EAST WATERWAY OPERABLE UNIT SUPPLEMENTAL REMEDIAL INVESTIGATION/ FEASIBILITY STUDY DATA REPORT: RESULTS OF DIOXIN AND FURAN ANALYSES OF ARCHIVED SURFACE AND SUBSURFACE SEDIMENT SAMPLES

FINAL

For submittal to:

The US Environmental Protection Agency
Region 10
Seattle, WA

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Acronyms

AP	Analytical Perspectives, Inc.
CSO/SD	combined sewer overflow/storm drain
dw	dry weight
EPA	US Environmental Protection Agency
EMPC	estimated maximum possible concentration
EW	East Waterway
EWG	East Waterway Group
HpCDD	heptachlorodibenzo-*p*-dioxin
HpCDF	heptachlorodibenzofuran
HxCDD	hexachlorodibenzo-*p*-dioxin
HxCDF	hexachlorodibenzofuran
J	estimated concentration
OCDD	octachlorodibenzo-*p*-dioxin
OCDF	octachlorodibenzofuran
PeCDD	pentachlorodibenzo-*p*-dioxin
PeCDF	pentachlorodibenzofuran
QAPP	quality assurance project plan
RL	reporting limit
TCDD	tetrachlorodibenzo-*p*-dioxin
TCDF	tetrachlorodibenzofuran
TEQ	toxic equivalent
U	not detected at given concentration

1 Introduction

This data report presents the results of the dioxin and furan analyses conducted on archived surface and subsurface sediment samples collected in the East Waterway (EW) as part of the EW supplemental remedial investigation. Dioxin/furan results for composite surface sediment samples were presented in the Surface Sediment Data Report (Windward 2010a). Sampling and analyses were conducted in accordance with the surface sediment quality assurance project plan (QAPP) (Windward 2009) and the subsurface sediment QAPP (Windward 2010b). Sediment samples were analyzed by Analytical Perspectives, Inc. (AP), for dioxins and furans using US Environmental Protection Agency (EPA) Method1613B.

2 Sediment Collection and Sample Processing Methods

Ninety-seven surface sediment grab samples were collected from March 1 to 6, 2009, and June 22 to 24, 2009, throughout EW. For the purposes of the analysis of dioxins and furans and PCB congeners, East Waterway was divided into ten sampling areas and composite samples were created for each sampling area by combining the grab samples collected in each area. The composite samples were then analyzed for dioxins and furans and PCB congeners. In addition, an archive sample was stored for each grab sample for potential future analyses. Composite samples were created for 10 areas. Subsurface sediment cores were collected at 65 locations in the EW during the subsurface sediment sampling event in February and March of 2010. Surface and subsurface sediment samples were archived frozen following the initial analyses.

The selection of archived surface and subsurface sediment samples to be submitted for the analysis of dioxins and furans was based on a review of the results for the surface sediment composite samples that were analyzed for dioxins and furans, the results for SMS chemicals for subsurface core intervals, and the dioxin and furan results for source control samples. EPA and East Waterway Group (EWG) met initially in July 2010 to identify subsurface core intervals for dioxin and furan analysis based on the subsurface sediment results for SMS chemicals. An initial list of samples was identified. However, the sample list was not finalized because the source control dioxin and furan data was not available.

EPA and the East Waterway Group (EWG) met on November 2, 2010, to review the dioxin results for the source control samples and finalize the selection of sediment samples for dioxin analysis. At that time, 9 surface sediment samples and 15 subsurface core samples were identified for Round 1 dioxin and furan analysis (Table 2-1). In two cases (SS-02/SS-04 and SS-14/SS-15), two adjacent samples were proposed for compositing, instead of selecting a single grab, to create a combined sample that characterized the area. These samples were selected for the following reasons:

- to determine dioxin concentrations in subsurface intervals identified as native material and intervals with no chemical concentrations above SMS values
- to provide spatial coverage throughout the waterway
- to characterize surface and subsurface sediments in areas near potential sources of dioxins and furans.

After reviewing preliminary data from the Round 1 dioxin and furan analyses, EPA and EWG met again on February 17, 2011, to identify additional samples for dioxin and furan analysis. Four additional surface sediment samples and one additional subsurface core sample were identified as Round 2 samples for dioxin and furan analysis. The sampling locations and the rationale are provided in Table 2-1. All sample locations are shown on Map 2-1.

Table 2-1. Sediment samples selected for dioxin and furan analysis

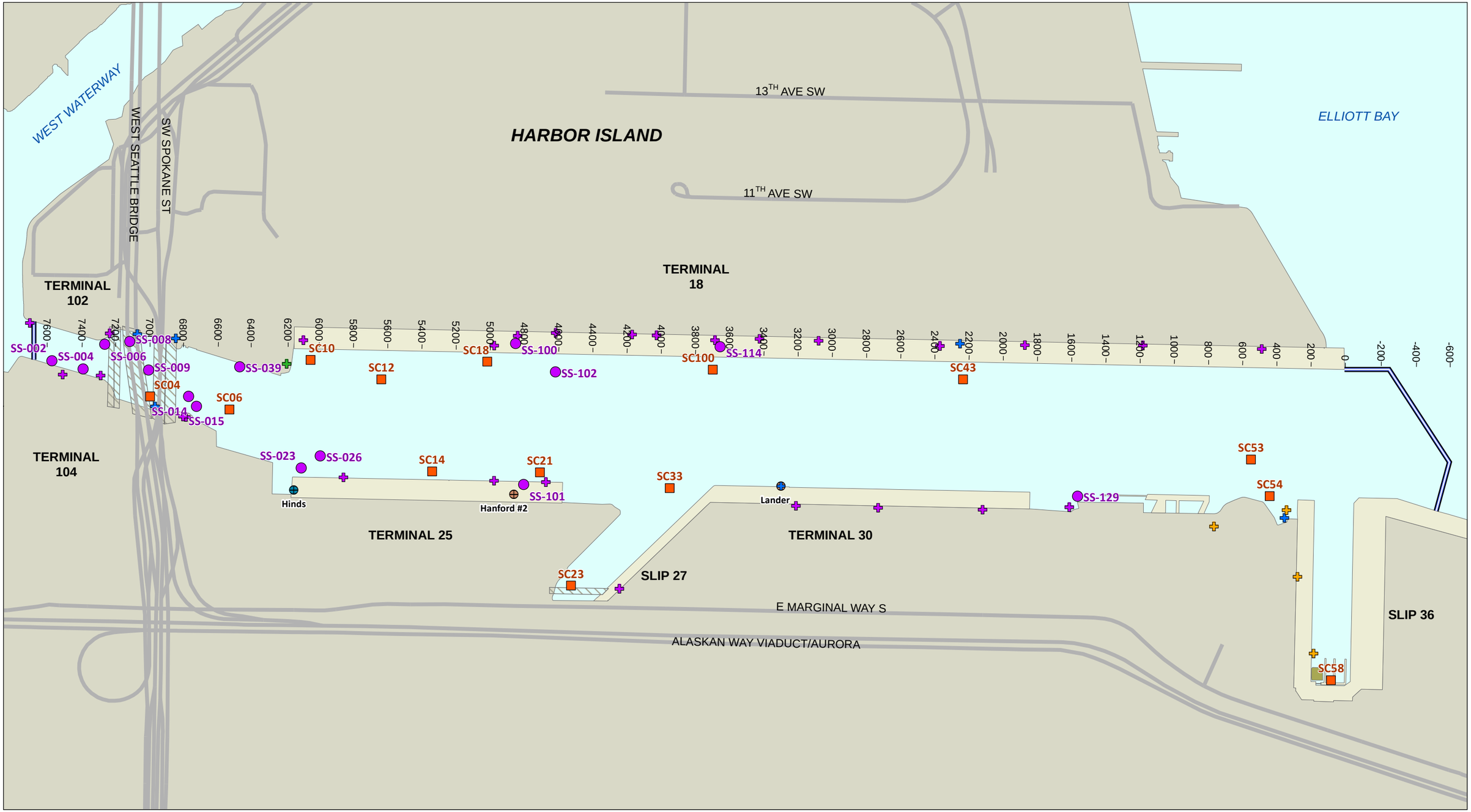
Location	Round	Depth	Date	Sampling Rationale
Surface Sediment Samples				
Combined SS-02 and SS-04[a]	1	0 – 10 cm	6/24/2009	spatial coverage on the intertidal bench proximate to B-1 and B-37
SS-06	2	0 – 10 cm	6/24/2009	spatial coverage, proximate to SS-08
SS-08	1	0 – 10 cm	3/04/2009	spatial coverage, proximate to storm drain
SS-09	2	0 – 10 cm	6/23/2009	spatial coverage, proximate to SS-08
Combined SS-14 and SS-15[b]	1	0 – 10 cm	6/22/2009	location adjacent to B-34 storm drain
SS-23	1	0 – 10 cm	3/04/2009	location adjacent to Hinds CSO/SD
SS-26	2	0 – 10 cm	6/22/2009	location proximate to SS-23 and Hinds CSO/SD
SS-39	1	0 – 10 cm	6/22/2009	spatial coverage
SS-100	1	0 – 10 cm	3/04/2009	location adjacent to B-11 storm drain
SS-101	1	0 – 10 cm	3/04/2009	location adjacent to Hanford #2 CSO
SS-102	2	0 – 10 cm	3/04/2009	spatial coverage, in the vicinity of SS-100
SS-114	1	0 – 10 cm	3/04/2009	location adjacent to B-16 storm drain
SS -129	1	0 – 10 cm	3/01/2009	spatial coverage
Subsurface Core Intervals				
SC-04	1	2 – 4 ft	2/23/2010	spatial coverage, proximate to storm drain, predominately native material
SC-06	1	6 – 7 ft	2/22/2010	spatial coverage, no SMS exceedances
SC-10	1	4 – 6 ft	3/01//2010	spatial coverage, proximate to storm drains, no SMS exceedances
SC-12	1	5 – 7 ft	3/01//2010	spatial coverage, native material
SC-14	1	5 – 7 ft	3/09//2010	spatial coverage, native material
SC-18	1	2 – 4 ft	3/01//2010	spatial coverage, proximate to B-11 storm drain, 6-8ft interval is native material
		6 – 8 ft		

Location	Round	Depth	Date	Sampling Rationale
SC-21	1	5 – 8 ft	2/25/2010	spatial coverage, proximate to Hanford, no SQS exceedances
SC-23	1	1 – 3 ft	3/03/2010	spatial coverage, head of Slip 27, 9-11ft interval is predominately native material
		9 – 11 ft		
SC-33	1	6 – 8 ft	3/04/2010	spatial coverage, mouth of Slip 27, native material
SC-43	1	4 – 6 ft	2/26/2010	spatial coverage, Terminal 18, predominately native material
SC-53	1	5 – 7 ft	3/05/2010	spatial coverage, native material
SC-54	1	8 – 9 ft	3/05/2010	spatial coverage, GATX area, native material
SC-58	1	6 – 8 ft	3/02/2010	spatial coverage, US Coast Guard slip, native material
SC-100	2	0 – 1 ft	3/04/2010	spatial coverage, in the vicinity of SS-114 and B-16 storm drain

[a] The combined sample is SS-Comp1

[b] The combined sample is SS-Comp2

CSO/SD – combined sewer overflow/storm drain



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N

0 300 600 Feet

0 100 200 Meters

- Surface sediment location
- Subsurface sediment location
- East Waterway Study Area Boundary

SD Outfalls
- Port of Seattle, SD
- City of Seattle, SD
- US Coast Guard, SD
- Private, SD
- Unknown, SD

CSO outfalls
- City of Seattle, CSO/SD
- King County, CSO
- King County, CSO/City of Seattle, SD

- Road
- Dock/pier
- Boathouse
- Bridge

Map 2-1. Surface and subsurface sediment dioxin/furan sampling locations

Prepared by: craigh, 10/5/2011; W:\Projects\00-08-08 East Waterway\EW RI-FS\Data\GIS\Data Report\Dioxin sampling\Map 2-1 4505 Dioxin furan sampling locations.mxd

3 Analytical Methods

Sediment samples were analyzed for dioxins and furans using EPA Method 1613B at AP. There were no analytical deviations from the analytical approach proposed in the surface sediment QAPP (Windward 2009) and the subsurface sediment QAPP (Windward 2010b).

4 Results of Chemical Analysis

This section presents results of the chemical analysis and data validation of the sediment samples submitted for dioxin and furan analysis. The complete results are provided in Appendix A. The COCs and laboratory data forms are provided in Appendix B.

The quality assurance review of the chemistry data was conducted in accordance with the quality assurance/quality control requirements and technical specifications of the methods and the national functional guidelines for organic and inorganic data review (EPA 1999, 2002, 2004). EcoChem, Inc., conducted the data review and full validation on all samples. The results of the data validation are summarized in Section 4.2. The data validation report is provided in Appendix C.

4.1 DIOXIN AND FURAN RESULTS

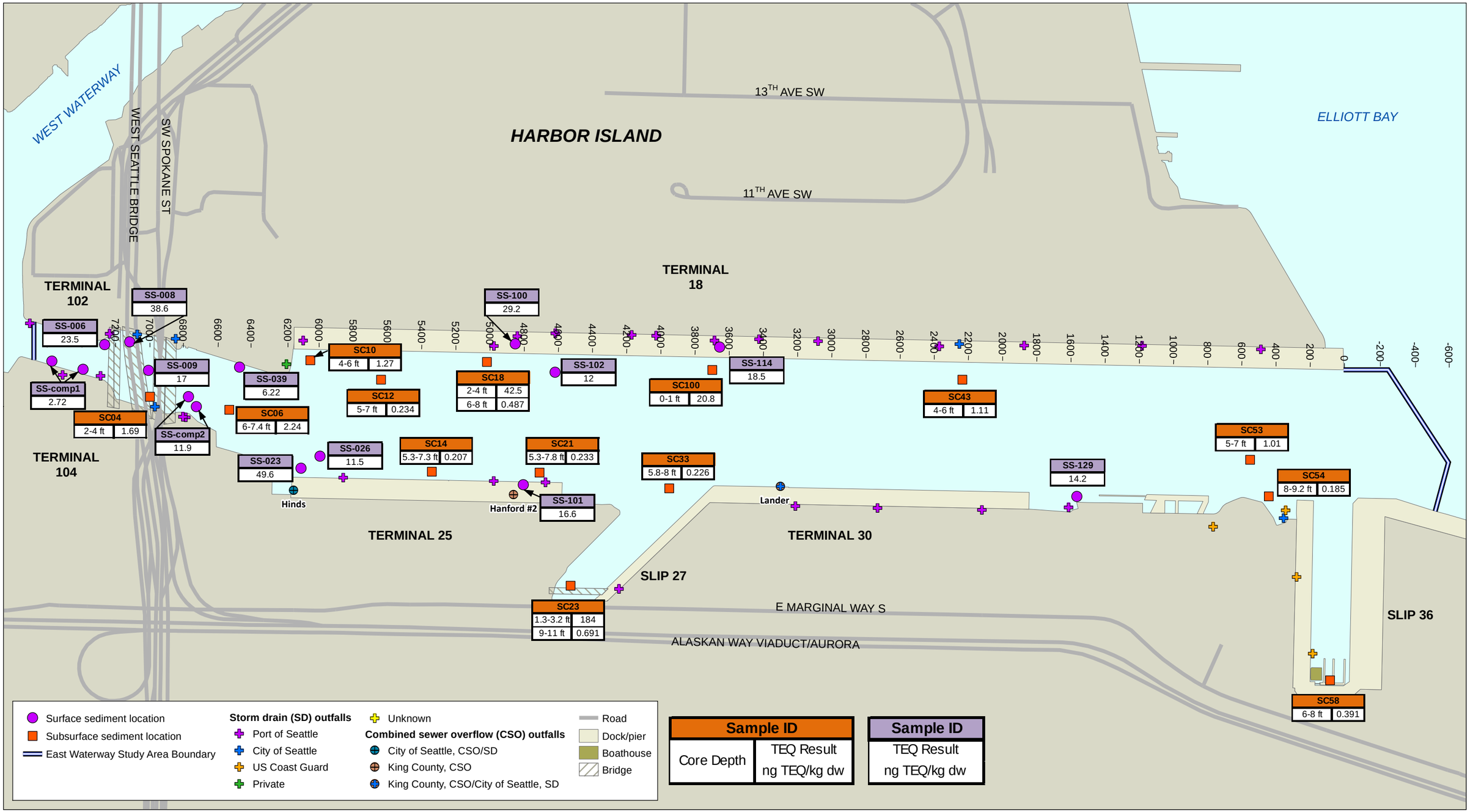
4.1.1 Surface sediment dioxin and furan results

All of the 17 dioxin and furan congeners were detected in at least one of the surface sediment samples that were analyzed (Table 4-1). The only congeners that were not detected in all samples were 2,3,7,8-tetrachlorodibenzo-*p*-dioxin (TCDD) (detected in six samples) and 1,2,3,7,8,9-hexachlorodibenzofuran (HxCDF) (detected in one sample). The calculated dioxin/furan toxic equivalent (TEQ) values(FOOTNOTE TEF VALUES) ranged from 2.78 to 49.7 ng TEQ/kg dry weight (dw). The TEQ values for each location are provided in Appendix A and shown on Map 4-1. The highest TEQ values were calculated for sampling locations SS-023 (49.7 ng/kg dw) and SS-008 (38.7 ng TEQ/kg dw).

Table 4-1. Summary of dioxin and furan results in surface sediment samples

Chemical	Detection Frequency	Detected Results (ng/kg dw)		Non-Detected Results (ng/kg dw)
		Minimum	Maximum	Range of RLs
2,3,7,8-TCDD	6/13	0.470 J	2.32 J	0.0569 – 1.15
1,2,3,7,8-PeCDD	13/13	0.384 J	9.30 J	na
1,2,3,4,7,8-HxCDD	13/13	0.688 J	11.1 J	na
1,2,3,6,7,8-HxCDD	13/13	3.05 J	54.9 J	na
1,2,3,7,8,9-HxCDD	13/13	1.50 J	22.5 J	na
1,2,3,4,6,7,8-HpCDD	13/13	77.3 J	1,250 J	na
OCDD	13/13	656 J	12,400 J	na
2,3,7,8-TCDF	13/13	0.492 J	19.3 J	na
1,2,3,7,8-PeCDF	13/13	0.293 J	8.17 J	na
2,3,4,7,8-PeCDF	13/13	0.829 J	19.0 J	na
1,2,3,4,7,8-HxCDF	13/13	1.26 J	28.7 J	na
1,2,3,6,7,8-HxCDF	13/13	0.622 J	17.9 J	na
1,2,3,7,8,9-HxCDF	1/13	2.21 J	2.21 J	1.77 – 2.49
2,3,4,6,7,8-HxCDF	13/13	0.987 J	32.4 J	na
1,2,3,4,6,7,8-HpCDF	13/13	16.6 J	283 J	na
1,2,3,4,7,8,9-HpCDF	13/13	0.984 J	24.5 J	na
OCDF	13/13	40.0 J	516 J	na
Dioxin/furan TEQ	13/13	2.78 J	49.7 J	na

dw – dry weight
HpCDD – heptachlorodibenzo-*p*-dioxin
HpCDF – heptachlorodibenzofuran
HxCDD – hexachlorodibenzo-*p*-dioxin
HxCDF – hexachlorodibenzofuran
J – estimated concentration
na – not applicable
OCDD – octachlorodibenzo-*p*-dioxin
OCDF – octachlorodibenzofuran
PeCDD – pentachlorodibenzo-*p*-dioxin
PeCDF – pentachlorodibenzofuran
RL – reporting limit
TCDD – tetrachlorodibenzo-*p*-dioxin
TCDF – tetrachlorodibenzofuran
TEQ – toxic equivalent



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Map 4-1. Surface and subsurface sediment dioxin/furan TEQ data

Prepared by craigh, 10/5/2011; W:\Projects\00-08-08 East Waterway\EW RI-FS\Data\GIS\Data Report\Dioxin sampling\Map 4-1 4505 Dioxin furan sampling results.mxd

4.1.2 Subsurface sediment dioxin and furan results

Most of the 17 dioxin and furan congeners were detected in the subsurface sediment samples that were analyzed (Table 4-2). The most commonly detected congener was octachlorodibenzo-*p*-dioxin, which was detected in all 16 samples. 1,2,3,7,8,9-HxCDF was not detected in any of the subsurface sediment samples. The calculated dioxin/furan TEQ values ranged from 0.748 to 184 ng TEQ/kg dw. The highest TEQ values were calculated for samples SC23 in the 1.3-3.2ft interval (184 ng TEQ/kg dw) and SC18-2 in the 4ft interval (42.7 ng TEQ/kg dw). The TEQ values for each location are provided in Appendix A and shown on Map 4-1.

Table 4-2. Summary of dioxin and furan results in subsurface sediment samples

Chemical	Detection Frequency	Detected Results (ng/kg dw)		Non-Detected Results (ng/kg dw)
		Minimum	Maximum	Range of RLs
2,3,7,8-TCDD	3/16	0.319 J	12.0	0.0816 – 1.42
1,2,3,7,8-PeCDD	6/16	0.224 J	30.5	0.149 – 2.49
1,2,3,4,7,8-HxCDD	6/16	0.130 J	28.9	0.162 – 2.49
1,2,3,6,7,8-HxCDD	8/16	0.618 J	149	0.374 – 2.49
1,2,3,7,8,9-HxCDD	10/16	0.194 J	76.5	0.131 – 2.46
1,2,3,4,6,7,8-HpCDD	14/16	0.806 J	3130	0.652 – 0.922
OCDD	16/16	6.71	22,000 J	na
2,3,7,8-TCDF	8/16	0.315 J	29.2	0.123 – 0.499
1,2,3,7,8-PeCDF	9/16	0.141 J	18.5	2.38 – 2.49
2,3,4,7,8-PeCDF	8/16	0.342 J	141	2.26 – 2.49
1,2,3,4,7,8-HxCDF	9/16	0.234 J	87.1	2.38 – 2.49
1,2,3,6,7,8-HxCDF	8/16	0.182 J	46.5	0.329 – 2.49
1,2,3,7,8,9-HxCDF	0/16	nd	nd	2.26 – 2.49
2,3,4,6,7,8-HxCDF	8/16	0.480 J	84.4	0.174 – 2.49
1,2,3,4,6,7,8-HpCDF	11/16	0.234 J	938	2.38 – 2.49
1,2,3,4,7,8,9-HpCDF	6/16	0.369 J	55.5	0.322 – 2.49
OCDF	11/16	0.435 J	2,750	4.77 – 4.99
Dioxin/furan TEQ	16/16	0.748 J	184 J	na

dw – dry weight
HpCDD – heptachlorodibenzo-*p*-dioxin
HpCDF – heptachlorodibenzofuran
HxCDD – hexachlorodibenzo-*p*-dioxin
HxCDF – hexachlorodibenzofuran
J – estimated concentration
na – not applicable
OCDD – octachlorodibenzo-*p*-dioxin
OCDF – octachlorodibenzofuran
PeCDD – pentachlorodibenzo-*p*-dioxin
PeCDF – pentachlorodibenzofuran
RL – reporting limit
TCDD – tetrachlorodibenzo-*p*-dioxin
TCDF – tetrachlorodibenzofuran
TEQ – toxic equivalent

4.2 DATA VALIDATION RESULTS

The complete data validation reports are provided in Appendix C. In general, the data met all the quality assurance requirements. All results for Round 1 and Round 2 surface sediment samples and the results for one subsurface sample (SC-100-0-1ft) were qualified as estimated (J-qualified) because the analyses were conducted outside of the 1-year holding time for dioxins and furans. The exceedance of holding times was discussed with the EPA QA office prior to sample analysis and it was agreed that the results would be acceptable for use with J-qualification due to the fact that the samples were stored frozen. In addition, the laboratory reported estimated maximum possible concentrations (EMPCs) for one or more of the target analytes. An EMPC is reported when a peak was detected but did not meet identification criteria as required by the method. The EMPCs were qualified as not detected at the reported values (U-qualified). The presence of 2,3,7,8-TCDD in laboratory blanks resulted in the qualification of all the 2,3,7,8-TCDD results for the Round 2 samples as not detected (U-qualified) because all of the results were within 5 times the blank value.

5 References

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APPENDIX A. DATA TABLES

Appendix A. Data Tables

Table A-1. Dioxin and furan results for surface sediment samples 1

Table A-2. Dioxin and furan results for subsurface sediment samples 3

Table A-1. Dioxin and furan results for surface sediment samples

a. Sampling Locations EW09-SS-006 to EW09-SS-100

Sampling Location ID	EW09-SS-006	EW09-SS-008	EW09-SS-009	EW09-SS-023	EW09-SS-026	EW09-SS-039	EW09-SS-100
Depth Interval	0 to 10 cm	0 to 10 cm	0 to 10 cm	0 to 10 cm	0 to 10 cm	0 to 10 cm	0 to 10 cm
Sampling Date	6/24/2009	3/4/2009	6/23/2009	3/4/2009	6/22/2009	6/22/2009	3/4/2009

Chemical	Concentration (ng/kg dw) by Sample ID						
	EW09-SS-006-010	EW09-SS-008-010	EW09-SS-009-010	EW09-SS-023-010	EW09-SS-026-010	EW09-SS-039-010	EW09-SS-100-010
2,3,7,8-TCDD	0.463 UJ	1.05 J	0.829 UJ	2.32 J	1.00 UJ	0.191 UJ	0.739 J
1,2,3,7,8-PeCDD	2.70 J	5.86 J	2.05 J	9.30 J	1.61 J	0.955 J	3.11 J
1,2,3,4,7,8-HxCDD	6.08 J	9.58 J	3.51 J	11.1 J	2.08 J	1.37 J	4.74 J
1,2,3,6,7,8-HxCDD	39.4 J	46.9 J	17.0 J	54.9 J	10.7 J	6.63 J	17.2 J
1,2,3,7,8,9-HxCDD	15.4 J	22.5 J	7.26 J	20.1 J	4.67 J	3.51 J	9.61 J
1,2,3,4,6,7,8-HpCDD	931 J	1,130 J	445 J	1,250 J	283 J	157 J	416 J
OCDD	7,080 J	10,200 J	4,070 J	12,400 J	2,850 J	1,340 J	3,270 J
2,3,7,8-TCDF	0.662 J	4.75 J	2.78 J	10.1 J	2.01 J	1.02 J	4.85 J
1,2,3,7,8-PeCDF	1.39 J	3.75 J	1.96 J	8.17 J	1.32 J	0.631 J	5.50 J
2,3,4,7,8-PeCDF	3.45 J	12.2 J	7.26 J	19.0 J	4.72 J	2.50 J	17.5 J
1,2,3,4,7,8-HxCDF	4.81 J	16.2 J	10.5 J	18.0 J	5.42 J	3.24 J	28.7 J
1,2,3,6,7,8-HxCDF	2.30 J	6.89 J	3.75 J	10.0 J	2.58 J	1.34 J	17.9 J
1,2,3,7,8,9-HxCDF	1.91 UJ	2.37 U	2.21 J	2.49 UJ	2.20 UJ	2.03 UJ	2.26 U
2,3,4,6,7,8-HxCDF	4.15 J	10.9 J	5.47 J	15.7 J	4.18 J	2.14 J	32.4 J
1,2,3,4,6,7,8-HpCDF	45.5 J	153 J	84.4 J	154 J	52.8 J	33.9 J	283 J
1,2,3,4,7,8,9-HpCDF	2.39 J	9.91 J	5.92 J	11.8 J	3.72 J	2.21 J	24.5 J
OCDF	63.8 J	501 J	281 J	482 J	176 J	109 J	516 J
Dioxin/furan TEQ – mammal (half DL)	23.3 J	38.7 J	16.6 J	49.7 J	11.1 J	6.21 J	29.3 J

DL – detection limit
dw – dry weight
HpCDD – heptachlorodibenzo-*p*-dioxin
HpCDF – heptachlorodibenzofuran
HxCDD – hexachlorodibenzo-*p*-dioxin
HxCDF – hexachlorodibenzofuran
ID – identification
J – estimated concentration
OCDD – octachlorodibenzo-*p*-dioxin
OCDF – octachlorodibenzofuran
PeCDD – pentachlorodibenzo-*p*-dioxin
PeCDF – pentachlorodibenzofuran
TCDD – tetrachlorodibenzo-*p*-dioxin
TCDF – tetrachlorodibenzofuran
TEQ – toxic equivalent
U – not detected at given concentration

b. Sampling Locations EW09-SS-101 to EW09-SS-comp2-010

Sampling Location ID	EW09-SS-101	EW09-SS-102	EW09-SS-114	EW09-SS-129	EW09-SS-comp1-010	EW09-SS-comp2-010
Depth Interval	0 to 10 cm	0 to 10 cm	0 to 10 cm	0 to 10 cm	0 to 10 cm	0 to 10 cm
Sampling Date	3/4/2009	3/4/2009	3/4/2009	3/1/2009	6/24/2009	6/22/2009

Chemical	Concentration (ng/kg dw) by Sample ID					
	EW09-SS-101-010	EW09-SS-102-010	EW09-SS-114-010	EW09-SS-129-010	EW09-SS-comp1-010	EW09-SS-comp2-010
2,3,7,8-TCDD	0.810 J	1.15 UJ	0.647 UJ	0.474 J	0.0569 UJ	0.470 J
1,2,3,7,8-PeCDD	2.41 J	1.65 J	2.89 J	1.71 J	0.384 J	1.61 J
1,2,3,4,7,8-HxCDD	3.26 J	2.04 J	3.42 J	2.18 J	0.688 J	2.37 J
1,2,3,6,7,8-HxCDD	14.2 J	10.4 J	16.0 J	10.3 J	3.05 J	12.0 J
1,2,3,7,8,9-HxCDD	7.64 J	4.87 J	8.16 J	5.21 J	1.50 J	5.62 J
1,2,3,4,6,7,8-HpCDD	391 J	250 J	445 J	279 J	77.3 J	310 J
OCDD	3,520 J	2,090 J	4,430 J	2,460 J	656 J	2,630 J
2,3,7,8-TCDF	3.42 J	2.70 J	4.53 J	19.3 J	0.492 J	2.29 J
1,2,3,7,8-PeCDF	2.09 J	1.44 J	2.35 J	4.92 J	0.293 J	1.50 J
2,3,4,7,8-PeCDF	8.45 J	6.11 J	9.32 J	8.81 J	0.829 J	5.47 J
1,2,3,4,7,8-HxCDF	9.78 J	7.27 J	9.91 J	7.32 J	1.26 J	6.41 J
1,2,3,6,7,8-HxCDF	4.22 J	3.04 J	4.45 J	2.77 J	0.622 J	2.67 J
1,2,3,7,8,9-HxCDF	2.39 UJ	2.33 UJ	2.47 UJ	2.02 UJ	1.77 UJ	2.02 UJ
2,3,4,6,7,8-HxCDF	6.62 J	4.91 J	7.24 J	4.25 J	0.987 J	4.34 J
1,2,3,4,6,7,8-HpCDF	77.0 J	58.4 J	83.8 J	49.9 J	16.6 J	59.2 J
1,2,3,4,7,8,9-HpCDF	6.41 J	4.16 J	6.17 J	3.76 J	0.984 J	4.64 J
OCDF	253 J	193 J	266 J	162 J	40.0 J	199 J
Dioxin/furan TEQ - mammal (half DL)	16.7 J	11.6 J	18.3 J	14.3 J	2.78 J	12.0 J

DL – detection limit
dw – dry weight
HpCDD – heptachlorodibenzo-*p*-dioxin
HpCDF – heptachlorodibenzofuran
HxCDD – hexachlorodibenzo-*p*-dioxin
HxCDF – hexachlorodibenzofuran
ID – identification
J – estimated concentration
OCDD – octachlorodibenzo-*p*-dioxin
OCDF – octachlorodibenzofuran
PeCDD – pentachlorodibenzo-*p*-dioxin
PeCDF – pentachlorodibenzofuran
TCDD – tetrachlorodibenzo-*p*-dioxin
TCDF – tetrachlorodibenzofuran
TEQ – toxic equivalent
U – not detected at given concentration

Table A-2. Dioxin and furan results for subsurface sediment samples

a. Sampling Locations EW10-SC-04 to EW10-SC-18

Sampling Location ID	EW10-SC-04	EW10-SC-06	EW10-SC-10	EW10-SC-100	EW10-SC-12	EW10-SC-14	EW10-SC-18	
Depth Interval	2 to 4 ft	6 to 7.4 ft	4 to 6 ft	0 to 1.1 ft	5 to 7 ft	5.3 to 7.3 ft	2 to 4 ft	6 to 8 ft
Sampling Date	2/23/2010	2/22/2010	3/1/2010	3/4/2010	3/1/2010	3/9/2010	3/1/2010	3/1/2010
Chemical	Concentration (ng/kg dw) by Sample ID							
	EW10-SC-04-2-4	EW10-SC-06-6-7.4	EW10-SC-10-4-6	EW10-SC-100-0-1.1	EW10-SC-12-5-7	EW10-SC-14-5.3-7.3	EW10-SC-18-2-4	EW10-SC-18-6-8
2,3,7,8-TCDD	0.489 U	0.319 J	0.487 U	1.42 UJ	0.491 U	0.491 U	2.37	0.483 U
1,2,3,7,8-PeCDD	0.462 J	0.910 J	0.150 U	3.31 J	2.46 U	2.46 U	6.01	2.41 U
1,2,3,4,7,8-HxCDD	0.340 U	1.10 J	0.210 J	4.09 J	2.46 U	2.46 U	6.55	2.41 U
1,2,3,6,7,8-HxCDD	1.00 J	0.864 J	0.834 J	21.6 J	2.46 U	2.46 U	32.8	2.41 U
1,2,3,7,8,9-HxCDD	0.527 J	0.885 J	0.526 J	9.89 J	2.46 U	0.314 J	16.3	2.41 U
1,2,3,4,6,7,8-HpCDD	12.0	6.30	20.6	584 J	1.26 J	1.95 J	863	0.922 U
OCDD	69.4	24.4	169	5,320 J	10.3	16.5	7,570	8.72
2,3,7,8-TCDF	0.554	1.42	0.123 U	4.42 J	0.491 U	0.491 U	7.65	0.483 U
1,2,3,7,8-PeCDF	0.380 J	0.934 J	0.141 J	2.89 J	2.46 U	2.46 U	5.06	2.41 U
2,3,4,7,8-PeCDF	1.63 J	1.02 J	0.719 J	2.26 UJ	2.46 U	2.46 U	28.7	2.41 U
1,2,3,4,7,8-HxCDF	0.534 J	0.598 J	1.74 J	15.6 J	2.46 U	2.46 U	26.3	2.41 U
1,2,3,6,7,8-HxCDF	0.526 J	0.557 J	0.396 J	6.19 J	2.46 U	2.46 U	12.2	2.41 U
1,2,3,7,8,9-HxCDF	2.45 U	2.43 U	2.44 U	2.26 UJ	2.46 U	2.46 U	2.43 U	2.41 U
2,3,4,6,7,8-HxCDF	0.919 J	0.480 J	0.661 J	10.1 J	2.46 U	2.46 U	20.0	2.41 U
1,2,3,4,6,7,8-HpCDF	6.80	1.04 J	8.96	112 J	0.234 J	2.46 U	199	2.41 U
1,2,3,4,7,8,9-HpCDF	0.322 U	2.43 U	0.894 J	7.96 J	2.46 U	2.46 U	14.6	2.41 U
OCDF	15.9	0.435 J	35.3	319 J	0.586 J	4.91 U	555	4.83 U
Dioxin/furan TEQ – mammal (half DL)	1.97 J	2.37 J	1.47 J	20.5 J	2.80 J	2.73 J	42.7	2.74

DL – detection limit
dw – dry weight
HpCDD – heptachlorodibenzo-*p*-dioxin
HpCDF – heptachlorodibenzofuran
HxCDD – hexachlorodibenzo-*p*-dioxin
HxCDF – hexachlorodibenzofuran
ID – identification
J – estimated concentration
OCDD – octachlorodibenzo-*p*-dioxin
OCDF – octachlorodibenzofuran
PeCDD – pentachlorodibenzo-*p*-dioxin
PeCDF – pentachlorodibenzofuran
TCDD – tetrachlorodibenzo-*p*-dioxin
TCDF – tetrachlorodibenzofuran
TEQ – toxic equivalent
U – not detected at given concentration

b. Sampling Locations EW10-SC-21 to EW10-SC-58

Sampling Location ID	EW10-SC-21	EW10-SC-23		EW10-SC-33	EW10-SC-43	EW10-SC-53	EW10-SC-54	EW10-SC-58
Depth Interval	5.3 to 7.8 ft	1.3 to 3.2 ft	9 to 11 ft	5.8 to 8 ft	4 to 6 ft	5 to 7 ft	8 to 9.2 ft	6 to 8 ft
Sampling Date	2/25/2010	3/3/2010	3/3/2010	3/4/2010	2/26/2010	3/5/2010	3/5/2010	3/2/2010

Chemical	Concentration (ng/kg dw) by Sample ID							
	EW10-SC-21-5.3-7.8	EW10-SC-23-1.3-3.2	EW10-SC-23-9-11	EW10-SC-33-5.8-8	EW10-SC-43-4-6	EW10-SC-53-5-7	EW10-SC-54-8-9.2	EW10-SC-58-6-8
2,3,7,8-TCDD	0.487 U	12.0	0.0816 U	0.499 U	0.494 U	0.0856 U	0.484 U	0.477 U
1,2,3,7,8-PeCDD	2.43 U	30.5	0.224 J	2.49 U	0.156 U	0.149 U	2.42 U	2.38 U
1,2,3,4,7,8-HxCDD	2.43 U	28.9	0.130 J	2.49 U	0.162 U	2.41 U	2.42 U	2.38 U
1,2,3,6,7,8-HxCDD	2.43 U	149	0.374 U	2.49 U	0.749 J	0.618 J	2.42 U	2.38 U
1,2,3,7,8,9-HxCDD	0.194 J	76.5	0.487 J	0.146 U	0.463 J	0.302 U	0.131 U	2.38 U
1,2,3,4,6,7,8-HpCDD	2.34 J	3,130	3.91	0.806 J	15.1	11.9	0.892 J	0.652 U
OCDD	17.2	22,000 J	32.0	6.71	95.0	84.2	6.98	7.05
2,3,7,8-TCDF	0.487 U	29.2	0.500	0.499 U	0.315 J	0.482	0.484 U	0.477 U
1,2,3,7,8-PeCDF	2.43 U	18.5	0.255 J	2.49 U	0.220 J	0.372 J	2.42 U	2.38 U
2,3,4,7,8-PeCDF	2.43 U	141	0.342 J	2.49 U	0.979 J	0.874 J	2.42 U	2.38 U
1,2,3,4,7,8-HxCDF	2.43 U	87.1	0.234 J	2.49 U	0.733 J	0.513 J	2.42 U	2.38 U
1,2,3,6,7,8-HxCDF	2.43 U	46.5	0.182 J	2.49 U	0.329 U	0.356 J	2.42 U	2.38 U
1,2,3,7,8,9-HxCDF	2.43 U	2.48 U	2.45 U	2.49 U	2.47 U	2.41 U	2.42 U	2.38 U
2,3,4,6,7,8-HxCDF	2.43 U	84.4	0.174 U	2.49 U	0.634 J	0.510 J	2.42 U	2.38 U
1,2,3,4,6,7,8-HpCDF	0.301 J	938	0.841 J	2.49 U	5.45	5.16	2.42 U	2.38 U
1,2,3,4,7,8,9-HpCDF	2.43 U	55.5	2.45 U	2.49 U	0.388 J	0.369 J	2.42 U	2.38 U
OCDF	0.738 J	2,750	0.905 J	4.99 U	17.2	20.8	4.84 U	4.77 U
Dioxin/furan TEQ – mammal (half DL)	2.68 J	184 J	0.748 J	2.72 J	1.31 J	1.10 J	2.64 J	2.71

DL – detection limit
dw – dry weight
HpCDD – heptachlorodibenzo-*p*-dioxin
HpCDF – heptachlorodibenzofuran
HxCDD – hexachlorodibenzo-*p*-dioxin
HxCDF – hexachlorodibenzofuran
ID – identification
J – estimated concentration
OCDD – octachlorodibenzo-*p*-dioxin
OCDF – octachlorodibenzofuran
PeCDD – pentachlorodibenzo-*p*-dioxin
PeCDF – pentachlorodibenzofuran
TCDD – tetrachlorodibenzo-*p*-dioxin
TCDF – tetrachlorodibenzofuran
TEQ – toxic equivalent
U – not detected at given concentration

APPENDIX B. LABORATORY DATA FORMS

Round 1 Data

ANALYTICAL PERSPECTIVES

5 January 2011

Nate Lewis
Windward Environmental LLC
200 W. Mercer St. Suite 401
Seattle, WA 98119

Subject: Certificate of Results

Dear Nate;

Attached to this narrative are the analytical results you requested on the sample submitted for the determination of polychlorinated dibenzo-*p*-dioxins and dibenzofurans. The insert below summarizes the relevant information pertaining to your project. In particular, QC annotations bring to your attention specific analytical observations and assessments made during the sample handling and data interpretation phases. Results reported relate only to the items tested.

Project Information Summary	When applicable, see QC Annotations for details
Client Project No.	EW Source Control
AP Project No.	**A2870**
Analytical Protocol	EPA Method 1613
No. Samples Submitted	9
No. Samples Analyzed	9
No. Laboratory Method Blanks	1
No. OPRs / Batch CS3	1
No. Outstanding Samples	0
Date Received	14-Dec-2010
Condition Received	see below
Temperature upon Receipt (C)	0
Extraction within Holding Time	yes
Analysis within Holding Time	yes
Data meet QA/QC Requirements	yes
Exceptions	none
Analytical Difficulties	none

2714 EXCHANGE DRIVE
WILMINGTON, NC 28405
PH.: 910-794-1613

QC Annotations:

1. Please see Appendix A & B attached for data qualifier/attribute and lab identifier information.

2. The container for sample 006, "EW009-SS-comp2-010", arrived cracked. However, the crack in the glass was internal to the sample and thus, we determined that the sample was acceptable for analysis.

Analytical Perspectives remains committed to serving you in the most effective manner. Should you have any questions or need additional information and technical support, please, do not hesitate to contact us. Thank you for choosing Analytical Perspectives as part of your analytical support team.

Sincerely,

Kimberly Mace, Ph.D.
Project Manager

2714 EXCHANGE DRIVE
WILMINGTON, NC 28405
PH.: 910-794-1613

APPENDIX A: DATA QUALIFIERS / DATA ATTRIBUTES	
*	The reported concentration exceeds the calibration range (upper point of the calibration curve).[1]
>	Indicates high recoveries. Shown with the numeric value at the top of the range.[1]
B	The analyte is found in the method blank, at a level that is <=10x the sample concentration.
C	Two or more congeners co-elute. In EDDs C denotes the lowest IUPAC congener in a co-elution group and additional co-eluters for the group are shown with the number of the lowest IUPAC co-eluter.
E	The reported concentration exceeds the calibration range (upper point of the calibration curve).
EMPC	Represents an Estimated Maximum Possible Concentration. EMPC's arise in cases where the signal/noise ratio is not sufficient for peak identification (the determined ion-abundance ratio is outside the allowed theoretical range), or where there is a co-eluting interference.
ETH	Indicates the presence of a diphenyl ether that appears to interfere with the quantitation of a furan. The reported concentration is the maximum.
H/h	If the standard recovery is below the method or SOP specified value "H" is assigned. If the obtained value is less than half the specified value "h" is assigned.[1]
J	Indicates that an analyte has a concentration below the reporting limit (lowest point of the calibration curve).
ND	Indicates a non-detect.
NR	Indicates a value that is not reportable.
PR	Due to interference, the associated congener is poorly resolved.
QI	Indicates the presence of a quantitative interference.
Ra	The new ratio – [Ra] -- for 2,3,7,8-TCDD following the $^{37}Cl_4$-2,3,7,8-TCDD correction is shown between squared brackets in the DL column.[1]
SI	Denotes "Single Ion Mode" and is utilized for PCBs where the secondary ion trace has a significantly elevated noise level due to background PFK. Responses for such peaks are calculated using an EMPC approach based solely on the primary ion area(s) and may be considered estimates.[1]
U	The analyte was not detected. The estimated detection limit (EDL) may be reported for this analyte.
V	The labeled standard recovery was found to be outside of the method control limits.
X	Indicates results reported from reinjection, refractionation, or repeat analyses.
APPENDIX B: LAB ID IDENTIFIERS	
AR	Indicates use of the archived portion of the sample extract.
CU	Indicates a sample that required additional clean-up prior to MS injection/processing.
D	Indicates a dilution of the sample extract. The number that follows the "D" indicates the dilution factor.
DE	Indicates a dilution performed with the addition of ES (extraction standard) solution.
DUP	Designation for a duplicate sample.
MS	Designation for a matrix spike.
MSD	Designation for a matrix spike duplicate.
RJ	Indicates a reinjection of the sample extract.
S	Indicates a sample split. The number that follows the "S" indicates the split factor.

[1]Denotes data qualifiers/attributes whose use will be phased out over time

A2870 - TEQ

Project ID: EW Source Control

Sample Summary
Part 1 (dry weight)

ANALYTICAL PERSPECTIVES

Method 1613

Analyte	MB1_8380_DF_SDS 0_8380_MB001	EW09-SS-023-010	EW09-SS-008-010	EW09-SS-129-010	EW09-SS-039-010	EW09-SS-comp1-010	EW09-SS-comp2-010	EW09-SS-100-010	EW09-SS-101-010	EW09-SS-114-010
	pg/g	pg/g	pg/g	pg/g	pg/g	pg/g	pg/g	pg/g	pg/g	pg/g
2,3,7,8-TCDD	(0.0571)	2.32	1.05	0.474	[0.191]	[0.0569]	0.47	0.739	0.81	[0.647]
1,2,3,7,8-PeCDD	(0.0766)	9.3	5.86	1.71	0.955	0.384	1.61	3.11	2.41	2.89
1,2,3,4,7,8-HxCDD	(0.0751)	11.1	9.58	2.18	1.37	0.688	2.37	4.74	3.26	3.42
1,2,3,6,7,8-HxCDD	(0.0806)	54.9	46.9	10.3	6.63	3.05	12	17.2	14.2	16
1,2,3,7,8,9-HxCDD	(0.0814)	20.1	22.5	5.21	3.51	1.5	5.62	9.61	7.64	8.16
1,2,3,4,6,7,8-HpCDD	(0.0814)	1250	1130	279	157	77.3	310	416	391	445
OCDD	(0.187)	12400	10200	2460	1340	656	2630	3270	3520	4430
2,3,7,8-TCDF	(0.039)	10.1	4.75	19.3	1.02	0.492	2.29	4.85	3.42	4.53
1,2,3,7,8-PeCDF	(0.0538)	8.17	3.75	4.92	0.631	0.293	1.5	5.5	2.09	2.35
2,3,4,7,8-PeCDF	(0.0524)	19	12.2	8.81	2.5	0.829	5.47	17.5	8.45	9.32
1,2,3,4,7,8-HxCDF	(0.0625)	18	16.2	7.32	3.24	1.26	6.41	28.7	9.78	9.91
1,2,3,6,7,8-HxCDF	(0.0588)	10	6.89	2.77	1.34	0.622	2.67	17.9	4.22	4.45
2,3,4,6,7,8-HxCDF	(0.0696)	15.7	10.9	4.25	2.14	0.987	4.34	32.4	6.62	7.24
1,2,3,7,8,9-HxCDF	(0.0865)	(0.244)	(0.268)	(0.093)	(0.086)	(0.0768)	(0.166)	(0.29)	(0.15)	(0.136)
1,2,3,4,6,7,8-HpCDF	(0.0576)	154	153	49.9	33.9	16.6	59.2	283	77	83.8
1,2,3,4,7,8,9-HpCDF	(0.0758)	11.8	9.91	3.76	2.21	0.984	4.64	24.5	6.41	6.17
OCDF	(0.0959)	482	501	162	109	40	199	516	253	266
ITEF TEQ (ND=0; EMPC=0)	**0.00**	**57.9**	**45.7**	**17.1**	**7.06**	**3.13**	**14.2**	**33.9**	**19.8**	**21.6**
ITEF TEQ (ND=0; EMPC=EMPC)	**0.00**	**57.9**	**45.7**	**17.1**	**7.25**	**3.18**	**14.2**	**33.9**	**19.8**	**22.3**
ITEF TEQ (ND=DL/2; EMPC=0)	**0.091**	**58.0**	**45.7**	**17.1**	**7.09**	**3.15**	**14.2**	**33.9**	**19.8**	**21.7**
ITEF TEQ (ND=DL/2; EMPC=EMPC)	**0.091**	**58.0**	**45.7**	**17.1**	**7.26**	**3.19**	**14.2**	**33.9**	**19.8**	**22.3**
ITEF TEQ (ND=DL; EMPC=EMPC)	**0.182**	**58.0**	**45.7**	**17.1**	**7.26**	**3.19**	**14.2**	**33.9**	**19.8**	**22.3**
Checkcode	761-757	739-933	950-697	443-763	000-529	584-696	869-178	632-038	486-287	674-671
Lab ID	MB1_8380_DF_SDS	A2870_8380_DF_001	A2870_8380_DF_002	A2870_8380_DF_003	A2870_8380_DF_004	A2870_8380_DF_005	A2870_8380_DF_006	A2870_8380_DF_007	A2870_8380_DF_008	A2870_8380_DF_009

( ) = DL
[ ] = EMPC

A2870 - TEQ

Project ID: EW Source Control

Sample Summary
Part 1 (wet weight)

ANALYTICAL PERSPECTIVES

Method 1613

Analyte	MB1_8380_DF_SDS 0_8380_MB001	EW09-SS-023-010	EW09-SS-008-010	EW09-SS-129-010	EW09-SS-039-010	EW09-SS-comp1-010	EW09-SS-comp2-010	EW09-SS-100-010	EW09-SS-101-010	EW09-SS-114-010
	pg/g	pg/g	pg/g	pg/g	pg/g	pg/g	pg/g	pg/g	pg/g	pg/g
2,3,7,8-TCDD	(0.0571)	1.08	0.488	0.288	[0.131]	[0.0554]	0.28	0.474	0.466	[0.348]
1,2,3,7,8-PeCDD	(0.0766)	4.33	2.72	1.04	0.657	0.374	0.958	2	1.39	1.55
1,2,3,4,7,8-HxCDD	(0.0751)	5.17	4.45	1.33	0.943	0.669	1.41	3.04	1.87	1.84
1,2,3,6,7,8-HxCDD	(0.0806)	25.6	21.8	6.26	4.56	2.97	7.14	11	8.17	8.61
1,2,3,7,8,9-HxCDD	(0.0814)	9.37	10.5	3.17	2.41	1.46	3.34	6.17	4.39	4.39
1,2,3,4,6,7,8-HpCDD	(0.0814)	583	525	170	108	75.2	184	267	225	239
OCDD	(0.187)	5780	4740	1500	922	638	1560	2100	2020	2380
2,3,7,8-TCDF	(0.039)	4.71	2.21	11.7	0.702	0.479	1.36	3.11	1.97	2.44
1,2,3,7,8-PeCDF	(0.0538)	3.81	1.74	2.99	0.434	0.285	0.893	3.53	1.2	1.26
2,3,4,7,8-PeCDF	(0.0524)	8.85	5.67	5.36	1.72	0.807	3.25	11.2	4.86	5.01
1,2,3,4,7,8-HxCDF	(0.0625)	8.39	7.53	4.45	2.23	1.23	3.81	18.4	5.62	5.33
1,2,3,6,7,8-HxCDF	(0.0588)	4.66	3.2	1.68	0.922	0.605	1.59	11.5	2.43	2.39
2,3,4,6,7,8-HxCDF	(0.0696)	7.32	5.07	2.58	1.47	0.96	2.58	20.8	3.81	3.9
1,2,3,7,8,9-HxCDF	(0.0865)	(0.244)	(0.268)	(0.093)	(0.086)	(0.0768)	(0.166)	(0.29)	(0.15)	(0.136)
1,2,3,4,6,7,8-HpCDF	(0.0576)	71.8	71.1	30.3	23.3	16.2	35.2	182	44.3	45.1
1,2,3,4,7,8,9-HpCDF	(0.0758)	5.5	4.61	2.29	1.52	0.957	2.76	15.7	3.69	3.32
OCDF	(0.0959)	225	233	98.5	75	38.9	118	331	145	143
ITEF TEQ (ND=0; EMPC=0)	**0.00**	**27.0**	**21.2**	**10.4**	**4.86**	**3.04**	**8.46**	**21.8**	**11.4**	**11.6**
ITEF TEQ (ND=0; EMPC=EMPC)	**0.00**	**27.0**	**21.2**	**10.4**	**4.99**	**3.10**	**8.46**	**21.8**	**11.4**	**12.0**
ITEF TEQ (ND=DL/2; EMPC=0)	**0.091**	**27.0**	**21.3**	**10.4**	**4.88**	**3.07**	**8.47**	**21.8**	**11.4**	**11.7**
ITEF TEQ (ND=DL/2; EMPC=EMPC)	**0.091**	**27.0**	**21.3**	**10.4**	**4.99**	**3.10**	**8.47**	**21.8**	**11.4**	**12.0**
ITEF TEQ (ND=DL; EMPC=EMPC)	**0.182**	**27.0**	**21.3**	**10.4**	**5.00**	**3.11**	**8.47**	**21.8**	**11.4**	**12.0**
Checkcode	761-757	739-933	950-697	443-763	000-529	584-696	869-178	632-038	486-287	674-671
Lab ID	MB1_8380_DF_SDS	A2870_8380_DF_001	A2870_8380_DF_002	A2870_8380_DF_003	A2870_8380_DF_004	A2870_8380_DF_005	A2870_8380_DF_006	A2870_8380_DF_007	A2870_8380_DF_008	A2870_8380_DF_009

( ) = DL
[ ] = EMPC

A2870 - WHO-2005-TEQ
Project ID: EW Source Control

Sample Summary
Part 1 (dry weight)

ANALYTICAL PERSPECTIVES

Method 1613

Analyte	MB1_8380_DF_SDS0_8380_MB001	EW09-SS-023-010	EW09-SS-008-010	EW09-SS-129-010	EW09-SS-039-010	EW09-SS-comp1-010	EW09-SS-comp2-010	EW09-SS-100-010	EW09-SS-101-010	EW09-SS-114-010
	pg/g	pg/g	pg/g	pg/g	pg/g	pg/g	pg/g	pg/g	pg/g	pg/g
2,3,7,8-TCDD	(0.0571)	2.32	1.05	0.474	[0.191]	[0.0569]	0.47	0.739	0.81	[0.647]
1,2,3,7,8-PeCDD	(0.0766)	9.3	5.86	1.71	0.955	0.384	1.61	3.11	2.41	2.89
1,2,3,4,7,8-HxCDD	(0.0751)	11.1	9.58	2.18	1.37	0.688	2.37	4.74	3.26	3.42
1,2,3,6,7,8-HxCDD	(0.0806)	54.9	46.9	10.3	6.63	3.05	12	17.2	14.2	16
1,2,3,7,8,9-HxCDD	(0.0814)	20.1	22.5	5.21	3.51	1.5	5.62	9.61	7.64	8.16
1,2,3,4,6,7,8-HpCDD	(0.0814)	1250	1130	279	157	77.3	310	416	391	445
OCDD	(0.187)	12400	10200	2460	1340	656	2630	3270	3520	4430
2,3,7,8-TCDF	(0.039)	10.1	4.75	19.3	1.02	0.492	2.29	4.85	3.42	4.53
1,2,3,7,8-PeCDF	(0.0538)	8.17	3.75	4.92	0.631	0.293	1.5	5.5	2.09	2.35
2,3,4,7,8-PeCDF	(0.0524)	19	12.2	8.81	2.5	0.829	5.47	17.5	8.45	9.32
1,2,3,4,7,8-HxCDF	(0.0625)	18	16.2	7.32	3.24	1.26	6.41	28.7	9.78	9.91
1,2,3,6,7,8-HxCDF	(0.0588)	10	6.89	2.77	1.34	0.622	2.67	17.9	4.22	4.45
2,3,4,6,7,8-HxCDF	(0.0696)	15.7	10.9	4.25	2.14	0.987	4.34	32.4	6.62	7.24
1,2,3,7,8,9-HxCDF	(0.0865)	(0.244)	(0.268)	(0.093)	(0.086)	(0.0768)	(0.166)	(0.29)	(0.15)	(0.136)
1,2,3,4,6,7,8-HpCDF	(0.0576)	154	153	49.9	33.9	16.6	59.2	283	77	83.8
1,2,3,4,7,8,9-HpCDF	(0.0758)	11.8	9.91	3.76	2.21	0.984	4.64	24.5	6.41	6.17
OCDF	(0.0959)	482	501	162	109	40	199	516	253	266
WHO-2005 TEQ (ND=0; EMPC=0)	**0.00**	**49.6**	**38.6**	**14.2**	**6.02**	**2.66**	**11.9**	**29.2**	**16.6**	**17.9**
WHO-2005 TEQ (ND=0; EMPC=EMPC)	**0.00**	**49.6**	**38.6**	**14.2**	**6.21**	**2.72**	**11.9**	**29.2**	**16.6**	**18.5**
WHO-2005 TEQ (ND=DL/2; EMPC=0)	**0.104**	**49.6**	**38.6**	**14.2**	**6.05**	**2.69**	**11.9**	**29.2**	**16.6**	**17.9**
WHO-2005 TEQ (ND=DL/2; EMPC=EMPC)	**0.104**	**49.6**	**38.6**	**14.2**	**6.21**	**2.72**	**11.9**	**29.2**	**16.6**	**18.5**
WHO-2005 TEQ (ND=DL; EMPC=EMPC)	**0.209**	**49.6**	**38.6**	**14.2**	**6.22**	**2.72**	**11.9**	**29.2**	**16.6**	**18.5**
Checkcode	761-757	739-933	950-697	443-763	000-529	584-696	869-178	632-038	486-287	674-671
Lab ID	MB1_8380_DF_SDS	A2870_8380_DF_001	A2870_8380_DF_002	A2870_8380_DF_003	A2870_8380_DF_004	A2870_8380_DF_005	A2870_8380_DF_006	A2870_8380_DF_007	A2870_8380_DF_008	A2870_8380_DF_009

( ) = DL
[ ] = EMPC

A2870 - Totals

Project ID: EW Source Control

Sample Summary
Part 2 (dry weight)

ANALYTICAL PERSPECTIVES

Method 1613

Analyte	MB1_8380_DF_SDS0_8380_MB001	EW09-SS-023-010	EW09-SS-008-010	EW09-SS-129-010	EW09-SS-039-010	EW09-SS-comp1-010	EW09-SS-comp2-010	EW09-SS-100-010	EW09-SS-101-010	EW09-SS-114-010
	pg/g	pg/g	pg/g	pg/g	pg/g	pg/g	pg/g	pg/g	pg/g	pg/g
Totals										
TCDDs	0	186	23	11.2	3.53	1.06	11.5	14.3	15.3	14.9
PeCDDs	0	221	49.8	17.2	8.49	2.34	18.5	31.6	23.9	26.3
HxCDDs	0	489	373	106	56	25.2	117	166	134	160
HpCDDs	0	3650	3470	988	429	209	933	1060	1030	1610
OCDD	0	12400	10200	2460	1340	656	2630	3270	3520	4430
TCDFs	0	199	82.3	63.7	19.9	6.18	42.9	100	53.9	61.4
PeCDFs	0	182	112	66.1	24.3	7.35	50.9	169	83.7	96.2
HxCDFs	0	290	271	91.7	49	20.7	93.2	276	128	143
HpCDFs	0	554	568	183	119	47.5	210	547	269	302
OCDF	0	482	501	162	109	40	199	516	253	266
Total PCDD/Fs (ND=0; EMPC=0)	**0.00**	**18,700**	**15,700**	**4,150**	**2,160**	**1,020**	**4,300**	**6,150**	**5,510**	**7,110**
Total PCDD/Fs (ND=0; EMPC=EMPC)	**0.00**	**18,700**	**15,700**	**4,160**	**2,160**	**1,020**	**4,310**	**6,160**	**5,520**	**7,120**
Total PCDD/Fs (2378-X ND=DL; EMPC=EMPC)	**1.29**	**18,700**	**15,700**	**4,160**	**2,160**	**1,020**	**4,310**	**6,160**	**5,520**	**7,120**
Total 2378s (ND=0; EMPC=0)	**0.00**	**14,500**	**12,200**	**3,020**	**1,660**	**801**	**3,250**	**4,650**	**4,310**	**5,300**
Total 2378s (ND=0.5; EMPC=0)	**0.645**	**14,500**	**12,200**	**3,020**	**1,660**	**801**	**3,250**	**4,650**	**4,310**	**5,300**
Total 2378s (ND=1; EMPC=0)	**1.29**	**14,500**	**12,200**	**3,030**	**1,660**	**801**	**3,250**	**4,650**	**4,310**	**5,300**
Total 2378s (ND=0; EMPC=1)	**0.00**	**14,500**	**12,200**	**3,020**	**1,660**	**801**	**3,250**	**4,650**	**4,310**	**5,300**
Total 2378s (ND=0.5; EMPC=1)	**0.645**	**14,500**	**12,200**	**3,020**	**1,660**	**801**	**3,250**	**4,650**	**4,310**	**5,300**
Total 2378s (ND=1; EMPC=1)	**1.29**	**14,500**	**12,200**	**3,030**	**1,660**	**801**	**3,250**	**4,650**	**4,310**	**5,300**
Checkcode	761-757	739-933	950-697	443-763	000-529	584-696	869-178	632-038	486-287	674-671
Lab ID	MB1_8380_DF_SDS	A2870_8380_DF_001	A2870_8380_DF_002	A2870_8380_DF_003	A2870_8380_DF_004	A2870_8380_DF_005	A2870_8380_DF_006	A2870_8380_DF_007	A2870_8380_DF_008	A2870_8380_DF_009

( ) = DL
[ ] = EMPC

A2870 - Totals

Project ID: EW Source Control

Sample Summary
Part 2 (wet weight)

ANALYTICAL PERSPECTIVES

Method 1613

Analyte	MB1_8380_DF_SDS0_8380_MB001	EW09-SS-023-010	EW09-SS-008-010	EW09-SS-129-010	EW09-SS-039-010	EW09-SS-comp1-010	EW09-SS-comp2-010	EW09-SS-100-010	EW09-SS-101-010	EW09-SS-114-010
	pg/g	pg/g	pg/g	pg/g	pg/g	pg/g	pg/g	pg/g	pg/g	pg/g
Totals										
TCDDs	0	86.8	10.7	6.82	2.43	1.03	6.86	9.18	8.78	8.03
PeCDDs	0	103	23.1	10.4	5.84	2.27	11	20.3	13.7	14.1
HxCDDs	0	228	173	64.4	38.5	24.5	69.5	106	77	85.9
HpCDDs	0	1700	1610	601	295	204	555	682	590	866
OCDD	0	5780	4740	1500	922	638	1560	2100	2020	2380
TCDFs	0	92.6	38.3	38.8	13.7	6.01	25.5	64.3	31	33
PeCDFs	0	85	52.2	40.2	16.7	7.15	30.3	109	48.1	51.8
HxCDFs	0	135	126	55.7	33.7	20.1	55.4	177	73.5	76.8
HpCDFs	0	258	264	111	82.1	46.2	125	351	155	162
OCDF	0	225	233	98.5	75	38.9	118	331	145	143
Total PCDD/Fs (ND=0; EMPC=0)	**0.00**	**8,700**	**7,300**	**2,520**	**1,480**	**988**	**2,560**	**3,950**	**3,170**	**3,820**
Total PCDD/Fs (ND=0; EMPC=EMPC)	**0.00**	**8,700**	**7,300**	**2,530**	**1,490**	**991**	**2,560**	**3,960**	**3,170**	**3,830**
Total PCDD/Fs (2378-X ND=DL; EMPC=EMPC)	**1.29**	**8,700**	**7,300**	**2,530**	**1,490**	**991**	**2,560**	**3,960**	**3,170**	**3,830**
Total 2378s (ND=0; EMPC=0)	**0.00**	**6,750**	**5,660**	**1,840**	**1,140**	**780**	**1,930**	**2,990**	**2,480**	**2,850**
Total 2378s (ND=0.5; EMPC=0)	**0.645**	**6,750**	**5,660**	**1,840**	**1,140**	**780**	**1,930**	**2,990**	**2,480**	**2,850**
Total 2378s (ND=1; EMPC=0)	**1.29**	**6,750**	**5,660**	**1,840**	**1,140**	**780**	**1,930**	**2,990**	**2,480**	**2,850**
Total 2378s (ND=0; EMPC=1)	**0.00**	**6,750**	**5,660**	**1,840**	**1,140**	**780**	**1,930**	**2,990**	**2,480**	**2,850**
Total 2378s (ND=0.5; EMPC=1)	**0.645**	**6,750**	**5,660**	**1,840**	**1,140**	**780**	**1,930**	**2,990**	**2,480**	**2,850**
Total 2378s (ND=1; EMPC=1)	**1.29**	**6,750**	**5,660**	**1,840**	**1,140**	**780**	**1,930**	**2,990**	**2,480**	**2,850**
Checkcode	761-757	739-933	950-697	443-763	000-529	584-696	869-178	632-038	486-287	674-671
Lab ID	MB1_8380_DF_SDS	A2870_8380_DF_001	A2870_8380_DF_002	A2870_8380_DF_003	A2870_8380_DF_004	A2870_8380_DF_005	A2870_8380_DF_006	A2870_8380_DF_007	A2870_8380_DF_008	A2870_8380_DF_009

( ) = DL
[ ] = EMPC

A2870 - Others

Project ID: EW Source Control

Sample Summary
Part 3 (dry weight)

ANALYTICAL PERSPECTIVES

Method 1613

Analyte	MB1_8380_DF_SDS0_8380_MB001	EW09-SS-023-010	EW09-SS-008-010	EW09-SS-129-010	EW09-SS-039-010	EW09-SS-comp1-010	EW09-SS-comp2-010	EW09-SS-100-010	EW09-SS-101-010	EW09-SS-114-010
	pg/g	pg/g	pg/g	pg/g	pg/g	pg/g	pg/g	pg/g	pg/g	pg/g
Other PCDD/Fs (ND=0, EMPC=0)										
Other TCDD	0	184	21.9	10.7	3.53	1.06	11.1	13.6	14.5	14.9
Other PeCDD	0	212	43.9	15.5	7.53	1.95	16.9	28.5	21.4	23.4
Other HxCDD	0	403	294	88.2	44.5	19.9	96.8	134	109	132
Other HpCDD	0	2400	2340	709	272	132	624	647	635	1160
Other TCDF	0	189	77.6	44.5	18.8	5.68	40.6	95.3	50.5	56.9
Other PeCDF	0	155	96.4	52.3	21.1	6.23	44	146	73.1	84.5
Other HxCDF	0	240	232	75.7	41.5	17.8	78.1	189	105	119
Other HpCDF	0	387	405	130	83.2	29.9	146	239	186	212
Other PCDD/Fs (ND=0, EMPC=EMPC)										
Other TCDD	0	185	22.1	10.7	4.45	1.21	11.5	15.4	14.9	14.9
Other PeCDD	0	212	43.9	17.6	8.24	2.96	19.1	36.1	25.4	25.8
Other HxCDD	0	403	294	88.2	44.5	19.9	96.8	134	109	132
Other HpCDD	0	2400	2340	709	272	132	624	647	635	1160
Other TCDF	0	189	84	45.9	19.6	6.14	41.9	95.7	51.1	60.1
Other PeCDF	0	155	97.1	52.5	21.3	6.77	44	146	73.1	85
Other HxCDF	0	240	234	75.7	41.5	17.8	78.7	189	105	119
Other HpCDF	0	387	405	130	83.2	29.9	146	239	186	212
Checkcode	761-757	739-933	950-697	443-763	000-529	584-696	869-178	632-038	486-287	674-671
Lab ID	MB1_8380_DF_SDS	A2870_8380_DF_001	A2870_8380_DF_002	A2870_8380_DF_003	A2870_8380_DF_004	A2870_8380_DF_005	A2870_8380_DF_006	A2870_8380_DF_007	A2870_8380_DF_008	A2870_8380_DF_009

( ) = DL
[ ] = EMPC

A2870 - DLs
Project ID: EW Source Control

Sample Summary
Part 5 (DLs) (dry weight)

ANALYTICAL PERSPECTIVES

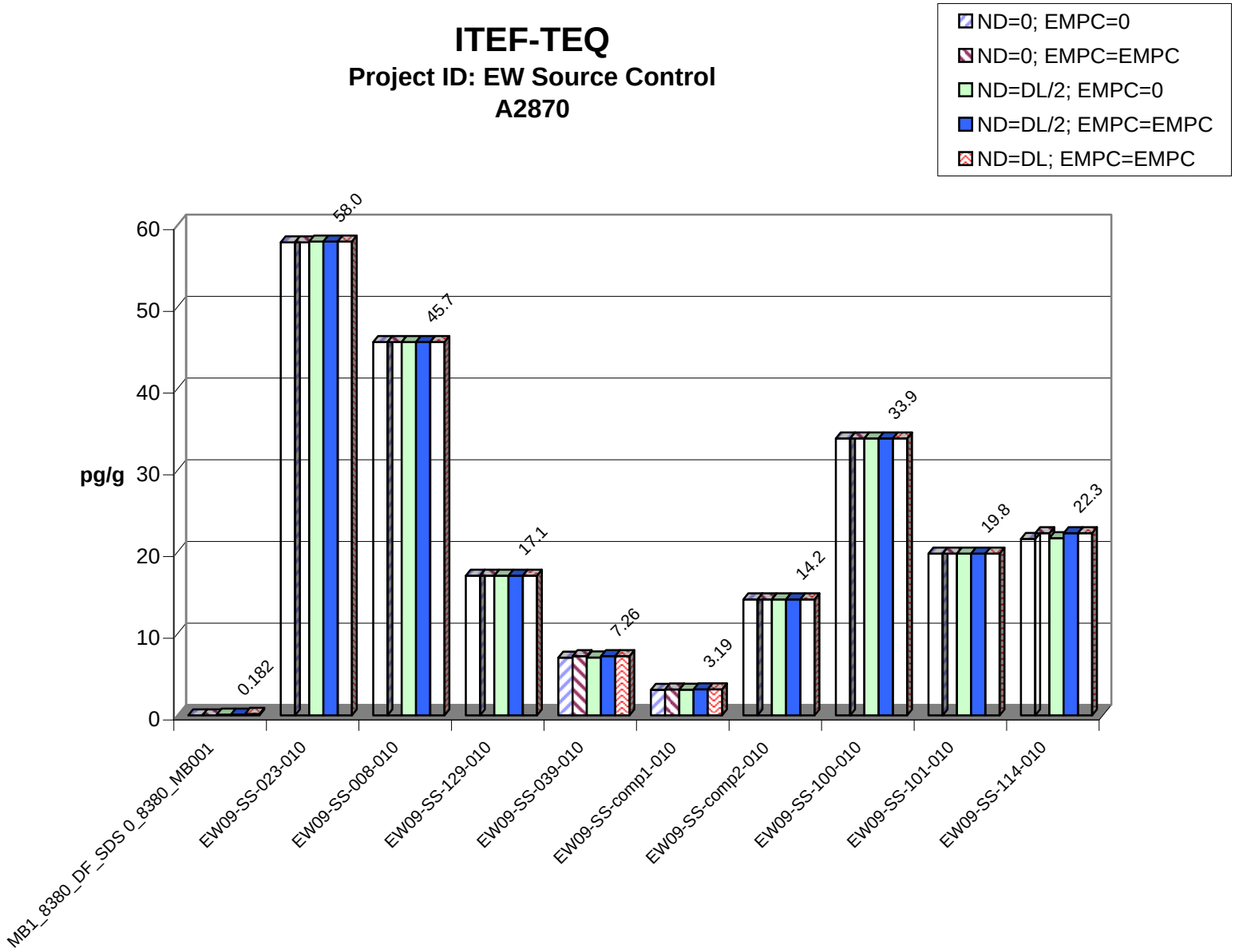
Method 1613

Analyte	MB1_8380_DF_SDS 0_8380_MB001	EW09-SS-023-010	EW09-SS-008-010	EW09-SS-129-010	EW09-SS-039-010	EW09-SS-comp1-010	EW09-SS-comp2-010	EW09-SS-100-010	EW09-SS-101-010	EW09-SS-114-010
	pg/g	pg/g	pg/g	pg/g	pg/g	pg/g	pg/g	pg/g	pg/g	pg/g
2,3,7,8-TCDD	0.0571	0.0667	0.0981	0.0469	0.0527	0.044	0.0879	0.0732	0.0597	0.066
1,2,3,7,8-PeCDD	0.0766	0.115	0.216	0.066	0.0701	0.0644	0.154	0.144	0.139	0.131
1,2,3,4,7,8-HxCDD	0.0751	0.16	0.172	0.15	0.0901	0.125	0.169	0.188	0.176	0.149
1,2,3,6,7,8-HxCDD	0.0806	0.166	0.187	0.157	0.0904	0.139	0.182	0.198	0.189	0.143
1,2,3,7,8,9-HxCDD	0.0814	0.183	0.185	0.164	0.0976	0.137	0.192	0.214	0.213	0.157
1,2,3,4,6,7,8-HpCDD	0.0814	0.148	0.23	0.148	0.117	0.108	0.186	0.168	0.138	0.217
OCDD	0.187	0.14	0.369	0.188	0.197	0.156	0.298	0.228	0.282	0.269
2,3,7,8-TCDF	0.039	0.075	0.0816	0.033	0.041	0.0327	0.0582	0.0619	0.0617	0.0651
1,2,3,7,8-PeCDF	0.0538	0.179	0.123	0.0671	0.0557	0.0478	0.116	0.177	0.12	0.118
2,3,4,7,8-PeCDF	0.0524	0.164	0.118	0.063	0.0519	0.0462	0.106	0.16	0.114	0.103
1,2,3,4,7,8-HxCDF	0.0625	0.181	0.214	0.0856	0.068	0.0616	0.148	0.244	0.147	0.116
1,2,3,6,7,8-HxCDF	0.0588	0.2	0.221	0.0824	0.0603	0.0582	0.123	0.23	0.137	0.12
2,3,4,6,7,8-HxCDF	0.0696	0.202	0.223	0.0949	0.0685	0.0631	0.14	0.27	0.176	0.12
1,2,3,7,8,9-HxCDF	0.0865	0.244	0.268	0.093	0.086	0.0768	0.166	0.29	0.15	0.136
1,2,3,4,6,7,8-HpCDF	0.0576	0.072	0.127	0.059	0.059	0.055	0.0995	0.0956	0.0835	0.0943
1,2,3,4,7,8,9-HpCDF	0.0758	0.101	0.175	0.0813	0.0876	0.0811	0.135	0.13	0.11	0.111
OCDF	0.0959	0.133	0.2	0.0871	0.0988	0.0991	0.184	0.169	0.13	0.166
Total TCDD	0.0571	0.0667	0.0981	0.0469	0.0527	0.044	0.0879	0.0732	0.0597	0.066
Total PeCDD	0.0766	0.115	0.216	0.066	0.0701	0.0644	0.154	0.144	0.139	0.131
Total HxCDD	0.0789	0.169	0.181	0.157	0.0925	0.133	0.181	0.199	0.192	0.149
Total HpCDD	0.0814	0.148	0.23	0.148	0.117	0.108	0.186	0.168	0.138	0.217
Total TCDF	0.039	0.075	0.0816	0.033	0.041	0.0327	0.0582	0.0619	0.0617	0.0651
Total PeCDF	0.053	0.171	0.12	0.0649	0.0537	0.0469	0.111	0.168	0.116	0.11
Total HxCDF	0.0682	0.205	0.23	0.0887	0.0698	0.0643	0.143	0.256	0.152	0.122
Total HpCDF	0.066	0.0853	0.149	0.069	0.072	0.0662	0.116	0.111	0.0958	0.102
Checkcode	761-757	739-933	950-697	443-763	000-529	584-696	869-178	632-038	486-287	674-671
Lab ID	MB1_8380_DF_SDS	A2870_8380_DF_001	A2870_8380_DF_002	A2870_8380_DF_003	A2870_8380_DF_004	A2870_8380_DF_005	A2870_8380_DF_006	A2870_8380_DF_007	A2870_8380_DF_008	A2870_8380_DF_009

ITEF-TEQ

Project ID: EW Source Control

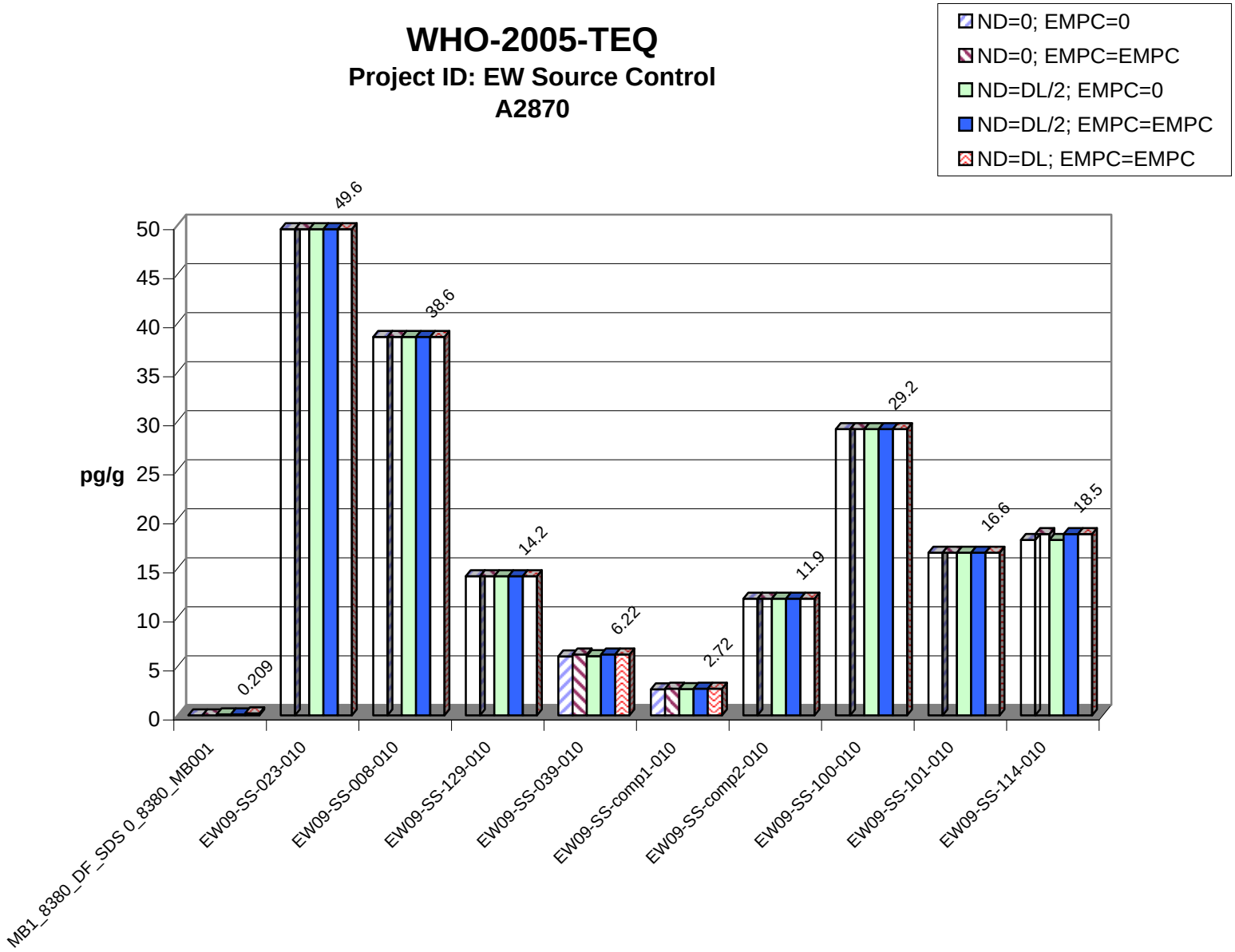
A2870



WHO-2005-TEQ

Project ID: EW Source Control

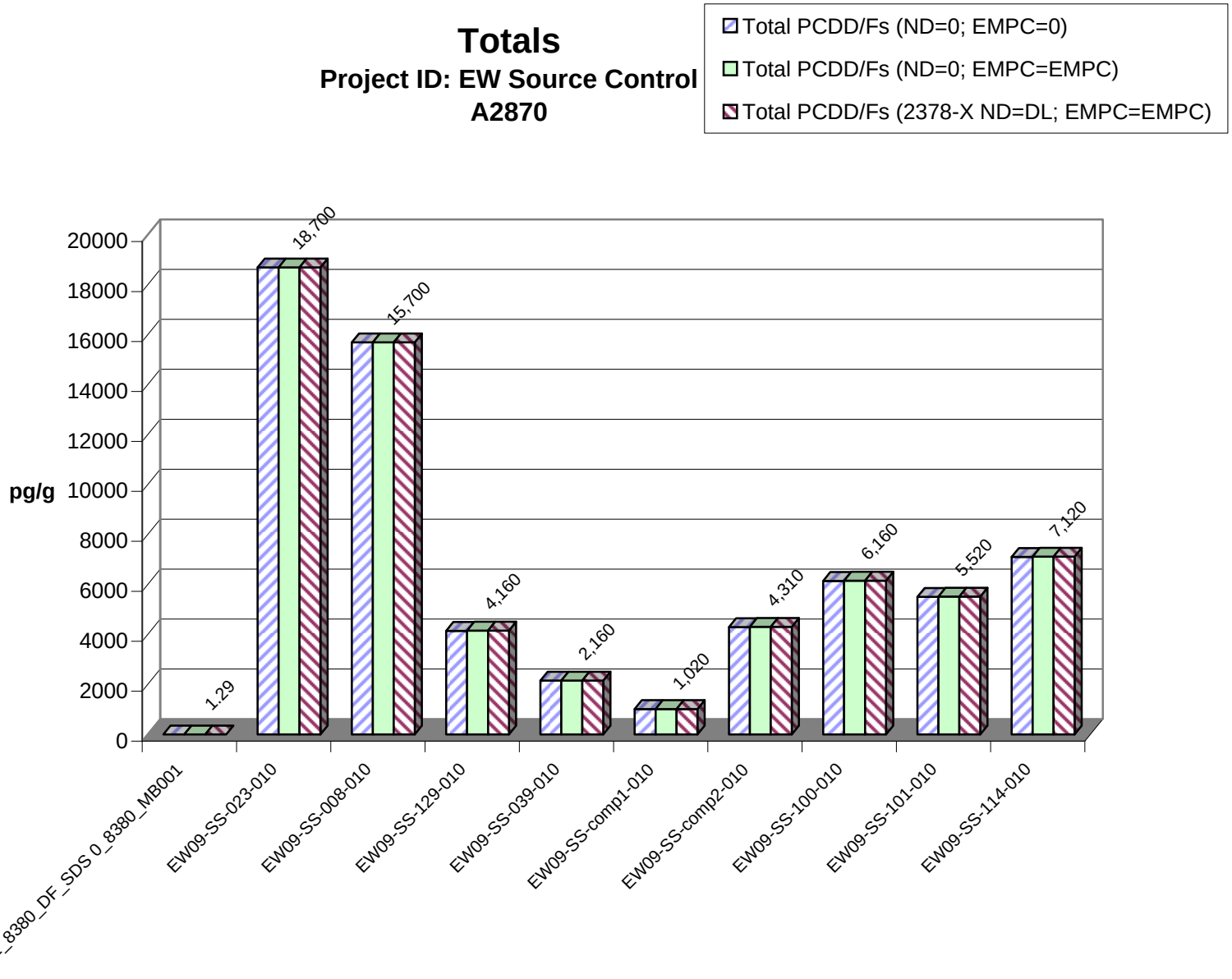
A2870

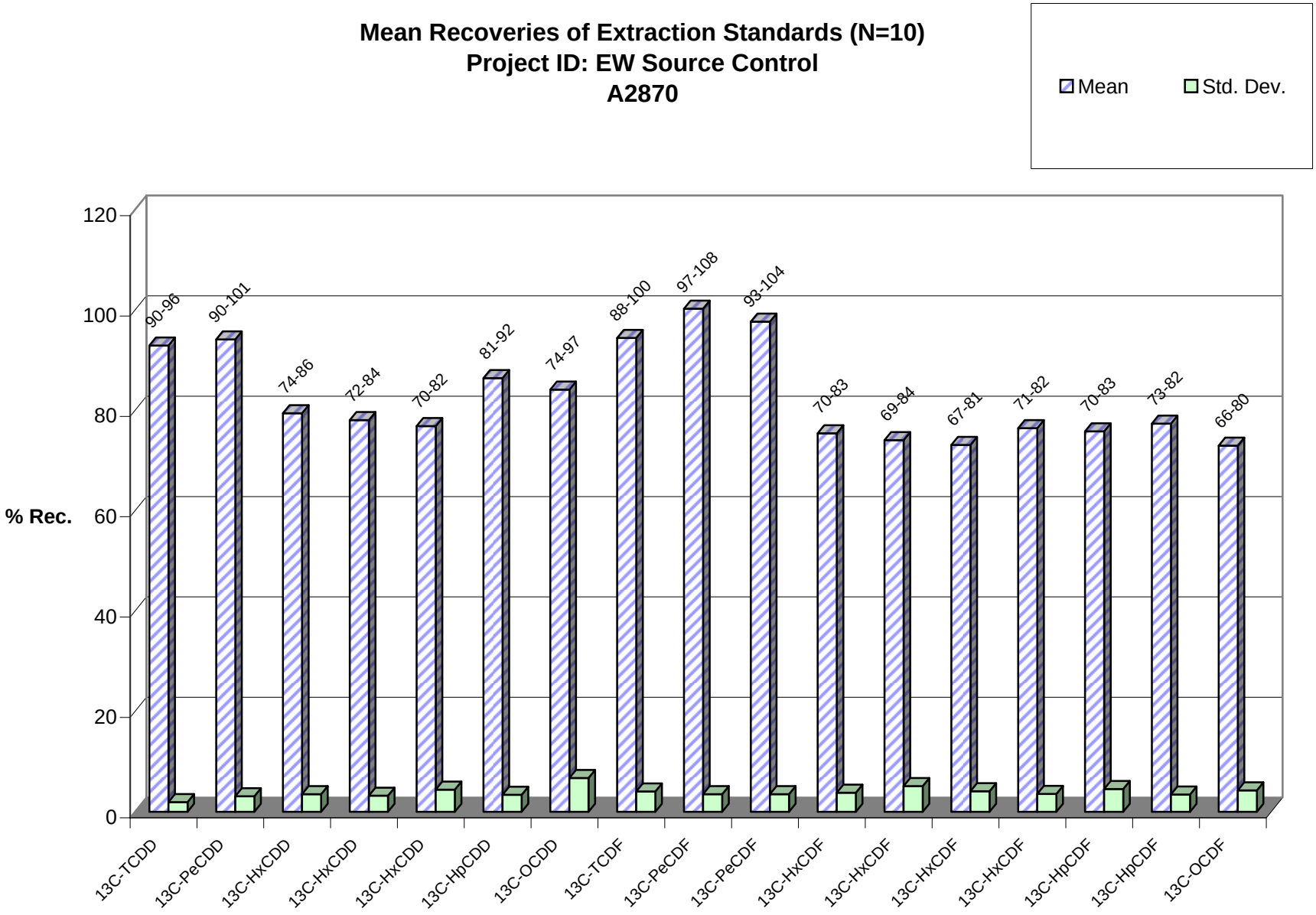


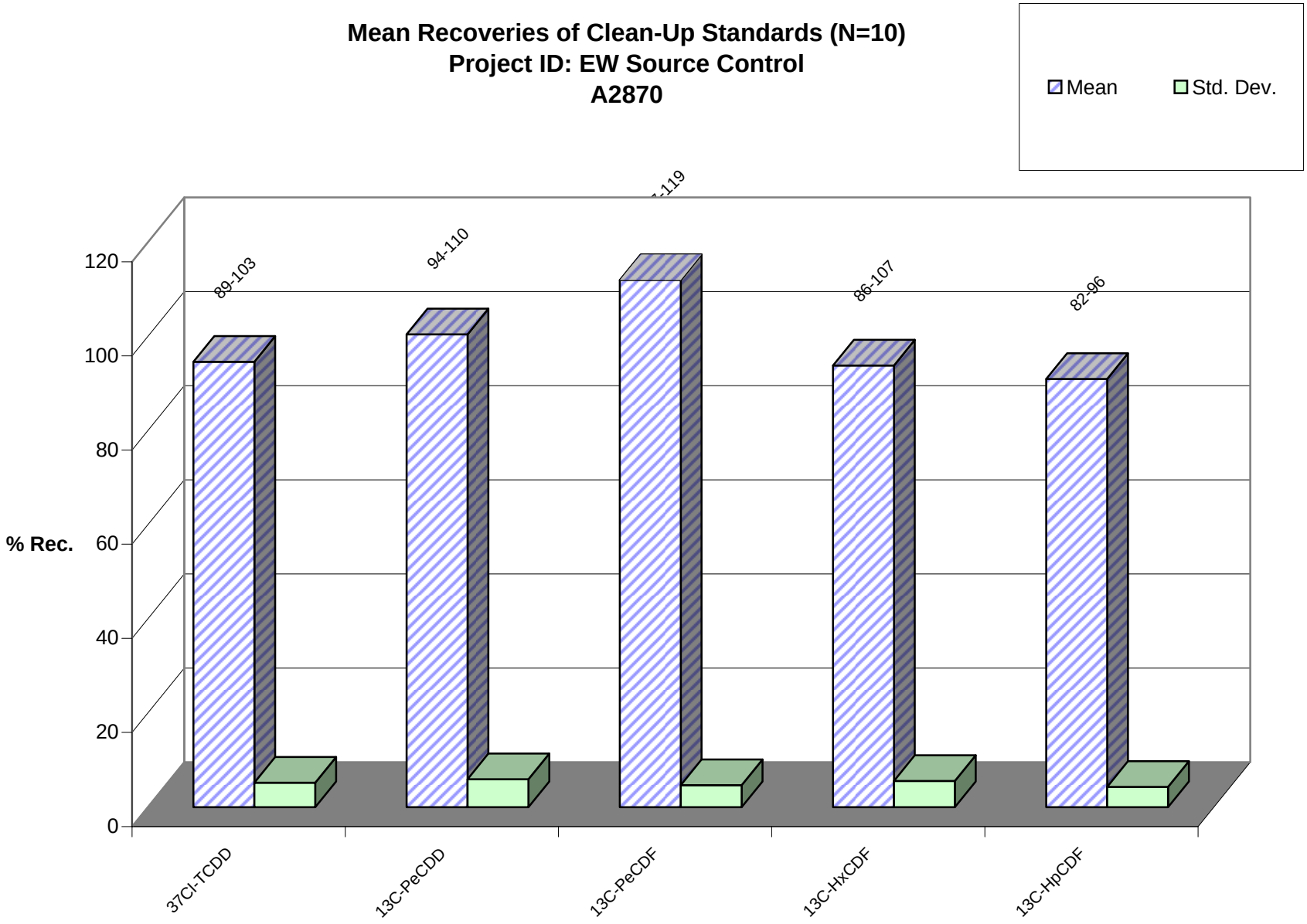
Totals

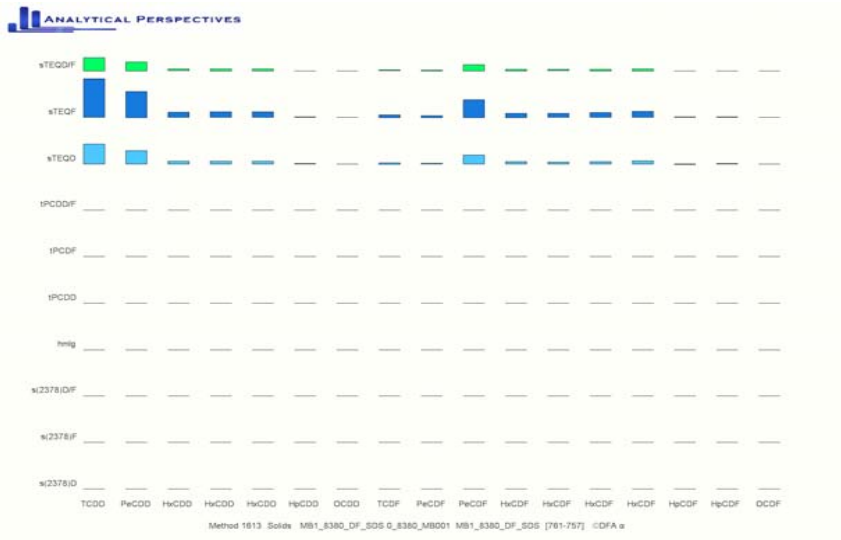
Project ID: EW Source Control

A2870

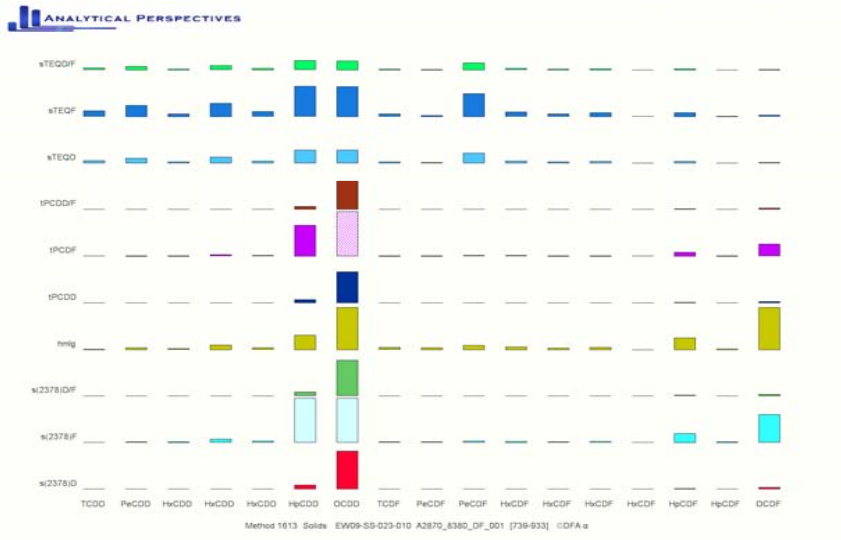


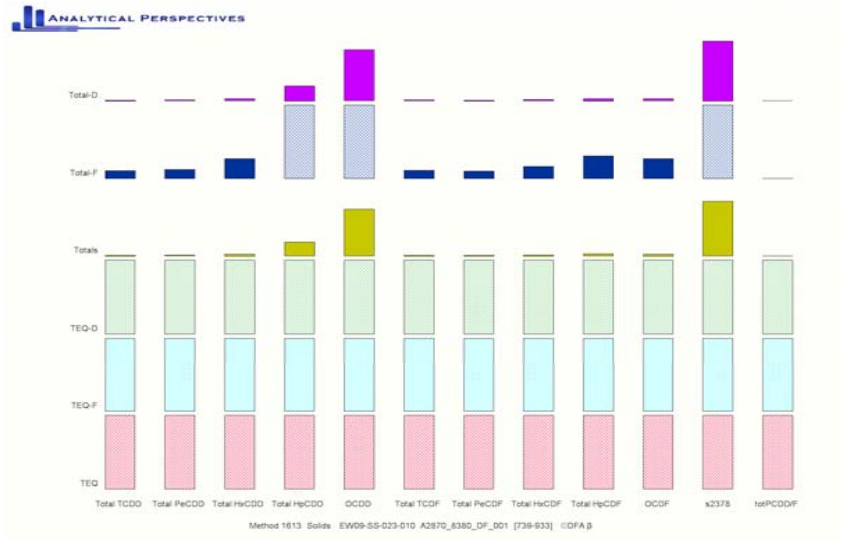

Mean Recoveries of Extraction Standards (N=10)
Project ID: EW Source Control
A2870
Mean
Std. Dev.
% Rec.
120
100
80
60
40
20
0
90-96
90-101
74-86
72-84
70-82
81-92
74-97
88-100
97-108
93-104
70-83
69-84
67-81
71-82
70-83
73-82
66-80
13C-TCDD
13C-PeCDD
13C-HxCDD
13C-HxCDD
13C-HxCDD
13C-HpCDD
13C-OCDD
13C-TCDF
13C-PeCDF
13C-PeCDF
13C-HxCDF
13C-HxCDF
13C-HxCDF
13C-HxCDF
13C-HpCDF
13C-HpCDF
13C-OCDF

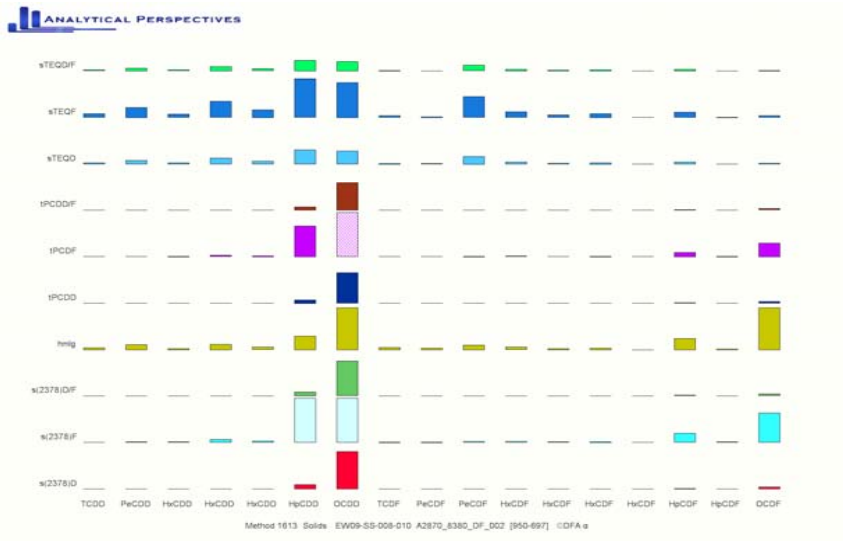

Mean Recoveries of Clean-Up Standards (N=10)
Project ID: EW Source Control
A2870
Mean
Std. Dev.
% Rec.
0
20
40
60
80
100
120
89-103
94-110
-119
86-107
82-96
37Cl-TCDD
13C-PeCDD
13C-PeCDF
13C-HxCDF
13C-HpCDF

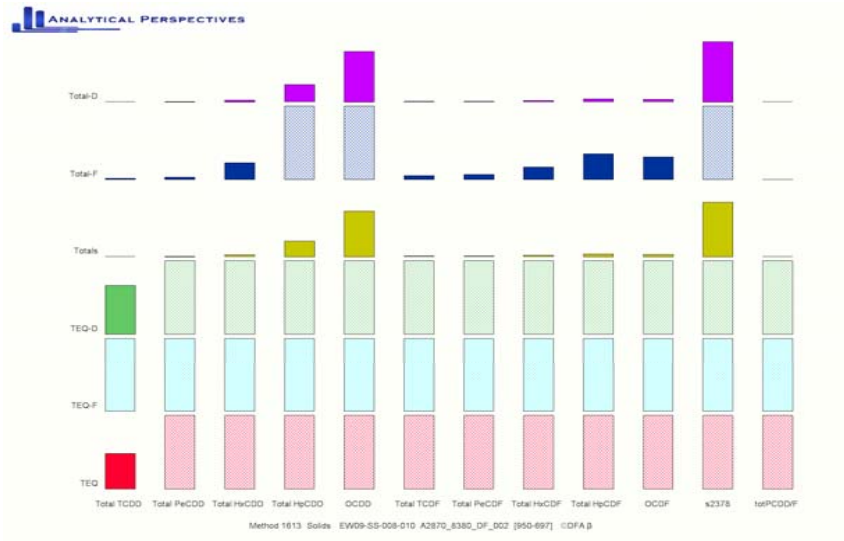

ANALYTICAL PERSPECTIVES
sTEQD/F
sTEQF
sTEQD
tPCDD/F
tPCDF
tPCDD
hmlg
s(2378)D/F
s(2378)F
s(2378)D
TCDD PeCDD HxCDD HxCDD HxCDD HpCDD OCDD TCDF PeCDF PeCDF HxCDF HxCDF HxCDF HxCDF HpCDF HpCDF OCDF
Method 1613 Solids MB1_8380_DF_SDS 0_8380_MB001 MB1_8380_DF_SDS [761-757] ©DFA α

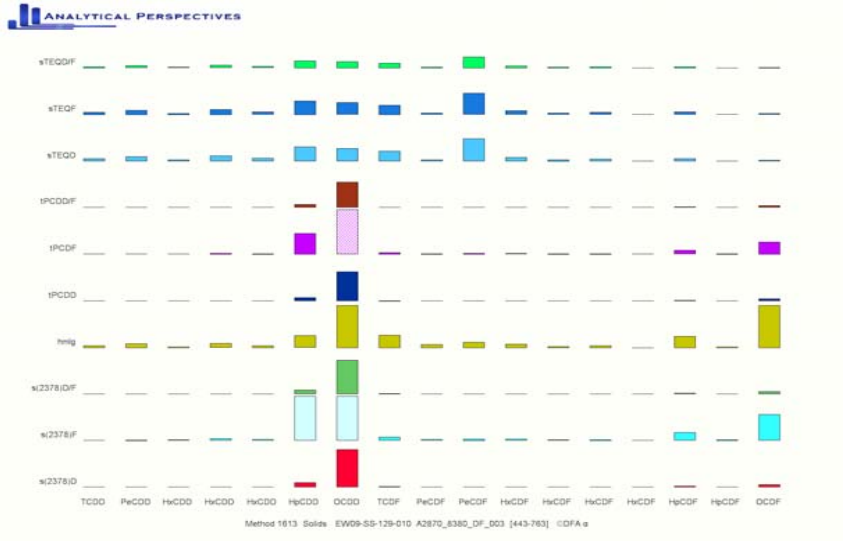
ANALYTICAL PERSPECTIVES
Total-D
Total-F
Totals
TEQ-D
TEQ-F
TEQ
Total TCDD Total PeCDD Total HxCDD Total HpCDD OCDD Total TCDF Total PeCDF Total HxCDF Total HpCDF OCDF s2378 totPCDD/F
Method 1613 Solids MB1_8380_DF_SDS 0_8380_MB001 MB1_8380_DF_SDS [761-757] ©DFA β

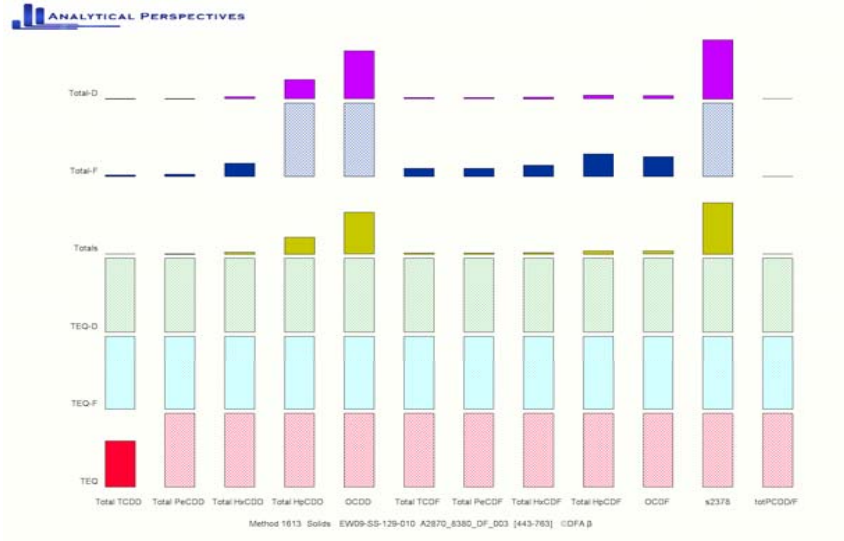

ANALYTICAL PERSPECTIVES
sTEQD/F
sTEQF
sTEQD
tPCDD/F
tPCDF
tPCDD
hmlg
s(2378)D/F
s(2378)F
s(2378)D
TCDD PeCDD HxCDD HxCDD HxCDD HpCDD OCDD TCDF PeCDF PeCDF HxCDF HxCDF HxCDF HxCDF HpCDF HpCDF OCDF
Method 1613 Solids EW09-SS-023-010 A2870_8380_DF_001 [739-933] ©DFA α

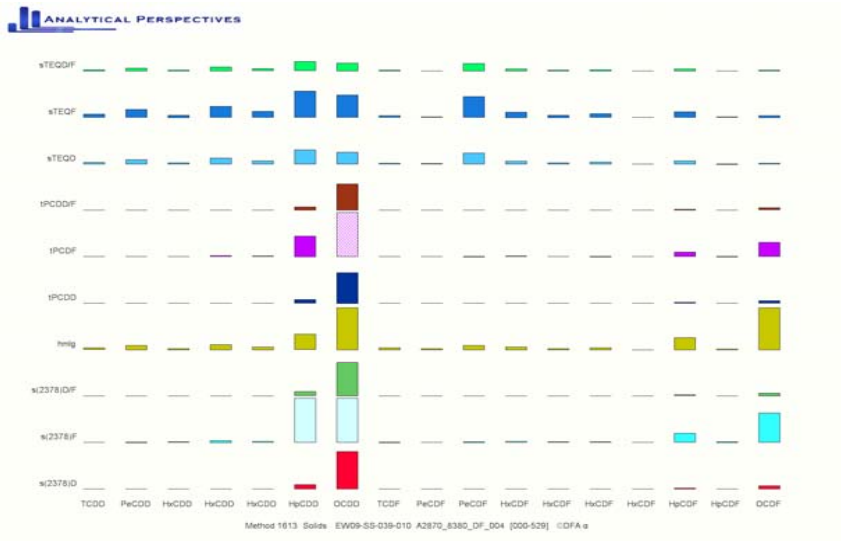

ANALYTICAL PERSPECTIVES
Total-D
Total-F
Totals
TEQ-D
TEQ-F
TEQ
Total TCDD Total PeCDD Total HxCDD Total HpCDD OCDD Total TCDF Total PeCDF Total HxCDF Total HpCDF OCDF s2378 totPCDD/F
Method 1613 Solids EW09-SS-023-010 A2870_8380_DF_001 [739-933] ©DFA β

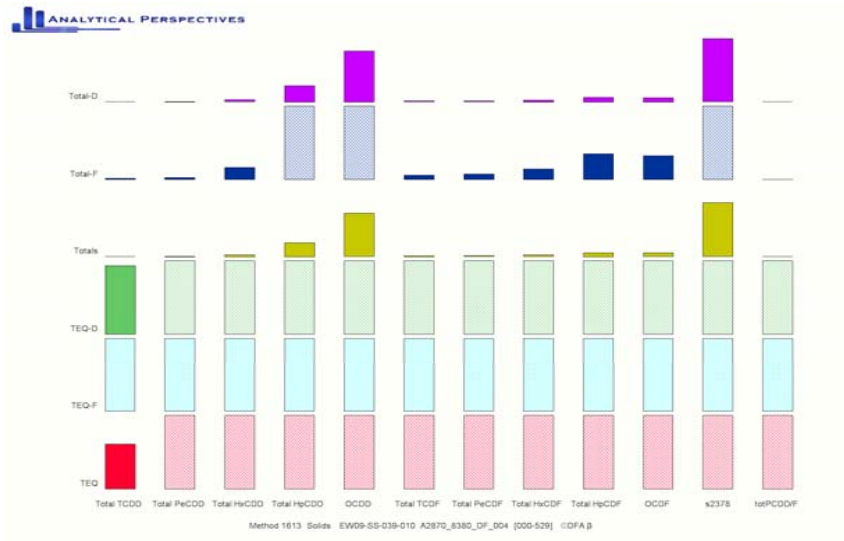

ANALYTICAL PERSPECTIVES
sTEQD/F
sTEQF
sTEQD
tPCDD/F
tPCDF
tPCDD
hmlg
s(2378)D/F
s(2378)F
s(2378)D
TCDD PeCDD HxCDD HxCDD HxCDD HpCDD OCDD TCDF PeCDF PeCDF HxCDF HxCDF HxCDF HxCDF HpCDF HpCDF OCDF
Method 1613 Solids EW09-SS-008-010 A2870_8380_DF_002 [950-697] ©DFA α

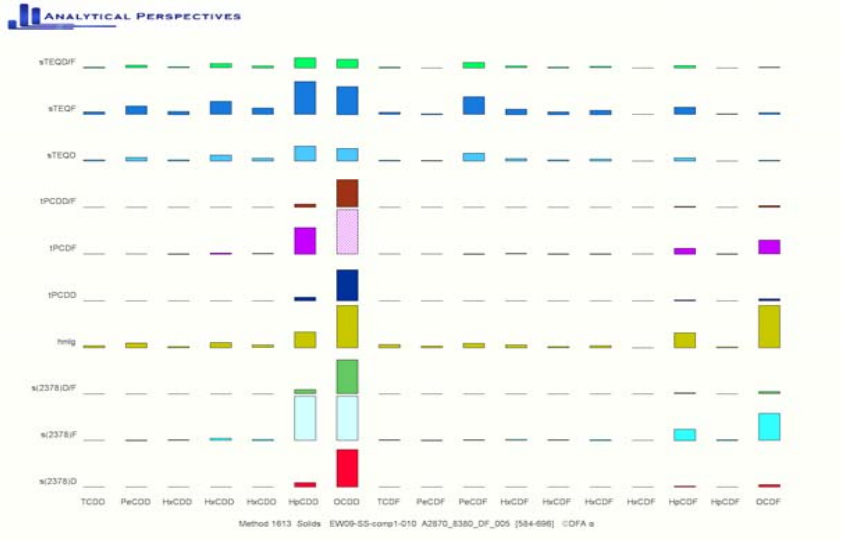

ANALYTICAL PERSPECTIVES
Total-D
Total-F
Totals
TEQ-D
TEQ-F
TEQ
Total TCDD Total PeCDD Total HxCDD Total HpCDD OCDD Total TCDF Total PeCDF Total HxCDF Total HpCDF OCDF s2378 totPCDD/F
Method 1613 Solids EW09-SS-008-010 A2870_8380_DF_002 [950-697] ©DFA β

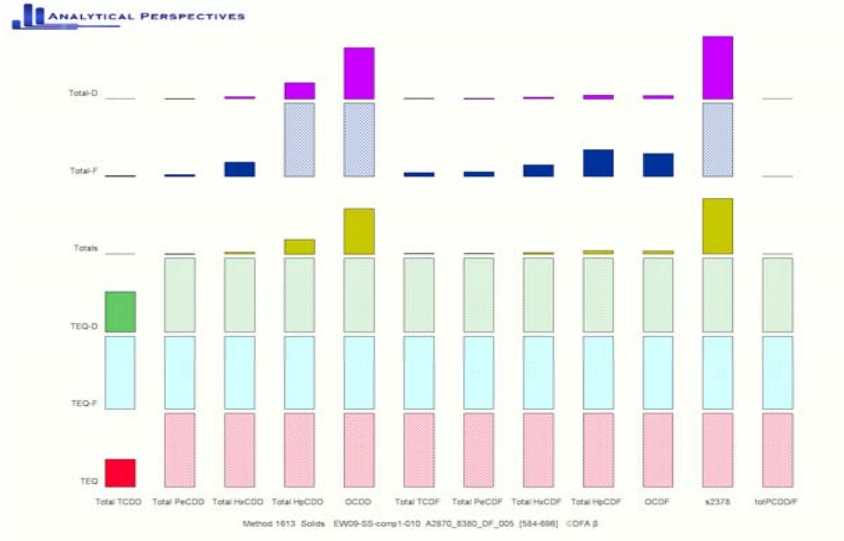

ANALYTICAL PERSPECTIVES
sTEQD/F
sTEQF
sTEQD
tPCDD/F
tPCDF
tPCDD
hmlg
s(2378)D/F
s(2378)F
s(2378)D
TCDD PeCDD HxCDD HxCDD HxCDD HpCDD OCDD TCDF PeCDF PeCDF HxCDF HxCDF HxCDF HxCDF HpCDF HpCDF OCDF
Method 1613 Solids EW09-SS-129-010 A2870_8380_DF_003 [443-763] ©DFA α

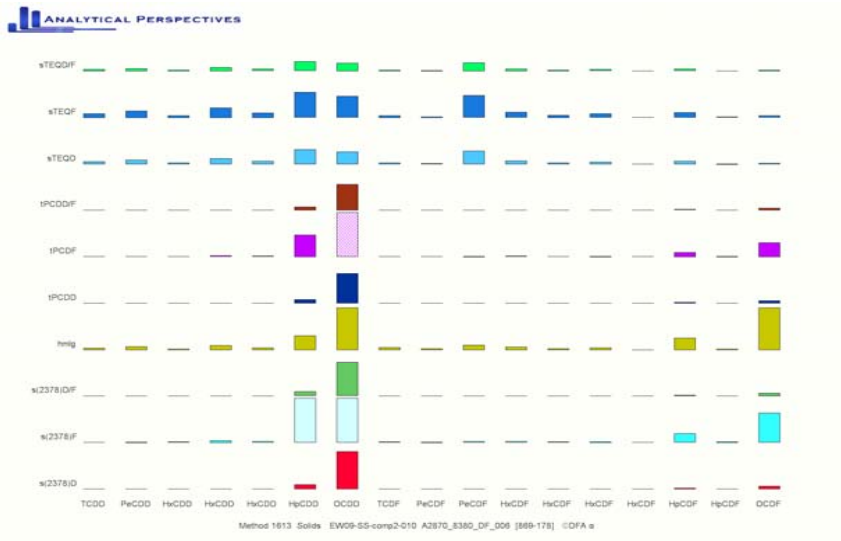

ANALYTICAL PERSPECTIVES
Total-D
Total-F
Totals
TEQ-D
TEQ-F
TEQ
Total TCDD Total PeCDD Total HxCDD Total HpCDD OCDD Total TCDF Total PeCDF Total HxCDF Total HpCDF OCDF s2378 totPCDD/F
Method 1613 Solids EW09-SS-129-010 A2870_8380_DF_003 [443-763] ©DFA β

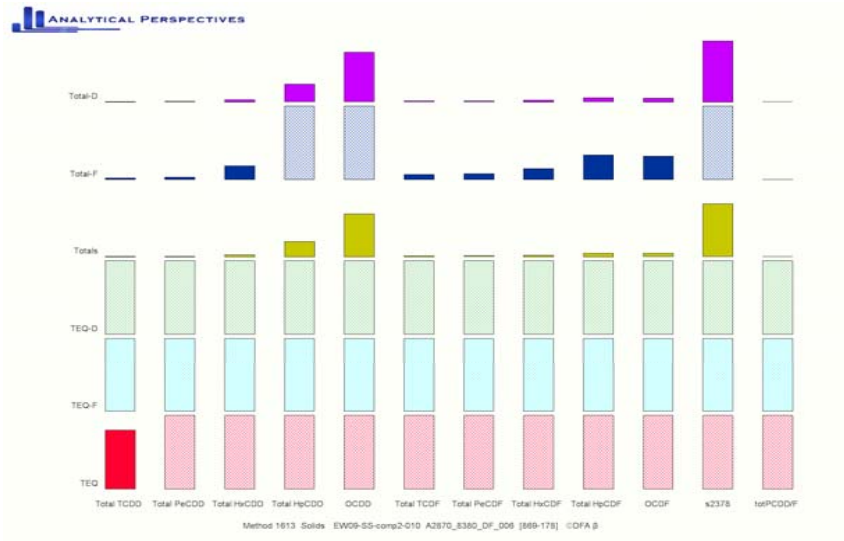

ANALYTICAL PERSPECTIVES
sTEQD/F
sTEQF
sTEQD
tPCDD/F
tPCDF
tPCDD
hmlg
s(2378)D/F
s(2378)F
s(2378)D
TCDD PeCDD HxCDD HxCDD HxCDD HpCDD OCDD TCDF PeCDF PeCDF HxCDF HxCDF HxCDF HxCDF HpCDF HpCDF OCDF
Method 1613 Solids EW09-SS-039-010 A2870_8380_DF_004 [000-529] ©DFA α

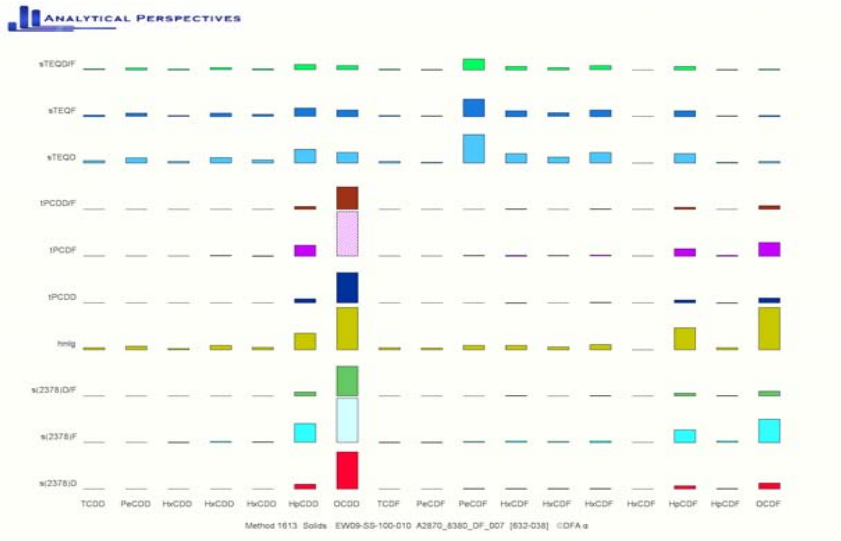

ANALYTICAL PERSPECTIVES
Total-D
Total-F
Totals
TEQ-D
TEQ-F
TEQ
Total TCDD Total PeCDD Total HxCDD Total HpCDD OCDD Total TCDF Total PeCDF Total HxCDF Total HpCDF OCDF s2378 totPCDD/F
Method 1613 Solids EW09-SS-039-010 A2870_8380_DF_004 [000-529] ©DFA β

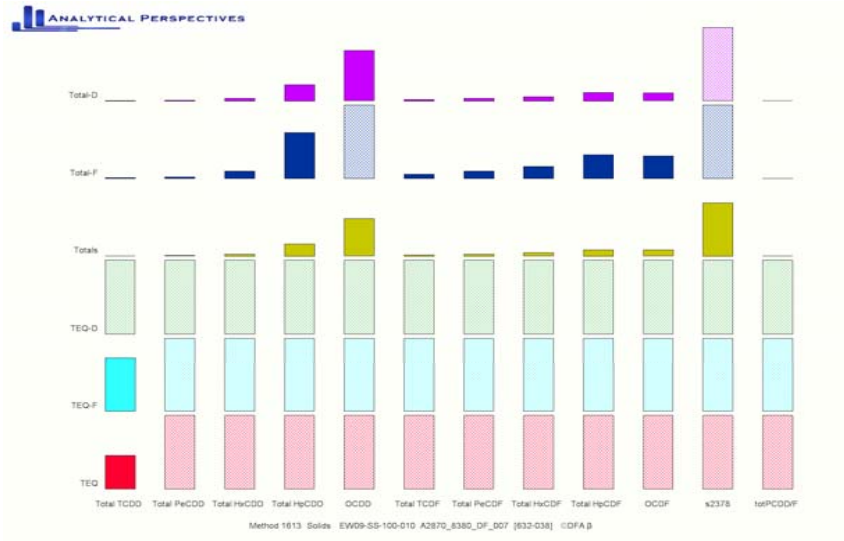

ANALYTICAL PERSPECTIVES
sTEQD/F
sTEQF
sTEQD
tPCDD/F
tPCDF
tPCDD
hmlg
s(2378)D/F
s(2378)F
s(2378)D
TCDD PeCDD HxCDD HxCDD HxCDD HpCDD OCDD TCDF PeCDF PeCDF HxCDF HxCDF HxCDF HxCDF HpCDF HpCDF OCDF
Method 1613 Solids EW09-SS-comp1-010 A2870_8380_DF_005 [584-696] ©DFA α

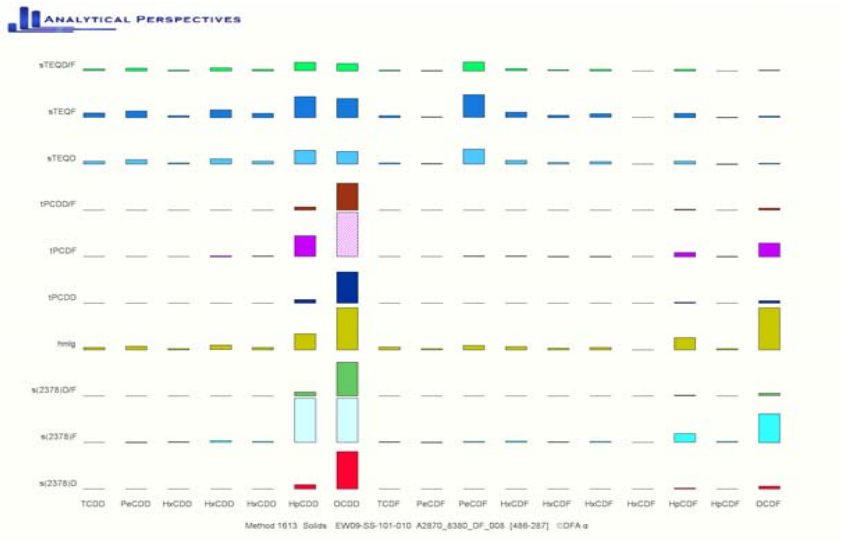

ANALYTICAL PERSPECTIVES
Total-D
Total-F
Totals
TEQ-D
TEQ-F
TEQ
Total TCDD Total PeCDD Total HxCDD Total HpCDD OCDD Total TCDF Total PeCDF Total HxCDF Total HpCDF OCDF s2378 totPCDD/F
Method 1613 Solids EW09-SS-comp1-010 A2870_8380_DF_005 [584-696] ©DFA β

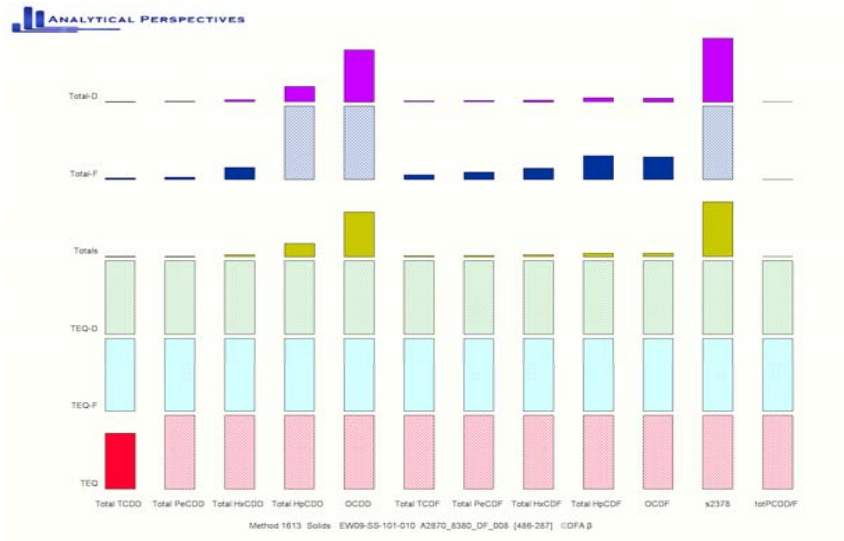

ANALYTICAL PERSPECTIVES
sTEQD/F
sTEQF
sTEQD
tPCDD/F
tPCDF
tPCDD
hmlg
s(2378)D/F
s(2378)F
s(2378)D
TCDD PeCDD HxCDD HxCDD HxCDD HpCDD OCDD TCDF PeCDF PeCDF HxCDF HxCDF HxCDF HxCDF HpCDF HpCDF OCDF
Method 1613 Solids EW09-SS-comp2-010 A2870_8380_DF_006 [869-178] ©DFA α

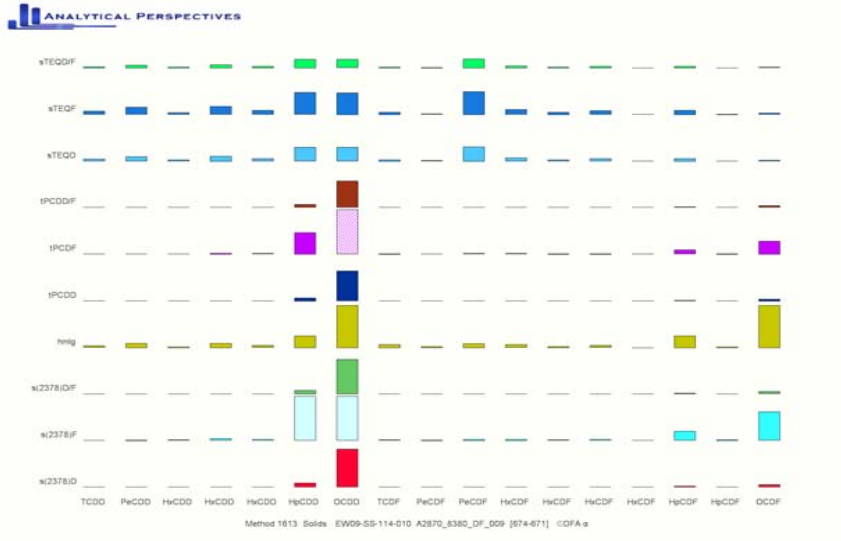

ANALYTICAL PERSPECTIVES
Total-D
Total-F
Totals
TEQ-D
TEQ-F
TEQ
Total TCDD Total PeCDD Total HxCDD Total HpCDD OCDD Total TCDF Total PeCDF Total HxCDF Total HpCDF OCDF s2378 totPCDD/F
Method 1613 Solids EW09-SS-comp2-010 A2870_8380_DF_006 [869-178] ©DFA β

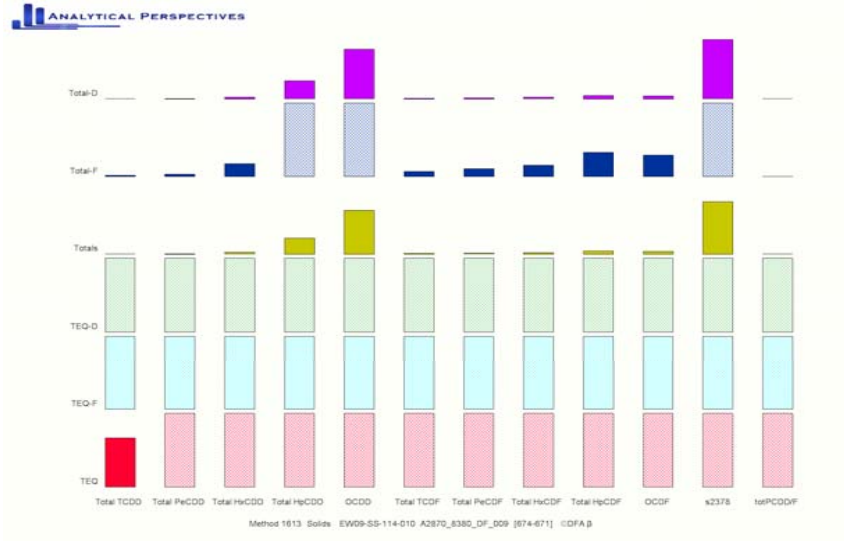

ANALYTICAL PERSPECTIVES
sTEQD/F
sTEQF
sTEQD
tPCDD/F
tPCDF
tPCDD
hmlg
s(2378)D/F
s(2378)F
s(2378)D
TCDD PeCDD HxCDD HxCDD HxCDD HpCDD OCDD TCDF PeCDF PeCDF HxCDF HxCDF HxCDF HxCDF HpCDF HpCDF OCDF
Method 1613 Solids EW09-SS-100-010 A2870_8380_DF_007 [632-038] ©DFA α


ANALYTICAL PERSPECTIVES
Total-D
Total-F
Totals
TEQ-D
TEQ-F
TEQ
Total TCDD Total PeCDD Total HxCDD Total HpCDD OCDD Total TCDF Total PeCDF Total HxCDF Total HpCDF OCDF s2378 totPCDD/F
Method 1613 Solids EW09-SS-100-010 A2870_8380_DF_007 [632-038] ©DFA β


ANALYTICAL PERSPECTIVES
sTEQD/F
sTEQF
sTEQD
tPCDD/F
tPCDF
tPCDD
hmlg
s(2378)D/F
s(2378)F
s(2378)D
TCDD PeCDD HxCDD HxCDD HxCDD HpCDD OCDD TCDF PeCDF PeCDF HxCDF HxCDF HxCDF HxCDF HpCDF HpCDF OCDF
Method 1613 Solids EW09-SS-101-010 A2870_8380_DF_008 [486-287] ©DFA α


ANALYTICAL PERSPECTIVES
Total-D
Total-F
Totals
TEQ-D
TEQ-F
TEQ
Total TCDD Total PeCDD Total HxCDD Total HpCDD OCDD Total TCDF Total PeCDF Total HxCDF Total HpCDF OCDF s2378 totPCDD/F
Method 1613 Solids EW09-SS-101-010 A2870_8380_DF_008 [486-287] ©DFA β


ANALYTICAL PERSPECTIVES
sTEQD/F
sTEQF
sTEQD
tPCDD/F
tPCDF
tPCDD
hmlg
s(2378)D/F
s(2378)F
s(2378)D
TCDD PeCDD HxCDD HxCDD HxCDD HpCDD OCDD TCDF PeCDF PeCDF HxCDF HxCDF HxCDF HxCDF HpCDF HpCDF OCDF
Method 1613 Solids EW09-SS-114-010 A2870_8380_DF_009 [674-671] ©DFA α


ANALYTICAL PERSPECTIVES
Total-D
Total-F
Totals
TEQ-D
TEQ-F
TEQ
Total TCDD Total PeCDD Total HxCDD Total HpCDD OCDD Total TCDF Total PeCDF Total HxCDF Total HpCDF OCDF s2378 totPCDD/F
Method 1613 Solids EW09-SS-114-010 A2870_8380_DF_009 [674-671] ©DFA β

Sample ID: MB1_8380_DF_SDS 0_8380_MB001 — Method 1613

Client Data		Sample Data		Laboratory Data			
Name:	Windward Environmental, LLC	Matrix:	Solids	Lab Project ID:	A2870	Date Received:	n/a
Project ID:	EW Source Control	Weight/Volume:	10.00 g	Lab Sample ID	MB1_8380_DF_SDS	Date Extracted:	21 Dec 2010
Date Collected:	n/a	% Solids:	n/a	QC Batch No:	8380	Date Analyzed:	28 Dec 2010
		Split:	-	Dilution:	-	Time Analyzed:	19:09:18

Analyte	Conc. (pg/g)	DL (pg/g)	EMPC (pg/g)	Qualifiers	Standard	ES Recoveries	Qualifiers
2378-TCDD	ND	0.0571			ES 2378-TCDD	92.7	
12378-PeCDD	ND	0.0766			ES 12378-PeCDD	96.1	
123478-HxCDD	ND	0.0751			ES 123478-HxCDD	82	
123678-HxCDD	ND	0.0806			ES 123678-HxCDD	78.6	
123789-HxCDD	ND	0.0814			ES 123789-HxCDD	80.3	
1234678-HpCDD	ND	0.0814			ES 1234678-HpCDD	84	
OCDD	ND	0.187			ES OCDD	82.4	
2378-TCDF	ND	0.039			ES 2378-TCDF	98.3	
12378-PeCDF	ND	0.0538			ES 12378-PeCDF	108	
23478-PeCDF	ND	0.0524			ES 23478-PeCDF	104	
123478-HxCDF	ND	0.0625			ES 123478-HxCDF	76.6	
123678-HxCDF	ND	0.0588			ES 123678-HxCDF	80.5	
234678-HxCDF	ND	0.0696			ES 234678-HxCDF	76.2	
123789-HxCDF	ND	0.0865			ES 123789-HxCDF	76.3	
1234678-HpCDF	ND	0.0576			ES 1234678-HpCDF	76	
1234789-HpCDF	ND	0.0758			ES 1234789-HpCDF	79.7	
OCDF	ND	0.0959			ES OCDF	75.5	
Totals					**Standard**	**CS/AS Recoveries**	
					CS 37Cl-2378-TCDD	91.4	
Total TCDD	ND	0.0571	ND		CS 12347-PeCDD	110	
Total PeCDD	ND	0.0766	ND		CS 12346-PeCDF	118	
Total HxCDD	ND	0.0789	ND		CS 123469-HxCDF	93.5	
Total HpCDD	ND	0.0814	ND		CS 1234689-HpCDF	88.9	
					AS 1368-TCDD	90.1	
Total TCDF	ND	0.039	ND		AS 1368-TCDF	94.3	
Total PeCDF	ND	0.053	ND				
Total HxCDF	ND	0.0682	ND				
Total HpCDF	ND	0.066	ND				
Total PCDD/Fs	**ND**		**ND**				
ITEF TEQs							
TEQ: ND=0	0		0				
TEQ: ND=DL/2	0.091		0.091				
TEQ: ND=DL	0.182		0.182				

ANALYTICAL PERSPECTIVES
2714 Exchange Drive
Wilmington, NC 28405 , USA
info@ultratrace.com
www.ultratrace.com
Tel: +1 910 794-1613 (Fax: -3919); Toll-Free 866 846-8290

Sample ID: EW09-SS-023-010 — Method 1613

Client Data		Sample Data		Laboratory Data			
Name:	Windward Environmental, LLC	Matrix:	Solids	Lab Project ID:	A2870	Date Received:	14 Dec 2010
Project ID:	EW Source Control	Weight/Volume:	10.05 g	Lab Sample ID	A2870_8380_DF_001	Date Extracted:	21 Dec 2010
Date Collected:	22 Apr 2010	% Solids:	46.6 %	QC Batch No:	8380	Date Analyzed:	28 Dec 2010
		Split:	-	Dilution:	-	Time Analyzed:	19:59:04

Analyte	Conc. (pg/g)	DL (pg/g)	EMPC (pg/g)	Qualifiers	Standard	ES Recoveries	Qualifiers
2378-TCDD	2.32	[Ra=0.81]			ES 2378-TCDD	92.7	
12378-PeCDD	9.3				ES 12378-PeCDD	101	
123478-HxCDD	11.1				ES 123478-HxCDD	81.6	
123678-HxCDD	54.9				ES 123678-HxCDD	80.2	
123789-HxCDD	20.1				ES 123789-HxCDD	81.4	
1234678-HpCDD	1250				ES 1234678-HpCDD	92.5	
OCDD	12400			*	ES OCDD	97	
2378-TCDF	10.1				ES 2378-TCDF	97.8	
12378-PeCDF	8.17				ES 12378-PeCDF	105	
23478-PeCDF	19				ES 23478-PeCDF	103	
123478-HxCDF	18				ES 123478-HxCDF	78.9	
123678-HxCDF	10				ES 123678-HxCDF	73.6	
234678-HxCDF	15.7				ES 234678-HxCDF	75.2	
123789-HxCDF	ND	0.244			ES 123789-HxCDF	80.4	
1234678-HpCDF	154				ES 1234678-HpCDF	79.6	
1234789-HpCDF	11.8				ES 1234789-HpCDF	82.5	
OCDF	482				ES OCDF	79.7	
Totals					**Standard**	**CS/AS Recoveries**	
					CS 37Cl-2378-TCDD	89.9	
Total TCDD	186		187		CS 12347-PeCDD	96.9	
Total PeCDD	221		221		CS 12346-PeCDF	110	
Total HxCDD	489		489		CS 123469-HxCDF	92.3	
Total HpCDD	3650		3650		CS 1234689-HpCDF	93.1	
					AS 1368-TCDD	86.4	
Total TCDF	199		199		AS 1368-TCDF	90.3	
Total PeCDF	182		182				
Total HxCDF	290		290				
Total HpCDF	554		554				
Total PCDD/Fs	**18700**		**18700**				
ITEF TEQs							
TEQ: ND=0	57.9		57.9				
TEQ: ND=DL/2	58		58				
TEQ: ND=DL	58		58				

ANALYTICAL PERSPECTIVES
2714 Exchange Drive
Wilmington, NC 28405 , USA
info@ultratrace.com
www.ultratrace.com
Tel: +1 910 794-1613 (Fax: -3919); Toll-Free 866 846-8290

Sample ID: EW09-SS-008-010 — Method 1613

Client Data		Sample Data		Laboratory Data			
Name:	Windward Environmental, LLC	Matrix:	Solids	Lab Project ID:	A2870	Date Received:	14 Dec 2010
Project ID:	EW Source Control	Weight/Volume:	10.57 g	Lab Sample ID	A2870_8380_DF_002	Date Extracted:	21 Dec 2010
Date Collected:	22 Apr 2010	% Solids:	46.5 %	QC Batch No:	8380	Date Analyzed:	28 Dec 2010
		Split:	-	Dilution:	-	Time Analyzed:	20:48:49

Analyte	Conc. (pg/g)	DL (pg/g)	EMPC (pg/g)	Qualifiers	Standard	ES Recoveries	Qualifiers
2378-TCDD	1.05	[Ra=0.70]			ES 2378-TCDD	92.2	
12378-PeCDD	5.86				ES 12378-PeCDD	95.7	
123478-HxCDD	9.58				ES 123478-HxCDD	77.4	
123678-HxCDD	46.9				ES 123678-HxCDD	77.1	
123789-HxCDD	22.5				ES 123789-HxCDD	75.4	
1234678-HpCDD	1130				ES 1234678-HpCDD	84.5	
OCDD	10200			*	ES OCDD	88.6	
2378-TCDF	4.75				ES 2378-TCDF	94.6	
12378-PeCDF	3.75				ES 12378-PeCDF	99.5	
23478-PeCDF	12.2				ES 23478-PeCDF	98	
123478-HxCDF	16.2				ES 123478-HxCDF	74.3	
123678-HxCDF	6.89				ES 123678-HxCDF	69.2	
234678-HxCDF	10.9				ES 234678-HxCDF	72.4	
123789-HxCDF	ND	0.268			ES 123789-HxCDF	75.3	
1234678-HpCDF	153				ES 1234678-HpCDF	73.3	
1234789-HpCDF	9.91				ES 1234789-HpCDF	74.9	
OCDF	501				ES OCDF	75	
Totals					**Standard**	**CS/AS Recoveries**	
					CS 37Cl-2378-TCDD	92.4	
Total TCDD	23		23.2		CS 12347-PeCDD	95.5	
Total PeCDD	49.8		49.8		CS 12346-PeCDF	110	
Total HxCDD	373		373		CS 123469-HxCDF	90.9	
Total HpCDD	3470		3470		CS 1234689-HpCDF	88.1	
					AS 1368-TCDD	86.8	
Total TCDF	82.3		88.7		AS 1368-TCDF	89.4	
Total PeCDF	112		113				
Total HxCDF	271		272				
Total HpCDF	568		568				
Total PCDD/Fs	**15700**		**15700**				
ITEF TEQs							
TEQ: ND=0	45.7		45.7				
TEQ: ND=DL/2	45.7		45.7				
TEQ: ND=DL	45.7		45.7				

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Sample ID: EW09-SS-129-010 — Method 1613

Client Data		Sample Data		Laboratory Data			
Name:	Windward Environmental, LLC	Matrix:	Solids	Lab Project ID:	A2870	Date Received:	14 Dec 2010
Project ID:	EW Source Control	Weight/Volume:	12.38 g	Lab Sample ID	A2870_8380_DF_003	Date Extracted:	21 Dec 2010
Date Collected:	22 Apr 2010	% Solids:	60.8 %	QC Batch No:	8380	Date Analyzed:	28 Dec 2010
		Split:	-	Dilution:	-	Time Analyzed:	21:38:36

Analyte	Conc. (pg/g)	DL (pg/g)	EMPC (pg/g)	Qualifiers	Standard	ES Recoveries	Qualifiers
2378-TCDD	0.474	[Ra=0.84]			ES 2378-TCDD	90.6	
12378-PeCDD	1.71			J	ES 12378-PeCDD	93.7	
123478-HxCDD	2.18				ES 123478-HxCDD	80.9	
123678-HxCDD	10.3				ES 123678-HxCDD	80	
123789-HxCDD	5.21				ES 123789-HxCDD	78	
1234678-HpCDD	279				ES 1234678-HpCDD	88.1	
OCDD	2460				ES OCDD	89	
2378-TCDF	19.3				ES 2378-TCDF	92.4	
12378-PeCDF	4.92				ES 12378-PeCDF	99.3	
23478-PeCDF	8.81				ES 23478-PeCDF	97.4	
123478-HxCDF	7.32				ES 123478-HxCDF	76.7	
123678-HxCDF	2.77				ES 123678-HxCDF	71.8	
234678-HxCDF	4.25				ES 234678-HxCDF	73.9	
123789-HxCDF	ND	0.093			ES 123789-HxCDF	80.2	
1234678-HpCDF	49.9				ES 1234678-HpCDF	78	
1234789-HpCDF	3.76				ES 1234789-HpCDF	77.4	
OCDF	162				ES OCDF	76.6	
Totals					**Standard**	**CS/AS Recoveries**	
					CS 37Cl-2378-TCDD	91.5	
Total TCDD	11.2		11.2		CS 12347-PeCDD	94.4	
Total PeCDD	17.2		19.3		CS 12346-PeCDF	108	
Total HxCDD	106		106		CS 123469-HxCDF	96	
Total HpCDD	988		988		CS 1234689-HpCDF	94.2	
					AS 1368-TCDD	84.3	
Total TCDF	63.7		65.1		AS 1368-TCDF	88.7	
Total PeCDF	66.1		66.3				
Total HxCDF	91.7		91.7				
Total HpCDF	183		183				
Total PCDD/Fs	**4150**		**4160**				
ITEF TEQs							
TEQ: ND=0	17.1		17.1				
TEQ: ND=DL/2	17.1		17.1				
TEQ: ND=DL	17.1		17.1				

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Sample ID: EW09-SS-039-010 — Method 1613

Client Data		Sample Data		Laboratory Data			
Name:	Windward Environmental, LLC	Matrix:	Solids	Lab Project ID:	A2870	Date Received:	14 Dec 2010
Project ID:	EW Source Control	Weight/Volume:	12.32 g	Lab Sample ID	A2870_8380_DF_004	Date Extracted:	21 Dec 2010
Date Collected:	22 Apr 2010	% Solids:	68.8 %	QC Batch No:	8380	Date Analyzed:	28 Dec 2010
		Split:	-	Dilution:	-	Time Analyzed:	22:28:16

Analyte	Conc. (pg/g)	DL (pg/g)	EMPC (pg/g)	Qualifiers	Standard	ES Recoveries	Qualifiers
2378-TCDD	EMPC	[Ra=0.95]	0.191	J	ES 2378-TCDD	90.3	
12378-PeCDD	0.955			J	ES 12378-PeCDD	91	
123478-HxCDD	1.37			J	ES 123478-HxCDD	78.8	
123678-HxCDD	6.63				ES 123678-HxCDD	77.4	
123789-HxCDD	3.51				ES 123789-HxCDD	76.5	
1234678-HpCDD	157				ES 1234678-HpCDD	85.6	
OCDD	1340				ES OCDD	78.5	
2378-TCDF	1.02				ES 2378-TCDF	89.1	
12378-PeCDF	0.631			J	ES 12378-PeCDF	98.1	
23478-PeCDF	2.5				ES 23478-PeCDF	94.5	
123478-HxCDF	3.24				ES 123478-HxCDF	75.2	
123678-HxCDF	1.34			J	ES 123678-HxCDF	76.2	
234678-HxCDF	2.14				ES 234678-HxCDF	72.6	
123789-HxCDF	ND	0.086			ES 123789-HxCDF	74.5	
1234678-HpCDF	33.9				ES 1234678-HpCDF	73.1	
1234789-HpCDF	2.21				ES 1234789-HpCDF	74.6	
OCDF	109				ES OCDF	69.5	
Totals					**Standard**	**CS/AS Recoveries**	
					CS 37Cl-2378-TCDD	91.5	
Total TCDD	3.53		4.64		CS 12347-PeCDD	99.2	
Total PeCDD	8.49		9.2		CS 12346-PeCDF	108	
Total HxCDD	56		56		CS 123469-HxCDF	92.4	
Total HpCDD	429		429		CS 1234689-HpCDF	89.6	
					AS 1368-TCDD	86.4	
Total TCDF	19.9		20.6		AS 1368-TCDF	89	
Total PeCDF	24.3		24.4				
Total HxCDF	49		49				
Total HpCDF	119		119				
Total PCDD/Fs	**2160**		**2160**				
ITEF TEQs							
TEQ: ND=0	7.06		7.25				
TEQ: ND=DL/2	7.09		7.26				
TEQ: ND=DL	7.12		7.26				

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Sample ID: EW09-SS-comp1-010 — Method 1613

Client Data		Sample Data		Laboratory Data			
Name:	Windward Environmental, LLC	Matrix:	Solids	Lab Project ID:	A2870	Date Received:	14 Dec 2010
Project ID:	EW Source Control	Weight/Volume:	14.16 g	Lab Sample ID	A2870_8380_DF_005	Date Extracted:	21 Dec 2010
Date Collected:	22 Apr 2010	% Solids:	97.3 %	QC Batch No:	8380	Date Analyzed:	28 Dec 2010
		Split:	-	Dilution:	-	Time Analyzed:	23:18:02

Analyte	Conc. (pg/g)	DL (pg/g)	EMPC (pg/g)	Qualifiers	Standard	ES Recoveries	Qualifiers
2378-TCDD	EMPC	[Ra=1.26]	0.0569	J	ES 2378-TCDD	93	
12378-PeCDD	0.384			J	ES 12378-PeCDD	92.1	
123478-HxCDD	0.688			J	ES 123478-HxCDD	78.7	
123678-HxCDD	3.05				ES 123678-HxCDD	79.4	
123789-HxCDD	1.5			J	ES 123789-HxCDD	75	
1234678-HpCDD	77.3				ES 1234678-HpCDD	86.9	
OCDD	656				ES OCDD	79.8	
2378-TCDF	0.492				ES 2378-TCDF	97.4	
12378-PeCDF	0.293			J	ES 12378-PeCDF	99.3	
23478-PeCDF	0.829			J	ES 23478-PeCDF	96.6	
123478-HxCDF	1.26			J	ES 123478-HxCDF	75.7	
123678-HxCDF	0.622			J	ES 123678-HxCDF	75.6	
234678-HxCDF	0.987			J	ES 234678-HxCDF	73.4	
123789-HxCDF	ND	0.0768			ES 123789-HxCDF	73.9	
1234678-HpCDF	16.6				ES 1234678-HpCDF	83.2	
1234789-HpCDF	0.984			J	ES 1234789-HpCDF	77.8	
OCDF	40				ES OCDF	69.9	
Totals					**Standard**	**CS/AS Recoveries**	
					CS 37Cl-2378-TCDD	89	
Total TCDD	1.06		1.26		CS 12347-PeCDD	97	
Total PeCDD	2.34		3.34		CS 12346-PeCDF	107	
Total HxCDD	25.2		25.2		CS 123469-HxCDF	90.2	
Total HpCDD	209		209		CS 1234689-HpCDF	89.5	
					AS 1368-TCDD	90	
Total TCDF	6.18		6.64		AS 1368-TCDF	92.1	
Total PeCDF	7.35		7.89				
Total HxCDF	20.7		20.7				
Total HpCDF	47.5		47.5				
Total PCDD/Fs	**1020**		**1020**				
ITEF TEQs							
TEQ: ND=0	3.13		3.18				
TEQ: ND=DL/2	3.15		3.19				
TEQ: ND=DL	3.18		3.19				

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Sample ID: EW09-SS-comp2-010 — Method 1613

Client Data		Sample Data		Laboratory Data			
Name:	Windward Environmental, LLC	Matrix:	Solids	Lab Project ID:	A2870	Date Received:	14 Dec 2010
Project ID:	EW Source Control	Weight/Volume:	12.39 g	Lab Sample ID	A2870_8380_DF_006	Date Extracted:	21 Dec 2010
Date Collected:	22 Apr 2010	% Solids:	59.5 %	QC Batch No:	8380	Date Analyzed:	29 Dec 2010
		Split:	-	Dilution:	-	Time Analyzed:	00:07:47

Analyte	Conc. (pg/g)	DL (pg/g)	EMPC (pg/g)	Qualifiers	Standard	ES Recoveries	Qualifiers
2378-TCDD	0.47	[Ra=0.70]			ES 2378-TCDD	93.3	
12378-PeCDD	1.61			J	ES 12378-PeCDD	95	
123478-HxCDD	2.37				ES 123478-HxCDD	85.5	
123678-HxCDD	12				ES 123678-HxCDD	83.5	
123789-HxCDD	5.62				ES 123789-HxCDD	82	
1234678-HpCDD	310				ES 1234678-HpCDD	89.2	
OCDD	2630				ES OCDD	86.4	
2378-TCDF	2.29				ES 2378-TCDF	94.5	
12378-PeCDF	1.5			J	ES 12378-PeCDF	100	
23478-PeCDF	5.47				ES 23478-PeCDF	98.2	
123478-HxCDF	6.41				ES 123478-HxCDF	82.8	
123678-HxCDF	2.67				ES 123678-HxCDF	84.2	
234678-HxCDF	4.34				ES 234678-HxCDF	81.4	
123789-HxCDF	ND	0.166			ES 123789-HxCDF	82	
1234678-HpCDF	59.2				ES 1234678-HpCDF	81	
1234789-HpCDF	4.64				ES 1234789-HpCDF	82.1	
OCDF	199				ES OCDF	75.4	
Totals					**Standard**	**CS/AS Recoveries**	
					CS 37Cl-2378-TCDD	100	
Total TCDD	11.5		12		CS 12347-PeCDD	110	
Total PeCDD	18.5		20.7		CS 12346-PeCDF	116	
Total HxCDD	117		117		CS 123469-HxCDF	107	
Total HpCDD	933		933		CS 1234689-HpCDF	95.7	
					AS 1368-TCDD	96.2	
Total TCDF	42.9		44.2		AS 1368-TCDF	95.1	
Total PeCDF	50.9		50.9				
Total HxCDF	93.2		93.8				
Total HpCDF	210		210				
Total PCDD/Fs	**4300**		**4310**				
ITEF TEQs							
TEQ: ND=0	14.2		14.2				
TEQ: ND=DL/2	14.2		14.2				
TEQ: ND=DL	14.2		14.2				

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Sample ID: EW09-SS-100-010 — Method 1613

Client Data		Sample Data		Laboratory Data			
Name:	Windward Environmental, LLC	Matrix:	Solids	Lab Project ID:	A2870	Date Received:	14 Dec 2010
Project ID:	EW Source Control	Weight/Volume:	11.08 g	Lab Sample ID	A2870_8380_DF_007	Date Extracted:	21 Dec 2010
Date Collected:	22 Apr 2010	% Solids:	64.2 %	QC Batch No:	8380	Date Analyzed:	29 Dec 2010
		Split:	-	Dilution:	-	Time Analyzed:	00:57:33

Analyte	Conc. (pg/g)	DL (pg/g)	EMPC (pg/g)	Qualifiers	Standard	ES Recoveries	Qualifiers
2378-TCDD	0.739	[Ra=0.77]			ES 2378-TCDD	95.5	
12378-PeCDD	3.11				ES 12378-PeCDD	92.6	
123478-HxCDD	4.74				ES 123478-HxCDD	74	
123678-HxCDD	17.2				ES 123678-HxCDD	74.3	
123789-HxCDD	9.61				ES 123789-HxCDD	69.9	
1234678-HpCDD	416				ES 1234678-HpCDD	81.4	
OCDD	3270				ES OCDD	73.5	
2378-TCDF	4.85				ES 2378-TCDF	92.5	
12378-PeCDF	5.5				ES 12378-PeCDF	97.6	
23478-PeCDF	17.5				ES 23478-PeCDF	94.9	
123478-HxCDF	28.7				ES 123478-HxCDF	69.6	
123678-HxCDF	17.9				ES 123678-HxCDF	70.2	
234678-HxCDF	32.4				ES 234678-HxCDF	67.1	
123789-HxCDF	ND	0.29			ES 123789-HxCDF	70.9	
1234678-HpCDF	283				ES 1234678-HpCDF	70.4	
1234789-HpCDF	24.5				ES 1234789-HpCDF	72.8	
OCDF	516				ES OCDF	65.9	
Totals					**Standard**	**CS/AS Recoveries**	
					CS 37Cl-2378-TCDD	95.7	
Total TCDD	14.3		16.2		CS 12347-PeCDD	99.5	
Total PeCDD	31.6		39.2		CS 12346-PeCDF	108	
Total HxCDD	166		166		CS 123469-HxCDF	85.5	
Total HpCDD	1060		1060		CS 1234689-HpCDF	81.7	
					AS 1368-TCDD	88.4	
Total TCDF	100		101		AS 1368-TCDF	87.9	
Total PeCDF	169		169				
Total HxCDF	276		276				
Total HpCDF	547		547				
Total PCDD/Fs	**6150**		**6160**				
ITEF TEQs							
TEQ: ND=0	33.9		33.9				
TEQ: ND=DL/2	33.9		33.9				
TEQ: ND=DL	33.9		33.9				

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Sample ID: EW09-SS-101-010 — Method 1613

Client Data		Sample Data		Laboratory Data			
Name:	Windward Environmental, LLC	Matrix:	Solids	Lab Project ID:	A2870	Date Received:	14 Dec 2010
Project ID:	EW Source Control	Weight/Volume:	10.47 g	Lab Sample ID	A2870_8380_DF_008	Date Extracted:	21 Dec 2010
Date Collected:	22 Apr 2010	% Solids:	57.5 %	QC Batch No:	8380	Date Analyzed:	29 Dec 2010
		Split:	-	Dilution:	-	Time Analyzed:	01:47:17

Analyte	Conc. (pg/g)	DL (pg/g)	EMPC (pg/g)	Qualifiers	Standard	ES Recoveries	Qualifiers
2378-TCDD	0.81	[Ra=0.80]			ES 2378-TCDD	92.3	
12378-PeCDD	2.41				ES 12378-PeCDD	90.2	
123478-HxCDD	3.26				ES 123478-HxCDD	74.5	
123678-HxCDD	14.2				ES 123678-HxCDD	72	
123789-HxCDD	7.64				ES 123789-HxCDD	69.8	
1234678-HpCDD	391				ES 1234678-HpCDD	82.8	
OCDD	3520				ES OCDD	79.6	
2378-TCDF	3.42				ES 2378-TCDF	87.7	
12378-PeCDF	2.09			J	ES 12378-PeCDF	96.8	
23478-PeCDF	8.45				ES 23478-PeCDF	93	
123478-HxCDF	9.78				ES 123478-HxCDF	70.8	
123678-HxCDF	4.22				ES 123678-HxCDF	70.1	
234678-HxCDF	6.62				ES 234678-HxCDF	68	
123789-HxCDF	ND	0.15			ES 123789-HxCDF	73.4	
1234678-HpCDF	77				ES 1234678-HpCDF	69.8	
1234789-HpCDF	6.41				ES 1234789-HpCDF	73.3	
OCDF	253				ES OCDF	68.8	
Totals					**Standard**	**CS/AS Recoveries**	
					CS 37Cl-2378-TCDD	103	
Total TCDD	15.3		15.8		CS 12347-PeCDD	106	
Total PeCDD	23.9		27.8		CS 12346-PeCDF	119	
Total HxCDD	134		134		CS 123469-HxCDF	95.9	
Total HpCDD	1030		1030		CS 1234689-HpCDF	93.6	
					AS 1368-TCDD	79.2	
Total TCDF	53.9		54.6		AS 1368-TCDF	84.4	
Total PeCDF	83.7		83.7				
Total HxCDF	128		128				
Total HpCDF	269		269				
Total PCDD/Fs	**5510**		**5520**				
ITEF TEQs							
TEQ: ND=0	19.8		19.8				
TEQ: ND=DL/2	19.8		19.8				
TEQ: ND=DL	19.8		19.8				

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Sample ID: EW09-SS-114-010 — Method 1613

Client Data		Sample Data		Laboratory Data			
Name:	Windward Environmental, LLC	Matrix:	Solids	Lab Project ID:	A2870	Date Received:	14 Dec 2010
Project ID:	EW Source Control	Weight/Volume:	10.12 g	Lab Sample ID	A2870_8380_DF_009	Date Extracted:	21 Dec 2010
Date Collected:	22 Apr 2010	% Solids:	53.8 %	QC Batch No:	8380	Date Analyzed:	29 Dec 2010
		Split:	-	Dilution:	-	Time Analyzed:	02:37:01

Analyte	Conc. (pg/g)	DL (pg/g)	EMPC (pg/g)	Qualifiers	Standard	ES Recoveries	Qualifiers
2378-TCDD	EMPC	[Ra=1.01]	0.647		ES 2378-TCDD	96.5	
12378-PeCDD	2.89				ES 12378-PeCDD	93.9	
123478-HxCDD	3.42				ES 123478-HxCDD	80.7	
123678-HxCDD	16				ES 123678-HxCDD	78	
123789-HxCDD	8.16				ES 123789-HxCDD	80.2	
1234678-HpCDD	445				ES 1234678-HpCDD	89.1	
OCDD	4430				ES OCDD	86.5	
2378-TCDF	4.53				ES 2378-TCDF	99.9	
12378-PeCDF	2.35			J	ES 12378-PeCDF	98.8	
23478-PeCDF	9.32				ES 23478-PeCDF	97	
123478-HxCDF	9.91				ES 123478-HxCDF	73.6	
123678-HxCDF	4.45				ES 123678-HxCDF	69.2	
234678-HxCDF	7.24				ES 234678-HxCDF	70.9	
123789-HxCDF	ND	0.136			ES 123789-HxCDF	77.6	
1234678-HpCDF	83.8				ES 1234678-HpCDF	73.6	
1234789-HpCDF	6.17				ES 1234789-HpCDF	78.3	
OCDF	266				ES OCDF	73.3	
Totals					**Standard**	**CS/AS Recoveries**	
					CS 37Cl-2378-TCDD	102	
Total TCDD	14.9		15.6		CS 12347-PeCDD	96.2	
Total PeCDD	26.3		28.7		CS 12346-PeCDF	116	
Total HxCDD	160		160		CS 123469-HxCDF	94.8	
Total HpCDD	1610		1610		CS 1234689-HpCDF	95.5	
					AS 1368-TCDD	90.7	
Total TCDF	61.4		64.6		AS 1368-TCDF	93.2	
Total PeCDF	96.2		96.6				
Total HxCDF	143		143				
Total HpCDF	302		302				
Total PCDD/Fs	**7110**		**7120**				
ITEF TEQs							
TEQ: ND=0	21.6		22.3				
TEQ: ND=DL/2	21.7		22.3				
TEQ: ND=DL	21.7		22.3				

ANALYTICAL PERSPECTIVES
2714 Exchange Drive
Wilmington, NC 28405 , USA
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Tel: +1 910 794-1613 (Fax: -3919); Toll-Free 866 846-8290

ANALYTICAL PERSPECTIVES

5 January 2011

Nate Lewis
Windward Environmental LLC
200 W. Mercer St. Suite 401
Seattle, WA 98119

Subject: Certificate of Results

Dear Nate;

Attached to this narrative are the analytical results you requested on the sample submitted for the determination of polychlorinated dibenzo-*p*-dioxins and dibenzofurans. The insert below summarizes the relevant information pertaining to your project. In particular, QC annotations bring to your attention specific analytical observations and assessments made during the sample handling and data interpretation phases. Results reported relate only to the items tested.

Project Information Summary	When applicable, see QC Annotations for details
Client Project No.	EW Source Control
AP Project No.	**A2871**
Analytical Protocol	EPA Method 1613
No. Samples Submitted	15
No. Samples Analyzed	15
No. Laboratory Method Blanks	1
No. OPRs / Batch CS3	1
No. Outstanding Samples	0
Date Received	14-Dec-2010
Condition Received	good
Temperature upon Receipt (C)	0
Extraction within Holding Time	yes
Analysis within Holding Time	yes
Data meet QA/QC Requirements	yes
Exceptions	none
Analytical Difficulties	none

2714 EXCHANGE DRIVE
WILMINGTON, NC 28405
PH.: 910-794-1613

QC Annotations:

Please see Appendix A & B attached for data qualifier/attribute and lab identifier information.

Analytical Perspectives remains committed to serving you in the most effective manner. Should you have any questions or need additional information and technical support, please, do not hesitate to contact us. Thank you for choosing Analytical Perspectives as part of your analytical support team.

Sincerely,

Kimberly Mace, Ph.D.
Project Manager

2714 EXCHANGE DRIVE
WILMINGTON, NC 28405
PH.: 910-794-1613

APPENDIX A: DATA QUALIFIERS / DATA ATTRIBUTES	
*	The reported concentration exceeds the calibration range (upper point of the calibration curve).[1]
>	Indicates high recoveries. Shown with the numeric value at the top of the range.[1]
B	The analyte is found in the method blank, at a level that is <=10x the sample concentration.
C	Two or more congeners co-elute. In EDDs C denotes the lowest IUPAC congener in a co-elution group and additional co-eluters for the group are shown with the number of the lowest IUPAC co-eluter.
E	The reported concentration exceeds the calibration range (upper point of the calibration curve).
EMPC	Represents an Estimated Maximum Possible Concentration. EMPC's arise in cases where the signal/noise ratio is not sufficient for peak identification (the determined ion-abundance ratio is outside the allowed theoretical range), or where there is a co-eluting interference.
ETH	Indicates the presence of a diphenyl ether that appears to interfere with the quantitation of a furan. The reported concentration is the maximum.
H/h	If the standard recovery is below the method or SOP specified value "H" is assigned. If the obtained value is less than half the specified value "h" is assigned.[1]
J	Indicates that an analyte has a concentration below the reporting limit (lowest point of the calibration curve).
ND	Indicates a non-detect.
NR	Indicates a value that is not reportable.
PR	Due to interference, the associated congener is poorly resolved.
QI	Indicates the presence of a quantitative interference.
Ra	The new ratio – [Ra] -- for 2,3,7,8-TCDD following the $^{37}Cl_4$-2,3,7,8-TCDD correction is shown between squared brackets in the DL column.[1]
SI	Denotes "Single Ion Mode" and is utilized for PCBs where the secondary ion trace has a significantly elevated noise level due to background PFK. Responses for such peaks are calculated using an EMPC approach based solely on the primary ion area(s) and may be considered estimates.[1]
U	The analyte was not detected. The estimated detection limit (EDL) may be reported for this analyte.
V	The labeled standard recovery was found to be outside of the method control limits.
X	Indicates results reported from reinjection, refractionation, or repeat analyses.
APPENDIX B: LAB ID IDENTIFIERS	
AR	Indicates use of the archived portion of the sample extract.
CU	Indicates a sample that required additional clean-up prior to MS injection/processing.
D	Indicates a dilution of the sample extract. The number that follows the "D" indicates the dilution factor.
DE	Indicates a dilution performed with the addition of ES (extraction standard) solution.
DUP	Designation for a duplicate sample.
MS	Designation for a matrix spike.
MSD	Designation for a matrix spike duplicate.
RJ	Indicates a reinjection of the sample extract.
S	Indicates a sample split. The number that follows the "S" indicates the split factor.

[1]Denotes data qualifiers/attributes whose use will be phased out over time

A2871 - TEQ

Project ID: EW Source Control

Sample Summary
Part 1 (dry weight)

ANALYTICAL PERSPECTIVES

Method 1613

Analyte	MB1_8384_DF_SDS0_8384_MB001	EW10-SC18-2-4	EW10-SC10-4-6	EW10-SC12-5-7	EW10-SC18-6-8	EW10-SC58-6-8	EW10-SC23-1.3-3.2	EW10-SC23-9-11	EW10-SC33-5.8-8	EW10-SC53-5-7	EW10-SC54-8-9.2	EW09-SC06-6-7.4	EW10-SC04-2-4	EW10-SC21-5.3-7.8	EW10-SC43-4-6	EW10-SC14-5.3-7.3
	pg/g	pg/g	pg/g	pg/g	pg/g	pg/g	pg/g	pg/g	pg/g	pg/g	pg/g	pg/g	pg/g	pg/g	pg/g	pg/g
2,3,7,8-TCDD	(0.0818)	2.37	(0.0787)	(0.0564)	(0.141)	(0.084)	12	[0.0816]	(0.0674)	[0.0856]	(0.0437)	0.319	(0.0611)	(0.0578)	(0.0597)	(0.0476)
1,2,3,7,8-PeCDD	(0.08)	6.01	[0.15]	(0.0719)	(0.169)	(0.145)	30.5	0.224	(0.0735)	[0.149]	(0.0642)	0.91	0.462	(0.0654)	[0.156]	(0.0593)
1,2,3,4,7,8-HxCDD	(0.0741)	6.55	0.21	(0.108)	(0.181)	(0.186)	28.9	0.13	(0.0647)	(0.0872)	(0.0769)	1.1	[0.34]	(0.0725)	[0.162]	(0.0649)
1,2,3,6,7,8-HxCDD	(0.0815)	32.8	0.834	(0.108)	(0.186)	(0.176)	149	[0.374]	(0.0682)	0.618	(0.0805)	0.864	1	(0.0787)	0.749	(0.0692)
1,2,3,7,8,9-HxCDD	(0.0859)	16.3	0.526	(0.118)	(0.213)	(0.203)	76.5	0.487	[0.146]	[0.302]	[0.131]	0.885	0.527	0.194	0.463	0.314
1,2,3,4,6,7,8-HpCDD	(0.115)	863	20.6	1.26	[0.922]	[0.652]	3130	3.91	0.806	11.9	0.892	6.3	12	2.34	15.1	1.95
OCDD	(0.221)	7570	169	10.3	8.72	7.05	22000	32	6.71	84.2	6.98	24.4	69.4	17.2	95	16.5
2,3,7,8-TCDF	(0.0612)	7.65	[0.123]	(0.0483)	(0.124)	(0.0777)	29.2	0.5	(0.049)	0.482	(0.0341)	1.42	0.554	(0.0449)	0.315	(0.0288)
1,2,3,7,8-PeCDF	(0.0633)	5.06	0.141	(0.0548)	(0.132)	(0.091)	18.5	0.255	(0.0515)	0.372	(0.0407)	0.934	0.38	(0.0479)	0.22	(0.0358)
2,3,4,7,8-PeCDF	(0.0577)	28.7	0.719	(0.0527)	(0.104)	(0.0812)	141	0.342	(0.0454)	0.874	(0.0366)	1.02	1.63	(0.0411)	0.979	(0.0326)
1,2,3,4,7,8-HxCDF	(0.0652)	26.3	1.74	(0.0739)	(0.131)	(0.139)	87.1	0.234	(0.0592)	0.513	(0.0488)	0.598	0.534	(0.0572)	0.733	(0.0361)
1,2,3,6,7,8-HxCDF	(0.0606)	12.2	0.396	(0.0635)	(0.124)	(0.117)	46.5	0.182	(0.0554)	0.356	(0.0451)	0.557	0.526	(0.0543)	[0.329]	(0.0335)
2,3,4,6,7,8-HxCDF	(0.0668)	20	0.661	(0.0715)	(0.117)	(0.135)	84.4	[0.174]	(0.0574)	0.51	(0.045)	0.48	0.919	(0.0555)	0.634	(0.0356)
1,2,3,7,8,9-HxCDF	(0.0891)	(0.276)	(0.0984)	(0.101)	(0.177)	(0.187)	(0.715)	(0.0928)	(0.0785)	(0.104)	(0.0705)	(0.0809)	(0.112)	(0.0789)	(0.0872)	(0.0535)
1,2,3,4,6,7,8-HpCDF	(0.0698)	199	8.96	0.234	(0.214)	(0.151)	938	0.841	(0.0689)	5.16	(0.0428)	1.04	6.8	0.301	5.45	(0.0493)
1,2,3,4,7,8,9-HpCDF	(0.094)	14.6	0.894	(0.114)	(0.304)	(0.239)	55.5	(0.0787)	(0.0902)	0.369	(0.0582)	(0.0879)	[0.322]	(0.0738)	0.388	(0.0635)
OCDF	(0.177)	555	35.3	0.586	(0.573)	(0.554)	2750	0.905	(0.139)	20.8	(0.112)	0.435	15.9	0.738	17.2	(0.114)
ITEF TEQ (ND=0; EMPC=0)	**0.00**	**51.0**	**1.31**	**0.0258**	**0.00872**	**0.00705**	**215**	**0.529**	**0.0148**	**0.982**	**0.0159**	**2.02**	**1.74**	**0.0637**	**1.11**	**0.0674**
ITEF TEQ (ND=0; EMPC=EMPC)	**0.00**	**51.0**	**1.40**	**0.0258**	**0.0179**	**0.0136**	**215**	**0.666**	**0.0294**	**1.17**	**0.029**	**2.02**	**1.78**	**0.0637**	**1.24**	**0.0674**
ITEF TEQ (ND=DL/2; EMPC=0)	**0.108**	**51.1**	**1.38**	**0.122**	**0.217**	**0.173**	**215**	**0.574**	**0.106**	**1.05**	**0.0893**	**2.02**	**1.78**	**0.143**	**1.17**	**0.132**
ITEF TEQ (ND=DL/2; EMPC=EMPC)	**0.108**	**51.1**	**1.44**	**0.122**	**0.225**	**0.178**	**215**	**0.671**	**0.117**	**1.18**	**0.0976**	**2.02**	**1.82**	**0.143**	**1.27**	**0.132**
ITEF TEQ (ND=DL; EMPC=EMPC)	**0.215**	**51.1**	**1.49**	**0.218**	**0.432**	**0.342**	**215**	**0.676**	**0.204**	**1.19**	**0.166**	**2.03**	**1.85**	**0.222**	**1.31**	**0.196**
Checkcode	004-813	066-121	092-823	425-506	142-471	340-868	188-811	318-643	182-075	224-352	005-345	569-757	874-420	392-411	567-262	862-372
Lab ID	MB1_8384_DF_SDS	A2871_8384_DF_001	A2871_8384_DF_002	A2871_8384_DF_003	A2871_8384_DF_004	A2871_8384_DF_005	A2871_8384_DF_006	A2871_8384_DF_007	A2871_8384_DF_008	A2871_8384_DF_009	A2871_8384_DF_010	A2871_8384_DF_011	A2871_8384_DF_012	A2871_8384_DF_013	A2871_8384_DF_014	A2871_8384_DF_015

( ) = DL
[ ] = EMPC

A2871 - TEQ

Project ID: EW Source Control

Sample Summary
Part 1 (wet weight)

ANALYTICAL PERSPECTIVES

Method 1613

Analyte	MB1_8384_DF_SDS0_8384_MB001	EW10-SC18-2-4	EW10-SC10-4-6	EW10-SC12-5-7	EW10-SC18-6-8	EW10-SC58-6-8	EW10-SC23-1.3-3.2	EW10-SC23-9-11	EW10-SC33-5.8-8	EW10-SC53-5-7	EW10-SC54-8-9.2	EW09-SC06-6-7.4	EW10-SC04-2-4	EW10-SC21-5.3-7.8	EW10-SC43-4-6	EW10-SC14-5.3-7.3
	pg/g	pg/g	pg/g	pg/g	pg/g	pg/g	pg/g	pg/g	pg/g	pg/g	pg/g	pg/g	pg/g	pg/g	pg/g	pg/g
2,3,7,8-TCDD	(0.0818)	1.52	(0.0787)	(0.0564)	(0.141)	(0.084)	6.46	[0.056]	(0.0674)	[0.063]	(0.0437)	0.193	(0.0611)	(0.0578)	(0.0597)	(0.0476)
1,2,3,7,8-PeCDD	(0.08)	3.86	[0.116]	(0.0719)	(0.169)	(0.145)	16.4	0.154	(0.0735)	[0.11]	(0.0642)	0.55	0.365	(0.0654)	[0.124]	(0.0593)
1,2,3,4,7,8-HxCDD	(0.0741)	4.21	0.163	(0.108)	(0.181)	(0.186)	15.5	0.0893	(0.0647)	(0.0872)	(0.0769)	0.665	[0.268]	(0.0725)	[0.128]	(0.0649)
1,2,3,6,7,8-HxCDD	(0.0815)	21.1	0.646	(0.108)	(0.186)	(0.176)	80.2	[0.257]	(0.0682)	0.455	(0.0805)	0.523	0.79	(0.0787)	0.593	(0.0692)
1,2,3,7,8,9-HxCDD	(0.0859)	10.5	0.407	(0.118)	(0.213)	(0.203)	41.2	0.334	[0.114]	[0.222]	[0.0922]	0.535	0.416	0.146	0.367	0.249
1,2,3,4,6,7,8-HpCDD	(0.115)	555	16	1.15	[0.663]	[0.493]	1680	2.69	0.631	8.76	0.628	3.81	9.48	1.77	12	1.55
OCDD	(0.221)	4870	131	9.41	6.27	5.33	11800	22	5.26	62	4.91	14.8	54.8	13	75.2	13.1
2,3,7,8-TCDF	(0.0612)	4.92	[0.0953]	(0.0483)	(0.124)	(0.0777)	15.7	0.343	(0.049)	0.355	(0.0341)	0.859	0.437	(0.0449)	0.249	(0.0288)
1,2,3,7,8-PeCDF	(0.0633)	3.25	0.109	(0.0548)	(0.132)	(0.091)	9.95	0.175	(0.0515)	0.274	(0.0407)	0.565	0.3	(0.0479)	0.174	(0.0358)
2,3,4,7,8-PeCDF	(0.0577)	18.5	0.557	(0.0527)	(0.104)	(0.0812)	75.9	0.235	(0.0454)	0.643	(0.0366)	0.617	1.29	(0.0411)	0.775	(0.0326)
1,2,3,4,7,8-HxCDF	(0.0652)	16.9	1.35	(0.0739)	(0.131)	(0.139)	46.9	0.161	(0.0592)	0.378	(0.0488)	0.362	0.422	(0.0572)	0.581	(0.0361)
1,2,3,6,7,8-HxCDF	(0.0606)	7.84	0.307	(0.0635)	(0.124)	(0.117)	25	0.125	(0.0554)	0.262	(0.0451)	0.337	0.415	(0.0543)	[0.261]	(0.0335)
2,3,4,6,7,8-HxCDF	(0.0668)	12.9	0.512	(0.0715)	(0.117)	(0.135)	45.4	[0.12]	(0.0574)	0.375	(0.045)	0.29	0.726	(0.0555)	0.502	(0.0356)
1,2,3,7,8,9-HxCDF	(0.0891)	(0.276)	(0.0984)	(0.101)	(0.177)	(0.187)	(0.715)	(0.0928)	(0.0785)	(0.104)	(0.0705)	(0.0809)	(0.112)	(0.0789)	(0.0872)	(0.0535)
1,2,3,4,6,7,8-HpCDF	(0.0698)	128	6.94	0.214	(0.214)	(0.151)	505	0.578	(0.0689)	3.8	(0.0428)	0.629	5.37	0.227	4.32	(0.0493)
1,2,3,4,7,8,9-HpCDF	(0.094)	9.39	0.692	(0.114)	(0.304)	(0.239)	29.9	(0.0787)	(0.0902)	0.272	(0.0582)	(0.0879)	[0.254]	(0.0738)	0.307	(0.0635)
OCDF	(0.177)	357	27.3	0.536	(0.573)	(0.554)	1480	0.622	(0.139)	15.3	(0.112)	0.263	12.6	0.557	13.6	(0.114)
ITEF TEQ (ND=0; EMPC=0)	**0.00**	**32.8**	**1.02**	**0.0236**	**0.00627**	**0.00533**	**116**	**0.364**	**0.0116**	**0.723**	**0.0112**	**1.22**	**1.38**	**0.0481**	**0.88**	**0.0535**
ITEF TEQ (ND=0; EMPC=EMPC)	**0.00**	**32.8**	**1.08**	**0.0236**	**0.0129**	**0.0103**	**116**	**0.457**	**0.023**	**0.863**	**0.0204**	**1.22**	**1.41**	**0.0481**	**0.981**	**0.0535**
ITEF TEQ (ND=DL/2; EMPC=0)	**0.108**	**32.8**	**1.07**	**0.111**	**0.156**	**0.13**	**116**	**0.394**	**0.0829**	**0.772**	**0.0628**	**1.22**	**1.41**	**0.108**	**0.926**	**0.105**
ITEF TEQ (ND=DL/2; EMPC=EMPC)	**0.108**	**32.8**	**1.12**	**0.111**	**0.162**	**0.134**	**116**	**0.461**	**0.0913**	**0.87**	**0.0687**	**1.22**	**1.43**	**0.108**	**1.01**	**0.105**
ITEF TEQ (ND=DL; EMPC=EMPC)	**0.215**	**32.8**	**1.15**	**0.199**	**0.311**	**0.258**	**116**	**0.464**	**0.16**	**0.877**	**0.117**	**1.23**	**1.46**	**0.168**	**1.03**	**0.156**
Checkcode	004-813	066-121	092-823	425-506	142-471	340-868	188-811	318-643	182-075	224-352	005-345	569-757	874-420	392-411	567-262	862-372
Lab ID	MB1_8384_DF_SDS	A2871_8384_DF_001	A2871_8384_DF_002	A2871_8384_DF_003	A2871_8384_DF_004	A2871_8384_DF_005	A2871_8384_DF_006	A2871_8384_DF_007	A2871_8384_DF_008	A2871_8384_DF_009	A2871_8384_DF_010	A2871_8384_DF_011	A2871_8384_DF_012	A2871_8384_DF_013	A2871_8384_DF_014	A2871_8384_DF_015

( ) = DL
[ ] = EMPC

A2871 - WHO-2005-TEQ
Project ID: EW Source Control

Sample Summary
Part 1 (dry weight)

ANALYTICAL PERSPECTIVES

Method 1613

Analyte	MB1_8384_DF_SDS0_8384_MB001	EW10-SC18-2-4	EW10-SC10-4-6	EW10-SC12-5-7	EW10-SC18-6-8	EW10-SC58-6-8	EW10-SC23-1.3-3.2	EW10-SC23-9-11	EW10-SC33-5.8-8	EW10-SC53-5-7	EW10-SC54-8-9.2	EW09-SC06-6-7.4	EW10-SC04-2-4	EW10-SC21-5.3-7.8	EW10-SC43-4-6	EW10-SC14-5.3-7.3
	pg/g	pg/g	pg/g	pg/g	pg/g	pg/g	pg/g	pg/g	pg/g	pg/g	pg/g	pg/g	pg/g	pg/g	pg/g	pg/g
2,3,7,8-TCDD	(0.0818)	2.37	(0.0787)	(0.0564)	(0.141)	(0.084)	12	[0.0816]	(0.0674)	[0.0856]	(0.0437)	0.319	(0.0611)	(0.0578)	(0.0597)	(0.0476)
1,2,3,7,8-PeCDD	(0.08)	6.01	[0.15]	(0.0719)	(0.169)	(0.145)	30.5	0.224	(0.0735)	[0.149]	(0.0642)	0.91	0.462	(0.0654)	[0.156]	(0.0593)
1,2,3,4,7,8-HxCDD	(0.0741)	6.55	0.21	(0.108)	(0.181)	(0.186)	28.9	0.13	(0.0647)	(0.0872)	(0.0769)	1.1	[0.34]	(0.0725)	[0.162]	(0.0649)
1,2,3,6,7,8-HxCDD	(0.0815)	32.8	0.834	(0.108)	(0.186)	(0.176)	149	[0.374]	(0.0682)	0.618	(0.0805)	0.864	1	(0.0787)	0.749	(0.0692)
1,2,3,7,8,9-HxCDD	(0.0859)	16.3	0.526	(0.118)	(0.213)	(0.203)	76.5	0.487	[0.146]	[0.302]	[0.131]	0.885	0.527	0.194	0.463	0.314
1,2,3,4,6,7,8-HpCDD	(0.115)	863	20.6	1.26	[0.922]	[0.652]	3130	3.91	0.806	11.9	0.892	6.3	12	2.34	15.1	1.95
OCDD	(0.221)	7570	169	10.3	8.72	7.05	22000	32	6.71	84.2	6.98	24.4	69.4	17.2	95	16.5
2,3,7,8-TCDF	(0.0612)	7.65	[0.123]	(0.0483)	(0.124)	(0.0777)	29.2	0.5	(0.049)	0.482	(0.0341)	1.42	0.554	(0.0449)	0.315	(0.0288)
1,2,3,7,8-PeCDF	(0.0633)	5.06	0.141	(0.0548)	(0.132)	(0.091)	18.5	0.255	(0.0515)	0.372	(0.0407)	0.934	0.38	(0.0479)	0.22	(0.0358)
2,3,4,7,8-PeCDF	(0.0577)	28.7	0.719	(0.0527)	(0.104)	(0.0812)	141	0.342	(0.0454)	0.874	(0.0366)	1.02	1.63	(0.0411)	0.979	(0.0326)
1,2,3,4,7,8-HxCDF	(0.0652)	26.3	1.74	(0.0739)	(0.131)	(0.139)	87.1	0.234	(0.0592)	0.513	(0.0488)	0.598	0.534	(0.0572)	0.733	(0.0361)
1,2,3,6,7,8-HxCDF	(0.0606)	12.2	0.396	(0.0635)	(0.124)	(0.117)	46.5	0.182	(0.0554)	0.356	(0.0451)	0.557	0.526	(0.0543)	[0.329]	(0.0335)
2,3,4,6,7,8-HxCDF	(0.0668)	20	0.661	(0.0715)	(0.117)	(0.135)	84.4	[0.174]	(0.0574)	0.51	(0.045)	0.48	0.919	(0.0555)	0.634	(0.0356)
1,2,3,7,8,9-HxCDF	(0.0891)	(0.276)	(0.0984)	(0.101)	(0.177)	(0.187)	(0.715)	(0.0928)	(0.0785)	(0.104)	(0.0705)	(0.0809)	(0.112)	(0.0789)	(0.0872)	(0.0535)
1,2,3,4,6,7,8-HpCDF	(0.0698)	199	8.96	0.234	(0.214)	(0.151)	938	0.841	(0.0689)	5.16	(0.0428)	1.04	6.8	0.301	5.45	(0.0493)
1,2,3,4,7,8,9-HpCDF	(0.094)	14.6	0.894	(0.114)	(0.304)	(0.239)	55.5	(0.0787)	(0.0902)	0.369	(0.0582)	(0.0879)	[0.322]	(0.0738)	0.388	(0.0635)
OCDF	(0.177)	555	35.3	0.586	(0.573)	(0.554)	2750	0.905	(0.139)	20.8	(0.112)	0.435	15.9	0.738	17.2	(0.114)
WHO-2005 TEQ (ND=0; EMPC=0)	**0.00**	**42.5**	**1.02**	**0.0182**	**0.00262**	**0.00212**	**184**	**0.545**	**0.010**	**0.726**	**0.011**	**2.23**	**1.58**	**0.0511**	**0.832**	**0.0559**
WHO-2005 TEQ (ND=0; EMPC=EMPC)	**0.00**	**42.5**	**1.18**	**0.0182**	**0.0118**	**0.00864**	**184**	**0.681**	**0.0247**	**0.991**	**0.0241**	**2.23**	**1.62**	**0.0511**	**1.04**	**0.0559**
WHO-2005 TEQ (ND=DL/2; EMPC=0)	**0.121**	**42.5**	**1.11**	**0.126**	**0.242**	**0.195**	**184**	**0.59**	**0.114**	**0.812**	**0.0963**	**2.24**	**1.62**	**0.142**	**0.906**	**0.131**
WHO-2005 TEQ (ND=DL/2; EMPC=EMPC)	**0.121**	**42.5**	**1.23**	**0.126**	**0.249**	**0.200**	**184**	**0.686**	**0.125**	**1.00**	**0.105**	**2.24**	**1.65**	**0.142**	**1.07**	**0.131**
WHO-2005 TEQ (ND=DL; EMPC=EMPC)	**0.242**	**42.5**	**1.27**	**0.234**	**0.487**	**0.391**	**184**	**0.691**	**0.226**	**1.01**	**0.185**	**2.24**	**1.69**	**0.233**	**1.11**	**0.207**
Checkcode	004-813	066-121	092-823	425-506	142-471	340-868	188-811	318-643	182-075	224-352	005-345	569-757	874-420	392-411	567-262	862-372
Lab ID	MB1_8384_DF_SDS	A2871_8384_DF_001	A2871_8384_DF_002	A2871_8384_DF_003	A2871_8384_DF_004	A2871_8384_DF_005	A2871_8384_DF_006	A2871_8384_DF_007	A2871_8384_DF_008	A2871_8384_DF_009	A2871_8384_DF_010	A2871_8384_DF_011	A2871_8384_DF_012	A2871_8384_DF_013	A2871_8384_DF_014	A2871_8384_DF_015

( ) = DL
[ ] = EMPC

A2871 - Totals

Project ID: EW Source Control

Sample Summary
Part 2 (dry weight)

ANALYTICAL PERSPECTIVES

Method 1613

Analyte	MB1_8384_DF_SDS0_8384_MB001	EW10-SC18-2-4	EW10-SC10-4-6	EW10-SC12-5-7	EW10-SC18-6-8	EW10-SC58-6-8	EW10-SC23-1.3-3.2	EW10-SC23-9-11	EW10-SC33-5.8-8	EW10-SC53-5-7	EW10-SC54-8-9.2	EW09-SC06-6-7.4	EW10-SC04-2-4	EW10-SC21-5.3-7.8	EW10-SC43-4-6	EW10-SC14-5.3-7.3
	pg/g	pg/g	pg/g	pg/g	pg/g	pg/g	pg/g	pg/g	pg/g	pg/g	pg/g	pg/g	pg/g	pg/g	pg/g	pg/g
Totals																
TCDDs	0	30.6	0.244	0.159	0.439	0.563	198	3.36	0	1.05	0.555	62.9	14.2	0.539	0.356	0.124
PeCDDs	0	53.2	1.22	0	0	0	353	4.16	0	1.36	0	63.8	11.7	0	1.76	0
HxCDDs	0	267	6.72	0.234	0.735	0.414	1130	6.58	0.698	4.18	0.541	40.6	11.4	1.68	6.2	1.54
HpCDDs	0	1890	41	2.94	1.57	0	6640	9.48	1.98	22.9	2.44	13.9	22.3	8.26	30.3	4.58
OCDD	0	7570	169	10.3	8.72	7.05	22000	32	6.71	84.2	6.98	24.4	69.4	17.2	95	16.5
TCDFs	0	244	2.76	0	0	0	849	4.81	0	8.1	0.113	30.8	15.4	0	8.91	0
PeCDFs	0	290	4.25	0	0	0	1500	2.33	0	8.42	0	12.2	16.1	0	9.73	0
HxCDFs	0	369	16.1	0	0	0	1600	1.18	0	9	0	4.88	12.6	0	9.47	0
HpCDFs	0	670	40.6	0.794	0	0	3150	1.35	0	21.1	0	1.38	20.2	0.899	19.5	0
OCDF	0	555	35.3	0.586	0	0	2750	0.905	0	20.8	0	0.435	15.9	0.738	17.2	0
Total PCDD/Fs (ND=0; EMPC=0)	**0.00**	**11,900**	**317**	**15.0**	**11.5**	**8.03**	**40,100**	**66.1**	**9.39**	**181**	**10.6**	**255**	**209**	**29.3**	**198**	**22.7**
Total PCDD/Fs (ND=0; EMPC=EMPC)	**0.00**	**11,900**	**322**	**15.7**	**12.4**	**9.99**	**40,100**	**72.5**	**9.53**	**185**	**11.3**	**260**	**213**	**30.1**	**202**	**23.0**
Total PCDD/Fs (2378-X ND=DL; EMPC=EMPC)	**1.54**	**11,900**	**322**	**16.7**	**15.3**	**12.6**	**40,100**	**72.7**	**10.5**	**185**	**12.1**	**261**	**213**	**30.8**	**202**	**23.7**
Total 2378s (ND=0; EMPC=0)	**0.00**	**9,360**	**240**	**12.3**	**8.72**	**7.05**	**29,500**	**40.0**	**7.52**	**126**	**7.87**	**41.3**	**111**	**20.7**	**137**	**18.7**
Total 2378s (ND=0.5; EMPC=0)	**0.772**	**9,360**	**241**	**12.9**	**10.3**	**8.49**	**29,500**	**40.2**	**8.04**	**126**	**8.32**	**41.4**	**111**	**21.1**	**137**	**19.1**
Total 2378s (ND=1; EMPC=0)	**1.54**	**9,360**	**241**	**13.4**	**11.9**	**9.94**	**29,500**	**40.4**	**8.56**	**127**	**8.76**	**41.5**	**111**	**21.5**	**138**	**19.5**
Total 2378s (ND=0; EMPC=1)	**0.00**	**9,360**	**241**	**12.3**	**9.65**	**7.71**	**29,500**	**40.6**	**7.66**	**127**	**8.00**	**41.3**	**111**	**20.7**	**138**	**18.7**
Total 2378s (ND=0.5; EMPC=1)	**0.772**	**9,360**	**241**	**12.9**	**11.1**	**8.99**	**29,500**	**40.7**	**8.15**	**127**	**8.40**	**41.4**	**111**	**21.1**	**138**	**19.1**
Total 2378s (ND=1; EMPC=1)	**1.54**	**9,360**	**241**	**13.4**	**12.5**	**10.3**	**29,500**	**40.8**	**8.63**	**127**	**8.80**	**41.5**	**111**	**21.5**	**138**	**19.5**
Checkcode	004-813	066-121	092-823	425-506	142-471	340-868	188-811	318-643	182-075	224-352	005-345	569-757	874-420	392-411	567-262	862-372
Lab ID	MB1_8384_DF_SDS	A2871_8384_DF_001	A2871_8384_DF_002	A2871_8384_DF_003	A2871_8384_DF_004	A2871_8384_DF_005	A2871_8384_DF_006	A2871_8384_DF_007	A2871_8384_DF_008	A2871_8384_DF_009	A2871_8384_DF_010	A2871_8384_DF_011	A2871_8384_DF_012	A2871_8384_DF_013	A2871_8384_DF_014	A2871_8384_DF_015

( ) = DL
[ ] = EMPC

A2871 - Totals

Project ID: EW Source Control

Sample Summary
Part 2 (wet weight)

ANALYTICAL PERSPECTIVES

Method 1613

Analyte	MB1_8384_DF_SDS0_8384_MB001	EW10-SC18-2-4	EW10-SC10-4-6	EW10-SC12-5-7	EW10-SC18-6-8	EW10-SC58-6-8	EW10-SC23-1.3-3.2	EW10-SC23-9-11	EW10-SC33-5.8-8	EW10-SC53-5-7	EW10-SC54-8-9.2	EW09-SC06-6-7.4	EW10-SC04-2-4	EW10-SC21-5.3-7.8	EW10-SC43-4-6	EW10-SC14-5.3-7.3
	pg/g	pg/g	pg/g	pg/g	pg/g	pg/g	pg/g	pg/g	pg/g	pg/g	pg/g	pg/g	pg/g	pg/g	pg/g	pg/g
Totals																
TCDDs	0	19.7	0.189	0.146	0.316	0.425	107	2.31	0	0.773	0.391	38.1	11.2	0.407	0.282	0.0984
PeCDDs	0	34.2	0.942	0	0	0	190	2.86	0	0.999	0	38.6	9.2	0	1.39	0
HxCDDs	0	172	5.2	0.214	0.528	0.313	605	4.52	0.546	3.08	0.381	24.6	8.97	1.27	4.91	1.22
HpCDDs	0	1220	31.7	2.69	1.13	0	3570	6.51	1.55	16.8	1.71	8.42	17.6	6.24	24	3.64
OCDD	0	4870	131	9.41	6.27	5.33	11800	22	5.26	62	4.91	14.8	54.8	13	75.2	13.1
TCDFs	0	157	2.14	0	0	0	457	3.3	0	5.96	0.0793	18.6	12.1	0	7.06	0
PeCDFs	0	186	3.29	0	0	0	809	1.6	0	6.19	0	7.37	12.7	0	7.71	0
HxCDFs	0	237	12.4	0	0	0	859	0.809	0	6.63	0	2.95	9.93	0	7.5	0
HpCDFs	0	431	31.4	0.726	0	0	1700	0.925	0	15.5	0	0.836	15.9	0.678	15.4	0
OCDF	0	357	27.3	0.536	0	0	1480	0.622	0	15.3	0	0.263	12.6	0.557	13.6	0
Total PCDD/Fs (ND=0; EMPC=0)	**0.00**	**7,680**	**246**	**13.7**	**8.24**	**6.07**	**21,600**	**45.4**	**7.35**	**133**	**7.48**	**154**	**165**	**22.1**	**157**	**18.0**
Total PCDD/Fs (ND=0; EMPC=EMPC)	**0.00**	**7,680**	**249**	**14.3**	**8.90**	**7.55**	**21,600**	**49.8**	**7.47**	**136**	**7.94**	**158**	**168**	**22.7**	**160**	**18.2**
Total PCDD/Fs (2378-X ND=DL; EMPC=EMPC)	**1.54**	**7,680**	**250**	**15.3**	**11.0**	**9.48**	**21,600**	**49.9**	**8.23**	**136**	**8.50**	**158**	**168**	**23.3**	**160**	**18.8**
Total 2378s (ND=0; EMPC=0)	**0.00**	**6,020**	**186**	**11.3**	**6.27**	**5.33**	**15,900**	**27.5**	**5.89**	**92.8**	**5.54**	**25.0**	**87.3**	**15.7**	**109**	**14.9**
Total 2378s (ND=0.5; EMPC=0)	**0.772**	**6,020**	**186**	**11.8**	**7.41**	**6.42**	**15,900**	**27.6**	**6.30**	**93.0**	**5.85**	**25.0**	**87.5**	**15.9**	**109**	**15.1**
Total 2378s (ND=1; EMPC=0)	**1.54**	**6,020**	**186**	**12.2**	**8.56**	**7.51**	**15,900**	**27.8**	**6.71**	**93.1**	**6.17**	**25.1**	**87.6**	**16.2**	**109**	**15.4**
Total 2378s (ND=0; EMPC=1)	**0.00**	**6,020**	**186**	**11.3**	**6.93**	**5.82**	**15,900**	**27.9**	**6.00**	**93.2**	**5.63**	**25.0**	**87.9**	**15.7**	**109**	**14.9**
Total 2378s (ND=0.5; EMPC=1)	**0.772**	**6,020**	**186**	**11.8**	**7.97**	**6.79**	**15,900**	**28.0**	**6.38**	**93.3**	**5.91**	**25.0**	**87.9**	**15.9**	**109**	**15.1**
Total 2378s (ND=1; EMPC=1)	**1.54**	**6,020**	**186**	**12.2**	**9.01**	**7.76**	**15,900**	**28.0**	**6.76**	**93.3**	**6.19**	**25.1**	**88.0**	**16.2**	**109**	**15.4**
Checkcode	004-813	066-121	092-823	425-506	142-471	340-868	188-811	318-643	182-075	224-352	005-345	569-757	874-420	392-411	567-262	862-372
Lab ID	MB1_8384_DF_SDS	A2871_8384_DF_001	A2871_8384_DF_002	A2871_8384_DF_003	A2871_8384_DF_004	A2871_8384_DF_005	A2871_8384_DF_006	A2871_8384_DF_007	A2871_8384_DF_008	A2871_8384_DF_009	A2871_8384_DF_010	A2871_8384_DF_011	A2871_8384_DF_012	A2871_8384_DF_013	A2871_8384_DF_014	A2871_8384_DF_015

( ) = DL
[ ] = EMPC

A2871 - Others

Project ID: EW Source Control

Sample Summary
Part 3 (dry weight)

ANALYTICAL PERSPECTIVES

Method 1613

Analyte	MB1_8384_DF_SDS0_8384_MB001	EW10-SC18-2-4	EW10-SC10-4-6	EW10-SC12-5-7	EW10-SC18-6-8	EW10-SC58-6-8	EW10-SC23-1.3-3.2	EW10-SC23-9-11	EW10-SC33-5.8-8	EW10-SC53-5-7	EW10-SC54-8-9.2	EW09-SC06-6-7.4	EW10-SC04-2-4	EW10-SC21-5.3-7.8	EW10-SC43-4-6	EW10-SC14-5.3-7.3
	pg/g	pg/g	pg/g	pg/g	pg/g	pg/g	pg/g	pg/g	pg/g	pg/g	pg/g	pg/g	pg/g	pg/g	pg/g	pg/g
Other PCDD/Fs (ND=0, EMPC=0)																
Other TCDD	0	28.3	0.244	0.159	0.439	0.563	186	3.36	0	1.05	0.555	62.6	14.2	0.539	0.356	0.124
Other PeCDD	0	47.2	1.22	0	0	0	322	3.93	0	1.36	0	62.9	11.2	0	1.76	0
Other HxCDD	0	211	5.15	0.234	0.735	0.414	871	5.97	0.698	3.56	0.541	37.8	9.83	1.49	4.99	1.23
Other HpCDD	0	1030	20.3	1.69	1.57	0	3510	5.57	1.17	11	1.54	7.61	10.2	5.92	15.3	2.63
Other TCDF	0	236	2.76	0	0	0	820	4.31	0	7.61	0.113	29.4	14.8	0	8.6	0
Other PeCDF	0	256	3.39	0	0	0	1340	1.73	0	7.17	0	10.2	14.1	0	8.53	0
Other HxCDF	0	304	13.3	0	0	0	1360	0.763	0	7.62	0	3.06	10.6	0	8.11	0
Other HpCDF	0	457	30.8	0.56	0	0	2160	0.506	0	15.6	0	0.337	13.4	0.598	13.6	0
Other PCDD/Fs (ND=0, EMPC=EMPC)																
Other TCDD	0	29.2	0.882	0.282	0.439	0.563	186	5.06	0	1.53	0.673	63.7	15	0.657	1.47	0.366
Other PeCDD	0	51.9	1.69	0	0	0	331	4.57	0	1.71	0.147	63.6	11.5	0.158	2.36	0
Other HxCDD	0	211	5.15	0.568	0.735	0.414	871	5.97	0.698	4.16	0.805	38.5	9.83	1.49	4.99	1.23
Other HpCDD	0	1030	20.3	1.69	1.57	1.31	3510	5.57	1.17	11	1.54	7.61	10.2	5.92	15.3	2.63
Other TCDF	0	236	3.57	0	0	0	821	6.65	0	8.91	0.113	31.3	15.6	0.106	9.2	0
Other PeCDF	0	257	5.22	0	0	0	1340	2.49	0	7.17	0	10.7	14.3	0	8.66	0
Other HxCDF	0	304	13.9	0.246	0	0	1360	1.1	0	7.77	0	3.22	11.9	0.436	8.29	0
Other HpCDF	0	457	30.8	0.56	0	0	2160	0.506	0	15.7	0	0.337	13.4	0.598	13.6	0
Checkcode	004-813	066-121	092-823	425-506	142-471	340-868	188-811	318-643	182-075	224-352	005-345	569-757	874-420	392-411	567-262	862-372
Lab ID	MB1_8384_DF_SDS	A2871_8384_DF_001	A2871_8384_DF_002	A2871_8384_DF_003	A2871_8384_DF_004	A2871_8384_DF_005	A2871_8384_DF_006	A2871_8384_DF_007	A2871_8384_DF_008	A2871_8384_DF_009	A2871_8384_DF_010	A2871_8384_DF_011	A2871_8384_DF_012	A2871_8384_DF_013	A2871_8384_DF_014	A2871_8384_DF_015

( ) = DL
[ ] = EMPC

A2871 - DLs

Project ID: EW Source Control

Sample Summary
Part 5 (DLs) (dry weight)

ANALYTICAL PERSPECTIVES

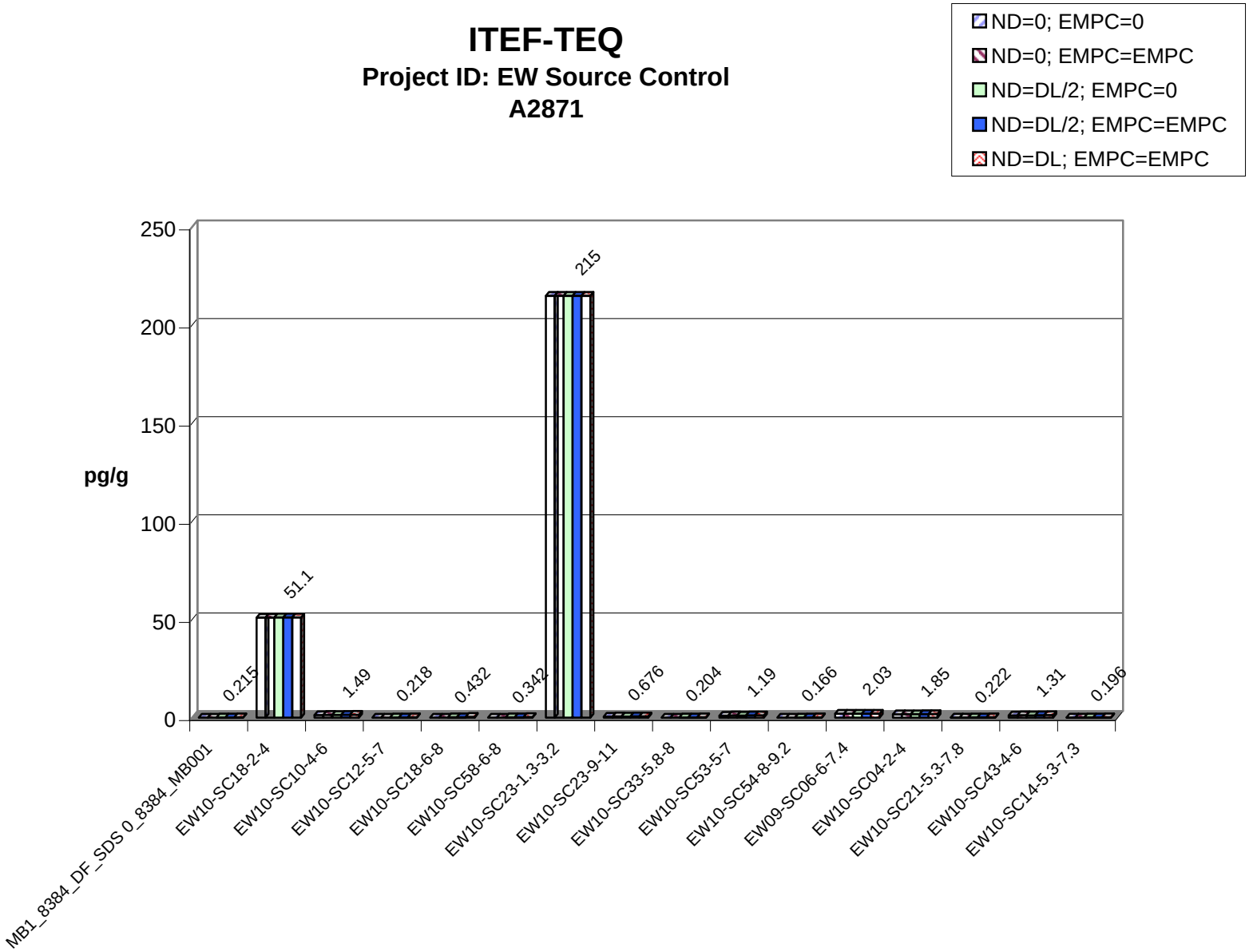
Method 1613

Analyte	MB1_8384_DF_SDS0_8384_MB001	EW10-SC18-2-4	EW10-SC10-4-6	EW10-SC12-5-7	EW10-SC18-6-8	EW10-SC58-6-8	EW10-SC23-1.3-3.2	EW10-SC23-9-11	EW10-SC33-5.8-8	EW10-SC53-5-7	EW10-SC54-8-9.2	EW09-SC06-6-7.4	EW10-SC04-2-4	EW10-SC21-5.3-7.8	EW10-SC43-4-6	EW10-SC14-5.3-7.3
	pg/g	pg/g	pg/g	pg/g	pg/g	pg/g	pg/g	pg/g	pg/g	pg/g	pg/g	pg/g	pg/g	pg/g	pg/g	pg/g
2,3,7,8-TCDD	0.0818	0.0818	0.0818	0.0818	0.0818	0.0818	0.0818	0.0818	0.0818	0.0818	0.0818	0.0818	0.0818	0.0818	0.0818	0.0818
1,2,3,7,8-PeCDD	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08
1,2,3,4,7,8-HxCDD	0.0741	0.0741	0.0741	0.0741	0.0741	0.0741	0.0741	0.0741	0.0741	0.0741	0.0741	0.0741	0.0741	0.0741	0.0741	0.0741
1,2,3,6,7,8-HxCDD	0.0815	0.0815	0.0815	0.0815	0.0815	0.0815	0.0815	0.0815	0.0815	0.0815	0.0815	0.0815	0.0815	0.0815	0.0815	0.0815
1,2,3,7,8,9-HxCDD	0.0859	0.0859	0.0859	0.0859	0.0859	0.0859	0.0859	0.0859	0.0859	0.0859	0.0859	0.0859	0.0859	0.0859	0.0859	0.0859
1,2,3,4,6,7,8-HpCDD	0.115	0.115	0.115	0.115	0.115	0.115	0.115	0.115	0.115	0.115	0.115	0.115	0.115	0.115	0.115	0.115
OCDD	0.221	0.221	0.221	0.221	0.221	0.221	0.221	0.221	0.221	0.221	0.221	0.221	0.221	0.221	0.221	0.221
2,3,7,8-TCDF	0.0612	0.0612	0.0612	0.0612	0.0612	0.0612	0.0612	0.0612	0.0612	0.0612	0.0612	0.0612	0.0612	0.0612	0.0612	0.0612
1,2,3,7,8-PeCDF	0.0633	0.0633	0.0633	0.0633	0.0633	0.0633	0.0633	0.0633	0.0633	0.0633	0.0633	0.0633	0.0633	0.0633	0.0633	0.0633
2,3,4,7,8-PeCDF	0.0577	0.0577	0.0577	0.0577	0.0577	0.0577	0.0577	0.0577	0.0577	0.0577	0.0577	0.0577	0.0577	0.0577	0.0577	0.0577
1,2,3,4,7,8-HxCDF	0.0652	0.0652	0.0652	0.0652	0.0652	0.0652	0.0652	0.0652	0.0652	0.0652	0.0652	0.0652	0.0652	0.0652	0.0652	0.0652
1,2,3,6,7,8-HxCDF	0.0606	0.0606	0.0606	0.0606	0.0606	0.0606	0.0606	0.0606	0.0606	0.0606	0.0606	0.0606	0.0606	0.0606	0.0606	0.0606
2,3,4,6,7,8-HxCDF	0.0668	0.0668	0.0668	0.0668	0.0668	0.0668	0.0668	0.0668	0.0668	0.0668	0.0668	0.0668	0.0668	0.0668	0.0668	0.0668
1,2,3,7,8,9-HxCDF	0.0891	0.0891	0.0891	0.0891	0.0891	0.0891	0.0891	0.0891	0.0891	0.0891	0.0891	0.0891	0.0891	0.0891	0.0891	0.0891
1,2,3,4,6,7,8-HpCDF	0.0698	0.0698	0.0698	0.0698	0.0698	0.0698	0.0698	0.0698	0.0698	0.0698	0.0698	0.0698	0.0698	0.0698	0.0698	0.0698
1,2,3,4,7,8,9-HpCDF	0.094	0.094	0.094	0.094	0.094	0.094	0.094	0.094	0.094	0.094	0.094	0.094	0.094	0.094	0.094	0.094
OCDF	0.177	0.177	0.177	0.177	0.177	0.177	0.177	0.177	0.177	0.177	0.177	0.177	0.177	0.177	0.177	0.177
Total TCDD	0.0818	0.0672	0.0787	0.0564	0.141	0.084	0.12	0.0616	0.0674	0.0696	0.0437	0.0509	0.0611	0.0578	0.0597	0.0476
Total PeCDD	0.08	0.0884	0.0881	0.0719	0.169	0.145	0.179	0.0825	0.0735	0.0721	0.0642	0.0671	0.0704	0.0654	0.0646	0.0593
Total HxCDD	0.0803	0.118	0.099	0.111	0.192	0.187	0.309	0.104	0.0696	0.0936	0.0834	0.102	0.0999	0.0786	0.0916	0.0687
Total HpCDD	0.115	0.102	0.163	0.137	0.294	0.317	0.204	0.135	0.121	0.0989	0.0928	0.0957	0.114	0.112	0.126	0.0663
Total TCDF	0.0612	0.0709	0.054	0.0483	0.124	0.0777	0.21	0.0566	0.049	0.0371	0.0341	0.0384	0.0555	0.0449	0.037	0.0288
Total PeCDF	0.0604	0.181	0.0575	0.0537	0.117	0.0859	0.462	0.0695	0.0483	0.0529	0.0386	0.0424	0.0639	0.0444	0.0562	0.0341
Total HxCDF	0.0692	0.218	0.0768	0.076	0.134	0.141	0.681	0.0771	0.0618	0.0763	0.0512	0.0639	0.0832	0.0603	0.0646	0.0387
Total HpCDF	0.0806	0.0942	0.111	0.0978	0.254	0.188	0.157	0.0708	0.0786	0.0893	0.0495	0.0732	0.0687	0.0599	0.0599	0.0557
Checkcode	004-813	066-121	092-823	425-506	142-471	340-868	188-811	318-643	182-075	224-352	005-345	569-757	874-420	392-411	567-262	862-372
Lab ID	MB1_8384_DF_SDS	A2871_8384_DF_001	A2871_8384_DF_002	A2871_8384_DF_003	A2871_8384_DF_004	A2871_8384_DF_005	A2871_8384_DF_006	A2871_8384_DF_007	A2871_8384_DF_008	A2871_8384_DF_009	A2871_8384_DF_010	A2871_8384_DF_011	A2871_8384_DF_012	A2871_8384_DF_013	A2871_8384_DF_014	A2871_8384_DF_015

ITEF-TEQ

Project ID: EW Source Control

A2871



WHO-2005-TEQ

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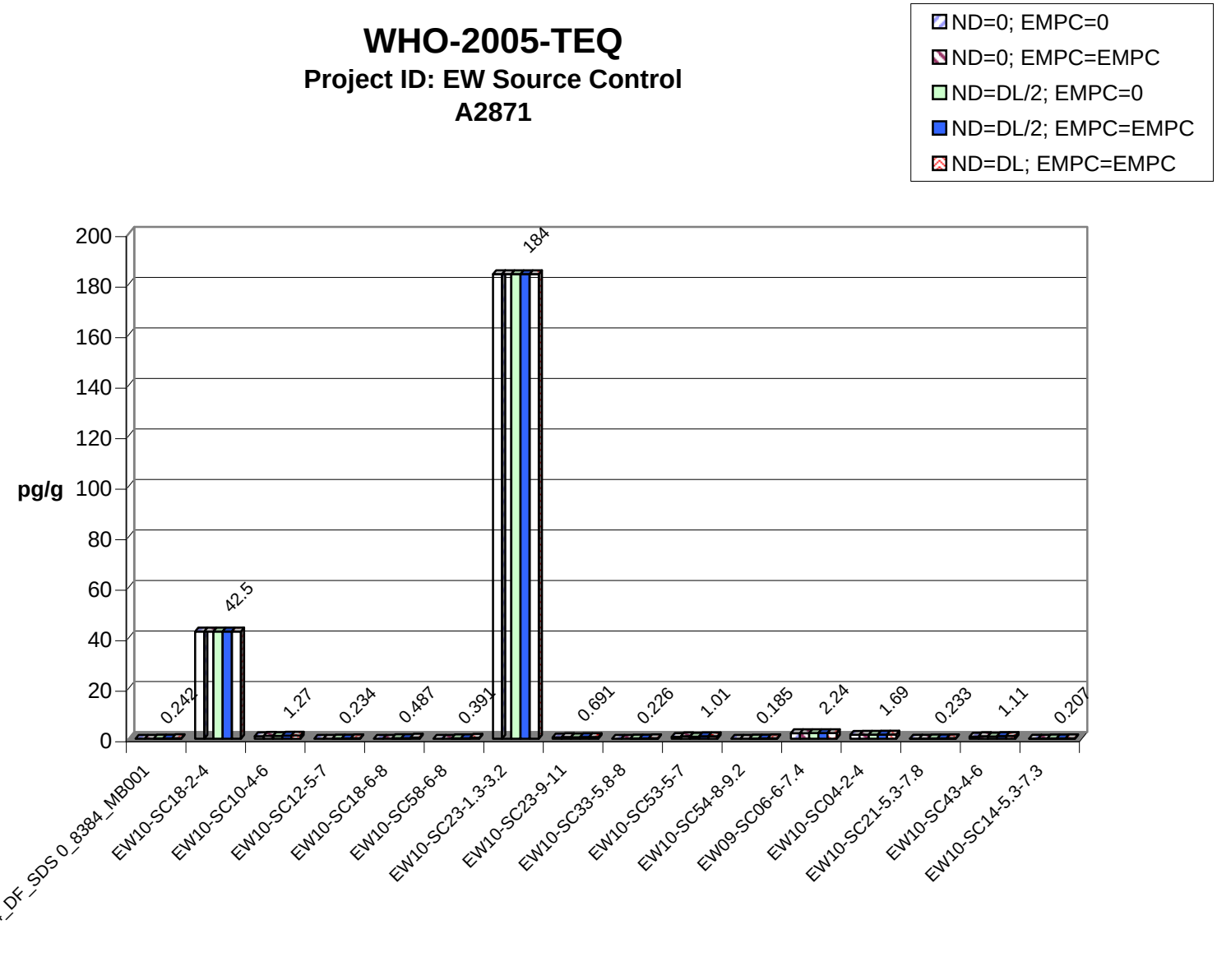

Totals

Project ID: EW Source Control

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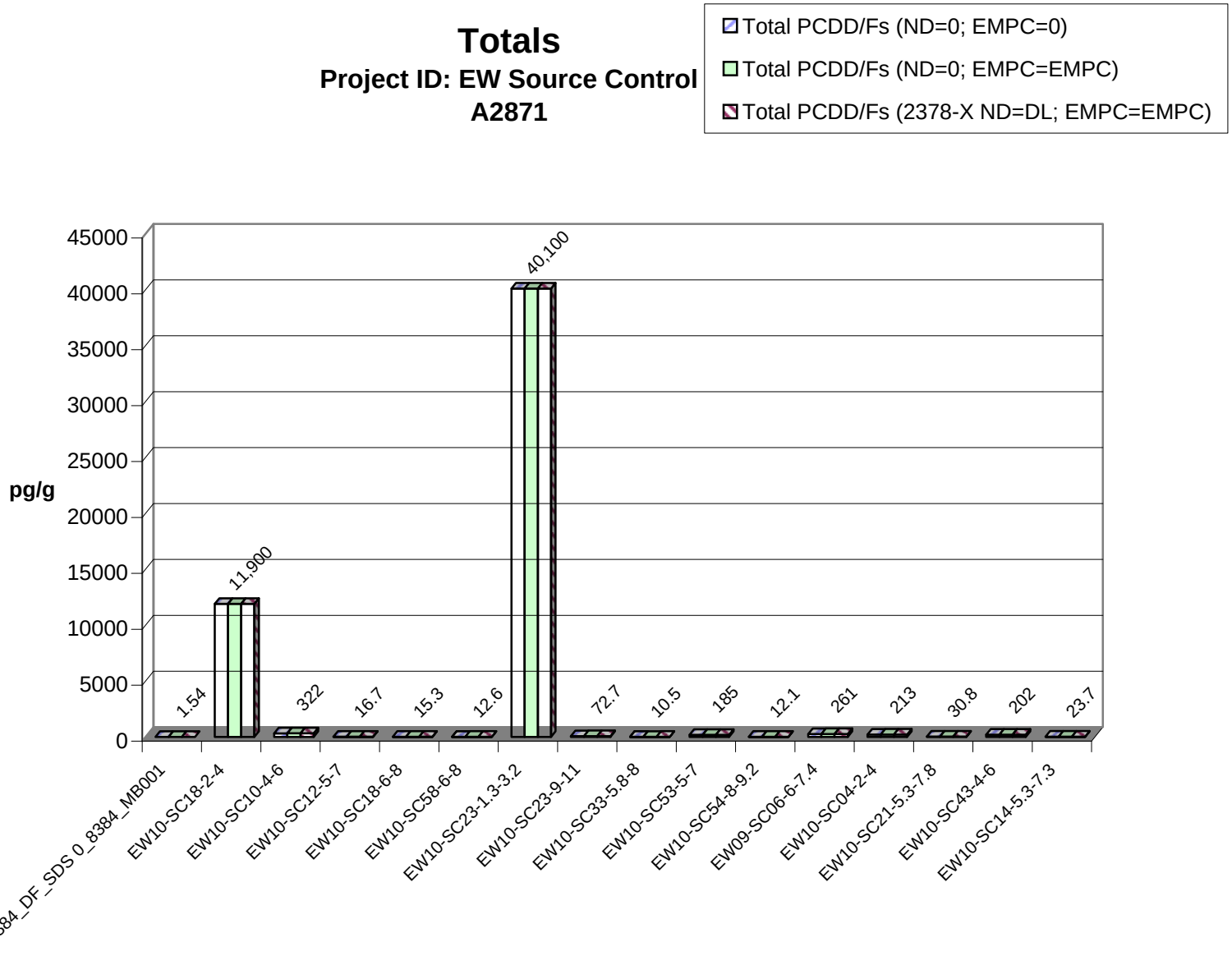

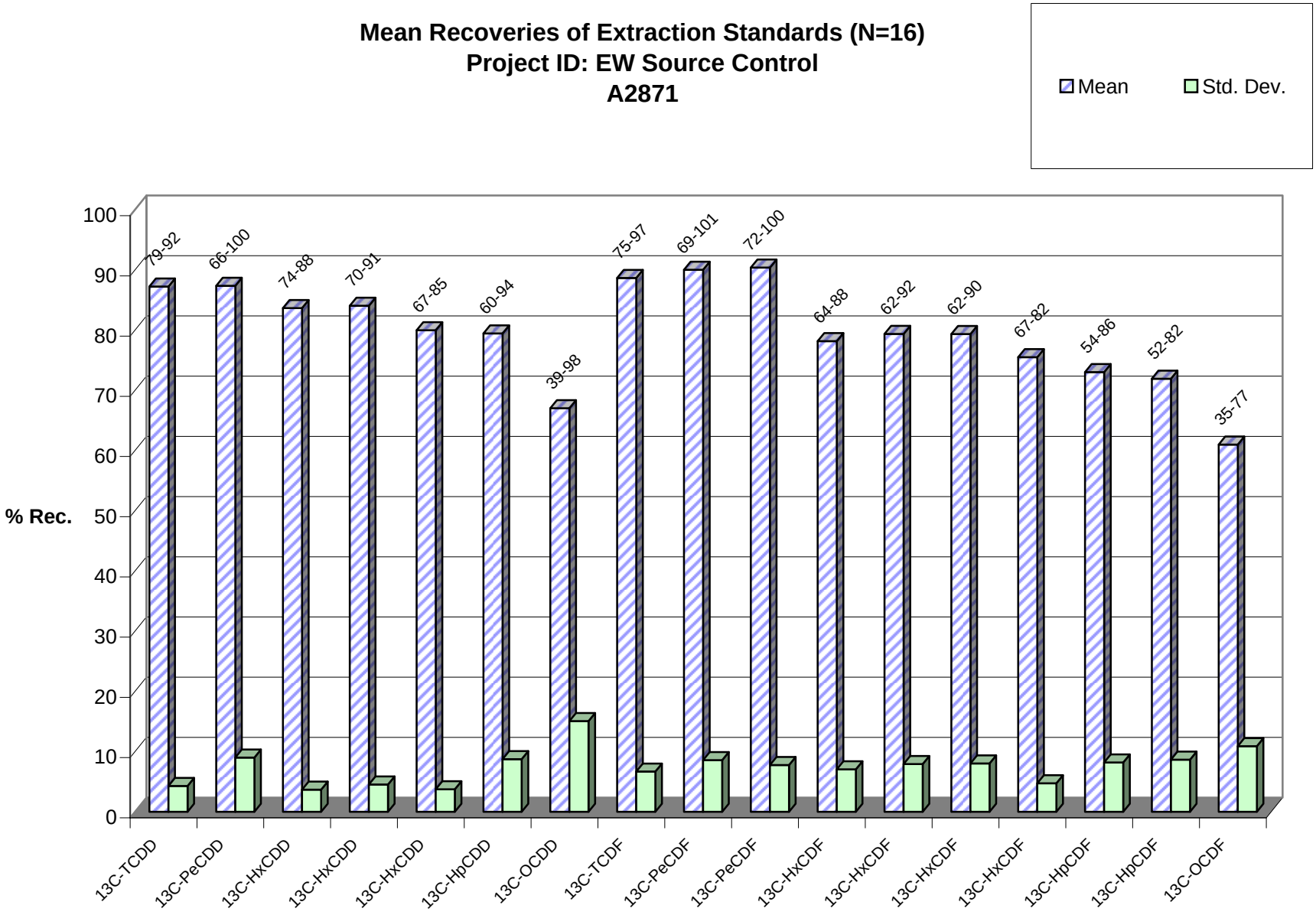
Mean Recoveries of Extraction Standards (N=16)
Project ID: EW Source Control
A2871
Mean
Std. Dev.
% Rec.
100
90
80
70
60
50
40
30
20
10
0
79-92
66-100
74-88
70-91
67-85
60-94
39-98
75-97
69-101
72-100
64-88
62-92
62-90
67-82
54-86
52-82
35-77
13C-TCDD
13C-PeCDD
13C-HxCDD
13C-HxCDD
13C-HxCDD
13C-HpCDD
13C-OCDD
13C-TCDF
13C-PeCDF
13C-PeCDF
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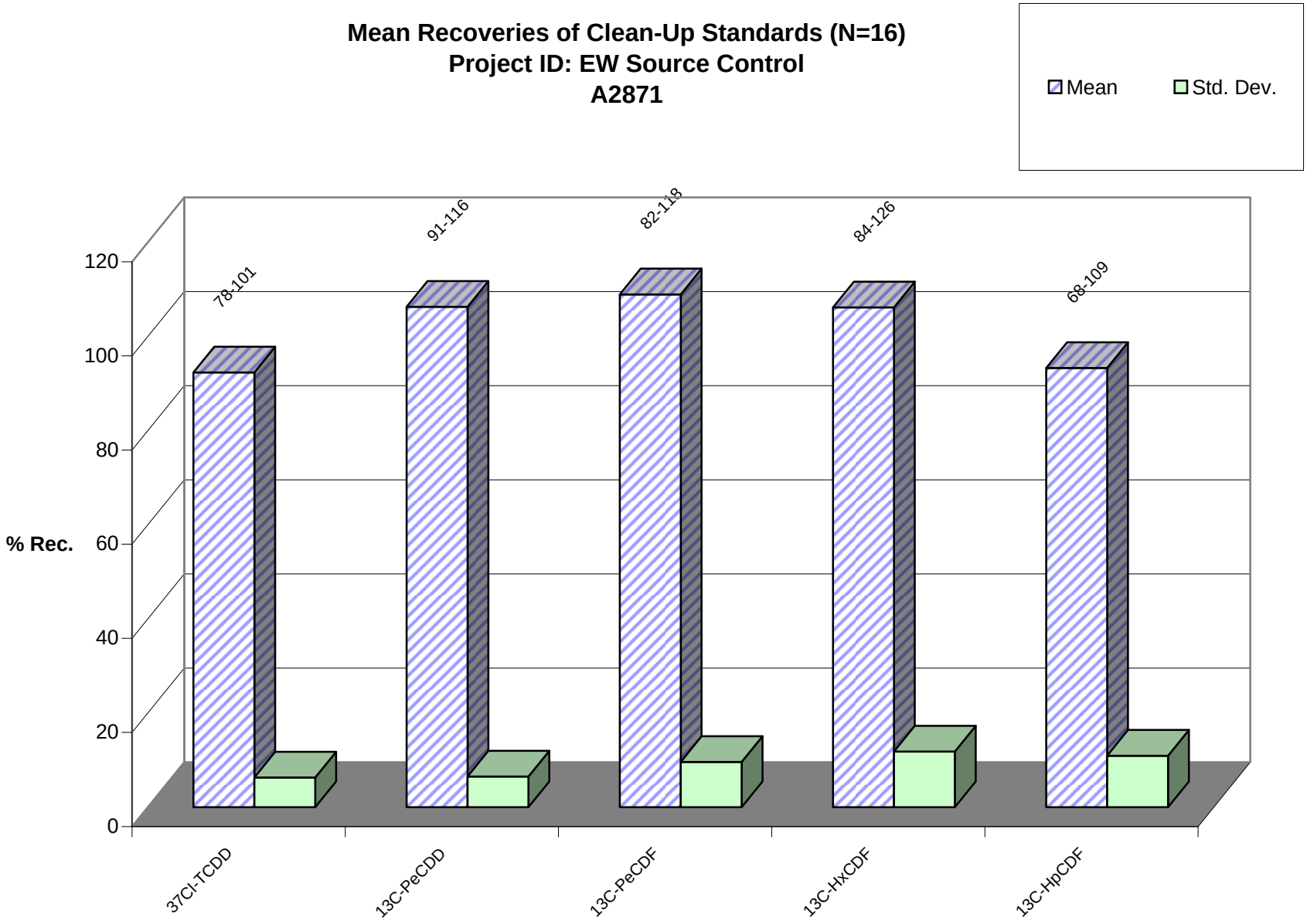
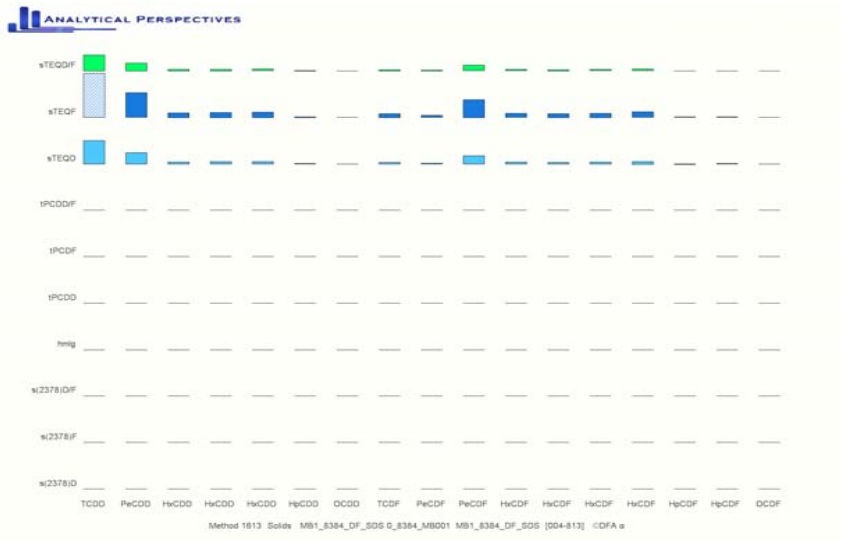
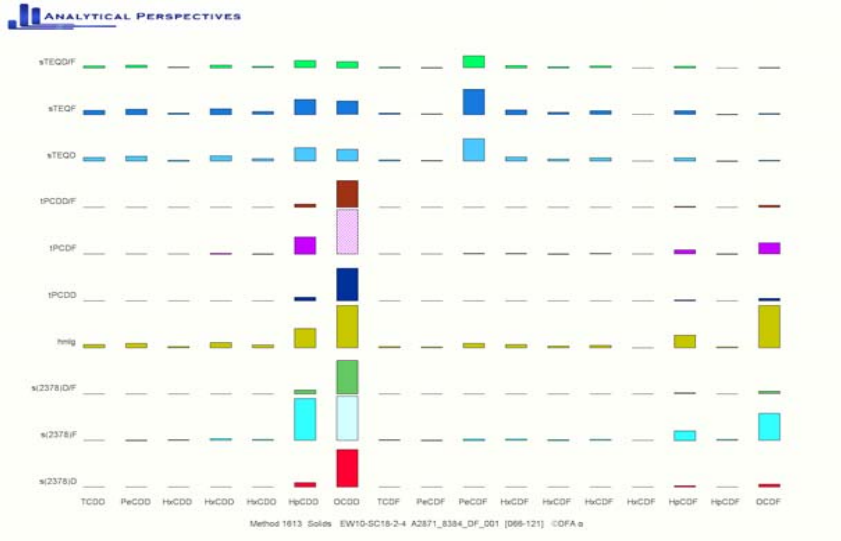
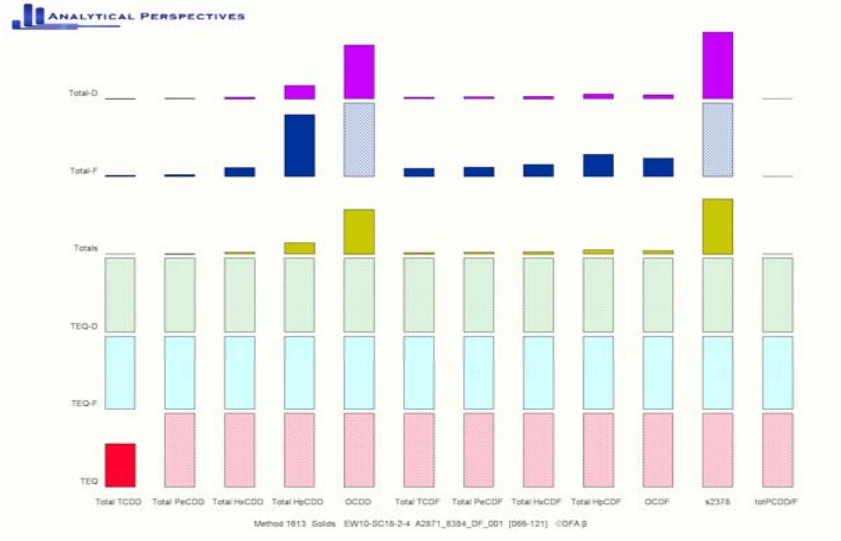
13C-HpCDF
13C-OCDF

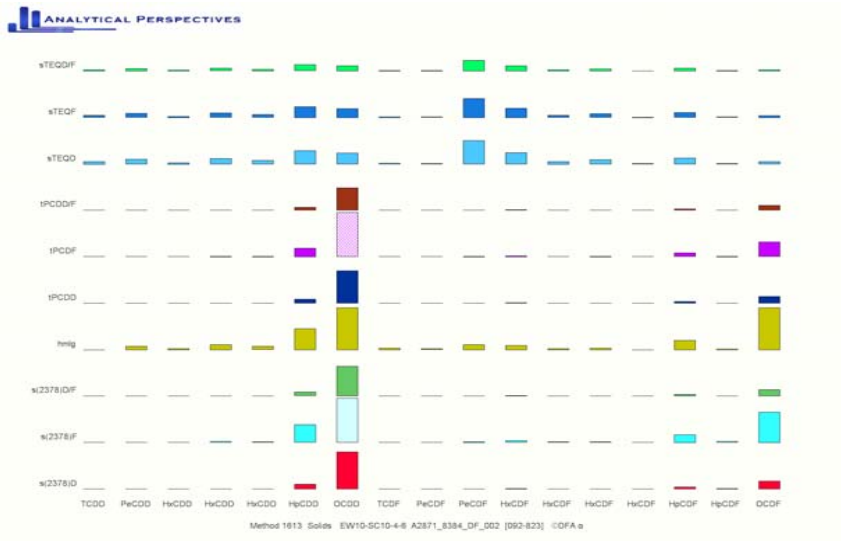

Mean Recoveries of Clean-Up Standards (N=16)
Project ID: EW Source Control
A2871
Mean
Std. Dev.
% Rec.
0
20
40
60
80
100
120
78-101
91-116
82-118
84-126
68-109
37Cl-TCDD
13C-PeCDD
13C-PeCDF
13C-HxCDF
13C-HpCDF

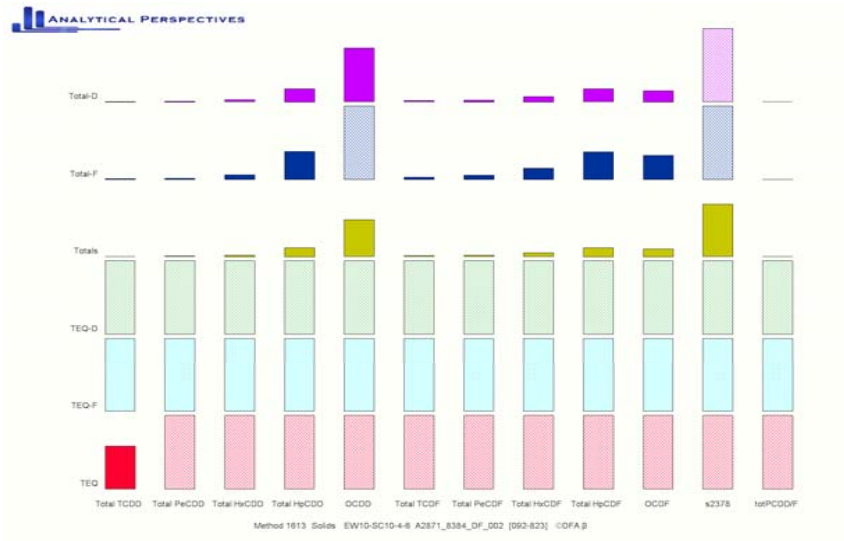

ANALYTICAL PERSPECTIVES
sTEQD/F
sTEQF
sTEQD
tPCDD/F
tPCDF
tPCDD
hmlg
s(2378)D/F
s(2378)F
s(2378)D
TCDD PeCDD HxCDD HxCDD HxCDD HpCDD OCDD TCDF PeCDF PeCDF HxCDF HxCDF HxCDF HxCDF HpCDF HpCDF OCDF
Method 1613 Solids MB1_8384_DF_SDS 0_8384_MB001 MB1_8384_DF_SDS [004-813] ©DFA α

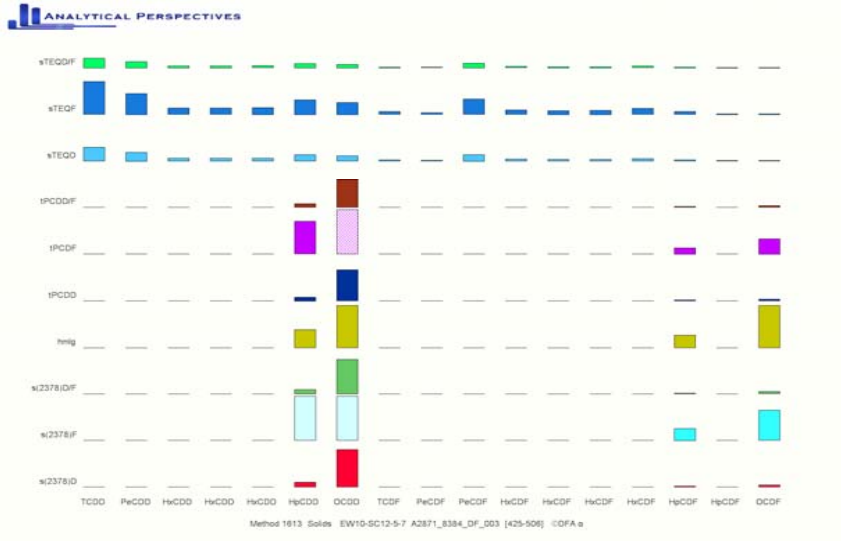
ANALYTICAL PERSPECTIVES
Total-D
Total-F
Totals
TEQ-D
TEQ-F
TEQ
Total TCDD Total PeCDD Total HxCDD Total HpCDD OCDD Total TCDF Total PeCDF Total HxCDF Total HpCDF OCDF s2378 totPCDD/F
Method 1613 Solids MB1_8384_DF_SDS 0_8384_MB001 MB1_8384_DF_SDS [004-813] ©DFA β

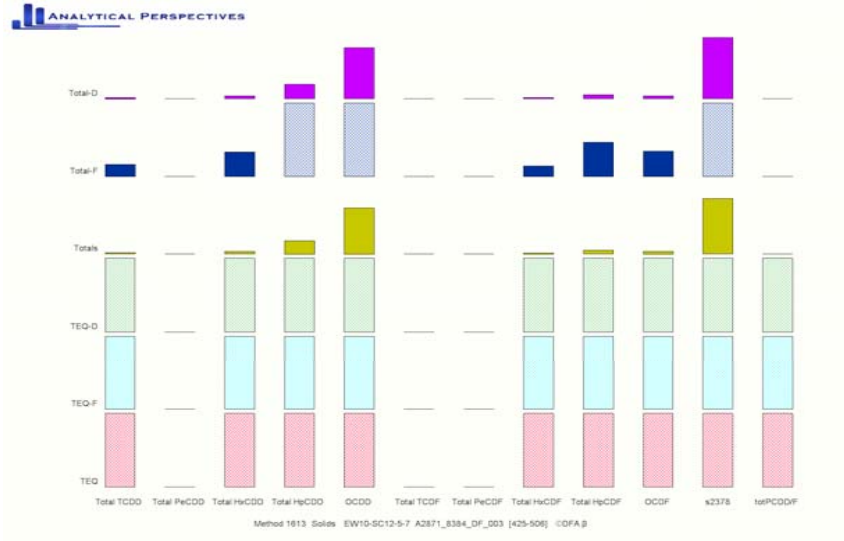

ANALYTICAL PERSPECTIVES
sTEQD/F
sTEQF
sTEQD
tPCDD/F
tPCDF
tPCDD
hmlg
s(2378)D/F
s(2378)F
s(2378)D
TCDD PeCDD HxCDD HxCDD HxCDD HpCDD OCDD TCDF PeCDF PeCDF HxCDF HxCDF HxCDF HxCDF HpCDF HpCDF OCDF
Method 1613 Solids EW10-SC18-2-4 A2871_8384_DF_001 [066-121] ©DFA α

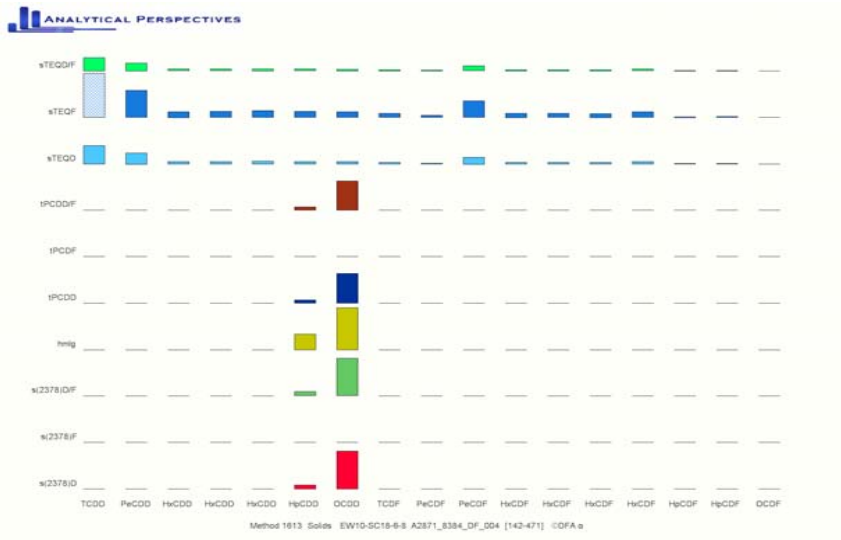

ANALYTICAL PERSPECTIVES
Total-D
Total-F
Totals
TEQ-D
TEQ-F
TEQ
Total TCDD Total PeCDD Total HxCDD Total HpCDD OCDD Total TCDF Total PeCDF Total HxCDF Total HpCDF OCDF s2378 totPCDD/F
Method 1613 Solids EW10-SC18-2-4 A2871_8384_DF_001 [066-121] ©DFA β

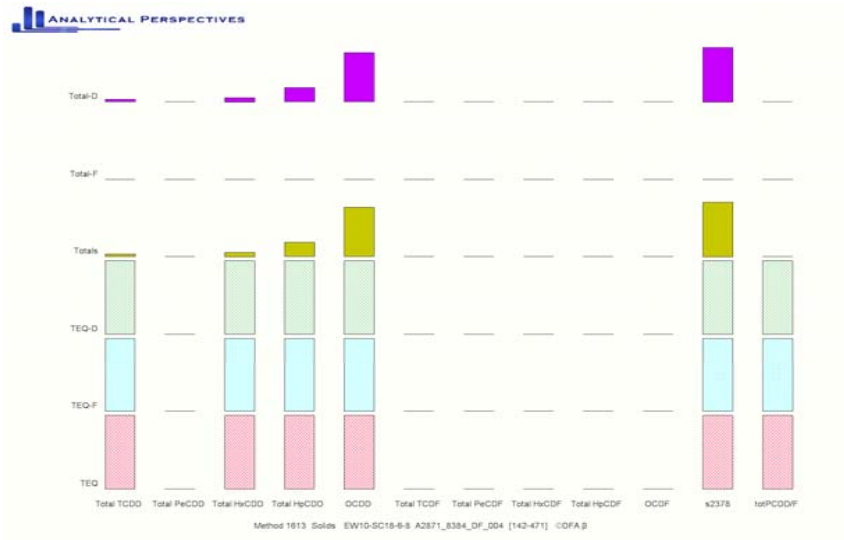

ANALYTICAL PERSPECTIVES
sTEQD/F
sTEQF
sTEQD
tPCDD/F
tPCDF
tPCDD
hmlg
s(2378)D/F
s(2378)F
s(2378)D
TCDD PeCDD HxCDD HxCDD HxCDD HpCDD OCDD TCDF PeCDF PeCDF HxCDF HxCDF HxCDF HxCDF HpCDF HpCDF OCDF
Method 1613 Solids EW10-SC10-4-6 A2871_8384_DF_002 [092-823] ©DFA a

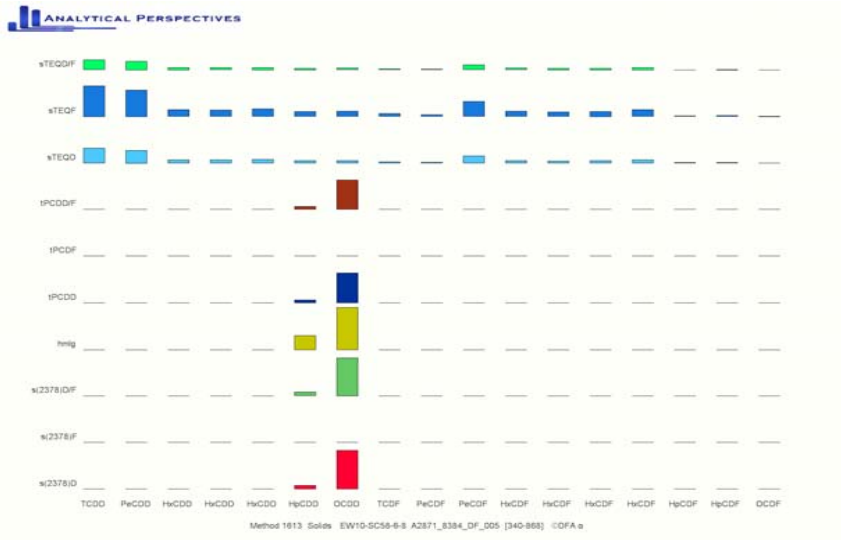

ANALYTICAL PERSPECTIVES
Total-D
Total-F
Totals
TEQ-D
TEQ-F
TEQ
Total TCDD Total PeCDD Total HxCDD Total HpCDD OCDD Total TCDF Total PeCDF Total HxCDF Total HpCDF OCDF s2378 totPCDD/F
Method 1613 Solids EW10-SC10-4-6 A2871_8384_DF_002 [092-823] ©DFA β


ANALYTICAL PERSPECTIVES
sTEQD/F
sTEQF
sTEQD
tPCDD/F
tPCDF
tPCDD
hmlg
s(2378)D/F
s(2378)F
s(2378)D
TCDD PeCDD HxCDD HxCDD HxCDD HpCDD OCDD TCDF PeCDF PeCDF HxCDF HxCDF HxCDF HxCDF HpCDF HpCDF OCDF
Method 1613 Solids EW10-SC12-5-7 A2871_8384_DF_003 [425-506] ©DFA a


ANALYTICAL PERSPECTIVES
Total-D
Total-F
Totals
TEQ-D
TEQ-F
TEQ
Total TCDD Total PeCDD Total HxCDD Total HpCDD OCDD Total TCDF Total PeCDF Total HxCDF Total HpCDF OCDF s2378 totPCDD/F
Method 1613 Solids EW10-SC12-5-7 A2871_8384_DF_003 [425-506] ©DFA β


ANALYTICAL PERSPECTIVES
sTEQD/F
sTEQF
sTEQD
tPCDD/F
tPCDF
tPCDD
hmlg
s(2378)D/F
s(2378)F
s(2378)D
TCDD PeCDD HxCDD HxCDD HxCDD HpCDD OCDD TCDF PeCDF PeCDF HxCDF HxCDF HxCDF HxCDF HpCDF HpCDF OCDF
Method 1613 Solids EW10-SC18-6-S A2871_8384_DF_004 [142-471] ©DFA.a


ANALYTICAL PERSPECTIVES
Total-D
Total-F
Totals
TEQ-D
TEQ-F
TEQ
Total TCDD Total PeCDD Total HxCDD Total HpCDD OCDD Total TCDF Total PeCDF Total HxCDF Total HpCDF OCDF s2378 totPCDD/F
Method 1613 Solids EW10-SC18-6-S A2871_8384_DF_004 [142-471] ©DFA.β


ANALYTICAL PERSPECTIVES
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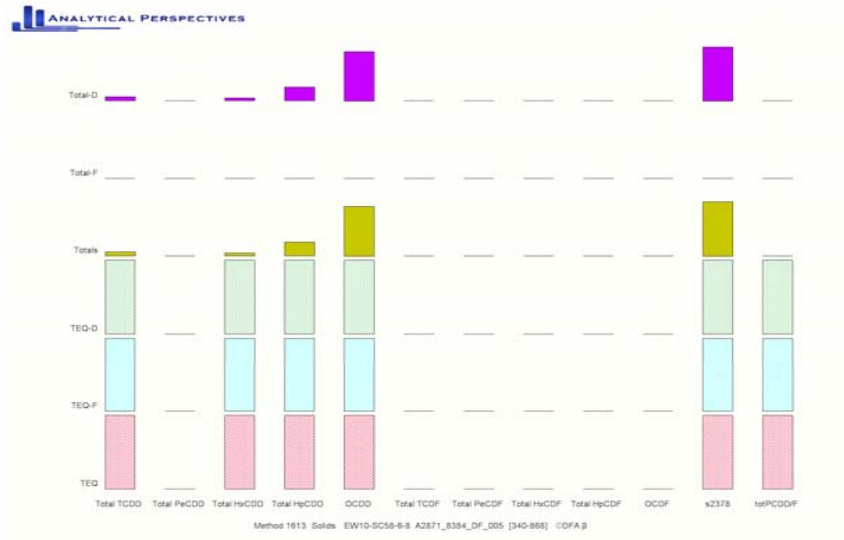
tPCDF
tPCDD
hmlg
s(2378)D/F
s(2378)F
s(2378)D
TCDD PeCDD HxCDD HxCDD HxCDD HpCDD OCDD TCDF PeCDF PeCDF HxCDF HxCDF HxCDF HxCDF HpCDF HpCDF OCDF
Method 1613 Solids EW10-SC58-6-S A2871_8384_DF_005 [340-868] ©DFA.a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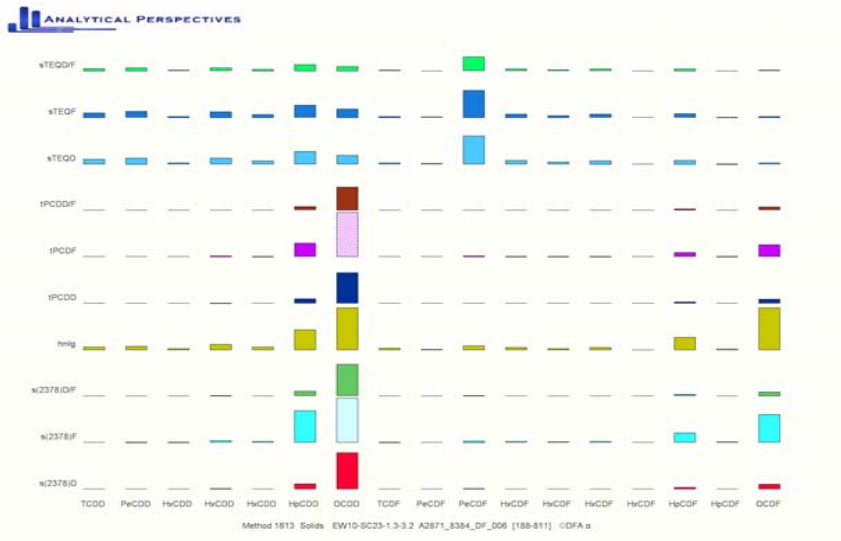
Total-D
Total-F
Totals
TEQ-D
TEQ-F
TEQ
Total TCDD Total PeCDD Total HxCDD Total HpCDD OCDD Total TCDF Total PeCDF Total HxCDF Total HpCDF OCDF s2378 totPCDD/F
Method 1613 Solids EW10-SC58-6-S A2871_8384_DF_005 [340-868] ©DFA.β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hmlg
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s(2378)F
s(2378)D
TCDD PeCDD HxCDD HxCDD HxCDD HpCDD OCDD TCDF PeCDF PeCDF HxCDF HxCDF HxCDF HxCDF HpCDF HpCDF OCDF
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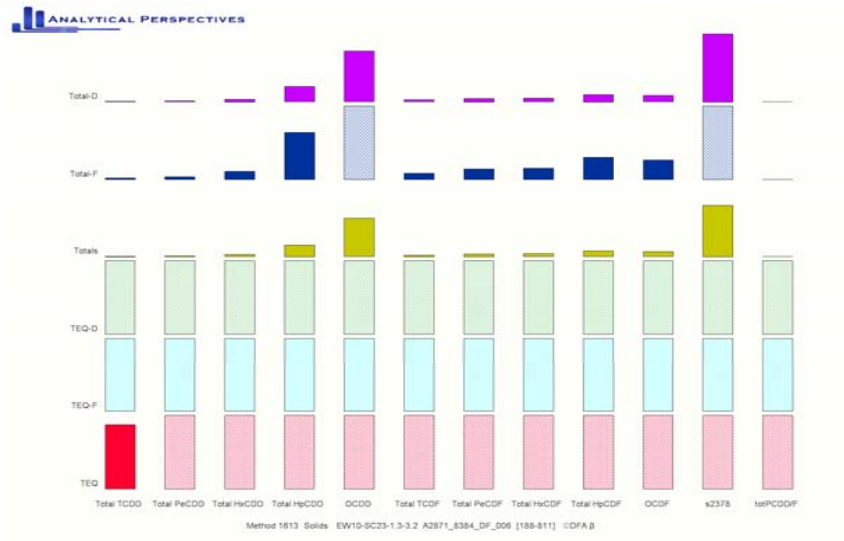
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Total-F
Totals
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TEQ-F
TEQ
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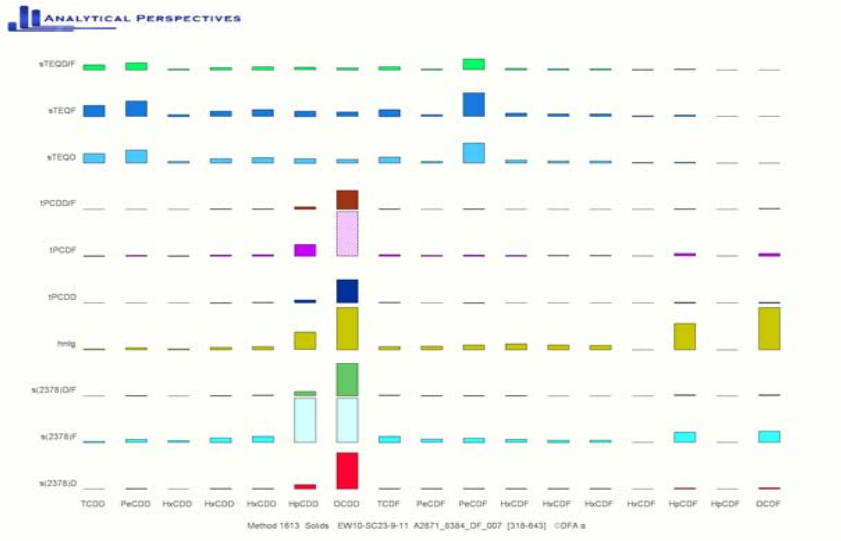
Method 1613 Solids EW10-SC23-1.3-3.2 A2871_8384_DF_006 [188-811] ©DFA β


ANALYTICAL PERSPECTIVES
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sTEQD
tPCDD/F
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tPCDD
hmlg
s(2378)D/F
s(2378)F
s(2378)D
TCDD PeCDD HxCDD HxCDD HxCDD HpCDD OCDD TCDF PeCDF PeCDF HxCDF HxCDF HxCDF HxCDF HpCDF HpCDF OCDF
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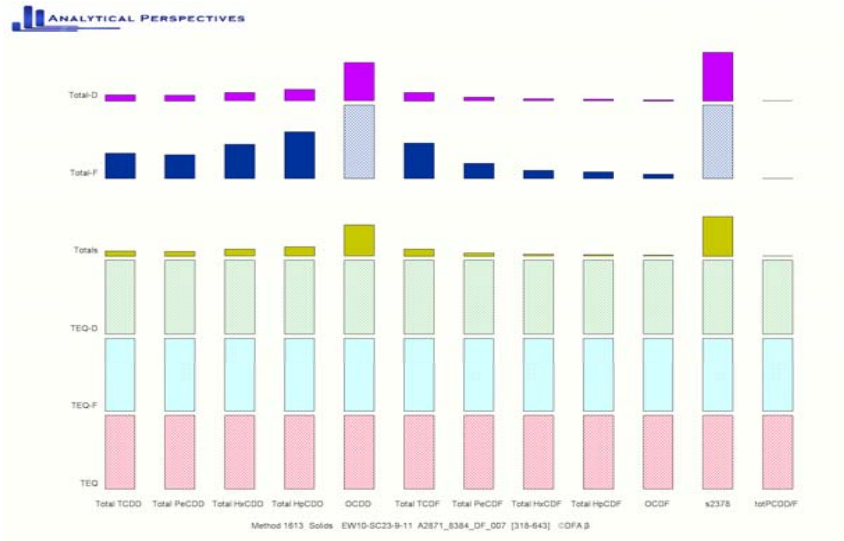
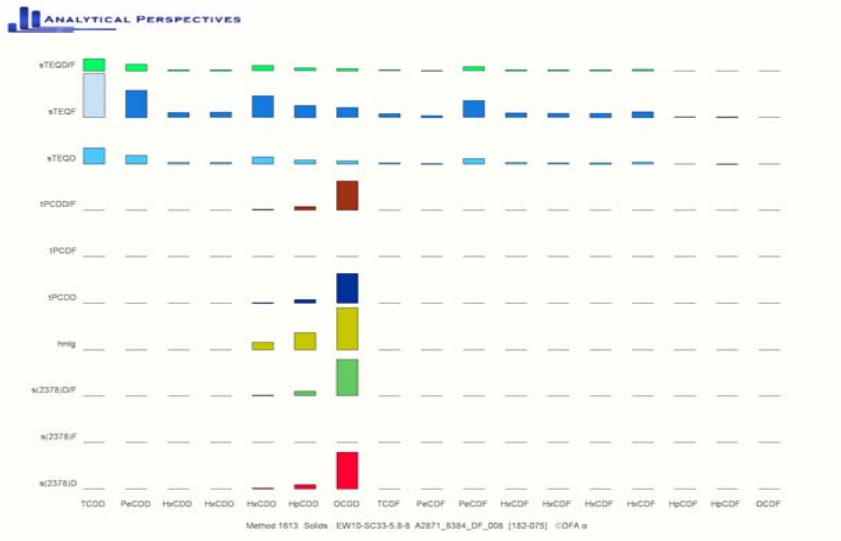
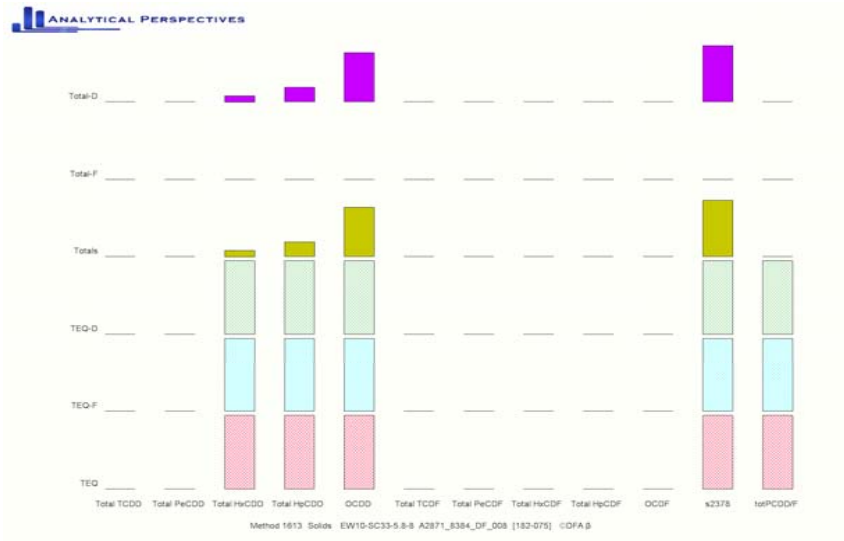
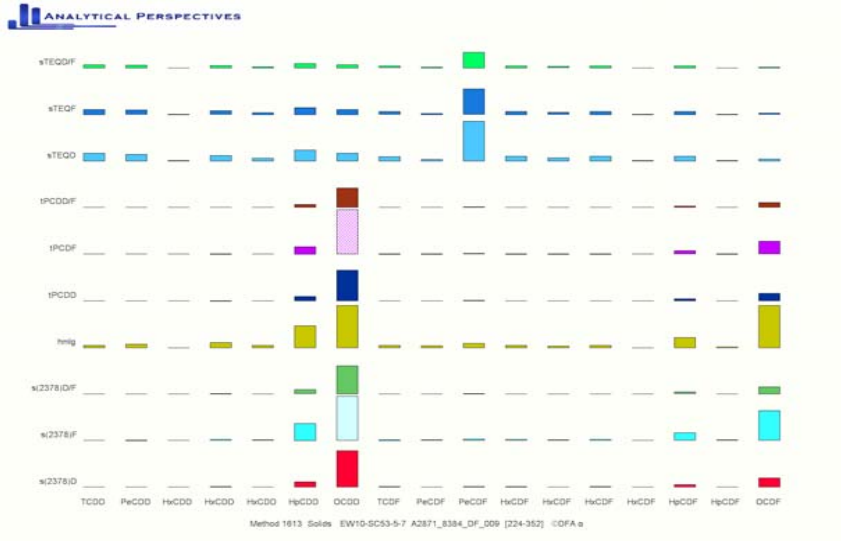
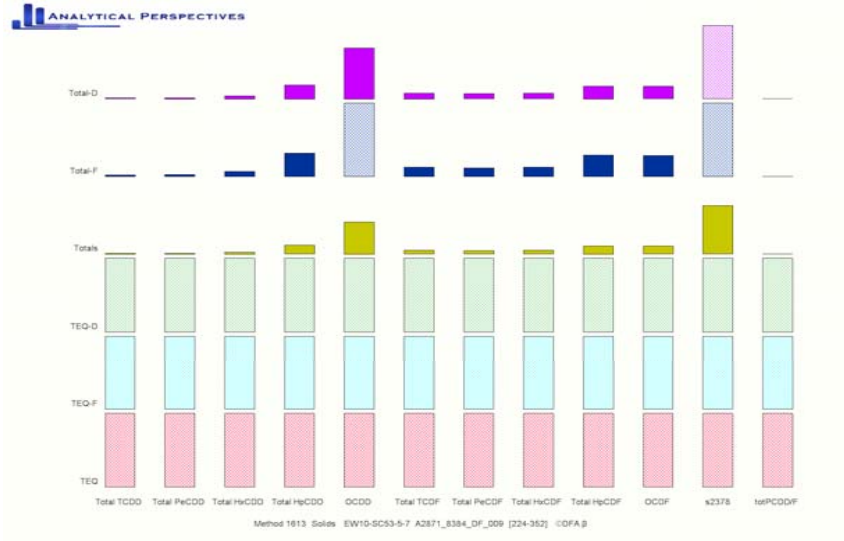

ANALYTICAL PERSPECTIVES
Total-D
Total-F
Totals
TEQ-D
TEQ-F
TEQ
Total TCDD Total PeCDD Total HxCDD Total HpCDD OCDD Total TCDF Total PeCDF Total HxCDF Total HpCDF OCDF s2378 totPCDD/F
Method 1613 Solids EW10-SC23-9-11 A2871_8384_DF_007 [318-643] ©DFA β

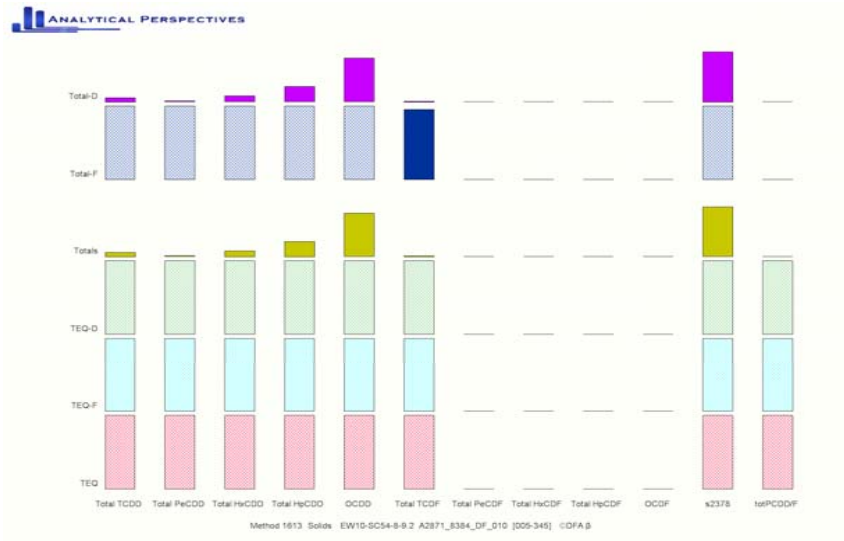

ANALYTICAL PERSPECTIVES
sTEQD/F
sTEQF
sTEQD
tPCDD/F
tPCDF
tPCDD
hmlg
s(2378)D/F
s(2378)F
s(2378)D
TCDD PeCDD HxCDD HxCDD HxCDD HpCDD OCDD TCDF PeCDF PeCDF HxCDF HxCDF HxCDF HxCDF HpCDF HpCDF OCDF
Method 1613 Solids EW10-SC33-5.8-8 A2871_8384_DF_008 [182-075] ©DFA α

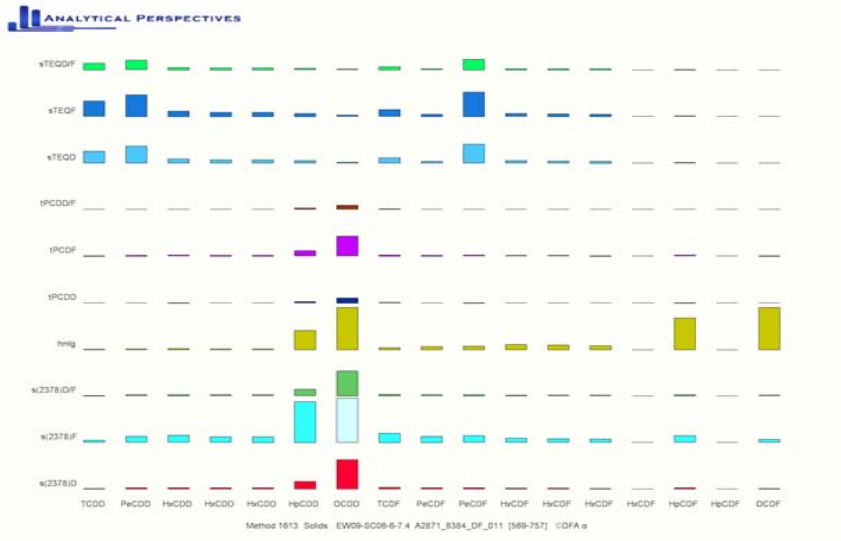

ANALYTICAL PERSPECTIVES
Total-D
Total-F
Totals
TEQ-D
TEQ-F
TEQ
Total TCDD Total PeCDD Total HxCDD Total HpCDD OCDD Total TCDF Total PeCDF Total HxCDF Total HpCDF OCDF s2378 totPCDD/F
Method 1613 Solids EW10-SC33-5.8-8 A2871_8384_DF_008 [182-075] ©DFA β

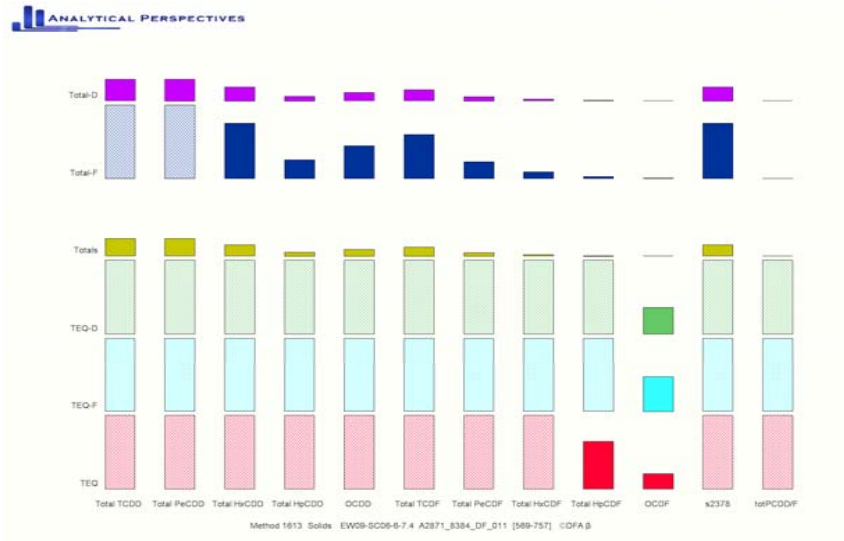

ANALYTICAL PERSPECTIVES
sTEQD/F
sTEQF
sTEQD
tPCDD/F
tPCDF
tPCDD
hmlg
s(2378)D/F
s(2378)F
s(2378)D
TCDD PeCDD HxCDD HxCDD HxCDD HpCDD OCDD TCDF PeCDF PeCDF HxCDF HxCDF HxCDF HxCDF HpCDF HpCDF OCDF
Method 1613 Solids EW10-SC53-5-7 A2871_8384_DF_009 [224-352] ©DFA α

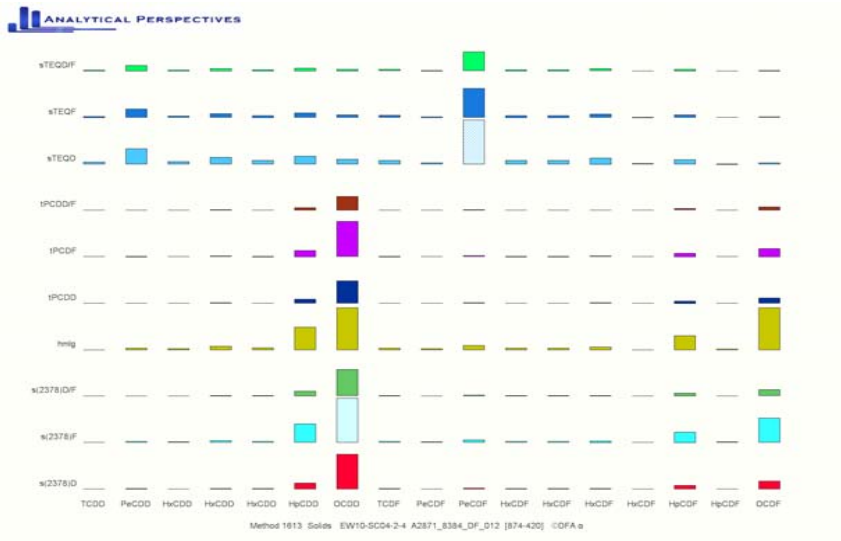

ANALYTICAL PERSPECTIVES
Total-D
Total-F
Totals
TEQ-D
TEQ-F
TEQ
Total TCDD Total PeCDD Total HxCDD Total HpCDD OCDD Total TCDF Total PeCDF Total HxCDF Total HpCDF OCDF s2378 totPCDD/F
Method 1613 Solids EW10-SC53-5-7 A2871_8384_DF_009 [224-352] ©DFA β

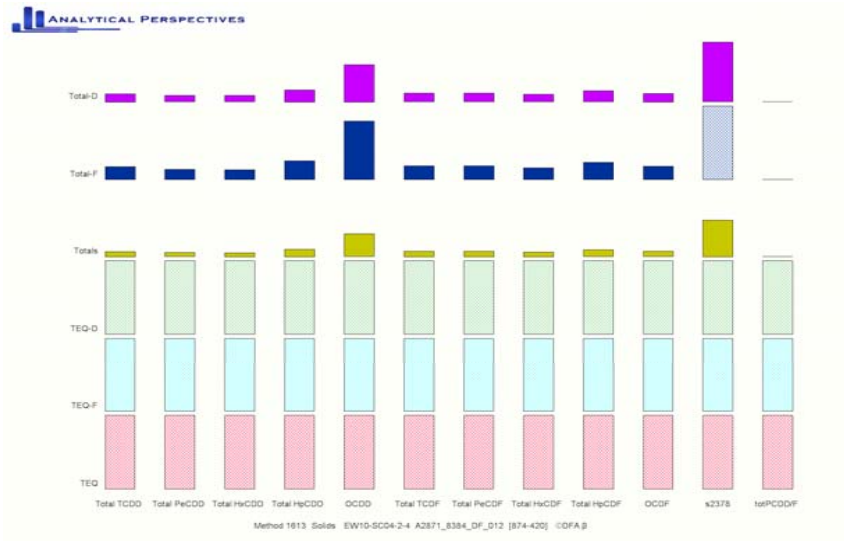
ANALYTICAL PERSPECTIVES
sTEQD/F
sTEQF
sTEQD
tPCDD/F
tPCDF
tPCDD
hmlg
s(2378)D/F
s(2378)F
s(2378)D
TCDD PeCDD HxCDD HxCDD HxCDD HpCDD OCDD TCDF PeCDF PeCDF HxCDF HxCDF HxCDF HxCDF HpCDF HpCDF OCDF
Method 1613 Solids EW10-SC54-8-9.2 A2871_8384_DF_010 [005-345] ©DFA α

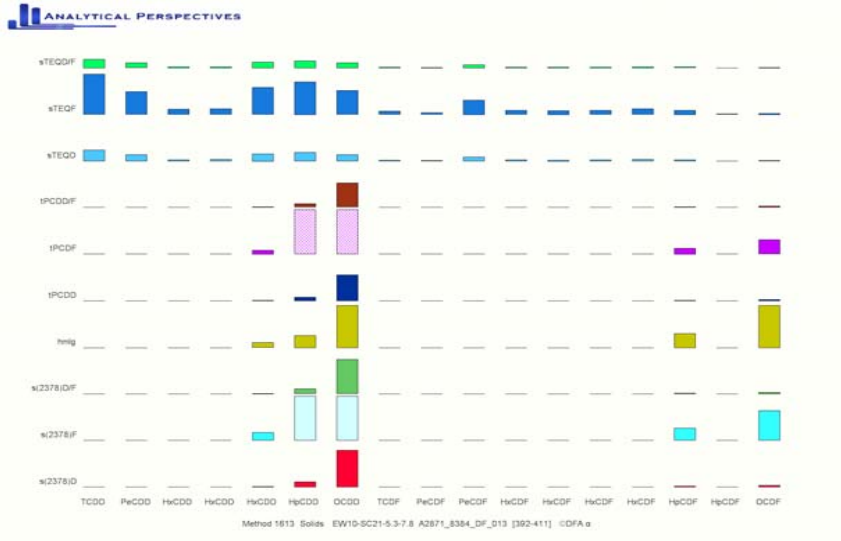

ANALYTICAL PERSPECTIVES
Total-D
Total-F
Totals
TEQ-D
TEQ-F
TEQ
Total TCDD Total PeCDD Total HxCDD Total HpCDD OCDD Total TCDF Total PeCDF Total HxCDF Total HpCDF OCDF s2378 totPCDD/F
Method 1613 Solids EW10-SC54-8-9.2 A2871_8384_DF_010 [005-345] ©DFA β

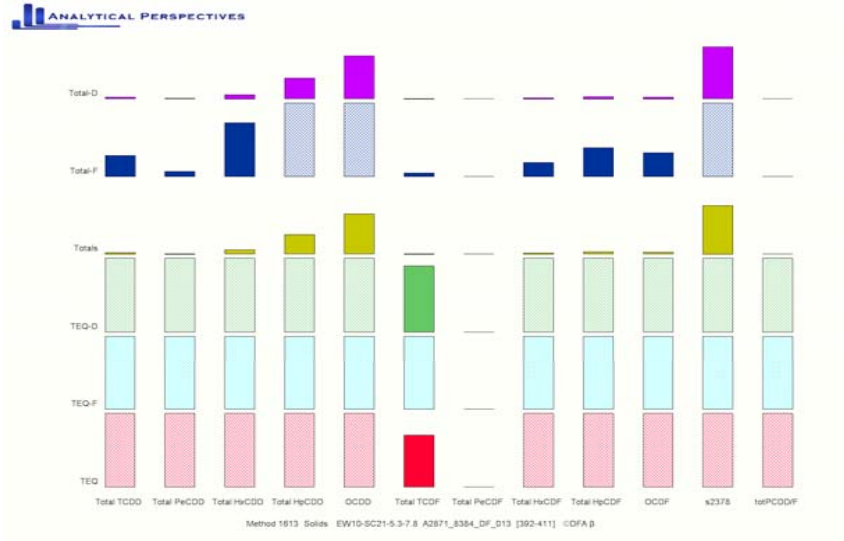

ANALYTICAL PERSPECTIVES
sTEQD/F
sTEQF
sTEQD
tPCDD/F
tPCDF
tPCDD
hmlg
s(2378)D/F
s(2378)F
s(2378)D
TCDD PeCDD HxCDD HxCDD HxCDD HpCDD OCDD TCDF PeCDF PeCDF HxCDF HxCDF HxCDF HxCDF HpCDF HpCDF OCDF
Method 1613 Solids EW09-SC06-6-7.4 A2871_8384_DF_011 [589-757] ©DFA α

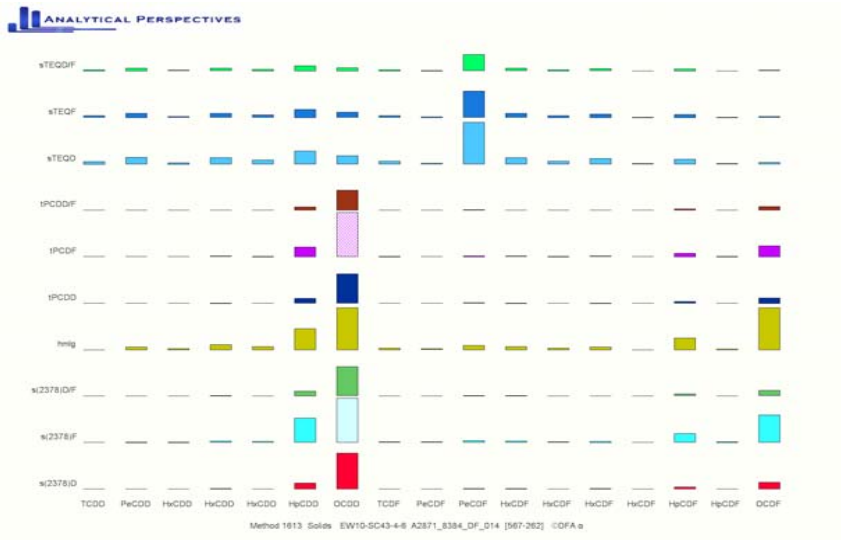

ANALYTICAL PERSPECTIVES
Total-D
Total-F
Totals
TEQ-D
TEQ-F
TEQ
Total TCDD Total PeCDD Total HxCDD Total HpCDD OCDD Total TCDF Total PeCDF Total HxCDF Total HpCDF OCDF s2378 totPCDD/F
Method 1613 Solids EW09-SC06-6-7.4 A2871_8384_DF_011 [589-757] ©DFA β

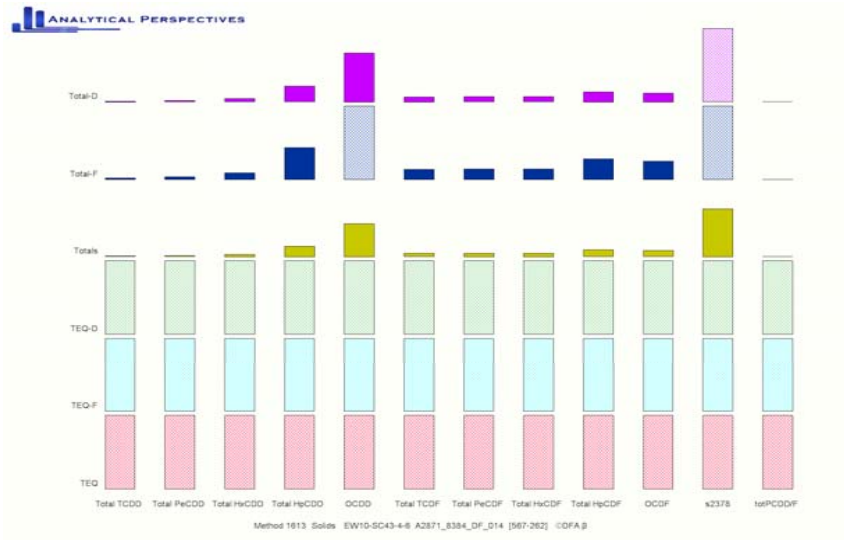

ANALYTICAL PERSPECTIVES
sTEQD/F
sTEQF
sTEQD
tPCDD/F
tPCDF
tPCDD
hmlg
s(2378)D/F
s(2378)F
s(2378)D
TCDD PeCDD HxCDD HxCDD HxCDD HpCDD OCDD TCDF PeCDF PeCDF HxCDF HxCDF HxCDF HxCDF HpCDF HpCDF OCDF
Method 1613 Solids EW10-SC04-2-4 A2871_8384_DF_012 [874-420] ©DFA α

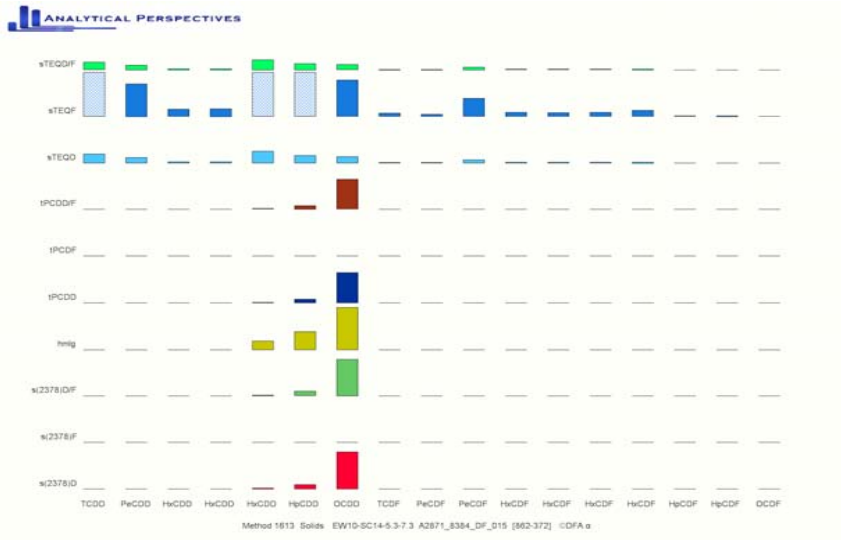

ANALYTICAL PERSPECTIVES
Total-D
Total-F
Totals
TEQ-D
TEQ-F
TEQ
Total TCDD Total PeCDD Total HxCDD Total HpCDD OCDD Total TCDF Total PeCDF Total HxCDF Total HpCDF OCDF s2378 totPCDD/F
Method 1613 Solids EW10-SC04-2-4 A2871_8384_DF_012 [874-420] ©DFA β

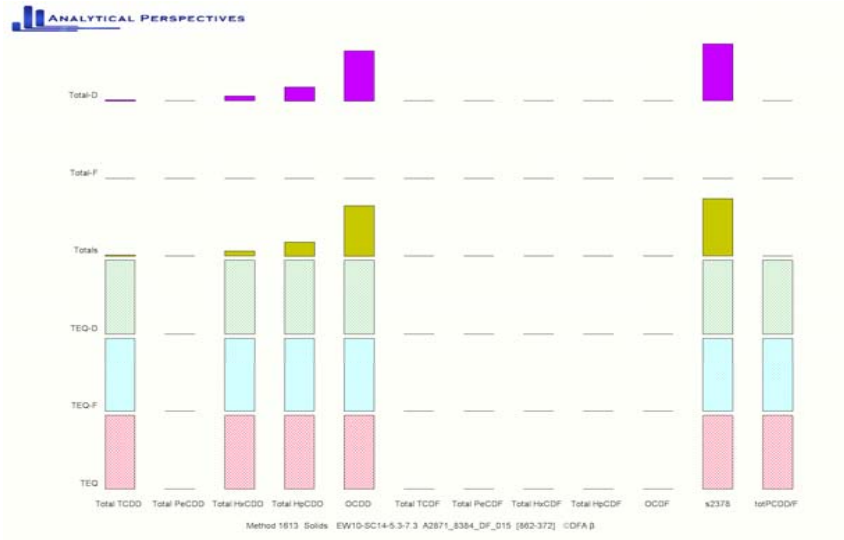

ANALYTICAL PERSPECTIVES
sTEQD/F
sTEQF
sTEQD
tPCDD/F
tPCDF
tPCDD
hmlg
s(2378)D/F
s(2378)F
s(2378)D
TCDD PeCDD HxCDD HxCDD HxCDD HpCDD OCDD TCDF PeCDF PeCDF HxCDF HxCDF HxCDF HxCDF HpCDF HpCDF OCDF
Method 1613 Solids EW10-SC21-5.3-7.8 A2871_8384_DF_013 [392-411] ©DFA α


ANALYTICAL PERSPECTIVES
Total-D
Total-F
Totals
TEQ-D
TEQ-F
TEQ
Total TCDD Total PeCDD Total HxCDD Total HpCDD OCDD Total TCDF Total PeCDF Total HxCDF Total HpCDF OCDF s2378 totPCDD/F
Method 1613 Solids EW10-SC21-5.3-7.8 A2871_8384_DF_013 [392-411] ©DFA β


ANALYTICAL PERSPECTIVES
sTEQD/F
sTEQF
sTEQD
tPCDD/F
tPCDF
tPCDD
hmlg
s(2378)D/F
s(2378)F
s(2378)D
TCDD PeCDD HxCDD HxCDD HxCDD HpCDD OCDD TCDF PeCDF PeCDF HxCDF HxCDF HxCDF HxCDF HpCDF HpCDF OCDF
Method 1613 Solids EW10-SC43-4-6 A2871_8384_DF_014 [567-262] ©DFA α


ANALYTICAL PERSPECTIVES
Total-D
Total-F
Totals
TEQ-D
TEQ-F
TEQ
Total TCDD Total PeCDD Total HxCDD Total HpCDD OCDD Total TCDF Total PeCDF Total HxCDF Total HpCDF OCDF s2378 totPCDD/F
Method 1613 Solids EW10-SC43-4-6 A2871_8384_DF_014 [567-262] ©DFA β


ANALYTICAL PERSPECTIVES
sTEQD/F
sTEQF
sTEQD
tPCDD/F
tPCDF
tPCDD
hmlg
s(2378)D/F
s(2378)F
s(2378)D
TCDD PeCDD HxCDD HxCDD HxCDD HpCDD OCDD TCDF PeCDF PeCDF HxCDF HxCDF HxCDF HxCDF HpCDF HpCDF OCDF
Method 1613 Solids EW10-SC14-5.3-7.3 A2871_8384_DF_015 [862-372] ©DFA α


ANALYTICAL PERSPECTIVES
Total-D
Total-F
Totals
TEQ-D
TEQ-F
TEQ
Total TCDD Total PeCDD Total HxCDD Total HpCDD OCDD Total TCDF Total PeCDF Total HxCDF Total HpCDF OCDF s2378 totPCDD/F
Method 1613 Solids EW10-SC14-5.3-7.3 A2871_8384_DF_015 [862-372] ©DFA β

Sample ID: MB1_8384_DF_SDS 0_8384_MB001 — Method 1613

Client Data		Sample Data		Laboratory Data			
Name:	Windward Environmental, LLC	Matrix:	Solids	Lab Project ID:	A2871	Date Received:	n/a
Project ID:	EW Source Control	Weight/Volume:	10.00 g	Lab Sample ID	MB1_8384_DF_SDS	Date Extracted:	27 Dec 2010
Date Collected:	n/a	% Solids:	n/a	QC Batch No:	8384	Date Analyzed:	31 Dec 2010
		Split:	-	Dilution:	-	Time Analyzed:	11:32:49

Analyte	Conc. (pg/g)	DL (pg/g)	EMPC (pg/g)	Qualifiers	Standard	ES Recoveries	Qualifiers
2378-TCDD	ND	0.0818			ES 2378-TCDD	89.3	
12378-PeCDD	ND	0.08			ES 12378-PeCDD	95.7	
123478-HxCDD	ND	0.0741			ES 123478-HxCDD	88	
123678-HxCDD	ND	0.0815			ES 123678-HxCDD	85.2	
123789-HxCDD	ND	0.0859			ES 123789-HxCDD	81.2	
1234678-HpCDD	ND	0.115			ES 1234678-HpCDD	83.6	
OCDD	ND	0.221			ES OCDD	75.6	
2378-TCDF	ND	0.0612			ES 2378-TCDF	88.1	
12378-PeCDF	ND	0.0633			ES 12378-PeCDF	99.2	
23478-PeCDF	ND	0.0577			ES 23478-PeCDF	98.3	
123478-HxCDF	ND	0.0652			ES 123478-HxCDF	76.4	
123678-HxCDF	ND	0.0606			ES 123678-HxCDF	77.7	
234678-HxCDF	ND	0.0668			ES 234678-HxCDF	75.5	
123789-HxCDF	ND	0.0891			ES 123789-HxCDF	73	
1234678-HpCDF	ND	0.0698			ES 1234678-HpCDF	73.1	
1234789-HpCDF	ND	0.094			ES 1234789-HpCDF	72.6	
OCDF	ND	0.177			ES OCDF	65.8	
Totals					**Standard**	**CS/AS Recoveries**	
					CS 37Cl-2378-TCDD	91.5	
Total TCDD	ND	0.0818	ND		CS 12347-PeCDD	110	
Total PeCDD	ND	0.08	ND		CS 12346-PeCDF	114	
Total HxCDD	ND	0.0803	ND		CS 123469-HxCDF	102	
Total HpCDD	ND	0.115	ND		CS 1234689-HpCDF	89.5	
					AS 1368-TCDD	80.5	
Total TCDF	ND	0.0612	ND		AS 1368-TCDF	85.7	
Total PeCDF	ND	0.0604	ND				
Total HxCDF	ND	0.0692	ND				
Total HpCDF	ND	0.0806	ND				
Total PCDD/Fs	**ND**		**ND**				
ITEF TEQs							
TEQ: ND=0	0		0				
TEQ: ND=DL/2	0.108		0.108				
TEQ: ND=DL	0.215		0.215				

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Sample ID: EW10-SC18-2-4 — Method 1613

Client Data		Sample Data		Laboratory Data			
Name:	Windward Environmental, LLC	Matrix:	Solids	Lab Project ID:	A2871	Date Received:	14 Dec 2010
Project ID:	EW Source Control	Weight/Volume:	10.27 g	Lab Sample ID	A2871_8384_DF_001	Date Extracted:	27 Dec 2010
Date Collected:	22 Apr 2010	% Solids:	64.3 %	QC Batch No:	8384	Date Analyzed:	31 Dec 2010
		Split:	-	Dilution:	-	Time Analyzed:	12:22:37

Analyte	Conc. (pg/g)	DL (pg/g)	EMPC (pg/g)	Qualifiers	Standard	ES Recoveries	Qualifiers
2378-TCDD	2.37	[Ra=0.79]			ES 2378-TCDD	92.5	
12378-PeCDD	6.01				ES 12378-PeCDD	100	
123478-HxCDD	6.55				ES 123478-HxCDD	88	
123678-HxCDD	32.8				ES 123678-HxCDD	86.5	
123789-HxCDD	16.3				ES 123789-HxCDD	81.8	
1234678-HpCDD	863				ES 1234678-HpCDD	94.5	
OCDD	7570				ES OCDD	98.4	
2378-TCDF	7.65				ES 2378-TCDF	93.8	
12378-PeCDF	5.06				ES 12378-PeCDF	97.7	
23478-PeCDF	28.7				ES 23478-PeCDF	98.9	
123478-HxCDF	26.3				ES 123478-HxCDF	78.4	
123678-HxCDF	12.2				ES 123678-HxCDF	76.4	
234678-HxCDF	20				ES 234678-HxCDF	75.2	
123789-HxCDF	ND	0.276			ES 123789-HxCDF	76.1	
1234678-HpCDF	199				ES 1234678-HpCDF	74.9	
1234789-HpCDF	14.6				ES 1234789-HpCDF	78	
OCDF	555				ES OCDF	77.1	
Totals					**Standard**	**CS/AS Recoveries**	
					CS 37Cl-2378-TCDD	96.8	
Total TCDD	30.6		31.5		CS 12347-PeCDD	112	
Total PeCDD	53.2		57.9		CS 12346-PeCDF	116	
Total HxCDD	267		267		CS 123469-HxCDF	102	
Total HpCDD	1890		1890		CS 1234689-HpCDF	97.3	
					AS 1368-TCDD	83.8	
Total TCDF	244		244		AS 1368-TCDF	93.1	
Total PeCDF	290		290				
Total HxCDF	369		369				
Total HpCDF	670		670				
Total PCDD/Fs	**11900**		**11900**				
ITEF TEQs							
TEQ: ND=0	51		51				
TEQ: ND=DL/2	51.1		51.1				
TEQ: ND=DL	51.1		51.1				

ANALYTICAL PERSPECTIVES
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Sample ID: EW10-SC10-4-6 — Method 1613

Client Data		Sample Data		Laboratory Data			
Name:	Windward Environmental, LLC	Matrix:	Solids	Lab Project ID:	A2871	Date Received:	14 Dec 2010
Project ID:	EW Source Control	Weight/Volume:	10.26 g	Lab Sample ID	A2871_8384_DF_002	Date Extracted:	27 Dec 2010
Date Collected:	22 Apr 2010	% Solids:	77.4 %	QC Batch No:	8384	Date Analyzed:	31 Dec 2010
		Split:	-	Dilution:	-	Time Analyzed:	13:12:30

Analyte	Conc. (pg/g)	DL (pg/g)	EMPC (pg/g)	Qualifiers	Standard	ES Recoveries	Qualifiers
2378-TCDD	ND	0.0787			ES 2378-TCDD	86.6	
12378-PeCDD	EMPC		0.15	J	ES 12378-PeCDD	86.6	
123478-HxCDD	0.21			J	ES 123478-HxCDD	85.4	
123678-HxCDD	0.834			J	ES 123678-HxCDD	83.9	
123789-HxCDD	0.526			J	ES 123789-HxCDD	80	
1234678-HpCDD	20.6				ES 1234678-HpCDD	80.1	
OCDD	169				ES OCDD	71.6	
2378-TCDF	EMPC		0.123	J	ES 2378-TCDF	87.1	
12378-PeCDF	0.141			J	ES 12378-PeCDF	90.2	
23478-PeCDF	0.719			J	ES 23478-PeCDF	92.5	
123478-HxCDF	1.74			J	ES 123478-HxCDF	76.2	
123678-HxCDF	0.396			J	ES 123678-HxCDF	79.9	
234678-HxCDF	0.661			J	ES 234678-HxCDF	74.9	
123789-HxCDF	ND	0.0984			ES 123789-HxCDF	72.7	
1234678-HpCDF	8.96				ES 1234678-HpCDF	70.9	
1234789-HpCDF	0.894			J	ES 1234789-HpCDF	68.7	
OCDF	35.3				ES OCDF	64.8	
Totals					**Standard**	**CS/AS Recoveries**	
					CS 37Cl-2378-TCDD	93	
Total TCDD	0.244		0.882		CS 12347-PeCDD	116	
Total PeCDD	1.22		1.84		CS 12346-PeCDF	116	
Total HxCDD	6.72		6.72		CS 123469-HxCDF	105	
Total HpCDD	41		41		CS 1234689-HpCDF	91.6	
					AS 1368-TCDD	86.1	
Total TCDF	2.76		3.69		AS 1368-TCDF	90.4	
Total PeCDF	4.25		6.08				
Total HxCDF	16.1		16.7				
Total HpCDF	40.6		40.6				
Total PCDD/Fs	**317**		**322**				
ITEF TEQs							
TEQ: ND=0	1.31		1.4				
TEQ: ND=DL/2	1.38		1.44				
TEQ: ND=DL	1.45		1.49				

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Sample ID: EW10-SC12-5-7 — Method 1613

Client Data		Sample Data		Laboratory Data			
Name:	Windward Environmental, LLC	Matrix:	Solids	Lab Project ID:	A2871	Date Received:	14 Dec 2010
Project ID:	EW Source Control	Weight/Volume:	10.18 g	Lab Sample ID	A2871_8384_DF_003	Date Extracted:	27 Dec 2010
Date Collected:	22 Apr 2010	% Solids:	91.4 %	QC Batch No:	8384	Date Analyzed:	31 Dec 2010
		Split:	-	Dilution:	-	Time Analyzed:	14:02:18

Analyte	Conc. (pg/g)	DL (pg/g)	EMPC (pg/g)	Qualifiers	Standard	ES Recoveries	Qualifiers
2378-TCDD	ND	0.0564			ES 2378-TCDD	83.9	
12378-PeCDD	ND	0.0719			ES 12378-PeCDD	82	
123478-HxCDD	ND	0.108			ES 123478-HxCDD	87.5	
123678-HxCDD	ND	0.108			ES 123678-HxCDD	88.8	
123789-HxCDD	ND	0.118			ES 123789-HxCDD	84.6	
1234678-HpCDD	1.26			J	ES 1234678-HpCDD	81.2	
OCDD	10.3				ES OCDD	63.8	
2378-TCDF	ND	0.0483			ES 2378-TCDF	85.3	
12378-PeCDF	ND	0.0548			ES 12378-PeCDF	86.1	
23478-PeCDF	ND	0.0527			ES 23478-PeCDF	84.1	
123478-HxCDF	ND	0.0739			ES 123478-HxCDF	76.6	
123678-HxCDF	ND	0.0635			ES 123678-HxCDF	81.3	
234678-HxCDF	ND	0.0715			ES 234678-HxCDF	78	
123789-HxCDF	ND	0.101			ES 123789-HxCDF	76.6	
1234678-HpCDF	0.234			J	ES 1234678-HpCDF	69.3	
1234789-HpCDF	ND	0.114			ES 1234789-HpCDF	68.1	
OCDF	0.586			J	ES OCDF	60.3	
Totals					**Standard**	**CS/AS Recoveries**	
					CS 37Cl-2378-TCDD	86.9	
Total TCDD	0.159		0.282		CS 12347-PeCDD	101	
Total PeCDD	ND	0.0719	ND		CS 12346-PeCDF	97.8	
Total HxCDD	0.234		0.568		CS 123469-HxCDF	105	
Total HpCDD	2.94		2.94		CS 1234689-HpCDF	91.8	
					AS 1368-TCDD	80.7	
Total TCDF	ND	0.0483	ND		AS 1368-TCDF	90.4	
Total PeCDF	ND	0.0537	ND				
Total HxCDF	ND		0.246				
Total HpCDF	0.794		0.794				
Total PCDD/Fs	**15**		**15.7**				
ITEF TEQs							
TEQ: ND=0	0.0258		0.0258				
TEQ: ND=DL/2	0.122		0.122				
TEQ: ND=DL	0.218		0.218				

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Sample ID: EW10-SC18-6-8 — Method 1613

Client Data		Sample Data		Laboratory Data			
Name:	Windward Environmental, LLC	Matrix:	Solids	Lab Project ID:	A2871	Date Received:	14 Dec 2010
Project ID:	EW Source Control	Weight/Volume:	10.36 g	Lab Sample ID	A2871_8384_DF_004	Date Extracted:	27 Dec 2010
Date Collected:	22 Apr 2010	% Solids:	71.9 %	QC Batch No:	8384	Date Analyzed:	31 Dec 2010
		Split:	-	Dilution:	-	Time Analyzed:	14:52:06

Analyte	Conc. (pg/g)	DL (pg/g)	EMPC (pg/g)	Qualifiers	Standard	ES Recoveries	Qualifiers
2378-TCDD	ND	0.141			ES 2378-TCDD	79.9	
12378-PeCDD	ND	0.169			ES 12378-PeCDD	78.9	
123478-HxCDD	ND	0.181			ES 123478-HxCDD	83.3	
123678-HxCDD	ND	0.186			ES 123678-HxCDD	90.6	
123789-HxCDD	ND	0.213			ES 123789-HxCDD	79.6	
1234678-HpCDD	EMPC		0.922	J	ES 1234678-HpCDD	62.4	
OCDD	8.72				ES OCDD	41.5	
2378-TCDF	ND	0.124			ES 2378-TCDF	78.4	
12378-PeCDF	ND	0.132			ES 12378-PeCDF	79.5	
23478-PeCDF	ND	0.104			ES 23478-PeCDF	83.1	
123478-HxCDF	ND	0.131			ES 123478-HxCDF	68.1	
123678-HxCDF	ND	0.124			ES 123678-HxCDF	69.2	
234678-HxCDF	ND	0.117			ES 234678-HxCDF	82.3	
123789-HxCDF	ND	0.177			ES 123789-HxCDF	68.9	
1234678-HpCDF	ND	0.214			ES 1234678-HpCDF	53.7	
1234789-HpCDF	ND	0.304			ES 1234789-HpCDF	52.5	
OCDF	ND	0.573			ES OCDF	35.5	
Totals					**Standard**	**CS/AS Recoveries**	
					CS 37Cl-2378-TCDD	81.4	
Total TCDD	0.439		0.439		CS 12347-PeCDD	103	
Total PeCDD	ND	0.169	ND		CS 12346-PeCDF	98.8	
Total HxCDD	0.735		0.735		CS 123469-HxCDF	89.4	
Total HpCDD	1.57		2.49		CS 1234689-HpCDF	67.6	
					AS 1368-TCDD	84.7	
Total TCDF	ND	0.124	ND		AS 1368-TCDF	93.8	
Total PeCDF	ND	0.117	ND				
Total HxCDF	ND	0.134	ND				
Total HpCDF	ND	0.254	ND				
Total PCDD/Fs	**11.5**		**12.4**				
ITEF TEQs							
TEQ: ND=0	0.00872		0.0179				
TEQ: ND=DL/2	0.217		0.225				
TEQ: ND=DL	0.426		0.432				

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Sample ID: EW10-SC58-6-8 — Method 1613

Client Data		Sample Data		Laboratory Data			
Name:	Windward Environmental, LLC	Matrix:	Solids	Lab Project ID:	A2871	Date Received:	14 Dec 2010
Project ID:	EW Source Control	Weight/Volume:	10.49 g	Lab Sample ID	A2871_8384_DF_005	Date Extracted:	27 Dec 2010
Date Collected:	22 Apr 2010	% Solids:	75.6 %	QC Batch No:	8384	Date Analyzed:	31 Dec 2010
		Split:	-	Dilution:	-	Time Analyzed:	15:41:54

Analyte	Conc. (pg/g)	DL (pg/g)	EMPC (pg/g)	Qualifiers	Standard	ES Recoveries	Qualifiers
2378-TCDD	ND	0.084			ES 2378-TCDD	78.7	
12378-PeCDD	ND	0.145			ES 12378-PeCDD	66.5	
123478-HxCDD	ND	0.186			ES 123478-HxCDD	80.8	
123678-HxCDD	ND	0.176			ES 123678-HxCDD	89.4	
123789-HxCDD	ND	0.203			ES 123789-HxCDD	82.4	
1234678-HpCDD	EMPC		0.652	J	ES 1234678-HpCDD	59.8	
OCDD	7.05				ES OCDD	38.8	
2378-TCDF	ND	0.0777			ES 2378-TCDF	78	
12378-PeCDF	ND	0.091			ES 12378-PeCDF	68.9	
23478-PeCDF	ND	0.0812			ES 23478-PeCDF	72.4	
123478-HxCDF	ND	0.139			ES 123478-HxCDF	71.8	
123678-HxCDF	ND	0.117			ES 123678-HxCDF	80.8	
234678-HxCDF	ND	0.135			ES 234678-HxCDF	70.6	
123789-HxCDF	ND	0.187			ES 123789-HxCDF	70.7	
1234678-HpCDF	ND	0.151			ES 1234678-HpCDF	58.9	
1234789-HpCDF	ND	0.239			ES 1234789-HpCDF	51.7	
OCDF	ND	0.554			ES OCDF	35.1	
Totals					**Standard**	**CS/AS Recoveries**	
					CS 37Cl-2378-TCDD	78.3	
Total TCDD	0.563		0.563		CS 12347-PeCDD	97.5	
Total PeCDD	ND	0.145	ND		CS 12346-PeCDF	82	
Total HxCDD	0.414		0.414		CS 123469-HxCDF	104	
Total HpCDD	ND		1.96		CS 1234689-HpCDF	72.4	
					AS 1368-TCDD	86.3	
Total TCDF	ND	0.0777	ND		AS 1368-TCDF	94.2	
Total PeCDF	ND	0.0859	ND				
Total HxCDF	ND	0.141	ND				
Total HpCDF	ND	0.188	ND				
Total PCDD/Fs	**8.03**		**9.99**				
ITEF TEQs							
TEQ: ND=0	0.00705		0.0136				
TEQ: ND=DL/2	0.173		0.178				
TEQ: ND=DL	0.338		0.342				

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Sample ID: EW10-SC23-1.3-3.2 — Method 1613

Client Data		Sample Data		Laboratory Data			
Name:	Windward Environmental, LLC	Matrix:	Solids	Lab Project ID:	A2871	Date Received:	14 Dec 2010
Project ID:	EW Source Control	Weight/Volume:	10.10 g	Lab Sample ID	A2871_8384_DF_006	Date Extracted:	27 Dec 2010
Date Collected:	22 Apr 2010	% Solids:	53.8 %	QC Batch No:	8384	Date Analyzed:	31 Dec 2010
		Split:	-	Dilution:	-	Time Analyzed:	16:31:41

Analyte	Conc. (pg/g)	DL (pg/g)	EMPC (pg/g)	Qualifiers	Standard	ES Recoveries	Qualifiers
2378-TCDD	12	[Ra=0.77]			ES 2378-TCDD	82	
12378-PeCDD	30.5				ES 12378-PeCDD	82.4	
123478-HxCDD	28.9				ES 123478-HxCDD	73.5	
123678-HxCDD	149				ES 123678-HxCDD	70.2	
123789-HxCDD	76.5				ES 123789-HxCDD	67.3	
1234678-HpCDD	3130				ES 1234678-HpCDD	78.4	
OCDD	22000			*	ES OCDD	85.9	
2378-TCDF	29.2				ES 2378-TCDF	74.9	
12378-PeCDF	18.5				ES 12378-PeCDF	83.9	
23478-PeCDF	141				ES 23478-PeCDF	82.4	
123478-HxCDF	87.1				ES 123478-HxCDF	64.1	
123678-HxCDF	46.5				ES 123678-HxCDF	62.3	
234678-HxCDF	84.4				ES 234678-HxCDF	62	
123789-HxCDF	ND	0.715			ES 123789-HxCDF	66.8	
1234678-HpCDF	938				ES 1234678-HpCDF	66.5	
1234789-HpCDF	55.5				ES 1234789-HpCDF	68.3	
OCDF	2750				ES OCDF	68.7	
Totals					**Standard**	**CS/AS Recoveries**	
					CS 37Cl-2378-TCDD	86.4	
Total TCDD	198		198		CS 12347-PeCDD	90.8	
Total PeCDD	353		361		CS 12346-PeCDF	103	
Total HxCDD	1130		1130		CS 123469-HxCDF	84.4	
Total HpCDD	6640		6640		CS 1234689-HpCDF	88.4	
					AS 1368-TCDD	43.8	
Total TCDF	849		851		AS 1368-TCDF	51.8	
Total PeCDF	1500		1500				
Total HxCDF	1600		1600				
Total HpCDF	3150		3150				
Total PCDD/Fs	**40100**		**40100**				
ITEF TEQs							
TEQ: ND=0	215		215				
TEQ: ND=DL/2	215		215				
TEQ: ND=DL	215		215				

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Sample ID: EW10-SC23-9-11 — Method 1613

Client Data		Sample Data		Laboratory Data			
Name:	Windward Environmental, LLC	Matrix:	Solids	Lab Project ID:	A2871	Date Received:	14 Dec 2010
Project ID:	EW Source Control	Weight/Volume:	10.22 g	Lab Sample ID	A2871_8384_DF_007	Date Extracted:	27 Dec 2010
Date Collected:	22 Apr 2010	% Solids:	68.7 %	QC Batch No:	8384	Date Analyzed:	31 Dec 2010
		Split:	-	Dilution:	-	Time Analyzed:	17:21:27

Analyte	Conc. (pg/g)	DL (pg/g)	EMPC (pg/g)	Qualifiers	Standard	ES Recoveries	Qualifiers
2378-TCDD	EMPC	[Ra=1.22]	0.0816	J	ES 2378-TCDD	91.6	
12378-PeCDD	0.224			J	ES 12378-PeCDD	95.8	
123478-HxCDD	0.13			J	ES 123478-HxCDD	84	
123678-HxCDD	EMPC		0.374	J	ES 123678-HxCDD	82.1	
123789-HxCDD	0.487			J	ES 123789-HxCDD	82.3	
1234678-HpCDD	3.91				ES 1234678-HpCDD	87.3	
OCDD	32				ES OCDD	81.3	
2378-TCDF	0.5				ES 2378-TCDF	94.3	
12378-PeCDF	0.255			J	ES 12378-PeCDF	101	
23478-PeCDF	0.342			J	ES 23478-PeCDF	99.4	
123478-HxCDF	0.234			J	ES 123478-HxCDF	71.6	
123678-HxCDF	0.182			J	ES 123678-HxCDF	68.8	
234678-HxCDF	EMPC		0.174	J	ES 234678-HxCDF	71.1	
123789-HxCDF	ND	0.0928			ES 123789-HxCDF	72.6	
1234678-HpCDF	0.841			J	ES 1234678-HpCDF	71.9	
1234789-HpCDF	ND	0.0787			ES 1234789-HpCDF	75.9	
OCDF	0.905			J	ES OCDF	67.5	
Totals					**Standard**	**CS/AS Recoveries**	
					CS 37Cl-2378-TCDD	96.1	
Total TCDD	3.36		5.14		CS 12347-PeCDD	109	
Total PeCDD	4.16		4.8		CS 12346-PeCDF	116	
Total HxCDD	6.58		6.96		CS 123469-HxCDF	90.6	
Total HpCDD	9.48		9.48		CS 1234689-HpCDF	90.5	
					AS 1368-TCDD	83.4	
Total TCDF	4.81		7.15		AS 1368-TCDF	89.2	
Total PeCDF	2.33		3.08				
Total HxCDF	1.18		1.69				
Total HpCDF	1.35		1.35				
Total PCDD/Fs	**66.1**		**72.5**				
ITEF TEQs							
TEQ: ND=0	0.529		0.666				
TEQ: ND=DL/2	0.574		0.671				
TEQ: ND=DL	0.619		0.676				

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Sample ID: EW10-SC33-5.8-8 — Method 1613

Client Data		Sample Data		Laboratory Data			
Name:	Windward Environmental, LLC	Matrix:	Solids	Lab Project ID:	A2871	Date Received:	14 Dec 2010
Project ID:	EW Source Control	Weight/Volume:	10.03 g	Lab Sample ID	A2871_8384_DF_008	Date Extracted:	27 Dec 2010
Date Collected:	22 Apr 2010	% Solids:	78.3 %	QC Batch No:	8384	Date Analyzed:	31 Dec 2010
		Split:	-	Dilution:	-	Time Analyzed:	18:11:12

Analyte	Conc. (pg/g)	DL (pg/g)	EMPC (pg/g)	Qualifiers	Standard	ES Recoveries	Qualifiers
2378-TCDD	ND	0.0674			ES 2378-TCDD	91	
12378-PeCDD	ND	0.0735			ES 12378-PeCDD	96.7	
123478-HxCDD	ND	0.0647			ES 123478-HxCDD	85.7	
123678-HxCDD	ND	0.0682			ES 123678-HxCDD	83.5	
123789-HxCDD	EMPC		0.146	J	ES 123789-HxCDD	81.2	
1234678-HpCDD	0.806			J	ES 1234678-HpCDD	85.9	
OCDD	6.71				ES OCDD	78.5	
2378-TCDF	ND	0.049			ES 2378-TCDF	97.3	
12378-PeCDF	ND	0.0515			ES 12378-PeCDF	100	
23478-PeCDF	ND	0.0454			ES 23478-PeCDF	99.5	
123478-HxCDF	ND	0.0592			ES 123478-HxCDF	75.3	
123678-HxCDF	ND	0.0554			ES 123678-HxCDF	73.3	
234678-HxCDF	ND	0.0574			ES 234678-HxCDF	72.6	
123789-HxCDF	ND	0.0785			ES 123789-HxCDF	71.6	
1234678-HpCDF	ND	0.0689			ES 1234678-HpCDF	72.2	
1234789-HpCDF	ND	0.0902			ES 1234789-HpCDF	74.9	
OCDF	ND	0.139			ES OCDF	66	
Totals					**Standard**	**CS/AS Recoveries**	
					CS 37Cl-2378-TCDD	93.4	
Total TCDD	ND	0.0674	ND		CS 12347-PeCDD	112	
Total PeCDD	ND	0.0735	ND		CS 12346-PeCDF	116	
Total HxCDD	0.698		0.844		CS 123469-HxCDF	96.8	
Total HpCDD	1.98		1.98		CS 1234689-HpCDF	91.5	
					AS 1368-TCDD	90	
Total TCDF	ND	0.049	ND		AS 1368-TCDF	95.5	
Total PeCDF	ND	0.0483	ND				
Total HxCDF	ND	0.0618	ND				
Total HpCDF	ND	0.0786	ND				
Total PCDD/Fs	**9.39**		**9.53**				
ITEF TEQs							
TEQ: ND=0	0.0148		0.0294				
TEQ: ND=DL/2	0.106		0.117				
TEQ: ND=DL	0.197		0.204				

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Sample ID: EW10-SC53-5-7 — Method 1613

Client Data		Sample Data		Laboratory Data			
Name:	Windward Environmental, LLC	Matrix:	Solids	Lab Project ID:	A2871	Date Received:	14 Dec 2010
Project ID:	EW Source Control	Weight/Volume:	10.39 g	Lab Sample ID	A2871_8384_DF_009	Date Extracted:	27 Dec 2010
Date Collected:	22 Apr 2010	% Solids:	73.6 %	QC Batch No:	8384	Date Analyzed:	31 Dec 2010
		Split:	-	Dilution:	-	Time Analyzed:	23:54:54

Analyte	Conc. (pg/g)	DL (pg/g)	EMPC (pg/g)	Qualifiers	Standard	ES Recoveries	Qualifiers
2378-TCDD	EMPC	[Ra=0.60]	0.0856	J	ES 2378-TCDD	85.8	
12378-PeCDD	EMPC		0.149	J	ES 12378-PeCDD	96.6	
123478-HxCDD	ND	0.0872			ES 123478-HxCDD	80.8	
123678-HxCDD	0.618			J	ES 123678-HxCDD	82.2	
123789-HxCDD	EMPC		0.302	J	ES 123789-HxCDD	79.3	
1234678-HpCDD	11.9				ES 1234678-HpCDD	80.5	
OCDD	84.2				ES OCDD	60.1	
2378-TCDF	0.482				ES 2378-TCDF	93	
12378-PeCDF	0.372			J	ES 12378-PeCDF	96.8	
23478-PeCDF	0.874			J	ES 23478-PeCDF	96.5	
123478-HxCDF	0.513			J	ES 123478-HxCDF	83.1	
123678-HxCDF	0.356			J	ES 123678-HxCDF	85.3	
234678-HxCDF	0.51			J	ES 234678-HxCDF	84.2	
123789-HxCDF	ND	0.104			ES 123789-HxCDF	77	
1234678-HpCDF	5.16				ES 1234678-HpCDF	76.5	
1234789-HpCDF	0.369			J	ES 1234789-HpCDF	74.2	
OCDF	20.8				ES OCDF	59.7	
Totals					**Standard**	**CS/AS Recoveries**	
					CS 37Cl-2378-TCDD	93.8	
Total TCDD	1.05		1.61		CS 12347-PeCDD	114	
Total PeCDD	1.36		1.86		CS 12346-PeCDF	118	
Total HxCDD	4.18		5.08		CS 123469-HxCDF	112	
Total HpCDD	22.9		22.9		CS 1234689-HpCDF	101	
					AS 1368-TCDD	87.4	
Total TCDF	8.1		9.39		AS 1368-TCDF	88.8	
Total PeCDF	8.42		8.42				
Total HxCDF	9		9.3				
Total HpCDF	21.1		21.2				
Total PCDD/Fs	**181**		**185**				
ITEF TEQs							
TEQ: ND=0	0.982		1.17				
TEQ: ND=DL/2	1.05		1.18				
TEQ: ND=DL	1.12		1.19				

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Sample ID: EW10-SC54-8-9.2 — Method 1613

Client Data		Sample Data		Laboratory Data			
Name:	Windward Environmental, LLC	Matrix:	Solids	Lab Project ID:	A2871	Date Received:	14 Dec 2010
Project ID:	EW Source Control	Weight/Volume:	10.34 g	Lab Sample ID	A2871_8384_DF_010	Date Extracted:	27 Dec 2010
Date Collected:	22 Apr 2010	% Solids:	70.4 %	QC Batch No:	8384	Date Analyzed:	01 Jan 2011
		Split:	-	Dilution:	-	Time Analyzed:	00:44:40

Analyte	Conc. (pg/g)	DL (pg/g)	EMPC (pg/g)	Qualifiers	Standard	ES Recoveries	Qualifiers
2378-TCDD	ND	0.0437			ES 2378-TCDD	87.3	
12378-PeCDD	ND	0.0642			ES 12378-PeCDD	82.6	
123478-HxCDD	ND	0.0769			ES 123478-HxCDD	83.5	
123678-HxCDD	ND	0.0805			ES 123678-HxCDD	82.7	
123789-HxCDD	EMPC		0.131	J	ES 123789-HxCDD	80.3	
1234678-HpCDD	0.892			J	ES 1234678-HpCDD	85.4	
OCDD	6.98				ES OCDD	64.3	
2378-TCDF	ND	0.0341			ES 2378-TCDF	87.3	
12378-PeCDF	ND	0.0407			ES 12378-PeCDF	87.8	
23478-PeCDF	ND	0.0366			ES 23478-PeCDF	88.8	
123478-HxCDF	ND	0.0488			ES 123478-HxCDF	87.4	
123678-HxCDF	ND	0.0451			ES 123678-HxCDF	88.7	
234678-HxCDF	ND	0.045			ES 234678-HxCDF	87.2	
123789-HxCDF	ND	0.0705			ES 123789-HxCDF	82	
1234678-HpCDF	ND	0.0428			ES 1234678-HpCDF	85.6	
1234789-HpCDF	ND	0.0582			ES 1234789-HpCDF	81.7	
OCDF	ND	0.112			ES OCDF	65.8	
Totals					**Standard**	**CS/AS Recoveries**	
					CS 37Cl-2378-TCDD	99.5	
Total TCDD	0.555		0.673		CS 12347-PeCDD	108	
Total PeCDD	ND		0.147		CS 12346-PeCDF	113	
Total HxCDD	0.541		0.935		CS 123469-HxCDF	126	
Total HpCDD	2.44		2.44		CS 1234689-HpCDF	109	
					AS 1368-TCDD	85.2	
Total TCDF	0.113		0.113		AS 1368-TCDF	91.8	
Total PeCDF	ND	0.0386	ND				
Total HxCDF	ND	0.0512	ND				
Total HpCDF	ND	0.0495	ND				
Total PCDD/Fs	**10.6**		**11.3**				
ITEF TEQs							
TEQ: ND=0	0.0159		0.029				
TEQ: ND=DL/2	0.0893		0.0976				
TEQ: ND=DL	0.163		0.166				

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Sample ID: EW09-SC06-6-7.4 — Method 1613

Client Data		Sample Data		Laboratory Data			
Name:	Windward Environmental, LLC	Matrix:	Solids	Lab Project ID:	A2871	Date Received:	14 Dec 2010
Project ID:	EW Source Control	Weight/Volume:	10.30 g	Lab Sample ID	A2871_8384_DF_011	Date Extracted:	27 Dec 2010
Date Collected:	21 Jun 2010	% Solids:	60.5 %	QC Batch No:	8384	Date Analyzed:	01 Jan 2011
		Split:	-	Dilution:	-	Time Analyzed:	01:34:21

Analyte	Conc. (pg/g)	DL (pg/g)	EMPC (pg/g)	Qualifiers	Standard	ES Recoveries	Qualifiers
2378-TCDD	0.319	[Ra=0.74]		J	ES 2378-TCDD	89.8	
12378-PeCDD	0.91			J	ES 12378-PeCDD	90.2	
123478-HxCDD	1.1			J	ES 123478-HxCDD	83.4	
123678-HxCDD	0.864			J	ES 123678-HxCDD	83.6	
123789-HxCDD	0.885			J	ES 123789-HxCDD	79.7	
1234678-HpCDD	6.3				ES 1234678-HpCDD	75.4	
OCDD	24.4				ES OCDD	63.4	
2378-TCDF	1.42				ES 2378-TCDF	88.9	
12378-PeCDF	0.934			J	ES 12378-PeCDF	91.7	
23478-PeCDF	1.02			J	ES 23478-PeCDF	91.8	
123478-HxCDF	0.598			J	ES 123478-HxCDF	81.3	
123678-HxCDF	0.557			J	ES 123678-HxCDF	82.1	
234678-HxCDF	0.48			J	ES 234678-HxCDF	87.1	
123789-HxCDF	ND	0.0809			ES 123789-HxCDF	79.9	
1234678-HpCDF	1.04			J	ES 1234678-HpCDF	76.4	
1234789-HpCDF	ND	0.0879			ES 1234789-HpCDF	74.6	
OCDF	0.435			J	ES OCDF	61.8	
Totals					**Standard**	**CS/AS Recoveries**	
					CS 37Cl-2378-TCDD	97.1	
Total TCDD	62.9		64		CS 12347-PeCDD	110	
Total PeCDD	63.8		64.5		CS 12346-PeCDF	115	
Total HxCDD	40.6		41.3		CS 123469-HxCDF	116	
Total HpCDD	13.9		13.9		CS 1234689-HpCDF	94.3	
					AS 1368-TCDD	86.8	
Total TCDF	30.8		32.7		AS 1368-TCDF	89.7	
Total PeCDF	12.2		12.6				
Total HxCDF	4.88		5.04				
Total HpCDF	1.38		1.38				
Total PCDD/Fs	**255**		**260**				
ITEF TEQs							
TEQ: ND=0	2.02		2.02				
TEQ: ND=DL/2	2.02		2.02				
TEQ: ND=DL	2.03		2.03				

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Sample ID: EW10-SC04-2-4 — Method 1613

Client Data		Sample Data		Laboratory Data			
Name:	Windward Environmental, LLC	Matrix:	Solids	Lab Project ID:	A2871	Date Received:	14 Dec 2010
Project ID:	EW Source Control	Weight/Volume:	10.22 g	Lab Sample ID	A2871_8384_DF_012	Date Extracted:	27 Dec 2010
Date Collected:	22 Apr 2010	% Solids:	79.0 %	QC Batch No:	8384	Date Analyzed:	01 Jan 2011
		Split:	-	Dilution:	-	Time Analyzed:	02:24:03

Analyte	Conc. (pg/g)	DL (pg/g)	EMPC (pg/g)	Qualifiers	Standard	ES Recoveries	Qualifiers
2378-TCDD	ND	0.0611			ES 2378-TCDD	91.2	
12378-PeCDD	0.462			J	ES 12378-PeCDD	87.5	
123478-HxCDD	EMPC		0.34	J	ES 123478-HxCDD	86.3	
123678-HxCDD	1			J	ES 123678-HxCDD	85.6	
123789-HxCDD	0.527			J	ES 123789-HxCDD	81.7	
1234678-HpCDD	12				ES 1234678-HpCDD	84.4	
OCDD	69.4				ES OCDD	64.4	
2378-TCDF	0.554				ES 2378-TCDF	96.4	
12378-PeCDF	0.38			J	ES 12378-PeCDF	96.5	
23478-PeCDF	1.63			J	ES 23478-PeCDF	96.6	
123478-HxCDF	0.534			J	ES 123478-HxCDF	88.4	
123678-HxCDF	0.526			J	ES 123678-HxCDF	92	
234678-HxCDF	0.919			J	ES 234678-HxCDF	89.9	
123789-HxCDF	ND	0.112			ES 123789-HxCDF	82.2	
1234678-HpCDF	6.8				ES 1234678-HpCDF	82.1	
1234789-HpCDF	EMPC		0.322	J	ES 1234789-HpCDF	75.8	
OCDF	15.9				ES OCDF	63.2	
Totals					**Standard**	**CS/AS Recoveries**	
					CS 37Cl-2378-TCDD	92.2	
Total TCDD	14.2		15		CS 12347-PeCDD	106	
Total PeCDD	11.7		11.9		CS 12346-PeCDF	114	
Total HxCDD	11.4		11.7		CS 123469-HxCDF	117	
Total HpCDD	22.3		22.3		CS 1234689-HpCDF	103	
					AS 1368-TCDD	89.4	
Total TCDF	15.4		16.2		AS 1368-TCDF	96.3	
Total PeCDF	16.1		16.3				
Total HxCDF	12.6		13.9				
Total HpCDF	20.2		20.5				
Total PCDD/Fs	**209**		**213**				
ITEF TEQs							
TEQ: ND=0	1.74		1.78				
TEQ: ND=DL/2	1.78		1.82				
TEQ: ND=DL	1.83		1.85				

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Sample ID: EW10-SC21-5.3-7.8 — Method 1613

Client Data		Sample Data		Laboratory Data			
Name:	Windward Environmental, LLC	Matrix:	Solids	Lab Project ID:	A2871	Date Received:	14 Dec 2010
Project ID:	EW Source Control	Weight/Volume:	10.27 g	Lab Sample ID	A2871_8384_DF_013	Date Extracted:	27 Dec 2010
Date Collected:	22 Apr 2010	% Solids:	75.5 %	QC Batch No:	8384	Date Analyzed:	01 Jan 2011
		Split:	-	Dilution:	-	Time Analyzed:	03:13:44

Analyte	Conc. (pg/g)	DL (pg/g)	EMPC (pg/g)	Qualifiers	Standard	ES Recoveries	Qualifiers
2378-TCDD	ND	0.0578			ES 2378-TCDD	88.2	
12378-PeCDD	ND	0.0654			ES 12378-PeCDD	84.5	
123478-HxCDD	ND	0.0725			ES 123478-HxCDD	82.7	
123678-HxCDD	ND	0.0787			ES 123678-HxCDD	84.1	
123789-HxCDD	0.194			J	ES 123789-HxCDD	80.6	
1234678-HpCDD	2.34			J	ES 1234678-HpCDD	81.4	
OCDD	17.2				ES OCDD	59.8	
2378-TCDF	ND	0.0449			ES 2378-TCDF	91.2	
12378-PeCDF	ND	0.0479			ES 12378-PeCDF	85.6	
23478-PeCDF	ND	0.0411			ES 23478-PeCDF	84.8	
123478-HxCDF	ND	0.0572			ES 123478-HxCDF	86.5	
123678-HxCDF	ND	0.0543			ES 123678-HxCDF	86.1	
234678-HxCDF	ND	0.0555			ES 234678-HxCDF	87.8	
123789-HxCDF	ND	0.0789			ES 123789-HxCDF	80.6	
1234678-HpCDF	0.301			J	ES 1234678-HpCDF	78.5	
1234789-HpCDF	ND	0.0738			ES 1234789-HpCDF	76.3	
OCDF	0.738			J	ES OCDF	61.2	
Totals					**Standard**	**CS/AS Recoveries**	
					CS 37Cl-2378-TCDD	97.8	
Total TCDD	0.539		0.657		CS 12347-PeCDD	102	
Total PeCDD	ND		0.158		CS 12346-PeCDF	105	
Total HxCDD	1.68		1.68		CS 123469-HxCDF	119	
Total HpCDD	8.26		8.26		CS 1234689-HpCDF	102	
					AS 1368-TCDD	80.8	
Total TCDF	ND		0.106		AS 1368-TCDF	89.6	
Total PeCDF	ND	0.0444	ND				
Total HxCDF	ND		0.436				
Total HpCDF	0.899		0.899				
Total PCDD/Fs	**29.3**		**30.1**				
ITEF TEQs							
TEQ: ND=0	0.0637		0.0637				
TEQ: ND=DL/2	0.143		0.143				
TEQ: ND=DL	0.222		0.222				

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Sample ID: EW10-SC43-4-6 — Method 1613

Client Data		Sample Data		Laboratory Data			
Name:	Windward Environmental, LLC	Matrix:	Solids	Lab Project ID:	A2871	Date Received:	14 Dec 2010
Project ID:	EW Source Control	Weight/Volume:	10.12 g	Lab Sample ID	A2871_8384_DF_014	Date Extracted:	27 Dec 2010
Date Collected:	22 Apr 2010	% Solids:	79.2 %	QC Batch No:	8384	Date Analyzed:	01 Jan 2011
		Split:	-	Dilution:	-	Time Analyzed:	04:03:35

Analyte	Conc. (pg/g)	DL (pg/g)	EMPC (pg/g)	Qualifiers	Standard	ES Recoveries	Qualifiers
2378-TCDD	ND	0.0597			ES 2378-TCDD	91.5	
12378-PeCDD	EMPC		0.156	J	ES 12378-PeCDD	94.1	
123478-HxCDD	EMPC		0.162	J	ES 123478-HxCDD	80.1	
123678-HxCDD	0.749			J	ES 123678-HxCDD	83.4	
123789-HxCDD	0.463			J	ES 123789-HxCDD	77.6	
1234678-HpCDD	15.1				ES 1234678-HpCDD	74.9	
OCDD	95				ES OCDD	62	
2378-TCDF	0.315			J	ES 2378-TCDF	92.5	
12378-PeCDF	0.22			J	ES 12378-PeCDF	86.6	
23478-PeCDF	0.979			J	ES 23478-PeCDF	87.4	
123478-HxCDF	0.733			J	ES 123478-HxCDF	80.4	
123678-HxCDF	EMPC		0.329	J	ES 123678-HxCDF	79.7	
234678-HxCDF	0.634			J	ES 234678-HxCDF	83.8	
123789-HxCDF	ND	0.0872			ES 123789-HxCDF	78.8	
1234678-HpCDF	5.45				ES 1234678-HpCDF	79.7	
1234789-HpCDF	0.388			J	ES 1234789-HpCDF	78.5	
OCDF	17.2				ES OCDF	61.7	
Totals					**Standard**	**CS/AS Recoveries**	
					CS 37Cl-2378-TCDD	101	
Total TCDD	0.356		1.47		CS 12347-PeCDD	106	
Total PeCDD	1.76		2.51		CS 12346-PeCDF	109	
Total HxCDD	6.2		6.36		CS 123469-HxCDF	113	
Total HpCDD	30.3		30.3		CS 1234689-HpCDF	104	
					AS 1368-TCDD	89.6	
Total TCDF	8.91		9.51		AS 1368-TCDF	93	
Total PeCDF	9.73		9.86				
Total HxCDF	9.47		10.1				
Total HpCDF	19.5		19.5				
Total PCDD/Fs	**198**		**202**				
ITEF TEQs							
TEQ: ND=0	1.11		1.24				
TEQ: ND=DL/2	1.17		1.27				
TEQ: ND=DL	1.23		1.31				

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Sample ID: EW10-SC14-5.3-7.3 — Method 1613

Client Data		Sample Data		Laboratory Data			
Name:	Windward Environmental, LLC	Matrix:	Solids	Lab Project ID:	A2871	Date Received:	14 Dec 2010
Project ID:	EW Source Control	Weight/Volume:	10.18 g	Lab Sample ID	A2871_8384_DF_015	Date Extracted:	27 Dec 2010
Date Collected:	22 Apr 2010	% Solids:	79.3 %	QC Batch No:	8384	Date Analyzed:	01 Jan 2011
		Split:	-	Dilution:	-	Time Analyzed:	04:53:18

Analyte	Conc. (pg/g)	DL (pg/g)	EMPC (pg/g)	Qualifiers	Standard	ES Recoveries	Qualifiers
2378-TCDD	ND	0.0476			ES 2378-TCDD	86.4	
12378-PeCDD	ND	0.0593			ES 12378-PeCDD	77.5	
123478-HxCDD	ND	0.0649			ES 123478-HxCDD	85.2	
123678-HxCDD	ND	0.0692			ES 123678-HxCDD	82.6	
123789-HxCDD	0.314			J	ES 123789-HxCDD	79.7	
1234678-HpCDD	1.95			J	ES 1234678-HpCDD	75.9	
OCDD	16.5				ES OCDD	62.8	
2378-TCDF	ND	0.0288			ES 2378-TCDF	91.9	
12378-PeCDF	ND	0.0358			ES 12378-PeCDF	88.6	
23478-PeCDF	ND	0.0326			ES 23478-PeCDF	89.5	
123478-HxCDF	ND	0.0361			ES 123478-HxCDF	84.8	
123678-HxCDF	ND	0.0335			ES 123678-HxCDF	86.1	
234678-HxCDF	ND	0.0356			ES 234678-HxCDF	87.2	
123789-HxCDF	ND	0.0535			ES 123789-HxCDF	78.3	
1234678-HpCDF	ND	0.0493			ES 1234678-HpCDF	78	
1234789-HpCDF	ND	0.0635			ES 1234789-HpCDF	78.9	
OCDF	ND	0.114			ES OCDF	61.6	
Totals					**Standard**	**CS/AS Recoveries**	
					CS 37Cl-2378-TCDD	93	
Total TCDD	0.124		0.366		CS 12347-PeCDD	104	
Total PeCDD	ND	0.0593	ND		CS 12346-PeCDF	110	
Total HxCDD	1.54		1.54		CS 123469-HxCDF	117	
Total HpCDD	4.58		4.58		CS 1234689-HpCDF	99.5	
					AS 1368-TCDD	92.8	
Total TCDF	ND	0.0288	ND		AS 1368-TCDF	97.2	
Total PeCDF	ND	0.0341	ND				
Total HxCDF	ND	0.0387	ND				
Total HpCDF	ND	0.0557	ND				
Total PCDD/Fs	**22.7**		**23**				
ITEF TEQs							
TEQ: ND=0	0.0674		0.0674				
TEQ: ND=DL/2	0.132		0.132				
TEQ: ND=DL	0.196		0.196				

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Round 2 Data

ANALYTICAL PERSPECTIVES

27 March 2011

Nate Lewis
Windward Environmental LLC
200 W. Mercer St. Suite 401
Seattle, WA 98119

Subject: Certificate of Results

Dear Nate;

Attached to this narrative are the analytical results you requested on the sample submitted for the determination of polychlorinated dibenzo-*p*-dioxins and dibenzofurans. The insert below summarizes the relevant information pertaining to your project. In particular, QC annotations bring to your attention specific analytical observations and assessments made during the sample handling and data interpretation phases. Results reported relate only to the items tested.

Project Information Summary	When applicable, see QC Annotations for details
Client Project No.	EW RI/FS Surface Sediment
AP Project No.	**A3041**
Analytical Protocol	EPA Method 1613
No. Samples Submitted	5
No. Samples Analyzed	5
No. Laboratory Method Blanks	1
No. OPRs / Batch CS3	1
No. Outstanding Samples	0
Date Received	24-Feb-2011
Condition Received	good
Temperature upon Receipt (C)	1
Extraction within Holding Time	yes
Analysis within Holding Time	yes
Data meet QA/QC Requirements	see below
Exceptions	see below
Analytical Difficulties	see below

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QC Annotations:

1. Please see Appendix A & B attached for data qualifier/attribute and lab identifier information.

2. 2,3,7,8-TCDD was found in the method blank. The impact of 2,3,7,8-TCDD within the method blank, on the samples contained within the project, has been qualified as appropriate.

Analytical Perspectives Certification IDs:

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Analytical Perspectives remains committed to serving you in the most effective manner. Should you have any questions or need additional information and technical support, please, do not hesitate to contact us. Thank you for choosing Analytical Perspectives as part of your analytical support team.

Sincerely,

Kimberly Mace, Ph.D.
Project Manager

APPENDIX A: DATA QUALIFIERS / DATA ATTRIBUTES	
*	The reported concentration exceeds the calibration range (upper point of the calibration curve).[1]
>	Indicates high recoveries. Shown with the numeric value at the top of the range.[1]
B	The analyte is found in the method blank, at a level that is <=10x the sample concentration.
C	Two or more congeners co-elute. In EDDs C denotes the lowest IUPAC congener in a co-elution group and additional co-eluters for the group are shown with the number of the lowest IUPAC co-eluter.
E	The reported concentration exceeds the calibration range (upper point of the calibration curve).
EMPC	Represents an Estimated Maximum Possible Concentration. EMPC's arise in cases where the signal/noise ratio is not sufficient for peak identification (the determined ion-abundance ratio is outside the allowed theoretical range), or where there is a co-eluting interference.
ETH	Indicates the presence of a diphenyl ether that appears to interfere with the quantitation of a furan. The reported concentration is the maximum.
H/h	If the standard recovery is below the method or SOP specified value "H" is assigned. If the obtained value is less than half the specified value "h" is assigned.[1]
J	Indicates that an analyte has a concentration below the reporting limit (lowest point of the calibration curve).
ND	Indicates a non-detect.
NR	Indicates a value that is not reportable.
PR	Due to interference, the associated congener is poorly resolved.
QI	Indicates the presence of a quantitative interference.
Ra	The new ratio – [Ra] -- for 2,3,7,8-TCDD following the $^{37}Cl_4$-2,3,7,8-TCDD correction is shown between squared brackets in the DL column.[1]
SI	Denotes "Single Ion Mode" and is utilized for PCBs where the secondary ion trace has a significantly elevated noise level due to background PFK. Responses for such peaks are calculated using an EMPC approach based solely on the primary ion area(s) and may be considered estimates.[1]
U	The analyte was not detected. The estimated detection limit (EDL) may be reported for this analyte.
V	The labeled standard recovery was found to be outside of the method control limits.
X	Indicates results reported from reinjection, refractionation, or repeat analyses.
APPENDIX B: LAB ID IDENTIFIERS	
AR	Indicates use of the archived portion of the sample extract.
CU	Indicates a sample that required additional clean-up prior to MS injection/processing.
D	Indicates a dilution of the sample extract. The number that follows the "D" indicates the dilution factor.
DE	Indicates a dilution performed with the addition of ES (extraction standard) solution.
DUP	Designation for a duplicate sample.
MS	Designation for a matrix spike.
MSD	Designation for a matrix spike duplicate.
RJ	Indicates a reinjection of the sample extract.
S	Indicates a sample split. The number that follows the "S" indicates the split factor.

[1]Denotes data qualifiers/attributes whose use will be phased out over time

A3041 - TEQ

Project ID: EW RI/FS Surface Sediment

Sample Summary
Part 1 (dry weight)

ANALYTICAL PERSPECTIVES

Method 1613

Analyte	MB1_8530_DF_SDS	EW09-SS-006-010	EW09-SS-009-010	EW09-SS-026-010	EW09-SS-102-010	EW10-SC100-0-1.1
	pg/g	pg/g	pg/g	pg/g	pg/g	pg/g
2,3,7,8-TCDD	1.58	0.463	0.829	1	1.15	1.42
1,2,3,7,8-PeCDD	(0.0424)	2.7	2.05	1.61	1.65	3.31
1,2,3,4,7,8-HxCDD	(0.043)	6.08	3.51	2.08	2.04	4.09
1,2,3,6,7,8-HxCDD	(0.0463)	39.4	17	10.7	10.4	21.6
1,2,3,7,8,9-HxCDD	(0.0502)	15.4	7.26	4.67	4.87	9.89
1,2,3,4,6,7,8-HpCDD	[0.102]	931	445	283	250	584
OCDD	[0.889]	7080	4070	2850	2090	5320
2,3,7,8-TCDF	(0.0224)	0.662	2.78	2.01	2.7	4.42
1,2,3,7,8-PeCDF	(0.0189)	1.39	1.96	1.32	1.44	2.89
2,3,4,7,8-PeCDF	(0.0175)	3.45	7.26	4.72	6.11	(0.077)
1,2,3,4,7,8-HxCDF	[0.0888]	4.81	10.5	5.42	7.27	15.6
1,2,3,6,7,8-HxCDF	(0.028)	2.3	3.75	2.58	3.04	6.19
2,3,4,6,7,8-HxCDF	(0.0319)	4.15	5.47	4.18	4.91	10.1
1,2,3,7,8,9-HxCDF	(0.0406)	(0.115)	2.21	(0.0987)	(0.135)	(0.2)
1,2,3,4,6,7,8-HpCDF	0.233	45.5	84.4	52.8	58.4	112
1,2,3,4,7,8,9-HpCDF	(0.057)	2.39	5.92	3.72	4.16	7.96
OCDF	[0.416]	63.8	281	176	193	319
ITEF TEQ (ND=0; EMPC=0)	**1.58**	**27.8**	**20.5**	**13.8**	**14.0**	**23.1**
ITEF TEQ (ND=0; EMPC=EMPC)	**1.59**	**27.8**	**20.5**	**13.8**	**14.0**	**23.1**
ITEF TEQ (ND=DL/2; EMPC=0)	**1.61**	**27.8**	**20.5**	**13.8**	**14.0**	**23.1**
ITEF TEQ (ND=DL/2; EMPC=EMPC)	**1.62**	**27.8**	**20.5**	**13.8**	**14.0**	**23.1**
ITEF TEQ (ND=DL; EMPC=EMPC)	**1.65**	**27.8**	**20.5**	**13.8**	**14.0**	**23.1**
Checkcode	830-006-JDW	885-222-NVC	222-062-CTF	304-230-CWZ	113-307-LVZ	918-884-LZS
Lab ID	MB1_8530_DF_SDS-RJ2	A3041_8530_DF_001-RJ2	A3041_8530_DF_002-RJ2	A3041_8530_DF_003-RJ2	A3041_8530_DF_004-RJ2	A3041_8530_DF_005-RJ2

( ) = DL
[ ] = EMPC

A3041 - TEQ

Project ID: EW RI/FS Surface Sediment

Sample Summary
Part 1 (wet weight)

ANALYTICAL PERSPECTIVES

Method 1613

Analyte	MB1_8530_DF_SDS	EW09-SS-006-010	EW09-SS-009-010	EW09-SS-026-010	EW09-SS-102-010	EW10-SC100-0-1.1
	pg/g	pg/g	pg/g	pg/g	pg/g	pg/g
2,3,7,8-TCDD	1.58	0.359	0.516	0.648	0.676	0.821
1,2,3,7,8-PeCDD	(0.0424)	2.1	1.28	1.04	0.97	1.91
1,2,3,4,7,8-HxCDD	(0.043)	4.72	2.19	1.35	1.2	2.36
1,2,3,6,7,8-HxCDD	(0.0463)	30.6	10.6	6.93	6.12	12.5
1,2,3,7,8,9-HxCDD	(0.0502)	12	4.52	3.03	2.86	5.72
1,2,3,4,6,7,8-HpCDD	[0.102]	722	277	183	147	338
OCDD	[0.889]	5490	2540	1850	1230	3070
2,3,7,8-TCDF	(0.0224)	0.514	1.73	1.3	1.59	2.55
1,2,3,7,8-PeCDF	(0.0189)	1.08	1.22	0.855	0.847	1.67
2,3,4,7,8-PeCDF	(0.0175)	2.68	4.52	3.06	3.59	(0.077)
1,2,3,4,7,8-HxCDF	[0.0888]	3.73	6.54	3.51	4.27	9.02
1,2,3,6,7,8-HxCDF	(0.028)	1.78	2.34	1.67	1.79	3.58
2,3,4,6,7,8-HxCDF	(0.0319)	3.22	3.41	2.71	2.89	5.84
1,2,3,7,8,9-HxCDF	(0.0406)	(0.115)	1.38	(0.0987)	(0.135)	(0.2)
1,2,3,4,6,7,8-HpCDF	0.233	35.3	52.6	34.2	34.3	64.7
1,2,3,4,7,8,9-HpCDF	(0.057)	1.85	3.69	2.41	2.45	4.6
OCDF	[0.416]	49.5	175	114	113	184
ITEF TEQ (ND=0; EMPC=0)	**1.58**	**21.6**	**12.8**	**8.95**	**8.25**	**13.3**
ITEF TEQ (ND=0; EMPC=EMPC)	**1.59**	**21.6**	**12.8**	**8.95**	**8.25**	**13.3**
ITEF TEQ (ND=DL/2; EMPC=0)	**1.61**	**21.6**	**12.8**	**8.95**	**8.25**	**13.4**
ITEF TEQ (ND=DL/2; EMPC=EMPC)	**1.62**	**21.6**	**12.8**	**8.95**	**8.25**	**13.4**
ITEF TEQ (ND=DL; EMPC=EMPC)	**1.65**	**21.6**	**12.8**	**8.96**	**8.26**	**13.4**
Checkcode	830-006-JDW	885-222-NVC	222-062-CTF	304-230-CWZ	113-307-LVZ	918-884-LZS
Lab ID	MB1_8530_DF_SDS-RJ2	A3041_8530_DF_001-RJ2	A3041_8530_DF_002-RJ2	A3041_8530_DF_003-RJ2	A3041_8530_DF_004-RJ2	A3041_8530_DF_005-RJ2

( ) = DL
[ ] = EMPC

A3041 - WHO-2005-TEQ

Project ID: EW RI/FS Surface Sediment

Sample Summary
Part 1 (dry weight)

ANALYTICAL PERSPECTIVES

Method 1613

Analyte	MB1_8530_DF_SDS	EW09-SS-006-010	EW09-SS-009-010	EW09-SS-026-010	EW09-SS-102-010	EW10-SC100-0-1.1
	pg/g	pg/g	pg/g	pg/g	pg/g	pg/g
2,3,7,8-TCDD	1.58	0.463	0.829	1	1.15	1.42
1,2,3,7,8-PeCDD	(0.0424)	2.7	2.05	1.61	1.65	3.31
1,2,3,4,7,8-HxCDD	(0.043)	6.08	3.51	2.08	2.04	4.09
1,2,3,6,7,8-HxCDD	(0.0463)	39.4	17	10.7	10.4	21.6
1,2,3,7,8,9-HxCDD	(0.0502)	15.4	7.26	4.67	4.87	9.89
1,2,3,4,6,7,8-HpCDD	[0.102]	931	445	283	250	584
OCDD	[0.889]	7080	4070	2850	2090	5320
2,3,7,8-TCDF	(0.0224)	0.662	2.78	2.01	2.7	4.42
1,2,3,7,8-PeCDF	(0.0189)	1.39	1.96	1.32	1.44	2.89
2,3,4,7,8-PeCDF	(0.0175)	3.45	7.26	4.72	6.11	(0.077)
1,2,3,4,7,8-HxCDF	[0.0888]	4.81	10.5	5.42	7.27	15.6
1,2,3,6,7,8-HxCDF	(0.028)	2.3	3.75	2.58	3.04	6.19
2,3,4,6,7,8-HxCDF	(0.0319)	4.15	5.47	4.18	4.91	10.1
1,2,3,7,8,9-HxCDF	(0.0406)	(0.115)	2.21	(0.0987)	(0.135)	(0.2)
1,2,3,4,6,7,8-HpCDF	0.233	45.5	84.4	52.8	58.4	112
1,2,3,4,7,8,9-HpCDF	(0.057)	2.39	5.92	3.72	4.16	7.96
OCDF	[0.416]	63.8	281	176	193	319
WHO-2005 TEQ (ND=0; EMPC=0)	**1.58**	**23.4**	**17.0**	**11.5**	**12.0**	**20.7**
WHO-2005 TEQ (ND=0; EMPC=EMPC)	**1.59**	**23.4**	**17.0**	**11.5**	**12.0**	**20.7**
WHO-2005 TEQ (ND=DL/2; EMPC=0)	**1.62**	**23.4**	**17.0**	**11.5**	**12.0**	**20.8**
WHO-2005 TEQ (ND=DL/2; EMPC=EMPC)	**1.63**	**23.4**	**17.0**	**11.5**	**12.0**	**20.8**
WHO-2005 TEQ (ND=DL; EMPC=EMPC)	**1.67**	**23.5**	**17.0**	**11.5**	**12.0**	**20.8**
Checkcode	830-006-JDW	885-222-NVC	222-062-CTF	304-230-CWZ	113-307-LVZ	918-884-LZS
Lab ID	MB1_8530_DF_SDS-RJ2	A3041_8530_DF_001-RJ2	A3041_8530_DF_002-RJ2	A3041_8530_DF_003-RJ2	A3041_8530_DF_004-RJ2	A3041_8530_DF_005-RJ2

( ) = DL
[ ] = EMPC

A3041 - Totals

Project ID: EW RI/FS Surface Sediment

Sample Summary
Part 2 (dry weight)

ANALYTICAL PERSPECTIVES

Method 1613

Analyte	MB1_8530_DF_SDS	EW09-SS-006-010	EW09-SS-009-010	EW09-SS-026-010	EW09-SS-102-010	EW10-SC100-0-1.1
	pg/g	pg/g	pg/g	pg/g	pg/g	pg/g
Totals						
TCDDs	1.58	2.49	9.26	15.7	11.7	15.4
PeCDDs	0	11	23.2	22	17.8	32.7
HxCDDs	0	198	147	89.8	82.3	179
HpCDDs	0	2060	1200	781	661	1760
OCDD	0.889	7080	4070	2850	2090	5320
TCDFs	0	8.15	64.6	35.3	44.6	61.4
PeCDFs	0	29.6	81.1	55.8	75.7	135
HxCDFs	0.0604	120	123	78.8	92.3	193
HpCDFs	0.233	148	303	186	203	384
OCDF	0.416	63.8	281	176	193	319
Total PCDD/Fs (ND=0; EMPC=0)	**1.87**	**9,720**	**6,300**	**4,290**	**3,470**	**8,400**
Total PCDD/Fs (ND=0; EMPC=EMPC)	**3.56**	**9,720**	**6,300**	**4,290**	**3,470**	**8,410**
Total PCDD/Fs (2378-X ND=DL; EMPC=EMPC)	**3.95**	**9,720**	**6,300**	**4,290**	**3,470**	**8,410**
Total 2378s (ND=0; EMPC=0)	**1.81**	**8,200**	**4,950**	**3,410**	**2,640**	**6,420**
Total 2378s (ND=0.5; EMPC=0)	**2.14**	**8,200**	**4,950**	**3,410**	**2,640**	**6,430**
Total 2378s (ND=1; EMPC=0)	**2.46**	**8,200**	**4,950**	**3,410**	**2,640**	**6,430**
Total 2378s (ND=0; EMPC=1)	**3.31**	**8,200**	**4,950**	**3,410**	**2,640**	**6,420**
Total 2378s (ND=0.5; EMPC=1)	**3.51**	**8,200**	**4,950**	**3,410**	**2,640**	**6,430**
Total 2378s (ND=1; EMPC=1)	**3.71**	**8,200**	**4,950**	**3,410**	**2,640**	**6,430**
Checkcode	830-006-JDW	885-222-NVC	222-062-CTF	304-230-CWZ	113-307-LVZ	918-884-LZS
Lab ID	MB1_8530_DF_SDS-RJ2	A3041_8530_DF_001-RJ2	A3041_8530_DF_002-RJ2	A3041_8530_DF_003-RJ2	A3041_8530_DF_004-RJ2	A3041_8530_DF_005-RJ2

( ) = DL
[ ] = EMPC

A3041 - Totals

Project ID: EW RI/FS Surface Sediment

Sample Summary
Part 2 (wet weight)

ANALYTICAL PERSPECTIVES

Method 1613

Analyte	MB1_8530_DF_SDS	EW09-SS-006-010	EW09-SS-009-010	EW09-SS-026-010	EW09-SS-102-010	EW10-SC100-0-1.1
	pg/g	pg/g	pg/g	pg/g	pg/g	pg/g
Totals						
TCDDs	1.58	1.93	5.77	10.2	6.87	8.9
PeCDDs	0	8.56	14.4	14.3	10.5	18.9
HxCDDs	0	154	91.5	58.2	48.4	104
HpCDDs	0	1600	747	506	389	1020
OCDD	0	5490	2540	1850	1230	3070
TCDFs	0	6.33	40.3	22.8	26.2	35.5
PeCDFs	0	23	50.5	36.2	44.5	77.9
HxCDFs	0.0604	92.8	76.8	51.1	54.3	112
HpCDFs	0.233	115	189	121	119	222
OCDF	0	49.5	175	114	113	184
Total PCDD/Fs (ND=0; EMPC=0)	**1.87**	**7,540**	**3,920**	**2,780**	**2,040**	**4,860**
Total PCDD/Fs (ND=0; EMPC=EMPC)	**3.56**	**7,550**	**3,930**	**2,780**	**2,040**	**4,860**
Total PCDD/Fs (2378-X ND=DL; EMPC=EMPC)	**3.95**	**7,550**	**3,930**	**2,780**	**2,040**	**4,860**
Total 2378s (ND=0; EMPC=0)	**1.81**	**6,360**	**3,080**	**2,210**	**1,550**	**3,710**
Total 2378s (ND=0.5; EMPC=0)	**2.14**	**6,360**	**3,080**	**2,210**	**1,550**	**3,710**
Total 2378s (ND=1; EMPC=0)	**2.46**	**6,360**	**3,080**	**2,210**	**1,550**	**3,710**
Total 2378s (ND=0; EMPC=1)	**3.31**	**6,360**	**3,080**	**2,210**	**1,550**	**3,710**
Total 2378s (ND=0.5; EMPC=1)	**3.51**	**6,360**	**3,080**	**2,210**	**1,550**	**3,710**
Total 2378s (ND=1; EMPC=1)	**3.71**	**6,360**	**3,080**	**2,210**	**1,550**	**3,710**
Checkcode	830-006-JDW	885-222-NVC	222-062-CTF	304-230-CWZ	113-307-LVZ	918-884-LZS
Lab ID	MB1_8530_DF_SDS-RJ2	A3041_8530_DF_001-RJ2	A3041_8530_DF_002-RJ2	A3041_8530_DF_003-RJ2	A3041_8530_DF_004-RJ2	A3041_8530_DF_005-RJ2

( ) = DL
[ ] = EMPC

A3041 - Others

Project ID: EW RI/FS Surface Sediment

Sample Summary
Part 3 (dry weight)

ANALYTICAL PERSPECTIVES

Method 1613

Analyte	MB1_8530_DF_SDS	EW09-SS-006-010	EW09-SS-009-010	EW09-SS-026-010	EW09-SS-102-010	EW10-SC100-0-1.1
	pg/g	pg/g	pg/g	pg/g	pg/g	pg/g
Other PCDD/Fs (ND=0, EMPC=0)						
Other TCDD	0	2.03	8.43	14.7	10.5	14
Other PeCDD	0	8.33	21.1	20.4	16.1	29.4
Other HxCDD	0	137	119	72.4	65	144
Other HpCDD	0	1130	754	498	411	1180
Other TCDF	0	7.49	61.8	33.2	41.9	57
Other PeCDF	0	24.7	71.9	49.8	68.1	120
Other HxCDF	0.0604	105	101	65.2	75.4	157
Other HpCDF	0	100	213	130	140	264
Other PCDD/Fs (ND=0, EMPC=EMPC)						
Other TCDD	0.0658	2.39	8.64	14.9	11	14.3
Other PeCDD	0	10.7	21.1	20.4	17.6	30.1
Other HxCDD	0	137	119	72.4	65	144
Other HpCDD	0.12	1130	754	498	411	1180
Other TCDF	0	8.76	63.6	33.5	41.9	57
Other PeCDF	0	24.8	71.9	50.3	68.1	123
Other HxCDF	0.0604	106	102	65.2	75.9	158
Other HpCDF	0	101	213	130	140	264
Checkcode	830-006-JDW	885-222-NVC	222-062-CTF	304-230-CWZ	113-307-LVZ	918-884-LZS
Lab ID	MB1_8530_DF_SDS-RJ2	A3041_8530_DF_001-RJ2	A3041_8530_DF_002-RJ2	A3041_8530_DF_003-RJ2	A3041_8530_DF_004-RJ2	A3041_8530_DF_005-RJ2

( ) = DL
[ ] = EMPC

A3041 - DLs

Project ID: EW RI/FS Surface Sediment

Sample Summary
Part 5 (DLs) (dry weight)

ANALYTICAL PERSPECTIVES

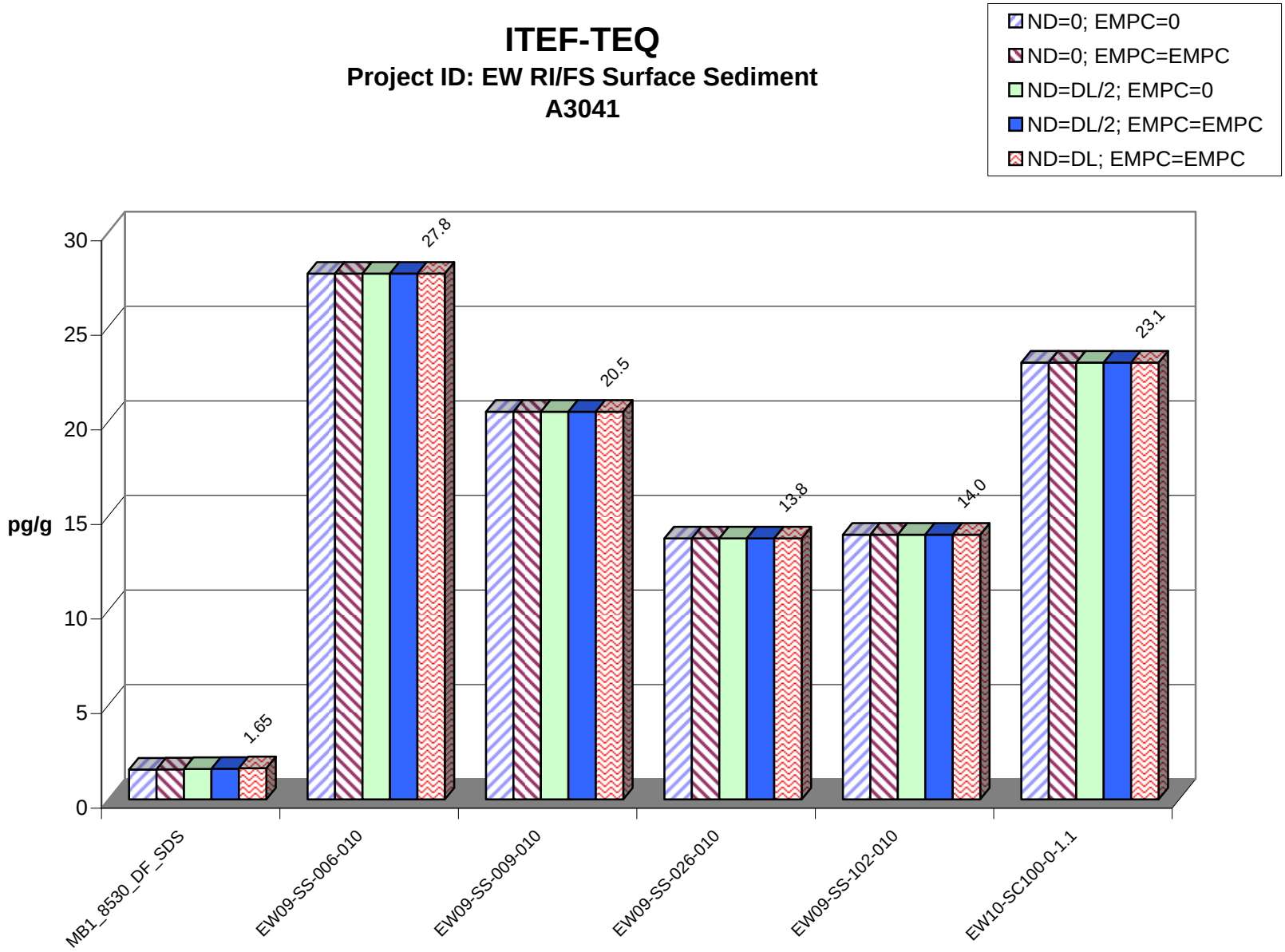
Method 1613

Analyte	MB1_8530_DF_SDS	EW09-SS-006-010	EW09-SS-009-010	EW09-SS-026-010	EW09-SS-102-010	EW10-SC100-0-1.1
	pg/g	pg/g	pg/g	pg/g	pg/g	pg/g
2,3,7,8-TCDD	0.0308	0.0254	0.0448	0.0384	0.0369	0.0395
1,2,3,7,8-PeCDD	0.0424	0.0414	0.0683	0.0745	0.109	0.0919
1,2,3,4,7,8-HxCDD	0.043	0.161	0.149	0.0979	0.111	0.0898
1,2,3,6,7,8-HxCDD	0.0463	0.164	0.164	0.0975	0.11	0.101
1,2,3,7,8,9-HxCDD	0.0502	0.18	0.15	0.104	0.122	0.109
1,2,3,4,6,7,8-HpCDD	0.0586	0.0765	0.103	0.123	0.116	0.143
OCDD	0.0921	0.0836	0.113	0.15	0.14	0.124
2,3,7,8-TCDF	0.0224	0.0195	0.03	0.0311	0.0316	0.0442
1,2,3,7,8-PeCDF	0.0189	0.0464	0.0572	0.0661	0.0632	0.0895
2,3,4,7,8-PeCDF	0.0175	0.0445	0.0549	0.057	0.0571	0.077
1,2,3,4,7,8-HxCDF	0.0306	0.0942	0.121	0.0772	0.106	0.143
1,2,3,6,7,8-HxCDF	0.028	0.084	0.126	0.0717	0.102	0.135
2,3,4,6,7,8-HxCDF	0.0319	0.105	0.166	0.0783	0.111	0.147
1,2,3,7,8,9-HxCDF	0.0406	0.115	0.0643	0.0987	0.135	0.2
1,2,3,4,6,7,8-HpCDF	0.0437	0.0495	0.0615	0.0793	0.0691	0.0489
1,2,3,4,7,8,9-HpCDF	0.057	0.0763	0.0845	0.104	0.0899	0.0654
OCDF	0.0687	0.0606	0.0804	0.0966	0.105	0.132
Total TCDD	0.0308	0.0254	0.0448	0.0384	0.0369	0.0395
Total PeCDD	0.0424	0.0414	0.0683	0.0745	0.109	0.0919
Total HxCDD	0.0464	0.168	0.154	0.0994	0.114	0.1
Total HpCDD	0.0586	0.0765	0.103	0.123	0.116	0.143
Total TCDF	0.0224	0.0195	0.03	0.0311	0.0316	0.0442
Total PeCDF	0.0182	0.0454	0.056	0.0614	0.06	0.0829
Total HxCDF	0.0323	0.0985	0.116	0.0807	0.113	0.154
Total HpCDF	0.0499	0.0616	0.0724	0.0911	0.0786	0.0564
Checkcode	830-006-JDW	885-222-NVC	222-062-CTF	304-230-CWZ	113-307-LVZ	918-884-LZS
Lab ID	MB1_8530_DF_SDS-RJ2	A3041_8530_DF_001-RJ2	A3041_8530_DF_002-RJ2	A3041_8530_DF_003-RJ2	A3041_8530_DF_004-RJ2	A3041_8530_DF_005-RJ2

ITEF-TEQ

Project ID: EW RI/FS Surface Sediment

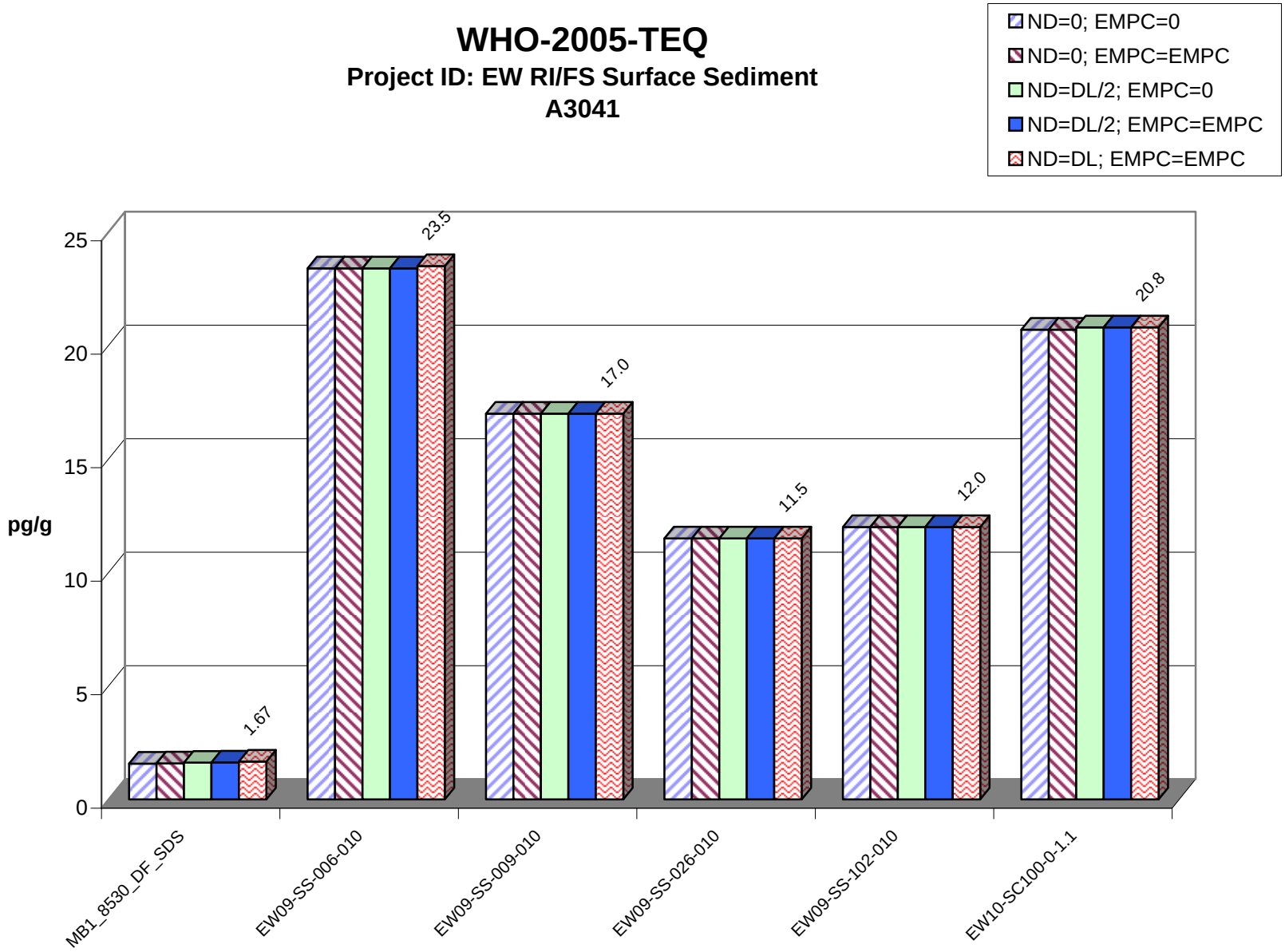
A3041



WHO-2005-TEQ

Project ID: EW RI/FS Surface Sediment

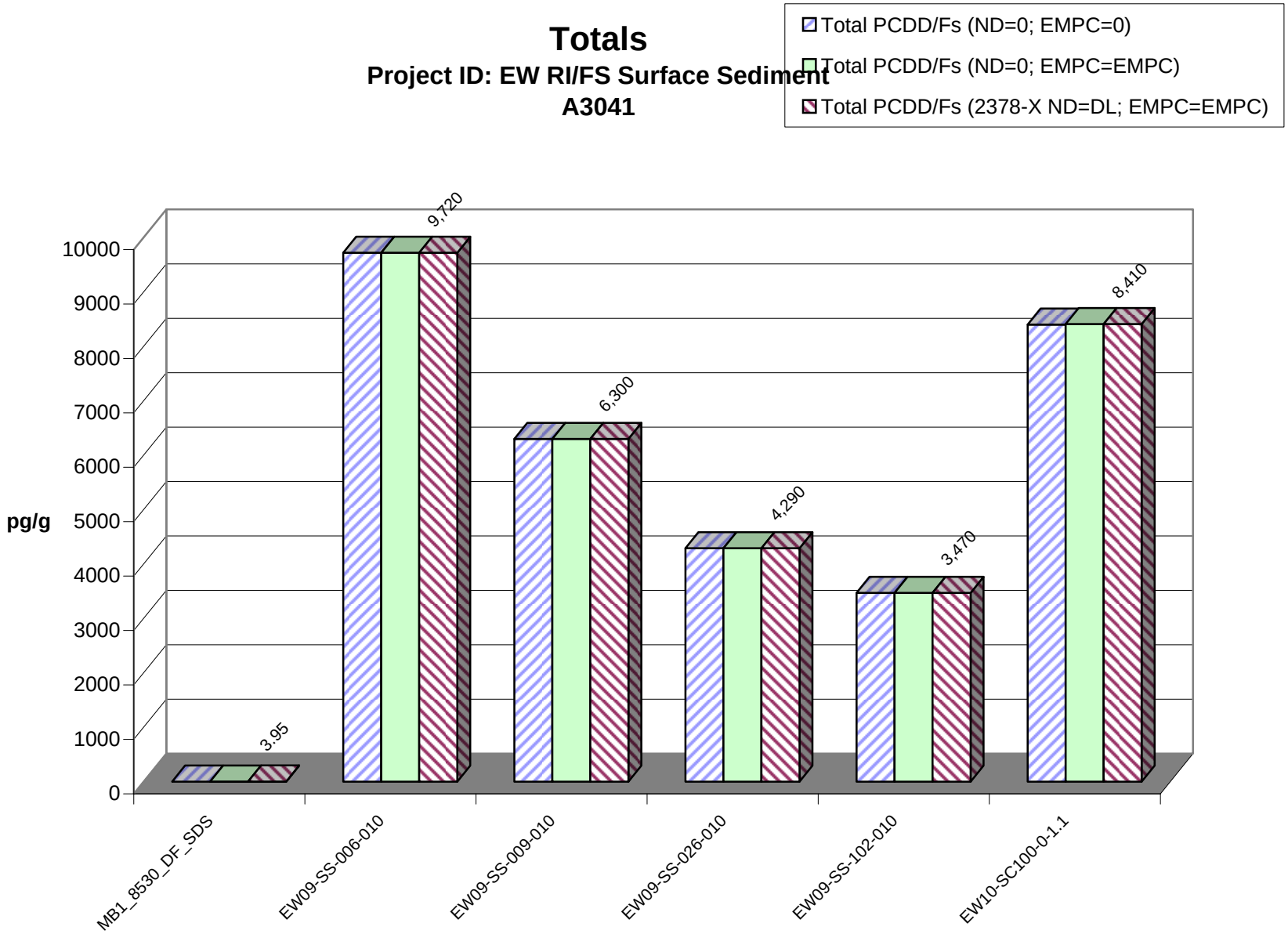
A3041

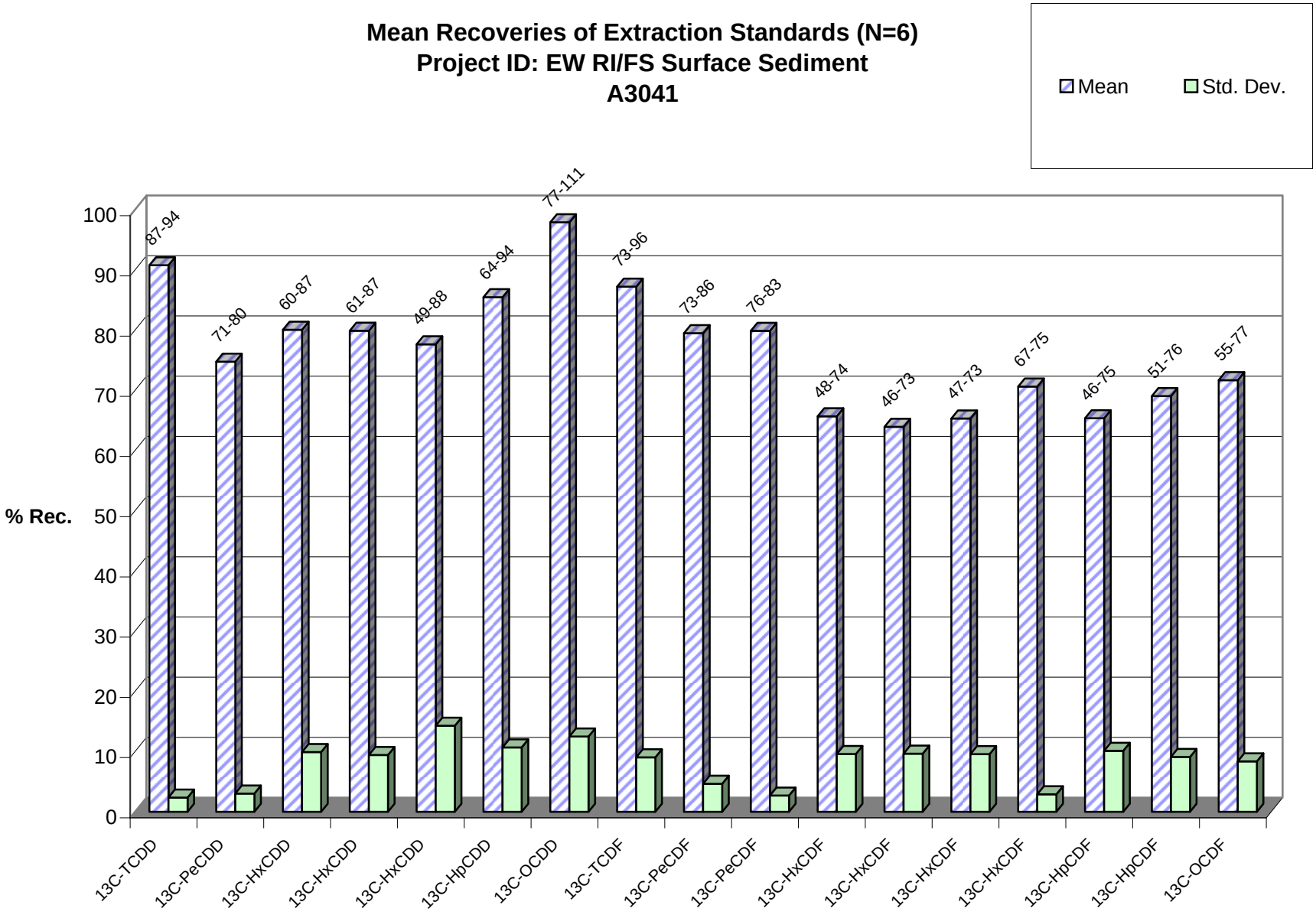


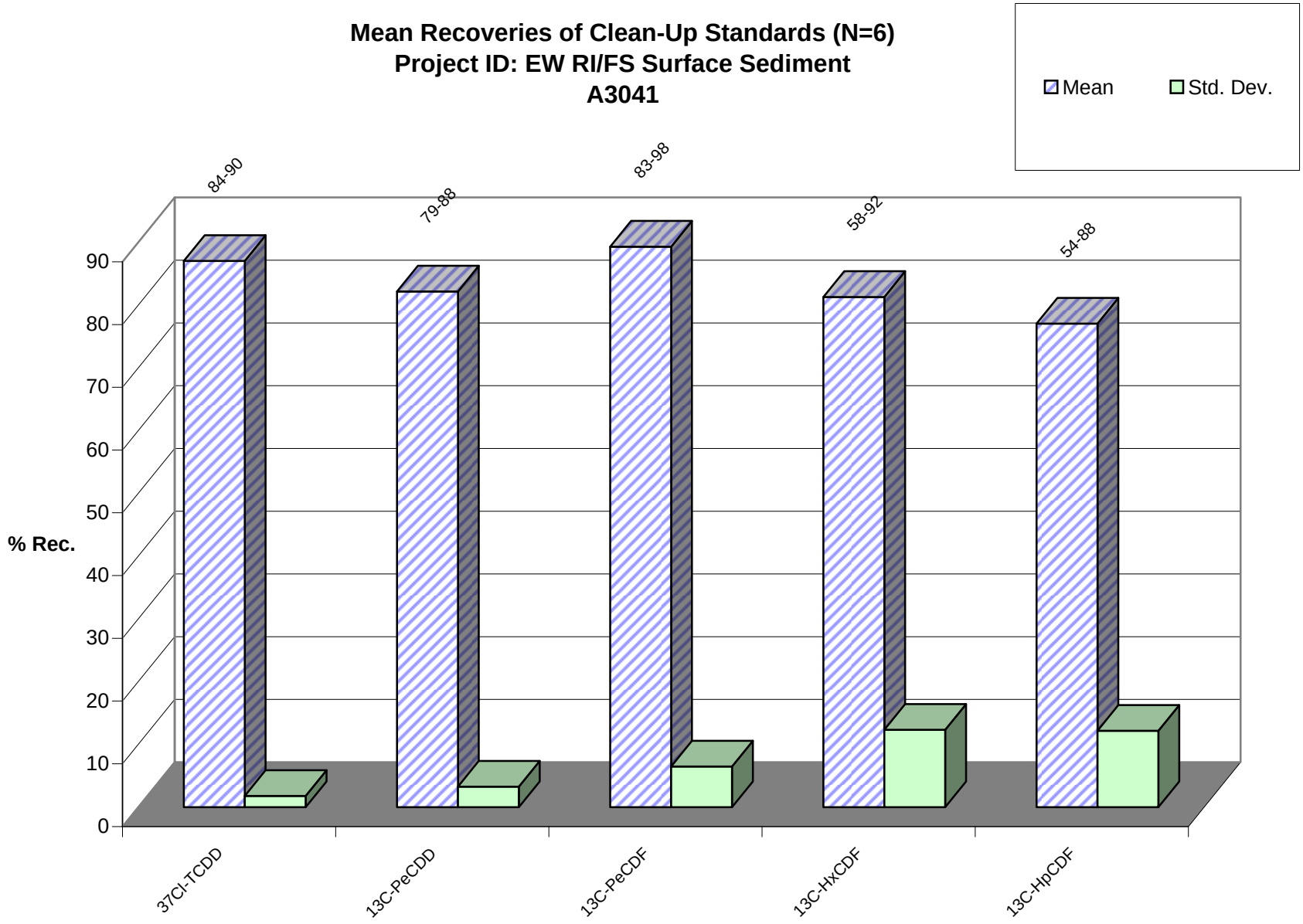
Totals

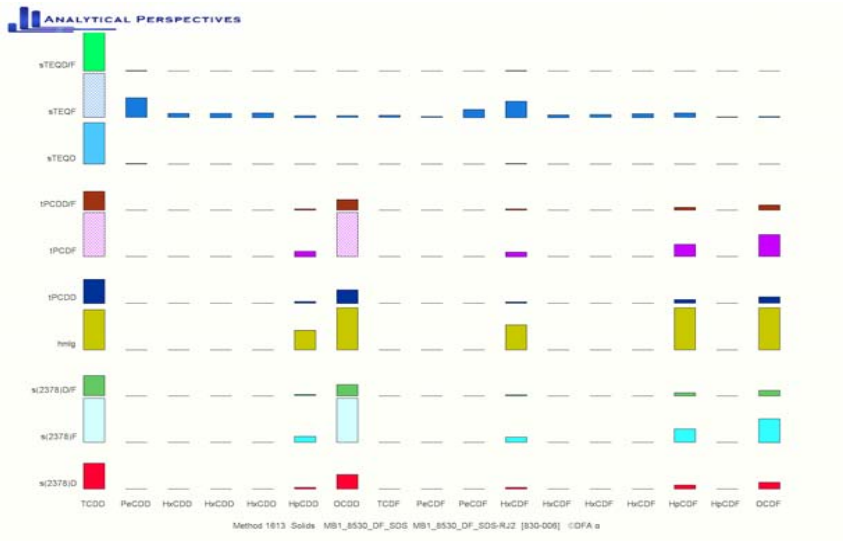
Project ID: EW RI/FS Surface Sediment

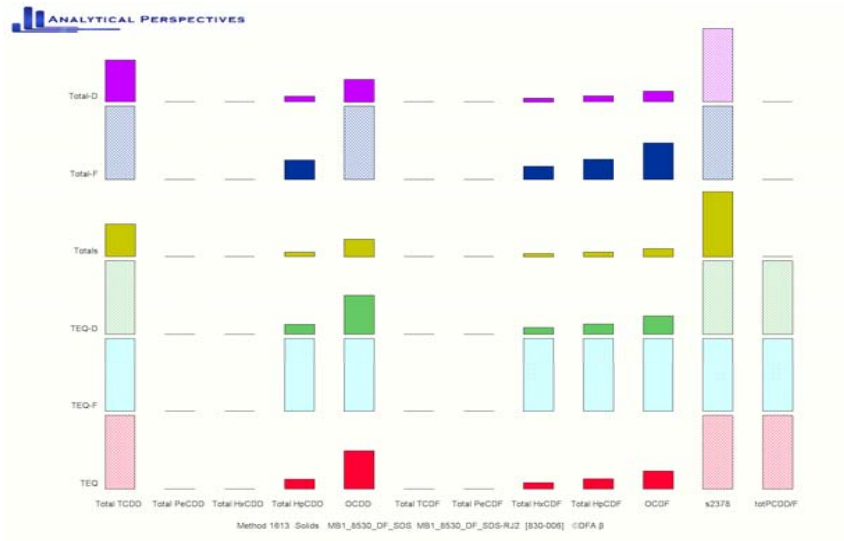
A3041

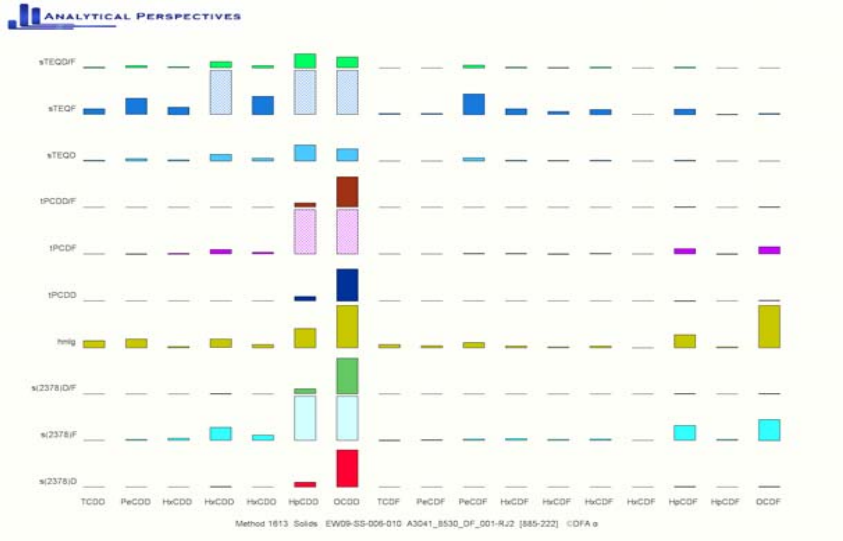


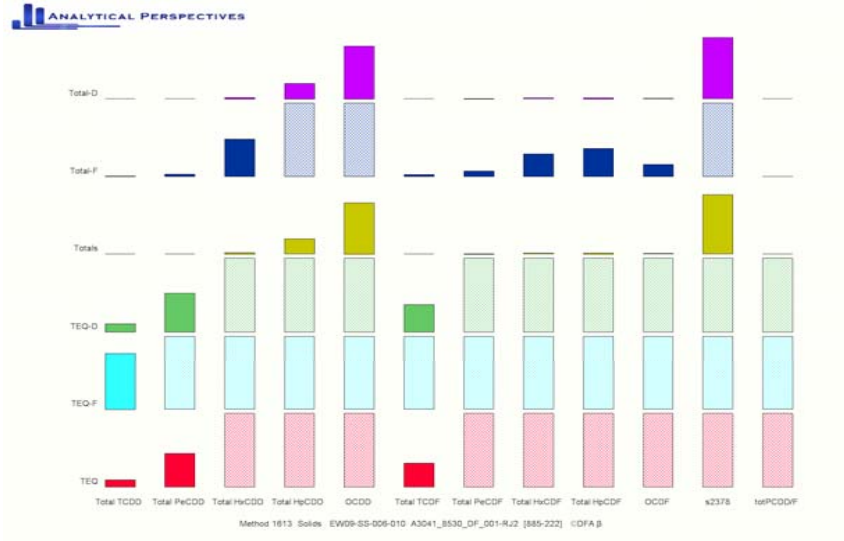

Mean Recoveries of Extraction Standards (N=6)
Project ID: EW RI/FS Surface Sediment
A3041
Mean
Std. Dev.
% Rec.
0
10
20
30
40
50
60
70
80
90
100
87-94
71-80
60-87
61-87
49-88
64-94
77-111
73-96
73-86
76-83
48-74
46-73
47-73
67-75
46-75
51-76
55-77
13C-TCDD
13C-PeCDD
13C-HxCDD
13C-HxCDD
13C-HxCDD
13C-HpCDD
13C-OCDD
13C-TCDF
13C-PeCDF
13C-PeCDF
13C-HxCDF
13C-HxCDF
13C-HxCDF
13C-HxCDF
13C-HpCDF
13C-HpCDF
13C-OCDF

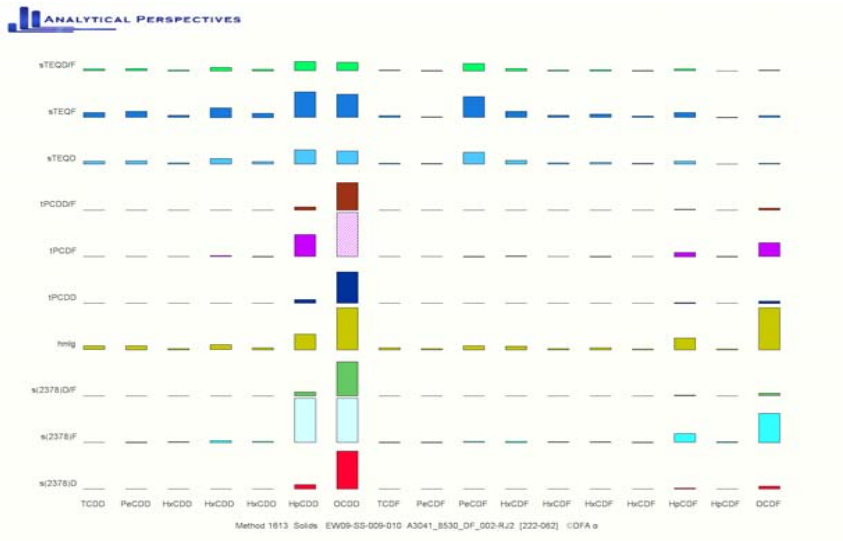

Mean Recoveries of Clean-Up Standards (N=6)
Project ID: EW RI/FS Surface Sediment
A3041
Mean
Std. Dev.
% Rec.
0
10
20
30
40
50
60
70
80
90
84-90
79-88
83-98
58-92
54-88
37Cl-TCDD
13C-PeCDD
13C-PeCDF
13C-HxCDF
13C-HpCDF

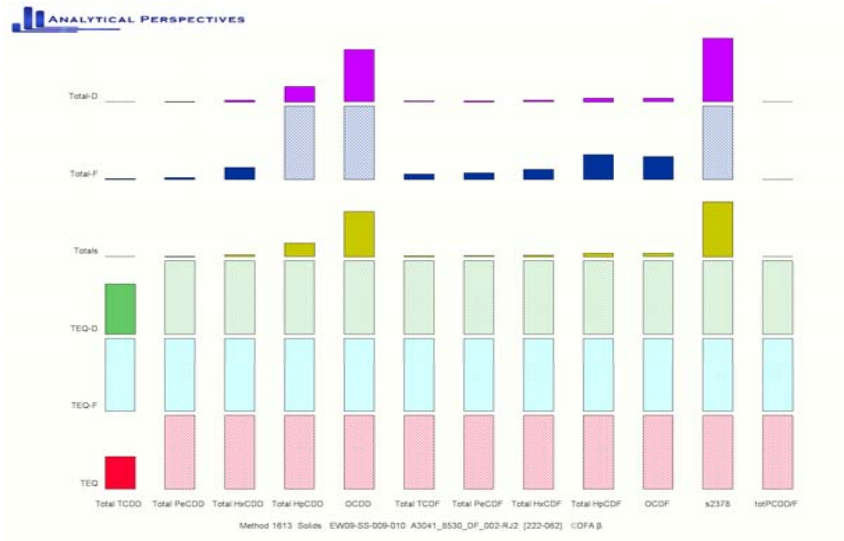

ANALYTICAL PERSPECTIVES
sTEQD/F
sTEQF
sTEQD
tPCDD/F
tPCDF
tPCDD
hmlg
s(2378)D/F
s(2378)F
s(2378)D
TCDD PeCDD HxCDD HxCDD HxCDD HpCDD OCDD TCDF PeCDF PeCDF HxCDF HxCDF HxCDF HxCDF HpCDF HpCDF OCDF
Method 1613 Solids MB1_8530_DF_SDS MB1_8530_DF_SDS-RJ2 [830-006] ©DFA α

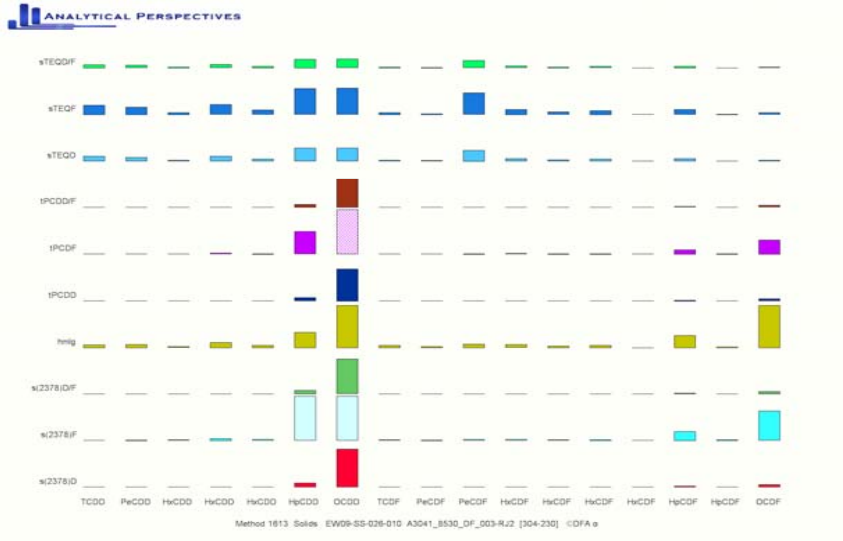

ANALYTICAL PERSPECTIVES
Total-D
Total-F
Totals
TEQ-D
TEQ-F
TEQ
Total TCDD Total PeCDD Total HxCDD Total HpCDD OCDD Total TCDF Total PeCDF Total HxCDF Total HpCDF OCDF s2378 totPCDD/F
Method 1613 Solids MB1_8530_DF_SDS MB1_8530_DF_SDS-RJ2 [830-006] ©DFA β

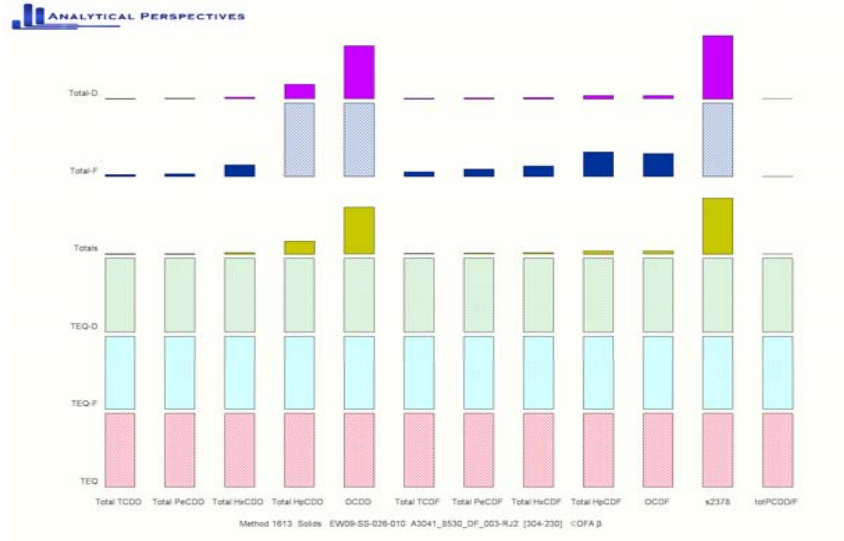

ANALYTICAL PERSPECTIVES
sTEQD/F
sTEQF
sTEQD
tPCDD/F
tPCDF
tPCDD
hmlg
s(2378)D/F
s(2378)F
s(2378)D
TCDD PeCDD HxCDD HxCDD HxCDD HpCDD OCDD TCDF PeCDF PeCDF HxCDF HxCDF HxCDF HxCDF HpCDF HpCDF OCDF
Method 1613 Solids EW09-SS-006-010 A3041_8530_DF_001-RJ2 [885-222] ©DFA α


ANALYTICAL PERSPECTIVES
Total-D
Total-F
Totals
TEQ-D
TEQ-F
TEQ
Total TCDD Total PeCDD Total HxCDD Total HpCDD OCDD Total TCDF Total PeCDF Total HxCDF Total HpCDF OCDF s2378 totPCDD/F
Method 1613 Solids EW09-SS-006-010 A3041_8530_DF_001-RJ2 [885-222] ©DFA β

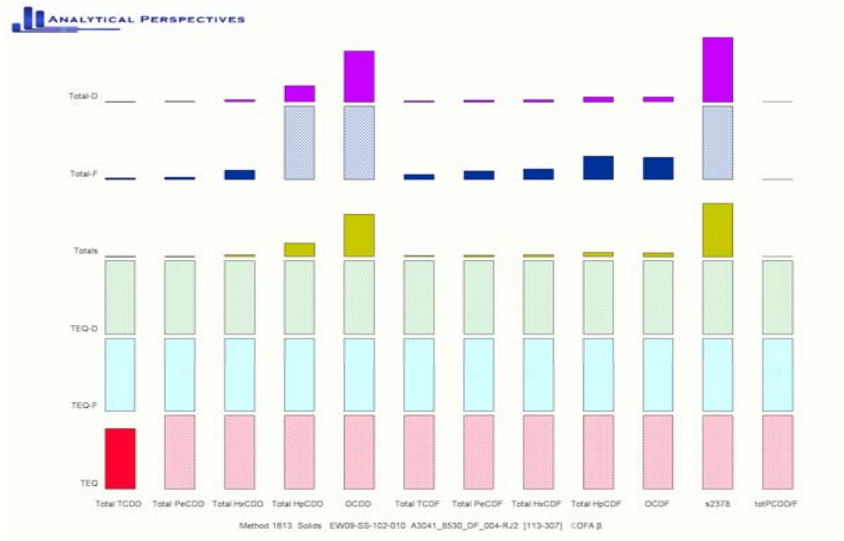

ANALYTICAL PERSPECTIVES
sTEQD/F
sTEQF
sTEQD
tPCDD/F
tPCDF
tPCDD
hmlg
s(2378)D/F
s(2378)F
s(2378)D
TCDD PeCDD HxCDD HxCDD HxCDD HpCDD OCDD TCDF PeCDF PeCDF HxCDF HxCDF HxCDF HxCDF HpCDF HpCDF OCDF
Method 1613 Solids EW09-SS-009-010 A3041_8530_OF_002-RJ2 [222-062] ©DFA α

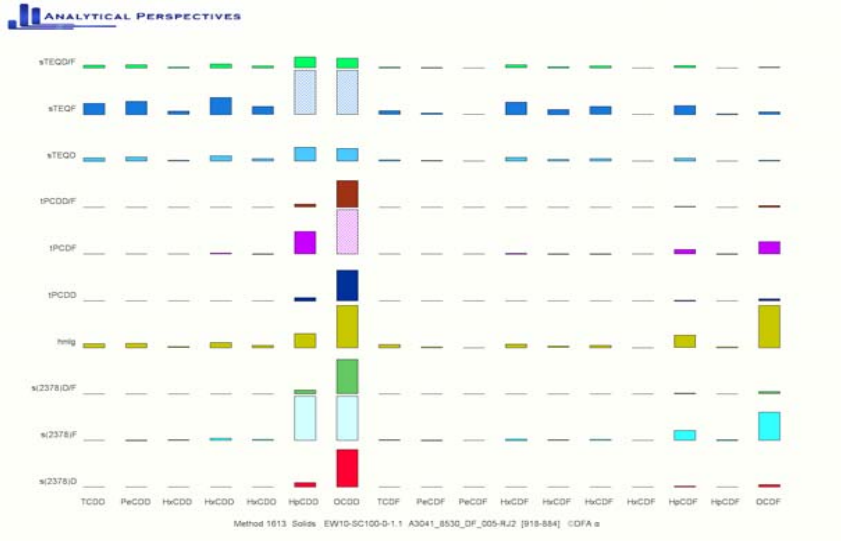

ANALYTICAL PERSPECTIVES
Total-D
Total-F
Totals
TEQ-D
TEQ-F
TEQ
Total TCDD Total PeCDD Total HxCDD Total HpCDD OCDD Total TCDF Total PeCDF Total HxCDF Total HpCDF OCDF s2378 totPCDD/F
Method 1613 Solids EW09-SS-009-010 A3041_8530_OF_002-RJ2 [222-062] ©DFA β

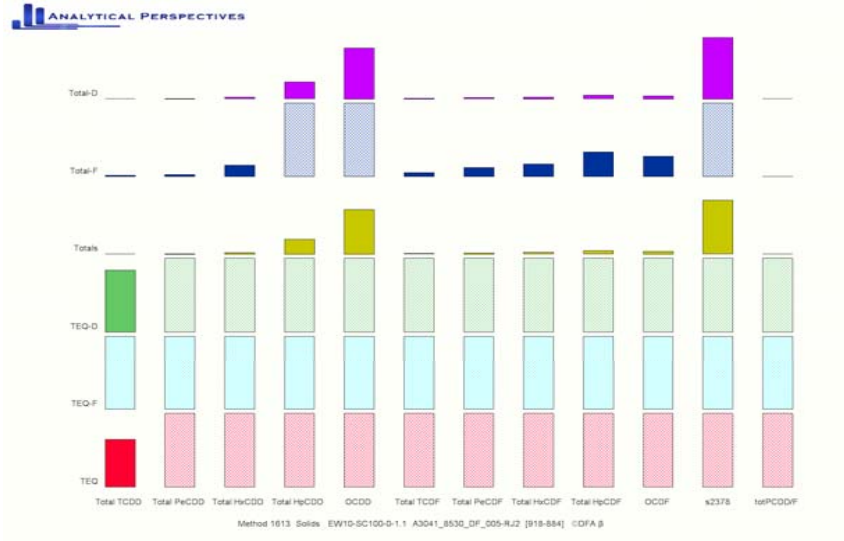

ANALYTICAL PERSPECTIVES
sTEQD/F
sTEQF
sTEQD
tPCDD/F
tPCDF
tPCDD
hmlg
s(2378)D/F
s(2378)F
s(2378)D
TCDD PeCDD HxCDD HxCDD HxCDD HpCDD OCDD TCDF PeCDF PeCDF HxCDF HxCDF HxCDF HxCDF HpCDF HpCDF OCDF
Method 1613 Solids EW09-SS-026-010 A3041_8530_OF_003-RJ2 [304-230] ©DFA α


ANALYTICAL PERSPECTIVES
Total-D
Total-F
Totals
TEQ-D
TEQ-F
TEQ
Total TCDD Total PeCDD Total HxCDD Total HpCDD OCDD Total TCDF Total PeCDF Total HxCDF Total HpCDF OCDF s2378 totPCDD/F
Method 1613 Solids EW09-SS-026-010 A3041_8530_OF_003-RJ2 [304-230] ©DFA β

ANALYTICAL PERSPECTIVES
sTEQD/F
sTEQF
sTEQD
tPCDD/F
tPCDF
tPCDD
hmlg
s(2378)D/F
s(2378)F
s(2378)D
TCDD PeCDD HxCDD HxCDD HxCDD HpCDD OCDD TCDF PeCDF PeCDF HxCDF HxCDF HxCDF HxCDF HpCDF HpCDF OCDF
Method 1613 Solids EW09-SS-102-010 A3041_8530_DF_004-RJ2 [113-307] ©DFA α


ANALYTICAL PERSPECTIVES
Total-D
Total-F
Totals
TEQ-D
TEQ-F
TEQ
Total TCDD Total PeCDD Total HxCDD Total HpCDD OCDD Total TCDF Total PeCDF Total HxCDF Total HpCDF OCDF s2378 totPCDD/F
Method 1613 Solids EW09-SS-102-010 A3041_8530_DF_004-RJ2 [113-307] ©DFA β


ANALYTICAL PERSPECTIVES
sTEQD/F
sTEQF
sTEQD
tPCDD/F
tPCDF
tPCDD
hmlg
s(2378)D/F
s(2378)F
s(2378)D
TCDD PeCDD HxCDD HxCDD HxCDD HpCDD OCDD TCDF PeCDF PeCDF HxCDF HxCDF HxCDF HxCDF HpCDF HpCDF OCDF
Method 1613 Solids EW10-SC100-0-1.1 A3041_8530_DF_005-RJ2 [918-884] ©DFA α


ANALYTICAL PERSPECTIVES
Total-D
Total-F
Totals
TEQ-D
TEQ-F
TEQ
Total TCDD Total PeCDD Total HxCDD Total HpCDD OCDD Total TCDF Total PeCDF Total HxCDF Total HpCDF OCDF s2378 totPCDD/F
Method 1613 Solids EW10-SC100-0-1.1 A3041_8530_DF_005-RJ2 [918-884] ©DFA β

Sample ID: MB1_8530_DF_SDS — Method 1613

Client Data		Sample Data		Laboratory Data			
Name:	Windward Environmental, LLC	Matrix:	Solids	Lab Project ID:	A3041	Date Received:	n/a
Project ID:	EW RI/FS Surface Sediment	Weight/Volume:	10.00 g	Lab Sample ID	MB1_8530_DF_SDS-RJ2	Date Extracted:	10-Mar-2011
Date Collected:	n/a	% Solids:	n/a	QC Batch No:	8530	Date Analyzed:	25-Mar-2011
		Split:	-	Dilution:	-	Time Analyzed:	15:31:20

Analyte	Conc. (pg/g)	DL (pg/g)	EMPC (pg/g)	Qualifiers	Standard	ES Recoveries	Qualifiers
2378-TCDD	1.58				ES 2378-TCDD	88.8	
12378-PeCDD	ND	0.0424			ES 12378-PeCDD	73.9	
123478-HxCDD	ND	0.043			ES 123478-HxCDD	84.1	
123678-HxCDD	ND	0.0463			ES 123678-HxCDD	82.5	
123789-HxCDD	ND	0.0502			ES 123789-HxCDD	83.3	
1234678-HpCDD	EMPC		0.102	J	ES 1234678-HpCDD	86	
OCDD	EMPC		0.889	J	ES OCDD	89.5	
2378-TCDF	ND	0.0224			ES 2378-TCDF	85.7	
12378-PeCDF	ND	0.0189			ES 12378-PeCDF	82	
23478-PeCDF	ND	0.0175			ES 23478-PeCDF	80.1	
123478-HxCDF	EMPC		0.0888	J	ES 123478-HxCDF	74	
123678-HxCDF	ND	0.028			ES 123678-HxCDF	73	
234678-HxCDF	ND	0.0319			ES 234678-HxCDF	72.7	
123789-HxCDF	ND	0.0406			ES 123789-HxCDF	72.3	
1234678-HpCDF	0.233			J	ES 1234678-HpCDF	70.7	
1234789-HpCDF	ND	0.057			ES 1234789-HpCDF	75.8	
OCDF	EMPC		0.416	J	ES OCDF	74.7	
Totals					**Standard**	**CS/AS Recoveries**	
					CS 37Cl-2378-TCDD	87.2	
Total TCDD	1.58		1.65		CS 12347-PeCDD	78.7	
Total PeCDD	ND	0.0424	ND		CS 12346-PeCDF	94.6	
Total HxCDD	ND	0.0464	ND		CS 123469-HxCDF	91.7	
Total HpCDD	ND		0.222		CS 1234689-HpCDF	83.2	
					AS 1368-TCDD	82.8	
Total TCDF	ND	0.0224	ND		AS 1368-TCDF	84.7	
Total PeCDF	ND	0.0182	ND				
Total HxCDF	0.0604		0.149				
Total HpCDF	0.233		0.233				
Total PCDD/Fs	**1.87**		**3.56**				
ITEF TEQs							
TEQ: ND=0	1.58		1.59				
TEQ: ND=DL/2	1.61	0.0464	1.62				
TEQ: ND=DL	1.64	0.0927	1.65				

ANALYTICAL PERSPECTIVES
2714 Exchange Drive
Wilmington, NC 28405 , USA
info@ultratrace.com
www.ultratrace.com
Tel: +1 910 794-1613 (Fax: -3919); Toll-Free 866 846-8290

Sample ID: MB1_8530_DF_SDS — Method 1613

Client Data		Sample Data		Laboratory Data			
Name:	Windward Environmental, LLC	Matrix:	Solids	Lab Project ID:	A3041	Date Received:	n/a
Project ID:	EW RI/FS Surface Sediment	Weight/Volume:	10.00 g	Lab Sample ID:	MB1_8530_DF_SDS-RJ2	Date Extracted:	10-Mar-2011
Date Collected:	n/a	% Solids:	n/a	QC Batch No.:	8530	Date Analyzed:	25-Mar-2011
		Split:	-	Dilution:	-	Time Analyzed:	15:31:20

Tetra-Dioxins	Conc. (pg/g)	Qualifiers	Penta-Dioxins	Conc. (pg/g)	Qualifiers	Hexa-Dioxins	Conc (pg/g)	Qualifiers	Hepta-Dioxins	Conc (pg/g)	Qualifiers
1368D	[0.0658]	J	12479/12468D	(0.0424)		124679/124689D	(0.0464)		1234679D	[0.12]	J
1379D	(0.0308)		12469D	(0.0424)		123468D	(0.0464)		1234678D	[0.102]	J
1369D	(0.0308)		12368D	(0.0424)		123679/123689D	(0.0464)				
1469D	(0.0308)		12478D	(0.0424)		123469D	(0.0464)				
1247D...[4]	(0.0308)		12379D	(0.0424)		123478D	(0.043)				
1378D	(0.0308)		12369D...[3]	(0.0424)		123678D	(0.0463)				
1268D	(0.0308)		12346/12347D	(0.0424)		123467D	(0.0464)				
1478D	(0.0308)		12378D	(0.0424)		123789D	(0.0502)		**Conc.**	0	
1279D	(0.0308)		12367D	(0.0424)					**EMPC**	0.222	
1234/1269D	(0.0308)		12389D	(0.0424)							
1236D	(0.0308)								**Octa-Dioxin**	**Conc (pg/g)**	**Qualifiers**
1237/1238D	(0.0308)										
1239D	(0.0308)								OCDD	[0.889]	J
2378D	1.58										
1278D	(0.0308)										
1267D	(0.0308)										
1289D	(0.0308)										
Conc.	1.58		**Conc.**	0		**Conc.**	0				
EMPC	1.65		**EMPC**	0		**EMPC**	0				

ANALYTICAL PERSPECTIVES

2714 Exchange Drive
Wilmington, NC 28405, USA

Tel: +1 910 794-1613
Fax: +1 910 794-3919
info@ultratrace.com
www.ultratrace.com

ITEF TEQs	Conc.	EMPC
TEQ: ND=0	1.58	1.59
TEQ: ND=DL/2	1.61	1.62
TEQ: ND=DL	1.64	1.65

	Conc.	EMPC
Total PCDD/Fs	1.87	3.56

Checkcode: 830-006-JDW

Report Created: 25-Mar-2011 21:51 Analyst: MC

Sample ID: MB1_8530_DF_SDS — Method 1613

Client Data		Sample Data		Laboratory Data			
Name:	Windward Environmental, LLC	Matrix:	Solids	Lab Project ID:	A3041	Date Received:	n/a
Project ID:	EW RI/FS Surface Sediment	Weight/Volume:	10.00 g	Lab Sample ID:	MB1_8530_DF_SDS-RJ2	Date Extracted:	10 Mar 2011
Date Collected:	n/a	% Solids:	n/a	QC Batch No.:	8530	Date Analyzed:	25 Mar 2011
		Split:	-	Dilution:	-	Time Analyzed:	15:31:20

Tetra-Furans	Conc. (pg/g)	Qualifiers	Penta-Furans	Conc. (pg/g)	Qualifiers	Hexa-Furans	Conc (pg/g)	Qualifiers	Hepta-Furans	Conc (pg/g)	Qualifiers
1368F	(0.0224)		13468/12468F	(0.0251)		123468F	(0.0323)		1234678F	0.233	J
1468F	(0.0224)		13678F...[3]	(0.0182)		124678/134678F	0.0604	J	1234679F	(0.0499)	
2468F	(0.0224)		12368F...[3]	(0.0182)		134679F	(0.0323)		1234689F	(0.0499)	
1346/1246F	(0.0224)		14678F	(0.0182)		124679F	(0.0323)		1234789F	(0.057)	
1347F...[3]	(0.0224)		13479F	(0.0182)		124689F	(0.0323)				
1348F	(0.0224)		13469/12479F	(0.0182)		123467F	(0.0323)				
1248F...[3]	(0.0224)		12346F	(0.0182)		123478F	[0.0888]	J			
1268F	(0.0224)		23468/12469F	(0.0182)		123678F	(0.028)				
1467F	(0.0224)		12347F	(0.0182)		123479F	(0.0323)				
1478F	(0.0224)		12348F	(0.0182)		123469F	(0.0323)				
1369/1237F	(0.0224)		12378F	(0.0189)		123679F	(0.0323)				
2467F	(0.0224)		12678/12367F	(0.0182)		234678F	(0.0319)		**Conc.**	0.233	
2368F	(0.0224)		12379F	(0.0182)		234678/123689F	(0.0319)		**EMPC**	0.233	
1238F...[5]	(0.0224)		12679F	(0.0182)		123689F	(0.0323)				
1278F	(0.0224)		23467/12369F	(0.0182)		123789F	(0.0406)		**Octa-Furan**	**Conc (pg/g)**	**Qualifiers**
1349F	(0.0224)		23478F	(0.0175)		123789/123489F	(0.0406)				
1267F	(0.0224)		23478/12489F	(0.0175)		123489F	(0.0323)		OCDF	[0.416]	J
2346/1249F	(0.0224)		12489F	(0.0182)							
2347/1279F	(0.0224)		12349F	(0.0182)							
2348F	(0.0224)		12389F	(0.0182)							
2378F	(0.0224)										
2367/3467F	(0.0224)										
1269F	(0.0224)										
1239F	(0.0224)										
1289F	(0.0224)										
Conc.	0		**Conc.**	0		**Conc.**	0.0604				
EMPC	0		**EMPC**	0		**EMPC**	0.149				

Checkcode: 830-006-JDW

Report Created: 25-Mar-2011 21:51 Analyst: MC

Sample ID: MB1_8530_DF_SDS — TEQ Summary — Method 1613

Client Project Name:	Windward Environmental, LLC	Matrix:	Solids	Lab Sample ID:	MB1_8530_DF_SDS-RJ2
Cliend Project ID:	EW RI/FS Surface Sediment	Weight/Volume:	10.00 g	QC Batch No.:	8530
Date Collected:	n/a	Split:	-	Date Extracted:	10-Mar-2011
Date Received:	n/a	Dilution:	-	Date Analyzed:	25-Mar-2011 15:31
Lab Project No:	A3041	Units	pg/g		

Analyte	Result	Qualifiers	DLs	I-TEQ	WHO-1998	WHO-2005
2378-TCDD	1.58		0.0308	1.58	1.58	1.58
12378-PeCDD	(0.0424)		0.0424	(0.0212)	(0.0424)	(0.0424)
123478-HxCDD	(0.043)		0.043	(0.0043)	(0.0043)	(0.0043)
123678-HxCDD	(0.0463)		0.0463	(0.00463)	(0.00463)	(0.00463)
123789-HxCDD	(0.0502)		0.0502	(0.00502)	(0.00502)	(0.00502)
1234678-HpCDD	[0.102]	J	0.0586	[0.00102]	[0.00102]	[0.00102]
OCDD	[0.889]	J	0.0921	[0.000889]	[0.0000889]	[0.000267]
2378-TCDF	(0.0224)		0.0224	(0.00224)	(0.00224)	(0.00224)
12378-PeCDF	(0.0189)		0.0189	(0.000945)	(0.000945)	(0.000567)
23478-PeCDF	(0.0175)		0.0175	(0.00875)	(0.00875)	(0.00525)
123478-HxCDF	[0.0888]	J	0.0306	[0.00888]	[0.00888]	[0.00888]
123678-HxCDF	(0.028)		0.028	(0.0028)	(0.0028)	(0.0028)
234678-HxCDF	(0.0319)		0.0319	(0.00319)	(0.00319)	(0.00319)
123789-HxCDF	(0.0406)		0.0406	(0.00406)	(0.00406)	(0.00406)
1234678-HpCDF	0.233	J	0.0437	0.00233	0.00233	0.00233
1234789-HpCDF	(0.057)		0.057	(0.00057)	(0.00057)	(0.00057)
OCDF	[0.416]	J	0.0687	[0.000416]	[0.0000416]	[0.000125]

TEQ Summaries			
EMPC = 0, ND = 0	1.58	1.58	1.58
EMPC = 0, ND = DL / 2	1.61	1.62	1.62
EMPC = 0, ND = DL	1.64	1.66	1.66
EMPC = 0, < J-level = 0	1.58	1.58	1.58
EMPC = EMPC, ND = 0	1.59	1.59	1.59
EMPC = EMPC, ND = DL / 2	1.62	1.63	1.63
EMPC = EMPC, ND = DL	1.65	1.67	1.67
EMPC = EMPC, < J-level = 0	1.59	1.59	1.59

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Sample ID: EW09-SS-006-010 — Method 1613

Client Data		Sample Data		Laboratory Data			
Name:	Windward Environmental, LLC	Matrix:	Solids	Lab Project ID:	A3041	Date Received:	24-Feb-2011
Project ID:	EW RI/FS Surface Sediment	Weight/Volume:	13.07 g	Lab Sample ID	A3041_8530_DF_001-RJ2	Date Extracted:	10-Mar-2011
Date Collected:	24-Jun-2009	% Solids:	77.6 %	QC Batch No:	8530	Date Analyzed:	25-Mar-2011
		Split:	-	Dilution:	-	Time Analyzed:	16:22:21

Analyte	Conc. (pg/g)	DL (pg/g)	EMPC (pg/g)	Qualifiers	Standard	ES Recoveries	Qualifiers
2378-TCDD	0.463			B	ES 2378-TCDD	93.5	
12378-PeCDD	2.7				ES 12378-PeCDD	76	
123478-HxCDD	6.08				ES 123478-HxCDD	81	
123678-HxCDD	39.4				ES 123678-HxCDD	82	
123789-HxCDD	15.4				ES 123789-HxCDD	79.9	
1234678-HpCDD	931				ES 1234678-HpCDD	90.1	
OCDD	7080				ES OCDD	105	
2378-TCDF	0.662				ES 2378-TCDF	93.2	
12378-PeCDF	1.39			J	ES 12378-PeCDF	86.2	
23478-PeCDF	3.45				ES 23478-PeCDF	83.3	
123478-HxCDF	4.81				ES 123478-HxCDF	73.3	
123678-HxCDF	2.3				ES 123678-HxCDF	71.2	
234678-HxCDF	4.15				ES 234678-HxCDF	71.1	
123789-HxCDF	ND	0.115			ES 123789-HxCDF	75	
1234678-HpCDF	45.5				ES 1234678-HpCDF	75	
1234789-HpCDF	2.39				ES 1234789-HpCDF	75.5	
OCDF	63.8				ES OCDF	76.3	
Totals					**Standard**	**CS/AS Recoveries**	
					CS 37Cl-2378-TCDD	90.1	
Total TCDD	2.49		2.85		CS 12347-PeCDD	82	
Total PeCDD	11		13.4		CS 12346-PeCDF	97.6	
Total HxCDD	198		198		CS 123469-HxCDF	89.3	
Total HpCDD	2060		2060		CS 1234689-HpCDF	87.7	
					AS 1368-TCDD	91.3	
Total TCDF	8.15		9.42		AS 1368-TCDF	93.4	
Total PeCDF	29.6		29.7				
Total HxCDF	120		120				
Total HpCDF	148		149				
Total PCDD/Fs	**9720**		**9720**				
ITEF TEQs							
TEQ: ND=0	27.8		27.8				
TEQ: ND=DL/2	27.8	0.0824	27.8				
TEQ: ND=DL	27.8	0.165	27.8				

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Sample ID: EW09-SS-006-010 Method 1613

Client Data		Sample Data		Laboratory Data			
Name:	Windward Environmental, LLC	Matrix:	Solids	Lab Project ID:	A3041	Date Received:	24-Feb-2011
Project ID:	EW RI/FS Surface Sediment	Weight/Volume:	13.07 g	Lab Sample ID:	A3041_8530_DF_001-RJ2	Date Extracted:	10-Mar-2011
Date Collected:	24-Jun-2009	% Solids:	77.6 %	QC Batch No.:	8530	Date Analyzed:	25-Mar-2011
		Split:	-	Dilution:	-	Time Analyzed:	16:22:21

Tetra-Dioxins	Conc. (pg/g)	Qualifiers	Penta-Dioxins	Conc. (pg/g)	Qualifiers	Hexa-Dioxins	Conc (pg/g)	Qualifiers	Hepta-Dioxins	Conc (pg/g)	Qualifiers
1368D	0.576	B	12479/12468D	3.05		124679/124689D	43.3		1234679D	1130	
1379D	0.333	J	12469D	0.806	J	123468D	5.77		1234678D	931	
1369D	0.116	J	12368D	1.21	J	123679/123689D	77.2				
1469D	[0.122]	J	12478D	[2.38]		123469D	8.6				
1247D...[4]	[0.129]	J	12379D	0.978	J	123478D	6.08				
1378D	0.331	J	12369D...[3]	1.22	J	123678D	39.4				
1268D	0.0741	J	12346/12347D	0.274	J	123467D	2.31				
1478D	0.0729	J	12378D	2.7		123789D	15.4		**Conc.**	2,060	
1279D	[0.0774]	J	12367D	0.374	J				**EMPC**	2,060	
1234/1269D	0.123	J	12389D	0.42	J						
1236D	(0.0254)								**Octa-Dioxin**	**Conc (pg/g)**	**Qualifiers**
1237/1238D	0.279	J									
1239D	(0.0254)								OCDD	7080	
2378D	0.463	B									
1278D	0.123	J									
1267D	(0.0254)										
1289D	[0.029]	J									
Conc.	2.49		**Conc.**	11		**Conc.**	198				
EMPC	2.85		**EMPC**	13.4		**EMPC**	198				

ITEF TEQs	Conc.	EMPC
TEQ: ND=0	27.8	27.8
TEQ: ND=DL/2	27.8	27.8
TEQ: ND=DL	27.8	27.8

	Conc.	EMPC
Total PCDD/Fs	9,720	9,720

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Checkcode: 885-222-NVC

Report Created: 25-Mar-2011 21:51 Analyst: MC

Sample ID: EW09-SS-006-010 Method 1613

Client Data		Sample Data		Laboratory Data			
Name:	Windward Environmental, LLC	Matrix:	Solids	Lab Project ID:	A3041	Date Received:	24 Feb 2011
Project ID:	EW RI/FS Surface Sediment	Weight/Volume:	13.07 g	Lab Sample ID:	A3041_8530_DF_001-RJ2	Date Extracted:	10 Mar 2011
Date Collected:	24 Jun 2009	% Solids:	77.6 %	QC Batch No.:	8530	Date Analyzed:	25 Mar 2011
		Split:	-	Dilution:	-	Time Analyzed:	16:22:21

Tetra-Furans	Conc. (pg/g)	Qualifiers	Penta-Furans	Conc. (pg/g)	Qualifiers	Hexa-Furans	Conc (pg/g)	Qualifiers	Hepta-Furans	Conc (pg/g)	Qualifiers
1368F	0.143	J	13468/12468F	15		123468F	12.3		1234678F	45.5	
1468F	0.279	J	13678F...[3]	0.749	J	124678/134678F	35.2		1234679F	[0.963]	J
2468F	0.907		12368F...[3]	4.14		134679F	(0.0985)		1234689F	100	
1346/1246F	0.332	J	14678F	0.585	J	124679F	[0.338]	J	1234789F	2.39	
1347F...[3]	0.744		13479F	(0.0454)		124689F	57.1				
1348F	0.123	J	13469/12479F	0.15	J	123467F	0.423	J			
1248F...[3]	0.761		12346F	[0.0765]	J	123478F	4.81				
1268F	0.709		23468/12469F	1.23	J	123678F	2.3				
1467F	0.239	J	12347F	0.287	J	123479F	(0.0985)				
1478F	0.585		12348F	0.454	J	123469F	[0.209]	J			
1369/1237F	0.117	J	12378F	1.39	J	123679F	(0.0985)				
2467F	[0.197]	J	12678/12367F	1.57	J	234678F	4.15		**Conc.**	148	
2368F	0.795		12379F	(0.0454)		234678/123689F	(0.105)		**EMPC**	149	
1238F...[5]	[0.234]	J	12679F	(0.0454)		123689F	(0.0985)				
1278F	0.323	J	23467/12369F	0.358	J	123789F	(0.115)		**Octa-Furan**	**Conc (pg/g)**	**Qualifiers**
1349F	(0.0195)		23478F	3.45		123789/123489F	3.3				
1267F	0.162	J	23478/12489F	(0.0445)		123489F	(0.0985)		OCDF	63.8	
2346/1249F	(0.0195)		12489F	(0.0454)							
2347/1279F	0.352	J	12349F	(0.0454)							
2348F	0.315	J	12389F	0.215	J						
2378F	0.662										
2367/3467F	0.606										
1269F	[0.0899]	J									
1239F	(0.0195)										
1289F	[0.748]										
Conc.	8.15		**Conc.**	29.6		**Conc.**	120				
EMPC	9.42		**EMPC**	29.7		**EMPC**	120				

Checkcode: 885-222-NVC

Report Created: 25-Mar-2011 21:51 Analyst: MC

Sample ID: EW09-SS-006-010 — TEQ Summary — Method 1613

Client Project Name:	Windward Environmental, LLC	Matrix:	Solids	Lab Sample ID:	A3041_8530_DF_001-RJ2
Cliend Project ID:	EW RI/FS Surface Sediment	Weight/Volume:	13.07 g	QC Batch No.:	8530
Date Collected:	24-Jun-2009	Split:	-	Date Extracted:	10-Mar-2011
Date Received:	24-Feb-2011	Dilution:	-	Date Analyzed:	25-Mar-2011 16:22
Lab Project No:	A3041	Units	pg/g		

Analyte	Result	Qualifiers	DLs	I-TEQ	WHO-1998	WHO-2005
2378-TCDD	0.463	B	0.0254	0.463	0.463	0.463
12378-PeCDD	2.7		0.0414	1.35	2.7	2.7
123478-HxCDD	6.08		0.161	0.608	0.608	0.608
123678-HxCDD	39.4		0.164	3.94	3.94	3.94
123789-HxCDD	15.4		0.18	1.54	1.54	1.54
1234678-HpCDD	931		0.0765	9.31	9.31	9.31
OCDD	7080		0.0836	7.08	0.708	2.12
2378-TCDF	0.662		0.0195	0.0662	0.0662	0.0662
12378-PeCDF	1.39	J	0.0464	0.0697	0.0697	0.0418
23478-PeCDF	3.45		0.0445	1.73	1.73	1.04
123478-HxCDF	4.81		0.0942	0.481	0.481	0.481
123678-HxCDF	2.3		0.084	0.23	0.23	0.23
234678-HxCDF	4.15		0.105	0.415	0.415	0.415
123789-HxCDF	(0.115)		0.115	(0.0115)	(0.0115)	(0.0115)
1234678-HpCDF	45.5		0.0495	0.455	0.455	0.455
1234789-HpCDF	2.39		0.0763	0.0239	0.0239	0.0239
OCDF	63.8		0.0606	0.0638	0.00638	0.0191

TEQ Summaries			
EMPC = 0, ND = 0	27.8	22.7	23.4
EMPC = 0, ND = DL / 2	27.8	22.7	23.4
EMPC = 0, ND = DL	27.8	22.7	23.5
EMPC = 0, < J-level = 0	27.7	22.7	23.4
EMPC = EMPC, ND = 0	27.8	22.7	23.4
EMPC = EMPC, ND = DL / 2	27.8	22.7	23.4
EMPC = EMPC, ND = DL	27.8	22.7	23.5
EMPC = EMPC, < J-level = 0	27.7	22.7	23.4

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Sample ID: EW09-SS-009-010 — Method 1613

Client Data		Sample Data		Laboratory Data			
Name:	Windward Environmental, LLC	Matrix:	Solids	Lab Project ID:	A3041	Date Received:	24-Feb-2011
Project ID:	EW RI/FS Surface Sediment	Weight/Volume:	12.71 g	Lab Sample ID	A3041_8530_DF_002-RJ2	Date Extracted:	10-Mar-2011
Date Collected:	23-Jun-2009	% Solids:	62.3 %	QC Batch No:	8530	Date Analyzed:	25-Mar-2011
		Split:	-	Dilution:	-	Time Analyzed:	17:13:28

Analyte	Conc. (pg/g)	DL (pg/g)	EMPC (pg/g)	Qualifiers	Standard	ES Recoveries	Qualifiers
2378-TCDD	0.829			B	ES 2378-TCDD	91.7	
12378-PeCDD	2.05				ES 12378-PeCDD	79.7	
123478-HxCDD	3.51				ES 123478-HxCDD	60.2	
123678-HxCDD	17				ES 123678-HxCDD	61	
123789-HxCDD	7.26				ES 123789-HxCDD	49	
1234678-HpCDD	445				ES 1234678-HpCDD	64.2	
OCDD	4070				ES OCDD	76.9	
2378-TCDF	2.78				ES 2378-TCDF	80.6	
12378-PeCDF	1.96			J	ES 12378-PeCDF	81.4	
23478-PeCDF	7.26				ES 23478-PeCDF	82.2	
123478-HxCDF	10.5				ES 123478-HxCDF	47.6	
123678-HxCDF	3.75				ES 123678-HxCDF	46	
234678-HxCDF	5.47				ES 234678-HxCDF	46.6	
123789-HxCDF	2.21				ES 123789-HxCDF	71.2	
1234678-HpCDF	84.4				ES 1234678-HpCDF	46.2	
1234789-HpCDF	5.92				ES 1234789-HpCDF	51.2	
OCDF	281				ES OCDF	54.8	
Totals					**Standard**	**CS/AS Recoveries**	
					CS 37Cl-2378-TCDD	86.4	
Total TCDD	9.26		9.46		CS 12347-PeCDD	88.4	
Total PeCDD	23.2		23.2		CS 12346-PeCDF	93	
Total HxCDD	147		147		CS 123469-HxCDF	57.7	
Total HpCDD	1200		1200		CS 1234689-HpCDF	54.3	
					AS 1368-TCDD	66.9	
Total TCDF	64.6		66.4		AS 1368-TCDF	70.3	
Total PeCDF	81.1		81.1				
Total HxCDF	123		123				
Total HpCDF	303		303				
Total PCDD/Fs	**6300**		**6300**				
ITEF TEQs							
TEQ: ND=0	20.5		20.5				
TEQ: ND=DL/2	20.5	0.104	20.5				
TEQ: ND=DL	20.5	0.209	20.5				

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Sample ID: EW09-SS-009-010 Method 1613

Client Data		Sample Data		Laboratory Data			
Name:	Windward Environmental, LLC	Matrix:	Solids	Lab Project ID:	A3041	Date Received:	24-Feb-2011
Project ID:	EW RI/FS Surface Sediment	Weight/Volume:	12.71 g	Lab Sample ID:	A3041_8530_DF_002-RJ2	Date Extracted:	10-Mar-2011
Date Collected:	23-Jun-2009	% Solids:	62.3 %	QC Batch No.:	8530	Date Analyzed:	25-Mar-2011
		Split:	-	Dilution:	-	Time Analyzed:	17:13:28

Tetra-Dioxins	Conc. (pg/g)	Qualifiers	Penta-Dioxins	Conc. (pg/g)	Qualifiers	Hexa-Dioxins	Conc (pg/g)	Qualifiers	Hepta-Dioxins	Conc (pg/g)	Qualifiers
1368D	2.25		12479/12468D	5.65		124679/124689D	43.5		1234679D	754	
1379D	1.54		12469D	1.22	J	123468D	8.86		1234678D	445	
1369D	0.265	J	12368D	3.09		123679/123689D	52.8				
1469D	0.404		12478D	2.66		123469D	9.39				
1247D...[4]	0.564		12379D	2.45		123478D	3.51				
1378D	0.811		12369D...[3]	1.8	J	123678D	17				
1268D	0.237	J	12346/12347D	1.14	J	123467D	4.63				
1478D	0.0906	J	12378D	2.05		123789D	7.26		**Conc.**	1,200	
1279D	0.391	J	12367D	2.39					**EMPC**	1,200	
1234/1269D	0.315	J	12389D	0.703	J						
1236D	[0.0955]	J							**Octa-Dioxin**	**Conc (pg/g)**	**Qualifiers**
1237/1238D	1.06										
1239D	0.117	J							OCDD	4070	
2378D	0.829	B									
1278D	0.286	J									
1267D	0.0854	J									
1289D	[0.113]	J									
Conc.	9.26		**Conc.**	23.2		**Conc.**	147				
EMPC	9.46		**EMPC**	23.2		**EMPC**	147				

ITEF TEQs	Conc.	EMPC
TEQ: ND=0	20.5	20.5
TEQ: ND=DL/2	20.5	20.5
TEQ: ND=DL	20.5	20.5

	Conc.	EMPC
Total PCDD/Fs	6,300	6,300

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Checkcode: 222-062-CTF

Report Created: 25-Mar-2011 21:52 Analyst: MC

Sample ID: EW09-SS-009-010 Method 1613

Client Data		Sample Data		Laboratory Data			
Name:	Windward Environmental, LLC	Matrix:	Solids	Lab Project ID:	A3041	Date Received:	24 Feb 2011
Project ID:	EW RI/FS Surface Sediment	Weight/Volume:	12.71 g	Lab Sample ID:	A3041_8530_DF_002-RJ2	Date Extracted:	10 Mar 2011
Date Collected:	23 Jun 2009	% Solids:	62.3 %	QC Batch No.:	8530	Date Analyzed:	25 Mar 2011
		Split:	-	Dilution:	-	Time Analyzed:	17:13:28

Tetra-Furans	Conc. (pg/g)	Qualifiers	Penta-Furans	Conc. (pg/g)	Qualifiers	Hexa-Furans	Conc (pg/g)	Qualifiers	Hepta-Furans	Conc (pg/g)	Qualifiers
1368F	0.962		13468/12468F	30.9		123468F	10.2		1234678F	84.4	
1468F	1.88		13678F...[3]	6.64		124678/134678F	34.4		1234679F	1.92	J
2468F	3.78		12368F...[3]	15.5		134679F	(0.116)		1234689F	211	
1346/1246F	3.4		14678F	1.77	J	124679F	1.13	J	1234789F	5.92	
1347F...[3]	9.21		13479F	(0.056)		124689F	53				
1348F	0.97		13469/12479F	0.399	J	123467F	1.89	J			
1248F...[3]	4.98		12346F	0.61	J	123478F	10.5				
1268F	3.18		23468/12469F	3.39		123678F	3.75				
1467F	2.32		12347F	4.11		123479F	[0.238]	J			
1478F	1.72		12348F	1.72	J	123469F	0.491	J			
1369/1237F	0.97		12378F	1.96	J	123679F	0.233	J			
2467F	2.39		12678/12367F	3.9		234678F	5.47		**Conc.**	303	
2368F	3.32		12379F	(0.056)		234678/123689F	(0.166)		**EMPC**	303	
1238F...[5]	2.98		12679F	0.189	J	123689F	(0.116)				
1278F	2.57		23467/12369F	2.39		123789F	2.21		**Octa-Furan**	**Conc (pg/g)**	**Qualifiers**
1349F	(0.03)		23478F	7.26		123789/123489F	(0.0643)				
1267F	1.56		23478/12489F	(0.0549)		123489F	(0.116)		OCDF	281	
2346/1249F	1.24		12489F	(0.056)							
2347/1279F	10.2		12349F	0.192	J						
2348F	[1.78]		12389F	0.205	J						
2378F	2.78										
2367/3467F	3.18										
1269F	(0.03)										
1239F	(0.03)										
1289F	1.05										
Conc.	64.6		**Conc.**	81.1		**Conc.**	123				
EMPC	66.4		**EMPC**	81.1		**EMPC**	123				

Checkcode: 222-062-CTF

Report Created: 25-Mar-2011 21:52 Analyst: MC

Sample ID: EW09-SS-009-010 — TEQ Summary — Method 1613

Client Project Name:	Windward Environmental, LLC	Matrix:	Solids	Lab Sample ID:	A3041_8530_DF_002-RJ2
Cliend Project ID:	EW RI/FS Surface Sediment	Weight/Volume:	12.71 g	QC Batch No.:	8530
Date Collected:	23-Jun-2009	Split:	-	Date Extracted:	10-Mar-2011
Date Received:	24-Feb-2011	Dilution:	-	Date Analyzed:	25-Mar-2011 17:13
Lab Project No:	A3041	Units	pg/g		

Analyte	Result	Qualifiers	DLs	I-TEQ	WHO-1998	WHO-2005
2378-TCDD	0.829	B	0.0448	0.829	0.829	0.829
12378-PeCDD	2.05		0.0683	1.03	2.05	2.05
123478-HxCDD	3.51		0.149	0.351	0.351	0.351
123678-HxCDD	17		0.164	1.7	1.7	1.7
123789-HxCDD	7.26		0.15	0.726	0.726	0.726
1234678-HpCDD	445		0.103	4.45	4.45	4.45
OCDD	4070		0.113	4.07	0.407	1.22
2378-TCDF	2.78		0.03	0.278	0.278	0.278
12378-PeCDF	1.96	J	0.0572	0.0979	0.0979	0.0587
23478-PeCDF	7.26		0.0549	3.63	3.63	2.18
123478-HxCDF	10.5		0.121	1.05	1.05	1.05
123678-HxCDF	3.75		0.126	0.375	0.375	0.375
234678-HxCDF	5.47		0.166	0.547	0.547	0.547
123789-HxCDF	2.21		0.0643	0.221	0.221	0.221
1234678-HpCDF	84.4		0.0615	0.844	0.844	0.844
1234789-HpCDF	5.92		0.0845	0.0592	0.0592	0.0592
OCDF	281		0.0804	0.281	0.0281	0.0843

TEQ Summaries			
EMPC = 0, ND = 0	20.5	17.6	17
EMPC = 0, ND = DL / 2	20.5	17.6	17
EMPC = 0, ND = DL	20.5	17.6	17
EMPC = 0, < J-level = 0	20.4	17.5	17
EMPC = EMPC, ND = 0	20.5	17.6	17
EMPC = EMPC, ND = DL / 2	20.5	17.6	17
EMPC = EMPC, ND = DL	20.5	17.6	17
EMPC = EMPC, < J-level = 0	20.4	17.5	17

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Sample ID: EW09-SS-026-010 — Method 1613

Client Data		Sample Data		Laboratory Data			
Name:	Windward Environmental, LLC	Matrix:	Solids	Lab Project ID:	A3041	Date Received:	24-Feb-2011
Project ID:	EW RI/FS Surface Sediment	Weight/Volume:	11.36 g	Lab Sample ID	A3041_8530_DF_003-RJ2	Date Extracted:	10-Mar-2011
Date Collected:	22-Jun-2009	% Solids:	64.8 %	QC Batch No:	8530	Date Analyzed:	25-Mar-2011
		Split:	-	Dilution:	-	Time Analyzed:	18:04:29

Analyte	Conc. (pg/g)	DL (pg/g)	EMPC (pg/g)	Qualifiers	Standard	ES Recoveries	Qualifiers
2378-TCDD	1			B	ES 2378-TCDD	92.6	
12378-PeCDD	1.61			J	ES 12378-PeCDD	75.2	
123478-HxCDD	2.08			J	ES 123478-HxCDD	83.8	
123678-HxCDD	10.7				ES 123678-HxCDD	84.4	
123789-HxCDD	4.67				ES 123789-HxCDD	82	
1234678-HpCDD	283				ES 1234678-HpCDD	89.8	
OCDD	2850				ES OCDD	104	
2378-TCDF	2.01				ES 2378-TCDF	95.8	
12378-PeCDF	1.32			J	ES 12378-PeCDF	78	
23478-PeCDF	4.72				ES 23478-PeCDF	79.9	
123478-HxCDF	5.42				ES 123478-HxCDF	66.9	
123678-HxCDF	2.58				ES 123678-HxCDF	63.1	
234678-HxCDF	4.18				ES 234678-HxCDF	65.9	
123789-HxCDF	ND	0.0987			ES 123789-HxCDF	67.2	
1234678-HpCDF	52.8				ES 1234678-HpCDF	63.3	
1234789-HpCDF	3.72				ES 1234789-HpCDF	71.2	
OCDF	176				ES OCDF	73.7	
Totals					**Standard**	**CS/AS Recoveries**	
					CS 37Cl-2378-TCDD	84.5	
Total TCDD	15.7		15.9		CS 12347-PeCDD	81	
Total PeCDD	22		22		CS 12346-PeCDF	83.3	
Total HxCDD	89.8		89.8		CS 123469-HxCDF	80.1	
Total HpCDD	781		781		CS 1234689-HpCDF	73.7	
					AS 1368-TCDD	91.3	
Total TCDF	35.3		35.5		AS 1368-TCDF	92.9	
Total PeCDF	55.8		56.3				
Total HxCDF	78.8		78.8				
Total HpCDF	186		186				
Total PCDD/Fs	**4290**		**4290**				
ITEF TEQs							
TEQ: ND=0	13.8		13.8				
TEQ: ND=DL/2	13.8	0.0882	13.8				
TEQ: ND=DL	13.8	0.176	13.8				

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Sample ID: EW09-SS-026-010 Method 1613

Client Data		Sample Data		Laboratory Data			
Name:	Windward Environmental, LLC	Matrix:	Solids	Lab Project ID:	A3041	Date Received:	24-Feb-2011
Project ID:	EW RI/FS Surface Sediment	Weight/Volume:	11.36 g	Lab Sample ID:	A3041_8530_DF_003-RJ2	Date Extracted:	10-Mar-2011
Date Collected:	22-Jun-2009	% Solids:	64.8 %	QC Batch No.:	8530	Date Analyzed:	25-Mar-2011
		Split:	-	Dilution:	-	Time Analyzed:	18:04:29

Tetra-Dioxins	Conc. (pg/g)	Qualifiers	Penta-Dioxins	Conc. (pg/g)	Qualifiers	Hexa-Dioxins	Conc (pg/g)	Qualifiers	Hepta-Dioxins	Conc (pg/g)	Qualifiers
1368D	5.14		12479/12468D	6.37		124679/124689D	25.9		1234679D	498	
1379D	3.41		12469D	0.804	J	123468D	11		1234678D	283	
1369D	0.33	J	12368D	4.37		123679/123689D	30.6				
1469D	0.675		12478D	1.62	J	123469D	3.57				
1247D...[4]	0.883		12379D	3.16		123478D	2.08	J			
1378D	0.927		12369D...[3]	1.44	J	123678D	10.7				
1268D	0.294	J	12346/12347D	1.8	J	123467D	1.28	J			
1478D	0.0881	J	12378D	1.61	J	123789D	4.67		**Conc.**	781	
1279D	0.387	J	12367D	0.344	J				**EMPC**	781	
1234/1269D	0.8		12389D	0.496	J						
1236D	0.114	J							**Octa-Dioxin**	**Conc (pg/g)**	**Qualifiers**
1237/1238D	1.26										
1239D	[0.114]	J							OCDD	2850	
2378D	1	B									
1278D	0.28	J									
1267D	[0.0622]	J									
1289D	0.105	J									
Conc.	15.7		**Conc.**	22		**Conc.**	89.8				
EMPC	15.9		**EMPC**	22		**EMPC**	89.8				

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ITEF TEQs	Conc.	EMPC
TEQ: ND=0	13.8	13.8
TEQ: ND=DL/2	13.8	13.8
TEQ: ND=DL	13.8	13.8

	Conc.	EMPC
Total PCDD/Fs	4,290	4,290

Checkcode: 304-230-CWZ

Report Created: 25-Mar-2011 21:52 Analyst: MC

Sample ID: EW09-SS-026-010 Method 1613

Client Data		Sample Data		Laboratory Data			
Name:	Windward Environmental, LLC	Matrix:	Solids	Lab Project ID:	A3041	Date Received:	24 Feb 2011
Project ID:	EW RI/FS Surface Sediment	Weight/Volume:	11.36 g	Lab Sample ID:	A3041_8530_DF_003-RJ2	Date Extracted:	10 Mar 2011
Date Collected:	22 Jun 2009	% Solids:	64.8 %	QC Batch No.:	8530	Date Analyzed:	25 Mar 2011
		Split:	-	Dilution:	-	Time Analyzed:	18:04:29

Tetra-Furans	Conc. (pg/g)	Qualifiers	Penta-Furans	Conc. (pg/g)	Qualifiers	Hexa-Furans	Conc (pg/g)	Qualifiers	Hepta-Furans	Conc (pg/g)	Qualifiers
1368F	0.722		13468/12468F	26.7		123468F	6.55		1234678F	52.8	
1468F	0.939		13678F...[3]	2.76		124678/134678F	23.6		1234679F	1.59	J
2468F	3.17		12368F...[3]	11		134679F	(0.0807)		1234689F	128	
1346/1246F	1.5		14678F	(0.0614)		124679F	0.896	J	1234789F	3.72	
1347F...[3]	3.38		13479F	(0.0614)		124689F	32.6				
1348F	0.911		13469/12479F	[0.327]	J	123467F	1.58	J			
1248F...[3]	2.65		12346F	0.434	J	123478F	5.42				
1268F	2.95		23468/12469F	2.86		123678F	2.58				
1467F	0.85		12347F	0.945	J	123479F	(0.0807)				
1478F	1.04		12348F	0.73	J	123469F	(0.0807)				
1369/1237F	0.596		12378F	1.32	J	123679F	(0.0807)				
2467F	1		12678/12367F	2.47		234678F	4.18		**Conc.**	186	
2368F	2.89		12379F	(0.0614)		234678/123689F	(0.0783)		**EMPC**	186	
1238F...[5]	1.75		12679F	0.164	J	123689F	(0.0807)				
1278F	1.65		23467/12369F	1.52	J	123789F	(0.0987)		**Octa-Furan**	**Conc (pg/g)**	**Qualifiers**
1349F	(0.0311)		23478F	4.72		123789/123489F	1.39	J			
1267F	0.851		23478/12489F	(0.057)		123489F	(0.0807)		OCDF	176	
2346/1249F	0.675		12489F	(0.0614)							
2347/1279F	1.99		12349F	[0.219]	J						
2348F	1.11		12389F	0.17	J						
2378F	2.01										
2367/3467F	1.85										
1269F	[0.145]	J									
1239F	[0.0743]	J									
1289F	0.759										
Conc.	35.3		**Conc.**	55.8		**Conc.**	78.8				
EMPC	35.5		**EMPC**	56.3		**EMPC**	78.8				

Checkcode: 304-230-CWZ

Report Created: 25-Mar-2011 21:52 Analyst: MC

Sample ID: EW09-SS-026-010 — TEQ Summary — Method 1613

Client Project Name:	Windward Environmental, LLC	Matrix:	Solids	Lab Sample ID:	A3041_8530_DF_003-RJ2
Cliend Project ID:	EW RI/FS Surface Sediment	Weight/Volume:	11.36 g	QC Batch No.:	8530
Date Collected:	22-Jun-2009	Split:	-	Date Extracted:	10-Mar-2011
Date Received:	24-Feb-2011	Dilution:	-	Date Analyzed:	25-Mar-2011 18:04
Lab Project No:	A3041	Units	pg/g		

Analyte	Result	Qualifiers	DLs	I-TEQ	WHO-1998	WHO-2005
2378-TCDD	1	B	0.0384	1	1	1
12378-PeCDD	1.61	J	0.0745	0.805	1.61	1.61
123478-HxCDD	2.08	J	0.0979	0.208	0.208	0.208
123678-HxCDD	10.7		0.0975	1.07	1.07	1.07
123789-HxCDD	4.67		0.104	0.467	0.467	0.467
1234678-HpCDD	283		0.123	2.83	2.83	2.83
OCDD	2850		0.15	2.85	0.285	0.855
2378-TCDF	2.01		0.0311	0.201	0.201	0.201
12378-PeCDF	1.32	J	0.0661	0.0662	0.0662	0.0397
23478-PeCDF	4.72		0.057	2.36	2.36	1.42
123478-HxCDF	5.42		0.0772	0.542	0.542	0.542
123678-HxCDF	2.58		0.0717	0.258	0.258	0.258
234678-HxCDF	4.18		0.0783	0.418	0.418	0.418
123789-HxCDF	(0.0987)		0.0987	(0.00987)	(0.00987)	(0.00987)
1234678-HpCDF	52.8		0.0793	0.528	0.528	0.528
1234789-HpCDF	3.72		0.104	0.0372	0.0372	0.0372
OCDF	176		0.0966	0.176	0.0176	0.0527

TEQ Summaries			
EMPC = 0, ND = 0	13.8	11.9	11.5
EMPC = 0, ND = DL / 2	13.8	11.9	11.5
EMPC = 0, ND = DL	13.8	11.9	11.5
EMPC = 0, < J-level = 0	12.7	10	9.67
EMPC = EMPC, ND = 0	13.8	11.9	11.5
EMPC = EMPC, ND = DL / 2	13.8	11.9	11.5
EMPC = EMPC, ND = DL	13.8	11.9	11.5
EMPC = EMPC, < J-level = 0	12.7	10	9.67

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Sample ID: EW09-SS-102-010 — Method 1613

Client Data		Sample Data		Laboratory Data			
Name:	Windward Environmental, LLC	Matrix:	Solids	Lab Project ID:	A3041	Date Received:	24-Feb-2011
Project ID:	EW RI/FS Surface Sediment	Weight/Volume:	10.72 g	Lab Sample ID	A3041_8530_DF_004-RJ2	Date Extracted:	10-Mar-2011
Date Collected:	04-Mar-2009	% Solids:	58.8 %	QC Batch No:	8530	Date Analyzed:	25-Mar-2011
		Split:	-	Dilution:	-	Time Analyzed:	18:55:36

Analyte	Conc. (pg/g)	DL (pg/g)	EMPC (pg/g)	Qualifiers	Standard	ES Recoveries	Qualifiers
2378-TCDD	1.15			B	ES 2378-TCDD	90.6	
12378-PeCDD	1.65			J	ES 12378-PeCDD	72.6	
123478-HxCDD	2.04			J	ES 123478-HxCDD	84.3	
123678-HxCDD	10.4				ES 123678-HxCDD	82.6	
123789-HxCDD	4.87				ES 123789-HxCDD	83.6	
1234678-HpCDD	250				ES 1234678-HpCDD	89.1	
OCDD	2090				ES OCDD	101	
2378-TCDF	2.7				ES 2378-TCDF	94.7	
12378-PeCDF	1.44			J	ES 12378-PeCDF	76	
23478-PeCDF	6.11				ES 23478-PeCDF	77.4	
123478-HxCDF	7.27				ES 123478-HxCDF	64.9	
123678-HxCDF	3.04				ES 123678-HxCDF	63.4	
234678-HxCDF	4.91				ES 234678-HxCDF	65.9	
123789-HxCDF	ND	0.135			ES 123789-HxCDF	67.8	
1234678-HpCDF	58.4				ES 1234678-HpCDF	68.1	
1234789-HpCDF	4.16				ES 1234789-HpCDF	70.1	
OCDF	193				ES OCDF	73.7	
Totals					**Standard**	**CS/AS Recoveries**	
					CS 37Cl-2378-TCDD	87.1	
Total TCDD	11.7		12.1		CS 12347-PeCDD	82.1	
Total PeCDD	17.8		19.2		CS 12346-PeCDF	84.8	
Total HxCDD	82.3		82.3		CS 123469-HxCDF	82.3	
Total HpCDD	661		661		CS 1234689-HpCDF	78.7	
					AS 1368-TCDD	88.9	
Total TCDF	44.6		44.6		AS 1368-TCDF	91.3	
Total PeCDF	75.7		75.7				
Total HxCDF	92.3		92.7				
Total HpCDF	203		203				
Total PCDD/Fs	**3470**		**3470**				
ITEF TEQs							
TEQ: ND=0	14		14				
TEQ: ND=DL/2	14	0.104	14				
TEQ: ND=DL	14	0.209	14				

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Sample ID: EW09-SS-102-010 Method 1613

Client Data		Sample Data		Laboratory Data			
Name:	Windward Environmental, LLC	Matrix:	Solids	Lab Project ID:	A3041	Date Received:	24-Feb-2011
Project ID:	EW RI/FS Surface Sediment	Weight/Volume:	10.72 g	Lab Sample ID:	A3041_8530_DF_004-RJ2	Date Extracted:	10-Mar-2011
Date Collected:	04-Mar-2009	% Solids:	58.8 %	QC Batch No.:	8530	Date Analyzed:	25-Mar-2011
		Split:	-	Dilution:	-	Time Analyzed:	18:55:36

Tetra-Dioxins	Conc. (pg/g)	Qualifiers	Penta-Dioxins	Conc. (pg/g)	Qualifiers	Hexa-Dioxins	Conc (pg/g)	Qualifiers	Hepta-Dioxins	Conc (pg/g)	Qualifiers
1368D	3.28		12479/12468D	4.95		124679/124689D	23.4		1234679D	411	
1379D	2.05		12469D	[0.927]	J	123468D	7.59		1234678D	250	
1369D	0.247	J	12368D	3.36		123679/123689D	28.9				
1469D	0.56		12478D	2.03	J	123469D	3.39				
1247D...[4]	0.813		12379D	2.27	J	123478D	2.04	J			
1378D	0.835		12369D...[3]	1.66	J	123678D	10.4				
1268D	0.253	J	12346/12347D	1.35	J	123467D	1.76	J			
1478D	0.12	J	12378D	1.65	J	123789D	4.87		**Conc.**	661	
1279D	0.346	J	12367D	0.505	J				**EMPC**	661	
1234/1269D	0.512		12389D	[0.528]	J						
1236D	0.0948	J							**Octa-Dioxin**	**Conc (pg/g)**	**Qualifiers**
1237/1238D	1.34										
1239D	0.0873	J							OCDD	2090	
2378D	1.15	B									
1278D	[0.264]	J									
1267D	[0.0666]	J									
1289D	[0.0896]	J									
Conc.	11.7		**Conc.**	17.8		**Conc.**	82.3				
EMPC	12.1		**EMPC**	19.2		**EMPC**	82.3				

ITEF TEQs	Conc.	EMPC
TEQ: ND=0	14	14
TEQ: ND=DL/2	14	14
TEQ: ND=DL	14	14

	Conc.	EMPC
Total PCDD/Fs	3,470	3,470

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Checkcode: 113-307-LVZ

Report Created: 25-Mar-2011 21:52 Analyst: MC

Sample ID: EW09-SS-102-010 Method 1613

Client Data		Sample Data		Laboratory Data			
Name:	Windward Environmental, LLC	Matrix:	Solids	Lab Project ID:	A3041	Date Received:	24 Feb 2011
Project ID:	EW RI/FS Surface Sediment	Weight/Volume:	10.72 g	Lab Sample ID:	A3041_8530_DF_004-RJ2	Date Extracted:	10 Mar 2011
Date Collected:	04 Mar 2009	% Solids:	58.8 %	QC Batch No.:	8530	Date Analyzed:	25 Mar 2011
		Split:	-	Dilution:	-	Time Analyzed:	18:55:36

Tetra-Furans	Conc. (pg/g)	Qualifiers	Penta-Furans	Conc. (pg/g)	Qualifiers	Hexa-Furans	Conc (pg/g)	Qualifiers	Hepta-Furans	Conc (pg/g)	Qualifiers
1368F	0.936		13468/12468F	36.9		123468F	7.46		1234678F	58.4	
1468F	1.24		13678F...[3]	3.14		124678/134678F	28.4		1234679F	1.7	J
2468F	5.29		12368F...[3]	15		134679F	(0.113)		1234689F	138	
1346/1246F	1.04		14678F	(0.06)		124679F	0.88	J	1234789F	4.16	
1347F...[3]	4.1		13479F	(0.06)		124689F	36.8				
1348F	0.513		13469/12479F	0.695	J	123467F	1.82	J			
1248F...[3]	3.43		12346F	0.433	J	123478F	7.27				
1268F	4.07		23468/12469F	4.28		123678F	3.04				
1467F	0.956		12347F	1.2	J	123479F	(0.113)				
1478F	1.31		12348F	0.878	J	123469F	[0.439]	J			
1369/1237F	0.534		12378F	1.44	J	123679F	(0.113)				
2467F	1.11		12678/12367F	3.8		234678F	4.91		**Conc.**	203	
2368F	4.25		12379F	(0.06)		234678/123689F	(0.111)		**EMPC**	203	
1238F...[5]	2.22		12679F	(0.06)		123689F	(0.113)				
1278F	2.52		23467/12369F	1.52	J	123789F	(0.135)		**Octa-Furan**	**Conc (pg/g)**	**Qualifiers**
1349F	(0.0316)		23478F	6.11		123789/123489F	1.64	J			
1267F	0.83		23478/12489F	(0.0571)		123489F	(0.113)		OCDF	193	
2346/1249F	0.666		12489F	(0.06)							
2347/1279F	2.69		12349F	(0.06)							
2348F	0.829		12389F	0.25	J						
2378F	2.7										
2367/3467F	2.2										
1269F	0.168	J									
1239F	(0.0316)										
1289F	0.969										
Conc.	44.6		**Conc.**	75.7		**Conc.**	92.3				
EMPC	44.6		**EMPC**	75.7		**EMPC**	92.7				

Checkcode: 113-307-LVZ

Report Created: 25-Mar-2011 21:52 Analyst: MC

Sample ID: EW09-SS-102-010 — TEQ Summary — Method 1613

Client Project Name:	Windward Environmental, LLC	Matrix:	Solids	Lab Sample ID:	A3041_8530_DF_004-RJ2
Cliend Project ID:	EW RI/FS Surface Sediment	Weight/Volume:	10.72 g	QC Batch No.:	8530
Date Collected:	04-Mar-2009	Split:	-	Date Extracted:	10-Mar-2011
Date Received:	24-Feb-2011	Dilution:	-	Date Analyzed:	25-Mar-2011 18:55
Lab Project No:	A3041	Units	pg/g		

Analyte	Result	Qualifiers	DLs	I-TEQ	WHO-1998	WHO-2005
2378-TCDD	1.15	B	0.0369	1.15	1.15	1.15
12378-PeCDD	1.65	J	0.109	0.827	1.65	1.65
123478-HxCDD	2.04	J	0.111	0.204	0.204	0.204
123678-HxCDD	10.4		0.11	1.04	1.04	1.04
123789-HxCDD	4.87		0.122	0.487	0.487	0.487
1234678-HpCDD	250		0.116	2.5	2.5	2.5
OCDD	2090		0.14	2.09	0.209	0.627
2378-TCDF	2.7		0.0316	0.27	0.27	0.27
12378-PeCDF	1.44	J	0.0632	0.0718	0.0718	0.0431
23478-PeCDF	6.11		0.0571	3.05	3.05	1.83
123478-HxCDF	7.27		0.106	0.727	0.727	0.727
123678-HxCDF	3.04		0.102	0.304	0.304	0.304
234678-HxCDF	4.91		0.111	0.491	0.491	0.491
123789-HxCDF	(0.135)		0.135	(0.0135)	(0.0135)	(0.0135)
1234678-HpCDF	58.4		0.0691	0.584	0.584	0.584
1234789-HpCDF	4.16		0.0899	0.0416	0.0416	0.0416
OCDF	193		0.105	0.193	0.0193	0.0578

TEQ Summaries			
EMPC = 0, ND = 0	14	12.8	12
EMPC = 0, ND = DL / 2	14	12.8	12
EMPC = 0, ND = DL	14	12.8	12
EMPC = 0, < J-level = 0	12.9	10.9	10.1
EMPC = EMPC, ND = 0	14	12.8	12
EMPC = EMPC, ND = DL / 2	14	12.8	12
EMPC = EMPC, ND = DL	14	12.8	12
EMPC = EMPC, < J-level = 0	12.9	10.9	10.1

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Sample ID: EW10-SC100-0-1.1 — Method 1613

Client Data		Sample Data		Laboratory Data			
Name:	Windward Environmental, LLC	Matrix:	Solids	Lab Project ID:	A3041	Date Received:	24-Feb-2011
Project ID:	EW RI/FS Surface Sediment	Weight/Volume:	11.05 g	Lab Sample ID	A3041_8530_DF_005-RJ2	Date Extracted:	10-Mar-2011
Date Collected:	04-Mar-2009	% Solids:	57.8 %	QC Batch No:	8530	Date Analyzed:	25-Mar-2011
		Split:	-	Dilution:	-	Time Analyzed:	19:46:36

Analyte	Conc. (pg/g)	DL (pg/g)	EMPC (pg/g)	Qualifiers	Standard	ES Recoveries	Qualifiers
2378-TCDD	1.42			B	ES 2378-TCDD	87.3	
12378-PeCDD	3.31				ES 12378-PeCDD	71	
123478-HxCDD	4.09				ES 123478-HxCDD	86.9	
123678-HxCDD	21.6				ES 123678-HxCDD	86.8	
123789-HxCDD	9.89				ES 123789-HxCDD	88	
1234678-HpCDD	584				ES 1234678-HpCDD	93.5	
OCDD	5320				ES OCDD	111	
2378-TCDF	4.42				ES 2378-TCDF	73.2	
12378-PeCDF	2.89				ES 12378-PeCDF	73.3	
23478-PeCDF	ND	0.077			ES 23478-PeCDF	76.3	
123478-HxCDF	15.6				ES 123478-HxCDF	67.3	
123678-HxCDF	6.19				ES 123678-HxCDF	66.9	
234678-HxCDF	10.1				ES 234678-HxCDF	69.6	
123789-HxCDF	ND	0.2			ES 123789-HxCDF	70.2	
1234678-HpCDF	112				ES 1234678-HpCDF	68.8	
1234789-HpCDF	7.96				ES 1234789-HpCDF	70.4	
OCDF	319				ES OCDF	76.8	
Totals					**Standard**	**CS/AS Recoveries**	
					CS 37Cl-2378-TCDD	87.1	
Total TCDD	15.4		15.7		CS 12347-PeCDD	81	
Total PeCDD	32.7		33.4		CS 12346-PeCDF	82.7	
Total HxCDD	179		179		CS 123469-HxCDF	86.8	
Total HpCDD	1760		1760		CS 1234689-HpCDF	84.8	
					AS 1368-TCDD	70	
Total TCDF	61.4		61.4		AS 1368-TCDF	70.7	
Total PeCDF	135		138				
Total HxCDF	193		193				
Total HpCDF	384		384				
Total PCDD/Fs	**8400**		**8410**				
ITEF TEQs							
TEQ: ND=0	23.1		23.1				
TEQ: ND=DL/2	23.1	0.114	23.1				
TEQ: ND=DL	23.1	0.228	23.1				

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Sample ID: EW10-SC100-0-1.1 Method 1613

Client Data		Sample Data		Laboratory Data			
Name:	Windward Environmental, LLC	Matrix:	Solids	Lab Project ID:	A3041	Date Received:	24-Feb-2011
Project ID:	EW RI/FS Surface Sediment	Weight/Volume:	11.05 g	Lab Sample ID:	A3041_8530_DF_005-RJ2	Date Extracted:	10-Mar-2011
Date Collected:	04-Mar-2009	% Solids:	57.8 %	QC Batch No.:	8530	Date Analyzed:	25-Mar-2011
		Split:	-	Dilution:	-	Time Analyzed:	19:46:36

Tetra-Dioxins	Conc. (pg/g)	Qualifiers	Penta-Dioxins	Conc. (pg/g)	Qualifiers	Hexa-Dioxins	Conc (pg/g)	Qualifiers	Hepta-Dioxins	Conc (pg/g)	Qualifiers
1368D	3.76		12479/12468D	8.95		124679/124689D	52.4		1234679D	1180	
1379D	2.98		12469D	1.73	J	123468D	13.8		1234678D	584	
1369D	0.398	J	12368D	5.07		123679/123689D	65.5				
1469D	0.59		12478D	4.18		123469D	9.17				
1247D...[4]	0.931		12379D	3.77		123478D	4.09				
1378D	1.36		12369D...[3]	2.85		123678D	21.6				
1268D	0.388	J	12346/12347D	1.88	J	123467D	2.8				
1478D	0.108	J	12378D	3.31		123789D	9.89		**Conc.**	1,760	
1279D	0.563		12367D	[0.675]	J				**EMPC**	1,760	
1234/1269D	0.486		12389D	0.981	J						
1236D	[0.105]	J							**Octa-Dioxin**	**Conc (pg/g)**	**Qualifiers**
1237/1238D	1.68										
1239D	[0.195]	J							OCDD	5320	
2378D	1.42	B									
1278D	0.472										
1267D	0.102	J									
1289D	0.172	J									
Conc.	15.4		**Conc.**	32.7		**Conc.**	179				
EMPC	15.7		**EMPC**	33.4		**EMPC**	179				

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ITEF TEQs	Conc.	EMPC
TEQ: ND=0	23.1	23.1
TEQ: ND=DL/2	23.1	23.1
TEQ: ND=DL	23.1	23.1

	Conc.	EMPC
Total PCDD/Fs	8,400	8,410

Checkcode: 918-884-LZS

Report Created: 25-Mar-2011 21:52 Analyst: MC

Sample ID: EW10-SC100-0-1.1 Method 1613

Client Data		Sample Data		Laboratory Data			
Name:	Windward Environmental, LLC	Matrix:	Solids	Lab Project ID:	A3041	Date Received:	24 Feb 2011
Project ID:	EW RI/FS Surface Sediment	Weight/Volume:	11.05 g	Lab Sample ID:	A3041_8530_DF_005-RJ2	Date Extracted:	10 Mar 2011
Date Collected:	04 Mar 2009	% Solids:	57.8 %	QC Batch No.:	8530	Date Analyzed:	25 Mar 2011
		Split:	-	Dilution:	-	Time Analyzed:	19:46:36

Tetra-Furans	Conc. (pg/g)	Qualifiers	Penta-Furans	Conc. (pg/g)	Qualifiers	Hexa-Furans	Conc (pg/g)	Qualifiers	Hepta-Furans	Conc (pg/g)	Qualifiers
1368F	1.05		13468/12468F	66.7		123468F	18.2		1234678F	112	
1468F	1.83		13678F...[3]	6.23		124678/134678F	56.8		1234679F	4.95	
2468F	8.07		12368F...[3]	26.1		134679F	0.714	J	1234689F	259	
1346/1246F	2.68		14678F	(0.0829)		124679F	1.72	J	1234789F	7.96	
1347F...[3]	3.83		13479F	(0.0829)		124689F	73				
1348F	0.697		13469/12479F	[0.822]	J	123467F	5.31				
1248F...[3]	3.52		12346F	1.06	J	123478F	15.6				
1268F	3.85		23468/12469F	6.76		123678F	6.19				
1467F	1.67		12347F	[1.83]	J	123479F	[0.375]	J			
1478F	1.09		12348F	2.1	J	123469F	1.18	J			
1369/1237F	0.74		12378F	2.89		123679F	0.333	J			
2467F	2.71		12678/12367F	6.51		234678F	10.1		**Conc.**	384	
2368F	4.67		12379F	(0.0829)		234678/123689F	(0.147)		**EMPC**	384	
1238F...[5]	1.9		12679F	0.309	J	123689F	(0.154)				
1278F	3.67		23467/12369F	3.98		123789F	(0.2)		**Octa-Furan**	**Conc (pg/g)**	**Qualifiers**
1349F	(0.0442)		23478F	(0.077)		123789/123489F	3.82				
1267F	1.1		23478/12489F	11.8		123489F	(0.154)		OCDF	319	
2346/1249F	1.67		12489F	(0.0829)							
2347/1279F	4.54		12349F	[0.189]	J						
2348F	1.56		12389F	0.477	J						
2378F	4.42										
2367/3467F	4.28										
1269F	(0.0442)										
1239F	(0.0442)										
1289F	1.83										
Conc.	61.4		**Conc.**	135		**Conc.**	193				
EMPC	61.4		**EMPC**	138		**EMPC**	193				

Checkcode: 918-884-LZS

Report Created: 25-Mar-2011 21:52 Analyst: MC

Sample ID: EW10-SC100-0-1.1 TEQ Summary Method 1613

Client Project Name:	Windward Environmental, LLC	Matrix:	Solids	Lab Sample ID:	A3041_8530_DF_005-RJ2
Cliend Project ID:	EW RI/FS Surface Sediment	Weight/Volume:	11.05 g	QC Batch No.:	8530
Date Collected:	04-Mar-2009	Split:	-	Date Extracted:	10-Mar-2011
Date Received:	24-Feb-2011	Dilution:	-	Date Analyzed:	25-Mar-2011 19:46
Lab Project No:	A3041	Units	pg/g		

Analyte	Result	Qualifiers	DLs	I-TEQ	WHO-1998	WHO-2005
2378-TCDD	1.42	B	0.0395	1.42	1.42	1.42
12378-PeCDD	3.31		0.0919	1.66	3.31	3.31
123478-HxCDD	4.09		0.0898	0.409	0.409	0.409
123678-HxCDD	21.6		0.101	2.16	2.16	2.16
123789-HxCDD	9.89		0.109	0.989	0.989	0.989
1234678-HpCDD	584		0.143	5.84	5.84	5.84
OCDD	5320		0.124	5.32	0.532	1.6
2378-TCDF	4.42		0.0442	0.442	0.442	0.442
12378-PeCDF	2.89		0.0895	0.144	0.144	0.0867
23478-PeCDF	(0.077)		0.077	(0.0385)	(0.0385)	(0.0231)
123478-HxCDF	15.6		0.143	1.56	1.56	1.56
123678-HxCDF	6.19		0.135	0.619	0.619	0.619
234678-HxCDF	10.1		0.147	1.01	1.01	1.01
123789-HxCDF	(0.2)		0.2	(0.02)	(0.02)	(0.02)
1234678-HpCDF	112		0.0489	1.12	1.12	1.12
1234789-HpCDF	7.96		0.0654	0.0796	0.0796	0.0796
OCDF	319		0.132	0.319	0.0319	0.0956

TEQ Summaries			
EMPC = 0, ND = 0	23.1	19.7	20.7
EMPC = 0, ND = DL / 2	23.1	19.7	20.8
EMPC = 0, ND = DL	23.1	19.7	20.8
EMPC = 0, < J-level = 0	23.1	19.7	20.7
EMPC = EMPC, ND = 0	23.1	19.7	20.7
EMPC = EMPC, ND = DL / 2	23.1	19.7	20.8
EMPC = EMPC, ND = DL	23.1	19.7	20.8
EMPC = EMPC, < J-level = 0	23.1	19.7	20.7

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APPENDIX C. DATA VALIDATION

Round 1 Data

EcoChem, INC.
Environmental Data Quality

DATA VALIDATION REPORT

Port of Seattle
East Waterway Subsurface Sediment Sampling

Prepared for:

Windward Environmental, LLC
200 West Mercer Street, Suite 401
Seattle, Washington 98119

Prepared by:

EcoChem, Inc.
710 Second Avenue, Suite 660
Seattle, Washington 98104

EcoChem Project: C22022-2

January 31, 2011

Approved for Release:

Christina Mott
Project Manager
EcoChem, Inc.

PROJECT NARRATIVE

Basis for the Data Validation

This report summarizes the results of full validation (EPA Stage 4) performed on sediment and quality control sample data for the East Waterway Subsurface Sediment sampling. A complete list of samples is provided in the **Sample Index**.

Samples were analyzed by Analytical Perspectives, Inc., Wilmington, North Carolina. The analytical methods and EcoChem project chemists are listed below.

Analysis	Method	Primary Review	Secondary Review
Dioxin & Furan Compounds	EPA 1613b	Mark Brindle	Christine Mott

The data were reviewed using guidance and quality control criteria documented in the analytical methods; the quality assurance project plans (QAPP) from the *Subsurface Sediment Sampling for Chemical Analyses in the East Waterway* (January 2010); *USEPA National Functional Guidelines for Chlorinated Dioxin/Furan Data Review* (USEPA, September 2005);

EcoChem's goal in assigning data assessment qualifiers is to assist in proper data interpretation. If values are estimated (J or UJ), data may be used for site evaluation and risk assessment purposes but reasons for data qualification should be taken into consideration when interpreting sample concentrations. If values are assigned an R, the data are to be rejected and should not be used for any site evaluation purposes. If values have no data qualifier assigned, then the data meet the data quality objectives as stated in the documents and methods referenced above.

Data qualifier definitions, reason codes, and validation criteria are included as **APPENDIX A**. A Qualified Data Summary Table is included in **APPENDIX B**. Data Validation Worksheets will be kept on file at EcoChem, Inc. A qualified laboratory electronic data deliverable (EDD) is also submitted with this report.

Sample Index
Port of Seattle - East Waterway Source Ccontrol

SDG	Sample ID	Laboratory ID	Dioxin
A2870	EW09-SS-023-010T3	A2870_8380_DF_001	✓
	EW09-SS-008-010T3	A2870_8380_DF_002	✓
	EW09-SS-129-010T3	A2870_8380_DF_003	✓
	EW09-SS-039-010T3	A2870_8380_DF_004	✓
	EW09-SS-comp1-010	A2870_8380_DF_005	✓
	EW09-SS-comp2-010	A2870_8380_DF_006	✓
	EW09-SS-100-010T3	A2870_8380_DF_007	✓
	EW09-SS-101-010T3	A2870_8380_DF_008	✓
	EW09-SS-114-010T3	A2870_8380_DF_009	✓
A2871	EW10-SC18-2-4T3	A2871_8384_DF_001	✓
	EW10-SC10-4-6T3	A2871_8384_DF_002	✓
	EW10-SC12-5-7T3	A2871_8384_DF_003	✓
	EW10-SC18-6-8T3	A2871_8384_DF_004	✓
	EW10-SC58-6-8T3	A2871_8384_DF_005	✓
	EW10-SC23-1.3-3.2T3	A2871_8384_DF_006	✓
	EW10-SC23-9-11T3	A2871_8384_DF_007	✓
	EW10-SC33-5.8-8T3	A2871_8384_DF_008	✓
	EW10-SC53-5-7T3	A2871_8384_DF_009	✓
	EW10-SC54-8-9.2T3	A2871_8384_DF_010	✓
	EW10-SC06-6-7.4T3	A2871_8384_DF_011	✓
	EW10-SC04-2-4T3	A2871_8384_DF_012	✓
	EW10-SC21-5.3-7.8T3	A2871_8384_DF_013	✓
	EW10-SC43-4-6T3	A2871_8384_DF_014	✓
	EW10-SC14-5.3-7.3T3	A2871_8384_DF_015	✓

YDATA VALIDATION REPORT
East Waterway Subsurface Sediment
Dioxin/Furan Compounds by EPA 1613B

This report documents the review of analytical data from the analysis of sediment samples and the associated laboratory quality control (QC) samples. Analytical Perspectives, Wilmington, North Carolina, analyzed the samples. Refer to the **Sample Index** for a list of samples reviewed.

SDG	Number of Samples	Validation Level
A2870	9 Sediment	Stage 4
A2871	15 Sediment	Stage 4

I. DATA PACKAGE COMPLETENESS

The laboratory submitted all required deliverables. The laboratory followed adequate corrective action processes and all anomalies were discussed in the case narrative.

II. EDD VERIFICATION

A verification of the electronic data deliverable (EDD) results was performed by comparison to the hardcopy laboratory data packages. All sample results were verified along with ten percent of the QC results. No errors were found.

III. TECHNICAL DATA VALIDATION

The quality control (QC) requirements that were reviewed are listed in the following table.

1	Holding Times and Sample Preservation
1	System Performance and Resolution Checks
	Initial Calibration (ICAL)
	Calibration Verification (CVER)
	Laboratory Blanks
1	Field Blanks
	Labeled Compound Recovery
1	Matrix Spike/Matrix Spike Duplicates (MS/MSD)
	Ongoing Precision and Recovery (OPR)
1	Field Duplicates
	Target Analyte List
	Reporting Limits
2	Compound Identification
2	Compound Quantitation
1	Calculation Verification

[1] ***Quality control results are discussed below, but no data were qualified.***
[2] ***Quality control outliers that impact the reported data were noted. Data qualifiers were issued as discussed below.***

Holding Times and Sample Preservation

Intra-laboratory transfer documents served as the Analytical Perspectives chain-of-custody (COC) forms. Original sample COC forms and compositing instructions are on file at Windward and Analytical Resources, Inc.

System Performance and Resolution Checks

The method requires the analysis of an isomer-specificity test solution. The analysis of this solution (performed near the beginning of an analytical sequence) demonstrates that the GC column can successfully separate 2,3,7,8-TCDD (on the DB5 column) and 2,3,7,8-TCDF (on the DB225 or equivalent column) from closely eluting non-target isomers.

The isomer-specificity analysis was acceptable for 2,3,7,8-TCDD. However, the laboratory does not perform second column analysis. Instead, the laboratory includes the known co-eluting isomers in the ongoing precision and recovery (OPR) spike solution. This QC sample goes through the entire extraction process prior to analysis. Isomer specificity is verified using the results of the OPR analysis.

The method criteria for evaluating the isomer-specificity test is that the peak-to-valley ratio between the 2,3,7,8-isomer and the closest eluting non-target isomer must be less than or equal to 25%. The laboratory uses a 10% criterion for 2,3,7,8-TCDD, and a 40% criterion for 2,3,7,8-TCDF.

For 2,3,7,8-TCDF, the method criterion of 25% is for analyses performed using a DB225 (or equivalent) column. The laboratory uses a DB5MS column (see the **Compound Identification** section for further discussion). Although the laboratory criterion for 2,3,7,8-TCDF is greater than 25%, the laboratory also requires that despite the presence of a potentially interfering peak, the 2,3,7,8-TCDF recovery and retention time must still meet the OPR control limits, proving that 2,3,7,8-TCDF was adequately resolved.

The 2,3,7,8-TCDF peak was judged to be adequately resolved and no further action was necessary given that the 2,3,7,8-TCDF peak-to-valley ratio was less than 40% and all other OPR control limits were met.

Field Blanks

SDG A2870 & A2871: No samples identified as field blanks were submitted.

Matrix Spike/Matrix Spike Duplicate

SDG A2870 & A2871: Matrix spike/matrix spike duplicate (MS/MSD) analyses were not performed. Accuracy was assessed using labeled compound recoveries and ongoing precision and recovery (OPR) samples. Precision is monitored by the laboratory by comparing the OPR results between extraction batches. All laboratory precision criteria were met.

Field Duplicates

SDG A2870 & A2871: No samples identified as field duplicates were submitted.

Compound Identification

The method requires the confirmation of 2,3,7,8-TCDF detects using an alternate GC column. The DB5 column that is typically used cannot fully separate 2,3,7,8-TCDF from closely eluting non-target TCDF isomers. The laboratory did not perform a second column confirmation; however the laboratory uses a DB5MS column. This modified column has been proven to adequately resolve the TCDF isomers. The laboratory also includes the interfering TCDF isomer as a spiked compound in the OPR solution to demonstrate acceptable resolution, as discussed in the **Instrument Performance** section above. Since the 2,3,7,8-TCDF resolution was acceptable, no further action was necessary.

For several samples, the laboratory reported EMPC or "estimated maximum possible concentrations" values for one or more of the target analytes. An EMPC value is reported when a peak was detected but did not meet identification criteria, as required by the method; therefore the result cannot be considered as positive identification for the analyte. To indicate that the reported result for an individual analyte is in effect an elevated detection limit, the EMPC values were qualified as not detected (U-22) at the reported values. Summed analytes (homolog groups) that have been EMPC flagged by the laboratory were qualified as estimated (J-22).

Compound Quantitation

SDG A2870: The results for OCDD in Samples EW09-SS-023-010 and EW09-SS-008-010 exceeded the calibrated linear range of the instrument. These results were estimated (J-20).

SDG A2871: The result for OCDD in Sample EW10-SC23-1.3-3.2 exceeded the calibrated linear range of the instrument. This result was estimated (J-20).

Calculation Verification

SDG A2870 & A2871: Several results were verified by recalculation from the raw data. No calculation or transcription errors were found.

IV. OVERALL ASSESSMENT

As determined by this evaluation, the laboratory performed an acceptable modification of the specified analytical method. Accuracy was acceptable, as demonstrated by the labeled compound and OPR recoveries. Precision was also acceptable as indicated by the OPR recoveries from multiple extraction batches.

Data were qualified as not detected to indicate that EMPC values represent elevated detection limits. Data were estimated due to values that exceeded the linear calibration range.

All data, as qualified, are acceptable for use.

EcoChem, INC.
Environmental Data Quality

APPENDIX A

DATA QUALIFIER DEFINITIONS, REASON CODES, AND CRITERIA TABLES

DATA VALIDATION QUALIFIER CODES
Based on National Functional Guidelines

The following definitions provide brief explanations of the qualifiers assigned to results in the data review process.

U	The analyte was analyzed for, but was not detected above the reported sample quantitation limit.
J	The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.
NJ	The analysis indicates the presence of an analyte that has been "tentatively identified" and the associated numerical value represents the approximate concentration.
UJ	The analyte was not detected above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.
R	The sample results are rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria. The presence or absence of the analyte cannot be verified.

The following is an EcoChem qualifier that may also be assigned during the data review process:

DNR	Do not report; a more appropriate result is reported from another analysis or dilution.

DATA QUALIFIER REASON CODES

1	Holding Time/Sample Preservation
2	Chromatographic pattern in sample does not match pattern of calibration standard.
3	Compound Confirmation
4	Tentatively Identified Compound (TIC) (associated with NJ only)
5A	Calibration (initial)
5B	Calibration (continuing)
6	Field Blank Contamination
7	Lab Blank Contamination (e.g., method blank, instrument, etc.)
8	Matrix Spike(MS & MSD) Recoveries
9	Precision (all replicates)
10	Laboratory Control Sample Recoveries
11	A more appropriate result is reported (associated with “R” and “DNR” only)
12	Reference Material
13	Surrogate Spike Recoveries (a.k.a., labeled compounds & recovery standards)
14	Other (define in validation report)
15	GFAA Post Digestion Spike Recoveries
16	ICP Serial Dilution % Difference
17	ICP Interference Check Standard Recovery
18	Trip Blank Contamination
19	Internal Standard Performance (e.g., area, retention time, recovery)
20	Linear Range Exceeded
21	Potential False Positives
22	Elevated Detection Limit Due to Interference (i.e., laboratory, chemical and/or matrix)

EcoChem Validation Guidelines for Dioxin/Furan Analysis by HRMS
(Based on EPA Reg. 10 SOP, Rev. 2, 1996 & EPA SW-846, Methods 1613b and 8290)

VALIDATION QC ELEMENT	ACCEPTANCE CRITERIA	ACTION	REASON CODE
Cooler/Storage Temperature	Waters/Solids < 4°C Tissues <-10°C	EcoChem PJ, see TM-05	1
Holding Time	Extraction - Water: 30 days from collection *Note:* Under CWA, SDWA, and RCRA the HT for H2O is 7 days* Extraction - Soil: 30 days from collection Analysis: 40 days from extraction	J(+)/UJ(-) if ext > 30 days J(+)/UJ(-) if analysis > 40 Days EcoChem PJ, see TM-05	1
Mass Resolution	>=10,000 resolving power at m/z 304.9824 Exact mass of m/z 380.9760 w/in 5 ppm of theoretical value (380.97410 to 380.97790) . Analyzed prior to ICAL and at the start and end of each 12 hr. shift	R(+/-) if not met	14
Window Defining Mix and Column Performance Mix	Window defining mixture/Isomer specificity std run before ICAL and CCAL Valley < 25% (valley = (x/y)*100%) x = ht. of TCDD y = baseline to bottom of valley For all isomers eluting near 2378-TCDD/TCDF isomers (TCDD only for 8290)	J(+) if valley > 25%	5A (ICAL) 5B (CCAL
Initial Calibration	Minimum of five standards %RSD < 20% for native compounds %RSD <30% for labeled compounds (%RSD <35% for labeled compounds under 1613b)	J(+) natives if %RSD > 20%	5A
	Abs. RT of $^{13}C_{12}$-1234-TCDD >25 min on DB5 >15 min on DB-225	EcoChem PJ, see TM-05	
	Ion Abundance ratios within QC limits (Table 8 of method 8290) (Table 9 of method 1613B)	EcoChem PJ, see TM-05	
	S/N ratio > 10 for all native and labeled compounds in CS1 std.	If <10, elevate Det. Limit or R(-)	

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EcoChem Validation Guidelines for Dioxin/Furan Analysis by HRMS
(Based on EPA Reg. 10 SOP, Rev. 2, 1996 & EPA SW-846, Methods 1613b and 8290)

VALIDATION QC ELEMENT	ACCEPTANCE CRITERIA	ACTION	REASON CODE
Continuing Calibration	Analyzed at the start and end of each 12 hour shift. %D+/-20% for native compounds %D +/-30% for labeled compounds (Must meet limits in Table 6, Method 1613B) (If %Ds in the closing CCAL are w/in 25%/35% the avg RF from the two CCAL may be used to calculate samples per Method 8290, Section 8.3.2.4)	Do not qualify labeled compounds. Narrate in report for labeled compound %D outliers. For native compound %D outliers: 8290: J(+)/UJ(-) if %D = 20% - 75% J(+)/R(-) if %D > 75% 1613: J(+)/UJ(-) if %D is outside Table 6 limits J(+)/R(-) if %D is +/- 75% of Table 6 limit	5B
	Abs. RT of $^{13}C_{12}$-1234-TCDD and ^{13}C12-123789-HxCDD +/- 15 sec of ICAL.	EcoChem PJ, see ICAL section of TM-05	
	RRT of all other compounds must meet Table 2 of 1613B.	EcoChem PJ, see TM-05	
	Ion Abundance ratios within QC limits (Table 8 of method 8290) (Table 9 of method 1613B)	EcoChem PJ, see TM-05	
	S/N ratio > 10	If <10, elevate Det. Limit or R(-)	
Method Blank	One per matrix per batch No positive results	If sample result <5X action level, qualify U at reported value.	7
Field Blanks (Not Required)	No positive results	If sample result <5X action level, qualify U at reported value.	6
LCS / OPR	Concentrations must meet limits in Table 6, Method 1613B or lab limits.	J(+) if %R > UCL J(+)/UJ(-) if %R < LCL J(+)/R(-) using PJ if %R <<LCL (< 10%)	10
MS/MSD (recovery)	May not analyze MS/MSD %R should meet lab limits.	Qualify parent only unless other QC indicates systematic problems: J(+) if both %R > UCL J(+)/UJ(-) if both %R < LCL J(+)/R(-) if both %R < 10% PJ if only one %R outlier	8
MS/MSD (RPD)	May not analyze MS/MSD RPD < 20%	J(+) in parent sample if RPD > CL	9

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EcoChem Validation Guidelines for Dioxin/Furan Analysis by HRMS
(Based on EPA Reg. 10 SOP, Rev. 2, 1996 & EPA SW-846, Methods 1613b and 8290)

VALIDATION QC ELEMENT	ACCEPTANCE CRITERIA	ACTION	REASON CODE
Lab Duplicate	RPD <25% if present.	J(+)/UJ(-) if outside limts	9
Labeled Compounds / Internal Standards	*Method 8290:* %R = 40% - 135% in all samples *Method 1613B:* %R must meet limits specified in Table 7, Method 1613	J(+)/UJ(-) if %R = 10% to LCL J(+) if %R > UCL J(+)/R(-) if %R < 10%	13
Quantitation/ Identification	Ions for analyte, IS, and rec. std. must max w/in 2 sec. S/N >2.5 IA ratios meet limits in Table 9 of 1613B or Table 8 of 8290 RRTs w/in limits in Table 2 of 1613B	If RT criteria not met, use PJ (see TM-05) If S/N criteria not met, J(+). if unlabelled ion abundance not met, change to EMPC If labelled ion abundance not met, J(+).	21
EMPC (estimated maximum possible concentration)	If quantitation idenfication criteria are not met, laboratory should report an EMPC value.	If laboratory correctly reported an EMPC value, qualify with U to indicate that the value is a detection limit.	14
Interferences	PCDF interferences from PCDPE	If both detected, change PCDF result to EMPC	14
Second Column Confirmation	All 2378-TCDF hits must be confirmed on a DB-225 (or equiv) column. All QC specs in this table must be met for the confirmation analysis.	Report lower of the two values. If not performed use PJ (see TM-05).	3
Field Duplicates	Use QAPP limits. If no QAPP: Solids: RPD <50% OR absolute diff. < 2X RL (for results < 5X RL) Aqueous: RPD <35% OR absolute diff. < 1X RL (for results < 5X RL)	Narrate and qualify if required by project (EcoChem PJ)	9
Two analyses for one sample	Report only one result per analyte	"DNR" results that should not be used	11

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Environmental Data Quality

APPENDIX B
QUALIFIED DATA SUMMARY TABLE

Qualified Data Summary Table
Port of Seattle - East Waterway Subsurfce Sediments

SDG	Sample ID	Lab ID	Method	Analyte	Result	Units	Lab Qualifier	Val Qualifier	Val Reason
A2870	EW09-SS-023-010T3	A2870_8380_DF_001	EPA 1613	OCDD	12400	ng/kg	*	J	20
A2870	EW09-SS-023-010T3	A2870_8380_DF_001	EPA 1613	Total TCDD	187	ng/kg	EMPC	J	22
A2870	EW09-SS-008-010T3	A2870_8380_DF_002	EPA 1613	OCDD	10200	ng/kg	*	J	20
A2870	EW09-SS-008-010T3	A2870_8380_DF_002	EPA 1613	Total HxCDF	272	ng/kg	EMPC	J	22
A2870	EW09-SS-008-010T3	A2870_8380_DF_002	EPA 1613	Total PeCDF	113	ng/kg	EMPC	J	22
A2870	EW09-SS-008-010T3	A2870_8380_DF_002	EPA 1613	Total TCDD	23.2	ng/kg	EMPC	J	22
A2870	EW09-SS-008-010T3	A2870_8380_DF_002	EPA 1613	Total TCDF	88.7	ng/kg	EMPC	J	22
A2870	EW09-SS-129-010T3	A2870_8380_DF_003	EPA 1613	Total PeCDD	19.3	ng/kg	EMPC	J	22
A2870	EW09-SS-129-010T3	A2870_8380_DF_003	EPA 1613	Total PeCDF	66.3	ng/kg	EMPC	J	22
A2870	EW09-SS-129-010T3	A2870_8380_DF_003	EPA 1613	Total TCDF	65.1	ng/kg	EMPC	J	22
A2870	EW09-SS-039-010T3	A2870_8380_DF_004	EPA 1613	2378-TCDD	0.191	ng/kg	EMPC J	U	22
A2870	EW09-SS-039-010T3	A2870_8380_DF_004	EPA 1613	Total PeCDD	9.2	ng/kg	EMPC	J	22
A2870	EW09-SS-039-010T3	A2870_8380_DF_004	EPA 1613	Total PeCDF	24.4	ng/kg	EMPC	J	22
A2870	EW09-SS-039-010T3	A2870_8380_DF_004	EPA 1613	Total TCDD	4.64	ng/kg	EMPC	J	22
A2870	EW09-SS-039-010T3	A2870_8380_DF_004	EPA 1613	Total TCDF	20.6	ng/kg	EMPC	J	22
A2870	EW09-SS-comp1-010	A2870_8380_DF_005	EPA 1613	2378-TCDD	0.0569	ng/kg	EMPC J	U	22
A2870	EW09-SS-comp1-010	A2870_8380_DF_005	EPA 1613	Total PeCDD	3.34	ng/kg	EMPC	J	22
A2870	EW09-SS-comp1-010	A2870_8380_DF_005	EPA 1613	Total PeCDF	7.89	ng/kg	EMPC	J	22
A2870	EW09-SS-comp1-010	A2870_8380_DF_005	EPA 1613	Total TCDD	1.26	ng/kg	EMPC	J	22
A2870	EW09-SS-comp1-010	A2870_8380_DF_005	EPA 1613	Total TCDF	6.64	ng/kg	EMPC	J	22
A2870	EW09-SS-comp2-010	A2870_8380_DF_006	EPA 1613	Total HxCDF	93.8	ng/kg	EMPC	J	22
A2870	EW09-SS-comp2-010	A2870_8380_DF_006	EPA 1613	Total PeCDD	20.7	ng/kg	EMPC	J	22
A2870	EW09-SS-comp2-010	A2870_8380_DF_006	EPA 1613	Total TCDD	12	ng/kg	EMPC	J	22
A2870	EW09-SS-comp2-010	A2870_8380_DF_006	EPA 1613	Total TCDF	44.2	ng/kg	EMPC	J	22
A2870	EW09-SS-100-010T3	A2870_8380_DF_007	EPA 1613	Total PeCDD	39.2	ng/kg	EMPC	J	22
A2870	EW09-SS-100-010T3	A2870_8380_DF_007	EPA 1613	Total TCDD	16.2	ng/kg	EMPC	J	22
A2870	EW09-SS-100-010T3	A2870_8380_DF_007	EPA 1613	Total TCDF	101	ng/kg	EMPC	J	22
A2870	EW09-SS-101-010T3	A2870_8380_DF_008	EPA 1613	Total PeCDD	27.8	ng/kg	EMPC	J	22
A2870	EW09-SS-101-010T3	A2870_8380_DF_008	EPA 1613	Total TCDD	15.8	ng/kg	EMPC	J	22
A2870	EW09-SS-101-010T3	A2870_8380_DF_008	EPA 1613	Total TCDF	54.6	ng/kg	EMPC	J	22
A2870	EW09-SS-114-010T3	A2870_8380_DF_009	EPA 1613	2378-TCDD	0.647	ng/kg	EMPC	U	22
A2870	EW09-SS-114-010T3	A2870_8380_DF_009	EPA 1613	Total PeCDD	28.7	ng/kg	EMPC	J	22
A2870	EW09-SS-114-010T3	A2870_8380_DF_009	EPA 1613	Total PeCDF	96.6	ng/kg	EMPC	J	22
A2870	EW09-SS-114-010T3	A2870_8380_DF_009	EPA 1613	Total TCDD	15.6	ng/kg	EMPC	J	22
A2870	EW09-SS-114-010T3	A2870_8380_DF_009	EPA 1613	Total TCDF	64.6	ng/kg	EMPC	J	22
A2871	EW10-SC18-2-4T3	A2871_8384_DF_001	EPA 1613	Total PeCDD	57.9	ng/kg	EMPC	J	22
A2871	EW10-SC18-2-4T3	A2871_8384_DF_001	EPA 1613	Total TCDD	31.5	ng/kg	EMPC	J	22
A2871	EW10-SC10-4-6T3	A2871_8384_DF_002	EPA 1613	12378-PeCDD	0.15	ng/kg	EMPC J	U	22
A2871	EW10-SC10-4-6T3	A2871_8384_DF_002	EPA 1613	2378-TCDF	0.123	ng/kg	EMPC J	U	22
A2871	EW10-SC10-4-6T3	A2871_8384_DF_002	EPA 1613	Total HxCDF	16.7	ng/kg	EMPC	J	22
A2871	EW10-SC10-4-6T3	A2871_8384_DF_002	EPA 1613	Total PeCDD	1.84	ng/kg	EMPC	J	22
A2871	EW10-SC10-4-6T3	A2871_8384_DF_002	EPA 1613	Total PeCDF	6.08	ng/kg	EMPC	J	22
A2871	EW10-SC10-4-6T3	A2871_8384_DF_002	EPA 1613	Total TCDD	0.882	ng/kg	EMPC	J	22
A2871	EW10-SC10-4-6T3	A2871_8384_DF_002	EPA 1613	Total TCDF	3.69	ng/kg	EMPC	J	22
A2871	EW10-SC12-5-7T3	A2871_8384_DF_003	EPA 1613	Total HxCDD	0.568	ng/kg	EMPC	J	22
A2871	EW10-SC12-5-7T3	A2871_8384_DF_003	EPA 1613	Total HxCDF	0.246	ng/kg	EMPC	J	22
A2871	EW10-SC12-5-7T3	A2871_8384_DF_003	EPA 1613	Total TCDD	0.282	ng/kg	EMPC	J	22
A2871	EW10-SC18-6-8T3	A2871_8384_DF_004	EPA 1613	1234678-HpCDD	0.922	ng/kg	EMPC J	U	22
A2871	EW10-SC18-6-8T3	A2871_8384_DF_004	EPA 1613	Total HpCDD	2.49	ng/kg	EMPC	J	22
A2871	EW10-SC58-6-8T3	A2871_8384_DF_005	EPA 1613	1234678-HpCDD	0.652	ng/kg	EMPC J	U	22

Qualified Data Summary Table
Port of Seattle - East Waterway Subsurfce Sediments

SDG	Sample ID	Lab ID	Method	Analyte	Result	Units	Lab Qualifier	Val Qualifier	Val Reason
A2871	EW10-SC58-6-8T3	A2871_8384_DF_005	EPA 1613	Total HpCDD	1.96	ng/kg	EMPC	J	22
A2871	EW10-SC23-1.3-3.2T3	A2871_8384_DF_006	EPA 1613	OCDD	22000	ng/kg	*	J	20
A2871	EW10-SC23-1.3-3.2T3	A2871_8384_DF_006	EPA 1613	Total PeCDD	361	ng/kg	EMPC	J	22
A2871	EW10-SC23-1.3-3.2T3	A2871_8384_DF_006	EPA 1613	Total TCDF	851	ng/kg	EMPC	J	22
A2871	EW10-SC23-9-11T3	A2871_8384_DF_007	EPA 1613	123678-HxCDD	0.374	ng/kg	EMPC J	U	22
A2871	EW10-SC23-9-11T3	A2871_8384_DF_007	EPA 1613	234678-HxCDF	0.174	ng/kg	EMPC J	U	22
A2871	EW10-SC23-9-11T3	A2871_8384_DF_007	EPA 1613	2378-TCDD	0.0816	ng/kg	EMPC J	U	22
A2871	EW10-SC23-9-11T3	A2871_8384_DF_007	EPA 1613	Total HxCDD	6.96	ng/kg	EMPC	J	22
A2871	EW10-SC23-9-11T3	A2871_8384_DF_007	EPA 1613	Total HxCDF	1.69	ng/kg	EMPC	J	22
A2871	EW10-SC23-9-11T3	A2871_8384_DF_007	EPA 1613	Total PeCDD	4.8	ng/kg	EMPC	J	22
A2871	EW10-SC23-9-11T3	A2871_8384_DF_007	EPA 1613	Total PeCDF	3.08	ng/kg	EMPC	J	22
A2871	EW10-SC23-9-11T3	A2871_8384_DF_007	EPA 1613	Total TCDD	5.14	ng/kg	EMPC	J	22
A2871	EW10-SC23-9-11T3	A2871_8384_DF_007	EPA 1613	Total TCDF	7.15	ng/kg	EMPC	J	22
A2871	EW10-SC33-5.8-8T3	A2871_8384_DF_008	EPA 1613	123789-HxCDD	0.146	ng/kg	EMPC J	U	22
A2871	EW10-SC33-5.8-8T3	A2871_8384_DF_008	EPA 1613	Total HxCDD	0.844	ng/kg	EMPC	J	22
A2871	EW10-SC53-5-7T3	A2871_8384_DF_009	EPA 1613	123789-HxCDD	0.302	ng/kg	EMPC J	U	22
A2871	EW10-SC53-5-7T3	A2871_8384_DF_009	EPA 1613	12378-PeCDD	0.149	ng/kg	EMPC J	U	22
A2871	EW10-SC53-5-7T3	A2871_8384_DF_009	EPA 1613	2378-TCDD	0.0856	ng/kg	EMPC J	U	22
A2871	EW10-SC53-5-7T3	A2871_8384_DF_009	EPA 1613	Total HpCDF	21.2	ng/kg	EMPC	J	22
A2871	EW10-SC53-5-7T3	A2871_8384_DF_009	EPA 1613	Total HxCDD	5.08	ng/kg	EMPC	J	22
A2871	EW10-SC53-5-7T3	A2871_8384_DF_009	EPA 1613	Total HxCDF	9.3	ng/kg	EMPC	J	22
A2871	EW10-SC53-5-7T3	A2871_8384_DF_009	EPA 1613	Total PeCDD	1.86	ng/kg	EMPC	J	22
A2871	EW10-SC53-5-7T3	A2871_8384_DF_009	EPA 1613	Total TCDD	1.61	ng/kg	EMPC	J	22
A2871	EW10-SC53-5-7T3	A2871_8384_DF_009	EPA 1613	Total TCDF	9.39	ng/kg	EMPC	J	22
A2871	EW10-SC54-8-9.2T3	A2871_8384_DF_010	EPA 1613	123789-HxCDD	0.131	ng/kg	EMPC J	U	22
A2871	EW10-SC54-8-9.2T3	A2871_8384_DF_010	EPA 1613	Total HxCDD	0.935	ng/kg	EMPC	J	22
A2871	EW10-SC54-8-9.2T3	A2871_8384_DF_010	EPA 1613	Total PeCDD	0.147	ng/kg	EMPC	J	22
A2871	EW10-SC54-8-9.2T3	A2871_8384_DF_010	EPA 1613	Total TCDD	0.673	ng/kg	EMPC	J	22
A2871	EW10-SC06-6-7.4T3	A2871_8384_DF_011	EPA 1613	Total HxCDD	41.3	ng/kg	EMPC	J	22
A2871	EW10-SC06-6-7.4T3	A2871_8384_DF_011	EPA 1613	Total HxCDF	5.04	ng/kg	EMPC	J	22
A2871	EW10-SC06-6-7.4T3	A2871_8384_DF_011	EPA 1613	Total PeCDD	64.5	ng/kg	EMPC	J	22
A2871	EW10-SC06-6-7.4T3	A2871_8384_DF_011	EPA 1613	Total PeCDF	12.6	ng/kg	EMPC	J	22
A2871	EW10-SC06-6-7.4T3	A2871_8384_DF_011	EPA 1613	Total TCDD	64	ng/kg	EMPC	J	22
A2871	EW10-SC06-6-7.4T3	A2871_8384_DF_011	EPA 1613	Total TCDF	32.7	ng/kg	EMPC	J	22
A2871	EW10-SC04-2-4T3	A2871_8384_DF_012	EPA 1613	1234789-HpCDF	0.322	ng/kg	EMPC J	U	22
A2871	EW10-SC04-2-4T3	A2871_8384_DF_012	EPA 1613	123478-HxCDD	0.34	ng/kg	EMPC J	U	22
A2871	EW10-SC04-2-4T3	A2871_8384_DF_012	EPA 1613	Total HpCDF	20.5	ng/kg	EMPC	J	22
A2871	EW10-SC04-2-4T3	A2871_8384_DF_012	EPA 1613	Total HxCDD	11.7	ng/kg	EMPC	J	22
A2871	EW10-SC04-2-4T3	A2871_8384_DF_012	EPA 1613	Total HxCDF	13.9	ng/kg	EMPC	J	22
A2871	EW10-SC04-2-4T3	A2871_8384_DF_012	EPA 1613	Total PeCDD	11.9	ng/kg	EMPC	J	22
A2871	EW10-SC04-2-4T3	A2871_8384_DF_012	EPA 1613	Total PeCDF	16.3	ng/kg	EMPC	J	22
A2871	EW10-SC04-2-4T3	A2871_8384_DF_012	EPA 1613	Total TCDD	15	ng/kg	EMPC	J	22
A2871	EW10-SC04-2-4T3	A2871_8384_DF_012	EPA 1613	Total TCDF	16.2	ng/kg	EMPC	J	22
A2871	EW10-SC21-5.3-7.8T3	A2871_8384_DF_013	EPA 1613	Total HxCDF	0.436	ng/kg	EMPC	J	22
A2871	EW10-SC21-5.3-7.8T3	A2871_8384_DF_013	EPA 1613	Total PeCDD	0.158	ng/kg	EMPC	J	22
A2871	EW10-SC21-5.3-7.8T3	A2871_8384_DF_013	EPA 1613	Total TCDD	0.657	ng/kg	EMPC	J	22
A2871	EW10-SC21-5.3-7.8T3	A2871_8384_DF_013	EPA 1613	Total TCDF	0.106	ng/kg	EMPC	J	22
A2871	EW10-SC43-4-6T3	A2871_8384_DF_014	EPA 1613	123478-HxCDD	0.162	ng/kg	EMPC J	U	22
A2871	EW10-SC43-4-6T3	A2871_8384_DF_014	EPA 1613	123678-HxCDF	0.329	ng/kg	EMPC J	U	22
A2871	EW10-SC43-4-6T3	A2871_8384_DF_014	EPA 1613	12378-PeCDD	0.156	ng/kg	EMPC J	U	22

Qualified Data Summary Table
Port of Seattle - East Waterway Subsurfce Sediments

SDG	Sample ID	Lab ID	Method	Analyte	Result	Units	Lab Qualifier	Val Qualifier	Val Reason
A2871	EW10-SC43-4-6T3	A2871_8384_DF_014	EPA 1613	Total HxCDD	6.36	ng/kg	EMPC	J	22
A2871	EW10-SC43-4-6T3	A2871_8384_DF_014	EPA 1613	Total HxCDF	10.1	ng/kg	EMPC	J	22
A2871	EW10-SC43-4-6T3	A2871_8384_DF_014	EPA 1613	Total PeCDD	2.51	ng/kg	EMPC	J	22
A2871	EW10-SC43-4-6T3	A2871_8384_DF_014	EPA 1613	Total PeCDF	9.86	ng/kg	EMPC	J	22
A2871	EW10-SC43-4-6T3	A2871_8384_DF_014	EPA 1613	Total TCDD	1.47	ng/kg	EMPC	J	22
A2871	EW10-SC43-4-6T3	A2871_8384_DF_014	EPA 1613	Total TCDF	9.51	ng/kg	EMPC	J	22
A2871	EW10-SC14-5.3-7.3T3	A2871_8384_DF_015	EPA 1613	Total TCDD	0.366	ng/kg	EMPC	J	22

Round 2 Data

EcoChem, INC.
Environmental Data Quality

DATA VALIDATION REPORT

Port of Seattle
East Waterway Subsurface Sediment Sampling

Prepared for:

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EcoChem Project: C22022-4

April 27, 2011

Approved for Release:

Christina Mott
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PROJECT NARRATIVE

Basis for the Data Validation

This report summarizes the results of full validation (EPA Stage 4) performed on sediment and quality control sample data for the East Waterway Subsurface Sediment sampling. A complete list of samples is provided in the **Sample Index**.

Samples were analyzed by Analytical Perspectives, Inc., Wilmington, North Carolina. The analytical methods and EcoChem project chemists are listed below.

Analysis	Method	Primary Review	Secondary Review
Dioxin & Furan Compounds	EPA 1613b	Melissa Swanson	Christina Mott

The data were reviewed using guidance and quality control criteria documented in the analytical methods; the quality assurance project plans (QAPP) from the *Subsurface Sediment Sampling for Chemical Analyses in the East Waterway* (January 2010); *USEPA National Functional Guidelines for Chlorinated Dioxin/Furan Data Review* (USEPA, September 2005);

EcoChem's goal in assigning data assessment qualifiers is to assist in proper data interpretation. If values are estimated (J or UJ), data may be used for site evaluation and risk assessment purposes but reasons for data qualification should be taken into consideration when interpreting sample concentrations. If values are assigned an R, the data are to be rejected and should not be used for any site evaluation purposes. If values have no data qualifier assigned, then the data meet the data quality objectives as stated in the documents and methods referenced above.

Data qualifier definitions, reason codes, and validation criteria are included as **APPENDIX A**. A Qualified Data Summary Table is included in **APPENDIX B**. Data Validation Worksheets will be kept on file at EcoChem, Inc. A qualified laboratory electronic data deliverable (EDD) is also submitted with this report.

Sample Index
Port of Seattle - East Waterway Source Control

SDG	Sample ID	Laboratory ID	Dioxin
A3041	EW09-SS-006-010T5	A3041_8530_DF_001RJ2	✓
	EW09-SS-009-010T5	A3041_8530_DF_002RJ2	✓
	EW09-SS-026-010T5	A3041_8530_DF_003RJ2	✓
	EW09-SS-102-010T5	A3041_8530_DF_004RJ2	✓
	EW10-SC100-0-1.1T5	A3041_8530_DF_005RJ2	✓

DATA VALIDATION REPORT
East Waterway Subsurface Sediment
Dioxin/Furan Compounds by EPA 1613B

This report documents the review of analytical data from the analysis of sediment samples and the associated laboratory quality control (QC) samples. Analytical Perspectives, Wilmington, North Carolina, analyzed the samples. Refer to the **Sample Index** for a list of samples reviewed.

SDG	Number of Samples	Validation Level
A3041	5 Sediment	Stage 4

I. DATA PACKAGE COMPLETENESS

The laboratory submitted all required deliverables. The laboratory followed adequate corrective action processes and all anomalies were discussed in the case narrative.

II. EDD VERIFICATION

A verification of the electronic data deliverable (EDD) results was performed by comparison to the hardcopy laboratory data packages. All sample results were verified along with ten percent of the QC results. No errors were found.

III. TECHNICAL DATA VALIDATION

The quality control (QC) requirements that were reviewed are listed in the following table.

2	Sample Receipt, Preservation, and Holding Times		Ongoing Precision and Recovery (OPR)
1	System Performance and Resolution Checks	1	Field Duplicates
	Initial Calibration (ICAL)		Target Analyte List
	Calibration Verification (CVER)		Reporting Limits
2	Laboratory Blanks	2	Compound Identification
1	Field Blanks		Compound Quantitation
	Labeled Compound Recovery	1	Calculation Verification
1	Matrix Spike/Matrix Spike Duplicates (MS/MSD)		

[1] ***Quality control results are discussed below, but no data were qualified.***
[2] ***Quality control outliers that impact the reported data were noted. Data qualifiers were issued as discussed below.***

Sample Receipt, Preservation, and Holding Times

Intra-laboratory transfer documents served as the Analytical Perspectives chain-of-custody (COC) forms. Original sample COC forms and compositing instructions are on file at Windward and Analytical Resources, Inc.

The five sediment samples were extracted past the one year hold time criteria at 624 to 736 days after collection. All results were estimated (J/UJ-1).

System Performance and Resolution Checks

The method requires the analysis of an isomer-specificity test solution. The analysis of this solution (performed near the beginning of an analytical sequence) demonstrates that the GC column can successfully separate 2,3,7,8-TCDD (on the DB5 column) and 2,3,7,8-TCDF (on the DB225 or equivalent column) from closely eluting non-target isomers.

The isomer-specificity analysis was acceptable for 2,3,7,8-TCDD. However, the laboratory does not perform second column analysis. Instead, the laboratory includes the known co-eluting isomers in the ongoing precision and recovery (OPR) spike solution. This QC sample goes through the entire extraction process prior to analysis. Isomer specificity is verified using the results of the OPR analysis.

The method criteria for evaluating the isomer-specificity test is that the peak-to-valley ratio between the 2,3,7,8-isomer and the closest eluting non-target isomer must be less than or equal to 25%. The laboratory uses a 10% criterion for 2,3,7,8-TCDD, and a 40% criterion for 2,3,7,8-TCDF.

For 2,3,7,8-TCDF, the method criterion of 25% is for analyses performed using a DB225 (or equivalent) column. The laboratory uses a DB5MS column (see the **Compound Identification** section for further discussion). Although the laboratory criterion for 2,3,7,8-TCDF is greater than 25%, the laboratory also requires that despite the presence of a potentially interfering peak, the 2,3,7,8-TCDF recovery and retention time must still meet the OPR control limits, proving that 2,3,7,8-TCDF was adequately resolved.

The 2,3,7,8-TCDF peak was judged to be adequately resolved and no further action was necessary given that the 2,3,7,8-TCDF peak-to-valley ratio was less than 40% and all other OPR control limits were met.

Laboratory Blanks

To assess the impact of any blank contaminant on the reported sample results, an action level is established at five times (5x) the concentration reported in the blank. If a contaminant is reported in an associated field sample and the concentration is less than the action level, the result is qualified as not detected (U-7). No action is taken if the sample result is greater than the action level, or for non-detected results. The laboratory assigned EMPC-flags to values when a peak was detected but did not meet identification criteria. These values cannot be considered as positive identifications, but are “estimated maximum possible concentrations”. When these occurred in the method blank, the results were considered as false positives. No action levels were established for these analytes.

Method blanks were analyzed at the appropriate frequency. Contaminant levels, associated samples, and action levels are documented in the data validation worksheets. Various target analytes were detected in the method blanks however; only the 2,3,7,8-TCDD required qualification in all samples (U-7).

Field Blanks

No samples identified as field blanks were submitted.

Matrix Spike/Matrix Spike Duplicate

Matrix spike/matrix spike duplicate (MS/MSD) analyses were not performed. Accuracy was assessed using labeled compound recoveries and ongoing precision and recovery (OPR) samples. Precision is monitored by the laboratory by comparing the OPR results between extraction batches. All laboratory precision criteria were met.

Field Duplicates

No samples identified as field duplicates were submitted.

Compound Identification

The method requires the confirmation of 2,3,7,8-TCDF detects using an alternate GC column. The DB5 column that is typically used cannot fully separate 2,3,7,8-TCDF from closely eluting non-target TCDF isomers. The laboratory did not perform a second column confirmation; however the laboratory uses a DB5MS column. This modified column has been proven to adequately resolve the TCDF isomers. The laboratory also includes the interfering TCDF isomer as a spiked compound in the OPR solution to demonstrate acceptable resolution, as discussed in the **Instrument Performance** section above. Since the 2,3,7,8-TCDF resolution was acceptable, no further action was necessary.

For several samples, the laboratory reported EMPC or "estimated maximum possible concentrations" values for one or more of the target analytes. An EMPC value is reported when a peak was detected but did not meet identification criteria, as required by the method; therefore the result cannot be considered as positive identification for the analyte. To indicate that the reported result for an individual analyte is in effect an elevated detection limit, the EMPC values were qualified as not detected (U-22) at the reported values. Summed analytes (homolog groups) that have been EMPC flagged by the laboratory were qualified as estimated (J-22).

Calculation Verification

Several results were verified by recalculation from the raw data. No calculation or transcription errors were found.

IV. OVERALL ASSESSMENT

As determined by this evaluation, the laboratory performed an acceptable modification of the specified analytical method. Accuracy was acceptable, as demonstrated by the labeled compound and OPR recoveries. Precision was also acceptable as indicated by the OPR recoveries from multiple extraction batches.

Data were qualified as not detected due to method blank contamination and to indicate that EMPC values represent elevated detection limits. Data were estimated due to holding time outliers.

All data, as qualified, are acceptable for use.

EcoChem, INC.
Environmental Data Quality

APPENDIX A

DATA QUALIFIER DEFINITIONS, REASON CODES, AND CRITERIA TABLES

DATA VALIDATION QUALIFIER CODES
Based on National Functional Guidelines

The following definitions provide brief explanations of the qualifiers assigned to results in the data review process.

U	The analyte was analyzed for, but was not detected above the reported sample quantitation limit.
J	The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.
NJ	The analysis indicates the presence of an analyte that has been "tentatively identified" and the associated numerical value represents the approximate concentration.
UJ	The analyte was not detected above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.
R	The sample results are rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria. The presence or absence of the analyte cannot be verified.

The following is an EcoChem qualifier that may also be assigned during the data review process:

DNR	Do not report; a more appropriate result is reported from another analysis or dilution.

DATA QUALIFIER REASON CODES

1	Holding Time/Sample Preservation
2	Chromatographic pattern in sample does not match pattern of calibration standard.
3	Compound Confirmation
4	Tentatively Identified Compound (TIC) (associated with NJ only)
5A	Calibration (initial)
5B	Calibration (continuing)
6	Field Blank Contamination
7	Lab Blank Contamination (e.g., method blank, instrument, etc.)
8	Matrix Spike(MS & MSD) Recoveries
9	Precision (all replicates)
10	Laboratory Control Sample Recoveries
11	A more appropriate result is reported (associated with “R” and “DNR” only)
12	Reference Material
13	Surrogate Spike Recoveries (a.k.a., labeled compounds & recovery standards)
14	Other (define in validation report)
15	GFAA Post Digestion Spike Recoveries
16	ICP Serial Dilution % Difference
17	ICP Interference Check Standard Recovery
18	Trip Blank Contamination
19	Internal Standard Performance (e.g., area, retention time, recovery)
20	Linear Range Exceeded
21	Potential False Positives
22	Elevated Detection Limit Due to Interference (i.e., laboratory, chemical and/or matrix)

EcoChem Validation Guidelines for Dioxin/Furan Analysis by HRMS
(Based on EPA Reg. 10 SOP, Rev. 2, 1996 & EPA SW-846, Methods 1613b and 8290)

VALIDATION QC ELEMENT	ACCEPTANCE CRITERIA	ACTION	REASON CODE
Cooler/Storage Temperature	Waters/Solids < 4°C Tissues <-10°C	EcoChem PJ, see TM-05	1
Holding Time	Extraction - Water: 30 days from collection *Note:* Under CWA, SDWA, and RCRA the HT for H2O is 7 days* Extraction - Soil: 30 days from collection Analysis: 40 days from extraction	J(+)/UJ(-) if ext > 30 days J(+)/UJ(-) if analysis > 40 Days EcoChem PJ, see TM-05	1
Mass Resolution	>=10,000 resolving power at m/z 304.9824 Exact mass of m/z 380.9760 w/in 5 ppm of theoretical value (380.97410 to 380.97790) . Analyzed prior to ICAL and at the start and end of each 12 hr. shift	R(+/-) if not met	14
Window Defining Mix and Column Performance Mix	Window defining mixture/Isomer specificity std run before ICAL and CCAL Valley < 25% (valley = (x/y)*100%) x = ht. of TCDD y = baseline to bottom of valley For all isomers eluting near 2378-TCDD/TCDF isomers (TCDD only for 8290)	J(+) if valley > 25%	5A (ICAL) 5B (CCAL
Initial Calibration	Minimum of five standards %RSD < 20% for native compounds %RSD <30% for labeled compounds (%RSD <35% for labeled compounds under 1613b)	J(+) natives if %RSD > 20%	5A
	Abs. RT of $^{13}C_{12}$-1234-TCDD >25 min on DB5 >15 min on DB-225	EcoChem PJ, see TM-05	
	Ion Abundance ratios within QC limits (Table 8 of method 8290) (Table 9 of method 1613B)	EcoChem PJ, see TM-05	
	S/N ratio > 10 for all native and labeled compounds in CS1 std.	If <10, elevate Det. Limit or R(-)	

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EcoChem Validation Guidelines for Dioxin/Furan Analysis by HRMS
(Based on EPA Reg. 10 SOP, Rev. 2, 1996 & EPA SW-846, Methods 1613b and 8290)

VALIDATION QC ELEMENT	ACCEPTANCE CRITERIA	ACTION	REASON CODE
Continuing Calibration	Analyzed at the start and end of each 12 hour shift. %D+/-20% for native compounds %D +/-30% for labeled compounds (Must meet limits in Table 6, Method 1613B) (If %Ds in the closing CCAL are w/in 25%/35% the avg RF from the two CCAL may be used to calculate samples per Method 8290, Section 8.3.2.4)	Do not qualify labeled compounds. Narrate in report for labeled compound %D outliers. For native compound %D outliers: 8290: J(+)/UJ(-) if %D = 20% - 75% J(+)/R(-) if %D > 75% 1613: J(+)/UJ(-) if %D is outside Table 6 limits J(+)/R(-) if %D is +/- 75% of Table 6 limit	5B
	Abs. RT of $^{13}C_{12}$-1234-TCDD and ^{13}C12-123789-HxCDD +/- 15 sec of ICAL.	EcoChem PJ, see ICAL section of TM-05	
	RRT of all other compounds must meet Table 2 of 1613B.	EcoChem PJ, see TM-05	
	Ion Abundance ratios within QC limits (Table 8 of method 8290) (Table 9 of method 1613B)	EcoChem PJ, see TM-05	
	S/N ratio > 10	If <10, elevate Det. Limit or R(-)	
Method Blank	One per matrix per batch No positive results	If sample result <5X action level, qualify U at reported value.	7
Field Blanks (Not Required)	No positive results	If sample result <5X action level, qualify U at reported value.	6
LCS / OPR	Concentrations must meet limits in Table 6, Method 1613B or lab limits.	J(+) if %R > UCL J(+)/UJ(-) if %R < LCL J(+)/R(-) using PJ if %R <<LCL (< 10%)	10
MS/MSD (recovery)	May not analyze MS/MSD %R should meet lab limits.	Qualify parent only unless other QC indicates systematic problems: J(+) if both %R > UCL J(+)/UJ(-) if both %R < LCL J(+)/R(-) if both %R < 10% PJ if only one %R outlier	8
MS/MSD (RPD)	May not analyze MS/MSD RPD < 20%	J(+) in parent sample if RPD > CL	9

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EcoChem Validation Guidelines for Dioxin/Furan Analysis by HRMS
(Based on EPA Reg. 10 SOP, Rev. 2, 1996 & EPA SW-846, Methods 1613b and 8290)

VALIDATION QC ELEMENT	ACCEPTANCE CRITERIA	ACTION	REASON CODE
Lab Duplicate	RPD <25% if present.	J(+)/UJ(-) if outside limts	9
Labeled Compounds / Internal Standards	*Method 8290:* %R = 40% - 135% in all samples *Method 1613B:* %R must meet limits specified in Table 7, Method 1613	J(+)/UJ(-) if %R = 10% to LCL J(+) if %R > UCL J(+)/R(-) if %R < 10%	13
Quantitation/ Identification	Ions for analyte, IS, and rec. std. must max w/in 2 sec. S/N >2.5 IA ratios meet limits in Table 9 of 1613B or Table 8 of 8290 RRTs w/in limits in Table 2 of 1613B	If RT criteria not met, use PJ (see TM-05) If S/N criteria not met, J(+). if unlabelled ion abundance not met, change to EMPC If labelled ion abundance not met, J(+).	21
EMPC (estimated maximum possible concentration)	If quantitation idenfication criteria are not met, laboratory should report an EMPC value.	If laboratory correctly reported an EMPC value, qualify with U to indicate that the value is a detection limit.	14
Interferences	PCDF interferences from PCDPE	If both detected, change PCDF result to EMPC	14
Second Column Confirmation	All 2378-TCDF hits must be confirmed on a DB-225 (or equiv) column. All QC specs in this table must be met for the confirmation analysis.	Report lower of the two values. If not performed use PJ (see TM-05).	3
Field Duplicates	Use QAPP limits. If no QAPP: Solids: RPD <50% OR absolute diff. < 2X RL (for results < 5X RL) Aqueous: RPD <35% OR absolute diff. < 1X RL (for results < 5X RL)	Narrate and qualify if required by project (EcoChem PJ)	9
Two analyses for one sample	Report only one result per analyte	"DNR" results that should not be used	11

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APPENDIX B
QUALIFIED DATA SUMMARY TABLE

Qualified Data Summary Table
Port of Seattle - East Waterway Subsurfce Sediments

SDG	Sample ID	Lab ID	Method	Analyte	Result	Units	Lab Qualifier	Val Qualifier	Val Reason
A3041	EW09-SS-006-010T5	A3041_8530_DF_001RJ2	EPA 1613	1234678-HpCDD	931	ng/kg		J	1
A3041	EW09-SS-006-010T5	A3041_8530_DF_001RJ2	EPA 1613	1234678-HpCDF	45.5	ng/kg		J	1
A3041	EW09-SS-006-010T5	A3041_8530_DF_001RJ2	EPA 1613	1234789-HpCDF	2.39	ng/kg		J	1
A3041	EW09-SS-006-010T5	A3041_8530_DF_001RJ2	EPA 1613	123478-HxCDD	6.08	ng/kg		J	1
A3041	EW09-SS-006-010T5	A3041_8530_DF_001RJ2	EPA 1613	123478-HxCDF	4.81	ng/kg		J	1
A3041	EW09-SS-006-010T5	A3041_8530_DF_001RJ2	EPA 1613	123678-HxCDD	39.4	ng/kg		J	1
A3041	EW09-SS-006-010T5	A3041_8530_DF_001RJ2	EPA 1613	123678-HxCDF	2.3	ng/kg		J	1
A3041	EW09-SS-006-010T5	A3041_8530_DF_001RJ2	EPA 1613	123789-HxCDD	15.4	ng/kg		J	1
A3041	EW09-SS-006-010T5	A3041_8530_DF_001RJ2	EPA 1613	123789-HxCDF		ng/kg	U	UJ	1
A3041	EW09-SS-006-010T5	A3041_8530_DF_001RJ2	EPA 1613	12378-PeCDD	2.7	ng/kg		J	1
A3041	EW09-SS-006-010T5	A3041_8530_DF_001RJ2	EPA 1613	12378-PeCDF	1.39	ng/kg	J	J	1
A3041	EW09-SS-006-010T5	A3041_8530_DF_001RJ2	EPA 1613	234678-HxCDF	4.15	ng/kg		J	1
A3041	EW09-SS-006-010T5	A3041_8530_DF_001RJ2	EPA 1613	23478-PeCDF	3.45	ng/kg		J	1
A3041	EW09-SS-006-010T5	A3041_8530_DF_001RJ2	EPA 1613	2378-TCDD	0.463	ng/kg	B	UJ	1,7
A3041	EW09-SS-006-010T5	A3041_8530_DF_001RJ2	EPA 1613	2378-TCDF	0.662	ng/kg		J	1
A3041	EW09-SS-006-010T5	A3041_8530_DF_001RJ2	EPA 1613	OCDD	7080	ng/kg		J	1
A3041	EW09-SS-006-010T5	A3041_8530_DF_001RJ2	EPA 1613	OCDF	63.8	ng/kg		J	1
A3041	EW09-SS-006-010T5	A3041_8530_DF_001RJ2	EPA 1613	Total HpCDD	2060	ng/kg		J	1
A3041	EW09-SS-006-010T5	A3041_8530_DF_001RJ2	EPA 1613	Total HpCDF	149	ng/kg	EMPC	J	1,22
A3041	EW09-SS-006-010T5	A3041_8530_DF_001RJ2	EPA 1613	Total HxCDD	198	ng/kg		J	1
A3041	EW09-SS-006-010T5	A3041_8530_DF_001RJ2	EPA 1613	Total HxCDF	120	ng/kg		J	1
A3041	EW09-SS-006-010T5	A3041_8530_DF_001RJ2	EPA 1613	Total PeCDD	13.4	ng/kg	EMPC	J	1,22
A3041	EW09-SS-006-010T5	A3041_8530_DF_001RJ2	EPA 1613	Total PeCDF	29.7	ng/kg	EMPC	J	1,22
A3041	EW09-SS-006-010T5	A3041_8530_DF_001RJ2	EPA 1613	Total TCDD	2.85	ng/kg	EMPC	J	1,22
A3041	EW09-SS-006-010T5	A3041_8530_DF_001RJ2	EPA 1613	Total TCDF	9.42	ng/kg	EMPC	J	1,22
A3041	EW09-SS-009-010T5	A3041_8530_DF_002RJ2	EPA 1613	1234678-HpCDD	445	ng/kg		J	1
A3041	EW09-SS-009-010T5	A3041_8530_DF_002RJ2	EPA 1613	1234678-HpCDF	84.4	ng/kg		J	1
A3041	EW09-SS-009-010T5	A3041_8530_DF_002RJ2	EPA 1613	1234789-HpCDF	5.92	ng/kg		J	1
A3041	EW09-SS-009-010T5	A3041_8530_DF_002RJ2	EPA 1613	123478-HxCDD	3.51	ng/kg		J	1
A3041	EW09-SS-009-010T5	A3041_8530_DF_002RJ2	EPA 1613	123478-HxCDF	10.5	ng/kg		J	1
A3041	EW09-SS-009-010T5	A3041_8530_DF_002RJ2	EPA 1613	123678-HxCDD	17	ng/kg		J	1
A3041	EW09-SS-009-010T5	A3041_8530_DF_002RJ2	EPA 1613	123678-HxCDF	3.75	ng/kg		J	1
A3041	EW09-SS-009-010T5	A3041_8530_DF_002RJ2	EPA 1613	123789-HxCDD	7.26	ng/kg		J	1
A3041	EW09-SS-009-010T5	A3041_8530_DF_002RJ2	EPA 1613	123789-HxCDF	2.21	ng/kg		J	1
A3041	EW09-SS-009-010T5	A3041_8530_DF_002RJ2	EPA 1613	12378-PeCDD	2.05	ng/kg		J	1
A3041	EW09-SS-009-010T5	A3041_8530_DF_002RJ2	EPA 1613	12378-PeCDF	1.96	ng/kg	J	J	1
A3041	EW09-SS-009-010T5	A3041_8530_DF_002RJ2	EPA 1613	234678-HxCDF	5.47	ng/kg		J	1
A3041	EW09-SS-009-010T5	A3041_8530_DF_002RJ2	EPA 1613	23478-PeCDF	7.26	ng/kg		J	1
A3041	EW09-SS-009-010T5	A3041_8530_DF_002RJ2	EPA 1613	2378-TCDD	0.829	ng/kg	B	UJ	1,7
A3041	EW09-SS-009-010T5	A3041_8530_DF_002RJ2	EPA 1613	2378-TCDF	2.78	ng/kg		J	1
A3041	EW09-SS-009-010T5	A3041_8530_DF_002RJ2	EPA 1613	OCDD	4070	ng/kg		J	1
A3041	EW09-SS-009-010T5	A3041_8530_DF_002RJ2	EPA 1613	OCDF	281	ng/kg		J	1
A3041	EW09-SS-009-010T5	A3041_8530_DF_002RJ2	EPA 1613	Total HpCDD	1200	ng/kg		J	1
A3041	EW09-SS-009-010T5	A3041_8530_DF_002RJ2	EPA 1613	Total HpCDF	303	ng/kg		J	1
A3041	EW09-SS-009-010T5	A3041_8530_DF_002RJ2	EPA 1613	Total HxCDD	147	ng/kg		J	1
A3041	EW09-SS-009-010T5	A3041_8530_DF_002RJ2	EPA 1613	Total HxCDF	123	ng/kg		J	1
A3041	EW09-SS-009-010T5	A3041_8530_DF_002RJ2	EPA 1613	Total PeCDD	23.2	ng/kg		J	1
A3041	EW09-SS-009-010T5	A3041_8530_DF_002RJ2	EPA 1613	Total PeCDF	81.1	ng/kg		J	1
A3041	EW09-SS-009-010T5	A3041_8530_DF_002RJ2	EPA 1613	Total TCDD	9.46	ng/kg	EMPC	J	1,22
A3041	EW09-SS-009-010T5	A3041_8530_DF_002RJ2	EPA 1613	Total TCDF	66.4	ng/kg	EMPC	J	1,22

Qualified Data Summary Table
Port of Seattle - East Waterway Subsurfce Sediments

SDG	Sample ID	Lab ID	Method	Analyte	Result	Units	Lab Qualifier	Val Qualifier	Val Reason
A3041	EW09-SS-026-010T5	A3041_8530_DF_003RJ2	EPA 1613	1234678-HpCDD	283	ng/kg		J	1
A3041	EW09-SS-026-010T5	A3041_8530_DF_003RJ2	EPA 1613	1234678-HpCDF	52.8	ng/kg		J	1
A3041	EW09-SS-026-010T5	A3041_8530_DF_003RJ2	EPA 1613	1234789-HpCDF	3.72	ng/kg		J	1
A3041	EW09-SS-026-010T5	A3041_8530_DF_003RJ2	EPA 1613	123478-HxCDD	2.08	ng/kg	J	J	1
A3041	EW09-SS-026-010T5	A3041_8530_DF_003RJ2	EPA 1613	123478-HxCDF	5.42	ng/kg		J	1
A3041	EW09-SS-026-010T5	A3041_8530_DF_003RJ2	EPA 1613	123678-HxCDD	10.7	ng/kg		J	1
A3041	EW09-SS-026-010T5	A3041_8530_DF_003RJ2	EPA 1613	123678-HxCDF	2.58	ng/kg		J	1
A3041	EW09-SS-026-010T5	A3041_8530_DF_003RJ2	EPA 1613	123789-HxCDD	4.67	ng/kg		J	1
A3041	EW09-SS-026-010T5	A3041_8530_DF_003RJ2	EPA 1613	123789-HxCDF		ng/kg	U	UJ	1
A3041	EW09-SS-026-010T5	A3041_8530_DF_003RJ2	EPA 1613	12378-PeCDD	1.61	ng/kg	J	J	1
A3041	EW09-SS-026-010T5	A3041_8530_DF_003RJ2	EPA 1613	12378-PeCDF	1.32	ng/kg	J	J	1
A3041	EW09-SS-026-010T5	A3041_8530_DF_003RJ2	EPA 1613	234678-HxCDF	4.18	ng/kg		J	1
A3041	EW09-SS-026-010T5	A3041_8530_DF_003RJ2	EPA 1613	23478-PeCDF	4.72	ng/kg		J	1
A3041	EW09-SS-026-010T5	A3041_8530_DF_003RJ2	EPA 1613	2378-TCDD	1	ng/kg	B	UJ	1,7
A3041	EW09-SS-026-010T5	A3041_8530_DF_003RJ2	EPA 1613	2378-TCDF	2.01	ng/kg		J	1
A3041	EW09-SS-026-010T5	A3041_8530_DF_003RJ2	EPA 1613	OCDD	2850	ng/kg		J	1
A3041	EW09-SS-026-010T5	A3041_8530_DF_003RJ2	EPA 1613	OCDF	176	ng/kg		J	1
A3041	EW09-SS-026-010T5	A3041_8530_DF_003RJ2	EPA 1613	Total HpCDD	781	ng/kg		J	1
A3041	EW09-SS-026-010T5	A3041_8530_DF_003RJ2	EPA 1613	Total HpCDF	186	ng/kg		J	1
A3041	EW09-SS-026-010T5	A3041_8530_DF_003RJ2	EPA 1613	Total HxCDD	89.8	ng/kg		J	1
A3041	EW09-SS-026-010T5	A3041_8530_DF_003RJ2	EPA 1613	Total HxCDF	78.8	ng/kg		J	1
A3041	EW09-SS-026-010T5	A3041_8530_DF_003RJ2	EPA 1613	Total PeCDD	22	ng/kg		J	1
A3041	EW09-SS-026-010T5	A3041_8530_DF_003RJ2	EPA 1613	Total PeCDF	56.3	ng/kg	EMPC	J	1,22
A3041	EW09-SS-026-010T5	A3041_8530_DF_003RJ2	EPA 1613	Total TCDD	15.9	ng/kg	EMPC	J	1,22
A3041	EW09-SS-026-010T5	A3041_8530_DF_003RJ2	EPA 1613	Total TCDF	35.5	ng/kg	EMPC	J	1,22
A3041	EW09-SS-102-010T5	A3041_8530_DF_004RJ2	EPA 1613	1234678-HpCDD	250	ng/kg		J	1
A3041	EW09-SS-102-010T5	A3041_8530_DF_004RJ2	EPA 1613	1234678-HpCDF	58.4	ng/kg		J	1
A3041	EW09-SS-102-010T5	A3041_8530_DF_004RJ2	EPA 1613	1234789-HpCDF	4.16	ng/kg		J	1
A3041	EW09-SS-102-010T5	A3041_8530_DF_004RJ2	EPA 1613	123478-HxCDD	2.04	ng/kg	J	J	1
A3041	EW09-SS-102-010T5	A3041_8530_DF_004RJ2	EPA 1613	123478-HxCDF	7.27	ng/kg		J	1
A3041	EW09-SS-102-010T5	A3041_8530_DF_004RJ2	EPA 1613	123678-HxCDD	10.4	ng/kg		J	1
A3041	EW09-SS-102-010T5	A3041_8530_DF_004RJ2	EPA 1613	123678-HxCDF	3.04	ng/kg		J	1
A3041	EW09-SS-102-010T5	A3041_8530_DF_004RJ2	EPA 1613	123789-HxCDD	4.87	ng/kg		J	1
A3041	EW09-SS-102-010T5	A3041_8530_DF_004RJ2	EPA 1613	123789-HxCDF		ng/kg	U	UJ	1
A3041	EW09-SS-102-010T5	A3041_8530_DF_004RJ2	EPA 1613	12378-PeCDD	1.65	ng/kg	J	J	1
A3041	EW09-SS-102-010T5	A3041_8530_DF_004RJ2	EPA 1613	12378-PeCDF	1.44	ng/kg	J	J	1
A3041	EW09-SS-102-010T5	A3041_8530_DF_004RJ2	EPA 1613	234678-HxCDF	4.91	ng/kg		J	1
A3041	EW09-SS-102-010T5	A3041_8530_DF_004RJ2	EPA 1613	23478-PeCDF	6.11	ng/kg		J	1
A3041	EW09-SS-102-010T5	A3041_8530_DF_004RJ2	EPA 1613	2378-TCDD	1.15	ng/kg	B	UJ	1,7
A3041	EW09-SS-102-010T5	A3041_8530_DF_004RJ2	EPA 1613	2378-TCDF	2.7	ng/kg		J	1
A3041	EW09-SS-102-010T5	A3041_8530_DF_004RJ2	EPA 1613	OCDD	2090	ng/kg		J	1
A3041	EW09-SS-102-010T5	A3041_8530_DF_004RJ2	EPA 1613	OCDF	193	ng/kg		J	1
A3041	EW09-SS-102-010T5	A3041_8530_DF_004RJ2	EPA 1613	Total HpCDD	661	ng/kg		J	1
A3041	EW09-SS-102-010T5	A3041_8530_DF_004RJ2	EPA 1613	Total HpCDF	203	ng/kg		J	1
A3041	EW09-SS-102-010T5	A3041_8530_DF_004RJ2	EPA 1613	Total HxCDD	82.3	ng/kg		J	1
A3041	EW09-SS-102-010T5	A3041_8530_DF_004RJ2	EPA 1613	Total HxCDF	92.7	ng/kg	EMPC	J	1,22
A3041	EW09-SS-102-010T5	A3041_8530_DF_004RJ2	EPA 1613	Total PeCDD	19.2	ng/kg	EMPC	J	1,22
A3041	EW09-SS-102-010T5	A3041_8530_DF_004RJ2	EPA 1613	Total PeCDF	75.7	ng/kg		J	1
A3041	EW09-SS-102-010T5	A3041_8530_DF_004RJ2	EPA 1613	Total TCDD	12.1	ng/kg	EMPC	J	1,22
A3041	EW09-SS-102-010T5	A3041_8530_DF_004RJ2	EPA 1613	Total TCDF	44.6	ng/kg		J	1

Qualified Data Summary Table
Port of Seattle - East Waterway Subsurfce Sediments

SDG	Sample ID	Lab ID	Method	Analyte	Result	Units	Lab Qualifier	Val Qualifier	Val Reason
A3041	EW10-SC100-0-1.1T5	A3041_8530_DF_005RJ2	EPA 1613	1234678-HpCDD	584	ng/kg		J	1
A3041	EW10-SC100-0-1.1T5	A3041_8530_DF_005RJ2	EPA 1613	1234678-HpCDF	112	ng/kg		J	1
A3041	EW10-SC100-0-1.1T5	A3041_8530_DF_005RJ2	EPA 1613	1234789-HpCDF	7.96	ng/kg		J	1
A3041	EW10-SC100-0-1.1T5	A3041_8530_DF_005RJ2	EPA 1613	123478-HxCDD	4.09	ng/kg		J	1
A3041	EW10-SC100-0-1.1T5	A3041_8530_DF_005RJ2	EPA 1613	123478-HxCDF	15.6	ng/kg		J	1
A3041	EW10-SC100-0-1.1T5	A3041_8530_DF_005RJ2	EPA 1613	123678-HxCDD	21.6	ng/kg		J	1
A3041	EW10-SC100-0-1.1T5	A3041_8530_DF_005RJ2	EPA 1613	123678-HxCDF	6.19	ng/kg		J	1
A3041	EW10-SC100-0-1.1T5	A3041_8530_DF_005RJ2	EPA 1613	123789-HxCDD	9.89	ng/kg		J	1
A3041	EW10-SC100-0-1.1T5	A3041_8530_DF_005RJ2	EPA 1613	123789-HxCDF		ng/kg	U	UJ	1
A3041	EW10-SC100-0-1.1T5	A3041_8530_DF_005RJ2	EPA 1613	12378-PeCDD	3.31	ng/kg		J	1
A3041	EW10-SC100-0-1.1T5	A3041_8530_DF_005RJ2	EPA 1613	12378-PeCDF	2.89	ng/kg		J	1
A3041	EW10-SC100-0-1.1T5	A3041_8530_DF_005RJ2	EPA 1613	234678-HxCDF	10.1	ng/kg		J	1
A3041	EW10-SC100-0-1.1T5	A3041_8530_DF_005RJ2	EPA 1613	23478-PeCDF		ng/kg	U	UJ	1
A3041	EW10-SC100-0-1.1T5	A3041_8530_DF_005RJ2	EPA 1613	2378-TCDD	1.42	ng/kg	B	UJ	1,7
A3041	EW10-SC100-0-1.1T5	A3041_8530_DF_005RJ2	EPA 1613	2378-TCDF	4.42	ng/kg		J	1
A3041	EW10-SC100-0-1.1T5	A3041_8530_DF_005RJ2	EPA 1613	OCDD	5320	ng/kg		J	1
A3041	EW10-SC100-0-1.1T5	A3041_8530_DF_005RJ2	EPA 1613	OCDF	319	ng/kg		J	1
A3041	EW10-SC100-0-1.1T5	A3041_8530_DF_005RJ2	EPA 1613	Total HpCDD	1760	ng/kg		J	1
A3041	EW10-SC100-0-1.1T5	A3041_8530_DF_005RJ2	EPA 1613	Total HpCDF	384	ng/kg		J	1
A3041	EW10-SC100-0-1.1T5	A3041_8530_DF_005RJ2	EPA 1613	Total HxCDD	179	ng/kg		J	1
A3041	EW10-SC100-0-1.1T5	A3041_8530_DF_005RJ2	EPA 1613	Total HxCDF	193	ng/kg		J	1
A3041	EW10-SC100-0-1.1T5	A3041_8530_DF_005RJ2	EPA 1613	Total PeCDD	33.4	ng/kg	EMPC	J	1,22
A3041	EW10-SC100-0-1.1T5	A3041_8530_DF_005RJ2	EPA 1613	Total PeCDF	138	ng/kg	EMPC	J	1,22
A3041	EW10-SC100-0-1.1T5	A3041_8530_DF_005RJ2	EPA 1613	Total TCDD	15.7	ng/kg	EMPC	J	1,22
A3041	EW10-SC100-0-1.1T5	A3041_8530_DF_005RJ2	EPA 1613	Total TCDF	61.4	ng/kg		J	1