**W07210 Analytical Report ..... 1**

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TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Laboratories, Inc.

# ANALYTICAL REPORT

PROJECT #: W16-003

SDG # W07210

Contract #: 54784

Site Location: Hanford

Karen Waters-Husted

CH2MHILL PLATEAU REMEDIATION CO.
SAMPLE MANAGEMENT AND REPORTING
200 EAST/MO277
MSIN 3-50
Richland, WA 99352

TESTAMERICA LABORATORIES, INC.
Jamie McKinney
Project Manager
March 31, 2016

Unless otherwise noted in the narrative, all holding times and QC criteria were met and the test results shown in this report meet all applicable NELAC requirements.

# ANALYTICAL METHODS SUMMARY

W07210

| PARAMETER | ANALYTICAL METHOD |
|---|---|
| Dibenzodioxins and Dibenzofurans, HRGC/HRMS | SW846 8290A |

**References:**

SW846 "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 and its updates.

# SAMPLE SUMMARY

W07210 : H6C170402

| WO # | SAMPLE# | CLIENT SAMPLE ID | SAMPLED DATE | SAMP TIME |
|---|---|---|---|---|
| M8DAF | 001 | B34B41 | 03/08/16 | 10:35 |
| M8DAG | 002 | B34B47 | 03/08/16 | 06:30 |
| M8DAH | 003 | B34B48 | 03/08/16 | 09:43 |
| M8DAJ | 004 | B34B58 | 03/08/16 | 12:15 |
| M8DAK | 005 | B34B81 | 03/08/16 | 08:32 |
| M8DAL | 006 | B34B82 | 03/08/16 | 08:32 |

**NOTE(S):**

- The analytical results of the samples listed above are presented on the following pages.
- All calculations are performed before rounding to avoid round-off errors in calculated results.
- Results noted as "ND" were not detected at or above the stated limit.
- This report must not be reproduced, except in full, without the written approval of the laboratory.
- Results for the following parameters are never reported on a dry weight basis: color, corrosivity, density, flashpoint, ignitability, layers, odor, paint filter test, pH, porosity pressure, reactivity, redox potential, specific gravity, spot tests, solids, solubility, temperature, viscosity, and weight.

# PROJECT NARRATIVE
## W07210

Contract Number: 54784
Site Location: Hanford

The results reported herein are applicable to the samples submitted for analysis only. If you have any questions about this report, please call (865) 291-3000 to speak with the TestAmerica project manager listed on the cover page.

This report shall not be reproduced except in full, without the written approval of the laboratory.

**The original chain of custody documentation is included with this report.**

**Sample Receipt**

There were no problems with the condition of the samples received.

Per client instructions, the firm responsible for delivery was filled in and dated by the sample receiving department on completion of the shipment. Relinquished date and time recorded is the same as laboratory receipt date and time.

**Quality Control and Data Interpretation**

Unless otherwise noted, all holding times and QC criteria were met and the test results shown in this report meet all applicable NELAC requirements.

The following flags are used to qualify results for chlorinated dioxin and furan results:

**J** – The reported result is an estimate. The amount reported is below the Minimum Level (ML). The qualitative definition of the ML is "the lowest level at which the analytical system must give a reliable signal and an acceptable calibration point". The ML was introduced in EPA Methods 1624 and 1625 in 1980 and was promulgated in these methods in 1984 at 40 CFR Part 136, Appendix A. For the purposes of this report, the ML is qualitatively defined as described above, and quantitatively defined as follows:

**Minimum Level**: The concentration or mass of analyte in the sample that corresponds to the lowest calibration level in the initial calibration. It represents a concentration (in the sample extract) equivalent to that of the lowest calibration standard, after corrections for method-specified sample weights, volumes and cleanup procedures has been employed.

Example: The lowest calibration level for TCDD in the initial calibration is 0.5 pg/uL. A mass of 10 pg of 2,3,7,8-TCDD in the sample would result in a concentration of 0.5 pg/uL in the sample extract (at a final volume of 20 uL). Since the concentration in the sample extract corresponds to the concentration in the lowest calibration standard, the 10 pg mass in the sample components is the ML. If the sample extract is further diluted, the ML will increase by the dilution factor.

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Example: A 1/10 dilution is performed on the sample extract described above. The ML for 2,3,7,8-TCDD becomes 100 pg rather than the default of 10 pg.

**E** – The reported result is an estimate. The amount reported is above the Upper Calibration Level (UCL) described below. The quantitative definition of the UCL is listed below:

**Upper Calibration Level:** The concentration or mass of analyte in the sample that corresponds to the highest calibration level in the initial calibration. It is equivalent to the concentration of the highest calibration standard, assuming that all method-specified sample weights, volumes, and cleanup procedures have been employed.

Example: The maximum calibration level for TCDD in the initial calibration is 200 pg/uL. A mass of 4000 pg of 2,3,7,8-TCDD in the sampling components would result in a concentration of 200 pg/uL in the sample extract (at a final volume of 20 uL). Since the concentration in the sample extract corresponds to the concentration in the highest calibration standard, the 4000 pg mass in the sample components is the UCL. If the sample extract is further diluted, the ML will increase by the dilution factor.

Example: A 1/10 dilution is performed on the sample extract described above. The UCL for 2,3,7,8-TCDD becomes 40,000 pg rather than the default of 4000 pg. In this example, all positive 2,3,7,8-TCDD results above 40,000 pg are flagged with an E.

**B** – The analyte is present in the associated method blank at a detectable level. For this analysis, there is no method specified reporting level other than the qualitative criterion that peaks must exhibit a signal-to-noise ratio of $\geq$2.5 to 1. Therefore, the presence of any reportable amount of the analyte in the blank will result in a B qualifier on all associated samples.

**Q** – Estimated maximum possible concentration. This qualifier is used when the result is generated from chromatographic data that does not meet all the qualitative criteria for a positive identification given in the method. These may include one or more of the following:

- Ion abundance ratios must be within specified limits (+/-15% of theoretical ion abundance ratio).
- Retention time criteria (relative to the method-specified isotope labeled retention time standard).
- Co-maximization criterion. The two quantitation ion peaks must reach their maxima within 2 seconds of each other.
- 2,3,7,8-TCDF result is reported from the non-isomer specific Rtx-5 column.
- Polychlorinated dibenzofuran purity. An interference may be present on the indicated polychlorinated dibenzofuran when a polychlorinated diphenyl ether peak is present and maximizes within +/- 3 seconds of the dibenzofuran candidate.

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**S** – Ion suppression evident. The trace indicating the signal from the lock mass of the calibration compound shows a deflection at the retention time of the analyte. This may indicate a temporary suppression of the instrument sensitivity due to a matrix-borne interference.

**C** – Coeluting Isomer. The isomer is known to coelute with another member of its homologue group, or the peak shape is shouldered, indicating the likelihood of a coeluting isomer.

**X** – Other. See explanation in narrative.

Laboratory studies supporting risk assessment and Total Maximum Daily Load (TMDL) evaluations, frequently use qualified data reported as low as the Method Detection Limit (MDL), or the Estimated Detection Limit (EDL). Several of EPA's isotope dilution methods employ the EDL.[1,2,3] The EDL is based on a direct measurement of the signal-to-noise (S/N) ratio acquired during sample analysis. This S/N measurement is used to calculate the concentration in the sample corresponding to the minimum intensity of the smallest quantifiable peak. The EDL reflects the amount of the particular analyte which would be required to cause a positive result for the particular analysis. Because the S/N obtained covaries with recovery, instrument sensitivity and sample-specific cleanup efficacy, the EDL is a more valid measure of the sensitivity of the entire analytical process for the specific sample than is an MDL run periodically on a reference matrix.

The EDL is typically calculated according to the following equation:

$$\text{Estimated Detection Limit} = \frac{N \times 2.5 \times Qis}{His \times RRF \times W \times S}$$

Where:

| | | |
|---|---|---|
| N | = | peak to peak noise of quantitation ion signal in the region of the ion chromatogram where the compound of interest is expected to elute |
| His | = | peak height of quantitation ion for appropriate internal standard |
| Qis | = | ng of internal standard added to sample |
| RRF | = | mean relative response factor of compound obtained during initial calibration |
| W | = | amount of sample extracted (grams or liters) |
| S | = | percent solids (optional, if results are requested to be reported on dry weight basis) |

(The area of the internal standard is sometimes used instead of height, along with an area-to-height conversion factor.)

This method of estimating the detection limit differs from the MDL in that it does not carry the requirement that the sample be statistically distinguished as being from a contaminated population. As results approach the EDL, the risk of false positives and the analytical uncertainty increase significantly. However, a low false positive well below the ML or MDL is often closer to the true value than an assumption that the target

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analyte is present at the detection or reporting limits. For relatively clean samples, MDL studies may give an elevated estimate of the detection limit. Additionally, on contaminated samples, the MDL may give a falsely low estimate of the detection limit.

$$\text{Analyte Concentration} = \frac{As \times Qis}{Ais \times RRF \times W \times S}$$

Where:

| | | |
|---|---|---|
| As | = | Sum of areas of the target peaks |
| Qis | = | ng of internal standard added to sample |
| Ais | = | Sum of areas of the internal standard peaks |
| RRF | = | mean relative response factor of compound obtained during initial calibration |
| W | = | amount of sample extracted (grams or liters) |
| S | = | percent solids (optional, if results are requested to be reported on dry weight basis) |

In sample data, peaks must have an intensity of $\geq$2.5 times the height of the background noise in order to be considered. Careful examination of the two equations above reveals that for the concentration of the smallest peak detectable (per the EDL equation) to exactly equal the smallest peaks that are calculated, requires that the average height to area ratio obtained during the calibration must equal the area to height ratio for every peak obtained near 2.5 times the noise. When the area to height ratio on a peak in a sample is less than the average obtained during calibration, the calculated result will correspond to a peak that would have been less than 2.5 times the noise on the calibration. This is the result of normal variability. Because the source methods for the EDL (SW-846 8290 and 8280A) do not provide for censoring of results by any other magnitude standard than being 2.5 times the noise, the laboratory does not censor at the calculated EDL. Hence, detections may be reported below the estimated detection limits.

Footnotes:

1. Code of Federal Regulations, Part 136, Chapter 1, Appendix 1, October 1994: Method 1613 Tetra- Through Octa-Chlorinated Dioxins and Furans by Isotope Dilution High Resolution Gas Chromatography/High Resolution Mass Spectrometry.
2. U.S. EPA. Test Methods for Evaluating Solid Waste, Volume II, SW-846, Update III, December 1996. Method 8280A: The Analysis of Polychlorinated Dibenzo-p-Dioxins and Polychlorinated Dibenzofurans by High Resolution Gas Chromatography/Low Resolution Mass Spectrometry.
3. U.S. EPA. Test Methods for Evaluating Solid Waste, SW-846. Third Edition. March 1995 Method 8290: Polychlorinated Dibenzo-p-Dioxins and Polychlorinated Dibenzofurans by High Resolution Gas Chromatography/High Resolution Mass Spectrometry.

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**Attachments**

Attachment 1 includes CAS registery numbers for dioxins/furans.

# CERTIFICATION SUMMARY

| Laboratory | Authority | Program | EPA Region | Certification ID |
|---|---|---|---|---|
| TestAmerica Knoxville | L-A-B | DoD ELAP | | L2311 |
| TestAmerica Knoxville | Arkansas DEQ | State Program | 6 | 88-0688 |
| TestAmerica Knoxville | California | State Program | 9 | 2423 |
| TestAmerica Knoxville | Colorado | State Program | 8 | N/A |
| TestAmerica Knoxville | Connecticut | State Program | 1 | PH-0223 |
| TestAmerica Knoxville | Florida | NELAC | 4 | E87177 |
| TestAmerica Knoxville | Georgia | State Program | 4 | 906 |
| TestAmerica Knoxville | Hawaii | State Program | 9 | N/A |
| TestAmerica Knoxville | Kansas | NELAC | 7 | E-10349 |
| TestAmerica Knoxville | Kentucky | State Program | 4 | 90101 |
| TestAmerica Knoxville | Louisiana DOHH | State Program | 6 | LA150004 |
| TestAmerica Knoxville | Louisiana DEQ | NELAC | 6 | 83979 |
| TestAmerica Knoxville | Maryland | State Program | 3 | 277 |
| TestAmerica Knoxville | Michigan | State Program | 5 | 9933 |
| TestAmerica Knoxville | Nevada | State Program | 9 | TN00009 |
| TestAmerica Knoxville | New Jersey | NELAC | 2 | TN001 |
| TestAmerica Knoxville | New York | NELAC | 2 | 10781 |
| TestAmerica Knoxville | North Carolina DENR | State Program | 4 | 64 |
| TestAmerica Knoxville | North Carolina DHHS | State Program | 4 | 21705 |
| TestAmerica Knoxville | Ohio | OVAP | 5 | CL0059 |
| TestAmerica Knoxville | Oklahoma | State Program | 6 | 9415 |
| TestAmerica Knoxville | Pennsylvania | NELAC | 3 | 68-00576 |
| TestAmerica Knoxville | South Carolina | State Program | 4 | 84001 |
| TestAmerica Knoxville | Tennessee | State Program | 4 | TN02014 |
| TestAmerica Knoxville | Texas | NELAC | 6 | T104704380-14-7 |
| TestAmerica Knoxville | Federal | USDA | | P330-11-00260 |
| TestAmerica Knoxville | Utah | NELAC | 8 | TN000092014-5 |
| TestAmerica Knoxville | Virginia | NELAC | 3 | 460176 |
| TestAmerica Knoxville | Virginia | State Program | 3 | 00165 |
| TestAmerica Knoxville | Washington | State Program | 10 | C593 |
| TestAmerica Knoxville | West Virginia DEP | State Program | 3 | 345 |
| TestAmerica Knoxville | West Virginia DHHR | State Program | 3 | 9955C |
| TestAmerica Knoxville | Wisconsin | State Program | 5 | 998044300 |

Accreditation may not be offered or required for all methods and analytes in this report. Please contact your project manager for the laboratory's current list of certified methods and analytes.

# ATTACHMENT 1

| Analyte | CAS Registry Number |
|---|---|
| 2,3,7,8-TCDD | 1746-01-6 |
| Total TCDD | 41903-57-5 |
| 2,3,7,8-TCDF | 51207-31-9 |
| Total TCDF | 55722-27-5 |
| 1,2,3,7,8-PeCDD | 40321-76-4 |
| Total PeCDD | 36088-22-9 |
| 1,2,3,7,8-PeCDF | 57117-41-6 |
| 2,3,4,7,8-PeCDF | 57117-31-4 |
| Total PeCDF | 30402-15-4 |
| 1,2,3,4,7,8-HxCDD | 39227-28-6 |
| 1,2,3,6,7,8-HxCDD | 57653-85-7 |
| 1,2,3,7,8,9-HxCDD | 19408-74-3 |
| Total HxCDD | 34465-46-8 |
| 1,2,3,4,7,8-HxCDF | 70648-26-9 |
| 1,2,3,6,7,8-HxCDF | 57117-44-9 |
| 2,3,4,6,7,8-HxCDF | 60851-34-5 |
| 1,2,3,7,8,9-HxCDF | 72918-21-9 |
| Total HxCDF | 55684-94-1 |
| 1,2,3,4,6,7,8-HpCDD | 35822-46-9 |
| Total HpCDD | 37871-00-4 |
| 1,2,3,4,6,7,8-HpCDF | 67562-39-4 |
| 1,2,3,4,7,8,9-HpCDF | 55673-89-7 |
| Total HpCDF | 38998-75-3 |
| OCDD | 3268-87-9 |
| OCDF | 39001-02-0 |

**CH2M Hill Plateau Remediation DOE RL**

**Sample ID: B34B41**

**Trace Level Organic Compounds**

| | | | | | |
|---|---|---|---|---|---|
| **Lot - Sample #....:** | H6C170402 - 001 | **Work Order #....:** | M8DAF1AA | **Matrix....:** | WATER |
| **Date Sampled....:** | 03/08/16 | **Date Received....:** | 03/09/16 | **Dilution Factor:** | 1 |
| **Prep Date....:** | 03/22/16 | **Analysis Date....:** | 03/25/16 | | |
| **Prep Batch # ....:** | 6082032 | | | | |
| **Initial Wgt/Vol :** | 1062 mL | **Instrument ID....:** | D2A | **Method:** | SW846 8290A |
| **Analyst ID....:** | Linda K. McWhirter | | | | |

| PARAMETER | RESULT | | MINIMUM LEVEL | ESTIMATED DETECTION LIMIT | UNITS |
|---|---|---|---|---|---|
| 2,3,7,8-TCDD | ND | | 9.4 | 0.22 | pg/L |
| Total TCDD | ND | | 9.4 | 0.22 | pg/L |
| 1,2,3,7,8-PeCDD | ND | | 47 | 0.073 | pg/L |
| Total PeCDD | ND | | 47 | 0.073 | pg/L |
| 1,2,3,4,7,8-HxCDD | ND | | 47 | 0.15 | pg/L |
| 1,2,3,6,7,8-HxCDD | ND | | 47 | 0.15 | pg/L |
| 1,2,3,7,8,9-HxCDD | ND | | 47 | 0.14 | pg/L |
| Total HxCDD | ND | | 47 | 0.15 | pg/L |
| **1,2,3,4,6,7,8-HpCDD** | **0.61** | **Q J** | **47** | **0.21** | **pg/L** |
| **Total HpCDD** | **0.61** | **Q J** | **47** | **0.21** | **pg/L** |
| **OCDD** | **1.4** | **Q B J** | **94** | **0.21** | **pg/L** |
| 2,3,7,8-TCDF | ND | | 9.4 | 0.12 | pg/L |
| Total TCDF | ND | | 9.4 | 0.12 | pg/L |
| 1,2,3,7,8-PeCDF | ND | | 47 | 0.13 | pg/L |
| 2,3,4,7,8-PeCDF | ND | | 47 | 0.12 | pg/L |
| Total PeCDF | ND | | 47 | 0.12 | pg/L |
| 1,2,3,4,7,8-HxCDF | ND | | 47 | 0.13 | pg/L |
| 1,2,3,6,7,8-HxCDF | ND | | 47 | 0.13 | pg/L |
| 2,3,4,6,7,8-HxCDF | ND | | 47 | 0.14 | pg/L |
| 1,2,3,7,8,9-HxCDF | ND | | 47 | 0.18 | pg/L |
| Total HxCDF | ND | | 47 | 0.14 | pg/L |
| 1,2,3,4,6,7,8-HpCDF | ND | | 47 | 0.073 | pg/L |
| 1,2,3,4,7,8,9-HpCDF | ND | | 47 | 0.098 | pg/L |
| Total HpCDF | ND | | 47 | 0.084 | pg/L |
| **OCDF** | **2.6** | **Q B J** | **94** | **0.11** | **pg/L** |

**CH2M Hill Plateau Remediation DOE RL**

**Sample ID: B34B41**

**Trace Level Organic Compounds**

| | | | | | |
|---|---|---|---|---|---|
| **Lot - Sample #....:** | H6C170402 - 001 | **Work Order #....:** | M8DAF1AA | **Matrix....:** | WATER |
| **Date Sampled....:** | 03/08/16 | **Date Received....:** | 03/09/16 | **Dilution Factor:** | 1 |
| **Prep Date....:** | 03/22/16 | **Analysis Date....:** | 03/25/16 | | |
| **Prep Batch # ....:** | 6082032 | | | | |
| **Initial Wgt/Vol :** | 1062 mL | **Instrument ID....:** | D2A | **Method:** | SW846 8290A |
| **Analyst ID....:** | Linda K. McWhirter | | | | |

| INTERNAL STANDARDS | PERCENT RECOVERY | RECOVERY LIMITS |
|---|---|---|
| 13C-2,3,7,8-TCDD | 86 | 40 - 135 |
| 13C-1,2,3,7,8-PeCDD | 93 | 40 - 135 |
| 13C-1,2,3,4,7,8-HxCDD | 84 | 40 - 135 |
| 13C-1,2,3,6,7,8-HxCDD | 93 | 40 - 135 |
| 13C-1,2,3,4,6,7,8-HpCDD | 96 | 40 - 135 |
| 13C-OCDD | 90 | 40 - 135 |
| 13C-2,3,7,8-TCDF | 83 | 40 - 135 |
| 13C-1,2,3,7,8-PeCDF | 91 | 40 - 135 |
| 13C-2,3,4,7,8-PeCDF | 92 | 40 - 135 |
| 13C-1,2,3,4,7,8-HxCDF | 85 | 40 - 135 |
| 13C-1,2,3,6,7,8-HxCDF | 85 | 40 - 135 |
| 13C-2,3,4,6,7,8-HxCDF | 88 | 40 - 135 |
| 13C-1,2,3,7,8,9-HxCDF | 88 | 40 - 135 |
| 13C-1,2,3,4,6,7,8-HpCDF | 84 | 40 - 135 |
| 13C-1,2,3,4,7,8,9-HpCDF | 89 | 40 - 135 |
| 13C-OCDF | 77 | 40 - 135 |

**QUALIFIERS**

| | |
|---|---|
| B | Method blank contamination. The associated method blank contains the target analyte at a reportable level. |
| J | Estimated Result. |
| Q | Estimated maximum possible concentration (EMPC). |

**CH2M Hill Plateau Remediation DOE RL**

**Sample ID: B34B47**

**Trace Level Organic Compounds**

| | | | | | |
|---|---|---|---|---|---|
| **Lot - Sample #....:** | H6C170402 - 002 | **Work Order #....:** | M8DAG1AA | **Matrix....:** | WATER |
| **Date Sampled....:** | 03/08/16 | **Date Received....:** | 03/09/16 | **Dilution Factor:** | 1 |
| **Prep Date....:** | 03/22/16 | **Analysis Date....:** | 03/25/16 | | |
| **Prep Batch # ....:** | 6082032 | | | | |
| **Initial Wgt/Vol :** | 1061 mL | **Instrument ID....:** | D2A | **Method:** | SW846 8290A |
| **Analyst ID....:** | Linda K. McWhirter | | | | |

| PARAMETER | RESULT | | MINIMUM LEVEL | ESTIMATED DETECTION LIMIT | UNITS |
|---|---|---|---|---|---|
| 2,3,7,8-TCDD | ND | | 9.4 | 0.34 | pg/L |
| Total TCDD | ND | | 9.4 | 0.34 | pg/L |
| 1,2,3,7,8-PeCDD | ND | | 47 | 0.14 | pg/L |
| Total PeCDD | ND | | 47 | 0.14 | pg/L |
| 1,2,3,4,7,8-HxCDD | ND | | 47 | 0.22 | pg/L |
| 1,2,3,6,7,8-HxCDD | ND | | 47 | 0.22 | pg/L |
| 1,2,3,7,8,9-HxCDD | ND | | 47 | 0.21 | pg/L |
| Total HxCDD | ND | | 47 | 0.22 | pg/L |
| 1,2,3,4,6,7,8-HpCDD | ND | | 47 | 0.36 | pg/L |
| Total HpCDD | ND | | 47 | 0.36 | pg/L |
| **OCDD** | **2.1** | **B J** | **94** | **0.27** | **pg/L** |
| 2,3,7,8-TCDF | ND | | 9.4 | 0.21 | pg/L |
| Total TCDF | ND | | 9.4 | 0.21 | pg/L |
| 1,2,3,7,8-PeCDF | ND | | 47 | 0.20 | pg/L |
| 2,3,4,7,8-PeCDF | ND | | 47 | 0.21 | pg/L |
| Total PeCDF | ND | | 47 | 0.20 | pg/L |
| 1,2,3,4,7,8-HxCDF | ND | | 47 | 0.20 | pg/L |
| 1,2,3,6,7,8-HxCDF | ND | | 47 | 0.20 | pg/L |
| 2,3,4,6,7,8-HxCDF | ND | | 47 | 0.22 | pg/L |
| 1,2,3,7,8,9-HxCDF | ND | | 47 | 0.29 | pg/L |
| Total HxCDF | ND | | 47 | 0.22 | pg/L |
| 1,2,3,4,6,7,8-HpCDF | ND | | 47 | 0.13 | pg/L |
| 1,2,3,4,7,8,9-HpCDF | ND | | 47 | 0.18 | pg/L |
| Total HpCDF | ND | | 47 | 0.15 | pg/L |
| OCDF | ND | | 94 | 0.14 | pg/L |

**CH2M Hill Plateau Remediation DOE RL**

**Sample ID: B34B47**

**Trace Level Organic Compounds**

| | | | | | |
|---|---|---|---|---|---|
| **Lot - Sample #....:** | H6C170402 - 002 | **Work Order #....:** | M8DAG1AA | **Matrix....:** | WATER |
| **Date Sampled....:** | 03/08/16 | **Date Received....:** | 03/09/16 | **Dilution Factor:** | 1 |
| **Prep Date....:** | 03/22/16 | **Analysis Date....:** | 03/25/16 | | |
| **Prep Batch # ....:** | 6082032 | | | | |
| **Initial Wgt/Vol :** | 1061 mL | **Instrument ID....:** | D2A | **Method:** | SW846 8290A |
| **Analyst ID....:** | Linda K. McWhirter | | | | |

| INTERNAL STANDARDS | PERCENT RECOVERY | RECOVERY LIMITS |
|---|---|---|
| 13C-2,3,7,8-TCDD | 71 | 40 - 135 |
| 13C-1,2,3,7,8-PeCDD | 79 | 40 - 135 |
| 13C-1,2,3,4,7,8-HxCDD | 76 | 40 - 135 |
| 13C-1,2,3,6,7,8-HxCDD | 82 | 40 - 135 |
| 13C-1,2,3,4,6,7,8-HpCDD | 88 | 40 - 135 |
| 13C-OCDD | 81 | 40 - 135 |
| 13C-2,3,7,8-TCDF | 71 | 40 - 135 |
| 13C-1,2,3,7,8-PeCDF | 78 | 40 - 135 |
| 13C-2,3,4,7,8-PeCDF | 76 | 40 - 135 |
| 13C-1,2,3,4,7,8-HxCDF | 77 | 40 - 135 |
| 13C-1,2,3,6,7,8-HxCDF | 76 | 40 - 135 |
| 13C-2,3,4,6,7,8-HxCDF | 77 | 40 - 135 |
| 13C-1,2,3,7,8,9-HxCDF | 79 | 40 - 135 |
| 13C-1,2,3,4,6,7,8-HpCDF | 76 | 40 - 135 |
| 13C-1,2,3,4,7,8,9-HpCDF | 81 | 40 - 135 |
| 13C-OCDF | 72 | 40 - 135 |

**QUALIFIERS**

B Method blank contamination. The associated method blank contains the target analyte at a reportable level.

J Estimated Result.

**CH2M Hill Plateau Remediation DOE RL**

**Sample ID: B34B48**

**Trace Level Organic Compounds**

| | | | | | |
|---|---|---|---|---|---|
| **Lot - Sample #....:** | H6C170402 - 003 | **Work Order #....:** | M8DAH1AA | **Matrix....:** | WATER |
| **Date Sampled....:** | 03/08/16 | **Date Received....:** | 03/09/16 | **Dilution Factor:** | 1 |
| **Prep Date....:** | 03/22/16 | **Analysis Date....:** | 03/25/16 | | |
| **Prep Batch # ....:** | 6082032 | | | | |
| **Initial Wgt/Vol :** | 1047 mL | **Instrument ID....:** | D2A | **Method:** | SW846 8290A |
| **Analyst ID....:** | Melissa A. Davidson | | | | |

| PARAMETER | RESULT | | MINIMUM LEVEL | ESTIMATED DETECTION LIMIT | UNITS |
|---|---|---|---|---|---|
| 2,3,7,8-TCDD | ND | | 9.6 | 0.26 | pg/L |
| Total TCDD | ND | | 9.6 | 0.26 | pg/L |
| 1,2,3,7,8-PeCDD | ND | | 48 | 0.098 | pg/L |
| **Total PeCDD** | **0.39** | **Q J** | **48** | **0.098** | **pg/L** |
| 1,2,3,4,7,8-HxCDD | ND | | 48 | 0.17 | pg/L |
| 1,2,3,6,7,8-HxCDD | ND | | 48 | 0.17 | pg/L |
| 1,2,3,7,8,9-HxCDD | ND | | 48 | 0.16 | pg/L |
| Total HxCDD | ND | | 48 | 0.17 | pg/L |
| 1,2,3,4,6,7,8-HpCDD | ND | | 48 | 0.26 | pg/L |
| **Total HpCDD** | **1.2** | **Q B J** | **48** | **0.26** | **pg/L** |
| **OCDD** | **1.8** | **Q B J** | **96** | **0.22** | **pg/L** |
| 2,3,7,8-TCDF | ND | | 9.6 | 0.21 | pg/L |
| Total TCDF | ND | | 9.6 | 0.21 | pg/L |
| 1,2,3,7,8-PeCDF | ND | | 48 | 0.19 | pg/L |
| 2,3,4,7,8-PeCDF | ND | | 48 | 0.18 | pg/L |
| Total PeCDF | ND | | 48 | 0.19 | pg/L |
| 1,2,3,4,7,8-HxCDF | ND | | 48 | 0.18 | pg/L |
| 1,2,3,6,7,8-HxCDF | ND | | 48 | 0.18 | pg/L |
| 2,3,4,6,7,8-HxCDF | ND | | 48 | 0.19 | pg/L |
| 1,2,3,7,8,9-HxCDF | ND | | 48 | 0.24 | pg/L |
| Total HxCDF | ND | | 48 | 0.19 | pg/L |
| 1,2,3,4,6,7,8-HpCDF | ND | | 48 | 0.085 | pg/L |
| 1,2,3,4,7,8,9-HpCDF | ND | | 48 | 0.11 | pg/L |
| Total HpCDF | ND | | 48 | 0.097 | pg/L |
| **OCDF** | **1.0** | **B J** | **96** | **0.12** | **pg/L** |

**CH2M Hill Plateau Remediation DOE RL**

**Sample ID: B34B48**

**Trace Level Organic Compounds**

| | | | | | |
|---|---|---|---|---|---|
| **Lot - Sample #....:** | H6C170402 - 003 | **Work Order #....:** | M8DAH1AA | **Matrix....:** | WATER |
| **Date Sampled....:** | 03/08/16 | **Date Received....:** | 03/09/16 | **Dilution Factor:** | 1 |
| **Prep Date....:** | 03/22/16 | **Analysis Date....:** | 03/25/16 | | |
| **Prep Batch # ....:** | 6082032 | | | | |
| **Initial Wgt/Vol :** | 1047 mL | **Instrument ID....:** | D2A | **Method:** | SW846 8290A |
| **Analyst ID....:** | Melissa A. Davidson | | | | |

| INTERNAL STANDARDS | PERCENT RECOVERY | RECOVERY LIMITS |
|---|---|---|
| 13C-2,3,7,8-TCDD | 74 | 40 - 135 |
| 13C-1,2,3,7,8-PeCDD | 84 | 40 - 135 |
| 13C-1,2,3,4,7,8-HxCDD | 81 | 40 - 135 |
| 13C-1,2,3,6,7,8-HxCDD | 84 | 40 - 135 |
| 13C-1,2,3,4,6,7,8-HpCDD | 94 | 40 - 135 |
| 13C-OCDD | 87 | 40 - 135 |
| 13C-2,3,7,8-TCDF | 73 | 40 - 135 |
| 13C-1,2,3,7,8-PeCDF | 82 | 40 - 135 |
| 13C-2,3,4,7,8-PeCDF | 79 | 40 - 135 |
| 13C-1,2,3,4,7,8-HxCDF | 79 | 40 - 135 |
| 13C-1,2,3,6,7,8-HxCDF | 82 | 40 - 135 |
| 13C-2,3,4,6,7,8-HxCDF | 81 | 40 - 135 |
| 13C-1,2,3,7,8,9-HxCDF | 83 | 40 - 135 |
| 13C-1,2,3,4,6,7,8-HpCDF | 81 | 40 - 135 |
| 13C-1,2,3,4,7,8,9-HpCDF | 89 | 40 - 135 |
| 13C-OCDF | 74 | 40 - 135 |

**QUALIFIERS**

B Method blank contamination. The associated method blank contains the target analyte at a reportable level.

J Estimated Result.

Q Estimated maximum possible concentration (EMPC).

**CH2M Hill Plateau Remediation DOE RL**

**Sample ID: B34B58**

**Trace Level Organic Compounds**

| | | | | | |
|---|---|---|---|---|---|
| **Lot - Sample #....:** | H6C170402 - 004 | **Work Order #....:** | M8DAJ1AA | **Matrix....:** | WATER |
| **Date Sampled....:** | 03/08/16 | **Date Received....:** | 03/09/16 | **Dilution Factor:** | 1 |
| **Prep Date....:** | 03/22/16 | **Analysis Date....:** | 03/25/16 | | |
| **Prep Batch # ....:** | 6082032 | | | | |
| **Initial Wgt/Vol :** | 1052 mL | **Instrument ID....:** | D2A | **Method:** | SW846 8290A |
| **Analyst ID....:** | Melissa A. Davidson | | | | |

| PARAMETER | RESULT | | MINIMUM LEVEL | ESTIMATED DETECTION LIMIT | UNITS |
|---|---|---|---|---|---|
| 2,3,7,8-TCDD | ND | | 9.5 | 0.24 | pg/L |
| **Total TCDD** | **0.98** | **Q J** | **9.5** | **0.24** | **pg/L** |
| 1,2,3,7,8-PeCDD | ND | | 48 | 0.11 | pg/L |
| **Total PeCDD** | **3.2** | **Q J** | **48** | **0.11** | **pg/L** |
| 1,2,3,4,7,8-HxCDD | ND | | 48 | 0.18 | pg/L |
| 1,2,3,6,7,8-HxCDD | ND | | 48 | 0.17 | pg/L |
| 1,2,3,7,8,9-HxCDD | ND | | 48 | 0.17 | pg/L |
| **Total HxCDD** | **3.2** | **Q J** | **48** | **0.17** | **pg/L** |
| **1,2,3,4,6,7,8-HpCDD** | **1.6** | **Q J** | **48** | **0.27** | **pg/L** |
| **Total HpCDD** | **3.3** | **B J Q** | **48** | **0.27** | **pg/L** |
| **OCDD** | **3.1** | **B J** | **95** | **0.13** | **pg/L** |
| 2,3,7,8-TCDF | ND | | 9.5 | 0.16 | pg/L |
| **Total TCDF** | **0.68** | **J Q** | **9.5** | **0.16** | **pg/L** |
| 1,2,3,7,8-PeCDF | ND | | 48 | 0.14 | pg/L |
| **2,3,4,7,8-PeCDF** | **0.57** | **Q J** | **48** | **0.13** | **pg/L** |
| **Total PeCDF** | **1.1** | **J Q** | **48** | **0.13** | **pg/L** |
| **1,2,3,4,7,8-HxCDF** | **0.86** | **Q J** | **48** | **0.16** | **pg/L** |
| 1,2,3,6,7,8-HxCDF | ND | | 48 | 0.15 | pg/L |
| **2,3,4,6,7,8-HxCDF** | **0.44** | **Q J** | **48** | **0.14** | **pg/L** |
| 1,2,3,7,8,9-HxCDF | ND | | 48 | 0.18 | pg/L |
| **Total HxCDF** | **1.8** | **J Q** | **48** | **0.16** | **pg/L** |
| **1,2,3,4,6,7,8-HpCDF** | **1.4** | **J** | **48** | **0.12** | **pg/L** |
| **1,2,3,4,7,8,9-HpCDF** | **0.55** | **Q J** | **48** | **0.15** | **pg/L** |
| **Total HpCDF** | **2.0** | **J Q** | **48** | **0.13** | **pg/L** |
| **OCDF** | **1.4** | **B J** | **95** | **0.12** | **pg/L** |

**CH2M Hill Plateau Remediation DOE RL**

**Sample ID: B34B58**

**Trace Level Organic Compounds**

| | | | | | |
|---|---|---|---|---|---|
| **Lot - Sample #....:** | H6C170402 - 004 | **Work Order #....:** | M8DAJ1AA | **Matrix....:** | WATER |
| **Date Sampled....:** | 03/08/16 | **Date Received....:** | 03/09/16 | **Dilution Factor:** | 1 |
| **Prep Date....:** | 03/22/16 | **Analysis Date....:** | 03/25/16 | | |
| **Prep Batch # ....:** | 6082032 | | | | |
| **Initial Wgt/Vol :** | 1052 mL | **Instrument ID....:** | D2A | **Method:** | SW846 8290A |
| **Analyst ID....:** | Melissa A. Davidson | | | | |

| INTERNAL STANDARDS | PERCENT RECOVERY | RECOVERY LIMITS |
|---|---|---|
| 13C-2,3,7,8-TCDD | 87 | 40 - 135 |
| 13C-1,2,3,7,8-PeCDD | 92 | 40 - 135 |
| 13C-1,2,3,4,7,8-HxCDD | 86 | 40 - 135 |
| 13C-1,2,3,6,7,8-HxCDD | 87 | 40 - 135 |
| 13C-1,2,3,4,6,7,8-HpCDD | 101 | 40 - 135 |
| 13C-OCDD | 92 | 40 - 135 |
| 13C-2,3,7,8-TCDF | 86 | 40 - 135 |
| 13C-1,2,3,7,8-PeCDF | 95 | 40 - 135 |
| 13C-2,3,4,7,8-PeCDF | 94 | 40 - 135 |
| 13C-1,2,3,4,7,8-HxCDF | 80 | 40 - 135 |
| 13C-1,2,3,6,7,8-HxCDF | 80 | 40 - 135 |
| 13C-2,3,4,6,7,8-HxCDF | 92 | 40 - 135 |
| 13C-1,2,3,7,8,9-HxCDF | 91 | 40 - 135 |
| 13C-1,2,3,4,6,7,8-HpCDF | 79 | 40 - 135 |
| 13C-1,2,3,4,7,8,9-HpCDF | 91 | 40 - 135 |
| 13C-OCDF | 78 | 40 - 135 |

**QUALIFIERS**

B Method blank contamination. The associated method blank contains the target analyte at a reportable level.

J Estimated Result.

Q Estimated maximum possible concentration (EMPC).

**CH2M Hill Plateau Remediation DOE RL**

**Sample ID: B34B81**

**Trace Level Organic Compounds**

| | | | | | |
|---|---|---|---|---|---|
| **Lot - Sample #....:** | H6C170402 - 005 | **Work Order #....:** | M8DAK1AA | **Matrix....:** | WATER |
| **Date Sampled....:** | 03/08/16 | **Date Received....:** | 03/09/16 | **Dilution Factor:** | 1 |
| **Prep Date....:** | 03/22/16 | **Analysis Date....:** | 03/28/16 | | |
| **Prep Batch # ....:** | 6082032 | | | | |
| **Initial Wgt/Vol :** | 1054 mL | **Instrument ID....:** | D2A | **Method:** | SW846 8290A |
| **Analyst ID....:** | Linda K. McWhirter | | | | |

| PARAMETER | RESULT | | MINIMUM LEVEL | ESTIMATED DETECTION LIMIT | UNITS |
|---|---|---|---|---|---|
| 2,3,7,8-TCDD | ND | | 9.5 | 0.15 | pg/L |
| **Total TCDD** | **0.75** | **Q J** | **9.5** | **0.15** | **pg/L** |
| 1,2,3,7,8-PeCDD | ND | | 47 | 0.077 | pg/L |
| **Total PeCDD** | **0.33** | **J** | **47** | **0.077** | **pg/L** |
| 1,2,3,4,7,8-HxCDD | ND | | 47 | 0.12 | pg/L |
| 1,2,3,6,7,8-HxCDD | ND | | 47 | 0.12 | pg/L |
| 1,2,3,7,8,9-HxCDD | ND | | 47 | 0.11 | pg/L |
| **Total HxCDD** | **0.84** | **Q J** | **47** | **0.12** | **pg/L** |
| **1,2,3,4,6,7,8-HpCDD** | **1.3** | **J** | **47** | **0.16** | **pg/L** |
| **Total HpCDD** | **3.5** | **Q B J** | **47** | **0.16** | **pg/L** |
| **OCDD** | **13** | **B J** | **95** | **0.14** | **pg/L** |
| **2,3,7,8-TCDF** | **0.16** | **Q J** | **9.5** | **0.10** | **pg/L** |
| **Total TCDF** | **0.42** | **Q J** | **9.5** | **0.10** | **pg/L** |
| 1,2,3,7,8-PeCDF | ND | | 47 | 0.092 | pg/L |
| 2,3,4,7,8-PeCDF | ND | | 47 | 0.090 | pg/L |
| Total PeCDF | ND | | 47 | 0.091 | pg/L |
| **1,2,3,4,7,8-HxCDF** | **0.38** | **Q J** | **47** | **0.089** | **pg/L** |
| 1,2,3,6,7,8-HxCDF | ND | | 47 | 0.086 | pg/L |
| 2,3,4,6,7,8-HxCDF | ND | | 47 | 0.090 | pg/L |
| 1,2,3,7,8,9-HxCDF | ND | | 47 | 0.11 | pg/L |
| **Total HxCDF** | **0.38** | **Q J** | **47** | **0.093** | **pg/L** |
| **1,2,3,4,6,7,8-HpCDF** | **0.48** | **J** | **47** | **0.080** | **pg/L** |
| 1,2,3,4,7,8,9-HpCDF | ND | | 47 | 0.10 | pg/L |
| **Total HpCDF** | **0.48** | **J** | **47** | **0.091** | **pg/L** |
| **OCDF** | **0.71** | **B J** | **95** | **0.083** | **pg/L** |

**CH2M Hill Plateau Remediation DOE RL**

**Sample ID: B34B81**

**Trace Level Organic Compounds**

| | | | | | |
|---|---|---|---|---|---|
| **Lot - Sample #....:** | H6C170402 - 005 | **Work Order #....:** | M8DAK1AA | **Matrix....:** | WATER |
| **Date Sampled....:** | 03/08/16 | **Date Received....:** | 03/09/16 | **Dilution Factor:** | 1 |
| **Prep Date....:** | 03/22/16 | **Analysis Date....:** | 03/28/16 | | |
| **Prep Batch # ....:** | 6082032 | | | | |
| **Initial Wgt/Vol :** | 1054 mL | **Instrument ID....:** | D2A | **Method:** | SW846 8290A |
| **Analyst ID....:** | Linda K. McWhirter | | | | |

| INTERNAL STANDARDS | PERCENT RECOVERY | RECOVERY LIMITS |
|---|---|---|
| 13C-2,3,7,8-TCDD | 75 | 40 - 135 |
| 13C-1,2,3,7,8-PeCDD | 90 | 40 - 135 |
| 13C-1,2,3,4,7,8-HxCDD | 79 | 40 - 135 |
| 13C-1,2,3,6,7,8-HxCDD | 83 | 40 - 135 |
| 13C-1,2,3,4,6,7,8-HpCDD | 91 | 40 - 135 |
| 13C-OCDD | 91 | 40 - 135 |
| 13C-2,3,7,8-TCDF | 68 | 40 - 135 |
| 13C-1,2,3,7,8-PeCDF | 84 | 40 - 135 |
| 13C-2,3,4,7,8-PeCDF | 81 | 40 - 135 |
| 13C-1,2,3,4,7,8-HxCDF | 72 | 40 - 135 |
| 13C-1,2,3,6,7,8-HxCDF | 71 | 40 - 135 |
| 13C-2,3,4,6,7,8-HxCDF | 76 | 40 - 135 |
| 13C-1,2,3,7,8,9-HxCDF | 79 | 40 - 135 |
| 13C-1,2,3,4,6,7,8-HpCDF | 71 | 40 - 135 |
| 13C-1,2,3,4,7,8,9-HpCDF | 81 | 40 - 135 |
| 13C-OCDF | 74 | 40 - 135 |

**QUALIFIERS**

B Method blank contamination. The associated method blank contains the target analyte at a reportable level.

J Estimated Result.

Q Estimated maximum possible concentration (EMPC).

**CH2M Hill Plateau Remediation DOE RL**

**Sample ID: B34B82**

**Trace Level Organic Compounds**

| | | | | | |
|---|---|---|---|---|---|
| **Lot - Sample #....:** | H6C170402 - 006 | **Work Order #....:** | M8DAL1AA | **Matrix....:** | WATER |
| **Date Sampled....:** | 03/08/16 | **Date Received....:** | 03/09/16 | **Dilution Factor:** | 1 |
| **Prep Date....:** | 03/22/16 | **Analysis Date....:** | 03/28/16 | | |
| **Prep Batch # ....:** | 6082032 | | | | |
| **Initial Wgt/Vol :** | 1047 mL | **Instrument ID....:** | D2A | **Method:** | SW846 8290A |
| **Analyst ID....:** | Linda K. McWhirter | | | | |

| PARAMETER | RESULT | | MINIMUM LEVEL | ESTIMATED DETECTION LIMIT | UNITS |
|---|---|---|---|---|---|
| 2,3,7,8-TCDD | ND | | 9.6 | 0.19 | pg/L |
| Total TCDD | ND | | 9.6 | 0.19 | pg/L |
| 1,2,3,7,8-PeCDD | ND | | 48 | 0.072 | pg/L |
| Total PeCDD | ND | | 48 | 0.072 | pg/L |
| 1,2,3,4,7,8-HxCDD | ND | | 48 | 0.13 | pg/L |
| 1,2,3,6,7,8-HxCDD | ND | | 48 | 0.13 | pg/L |
| 1,2,3,7,8,9-HxCDD | ND | | 48 | 0.13 | pg/L |
| Total HxCDD | ND | | 48 | 0.13 | pg/L |
| 1,2,3,4,6,7,8-HpCDD | ND | | 48 | 0.26 | pg/L |
| Total HpCDD | ND | | 48 | 0.26 | pg/L |
| **OCDD** | **5.1** | **B J** | **96** | **0.20** | **pg/L** |
| **2,3,7,8-TCDF** | **0.34** | **Q J** | **9.6** | **0.13** | **pg/L** |
| **Total TCDF** | **0.63** | **J Q** | **9.6** | **0.13** | **pg/L** |
| 1,2,3,7,8-PeCDF | ND | | 48 | 0.11 | pg/L |
| 2,3,4,7,8-PeCDF | ND | | 48 | 0.11 | pg/L |
| Total PeCDF | ND | | 48 | 0.11 | pg/L |
| 1,2,3,4,7,8-HxCDF | ND | | 48 | 0.12 | pg/L |
| 1,2,3,6,7,8-HxCDF | ND | | 48 | 0.12 | pg/L |
| 2,3,4,6,7,8-HxCDF | ND | | 48 | 0.12 | pg/L |
| 1,2,3,7,8,9-HxCDF | ND | | 48 | 0.16 | pg/L |
| Total HxCDF | ND | | 48 | 0.13 | pg/L |
| **1,2,3,4,6,7,8-HpCDF** | **0.32** | **Q J** | **48** | **0.091** | **pg/L** |
| 1,2,3,4,7,8,9-HpCDF | ND | | 48 | 0.12 | pg/L |
| **Total HpCDF** | **0.32** | **Q J** | **48** | **0.10** | **pg/L** |
| **OCDF** | **0.63** | **Q B J** | **96** | **0.11** | **pg/L** |

**CH2M Hill Plateau Remediation DOE RL**

**Sample ID: B34B82**

**Trace Level Organic Compounds**

| | | | | | |
|---|---|---|---|---|---|
| **Lot - Sample #....:** | H6C170402 - 006 | **Work Order #....:** | M8DAL1AA | **Matrix....:** | WATER |
| **Date Sampled....:** | 03/08/16 | **Date Received....:** | 03/09/16 | **Dilution Factor:** | 1 |
| **Prep Date....:** | 03/22/16 | **Analysis Date....:** | 03/28/16 | | |
| **Prep Batch # ....:** | 6082032 | | | | |
| **Initial Wgt/Vol :** | 1047 mL | **Instrument ID....:** | D2A | **Method:** | SW846 8290A |
| **Analyst ID....:** | Linda K. McWhirter | | | | |

| INTERNAL STANDARDS | PERCENT RECOVERY | RECOVERY LIMITS |
|---|---|---|
| 13C-2,3,7,8-TCDD | 78 | 40 - 135 |
| 13C-1,2,3,7,8-PeCDD | 97 | 40 - 135 |
| 13C-1,2,3,4,7,8-HxCDD | 83 | 40 - 135 |
| 13C-1,2,3,6,7,8-HxCDD | 85 | 40 - 135 |
| 13C-1,2,3,4,6,7,8-HpCDD | 91 | 40 - 135 |
| 13C-OCDD | 86 | 40 - 135 |
| 13C-2,3,7,8-TCDF | 73 | 40 - 135 |
| 13C-1,2,3,7,8-PeCDF | 92 | 40 - 135 |
| 13C-2,3,4,7,8-PeCDF | 90 | 40 - 135 |
| 13C-1,2,3,4,7,8-HxCDF | 78 | 40 - 135 |
| 13C-1,2,3,6,7,8-HxCDF | 77 | 40 - 135 |
| 13C-2,3,4,6,7,8-HxCDF | 80 | 40 - 135 |
| 13C-1,2,3,7,8,9-HxCDF | 78 | 40 - 135 |
| 13C-1,2,3,4,6,7,8-HpCDF | 75 | 40 - 135 |
| 13C-1,2,3,4,7,8,9-HpCDF | 82 | 40 - 135 |
| 13C-OCDF | 72 | 40 - 135 |

**QUALIFIERS**

B Method blank contamination. The associated method blank contains the target analyte at a reportable level.

J Estimated Result.

Q Estimated maximum possible concentration (EMPC).

## Method Blank Report

### Trace Level Organic Compounds

| | | | | | |
|---|---|---|---|---|---|
| **Lot - Sample #....:** | H6C220000 - 032B | **Work Order #....:** | M8D251AA | **Matrix....:** | WATER |
| **Dilution Factor:** | 1 | | | | |
| **Prep Date....:** | 03/22/16 | **Analysis Date....:** | 03/24/16 | | |
| **Prep Batch # ....:** | 6082032 | | | | |
| **Initial Wgt/Vol :** | 1000 mL | **Instrument ID....:** | D2A | **Method:** | SW846 8290A |
| **Analyst ID....:** | Melissa A. Davidson | | | | |

| PARAMETER | RESULT | | MINIMUM LEVEL | ESTIMATED DETECTION LIMIT | UNITS |
|---|---|---|---|---|---|
| 2,3,7,8-TCDD | ND | | 10 | 0.43 | pg/L |
| Total TCDD | ND | | 10 | 0.43 | pg/L |
| 1,2,3,7,8-PeCDD | ND | | 50 | 0.14 | pg/L |
| Total PeCDD | ND | | 50 | 0.14 | pg/L |
| 1,2,3,4,7,8-HxCDD | ND | | 50 | 0.23 | pg/L |
| 1,2,3,6,7,8-HxCDD | ND | | 50 | 0.24 | pg/L |
| 1,2,3,7,8,9-HxCDD | ND | | 50 | 0.22 | pg/L |
| Total HxCDD | ND | | 50 | 0.23 | pg/L |
| 1,2,3,4,6,7,8-HpCDD | ND | | 50 | 0.35 | pg/L |
| **Total HpCDD** | **0.92** | **Q J** | **50** | **0.35** | **pg/L** |
| **OCDD** | **3.7** | **J** | **100** | **0.31** | **pg/L** |
| 2,3,7,8-TCDF | ND | | 10 | 0.24 | pg/L |
| Total TCDF | ND | | 10 | 0.24 | pg/L |
| 1,2,3,7,8-PeCDF | ND | | 50 | 0.24 | pg/L |
| 2,3,4,7,8-PeCDF | ND | | 50 | 0.22 | pg/L |
| Total PeCDF | ND | | 50 | 0.23 | pg/L |
| 1,2,3,4,7,8-HxCDF | ND | | 50 | 0.25 | pg/L |
| 1,2,3,6,7,8-HxCDF | ND | | 50 | 0.23 | pg/L |
| 2,3,4,6,7,8-HxCDF | ND | | 50 | 0.22 | pg/L |
| 1,2,3,7,8,9-HxCDF | ND | | 50 | 0.28 | pg/L |
| Total HxCDF | ND | | 50 | 0.24 | pg/L |
| 1,2,3,4,6,7,8-HpCDF | ND | | 50 | 0.16 | pg/L |
| 1,2,3,4,7,8,9-HpCDF | ND | | 50 | 0.19 | pg/L |
| Total HpCDF | ND | | 50 | 0.17 | pg/L |
| **OCDF** | **2.0** | **J** | **100** | **0.20** | **pg/L** |

## Method Blank Report

### Trace Level Organic Compounds

| | | | | | |
|---|---|---|---|---|---|
| **Lot - Sample #....:** | H6C220000 - 032B | **Work Order #....:** | M8D251AA | **Matrix....:** | WATER |
| **Dilution Factor:** | 1 | | | | |
| **Prep Date....:** | 03/22/16 | **Analysis Date....:** | 03/24/16 | | |
| **Prep Batch # ....:** | 6082032 | | | | |
| **Initial Wgt/Vol :** | 1000 mL | **Instrument ID....:** | D2A | **Method:** | SW846 8290A |
| **Analyst ID....:** | Melissa A. Davidson | | | | |

| INTERNAL STANDARDS | PERCENT RECOVERY | RECOVERY LIMITS |
|---|---|---|
| 13C-2,3,7,8-TCDD | 83 | 40 - 135 |
| 13C-1,2,3,7,8-PeCDD | 93 | 40 - 135 |
| 13C-1,2,3,4,7,8-HxCDD | 88 | 40 - 135 |
| 13C-1,2,3,6,7,8-HxCDD | 87 | 40 - 135 |
| 13C-1,2,3,4,6,7,8-HpCDD | 95 | 40 - 135 |
| 13C-OCDD | 85 | 40 - 135 |
| 13C-2,3,7,8-TCDF | 82 | 40 - 135 |
| 13C-1,2,3,7,8-PeCDF | 90 | 40 - 135 |
| 13C-2,3,4,7,8-PeCDF | 90 | 40 - 135 |
| 13C-1,2,3,4,7,8-HxCDF | 74 | 40 - 135 |
| 13C-1,2,3,6,7,8-HxCDF | 74 | 40 - 135 |
| 13C-2,3,4,6,7,8-HxCDF | 86 | 40 - 135 |
| 13C-1,2,3,7,8,9-HxCDF | 88 | 40 - 135 |
| 13C-1,2,3,4,6,7,8-HpCDF | 73 | 40 - 135 |
| 13C-1,2,3,4,7,8,9-HpCDF | 87 | 40 - 135 |
| 13C-OCDF | 73 | 40 - 135 |

**QUALIFIERS**

J Estimated Result.

Q Estimated maximum possible concentration (EMPC).

## LABORATORY CONTROL SAMPLE DATA REPORT

### Trace Level Organic Compounds

| | | | | | |
|---|---|---|---|---|---|
| **Client Lot # ...:** | W07210 | **Work Order # ...:** | M8D251AC-LCS | **Matrix .....:** | WATER |
| **LCS Lot-Sample# :** | H6C220000 - 032 | | | | |
| **Prep Date .....:** | 03/22/16 | **Analysis Date ..:** | 03/24/16 | | |
| **Prep Batch # ...:** | 6082032 | | | | |
| **Dilution Factor :** | 1 | | | | |
| **Analyst ID.....:** | Melissa A. Davidson | **Instrument ID..:** | D2A | **Method.....:** | SW846 8290A |
| **Initial Wgt/Vol:** | 1000 mL | | | | |

| PARAMETER | SPIKE AMOUNT | MEASURED AMOUNT | UNITS | PERCENT RECOVERY | | RECOVERY LIMITS |
|---|---|---|---|---|---|---|
| **2,3,7,8-TCDD** | **200** | **187** | **pg/L** | **93** | | **(71 - 125)** |
| **1,2,3,7,8-PeCDD** | **1000** | **963** | **pg/L** | **96** | | **(76 - 121)** |
| **1,2,3,4,7,8-HxCDD** | **1000** | **945** | **pg/L** | **94** | | **(80 - 126)** |
| **1,2,3,6,7,8-HxCDD** | **1000** | **910** | **pg/L** | **91** | | **(78 - 134)** |
| **1,2,3,7,8,9-HxCDD** | **1000** | **1150** | **pg/L** | **115** | | **(76 - 137)** |
| **1,2,3,4,6,7,8-HpCDD** | **1000** | **920** | **pg/L** | **92** | | **(79 - 122)** |
| **OCDD** | **2000** | **1800** | **pg/L** | **90** | **B** | **(81 - 135)** |
| **2,3,7,8-TCDF** | **200** | **196** | **pg/L** | **98** | | **(72 - 138)** |
| **1,2,3,7,8-PeCDF** | **1000** | **858** | **pg/L** | **86** | | **(82 - 130)** |
| **2,3,4,7,8-PeCDF** | **1000** | **911** | **pg/L** | **91** | | **(77 - 129)** |
| **1,2,3,4,7,8-HxCDF** | **1000** | **949** | **pg/L** | **95** | | **(80 - 130)** |
| **1,2,3,6,7,8-HxCDF** | **1000** | **941** | **pg/L** | **94** | | **(79 - 131)** |
| **2,3,4,6,7,8-HxCDF** | **1000** | **935** | **pg/L** | **93** | | **(81 - 130)** |
| **1,2,3,7,8,9-HxCDF** | **1000** | **953** | **pg/L** | **95** | | **(83 - 130)** |
| **1,2,3,4,6,7,8-HpCDF** | **1000** | **964** | **pg/L** | **96** | | **(81 - 130)** |
| **1,2,3,4,7,8,9-HpCDF** | **1000** | **961** | **pg/L** | **96** | | **(77 - 128)** |
| **OCDF** | **2000** | **1840** | **pg/L** | **92** | **B** | **(66 - 150)** |

| INTERNAL STANDARD | PERCENT RECOVERY | RECOVERY LIMITS |
|---|---|---|
| 13C-2,3,7,8-TCDD | 67 | (40 - 135) |
| 13C-1,2,3,7,8-PeCDD | 71 | (40 - 135) |
| 13C-1,2,3,4,7,8-HxCDD | 68 | (40 - 135) |
| 13C-1,2,3,6,7,8-HxCDD | 68 | (40 - 135) |
| 13C-1,2,3,4,6,7,8-HpCDD | 93 | (40 - 135) |
| 13C-OCDD | 90 | (40 - 135) |
| 13C-2,3,7,8-TCDF | 68 | (40 - 135) |
| 13C-1,2,3,7,8-PeCDF | 71 | (40 - 135) |
| 13C-2,3,4,7,8-PeCDF | 71 | (40 - 135) |
| 13C-1,2,3,4,7,8-HxCDF | 58 | (40 - 135) |
| 13C-1,2,3,6,7,8-HxCDF | 56 | (40 - 135) |
| 13C-2,3,4,6,7,8-HxCDF | 73 | (40 - 135) |
| 13C-1,2,3,7,8,9-HxCDF | 77 | (40 - 135) |
| 13C-1,2,3,4,6,7,8-HpCDF | 63 | (40 - 135) |
| 13C-1,2,3,4,7,8,9-HpCDF | 80 | (40 - 135) |
| 13C-OCDF | 73 | (40 - 135) |

## LABORATORY CONTROL SAMPLE DATA REPORT

### Trace Level Organic Compounds

**Notes:**

Calculations are performed before rounding to avoid round-off errors in calculated results.

Bold print denotes control parameters

B Method blank contamination. The associated method blank contains the target analyte at a reportable level.

3016

H6C170402

| CH2MHill Plateau Remediation Company | CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST | C.O.C. # W16-003-094 |
|---|---|---|
| | | Page 1 of 1 |

| | | | | | |
|---|---|---|---|---|---|
| **Collector** | K.C. Patterson/CHPRC | **Contact/Requester** | Karen Waters-Husted | **Telephone No.** | 509-376-4650 |
| **SAF No.** | W16-003 | **Sampling Origin** | Hanford Site | **Purchase Order/Charge Code** | 300071 |
| **Project Title** | RCRA, MARCH 2016 | **Logbook No.** | HNF-N-506 81/83 | **Ice Chest No.** | GWS-507 |
| **Shipped To (Lab)** | TestAmerica Knoxville | **Method of Shipment** | Commercial Carrier | **Bill of Lading/Air Bill No.** | 7758 2492 8920 |
| **Protocol** | RCRA | **Priority:** | 30 Days **PRIORITY** | **Offsite Property No.** | N/A |

**POSSIBLE SAMPLE HAZARDS/REMARKS**
** ** Contains Radioactive Material at concentrations that are not regulated for transportation per 49 CFR / IATA Dangerous Goods Regulations but are not releasable per DOE Order 458.1

**SPECIAL INSTRUCTIONS** **Hold Time** Total Activity Exemption: Yes ☑ No ☐
N/A

| Sample No. | Filter | * | Date | Time | No/Type Container | Sample Analysis | Holding Time | Preservative |
|---|---|---|---|---|---|---|---|---|
| B34B41 | N | W | MAR 0 8 2016 | 1035 | 4x1-L aG | 8290_DIOXINS_GCMS: COMMON | 30/45 Days | Cool <=6C |

March 31, 2016

CUSTODY SEALS INTACT
RECEIVED AT AT 0.3,0.1 / CT 0.3,0.1°C
DKD 3-9-16
2 COOLERS FEDEX 7758 2678 6298
7758 2492 8920

SDG# W07210

| Relinquished By | Print | Sign | Date/Time | Received By | Print | Sign | Date/Time |
|---|---|---|---|---|---|---|---|
| K.C. Patterson/CHPRC | | | MAR 0 8 2016 1051 | L.D. Wall CHPRC | | | MAR 0 8 2015 1051 |
| Relinquished By | | | Date/Time | Received By | | | Date/Time |
| L.D. Wall CHPRC | | | MAR 0 8 2016 1400 | FEDEX | | | |
| Relinquished By | | | Date/Time | Received By | | | Date/Time |
| FEDEX 3-9-16 11:40 FURTHER BY TESTAMERICA DKD 3-9-16 11:40 | | | | | | | 3-9-16 11:40 |
| Relinquished By | | | Date/Time | Received By | | | Date/Time |
| | | | | | | | |

Matrix *

| | | | | | |
|---|---|---|---|---|---|
| S | = Soil | DS | = Drum Solids | | |
| SE | = Sediment | DL | = Drum Liquids | | |
| SO | = Solid | T | = Tissue | | |
| SL | = Sludge | WI | = Wipe | | |
| W | = Water | L | = Liquid | | |
| O | = Oil | V | = Vegetation | | |
| A | = Air | X | = Other | | |

| FINAL SAMPLE DISPOSITION | Disposal Method (e.g., Return to customer, per lab procedure, used in process) | Disposed By | Date/Time |
|---|---|---|---|
| | | | |

PRINTED ON 3/1/2016 FSR ID = FSR21683 A-6004-842 (REV 2)

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| CH2MHill Plateau Remediation Company | CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST H6C170402 | C.O.C. # W16-003-095 |
|---|---|---|
| | | Page 1 of 1 |

| | | | | | |
|---|---|---|---|---|---|
| **Collector** | K.C. Patterson/CHPRC | **Contact/Requester** | Karen Waters-Husted | **Telephone No.** | 509-376-4650 |
| **SAF No.** | W16-003 | **Sampling Origin** | Hanford Site | **Purchase Order/Charge Code** | 300071 |
| **Project Title** | RCRA, MARCH 2016 | **Logbook No.** | HNF-N-506 81 / 83 | **Ice Chest No.** | GCWS-415 |
| **Shipped To (Lab)** | TestAmerica Knoxville | **Method of Shipment** | Commercial Carrier | **Bill of Lading/Air Bill No.** | 779582678629 8 |
| **Protocol** | RCRA | **Priority:** | 30 Days **PRIORITY** | **Offsite Property No.** | N/A |

**POSSIBLE SAMPLE HAZARDS/REMARKS**
** ** Contains Radioactive Material at concentrations that are not regulated for transportation per 49 CFR / IATA Dangerous Goods Regulations but are not releasable per DOE Order 458.1

**SPECIAL INSTRUCTIONS** **Hold Time** Total Activity Exemption: Yes ☑ No ☐
N/A

| Sample No. | Filter | * | Date | Time | No/Type Container | Sample Analysis | Holding Time | Preservative |
|---|---|---|---|---|---|---|---|---|
| B34B47 | N | W | MAR 0 8 2016 | 0630 | 4x1-L aG | 8290_DIOXINS_GCMS: COMMON | 30/45 Days | Cool <=6C |

March 31, 2016

SOGH W07210

| Relinquished By | Print | Sign | Date/Time | Received By | Print | Sign | Date/Time |
|---|---|---|---|---|---|---|---|
| K.C. Patterson/CHPRC | | | MAR 0 8 2016 1051 | L.D. Wall CHPRC | | | MAR 0 8 2016 1051 |
| Relinquished By | | | Date/Time | Received By | | | Date/Time |
| L.D. Wall CHPRC | | | MAR 0 8 2016 1400 | FEDEX | | | |
| Relinquished By | | | Date/Time | Received By | | | Date/Time |
| FEDEX 3-9-16 11:40 BOTHELD BY TESTAMERICA BNA 3-9-16 11:40 | | | | | | | 3-9-16 11:40 |
| Relinquished By | | | Date/Time | Received By | | | Date/Time |

Matrix *

| | | | | | |
|---|---|---|---|---|---|
| S | = Soil | DS | = Drum Solids | | |
| SE | = Sediment | DL | = Drum Liquids | | |
| SO | = Solid | T | = Tissue | | |
| SL | = Sludge | WI | = Wipe | | |
| W | = Water | L | = Liquid | | |
| O | = Oil | V | = Vegetation | | |
| A | = Air | X | = Other | | |

| FINAL SAMPLE DISPOSITION | Disposal Method (e.g., Return to customer, per lab procedure, used in process) | Disposed By | Date/Time |
|---|---|---|---|

PRINTED ON 3/1/2016 FSR ID = FSR25973 A-6004-842 (REV 2)

| CH2MHill Plateau Remediation Company | CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST H6C170402 | C.O.C. # W16-003-096 Page 1 of 1 |
|---|---|---|

| | | |
|---|---|---|
| **Collector** K.C. Patterson/CHPRC | **Contact/Requester** Karen Waters-Husted | **Telephone No.** 509-376-4650 |
| **SAF No.** W16-003 | **Sampling Origin** Hanford Site | **Purchase Order/Charge Code** 300071 |
| **Project Title** RCRA, MARCH 2016 | **Logbook No.** HNF-N-506 81/83 | **Ice Chest No.** GCS-415 |
| **Shipped To (Lab)** TestAmerica Knoxville | **Method of Shipment** Commercial Carrier | **Bill of Lading/Air Bill No.** 775826786298 |
| **Protocol** RCRA | **Priority:** 30 Days **PRIORITY** | **Offsite Property No.** N/A |

**POSSIBLE SAMPLE HAZARDS/REMARKS**
** ** Contains Radioactive Material at concentrations that are not regulated for transportation per 49 CFR / IATA Dangerous Goods Regulations but are not releasable per DOE Order 458.1

**SPECIAL INSTRUCTIONS** **Hold Time** Total Activity Exemption: Yes ☑ No ☐
N/A

| Sample No. | Filter | * | Date | Time | No/Type Container | Sample Analysis | Holding Time | Preservative |
|---|---|---|---|---|---|---|---|---|
| B34B48 | N | W | MAR 0 8 2016 | 0943 | 4x1-L aG | 8290_DIOXINS_GCMS: COMMON | 30/45 Days | Cool <=6C |

March 31, 2016

SDG# W07210

| Relinquished By | Print | Sign | Date/Time | Received By | Print | Sign | Date/Time |
|---|---|---|---|---|---|---|---|
| | K.C. Patterson/CHPRC | | MAR 0 8 2016 1051 | | L.D. Wall CHPRC | | MAR 0 8 2016 1051 |
| Relinquished By | L.D. Wall CHPRC | | MAR 0 8 2016 1400 | Received By | FEDEX | | |
| Relinquished By | FEDEX 3-9-16 11:40 ENTERED BY TESTAMERICA ORD 3-9-16 11:40 | | | Received By | | | 3-9-16 11:40 |
| Relinquished By | | | | Received By | | | |

Matrix *

| | | | |
|---|---|---|---|
| S = Soil | DS = Drum Solids | | |
| SE = Sediment | DL = Drum Liquids | | |
| SO = Solid | T = Tissue | | |
| SL = Sludge | WI = Wipe | | |
| W = Water | L = Liquid | | |
| O = Oil | V = Vegetation | | |
| A = Air | X = Other | | |

| FINAL SAMPLE DISPOSITION | Disposal Method (e.g., Return to customer, per lab procedure, used in process) | Disposed By | Date/Time |
|---|---|---|---|

79 185

| CH2MHill Plateau Remediation Company | CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST H6C170402 | C.O.C. # W16-003-098 Page 1 of 1 |
|---|---|---|

| | | | | | |
|---|---|---|---|---|---|
| **Collector** | K.C. Patterson/CHPRC | **Contact/Requester** | Karen Waters-Husted | **Telephone No.** | 509-376-4650 |
| **SAF No.** | W16-003 | **Sampling Origin** | Hanford Site | **Purchase Order/Charge Code** | 300071 |
| **Project Title** | RCRA, MARCH 2016 | **Logbook No.** | HNF-N-506 81 / 83 | **Ice Chest No.** | GWS-415 |
| **Shipped To (Lab)** | TestAmerica Knoxville | **Method of Shipment** | Commercial Carrier | **Bill of Lading/Air Bill No.** | 7758 2678 6298 |
| **Protocol** | RCRA | **Priority:** | 30 Days **PRIORITY** | **Offsite Property No.** | N/A |

**POSSIBLE SAMPLE HAZARDS/REMARKS**
** ** Contains Radioactive Material at concentrations that are not regulated for transportation per 49 CFR / IATA Dangerous Goods Regulations but are not releasable per DOE Order 458.1

**SPECIAL INSTRUCTIONS** **Hold Time** Total Activity Exemption: Yes ☑ No ☐
N/A

| Sample No. | Filter | * | Date | Time | No/Type Container | Sample Analysis | Holding Time | Preservative |
|---|---|---|---|---|---|---|---|---|
| B34B58 | N | W | MAR 0 8 2016 | 1215 | 4x1-L aG | 8290_DIOXINS_GCMS: COMMON | 30/45 Days | Cool <=6C |

March 31, 2016

SDG# W07210

| Relinquished By | Print / Sign | Date/Time | Received By | Print / Sign | Date/Time |
|---|---|---|---|---|---|
| K.C. Patterson/CHPRC | | MAR 0 8 2016 1230 | Frank Hall CHPRC | | MAR 0 8 2016 1230 |
| Frank Hall CHPRC | | MAR 0 8 2016 1400 | | | |
| | | | FEDEX | | |
| FEDEX 3-9-16 11:40 ENTERED BY TESTAMERICA OKD 3-9-16 11:40 | | | | | 3-9-16 11:210 |
| Relinquished By | | Date/Time | Received By | | Date/Time |

Matrix *

| | | | | | |
|---|---|---|---|---|---|
| S | = Soil | | DS | = Drum Solids | |
| SE | = Sediment | | DL | = Drum Liquids | |
| SO | = Solid | | T | = Tissue | |
| SL | = Sludge | | WI | = Wipe | |
| W | = Water | | L | = Liquid | |
| O | = Oil | | V | = Vegetation | |
| A | = Air | | X | = Other | |

| FINAL SAMPLE DISPOSITION | Disposal Method (e.g., Return to customer, per lab procedure, used in process) | Disposed By | Date/Time |
|---|---|---|---|

| CH2MHill Plateau Remediation Company | CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST | C.O.C. # W16-003-104 |
|---|---|---|
| | 14C170402 | Page 1 of 1 |

| | | | | | |
|---|---|---|---|---|---|
| **Collector** | K.C. Patterson/CHPRC | **Contact/Requester** | Karen Waters-Husted | **Telephone No.** | 509-376-4650 |
| **SAF No.** | W16-003 | **Sampling Origin** | Hanford Site | **Purchase Order/Charge Code** | 300071 |
| **Project Title** | RCRA, MARCH 2016 | **Logbook No.** | HNF-N-506 81 / 83 | **Ice Chest No.** | GWS-507 |
| **Shipped To (Lab)** | TestAmerica Knoxville | **Method of Shipment** | Commercial Carrier | **Bill of Lading/Air Bill No.** | 7758 2492 8920 |
| **Protocol** | RCRA | **Priority:** | 30 Days **PRIORITY** | **Offsite Property No.** | N/A |

**POSSIBLE SAMPLE HAZARDS/REMARKS**

** ** Contains Radioactive Material at concentrations that are not regulated for transportation per 49 CFR / IATA Dangerous Goods Regulations but are not releasable per DOE Order 458.1

**SPECIAL INSTRUCTIONS** **Hold Time** Total Activity Exemption: Yes ☑ No ☐

N/A

| Sample No. | Filter | * | Date | Time | No/Type Container | Sample Analysis | Holding Time | Preservative |
|---|---|---|---|---|---|---|---|---|
| B34B81 | N | W | MAR 0 8 2016 | 0832 | 4x1-L aG | 8290_DIOXINS_GCMS: COMMON | 30/45 Days | Cool <=6C |

March 31, 2016

SDG# W07210

| Relinquished By | Print / Sign | Date/Time | Received By | Print / Sign | Date/Time |
|---|---|---|---|---|---|
| K.C. Patterson/CHPRC | | MAR 0 8 2016 0930 | L.D. Wall CHPRC | L.D. Wall | MAR 0 8 2016 0930 |
| L.D. Wall CHPRC | L.D. Wall | MAR 0 8 2016 1400 | | | |
| | | | FEDEX | | |
| FEDEX 3-9-16 11:40 ENTERED BY TESTAMERICA DNO 3-9-16 11:40 | | | | | 3-9-16 11:40 |

Matrix *

| | | | | | |
|---|---|---|---|---|---|
| S | = Soil | DS | = Drum Solids | | |
| SE | = Sediment | DL | = Drum Liquids | | |
| SO | = Solid | T | = Tissue | | |
| SL | = Sludge | WI | = Wipe | | |
| W | = Water | L | = Liquid | | |
| O | = Oil | V | = Vegetation | | |
| A | = Air | X | = Other | | |

| Relinquished By | Date/Time | Received By | Date/Time |
|---|---|---|---|
| | | | |

| FINAL SAMPLE DISPOSITION | Disposal Method (e.g., Return to customer, per lab procedure, used in process) | Disposed By | Date/Time |
|---|---|---|---|
| | | | |

| CH2MHill Plateau Remediation Company | CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST 1461704O2 | C.O.C. # W16-003-105 Page 1 of 1 |
|---|---|---|

| | | |
|---|---|---|
| Collector K.C. Patterson/CHPRC | Contact/Requester Karen Waters-Husted | Telephone No. 509-376-4650 |
| SAF No. W16-003 | Sampling Origin Hanford Site | Purchase Order/Charge Code 300071 |
| Project Title RCRA, MARCH 2016 | Logbook No. HNF-N-506 81/83 | Ice Chest No. GWS-507 |
| Shipped To (Lab) TestAmerica Knoxville | Method of Shipment Commercial Carrier | Bill of Lading/Air Bill No. 7758 2492 8920 |
| Protocol RCRA | Priority: 30 Days **PRIORITY** | Offsite Property No. N/A |

**POSSIBLE SAMPLE HAZARDS/REMARKS**
** ** Contains Radioactive Material at concentrations that are not regulated for transportation per 49 CFR / IATA Dangerous Goods Regulations but are not releasable per DOE Order 458.1

**SPECIAL INSTRUCTIONS** **Hold Time** Total Activity Exemption: Yes ☑ No ☐
N/A

| Sample No. | Filter | * | Date | Time | No/Type Container | Sample Analysis | Holding Time | Preservative |
|---|---|---|---|---|---|---|---|---|
| B34B82 | N | W | MAR 0 8 2016 | 0832 | 4x1-L aG | 8290_DIOXINS_GCMS: COMMON | 30/45 Days | Cool <=6C |

March 31, 2016

SDG # W07210

| Relinquished By / Print / Sign | Date/Time | Received By / Print / Sign | Date/Time |
|---|---|---|---|
| K.C. Patterson/CHPRC | MAR 0 8 2016 0930 | L.D. Wall CHPRC | MAR 0 8 2016 0930 |
| L.D. Wall CHPRC | MAR 0 8 2016 1400 | FEDEX | |
| FEDEX 3-9-16 11:40 EXCHANGED BY TESTAMERICA DMD 3-9-16 11:40 | | | 3-9-16 11:40 |
| | | | |

Matrix *

| | | | |
|---|---|---|---|
| S = Soil | | DS = Drum Solids | |
| SE = Sediment | | DL = Drum Liquids | |
| SO = Solid | | T = Tissue | |
| SL = Sludge | | WI = Wipe | |
| W = Water | | L = Liquid | |
| O = Oil | | V = Vegetation | |
| A = Air | | X = Other | |

**FINAL SAMPLE DISPOSITION** Disposal Method (e.g., Return to customer, per lab procedure, used in process) Disposed By Date/Time

PRINTED ON 3/1/2016 FSR ID = FSR8318 A-6004-842 (REV 2)

## TESTAMERICA KNOXVILLE SAMPLE RECEIPT/CONDITION UPON RECEIPT ANOMALY CHECKLIST

**Lot Number:** 160170402

| Review Items | Yes | No | NA | If No, what was the problem? | Comments/Actions Taken |
|---|---|---|---|---|---|
| 1. Do sample container labels match COC? (IDs, Dates, Times) | ✓ | | | ☐ 1a Do not match COC<br>☐ 1b Incomplete information<br>☐ 1c Marking smeared<br>☐ 1d Label torn<br>☐ 1e No label<br>☐ 1f COC not received<br>☒ 1g Other: | PER CLIENT INSTRUCTIONS, THE FIRM RESPONSIBLE FOR DELIVERY WAS FILLED IN AND DATED BY THE SAMPLE RECEIVING DEPARTMENT ON COMPLETION OF THE SHIPMENT. RELINQUISHED DATE AND TIME RECORDED IS THE SAME AS LABORATORY RECEIPT DATE AND TIME. |
| 2. Is the cooler temperature within limits? (> freezing temp. of water to 6 °C, VOST: 10°C)<br>Thermometer ID : SC63<br>Correction factor: 0.0 | ✓ | | | ☐ 2a Temp Blank = _____<br>☐ 2b Cooler Temp = _____<br>☐ 2c Cooling initiated for recently collected samples, ice present. | |
| 3. Were samples received with correct chemical preservative (excluding Encore)? | | | ✓ | ☐ 3a See box 3A for pH Preservation<br>☐ 3b Other: | |
| 4. Were custody seals present/intact on cooler and/or containers? | ✓ | | | ☐ 4a Not present<br>☐ 4b Not intact<br>☐ 4c Other: | |
| 5. Were all of the samples listed on the COC received? | ✓ | | | ☐ 5a Samples received-not on COC<br>☐ 5b Samples not received-on COC | |
| 6. Were all of the sample containers received intact? | ✓ | | | ☐ 6a Leaking<br>☐ 6b Broken | |
| 7. Were VOA samples received without headspace? | | | ✓ | ☐ 7a Headspace (VOA only) | |
| 8. Were samples received in appropriate containers? | ✓ | | | ☐ 8a Improper container | |
| 9. Did you check for residual chlorine, if necessary? (e.g. 1613B, 1668)<br>Chlorine test strip lot number: | | | ✓ | ☐ 9a Could not be determined due to matrix interference | |
| 10. Were samples received within holding time? | ✓ | | | ☐ 10a Holding time expired | **Labeling Verified by:** **Date:** |
| 11. For rad samples, was sample activity info. provided? | ✓ | MS 3-9-16 | | ☒ Incomplete information | |
| 12. For 1613B water samples is pH<9? | | | ✓ | If no, was pH adjusted to pH 7 - 9 with sulfuric acid? _____ | **pH test strip lot number:** |
| 13. Are the shipping containers intact? | ✓ | | | ☐ 13a Leaking<br>☐ 13b Other: | |
| 14. Was COC relinquished? (Signed/Dated/Timed) | ✓ | | | ☐ 14a Not relinquished | |
| 15. Are tests/parameters listed for each sample? | ✓ | | | ☐ 15a Incomplete information | |
| 16. Is the matrix of the samples noted? | ✓ | | | ☐ 15a Incomplete information | |
| 17. Is the date/time of sample collection noted? | ✓ | | | ☐ 15a Incomplete information | |
| 18. Is the client and project name/# identified? | ✓ | ✓ | | ☐ 15a Incomplete information | |
| 19. Was the sampler identified on the COC? | | ✓ | | ☐ 19a Other | |

| | Box 3A: pH Preservation | Box 9A: Residual Chlorine |
|---|---|---|
| Preservative: | | |
| Lot Number: | | |
| Exp Date: | | |
| Analyst: | | |
| Date: | | |
| Time: | | |

Quote #: 82502 PM Instructions: _____

Sample Receiving Associate: _____ Date: 3-9-16