biphenyls (PCBs) by Gas Chromatography

Analysis Method:	8082	Analysis Batch:	280-227569	Instrument ID:	SGC_W
Prep Method:	3550C	Prep Batch:	280-227270	Initial Weight/Volume:	31.8 g
Dilution:	1.0			Final Weight/Volume:	5 mL
Analysis Date:	05/28/2014 1731			Injection Volume:	1 uL
Prep Date:	05/23/2014 1855			Result Type:	PRIMARY

Analyte	DryWM Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
Aroclor 1016		2.6	U	2.6	9.5
Aroclor 1221		7.6	U	7.6	16
Aroclor 1232		1.9	U	1.9	9.5
Aroclor 1242		4.4	U	4.4	9.5
Aroclor 1248		4.4	U	4.4	9.5
Aroclor 1254		28		2.5	9.5
Aroclor 1260		2.5	U	2.5	9.5
Surrogate		%Rec	Qualifier	Acceptance Limits	
Decachlorobiphenyl		71		59 - 130	
Tetrachloro-m-xylene		87		53 - 128	

Handwritten signature

Analytical Data

Client: Washington Closure Hanford

Job Number: 280-55787-1
Sdg Number: JP0808

Client Sample ID: J1TR44

Lab Sample ID: 280-55787-12
Client Matrix: Solid

% Moisture: 1.4

Date Sampled: 05/21/2014 1259
Date Received: 05/23/2014 0945

8082 Polychlorinated Biphenyls (PCBs) by Gas Chromatography

Analysis Method:	8082	Analysis Batch:	280-227569	Instrument ID:	SGC_W
Prep Method:	3550C	Prep Batch:	280-227270	Initial Weight/Volume:	31.4 g
Dilution:	1.0			Final Weight/Volume:	5 mL
Analysis Date:	05/28/2014 1755			Injection Volume:	1 uL
Prep Date:	05/23/2014 1855			Result Type:	PRIMARY

Analyte	DryWM Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
Aroclor 1016		2.7	U	2.7	9.7
Aroclor 1221		7.8	U	7.8	16
Aroclor 1232		1.9	U	1.9	9.7
Aroclor 1242		4.5	U	4.5	9.7
Aroclor 1248		4.5	U	4.5	9.7
Aroclor 1254		2.5	U	2.5	9.7
Aroclor 1260		2.5	U	2.5	9.7

Surrogate	%Rec	Qualifier	Acceptance Limits
Decachlorobiphenyl	97		59 - 130
Tetrachloro-m-xylene	94		53 - 128

Handwritten signature and date: 6/11/14

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

CASE NARRATIVE

Client: Washington Closure Hanford

Project: WASHINGTON CLOSURE HANFORD

Report Number: 280-55787-1

SDG #: JP0808

SAF#: RC-189

Data SDG Closed: May 23, 2014

Data Deliverable: 7 Day / Summary

<u>CLIENT ID</u>	<u>LAB ID</u>	<u>ANALYSES REQUESTED</u>	<u>ANALYSES PERFORMED</u>
J1TR30	280-55787-1	6010/7471/9056M/8082	6010B/7471A/9056M/8082
J1TR31	280-55787-2	6010/7471/9056M/8082	6010B/7471A/9056M/8082
J1TR32	280-55787-3	6010/7471/9056M/8082	6010B/7471A/9056M/8082
J1TR33	280-55787-4	6010/7471/9056M/8082	6010B/7471A/9056M/8082
J1TR34	280-55787-5	6010/7471/9056M/8082	6010B/7471A/9056M/8082
J1TR35	280-55787-6	6010/7471/9056M/8082	6010B/7471A/9056M/8082
J1TR36	280-55787-7	6010/7471/9056M/8082	6010B/7471A/9056M/8082
J1TR37	280-55787-8	6010/7471/9056M/8082	6010B/7471A/9056M/8082
J1TR38	280-55787-9	6010/7471/9056M/8082	6010B/7471A/9056M/8082
J1TR42	280-55787-10	6010/7471/9056M/8082	6010B/7471A/9056M/8082
J1TR43	280-55787-11	6010/7471	6010B/7471A
J1TR44	280-55787-12	6010/7471/9056M/8082	6010B/7471A/9056M/8082

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 5/23/2014 9:45 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperatures of the 3 coolers at receipt time were 1.1° C, 2.9° C and 3.1° C.

GC SEMIVOLATILES - SW846 8082 - PCBs

The laboratory noted that a Sulfuric Acid clean-up was performed on the samples presented in this report to reduce matrix interferences.

Samples J1TR30, J1TR32, J1TR33, J1TR37 and J1TR42 contained a combination of Aroclor 1254 and Aroclor 1260 with insufficient separation to quantify individually. The samples have been quantified and reported as the predominant Aroclor.

No other anomalies were encountered.

TOTAL METALS - SW846 6010B/7471A

Serial dilution of a digestate in batch 280-227289 indicates that physical and chemical interferences are present for Cobalt, Nickel and Silicon. Results have been flagged with an "X".

Each sample is analyzed to achieve the lowest possible reporting limits within the constraints of the methods. Samples J1TR33, J1TR35 and J1TR44 required a 5X dilution prior to the analysis of Antimony, Beryllium, Cobalt, Copper, Lead, Silicon and Vanadium to minimize the interference caused by Titanium concentrations greater than the linear range. The reporting limits have been adjusted relative to the dilution required.

Low levels of Barium and Chromium are present in the method blank associated with batch 280-227289. Because the concentrations in the method blank are not present at levels greater than half the reporting limit, corrective action is deemed unnecessary.

Silicon is present in the method blank associated with batch 280-227289 at 7.23 mg/kg, which is greater than half the project specific reporting limit (PSRL) of 10 mg/kg. TestAmerica's practical quantitation limit (PQL) for Silicon is 50 mg/kg. The laboratory cannot maintain system cleanliness at this low level; therefore, corrective action is not initiated. It can be noted that the concentration found in the method blank is less than half of the laboratory standard PQL, and with the exception of 'blank' sample J1TR43, the associated sample amounts are twenty times greater than the method blank concentration.

Cadmium was recovered outside the control limits, biased high, in the LCS associated with batch 280-227289, and the associated sample results have been flagged "N". This is an indicator that data may be biased high. As Cadmium is not present at a level greater than the reporting limit in the associated samples, corrective action is deemed unnecessary.

It can be noted that the sample amount was greater than four times the spike amount for Aluminum, Copper, Iron and Manganese in the Matrix Spike performed on sample J1TR30; therefore, control limits are not applicable.

The Matrix Spike performed on sample J1TR30 exhibited percent recoveries outside the control limits for Silicon and Zinc, and the associated sample results have 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.

The duplicate analysis of sample J1TR30 exhibited RPD data outside the control limits for Cadmium and Copper, and the associated sample results have been flagged "M". 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.

GENERAL CHEMISTRY - SW846 9056M - ANIONS

The Matrix Spikes performed on samples J1TR30 and J1TR44 exhibited percent recoveries outside the control limits for Orthophosphate as P and Fluoride, and the associated sample results have been flagged "N". There is no indication that the analytical systems were 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-189-307		Page 2 of 3			
Collector <i>R. Stone</i>				Company Contact Joan Kessner		Telephone No. 375-4688		Project Coordinator KESSNER, JH		Price Code		Data Turnaround <i>7 days</i>			
Project Designation 100N Field Remediation				Sampling Location 100-N-84:6, Verification		SAF No. RC-189		Method of Shipment Commercial Carrier							
Ice Chest No. <i>RCC-07-027, RCC-07-002, 004</i> <i>RCC-07-027, 002, 004 SMS 5-22-14</i>				Field Logbook No. EL-1852-12		COA 01N8462000		Bill of Lading/Air Bill No. <i>See OSPC</i>							
Shipped To TestAmerica Denver				Offsite Property No. <i>A131148</i>											
Other Labs Shipped To TestAmerica Richland				Preservation		Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C					
				Type of Container		G/P	G/P	gG	G	gG					
POSSIBLE SAMPLE HAZARDS/REMARKS <i>potentially radioactive</i>				No. of Container(s)		1	1	1		1					
				Volume		250mL	250mL	250mL	125mL	250mL					
Special Handling and/or Storage				Sample Analysis		See item (1) in Special Instructions	IC Anions - 8006 Modified; NO2/NO3 - 8006; 8006	PCBs - 8082	TPH-Diesel Range - WTPHD +	PAHs - 8310					
Page 2				Sample No.		Matrix	Sample Date	Sample Time							
				J1TR35		SOIL	5-21-14	1204	X	X	X				
				J1TR36		SOIL	5-21-14	1242	X	X	X				
				J1TR37		SOIL	5-21-14	1414	X	X	X				
				J1TR38		SOIL	5-21-14	1409	X	X	X				
				J1TR39		SOIL	<i>MS 5/21/14</i>								
CHAIN OF POSSESSION				Sign/Print Names				SPECIAL INSTRUCTIONS							
Relinquished By/Removed From <i>R. Stone</i>				Date/Time <i>5-21-14</i>		Received By/Stored In <i>Mosher</i>		Date/Time <i>5/21/14 1442</i>		(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)					
Relinquished By/Removed From <i>Mosher</i>				Date/Time <i>5/21/14 1644</i>		Received By/Stored In <i>Fridge 3C</i>		Date/Time <i>5/21/14 1644</i>							
Relinquished By/Removed From <i>Fridge 3C</i>				Date/Time <i>5/22/14 0840</i>		Received By/Stored In <i>Mosher</i>		Date/Time <i>5/22/14 0840</i>							
Relinquished By/Removed From <i>Mosher</i>				Date/Time <i>5/22/14 0851</i>		Received By/Stored In <i>Field Ex</i>		Date/Time <i>5/22/14 9:45</i>							
Relinquished By/Removed From				Date/Time		Received By/Stored In		Date/Time							
Relinquished By/Removed From				Date/Time		Received By/Stored In		Date/Time							
Relinquished By/Removed From				Date/Time		Received By/Stored In		Date/Time							
FINAL SAMPLE DISPOSITION				Disposal Method		Disposed By		DATE <i>5/22/14</i>							
WCH-EE-011								JP0808							

23

Washington Closure Hanford		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST					RC-189-308	Page 1 of 1
Collector <i>A. Stowe</i>	Company Contact Joan Kessner	Telephone No. 375-4688	Project Coordinator KESSNER, JH	Price Code	Data Turnaround <i>7 days</i>			
Project Designation 100N Field Remediation <i>8MS 5-22-14</i>	Sampling Location 100-N-84-6, Verification, focused	SAF No. RC-189	Method of Shipment Commercial Carrier					
Ice Chest No. <i>8MS 5-22-14 REC-08-027, REC-07-027, REC-07-027, REC-07-027, REC-07-027, REC-07-027</i>	Field Logbook No. EL-1852-12	COA 01N8462000	Bill of Lading/Air Bill No. <i>See OSC</i>					
Shipped To <i>TestAmerica Denver - GEL 8MS 5/21/14</i>	Offsite Property No. <i>A131148</i>							
Other Labs Shipped To <i>TestAmerica Richland - NA TAPL 8MS 5/21/14 8MS 5/21/14</i>	Preservation	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool	
	Type of Container	GP	GP	uG	G	uG	GP	
POSSIBLE SAMPLE HAZARDS/REMARKS <i>Potentially radioactive</i>	No. of Container(s)	1	1	1	1	1	1	
	Vokume	250mL	250mL	250mL	125mL	250mL	125mL	
Special Handling and/or Storage	Sample Analysis	See Item (1) in Special Instructions	IC Anions - 9056 Modified - NO2/NNO3 - <i>5/21/14</i>	PCBs - 8082	TPH-Diesel Range - WTPH-D+	PAHs - 8310	<i>Cr-6 7196</i>	
RSP	Sample No.	Matrix	Sample Date	Sample Time				
	<i>STR44</i>	<i>SOIL</i>	<i>5-21-14</i>	<i>1259</i>	<i>X</i>	<i>X</i>	<i>X</i>	
PT								
74								
CHAIN OF POSSESSION				Sign/Print Names				
Relinquished By/Removed From <i>Ashley Stowe</i>	Date/Time <i>5-21-14</i>	1442	Received By/Stored In <i>DUSHEA DUSHEA</i>	Date/Time <i>5/21/14</i>	1442	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)		
Relinquished By/Removed From <i>DUSHEA DUSHEA</i>	Date/Time <i>5/21/14</i>	1644	Received By/Stored In <i>Fridge 3C Botella</i>	Date/Time <i>5/21/14</i>	1644			
Relinquished By/Removed From <i>Fridge 3C Botella</i>	Date/Time <i>5/22/14</i>	0840	Received By/Stored In <i>DUSHEA DUSHEA</i>	Date/Time <i>5/22/14</i>	0840			
Relinquished By/Removed From <i>DUSHEA DUSHEA</i>	Date/Time <i>5/22/14</i>	0851	Received By/Stored In <i>Feed EX</i>	Date/Time				
Relinquished By/Removed From	Date/Time		Received By/Stored In <i>[Signature]</i>	Date/Time <i>5/23/14 9MS</i>				
Relinquished By/Removed From	Date/Time		Received By/Stored In	Date/Time				
Relinquished By/Removed From	Date/Time		Received By/Stored In	Date/Time				
Relinquished By/Removed From	Date/Time		Received By/Stored In	Date/Time				
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time					

WCH-EE-011



JP0808

25

Appendix 5
Data Validation Supporting Documentation

PCB DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
PROJECT:	100-N-84:6		DATA PACKAGE: JP0808		
VALIDATOR:	ELR	LAB:	TAC	DATE: 6/9/14	
			SDG:	JP0808	
ANALYSES PERFORMED					
SW-846 8081 SW-846 8081	SW-846 8081 (TCLP)	SW-846 8082	SW-846 8081 (TCLP)		
SAMPLES/MATRIX					
J1TR30	J1TR31	J1TR32	J1TR33		
J1TR34	J1TR35	J1TR36	J1TR37		
J1TR38	J1TR42	J1TR43	J1TR44		

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 acceptable? Yes No **N/A**
 Continuing calibrations acceptable? Yes No **N/A**
 Standards traceable? Yes No **N/A**
 Standards expired? Yes No **N/A**
 Calculation check acceptable? Yes No **N/A**
 DDT and endrin breakdowns acceptable? Yes No **N/A**

Comments: _____

PCB DATA VALIDATION CHECKLIST

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

Calibration blanks analyzed? (Levels D, E) Yes No N/A
Calibration blank 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/trip blanks analyzed? (Levels C, D, E) Yes No N/A
Field/trip blank results acceptable? (Levels C, D, E) Yes No N/A
Transcription/calculation errors? (Levels D, E) Yes No N/A

Comments: No PB

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

Surrogates analyzed? Yes No N/A
Surrogate recoveries acceptable? Yes No N/A
Surrogates traceable? (Levels D, E) Yes No N/A
Surrogates expired? (Levels D, E) Yes No N/A
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: _____
_____ No PAS

PCB 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. SYSTEM PERFORMANCE (Levels D and E)

- Chromatographic performance acceptable? Yes No N/A
- Positive results resolved acceptably? Yes No N/A

Comments: _____

7. HOLDING TIMES (all levels)

- Samples properly preserved? Yes No N/A
- Sample holding times acceptable? Yes No N/A

Comments: _____

PCB DATA VALIDATION CHECKLIST

8. COMPOUND IDENTIFICATION, QUANTITATION, AND DETECTION LIMITS (all levels)

Compound identification acceptable? (Levels D, E) Yes No N/A
Compound quantitation acceptable? (Levels D, E) Yes No N/A
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: _____

9. SAMPLE CLEANUP (Levels D and E)

Fluorilicil ® (or other absorbent) cleanup performed? Yes No N/A
Lot check performed? Yes No N/A
Check recoveries acceptable? Yes No N/A
GPC cleanup performed? Yes No N/A
GPC check performed? Yes No N/A
GPC check recoveries acceptable? Yes No N/A
GPC calibration performed? Yes No N/A
GPC calibration check performed? Yes No N/A
GPC calibration check retention times acceptable? Yes No N/A
Check/calibration materials traceable? Yes No N/A
Check/calibration materials Expired? Yes No N/A
Analytical batch QC given similar cleanup? Yes No N/A
Transcription/Calculation Errors? Yes No N/A
Comments: _____

Appendix 6
Additional Documentation Requested by Client

Quality Control Results

Client: Washington Closure Hanford

Job Number: 280-55787-1
Sdg Number: JP0808

Method Blank - Batch: 280-227270

Method: 8082
Preparation: 3550C

Lab Sample ID: MB 280-227270/1-A
Client Matrix: Solid
Dilution: 1.0
Analysis Date: 05/28/2014 1201
Prep Date: 05/23/2014 1855
Leach Date: N/A

Analysis Batch: 280-227569
Prep Batch: 280-227270
Leach Batch: N/A
Units: ug/Kg

Instrument ID: SGC_W
Lab File ID: 05280004.D
Initial Weight/Volume: 31.5 g
Final Weight/Volume: 5 mL
Injection Volume: 1 uL
Column ID: PRIMARY

Analyte	Result	Qual	MDL	RL
Aroclor 1016	2.6	U	2.6	9.5
Aroclor 1221	7.6	U	7.6	16
Aroclor 1232	1.9	U	1.9	9.5
Aroclor 1242	4.4	U	4.4	9.5
Aroclor 1248	4.4	U	4.4	9.5
Aroclor 1254	2.5	U	2.5	9.5
Aroclor 1260	2.5	U	2.5	9.5
Surrogate	% Rec		Acceptance Limits	
Decachlorobiphenyl	108		59 - 130	
Tetrachloro-m-xylene	95		53 - 128	

Lab Control Sample - Batch: 280-227270

Method: 8082
Preparation: 3550C

Lab Sample ID: LCS 280-227270/2-A
Client Matrix: Solid
Dilution: 1.0
Analysis Date: 05/28/2014 1224
Prep Date: 05/23/2014 1855
Leach Date: N/A

Analysis Batch: 280-227569
Prep Batch: 280-227270
Leach Batch: N/A
Units: ug/Kg

Instrument ID: SGC_W
Lab File ID: 05280005.D
Initial Weight/Volume: 31.9 g
Final Weight/Volume: 5 mL
Injection Volume: 1 uL
Column ID: PRIMARY

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
Aroclor 1016	31.3	37.1	118	54 - 132	
Aroclor 1260	31.3	35.5	113	62 - 129	
Surrogate		% Rec		Acceptance Limits	
Decachlorobiphenyl		105		59 - 130	
Tetrachloro-m-xylene		100		53 - 128	

Quality Control Results

Client: Washington Closure Hanford

Job Number: 280-55787-1
Sdg Number: JP0808

**Matrix Spike/
Matrix Spike Duplicate Recovery Report - Batch: 280-227270**

**Method: 8082
Preparation: 3550C**

MS Lab Sample ID: 280-55787-2
Client Matrix: Solid
Dilution: 1.0
Analysis Date: 05/28/2014 1335
Prep Date: 05/23/2014 1855
Leach Date: N/A

Analysis Batch: 280-227569
Prep Batch: 280-227270
Leach Batch: N/A

Instrument ID: SGC_W
Lab File ID: 05280008.D
Initial Weight/Volume: 30.1 g
Final Weight/Volume: 5 mL
Injection Volume: 1 uL
Column ID: PRIMARY

MSD Lab Sample ID: 280-55787-2
Client Matrix: Solid
Dilution: 1.0
Analysis Date: 05/28/2014 1359
Prep Date: 05/23/2014 1855
Leach Date: N/A

Analysis Batch: 280-227569
Prep Batch: 280-227270
Leach Batch: N/A

Instrument ID: SGC_W
Lab File ID: 05280009.D
Initial Weight/Volume: 30.4 g
Final Weight/Volume: 5 mL
Injection Volume: 1 uL
Column ID: PRIMARY

Analyte	% Rec.		Limit	RPD	RPD Limit	MS Qual	MSD Qual
	MS	MSD					
Aroclor 1016	117	116	54 - 132	2	26		
Aroclor 1260	107	115	62 - 129	6	26		
Surrogate	MS % Rec		MSD % Rec	Acceptance Limits			
Decachlorobiphenyl	98		99	59 - 130			
Tetrachloro-m-xylene	98		98	53 - 128			

**Matrix Spike/
Matrix Spike Duplicate Recovery Report - Batch: 280-227270**

**Method: 8082
Preparation: 3550C**

MS Lab Sample ID: 280-55787-2
Client Matrix: Solid
Dilution: 1.0
Analysis Date: 05/28/2014 1335
Prep Date: 05/23/2014 1855
Leach Date: N/A

Units: ug/Kg

MSD Lab Sample ID: 280-55787-2
Client Matrix: Solid
Dilution: 1.0
Analysis Date: 05/28/2014 1359
Prep Date: 05/23/2014 1855
Leach Date: N/A

Analyte	Sample Result/Qual	MS Spike Amount	MSD Spike Amount	MS Result/Qual	MSD Result/Qual
Aroclor 1016	2.8 U	33.6	33.3	39.5	38.6
Aroclor 1260	2.6 U	33.6	33.3	36.1	38.3