# SAF-RC-075
# 100-D/DR Burial Grounds & Remaining Sites – Soil Full Protocol
# FINAL VALIDATION PACKAGE

**COMPLETE COPY OF FINAL VALIDATION PACKAGE TO:**

Kathy Wendt H4-21

**COMMENTS:**

**SDG JP0877 SAF-RC-075**

**Waste Site: 100-D-86:3**

Date: 23 February 2015
To: Washington Closure Hanford Inc. (technical representative)
From: ELR Consulting
Project: 100-D/DR Burial Grounds & Remaining Sites – Soil Full Protocol - Waste Site 100-D-86:3
Subject: Pesticide/PCB - Data Package No. JP0877-TAL

## INTRODUCTION

This memo presents the results of data validation on Data Package No. JP0877 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 |
|---|---|---|---|---|
| J1TWT8 | 10/28/14 | Soil | C | See note 1 |
| J1TWT9 | 10/28/14 | Soil | C | See note 1 |
| J1TWV0 | 10/28/14 | Soil | C | See note 1 |
| J1TWV1 | 10/28/14 | Soil | C | See note 1 |
| J1TWV2 | 10/28/14 | Soil | C | See note 1 |
| J1TWV3 | 10/28/14 | Soil | C | See note 1 |
| J1TWV4 | 10/28/14 | Soil | C | See note 1 |
| J1TWV5 | 10/28/14 | Soil | C | See note 1 |
| J1TWV6 | 10/28/14 | Soil | C | See note 1 |
| J1TWV7 | 10/28/14 | Soil | C | See note 1 |
| J1TWV8 | 10/28/14 | Soil | C | See note 1 |
| J1TWV9 | 10/28/14 | Soil | C | See note 1 |
| J1TWW0 | 10/28/14 | Soil | C | See note 1 |

1 – Pesticides by 8081B and PCBs by 8082.

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

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

## DATA QUALITY OBJECTIVES

### Holding Times

Analytical holding times were assessed to ascertain whether the holding time requirements were met by the laboratory. The holding time requirements are as follows: Samples must be extracted within 14 days of the date of sample collection and analyzed within 40 days from the date of extraction. Holding times are not applicable for PCB analysis.

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

All holding times were acceptable.

### Method 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 70% to 130%. 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.

Due to the lack of a matrix spike, matrix spike duplicate or LCS analysis, all toxaphene results were qualified as estimates and flagged "J".

All other 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.

Due to a surrogate recovery outside QC limits, the dieldrin result in sample J1TWV7 was qualified as an estimate and flagged "J".

Due to surrogate recoveries outside QC limits, all PCB results in sample J1TWV0 were qualified as estimates and flagged "J".

All other 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.

Due to the lack of a matrix spike and matrix spike duplicate analysis, all toxaphene results were qualified as estimates and flagged "J".

All other precision results were acceptable.

Field Duplicate Samples

One set of field duplicates (J1TWT9/J1TWW0) 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. The RQL was exceeded for seventeen PCB and five pesticide analytes. Under the WCH statement of work, no qualification is required. All other results met the RQL.

- **Completeness**

Data Package No. JP0877 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 the lack of a matrix spike, matrix spike duplicate or LCS analysis, all toxaphene results were qualified as estimates and flagged "J".
- Due to a surrogate recovery outside QC limits, the dieldrin result in sample J1TWV7 was qualified as an estimate and flagged "J".
- Due to surrogate recoveries outside QC limits, all PCB results in sample J1TWV0 were qualified as estimates and flagged "J".

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

## REFERENCES

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

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

## Appendix 1

## Glossary of Data Reporting Qualifiers

Qualifiers which may be applied by data validators in compliance with 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

PESTICIDE/PCB DATA QUALIFICATION SUMMARY*

| **SDG: JP0877** | **REVIEWER: ELR** | **Project: 100-D-86:3** | **PAGE_1_OF_1** |
|---|---|---|---|
| COMPOUND | QUALIFIER | SAMPLES AFFECTED | REASON |
| Toxaphene | J | All | No MS/MSD/LCS analysis |
| Dieldrin | J | J1TWV7 | Surrogate recovery |
| All PCB | J | J1TWV0 | Surrogate recovery |

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

# Appendix 3

# Annotated Laboratory Reports

## Analytical Data

Client: Washington Closure Hanford

Job Number: 280-61898-1
Sdg Number: JP0877

**Client Sample ID:** **J1TWT8**

Lab Sample ID: 280-61898-1
Client Matrix: Solid

% Moisture: 3.3

Date Sampled: 10/28/2014 1008
Date Received: 10/30/2014 0930

**8081A Organochlorine Pesticides (GC)**

| | | | | | |
|---|---|---|---|---|---|
| Analysis Method: | 8081A | Analysis Batch: | 280-251090 | Instrument ID: | SGC_P1 |
| Prep Method: | 3550C | Prep Batch: | 280-250643 | Initial Weight/Volume: | 31.5 g |
| Dilution: | 1.0 | | | Final Weight/Volume: | 10 mL |
| Analysis Date: | 11/04/2014 0404 | | | Injection Volume: | 1 uL |
| Prep Date: | 10/30/2014 2214 | | | Result Type: | PRIMARY |

✓ 2/22/14

| Analyte | DryWt Corrected: Y | Result (ug/Kg) | Qualifier | MDL | RL |
|---|---|---|---|---|---|
| 4,4'-DDD | | 0.54 | U | 0.54 | 1.7 |
| *4,4'-DDE* | | *0.23* | *U* | *0.23* | *1.7* |
| 4,4'-DDT | | 0.58 | U | 0.58 | 1.7 |
| Aldrin | | 0.25 | U | 0.25 | 1.6 |
| alpha-BHC | | 0.21 | U | 0.21 | 1.6 |
| beta-BHC | | 0.65 | U | 0.65 | 1.6 |
| delta-BHC | | 0.39 | U | 0.39 | 1.6 |
| gamma-BHC (Lindane) | | 0.46 | U | 0.46 | 1.6 |
| Heptachlor | | 0.21 | U | 0.21 | 1.6 |
| Heptachlor epoxide | | 0.42 | U | 0.42 | 1.6 |
| Endosulfan I | | 0.17 | U | 0.17 | 1.6 |
| Endosulfan II | | 0.28 | U | 0.28 | 1.7 |
| Endosulfan sulfate | | 0.27 | U | 0.27 | 1.7 |
| Endrin | | 0.30 | U | 0.30 | 1.7 |
| Endrin aldehyde | | 0.17 | U | 0.17 | 1.7 |
| Endrin ketone | | 0.48 | U | 0.48 | 1.7 |
| gamma-Chlordane | | 0.26 | U | 0.26 | 1.7 |
| Methoxychlor | | 0.44 | U | 0.44 | 3.3 |
| alpha-Chlordane | | 0.32 | U | 0.32 | 1.7 |
| Dieldrin | | 0.21 | U | 0.21 | 1.7 |
| Toxaphene | | 16 | U J | 16 | 160 |

| Surrogate | %Rec | Qualifier | Acceptance Limits |
|---|---|---|---|
| Tetrachloro-m-xylene | 74 | | 59 - 115 |
| Decachlorobiphenyl | 91 | | 63 - 124 |

## Analytical Data

Client: Washington Closure Hanford

Job Number: 280-61898-1
Sdg Number: JP0877

**Client Sample ID:** **J1TWT9**

Lab Sample ID: 280-61898-2
Client Matrix: Solid

% Moisture: 5.5

Date Sampled: 10/28/2014 0857
Date Received: 10/30/2014 0930

**8081A Organochlorine Pesticides (GC)**

| | | | | | |
|---|---|---|---|---|---|
| Analysis Method: | 8081A | Analysis Batch: | 280-251366 | Instrument ID: | SGC_P1 |
| Prep Method: | 3550C | Prep Batch: | 280-250643 | Initial Weight/Volume: | 30.6 g |
| Dilution: | 1.0 | | | Final Weight/Volume: | 10 mL |
| Analysis Date: | 11/05/2014 1359 | | | Injection Volume: | 1 uL |
| Prep Date: | 10/30/2014 2214 | | | Result Type: | PRIMARY |

| Analyte | DryWt Corrected: Y | Result (ug/Kg) | Qualifier | MDL | RL |
|---|---|---|---|---|---|
| 4,4'-DDD | | 0.57 | U | 0.57 | 1.8 |
| *4,4'-DDE* | | *0.25* | *U* | *0.25* | *1.8* |
| 4,4'-DDT | | 1.2 | J X | 0.61 | 1.8 |
| Aldrin | | 0.26 | U | 0.26 | 1.7 |
| alpha-BHC | | 0.22 | U | 0.22 | 1.7 |
| beta-BHC | | 0.69 | U | 0.69 | 1.7 |
| delta-BHC | | 0.42 | U | 0.42 | 1.7 |
| gamma-BHC (Lindane) | | 0.48 | U | 0.48 | 1.7 |
| Heptachlor | | 0.22 | U | 0.22 | 1.7 |
| Heptachlor epoxide | | 0.44 | U | 0.44 | 1.7 |
| Endosulfan I | | 0.18 | U | 0.18 | 1.7 |
| Endosulfan II | | 0.30 | U | 0.30 | 1.8 |
| Endosulfan sulfate | | 0.29 | U | 0.29 | 1.8 |
| Endrin | | 0.32 | U | 0.32 | 1.8 |
| Endrin aldehyde | | 0.18 | U | 0.18 | 1.8 |
| Endrin ketone | | 0.51 | U | 0.51 | 1.8 |
| gamma-Chlordane | | 0.28 | U | 0.28 | 1.8 |
| Methoxychlor | | 0.47 | U | 0.47 | 3.4 |
| alpha-Chlordane | | 0.34 | U | 0.34 | 1.8 |
| Dieldrin | | 0.22 | U | 0.22 | 1.8 |
| Toxaphene | | 16 | U J | 16 | 170 |

| Surrogate | %Rec | Qualifier | Acceptance Limits |
|---|---|---|---|
| Tetrachloro-m-xylene | 83 | | 59 - 115 |
| Decachlorobiphenyl | 98 | | 63 - 124 |

2/22/14

Client: Washington Closure Hanford

Job Number: 280-61898-1
Sdg Number: JP0877

***Client Sample ID:*** ***J1TWV0***

Lab Sample ID: 280-61898-3
Client Matrix: Solid
% Moisture: 5.2

Date Sampled: 10/28/2014 1003
Date Received: 10/30/2014 0930

**8081A Organochlorine Pesticides (GC)**

| | | | | | |
|---|---|---|---|---|---|
| Analysis Method: | 8081A | Analysis Batch: | 280-251653 | Instrument ID: | SGC_P1 |
| Prep Method: | 3550C | Prep Batch: | 280-250643 | Initial Weight/Volume: | 30.4 g |
| Dilution: | 5.0 | | | Final Weight/Volume: | 10 mL |
| Analysis Date: | 11/06/2014 1408 | | | Injection Volume: | 1 uL |
| Prep Date: | 10/30/2014 2214 | | | Result Type: | PRIMARY |

| Analyte | DryWt Corrected: Y | Result (ug/Kg) | Qualifier | MDL | RL |
|---|---|---|---|---|---|
| 4,4'-DDD | | 2.8 | U D | 2.8 | 8.9 |
| *4,4'-DDE* | | *1.2* | *U D* | *1.2* | *8.9* |
| 4,4'-DDT | | 3.1 | U D | 3.1 | 8.9 |
| Aldrin | | 1.3 | U D | 1.3 | 8.6 |
| alpha-BHC | | 1.1 | U D | 1.1 | 8.6 |
| beta-BHC | | 3.5 | U D | 3.5 | 8.6 |
| delta-BHC | | 2.1 | U D | 2.1 | 8.6 |
| gamma-BHC (Lindane) | | 2.4 | U D | 2.4 | 8.6 |
| Heptachlor | | 1.1 | U D | 1.1 | 8.6 |
| Heptachlor epoxide | | 5.3 | J X D | 2.2 | 8.6 |
| Endosulfan I | | 0.92 | U D | 0.92 | 8.6 |
| *Endosulfan II* | | *1.5* | *U D* | *1.5* | *8.9* |
| Endosulfan sulfate | | 1.4 | U D | 1.4 | 8.9 |
| Endrin | | 1.6 | U D | 1.6 | 8.9 |
| Endrin aldehyde | | 0.89 | U D | 0.89 | 8.9 |
| Endrin ketone | | 2.5 | U D | 2.5 | 8.9 |
| gamma-Chlordane | | 1.4 | U D | 1.4 | 8.9 |
| Methoxychlor | | 2.3 | U D | 2.3 | 17 |
| alpha-Chlordane | | 1.7 | U D | 1.7 | 8.9 |
| Dieldrin | | 60 | X D | 1.1 | 8.9 |
| Toxaphene | | 82 | U D J | 82 | 860 |

| Surrogate | %Rec | Qualifier | Acceptance Limits |
|---|---|---|---|
| Tetrachloro-m-xylene | 85 | D | 59 - 115 |
| Decachlorobiphenyl | 121 | D | 63 - 124 |

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## Analytical Data

Client: Washington Closure Hanford

Job Number: 280-61898-1
Sdg Number: JP0877

**Client Sample ID:** **J1TWV1**

Lab Sample ID: 280-61898-4
Client Matrix: Solid
% Moisture: 4.6

Date Sampled: 10/28/2014 0907
Date Received: 10/30/2014 0930

**8081A Organochlorine Pesticides (GC)**

| | | | | | |
|---|---|---|---|---|---|
| Analysis Method: | 8081A | Analysis Batch: | 280-251366 | Instrument ID: | SGC_P1 |
| Prep Method: | 3550C | Prep Batch: | 280-250643 | Initial Weight/Volume: | 30.0 g |
| Dilution: | 1.0 | | | Final Weight/Volume: | 10 mL |
| Analysis Date: | 11/05/2014 1434 | | | Injection Volume: | 1 uL |
| Prep Date: | 10/30/2014 2214 | | | Result Type: | PRIMARY |

| Analyte | DryWt Corrected: Y | Result (ug/Kg) | Qualifier | MDL | RL |
|---|---|---|---|---|---|
| 4,4'-DDD | | 0.57 | U | 0.57 | 1.8 |
| *4,4'-DDE* | | *0.25* | *U* | *0.25* | *1.8* |
| 4,4'-DDT | | 1.1 | J X | 0.62 | 1.8 |
| Aldrin | | 0.26 | U | 0.26 | 1.7 |
| alpha-BHC | | 0.22 | U | 0.22 | 1.7 |
| beta-BHC | | 0.70 | U | 0.70 | 1.7 |
| delta-BHC | | 0.42 | U | 0.42 | 1.7 |
| gamma-BHC (Lindane) | | 0.49 | U | 0.49 | 1.7 |
| Heptachlor | | 0.22 | U | 0.22 | 1.7 |
| Heptachlor epoxide | | 0.45 | U | 0.45 | 1.7 |
| Endosulfan I | | 0.18 | U | 0.18 | 1.7 |
| Endosulfan II | | 0.30 | U | 0.30 | 1.8 |
| Endosulfan sulfate | | 0.29 | U | 0.29 | 1.8 |
| Endrin | | 0.32 | U | 0.32 | 1.8 |
| Endrin aldehyde | | 0.18 | U | 0.18 | 1.8 |
| Endrin ketone | | 0.51 | U | 0.51 | 1.8 |
| gamma-Chlordane | | 0.28 | U | 0.28 | 1.8 |
| Methoxychlor | | 0.47 | U | 0.47 | 3.5 |
| alpha-Chlordane | | 0.34 | U | 0.34 | 1.8 |
| Dieldrin | | 0.22 | U | 0.22 | 1.8 |
| Toxaphene | | 17 | U J | 17 | 170 |

| Surrogate | %Rec | Qualifier | Acceptance Limits |
|---|---|---|---|
| Tetrachloro-m-xylene | 88 | | 59 - 115 |
| Decachlorobiphenyl | 109 | | 63 - 124 |

2/22/14

Client: Washington Closure Hanford

Job Number: 280-61898-1
Sdg Number: JP0877

***Client Sample ID:*** ***J1TWV2***

Lab Sample ID: 280-61898-5
Client Matrix: Solid
% Moisture: 7.3

Date Sampled: 10/28/2014 0916
Date Received: 10/30/2014 0930

**8081A Organochlorine Pesticides (GC)**

| | | | | | |
|---|---|---|---|---|---|
| Analysis Method: | 8081A | Analysis Batch: | 280-251653 | Instrument ID: | SGC_P1 |
| Prep Method: | 3550C | Prep Batch: | 280-250643 | Initial Weight/Volume: | 32.5 g |
| Dilution: | 1.0 | | | Final Weight/Volume: | 10 mL |
| Analysis Date: | 11/06/2014 1426 | | | Injection Volume: | 1 uL |
| Prep Date: | 10/30/2014 2214 | | | Result Type: | PRIMARY |

| Analyte | DryWt Corrected: Y | Result (ug/Kg) | Qualifier | MDL | RL |
|---|---|---|---|---|---|
| 4,4'-DDD | | 0.54 | U | 0.54 | 1.7 |
| *4,4'-DDE* | | *0.24* | *U* | *0.24* | *1.7* |
| 4,4'-DDT | | 0.59 | U | 0.59 | 1.7 |
| Aldrin | | 0.25 | U | 0.25 | 1.6 |
| alpha-BHC | | 0.21 | U | 0.21 | 1.6 |
| beta-BHC | | 0.66 | U | 0.66 | 1.6 |
| delta-BHC | | 0.40 | U | 0.40 | 1.6 |
| gamma-BHC (Lindane) | | 0.46 | U | 0.46 | 1.6 |
| Heptachlor | | 0.21 | U | 0.21 | 1.6 |
| Heptachlor epoxide | | 0.42 | U | 0.42 | 1.6 |
| Endosulfan I | | 0.18 | U | 0.18 | 1.6 |
| Endosulfan II | | 0.29 | U | 0.29 | 1.7 |
| Endosulfan sulfate | | 0.27 | U | 0.27 | 1.7 |
| Endrin | | 0.30 | U | 0.30 | 1.7 |
| Endrin aldehyde | | 0.17 | U | 0.17 | 1.7 |
| Endrin ketone | | 0.49 | U | 0.49 | 1.7 |
| gamma-Chlordane | | 0.26 | U | 0.26 | 1.7 |
| Methoxychlor | | 0.45 | U | 0.45 | 3.3 |
| alpha-Chlordane | | 0.32 | U | 0.32 | 1.7 |
| Dieldrin | | 0.21 | U | 0.21 | 1.7 |
| Toxaphene | | 16 | U J | 16 | 160 |

| Surrogate | %Rec | Qualifier | Acceptance Limits |
|---|---|---|---|
| Tetrachloro-m-xylene | 83 | | 59 - 115 |
| Decachlorobiphenyl | 99 | | 63 - 124 |

2/22/14

## Analytical Data

Client: Washington Closure Hanford

Job Number: 280-61898-1
Sdg Number: JP0877

**Client Sample ID:** **J1TWV3**

Lab Sample ID: 280-61898-6
Client Matrix: Solid

% Moisture: 5.9

Date Sampled: 10/28/2014 0955
Date Received: 10/30/2014 0930

**8081A Organochlorine Pesticides (GC)**

| | | | | | |
|---|---|---|---|---|---|
| Analysis Method: | 8081A | Analysis Batch: | 280-251090 | Instrument ID: | SGC_P1 |
| Prep Method: | 3550C | Prep Batch: | 280-250643 | Initial Weight/Volume: | 30.4 g |
| Dilution: | 1.0 | | | Final Weight/Volume: | 10 mL |
| Analysis Date: | 11/04/2014 0529 | | | Injection Volume: | 1 uL |
| Prep Date: | 10/30/2014 2214 | | | Result Type: | PRIMARY |

| Analyte | DryWt Corrected: Y | Result (ug/Kg) | Qualifier | MDL | RL |
|---|---|---|---|---|---|
| 4,4'-DDD | | 0.57 | U | 0.57 | 1.8 |
| *4,4'-DDE* | | *0.25* | *U* | *0.25* | *1.8* |
| 4,4'-DDT | | 0.62 | U | 0.62 | 1.8 |
| Aldrin | | 0.26 | U | 0.26 | 1.7 |
| alpha-BHC | | 0.22 | U | 0.22 | 1.7 |
| beta-BHC | | 0.70 | U | 0.70 | 1.7 |
| delta-BHC | | 0.42 | U | 0.42 | 1.7 |
| gamma-BHC (Lindane) | | 0.49 | U | 0.49 | 1.7 |
| Heptachlor | | 0.22 | U | 0.22 | 1.7 |
| Heptachlor epoxide | | 0.45 | U | 0.45 | 1.7 |
| Endosulfan I | | 0.18 | U | 0.18 | 1.7 |
| Endosulfan II | | 0.30 | U | 0.30 | 1.8 |
| Endosulfan sulfate | | 0.29 | U | 0.29 | 1.8 |
| Endrin | | 0.32 | U | 0.32 | 1.8 |
| Endrin aldehyde | | 0.18 | U | 0.18 | 1.8 |
| Endrin ketone | | 0.51 | U | 0.51 | 1.8 |
| gamma-Chlordane | | 0.28 | U | 0.28 | 1.8 |
| Methoxychlor | | 0.47 | U | 0.47 | 3.5 |
| alpha-Chlordane | | 0.34 | U | 0.34 | 1.8 |
| Dieldrin | | 0.22 | U | 0.22 | 1.8 |
| Toxaphene | | 17 | U J | 17 | 170 |

| Surrogate | %Rec | Qualifier | Acceptance Limits |
|---|---|---|---|
| Tetrachloro-m-xylene | 77 | | 59 - 115 |
| Decachlorobiphenyl | 98 | | 63 - 124 |

2/22/14

Client: Washington Closure Hanford

Job Number: 280-61898-1
Sdg Number: JP0877

***Client Sample ID:*** ***J1TWV4***

Lab Sample ID: 280-61898-7
Client Matrix: Solid
% Moisture: 7.2

Date Sampled: 10/28/2014 0929
Date Received: 10/30/2014 0930

**8081A Organochlorine Pesticides (GC)**

| | | | | | |
|---|---|---|---|---|---|
| Analysis Method: | 8081A | Analysis Batch: | 280-251653 | Instrument ID: | SGC_P1 |
| Prep Method: | 3550C | Prep Batch: | 280-250643 | Initial Weight/Volume: | 32.4 g |
| Dilution: | 1.0 | | | Final Weight/Volume: | 10 mL |
| Analysis Date: | 11/06/2014 1443 | | | Injection Volume: | 1 uL |
| Prep Date: | 10/30/2014 2214 | | | Result Type: | PRIMARY |

| Analyte | DryWt Corrected: Y | Result (ug/Kg) | Qualifier | MDL | RL |
|---|---|---|---|---|---|
| 4,4'-DDD | | 0.54 | U | 0.54 | 1.7 |
| *4,4'-DDE* | | *0.24* | *U* | *0.24* | *1.7* |
| 4,4'-DDT | | 0.59 | U | 0.59 | 1.7 |
| Aldrin | | 0.25 | U | 0.25 | 1.6 |
| alpha-BHC | | 0.21 | U | 0.21 | 1.6 |
| beta-BHC | | 0.66 | U | 0.66 | 1.6 |
| delta-BHC | | 0.40 | U | 0.40 | 1.6 |
| gamma-BHC (Lindane) | | 0.46 | U | 0.46 | 1.6 |
| Heptachlor | | 0.21 | U | 0.21 | 1.6 |
| Heptachlor epoxide | | 1.1 | J X | 0.42 | 1.6 |
| Endosulfan I | | 0.18 | U | 0.18 | 1.6 |
| Endosulfan II | | 0.29 | U | 0.29 | 1.7 |
| Endosulfan sulfate | | 0.28 | U | 0.28 | 1.7 |
| Endrin | | 0.31 | U | 0.31 | 1.7 |
| Endrin aldehyde | | 0.17 | U | 0.17 | 1.7 |
| Endrin ketone | | 0.49 | U | 0.49 | 1.7 |
| gamma-Chlordane | | 0.27 | U | 0.27 | 1.7 |
| Methoxychlor | | 0.45 | U | 0.45 | 3.3 |
| alpha-Chlordane | | 0.32 | U | 0.32 | 1.7 |
| Dieldrin | | 18 | X | 0.21 | 1.7 |
| Toxaphene | | 16 | U J | 16 | 160 |

| Surrogate | %Rec | Qualifier | Acceptance Limits |
|---|---|---|---|
| Tetrachloro-m-xylene | 82 | | 59 - 115 |
| Decachlorobiphenyl | 101 | | 63 - 124 |

2/22/14

Client: Washington Closure Hanford

Job Number: 280-61898-1
Sdg Number: JP0877

**Client Sample ID:** **J1TWV5**

Lab Sample ID: 280-61898-8
Client Matrix: Solid
% Moisture: 8.8

Date Sampled: 10/28/2014 0925
Date Received: 10/30/2014 0930

**8081A Organochlorine Pesticides (GC)**

| | | | | | |
|---|---|---|---|---|---|
| Analysis Method: | 8081A | Analysis Batch: | 280-251090 | Instrument ID: | SGC_P1 |
| Prep Method: | 3550C | Prep Batch: | 280-250643 | Initial Weight/Volume: | 31.4 g |
| Dilution: | 1.0 | | | Final Weight/Volume: | 10 mL |
| Analysis Date: | 11/04/2014 0712 | | | Injection Volume: | 1 uL |
| Prep Date: | 10/30/2014 2214 | | | Result Type: | PRIMARY |

| Analyte | DryWt Corrected: Y | Result (ug/Kg) | Qualifier | MDL | RL |
|---|---|---|---|---|---|
| 4,4'-DDD | | 0.57 | U | 0.57 | 1.8 |
| *4,4'-DDE* | | *0.25* | *U* | *0.25* | *1.8* |
| 4,4'-DDT | | 0.72 | J X | 0.62 | 1.8 |
| Aldrin | | 0.26 | U | 0.26 | 1.7 |
| alpha-BHC | | 0.22 | U | 0.22 | 1.7 |
| beta-BHC | | 0.70 | U | 0.70 | 1.7 |
| delta-BHC | | 0.42 | U | 0.42 | 1.7 |
| gamma-BHC (Lindane) | | 0.49 | U | 0.49 | 1.7 |
| Heptachlor | | 0.22 | U | 0.22 | 1.7 |
| Heptachlor epoxide | | 0.45 | U | 0.45 | 1.7 |
| Endosulfan I | | 0.18 | U | 0.18 | 1.7 |
| *Endosulfan II* | | *0.30* | *U* | *0.30* | *1.8* |
| Endosulfan sulfate | | 0.29 | U | 0.29 | 1.8 |
| Endrin | | 0.32 | U | 0.32 | 1.8 |
| Endrin aldehyde | | 0.18 | U | 0.18 | 1.8 |
| Endrin ketone | | 0.51 | U | 0.51 | 1.8 |
| gamma-Chlordane | | 0.28 | U | 0.28 | 1.8 |
| Methoxychlor | | 0.47 | U | 0.47 | 3.5 |
| alpha-Chlordane | | 0.34 | U | 0.34 | 1.8 |
| Dieldrin | | 0.49 | J X | 0.22 | 1.8 |
| Toxaphene | | 17 | U J | 17 | 170 |

| Surrogate | %Rec | Qualifier | Acceptance Limits |
|---|---|---|---|
| Tetrachloro-m-xylene | 79 | | 59 - 115 |
| Decachlorobiphenyl | 97 | | 63 - 124 |

2/22/14

## Analytical Data

Client: Washington Closure Hanford

Job Number: 280-61898-1
Sdg Number: JP0877

***Client Sample ID:*** ***J1TWV6***

Lab Sample ID: 280-61898-9
Client Matrix: Solid
% Moisture: 6.1

Date Sampled: 10/28/2014 0948
Date Received: 10/30/2014 0930

**8081A Organochlorine Pesticides (GC)**

| | | | | | |
|---|---|---|---|---|---|
| Analysis Method: | 8081A | Analysis Batch: | 280-251090 | Instrument ID: | SGC_P1 |
| Prep Method: | 3550C | Prep Batch: | 280-250643 | Initial Weight/Volume: | 30.0 g |
| Dilution: | 1.0 | | | Final Weight/Volume: | 10 mL |
| Analysis Date: | 11/04/2014 0729 | | | Injection Volume: | 1 uL |
| Prep Date: | 10/30/2014 2214 | | | Result Type: | PRIMARY |

| Analyte | DryWt Corrected: Y | Result (ug/Kg) | Qualifier | MDL | RL |
|---|---|---|---|---|---|
| 4,4'-DDD | | 0.58 | U | 0.58 | 1.8 |
| *4,4'-DDE* | | *0.25* | *U* | *0.25* | *1.8* |
| 4,4'-DDT | | 0.63 | U | 0.63 | 1.8 |
| Aldrin | | 0.27 | U | 0.27 | 1.8 |
| alpha-BHC | | 0.23 | U | 0.23 | 1.8 |
| beta-BHC | | 0.71 | U | 0.71 | 1.8 |
| delta-BHC | | 0.43 | U | 0.43 | 1.8 |
| gamma-BHC (Lindane) | | 0.49 | U | 0.49 | 1.8 |
| Heptachlor | | 0.23 | U | 0.23 | 1.8 |
| Heptachlor epoxide | | 0.45 | U | 0.45 | 1.8 |
| Endosulfan I | | 0.19 | U | 0.19 | 1.8 |
| *Endosulfan II* | | *0.31* | *U* | *0.31* | *1.8* |
| Endosulfan sulfate | | 0.29 | U | 0.29 | 1.8 |
| Endrin | | 0.33 | U | 0.33 | 1.8 |
| Endrin aldehyde | | 0.18 | U | 0.18 | 1.8 |
| Endrin ketone | | 0.52 | U | 0.52 | 1.8 |
| gamma-Chlordane | | 0.28 | U | 0.28 | 1.8 |
| Methoxychlor | | 0.48 | U | 0.48 | 3.5 |
| alpha-Chlordane | | 0.34 | U | 0.34 | 1.8 |
| Dieldrin | | 1.1 | J X | 0.22 | 1.8 |
| Toxaphene | | 17 | U J | 17 | 180 |

| Surrogate | %Rec | Qualifier | Acceptance Limits |
|---|---|---|---|
| Tetrachloro-m-xylene | 77 | | 59 - 115 |
| Decachlorobiphenyl | 102 | | 63 - 124 |

2/22/14

Client: Washington Closure Hanford

Job Number: 280-61898-1
Sdg Number: JP0877

**Client Sample ID:** **J1TWV7**

Lab Sample ID: 280-61898-10
Client Matrix: Solid
% Moisture: 9.4

Date Sampled: 10/28/2014 1018
Date Received: 10/30/2014 0930

**8081A Organochlorine Pesticides (GC)**

| | | | | | |
|---|---|---|---|---|---|
| Analysis Method: | 8081A | Analysis Batch: | 280-251653 | Instrument ID: | SGC_P1 |
| Prep Method: | 3550C | Prep Batch: | 280-250643 | Initial Weight/Volume: | 30.4 g |
| Dilution: | 10 | | | Final Weight/Volume: | 10 mL |
| Analysis Date: | 11/06/2014 1500 | | | Injection Volume: | 1 uL |
| Prep Date: | 10/30/2014 2214 | | | Result Type: | PRIMARY |

| Analyte | DryWt Corrected: Y | Result (ug/Kg) | Qualifier | MDL | RL |
|---|---|---|---|---|---|
| 4,4'-DDD | | 5.9 | U D | 5.9 | 19 |
| *4,4'-DDE* | | *2.6* | *U D* | *2.6* | *19* |
| 4,4'-DDT | | 6.4 | U D | 6.4 | 19 |
| Aldrin | | 2.7 | U D | 2.7 | 18 |
| alpha-BHC | | 2.3 | U D | 2.3 | 18 |
| beta-BHC | | 7.2 | U D | 7.2 | 18 |
| delta-BHC | | 4.4 | U D | 4.4 | 18 |
| gamma-BHC (Lindane) | | 5.1 | U D | 5.1 | 18 |
| Heptachlor | | 2.3 | U D | 2.3 | 18 |
| Heptachlor epoxide | | 4.6 | U D | 4.6 | 18 |
| Endosulfan I | | 1.9 | U D | 1.9 | 18 |
| Endosulfan II | | 3.1 | U D | 3.1 | 19 |
| Endosulfan sulfate | | 3.0 | U D | 3.0 | 19 |
| Endrin | | 3.3 | U D | 3.3 | 19 |
| Endrin aldehyde | | 1.9 | U D | 1.9 | 19 |
| Endrin ketone | | 5.3 | U D | 5.3 | 19 |
| gamma-Chlordane | | 2.9 | U D | 2.9 | 19 |
| Methoxychlor | | 4.9 | U D | 4.9 | 36 |
| alpha-Chlordane | | 3.5 | U D | 3.5 | 19 |
| Dieldrin | | 32 | X D J | 2.3 | 19 |
| Toxaphene | | 170 | U D J | 170 | 1800 |

| Surrogate | %Rec | Qualifier | Acceptance Limits |
|---|---|---|---|
| Tetrachloro-m-xylene | 79 | D | 59 - 115 |
| Decachlorobiphenyl | 152 | D | 63 - 124 |

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Client: Washington Closure Hanford

Job Number: 280-61898-1
Sdg Number: JP0877

**Client Sample ID:** **J1TWV8**

Lab Sample ID: 280-61898-11
Client Matrix: Solid
% Moisture: 6.9

Date Sampled: 10/28/2014 0933
Date Received: 10/30/2014 0930

**8081A Organochlorine Pesticides (GC)**

| | | | | | |
|---|---|---|---|---|---|
| Analysis Method: | 8081A | Analysis Batch: | 280-251653 | Instrument ID: | SGC_P1 |
| Prep Method: | 3550C | Prep Batch: | 280-250643 | Initial Weight/Volume: | 31.6 g |
| Dilution: | 1.0 | | | Final Weight/Volume: | 10 mL |
| Analysis Date: | 11/06/2014 1518 | | | Injection Volume: | 1 uL |
| Prep Date: | 10/30/2014 2214 | | | Result Type: | PRIMARY |

| Analyte | DryWt Corrected: Y | Result (ug/Kg) | Qualifier | MDL | RL |
|---|---|---|---|---|---|
| 4,4'-DDD | | 0.56 | U | 0.56 | 1.7 |
| *4,4'-DDE* | | *0.24* | *U* | *0.24* | *1.7* |
| 4,4'-DDT | | 1.2 | J X | 0.60 | 1.7 |
| Aldrin | | 0.26 | U | 0.26 | 1.7 |
| alpha-BHC | | 0.22 | U | 0.22 | 1.7 |
| beta-BHC | | 0.68 | U | 0.68 | 1.7 |
| delta-BHC | | 0.41 | U | 0.41 | 1.7 |
| gamma-BHC (Lindane) | | 0.47 | U | 0.47 | 1.7 |
| Heptachlor | | 0.22 | U | 0.22 | 1.7 |
| Heptachlor epoxide | | 0.43 | U | 0.43 | 1.7 |
| Endosulfan I | | 0.18 | U | 0.18 | 1.7 |
| Endosulfan II | | 0.29 | U | 0.29 | 1.7 |
| Endosulfan sulfate | | 0.28 | U | 0.28 | 1.7 |
| Endrin | | 0.31 | U | 0.31 | 1.7 |
| Endrin aldehyde | | 0.17 | U | 0.17 | 1.7 |
| Endrin ketone | | 0.50 | U | 0.50 | 1.7 |
| gamma-Chlordane | | 0.27 | U | 0.27 | 1.7 |
| Methoxychlor | | 0.46 | U | 0.46 | 3.4 |
| alpha-Chlordane | | 0.33 | U | 0.33 | 1.7 |
| Dieldrin | | 0.21 | U | 0.21 | 1.7 |
| Toxaphene | | 16 | U J | 16 | 170 |

| Surrogate | %Rec | Qualifier | Acceptance Limits |
|---|---|---|---|
| Tetrachloro-m-xylene | 81 | | 59 - 115 |
| Decachlorobiphenyl | 80 | | 63 - 124 |

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Client: Washington Closure Hanford

Job Number: 280-61898-1
Sdg Number: JP0877

***Client Sample ID:*** ***J1TWV9***

Lab Sample ID: 280-61898-12
Client Matrix: Solid
% Moisture: 8.2

Date Sampled: 10/28/2014 0943
Date Received: 10/30/2014 0930

**8081A Organochlorine Pesticides (GC)**

| | | | | | |
|---|---|---|---|---|---|
| Analysis Method: | 8081A | Analysis Batch: | 280-251090 | Instrument ID: | SGC_P1 |
| Prep Method: | 3550C | Prep Batch: | 280-250643 | Initial Weight/Volume: | 32.2 g |
| Dilution: | 1.0 | | | Final Weight/Volume: | 10 mL |
| Analysis Date: | 11/04/2014 0820 | | | Injection Volume: | 1 uL |
| Prep Date: | 10/30/2014 2214 | | | Result Type: | PRIMARY |

| Analyte | DryWt Corrected: Y | Result (ug/Kg) | Qualifier | MDL | RL |
|---|---|---|---|---|---|
| 4,4'-DDD | | 0.55 | U | 0.55 | 1.7 |
| *4,4'-DDE* | | *0.24* | *U* | *0.24* | *1.7* |
| 4,4'-DDT | | 0.81 | J X | 0.60 | 1.7 |
| Aldrin | | 0.25 | U | 0.25 | 1.7 |
| alpha-BHC | | 0.22 | U | 0.22 | 1.7 |
| beta-BHC | | 0.67 | U | 0.67 | 1.7 |
| delta-BHC | | 0.41 | U | 0.41 | 1.7 |
| gamma-BHC (Lindane) | | 0.47 | U | 0.47 | 1.7 |
| Heptachlor | | 0.22 | U | 0.22 | 1.7 |
| Heptachlor epoxide | | 0.43 | U | 0.43 | 1.7 |
| Endosulfan I | | 0.18 | U | 0.18 | 1.7 |
| *Endosulfan II* | | *0.29* | *U* | *0.29* | *1.7* |
| Endosulfan sulfate | | 0.28 | U | 0.28 | 1.7 |
| Endrin | | 0.31 | U | 0.31 | 1.7 |
| Endrin aldehyde | | 0.17 | U | 0.17 | 1.7 |
| Endrin ketone | | 0.50 | U | 0.50 | 1.7 |
| gamma-Chlordane | | 0.27 | U | 0.27 | 1.7 |
| Methoxychlor | | 0.46 | U | 0.46 | 3.3 |
| alpha-Chlordane | | 0.33 | U | 0.33 | 1.7 |
| Dieldrin | | 0.68 | J X | 0.21 | 1.7 |
| Toxaphene | | 16 | U J | 16 | 170 |

| Surrogate | %Rec | Qualifier | Acceptance Limits |
|---|---|---|---|
| Tetrachloro-m-xylene | 78 | | 59 - 115 |
| Decachlorobiphenyl | 102 | | 63 - 124 |

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## Analytical Data

Client: Washington Closure Hanford

Job Number: 280-61898-1
Sdg Number: JP0877

***Client Sample ID:*** ***J1TWW0***

Lab Sample ID: 280-61898-13
Client Matrix: Solid

% Moisture: 5.2

Date Sampled: 10/28/2014 0857
Date Received: 10/30/2014 0930

**8081A Organochlorine Pesticides (GC)**

| | | | | | |
|---|---|---|---|---|---|
| Analysis Method: | 8081A | Analysis Batch: | 280-251090 | Instrument ID: | SGC_P1 |
| Prep Method: | 3550C | Prep Batch: | 280-250643 | Initial Weight/Volume: | 31.7 g |
| Dilution: | 1.0 | | | Final Weight/Volume: | 10 mL |
| Analysis Date: | 11/04/2014 0838 | | | Injection Volume: | 1 uL |
| Prep Date: | 10/30/2014 2214 | | | Result Type: | PRIMARY |

| Analyte | DryWt Corrected: Y | Result (ug/Kg) | Qualifier | MDL | RL |
|---|---|---|---|---|---|
| 4,4'-DDD | | 0.55 | U | 0.55 | 1.7 |
| *4,4'-DDE* | | *0.24* | *U* | *0.24* | *1.7* |
| 4,4'-DDT | | 0.59 | U | 0.59 | 1.7 |
| Aldrin | | 0.25 | U | 0.25 | 1.6 |
| alpha-BHC | | 0.21 | U | 0.21 | 1.6 |
| beta-BHC | | 0.66 | U | 0.66 | 1.6 |
| delta-BHC | | 0.40 | U | 0.40 | 1.6 |
| gamma-BHC (Lindane) | | 0.46 | U | 0.46 | 1.6 |
| Heptachlor | | 0.21 | U | 0.21 | 1.6 |
| Heptachlor epoxide | | 0.43 | U | 0.43 | 1.6 |
| Endosulfan I | | 0.18 | U | 0.18 | 1.6 |
| *Endosulfan II* | | *0.29* | *U* | *0.29* | *1.7* |
| Endosulfan sulfate | | 0.28 | U | 0.28 | 1.7 |
| Endrin | | 0.31 | U | 0.31 | 1.7 |
| Endrin aldehyde | | 0.17 | U | 0.17 | 1.7 |
| Endrin ketone | | 0.49 | U | 0.49 | 1.7 |
| gamma-Chlordane | | 0.27 | U | 0.27 | 1.7 |
| Methoxychlor | | 0.45 | U | 0.45 | 3.3 |
| alpha-Chlordane | | 0.32 | U | 0.32 | 1.7 |
| Dieldrin | | 0.21 | U | 0.21 | 1.7 |
| Toxaphene | | 16 | U J | 16 | 160 |

| Surrogate | %Rec | Qualifier | Acceptance Limits |
|---|---|---|---|
| Tetrachloro-m-xylene | 93 | | 59 - 115 |
| Decachlorobiphenyl | 105 | | 63 - 124 |

2/22/14

Client: Washington Closure Hanford

Job Number: 280-61898-1
Sdg Number: JP0877

**Client Sample ID:** **J1TWT8**

Lab Sample ID: 280-61898-1
Client Matrix: Solid
% Moisture: 3.3

Date Sampled: 10/28/2014 1008
Date Received: 10/30/2014 0930

**8082 Polychlorinated Biphenyls (PCBs) by Gas Chromatography**

| | | | | | |
|---|---|---|---|---|---|
| Analysis Method: | 8082 | Analysis Batch: | 280-251166 | Instrument ID: | SGC_P3a |
| Prep Method: | 3550C | Prep Batch: | 280-250649 | Initial Weight/Volume: | 30.1 g |
| Dilution: | 1.0 | | | Final Weight/Volume: | 5 mL |
| Analysis Date: | 11/04/2014 1106 | | | Injection Volume: | 1 uL |
| Prep Date: | 10/30/2014 2330 | | | Result Type: | PRIMARY |

| Analyte | DryWt Corrected: Y | Result (ug/Kg) | Qualifier | MDL | RL |
|---|---|---|---|---|---|
| Aroclor 1016 | | 2.9 | U | 2.9 | 10 |
| *Aroclor 1232* | | *2.1* | *U* | *2.1* | *10* |
| Aroclor 1242 | | 4.8 | U | 4.8 | 10 |
| Aroclor 1248 | | 4.8 | U | 4.8 | 10 |
| Aroclor 1254 | | 2.7 | U | 2.7 | 10 |
| Aroclor 1260 | | 20 | | 2.7 | 10 |

| Surrogate | %Rec | Qualifier | Acceptance Limits |
|---|---|---|---|
| Decachlorobiphenyl | 86 | | 59 - 130 |
| Tetrachloro-m-xylene | 84 | | 53 - 128 |

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Client: Washington Closure Hanford

Job Number: 280-61898-1
Sdg Number: JP0877

***Client Sample ID:*** ***J1TWT8***

Lab Sample ID: 280-61898-1
Client Matrix: Solid
% Moisture: 3.3

Date Sampled: 10/28/2014 1008
Date Received: 10/30/2014 0930

**8082 Polychlorinated Biphenyls (PCBs) by Gas Chromatography**

| | | | | | |
|---|---|---|---|---|---|
| Analysis Method: | 8082 | Analysis Batch: | 280-251168 | Instrument ID: | SGC_P3b |
| Prep Method: | 3550C | Prep Batch: | 280-250649 | Initial Weight/Volume: | 30.1 g |
| Dilution: | 1.0 | | | Final Weight/Volume: | 5 mL |
| Analysis Date: | 11/04/2014 1127 | | | Injection Volume: | 1 uL |
| Prep Date: | 10/30/2014 2330 | | | Result Type: | PRIMARY |

| Analyte | DryWt Corrected: Y | Result (ug/Kg) | Qualifier | MDL | RL |
|---|---|---|---|---|---|
| Aroclor 1221 | | 8.3 | U | 8.3 | 17 |

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Client: Washington Closure Hanford

Job Number: 280-61898-1
Sdg Number: JP0877

**Client Sample ID:** **J1TWT9**

Lab Sample ID: 280-61898-2
Client Matrix: Solid
% Moisture: 5.5

Date Sampled: 10/28/2014 0857
Date Received: 10/30/2014 0930

**8082 Polychlorinated Biphenyls (PCBs) by Gas Chromatography**

| | | | | | |
|---|---|---|---|---|---|
| Analysis Method: | 8082 | Analysis Batch: | 280-251166 | Instrument ID: | SGC_P3a |
| Prep Method: | 3550C | Prep Batch: | 280-250649 | Initial Weight/Volume: | 31.5 g |
| Dilution: | 1.0 | | | Final Weight/Volume: | 5 mL |
| Analysis Date: | 11/04/2014 1127 | | | Injection Volume: | 1 uL |
| Prep Date: | 10/30/2014 2330 | | | Result Type: | PRIMARY |

| Analyte | DryWt Corrected: Y | Result (ug/Kg) | Qualifier | MDL | RL |
|---|---|---|---|---|---|
| Aroclor 1016 | | 2.8 | U | 2.8 | 10 |
| *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 | | 80 | | 2.6 | 10 |

| Surrogate | %Rec | Qualifier | Acceptance Limits |
|---|---|---|---|
| Decachlorobiphenyl | 79 | | 59 - 130 |
| Tetrachloro-m-xylene | 83 | | 53 - 128 |

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## Analytical Data

Client: Washington Closure Hanford

Job Number: 280-61898-1
Sdg Number: JP0877

***Client Sample ID:*** ***J1TWT9***

Lab Sample ID: 280-61898-2
Client Matrix: Solid
% Moisture: 5.5

Date Sampled: 10/28/2014 0857
Date Received: 10/30/2014 0930

**8082 Polychlorinated Biphenyls (PCBs) by Gas Chromatography**

| | | | | | |
|---|---|---|---|---|---|
| Analysis Method: | 8082 | Analysis Batch: | 280-251168 | Instrument ID: | SGC_P3b |
| Prep Method: | 3550C | Prep Batch: | 280-250649 | Initial Weight/Volume: | 31.5 g |
| Dilution: | 1.0 | | | Final Weight/Volume: | 5 mL |
| Analysis Date: | 11/04/2014 1149 | | | Injection Volume: | 1 uL |
| Prep Date: | 10/30/2014 2330 | | | Result Type: | PRIMARY |

| Analyte | DryWt Corrected: Y | Result (ug/Kg) | Qualifier | MDL | RL |
|---|---|---|---|---|---|
| Aroclor 1221 | | 8.1 | U | 8.1 | 17 |

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Client: Washington Closure Hanford

Job Number: 280-61898-1
Sdg Number: JP0877

**Client Sample ID:** **J1TWV0**

Lab Sample ID: 280-61898-3
Client Matrix: Solid
% Moisture: 5.2

Date Sampled: 10/28/2014 1003
Date Received: 10/30/2014 0930

**8082 Polychlorinated Biphenyls (PCBs) by Gas Chromatography**

| | | | | | |
|---|---|---|---|---|---|
| Analysis Method: | 8082 | Analysis Batch: | 280-251166 | Instrument ID: | SGC_P3a |
| Prep Method: | 3550C | Prep Batch: | 280-250649 | Initial Weight/Volume: | 31.2 g |
| Dilution: | 80 | | | Final Weight/Volume: | 5 mL |
| Analysis Date: | 11/05/2014 0717 | | | Injection Volume: | 1 uL |
| Prep Date: | 10/30/2014 2330 | | | Result Type: | PRIMARY |

| Analyte | DryWt Corrected: Y | Result (ug/Kg) | Qualifier | MDL | RL |
|---|---|---|---|---|---|
| Aroclor 1016 | | 220 | U D J | 220 | 810 |
| *Aroclor 1232* | | *160* | *U D* | *160* | *810* |
| Aroclor 1242 | | 380 | U D | 380 | 810 |
| Aroclor 1248 | | 380 | U D | 380 | 810 |
| Aroclor 1254 | | 210 | U D | 210 | 810 |
| Aroclor 1260 | | 7900 | D | 210 | 810 |

| Surrogate | %Rec | Qualifier | Acceptance Limits |
|---|---|---|---|
| Decachlorobiphenyl | 19 | D | 59 - 130 |
| Tetrachloro-m-xylene | -36 | D | 53 - 128 |

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## Analytical Data

Client: Washington Closure Hanford

Job Number: 280-61898-1
Sdg Number: JP0877

**Client Sample ID:** **J1TWV0**

Lab Sample ID: 280-61898-3
Client Matrix: Solid
% Moisture: 5.2

Date Sampled: 10/28/2014 1003
Date Received: 10/30/2014 0930

***8082 Polychlorinated Biphenyls (PCBs) by Gas Chromatography***

| | | | | | |
|---|---|---|---|---|---|
| Analysis Method: | 8082 | Analysis Batch: | 280-251168 | Instrument ID: | SGC_P3b |
| Prep Method: | 3550C | Prep Batch: | 280-250649 | Initial Weight/Volume: | 31.2 g |
| Dilution: | 80 | | | Final Weight/Volume: | 5 mL |
| Analysis Date: | 11/05/2014 0738 | | | Injection Volume: | 1 uL |
| Prep Date: | 10/30/2014 2330 | | | Result Type: | PRIMARY |

| Analyte | DryWt Corrected: Y | Result (ug/Kg) | Qualifier | MDL | RL |
|---|---|---|---|---|---|
| Aroclor 1221 | | 650 | U D J | 650 | 1300 |

2/22/15

Client: Washington Closure Hanford

Job Number: 280-61898-1
Sdg Number: JP0877

**Client Sample ID:** **J1TWV1**

Lab Sample ID: 280-61898-4
Client Matrix: Solid
% Moisture: 4.6

Date Sampled: 10/28/2014 0907
Date Received: 10/30/2014 0930

**8082 Polychlorinated Biphenyls (PCBs) by Gas Chromatography**

| | | | | | |
|---|---|---|---|---|---|
| Analysis Method: | 8082 | Analysis Batch: | 280-251166 | Instrument ID: | SGC_P3a |
| Prep Method: | 3550C | Prep Batch: | 280-250649 | Initial Weight/Volume: | 30.6 g |
| Dilution: | 1.0 | | | Final Weight/Volume: | 5 mL |
| Analysis Date: | 11/05/2014 0714 | | | Injection Volume: | 1 uL |
| Prep Date: | 10/30/2014 2330 | | | Result Type: | PRIMARY |

| Analyte | DryWt Corrected: Y | Result (ug/Kg) | Qualifier | MDL | RL |
|---|---|---|---|---|---|
| Aroclor 1016 | | 2.8 | U | 2.8 | 10 |
| Aroclor 1232 | | 2.1 | U | 2.1 | 10 |
| Aroclor 1242 | | 4.8 | U | 4.8 | 10 |
| Aroclor 1248 | | 4.8 | U | 4.8 | 10 |
| Aroclor 1254 | | 2.7 | U | 2.7 | 10 |
| Aroclor 1260 | | 75 | | 2.7 | 10 |

| Surrogate | %Rec | Qualifier | Acceptance Limits |
|---|---|---|---|
| Decachlorobiphenyl | 79 | | 59 - 130 |
| Tetrachloro-m-xylene | 77 | | 53 - 128 |

3/1/15

Client: Washington Closure Hanford

Job Number: 280-61898-1
Sdg Number: JP0877

**Client Sample ID:** **J1TWV1**

Lab Sample ID: 280-61898-4
Client Matrix: Solid
% Moisture: 4.6

Date Sampled: 10/28/2014 0907
Date Received: 10/30/2014 0930

**8082 Polychlorinated Biphenyls (PCBs) by Gas Chromatography**

| | | | | | |
|---|---|---|---|---|---|
| Analysis Method: | 8082 | Analysis Batch: | 280-251168 | Instrument ID: | SGC_P3b |
| Prep Method: | 3550C | Prep Batch: | 280-250649 | Initial Weight/Volume: | 30.6 g |
| Dilution: | 1.0 | | | Final Weight/Volume: | 5 mL |
| Analysis Date: | 11/05/2014 0735 | | | Injection Volume: | 1 uL |
| Prep Date: | 10/30/2014 2330 | | | Result Type: | PRIMARY |

| Analyte | DryWt Corrected: Y | Result (ug/Kg) | Qualifier | MDL | RL |
|---|---|---|---|---|---|
| Aroclor 1221 | | 8.2 | U | 8.2 | 17 |

2/22/15

Client: Washington Closure Hanford

Job Number: 280-61898-1
Sdg Number: JP0877

**Client Sample ID:** **J1TWV2**

Lab Sample ID: 280-61898-5
Client Matrix: Solid
% Moisture: 7.3

Date Sampled: 10/28/2014 0916
Date Received: 10/30/2014 0930

**8082 Polychlorinated Biphenyls (PCBs) by Gas Chromatography**

| | | | | | |
|---|---|---|---|---|---|
| Analysis Method: | 8082 | Analysis Batch: | 280-251166 | Instrument ID: | SGC_P3a |
| Prep Method: | 3550C | Prep Batch: | 280-250649 | Initial Weight/Volume: | 30.5 g |
| Dilution: | 4.0 | | | Final Weight/Volume: | 5 mL |
| Analysis Date: | 11/04/2014 1231 | | | Injection Volume: | 1 uL |
| Prep Date: | 10/30/2014 2330 | | | Result Type: | PRIMARY |

| Analyte | DryWt Corrected: Y | Result (ug/Kg) | Qualifier | MDL | RL |
|---|---|---|---|---|---|
| Aroclor 1016 | | 12 | U D | 12 | 42 |
| *Aroclor 1232* | | *8.5* | *U D* | *8.5* | *42* |
| Aroclor 1242 | | 20 | U D | 20 | 42 |
| Aroclor 1248 | | 20 | U D | 20 | 42 |
| Aroclor 1254 | | 11 | U D | 11 | 42 |
| Aroclor 1260 | | 370 | D | 11 | 42 |

| Surrogate | %Rec | Qualifier | Acceptance Limits |
|---|---|---|---|
| Decachlorobiphenyl | 86 | D | 59 - 130 |
| Tetrachloro-m-xylene | 79 | D | 53 - 128 |

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## Analytical Data

Client: Washington Closure Hanford

Job Number: 280-61898-1
Sdg Number: JP0877

***Client Sample ID:*** ***J1TWV2***

Lab Sample ID: 280-61898-5
Client Matrix: Solid

% Moisture: 7.3

Date Sampled: 10/28/2014 0916
Date Received: 10/30/2014 0930

**8082 Polychlorinated Biphenyls (PCBs) by Gas Chromatography**

| | | | | | |
|---|---|---|---|---|---|
| Analysis Method: | 8082 | Analysis Batch: | 280-251168 | Instrument ID: | SGC_P3b |
| Prep Method: | 3550C | Prep Batch: | 280-250649 | Initial Weight/Volume: | 30.5 g |
| Dilution: | 4.0 | | | Final Weight/Volume: | 5 mL |
| Analysis Date: | 11/04/2014 1253 | | | Injection Volume: | 1 uL |
| Prep Date: | 10/30/2014 2330 | | | Result Type: | PRIMARY |

| Analyte | DryWt Corrected: Y | Result (ug/Kg) | Qualifier | MDL | RL |
|---|---|---|---|---|---|
| Aroclor 1221 | | 34 | U D | 34 | 70 |

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Client: Washington Closure Hanford

Job Number: 280-61898-1
Sdg Number: JP0877

**Client Sample ID:** **J1TWV3**

Lab Sample ID: 280-61898-6
Client Matrix: Solid
% Moisture: 5.9

Date Sampled: 10/28/2014 0955
Date Received: 10/30/2014 0930

**8082 Polychlorinated Biphenyls (PCBs) by Gas Chromatography**

| | | | | | |
|---|---|---|---|---|---|
| Analysis Method: | 8082 | Analysis Batch: | 280-251166 | Instrument ID: | SGC_P3a |
| Prep Method: | 3550C | Prep Batch: | 280-250649 | Initial Weight/Volume: | 31.9 g |
| Dilution: | 1.0 | | | Final Weight/Volume: | 5 mL |
| Analysis Date: | 11/04/2014 1337 | | | Injection Volume: | 1 uL |
| Prep Date: | 10/30/2014 2330 | | | Result Type: | PRIMARY |

| Analyte | DryWt Corrected: Y | Result (ug/Kg) | Qualifier | MDL | RL |
|---|---|---|---|---|---|
| Aroclor 1016 | | 2.8 | U | 2.8 | 10 |
| *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 | | 39 | | 2.6 | 10 |

| Surrogate | %Rec | Qualifier | Acceptance Limits |
|---|---|---|---|
| Decachlorobiphenyl | 87 | | 59 - 130 |
| Tetrachloro-m-xylene | 85 | | 53 - 128 |

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## Analytical Data

Client: Washington Closure Hanford

Job Number: 280-61898-1
Sdg Number: JP0877

**Client Sample ID:** ***J1TWV3***

Lab Sample ID: 280-61898-6
Client Matrix: Solid
% Moisture: 5.9

Date Sampled: 10/28/2014 0955
Date Received: 10/30/2014 0930

**8082 Polychlorinated Biphenyls (PCBs) by Gas Chromatography**

| | | | | | |
|---|---|---|---|---|---|
| Analysis Method: | 8082 | Analysis Batch: | 280-251168 | Instrument ID: | SGC_P3b |
| Prep Method: | 3550C | Prep Batch: | 280-250649 | Initial Weight/Volume: | 31.9 g |
| Dilution: | 1.0 | | | Final Weight/Volume: | 5 mL |
| Analysis Date: | 11/04/2014 1358 | | | Injection Volume: | 1 uL |
| Prep Date: | 10/30/2014 2330 | | | Result Type: | PRIMARY |

| Analyte | DryWt Corrected: Y | Result (ug/Kg) | Qualifier | MDL | RL |
|---|---|---|---|---|---|
| Aroclor 1221 | | 8.0 | U | 8.0 | 16 |

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Client: Washington Closure Hanford

Job Number: 280-61898-1
Sdg Number: JP0877

**Client Sample ID:** **J1TWV4**

Lab Sample ID: 280-61898-7
Client Matrix: Solid
% Moisture: 7.2

Date Sampled: 10/28/2014 0929
Date Received: 10/30/2014 0930

**8082 Polychlorinated Biphenyls (PCBs) by Gas Chromatography**

| | | | | | |
|---|---|---|---|---|---|
| Analysis Method: | 8082 | Analysis Batch: | 280-251166 | Instrument ID: | SGC_P3a |
| Prep Method: | 3550C | Prep Batch: | 280-250649 | Initial Weight/Volume: | 32.5 g |
| Dilution: | 10 | | | Final Weight/Volume: | 5 mL |
| Analysis Date: | 11/04/2014 1420 | | | Injection Volume: | 1 uL |
| Prep Date: | 10/30/2014 2330 | | | Result Type: | PRIMARY |

| Analyte | DryWt Corrected: Y | Result (ug/Kg) | Qualifier | MDL | RL |
|---|---|---|---|---|---|
| Aroclor 1016 | | 28 | U D | 28 | 99 |
| *Aroclor 1232* | | *20* | *U D* | *20* | *99* |
| Aroclor 1242 | | 46 | U D | 46 | 99 |
| Aroclor 1248 | | 46 | U D | 46 | 99 |
| Aroclor 1254 | | 26 | U D | 26 | 99 |
| Aroclor 1260 | | 1200 | D | 26 | 99 |

| Surrogate | %Rec | Qualifier | Acceptance Limits |
|---|---|---|---|
| Decachlorobiphenyl | 82 | D | 59 - 130 |
| Tetrachloro-m-xylene | 70 | D | 53 - 128 |

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## Analytical Data

Client: Washington Closure Hanford

Job Number: 280-61898-1
Sdg Number: JP0877

**Client Sample ID:** **J1TWV4**

Lab Sample ID: 280-61898-7
Client Matrix: Solid

% Moisture: 7.2

Date Sampled: 10/28/2014 0929
Date Received: 10/30/2014 0930

***8082 Polychlorinated Biphenyls (PCBs) by Gas Chromatography***

| | | | | | |
|---|---|---|---|---|---|
| Analysis Method: | 8082 | Analysis Batch: | 280-251168 | Instrument ID: | SGC_P3b |
| Prep Method: | 3550C | Prep Batch: | 280-250649 | Initial Weight/Volume: | 32.5 g |
| Dilution: | 10 | | | Final Weight/Volume: | 5 mL |
| Analysis Date: | 11/04/2014 1441 | | | Injection Volume: | 1 uL |
| Prep Date: | 10/30/2014 2330 | | | Result Type: | PRIMARY |

| Analyte | DryWt Corrected: Y | Result (ug/Kg) | Qualifier | MDL | RL |
|---|---|---|---|---|---|
| Aroclor 1221 | | 80 | U D | 80 | 160 |

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Client: Washington Closure Hanford

Job Number: 280-61898-1
Sdg Number: JP0877

**Client Sample ID:** **J1TWV5**

Lab Sample ID: 280-61898-8
Client Matrix: Solid
% Moisture: 8.8

Date Sampled: 10/28/2014 0925
Date Received: 10/30/2014 0930

**8082 Polychlorinated Biphenyls (PCBs) by Gas Chromatography**

| | | | | | |
|---|---|---|---|---|---|
| Analysis Method: | 8082 | Analysis Batch: | 280-251166 | Instrument ID: | SGC_P3a |
| Prep Method: | 3550C | Prep Batch: | 280-250649 | Initial Weight/Volume: | 31.6 g |
| Dilution: | 1.0 | | | Final Weight/Volume: | 5 mL |
| Analysis Date: | 11/04/2014 1441 | | | Injection Volume: | 1 uL |
| Prep Date: | 10/30/2014 2330 | | | Result Type: | PRIMARY |

| Analyte | DryWt Corrected: Y | Result (ug/Kg) | Qualifier | MDL | RL |
|---|---|---|---|---|---|
| Aroclor 1016 | | 2.9 | U | 2.9 | 10 |
| *Aroclor 1232* | | *2.1* | *U* | *2.1* | *10* |
| Aroclor 1242 | | 4.9 | U | 4.9 | 10 |
| Aroclor 1248 | | 4.9 | U | 4.9 | 10 |
| Aroclor 1254 | | 2.7 | U | 2.7 | 10 |
| Aroclor 1260 | | 100 | | 2.7 | 10 |

| Surrogate | %Rec | Qualifier | Acceptance Limits |
|---|---|---|---|
| Decachlorobiphenyl | 81 | | 59 - 130 |
| Tetrachloro-m-xylene | 81 | | 53 - 128 |

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## Analytical Data

Client: Washington Closure Hanford

Job Number: 280-61898-1
Sdg Number: JP0877

**Client Sample ID:** **J1TWV5**

Lab Sample ID: 280-61898-8
Client Matrix: Solid

% Moisture: 8.8

Date Sampled: 10/28/2014 0925
Date Received: 10/30/2014 0930

***8082 Polychlorinated Biphenyls (PCBs) by Gas Chromatography***

| | | | | | |
|---|---|---|---|---|---|
| Analysis Method: | 8082 | Analysis Batch: | 280-251168 | Instrument ID: | SGC_P3b |
| Prep Method: | 3550C | Prep Batch: | 280-250649 | Initial Weight/Volume: | 31.6 g |
| Dilution: | 1.0 | | | Final Weight/Volume: | 5 mL |
| Analysis Date: | 11/04/2014 1502 | | | Injection Volume: | 1 uL |
| Prep Date: | 10/30/2014 2330 | | | Result Type: | PRIMARY |

| Analyte | DryWt Corrected: Y | Result (ug/Kg) | Qualifier | MDL | RL |
|---|---|---|---|---|---|
| Aroclor 1221 | | 8.4 | U | 8.4 | 17 |

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Client: Washington Closure Hanford

Job Number: 280-61898-1
Sdg Number: JP0877

**Client Sample ID:** **J1TWV6**

Lab Sample ID: 280-61898-9
Client Matrix: Solid
% Moisture: 6.1

Date Sampled: 10/28/2014 0948
Date Received: 10/30/2014 0930

**8082 Polychlorinated Biphenyls (PCBs) by Gas Chromatography**

| | | | | | |
|---|---|---|---|---|---|
| Analysis Method: | 8082 | Analysis Batch: | 280-251166 | Instrument ID: | SGC_P3a |
| Prep Method: | 3550C | Prep Batch: | 280-250649 | Initial Weight/Volume: | 31.4 g |
| Dilution: | 1.0 | | | Final Weight/Volume: | 5 mL |
| Analysis Date: | 11/04/2014 1502 | | | Injection Volume: | 1 uL |
| Prep Date: | 10/30/2014 2330 | | | Result Type: | PRIMARY |

| Analyte | DryWt Corrected: Y | Result (ug/Kg) | Qualifier | MDL | RL |
|---|---|---|---|---|---|
| Aroclor 1016 | | 2.8 | U | 2.8 | 10 |
| *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 | | 99 | | 2.6 | 10 |

| Surrogate | %Rec | Qualifier | Acceptance Limits |
|---|---|---|---|
| Decachlorobiphenyl | 87 | | 59 - 130 |
| Tetrachloro-m-xylene | 85 | | 53 - 128 |

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## Analytical Data

Client: Washington Closure Hanford

Job Number: 280-61898-1
Sdg Number: JP0877

**Client Sample ID:** **J1TWV6**

Lab Sample ID: 280-61898-9
Client Matrix: Solid
% Moisture: 6.1

Date Sampled: 10/28/2014 0948
Date Received: 10/30/2014 0930

**8082 Polychlorinated Biphenyls (PCBs) by Gas Chromatography**

| | | | | | |
|---|---|---|---|---|---|
| Analysis Method: | 8082 | Analysis Batch: | 280-251168 | Instrument ID: | SGC_P3b |
| Prep Method: | 3550C | Prep Batch: | 280-250649 | Initial Weight/Volume: | 31.4 g |
| Dilution: | 1.0 | | | Final Weight/Volume: | 5 mL |
| Analysis Date: | 11/04/2014 1524 | | | Injection Volume: | 1 uL |
| Prep Date: | 10/30/2014 2330 | | | Result Type: | PRIMARY |

| Analyte | DryWt Corrected: Y | Result (ug/Kg) | Qualifier | MDL | RL |
|---|---|---|---|---|---|
| Aroclor 1221 | | 8.2 | U | 8.2 | 17 |

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Client: Washington Closure Hanford

Job Number: 280-61898-1
Sdg Number: JP0877

**Client Sample ID:** **J1TWV7**

Lab Sample ID: 280-61898-10
Client Matrix: Solid
% Moisture: 9.4

Date Sampled: 10/28/2014 1018
Date Received: 10/30/2014 0930

**8082 Polychlorinated Biphenyls (PCBs) by Gas Chromatography**

| | | | | | |
|---|---|---|---|---|---|
| Analysis Method: | 8082 | Analysis Batch: | 280-251166 | Instrument ID: | SGC_P3a |
| Prep Method: | 3550C | Prep Batch: | 280-250649 | Initial Weight/Volume: | 31.5 g |
| Dilution: | 20 | | | Final Weight/Volume: | 5 mL |
| Analysis Date: | 11/04/2014 1524 | | | Injection Volume: | 1 uL |
| Prep Date: | 10/30/2014 2330 | | | Result Type: | PRIMARY |

| Analyte | DryWt Corrected: Y | Result (ug/Kg) | Qualifier | MDL | RL |
|---|---|---|---|---|---|
| Aroclor 1016 | | 58 | U D | 58 | 210 |
| *Aroclor 1232* | | *42* | *U D* | *42* | *210* |
| Aroclor 1242 | | 98 | U D | 98 | 210 |
| Aroclor 1248 | | 98 | U D | 98 | 210 |
| Aroclor 1254 | | 55 | U D | 55 | 210 |
| Aroclor 1260 | | 2300 | D | 55 | 210 |

| Surrogate | %Rec | Qualifier | Acceptance Limits |
|---|---|---|---|
| Decachlorobiphenyl | 83 | D | 59 - 130 |
| Tetrachloro-m-xylene | 66 | D | 53 - 128 |

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## Analytical Data

Client: Washington Closure Hanford

Job Number: 280-61898-1
Sdg Number: JP0877

***Client Sample ID:*** ***J1TWV7***

Lab Sample ID: 280-61898-10
Client Matrix: Solid
% Moisture: 9.4

Date Sampled: 10/28/2014 1018
Date Received: 10/30/2014 0930

**8082 Polychlorinated Biphenyls (PCBs) by Gas Chromatography**

| | | | | | |
|---|---|---|---|---|---|
| Analysis Method: | 8082 | Analysis Batch: | 280-251168 | Instrument ID: | SGC_P3b |
| Prep Method: | 3550C | Prep Batch: | 280-250649 | Initial Weight/Volume: | 31.5 g |
| Dilution: | 20 | | | Final Weight/Volume: | 5 mL |
| Analysis Date: | 11/04/2014 1545 | | | Injection Volume: | 1 uL |
| Prep Date: | 10/30/2014 2330 | | | Result Type: | PRIMARY |

| Analyte | DryWt Corrected: Y | Result (ug/Kg) | Qualifier | MDL | RL |
|---|---|---|---|---|---|
| Aroclor 1221 | | 170 | U D | 170 | 350 |

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## Analytical Data

Client: Washington Closure Hanford

Job Number: 280-61898-1
Sdg Number: JP0877

**Client Sample ID:** **J1TWV8**

Lab Sample ID: 280-61898-11
Client Matrix: Solid

% Moisture: 6.9

Date Sampled: 10/28/2014 0933
Date Received: 10/30/2014 0930

**8082 Polychlorinated Biphenyls (PCBs) by Gas Chromatography**

| | | | | | |
|---|---|---|---|---|---|
| Analysis Method: | 8082 | Analysis Batch: | 280-251166 | Instrument ID: | SGC_P3a |
| Prep Method: | 3550C | Prep Batch: | 280-250649 | Initial Weight/Volume: | 32.2 g |
| Dilution: | 1.0 | | | Final Weight/Volume: | 5 mL |
| Analysis Date: | 11/04/2014 1545 | | | Injection Volume: | 1 uL |
| Prep Date: | 10/30/2014 2330 | | | Result Type: | PRIMARY |

| Analyte | DryWt Corrected: Y | Result (ug/Kg) | Qualifier | MDL | RL |
|---|---|---|---|---|---|
| Aroclor 1016 | | 2.8 | U | 2.8 | 10 |
| *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 | | 68 | | 2.6 | 10 |

| Surrogate | %Rec | Qualifier | Acceptance Limits |
|---|---|---|---|
| Decachlorobiphenyl | 69 | | 59 - 130 |
| Tetrachloro-m-xylene | 90 | | 53 - 128 |

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## Analytical Data

Client: Washington Closure Hanford

Job Number: 280-61898-1
Sdg Number: JP0877

**Client Sample ID:** **J1TWV8**

Lab Sample ID: 280-61898-11
Client Matrix: Solid
% Moisture: 6.9

Date Sampled: 10/28/2014 0933
Date Received: 10/30/2014 0930

**8082 Polychlorinated Biphenyls (PCBs) by Gas Chromatography**

| | | | | | |
|---|---|---|---|---|---|
| Analysis Method: | 8082 | Analysis Batch: | 280-251168 | Instrument ID: | SGC_P3b |
| Prep Method: | 3550C | Prep Batch: | 280-250649 | Initial Weight/Volume: | 32.2 g |
| Dilution: | 1.0 | | | Final Weight/Volume: | 5 mL |
| Analysis Date: | 11/04/2014 1607 | | | Injection Volume: | 1 uL |
| Prep Date: | 10/30/2014 2330 | | | Result Type: | PRIMARY |

| Analyte | DryWt Corrected: Y | Result (ug/Kg) | Qualifier | MDL | RL |
|---|---|---|---|---|---|
| Aroclor 1221 | | 8.0 | U | 8.0 | 17 |

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Client: Washington Closure Hanford

Job Number: 280-61898-1
Sdg Number: JP0877

**Client Sample ID:** **J1TWV9**

Lab Sample ID: 280-61898-12
Client Matrix: Solid
% Moisture: 8.2

Date Sampled: 10/28/2014 0943
Date Received: 10/30/2014 0930

***8082 Polychlorinated Biphenyls (PCBs) by Gas Chromatography***

| | | | | | |
|---|---|---|---|---|---|
| Analysis Method: | 8082 | Analysis Batch: | 280-251166 | Instrument ID: | SGC_P3a |
| Prep Method: | 3550C | Prep Batch: | 280-250649 | Initial Weight/Volume: | 31.0 g |
| Dilution: | 1.0 | | | Final Weight/Volume: | 5 mL |
| Analysis Date: | 11/04/2014 1607 | | | Injection Volume: | 1 uL |
| Prep Date: | 10/30/2014 2330 | | | Result Type: | PRIMARY |

| Analyte | DryWt Corrected: Y | Result (ug/Kg) | Qualifier | MDL | RL |
|---|---|---|---|---|---|
| Aroclor 1016 | | 2.9 | U | 2.9 | 11 |
| Aroclor 1232 | | 2.1 | U | 2.1 | 11 |
| Aroclor 1242 | | 4.9 | U | 4.9 | 11 |
| Aroclor 1248 | | 4.9 | U | 4.9 | 11 |
| Aroclor 1254 | | 2.7 | U | 2.7 | 11 |
| Aroclor 1260 | | 77 | | 2.7 | 11 |

| Surrogate | %Rec | Qualifier | Acceptance Limits |
|---|---|---|---|
| Decachlorobiphenyl | 78 | | 59 - 130 |
| Tetrachloro-m-xylene | 83 | | 53 - 128 |

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## Analytical Data

Client: Washington Closure Hanford

Job Number: 280-61898-1
Sdg Number: JP0877

**Client Sample ID:** **J1TWV9**

Lab Sample ID: 280-61898-12
Client Matrix: Solid
% Moisture: 8.2

Date Sampled: 10/28/2014 0943
Date Received: 10/30/2014 0930

***8082 Polychlorinated Biphenyls (PCBs) by Gas Chromatography***

| | | | | | |
|---|---|---|---|---|---|
| Analysis Method: | 8082 | Analysis Batch: | 280-251168 | Instrument ID: | SGC_P3b |
| Prep Method: | 3550C | Prep Batch: | 280-250649 | Initial Weight/Volume: | 31.0 g |
| Dilution: | 1.0 | | | Final Weight/Volume: | 5 mL |
| Analysis Date: | 11/04/2014 1628 | | | Injection Volume: | 1 uL |
| Prep Date: | 10/30/2014 2330 | | | Result Type: | PRIMARY |

| Analyte | DryWt Corrected: Y | Result (ug/Kg) | Qualifier | MDL | RL |
|---|---|---|---|---|---|
| Aroclor 1221 | | 8.5 | U | 8.5 | 17 |

2/22/15

Client: Washington Closure Hanford

Job Number: 280-61898-1
Sdg Number: JP0877

**Client Sample ID:** **J1TWW0**

Lab Sample ID: 280-61898-13
Client Matrix: Solid
% Moisture: 5.2

Date Sampled: 10/28/2014 0857
Date Received: 10/30/2014 0930

***8082 Polychlorinated Biphenyls (PCBs) by Gas Chromatography***

| | | | | | |
|---|---|---|---|---|---|
| Analysis Method: | 8082 | Analysis Batch: | 280-251166 | Instrument ID: | SGC_P3a |
| Prep Method: | 3550C | Prep Batch: | 280-250649 | Initial Weight/Volume: | 31.1 g |
| Dilution: | 1.0 | | | Final Weight/Volume: | 5 mL |
| Analysis Date: | 11/04/2014 1628 | | | Injection Volume: | 1 uL |
| Prep Date: | 10/30/2014 2330 | | | Result Type: | PRIMARY |

| Analyte | DryWt Corrected: Y | Result (ug/Kg) | Qualifier | MDL | RL |
|---|---|---|---|---|---|
| Aroclor 1016 | | 2.8 | U | 2.8 | 10 |
| 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 | | 91 | | 2.6 | 10 |

| Surrogate | %Rec | Qualifier | Acceptance Limits |
|---|---|---|---|
| Decachlorobiphenyl | 78 | | 59 - 130 |
| Tetrachloro-m-xylene | 81 | | 53 - 128 |

3/1/15

## Analytical Data

Client: Washington Closure Hanford

Job Number: 280-61898-1
Sdg Number: JP0877

**Client Sample ID:** **J1TWW0**

Lab Sample ID: 280-61898-13
Client Matrix: Solid

% Moisture: 5.2

Date Sampled: 10/28/2014 0857
Date Received: 10/30/2014 0930

***8082 Polychlorinated Biphenyls (PCBs) by Gas Chromatography***

| | | | | | |
|---|---|---|---|---|---|
| Analysis Method: | 8082 | Analysis Batch: | 280-251168 | Instrument ID: | SGC_P3b |
| Prep Method: | 3550C | Prep Batch: | 280-250649 | Initial Weight/Volume: | 31.1 g |
| Dilution: | 1.0 | | | Final Weight/Volume: | 5 mL |
| Analysis Date: | 11/04/2014 1649 | | | Injection Volume: | 1 uL |
| Prep Date: | 10/30/2014 2330 | | | Result Type: | PRIMARY |

| Analyte | DryWt Corrected: Y | Result (ug/Kg) | Qualifier | MDL | RL |
|---|---|---|---|---|---|
| Aroclor 1221 | | 8.2 | U | 8.2 | 17 |

✓ 2/22/15

## Appendix 4

## Laboratory Narrative and Chain-of-Custody Documentation

# CASE NARRATIVE

## Client: Washington Closure Hanford

## Project: WASHINGTON CLOSURE HANFORD

## Report Number: 280-61898-1

**SDG #: JP0877**
**SAF#: RC-075**

**Date SDG Closed: October 30, 2014**
**Data Deliverable: 7 Day / Summary**

| CLIENT ID | LAB ID | ANALYSES REQUESTED | ANALYSES PERFORMED |
|---|---|---|---|
| J1TWT8 | 280-61898-1 | 6010/7471/8310/8082/8081 | 6010B/7471A/8310/8082/8081A |
| J1TWT9 | 280-61898-2 | 6010/7471/8310/8082/8081 | 6010B/7471A/8310/8082/8081A |
| J1TWV0 | 280-61898-3 | 6010/7471/8310/8082/8081 | 6010B/7471A/8310/8082/8081A |
| J1TWV1 | 280-61898-4 | 6010/7471/8310/8082/8081 | 6010B/7471A/8310/8082/8081A |
| J1TWV2 | 280-61898-5 | 6010/7471/8310/8082/8081 | 6010B/7471A/8310/8082/8081A |
| J1TWV3 | 280-61898-6 | 6010/7471/8310/8082/8081 | 6010B/7471A/8310/8082/8081A |
| J1TWV4 | 280-61898-7 | 6010/7471/8310/8082/8081 | 6010B/7471A/8310/8082/8081A |
| J1TWV5 | 280-61898-8 | 6010/7471/8310/8082/8081 | 6010B/7471A/8310/8082/8081A |
| J1TWV6 | 280-61898-9 | 6010/7471/8310/8082/8081 | 6010B/7471A/8310/8082/8081A |
| J1TWV7 | 280-61898-10 | 6010/7471/8310/8082/8081 | 6010B/7471A/8310/8082/8081A |
| J1TWV8 | 280-61898-11 | 6010/7471/8310/8082/8081 | 6010B/7471A/8310/8082/8081A |
| J1TWV9 | 280-61898-12 | 6010/7471/8310/8082/8081 | 6010B/7471A/8310/8082/8081A |
| J1TWW0 | 280-61898-13 | 6010/7471/8310/8082/8081 | 6010B/7471A/8310/8082/8081A |
| J1TWW1 | 280-61898-14 | 6010/7471/8310 | 6010B/7471A/8310 |

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 10/30/2014 9:30 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperatures of the 2 coolers at receipt time were 1.3° C and 1.5° C.

The samples presented in this report contained large rocks that were not included in the aliquots used for extraction and/or analysis.

**GC SEMIVOLATILES - SW846 8081A - Pesticides**
The organic prep laboratory noted that a Florisil clean-up was performed on the samples presented in this report to reduce matrix interferences.

The laboratory noted that the samples presented in this report contained numerous non-target peaks and significant baseline rise that could be interfering with the identification and quantitation of target analytes. This inference could cause false positive and/or negative results. The interference appears to be Aroclors/PCBs which had numerous peaks.

The RPD between the primary and confirmation columns exceeded 40% for analytes in several samples. The lower of the two values have been reported, as matrix interference is evident. Associated results have been flagged with an "X".

Each sample is analyzed to achieve the lowest possible reporting limits within the constraints of the method. Due to the presence of interfering, non-target analytes, samples J1TWV0 and J1TWV7 required dilutions prior to analysis, and the associated results have been flagged with a "D". The reporting limits have been adjusted relative to the dilution required.

Surrogate recoveries obtained for samples J1TWV0 and J1TWV7 are calculated from diluted samples and are not considered reliable.

A Continuing Calibration Verification (CCV) standard associated with samples J1TWT8 and J1TWV3 in analysis batch 280-251090 exhibited %Difference (%D) values >15%, biased low, for 4,4'-DDT (-25%, -24%). The overall mean %D is ≤15%; therefore, method criteria have been met and corrective action is deemed unnecessary.

No other anomalies were encountered.

**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.

It can be noted that Aroclor 1221 is reported from a separate injection in order to acquire/maintain the associated second column confirmation chromatographic data for the samples. Due to a system limitation, this reporting style is necessary when samples are analyzed on a non-sequential injection instrument and second column confirmation is required.

Each sample is analyzed to achieve the lowest possible reporting limits within the constraints of the method. Due to the high constituent concentration, samples J1TWV0, J1TWV2, J1TWV4 and J1TWV7 had to be analyzed at dilutions, and the associated results have been flagged with a "D". The reporting limits have been adjusted relative to the dilutions required.

Surrogate recoveries obtained for samples J1TWV0, J1TWV2, J1TWV4 and J1TWV7 are calculated from diluted samples and are not considered reliable.

Spike compound recoveries, RPD data and surrogate recoveries obtained for the MS/MSD performed on sample J1TWV2 are calculated from a diluted sample and are not considered reliable. The acceptable LCS analysis data indicated that the analytical system was operating within control.

No other anomalies were encountered.

**HPLC - SW846 8310 - PAHs**

The RPD between the primary and confirmation columns exceeded 40% for analytes in samples J1TW0, J1TWV4, J1TWV7 and J1TWV8. The lower of the two values has been reported, as matrix interference is evident on both columns. Associated results have been flagged with an "X".

The LCS associated with batch 280-250638 exhibited the percent recovery outside the control limits for Benzo[k]fluoranthene at 84% (lower limit 85%), and associated sample results have been flagged "N". Although Benzo[k]fluoranthene was recovered outside current historical control limits, the recovery was within the allowed Marginal Exceedance control limits. This marginal exceedance has been determined to be sporadic, not systematic, and all other quality control acceptance criteria have been met; therefore, corrective action is deemed unnecessary.

The MS/MSD performed on sample J1TWV2 exhibited percent recoveries outside the control limits for Benzo[a]anthracene and Dibenzo(a,h)anthracene, and the associated sample results have been flagged "N". The acceptable LCS analysis data indicated that the analytical system was operating within control; therefore, corrective action is deemed unnecessary.

No other anomalies were encountered.

**TOTAL METALS - SW846 6010B/7471A**

Serial dilution of a digestate in batch 280-250668 indicates that physical and chemical interferences are present for several elements. Results have been flagged with an "X".

Each sample is analyzed to achieve the lowest possible reporting limits within the constraints of the methods. Due to matrix interference, the Beryllium analysis of several samples had to be performed at a dilution. The reporting limits have been adjusted relative to the dilution required.

Low levels of Vanadium are present in the method blank associated with batch 280-250668. Because the concentration in the method blank is not present at a level greater than half the reporting limit, corrective action is deemed unnecessary.

It can be noted that the sample amount was greater than four times the spike amount for Aluminum, Iron and Manganese in the Matrix Spike performed on sample J1TWT8; therefore, control limits are not applicable.

The duplicate analysis of sample J1TWT8 exhibited RPD data outside the control limits for Cadmium and Nickel, 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.

# Washington Closure Hanford

# CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

RC-075-441



| | | | |
|---|---|---|---|
| Collector: H. Weber | Company Contact: Joan Kessner | Telephone No.: 375-4688 | Project Coordinator: KESSNER, JH |
| Project Designation: 100-D/DR Field Remediation | Sampling Location: 100-D-86:3, Verification II | | SAF No.: RC-075 |
| Chest No.: RCC-07-015 | Field Logbook No.: EL-1662-03 10/28/14 | COA: 01D8632000 | Method of Shipment: Commercial Carrier / Fed Ex |
| Shipped To: TestAmerica Denver | Offsite Property No.: A13/281 | | Bill of Lading/Air Bill No.: see OSPC |
| Other Labs Shipped To: TestAmerica Richland RCF37029 | | | |

Price Code: 8B 7 days

Data Turnaround

POSSIBLE SAMPLE HAZARDS/REMARKS

n/A

Special Handling and/or Storage

4001 4C

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Preservation | Cool 4C | Cool 4C | Cool 4C | Cool 4C | | | | | | | | |
| Type of Container | G/P | aG | aG | aG | | | | | | | | |
| No. of Container(s) | 1 | 1 | 1 | 1 | | | | | | | | |
| Volume | 250mL | 250mL | 250mL | 250mL | | | | | | | | |
| Sample Analysis | See item (1) in Special Instructions | PAHs - 8310 | PCBs - 8082 | Pesticides - 8081 | | | | | | | | |
| Sample No. | Matrix | Sample Date | Sample Time | | | | | | | | | |
| J1TWT8 | SOIL | 10/28/14 | 1008 | X | X | X | X | | | | | |
| J1TWT9 | SOIL | 10/28/14 | 0857 | X | X | X | X | | | | | |
| J1TWV0 | SOIL | 10/28/14 | 1003 | X | X | X | X | | | | | |
| J1TWV1 | SOIL | 10/28/14 | 0907 | X | X | X | X | | | | | |
| J1TWV2 | SOIL | 10/28/14 | 0916 | X | X | X | X | | | | | |

## CHAIN OF POSSESSION

Sign/Print Names

| Relinquished By/Removed From | Date/Time | Received By/Stored In | Date/Time |
|---|---|---|---|
| Heather Weber | 10/28/14 1035 | WCH DWSHEA | 10/28/14 1035 |
| DWSHEA DWSHEA | 10/28/14 1545 | C Bingham | 10-28-14 1545 |
| C. Bingham | 10-28-14 1550 | 1060 Battelle, fridge #2A | 10-28-14 1550 |
| 1060 Battelle, fridge #2A | 10-29-14 1000 | C. Bingham | 10-29-14 1000 |
| C. Bingham WCH | 10-29-14 1010 | FedEx | |
| | | | 10/30/14 9:30 |

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) (Mercury)

1.3, 1.5 IRG CF 0.0
Transferred By MT 01/23/14

REVIEWED BY K. Neil Viacnel DATE 10-29-14

JP0877

WCH-EE-011

# Washington Closure Hanford

# CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

RC-075-441



| | | | |
|---|---|---|---|
| Collector: H. Weber | Company Contact: Joan Kessner | Telephone No.: 375-4688 | Project Coordinator: KESSNER, JH |
| Price Code: 8B | Data Turnaround: 7 days | | |
| Project Designation: 100-D/DR Field Remediation | Sampling Location: 100-D-86:3, Verification II | | SAF No.: RC-075 |
| Ice Chest No.: RCC-07-015 | Field Logbook No.: EL-1662-62-03 10/28/14 | COA: 01D8632000 | Method of Shipment: Commercial Carrier / Fed Ex |
| Shipped To: TestAmerica Denver | Offsite Property No.: A131281 | | Bill of Lading/Air Bill No.: See OSR |
| Other Labs Shipped To: TestAmerica Richland RCF 37029 | | | |

POSSIBLE SAMPLE HAZARDS/REMARKS

N/A

Special Handling and/or Storage

Cool 4C

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Preservation | Cool 4C | Cool 4C | Cool 4C | Cool 4C | | | | | | | | |
| Type of Container | G/P | aG | aG | aG | | | | | | | | |
| No. of Container(s) | 1 | 1 | 1 | 1 | | | | | | | | |
| Volume | 250mL | 250mL | 250mL | 250mL | | | | | | | | |
| Sample Analysis | See item (1) in Special Instructions | PAHs - 8310 | PCBs - 8082 | Pesticides - 8081 | | | | | | | | |

| Sample No. | Matrix | Sample Date | Sample Time | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| J1TWV3 | SOIL | 10/28/14 | 0955 | X | X | X | X | | | | | | |
| J1TWV4 | SOIL | 10/28/14 | 0929 | X | X | X | X | | | | | | |
| J1TWV5 | SOIL | 10/28/14 | 0925 | X | X | X | X | | | | | | |
| J1TWV6 | SOIL | 10/28/14 | 0948 | X | X | X | X | | | | | | |
| J1TWV7 | SOIL | 10/28/14 | 1018 | X | X | X | X | | | | | | |

## CHAIN OF POSSESSION / Sign/Print Names

| Relinquished By/Removed From | Date/Time | Received By/Stored In | Date/Time |
|---|---|---|---|
| Heather Weber / [signature] | 10/28/14 1035 | [signature] WCH | 10/28/14 1035 |
| [signature] | 10/28/14 1545 | C. Bingham [signature] | 10-28-14 1545 |
| C. Bingham [signature] | 10-28-14 1550 | 1060 Battelle, fridge #2A | 10-28-14 1550 |
| 1060 Battelle, fridge #2A | 10-29-14 1000 | C. Bingham [signature] | 10-29-14 1000 |
| C. Bingham [signature] WCH | 10-29-14 1010 | Fed EX | |
| | | [signature] | 10/30/14 9:30 |
| | | | |

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) (Mercury)

REVIEWED BY K. Wood Vickmark DATE 10-29-14

JP0877

WCH-EE-011

# Washington Closure Hanford

# CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

RC-075-441

| | | | |
|---|---|---|---|
| Collector: H. weber | Company Contact: Joan Kessner | Telephone No.: 375-4688 | Project Coordinator: KESSNER, JH |
| Project Designation: 100-D/DR Field Remediation | Sampling Location: 100-D-86:3, Verification II | | SAF No.: RC-075 |
| Ice Chest No.: RCC-07-015 | Field Logbook No.: EL-1662-02 03 | COA: 01D8632000 | Method of Shipment: Commercial Carrier \ Fed Ex |
| Shipped To: TestAmerica Denver | Offsite Property No.: A131281 | | Bill of Lading/Air Bill No.: See OSPC |
| Other Labs Shipped To: TestAmerica Richland RCF37029 | | | |

Price Code: 8B

Data Turnaround: 7 days

POSSIBLE SAMPLE HAZARDS/REMARKS

n/A

Special Handling and/or Storage

cool 4C

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Preservation | | | Cool 4C | Cool 4C | Cool 4C | Cool 4C | | | | | | |
| Type of Container | | | G/P | aG | aG | aG | | | | | | |
| No. of Container(s) | | | 1 | 1 | 1 | 1 | | | | | | |
| Volume | | | 250mL | 250mL | 250mL | 250mL | | | | | | |
| Sample Analysis | | | See item (1) in Special Instructions | PAHs - 8310 | PCBs - 8082 | Pesticides - 8081 | | | | | | |
| Sample No. | Matrix | Sample Date | Sample Time | | | | | | | | | |
| J1TWV8 | SOIL | 10/28/14 | 0933 | X | X | X | X | | | | | |
| J1TWV9 | SOIL | 10/28/14 | 0943 | X | X | X | X | | | | | |
| J1TWW0 | SOIL | 10/28/14 | 0857 | X | X | X | X | | | | | |
| J1TWW1 | SOIL | 10/28/14 | 0850 | X | X | n/A | n/A | | | | | |

## CHAIN OF POSSESSION

Sign/Print Names

| Relinquished By/Removed From | Date/Time | Received By/Stored In | Date/Time |
|---|---|---|---|
| Heather Weber / [signature] | 10/28/14 1035 | WCH DWSHEA [signature] | 10/28/14 1035 |
| DWSHEA [signature] | 10/28/14 1545 | C. Bingham [signature] | 10-28-14 1545 |
| C. Bingham [signature] | 10-28-14 1550 | 1060 Battelle, fridge #2A [signature] | 10-28-14 1550 |
| 1060 Battelle, fridge #2A | 10-29-14 1000 | C. Bingham [signature] | 10-29-14 1000 |
| C. Bingham [signature] WCH | 10-29-14 1010 | Fed EX | |
| | | [signature] | 10/30/14 9:30 |

| 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) {Mercury}

REVIEWED BY Kuhnhaenel DATE 10-29-14

JP0877

WCH-EE-011

# Appendix 5

## Data Validation Supporting Documentation

# PCB DATA VALIDATION CHECKLIST

| VALIDATION LEVEL: | A | B | C | D | E |
|---|---|---|---|---|---|
| PROJECT: 100-D-86:3 | | | DATA PACKAGE: JP0877 | | |
| VALIDATOR: ELR | | LAB: TAL | | DATE: 2/22/15 | |
| | | | SDG: JP0877 | | |

ANALYSES PERFORMED

| SW-846 8081 | SW-846 8081 (TCLP) | SW-846 8082 | SW-846 8081 (TCLP) | | |
|---|---|---|---|---|---|

SAMPLES/MATRIX

| | | | | |
|---|---|---|---|---|
| J1TWT8 | J1TWT9 | J1TWV0 | J1TWV1 | J1TWV2 |
| J1TWV3 | J1TWV4 | J1TWV5 | J1TWV6 | J1TWV7 |
| J1TWV8 | J1TWV9 | J1TWW0 | | |
| | | | | |
| | | | | 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 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 FB

## 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 3/16/16

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: surr dieldrin V7 - J surr V0 PCB - all ~~MS - 1260 - J all detects (1998)~~ 3/11/15

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:

6 + 5 + 6 = 17 arm pcb

5 = 5 pest

## 9. SAMPLE CLEANUP (Levels D and E)

Fluoricil ® (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

Client: Washington Closure Hanford

Job Number: 280-61898-1
Sdg Number: JP0877

**Method Blank - Batch: 280-250643**

**Method: 8081A**
**Preparation: 3550C**

| | | | | | |
|---|---|---|---|---|---|
| Lab Sample ID: | MB 280-250643/1-A | Analysis Batch: | 280-251653 | Instrument ID: | SGC_P1 |
| Client Matrix: | Solid | Prep Batch: | 280-250643 | Lab File ID: | 11060018.D |
| Dilution: | 1.0 | Leach Batch: | N/A | Initial Weight/Volume: | 30.9 g |
| Analysis Date: | 11/06/2014 1535 | Units: | ug/Kg | Final Weight/Volume: | 10 mL |
| Prep Date: | 10/30/2014 2214 | | | Injection Volume: | 1 uL |
| Leach Date: | N/A | | | Column ID: | PRIMARY |

| Analyte | Result | Qual | MDL | RL |
|---|---|---|---|---|
| 4,4'-DDD | 0.53 | U | 0.53 | 1.7 |
| 4,4'-DDE | 0.23 | U | 0.23 | 1.7 |
| 4,4'-DDT | 0.57 | U | 0.57 | 1.7 |
| Aldrin | 0.24 | U | 0.24 | 1.6 |
| alpha-BHC | 0.21 | U | 0.21 | 1.6 |
| beta-BHC | 0.64 | U | 0.64 | 1.6 |
| delta-BHC | 0.39 | U | 0.39 | 1.6 |
| gamma-BHC (Lindane) | 0.45 | U | 0.45 | 1.6 |
| Heptachlor | 0.21 | U | 0.21 | 1.6 |
| Heptachlor epoxide | 0.41 | U | 0.41 | 1.6 |
| Endosulfan I | 0.17 | U | 0.17 | 1.6 |
| Endosulfan II | 0.28 | U | 0.28 | 1.7 |
| Endosulfan sulfate | 0.27 | U | 0.27 | 1.7 |
| Endrin | 0.30 | U | 0.30 | 1.7 |
| Endrin aldehyde | 0.17 | U | 0.17 | 1.7 |
| Endrin ketone | 0.47 | U | 0.47 | 1.7 |
| gamma-Chlordane | 0.26 | U | 0.26 | 1.7 |
| Methoxychlor | 0.44 | U | 0.44 | 3.2 |
| alpha-Chlordane | 0.31 | U | 0.31 | 1.7 |
| Dieldrin | 0.20 | U | 0.20 | 1.7 |
| Toxaphene | 15 | U | 15 | 160 |

| Surrogate | % Rec | Acceptance Limits |
|---|---|---|
| Tetrachloro-m-xylene | 85 | 59 - 115 |
| Decachlorobiphenyl | 99 | 63 - 124 |

Client: Washington Closure Hanford

Job Number: 280-61898-1
Sdg Number: JP0877

**Lab Control Sample - Batch: 280-250643**

**Method: 8081A**
**Preparation: 3550C**

| | | | | | |
|---|---|---|---|---|---|
| *Lab Sample ID:* | *LCS 280-250643/2-A* | *Analysis Batch:* | *280-251653* | *Instrument ID:* | *SGC_P1* |
| Client Matrix: | Solid | Prep Batch: | 280-250643 | Lab File ID: | 11060012.D |
| Dilution: | 1.0 | Leach Batch: | N/A | Initial Weight/Volume: | 31.5 g |
| Analysis Date: | 11/06/2014 1351 | Units: | ug/Kg | Final Weight/Volume: | 10 mL |
| Prep Date: | 10/30/2014 2214 | | | Injection Volume: | 1 uL |
| Leach Date: | N/A | | | Column ID: | PRIMARY |

| Analyte | Spike Amount | Result | % Rec. | Limit | Qual |
|---|---|---|---|---|---|
| 4,4'-DDD | 15.9 | 13.3 | 84 | 69 - 126 | |
| 4,4'-DDE | 15.9 | 13.7 | 86 | 71 - 116 | |
| 4,4'-DDT | 15.9 | 14.1 | 89 | 67 - 132 | |
| Aldrin | 15.9 | 13.4 | 84 | 69 - 116 | |
| alpha-BHC | 15.9 | 13.5 | 85 | 65 - 122 | |
| beta-BHC | 15.9 | 11.1 | 70 | 62 - 121 | |
| delta-BHC | 15.9 | 13.6 | 86 | 67 - 122 | |
| gamma-BHC (Lindane) | 15.9 | 13.5 | 85 | 66 - 120 | |
| Heptachlor | 15.9 | 13.9 | 87 | 61 - 126 | |
| Heptachlor epoxide | 15.9 | 13.8 | 87 | 71 - 119 | |
| Endosulfan I | 15.9 | 12.7 | 80 | 67 - 115 | |
| Endosulfan II | 15.9 | 13.3 | 84 | 69 - 120 | |
| Endosulfan sulfate | 15.9 | 14.7 | 93 | 69 - 126 | |
| Endrin | 15.9 | 14.7 | 93 | 69 - 129 | |
| Endrin aldehyde | 15.9 | 12.7 | 80 | 41 - 128 | |
| Endrin ketone | 15.9 | 14.3 | 90 | 70 - 125 | |
| gamma-Chlordane | 15.9 | 14.0 | 88 | 69 - 122 | |
| Methoxychlor | 15.9 | 14.5 | 92 | 65 - 139 | |
| alpha-Chlordane | 15.9 | 13.6 | 86 | 71 - 118 | |
| Dieldrin | 15.9 | 14.0 | 88 | 71 - 120 | |

| Surrogate | % Rec | Acceptance Limits |
|---|---|---|
| Tetrachloro-m-xylene | 84 | 59 - 115 |
| Decachlorobiphenyl | 98 | 63 - 124 |

Client: Washington Closure Hanford

Job Number: 280-61898-1
Sdg Number: JP0877

**Matrix Spike/**
**Matrix Spike Duplicate Recovery Report - Batch: 280-250643**

**Method: 8081A**
**Preparation: 3550C**

| | | | | | |
|---|---|---|---|---|---|
| *MS Lab Sample ID:* | *280-61898-6* | *Analysis Batch:* | *280-251090* | *Instrument ID:* | *SGC_P1* |
| Client Matrix: | Solid | Prep Batch: | 280-250643 | Lab File ID: | 11030043.D |
| Dilution: | 1.0 | Leach Batch: | N/A | Initial Weight/Volume: | 31.1 g |
| Analysis Date: | 11/04/2014 0546 | | | Final Weight/Volume: | 10 mL |
| Prep Date: | 10/30/2014 2214 | | | Injection Volume: | 1 uL |
| Leach Date: | N/A | | | Column ID: | PRIMARY |

| | | | | | |
|---|---|---|---|---|---|
| MSD Lab Sample ID: | 280-61898-6 | Analysis Batch: | 280-251090 | Instrument ID: | SGC_P1 |
| Client Matrix: | Solid | Prep Batch: | 280-250643 | Lab File ID: | 11030044.D |
| Dilution: | 1.0 | Leach Batch: | N/A | Initial Weight/Volume: | 32.3 g |
| Analysis Date: | 11/04/2014 0603 | | | Final Weight/Volume: | 10 mL |
| Prep Date: | 10/30/2014 2214 | | | Injection Volume: | 1 uL |
| Leach Date: | N/A | | | Column ID: | PRIMARY |

| Analyte | % Rec. MS | % Rec. MSD | Limit | RPD | RPD Limit | MS Qual | MSD Qual |
|---|---|---|---|---|---|---|---|
| 4,4'-DDD | 87 | 106 | 69 - 126 | 16 | 20 | | |
| 4,4'-DDE | 83 | 100 | 71 - 116 | 15 | 15 | | |
| 4,4'-DDT | 92 | 113 | 67 - 132 | 17 | 29 | | |
| Aldrin | 77 | 89 | 69 - 116 | 11 | 50 | | |
| alpha-BHC | 80 | 93 | 65 - 122 | 11 | 17 | | |
| beta-BHC | 65 | 74 | 62 - 121 | 10 | 17 | | |
| delta-BHC | 80 | 92 | 67 - 122 | 10 | 19 | | |
| gamma-BHC (Lindane) | 79 | 92 | 66 - 120 | 11 | 24 | | |
| Heptachlor | 80 | 92 | 61 - 126 | 11 | 18 | | |
| Heptachlor epoxide | 80 | 93 | 71 - 119 | 11 | 18 | | |
| Endosulfan I | 73 | 86 | 67 - 115 | 12 | 26 | | |
| Endosulfan II | 79 | 95 | 69 - 120 | 14 | 20 | | |
| Endosulfan sulfate | 97 | 117 | 69 - 126 | 14 | 22 | | |
| Endrin | 90 | 106 | 69 - 129 | 13 | 30 | | |
| Endrin aldehyde | 67 | 82 | 41 - 128 | 17 | 29 | | |
| Endrin ketone | 91 | 111 | 70 - 125 | 16 | 20 | | |
| gamma-Chlordane | 78 | 93 | 69 - 122 | 13 | 21 | | |
| Methoxychlor | 93 | 114 | 65 - 139 | 16 | 23 | | |
| alpha-Chlordane | 79 | 93 | 71 - 118 | 12 | 18 | | |
| Dieldrin | 88 | 108 | 71 - 120 | 17 | 25 | | |

| Surrogate | MS % Rec | MSD % Rec | Acceptance Limits |
|---|---|---|---|
| Tetrachloro-m-xylene | 76 | 91 | 59 - 115 |
| Decachlorobiphenyl | 102 | 116 | 63 - 124 |

## Quality Control Results

Client: Washington Closure Hanford

Job Number: 280-61898-1
Sdg Number: JP0877

**Matrix Spike/**
**Matrix Spike Duplicate Recovery Report - Batch: 280-250643**

**Method: 8081A**
**Preparation: 3550C**

| | | | |
|---|---|---|---|
| MS Lab Sample ID: | 280-61898-6 | Units: ug/Kg | |
| Client Matrix: | Solid | | |
| Dilution: | 1.0 | | |
| Analysis Date: | 11/04/2014 0546 | | |
| Prep Date: | 10/30/2014 2214 | | |
| Leach Date: | N/A | | |

| | |
|---|---|
| MSD Lab Sample ID: | 280-61898-6 |
| Client Matrix: | Solid |
| Dilution: | 1.0 |
| Analysis Date: | 11/04/2014 0603 |
| Prep Date: | 10/30/2014 2214 |
| Leach Date: | N/A |

| Analyte | Sample Result/Qual | | MS Spike Amount | MSD Spike Amount | MS Result/Qual | MSD Result/Qual |
|---|---|---|---|---|---|---|
| 4,4'-DDD | 0.57 | U | 17.1 | 16.5 | 14.9 | 17.5 |
| 4,4'-DDE | 0.25 | U | 17.1 | 16.5 | 14.1 | 16.4 |
| 4,4'-DDT | 0.62 | U | 17.1 | 16.5 | 15.7 | 18.6 |
| Aldrin | 0.26 | U | 17.1 | 16.5 | 13.1 | 14.6 |
| alpha-BHC | 0.22 | U | 17.1 | 16.5 | 13.6 | 15.2 |
| beta-BHC | 0.70 | U | 17.1 | 16.5 | 11.0 | 12.2 |
| delta-BHC | 0.42 | U | 17.1 | 16.5 | 13.6 | 15.1 |
| gamma-BHC (Lindane) | 0.49 | U | 17.1 | 16.5 | 13.5 | 15.1 |
| Heptachlor | 0.22 | U | 17.1 | 16.5 | 13.6 | 15.2 |
| Heptachlor epoxide | 0.45 | U | 17.1 | 16.5 | 13.7 | 15.2 |
| Endosulfan I | 0.18 | U | 17.1 | 16.5 | 12.5 | 14.1 |
| Endosulfan II | 0.30 | U | 17.1 | 16.5 | 13.5 | 15.6 |
| Endosulfan sulfate | 0.29 | U | 17.1 | 16.5 | 16.6 | 19.2 |
| Endrin | 0.32 | U | 17.1 | 16.5 | 15.3 | 17.5 |
| Endrin aldehyde | 0.18 | U | 17.1 | 16.5 | 11.4 | 13.5 |
| Endrin ketone | 0.51 | U | 17.1 | 16.5 | 15.6 | 18.2 |
| gamma-Chlordane | 0.28 | U | 17.1 | 16.5 | 13.4 | 15.3 |
| Methoxychlor | 0.47 | U | 17.1 | 16.5 | 16.0 | 18.8 |
| alpha-Chlordane | 0.34 | U | 17.1 | 16.5 | 13.6 | 15.4 |
| Dieldrin | 0.22 | U | 17.1 | 16.5 | 15.0 | 17.8 |

Client: Washington Closure Hanford

Job Number: 280-61898-1
Sdg Number: JP0877

**Method Blank - Batch: 280-250649**

**Method: 8082**
**Preparation: 3550C**

| | | | | | |
|---|---|---|---|---|---|
| *Lab Sample ID:* | *MB 280-250649/1-A* | *Analysis Batch:* | *280-251166* | *Instrument ID:* | *SGC_P3a* |
| Client Matrix: | Solid | Prep Batch: | 280-250649 | Lab File ID: | 1104A004.D |
| Dilution: | 1.0 | Leach Batch: | N/A | Initial Weight/Volume: | 30.2 g |
| Analysis Date: | 11/04/2014 1023 | Units: | ug/Kg | Final Weight/Volume: | 5 mL |
| Prep Date: | 10/30/2014 2330 | | | Injection Volume: | 1 uL |
| Leach Date: | N/A | | | Column ID: | PRIMARY |

| Analyte | Result | Qual | MDL | RL |
|---|---|---|---|---|
| Aroclor 1016 | 2.8 | U | 2.8 | 9.9 |
| Aroclor 1221 | 8.0 | U | 8.0 | 16 |
| Aroclor 1232 | 2.0 | U | 2.0 | 9.9 |
| Aroclor 1242 | 4.6 | U | 4.6 | 9.9 |
| Aroclor 1248 | 4.6 | U | 4.6 | 9.9 |
| Aroclor 1254 | 2.6 | U | 2.6 | 9.9 |
| Aroclor 1260 | 2.6 | U | 2.6 | 9.9 |

| Surrogate | % Rec | Acceptance Limits |
|---|---|---|
| Decachlorobiphenyl | 85 | 59 - 130 |
| Tetrachloro-m-xylene | 78 | 53 - 128 |

**Method Blank - Batch: 280-250649**

**Method: 8082**
**Preparation: 3550C**

| | | | | | |
|---|---|---|---|---|---|
| Lab Sample ID: | MB 280-250649/1-A | Analysis Batch: | 280-251168 | Instrument ID: | SGC_P3b |
| Client Matrix: | Solid | Prep Batch: | 280-250649 | Lab File ID: | 1104B004.D |
| Dilution: | 1.0 | Leach Batch: | N/A | Initial Weight/Volume: | 30.2 g |
| Analysis Date: | 11/04/2014 1044 | Units: | ug/Kg | Final Weight/Volume: | 5 mL |
| Prep Date: | 10/30/2014 2330 | | | Injection Volume: | 1 uL |
| Leach Date: | N/A | | | Column ID: | PRIMARY |

| Analyte | Result | Qual | MDL | RL |
|---|---|---|---|---|
| Aroclor 1016 | 2.8 | U | 2.8 | 9.9 |
| Aroclor 1221 | 8.0 | U | 8.0 | 16 |
| Aroclor 1232 | 2.0 | U | 2.0 | 9.9 |
| Aroclor 1242 | 4.6 | U | 4.6 | 9.9 |
| Aroclor 1248 | 4.6 | U | 4.6 | 9.9 |
| Aroclor 1254 | 2.6 | U | 2.6 | 9.9 |
| Aroclor 1260 | 2.6 | U | 2.6 | 9.9 |

| Surrogate | % Rec | Acceptance Limits |
|---|---|---|
| Decachlorobiphenyl | 82 | 59 - 130 |
| Tetrachloro-m-xylene | 71 | 53 - 128 |

Client: Washington Closure Hanford

Job Number: 280-61898-1
Sdg Number: JP0877

**Lab Control Sample - Batch: 280-250649**

**Method: 8082**
**Preparation: 3550C**

| | | | | | |
|---|---|---|---|---|---|
| *Lab Sample ID:* | *LCS 280-250649/2-A* | *Analysis Batch:* | *280-251166* | *Instrument ID:* | *SGC_P3a* |
| Client Matrix: | Solid | Prep Batch: | 280-250649 | Lab File ID: | 1104A005.D |
| Dilution: | 1.0 | Leach Batch: | N/A | Initial Weight/Volume: | 30.3 g |
| Analysis Date: | 11/04/2014 1044 | Units: | ug/Kg | Final Weight/Volume: | 5 mL |
| Prep Date: | 10/30/2014 2330 | | | Injection Volume: | 1 uL |
| Leach Date: | N/A | | | Column ID: | PRIMARY |

| Analyte | Spike Amount | Result | % Rec. | Limit | Qual |
|---|---|---|---|---|---|
| Aroclor 1016 | 33.0 | 35.1 | 106 | 54 - 132 | |
| Aroclor 1260 | 33.0 | 30.5 | 92 | 62 - 129 | |

| Surrogate | % Rec | Acceptance Limits |
|---|---|---|
| Decachlorobiphenyl | 90 | 59 - 130 |
| Tetrachloro-m-xylene | 85 | 53 - 128 |

**Lab Control Sample - Batch: 280-250649**

**Method: 8082**
**Preparation: 3550C**

| | | | | | |
|---|---|---|---|---|---|
| Lab Sample ID: | LCS 280-250649/2-A | Analysis Batch: | 280-251168 | Instrument ID: | SGC_P3b |
| Client Matrix: | Solid | Prep Batch: | 280-250649 | Lab File ID: | 1104B005.D |
| Dilution: | 1.0 | Leach Batch: | N/A | Initial Weight/Volume: | 30.3 g |
| Analysis Date: | 11/04/2014 1106 | Units: | ug/Kg | Final Weight/Volume: | 5 mL |
| Prep Date: | 10/30/2014 2330 | | | Injection Volume: | 1 uL |
| Leach Date: | N/A | | | Column ID: | PRIMARY |

| Analyte | Spike Amount | Result | % Rec. | Limit | Qual |
|---|---|---|---|---|---|
| Aroclor 1016 | 33.0 | 28.4 | 86 | 54 - 132 | |
| Aroclor 1260 | 33.0 | 30.2 | 91 | 62 - 129 | |

| Surrogate | % Rec | Acceptance Limits |
|---|---|---|
| Decachlorobiphenyl | 88 | 59 - 130 |
| Tetrachloro-m-xylene | 77 | 53 - 128 |

Client: Washington Closure Hanford

Job Number: 280-61898-1
Sdg Number: JP0877

**Matrix Spike/**
**Matrix Spike Duplicate Recovery Report - Batch: 280-250649**

**Method: 8082**
**Preparation: 3550C**

| | | | | | |
|---|---|---|---|---|---|
| MS Lab Sample ID: | 280-61898-5 | Analysis Batch: | 280-251166 | Instrument ID: | SGC_P3a |
| Client Matrix: | Solid | Prep Batch: | 280-250649 | Lab File ID: | 1104A011.D |
| Dilution: | 4.0 | Leach Batch: | N/A | Initial Weight/Volume: | 30.2 g |
| Analysis Date: | 11/04/2014 1253 | | | Final Weight/Volume: | 5 mL |
| Prep Date: | 10/30/2014 2330 | | | Injection Volume: | 1 uL |
| Leach Date: | N/A | | | Column ID: | PRIMARY |

| | | | | | |
|---|---|---|---|---|---|
| MSD Lab Sample ID: | 280-61898-5 | Analysis Batch: | 280-251166 | Instrument ID: | SGC_P3a |
| Client Matrix: | Solid | Prep Batch: | 280-250649 | Lab File ID: | 1104A012.D |
| Dilution: | 4.0 | Leach Batch: | N/A | Initial Weight/Volume: | 30.4 g |
| Analysis Date: | 11/04/2014 1315 | | | Final Weight/Volume: | 5 mL |
| Prep Date: | 10/30/2014 2330 | | | Injection Volume: | 1 uL |
| Leach Date: | N/A | | | Column ID: | PRIMARY |

| Analyte | % Rec. MS | % Rec. MSD | Limit | RPD | RPD Limit | MS Qual | MSD Qual |
|---|---|---|---|---|---|---|---|
| Aroclor 1016 | 92 | 85 | 54 - 132 | 9 | 26 | J D | J D |
| Aroclor 1260 | 199 | 55 | 62 - 129 | 12 | 26 | D | D |

| Surrogate | MS % Rec | | MSD % Rec | | Acceptance Limits |
|---|---|---|---|---|---|
| Decachlorobiphenyl | 90 | D | 90 | D | 59 - 130 |
| Tetrachloro-m-xylene | 86 | D | 85 | D | 53 - 128 |

**Matrix Spike/**
**Matrix Spike Duplicate Recovery Report - Batch: 280-250649**

**Method: 8082**
**Preparation: 3550C**

| | | | | | |
|---|---|---|---|---|---|
| MS Lab Sample ID: | 280-61898-5 | Units: | ug/Kg | MSD Lab Sample ID: | 280-61898-5 |
| Client Matrix: | Solid | | | Client Matrix: | Solid |
| Dilution: | 4.0 | | | Dilution: | 4.0 |
| Analysis Date: | 11/04/2014 1253 | | | Analysis Date: | 11/04/2014 1315 |
| Prep Date: | 10/30/2014 2330 | | | Prep Date: | 10/30/2014 2330 |
| Leach Date: | N/A | | | Leach Date: | N/A |

| Analyte | Sample Result/Qual | | MS Spike Amount | MSD Spike Amount | MS Result/Qual | | MSD Result/Qual | |
|---|---|---|---|---|---|---|---|---|
| Aroclor 1016 | 12 | U | 35.7 | 35.5 | 32.8 | J D | 30.1 | J D |
| Aroclor 1260 | 370 | | 35.7 | 35.5 | 439 | D | 388 | D |

Date: 23 February 2015
To: Washington Closure Hanford Inc. (technical representative)
From: ELR Consulting
Project: 100-D/DR Burial Grounds & Remaining Sites – Soil Full Protocol - Waste Site 100-D-86:3
Subject: Inorganic - Data Package No. JP0877-TAL

## INTRODUCTION

This memo presents the results of data validation on Data Package No. JP0877 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 |
|---|---|---|---|---|
| J1TWT8 | 10/28/14 | Soil | C | See note 1 |
| J1TWT9 | 10/28/14 | Soil | C | See note 1 |
| J1TWV0 | 10/28/14 | Soil | C | See note 1 |
| J1TWV1 | 10/28/14 | Soil | C | See note 1 |
| J1TWV2 | 10/28/14 | Soil | C | See note 1 |
| J1TWV3 | 10/28/14 | Soil | C | See note 1 |
| J1TWV4 | 10/28/14 | Soil | C | See note 1 |
| J1TWV5 | 10/28/14 | Soil | C | See note 1 |
| J1TWV6 | 10/28/14 | Soil | C | See note 1 |
| J1TWV7 | 10/28/14 | Soil | C | See note 1 |
| J1TWV8 | 10/28/14 | Soil | C | See note 1 |
| J1TWV9 | 10/28/14 | Soil | C | See note 1 |
| J1TWW0 | 10/28/14 | Soil | C | See note 1 |
| J1TWW1 | 10/28/14 | Soil | C | See note 1 |

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

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

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

## DATA QUALITY PARAMETERS

- **Holding Times**

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

All holding times were acceptable.

- **Preparation (Method) Blanks**

Preparation Blanks

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

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

Due to method blank contamination, the vanadium result in sample J1TWW1 was qualified as undetected and flagged "UJ".

All other preparation blank results were acceptable.

Field (Equipment) Blank

One field blank (J1TWW1) was submitted for analysis. Thirteen analytes were detected in the field blank. Under the WCH statement of work, no qualification is required.

- **Accuracy**

Matrix Spike and Laboratory Control Sample

Matrix spike (MS) and laboratory control sample (LCS) analyses are used to assess the analytical accuracy of the reported data. The matrix spike is used to assess the effect of the matrix on the ability to accurately quantify sample concentrations. Recoveries must fall within the range of 70% to 130%. Samples with a recovery of less than 30% and a sample result below the IDL are rejected and flagged "UR". Samples with a recovery of 30% to 69% and a sample result less than the IDL are qualified "UJ". Samples with a recovery of greater than 130% or less than 70% and a sample result greater than the IDL are qualified as estimates and flagged "J". Finally, for samples with a recovery greater than 130% and a sample result less than the IDL, no qualification is required.

Due to matrix spike recoveries outside QC limits, all antimony (56%), calcium (133%), and silicon (28%) results were qualified as estimates and flagged "J".

Due to an LCS recovery outside QC limits (10%), all silicon results were qualified as estimates and flagged "J".

All other accuracy results were acceptable.

- **Precision**

Laboratory Duplicate Samples

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

All laboratory duplicate results were acceptable.

Field Duplicate

One set of field duplicates (J1TWT9/J1TWW0) was submitted for analysis. Field duplicates are compared using the same criteria as for laboratory duplicates. All field duplicate results were acceptable.

- **Analytical Detection Levels**

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

- **Completeness**

Data package No. JP0877 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 vanadium result in sample J1TWW1 was qualified as undetected and flagged "UJ".
- Due to matrix spike recoveries outside QC limits, all antimony (56%), calcium (133%), and silicon (28%) results were qualified as estimates and flagged "J".
- Due to an LCS recovery outside QC limits (10%), all silicon results were qualified as estimates and flagged "J".

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

## REFERENCES

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

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

## Appendix 1

## Glossary of Data Reporting Qualifiers

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

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

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

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

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

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

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

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

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

## Appendix 2

## Summary of Data Qualification

INORGANIC DATA QUALIFICATION SUMMARY*

| SDG: JP0877 | REVIEWER: ELR | Project: 100-D-86:3 | PAGE 1 OF 1 |
|---|---|---|---|
| COMPOUND | QUALIFIER | SAMPLES AFFECTED | REASON |
| Antimony<br>Calcium<br>Silicon | J | All | MS recovery |
| Silicon | J | All | LCS recovery |
| Vanadium | UJ | J1TWW1 | Method blank contamination |

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

## Appendix 3

## Annotated Laboratory Reports

Client: Washington Closure Hanford

Job Number: 280-61898-1
Sdg Number: JP0877

**Client Sample ID:** **J1TWT8**

Lab Sample ID: 280-61898-1
Client Matrix: Solid

% Moisture: 3.3

Date Sampled: 10/28/2014 1008
Date Received: 10/30/2014 0930

**6010B Metals (ICP)**

Analysis Method: 6010B
Prep Method: 3050B
Dilution: 1.0
Analysis Date: 11/03/2014 2329
Prep Date: 11/03/2014 0815

Analysis Batch: 280-251210
Prep Batch: 280-250668

2/22/15

Instrument ID: MT_026
Lab File ID: 26f110314.asc
Initial Weight/Volume: 1.06 g
Final Weight/Volume: 100 mL

| Analyte | DryWt Corrected: Y | Result (mg/Kg) | Qualifier | MDL | RL |
|---|---|---|---|---|---|
| Aluminum | | 4550 | X | 1.5 | 4.9 |
| Antimony | | 0.37 | U J | 0.37 | 0.59 |
| Arsenic | | 1.6 | | 0.64 | 0.98 |
| Barium | | 47.6 | X | 0.074 | 0.49 |
| Boron | | 0.96 | U | 0.96 | 2.0 |
| Cadmium | | 0.050 | B M | 0.040 | 0.20 |
| Calcium | | 5060 | X J | 13.8 | 48.8 |
| Chromium | | 4.7 | X | 0.057 | 0.20 |
| Cobalt | | 8.3 | X | 0.098 | 0.98 |
| Copper | | 13.3 | | 0.21 | 0.98 |
| Iron | | 20500 | X | 3.7 | 4.9 |
| Lead | | 2.4 | | 0.26 | 0.49 |
| Magnesium | | 3870 | X | 3.6 | 19.5 |
| Manganese | | 241 | X | 0.098 | 0.98 |
| Molybdenum | | 0.25 | U | 0.25 | 2.0 |
| Nickel | | 8.9 | X M | 0.12 | 3.9 |
| Potassium | | 540 | | 40.0 | 293 |
| Selenium | | 0.84 | U J | 0.84 | 0.98 |
| Silicon | | 257 | | 5.5 | 9.8 |
| Silver | | 0.16 | U | 0.16 | 0.20 |
| Sodium | | 333 | | 57.6 | 117 |
| Vanadium | | 55.1 | | 0.092 | 2.0 |
| Zinc | | 36.9 | X | 0.39 | 0.98 |

Analysis Method: 6010B
Prep Method: 3050B
Dilution: 2.0
Analysis Date: 11/04/2014 1536
Prep Date: 11/03/2014 0815

Analysis Batch: 280-251399
Prep Batch: 280-250668

Instrument ID: MT_026
Lab File ID: 26a110414.asc
Initial Weight/Volume: 1.06 g
Final Weight/Volume: 100 mL

| Analyte | DryWt Corrected: Y | Result (mg/Kg) | Qualifier | MDL | RL |
|---|---|---|---|---|---|
| Beryllium | | 0.064 | U | 0.064 | 0.39 |

**7471A Mercury (CVAA)**

Analysis Method: 7471A
Prep Method: 7471A
Dilution: 1.0
Analysis Date: 11/04/2014 1346
Prep Date: 11/04/2014 0730

Analysis Batch: 280-251373
Prep Batch: 280-250894

Instrument ID: MT_033
Lab File ID: 141104aa.txt
Initial Weight/Volume: 0.64 g
Final Weight/Volume: 50 mL

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

Client: Washington Closure Hanford

Job Number: 280-61898-1
Sdg Number: JP0877

**Client Sample ID:** J1TWT9

Lab Sample ID: 280-61898-2
Client Matrix: Solid

% Moisture: 5.5

Date Sampled: 10/28/2014 0857
Date Received: 10/30/2014 0930

**6010B Metals (ICP)**

Analysis Method: 6010B
Prep Method: 3050B
Dilution: 1.0
Analysis Date: 11/03/2014 2339
Prep Date: 11/03/2014 0815

Analysis Batch: 280-251210
Prep Batch: 280-250668

2/22/15

Instrument ID: MT_026
Lab File ID: 26f110314.asc
Initial Weight/Volume: 1.00 g
Final Weight/Volume: 100 mL

| Analyte | DryWt Corrected: Y | Result (mg/Kg) | Qualifier | MDL | RL |
|---|---|---|---|---|---|
| Aluminum | | 8300 | X | 1.6 | 5.3 |
| Antimony | | 0.40 | U J | 0.40 | 0.64 |
| Arsenic | | 3.3 | | 0.70 | 1.1 |
| Barium | | 76.8 | X | 0.080 | 0.53 |
| Beryllium | | 0.035 | U | 0.035 | 0.21 |
| Boron | | 1.6 | B | 1.0 | 2.1 |
| Cadmium | | 0.11 | B | 0.043 | 0.21 |
| Calcium | | 4950 | X J | 14.9 | 52.9 |
| Chromium | | 11.5 | X | 0.061 | 0.21 |
| Cobalt | | 7.5 | X | 0.11 | 1.1 |
| Copper | | 13.3 | | 0.23 | 1.1 |
| Iron | | 19200 | X | 4.0 | 5.3 |
| Lead | | 4.4 | | 0.29 | 0.53 |
| Magnesium | | 4370 | X | 3.9 | 21.2 |
| Manganese | | 309 | X | 0.11 | 1.1 |
| Molybdenum | | 0.28 | U | 0.28 | 2.1 |
| Nickel | | 11.3 | X | 0.13 | 4.2 |
| Potassium | | 1520 | | 43.4 | 318 |
| Selenium | | 0.91 | U J | 0.91 | 1.1 |
| Silicon | | 596 | | 6.0 | 10.6 |
| Silver | | 0.17 | U | 0.17 | 0.21 |
| Sodium | | 249 | | 62.5 | 127 |
| Vanadium | | 42.3 | | 0.099 | 2.1 |
| Zinc | | 38.6 | X | 0.42 | 1.1 |

**7471A Mercury (CVAA)**

Analysis Method: 7471A
Prep Method: 7471A
Dilution: 1.0
Analysis Date: 11/04/2014 1353
Prep Date: 11/04/2014 0730

Analysis Batch: 280-251373
Prep Batch: 280-250894

Instrument ID: MT_033
Lab File ID: 141104aa.txt
Initial Weight/Volume: 0.60 g
Final Weight/Volume: 50 mL

| Analyte | DryWt Corrected: Y | Result (mg/Kg) | Qualifier | MDL | RL |
|---|---|---|---|---|---|
| Mercury | | 0.0062 | B | 0.0059 | 0.018 |

Client: Washington Closure Hanford

Job Number: 280-61898-1
Sdg Number: JP0877

**Client Sample ID:** J1TWV0

Lab Sample ID: 280-61898-3
Client Matrix: Solid

% Moisture: 5.2

Date Sampled: 10/28/2014 1003
Date Received: 10/30/2014 0930

**6010B Metals (ICP)**

Analysis Method: 6010B
Prep Method: 3050B
Dilution: 1.0
Analysis Date: 11/03/2014 2342
Prep Date: 11/03/2014 0815

Analysis Batch: 280-251210
Prep Batch: 280-250668

Instrument ID: MT_026
Lab File ID: 26f110314.asc
Initial Weight/Volume: 1.08 g
Final Weight/Volume: 100 mL

✓ 2/22/15

| Analyte | DryWt Corrected: Y | Result (mg/Kg) | Qualifier | MDL | RL |
|---|---|---|---|---|---|
| Aluminum | | 6630 | X | 1.5 | 4.9 |
| Antimony | | 0.37 | U J | 0.37 | 0.59 |
| Arsenic | | 2.9 | | 0.64 | 0.98 |
| Barium | | 61.4 | X | 0.074 | 0.49 |
| Beryllium | | 0.032 | U | 0.032 | 0.20 |
| Boron | | 1.4 | B | 0.96 | 2.0 |
| *Cadmium* | | *0.11* | B | *0.040* | *0.20* |
| Calcium | | 7970 | X J | 13.8 | 48.8 |
| Chromium | | 10.2 | X | 0.057 | 0.20 |
| Cobalt | | 7.0 | X | 0.098 | 0.98 |
| Copper | | 12.7 | | 0.21 | 0.98 |
| Iron | | 17700 | X | 3.7 | 4.9 |
| Lead | | 4.7 | | 0.26 | 0.49 |
| Magnesium | | 4260 | X | 3.6 | 19.5 |
| Manganese | | 265 | X | 0.098 | 0.98 |
| Molybdenum | | 0.25 | U | 0.25 | 2.0 |
| Nickel | | 10.6 | X | 0.12 | 3.9 |
| Potassium | | 1150 | | 40.1 | 293 |
| Selenium | | 1.2 | J | 0.84 | 0.98 |
| Silicon | | 449 | | 5.5 | 9.8 |
| Silver | | 0.16 | U | 0.16 | 0.20 |
| Sodium | | 254 | | 57.6 | 117 |
| Vanadium | | 41.1 | | 0.092 | 2.0 |
| Zinc | | 36.1 | X | 0.39 | 0.98 |

**7471A Mercury (CVAA)**

Analysis Method: 7471A
Prep Method: 7471A
Dilution: 1.0
Analysis Date: 11/04/2014 1355
Prep Date: 11/04/2014 0730

Analysis Batch: 280-251373
Prep Batch: 280-250894

Instrument ID: MT_033
Lab File ID: 141104aa.txt
Initial Weight/Volume: 0.61 g
Final Weight/Volume: 50 mL

| Analyte | DryWt Corrected: Y | Result (mg/Kg) | Qualifier | MDL | RL |
|---|---|---|---|---|---|
| Mercury | | 0.012 | B | 0.0057 | 0.018 |

Client: Washington Closure Hanford

Job Number: 280-61898-1
Sdg Number: JP0877

***Client Sample ID:*** ***J1TWV1***

Lab Sample ID: 280-61898-4
Client Matrix: Solid

% Moisture: 4.6

Date Sampled: 10/28/2014 0907
Date Received: 10/30/2014 0930

**6010B Metals (ICP)**

| | | | | | |
|---|---|---|---|---|---|
| Analysis Method: | 6010B | Analysis Batch: | 280-251210 | Instrument ID: | MT_026 |
| Prep Method: | 3050B | Prep Batch: | 280-250668 | Lab File ID: | 26f110314.asc |
| Dilution: | 1.0 | | | Initial Weight/Volume: | 1.04 g |
| Analysis Date: | 11/03/2014 2345 | | | Final Weight/Volume: | 100 mL |
| Prep Date: | 11/03/2014 0815 | | | | |

2/22/15

| Analyte | DryWt Corrected: Y | Result (mg/Kg) | Qualifier | MDL | RL |
|---|---|---|---|---|---|
| Aluminum | | 7350 | X | 1.6 | 5.0 |
| Antimony | | 0.38 | U J | 0.38 | 0.60 |
| Arsenic | | 2.9 | | 0.66 | 1.0 |
| Barium | | 70.0 | X | 0.077 | 0.50 |
| Beryllium | | 0.033 | U | 0.033 | 0.20 |
| Boron | | 3.2 | | 0.99 | 2.0 |
| *Cadmium* | | *0.097* | *B* | *0.041* | *0.20* |
| Calcium | | 7810 | X J | 14.2 | 50.4 |
| Chromium | | 10.3 | X | 0.058 | 0.20 |
| Cobalt | | 8.3 | X | 0.10 | 1.0 |
| Copper | | 15.4 | | 0.22 | 1.0 |
| Iron | | 21000 | X | 3.8 | 5.0 |
| Lead | | 4.1 | | 0.27 | 0.50 |
| Magnesium | | 4590 | X | 3.7 | 20.1 |
| Manganese | | 309 | X | 0.10 | 1.0 |
| Molybdenum | | 0.26 | U | 0.26 | 2.0 |
| Nickel | | 11.6 | X | 0.12 | 4.0 |
| Potassium | | 1310 | | 41.3 | 302 |
| Selenium | | 0.87 | U | 0.87 | 1.0 |
| Silicon | | 464 | J | 5.7 | 10.1 |
| Silver | | 0.16 | U | 0.16 | 0.20 |
| Sodium | | 260 | | 59.4 | 121 |
| Vanadium | | 50.3 | | 0.095 | 2.0 |
| Zinc | | 41.2 | X | 0.40 | 1.0 |

**7471A Mercury (CVAA)**

| | | | | | |
|---|---|---|---|---|---|
| Analysis Method: | 7471A | Analysis Batch: | 280-251373 | Instrument ID: | MT_033 |
| Prep Method: | 7471A | Prep Batch: | 280-250894 | Lab File ID: | 141104aa.txt |
| Dilution: | 1.0 | | | Initial Weight/Volume: | 0.64 g |
| Analysis Date: | 11/04/2014 1402 | | | Final Weight/Volume: | 50 mL |
| Prep Date: | 11/04/2014 0730 | | | | |

| Analyte | DryWt Corrected: Y | Result (mg/Kg) | Qualifier | MDL | RL |
|---|---|---|---|---|---|
| Mercury | | 0.0056 | B | 0.0054 | 0.017 |

Client: Washington Closure Hanford

Job Number: 280-61898-1
Sdg Number: JP0877

***Client Sample ID:*** ***J1TWV2***

Lab Sample ID: 280-61898-5
Client Matrix: Solid

% Moisture: 7.3

Date Sampled: 10/28/2014 0916
Date Received: 10/30/2014 0930

**6010B Metals (ICP)**

Analysis Method: 6010B
Prep Method: 3050B
Dilution: 1.0
Analysis Date: 11/03/2014 2347
Prep Date: 11/03/2014 0815

Analysis Batch: 280-251210
Prep Batch: 280-250668

Instrument ID: MT_026
Lab File ID: 26f110314.asc
Initial Weight/Volume: 1.14 g
Final Weight/Volume: 100 mL

2/22/15

| Analyte | DryWt Corrected: Y | Result (mg/Kg) | Qualifier | MDL | RL |
|---|---|---|---|---|---|
| Aluminum | | 6800 | X | 1.5 | 4.7 |
| Antimony | | 0.36 | U J | 0.36 | 0.57 |
| Arsenic | | 2.7 | | 0.62 | 0.95 |
| Barium | | 55.8 | X | 0.072 | 0.47 |
| Boron | | 0.93 | U | 0.93 | 1.9 |
| Cadmium | | 0.10 | B | 0.039 | 0.19 |
| *Calcium* | | *8740* | X J | 13.3 | 47.3 |
| Chromium | | 7.2 | X | 0.055 | 0.19 |
| Cobalt | | 10.1 | X | 0.095 | 0.95 |
| Copper | | 16.3 | | 0.21 | 0.95 |
| Iron | | 25400 | X | 3.6 | 4.7 |
| Lead | | 5.0 | | 0.26 | 0.47 |
| Magnesium | | 5120 | X | 3.5 | 18.9 |
| Manganese | | 325 | X | 0.095 | 0.95 |
| Molybdenum | | 0.25 | U | 0.25 | 1.9 |
| Nickel | | 10.1 | X | 0.12 | 3.8 |
| Potassium | | 1010 | | 38.8 | 284 |
| Selenium | | 0.81 | U | 0.81 | 0.95 |
| Silicon | | 383 | J | 5.4 | 9.5 |
| Silver | | 0.15 | U | 0.15 | 0.19 |
| Sodium | | 318 | | 55.9 | 114 |
| Vanadium | | 66.5 | | 0.089 | 1.9 |
| Zinc | | 49.2 | X | 0.38 | 0.95 |

Analysis Method: 6010B
Prep Method: 3050B
Dilution: 5.0
Analysis Date: 11/04/2014 1546
Prep Date: 11/03/2014 0815

Analysis Batch: 280-251399
Prep Batch: 280-250668

Instrument ID: MT_026
Lab File ID: 26a110414.asc
Initial Weight/Volume: 1.14 g
Final Weight/Volume: 100 mL

| Analyte | DryWt Corrected: Y | Result (mg/Kg) | Qualifier | MDL | RL |
|---|---|---|---|---|---|
| Beryllium | | 0.16 | U | 0.16 | 0.95 |

**7471A Mercury (CVAA)**

Analysis Method: 7471A
Prep Method: 7471A
Dilution: 1.0
Analysis Date: 11/04/2014 1404
Prep Date: 11/04/2014 0730

Analysis Batch: 280-251373
Prep Batch: 280-250894

Instrument ID: MT_033
Lab File ID: 141104aa.txt
Initial Weight/Volume: 0.63 g
Final Weight/Volume: 50 mL

| Analyte | DryWt Corrected: Y | Result (mg/Kg) | Qualifier | MDL | RL |
|---|---|---|---|---|---|
| Mercury | | 0.013 | B | 0.0057 | 0.017 |

Client: Washington Closure Hanford

Job Number: 280-61898-1
Sdg Number: JP0877

**Client Sample ID:** **J1TWV3**

Lab Sample ID: 280-61898-6
Client Matrix: Solid

% Moisture: 5.9

Date Sampled: 10/28/2014 0955
Date Received: 10/30/2014 0930

**6010B Metals (ICP)**

Analysis Method: 6010B
Prep Method: 3050B
Dilution: 1.0
Analysis Date: 11/04/2014 0001
Prep Date: 11/03/2014 0815

Analysis Batch: 280-251210
Prep Batch: 280-250668

Instrument ID: MT_026
Lab File ID: 26f110314.asc
Initial Weight/Volume: 1.06 g
Final Weight/Volume: 100 mL

2/22/18

| Analyte | DryWt Corrected: Y | Result (mg/Kg) | Qualifier | MDL | RL |
|---|---|---|---|---|---|
| Aluminum | | 6160 | X | 1.6 | 5.0 |
| Antimony | | 0.38 | U J | 0.38 | 0.60 |
| Arsenic | | 3.0 | | 0.66 | 1.0 |
| Barium | | 51.5 | X | 0.076 | 0.50 |
| Boron | | 0.98 | U | 0.98 | 2.0 |
| Cadmium | | 0.10 | B | 0.041 | 0.20 |
| Calcium | | 8230 | X J | 14.1 | 50.1 |
| Chromium | | 6.7 | X | 0.058 | 0.20 |
| Cobalt | | 9.3 | X | 0.10 | 1.0 |
| Copper | | 14.7 | | 0.22 | 1.0 |
| Iron | | 22400 | X | 3.8 | 5.0 |
| Lead | | 4.3 | | 0.27 | 0.50 |
| Magnesium | | 4610 | X | 3.7 | 20.1 |
| Manganese | | 319 | X | 0.10 | 1.0 |
| Molybdenum | | 0.26 | U | 0.26 | 2.0 |
| Nickel | | 9.8 | X | 0.12 | 4.0 |
| Potassium | | 927 | | 41.1 | 301 |
| Selenium | | 0.86 | U | 0.86 | 1.0 |
| Silicon | | 432 | J | 5.7 | 10.0 |
| Silver | | 0.16 | U | 0.16 | 0.20 |
| Sodium | | 284 | | 59.2 | 120 |
| Vanadium | | 70.5 | | 0.094 | 2.0 |
| Zinc | | 44.5 | X | 0.40 | 1.0 |

Analysis Method: 6010B
Prep Method: 3050B
Dilution: 2.0
Analysis Date: 11/04/2014 1549
Prep Date: 11/03/2014 0815

Analysis Batch: 280-251399
Prep Batch: 280-250668

Instrument ID: MT_026
Lab File ID: 26a110414.asc
Initial Weight/Volume: 1.06 g
Final Weight/Volume: 100 mL

| Analyte | DryWt Corrected: Y | Result (mg/Kg) | Qualifier | MDL | RL |
|---|---|---|---|---|---|
| Beryllium | | 0.066 | U | 0.066 | 0.40 |

**7471A Mercury (CVAA)**

Analysis Method: 7471A
Prep Method: 7471A
Dilution: 1.0
Analysis Date: 11/04/2014 1407
Prep Date: 11/04/2014 0730

Analysis Batch: 280-251373
Prep Batch: 280-250894

Instrument ID: MT_033
Lab File ID: 141104aa.txt
Initial Weight/Volume: 0.63 g
Final Weight/Volume: 50 mL

| Analyte | DryWt Corrected: Y | Result (mg/Kg) | Qualifier | MDL | RL |
|---|---|---|---|---|---|
| Mercury | | 0.0056 | U | 0.0056 | 0.017 |

Client: Washington Closure Hanford

Job Number: 280-61898-1
Sdg Number: JP0877

**Client Sample ID:** J1TWV4

Lab Sample ID: 280-61898-7
Client Matrix: Solid

% Moisture: 7.2

Date Sampled: 10/28/2014 0929
Date Received: 10/30/2014 0930

**6010B Metals (ICP)**

| | | | | | |
|---|---|---|---|---|---|
| Analysis Method: | 6010B | Analysis Batch: | 280-251210 | Instrument ID: | MT_026 |
| Prep Method: | 3050B | Prep Batch: | 280-250668 | Lab File ID: | 26f110314.asc |
| Dilution: | 1.0 | | | Initial Weight/Volume: | 1.02 g |
| Analysis Date: | 11/04/2014 0003 | | | Final Weight/Volume: | 100 mL |
| Prep Date: | 11/03/2014 0815 | | | | |

V 2/22/15

| Analyte | DryWt Corrected: Y | Result (mg/Kg) | Qualifier | MDL | RL |
|---|---|---|---|---|---|
| Aluminum | | 6240 | X | 1.6 | 5.3 |
| Antimony | | 0.40 | U J | 0.40 | 0.63 |
| Arsenic | | 2.9 | | 0.70 | 1.1 |
| Barium | | 65.3 | X | 0.080 | 0.53 |
| Beryllium | | 0.035 | U | 0.035 | 0.21 |
| Boron | | 1.1 | B | 1.0 | 2.1 |
| Cadmium | | 0.12 | B | 0.043 | 0.21 |
| Calcium | | 7530 | X J | 14.9 | 52.8 |
| Chromium | | 9.5 | X | 0.061 | 0.21 |
| Cobalt | | 8.2 | X | 0.11 | 1.1 |
| Copper | | 13.1 | | 0.23 | 1.1 |
| Iron | | 20800 | X | 4.0 | 5.3 |
| Lead | | 4.4 | | 0.29 | 0.53 |
| Magnesium | | 4170 | X | 3.9 | 21.1 |
| Manganese | | 290 | X | 0.11 | 1.1 |
| Molybdenum | | 0.27 | U | 0.27 | 2.1 |
| Nickel | | 10.7 | X | 0.13 | 4.2 |
| Potassium | | 1090 | | 43.3 | 317 |
| Selenium | | 0.92 | B | 0.91 | 1.1 |
| Silicon | | 486 | J | 6.0 | 10.6 |
| Silver | | 0.17 | U | 0.17 | 0.21 |
| Sodium | | 245 | | 62.3 | 127 |
| Vanadium | | 55.0 | | 0.099 | 2.1 |
| Zinc | | 47.1 | X | 0.42 | 1.1 |

**7471A Mercury (CVAA)**

| | | | | | |
|---|---|---|---|---|---|
| Analysis Method: | 7471A | Analysis Batch: | 280-251373 | Instrument ID: | MT_033 |
| Prep Method: | 7471A | Prep Batch: | 280-250894 | Lab File ID: | 141104aa.txt |
| Dilution: | 1.0 | | | Initial Weight/Volume: | 0.69 g |
| Analysis Date: | 11/04/2014 1409 | | | Final Weight/Volume: | 50 mL |
| Prep Date: | 11/04/2014 0730 | | | | |

| Analyte | DryWt Corrected: Y | Result (mg/Kg) | Qualifier | MDL | RL |
|---|---|---|---|---|---|
| Mercury | | 0.011 | B | 0.0052 | 0.016 |

Client: Washington Closure Hanford

Job Number: 280-61898-1
Sdg Number: JP0877

**Client Sample ID:** **J1TWV5**

Lab Sample ID: 280-61898-8
Client Matrix: Solid

% Moisture: 8.8

Date Sampled: 10/28/2014 0925
Date Received: 10/30/2014 0930

## 6010B Metals (ICP)

Analysis Method: 6010B
Prep Method: 3050B
Dilution: 1.0
Analysis Date: 11/04/2014 0006
Prep Date: 11/03/2014 0815

Analysis Batch: 280-251210
Prep Batch: 280-250668

Instrument ID: MT_026
Lab File ID: 26f110314.asc
Initial Weight/Volume: 1.03 g
Final Weight/Volume: 100 mL

r 2/22/15

| Analyte | DryWt Corrected: Y | Result (mg/Kg) | Qualifier | MDL | RL |
|---|---|---|---|---|---|
| Aluminum | | 6390 | X | 1.7 | 5.3 |
| Antimony | | 0.40 | U J | 0.40 | 0.64 |
| Arsenic | | 2.6 | | 0.70 | 1.1 |
| Barium | | 67.0 | X | 0.081 | 0.53 |
| Boron | | 1.0 | U | 1.0 | 2.1 |
| Cadmium | | 0.10 | B | 0.044 | 0.21 |
| *Calcium* | | *8770* | X J | *15.0* | *53.2* |
| Chromium | | 6.5 | X | 0.062 | 0.21 |
| Cobalt | | 9.5 | X | 0.11 | 1.1 |
| Copper | | 14.6 | | 0.23 | 1.1 |
| Iron | | 23500 | X | 4.0 | 5.3 |
| Lead | | 4.0 | | 0.29 | 0.53 |
| Magnesium | | 4580 | X | 3.9 | 21.3 |
| Manganese | | 308 | X | 0.11 | 1.1 |
| Molybdenum | | 0.28 | U | 0.28 | 2.1 |
| Nickel | | 10.1 | X | 0.13 | 4.3 |
| Potassium | | 985 | | 43.7 | 319 |
| Selenium | | 0.92 | U | 0.92 | 1.1 |
| Silicon | | 440 | J | 6.0 | 10.6 |
| Silver | | 0.17 | U | 0.17 | 0.21 |
| Sodium | | 315 | | 62.8 | 128 |
| Vanadium | | 63.3 | | 0.10 | 2.1 |
| Zinc | | 46.2 | X | 0.42 | 1.1 |

Analysis Method: 6010B
Prep Method: 3050B
Dilution: 2.0
Analysis Date: 11/05/2014 1640
Prep Date: 11/03/2014 0815

Analysis Batch: 280-251617
Prep Batch: 280-250668

Instrument ID: MT_026
Lab File ID: 26a110614.asc
Initial Weight/Volume: 1.03 g
Final Weight/Volume: 100 mL

| Analyte | DryWt Corrected: Y | Result (mg/Kg) | Qualifier | MDL | RL |
|---|---|---|---|---|---|
| Beryllium | | 0.070 | U | 0.070 | 0.43 |

## 7471A Mercury (CVAA)

Analysis Method: 7471A
Prep Method: 7471A
Dilution: 1.0
Analysis Date: 11/04/2014 1411
Prep Date: 11/04/2014 0730

Analysis Batch: 280-251373
Prep Batch: 280-250894

Instrument ID: MT_033
Lab File ID: 141104aa.txt
Initial Weight/Volume: 0.60 g
Final Weight/Volume: 50 mL

| Analyte | DryWt Corrected: Y | Result (mg/Kg) | Qualifier | MDL | RL |
|---|---|---|---|---|---|
| Mercury | | 0.017 | B | 0.0061 | 0.019 |

Client: Washington Closure Hanford

Job Number: 280-61898-1
Sdg Number: JP0877

**Client Sample ID:** J1TWV6

Lab Sample ID: 280-61898-9
Client Matrix: Solid

% Moisture: 6.1

Date Sampled: 10/28/2014 0948
Date Received: 10/30/2014 0930

**6010B Metals (ICP)**

Analysis Method: 6010B
Prep Method: 3050B
Dilution: 1.0
Analysis Date: 11/04/2014 0009
Prep Date: 11/03/2014 0815

Analysis Batch: 280-251210
Prep Batch: 280-250668

Instrument ID: MT_026
Lab File ID: 26f110314.asc
Initial Weight/Volume: 1.03 g
Final Weight/Volume: 100 mL

2/22/15

| Analyte | DryWt Corrected: Y | Result (mg/Kg) | Qualifier | MDL | RL |
|---|---|---|---|---|---|
| Aluminum | | 5110 | X | 1.6 | 5.2 |
| Antimony | | 0.39 | U J | 0.39 | 0.62 |
| Arsenic | | 2.6 | | 0.68 | 1.0 |
| Barium | | 56.6 | X | 0.079 | 0.52 |
| Boron | | 1.0 | U | 1.0 | 2.1 |
| Cadmium | | 0.10 | B | 0.042 | 0.21 |
| Calcium | | 7060 | X J | 14.6 | 51.7 |
| Chromium | | 6.4 | X | 0.060 | 0.21 |
| Cobalt | | 8.8 | X | 0.10 | 1.0 |
| Copper | | 12.5 | | 0.22 | 1.0 |
| Iron | | 21300 | X | 3.9 | 5.2 |
| Lead | | 3.3 | | 0.28 | 0.52 |
| Magnesium | | 4330 | X | 3.8 | 20.7 |
| Manganese | | 286 | X | 0.10 | 1.0 |
| Molybdenum | | 0.27 | U | 0.27 | 2.1 |
| Nickel | | 8.6 | X | 0.13 | 4.1 |
| Potassium | | 845 | | 42.4 | 310 |
| Selenium | | 0.89 | U | 0.89 | 1.0 |
| Silicon | | 455 | J | 5.9 | 10.3 |
| Silver | | 0.17 | U | 0.17 | 0.21 |
| Sodium | | 221 | | 61.0 | 124 |
| Vanadium | | 53.6 | | 0.097 | 2.1 |
| Zinc | | 39.7 | X | 0.41 | 1.0 |

Analysis Method: 6010B
Prep Method: 3050B
Dilution: 2.0
Analysis Date: 11/05/2014 1643
Prep Date: 11/03/2014 0815

Analysis Batch: 280-251617
Prep Batch: 280-250668

Instrument ID: MT_026
Lab File ID: 26a110614.asc
Initial Weight/Volume: 1.03 g
Final Weight/Volume: 100 mL

| Analyte | DryWt Corrected: Y | Result (mg/Kg) | Qualifier | MDL | RL |
|---|---|---|---|---|---|
| Beryllium | | 0.068 | U | 0.068 | 0.41 |

**7471A Mercury (CVAA)**

Analysis Method: 7471A
Prep Method: 7471A
Dilution: 1.0
Analysis Date: 11/04/2014 1413
Prep Date: 11/04/2014 0730

Analysis Batch: 280-251373
Prep Batch: 280-250894

Instrument ID: MT_033
Lab File ID: 141104aa.txt
Initial Weight/Volume: 0.61 g
Final Weight/Volume: 50 mL

| Analyte | DryWt Corrected: Y | Result (mg/Kg) | Qualifier | MDL | RL |
|---|---|---|---|---|---|
| Mercury | | 0.0058 | U | 0.0058 | 0.018 |

Client: Washington Closure Hanford

Job Number: 280-61898-1
Sdg Number: JP0877

***Client Sample ID:*** ***J1TWV7***

Lab Sample ID: 280-61898-10
Client Matrix: Solid

% Moisture: 9.4

Date Sampled: 10/28/2014 1018
Date Received: 10/30/2014 0930

**6010B Metals (ICP)**

Analysis Method: 6010B
Prep Method: 3050B
Dilution: 1.0
Analysis Date: 11/04/2014 0011
Prep Date: 11/03/2014 0815

Analysis Batch: 280-251210
Prep Batch: 280-250668

Instrument ID: MT_026
Lab File ID: 26f110314.asc
Initial Weight/Volume: 1.13 g
Final Weight/Volume: 100 mL

✓ 2/22/15

| Analyte | DryWt Corrected: Y | Result (mg/Kg) | Qualifier | MDL | RL |
|---|---|---|---|---|---|
| Aluminum | | 4860 | X | 1.5 | 4.9 |
| Antimony | | 0.37 | U J | 0.37 | 0.59 |
| Arsenic | | 2.3 | | 0.64 | 0.98 |
| Barium | | 57.8 | X | 0.074 | 0.49 |
| Boron | | 0.96 | U | 0.96 | 2.0 |
| Cadmium | | 0.11 | B | 0.040 | 0.20 |
| *Calcium* | | *7680* | X J | *13.8* | *48.9* |
| Chromium | | 6.1 | X | 0.057 | 0.20 |
| Cobalt | | 8.4 | X | 0.098 | 0.98 |
| Copper | | 13.9 | | 0.21 | 0.98 |
| Iron | | 21300 | X | 3.7 | 4.9 |
| Lead | | 7.3 | | 0.26 | 0.49 |
| Magnesium | | 3810 | X | 3.6 | 19.5 |
| Manganese | | 264 | X | 0.098 | 0.98 |
| Molybdenum | | 0.25 | U | 0.25 | 2.0 |
| Nickel | | 7.7 | X | 0.12 | 3.9 |
| Potassium | | 725 | | 40.1 | 293 |
| Selenium | | 0.99 | J | 0.84 | 0.98 |
| Silicon | | 434 | | 5.5 | 9.8 |
| Silver | | 0.16 | U | 0.16 | 0.20 |
| Sodium | | 257 | | 57.7 | 117 |
| Vanadium | | 54.4 | | 0.092 | 2.0 |
| Zinc | | 107 | X | 0.39 | 0.98 |

Analysis Method: 6010B
Prep Method: 3050B
Dilution: 2.0
Analysis Date: 11/05/2014 1645
Prep Date: 11/03/2014 0815

Analysis Batch: 280-251617
Prep Batch: 280-250668

Instrument ID: MT_026
Lab File ID: 26a110614.asc
Initial Weight/Volume: 1.13 g
Final Weight/Volume: 100 mL

| Analyte | DryWt Corrected: Y | Result (mg/Kg) | Qualifier | MDL | RL |
|---|---|---|---|---|---|
| Beryllium | | 0.064 | U | 0.064 | 0.39 |

**7471A Mercury (CVAA)**

Analysis Method: 7471A
Prep Method: 7471A
Dilution: 1.0
Analysis Date: 11/04/2014 1420
Prep Date: 11/04/2014 0730

Analysis Batch: 280-251373
Prep Batch: 280-250894

Instrument ID: MT_033
Lab File ID: 141104aa.txt
Initial Weight/Volume: 0.61 g
Final Weight/Volume: 50 mL

| Analyte | DryWt Corrected: Y | Result (mg/Kg) | Qualifier | MDL | RL |
|---|---|---|---|---|---|
| Mercury | | 0.0060 | U | 0.0060 | 0.018 |

Client: Washington Closure Hanford

Job Number: 280-61898-1
Sdg Number: JP0877

***Client Sample ID:*** ***J1TWV8***

Lab Sample ID: 280-61898-11
Client Matrix: Solid
% Moisture: 6.9

Date Sampled: 10/28/2014 0933
Date Received: 10/30/2014 0930

**6010B Metals (ICP)**

| | | | | | |
|---|---|---|---|---|---|
| Analysis Method: | 6010B | Analysis Batch: | 280-251210 | Instrument ID: | MT_026 |
| Prep Method: | 3050B | Prep Batch: | 280-250668 | Lab File ID: | 26f110314.asc |
| Dilution: | 1.0 | | | Initial Weight/Volume: | 1.09 g |
| Analysis Date: | 11/04/2014 0014 | | | Final Weight/Volume: | 100 mL |
| Prep Date: | 11/03/2014 0815 | | | | |

2/22/15

| Analyte | DryWt Corrected: Y | Result (mg/Kg) | Qualifier | MDL | RL |
|---|---|---|---|---|---|
| Aluminum | | 5820 | X | 1.5 | 4.9 |
| Antimony | | 0.37 | U J | 0.37 | 0.59 |
| Arsenic | | 2.6 | | 0.65 | 0.99 |
| Barium | | 64.7 | X | 0.075 | 0.49 |
| Boron | | 0.97 | U | 0.97 | 2.0 |
| Cadmium | | 0.12 | B | 0.040 | 0.20 |
| *Calcium* | | *6300* | X J | *13.9* | *49.3* |
| Chromium | | 9.1 | X | 0.057 | 0.20 |
| Cobalt | | 8.6 | X | 0.099 | 0.99 |
| Copper | | 13.9 | | 0.21 | 0.99 |
| Iron | | 22300 | X | 3.7 | 4.9 |
| Lead | | 6.0 | | 0.27 | 0.49 |
| Magnesium | | 4280 | X | 3.6 | 19.7 |
| Manganese | | 289 | X | 0.099 | 0.99 |
| Molybdenum | | 0.26 | U | 0.26 | 2.0 |
| Nickel | | 9.0 | X | 0.12 | 3.9 |
| Potassium | | 957 | | 40.4 | 296 |
| Selenium | | 0.85 | U | 0.85 | 0.99 |
| Silicon | | 418 | | 5.6 | 9.9 |
| Silver | | 0.16 | U J | 0.16 | 0.20 |
| Sodium | | 510 | | 58.1 | 118 |
| Vanadium | | 56.9 | | 0.093 | 2.0 |
| Zinc | | 63.6 | X | 0.39 | 0.99 |

| | | | | | |
|---|---|---|---|---|---|
| Analysis Method: | 6010B | Analysis Batch: | 280-251617 | Instrument ID: | MT_026 |
| Prep Method: | 3050B | Prep Batch: | 280-250668 | Lab File ID: | 26a110614.asc |
| Dilution: | 2.0 | | | Initial Weight/Volume: | 1.09 g |
| Analysis Date: | 11/05/2014 1648 | | | Final Weight/Volume: | 100 mL |
| Prep Date: | 11/03/2014 0815 | | | | |

| Analyte | DryWt Corrected: Y | Result (mg/Kg) | Qualifier | MDL | RL |
|---|---|---|---|---|---|
| Beryllium | | 0.065 | U | 0.065 | 0.39 |

**7471A Mercury (CVAA)**

| | | | | | |
|---|---|---|---|---|---|
| Analysis Method: | 7471A | Analysis Batch: | 280-251373 | Instrument ID: | MT_033 |
| Prep Method: | 7471A | Prep Batch: | 280-250894 | Lab File ID: | 141104aa.txt |
| Dilution: | 1.0 | | | Initial Weight/Volume: | 0.65 g |
| Analysis Date: | 11/04/2014 1423 | | | Final Weight/Volume: | 50 mL |
| Prep Date: | 11/04/2014 0730 | | | | |

| Analyte | DryWt Corrected: Y | Result (mg/Kg) | Qualifier | MDL | RL |
|---|---|---|---|---|---|
| Mercury | | 0.069 | | 0.0055 | 0.017 |

Client: Washington Closure Hanford

Job Number: 280-61898-1
Sdg Number: JP0877

***Client Sample ID:*** ***J1TWV9***

Lab Sample ID: 280-61898-12
Client Matrix: Solid
% Moisture: 8.2

Date Sampled: 10/28/2014 0943
Date Received: 10/30/2014 0930

**6010B Metals (ICP)**

Analysis Method: 6010B
Prep Method: 3050B
Dilution: 1.0
Analysis Date: 11/04/2014 0017
Prep Date: 11/03/2014 0815

Analysis Batch: 280-251210
Prep Batch: 280-250668

Instrument ID: MT_026
Lab File ID: 26f110314.asc
Initial Weight/Volume: 1.10 g
Final Weight/Volume: 100 mL

2/22/15

| Analyte | DryWt Corrected: Y | Result (mg/Kg) | Qualifier | MDL | RL |
|---|---|---|---|---|---|
| Aluminum | | 4460 | X | 1.5 | 4.9 |
| Antimony | | 0.38 | U J | 0.38 | 0.59 |
| Arsenic | | 2.0 | | 0.65 | 0.99 |
| Barium | | 55.6 | X | 0.075 | 0.49 |
| Boron | | 0.97 | U | 0.97 | 2.0 |
| Cadmium | | 0.094 | B | 0.041 | 0.20 |
| Calcium | | 5770 | X J | 14.0 | 49.5 |
| Chromium | | 5.4 | X | 0.057 | 0.20 |
| Cobalt | | 9.7 | X | 0.099 | 0.99 |
| Copper | | 12.0 | | 0.21 | 0.99 |
| Iron | | 22100 | X | 3.8 | 4.9 |
| Lead | | 3.6 | | 0.27 | 0.49 |
| Magnesium | | 4090 | X | 3.7 | 19.8 |
| Manganese | | 274 | X | 0.099 | 0.99 |
| Molybdenum | | 0.26 | U | 0.26 | 2.0 |
| Nickel | | 8.1 | X | 0.12 | 4.0 |
| Potassium | | 648 | | 40.6 | 297 |
| Selenium | | 0.85 | U | 0.85 | 0.99 |
| Silicon | | 360 | J | 5.6 | 9.9 |
| Silver | | 0.16 | U | 0.16 | 0.20 |
| Sodium | | 258 | | 58.4 | 119 |
| Vanadium | | 59.9 | | 0.093 | 2.0 |
| Zinc | | 46.9 | X | 0.39 | 0.99 |

Analysis Method: 6010B
Prep Method: 3050B
Dilution: 5.0
Analysis Date: 11/05/2014 1650
Prep Date: 11/03/2014 0815

Analysis Batch: 280-251617
Prep Batch: 280-250668

Instrument ID: MT_026
Lab File ID: 26a110614.asc
Initial Weight/Volume: 1.10 g
Final Weight/Volume: 100 mL

| Analyte | DryWt Corrected: Y | Result (mg/Kg) | Qualifier | MDL | RL |
|---|---|---|---|---|---|
| Beryllium | | 0.16 | U | 0.16 | 0.99 |

**7471A Mercury (CVAA)**

Analysis Method: 7471A
Prep Method: 7471A
Dilution: 1.0
Analysis Date: 11/04/2014 1425
Prep Date: 11/04/2014 0730

Analysis Batch: 280-251373
Prep Batch: 280-250894

Instrument ID: MT_033
Lab File ID: 141104aa.txt
Initial Weight/Volume: 0.66 g
Final Weight/Volume: 50 mL

| Analyte | DryWt Corrected: Y | Result (mg/Kg) | Qualifier | MDL | RL |
|---|---|---|---|---|---|
| Mercury | | 0.0064 | B | 0.0055 | 0.017 |

Client: Washington Closure Hanford

Job Number: 280-61898-1
Sdg Number: JP0877

**Client Sample ID:** J1TWW0

Lab Sample ID: 280-61898-13
Client Matrix: Solid

% Moisture: 5.2

Date Sampled: 10/28/2014 0857
Date Received: 10/30/2014 0930

**6010B Metals (ICP)**

Analysis Method: 6010B
Prep Method: 3050B
Dilution: 1.0
Analysis Date: 11/04/2014 0019
Prep Date: 11/03/2014 0815

Analysis Batch: 280-251210
Prep Batch: 280-250668

Instrument ID: MT_026
Lab File ID: 26f110314.asc
Initial Weight/Volume: 1.03 g
Final Weight/Volume: 100 mL

V 2/22/15

| Analyte | DryWt Corrected: Y | Result (mg/Kg) | Qualifier | MDL | RL |
|---|---|---|---|---|---|
| Aluminum | | 8190 | X J | 1.6 | 5.1 |
| Antimony | | 0.39 | U | 0.39 | 0.61 |
| Arsenic | | 3.0 | | 0.68 | 1.0 |
| Barium | | 73.9 | X | 0.078 | 0.51 |
| Beryllium | | 0.034 | U | 0.034 | 0.20 |
| Boron | | 1.2 | B | 1.0 | 2.0 |
| *Cadmium* | | *0.083* | *B* | *0.042* | *0.20* |
| Calcium | | 4710 | X J | 14.4 | 51.2 |
| Chromium | | 12.4 | X | 0.059 | 0.20 |
| Cobalt | | 7.3 | X | 0.10 | 1.0 |
| Copper | | 13.0 | | 0.22 | 1.0 |
| Iron | | 19100 | X | 3.9 | 5.1 |
| Lead | | 4.2 | | 0.28 | 0.51 |
| Magnesium | | 4480 | X | 3.8 | 20.5 |
| Manganese | | 295 | X | 0.10 | 1.0 |
| Molybdenum | | 0.27 | U | 0.27 | 2.0 |
| Nickel | | 12.0 | X | 0.13 | 4.1 |
| Potassium | | 1580 | | 42.0 | 307 |
| Selenium | | 0.88 | U J | 0.88 | 1.0 |
| Silicon | | 520 | | 5.8 | 10.2 |
| Silver | | 0.16 | U | 0.16 | 0.20 |
| Sodium | | 222 | | 60.4 | 123 |
| Vanadium | | 42.0 | | 0.096 | 2.0 |
| Zinc | | 37.3 | X | 0.41 | 1.0 |

**7471A Mercury (CVAA)**

Analysis Method: 7471A
Prep Method: 7471A
Dilution: 1.0
Analysis Date: 11/04/2014 1427
Prep Date: 11/04/2014 0730

Analysis Batch: 280-251373
Prep Batch: 280-250894

Instrument ID: MT_033
Lab File ID: 141104aa.txt
Initial Weight/Volume: 0.61 g
Final Weight/Volume: 50 mL

| Analyte | DryWt Corrected: Y | Result (mg/Kg) | Qualifier | MDL | RL |
|---|---|---|---|---|---|
| Mercury | | 0.0057 | U | 0.0057 | 0.018 |

Client: Washington Closure Hanford

Job Number: 280-61898-1
Sdg Number: JP0877

***Client Sample ID:*** **J1TWW1**

Lab Sample ID: 280-61898-14
Client Matrix: Solid

% Moisture: 0.2

Date Sampled: 10/28/2014 0850
Date Received: 10/30/2014 0930

**6010B Metals (ICP)**

Analysis Method: 6010B
Prep Method: 3050B
Dilution: 1.0
Analysis Date: 11/04/2014 0022
Prep Date: 11/03/2014 0815

Analysis Batch: 280-251210
Prep Batch: 280-250668

Instrument ID: MT_026
Lab File ID: 26f110314.asc
Initial Weight/Volume: 1.17 g
Final Weight/Volume: 100 mL

| Analyte | DryWt Corrected: Y | Result (mg/Kg) | Qualifier | MDL | RL |
|---|---|---|---|---|---|
| Aluminum | | 179 | X | 1.3 | 4.3 |
| Antimony | | 0.33 | U J | 0.33 | 0.51 |
| Arsenic | | 0.57 | U | 0.57 | 0.86 |
| Barium | | 1.8 | X | 0.065 | 0.43 |
| Beryllium | | 0.028 | U | 0.028 | 0.17 |
| Boron | | 0.84 | U | 0.84 | 1.7 |
| Cadmium | | 0.035 | U | 0.035 | 0.17 |
| Calcium | | 34.0 | B X J | 12.1 | 42.8 |
| Chromium | | 0.14 | B X | 0.050 | 0.17 |
| Cobalt | | 0.11 | B X | 0.086 | 0.86 |
| Copper | | 0.19 | U | 0.19 | 0.86 |
| Iron | | 216 | X | 3.3 | 4.3 |
| Lead | | 0.37 | B | 0.23 | 0.43 |
| Magnesium | | 21.3 | X | 3.2 | 17.1 |
| Manganese | | 4.3 | X | 0.086 | 0.86 |
| Molybdenum | | 0.22 | U | 0.22 | 1.7 |
| Nickel | | 0.14 | B X | 0.11 | 3.4 |
| Potassium | | 51.3 | B | 35.1 | 257 |
| Selenium | | 0.74 | U | 0.74 | 0.86 |
| Silicon | | 118 | J | 4.8 | 8.6 |
| Silver | | 0.14 | U | 0.14 | 0.17 |
| Sodium | | 50.5 | U | 50.5 | 103 |
| Vanadium | | 0.34 | B C UJ | 0.080 | 1.7 |
| Zinc | | 1.1 | X | 0.34 | 0.86 |

**7471A Mercury (CVAA)**

Analysis Method: 7471A
Prep Method: 7471A
Dilution: 1.0
Analysis Date: 11/04/2014 1430
Prep Date: 11/04/2014 0730

Analysis Batch: 280-251373
Prep Batch: 280-250894

Instrument ID: MT_033
Lab File ID: 141104aa.txt
Initial Weight/Volume: 0.65 g
Final Weight/Volume: 50 mL

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

## Appendix 4

## Laboratory Narrative and Chain-of-Custody Documentation

# CASE NARRATIVE

## Client: Washington Closure Hanford

## Project: WASHINGTON CLOSURE HANFORD

## Report Number: 280-61898-1

**SDG #: JP0877**
**SAF#: RC-075**

**Date SDG Closed: October 30, 2014**
**Data Deliverable: 7 Day / Summary**

| CLIENT ID | LAB ID | ANALYSES REQUESTED | ANALYSES PERFORMED |
|---|---|---|---|
| J1TWT8 | 280-61898-1 | 6010/7471/8310/8082/8081 | 6010B/7471A/8310/8082/8081A |
| J1TWT9 | 280-61898-2 | 6010/7471/8310/8082/8081 | 6010B/7471A/8310/8082/8081A |
| J1TWV0 | 280-61898-3 | 6010/7471/8310/8082/8081 | 6010B/7471A/8310/8082/8081A |
| J1TWV1 | 280-61898-4 | 6010/7471/8310/8082/8081 | 6010B/7471A/8310/8082/8081A |
| J1TWV2 | 280-61898-5 | 6010/7471/8310/8082/8081 | 6010B/7471A/8310/8082/8081A |
| J1TWV3 | 280-61898-6 | 6010/7471/8310/8082/8081 | 6010B/7471A/8310/8082/8081A |
| J1TWV4 | 280-61898-7 | 6010/7471/8310/8082/8081 | 6010B/7471A/8310/8082/8081A |
| J1TWV5 | 280-61898-8 | 6010/7471/8310/8082/8081 | 6010B/7471A/8310/8082/8081A |
| J1TWV6 | 280-61898-9 | 6010/7471/8310/8082/8081 | 6010B/7471A/8310/8082/8081A |
| J1TWV7 | 280-61898-10 | 6010/7471/8310/8082/8081 | 6010B/7471A/8310/8082/8081A |
| J1TWV8 | 280-61898-11 | 6010/7471/8310/8082/8081 | 6010B/7471A/8310/8082/8081A |
| J1TWV9 | 280-61898-12 | 6010/7471/8310/8082/8081 | 6010B/7471A/8310/8082/8081A |
| J1TWW0 | 280-61898-13 | 6010/7471/8310/8082/8081 | 6010B/7471A/8310/8082/8081A |
| J1TWW1 | 280-61898-14 | 6010/7471/8310 | 6010B/7471A/8310 |

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 10/30/2014 9:30 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperatures of the 2 coolers at receipt time were 1.3° C and 1.5° C.

The samples presented in this report contained large rocks that were not included in the aliquots used for extraction and/or analysis.

**GC SEMIVOLATILES - SW846 8081A - Pesticides**
The organic prep laboratory noted that a Florisil clean-up was performed on the samples presented in this report to reduce matrix interferences.

The laboratory noted that the samples presented in this report contained numerous non-target peaks and significant baseline rise that could be interfering with the identification and quantitation of target analytes. This inference could cause false positive and/or negative results. The interference appears to be Aroclors/PCBs which had numerous peaks.

The RPD between the primary and confirmation columns exceeded 40% for analytes in several samples. The lower of the two values have been reported, as matrix interference is evident. Associated results have been flagged with an "X".

Each sample is analyzed to achieve the lowest possible reporting limits within the constraints of the method. Due to the presence of interfering, non-target analytes, samples J1TWV0 and J1TWV7 required dilutions prior to analysis, and the associated results have been flagged with a "D". The reporting limits have been adjusted relative to the dilution required.

Surrogate recoveries obtained for samples J1TWV0 and J1TWV7 are calculated from diluted samples and are not considered reliable.

A Continuing Calibration Verification (CCV) standard associated with samples J1TWT8 and J1TWV3 in analysis batch 280-251090 exhibited %Difference (%D) values >15%, biased low, for 4,4'-DDT (-25%, -24%). The overall mean %D is ≤15%; therefore, method criteria have been met and corrective action is deemed unnecessary.

No other anomalies were encountered.

**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.

It can be noted that Aroclor 1221 is reported from a separate injection in order to acquire/maintain the associated second column confirmation chromatographic data for the samples. Due to a system limitation, this reporting style is necessary when samples are analyzed on a non-sequential injection instrument and second column confirmation is required.

Each sample is analyzed to achieve the lowest possible reporting limits within the constraints of the method. Due to the high constituent concentration, samples J1TWV0, J1TWV2, J1TWV4 and J1TWV7 had to be analyzed at dilutions, and the associated results have been flagged with a "D". The reporting limits have been adjusted relative to the dilutions required.

Surrogate recoveries obtained for samples J1TWV0, J1TWV2, J1TWV4 and J1TWV7 are calculated from diluted samples and are not considered reliable.

Spike compound recoveries, RPD data and surrogate recoveries obtained for the MS/MSD performed on sample J1TWV2 are calculated from a diluted sample and are not considered reliable. The acceptable LCS analysis data indicated that the analytical system was operating within control.

No other anomalies were encountered.

**HPLC - SW846 8310 - PAHs**

The RPD between the primary and confirmation columns exceeded 40% for analytes in samples J1TW0, J1TWV4, J1TWV7 and J1TWV8. The lower of the two values has been reported, as matrix interference is evident on both columns. Associated results have been flagged with an "X".

The LCS associated with batch 280-250638 exhibited the percent recovery outside the control limits for Benzo[k]fluoranthene at 84% (lower limit 85%), and associated sample results have been flagged "N". Although Benzo[k]fluoranthene was recovered outside current historical control limits, the recovery was within the allowed Marginal Exceedance control limits. This marginal exceedance has been determined to be sporadic, not systematic, and all other quality control acceptance criteria have been met; therefore, corrective action is deemed unnecessary.

The MS/MSD performed on sample J1TWV2 exhibited percent recoveries outside the control limits for Benzo[a]anthracene and Dibenzo(a,h)anthracene, and the associated sample results have been flagged "N". The acceptable LCS analysis data indicated that the analytical system was operating within control; therefore, corrective action is deemed unnecessary.

No other anomalies were encountered.

**TOTAL METALS - SW846 6010B/7471A**

Serial dilution of a digestate in batch 280-250668 indicates that physical and chemical interferences are present for several elements. Results have been flagged with an "X".

Each sample is analyzed to achieve the lowest possible reporting limits within the constraints of the methods. Due to matrix interference, the Beryllium analysis of several samples had to be performed at a dilution. The reporting limits have been adjusted relative to the dilution required.

Low levels of Vanadium are present in the method blank associated with batch 280-250668. Because the concentration in the method blank is not present at a level greater than half the reporting limit, corrective action is deemed unnecessary.

It can be noted that the sample amount was greater than four times the spike amount for Aluminum, Iron and Manganese in the Matrix Spike performed on sample J1TWT8; therefore, control limits are not applicable.

The duplicate analysis of sample J1TWT8 exhibited RPD data outside the control limits for Cadmium and Nickel, 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.

# Washington Closure Hanford

# CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

RC-075-441



| | | | |
|---|---|---|---|
| Collector: H. Weber | Company Contact: Joan Kessner | Telephone No.: 375-4688 | Project Coordinator: KESSNER, JH |
| Price Code: 8B | Data Turnaround: 7 days | | |
| Project Designation: 100-D/DR Field Remediation | Sampling Location: 100-D-86:3, Verification II | | SAF No.: RC-075 |
| Chest No.: RCC-07-015 | Field Logbook No.: EL-1662-02 03 10/28/14 | COA: 01D8632000 | Method of Shipment: Commercial Carrier / Fed Ex |
| Shipped To: TestAmerica Denver | Offsite Property No.: A13/281 | | Bill of Lading/Air Bill No.: See OSPC |
| Other Labs Shipped To: TestAmerica Richland RCF37029 | | | |

POSSIBLE SAMPLE HAZARDS/REMARKS

N/A

Special Handling and/or Storage

Cool 4C

| Sample No. | Matrix | Sample Date | Sample Time | Preservation: Cool 4C | Cool 4C | Cool 4C | Cool 4C | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Type of Container: G/P | aG | aG | aG | | | | | | |
| | | | | No. of Container(s): 1 | 1 | 1 | 1 | | | | | | |
| | | | | Volume: 250mL | 250mL | 250mL | 250mL | | | | | | |
| | | | | Sample Analysis: See item (1) in Special Instructions | PAHs - 8310 | PCBs - 8082 | Pesticides - 8081 | | | | | | |
| J1TWT8 | SOIL | 10/28/14 | 1008 | X | X | X | X | | | | | | |
| J1TWT9 | SOIL | 10/28/14 | 0857 | X | X | X | X | | | | | | |
| J1TWV0 | SOIL | 10/28/14 | 1003 | X | X | X | X | | | | | | |
| J1TWV1 | SOIL | 10/28/14 | 0907 | X | X | X | X | | | | | | |
| J1TWV2 | SOIL | 10/28/14 | 0916 | X | X | X | X | | | | | | |

Page 1 of 2

## CHAIN OF POSSESSION

| Relinquished By/Removed From | Date/Time | Received By/Stored In | Date/Time |
|---|---|---|---|
| Leather Weber | 10/28/14 1025 | WCH DWSHEA | 10/28/14 1035 |
| DWSHEA DWSHEA | 10/28/14 1545 | C. Bingham | 10-28-14 1545 |
| C. Bingham | 10-28-14 1550 | 1060 Battelle, fridge #2A | 10-28-14 1550 |
| 1060 Battelle, fridge #2A | 10-29-14 1000 | C. Bingham | 10-29-14 1000 |
| C. Bingham WCH | 10-29-14 1010 | Fed Ex | |
| | | | 10/30/14 9:30 |

Sign/Print Names

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) (Mercury)

1.3/1.5 IEC CF 0.0
Transferred by MT 10/30/14

REVIEWED BY K. Niedhammer DATE 10-29-14

JP0877

WCH-EE-011

# Washington Closure Hanford

# CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

RC-075-441

| | | | |
|---|---|---|---|
| Collector: M. Weber | Company Contact: Joan Kessner | Telephone No.: 375-4688 | Project Coordinator: KESSNER, JH |
| Price Code: 8B 7 days | Data Turnaround | | |
| Project Designation: 100-D/DR Field Remediation | Sampling Location: 100-D-86:3, Verification II | | SAF No.: RC-075 |
| Chest No.: RCC-07-015 | Field Logbook No.: EL-1662-02 03 10/28/14 | COA: 01D8632000 | Method of Shipment: Commercial Carrier \ Fed Ex |
| Shipped To: TestAmerica Denver | Offsite Property No.: A131281 | | Bill of Lading/Air Bill No.: See OSR |
| Other Labs Shipped To: TestAmerica Richland RCF 37029 | | | |

| Preservation | Cool 4C | Cool 4C | Cool 4C | Cool 4C |
|---|---|---|---|---|
| Type of Container | G/P | aG | aG | aG |
| No. of Container(s) | 1 | 1 | 1 | 1 |
| Volume | 250mL | 250mL | 250mL | 250mL |
| Sample Analysis | See item (1) in Special Instructions | PAHs - 8310 | PCBs - 8082 | Pesticides - 8081 |

POSSIBLE SAMPLE HAZARDS/REMARKS

N/A

Special Handling and/or Storage

Cool 4C

| Sample No. | Matrix | Sample Date | Sample Time | | | | |
|---|---|---|---|---|---|---|---|
| J1TW3 | SOIL | 10/28/14 | 0955 | X | X | X | X |
| J1TW4 | SOIL | 10/28/14 | 0929 | X | X | X | X |
| J1TW5 | SOIL | 10/28/14 | 0925 | X | X | X | X |
| J1TW6 | SOIL | 10/28/14 | 0948 | X | X | X | X |
| J1TW7 | SOIL | 10/28/14 | 1018 | X | X | X | X |

## CHAIN OF POSSESSION

| Relinquished By/Removed From | Date/Time | Received By/Stored In | Date/Time |
|---|---|---|---|
| Heather Weber / [signature] | 10/28/14 1035 | [signature] WCH | 10/28/14 1035 |
| [signature] WCH | 10/28/14 1545 | C. Bingham [signature] | 10-28-14 1545 |
| C. Bingham [signature] | 10-28-14 1550 | 1060 Battelle, fridge #2A | 10-28-14 1550 |
| 1060 Battelle, fridge #2A | 10-29-14 1000 | C. Bingham [signature] | 10-29-14 1000 |
| C. Bingham [signature] WCH | 10-29-14 1010 | Fed EX | |
| | | [signature] | 10/30/14 9:30 |

Sign/Print Names

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

WCH-EE-011

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) (Mercury)

REVIEWED BY K. Vannal DATE 10-29-14

JP0877

# Washington Closure Hanford

# CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

RC-075-441



| | | | |
|---|---|---|---|
| Collector: H. Weber | Company Contact: Joan Kessner | Telephone No.: 375-4688 | Project Coordinator: KESSNER, JH |
| Price Code: 8B | Data Turnaround: 7 days | | |
| Project Designation: 100-D/DR Field Remediation | Sampling Location: 100-D-86:3, Verification II | | SAF No.: RC-075 |
| Chest No.: RCC-07-015 | Field Logbook No.: EL-1662-02 03 10/28/14 | COA: 01D8632000 | Method of Shipment: Commercial Carrier \ Fed Ex |
| Shipped To: TestAmerica Denver | Offsite Property No.: A131281 | | Bill of Lading/Air Bill No.: See OSPC |
| Other Labs Shipped To: TestAmerica Richland RCF37029 | | | |

POSSIBLE SAMPLE HAZARDS/REMARKS

N/A

Special Handling and/or Storage

Cool 4C

| Sample No. | Matrix | Sample Date | Sample Time | Preservation: Cool 4C | Cool 4C | Cool 4C | Cool 4C | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Type of Container: G/P | aG | aG | aG | | | | | | |
| | | | | No. of Container(s): 1 | 1 | 1 | 1 | | | | | | |
| | | | | Volume: 250mL | 250mL | 250mL | 250mL | | | | | | |
| | | | | Sample Analysis: See item (1) in Special Instructions | PAHs - 8310 | PCBs - 8082 | Pesticides - 8081 | | | | | | |
| J1TWV8 | SOIL | 10/28/14 | 0933 | X | X | X | X | | | | | | |
| J1TWV9 | SOIL | 10/28/14 | 0943 | X | X | X | X | | | | | | |
| J1TWW0 | SOIL | 10/28/14 | 0857 | X | X | X | X | | | | | | |
| J1TWW1 | SOIL | 10/28/14 | 0850 | X | X | N/A | N/A | | | | | | |

Page 1 of 1

| CHAIN OF POSSESSION | Sign/Print Names | | |
|---|---|---|---|
| Relinquished By/Removed From: Heather Weber / [signature] | Date/Time: 10/28/14 1035 | Received By/Stored In: WCH DWSHEA | Date/Time: 10/28/14 1035 |
| Relinquished By/Removed From: DWSHEA DWSHEA | Date/Time: 10/28/14 1545 | Received By/Stored In: C. Bingham [signature] | Date/Time: 10-28-14 1545 |
| Relinquished By/Removed From: C. Bingham [signature] | Date/Time: 10-28-14 1550 | Received By/Stored In: 1060 Battelle, fridge #2A | Date/Time: 10-28-14 1550 |
| Relinquished By/Removed From: 1060 Battelle, fridge #2A | Date/Time: 10-29-14 1000 | Received By/Stored In: C. Bingham [signature] | Date/Time: 10-29-14 1000 |
| Relinquished By/Removed From: C. Bingham [signature] WCH | Date/Time: 10-29-14 1010 | Received By/Stored In: fed EX | Date/Time: |
| Relinquished By/Removed From: | Date/Time: | Received By/Stored In: [signature] | Date/Time: 10/30/14 9:30 |
| 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) (Mercury)

REVIEWED BY Kwadhaemo DATE 10-29-14

JP0877

WCH-EE-011

## Appendix 5

## Data Validation Supporting Documentation

# INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

| VALIDATION LEVEL: | A | B | C | D | E |
|---|---|---|---|---|---|
| PROJECT: 100-D-96:3 | | | DATA PACKAGE: JP0877 | | |
| VALIDATOR: ELR | | LAB: TAL | | DATE: 2/23/15 | |
| | | | SDG: JP0877 | | |

ANALYSES PERFORMED

| SW-846/ICP | SW-846/GFAA | SW-846/Hg | SW-846 Cyanide | | |
|---|---|---|---|---|---|
| | | | | | |

SAMPLES/MATRIX

| | | | | |
|---|---|---|---|---|
| J1TWT8 | J1TWT9 | J1TWV0 | J1TWV1 | J1TWV2 |
| J1TWV3 | J1TWV4 | J1TWV5 | J1TWV6 | J1TWV7 |
| J1TWV8 | J1TWV9 | J1TWW0 | J1TWW1 | |
| | | | | |
| | | | | Soil |

## 1. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE

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

Comments:

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

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

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

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

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

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

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

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

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

Comments:

# INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

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

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

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

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

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

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

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

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

Comments: Vanadium – UJ WP

FB – 13 detects

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

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

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

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

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

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

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

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

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

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

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

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

Comments: LCS – silicon (107%) – J all

MS – antimony (567%) calcium (133%) silicon (292%) – J all

NO PAS

# INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

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

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

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

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

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

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

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

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

Comments: _____

## 6. ICP QUALITY CONTROL (Levels D and E)

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

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

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

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

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

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

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

Comments: _____

# INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

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

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

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

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

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

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

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

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

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

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

Comments: _____

## 8. HOLDING TIMES (all levels)

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

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

Comments: _____

# INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

## 9. RESULT QUANTITATION AND DETECTION LIMITS (all levels)

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

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

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

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

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

Comments: _____

## Appendix 6

## Additional Documentation Requested by Client

Client: Washington Closure Hanford

Job Number: 280-61898-1
Sdg Number: JP0877

**Method Blank - Batch: 280-250668**

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

| | | | | | |
|---|---|---|---|---|---|
| Lab Sample ID: | MB 280-250668/1-A | Analysis Batch: | 280-251210 | Instrument ID: | MT_026 |
| Client Matrix: | Solid | Prep Batch: | 280-250668 | Lab File ID: | 26f110314.asc |
| Dilution: | 1.0 | Leach Batch: | N/A | Initial Weight/Volume: | 1.00 g |
| Analysis Date: | 11/03/2014 2324 | Units: | mg/Kg | Final Weight/Volume: | 100 mL |
| Prep Date: | 11/03/2014 0815 | | | | |
| Leach Date: | N/A | | | | |

| Analyte | Result | Qual | MDL | RL |
|---|---|---|---|---|
| Aluminum | 1.6 | U | 1.6 | 5.0 |
| Antimony | 0.38 | U | 0.38 | 0.60 |
| Arsenic | 0.66 | U | 0.66 | 1.0 |
| Barium | 0.076 | U | 0.076 | 0.50 |
| Beryllium | 0.033 | U | 0.033 | 0.20 |
| Boron | 0.98 | U | 0.98 | 2.0 |
| Cadmium | 0.041 | U | 0.041 | 0.20 |
| Calcium | 14.1 | U | 14.1 | 50.0 |
| Chromium | 0.058 | U | 0.058 | 0.20 |
| Cobalt | 0.10 | U | 0.10 | 1.0 |
| Copper | 0.22 | U | 0.22 | 1.0 |
| Iron | 3.8 | U | 3.8 | 5.0 |
| Lead | 0.27 | U | 0.27 | 0.50 |
| Magnesium | 3.7 | U | 3.7 | 20.0 |
| Manganese | 0.10 | U | 0.10 | 1.0 |
| Molybdenum | 0.26 | U | 0.26 | 2.0 |
| Nickel | 0.12 | U | 0.12 | 4.0 |
| Potassium | 41.0 | U | 41.0 | 300 |
| Selenium | 0.86 | U | 0.86 | 1.0 |
| Silicon | 5.7 | U | 5.7 | 10.0 |
| Silver | 0.16 | U | 0.16 | 0.20 |
| Sodium | 59.0 | U | 59.0 | 120 |
| Vanadium | 0.499 | B | 0.094 | 2.0 |
| Zinc | 0.40 | U | 0.40 | 1.0 |

## Quality Control Results

Client: Washington Closure Hanford

Job Number: 280-61898-1
Sdg Number: JP0877

**Lab Control Sample - Batch: 280-250668**

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

| | | | | | |
|---|---|---|---|---|---|
| Lab Sample ID: | LCS 280-250668/2-A | Analysis Batch: | 280-251210 | Instrument ID: | MT_026 |
| Client Matrix: | Solid | Prep Batch: | 280-250668 | Lab File ID: | 26f110314.asc |
| Dilution: | 1.0 | Leach Batch: | N/A | Initial Weight/Volume: | 1.00 g |
| Analysis Date: | 11/03/2014 2326 | Units: | mg/Kg | Final Weight/Volume: | 100 mL |
| Prep Date: | 11/03/2014 0815 | | | | |
| Leach Date: | N/A | | | | |

| Analyte | Spike Amount | Result | % Rec. | Limit | Qual |
|---|---|---|---|---|---|
| Aluminum | 200 | 197.3 | 99 | 82 - 116 | |
| Antimony | 50.0 | 48.23 | 96 | 82 - 110 | |
| Arsenic | 100 | 93.57 | 94 | 85 - 110 | |
| Barium | 200 | 204.5 | 102 | 87 - 112 | |
| Beryllium | 5.00 | 4.79 | 96 | 84 - 114 | |
| Boron | 100 | 96.82 | 97 | 80 - 120 | |
| Cadmium | 10.0 | 10.17 | 102 | 87 - 110 | |
| Calcium | 5000 | 4914 | 98 | 82 - 114 | |
| Chromium | 20.0 | 19.46 | 97 | 84 - 114 | |
| Cobalt | 50.0 | 47.97 | 96 | 87 - 110 | |
| Copper | 25.0 | 24.14 | 97 | 88 - 110 | |
| Iron | 100 | 96.74 | 97 | 87 - 120 | |
| Lead | 50.0 | 49.46 | 99 | 86 - 110 | |
| Magnesium | 5000 | 4873 | 97 | 90 - 110 | |
| Manganese | 50.0 | 48.51 | 97 | 88 - 110 | |
| Molybdenum | 100 | 97.70 | 98 | 86 - 110 | |
| Nickel | 50.0 | 47.79 | 96 | 87 - 110 | |
| Potassium | 5000 | 5022 | 100 | 89 - 110 | |
| Selenium | 200 | 191.5 | 96 | 83 - 110 | |
| Silicon | 1000 | 103.4 | 10 | 10 - 70 | |
| Silver | 5.00 | 5.06 | 101 | 87 - 114 | |
| Sodium | 5000 | 5177 | 104 | 90 - 112 | |
| Vanadium | 50.0 | 48.65 | 97 | 88 - 110 | |
| Zinc | 50.0 | 49.51 | 99 | 76 - 114 | |

Client: Washington Closure Hanford

Job Number: 280-61898-1
Sdg Number: JP0877

**Matrix Spike - Batch: 280-250668**

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

| | | | | | |
|---|---|---|---|---|---|
| *Lab Sample ID:* | *280-61898-1* | *Analysis Batch:* | *280-251210* | *Instrument ID:* | *MT_026* |
| Client Matrix: | Solid | Prep Batch: | 280-250668 | Lab File ID: | 26f110314.asc |
| Dilution: | 1.0 | Leach Batch: | N/A | Initial Weight/Volume: | 1.10 g |
| Analysis Date: | 11/03/2014 2337 | Units: | mg/Kg | Final Weight/Volume: | 100 mL |
| Prep Date: | 11/03/2014 0815 | | | | |
| Leach Date: | N/A | | | | |

| Analyte | Sample Result/Qual | | Spike Amount | Result | % Rec. | Limit | Qual |
|---|---|---|---|---|---|---|---|
| Aluminum | 4550 | | 188 | 6542 | 1059 | 50 - 200 | 4 |
| Antimony | 0.37 | U | 47.0 | 26.55 | 56 | 20 - 200 | |
| Arsenic | 1.6 | | 94.0 | 76.96 | 80 | 76 - 111 | |
| Barium | 47.6 | | 188 | 217.8 | 90 | 52 - 159 | |
| Boron | 0.96 | U | 94.0 | 75.94 | 81 | 80 - 120 | |
| *Cadmium* | *0.050* | *B* | *9.40* | *8.42* | *89* | *40 - 130* | |
| Calcium | 5060 | | 4700 | 11300 | 133 | 43 - 165 | |
| Chromium | 4.7 | | 18.8 | 24.44 | 105 | 70 - 200 | |
| Cobalt | 8.3 | | 47.0 | 47.31 | 83 | 72 - 106 | |
| Copper | 13.3 | | 23.5 | 32.29 | 81 | 37 - 187 | |
| Iron | 20500 | | 94.0 | 23040 | 2747 | 70 - 200 | 4 |
| Lead | 2.4 | | 47.0 | 41.67 | 84 | 70 - 200 | |
| Magnesium | 3870 | | 4700 | 9015 | 109 | 64 - 145 | |
| Manganese | 241 | | 47.0 | 350.6 | 234 | 40 - 200 | 4 |
| Molybdenum | 0.25 | U | 94.0 | 78.07 | 83 | 75 - 103 | |
| Nickel | 8.9 | | 47.0 | 48.63 | 84 | 61 - 126 | |
| Potassium | 540 | | 4700 | 4830 | 91 | 56 - 172 | |
| Selenium | 0.84 | U | 188 | 153.0 | 81 | 76 - 104 | |
| Silicon | 257 | | 940 | 516.7 | 28 | 20 - 200 | |
| Silver | 0.16 | U | 4.70 | 4.20 | 89 | 75 - 141 | |
| Sodium | 333 | | 4700 | 4848 | 96 | 78 - 111 | |
| Vanadium | 55.1 | | 47.0 | 105.1 | 106 | 50 - 169 | |
| Zinc | 36.9 | | 47.0 | 82.32 | 97 | 70 - 200 | |

**Matrix Spike - Batch: 280-250668**

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

| | | | | | |
|---|---|---|---|---|---|
| Lab Sample ID: | 280-61898-1 | Analysis Batch: | 280-251399 | Instrument ID: | MT_026 |
| Client Matrix: | Solid | Prep Batch: | 280-250668 | Lab File ID: | 26a110414.asc |
| Dilution: | 2.0 | Leach Batch: | N/A | Initial Weight/Volume: | 1.10 g |
| Analysis Date: | 11/04/2014 1544 | Units: | mg/Kg | Final Weight/Volume: | 100 mL |
| Prep Date: | 11/03/2014 0815 | | | | |
| Leach Date: | N/A | | | | |

| Analyte | Sample Result/Qual | | Spike Amount | Result | % Rec. | Limit | Qual |
|---|---|---|---|---|---|---|---|
| Beryllium | 0.064 | U | 4.70 | 3.69 | 78 | 72 - 105 | |

Client: Washington Closure Hanford

Job Number: 280-61898-1
Sdg Number: JP0877

**Duplicate - Batch: 280-250668**

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

| | | | | | |
|---|---|---|---|---|---|
| Lab Sample ID: | 280-61898-1 | Analysis Batch: | 280-251210 | Instrument ID: | MT_026 |
| Client Matrix: | Solid | Prep Batch: | 280-250668 | Lab File ID: | 26f110314.asc |
| Dilution: | 1.0 | Leach Batch: | N/A | Initial Weight/Volume: | 1.05 g |
| Analysis Date: | 11/03/2014 2334 | Units: | mg/Kg | Final Weight/Volume: | 100 mL |
| Prep Date: | 11/03/2014 0815 | | | | |
| Leach Date: | N/A | | | | |

| Analyte | Sample Result/Qual | | Result | RPD | Limit | Qual |
|---|---|---|---|---|---|---|
| Aluminum | 4550 | | 4863 | 7 | 40 | |
| Antimony | 0.37 | U | 0.37 | NC | 40 | U |
| Arsenic | 1.6 | | 1.68 | 7 | 30 | |
| Barium | 47.6 | | 50.30 | 5 | 30 | |
| Boron | 0.96 | U | 0.97 | NC | 30 | U |
| Cadmium | 0.050 | B | 0.0699 | 34 | 30 | B M |
| Calcium | 5060 | | 5394 | 6 | 30 | |
| Chromium | 4.7 | | 5.93 | 23 | 40 | |
| Cobalt | 8.3 | | 9.09 | 9 | 30 | |
| Copper | 13.3 | | 13.04 | 2 | 30 | |
| Iron | 20500 | | 21760 | 6 | 40 | |
| Lead | 2.4 | | 2.41 | 0.07 | 40 | |
| Magnesium | 3870 | | 4622 | 18 | 30 | |
| Manganese | 241 | | 269.0 | 11 | 40 | |
| Molybdenum | 0.25 | U | 0.26 | NC | 30 | U |
| Nickel | 8.9 | | 12.36 | 32 | 30 | M |
| Potassium | 540 | | 592.5 | 9 | 40 | |
| Selenium | 0.84 | U | 0.85 | NC | 30 | U |
| Silicon | 257 | | 285.3 | 11 | 40 | |
| Silver | 0.16 | U | 0.16 | NC | 30 | U |
| Sodium | 333 | | 308.0 | 8 | 30 | |
| Vanadium | 55.1 | | 58.26 | 6 | 30 | |
| Zinc | 36.9 | | 39.46 | 7 | 40 | |

**Duplicate - Batch: 280-250668**

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

| | | | | | |
|---|---|---|---|---|---|
| Lab Sample ID: | 280-61898-1 | Analysis Batch: | 280-251399 | Instrument ID: | MT_026 |
| Client Matrix: | Solid | Prep Batch: | 280-250668 | Lab File ID: | 26a110414.asc |
| Dilution: | 2.0 | Leach Batch: | N/A | Initial Weight/Volume: | 1.05 g |
| Analysis Date: | 11/04/2014 1541 | Units: | mg/Kg | Final Weight/Volume: | 100 mL |
| Prep Date: | 11/03/2014 0815 | | | | |
| Leach Date: | N/A | | | | |

| Analyte | Sample Result/Qual | | Result | RPD | Limit | Qual |
|---|---|---|---|---|---|---|
| Beryllium | 0.064 | U | 0.065 | NC | 30 | U |

Client: Washington Closure Hanford

Job Number: 280-61898-1
Sdg Number: JP0877

**Method Blank - Batch: 280-250894**

**Method: 7471A**
**Preparation: 7471A**

| | | | | | |
|---|---|---|---|---|---|
| Lab Sample ID: | MB 280-250894/1-A | Analysis Batch: | 280-251373 | Instrument ID: | MT_033 |
| Client Matrix: | Solid | Prep Batch: | 280-250894 | Lab File ID: | 141104aa.txt |
| Dilution: | 1.0 | Leach Batch: | N/A | Initial Weight/Volume: | 0.60 g |
| Analysis Date: | 11/04/2014 1341 | Units: | mg/Kg | Final Weight/Volume: | 50 mL |
| Prep Date: | 11/04/2014 0730 | | | | |
| Leach Date: | N/A | | | | |

| Analyte | Result | Qual | MDL | RL |
|---|---|---|---|---|
| Mercury | 0.0055 | U | 0.0055 | 0.017 |

**Lab Control Sample - Batch: 280-250894**

**Method: 7471A**
**Preparation: 7471A**

| | | | | | |
|---|---|---|---|---|---|
| Lab Sample ID: | LCS 280-250894/2-A | Analysis Batch: | 280-251373 | Instrument ID: | MT_033 |
| Client Matrix: | Solid | Prep Batch: | 280-250894 | Lab File ID: | 141104aa.txt |
| Dilution: | 1.0 | Leach Batch: | N/A | Initial Weight/Volume: | 0.60 g |
| Analysis Date: | 11/04/2014 1344 | Units: | mg/Kg | Final Weight/Volume: | 50 mL |
| Prep Date: | 11/04/2014 0730 | | | | |
| Leach Date: | N/A | | | | |

| Analyte | Spike Amount | Result | % Rec. | Limit | Qual |
|---|---|---|---|---|---|
| Mercury | 0.417 | 0.412 | 99 | 87 - 111 | |

**Matrix Spike - Batch: 280-250894**

**Method: 7471A**
**Preparation: 7471A**

| | | | | | |
|---|---|---|---|---|---|
| Lab Sample ID: | 280-61898-1 | Analysis Batch: | 280-251373 | Instrument ID: | MT_033 |
| Client Matrix: | Solid | Prep Batch: | 280-250894 | Lab File ID: | 141104aa.txt |
| Dilution: | 1.0 | Leach Batch: | N/A | Initial Weight/Volume: | 0.64 g |
| Analysis Date: | 11/04/2014 1350 | Units: | mg/Kg | Final Weight/Volume: | 50 mL |
| Prep Date: | 11/04/2014 0730 | | | | |
| Leach Date: | N/A | | | | |

| Analyte | Sample Result/Qual | | Spike Amount | Result | % Rec. | Limit | Qual |
|---|---|---|---|---|---|---|---|
| Mercury | 0.0054 | U | 0.404 | 0.404 | 100 | 87 - 111 | |

## Quality Control Results

Client: Washington Closure Hanford

Job Number: 280-61898-1
Sdg Number: JP0877

**Duplicate - Batch: 280-250894**

**Method: 7471A**
**Preparation: 7471A**

| | | | | | |
|---|---|---|---|---|---|
| Lab Sample ID: | 280-61898-1 | Analysis Batch: | 280-251373 | Instrument ID: | MT_033 |
| Client Matrix: | Solid | Prep Batch: | 280-250894 | Lab File ID: | 141104aa.txt |
| Dilution: | 1.0 | Leach Batch: | N/A | Initial Weight/Volume: | 0.66 g |
| Analysis Date: | 11/04/2014 1348 | Units: | mg/Kg | Final Weight/Volume: | 50 mL |
| Prep Date: | 11/04/2014 0730 | | | | |
| Leach Date: | N/A | | | | |

| Analyte | Sample Result/Qual | | Result | RPD | Limit | Qual |
|---|---|---|---|---|---|---|
| Mercury | 0.0054 | U | 0.0052 | NC | 20 | U |

Date: 23 February 2015
To: Washington Closure Hanford Inc. (technical representative)
From: ELR Consulting
Project: 100-D/DR Burial Grounds & Remaining Sites – Soil Full Protocol - Waste Site 100-D-86:3
Subject: Polyaromatic Hydrocarbon- Data Package No. JP0877-TAL

## INTRODUCTION

This memo presents the results of data validation on Data Package No. JP0877 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 |
|---|---|---|---|---|
| J1TWT8 | 10/28/14 | Soil | C | See note 1 |
| J1TWT9 | 10/28/14 | Soil | C | See note 1 |
| J1TWV0 | 10/28/14 | Soil | C | See note 1 |
| J1TWV1 | 10/28/14 | Soil | C | See note 1 |
| J1TWV2 | 10/28/14 | Soil | C | See note 1 |
| J1TWV3 | 10/28/14 | Soil | C | See note 1 |
| J1TWV4 | 10/28/14 | Soil | C | See note 1 |
| J1TWV5 | 10/28/14 | Soil | C | See note 1 |
| J1TWV6 | 10/28/14 | Soil | C | See note 1 |
| J1TWV7 | 10/28/14 | Soil | C | See note 1 |
| J1TWV8 | 10/28/14 | Soil | C | See note 1 |
| J1TWV9 | 10/28/14 | Soil | C | See note 1 |
| J1TWW0 | 10/28/14 | Soil | C | See note 1 |

1 – Polyaromatic hydrocarbons by 8310.

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

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

## DATA QUALITY OBJECTIVES

- **Holding Times**

Analytical holding times were assessed to ascertain whether the holding time requirements were met by the laboratory. The holding time requirements are as follows: Samples must be extracted within 14 days of the date of sample collection and analyzed within 40 days from the date of extraction.

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

All holding times were acceptable.

- **Method Blanks**

Method blank analyses are conducted 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. Analytical results for analytes present in any sample at less than five times the concentration of that analyte found in the associated blank are qualified as non-detects and flagged "U". Common laboratory contaminants present in samples at less than ten times the concentration of that analyte found in the associated blank are qualified as non-detects. If a sample result is less than the CRQL and is less than five times (or less than ten times for lab contaminants) the highest associated blank result, the sample result value is raised to the CRQL level and qualified as undetected "U".

All method blank results were acceptable.

<u>Field (equipment) Blanks</u>

No field blanks were submitted for analysis.

- **Accuracy**

<u>Matrix Spike/Matrix Spike Duplicate & Blank Spike Recoveries</u>

Matrix spike/matrix spike duplicate analyses are used to assess the analytical accuracy of the reported data and the effect of the matrix on the ability to accurately quantify sample concentrations. Matrix spike/matrix spike duplicate analyses are performed in

duplicate using five compounds for which percent recoveries must be within a range of 50-150% or within laboratory control limits. If spike recoveries are outside control limits, detected sample results less than five times the spike concentration are qualified as estimates and flagged "J". Undetected sample results with spike recoveries below control limits are qualified as estimates and flagged "UJ". Undetected sample results are not qualified if the spike recovery is above control limits. Sample results greater than five times the spike concentration require no qualification.

All accuracy results were acceptable.

*Surrogate Recovery*

The analyses of surrogate compounds provide a measure of performance for individual samples. Matrix-specific surrogate compound recovery control windows have been established by the EPA CLP program. If two surrogates of the same class of compounds (base/neutral or acid) are out of control limits, all associated sample results greater than the contract required quantitation limit (CRQL) are qualified as estimates and flagged "J". Sample results less than the CRQL and below the lower control limit are qualified as estimates and flagged "UJ". Sample results less than the CRQL with recoveries above the upper control limit require no qualification. If a surrogate recovery is less than 10%, detects are qualified as estimates and flagged "J" and nondetects are rejected and flagged "UR".

All surrogate results were acceptable.

- **Precision**

Matrix Spike/Matrix Spike Duplicate Samples

Matrix spike (MS)/matrix spike duplicate (MSD) results provide matrix-specific information on the precision of the method for specific target compound classes. Precision is expressed by the relative percent difference (RPD) between the recoveries of duplicate matrix spike analyses performed on a sample. Samples results must be within RPD limits of +/-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 laboratory results were acceptable.

Field Duplicate Samples

One set of field duplicates (J1TWV9/J1TWW0) 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 required quantitation limits (RQL's) to ensure that laboratory detection levels meet the required criteria. All analytes met the RQL.

- **Completeness**

Data package No. JP0877 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-96-22, Rev. 5, *100 Area Remedial Action Sampling and Analysis Plan*, U.S. Department of Energy, September 2009.

## Appendix 1

## Glossary of Data Reporting Qualifiers

Qualifiers which may be applied by data validators in compliance with the WCH 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 same 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 usable for decision-making purposes).

## Appendix 2

## Summary of Data Qualification

POLYAROMATIC HYDROCARBON DATA QUALIFICATION SUMMARY*

| SDG: JP0877 | REVIEWER: ELR | Project: 100-D-86:3 | PAGE 1 OF 1 |
|---|---|---|---|
| COMMENTS: No qualifiers assigned | | | |

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

## Appendix 3

## Annotated Laboratory Reports

## Analytical Data

Client: Washington Closure Hanford

Job Number: 280-61898-1
Sdg Number: JP0877

**Client Sample ID:** **J1TWT8**

Lab Sample ID: 280-61898-1
Client Matrix: Solid

% Moisture: 3.3

Date Sampled: 10/28/2014 1008
Date Received: 10/30/2014 0930

**8310 PAHs (HPLC)**

| | | | | | |
|---|---|---|---|---|---|
| Analysis Method: | 8310 | Analysis Batch: | 280-251013 | Instrument ID: | CHHPLC_G |
| Prep Method: | 3550C | Prep Batch: | 280-250638 | Initial Weight/Volume: | 30.5 g |
| Dilution: | 1.0 | | | Final Weight/Volume: | 4 mL |
| Analysis Date: | 11/03/2014 1703 | | | Injection Volume: | 20 uL |
| Prep Date: | 10/30/2014 2156 | | | Result Type: | PRIMARY |

| Analyte | DryWt Corrected: Y | Result (ug/Kg) | Qualifier | MDL | RL |
|---|---|---|---|---|---|
| Acenaphthene | | 10 | U | 10 | 100 |
| ~~Acenaphthylene~~ | | *9.2* | *U* | *9.2* | *100* |
| Anthracene | | 3.1 | U | 3.1 | 20 |
| Benzo[a]anthracene | | 3.2 | U | 3.2 | 15 |
| Benzo[a]pyrene | | 6.5 | U | 6.5 | 15 |
| Benzo[b]fluoranthene | | 4.3 | U | 4.3 | 15 |
| Benzo[g,h,i]perylene | | 7.3 | U | 7.3 | 31 |
| Benzo[k]fluoranthene | | 4.0 | U N | 4.0 | 15 |
| Chrysene | | 4.9 | U | 4.9 | 41 |
| Dibenzo(a,h)anthracene | | 11 | U | 11 | 31 |
| Fluoranthene | | 13 | U | 13 | 41 |
| Fluorene | | 5.4 | U | 5.4 | 31 |
| Indeno[1,2,3-cd]pyrene | | 12 | U | 12 | 31 |
| Naphthalene | | 12 | U | 12 | 100 |
| Phenanthrene | | 12 | U | 12 | 41 |
| Pyrene | | 12 | U | 12 | 41 |

| Surrogate | %Rec | Qualifier | Acceptance Limits |
|---|---|---|---|
| Terphenyl-d14 (SUR) | 86 | | 72 - 115 |

2/22/14



TestAmerica Denver

## Analytical Data

Client: Washington Closure Hanford

Job Number: 280-61898-1
Sdg Number: JP0877

**Client Sample ID:** J1TWT9

Lab Sample ID: 280-61898-2
Client Matrix: Solid

% Moisture: 5.5

Date Sampled: 10/28/2014 0857
Date Received: 10/30/2014 0930

**8310 PAHs (HPLC)**

| | | | | | |
|---|---|---|---|---|---|
| Analysis Method: | 8310 | Analysis Batch: | 280-251013 | Instrument ID: | CHHPLC_G |
| Prep Method: | 3550C | Prep Batch: | 280-250638 | Initial Weight/Volume: | 30.8 g |
| Dilution: | 1.0 | | | Final Weight/Volume: | 4 mL |
| Analysis Date: | 11/03/2014 1733 | | | Injection Volume: | 20 uL |
| Prep Date: | 10/30/2014 2156 | | | Result Type: | PRIMARY |

| Analyte | DryWt Corrected: Y | Result (ug/Kg) | Qualifier | MDL | RL |
|---|---|---|---|---|---|
| Acenaphthene | | 10 | U | 10 | 100 |
| Acenaphthylene | | 9.3 | U | 9.3 | 100 |
| Anthracene | | 3.1 | U | 3.1 | 21 |
| Benzo[a]anthracene | | 3.3 | U | 3.3 | 15 |
| Benzo[a]pyrene | | 6.6 | U | 6.6 | 15 |
| Benzo[b]fluoranthene | | 4.3 | U | 4.3 | 15 |
| Benzo[g,h,i]perylene | | 7.4 | U | 7.4 | 31 |
| Benzo[k]fluoranthene | | 4.1 | U N | 4.1 | 15 |
| Chrysene | | 5.0 | U | 5.0 | 41 |
| Dibenzo(a,h)anthracene | | 11 | U | 11 | 31 |
| Fluoranthene | | 13 | U | 13 | 41 |
| Fluorene | | 5.4 | U | 5.4 | 31 |
| Indeno[1,2,3-cd]pyrene | | 12 | U | 12 | 31 |
| Naphthalene | | 12 | U | 12 | 100 |
| Phenanthrene | | 12 | U | 12 | 41 |
| Pyrene | | 12 | U | 12 | 41 |

| Surrogate | %Rec | Qualifier | Acceptance Limits |
|---|---|---|---|
| Terphenyl-d14 (SUR) | 87 | | 72 - 115 |

V 2/22/14



TestAmerica Denver

## Analytical Data

Client: Washington Closure Hanford

Job Number: 280-61898-1
Sdg Number: JP0877

**Client Sample ID:** **J1TWV0**

Lab Sample ID: 280-61898-3
Client Matrix: Solid

% Moisture: 5.2

Date Sampled: 10/28/2014 1003
Date Received: 10/30/2014 0930

**8310 PAHs (HPLC)**

Analysis Method: 8310
Prep Method: 3550C
Dilution: 1.0
Analysis Date: 11/03/2014 1804
Prep Date: 10/30/2014 2156

Analysis Batch: 280-251013
Prep Batch: 280-250638

Instrument ID: CHHPLC_G
Initial Weight/Volume: 31.4 g
Final Weight/Volume: 4 mL
Injection Volume: 20 uL
Result Type: PRIMARY

| Analyte | DryWt Corrected: Y | Result (ug/Kg) | Qualifier | MDL | RL |
|---|---|---|---|---|---|
| Acenaphthene | | 10 | U | 10 | 100 |
| Acenaphthylene | | 9.1 | U | 9.1 | 100 |
| Anthracene | | 3.1 | U | 3.1 | 20 |
| Benzo[a]anthracene | | 12 | J X | 3.2 | 15 |
| Benzo[a]pyrene | | 22 | | 6.5 | 15 |
| Benzo[b]fluoranthene | | 4.2 | U | 4.2 | 15 |
| Benzo[g,h,i]perylene | | 22 | J | 7.3 | 30 |
| Benzo[k]fluoranthene | | 7.0 | J N X | 4.0 | 15 |
| Chrysene | | 39 | J X | 4.9 | 40 |
| Dibenzo(a,h)anthracene | | 11 | U | 11 | 30 |
| Fluoranthene | | 47 | | 13 | 40 |
| Fluorene | | 5.3 | U | 5.3 | 30 |
| Indeno[1,2,3-cd]pyrene | | 15 | J X | 12 | 30 |
| Naphthalene | | 12 | U | 12 | 100 |
| Phenanthrene | | 28 | J | 12 | 40 |
| Pyrene | | 38 | J | 12 | 40 |

| Surrogate | %Rec | Qualifier | Acceptance Limits |
|---|---|---|---|
| Terphenyl-d14 (SUR) | 97 | | 72 - 115 |

2/22/14



TestAmerica Denver

Client: Washington Closure Hanford

Job Number: 280-61898-1
Sdg Number: JP0877

***Client Sample ID:*** ***J1TWV1***

Lab Sample ID: 280-61898-4
Client Matrix: Solid

% Moisture: 4.6

Date Sampled: 10/28/2014 0907
Date Received: 10/30/2014 0930

**8310 PAHs (HPLC)**

| | | | | | |
|---|---|---|---|---|---|
| Analysis Method: | 8310 | Analysis Batch: | 280-251013 | Instrument ID: | CHHPLC_G |
| Prep Method: | 3550C | Prep Batch: | 280-250638 | Initial Weight/Volume: | 30.6 g |
| Dilution: | 1.0 | | | Final Weight/Volume: | 4 mL |
| Analysis Date: | 11/03/2014 1834 | | | Injection Volume: | 20 uL |
| Prep Date: | 10/30/2014 2156 | | | Result Type: | PRIMARY |

| Analyte | DryWt Corrected: Y | Result (ug/Kg) | Qualifier | MDL | RL |
|---|---|---|---|---|---|
| Acenaphthene | | 10 | U | 10 | 100 |
| Acenaphthylene | | 9.2 | U | 9.2 | 100 |
| Anthracene | | 3.1 | U | 3.1 | 21 |
| Benzo[a]anthracene | | 3.7 | J | 3.3 | 15 |
| Benzo[a]pyrene | | 6.6 | U | 6.6 | 15 |
| Benzo[b]fluoranthene | | 4.3 | U | 4.3 | 15 |
| Benzo[g,h,i]perylene | | 7.4 | U | 7.4 | 31 |
| Benzo[k]fluoranthene | | 4.0 | U N | 4.0 | 15 |
| Chrysene | | 5.0 | U | 5.0 | 41 |
| Dibenzo(a,h)anthracene | | 11 | U | 11 | 31 |
| Fluoranthene | | 13 | U | 13 | 41 |
| Fluorene | | 5.4 | U | 5.4 | 31 |
| Indeno[1,2,3-cd]pyrene | | 12 | U | 12 | 31 |
| Naphthalene | | 12 | U | 12 | 100 |
| Phenanthrene | | 12 | U | 12 | 41 |
| Pyrene | | 12 | U | 12 | 41 |

| Surrogate | %Rec | Qualifier | Acceptance Limits |
|---|---|---|---|
| Terphenyl-d14 (SUR) | 87 | | 72 - 115 |

2/22/14

## Analytical Data

Client: Washington Closure Hanford

Job Number: 280-61898-1
Sdg Number: JP0877

**Client Sample ID:** **J1TWV2**

Lab Sample ID: 280-61898-5
Client Matrix: Solid

% Moisture: 7.3

Date Sampled: 10/28/2014 0916
Date Received: 10/30/2014 0930

**8310 PAHs (HPLC)**

| | | | | | |
|---|---|---|---|---|---|
| Analysis Method: | 8310 | Analysis Batch: | 280-251013 | Instrument ID: | CHHPLC_G |
| Prep Method: | 3550C | Prep Batch: | 280-250638 | Initial Weight/Volume: | 30.3 g |
| Dilution: | 1.0 | | | Final Weight/Volume: | 4 mL |
| Analysis Date: | 11/03/2014 1905 | | | Injection Volume: | 20 uL |
| Prep Date: | 10/30/2014 2156 | | | Result Type: | PRIMARY |

| Analyte | DryWt Corrected: Y | Result (ug/Kg) | Qualifier | MDL | RL |
|---|---|---|---|---|---|
| Acenaphthene | | 11 | U | 11 | 110 |
| Acenaphthylene | | 9.6 | U | 9.6 | 110 |
| Anthracene | | 3.3 | U | 3.3 | 21 |
| Benzo[a]anthracene | | 3.4 | U N | 3.4 | 16 |
| Benzo[a]pyrene | | 6.8 | U | 6.8 | 16 |
| Benzo[b]fluoranthene | | 4.5 | U | 4.5 | 16 |
| Benzo[g,h,i]perylene | | 7.7 | U | 7.7 | 32 |
| Benzo[k]fluoranthene | | 4.2 | U N | 4.2 | 16 |
| Chrysene | | 5.2 | U | 5.2 | 43 |
| Dibenzo(a,h)anthracene | | 12 | U N | 12 | 32 |
| Fluoranthene | | 14 | U | 14 | 43 |
| Fluorene | | 5.6 | U | 5.6 | 32 |
| Indeno[1,2,3-cd]pyrene | | 13 | U | 13 | 32 |
| Naphthalene | | 13 | U | 13 | 110 |
| Phenanthrene | | 13 | U | 13 | 43 |
| Pyrene | | 13 | U | 13 | 43 |

| Surrogate | %Rec | Qualifier | Acceptance Limits |
|---|---|---|---|
| Terphenyl-d14 (SUR) | 89 | | 72 - 115 |

2/22/14



TestAmerica Denver

## Analytical Data

Client: Washington Closure Hanford

Job Number: 280-61898-1
Sdg Number: JP0877

**Client Sample ID:** **J1TWV3**

Lab Sample ID: 280-61898-6
Client Matrix: Solid

% Moisture: 5.9

Date Sampled: 10/28/2014 0955
Date Received: 10/30/2014 0930

**8310 PAHs (HPLC)**

| | | | | | |
|---|---|---|---|---|---|
| Analysis Method: | 8310 | Analysis Batch: | 280-251013 | Instrument ID: | CHHPLC_G |
| Prep Method: | 3550C | Prep Batch: | 280-250638 | Initial Weight/Volume: | 31.7 g |
| Dilution: | 1.0 | | | Final Weight/Volume: | 4 mL |
| Analysis Date: | 11/03/2014 2036 | | | Injection Volume: | 20 uL |
| Prep Date: | 10/30/2014 2156 | | | Result Type: | PRIMARY |

| Analyte | DryWt Corrected: Y | Result (ug/Kg) | Qualifier | MDL | RL |
|---|---|---|---|---|---|
| Acenaphthene | | 10 | U | 10 | 100 |
| Acenaphthylene | | 9.1 | U | 9.1 | 100 |
| Anthracene | | 3.1 | U | 3.1 | 20 |
| Benzo[a]anthracene | | 3.2 | U | 3.2 | 15 |
| Benzo[a]pyrene | | 6.4 | U | 6.4 | 15 |
| Benzo[b]fluoranthene | | 4.2 | U | 4.2 | 15 |
| Benzo[g,h,i]perylene | | 7.2 | U | 7.2 | 30 |
| Benzo[k]fluoranthene | | 4.0 | U N | 4.0 | 15 |
| Chrysene | | 4.9 | U | 4.9 | 40 |
| Dibenzo(a,h)anthracene | | 11 | U | 11 | 30 |
| Fluoranthene | | 13 | U | 13 | 40 |
| Fluorene | | 5.3 | U | 5.3 | 30 |
| Indeno[1,2,3-cd]pyrene | | 12 | U | 12 | 30 |
| Naphthalene | | 12 | U | 12 | 100 |
| Phenanthrene | | 12 | U | 12 | 40 |
| Pyrene | | 12 | U | 12 | 40 |

| Surrogate | %Rec | Qualifier | Acceptance Limits |
|---|---|---|---|
| Terphenyl-d14 (SUR) | 83 | | 72 - 115 |

2/22/14

## Analytical Data

Client: Washington Closure Hanford

Job Number: 280-61898-1
Sdg Number: JP0877

***Client Sample ID:*** ***J1TWV4***

Lab Sample ID: 280-61898-7
Client Matrix: Solid

% Moisture: 7.2

Date Sampled: 10/28/2014 0929
Date Received: 10/30/2014 0930

**8310 PAHs (HPLC)**

| | | | | | |
|---|---|---|---|---|---|
| Analysis Method: | 8310 | Analysis Batch: | 280-251013 | Instrument ID: | CHHPLC_G |
| Prep Method: | 3550C | Prep Batch: | 280-250638 | Initial Weight/Volume: | 32.0 g |
| Dilution: | 1.0 | | | Final Weight/Volume: | 4 mL |
| Analysis Date: | 11/03/2014 2137 | | | Injection Volume: | 20 uL |
| Prep Date: | 10/30/2014 2156 | | | Result Type: | PRIMARY |

| Analyte | DryWt Corrected: Y | Result (ug/Kg) | Qualifier | MDL | RL |
|---|---|---|---|---|---|
| Acenaphthene | | 10 | U | 10 | 100 |
| *Acenaphthylene* | | *9.1* | *U* | *9.1* | *100* |
| Anthracene | | 3.1 | U | 3.1 | 20 |
| Benzo[a]anthracene | | 3.2 | U | 3.2 | 15 |
| Benzo[a]pyrene | | 6.5 | J X | 6.5 | 15 |
| Benzo[b]fluoranthene | | 5.6 | J X | 4.2 | 15 |
| Benzo[g,h,i]perylene | | 7.3 | U | 7.3 | 30 |
| Benzo[k]fluoranthene | | 4.0 | U N | 4.0 | 15 |
| Chrysene | | 6.3 | J X | 4.9 | 40 |
| Dibenzo(a,h)anthracene | | 11 | U | 11 | 30 |
| Fluoranthene | | 14 | J X | 13 | 40 |
| Fluorene | | 5.3 | U | 5.3 | 30 |
| Indeno[1,2,3-cd]pyrene | | 12 | U | 12 | 30 |
| Naphthalene | | 12 | U | 12 | 100 |
| Phenanthrene | | 12 | U | 12 | 40 |
| Pyrene | | 12 | U | 12 | 40 |

| Surrogate | %Rec | Qualifier | Acceptance Limits |
|---|---|---|---|
| Terphenyl-d14 (SUR) | 92 | | 72 - 115 |

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TestAmerica Denver

## Analytical Data

Client: Washington Closure Hanford

Job Number: 280-61898-1
Sdg Number: JP0877

**Client Sample ID:** J1TWV5

Lab Sample ID: 280-61898-8
Client Matrix: Solid

% Moisture: 8.8

Date Sampled: 10/28/2014 0925
Date Received: 10/30/2014 0930

### 8310 PAHs (HPLC)

Analysis Method: 8310
Prep Method: 3550C
Dilution: 1.0
Analysis Date: 11/03/2014 2208
Prep Date: 10/30/2014 2156

Analysis Batch: 280-251013
Prep Batch: 280-250638

Instrument ID: CHHPLC_G
Initial Weight/Volume: 31.0 g
Final Weight/Volume: 4 mL
Injection Volume: 20 uL
Result Type: PRIMARY

| Analyte | DryWt Corrected: Y | Result (ug/Kg) | Qualifier | MDL | RL |
|---|---|---|---|---|---|
| Acenaphthene | | 11 | U | 11 | 110 |
| Acenaphthylene | | 9.6 | U | 9.6 | 110 |
| Anthracene | | 3.2 | U | 3.2 | 21 |
| Benzo[a]anthracene | | 3.4 | U | 3.4 | 16 |
| Benzo[a]pyrene | | 6.8 | U | 6.8 | 16 |
| Benzo[b]fluoranthene | | 4.5 | U | 4.5 | 16 |
| *Benzo[g,h,i]perylene* | | *7.6* | *U* | *7.6* | *32* |
| Benzo[k]fluoranthene | | 4.2 | U N | 4.2 | 16 |
| Chrysene | | 5.1 | U | 5.1 | 42 |
| Dibenzo(a,h)anthracene | | 12 | U | 12 | 32 |
| Fluoranthene | | 14 | U | 14 | 42 |
| Fluorene | | 5.6 | U | 5.6 | 32 |
| Indeno[1,2,3-cd]pyrene | | 13 | U | 13 | 32 |
| Naphthalene | | 13 | U | 13 | 110 |
| Phenanthrene | | 13 | U | 13 | 42 |
| Pyrene | | 13 | U | 13 | 42 |

| Surrogate | %Rec | Qualifier | Acceptance Limits |
|---|---|---|---|
| Terphenyl-d14 (SUR) | 88 | | 72 - 115 |

2/22/14

Client: Washington Closure Hanford

Job Number: 280-61898-1
Sdg Number: JP0877

***Client Sample ID:*** ***J1TWV6***

Lab Sample ID: 280-61898-9
Client Matrix: Solid

% Moisture: 6.1

Date Sampled: 10/28/2014 0948
Date Received: 10/30/2014 0930

**8310 PAHs (HPLC)**

| | | | | | |
|---|---|---|---|---|---|
| Analysis Method: | 8310 | Analysis Batch: | 280-251013 | Instrument ID: | CHHPLC_G |
| Prep Method: | 3550C | Prep Batch: | 280-250638 | Initial Weight/Volume: | 30.8 g |
| Dilution: | 1.0 | | | Final Weight/Volume: | 4 mL |
| Analysis Date: | 11/03/2014 2239 | | | Injection Volume: | 20 uL |
| Prep Date: | 10/30/2014 2156 | | | Result Type: | PRIMARY |

| Analyte | DryWt Corrected: Y | Result (ug/Kg) | Qualifier | MDL | RL |
|---|---|---|---|---|---|
| Acenaphthene | | 10 | U | 10 | 100 |
| *Acenaphthylene* | | *9.3* | *U* | *9.3* | *100* |
| Anthracene | | 3.2 | U | 3.2 | 21 |
| Benzo[a]anthracene | | 3.3 | U | 3.3 | 16 |
| Benzo[a]pyrene | | 6.6 | U | 6.6 | 16 |
| Benzo[b]fluoranthene | | 4.4 | U | 4.4 | 16 |
| Benzo[g,h,i]perylene | | 7.5 | U | 7.5 | 31 |
| Benzo[k]fluoranthene | | 4.1 | U N | 4.1 | 16 |
| Chrysene | | 5.0 | U | 5.0 | 41 |
| Dibenzo(a,h)anthracene | | 11 | U | 11 | 31 |
| Fluoranthene | | 13 | U | 13 | 41 |
| Fluorene | | 5.5 | U | 5.5 | 31 |
| Indeno[1,2,3-cd]pyrene | | 12 | U | 12 | 31 |
| Naphthalene | | 12 | U | 12 | 100 |
| Phenanthrene | | 12 | U | 12 | 41 |
| Pyrene | | 12 | U | 12 | 41 |

| Surrogate | %Rec | Qualifier | Acceptance Limits |
|---|---|---|---|
| Terphenyl-d14 (SUR) | 83 | | 72 - 115 |

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## Analytical Data

Client: Washington Closure Hanford

Job Number: 280-61898-1
Sdg Number: JP0877

**Client Sample ID:** J1TWV7

Lab Sample ID: 280-61898-10
Client Matrix: Solid

% Moisture: 9.4

Date Sampled: 10/28/2014 1018
Date Received: 10/30/2014 0930

**8310 PAHs (HPLC)**

| | | | | | |
|---|---|---|---|---|---|
| Analysis Method: | 8310 | Analysis Batch: | 280-251013 | Instrument ID: | CHHPLC_G |
| Prep Method: | 3550C | Prep Batch: | 280-250638 | Initial Weight/Volume: | 31.2 g |
| Dilution: | 1.0 | | | Final Weight/Volume: | 4 mL |
| Analysis Date: | 11/03/2014 2309 | | | Injection Volume: | 20 uL |
| Prep Date: | 10/30/2014 2156 | | | Result Type: | PRIMARY |

| Analyte | DryWt Corrected: Y | Result (ug/Kg) | Qualifier | MDL | RL |
|---|---|---|---|---|---|
| Acenaphthene | | 11 | U | 11 | 110 |
| ~~Acenaphthylene~~ | | 9.6 | U | 9.6 | 110 |
| Anthracene | | 3.2 | U | 3.2 | 21 |
| Benzo[a]anthracene | | 3.4 | U | 3.4 | 16 |
| Benzo[a]pyrene | | 6.8 | U | 6.8 | 16 |
| Benzo[b]fluoranthene | | 4.5 | U | 4.5 | 16 |
| Benzo[g,h,i]perylene | | 7.6 | U | 7.6 | 32 |
| Benzo[k]fluoranthene | | 4.2 | U N | 4.2 | 16 |
| Chrysene | | 9.0 | J X | 5.1 | 42 |
| Dibenzo(a,h)anthracene | | 12 | U | 12 | 32 |
| Fluoranthene | | 14 | U | 14 | 42 |
| Fluorene | | 5.6 | U | 5.6 | 32 |
| Indeno[1,2,3-cd]pyrene | | 13 | U | 13 | 32 |
| Naphthalene | | 13 | U | 13 | 110 |
| Phenanthrene | | 13 | U | 13 | 42 |
| Pyrene | | 13 | U | 13 | 42 |

| Surrogate | %Rec | Qualifier | Acceptance Limits |
|---|---|---|---|
| Terphenyl-d14 (SUR) | 85 | | 72 - 115 |

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## Analytical Data

Client: Washington Closure Hanford

Job Number: 280-61898-1
Sdg Number: JP0877

**Client Sample ID:** **J1TWV8**

Lab Sample ID: 280-61898-11
Client Matrix: Solid

% Moisture: 6.9

Date Sampled: 10/28/2014 0933
Date Received: 10/30/2014 0930

**8310 PAHs (HPLC)**

| | | | | | |
|---|---|---|---|---|---|
| Analysis Method: | 8310 | Analysis Batch: | 280-251013 | Instrument ID: | CHHPLC_G |
| Prep Method: | 3550C | Prep Batch: | 280-250638 | Initial Weight/Volume: | 30.7 g |
| Dilution: | 1.0 | | | Final Weight/Volume: | 4 mL |
| Analysis Date: | 11/03/2014 2340 | | | Injection Volume: | 20 uL |
| Prep Date: | 10/30/2014 2156 | | | Result Type: | PRIMARY |

| Analyte | DryWt Corrected: Y | Result (ug/Kg) | Qualifier | MDL | RL |
|---|---|---|---|---|---|
| Acenaphthene | | 10 | U | 10 | 100 |
| *Acenaphthylene* | | *9.4* | *U* | *9.4* | *100* |
| Anthracene | | 3.2 | U | 3.2 | 21 |
| Benzo[a]anthracene | | 6.0 | J X | 3.3 | 16 |
| Benzo[a]pyrene | | 15 | J | 6.7 | 16 |
| Benzo[b]fluoranthene | | 12 | J | 4.4 | 16 |
| Benzo[g,h,i]perylene | | 7.6 | U | 7.6 | 31 |
| Benzo[k]fluoranthene | | 4.1 | U N | 4.1 | 16 |
| Chrysene | | 13 | J | 5.1 | 42 |
| Dibenzo(a,h)anthracene | | 12 | U | 12 | 31 |
| Fluoranthene | | 14 | U X | 14 | 42 |
| Fluorene | | 5.5 | U | 5.5 | 31 |
| Indeno[1,2,3-cd]pyrene | | 13 | U | 13 | 31 |
| Naphthalene | | 13 | U | 13 | 100 |
| Phenanthrene | | 13 | U | 13 | 42 |
| Pyrene | | 13 | U | 13 | 42 |

| Surrogate | %Rec | Qualifier | Acceptance Limits |
|---|---|---|---|
| Terphenyl-d14 (SUR) | 87 | | 72 - 115 |

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## Analytical Data

Client: Washington Closure Hanford

Job Number: 280-61898-1
Sdg Number: JP0877

***Client Sample ID:*** ***J1TWV9***

Lab Sample ID: 280-61898-12
Client Matrix: Solid

% Moisture: 8.2

Date Sampled: 10/28/2014 0943
Date Received: 10/30/2014 0930

**8310 PAHs (HPLC)**

| | | | | | |
|---|---|---|---|---|---|
| Analysis Method: | 8310 | Analysis Batch: | 280-251013 | Instrument ID: | CHHPLC_G |
| Prep Method: | 3550C | Prep Batch: | 280-250638 | Initial Weight/Volume: | 31.2 g |
| Dilution: | 1.0 | | | Final Weight/Volume: | 4 mL |
| Analysis Date: | 11/04/2014 0010 | | | Injection Volume: | 20 uL |
| Prep Date: | 10/30/2014 2156 | | | Result Type: | PRIMARY |

| Analyte | DryWt Corrected: Y | Result (ug/Kg) | Qualifier | MDL | RL |
|---|---|---|---|---|---|
| Acenaphthene | | 10 | U | 10 | 100 |
| Acenaphthylene | | 9.4 | U | 9.4 | 100 |
| Anthracene | | 3.2 | U | 3.2 | 21 |
| Benzo[a]anthracene | | 3.3 | U | 3.3 | 16 |
| Benzo[a]pyrene | | 6.7 | U | 6.7 | 16 |
| Benzo[b]fluoranthene | | 4.4 | U | 4.4 | 16 |
| Benzo[g,h,i]perylene | | 7.5 | U | 7.5 | 31 |
| Benzo[k]fluoranthene | | 4.1 | U N | 4.1 | 16 |
| Chrysene | | 5.1 | U | 5.1 | 42 |
| Dibenzo(a,h)anthracene | | 12 | U | 12 | 31 |
| Fluoranthene | | 14 | U | 14 | 42 |
| Fluorene | | 5.5 | U | 5.5 | 31 |
| Indeno[1,2,3-cd]pyrene | | 13 | U | 13 | 31 |
| Naphthalene | | 13 | U | 13 | 100 |
| Phenanthrene | | 13 | U | 13 | 42 |
| Pyrene | | 13 | U | 13 | 42 |

| Surrogate | %Rec | Qualifier | Acceptance Limits |
|---|---|---|---|
| Terphenyl-d14 (SUR) | 87 | | 72 - 115 |

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## Analytical Data

Client: Washington Closure Hanford

Job Number: 280-61898-1
Sdg Number: JP0877

***Client Sample ID:*** ***J1TWW0***

Lab Sample ID: 280-61898-13
Client Matrix: Solid

% Moisture: 5.2

Date Sampled: 10/28/2014 0857
Date Received: 10/30/2014 0930

**8310 PAHs (HPLC)**

| | | | | | |
|---|---|---|---|---|---|
| Analysis Method: | 8310 | Analysis Batch: | 280-251013 | Instrument ID: | CHHPLC_G |
| Prep Method: | 3550C | Prep Batch: | 280-250638 | Initial Weight/Volume: | 32.2 g |
| Dilution: | 1.0 | | | Final Weight/Volume: | 4 mL |
| Analysis Date: | 11/04/2014 0041 | | | Injection Volume: | 20 uL |
| Prep Date: | 10/30/2014 2156 | | | Result Type: | PRIMARY |

| Analyte | DryWt Corrected: Y | Result (ug/Kg) | Qualifier | MDL | RL |
|---|---|---|---|---|---|
| Acenaphthene | | 9.8 | U | 9.8 | 98 |
| *Acenaphthylene* | | *8.8* | *U* | *8.8* | *98* |
| Anthracene | | 3.0 | U | 3.0 | 20 |
| Benzo[a]anthracene | | 3.1 | U | 3.1 | 15 |
| Benzo[a]pyrene | | 6.3 | U | 6.3 | 15 |
| Benzo[b]fluoranthene | | 4.1 | U | 4.1 | 15 |
| Benzo[g,h,i]perylene | | 7.1 | U | 7.1 | 29 |
| Benzo[k]fluoranthene | | 3.9 | U N | 3.9 | 15 |
| Chrysene | | 4.8 | U | 4.8 | 39 |
| Dibenzo(a,h)anthracene | | 11 | U | 11 | 29 |
| Fluoranthene | | 13 | U | 13 | 39 |
| Fluorene | | 5.2 | U | 5.2 | 29 |
| Indeno[1,2,3-cd]pyrene | | 12 | U | 12 | 29 |
| Naphthalene | | 12 | U | 12 | 98 |
| Phenanthrene | | 12 | U | 12 | 39 |
| Pyrene | | 12 | U | 12 | 39 |

| Surrogate | %Rec | Qualifier | Acceptance Limits |
|---|---|---|---|
| Terphenyl-d14 (SUR) | 83 | | 72 - 115 |

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## Analytical Data

Client: Washington Closure Hanford

Job Number: 280-61898-1
Sdg Number: JP0877

***Client Sample ID:*** ***J1TWW1***

Lab Sample ID: 280-61898-14
Client Matrix: Solid

% Moisture: 0.2

Date Sampled: 10/28/2014 0850
Date Received: 10/30/2014 0930

**8310 PAHs (HPLC)**

| | | | | | |
|---|---|---|---|---|---|
| Analysis Method: | 8310 | Analysis Batch: | 280-251013 | Instrument ID: | CHHPLC_G |
| Prep Method: | 3550C | Prep Batch: | 280-250638 | Initial Weight/Volume: | 30.5 g |
| Dilution: | 1.0 | | | Final Weight/Volume: | 4 mL |
| Analysis Date: | 11/04/2014 0111 | | | Injection Volume: | 20 uL |
| Prep Date: | 10/30/2014 2156 | | | Result Type: | PRIMARY |

| Analyte | DryWt Corrected: Y | Result (ug/Kg) | Qualifier | MDL | RL |
|---|---|---|---|---|---|
| Acenaphthene | | 9.9 | U | 9.9 | 99 |
| *Acenaphthylene* | | *8.9* | *U* | *8.9* | *99* |
| Anthracene | | 3.0 | U | 3.0 | 20 |
| Benzo[a]anthracene | | 3.1 | U | 3.1 | 15 |
| Benzo[a]pyrene | | 6.3 | U | 6.3 | 15 |
| Benzo[b]fluoranthene | | 4.1 | U | 4.1 | 15 |
| Benzo[g,h,i]perylene | | 7.1 | U | 7.1 | 30 |
| Benzo[k]fluoranthene | | 3.9 | U N | 3.9 | 15 |
| Chrysene | | 4.8 | U | 4.8 | 39 |
| Dibenzo(a,h)anthracene | | 11 | U | 11 | 30 |
| Fluoranthene | | 13 | U | 13 | 39 |
| Fluorene | | 5.2 | U | 5.2 | 30 |
| Indeno[1,2,3-cd]pyrene | | 12 | U | 12 | 30 |
| Naphthalene | | 12 | U | 12 | 99 |
| Phenanthrene | | 12 | U | 12 | 39 |
| Pyrene | | 12 | U | 12 | 39 |

| Surrogate | %Rec | Qualifier | Acceptance Limits |
|---|---|---|---|
| Terphenyl-d14 (SUR) | 89 | | 72 - 115 |

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## Appendix 4

## Laboratory Narrative and Chain-of-Custody Documentation

# CASE NARRATIVE

## Client: Washington Closure Hanford

## *Project: WASHINGTON CLOSURE HANFORD*

## Report Number: 280-61898-1

**SDG #: JP0877**
**SAF#: RC-075**

**Date SDG Closed: October 30, 2014**
**Data Deliverable: 7 Day / Summary**

| CLIENT ID | LAB ID | ANALYSES REQUESTED | ANALYSES PERFORMED |
|---|---|---|---|
| J1TWT8 | 280-61898-1 | 6010/7471/8310/8082/8081 | 6010B/7471A/8310/8082/8081A |
| J1TWT9 | 280-61898-2 | 6010/7471/8310/8082/8081 | 6010B/7471A/8310/8082/8081A |
| J1TWV0 | 280-61898-3 | 6010/7471/8310/8082/8081 | 6010B/7471A/8310/8082/8081A |
| J1TWV1 | 280-61898-4 | 6010/7471/8310/8082/8081 | 6010B/7471A/8310/8082/8081A |
| J1TWV2 | 280-61898-5 | 6010/7471/8310/8082/8081 | 6010B/7471A/8310/8082/8081A |
| J1TWV3 | 280-61898-6 | 6010/7471/8310/8082/8081 | 6010B/7471A/8310/8082/8081A |
| J1TWV4 | 280-61898-7 | 6010/7471/8310/8082/8081 | 6010B/7471A/8310/8082/8081A |
| J1TWV5 | 280-61898-8 | 6010/7471/8310/8082/8081 | 6010B/7471A/8310/8082/8081A |
| J1TWV6 | 280-61898-9 | 6010/7471/8310/8082/8081 | 6010B/7471A/8310/8082/8081A |
| J1TWV7 | 280-61898-10 | 6010/7471/8310/8082/8081 | 6010B/7471A/8310/8082/8081A |
| J1TWV8 | 280-61898-11 | 6010/7471/8310/8082/8081 | 6010B/7471A/8310/8082/8081A |
| J1TWV9 | 280-61898-12 | 6010/7471/8310/8082/8081 | 6010B/7471A/8310/8082/8081A |
| J1TWW0 | 280-61898-13 | 6010/7471/8310/8082/8081 | 6010B/7471A/8310/8082/8081A |
| J1TWW1 | 280-61898-14 | 6010/7471/8310 | 6010B/7471A/8310 |

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 10/30/2014 9:30 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperatures of the 2 coolers at receipt time were 1.3° C and 1.5° C.

The samples presented in this report contained large rocks that were not included in the aliquots used for extraction and/or analysis.

**GC SEMIVOLATILES - SW846 8081A - Pesticides**
The organic prep laboratory noted that a Florisil clean-up was performed on the samples presented in this report to reduce matrix interferences.

The laboratory noted that the samples presented in this report contained numerous non-target peaks and significant baseline rise that could be interfering with the identification and quantitation of target analytes. This inference could cause false positive and/or negative results. The interference appears to be Aroclors/PCBs which had numerous peaks.

The RPD between the primary and confirmation columns exceeded 40% for analytes in several samples. The lower of the two values have been reported, as matrix interference is evident. Associated results have been flagged with an "X".

Each sample is analyzed to achieve the lowest possible reporting limits within the constraints of the method. Due to the presence of interfering, non-target analytes, samples J1TWV0 and J1TWV7 required dilutions prior to analysis, and the associated results have been flagged with a "D". The reporting limits have been adjusted relative to the dilution required.

Surrogate recoveries obtained for samples J1TWV0 and J1TWV7 are calculated from diluted samples and are not considered reliable.

A Continuing Calibration Verification (CCV) standard associated with samples J1TWT8 and J1TWV3 in analysis batch 280-251090 exhibited %Difference (%D) values >15%, biased low, for 4,4'-DDT (-25%, -24%). The overall mean %D is ≤15%; therefore, method criteria have been met and corrective action is deemed unnecessary.

No other anomalies were encountered.

**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.*

It can be noted that Aroclor 1221 is reported from a separate injection in order to acquire/maintain the associated second column confirmation chromatographic data for the samples. Due to a system limitation, this reporting style is necessary when samples are analyzed on a non-sequential injection instrument and second column confirmation is required.

Each sample is analyzed to achieve the lowest possible reporting limits within the constraints of the method. Due to the high constituent concentration, samples J1TWV0, J1TWV2, J1TWV4 and J1TWV7 had to be analyzed at dilutions, and the associated results have been flagged with a "D". The reporting limits have been adjusted relative to the dilutions required.

Surrogate recoveries obtained for samples J1TWV0, J1TWV2, J1TWV4 and J1TWV7 are calculated from diluted samples and are not considered reliable.

Spike compound recoveries, RPD data and surrogate recoveries obtained for the MS/MSD performed on sample J1TWV2 are calculated from a diluted sample and are not considered reliable. The acceptable LCS analysis data indicated that the analytical system was operating within control.

No other anomalies were encountered.

**HPLC - SW846 8310 - PAHs**

The RPD between the primary and confirmation columns exceeded 40% for analytes in samples J1TW0, J1TWV4, J1TWV7 and J1TWV8. The lower of the two values has been reported, as matrix interference is evident on both columns. Associated results have been flagged with an "X".

The LCS associated with batch 280-250638 exhibited the percent recovery outside the control limits for Benzo[k]fluoranthene at 84% (lower limit 85%), and associated sample results have been flagged "N". Although Benzo[k]fluoranthene was recovered outside current historical control limits, the recovery was within the allowed Marginal Exceedance control limits. This marginal exceedance has been determined to be sporadic, not systematic, and all other quality control acceptance criteria have been met; therefore, corrective action is deemed unnecessary.

The MS/MSD performed on sample J1TWV2 exhibited percent recoveries outside the control limits for Benzo[a]anthracene and Dibenzo(a,h)anthracene, and the associated sample results have been flagged "N". The acceptable LCS analysis data indicated that the analytical system was operating within control; therefore, corrective action is deemed unnecessary.

No other anomalies were encountered.

**TOTAL METALS - SW846 6010B/7471A**

Serial dilution of a digestate in batch 280-250668 indicates that physical and chemical interferences are present for several elements. Results have been flagged with an "X".

Each sample is analyzed to achieve the lowest possible reporting limits within the constraints of the methods. Due to matrix interference, the Beryllium analysis of several samples had to be performed at a dilution. The reporting limits have been adjusted relative to the dilution required.

Low levels of Vanadium are present in the method blank associated with batch 280-250668. Because the concentration in the method blank is not present at a level greater than half the reporting limit, corrective action is deemed unnecessary.

It can be noted that the sample amount was greater than four times the spike amount for Aluminum, Iron and Manganese in the Matrix Spike performed on sample J1TWT8; therefore, control limits are not applicable.

The duplicate analysis of sample J1TWT8 exhibited RPD data outside the control limits for Cadmium and Nickel, 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.

# Washington Closure Hanford

# CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

RC-075-441

| | | | |
|---|---|---|---|
| Collector: H. Weber | Company Contact: Joan Kessner | Telephone No.: 375-4688 | Project Coordinator: KESSNER, JH |
| Price Code: 8B | Data Turnaround: 7 days | | |
| Project Designation: 100-D/DR Field Remediation | Sampling Location: 100-D-86:3, Verification II | | SAF No.: RC-075 |
| Ice Chest No.: RCC-07-015 | Field Logbook No.: EL-1662-02 03 10/28/14 | COA: 01D8632000 | Method of Shipment: Commercial Carrier \ Fed Ex |
| Shipped To: TestAmerica Denver | Offsite Property No.: A13/281 | | Bill of Lading/Air Bill No.: see OSPC |

Other Labs Shipped To: TestAmerica Richland

RCF37029

POSSIBLE SAMPLE HAZARDS/REMARKS

n/A

Special Handling and/or Storage

Cool 4C

| Preservation | Cool 4C | Cool 4C | Cool 4C | Cool 4C |
|---|---|---|---|---|
| Type of Container | G/P | aG | aG | aG |
| No. of Container(s) | 1 | 1 | 1 | 1 |
| Volume | 250mL | 250mL | 250mL | 250mL |
| Sample Analysis | See item (1) in Special Instructions | PAHs - 8310 | PCBs - 8082 | Pesticides - 8081 |

| Sample No. | Matrix | Sample Date | Sample Time | | | | |
|---|---|---|---|---|---|---|---|
| J1TWT8 | SOIL | 10/28/14 | 1008 | X | X | X | X |
| J1TWT9 | SOIL | 10/28/14 | 0857 | X | X | X | X |
| J1TWV0 | SOIL | 10/28/14 | 1003 | X | X | X | X |
| J1TWV1 | SOIL | 10/28/14 | 0907 | X | X | X | X |
| J1TWV2 | SOIL | 10/28/14 | 0916 | X | X | X | X |

Page 1 of 1

## CHAIN OF POSSESSION

Sign/Print Names

| Relinquished By/Removed From | Date/Time | Received By/Stored In | Date/Time |
|---|---|---|---|
| Heather Weber | 10/28/14 1035 | WCH DWSHEA | 10/28/14 1035 |
| DWSHEA DWSHEA | 10/28/14 1545 | C. Bingham | 10-28-14 1545 |
| C. Bingham | 10-28-14 1550 | 1060 Battelle, fridge #2A | 10-28-14 1550 |
| 1060 Battelle, fridge #2A | 10-29-14 1000 | C. Bingham | 10-29-14 1000 |
| C. Bingham WCH | 10-29-14 1010 | Fed Ex | |
| | | | 10/30/14 9:30 |

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) (Mercury)

1.3/1.5 IRG CF 0.0
Transferred by MT 10/30/14

REVIEWED BY K. Niedhammer DATE 10-29-14

JP0877

WCH-EE-011

# Washington Closure Hanford — CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

RC-075-441

| | |
|---|---|
| Collector | H. Weber |
| Company Contact | Joan Kessner |
| Telephone No. | 375-4688 |
| Project Coordinator | KESSNER, JH |
| Price Code | 8B 7 days |
| Data Turnaround | |
| Project Designation | 100-D/DR Field Remediation |
| Sampling Location | 100-D-86:3, Verification II |
| SAF No. | RC-075 |
| Ice Chest No. | RCC-07-015 |
| Field Logbook No. | EL-1662-82 03 10/28/14 |
| COA | 01D8632000 |
| Method of Shipment | Commercial Carrier \ Fed Ex |
| Shipped To | TestAmerica Denver |
| Offsite Property No. | A131281 |
| Bill of Lading/Air Bill No. | See OSR |
| Other Labs Shipped To | TestAmerica Richland RCF 37029 |

POSSIBLE SAMPLE HAZARDS/REMARKS: N/A

Special Handling and/or Storage: Cool 4C

| Sample No. | Matrix | Sample Date | Sample Time | Preservation: Cool 4C | Cool 4C | Cool 4C | Cool 4C |
|---|---|---|---|---|---|---|---|
| | | | | Type of Container: G/P | aG | aG | aG |
| | | | | No. of Container(s): 1 | 1 | 1 | 1 |
| | | | | Volume: 250mL | 250mL | 250mL | 250mL |
| | | | | Sample Analysis: See item (1) in Special Instructions | PAHs - 8310 | PCBs - 8082 | Pesticides - 8081 |
| J1TWV3 | SOIL | 10/28/14 | 0955 | X | X | X | X |
| J1TWV4 | SOIL | 10/28/14 | 0929 | X | X | X | X |
| J1TWV5 | SOIL | 10/28/14 | 0925 | X | X | X | X |
| J1TWV6 | SOIL | 10/28/14 | 0948 | X | X | X | X |
| J1TWV7 | SOIL | 10/28/14 | 1018 | X | X | X | X |

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## CHAIN OF POSSESSION / Sign/Print Names

| Relinquished By/Removed From | Date/Time | Received By/Stored In | Date/Time |
|---|---|---|---|
| Heather Weber / [illegible] | 10/28/14 1035 | WCH Bushea DW34 #A | 10/28/14 1035 |
| Bushea DW34 #A | 10/28/14 1545 | C. Bingham | 10-28-14 1545 |
| C. Bingham | 10-28-14 1550 | 1060 Battelle, fridge #2A | 10-28-14 1550 |
| 1060 Battelle, fridge #2A | 10-29-14 1000 | C. Bingham | 10-29-14 1000 |
| C. Bingham WCH | 10-29-14 1010 | Fed EX | |
| | | [illegible] | 10/30/14 9:30 |

| 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) {Mercury}

REVIEWED BY K. Johnson DATE 10-29-14

JP0877

WCH-EE-011

# Washington Closure Hanford

# CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

RC-075-441

| | | | |
|---|---|---|---|
| Collector: H. Weber | Company Contact: Joan Kessner | Telephone No.: 375-4688 | Project Coordinator: KESSNER, JH |
| Project Designation: 100-D/DR Field Remediation | Sampling Location: 100-D-86:3, Verification II | | SAF No.: RC-075 |
| Ice Chest No.: RCC-07-015 | Field Logbook No.: EL-1662-02 03 10/28/14 | COA: 01D8632000 | Method of Shipment: Commercial Carrier / Fed Ex |
| Shipped To: TestAmerica Denver | Offsite Property No.: A131281 | | Bill of Lading/Air Bill No.: See OSPC |

Price Code: 8B

Data Turnaround: 7 days

Other Labs Shipped To: TestAmerica Richland

RCF37029

POSSIBLE SAMPLE HAZARDS/REMARKS

n/A

Special Handling and/or Storage

cool 4C

| Preservation | Cool 4C | Cool 4C | Cool 4C | Cool 4C |
|---|---|---|---|---|
| Type of Container | G/P | aG | aG | aG |
| No. of Container(s) | 1 | 1 | 1 | 1 |
| Volume | 250mL | 250mL | 250mL | 250mL |
| Sample Analysis | See item (1) in Special Instructions | PAHs - 8310 | PCBs - 8082 | Pesticides - 8081 |

| Sample No. | Matrix | Sample Date | Sample Time | | | | |
|---|---|---|---|---|---|---|---|
| J1TWW8 | SOIL | 10/28/14 | 0933 | X | X | X | X |
| J1TWW9 | SOIL | 10/28/14 | 0943 | X | X | X | X |
| J1TWW0 | SOIL | 10/28/14 | 0857 | X | X | X | X |
| J1TWW1 | SOIL | 10/28/14 | 0850 | X | X | n/A | n/A |

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## CHAIN OF POSSESSION

| Relinquished By/Removed From | Date/Time | Received By/Stored In | Date/Time |
|---|---|---|---|
| Heather Weber / [signature] | 10/28/14 1035 | WCH DWSHEA | 10/28/14 1035 |
| DWSHEA DWSHEA | 10/28/14 1545 | C. Bingham [signature] | 10-28-14 1545 |
| C. Bingham [signature] | 10-28-14 1550 | 1060 Battelle, fridge #2A | 10-28-14 1550 |
| 1060 Battelle, fridge #2A | 10-29-14 1000 | C. Bingham [signature] | 10-29-14 1000 |
| C. Bingham [signature] WCH | 10-29-14 1010 | fed EX | |
| | | [signature] | 10/30/14 9:30 |

Sign/Print Names

| 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) (Mercury)

REVIEWED BY Khoadhaemd DATE 10-29-14

JP0877

WCH-EE-011

## Appendix 5

## Data Validation Supporting Documentation

# GENERAL ORGANIC DATA VALIDATION CHECKLIST

| VALIDATION LEVEL: | A | B | C | D | E |
|---|---|---|---|---|---|
| PROJECT: 100-D-86:3 | | | DATA PACKAGE: JP0877 | | |
| VALIDATOR: ELK | | LAB: JAL | | DATE: 2/22/13 | |
| | | | SDG: JP0877 | | |

| ANALYSES PERFORMED | | | | | |
|---|---|---|---|---|---|
| 8015 | 8021 | 8141 | 8151 | 8315 | 8310 |
| | | WTPH-HCID | WTPH-G | WTPH-D | |
| | | | | | |

SAMPLES/MATRIX:

| | | | |
|---|---|---|---|
| JITWT8 | JITWT9 | JITWV0 | JITWV1 |
| JITWV2 | JITWV3 | JITWV4 | JITWV5 |
| JITWV6 | JITWV7 | JITWV8 | JITWV9 |
| JITWW0 | | | |

Col

## 1. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE

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

Comments:

## 2. INSTRUMENT TUNING AND CALIBRATION (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

Comments:

# GENERAL ORGANIC 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 FB

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

Surrogates/system monitoring compounds analyzed? ..... Yes No N/A

Surrogate/system monitoring compound 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 PSA

# GENERAL ORGANIC DATA VALIDATION CHECKLIST

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

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

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

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

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

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

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

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

Comments: _____

## 6. HOLDING TIMES (all levels)

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

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

Comments: _____

# GENERAL ORGANIC DATA VALIDATION CHECKLIST

## 8. COMPOUND IDENTIFICATION, 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: _____

## 9. SAMPLE CLEANUP (Levels D and E)

Fluoricil ® (or other aborbant) cleanup performed? ..... Yes No N/A

Lot check performed? ..... Yes No N/A

Check recoveries aceptable? ..... Yes No N/A

Check materials traceable? ..... Yes No N/A

Check 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: 280-61898-1
Sdg Number: JP0877

**Method Blank - Batch: 280-250638**

**Method: 8310**
**Preparation: 3550C**

| | | | | | |
|---|---|---|---|---|---|
| Lab Sample ID: | MB 280-250638/1-A | Analysis Batch: | 280-251013 | Instrument ID: | CHHPLC_G |
| Client Matrix: | Solid | Prep Batch: | 280-250638 | Lab File ID: | G1103008.D |
| Dilution: | 1.0 | Leach Batch: | N/A | Initial Weight/Volume: | 30.8 g |
| Analysis Date: | 11/03/2014 1602 | Units: | ug/Kg | Final Weight/Volume: | 4 mL |
| Prep Date: | 10/30/2014 2156 | | | Injection Volume: | 20 uL |
| Leach Date: | N/A | | | Column ID: | PRIMARY |

| Analyte | Result | Qual | MDL | RL |
|---|---|---|---|---|
| Acenaphthene | 9.7 | U | 9.7 | 97 |
| Acenaphthylene | 8.8 | U | 8.8 | 97 |
| Anthracene | 3.0 | U | 3.0 | 19 |
| Benzo[a]anthracene | 3.1 | U | 3.1 | 15 |
| Benzo[a]pyrene | 6.2 | U | 6.2 | 15 |
| Benzo[b]fluoranthene | 4.1 | U | 4.1 | 15 |
| Benzo[g,h,i]perylene | 7.0 | U | 7.0 | 29 |
| Benzo[k]fluoranthene | 3.8 | U | 3.8 | 15 |
| Chrysene | 4.7 | U | 4.7 | 39 |
| Dibenzo(a,h)anthracene | 11 | U | 11 | 29 |
| Fluoranthene | 13 | U | 13 | 39 |
| Fluorene | 5.1 | U | 5.1 | 29 |
| Indeno[1,2,3-cd]pyrene | 12 | U | 12 | 29 |
| Naphthalene | 12 | U | 12 | 97 |
| Phenanthrene | 12 | U | 12 | 39 |
| Pyrene | 12 | U | 12 | 39 |

| Surrogate | % Rec | Acceptance Limits |
|---|---|---|
| Terphenyl-d14 (SUR) | 88 | 72 - 115 |

## Quality Control Results

Client: Washington Closure Hanford

Job Number: 280-61898-1
Sdg Number: JP0877

**Lab Control Sample - Batch: 280-250638**

**Method: 8310**
**Preparation: 3550C**

| | | | | | |
|---|---|---|---|---|---|
| Lab Sample ID: | LCS 280-250638/2-A | Analysis Batch: | 280-251013 | Instrument ID: | CHHPLC_G |
| Client Matrix: | Solid | Prep Batch: | 280-250638 | Lab File ID: | G1103009.D |
| Dilution: | 1.0 | Leach Batch: | N/A | Initial Weight/Volume: | 31.1 g |
| Analysis Date: | 11/03/2014 1632 | Units: | ug/Kg | Final Weight/Volume: | 4 mL |
| Prep Date: | 10/30/2014 2156 | | | Injection Volume: | 20 uL |
| Leach Date: | N/A | | | Column ID: | PRIMARY |

| Analyte | Spike Amount | Result | % Rec. | Limit | Qual |
|---|---|---|---|---|---|
| Acenaphthene | 1930 | 1610 | 84 | 78 - 116 | |
| Acenaphthylene | 1930 | 1590 | 82 | 76 - 115 | |
| Anthracene | 1930 | 1580 | 82 | 74 - 115 | |
| Benzo[a]anthracene | 1930 | 1630 | 85 | 85 - 120 | |
| Benzo[a]pyrene | 1930 | 1740 | 90 | 74 - 121 | |
| Benzo[b]fluoranthene | 1930 | 1630 | 85 | 85 - 115 | |
| Benzo[g,h,i]perylene | 1930 | 1780 | 92 | 85 - 120 | |
| Benzo[k]fluoranthene | 1930 | 1630 | 84 | 85 - 115 | N |
| Chrysene | 1930 | 1710 | 89 | 83 - 115 | |
| Dibenzo(a,h)anthracene | 1930 | 1600 | 83 | 83 - 115 | |
| Fluoranthene | 1930 | 1630 | 84 | 83 - 115 | |
| Fluorene | 1930 | 1660 | 86 | 80 - 115 | |
| Indeno[1,2,3-cd]pyrene | 1930 | 1750 | 90 | 85 - 123 | |
| Naphthalene | 1930 | 1570 | 82 | 80 - 121 | |
| Phenanthrene | 1930 | 1590 | 82 | 80 - 115 | |
| Pyrene | 1930 | 1730 | 90 | 75 - 116 | |

| Surrogate | % Rec | Acceptance Limits |
|---|---|---|
| Terphenyl-d14 (SUR) | 89 | 72 - 115 |

Client: Washington Closure Hanford

Job Number: 280-61898-1
Sdg Number: JP0877

**Matrix Spike/**
**Matrix Spike Duplicate Recovery Report - Batch: 280-250638**

**Method: 8310**
**Preparation: 3550C**

| | | | | | |
|---|---|---|---|---|---|
| MS Lab Sample ID: | 280-61898-5 | Analysis Batch: | 280-251013 | Instrument ID: | CHHPLC_G |
| Client Matrix: | Solid | Prep Batch: | 280-250638 | Lab File ID: | G1103015.D |
| Dilution: | 1.0 | Leach Batch: | N/A | Initial Weight/Volume: | 30.1 g |
| Analysis Date: | 11/03/2014 1935 | | | Final Weight/Volume: | 4 mL |
| Prep Date: | 10/30/2014 2156 | | | Injection Volume: | 20 uL |
| Leach Date: | N/A | | | Column ID: | PRIMARY |

| | | | | | |
|---|---|---|---|---|---|
| MSD Lab Sample ID: | 280-61898-5 | Analysis Batch: | 280-251013 | Instrument ID: | CHHPLC_G |
| Client Matrix: | Solid | Prep Batch: | 280-250638 | Lab File ID: | G1103016.D |
| Dilution: | 1.0 | Leach Batch: | N/A | Initial Weight/Volume: | 32.3 g |
| Analysis Date: | 11/03/2014 2006 | | | Final Weight/Volume: | 4 mL |
| Prep Date: | 10/30/2014 2156 | | | Injection Volume: | 20 uL |
| Leach Date: | N/A | | | Column ID: | PRIMARY |

| Analyte | % Rec. MS | % Rec. MSD | Limit | RPD | RPD Limit | MS Qual | MSD Qual |
|---|---|---|---|---|---|---|---|
| Acenaphthene | 79 | 81 | 78 - 116 | 3 | 20 | | |
| Acenaphthylene | 82 | 81 | 76 - 115 | 8 | 21 | | |
| Anthracene | 82 | 81 | 74 - 115 | 8 | 20 | | |
| Benzo[a]anthracene | 85 | 84 | 85 - 120 | 9 | 20 | | N |
| Benzo[a]pyrene | 78 | 77 | 74 - 121 | 9 | 20 | | |
| Benzo[b]fluoranthene | 88 | 87 | 85 - 115 | 8 | 20 | | |
| Benzo[g,h,i]perylene | 95 | 93 | 85 - 120 | 8 | 20 | | |
| Benzo[k]fluoranthene | 87 | 86 | 85 - 115 | 8 | 20 | | |
| Chrysene | 86 | 85 | 83 - 115 | 8 | 20 | | |
| Dibenzo(a,h)anthracene | 82 | 81 | 83 - 115 | 9 | 20 | N | N |
| Fluoranthene | 84 | 83 | 83 - 115 | 8 | 20 | | |
| Fluorene | 85 | 84 | 80 - 115 | 8 | 20 | | |
| Indeno[1,2,3-cd]pyrene | 91 | 90 | 85 - 123 | 8 | 20 | | |
| Naphthalene | 82 | 80 | 80 - 121 | 8 | 20 | | |
| Phenanthrene | 83 | 81 | 80 - 115 | 9 | 20 | | |
| Pyrene | 89 | 89 | 75 - 116 | 8 | 20 | | |

| Surrogate | MS % Rec | MSD % Rec | Acceptance Limits |
|---|---|---|---|
| Terphenyl-d14 (SUR) | 87 | 86 | 72 - 115 |

## Quality Control Results

Job Number: 280-61898-1
Sdg Number: JP0877

Client: Washington Closure Hanford

**Matrix Spike/**
**Matrix Spike Duplicate Recovery Report - Batch: 280-250638**

**Method: 8310**
**Preparation: 3550C**

| | | | |
|---|---|---|---|
| MS Lab Sample ID: | 280-61898-5 | Units: ug/Kg | |
| Client Matrix: | Solid | | |
| Dilution: | 1.0 | | |
| Analysis Date: | 11/03/2014 1935 | | |
| Prep Date: | 10/30/2014 2156 | | |
| Leach Date: | N/A | | |

| | |
|---|---|
| MSD Lab Sample ID: | 280-61898-5 |
| Client Matrix: | Solid |
| Dilution: | 1.0 |
| Analysis Date: | 11/03/2014 2006 |
| Prep Date: | 10/30/2014 2156 |
| Leach Date: | N/A |

| Analyte | Sample Result/Qual | | MS Spike Amount | MSD Spike Amount | MS Result/Qual | | MSD Result/Qual | |
|---|---|---|---|---|---|---|---|---|
| Acenaphthene | 11 | U | 2150 | 2000 | 1690 | | 1630 | |
| Acenaphthylene | 9.6 | U | 2150 | 2000 | 1750 | | 1620 | |
| Anthracene | 3.3 | U | 2150 | 2000 | 1750 | | 1620 | |
| Benzo[a]anthracene | 3.4 | U | 2150 | 2000 | 1840 | | 1690 | N |
| Benzo[a]pyrene | 13 | J | 2150 | 2000 | 1690 | | 1550 | |
| Benzo[b]fluoranthene | 4.5 | U | 2150 | 2000 | 1900 | | 1750 | |
| Benzo[g,h,i]perylene | 7.7 | U | 2150 | 2000 | 2030 | | 1870 | |
| Benzo[k]fluoranthene | 4.2 | U | 2150 | 2000 | 1870 | | 1720 | |
| Chrysene | 20 | J | 2150 | 2000 | 1870 | | 1720 | |
| Dibenzo(a,h)anthracene | 12 | U | 2150 | 2000 | 1760 | N | 1620 | N |
| Fluoranthene | 14 | U | 2150 | 2000 | 1820 | | 1670 | |
| Fluorene | 5.6 | U | 2150 | 2000 | 1840 | | 1690 | |
| Indeno[1,2,3-cd]pyrene | 13 | U | 2150 | 2000 | 1960 | | 1810 | |
| Naphthalene | 13 | U | 2150 | 2000 | 1760 | | 1610 | |
| Phenanthrene | 13 | U | 2150 | 2000 | 1780 | | 1630 | |
| Pyrene | 13 | U | 2150 | 2000 | 1920 | | 1780 | |

Date: 23 February 2015
To: Washington Closure Hanford Inc. (technical representative)
From: ELR Consulting
Project: 100-D/DR Burial Grounds & Remaining Sites – Soil Full Protocol - Waste Site 100-D-86:3
Subject: Wet Chemistry - Data Package No. JP0877-TAL

## INTRODUCTION

This memo presents the results of data validation on Data Package No. JP0877 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 |
|---|---|---|---|---|
| J1TWT8 | 10/28/14 | Soil | C | See note 1 |
| J1TWT9 | 10/28/14 | Soil | C | See note 1 |
| J1TWV0 | 10/28/14 | Soil | C | See note 1 |
| J1TWV1 | 10/28/14 | Soil | C | See note 1 |
| J1TWV2 | 10/28/14 | Soil | C | See note 1 |
| J1TWV3 | 10/28/14 | Soil | C | See note 1 |
| J1TWV4 | 10/28/14 | Soil | C | See note 1 |
| J1TWV5 | 10/28/14 | Soil | C | See note 1 |
| J1TWV6 | 10/28/14 | Soil | C | See note 1 |
| J1TWV7 | 10/28/14 | Soil | C | See note 1 |
| J1TWV8 | 10/28/14 | Soil | C | See note 1 |
| J1TWV9 | 10/28/14 | Soil | C | See note 1 |
| J1TWW0 | 10/28/14 | Soil | C | See note 1 |

1 – Chromium VI by 7196.

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

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

## DATA QUALITY PARAMETERS

- **Holding Times**

Analytical holding times for metals are assessed to ascertain whether the holding time requirements were met by the laboratory. The holding time requirements

are as follows: 30 days for chromium VI.

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

All holding times were acceptable.

- **Method Blanks**

Method Blanks

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

All method blank results were acceptable.

Field Blanks

No field blanks were submitted for analysis.

- **Accuracy**

Matrix Spike and Laboratory Control Sample

Matrix spike (MS) and laboratory control sample (LCS) analyses are used to assess the analytical accuracy of the reported data. The matrix spike is used to assess the effect of the matrix on the ability to accurately quantify sample concentrations. Recoveries must fall within the range of 70% to 130%. Samples with a recovery of less than 30% and a sample result below the IDL are rejected and flagged "UR". Samples with a recovery of 30% to 69% and a sample result less than the IDL are qualified "UJ". Samples with a recovery of greater than 130% or less than 70% and a sample result greater than the IDL are qualified as estimates and flagged "J". Finally, for samples with a recovery greater than 130% and a sample result less than the IDL, no qualification is required.

All accuracy results were acceptable.

- **Precision**

Laboratory Duplicate Samples

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

All laboratory duplicate results were acceptable.

Field Duplicate

One set of field duplicates (J1TWT9/J1TWW0) 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 required quantitation limits (RQLs) to ensure that laboratory detection levels meet the required criteria. All analytes met the RQL.

- **Completeness**

Data package JP0877 was submitted for validation and verified for completeness. Completeness is based on the percentage of data determined to be valid (i.e., not rejected). The completion percentage was 100%.

**MAJOR DEFICIENCIES**

None found.

**MINOR DEFICIENCIES**

None found.

## REFERENCES

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

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

## Appendix 1

## Glossary of Data Reporting Qualifiers

Qualifiers which may be applied by data validators in compliance with 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: JP0877 | REVIEWER: ELR | Project: 100-D-86:3 | PAGE_1_OF_1 |
|---|---|---|---|
| COMMENTS: No qualifiers assigned | | | |

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

## Appendix 3

## Annotated Laboratory Reports

# Sample Results Summary

## TestAmerica Inc TARL

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

**Date:** 04-Nov-14

**Report No. :** 63259

**SDG No:** JP0877

| Batch | Client Id Work Order | Parameter | Result +- Uncertainty ( 2s) | Qual | Units | Tracer Yield | MDL | CRDL | RPD |
|---|---|---|---|---|---|---|---|---|---|
| 4303027 | 7196_CR6 | | | | | | | | |
| | J1TWT8 | | | | | | | | |
| | M5ELP1AA | HEXCHROME | 2.58E-01 +- 0.0E+00 | | mg/kg | N/A | 1.55E-01 | 1.55E-01 | |
| | M5ELP1AD | HEXCHROME | 2.37E-01 +- 0.0E+00 | | mg/kg | N/A | 1.55E-01 | 1.55E-01 | 8.5 |
| | J1TWT9 | | | | | | | | |
| | M5ELQ1AA | HEXCHROME | 3.46E-01 +- 0.0E+00 | | mg/kg | N/A | 1.55E-01 | 1.55E-01 | |
| | J1TWV0 | | | | | | | | |
| | M5ELR1AA | HEXCHROME | 3.04E-01 +- 0.0E+00 | | mg/kg | N/A | 1.55E-01 | 1.55E-01 | |
| | J1TWV1 | | | | | | | | |
| | M5ELT1AA | HEXCHROME | 3.45E-01 +- 0.0E+00 | | mg/kg | N/A | 1.55E-01 | 1.55E-01 | |
| | J1TWV2 | | | | | | | | |
| | M5ELV1AA | HEXCHROME | 3.16E-01 +- 0.0E+00 | | mg/kg | N/A | 1.55E-01 | 1.55E-01 | |
| | J1TWV3 | | | | | | | | |
| | M5ELW1AA | HEXCHROME | 2.22E-01 +- 0.0E+00 | | mg/kg | N/A | 1.55E-01 | 1.55E-01 | |
| | J1TWV4 | | | | | | | | |
| | M5ELX1AA | HEXCHROME | 3.33E-01 +- 0.0E+00 | | mg/kg | N/A | 1.55E-01 | 1.55E-01 | |
| | J1TWV5 | | | | | | | | |
| | M5EL01AA | HEXCHROME | 1.83E-01 +- 0.0E+00 | | mg/kg | N/A | 1.55E-01 | 1.55E-01 | |
| | J1TWV6 | | | | | | | | |
| | M5EL11AA | HEXCHROME | 3.52E-01 +- 0.0E+00 | | mg/kg | N/A | 1.55E-01 | 1.55E-01 | |
| | J1TWV7 | | | | | | | | |
| | M5EL21AA | HEXCHROME | 3.78E-01 +- 0.0E+00 | | mg/kg | N/A | 1.55E-01 | 1.55E-01 | |
| | J1TWV8 | | | | | | | | |
| | M5EL31AA | HEXCHROME | 3.82E-01 +- 0.0E+00 | | mg/kg | N/A | 1.55E-01 | 1.55E-01 | |
| | J1TWV9 | | | | | | | | |
| | M5EL41AA | HEXCHROME | 4.50E-01 +- 0.0E+00 | | mg/kg | N/A | 1.55E-01 | 1.55E-01 | |
| | J1TWW0 | | | | | | | | |
| | M5EL51AA | HEXCHROME | 2.82E-01 +- 0.0E+00 | | mg/kg | N/A | 1.55E-01 | 1.55E-01 | |

**No. of Results:** 14

2/22/14

TestAmerica Inc RPD - Relative Percent Difference.

rptTALRchSaSum
mary2 V5.3.5
A2002

## Appendix 4

## Laboratory Narrative and Chain-of-Custody Documentation

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

# Certificate of Analysis

Washington Hanford Closure
2620 Fermi Avenue
Richland, WA 99354

November 4, 2014

Attention: Joan Kessner

| | | |
|---|---|---|
| SAF Number | : | RC-075 |
| Date SDG Closed | : | October 29, 2014 |
| Number of Samples | : | Thirteen (13) |
| Sample Type | : | Soil |
| SDG Number | : | JP0877 |
| Data Deliverable | : | 7-Day / Summary |

## CASE NARRATIVE

### I. Introduction

On October 29, 2014, thirteen 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:

| WCH ID# | TARL ID# | MATRIX | DATE OF RECEIPT |
|---|---|---|---|
| J1TWT8 | M5ELP | SOIL | 10/29/14 |
| J1TWT9 | M5ELQ | SOIL | 10/29/14 |
| J1TWV0 | M5ELR | SOIL | 10/29/14 |
| J1TWV1 | M5ELT | SOIL | 10/29/14 |
| J1TWV2 | M5ELV | SOIL | 10/29/14 |
| J1TWV3 | M5ELW | SOIL | 10/29/14 |
| J1TWV4 | M5ELX | SOIL | 10/29/14 |
| J1TWV5 | M5EL0 | SOIL | 10/29/14 |
| J1TWV6 | M5EL1 | SOIL | 10/29/14 |
| J1TWV7 | M5EL2 | SOIL | 10/29/14 |
| J1TWV8 | M5EL3 | SOIL | 10/29/14 |
| J1TWV9 | M5EL4 | SOIL | 10/29/14 |
| J1TWW0 | M5EL5 | SOIL | 10/29/14 |

### II. Sample Receipt

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

## III. Analytical Results/Methodology

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

The requested 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 (J1TWT8) and sample matrix spike (J1TWT8) 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-075-441



| | | | |
|---|---|---|---|
| Collector: H. Weber | Company Contact: Joan Kessner | Telephone No.: 375-4688 | Project Coordinator: KESSNER, JH |
| Price Code: 8B | Data Turnaround: 7 days | | |
| Project Designation: 100-D/DR Field Remediation | Sampling Location: 100-D-86:3, Verification II | | SAF No.: RC-075 |
| Ice Chest No.: WCH-12-008 ~~ATT~~ 10-28-14 CMB | Field Logbook No.: EL-1662-82 03 10/28/14 | COA: 01D8632000 | Method of Shipment: Local Delivery |
| Shipped To: TestAmerica Richland | Offsite Property No.: N/A | | Bill of Lading/Air Bill No.: N/A |

Other Labs Shipped To: TestAmerica Denver

RCF 37029

POSSIBLE SAMPLE HAZARDS/REMARKS

N/A

Special Handling and/or Storage

Cool 4C

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Preservation | Cool 4C | | | | | | | | | | |
| Type of Container | G/P | | | | | | | | | | |
| No. of Container(s) | 1 | | | | | | | | | | |
| Volume | 125mL | | | | | | | | | | |
| Sample Analysis | Chromium Hex - 7196 | | | | | | | | | | |

| Sample No. | Matrix | Sample Date | Sample Time | Sample Analysis |
|---|---|---|---|---|
| J1TWT8 MSELQ | SOIL | 10/28/14 | 1008 | X |
| J1TWT9 MSELQ | SOIL | 10/28/14 | 0857 | X |
| J1TWV0 MSELR | SOIL | 10/28/14 | 1003 | X |
| J1TWV1 MSELT | SOIL | 10/28/14 | 0907 | X |
| J1TWV2 MSELV | SOIL | 10/28/14 | 0916 | X |

CHAIN OF POSSESSION — Sign/Print Names

| Relinquished By/Removed From | Date/Time | Received By/Stored In | Date/Time |
|---|---|---|---|
| Heather Weber | 10/28/14 1035 | DWSHEA DWSHEA | 10/28/14 1035 |
| DWSHEA DWSHEA | 10/28/14 1545 | C. Bingham | 10-28-14 1545 |
| C. Bingham | 10-28-14 1550 | 1060 Battelle, fridge #2A | 10-28-14 1550 |
| 1060 Battelle, fridge #2A | 10-29-14 1000 | C. Bingham | 10-29-14 1000 |
| C. Bingham WCH | 10-29-14 1340 | J. Frear | 10/29/14 1340 |
| | | | |
| | | | |

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

SPECIAL INSTRUCTIONS

J4J290445
~~JP0877~~ 10-29-14
Due 11-5-14

J4J290445

REVIEWED BY K. Wood DATE 10-29-14

SDG: JP0877

WCH-EE-011

# Washington Closure Hanford — CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

RC-075-441

| | | | |
|---|---|---|---|
| Collector: H. Weber | Company Contact: Joan Kessner | Telephone No.: 375-4688 | Project Coordinator: KESSNER, JH |
| Price Code: 8B 7 days | Data Turnaround | | |
| Project Designation: 100-D/DR Field Remediation | Sampling Location: 100-D-86:3, Verification II | | SAF No.: RC-075 |
| Ice Chest No.: WCH-12-008 ~~A1A~~ 10-28-14 | Field Logbook No.: EL-1662-02 03 10/28/14 | COA: 01D8632000 | Method of Shipment: Local Delivery |
| Shipped To: TestAmerica Richland | Offsite Property No.: n/A | | Bill of Lading/Air Bill No.: n/A |

Other Labs Shipped To: TestAmerica Denver

RCF37029

POSSIBLE SAMPLE HAZARDS/REMARKS: n/A

Special Handling and/or Storage: cool 4C

| | |
|---|---|
| Preservation | Cool 4C |
| Type of Container | G/P |
| No. of Container(s) | 1 |
| Volume | 125mL |
| Sample Analysis | Chromium Hex - 7196 |

| Sample No. | Matrix | Sample Date | Sample Time | Chromium Hex - 7196 |
|---|---|---|---|---|
| J1TWV3 MSELW | SOIL | 10/28/14 | 0955 | X |
| J1TWV4 MSELX | SOIL | 10/28/14 | 0929 | X |
| J1TWV5 MSELO | SOIL | 10/28/14 | 0925 | X |
| J1TWV6 MSEL1 | SOIL | 10/28/14 | 0948 | X |
| J1TWV7 MSEL2 | SOIL | 10/28/14 | 1018 | X |

## CHAIN OF POSSESSION — Sign/Print Names

| Relinquished By/Removed From | Date/Time | Received By/Stored In | Date/Time |
|---|---|---|---|
| Heather Weber | 10/28/14 1035 | WCH DWSHEA | 10/28/14 1035 |
| DWSHEA | 10/28/14 1545 | C. Bingham | 10-28-14 1545 |
| C. Bingham | 10-28-14 1550 | 1060 Battelle, fridge #2A | 10-28-14 1550 |
| 1060 Battelle, fridge #2A | 10-28-14 1000 | C. Bingham | 10-29-14 1000 |
| C. Bingham WCH | 10-29-14 1340 | J. Fricke TALK | 10/29/14 1340 |
| | | | |
| | | | |

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

SPECIAL INSTRUCTIONS

J4J290445

Due 11-5-14

REVIEWED BY Kirkwood Vincent DATE 10-29-14

JP0877

WCH-EE-011

| Washington Closure Hanford | CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST | RC-075-441 | Page 3 of 3 |
|---|---|---|---|

| | | | |
|---|---|---|---|
| Collector: H. weber | Company Contact: Joan Kessner | Telephone No.: 375-4688 | Project Coordinator: KESSNER, JH |
| Price Code: 8B | Data Turnaround: 7 days | | |
| Project Designation: 100-D/DR Field Remediation | Sampling Location: 100-D-86:3, Verification II | | SAF No.: RC-075 |
| Ice Chest No.: ~~A1A~~ 10-28-14 cmB WCH-12-008 | Field Logbook No.: EL-1662-02-03 10/28/14 | COA: 01D8632000 | Method of Shipment: Local Delivery |
| Shipped To: TestAmerica Richland | Offsite Property No.: N/A | | Bill of Lading/Air Bill No.: N/A |

Other Labs Shipped To: TestAmerica Denver

RCF37029

POSSIBLE SAMPLE HAZARDS/REMARKS

N/A

Special Handling and/or Storage

Cool 4C

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Preservation | Cool 4C | | | | | | | | | | |
| Type of Container | G/P | | | | | | | | | | |
| No. of Container(s) | 1 | | | | | | | | | | |
| Volume | 125mL | | | | | | | | | | |
| Sample Analysis | Chromium Hex - 7196 | | | | | | | | | | |

| Sample No. | Matrix | Sample Date | Sample Time | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| J1TWV8 MSEL3 | SOIL | 10/28/14 | 0933 | X | | | | | | | | | |
| J1TWV9 MSEL4 | SOIL | 10/28/14 | 0943 | X | | | | | | | | | |
| J1TWW0 MSEL5 | SOIL | 10/28/14 | 0857 | X | | | | | | | | | |
| J1TWW1 | SOIL | | 10/28/14 | | | | | | | | | | |
| | | | | | | | | | | | | | |

| CHAIN OF POSSESSION | Sign/Print Names |
|---|---|
| Relinquished By/Removed From: Heather Weber/ Date/Time: 10/28/14 1035 | Received By/Stored In: WCH Date/Time: 10/28/14 1035 |
| Relinquished By/Removed From: DWSHEA DWSHEA 10/28/14 1545 | Received By/Stored In: C. Bingham 10-28-14 1545 |
| Relinquished By/Removed From: C. Bingham 10-28-14 1550 | Received By/Stored In: 1060 Battelle, fridge #24 Date/Time: 10-28-14 1550 |
| Relinquished By/Removed From: 1060 Battelle, fridge #24 10-29-14 Date/Time: 1000 | Received By/Stored In: C. Bingham 10-29-14 Date/Time: 1000 |
| Relinquished By/Removed From: C. Bingham WCH 10-29-14 Date/Time: 1340 | Received By/Stored In: J. Frick 10/29/14 Date/Time: TALK 1340 |
| 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

J4J290445
Due 11-5-14

REVIEWED BY K. Wood Hanford DATE 10-29-14

JP0877

WCH-EE-011

## Appendix 5

## Data Validation Supporting Documentation

# GENERAL CHEMISTRY ANALYSIS DATA VALIDATION CHECKLIST

| VALIDATION LEVEL: | A | B | C | D | E |
|---|---|---|---|---|---|
| PROJECT: | 100-D-813 | | DATA PACKAGE: | JP0877 | |
| VALIDATOR: | ELR | LAB: TAC | | DATE: 2/22/13 | |
| | | | SDG: | JP0877 | |

| 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 | | | |
|---|---|---|---|
| J1TWT8 | J1TWT9 | J1TWV0 | J1TWV1 |
| J1TWV2 | J1TWV3 | J1TWV4 | J1TWV5 |
| J1TWV6 | J1TWV7 | J1TWV8 | J1TWV9 |
| J1TWW0 | | | |
| | | | Soil |

## 1. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE

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

Comments:

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

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

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

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

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

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

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

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

Comments:

# GENERAL CHEMISTRY ANALYSIS DATA VALIDATION CHECKLIST

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

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

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

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

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

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

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

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

Comments: _____

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

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

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

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

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

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

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

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

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

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

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

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

Comments: No PAS

# 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: _____

WO/T9

## 6. HOLDING TIMES (all levels)

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

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

Comments: _____

# GENERAL CHEMISTRY ANALYSIS DATA VALIDATION CHECKLIST

## 7. RESULT QUANTITATION AND DETECTION LIMITS (all levels)

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

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

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

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

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

Comments:

## Appendix 6

## Additional Documentation Requested by Client

Date: 04-Nov-14

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

Report No. : 63259

SDG No.: JP0877

| Batch Work Order | Parameter | Result +- Uncertainty ( 2s) | Qual | Units | Tracer Yield | LCS Recovery | Bias | MDL |
|---|---|---|---|---|---|---|---|---|
| 7196_CR6 | | | | | | | | |
| 4303027 MATRIX SPIKE, J1TWT8 M5ELP1AC | HEXCHROME | 2.83E+01 +- 0.0E+00 | | mg/kg | N/A | 90% | -0.1 | 1.55E-01 |
| 4303027 LCS, M5ERN1AC | HEXCHROME | 1.86E+01 +- 0.0E+00 | | mg/kg | N/A | 93% | -0.1 | 1.55E-01 |
| 4303027 BLANK QC, M5ERN1AA | HEXCHROME | 1.55E-01 +- 0.0E+00 | U | mg/kg | N/A | | | 1.55E-01 |

No. of Results: 3

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rptSTLRchQcSummary V5.3.5 A2002

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



TestAmerica Laboratories, Inc.