FEBRUARY 20, 2013

W06509 Analytical Report 1

Sample Receipt Documentation 16

Trace Level Organics 19
Raw Sample Data 20
Standards Data 84
Initial Calibration 121112iepa.pdf 85
Continuing Calibration 121231s1.pdf..... 342
Continuing Calibration 121231s2.pdf..... 405
Raw QC Data 463
Miscellaneous Data..... 584

Sample Receipt Documentation 590

Total Number of Pages 592

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Laboratories, Inc.

ANALYTICAL REPORT

PROJECT NO. X13-012

X13-012
SDG #: W06509

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CH2M Hill Plateau Remediation
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TESTAMERICA LABORATORIES, INC.

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January 3, 2013

ANALYTICAL METHODS SUMMARY

W06509

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

References:

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

SAMPLE SUMMARY

W06509 : H2L170403

WO #	SAMPLE#	CLIENT SAMPLE ID	SAMPLED DATE	SAMP TIME
MXL1T	001	B2N3C6	12/12/12	09:21

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
W06509

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.

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

Sample Receipt

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

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.

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

PROJECT NARRATIVE
W06509

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 criteria include 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.
- Polychlorinated dibenzofuran purity. No peak can be identified as a polychlorinated dibenzofuran if a polychlorinated diphenyl ether peak maximizes within +/- 2 seconds of the furan candidate.

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

PROJECT NARRATIVE
W06509

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 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)

PROJECT NARRATIVE
W06509

In sample data, peaks must have an intensity of ≥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.

CERTIFICATION SUMMARY

Laboratory	Authority	Program	EPA Region	Certification ID
TestAmerica Knoxville	ACLASS	DoD ELAP		ADE-1434
TestAmerica Knoxville	Arkansas	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	Indiana	State Program	5	C-TN-02
TestAmerica Knoxville	Iowa	State Program	7	375
TestAmerica Knoxville	Kansas	NELAC	7	E-10349
TestAmerica Knoxville	Kentucky	State Program	4	90101
TestAmerica Knoxville	Louisiana	NELAC	6	LA110001
TestAmerica Knoxville	Louisiana	NELAC	6	83979
TestAmerica Knoxville	Maryland	State Program	3	277
TestAmerica Knoxville	Michigan	State Program	5	9933
TestAmerica Knoxville	Minnesota	NELAC	5	047-999-429
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	North Carolina DENR	4	64
TestAmerica Knoxville	North Carolina	North Carolina PHL	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	2014
TestAmerica Knoxville	Texas	NELAC	6	T104704380-TX
TestAmerica Knoxville	USDA	USDA		P330-11-00035
TestAmerica Knoxville	Utah	NELAC	8	QUAN3
TestAmerica Knoxville	Virginia	State Program	3	165
TestAmerica Knoxville	Washington	State Program	10	C593
TestAmerica Knoxville	West Virginia	West Virginia DEP	3	345
TestAmerica Knoxville	West Virginia	West Virginia DHHR (DW)	3	9955C
TestAmerica Knoxville	Wisconsin	State Program	5	998044300

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

Sample Data Summary

CH2M Hill Plateau Remediation DOE RL

Sample ID: B2N3C6

Trace Level Organic Compounds

Lot - Sample #....:	H2L170403 - 001	**Work Order #....:**	MXL1T1AA	**Matrix....:**	WATER
Date Sampled....:	12/12/12	**Date Received....:**	12/14/12	**Dilution Factor:**	1
Prep Date....:	12/26/12	**Analysis Date....:**	12/31/12		
Prep Batch # ....:	2361037				
Initial Wgt/Vol :	1053 mL	**Instrument ID....:**	D2A	**Method:**	SW846 8290
Analyst ID....:	Melissa A. Davidson				

PARAMETER	RESULT		MINIMUM LEVEL	ESTIMATED DETECTION LIMIT	UNITS
2,3,7,8-TCDD	ND		9.5	0.61	pg/L
Total TCDD	**1.6**	**Q J**	**9.5**	**0.61**	**pg/L**
1,2,3,7,8-PeCDD	ND		47	0.47	pg/L
Total PeCDD	**2.2**	**Q J**	**47**	**0.47**	**pg/L**
1,2,3,4,7,8-HxCDD	**1.7**	**Q J**	**47**	**0.69**	**pg/L**
1,2,3,6,7,8-HxCDD	**13**	**B J**	**47**	**0.76**	**pg/L**
1,2,3,7,8,9-HxCDD	**7.8**	**Q B J**	**47**	**0.70**	**pg/L**
Total HxCDD	**53**	**J Q B**	**47**	**0.72**	**pg/L**
1,2,3,4,6,7,8-HpCDD	**110**	**B**	**47**	**0.98**	**pg/L**
Total HpCDD	**150**	**B**	**47**	**0.98**	**pg/L**
OCDD	**78**	**B J**	**95**	**0.79**	**pg/L**
2,3,7,8-TCDF	ND		9.5	0.50	pg/L
Total TCDF	**2.8**	**Q J**	**9.5**	**0.50**	**pg/L**
1,2,3,7,8-PeCDF	**1.0**	**Q B J**	**47**	**0.42**	**pg/L**
2,3,4,7,8-PeCDF	**0.95**	**Q B J**	**47**	**0.39**	**pg/L**
Total PeCDF	**7.4**	**Q J B**	**47**	**0.40**	**pg/L**
1,2,3,4,7,8-HxCDF	**5.0**	**Q B J**	**47**	**0.38**	**pg/L**
1,2,3,6,7,8-HxCDF	**2.2**	**Q B J**	**47**	**0.37**	**pg/L**
2,3,4,6,7,8-HxCDF	**0.75**	**Q B J**	**47**	**0.41**	**pg/L**
1,2,3,7,8,9-HxCDF	ND		47	0.50	pg/L
Total HxCDF	**19**	**Q J B**	**47**	**0.41**	**pg/L**
1,2,3,4,6,7,8-HpCDF	**6.0**	**Q B J**	**47**	**0.37**	**pg/L**
1,2,3,4,7,8,9-HpCDF	**3.6**	**B J**	**47**	**0.53**	**pg/L**
Total HpCDF	**16**	**Q J B**	**47**	**0.44**	**pg/L**
OCDF	**36**	**B J**	**95**	**0.60**	**pg/L**

CH2M Hill Plateau Remediation DOE RL

Sample ID: B2N3C6

Trace Level Organic Compounds

Lot - Sample #....:	H2L170403 - 001	**Work Order #....:**	MXL1T1AA	**Matrix....:**	WATER
Date Sampled....:	12/12/12	**Date Received....:**	12/14/12	**Dilution Factor:**	1
Prep Date....:	12/26/12	**Analysis Date....:**	12/31/12		
Prep Batch # ....:	2361037				
Initial Wgt/Vol :	1053 mL	**Instrument ID....:**	D2A	**Method:**	SW846 8290
Analyst ID....:	Melissa A. Davidson				

INTERNAL STANDARDS	PERCENT RECOVERY	RECOVERY LIMITS
13C-2,3,7,8-TCDD	69	40 - 135
13C-1,2,3,7,8-PeCDD	79	40 - 135
13C-1,2,3,4,7,8-HxCDD	75	40 - 135
13C-1,2,3,6,7,8-HxCDD	65	40 - 135
13C-1,2,3,4,6,7,8-HpCDD	79	40 - 135
13C-OCDD	82	40 - 135
13C-2,3,7,8-TCDF	77	40 - 135
13C-1,2,3,7,8-PeCDF	79	40 - 135
13C-2,3,4,7,8-PeCDF	82	40 - 135
13C-1,2,3,4,7,8-HxCDF	70	40 - 135
13C-1,2,3,6,7,8-HxCDF	69	40 - 135
13C-2,3,4,6,7,8-HxCDF	71	40 - 135
13C-1,2,3,7,8,9-HxCDF	81	40 - 135
13C-1,2,3,4,6,7,8-HpCDF	75	40 - 135
13C-1,2,3,4,7,8,9-HpCDF	73	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 #....: H2L260000 - 037B **Work Order #....:** MXP661AA **Matrix....:** WATER
Dilution Factor: 1
Prep Date....: 12/26/12 **Analysis Date....:** 12/31/12
Prep Batch # ....: 2361037
Initial Wgt/Vol : 1000 mL **Instrument ID....:** D2A **Method:** SW846 8290
Analyst ID....: Melissa A. Davidson

PARAMETER	RESULT		MINIMUM LEVEL	ESTIMATED DETECTION LIMIT	UNITS
2,3,7,8-TCDD	ND		10	0.69	pg/L
Total TCDD	ND		10	0.69	pg/L
1,2,3,7,8-PeCDD	**1.1**	**Q J**	**50**	**0.41**	**pg/L**
Total PeCDD	**1.1**	**Q J**	**50**	**0.41**	**pg/L**
1,2,3,4,7,8-HxCDD	ND		50	0.42	pg/L
1,2,3,6,7,8-HxCDD	**1.1**	**Q J**	**50**	**0.43**	**pg/L**
1,2,3,7,8,9-HxCDD	**2.4**	**Q J**	**50**	**0.41**	**pg/L**
Total HxCDD	**6.6**	**Q J**	**50**	**0.42**	**pg/L**
1,2,3,4,6,7,8-HpCDD	**1.7**	**Q J**	**50**	**0.45**	**pg/L**
Total HpCDD	**1.7**	**Q J**	**50**	**0.45**	**pg/L**
OCDD	**6.5**	**Q J**	**100**	**0.48**	**pg/L**
2,3,7,8-TCDF	ND		10	0.41	pg/L
Total TCDF	ND		10	0.41	pg/L
1,2,3,7,8-PeCDF	**1.3**	**Q J**	**50**	**0.35**	**pg/L**
2,3,4,7,8-PeCDF	**0.85**	**Q J**	**50**	**0.32**	**pg/L**
Total PeCDF	**4.1**	**Q J**	**50**	**0.33**	**pg/L**
1,2,3,4,7,8-HxCDF	**1.3**	**Q J**	**50**	**0.26**	**pg/L**
1,2,3,6,7,8-HxCDF	**0.62**	**Q J**	**50**	**0.25**	**pg/L**
2,3,4,6,7,8-HxCDF	**1.7**	**Q J**	**50**	**0.27**	**pg/L**
1,2,3,7,8,9-HxCDF	**0.92**	**Q J**	**50**	**0.33**	**pg/L**
Total HxCDF	**5.4**	**Q J**	**50**	**0.27**	**pg/L**
1,2,3,4,6,7,8-HpCDF	**1.6**	**J**	**50**	**0.26**	**pg/L**
1,2,3,4,7,8,9-HpCDF	**1.3**	**Q J**	**50**	**0.37**	**pg/L**
Total HpCDF	**2.9**	**J Q**	**50**	**0.31**	**pg/L**
OCDF	**3.8**	**Q J**	**100**	**0.28**	**pg/L**

Method Blank Report

Trace Level Organic Compounds

Lot - Sample #....:	H2L260000 - 037B	**Work Order #....:**	MXP661AA	**Matrix....:**	WATER
Dilution Factor:	1				
Prep Date....:	12/26/12	**Analysis Date....:**	12/31/12		
Prep Batch # ....:	2361037				
Initial Wgt/Vol :	1000 mL	**Instrument ID....:**	D2A	**Method:**	SW846 8290
Analyst ID....:	Melissa A. Davidson				

INTERNAL STANDARDS	PERCENT RECOVERY	RECOVERY LIMITS
13C-2,3,7,8-TCDD	71	40 - 135
13C-1,2,3,7,8-PeCDD	76	40 - 135
13C-1,2,3,4,7,8-HxCDD	67	40 - 135
13C-1,2,3,6,7,8-HxCDD	64	40 - 135
13C-1,2,3,4,6,7,8-HpCDD	78	40 - 135
13C-OCDD	71	40 - 135
13C-2,3,7,8-TCDF	77	40 - 135
13C-1,2,3,7,8-PeCDF	74	40 - 135
13C-2,3,4,7,8-PeCDF	77	40 - 135
13C-1,2,3,4,7,8-HxCDF	71	40 - 135
13C-1,2,3,6,7,8-HxCDF	64	40 - 135
13C-2,3,4,6,7,8-HxCDF	66	40 - 135
13C-1,2,3,7,8,9-HxCDF	75	40 - 135
13C-1,2,3,4,6,7,8-HpCDF	63	40 - 135
13C-1,2,3,4,7,8,9-HpCDF	69	40 - 135

QUALIFIERS

J Estimated Result.

Q Estimated maximum possible concentration (EMPC).

LABORATORY CONTROL SAMPLE DATA REPORT

Trace Level Organic Compounds

Client Lot # ...:	W06509	**Work Order # ...:**	MXP661AC-LCS MXP661AD-LCSD	**Matrix .....:**	WATER
LCS Lot-Sample# :	H2L260000 - 037				
Prep Date .....:	12/26/12	**Analysis Date ..:**	12/31/12		
Prep Batch # ...:	2361037				
Dilution Factor :	1				
Analyst ID.....:	Melissa A. Davidson	**Instrument ID..:**	D2A	**Method.....:**	SW846 8290
Initial Wgt/Vol:	1000 mL				

PARAMETER	SPIKE AMOUNT	MEASURED AMOUNT	UNITS	PERCENT RECOVERY		RECOVERY LIMITS	RPD	RPD LIMITS
2,3,7,8-TCDD	**200**	**216**	**pg/L**	**108**		**(77 - 127)**		
	200	**223**	**pg/L**	**111**		**(77 - 127)**	**3.1**	**(0 - 15)**
1,2,3,7,8-PeCDD	**1000**	**1060**	**pg/L**	**106**	**B**	**(78 - 128)**		
	1000	**1050**	**pg/L**	**105**	**B**	**(78 - 128)**	**0.82**	**(0 - 15)**
1,2,3,4,7,8-HxCDD	**1000**	**979**	**pg/L**	**98**		**(73 - 123)**		
	1000	**968**	**pg/L**	**97**		**(73 - 123)**	**1.1**	**(0 - 15)**
1,2,3,6,7,8-HxCDD	**1000**	**1230**	**pg/L**	**123**	**B**	**(72 - 127)**		
	1000	**1140**	**pg/L**	**114**	**B**	**(72 - 127)**	**7.6**	**(0 - 15)**
1,2,3,7,8,9-HxCDD	**1000**	**1210**	**pg/L**	**121**	**B**	**(76 - 126)**		
	1000	**1180**	**pg/L**	**118**	**B**	**(76 - 126)**	**2.5**	**(0 - 15)**
1,2,3,4,6,7,8-HpCDD	**1000**	**1080**	**pg/L**	**108**	**B**	**(73 - 123)**		
	1000	**1040**	**pg/L**	**104**	**B**	**(73 - 123)**	**3.3**	**(0 - 15)**
OCDD	**2000**	**2170**	**pg/L**	**108**	**B**	**(75 - 125)**		
	2000	**2300**	**pg/L**	**115**	**B**	**(75 - 125)**	**6.0**	**(0 - 15)**
2,3,7,8-TCDF	**200**	**194**	**pg/L**	**97**		**(74 - 124)**		
	200	**198**	**pg/L**	**99**		**(74 - 124)**	**2.4**	**(0 - 15)**
1,2,3,7,8-PeCDF	**1000**	**1140**	**pg/L**	**114**	**B**	**(74 - 124)**		
	1000	**1130**	**pg/L**	**113**	**B**	**(74 - 124)**	**0.63**	**(0 - 15)**
2,3,4,7,8-PeCDF	**1000**	**1050**	**pg/L**	**105**	**B**	**(74 - 124)**		
	1000	**1090**	**pg/L**	**109**	**B**	**(74 - 124)**	**3.8**	**(0 - 15)**
1,2,3,4,7,8-HxCDF	**1000**	**925**	**pg/L**	**92**	**B**	**(75 - 125)**		
	1000	**914**	**pg/L**	**91**	**B**	**(75 - 125)**	**1.2**	**(0 - 15)**
1,2,3,6,7,8-HxCDF	**1000**	**1040**	**pg/L**	**104**	**B**	**(75 - 125)**		
	1000	**982**	**pg/L**	**98**	**B**	**(75 - 125)**	**5.4**	**(0 - 15)**
2,3,4,6,7,8-HxCDF	**1000**	**1040**	**pg/L**	**104**	**B**	**(76 - 126)**		
	1000	**1000**	**pg/L**	**100**	**B**	**(76 - 126)**	**3.6**	**(0 - 15)**
1,2,3,7,8,9-HxCDF	**1000**	**957**	**pg/L**	**96**	**B**	**(76 - 126)**		
	1000	**926**	**pg/L**	**93**	**B**	**(76 - 126)**	**3.3**	**(0 - 15)**
1,2,3,4,6,7,8-HpCDF	**1000**	**958**	**pg/L**	**96**	**B**	**(71 - 121)**		
	1000	**1040**	**pg/L**	**104**	**B**	**(71 - 121)**	**8.3**	**(0 - 15)**
1,2,3,4,7,8,9-HpCDF	**1000**	**1120**	**pg/L**	**112**	**B**	**(73 - 123)**		
	1000	**1010**	**pg/L**	**101**	**B**	**(73 - 123)**	**10**	**(0 - 15)**
OCDF	**2000**	**1780**	**pg/L**	**89**	**B**	**(68 - 132)**		
	2000	**1970**	**pg/L**	**98**	**B**	**(68 - 132)**	**9.8**	**(0 - 15)**

INTERNAL STANDARD	PERCENT RECOVERY	RECOVERY LIMITS
13C-2,3,7,8-TCDD	66	(40 - 135)
	65	(40 - 135)
13C-1,2,3,7,8-PeCDD	76	(40 - 135)
	77	(40 - 135)
13C-1,2,3,4,7,8-HxCDD	73	(40 - 135)

LABORATORY CONTROL SAMPLE DATA REPORT

Trace Level Organic Compounds

Client Lot # ...: W06509
LCS Lot-Sample# : H2L260000 - 037

Work Order # ...: MXP661AC-LCS
MXP661AD-LCSD

Matrix .....: WATER

INTERNAL STANDARD	PERCENT RECOVERY	RECOVERY LIMITS
	71	(40 - 135)
13C-1,2,3,6,7,8-HxCDD	60	(40 - 135)
	59	(40 - 135)
13C-1,2,3,4,6,7,8-HpCDD	74	(40 - 135)
	76	(40 - 135)
13C-OCDD	80	(40 - 135)
	77	(40 - 135)
13C-2,3,7,8-TCDF	71	(40 - 135)
	69	(40 - 135)
13C-1,2,3,7,8-PeCDF	72	(40 - 135)
	72	(40 - 135)
13C-2,3,4,7,8-PeCDF	77	(40 - 135)
	75	(40 - 135)
13C-1,2,3,4,7,8-HxCDF	71	(40 - 135)
	69	(40 - 135)
13C-1,2,3,6,7,8-HxCDF	63	(40 - 135)
	62	(40 - 135)
13C-2,3,4,6,7,8-HxCDF	66	(40 - 135)
	65	(40 - 135)
13C-1,2,3,7,8,9-HxCDF	74	(40 - 135)
	77	(40 - 135)
13C-1,2,3,4,6,7,8-HpCDF	72	(40 - 135)
	65	(40 - 135)
13C-1,2,3,4,7,8,9-HpCDF	65	(40 - 135)
	74	(40 - 135)

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.

Sample Receipt Documentation

CH2MHill Plateau Remediation Company	1412120413 CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	C.O.C. # X13-012-002 Page 1 of 1

Collector	F. M. Hall	Contact/Requester	WATERS-HUSTED, K	Telephone No.	376-4650
SAF No.	X13-012	Sampling Origin	Hanford Site	Purchase Order/Charge Code	300071ES20
Project Title	Pre-purge Special Sampling, December 2	Logbook No.	HNF-N-506 36/44	Ice Chest No.	
Shipped To (Lab)	TestAmerica Knoxville	Method of Shipment	COMMERCIAL CARRIER	Bill of Lading/Air Bill No.	
Protocol	SURV	Priority: 30 Days	PRIORITY	Offsite Property No.	

POSSIBLE SAMPLE HAZARDS/REMARKS
Contains Radioactive Material at concentrations that may or may not be 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 ☐
200 Area Generator Knowledge Information Form applies. The CACN for all analytical work at WSCF is 401647.

Sample No.	Filter	*	Date	Time	No/Type Container	Sample Analysis	Holding Time	Preservative
B2N3C6	N	W	12/12/12	0921	4x1-L aG	8290_DIOXINS_GCMS: List-1 (25)	7/40 Days	Cool~4C

~~S#~~ W 12-13-12
SDG# WU6509

CUSTODY SEALS INTACT
REC @ 0.4°C
BKD 12-14-12
1 COOLER FEDX#
7942 9700 1155

Relinquished By	Print	Sign	Date/Time	Received By	Print	Sign	Date/Time
F. M. Hall			DEC 12 2012 1535	SSU #1			12-12-12 1535
SSU #1			12-13-12 0800	CFulton			12-13-12 0800
CFulton			12-13-12 1005	Lucas Velazquez		TALR	12-13-12 1005
Lucas Velazquez		TALR	12-13-12 1135	Ryan Henry	RYAN HENRY		12/14/12 1000

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 11/14/2012

A-6004-842 (REV 2)

FEBRUARY 20, 2013

TESTAMERICA KNOXVILLE SAMPLE RECEIPT/CONDITION UPON RECEIPT ANOMALY CHECKLIST

Lot Number: H2L170403

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 ☐ **1b** Incomplete information ☐ **1c** Marking smeared ☐ **1d** Label torn ☐ **1e** No label ☐ **1f** COC not received ☐ **1g** Other:	
2. Is the cooler temperature within limits? (> freezing temp. of water to 6 °C, VOST: 10°C)	✓			☐ **2a** Temp Blank = _____ ☐ **2b** Cooler Temp = _____ ☐ **2c** Cooling initiated for recently collected samples, ice present.	
3. Were samples received with correct chemical preservative (excluding Encore)?			✓	☐ **3a** Sample preservative =	
4. Were custody seals present/intact on cooler and/or containers?	✓			☐ **4a** Not present ☐ **4b** Not intact ☐ **4c** Other:	
5. Were all of the samples listed on the COC received?	✓			☐ **5a** Samples received-not on COC ☐ **5b** Samples not received-on COC	
6. Were all of the sample containers received intact?	✓			☐ **6a** Leaking ☐ **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?			✓	☐ **9a** Could not be determined due to matrix interference	
10. Were samples received within holding time?	✓			☐ **10a** Holding time expired	
11. For rad samples, was sample activity info. provided?		✓		☐ Incomplete information	
12. For 1613B water samples is pH<9?			✓	If no, was pH adjusted to pH 7 - 9 with sulfuric acid? _____	
13. Are the shipping containers intact?	✓			☐ **13a** Leaking ☐ **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	

Quote #: 90950 PM Instructions: NA

Sample Receiving Associate: [signature] Date: 1

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FEBRUARY 20, 2013