# 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 JP0899 SAF-RC-075**

**Waste Site: 100-D-75:1**

Date: 9 March 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-75:1
Subject: Semivolatile Organic - Data Package No. JP0899-TAL

## INTRODUCTION

This memo presents the results of data validation on Data Package No. JP0899 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 |
|---|---|---|---|---|
| J1V3P2 | 2/2/15 | Soil | C | See note 1 |
| J1V3P3 | 2/2/15 | Soil | C | See note 1 |
| J1V3P4 | 2/2/15 | Soil | C | See note 1 |
| J1V3P5 | 2/2/15 | Soil | C | See note 1 |
| J1V3P6 | 2/2/15 | Soil | C | See note 1 |
| J1V3P7 | 2/2/15 | Soil | C | See note 1 |
| J1V3P8 | 2/2/15 | Soil | C | See note 1 |
| J1V3P9 | 2/2/15 | Soil | C | See note 1 |
| J1V3R0 | 2/2/15 | Soil | C | See note 1 |
| J1V3R1 | 2/2/15 | Soil | C | See note 1 |
| J1V3R2 | 2/2/15 | Soil | C | See note 1 |
| J1V3R3 | 2/2/15 | Soil | C | See note 1 |
| J1V3R4 | 2/2/15 | Soil | C | See note 1 |

1 – Semivolatile organics by 8270C.

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: Analytes 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 duplicate results were acceptable.

Field Duplicate Samples

One set field duplicates (J1V3P5/J1V3R4) were submitted for analysis. Laboratory duplicates are compared using the same criteria as for laboratory results. All field

duplicate results are 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. JP0899 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

SEMIVOLATILE ORGANIC DATA QUALIFICATION SUMMARY*

| SDG: JP0899 | REVIEWER: ELR | Project: 100-D-75:1 | PAGE_1_OF_1 |
|---|---|---|---|
| COMMENTS: No qualifiers assigned | | | |

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

## Appendix 3

## Annotated Laboratory Reports

Client: Washington Closure Hanford

Job Number: 280-65030-1
Sdg Number: JP0899

**Client Sample ID:** **J1V3P2**

Lab Sample ID: 280-65030-1
Client Matrix: Solid
% Moisture: 9.1

Date Sampled: 02/02/2015 0815
Date Received: 02/04/2015 1000

**8270C Semivolatile Organic Compounds (GC/MS)**

| | | | | | |
|---|---|---|---|---|---|
| Analysis Method: | 8270C | Analysis Batch: | 280-263137 | Instrument ID: | SMS_G6 |
| Prep Method: | 3550C | Prep Batch: | 280-263016 | Lab File ID: | G6_16356.D |
| Dilution: | 1.0 | | | Initial Weight/Volume: | 30.2 g |
| Analysis Date: | 02/05/2015 1448 | | | Final Weight/Volume: | 1 mL |
| Prep Date: | 02/04/2015 1828 | | | Injection Volume: | 0.5 uL |

r 3/8/15

| Analyte DryWt Corrected: Y | Result (ug/Kg) | Qualifier | MDL | RL |
|---|---|---|---|---|
| Acenaphthene | 11 | U | 11 | 360 |
| Acenaphthylene | 19 | U | 19 | 360 |
| Anthracene | 19 | U | 19 | 360 |
| Benzo[a]anthracene | 22 | U | 22 | 360 |
| Benzo[a]pyrene | 22 | U | 22 | 360 |
| Benzo[b]fluoranthene | 29 | U | 29 | 360 |
| Benzo[ghi]perylene | 17 | U | 17 | 360 |
| Benzo[k]fluoranthene | 44 | U | 44 | 360 |
| Bis(2-chloroethoxy)methane | 25 | U | 25 | 360 |
| Bis(2-chloroethyl)ether | 18 | U | 18 | 360 |
| bis (2-chloroisopropyl) ether | 25 | U | 25 | 360 |
| Bis(2-ethylhexyl) phthalate | 50 | U | 50 | 360 |
| 4-Bromophenyl phenyl ether | 21 | U | 21 | 360 |
| Butyl benzyl phthalate | 47 | U | 47 | 360 |
| Carbazole | 39 | U | 39 | 360 |
| 4-Chloroaniline | 89 | U | 89 | 360 |
| 4-Chloro-3-methylphenol | 72 | U | 72 | 360 |
| 2-Chloronaphthalene | 11 | U | 11 | 360 |
| 2-Chlorophenol | 23 | U | 23 | 360 |
| 4-Chlorophenyl phenyl ether | 23 | U | 23 | 360 |
| Chrysene | 29 | U | 29 | 360 |
| Dibenz(a,h)anthracene | 21 | U | 21 | 360 |
| Dibenzofuran | 22 | U | 22 | 360 |
| 1,2-Dichlorobenzene | 24 | U | 24 | 360 |
| 1,3-Dichlorobenzene | 13 | U | 13 | 360 |
| 1,4-Dichlorobenzene | 15 | U | 15 | 360 |
| 3,3'-Dichlorobenzidine | 98 | U | 98 | 720 |
| 2,4-Dichlorophenol | 11 | U | 11 | 360 |
| Diethyl phthalate | 28 | U | 28 | 360 |
| 2,4-Dimethylphenol | 72 | U | 72 | 360 |
| Dimethyl phthalate | 25 | U | 25 | 360 |
| Di-n-butyl phthalate | 32 | U | 32 | 360 |
| 4,6-Dinitro-2-methylphenol | 360 | U | 360 | 720 |
| 2,4-Dinitrophenol | 360 | U | 360 | 900 |
| 2,4-Dinitrotoluene | 72 | U | 72 | 360 |
| 2,6-Dinitrotoluene | 31 | U | 31 | 360 |
| Di-n-octyl phthalate | 16 | U | 16 | 360 |
| Fluoranthene | 39 | U | 39 | 360 |
| Fluorene | 20 | U | 20 | 360 |
| Hexachlorobenzene | 32 | U | 32 | 360 |
| Hexachlorobutadiene | 11 | U | 11 | 360 |
| Hexachlorocyclopentadiene | 55 | U | 55 | 360 |
| Hexachloroethane | 23 | U | 23 | 360 |
| Indeno[1,2,3-cd]pyrene | 24 | U | 24 | 360 |
| Isophorone | 19 | U | 19 | 360 |
| 2-Methylnaphthalene | 21 | U | 21 | 360 |

Client: Washington Closure Hanford

Job Number: 280-65030-1
Sdg Number: JP0899

**Client Sample ID:** **J1V3P2**

Lab Sample ID: 280-65030-1
Client Matrix: Solid
% Moisture: 9.1

Date Sampled: 02/02/2015 0815
Date Received: 02/04/2015 1000

**8270C Semivolatile Organic Compounds (GC/MS)**

| | | | | | |
|---|---|---|---|---|---|
| Analysis Method: | 8270C | Analysis Batch: | 280-263137 | Instrument ID: | SMS_G6 |
| Prep Method: | 3550C | Prep Batch: | 280-263016 | Lab File ID: | G6_16356.D |
| Dilution: | 1.0 | | | Initial Weight/Volume: | 30.2 g |
| Analysis Date: | 02/05/2015 1448 | | | Final Weight/Volume: | 1 mL |
| Prep Date: | 02/04/2015 1828 | | | Injection Volume: | 0.5 uL |

3/8/15

| Analyte | DryWt Corrected: Y | Result (ug/Kg) | Qualifier | MDL | RL |
|---|---|---|---|---|---|
| 2-Methylphenol | | 14 | U | 14 | 360 |
| 3 & 4 Methylphenol | | 36 | U | 36 | 360 |
| Naphthalene | | 34 | U | 34 | 360 |
| 2-Nitroaniline | | 55 | U | 55 | 360 |
| 3-Nitroaniline | | 80 | U | 80 | 360 |
| 4-Nitroaniline | | 79 | U | 79 | 360 |
| Nitrobenzene | | 24 | U | 24 | 360 |
| 2-Nitrophenol | | 11 | U | 11 | 360 |
| 4-Nitrophenol | | 110 | U | 110 | 720 |
| N-Nitrosodi-n-propylamine | | 34 | U | 34 | 360 |
| N-Nitrosodiphenylamine | | 23 | U | 23 | 360 |
| Pentachlorophenol | | 360 | U | 360 | 720 |
| Phenanthrene | | 19 | U | 19 | 360 |
| Phenol | | 20 | U | 20 | 360 |
| Pyrene | | 13 | U | 13 | 360 |
| 1,2,4-Trichlorobenzene | | 31 | U | 31 | 360 |
| 2,4,5-Trichlorophenol | | 11 | U | 11 | 360 |
| 2,4,6-Trichlorophenol | | 11 | U | 11 | 360 |

| Surrogate | %Rec | Qualifier | Acceptance Limits |
|---|---|---|---|
| 2-Fluorobiphenyl | 71 | | 50 - 120 |
| 2-Fluorophenol | 72 | | 53 - 120 |
| Nitrobenzene-d5 | 70 | | 50 - 120 |
| Phenol-d5 | 70 | | 52 - 120 |
| Terphenyl-d14 | 79 | | 55 - 120 |
| 2,4,6-Tribromophenol | 74 | | 51 - 120 |

## Analytical Data

Client: Washington Closure Hanford

Job Number: 280-65030-1
Sdg Number: JP0899

**Client Sample ID:** **J1V3P2**

Lab Sample ID: 280-65030-1
Client Matrix: Solid % Moisture: 9.1

Date Sampled: 02/02/2015 0815
Date Received: 02/04/2015 1000

**8270C Semivolatile Organic Compounds (GC/MS)**

| | | | | | |
|---|---|---|---|---|---|
| Analysis Method: | 8270C | Analysis Batch: | 280-263137 | Instrument ID: | SMS_G6 |
| Prep Method: | 3550C | Prep Batch: | 280-263016 | Lab File ID: | G6_16356.D |
| Dilution: | 1.0 | | | Initial Weight/Volume: | 30.2 g |
| Analysis Date: | 02/05/2015 1448 | | | Final Weight/Volume: | 1 mL |
| Prep Date: | 02/04/2015 1828 | | | Injection Volume: | 0.5 uL |

3/8/15

**Tentatively Identified Compounds** **Number TIC's Found:** 2

| Cas Number | Analyte | RT | Est. Result (ug/Kg) | Qualifier |
|---|---|---|---|---|
| | Unknown | 3.28 | 7000 | J N |
| 107-70-0 | 2-Pentanone, 4-methoxy-4-methyl- | 3.85 | 170 | N J |

## Analytical Data

Client: Washington Closure Hanford

Job Number: 280-65030-1
Sdg Number: JP0899

**Client Sample ID:** J1V3P3

Lab Sample ID: 280-65030-2
Client Matrix: Solid

% Moisture: 9.5

Date Sampled: 02/02/2015 0819
Date Received: 02/04/2015 1000

**8270C Semivolatile Organic Compounds (GC/MS)**

| | | | | | |
|---|---|---|---|---|---|
| Analysis Method: | 8270C | Analysis Batch: | 280-263137 | Instrument ID: | SMS_G6 |
| Prep Method: | 3550C | Prep Batch: | 280-263016 | Lab File ID: | G6_16359.D |
| Dilution: | 1.0 | | | Initial Weight/Volume: | 31.5 g |
| Analysis Date: | 02/05/2015 1610 | | | Final Weight/Volume: | 1 mL |
| Prep Date: | 02/04/2015 1828 | | | Injection Volume: | 0.5 uL |

3/8/15

| Analyte DryWt Corrected: Y | Result (ug/Kg) | Qualifier | MDL | RL |
|---|---|---|---|---|
| Acenaphthene | 11 | U | 11 | 350 |
| Acenaphthylene | 18 | U | 18 | 350 |
| Anthracene | 18 | U | 18 | 350 |
| Benzo[a]anthracene | 21 | U | 21 | 350 |
| Benzo[a]pyrene | 21 | U | 21 | 350 |
| Benzo[b]fluoranthene | 28 | U | 28 | 350 |
| Benzo[ghi]perylene | 17 | U | 17 | 350 |
| Benzo[k]fluoranthene | 42 | U | 42 | 350 |
| Bis(2-chloroethoxy)methane | 24 | U | 24 | 350 |
| Bis(2-chloroethyl)ether | 17 | U | 17 | 350 |
| bis (2-chloroisopropyl) ether | 24 | U | 24 | 350 |
| Bis(2-ethylhexyl) phthalate | 48 | U | 48 | 350 |
| 4-Bromophenyl phenyl ether | 20 | U | 20 | 350 |
| Butyl benzyl phthalate | 45 | U | 45 | 350 |
| Carbazole | 38 | U | 38 | 350 |
| 4-Chloroaniline | 86 | U | 86 | 350 |
| 4-Chloro-3-methylphenol | 69 | U | 69 | 350 |
| 2-Chloronaphthalene | 11 | U | 11 | 350 |
| 2-Chlorophenol | 22 | U | 22 | 350 |
| 4-Chlorophenyl phenyl ether | 22 | U | 22 | 350 |
| Chrysene | 28 | U | 28 | 350 |
| Dibenz(a,h)anthracene | 20 | U | 20 | 350 |
| Dibenzofuran | 21 | U | 21 | 350 |
| 1,2-Dichlorobenzene | 23 | U | 23 | 350 |
| 1,3-Dichlorobenzene | 13 | U | 13 | 350 |
| 1,4-Dichlorobenzene | 14 | U | 14 | 350 |
| 3,3'-Dichlorobenzidine | 95 | U | 95 | 690 |
| 2,4-Dichlorophenol | 11 | U | 11 | 350 |
| Diethyl phthalate | 27 | U | 27 | 350 |
| 2,4-Dimethylphenol | 69 | U | 69 | 350 |
| Dimethyl phthalate | 24 | U | 24 | 350 |
| Di-n-butyl phthalate | 31 | U | 31 | 350 |
| 4,6-Dinitro-2-methylphenol | 350 | U | 350 | 690 |
| 2,4-Dinitrophenol | 350 | U | 350 | 870 |
| 2,4-Dinitrotoluene | 69 | U | 69 | 350 |
| 2,6-Dinitrotoluene | 29 | U | 29 | 350 |
| Di-n-octyl phthalate | 15 | U | 15 | 350 |
| Fluoranthene | 38 | U | 38 | 350 |
| Fluorene | 19 | U | 19 | 350 |
| Hexachlorobenzene | 31 | U | 31 | 350 |
| Hexachlorobutadiene | 11 | U | 11 | 350 |
| Hexachlorocyclopentadiene | 53 | U | 53 | 350 |
| Hexachloroethane | 22 | U | 22 | 350 |
| Indeno[1,2,3-cd]pyrene | 23 | U | 23 | 350 |
| Isophorone | 18 | U | 18 | 350 |
| 2-Methylnaphthalene | 20 | U | 20 | 350 |

## Analytical Data

Client: Washington Closure Hanford

Job Number: 280-65030-1
Sdg Number: JP0899

**Client Sample ID:** **J1V3P3**

Lab Sample ID: 280-65030-2
Client Matrix: Solid

% Moisture: 9.5

Date Sampled: 02/02/2015 0819
Date Received: 02/04/2015 1000

**8270C Semivolatile Organic Compounds (GC/MS)**

| | | | | | |
|---|---|---|---|---|---|
| Analysis Method: | 8270C | Analysis Batch: | 280-263137 | Instrument ID: | SMS_G6 |
| Prep Method: | 3550C | Prep Batch: | 280-263016 | Lab File ID: | G6_16359.D |
| Dilution: | 1.0 | | | Initial Weight/Volume: | 31.5 g |
| Analysis Date: | 02/05/2015 1610 | | | Final Weight/Volume: | 1 mL |
| Prep Date: | 02/04/2015 1828 | | | Injection Volume: | 0.5 uL |

3/8/15

| Analyte | DryWt Corrected: Y | Result (ug/Kg) | Qualifier | MDL | RL |
|---|---|---|---|---|---|
| 2-Methylphenol | | 14 | U | 14 | 350 |
| 3 & 4 Methylphenol | | 35 | U | 35 | 350 |
| Naphthalene | | 33 | U | 33 | 350 |
| 2-Nitroaniline | | 53 | U | 53 | 350 |
| 3-Nitroaniline | | 77 | U | 77 | 350 |
| 4-Nitroaniline | | 76 | U | 76 | 350 |
| Nitrobenzene | | 23 | U | 23 | 350 |
| 2-Nitrophenol | | 11 | U | 11 | 350 |
| 4-Nitrophenol | | 100 | U | 100 | 690 |
| N-Nitrosodi-n-propylamine | | 33 | U | 33 | 350 |
| N-Nitrosodiphenylamine | | 22 | U | 22 | 350 |
| Pentachlorophenol | | 350 | U | 350 | 690 |
| Phenanthrene | | 18 | U | 18 | 350 |
| Phenol | | 19 | U | 19 | 350 |
| Pyrene | | 13 | U | 13 | 350 |
| 1,2,4-Trichlorobenzene | | 29 | U | 29 | 350 |
| 2,4,5-Trichlorophenol | | 11 | U | 11 | 350 |
| 2,4,6-Trichlorophenol | | 11 | U | 11 | 350 |

| Surrogate | %Rec | Qualifier | Acceptance Limits |
|---|---|---|---|
| 2-Fluorobiphenyl | 81 | | 50 - 120 |
| 2-Fluorophenol | 82 | | 53 - 120 |
| Nitrobenzene-d5 | 79 | | 50 - 120 |
| Phenol-d5 | 82 | | 52 - 120 |
| Terphenyl-d14 | 87 | | 55 - 120 |
| 2,4,6-Tribromophenol | 84 | | 51 - 120 |

## Analytical Data

Client: Washington Closure Hanford

Job Number: 280-65030-1
Sdg Number: JP0899

**Client Sample ID:** **J1V3P3**

Lab Sample ID: 280-65030-2
Client Matrix: Solid
% Moisture: 9.5

Date Sampled: 02/02/2015 0819
Date Received: 02/04/2015 1000

**8270C Semivolatile Organic Compounds (GC/MS)**

| | | | | | |
|---|---|---|---|---|---|
| Analysis Method: | 8270C | Analysis Batch: | 280-263137 | Instrument ID: | SMS_G6 |
| Prep Method: | 3550C | Prep Batch: | 280-263016 | Lab File ID: | G6_16359.D |
| Dilution: | 1.0 | | | Initial Weight/Volume: | 31.5 g |
| Analysis Date: | 02/05/2015 1610 | | | Final Weight/Volume: | 1 mL |
| Prep Date: | 02/04/2015 1828 | | | Injection Volume: | 0.5 uL |

3/8/15

**Tentatively Identified Compounds** **Number TIC's Found:** **2**

| Cas Number | Analyte | RT | Est. Result (ug/Kg) | Qualifier |
|---|---|---|---|---|
| | Unknown | 3.28 | 7600 | N J |
| 107-70-0 | 2-Pentanone, 4-methoxy-4-methyl- | 3.85 | 190 | N J |

Client: Washington Closure Hanford

Job Number: 280-65030-1
Sdg Number: JP0899

**Client Sample ID:** J1V3P4

Lab Sample ID: 280-65030-3
Client Matrix: Solid

% Moisture: 6.7

Date Sampled: 02/02/2015 0823
Date Received: 02/04/2015 1000

**8270C Semivolatile Organic Compounds (GC/MS)**

| | | | | | |
|---|---|---|---|---|---|
| Analysis Method: | 8270C | Analysis Batch: | 280-263137 | Instrument ID: | SMS_G6 |
| Prep Method: | 3550C | Prep Batch: | 280-263016 | Lab File ID: | G6_16360.D |
| Dilution: | 1.0 | | | Initial Weight/Volume: | 30.8 g |
| Analysis Date: | 02/05/2015 1638 | | | Final Weight/Volume: | 1 mL |
| Prep Date: | 02/04/2015 1828 | | | Injection Volume: | 0.5 uL |

3/8/15

| Analyte | DryWt Corrected: Y | Result (ug/Kg) | Qualifier | MDL | RL |
|---|---|---|---|---|---|
| Acenaphthene | | 11 | U | 11 | 340 |
| Acenaphthylene | | 18 | U | 18 | 340 |
| Anthracene | | 18 | U | 18 | 340 |
| Benzo[a]anthracene | | 21 | U | 21 | 340 |
| Benzo[a]pyrene | | 21 | U | 21 | 340 |
| Benzo[b]fluoranthene | | 27 | U | 27 | 340 |
| Benzo[ghi]perylene | | 17 | U | 17 | 340 |
| Benzo[k]fluoranthene | | 42 | U | 42 | 340 |
| Bis(2-chloroethoxy)methane | | 24 | U | 24 | 340 |
| Bis(2-chloroethyl)ether | | 17 | U | 17 | 340 |
| bis (2-chloroisopropyl) ether | | 24 | U | 24 | 340 |
| Bis(2-ethylhexyl) phthalate | | 48 | U | 48 | 340 |
| 4-Bromophenyl phenyl ether | | 20 | U | 20 | 340 |
| Butyl benzyl phthalate | | 45 | U | 45 | 340 |
| Carbazole | | 38 | U | 38 | 340 |
| 4-Chloroaniline | | 86 | U | 86 | 340 |
| 4-Chloro-3-methylphenol | | 69 | U | 69 | 340 |
| 2-Chloronaphthalene | | 10 | U | 10 | 340 |
| 2-Chlorophenol | | 22 | U | 22 | 340 |
| 4-Chlorophenyl phenyl ether | | 22 | U | 22 | 340 |
| Chrysene | | 28 | U | 28 | 340 |
| Dibenz(a,h)anthracene | | 20 | U | 20 | 340 |
| Dibenzofuran | | 21 | U | 21 | 340 |
| 1,2-Dichlorobenzene | | 23 | U | 23 | 340 |
| 1,3-Dichlorobenzene | | 13 | U | 13 | 340 |
| 1,4-Dichlorobenzene | | 14 | U | 14 | 340 |
| 3,3'-Dichlorobenzidine | | 94 | U | 94 | 690 |
| 2,4-Dichlorophenol | | 10 | U | 10 | 340 |
| Diethyl phthalate | | 27 | U | 27 | 340 |
| 2,4-Dimethylphenol | | 69 | U | 69 | 340 |
| Dimethyl phthalate | | 24 | U | 24 | 340 |
| Di-n-butyl phthalate | | 30 | U | 30 | 340 |
| 4,6-Dinitro-2-methylphenol | | 340 | U | 340 | 690 |
| 2,4-Dinitrophenol | | 350 | U | 350 | 860 |
| 2,4-Dinitrotoluene | | 69 | U | 69 | 340 |
| 2,6-Dinitrotoluene | | 29 | U | 29 | 340 |
| Di-n-octyl phthalate | | 15 | U | 15 | 340 |
| Fluoranthene | | 38 | U | 38 | 340 |
| Fluorene | | 19 | U | 19 | 340 |
| Hexachlorobenzene | | 30 | U | 30 | 340 |
| Hexachlorobutadiene | | 10 | U | 10 | 340 |
| Hexachlorocyclopentadiene | | 52 | U | 52 | 340 |
| Hexachloroethane | | 22 | U | 22 | 340 |
| Indeno[1,2,3-cd]pyrene | | 23 | U | 23 | 340 |
| Isophorone | | 18 | U | 18 | 340 |
| 2-Methylnaphthalene | | 20 | U | 20 | 340 |

## Analytical Data

Client: Washington Closure Hanford

Job Number: 280-65030-1
Sdg Number: JP0899

**Client Sample ID:** J1V3P4

Lab Sample ID: 280-65030-3
Client Matrix: Solid

% Moisture: 6.7

Date Sampled: 02/02/2015 0823
Date Received: 02/04/2015 1000

**8270C Semivolatile Organic Compounds (GC/MS)**

| | | | | | |
|---|---|---|---|---|---|
| Analysis Method: | 8270C | Analysis Batch: | 280-263137 | Instrument ID: | SMS_G6 |
| Prep Method: | 3550C | Prep Batch: | 280-263016 | Lab File ID: | G6_16360.D |
| Dilution: | 1.0 | | | Initial Weight/Volume: | 30.8 g |
| Analysis Date: | 02/05/2015 1638 | | | Final Weight/Volume: | 1 mL |
| Prep Date: | 02/04/2015 1828 | | | Injection Volume: | 0.5 uL |

V 3/8/15

| Analyte | DryWt Corrected: Y | Result (ug/Kg) | Qualifier | MDL | RL |
|---|---|---|---|---|---|
| 2-Methylphenol | | 14 | U | 14 | 340 |
| 3 & 4 Methylphenol | | 34 | U | 34 | 340 |
| Naphthalene | | 32 | U | 32 | 340 |
| 2-Nitroaniline | | 52 | U | 52 | 340 |
| 3-Nitroaniline | | 76 | U | 76 | 340 |
| 4-Nitroaniline | | 76 | U | 76 | 340 |
| Nitrobenzene | | 23 | U | 23 | 340 |
| 2-Nitrophenol | | 10 | U | 10 | 340 |
| 4-Nitrophenol | | 100 | U | 100 | 690 |
| N-Nitrosodi-n-propylamine | | 32 | U | 32 | 340 |
| N-Nitrosodiphenylamine | | 22 | U | 22 | 340 |
| Pentachlorophenol | | 340 | U | 340 | 690 |
| Phenanthrene | | 18 | J | 18 | 340 |
| Phenol | | 19 | U | 19 | 340 |
| Pyrene | | 19 | J | 13 | 340 |
| 1,2,4-Trichlorobenzene | | 29 | U | 29 | 340 |
| 2,4,5-Trichlorophenol | | 10 | U | 10 | 340 |
| 2,4,6-Trichlorophenol | | 10 | U | 10 | 340 |

| Surrogate | %Rec | Qualifier | Acceptance Limits |
|---|---|---|---|
| 2-Fluorobiphenyl | 76 | | 50 - 120 |
| 2-Fluorophenol | 82 | | 53 - 120 |
| Nitrobenzene-d5 | 77 | | 50 - 120 |
| Phenol-d5 | 81 | | 52 - 120 |
| Terphenyl-d14 | 78 | | 55 - 120 |
| 2,4,6-Tribromophenol | 77 | | 51 - 120 |

## Analytical Data

Client: Washington Closure Hanford

Job Number: 280-65030-1
Sdg Number: JP0899

**Client Sample ID:** **J1V3P4**

Lab Sample ID: 280-65030-3
Client Matrix: Solid

% Moisture: 6.7

Date Sampled: 02/02/2015 0823
Date Received: 02/04/2015 1000

**8270C Semivolatile Organic Compounds (GC/MS)**

| | | | | | |
|---|---|---|---|---|---|
| Analysis Method: | 8270C | Analysis Batch: | 280-263137 | Instrument ID: | SMS_G6 |
| Prep Method: | 3550C | Prep Batch: | 280-263016 | Lab File ID: | G6_16360.D |
| Dilution: | 1.0 | | | Initial Weight/Volume: | 30.8 g |
| Analysis Date: | 02/05/2015 1638 | | | Final Weight/Volume: | 1 mL |
| Prep Date: | 02/04/2015 1828 | | | Injection Volume: | 0.5 uL |

✓ 3/8/15

**Tentatively Identified Compounds** **Number TIC's Found:** **2**

| Cas Number | Analyte | RT | Est. Result (ug/Kg) | Qualifier |
|---|---|---|---|---|
| | Unknown | 3.28 | 7600 | N J |
| 107-70-0 | 2-Pentanone, 4-methoxy-4-methyl- | 3.85 | 180 | N J |

Client: Washington Closure Hanford

Job Number: 280-65030-1
Sdg Number: JP0899

**Client Sample ID:** J1V3P5

Lab Sample ID: 280-65030-4
Client Matrix: Solid
% Moisture: 3.4

Date Sampled: 02/02/2015 0830
Date Received: 02/04/2015 1000

**8270C Semivolatile Organic Compounds (GC/MS)**

| | | | | | |
|---|---|---|---|---|---|
| Analysis Method: | 8270C | Analysis Batch: | 280-263137 | Instrument ID: | SMS_G6 |
| Prep Method: | 3550C | Prep Batch: | 280-263016 | Lab File ID: | G6_16361.D |
| Dilution: | 1.0 | | | Initial Weight/Volume: | 31.2 g |
| Analysis Date: | 02/05/2015 1705 | | | Final Weight/Volume: | 1 mL |
| Prep Date: | 02/04/2015 1828 | | | Injection Volume: | 0.5 uL |

V 2/8/15

| Analyte | DryWt Corrected: Y | Result (ug/Kg) | Qualifier | MDL | RL |
|---|---|---|---|---|---|
| Acenaphthene | | 10 | U | 10 | 330 |
| Acenaphthylene | | 17 | U | 17 | 330 |
| Anthracene | | 17 | U | 17 | 330 |
| Benzo[a]anthracene | | 20 | U | 20 | 330 |
| Benzo[a]pyrene | | 20 | U | 20 | 330 |
| Benzo[b]fluoranthene | | 26 | U | 26 | 330 |
| Benzo[ghi]perylene | | 16 | U | 16 | 330 |
| Benzo[k]fluoranthene | | 40 | U | 40 | 330 |
| Bis(2-chloroethoxy)methane | | 23 | U | 23 | 330 |
| Bis(2-chloroethyl)ether | | 17 | U | 17 | 330 |
| bis (2-chloroisopropyl) ether | | 23 | U | 23 | 330 |
| Bis(2-ethylhexyl) phthalate | | 46 | U | 46 | 330 |
| 4-Bromophenyl phenyl ether | | 19 | U | 19 | 330 |
| Butyl benzyl phthalate | | 43 | U | 43 | 330 |
| Carbazole | | 36 | U | 36 | 330 |
| 4-Chloroaniline | | 82 | U | 82 | 330 |
| 4-Chloro-3-methylphenol | | 66 | U | 66 | 330 |
| 2-Chloronaphthalene | | 10 | U | 10 | 330 |
| 2-Chlorophenol | | 21 | U | 21 | 330 |
| 4-Chlorophenyl phenyl ether | | 21 | U | 21 | 330 |
| Chrysene | | 27 | U | 27 | 330 |
| Dibenz(a,h)anthracene | | 19 | U | 19 | 330 |
| Dibenzofuran | | 20 | U | 20 | 330 |
| 1,2-Dichlorobenzene | | 22 | U | 22 | 330 |
| 1,3-Dichlorobenzene | | 12 | U | 12 | 330 |
| 1,4-Dichlorobenzene | | 14 | U | 14 | 330 |
| 3,3'-Dichlorobenzidine | | 90 | U | 90 | 660 |
| 2,4-Dichlorophenol | | 10 | U | 10 | 330 |
| Diethyl phthalate | | 26 | U | 26 | 330 |
| 2,4-Dimethylphenol | | 66 | U | 66 | 330 |
| Dimethyl phthalate | | 23 | U | 23 | 330 |
| Di-n-butyl phthalate | | 29 | U | 29 | 330 |
| 4,6-Dinitro-2-methylphenol | | 330 | U | 330 | 660 |
| 2,4-Dinitrophenol | | 330 | U | 330 | 820 |
| 2,4-Dinitrotoluene | | 66 | U | 66 | 330 |
| 2,6-Dinitrotoluene | | 28 | U | 28 | 330 |
| Di-n-octyl phthalate | | 14 | U | 14 | 330 |
| Fluoranthene | | 36 | U | 36 | 330 |
| Fluorene | | 18 | U | 18 | 330 |
| Hexachlorobenzene | | 29 | U | 29 | 330 |
| Hexachlorobutadiene | | 10 | U | 10 | 330 |
| Hexachlorocyclopentadiene | | 50 | U | 50 | 330 |
| Hexachloroethane | | 21 | U | 21 | 330 |
| Indeno[1,2,3-cd]pyrene | | 22 | U | 22 | 330 |
| Isophorone | | 17 | U | 17 | 330 |
| 2-Methylnaphthalene | | 19 | U | 19 | 330 |

## Analytical Data

Client: Washington Closure Hanford

Job Number: 280-65030-1
Sdg Number: JP0899

**Client Sample ID:** **J1V3P5**

Lab Sample ID: 280-65030-4
Client Matrix: Solid
% Moisture: 3.4

Date Sampled: 02/02/2015 0830
Date Received: 02/04/2015 1000

**8270C Semivolatile Organic Compounds (GC/MS)**

| | | | | | |
|---|---|---|---|---|---|
| Analysis Method: | 8270C | Analysis Batch: | 280-263137 | Instrument ID: | SMS_G6 |
| Prep Method: | 3550C | Prep Batch: | 280-263016 | Lab File ID: | G6_16361.D |
| Dilution: | 1.0 | | | Initial Weight/Volume: | 31.2 g |
| Analysis Date: | 02/05/2015 1705 | | | Final Weight/Volume: | 1 mL |
| Prep Date: | 02/04/2015 1828 | | | Injection Volume: | 0.5 uL |

M 3/8/15

| Analyte | DryWt Corrected: Y | Result (ug/Kg) | Qualifier | MDL | RL |
|---|---|---|---|---|---|
| 2-Methylphenol | | 13 | U | 13 | 330 |
| 3 & 4 Methylphenol | | 33 | U | 33 | 330 |
| Naphthalene | | 31 | U | 31 | 330 |
| 2-Nitroaniline | | 50 | U | 50 | 330 |
| 3-Nitroaniline | | 73 | U | 73 | 330 |
| 4-Nitroaniline | | 72 | U | 72 | 330 |
| Nitrobenzene | | 22 | U | 22 | 330 |
| 2-Nitrophenol | | 10 | U | 10 | 330 |
| 4-Nitrophenol | | 97 | U | 97 | 660 |
| N-Nitrosodi-n-propylamine | | 31 | U | 31 | 330 |
| N-Nitrosodiphenylamine | | 21 | U | 21 | 330 |
| Pentachlorophenol | | 330 | U | 330 | 660 |
| Phenanthrene | | 17 | U | 17 | 330 |
| Phenol | | 18 | U | 18 | 330 |
| Pyrene | | 12 | U | 12 | 330 |
| 1,2,4-Trichlorobenzene | | 28 | U | 28 | 330 |
| 2,4,5-Trichlorophenol | | 10 | U | 10 | 330 |
| 2,4,6-Trichlorophenol | | 10 | U | 10 | 330 |

| Surrogate | %Rec | Qualifier | Acceptance Limits |
|---|---|---|---|
| 2-Fluorobiphenyl | 76 | | 50 - 120 |
| 2-Fluorophenol | 80 | | 53 - 120 |
| Nitrobenzene-d5 | 77 | | 50 - 120 |
| Phenol-d5 | 79 | | 52 - 120 |
| Terphenyl-d14 | 85 | | 55 - 120 |
| 2,4,6-Tribromophenol | 75 | | 51 - 120 |

## Analytical Data

Client: Washington Closure Hanford

Job Number: 280-65030-1
Sdg Number: JP0899

**Client Sample ID:** **J1V3P5**

Lab Sample ID: 280-65030-4
Client Matrix: Solid
% Moisture: 3.4

Date Sampled: 02/02/2015 0830
Date Received: 02/04/2015 1000

**8270C Semivolatile Organic Compounds (GC/MS)**

| | | | | | |
|---|---|---|---|---|---|
| Analysis Method: | 8270C | Analysis Batch: | 280-263137 | Instrument ID: | SMS_G6 |
| Prep Method: | 3550C | Prep Batch: | 280-263016 | Lab File ID: | G6_16361.D |
| Dilution: | 1.0 | | | Initial Weight/Volume: | 31.2 g |
| Analysis Date: | 02/05/2015 1705 | | | Final Weight/Volume: | 1 mL |
| Prep Date: | 02/04/2015 1828 | | | Injection Volume: | 0.5 uL |

3/8/15

**Tentatively Identified Compounds** **Number TIC's Found:** **2**

| Cas Number | Analyte | RT | Est. Result (ug/Kg) | Qualifier |
|---|---|---|---|---|
| | Unknown | 3.28 | 7400 | N J |
| 107-70-0 | 2-Pentanone, 4-methoxy-4-methyl- | 3.85 | 180 | N J |

Client: Washington Closure Hanford

Job Number: 280-65030-1
Sdg Number: JP0899

**Client Sample ID:** J1V3P6

Lab Sample ID: 280-65030-5
Client Matrix: Solid
% Moisture: 17.7

Date Sampled: 02/02/2015 0859
Date Received: 02/04/2015 1000

**8270C Semivolatile Organic Compounds (GC/MS)**

| | | | | | |
|---|---|---|---|---|---|
| Analysis Method: | 8270C | Analysis Batch: | 280-263137 | Instrument ID: | SMS_G6 |
| Prep Method: | 3550C | Prep Batch: | 280-263016 | Lab File ID: | G6_16362.D |
| Dilution: | 1.0 | | | Initial Weight/Volume: | 31.1 g |
| Analysis Date: | 02/05/2015 1733 | | | Final Weight/Volume: | 1 mL |
| Prep Date: | 02/04/2015 1828 | | | Injection Volume: | 0.5 uL |

3/8/15

| Analyte | DryWt Corrected: Y | Result (ug/Kg) | Qualifier | MDL | RL |
|---|---|---|---|---|---|
| Acenaphthene | | 12 | U | 12 | 390 |
| Acenaphthylene | | 20 | U | 20 | 390 |
| Anthracene | | 20 | U | 20 | 390 |
| Benzo[a]anthracene | | 23 | U | 23 | 390 |
| Benzo[a]pyrene | | 23 | U | 23 | 390 |
| Benzo[b]fluoranthene | | 31 | U | 31 | 390 |
| Benzo[ghi]perylene | | 19 | U | 19 | 390 |
| Benzo[k]fluoranthene | | 47 | U | 47 | 390 |
| Bis(2-chloroethoxy)methane | | 27 | U | 27 | 390 |
| Bis(2-chloroethyl)ether | | 19 | U | 19 | 390 |
| bis (2-chloroisopropyl) ether | | 27 | U | 27 | 390 |
| Bis(2-ethylhexyl) phthalate | | 54 | U | 54 | 390 |
| 4-Bromophenyl phenyl ether | | 22 | U | 22 | 390 |
| Butyl benzyl phthalate | | 50 | U | 50 | 390 |
| Carbazole | | 42 | U | 42 | 390 |
| 4-Chloroaniline | | 96 | U | 96 | 390 |
| 4-Chloro-3-methylphenol | | 77 | U | 77 | 390 |
| 2-Chloronaphthalene | | 12 | U | 12 | 390 |
| 2-Chlorophenol | | 25 | U | 25 | 390 |
| 4-Chlorophenyl phenyl ether | | 25 | U | 25 | 390 |
| Chrysene | | 32 | U | 32 | 390 |
| Dibenz(a,h)anthracene | | 22 | U | 22 | 390 |
| Dibenzofuran | | 23 | U | 23 | 390 |
| 1,2-Dichlorobenzene | | 26 | U | 26 | 390 |
| 1,3-Dichlorobenzene | | 14 | U | 14 | 390 |
| 1,4-Dichlorobenzene | | 16 | U | 16 | 390 |
| 3,3'-Dichlorobenzidine | | 110 | U | 110 | 770 |
| 2,4-Dichlorophenol | | 12 | U | 12 | 390 |
| Diethyl phthalate | | 30 | U | 30 | 390 |
| 2,4-Dimethylphenol | | 77 | U | 77 | 390 |
| Dimethyl phthalate | | 27 | U | 27 | 390 |
| Di-n-butyl phthalate | | 34 | U | 34 | 390 |
| 4,6-Dinitro-2-methylphenol | | 390 | U | 390 | 770 |
| 2,4-Dinitrophenol | | 390 | U | 390 | 970 |
| 2,4-Dinitrotoluene | | 77 | U | 77 | 390 |
| 2,6-Dinitrotoluene | | 33 | U | 33 | 390 |
| Di-n-octyl phthalate | | 17 | U | 17 | 390 |
| Fluoranthene | | 42 | U | 42 | 390 |
| Fluorene | | 21 | U | 21 | 390 |
| Hexachlorobenzene | | 34 | U | 34 | 390 |
| Hexachlorobutadiene | | 12 | U | 12 | 390 |
| Hexachlorocyclopentadiene | | 59 | U | 59 | 390 |
| Hexachloroethane | | 25 | U | 25 | 390 |
| Indeno[1,2,3-cd]pyrene | | 26 | U | 26 | 390 |
| Isophorone | | 20 | U | 20 | 390 |
| 2-Methylnaphthalene | | 22 | U | 22 | 390 |

## Analytical Data

Client: Washington Closure Hanford

Job Number: 280-65030-1
Sdg Number: JP0899

**Client Sample ID:** J1V3P6

Lab Sample ID: 280-65030-5
Client Matrix: Solid
% Moisture: 17.7

Date Sampled: 02/02/2015 0859
Date Received: 02/04/2015 1000

**8270C Semivolatile Organic Compounds (GC/MS)**

| | | | | | |
|---|---|---|---|---|---|
| Analysis Method: | 8270C | Analysis Batch: | 280-263137 | Instrument ID: | SMS_G6 |
| Prep Method: | 3550C | Prep Batch: | 280-263016 | Lab File ID: | G6_16362.D |
| Dilution: | 1.0 | | | Initial Weight/Volume: | 31.1 g |
| Analysis Date: | 02/05/2015 1733 | | | Final Weight/Volume: | 1 mL |
| Prep Date: | 02/04/2015 1828 | | | Injection Volume: | 0.5 uL |

3/8/15

| Analyte | DryWt Corrected: Y | Result (ug/Kg) | Qualifier | MDL | RL |
|---|---|---|---|---|---|
| 2-Methylphenol | | 15 | U | 15 | 390 |
| 3 & 4 Methylphenol | | 39 | U | 39 | 390 |
| Naphthalene | | 36 | U | 36 | 390 |
| 2-Nitroaniline | | 59 | U | 59 | 390 |
| 3-Nitroaniline | | 86 | U | 86 | 390 |
| 4-Nitroaniline | | 85 | U | 85 | 390 |
| Nitrobenzene | | 26 | U | 26 | 390 |
| 2-Nitrophenol | | 12 | U | 12 | 390 |
| 4-Nitrophenol | | 110 | U | 110 | 770 |
| N-Nitrosodi-n-propylamine | | 36 | U | 36 | 390 |
| N-Nitrosodiphenylamine | | 25 | U | 25 | 390 |
| Pentachlorophenol | | 390 | U | 390 | 770 |
| Phenanthrene | | 20 | U | 20 | 390 |
| Phenol | | 21 | U | 21 | 390 |
| Pyrene | | 14 | U | 14 | 390 |
| 1,2,4-Trichlorobenzene | | 33 | U | 33 | 390 |
| 2,4,5-Trichlorophenol | | 12 | U | 12 | 390 |
| 2,4,6-Trichlorophenol | | 12 | U | 12 | 390 |

| Surrogate | %Rec | Qualifier | Acceptance Limits |
|---|---|---|---|
| 2-Fluorobiphenyl | 73 | | 50 - 120 |
| 2-Fluorophenol | 76 | | 53 - 120 |
| Nitrobenzene-d5 | 71 | | 50 - 120 |
| Phenol-d5 | 76 | | 52 - 120 |
| Terphenyl-d14 | 79 | | 55 - 120 |
| 2,4,6-Tribromophenol | 76 | | 51 - 120 |

## Analytical Data

Client: Washington Closure Hanford

Job Number: 280-65030-1
Sdg Number: JP0899

**Client Sample ID:** **J1V3P6**

Lab Sample ID: 280-65030-5
Client Matrix: Solid
% Moisture: 17.7

Date Sampled: 02/02/2015 0859
Date Received: 02/04/2015 1000

**8270C Semivolatile Organic Compounds (GC/MS)**

| | | | | | |
|---|---|---|---|---|---|
| Analysis Method: | 8270C | Analysis Batch: | 280-263137 | Instrument ID: | SMS_G6 |
| Prep Method: | 3550C | Prep Batch: | 280-263016 | Lab File ID: | G6_16362.D |
| Dilution: | 1.0 | | | Initial Weight/Volume: | 31.1 g |
| Analysis Date: | 02/05/2015 1733 | | | Final Weight/Volume: | 1 mL |
| Prep Date: | 02/04/2015 1828 | | | Injection Volume: | 0.5 uL |

V 3/8/17

**Tentatively Identified Compounds** **Number TIC's Found:** **2**

| Cas Number | Analyte | RT | Est. Result (ug/Kg) | Qualifier |
|---|---|---|---|---|
| | Unknown | 3.28 | 7900 | N J |
| 107-70-0 | 2-Pentanone, 4-methoxy-4-methyl- | 3.85 | 210 | N J |

Client: Washington Closure Hanford

Job Number: 280-65030-1
Sdg Number: JP0899

**Client Sample ID:** J1V3P7

Lab Sample ID: 280-65030-6
Client Matrix: Solid
% Moisture: 13.9

Date Sampled: 02/02/2015 0855
Date Received: 02/04/2015 1000

**8270C Semivolatile Organic Compounds (GC/MS)**

| | | | | | |
|---|---|---|---|---|---|
| Analysis Method: | 8270C | Analysis Batch: | 280-263137 | Instrument ID: | SMS_G6 |
| Prep Method: | 3550C | Prep Batch: | 280-263016 | Lab File ID: | G6_16363.D |
| Dilution: | 1.0 | | | Initial Weight/Volume: | 33.0 g |
| Analysis Date: | 02/05/2015 1800 | | | Final Weight/Volume: | 1 mL |
| Prep Date: | 02/04/2015 1828 | | | Injection Volume: | 0.5 uL |

V 3/18/15

| Analyte | DryWt Corrected: Y | Result (ug/Kg) | Qualifier | MDL | RL |
|---|---|---|---|---|---|
| Acenaphthene | | 11 | U | 11 | 350 |
| Acenaphthylene | | 18 | U | 18 | 350 |
| Anthracene | | 18 | U | 18 | 350 |
| Benzo[a]anthracene | | 21 | U | 21 | 350 |
| Benzo[a]pyrene | | 21 | U | 21 | 350 |
| Benzo[b]fluoranthene | | 28 | U | 28 | 350 |
| Benzo[ghi]perylene | | 17 | U | 17 | 350 |
| Benzo[k]fluoranthene | | 42 | U | 42 | 350 |
| Bis(2-chloroethoxy)methane | | 24 | U | 24 | 350 |
| Bis(2-chloroethyl)ether | | 18 | U | 18 | 350 |
| bis (2-chloroisopropyl) ether | | 24 | U | 24 | 350 |
| Bis(2-ethylhexyl) phthalate | | 49 | U | 49 | 350 |
| 4-Bromophenyl phenyl ether | | 20 | U | 20 | 350 |
| Butyl benzyl phthalate | | 45 | U | 45 | 350 |
| Carbazole | | 38 | U | 38 | 350 |
| 4-Chloroaniline | | 86 | U | 86 | 350 |
| 4-Chloro-3-methylphenol | | 70 | U | 70 | 350 |
| 2-Chloronaphthalene | | 11 | U | 11 | 350 |
| 2-Chlorophenol | | 22 | U | 22 | 350 |
| 4-Chlorophenyl phenyl ether | | 22 | U | 22 | 350 |
| Chrysene | | 29 | U | 29 | 350 |
| Dibenz(a,h)anthracene | | 20 | U | 20 | 350 |
| Dibenzofuran | | 21 | U | 21 | 350 |
| 1,2-Dichlorobenzene | | 23 | U | 23 | 350 |
| 1,3-Dichlorobenzene | | 13 | U | 13 | 350 |
| 1,4-Dichlorobenzene | | 14 | U | 14 | 350 |
| 3,3'-Dichlorobenzidine | | 95 | U | 95 | 700 |
| 2,4-Dichlorophenol | | 11 | U | 11 | 350 |
| Diethyl phthalate | | 27 | U | 27 | 350 |
| 2,4-Dimethylphenol | | 70 | U | 70 | 350 |
| Dimethyl phthalate | | 24 | U | 24 | 350 |
| Di-n-butyl phthalate | | 31 | U | 31 | 350 |
| 4,6-Dinitro-2-methylphenol | | 350 | U | 350 | 700 |
| 2,4-Dinitrophenol | | 350 | U | 350 | 870 |
| 2,4-Dinitrotoluene | | 70 | U | 70 | 350 |
| 2,6-Dinitrotoluene | | 30 | U | 30 | 350 |
| Di-n-octyl phthalate | | 15 | U | 15 | 350 |
| Fluoranthene | | 38 | U | 38 | 350 |
| Fluorene | | 19 | U | 19 | 350 |
| Hexachlorobenzene | | 31 | U | 31 | 350 |
| Hexachlorobutadiene | | 11 | U | 11 | 350 |
| Hexachlorocyclopentadiene | | 53 | U | 53 | 350 |
| Hexachloroethane | | 22 | U | 22 | 350 |
| Indeno[1,2,3-cd]pyrene | | 23 | U | 23 | 350 |
| Isophorone | | 18 | U | 18 | 350 |
| 2-Methylnaphthalene | | 20 | U | 20 | 350 |

## Analytical Data

Client: Washington Closure Hanford

Job Number: 280-65030-1
Sdg Number: JP0899

**Client Sample ID:** **J1V3P7**

Lab Sample ID: 280-65030-6
Client Matrix: Solid

% Moisture: 13.9

Date Sampled: 02/02/2015 0855
Date Received: 02/04/2015 1000

**8270C Semivolatile Organic Compounds (GC/MS)**

| | | | | | |
|---|---|---|---|---|---|
| Analysis Method: | 8270C | Analysis Batch: | 280-263137 | Instrument ID: | SMS_G6 |
| Prep Method: | 3550C | Prep Batch: | 280-263016 | Lab File ID: | G6_16363.D |
| Dilution: | 1.0 | | | Initial Weight/Volume: | 33.0 g |
| Analysis Date: | 02/05/2015 1800 | | | Final Weight/Volume: | 1 mL |
| Prep Date: | 02/04/2015 1828 | | | Injection Volume: | 0.5 uL |

V 3/8/15

| Analyte | DryWt Corrected: Y | Result (ug/Kg) | Qualifier | MDL | RL |
|---|---|---|---|---|---|
| 2-Methylphenol | | 14 | U | 14 | 350 |
| 3 & 4 Methylphenol | | 35 | U | 35 | 350 |
| Naphthalene | | 33 | U | 33 | 350 |
| 2-Nitroaniline | | 53 | U | 53 | 350 |
| 3-Nitroaniline | | 77 | U | 77 | 350 |
| 4-Nitroaniline | | 77 | U | 77 | 350 |
| Nitrobenzene | | 23 | U | 23 | 350 |
| 2-Nitrophenol | | 11 | U | 11 | 350 |
| 4-Nitrophenol | | 100 | U | 100 | 700 |
| N-Nitrosodi-n-propylamine | | 33 | U | 33 | 350 |
| N-Nitrosodiphenylamine | | 22 | U | 22 | 350 |
| Pentachlorophenol | | 350 | U | 350 | 700 |
| Phenanthrene | | 18 | U | 18 | 350 |
| Phenol | | 19 | U | 19 | 350 |
| Pyrene | | 13 | U | 13 | 350 |
| 1,2,4-Trichlorobenzene | | 30 | U | 30 | 350 |
| 2,4,5-Trichlorophenol | | 11 | U | 11 | 350 |
| 2,4,6-Trichlorophenol | | 11 | U | 11 | 350 |

| Surrogate | %Rec | Qualifier | Acceptance Limits |
|---|---|---|---|
| 2-Fluorobiphenyl | 70 | | 50 - 120 |
| 2-Fluorophenol | 72 | | 53 - 120 |
| Nitrobenzene-d5 | 68 | | 50 - 120 |
| Phenol-d5 | 72 | | 52 - 120 |
| Terphenyl-d14 | 76 | | 55 - 120 |
| 2,4,6-Tribromophenol | 72 | | 51 - 120 |

## Analytical Data

Client: Washington Closure Hanford

Job Number: 280-65030-1
Sdg Number: JP0899

**Client Sample ID:** **J1V3P7**

Lab Sample ID: 280-65030-6
Client Matrix: Solid

% Moisture: 13.9

Date Sampled: 02/02/2015 0855
Date Received: 02/04/2015 1000

**8270C Semivolatile Organic Compounds (GC/MS)**

| | | | | | |
|---|---|---|---|---|---|
| Analysis Method: | 8270C | Analysis Batch: | 280-263137 | Instrument ID: | SMS_G6 |
| Prep Method: | 3550C | Prep Batch: | 280-263016 | Lab File ID: | G6_16363.D |
| Dilution: | 1.0 | | | Initial Weight/Volume: | 33.0 g |
| Analysis Date: | 02/05/2015 1800 | | | Final Weight/Volume: | 1 mL |
| Prep Date: | 02/04/2015 1828 | | | Injection Volume: | 0.5 uL |

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**Tentatively Identified Compounds** **Number TIC's Found:** 2

| Cas Number | Analyte | RT | Est. Result (ug/Kg) | Qualifier |
|---|---|---|---|---|
| | Unknown | 3.28 | 6600 | N J |
| 107-70-0 | 2-Pentanone, 4-methoxy-4-methyl- | 3.85 | 170 | N J |

Client: Washington Closure Hanford

Job Number: 280-65030-1
Sdg Number: JP0899

**Client Sample ID:** **J1V3P8**

Lab Sample ID: 280-65030-7
Client Matrix: Solid
% Moisture: 7.2

Date Sampled: 02/02/2015 0837
Date Received: 02/04/2015 1000

**8270C Semivolatile Organic Compounds (GC/MS)**

| | | | | | |
|---|---|---|---|---|---|
| Analysis Method: | 8270C | Analysis Batch: | 280-263137 | Instrument ID: | SMS_G6 |
| Prep Method: | 3550C | Prep Batch: | 280-263016 | Lab File ID: | G6_16364.D |
| Dilution: | 1.0 | | | Initial Weight/Volume: | 31.0 g |
| Analysis Date: | 02/05/2015 1828 | | | Final Weight/Volume: | 1 mL |
| Prep Date: | 02/04/2015 1828 | | | Injection Volume: | 0.5 uL |

| Analyte | DryWt Corrected: Y | Result (ug/Kg) | Qualifier | MDL | RL |
|---|---|---|---|---|---|
| Acenaphthene | | 11 | U | 11 | 340 |
| Acenaphthylene | | 18 | U | 18 | 340 |
| Anthracene | | 18 | U | 18 | 340 |
| Benzo[a]anthracene | | 21 | U | 21 | 340 |
| Benzo[a]pyrene | | 21 | U | 21 | 340 |
| Benzo[b]fluoranthene | | 27 | U | 27 | 340 |
| Benzo[ghi]perylene | | 17 | U | 17 | 340 |
| Benzo[k]fluoranthene | | 42 | U | 42 | 340 |
| Bis(2-chloroethoxy)methane | | 24 | U | 24 | 340 |
| Bis(2-chloroethyl)ether | | 17 | U | 17 | 340 |
| bis (2-chloroisopropyl) ether | | 24 | U | 24 | 340 |
| Bis(2-ethylhexyl) phthalate | | 48 | U | 48 | 340 |
| 4-Bromophenyl phenyl ether | | 20 | U | 20 | 340 |
| Butyl benzyl phthalate | | 45 | U | 45 | 340 |
| Carbazole | | 38 | U | 38 | 340 |
| 4-Chloroaniline | | 85 | U | 85 | 340 |
| 4-Chloro-3-methylphenol | | 69 | U | 69 | 340 |
| 2-Chloronaphthalene | | 10 | U | 10 | 340 |
| 2-Chlorophenol | | 22 | U | 22 | 340 |
| 4-Chlorophenyl phenyl ether | | 22 | U | 22 | 340 |
| Chrysene | | 28 | U | 28 | 340 |
| Dibenz(a,h)anthracene | | 20 | U | 20 | 340 |
| Dibenzofuran | | 21 | U | 21 | 340 |
| 1,2-Dichlorobenzene | | 23 | U | 23 | 340 |
| 1,3-Dichlorobenzene | | 13 | U | 13 | 340 |
| 1,4-Dichlorobenzene | | 14 | U | 14 | 340 |
| 3,3'-Dichlorobenzidine | | 94 | U | 94 | 690 |
| 2,4-Dichlorophenol | | 10 | U | 10 | 340 |
| Diethyl phthalate | | 27 | U | 27 | 340 |
| 2,4-Dimethylphenol | | 69 | U | 69 | 340 |
| Dimethyl phthalate | | 24 | U | 24 | 340 |
| Di-n-butyl phthalate | | 30 | U | 30 | 340 |
| *4,6-Dinitro-2-methylphenol* | | *340* | *U* | *340* | *690* |
| 2,4-Dinitrophenol | | 350 | U | 350 | 860 |
| 2,4-Dinitrotoluene | | 69 | U | 69 | 340 |
| 2,6-Dinitrotoluene | | 29 | U | 29 | 340 |
| Di-n-octyl phthalate | | 15 | U | 15 | 340 |
| Fluoranthene | | 38 | U | 38 | 340 |
| Fluorene | | 19 | U | 19 | 340 |
| Hexachlorobenzene | | 30 | U | 30 | 340 |
| Hexachlorobutadiene | | 10 | U | 10 | 340 |
| Hexachlorocyclopentadiene | | 52 | U | 52 | 340 |
| *Hexachloroethane* | | *22* | *U* | *22* | *340* |
| Indeno[1,2,3-cd]pyrene | | 23 | U | 23 | 340 |
| Isophorone | | 18 | U | 18 | 340 |
| 2-Methylnaphthalene | | 20 | U | 20 | 340 |

## Analytical Data

Client: Washington Closure Hanford

Job Number: 280-65030-1
Sdg Number: JP0899

**Client Sample ID:** **J1V3P8**

Lab Sample ID: 280-65030-7
Client Matrix: Solid
% Moisture: 7.2

Date Sampled: 02/02/2015 0837
Date Received: 02/04/2015 1000

**8270C Semivolatile Organic Compounds (GC/MS)**

| | | | | | |
|---|---|---|---|---|---|
| Analysis Method: | 8270C | Analysis Batch: | 280-263137 | Instrument ID: | SMS_G6 |
| Prep Method: | 3550C | Prep Batch: | 280-263016 | Lab File ID: | G6_16364.D |
| Dilution: | 1.0 | | | Initial Weight/Volume: | 31.0 g |
| Analysis Date: | 02/05/2015 1828 | | | Final Weight/Volume: | 1 mL |
| Prep Date: | 02/04/2015 1828 | | | Injection Volume: | 0.5 uL |

vr 3/8/15

| Analyte | DryWt Corrected: Y | Result (ug/Kg) | Qualifier | MDL | RL |
|---|---|---|---|---|---|
| 2-Methylphenol | | 14 | U | 14 | 340 |
| 3 & 4 Methylphenol | | 34 | U | 34 | 340 |
| Naphthalene | | 32 | U | 32 | 340 |
| 2-Nitroaniline | | 52 | U | 52 | 340 |
| 3-Nitroaniline | | 76 | U | 76 | 340 |
| 4-Nitroaniline | | 76 | U | 76 | 340 |
| Nitrobenzene | | 23 | U | 23 | 340 |
| 2-Nitrophenol | | 10 | U | 10 | 340 |
| 4-Nitrophenol | | 100 | U | 100 | 690 |
| N-Nitrosodi-n-propylamine | | 32 | U | 32 | 340 |
| N-Nitrosodiphenylamine | | 22 | U | 22 | 340 |
| Pentachlorophenol | | 340 | U | 340 | 690 |
| Phenanthrene | | 19 | J | 18 | 340 |
| Phenol | | 19 | U | 19 | 340 |
| Pyrene | | 23 | J | 13 | 340 |
| 1,2,4-Trichlorobenzene | | 29 | U | 29 | 340 |
| 2,4,5-Trichlorophenol | | 10 | U | 10 | 340 |
| 2,4,6-Trichlorophenol | | 10 | U | 10 | 340 |

| Surrogate | %Rec | Qualifier | Acceptance Limits |
|---|---|---|---|
| 2-Fluorobiphenyl | 75 | | 50 - 120 |
| 2-Fluorophenol | 76 | | 53 - 120 |
| Nitrobenzene-d5 | 71 | | 50 - 120 |
| Phenol-d5 | 76 | | 52 - 120 |
| Terphenyl-d14 | 84 | | 55 - 120 |
| 2,4,6-Tribromophenol | 78 | | 51 - 120 |

## Analytical Data

Client: Washington Closure Hanford

Job Number: 280-65030-1
Sdg Number: JP0899

**Client Sample ID:** **J1V3P8**

Lab Sample ID: 280-65030-7
Client Matrix: Solid
% Moisture: 7.2

Date Sampled: 02/02/2015 0837
Date Received: 02/04/2015 1000

**8270C Semivolatile Organic Compounds (GC/MS)**

| | | | | | |
|---|---|---|---|---|---|
| Analysis Method: | 8270C | Analysis Batch: | 280-263137 | Instrument ID: | SMS_G6 |
| Prep Method: | 3550C | Prep Batch: | 280-263016 | Lab File ID: | G6_16364.D |
| Dilution: | 1.0 | | | Initial Weight/Volume: | 31.0 g |
| Analysis Date: | 02/05/2015 1828 | | | Final Weight/Volume: | 1 mL |
| Prep Date: | 02/04/2015 1828 | | | Injection Volume: | 0.5 uL |

3/8/15

**Tentatively Identified Compounds** **Number TIC's Found:** **2**

| Cas Number | Analyte | RT | Est. Result (ug/Kg) | Qualifier |
|---|---|---|---|---|
| | Unknown | 3.28 | 7000 | N J |
| 107-70-0 | 2-Pentanone, 4-methoxy-4-methyl- | 3.85 | 170 | N J |

## Analytical Data

Client: Washington Closure Hanford

Job Number: 280-65030-1
Sdg Number: JP0899

**Client Sample ID:** **J1V3P9**

Lab Sample ID: 280-65030-8
Client Matrix: Solid

% Moisture: 4.6

Date Sampled: 02/02/2015 0857
Date Received: 02/04/2015 1000

**8270C Semivolatile Organic Compounds (GC/MS)**

| | | | | | |
|---|---|---|---|---|---|
| Analysis Method: | 8270C | Analysis Batch: | 280-263137 | Instrument ID: | SMS_G6 |
| Prep Method: | 3550C | Prep Batch: | 280-263016 | Lab File ID: | G6_16365.D |
| Dilution: | 1.0 | | | Initial Weight/Volume: | 32.0 g |
| Analysis Date: | 02/05/2015 1855 | | | Final Weight/Volume: | 1 mL |
| Prep Date: | 02/04/2015 1828 | | | Injection Volume: | 0.5 uL |

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| Analyte | DryWt Corrected: Y | Result (ug/Kg) | Qualifier | MDL | RL |
|---|---|---|---|---|---|
| Acenaphthene | | 10 | U | 10 | 320 |
| Acenaphthylene | | 17 | U | 17 | 320 |
| Anthracene | | 17 | U | 17 | 320 |
| Benzo[a]anthracene | | 20 | U | 20 | 320 |
| Benzo[a]pyrene | | 20 | U | 20 | 320 |
| Benzo[b]fluoranthene | | 26 | U | 26 | 320 |
| Benzo[ghi]perylene | | 16 | U | 16 | 320 |
| Benzo[k]fluoranthene | | 39 | U | 39 | 320 |
| Bis(2-chloroethoxy)methane | | 23 | U | 23 | 320 |
| Bis(2-chloroethyl)ether | | 16 | U | 16 | 320 |
| bis (2-chloroisopropyl) ether | | 23 | U | 23 | 320 |
| Bis(2-ethylhexyl) phthalate | | 45 | U | 45 | 320 |
| 4-Bromophenyl phenyl ether | | 19 | U | 19 | 320 |
| Butyl benzyl phthalate | | 42 | U | 42 | 320 |
| Carbazole | | 35 | U | 35 | 320 |
| 4-Chloroaniline | | 81 | U | 81 | 320 |
| 4-Chloro-3-methylphenol | | 65 | U | 65 | 320 |
| 2-Chloronaphthalene | | 9.8 | U | 9.8 | 320 |
| 2-Chlorophenol | | 21 | U | 21 | 320 |
| 4-Chlorophenyl phenyl ether | | 21 | U | 21 | 320 |
| Chrysene | | 27 | U | 27 | 320 |
| Dibenz(a,h)anthracene | | 19 | U | 19 | 320 |
| Dibenzofuran | | 20 | U | 20 | 320 |
| 1,2-Dichlorobenzene | | 22 | U | 22 | 320 |
| 1,3-Dichlorobenzene | | 12 | U | 12 | 320 |
| 1,4-Dichlorobenzene | | 13 | U | 13 | 320 |
| 3,3'-Dichlorobenzidine | | 88 | U | 88 | 650 |
| 2,4-Dichlorophenol | | 9.8 | U | 9.8 | 320 |
| Diethyl phthalate | | 26 | U | 26 | 320 |
| 2,4-Dimethylphenol | | 65 | U | 65 | 320 |
| Dimethyl phthalate | | 23 | U | 23 | 320 |
| Di-n-butyl phthalate | | 29 | U | 29 | 320 |
| 4,6-Dinitro-2-methylphenol | | 320 | U | 320 | 650 |
| 2,4-Dinitrophenol | | 330 | U | 330 | 810 |
| 2,4-Dinitrotoluene | | 65 | U | 65 | 320 |
| 2,6-Dinitrotoluene | | 28 | U | 28 | 320 |
| Di-n-octyl phthalate | | 14 | U | 14 | 320 |
| Fluoranthene | | 35 | U | 35 | 320 |
| Fluorene | | 18 | U | 18 | 320 |
| Hexachlorobenzene | | 29 | U | 29 | 320 |
| Hexachlorobutadiene | | 9.8 | U | 9.8 | 320 |
| Hexachlorocyclopentadiene | | 49 | U | 49 | 320 |
| Hexachloroethane | | 21 | U | 21 | 320 |
| Indeno[1,2,3-cd]pyrene | | 22 | U | 22 | 320 |
| Isophorone | | 17 | U | 17 | 320 |
| 2-Methylnaphthalene | | 19 | U | 19 | 320 |

Client: Washington Closure Hanford

Job Number: 280-65030-1
Sdg Number: JP0899

**Client Sample ID:** **J1V3P9**

Lab Sample ID: 280-65030-8
Client Matrix: Solid
% Moisture: 4.6

Date Sampled: 02/02/2015 0857
Date Received: 02/04/2015 1000

**8270C Semivolatile Organic Compounds (GC/MS)**

| | | | | | |
|---|---|---|---|---|---|
| Analysis Method: | 8270C | Analysis Batch: | 280-263137 | Instrument ID: | SMS_G6 |
| Prep Method: | 3550C | Prep Batch: | 280-263016 | Lab File ID: | G6_16365.D |
| Dilution: | 1.0 | | | Initial Weight/Volume: | 32.0 g |
| Analysis Date: | 02/05/2015 1855 | | | Final Weight/Volume: | 1 mL |
| Prep Date: | 02/04/2015 1828 | | | Injection Volume: | 0.5 uL |

| Analyte | DryWt Corrected: Y | Result (ug/Kg) | Qualifier | MDL | RL |
|---|---|---|---|---|---|
| 2-Methylphenol | | 13 | U | 13 | 320 |
| 3 & 4 Methylphenol | | 32 | U | 32 | 320 |
| Naphthalene | | 30 | U | 30 | 320 |
| 2-Nitroaniline | | 49 | U | 49 | 320 |
| 3-Nitroaniline | | 72 | U | 72 | 320 |
| 4-Nitroaniline | | 71 | U | 71 | 320 |
| Nitrobenzene | | 22 | U | 22 | 320 |
| 2-Nitrophenol | | 9.8 | U | 9.8 | 320 |
| 4-Nitrophenol | | 95 | U | 95 | 650 |
| N-Nitrosodi-n-propylamine | | 30 | U | 30 | 320 |
| N-Nitrosodiphenylamine | | 21 | U | 21 | 320 |
| Pentachlorophenol | | 320 | U | 320 | 650 |
| Phenanthrene | | 17 | U | 17 | 320 |
| Phenol | | 18 | U | 18 | 320 |
| Pyrene | | 12 | U | 12 | 320 |
| 1,2,4-Trichlorobenzene | | 28 | U | 28 | 320 |
| 2,4,5-Trichlorophenol | | 9.8 | U | 9.8 | 320 |
| 2,4,6-Trichlorophenol | | 9.8 | U | 9.8 | 320 |

| Surrogate | %Rec | Qualifier | Acceptance Limits |
|---|---|---|---|
| 2-Fluorobiphenyl | 75 | | 50 - 120 |
| 2-Fluorophenol | 78 | | 53 - 120 |
| Nitrobenzene-d5 | 74 | | 50 - 120 |
| Phenol-d5 | 78 | | 52 - 120 |
| Terphenyl-d14 | 80 | | 55 - 120 |
| 2,4,6-Tribromophenol | 74 | | 51 - 120 |

## Analytical Data

Client: Washington Closure Hanford

Job Number: 280-65030-1
Sdg Number: JP0899

**Client Sample ID:** **J1V3P9**

Lab Sample ID: 280-65030-8
Client Matrix: Solid

% Moisture: 4.6

Date Sampled: 02/02/2015 0857
Date Received: 02/04/2015 1000

**8270C Semivolatile Organic Compounds (GC/MS)**

| | | | | | |
|---|---|---|---|---|---|
| Analysis Method: | 8270C | Analysis Batch: | 280-263137 | Instrument ID: | SMS_G6 |
| Prep Method: | 3550C | Prep Batch: | 280-263016 | Lab File ID: | G6_16365.D |
| Dilution: | 1.0 | | | Initial Weight/Volume: | 32.0 g |
| Analysis Date: | 02/05/2015 1855 | | | Final Weight/Volume: | 1 mL |
| Prep Date: | 02/04/2015 1828 | | | Injection Volume: | 0.5 uL |

3/8/15

**Tentatively Identified Compounds** **Number TIC's Found:** **2**

| Cas Number | Analyte | RT | Est. Result (ug/Kg) | Qualifier |
|---|---|---|---|---|
| | Unknown | 3.28 | 6800 | N J |
| 107-70-0 | 2-Pentanone, 4-methoxy-4-methyl- | 3.85 | 180 | N J |

## Analytical Data

Client: Washington Closure Hanford

Job Number: 280-65030-1
Sdg Number: JP0899

**Client Sample ID:** J1V3R0

Lab Sample ID: 280-65030-9
Client Matrix: Solid

% Moisture: 9.6

Date Sampled: 02/02/2015 0847
Date Received: 02/04/2015 1000

**8270C Semivolatile Organic Compounds (GC/MS)**

| | | | | | |
|---|---|---|---|---|---|
| Analysis Method: | 8270C | Analysis Batch: | 280-263137 | Instrument ID: | SMS_G6 |
| Prep Method: | 3550C | Prep Batch: | 280-263016 | Lab File ID: | G6_16366.D |
| Dilution: | 1.0 | | | Initial Weight/Volume: | 30.1 g |
| Analysis Date: | 02/05/2015 1923 | | | Final Weight/Volume: | 1 mL |
| Prep Date: | 02/04/2015 1828 | | | Injection Volume: | 0.5 uL |

3/8/15

| Analyte | DryWt Corrected: Y | Result (ug/Kg) | Qualifier | MDL | RL |
|---|---|---|---|---|---|
| Acenaphthene | | 11 | U | 11 | 360 |
| Acenaphthylene | | 19 | U | 19 | 360 |
| Anthracene | | 19 | U | 19 | 360 |
| Benzo[a]anthracene | | 22 | U | 22 | 360 |
| Benzo[a]pyrene | | 22 | U | 22 | 360 |
| Benzo[b]fluoranthene | | 29 | U | 29 | 360 |
| Benzo[ghi]perylene | | 18 | U | 18 | 360 |
| Benzo[k]fluoranthene | | 44 | U | 44 | 360 |
| Bis(2-chloroethoxy)methane | | 25 | U | 25 | 360 |
| Bis(2-chloroethyl)ether | | 18 | U | 18 | 360 |
| bis (2-chloroisopropyl) ether | | 25 | U | 25 | 360 |
| Bis(2-ethylhexyl) phthalate | | 51 | U | 51 | 360 |
| 4-Bromophenyl phenyl ether | | 21 | U | 21 | 360 |
| Butyl benzyl phthalate | | 47 | U | 47 | 360 |
| Carbazole | | 40 | U | 40 | 360 |
| 4-Chloroaniline | | 90 | U | 90 | 360 |
| 4-Chloro-3-methylphenol | | 73 | U | 73 | 360 |
| 2-Chloronaphthalene | | 11 | U | 11 | 360 |
| 2-Chlorophenol | | 23 | U | 23 | 360 |
| 4-Chlorophenyl phenyl ether | | 23 | U | 23 | 360 |
| Chrysene | | 30 | U | 30 | 360 |
| Dibenz(a,h)anthracene | | 21 | U | 21 | 360 |
| Dibenzofuran | | 22 | U | 22 | 360 |
| 1,2-Dichlorobenzene | | 24 | U | 24 | 360 |
| 1,3-Dichlorobenzene | | 13 | U | 13 | 360 |
| 1,4-Dichlorobenzene | | 15 | U | 15 | 360 |
| 3,3'-Dichlorobenzidine | | 99 | U | 99 | 730 |
| 2,4-Dichlorophenol | | 11 | U | 11 | 360 |
| Diethyl phthalate | | 29 | U | 29 | 360 |
| 2,4-Dimethylphenol | | 73 | U | 73 | 360 |
| Dimethyl phthalate | | 25 | U | 25 | 360 |
| Di-n-butyl phthalate | | 32 | U | 32 | 360 |
| 4,6-Dinitro-2-methylphenol | | 360 | U | 360 | 730 |
| 2,4-Dinitrophenol | | 370 | U | 370 | 910 |
| 2,4-Dinitrotoluene | | 73 | U | 73 | 360 |
| 2,6-Dinitrotoluene | | 31 | U | 31 | 360 |
| Di-n-octyl phthalate | | 16 | U | 16 | 360 |
| Fluoranthene | | 40 | U | 40 | 360 |
| Fluorene | | 20 | U | 20 | 360 |
| Hexachlorobenzene | | 32 | U | 32 | 360 |
| Hexachlorobutadiene | | 11 | U | 11 | 360 |
| Hexachlorocyclopentadiene | | 55 | U | 55 | 360 |
| Hexachloroethane | | 23 | U | 23 | 360 |
| Indeno[1,2,3-cd]pyrene | | 24 | U | 24 | 360 |
| Isophorone | | 19 | U | 19 | 360 |
| 2-Methylnaphthalene | | 21 | U | 21 | 360 |

## Analytical Data

Client: Washington Closure Hanford

Job Number: 280-65030-1
Sdg Number: JP0899

**Client Sample ID:** **J1V3R0**

Lab Sample ID: 280-65030-9
Client Matrix: Solid

% Moisture: 9.6

Date Sampled: 02/02/2015 0847
Date Received: 02/04/2015 1000

**8270C Semivolatile Organic Compounds (GC/MS)**

| | | | | | |
|---|---|---|---|---|---|
| Analysis Method: | 8270C | Analysis Batch: | 280-263137 | Instrument ID: | SMS_G6 |
| Prep Method: | 3550C | Prep Batch: | 280-263016 | Lab File ID: | G6_16366.D |
| Dilution: | 1.0 | | | Initial Weight/Volume: | 30.1 g |
| Analysis Date: | 02/05/2015 1923 | | | Final Weight/Volume: | 1 mL |
| Prep Date: | 02/04/2015 1828 | | | Injection Volume: | 0.5 uL |

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| Analyte | DryWt Corrected: Y | Result (ug/Kg) | Qualifier | MDL | RL |
|---|---|---|---|---|---|
| 2-Methylphenol | | 14 | U | 14 | 360 |
| 3 & 4 Methylphenol | | 36 | U | 36 | 360 |
| Naphthalene | | 34 | U | 34 | 360 |
| 2-Nitroaniline | | 55 | U | 55 | 360 |
| 3-Nitroaniline | | 80 | U | 80 | 360 |
| 4-Nitroaniline | | 80 | U | 80 | 360 |
| Nitrobenzene | | 24 | U | 24 | 360 |
| 2-Nitrophenol | | 11 | U | 11 | 360 |
| 4-Nitrophenol | | 110 | U | 110 | 730 |
| N-Nitrosodi-n-propylamine | | 34 | U | 34 | 360 |
| N-Nitrosodiphenylamine | | 23 | U | 23 | 360 |
| Pentachlorophenol | | 360 | U | 360 | 730 |
| Phenanthrene | | 19 | U | 19 | 360 |
| Phenol | | 20 | U | 20 | 360 |
| Pyrene | | 13 | U | 13 | 360 |
| 1,2,4-Trichlorobenzene | | 31 | U | 31 | 360 |
| 2,4,5-Trichlorophenol | | 11 | U | 11 | 360 |
| 2,4,6-Trichlorophenol | | 11 | U | 11 | 360 |

| Surrogate | %Rec | Qualifier | Acceptance Limits |
|---|---|---|---|
| 2-Fluorobiphenyl | 73 | | 50 - 120 |
| 2-Fluorophenol | 72 | | 53 - 120 |
| Nitrobenzene-d5 | 71 | | 50 - 120 |
| Phenol-d5 | 73 | | 52 - 120 |
| Terphenyl-d14 | 87 | | 55 - 120 |
| 2,4,6-Tribromophenol | 81 | | 51 - 120 |

## Analytical Data

Client: Washington Closure Hanford

Job Number: 280-65030-1
Sdg Number: JP0899

**Client Sample ID:** **J1V3R0**

Lab Sample ID: 280-65030-9
Client Matrix: Solid

% Moisture: 9.6

Date Sampled: 02/02/2015 0847
Date Received: 02/04/2015 1000

**8270C Semivolatile Organic Compounds (GC/MS)**

| | | | | | |
|---|---|---|---|---|---|
| Analysis Method: | 8270C | Analysis Batch: | 280-263137 | Instrument ID: | SMS_G6 |
| Prep Method: | 3550C | Prep Batch: | 280-263016 | Lab File ID: | G6_16366.D |
| Dilution: | 1.0 | | | Initial Weight/Volume: | 30.1 g |
| Analysis Date: | 02/05/2015 1923 | | | Final Weight/Volume: | 1 mL |
| Prep Date: | 02/04/2015 1828 | | | Injection Volume: | 0.5 uL |

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**Tentatively Identified Compounds** **Number TIC's Found:** 3

| Cas Number | Analyte | RT | Est. Result (ug/Kg) | Qualifier |
|---|---|---|---|---|
| | Unknown | 3.28 | 6800 | N J |
| 107-70-0 | 2-Pentanone, 4-methoxy-4-methyl- | 3.85 | 180 | N J |
| 126-73-8 | Tributyl phosphate | 8.28 | 160 | J N J |

Client: Washington Closure Hanford

Job Number: 280-65030-1
Sdg Number: JP0899

**Client Sample ID:** J1V3R1

Lab Sample ID: 280-65030-10
Client Matrix: Solid

% Moisture: 6.3

Date Sampled: 02/02/2015 0843
Date Received: 02/04/2015 1000

**8270C Semivolatile Organic Compounds (GC/MS)**

| | | | | | |
|---|---|---|---|---|---|
| Analysis Method: | 8270C | Analysis Batch: | 280-263137 | Instrument ID: | SMS_G6 |
| Prep Method: | 3550C | Prep Batch: | 280-263016 | Lab File ID: | G6_16367.D |
| Dilution: | 1.0 | | | Initial Weight/Volume: | 32.5 g |
| Analysis Date: | 02/05/2015 1950 | | | Final Weight/Volume: | 1 mL |
| Prep Date: | 02/04/2015 1828 | | | Injection Volume: | 0.5 uL |

K 3/8/15

| Analyte | DryWt Corrected: Y | Result (ug/Kg) | Qualifier | MDL | RL |
|---|---|---|---|---|---|
| Acenaphthene | | 10 | U | 10 | 330 |
| Acenaphthylene | | 17 | U | 17 | 330 |
| Anthracene | | 17 | U | 17 | 330 |
| Benzo[a]anthracene | | 20 | U | 20 | 330 |
| Benzo[a]pyrene | | 20 | U | 20 | 330 |
| Benzo[b]fluoranthene | | 26 | U | 26 | 330 |
| Benzo[ghi]perylene | | 16 | U | 16 | 330 |
| Benzo[k]fluoranthene | | 39 | U | 39 | 330 |
| Bis(2-chloroethoxy)methane | | 23 | U | 23 | 330 |
| Bis(2-chloroethyl)ether | | 16 | U | 16 | 330 |
| bis (2-chloroisopropyl) ether | | 23 | U | 23 | 330 |
| Bis(2-ethylhexyl) phthalate | | 45 | U | 45 | 330 |
| 4-Bromophenyl phenyl ether | | 19 | U | 19 | 330 |
| Butyl benzyl phthalate | | 42 | U | 42 | 330 |
| Carbazole | | 35 | U | 35 | 330 |
| 4-Chloroaniline | | 81 | U | 81 | 330 |
| 4-Chloro-3-methylphenol | | 65 | U | 65 | 330 |
| 2-Chloronaphthalene | | 9.9 | U | 9.9 | 330 |
| 2-Chlorophenol | | 21 | U | 21 | 330 |
| 4-Chlorophenyl phenyl ether | | 21 | U | 21 | 330 |
| Chrysene | | 27 | U | 27 | 330 |
| Dibenz(a,h)anthracene | | 19 | U | 19 | 330 |
| Dibenzofuran | | 20 | U | 20 | 330 |
| 1,2-Dichlorobenzene | | 22 | U | 22 | 330 |
| 1,3-Dichlorobenzene | | 12 | U | 12 | 330 |
| 1,4-Dichlorobenzene | | 13 | U | 13 | 330 |
| 3,3'-Dichlorobenzidine | | 89 | U | 89 | 650 |
| 2,4-Dichlorophenol | | 9.9 | U | 9.9 | 330 |
| Diethyl phthalate | | 26 | U | 26 | 330 |
| 2,4-Dimethylphenol | | 65 | U | 65 | 330 |
| Dimethyl phthalate | | 23 | U | 23 | 330 |
| Di-n-butyl phthalate | | 29 | U | 29 | 330 |
| 4,6-Dinitro-2-methylphenol | | 330 | U | 330 | 850 |
| 2,4-Dinitrophenol | | 330 | U | 330 | 810 |
| 2,4-Dinitrotoluene | | 65 | U | 65 | 330 |
| 2,6-Dinitrotoluene | | 28 | U | 28 | 330 |
| Di-n-octyl phthalate | | 14 | U | 14 | 330 |
| Fluoranthene | | 35 | U | 35 | 330 |
| Fluorene | | 18 | U | 18 | 330 |
| Hexachlorobenzene | | 29 | U | 29 | 330 |
| Hexachlorobutadiene | | 9.9 | U | 9.9 | 330 |
| Hexachlorocyclopentadiene | | 49 | U | 49 | 330 |
| Hexachloroethane | | 21 | U | 21 | 330 |
| Indeno[1,2,3-cd]pyrene | | 22 | U | 22 | 330 |
| Isophorone | | 17 | U | 17 | 330 |
| 2-Methylnaphthalene | | 19 | U | 19 | 330 |

## Analytical Data

Client: Washington Closure Hanford

Job Number: 280-65030-1
Sdg Number: JP0899

**Client Sample ID:** **J1V3R1**

Lab Sample ID: 280-65030-10
Client Matrix: Solid
% Moisture: 6.3

Date Sampled: 02/02/2015 0843
Date Received: 02/04/2015 1000

**8270C Semivolatile Organic Compounds (GC/MS)**

| | | | | | |
|---|---|---|---|---|---|
| Analysis Method: | 8270C | Analysis Batch: | 280-263137 | Instrument ID: | SMS_G6 |
| Prep Method: | 3550C | Prep Batch: | 280-263016 | Lab File ID: | G6_16367.D |
| Dilution: | 1.0 | | | Initial Weight/Volume: | 32.5 g |
| Analysis Date: | 02/05/2015 1950 | | | Final Weight/Volume: | 1 mL |
| Prep Date: | 02/04/2015 1828 | | | Injection Volume: | 0.5 uL |

✓ 3/18/15

| Analyte | DryWt Corrected: Y | Result (ug/Kg) | Qualifier | MDL | RL |
|---|---|---|---|---|---|
| 2-Methylphenol | | 13 | U | 13 | 330 |
| 3 & 4 Methylphenol | | 33 | U | 33 | 330 |
| Naphthalene | | 31 | U | 31 | 330 |
| 2-Nitroaniline | | 49 | U | 49 | 330 |
| 3-Nitroaniline | | 72 | U | 72 | 330 |
| 4-Nitroaniline | | 71 | U | 71 | 330 |
| Nitrobenzene | | 22 | U | 22 | 330 |
| 2-Nitrophenol | | 9.9 | U | 9.9 | 330 |
| 4-Nitrophenol | | 96 | U | 96 | 650 |
| N-Nitrosodi-n-propylamine | | 31 | U | 31 | 330 |
| N-Nitrosodiphenylamine | | 21 | U | 21 | 330 |
| Pentachlorophenol | | 330 | U | 330 | 650 |
| Phenanthrene | | 17 | U | 17 | 330 |
| Phenol | | 18 | U | 18 | 330 |
| Pyrene | | 12 | U | 12 | 330 |
| 1,2,4-Trichlorobenzene | | 28 | U | 28 | 330 |
| 2,4,5-Trichlorophenol | | 9.9 | U | 9.9 | 330 |
| 2,4,6-Trichlorophenol | | 9.9 | U | 9.9 | 330 |

| Surrogate | %Rec | Qualifier | Acceptance Limits |
|---|---|---|---|
| 2-Fluorobiphenyl | 79 | | 50 - 120 |
| 2-Fluorophenol | 82 | | 53 - 120 |
| Nitrobenzene-d5 | 78 | | 50 - 120 |
| Phenol-d5 | 81 | | 52 - 120 |
| Terphenyl-d14 | 89 | | 55 - 120 |
| 2,4,6-Tribromophenol | 79 | | 51 - 120 |

## Analytical Data

Client: Washington Closure Hanford

Job Number: 280-65030-1
Sdg Number: JP0899

**Client Sample ID:** **J1V3R1**

Lab Sample ID: 280-65030-10
Client Matrix: Solid

% Moisture: 6.3

Date Sampled: 02/02/2015 0843
Date Received: 02/04/2015 1000

**8270C Semivolatile Organic Compounds (GC/MS)**

| | | | | | |
|---|---|---|---|---|---|
| Analysis Method: | 8270C | Analysis Batch: | 280-263137 | Instrument ID: | SMS_G6 |
| Prep Method: | 3550C | Prep Batch: | 280-263016 | Lab File ID: | G6_16367.D |
| Dilution: | 1.0 | | | Initial Weight/Volume: | 32.5 g |
| Analysis Date: | 02/05/2015 1950 | | | Final Weight/Volume: | 1 mL |
| Prep Date: | 02/04/2015 1828 | | | Injection Volume: | 0.5 uL |

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**Tentatively Identified Compounds** **Number TIC's Found:** **3**

| Cas Number | Analyte | RT | Est. Result (ug/Kg) | Qualifier |
|---|---|---|---|---|
| 78-95-5 | 2-Propanone, 1-chloro- | 2.03 | 140 | N J |
| | Unknown | 3.28 | 6800 | N J |
| 107-70-0 | 2-Pentanone, 4-methoxy-4-methyl- | 3.85 | 170 | N J |

## Analytical Data

Client: Washington Closure Hanford

Job Number: 280-65030-1
Sdg Number: JP0899

**Client Sample ID:** J1V3R2

Lab Sample ID: 280-65030-11
Client Matrix: Solid

% Moisture: 5.2

Date Sampled: 02/02/2015 0902
Date Received: 02/04/2015 1000

**8270C Semivolatile Organic Compounds (GC/MS)**

| | | | | | |
|---|---|---|---|---|---|
| Analysis Method: | 8270C | Analysis Batch: | 280-263137 | Instrument ID: | SMS_G6 |
| Prep Method: | 3550C | Prep Batch: | 280-263016 | Lab File ID: | G6_16368.D |
| Dilution: | 1.0 | | | Initial Weight/Volume: | 30.8 g |
| Analysis Date: | 02/05/2015 2017 | | | Final Weight/Volume: | 1 mL |
| Prep Date: | 02/04/2015 1828 | | | Injection Volume: | 0.5 uL |

K 3/8/15

| Analyte | DryWt Corrected: Y | Result (ug/Kg) | Qualifier | MDL | RL |
|---|---|---|---|---|---|
| Acenaphthene | | 11 | U | 11 | 340 |
| Acenaphthylene | | 17 | U | 17 | 340 |
| Anthracene | | 17 | U | 17 | 340 |
| Benzo[a]anthracene | | 21 | U | 21 | 340 |
| Benzo[a]pyrene | | 21 | U | 21 | 340 |
| Benzo[b]fluoranthene | | 27 | U | 27 | 340 |
| Benzo[ghi]perylene | | 16 | U | 16 | 340 |
| Benzo[k]fluoranthene | | 41 | U | 41 | 340 |
| Bis(2-chloroethoxy)methane | | 24 | U | 24 | 340 |
| Bis(2-chloroethyl)ether | | 17 | U | 17 | 340 |
| bis (2-chloroisopropyl) ether | | 24 | U | 24 | 340 |
| Bis(2-ethylhexyl) phthalate | | 47 | U | 47 | 340 |
| 4-Bromophenyl phenyl ether | | 20 | U | 20 | 340 |
| Butyl benzyl phthalate | | 44 | U | 44 | 340 |
| Carbazole | | 37 | U | 37 | 340 |
| 4-Chloroaniline | | 84 | U | 84 | 340 |
| 4-Chloro-3-methylphenol | | 68 | U | 68 | 340 |
| 2-Chloronaphthalene | | 10 | U | 10 | 340 |
| 2-Chlorophenol | | 22 | U | 22 | 340 |
| 4-Chlorophenyl phenyl ether | | 22 | U | 22 | 340 |
| Chrysene | | 28 | U | 28 | 340 |
| Dibenz(a,h)anthracene | | 20 | U | 20 | 340 |
| Dibenzofuran | | 21 | U | 21 | 340 |
| 1,2-Dichlorobenzene | | 23 | U | 23 | 340 |
| 1,3-Dichlorobenzene | | 12 | U | 12 | 340 |
| 1,4-Dichlorobenzene | | 14 | U | 14 | 340 |
| 3,3'-Dichlorobenzidine | | 92 | U | 92 | 680 |
| 2,4-Dichlorophenol | | 10 | U | 10 | 340 |
| Diethyl phthalate | | 27 | U | 27 | 340 |
| 2,4-Dimethylphenol | | 68 | U | 68 | 340 |
| Dimethyl phthalate | | 24 | U | 24 | 340 |
| Di-n-butyl phthalate | | 30 | U | 30 | 340 |
| 4,6-Dinitro-2-methylphenol | | 340 | U | 340 | 680 |
| 2,4-Dinitrophenol | | 340 | U | 340 | 850 |
| 2,4-Dinitrotoluene | | 68 | U | 68 | 340 |
| 2,6-Dinitrotoluene | | 29 | U | 29 | 340 |
| Di-n-octyl phthalate | | 15 | U | 15 | 340 |
| Fluoranthene | | 37 | U | 37 | 340 |
| Fluorene | | 18 | U | 18 | 340 |
| Hexachlorobenzene | | 30 | U | 30 | 340 |
| Hexachlorobutadiene | | 10 | U | 10 | 340 |
| Hexachlorocyclopentadiene | | 51 | U | 51 | 340 |
| Hexachloroethane | | 22 | U | 22 | 340 |
| Indeno[1,2,3-cd]pyrene | | 23 | U | 23 | 340 |
| Isophorone | | 17 | U | 17 | 340 |
| 2-Methylnaphthalene | | 20 | U | 20 | 340 |

Client: Washington Closure Hanford

Job Number: 280-65030-1
Sdg Number: JP0899

**Client Sample ID:** **J1V3R2**

Lab Sample ID: 280-65030-11
Client Matrix: Solid

% Moisture: 5.2

Date Sampled: 02/02/2015 0902
Date Received: 02/04/2015 1000

**8270C Semivolatile Organic Compounds (GC/MS)**

| | | | | | |
|---|---|---|---|---|---|
| Analysis Method: | 8270C | Analysis Batch: | 280-263137 | Instrument ID: | SMS_G6 |
| Prep Method: | 3550C | Prep Batch: | 280-263016 | Lab File ID: | G6_16368.D |
| Dilution: | 1.0 | | | Initial Weight/Volume: | 30.8 g |
| Analysis Date: | 02/05/2015 2017 | | | Final Weight/Volume: | 1 mL |
| Prep Date: | 02/04/2015 1828 | | | Injection Volume: | 0.5 uL |

3/8/15

| Analyte | DryWt Corrected: Y | Result (ug/Kg) | Qualifier | MDL | RL |
|---|---|---|---|---|---|
| 2-Methylphenol | | 13 | U | 13 | 340 |
| 3 & 4 Methylphenol | | 34 | U | 34 | 340 |
| Naphthalene | | 32 | U | 32 | 340 |
| 2-Nitroaniline | | 51 | U | 51 | 340 |
| 3-Nitroaniline | | 75 | U | 75 | 340 |
| 4-Nitroaniline | | 74 | U | 74 | 340 |
| Nitrobenzene | | 23 | U | 23 | 340 |
| 2-Nitrophenol | | 10 | U | 10 | 340 |
| 4-Nitrophenol | | 100 | U | 100 | 680 |
| N-Nitrosodi-n-propylamine | | 32 | U | 32 | 340 |
| N-Nitrosodiphenylamine | | 22 | U | 22 | 340 |
| Pentachlorophenol | | 340 | U | 340 | 680 |
| Phenanthrene | | 17 | U | 17 | 340 |
| Phenol | | 18 | U | 18 | 340 |
| Pyrene | | 15 | J | 12 | 340 |
| 1,2,4-Trichlorobenzene | | 29 | U | 29 | 340 |
| 2,4,5-Trichlorophenol | | 10 | U | 10 | 340 |
| 2,4,6-Trichlorophenol | | 10 | U | 10 | 340 |

| Surrogate | %Rec | Qualifier | Acceptance Limits |
|---|---|---|---|
| 2-Fluorobiphenyl | 74 | | 50 - 120 |
| 2-Fluorophenol | 74 | | 53 - 120 |
| Nitrobenzene-d5 | 70 | | 50 - 120 |
| Phenol-d5 | 75 | | 52 - 120 |
| Terphenyl-d14 | 87 | | 55 - 120 |
| 2,4,6-Tribromophenol | 83 | | 51 - 120 |

## Analytical Data

Client: Washington Closure Hanford

Job Number: 280-65030-1
Sdg Number: JP0899

**Client Sample ID:** **J1V3R2**

Lab Sample ID: 280-65030-11
Client Matrix: Solid
% Moisture: 5.2

Date Sampled: 02/02/2015 0902
Date Received: 02/04/2015 1000

**8270C Semivolatile Organic Compounds (GC/MS)**

| | | | | | |
|---|---|---|---|---|---|
| Analysis Method: | 8270C | Analysis Batch: | 280-263137 | Instrument ID: | SMS_G6 |
| Prep Method: | 3550C | Prep Batch: | 280-263016 | Lab File ID: | G6_16368.D |
| Dilution: | 1.0 | | | Initial Weight/Volume: | 30.8 g |
| Analysis Date: | 02/05/2015 2017 | | | Final Weight/Volume: | 1 mL |
| Prep Date: | 02/04/2015 1828 | | | Injection Volume: | 0.5 uL |

3/8/15

**Tentatively Identified Compounds** **Number TIC's Found:** 2

| Cas Number | Analyte | RT | Est. Result (ug/Kg) | Qualifier |
|---|---|---|---|---|
| | Unknown | 3.28 | 6500 | N J |
| 107-70-0 | 2-Pentanone, 4-methoxy-4-methyl- | 3.85 | 160 | N J |

## Analytical Data

Client: Washington Closure Hanford

Job Number: 280-65030-1
Sdg Number: JP0899

**Client Sample ID:** J1V3R3

Lab Sample ID: 280-65030-12
Client Matrix: Solid

% Moisture: 4.1

Date Sampled: 02/02/2015 0910
Date Received: 02/04/2015 1000

**8270C Semivolatile Organic Compounds (GC/MS)**

| | | | | | |
|---|---|---|---|---|---|
| Analysis Method: | 8270C | Analysis Batch: | 280-263137 | Instrument ID: | SMS_G6 |
| Prep Method: | 3550C | Prep Batch: | 280-263016 | Lab File ID: | G6_16369.D |
| Dilution: | 1.0 | | | Initial Weight/Volume: | 32.4 g |
| Analysis Date: | 02/05/2015 2045 | | | Final Weight/Volume: | 1 mL |
| Prep Date: | 02/04/2015 1828 | | | Injection Volume: | 0.5 uL |

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| Analyte | DryWt Corrected: Y | Result (ug/Kg) | Qualifier | MDL | RL |
|---|---|---|---|---|---|
| Acenaphthene | | 9.9 | U | 9.9 | 320 |
| Acenaphthylene | | 16 | U | 16 | 320 |
| Anthracene | | 16 | U | 16 | 320 |
| Benzo[a]anthracene | | 19 | U | 19 | 320 |
| Benzo[a]pyrene | | 19 | U | 19 | 320 |
| Benzo[b]fluoranthene | | 25 | U | 25 | 320 |
| Benzo[ghi]perylene | | 15 | U | 15 | 320 |
| Benzo[k]fluoranthene | | 39 | U | 39 | 320 |
| Bis(2-chloroethoxy)methane | | 22 | U | 22 | 320 |
| Bis(2-chloroethyl)ether | | 16 | U | 16 | 320 |
| bis (2-chloroisopropyl) ether | | 22 | U | 22 | 320 |
| Bis(2-ethylhexyl) phthalate | | 44 | U | 44 | 320 |
| 4-Bromophenyl phenyl ether | | 18 | U | 18 | 320 |
| Butyl benzyl phthalate | | 42 | U | 42 | 320 |
| Carbazole | | 35 | U | 35 | 320 |
| 4-Chloroaniline | | 79 | U | 79 | 320 |
| 4-Chloro-3-methylphenol | | 64 | U | 64 | 320 |
| 2-Chloronaphthalene | | 9.7 | U | 9.7 | 320 |
| 2-Chlorophenol | | 20 | U | 20 | 320 |
| 4-Chlorophenyl phenyl ether | | 20 | U | 20 | 320 |
| Chrysene | | 26 | U | 26 | 320 |
| Dibenz(a,h)anthracene | | 18 | U | 18 | 320 |
| Dibenzofuran | | 19 | U | 19 | 320 |
| 1,2-Dichlorobenzene | | 21 | U | 21 | 320 |
| 1,3-Dichlorobenzene | | 12 | U | 12 | 320 |
| 1,4-Dichlorobenzene | | 13 | U | 13 | 320 |
| 3,3'-Dichlorobenzidine | | 87 | U | 87 | 640 |
| 2,4-Dichlorophenol | | 9.7 | U | 9.7 | 320 |
| Diethyl phthalate | | 25 | U | 25 | 320 |
| 2,4-Dimethylphenol | | 64 | U | 64 | 320 |
| Dimethyl phthalate | | 22 | U | 22 | 320 |
| Di-n-butyl phthalate | | 28 | U | 28 | 320 |
| 4,6-Dinitro-2-methylphenol | | 320 | U | 320 | 640 |
| 2,4-Dinitrophenol | | 320 | U | 320 | 800 |
| 2,4-Dinitrotoluene | | 64 | U | 64 | 320 |
| 2,6-Dinitrotoluene | | 27 | U | 27 | 320 |
| Di-n-octyl phthalate | | 14 | U | 14 | 320 |
| Fluoranthene | | 35 | U | 35 | 320 |
| Fluorene | | 17 | U | 17 | 320 |
| Hexachlorobenzene | | 28 | U | 28 | 320 |
| Hexachlorobutadiene | | 9.7 | U | 9.7 | 320 |
| Hexachlorocyclopentadiene | | 48 | U | 48 | 320 |
| Hexachloroethane | | 21 | U | 21 | 320 |
| Indeno[1,2,3-cd]pyrene | | 21 | U | 21 | 320 |
| Isophorone | | 16 | U | 16 | 320 |
| 2-Methylnaphthalene | | 18 | U | 18 | 320 |

## Analytical Data

Client: Washington Closure Hanford

Job Number: 280-65030-1
Sdg Number: JP0899

**Client Sample ID:** **J1V3R3**

Lab Sample ID: 280-65030-12
Client Matrix: Solid

% Moisture: 4.1

Date Sampled: 02/02/2015 0910
Date Received: 02/04/2015 1000

**8270C Semivolatile Organic Compounds (GC/MS)**

| | | | | | |
|---|---|---|---|---|---|
| Analysis Method: | 8270C | Analysis Batch: | 280-263137 | Instrument ID: | SMS_G6 |
| Prep Method: | 3550C | Prep Batch: | 280-263016 | Lab File ID: | G6_16369.D |
| Dilution: | 1.0 | | | Initial Weight/Volume: | 32.4 g |
| Analysis Date: | 02/05/2015 2045 | | | Final Weight/Volume: | 1 mL |
| Prep Date: | 02/04/2015 1828 | | | Injection Volume: | 0.5 uL |

✓ 3/8/15

| Analyte | DryWt Corrected: Y | Result (ug/Kg) | Qualifier | MDL | RL |
|---|---|---|---|---|---|
| 2-Methylphenol | | 13 | U | 13 | 320 |
| 3 & 4 Methylphenol | | 32 | U | 32 | 320 |
| Naphthalene | | 30 | U | 30 | 320 |
| 2-Nitroaniline | | 48 | U | 48 | 320 |
| 3-Nitroaniline | | 70 | U | 70 | 320 |
| 4-Nitroaniline | | 70 | U | 70 | 320 |
| Nitrobenzene | | 21 | U | 21 | 320 |
| 2-Nitrophenol | | 9.7 | U | 9.7 | 320 |
| 4-Nitrophenol | | 94 | U | 94 | 640 |
| N-Nitrosodi-n-propylamine | | 30 | U | 30 | 320 |
| N-Nitrosodiphenylamine | | 20 | U | 20 | 320 |
| Pentachlorophenol | | 320 | U | 320 | 640 |
| Phenanthrene | | 16 | U | 16 | 320 |
| Phenol | | 17 | U | 17 | 320 |
| Pyrene | | 12 | U | 12 | 320 |
| 1,2,4-Trichlorobenzene | | 27 | U | 27 | 320 |
| 2,4,5-Trichlorophenol | | 9.7 | U | 9.7 | 320 |
| 2,4,6-Trichlorophenol | | 9.7 | U | 9.7 | 320 |

| Surrogate | %Rec | Qualifier | Acceptance Limits |
|---|---|---|---|
| 2-Fluorobiphenyl | 83 | | 50 - 120 |
| 2-Fluorophenol | 81 | | 53 - 120 |
| Nitrobenzene-d5 | 79 | | 50 - 120 |
| Phenol-d5 | 83 | | 52 - 120 |
| Terphenyl-d14 | 87 | | 55 - 120 |
| 2,4,6-Tribromophenol | 78 | | 51 - 120 |

## Analytical Data

Client: Washington Closure Hanford

Job Number: 280-65030-1
Sdg Number: JP0899

**Client Sample ID:** J1V3R3

Lab Sample ID: 280-65030-12
Client Matrix: Solid

% Moisture: 4.1

Date Sampled: 02/02/2015 0910
Date Received: 02/04/2015 1000

**8270C Semivolatile Organic Compounds (GC/MS)**

| | | | | | |
|---|---|---|---|---|---|
| Analysis Method: | 8270C | Analysis Batch: | 280-263137 | Instrument ID: | SMS_G6 |
| Prep Method: | 3550C | Prep Batch: | 280-263016 | Lab File ID: | G6_16369.D |
| Dilution: | 1.0 | | | Initial Weight/Volume: | 32.4 g |
| Analysis Date: | 02/05/2015 2045 | | | Final Weight/Volume: | 1 mL |
| Prep Date: | 02/04/2015 1828 | | | Injection Volume: | 0.5 uL |

3/8/15

**Tentatively Identified Compounds** **Number TIC's Found:** 2

| Cas Number | Analyte | RT | Est. Result (ug/Kg) | Qualifier |
|---|---|---|---|---|
| | Unknown | 3.28 | 7000 | N J |
| 107-70-0 | 2-Pentanone, 4-methoxy-4-methyl- | 3.85 | 170 | N J |

Client: Washington Closure Hanford

Job Number: 280-65030-1
Sdg Number: JP0899

**Client Sample ID:** J1V3R4

Lab Sample ID: 280-65030-13
Client Matrix: Solid

% Moisture: 3.4

Date Sampled: 02/02/2015 0830
Date Received: 02/04/2015 1000

**8270C Semivolatile Organic Compounds (GC/MS)**

| | | | | | |
|---|---|---|---|---|---|
| Analysis Method: | 8270C | Analysis Batch: | 280-263137 | Instrument ID: | SMS_G6 |
| Prep Method: | 3550C | Prep Batch: | 280-263016 | Lab File ID: | G6_16370.D |
| Dilution: | 1.0 | | | Initial Weight/Volume: | 33.0 g |
| Analysis Date: | 02/05/2015 2112 | | | Final Weight/Volume: | 1 mL |
| Prep Date: | 02/04/2015 1828 | | | Injection Volume: | 0.5 uL |

✓ 3/6/15

| Analyte | DryWt Corrected: Y | Result (ug/Kg) | Qualifier | MDL | RL |
|---|---|---|---|---|---|
| Acenaphthene | | 9.7 | U | 9.7 | 310 |
| Acenaphthylene | | 16 | U | 16 | 310 |
| Anthracene | | 16 | U | 16 | 310 |
| Benzo[a]anthracene | | 19 | U | 19 | 310 |
| Benzo[a]pyrene | | 19 | U | 19 | 310 |
| Benzo[b]fluoranthene | | 25 | U | 25 | 310 |
| Benzo[ghi]perylene | | 15 | U | 15 | 310 |
| Benzo[k]fluoranthene | | 38 | U | 38 | 310 |
| Bis(2-chloroethoxy)methane | | 22 | U | 22 | 310 |
| Bis(2-chloroethyl)ether | | 16 | U | 16 | 310 |
| bis (2-chloroisopropyl) ether | | 22 | U | 22 | 310 |
| Bis(2-ethylhexyl) phthalate | | 43 | U | 43 | 310 |
| 4-Bromophenyl phenyl ether | | 18 | U | 18 | 310 |
| Butyl benzyl phthalate | | 40 | U | 40 | 310 |
| Carbazole | | 34 | U | 34 | 310 |
| 4-Chloroaniline | | 77 | U | 77 | 310 |
| 4-Chloro-3-methylphenol | | 62 | U | 62 | 310 |
| 2-Chloronaphthalene | | 9.4 | U | 9.4 | 310 |
| 2-Chlorophenol | | 20 | U | 20 | 310 |
| 4-Chlorophenyl phenyl ether | | 20 | U | 20 | 310 |
| Chrysene | | 25 | U | 25 | 310 |
| Dibenz(a,h)anthracene | | 18 | U | 18 | 310 |
| Dibenzofuran | | 19 | U | 19 | 310 |
| 1,2-Dichlorobenzene | | 21 | U | 21 | 310 |
| 1,3-Dichlorobenzene | | 11 | U | 11 | 310 |
| 1,4-Dichlorobenzene | | 13 | U | 13 | 310 |
| 3,3'-Dichlorobenzidine | | 85 | U | 85 | 620 |
| 2,4-Dichlorophenol | | 9.4 | U | 9.4 | 310 |
| Diethyl phthalate | | 24 | U | 24 | 310 |
| 2,4-Dimethylphenol | | 62 | U | 62 | 310 |
| Dimethyl phthalate | | 22 | U | 22 | 310 |
| Di-n-butyl phthalate | | 27 | U | 27 | 310 |
| 4,6-Dinitro-2-methylphenol | | 310 | U | 310 | 620 |
| 2,4-Dinitrophenol | | 310 | U | 310 | 780 |
| 2,4-Dinitrotoluene | | 62 | U | 62 | 310 |
| 2,6-Dinitrotoluene | | 26 | U | 26 | 310 |
| Di-n-octyl phthalate | | 14 | U | 14 | 310 |
| Fluoranthene | | 34 | U | 34 | 310 |
| Fluorene | | 17 | U | 17 | 310 |
| Hexachlorobenzene | | 27 | U | 27 | 310 |
| Hexachlorobutadiene | | 9.4 | U | 9.4 | 310 |
| Hexachlorocyclopentadiene | | 47 | U | 47 | 310 |
| Hexachloroethane | | 20 | U | 20 | 310 |
| Indeno[1,2,3-cd]pyrene | | 21 | U | 21 | 310 |
| Isophorone | | 16 | U | 16 | 310 |
| 2-Methylnaphthalene | | 18 | U | 18 | 310 |

## Analytical Data

Client: Washington Closure Hanford

Job Number: 280-65030-1
Sdg Number: JP0899

**Client Sample ID:** J1V3R4

Lab Sample ID: 280-65030-13
Client Matrix: Solid
% Moisture: 3.4

Date Sampled: 02/02/2015 0830
Date Received: 02/04/2015 1000

**8270C Semivolatile Organic Compounds (GC/MS)**

| | | | | | |
|---|---|---|---|---|---|
| Analysis Method: | 8270C | Analysis Batch: | 280-263137 | Instrument ID: | SMS_G6 |
| Prep Method: | 3550C | Prep Batch: | 280-263016 | Lab File ID: | G6_16370.D |
| Dilution: | 1.0 | | | Initial Weight/Volume: | 33.0 g |
| Analysis Date: | 02/05/2015 2112 | | | Final Weight/Volume: | 1 mL |
| Prep Date: | 02/04/2015 1828 | | | Injection Volume: | 0.5 uL |

3/18/15

| Analyte | DryWt Corrected: Y | Result (ug/Kg) | Qualifier | MDL | RL |
|---|---|---|---|---|---|
| 2-Methylphenol | | 12 | U | 12 | 310 |
| 3 & 4 Methylphenol | | 31 | U | 31 | 310 |
| Naphthalene | | 29 | U | 29 | 310 |
| 2-Nitroaniline | | 47 | U | 47 | 310 |
| 3-Nitroaniline | | 69 | U | 69 | 310 |
| 4-Nitroaniline | | 68 | U | 68 | 310 |
| Nitrobenzene | | 21 | U | 21 | 310 |
| 2-Nitrophenol | | 9.4 | U | 9.4 | 310 |
| 4-Nitrophenol | | 91 | U | 91 | 620 |
| N-Nitrosodi-n-propylamine | | 29 | U | 29 | 310 |
| N-Nitrosodiphenylamine | | 20 | U | 20 | 310 |
| Pentachlorophenol | | 310 | U | 310 | 620 |
| Phenanthrene | | 16 | U | 16 | 310 |
| Phenol | | 17 | U | 17 | 310 |
| Pyrene | | 11 | U | 11 | 310 |
| 1,2,4-Trichlorobenzene | | 26 | U | 26 | 310 |
| 2,4,5-Trichlorophenol | | 9.4 | U | 9.4 | 310 |
| 2,4,6-Trichlorophenol | | 9.4 | U | 9.4 | 310 |

| Surrogate | %Rec | Qualifier | Acceptance Limits |
|---|---|---|---|
| 2-Fluorobiphenyl | 76 | | 50 - 120 |
| 2-Fluorophenol | 77 | | 53 - 120 |
| Nitrobenzene-d5 | 76 | | 50 - 120 |
| Phenol-d5 | 77 | | 52 - 120 |
| Terphenyl-d14 | 80 | | 55 - 120 |
| 2,4,6-Tribromophenol | 69 | | 51 - 120 |

## Analytical Data

Client: Washington Closure Hanford

Job Number: 280-65030-1
Sdg Number: JP0899

**Client Sample ID:** J1V3R4

Lab Sample ID: 280-65030-13
Client Matrix: Solid

% Moisture: 3.4

Date Sampled: 02/02/2015 0830
Date Received: 02/04/2015 1000

**8270C Semivolatile Organic Compounds (GC/MS)**

| | | | | | |
|---|---|---|---|---|---|
| Analysis Method: | 8270C | Analysis Batch: | 280-263137 | Instrument ID: | SMS_G6 |
| Prep Method: | 3550C | Prep Batch: | 280-263016 | Lab File ID: | G6_16370.D |
| Dilution: | 1.0 | | | Initial Weight/Volume: | 33.0 g |
| Analysis Date: | 02/05/2015 2112 | | | Final Weight/Volume: | 1 mL |
| Prep Date: | 02/04/2015 1828 | | | Injection Volume: | 0.5 uL |

3/8/15

**Tentatively Identified Compounds** **Number TIC's Found:** 2

| Cas Number | Analyte | RT | Est. Result (ug/Kg) | Qualifier |
|---|---|---|---|---|
| | Unknown | 3.28 | 6200 | N J |
| | Unknown | 3.85 | 150 | N J |

## Appendix 4

## Laboratory Narrative and Chain-of-Custody Documentation

## CASE NARRATIVE

### Client: Washington Closure Hanford

### Project: WASHINGTON CLOSURE HANFORD

### Job Number: 280-65030-1

**SDG #: JP0899**
**SAF#: RC-075**

**Date SDG Closed: February 4, 2015**
**Data Deliverable: 7 Day / Summary**

| CLIENT ID | LAB ID | ANALYSES REQUESTED | ANALYSES PERFORMED |
|---|---|---|---|
| J1V3P2 | 280-65030-1 | 6010/7471/8082/8270/WTPH-D+ | 6010B/7471A/8082/8270C/NWTPH-Dx |
| J1V3P3 | 280-65030-2 | 6010/7471/8082/8270/WTPH-D+ | 6010B/7471A/8082/8270C/NWTPH-Dx |
| J1V3P4 | 280-65030-3 | 6010/7471/8082/8270/WTPH-D+ | 6010B/7471A/8082/8270C/NWTPH-Dx |
| J1V3P5 | 280-65030-4 | 6010/7471/8082/8270/WTPH-D+ | 6010B/7471A/8082/8270C/NWTPH-Dx |
| J1V3P6 | 280-65030-5 | 6010/7471/8082/8270/WTPH-D+ | 6010B/7471A/8082/8270C/NWTPH-Dx |
| J1V3P7 | 280-65030-6 | 6010/7471/8082/8270/WTPH-D+ | 6010B/7471A/8082/8270C/NWTPH-Dx |
| J1V3P8 | 280-65030-7 | 6010/7471/8082/8270/WTPH-D+ | 6010B/7471A/8082/8270C/NWTPH-Dx |
| J1V3P9 | 280-65030-8 | 6010/7471/8082/8270/WTPH-D+ | 6010B/7471A/8082/8270C/NWTPH-Dx |
| J1V3R0 | 280-65030-9 | 6010/7471/8082/8270/WTPH-D+ | 6010B/7471A/8082/8270C/NWTPH-Dx |
| J1V3R1 | 280-65030-10 | 6010/7471/8082/8270/WTPH-D+ | 6010B/7471A/8082/8270C/NWTPH-Dx |
| J1V3R2 | 280-65030-11 | 6010/7471/8082/8270/WTPH-D+ | 6010B/7471A/8082/8270C/NWTPH-Dx |
| J1V3R3 | 280-65030-12 | 6010/7471/8082/8270/WTPH-D+ | 6010B/7471A/8082/8270C/NWTPH-Dx |
| J1V3R4 | 280-65030-13 | 6010/7471/8082/8270/WTPH-D+ | 6010B/7471A/8082/8270C/NWTPH-Dx |

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 2/4/2015 10:00 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperatures of the 3 coolers at receipt time were 0.8° C, 3.4° C and 4.4° C.

**GC/MS SEMIVOLATILES - SW846 8270C**
Low levels of Dimethyl phthalate, a common laboratory contaminant, are present in the method blank associated with batch 280-263016. Because the concentration in the method blank is not present at a level greater than the reporting limit, corrective action is deemed unnecessary. Associated sample results present above the MDL and/or RL have been flagged with a "B".

*No other anomalies were encountered.*

**GC SEMIVOLATILES - SW846 8082 - PCBs**
No anomalies were encountered.

**GC SEMIVOLATILES - NWTPH-Dx - DRO**
No anomalies were encountered.

**TOTAL METALS - SW846 6010B/7471A**
Serial dilution of a digestate in batch 280-263128 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. Samples J1V3P5 and J1V3R3 required a 5X dilution prior to the analysis of Antimony, Beryllium, Cobalt, Copper, Lead and Vanadium to minimize the interference caused by Titanium concentrations greater than the linear range. The reporting limits have been adjusted relative to the dilution required.

Low levels of Barium, Calcium and Magnesium are present in the method blank associated with batch 280-263128. Because the concentrations in the method blank are not present at levels greater than half the reporting limit, corrective action is deemed unnecessary.

Silicon was recovered outside the control limits, biased low, in the LCS associated with batch 280-263128 and in the Matrix Spike performed on sample J1V3P2 in batch 280-263128. The associated sample results have been flagged "N". Silicon has been identified as a poor performing element when analyzed using this method and has a history of reacting inconsistently; therefore, corrective action is not initiated. Data are reported as is.

It can be noted that the sample amount was greater than four times the spike amount for Aluminum, Iron and Manganese in the Matrix Spike performed on sample J1V3P2; therefore, control limits are not applicable.

The duplicate analysis of sample J1V3P2 exhibited RPD data outside the control limits for Boron, and the associated sample result has 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-075-465



| | | | |
|---|---|---|---|
| Collector: STOWE, QG | Company Contact: Joan Kessner | Telephone No.: 375-4688 | Project Coordinator: KESSNER, JH |
| Project Designation: 100-D/DR Field Remediation | Sampling Location: 100-D-75:1 (excavation, verification) | | SAF No.: RC-075 |
| Ice Chest No.: WCH-08-030 | Field Logbook No.: EL-1662-03 | COA: 01D7512000 | Method of Shipment: Commercial Carrier \ Fed Ex |
| Shipped To: TestAmerica Denver | Offsite Property No.: A131318 | | Bill of Lading/Air Bill No.: See OSPC |

Price Code: 8B

Data Turnaround: 7 days

Other Labs Shipped To: N/A

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 | 125mL | | | | | |
| Sample Analysis | | | | See item (1) in Special Instructions | PCBs - 8082 | Semi-VOA - 8270 (TCL) | TPH-Diesel Range - WTPH-D + | | | | | |
| Sample No. | Matrix | Sample Date | Sample Time | | | | | | | | | |
| J1V3P2 | SOIL | 02/02/15 | 0815 | X | X | X | X | | | | | |
| J1V3P3 | SOIL | 02/02/15 | 0819 | X | X | X | X | | | | | |
| J1V3P4 | SOIL | 02/02/15 | 0823 | X | X | X | X | | | | | |
| J1V3P5 | SOIL | 02/02/15 | 0830 | X | X | X | X | | | | | |
| J1V3P6 | SOIL | 02/02/15 | 0859 | X | X | X | X | | | | | |

280-65030 Chain of Custody

## CHAIN OF POSSESSION / Sign/Print Names

| Relinquished By/Removed From | Date/Time | Received By/Stored In | Date/Time |
|---|---|---|---|
| Quincy Stowe | 2-2-15 0922 | C. Martinez/C. Martinez | 02/02/15 0922 |
| C. Martinez/C. Martinez | 02/02/15 1600 | C. Bingham | 2-2-15 1600 |
| C. Bingham | 2-2-15 1630 | 1060 Battelle, fridge #1A | 2-2-15 1630 |
| 1060 Battelle, fridge #1A | 2-3-15 0715 | C. Bingham | 2-3-15 0715 |
| C. Bingham WCH | 2-3-15 0720 | Fed Ex | 2-3-15 0720 |
| [signature] | 04Feb15 1000 | [signature] | 1000 04Feb15 |

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}

3.9, 2.9, 0.3 VR STO, 5 04Feb15
Transferred by [initials]

REVIEWED BY [signature] DATE 2-3-15

JP0899

WCH-EE-011

# Washington Closure Hanford — CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

RC-075-465 | Page 2 of 3

| | | | |
|---|---|---|---|
| Collector: STOWE, QG | Company Contact: Joan Kessner | Telephone No.: 375-4688 | Project Coordinator: KESSNER, JH |
| Project Designation: 100-D/DR Field Remediation | Sampling Location: 100-D-75:1 (excavation, verification) | | SAF No.: RC-075 |
| Ice Chest No.: WCH-08-030 | Field Logbook No.: EL-1662-03 | COA: 01D7512000 | Method of Shipment: Commercial Carrier \ Fed Ex |
| Shipped To: TestAmerica Denver | Offsite Property No.: A131318 | | Bill of Lading/Air Bill No.: See OSPC |

Price Code: 8B

Data Turnaround: 7 days

Other Labs Shipped To: N/A

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 | 125mL |
| Sample Analysis | See item (1) in Special Instructions | PCBs - 8082 | Semi-VOA - 8270 (TCL) | TPH-Diesel Range - WTPH-D + |

| Sample No. | Matrix | Sample Date | Sample Time | | | | |
|---|---|---|---|---|---|---|---|
| J1V3P7 | SOIL | 02/02/15 | 0855 | X | X | X | X |
| J1V3P8 | SOIL | 02/02/15 | 0837 | X | X | X | X |
| J1V3P9 | SOIL | 02/02/15 | 0857 | X | X | X | X |
| J1V3R0 | SOIL | 02/02/15 | 0847 | X | X | X | X |
| J1V3R1 | SOIL | 02/02/15 | 0843 | X | X | X | X |

## CHAIN OF POSSESSION

| Relinquished By/Removed From | Date/Time | Received By/Stored In | Date/Time |
|---|---|---|---|
| Quincy Stowe | 2-2-15 0922 | C. Martinez/C. Martinez | 02/02/15 0922 |
| C. Martinez/C. Martinez | 02/02/15 1600 | C. Bingham | 2-2-15 1600 |
| C. Bingham | 2-2-15 1630 | 1060 Battelle fridge #1A | 2-2-15 1630 |
| 1060 Battelle fridge #1A | 2-3-15 0715 | C. Bingham | 2-3-15 0715 |
| C. Bingham WCH | 2-3-15 0720 | Fed Ex | 2-3-15 0720 |
| | | [signature] | 1000 04Feb15 |

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 Via email — DATE: 2-3-15

JP0899

WCH-EE-011

# Washington Closure Hanford

# CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

RC-075-465



| | | | |
|---|---|---|---|
| Collector: STOWE, QG | 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-75.1 (excavation, verification) | | SAF No.: RC-075 |
| Ice Chest No.: WCH-08-030 | Field Logbook No.: EL-1662-03 | COA: 01D7512000 | Method of Shipment: Commercial Carrier / Fed Ex |
| Shipped To: TestAmerica Denver | Offsite Property No.: A131318 | | Bill of Lading/Air Bill No.: See OSPC |
| Other Labs Shipped To: N/A | | | |

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 | 125mL | | | | | | | |
| Sample Analysis | See Item (1) in Special Instructions | PCBs - 8082 | Semi-VOA - 8270 (TCL) | TPH-Diesel Range - WTPH-D+ | | | | | | | |

| Sample No. | Matrix | Sample Date | Sample Time | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| J1V9R2 | SOIL | 02/02/15 | 0902 | X | X | X | X | | | | | | |
| J1V9R3 | SOIL | 02/02/15 | 0910 | X | X | X | X | | | | | | |
| J1V9R4 | SOIL | 02/02/15 | 0830 | X | X | X | X | | | | | | |
| | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |

CHAIN OF POSSESSION — Sign/Print Names

| Relinquished By/Removed From | Date/Time | Received By/Stored In | Date/Time |
|---|---|---|---|
| Quincy Stowe | 0922 2-2-15 | S Martinez / C Martinez | 0922 02/02/15 |
| S Martinez / C Martinez | 1600 02/02/15 | C Bingham | 1600 2-2-15 |
| C Bingham | 1630 2-2-15 | 1060 Battelle fridge #1A | 1630 2-2-15 |
| 1060 Battelle fridge #1A | 0715 2-3-15 | C Bingham | 0715 2-3-15 |
| C Bingham / WCH | 0700 2-3-15 | Fed Ex | 0700 2-3-15 |
| | | | 1600 04Feb15 |
| | | | |

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 Woodworth DATE 2-3-15

JP0899

WCH-EE-011

## Appendix 5

## Data Validation Supporting Documentation

# GC/MS ORGANIC DATA VALIDATION CHECKLIST

| VALIDATION LEVEL: | A | B | C | D | E |
|---|---|---|---|---|---|
| PROJECT: 100-D-7521 | | | DATA PACKAGE: JP0899 | | |
| VALIDATOR: ECR | | LAB: TAL | | DATE: 3/7/15 | |
| | | | SDG: JP0899 | | |
| ANALYSES PERFORMED | | | | | |
| SW-846 8260 | | SW-846 8260 (TCLP) | SW-846 8270 | | SW-846 8270 (TCLP) |
| | | | | | |
| SAMPLES/MATRIX | | | | | |
| J1U3P2 | J1U3P3 | J1U3P4 | J1U3P5 | J1U3P6 | |
| J1U3P7 | J1U3P8 | J1U3P9 | J1U3R0 | J1U3R1 | |
| J1U3R2 | J1U3R3 | J1U3R4 | | | |
| | | | | | |
| | | | | | Soil |

## 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)

GC/MS tuning/performance check acceptable? ..... Yes No N/A

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:

# GC/MS 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:

## 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? (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

## GC/MS ORGANIC DATA VALIDATION CHECKLIST

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

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

MS/MSD RPD values 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)

Internal standards analyzed? ..... Yes No N/A

Iinternal standard areas acceptable? ..... Yes No N/A

Internal standard retention times 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: _____

### 7. HOLDING TIMES (all levels )

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

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

Comments: _____

# GC/MS ORGANIC 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

Laboratory properly identified and coded all TIC? (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)

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: 280-65030-1
Sdg Number: JP0899

**Method Blank - Batch: 280-263016**

**Method: 8270C**
**Preparation: 3550C**

| | | | | | |
|---|---|---|---|---|---|
| Lab Sample ID: | MB 280-263016/1-A | Analysis Batch: | 280-263137 | Instrument ID: | SMS_G6 |
| Client Matrix: | Solid | Prep Batch: | 280-263016 | Lab File ID: | G6_16352.D |
| Dilution: | 1.0 | Leach Batch: | N/A | Initial Weight/Volume: | 30 g |
| Analysis Date: | 02/05/2015 1257 | Units: | ug/Kg | Final Weight/Volume: | 1 mL |
| Prep Date: | 02/04/2015 1828 | | | Injection Volume: | 0.5 uL |
| Leach Date: | N/A | | | | |

| Analyte | Result | Qual | MDL | RL |
|---|---|---|---|---|
| Acenaphthene | 10 | U | 10 | 330 |
| Acenaphthylene | 17 | U | 17 | 330 |
| Anthracene | 17 | U | 17 | 330 |
| Benzo[a]anthracene | 20 | U | 20 | 330 |
| Benzo[a]pyrene | 20 | U | 20 | 330 |
| Benzo[b]fluoranthene | 26 | U | 26 | 330 |
| Benzo[ghi]perylene | 16 | U | 16 | 330 |
| Benzo[k]fluoranthene | 40 | U | 40 | 330 |
| Bis(2-chloroethoxy)methane | 23 | U | 23 | 330 |
| Bis(2-chloroethyl)ether | 17 | U | 17 | 330 |
| bis (2-chloroisopropyl) ether | 23 | U | 23 | 330 |
| Bis(2-ethylhexyl) phthalate | 46 | U | 46 | 330 |
| 4-Bromophenyl phenyl ether | 19 | U | 19 | 330 |
| Butyl benzyl phthalate | 43 | U | 43 | 330 |
| Carbazole | 36 | U | 36 | 330 |
| 4-Chloroaniline | 82 | U | 82 | 330 |
| 4-Chloro-3-methylphenol | 66 | U | 66 | 330 |
| 2-Chloronaphthalene | 10 | U | 10 | 330 |
| 2-Chlorophenol | 21 | U | 21 | 330 |
| 4-Chlorophenyl phenyl ether | 21 | U | 21 | 330 |
| Chrysene | 27 | U | 27 | 330 |
| Dibenz(a,h)anthracene | 19 | U | 19 | 330 |
| Dibenzofuran | 20 | U | 20 | 330 |
| 1,2-Dichlorobenzene | 22 | U | 22 | 330 |
| 1,3-Dichlorobenzene | 12 | U | 12 | 330 |
| 1,4-Dichlorobenzene | 14 | U | 14 | 330 |
| 3,3'-Dichlorobenzidine | 90 | U | 90 | 660 |
| 2,4-Dichlorophenol | 10 | U | 10 | 330 |
| Diethyl phthalate | 26 | U | 26 | 330 |
| 2,4-Dimethylphenol | 66 | U | 66 | 330 |
| Dimethyl phthalate | 30.8 | J | 23 | 330 |
| Di-n-butyl phthalate | 29 | U | 29 | 330 |
| 4,6-Dinitro-2-methylphenol | 330 | U | 330 | 660 |
| 2,4-Dinitrophenol | 330 | U | 330 | 830 |
| 2,4-Dinitrotoluene | 66 | U | 66 | 330 |
| 2,6-Dinitrotoluene | 28 | U | 28 | 330 |
| Di-n-octyl phthalate | 14 | U | 14 | 330 |
| Fluoranthene | 36 | U | 36 | 330 |
| Fluorene | 18 | U | 18 | 330 |
| Hexachlorobenzene | 29 | U | 29 | 330 |
| Hexachlorobutadiene | 10 | U | 10 | 330 |
| Hexachlorocyclopentadiene | 50 | U | 50 | 330 |
| Hexachloroethane | 21 | U | 21 | 330 |
| Indeno[1,2,3-cd]pyrene | 22 | U | 22 | 330 |
| Isophorone | 17 | U | 17 | 330 |

Client: Washington Closure Hanford

Job Number: 280-65030-1
Sdg Number: JP0899

**Method Blank - Batch: 280-263016**

**Method: 8270C**
**Preparation: 3550C**

| | | | | | |
|---|---|---|---|---|---|
| Lab Sample ID: | MB 280-263016/1-A | Analysis Batch: | 280-263137 | Instrument ID: | SMS_G6 |
| Client Matrix: | Solid | Prep Batch: | 280-263016 | Lab File ID: | G6_16352.D |
| Dilution: | 1.0 | Leach Batch: | N/A | Initial Weight/Volume: | 30 g |
| Analysis Date: | 02/05/2015 1257 | Units: | ug/Kg | Final Weight/Volume: | 1 mL |
| Prep Date: | 02/04/2015 1828 | | | Injection Volume: | 0.5 uL |
| Leach Date: | N/A | | | | |

| Analyte | Result | Qual | MDL | RL |
|---|---|---|---|---|
| 2-Methylnaphthalene | 19 | U | 19 | 330 |
| 2-Methylphenol | 13 | U | 13 | 330 |
| 3 & 4 Methylphenol | 33 | U | 33 | 330 |
| Naphthalene | 31 | U | 31 | 330 |
| 2-Nitroaniline | 50 | U | 50 | 330 |
| 3-Nitroaniline | 73 | U | 73 | 330 |
| 4-Nitroaniline | 73 | U | 73 | 330 |
| Nitrobenzene | 22 | U | 22 | 330 |
| 2-Nitrophenol | 10 | U | 10 | 330 |
| 4-Nitrophenol | 97 | U | 97 | 660 |
| N-Nitrosodi-n-propylamine | 31 | U | 31 | 330 |
| N-Nitrosodiphenylamine | 21 | U | 21 | 330 |
| Pentachlorophenol | 330 | U | 330 | 660 |
| Phenanthrene | 17 | U | 17 | 330 |
| Phenol | 18 | U | 18 | 330 |
| Pyrene | 12 | U | 12 | 330 |
| 1,2,4-Trichlorobenzene | 28 | U | 28 | 330 |
| 2,4,5-Trichlorophenol | 10 | U | 10 | 330 |
| 2,4,6-Trichlorophenol | 10 | U | 10 | 330 |

| Surrogate | % Rec | Acceptance Limits |
|---|---|---|
| 2-Fluorobiphenyl | 71 | 50 - 120 |
| 2-Fluorophenol | 72 | 53 - 120 |
| Nitrobenzene-d5 | 72 | 50 - 120 |
| Phenol-d5 | 71 | 52 - 120 |
| Terphenyl-d14 | 78 | 55 - 120 |
| 2,4,6-Tribromophenol | 73 | 51 - 120 |

**Method Blank TICs- Batch: 280-263016**

| Cas Number | Analyte | RT | Est. Result (ug/K | Qual |
|---|---|---|---|---|
| | Tentatively Identified Compound | | None | |

Client: Washington Closure Hanford

Job Number: 280-65030-1
Sdg Number: JP0899

**Lab Control Sample - Batch: 280-263016**

**Method: 8270C**
**Preparation: 3550C**

| | | | | | |
|---|---|---|---|---|---|
| Lab Sample ID: | LCS 280-263016/2-A | Analysis Batch: | 280-263137 | Instrument ID: | SMS_G6 |
| Client Matrix: | Solid | Prep Batch: | 280-263016 | Lab File ID: | G6_16353.D |
| Dilution: | 1.0 | Leach Batch: | N/A | Initial Weight/Volume: | 30 g |
| Analysis Date: | 02/05/2015 1325 | Units: | ug/Kg | Final Weight/Volume: | 1 mL |
| Prep Date: | 02/04/2015 1828 | | | Injection Volume: | 0.5 uL |
| Leach Date: | N/A | | | | |

| Analyte | Spike Amount | Result | % Rec. | Limit | Qual |
|---|---|---|---|---|---|
| Acenaphthene | 2670 | 2190 | 82 | 60 - 120 | |
| Acenaphthylene | 2670 | 2130 | 80 | 64 - 120 | |
| Anthracene | 2670 | 2240 | 84 | 63 - 120 | |
| Benzo[a]anthracene | 2670 | 2330 | 87 | 65 - 120 | |
| Benzo[a]pyrene | 2670 | 2330 | 87 | 59 - 120 | |
| Benzo[b]fluoranthene | 2670 | 2320 | 87 | 47 - 129 | |
| Benzo[ghi]perylene | 2670 | 2350 | 88 | 55 - 126 | |
| Benzo[k]fluoranthene | 2670 | 2380 | 89 | 48 - 130 | |
| Bis(2-chloroethoxy)methane | 2670 | 2080 | 78 | 56 - 120 | |
| Bis(2-chloroethyl)ether | 2670 | 2170 | 81 | 51 - 120 | |
| bis (2-chloroisopropyl) ether | 2670 | 1780 | 67 | 49 - 120 | |
| Bis(2-ethylhexyl) phthalate | 2670 | 2560 | 96 | 65 - 120 | |
| 4-Bromophenyl phenyl ether | 2670 | 2260 | 85 | 64 - 120 | |
| Butyl benzyl phthalate | 2670 | 2480 | 93 | 65 - 120 | |
| Carbazole | 2670 | 2290 | 86 | 64 - 120 | |
| 4-Chloroaniline | 2670 | 1560 | 58 | 28 - 120 | |
| 4-Chloro-3-methylphenol | 2670 | 2260 | 85 | 63 - 120 | |
| 2-Chloronaphthalene | 2670 | 2130 | 80 | 59 - 120 | |
| 2-Chlorophenol | 2670 | 2110 | 79 | 57 - 120 | |
| 4-Chlorophenyl phenyl ether | 2670 | 2200 | 83 | 64 - 120 | |
| Chrysene | 2670 | 2330 | 87 | 64 - 120 | |
| Dibenz(a,h)anthracene | 2670 | 2440 | 91 | 50 - 133 | |
| Dibenzofuran | 2670 | 2180 | 82 | 61 - 120 | |
| 1,2-Dichlorobenzene | 2670 | 1970 | 74 | 53 - 120 | |
| 1,3-Dichlorobenzene | 2670 | 1930 | 72 | 52 - 120 | |
| 1,4-Dichlorobenzene | 2670 | 1960 | 74 | 52 - 120 | |
| 3,3'-Dichlorobenzidine | 2670 | 1910 | 72 | 30 - 120 | |
| 2,4-Dichlorophenol | 2670 | 2170 | 81 | 60 - 120 | |
| Diethyl phthalate | 2670 | 2340 | 88 | 66 - 120 | |
| 2,4-Dimethylphenol | 2670 | 2100 | 79 | 54 - 120 | |
| Dimethyl phthalate | 2670 | 2250 | 84 | 65 - 120 | |
| Di-n-butyl phthalate | 2670 | 2410 | 90 | 67 - 120 | |
| 4,6-Dinitro-2-methylphenol | 5330 | 4710 | 88 | 57 - 120 | |
| 2,4-Dinitrophenol | 5330 | 4340 | 81 | 46 - 120 | |
| 2,4-Dinitrotoluene | 2670 | 2370 | 89 | 68 - 120 | |
| 2,6-Dinitrotoluene | 2670 | 2350 | 88 | 64 - 120 | |
| Di-n-octyl phthalate | 2670 | 2470 | 93 | 66 - 120 | |
| Fluoranthene | 2670 | 2300 | 86 | 66 - 120 | |
| Fluorene | 2670 | 2240 | 84 | 64 - 120 | |
| Hexachlorobenzene | 2670 | 2210 | 83 | 62 - 120 | |
| Hexachlorobutadiene | 2670 | 1980 | 74 | 53 - 120 | |
| Hexachlorocyclopentadiene | 2670 | 1760 | 66 | 47 - 120 | |
| Hexachloroethane | 2670 | 1980 | 74 | 51 - 120 | |
| Indeno[1,2,3-cd]pyrene | 2670 | 2420 | 91 | 63 - 120 | |
| Isophorone | 2670 | 1970 | 74 | 56 - 120 | |
| 2-Methylnaphthalene | 2670 | 2090 | 78 | 57 - 120 | |

Client: Washington Closure Hanford

Job Number: 280-65030-1
Sdg Number: JP0899

**Lab Control Sample - Batch: 280-263016**

**Method: 8270C**
**Preparation: 3550C**

| | | | | | |
|---|---|---|---|---|---|
| Lab Sample ID: | LCS 280-263016/2-A | Analysis Batch: | 280-263137 | Instrument ID: | SMS_G6 |
| Client Matrix: | Solid | Prep Batch: | 280-263016 | Lab File ID: | G6_16353.D |
| Dilution: | 1.0 | Leach Batch: | N/A | Initial Weight/Volume: | 30 g |
| Analysis Date: | 02/05/2015 1325 | Units: | ug/Kg | Final Weight/Volume: | 1 mL |
| Prep Date: | 02/04/2015 1828 | | | Injection Volume: | 0.5 uL |
| Leach Date: | N/A | | | | |

| Analyte | Spike Amount | Result | % Rec. | Limit | Qual |
|---|---|---|---|---|---|
| 2-Methylphenol | 2670 | 2060 | 77 | 56 - 120 | |
| 3 & 4 Methylphenol | 2670 | 2050 | 77 | 53 - 120 | |
| Naphthalene | 2670 | 2050 | 77 | 57 - 120 | |
| 2-Nitroaniline | 2670 | 2280 | 85 | 63 - 120 | |
| 3-Nitroaniline | 2670 | 1880 | 71 | 47 - 120 | |
| 4-Nitroaniline | 2670 | 2230 | 84 | 64 - 120 | |
| Nitrobenzene | 2670 | 2030 | 76 | 54 - 120 | |
| 2-Nitrophenol | 2670 | 2200 | 82 | 56 - 120 | |
| 4-Nitrophenol | 5330 | 4920 | 92 | 63 - 121 | |
| N-Nitrosodi-n-propylamine | 2670 | 1980 | 74 | 51 - 120 | |
| N-Nitrosodiphenylamine | 2670 | 2290 | 86 | 61 - 120 | |
| Pentachlorophenol | 5330 | 4360 | 82 | 56 - 120 | |
| Phenanthrene | 2670 | 2280 | 86 | 64 - 120 | |
| Phenol | 2670 | 2100 | 79 | 56 - 120 | |
| Pyrene | 2670 | 2360 | 89 | 64 - 120 | |
| 1,2,4-Trichlorobenzene | 2670 | 2040 | 77 | 52 - 120 | |
| 2,4,5-Trichlorophenol | 2670 | 2300 | 86 | 64 - 120 | |
| 2,4,6-Trichlorophenol | 2670 | 2240 | 84 | 61 - 120 | |

| Surrogate | % Rec | Acceptance Limits |
|---|---|---|
| 2-Fluorobiphenyl | 77 | 50 - 120 |
| 2-Fluorophenol | 78 | 53 - 120 |
| *Nitrobenzene-d5* | *76* | *50 - 120* |
| Phenol-d5 | 77 | 52 - 120 |
| Terphenyl-d14 | 84 | 55 - 120 |
| 2,4,6-Tribromophenol | 83 | 51 - 120 |

Client: Washington Closure Hanford

Job Number: 280-65030-1
Sdg Number: JP0899

**Matrix Spike/**
**Matrix Spike Duplicate Recovery Report - Batch: 280-263016**

**Method: 8270C**
**Preparation: 3550C**

| | | | | | |
|---|---|---|---|---|---|
| MS Lab Sample ID: | 280-65030-1 | Analysis Batch: | 280-263137 | Instrument ID: | SMS_G6 |
| Client Matrix: | Solid | Prep Batch: | 280-263016 | Lab File ID: | G6_16357.D |
| Dilution: | 1.0 | Leach Batch: | N/A | Initial Weight/Volume: | 31.7 g |
| Analysis Date: | 02/05/2015 1515 | | | Final Weight/Volume: | 1 mL |
| Prep Date: | 02/04/2015 1828 | | | Injection Volume: | 0.5 uL |
| Leach Date: | N/A | | | | |

| | | | | | |
|---|---|---|---|---|---|
| MSD Lab Sample ID: | 280-65030-1 | Analysis Batch: | 280-263137 | Instrument ID: | SMS_G6 |
| Client Matrix: | Solid | Prep Batch: | 280-263016 | Lab File ID: | G6_16358.D |
| Dilution: | 1.0 | Leach Batch: | N/A | Initial Weight/Volume: | 31.0 g |
| Analysis Date: | 02/05/2015 1543 | | | Final Weight/Volume: | 1 mL |
| Prep Date: | 02/04/2015 1828 | | | Injection Volume: | 0.5 uL |
| Leach Date: | N/A | | | | |

| | % Rec. | | | | | | |
|---|---|---|---|---|---|---|---|
| Analyte | MS | MSD | Limit | RPD | RPD Limit | MS Qual | MSD Qual |
| Acenaphthene | 80 | 85 | 60 - 120 | 8 | 30 | | |
| Acenaphthylene | 79 | 82 | 64 - 120 | 6 | 30 | | |
| Anthracene | 83 | 86 | 63 - 120 | 5 | 30 | | |
| Benzo[a]anthracene | 85 | 88 | 65 - 120 | 6 | 30 | | |
| Benzo[a]pyrene | 86 | 89 | 59 - 120 | 6 | 30 | | |
| Benzo[b]fluoranthene | 86 | 89 | 47 - 129 | 5 | 44 | | |
| Benzo[ghi]perylene | 87 | 89 | 55 - 126 | 5 | 31 | | |
| Benzo[k]fluoranthene | 88 | 91 | 48 - 130 | 6 | 30 | | |
| Bis(2-chloroethoxy)methane | 75 | 78 | 56 - 120 | 5 | 30 | | |
| Bis(2-chloroethyl)ether | 73 | 77 | 51 - 120 | 8 | 30 | | |
| bis (2-chloroisopropyl) ether | 62 | 66 | 49 - 120 | 8 | 30 | | |
| Bis(2-ethylhexyl) phthalate | 92 | 97 | 65 - 120 | 7 | 30 | | |
| 4-Bromophenyl phenyl ether | 81 | 83 | 64 - 120 | 5 | 30 | | |
| Butyl benzyl phthalate | 89 | 93 | 65 - 120 | 7 | 30 | | |
| Carbazole | 85 | 87 | 64 - 120 | 5 | 30 | | |
| 4-Chloroaniline | 68 | 68 | 28 - 120 | 2 | 30 | | |
| 4-Chloro-3-methylphenol | 83 | 87 | 63 - 120 | 6 | 30 | | |
| 2-Chloronaphthalene | 80 | 82 | 59 - 120 | 5 | 30 | | |
| 2-Chlorophenol | 75 | 79 | 57 - 120 | 7 | 30 | | |
| 4-Chlorophenyl phenyl ether | 83 | 86 | 64 - 120 | 6 | 30 | | |
| Chrysene | 85 | 89 | 64 - 120 | 6 | 35 | | |
| Dibenz(a,h)anthracene | 87 | 89 | 50 - 133 | 4 | 30 | | |
| Dibenzofuran | 81 | 85 | 61 - 120 | 6 | 30 | | |
| 1,2-Dichlorobenzene | 69 | 73 | 53 - 120 | 8 | 30 | | |
| 1,3-Dichlorobenzene | 67 | 71 | 52 - 120 | 7 | 32 | | |
| 1,4-Dichlorobenzene | 68 | 72 | 52 - 120 | 8 | 30 | | |
| 3,3'-Dichlorobenzidine | 73 | 79 | 30 - 120 | 10 | 30 | | |
| 2,4-Dichlorophenol | 80 | 82 | 60 - 120 | 5 | 30 | | |
| Diethyl phthalate | 87 | 91 | 66 - 120 | 7 | 30 | | |
| 2,4-Dimethylphenol | 78 | 79 | 54 - 120 | 4 | 30 | | |
| Dimethyl phthalate | 83 | 87 | 65 - 120 | 7 | 30 | | |
| Di-n-butyl phthalate | 88 | 90 | 67 - 120 | 5 | 30 | | |
| 4,6-Dinitro-2-methylphenol | 84 | 84 | 57 - 120 | 2 | 30 | | |

Client: Washington Closure Hanford

Job Number: 280-65030-1
Sdg Number: JP0899

**Matrix Spike/**
**Matrix Spike Duplicate Recovery Report - Batch: 280-263016**

**Method: 8270C**
**Preparation: 3550C**

| | | | | | |
|---|---|---|---|---|---|
| MS Lab Sample ID: | 280-65030-1 | Analysis Batch: | 280-263137 | Instrument ID: | SMS_G6 |
| Client Matrix: | Solid | Prep Batch: | 280-263016 | Lab File ID: | G6_16357.D |
| Dilution: | 1.0 | Leach Batch: | N/A | Initial Weight/Volume: | 31.7 g |
| Analysis Date: | 02/05/2015 1515 | | | Final Weight/Volume: | 1 mL |
| Prep Date: | 02/04/2015 1828 | | | Injection Volume: | 0.5 uL |
| Leach Date: | N/A | | | | |

| | | | | | |
|---|---|---|---|---|---|
| MSD Lab Sample ID: | 280-65030-1 | Analysis Batch: | 280-263137 | Instrument ID: | SMS_G6 |
| Client Matrix: | Solid | Prep Batch: | 280-263016 | Lab File ID: | G6_16358.D |
| Dilution: | 1.0 | Leach Batch: | N/A | Initial Weight/Volume: | 31.0 g |
| Analysis Date: | 02/05/2015 1543 | | | Final Weight/Volume: | 1 mL |
| Prep Date: | 02/04/2015 1828 | | | Injection Volume: | 0.5 uL |
| Leach Date: | N/A | | | | |

| Analyte | % Rec. MS | % Rec. MSD | Limit | RPD | RPD Limit | MS Qual | MSD Qual |
|---|---|---|---|---|---|---|---|
| 2,4-Dinitrophenol | 72 | 72 | 46 - 120 | 2 | 34 | | |
| 2,4-Dinitrotoluene | 88 | 90 | 68 - 120 | 4 | 30 | | |
| 2,6-Dinitrotoluene | 86 | 90 | 64 - 120 | 6 | 30 | | |
| Di-n-octyl phthalate | 87 | 91 | 66 - 120 | 7 | 30 | | |
| Fluoranthene | 84 | 88 | 66 - 120 | 6 | 30 | | |
| Fluorene | 84 | 86 | 64 - 120 | 6 | 30 | | |
| Hexachlorobenzene | 82 | 84 | 62 - 120 | 4 | 30 | | |
| Hexachlorobutadiene | 69 | 71 | 53 - 120 | 6 | 30 | | |
| Hexachlorocyclopentadiene | 60 | 66 | 47 - 120 | 11 | 30 | | |
| Hexachloroethane | 69 | 72 | 51 - 120 | 7 | 30 | | |
| Indeno[1,2,3-cd]pyrene | 81 | 85 | 63 - 120 | 7 | 30 | | |
| Isophorone | 71 | 73 | 56 - 120 | 5 | 30 | | |
| 2-Methylnaphthalene | 75 | 78 | 57 - 120 | 6 | 30 | | |
| 2-Methylphenol | 77 | 80 | 56 - 120 | 5 | 30 | | |
| 3 & 4 Methylphenol | 77 | 81 | 53 - 120 | 7 | 30 | | |
| Naphthalene | 72 | 75 | 57 - 120 | 7 | 30 | | |
| 2-Nitroaniline | 84 | 88 | 63 - 120 | 7 | 30 | | |
| 3-Nitroaniline | 80 | 80 | 47 - 120 | 2 | 30 | | |
| 4-Nitroaniline | 87 | 89 | 64 - 120 | 5 | 30 | | |
| Nitrobenzene | 72 | 75 | 54 - 120 | 7 | 30 | | |
| 2-Nitrophenol | 77 | 77 | 56 - 120 | 3 | 30 | | |
| 4-Nitrophenol | 91 | 96 | 63 - 121 | 8 | 30 | | |
| N-Nitrosodi-n-propylamine | 73 | 76 | 51 - 120 | 7 | 30 | | |
| N-Nitrosodiphenylamine | 85 | 87 | 61 - 120 | 5 | 36 | | |
| Pentachlorophenol | 81 | 85 | 56 - 120 | 7 | 30 | | |
| Phenanthrene | 85 | 87 | 64 - 120 | 5 | 30 | | |
| Phenol | 78 | 81 | 56 - 120 | 6 | 30 | | |
| Pyrene | 86 | 89 | 64 - 120 | 6 | 38 | | |
| 1,2,4-Trichlorobenzene | 72 | 74 | 52 - 120 | 5 | 30 | | |
| 2,4,5-Trichlorophenol | 86 | 90 | 64 - 120 | 6 | 30 | | |
| 2,4,6-Trichlorophenol | 85 | 88 | 61 - 120 | 5 | 30 | | |

| Surrogate | MS % Rec | MSD % Rec | Acceptance Limits |
|---|---|---|---|
| 2-Fluorobiphenyl | 77 | 80 | 50 - 120 |

## Quality Control Results

Client: Washington Closure Hanford

Job Number: 280-65030-1
Sdg Number: JP0899

| Surrogate | MS % Rec | MSD % Rec | Acceptance Limits |
|---|---|---|---|
| 2-Fluorophenol | 74 | 77 | 53 - 120 |
| Nitrobenzene-d5 | 71 | 74 | 50 - 120 |
| Phenol-d5 | 76 | 78 | 52 - 120 |
| Terphenyl-d14 | 82 | 85 | 55 - 120 |
| 2,4,6-Tribromophenol | 83 | 87 | 51 - 120 |

Client: Washington Closure Hanford

Job Number: 280-65030-1
Sdg Number: JP0899

**Matrix Spike/**
**Matrix Spike Duplicate Recovery Report - Batch: 280-263016**

**Method: 8270C**
**Preparation: 3550C**

| | | | | | |
|---|---|---|---|---|---|
| MS Lab Sample ID: | 280-65030-1 | Units: ug/Kg | | MSD Lab Sample ID: | 280-65030-1 |
| Client Matrix: | Solid | | | Client Matrix: | Solid |
| Dilution: | 1.0 | | | Dilution: | 1.0 |
| Analysis Date: | 02/05/2015 1515 | | | Analysis Date: | 02/05/2015 1543 |
| Prep Date: | 02/04/2015 1828 | | | Prep Date: | 02/04/2015 1828 |
| Leach Date: | N/A | | | Leach Date: | N/A |

| Analyte | Sample Result/Qual | | MS Spike Amount | MSD Spike Amount | MS Result/Qual | MSD Result/Qual |
|---|---|---|---|---|---|---|
| Acenaphthene | 11 | U | 2770 | 2840 | 2220 | 2400 |
| Acenaphthylene | 19 | U | 2770 | 2840 | 2180 | 2330 |
| Anthracene | 19 | U | 2770 | 2840 | 2310 | 2440 |
| Benzo[a]anthracene | 22 | U | 2770 | 2840 | 2350 | 2500 |
| Benzo[a]pyrene | 22 | U | 2770 | 2840 | 2400 | 2540 |
| Benzo[b]fluoranthene | 29 | U | 2770 | 2840 | 2390 | 2510 |
| Benzo[ghi]perylene | 17 | U | 2770 | 2840 | 2400 | 2520 |
| Benzo[k]fluoranthene | 44 | U | 2770 | 2840 | 2430 | 2580 |
| Bis(2-chloroethoxy)methane | 25 | U | 2770 | 2840 | 2090 | 2210 |
| Bis(2-chloroethyl)ether | 18 | U | 2770 | 2840 | 2020 | 2180 |
| bis (2-chloroisopropyl) ether | 25 | U | 2770 | 2840 | 1720 | 1870 |
| Bis(2-ethylhexyl) phthalate | 50 | U | 2770 | 2840 | 2570 | 2760 |
| 4-Bromophenyl phenyl ether | 21 | U | 2770 | 2840 | 2240 | 2370 |
| Butyl benzyl phthalate | 47 | U | 2770 | 2840 | 2480 | 2650 |
| Carbazole | 39 | U | 2770 | 2840 | 2360 | 2480 |
| 4-Chloroaniline | 89 | U | 2770 | 2840 | 1890 | 1930 |
| 4-Chloro-3-methylphenol | 72 | U | 2770 | 2840 | 2320 | 2460 |
| 2-Chloronaphthalene | 11 | U | 2770 | 2840 | 2210 | 2330 |
| 2-Chlorophenol | 23 | U | 2770 | 2840 | 2080 | 2230 |
| 4-Chlorophenyl phenyl ether | 23 | U | 2770 | 2840 | 2300 | 2450 |
| Chrysene | 29 | U | 2770 | 2840 | 2360 | 2510 |
| Dibenz(a,h)anthracene | 21 | U | 2770 | 2840 | 2410 | 2520 |
| Dibenzofuran | 22 | U | 2770 | 2840 | 2260 | 2400 |
| 1,2-Dichlorobenzene | 24 | U | 2770 | 2840 | 1910 | 2070 |
| 1,3-Dichlorobenzene | 13 | U | 2770 | 2840 | 1860 | 2010 |
| 1,4-Dichlorobenzene | 15 | U | 2770 | 2840 | 1890 | 2040 |
| 3,3'-Dichlorobenzidine | 98 | U | 2770 | 2840 | 2020 | 2250 |
| 2,4-Dichlorophenol | 11 | U | 2770 | 2840 | 2230 | 2340 |
| Diethyl phthalate | 28 | U | 2770 | 2840 | 2410 | 2570 |
| 2,4-Dimethylphenol | 72 | U | 2770 | 2840 | 2160 | 2250 |
| Dimethyl phthalate | 25 | U | 2770 | 2840 | 2300 | 2460 |
| Di-n-butyl phthalate | 32 | U | 2770 | 2840 | 2440 | 2570 |
| 4,6-Dinitro-2-methylphenol | 360 | U | 5550 | 5680 | 4670 | 4750 |
| 2,4-Dinitrophenol | 360 | U | 5550 | 5680 | 3990 | 4070 |
| 2,4-Dinitrotoluene | 72 | U | 2770 | 2840 | 2450 | 2550 |
| 2,6-Dinitrotoluene | 31 | U | 2770 | 2840 | 2390 | 2550 |
| Di-n-octyl phthalate | 16 | U | 2770 | 2840 | 2420 | 2590 |
| Fluoranthene | 39 | U | 2770 | 2840 | 2340 | 2490 |
| Fluorene | 20 | U | 2770 | 2840 | 2320 | 2450 |
| Hexachlorobenzene | 32 | U | 2770 | 2840 | 2270 | 2380 |
| Hexachlorobutadiene | 11 | U | 2770 | 2840 | 1920 | 2030 |
| Hexachlorocyclopentadiene | 55 | U | 2770 | 2840 | 1680 | 1870 |
| Hexachloroethane | 23 | U | 2770 | 2840 | 1920 | 2050 |

Client: Washington Closure Hanford

Job Number: 280-65030-1
Sdg Number: JP0899

**Matrix Spike/**
**Matrix Spike Duplicate Recovery Report - Batch: 280-263016**

**Method: 8270C**
**Preparation: 3550C**

| | | | |
|---|---|---|---|
| MS Lab Sample ID: | 280-65030-1 | Units: | ug/Kg |
| Client Matrix: | Solid | | |
| Dilution: | 1.0 | | |
| Analysis Date: | 02/05/2015 1515 | | |
| Prep Date: | 02/04/2015 1828 | | |
| Leach Date: | N/A | | |

| | |
|---|---|
| MSD Lab Sample ID: | 280-65030-1 |
| Client Matrix: | Solid |
| Dilution: | 1.0 |
| Analysis Date: | 02/05/2015 1543 |
| Prep Date: | 02/04/2015 1828 |
| Leach Date: | N/A |

| Analyte | Sample Result/Qual | | MS Spike Amount | MSD Spike Amount | MS Result/Qual | MSD Result/Qual |
|---|---|---|---|---|---|---|
| Indeno[1,2,3-cd]pyrene | 24 | U | 2770 | 2840 | 2250 | 2400 |
| Isophorone | 19 | U | 2770 | 2840 | 1980 | 2080 |
| 2-Methylnaphthalene | 21 | U | 2770 | 2840 | 2090 | 2220 |
| 2-Methylphenol | 14 | U | 2770 | 2840 | 2150 | 2260 |
| 3 & 4 Methylphenol | 36 | U | 2770 | 2840 | 2140 | 2300 |
| Naphthalene | 34 | U | 2770 | 2840 | 1990 | 2140 |
| 2-Nitroaniline | 55 | U | 2770 | 2840 | 2340 | 2510 |
| 3-Nitroaniline | 80 | U | 2770 | 2840 | 2220 | 2260 |
| 4-Nitroaniline | 79 | U | 2770 | 2840 | 2400 | 2510 |
| Nitrobenzene | 24 | U | 2770 | 2840 | 1990 | 2120 |
| 2-Nitrophenol | 11 | U | 2770 | 2840 | 2120 | 2190 |
| 4-Nitrophenol | 110 | U | 5550 | 5680 | 5030 | 5440 |
| N-Nitrosodi-n-propylamine | 34 | U | 2770 | 2840 | 2010 | 2160 |
| N-Nitrosodiphenylamine | 23 | U | 2770 | 2840 | 2350 | 2480 |
| Pentachlorophenol | 360 | U | 5550 | 5680 | 4490 | 4820 |
| Phenanthrene | 19 | U | 2770 | 2840 | 2350 | 2470 |
| Phenol | 20 | U | 2770 | 2840 | 2150 | 2300 |
| Pyrene | 13 | U | 2770 | 2840 | 2390 | 2530 |
| 1,2,4-Trichlorobenzene | 31 | U | 2770 | 2840 | 2000 | 2110 |
| 2,4,5-Trichlorophenol | 11 | U | 2770 | 2840 | 2390 | 2540 |
| 2,4,6-Trichlorophenol | 11 | U | 2770 | 2840 | 2370 | 2500 |

Date: 9 March 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-75:1
Subject: Diesel Range Organic - Data Package No. JP0899-TAL

## INTRODUCTION

This memo presents the results of data validation on Data Package No. JP0899 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 |
|---|---|---|---|---|
| J1V3P2 | 2/2/15 | Soil | C | See note 1 |
| J1V3P3 | 2/2/15 | Soil | C | See note 1 |
| J1V3P4 | 2/2/15 | Soil | C | See note 1 |
| J1V3P5 | 2/2/15 | Soil | C | See note 1 |
| J1V3P6 | 2/2/15 | Soil | C | See note 1 |
| J1V3P7 | 2/2/15 | Soil | C | See note 1 |
| J1V3P8 | 2/2/15 | Soil | C | See note 1 |
| J1V3P9 | 2/2/15 | Soil | C | See note 1 |
| J1V3R0 | 2/2/15 | Soil | C | See note 1 |
| J1V3R1 | 2/2/15 | Soil | C | See note 1 |
| J1V3R2 | 2/2/15 | Soil | C | See note 1 |
| J1V3R3 | 2/2/15 | Soil | C | See note 1 |
| J1V3R4 | 2/2/15 | Soil | C | See note 1 |

1 – Diesel range organics by 8015B.

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.

Field Blanks

No field blank was submitted for analysis.

- **Accuracy**

Matrix Spike/Matrix Spike Duplicate & Blank Spike Recoveries

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 duplicate results were acceptable.

Field Duplicate Samples

One set of field duplicates (J1V3P5/J1V3R4) were submitted for analysis. Laboratory 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. JP0899 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

DIESEL RANGE ORGANIC DATA QUALIFICATION SUMMARY*

| SDG: JP0899 | REVIEWER: ELR | Project: 100-D-75:1 | PAGE 1 OF 1 |
|---|---|---|---|
| COMMENTS: No qualifiers assigned | | | |

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

## Appendix 3

## Annotated Laboratory Reports

## Analytical Data

Client: Washington Closure Hanford

Job Number: 280-65030-1
Sdg Number: JP0899

**Client Sample ID:** **J1V3P2**

Lab Sample ID: 280-65030-1
Client Matrix: Solid

% Moisture: 9.1

Date Sampled: 02/02/2015 0815
Date Received: 02/04/2015 1000

**NWTPH-Dx Northwest - Semi-Volatile Petroleum Products (GC)**

| | | | | | |
|---|---|---|---|---|---|
| Analysis Method: | NWTPH-Dx | Analysis Batch: | 280-263287 | Instrument ID: | SGC_U |
| Prep Method: | 3550C | Prep Batch: | 280-263026 | Lab File ID: | 02060009.D |
| Dilution: | 1.0 | | | Initial Weight/Volume: | 31.2 g |
| Analysis Date: | 02/06/2015 1302 | | | Final Weight/Volume: | 1 mL |
| Prep Date: | 02/04/2015 2030 | | | Injection Volume: | 1 uL |

| Analyte | DryWt Corrected: Y | Result (ug/Kg) | Qualifier | MDL | RL |
|---|---|---|---|---|---|
| C10-C36 | | 2200 | J | 1100 | 4200 |
| C10-C28 | | 2000 | J | 720 | 4200 |

| Surrogate | %Rec | Qualifier | Acceptance Limits |
|---|---|---|---|
| o-Terphenyl | 90 | | 49 - 115 |

3/8/15

## Analytical Data

Client: Washington Closure Hanford

Job Number: 280-65030-1
Sdg Number: JP0899

**Client Sample ID:** **J1V3P3**

Lab Sample ID: 280-65030-2
Client Matrix: Solid

% Moisture: 9.5

Date Sampled: 02/02/2015 0819
Date Received: 02/04/2015 1000

**NWTPH-Dx Northwest - Semi-Volatile Petroleum Products (GC)**

| | | | | | |
|---|---|---|---|---|---|
| Analysis Method: | NWTPH-Dx | Analysis Batch: | 280-263287 | Instrument ID: | SGC_U |
| Prep Method: | 3550C | Prep Batch: | 280-263026 | Lab File ID: | 02060010.D |
| Dilution: | 1.0 | | | Initial Weight/Volume: | 30.3 g |
| Analysis Date: | 02/06/2015 1331 | | | Final Weight/Volume: | 1 mL |
| Prep Date: | 02/04/2015 2030 | | | Injection Volume: | 1 uL |

| Analyte | DryWt Corrected: Y | Result (ug/Kg) | Qualifier | MDL | RL |
|---|---|---|---|---|---|
| C10-C36 | | 13000 | | 1100 | 4400 |
| C10-C28 | | 11000 | | 740 | 4400 |

| Surrogate | %Rec | Qualifier | Acceptance Limits |
|---|---|---|---|
| o-Terphenyl | 91 | | 49 - 115 |

5/8/15

## Analytical Data

Client: Washington Closure Hanford

Job Number: 280-65030-1
Sdg Number: JP0899

**Client Sample ID:** **J1V3P4**

Lab Sample ID: 280-65030-3
Client Matrix: Solid

% Moisture: 6.7

Date Sampled: 02/02/2015 0823
Date Received: 02/04/2015 1000

**NWTPH-Dx Northwest - Semi-Volatile Petroleum Products (GC)**

| | | | | | |
|---|---|---|---|---|---|
| Analysis Method: | NWTPH-Dx | Analysis Batch: | 280-263287 | Instrument ID: | SGC_U |
| Prep Method: | 3550C | Prep Batch: | 280-263026 | Lab File ID: | 02060011.D |
| Dilution: | 1.0 | | | Initial Weight/Volume: | 31.2 g |
| Analysis Date: | 02/06/2015 1400 | | | Final Weight/Volume: | 1 mL |
| Prep Date: | 02/04/2015 2030 | | | Injection Volume: | 1 uL |

| Analyte | DryWt Corrected: Y | Result (ug/Kg) | Qualifier | MDL | RL |
|---|---|---|---|---|---|
| C10-C36 | | 16000 | | 1000 | 4100 |
| C10-C28 | | 13000 | | 700 | 4100 |

| Surrogate | %Rec | Qualifier | Acceptance Limits |
|---|---|---|---|
| o-Terphenyl | 90 | | 49 - 115 |

## Analytical Data

Client: Washington Closure Hanford

Job Number: 280-65030-1
Sdg Number: JP0899

**Client Sample ID:** **J1V3P5**

Lab Sample ID: 280-65030-4
Client Matrix: Solid

% Moisture: 3.4

Date Sampled: 02/02/2015 0830
Date Received: 02/04/2015 1000

**NWTPH-Dx Northwest - Semi-Volatile Petroleum Products (GC)**

| | | | | | |
|---|---|---|---|---|---|
| Analysis Method: | NWTPH-Dx | Analysis Batch: | 280-263287 | Instrument ID: | SGC_U |
| Prep Method: | 3550C | Prep Batch: | 280-263026 | Lab File ID: | 02060012.D |
| Dilution: | 1.0 | | | Initial Weight/Volume: | 30.6 g |
| Analysis Date: | 02/06/2015 1429 | | | Final Weight/Volume: | 1 mL |
| Prep Date: | 02/04/2015 2030 | | | Injection Volume: | 1 uL |

| Analyte | DryWt Corrected: Y | Result (ug/Kg) | Qualifier | MDL | RL |
|---|---|---|---|---|---|
| C10-C36 | | 1000 | U | 1000 | 4100 |
| C10-C28 | | 710 | J | 690 | 4100 |

| Surrogate | %Rec | Qualifier | Acceptance Limits |
|---|---|---|---|
| o-Terphenyl | 90 | | 49 - 115 |

3/8/15

## Analytical Data

Client: Washington Closure Hanford

Job Number: 280-65030-1
Sdg Number: JP0899

**Client Sample ID:** **J1V3P6**

Lab Sample ID: 280-65030-5
Client Matrix: Solid

% Moisture: 17.7

Date Sampled: 02/02/2015 0859
Date Received: 02/04/2015 1000

**NWTPH-Dx Northwest - Semi-Volatile Petroleum Products (GC)**

| | | | | | |
|---|---|---|---|---|---|
| Analysis Method: | NWTPH-Dx | Analysis Batch: | 280-263287 | Instrument ID: | SGC_U |
| Prep Method: | 3550C | Prep Batch: | 280-263026 | Lab File ID: | 02060013.D |
| Dilution: | 1.0 | | | Initial Weight/Volume: | 31.5 g |
| Analysis Date: | 02/06/2015 1457 | | | Final Weight/Volume: | 1 mL |
| Prep Date: | 02/04/2015 2030 | | | Injection Volume: | 1 uL |

| Analyte | DryWt Corrected: Y | Result (ug/Kg) | Qualifier | MDL | RL |
|---|---|---|---|---|---|
| C10-C36 | | 1200 | U | 1200 | 4600 |
| C10-C28 | | 780 | U | 780 | 4600 |

| Surrogate | %Rec | Qualifier | Acceptance Limits |
|---|---|---|---|
| o-Terphenyl | 83 | | 49 - 115 |

3/8/15

## Analytical Data

Client: Washington Closure Hanford

Job Number: 280-65030-1
Sdg Number: JP0899

**Client Sample ID:** J1V3P7

Lab Sample ID: 280-65030-6
Client Matrix: Solid

% Moisture: 13.9

Date Sampled: 02/02/2015 0855
Date Received: 02/04/2015 1000

**NWTPH-Dx Northwest - Semi-Volatile Petroleum Products (GC)**

| | | | | | |
|---|---|---|---|---|---|
| Analysis Method: | NWTPH-Dx | Analysis Batch: | 280-263287 | Instrument ID: | SGC_U |
| Prep Method: | 3550C | Prep Batch: | 280-263026 | Lab File ID: | 02060014.D |
| Dilution: | 1.0 | | | Initial Weight/Volume: | 31.6 g |
| Analysis Date: | 02/06/2015 1526 | | | Final Weight/Volume: | 1 mL |
| Prep Date: | 02/04/2015 2030 | | | Injection Volume: | 1 uL |

| Analyte | DryWt Corrected: Y | Result (ug/Kg) | Qualifier | MDL | RL |
|---|---|---|---|---|---|
| C10-C36 | | 1100 | U | 1100 | 4400 |
| C10-C28 | | 840 | J | 750 | 4400 |

| Surrogate | %Rec | Qualifier | Acceptance Limits |
|---|---|---|---|
| o-Terphenyl | 85 | | 49 - 115 |

3/8/15

## Analytical Data

Client: Washington Closure Hanford

Job Number: 280-65030-1
Sdg Number: JP0899

**Client Sample ID:** **J1V3P8**

Lab Sample ID: 280-65030-7
Client Matrix: Solid

% Moisture: 7.2

Date Sampled: 02/02/2015 0837
Date Received: 02/04/2015 1000

**NWTPH-Dx Northwest - Semi-Volatile Petroleum Products (GC)**

| | | | | | |
|---|---|---|---|---|---|
| Analysis Method: | NWTPH-Dx | Analysis Batch: | 280-263287 | Instrument ID: | SGC_U |
| Prep Method: | 3550C | Prep Batch: | 280-263026 | Lab File ID: | 02060017.D |
| Dilution: | 1.0 | | | Initial Weight/Volume: | 30.3 g |
| Analysis Date: | 02/06/2015 1653 | | | Final Weight/Volume: | 1 mL |
| Prep Date: | 02/04/2015 2030 | | | Injection Volume: | 1 uL |

| Analyte | DryWt Corrected: Y | Result (ug/Kg) | Qualifier | MDL | RL |
|---|---|---|---|---|---|
| C10-C36 | | 8500 | | 1100 | 4300 |
| C10-C28 | | 3900 | J | 720 | 4300 |

| Surrogate | %Rec | Qualifier | Acceptance Limits |
|---|---|---|---|
| o-Terphenyl | 90 | | 49 - 115 |

3/8/15

## Analytical Data

Client: Washington Closure Hanford

Job Number: 280-65030-1
Sdg Number: JP0899

**Client Sample ID:** **J1V3P9**

Lab Sample ID: 280-65030-8
Client Matrix: Solid

% Moisture: 4.6

Date Sampled: 02/02/2015 0857
Date Received: 02/04/2015 1000

**NWTPH-Dx Northwest - Semi-Volatile Petroleum Products (GC)**

| | | | | | |
|---|---|---|---|---|---|
| Analysis Method: | NWTPH-Dx | Analysis Batch: | 280-263287 | Instrument ID: | SGC_U |
| Prep Method: | 3550C | Prep Batch: | 280-263026 | Lab File ID: | 02060018.D |
| Dilution: | 1.0 | | | Initial Weight/Volume: | 30.9 g |
| Analysis Date: | 02/06/2015 1721 | | | Final Weight/Volume: | 1 mL |
| Prep Date: | 02/04/2015 2030 | | | Injection Volume: | 1 uL |

| Analyte | DryWt Corrected: Y | Result (ug/Kg) | Qualifier | MDL | RL |
|---|---|---|---|---|---|
| C10-C36 | | 8200 | | 1000 | 4100 |
| C10-C28 | | 7500 | | 690 | 4100 |

| Surrogate | %Rec | Qualifier | Acceptance Limits |
|---|---|---|---|
| o-Terphenyl | 92 | | 49 - 115 |

✓ 3/8/15

## Analytical Data

Client: Washington Closure Hanford

Job Number: 280-65030-1
Sdg Number: JP0899

**Client Sample ID:** **J1V3R0**

Lab Sample ID: 280-65030-9
Client Matrix: Solid

% Moisture: 9.6

Date Sampled: 02/02/2015 0847
Date Received: 02/04/2015 1000

**NWTPH-Dx Northwest - Semi-Volatile Petroleum Products (GC)**

| | | | | | |
|---|---|---|---|---|---|
| Analysis Method: | NWTPH-Dx | Analysis Batch: | 280-263287 | Instrument ID: | SGC_U |
| Prep Method: | 3550C | Prep Batch: | 280-263026 | Lab File ID: | 02060019.D |
| Dilution: | 1.0 | | | Initial Weight/Volume: | 31.0 g |
| Analysis Date: | 02/06/2015 1750 | | | Final Weight/Volume: | 1 mL |
| Prep Date: | 02/04/2015 2030 | | | Injection Volume: | 1 uL |

| Analyte | DryWt Corrected: Y | Result (ug/Kg) | Qualifier | MDL | RL |
|---|---|---|---|---|---|
| C10-C36 | | 3300 | J | 1100 | 4300 |
| C10-C28 | | 2800 | J | 730 | 4300 |

| Surrogate | %Rec | Qualifier | Acceptance Limits |
|---|---|---|---|
| o-Terphenyl | 93 | | 49 - 115 |

## Analytical Data

Client: Washington Closure Hanford

Job Number: 280-65030-1
Sdg Number: JP0899

**Client Sample ID:** **J1V3R1**

Lab Sample ID: 280-65030-10
Client Matrix: Solid

% Moisture: 6.3

Date Sampled: 02/02/2015 0843
Date Received: 02/04/2015 1000

**NWTPH-Dx Northwest - Semi-Volatile Petroleum Products (GC)**

| | | | | | |
|---|---|---|---|---|---|
| Analysis Method: | NWTPH-Dx | Analysis Batch: | 280-263287 | Instrument ID: | SGC_U |
| Prep Method: | 3550C | Prep Batch: | 280-263026 | Lab File ID: | 02060020.D |
| Dilution: | 1.0 | | | Initial Weight/Volume: | 32.5 g |
| Analysis Date: | 02/06/2015 1818 | | | Final Weight/Volume: | 1 mL |
| Prep Date: | 02/04/2015 2030 | | | Injection Volume: | 1 uL |

| Analyte | DryWt Corrected: Y | Result (ug/Kg) | Qualifier | MDL | RL |
|---|---|---|---|---|---|
| C10-C36 | | 2100 | J | 980 | 3900 |
| C10-C28 | | 2200 | J | 670 | 3900 |

| Surrogate | %Rec | Qualifier | Acceptance Limits |
|---|---|---|---|
| o-Terphenyl | 91 | | 49 - 115 |

3/8/15

## Analytical Data

Client: Washington Closure Hanford

Job Number: 280-65030-1
Sdg Number: JP0899

**Client Sample ID:** **J1V3R2**

Lab Sample ID: 280-65030-11
Client Matrix: Solid

% Moisture: 5.2

Date Sampled: 02/02/2015 0902
Date Received: 02/04/2015 1000

**NWTPH-Dx Northwest - Semi-Volatile Petroleum Products (GC)**

| | | | | | |
|---|---|---|---|---|---|
| Analysis Method: | NWTPH-Dx | Analysis Batch: | 280-263287 | Instrument ID: | SGC_U |
| Prep Method: | 3550C | Prep Batch: | 280-263026 | Lab File ID: | 02060021.D |
| Dilution: | 1.0 | | | Initial Weight/Volume: | 31.7 g |
| Analysis Date: | 02/06/2015 1847 | | | Final Weight/Volume: | 1 mL |
| Prep Date: | 02/04/2015 2030 | | | Injection Volume: | 1 uL |

| Analyte | DryWt Corrected: Y | Result (ug/Kg) | Qualifier | MDL | RL |
|---|---|---|---|---|---|
| C10-C36 | | 5300 | | 1000 | 4000 |
| C10-C28 | | 3700 | J | 680 | 4000 |

| Surrogate | %Rec | Qualifier | Acceptance Limits |
|---|---|---|---|
| o-Terphenyl | 91 | | 49 - 115 |

3/18/15

## Analytical Data

Client: Washington Closure Hanford

Job Number: 280-65030-1
Sdg Number: JP0899

**Client Sample ID:** **J1V3R3**

Lab Sample ID: 280-65030-12
Client Matrix: Solid

% Moisture: 4.1

Date Sampled: 02/02/2015 0910
Date Received: 02/04/2015 1000

**NWTPH-Dx Northwest - Semi-Volatile Petroleum Products (GC)**

| | | | | | |
|---|---|---|---|---|---|
| Analysis Method: | NWTPH-Dx | Analysis Batch: | 280-263287 | Instrument ID: | SGC_U |
| Prep Method: | 3550C | Prep Batch: | 280-263026 | Lab File ID: | 02060022.D |
| Dilution: | 1.0 | | | Initial Weight/Volume: | 31.0 g |
| Analysis Date: | 02/06/2015 1915 | | | Final Weight/Volume: | 1 mL |
| Prep Date: | 02/04/2015 2030 | | | Injection Volume: | 1 uL |

| Analyte | DryWt Corrected: Y | Result (ug/Kg) | Qualifier | MDL | RL |
|---|---|---|---|---|---|
| C10-C36 | | 1400 | J | 1000 | 4000 |
| C10-C28 | | 1900 | J | 680 | 4000 |

| Surrogate | %Rec | Qualifier | Acceptance Limits |
|---|---|---|---|
| o-Terphenyl | 91 | | 49 - 115 |

2/8/15

## Analytical Data

Client: Washington Closure Hanford

Job Number: 280-65030-1
Sdg Number: JP0899

**Client Sample ID:** **J1V3R4**

Lab Sample ID: 280-65030-13
Client Matrix: Solid

% Moisture: 3.4

Date Sampled: 02/02/2015 0830
Date Received: 02/04/2015 1000

**NWTPH-Dx Northwest - Semi-Volatile Petroleum Products (GC)**

| | | | | | |
|---|---|---|---|---|---|
| Analysis Method: | NWTPH-Dx | Analysis Batch: | 280-263287 | Instrument ID: | SGC_U |
| Prep Method: | 3550C | Prep Batch: | 280-263026 | Lab File ID: | 02060023.D |
| Dilution: | 1.0 | | | Initial Weight/Volume: | 31.0 g |
| Analysis Date: | 02/06/2015 1943 | | | Final Weight/Volume: | 1 mL |
| Prep Date: | 02/04/2015 2030 | | | Injection Volume: | 1 uL |

| Analyte | DryWt Corrected: Y | Result (ug/Kg) | Qualifier | MDL | RL |
|---|---|---|---|---|---|
| C10-C36 | | 1000 | U | 1000 | 4000 |
| C10-C28 | | 680 | U | 680 | 4000 |

| Surrogate | %Rec | Qualifier | Acceptance Limits |
|---|---|---|---|
| o-Terphenyl | 93 | | 49 - 115 |

RT 3/8/15

## Appendix 4

## Laboratory Narrative and Chain-of-Custody Documentation

## CASE NARRATIVE

**Client: Washington Closure Hanford**

**Project: WASHINGTON CLOSURE HANFORD**

**Job Number: 280-65030-1**

**SDG #: JP0899**
**SAF#: RC-075**

**Date SDG Closed: February 4, 2015**
**Data Deliverable: 7 Day / Summary**

| CLIENT ID | LAB ID | ANALYSES REQUESTED | ANALYSES PERFORMED |
|---|---|---|---|
| J1V3P2 | 280-65030-1 | 6010/7471/8082/8270/WTPH-D+ | 6010B/7471A/8082/8270C/NWTPH-Dx |
| J1V3P3 | 280-65030-2 | 6010/7471/8082/8270/WTPH-D+ | 6010B/7471A/8082/8270C/NWTPH-Dx |
| J1V3P4 | 280-65030-3 | 6010/7471/8082/8270/WTPH-D+ | 6010B/7471A/8082/8270C/NWTPH-Dx |
| J1V3P5 | 280-65030-4 | 6010/7471/8082/8270/WTPH-D+ | 6010B/7471A/8082/8270C/NWTPH-Dx |
| J1V3P6 | 280-65030-5 | 6010/7471/8082/8270/WTPH-D+ | 6010B/7471A/8082/8270C/NWTPH-Dx |
| J1V3P7 | 280-65030-6 | 6010/7471/8082/8270/WTPH-D+ | 6010B/7471A/8082/8270C/NWTPH-Dx |
| J1V3P8 | 280-65030-7 | 6010/7471/8082/8270/WTPH-D+ | 6010B/7471A/8082/8270C/NWTPH-Dx |
| J1V3P9 | 280-65030-8 | 6010/7471/8082/8270/WTPH-D+ | 6010B/7471A/8082/8270C/NWTPH-Dx |
| J1V3R0 | 280-65030-9 | 6010/7471/8082/8270/WTPH-D+ | 6010B/7471A/8082/8270C/NWTPH-Dx |
| J1V3R1 | 280-65030-10 | 6010/7471/8082/8270/WTPH-D+ | 6010B/7471A/8082/8270C/NWTPH-Dx |
| J1V3R2 | 280-65030-11 | 6010/7471/8082/8270/WTPH-D+ | 6010B/7471A/8082/8270C/NWTPH-Dx |
| J1V3R3 | 280-65030-12 | 6010/7471/8082/8270/WTPH-D+ | 6010B/7471A/8082/8270C/NWTPH-Dx |
| J1V3R4 | 280-65030-13 | 6010/7471/8082/8270/WTPH-D+ | 6010B/7471A/8082/8270C/NWTPH-Dx |

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 2/4/2015 10:00 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperatures of the 3 coolers at receipt time were 0.8° C, 3.4° C and 4.4° C.

**GC/MS SEMIVOLATILES - SW846 8270C**
Low levels of Dimethyl phthalate, a common laboratory contaminant, are present in the method blank associated with batch 280-263016. Because the concentration in the method blank is not present at a level greater than the reporting limit, corrective action is deemed unnecessary. Associated sample results present above the MDL and/or RL have been flagged with a "B".

*No other anomalies were encountered.*

**GC SEMIVOLATILES - SW846 8082 - PCBs**
No anomalies were encountered.

**GC SEMIVOLATILES - NWTPH-Dx - DRO**
No anomalies were encountered.

**TOTAL METALS - SW846 6010B/7471A**
Serial dilution of a digestate in batch 280-263128 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. Samples J1V3P5 and J1V3R3 required a 5X dilution prior to the analysis of Antimony, Beryllium, Cobalt, Copper, Lead and Vanadium to minimize the interference caused by Titanium concentrations greater than the linear range. The reporting limits have been adjusted relative to the dilution required.

Low levels of Barium, Calcium and Magnesium are present in the method blank associated with batch 280-263128. Because the concentrations in the method blank are not present at levels greater than half the reporting limit, corrective action is deemed unnecessary.

Silicon was recovered outside the control limits, biased low, in the LCS associated with batch 280-263128 and in the Matrix Spike performed on sample J1V3P2 in batch 280-263128. The associated sample results have been flagged "N". Silicon has been identified as a poor performing element when analyzed using this method and has a history of reacting inconsistently; therefore, corrective action is not initiated. Data are reported as is.

It can be noted that the sample amount was greater than four times the spike amount for Aluminum, Iron and Manganese in the Matrix Spike performed on sample J1V3P2; therefore, control limits are not applicable.

The duplicate analysis of sample J1V3P2 exhibited RPD data outside the control limits for Boron, and the associated sample result has 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-075-465



| | | | |
|---|---|---|---|
| Collector: STOWE, QG | Company Contact: Joan Kessner | Telephone No.: 375-4688 | Project Coordinator: KESSNER, JH |
| Project Designation: 100-D/DR Field Remediation | Sampling Location: 100-D-75:1 (excavation, verification) | | SAF No.: RC-075 |
| Ice Chest No.: WCH-08-030 | Field Logbook No.: EL-1662-03 | COA: 01D7512000 | Method of Shipment: Commercial Carrier / Fed Ex |
| Shipped To: TestAmerica Denver | Offsite Property No.: A131318 | | Bill of Lading/Air Bill No.: See OSR |

Price Code: 8B

Data Turnaround: 7 days

Other Labs Shipped To: N/A

POSSIBLE SAMPLE HAZARDS/REMARKS: N/A

Special Handling and/or Storage: Cool 4C

280-65030 Chain of Custody

| 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 | 125mL |
| | | | | Sample Analysis: See Item (1) in Special Instructions | PCBs - 8082 | Semi-VOA - 8270 (TCL) | TPH-Diesel Range - WTPH-D + |
| J1V3P2 | SOIL | 02/02/15 | 0815 | X | X | X | X |
| J1V3P3 | SOIL | 02/02/15 | 0819 | X | X | X | X |
| J1V3P4 | SOIL | 02/02/15 | 0823 | X | X | X | X |
| J1V3P5 | SOIL | 02/02/15 | 0830 | X | X | X | X |
| J1V3P6 | SOIL | 02/02/15 | 0859 | X | X | X | X |

## CHAIN OF POSSESSION / Sign/Print Names

| Relinquished By/Removed From | Date/Time | Received By/Stored In | Date/Time |
|---|---|---|---|
| Quincy Stowe | 2-2-15 0922 | C. Martinez/C. Martinez | 02/02/15 0922 |
| C. Martinez/C. Martinez | 02/02/15 1600 | C. Bingham | 2-2-15 1600 |
| C. Bingham | 2-2-15 1630 | 1000 Battelle fridge #1A | 2-2-15 1630 |
| 1000 Battelle fridge #1A | 2-3-15 0715 | C. Bingham | 2-3-15 0715 |
| C. Bingham WCH | 2-3-15 0720 | Fed Ex | 2-3-15 0720 |
| [illegible] | 04Feb15 1000 | [illegible] | 1000 04Feb15 |
| | | | |

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)

3.9, 2.9, 0.3 [illegible] 0.5 04Feb15
Transferred by [illegible]

REVIEWED BY [illegible] DATE 2-3-15

JP0899

WCH-EE-011

# Washington Closure Hanford

# CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

RC-075-465



| | | | |
|---|---|---|---|
| Collector: STOWE, QG | Company Contact: Joan Kessner | Telephone No.: 375-4688 | Project Coordinator: KESSNER, JH |
| Project Designation: 100-D/DR Field Remediation | Sampling Location: 100-D-75:1 (excavation, verification) | | SAF No.: RC-075 |
| Ice Chest No.: WCH-08-030 | Field Logbook No.: EL-1662-03 | COA: 01D7512000 | Method of Shipment: Commercial Carrier \ Fed Ex |
| Shipped To: TestAmerica Denver | Offsite Property No.: A131318 | | Bill of Lading/Air Bill No.: See OSRC |

Price Code: 8B

Data Turnaround: 17 days

Other Labs Shipped To: N/A

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 | 125mL |
| Sample Analysis | See item (1) in Special Instructions | PCBs - 8082 | Semi-VOA - 8270 (TCL) | TPH-Diesel Range - WTPH-D + |

| Sample No. | Matrix | Sample Date | Sample Time | | | | |
|---|---|---|---|---|---|---|---|
| J1V3P7 | SOIL | 02/02/15 | 0855 | X | X | X | X |
| J1V3P8 | SOIL | 02/02/15 | 0837 | X | X | X | X |
| J1V3P9 | SOIL | 02/02/15 | 0857 | X | X | X | X |
| J1V3R0 | SOIL | 02/02/15 | 0847 | X | X | X | X |
| J1V3R1 | SOIL | 02/02/15 | 0843 | X | X | X | X |

## CHAIN OF POSSESSION

| Relinquished By/Removed From | Date/Time | Received By/Stored In | Date/Time |
|---|---|---|---|
| Quincy Stowe | 0922 2-2-15 | C. Martinez/C. Martinez | 0922 02/02/15 |
| C. Martinez/C. Martinez | 1600 02/02/15 | C. Bingham | 2-2-15 1600 |
| C. Bingham | 2-2-15 1630 | 1060 Battelle fridge #14 | 1630 2-2-15 |
| 1060 Battelle fridge #14 | 0715 2-3-15 | C. Bingham | 2-3-15 0715 |
| C. Bingham WCH | 2-3-15 0720 | Fed Ex | 2-3-15 0720 |
| | | | 1000 04Feb15 |

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 K Wood Vincent DATE 2-3-15

JP0899

WCH-EE-011

# Washington Closure Hanford

# CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

RC-075-465



| | | | |
|---|---|---|---|
| Collector: STOWE, QG | Company Contact: Joan Kessner | Telephone No.: 375-4688 | Project Coordinator: KESSNER, JH |
| Project Designation: 100-D/DR Field Remediation | Sampling Location: 100-D-75:1 (excavation, verification) | | SAF No.: RC-075 |
| Ice Chest No.: WCH-08-030 | Field Logbook No.: EL-1662-03 | COA: 01D7512000 | Method of Shipment: Commercial Carrier \ Fed Ex |
| Shipped To: TestAmerica Denver | Offsite Property No.: A131318 | | Bill of Lading/Air Bill No.: See OSPC |

Price Code: 8B

Data Turnaround: 7 days

Other Labs Shipped To: N/A

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 | 125mL | | | | | | |
| Sample Analysis | See item (1) in Special Instructions | PCBs - 8082 | Semi-VOA - 8270 (TCL) | TPH-Diesel Range - WTPH-D + | | | | | | |

| Sample No. | Matrix | Sample Date | Sample Time | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| J1V3R2 | SOIL | 02/02/15 | 0902 | X | X | X | X | | | | | | |
| J1V3R3 | SOIL | 02/02/15 | 0910 | X | X | X | X | | | | | | |
| J1V3R4 | SOIL | 02/02/15 | 0830 | X | X | X | X | | | | | | |

## CHAIN OF POSSESSION

| Relinquished By/Removed From | Date/Time | Received By/Stored In | Date/Time |
|---|---|---|---|
| Quincy Stowe | 2-2-15 0922 | C. Martinez / C. Martinez | 02/02/15 0922 |
| C. Martinez / C. Martinez | 02/02/15 1600 | C. Bingham | 2-2-15 1600 |
| C. Bingham | 2-2-15 1630 | 1060 Battelle fridge #1A | 2-2-15 1630 |
| 1060 Battelle fridge #1A | 2-3-15 0715 | C. Bingham | 2-3-15 0715 |
| C. Bingham WCH | 2-3-15 0720 | Fed Ex | 2-3-15 0720 |
| | | [signature] | 1000 04Feb15 |

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. Woodvincenzo DATE 2-3-15

JP0899

## Appendix 5

## Data Validation Supporting Documentation

# GENERAL ORGANIC DATA VALIDATION CHECKLIST

| VALIDATION LEVEL: | A | B | C | D | E |
|---|---|---|---|---|---|
| PROJECT: 100-D-75:1 | | | DATA PACKAGE: JP0899 | | |
| VALIDATOR: ELR | | LAB: TAL | | DATE: 3/7/15 | |
| | | | SDG: JP0899 | | |

| ANALYSES PERFORMED | | | | | |
|---|---|---|---|---|---|
| 8015 | 8021 | 8141 | 8151 | 8315 | |
| | | WTPH-HCID | WTPH-G | WTPH-D | |
| | | | | | |

| SAMPLES/MATRIX: | | | | | |
|---|---|---|---|---|---|
| J1V3P2 | J1V3P3 | J1V3P4 | J1V3P5 | J1V3P6 | J1V3P7 |
| J1V3P8 | J1V3P9 | J1V3R0 | J1V3R1 | J1V3R2 | J1V3R3 |
| J1V3R4 | | | | | |
| | | | | | |
| | | | | | Soil |

## 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 PA

# 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

Client: Washington Closure Hanford

Job Number: 280-65030-1
Sdg Number: JP0899

**Method Blank - Batch: 280-263026**

**Method: NWTPH-Dx**
**Preparation: 3550C**

| | | | | | |
|---|---|---|---|---|---|
| Lab Sample ID: | MB 280-263026/1-A | Analysis Batch: | 280-263287 | Instrument ID: | SGC_U |
| Client Matrix: | Solid | Prep Batch: | 280-263026 | Lab File ID: | 02060006.D |
| Dilution: | 1.0 | Leach Batch: | N/A | Initial Weight/Volume: | 31.3 g |
| Analysis Date: | 02/06/2015 1136 | Units: | ug/Kg | Final Weight/Volume: | 1 mL |
| Prep Date: | 02/04/2015 2030 | | | Injection Volume: | 1 uL |
| Leach Date: | N/A | | | | |

| Analyte | Result | Qual | MDL | RL |
|---|---|---|---|---|
| C10-C36 | 960 | U | 960 | 3800 |
| C10-C28 | 650 | U | 650 | 3800 |

| Surrogate | % Rec | Acceptance Limits |
|---|---|---|
| o-Terphenyl | 87 | 49 - 115 |

**Lab Control Sample/**
**Lab Control Sample Duplicate Recovery Report - Batch: 280-263026**

**Method: NWTPH-Dx**
**Preparation: 3550C**

| | | | | | |
|---|---|---|---|---|---|
| LCS Lab Sample ID: | LCS 280-263026/2-A | Analysis Batch: | 280-263287 | Instrument ID: | SGC_U |
| Client Matrix: | Solid | Prep Batch: | 280-263026 | Lab File ID: | 02060007.D |
| Dilution: | 1.0 | Leach Batch: | N/A | Initial Weight/Volume: | 30.0 g |
| Analysis Date: | 02/06/2015 1205 | Units: | ug/Kg | Final Weight/Volume: | 1 mL |
| Prep Date: | 02/04/2015 2030 | | | Injection Volume: | 1 uL |
| Leach Date: | N/A | | | | |

| | | | | | |
|---|---|---|---|---|---|
| LCSD Lab Sample ID: | LCSD 280-263026/18-A | Analysis Batch: | 280-263287 | Instrument ID: | SGC_U |
| Client Matrix: | Solid | Prep Batch: | 280-263026 | Lab File ID: | 02060008.D |
| Dilution: | 1.0 | Leach Batch: | N/A | Initial Weight/Volume: | 30 g |
| Analysis Date: | 02/06/2015 1233 | Units: | ug/Kg | Final Weight/Volume: | 1 mL |
| Prep Date: | 02/04/2015 2030 | | | Injection Volume: | 1 uL |
| Leach Date: | N/A | | | | |

| Analyte | % Rec. LCS | % Rec. LCSD | Limit | RPD | RPD Limit | LCS Qual | LCSD Qual |
|---|---|---|---|---|---|---|---|
| C10-C36 | 95 | 94 | 57 - 115 | 0 | 23 | | |
| C10-C28 | 92 | 92 | 53 - 115 | 0 | 23 | | |

| Surrogate | LCS % Rec | LCSD % Rec | Acceptance Limits |
|---|---|---|---|
| o-Terphenyl | 91 | 90 | 49 - 115 |

Client: Washington Closure Hanford

Job Number: 280-65030-1
Sdg Number: JP0899

**Laboratory Control/**
**Laboratory Duplicate Data Report - Batch: 280-263026**

**Method: NWTPH-Dx**
**Preparation: 3550C**

| | | | |
|---|---|---|---|
| LCS Lab Sample ID: | LCS 280-263026/2-A | Units: ug/Kg | |
| Client Matrix: | Solid | | |
| Dilution: | 1.0 | | |
| Analysis Date: | 02/06/2015 1205 | | |
| Prep Date: | 02/04/2015 2030 | | |
| Leach Date: | N/A | | |

| | |
|---|---|
| LCSD Lab Sample ID: | LCSD 280-263026/18-A |
| Client Matrix: | Solid |
| Dilution: | 1.0 |
| Analysis Date: | 02/06/2015 1233 |
| Prep Date: | 02/04/2015 2030 |
| Leach Date: | N/A |

| Analyte | LCS Spike Amount | LCSD Spike Amount | LCS Result/Qual | LCSD Result/Qual |
|---|---|---|---|---|
| C10-C36 | 66700 | 66700 | 63200 | 62900 |
| C10-C28 | 66700 | 66700 | 61400 | 61100 |

**Matrix Spike/**
**Matrix Spike Duplicate Recovery Report - Batch: 280-263026**

**Method: NWTPH-Dx**
**Preparation: 3550C**

| | | | | | |
|---|---|---|---|---|---|
| MS Lab Sample ID: | 280-65030-13 | Analysis Batch: | 280-263287 | Instrument ID: | SGC_U |
| Client Matrix: | Solid | Prep Batch: | 280-263026 | Lab File ID: | 02060024.D |
| Dilution: | 1.0 | Leach Batch: | N/A | Initial Weight/Volume: | 30.7 g |
| Analysis Date: | 02/06/2015 2011 | | | Final Weight/Volume: | 1 mL |
| Prep Date: | 02/04/2015 2030 | | | Injection Volume: | 1 uL |
| Leach Date: | N/A | | | | |

| | | | | | |
|---|---|---|---|---|---|
| MSD Lab Sample ID: | 280-65030-13 | Analysis Batch: | 280-263287 | Instrument ID: | SGC_U |
| Client Matrix: | Solid | Prep Batch: | 280-263026 | Lab File ID: | 02060025.D |
| Dilution: | 1.0 | Leach Batch: | N/A | Initial Weight/Volume: | 30.7 g |
| Analysis Date: | 02/06/2015 2040 | | | Final Weight/Volume: | 1 mL |
| Prep Date: | 02/04/2015 2030 | | | Injection Volume: | 1 uL |
| Leach Date: | N/A | | | | |

| Analyte | % Rec. MS | % Rec. MSD | Limit | RPD | RPD Limit | MS Qual | MSD Qual |
|---|---|---|---|---|---|---|---|
| C10-C36 | 95 | 97 | 57 - 115 | 2 | 23 | | |
| C10-C28 | 92 | 94 | 56 - 115 | 2 | 23 | | |

| Surrogate | MS % Rec | MSD % Rec | Acceptance Limits |
|---|---|---|---|
| o-Terphenyl | 90 | 91 | 49 - 115 |

Client: Washington Closure Hanford

Job Number: 280-65030-1
Sdg Number: JP0899

**Matrix Spike/**
**Matrix Spike Duplicate Recovery Report - Batch: 280-263026**

**Method: NWTPH-Dx**
**Preparation: 3550C**

| | | | | | |
|---|---|---|---|---|---|
| MS Lab Sample ID: | 280-65030-13 | Units: | ug/Kg | MSD Lab Sample ID: | 280-65030-13 |
| Client Matrix: | Solid | | | Client Matrix: | Solid |
| Dilution: | 1.0 | | | Dilution: | 1.0 |
| Analysis Date: | 02/06/2015 2011 | | | Analysis Date: | 02/06/2015 2040 |
| Prep Date: | 02/04/2015 2030 | | | Prep Date: | 02/04/2015 2030 |
| Leach Date: | N/A | | | Leach Date: | N/A |

| Analyte | Sample Result/Qual | | MS Spike Amount | MSD Spike Amount | MS Result/Qual | MSD Result/Qual |
|---|---|---|---|---|---|---|
| C10-C36 | 1000 | U | 67400 | 67400 | 63800 | 65400 |
| C10-C28 | 680 | U | 67400 | 67400 | 62000 | 63500 |

Date: 9 March 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-75:1
Subject: Inorganic - Data Package No. JP0899-TAL

## INTRODUCTION

This memo presents the results of data validation on Data Package No. JP0899 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 |
|---|---|---|---|---|
| J1V3P2 | 2/2/15 | Soil | C | See note 1 |
| J1V3P3 | 2/2/15 | Soil | C | See note 1 |
| J1V3P4 | 2/2/15 | Soil | C | See note 1 |
| J1V3P5 | 2/2/15 | Soil | C | See note 1 |
| J1V3P6 | 2/2/15 | Soil | C | See note 1 |
| J1V3P7 | 2/2/15 | Soil | C | See note 1 |
| J1V3P8 | 2/2/15 | Soil | C | See note 1 |
| J1V3P9 | 2/2/15 | Soil | C | See note 1 |
| J1V3R0 | 2/2/15 | Soil | C | See note 1 |
| J1V3R1 | 2/2/15 | Soil | C | See note 1 |
| J1V3R2 | 2/2/15 | Soil | C | See note 1 |
| J1V3R3 | 2/2/15 | Soil | C | See note 1 |
| J1V3R4 | 2/2/15 | Soil | C | See note 1 |

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

Data validation was conducted in accordance with the Washington Closure Hanford (WCH) validation statement of work and the 100 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 6 months for ICP metals and 28 days for mercury.

All holding times were acceptable.

- **Preparation (Method) Blanks**

Preparation Blanks

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

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

All preparation blank results were acceptable.

Field (Equipment) Blank

No field blanks were submitted for analysis.

- **Accuracy**

Matrix Spike and Laboratory Control Sample

Matrix spike (MS) and laboratory control sample (LCS) analyses are used to assess the analytical accuracy of the reported data. The matrix spike is used to assess the effect of the matrix on the ability to accurately quantify sample concentrations. Recoveries must fall within the range of 75% to 125%. Samples with a recovery of less than 30%

and a sample result below the IDL are rejected and flagged "UR". Samples with a recovery of 30% to 74% and a sample result less than the IDL are qualified "UJ". Samples with a recovery of greater than 125% or less than 74% and a sample result greater than the IDL are qualified as estimates and flagged "J". Finally, for samples with a recovery greater than 125% and a sample result less than the IDL, no qualification is required.

Due to matrix spike recoveries outside QC limits, all antimony (55%) and silicon (12%) results were qualified as estimates and flagged "J".

Due to an LCS recovery outside QC limits, all silicon (9%) 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 (J1V3P5/J1V3R4) were submitted for analysis. Field duplicates are compared using the same criteria as for laboratory duplicates. All field duplicate results were acceptable.

- **Analytical Detection Levels**

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

- **Completeness**

Data package No. JP0899 was submitted for validation and verified for completeness. Completeness is based on the percentage of data determined to be valid (i.e., not rejected). The completion percentage was 100%.

## MAJOR DEFICIENCIES

None found.

## MINOR DEFICIENCIES

The following minor deficiencies were noted:

- Due to matrix spike recoveries outside QC limits, all antimony (55%) and silicon (12%) results were qualified as estimates and flagged "J".

- Due to an LCS recovery outside QC limits, all silicon (9%) 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: JP0899** | **REVIEWER: ELR** | **Project: 100-D-75:1** | **PAGE_1_OF_1** |
|---|---|---|---|
| COMPOUND | QUALIFIER | SAMPLES AFFECTED | REASON |
| Silicon | J | All | LCS recovery |
| Antimony<br>Silicon | J | All | MS 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: 280-65030-1
Sdg Number: JP0899

**Client Sample ID:** **J1V3P2**

Lab Sample ID: 280-65030-1
Client Matrix: Solid
% Moisture: 9.1

Date Sampled: 02/02/2015 0815
Date Received: 02/04/2015 1000

### 6010B Metals (ICP)

| | | | | | |
|---|---|---|---|---|---|
| Analysis Method: | 6010B | Analysis Batch: | 280-263701 | Instrument ID: | MT_026 |
| Prep Method: | 3050B | Prep Batch: | 280-263128 | Lab File ID: | 26a020915.asc |
| Dilution: | 1.0 | | | Initial Weight/Volume: | 1.01 g |
| Analysis Date: | 02/09/2015 1328 | | | Final Weight/Volume: | 100 mL |
| Prep Date: | 02/05/2015 1445 | | | | |

✓ 3/8/15

| Analyte | DryWt Corrected: Y | Result (mg/Kg) | Qualifier | MDL | RL |
|---|---|---|---|---|---|
| Aluminum | | 6370 | X | 1.7 | 5.4 |
| Antimony | | 0.51 | B J | 0.41 | 0.65 |
| Arsenic | | 3.8 | | 0.72 | 1.1 |
| Barium | | 61.1 | X | 0.083 | 0.54 |
| Beryllium | | 0.21 | B | 0.036 | 0.22 |
| Boron | | 1.4 | B M | 1.1 | 2.2 |
| Cadmium | | 0.091 | B | 0.045 | 0.22 |
| Calcium | | 7700 | X | 15.4 | 54.4 |
| Chromium | | 13.3 | | 0.063 | 0.22 |
| Cobalt | | 7.0 | X | 0.11 | 1.1 |
| Copper | | 15.8 | | 0.24 | 1.1 |
| Iron | | 20000 | X | 4.1 | 5.4 |
| Lead | | 4.4 | | 0.29 | 0.54 |
| Magnesium | | 4920 | | 4.0 | 21.8 |
| Manganese | | 332 | | 0.11 | 1.1 |
| Molybdenum | | 0.28 | U | 0.28 | 2.2 |
| Nickel | | 15.5 | | 0.13 | 4.4 |
| Potassium | | 900 | | 44.6 | 327 |
| Selenium | | 0.94 | U | 0.94 | 1.1 |
| Silicon | | 182 | N J | 6.2 | 10.9 |
| Silver | | 0.17 | U | 0.17 | 0.22 |
| Sodium | | 204 | | 64.2 | 131 |
| Vanadium | | 47.2 | X | 0.10 | 2.2 |
| Zinc | | 37.2 | | 0.43 | 1.1 |

### 7471A Mercury (CVAA)

| | | | | | |
|---|---|---|---|---|---|
| Analysis Method: | 7471A | Analysis Batch: | 280-263638 | Instrument ID: | MT_033 |
| Prep Method: | 7471A | Prep Batch: | 280-263085 | Lab File ID: | 150205aa.txt |
| Dilution: | 1.0 | | | Initial Weight/Volume: | 0.64 g |
| Analysis Date: | 02/05/2015 1441 | | | Final Weight/Volume: | 50 mL |
| Prep Date: | 02/05/2015 1105 | | | | |

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

## Analytical Data

Client: Washington Closure Hanford

Job Number: 280-65030-1
Sdg Number: JP0899

**Client Sample ID:** J1V3P3

Lab Sample ID: 280-65030-2
Client Matrix: Solid

% Moisture: 9.5

Date Sampled: 02/02/2015 0819
Date Received: 02/04/2015 1000

### 6010B Metals (ICP)

| | | | | | |
|---|---|---|---|---|---|
| Analysis Method: | 6010B | Analysis Batch: | 280-263701 | Instrument ID: | MT_026 |
| Prep Method: | 3050B | Prep Batch: | 280-263128 | Lab File ID: | 26a020915.asc |
| Dilution: | 1.0 | | | Initial Weight/Volume: | 1.08 g |
| Analysis Date: | 02/09/2015 1338 | | | Final Weight/Volume: | 100 mL |
| Prep Date: | 02/05/2015 1445 | | | | |

r 3/8/15

| Analyte | DryWt Corrected: Y | Result (mg/Kg) | Qualifier | MDL | RL |
|---|---|---|---|---|---|
| Aluminum | | 5710 | X J | 1.6 | 5.1 |
| Antimony | | 0.62 | | 0.39 | 0.61 |
| Arsenic | | 3.6 | | 0.67 | 1.0 |
| Barium | | 52.3 | X | 0.078 | 0.51 |
| Beryllium | | 0.18 | B | 0.034 | 0.20 |
| Boron | | 1.9 | B | 1.0 | 2.0 |
| Cadmium | | 0.052 | B | 0.042 | 0.20 |
| Calcium | | 17400 | X | 14.4 | 51.1 |
| Chromium | | 9.8 | | 0.059 | 0.20 |
| Cobalt | | 7.1 | X | 0.10 | 1.0 |
| Copper | | 17.0 | | 0.22 | 1.0 |
| Iron | | 21200 | X | 3.9 | 5.1 |
| Lead | | 3.1 | | 0.28 | 0.51 |
| Magnesium | | 4700 | | 3.8 | 20.5 |
| Manganese | | 272 | | 0.10 | 1.0 |
| Molybdenum | | 0.27 | U | 0.27 | 2.0 |
| Nickel | | 11.8 | | 0.13 | 4.1 |
| Potassium | | 705 | | 41.9 | 307 |
| Selenium | | 0.88 | U | 0.88 | 1.0 |
| Silicon | | 165 | N J | 5.8 | 10.2 |
| Silver | | 0.16 | U | 0.16 | 0.20 |
| Sodium | | 244 | | 60.3 | 123 |
| Vanadium | | 53.5 | X | 0.096 | 2.0 |
| Zinc | | 39.0 | | 0.41 | 1.0 |

### 7471A Mercury (CVAA)

| | | | | | |
|---|---|---|---|---|---|
| Analysis Method: | 7471A | Analysis Batch: | 280-263638 | Instrument ID: | MT_033 |
| Prep Method: | 7471A | Prep Batch: | 280-263085 | Lab File ID: | 150205aa.txt |
| Dilution: | 1.0 | | | Initial Weight/Volume: | 0.64 g |
| Analysis Date: | 02/05/2015 1448 | | | Final Weight/Volume: | 50 mL |
| Prep Date: | 02/05/2015 1105 | | | | |

| Analyte | DryWt Corrected: Y | Result (mg/Kg) | Qualifier | MDL | RL |
|---|---|---|---|---|---|
| Mercury | | 0.0085 | B | 0.0057 | 0.018 |

## Analytical Data

Client: Washington Closure Hanford

Job Number: 280-65030-1
Sdg Number: JP0899

**Client Sample ID:** **J1V3P4**

Lab Sample ID: 280-65030-3
Client Matrix: Solid
% Moisture: 6.7

Date Sampled: 02/02/2015 0823
Date Received: 02/04/2015 1000

**6010B Metals (ICP)**

| | | | | | |
|---|---|---|---|---|---|
| Analysis Method: | 6010B | Analysis Batch: | 280-263701 | Instrument ID: | MT_026 |
| Prep Method: | 3050B | Prep Batch: | 280-263128 | Lab File ID: | 26a020915.asc |
| Dilution: | 1.0 | | | Initial Weight/Volume: | 1.04 g |
| Analysis Date: | 02/09/2015 1340 | | | Final Weight/Volume: | 100 mL |
| Prep Date: | 02/05/2015 1445 | | | | |

r 3/8/15

| Analyte | DryWt Corrected: Y | Result (mg/Kg) | Qualifier | MDL | RL |
|---|---|---|---|---|---|
| Aluminum | | 6330 | X | 1.6 | 5.2 |
| Antimony | | 0.74 | J | 0.39 | 0.62 |
| Arsenic | | 2.8 | | 0.68 | 1.0 |
| Barium | | 56.8 | X | 0.078 | 0.52 |
| Beryllium | | 0.21 | | 0.034 | 0.21 |
| Boron | | 1.9 | B | 1.0 | 2.1 |
| Cadmium | | 0.097 | B | 0.042 | 0.21 |
| Calcium | | 6420 | X | 14.5 | 51.5 |
| Chromium | | 8.0 | | 0.060 | 0.21 |
| Cobalt | | 6.7 | X | 0.10 | 1.0 |
| Copper | | 15.2 | | 0.22 | 1.0 |
| Iron | | 19000 | X | 3.9 | 5.2 |
| Lead | | 5.4 | | 0.28 | 0.52 |
| Magnesium | | 3900 | | 3.8 | 20.6 |
| Manganese | | 283 | | 0.10 | 1.0 |
| Molybdenum | | 0.27 | U | 0.27 | 2.1 |
| Nickel | | 10.4 | | 0.13 | 4.1 |
| Potassium | | 967 | | 42.3 | 309 |
| Selenium | | 0.89 | U | 0.89 | 1.0 |
| Silicon | | 196 | N J | 5.8 | 10.3 |
| Silver | | 0.16 | U | 0.16 | 0.21 |
| Sodium | | 303 | | 60.8 | 124 |
| Vanadium | | 47.9 | X | 0.097 | 2.1 |
| Zinc | | 60.2 | | 0.41 | 1.0 |

**7471A Mercury (CVAA)**

| | | | | | |
|---|---|---|---|---|---|
| Analysis Method: | 7471A | Analysis Batch: | 280-263638 | Instrument ID: | MT_033 |
| Prep Method: | 7471A | Prep Batch: | 280-263085 | Lab File ID: | 150205aa.txt |
| Dilution: | 1.0 | | | Initial Weight/Volume: | 0.66 g |
| Analysis Date: | 02/05/2015 1451 | | | Final Weight/Volume: | 50 mL |
| Prep Date: | 02/05/2015 1105 | | | | |

| Analyte | DryWt Corrected: Y | Result (mg/Kg) | Qualifier | MDL | RL |
|---|---|---|---|---|---|
| Mercury | | 0.045 | | 0.0054 | 0.017 |

Client: Washington Closure Hanford

Job Number: 280-65030-1
Sdg Number: JP0899

**Client Sample ID:** J1V3P5

Lab Sample ID: 280-65030-4
Client Matrix: Solid
% Moisture: 3.4

Date Sampled: 02/02/2015 0830
Date Received: 02/04/2015 1000

**6010B Metals (ICP)**

| | | | | | |
|---|---|---|---|---|---|
| Analysis Method: | 6010B | Analysis Batch: | 280-263701 | Instrument ID: | MT_026 |
| Prep Method: | 3050B | Prep Batch: | 280-263128 | Lab File ID: | 26a020915.asc |
| Dilution: | 1.0 | | | Initial Weight/Volume: | 1.19 g |
| Analysis Date: | 02/09/2015 1343 | | | Final Weight/Volume: | 100 mL |
| Prep Date: | 02/05/2015 1445 | | | | |

3/8/15

| Analyte | DryWt Corrected: Y | Result (mg/Kg) | Qualifier | MDL | RL |
|---|---|---|---|---|---|
| Aluminum | | 4120 | X | 1.3 | 4.3 |
| Arsenic | | 1.5 | | 0.57 | 0.87 |
| Barium | | 47.1 | X | 0.066 | 0.43 |
| Boron | | 0.85 | U | 0.85 | 1.7 |
| Cadmium | | 0.049 | B | 0.036 | 0.17 |
| Calcium | | 5480 | X | 12.3 | 43.5 |
| Chromium | | 3.8 | | 0.050 | 0.17 |
| Iron | | 24900 | X | 3.3 | 4.3 |
| Magnesium | | 4350 | | 3.2 | 17.4 |
| Manganese | | 297 | | 0.087 | 0.87 |
| Molybdenum | | 0.23 | U | 0.23 | 1.7 |
| Nickel | | 11.2 | | 0.11 | 3.5 |
| Potassium | | 532 | | 35.7 | 261 |
| Selenium | | 0.75 | U | 0.75 | 0.87 |
| Silicon | | 107 | N J | 4.9 | 8.7 |
| Silver | | 0.14 | U | 0.14 | 0.17 |
| Sodium | | 450 | | 51.3 | 104 |
| Zinc | | 42.1 | | 0.35 | 0.87 |

| | | | | | |
|---|---|---|---|---|---|
| Analysis Method: | 6010B | Analysis Batch: | 280-263701 | Instrument ID: | MT_026 |
| Prep Method: | 3050B | Prep Batch: | 280-263128 | Lab File ID: | 26a020915.asc |
| Dilution: | 5.0 | | | Initial Weight/Volume: | 1.19 g |
| Analysis Date: | 02/09/2015 1345 | | | Final Weight/Volume: | 100 mL |
| Prep Date: | 02/05/2015 1445 | | | | |

| Analyte | DryWt Corrected: Y | Result (mg/Kg) | Qualifier | MDL | RL |
|---|---|---|---|---|---|
| Antimony | | 1.7 | U J | 1.7 | 2.6 |
| Beryllium | | 0.14 | U | 0.14 | 0.87 |
| Cobalt | | 10.1 | X | 0.43 | 4.3 |
| Copper | | 18.2 | | 0.94 | 4.3 |
| Lead | | 2.1 | B | 1.2 | 2.2 |
| Vanadium | | 80.2 | X | 0.41 | 8.7 |

**7471A Mercury (CVAA)**

| | | | | | |
|---|---|---|---|---|---|
| Analysis Method: | 7471A | Analysis Batch: | 280-263638 | Instrument ID: | MT_033 |
| Prep Method: | 7471A | Prep Batch: | 280-263085 | Lab File ID: | 150205aa.txt |
| Dilution: | 1.0 | | | Initial Weight/Volume: | 0.61 g |
| Analysis Date: | 02/05/2015 1453 | | | Final Weight/Volume: | 50 mL |
| Prep Date: | 02/05/2015 1105 | | | | |

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

## Analytical Data

Client: Washington Closure Hanford

Job Number: 280-65030-1
Sdg Number: JP0899

**Client Sample ID:** J1V3P6

Lab Sample ID: 280-65030-5
Client Matrix: Solid

% Moisture: 17.7

Date Sampled: 02/02/2015 0859
Date Received: 02/04/2015 1000

### 6010B Metals (ICP)

| | | | | | |
|---|---|---|---|---|---|
| Analysis Method: | 6010B | Analysis Batch: | 280-263701 | Instrument ID: | MT_026 |
| Prep Method: | 3050B | Prep Batch: | 280-263128 | Lab File ID: | 26a020915.asc |
| Dilution: | 1.0 | | | Initial Weight/Volume: | 1.06 g |
| Analysis Date: | 02/09/2015 1358 | | | Final Weight/Volume: | 100 mL |
| Prep Date: | 02/05/2015 1445 | | | | |

✓ 3/8/15

| Analyte | DryWt Corrected: Y | Result (mg/Kg) | Qualifier | MDL | RL |
|---|---|---|---|---|---|
| Aluminum | | 7430 | X | 1.8 | 5.7 |
| Antimony | | 0.44 | U J | 0.44 | 0.69 |
| Arsenic | | 4.6 | | 0.76 | 1.1 |
| Barium | | 71.7 | X | 0.087 | 0.57 |
| Beryllium | | 0.25 | | 0.038 | 0.23 |
| Boron | | 1.1 | B | 1.1 | 2.3 |
| Cadmium | | 0.080 | B | 0.047 | 0.23 |
| Calcium | | 13500 | X | 16.2 | 57.3 |
| Chromium | | 15.2 | | 0.066 | 0.23 |
| Cobalt | | 6.5 | X | 0.11 | 1.1 |
| Copper | | 16.1 | | 0.25 | 1.1 |
| Iron | | 18500 | X | 4.4 | 5.7 |
| Lead | | 4.4 | | 0.31 | 0.57 |
| Magnesium | | 5210 | | 4.2 | 22.9 |
| Manganese | | 308 | | 0.11 | 1.1 |
| Molybdenum | | 0.30 | U | 0.30 | 2.3 |
| Nickel | | 14.5 | | 0.14 | 4.6 |
| Potassium | | 968 | | 47.0 | 344 |
| Selenium | | 0.99 | U | 0.99 | 1.1 |
| Silicon | | 223 | N J | 6.5 | 11.5 |
| Silver | | 0.18 | U | 0.18 | 0.23 |
| Sodium | | 211 | | 67.6 | 137 |
| Vanadium | | 41.6 | X | 0.11 | 2.3 |
| Zinc | | 37.0 | | 0.46 | 1.1 |

### 7471A Mercury (CVAA)

| | | | | | |
|---|---|---|---|---|---|
| Analysis Method: | 7471A | Analysis Batch: | 280-263638 | Instrument ID: | MT_033 |
| Prep Method: | 7471A | Prep Batch: | 280-263085 | Lab File ID: | 150205aa.txt |
| Dilution: | 1.0 | | | Initial Weight/Volume: | 0.68 g |
| Analysis Date: | 02/05/2015 1455 | | | Final Weight/Volume: | 50 mL |
| Prep Date: | 02/05/2015 1105 | | | | |

| Analyte | DryWt Corrected: Y | Result (mg/Kg) | Qualifier | MDL | RL |
|---|---|---|---|---|---|
| Mercury | | 0.0080 | B | 0.0059 | 0.018 |

## Analytical Data

Client: Washington Closure Hanford

Job Number: 280-65030-1
Sdg Number: JP0899

**Client Sample ID:** J1V3P7

Lab Sample ID: 280-65030-6
Client Matrix: Solid
% Moisture: 13.9

Date Sampled: 02/02/2015 0855
Date Received: 02/04/2015 1000

### 6010B Metals (ICP)

| | | | | | |
|---|---|---|---|---|---|
| Analysis Method: | 6010B | Analysis Batch: | 280-263701 | Instrument ID: | MT_026 |
| Prep Method: | 3050B | Prep Batch: | 280-263128 | Lab File ID: | 26a020915.asc |
| Dilution: | 1.0 | | | Initial Weight/Volume: | 1.14 g |
| Analysis Date: | 02/09/2015 1401 | | | Final Weight/Volume: | 100 mL |
| Prep Date: | 02/05/2015 1445 | | | | |

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| Analyte | DryWt Corrected: Y | Result (mg/Kg) | Qualifier | MDL | RL |
|---|---|---|---|---|---|
| Aluminum | | 6800 | X | 1.6 | 5.1 |
| Antimony | | 0.55 | B J | 0.39 | 0.61 |
| Arsenic | | 4.6 | | 0.67 | 1.0 |
| Barium | | 66.8 | X | 0.077 | 0.51 |
| Beryllium | | 0.22 | | 0.034 | 0.20 |
| Boron | | 1.3 | B | 1.0 | 2.0 |
| Cadmium | | 0.075 | B | 0.042 | 0.20 |
| Calcium | | 14200 | X | 14.4 | 50.9 |
| Chromium | | 12.6 | | 0.059 | 0.20 |
| Cobalt | | 6.5 | X | 0.10 | 1.0 |
| Copper | | 15.7 | | 0.22 | 1.0 |
| Iron | | 17300 | X | 3.9 | 5.1 |
| Lead | | 4.0 | | 0.28 | 0.51 |
| Magnesium | | 5080 | | 3.8 | 20.4 |
| Manganese | | 289 | | 0.10 | 1.0 |
| Molybdenum | | 0.26 | U | 0.26 | 2.0 |
| Nickel | | 12.4 | | 0.13 | 4.1 |
| Potassium | | 939 | | 41.8 | 306 |
| Selenium | | 0.88 | U | 0.88 | 1.0 |
| Silicon | | 187 | N J | 5.8 | 10.2 |
| Silver | | 0.16 | U | 0.16 | 0.20 |
| Sodium | | 214 | | 60.1 | 122 |
| Vanadium | | 40.7 | X | 0.096 | 2.0 |
| Zinc | | 36.0 | | 0.41 | 1.0 |

### 7471A Mercury (CVAA)

| | | | | | |
|---|---|---|---|---|---|
| Analysis Method: | 7471A | Analysis Batch: | 280-263638 | Instrument ID: | MT_033 |
| Prep Method: | 7471A | Prep Batch: | 280-263085 | Lab File ID: | 150205aa.txt |
| Dilution: | 1.0 | | | Initial Weight/Volume: | 0.65 g |
| Analysis Date: | 02/05/2015 1502 | | | Final Weight/Volume: | 50 mL |
| Prep Date: | 02/05/2015 1105 | | | | |

| Analyte | DryWt Corrected: Y | Result (mg/Kg) | Qualifier | MDL | RL |
|---|---|---|---|---|---|
| Mercury | | 0.0080 | B | 0.0059 | 0.018 |

Client: Washington Closure Hanford

Job Number: 280-65030-1
Sdg Number: JP0899

**Client Sample ID:** J1V3P8

Lab Sample ID: 280-65030-7
Client Matrix: Solid
% Moisture: 7.2

Date Sampled: 02/02/2015 0837
Date Received: 02/04/2015 1000

**6010B Metals (ICP)**

| | | | | | |
|---|---|---|---|---|---|
| Analysis Method: | 6010B | Analysis Batch: | 280-263701 | Instrument ID: | MT_026 |
| Prep Method: | 3050B | Prep Batch: | 280-263128 | Lab File ID: | 26a020915.asc |
| Dilution: | 1.0 | | | Initial Weight/Volume: | 1.13 g |
| Analysis Date: | 02/09/2015 1403 | | | Final Weight/Volume: | 100 mL |
| Prep Date: | 02/05/2015 1445 | | | | |

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| Analyte | DryWt Corrected: Y | Result (mg/Kg) | Qualifier | MDL | RL |
|---|---|---|---|---|---|
| Aluminum | | 5700 | X | 1.5 | 4.8 |
| Antimony | | 0.74 | J | 0.36 | 0.57 |
| Arsenic | | 2.6 | | 0.63 | 0.95 |
| Barium | | 62.3 | X | 0.072 | 0.48 |
| Beryllium | | 0.15 | B | 0.031 | 0.19 |
| Boron | | 0.98 | B | 0.93 | 1.9 |
| Cadmium | | 0.059 | B | 0.039 | 0.19 |
| Calcium | | 5870 | X | 13.4 | 47.7 |
| Chromium | | 7.0 | | 0.055 | 0.19 |
| Cobalt | | 7.6 | X | 0.095 | 0.95 |
| Copper | | 15.1 | | 0.21 | 0.95 |
| Iron | | 22400 | X | 3.6 | 4.8 |
| Lead | | 3.8 | | 0.26 | 0.48 |
| Magnesium | | 4140 | | 3.5 | 19.1 |
| Manganese | | 296 | | 0.095 | 0.95 |
| Molybdenum | | 0.25 | U | 0.25 | 1.9 |
| Nickel | | 9.7 | | 0.12 | 3.8 |
| Potassium | | 937 | | 39.1 | 286 |
| Selenium | | 0.82 | U | 0.82 | 0.95 |
| Silicon | | 189 | N J | 5.4 | 9.5 |
| Silver | | 0.15 | U | 0.15 | 0.19 |
| Sodium | | 256 | | 56.3 | 114 |
| Vanadium | | 56.8 | X | 0.090 | 1.9 |
| Zinc | | 42.6 | | 0.38 | 0.95 |

**7471A Mercury (CVAA)**

| | | | | | |
|---|---|---|---|---|---|
| Analysis Method: | 7471A | Analysis Batch: | 280-263638 | Instrument ID: | MT_033 |
| Prep Method: | 7471A | Prep Batch: | 280-263085 | Lab File ID: | 150205aa.txt |
| Dilution: | 1.0 | | | Initial Weight/Volume: | 0.62 g |
| Analysis Date: | 02/05/2015 1505 | | | Final Weight/Volume: | 50 mL |
| Prep Date: | 02/05/2015 1105 | | | | |

| Analyte | DryWt Corrected: Y | Result (mg/Kg) | Qualifier | MDL | RL |
|---|---|---|---|---|---|
| Mercury | | 0.0062 | B | 0.0058 | 0.018 |

## Analytical Data

Client: Washington Closure Hanford

Job Number: 280-65030-1
Sdg Number: JP0899

**Client Sample ID:** J1V3P9

Lab Sample ID: 280-65030-8
Client Matrix: Solid

% Moisture: 4.6

Date Sampled: 02/02/2015 0857
Date Received: 02/04/2015 1000

### 6010B Metals (ICP)

| | | | | | |
|---|---|---|---|---|---|
| Analysis Method: | 6010B | Analysis Batch: | 280-263701 | Instrument ID: | MT_026 |
| Prep Method: | 3050B | Prep Batch: | 280-263128 | Lab File ID: | 26a020915.asc |
| Dilution: | 1.0 | | | Initial Weight/Volume: | 1.14 g |
| Analysis Date: | 02/09/2015 1406 | | | Final Weight/Volume: | 100 mL |
| Prep Date: | 02/05/2015 1445 | | | | |

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| Analyte | DryWt Corrected: Y | Result (mg/Kg) | Qualifier | MDL | RL |
|---|---|---|---|---|---|
| Aluminum | | 5430 | X J | 1.4 | 4.6 |
| Antimony | | 0.91 | | 0.35 | 0.55 |
| Arsenic | | 2.7 | | 0.61 | 0.92 |
| Barium | | 40.8 | X | 0.070 | 0.46 |
| Beryllium | | 0.15 | B | 0.030 | 0.18 |
| Boron | | 0.90 | U | 0.90 | 1.8 |
| Cadmium | | 0.063 | B | 0.038 | 0.18 |
| Calcium | | 6310 | X | 13.0 | 46.0 |
| Chromium | | 6.6 | | 0.053 | 0.18 |
| Cobalt | | 8.1 | X | 0.092 | 0.92 |
| Copper | | 16.2 | | 0.20 | 0.92 |
| Iron | | 23800 | X | 3.5 | 4.6 |
| Lead | | 2.8 | | 0.25 | 0.46 |
| Magnesium | | 5040 | | 3.4 | 18.4 |
| Manganese | | 302 | | 0.092 | 0.92 |
| Molybdenum | | 0.24 | U | 0.24 | 1.8 |
| Nickel | | 10.4 | | 0.11 | 3.7 |
| Potassium | | 619 | | 37.7 | 276 |
| Selenium | | 0.79 | U | 0.79 | 0.92 |
| Silicon | | 131 | N J | 5.2 | 9.2 |
| Silver | | 0.15 | U | 0.15 | 0.18 |
| Sodium | | 296 | | 54.3 | 110 |
| Vanadium | | 65.0 | X | 0.086 | 1.8 |
| Zinc | | 53.9 | | 0.37 | 0.92 |

### 7471A Mercury (CVAA)

| | | | | | |
|---|---|---|---|---|---|
| Analysis Method: | 7471A | Analysis Batch: | 280-263638 | Instrument ID: | MT_033 |
| Prep Method: | 7471A | Prep Batch: | 280-263085 | Lab File ID: | 150205aa.txt |
| Dilution: | 1.0 | | | Initial Weight/Volume: | 0.64 g |
| Analysis Date: | 02/05/2015 1507 | | | Final Weight/Volume: | 50 mL |
| Prep Date: | 02/05/2015 1105 | | | | |

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

## Analytical Data

Client: Washington Closure Hanford

Job Number: 280-65030-1
Sdg Number: JP0899

**Client Sample ID:** J1V3R0

Lab Sample ID: 280-65030-9
Client Matrix: Solid

% Moisture: 9.6

Date Sampled: 02/02/2015 0847
Date Received: 02/04/2015 1000

### 6010B Metals (ICP)

| | | | | | |
|---|---|---|---|---|---|
| Analysis Method: | 6010B | Analysis Batch: | 280-263701 | Instrument ID: | MT_026 |
| Prep Method: | 3050B | Prep Batch: | 280-263128 | Lab File ID: | 26a020915.asc |
| Dilution: | 1.0 | | | Initial Weight/Volume: | 1.11 g |
| Analysis Date: | 02/09/2015 1409 | | | Final Weight/Volume: | 100 mL |
| Prep Date: | 02/05/2015 1445 | | | | |

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| Analyte | DryWt Corrected: Y | Result (mg/Kg) | Qualifier | MDL | RL |
|---|---|---|---|---|---|
| Aluminum | | 6140 | X | 1.5 | 5.0 |
| Antimony | | 0.78 | J | 0.38 | 0.60 |
| Arsenic | | 3.3 | | 0.66 | 1.0 |
| Barium | | 65.9 | X | 0.076 | 0.50 |
| Beryllium | | 0.17 | B | 0.033 | 0.20 |
| Boron | | 0.98 | U | 0.98 | 2.0 |
| Cadmium | | 0.055 | B | 0.041 | 0.20 |
| Calcium | | 7960 | X | 14.0 | 49.8 |
| Chromium | | 8.5 | | 0.058 | 0.20 |
| Cobalt | | 8.4 | X | 0.10 | 1.0 |
| Copper | | 16.0 | | 0.22 | 1.0 |
| Iron | | 23500 | X | 3.8 | 5.0 |
| Lead | | 3.4 | | 0.27 | 0.50 |
| Magnesium | | 5120 | | 3.7 | 19.9 |
| Manganese | | 332 | | 0.10 | 1.0 |
| Molybdenum | | 0.26 | U | 0.26 | 2.0 |
| Nickel | | 11.2 | | 0.12 | 4.0 |
| Potassium | | 864 | | 40.9 | 299 |
| Selenium | | 0.86 | U | 0.86 | 1.0 |
| Silicon | | 148 | N J | 5.6 | 10 |
| Silver | | 0.16 | U | 0.16 | 0.20 |
| Sodium | | 264 | | 58.8 | 120 |
| Vanadium | | 59.1 | X | 0.094 | 2.0 |
| Zinc | | 45.4 | | 0.40 | 1.0 |

### 7471A Mercury (CVAA)

| | | | | | |
|---|---|---|---|---|---|
| Analysis Method: | 7471A | Analysis Batch: | 280-263638 | Instrument ID: | MT_033 |
| Prep Method: | 7471A | Prep Batch: | 280-263085 | Lab File ID: | 150205aa.txt |
| Dilution: | 1.0 | | | Initial Weight/Volume: | 0.61 g |
| Analysis Date: | 02/05/2015 1509 | | | Final Weight/Volume: | 50 mL |
| Prep Date: | 02/05/2015 1105 | | | | |

| Analyte | DryWt Corrected: Y | Result (mg/Kg) | Qualifier | MDL | RL |
|---|---|---|---|---|---|
| Mercury | | 0.0071 | B | 0.0060 | 0.018 |

## Analytical Data

Client: Washington Closure Hanford

Job Number: 280-65030-1
Sdg Number: JP0899

**Client Sample ID:** J1V3R1

Lab Sample ID: 280-65030-10
Client Matrix: Solid

% Moisture: 6.3

Date Sampled: 02/02/2015 0843
Date Received: 02/04/2015 1000

### 6010B Metals (ICP)

| | | | | | |
|---|---|---|---|---|---|
| Analysis Method: | 6010B | Analysis Batch: | 280-263701 | Instrument ID: | MT_026 |
| Prep Method: | 3050B | Prep Batch: | 280-263128 | Lab File ID: | 26a020915.asc |
| Dilution: | 1.0 | | | Initial Weight/Volume: | 1.09 g |
| Analysis Date: | 02/09/2015 1411 | | | Final Weight/Volume: | 100 mL |
| Prep Date: | 02/05/2015 1445 | | | | |

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| Analyte | DryWt Corrected: Y | Result (mg/Kg) | Qualifier | MDL | RL |
|---|---|---|---|---|---|
| Aluminum | | 5580 | X | 1.5 | 4.9 |
| Antimony | | 0.59 | J | 0.37 | 0.59 |
| Arsenic | | 2.1 | | 0.65 | 0.98 |
| Barium | | 58.3 | X | 0.074 | 0.49 |
| Beryllium | | 0.15 | B | 0.032 | 0.20 |
| Boron | | 1.0 | B | 0.96 | 2.0 |
| Cadmium | | 0.075 | B | 0.040 | 0.20 |
| Calcium | | 6010 | X | 13.8 | 49.0 |
| Chromium | | 7.6 | | 0.057 | 0.20 |
| Cobalt | | 7.7 | X | 0.098 | 0.98 |
| Copper | | 15.1 | | 0.21 | 0.98 |
| Iron | | 21900 | X | 3.7 | 4.9 |
| Lead | | 3.7 | | 0.26 | 0.49 |
| Magnesium | | 4340 | | 3.6 | 19.6 |
| Manganese | | 296 | | 0.098 | 0.98 |
| Molybdenum | | 0.25 | U | 0.25 | 2.0 |
| Nickel | | 10.8 | | 0.12 | 3.9 |
| Potassium | | 793 | | 40.1 | 294 |
| Selenium | | 0.84 | U | 0.84 | 0.98 |
| Silicon | | 145 | N J | 5.5 | 9.8 |
| Silver | | 0.16 | U | 0.16 | 0.20 |
| Sodium | | 287 | | 57.8 | 118 |
| Vanadium | | 57.4 | X | 0.092 | 2.0 |
| Zinc | | 48.0 | | 0.39 | 0.98 |

### 7471A Mercury (CVAA)

| | | | | | |
|---|---|---|---|---|---|
| Analysis Method: | 7471A | Analysis Batch: | 280-263638 | Instrument ID: | MT_033 |
| Prep Method: | 7471A | Prep Batch: | 280-263085 | Lab File ID: | 150205aa.txt |
| Dilution: | 1.0 | | | Initial Weight/Volume: | 0.65 g |
| Analysis Date: | 02/05/2015 1511 | | | Final Weight/Volume: | 50 mL |
| Prep Date: | 02/05/2015 1105 | | | | |

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

## Analytical Data

Client: Washington Closure Hanford

Job Number: 280-65030-1
Sdg Number: JP0899

**Client Sample ID:** J1V3R2

Lab Sample ID: 280-65030-11
Client Matrix: Solid

% Moisture: 5.2

Date Sampled: 02/02/2015 0902
Date Received: 02/04/2015 1000

### 6010B Metals (ICP)

| | | | | | |
|---|---|---|---|---|---|
| Analysis Method: | 6010B | Analysis Batch: | 280-263701 | Instrument ID: | MT_026 |
| Prep Method: | 3050B | Prep Batch: | 280-263128 | Lab File ID: | 26a020915.asc |
| Dilution: | 1.0 | | | Initial Weight/Volume: | 1.12 g |
| Analysis Date: | 02/09/2015 1414 | | | Final Weight/Volume: | 100 mL |
| Prep Date: | 02/05/2015 1445 | | | | |

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| Analyte | DryWt Corrected: Y | Result (mg/Kg) | Qualifier | MDL | RL |
|---|---|---|---|---|---|
| Aluminum | | 5000 | X | 1.5 | 4.7 |
| Antimony | | 0.75 | J | 0.36 | 0.57 |
| Arsenic | | 1.8 | | 0.62 | 0.94 |
| Barium | | 63.7 | X | 0.072 | 0.47 |
| Beryllium | | 0.14 | B | 0.031 | 0.19 |
| Boron | | 0.92 | U | 0.92 | 1.9 |
| Cadmium | | 0.074 | B | 0.039 | 0.19 |
| Calcium | | 5950 | X | 13.3 | 47.1 |
| Chromium | | 6.2 | | 0.055 | 0.19 |
| Cobalt | | 8.6 | X | 0.094 | 0.94 |
| Copper | | 14.2 | | 0.20 | 0.94 |
| Iron | | 23700 | X | 3.6 | 4.7 |
| Lead | | 4.1 | | 0.25 | 0.47 |
| Magnesium | | 4720 | | 3.5 | 18.8 |
| Manganese | | 305 | | 0.094 | 0.94 |
| Molybdenum | | 0.24 | U | 0.24 | 1.9 |
| Nickel | | 9.1 | | 0.12 | 3.8 |
| Potassium | | 805 | | 38.6 | 283 |
| Selenium | | 0.81 | U | 0.81 | 0.94 |
| Silicon | | 154 | N J | 5.3 | 9.4 |
| Silver | | 0.15 | U | 0.15 | 0.19 |
| Sodium | | 265 | | 55.6 | 113 |
| Vanadium | | 56.6 | X | 0.089 | 1.9 |
| Zinc | | 48.3 | | 0.37 | 0.94 |

### 7471A Mercury (CVAA)

| | | | | | |
|---|---|---|---|---|---|
| Analysis Method: | 7471A | Analysis Batch: | 280-263638 | Instrument ID: | MT_033 |
| Prep Method: | 7471A | Prep Batch: | 280-263085 | Lab File ID: | 150205aa.txt |
| Dilution: | 1.0 | | | Initial Weight/Volume: | 0.63 g |
| Analysis Date: | 02/05/2015 1514 | | | Final Weight/Volume: | 50 mL |
| Prep Date: | 02/05/2015 1105 | | | | |

| Analyte | DryWt Corrected: Y | Result (mg/Kg) | Qualifier | MDL | RL |
|---|---|---|---|---|---|
| Mercury | | 0.0067 | B | 0.0056 | 0.017 |

Client: Washington Closure Hanford

Job Number: 280-65030-1
Sdg Number: JP0899

**Client Sample ID:** J1V3R3

Lab Sample ID: 280-65030-12
Client Matrix: Solid
% Moisture: 4.1

Date Sampled: 02/02/2015 0910
Date Received: 02/04/2015 1000

**6010B Metals (ICP)**

| | | | | | |
|---|---|---|---|---|---|
| Analysis Method: | 6010B | Analysis Batch: | 280-263701 | Instrument ID: | MT_026 |
| Prep Method: | 3050B | Prep Batch: | 280-263128 | Lab File ID: | 26a020915.asc |
| Dilution: | 1.0 | | | Initial Weight/Volume: | 1.05 g |
| Analysis Date: | 02/09/2015 1417 | | | Final Weight/Volume: | 100 mL |
| Prep Date: | 02/05/2015 1445 | | | | |

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| Analyte | DryWt Corrected: Y | Result (mg/Kg) | Qualifier | MDL | RL |
|---|---|---|---|---|---|
| Aluminum | | 4420 | X | 1.5 | 5.0 |
| Arsenic | | 2.0 | | 0.66 | 0.99 |
| Barium | | 51.2 | X | 0.075 | 0.50 |
| Boron | | 0.97 | U | 0.97 | 2.0 |
| Cadmium | | 0.13 | B | 0.041 | 0.20 |
| Calcium | | 5080 | X | 14.0 | 49.7 |
| Chromium | | 3.9 | | 0.058 | 0.20 |
| Iron | | 26800 | X | 3.8 | 5.0 |
| Magnesium | | 4290 | | 3.7 | 19.9 |
| Manganese | | 372 | | 0.099 | 0.99 |
| Molybdenum | | 0.26 | U | 0.26 | 2.0 |
| Nickel | | 8.8 | | 0.12 | 4.0 |
| Potassium | | 532 | | 40.7 | 298 |
| Selenium | | 0.85 | U | 0.85 | 0.99 |
| Silicon | | 121 | N J | 5.6 | 9.9 |
| Silver | | 0.16 | U | 0.16 | 0.20 |
| Sodium | | 280 | | 58.6 | 119 |
| Zinc | | 47.3 | | 0.40 | 0.99 |

| | | | | | |
|---|---|---|---|---|---|
| Analysis Method: | 6010B | Analysis Batch: | 280-263701 | Instrument ID: | MT_026 |
| Prep Method: | 3050B | Prep Batch: | 280-263128 | Lab File ID: | 26a020915.asc |
| Dilution: | 5.0 | | | Initial Weight/Volume: | 1.05 g |
| Analysis Date: | 02/09/2015 1419 | | | Final Weight/Volume: | 100 mL |
| Prep Date: | 02/05/2015 1445 | | | | |

| Analyte | DryWt Corrected: Y | Result (mg/Kg) | Qualifier | MDL | RL |
|---|---|---|---|---|---|
| Antimony | | 1.9 | B J | 1.9 | 3.0 |
| Beryllium | | 0.20 | B | 0.16 | 0.99 |
| Cobalt | | 11.7 | X | 0.50 | 5.0 |
| Copper | | 19.1 | | 1.1 | 5.0 |
| Lead | | 3.8 | | 1.3 | 2.5 |
| Vanadium | | 90.8 | X | 0.47 | 9.9 |

**7471A Mercury (CVAA)**

| | | | | | |
|---|---|---|---|---|---|
| Analysis Method: | 7471A | Analysis Batch: | 280-263638 | Instrument ID: | MT_033 |
| Prep Method: | 7471A | Prep Batch: | 280-263085 | Lab File ID: | 150205aa.txt |
| Dilution: | 1.0 | | | Initial Weight/Volume: | 0.63 g |
| Analysis Date: | 02/05/2015 1516 | | | Final Weight/Volume: | 50 mL |
| Prep Date: | 02/05/2015 1105 | | | | |

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

Client: Washington Closure Hanford

Job Number: 280-65030-1
Sdg Number: JP0899

**Client Sample ID:** **J1V3R4**

Lab Sample ID: 280-65030-13
Client Matrix: Solid
% Moisture: 3.4

Date Sampled: 02/02/2015 0830
Date Received: 02/04/2015 1000

**6010B Metals (ICP)**

| | | | | | |
|---|---|---|---|---|---|
| Analysis Method: | 6010B | Analysis Batch: | 280-263701 | Instrument ID: | MT_026 |
| Prep Method: | 3050B | Prep Batch: | 280-263128 | Lab File ID: | 26a020915.asc |
| Dilution: | 1.0 | | | Initial Weight/Volume: | 1.17 g |
| Analysis Date: | 02/09/2015 1422 | | | Final Weight/Volume: | 100 mL |
| Prep Date: | 02/05/2015 1445 | | | | |

3/9/15

| Analyte | DryWt Corrected: Y | Result (mg/Kg) | Qualifier | MDL | RL |
|---|---|---|---|---|---|
| Aluminum | | 3580 | X J | 1.4 | 4.4 |
| Antimony | | 0.66 | | 0.34 | 0.53 |
| Arsenic | | 1.5 | | 0.58 | 0.88 |
| Barium | | 35.3 | X | 0.067 | 0.44 |
| Beryllium | | 0.081 | B | 0.029 | 0.18 |
| Boron | | 0.87 | U | 0.87 | 1.8 |
| Cadmium | | 0.045 | B | 0.036 | 0.18 |
| Calcium | | 5630 | X | 12.5 | 44.2 |
| Chromium | | 3.3 | | 0.051 | 0.18 |
| Cobalt | | 7.4 | X | 0.088 | 0.88 |
| Copper | | 15.3 | | 0.19 | 0.88 |
| Iron | | 20900 | X | 3.4 | 4.4 |
| Lead | | 1.7 | | 0.24 | 0.44 |
| Magnesium | | 3200 | | 3.3 | 17.7 |
| Manganese | | 243 | | 0.088 | 0.88 |
| Molybdenum | | 0.23 | U | 0.23 | 1.8 |
| Nickel | | 7.9 | | 0.11 | 3.5 |
| Potassium | | 451 | | 36.3 | 265 |
| Selenium | | 0.76 | U | 0.76 | 0.88 |
| Silicon | | 90.1 | N J | 5.0 | 8.8 |
| Silver | | 0.14 | U | 0.14 | 0.18 |
| Sodium | | 436 | | 52.2 | 106 |
| Vanadium | | 57.2 | X | 0.083 | 1.8 |
| Zinc | | 35.3 | | 0.35 | 0.88 |

**7471A Mercury (CVAA)**

| | | | | | |
|---|---|---|---|---|---|
| Analysis Method: | 7471A | Analysis Batch: | 280-263638 | Instrument ID: | MT_033 |
| Prep Method: | 7471A | Prep Batch: | 280-263085 | Lab File ID: | 150205aa.txt |
| Dilution: | 1.0 | | | Initial Weight/Volume: | 0.64 g |
| Analysis Date: | 02/05/2015 1518 | | | Final Weight/Volume: | 50 mL |
| Prep Date: | 02/05/2015 1105 | | | | |

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

## Appendix 4

## Laboratory Narrative and Chain-of-Custody Documentation

# CASE NARRATIVE

## Client: Washington Closure Hanford

## Project: WASHINGTON CLOSURE HANFORD

## Job Number: 280-65030-1

**SDG #: JP0899**
**SAF#: RC-075**

**Date SDG Closed: February 4, 2015**
**Data Deliverable: 7 Day / Summary**

| CLIENT ID | LAB ID | ANALYSES REQUESTED | ANALYSES PERFORMED |
|---|---|---|---|
| J1V3P2 | 280-65030-1 | 6010/7471/8082/8270/WTPH-D+ | 6010B/7471A/8082/8270C/NWTPH-Dx |
| J1V3P3 | 280-65030-2 | 6010/7471/8082/8270/WTPH-D+ | 6010B/7471A/8082/8270C/NWTPH-Dx |
| J1V3P4 | 280-65030-3 | 6010/7471/8082/8270/WTPH-D+ | 6010B/7471A/8082/8270C/NWTPH-Dx |
| J1V3P5 | 280-65030-4 | 6010/7471/8082/8270/WTPH-D+ | 6010B/7471A/8082/8270C/NWTPH-Dx |
| J1V3P6 | 280-65030-5 | 6010/7471/8082/8270/WTPH-D+ | 6010B/7471A/8082/8270C/NWTPH-Dx |
| J1V3P7 | 280-65030-6 | 6010/7471/8082/8270/WTPH-D+ | 6010B/7471A/8082/8270C/NWTPH-Dx |
| J1V3P8 | 280-65030-7 | 6010/7471/8082/8270/WTPH-D+ | 6010B/7471A/8082/8270C/NWTPH-Dx |
| J1V3P9 | 280-65030-8 | 6010/7471/8082/8270/WTPH-D+ | 6010B/7471A/8082/8270C/NWTPH-Dx |
| J1V3R0 | 280-65030-9 | 6010/7471/8082/8270/WTPH-D+ | 6010B/7471A/8082/8270C/NWTPH-Dx |
| J1V3R1 | 280-65030-10 | 6010/7471/8082/8270/WTPH-D+ | 6010B/7471A/8082/8270C/NWTPH-Dx |
| J1V3R2 | 280-65030-11 | 6010/7471/8082/8270/WTPH-D+ | 6010B/7471A/8082/8270C/NWTPH-Dx |
| J1V3R3 | 280-65030-12 | 6010/7471/8082/8270/WTPH-D+ | 6010B/7471A/8082/8270C/NWTPH-Dx |
| J1V3R4 | 280-65030-13 | 6010/7471/8082/8270/WTPH-D+ | 6010B/7471A/8082/8270C/NWTPH-Dx |

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 2/4/2015 10:00 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperatures of the 3 coolers at receipt time were 0.8° C, 3.4° C and 4.4° C.

**GC/MS SEMIVOLATILES - SW846 8270C**
Low levels of Dimethyl phthalate, a common laboratory contaminant, are present in the method blank associated with batch 280-263016. Because the concentration in the method blank is not present at a level greater than the reporting limit, corrective action is deemed unnecessary. Associated sample results present above the MDL and/or RL have been flagged with a "B".

No other anomalies were encountered.

**GC SEMIVOLATILES - SW846 8082 - PCBs**
No anomalies were encountered.

**GC SEMIVOLATILES - NWTPH-Dx - DRO**
No anomalies were encountered.

**TOTAL METALS - SW846 6010B/7471A**
Serial dilution of a digestate in batch 280-263128 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. Samples J1V3P5 and J1V3R3 required a 5X dilution prior to the analysis of Antimony, Beryllium, Cobalt, Copper, Lead and Vanadium to minimize the interference caused by Titanium concentrations greater than the linear range. The reporting limits have been adjusted relative to the dilution required.

Low levels of Barium, Calcium and Magnesium are present in the method blank associated with batch 280-263128. Because the concentrations in the method blank are not present at levels greater than half the reporting limit, corrective action is deemed unnecessary.

Silicon was recovered outside the control limits, biased low, in the LCS associated with batch 280-263128 and in the Matrix Spike performed on sample J1V3P2 in batch 280-263128. The associated sample results have been flagged "N". Silicon has been identified as a poor performing element when analyzed using this method and has a history of reacting inconsistently; therefore, corrective action is not initiated. Data are reported as is.

It can be noted that the sample amount was greater than four times the spike amount for Aluminum, Iron and Manganese in the Matrix Spike performed on sample J1V3P2; therefore, control limits are not applicable.

The duplicate analysis of sample J1V3P2 exhibited RPD data outside the control limits for Boron, and the associated sample result has 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-075-465



| | | | |
|---|---|---|---|
| Collector: STOWE, QG | Company Contact: Joan Kessner | Telephone No.: 375-4688 | Project Coordinator: KESSNER, JH |
| Project Designation: 100-D/DR Field Remediation | Sampling Location: 100-D-75:1 (excavation, verification) | | SAF No.: RC-075 |
| Ice Chest No.: WCH-08-030 | Field Logbook No.: EL-1662-03 | COA: 01D7512000 | Method of Shipment: Commercial Carrier \ Fed Ex |
| Shipped To: TestAmerica Denver | Offsite Property No.: A131318 | | Bill of Lading/Air Bill No.: See OSPC |

Price Code: 8B

Data Turnaround: 7 days

Other Labs Shipped To: N/A

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 | 125mL | |
| Sample Analysis | See item (1) in Special Instructions | PCBs - 8082 | Semi-VOA - 8270 (TCL) | TPH-Diesel Range - WTPH-D + | |

280-65030 Chain of Custody

| Sample No. | Matrix | Sample Date | Sample Time | | | | |
|---|---|---|---|---|---|---|---|
| J1V3P2 | SOIL | 02/02/15 | 0815 | X | X | X | X |
| J1V3P3 | SOIL | 02/02/15 | 0819 | X | X | X | X |
| J1V3P4 | SOIL | 02/02/15 | 0823 | X | X | X | X |
| J1V3P5 | SOIL | 02/02/15 | 0830 | X | X | X | X |
| J1V3P6 | SOIL | 02/02/15 | 0859 | X | X | X | X |

## CHAIN OF POSSESSION

| Relinquished By/Removed From | Date/Time | Received By/Stored In | Date/Time |
|---|---|---|---|
| Quincy Stowe | 2-2-15 0922 | C. Martinez / C. Martinez | 02/02/15 0922 |
| C. Martinez / C. Martinez | 02/02/15 1600 | C. Bingham | 2-2-15 1600 |
| C. Bingham | 2-2-15 1630 | 1060 Battelle, fridge #1A | 2-2-15 1630 |
| 1060 Battelle, fridge #1A | 2-3-15 0715 | C. Bingham | 2-3-15 0715 |
| C. Bingham WCH | 2-3-15 0720 | Fed Ex | 2-3-15 0720 |
| ~~[signature] (AM)~~ | ~~04Feb15 1000~~ | [signature] | 1000 04Feb15 |

Sign/Print Names

## 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}

3.9, 2.9, 0.3 IR 5 to 15 04Feb15
Transferred by (AM)

REVIEWED BY K. Woodvineman DATE 2-3-15

JP0899

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

WCH-EE-011

# Washington Closure Hanford

# CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

RC-075-465



| | | | |
|---|---|---|---|
| Collector: STOWE, QG | Company Contact: Joan Kessner | Telephone No.: 375-4688 | Project Coordinator: KESSNER, JH |
| Project Designation: 100-D/DR Field Remediation | Sampling Location: 100-D-75:1 (excavation, verification) | | SAF No.: RC-075 |
| Ice Chest No.: WCH-08-030 | Field Logbook No.: EL-1662-03 | COA: 01D7512000 | Method of Shipment: Commercial Carrier \ Fed Ex |
| Shipped To: TestAmerica Denver | Offsite Property No.: A131318 | | Bill of Lading/Air Bill No.: See OSRC |

Price Code: 8B

Data Turnaround: 7 days

Other Labs Shipped To: N/A

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 | 125mL | | | | | | | | | |
| Sample Analysis | See item (1) in Special Instructions | PCBs - 8082 | Semi-VOA - 8270 (TCL) | TPH-Diesel Range - WTPH-D + | | | | | | | | | |

| Sample No. | Matrix | Sample Date | Sample Time | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| J1V3P7 | SOIL | 02/02/15 | 0855 | X | X | X | X | | | | | | |
| J1V3P8 | SOIL | 02/02/15 | 0837 | X | X | X | X | | | | | | |
| J1V3P9 | SOIL | 02/02/15 | 0857 | X | X | X | X | | | | | | |
| J1V3R0 | SOIL | 02/02/15 | 0847 | X | X | X | X | | | | | | |
| J1V3R1 | SOIL | 02/02/15 | 0843 | X | X | X | X | | | | | | |

## CHAIN OF POSSESSION

| Relinquished By/Removed From | Date/Time | Received By/Stored In | Date/Time |
|---|---|---|---|
| Quincy Stowe | 2-2-15 0922 | C. Martinez/C. Martinez | 02/02/15 0922 |
| C. Martinez/C. Martinez | 02/02/15 1600 | C. Bingham | 2-2-15 1600 |
| C. Bingham | 2-2-15 1630 | 1060 Battelle fridge #1A | 2-2-15 1630 |
| 1060 Battelle fridge #1A | 2-3-15 0715 | C. Bingham | 2-3-15 0715 |
| C. Bingham WCH | 2-3-15 0720 | Fed Ex | 2-3-15 0720 |
| | | [signature] | 1000 04FEB15 |

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 K Wood Via email DATE 2-3-15

JP0899

WCH-EE-011

# Washington Closure Hanford

# CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

RC-075-465



| | | | |
|---|---|---|---|
| Collector: STOWE, QG | 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-75:1 (excavation, verification) | | SAF No.: RC-075 |
| Ice Chest No.: WCH-08-030 | Field Logbook No.: EL-1662-03 | COA: 01D7512000 | Method of Shipment: Commercial Carrier / Fed Ex |
| Shipped To: TestAmerica Denver | Offsite Property No.: A13318 | | Bill of Lading/Air Bill No.: See OSPC |
| Other Labs Shipped To: N/A | | | |

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 | 125mL | | | | | | |
| | | | | Sample Analysis: See item (1) in Special Instructions | PCBs - 8082 | Semi-VOA - 8270 (TCL) | TPH-Diesel Range - WTPH-D + | | | | | | |
| J1V8R2 | SOIL | 02/02/15 | 0902 | X | X | X | X | | | | | | |
| J1V8R3 | SOIL | 02/02/15 | 0910 | X | X | X | X | | | | | | |
| J1V3R4 | SOIL | 02/02/15 | 0830 | X | X | X | X | | | | | | |

CHAIN OF POSSESSION — Sign/Print Names

| Relinquished By/Removed From | Date/Time | Received By/Stored In | Date/Time |
|---|---|---|---|
| Quincy Stowe | 2-2-15 0922 | C. Martinez / C. Martinez | 02/02/15 0922 |
| C. Martinez / C. Martinez | 02/02/15 1600 | C. Bingham | 2-2-15 1600 |
| C. Bingham | 2-2-15 1630 | 1060 Battelle fridge #1A | 2-2-15 1630 |
| 1060 Battelle fridge #1A | 2-3-15 0715 | C. Bingham | 2-3-15 0715 |
| C. Bingham WCH | 2-3-15 0700 | Fed Ex | 2-3-15 0700 |
| | | | 04Feb15 |

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. Wardvincent DATE 2-3-15

JP0899

WCH-EE-011

## Appendix 5

## Data Validation Supporting Documentation

# INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

| VALIDATION LEVEL: | A | B | C | D | E |
|---|---|---|---|---|---|
| PROJECT: | 100-D-7511 | | DATA PACKAGE: | JP0899 | |
| VALIDATOR: | ELR | LAB: | TAC | DATE: | 3/7/13 |
| | | | SDG: | JP0829 | |

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

| SAMPLES/MATRIX | | | | | |
|---|---|---|---|---|---|
| J1V3P2 | J1V3P3 | J1V3P4 | J1V3P5 | J1V3P6 | J1V3P7 |
| J1V3P8 | J1V3P9 | J1V3R0 | J1V3R1 | J1V3R2 | J1V3R3 |
| J1V3R4 | | | | | |
| | | | | | |
| | | | | | Soil |

## 1. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE

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

Comments:

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

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

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

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

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

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

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

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

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

Comments:

# INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

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

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

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

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

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

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

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

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

Comments:

no FB

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

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

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

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

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

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

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

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

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

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

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

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

Comments: LCS - silicon (97%) - J all

MS - antimony (55%) silicon (127%) - 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: 280-65030-1
Sdg Number: JP0899

**Method Blank - Batch: 280-263128**

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

| | | | | | |
|---|---|---|---|---|---|
| Lab Sample ID: | MB 280-263128/1-A | Analysis Batch: | 280-263701 | Instrument ID: | MT_026 |
| Client Matrix: | Solid | Prep Batch: | 280-263128 | Lab File ID: | 26a020915.asc |
| Dilution: | 1.0 | Leach Batch: | N/A | Initial Weight/Volume: | 1 g |
| Analysis Date: | 02/09/2015 1322 | Units: | mg/Kg | Final Weight/Volume: | 100 mL |
| Prep Date: | 02/05/2015 1445 | | | | |
| 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 | 0.230 | B | 0.076 | 0.50 |
| Beryllium | 0.033 | U | 0.033 | 0.20 |
| Boron | 0.98 | U | 0.98 | 2.0 |
| Cadmium | 0.041 | U | 0.041 | 0.20 |
| Calcium | 19.03 | B | 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 | 5.46 | B | 3.7 | 20.0 |
| Manganese | 0.10 | U | 0.10 | 1.0 |
| Molybdenum | 0.26 | U | 0.26 | 2.0 |
| Nickel | 0.12 | U | 0.12 | 4.0 |
| Potassium | 41.0 | U | 41.0 | 300 |
| Selenium | 0.86 | U | 0.86 | 1.0 |
| Silicon | 5.7 | U | 5.7 | 10.0 |
| Silver | 0.16 | U | 0.16 | 0.20 |
| Sodium | 59.0 | U | 59.0 | 120 |
| Vanadium | 0.094 | U | 0.094 | 2.0 |
| Zinc | 0.40 | U | 0.40 | 1.0 |

## Quality Control Results

Client: Washington Closure Hanford

Job Number: 280-65030-1
Sdg Number: JP0899

**Lab Control Sample - Batch: 280-263128**

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

| | | | | | |
|---|---|---|---|---|---|
| Lab Sample ID: | LCS 280-263128/2-A | Analysis Batch: | 280-263701 | Instrument ID: | MT_026 |
| Client Matrix: | Solid | Prep Batch: | 280-263128 | Lab File ID: | 26a020915.asc |
| Dilution: | 1.0 | Leach Batch: | N/A | Initial Weight/Volume: | 1 g |
| Analysis Date: | 02/09/2015 1325 | Units: | mg/Kg | Final Weight/Volume: | 100 mL |
| *Prep Date:* | *02/05/2015 1445* | | | | |
| Leach Date: | N/A | | | | |

| Analyte | Spike Amount | Result | % Rec. | Limit | Qual |
|---|---|---|---|---|---|
| Aluminum | 200 | 200.1 | 100 | 82 - 116 | |
| Antimony | 50.0 | 51.37 | 103 | 82 - 110 | |
| Arsenic | 100 | 98.41 | 98 | 85 - 110 | |
| Barium | 200 | 198.0 | 99 | 87 - 112 | |
| Beryllium | 5.00 | 4.98 | 100 | 84 - 114 | |
| Boron | 100 | 98.21 | 98 | 80 - 120 | |
| Cadmium | *10.0* | *8.90* | *89* | *87 - 110* | |
| Calcium | 5000 | 4986 | 100 | 82 - 114 | |
| Chromium | 20.0 | 20.11 | 101 | 84 - 114 | |
| Cobalt | 50.0 | 49.22 | 98 | 87 - 110 | |
| Copper | 25.0 | 24.75 | 99 | 88 - 110 | |
| Iron | 100 | 103.0 | 103 | 87 - 120 | |
| Lead | 50.0 | 50.37 | 101 | 86 - 110 | |
| Magnesium | 5000 | 4978 | 100 | 90 - 110 | |
| Manganese | 50.0 | 49.57 | 99 | 88 - 110 | |
| Molybdenum | 100 | 99.96 | 100 | 86 - 110 | |
| Nickel | 50.0 | 48.88 | 98 | 87 - 110 | |
| Potassium | 5000 | 4998 | 100 | 89 - 110 | |
| Selenium | 200 | 203.3 | 102 | 83 - 110 | |
| Silicon | 1000 | 91.30 | 9 | 10 - 70 | N |
| Silver | 5.00 | 5.20 | 104 | 87 - 114 | |
| Sodium | 5000 | 5121 | 102 | 90 - 112 | |
| Vanadium | 50.0 | 50.08 | 100 | 88 - 110 | |
| Zinc | 50.0 | 50.08 | 100 | 76 - 114 | |

## Quality Control Results

Client: Washington Closure Hanford

Job Number: 280-65030-1
Sdg Number: JP0899

**Matrix Spike - Batch: 280-263128**

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

| | | | | | |
|---|---|---|---|---|---|
| Lab Sample ID: | 280-65030-1 | Analysis Batch: | 280-263701 | Instrument ID: | MT_026 |
| Client Matrix: | Solid | Prep Batch: | 280-263128 | Lab File ID: | 26a020915.asc |
| Dilution: | 1.0 | Leach Batch: | N/A | Initial Weight/Volume: | 1.13 g |
| Analysis Date: | 02/09/2015 1335 | Units: | mg/Kg | Final Weight/Volume: | 100 mL |
| Prep Date: | 02/05/2015 1445 | | | | |
| Leach Date: | N/A | | | | |

| Analyte | Sample Result/Qual | | Spike Amount | Result | % Rec. | Limit | Qual |
|---|---|---|---|---|---|---|---|
| Aluminum | 6370 | | 195 | 8254 | 970 | 50 - 200 | 4 |
| Antimony | 0.51 | B | 48.7 | 27.39 | 55 | 20 - 200 | |
| Arsenic | 3.8 | | 97.3 | 86.98 | 85 | 76 - 111 | |
| Barium | 61.1 | | 195 | 224.6 | 84 | 52 - 159 | |
| Beryllium | 0.21 | B | 4.87 | 4.46 | 87 | 72 - 105 | |
| Boron | 1.4 | B | 97.3 | 83.76 | 85 | 80 - 120 | |
| Cadmium | 0.091 | B | 9.73 | 7.83 | 80 | 40 - 130 | |
| Calcium | 7700 | | 4870 | 12950 | 108 | 43 - 165 | |
| Chromium | 13.3 | | 19.5 | 29.96 | 86 | 70 - 200 | |
| Cobalt | 7.0 | | 48.7 | 48.68 | 86 | 72 - 106 | |
| Copper | 15.8 | | 24.3 | 37.26 | 88 | 37 - 187 | |
| Iron | 20000 | | 97.3 | 20740 | 757 | 70 - 200 | 4 |
| Lead | 4.4 | | 48.7 | 46.60 | 87 | 70 - 200 | |
| Magnesium | 4920 | | 4870 | 9443 | 93 | 64 - 145 | |
| Manganese | 332 | | 48.7 | 357.2 | 52 | 40 - 200 | 4 |
| Molybdenum | 0.28 | U | 97.3 | 85.28 | 88 | 75 - 103 | |
| Nickel | 15.5 | | 48.7 | 53.77 | 79 | 61 - 126 | |
| Potassium | 900 | | 4870 | 5410 | 93 | 56 - 172 | |
| Selenium | 0.94 | U | 195 | 171.6 | 88 | 76 - 104 | |
| Silicon | 182 | | 973 | 301.1 | 12 | 20 - 200 | N |
| Silver | 0.17 | U | 4.87 | 4.50 | 92 | 75 - 141 | |
| Sodium | 204 | | 4870 | 4851 | 96 | 78 - 111 | |
| Vanadium | 47.2 | | 48.7 | 95.86 | 100 | 50 - 169 | |
| Zinc | 37.2 | | 48.7 | 80.78 | 90 | 70 - 200 | |

## Quality Control Results

Client: Washington Closure Hanford

Job Number: 280-65030-1
Sdg Number: JP0899

**Duplicate - Batch: 280-263128**

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

| | | | | | |
|---|---|---|---|---|---|
| Lab Sample ID: | 280-65030-1 | Analysis Batch: | 280-263701 | Instrument ID: | MT_026 |
| Client Matrix: | Solid | Prep Batch: | 280-263128 | Lab File ID: | 26a020915.asc |
| Dilution: | 1.0 | Leach Batch: | N/A | Initial Weight/Volume: | 1.16 g |
| Analysis Date: | 02/09/2015 1333 | Units: | mg/Kg | Final Weight/Volume: | 100 mL |
| Prep Date: | 02/05/2015 1445 | | | | |
| Leach Date: | N/A | | | | |

| Analyte | Sample Result/Qual | | Result | RPD | Limit | Qual |
|---|---|---|---|---|---|---|
| Aluminum | 6370 | | 6328 | 0.6 | 40 | |
| Antimony | 0.51 | B | 0.36 | NC | 40 | U |
| Arsenic | 3.8 | | 3.60 | 5 | 30 | |
| Barium | 61.1 | | 55.11 | 10 | 30 | |
| Beryllium | 0.21 | B | 0.222 | 6 | 30 | |
| *Boron* | 1.4 | B | 0.949 | 38 | 30 | B M |
| Cadmium | 0.091 | B | 0.0910 | 0.5 | 30 | B |
| Calcium | 7700 | | 7377 | 4 | 30 | |
| Chromium | 13.3 | | 11.42 | 15 | 40 | |
| Cobalt | 7.0 | | 6.59 | 7 | 30 | |
| Copper | 15.8 | | 16.11 | 2 | 30 | |
| Iron | 20000 | | 19380 | 3 | 40 | |
| Lead | 4.4 | | 3.99 | 9 | 40 | |
| Magnesium | 4920 | | 4464 | 10 | 30 | |
| Manganese | 332 | | 281.0 | 17 | 40 | |
| Molybdenum | 0.28 | U | 0.25 | NC | 30 | U |
| Nickel | 15.5 | | 12.50 | 21 | 30 | |
| Potassium | 900 | | 884.9 | 2 | 40 | |
| Selenium | 0.94 | U | 0.82 | NC | 30 | U |
| Silicon | 182 | | 158.5 | 14 | 40 | N |
| Silver | 0.17 | U | 0.15 | NC | 30 | U |
| Sodium | 204 | | 214.8 | 5 | 30 | |
| Vanadium | 47.2 | | 47.77 | 1 | 30 | |
| Zinc | 37.2 | | 36.94 | 0.7 | 40 | |

Client: Washington Closure Hanford

Job Number: 280-65030-1
Sdg Number: JP0899

**Method Blank - Batch: 280-263085**

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

| | | | | | |
|---|---|---|---|---|---|
| Lab Sample ID: | MB 280-263085/1-A | Analysis Batch: | 280-263638 | Instrument ID: | MT_033 |
| Client Matrix: | Solid | Prep Batch: | 280-263085 | Lab File ID: | 150205aa.txt |
| Dilution: | 1.0 | Leach Batch: | N/A | Initial Weight/Volume: | 0.60 g |
| Analysis Date: | 02/05/2015 1437 | Units: | mg/Kg | Final Weight/Volume: | 50 mL |
| Prep Date: | 02/05/2015 1105 | | | | |
| Leach Date: | N/A | | | | |

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

**Lab Control Sample - Batch: 280-263085**

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

| | | | | | |
|---|---|---|---|---|---|
| Lab Sample ID: | LCS 280-263085/2-A | Analysis Batch: | 280-263638 | Instrument ID: | MT_033 |
| Client Matrix: | Solid | Prep Batch: | 280-263085 | Lab File ID: | 150205aa.txt |
| Dilution: | 1.0 | Leach Batch: | N/A | Initial Weight/Volume: | 0.60 g |
| Analysis Date: | 02/05/2015 1439 | Units: | mg/Kg | Final Weight/Volume: | 50 mL |
| Prep Date: | 02/05/2015 1105 | | | | |
| Leach Date: | N/A | | | | |

| Analyte | Spike Amount | Result | % Rec. | Limit | Qual |
|---|---|---|---|---|---|
| Mercury | 0.417 | 0.428 | 103 | 87 - 111 | |

**Matrix Spike - Batch: 280-263085**

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

| | | | | | |
|---|---|---|---|---|---|
| Lab Sample ID: | 280-65030-1 | Analysis Batch: | 280-263638 | Instrument ID: | MT_033 |
| Client Matrix: | Solid | Prep Batch: | 280-263085 | Lab File ID: | 150205aa.txt |
| Dilution: | 1.0 | Leach Batch: | N/A | Initial Weight/Volume: | 0.64 g |
| Analysis Date: | 02/05/2015 1446 | Units: | mg/Kg | Final Weight/Volume: | 50 mL |
| Prep Date: | 02/05/2015 1105 | | | | |
| Leach Date: | N/A | | | | |

| Analyte | Sample Result/Qual | | Spike Amount | Result | % Rec. | Limit | Qual |
|---|---|---|---|---|---|---|---|
| Mercury | 0.0057 | U | 0.430 | 0.454 | 106 | 87 - 111 | |

## Quality Control Results

Client: Washington Closure Hanford

Job Number: 280-65030-1
Sdg Number: JP0899

**Duplicate - Batch: 280-263085**

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

| | | | | | |
|---|---|---|---|---|---|
| Lab Sample ID: | 280-65030-1 | Analysis Batch: | 280-263638 | Instrument ID: | MT_033 |
| Client Matrix: | Solid | Prep Batch: | 280-263085 | Lab File ID: | 150205aa.txt |
| Dilution: | 1.0 | Leach Batch: | N/A | Initial Weight/Volume: | 0.64 g |
| Analysis Date: | 02/05/2015 1444 | Units: | mg/Kg | Final Weight/Volume: | 50 mL |
| Prep Date: | 02/05/2015 1105 | | | | |
| Leach Date: | N/A | | | | |

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

Date: 9 March 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-75:1
Subject: PCB - Data Package No. JP0899-TAL

## INTRODUCTION

This memo presents the results of data validation on Data Package No. JP0899 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 |
|---|---|---|---|---|
| J1V3P2 | 2/2/15 | Soil | C | See note 1 |
| J1V3P3 | 2/2/15 | Soil | C | See note 1 |
| J1V3P4 | 2/2/15 | Soil | C | See note 1 |
| J1V3P5 | 2/2/15 | Soil | C | See note 1 |
| J1V3P6 | 2/2/15 | Soil | C | See note 1 |
| J1V3P7 | 2/2/15 | Soil | C | See note 1 |
| J1V3P8 | 2/2/15 | Soil | C | See note 1 |
| J1V3P9 | 2/2/15 | Soil | C | See note 1 |
| J1V3R0 | 2/2/15 | Soil | C | See note 1 |
| J1V3R1 | 2/2/15 | Soil | C | See note 1 |
| J1V3R2 | 2/2/15 | Soil | C | See note 1 |
| J1V3R3 | 2/2/15 | Soil | C | See note 1 |
| J1V3R4 | 2/2/15 | Soil | C | See note 1 |

1 – PCBs by 8082.

Data validation was conducted in accordance with the Washington Closure Hanford (WCH) validation statement of work and the 100 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**

Holding times are not applicable for PCB analysis.

- **Method Blank**

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

All method blank results were acceptable.

Field Blanks

No field blanks were submitted for analysis.

- **Accuracy**

Matrix Spike & Laboratory Control Sample

Matrix spike (MS) and laboratory control sample (LCS) analyses are used to assess the analytical accuracy of the reported data. The matrix spike is used to assess the effect of the matrix on the ability to accurately quantify sample concentrations. Recoveries must fall within the range of 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.

All accuracy results were acceptable.

Surrogate Recovery

The analysis of surrogate compounds provides a measure of performance for individual samples. Matrix-specific surrogate compound recovery control windows have been established by the laboratory. When a surrogate compound recovery is outside the control window, all positively identified target compounds associated with the

unacceptable surrogate recoveries are qualified as estimates and flagged "J". Non-detected compounds with surrogate recoveries less than the lower control limit are qualified as having an estimated detection limit and flagged "UJ". Non-detected compounds with surrogate recoveries above the upper control limit require no qualification.

All surrogate results were acceptable.

- **Precision**

Matrix Spike/Matrix Spike Duplicate Samples

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

All precision results were acceptable.

Field Duplicate Samples

One set of field duplicates (J1V3P5/J1V3R4) were submitted for analysis. Field duplicates are compared using the same criteria as for laboratory duplicates. All field duplicate results were acceptable.

- **Analytical Detection Levels**

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

- **Completeness**

*Data Package No. JP0899 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 procedures herein are as follows:

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

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

J - Indicates the compound or analyte was analyzed for and detected. Due to a minor QC deficiency identified during the data validation, the associated quantitation limit is an estimate.

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

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

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

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

## Appendix 2

## Summary of Data Qualification

PCB DATA QUALIFICATION SUMMARY*

| SDG: JP0899 | REVIEWER: ELR | Project: 100-D-75:1 | PAGE_1_OF_1 |
|---|---|---|---|
| COMMENTS: No qualifiers assigned | | | |

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

## Appendix 3

## Annotated Laboratory Reports

## Analytical Data

Client: Washington Closure Hanford

Job Number: 280-65030-1
Sdg Number: JP0899

**Client Sample ID:** **J1V3P2**

Lab Sample ID: 280-65030-1
Client Matrix: Solid
% Moisture: 9.1

Date Sampled: 02/02/2015 0815
Date Received: 02/04/2015 1000

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

| | | | | | |
|---|---|---|---|---|---|
| Analysis Method: | 8082 | Analysis Batch: | 280-263251 | Instrument ID: | SGC_W |
| Prep Method: | 3550C | Prep Batch: | 280-263043 | Initial Weight/Volume: | 30.0 g |
| Dilution: | 1.0 | | | Final Weight/Volume: | 5 mL |
| Analysis Date: | 02/06/2015 1325 | | | Injection Volume: | 1 uL |
| Prep Date: | 02/04/2015 2130 | | | Result Type: | PRIMARY |

| Analyte | DryWt Corrected: Y | Result (ug/Kg) | Qualifier | MDL | RL |
|---|---|---|---|---|---|
| Aroclor 1016 | | 3.0 | U | 3.0 | 11 |
| Aroclor 1221 | | 8.8 | U | 8.8 | 18 |
| Aroclor 1232 | | 2.2 | U | 2.2 | 11 |
| Aroclor 1242 | | 5.1 | U | 5.1 | 11 |
| Aroclor 1248 | | 5.1 | U | 5.1 | 11 |
| Aroclor 1254 | | 2.9 | U | 2.9 | 11 |
| Aroclor 1260 | | 2.9 | U | 2.9 | 11 |

| Surrogate | %Rec | Qualifier | Acceptance Limits |
|---|---|---|---|
| Decachlorobiphenyl | 91 | | 59 - 130 |
| Tetrachloro-m-xylene | 85 | | 53 - 128 |

3/8/15

## Analytical Data

Client: Washington Closure Hanford

Job Number: 280-65030-1
Sdg Number: JP0899

**Client Sample ID:** **J1V3P3**

Lab Sample ID: 280-65030-2
Client Matrix: Solid

% Moisture: 9.5

Date Sampled: 02/02/2015 0819
Date Received: 02/04/2015 1000

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

| | | | | | |
|---|---|---|---|---|---|
| Analysis Method: | 8082 | Analysis Batch: | 280-263251 | Instrument ID: | SGC_W |
| Prep Method: | 3550C | Prep Batch: | 280-263043 | Initial Weight/Volume: | 30.5 g |
| Dilution: | 1.0 | | | Final Weight/Volume: | 5 mL |
| Analysis Date: | 02/06/2015 1349 | | | Injection Volume: | 1 uL |
| Prep Date: | 02/04/2015 2130 | | | Result Type: | PRIMARY |

| Analyte | DryWt Corrected: Y | Result (ug/Kg) | Qualifier | MDL | RL |
|---|---|---|---|---|---|
| Aroclor 1016 | | 3.0 | U | 3.0 | 11 |
| Aroclor 1221 | | 8.7 | U | 8.7 | 18 |
| Aroclor 1232 | | 2.2 | U | 2.2 | 11 |
| Aroclor 1242 | | 5.1 | U | 5.1 | 11 |
| Aroclor 1248 | | 5.1 | U | 5.1 | 11 |
| Aroclor 1254 | | 2.8 | U | 2.8 | 11 |
| Aroclor 1260 | | 2.8 | U | 2.8 | 11 |

| Surrogate | %Rec | Qualifier | Acceptance Limits |
|---|---|---|---|
| Decachlorobiphenyl | 85 | | 59 - 130 |
| Tetrachloro-m-xylene | 84 | | 53 - 128 |

3/8/15

## Analytical Data

Client: Washington Closure Hanford

Job Number: 280-65030-1
Sdg Number: JP0899

**Client Sample ID:** J1V3P4

Lab Sample ID: 280-65030-3
Client Matrix: Solid

% Moisture: 6.7

Date Sampled: 02/02/2015 0823
Date Received: 02/04/2015 1000

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

| | | | | | |
|---|---|---|---|---|---|
| Analysis Method: | 8082 | Analysis Batch: | 280-263251 | Instrument ID: | SGC_W |
| Prep Method: | 3550C | Prep Batch: | 280-263043 | Initial Weight/Volume: | 30.8 g |
| Dilution: | 1.0 | | | Final Weight/Volume: | 5 mL |
| Analysis Date: | 02/06/2015 1412 | | | Injection Volume: | 1 uL |
| Prep Date: | 02/04/2015 2130 | | | Result Type: | PRIMARY |

| Analyte | DryWt Corrected: Y | Result (ug/Kg) | Qualifier | MDL | RL |
|---|---|---|---|---|---|
| Aroclor 1016 | | 2.9 | U | 2.9 | 10 |
| Aroclor 1221 | | 8.4 | U | 8.4 | 17 |
| 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 | | 46 | | 2.7 | 10 |

| Surrogate | %Rec | Qualifier | Acceptance Limits |
|---|---|---|---|
| Decachlorobiphenyl | 73 | | 59 - 130 |
| Tetrachloro-m-xylene | 81 | | 53 - 128 |

3/8/15

## Analytical Data

Client: Washington Closure Hanford

Job Number: 280-65030-1
Sdg Number: JP0899

**Client Sample ID:** **J1V3P5**

Lab Sample ID: 280-65030-4
Client Matrix: Solid

% Moisture: 3.4

Date Sampled: 02/02/2015 0830
Date Received: 02/04/2015 1000

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

| | | | | | |
|---|---|---|---|---|---|
| Analysis Method: | 8082 | Analysis Batch: | 280-263251 | Instrument ID: | SGC_W |
| Prep Method: | 3550C | Prep Batch: | 280-263043 | Initial Weight/Volume: | 31.2 g |
| Dilution: | 1.0 | | | Final Weight/Volume: | 5 mL |
| Analysis Date:. | 02/06/2015 1435 | | | Injection Volume: | 1 uL |
| Prep Date: | 02/04/2015 2130 | | | Result Type: | PRIMARY |

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

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

3/8/15

## Analytical Data

Client: Washington Closure Hanford

Job Number: 280-65030-1
Sdg Number: JP0899

**Client Sample ID:** **J1V3P6**

Lab Sample ID: 280-65030-5
Client Matrix: Solid

% Moisture: 17.7

Date Sampled: 02/02/2015 0859
Date Received: 02/04/2015 1000

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

| | | | | | |
|---|---|---|---|---|---|
| Analysis Method: | 8082 | Analysis Batch: | 280-263251 | Instrument ID: | SGC_W |
| Prep Method: | 3550C | Prep Batch: | 280-263043 | Initial Weight/Volume: | 30.8 g |
| Dilution: | 1.0 | | | Final Weight/Volume: | 5 mL |
| Analysis Date: | 02/06/2015 1459 | | | Injection Volume: | 1 uL |
| Prep Date: | 02/04/2015 2130 | | | Result Type: | PRIMARY |

| Analyte | DryWt Corrected: Y | Result (ug/Kg) | Qualifier | MDL | RL |
|---|---|---|---|---|---|
| Aroclor 1016 | | 3.3 | U | 3.3 | 12 |
| Aroclor 1221 | | 9.5 | U | 9.5 | 20 |
| Aroclor 1232 | | 2.4 | U | 2.4 | 12 |
| Aroclor 1242 | | 5.5 | U | 5.5 | 12 |
| Aroclor 1248 | | 5.5 | U | 5.5 | 12 |
| Aroclor 1254 | | 3.1 | U | 3.1 | 12 |
| Aroclor 1260 | | 3.1 | U | 3.1 | 12 |

| Surrogate | %Rec | Qualifier | Acceptance Limits |
|---|---|---|---|
| Decachlorobiphenyl | 88 | | 59 - 130 |
| Tetrachloro-m-xylene | 83 | | 53 - 128 |

3/8/15

## Analytical Data

Client: Washington Closure Hanford

Job Number: 280-65030-1
Sdg Number: JP0899

**Client Sample ID:** J1V3P7

Lab Sample ID: 280-65030-6
Client Matrix: Solid

% Moisture: 13.9

Date Sampled: 02/02/2015 0855
Date Received: 02/04/2015 1000

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

| | | | | | |
|---|---|---|---|---|---|
| Analysis Method: | 8082 | Analysis Batch: | 280-263251 | Instrument ID: | SGC_W |
| Prep Method: | 3550C | Prep Batch: | 280-263043 | Initial Weight/Volume: | 30.8 g |
| Dilution: | 1.0 | | | Final Weight/Volume: | 5 mL |
| Analysis Date: | 02/06/2015 1522 | | | Injection Volume: | 1 uL |
| Prep Date: | 02/04/2015 2130 | | | Result Type: | PRIMARY |

| Analyte | DryWt Corrected: Y | Result (ug/Kg) | Qualifier | MDL | RL |
|---|---|---|---|---|---|
| Aroclor 1016 | | 3.1 | U | 3.1 | 11 |
| Aroclor 1221 | | 9.1 | U | 9.1 | 19 |
| Aroclor 1232 | | 2.3 | U | 2.3 | 11 |
| Aroclor 1242 | | 5.3 | U | 5.3 | 11 |
| Aroclor 1248 | | 5.3 | U | 5.3 | 11 |
| Aroclor 1254 | | 2.9 | U | 2.9 | 11 |
| Aroclor 1260 | | 2.9 | U | 2.9 | 11 |

| Surrogate | %Rec | Qualifier | Acceptance Limits |
|---|---|---|---|
| Decachlorobiphenyl | 90 | | 59 - 130 |
| Tetrachloro-m-xylene | 86 | | 53 - 128 |

3/8/15

## Analytical Data

Client: Washington Closure Hanford

Job Number: 280-65030-1
Sdg Number: JP0899

**Client Sample ID:** **J1V3P8**

Lab Sample ID: 280-65030-7
Client Matrix: Solid

% Moisture: 7.2

Date Sampled: 02/02/2015 0837
Date Received: 02/04/2015 1000

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

| | | | | | |
|---|---|---|---|---|---|
| Analysis Method: | 8082 | Analysis Batch: | 280-263251 | Instrument ID: | SGC_W |
| Prep Method: | 3550C | Prep Batch: | 280-263043 | Initial Weight/Volume: | 31.4 g |
| Dilution: | 1.0 | | | Final Weight/Volume: | 5 mL |
| Analysis Date: | 02/06/2015 1545 | | | Injection Volume: | 1 uL |
| Prep Date: | 02/04/2015 2130 | | | Result Type: | PRIMARY |

| Analyte | DryWt Corrected: Y | Result (ug/Kg) | Qualifier | MDL | RL |
|---|---|---|---|---|---|
| Aroclor 1016 | | 2.9 | U | 2.9 | 10 |
| Aroclor 1221 | | 8.3 | U | 8.3 | 17 |
| 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 | | 2.7 | U | 2.7 | 10 |

| Surrogate | %Rec | Qualifier | Acceptance Limits |
|---|---|---|---|
| Decachlorobiphenyl | 79 | | 59 - 130 |
| Tetrachloro-m-xylene | 84 | | 53 - 128 |

3/8/15

## Analytical Data

Client: Washington Closure Hanford

Job Number: 280-65030-1
Sdg Number: JP0899

**Client Sample ID:** **J1V3P9**

Lab Sample ID: 280-65030-8
Client Matrix: Solid

% Moisture: 4.6

Date Sampled: 02/02/2015 0857
Date Received: 02/04/2015 1000

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

| | | | | | |
|---|---|---|---|---|---|
| Analysis Method: | 8082 | Analysis Batch: | 280-263251 | Instrument ID: | SGC_W |
| Prep Method: | 3550C | Prep Batch: | 280-263043 | Initial Weight/Volume: | 32.1 g |
| Dilution: | 1.0 | | | Final Weight/Volume: | 5 mL |
| Analysis Date: | 02/06/2015 1608 | | | Injection Volume: | 1 uL |
| Prep Date: | 02/04/2015 2130 | | | Result Type: | PRIMARY |

| Analyte | DryWt Corrected: Y | Result (ug/Kg) | Qualifier | MDL | RL |
|---|---|---|---|---|---|
| Aroclor 1016 | | 2.7 | U | 2.7 | 9.8 |
| Aroclor 1221 | | 7.9 | U | 7.9 | 16 |
| Aroclor 1232 | | 2.0 | U | 2.0 | 9.8 |
| Aroclor 1242 | | 4.6 | U | 4.6 | 9.8 |
| Aroclor 1248 | | 4.6 | U | 4.6 | 9.8 |
| Aroclor 1254 | | 2.5 | U | 2.5 | 9.8 |
| Aroclor 1260 | | 3.7 | J | 2.5 | 9.8 |

| Surrogate | %Rec | Qualifier | Acceptance Limits |
|---|---|---|---|
| Decachlorobiphenyl | 85 | | 59 - 130 |
| Tetrachloro-m-xylene | 82 | | 53 - 128 |

3/8/15

## Analytical Data

Client: Washington Closure Hanford

Job Number: 280-65030-1
Sdg Number: JP0899

**Client Sample ID:** **J1V3R0**

Lab Sample ID: 280-65030-9
Client Matrix: Solid
% Moisture: 9.6

Date Sampled: 02/02/2015 0847
Date Received: 02/04/2015 1000

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

| | | | | | |
|---|---|---|---|---|---|
| Analysis Method: | 8082 | Analysis Batch: | 280-263251 | Instrument ID: | SGC_W |
| Prep Method: | 3550C | Prep Batch: | 280-263043 | Initial Weight/Volume: | 30.1 g |
| Dilution: | 1.0 | | | Final Weight/Volume: | 5 mL |
| Analysis Date: | 02/06/2015 1655 | | | Injection Volume: | 1 uL |
| Prep Date: | 02/04/2015 2130 | | | Result Type: | PRIMARY |

| Analyte | DryWt Corrected: Y | Result (ug/Kg) | Qualifier | MDL | RL |
|---|---|---|---|---|---|
| Aroclor 1016 | | 3.1 | U | 3.1 | 11 |
| Aroclor 1221 | | 8.8 | U | 8.8 | 18 |
| Aroclor 1232 | | 2.2 | U | 2.2 | 11 |
| Aroclor 1242 | | 5.1 | U | 5.1 | 11 |
| Aroclor 1248 | | 5.1 | U | 5.1 | 11 |
| Aroclor 1254 | | 2.9 | U | 2.9 | 11 |
| Aroclor 1260 | | 2.9 | U | 2.9 | 11 |

| Surrogate | %Rec | Qualifier | Acceptance Limits |
|---|---|---|---|
| Decachlorobiphenyl | 85 | | 59 - 130 |
| Tetrachloro-m-xylene | 84 | | 53 - 128 |

3/8/15

## Analytical Data

Client: Washington Closure Hanford

Job Number: 280-65030-1
Sdg Number: JP0899

**Client Sample ID:** **J1V3R1**

Lab Sample ID: 280-65030-10
Client Matrix: Solid
% Moisture: 6.3

Date Sampled: 02/02/2015 0843
Date Received: 02/04/2015 1000

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

| | | | | | |
|---|---|---|---|---|---|
| Analysis Method: | 8082 | Analysis Batch: | 280-263251 | Instrument ID: | SGC_W |
| Prep Method: | 3550C | Prep Batch: | 280-263043 | Initial Weight/Volume: | 31.8 g |
| Dilution: | 1.0 | | | Final Weight/Volume: | 5 mL |
| Analysis Date: | 02/06/2015 1718 | | | Injection Volume: | 1 uL |
| Prep Date: | 02/04/2015 2130 | | | Result Type: | PRIMARY |

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

| Surrogate | %Rec | Qualifier | Acceptance Limits |
|---|---|---|---|
| Decachlorobiphenyl | 88 | | 59 - 130 |
| Tetrachloro-m-xylene | 84 | | 53 - 128 |

3/8/15

## Analytical Data

Client: Washington Closure Hanford

Job Number: 280-65030-1
Sdg Number: JP0899

**Client Sample ID:** **J1V3R2**

Lab Sample ID: 280-65030-11
Client Matrix: Solid

% Moisture: 5.2

Date Sampled: 02/02/2015 0902
Date Received: 02/04/2015 1000

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

| | | | | | |
|---|---|---|---|---|---|
| Analysis Method: | 8082 | Analysis Batch: | 280-263251 | Instrument ID: | SGC_W |
| Prep Method: | 3550C | Prep Batch: | 280-263043 | Initial Weight/Volume: | 30.4 g |
| Dilution: | 1.0 | | | Final Weight/Volume: | 5 mL |
| Analysis Date: | 02/06/2015 1742 | | | Injection Volume: | 1 uL |
| Prep Date: | 02/04/2015 2130 | | | Result Type: | PRIMARY |

| Analyte | DryWt Corrected: Y | Result (ug/Kg) | Qualifier | MDL | RL |
|---|---|---|---|---|---|
| Aroclor 1016 | | 2.9 | U | 2.9 | 10 |
| Aroclor 1221 | | 8.3 | U | 8.3 | 17 |
| 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 | | 2.7 | U | 2.7 | 10 |

| Surrogate | %Rec | Qualifier | Acceptance Limits |
|---|---|---|---|
| Decachlorobiphenyl | 79 | | 59 - 130 |
| Tetrachloro-m-xylene | 81 | | 53 - 128 |

3/18/15

## Analytical Data

Client: Washington Closure Hanford

Job Number: 280-65030-1
Sdg Number: JP0899

**Client Sample ID:** **J1V3R3**

Lab Sample ID: 280-65030-12
Client Matrix: Solid
% Moisture: 4.1

Date Sampled: 02/02/2015 0910
Date Received: 02/04/2015 1000

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

| | | | | | |
|---|---|---|---|---|---|
| Analysis Method: | 8082 | Analysis Batch: | 280-263251 | Instrument ID: | SGC_W |
| Prep Method: | 3550C | Prep Batch: | 280-263043 | Initial Weight/Volume: | 31.5 g |
| Dilution: | 1.0 | | | Final Weight/Volume: | 5 mL |
| Analysis Date: | 02/06/2015 1851 | | | Injection Volume: | 1 uL |
| Prep Date: | 02/04/2015 2130 | | | Result Type: | PRIMARY |

| Analyte | DryWt Corrected: Y | Result (ug/Kg) | Qualifier | 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 | Qualifier | Acceptance Limits |
|---|---|---|---|
| Decachlorobiphenyl | 88 | | 59 - 130 |
| Tetrachloro-m-xylene | 84 | | 53 - 128 |

3/8/15

## Analytical Data

Client: Washington Closure Hanford

Job Number: 280-65030-1
Sdg Number: JP0899

**Client Sample ID:** **J1V3R4**

Lab Sample ID: 280-65030-13
Client Matrix: Solid
% Moisture: 3.4

Date Sampled: 02/02/2015 0830
Date Received: 02/04/2015 1000

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

| | | | | | |
|---|---|---|---|---|---|
| Analysis Method: | 8082 | Analysis Batch: | 280-263251 | Instrument ID: | SGC_W |
| Prep Method: | 3550C | Prep Batch: | 280-263043 | Initial Weight/Volume: | 30.7 g |
| Dilution: | 1.0 | | | Final Weight/Volume: | 5 mL |
| Analysis Date: | 02/06/2015 1915 | | | Injection Volume: | 1 uL |
| Prep Date: | 02/04/2015 2130 | | | Result Type: | PRIMARY |

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

| Surrogate | %Rec | Qualifier | Acceptance Limits |
|---|---|---|---|
| Decachlorobiphenyl | 87 | | 59 - 130 |
| Tetrachloro-m-xylene | 82 | | 53 - 128 |

3/8/15

## Appendix 4

## Laboratory Narrative and Chain-of-Custody Documentation

## CASE NARRATIVE

**Client: Washington Closure Hanford**

**Project: WASHINGTON CLOSURE HANFORD**

**Job Number: 280-65030-1**

**SDG #: JP0899**
**SAF#: RC-075**

**Date SDG Closed: February 4, 2015**
**Data Deliverable: 7 Day / Summary**

| CLIENT ID | LAB ID | ANALYSES REQUESTED | ANALYSES PERFORMED |
|---|---|---|---|
| J1V3P2 | 280-65030-1 | 6010/7471/8082/8270/WTPH-D+ | 6010B/7471A/8082/8270C/NWTPH-Dx |
| J1V3P3 | 280-65030-2 | 6010/7471/8082/8270/WTPH-D+ | 6010B/7471A/8082/8270C/NWTPH-Dx |
| J1V3P4 | 280-65030-3 | 6010/7471/8082/8270/WTPH-D+ | 6010B/7471A/8082/8270C/NWTPH-Dx |
| J1V3P5 | 280-65030-4 | 6010/7471/8082/8270/WTPH-D+ | 6010B/7471A/8082/8270C/NWTPH-Dx |
| J1V3P6 | 280-65030-5 | 6010/7471/8082/8270/WTPH-D+ | 6010B/7471A/8082/8270C/NWTPH-Dx |
| J1V3P7 | 280-65030-6 | 6010/7471/8082/8270/WTPH-D+ | 6010B/7471A/8082/8270C/NWTPH-Dx |
| J1V3P8 | 280-65030-7 | 6010/7471/8082/8270/WTPH-D+ | 6010B/7471A/8082/8270C/NWTPH-Dx |
| J1V3P9 | 280-65030-8 | 6010/7471/8082/8270/WTPH-D+ | 6010B/7471A/8082/8270C/NWTPH-Dx |
| J1V3R0 | 280-65030-9 | 6010/7471/8082/8270/WTPH-D+ | 6010B/7471A/8082/8270C/NWTPH-Dx |
| J1V3R1 | 280-65030-10 | 6010/7471/8082/8270/WTPH-D+ | 6010B/7471A/8082/8270C/NWTPH-Dx |
| J1V3R2 | 280-65030-11 | 6010/7471/8082/8270/WTPH-D+ | 6010B/7471A/8082/8270C/NWTPH-Dx |
| J1V3R3 | 280-65030-12 | 6010/7471/8082/8270/WTPH-D+ | 6010B/7471A/8082/8270C/NWTPH-Dx |
| J1V3R4 | 280-65030-13 | 6010/7471/8082/8270/WTPH-D+ | 6010B/7471A/8082/8270C/NWTPH-Dx |

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 2/4/2015 10:00 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperatures of the 3 coolers at receipt time were 0.8° C, 3.4° C and 4.4° C.

**GC/MS SEMIVOLATILES - SW846 8270C**
Low levels of Dimethyl phthalate, a common laboratory contaminant, are present in the method blank associated with batch 280-263016. Because the concentration in the method blank is not present at a level greater than the reporting limit, corrective action is deemed unnecessary. Associated sample results present above the MDL and/or RL have been flagged with a "B".

No other anomalies were encountered.

**GC SEMIVOLATILES - SW846 8082 - PCBs**
No anomalies were encountered.

**GC SEMIVOLATILES - NWTPH-Dx - DRO**
No anomalies were encountered.

**TOTAL METALS - SW846 6010B/7471A**
Serial dilution of a digestate in batch 280-263128 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. Samples J1V3P5 and J1V3R3 *required a 5X dilution prior to the analysis of Antimony, Beryllium, Cobalt, Copper, Lead and Vanadium to minimize the* interference caused by Titanium concentrations greater than the linear range. The reporting limits have been adjusted relative to the dilution required.

Low levels of Barium, Calcium and Magnesium are present in the method blank associated with batch 280-263128. Because the concentrations in the method blank are not present at levels greater than half the reporting limit, corrective action is deemed unnecessary.

Silicon was recovered outside the control limits, biased low, in the LCS associated with batch 280-263128 and in the Matrix Spike performed on sample J1V3P2 in batch 280-263128. The associated sample results have been flagged "N". Silicon has been identified as a poor performing element when analyzed using this method and has a history of reacting inconsistently; therefore, corrective action is *not initiated. Data are reported as is.*

It can be noted that the sample amount was greater than four times the spike amount for Aluminum, Iron and Manganese in the Matrix Spike performed on sample J1V3P2; therefore, control limits are not applicable.

The duplicate analysis of sample J1V3P2 exhibited RPD data outside the control limits for Boron, and the associated sample result has 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-075-465



| | | | |
|---|---|---|---|
| Collector: STOWE, QG | Company Contact: Joan Kessner | Telephone No.: 375-4688 | Project Coordinator: KESSNER, JH |
| Project Designation: 100-D/DR Field Remediation | Sampling Location: 100-D-75:1 (excavation, verification) | | SAF No.: RC-075 |
| Ice Chest No.: WCH-08-030 | Field Logbook No.: EL-1662-03 | COA: 01D7512000 | Method of Shipment: Commercial Carrier \ Fed Ex |
| Shipped To: TestAmerica Denver | Offsite Property No.: A131 318 | | Bill of Lading/Air Bill No.: See OSPC |

Price Code: 8B

Data Turnaround: 7 days

Other Labs Shipped To: N/A

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 | 125mL |
| Sample Analysis | See item (1) in Special Instructions | PCBs - 8082 | Semi-VOA - 8270 (TCL) | TPH-Diesel Range - WTPH-D + |

280-65030 Chain of Custody

| Sample No. | Matrix | Sample Date | Sample Time | | | | |
|---|---|---|---|---|---|---|---|
| J1V3P2 | SOIL | 02/02/15 | 0815 | X | X | X | X |
| J1V3P3 | SOIL | 02/02/15 | 0819 | X | X | X | X |
| J1V3P4 | SOIL | 02/02/15 | 0823 | X | X | X | X |
| J1V3P5 | SOIL | 02/02/15 | 0830 | X | X | X | X |
| J1V3P6 | SOIL | 02/02/15 | 0859 | X | X | X | X |

## CHAIN OF POSSESSION

| Relinquished By/Removed From | Date/Time | Received By/Stored In | Date/Time |
|---|---|---|---|
| Quincy Stowe | 2-2-15 0922 | C. Martinez/C. Martinez | 02/02/15 0922 |
| C. Martinez/C. Martinez | 02/02/15 1600 | C. Bingham | 2-2-15 1600 |
| C. Bingham | 2-2-15 1630 | 1060 Battelle, Fridge #1A | 2-2-15 1630 |
| 1060 Battelle, Fridge #1A | 2-3-15 0715 | C. Bingham | 2-3-15 0715 |
| C. Bingham WCH | 2-3-15 0720 | Fed Ex | 2-3-15 0720 |
| [signature] | 04Feb15 1000 | [signature] | 1000 04Feb15 |

## Sign/Print Names

## 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}

3.9, 2.9, 0.3 VR STO.5 04Feb15
Transferred by (XM)

REVIEWED BY K. Woodvineman DATE 2-3-15

JP0899

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

WCH-EE-011

# Washington Closure Hanford

# CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

RC-075-465



| | | | |
|---|---|---|---|
| Collector: STOWE, QG | Company Contact: Joan Kessner | Telephone No.: 375-4688 | Project Coordinator: KESSNER, JH |
| Project Designation: 100-D/DR Field Remediation | Sampling Location: 100-D-75:1 (excavation, verification) | | SAF No.: RC-075 |
| Ice Chest No.: WCH-08-030 | Field Logbook No.: EL-1662-03 | COA: 01D7512000 | Method of Shipment: Commercial Carrier / Fed Ex |
| Shipped To: TestAmerica Denver | Offsite Property No.: A131318 | | Bill of Lading/Air Bill No.: See OSRC |

Price Code: 8B

Data Turnaround: 17 days

Other Labs Shipped To: N/A

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 | 125mL | | | | | | |
| Sample Analysis | See item (1) in Special Instructions | PCBs - 8082 | Semi-VOA - 8270 (TCL) | TPH-Diesel Range-WTPH-D + | | | | | | |

| Sample No. | Matrix | Sample Date | Sample Time | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| J1V3P7 | SOIL | 02/02/15 | 0855 | X | X | X | X | | | | | |
| J1V3P8 | SOIL | 02/02/15 | 0837 | X | X | X | X | | | | | |
| J1V3P9 | SOIL | 02/02/15 | 0857 | X | X | X | X | | | | | |
| J1V3R0 | SOIL | 02/02/15 | 0847 | X | X | X | X | | | | | |
| J1V3R1 | SOIL | 02/02/15 | 0843 | X | X | X | X | | | | | |

## CHAIN OF POSSESSION

Sign/Print Names

| Relinquished By/Removed From | Date/Time | Received By/Stored In | Date/Time |
|---|---|---|---|
| Quincy Stowe | 0922 2-2-15 | L. Martinez/L. Martinez | 0922 02/02/15 |
| L. Martinez/L. Martinez | 02/02/15 1600 | C. Bingham | 2-2-15 1600 |
| C. Bingham | 2-2-15 1630 | 1060 Battelle fridge #1A | 1630 2-2-15 |
| 1060 Battelle fridge #1A | 2-3-15 0715 | C. Bingham | 2-3-15 0715 |
| C. Bingham WCH | 2-3-15 0720 | Fed Ex | 2-3-15 0720 |
| | | | 1000 04/FEB/15 |

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

SPECIAL INSTRUCTIONS

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

REVIEWED BY Kwood Vincent DATE 2-3-15

JP0899

WCH-EE-011

# Washington Closure Hanford

# CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

RC-075-465



| | | | |
|---|---|---|---|
| Collector: STOWE, QG | Company Contact: Joan Kessner | Telephone No.: 375-4688 | Project Coordinator: KESSNER, JH |
| Project Designation: 100-D/DR Field Remediation | Sampling Location: 100-D-75:1 (excavation, verification) | | SAF No.: RC-075 |
| Ice Chest No.: WCH-08-030 | Field Logbook No.: EL-1662-03 | COA: 01D7512000 | Method of Shipment: Commercial Carrier \ Fed Ex |
| Shipped To: TestAmerica Denver | Offsite Property No.: A131318 | | Bill of Lading/Air Bill No.: See OSPC |

Price Code: 8B

Data Turnaround: 7 days

Other Labs Shipped To: N/A

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 | 125mL |
| Sample Analysis | See item (1) in Special Instructions | PCBs - 8082 | Semi-VOA - 8270 (TCL) | TPH-Diesel Range - WTPH-D + |

| Sample No. | Matrix | Sample Date | Sample Time | | | | |
|---|---|---|---|---|---|---|---|
| J1V3R2 | SOIL | 02/02/15 | 0902 | X | X | X | X |
| J1V3R3 | SOIL | 02/02/15 | 0910 | X | X | X | X |
| J1V3R4 | SOIL | 02/02/15 | 0830 | X | X | X | X |

## CHAIN OF POSSESSION

| Relinquished By/Removed From | Date/Time | Received By/Stored In | Date/Time |
|---|---|---|---|
| Quincy Stowe | 2-2-15 0922 | C. Martinez/C. Martinez | 02/02/15 0922 |
| C. Martinez/C. Martinez | 02/02/15 1600 | C. Bingham | 2-2-15 1600 |
| C. Bingham | 2-2-15 1630 | 1060 Battelle fridge #1A | 2-2-15 1630 |
| 1060 Battelle fridge #1A | 2-3-15 0715 | C. Bingham | 2-3-15 0715 |
| C. Bingham WCH | 2-3-15 0720 | Fed Ex | 2-3-15 0720 |
| | | [signature] | 1000 04Feb15 |

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. Woodvincente DATE 2-3-15

JP0899

## Appendix 5

## Data Validation Supporting Documentation

# PCB DATA VALIDATION CHECKLIST

| VALIDATION LEVEL: | A | B | C | D | E |
|---|---|---|---|---|---|
| PROJECT: | 100-D-75:1 | | DATA PACKAGE: | JP0899 | |
| VALIDATOR: | ELR | LAB: | TAL | DATE: | 3/7/15 |
| | | | SDG: | JP0899 | |

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

| SAMPLES/MATRIX | | | | | |
|---|---|---|---|---|---|
| J1V3P2 | J1V3P3 | J1V3P4 | J1V3P5 | J1V3P6 | J1V3P7 |
| J1V3P8 | J1V3P9 | J1V3R0 | J1V3R1 | J1V3R2 | J1V3R3 |
| J1V3R4 | | | | | |
| | | | | | |
| | | | | | 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

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

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

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

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

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

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

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

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

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

Comments:

No PAS

# PCB DATA VALIDATION CHECKLIST

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

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

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

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

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

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

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

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

Comments: _____

## 6. SYSTEM PERFORMANCE (Levels D and E)

Chromatographic performance acceptable? ..... Yes No N/A

Positive results resolved acceptably? ..... Yes No N/A

Comments: _____

## 7. HOLDING TIMES (all levels)

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

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

Comments: _____

# PCB DATA VALIDATION CHECKLIST

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

Compound identification acceptable? (Levels D, E) ..... Yes No N/A

Compound quantitation acceptable? (Levels D, E) ..... Yes No N/A

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

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

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

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

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

Comments:_____

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

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: 280-65030-1
Sdg Number: JP0899

**Method Blank - Batch: 280-263043**

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

| | | | | | |
|---|---|---|---|---|---|
| Lab Sample ID: | MB 280-263043/1-A | Analysis Batch: | 280-263251 | Instrument ID: | SGC_W |
| Client Matrix: | Solid | Prep Batch: | 280-263043 | Lab File ID: | 02061504.D |
| Dilution: | 1.0 | Leach Batch: | N/A | Initial Weight/Volume: | 30.2 g |
| Analysis Date: | 02/06/2015 1239 | Units: | ug/Kg | Final Weight/Volume: | 5 mL |
| Prep Date: | 02/04/2015 2130 | | | 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 | 87 | 59 - 130 |
| Tetrachloro-m-xylene | 80 | 53 - 128 |

**Lab Control Sample - Batch: 280-263043**

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

| | | | | | |
|---|---|---|---|---|---|
| Lab Sample ID: | LCS 280-263043/2-A | Analysis Batch: | 280-263251 | Instrument ID: | SGC_W |
| Client Matrix: | Solid | Prep Batch: | 280-263043 | Lab File ID: | 02061505.D |
| Dilution: | 1.0 | Leach Batch: | N/A | Initial Weight/Volume: | 30.1 g |
| Analysis Date: | 02/06/2015 1302 | Units: | ug/Kg | Final Weight/Volume: | 5 mL |
| Prep Date: | 02/04/2015 2130 | | | Injection Volume: | 1 uL |
| Leach Date: | N/A | | | Column ID: | PRIMARY |

| Analyte | Spike Amount | Result | % Rec. | Limit | Qual |
|---|---|---|---|---|---|
| Aroclor 1016 | 33.2 | 28.6 | 86 | 54 - 132 | |
| Aroclor 1260 | 33.2 | 31.7 | 95 | 62 - 129 | |

| Surrogate | % Rec | Acceptance Limits |
|---|---|---|
| Decachlorobiphenyl | 89 | 59 - 130 |
| Tetrachloro-m-xylene | 82 | 53 - 128 |

Client: Washington Closure Hanford

Job Number: 280-65030-1
Sdg Number: JP0899

**Matrix Spike/**
**Matrix Spike Duplicate Recovery Report - Batch: 280-263043**

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

| | | | | | |
|---|---|---|---|---|---|
| MS Lab Sample ID: | 280-65030-11 | Analysis Batch: | 280-263251 | Instrument ID: | SGC_W |
| Client Matrix: | Solid | Prep Batch: | 280-263043 | Lab File ID: | 02061518.D |
| Dilution: | 1.0 | Leach Batch: | N/A | Initial Weight/Volume: | 30.8 g |
| Analysis Date: | 02/06/2015 1805 | | | Final Weight/Volume: | 5 mL |
| Prep Date: | 02/04/2015 2130 | | | Injection Volume: | 1 uL |
| Leach Date: | N/A | | | Column ID: | PRIMARY |

| | | | | | |
|---|---|---|---|---|---|
| MSD Lab Sample ID: | 280-65030-11 | Analysis Batch: | 280-263251 | Instrument ID: | SGC_W |
| Client Matrix: | Solid | Prep Batch: | 280-263043 | Lab File ID: | 02061519.D |
| Dilution: | 1.0 | Leach Batch: | N/A | Initial Weight/Volume: | 30.8 g |
| Analysis Date: | 02/06/2015 1828 | | | Final Weight/Volume: | 5 mL |
| Prep Date: | 02/04/2015 2130 | | | 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 | 91 | 94 | 54 - 132 | 4 | 26 | | |
| Aroclor 1260 | 94 | 104 | 62 - 129 | 10 | 26 | | |

| Surrogate | MS % Rec | MSD % Rec | Acceptance Limits |
|---|---|---|---|
| Decachlorobiphenyl | 77 | 81 | 59 - 130 |
| Tetrachloro-m-xylene | 83 | 86 | 53 - 128 |

**Matrix Spike/**
**Matrix Spike Duplicate Recovery Report - Batch: 280-263043**

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

| | | | | | |
|---|---|---|---|---|---|
| MS Lab Sample ID: | 280-65030-11 | Units: | ug/Kg | MSD Lab Sample ID: | 280-65030-11 |
| Client Matrix: | Solid | | | Client Matrix: | Solid |
| Dilution: | 1.0 | | | Dilution: | 1.0 |
| Analysis Date: | 02/06/2015 1805 | | | Analysis Date: | 02/06/2015 1828 |
| Prep Date: | 02/04/2015 2130 | | | Prep Date: | 02/04/2015 2130 |
| 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 | 2.9 | U | 34.3 | 34.3 | 31.2 | 32.3 |
| Aroclor 1260 | 2.7 | U | 34.3 | 34.3 | 32.2 | 35.6 |