

**MONTANA DIOXIN BACKGROUND
INVESTIGATION REPORT**

**Attachment 4
Data Validation Reports**

**MONTANA DIOXIN BACKGROUND
INVESTIGATION REPORT**

This page intentionally left blank.

Montana Background Dioxin Study

1. **SDG Number:** 1059590
2. **Number of Samples:** (32)
3. **Sample Matrix:** (32) Soil/Solid
4. **Applicable Analytes:** PCDD/PCDF
5. **Reporting Tier:** Level 3
6. **Analysis Method** USEPA SW-846 Method 8290
7. **Laboratory:** Pace Analytical
8. **Validation Level:** III
9. **Validator Affiliation:** Portage Environmental, Inc.
10. **Project:** Montana Background Dioxin Study

Validator's Signature: *Amber Brinly*

Date: 02/20/08

Reviewed By: *[Signature]*

Date: 02/20/08

Montana Background Dioxin Study

1. **SDG Number:** 1059590
2. **Number of Samples:** (32)
3. **Sample Matrix:** (32) Soil/Solid
4. **Applicable Analytes:** PCDD/PCDF
5. **Reporting Tier:** Level 3
6. **Analysis Method** USEPA SW-846 Method 8290
7. **Laboratory:** Pace Analytical
8. **Validation Level:** III
9. **Validator Affiliation:** Portage Environmental, Inc.
10. **Project:** Montana Background Dioxin Study

Validator's Signature:

Date: 02/20/08

Reviewed By:

Date: 02/20/08

1. INTRODUCTION

Thirty-two (32) soil/solid samples were collected and analyzed for Dioxins/Furans by Pace Analytical using USEPA SW-846 Method 8290, *Polychlorinated Dibenzodioxins (PCDDs) and Polychlorinated Dibenzofurans (PCDFs) by High Resolution Gas Chromatography/High Resolution Mass Spectrometry (HRGC/HRMS)*. The data were validated to a Level III.

2. SAMPLE IDENTIFICATION

A sample cross-reference and holding time table is presented below.

Montana Background Dioxin Study SDG Number 1059590								
Field ID	Lab ID	Matrix	Sample Collection Date	Date Received	Date Extracted	Collection to Extraction Holding Time	Analysis Date	Extraction to Analysis Holding Time
MBDS-R11-F01	1059590001	Soil/Solid	09/18/07	09/25/07	10/03/07	15	10/07/07	4
MBDS-U14-R01	1059590002	Soil/Solid	09/19/07	09/25/07	10/03/07	14	10/07/07	4
MBDS-U14-C01	1059590003	Soil/Solid	09/19/07	09/25/07	10/03/07	14	10/07/07	4
MBDS-U14-I01	1059590004	Soil/Solid	09/19/07	09/25/07	10/03/07	14	10/09/07	6
MBDS-U14-I04	1059590005	Soil/Solid	09/19/07	09/25/07	10/03/07	14	10/09/07	6
MBDS-U15-R01	1059590006	Soil/Solid	09/19/07	09/25/07	10/03/07	14	10/07/07	4
MBDS-U15-C01	1059590007	Soil/Solid	09/19/07	09/25/07	10/03/07	14	10/09/07	6
MBDS-U15-I01	1059590008	Soil/Solid	09/19/07	09/25/07	10/04/07	15	10/11/07	7
MBDS-R10-F01	1059590009	Soil/Solid	09/19/07	09/25/07	10/04/07	15	10/11/07	7
MBDS-R10-O01	1059590010	Soil/Solid	09/19/07	09/25/07	10/04/07	15	10/11/07	7
MBDS-R16-O01	1059590011	Soil/Solid	09/20/07	09/25/07	10/04/07	14	10/12/07	8
MBDS-R16-A01	1059590012	Soil/Solid	09/20/07	09/25/07	10/04/07	14	10/12/07	8
MBDS-R01-F01	1059590013	Soil/Solid	09/21/07	09/25/07	10/04/07	13	10/11/07	7
MBDS-R01-F02	1059590014	Soil/Solid	09/22/07	09/25/07	10/04/07	12	10/11/07	7
MBDS-R01-O01	1059590015	Soil/Solid	09/22/07	09/25/07	10/04/07	12	10/11/07	7
MBDS-R01-A01	1059590016	Soil/Solid	09/22/07	09/25/07	10/04/07	12	10/11/07	7
MBDS-R08-F01	1059590017	Soil/Solid	09/22/07	09/25/07	10/04/07	12	10/12/07	8
MBDS-R08-O01	1059590018	Soil/Solid	09/22/07	09/25/07	10/04/07	12	10/12/07	8
MBDS-R08-A01	1059590019	Soil/Solid	09/22/07	09/25/07	10/04/07	12	10/12/07	8
MBDS-U14-I05 (Trip Blank)	1059590020	Soil/Solid	09/22/07	09/25/07	10/04/07	12	10/12/07	8
MBDS-R16-F01	1059590021	Soil/Solid	09/20/07	09/25/07	10/04/07	14	10/12/07	8
MBDS-R15-O01	1059590022	Soil/Solid	09/20/07	09/25/07	10/04/07	14	10/12/07	8
MBDS-R15-A01	1059590023	Soil/Solid	09/20/07	09/25/07	10/04/07	14	10/12/07	8
MBDS-R15-F01	1059590024	Soil/Solid	09/20/07	09/25/07	10/04/07	14	10/12/07	8
MBDS-R09-A01	1059590025	Soil/Solid	09/21/07	09/25/07	10/04/07	13	10/12/07	8
MBDS-R09-F01	1059590026	Soil/Solid	09/21/07	09/25/07	10/04/07	13	10/12/07	8
MBDS-R09-O01	1059590027	Soil/Solid	09/21/07	09/25/07	10/04/07	13	10/12/07	8

Montana Background Dioxin Study SDG Number 1059590								
Field ID	Lab ID	Matrix	Sample Collection Date	Date Received	Date Extracted	Collection to Extraction Holding Time	Analysis Date	Extraction to Analysis Holding Time
MBDS-R02-O01	1059590028	Soil/Solid	09/21/07	09/25/07	10/05/07	14	10/11/07	6
MBDS-R02-A01	1059590029	Soil/Solid	09/21/07	09/25/07	10/05/07	14	10/11/07	6
MBDS-U16-R01	1059590030	Soil/Solid	09/21/07	09/25/07	10/05/07	14	10/11/07	6
MBDS-U16-C01	1059590031	Soil/Solid	09/21/07	09/25/07	10/05/07	14	10/11/07	6
MBDS-R02-F01	1059590032	Soil/Solid	09/21/07	09/25/07	10/05/07	14	10/11/07	6

A '**' denotes an exceeded holding time.

3. DATA LIMITATION OVERVIEW

The target compound analyses, dioxin/furan, for soil/solid samples from Montana Background Dioxin Study showed compliance with the QC requirements set forth by USEPA SW-846 Method 8290. The data are valid and acceptable with the following exceptions:

MBDS-R11-F01:

- Total TCDF, 1,2,3,4,6,7,8-HpCDD, and total HpCDD have been qualified with a 'J' validation flag to denote the reported concentrations are estimates with an undetermined bias as they were reported below the quantitation limit (see CTR comment #10).
- OCDD has been qualified with a 'U' validation flag to denote the reported concentration is non-detect due to positive detection in the method blank (see CTR comment #6).

MBDS-U14-R01:

- 1,2,3,4,6,7,8-HpCDF, total HpCDF, and 1,2,3,4,6,7,8-HpCDD have been qualified with a 'J' validation flag to denote the reported concentrations are estimates with an undetermined bias as they were reported below the quantitation limit (see CTR comment #10).

MBDS-U14-C01:

- Total PeCDF and total HxCDF have been qualified with a 'J' validation flag to denote the reported concentrations are estimates with an undetermined bias as they were reported below the quantitation limit (see CTR comment #10).

- 1,2,3,4,6,7,8-HpCDD has been qualified with a 'J-' validation flag to denote the reported concentration is likely underestimate as it was reported below the quantitation limit and due to low internal standard recovery (see CTR comments # 9 and 10).
- Total HpCDD has been qualified with a 'J-' validation flag to denote the reported concentration is likely underestimate due to low internal standard recovery (see CTR comments #9).
- 1,2,3,4,7,8,9-HpCDF and total HpCDF have been qualified with a 'UJ' validation flag to denote the reported concentrations are non-detect, and the sample quantitation limit is an estimate due to low internal standard recovery (see CTR comments #9).

MBDS-U14-I01:

- 2,3,7,8-TCDF, total TCDD, 2,3,4,7,8-PeCDF, total PeCDD, 1,2,3,6,7,8-HxCDF, 2,3,4,6,7,8-HxCDF, 1,2,3,4,7,8-HxCDD, 1,2,3,7,8,9-HxCDD, and 1,2,3,4,7,8,9-HpCDF have been qualified with a 'J' validation flag to denote the reported concentrations are estimates with an undermined bias as they were reported below the quantitation limit (see CTR comment #10).
- 1,2,3,4,7,8-HxCDF was reported at an EMPC and has been qualified with a 'J+' validation flag to denote the reported result is likely overestimated due to possible interference in the sample (see CTR comment #10).
- 1,2,3,7,8-PeCDF has been qualified with an 'R' validation due to interference from polychlorinated diphenyl ethers (PCDE) (see CTR comment #10).

MBDS-U14-I04:

- 2,3,7,8-TCDF, 2,3,4,7,8-PeCDF, 1,2,3,4,7,8-HxCDF, 1,2,3,6,7,8-HxCDF, 2,3,4,6,7,8-HxCDF, 1,2,3,4,7,8-HxCDD, and 1,2,3,7,8,9-HxCDD have been qualified with a 'J' validation flag to denote the reported concentrations are estimates with an undetermined bias as they were reported below the quantitation limit (see CTR comment #10).
- 1,2,3,7,8-PeCDF has been qualified with an 'R' validation due to interference from polychlorinated diphenyl ethers (PCDE) (see CTR comment #10).

MBDS-U15-R01:

- Total TCDF, total TCDD, and 1,2,3,4,6,7,8-HpCDD have been qualified with a 'J' validation flag to denote the reported concentrations are estimates with an undetermined bias as they were reported below the quantitation limit (see CTR comment #10).

MBDS-U15-C01:

- 2,3,7,8-TCDF, 2,3,4,7,8-PeCDF, 1,2,3,4,6,7,8-HpCDF, and OCDF have been qualified with a 'J' validation flag to denote the reported concentrations are estimates with an undetermined bias as they were reported below the quantitation limit (see CTR comment #10).
- 1,2,3,7,8-PeCDF has been qualified with an 'R' validation due to interference from polychlorinated diphenyl ethers (PCDE) (see CTR comment #10).

MBDS-U15-I01:

- Total TCDD, total PeCDD, 1,2,3,4,7,8-HxCDF, 1,2,3,4,7,8-HxCDD, 1,2,3,6,7,8-HxCDD, and 1,2,3,7,8,9-HxCDD have been qualified with a 'J' validation flag to denote the reported concentrations are estimates with an undetermined bias as they were reported below the quantitation limit (see CTR comment #10).
- 1,2,3,7,8-PeCDF has been qualified with an 'R' validation due to interference from polychlorinated diphenyl ethers (PCDE) (see CTR comment #10).

MBDS-R10-F01:

- 2,3,7,8-TCDF, total TCDD, 1,2,3,4,7,8-HxCDF, 1,2,3,6,7,8-HxCDD, 1,2,3,7,8,9-HxCDD, and 1,2,3,4,7,8,9-HpCDF have been qualified with a 'J' validation flag to denote the reported concentrations are estimates with an undetermined bias as they were reported below the quantitation limit (see CTR comment #10).
- 1,2,3,7,8-PeCDF has been qualified with an 'R' validation due to interference from polychlorinated diphenyl ethers (PCDE) (see CTR comment #10).

MBDS-R10-O01:

- OCDD has been qualified has been qualified with a 'J' validation flag to denote the reported concentration is an estimate with an undetermined bias as it was reported below the quantitation limit (see CTR comment #10).

MBDS-R16-O01:

- 1,2,3,4,6,7,8-HpCDD and total HpCDD have been qualified with a 'J' validation flag to denote the reported concentrations are estimates with an undetermined bias as they were reported below the quantitation limit (see CTR comment #10).

MBDS-R16-A01:

- Total HxCDF, total HpCDF, 1,2,3,4,6,7,8-HpCDD, and OCDF have been qualified with a 'J' validation flag to denote the reported concentrations are estimates with an undetermined bias as they were reported below the quantitation limit (see CTR comment #10).
- 1,2,3,7,8-PeCDF has been qualified with an 'R' validation due to interference from polychlorinated diphenyl ethers (PCDE) (see CTR comment #10).

MBDS-R01-F01:

- Total TCDF has been qualified has been qualified with a 'J' validation flag to denote the reported concentration is an estimate with an undetermined bias as it was reported below the quantitation limit (see CTR comment #10).

MBDS-R01-F02:

- Total TCDD, total HxCDD, 1,2,3,4,6,7,8-HpCDF, and total HpCDF have been qualified with a 'J' validation flag to denote the reported concentrations are estimates with an undetermined bias as they were reported below the quantitation limit (see CTR comment #10).

MBDS-R01-O01:

- Total TCDF, total HxCDD, 1,2,3,4,6,7,8-HpCDF, total HpCDF, and OCDF have been qualified with a 'J' validation flag to denote the reported concentrations are estimates with an undetermined bias as they were reported below the quantitation limit (see CTR comment #10).
- 1,2,3,7,8-PeCDF has been qualified with an 'R' validation due to interference from polychlorinated diphenyl ethers (PCDE) (see CTR comment #10).

MBDS-R01-A01:

- 2,3,7,8-TCDF, total TCDD, total PeCDF, total PeCDD, total HxCDF, 1,2,3,4,6,7,8-HpCDF, total HpCDF, and OCDF have been qualified with a 'J' validation flag to denote the reported concentrations are estimates with an undetermined bias as they were reported below the quantitation limit (see CTR comment #10).
- 1,2,3,7,8-PeCDF has been qualified with an 'R' validation due to interference from polychlorinated diphenyl ethers (PCDE) (see CTR comment #10).

MBDS-R08-F01:

- 2,3,7,8-TCDF, total TCDD, total HxCDD, 1,2,3,4,6,7,8-HpCDF, total HpCDF, and OCDF have been qualified with a 'J' validation flag to denote the reported concentrations are estimates with an undetermined bias as they were reported below the quantitation limit (see CTR comment #10).

MBDS-R08-O01:

- Total TCDF, total HxCDD, and 1,2,3,4,6,7,8-HpCDD have been qualified with a 'J' validation flag to denote the reported concentrations are estimates with an undetermined bias as they were reported below the quantitation limit (see CTR comment #10).

MBDS-R08-A01:

- Total HxCDD, 1,2,3,4,6,7,8-HpCDF, total HpCDF, and OCDF have been qualified with a 'J' validation flag to denote the reported concentrations are estimates with an undetermined bias as they were reported below the quantitation limit (see CTR comment #10).

MBDS-U14-I05 (Trip Blank) and MBDS-R15-O01:

- No exceptions.

MBDS-R16-F01:

- Total TCDF and OCDD have been qualified with a 'J' validation flag to denote the reported concentrations are estimates with an undetermined bias as they were reported below the quantitation limit (see CTR comment #10).

MBDS-R15-A01:

- 1,2,3,4,6,7,8-HpCDD has been qualified with a 'J' validation flag to denote the reported concentration is an estimate with an undetermined bias as it was reported below the quantitation limit (see CTR comment #10).

MBDS-R15-F01:

- Total TCDD has been qualified with a 'J' validation flag to denote the reported concentration is an estimate with an undetermined bias as it was reported below the quantitation limit (see CTR comment #10).

MBDS-R09-A01:

- Total HxCDF, 1,2,3,6,7,8-HxCDD, 1,2,3,4,6,7,8-HpCDF, total HpCDF, and OCDF have been qualified with a 'J' validation flag to denote the reported concentrations are estimates with an undetermined bias as they were reported below the quantitation limit (see CTR comment #10).

MBDS-R09-F01:

- Total TCDD, total HxCDD, and OCDF have been qualified with a 'J' validation flag to denote the reported concentrations are estimates with an undetermined bias as they were reported below the quantitation limit (see CTR comment #10).
- 1,2,3,4,6,7,8-HpCDF was reported at an EMPC and has been qualified with a 'J+' validation flag to denote the reported result is likely overestimate due to possible interference in the sample (see CTR comment #10).

MBDS-R09-O01:

- Total TCDD and 1,2,3,4,6,7,8-HpCDD have been qualified with a 'J' validation flag to denote the reported concentrations are estimates with an undetermined bias as they were reported below the quantitation limit (see CTR comment #10).

MBDS-R02-O01:

- Total TCDF, total PeCDF, 1,2,3,4,7,8-HxCDF, 1,2,3,6,7,8-HxCDF, 2,3,4,6,7,8-HxCDF, 1,2,3,6,7,8-HxCDD, and 1,2,3,4,7,8,9-HpCDF have been qualified with a 'J' validation flag to denote the reported concentrations are estimates with an undetermined bias as they were reported below the quantitation limit (see CTR comment #10).

MBDS-R02-A01:

- Total TCDF, total PeCDD, 1,2,3,6,7,8-HxCDD, and 1,2,3,4,7,8,9-HpCDF have been qualified with a 'J' validation flag to denote the reported concentrations are estimates with an undetermined bias as they were reported below the quantitation limit (see CTR comment #10).

MBDS-U16-R01:

- Total TCDF, 1,2,3,4,6,7,8-HpCDD, and total HpCDD have been qualified with a 'J' validation flag to denote the reported concentrations are estimates with an undetermined bias as they were reported below the quantitation limit (see CTR comment #10).

MBDS-U16-C01:

- 2,3,7,8-TCDF, total PeCDF, 1,2,3,6,7,8-HxCDD, and 1,2,3,7,8,9-HxCDD have been qualified with a 'J' validation flag to denote the reported concentrations are estimates with an undetermined bias as they were reported below the quantitation limit (see CTR comment #10).

MBDS-R02-F01:

- 2,3,7,8-TCDF, 2,3,4,7,8-PeCDF, 1,2,3,7,8-PeCDD, 1,2,3,4,7,8-HxCDD, 1,2,3,6,7,8-HxCDD, 1,2,3,7,8,9-HxCDD, and 1,2,3,4,6,7,8-HpCDF have been qualified with a 'J' validation flag to denote the reported concentrations are estimates with an undetermined bias as they were reported below the quantitation limit (see CTR comment #10).
- 2,3,7,8-TCDD was reported at an EMPC and has been qualified with a 'J+' validation flag to denote the reported result is likely overestimated due to possible interference in the sample (see CTR comment #10).

4. CONTRACT AND TECHNICAL REVIEW (CTR)

Project Name: Montana Background Dioxin Study

Laboratory Name: Pace Analytical

SDG#: 1059590

Type of Analysis: USEPA SW-846 Method 8290

1. Data Completeness

The data has undergone a Level III validation.

2. Sample Integrity

No action was taken as sample integrity was compliant.

3. Sample Holding Times

No action was taken as sample holding times were met.

4. Instrument Performance

No action was taken as instrument performance was compliant.

5. Initial and Continuing Calibrations

The initial and continuing calibration forms were not included in the data package as it was a level III. No action was taken as the case narrative indicated that the acceptance criteria for the initial and continuing calibrations were met.

6. Method and Field Blank Contamination

Method Blank. A positive detection for OCDD was noted in method blank-14362 associated with samples MBDS-R11-F01, MBDS-U14-R01, MBDS-U14-C01, MBDS-U14-I01, MBDS-U14-I04, MBDS-U15-R01, and MBDS-U15-C01.

OCDD in MBDS-R11-F01 has been qualified with a 'U' validation flag as the sample result was less than five times the method blank value. The remaining associated results warrant no qualification due to sample results greater than five times the blank value. No action was taken for the remaining method blanks as they were compliant.

Trip Blank (MBDS-U14-I05). No action was taken as all target analytes were non-detect in the trip blank.

7. Matrix Spike/Matrix Spike Duplicate (MS/MSD)

The laboratory did not provide acceptance limits for the MS/MSD analysis. In the professional judgment of the validator, the acceptance limit of 50-150% for MS/MSD recovery and a 35% RPD for soil/solid samples has been used for validation purposes.

MBDS-U15-I01 MS/MSD. 1,2,3,4,6,7,8-HpCDD (180% and 290%) and OCDD (480% and 1156%) in the MS and MSD, respectively were outside of the 50-150% acceptance criteria. The MSD %RPD 1,2,3,4,6,7,8-HpCDD (46.9% and 63.6%) and OCDD (82.7% and 124.1%) between sample concentrations and percent recoveries, respectively, were outside of the 35% acceptance criteria. No action was taken based on MS/MSD data alone.

MBDS-R02-F01 MS/MSD. OCDD (178% and 210%) in the MS and MSD, respectively were outside of the 50-150% acceptance criteria. No action was taken based on MS/MSD data alone.

8. Laboratory Control Sample (LCS)

No action was taken as all LCS recoveries were within the acceptance criteria.

9. Internal Standards (IS) Performance

In sample MBDS-U14-C01, the internal standard recoveries for 1,2,3,4,7,8,9-HpCDF-13C (31%) and 1,2,3,4,6,7,8-HpCDD-13C (34%) were outside of the 40-135% acceptance criteria. 1,2,3,4,7,8,9-HpCDF and total HpCDF were non-detect and have been qualified with a 'UJ' validation flag due to low internal standard recovery. 1,2,3,4,6,7,8-HpCDD and total HpCDD exhibited positive detections and have been qualified with a 'J-' validation flag due to low internal standard recovery as the reported results are likely underestimated.

In sample MBDS-R02-F01-MSD, the internal standard recoveries for 2,3,7,8-TCDF-13C (5%), 2,3,7,8-TCDD (5%), 1,2,3,7,8-PeCDF-13C (6%), 2,3,4,7,8-PeCDF-13C (6%), 1,2,3,7,8-PeCDD-13C (7%), 1,2,3,4,7,8-HxCDF-13C (8%), 1,2,3,6,7,8-HxCDF-13C (7%), 2,3,4,6,7,8-HxCDF-13C (8%), 1,2,3,7,8,9-HxCDF-13C (7%), 1,2,3,4,7,8-HxCDD-13C (8%), 1,2,3,6,7,8-HxCDD-13C (7%), 1,2,3,4,6,7,8-HpCDF-13C (7%), 1,2,3,4,7,8,9-HpCDF-13C (5%), 1,2,3,4,6,7,8-HpCDD-13C (7%), OCDD-13C (5%), and 2,3,7,8-TCDD-37Cl4 (4%) were outside of the 40-135% acceptance criteria. No qualifications are warranted based on MS/MSD data alone.

10. Target Compound Identification and Quantitation

In MBDS-R11-F01, total TCDF, 1,2,3,4,6,7,8-HpCDD, and total HpCDD exhibited positive detections below the quantitation limit. They have been qualified with a 'J' validation flag as the reported results are estimates with an undetermined bias.

In MBDS-U14-R01, 1,2,3,4,6,7,8-HpCDF, total HpCDF, and 1,2,3,4,6,7,8-HpCDD exhibited positive detections below the quantitation limit. They have been qualified with a 'J' validation flag as the reported results are estimates with an undetermined bias.

In MBDS-U14-C01, total PeCDF, total HxCDF, and 1,2,3,4,6,7,8-HpCDD exhibited positive detections below the quantitation limit. Total PeCDF and total HxCDF have been qualified with a 'J' validation flag as the reported results are estimates with an undetermined bias.. 1,2,3,4,6,7,8-HpCDD has been qualified with a 'J-' validation flag as the reported result was likely underestimate due to low internal standard recoveries and as it was reported below the quantitation limit.

In MBDS-U14-I01, 2,3,7,8-TCDF, total TCDD, 2,3,4,7,8-PeCDF, total PeCDD, 1,2,3,6,7,8-HxCDF, 2,3,4,6,7,8-HxCDF, 1,2,3,4,7,8-HxCDD, 1,2,3,7,8,9-HxCDD, and 1,2,3,4,7,8,9-HpCDF exhibited positive detections below the quantitation limit. They have been qualified with a 'J' validation flag as the reported results are estimates with an undetermined bias. 1,2,3,4,7,8-HxCDF has been reported at an estimated maximum possible concentration (EMPC) due to interference. It has been qualified with a 'J+' validation flag as the reported result is likely overestimated. 1,2,3,7,8-PeCDF was reported at an EMPC and has been qualified with an 'R' validation flag due to interference from polychlorinated diphenyl ethers (PCDE).

In MBDS-U14-I04, 2,3,7,8-TCDF, 2,3,4,7,8-PeCDF, 1,2,3,4,7,8-HxCDF, 1,2,3,6,7,8-HxCDF, 2,3,4,6,7,8-HxCDF, 1,2,3,4,7,8-HxCDD, and 1,2,3,7,8,9-HxCDD exhibited positive detections below the quantitation limit. They have been qualified with a 'J' validation flag as the reported results are estimates with an undetermined bias. 1,2,3,7,8-PeCDF was reported at an EMPC and has been qualified with an 'R' validation flag due to interference from polychlorinated diphenyl ethers (PCDE).

In MBDS-U15-R01, total TCDF, total TCDD, and 1,2,3,4,6,7,8-HpCDD exhibited positive detections below the quantitation limit. They have been qualified with a 'J' validation flag as the reported results are estimates with an undetermined bias.

In MBDS-U15-R01, 2,3,7,8-TCDF, 2,3,4,7,8-PeCDF, 1,2,3,4,6,7,8-HpCDF, and OCDF exhibited positive detections below the quantitation limit. They have been qualified with a 'J' validation flag as the reported results are estimates with an undetermined bias. 1,2,3,7,8-PeCDF was reported at an EMPC and has been qualified with an 'R' validation flag due to interference from polychlorinated diphenyl ethers (PCDE).

In MBDS-U15-Io1, total TCDD, total PeCDD, 1,2,3,4,7,8-HxCDF, 1,2,3,4,7,8-HxCDD, 1,2,3,6,7,8-HxCDD, and 1,2,3,7,8,9-HxCDD OCDF exhibited positive detections below the quantitation limit. They have been qualified with a 'J' validation flag as the reported results are estimates with an undetermined bias. 1,2,3,7,8-PeCDF was reported at an EMPC and has been qualified with an 'R' validation flag due to interference from polychlorinated diphenyl ethers (PCDE).

In MBDS-R10-F01, 2,3,7,8-TCDF, total TCDD, 1,2,3,4,7,8-HxCDF, 1,2,3,6,7,8-HxCDD, 1,2,3,7,8,9-HxCDD, and 1,2,3,4,7,8,9-HpCDF OCDF exhibited positive detections below the quantitation limit. They have been qualified with a 'J' validation flag as the reported results are estimates with an undetermined bias. 1,2,3,7,8-PeCDF was reported at an EMPC and has been qualified with an 'R' validation flag due to interference from polychlorinated diphenyl ethers (PCDE).

In MBDS-R10-O01, OCDD exhibited a positive detection below the quantitation limit. It has been qualified with a 'J' validation flag as the report result is an estimate with an undetermined bias.

In MBDS-R16-O01, 1,2,3,4,6,7,8-HpCDD and total HpCDD exhibited positive detections below the quantitation limit. They have been qualified with a 'J' validation flag as the reported results are estimates with an undetermined bias.

In MBDS-R16-A01, total HxCDF, total HpCDF, 1,2,3,4,6,7,8-HpCDD, and OCDF exhibited positive detections below the quantitation limit. They have been qualified with a 'J' validation flag as the reported results are estimates with an undetermined bias. 1,2,3,7,8-PeCDF was reported at an EMPC and has been qualified with an 'R' validation flag due to interference from polychlorinated diphenyl ethers (PCDE).

In MBDS-R01-F01, total TCDF exhibited a positive detection below the quantitation limit. It has been qualified with a 'J' validation flag as the reported result is an estimate with an undetermined bias..

In MBDS-R01-F02, total TCDD, total HxCDD, 1,2,3,4,6,7,8-HpCDF, and total HpCDF and OCDF exhibited positive detections below the quantitation limit. They have been qualified with a 'J' validation flag as the reported results are estimates with an undetermined bias.

In MBDS-R01-O01, total TCDF, total HxCDD, 1,2,3,4,6,7,8-HpCDF, total HpCDF, and OCDF exhibited positive detections below the quantitation limit. They have been qualified with a 'J' validation flag as the reported results are estimates with an undetermined bias. 1,2,3,7,8-PeCDF was reported at an EMPC and has been qualified with an 'R' validation flag due to interference from polychlorinated diphenyl ethers (PCDE).

In MBDS-R01-A01, 2,3,7,8-TCDF, total TCDD, total PeCDF, total PeCDD, total HxCDF, 1,2,3,4,6,7,8-HpCDF, total HpCDF, and OCDF exhibited positive detections below the quantitation limit. They have been qualified with a 'J' validation flag as the reported results are estimates with an undetermined bias. 1,2,3,7,8-PeCDF was reported at an EMPC and has been qualified with an 'R' validation flag due to interference from polychlorinated diphenyl ethers (PCDE).

In MBDS-R08-F01, 2,3,7,8-TCDF, total TCDD, total HxCDD, 1,2,3,4,5,7,8-HpCDF, total HpCDF, and OCDF exhibited positive detections below the quantitation limit. They have been qualified with a 'J' validation flag as the reported results are estimates with an undetermined bias..

In MBDS-R08-O01, total TCDF, total HxCDD, and 1,2,3,4,6,7,8-HpCDD exhibited positive detections below the quantitation limit. They have been qualified with a 'J' validation flag as the reported results are estimates with an undetermined bias.

In MBDS-R08-A01, total HxCDD, 1,2,3,4,6,7,8-HpCDF, total HpCDF, and OCDF exhibited positive detections below the quantitation limit. They have been qualified with a 'J' validation flag as the reported results are estimates with an undetermined bias.

In MBDS-R16-F01, total TCDF and OCDD exhibited positive detections below the quantitation limit. They have been qualified with a 'J' validation flag as the reported results are estimates with an undetermined bias.

In MBDS-R15-A01, 1,2,3,4,6,7,8-HpCDD exhibited a positive detection below the quantitation limit. It has been qualified with a 'J' validation flag as the reported result is an estimate with an undetermined bias.

In MBDS-R15-F01, total TCDD exhibited a positive detection below the quantitation limit. It has been qualified with a 'J' validation flag as the reported result is an estimate with an undetermined bias.

In MBDS-R09-A01, total HxCDF, 1,2,3,6,7,8-HxCDD, 1,2,3,4,6,7,8-HpCDF, total HpCDF, and OCDF exhibited positive detections below the quantitation limit. They have been qualified with a 'J' validation flag as the reported results are estimates with an undetermined bias..

In MBDS-R09-F01, total TCDD, total HxCDD, and OCDF exhibited positive detections below the quantitation limit. They have been qualified with a 'J' validation flag as the reported results are estimates with an undetermined bias. 1,2,3,4,6,7,8-HpCDF has been reported at an estimated maximum possible concentration (EMPC) due to interference. It has been qualified with a 'J+' validation flag as the reported result is likely overestimated.

In MBDS-R09-O01, total TCDD and 1,2,3,4,6,7,8-HpCDD exhibited positive detections below the quantitation limit. They have been qualified with a 'J' validation flag as the reported results are estimates with an undetermined bias.

In MBDS-R02-O01, total TCDF, total PeCDF, 1,2,3,4,7,8-HxCDF, 1,2,3,6,7,8-HxCDF, and 2,3,4,6,7,8-HxCDF, 1,2,3,6,7,8-HxCDD, and 1,2,3,4,7,8,9-HpCDF exhibited positive detections below the quantitation limit. They have been qualified with a 'J' validation flag as the reported results are estimates with an undetermined bias.

In MBDS-R02-A01, total TCDF, total PeCDD, 1,2,3,6,7,8-HxCDD, and 1,2,3,4,7,8,9-HpCDF exhibited positive detections below the quantitation limit. They have been qualified with a 'J' validation flag as the reported results are estimates with an undetermined bias.

In MBDS-U16-R01, total TCDF, 1,2,3,4,6,7,8-HpCDD, and total HpCDD exhibited positive detections below the quantitation limit. They have been qualified with a 'J' validation flag as the reported results are estimates with an undetermined bias.

In MBDS-U16-C01, 2,3,7,8-TCDF, total PeCDF, 1,2,3,6,7,8-HxCDD, and 1,2,3,7,8,9-HxCDD exhibited positive detections below the quantitation limit. They have been qualified with a 'J' validation flag as the reported results are estimates with an undetermined bias.

In MBDS-R02-F01, 2,3,7,8-TCDF, 2,3,4,7,8-PeCDF, 1,2,3,7,8-PeCDD, 1,2,3,4,7,8-HxCDD, 1,2,3,6,7,8-HxCDD, 1,2,3,7,8,9-HxCDD, and 1,2,3,4,6,7,8-HpCDF exhibited positive detections below the quantitation limit. They have been qualified with a 'J' validation flag as the reported results are estimates with an undetermined bias. 2,3,7,8-TCDD was reported at an EMPC and has been qualified with a 'J+' validation flag as the reported result is likely overestimated.

11. Chromatogram Quality

No comments relating to chromatogram quality.

5. SUMMARY OF DATA USABILITY

The data validation summary flag table shows that qualifiers were applied to the target analytes for SDG# 1059590.

DATA VALIDATION SUMMARY TABLE					
Compound	MBDS-R11-F01	MBDS-U14-R01	MBDS-U14-C01	MBDS-U14-I01	MBDS-U14-I04
2,3,7,8-TCDF				J	J
Total TCDF	J				
2,3,7,8-TCDD					
Total TCDD				J	
1,2,3,7,8-PeCDF				R	R
2,3,4,7,8-PeCDF				J	J
Total PeCDF			J		
1,2,3,7,8-PeCDD					
Total PeCDD				J	
1,2,3,4,7,8-HxCDF				J+	J
1,2,3,6,7,8-HxCDF				J	J
2,3,4,6,7,8-HxCDF				J	J
1,2,3,7,8,9-HxCDF					
Total HxCDF			J		
1,2,3,4,7,8-HxCDD				J	J
1,2,3,6,7,8-HxCDD					
1,2,3,7,8,9-HxCDD				J	J
Total HxCDD					
1,2,3,4,6,7,8-HpCDF		J			
1,2,3,4,7,8,9-HpCDF			UJ	J	
Total HpCDF		J	UJ		
1,2,3,4,6,7,8-HpCDD	J	J	J-		
Total HpCDD	J		J-		
OCDF					
OCDD	U				

DATA VALIDATION SUMMARY TABLE					
Compound	MBDS-U15-R01	MBDS-U15-C01	MBDS-U15-I01	MBDS-R10-F01	MBDS-R10-O01
2,3,7,8-TCDF		J		J	
Total TCDF	J				
2,3,7,8-TCDD					
Total TCDD	J		J	J	
1,2,3,7,8-PeCDF		R	R	R	
2,3,4,7,8-PeCDF		J			
Total PeCDF					
1,2,3,7,8-PeCDD					
Total PeCDD			J		
1,2,3,4,7,8-HxCDF			J	J	
1,2,3,6,7,8-HxCDF					
2,3,4,6,7,8-HxCDF					
1,2,3,7,8,9-HxCDF					
Total HxCDF					
1,2,3,4,7,8-HxCDD			J		
1,2,3,6,7,8-HxCDD			J	J	
1,2,3,7,8,9-HxCDD			J	J	
Total HxCDD					
1,2,3,4,6,7,8-HpCDF		J			
1,2,3,4,7,8,9-HpCDF				J	
Total HpCDF					
1,2,3,4,6,7,8-HpCDD	J				
Total HpCDD					
OCDF		J			
OCDD					J

DATA VALIDATION SUMMARY TABLE					
Compound	MBDS-R16-O01	MBDS-R16-A01	MBDS-R01-F01	MBDS-R01-F02	MBDS-R01-O01
2,3,7,8-TCDF					
Total TCDF			J		J
2,3,7,8-TCDD					
Total TCDD				J	
1,2,3,7,8-PeCDF		R			R
2,3,4,7,8-PeCDF					
Total PeCDF					
1,2,3,7,8-PeCDD					
Total PeCDD					
1,2,3,4,7,8-HxCDF					
1,2,3,6,7,8-HxCDF					
2,3,4,6,7,8-HxCDF					
1,2,3,7,8,9-HxCDF					
Total HxCDF		J			
1,2,3,4,7,8-HxCDD					
1,2,3,6,7,8-HxCDD					
1,2,3,7,8,9-HxCDD					
Total HxCDD				J	J
1,2,3,4,6,7,8-HpCDF				J	J
1,2,3,4,7,8,9-HpCDF					
Total HpCDF		J		J	J
1,2,3,4,6,7,8-HpCDD	J	J			
Total HpCDD	J				
OCDF		J			J
OCDD					

DATA VALIDATION SUMMARY TABLE					
Compound	MBDS-R01-A01	MBDS-R08-F01	MBDS-R08-O01	MSDS-R08-A01	MBDS-U14-I05 (Trip Blank)
2,3,7,8-TCDF	J	J			
Total TCDF			J		
2,3,7,8-TCDD					
Total TCDD	J	J			
1,2,3,7,8-PeCDF	R				
2,3,4,7,8-PeCDF					
Total PeCDF	J				
1,2,3,7,8-PeCDD					
Total PeCDD	J				
1,2,3,4,7,8-HxCDF					
1,2,3,6,7,8-HxCDF					
2,3,4,6,7,8-HxCDF					
1,2,3,7,8,9-HxCDF					
Total HxCDF	J				
1,2,3,4,7,8-HxCDD					
1,2,3,6,7,8-HxCDD					
1,2,3,7,8,9-HxCDD					
Total HxCDD		J	J	J	
1,2,3,4,6,7,8-HpCDF	J	J		J	
1,2,3,4,7,8,9-HpCDF					
Total HpCDF	J	J		J	
1,2,3,4,6,7,8-HpCDD			J		
Total HpCDD					
OCDF	J	J		J	
OCDD					

DATA VALIDATION SUMMARY TABLE					
Compound	MBDS-R16-F01	MBDS-R15-O01	MBDS-R15-A01	MBDS-R15-F01	MBDS-R09-A01
2,3,7,8-TCDF					
Total TCDF	J				
2,3,7,8-TCDD					
Total TCDD				J	
1,2,3,7,8-PeCDF					
2,3,4,7,8-PeCDF					
Total PeCDF					
1,2,3,7,8-PeCDD					
Total PeCDD					
1,2,3,4,7,8-HxCDF					
1,2,3,6,7,8-HxCDF					
2,3,4,6,7,8-HxCDF					
1,2,3,7,8,9-HxCDF					
Total HxCDF					J
1,2,3,4,7,8-HxCDD					
1,2,3,6,7,8-HxCDD					J
1,2,3,7,8,9-HxCDD					
Total HxCDD					
1,2,3,4,6,7,8-HpCDF					J
1,2,3,4,7,8,9-HpCDF					
Total HpCDF					J
1,2,3,4,6,7,8-HpCDD			J		
Total HpCDD					
OCDF					J
OCDD	J				

DATA VALIDATION SUMMARY TABLE					
Compound	MBDS-R09-F01	MBDS-R09-O01	MBDS-R02-O01	MBDS-R02-A01	MBDS-U16-R01
2,3,7,8-TCDF					
Total TCDF			J	J	J
2,3,7,8-TCDD					
Total TCDD	J	J			
1,2,3,7,8-PeCDF					
2,3,4,7,8-PeCDF					
Total PeCDF			J		
1,2,3,7,8-PeCDD					
Total PeCDD				J	
1,2,3,4,7,8-HxCDF			J		
1,2,3,6,7,8-HxCDF			J		
2,3,4,6,7,8-HxCDF			J		
1,2,3,7,8,9-HxCDF					
Total HxCDF					
1,2,3,4,7,8-HxCDD					
1,2,3,6,7,8-HxCDD			J	J	
1,2,3,7,8,9-HxCDD					
Total HxCDD	J				
1,2,3,4,6,7,8-HpCDF	J+				
1,2,3,4,7,8,9-HpCDF			J	J	
Total HpCDF					
1,2,3,4,6,7,8-HpCDD		J			J
Total HpCDD					J
OCDF	J				
OCDD					

DATA VALIDATION SUMMARY TABLE		
Compound	MBDS-U16-C01	MBDS-R02-F01
2,3,7,8-TCDF	J	J
Total TCDF		
2,3,7,8-TCDD		J+
Total TCDD		
1,2,3,7,8-PeCDF		
2,3,4,7,8-PeCDF		J
Total PeCDF	J	
1,2,3,7,8-PeCDD		J
Total PeCDD		
1,2,3,4,7,8-HxCDF		
1,2,3,6,7,8-HxCDF		
2,3,4,6,7,8-HxCDF		
1,2,3,7,8,9-HxCDF		
Total HxCDF		
1,2,3,4,7,8-HxCDD		J
1,2,3,6,7,8-HxCDD	J	J
1,2,3,7,8,9-HxCDD	J	J
Total HxCDD		
1,2,3,4,6,7,8-HpCDF		J
1,2,3,4,7,8,9-HpCDF		
Total HpCDF		
1,2,3,4,6,7,8-HpCDD		
Total HpCDD		
OCDF		
OCDD		

Data Validation Summary Table Qualifier Codes

U = Result is a non-detect.

UJ = Result is a non-detect, but is estimated due to QC issues.

J = Result was detected, but is an estimate with undetermined bias due to QC issues.

J+ = Result was detected, but is likely overestimated due to QC issues.

J- = Result was detected, but is likely underestimated due to QC issues.

R = Result is rejected and is highly questionable for use as a quantitative value due to significant QC issues.

6. REFERENCES

Contract Laboratory Program National Functional Guidelines for Organic Data Review, EPA 540/R-99/008, October 1999, U.S. Environmental Protection Agency, Cincinnati, Ohio.

USEPA Analytical Operations / Data Quality Center, *National Functional Guidelines for Chlorinated Dioxin / Furan Data Review*, EPA 540-R-02-003, August 2002.

USEPA, *Methods for the Analysis of Wastes, High Resolution Gas Chromatography / Mass Spectrometry*, SW-846, July 2002.

USEPA Test Methods for Evaluating Solid Waste Physical/Chemical Methods, Doc. No. SW-846, 3rd Ed., Method 8290, Polychlorinated Dibenzodioxins (PCDDs) and Polychlorinated Dibenzofurans (PCDFs) by High Resolution Gas Chromatography/High Resolution Mass Spectrometry (HRGC/HRMS), Revision 0, September 1994.

9. ATTACHMENTS

The following items are included as an attachment to this L&V report:

- A. Qualified reported results (Form I)

Attachment A
Qualified Reported Results



Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612-607-6444

Method 8290 Sample Analysis Results

Client - Montana Dept. Of Env. Quality

Client's Sample ID	MBDS-R11-F01		
Lab Sample ID	1059590001		
Filename	P71007A_09		
Injected By	BAL		
Total Amount Extracted	16.5 g	Matrix	Solid
% Moisture	37.0	Dilution	NA
Dry Weight Extracted	10.4 g	Collected	09/18/2007
ICAL Date	08/29/2007	Received	09/25/2007
CCal Filename(s)	P71006B_18 & P71007A_15	Extracted	10/03/2007
Method Blank ID	BLANK-14362	Analyzed	10/07/2007 14:29

Native Isomers	Conc ng/Kg	EMPC ng/Kg	RL ng/Kg	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	ND	—	0.19	2,3,7,8-TCDF-13C	2.50	80
Total TCDF	0.28	—	0.19	2,3,7,8-TCDD-13C	2.50	78
				1,2,3,7,8-PeCDF-13C	2.50	73
2,3,7,8-TCDD	ND	—	0.19	2,3,4,7,8-PeCDF-13C	2.50	73
Total TCDD	ND	—	0.19	1,2,3,7,8-PeCDD-13C	2.50	82
				1,2,3,4,7,8-HxCDF-13C	2.50	81
1,2,3,7,8-PeCDF	ND	—	0.96	1,2,3,6,7,8-HxCDF-13C	2.50	78
2,3,4,7,8-PeCDF	ND	—	0.96	2,3,4,6,7,8-HxCDF-13C	2.50	78
Total PeCDF	ND	—	0.96	1,2,3,7,8,9-HxCDF-13C	2.50	83
				1,2,3,4,7,8-HxCDD-13C	2.50	85
1,2,3,7,8-PeCDD	ND	—	0.96	1,2,3,6,7,8-HxCDD-13C	2.50	83
Total PeCDD	ND	—	0.96	1,2,3,4,6,7,8-HpCDF-13C	2.50	74
				1,2,3,4,7,8,9-HpCDF-13C	2.50	63
1,2,3,4,7,8-HxCDF	ND	—	0.96	1,2,3,4,6,7,8-HpCDD-13C	2.50	74
1,2,3,6,7,8-HxCDF	ND	—	0.96	OCDD-13C	5.00	60
2,3,4,6,7,8-HxCDF	ND	—	0.96			
1,2,3,7,8,9-HxCDF	ND	—	0.96	1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	ND	—	0.96	1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	ND	—	0.96	2,3,7,8-TCDD-37Cl4	0.20	77
1,2,3,6,7,8-HxCDD	ND	—	0.96			
1,2,3,7,8,9-HxCDD	ND	—	0.96			
Total HxCDD	ND	—	0.96			
1,2,3,4,6,7,8-HpCDF	ND	—	0.96	Total 2,3,7,8-TCDD		
1,2,3,4,7,8,9-HpCDF	ND	—	0.96	Equivalence: 0.016 ng/Kg		
Total HpCDF	ND	—	0.96	(Using ITE Factors)		
1,2,3,4,6,7,8-HpCDD	1.10	—	0.96			
Total HpCDD	1.10	—	0.96			
OCDF	ND	—	1.90			
OCDD	4.50	—	1.90			

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).

EMPC = Estimated Maximum Possible Concentration

RL = Reporting Limit.

ND = Not Detected

NA = Not Applicable

NC = Not Calculated

Results reported on a dry weight basis and are valid to no more than 2 significant figures.

J = Value below calibration range

B = Less than 10x higher than method blank level

AB
1/21/08

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc.
10 of 53

Report No.1059590



Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612-607-6444

Method 8290 Sample Analysis Results

Client - Montana Dept. Of Env. Quality

Client's Sample ID	MBDS-U14-R01		
Lab Sample ID	1059590002		
Filename	P71007A_10		
Injected By	BAL		
Total Amount Extracted	12.7 g	Matrix	Solid
% Moisture	20.0	Dilution	NA
Dry Weight Extracted	10.2 g	Collected	09/19/2007
ICAL Date	08/29/2007	Received	09/25/2007
CCal Filename(s)	P71006B_18 & P71007A_15	Extracted	10/03/2007
Method Blank ID	BLANK-14362	Analyzed	10/07/2007 15:17

Native Isomers	Conc ng/Kg	EMPC ng/Kg	RL ng/Kg	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	ND	—	0.20	2,3,7,8-TCDF-13C	2.50	77
Total TCDF	1.9	—	0.20	2,3,7,8-TCDD-13C	2.50	78
				1,2,3,7,8-PeCDF-13C	2.50	69
2,3,7,8-TCDD	ND	—	0.20	2,3,4,7,8-PeCDF-13C	2.50	69
Total TCDD	ND	—	0.20	1,2,3,7,8-PeCDD-13C	2.50	76
				1,2,3,4,7,8-HxCDF-13C	2.50	78
1,2,3,7,8-PeCDF	ND	—	0.98	1,2,3,6,7,8-HxCDF-13C	2.50	74
2,3,4,7,8-PeCDF	ND	—	0.98	2,3,4,6,7,8-HxCDF-13C	2.50	72
Total PeCDF	ND	—	0.98	1,2,3,7,8,9-HxCDF-13C	2.50	78
				1,2,3,4,7,8-HxCDD-13C	2.50	81
1,2,3,7,8-PeCDD	ND	—	0.98	1,2,3,6,7,8-HxCDD-13C	2.50	79
Total PeCDD	ND	—	0.98	1,2,3,4,6,7,8-HpCDF-13C	2.50	69
				1,2,3,4,7,8,9-HpCDF-13C	2.50	56
1,2,3,4,7,8-HxCDF	ND	—	0.98	1,2,3,4,6,7,8-HpCDD-13C	2.50	68
1,2,3,6,7,8-HxCDF	ND	—	0.98	OCDD-13C	5.00	55
2,3,4,6,7,8-HxCDF	ND	—	0.98			
1,2,3,7,8,9-HxCDF	ND	—	0.98	1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	ND	—	0.98	1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	ND	—	0.98	2,3,7,8-TCDD-37Cl4	0.20	85
1,2,3,6,7,8-HxCDD	ND	—	0.98			
1,2,3,7,8,9-HxCDD	ND	—	0.98			
Total HxCDD	ND	—	0.98			
1,2,3,4,6,7,8-HpCDF	1.2	—	0.98	J J Total 2,3,7,8-TCDD		
1,2,3,4,7,8,9-HpCDF	ND	—	0.98	Equivalence: 0.066 ng/Kg		
Total HpCDF	1.2	—	0.98	(Using ITE Factors)		
1,2,3,4,6,7,8-HpCDD	3.2	—	0.98	J J		
Total HpCDD	7.3	—	0.98			
OCDF	ND	—	2.00			
OCDD	23.0	—	2.00			

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
EMPC = Estimated Maximum Possible Concentration
RL = Reporting Limit.

ND = Not Detected
NA = Not Applicable
NC = Not Calculated

Results reported on a dry weight basis and are valid to no more than 2 significant figures.
J = Value below calibration range

AB
1/21/08

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc.

11 of 53

Report No.....1059590



Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612-607-6444

Method 8290 Sample Analysis Results

Client - Montana Dept. Of Env. Quality

Client's Sample ID	MBDS-U14-C01		
Lab Sample ID	1059590003		
Filename	P71007A_11		
Injected By	BAL		
Total Amount Extracted	11.8 g	Matrix	Solid
% Moisture	13.2	Dilution	NA
Dry Weight Extracted	10.2 g	Collected	09/19/2007
ICAL Date	08/29/2007	Received	09/25/2007
CCal Filename(s)	P71006B_18 & P71007A_15	Extracted	10/03/2007
Method Blank ID	BLANK-14362	Analyzed	10/07/2007 16:06

Native isomers	Conc ng/Kg	EMPC ng/Kg	RL ng/Kg	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	ND	—	0.20	2,3,7,8-TCDF-13C	2.50	91
Total TCDF	2.8	—	0.20	2,3,7,8-TCDD-13C	2.50	92
				1,2,3,7,8-PeCDF-13C	2.50	81
2,3,7,8-TCDD	ND	—	0.20	2,3,4,7,8-PeCDF-13C	2.50	81
Total TCDD	ND	—	0.20	1,2,3,7,8-PeCDD-13C	2.50	90
				1,2,3,4,7,8-HxCDF-13C	2.50	91
1,2,3,7,8-PeCDF	ND	—	0.98	1,2,3,6,7,8-HxCDF-13C	2.50	92
2,3,4,7,8-PeCDF	ND	—	0.98	2,3,4,6,7,8-HxCDF-13C	2.50	87
Total PeCDF	2.2	—	0.98	1,2,3,7,8,9-HxCDF-13C	2.50	90
				1,2,3,4,7,8-HxCDD-13C	2.50	96
1,2,3,7,8-PeCDD	ND	—	0.98	1,2,3,6,7,8-HxCDD-13C	2.50	93
Total PeCDD	ND	—	0.98	1,2,3,4,6,7,8-HpCDF-13C	2.50	77
				1,2,3,4,7,8,9-HpCDF-13C	2.50	31 P
1,2,3,4,7,8-HxCDF	ND	—	0.98	1,2,3,4,6,7,8-HpCDD-13C	2.50	34 P
1,2,3,6,7,8-HxCDF	ND	—	0.98	OCDD-13C	5.00	51
2,3,4,6,7,8-HxCDF	ND	—	0.98			
1,2,3,7,8,9-HxCDF	ND	—	0.98	1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	3.6	—	0.98	1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	ND	—	0.98	2,3,7,8-TCDD-37Cl4	0.20	89
1,2,3,6,7,8-HxCDD	ND	—	0.98			
1,2,3,7,8,9-HxCDD	ND	—	0.98			
Total HxCDD	ND	—	0.98			
1,2,3,4,6,7,8-HpCDF	ND	—	0.98	Total 2,3,7,8-TCDD		
1,2,3,4,7,8,9-HpCDF	ND	—	0.98	Equivalence: 0.061 ng/Kg		
Total HpCDF	ND	—	0.98	(Using ITE Factors)		
1,2,3,4,6,7,8-HpCDD	3.6	—	0.98			
Total HpCDD	10.0	—	0.98			
OCDF	ND	—	2.00			
OCDD	26.0	—	2.00			

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
EMPC = Estimated Maximum Possible Concentration
RL = Reporting Limit.

ND = Not Detected
NA = Not Applicable
NC = Not Calculated

Results reported on a dry weight basis and are valid to no more than 2 significant figures.

J = Value below calibration range

P = Recovery outside target range

MB
1/2/08

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc.

12 of 53

Report No.....1059590



Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612-607-6444

Method 8290 Sample Analysis Results

Client - Montana Dept. Of Env. Quality

Client's Sample ID	MBDS-U14-101		
Lab Sample ID	1059590004		
Filename	F71009A_04		
Injected By	SMT		
Total Amount Extracted	11.8 g	Matrix	Solid
% Moisture	11.0	Dilution	NA
Dry Weight Extracted	10.5 g	Collected	09/19/2007
ICAL Date	08/30/2007	Received	09/25/2007
CCal Filename(s)	F71008B_17 & F71009A_07	Extracted	10/03/2007
Method Blank ID	BLANK-14362	Analyzed	10/09/2007 03:09

Native Isomers	Conc ng/Kg	EMPC ng/Kg	RL ng/Kg	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	0.34	—	0.19	2,3,7,8-TCDF-13C	2.50	76
Total TCDF	29.00	—	0.19	2,3,7,8-TCDD-13C	2.50	78
				1,2,3,7,8-PeCDF-13C	2.50	70
2,3,7,8-TCDD	ND	—	0.21	2,3,4,7,8-PeCDF-13C	2.50	70
Total TCDD	0.79	—	0.21	1,2,3,7,8-PeCDD-13C	2.50	82
				1,2,3,4,7,8-HxCDF-13C	2.50	72
1,2,3,7,8-PeCDF	—	10.0	0.95	1,2,3,6,7,8-HxCDF-13C	2.50	71
2,3,4,7,8-PeCDF	3.20	—	0.95	2,3,4,6,7,8-HxCDF-13C	2.50	67
Total PeCDF	27.00	—	0.95	1,2,3,7,8,9-HxCDF-13C	2.50	66
				1,2,3,4,7,8-HxCDD-13C	2.50	80
1,2,3,7,8-PeCDD	ND	—	0.95	1,2,3,6,7,8-HxCDD-13C	2.50	81
Total PeCDD	1.90	—	0.95	1,2,3,4,6,7,8-HpCDF-13C	2.50	78
				1,2,3,4,7,8,9-HpCDF-13C	2.50	65
1,2,3,4,7,8-HxCDF	—	1.2	0.95	1,2,3,4,6,7,8-HpCDD-13C	2.50	96
1,2,3,6,7,8-HxCDF	2.00	—	0.95	OCDD-13C	5.00	56
2,3,4,6,7,8-HxCDF	2.80	—	0.95			
1,2,3,7,8,9-HxCDF	ND	—	0.95	1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	93.00	—	0.95	1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	1.40	—	0.95	2,3,7,8-TCDD-37Cl4	0.20	74
1,2,3,6,7,8-HxCDD	6.40	—	0.95			
1,2,3,7,8,9-HxCDD	2.70	—	0.95			
Total HxCDD	40.00	—	0.95			
1,2,3,4,6,7,8-HpCDF	18.00	—	0.95	Total 2,3,7,8-TCDD		
1,2,3,4,7,8,9-HpCDF	0.97	—	0.95	Equivalence: 6.2 ng/Kg		
Total HpCDF	49.00	—	0.95	(Using ITE Factors)		
1,2,3,4,6,7,8-HpCDD	170.00	—	0.95			
Total HpCDD	310.00	—	0.95			
OCDF	43.00	—	1.90			
OCDD	1100.00	—	1.90			

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
EMPC = Estimated Maximum Possible Concentration
RL = Reporting Limit.

ND = Not Detected
NA = Not Applicable
NC = Not Calculated

Results reported on a dry weight basis and are valid to no more than 2 significant figures.

J = Value below calibration range

A = Reporting Limit based on signal to noise

E = PCDE Interference

I = Interference present

MS
11/21/08

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc.
13 of 53

Report No.....1059590



Pace Analytical Services, Inc
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612-607-6444

Method 8290 Sample Analysis Results

Client - Montana Dept. Of Env. Quality

Client's Sample ID	MBDS-U14-I04		
Lab Sample ID	1059590005		
Filename	F71009A_05		
Injected By	SMT		
Total Amount Extracted	11.4 g	Matrix	Solid
% Moisture	10.9	Dilution	NA
Dry Weight Extracted	10.2 g	Collected	09/19/2007
ICAL Date	08/30/2007	Received	09/25/2007
CCal Filename(s)	F71008B_17 & F71009A_07	Extracted	10/03/2007
Method Blank ID	BLANK-14362	Analyzed	10/09/2007 03:56

Native Isomers	Conc ng/Kg	EMPC ng/Kg	RL ng/Kg	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	0.38	—	0.20	2,3,7,8-TCDF-13C	2.50	71
Total TCDF	17.00	—	0.20	2,3,7,8-TCDD-13C	2.50	72
				1,2,3,7,8-PeCDF-13C	2.50	64
2,3,7,8-TCDD	ND	—	0.210	2,3,4,7,8-PeCDF-13C	2.50	65
Total TCDD	1.20	—	0.21	1,2,3,7,8-PeCDD-13C	2.50	79
				1,2,3,4,7,8-HxCDF-13C	2.50	59
1,2,3,7,8-PeCDF	—	5.4	0.98	1,2,3,6,7,8-HxCDF-13C	2.50	62
2,3,4,7,8-PeCDF	2.50	—	0.98	2,3,4,6,7,8-HxCDF-13C	2.50	63
Total PeCDF	57.00	—	0.98	1,2,3,7,8,9-HxCDF-13C	2.50	60
				1,2,3,4,7,8-HxCDD-13C	2.50	69
1,2,3,7,8-PeCDD	ND	—	0.98	1,2,3,6,7,8-HxCDD-13C	2.50	74
Total PeCDD	ND	—	0.98	1,2,3,4,6,7,8-HpCDF-13C	2.50	64
				1,2,3,4,7,8,9-HpCDF-13C	2.50	58
1,2,3,4,7,8-HxCDF	1.10	—	0.98	1,2,3,4,6,7,8-HpCDD-13C	2.50	86
1,2,3,6,7,8-HxCDF	1.40	—	0.98	OCDD-13C	5.00	48
2,3,4,6,7,8-HxCDF	2.60	—	0.98			
1,2,3,7,8,9-HxCDF	ND	—	0.98	1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	64.00	—	0.98	1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	1.20	—	0.98	2,3,7,8-TCDD-37Cl4	0.20	69
1,2,3,6,7,8-HxCDD	5.40	—	0.98			
1,2,3,7,8,9-HxCDD	2.20	—	0.98			
Total HxCDD	25.00	—	0.98			
1,2,3,4,6,7,8-HpCDF	13.00	—	0.98	Total 2,3,7,8-TCDD		
1,2,3,4,7,8,9-HpCDF	ND	—	0.98	Equivalence: 4.6 ng/Kg		
Total HpCDF	37.00	—	0.98	(Using ITE Factors)		
1,2,3,4,6,7,8-HpCDD	100.00	—	0.98			
Total HpCDD	180.00	—	0.98			
OCDF	19.00	—	2.00			
OCDD	740.00	—	2.00			

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
EMPC = Estimated Maximum Possible Concentration
RL = Reporting Limit.

ND = Not Detected
NA = Not Applicable
NC = Not Calculated

Results reported on a dry weight basis and are valid to no more than 2 significant figures.

J = Value below calibration range

A = Reporting Limit based on signal to noise

E = PCDE Interference

AKS
1/21/08

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc.
14 of 53

Report No.....1059590



Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612-607-6444

Method 8290 Sample Analysis Results

Client - Montana Dept. Of Env. Quality

Client's Sample ID	MBDS-U15-R01		
Lab Sample ID	1059590006		
Filename	P71007A_12		
Injected By	BAL		
Total Amount Extracted	12.9 g	Matrix	Solid
% Moisture	21.8	Dilution	NA
Dry Weight Extracted	10.1 g	Collected	09/19/2007
ICAL Date	08/29/2007	Received	09/25/2007
CCal Filename(s)	P71006B_18 & P71007A_15	Extracted	10/03/2007
Method Blank ID	BLANK-14362	Analyzed	10/07/2007 16:54

Native Isomers	Conc ng/Kg	EMPC ng/Kg	RL ng/Kg	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	ND	—	0.20	2,3,7,8-TCDF-13C	2.50	84
Total TCDF	0.89	—	0.20	2,3,7,8-TCDD-13C	2.50	81
				1,2,3,7,8-PeCDF-13C	2.50	76
2,3,7,8-TCDD	ND	—	0.20	2,3,4,7,8-PeCDF-13C	2.50	77
Total TCDD	0.27	—	0.20	1,2,3,7,8-PeCDD-13C	2.50	84
				1,2,3,4,7,8-HxCDF-13C	2.50	86
1,2,3,7,8-PeCDF	ND	—	0.99	1,2,3,6,7,8-HxCDF-13C	2.50	82
2,3,4,7,8-PeCDF	ND	—	0.99	2,3,4,6,7,8-HxCDF-13C	2.50	81
Total PeCDF	ND	—	0.99	1,2,3,7,8,9-HxCDF-13C	2.50	82
				1,2,3,4,7,8-HxCDD-13C	2.50	89
1,2,3,7,8-PeCDD	ND	—	0.99	1,2,3,6,7,8-HxCDD-13C	2.50	86
Total PeCDD	ND	—	0.99	1,2,3,4,6,7,8-HpCDF-13C	2.50	76
				1,2,3,4,7,8,9-HpCDF-13C	2.50	62
1,2,3,4,7,8-HxCDF	ND	—	0.99	1,2,3,4,6,7,8-HpCDD-13C	2.50	77
1,2,3,6,7,8-HxCDF	ND	—	0.99	OCDD-13C	5.00	61
2,3,4,6,7,8-HxCDF	ND	—	0.99			
1,2,3,7,8,9-HxCDF	ND	—	0.99	1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	ND	—	0.99	1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	ND	—	0.99	2,3,7,8-TCDD-37Cl4	0.20	78
1,2,3,6,7,8-HxCDD	ND	—	0.99			
1,2,3,7,8,9-HxCDD	ND	—	0.99			
Total HxCDD	ND	—	0.99			
1,2,3,4,6,7,8-HpCDF	ND	—	0.99	Total 2,3,7,8-TCDD		
1,2,3,4,7,8,9-HpCDF	ND	—	0.99	Equivalence: 0.060 ng/Kg		
Total HpCDF	ND	—	0.99	(Using ITE Factors)		
1,2,3,4,6,7,8-HpCDD	3.20	—	0.99			
Total HpCDD	6.60	—	0.99			
OCDF	ND	—	2.00			
OCDD	29.00	—	2.00			

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
EMPC = Estimated Maximum Possible Concentration
RL = Reporting Limit.

ND = Not Detected
NA = Not Applicable
NC = Not Calculated

Results reported on a dry weight basis and are valid to no more than 2 significant figures.
J = Value below calibration range

AB
11/21/08

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc.
15 of 53

Report No.....1059590



Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612-607-6444

Method 8290 Sample Analysis Results

Client - Montana Dept. Of Env. Quality

Client's Sample ID	MBDS-U15-C01		
Lab Sample ID	1059590007		
Filename	F71009A_03		
Injected By	SMT		
Total Amount Extracted	11.9 g	Matrix	Solid
% Moisture	14.2	Dilution	NA
Dry Weight Extracted	10.3 g	Collected	09/19/2007
ICAL Date	08/30/2007	Received	09/25/2007
CCal Filename(s)	F71008B_17 & F71009A_07	Extracted	10/03/2007
Method Blank ID	BLANK-14362	Analyzed	10/09/2007 02:22

Native Isomers	Conc ng/Kg	EMPC ng/Kg	RL ng/Kg	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	0.55	—	0.20	2,3,7,8-TCDF-13C	2.50	82
Total TCDF	12.00	—	0.20	2,3,7,8-TCDD-13C	2.50	84
				1,2,3,7,8-PeCDF-13C	2.50	75
2,3,7,8-TCDD	ND	—	0.20	2,3,4,7,8-PeCDF-13C	2.50	76
Total TCDD	1.10	—	0.20	1,2,3,7,8-PeCDD-13C	2.50	85
				1,2,3,4,7,8-HxCDF-13C	2.50	79
1,2,3,7,8-PeCDF	—	1.1	0.98	1,2,3,6,7,8-HxCDF-13C	2.50	85
2,3,4,7,8-PeCDF	1.60	—	0.98	2,3,4,6,7,8-HxCDF-13C	2.50	79
Total PeCDF	8.30	—	0.98	1,2,3,7,8,9-HxCDF-13C	2.50	76
				1,2,3,4,7,8-HxCDD-13C	2.50	79
1,2,3,7,8-PeCDD	ND	—	0.98	1,2,3,6,7,8-HxCDD-13C	2.50	94
Total PeCDD	ND	—	0.98	1,2,3,4,6,7,8-HpCDF-13C	2.50	82
				1,2,3,4,7,8,9-HpCDF-13C	2.50	68
1,2,3,4,7,8-HxCDF	ND	—	0.98	1,2,3,4,6,7,8-HpCDD-13C	2.50	93
1,2,3,6,7,8-HxCDF	ND	—	0.98	OCDD-13C	5.00	63
2,3,4,6,7,8-HxCDF	ND	—	0.98			
1,2,3,7,8,9-HxCDF	ND	—	0.98	1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	11.00	—	0.98	1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	ND	—	0.98	2,3,7,8-TCDD-37Cl4	0.20	78
1,2,3,6,7,8-HxCDD	ND	—	0.98			
1,2,3,7,8,9-HxCDD	ND	—	0.98			
Total HxCDD	5.10	—	0.98			
1,2,3,4,6,7,8-HpCDF	3.70	—	0.98	Total 2,3,7,8-TCDD		
1,2,3,4,7,8,9-HpCDF	ND	—	0.98	Equivalence: 1.2 ng/Kg		
Total HpCDF	10.00	—	0.98	(Using ITE Factors)		
1,2,3,4,6,7,8-HpCDD	14.00	—	0.98			
Total HpCDD	30.00	—	0.98			
OCDF	8.90	—	2.00			
OCDD	130.00	—	2.00			

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
EMPC = Estimated Maximum Possible Concentration
RL = Reporting Limit.

ND = Not Detected
NA = Not Applicable
NC = Not Calculated

Results reported on a dry weight basis and are valid to no more than 2 significant figures.
J = Value below calibration range
E = PCDE Interference

AB
11/21/02

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc.
16 of 53

Report No. 1059590



Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612-607-6444

Method 8290 Sample Analysis Results

Client - Montana Dept. Of Env. Quality

Client's Sample ID	MBDS-U15-I01		
Lab Sample ID	1059590008		
Filename	F71011B_04		
Injected By	SMT		
Total Amount Extracted	12.6 g	Matrix	Solid
% Moisture	20.8	Dilution	NA
Dry Weight Extracted	10.00 g	Collected	09/19/2007
ICAL Date	08/30/2007	Received	09/25/2007
CCal Filename(s)	F71011B_01 & F71011B_16	Extracted	10/04/2007
Method Blank ID	BLANK-14391	Analyzed	10/11/2007 16:26

Native Isomers	Conc ng/Kg	EMPC ng/Kg	RL ng/Kg	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	ND	—	0.20	2,3,7,8-TCDF-13C	2.50	86
Total TCDF	2.60	—	0.20	2,3,7,8-TCDD-13C	2.50	80
				1,2,3,7,8-PeCDF-13C	2.50	60
2,3,7,8-TCDD	ND	—	0.20	2,3,4,7,8-PeCDF-13C	2.50	64
Total TCDD	0.75	—	0.20	1,2,3,7,8-PeCDD-13C	2.50	83
				1,2,3,4,7,8-HxCDF-13C	2.50	71
1,2,3,7,8-PeCDF	—	4.8	1.00	1,2,3,6,7,8-HxCDF-13C	2.50	71
2,3,4,7,8-PeCDF	ND	—	1.00	2,3,4,6,7,8-HxCDF-13C	2.50	76
Total PeCDF	ND	—	1.00	1,2,3,7,8,9-HxCDF-13C	2.50	79
				1,2,3,4,7,8-HxCDD-13C	2.50	76
1,2,3,7,8-PeCDD	ND	—	1.00	1,2,3,6,7,8-HxCDD-13C	2.50	85
Total PeCDD	1.50	—	1.00	1,2,3,4,6,7,8-HpCDF-13C	2.50	87
				1,2,3,4,7,8,9-HpCDF-13C	2.50	83
1,2,3,4,7,8-HxCDF	1.30	—	1.00	1,2,3,4,6,7,8-HpCDD-13C	2.50	97
1,2,3,6,7,8-HxCDF	ND	—	1.00	OCDD-13C	5.00	100
2,3,4,6,7,8-HxCDF	ND	—	1.00			
1,2,3,7,8,9-HxCDF	ND	—	1.00	1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	16.00	—	1.00	1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	1.20	—	1.00	2,3,7,8-TCDD-37Cl4	0.20	78
1,2,3,6,7,8-HxCDD	2.40	—	1.00			
1,2,3,7,8,9-HxCDD	1.80	—	1.00			
Total HxCDD	17.00	—	1.00			
1,2,3,4,6,7,8-HpCDF	15.00	—	1.00	Total 2,3,7,8-TCDD		
1,2,3,4,7,8,9-HpCDF	ND	—	1.00	Equivalence: 2.0 ng/Kg		
Total HpCDF	44.00	—	1.00	(Using ITE Factors)		
1,2,3,4,6,7,8-HpCDD	64.00	—	1.00			
Total HpCDD	140.00	—	1.00			
OCDF	30.00	—	2.00			
OCDD	550.00	—	2.00			

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).

EMPC = Estimated Maximum Possible Concentration

RL = Reporting Limit.

Results reported on a dry weight basis and are valid to no more than 2 significant figures.

J = Value below calibration range

E = PCDE Interference

ND = Not Detected

NA = Not Applicable

NC = Not Calculated

AB
11/21/08

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc.
17 of 53

Report No.....1059590



Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612-607-6444

Method 8290 Sample Analysis Results

Client - Montana Dept. Of Env. Quality

Client's Sample ID	MBDS-R10-F01		
Lab Sample ID	1059590009		
Filename	F71011B_05		
Injected By	SMT		
Total Amount Extracted	12.7 g	Matrix	Solid
% Moisture	15.0	Dilution	NA
Dry Weight Extracted	10.8 g	Collected	09/19/2007
ICAL Date	08/30/2007	Received	09/25/2007
CCal Filename(s)	F71011B_01 & F71011B_16	Extracted	10/04/2007
Method Blank ID	BLANK-14391	Analyzed	10/11/2007 17:14

Native Isomers	Conc ng/Kg	EMPC ng/Kg	RL ng/Kg	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	0.27	—	0.19	+J 2,3,7,8-TCDF-13C	2.50	86
Total TCDF	2.40	—	0.19	2,3,7,8-TCDD-13C	2.50	76
				1,2,3,7,8-PeCDF-13C	2.50	57
2,3,7,8-TCDD	ND	—	0.19	+J 2,3,4,7,8-PeCDF-13C	2.50	59
Total TCDD	0.29	—	0.19	1,2,3,7,8-PeCDD-13C	2.50	67
				1,2,3,4,7,8-HxCDF-13C	2.50	72
1,2,3,7,8-PeCDF	—	4.1	0.93	-R 1,2,3,6,7,8-HxCDF-13C	2.50	76
2,3,4,7,8-PeCDF	ND	—	0.93	2,3,4,6,7,8-HxCDF-13C	2.50	77
Total PeCDF	ND	—	0.93	1,2,3,7,8,9-HxCDF-13C	2.50	78
				1,2,3,4,7,8-HxCDD-13C	2.50	82
1,2,3,7,8-PeCDD	ND	—	0.93	1,2,3,6,7,8-HxCDD-13C	2.50	84
Total PeCDD	ND	—	0.93	1,2,3,4,6,7,8-HpCDF-13C	2.50	90
				1,2,3,4,7,8,9-HpCDF-13C	2.50	87
1,2,3,4,7,8-HxCDF	2.10	—	0.93	+J 1,2,3,4,6,7,8-HpCDD-13C	2.50	103
1,2,3,6,7,8-HxCDF	ND	—	0.93	OCDD-13C	5.00	113
2,3,4,6,7,8-HxCDF	ND	—	0.93			
1,2,3,7,8,9-HxCDF	ND	—	0.93	1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	14.00	—	0.93	1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	ND	—	0.93	2,3,7,8-TCDD-37Cl4	0.20	79
1,2,3,6,7,8-HxCDD	1.60	—	0.93			
1,2,3,7,8,9-HxCDD	1.10	—	0.93			
Total HxCDD	7.90	—	0.93			
1,2,3,4,6,7,8-HpCDF	13.00	—	0.93	Total 2,3,7,8-TCDD		
1,2,3,4,7,8,9-HpCDF	1.20	—	0.93	+J Equivalence: 1.3 ng/Kg		
Total HpCDF	44.00	—	0.93	(Using ITE Factors)		
1,2,3,4,6,7,8-HpCDD	35.00	—	0.93			
Total HpCDD	67.00	—	0.93			
OCDF	31.00	—	1.90			
OCDD	260.00	—	1.90			

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
EMPC = Estimated Maximum Possible Concentration
RL = Reporting Limit.

ND = Not Detected
NA = Not Applicable
NC = Not Calculated

Results reported on a dry weight basis and are valid to no more than 2 significant figures.

J = Value below calibration range

E = PCDE Interference

AS
11/21/07

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc.
18 of 53

Report No.....1059590



Pace Analytical Services, Inc
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612-607-6444

Method 8290 Sample Analysis Results

Client - Montana Dept. Of Env. Quality

Client's Sample ID	MBDS-R10-O01		
Lab Sample ID	1059590010		
Filename	F71011B_06		
Injected By	SMT		
Total Amount Extracted	11.9 g	Matrix	Solid
% Moisture	10.4	Dilution	NA
Dry Weight Extracted	10.7 g	Collected	09/19/2007
ICAL Date	08/30/2007	Received	09/25/2007
CCal Filename(s)	F71011B_01 & F71011B_16	Extracted	10/04/2007
Method Blank ID	BLANK-14391	Analyzed	10/11/2007 18:00

Native Isomers	Conc ng/Kg	EMPC ng/Kg	RL ng/Kg	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	ND	—	0.19 A	2,3,7,8-TCDF-13C	2.50	87
Total TCDF	ND	—	0.19	2,3,7,8-TCDD-13C	2.50	80
				1,2,3,7,8-PeCDF-13C	2.50	66
2,3,7,8-TCDD	ND	—	0.31 A	2,3,4,7,8-PeCDF-13C	2.50	70
Total TCDD	ND	—	0.31	1,2,3,7,8-PeCDD-13C	2.50	79
				1,2,3,4,7,8-HxCDF-13C	2.50	70
1,2,3,7,8-PeCDF	ND	—	0.94	1,2,3,6,7,8-HxCDF-13C	2.50	80
2,3,4,7,8-PeCDF	ND	—	0.94	2,3,4,6,7,8-HxCDF-13C	2.50	79
Total PeCDF	ND	—	0.94	1,2,3,7,8,9-HxCDF-13C	2.50	80
				1,2,3,4,7,8-HxCDD-13C	2.50	79
1,2,3,7,8-PeCDD	ND	—	0.94	1,2,3,6,7,8-HxCDD-13C	2.50	90
Total PeCDD	ND	—	0.94	1,2,3,4,6,7,8-HpCDF-13C	2.50	91
				1,2,3,4,7,8,9-HpCDF-13C	2.50	87
1,2,3,4,7,8-HxCDF	ND	—	0.94	1,2,3,4,6,7,8-HpCDD-13C	2.50	102
1,2,3,6,7,8-HxCDF	ND	—	0.94	OCDD-13C	5.00	105
2,3,4,6,7,8-HxCDF	ND	—	0.94			
1,2,3,7,8,9-HxCDF	ND	—	0.94	1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	ND	—	0.94	1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	ND	—	0.94	2,3,7,8-TCDD-37Cl4	0.20	74
1,2,3,6,7,8-HxCDD	ND	—	0.94			
1,2,3,7,8,9-HxCDD	ND	—	0.94			
Total HxCDD	ND	—	0.94			
1,2,3,4,6,7,8-HpCDF	ND	—	0.94	Total 2,3,7,8-TCDD		
1,2,3,4,7,8,9-HpCDF	ND	—	0.94	Equivalence: 0.0024 ng/Kg		
Total HpCDF	ND	—	0.94	(Using ITE Factors)		
1,2,3,4,6,7,8-HpCDD	ND	—	0.94			
Total HpCDD	ND	—	0.94			
OCDF	ND	—	1.90			
OCDD	2.4	—	1.90 + J			

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
EMPC = Estimated Maximum Possible Concentration
RL = Reporting Limit.

ND = Not Detected
NA = Not Applicable
NC = Not Calculated

Results reported on a dry weight basis and are valid to no more than 2 significant figures.

J = Value below calibration range

A = Reporting Limit based on signal to noise

Handwritten: #3
11/21/08

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc.
19 of 53

Report No.....1059590

Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612-607-6444



Pace AnalyticalTM

Method 8290 Sample Analysis Results

Client - Montana Dept. Of Env. Quality

Client's Sample ID	MBDS-R16-001		
Lab Sample ID	1059590011		
Filename	F71012B_07		
Injected By	BAL		
Total Amount Extracted	11.0 g	Matrix	Solid
% Moisture	7.3	Dilution	NA
Dry Weight Extracted	10.2 g	Collected	09/20/2007
ICAL Date	08/30/2007	Received	09/25/2007
CCal Filename(s)	F71012B_01 & F71012B_15	Extracted	10/04/2007
Method Blank ID	BLANK-14391	Analyzed	10/12/2007 21:17

Native Isomers	Conc ng/Kg	EMPC ng/Kg	RL ng/Kg	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	ND	—	0.20	2,3,7,8-TCDF-13C	2.50	90
Total TCDF	ND	—	0.20	2,3,7,8-TCDD-13C	2.50	81
				1,2,3,7,8-PeCDF-13C	2.50	75
2,3,7,8-TCDD	ND	—	0.20	2,3,4,7,8-PeCDF-13C	2.50	79
Total TCDD	ND	—	0.20	1,2,3,7,8-PeCDD-13C	2.50	86
				1,2,3,4,7,8-HxCDF-13C	2.50	77
1,2,3,7,8-PeCDF	ND	—	0.98	1,2,3,6,7,8-HxCDF-13C	2.50	85
2,3,4,7,8-PeCDF	ND	—	0.98	2,3,4,6,7,8-HxCDF-13C	2.50	87
Total PeCDF	ND	—	0.98	1,2,3,7,8,9-HxCDF-13C	2.50	86
				1,2,3,4,7,8-HxCDD-13C	2.50	84
1,2,3,7,8-PeCDD	ND	—	0.98	1,2,3,6,7,8-HxCDD-13C	2.50	94
Total PeCDD	ND	—	0.98	1,2,3,4,6,7,8-HpCDF-13C	2.50	88
				1,2,3,4,7,8,9-HpCDF-13C	2.50	75
1,2,3,4,7,8-HxCDF	ND	—	0.98	1,2,3,4,6,7,8-HpCDD-13C	2.50	91
1,2,3,6,7,8-HxCDF	ND	—	0.98	OCDD-13C	5.00	85
2,3,4,6,7,8-HxCDF	ND	—	0.98			
1,2,3,7,8,9-HxCDF	ND	—	0.98	1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	ND	—	0.98	1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	ND	—	0.98	2,3,7,8-TCDD-37Cl4	0.20	83
1,2,3,6,7,8-HxCDD	ND	—	0.98			
1,2,3,7,8,9-HxCDD	ND	—	0.98			
Total HxCDD	ND	—	0.98			
1,2,3,4,6,7,8-HpCDF	ND	—	0.98	Total 2,3,7,8-TCDD		
1,2,3,4,7,8,9-HpCDF	ND	—	0.98	Equivalence: 0.032 ng/Kg		
Total HpCDF	ND	—	0.98	(Using ITE Factors)		
1,2,3,4,6,7,8-HpCDD	1.7	—	0.98			
Total HpCDD	3.6	—	0.98			
OCDF	ND	—	2.00			
OCDD	14.0	—	2.00			

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
EMPC = Estimated Maximum Possible Concentration
RL = Reporting Limit.

ND = Not Detected
NA = Not Applicable
NC = Not Calculated

Results reported on a dry weight basis and are valid to no more than 2 significant figures.
J = Value below calibration range

AB
11/21/08

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc.
20 of 53

Report No.....1059590

Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612-607-6444



Pace AnalyticalTM

Method 8290 Sample Analysis Results

Client - Montana Dept. Of Env. Quality

Client's Sample ID	MBDS-R16-A01		
Lab Sample ID	1059590012		
Filename	F71012B_08		
Injected By	BAL		
Total Amount Extracted	10.9 g	Matrix	Solid
% Moisture	6.0	Dilution	NA
Dry Weight Extracted	10.3 g	Collected	09/20/2007
ICAL Date	08/30/2007	Received	09/25/2007
CCal Filename(s)	F71012B_01 & F71012B_15	Extracted	10/04/2007
Method Blank ID	BLANK-14391	Analyzed	10/12/2007 22:04

Native Isomers	Conc ng/Kg	EMPC ng/Kg	RL ng/Kg	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	ND	—	0.19	2,3,7,8-TCDF-13C	2.50	90
Total TCDF	2.2	—	0.19	2,3,7,8-TCDD-13C	2.50	81
				1,2,3,7,8-PeCDF-13C	2.50	75
2,3,7,8-TCDD	ND	—	0.19	2,3,4,7,8-PeCDF-13C	2.50	79
Total TCDD	ND	—	0.19	1,2,3,7,8-PeCDD-13C	2.50	84
				1,2,3,4,7,8-HxCDF-13C	2.50	81
1,2,3,7,8-PeCDF	—	3.2	0.97	1,2,3,6,7,8-HxCDF-13C	2.50	85
2,3,4,7,8-PeCDF	ND	—	0.97	2,3,4,6,7,8-HxCDF-13C	2.50	85
Total PeCDF	ND	—	0.97	1,2,3,7,8,9-HxCDF-13C	2.50	86
				1,2,3,4,7,8-HxCDD-13C	2.50	85
1,2,3,7,8-PeCDD	ND	—	0.97	1,2,3,6,7,8-HxCDD-13C	2.50	92
Total PeCDD	ND	—	0.97	1,2,3,4,6,7,8-HpCDF-13C	2.50	84
				1,2,3,4,7,8,9-HpCDF-13C	2.50	73
1,2,3,4,7,8-HxCDF	ND	—	0.97	1,2,3,4,6,7,8-HpCDD-13C	2.50	87
1,2,3,6,7,8-HxCDF	ND	—	0.97	OCDD-13C	5.00	81
2,3,4,6,7,8-HxCDF	ND	—	0.97			
1,2,3,7,8,9-HxCDF	ND	—	0.97	1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	3.2	—	0.97	1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	ND	—	0.97	2,3,7,8-TCDD-37Cl4	0.20	79
1,2,3,6,7,8-HxCDD	ND	—	0.97			
1,2,3,7,8,9-HxCDD	ND	—	0.97			
Total HxCDD	ND	—	0.97			
1,2,3,4,6,7,8-HpCDF	ND	—	0.97	Total 2,3,7,8-TCDD		
1,2,3,4,7,8,9-HpCDF	ND	—	0.97	Equivalence: 0.061 ng/Kg		
Total HpCDF	1.4	—	0.97	(Using ITE Factors)		
1,2,3,4,6,7,8-HpCDD	3.1	—	0.97			
Total HpCDD	6.2	—	0.97			
OCDF	2.3	—	1.90			
OCDD	28.0	—	1.90			

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
EMPC = Estimated Maximum Possible Concentration
RL = Reporting Limit.

ND = Not Detected
NA = Not Applicable
NC = Not Calculated

Results reported on a dry weight basis and are valid to no more than 2 significant figures.
J = Value below calibration range
E = PCDE Interference

AB
11/21/08

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc.
21 of 53

Report No.....1059590

Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612-607-6444



Pace Analytical™

Method 8290 Sample Analysis Results

Client - Montana Dept. Of Env. Quality

Client's Sample ID	MBDS-R01-F01		
Lab Sample ID	1059590013		
Filename	F71011B_09		
Injected By	SMT		
Total Amount Extracted	12.0 g	Matrix	Solid
% Moisture	12.4	Dilution	NA
Dry Weight Extracted	10.5 g	Collected	09/21/2007
ICAL Date	08/30/2007	Received	09/25/2007
CCal Filename(s)	F71011B_01 & F71011B_16	Extracted	10/04/2007
Method Blank ID	BLANK-14391	Analyzed	10/11/2007 20:20

Native Isomers	Conc ng/Kg	EMPC ng/Kg	RL ng/Kg	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	ND	—	0.190 A	2,3,7,8-TCDF-13C	2.50	78
Total TCDF	0.30	—	0.19 J	2,3,7,8-TCDD-13C	2.50	71
				1,2,3,7,8-PeCDF-13C	2.50	62
2,3,7,8-TCDD	ND	—	0.220 A	2,3,4,7,8-PeCDF-13C	2.50	63
Total TCDD	ND	—	0.22	1,2,3,7,8-PeCDD-13C	2.50	70
				1,2,3,4,7,8-HxCDF-13C	2.50	66
1,2,3,7,8-PeCDF	ND	—	0.95	1,2,3,6,7,8-HxCDF-13C	2.50	74
2,3,4,7,8-PeCDF	ND	—	0.95	2,3,4,6,7,8-HxCDF-13C	2.50	74
Total PeCDF	ND	—	0.95	1,2,3,7,8,9-HxCDF-13C	2.50	73
				1,2,3,4,7,8-HxCDD-13C	2.50	78
1,2,3,7,8-PeCDD	ND	—	0.95	1,2,3,6,7,8-HxCDD-13C	2.50	83
Total PeCDD	ND	—	0.95	1,2,3,4,6,7,8-HpCDF-13C	2.50	82
				1,2,3,4,7,8,9-HpCDF-13C	2.50	72
1,2,3,4,7,8-HxCDF	ND	—	0.95	1,2,3,4,6,7,8-HpCDD-13C	2.50	89
1,2,3,6,7,8-HxCDF	ND	—	0.95	OCDD-13C	5.00	86
2,3,4,6,7,8-HxCDF	ND	—	0.95			
1,2,3,7,8,9-HxCDF	ND	—	0.95	1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	ND	—	0.95	1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	ND	—	0.95	2,3,7,8-TCDD-37Cl4	0.20	75
1,2,3,6,7,8-HxCDD	ND	—	0.95			
1,2,3,7,8,9-HxCDD	ND	—	0.95			
Total HxCDD	ND	—	0.95			
1,2,3,4,6,7,8-HpCDF	ND	—	0.95	Total 2,3,7,8-TCDD		
1,2,3,4,7,8,9-HpCDF	ND	—	0.95	Equivalence: 0.00 ng/Kg		
Total HpCDF	ND	—	0.95	(Using ITE Factors)		
1,2,3,4,6,7,8-HpCDD	ND	—	0.95			
Total HpCDD	ND	—	0.95			
OCDF	ND	—	1.90			
OCDD	ND	—	1.90			

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
EMPC = Estimated Maximum Possible Concentration
RL = Reporting Limit.

ND = Not Detected
NA = Not Applicable
NC = Not Calculated

Results reported on a dry weight basis and are valid to no more than 2 significant figures.

J = Value below calibration range

A = Reporting Limit based on signal to noise

MSB
11/21/08

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc.

22 of 53

Report No....1059590



Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612-607-6444

Method 8290 Sample Analysis Results

Client - Montana Dept. Of Env. Quality

Client's Sample ID	MBDS-R01-F02		
Lab Sample ID	1059590014		
Filename	F71011B_10		
Injected By	SMT		
Total Amount Extracted	12.6 g	Matrix	Solid
% Moisture	13.9	Dilution	NA
Dry Weight Extracted	10.9 g	Collected	09/22/2007
ICAL Date	08/30/2007	Received	09/25/2007
CCal Filename(s)	F71011B_01 & F71011B_16	Extracted	10/04/2007
Method Blank ID	BLANK-14391	Analyzed	10/11/2007 21:07

Native Isomers	Conc ng/Kg	EMPC ng/Kg	RL ng/Kg	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	ND	—	0.18	2,3,7,8-TCDF-13C	2.50	93
Total TCDF	1.60	—	0.18	2,3,7,8-TCDD-13C	2.50	81
				1,2,3,7,8-PeCDF-13C	2.50	59
2,3,7,8-TCDD	ND	—	0.18	2,3,4,7,8-PeCDF-13C	2.50	62
Total TCDD	0.28	—	0.18 + J	1,2,3,7,8-PeCDD-13C	2.50	71
				1,2,3,4,7,8-HxCDF-13C	2.50	82
1,2,3,7,8-PeCDF	ND	—	0.92	1,2,3,6,7,8-HxCDF-13C	2.50	83
2,3,4,7,8-PeCDF	ND	—	0.92	2,3,4,6,7,8-HxCDF-13C	2.50	87
Total PeCDF	ND	—	0.92	1,2,3,7,8,9-HxCDF-13C	2.50	90
				1,2,3,4,7,8-HxCDD-13C	2.50	86
1,2,3,7,8-PeCDD	ND	—	0.92	1,2,3,6,7,8-HxCDD-13C	2.50	100
Total PeCDD	ND	—	0.92	1,2,3,4,6,7,8-HpCDF-13C	2.50	95
				1,2,3,4,7,8,9-HpCDF-13C	2.50	101
1,2,3,4,7,8-HxCDF	ND	—	0.92	1,2,3,4,6,7,8-HpCDD-13C	2.50	108
1,2,3,6,7,8-HxCDF	ND	—	0.92	OCDD-13C	5.00	109
2,3,4,6,7,8-HxCDF	ND	—	0.92			
1,2,3,7,8,9-HxCDF	ND	—	0.92	1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	ND	—	0.92	1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	ND	—	0.92	2,3,7,8-TCDD-37Cl4	0.20	74
1,2,3,6,7,8-HxCDD	ND	—	0.92			
1,2,3,7,8,9-HxCDD	ND	—	0.92			
Total HxCDD	3.60	—	0.92 + J			
1,2,3,4,6,7,8-HpCDF	1.70	—	0.92 + J	Total 2,3,7,8-TCDD		
1,2,3,4,7,8,9-HpCDF	ND	—	0.92	Equivalence: 0.099 ng/Kg		
Total HpCDF	2.90	—	0.92 + J	(Using ITE Factors)		
1,2,3,4,6,7,8-HpCDD	5.40	—	0.92			
Total HpCDD	13.00	—	0.92			
OCDF	ND	—	1.80			
OCDD	28.00	—	1.80			

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).

EMPC = Estimated Maximum Possible Concentration

RL = Reporting Limit.

ND = Not Detected

NA = Not Applicable

NC = Not Calculated

Results reported on a dry weight basis and are valid to no more than 2 significant figures.

J = Value below calibration range

AB
1/21/08

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc.

23 of 53

Report No.....1059590


Pace Analytical™

 Pace Analytical Services, Inc.
 1700 Elm Street - Suite 200
 Minneapolis, MN 55414

 Tel: 612-607-1700
 Fax: 612-607-6444

Method 8290 Sample Analysis Results

Client - Montana Dept. Of Env. Quality

Client's Sample ID	MBDS-R01-O01		
Lab Sample ID	1059590015		
Filename	F71011B_11		
Injected By	SMT		
Total Amount Extracted	16.9 g	Matrix	Solid
% Moisture	40.8	Dilution	NA
Dry Weight Extracted	10.0 g	Collected	09/22/2007
ICAL Date	08/30/2007	Received	09/25/2007
CCal Filename(s)	F71011B_01 & F71011B_16	Extracted	10/04/2007
Method Blank ID	BLANK-14391	Analyzed	10/11/2007 21:53

Native Isomers	Conc ng/Kg	EMPC ng/Kg	RL ng/Kg	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	ND	—	0.20	2,3,7,8-TCDF-13C	2.50	94
Total TCDF	0.92	—	0.20	2,3,7,8-TCDD-13C	2.50	78
				1,2,3,7,8-PeCDF-13C	2.50	60
2,3,7,8-TCDD	ND	—	0.25	2,3,4,7,8-PeCDF-13C	2.50	62
Total TCDD	ND	—	0.25	1,2,3,7,8-PeCDD-13C	2.50	69
				1,2,3,4,7,8-HxCDF-13C	2.50	72
1,2,3,7,8-PeCDF	—	1.0	1.00	1,2,3,6,7,8-HxCDF-13C	2.50	79
2,3,4,7,8-PeCDF	ND	—	1.00	2,3,4,6,7,8-HxCDF-13C	2.50	81
Total PeCDF	ND	—	1.00	1,2,3,7,8,9-HxCDF-13C	2.50	79
				1,2,3,4,7,8-HxCDD-13C	2.50	83
1,2,3,7,8-PeCDD	ND	—	1.00	1,2,3,6,7,8-HxCDD-13C	2.50	88
Total PeCDD	ND	—	1.00	1,2,3,4,6,7,8-HpCDF-13C	2.50	88
				1,2,3,4,7,8,9-HpCDF-13C	2.50	86
1,2,3,4,7,8-HxCDF	ND	—	1.00	1,2,3,4,6,7,8-HpCDD-13C	2.50	101
1,2,3,6,7,8-HxCDF	ND	—	1.00	OCDD-13C	5.00	105
2,3,4,6,7,8-HxCDF	ND	—	1.00			
1,2,3,7,8,9-HxCDF	ND	—	1.00	1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	ND	—	1.00	1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	ND	—	1.00	2,3,7,8-TCDD-37Cl4	0.20	83
1,2,3,6,7,8-HxCDD	ND	—	1.00			
1,2,3,7,8,9-HxCDD	ND	—	1.00			
Total HxCDD	3.60	—	1.00			
1,2,3,4,6,7,8-HpCDF	1.20	—	1.00	Total 2,3,7,8-TCDD		
1,2,3,4,7,8,9-HpCDF	ND	—	1.00	Equivalence: 0.13 ng/Kg		
Total HpCDF	3.20	—	1.00	(Using ITE Factors)		
1,2,3,4,6,7,8-HpCDD	7.20	—	1.00			
Total HpCDD	17.00	—	1.00			
OCDF	2.00	—	2.00			
OCDD	39.00	—	2.00			

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).

EMPC = Estimated Maximum Possible Concentration

RL = Reporting Limit.

ND = Not Detected

NA = Not Applicable

NC = Not Calculated

Results reported on a dry weight basis and are valid to no more than 2 significant figures.

J = Value below calibration range

A = Reporting Limit based on signal to noise

E = PCDE Interference

AB
11/21/08
REPORT OF LABORATORY ANALYSIS

 This report shall not be reproduced, except in full,
 without the written consent of Pace Analytical Services, Inc.
 24 of 53

Report No....1059590

Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612-607-6444



Pace Analytical™

Method 8290 Sample Analysis Results

Client - Montana Dept. Of Env. Quality

Client's Sample ID	MBDS-R01-A01		
Lab Sample ID	1059590016		
Filename	F71011B_12		
Injected By	SMT		
Total Amount Extracted	12.8 g	Matrix	Solid
% Moisture	19.1	Dilution	NA
Dry Weight Extracted	10.4 g	Collected	09/22/2007
ICAL Date	08/30/2007	Received	09/25/2007
CCal Filename(s)	F71011B_01 & F71011B_16	Extracted	10/04/2007
Method Blank ID	BLANK-14391	Analyzed	10/11/2007 22:40

Native Isomers	Conc ng/Kg	EMPC ng/Kg	RL ng/Kg	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	0.62	—	0.19	2,3,7,8-TCDF-13C	2.50	89
Total TCDF	3.00	—	0.19	2,3,7,8-TCDD-13C	2.50	69
				1,2,3,7,8-PeCDF-13C	2.50	51
2,3,7,8-TCDD	ND	—	0.27	2,3,4,7,8-PeCDF-13C	2.50	54
Total TCDD	0.41	—	0.27	1,2,3,7,8-PeCDD-13C	2.50	59
				1,2,3,4,7,8-HxCDF-13C	2.50	69
1,2,3,7,8-PeCDF	—	1.1	0.96	1,2,3,6,7,8-HxCDF-13C	2.50	76
2,3,4,7,8-PeCDF	ND	—	0.96	2,3,4,6,7,8-HxCDF-13C	2.50	78
Total PeCDF	1.50	—	0.96	1,2,3,7,8,9-HxCDF-13C	2.50	78
				1,2,3,4,7,8-HxCDD-13C	2.50	79
1,2,3,7,8-PeCDD	ND	—	0.96	1,2,3,6,7,8-HxCDD-13C	2.50	89
Total PeCDD	1.10	—	0.96	1,2,3,4,6,7,8-HpCDF-13C	2.50	86
				1,2,3,4,7,8,9-HpCDF-13C	2.50	84
1,2,3,4,7,8-HxCDF	ND	—	0.96	1,2,3,4,6,7,8-HpCDD-13C	2.50	99
1,2,3,6,7,8-HxCDF	ND	—	0.96	OCDD-13C	5.00	98
2,3,4,6,7,8-HxCDF	ND	—	0.96			
1,2,3,7,8,9-HxCDF	ND	—	0.96	1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	1.10	—	0.96	1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	ND	—	0.96	2,3,7,8-TCDD-37Cl4	0.20	66
1,2,3,6,7,8-HxCDD	ND	—	0.96			
1,2,3,7,8,9-HxCDD	ND	—	0.96			
Total HxCDD	6.80	—	0.96			
1,2,3,4,6,7,8-HpCDF	1.70	—	0.96	Total 2,3,7,8-TCDD		
1,2,3,4,7,8,9-HpCDF	ND	—	0.96	Equivalence: 0.22 ng/Kg		
Total HpCDF	3.60	—	0.96	(Using ITE Factors)		
1,2,3,4,6,7,8-HpCDD	9.50	—	0.96			
Total HpCDD	22.00	—	0.96			
OCDF	2.90	—	1.90			
OCDD	46.00	—	1.90			

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).

EMPC = Estimated Maximum Possible Concentration

RL = Reporting Limit.

ND = Not Detected

NA = Not Applicable

NC = Not Calculated

Results reported on a dry weight basis and are valid to no more than 2 significant figures.

J = Value below calibration range

A = Reporting Limit based on signal to noise

E = PCDE Interference

AB
11/21/08

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc.

25 of 53

Report No....1059590


Pace Analytical™

 Pace Analytical Services, Inc.
 1700 Elm Street - Suite 200
 Minneapolis, MN 55414

 Tel: 612-607-1700
 Fax: 612-607-6444

Method 8290 Sample Analysis Results

Client - Montana Dept. Of Env. Quality

Client's Sample ID	MBDS-R08-F01		
Lab Sample ID	1059590017		
Filename	U71012A_05		
Injected By	BAL		
Total Amount Extracted	12.9 g	Matrix	Solid
% Moisture	15.9	Dilution	NA
Dry Weight Extracted	10.8 g	Collected	09/22/2007
ICAL Date	09/27/2007	Received	09/25/2007
CCal Filename(s)	U71012A_02 & U71012A_17	Extracted	10/04/2007
Method Blank ID	BLANK-14391	Analyzed	10/12/2007 12:05

Native Isomers	Conc ng/Kg	EMPC ng/Kg	RL ng/Kg	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	0.19	—	0.18	2,3,7,8-TCDF-13C	2.50	76
Total TCDF	1.70	—	0.18	2,3,7,8-TCDD-13C	2.50	76
2,3,7,8-TCDD	ND	—	0.18	1,2,3,7,8-PeCDF-13C	2.50	65
Total TCDD	0.34	—	0.18	2,3,4,7,8-PeCDF-13C	2.50	65
1,2,3,7,8-PeCDF	ND	—	0.92	1,2,3,7,8-PeCDD-13C	2.50	71
2,3,4,7,8-PeCDF	ND	—	0.92	1,2,3,4,7,8-HxCDF-13C	2.50	78
Total PeCDF	ND	—	0.92	1,2,3,6,7,8-HxCDF-13C	2.50	77
1,2,3,7,8-PeCDD	ND	—	0.92	2,3,4,6,7,8-HxCDF-13C	2.50	77
Total PeCDD	ND	—	0.92	1,2,3,7,8,9-HxCDF-13C	2.50	82
1,2,3,4,7,8-HxCDF	ND	—	0.92	1,2,3,4,7,8-HxCDD-13C	2.50	82
1,2,3,6,7,8-HxCDF	ND	—	0.92	1,2,3,6,7,8-HxCDD-13C	2.50	87
2,3,4,6,7,8-HxCDF	ND	—	0.92	1,2,3,4,6,7,8-HpCDF-13C	2.50	80
1,2,3,7,8,9-HxCDF	ND	—	0.92	1,2,3,4,7,8,9-HpCDF-13C	2.50	74
Total HxCDF	ND	—	0.92	1,2,3,4,6,7,8-HpCDD-13C	2.50	90
1,2,3,4,7,8-HxCDD	ND	—	0.92	OCDD-13C	5.00	85
1,2,3,6,7,8-HxCDD	ND	—	0.92	1,2,3,4-TCDD-13C	2.00	NA
1,2,3,7,8,9-HxCDD	ND	—	0.92	1,2,3,7,8,9-HxCDD-13C	2.00	NA
Total HxCDD	1.90	—	0.92	2,3,7,8-TCDD-37Cl4	0.20	75
1,2,3,4,6,7,8-HpCDF	1.00	—	0.92			
1,2,3,4,7,8,9-HpCDF	ND	—	0.92			
Total HpCDF	1.00	—	0.92			
1,2,3,4,6,7,8-HpCDD	5.40	—	0.92			
Total HpCDD	13.00	—	0.92			
OCDF	1.90	—	1.80			
OCDD	33.00	—	1.80			

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).

EMPC = Estimated Maximum Possible Concentration

RL = Reporting Limit.

ND = Not Detected

NA = Not Applicable

NC = Not Calculated

Results reported on a dry weight basis and are valid to no more than 2 significant figures.

J = Value below calibration range

*MS
11/21/08*
REPORT OF LABORATORY ANALYSIS

 This report shall not be reproduced, except in full,
 without the written consent of Pace Analytical Services, Inc.

26 of 53

Report No.....1059590


Pace Analytical™

 Pace Analytical Services, Inc.
 1700 Elm Street - Suite 200
 Minneapolis, MN 55414

 Tel: 612-607-1700
 Fax: 612-607-6444

Method 8290 Sample Analysis Results

Client - Montana Dept. Of Env. Quality

Client's Sample ID	MBDS-R08-O01		
Lab Sample ID	1059590018		
Filename	U71012A_06		
Injected By	BAL		
Total Amount Extracted	12.3 g	Matrix	Solid
% Moisture	14.7	Dilution	NA
Dry Weight Extracted	10.5 g	Collected	09/22/2007
ICAL Date	09/27/2007	Received	09/25/2007
CCal Filename(s)	U71012A_02 & U71012A_17	Extracted	10/04/2007
Method Blank ID	BLANK-14391	Analyzed	10/12/2007 12:52

Native Isomers	Conc ng/Kg	EMPC ng/Kg	RL ng/Kg	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	ND	—	0.19	2,3,7,8-TCDF-13C	2.50	
Total TCDF	0.38	—	0.19	2,3,7,8-TCDD-13C	2.50	77
				1,2,3,7,8-PeCDF-13C	2.50	74
2,3,7,8-TCDD	ND	—	0.19	2,3,4,7,8-PeCDF-13C	2.50	65
Total TCDD	ND	—	0.19	1,2,3,7,8-PeCDD-13C	2.50	67
				1,2,3,4,7,8-HxCDF-13C	2.50	72
1,2,3,7,8-PeCDF	ND	—	0.95	1,2,3,6,7,8-HxCDF-13C	2.50	78
2,3,4,7,8-PeCDF	ND	—	0.95	2,3,4,6,7,8-HxCDF-13C	2.50	73
Total PeCDF	ND	—	0.95	1,2,3,7,8,9-HxCDF-13C	2.50	74
				1,2,3,4,7,8-HxCDD-13C	2.50	79
1,2,3,7,8-PeCDD	ND	—	0.95	1,2,3,6,7,8-HxCDD-13C	2.50	84
Total PeCDD	ND	—	0.95	1,2,3,4,6,7,8-HpCDF-13C	2.50	81
				1,2,3,4,7,8,9-HpCDF-13C	2.50	74
1,2,3,4,7,8-HxCDF	ND	—	0.95	1,2,3,4,6,7,8-HpCDD-13C	2.50	69
1,2,3,6,7,8-HxCDF	ND	—	0.95	OCDD-13C	5.00	85
2,3,4,6,7,8-HxCDF	ND	—	0.95			82
1,2,3,7,8,9-HxCDF	ND	—	0.95	1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	ND	—	0.95	1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	ND	—	0.95	2,3,7,8-TCDD-37Cl4	0.20	70
1,2,3,6,7,8-HxCDD	ND	—	0.95			
1,2,3,7,8,9-HxCDD	ND	—	0.95			
Total HxCDD	2.00	—	0.95			
1,2,3,4,6,7,8-HpCDF	ND	—	0.95	Total 2,3,7,8-TCDD		
1,2,3,4,7,8,9-HpCDF	ND	—	0.95	Equivalence: 0.035 ng/Kg		
Total HpCDF	ND	—	0.95	(Using ITE Factors)		
1,2,3,4,6,7,8-HpCDD	2.40	—	0.95			
Total HpCDD	5.10	—	0.95			
OCDF	ND	—	1.90			
OCDD	11.00	—	1.90			

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
 EMPC = Estimated Maximum Possible Concentration
 RL = Reporting Limit.

ND = Not Detected
 NA = Not Applicable
 NC = Not Calculated

Results reported on a dry weight basis and are valid to no more than 2 significant figures.
 J = Value below calibration range

APB
11/21/08

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
 without the written consent of Pace Analytical Services, Inc.
 27 of 53

Report No.....1059590


Pace Analytical™

 Pace Analytical Services, Inc.
 1700 Elm Street - Suite 200
 Minneapolis, MN 55414

 Tel: 612-607-1700
 Fax: 612-607-6444

Method 8290 Sample Analysis Results

Client - Montana Dept. Of Env. Quality

Client's Sample ID	MBDS-R08-A01		
Lab Sample ID	1059590019		
Filename	U71012A_07		
Injected By	BAL		
Total Amount Extracted	10.4 g	Matrix	Solid
% Moisture	1.1	Dilution	NA
Dry Weight Extracted	10.2 g	Collected	09/22/2007
ICAL Date	09/27/2007	Received	09/25/2007
CCal Filename(s)	U71012A_02 & U71012A_17	Extracted	10/04/2007
Method Blank ID	BLANK-14391	Analyzed	10/12/2007 13:39

Native Isomers	Conc ng/Kg	EMPC ng/Kg	RL ng/Kg	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	ND	—	0.20	2,3,7,8-TCDF-13C	2.50	85
Total TCDF	1.3	—	0.20	2,3,7,8-TCDD-13C	2.50	83
				1,2,3,7,8-PeCDF-13C	2.50	76
2,3,7,8-TCDD	ND	—	0.20	2,3,4,7,8-PeCDF-13C	2.50	79
Total TCDD	ND	—	0.20	1,2,3,7,8-PeCDD-13C	2.50	84
				1,2,3,4,7,8-HxCDF-13C	2.50	86
1,2,3,7,8-PeCDF	ND	—	0.98	1,2,3,6,7,8-HxCDF-13C	2.50	85
2,3,4,7,8-PeCDF	ND	—	0.98	2,3,4,6,7,8-HxCDF-13C	2.50	84
Total PeCDF	ND	—	0.98	1,2,3,7,8,9-HxCDF-13C	2.50	88
				1,2,3,4,7,8-HxCDD-13C	2.50	86
1,2,3,7,8-PeCDD	ND	—	0.98	1,2,3,6,7,8-HxCDD-13C	2.50	96
Total PeCDD	ND	—	0.98	1,2,3,4,6,7,8-HpCDF-13C	2.50	86
				1,2,3,4,7,8,9-HpCDF-13C	2.50	75
1,2,3,4,7,8-HxCDF	ND	—	0.98	1,2,3,4,6,7,8-HpCDD-13C	2.50	94
1,2,3,6,7,8-HxCDF	ND	—	0.98	OCDD-13C	5.00	87
2,3,4,6,7,8-HxCDF	ND	—	0.98			
1,2,3,7,8,9-HxCDF	ND	—	0.98	1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	ND	—	0.98	1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	ND	—	0.98	2,3,7,8-TCDD-37Cl4	0.20	81
1,2,3,6,7,8-HxCDD	ND	—	0.98			
1,2,3,7,8,9-HxCDD	ND	—	0.98			
Total HxCDD	3.8	—	0.98			
1,2,3,4,6,7,8-HpCDF	2.3	—	0.98			
1,2,3,4,7,8,9-HpCDF	ND	—	0.98	Total 2,3,7,8-TCDD		
Total HpCDF	3.8	—	0.98	Equivalence: 0.28 ng/Kg		
				(Using ITE Factors)		
1,2,3,4,6,7,8-HpCDD	14.0	—	0.98			
Total HpCDD	26.0	—	0.98			
OCDF	7.7	—	2.00			
OCDD	110.0	—	2.00			

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).

EMPC = Estimated Maximum Possible Concentration

RL = Reporting Limit.

Results reported on a dry weight basis and are valid to no more than 2 significant figures.

J = Value below calibration range

ND = Not Detected

NA = Not Applicable

NC = Not Calculated

MS
 11/21/08

REPORT OF LABORATORY ANALYSIS

 This report shall not be reproduced, except in full,
 without the written consent of Pace Analytical Services, Inc.
 28 of 53

Report No.....1059590


Pace Analytical™

 Pace Analytical Services, Inc.
 1700 Elm Street - Suite 200
 Minneapolis, MN 55414

 Tel: 612-607-1700
 Fax: 612-607-6444

Method 8290 Sample Analysis Results

Client - Montana Dept. Of Env. Quality

Client's Sample ID	MBDS-U14-I05		
Lab Sample ID	1059590020		
Filename	U71012A_08		
Injected By	BAL		
Total Amount Extracted	10.2 g	Matrix	Solid
% Moisture	0.2	Dilution	NA
Dry Weight Extracted	10.2 g	Collected	09/22/2007
ICAL Date	09/27/2007	Received	09/25/2007
CCal Filename(s)	U71012A_02 & U71012A_17	Extracted	10/04/2007
Method Blank ID	BLANK-14391	Analyzed	10/12/2007 14:26

Native Isomers	Conc ng/Kg	EMPC ng/Kg	RL ng/Kg	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	ND	—	0.20	2,3,7,8-TCDF-13C	2.50	83
Total TCDF	ND	—	0.20	2,3,7,8-TCDD-13C	2.50	80
				1,2,3,7,8-PeCDF-13C	2.50	74
2,3,7,8-TCDD	ND	—	0.20	2,3,4,7,8-PeCDF-13C	2.50	75
Total TCDD	ND	—	0.20	1,2,3,7,8-PeCDD-13C	2.50	82
				1,2,3,4,7,8-HxCDF-13C	2.50	85
1,2,3,7,8-PeCDF	ND	—	0.98	1,2,3,6,7,8-HxCDF-13C	2.50	82
2,3,4,7,8-PeCDF	ND	—	0.98	2,3,4,6,7,8-HxCDF-13C	2.50	82
Total PeCDF	ND	—	0.98	1,2,3,7,8,9-HxCDF-13C	2.50	85
				1,2,3,4,7,8-HxCDD-13C	2.50	84
1,2,3,7,8-PeCDD	ND	—	0.98	1,2,3,6,7,8-HxCDD-13C	2.50	91
Total PeCDD	ND	—	0.98	1,2,3,4,6,7,8-HpCDF-13C	2.50	82
				1,2,3,4,7,8,9-HpCDF-13C	2.50	71
1,2,3,4,7,8-HxCDF	ND	—	0.98	1,2,3,4,6,7,8-HpCDD-13C	2.50	91
1,2,3,6,7,8-HxCDF	ND	—	0.98	OCDD-13C	5.00	80
2,3,4,6,7,8-HxCDF	ND	—	0.98			
1,2,3,7,8,9-HxCDF	ND	—	0.98	1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	ND	—	0.98	1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	ND	—	0.98	2,3,7,8-TCDD-37Cl4	0.20	80
1,2,3,6,7,8-HxCDD	ND	—	0.98			
1,2,3,7,8,9-HxCDD	ND	—	0.98			
Total HxCDD	ND	—	0.98			
1,2,3,4,6,7,8-HpCDF	ND	—	0.98	Total 2,3,7,8-TCDD		
1,2,3,4,7,8,9-HpCDF	ND	—	0.98	Equivalence: 0.00 ng/Kg		
Total HpCDF	ND	—	0.98	(Using ITE Factors)		
1,2,3,4,6,7,8-HpCDD	ND	—	0.98			
Total HpCDD	ND	—	0.98			
OCDF	ND	—	2.00			
OCDD	ND	—	2.00			

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
 EMPC = Estimated Maximum Possible Concentration
 RL = Reporting Limit.

ND = Not Detected
 NA = Not Applicable
 NC = Not Calculated

Results reported on a dry weight basis and are valid to no more than 2 significant figures.

APB
 1/21/08

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
 without the written consent of Pace Analytical Services, Inc.
 29 of 53

Report No.....1059590



Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612-607-6444

Method 8290 Sample Analysis Results

Client - Montana Dept. Of Env. Quality

Client's Sample ID	MBDS-R16-F01				
Lab Sample ID	1059590021				
Filename	U71012A_09				
Injected By	BAL				
Total Amount Extracted	12.0 g			Matrix	Solid
% Moisture	9.9			Dilution	NA
Dry Weight Extracted	10.8 g			Collected	09/20/2007
ICAL Date	09/27/2007			Received	09/25/2007
CCal Filename(s)	U71012A_02 & U71012A_17			Extracted	10/04/2007
Method Blank ID	BLANK-14391			Analyzed	10/12/2007 15:13

Native Isomers	Conc ng/Kg	EMPC ng/Kg	RL ng/Kg	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	ND	—	0.19	2,3,7,8-TCDF-13C	2.50	82
Total TCDF	0.62	—	0.19	2,3,7,8-TCDD-13C	2.50	78
				1,2,3,7,8-PeCDF-13C	2.50	72
2,3,7,8-TCDD	ND	—	0.19	2,3,4,7,8-PeCDF-13C	2.50	73
Total TCDD	ND	—	0.19	1,2,3,7,8-PeCDD-13C	2.50	80
				1,2,3,4,7,8-HxCDF-13C	2.50	78
1,2,3,7,8-PeCDF	ND	—	0.93	1,2,3,6,7,8-HxCDF-13C	2.50	79
2,3,4,7,8-PeCDF	ND	—	0.93	2,3,4,6,7,8-HxCDF-13C	2.50	77
Total PeCDF	ND	—	0.93	1,2,3,7,8,9-HxCDF-13C	2.50	82
				1,2,3,4,7,8-HxCDD-13C	2.50	79
1,2,3,7,8-PeCDD	ND	—	0.93	1,2,3,6,7,8-HxCDD-13C	2.50	88
Total PeCDD	ND	—	0.93	1,2,3,4,6,7,8-HpCDF-13C	2.50	79
				1,2,3,4,7,8,9-HpCDF-13C	2.50	68
1,2,3,4,7,8-HxCDF	ND	—	0.93	1,2,3,4,6,7,8-HpCDD-13C	2.50	84
1,2,3,6,7,8-HxCDF	ND	—	0.93	OCDD-13C	5.00	80
2,3,4,6,7,8-HxCDF	ND	—	0.93			
1,2,3,7,8,9-HxCDF	ND	—	0.93	1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	ND	—	0.93	1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	ND	—	0.93	2,3,7,8-TCDD-37Cl4	0.20	77
1,2,3,6,7,8-HxCDD	ND	—	0.93			
1,2,3,7,8,9-HxCDD	ND	—	0.93			
Total HxCDD	ND	—	0.93			
1,2,3,4,6,7,8-HpCDF	ND	—	0.93	Total 2,3,7,8-TCDD		
1,2,3,4,7,8,9-HpCDF	ND	—	0.93	Equivalence: 0.0035 ng/Kg		
Total HpCDF	ND	—	0.93	(Using ITE Factors)		
1,2,3,4,6,7,8-HpCDD	ND	—	0.93			
Total HpCDD	ND	—	0.93			
OCDF	ND	—	1.90			
OCDD	3.50	—	1.90			

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
EMPC = Estimated Maximum Possible Concentration
RL = Reporting Limit.

ND = Not Detected
NA = Not Applicable
NC = Not Calculated

Results reported on a dry weight basis and are valid to no more than 2 significant figures.
J = Value below calibration range

APB
11/21/08

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc.
30 of 53

Report No.....1059590



Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612-607-6444

Method 8290 Sample Analysis Results

Client - Montana Dept. Of Env. Quality

Client's Sample ID	MBDS-R15-001		
Lab Sample ID	1059590022		
Filename	U71012A_10		
Injected By	BAL		
Total Amount Extracted	11.7 g	Matrix	Solid
% Moisture	5.1	Dilution	NA
Dry Weight Extracted	11.1 g	Collected	09/20/2007
ICAL Date	09/27/2007	Received	09/25/2007
CCal Filename(s)	U71012A_02 & U71012A_17	Extracted	10/04/2007
Method Blank ID	BLANK-14391	Analyzed	10/12/2007 16:00

Native Isomers	Conc ng/Kg	EMPC ng/Kg	RL ng/Kg	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	ND	—	0.18	2,3,7,8-TCDF-13C	2.50	86
Total TCDF	ND	—	0.18	2,3,7,8-TCDD-13C	2.50	91
				1,2,3,7,8-PeCDF-13C	2.50	75
2,3,7,8-TCDD	ND	—	0.18	2,3,4,7,8-PeCDF-13C	2.50	75
Total TCDD	ND	—	0.18	1,2,3,7,8-PeCDD-13C	2.50	83
				1,2,3,4,7,8-HxCDF-13C	2.50	80
1,2,3,7,8-PeCDF	ND	—	0.90	1,2,3,6,7,8-HxCDF-13C	2.50	78
2,3,4,7,8-PeCDF	ND	—	0.90	2,3,4,6,7,8-HxCDF-13C	2.50	78
Total PeCDF	ND	—	0.90	1,2,3,7,8,9-HxCDF-13C	2.50	85
				1,2,3,4,7,8-HxCDD-13C	2.50	79
1,2,3,7,8-PeCDD	ND	—	0.90	1,2,3,6,7,8-HxCDD-13C	2.50	90
Total PeCDD	ND	—	0.90	1,2,3,4,6,7,8-HpCDF-13C	2.50	80
				1,2,3,4,7,8,9-HpCDF-13C	2.50	73
1,2,3,4,7,8-HxCDF	ND	—	0.90	1,2,3,4,6,7,8-HpCDD-13C	2.50	93
1,2,3,6,7,8-HxCDF	ND	—	0.90	OCDD-13C	5.00	85
2,3,4,6,7,8-HxCDF	ND	—	0.90			
1,2,3,7,8,9-HxCDF	ND	—	0.90	1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	ND	—	0.90	1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	ND	—	0.90	2,3,7,8-TCDD-37Cl4	0.20	89
1,2,3,6,7,8-HxCDD	ND	—	0.90			
1,2,3,7,8,9-HxCDD	ND	—	0.90			
Total HxCDD	ND	—	0.90			
1,2,3,4,6,7,8-HpCDF	ND	—	0.90	Total 2,3,7,8-TCDD		
1,2,3,4,7,8,9-HpCDF	ND	—	0.90	Equivalence: 0.00 ng/Kg		
Total HpCDF	ND	—	0.90	(Using ITE Factors)		
1,2,3,4,6,7,8-HpCDD	ND	—	0.90			
Total HpCDD	ND	—	0.90			
OCDF	ND	—	1.80			
OCDD	ND	—	1.80			

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
EMPC = Estimated Maximum Possible Concentration
RL = Reporting Limit.

ND = Not Detected
NA = Not Applicable
NC = Not Calculated

Results reported on a dry weight basis and are valid to no more than 2 significant figures.

AKS
11/21/08

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc.

Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612-607-6444



Pace AnalyticalTM

Method 8290 Sample Analysis Results

Client - Montana Dept. Of Env. Quality

Client's Sample ID	MBDS-R15-A01		
Lab Sample ID	1059590023		
Filename	U71012A_11		
Injected By	BAL		
Total Amount Extracted	11.3 g	Matrix	Solid
% Moisture	9.0	Dilution	NA
Dry Weight Extracted	10.3 g	Collected	09/20/2007
ICAL Date	09/27/2007	Received	09/25/2007
CCal Filename(s)	U71012A_02 & U71012A_17	Extracted	10/04/2007
Method Blank ID	BLANK-14391	Analyzed	10/12/2007 16:47

Native Isomers	Conc ng/Kg	EMPC ng/Kg	RL ng/Kg	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	ND	—	0.19	2,3,7,8-TCDF-13C	2.50	85
Total TCDF	ND	—	0.19	2,3,7,8-TCDD-13C	2.50	82
				1,2,3,7,8-PeCDF-13C	2.50	79
2,3,7,8-TCDD	ND	—	0.19	2,3,4,7,8-PeCDF-13C	2.50	80
Total TCDD	ND	—	0.19	1,2,3,7,8-PeCDD-13C	2.50	87
				1,2,3,4,7,8-HxCDF-13C	2.50	87
1,2,3,7,8-PeCDF	ND	—	0.97	1,2,3,6,7,8-HxCDF-13C	2.50	82
2,3,4,7,8-PeCDF	ND	—	0.97	2,3,4,6,7,8-HxCDF-13C	2.50	82
Total PeCDF	ND	—	0.97	1,2,3,7,8,9-HxCDF-13C	2.50	88
				1,2,3,4,7,8-HxCDD-13C	2.50	85
1,2,3,7,8-PeCDD	ND	—	0.97	1,2,3,6,7,8-HxCDD-13C	2.50	94
Total PeCDD	ND	—	0.97	1,2,3,4,6,7,8-HpCDF-13C	2.50	84
				1,2,3,4,7,8,9-HpCDF-13C	2.50	77
1,2,3,4,7,8-HxCDF	ND	—	0.97	1,2,3,4,6,7,8-HpCDD-13C	2.50	92
1,2,3,6,7,8-HxCDF	ND	—	0.97	OCDD-13C	5.00	86
2,3,4,6,7,8-HxCDF	ND	—	0.97			
1,2,3,7,8,9-HxCDF	ND	—	0.97	1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	ND	—	0.97	1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	ND	—	0.97	2,3,7,8-TCDD-37Cl4	0.20	77
1,2,3,6,7,8-HxCDD	ND	—	0.97			
1,2,3,7,8,9-HxCDD	ND	—	0.97			
Total HxCDD	ND	—	0.97			
1,2,3,4,6,7,8-HpCDF	ND	—	0.97	Total 2,3,7,8-TCDD		
1,2,3,4,7,8,9-HpCDF	ND	—	0.97	Equivalence: 0.045 ng/Kg		
Total HpCDF	ND	—	0.97	(Using ITE Factors)		
1,2,3,4,6,7,8-HpCDD	2.5	—	0.97			
Total HpCDD	5.1	—	0.97			
OCDF	ND	—	1.90			
OCDD	20.0	—	1.90			

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
EMPC = Estimated Maximum Possible Concentration
RL = Reporting Limit.

ND = Not Detected
NA = Not Applicable
NC = Not Calculated

Results reported on a dry weight basis and are valid to no more than 2 significant figures.
J = Value below calibration range

Handwritten: 1/21/08

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc.
32 of 53

Report No.....1059590

Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612-607-6444



Pace Analytical™

Method 8290 Sample Analysis Results

Client - Montana Dept. Of Env. Quality

Client's Sample ID	MBDS-R15-F01		
Lab Sample ID	1059590024		
Filename	U71012A_12		
Injected By	BAL		
Total Amount Extracted	11.6 g	Matrix	Solid
% Moisture	13.0	Dilution	NA
Dry Weight Extracted	10.1 g	Collected	09/20/2007
ICAL Date	09/27/2007	Received	09/25/2007
CCal Filename(s)	U71012A_02 & U71012A_17	Extracted	10/04/2007
Method Blank ID	BLANK-14391	Analyzed	10/12/2007 17:34

Native Isomers	Conc ng/Kg	EMPC ng/Kg	RL ng/Kg	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	ND	—	0.20	2,3,7,8-TCDF-13C	2.50	52
Total TCDF	5.40	—	0.20	2,3,7,8-TCDD-13C	2.50	52
				1,2,3,7,8-PeCDF-13C	2.50	57
2,3,7,8-TCDD	ND	—	0.200 A	2,3,4,7,8-PeCDF-13C	2.50	59
Total TCDD	0.28	—	0.20 J	1,2,3,7,8-PeCDD-13C	2.50	65
				1,2,3,4,7,8-HxCDF-13C	2.50	66
1,2,3,7,8-PeCDF	ND	—	0.99	1,2,3,6,7,8-HxCDF-13C	2.50	62
2,3,4,7,8-PeCDF	ND	—	0.99	2,3,4,6,7,8-HxCDF-13C	2.50	64
Total PeCDF	ND	—	0.99	1,2,3,7,8,9-HxCDF-13C	2.50	66
				1,2,3,4,7,8-HxCDD-13C	2.50	69
1,2,3,7,8-PeCDD	ND	—	0.99	1,2,3,6,7,8-HxCDD-13C	2.50	67
Total PeCDD	ND	—	0.99	1,2,3,4,6,7,8-HpCDF-13C	2.50	73
				1,2,3,4,7,8,9-HpCDF-13C	2.50	59
1,2,3,4,7,8-HxCDF	ND	—	0.99	1,2,3,4,6,7,8-HpCDD-13C	2.50	77
1,2,3,6,7,8-HxCDF	ND	—	0.99	OCDD-13C	5.00	70
2,3,4,6,7,8-HxCDF	ND	—	0.99			
1,2,3,7,8,9-HxCDF	ND	—	0.99	1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	ND	—	0.99	1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	ND	—	0.99	2,3,7,8-TCDD-37Cl4	0.20	82
1,2,3,6,7,8-HxCDD	ND	—	0.99			
1,2,3,7,8,9-HxCDD	ND	—	0.99			
Total HxCDD	ND	—	0.99			
1,2,3,4,6,7,8-HpCDF	ND	—	0.99	Total 2,3,7,8-TCDD		
1,2,3,4,7,8,9-HpCDF	ND	—	0.99	Equivalence: 0.092 ng/Kg		
Total HpCDF	ND	—	0.99	(Using ITE Factors)		
1,2,3,4,6,7,8-HpCDD	6.50	—	0.99			
Total HpCDD	10.00	—	0.99			
OCDF	ND	—	2.00			
OCDD	27.00	—	2.00			

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
EMPC = Estimated Maximum Possible Concentration
RL = Reporting Limit.

ND = Not Detected
NA = Not Applicable
NC = Not Calculated

Results reported on a dry weight basis and are valid to no more than 2 significant figures.

J = Value below calibration range

A = Reporting Limit based on signal to noise

As
11/21/08

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc.
33 of 53

Report No.....1059590

Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612-607-6444



Pace Analytical™

Method 8290 Sample Analysis Results

Client - Montana Dept. Of Env. Quality

Client's Sample ID	MBDS-R09-A01				
Lab Sample ID	1059590025				
Filename	U71012A_13				
Injected By	BAL				
Total Amount Extracted	14.2 g	Matrix	Solid		
% Moisture	28.9	Dilution	NA		
Dry Weight Extracted	10.1 g	Collected	09/21/2007		
ICAL Date	09/27/2007	Received	09/25/2007		
CCal Filename(s)	U71012A_02 & U71012A_17	Extracted	10/04/2007		
Method Blank ID	BLANK-14391	Analyzed	10/12/2007 18:21		

Native Isomers	Conc ng/Kg	EMPC ng/Kg	RL ng/Kg	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	ND	—	0.20	2,3,7,8-TCDF-13C	2.50	86
Total TCDF	2.4	—	0.20	2,3,7,8-TCDD-13C	2.50	87
				1,2,3,7,8-PeCDF-13C	2.50	79
2,3,7,8-TCDD	ND	—	0.20	2,3,4,7,8-PeCDF-13C	2.50	81
Total TCDD	2.6	—	0.20	1,2,3,7,8-PeCDD-13C	2.50	89
				1,2,3,4,7,8-HxCDF-13C	2.50	86
1,2,3,7,8-PeCDF	ND	—	0.99	1,2,3,6,7,8-HxCDF-13C	2.50	84
2,3,4,7,8-PeCDF	ND	—	0.99	2,3,4,6,7,8-HxCDF-13C	2.50	82
Total PeCDF	ND	—	0.99	1,2,3,7,8,9-HxCDF-13C	2.50	91
				1,2,3,4,7,8-HxCDD-13C	2.50	88
1,2,3,7,8-PeCDD	ND	—	0.99	1,2,3,6,7,8-HxCDD-13C	2.50	90
Total PeCDD	ND	—	0.99	1,2,3,4,6,7,8-HpCDF-13C	2.50	83
				1,2,3,4,7,8,9-HpCDF-13C	2.50	76
1,2,3,4,7,8-HxCDF	ND	—	0.99	1,2,3,4,6,7,8-HpCDD-13C	2.50	96
1,2,3,6,7,8-HxCDF	ND	—	0.99	OCDD-13C	5.00	90
2,3,4,6,7,8-HxCDF	ND	—	0.99			
1,2,3,7,8,9-HxCDF	ND	—	0.99	1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	2.7	—	0.99	1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	ND	—	0.99	2,3,7,8-TCDD-37Cl4	0.20	83
1,2,3,6,7,8-HxCDD	1.2	—	0.99			
1,2,3,7,8,9-HxCDD	ND	—	0.99			
Total HxCDD	8.1	—	0.99			
1,2,3,4,6,7,8-HpCDF	2.0	—	0.99	Total 2,3,7,8-TCDD		
1,2,3,4,7,8,9-HpCDF	ND	—	0.99	Equivalence: 0.51 ng/Kg		
Total HpCDF	4.8	—	0.99	(Using ITE Factors)		
1,2,3,4,6,7,8-HpCDD	20.0	—	0.99			
Total HpCDD	41.0	—	0.99			
OCDF	3.2	—	2.00			
OCDD	170.0	—	2.00			

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).

EMPC = Estimated Maximum Possible Concentration

RL = Reporting Limit.

ND = Not Detected

NA = Not Applicable

NC = Not Calculated

Results reported on a dry weight basis and are valid to no more than 2 significant figures.

J = Value below calibration range

AB
1/21/08

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc.

34 of 53

Report No.....1059590



Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612-607-6444

Method 8290 Sample Analysis Results

Client - Montana Dept. Of Env. Quality

Client's Sample ID	MBDS-R09-F01		
Lab Sample ID	1059590026		
Filename	U71012A_14		
Injected By	BAL		
Total Amount Extracted	13.4 g	Matrix	Solid
% Moisture	23.7	Dilution	NA
Dry Weight Extracted	10.2 g	Collected	09/21/2007
ICAL Date	09/27/2007	Received	09/25/2007
CCal Filename(s)	U71012A_02 & U71012A_17	Extracted	10/04/2007
Method Blank ID	BLANK-14391	Analyzed	10/12/2007 19:08

Native Isomers	Conc ng/Kg	EMPC ng/Kg	RL ng/Kg	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	ND	—	0.20	2,3,7,8-TCDF-13C	2.50	70
Total TCDF	1.20	—	0.20	2,3,7,8-TCDD-13C	2.50	71
				1,2,3,7,8-PeCDF-13C	2.50	65
2,3,7,8-TCDD	ND	—	0.20	2,3,4,7,8-PeCDF-13C	2.50	68
Total TCDD	0.32	—	0.20	1,2,3,7,8-PeCDD-13C	2.50	73
				1,2,3,4,7,8-HxCDF-13C	2.50	73
1,2,3,7,8-PeCDF	ND	—	0.98	1,2,3,6,7,8-HxCDF-13C	2.50	72
2,3,4,7,8-PeCDF	ND	—	0.98	2,3,4,6,7,8-HxCDF-13C	2.50	70
Total PeCDF	ND	—	0.98	1,2,3,7,8,9-HxCDF-13C	2.50	77
				1,2,3,4,7,8-HxCDD-13C	2.50	73
1,2,3,7,8-PeCDD	ND	—	0.98	1,2,3,6,7,8-HxCDD-13C	2.50	77
Total PeCDD	ND	—	0.98	1,2,3,4,6,7,8-HpCDF-13C	2.50	72
				1,2,3,4,7,8,9-HpCDF-13C	2.50	64
1,2,3,4,7,8-HxCDF	ND	—	0.98	1,2,3,4,6,7,8-HpCDD-13C	2.50	77
1,2,3,6,7,8-HxCDF	ND	—	0.98	OCDD-13C	5.00	77
2,3,4,6,7,8-HxCDF	ND	—	0.98			
1,2,3,7,8,9-HxCDF	ND	—	0.98	1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	ND	—	0.98	1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	ND	—	0.98	2,3,7,8-TCDD-37Cl4	0.20	73
1,2,3,6,7,8-HxCDD	ND	—	0.98			
1,2,3,7,8,9-HxCDD	ND	—	0.98			
Total HxCDD	2.10	—	0.98			
1,2,3,4,6,7,8-HpCDF	—	1.1	0.98	Total 2,3,7,8-TCDD		
1,2,3,4,7,8,9-HpCDF	ND	—	0.98	Equivalence: 0.11 ng/Kg		
Total HpCDF	ND	—	0.98	(Using ITE Factors)		
1,2,3,4,6,7,8-HpCDD	7.00	—	0.98			
Total HpCDD	15.00	—	0.98			
OCDF	2.30	—	2.00			
OCDD	40.00	—	2.00			

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
EMPC = Estimated Maximum Possible Concentration
RL = Reporting Limit.

ND = Not Detected
NA = Not Applicable
NC = Not Calculated

Results reported on a dry weight basis and are valid to no more than 2 significant figures.

J = Value below calibration range

I = Interference present

AB
11/21/08

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc.
35 of 53

Report No.....1059590


Pace Analytical™

 Pace Analytical Services, Inc.
 1700 Elm Street - Suite 200
 Minneapolis, MN 55414

 Tel: 612-607-1700
 Fax: 612-607-6444

Method 8290 Sample Analysis Results

Client - Montana Dept. Of Env. Quality

Client's Sample ID	MBDS-R09-O01		
Lab Sample ID	1059590027		
Filename	U71012A_15		
Injected By	BAL		
Total Amount Extracted	17.0 g	Matrix	Solid
% Moisture	41.1	Dilution	NA
Dry Weight Extracted	10.0 g	Collected	09/21/2007
ICAL Date	09/27/2007	Received	09/25/2007
CCal Filename(s)	U71012A_02 & U71012A_17	Extracted	10/04/2007
Method Blank ID	BLANK-14391	Analyzed	10/12/2007 19:55

Native Isomers	Conc ng/Kg	EMPC ng/Kg	RL ng/Kg	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	ND	—	0.20	2,3,7,8-TCDF-13C	2.50	76
Total TCDF	1.10	—	0.20	2,3,7,8-TCDD-13C	2.50	74
2,3,7,8-TCDD	ND	—	0.20	1,2,3,7,8-PeCDF-13C	2.50	73
Total TCDD	0.51	—	0.20	2,3,4,7,8-PeCDF-13C	2.50	73
1,2,3,7,8-PeCDF	ND	—	1.00	1,2,3,7,8-PeCDD-13C	2.50	82
2,3,4,7,8-PeCDF	ND	—	1.00	1,2,3,4,7,8-HxCDF-13C	2.50	78
Total PeCDF	ND	—	1.00	1,2,3,6,7,8-HxCDF-13C	2.50	72
1,2,3,7,8-PeCDD	ND	—	1.00	2,3,4,6,7,8-HxCDF-13C	2.50	72
Total PeCDD	ND	—	1.00	1,2,3,7,8,9-HxCDF-13C	2.50	80
1,2,3,4,7,8-HxCDF	ND	—	1.00	1,2,3,4,7,8-HxCDD-13C	2.50	82
1,2,3,6,7,8-HxCDF	ND	—	1.00	1,2,3,6,7,8-HxCDD-13C	2.50	78
2,3,4,6,7,8-HxCDF	ND	—	1.00	1,2,3,4,6,7,8-HpCDF-13C	2.50	71
1,2,3,7,8,9-HxCDF	ND	—	1.00	1,2,3,4,7,8,9-HpCDF-13C	2.50	68
Total HxCDF	ND	—	1.00	1,2,3,4,6,7,8-HpCDD-13C	2.50	81
1,2,3,4,7,8-HxCDD	ND	—	1.00	OCDD-13C	5.00	78
1,2,3,6,7,8-HxCDD	ND	—	1.00	1,2,3,4-TCDD-13C	2.00	NA
1,2,3,7,8,9-HxCDD	ND	—	1.00	1,2,3,7,8,9-HxCDD-13C	2.00	NA
Total HxCDD	ND	—	1.00	2,3,7,8-TCDD-37Cl4	0.20	73
1,2,3,4,6,7,8-HpCDF	ND	—	1.00	Total 2,3,7,8-TCDD		
1,2,3,4,7,8,9-HpCDF	ND	—	1.00	Equivalence: 0.071 ng/Kg		
Total HpCDF	ND	—	1.00	(Using ITE Factors)		
1,2,3,4,6,7,8-HpCDD	4.90	—	1.00			
Total HpCDD	11.00	—	1.00			
OCDF	ND	—	2.00			
OCDD	21.00	—	2.00			

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).

EMPC = Estimated Maximum Possible Concentration

RL = Reporting Limit.

ND = Not Detected

NA = Not Applicable

NC = Not Calculated

Results reported on a dry weight basis and are valid to no more than 2 significant figures.

J = Value below calibration range

 AB
 11/21/08

REPORT OF LABORATORY ANALYSIS

 This report shall not be reproduced, except in full,
 without the written consent of Pace Analytical Services, Inc.
 36 of 53

Report No.....1059590


Pace Analytical™

 Pace Analytical Services, Inc.
 1700 Elm Street - Suite 200
 Minneapolis, MN 55414

 Tel: 612-607-1700
 Fax: 612-607-6444

Method 8290 Sample Analysis Results

Client - Montana Dept. Of Env. Quality

Client's Sample ID	MBDS-R02-001		
Lab Sample ID	1059590028		
Filename	P71011A_07		
Injected By	BAL		
Total Amount Extracted	19.4 g	Matrix	Solid
% Moisture	47.5	Dilution	NA
Dry Weight Extracted	10.2 g	Collected	09/21/2007
ICAL Date	08/29/2007	Received	09/25/2007
CCal Filename(s)	P71010A_18 & P71011A_16	Extracted	10/05/2007
Method Blank ID	BLANK-14393	Analyzed	10/11/2007 10:05

Native Isomers	Conc ng/Kg	EMPC ng/Kg	RL ng/Kg	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	ND	—	0.31 A	2,3,7,8-TCDF-13C	2.00	64
Total TCDF	0.89	—	0.31 + J	2,3,7,8-TCDD-13C	2.00	66
				1,2,3,7,8-PeCDF-13C	2.00	64
2,3,7,8-TCDD	ND	—	0.30 A	2,3,4,7,8-PeCDF-13C	2.00	63
Total TCDD	ND	—	0.30	1,2,3,7,8-PeCDD-13C	2.00	70
				1,2,3,4,7,8-HxCDF-13C	2.00	70
1,2,3,7,8-PeCDF	ND	—	0.98	1,2,3,6,7,8-HxCDF-13C	2.00	69
2,3,4,7,8-PeCDF	ND	—	0.98	2,3,4,6,7,8-HxCDF-13C	2.00	66
Total PeCDF	1.00	—	0.98 + J	1,2,3,7,8,9-HxCDF-13C	2.00	63
				1,2,3,4,7,8-HxCDD-13C	2.00	69
1,2,3,7,8-PeCDD	ND	—	0.98	1,2,3,6,7,8-HxCDD-13C	2.00	70
Total PeCDD	ND	—	0.98	1,2,3,4,6,7,8-HpCDF-13C	2.00	60
				1,2,3,4,7,8,9-HpCDF-13C	2.00	48
1,2,3,4,7,8-HxCDF	3.20	—	0.98	1,2,3,4,6,7,8-HpCDD-13C	2.00	62
1,2,3,6,7,8-HxCDF	1.10	—	0.98	OCDD-13C	4.00	46
2,3,4,6,7,8-HxCDF	1.10	—	0.98			
1,2,3,7,8,9-HxCDF	ND	—	0.98	1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	20.00	—	0.98	1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	ND	—	0.98	2,3,7,8-TCDD-37Cl4	0.20	78
1,2,3,6,7,8-HxCDD	1.30	—	0.98 + J			
1,2,3,7,8,9-HxCDD	ND	—	0.98			
Total HxCDD	7.20	—	0.98			
1,2,3,4,6,7,8-HpCDF	19.00	—	0.98	Total 2,3,7,8-TCDD		
1,2,3,4,7,8,9-HpCDF	3.90	—	0.98 + J	Equivalence: 1.4 ng/Kg		
Total HpCDF	43.00	—	0.98	(Using ITE Factors)		
1,2,3,4,6,7,8-HpCDD	30.00	—	0.98			
Total HpCDD	47.00	—	0.98			
OCDF	39.00	—	2.00			
OCDD	160.00	—	2.00			

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
 EMPC = Estimated Maximum Possible Concentration
 RL = Reporting Limit

ND = Not Detected
 NA = Not Applicable
 NC = Not Calculated

Results reported on a dry weight basis and are valid to no more than 2 significant figures.
 J = Value below calibration range
 A = Reporting Limit based on signal to noise

AB
 11/21/07

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
 without the written consent of Pace Analytical Services, Inc.
 37 of 53

Report No.....1059590


Pace Analytical™

 Pace Analytical Services, Inc.
 1700 Elm Street - Suite 200
 Minneapolis, MN 55414

 Tel: 612-607-1700
 Fax: 612-607-6444

Method 8290 Sample Analysis Results

Client - Montana Dept. Of Env. Quality

Client's Sample ID	MBDS-R02-A01		
Lab Sample ID	1059590029		
Filename	P71011A_08		
Injected By	BAL		
Total Amount Extracted	13.6 g	Matrix	Solid
% Moisture	28.1	Dilution	NA
Dry Weight Extracted	9.77 g	Collected	09/21/2007
ICAL Date	08/29/2007	Received	09/25/2007
CCal Filename(s)	P71010A_18 & P71011A_16	Extracted	10/05/2007
Method Blank ID	BLANK-14393	Analyzed	10/11/2007 10:53

Native Isomers	Conc ng/Kg	EMPC ng/Kg	RL ng/Kg	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	ND	—	0.24 A	2,3,7,8-TCDF-13C	2.00	79
Total TCDF	0.85	—	0.24 +J	2,3,7,8-TCDD-13C	2.00	78
				1,2,3,7,8-PeCDF-13C	2.00	75
2,3,7,8-TCDD	ND	—	0.22 A	2,3,4,7,8-PeCDF-13C	2.00	74
Total TCDD	1.10	—	0.22	1,2,3,7,8-PeCDD-13C	2.00	83
				1,2,3,4,7,8-HxCDF-13C	2.00	85
1,2,3,7,8-PeCDF	ND	—	1.00	1,2,3,6,7,8-HxCDF-13C	2.00	82
2,3,4,7,8-PeCDF	ND	—	1.00	2,3,4,6,7,8-HxCDF-13C	2.00	78
Total PeCDF	ND	—	1.00	1,2,3,7,8,9-HxCDF-13C	2.00	76
				1,2,3,4,7,8-HxCDD-13C	2.00	85
1,2,3,7,8-PeCDD	ND	—	1.00	1,2,3,6,7,8-HxCDD-13C	2.00	83
Total PeCDD	1.30	—	1.00 +J	1,2,3,4,6,7,8-HpCDF-13C	2.00	73
				1,2,3,4,7,8,9-HpCDF-13C	2.00	57
1,2,3,4,7,8-HxCDF	ND	—	1.00	1,2,3,4,6,7,8-HpCDD-13C	2.00	76
1,2,3,6,7,8-HxCDF	ND	—	1.00	OCDD-13C	4.00	56
2,3,4,6,7,8-HxCDF	ND	—	1.00			
1,2,3,7,8,9-HxCDF	ND	—	1.00	1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	11.00	—	1.00	1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	ND	—	1.00	2,3,7,8-TCDD-37Cl4	0.20	82
1,2,3,6,7,8-HxCDD	1.20	—	1.00 +J			
1,2,3,7,8,9-HxCDD	ND	—	1.00			
Total HxCDD	12.00	—	1.00			
1,2,3,4,6,7,8-HpCDF	23.00	—	1.00	Total 2,3,7,8-TCDD		
1,2,3,4,7,8,9-HpCDF	1.10	—	1.00 +J	Equivalence: 1.0 ng/Kg		
Total HpCDF	84.00	—	1.00	(Using ITE Factors)		
1,2,3,4,6,7,8-HpCDD	29.00	—	1.00			
Total HpCDD	58.00	—	1.00			
OCDF	140.00	—	2.00			
OCDD	240.00	—	2.00			

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
 EMPC = Estimated Maximum Possible Concentration
 RL = Reporting Limit.

ND = Not Detected
 NA = Not Applicable
 NC = Not Calculated

Results reported on a dry weight basis and are valid to no more than 2 significant figures.
 J = Value below calibration range
 A = Reporting Limit based on signal to noise

AB
 11/21/08

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
 without the written consent of Pace Analytical Services, Inc.
 38 of 53

Report No.....1059590

Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612-607-6444



Pace Analytical™

Method 8290 Sample Analysis Results

Client - Montana Dept. Of Env. Quality

Client's Sample ID	MBDS-U16-R01		
Lab Sample ID	1059590030		
Filename	P71011A_09		
Injected By	BAL		
Total Amount Extracted	13.5 g	Matrix	Solid
% Moisture	22.7	Dilution	NA
Dry Weight Extracted	10.4 g	Collected	09/21/2007
ICAL Date	08/29/2007	Received	09/25/2007
CCal Filename(s)	P71010A_18 & P71011A_16	Extracted	10/05/2007
Method Blank ID	BLANK-14393	Analyzed	10/11/2007 11:41

Native Isomers	Conc ng/Kg	EMPC ng/Kg	RL ng/Kg	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	ND	—	0.240 A	2,3,7,8-TCDF-13C	2.00	74
Total TCDF	0.25	—	0.24 J	2,3,7,8-TCDD-13C	2.00	73
				1,2,3,7,8-PeCDF-13C	2.00	70
2,3,7,8-TCDD	ND	—	0.220 A	2,3,4,7,8-PeCDF-13C	2.00	69
Total TCDD	ND	—	0.22	1,2,3,7,8-PeCDD-13C	2.00	77
				1,2,3,4,7,8-HxCDF-13C	2.00	84
1,2,3,7,8-PeCDF	ND	—	0.96	1,2,3,6,7,8-HxCDF-13C	2.00	82
2,3,4,7,8-PeCDF	ND	—	0.96	2,3,4,6,7,8-HxCDF-13C	2.00	77
Total PeCDF	ND	—	0.96	1,2,3,7,8,9-HxCDF-13C	2.00	74
				1,2,3,4,7,8-HxCDD-13C	2.00	85
1,2,3,7,8-PeCDD	ND	—	0.96	1,2,3,6,7,8-HxCDD-13C	2.00	80
Total PeCDD	ND	—	0.96	1,2,3,4,6,7,8-HpCDF-13C	2.00	72
				1,2,3,4,7,8,9-HpCDF-13C	2.00	56
1,2,3,4,7,8-HxCDF	ND	—	0.96	1,2,3,4,6,7,8-HpCDD-13C	2.00	75
1,2,3,6,7,8-HxCDF	ND	—	0.96	OCDD-13C	4.00	54
2,3,4,6,7,8-HxCDF	ND	—	0.96			
1,2,3,7,8,9-HxCDF	ND	—	0.96	1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	ND	—	0.96	1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	ND	—	0.96	2,3,7,8-TCDD-37Cl4	0.20	75
1,2,3,6,7,8-HxCDD	ND	—	0.96			
1,2,3,7,8,9-HxCDD	ND	—	0.96			
Total HxCDD	ND	—	0.96			
1,2,3,4,6,7,8-HpCDF	ND	—	0.96	Total 2,3,7,8-TCDD		
1,2,3,4,7,8,9-HpCDF	ND	—	0.96	Equivalence: 0.024 ng/Kg		
Total HpCDF	ND	—	0.96	(Using ITE Factors)		
1,2,3,4,6,7,8-HpCDD	1.40	—	0.96 J			
Total HpCDD	2.90	—	0.96 J			
OCDF	ND	—	1.90			
OCDD	10.00	—	1.90			

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
EMPC = Estimated Maximum Possible Concentration
RL = Reporting Limit.

ND = Not Detected
NA = Not Applicable
NC = Not Calculated

Results reported on a dry weight basis and are valid to no more than 2 significant figures.
J = Value below calibration range
A = Reporting Limit based on signal to noise

AB
1/21/08

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc.
39 of 53

Report No.....1059590


Pace Analytical™

 Pace Analytical Services, Inc.
 1700 Elm Street - Suite 200
 Minneapolis, MN 55414

 Tel: 612-607-1700
 Fax: 612-607-6444

Method 8290 Sample Analysis Results

Client - Montana Dept. Of Env. Quality

Client's Sample ID	MBDS-U16-C01		
Lab Sample ID	1059590031		
Filename	P71011A_10		
Injected By	BAL		
Total Amount Extracted	14.8 g	Matrix	Solid
% Moisture	32.5	Dilution	NA
Dry Weight Extracted	10.0 g	Collected	09/21/2007
ICAL Date	08/29/2007	Received	09/25/2007
CCal Filename(s)	P71010A_18 & P71011A_16	Extracted	10/05/2007
Method Blank ID	BLANK-14393	Analyzed	10/11/2007 12:29

Native Isomers	Conc ng/Kg	EMPC ng/Kg	RL ng/Kg	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	0.32	—	0.26	+J 2,3,7,8-TCDF-13C	2.00	82
Total TCDF	2.00	—	0.26	2,3,7,8-TCDD-13C	2.00	80
				1,2,3,7,8-PeCDF-13C	2.00	77
2,3,7,8-TCDD	ND	—	0.28	A 2,3,4,7,8-PeCDF-13C	2.00	77
Total TCDD	ND	—	0.28	1,2,3,7,8-PeCDD-13C	2.00	85
				1,2,3,4,7,8-HxCDF-13C	2.00	86
1,2,3,7,8-PeCDF	ND	—	1.00	1,2,3,6,7,8-HxCDF-13C	2.00	82
2,3,4,7,8-PeCDF	ND	—	1.00	2,3,4,6,7,8-HxCDF-13C	2.00	79
Total PeCDF	2.00	—	1.00	+J 1,2,3,7,8,9-HxCDF-13C	2.00	77
				1,2,3,4,7,8-HxCDD-13C	2.00	88
1,2,3,7,8-PeCDD	ND	—	1.00	1,2,3,6,7,8-HxCDD-13C	2.00	83
Total PeCDD	ND	—	1.00	1,2,3,4,6,7,8-HpCDF-13C	2.00	72
				1,2,3,4,7,8,9-HpCDF-13C	2.00	57
1,2,3,4,7,8-HxCDF	ND	—	1.00	1,2,3,4,6,7,8-HpCDD-13C	2.00	78
1,2,3,6,7,8-HxCDF	ND	—	1.00	OCDD-13C	4.00	57
2,3,4,6,7,8-HxCDF	ND	—	1.00			
1,2,3,7,8,9-HxCDF	ND	—	1.00	1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	17.00	—	1.00	1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	ND	—	1.00			
1,2,3,6,7,8-HxCDD	4.10	—	1.00	+J 2,3,7,8-TCDD-37Cl4	0.20	81
1,2,3,7,8,9-HxCDD	2.10	—	1.00			
Total HxCDD	20.00	—	1.00			
1,2,3,4,6,7,8-HpCDF	15.00	—	1.00	Total 2,3,7,8-TCDD		
1,2,3,4,7,8,9-HpCDF	ND	—	1.00	Equivalence: 2.0 ng/Kg		
Total HpCDF	44.00	—	1.00	(Using ITE Factors)		
1,2,3,4,6,7,8-HpCDD	75.00	—	1.00			
Total HpCDD	130.00	—	1.00			
OCDF	37.00	—	2.00			
OCDD	390.00	—	2.00			

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
 EMPC = Estimated Maximum Possible Concentration
 RL = Reporting Limit.

ND = Not Detected
 NA = Not Applicable
 NC = Not Calculated

Results reported on a dry weight basis and are valid to no more than 2 significant figures.

J = Value below calibration range

A = Reporting Limit based on signal to noise

AKS
 11/21/08

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
 without the written consent of Pace Analytical Services, Inc.
 40 of 53

Report No.....1059590

Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612-607-6444



Pace Analytical™

Method 8290 Sample Analysis Results

Client - Montana Dept. Of Env. Quality

Client's Sample ID	MBDS-R02-F01		
Lab Sample ID	1059590032		
Filename	P71011A_11		
Injected By	BAL		
Total Amount Extracted	11.6 g	Matrix	Solid
% Moisture	11.0	Dilution	NA
Dry Weight Extracted	10.4 g	Collected	09/21/2007
ICAL Date	08/29/2007	Received	09/25/2007
CCal Filename(s)	P71010A_18 & P71011A_16	Extracted	10/05/2007
Method Blank ID	BLANK-14393	Analyzed	10/11/2007 13:18

Native Isomers	Conc ng/Kg	EMPC ng/Kg	RL ng/Kg	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	0.83	—	0.24	✱AJ 2,3,7,8-TCDF-13C	2.00	77
Total TCDF	17.00	—	0.24	2,3,7,8-TCDD-13C	2.00	76
				1,2,3,7,8-PeCDF-13C	2.00	72
2,3,7,8-TCDD	—	0.34	0.20	✱AJ+ 2,3,4,7,8-PeCDF-13C	2.00	71
Total TCDD	5.70	—	0.20	1,2,3,7,8-PeCDD-13C	2.00	78
				1,2,3,4,7,8-HxCDF-13C	2.00	81
1,2,3,7,8-PeCDF	ND	—	0.96	1,2,3,6,7,8-HxCDF-13C	2.00	76
2,3,4,7,8-PeCDF	1.20	—	0.96	✱J 2,3,4,6,7,8-HxCDF-13C	2.00	74
Total PeCDF	8.10	—	0.96	1,2,3,7,8,9-HxCDF-13C	2.00	73
				1,2,3,4,7,8-HxCDD-13C	2.00	81
1,2,3,7,8-PeCDD	1.00	—	0.96	✱J 1,2,3,6,7,8-HxCDD-13C	2.00	78
Total PeCDD	13.00	—	0.96	1,2,3,4,6,7,8-HpCDF-13C	2.00	69
				1,2,3,4,7,8,9-HpCDF-13C	2.00	53
1,2,3,4,7,8-HxCDF	ND	—	0.96	1,2,3,4,6,7,8-HpCDD-13C	2.00	70
1,2,3,6,7,8-HxCDF	ND	—	0.96	OCDD-13C	4.00	53
2,3,4,6,7,8-HxCDF	ND	—	0.96			
1,2,3,7,8,9-HxCDF	ND	—	0.96	1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	8.80	—	0.96	1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	1.20	—	0.96	✱J 2,3,7,8-TCDD-37Cl4	0.20	76
1,2,3,6,7,8-HxCDD	2.00	—	0.96			
1,2,3,7,8,9-HxCDD	1.90	—	0.96			
Total HxCDD	29.00	—	0.96			
1,2,3,4,6,7,8-HpCDF	4.60	—	0.96	✱J Total 2,3,7,8-TCDD		
1,2,3,4,7,8,9-HpCDF	ND	—	0.96	Equivalence: 2.2 ng/Kg		
Total HpCDF	11.00	—	0.96	(Using ITE Factors)		
1,2,3,4,6,7,8-HpCDD	26.00	—	0.96			
Total HpCDD	54.00	—	0.96			
OCDF	12.00	—	1.90			
OCDD	150.00	—	1.90			

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
EMPC = Estimated Maximum Possible Concentration
RL = Reporting Limit.

ND = Not Detected
NA = Not Applicable
NC = Not Calculated

Results reported on a dry weight basis and are valid to no more than 2 significant figures.

J = Value below calibration range

A = Reporting Limit based on signal to noise

I = Interference present

AB
11/21/08

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc.
41 of 53

Report No.....1059590

Montana Background Dioxin Study

1. **SDG Number:** 1065209
2. **Number of Samples:** (32)
3. **Sample Matrix:** (31) Soil and (1) Water
4. **Applicable Analytes:** PCDD/PCDF
5. **Reporting Tier:** Level 3
6. **Analysis Method** USEPA SW-846 Method 8290
7. **Laboratory:** Pace Analytical
8. **Validation Level:** III
9. **Validator Affiliation:** Portage Environmental, Inc.
10. **Project:** Montana Background Dioxin Study

Validator's Signature: *Amber Brinly*

Date: 2/20/08

Reviewed By: *Jeffrey Lewis*

Date: 2/20/08

1. INTRODUCTION

Thirty-one (31) soil samples and one (1) water sample were collected and analyzed for Dioxins/Furans by Pace Analytical using USEPA SW-846 Method 8290, *Polychlorinated Dibenzodioxins (PCDDs) and Polychlorinated Dibenzofurans (PCDFs) by High Resolution Gas Chromatography/High Resolution Mass Spectrometry (HRGC/HRMS)*. The data were validated to a Level III.

2. SAMPLE IDENTIFICATION

A sample cross-reference and holding time table is presented below.

Montana Background Dioxin Study SDG Number 1065209								
Field ID	Lab ID	Matrix	Sample Collection Date	Date Received	Date Extracted	Collection to Extraction Holding Time	Analysis Date	Extraction to Analysis Holding Time
MBDS-U10-R01	1065209001	Soil	12/13/07	12/18/07	12/29/07	16	01/09/08	11
MBDS-U10-I01	1065209002	Soil	12/13/07	12/18/07	12/29/07	16	01/05/08	7
MBDS-U10-C01	1065209003	Soil	12/13/07	12/18/07	12/29/07	16	01/05/08	7
MBDS-U11-R01	1065209004	Soil	12/13/07	12/18/07	12/29/07	16	01/05/08	7
MBDS-U11-C01	1065209005	Soil	12/13/07	12/18/07	12/29/07	16	01/05/08	7
MBDS-U11-I01	1065209006	Soil	12/13/07	12/18/07	12/29/07	16	01/05/08	7
MBDS-U13-R01	1065209007	Soil	12/13/07	12/18/07	12/29/07	16	01/05/08	7
MBDS-U13-R04	1065209008	Soil	12/13/07	12/18/07	12/29/07	16	01/05/08	7
MBDS-U13-C01	1065209009	Soil	12/13/07	12/18/07	12/29/07	16	01/05/08	7
MBDS-U13-I01	1065209010	Soil	12/13/07	12/18/07	01/03/08	21	01/09/08	6
MBDS-U12-R01	1065209011	Soil	12/13/07	12/18/07	01/03/08	21	01/09/08	6
MBDS-U12-C01	1065209012	Soil	12/13/07	12/18/07	01/03/08	21	01/09/08	6
MBDS-U12-I01	1065209013	Soil	12/13/07	12/18/07	01/03/08	21	01/09/08	6
MBDS-U13-R05 (Trip Blank)	1065209014	Soil	12/13/07	12/18/07	01/03/08	21	01/09/08	6
MBDS-U01-R01	1065209015	Soil	12/13/07	12/18/07	01/03/08	21	01/09/08	6
MBDS-U01-C01	1065209016	Soil	12/13/07	12/18/07	01/03/08	21	01/09/08	6
MBDS-U01-C04	1065209017	Soil	12/13/07	12/18/07	01/03/08	21	01/09/08	6
MBDS-U01-C05 (Trip Blank)	1065209018	Soil	12/13/07	12/18/07	01/03/08	21	01/09/08	6
MBDS-U01-I01	1065209019	Soil	12/13/07	12/18/07	01/03/08	21	01/09/08	6
MBDS-U01-C06 (Equipment Rinsate)	1065209020	Water	12/13/07	12/18/07	12/21/07	8	12/30/07	9
MBDS-U02-R01	1065209021	Soil	12/13/07	12/18/07	01/03/08	21	01/09/08	6
MBDS-U02-I01	1065209022	Soil	12/13/07	12/18/07	01/03/08	21	01/09/08	6
MBDS-U02-C01	1065209023	Soil	12/13/07	12/18/07	01/03/08	21	01/09/08	6
MBDS-U03-R01	1065209024	Soil	12/14/07	12/18/07	01/03/08	20	01/09/08	6
MBDS-U03-C01	1065209025	Soil	12/14/07	12/18/07	01/03/08	20	01/09/08	6
MBDS-U03-I01	1065209026	Soil	12/14/07	12/18/07	01/03/08	20	01/09/08	6
MBDS-U05-C01	1065209027	Soil	12/14/07	12/18/07	01/03/08	20	01/09/08	6

Montana Background Dioxin Study SDG Number 1065209								
Field ID	Lab ID	Matrix	Sample Collection Date	Date Received	Date Extracted	Collection to Extraction Holding Time	Analysis Date	Extraction to Analysis Holding Time
MBDS-U05-I01	1065209028	Soil	12/14/07	12/18/07	01/03/08	20	01/09/08	6
MBDS-U05-R01	1065209029	Soil	12/14/07	12/18/07	01/03/08	20	01/09/08	6
MBDS-U04-R01	1065209030	Soil	12/14/07	12/18/07	01/03/08	20	01/09/08	6
MBDS-U04-C01	1065209031	Soil	12/14/07	12/18/07	01/04/08	21	01/09/08	6
MBDS-U04-I01	1065209032	Soil	12/14/07	12/18/07	01/04/08	21	01/09/08	6

A '**' denotes an exceeded holding time.

3. DATA LIMITATION OVERVIEW

The target compound analyses, dioxin/furan, for soil and water samples from Montana Background Dioxin Study showed compliance with the QC requirements set forth by USEPA SW-846 Method 8290. The data are valid and acceptable with the following exceptions:

MBDS-U10-R01:

- 2,3,7,8-TCDF, total HpCDF and OCDF have been qualified with a 'U' validation flag to denote the reported concentrations are non-detect due to positive detection in the trip blank (see CTR comment #6).
- 1,2,3,7,8-PeCDF, 2,3,4,7,8-PeCDF, and 1,2,3,4,7,8-HxCDF have been qualified with a 'U' validation flag to denote the reported concentrations are non-detect due to positive detection in the method blank (see CTR comment #6).
- 2,3,7,8-TCDD, total TCDD, total PeCDF, 1,2,3,7,8-PeCDD, total PeCDD, 1,2,3,6,7,8-HxCDF, 2,3,4,6,7,8-HxCDF, 1,2,3,7,8,9-HxCDF, total HxCDF, 1,2,3,4,7,8-HxCDD, 1,2,3,6,7,8-HxCDD, 1,2,3,7,8,9-HxCDD, 1,2,3,4,6,7,8-HpCDF, and 1,2,3,4,7,8,9-HpCDF have been qualified with a 'J' validation flag to denote the reported concentrations are an estimates with an undetermined as they were reported below the quantitation limit (see CTR comment #10).

MBDS-U10-I01:

- 2,3,7,8-TCDD was reported at an EMPC and has been qualified with a 'J+' validation flag to denote the reported concentration is likely overestimated due to interference in the sample (see CTR comment #10).

- 2,3,4,7,8-PeCDF, total PeCDF, total PeCDD, 1,2,3,6,7,8-HxCDF, total HxCDF, 1,2,3,4,7,8-HxCDD, 1,2,3,6,7,8-HxCDD, total HxCDD, and 1,2,3,4,6,7,8-HpCDF have been qualified with a 'J' validation flag to denote the reported concentrations are estimates with an undetermined bias as they were reported below the quantitation limit (see CTR comment #10).
- 1,2,3,4,7,8-HxCDF and 2,3,4,6,7,8-HxCDF have been qualified with a 'U' validation flag to denote the reported concentrations are non-detect due to positive detection in the method blank (see CTR comment #6).
- 1,2,3,7,8,9-HxCDD was reported at an EMPC and has been qualified with a 'UJ' validation flag to denote the reported concentration was non-detect, and the sample quantitation limit is an estimate due to positive detection in the method blank and interference in the sample (see CTR comments #6 and 10).
- Total HpCDF has been qualified with a 'U' validation flag to denote the reported concentration is non-detect due to positive detection in the trip blank (see CTR comment #6).
- OCDF has been qualified with a 'UJ' validation flag to denote the reported concentration is non-detect, and the sample quantitation limit is an estimate due to positive detection in the trip blank and low internal standard recovery (see CTR comments #6 and 9).
- OCDD has been qualified with a 'J-' validation flag to denote the reported concentration is likely underestimated due to low internal standard recovery (see CTR comment #9).

MBDS-U10-C01:

- 2,3,7,8-TCDF has been qualified with a 'U' validation flag to denote the reported concentration is non-detect due to positive detection in the trip blank (see CTR comment #6).
- 2,3,7,8-TCDD, 1,2,3,7,8-PeCDF, 2,3,4,7,8-PeCDF, 1,2,3,7,8-PeCDD, total PeCDD, 1,2,3,4,7,8-HxCDF, 1,2,3,6,7,8-HxCDF, 2,3,4,6,7,8-HxCDF, 1,2,3,7,8,9-HxCDF, 1,2,3,6,7,8-HxCDD, 1,2,3,7,8,9-HxCDD, and 1,2,3,4,7,8,9-HpCDF have been qualified with a 'J' validation flag to denote the reported concentrations are estimates with an undetermined bias as they were reported below the quantitation limit (see CTR comment #10).
- 1,2,3,4,7,8-HxCDD was reported at an EMPC and has been qualified with a 'J+' validation flag to denote the reported concentration is likely overestimated due to interference in the sample (see CTR comment #10).

MBDS-U11-R01:

- 2,3,7,8-TCDF, 1,2,3,7,8-PeCDF, 2,3,4,7,8-PeCDF, 1,2,3,7,8-PeCDD, total PeCDD, 1,2,3,4,7,8-HxCDF, 1,2,3,6,7,8-HxCDF, 2,3,4,6,7,8-HxCDF, 1,2,3,4,7,8-HxCDD, 1,2,3,6,7,8-HxCDD, 1,2,3,7,8,9-HxCDD, and 1,2,3,4,7,8,9-HpCDF have been qualified with a 'J' validation flag to denote the reported concentrations are estimates with an undetermined bias as they were reported below the quantitation limit (see CTR comment #10).
- 1,2,3,7,8,9-HxCDF was reported at an EMPC and has been qualified with a 'J+' validation flag to denote the reported concentration is likely overestimated due to interference in the sample (see CTR comment #10).

MBDS-U11-C01:

- Total TCDF, total HpCDF, total HpCDD, OCDF, and OCDD have been qualified with a 'U' validation flag to denote the reported concentrations are non-detect due to positive detection in the trip blank (see CTR comment #6).
- Total TCDD, total PeCDF, total HxCDF, 1,2,3,6,7,8-HxCDD, total HxCDD, 1,2,3,4,6,7,8-HpCDF, and 1,2,3,4,6,7,8-HpCDD have been qualified with a 'J' validation flag to denote the reported concentrations are estimates with an undetermined bias as they were reported below the quantitation limit (see CTR comment #10).
- 2,3,4,7,8-PeCDF, 2,3,4,6,7,8-HxCDF, and 1,2,3,7,8,9-HxCDD have been qualified with a 'U' validation flag to denote the reported concentrations are non-detect due to positive detection in the method blank (see CTR comment #6).
- 1,2,3,4,7,8-HxCDF was reported at an EMPC and has been qualified with a 'UJ' validation flag to denote the reported concentration is non-detect, and the sample quantitation limit is an estimate due to positive detection in the method blank and interference in the sample (see CTR comments #6 and 10).
- 1,2,3,6,7,8-HxCDF was reported at an EMPC and has been qualified with an 'R' validation flag due to polychlorinated diphenyl ether (PCDE) interference in the sample (see CTR comment #10).

MBDS-U11-I01:

- 2,3,7,8-TCDF has been qualified with a 'U' validation flag to denote the reported concentration is non-detect due to positive detection in the trip blank (see CTR comment #6).

- 1,2,3,7,8-PeCDF, 2,3,4,7,8-PeCDF, 1,2,3,7,8-PeCDD, total PeCDD, 1,2,3,4,7,8-HxCDF, 1,2,3,6,7,8-HxCDF, 2,3,4,6,7,8-HxCDF, 1,2,3,4,7,8-HxCDD, 1,2,3,6,7,8-HxCDD, 1,2,3,7,8,9-HxCDD, and 1,2,3,4,7,8,9-HpCDF have been qualified with a 'J' validation flag to denote the reported concentrations are estimates with an undetermined bias as they were reported below the quantitation limit (see CTR comment #10).
- 1,2,3,7,8,9-HxCDF was reported at an EMPC and has been qualified with a 'J+' validation flag to denote the reported concentration is likely overestimated due to interference in the sample (see CTR comment #10).

MBDS-U13-R01:

- Total TCDF, total HpCDF, total HpCDD, and OCDD have been qualified with a 'U' validation flag to denote the reported concentrations are non-detect due to positive detections in the trip blank (see CTR comment #6).
- 1,2,3,7,8-PeCDF and 1,2,3,4,7,8-HxCDF have been qualified with a 'U' validation flag to denote the reported concentrations are non-detect due to positive detections in the method blank (see CTR comment #6).
- Total PeCDF, 1,2,3,7,8,9-HxCDF, total HxCDF, 1,2,3,4,7,8-HxCDD, total HxCDD, and 1,2,3,4,6,7,8-HpCDF have been qualified with a 'J' validation flag to denote the reported concentrations are estimates with an undetermined bias as they were reported below the quantitation limit (see CTR comment #10).
- 1,2,3,7,8-PeCDD, 1,2,3,6,7,8-HxCDF, 1,2,3,6,7,8-HxCDD, and 1,2,3,4,6,7,8-HpCDD were reported at an EMPC and have been qualified with a 'J+' validation flag to denote the reported concentrations are likely overestimated due to interference in the sample (see CTR comment #10).
- 2,3,4,6,7,8-HxCDF and 1,2,3,7,8,9-HxCDD were reported at an EMPC and have been qualified with a 'UJ' validation flag to denote the reported concentrations are non-detect, and the sample quantitation limits are estimates due to positive detection in the method blank and interference in the sample (see CTR comments #6 and 10).
- OCDF has been qualified with a 'U' validation flag to denote the reported concentration is non-detect due to positive detection in the method blank and trip blank (see CTR comment #6).

MBDS-U13-R04:

- Total TCDF, total HpCDF, total HpCDD, and OCDD have been qualified with a 'U' validation flag to denote the reported concentrations are non-detect due to positive detections in the trip blank (see CTR comment #6).
- 1,2,3,4,7,8-HxCDF, 2,3,4,6,7,8-HxCDF, and 1,2,3,7,8,9-HxCDD have been qualified with a 'U' validation flag to denote the reported concentrations are non-detect due to positive detections in the method blank (see CTR comment #6).
- 2,3,4,7,8-PeCDF was reported at an EMPC and has been qualified with a 'UJ' validation flag to denote the reported concentration is non-detect, and the sample quantitation limit is an estimate due to positive detection in the method blank and interference in the sample (see CTR comments #6 and 10).
- Total PeCDF, 1,2,3,7,8-PeCDD, total PeCDD, total HxCDF, 1,2,3,4,7,8-HxCDD, total HxCDD, 1,2,3,4,6,7,8-HpCDF, and 1,2,3,4,6,7,8-HpCDD have been qualified with a 'J' validation flag to denote the reported concentrations are estimates with an undetermined bias as they were reported below the quantitation limit (see CTR comment #10).
- 1,2,3,6,7,8-HxCDF and 1,2,3,6,7,8-HxCDD were reported at an EMPC and have been qualified with a 'J+' validation flag to denote the reported concentrations are likely overestimated due to interference in the sample (see CTR comment #10).
- OCDF has been qualified with a 'U' validation flag to denote the reported concentration is non-detect due to positive detection in the method blank and trip blank (see CTR comment #6).

MBDS-U13-C01:

- 2,3,7,8-TCDF has been qualified with a 'U' validation flag to denote the reported concentration is non-detect due to positive detections in the trip blank (see CTR comment #6).
- 2,3,4,7,8-PeCDF, total PeCDD, 1,2,3,4,7,8-HxCDF, 1,2,3,6,7,8-HxCDF, 2,3,4,6,7,8-HxCDF, 1,2,3,7,8,9-HxCDF, 1,2,3,4,7,8-HxCDD, 1,2,3,6,7,8-HxCDD, and 1,2,3,7,8,9-HxCDD have been qualified with a 'J' validation flag to denote the reported concentrations are estimates with an undetermined bias as they were reported below the quantitation limit (see CTR comment #10).

- 1,2,3,7,8-PeCDD and 1,2,3,4,7,8,9-HpCDF were reported at an EMPC and have been qualified with a 'J+' validation flag to denote the reported concentrations are likely overestimated due to interference in the sample (see CTR comment #10).

MBDS-U13-I01:

- 2,3,7,8-TCDF has been qualified with a 'U' validation flag to denote the reported concentration is non-detect due to positive detection in the trip blank (see CTR comment #6).
- 2,3,7,8-TCDD, total TCDD, 2,3,4,7,8-PeCDF, total PeCDD, 2,3,4,6,7,8-HxCDF, 1,2,3,6,7,8-HxCDD, and 1,2,3,7,8,9-HxCDD have been qualified with a 'J' validation flag to denote the reported concentrations are estimates with an undetermined bias as they were reported below the quantitation limit (see CTR comment #10).
- 1,2,3,7,8-PeCDD, 1,2,3,4,7,8-HxCDF, 1,2,3,7,8,9-HxCDF, 1,2,3,4,7,8-HxCDD, and 1,2,3,4,7,8,9-HpCDF have been qualified with a 'U' validation flag to denote the reported concentrations are non-detect due to positive detections in the method blank (see CTR comment #6).
- 1,2,3,6,7,8-HxCDF and 1,2,3,4,6,7,8-HpCDF were reported at an EMPC and have been qualified with an 'R' validation flag due to PCDE interference (see CTR comment #10).
- Total HpCDF has been qualified with a 'U' validation flag to denote the reported concentration is non-detect due to positive detection in the method blank and trip blank (see CTR comment #6).

MBDS-U12-R01:

- Total TCDD has been qualified with a 'J' validation flag to denote the reported concentration is an estimate with an undetermined bias as it was reported below the quantitation limit (see CTR comment #10).
- 1,2,3,7,8-PeCDF, 1,2,3,4,7,8-HxCDF, and 1,2,3,7,8,9-HxCDD were reported at an EMPC and have been qualified with a 'UJ' validation flag to denote the reported concentrations are non-detect, and the sample quantitation limit is an estimate due to positive detection in the method blank and interference in the sample (see CTR comments #6 and 10).

- 2,3,4,7,8-PeCDF, total PeCDF, 1,2,3,7,8-PeCDD, total PeCDD, 1,2,3,6,7,8-HxCDF, 2,3,4,6,7,8-HxCDF, 1,2,3,7,8,9-HxCDF, total HxCDF, 1,2,3,4,7,8-HxCDD, 1,2,3,6,7,8-HxCDD, total HxCDD, and 1,2,3,4,6,7,8-HpCDD have been qualified with a 'U' validation flag to denote the reported concentrations are non-detect due to positive detection in the method blank (see CTR comment #6).
- 1,2,3,4,6,7,8-HpCDF was reported at an EMPC and has been qualified with an 'R' validation flag due to PCDE interference (see CTR comment #10).
- Total HpCDF has been qualified with a 'U' validation flag to denote the reported concentration is non-detect due to positive detection in the method blank and trip blank (see CTR comment #6).
- Total HpCDD, OCDD, and OCDF have been qualified with a 'U' validation flag to denote the reported concentration is non-detect due to positive detection in the trip blank (see CTR comment #6).

MBDS-U12-C01:

- 2,3,7,8-TCDF, total TCDF, total HpCDD, and OCDD have been qualified with a 'U' validation flag to denote the reported concentrations are non-detect due to positive detection in the trip blank (see CTR comment #6).
- Total TCDD and 1,2,3,4,6,7,8-HpCDD have been qualified with a 'J' validation flag to denote the reported concentrations are estimates with an undetermined bias as they were reported below the quantitation limit (see CTR comment #10).
- 1,2,3,7,8-PeCDF, 2,3,4,7,8-PeCDF, total PeCDF, 1,2,3,7,8-PeCDD, total PeCDD, 1,2,3,4,7,8-HxCDF, 1,2,3,6,7,8-HxCDF, 2,3,4,6,7,8-HxCDF, total HxCDF, 1,2,3,4,7,8-HxCDD, and 1,2,3,6,7,8-HxCDD have been qualified with a 'U' validation flag to denote the reported concentration is non-detect due to positive detection in the method blank (see CTR comment #6).
- 1,2,3,7,8,9-HxCDF, 1,2,3,7,8,9-HxCDD, and 1,2,3,4,6,7,8-HpCDF were reported at an EMPC and have been qualified with a 'UJ' validation flag to denote the reported concentrations are non-detect, and the sample quantitation limit is an estimate due to positive detection in the method blank and interference in the sample (see CTR comments #6 and 10).
- OCDF has been qualified with a 'U' validation flag to denote the reported concentration is non-detect due to positive detection in the method blank and trip blank (see CTR comments #6 and 10).

MBDS-U12-I01:

- 2,3,7,8-TCDF, total TCDF, total HpCDD, total HpCDF, OCDF, and OCDD have been qualified with a 'U' validation flag to denote the reported concentrations are non-detect due to positive detection in the trip blank (see CTR comment #6).
- 1,2,3,7,8-PeCDF, 1,2,3,7,8-PeCDD, and 1,2,3,7,8,9-HxCDD were reported at an EMPC and have been qualified with a 'UJ' validation flag to denote the reported concentrations are non-detect, and the sample quantitation limit is an estimate due to positive detection in the method blank and interference in the sample (see CTR comments #6 and 10).
- 2,3,4,7,8-PeCDF, 1,2,3,6,7,8-HxCDF, 2,3,4,6,7,8-HxCDF, 1,2,3,7,8,9-HxCDF, total HxCDF, 1,2,3,4,7,8-HxCDD, 1,2,3,6,7,8-HxCDD, and 1,2,3,4,6,7,8-HpCDF have been qualified with a 'U' validation flag to denote the reported concentrations are non-detect due to positive detection in the method blank (see CTR comment #6).
- Total PeCDF and 1,2,3,4,6,7,8-HpCDD have been qualified with a 'J' validation flag to denote the reported concentrations are estimates with an undetermined bias as they were reported below the quantitation limit (see CTR comment #10).

MBDS-U13-R05 (Trip Blank):

- 2,3,7,8-TCDF, total TCDF, total HpCDF, total HpCDD, and OCDF have been qualified with a 'J' validation flag to denote the reported concentrations are estimates with an undetermined bias as they were reported below the quantitation limit (see CTR comment #10).
- 1,2,3,7,8-PeCDF, 2,3,4,7,8-PeCDF, total PeCDF, 1,2,3,4,7,8-HxCDF, 2,3,4,6,7,8-HxCDF, total HxCDF, 1,2,3,6,7,8-HxCDD, 1,2,3,7,8,9-HxCDD, total HxCDD, 1,2,3,4,6,7,8-HpCDF, and 1,2,3,4,6,7,8-HpCDD have been qualified with a 'U' validation flag to denote the reported concentrations are non-detect due to positive detection in the method blank (see CTR comment #6).
- 1,2,3,6,7,8-HxCDF was reported at an EMPC and has been qualified with a 'UJ' validation flag to denote the reported concentrations are non-detect, and the sample quantitation limit is an estimate due to positive detection in the method blank and interference in the sample (see CTR comments #6 and 10).

MBDS-U01-R01:

- 2,3,7,8-TCDF was reported at an EMPC and has been qualified with a 'UJ' validation flag to denote the reported concentration is non-detect, and the sample quantitation limit is an estimate due to positive detection in the trip blank and interference in the sample (see CTR comments #6 and 10).
- Total TCDF has been qualified with a 'U' validation flag to denote the reported concentration is non-detect due to positive detection in the trip blank (see CTR comment #6).
- 1,2,3,7,8-PeCDF and 1,2,3,7,8-PeCDD were reported at an EMPC and have been qualified with a 'UJ' validation flag to denote the reported concentrations are non-detect, and the sample quantitation limits are estimates due to positive detection in the method blank and interference in the sample (see CTR comments #6 and 10).
- 2,3,4,7,8-PeCDF, total PeCDD, 1,2,3,4,7,8-HxCDF, 1,2,3,6,7,8-HxCDF, 2,3,4,6,7,8-HxCDF, 1,2,3,7,8,9-HxCDF, 1,2,3,4,7,8-HxCDD, 1,2,3,6,7,8-HxCDD, and 1,2,3,7,8,9-HxCDD have been qualified with a 'U' validation flag to denote the reported concentrations are non-detect due to positive detections in the method blank (see CTR comment #6).
- Total PeCDF, total HxCDF, total HxCDD, 1,2,3,4,6,7,8-HpCDF, and OCDF have been qualified with a 'J' validation flag to denote the reported concentrations are estimates with an undetermined bias as they were reported below the quantitation limit (see CTR comment #10).

MBDS-U01-C01:

- 2,3,7,8-TCDD has been qualified with a 'U' validation flag to denote the reported concentration is non-detect due to positive detection in the trip blank (see CTR comment #6).
- Total TCDD, total PeCDD, 1,2,3,4,7,8-HxCDF, 2,3,4,6,7,8-HxCDF, 1,2,3,4,7,8-HxCDD, 1,2,3,6,7,8-HxCDD, 1,2,3,7,8,9-HxCDD, and 1,2,3,4,7,8,9-HpCDF have been qualified with a 'J' validation flag to denote the reported concentrations are estimates with an undetermined bias as they were reported below the quantitation limit (see CTR comment #10).
- 1,2,3,7,8-PeCDF were reported at an EMPC and has been qualified with a 'UJ' validation flag to denote the reported concentration is non-detect, and the sample quantitation limit is an estimate due to positive detection in the method blank and interference in the sample (see CTR comments #6 and 10).

- 2,3,4,7,8-PeCDF, 1,2,3,7,8-PeCDD, and 1,2,3,7,8,9-HxCDF have been qualified with a 'U' validation flag to denote the reported concentrations are non-detect due to positive detection in the method blank (see CTR comment #6).
- 1,2,3,6,7,8-HxCDF and 1,2,3,4,6,7,8-HpCDF were reported at an EMPC and have been qualified with an 'R' validation flag due to PCDE interference (see CTR comment #10).

MBDS-U01-C04:

- 2,3,7,8-TCDF was reported at an EMPC and has been qualified with a 'UJ' validation flag to denote the reported concentration is non-detect, and the sample quantitation limit is an estimate due to positive detection in the trip blank and interference in the sample (see CTR comments #6 and 10).
- 1,2,3,7,8-PeCDF, 2,3,4,7,8-PeCDF, 1,2,3,7,8-PeCDD, and 1,2,3,7,8,9-HxCDF have been qualified with a 'U' validation flag to denote the reported concentrations are non-detect due to positive detection in the method blank (see CTR comment #6).
- Total PeCDD, 1,2,3,4,7,8-HxCDF, 2,3,4,6,7,8-HxCDF, 1,2,3,4,7,8-HxCDD, 1,2,3,6,7,8-HxCDD, 1,2,3,7,8,9-HxCDD, and 1,2,3,4,7,8,9-HpCDF have been qualified with a 'J' validation flag to denote the reported concentrations are estimates with an undetermined bias as they were reported below the quantitation limit (see CTR comment #10).
- 1,2,3,6,7,8-HxCDF and 1,2,3,4,6,7,8-HpCDF were reported at an EMPC and have been qualified with an 'R' validation flag due to PCDE interference (see CTR comment #10).

MBDS-U01-C05 (Trip Blank):

- 2,3,7,8-TCDF, total TCDF, and total TCDD have been qualified with a 'J' validation flag to denote the reported concentrations are estimates with an undetermined bias as they were reported below the quantitation limit (see CTR comment #10).
- 2,3,7,8-TCDD was reported at an EMPC and has been qualified with a 'J+' validation flag to denote the reported concentration is likely overestimated due to interference in the sample (see CTR comment #10).

- 1,2,3,7,8-PeCDF, 2,3,4,7,8-PeCDF, total PeCDF, 1,2,3,7,8-PeCDD, total PeCDD, 1,2,3,4,7,8-HxCDF, 2,3,4,6,7,8-HxCDF, 1,2,3,7,8,9-HxCDF, total HxCDF, 1,2,3,4,7,8-HxCDD, 1,2,3,6,7,8-HxCDD, 1,2,3,7,8,9-HxCDD, total HxCDD, 1,2,3,4,6,7,8-HpCDF, total HpCDF, 1,2,3,4,6,7,8-HpCDD, total HpCDD, and OCDD have been qualified with a 'U' validation flag to denote the reported concentrations are non-detect due to positive detection in the method blank (see CTR comment #6).
- 1,2,3,6,7,8-HxCDF and OCDF were reported at EMPC and have been qualified with a 'UJ' validation flag to denote the reported concentrations are non-detect, and the sample quantitation limits are estimates due to positive detection in the method blank and interference in the sample (see CTR comments #6 and 10).

MBDS-U01-I01:

- 2,3,7,8-TCDF and 2,3,7,8-TCDD have been qualified with a 'U' validation to denote the reported concentrations were non-detect due to positive detection in the trip blank (see CTR comment #6).
- Total TCDD 1,2,3,6,7,8-HxCDF, 2,3,4,6,7,8-HxCDF, 1,2,3,6,7,8-HxCDD, 1,2,3,4,6,7,8-HpCDF, total HpCDF, and OCDF have been qualified with a 'J' validation flag to denote the reported concentrations are estimates with an undetermined bias as they were reported below the quantitation limit (see CTR comment #10).
- 1,2,3,7,8-PeCDF, 2,3,4,7,8-PeCDF, 1,2,3,7,8-PeCDD, total PeCDD, 1,2,3,4,7,8-HxCDF, 1,2,3,7,8,9-HxCDF, 1,2,3,4,7,8-HxCDD, and 1,2,3,7,8,9-HxCDD have been qualified with a 'U' validation flag to denote the reported concentrations were non-detect due to positive detection in the method blank (see CTR comment #6).

MBDS-U01-C06 (Equipment Rinsate):

- 1,2,3,4,6,7,8-HpCDF and OCDF were reported at an EMPC and have been qualified with a 'UJ' validation flag to denote the reported concentrations are non-detect, and the sample quantitation limits are estimates due to positive detection in the method blank and interference in the sample (see CTR comments #6 and 10).
- 1,2,3,4,6,7,8-HpCDD and OCDD have been qualified with a 'U' validation flag to denote the reported concentrations were non-detect due to positive detection in the method blank (see CTR comment #6).

- Total HpCDD has been qualified with a 'J' validation flag to denote the reported concentration is an estimate with an undetermined bias as it was reported below the quantitation limit (see CTR comment #10).

MBDS-U02-R01:

- 2,3,7,8-TCDF and total TCDD have been qualified with a 'U' validation flag to denote the reported concentrations were non-detect due to positive detection in the trip blank (see CTR comment #6).
- 2,3,7,8-TCDD was reported at an EMPC and has been qualified with a 'UJ' validation flag to denote the reported concentration is non-detect, and the sample quantitation limit is an estimate due to positive detection in the trip blank and interference in the sample (see CTR comments #6 and 10).
- 2,3,4,7,8-PeCDF, total PeCDD, 1,2,3,6,7,8-HxCDD, 1,2,3,4,6,7,8-HpCDF, and OCDF have been qualified with a 'J' validation flag to denote the reported concentrations are estimates with an undetermined bias as they were reported below the quantitation limit (see CTR comment #10).
- 1,2,3,7,8-PeCDD, 1,2,3,4,7,8-HxCDF, 2,3,4,6,7,8-HxCDF, 1,2,3,7,8,9-HxCDF, and 1,2,3,7,8,9-HxCDD have been qualified with a 'U' validation flag to denote the reported concentrations were non-detect due to positive detection in the method blank (see CTR comment #6).
- 1,2,3,6,7,8-HxCDF was reported at an EMPC and has been qualified with an 'R' validation flag due to PCDE interference (see CTR comment #10).
- 1,2,3,4,7,8-HxCDD was reported at an EMPC and has been qualified with a 'UJ' validation flag to denote the reported concentration is non-detect, and the sample quantitation limit is an estimate due to positive detection in the method blank and interference in the sample (see CTR comments #6 and 10).

MBDS-U02-I01:

- 2,3,7,8-TCDF has been qualified with a 'U' validation flag to denote the reported concentration is non-detect due to positive detection in the trip blank (see CTR comment #6).
- 2,3,7,8-TCDD, total PeCDF, total HxCDF, total HxCDD, 1,2,3,4,6,7,8-HpCDF, total HpCDF, and OCDF have been qualified with a 'J' validation flag to denote the reported concentrations are estimates with an undetermined bias as they were reported below the quantitation limit (see CTR comment #10).

- 1,2,3,7,8-PeCDF, 2,3,4,7,8-PeCDF, total PeCDD, 1,2,3,6,7,8-HxCDF, 1,2,3,6,7,8-HxCDD, and 1,2,3,7,8,9-HxCDD have been qualified with a 'U' validation flag to denote the reported concentrations were non-detect due to positive detection in the method blank (see CTR comment #6).
- 1,2,3,7,8-PeCDD, 1,2,3,4,7,8-HxCDF, 2,3,4,6,7,8-HxCDF, 1,2,3,7,8,9-HxCDF, 1,2,3,4,7,8-HxCDD, and 1,2,3,4,7,8,9-HpCDF were reported at an EMPC and have been qualified with a 'UJ' validation flag to denote the reported concentrations are non-detect, and the sample quantitation limits are estimates due to positive detection in the trip blank and interference in the sample (see CTR comments #6 and 10).

MBDS-U02-C01:

- 2,3,7,8-TCDF was reported at an EMPC and has been qualified with an 'R' validation flag due to PCDE interference (see CTR comment #10).
- 2,3,7,8-TCDD has been qualified with a 'U' validation flag to denote the reported concentration is non-detect due to positive detection in the trip blank (see CTR comment #6).
- 1,2,3,7,8-PeCDF, 1,2,3,7,8,9-HxCDF, and 1,2,3,4,7,8,9-HpCDF have been qualified with a 'U' validation flag to denote the reported concentrations are non-detect due to positive detections in the method blank (see CTR comment #6).
- 2,3,4,7,8-PeCDF, total PeCDD, 1,2,3,4,7,8-HxCDF, 1,2,3,6,7,8-HxCDF, 2,3,4,6,7,8-HxCDF, 1,2,3,4,7,8-HxCDD, 1,2,3,6,7,8-HxCDD, and 1,2,3,7,8,9-HxCDD have been qualified with a 'J' validation flag to denote the reported concentrations are estimates with an undetermined bias as they were reported below the quantitation limit (see CTR comment #10).
- 1,2,3,7,8-PeCDD was reported at an EMPC and has been qualified with a 'UJ' validation flag to denote the reported concentration is non-detect, and the sample quantitation limit is an estimate due to positive detection in the method blank and interference in the sample (see CTR comments #6 and 10).

MBDS-U03-R01:

- 2,3,7,8-TCDF and total TCDD have been qualified with a 'U' validation flag to denote the reported concentrations were non-detect due to positive detection in the trip blank (see CTR comment #6).

- 2,3,7,8-TCDD was reported at an EMPC and has been qualified with a 'UJ' validation flag to denote the reported concentration is non-detect, and the sample quantitation limit is an estimate due to positive detection in the trip blank and interference in the sample (see CTR comments #6 and 10).
- 2,3,4,7,8-PeCDF, total PeCDD, 2,3,4,6,7,8-HxCDF, 1,2,3,6,7,8-HxCDD, 1,2,3,7,8,9-HxCDD, and 1,2,3,4,7,8,9-HpCDF have been qualified with a 'U' validation flag to denote the reported concentrations were non-detect due to positive detection in the method blank (see CTR comment #6).
- Total PeCDF, total HxCDF, total HxCDD, 1,2,3,4,6,7,8-HpCDF, total HpCDF, 1,2,3,4,6,7,8-HpCDD, and OCDF have been qualified with a 'J' validation flag to denote the reported concentrations are estimates with an undetermined bias as they were reported below the quantitation limit (see CTR comment #10).
- 1,2,3,7,8-PeCDD, 1,2,3,4,7,8-HxCDF, 1,2,3,6,7,8-HxCDF, and 1,2,3,4,7,8-HxCDD were reported at EMPC and have been qualified with a 'UJ' validation flag to denote the reported concentrations are non-detect, and the sample quantitation limits are estimates due to positive detections in the trip blank and interference in the sample (see CTR comments #6 and 10).

MBDS-U03-C01:

- 2,3,7,8-TCDF has been qualified with a 'U' validation flag to denote the reported concentration is non-detect due to positive detection in the trip blank (see CTR comment #6).
- 2,3,7,8-TCDD was reported at an EMPC and has been qualified with a 'UJ' validation flag to denote the reported concentration is non-detect, and the sample quantitation limit is an estimate due to positive detection in the trip blank and interference in the sample (see CTR comments #6 and 10).
- Total TCDD, 2,3,4,7,8-PeCDF, total PeCDD, 1,2,3,4,7,8-HxCDF, 1,2,3,6,7,8-HxCDF, 1,2,3,4,7,8-HxCDD, 1,2,3,6,7,8-HxCDD, and 1,2,3,7,8,9-HxCDD have been qualified with a 'J' validation flag to denote the reported concentrations are estimates with an undetermined bias as they were reported below the quantitation limit (see CTR comment #10).
- 1,2,3,7,8-PeCDF, 1,2,3,7,8,9-HxCDF, and 1,2,3,4,7,8,9-HpCDF have been qualified with a 'U' validation flag to denote the reported concentrations were non-detect due to positive detections in the method blank (see CTR comment #6).

- 1,2,3,7,8-PeCDD was reported at an EMPC and has been qualified with a 'UJ' validation flag to denote the reported concentration is non-detect, and the sample quantitation limit is an estimate due to positive detection in the method blank and interference in the sample (see CTR comments #6 and 10).
- 2,3,4,6,7,8-HxCDF was reported at an EMPC and has been qualified with a 'J+' validation flag to denote the reported concentration is likely overestimated due to interference in the sample (see CTR comment #10).

MBDS-U03-I01:

- 2,3,7,8-TCDF, 2,3,7,8-TCDD, and total TCDD have been qualified with a 'U' validation flag to denote the reported concentrations were non-detect due to positive detections in the trip blank (see CTR comment #6).
- 1,2,3,7,8-PeCDF, 2,3,4,7,8-PeCDF, total PeCDD, 1,2,3,4,7,8-HxCDF, 1,2,3,6,7,8-HxCDF, 2,3,4,6,7,8-HxCDF, 1,2,3,4,7,8-HxCDD, and 1,2,3,4,7,8,9-HpCDF have been qualified with a 'U' validation flag to denote the reported concentrations were non-detect due to positive detections in the method blank (see CTR comment #6).
- Total PeCDF, 1,2,3,6,7,8-HxCDD, 1,2,3,7,8,9-HxCDD, 1,2,3,4,6,7,8-HpCDF, total HpCDF, and OCDF have been qualified with a 'J' validation flag to denote the reported concentrations are estimates with an undetermined bias as they were reported below the quantitation limit (see CTR comment #10).
- 1,2,3,7,8-PeCDD was reported at an EMPC and has been qualified with a 'UJ' validation flag to denote the reported concentration is non-detect, and the sample quantitation limit is an estimate due to positive detection in the method blank and interference in the sample (see CTR comments #6 and 10).

MBDS-U05-C01:

- 2,3,7,8-TCDF was reported at an EMPC and has been qualified with a 'J+' validation flag to denote the reported concentration is likely overestimated due to interference in the sample (see CTR comment #10).
- 2,3,7,8-TCDD was reported at an EMPC and has been qualified with a 'UJ' validation flag to denote the reported concentration is non-detect, and the sample quantitation limit is an estimate due to positive detection in the trip blank and interference in the sample (see CTR comments #6 and 10).

- Total TCDD, 2,3,4,7,8-PeCDF, total PeCDD, 1,2,3,6,7,8-HxCDF, 2,3,4,6,7,8-HxCDF, 1,2,3,4,7,8-HxCDD, 1,2,3,6,7,8-HxCDD, and 1,2,3,7,8,9-HxCDD have been qualified with a 'J' validation flag to denote the reported concentrations are estimates with an undetermined bias as they were reported below the quantitation limit (see CTR comment #10).
- 1,2,3,7,8-PeCDD, 1,2,3,4,7,8-HxCDF, and 1,2,3,4,7,8,9-HpCDF have been qualified with a 'U' validation flag to denote the reported concentrations are non-detect due to positive detections in the method blank (see CTR comment #6).
- 1,2,3,7,8,9-HxCDF was reported at an EMPC and has been qualified with a 'UJ' validation flag to denote the reported concentration is non-detect, and the sample quantitation limit is an estimate due to positive detection in the method blank and interference in the sample (see CTR comments #6 and 10).

MBDS-U05-I01:

- 2,3,7,8-TCDF was reported at an EMPC and has been qualified with a 'UJ' validation flag to denote the reported concentration is non-detect, and the sample quantitation limit is an estimate due to positive detection in the trip blank and interference in the sample (see CTR comments #6 and 10).
- Total TCDD has been qualified with a 'U' validation flag to denote the reported concentration is non-detect due to positive detections in the trip blank (see CTR comment #6).
- 1,2,3,7,8-PeCDF, 1,2,3,7,8-PeCDD, 1,2,3,7,8,9-HxCDF, 1,2,3,4,7,8-HxCDD, and 1,2,3,4,7,8,9-HpCDF were reported at an EMPC and have been qualified with a 'UJ' validation flag to denote the reported concentrations are non-detect, and the sample quantitation limits are estimates due to positive detections in the method blank and interference in the sample (see CTR comments #6 and 10).
- 2,3,4,7,8-PeCDF, total PeCDD, 1,2,3,4,7,8-HxCDF, and 2,3,4,6,7,8-HxCDF have been qualified with a 'U' validation flag to denote the reported concentrations are non-detect due to positive detections in the method blank (see CTR comment #6).
- 1,2,3,6,7,8-HxCDF, 1,2,3,6,7,8-HxCDD, 1,2,3,7,8,9-HxCDD, 1,2,3,4,6,7,8-HpCDF, and OCDF have been qualified with a 'J' validation flag to denote the reported concentrations are estimates with an undetermined bias as they were reported below the quantitation limit (see CTR comment #10).

MBDS-U05-R01:

- 2,3,7,8-TCDF has been qualified with a 'U' validation flag to denote the reported concentration is non-detect due to positive detections in the trip blank (see CTR comment #6).
- 2,3,7,8-TCDD was reported at an EMPC and has been qualified with a 'UJ' validation flag to denote the reported concentration is non-detect, and the sample quantitation limit is an estimate due to positive detection in the trip blank and interference in the sample (see CTR comments #6 and 10).
- 1,2,3,7,8-PeCDF, 1,2,3,7,8-PeCDD, total PeCDD, 1,2,3,7,8,9-HxCDF, 1,2,3,4,7,8-HxCDD, and 1,2,3,7,8,9-HxCDD have been qualified with a 'U' validation flag to denote the reported concentrations are non-detect due to positive detections in the method blank (see CTR comment 6).
- 2,3,4,7,8-PeCDF, 1,2,3,4,7,8-HxCDF, 1,2,3,6,7,8-HxCDF, 2,3,4,6,7,8-HxCDF, and 1,2,3,6,7,8-HxCDD have been qualified with a 'J' validation flag to denote the reported concentrations are estimates with an undetermined bias as they were reported below the quantitation limit (see CTR comment #10).
- 1,2,3,4,7,8,9-HpCDF was reported at an EMPC and has been qualified with a 'UJ' validation flag to denote the reported concentration is non-detect, and the sample quantitation limit is an estimate due to positive detection in the method blank and interference in the sample (see CTR comments #6 and 10).

MBDS-U04-R01:

- Total TCDD has been qualified with a 'U' validation flag to denote the reported concentration is non-detect due to positive detections in the trip blank (see CTR comment #6).
- 2,3,7,8-TCDD was reported at an EMPC and has been qualified with a 'UJ' validation flag to denote the reported concentration is non-detect, and the sample quantitation limit is an estimate due to positive detection in the trip blank and interference in the sample (see CTR comments #6 and 10).
- 1,2,3,7,8-PeCDF, 2,3,4,7,8-PeCDF, 1,2,3,7,8-PeCDD, total PeCDD, 2,3,4,6,7,8-HxCDF, 1,2,3,4,7,8-HxCDD, 1,2,3,6,7,8-HxCDD, 1,2,3,7,8,9-HxCDD, and 1,2,3,4,6,7,8-HpCDF have been qualified with a 'U' validation flag to denote the reported concentrations are non-detect due to positive detections in the method blank (see CTR comment #6).
- 1,2,3,6,7,8-HxCDF was reported at an EMPC and has been qualified with an 'R' validation flag due to PCDE interference (see CTR comment #10).

- 1,2,3,7,8,9-HxCDF was reported at an EMPC and has been qualified with a 'UJ' validation flag to denote the reported concentration is non-detect, and the sample quantitation limit is an estimate due to positive detection in the method blank and interference in the sample (see CTR comments #6 and 10).
- Total HxCDF, total HxCDD, total HpCDF, and OCDF have been qualified with a 'J' validation flag to denote the reported concentrations are estimates with an undetermined bias as they were reported below the quantitation limit (see CTR comment #10).

MBDS-U04-C01:

- 2,3,7,8-TCDF has been qualified with a 'U' validation flag to denote the reported concentration is non-detect due to positive detections in the method blank and trip blank (see CTR comment #6).
- Total TCDF, 1,2,3,7,8-PeCDF, and 2,3,4,7,8-PeCDF have been qualified with a 'U' validation flag to denote the reported concentrations are non-detect due to positive detections in the method blank (see CTR comment #6).
- Total TCDD has been qualified with a 'U' validation flag to denote the reported concentration is non-detect due to positive detections in the trip blank (see CTR comment #6).
- Total PeCDF, 1,2,3,7,8-PeCDD, total PeCDD, 1,2,3,4,7,8-HxCDF, 2,3,4,6,7,8-HxCDF, 1,2,3,4,7,8-HxCDD, 1,2,3,6,7,8-HxCDD, 1,2,3,7,8,9-HxCDD, and 1,2,3,4,6,7,8-HpCDF have been qualified with a 'J' validation flag to denote the reported concentrations are estimates with an undetermined bias as they were reported below the quantitation limit (see CTR comment #10).
- 1,2,3,6,7,8-HxCDF was reported at an EMPC and has been qualified with an 'R' validation flag due to PCDE interference (see CTR comment #10).
- 1,2,3,7,8,9-HxCDF and 1,2,3,4,7,8,9-HpCDF was reported at an EMPC and has been qualified with a 'J+' validation flag to denote the reported concentrations are likely overestimated due to interference in the sample (see CTR comment #10).
- OCDF has been qualified with a 'J-' validation flag to denote the reported concentration is likely underestimated due to low LCS recovery (see CTR comment #8).

MBDS-U04-I01:

- 2,3,7,8-TCDF has been qualified with a 'U' validation flag to denote the reported concentration is non-detect due to positive detections in the method blank (see CTR comment #6).
- 2,3,7,8-TCDD was reported at an EMPC and has been qualified with a 'UJ' validation flag to denote the reported concentration is non-detect, and the sample quantitation limit is an estimate due to positive detection in the trip blank and interference in the sample (see CTR comments #6 and 10).
- 1,2,3,7,8-PeCDF, 2,3,4,7,8-PeCDF, 1,2,3,7,8-PeCDD, 1,2,3,4,7,8-HxCDF, 1,2,3,6,7,8-HxCDF, 2,3,4,6,7,8-HxCDF, 1,2,3,7,8,9-HxCDF, and 1,2,3,4,7,8,9-HpCDF have been qualified with a 'J' validation flag to denote the reported concentrations are estimates with an undetermined bias as they were reported below the quantitation limit (see CTR comment #10).
- OCDF has been qualified with a 'J-' validation flag to denote the reported concentration is likely underestimated due to low LCS recovery (see CTR comment #8).

4. CONTRACT AND TECHNICAL REVIEW (CTR)

Project Name: Montana Background Dioxin Study

Laboratory Name: Pace Analytical

SDG#: 1065309

Type of Analysis: USEPA SW-846 Method 8290

1. Data Completeness

The data has undergone a Level III validation.

2. Sample Integrity

No action was taken as sample integrity was compliant.

3. Sample Holding Times

No action was taken as sample holding times were met.

4. Instrument Performance

No action was taken as instrument performance was compliant.

5. Initial and Continuing Calibrations

The initial and continuing calibration forms were not included in the data package as it was a level III. No action was taken as the case narrative indicated that the acceptance criteria for the initial and continuing calibrations were met.

6. Method and Field Blank Contamination

Method Blank 15160. Positive detections were noted in method blank 15160 for total PeCDF, total HxCDD, 1,2,3,4,6,7,8-HpCDF, total HpCDF, 1,2,3,4,6,7,8-HpCDD, total HpCDD, OCDF, and OCDD and estimate maximum possible contamination (EMPC) results were noted for 2,3,7,8-TCDF, 2,3,7,8-TCDD, 1,2,3,7,8-PeCDF, 2,3,4,7,8-PeCDF, 1,2,3,4,7,8-HxCDF, 2,3,4,6,7,8-HxCDF, and 1,2,3,7,8,9-HxCDD.

In MBDS-U10-R01, 1,2,3,7,8-PeCDF, 2,3,4,7,8-PeCDF, and 1,2,3,4,7,8-HxCDF have been qualified with a 'U' validation flag due to positive detections less than five times the blank value.

In MBDS-U10-I01, 1,2,3,4,7,8-HxCDF and 2,3,4,6,7,8-HxCDF have been qualified with a 'U' validation flag due to positive detections less than five times the blank value. 1,2,3,7,8,9-HxCDD has been qualified with a 'UJ' validation flag as it was reported at an EMPC and as the reported concentration was less than five times the blank value.

In MBDS-U11-C01, 2,3,4,7,8-PeCDF, 2,3,4,6,7,8-HxCDF, and 1,2,3,7,8,9-HxCDD have been qualified with a 'U' validation flag due to positive detections less than five times the blank value. 1,2,3,4,7,8-HxCDD has been qualified with a 'UJ' validation flag as it was reported at an EMPC and as the reported concentration was less than five times the blank value.

In MBdS-U13-R01, 1,2,3,7,8-PeCDF, 1,2,3,4,7,8-HxCDF, and OCDF have been qualified with a 'U' validation flag due to positive detections less than five times the blank value. 2,3,4,6,7,8-HxCDF and 1,2,3,7,8,9-HxCDF have been qualified with a 'UJ' validation flag as they were reported at an EMPC and as the reported concentrations were less than five times the blank value.

In MBDS-U13-R04, 1,2,3,4,7,8-HxCDF, 2,3,4,6,7,8-HxCDF, 1,2,3,7,8,9-HxCDD, and OCDF have been qualified with a 'U' validation flag due to positive detections less than five times the blank value. 2,3,4,7,8-PeCDF has been qualified with a 'UJ' validation flag as it was reported at an EMPC and as the reported concentration was less than five times the blank value.

The remaining total PeCDF, total HxCDD, 1,2,3,4,6,7,8-HpCDF, total HpCDF, 1,2,3,4,6,7,8-HpCDD, total HpCDD, OCDF, OCDD, 2,3,7,8-TCDF, 2,3,7,8-TCDD, 1,2,3,7,8-PeCDF, 2,3,4,7,8-PeCDF, 1,2,3,4,7,8-HxCDF, 2,3,4,6,7,8-HxCDF, and 1,2,3,7,8,9-HxCDD results were either non-detect or greater than five times the blank value and warrant no qualifications.

Method Blank 15116. Positive detections were noted in method blank 15116 for 1,2,3,7,8-PeCDD, total PeCDD, 1,2,3,6,7,8-HxCDF, total HxCDF, 1,2,3,7,8,9-HxCDD, total HxCDD, 1,2,3,4,7,8,9-HpCDF, total HpCDF, and OCDF and EMPC results were noted for 1,2,3,7,8-PeCDF, 2,3,4,7,8-PeCDF, 1,2,3,4,7,8-HxCDF, 2,3,4,6,7,8-HxCDF, 1,2,3,4,6,7,8-HpCDF, 1,2,3,4,6,7,8-HpCDD, and OCDD.

In MBDS-U01-C06, 1,2,3,4,6,7,8-HpCDD and OCDD have been qualified with a 'U' validation flag due to positive detections less than five times the blank value. 1,2,3,4,6,7,8-HpCDF and OCDF have been qualified with a 'UJ' validation flag as they were reported at an EMPC and as the reported concentrations were less than five times the blank value. The remaining compounds detected in the method blank warrant no qualification as the sample results were either non-detect or greater than five times the blank value.

Method Blank 15191. Positive detections were noted in the method blank 15191 for 2,3,4,7,8-PeCDF, total PeCDF, 1,2,3,7,8-PeCDD, total PeCDD, 1,2,3,4,7,8-HxCDF, 1,2,3,6,7,8-HxCDF, 2,3,4,6,7,8-HxCDF, total HxCDF, 1,2,3,4,7,8-HxCDD, total HxCDD, 1,2,3,4,7,8,9-HpCDF, total HpCDF, total HpCDD, and OCDD, and EMPC results for 1,2,3,7,8-PeCDF, 1,2,3,7,8,9-HxCDF, 1,2,3,6,7,8-HxCDD, 1,2,3,7,8,9-HxCDD, 1,2,3,4,6,7,8-HpCDF, 1,2,3,4,6,7,8-HpCDD, and OCDF.

In MBDS-U13-I01, 1,2,3,7,8-PeCDD, 1,2,3,4,7,8-HxCDF, 1,2,3,7,8,9-HxCDF, 1,2,3,4,7,8-HxCDD, 1,2,3,4,7,8,9-HpCDF, and total HpCDF have been qualified with a 'U' validation flag due to positive detections less than five times the blank value. 1,2,3,6,7,8-HxCDF would have been qualified with a 'U' validation flag as the reported concentration was less than five times the blank value. However, it has been qualified with an 'R' validation flag due to interference from polychlorinated diphenyl ethers (PCDE).

In MBDS-U12-R01, 2,3,4,7,8-PeCDF, total PeCDF, 1,2,3,7,8-PeCDD, total PeCDD, 1,2,3,6,7,8-HxCDF, 2,3,4,6,7,8-HxCDF, 1,2,3,7,8,9-HxCDF, total HxCDF, 1,2,3,4,7,8-HxCDD, 1,2,3,6,7,8-HxCDD, total HxCDD, total HpCDF, and 1,2,3,4,6,7,8-HpCDD have been qualified with a 'U' validation flag due to positive detections less than five times the blank value. 1,2,3,4,6,7,8-HpCDF would have been qualified with a 'U' validation flag as the reported concentration was less than five times the blank value. However, it has been qualified with an 'R' validation flag due to interference from polychlorinated diphenyl ethers (PCDE). 1,2,3,7,8-PeCDF, 1,2,3,4,7,8-HxCDF, and 1,2,3,7,8,9-HxCDD have been qualified with a 'UJ' validation flag as they were reported at an EMPC and as the reported concentrations were less than five times the blank value.

In MBDS-U12-C01, 1,2,3,7,8-PeCDF, 2,3,4,7,8-PeCDF, total PeCDF, 1,2,3,7,8-PeCDD, total PeCDD, 1,2,3,4,7,8-HxCDF, 1,2,3,6,7,8-HxCDF, 2,3,4,6,7,8-HxCDF, total HxCDF, 1,2,3,4,7,8-HxCDD, 1,2,3,6,7,8-HxCDD, and OCDF have been qualified with a 'U' validation flag due to positive detections less than five times the blank value. 1,2,3,7,8,9-HxCDF, 1,2,3,7,8,9-HxCDD, and 1,2,3,4,6,7,8-HpCDF have been qualified with a 'UJ' validation flag as they were reported at an EMPC and as the reported concentrations were less than five times the blank value.

In MBDS-U12-I01, 2,3,4,7,8-PeCDF, 1,2,3,6,7,8-HxCDF, 2,3,4,6,7,8-HxCDF, 1,2,3,7,8,9-HxCDF, total HxCDF, 1,2,3,4,7,8-HxCDD, 1,2,3,6,7,8-HxCDD, and 1,2,3,4,6,7,8-HpCDF have been qualified with a 'U' validation flag due to positive detections less than five times the blank value. 1,2,3,7,8-PeCDF, 1,2,3,7,8-PeCDD, and 1,2,3,7,8,9-HxCDD have been qualified with a 'UJ' validation flag as they were reported at an EMPC and as the reported concentrations were less than five times the blank value.

In MBDS-U13-R05, 1,2,3,7,8-PeCDF, 2,3,4,7,8-PeCDF, total PeCDF, 1,2,3,4,7,8-HxCDF, 2,3,4,6,7,8-HxCDF, total HxCDF, 1,2,3,6,7,8-HxCDD, 1,2,3,7,8,9-HxCDD, total HxCDD, 1,2,3,4,6,7,8-HpCDF, and 1,2,3,4,6,7,8-HpCDD have been qualified with a 'U' validation flag due to positive detections less than five times the blank value. 1,2,3,4,7,8-HxCDF has been qualified with a 'UJ' validation flag as it was reported at an EMPC and as the reported concentration was less than five times the blank value.

In MBDS-U01-R01, 2,3,4,7,8-PeCDF, total PeCDF, 1,2,3,4,7,8-HxCDF, 1,2,3,6,7,8-HxCDF, 2,3,4,6,7,8-HxCDF, 1,2,3,7,8,9-HxCDF, 1,2,3,4,7,8-HxCDD, 1,2,3,6,7,8-HxCDD, and 1,2,3,7,8,9-HxCDD have been qualified with a 'U' validation flag due to positive detections less than five times the blank value. 1,2,3,7,8-PeCDF and 1,2,3,7,8-PeCDD have been qualified with a 'UJ' validation flag as they were reported at an EMPC and as the reported concentrations were less than five times the blank value.

In MBDS-U01-C01, 2,3,4,7,8-PeCDF, 1,2,3,7,8-PeCDD, and 1,2,3,7,8,9-HxCDF have been qualified with a 'U' validation flag due to positive detections less than five times the blank value. 1,2,3,7,8-PeCDF has been qualified with a 'UJ' validation flag as it was reported at an EMPC and as the reported concentration was less than five times the blank value.

In MBDS-U01-C04, 1,2,3,7,8-PeCDF, 2,3,4,7,8-PeCDF, 1,2,3,7,8-PeCDF, and 1,2,3,7,8,9-HxCDF have been qualified with a 'U' validation flag due to positive detections less than five times the blank value.

In MBDS-U01-C05, 1,2,3,7,8-PeCDF, 2,3,4,7,8-PeCDF, total PeCDF, 1,2,3,7,8-PeCDD, total PeCDD, 1,2,3,4,7,8-HxCDF, 2,3,4,6,7,8-HxCDF, 1,2,3,7,8,9-HxCDF, total HxCDF, 1,2,3,4,7,8-HxCDD, 1,2,3,6,7,8-HxCDD, 1,2,3,7,8,9-HxCDD, total HxCDD, 1,2,3,4,6,7,8-HpCDF, total HpCDF, 1,2,3,4,6,7,8-HpCDD, total HpCDD, and OCDD have been qualified with a 'U' validation flag due to positive detections less than five times the blank value. 1,2,3,6,7,8-HxCDF and OCDF have been qualified with a 'UJ' validation flag as they were reported at an EMPC and as the reported concentration was less than five times the blank value.

In MBDS-U01-I01, 1,2,3,7,8-PeCDF, 2,3,4,7,8-PeCDF, 1,2,3,7,8-PeCDD, total PeCDD, 1,2,3,4,7,8-HxCDF, 1,2,3,7,8,9-HxCDF, 1,2,3,4,7,8-HxCDD, 1,2,3,7,8,9-HxCDD have been qualified with a 'U' validation flag due to positive detections less than five times the blank value.

In MBDS-U02-R01, 1,2,3,7,8-PeCDD, 1,2,3,4,7,8-HxCDF, 2,3,4,6,7,8-HxCDF, 1,2,3,7,8,9-HxCDF, and 1,2,3,7,8,9-HxCDD have been qualified with a 'U' validation flag due to positive detections less than five times the blank value. 1,2,3,4,7,8-HxCDD has been qualified with a 'UJ' validation flag as it was reported at an EMPC and as the reported concentration was less than five times the blank value.

In MBDS-U02-I01, 1,2,3,7,8-PeCDF, 2,3,4,7,8-PeCDF, total PeCDD, 1,2,3,6,7,8-HxCDF, 1,2,3,6,7,8-HxCDD, and 1,2,3,7,8,9-HxCDD have been qualified with a 'U' validation flag due to positive detections less than five times the blank value. 1,2,3,7,8-PeCDD, 1,2,3,4,7,8-HxCDF, 2,3,4,6,7,8-HxCDF, 1,2,3,7,8,9-HxCDF, 1,2,3,4,7,8-HxCDD, and 1,2,3,4,7,8,9-HpCDF have been qualified with a 'UJ' validation flag as they were reported at an EMPC and as the reported concentration was less than five times the blank value.

In MBDS-U02-C01, 1,2,3,7,8-PeCDF, 1,2,3,7,8,9-HxCDF, and 1,2,3,4,7,8,9-HpCDF have been qualified with a 'U' validation flag due to positive detections less than five times the blank value. 1,2,3,7,8-PeCDD has been qualified with a 'UJ' validation flag as it was reported at an EMPC and as the reported concentration was less than five times the blank value.

In MBDS-U03-R01, 2,3,4,7,8-PeCDF, total PeCDD, 2,3,4,6,7,8-HxCDF, 1,2,3,6,7,8-HxCDD, 1,2,3,7,8,9-HxCDD, and 1,2,3,4,7,8,9-HpCDF have been qualified with a 'U' validation flag due to positive detections less than five times the blank value. 1,2,3,7,8-PeCDD, 1,2,3,4,7,8-HxCDF, 1,2,3,6,7,8-HxCDF, and 1,2,3,4,7,8-HxCDD have been qualified with a 'UJ' validation flag as they were reported at an EMPC and as the reported concentration was less than five times the blank value.

In MBDS-U03-C01, 1,2,3,7,8-PeCDF, 1,2,3,7,8,9-HxCDF, and 1,2,3,4,7,8,9-HpCDF have been qualified with a 'U' validation flag due to positive detections less than five times the blank value. 1,2,3,7,8-PeCDD has been qualified with a 'UJ' validation flag as it was reported at an EMPC and as the reported concentration was less than five times the blank value.

In MBDS-U03-I01, 1,2,3,7,8-PeCDF, 2,3,4,7,8-PeCDF, total PeCDD, 1,2,3,4,7,8-HxCDF, 1,2,3,6,7,8-HxCDF, 2,3,4,6,7,8-HxCDF, 1,2,3,4,7,8-HxCDD, and 1,2,3,4,7,8,9-HpCDF have been qualified with a 'U' validation flag due to positive detections less than five times the blank value. 1,2,3,7,8-PeCDD has been qualified with a 'UJ' validation flag as it was reported at an EMPC and as the reported concentration was less than five times the blank value.

In MBDS-U05-C01, 1,2,3,7,8-PeCDD, 1,2,3,4,7,8-HxCDF, and 1,2,3,4,7,8,9-HpCDF have been qualified with a 'U' validation flag due to positive detections less than five times the blank value. 1,2,3,7,8,9-HxCDF has been qualified with a 'UJ' validation flag as it was reported at an EMPC and as the reported concentration was less than five times the blank value.

In MBDS-U05-I01, 2,3,4,7,8-PeCDF, total PeCDD, 1,2,3,4,7,8-HxCDF, and 2,3,4,6,7,8-HxCDF have been qualified with a 'U' validation flag due to positive detections less than five times the blank value. 1,2,3,7,8-PeCDF, 1,2,3,7,8-PeCDD, 1,2,3,7,8,9-HxCDF, 1,2,3,4,7,8-HxCDD, and 1,2,3,4,7,8,9-HpCDF have been qualified with a 'UJ' validation flag as they were reported at an EMPC and as the reported concentration was less than five times the blank value.

In MBDS-U05-R01, 1,2,3,7,8-PeCDF, 1,2,3,7,8-PeCDD, total PeCDD, 1,2,3,7,8,9-HxCDF, 1,2,3,4,7,8-HxCDD, and 1,2,3,7,8,9-HxCDD have been qualified with a 'U' validation flag due to positive detections less than five times the blank value. 1,2,3,4,7,8,9-HpCDF has been qualified with a 'UJ' validation flag as it was reported at an EMPC and as the reported concentration was less than five times the blank value.

In MBDS-U04-R01, 1,2,3,7,8-PeCDF, 2,3,4,7,8-PeCDF, 1,2,3,7,8-PeCDD, total PeCDD, 2,3,4,6,7,8-HxCDF, 1,2,3,4,7,8-HxCDD, 1,2,3,6,7,8-HxCDD, 1,2,3,7,8,9-HxCDD, 1,2,3,4,6,7,8-HpCDF have been qualified with a 'U' validation flag due to positive detections less than five times the blank value. 1,2,3,7,8,9-HxCDF has been qualified with a 'UJ' validation flag as it was reported at an EMPC and as the reported concentration was less than five times the blank value. 1,2,3,6,7,8-HxCDF would have been qualified with a 'U' validation flag as the reported concentration was less than five times the blank value. However, it has been qualified with an 'R' validation flag due to interference from polychlorinated diphenyl ethers (PCDE).

The remaining 2,3,4,7,8-PeCDF, total PeCDF, 1,2,3,7,8-PeCDD, total PeCDD, 1,2,3,4,7,8-HxCDF, 1,2,3,6,7,8-HxCDF, 2,3,4,6,7,8-HxCDF, total HxCDF, 1,2,3,4,7,8-HxCDD, total HxCDD, 1,2,3,4,7,8,9-HpCDF, total HpCDF, total HpCDD, OCDD, 1,2,3,7,8-PeCDF, 1,2,3,7,8,9-HxCDF, 1,2,3,6,7,8-HxCDD, 1,2,3,7,8,9-HxCDD, 1,2,3,4,6,7,8-HpCDF, 1,2,3,4,6,7,8-HpCDD, and OCDF results were either non-detect or greater than five times the blank value and warrant no qualifications.

Method Blank 15193. Positive detections were noted in method blank 15193 for total TCDF, 2,3,4,7,8-PeCDF, total PeCDF, 1,2,3,4,6,7,8-HpCDD, total HpCDD, and OCDD and EMPC results were noted for 2,3,7,8-TCDF, 2,3,7,8-TCDD, 1,2,3,7,8-PeCDF, 1,2,3,7,8-PeCDD, 1,2,3,4,6,7,8-HpCDF, and OCDF.

In MBDS-U04-C01, 2,3,7,8-TCDF, total TCDF, 1,2,3,7,8-PeCDF, and 2,3,4,7,8-PeCDF have been qualified with a 'U' validation flag due to positive detections less than five times the blank value.

In MBDS-U04-I01, 2,3,7,8-TCDF has been qualified with a 'U' validation flag due to positive detections less than five times the blank value.

The remaining total TCDF, 2,3,4,7,8-PeCDF, total PeCDF, 1,2,3,4,6,7,8-HpCDD, total HpCDD, OCDD 2,3,7,8-TCDD, 1,2,3,7,8-PeCDF, 1,2,3,7,8-PeCDD, 1,2,3,4,6,7,8-HpCDF, and OCDF results were either non-detect or greater than five times the blank value and warrant no qualifications.

Trip Blank (MBDS-U13-R05). Positive detections were noted in the trip blank (MBDS-U13-R05) for 2,3,7,8-TCDF, total TCDF, 1,2,3,7,8-PeCDF, 2,3,4,7,8-PeCDF, total PeCDF, 1,2,3,4,7,8-HxCDF, 2,3,4,6,7,8-HxCDF, total HxCDF, 1,2,3,6,7,8-HxCDD, 1,2,3,7,8,9-HxCDD, total HxCDD, 1,2,3,4,6,7,8-HpCDF, total HpCDF, 1,2,3,4,6,7,8-HpCDD, total HpCDD, OCDF, and OCDD and an EMPC result was noted for 1,2,3,6,7,8-HxCDF.

1,2,3,7,8-PeCDF, 2,3,4,7,8-PeCDF, total PeCDF, 1,2,3,4,7,8-HxCDF, 2,3,4,6,7,8-HxCDF, total HxCDF, 1,2,3,6,7,8-HxCDD, 1,2,3,7,8,9-HxCDD, total HxCDD, 1,2,3,4,6,7,8-HpCDF, and 1,2,3,4,6,7,8-HpCDD have been qualified with a 'U' validation flag due to positive detection in the method blank. 1,2,3,6,7,8-HxCDF has been qualified with a 'UJ' validation flag due to positive detection in the method blank and interference in the sample. No further qualification is warranted for these compounds.

In MBDS-U10-R01, 2,3,7,8-TCDF, total HpCDF, and OCDF have been qualified with a 'U' validation flag due to positive detections less than five times the trip blank value.

In MBDS-U10-I01, total HpCDF has been qualified with a 'U' validation flag due to positive detections less than five times the trip blank value.

In MBDS-U10-C01, MBDS-U11-I01, and MBDS-U13-C01, 2,3,7,8-TCDF has been qualified with a 'U' validation flag due to positive detections less than five times the trip blank value.

In MBDS-U11-C01, total TCDF, total HpCDF, total HpCDD, OCDF, and OCDD have been qualified with a 'U' validation flag due to positive detections less than five times the trip blank value..

In MBDS-U13-R01 and MBDS-U13-R04, total TCDF, total HpCDF, total HpCDD, and OCDD have been qualified with a 'U' validation flag due to positive detections less than five times the trip blank value. OCDF has been qualified with a 'U' validation flag due to a positive detection less than five times the method blank and trip blank values.

In MBDS-U13-I01, 2,3,7,8-TCDF has been qualified with a 'U' validation flag due to positive detections less than five times the trip blank value. Total HpCDF has been qualified with a 'U' validation flag due to a positive detection less than five times the method blank and trip blank values.

In MBDS-U12-R01, total HpCDD, OCDF, and OCDD have been qualified with a 'U' validation flag due to positive detections less than five times the trip blank value. Total HpCDF has been qualified with a 'U' validation flag due to a positive detection less than five times the method blank and trip blank values.

In MBDS-U12-C01, 2,3,7,8-TCDF, total TCDF, total HpCDD, and OCDD have been qualified with a 'U' validation flag due to positive detections less than five times the trip blank value. OCDF has been qualified with a 'U' validation flag due to a positive detection less than five times the method blank and trip blank values.

In MBDS-U12-I01, 2,3,7,8-TCDF, total tCDF, total HpCDF, total HpCDD, OCDF, and OCDD have been qualified with a 'U' validation flag due to positive detections less than five times the trip blank value.

Trip Blank (MBDS-U01-C05). Positive detections were noted in the trip blank (MBDS-U01-C05) for 2,3,7,8-TCDF, total TCDF, total TCDD, 1,2,3,7,8-PeCDF, 2,3,4,7,8-PeCDF, total PeCDF, 1,2,3,7,8-PeCDD, total PeCDD, 1,2,3,4,7,8-HxCDF, 2,3,4,6,7,8-HxCDF, 1,2,3,7,8,9-HxCDF, total HxCDF, 1,2,3,4,7,8-HxCDD, 1,2,3,6,7,8-HxCDD, 1,2,3,7,8,9-HxCDD, total HxCDD, 1,2,3,4,6,7,8-HpCDF, total HpCDF, 1,2,3,4,6,7,8-HpCDD, total HpCDD, and OCDD and EMPC results were noted for 2,3,7,8-TCDD, 1,2,3,6,7,8-HxCDF, and OCDF.

1,2,3,7,8-PeCDF, 2,3,4,7,8-PeCDF, total PeCDF, 1,2,3,7,8-PeCDD, total PeCDD, 1,2,3,4,7,8-HxCDF, 2,3,4,6,7,8-HxCDF, 1,2,3,7,8,9-HxCDF, total HxCDF, 1,2,3,4,7,8-HxCDD, 1,2,3,6,7,8-HxCDD, 1,2,3,7,8,9-HxCDD, total HxCDD, 1,2,3,4,6,7,8-HpCDF, total HpCDF, 1,2,3,4,6,7,8-HpCDD, total HpCDD, and OCDD have been qualified with a 'U' validation flag due to positive detection in the method blank. 1,2,3,6,7,8-HxCDF and OCDF have been qualified with a 'UJ' validation flag due to positive detections in the method blank and interference in the sample. No further qualification is warranted for these compounds.

In MBDS-U01-R01, total TCDF has been qualified with a 'U' validation flag the due to a positive detection less than five times the trip blank value. 2,3,7,8-TCDF was reported at an EMPC and has been qualified with a 'UJ' validation flag as the reported concentration was less than five times the trip blank value and interference in the sample.

In MBDS-U01-C01 and MBDS-U02-C01, 2,3,7,8-TCDD has been qualified with a 'U' validation flag the due to a positive detection less than five times the trip blank value.

In MBDS-U01-C04, 2,3,7,8-TCDF was reported at an EMPC and has been qualified with a 'UJ' validation flag as the reported concentration was less than five times the trip blank value and interference in the sample.

In MBDS-U01-I01, 2,3,7,8-TCDF and 2,3,7,8-TCDD have been qualified with a 'U' validation flag due to positive detections less than five times the trip blank value.

In MBDS-U02-R01 and MBDS-U03-R01, 2,3,7,8-TCDF and total TCDD have been qualified with a 'U' validation flag due to positive detections less than five times the trip blank value. 2,3,7,8-TCDD was reported at an EMPC and has been qualified with a 'UJ' validation flag as the reported concentration was less than five times the trip blank value and interference in the sample.

In MBDS-U02-I01, 2,3,7,8-TCDF has been qualified with a 'U' validation flag the due to a positive detection less than five times the trip blank value.

In MBDS-U03-C01 and MBDS-U05-R01, 2,3,7,8-TCDF has been qualified with a 'U' validation flag due to a positive detection less than five times the trip blank value. 2,3,7,8-TCDD was reported at an EMPC and has been qualified with a 'UJ' validation flag as the reported concentration was less than five times the trip blank value and interference in the sample.

In MBDS-U03-I01, 2,3,7,8-TCDF, 2,3,7,8-TCDD, and total TCDD have been qualified with a 'U' validation flag due to positive detections less than five times the trip blank value.

In MBDS-U05-C01, 2,3,7,8-TCDD was reported at an EMPC and has been qualified with a 'UJ' validation flag as the reported concentration was less than five times the trip blank value and interference in the sample.

In MBDS-U05-I01, total TCDD has been qualified with a 'U' validation flag due to a positive detection less than five times the trip blank value. 2,3,7,8-TCDF was reported at an EMPC and has been qualified with a 'UJ' validation flag as the reported concentration was less than five times the trip blank value and interference in the sample.

In MBDS-U05-R01, 2,3,7,8-TCDF has been qualified with a 'U' validation flag due to a positive detection less than five times the trip blank value. 2,3,7,8-TCDD was reported at an EMPC and has been qualified with a 'UJ' validation flag as the reported concentration was less than five times the trip blank value and interference in the sample.

In MBDS-U04-R01, total TCDD has been qualified with a 'U' validation flag due to a positive detection less than five times the trip blank value. 2,3,7,8-TCDD was reported at an EMPC and has been qualified with a 'UJ' validation flag as the reported concentration was less than five times the trip blank value and interference in the sample.

In MBDS-U04-C01, total TCDD has been qualified with a 'U' validation flag due to a positive detection less than five times the trip blank value. 2,3,7,8-TCDF has been qualified with a 'U' validation flag due to a positive detection less than five times the method blank and trip blank values.

In MBDS-U04-I01, 2,3,7,8-TCDD was reported at an EMPC and has been qualified with a 'UJ' validation flag as the reported concentration was less than five times the trip blank value and interference in the sample.

7. Matrix Spike/Matrix Spike Duplicate (MS/MSD)

The laboratory did not provide acceptance limits for the MS/MSD analysis. In the professional judgment of the validator, the acceptance limit of 50-150% for MS/MSD recovery and a 35% RPD for soil samples and has been used for validation purposes. A MS/MSD analysis was not performed for the water sample. Instead a LCS and duplicate LCS analysis were performed. No action was taken.

MBDS-U13-I01 MS/MSD. OCDD (183% and 183%) in the MS and MSD, respectively, was outside of the 50-150% acceptance criteria. No action was taken based on MS/MSD data alone.

MBDS-U04-C01 MS/MSD. OCDD (316% and 307%) in the MS and MSD, respectively, was outside of the 50-150% acceptance criteria. No action was taken based on MS/MSD data alone.

8. Laboratory Control Sample (LCS)

LCS 15117 and duplicate LCS 15118, LCS 15161, and LCS 15192. No action was taken as all LCS recoveries were within the acceptance criteria. For LCS 15117 and duplicate LCS 15118, all LCS precision criteria were met.

LCS 15194. OCDF (63%) was outside of the 70-130% acceptance criteria per the case narrative. OCDF in associated samples MBDS-U04-C01 and MBDS-U04-I01 exhibited positive detections and have been qualified with a 'J-' validation flag as the results are likely underestimated due to low LCS recovery.

9. Internal Standards (IS) Performance

In MBDS-U10-I01, internal standard OCDD-13C (39%) was outside of the 40-135% acceptance criteria. OCDD exhibited a positive detection and has been qualified with a 'J-' validation flag as the result is likely underestimated due to low internal standard recoveries. OCDF has been qualified with a 'UJ' validation flag as the reported concentration was less than five times the trip blank concentration and due to low internal standard recoveries.

In method blank 15193, internal standard 1,2,3,7,8,9-HxCDF-13C (37%) and 1,2,3,4,7,8,9-HpCDF-13C (30%) were outside of the 40-135% acceptance criteria. No qualification was warranted as the associated compounds were non-detect in the method blank.

In LCS 15194, internal standards 1,2,3,7,8,9-HxCDF-13C (33%) and 1,2,3,4,7,8,9-HpCDF-13C (25%) were outside of the 40-135% acceptance criteria. No qualification was warranted as the LCS recoveries for the associated compounds were within the acceptance criteria.

In MBDS-U04-C01 MS, internal standard 1,2,3,4,7,8,9-HpCDF-13C (38%) was outside of the 40-135% acceptance criteria. No qualification was warranted as the MS recovery for the associate compound was within the acceptance criteria.

10. Target Compound Identification and Quantitation

In MBDS-U10-R01, 2,3,7,8-TCDD, total TCDD, total PeCDF, 1,2,3,7,8-PeCDD, total PeCDD, 1,2,3,4,7,8-HxCDF, 2,3,4,6,7,8-HxCDF, 1,2,3,7,8,9-HxCDF, total HxCDF, 1,2,3,4,7,8-HxCDD, 1,2,3,6,7,8-HxCDD, 1,2,3,7,8,9-HxCDD, 1,2,3,4,6,7,8-HpCDF, and 1,2,3,4,7,8,9-HpCDF exhibited positive detections below the quantitation limit. They have been qualified with a 'J' validation flag as the reported results were estimates with an undetermined bias.

In MBDS-U10-I01, 2,3,4,7,8-PeCDF, total PeCDF, total PeCDD, 1,2,3,6,7,8-HxCDF, total HxCDF, 1,2,3,4,7,8-HxCDD, 1,2,3,6,7,8-HxCDD, total HxCDD, and 1,2,3,4,6,7,8-HpCDF exhibited positive detections below the quantitation limit. They have been qualified with a 'J' validation flag as the reported results were estimates with an undetermined bias. 2,3,7,8-TCDD was reported at an EMPC due to interference in the samples. It has been qualified with a 'J+' validation flag as the result was likely overestimated. 1,2,3,7,8,9-HxCDD was reported at an EMPC due to interference in the sample. It has been qualified with a 'UJ' validation flag due to positive detection in the method blank and interference in the sample.

In MBDS-U10-C01, 2,3,7,8-TCDD, 1,2,3,7,8-PeCDF, 2,3,4,7,8-PeCDF, 1,2,3,7,8-PeCDD, total PeCDD, 1,2,3,4,7,8-HxCDF, 1,2,3,6,7,8-HxCDF, 2,3,4,6,7,8-HxCDF, 1,2,3,7,8,9-HxCDF, 1,2,3,6,7,8-HxCDD, 1,2,3,7,8,9-HxCDD, and 1,2,3,4,7,8,9-HpCDF HpCDF exhibited positive detections below the quantitation limit. They have been qualified with a 'J' validation flag as the reported results were estimates with an undetermined bias. 1,2,3,4,7,8-HxCDD was reported at an EMPC due to interference in the samples. It has been qualified with a 'J+' validation flag as the reported result is likely overestimated.

In MBDS-U11-R01, 2,3,7,8-TCDF, 1,2,3,7,8-PeCDF, 2,3,4,7,8-PeCDF, 1,2,3,7,8-PeCDD, total PeCDD, 1,2,3,4,7,8-HxCDF, 1,2,3,6,7,8-HxCDF, 2,3,4,6,7,8-HxCDF, 1,2,3,4,7,8-HxCDD, 1,2,3,6,7,8-HxCDD, 1,2,3,7,8,9-HxCDD, and 1,2,3,4,7,8,9-HpCDF exhibited positive detections below the quantitation limit. They have been qualified with a 'J' validation flag as the results were estimates with an undetermined bias. 1,2,3,7,8,9-HxCDF was reported at an EMPC due to interference in the samples. It has been qualified with a 'J+' validation flag as the reported result is likely overestimated.

In MBDS-U11-C01, total TCDD, total PeCDF, total HxCDF, 12,3,4,7,8-HxCDD, total HxCDD, 1,2,3,4,6,7,8-HpCDF, and 1,2,3,4,6,7,8-HpCDD exhibited positive detections below the quantitation limit. They have been qualified with a 'J' validation flag as the reported results are estimates with an undetermined bias. 1,2,3,6,7,8-HxCDF was reported at an EMPC and has been qualified with an 'R' validation flag due to interference from PCDE. 1,2,3,4,7,8-HxCDF was reported at an EMPC due to interference in the sample. It has been qualified with a 'UJ' validation flag due to positive detection in the method blank and interference in the sample.

In MBDS-U11-I01, 1,2,3,7,8-PeCDF, 2,3,4,7,8-PeCDF, 1,2,3,7,8-PeCDD, total PeCDD, 1,2,3,4,7,8-HxCDF, 1,2,3,6,7,8-HxCDF, 2,3,4,6,7,8-HxCDF, 1,2,3,4,7,8-HxCDF, 1,2,3,6,7,8-HxCDF, 1,2,3,7,8,9-HxCDF, and 1,2,3,4,7,8,9-HpCDF exhibited positive detections below the quantitation limit. They have been qualified with a 'J' validation flag as the reported results were estimates with an undetermined bias. 1,2,3,7,8,9-HxCDF was reported at an EMPC due to interference in the samples. It has been qualified with a 'J+' validation flag as the reported result is likely overestimated.

In MBDS-U13-R01, total PeCDF, 1,2,3,7,8,9-HxCDF, total HxCDF, 1,2,3,4,7,8-HxCDD, total HxCDD, and 1,2,3,4,6,7,8-HpCDF exhibited positive detections below the quantitation limit. They have been qualified with a 'J' validation flag as the reported results were estimates with an undetermined bias. 1,2,3,7,8-PeCDD, 1,2,3,6,7,8-HxCDF, 1,2,3,6,7,8-HxCDD, and 1,2,3,4,6,7,8-HpCDD were reported at an EMPC due to interference in the samples. They have been qualified with a 'J+' validation flag as the reported results are likely overestimated. 2,3,4,6,7,8-HxCDF and 1,2,3,7,8,9-HxCDD were reported at an EMPC due to interference in the sample. They have been qualified with a 'UJ' validation flag due to positive detection in the method blank and interference in the sample.

In MBDS-U13-R04, total PeCDF, 1,2,3,7,8-PeCDD, total PeCDD, total HxCDF, 1,2,3,4,7,8-HxCDD, total HxCDD, 1,2,3,4,6,7,8-HpCDF, and 1,2,3,4,6,7,8-HpCDD exhibited positive detections below the quantitation limit. They have been qualified with a 'J' validation flag as the reported results are estimates with an undetermined bias. 1,2,3,6,7,8-HxCDF and 1,2,3,6,7,8-HxCDD were reported at an EMPC due to interference in the samples. They have been qualified with a 'J+' validation flag as the reported results are likely overestimated. 2,3,4,7,8-PeCDF was reported at an EMPC due to interference in the sample. It has been qualified with a 'UJ' validation flag due to positive detection in the method blank and interference in the sample.

In MBDS-U13-C01, 2,3,4,7,8-PeCDF, total PeCDD, 1,2,3,4,7,8-HxCDF, 1,2,3,6,7,8-HxCDF, 2,3,4,6,7,8-HxCDF, 1,2,3,7,8,9-HxCDF, 1,2,3,4,7,8-HxCDD, 1,2,3,6,7,8-HxCDD, and 1,2,3,7,8,9-HxCDD exhibited positive detections below the quantitation limit. They have been qualified with a 'J' validation flag as the reported results are estimates with an undetermined bias. 1,2,3,7,8-PeCDD and 1,2,3,4,6,7,8-HpCDF were reported at an EMPC due to interference in the samples. They have been qualified with a 'J+' validation flag as the reported results are likely overestimated.

In MBDS-U13-I01, 2,3,7,8-TCDD, total TCDD, 2,3,4,7,8-PeCDF, total PeCDD, 2,3,4,6,7,8-HxCDF, 1,2,3,6,7,8-HxCDD, and 1,2,3,7,8,9-HxCDD exhibited positive detections below the quantitation limit. They have been qualified with a 'J' validation flag as the reported results are estimates with an undetermined bias. 1,2,3,6,7,8-HxCDF and 1,2,3,4,6,7,8-HpCDF were reported at an EMPC and they have been qualified with an 'R' validation flag due to interference from PCDE.

In MBDS-U12-R01, total TCDD exhibited a positive detection below the quantitation limit. It has been qualified with a 'J' validation flag as the reported results are estimates with an undetermined bias. 1,2,3,4,6,7,8-HpCDF was reported at an EMPC as has been qualified with an 'R' validation flag due to interference from PCDE. 1,2,3,7,8-PeCDF, 1,2,3,4,7,8-HxCDF, and 1,2,3,7,8,9-HxCDD were reported at an EMPC due to interference in the sample. They have been qualified with a 'UJ' validation flag due to positive detection in the method blank and interference in the sample.

In MBDS-U12-C01, total TCDD and 1,2,3,4,6,7,8-HpCDD exhibited positive detections below the quantitation limit. They have been qualified with a 'J' validation flag as the reported results are estimates with an undetermined bias. 1,2,3,7,8,9-HxCDF, 1,2,3,7,8,9-HxCDD, and 1,2,3,4,6,7,8-HpCDF were reported at an EMPC due to interference in the sample. They have been qualified with a 'UJ' validation flag due to positive detection in the method blank and interference in the sample.

In MBDS-U12-I01, total PeCDF and 1,2,3,4,6,7,8-HpCDD exhibited positive detections below the quantitation limit. They have been qualified with a 'J' validation flag as the reported results are estimates with an undetermined bias. 1,2,3,7,8-PeCDF, 1,2,3,7,8-PeCDD, and 1,2,3,7,8,9-HxCDD were reported at an EMPC due to interference in the sample. They have been qualified with a 'UJ' validation flag due to positive detection in the method blank and interference in the sample.

In MBDS-U13-R05, 2,3,7,8-TCDF, total TCDF, total HpCDF, total HpCDD, and OCDF exhibited positive detections below the quantitation limit. They have been qualified with a 'J' validation flag as the reported results are estimates with an undetermined bias. 1,2,3,6,7,8-HxCDF was reported at an EMPC due to interference in the sample. It has been qualified with a 'UJ' validation flag due to positive detection in the method blank and interference in the sample.

In MBDS-U01-R01, total PeCDF, total HxCDF, total HxCDD, 1,2,3,4,6,7,8-HpCDF, and OCDF exhibited positive detections below the quantitation limit. They have been qualified with a 'J' validation flag as the reported results are estimates with an undetermined bias. 1,2,3,7,8-PeCDF, 1,2,3,7,8-PeCDD, and 2,3,7,8-TCDF were reported at an EMPC due to interference in the sample. 1,2,3,7,8-PeCDF and 1,2,3,7,8-PeCDD have been qualified with a 'UJ' validation flag due to positive detection in the method blank and interference in the sample. 2,3,7,8-TCDF has been qualified with a 'UJ' validation flag due to positive detection in the trip blank and interference in the sample.

In MBDS-U01-C01, total TCDD, total PeCDD, 1,2,3,4,7,8-HxCDF, 2,3,4,6,7,8-HxCDF, 1,2,3,4,7,8-HxCDD, 1,2,3,6,7,8-HxCDD, 1,2,3,7,8,9-HxCDD, and 1,2,3,4,7,8,9-HpCDF exhibited positive detections below the quantitation limit. They have been qualified with a 'J' validation flag as the reported results are estimates with an undetermined bias. 1,2,3,7,8-PeCDF was reported at an EMPC due to interference in the sample. It has been qualified with a 'UJ' validation flag due to positive detection in the method blank and interference in the sample. 1,2,3,6,7,8-HxCDF and 1,2,3,4,6,7,8-HpCDF were reported at an EMPC and they have been qualified with an 'R' validation flag due to interference from PCDE.

In MBDS-U01-C04, total PeCDD, 1,2,3,4,7,8-HxCDF, 2,3,4,6,7,8-HxCDF, 1,2,3,4,7,8-HxCDD, 1,2,3,6,7,8-HxCDD, 1,2,3,7,8,9-HxCDD, and 1,2,3,4,7,8,9-HpCDF exhibited positive detections below the quantitation limit. They have been qualified with a 'J' validation flag as the reported results are estimates with an undetermined bias. 1,2,3,6,7,8-HxCDF and 1,2,3,4,6,7,8-HpCDF were reported at an EMPC and they have been qualified with an 'R' validation flag due to interference from PCDE. 2,3,7,8-TCDF has been qualified with a 'UJ' validation flag due to positive detection in the trip blank and interference in the sample.

In MBDS-U01-C05, 2,3,7,8-TCDF, total TCDF, and total TCDD exhibited positive detections below the quantitation limit. They have been qualified with a 'J' validation flag as the reported results are estimates with an undetermined bias. 2,3,7,8-TCDD was reported at an EMPC due to interference in the sample. It has been qualified with a 'J+' validation flag as the reported result is likely overestimated. 1,2,3,6,7,8-HxCDF and OCDF was reported at an EMPC due to interference in the sample. They have been qualified with a 'UJ' validation flag due to positive detection in the method blank and interference in the sample.

In MBDS-U01-I01, total TCDD, 1,2,3,6,7,8-HxCDF, 2,3,4,6,7,8-HxCDF, 1,2,3,6,7,8-HxCDD, 1,2,3,4,6,7,8-HpCDF, total HpCDF, and OCDF exhibited positive detections below the quantitation limit. They have been qualified with a 'J' validation flag as the reported results are estimates with an undetermined bias.

In MBDS-U01-C06, total HpCDD exhibited a positive detection below the quantitation limit. It has been qualified with a 'J' validation flag as the reported results are estimates with an undetermined bias. 1,2,3,4,6,7,8-HpCDF and OCDF were reported at an EMPC due to interference in the sample. They have been qualified with a 'UJ' validation flag due to positive detection in the method blank and interference in the sample.

In MBDS-U02-R01, 2,3,4,7,8-PeCDF, total PeCDD, 1,2,3,6,7,8-HxCDD, 1,2,3,4,6,7,8-HpCDF, and OCDF exhibited positive detections below the quantitation limit. They have been qualified with a 'J' validation flag as the reported results are estimates with an undetermined bias. 2,3,7,8-TCDD and 1,2,3,4,7,8-HxCDD were reported at an EMPC due to interference in the sample. 2,3,7,8-TCDD has been qualified with a 'UJ' validation flag due to positive detection in the trip blank and interference in the sample. 1,2,3,4,7,8-HxCDD has been qualified with a 'UJ' validation flag due to positive detection in the method blank and interference in the sample. 1,2,3,6,7,8-HxCDF was reported at an EMPC and has been qualified with an 'R' validation flag due to interference from PCDE.

In MBDS-U02-I01, 2,3,7,8-TCDD, total PeCDF, total HxCDF, total HxCDD, 1,2,3,4,6,7,8-HpCDF, total HpCDF, and OCDF exhibited positive detections below the quantitation limit. They have been qualified with a 'J' validation flag as the reported results were estimates with an undetermined bias. 1,2,3,7,8-PeCDD, 1,2,3,4,7,8-HxCDF, 2,3,4,6,7,8-HxCDF, 1,2,3,7,8,9-HxCDF, 1,2,3,4,7,8-HxCDD, and 1,2,3,4,7,8,9-HpCDF were reported at an EMPC due to interference in the sample. They have been qualified with a 'UJ' validation flag due to positive detection in the method blank and interference in the sample.

In MBDS-U02-C01, 2,3,4,7,8-PeCDF, total PeCDD, 1,2,3,4,7,8-HxCDF, 1,2,3,6,7,8-HxCDF, 2,3,4,6,7,8-HxCDF, 1,2,3,4,7,8-HxCDD, 1,2,3,6,7,8-HxCDD, and 1,2,3,7,8,9-HxCDD exhibited positive detections below the quantitation limit. They have been qualified with a 'J' validation flag as the reported results were estimates with an undetermined bias. 1,2,3,7,8-PeCDD was reported at an EMPC due to interference in the sample. It has been qualified with a 'UJ' validation flag due to positive detection in the method blank and interference in the sample. 2,3,7,8-TCDF was reported at an EMPC and has been qualified with an 'R' validation flag due to interference from PCDE.

In MBDS-U03-R01, total PeCDF, total HxCDF, total HxCDD, 1,2,3,4,6,7,8-HpCDF, total HpCDF, 1,2,3,4,6,7,8-HpCDF, and OCDF exhibited positive detections below the quantitation limit. They have been qualified with a 'J' validation flag as the reported results are estimates with an undetermined bias. 2,3,7,8-TCDD, 1,2,3,7,8-PeCDD, 1,2,3,4,7,8-HxCDF, 1,2,3,6,7,8-HxCDF, and 1,2,3,4,7,8-HxCDD were reported at EMPC due to interference in the sample. 2,3,7,8-TCDD has been qualified with a 'UJ' validation flag due to positive detection in the trip blank and interference in the sample. 1,2,3,7,8-PeCDD, 1,2,3,4,7,8-HxCDF, 1,2,3,6,7,8-HxCDF, and 1,2,3,4,7,8-HxCDD have been qualified with a 'UJ' validation flag due to positive detection in the method blank and interference in the sample.

In MBDS-U03-C01, total TCDD, 2,3,4,7,8-PeCDF, total PeCDD, 1,2,3,4,7,8-HxCDF, 1,2,3,6,7,8-HxCDF, 1,2,3,4,7,8-HxCDD, 1,2,3,6,7,8-HxCDD, and 1,2,3,7,8,9-HxCDD exhibited positive detections below the quantitation limit. They have been qualified with a 'J' validation flag as the reported results are estimates with an undetermined bias. 2,3,4,6,7,8-HxCDF was reported at an EMPC due to interference in the sample. It has been qualified with a 'J+' validation flag as the reported result is likely overestimated. 2,3,7,8-TCDD and 1,2,3,7,8-PeCDD were reported at EMPC due to interference in the sample. 2,3,7,8-TCDD has been qualified with a 'UJ' validation flag due to positive detection in the trip blank and interference in the sample. 1,2,3,7,8-PeCDD has been qualified with a 'UJ' validation flag due to positive detection in the method blank and interference in the sample.

In MBDS-U03-I01, total PeCDF, 1,2,3,6,7,8-HxCDD, 1,2,3,7,8,9-HxCDD, 1,2,3,4,6,7,8-HpCDF, total HpCDF, and OCDF exhibited positive detections below the quantitation limit. They have been qualified with a 'J' validation flag as the reported results are estimates with an undetermined bias. 1,2,3,7,8-PeCDD was reported at an EMPC due to interference in the sample. It has been qualified with a 'UJ' validation flag due to positive detection in the method blank and interference in the sample.

In MBDS-U05-C01, total TCDD, 2,3,4,7,8-PeCDF, total PeCDD, 1,2,3,6,7,8-HxCDF, 2,3,4,6,7,8-HxCDF, 1,2,3,4,7,8-HxCDD, 1,2,3,6,7,8-HxCDD, and 1,2,3,7,8,9-HxCDD exhibited positive detections below the quantitation limit. They have been qualified with a 'J' validation flag as the reported results are estimates with an undetermined bias. 2,3,7,8-TCDF was reported at an EMPC due to interference in the sample. It has been qualified with a 'J+' validation flag as the reported result is likely overestimated.. 2,3,7,8-TCDD and 1,2,3,7,8,9-HxCDF were reported at an EMPC due to interference in the sample. 2,3,7,8-TCDD has been qualified with a 'UJ' validation flag due to positive detection in the trip blank and interference in the sample. 1,2,3,7,8,9-HxCDF has been qualified with a 'UJ' validation flag due to positive detection in the method blank and interference in the sample.

In MBDS-U05-I01, 1,2,3,6,7,8-HxCDF, 1,2,3,6,7,8-HxCDD, 1,2,3,7,8,9-HxCDD, 1,2,3,4,6,7,8-HpCDF, and OCDF exhibited positive detections below the quantitation limit. They have been qualified with a 'J' validation flag as the reported result is an estimate with an undetermined bias. 2,3,7,8-TCDF, 1,2,3,7,8-PeCDF, 1,2,3,7,8-PeCDD, 1,2,3,7,8,9-HxCDF, 1,2,3,4,7,8-HxCDD, and 1,2,3,4,7,8,9-HpCDF were reported at an EMPC due to interference in the sample. 2,3,7,8-TCDF has been qualified with a 'UJ' validation flag due to positive detection in the trip blank and interference in the sample. 1,2,3,7,8-PeCDF, 1,2,3,7,8-PeCDD, 1,2,3,7,8,9-HxCDF, 1,2,3,4,7,8-HxCDD, and 1,2,3,4,7,8,9-HpCDF have been qualified with a 'UJ' validation flag due to positive detection in the method blank and interference in the sample.

In MBDS-U05-R01, 2,3,4,7,8-PeCDF, 1,2,3,4,7,8-HxCDF, 1,2,3,6,7,8-HxCDF, 2,3,4,6,7,8-HxCDF, and 1,2,3,6,7,8-HxCDD exhibited positive detections below the quantitation limit. They have been qualified with a 'J' validation flag as the reported results were estimates with an undetermined bias. 2,3,7,8-TCDD and 1,2,3,4,7,8,9-HpCDF were reported at an EMPC due to interference in the sample. 2,3,7,8-TCDD has been qualified with a 'UJ' validation flag due to positive detection in the trip blank and interference in the sample. 1,2,3,4,7,8,9-HpCDF has been qualified with a 'UJ' validation flag due to positive detection in the method blank and interference in the sample.

In MBDS-U04-R01, total HxCDF, total HxCDD, total HpCDF, and OCDF exhibited positive detections below the quantitation limit. They have been qualified with a 'J' validation flag as the reported results were estimates with an undetermined bias. 2,3,7,8-TCDD and 1,2,3,7,8,9-HxCDF were reported at an EMPC due to interference in the sample. 2,3,7,8-TCDD has been qualified with a 'UJ' validation flag due to positive detection in the trip blank and interference in the sample. 1,2,3,7,8,9-HxCDF has been qualified with a 'UJ' validation flag due to positive detection in the method blank and interference in the sample.

In MBDS-U04-C01, total PeCDF, 1,2,3,7,8-PeCDD, total PeCDD, 1,2,3,4,7,8-HxCDF, 2,3,4,6,7,8-HxCDF, 1,2,3,4,7,8-HxCDD, 1,2,3,6,7,8-HxCDD, 1,2,3,7,8,9-HxCDD, and 1,2,3,7,8,9-HpCDF exhibited positive detections below the quantitation limit. They have been qualified with a 'J' validation flag as the reported results are estimates with an undetermined bias. OCDF exhibited a positive detection below the quantitation limit. However, it has already been qualified with a 'J-' validation flag as the reported result is likely underestimated due to low LCS recovery. No further qualification was warranted. 1,2,3,7,8,9-HxCDF and 1,2,3,4,7,8,9-HxCDF were reported at an EMPC due to interference in the sample. They have been qualified with a 'J+' validation flag as the reported results are likely overestimated. 1,2,3,6,7,8-HxCDF was reported at an EMPC and has been qualified with an 'R' validation flag due to interference from PCDE.

In MBDS-U04-I01, 1,2,3,7,8-PeCDF, 2,3,4,7,8-PeCDF, 1,2,3,7,8-PeCDD, 1,2,3,4,7,8-HxCDF, 1,2,3,6,7,8-HxCDF, 2,3,4,6,7,8-HxCDF, 1,2,3,7,8,9-HxCDF, and 1,2,3,4,7,8,9-HpCDF exhibited positive detections below the quantitation limit. They have been qualified with a 'J' validation flag as the reported results were estimates with an undetermined bias. OCDF exhibited a positive detection below the quantitation limit. However, it has already been qualified with a 'J-' validation flag as the reported result is likely underestimated due to low LCS recovery. No further qualification was warranted. 2,3,7,8-TCDD was reported at an EMPC due to interference in the sample. It has been qualified with a 'UJ' validation flag due to positive detection in the trip blank and interference in the sample.

11. Chromatogram Quality

No comments relating to chromatogram quality.

5. SUMMARY OF DATA USABILITY

The data validation summary flag table shows that qualifiers were applied to the target analytes for SDG# 1065209.

DATA VALIDATION SUMMARY TABLE					
Compound	MBDS-U10-R01	MBDS-U10-I01	MBDS-U10-C01	MBDS-U11-R01	MBDS-U11-C01
2,3,7,8-TCDF	U		U	J	
Total TCDF					U
2,3,7,8-TCDD	J	J+	J		
Total TCDD	J				J
1,2,3,7,8-PeCDF	U		J	J	
2,3,4,7,8-PeCDF	U	J	J	J	U
Total PeCDF	J	J			J
1,2,3,7,8-PeCDD	J		J	J	
Total PeCDD	J	J	J	J	
1,2,3,4,7,8-HxCDF	U	U	J	J	UJ
1,2,3,6,7,8-HxCDF	J	J	J	J	R
2,3,4,6,7,8-HxCDF	J	U	J	J	U
1,2,3,7,8,9-HxCDF	J		J	J+	
Total HxCDF	J	J			J
1,2,3,4,7,8-HxCDD	J	J	J+	J	
1,2,3,6,7,8-HxCDD	J	J	J	J	J
1,2,3,7,8,9-HxCDD	J	UJ	J	J	U
Total HxCDD		J			J
1,2,3,4,6,7,8-HpCDF	J	J			J
1,2,3,4,7,8,9-HpCDF	J		J	J	
Total HpCDF	U	U			U
1,2,3,4,6,7,8-HpCDD					J
Total HpCDD					U
OCDF	U	UJ			U
OCDD		J-			U

DATA VALIDATION SUMMARY TABLE					
Compound	MBDS-U11-I01	MBDS-U13-R01	MBDS-U13-R04	MBDS-U13-C01	MBDS-U13-I01
2,3,7,8-TCDF	U			U	U
Total TCDF		U	U		
2,3,7,8-TCDD					J
Total TCDD					J
1,2,3,7,8-PeCDF	J	U			
2,3,4,7,8-PeCDF	J		UJ	J	J
Total PeCDF		J	J		
1,2,3,7,8-PeCDD	J	J+	J	J+	U
Total PeCDD	J		J	J	J
1,2,3,4,7,8-HxCDF	J	U	U	J	U
1,2,3,6,7,8-HxCDF	J	J+	J+	J	R
2,3,4,6,7,8-HxCDF	J	UJ	U	J	J
1,2,3,7,8,9-HxCDF	J+	J		J	U
Total HxCDF		J	J		
1,2,3,4,7,8-HxCDD	J	J	J	J	U
1,2,3,6,7,8-HxCDD	J	J+	J+	J	J
1,2,3,7,8,9-HxCDD	J	UJ	U	J	J
Total HxCDD		J	J		
1,2,3,4,6,7,8-HpCDF		J	J		R
1,2,3,4,7,8,9-HpCDF	J			J+	U
Total HpCDF		U	U		U
1,2,3,4,6,7,8-HpCDD		J+	J		
Total HpCDD		U	U		
OCDF		U	U		
OCDD		U	U		

DATA VALIDATION SUMMARY TABLE					
Compound	MBDS-U12-R01	MBDS-U12-C01	MBDS-U12-I01	MBDS-U13-R05 (Trip Blank)	MBDS-U01-R01
2,3,7,8-TCDF		U	U	J	UJ
Total TCDF		U	U	J	U
2,3,7,8-TCDD					
Total TCDD	J	J			
1,2,3,7,8-PeCDF	UJ	U	UJ	U	UJ
2,3,4,7,8-PeCDF	U	U	U	U	U
Total PeCDF	U	U	J	U	J
1,2,3,7,8-PeCDD	U	U	UJ		UJ
Total PeCDD	U	U			U
1,2,3,4,7,8-HxCDF	UJ	U		U	U
1,2,3,6,7,8-HxCDF	U	U	U	UJ	U
2,3,4,6,7,8-HxCDF	U	U	U	U	U
1,2,3,7,8,9-HxCDF	U	UJ	U		U
Total HxCDF	U	U	U	U	J
1,2,3,4,7,8-HxCDD	U	U	U		U
1,2,3,6,7,8-HxCDD	U	U	U	U	U
1,2,3,7,8,9-HxCDD	UJ	UJ	UJ	U	U
Total HxCDD	U			U	J
1,2,3,4,6,7,8-HpCDF	R	UJ	U	U	J
1,2,3,4,7,8,9-HpCDF					
Total HpCDF	U		U	J	
1,2,3,4,6,7,8-HpCDD	U	J	J	U	
Total HpCDD	U	U	U	J	
OCDF	U	U	U	J	J
OCDD	U	U	U		

DATA VALIDATION SUMMARY TABLE					
Compound	MBDS-U01-C01	MBDS-U01-C04	MBDS-U01-C05 (Trip Blank)	MBDS-U01-I01	MBDS-U01-C06 (Equipment Rinsate)
2,3,7,8-TCDF		UJ	J	U	
Total TCDF			J		
2,3,7,8-TCDD	U		J+	U	
Total TCDD	J		J	J	
1,2,3,7,8-PeCDF	UJ	U	U	U	
2,3,4,7,8-PeCDF	U	U	U	U	
Total PeCDF			U		
1,2,3,7,8-PeCDD	U	U	U	U	
Total PeCDD	J	J	U	U	
1,2,3,4,7,8-HxCDF	J	J	U	U	
1,2,3,6,7,8-HxCDF	R	R	UJ	J	
2,3,4,6,7,8-HxCDF	J	J	U	J	
1,2,3,7,8,9-HxCDF	U	U	U	U	
Total HxCDF			U		
1,2,3,4,7,8-HxCDD	J	J	U	U	
1,2,3,6,7,8-HxCDD	J	J	U	J	
1,2,3,7,8,9-HxCDD	J	J	U	U	
Total HxCDD			U		
1,2,3,4,6,7,8-HpCDF	R	R	U	J	UJ
1,2,3,4,7,8,9-HpCDF	J	J			
Total HpCDF			U	J	
1,2,3,4,6,7,8-HpCDD			U		U
Total HpCDD			U		J
OCDF			UJ	J	UJ
OCDD			U		U

DATA VALIDATION SUMMARY TABLE					
Compound	MBDS-U02-R01	MBDS-U02-I01	MBDS-U02-C01	MBDS-U03-R01	MBDS-U03-C01
2,3,7,8-TCDF	U	U	R	U	U
Total TCDF					
2,3,7,8-TCDD	UJ	J	U	UJ	UJ
Total TCDD	U			U	J
1,2,3,7,8-PeCDF		U	U		U
2,3,4,7,8-PeCDF	J	U	J	U	J
Total PeCDF		J		J	
1,2,3,7,8-PeCDD	U	UJ	UJ	UJ	UJ
Total PeCDD	J	U	J	U	J
1,2,3,4,7,8-HxCDF	U	UJ	J	UJ	J
1,2,3,6,7,8-HxCDF	R	U	J	UJ	J
2,3,4,6,7,8-HxCDF	U	UJ	J	U	J+
1,2,3,7,8,9-HxCDF	U	UJ	U		U
Total HxCDF		J		J	
1,2,3,4,7,8-HxCDD	UJ	UJ	J	UJ	J
1,2,3,6,7,8-HxCDD	J	U	J	U	J
1,2,3,7,8,9-HxCDD	U	U	J	U	J
Total HxCDD		J		J	
1,2,3,4,6,7,8-HpCDF	J	J		J	
1,2,3,4,7,8,9-HpCDF		UJ	U	U	U
Total HpCDF		U		J	
1,2,3,4,6,7,8-HpCDD				J	
Total HpCDD					
OCDF	J	J		J	
OCDD					

DATA VALIDATION SUMMARY TABLE					
Compound	MBDS-U03-I01	MBDS-U05-C01	MBDS-U05-I01	MBDS-U05-R01	MBDS-U04-R01
2,3,7,8-TCDF	U	J+	UJ	U	
Total TCDF					
2,3,7,8-TCDD	U	UJ		UJ	UJ
Total TCDD	U	J	U		U
1,2,3,7,8-PeCDF	U		UJ	U	U
2,3,4,7,8-PeCDF	U	J	U	J	U
Total PeCDF	J				
1,2,3,7,8-PeCDD	UJ	U	UJ	U	U
Total PeCDD	U	J	U	U	U
1,2,3,4,7,8-HxCDF	U	U	U	J	
1,2,3,6,7,8-HxCDF	U	J	J	J	R
2,3,4,6,7,8-HxCDF	U	J	U	J	U
1,2,3,7,8,9-HxCDF		UJ	UJ	U	UJ
Total HxCDF					J
1,2,3,4,7,8-HxCDD	U	J	UJ	U	U
1,2,3,6,7,8-HxCDD	J	J	J	J	U
1,2,3,7,8,9-HxCDD	J	J	J	U	U
Total HxCDD					J
1,2,3,4,6,7,8-HpCDF	J		J		U
1,2,3,4,7,8,9-HpCDF	U	U	UJ	UJ	
Total HpCDF	J				J
1,2,3,4,6,7,8-HpCDD					
Total HpCDD					
OCDF	J		J		J
OCDD					

DATA VALIDATION SUMMARY TABLE		
Compound	MBDS-U04-C01	MBDS-U04-I01
2,3,7,8-TCDF	U	U
Total TCDF	U	
2,3,7,8-TCDD		UJ
Total TCDD	U	
1,2,3,7,8-PeCDF	U	J
2,3,4,7,8-PeCDF	U	J
Total PeCDF	J	
1,2,3,7,8-PeCDD	J	J
Total PeCDD	J	
1,2,3,4,7,8-HxCDF	J	J
1,2,3,6,7,8-HxCDF	J	J
2,3,4,6,7,8-HxCDF	J	J
1,2,3,7,8,9-HxCDF	J+	J
Total HxCDF		
1,2,3,4,7,8-HxCDD	J	
1,2,3,6,7,8-HxCDD	J	
1,2,3,7,8,9-HxCDD	J	
Total HxCDD		
1,2,3,4,6,7,8-HpCDF	J	
1,2,3,4,7,8,9-HpCDF	J+	J
Total HpCDF		
1,2,3,4,6,7,8-HpCDD		
Total HpCDD		
OCDF	J-	J-
OCDD		

Data Validation Summary Table Qualifier Codes

U = Result is a non-detect.

UJ = Result is a non-detect, but is estimated due to QC issues.

J = Result was detected, but is estimated with an undetermined bias due to QC issues.

J+ = Result was detected, but is likely overestimated due to QC issues.

J- = Result was detected, but is likely underestimated due to QC issues.

R = Result is rejected and is highly questionable for use as a quantitative value due to significant QC issues.

6. REFERENCES

Contract Laboratory Program National Functional Guidelines for Organic Data Review, EPA 540/R-99/008, October 1999, U.S. Environmental Protection Agency, Cincinnati, Ohio.

USEPA Analytical Operations / Data Quality Center, *National Functional Guidelines for Chlorinated Dioxin / Furan Data Review*, EPA 540-R-02-003, August 2002.

USEPA, *Methods for the Analysis of Wastes, High Resolution Gas Chromatography / Mass Spectrometry*, SW-846, July 2002.

USEPA Test Methods for Evaluating Solid Waste Physical/Chemical Methods, Doc. No. SW-846, 3rd Ed., Method 8290, Polychlorinated Dibenzodioxins (PCDDs) and Polychlorinated Dibenzofurans (PCDFs) by High Resolution Gas Chromatography/High Resolution Mass Spectrometry (HRGC/HRMS), Revision 0, September 1994.

9. ATTACHMENTS

The following items are included as an attachment to this L&V report:

- A. Qualified reported results (Form I)

Attachment A
Qualified Reported Results

Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612-607-6444



Pace Analytical™

Method 8290 Sample Analysis Results

Client - Montana Dept. Of Env. Quality

Client's Sample ID	MBDS-U10-R01				
Lab Sample ID	1065209001				
Filename	U80108A_17				
Injected By	SMT				
Total Amount Extracted	11.9 g			Matrix	Soil
% Moisture	14.8			Dilution	NA
Dry Weight Extracted	10.1 g			Collected	12/13/2007
ICAL Date	12/27/2007			Received	12/18/2007
CCal Filename(s)	U80108A_03 & U80108A_19			Extracted	12/29/2007
Method Blank ID	BLANK-15160			Analyzed	01/09/2008 00:20

Native Isomers	Conc ng/Kg	EMPC ng/Kg	RL ng/Kg	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	0.170	—	0.030	2,3,7,8-TCDF-13C	2.00	96
Total TCDF	1.800	—	0.030	2,3,7,8-TCDD-13C	2.00	91
				1,2,3,7,8-PeCDF-13C	2.00	97
2,3,7,8-TCDD	0.300	—	0.016	2,3,4,7,8-PeCDF-13C	2.00	98
Total TCDD	0.720	—	0.016	1,2,3,7,8-PeCDD-13C	2.00	112
				1,2,3,4,7,8-HxCDF-13C	2.00	89
1,2,3,7,8-PeCDF	0.085	—	0.026	1,2,3,6,7,8-HxCDF-13C	2.00	77
2,3,4,7,8-PeCDF	0.150	—	0.023	2,3,4,6,7,8-HxCDF-13C	2.00	79
Total PeCDF	3.800	—	0.025	1,2,3,7,8,9-HxCDF-13C	2.00	83
				1,2,3,4,7,8-HxCDD-13C	2.00	92
1,2,3,7,8-PeCDD	0.130	—	0.044	1,2,3,6,7,8-HxCDD-13C	2.00	82
Total PeCDD	0.570	—	0.044	1,2,3,4,6,7,8-HpCDF-13C	2.00	73
				1,2,3,4,7,8,9-HpCDF-13C	2.00	65
1,2,3,4,7,8-HxCDF	0.190	—	0.032	1,2,3,4,6,7,8-HpCDD-13C	2.00	83
1,2,3,6,7,8-HxCDF	0.270	—	0.029	OCDD-13C	4.00	65
2,3,4,6,7,8-HxCDF	0.310	—	0.026			
1,2,3,7,8,9-HxCDF	0.061	—	0.039	1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	4.500	—	0.031	1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	0.250	—	0.057	2,3,7,8-TCDD-37Cl4	0.20	91
1,2,3,6,7,8-HxCDD	0.610	—	0.055			
1,2,3,7,8,9-HxCDD	0.520	—	0.060			
Total HxCDD	5.600	—	0.057			
1,2,3,4,6,7,8-HpCDF	2.400	—	0.038	Total 2,3,7,8-TCDD		
1,2,3,4,7,8,9-HpCDF	0.120	—	0.056	Equivalence: 0.96 ng/Kg		
Total HpCDF	3.800	—	0.047	(Using ITE Factors)		
1,2,3,4,6,7,8-HpCDD	14.000	—	0.048			
Total HpCDD	25.000	—	0.048			
OCDF	5.800	—	0.059			
OCDD	100.000	—	0.051			

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
EMPC = Estimated Maximum Possible Concentration
RL = Reporting Limit.

ND = Not Detected
NA = Not Applicable
NC = Not Calculated

Results reported on a dry weight basis and are valid to no more than 2 significant figures.
J = Value below calibration range

JB
2/4/08

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc.
9 of 56

Report No.....1065209_8290

Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612-607-6444



Pace AnalyticalTM

Method 8290 Sample Analysis Results

Client - Montana Dept. Of Env. Quality

Client's Sample ID	MBDS-U10-101		
Lab Sample ID	1065209002		
Filename	F80105A_14		
Injected By	BAL		
Total Amount Extracted	11.1 g	Matrix	Soil
% Moisture	5.9	Dilution	NA
Dry Weight Extracted	10.4 g	Collected	12/13/2007
ICAL Date	12/28/2007	Received	12/18/2007
CCal Filename(s)	F80104B_20 & F80105A_17	Extracted	12/29/2007
Method Blank ID	BLANK-15160	Analyzed	01/05/2008 12:47

Native Isomers	Conc ng/Kg	EMPC ng/Kg	RL ng/Kg	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	ND	—	0.16	2,3,7,8-TCDF-13C	2.00	80
Total TCDF	3.70	—	0.16	2,3,7,8-TCDD-13C	2.00	78
				1,2,3,7,8-PeCDF-13C	2.00	76
2,3,7,8-TCDD	—	0.20	0.11 + J	2,3,4,7,8-PeCDF-13C	2.00	76
Total TCDD	2.60	—	0.11	1,2,3,7,8-PeCDD-13C	2.00	86
				1,2,3,4,7,8-HxCDF-13C	2.00	82
1,2,3,7,8-PeCDF	ND	—	0.17	1,2,3,6,7,8-HxCDF-13C	2.00	80
2,3,4,7,8-PeCDF	0.23	—	0.13 + J	2,3,4,6,7,8-HxCDF-13C	2.00	74
Total PeCDF	3.20	—	0.15 + J	1,2,3,7,8,9-HxCDF-13C	2.00	77
				1,2,3,4,7,8-HxCDD-13C	2.00	79
1,2,3,7,8-PeCDD	ND	—	0.11	1,2,3,6,7,8-HxCDD-13C	2.00	80
Total PeCDD	0.23	—	0.11 + J	1,2,3,4,6,7,8-HpCDF-13C	2.00	56
				1,2,3,4,7,8,9-HpCDF-13C	2.00	46
1,2,3,4,7,8-HxCDF	0.18	—	0.17 + U	1,2,3,4,6,7,8-HpCDD-13C	2.00	60
1,2,3,6,7,8-HxCDF	0.23	—	0.13 + J	OCDD-13C	4.00	39 P
2,3,4,6,7,8-HxCDF	0.26	—	0.17 + U			
1,2,3,7,8,9-HxCDF	ND	—	0.15	1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	2.30	—	0.16 + J	1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	0.21	—	0.19 + J	2,3,7,8-TCDD-37Cl4	0.20	84
1,2,3,6,7,8-HxCDD	0.32	—	0.18 + J			
1,2,3,7,8,9-HxCDD	—	0.17	0.12 + U J			
Total HxCDD	2.80	—	0.16 + J			
1,2,3,4,6,7,8-HpCDF	1.40	—	0.19 + J	Total 2,3,7,8-TCDD		
1,2,3,4,7,8,9-HpCDF	ND	—	0.15	Equivalence: 0.38 ng/Kg		
Total HpCDF	3.60	—	0.17 + U	(Using ITE Factors)		
1,2,3,4,6,7,8-HpCDD	6.90	—	0.16			
Total HpCDD	14.00	—	0.16 U			
OCDF	3.00	—	0.28 J U J			
OCDD	58.00	—	0.27 J -			

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).

EMPC = Estimated Maximum Possible Concentration

RL = Reporting Limit.

ND = Not Detected

NA = Not Applicable

NC = Not Calculated

Results reported on a dry weight basis and are valid to no more than 2 significant figures.

J = Value below calibration range

P = Recovery outside target range

I = Interference present

AB
2/4/08

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc.

10 of 56

Report No.....1065209_8290

Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612-607-6444



Pace Analytical™

Method 8290 Sample Analysis Results

Client - Montana Dept. Of Env. Quality

Client's Sample ID	MBDS-U10-C01		
Lab Sample ID	1065209003		
Filename	F80105A_13		
Injected By	BAL		
Total Amount Extracted	11.3 g	Matrix	Soil
% Moisture	8.0	Dilution	NA
Dry Weight Extracted	10.4 g	Collected	12/13/2007
ICAL Date	12/28/2007	Received	12/18/2007
CCal Filename(s)	F80104B_20 & F80105A_17	Extracted	12/29/2007
Method Blank ID	BLANK-15160	Analyzed	01/05/2008 11:58

Native Isomers	Conc ng/Kg	EMPC ng/Kg	RL ng/Kg	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	0.38	—	0.210	2,3,7,8-TCDF-13C	2.00	77
Total TCDF	11.00	—	0.210	2,3,7,8-TCDD-13C	2.00	71
				1,2,3,7,8-PeCDF-13C	2.00	77
2,3,7,8-TCDD	0.52	—	0.230	2,3,4,7,8-PeCDF-13C	2.00	69
Total TCDD	1.50	—	0.230	1,2,3,7,8-PeCDD-13C	2.00	88
				1,2,3,4,7,8-HxCDF-13C	2.00	76
1,2,3,7,8-PeCDF	0.35	—	0.240	1,2,3,6,7,8-HxCDF-13C	2.00	73
2,3,4,7,8-PeCDF	1.10	—	0.190	2,3,4,6,7,8-HxCDF-13C	2.00	70
Total PeCDF	33.00	—	0.220	1,2,3,7,8,9-HxCDF-13C	2.00	71
				1,2,3,4,7,8-HxCDD-13C	2.00	79
1,2,3,7,8-PeCDD	0.38	—	0.120	1,2,3,6,7,8-HxCDD-13C	2.00	73
Total PeCDD	2.30	—	0.120	1,2,3,4,6,7,8-HpCDF-13C	2.00	58
				1,2,3,4,7,8,9-HpCDF-13C	2.00	50
1,2,3,4,7,8-HxCDF	0.89	—	0.110	1,2,3,4,6,7,8-HpCDD-13C	2.00	63
1,2,3,6,7,8-HxCDF	0.92	—	0.100	OCDD-13C	4.00	44
2,3,4,6,7,8-HxCDF	1.50	—	0.096			
1,2,3,7,8,9-HxCDF	0.27	—	0.100	1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	24.00	—	0.100	1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	—	0.41	0.220	2,3,7,8-TCDD-37Cl4	0.20	73
1,2,3,6,7,8-HxCDD	1.50	—	0.240			
1,2,3,7,8,9-HxCDD	0.86	—	0.150			
Total HxCDD	12.00	—	0.200			
1,2,3,4,6,7,8-HpCDF	8.30	—	0.180	Total 2,3,7,8-TCDD		
1,2,3,4,7,8,9-HpCDF	0.47	—	0.130	Equivalence; 2.6 ng/Kg		
Total HpCDF	20.00	—	0.160	(Using ITE Factors)		
1,2,3,4,6,7,8-HpCDD	32.00	—	0.260			
Total HpCDD	59.00	—	0.260			
OCDF	17.00	—	0.210			
OCDD	270.00	—	0.330			

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).

EMPC = Estimated Maximum Possible Concentration

RL = Reporting Limit.

ND = Not Detected

NA = Not Applicable

NC = Not Calculated

Results reported on a dry weight basis and are valid to no more than 2 significant figures.

J = Value below calibration range

I = Interference present

*MB
2/14/08*

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc.

11 of 56

Report No. 1065209_8290



Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612-607-6444

Method 8290 Sample Analysis Results

Client - Montana Dept. Of Env. Quality

Client's Sample ID	MBDS-U11-R01		
Lab Sample ID	1065209004		
Filename	F80105A_12		
Injected By	BAL		
Total Amount Extracted	12.2 g	Matrix	Soil
% Moisture	13.6	Dilution	NA
Dry Weight Extracted	10.5 g	Collected	12/13/2007
ICAL Date	12/28/2007	Received	12/18/2007
CCal Filename(s)	F80404B_20 & F80105A_17	Extracted	12/29/2007
Method Blank ID	BLANK-15160	Analyzed	01/05/2008 11:10

Native Isomers	Conc ng/Kg	EMPC ng/Kg	RL ng/Kg	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	0.37	—	0.110	2,3,7,8-TCDF-13C	2.00	86
Total TCDF	7.70	—	0.110	2,3,7,8-TCDD-13C	2.00	81
				1,2,3,7,8-PeCDF-13C	2.00	85
2,3,7,8-TCDD	1.10	—	0.094	2,3,4,7,8-PeCDF-13C	2.00	87
Total TCDD	2.90	—	0.094	1,2,3,7,8-PeCDD-13C	2.00	97
				1,2,3,4,7,8-HxCDF-13C	2.00	85
1,2,3,7,8-PeCDF	0.21	—	0.180	1,2,3,6,7,8-HxCDF-13C	2.00	84
2,3,4,7,8-PeCDF	0.71	—	0.049	2,3,4,6,7,8-HxCDF-13C	2.00	80
Total PeCDF	33.00	—	0.110	1,2,3,7,8,9-HxCDF-13C	2.00	84
				1,2,3,4,7,8-HxCDD-13C	2.00	90
1,2,3,7,8-PeCDD	0.17	—	0.058	1,2,3,6,7,8-HxCDD-13C	2.00	83
Total PeCDD	2.90	—	0.058	1,2,3,4,6,7,8-HpCDF-13C	2.00	69
				1,2,3,4,7,8,9-HpCDF-13C	2.00	59
1,2,3,4,7,8-HxCDF	0.58	—	0.068	1,2,3,4,6,7,8-HpCDD-13C	2.00	73
1,2,3,6,7,8-HxCDF	1.50	—	0.062	OCDD-13C	4.00	52
2,3,4,6,7,8-HxCDF	1.80	—	0.064			
1,2,3,7,8,9-HxCDF	—	0.25	0.064	1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	26.00	—	0.065	1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	0.20	—	0.110	2,3,7,8-TCDD-37Cl4	0.20	79
1,2,3,6,7,8-HxCDD	0.97	—	0.160			
1,2,3,7,8,9-HxCDD	0.51	—	0.100			
Total HxCDD	7.50	—	0.120			
1,2,3,4,6,7,8-HpCDF	6.90	—	0.063	Total 2,3,7,8-TCDD		
1,2,3,4,7,8,9-HpCDF	0.43	—	0.100	Equivalence: 2.6 ng/Kg		
Total HpCDF	19.00	—	0.083	(Using ITE Factors)		
1,2,3,4,6,7,8-HpCDD	15.00	—	0.100			
Total HpCDD	33.00	—	0.100			
OCDF	12.00	—	0.150			
OCDD	130.00	—	0.160			

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
EMPC = Estimated Maximum Possible Concentration
RL = Reporting Limit.

ND = Not Detected
NA = Not Applicable
NC = Not Calculated

Results reported on a dry weight basis and are valid to no more than 2 significant figures.

J = Value below calibration range

I = Interference present

MS
2/4/08

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc.

12 of 56

Report No.....1065209_8290

Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612-607-6444



Pace Analytical™

Method 8290 Sample Analysis Results

Client - Montana Dept. Of Env. Quality

Client's Sample ID	MBDS-U11-C01		
Lab Sample ID	1065209005		
Filename	F80105A_11		
Injected By	BAL		
Total Amount Extracted	11.7 g	Matrix	Soil
% Moisture	11.6	Dilution	NA
Dry Weight Extracted	10.4 g	Collected	12/13/2007
ICAL Date	12/28/2007	Received	12/18/2007
CCal Filename(s)	F80104B_20 & F80105A_17	Extracted	12/29/2007
Method Blank ID	BLANK-15160	Analyzed	01/05/2008 10:22

Native Isomers	Conc ng/Kg	EMPC ng/Kg	RL ng/Kg	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	ND	—	0.092	2,3,7,8-TCDF-13C	2.00	84
Total TCDF	0.32	—	0.092	2,3,7,8-TCDD-13C	2.00	85
				1,2,3,7,8-PeCDF-13C	2.00	84
2,3,7,8-TCDD	ND	—	0.063	2,3,4,7,8-PeCDF-13C	2.00	87
Total TCDD	0.29	—	0.063	1,2,3,7,8-PeCDD-13C	2.00	98
				1,2,3,4,7,8-HxCDF-13C	2.00	88
1,2,3,7,8-PeCDF	ND	—	0.130	1,2,3,6,7,8-HxCDF-13C	2.00	85
2,3,4,7,8-PeCDF	0.12	—	0.068	2,3,4,6,7,8-HxCDF-13C	2.00	82
Total PeCDF	1.20	—	0.100	1,2,3,7,8,9-HxCDF-13C	2.00	87
				1,2,3,4,7,8-HxCDD-13C	2.00	94
1,2,3,7,8-PeCDD	ND	—	0.073	1,2,3,6,7,8-HxCDD-13C	2.00	87
Total PeCDD	ND	—	0.073	1,2,3,4,6,7,8-HpCDF-13C	2.00	74
				1,2,3,4,7,8,9-HpCDF-13C	2.00	65
1,2,3,4,7,8-HxCDF	—	0.071	0.055	1,2,3,4,6,7,8-HpCDD-13C	2.00	79
1,2,3,6,7,8-HxCDF	—	0.250	0.046	OCDD-13C	4.00	56
2,3,4,6,7,8-HxCDF	0.13	—	0.049			
1,2,3,7,8,9-HxCDF	ND	—	0.055	1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	1.60	—	0.051	1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	ND	—	0.075	2,3,7,8-TCDD-37Cl4	0.20	87
1,2,3,6,7,8-HxCDD	0.27	—	0.075			
1,2,3,7,8,9-HxCDD	0.23	—	0.073			
Total HxCDD	1.30	—	0.074			
1,2,3,4,6,7,8-HpCDF	1.00	—	0.058	Total 2,3,7,8-TCDD		
1,2,3,4,7,8,9-HpCDF	ND	—	0.079	Equivalence: 0.22 ng/Kg		
Total HpCDF	3.30	—	0.068	(Using ITE Factors)		
1,2,3,4,6,7,8-HpCDD	4.70	—	0.066			
Total HpCDD	8.80	—	0.066			
OCDF	3.40	—	0.140			
OCDD	39.00	—	0.150			

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
EMPC = Estimated Maximum Possible Concentration
RL = Reporting Limit.

ND = Not Detected
NA = Not Applicable
NC = Not Calculated

Results reported on a dry weight basis and are valid to no more than 2 significant figures.

J = Value below calibration range

E = PCDE Interference

I = Interference present

AB
2/4/08

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc.
13 of 56

Report No.....1065209_8290

Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612-607-6444



Pace Analytical™

Method 8290 Sample Analysis Results

Client - Montana Dept. Of Env. Quality

Client's Sample ID	MBDS-U11-I01		
Lab Sample ID	1065209006		
Filename	F80105A_10		
Injected By	BAL		
Total Amount Extracted	12.3 g	Matrix	Soil
% Moisture	15.0	Dilution	NA
Dry Weight Extracted	10.5 g	Collected	12/13/2007
ICAL Date	12/28/2007	Received	12/18/2007
Ccal Filename(s)	F80104B_20 & F80105A_17	Extracted	12/29/2007
Method Blank ID	BLANK-15160	Analyzed	01/05/2008 09:34

Native Isomers	Conc ng/Kg	EMPC ng/Kg	RL ng/Kg	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	0.50	—	0.160	J J 2,3,7,8-TCDF-13C	2.00	91
Total TCDF	14.00	—	0.160	2,3,7,8-TCDD-13C	2.00	90
				1,2,3,7,8-PeCDF-13C	2.00	90
2,3,7,8-TCDD	ND	—	0.120	2,3,4,7,8-PeCDF-13C	2.00	92
Total TCDD	1.20	—	0.120	1,2,3,7,8-PeCDD-13C	2.00	100
				1,2,3,4,7,8-HxCDF-13C	2.00	90
1,2,3,7,8-PeCDF	0.39	—	0.140	1,2,3,6,7,8-HxCDF-13C	2.00	89
2,3,4,7,8-PeCDF	1.10	—	0.076	2,3,4,6,7,8-HxCDF-13C	2.00	85
Total PeCDF	7.70	—	0.110	1,2,3,7,8,9-HxCDF-13C	2.00	84
				1,2,3,4,7,8-HxCDD-13C	2.00	93
1,2,3,7,8-PeCDD	0.17	—	0.074	1,2,3,6,7,8-HxCDD-13C	2.00	90
Total PeCDD	2.20	—	0.074	1,2,3,4,6,7,8-HpCDF-13C	2.00	71
				1,2,3,4,7,8,9-HpCDF-13C	2.00	62
1,2,3,4,7,8-HxCDF	0.59	—	0.051	1,2,3,4,6,7,8-HpCDD-13C	2.00	79
1,2,3,6,7,8-HxCDF	0.46	—	0.045	OCDD-13C	4.00	54
2,3,4,6,7,8-HxCDF	1.00	—	0.057			
1,2,3,7,8,9-HxCDF	—	0.17	0.061	1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	11.00	—	0.053	1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	0.33	—	0.055	2,3,7,8-TCDD-37Cl4	0.20	88
1,2,3,6,7,8-HxCDD	0.89	—	0.068			
1,2,3,7,8,9-HxCDD	0.54	—	0.061			
Total HxCDD	7.10	—	0.061			
1,2,3,4,6,7,8-HpCDF	4.90	—	0.067	Total 2,3,7,8-TCDD		
1,2,3,4,7,8,9-HpCDF	0.35	—	0.067	Equivalence: 1.4 ng/Kg		
Total HpCDF	12.00	—	0.067	(Using ITE Factors)		
1,2,3,4,6,7,8-HpCDD	17.00	—	0.140			
Total HpCDD	33.00	—	0.140			
OCDF	9.70	—	0.160			
OCDD	140.00	—	0.150			

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
EMPC = Estimated Maximum Possible Concentration
RL = Reporting Limit.

ND = Not Detected
NA = Not Applicable
NC = Not Calculated

Results reported on a dry weight basis and are valid to no more than 2 significant figures.

J = Value below calibration range
I = Interference present

MS
2/4/08

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc.

14 of 56

Report No.....1065209_8290

Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612-607-6444



Pace Analytical™

Method 8290 Sample Analysis Results

Client - Montana Dept. Of Env. Quality

Client's Sample ID	MBDS-U13-R01		
Lab Sample ID	1065209007		
Filename	F80105B_03		
Injected By	BAL		
Total Amount Extracted	11.5 g	Matrix	Soil
% Moisture	6.0	Dilution	NA
Dry Weight Extracted	10.8 g	Collected	12/13/2007
ICAL Date	12/28/2007	Received	12/18/2007
CCal Filename(s)	F80105A_17 & F80105B_15	Extracted	12/29/2007
Method Blank ID	BLANK-15160	Analyzed	01/05/2008 17:35

Native Isomers	Conc ng/Kg	EMPC ng/Kg	RL ng/Kg	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	ND	—	0.068	2,3,7,8-TCDF-13C	2.00	80
Total TCDF	0.660	—	0.068	2,3,7,8-TCDD-13C	2.00	80
				1,2,3,7,8-PeCDF-13C	2.00	83
2,3,7,8-TCDD	ND	—	0.056	2,3,4,7,8-PeCDF-13C	2.00	86
Total TCDD	ND	—	0.056	1,2,3,7,8-PeCDD-13C	2.00	98
				1,2,3,4,7,8-HxCDF-13C	2.00	85
1,2,3,7,8-PeCDF	0.097	—	0.044	1,2,3,6,7,8-HxCDF-13C	2.00	84
2,3,4,7,8-PeCDF	ND	—	0.045	2,3,4,6,7,8-HxCDF-13C	2.00	81
Total PeCDF	0.390	—	0.044	1,2,3,7,8,9-HxCDF-13C	2.00	79
				1,2,3,4,7,8-HxCDD-13C	2.00	87
1,2,3,7,8-PeCDD	—	0.076	0.074	1,2,3,6,7,8-HxCDD-13C	2.00	86
Total PeCDD	ND	—	0.074	1,2,3,4,6,7,8-HpCDF-13C	2.00	74
				1,2,3,4,7,8,9-HpCDF-13C	2.00	63
1,2,3,4,7,8-HxCDF	0.088	—	0.045	1,2,3,4,6,7,8-HpCDD-13C	2.00	78
1,2,3,6,7,8-HxCDF	—	0.094	0.050	OCDD-13C	4.00	62
2,3,4,6,7,8-HxCDF	—	0.110	0.043			
1,2,3,7,8,9-HxCDF	0.120	—	0.064	1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	0.210	—	0.050	1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	0.078	—	0.042	2,3,7,8-TCDD-37Cl4	0.20	83
1,2,3,6,7,8-HxCDD	—	0.073	0.056			
1,2,3,7,8,9-HxCDD	—	0.140	0.046			
Total HxCDD	0.860	—	0.048			
1,2,3,4,6,7,8-HpCDF	0.400	—	0.041	Total 2,3,7,8-TCDD		
1,2,3,4,7,8,9-HpCDF	ND	—	0.079	Equivalence: 0.049 ng/Kg		
Total HpCDF	0.550	—	0.060	(Using ITE Factors)		
1,2,3,4,6,7,8-HpCDD	—	1.200	0.084			
Total HpCDD	1.500	—	0.084			
OCDF	0.930	—	0.092			
OCDD	10.000	—	0.110			

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
EMPC = Estimated Maximum Possible Concentration
RL = Reporting Limit.

ND = Not Detected
NA = Not Applicable
NC = Not Calculated

Results reported on a dry weight basis and are valid to no more than 2 significant figures.
J = Value below calibration range
B = Less than 10x higher than method blank level
I = Interference present

AB
2/14/08

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc.
15 of 56

Report No.....1065209_8290

Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612-607-6444



Pace Analytical™

Method 8290 Sample Analysis Results

Client - Montana Dept. Of Env. Quality

Client's Sample ID	MBDS-U13-R04		
Lab Sample ID	1065209008		
Filename	F80105B_04		
Injected By	BAL		
Total Amount Extracted	10.8 g	Matrix	Soil
% Moisture	5.8	Dilution	NA
Dry Weight Extracted	10.2 g	Collected	12/13/2007
ICAL Date	12/28/2007	Received	12/18/2007
CCal Filename(s)	F80105A_17 & F80105B_15	Extracted	12/29/2007
Method Blank ID	BLANK-15160	Analyzed	01/05/2008 18:23

Native Isomers	Conc ng/Kg	EMPC ng/Kg	RL ng/Kg	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	ND	—	0.056	2,3,7,8-TCDF-13C	2.00	85
Total TCDF	0.170	—	0.056	2,3,7,8-TCDD-13C	2.00	86
				1,2,3,7,8-PeCDF-13C	2.00	84
2,3,7,8-TCDD	ND	—	0.086	2,3,4,7,8-PeCDF-13C	2.00	85
Total TCDD	ND	—	0.086	1,2,3,7,8-PeCDD-13C	2.00	98
				1,2,3,4,7,8-HxCDF-13C	2.00	87
1,2,3,7,8-PeCDF	ND	—	0.085	1,2,3,6,7,8-HxCDF-13C	2.00	86
2,3,4,7,8-PeCDF	—	0.065	0.050	2,3,4,6,7,8-HxCDF-13C	2.00	82
Total PeCDF	0.670	—	0.067	1,2,3,7,8,9-HxCDF-13C	2.00	83
				1,2,3,4,7,8-HxCDD-13C	2.00	89
1,2,3,7,8-PeCDD	0.081	—	0.063	1,2,3,6,7,8-HxCDD-13C	2.00	90
Total PeCDD	0.081	—	0.063	1,2,3,4,6,7,8-HpCDF-13C	2.00	70
				1,2,3,4,7,8,9-HpCDF-13C	2.00	57
1,2,3,4,7,8-HxCDF	0.091	—	0.064	1,2,3,4,6,7,8-HpCDD-13C	2.00	73
1,2,3,6,7,8-HxCDF	—	0.100	0.062	OCDD-13C	4.00	56
2,3,4,6,7,8-HxCDF	0.100	—	0.066			
1,2,3,7,8,9-HxCDF	ND	—	0.067	1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	0.580	—	0.065	1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	0.093	—	0.074	2,3,7,8-TCDD-37Cl4	0.20	88
1,2,3,6,7,8-HxCDD	—	0.110	0.096			
1,2,3,7,8,9-HxCDD	0.110	—	0.072			
Total HxCDD	0.530	—	0.081			
1,2,3,4,6,7,8-HpCDF	0.460	—	0.041	Total 2,3,7,8-TCDD		
1,2,3,4,7,8,9-HpCDF	ND	—	0.093	Equivalence: 0.12 ng/Kg		
Total HpCDF	0.460	—	0.067	(Using ITE Factors)		
1,2,3,4,6,7,8-HpCDD	1.700	—	0.097			
Total HpCDD	3.500	—	0.097			
OCDF	0.990	—	0.180			
OCDD	13.000	—	0.140			

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
EMPC = Estimated Maximum Possible Concentration
RL = Reporting Limit.

ND = Not Detected
NA = Not Applicable
NC = Not Calculated

Results reported on a dry weight basis and are valid to no more than 2 significant figures.

J = Value below calibration range

B = Less than 10x higher than method blank level

I = Interference present

*AB
2/4/08*

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc.

16 of 56

Report No.1065209_8290

Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612-607-6444



Pace AnalyticalTM

Method 8290 Sample Analysis Results

Client - Montana Dept. Of Env. Quality

Client's Sample ID	MBDS-U13-C01		
Lab Sample ID	1065209009		
Filename	F80105B_05		
Injected By	BAL		
Total Amount Extracted	11.3 g	Matrix	Soil
% Moisture	10.6	Dilution	NA
Dry Weight Extracted	10.1 g	Collected	12/13/2007
ICAL Date	12/28/2007	Received	12/18/2007
CCal Filename(s)	F80105A_17 & F80105B_15	Extracted	12/29/2007
Method Blank ID	BLANK-15160	Analyzed	01/05/2008 19:11

Native Isomers	Conc ng/Kg	EMPC ng/Kg	RL ng/Kg	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	0.37	—	0.130	2,3,7,8-TCDF-13C	2.00	86
Total TCDF	4.10	—	0.130	2,3,7,8-TCDD-13C	2.00	83
				1,2,3,7,8-PeCDF-13C	2.00	80
2,3,7,8-TCDD	1.60	—	0.120	2,3,4,7,8-PeCDF-13C	2.00	81
Total TCDD	2.20	—	0.120	1,2,3,7,8-PeCDD-13C	2.00	91
				1,2,3,4,7,8-HxCDF-13C	2.00	81
1,2,3,7,8-PeCDF	ND	—	0.081	1,2,3,6,7,8-HxCDF-13C	2.00	80
2,3,4,7,8-PeCDF	0.85	—	0.052	2,3,4,6,7,8-HxCDF-13C	2.00	76
Total PeCDF	16.00	—	0.066	1,2,3,7,8,9-HxCDF-13C	2.00	78
				1,2,3,4,7,8-HxCDD-13C	2.00	83
1,2,3,7,8-PeCDD	—	0.15	0.062	1,2,3,6,7,8-HxCDD-13C	2.00	82
Total PeCDD	0.46	—	0.062	1,2,3,4,6,7,8-HpCDF-13C	2.00	63
				1,2,3,4,7,8,9-HpCDF-13C	2.00	53
1,2,3,4,7,8-HxCDF	0.51	—	0.089	1,2,3,4,6,7,8-HpCDD-13C	2.00	66
1,2,3,6,7,8-HxCDF	0.74	—	0.073	OCDD-13C	4.00	42
2,3,4,6,7,8-HxCDF	0.89	—	0.062			
1,2,3,7,8,9-HxCDF	0.18	—	0.120	1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	15.00	—	0.086	1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	0.25	—	0.066	2,3,7,8-TCDD-37C4	0.20	81
1,2,3,6,7,8-HxCDD	0.84	—	0.080			
1,2,3,7,8,9-HxCDD	0.45	—	0.090			
Total HxCDD	6.20	—	0.079			
1,2,3,4,6,7,8-HpCDF	6.20	—	0.095	Total 2,3,7,8-TCDD		
1,2,3,4,7,8,9-HpCDF	—	0.29	0.120	Equivalence: 2.8 ng/Kg		
Total HpCDF	15.00	—	0.110	(Using ITE Factors)		
1,2,3,4,6,7,8-HpCDD	17.00	—	0.100			
Total HpCDD	31.00	—	0.100			
OCDF	13.00	—	0.140			
OCDD	140.00	—	0.120			

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
EMPC = Estimated Maximum Possible Concentration
RL = Reporting Limit.

ND = Not Detected
NA = Not Applicable
NC = Not Calculated

Results reported on a dry weight basis and are valid to no more than 2 significant figures.

J = Value below calibration range

I = Interference present

Handwritten: 2/14/08

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc.

17 of 56

Report No.1065209_8290

Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612-607-6444



Pace Analytical™

Method 8290 Sample Analysis Results

Client - Montana Dept. Of Env. Quality

Client's Sample ID	MBDS-U13-I01		
Lab Sample ID	1065209010		
Filename	P80108A_22		
Injected By	SMT		
Total Amount Extracted	12.6 g	Matrix	Soil
% Moisture	3.4	Dilution	NA
Dry Weight Extracted	12.2 g	Collected	12/13/2007
ICAL Date	01/08/2008	Received	12/18/2007
CCal Filename(s)	P80108A_10 & P80108A_26	Extracted	01/03/2008
Method Blank ID	BLANK-15191	Analyzed	01/09/2008 06:42

Native Isomers	Conc ng/Kg	EMPC ng/Kg	RL ng/Kg	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	0.16	—	0.150	J U	2,3,7,8-TCDF-13C	85
Total TCDF	2.80	—	0.150		2,3,7,8-TCDD-13C	83
					1,2,3,7,8-PeCDF-13C	82
2,3,7,8-TCDD	0.10	—	0.059	J J	2,3,4,7,8-PeCDF-13C	84
Total TCDD	0.43	—	0.059	J J	1,2,3,7,8-PeCDD-13C	93
					1,2,3,4,7,8-HxCDF-13C	81
1,2,3,7,8-PeCDF	ND	—	0.110		1,2,3,6,7,8-HxCDF-13C	76
2,3,4,7,8-PeCDF	0.86	—	0.040	B J	2,3,4,6,7,8-HxCDF-13C	75
Total PeCDF	9.20	—	0.076		1,2,3,7,8,9-HxCDF-13C	79
					1,2,3,4,7,8-HxCDD-13C	82
1,2,3,7,8-PeCDD	0.35	—	0.065	B U	1,2,3,6,7,8-HxCDD-13C	77
Total PeCDD	1.30	—	0.065	B J	1,2,3,4,6,7,8-HpCDF-13C	73
					1,2,3,4,7,8,9-HpCDF-13C	62
1,2,3,4,7,8-HxCDF	0.36	—	0.049	B U	1,2,3,4,6,7,8-HpCDD-13C	79
1,2,3,6,7,8-HxCDF	—	0.41	0.044	E R	OCDD-13C	56
2,3,4,6,7,8-HxCDF	0.57	—	0.047	B J		
1,2,3,7,8,9-HxCDF	0.11	—	0.065	J U	1,2,3,4-TCDD-13C	NA
Total HxCDF	8.50	—	0.051		1,2,3,7,8,9-HxCDD-13C	NA
1,2,3,4,7,8-HxCDD	0.35	—	0.064	B U	2,3,7,8-TCDD-37Cl4	80
1,2,3,6,7,8-HxCDD	0.81	—	0.058	J J		
1,2,3,7,8,9-HxCDD	0.67	—	0.089	J J		
Total HxCDD	7.80	—	0.070			
1,2,3,4,6,7,8-HpCDF	—	5.60	0.120	E R	Total 2,3,7,8-TCDD	
1,2,3,4,7,8,9-HpCDF	0.32	—	0.160	B U	Equivalence: 1.4 ng/Kg	
Total HpCDF	0.32	—	0.140	B U	(Using ITE Factors)	
1,2,3,4,6,7,8-HpCDD	18.00	—	0.130			
Total HpCDD	35.00	—	0.130			
OCDF	9.80	—	0.035			
OCDD	160.00	—	0.120			

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
EMPC = Estimated Maximum Possible Concentration
RL = Reporting Limit.

ND = Not Detected
NA = Not Applicable
NC = Not Calculated

Results reported on a dry weight basis and are valid to no more than 2 significant figures.

J = Value below calibration range
B = Less than 10x higher than method blank level
E = PCDE Interference

AB
2/4/08

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc.

18 of 56

Report No.....1065209_8290



Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612-607-6444

Method 8290 Sample Analysis Results

Client - Montana Dept. Of Env. Quality

Client's Sample ID	MBDS-U12-R01		
Lab Sample ID	1065209011		
Filename	P80108A_15		
Injected By	SMT		
Total Amount Extracted	13.3 g	Matrix	Soil
% Moisture	3.5	Dilution	NA
Dry Weight Extracted	12.8 g	Collected	12/13/2007
ICAL Date	01/08/2008	Received	12/18/2007
CCal Filename(s)	P80108A_10 & P80108A_26	Extracted	01/03/2008
Method Blank ID	BLANK-15191	Analyzed	01/09/2008 00:45

Native Isomers	Conc ng/Kg	EMPC ng/Kg	RL ng/Kg	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	ND	—	0.033	2,3,7,8-TCDF-13C	2.00	80
Total TCDF	5.500	—	0.033	2,3,7,8-TCDD-13C	2.00	81
				1,2,3,7,8-PeCDF-13C	2.00	81
2,3,7,8-TCDD	ND	—	0.045	2,3,4,7,8-PeCDF-13C	2.00	82
Total TCDD	0.430	—	0.045	1,2,3,7,8-PeCDD-13C	2.00	93
				1,2,3,4,7,8-HxCDF-13C	2.00	78
1,2,3,7,8-PeCDF	—	0.130	0.023	1,2,3,6,7,8-HxCDF-13C	2.00	76
2,3,4,7,8-PeCDF	0.098	—	0.018	2,3,4,6,7,8-HxCDF-13C	2.00	76
Total PeCDF	0.270	—	0.020	1,2,3,7,8,9-HxCDF-13C	2.00	78
				1,2,3,4,7,8-HxCDD-13C	2.00	82
1,2,3,7,8-PeCDD	0.077	—	0.027	1,2,3,6,7,8-HxCDD-13C	2.00	78
Total PeCDD	0.160	—	0.027	1,2,3,4,6,7,8-HpCDF-13C	2.00	82
				1,2,3,4,7,8,9-HpCDF-13C	2.00	69
1,2,3,4,7,8-HxCDF	—	0.055	0.046	1,2,3,4,6,7,8-HpCDD-13C	2.00	88
1,2,3,6,7,8-HxCDF	0.110	—	0.034	OCDD-13C	4.00	78
2,3,4,6,7,8-HxCDF	0.088	—	0.039			
1,2,3,7,8,9-HxCDF	0.093	—	0.037	1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	0.290	—	0.039	1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	0.071	—	0.023	2,3,7,8-TCDD-37Cl4	0.20	77
1,2,3,6,7,8-HxCDD	0.120	—	0.034			
1,2,3,7,8,9-HxCDD	—	0.110	0.042			
Total HxCDD	0.370	—	0.033			
1,2,3,4,6,7,8-HpCDF	—	0.470	0.058	Total 2,3,7,8-TCDD		
1,2,3,4,7,8,9-HpCDF	ND	—	0.100	Equivalence: 0.16 ng/Kg		
Total HpCDF	0.470	—	0.081	(Using ITE Factors)		
1,2,3,4,6,7,8-HpCDD	1.100	—	0.086			
Total HpCDD	2.000	—	0.086			
OCDF	1.300	—	0.035			
OCDD	9.900	—	0.047			

Conc = Concentration (Totals include 2,3,7,8-substituted isomers). ND = Not Detected
 EMPC = Estimated Maximum Possible Concentration NA = Not Applicable
 RL = Reporting Limit. NC = Not Calculated

Results reported on a dry weight basis and are valid to no more than 2 significant figures.
 J = Value below calibration range
 B = Less than 10x higher than method blank level
 E = PCDE Interference
 I = Interference present

*MB
2/14/08*

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
 without the written consent of Pace Analytical Services, Inc.
 19 of 56

Report No.....1065209_8290



Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612-607-6444

Method 8290 Sample Analysis Results

Client - Montana Dept. Of Env. Quality

Client's Sample ID	MBDS-U12-C01		
Lab Sample ID	1065209012		
Filename	P80108A_16		
Injected By	SMT		
Total Amount Extracted	13.0 g	Matrix	Soil
% Moisture	15.4	Dilution	NA
Dry Weight Extracted	11.0 g	Collected	12/13/2007
ICAL Date	01/08/2008	Received	12/18/2007
Ccal Filename(s)	P80108A_10 & P80108A_26	Extracted	01/03/2008
Method Blank ID	BLANK-15191	Analyzed	01/09/2008 01:36

Native Isomers	Conc ng/Kg	EMPC ng/Kg	RL ng/Kg	Internal Standards	ng's Added	Percent Recovery	
2,3,7,8-TCDF	0.086	—	0.046	±U	2,3,7,8-TCDF-13C	2.00	85
Total TCDF	0.930	—	0.046	U	2,3,7,8-TCDD-13C	2.00	84
					1,2,3,7,8-PeCDF-13C	2.00	84
2,3,7,8-TCDD	ND	—	0.061		2,3,4,7,8-PeCDF-13C	2.00	86
Total TCDD	0.360	—	0.061	+J	1,2,3,7,8-PeCDD-13C	2.00	95
					1,2,3,4,7,8-HxCDF-13C	2.00	81
1,2,3,7,8-PeCDF	0.092	—	0.038	+U	1,2,3,6,7,8-HxCDF-13C	2.00	78
2,3,4,7,8-PeCDF	0.069	—	0.030	B+J	2,3,4,6,7,8-HxCDF-13C	2.00	79
Total PeCDF	0.390	—	0.034	B+J	1,2,3,7,8,9-HxCDF-13C	2.00	82
					1,2,3,4,7,8-HxCDD-13C	2.00	83
1,2,3,7,8-PeCDD	0.057	—	0.052	B+U	1,2,3,6,7,8-HxCDD-13C	2.00	80
Total PeCDD	0.260	—	0.052	B+U	1,2,3,4,6,7,8-HpCDF-13C	2.00	82
					1,2,3,4,7,8,9-HpCDF-13C	2.00	72
1,2,3,4,7,8-HxCDF	0.096	—	0.034	B+U	1,2,3,4,6,7,8-HpCDD-13C	2.00	88
1,2,3,6,7,8-HxCDF	0.130	—	0.023	B+J	OCDD-13C	4.00	81
2,3,4,6,7,8-HxCDF	0.094	—	0.037	B+J			
1,2,3,7,8,9-HxCDF	—	0.074	0.051	+UJ	1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	0.790	—	0.036	B+U	1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	0.079	—	0.043	B+U	2,3,7,8-TCDD-37Cl4	0.20	83
1,2,3,6,7,8-HxCDD	0.170	—	0.043	+U			
1,2,3,7,8,9-HxCDD	—	0.110	0.039	+UJ			
Total HxCDD	0.680	—	0.042	B+J			
1,2,3,4,6,7,8-HpCDF	—	0.730	0.140	+UJ	Total 2,3,7,8-TCDD		
1,2,3,4,7,8,9-HpCDF	ND	—	0.230		Equivalence: 0.17 ng/Kg		
Total HpCDF	ND	—	0.180		(Using ITE Factors)		
1,2,3,4,6,7,8-HpCDD	2.000	—	0.071	+J			
Total HpCDD	4.000	—	0.071	+U			
OCDF	0.980	—	0.038	+U			
OCDD	15.000	—	0.050	U			

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
EMPC = Estimated Maximum Possible Concentration
RL = Reporting Limit.

ND = Not Detected
NA = Not Applicable
NC = Not Calculated

Results reported on a dry weight basis and are valid to no more than 2 significant figures.

J = Value below calibration range

B = Less than 10x higher than method blank level

I = Interference present

AP
2/4/08

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc.

20 of 56

Report No.....1065209_8290



Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612-607-6444

Method 8290 Sample Analysis Results

Client - Montana Dept. Of Env. Quality

Client's Sample ID	MBDS-U12-I01		
Lab Sample ID	1065209013		
Filename	P80108A_17		
Injected By	SMT		
Total Amount Extracted	12.4 g	Matrix	Soil
% Moisture	3.8	Dilution	NA
Dry Weight Extracted	12.0 g	Collected	12/13/2007
ICAL Date	01/08/2008	Received	12/18/2007
CCal Filename(s)	P80108A_10 & P80108A_26	Extracted	01/03/2008
Method Blank ID	BLANK-15191	Analyzed	01/09/2008 02:27

Native Isomers	Conc ng/Kg	EMPC ng/Kg	RL ng/Kg	Internal Standards	ng's Added	Percent Recovery	
2,3,7,8-TCDF	0.050	—	0.049	+U	2,3,7,8-TCDF-13C	2.00	84
Total TCDF	0.190	—	0.049	+U	2,3,7,8-TCDD-13C	2.00	82
					1,2,3,7,8-PeCDF-13C	2.00	84
2,3,7,8-TCDD	ND	—	0.045		2,3,4,7,8-PeCDF-13C	2.00	87
Total TCDD	ND	—	0.045		1,2,3,7,8-PeCDD-13C	2.00	95
					1,2,3,4,7,8-HxCDF-13C	2.00	82
1,2,3,7,8-PeCDF	—	0.065	0.033	+UJ	1,2,3,6,7,8-HxCDF-13C	2.00	79
2,3,4,7,8-PeCDF	0.078	—	0.021	BU	2,3,4,6,7,8-HxCDF-13C	2.00	80
Total PeCDF	0.200	—	0.027	BUJ	1,2,3,7,8,9-HxCDF-13C	2.00	84
					1,2,3,4,7,8-HxCDD-13C	2.00	85
1,2,3,7,8-PeCDD	—	0.070	0.034	+UJ	1,2,3,6,7,8-HxCDD-13C	2.00	81
Total PeCDD	ND	—	0.034		1,2,3,4,6,7,8-HpCDF-13C	2.00	83
					1,2,3,4,7,8,9-HpCDF-13C	2.00	72
1,2,3,4,7,8-HxCDF	ND	—	0.056		1,2,3,4,6,7,8-HpCDD-13C	2.00	89
1,2,3,6,7,8-HxCDF	0.084	—	0.048	BU	OCDD-13C	4.00	85
2,3,4,6,7,8-HxCDF	0.057	—	0.041	BU			
1,2,3,7,8,9-HxCDF	0.079	—	0.036	J	1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	0.450	—	0.045	BUJ	1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	0.088	—	0.053	BU	2,3,7,8-TCDD-37Cl4	0.20	80
1,2,3,6,7,8-HxCDD	0.140	—	0.050	+U			
1,2,3,7,8,9-HxCDD	—	0.085	0.057	+UJ			
Total HxCDD	0.600	—	0.053	BUJ			
1,2,3,4,6,7,8-HpCDF	0.730	—	0.076	+U	Total 2,3,7,8-TCDD		
1,2,3,4,7,8,9-HpCDF	ND	—	0.140		Equivalence: 0.14 ng/Kg		
Total HpCDF	0.730	—	0.110	BU	(Using ITE Factors)		
1,2,3,4,6,7,8-HpCDD	2.000	—	0.110	J			
Total HpCDD	3.900	—	0.110	+U			
OCDF	2.000	—	0.037	+U			
OCDD	24.000	—	0.110	U			

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).

EMPC = Estimated Maximum Possible Concentration

RL = Reporting Limit.

ND = Not Detected

NA = Not Applicable

NC = Not Calculated

Results reported on a dry weight basis and are valid to no more than 2 significant figures.

J = Value below calibration range

B = Less than 10x higher than method blank level

I = Interference present

2/4/08

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc.

21 of 56

Report No.....1065209_8290



Pace Analytical Services, Inc
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612-607-6444

Method 8290 Sample Analysis Results

Client - Montana Dept. Of Env. Quality

Client's Sample ID	MBDS-U13-R05		
Lab Sample ID	1065209014		
Filename	P80108A_18		
Injected By	SMT		
Total Amount Extracted	11.2 g	Matrix	Soil
% Moisture	0.2	Dilution	NA
Dry Weight Extracted	11.2 g	Collected	12/13/2007
ICAL Date	01/08/2008	Received	12/18/2007
CCal Filename(s)	P80108A_10 & P80108A_26	Extracted	01/03/2008
Method Blank ID	BLANK-15191	Analyzed	01/09/2008 03:18

Native Isomers	Conc ng/Kg	EMPC ng/Kg	RL ng/Kg	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	0.055	—	0.045	2,3,7,8-TCDF-13C	2.00	79
Total TCDF	0.250	—	0.045	2,3,7,8-TCDD-13C	2.00	79
				1,2,3,7,8-PeCDF-13C	2.00	77
2,3,7,8-TCDD	ND	—	0.053	2,3,4,7,8-PeCDF-13C	2.00	80
Total TCDD	ND	—	0.053	1,2,3,7,8-PeCDD-13C	2.00	87
				1,2,3,4,7,8-HxCDF-13C	2.00	77
1,2,3,7,8-PeCDF	0.075	—	0.054	1,2,3,6,7,8-HxCDF-13C	2.00	73
2,3,4,7,8-PeCDF	0.057	—	0.040	2,3,4,6,7,8-HxCDF-13C	2.00	74
Total PeCDF	0.350	—	0.047	1,2,3,7,8,9-HxCDF-13C	2.00	76
				1,2,3,4,7,8-HxCDD-13C	2.00	79
1,2,3,7,8-PeCDD	ND	—	0.041	1,2,3,6,7,8-HxCDD-13C	2.00	76
Total PeCDD	ND	—	0.041	1,2,3,4,6,7,8-HpCDF-13C	2.00	74
				1,2,3,4,7,8,9-HpCDF-13C	2.00	66
1,2,3,4,7,8-HxCDF	0.140	—	0.057	1,2,3,4,6,7,8-HpCDD-13C	2.00	81
1,2,3,6,7,8-HxCDF	—	0.090	0.089	OCDD-13C	4.00	77
2,3,4,6,7,8-HxCDF	0.082	—	0.063			
1,2,3,7,8,9-HxCDF	ND	—	0.084	1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	0.460	—	0.073	1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	ND	—	0.074	2,3,7,8-TCDD-37Cl4	0.20	82
1,2,3,6,7,8-HxCDD	0.084	—	0.066			
1,2,3,7,8,9-HxCDD	0.081	—	0.054			
Total HxCDD	0.380	—	0.064			
1,2,3,4,6,7,8-HpCDF	0.750	—	0.094	Total 2,3,7,8-TCDD		
1,2,3,4,7,8,9-HpCDF	ND	—	0.100	Equivalence: 0.11 ng/Kg		
Total HpCDF	2.000	—	0.098	(Using ITE Factors)		
1,2,3,4,6,7,8-HpCDD	1.100	—	0.100			
Total HpCDD	3.200	—	0.100			
OCDF	1.300	—	0.074			
OCDD	11.000	—	0.250			

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
EMPC = Estimated Maximum Possible Concentration
RL = Reporting Limit.

ND = Not Detected
NA = Not Applicable
NC = Not Calculated

Results reported on a dry weight basis and are valid to no more than 2 significant figures.

J = Value below calibration range

B = Less than 10x higher than method blank level

I = Interference present

AB
2/4/08

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc.
22 of 56

Report No.....1065209_8290



Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612-607-6444

Method 8290 Sample Analysis Results

Client - Montana Dept. Of Env. Quality

Client's Sample ID	MBDS-U01-R01		
Lab Sample ID	1065209015		
Filename	P80108A_19		
Injected By	SMT		
Total Amount Extracted	13.3 g	Matrix	Soil
% Moisture	16.7	Dilution	NA
Dry Weight Extracted	11.1 g	Collected	12/13/2007
ICAL Date	01/08/2008	Received	12/18/2007
CCal Filename(s)	P80108A_10 & P80108A_26	Extracted	01/03/2008
Method Blank ID	BLANK-15191	Analyzed	01/09/2008 04:09

Native Isomers	Conc ng/Kg	EMPC ng/Kg	RL ng/Kg	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	—	0.094	0.081 +UJ	2,3,7,8-TCDF-13C	2.00	78
Total TCDF	0.33	—	0.081 +U	2,3,7,8-TCDD-13C	2.00	77
				1,2,3,7,8-PeCDF-13C	2.00	76
2,3,7,8-TCDD	ND	—	0.067	2,3,4,7,8-PeCDF-13C	2.00	78
Total TCDD	ND	—	0.067	1,2,3,7,8-PeCDD-13C	2.00	86
				1,2,3,4,7,8-HxCDF-13C	2.00	79
1,2,3,7,8-PeCDF	—	0.140	0.047 +UJ	1,2,3,6,7,8-HxCDF-13C	2.00	73
2,3,4,7,8-PeCDF	0.21	—	0.051 BU	2,3,4,6,7,8-HxCDF-13C	2.00	73
Total PeCDF	1.60	—	0.049 BUJ	1,2,3,7,8,9-HxCDF-13C	2.00	75
				1,2,3,4,7,8-HxCDD-13C	2.00	80
1,2,3,7,8-PeCDD	—	0.140	0.055 +UJ	1,2,3,6,7,8-HxCDD-13C	2.00	75
Total PeCDD	0.26	—	0.055 BUJ	1,2,3,4,6,7,8-HpCDF-13C	2.00	75
				1,2,3,4,7,8,9-HpCDF-13C	2.00	65
1,2,3,4,7,8-HxCDF	0.20	—	0.066 BUJ	1,2,3,4,6,7,8-HpCDD-13C	2.00	82
1,2,3,6,7,8-HxCDF	0.12	—	0.084 BU	OCDD-13C	4.00	73
2,3,4,6,7,8-HxCDF	0.23	—	0.043 BU			
1,2,3,7,8,9-HxCDF	0.16	—	0.072 J	1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	2.80	—	0.066 BUJ	1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	0.21	—	0.091 BUJ	2,3,7,8-TCDD-37Cl4	0.20	78
1,2,3,6,7,8-HxCDD	0.38	—	0.061 J			
1,2,3,7,8,9-HxCDD	0.37	—	0.095 J			
Total HxCDD	3.50	—	0.083 +J			
1,2,3,4,6,7,8-HpCDF	2.70	—	0.064 JJ	Total 2,3,7,8-TCDD		
1,2,3,4,7,8,9-HpCDF	ND	—	0.150	Equivalence: 0.45 ng/Kg		
Total HpCDF	4.70	—	0.110	(Using ITE Factors)		
1,2,3,4,6,7,8-HpCDD	8.40	—	0.087			
Total HpCDD	16.00	—	0.087			
OCDF	2.00	—	0.035 +J			
OCDD	61.00	—	0.100			

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
EMPC = Estimated Maximum Possible Concentration
RL = Reporting Limit.

ND = Not Detected
NA = Not Applicable
NC = Not Calculated

Results reported on a dry weight basis and are valid to no more than 2 significant figures.

J = Value below calibration range

B = Less than 10x higher than method blank level

I = Interference present

AB
2/4/08

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc.
23 of 56

Report No.....1065209_8290



Pace Analytical Services, Inc
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612-607-6444

Method 8290 Sample Analysis Results

Client - Montana Dept. Of Env. Quality

Client's Sample ID	MBDS-U01-C01		
Lab Sample ID	1065209016		
Filename	P80108A_20		
Injected By	SMT		
Total Amount Extracted	13.5 g	Matrix	Soil
% Moisture	27.7	Dilution	NA
Dry Weight Extracted	9.77 g	Collected	12/13/2007
ICAL Date	01/08/2008	Received	12/18/2007
CCal Filename(s)	P80108A_10 & P80108A_26	Extracted	01/03/2008
Method Blank ID	BLANK-15191	Analyzed	01/09/2008 05:00

Native Isomers	Conc ng/Kg	EMPC ng/Kg	RL ng/Kg	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	ND	—	0.120	2,3,7,8-TCDF-13C	2.00	80
Total TCDF	1.300	—	0.120	2,3,7,8-TCDD-13C	2.00	80
				1,2,3,7,8-PeCDF-13C	2.00	77
2,3,7,8-TCDD	0.092	—	0.050	2,3,4,7,8-PeCDF-13C	2.00	80
Total TCDD	0.360	—	0.050	1,2,3,7,8-PeCDD-13C	2.00	88
				1,2,3,4,7,8-HxCDF-13C	2.00	77
1,2,3,7,8-PeCDF	—	0.18	0.110	1,2,3,6,7,8-HxCDF-13C	2.00	73
2,3,4,7,8-PeCDF	0.260	—	0.057	2,3,4,6,7,8-HxCDF-13C	2.00	73
Total PeCDF	6.100	—	0.083	1,2,3,7,8,9-HxCDF-13C	2.00	76
				1,2,3,4,7,8-HxCDD-13C	2.00	79
1,2,3,7,8-PeCDD	0.250	—	0.048	1,2,3,6,7,8-HxCDD-13C	2.00	75
Total PeCDD	1.300	—	0.048	1,2,3,4,6,7,8-HpCDF-13C	2.00	74
				1,2,3,4,7,8,9-HpCDF-13C	2.00	66
1,2,3,4,7,8-HxCDF	1.100	—	0.130	1,2,3,4,6,7,8-HpCDD-13C	2.00	83
1,2,3,6,7,8-HxCDF	—	1.20	0.089	OCDD-13C	4.00	76
2,3,4,6,7,8-HxCDF	1.100	—	0.087			
1,2,3,7,8,9-HxCDF	0.320	—	0.130	1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	22.000	—	0.110	1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	0.650	—	0.091	2,3,7,8-TCDD-37Cl4	0.20	81
1,2,3,6,7,8-HxCDD	1.600	—	0.061			
1,2,3,7,8,9-HxCDD	1.400	—	0.160			
Total HxCDD	10.000	—	0.110			
1,2,3,4,6,7,8-HpCDF	—	37.00	0.250	Total 2,3,7,8-TCDD		
1,2,3,4,7,8,9-HpCDF	1.800	—	0.210	Equivalence: 1.9 ng/Kg		
Total HpCDF	33.000	—	0.230	(Using ITE Factors)		
1,2,3,4,6,7,8-HpCDD	45.000	—	0.240			
Total HpCDD	72.000	—	0.240			
OCDF	54.000	—	0.210			
OCDD	380.000	—	0.170			

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
EMPC = Estimated Maximum Possible Concentration
RL = Reporting Limit.

ND = Not Detected
NA = Not Applicable
NC = Not Calculated

Results reported on a dry weight basis and are valid to no more than 2 significant figures.

J = Value below calibration range

B = Less than 10x higher than method blank level

E = PCDE Interference

I = Interference present

AS
2/4/08

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc.
24 of 56

Report No.....1065209_8290



Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612-607-6444

Method 8290 Sample Analysis Results

Client - Montana Dept. Of Env. Quality

Client's Sample ID	MBDS-U01-C04		
Lab Sample ID	1065209017		
Filename	P80108A_21		
Injected By	SMT		
Total Amount Extracted	13.6 g	Matrix	Soil
% Moisture	23.5	Dilution	NA
Dry Weight Extracted	10.4 g	Collected	12/13/2007
ICAL Date	01/08/2008	Received	12/18/2007
CCal Filename(s)	P80108A_10 & P80108A_26	Extracted	01/03/2008
Method Blank ID	BLANK-15191	Analyzed	01/09/2008 05:51

Native Isomers	Conc ng/Kg	EMPC ng/Kg	RL ng/Kg	Internal Standards	ng's Added	Percent Recovery	
2,3,7,8-TCDF	—	0.11	0.110	+ U J	2,3,7,8-TCDF-13C	2.00	67
Total TCDF	2.00	—	0.110		2,3,7,8-TCDD-13C	2.00	68
					1,2,3,7,8-PeCDF-13C	2.00	66
2,3,7,8-TCDD	ND	—	0.067		2,3,4,7,8-PeCDF-13C	2.00	68
Total TCDD	ND	—	0.067		1,2,3,7,8-PeCDD-13C	2.00	74
					1,2,3,4,7,8-HxCDF-13C	2.00	66
1,2,3,7,8-PeCDF	0.23	—	0.094	+ U	1,2,3,6,7,8-HxCDF-13C	2.00	61
2,3,4,7,8-PeCDF	0.20	—	0.059	B+U	2,3,4,6,7,8-HxCDF-13C	2.00	61
Total PeCDF	6.50	—	0.077		1,2,3,7,8,9-HxCDF-13C	2.00	65
					1,2,3,4,7,8-HxCDD-13C	2.00	68
1,2,3,7,8-PeCDD	0.20	—	0.074	B+U	1,2,3,6,7,8-HxCDD-13C	2.00	61
Total PeCDD	0.97	—	0.074	B+J	1,2,3,4,6,7,8-HpCDF-13C	2.00	64
					1,2,3,4,7,8,9-HpCDF-13C	2.00	57
1,2,3,4,7,8-HxCDF	0.90	—	0.074	+ J	1,2,3,4,6,7,8-HpCDD-13C	2.00	71
1,2,3,6,7,8-HxCDF	—	0.75	0.073	E R	OCDD-13C	4.00	65
2,3,4,6,7,8-HxCDF	0.94	—	0.081	B+J			
1,2,3,7,8,9-HxCDF	0.24	—	0.074	+ U	1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	16.00	—	0.075		1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	0.50	—	0.120	B+J	2,3,7,8-TCDD-37Cl4	0.20	68
1,2,3,6,7,8-HxCDD	1.50	—	0.100	+ J			
1,2,3,7,8,9-HxCDD	1.00	—	0.110	+ ↓			
Total HxCDD	9.00	—	0.110				
1,2,3,4,6,7,8-HpCDF	—	34.00	0.190	E R	Total 2,3,7,8-TCDD		
1,2,3,4,7,8,9-HpCDF	1.10	—	0.230	B+J	Equivalence: 1.5 ng/Kg		
Total HpCDF	27.00	—	0.210		(Using ITE Factors)		
1,2,3,4,6,7,8-HpCDD	39.00	—	0.120				
Total HpCDD	64.00	—	0.120				
OCDF	41.00	—	0.058				
OCDD	360.00	—	0.300				

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
EMPC = Estimated Maximum Possible Concentration
RL = Reporting Limit.

ND = Not Detected
NA = Not Applicable
NC = Not Calculated

Results reported on a dry weight basis and are valid to no more than 2 significant figures.

J = Value below calibration range

B = Less than 10x higher than method blank level

E = PCDE Interference

I = Interference present

Handwritten: 2/4/08

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc.

25 of 56

Report No.....1065209_8290



Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612-607-6444

Method 8290 Sample Analysis Results

Client - Montana Dept. Of Env. Quality

Client's Sample ID	MBDS-U01-C05		
Lab Sample ID	1065209018		
Filename	U80109A_03		
Injected By	SMT		
Total Amount Extracted	11.5 g	Matrix	Soil
% Moisture	0.2	Dilution	NA
Dry Weight Extracted	11.5 g	Collected	12/13/2007
ICAL Date	12/27/2007	Received	12/18/2007
CCal Filename(s)	U80108A_19 & U80109A_16	Extracted	01/03/2008
Method Blank ID	BLANK-15191	Analyzed	01/09/2008 04:18

Native Isomers	Conc ng/Kg	EMPC ng/Kg	RL ng/Kg	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	0.051	—	0.026 J J	2,3,7,8-TCDF-13C	2.00	85
Total TCDF	0.093	—	0.026 J J	2,3,7,8-TCDD-13C	2.00	81
				1,2,3,7,8-PeCDF-13C	2.00	88
2,3,7,8-TCDD	—	0.049	0.028 + J J	2,3,4,7,8-PeCDF-13C	2.00	90
Total TCDD	0.059	—	0.028 + J J	1,2,3,7,8-PeCDD-13C	2.00	97
				1,2,3,4,7,8-HxCDF-13C	2.00	81
1,2,3,7,8-PeCDF	0.076	—	0.032 + U	1,2,3,6,7,8-HxCDF-13C	2.00	70
2,3,4,7,8-PeCDF	0.055	—	0.021 B J	2,3,4,6,7,8-HxCDF-13C	2.00	73
Total PeCDF	0.430	—	0.027 B J	1,2,3,7,8,9-HxCDF-13C	2.00	77
				1,2,3,4,7,8-HxCDD-13C	2.00	85
1,2,3,7,8-PeCDD	0.067	—	0.029 B J U	1,2,3,6,7,8-HxCDD-13C	2.00	74
Total PeCDD	0.150	—	0.029 B J U	1,2,3,4,6,7,8-HpCDF-13C	2.00	73
				1,2,3,4,7,8,9-HpCDF-13C	2.00	68
1,2,3,4,7,8-HxCDF	0.064	—	0.042 B J U	1,2,3,4,6,7,8-HpCDD-13C	2.00	83
1,2,3,6,7,8-HxCDF	—	0.082	0.038 + U J	OCDD-13C	4.00	74
2,3,4,6,7,8-HxCDF	0.070	—	0.051 B J U			
1,2,3,7,8,9-HxCDF	0.075	—	0.057 + J	1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	0.440	—	0.047 B J	1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	0.052	—	0.043 B J U	2,3,7,8-TCDD-37Cl4	0.20	86
1,2,3,6,7,8-HxCDD	0.079	—	0.044 + J			
1,2,3,7,8,9-HxCDD	0.047	—	0.046 + J			
Total HxCDD	0.180	—	0.044 B J			
1,2,3,4,6,7,8-HpCDF	0.160	—	0.028 + U	Total 2,3,7,8-TCDD		
1,2,3,4,7,8,9-HpCDF	ND	—	0.077	Equivalence: 0.12 ng/Kg		
Total HpCDF	0.160	—	0.052 B J U	(Using ITE Factors)		
1,2,3,4,6,7,8-HpCDD	0.460	—	0.064 + U			
Total HpCDD	1.100	—	0.064 B J U			
OCDF	—	0.280	0.042 + U J			
OCDD	1.400	—	0.041 B J U			

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
EMPC = Estimated Maximum Possible Concentration
RL = Reporting Limit.

ND = Not Detected
NA = Not Applicable
NC = Not Calculated

Results reported on a dry weight basis and are valid to no more than 2 significant figures.

J = Value below calibration range

B = Less than 10x higher than method blank level

I = Interference present

AS
2/9/08

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc.
26 of 56

Report No.1065209_8290



Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612-607-6444

Method 8290 Sample Analysis Results

Client - Montana Dept. Of Env. Quality

Client's Sample ID	MBDS-U01-I01		
Lab Sample ID	1065209019		
Filename	U80109A_04		
Injected By	SMT		
Total Amount Extracted	13.1 g	Matrix	Soil
% Moisture	27.4	Dilution	NA
Dry Weight Extracted	9.53 g	Collected	12/13/2007
ICAL Date	12/27/2007	Received	12/18/2007
CCal Filename(s)	U80108A_19 & U80109A_16	Extracted	01/03/2008
Method Blank ID	BLANK-15191	Analyzed	01/09/2008 05:06

Native Isomers	Conc ng/Kg	EMPC ng/Kg	RL ng/Kg	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	0.18	—	0.086	+U 2,3,7,8-TCDF-13C	2.00	89
Total TCDF	2.20	—	0.086	2,3,7,8-TCDD-13C	2.00	84
				1,2,3,7,8-PeCDF-13C	2.00	87
2,3,7,8-TCDD	0.19	—	0.050	+U 2,3,4,7,8-PeCDF-13C	2.00	87
Total TCDD	0.47	—	0.050	+J 1,2,3,7,8-PeCDD-13C	2.00	94
				1,2,3,4,7,8-HxCDF-13C	2.00	90
1,2,3,7,8-PeCDF	0.12	—	0.088	+U 1,2,3,6,7,8-HxCDF-13C	2.00	78
2,3,4,7,8-PeCDF	0.58	—	0.085	B+U 2,3,4,6,7,8-HxCDF-13C	2.00	79
Total PeCDF	8.30	—	0.087	1,2,3,7,8,9-HxCDF-13C	2.00	80
				1,2,3,4,7,8-HxCDD-13C	2.00	92
1,2,3,7,8-PeCDD	0.16	—	0.057	B+U 1,2,3,6,7,8-HxCDD-13C	2.00	79
Total PeCDD	0.42	—	0.057	B+U 1,2,3,4,6,7,8-HpCDF-13C	2.00	66
				1,2,3,4,7,8,9-HpCDF-13C	2.00	57
1,2,3,4,7,8-HxCDF	0.23	—	0.068	B+U 1,2,3,4,6,7,8-HpCDD-13C	2.00	73
1,2,3,6,7,8-HxCDF	0.60	—	0.066	B+J OCDD-13C	4.00	45
2,3,4,6,7,8-HxCDF	0.55	—	0.044	B+J		
1,2,3,7,8,9-HxCDF	0.12	—	0.074	+U 1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	9.40	—	0.063	1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	0.23	—	0.150	B+U 2,3,7,8-TCDD-37Cl4	0.20	83
1,2,3,6,7,8-HxCDD	0.61	—	0.100	+J		
1,2,3,7,8,9-HxCDD	0.48	—	0.120	+U		
Total HxCDD	5.30	—	0.120			
1,2,3,4,6,7,8-HpCDF	3.30	—	0.200	+J Total 2,3,7,8-TCDD		
1,2,3,4,7,8,9-HpCDF	ND	—	0.230	Equivalence: 1.2 ng/Kg		
Total HpCDF	3.30	—	0.210	(Using ITE Factors)		
1,2,3,4,6,7,8-HpCDD	14.00	—	0.110			
Total HpCDD	26.00	—	0.110			
OCDF	9.60	—	0.220	+J		
OCDD	110.00	—	0.170			

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).

EMPC = Estimated Maximum Possible Concentration

RL = Reporting Limit.

ND = Not Detected

NA = Not Applicable

NC = Not Calculated

Results reported on a dry weight basis and are valid to no more than 2 significant figures.

J = Value below calibration range

B = Less than 10x higher than method blank level

AS
2/4/08

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc.
27 of 56

Report No.....1065209_8290



Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612-607-6444

Method 8290 Sample Analysis Results

Client - Montana Dept. Of Env. Quality

Client's Sample ID	MBDS-U01-C06		
Lab Sample ID	1065209020		
Filename	F71230A_09		
Injected By	BAL		
Total Amount Extracted	988 mL	Matrix	Water
% Moisture	NA	Dilution	NA
Dry Weight Extracted	NA	Collected	12/13/2007
ICAL Date	12/28/2007	Received	12/18/2007
CCal Filename(s)	F80104B_20 & F80105A_17	Extracted	12/21/2007
Method Blank ID	BLANK-15116	Analyzed	12/30/2007 20:58

Native Isomers	Conc pg/L	EMPC pg/L	RL pg/L	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	ND	—	1.00	2,3,7,8-TCDF-13C	2.00	91
Total TCDF	ND	—	1.00	2,3,7,8-TCDD-13C	2.00	88
				1,2,3,7,8-PeCDF-13C	2.00	88
2,3,7,8-TCDD	ND	—	1.50	2,3,4,7,8-PeCDF-13C	2.00	92
Total TCDD	ND	—	1.50	1,2,3,7,8-PeCDD-13C	2.00	103
				1,2,3,4,7,8-HxCDF-13C	2.00	84
1,2,3,7,8-PeCDF	ND	—	1.10	1,2,3,6,7,8-HxCDF-13C	2.00	83
2,3,4,7,8-PeCDF	ND	—	0.76	2,3,4,6,7,8-HxCDF-13C	2.00	84
Total PeCDF	ND	—	0.95	1,2,3,7,8,9-HxCDF-13C	2.00	84
				1,2,3,4,7,8-HxCDD-13C	2.00	91
1,2,3,7,8-PeCDD	ND	—	1.20	1,2,3,6,7,8-HxCDD-13C	2.00	92
Total PeCDD	ND	—	1.20	1,2,3,4,6,7,8-HpCDF-13C	2.00	80
				1,2,3,4,7,8,9-HpCDF-13C	2.00	69
1,2,3,4,7,8-HxCDF	ND	—	0.74	1,2,3,4,6,7,8-HpCDD-13C	2.00	88
1,2,3,6,7,8-HxCDF	ND	—	0.76	OCDD-13C	4.00	64
2,3,4,6,7,8-HxCDF	ND	—	0.92			
1,2,3,7,8,9-HxCDF	ND	—	0.82	1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	ND	—	0.81	1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	ND	—	1.60	2,3,7,8-TCDD-37Cl4	0.20	87
1,2,3,6,7,8-HxCDD	ND	—	1.30			
1,2,3,7,8,9-HxCDD	ND	—	1.30			
Total HxCDD	ND	—	1.40			
1,2,3,4,6,7,8-HpCDF	—	1.1	0.96 +UJ	Total 2,3,7,8-TCDD		
1,2,3,4,7,8,9-HpCDF	ND	—	1.00	Equivalence: 0.038 pg/L		
Total HpCDF	ND	—	1.00	(Using ITE Factors)		
1,2,3,4,6,7,8-HpCDD	2.5	—	1.20 +U			
Total HpCDD	6.5	—	1.20 +J			
OCDF	—	2.5	1.00 +UJ			
OCDD	13.0	—	2.10 +U			

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).

EMPC = Estimated Maximum Possible Concentration

RL = Reporting Limit.

J = Value below calibration range

I = Interference present

ND = Not Detected

NA = Not Applicable

NC = Not Calculated

AS
2/4/08

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc.
28 of 56

Report No.....1065209_8290

Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612-607-6444



Pace Analytical™

Method 8290 Sample Analysis Results

Client - Montana Dept. Of Env. Quality

Client's Sample ID	MBDS-U02-R01		
Lab Sample ID	1065209021		
Filename	U80109A_05		
Injected By	SMT		
Total Amount Extracted	13.4 g	Matrix	Soil
% Moisture	21.7	Dilution	NA
Dry Weight Extracted	10.5 g	Collected	12/13/2007
ICAL Date	12/27/2007	Received	12/18/2007
CCal Filename(s)	U80108A_19 & U80109A_16	Extracted	01/03/2008
Method Blank ID	BLANK-15191	Analyzed	01/09/2008 05:54

Native Isomers	Conc ng/Kg	EMPC ng/Kg	RL ng/Kg	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	0.22	—	0.045	+U	2,3,7,8-TCDF-13C	82
Total TCDF	4.30	—	0.045		2,3,7,8-TCDD-13C	79
					1,2,3,7,8-PeCDF-13C	77
2,3,7,8-TCDD	—	0.14	0.046	+UJ	2,3,4,7,8-PeCDF-13C	76
Total TCDD	0.28	—	0.046	+U	1,2,3,7,8-PeCDD-13C	87
					1,2,3,4,7,8-HxCDF-13C	85
1,2,3,7,8-PeCDF	ND	—	0.069		1,2,3,6,7,8-HxCDF-13C	75
2,3,4,7,8-PeCDF	0.68	—	0.071	+J	2,3,4,6,7,8-HxCDF-13C	76
Total PeCDF	11.00	—	0.070		1,2,3,7,8,9-HxCDF-13C	73
					1,2,3,4,7,8-HxCDD-13C	85
1,2,3,7,8-PeCDD	0.18	—	0.069	+U	1,2,3,6,7,8-HxCDD-13C	72
Total PeCDD	0.81	—	0.069	+J	1,2,3,4,6,7,8-HpCDF-13C	59
					1,2,3,4,7,8,9-HpCDF-13C	49
1,2,3,4,7,8-HxCDF	0.24	—	0.060	+U	1,2,3,4,6,7,8-HpCDD-13C	64
1,2,3,6,7,8-HxCDF	—	1.40	0.067	+R	OCDD-13C	40
2,3,4,6,7,8-HxCDF	0.53	—	0.100	+U		
1,2,3,7,8,9-HxCDF	0.10	—	0.090	+U	1,2,3,4-TCDD-13C	NA
Total HxCDF	8.90	—	0.079		1,2,3,7,8,9-HxCDD-13C	NA
1,2,3,4,7,8-HxCDD	—	0.24	0.110	+UJ	2,3,7,8-TCDD-37Cl4	83
1,2,3,6,7,8-HxCDD	0.75	—	0.130	+J		
1,2,3,7,8,9-HxCDD	0.37	—	0.084	+U		
Total HxCDD	4.80	—	0.100			
1,2,3,4,6,7,8-HpCDF	4.30	—	0.087	+J	Total 2,3,7,8-TCDD	
1,2,3,4,7,8,9-HpCDF	ND	—	0.200		Equivalence: 0.94 ng/Kg	
Total HpCDF	12.00	—	0.140		(Using ITE Factors)	
1,2,3,4,6,7,8-HpCDD	14.00	—	0.110			
Total HpCDD	25.00	—	0.110			
OCDF	8.80	—	0.130	+J		
OCDD	98.00	—	0.290			

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
EMPC = Estimated Maximum Possible Concentration
RL = Reporting Limit.

ND = Not Detected
NA = Not Applicable
NC = Not Calculated

Results reported on a dry weight basis and are valid to no more than 2 significant figures.

J = Value below calibration range
B = Less than 10x higher than method blank level
E = PCDE Interference
I = Interference present

Handwritten:
2/14/08

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc.
29 of 56

Report No.....1065209_8290

Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612-607-6444



Pace Analytical™

Method 8290 Sample Analysis Results

Client - Montana Dept. Of Env. Quality

Client's Sample ID	MBDS-U02-I01		
Lab Sample ID	1065209022		
Filename	U80109A_06		
Injected By	SMT		
Total Amount Extracted	12.9 g	Matrix	Soil
% Moisture	22.1	Dilution	NA
Dry Weight Extracted	10.1 g	Collected	12/13/2007
ICAL Date	12/27/2007	Received	12/18/2007
CCal Filename(s)	U80108A_19 & U80109A_16	Extracted	01/03/2008
Method Blank ID	BLANK-15191	Analyzed	01/09/2008 06:42

Native Isomers	Conc ng/Kg	EMPC ng/Kg	RL ng/Kg	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	0.190	—	0.045	+U 2,3,7,8-TCDF-13C	2.00	91
Total TCDF	1.400	—	0.045	2,3,7,8-TCDD-13C	2.00	87
				1,2,3,7,8-PeCDF-13C	2.00	89
2,3,7,8-TCDD	0.850	—	0.060	+J 2,3,4,7,8-PeCDF-13C	2.00	91
Total TCDD	1.500	—	0.060	1,2,3,7,8-PeCDD-13C	2.00	99
				1,2,3,4,7,8-HxCDF-13C	2.00	87
1,2,3,7,8-PeCDF	0.066	—	0.053	+U 1,2,3,6,7,8-HxCDF-13C	2.00	76
2,3,4,7,8-PeCDF	0.150	—	0.058	+U 2,3,4,6,7,8-HxCDF-13C	2.00	79
Total PeCDF	2.900	—	0.056	+J 1,2,3,7,8,9-HxCDF-13C	2.00	83
				1,2,3,4,7,8-HxCDD-13C	2.00	92
1,2,3,7,8-PeCDD	—	0.120	0.050	+UJ 1,2,3,6,7,8-HxCDD-13C	2.00	79
Total PeCDD	0.300	—	0.050	+U 1,2,3,4,6,7,8-HpCDF-13C	2.00	78
				1,2,3,4,7,8,9-HpCDF-13C	2.00	69
1,2,3,4,7,8-HxCDF	—	0.130	0.045	+UJ 1,2,3,4,6,7,8-HpCDD-13C	2.00	88
1,2,3,6,7,8-HxCDF	0.230	—	0.048	+U OCDD-13C	4.00	68
2,3,4,6,7,8-HxCDF	—	0.150	0.048	+UJ		
1,2,3,7,8,9-HxCDF	—	0.082	0.061	+UJ 1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	2.700	—	0.051	+J 1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	—	0.150	0.087	+UJ 2,3,7,8-TCDD-37Cl4	0.20	92
1,2,3,6,7,8-HxCDD	0.310	—	0.066	+U		
1,2,3,7,8,9-HxCDD	0.230	—	0.096	+U		
Total HxCDD	3.100	—	0.083	+J		
1,2,3,4,6,7,8-HpCDF	1.600	—	0.047	+J Total 2,3,7,8-TCDD		
1,2,3,4,7,8,9-HpCDF	—	0.130	0.084	+UJ Equivalence: 1.2 ng/Kg		
Total HpCDF	1.600	—	0.066	+J (Using ITE Factors)		
1,2,3,4,6,7,8-HpCDD	6.500	—	0.130			
Total HpCDD	13.000	—	0.130			
OCDF	3.800	—	0.110	+J		
OCDD	46.000	—	0.100			

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).

EMPC = Estimated Maximum Possible Concentration

RL = Reporting Limit.

Results reported on a dry weight basis and are valid to no more than 2 significant figures.

J = Value below calibration range

B = Less than 10x higher than method blank level

I = Interference present

ND = Not Detected

NA = Not Applicable

NC = Not Calculated

AB
2/14/08

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc.

30 of 56

Report No.1065209_8290

Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612-607-6444



Pace AnalyticalTM

Method 8290 Sample Analysis Results

Client - Montana Dept. Of Env. Quality

Client's Sample ID	MBDS-U02-C01		
Lab Sample ID	1065209023		
Filename	U80109A_07		
Injected By	SMT		
Total Amount Extracted	12.7 g	Matrix	Soil
% Moisture	22.8	Dilution	NA
Dry Weight Extracted	9.80 g	Collected	12/13/2007
ICAL Date	12/27/2007	Received	12/18/2007
CCal Filename(s)	U80108A_19 & U80109A_16	Extracted	01/03/2008
Method Blank ID	BLANK-15191	Analyzed	01/09/2008 07:30

Native Isomers	Conc ng/Kg	EMPC ng/Kg	RL ng/Kg	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	—	0.76	0.047	E R 2,3,7,8-TCDF-13C	2.00	76
Total TCDF	15.00	—	0.047	2,3,7,8-TCDD-13C	2.00	74
				1,2,3,7,8-PeCDF-13C	2.00	73
2,3,7,8-TCDD	0.19	—	0.055	+U 2,3,4,7,8-PeCDF-13C	2.00	75
Total TCDD	3.50	—	0.055	1,2,3,7,8-PeCDD-13C	2.00	85
				1,2,3,4,7,8-HxCDF-13C	2.00	84
1,2,3,7,8-PeCDF	0.29	—	0.081	+U 1,2,3,6,7,8-HxCDF-13C	2.00	61
2,3,4,7,8-PeCDF	3.60	—	0.064	+J 2,3,4,6,7,8-HxCDF-13C	2.00	68
Total PeCDF	47.00	—	0.073	1,2,3,7,8,9-HxCDF-13C	2.00	60
				1,2,3,4,7,8-HxCDD-13C	2.00	86
1,2,3,7,8-PeCDD	—	0.24	0.061	+UJ 1,2,3,6,7,8-HxCDD-13C	2.00	62
Total PeCDD	2.10	—	0.061	+J 1,2,3,4,6,7,8-HpCDF-13C	2.00	59
				1,2,3,4,7,8,9-HpCDF-13C	2.00	51
1,2,3,4,7,8-HxCDF	0.47	—	0.110	BJJ 1,2,3,4,6,7,8-HpCDD-13C	2.00	68
1,2,3,6,7,8-HxCDF	0.90	—	0.160	BJJ OCDD-13C	4.00	47
2,3,4,6,7,8-HxCDF	2.60	—	0.095	+J 1,2,3,4-TCDD-13C	2.00	NA
1,2,3,7,8,9-HxCDF	0.35	—	0.072	+U 1,2,3,7,8,9-HxCDD-13C	2.00	NA
Total HxCDF	36.00	—	0.110			
1,2,3,4,7,8-HxCDD	0.48	—	0.130	BJJ 2,3,7,8-TCDD-37Cl4	0.20	77
1,2,3,6,7,8-HxCDD	1.30	—	0.150	+J		
1,2,3,7,8,9-HxCDD	0.82	—	0.180	J ↓		
Total HxCDD	11.00	—	0.150			
1,2,3,4,6,7,8-HpCDF	7.70	—	0.078			
1,2,3,4,7,8,9-HpCDF	0.47	—	0.110	BJU Total 2,3,7,8-TCDD		
Total HpCDF	19.00	—	0.094	Equivalence: 3.2 ng/Kg		
				(Using ITE Factors)		
1,2,3,4,6,7,8-HpCDD	25.00	—	0.089			
Total HpCDD	48.00	—	0.089			
OCDF	13.00	—	0.160			
OCDD	200.00	—	0.170			

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
EMPC = Estimated Maximum Possible Concentration
RL = Reporting Limit.

ND = Not Detected
NA = Not Applicable
NC = Not Calculated

Results reported on a dry weight basis and are valid to no more than 2 significant figures.

J = Value below calibration range

B = Less than 10x higher than method blank level

E = PCDE Interference

I = Interference present

MS
2/4/08

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc.

31 of 56

Report No.....1065209_8290



Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612-607-6444

Method 8290 Sample Analysis Results

Client - Montana Dept. Of Env. Quality

Client's Sample ID	MBDS-U03-R01		
Lab Sample ID	1065209024		
Filename	U80109A_08		
Injected By	SMT		
Total Amount Extracted	12.4 g	Matrix	Soil
% Moisture	20.4	Dilution	NA
Dry Weight Extracted	9.88 g	Collected	12/14/2007
ICAL Date	12/27/2007	Received	12/18/2007
CCal Filename(s)	U80108A_19 & U80109A_16	Extracted	01/03/2008
Method Blank ID	BLANK-15191	Analyzed	01/09/2008 08:17

Native Isomers	Conc ng/Kg	EMPC ng/Kg	RL ng/Kg	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	0.150	—	0.130	+ U	2,3,7,8-TCDF-13C	76
Total TCDF	1.400	—	0.130		2,3,7,8-TCDD-13C	74
					1,2,3,7,8-PeCDF-13C	79
2,3,7,8-TCDD	—	0.085	0.078	+ U J	2,3,4,7,8-PeCDF-13C	80
Total TCDD	0.100	—	0.078	J U	1,2,3,7,8-PeCDD-13C	91
					1,2,3,4,7,8-HxCDF-13C	77
1,2,3,7,8-PeCDF	ND	—	0.094		1,2,3,6,7,8-HxCDF-13C	64
2,3,4,7,8-PeCDF	0.120	—	0.100	B U	2,3,4,6,7,8-HxCDF-13C	66
Total PeCDF	2.500	—	0.097	B J	1,2,3,7,8,9-HxCDF-13C	72
					1,2,3,4,7,8-HxCDD-13C	81
1,2,3,7,8-PeCDD	—	0.077	0.041	+ U J	1,2,3,6,7,8-HxCDD-13C	66
Total PeCDD	0.054	—	0.041	B U	1,2,3,4,6,7,8-HpCDF-13C	69
					1,2,3,4,7,8,9-HpCDF-13C	67
1,2,3,4,7,8-HxCDF	—	0.097	0.061	+ U J	1,2,3,4,6,7,8-HpCDD-13C	84
1,2,3,6,7,8-HxCDF	—	0.092	0.044	J U J	OCDD-13C	71
2,3,4,6,7,8-HxCDF	0.180	—	0.084	B U		
1,2,3,7,8,9-HxCDF	ND	—	0.073		1,2,3,4-TCDD-13C	NA
Total HxCDF	2.200	—	0.065	B J	1,2,3,7,8,9-HxCDD-13C	NA
1,2,3,4,7,8-HxCDD	—	0.120	0.064	+ U J	2,3,7,8-TCDD-37Cl4	78
1,2,3,6,7,8-HxCDD	0.300	—	0.072	J U		
1,2,3,7,8,9-HxCDD	0.240	—	0.064	J U		
Total HxCDD	1.500	—	0.067	J		
1,2,3,4,6,7,8-HpCDF	0.940	—	0.061	J	Total 2,3,7,8-TCDD	
1,2,3,4,7,8,9-HpCDF	0.096	—	0.066	B U	Equivalence: 0.23 ng/Kg	
Total HpCDF	1.000	—	0.063	B J	(Using ITE Factors)	
1,2,3,4,6,7,8-HpCDD	4.300	—	0.072	J		
Total HpCDD	8.200	—	0.072			
OCDF	2.000	—	0.073	J J		
OCDD	29.000	—	0.100			

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).

EMPC = Estimated Maximum Possible Concentration

RL = Reporting Limit.

ND = Not Detected

NA = Not Applicable

NC = Not Calculated

Results reported on a dry weight basis and are valid to no more than 2 significant figures.

J = Value below calibration range

B = Less than 10x higher than method blank level

I = Interference present

As
2/14/08

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc.

32 of 56

Report No.....1065209_8290

Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612-607-6444



Pace AnalyticalTM

Method 8290 Sample Analysis Results

Client - Montana Dept. Of Env. Quality

Client's Sample ID	MBDS-U03-C01		
Lab Sample ID	1065209025		
Filename	U80109A_09		
Injected By	SMT		
Total Amount Extracted	12.6 g	Matrix	Soil
% Moisture	19.7	Dilution	NA
Dry Weight Extracted	10.1 g	Collected	12/14/2007
ICAL Date	12/27/2007	Received	12/18/2007
CCal Filename(s)	U80108A_19 & U80109A_16	Extracted	01/03/2008
Method Blank ID	BLANK-15191	Analyzed	01/09/2008 09:06

Native Isomers	Conc ng/Kg	EMPC ng/Kg	RL ng/Kg	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	0.24	—	0.060	+U	2,3,7,8-TCDF-13C	86
Total TCDF	3.70	—	0.060		2,3,7,8-TCDD-13C	85
					1,2,3,7,8-PeCDF-13C	86
2,3,7,8-TCDD	—	0.087	0.071	+UJ	2,3,4,7,8-PeCDF-13C	88
Total TCDD	0.62	—	0.071	+J	1,2,3,7,8-PeCDD-13C	101
					1,2,3,4,7,8-HxCDF-13C	81
1,2,3,7,8-PeCDF	0.29	—	0.067	+U	1,2,3,6,7,8-HxCDF-13C	71
2,3,4,7,8-PeCDF	0.68	—	0.074	B+J	2,3,4,6,7,8-HxCDF-13C	73
Total PeCDF	7.30	—	0.071		1,2,3,7,8,9-HxCDF-13C	79
					1,2,3,4,7,8-HxCDD-13C	85
1,2,3,7,8-PeCDD	—	0.220	0.058	+UJ	1,2,3,6,7,8-HxCDD-13C	75
Total PeCDD	1.00	—	0.058	B+J	1,2,3,4,6,7,8-HpCDF-13C	74
					1,2,3,4,7,8,9-HpCDF-13C	71
1,2,3,4,7,8-HxCDF	0.91	—	0.073	+J	1,2,3,4,6,7,8-HpCDD-13C	91
1,2,3,6,7,8-HxCDF	0.61	—	0.077	B+J	OCDD-13C	71
2,3,4,6,7,8-HxCDF	—	0.580	0.049	+J+		
1,2,3,7,8,9-HxCDF	0.33	—	0.070	+U	1,2,3,4-TCDD-13C	NA
Total HxCDF	13.00	—	0.067		1,2,3,7,8,9-HxCDD-13C	NA
1,2,3,4,7,8-HxCDD	0.45	—	0.110	B+J	2,3,7,8-TCDD-37Cl4	88
1,2,3,6,7,8-HxCDD	1.40	—	0.120	J		
1,2,3,7,8,9-HxCDD	0.90	—	0.100	J↓		
Total HxCDD	11.00	—	0.110			
1,2,3,4,6,7,8-HpCDF	5.80	—	0.076		Total 2,3,7,8-TCDD	
1,2,3,4,7,8,9-HpCDF	0.55	—	0.083	B+U	Equivalence: 1.5 ng/Kg	
Total HpCDF	17.00	—	0.080		(Using ITE Factors)	
1,2,3,4,6,7,8-HpCDD	33.00	—	0.280			
Total HpCDD	60.00	—	0.280			
OCDF	11.00	—	0.060			
OCDD	280.00	—	0.080			

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
EMPC = Estimated Maximum Possible Concentration
RL = Reporting Limit.

ND = Not Detected
NA = Not Applicable
NC = Not Calculated

Results reported on a dry weight basis and are valid to no more than 2 significant figures.

J = Value below calibration range

B = Less than 10x higher than method blank level

I = Interference present

AB
2/4/08

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc.

33 of 56

Report No.....1065209_8290

Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612-607-6444



Pace Analytical™

Method 8290 Sample Analysis Results

Client - Montana Dept. Of Env. Quality

Client's Sample ID	MBDS-U03-I01		
Lab Sample ID	1065209026		
Filename	U80109A_10		
Injected By	SMT		
Total Amount Extracted	13.4 g	Matrix	Soil
% Moisture	30.1	Dilution	NA
Dry Weight Extracted	9.34 g	Collected	12/14/2007
ICAL Date	12/27/2007	Received	12/18/2007
CCal Filename(s)	U80108A_19 & U80109A_16	Extracted	01/03/2008
Method Blank ID	BLANK-15191	Analyzed	01/09/2008 09:54

Native Isomers	Conc ng/Kg	EMPC ng/Kg	RL ng/Kg	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	0.23	—	0.050	↗ U	2,3,7,8-TCDF-13C	86
Total TCDF	1.50	—	0.050		2,3,7,8-TCDD-13C	83
					1,2,3,7,8-PeCDF-13C	87
2,3,7,8-TCDD	0.12	—	0.066	↗ U	2,3,4,7,8-PeCDF-13C	90
Total TCDD	0.12	—	0.066	↗ U	1,2,3,7,8-PeCDD-13C	102
					1,2,3,4,7,8-HxCDF-13C	80
1,2,3,7,8-PeCDF	0.12	—	0.051	↗ U	1,2,3,6,7,8-HxCDF-13C	67
2,3,4,7,8-PeCDF	0.27	—	0.060	↗ U	2,3,4,6,7,8-HxCDF-13C	71
Total PeCDF	5.10	—	0.056	↗ J	1,2,3,7,8,9-HxCDF-13C	76
					1,2,3,4,7,8-HxCDD-13C	84
1,2,3,7,8-PeCDD	—	0.17	0.076	↗ U J	1,2,3,6,7,8-HxCDD-13C	72
Total PeCDD	0.63	—	0.076	↗ U	1,2,3,4,6,7,8-HpCDF-13C	74
					1,2,3,4,7,8,9-HpCDF-13C	71
1,2,3,4,7,8-HxCDF	0.29	—	0.073	↗ U	1,2,3,4,6,7,8-HpCDD-13C	85
1,2,3,6,7,8-HxCDF	0.46	—	0.066	↗ J	OCDD-13C	77
2,3,4,6,7,8-HxCDF	0.42	—	0.060	↗ J		
1,2,3,7,8,9-HxCDF	ND	—	0.073		1,2,3,4-TCDD-13C	NA
Total HxCDF	6.40	—	0.068		1,2,3,7,8,9-HxCDD-13C	NA
1,2,3,4,7,8-HxCDD	0.37	—	0.100	↗ U	2,3,7,8-TCDD-37Cl4	85
1,2,3,6,7,8-HxCDD	0.74	—	0.053	↗ J		
1,2,3,7,8,9-HxCDD	0.55	—	0.100	↗ J		
Total HxCDD	6.20	—	0.085			
1,2,3,4,6,7,8-HpCDF	3.80	—	0.087	↗ J	Total 2,3,7,8-TCDD	
1,2,3,4,7,8,9-HpCDF	0.27	—	0.130	↗ U	Equivalence: 0.99 ng/Kg	
Total HpCDF	4.00	—	0.110	↗ J	(Using ITE Factors)	
1,2,3,4,6,7,8-HpCDD	21.00	—	0.150			
Total HpCDD	41.00	—	0.150			
OCDF	9.60	—	0.061	↗ J		
OCDD	160.00	—	0.110			

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).

EMPC = Estimated Maximum Possible Concentration

RL = Reporting Limit.

ND = Not Detected

NA = Not Applicable

NC = Not Calculated

Results reported on a dry weight basis and are valid to no more than 2 significant figures.

J = Value below calibration range

B = Less than 10x higher than method blank level

I = Interference present

1/8
2/19/08

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc.

34 of 56

Report No. 1065209_8290


Pace Analytical™

 Pace Analytical Services, Inc.
 1700 Elm Street - Suite 200
 Minneapolis, MN 55414

 Tel: 612-607-1700
 Fax: 612-607-6444

Method 8290 Sample Analysis Results

Client - Montana Dept. Of Env. Quality

Client's Sample ID	MBDS-U05-C01		
Lab Sample ID	1065209027		
Filename	U80109A_11		
Injected By	SMT		
Total Amount Extracted	12.5 g	Matrix	Soil
% Moisture	22.7	Dilution	NA
Dry Weight Extracted	9.69 g	Collected	12/14/2007
ICAL Date	12/27/2007	Received	12/18/2007
CCal Filename(s)	U80108A_19 & U80109A_16	Extracted	01/03/2008
Method Blank ID	BLANK-15191	Analyzed	01/09/2008 10:42

Native Isomers	Conc ng/Kg	EMPC ng/Kg	RL ng/Kg	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	—	0.48	0.110	+ J+ 2,3,7,8-TCDF-13C	2.00	89
Total TCDF	15.00	—	0.110	2,3,7,8-TCDD-13C	2.00	86
				1,2,3,7,8-PeCDF-13C	2.00	88
2,3,7,8-TCDD	—	0.16	0.071	+ UJ 2,3,4,7,8-PeCDF-13C	2.00	90
Total TCDD	0.78	—	0.071	+ J 1,2,3,7,8-PeCDD-13C	2.00	102
				1,2,3,4,7,8-HxCDF-13C	2.00	81
1,2,3,7,8-PeCDF	ND	—	0.100	1,2,3,6,7,8-HxCDF-13C	2.00	71
2,3,4,7,8-PeCDF	0.77	—	0.085	+ J 2,3,4,6,7,8-HxCDF-13C	2.00	73
Total PeCDF	9.90	—	0.092	1,2,3,7,8,9-HxCDF-13C	2.00	78
				1,2,3,4,7,8-HxCDD-13C	2.00	85
1,2,3,7,8-PeCDD	0.27	—	0.058	+ U 1,2,3,6,7,8-HxCDD-13C	2.00	75
Total PeCDD	1.10	—	0.058	+ J 1,2,3,4,6,7,8-HpCDF-13C	2.00	70
				1,2,3,4,7,8,9-HpCDF-13C	2.00	67
1,2,3,4,7,8-HxCDF	0.38	—	0.100	+ U 1,2,3,4,6,7,8-HpCDD-13C	2.00	87
1,2,3,6,7,8-HxCDF	0.83	—	0.080	+ J OCDD-13C	4.00	63
2,3,4,6,7,8-HxCDF	0.99	—	0.110	+ J 1,2,3,4-TCDD-13C	2.00	NA
1,2,3,7,8,9-HxCDF	—	0.14	0.120	+ UJ 1,2,3,7,8,9-HxCDD-13C	2.00	NA
Total HxCDF	12.00	—	0.100			
1,2,3,4,7,8-HxCDD	0.43	—	0.120	+ J 2,3,7,8-TCDD-37Cl4	0.20	85
1,2,3,6,7,8-HxCDD	1.10	—	0.080	+ J		
1,2,3,7,8,9-HxCDD	0.96	—	0.120	+ J		
Total HxCDD	9.50	—	0.110			
1,2,3,4,6,7,8-HpCDF	6.30	—	0.110			
1,2,3,4,7,8,9-HpCDF	0.45	—	0.130	+ U Total 2,3,7,8-TCDD		
Total HpCDF	6.70	—	0.120	+ U Equivalence: 1.6 ng/Kg		
				(Using ITE Factors)		
1,2,3,4,6,7,8-HpCDD	26.00	—	0.210			
Total HpCDD	50.00	—	0.210			
OCDF	22.00	—	0.072			
OCDD	270.00	—	0.099			

Conc = Concentration (Totals include 2,3,7,8-substituted isomers),
 EMPC = Estimated Maximum Possible Concentration
 RL = Reporting Limit,

ND = Not Detected
 NA = Not Applicable
 NC = Not Calculated

Results reported on a dry weight basis and are valid to no more than 2 significant figures.

J = Value below calibration range

B = Less than 10x higher than method blank level

I = Interference present

AP
2/4/08

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
 without the written consent of Pace Analytical Services, Inc.

35 of 56

Report No.....1065209_8290


Pace Analytical™

 Pace Analytical Services, Inc.
 1700 Elm Street - Suite 200
 Minneapolis, MN 55414

 Tel: 612-607-1700
 Fax: 612-607-8444

Method 8290 Sample Analysis Results

Client - Montana Dept. Of Env. Quality

Client's Sample ID	MBDS-U05-I01		
Lab Sample ID	1065209028		
Filename	U80109A_12		
Injected By	SMT		
Total Amount Extracted	12.7 g	Matrix	Soil
% Moisture	20.3	Dilution	NA
Dry Weight Extracted	10.1 g	Collected	12/14/2007
ICAL Date	12/27/2007	Received	12/18/2007
CCal Filename(s)	U80108A_19 & U80109A_16	Extracted	01/03/2008
Method Blank ID	BLANK-15191	Analyzed	01/09/2008 11:29

Native Isomers	Conc ng/Kg	EMPC ng/Kg	RL ng/Kg	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	—	0.130	0.080 +UJ	2,3,7,8-TCDF-13C	2.00	82
Total TCDF	3.40	—	0.080	2,3,7,8-TCDD-13C	2.00	81
				1,2,3,7,8-PeCDF-13C	2.00	83
2,3,7,8-TCDD	ND	—	0.071	2,3,4,7,8-PeCDF-13C	2.00	85
Total TCDD	0.21	—	0.071 +U	1,2,3,7,8-PeCDD-13C	2.00	99
				1,2,3,4,7,8-HxCDF-13C	2.00	84
1,2,3,7,8-PeCDF	—	0.110	0.046 +UJ	1,2,3,6,7,8-HxCDF-13C	2.00	68
2,3,4,7,8-PeCDF	0.46	—	0.039 BU	2,3,4,6,7,8-HxCDF-13C	2.00	73
Total PeCDF	10.00	—	0.042	1,2,3,7,8,9-HxCDF-13C	2.00	79
				1,2,3,4,7,8-HxCDD-13C	2.00	89
1,2,3,7,8-PeCDD	—	0.150	0.048 +UJ	1,2,3,6,7,8-HxCDD-13C	2.00	74
Total PeCDD	0.46	—	0.048 BU	1,2,3,4,6,7,8-HpCDF-13C	2.00	77
				1,2,3,4,7,8,9-HpCDF-13C	2.00	74
1,2,3,4,7,8-HxCDF	0.27	—	0.092 BU	1,2,3,4,6,7,8-HpCDD-13C	2.00	93
1,2,3,6,7,8-HxCDF	0.83	—	0.070 BU	OCDD-13C	4.00	76
2,3,4,6,7,8-HxCDF	0.51	—	0.077 BU			
1,2,3,7,8,9-HxCDF	—	0.088	0.060 +UJ	1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	8.20	—	0.075	1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	—	0.260	0.045 +UJ	2,3,7,8-TCDD-37Cl4	0.20	80
1,2,3,6,7,8-HxCDD	0.76	—	0.084 +J			
1,2,3,7,8,9-HxCDD	0.59	—	0.110 +J			
Total HxCDD	5.30	—	0.081			
1,2,3,4,6,7,8-HpCDF	3.30	—	0.072 +J	Total 2,3,7,8-TCDD		
1,2,3,4,7,8,9-HpCDF	—	0.160	0.110 +UJ	Equivalence: 0.82 ng/Kg		
Total HpCDF	8.70	—	0.092	(Using ITE Factors)		
1,2,3,4,6,7,8-HpCDD	15.00	—	0.170			
Total HpCDD	26.00	—	0.170			
OCDF	7.20	—	0.066 +J			
OCDD	110.00	—	0.086			

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
 EMPC = Estimated Maximum Possible Concentration
 RL = Reporting Limit.

ND = Not Detected
 NA = Not Applicable
 NC = Not Calculated

Results reported on a dry weight basis and are valid to no more than 2 significant figures.

J = Value below calibration range

B = Less than 10x higher than method blank level

I = Interference present

Handwritten:
 X3
 2/9/08

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
 without the written consent of Pace Analytical Services, Inc.
 36 of 56

Report No.....1065209_8290



Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612-607-6444

Method 8290 Sample Analysis Results

Client - Montana Dept. Of Env. Quality

Client's Sample ID	MBDS-U05-R01		
Lab Sample ID	1065209029		
Filename	U80109A_13		
Injected By	SMT		
Total Amount Extracted	12.5 g	Matrix	Soil
% Moisture	26.5	Dilution	NA
Dry Weight Extracted	9.20 g	Collected	12/14/2007
ICAL Date	12/27/2007	Received	12/18/2007
CCal Filename(s)	U80108A_19 & U80109A_16	Extracted	01/03/2008
Method Blank ID	BLANK-15191	Analyzed	01/09/2008 12:17

Native Isomers	Conc ng/Kg	EMPC ng/Kg	RL ng/Kg	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	0.14	—	0.053	2,3,7,8-TCDF-13C	2.00	72
Total TCDF	4.00	—	0.053	2,3,7,8-TCDD-13C	2.00	71
				1,2,3,7,8-PeCDF-13C	2.00	74
2,3,7,8-TCDD	—	0.087	0.074	2,3,4,7,8-PeCDF-13C	2.00	75
Total TCDD	ND	—	0.074	1,2,3,7,8-PeCDD-13C	2.00	86
				1,2,3,4,7,8-HxCDF-13C	2.00	72
1,2,3,7,8-PeCDF	0.15	—	0.075	1,2,3,6,7,8-HxCDF-13C	2.00	60
2,3,4,7,8-PeCDF	1.00	—	0.069	2,3,4,6,7,8-HxCDF-13C	2.00	64
Total PeCDF	13.00	—	0.072	1,2,3,7,8,9-HxCDF-13C	2.00	68
				1,2,3,4,7,8-HxCDD-13C	2.00	76
1,2,3,7,8-PeCDD	0.13	—	0.062	1,2,3,6,7,8-HxCDD-13C	2.00	62
Total PeCDD	0.50	—	0.062	1,2,3,4,6,7,8-HpCDF-13C	2.00	64
				1,2,3,4,7,8,9-HpCDF-13C	2.00	59
1,2,3,4,7,8-HxCDF	0.51	—	0.100	1,2,3,4,6,7,8-HpCDD-13C	2.00	76
1,2,3,6,7,8-HxCDF	0.97	—	0.069	OCDD-13C	4.00	60
2,3,4,6,7,8-HxCDF	0.90	—	0.084			
1,2,3,7,8,9-HxCDF	0.20	—	0.100	1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	17.00	—	0.089	1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	0.30	—	0.110	2,3,7,8-TCDD-37Cl4	0.20	78
1,2,3,6,7,8-HxCDD	1.10	—	0.087			
1,2,3,7,8,9-HxCDD	0.46	—	0.120			
Total HxCDD	8.50	—	0.110			
1,2,3,4,6,7,8-HpCDF	10.00	—	0.130	Total 2,3,7,8-TCDD		
1,2,3,4,7,8,9-HpCDF	—	0.490	0.180	Equivalence: 1.7 ng/Kg		
Total HpCDF	33.00	—	0.160	(Using ITE Factors)		
1,2,3,4,6,7,8-HpCDD	26.00	—	0.110			
Total HpCDD	49.00	—	0.110			
OCDF	30.00	—	0.110			
OCDD	260.00	—	0.130			

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).

EMPC = Estimated Maximum Possible Concentration

RL = Reporting Limit.

ND = Not Detected

NA = Not Applicable

NC = Not Calculated

Results reported on a dry weight basis and are valid to no more than 2 significant figures.

J = Value below calibration range

B = Less than 10x higher than method blank level

I = Interference present

Ans
2/4/08

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc.

37 of 56

Report No.....1065209_8290



Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612-607-6444

Method 8290 Sample Analysis Results

Client - Montana Dept. Of Env. Quality

Client's Sample ID	MBDS-U04-R01		
Lab Sample ID	1065209030		
Filename	U80109A_14		
Injected By	SMT		
Total Amount Extracted	12.9 g	Matrix	Soil
% Moisture	10.9	Dilution	NA
Dry Weight Extracted	11.5 g	Collected	12/14/2007
ICAL Date	12/27/2007	Received	12/18/2007
CCal Filename(s)	U80108A_19 & U80109A_16	Extracted	01/03/2008
Method Blank ID	BLANK-15191	Analyzed	01/09/2008 13:05

Native Isomers	Conc ng/Kg	EMPC ng/Kg	RL ng/Kg	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	ND	—	0.140	2,3,7,8-TCDF-13C	2.00	89
Total TCDF	3.100	—	0.140	2,3,7,8-TCDD-13C	2.00	88
				1,2,3,7,8-PeCDF-13C	2.00	87
2,3,7,8-TCDD	—	0.066	0.049 +UJ	2,3,4,7,8-PeCDF-13C	2.00	91
Total TCDD	0.210	—	0.049 +U	1,2,3,7,8-PeCDD-13C	2.00	104
				1,2,3,4,7,8-HxCDF-13C	2.00	87
1,2,3,7,8-PeCDF	0.380	—	0.140 +U	1,2,3,6,7,8-HxCDF-13C	2.00	73
2,3,4,7,8-PeCDF	0.130	—	0.110 B+U	2,3,4,6,7,8-HxCDF-13C	2.00	78
Total PeCDF	6.900	—	0.120	1,2,3,7,8,9-HxCDF-13C	2.00	84
				1,2,3,4,7,8-HxCDD-13C	2.00	90
1,2,3,7,8-PeCDD	0.081	—	0.052 B+U	1,2,3,6,7,8-HxCDD-13C	2.00	79
Total PeCDD	0.200	—	0.052 B+U	1,2,3,4,6,7,8-HpCDF-13C	2.00	82
				1,2,3,4,7,8,9-HpCDF-13C	2.00	76
1,2,3,4,7,8-HxCDF	ND	—	0.063	1,2,3,4,6,7,8-HpCDD-13C	2.00	94
1,2,3,6,7,8-HxCDF	—	0.410	0.057 E R	OCDD-13C	4.00	79
2,3,4,6,7,8-HxCDF	0.120	—	0.052 B+U			
1,2,3,7,8,9-HxCDF	—	0.086	0.081 +UJ	1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	1.900	—	0.063 B+J	1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	0.100	—	0.046 B+U	2,3,7,8-TCDD-37Cl4	0.20	98
1,2,3,6,7,8-HxCDD	0.290	—	0.051 +			
1,2,3,7,8,9-HxCDD	0.210	—	0.048 +			
Total HxCDD	2.800	—	0.048 +			
1,2,3,4,6,7,8-HpCDF	0.710	—	0.060 +U	Total 2,3,7,8-TCDD		
1,2,3,4,7,8,9-HpCDF	ND	—	0.078	Equivalence: 0.29 ng/Kg		
Total HpCDF	1.900	—	0.069 +J	(Using ITE Factors)		
1,2,3,4,6,7,8-HpCDD	4.700	—	0.110			
Total HpCDD	9.100	—	0.110			
OCDF	1.700	—	0.093 +J			
OCDD	35.000	—	0.120			

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
EMPC = Estimated Maximum Possible Concentration
RL = Reporting Limit.

ND = Not Detected
NA = Not Applicable
NC = Not Calculated

Results reported on a dry weight basis and are valid to no more than 2 significant figures.

J = Value below calibration range

B = Less than 10x higher than method blank level

E = PCDE Interference

I = Interference present

Ag
2/4/08

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc.

38 of 56

Report No.....1065209_8290



Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612-607-6444

Method 8290 Sample Analysis Results

Client - Montana Dept. Of Env. Quality

Client's Sample ID	MBDS-U04-C01		
Lab Sample ID	1065209031		
Filename	U80109B_09		
Injected By	SMT		
Total Amount Extracted	12.6 g	Matrix	Soil
% Moisture	22.4	Dilution	NA
Dry Weight Extracted	9.81 g	Collected	12/14/2007
ICAL Date	12/27/2007	Received	12/18/2007
CCal Filename(s)	U80109A_16 & U80109B_16	Extracted	01/04/2008
Method Blank ID	BLANK-15193	Analyzed	01/09/2008 21:15

Native Isomers	Conc ng/Kg	EMPC ng/Kg	RL ng/Kg	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	0.120	—	0.043	J U 2,3,7,8-TCDF-13C	2.00	85
Total TCDF	0.870	—	0.043	B U 2,3,7,8-TCDD-13C	2.00	84
				1,2,3,7,8-PeCDF-13C	2.00	90
2,3,7,8-TCDD	ND	—	0.047	2,3,4,7,8-PeCDF-13C	2.00	81
Total TCDD	0.095	—	0.047	J U 1,2,3,7,8-PeCDD-13C	2.00	100
				1,2,3,4,7,8-HxCDF-13C	2.00	85
1,2,3,7,8-PeCDF	0.120	—	0.060	J U 1,2,3,6,7,8-HxCDF-13C	2.00	78
2,3,4,7,8-PeCDF	0.150	—	0.042	B U 2,3,4,6,7,8-HxCDF-13C	2.00	76
Total PeCDF	2.300	—	0.051	J J 1,2,3,7,8,9-HxCDF-13C	2.00	69
				1,2,3,4,7,8-HxCDD-13C	2.00	95
1,2,3,7,8-PeCDD	0.250	—	0.044	J J 1,2,3,6,7,8-HxCDD-13C	2.00	78
Total PeCDD	0.560	—	0.044	J J 1,2,3,4,6,7,8-HpCDF-13C	2.00	82
				1,2,3,4,7,8,9-HpCDF-13C	2.00	55
1,2,3,4,7,8-HxCDF	0.390	—	0.068	J J 1,2,3,4,6,7,8-HpCDD-13C	2.00	83
1,2,3,6,7,8-HxCDF	—	0.51	0.100	E J 1,2,3,4,6,7,8-HpCDD-13C	2.00	67
2,3,4,6,7,8-HxCDF	0.400	—	0.099	J J OCDD-13C	4.00	
1,2,3,7,8,9-HxCDF	—	0.13	0.100	J J 1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	6.800	—	0.092	J J 1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	0.620	—	0.088	J J 2,3,7,8-TCDD-37C4	0.20	94
1,2,3,6,7,8-HxCDD	2.100	—	0.110	J J		
1,2,3,7,8,9-HxCDD	1.400	—	0.140	J J		
Total HxCDD	13.000	—	0.110	J J		
1,2,3,4,6,7,8-HpCDF	3.500	—	0.110	J J Total 2,3,7,8-TCDD		
1,2,3,4,7,8,9-HpCDF	—	0.26	0.140	J J Equivalence: 1.6 ng/Kg		
Total HpCDF	8.100	—	0.120	J J (Using ITE Factors)		
1,2,3,4,6,7,8-HpCDD	41.000	—	0.320			
Total HpCDD	75.000	—	0.320			
OCDF	5.300	—	0.210	J J		
OCDD	450.000	—	0.270	J J		

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
EMPC = Estimated Maximum Possible Concentration
RL = Reporting Limit.

ND = Not Detected
NA = Not Applicable
NC = Not Calculated

Results reported on a dry weight basis and are valid to no more than 2 significant figures.

J = Value below calibration range

B = Less than 10x higher than method blank level

E = PCDE Interference

I = Interference present

Asy
2/4/08

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc.
39 of 56

Report No.....1065209_8290

Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612-607-6444



Pace Analytical™

Method 8290 Sample Analysis Results

Client - Montana Dept. Of Env. Quality

Client's Sample ID	MBDS-U04-I01		
Lab Sample ID	1065209032		
Filename	U80109B_10		
Injected By	SMT		
Total Amount Extracted	13.0 g	Matrix	Soil
% Moisture	12.3	Dilution	NA
Dry Weight Extracted	11.4 g	Collected	12/14/2007
ICAL Date	12/27/2007	Received	12/18/2007
CCal Filename(s)	U80109A_16 & U80109B_16	Extracted	01/04/2008
Method Blank ID	BLANK-15193	Analyzed	01/09/2008 22:03

Native Isomers	Conc ng/Kg	EMPC ng/Kg	RL ng/Kg	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	0.20	—	0.040	+u 2,3,7,8-TCDF-13C	2.00	85
Total TCDF	5.80	—	0.040	2,3,7,8-TCDD-13C	2.00	88
				1,2,3,7,8-PeCDF-13C	2.00	89
2,3,7,8-TCDD	—	0.20	0.047	+u 2,3,4,7,8-PeCDF-13C	2.00	83
Total TCDD	3.40	—	0.047	1,2,3,7,8-PeCDD-13C	2.00	102
				1,2,3,4,7,8-HxCDF-13C	2.00	87
1,2,3,7,8-PeCDF	0.26	—	0.046	J 1,2,3,6,7,8-HxCDF-13C	2.00	77
2,3,4,7,8-PeCDF	0.93	—	0.053	+J 2,3,4,6,7,8-HxCDF-13C	2.00	78
Total PeCDF	17.00	—	0.049	1,2,3,7,8,9-HxCDF-13C	2.00	73
				1,2,3,4,7,8-HxCDD-13C	2.00	94
1,2,3,7,8-PeCDD	1.90	—	0.034	+J 1,2,3,6,7,8-HxCDD-13C	2.00	82
Total PeCDD	18.00	—	0.034	1,2,3,4,6,7,8-HpCDF-13C	2.00	82
				1,2,3,4,7,8,9-HpCDF-13C	2.00	59
1,2,3,4,7,8-HxCDF	1.90	—	0.110	+J 1,2,3,4,6,7,8-HpCDD-13C	2.00	89
1,2,3,6,7,8-HxCDF	2.50	—	0.074	+J OCDD-13C	4.00	76
2,3,4,6,7,8-HxCDF	2.70	—	0.130			
1,2,3,7,8,9-HxCDF	0.61	—	0.100	+J 1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	60.00	—	0.100	1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	4.50	—	0.190	2,3,7,8-TCDD-37Cl4	0.20	97
1,2,3,6,7,8-HxCDD	9.50	—	0.240			
1,2,3,7,8,9-HxCDD	8.10	—	0.170			
Total HxCDD	110.00	—	0.200			
1,2,3,4,6,7,8-HpCDF	44.00	—	0.110	Total 2,3,7,8-TCDD		
1,2,3,4,7,8,9-HpCDF	3.50	—	0.530	+J Equivalence: 10 ng/Kg		
Total HpCDF	110.00	—	0.320	(Using ITE Factors)		
1,2,3,4,6,7,8-HpCDD	280.00	—	0.070			
Total HpCDD	520.00	—	0.070			
OCDF	110.00	—	0.120	J-		
OCDD	2500.00	—	0.170			

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
EMPC = Estimated Maximum Possible Concentration
RL = Reporting Limit.

ND = Not Detected
NA = Not Applicable
NC = Not Calculated

Results reported on a dry weight basis and are valid to no more than 2 significant figures.
J = Value below calibration range
I = Interference present

AK
2/9/08

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc.
40 of 56

Report No.....1065209_8290

Montana Background Dioxin Study

- 1. **SDG Number:** 1071797
- 2. **Number of Samples:** (12)
- 3. **Sample Matrix:** (12) Soil/Solid
- 4. **Applicable Analytes:** PCDD/PCDF
- 5. **Reporting Tier:** Level 3
- 6. **Analysis Method** USEPA SW-846 Method 8290
- 7. **Laboratory:** Pace Analytical
- 8. **Validation Level:** III
- 9. **Validator Affiliation:** Portage Environmental, Inc.
- 10. **Project:** Montana Background Dioxin Study

Validator's Signature: 

Date: 06/16/08

Reviewed By: 

Date: 06/16/08

1. INTRODUCTION

Twelve (12) soil/solid samples were collected and analyzed for Dioxins/Furans by Pace Analytical using USEPA SW-846 Method 8290, *Polychlorinated Dibenzodioxins (PCDDs) and Polychlorinated Dibenzofurans (PCDFs) by High Resolution Gas Chromatography/High Resolution Mass Spectrometry (HRGC/HRMS)*. The data were validated to a Level III.

2. SAMPLE IDENTIFICATION

A sample cross-reference and holding time table is presented below.

Montana Background Dioxin Study SDG Number 1071797								
Field ID	Lab ID	Matrix	Sample Collection Date	Date Received	Date Extracted	Collection to Extraction Holding Time	Analysis Date	Extraction to Analysis Holding Time
MBDS-U17-R01	1071797001	Soil/Solid	04/17/08	04/19/08	05/08/08	21	05/15/08	7
MBDS-U17-I01	1071797002	Soil/Solid	04/17/08	04/19/08	05/08/08	21	05/14/08	6
MBDS-U17-C01	1071797003	Soil/Solid	04/17/08	04/19/08	05/08/08	21	05/14/08	6
MBDS-U19-R01	1071797004	Soil/Solid	04/17/08	04/19/08	05/08/08	21	05/14/08	5
MBDS-U19-R02	1071797005	Soil/Solid	04/17/08	04/19/08	05/08/08	21	05/14/08	5
MBDS-U19-C01	1071797006	Soil/Solid	04/17/08	04/19/08	05/08/08	21	05/14/08	5
MBDS-U20-R01	1071797007	Soil/Solid	04/17/08	04/19/08	05/08/08	21	05/15/08	7
MBDS-U20-R02	1071797008	Soil/Solid	04/17/08	04/19/08	05/08/08	21	05/22/08	14
MBDS-U20-C01	1071797009	Soil/Solid	04/17/08	04/19/08	05/08/08	21	05/21/08	13
MBDS-U18-R01	1071797010	Soil/Solid	04/17/08	04/19/08	05/08/08	21	05/15/08	7
MBDS-U18-I01	1071797011	Soil/Solid	04/17/08	04/19/08	05/08/08	21	05/15/08	7
MBDS-U18-C01	1071797012	Soil/Solid	04/17/08	04/19/08	05/08/08	21	05/15/08	7

A '**' denotes an exceeded holding time.

3. DATA LIMITATION OVERVIEW

The target compound analyses, dioxin/furan, for soil/solid samples from Montana Background Dioxin Study showed compliance with the QC requirements set forth by USEPA SW-846 Method 8290. The data are valid and acceptable with the following exceptions:

MBDS-U17-I01:

- 2,3,7,8-TCDF, 2,3,4,7,8-PeCDF, 1,2,3,7,8-PeCDD, total PeCDD, 1,2,3,4,7,8-HxCDF, 1,2,3,6,7,8-HxCDF, 2,3,4,6,7,8-HxCDF, 1,2,3,7,8,9-HxCDF, 1,2,3,4,7,8-HxCDD, 1,2,3,6,7,8-HxCDD, 1,2,3,7,8,9-HxCDD, 1,2,3,4,7,8,9-HpCDF, and OCDF have been qualified with a 'J' validation flag to denote the reported concentrations are estimates with an undetermined bias as they were reported below the quantitation limit (see CTR comment #10).

- 2,3,7,8-TCDD and 1,2,3,7,8-PeCDF were reported at an EMPC and have been qualified with a 'J+' validation flag to denote the reported results are likely overestimated due to possible interference in the sample (see CTR comment #10).

MBDS-U17-I01:

- 2,3,7,8-TCDF, total TCDF, total TCDD, 2,3,4,7,8-PeCDF, total PeCDF, 1,2,3,7,8-PeCDD, total PeCDD, 2,3,4,6,7,8-HxCDF, 1,2,3,7,8,9-HxCDF, total HxCDF, 1,2,3,6,7,8-HxCDD, 1,2,3,7,8,9-HxCDD, 1,2,3,4,6,7,8-HpCDF, total HpCDF have been qualified with a 'J' validation flag to denote the reported concentrations are estimates with an undetermined bias as they were reported below the quantitation limit (see CTR comment #10).
- 1,2,3,4,7,8-HxCDD and 1,2,3,4,7,8,9-HpCDF were reported at an EMPC and have been qualified with a 'J+' validation flag to denote the reported results are likely overestimated due to possible interference in the sample (see CTR comment #10).
- 1,2,3,7,8-PeCDF has been qualified with an 'R' validation due to interference from polychlorinated diphenyl ethers (PCDE) (see CTR comment #10).
- OCDF has been qualified with a 'J-' validation flag to denote the reported concentration is likely underestimated as it was reported below the quantitation limit and due to low internal standard recovery (see CTR comments # 9 and 10).
- OCDD has been qualified with a 'J-' validation flag to denote the reported concentration is likely underestimated due to low internal standard recovery (see CTR comment #9).

MBDS-U17-C01:

- Total TCDD, total PeCDF, 1,2,3,7,8-PeCDD, total PeCDD, 1,2,3,4,7,8-HxCDF, 1,2,3,6,7,8-HxCDF, 1,2,3,4,7,8-HxCDD, 1,2,3,6,7,8-HxCDD, 1,2,3,7,8,9-HxCDD, 1,2,3,4,6,7,8-HpCDF, 1,2,3,4,7,8,9-HpCDF, total HpCDF, and OCDF have been qualified with a 'J' validation flag to denote the reported concentrations are estimates with an undetermined bias as they were reported below the quantitation limit (see CTR comment #10).
- 1,2,3,7,8-PeCDF has been qualified with an 'R' validation due to interference from polychlorinated diphenyl ethers (PCDE) (see CTR comment #10).

- 2,3,7,8-TCDF, 2,3,4,7,8-PeCDF, and 1,2,3,4,7,8-HxCDD were reported at an EMPC and have been qualified with a 'J+' validation flag to denote the reported results are likely overestimated due to possible interference in the sample (see CTR comment #10).

MBDS-U19-R01:

- 1,2,3,7,8-PeCDD, 1,2,3,6,7,8-HxCDF, 2,3,4,6,7,8-HxCDF, 1,2,3,4,7,8-HxCDD, and 1,2,3,7,8,9-HxCDD have been qualified with a 'J' validation flag to denote the reported concentrations are estimates with an undetermined bias as they were reported below the quantitation limit (see CTR comment #10).
- 2,3,7,8-TCDF and 1,2,3,7,8,9-HxCDF were reported at an EMPC and have been qualified with a 'J+' validation flag to denote the reported results are likely overestimated due to possible interference in the sample (see CTR comment #10).
- 1,2,3,7,8-PeCDF and 1,2,3,4,7,8-HxCDF have been qualified with an 'R' validation due to interference from polychlorinated diphenyl ethers (PCDE) (see CTR comment #10).
- 1,2,3,4,7,8,9-HpCDF has been qualified with a 'J-' validation flag to denote the reported concentration is likely underestimated as it was reported below the quantitation limit and low internal standard recovery (see CTR comments #9 and 10).
- Total HpCDF, OCDF, and OCDD have been qualified with a 'J-' validation to denote the reported concentration is an likely underestimated due to low internal standard recovery (see CTR comment #9).

MBDS-U19-R02:

- Total PeCDF, total PeCDD, total HxCDF, 1,2,3,6,7,8-HxCDD, 1,2,3,7,8,9-HxCDD, total HxCDD, 1,2,3,4,6,7,8,-HpCDF, total HpCDF, 1,2,3,4,6,7,8-HpCDD, and OCDF have been qualified with a 'J' validation flag to denote the reported concentrations are estimates with an undetermined bias as they were reported below the quantitation limit (see CTR comment #10).
- Total TCDF has been qualified with a 'U' validation flag to denote the reported concentration is non-detect due to positive detection in the method blank (see CTR comment #6).
- 1,2,3,7,8-PeCDF has been qualified with an 'R' validation due to interference from polychlorinated diphenyl ethers (PCDE) (see CTR comment #10).

- 2,3,7,8-TCDF was reported at an EMPC and has been qualified with a 'J+' validation flag to denote the reported results are likely overestimated due to possible interference in the sample (see CTR comment #10).

MBDS-U19-C01:

- 2,3,4,7,8-PeCDF, total PeCDF, total PeCDD, 1,2,3,6,7,8-HxCDF, 2,3,4,6,7,8-HxCDF, 1,2,3,6,7,8-HxCDD, 1,2,3,7,8,9-HxCDD, 1,2,3,4,6,7,8-HpCDF, and total HpCDF have been qualified with a 'J' validation flag to denote the reported concentrations are estimates with an undetermined bias as they were reported below the quantitation limit (see CTR comment #10).
- 2,3,7,8-TCDF, 1,2,3,4,7,8-HxCDF, and 1,2,3,4,7,8-HxCDD were reported at an EMPC and have been qualified with a 'J+' validation flag to denote the reported concentrations are likely overestimated due to possible interference in the sample (see CTR comment #10).
- 1,2,3,7,8-PeCDF has been qualified with an 'R' validation due to interference from polychlorinated diphenyl ethers (PCDE) (see CTR comment #10).

MBDS-U20-R01:

- 2,3,7,8-TCDF, 2,3,4,7,8-PeCDF, total PeCDF, total PeCDD, 1,2,3,4,7,8-HxCDF, 1,2,3,6,7,8-HxCDF, 2,3,4,6,7,8-HxCDF, 1,2,3,4,7,8-HxCDD, 1,2,3,6,7,8-HxCDD, 1,2,3,7,8,9-HxCDD, 1,2,3,4,6,7,8-HpCDF, 1,2,3,4,7,8,9-HpCDF, total HpCDF, and OCDF have been qualified with a 'J' validation flag to denote the reported concentrations are estimates with an undetermined bias as they were reported below the quantitation limit (see CTR comment #10).
- 1,2,3,7,8-PeCDD was reported at an EMPC and has been qualified with a 'J+' validation flag to denote the reported concentration is likely overestimated due to possible interference in the sample (see CTR comment #10).
- 1,2,3,7,8-PeCDF has been qualified with an 'R' validation due to interference from polychlorinated diphenyl ethers (PCDE) (see CTR comment #10).

MBDS-U20-R02:

- 2,3,7,8-TCDF, total TCDD, total HxCDF, 1,2,3,7,8,9-HxCDD, total HxCDD, 1,2,3,4,6,7,8-HpCDF, and total HpCDF have been qualified with a 'J' validation flag to denote the reported concentrations are estimates with an undetermined bias as they were reported below the quantitation limit (see CTR comment #10).

- OCDF has been qualified with a 'J-' validation flag to denote the reported concentration is likely underestimated as it was reported below the quantitation limit and due to low internal standard recovery (see CTR comments #9 and 10).
- OCDD has been qualified with a 'J-' validation flag to denote the reported concentration is likely underestimated due to low internal standard recovery (see CTR comment #9).
- 1,2,3,7,8-PeCDF, and 1,2,3,6,7,8-HxCDD have been reported at an EMPC and have been qualified with a 'J+' validation flag to denote the reported concentration is likely overestimated due to possible interference in the sample (see CTR comment #10).

MBDS-U20-C01:

- 2,3,7,8-TCDF, 1,2,3,7,8-PeCDD, total PeCDD, 1,2,3,4,7,8-HxCDF, 1,2,3,6,7,8-HxCDF, 2,3,4,6,7,8-HxCDF, 1,2,3,7,8,9-HxCDF, 1,2,3,4,7,8-HxCDD, and 1,2,3,7,8,9-HxCDD have been qualified with a 'J' validation flag to denote the reported concentrations are estimates with an undetermined bias as they were reported below the quantitation limit (see CTR comment #10).
- 2,3,7,8-TCDD and 2,3,4,7,8-PeCDF have been reported at an EMPC and have been qualified with a 'J+' validation flag to denote the reported concentration is likely overestimated due to possible interference in the sample (see CTR comment #10).
- 1,2,3,7,8-PeCDF has been qualified with an 'R' validation due to interference from polychlorinated diphenyl ethers (PCDE) (see CTR comment #10).

MBDS-U18-R01:

- 2,3,7,8-TCDF, 2,3,7,8-TCDD, 2,3,4,7,8-PeCDF, 1,2,3,7,8-PeCDD, 1,2,3,4,7,8-HxCDF, 1,2,3,6,7,8-HxCDF, 2,3,4,6,7,8-HxCDF, 1,2,3,7,8,9-HxCDF, 1,2,3,4,7,8-HxCDD, and 1,2,3,4,7,8,9-HpCDF have been qualified with a 'J' validation flag to denote the reported concentrations are estimates with an undetermined bias as they were reported below the quantitation limit (see CTR comment #10).
- 1,2,3,7,8-PeCDF has been qualified with an 'R' validation due to interference from polychlorinated diphenyl ethers (PCDE) (see CTR comment #10).

MBDS-U18-I01:

- 2,3,7,8-TCDF, 2,3,4,7,8-PeCDF, 1,2,3,7,8-PeCDD, total PeCDD, 1,2,3,4,7,8-HxCDF, 1,2,3,6,7,8-HxCDF, 2,3,4,6,7,8-HxCDF, 1,2,3,7,8,9-HxCDF, 1,2,3,4,7,8-HxCDD, 1,2,3,6,7,8-HxCDD, 1,2,3,7,8,9-HxCDD, and 1,2,3,4,7,8,9-HpCDF have been qualified with a 'J' validation flag to denote the reported concentrations are estimates with an undetermined bias as they were reported below the quantitation limit (see CTR comment #10).
- 1,2,3,7,8-PeCDF has been qualified with an 'R' validation due to interference from polychlorinated diphenyl ethers (PCDE) (see CTR comment #10).

MBDS-U18-C01:

- 2,3,7,8-TCDF, 2,3,7,8-TCDD, 2,3,4,7,8-PeCDF, 1,2,3,7,8-PeCDD, 1,2,3,4,7,8-HxCDF, 1,2,3,6,7,8-HxCDF, 2,3,4,6,7,8-HxCDF, 1,2,3,7,8,9-HxCDF, 1,2,3,4,7,8-HxCDD, 1,2,3,6,7,8-HxCDD, and 1,2,3,7,8,9-HxCDD have been qualified with a 'J' validation flag to denote the reported concentrations are estimates with an undetermined bias as they were reported below the quantitation limit (see CTR comment #10).
- 1,2,3,4,7,8,9-HpCDF was reported at an EMPC and has been qualified with a 'J+' validation flag to denote the reported concentration is likely overestimated due to possible interference in the sample (see CTR comment #10).
- 1,2,3,7,8-PeCDF has been qualified with an 'R' validation due to interference from polychlorinated diphenyl ethers (PCDE) (see CTR comment #10).

4. CONTRACT AND TECHNICAL REVIEW (CTR)

Project Name: Montana Background Dioxin Study

Laboratory Name: Pace Analytical

SDG#: 1071797

Type of Analysis: USEPA SW-846 Method 8290

1. Data Completeness

The data has undergone a Level III validation.

2. Sample Integrity

No action was taken as sample integrity was compliant.

3. Sample Holding Times

No action was taken as sample holding times were met.

4. Instrument Performance

No action was taken as instrument performance was compliant.

5. Initial and Continuing Calibrations

The initial and continuing calibration forms were not included in the data package as it was a level III. No action was taken as the case narrative indicated that the acceptance criteria for the initial and continuing calibrations were met.

6. Method and Field Blank Contamination

Method Blank. Positive detections were noted in the method blank for total TCDF, 1,2,3,4,7,8-HxCDF, total HxCDF, 1,2,3,4,6,7,8-HpCDF, and total HpCDF and estimated maximum possible concentration (EMPC) results were noted for 2,3,4,7,8-PeCDF, 1,2,3,4,6,7,8-HpCDD, OCDF, and OCDD. Total TCDF in MBDS-U19-R02 has been qualified with a 'U' validation flag as the detected concentration was less than five times the method blank concentration. The remaining total TCDF and all 1,2,3,4,7,8-HxCDF, total HxCDF, 1,2,3,4,6,7,8-HpCDF, total HpCDF, 2,3,4,7,8-PeCDF, 1,2,3,4,6,7,8-HpCDD, OCDF, and OCDD results warrant no qualification as sample results were either non-detect or greater than five times the method blank concentration.

7. Matrix Spike/Matrix Spike Duplicate (MS/MSD)

The laboratory did not provide acceptance limits for the MS/MSD analysis. In the professional judgment of the validator, the acceptance limit of 50-150% for MS/MSD recovery and a 35% RPD for soil/solid samples has been used for validation purposes.

No action was taken as all MS/MSD recovery and precision criteria were met.

8. Laboratory Control Sample (LCS)

No action was taken as all LCS recoveries were within the acceptance criteria.

9. Internal Standards (IS) Performance

The internal standard OCDD-13C in MBDS-U17-I01 (36%), MBDS-U19-R01 (33%), MBDS-U20-R02 (29%), matrix spike (36%), and matrix spike duplicate (38%) and internal standard 1,2,3,4,7,8,9-HpCDF (39%) in MBDS-U19-R01 were outside of the 40-135% acceptance criteria. OCDF and OCDD in MBDS-U17-I01, MBDS-U19-R01, and MBDS-U20-R02, and 1,2,3,4,7,8,9-HpCDF and total HpCDF in MBDS-U19-R01 exhibited positive detections and have been qualified with a 'J-' validation flag as the results are likely underestimated due to low internal standard recoveries. No qualification is warranted due to the low internal standard recovery of OCDD-13C in the matrix spike and matrix spike duplicate as qualifications are not made based on matrix spike/matrix spike duplicate data alone.

10. Target Compound Identification and Quantitation

In MBDS-U17-R01, 2,3,7,8-TCDF, 2,3,4,7,8-PeCDF, 1,2,3,7,8-PeCDD, total PeCDD, 1,2,3,4,7,8-HxCDF, 1,2,3,6,7,8-HxCDF, 2,3,4,6,7,8-HxCDF, 1,2,3,7,8,9-HxCDF, 1,2,3,4,7,8-HxCDD, 1,2,3,6,7,8-HxCDD, 1,2,3,7,8,9-HxCDD, 1,2,3,4,7,8,9-HpCDF, and OCDF exhibited positive detections below the quantitation limit. They have been qualified with a 'J' validation flag as the reported results are estimates with an undetermined bias. 2,3,7,8-TCDD and 1,2,3,7,8-PeCDF have been reported at an EMPC due to interference and has been qualified with a 'J+' validation flag as the results are likely overestimated.

In MBDS-U17-I01, 2,3,7,8-TCDF, total TCDF, total TCDD, 2,3,4,7,8-PeCDF, total PeCDF, 1,2,3,7,8-PeCDD, total PeCDD, 2,3,4,6,7,8-HxCDF, 1,2,3,7,8,9-HxCDF, total HxCDF, 1,2,3,6,7,8-HxCDD, 1,2,3,7,8,9-HxCDD, 1,2,3,4,6,7,8-HpCDF, total HpCDF, and OCDD exhibited positive detections below the quantitation limit. They have been qualified with a 'J' validation flag as the results are estimates with an undetermined bias. OCDD has also been qualified with a 'J-' validation flag as the reported result is likely underestimated due to low internal standard recovery. 1,2,3,7,8-PeCDF was reported at an EMPC and has been qualified with an 'R' validation flag due to due to interference from polychlorinated diphenyl ethers (PCDE). 1,2,3,4,7,8-HxCDD and 1,2,3,4,7,8,9-HpCDF were reported at an EMPC due to interference in the sample and have been qualified with a 'J+' validation flag as the reported results were likely overestimated.

In MBDS-U17-C01, total TCDD, total PeCDF, 1,2,3,7,8-PeCDD, total PeCDD, 1,2,3,4,7,8-HxCDF, 1,2,3,6,7,8-HxCDF, 1,2,3,4,7,8-HxCDD, 1,2,3,6,7,8-HxCDD, 1,2,3,7,8,9-HxCDD, 1,2,3,4,6,7,8-HpCDF, 1,2,3,4,7,8,9-HpCDF, total HpCDF, and OCDF exhibited positive detections below the quantitation limit. They have been qualified with a 'J' validation flag as the reported results are estimates with an undetermined bias. 2,3,7,8-TCDF, 2,3,4,7,8-PeCDF, and 2,3,4,6,7,8-HxCDF were reported at an EMPC due to interference in the sample

and have been qualified with a 'J+' validation flag as the reported results are likely overestimated. 1,2,3,7,8-PeCDF was reported at an EMPC and has been qualified with an 'R' validation flag due to due to interference from polychlorinated diphenyl ethers (PCDE).

In MBDS-U19-R01, 1,2,3,7,8-PeCDD, 1,2,3,6,7,8-HxCDF, 2,3,4,6,7,8-HxCDF, 1,2,3,4,7,8-HxCDD, 1,2,3,7,8,9-HxCDD, and 1,2,3,4,7,8,9-HpCDF exhibited positive detections below the quantitation limit. 1,2,3,4,7,8,9-HpCDF has been qualified with a 'J-' validation flag due to low internal standard recovery as the reported result is likely underestimated. The remaining analytes have been qualified with a 'J' validation flag as the reported results are estimates with an undetermined bias. 2,3,7,8-TCDF and 1,2,3,7,8,9-HxCDF were reported at an EMPC due to interference in the sample and have been qualified with a 'J+' validation flag as the reported results are likely overestimated. 1,2,3,7,8-PeCDF and 1,2,3,4,7,8-HxCDF were reported at an EMPC and have been qualified with an 'R' validation flag due to due to interference from polychlorinated diphenyl ethers (PCDE).

In MBDS-U19-R02, total PeCDF, total PeCDD, total HxCDF, 1,2,3,6,7,8-HxCDD, 1,2,3,7,8,9-HxCDD, total HxCDD, 1,2,3,4,6,7,8,-HpCDF, total HpCDF, 1,2,3,4,6,7,8-HpCDD, and OCDF exhibited positive detections below the quantitation limit. They have been qualified with a 'J' validation flag as the reported results are estimates with an undetermined bias. 2,3,7,8-TCDF has been reported at an EMPC due to interference in the sample and has been qualified with a 'J+' validation flag as the reported result is likely overestimated. 1,2,3,7,8-PeCDF was reported at an EMPC and has been qualified with an 'R' validation flag due to due to interference from polychlorinated diphenyl ethers (PCDE).

In MBDS-U19-C01, 2,3,4,7,8-PeCDF, total PeCDF, total PeCDD, 1,2,3,6,7,8-HxCDF, 2,3,4,6,7,8-HxCDF, 1,2,3,6,7,8-HxCDD, 1,2,3,7,8,9-HxCDD, 1,2,3,4,6,7,8-HpCDF, and total HpCDF exhibited positive detections below the quantitation limit. They have been qualified with a 'J' validation flag as the reported results are estimates with an undetermined bias. 2,3,7,8-TCDF, 1,2,3,4,7,8-HxCDF, and 1,2,3,4,7,8-HxCDD have been reported at an EMPC due to interference in the sample and they have been qualified with a 'J+' validation flag as the reported results are likely overestimated. 1,2,3,7,8-PeCDF was reported at an EMPC and has been qualified with an 'R' validation flag due to due to interference from polychlorinated diphenyl ethers (PCDE).

In MBDS-U20-R01, 2,3,7,8-TCDF, 2,3,4,7,8-PeCDF, total PeCDF, total PeCDD, 1,2,3,4,7,8-HxCDF, 1,2,3,6,7,8-HxCDF, 2,3,4,6,7,8-HxCDF, 1,2,3,4,7,8-HxCDD, 1,2,3,6,7,8-HxCDD, 1,2,3,7,8,9-HxCDD, 1,2,3,4,6,7,8-HpCDF, 1,2,3,4,7,8,9-HpCDF, total HpCDF, and OCDF exhibited positive detections below the quantitation limit. They have been qualified with a 'J' validation flag as the results are estimates with an undetermined bias. 1,2,3,7,8-PeCDD has been reported at an EMPC due to interference in the sample and it has been qualified with a 'J+' validation flag as the reported result is likely overestimated. 1,2,3,7,8-PeCDF was reported at an EMPC and has been qualified with an 'R' validation flag due to due to interference from polychlorinated diphenyl ethers (PCDE).

In MBDS-U20-R02, 2,3,7,8-TCDF, total TCDD, total HxCDF, 1,2,3,7,8,9-HxCDD, total HxCDD, 1,2,3,4,6,7,8-HpCDF, total HpCDF, and OCDF exhibited positive detections below the quantitation limit. OCDF has been qualified with a 'J-' validation flag due to low internal standard recovery as the reported result is likely underestimated. The remaining analytes have been qualified with a 'J' validation flag as the reported results are estimates with an undetermined bias. 1,2,3,7,8-PeCDF and 1,2,3,6,7,8-HxCDD were reported at an EMPC due to interference in the sample and they have been qualified with a 'J+' validation flag as the reported results are likely overestimated.

In MBDS-U20-C01, 2,3,7,8-TCDF, 1,2,3,7,8-PeCDD, total PeCDD, 1,2,3,4,7,8-HxCDF, 1,2,3,6,7,8-HxCDF, 2,3,4,6,7,8-HxCDF, 1,2,3,7,8,9-HxCDF, 1,2,3,4,7,8-HxCDD, and 1,2,3,7,8,9-HxCDD exhibited positive detections below the quantitation limit. They have been qualified with a 'J' validation flag as the reported results are estimates with an undetermined bias. 2,3,7,8-TCDD and 2,3,4,7,8-PeCDF were reported at an EMPC due to interference in the sample and they have been qualified with a 'J+' validation flag as the reported results are likely overestimated. 1,2,3,7,8-PeCDF was reported at an EMPC and has been qualified with an 'R' validation flag due to due to interference from polychlorinated diphenyl ethers (PCDE).

In MBDS-U18-R01, 2,3,7,8-TCDF, 2,3,7,8-TCDD, 2,3,4,7,8-PeCDF, 1,2,3,7,8-PeCDD, 1,2,3,4,7,8-HxCDF, 1,2,3,6,7,8-HxCDF, 2,3,4,6,7,8-HxCDF, 1,2,3,7,8,9-HxCDF, 1,2,3,4,7,8-HxCDD, and 1,2,3,4,7,8,9-HpCDF HxCDD exhibited positive detections below the quantitation limit. They have been qualified with a 'J' validation flag as the reported results are estimates with an undetermined bias. 1,2,3,7,8-PeCDF was reported at an EMPC and has been qualified with an 'R' validation flag due to due to interference from polychlorinated diphenyl ethers (PCDE).

In MBDS-U18-I01, 2,3,7,8-TCDF, 2,3,4,7,8-PeCDF, 1,2,3,7,8-PeCDD, total PeCDD, 1,2,3,4,7,8-HxCDF, 1,2,3,6,7,8-HxCDF, 2,3,4,6,7,8-HxCDF, 1,2,3,7,8,9-HxCDF, 1,2,3,4,7,8-HxCDD, 1,2,3,6,7,8-HxCDD, 1,2,3,7,8,9-HxCDD, and 1,2,3,4,7,8,9-HpCDF HxCDD exhibited positive detections below the quantitation limit. They have been qualified with a 'J' validation flag as the reported results are estimates with an undetermined bias. 1,2,3,7,8-PeCDF was reported at an EMPC and has been qualified with an 'R' validation flag due to due to interference from polychlorinated diphenyl ethers (PCDE).

In MBDS-U18-C01, 2,3,7,8-TCDF, 2,3,7,8-TCDD, 2,3,4,7,8-PeCDF, 1,2,3,7,8-PeCDD, 1,2,3,4,7,8-HxCDF, 1,2,3,6,7,8-HxCDF, 2,3,4,6,7,8-HxCDF, 1,2,3,7,8,9-HxCDF, 1,2,3,4,7,8-HxCDD, 1,2,3,6,7,8-HxCDD, and 1,2,3,7,8,9-HxCDD exhibited positive detections below the quantitation limit. They have been qualified with a 'J' validation flag as the reported results are estimates with an undetermined bias. 1,2,3,4,7,8,9-HpCDF has been reported at an EMPC due to interference in the sample and has been qualified with a 'J+' validation flag as the reported result is likely overestimated. 1,2,3,7,8-PeCDF was reported at an EMPC and has been qualified with an 'R' validation flag due to due to interference from polychlorinated diphenyl ethers (PCDE).

11. Chromatogram Quality

No comments relating to chromatogram quality.

5. SUMMARY OF DATA USABILITY

The data validation summary flag table shows that qualifiers were applied to the target analytes for SDG# 1071797.

DATA VALIDATION SUMMARY TABLE					
Compound	MBDS-U17-R01	MBDS-U17-I01	MBDS-U17-C01	MBDS-U19-R01	MBDS-U19-R02
2,3,7,8-TCDF	J	J	J+	J+	J+
Total TCDF		J			U
2,3,7,8-TCDD	J+				
Total TCDD		J	J		
1,2,3,7,8-PeCDF	J+	R	R	R	R
2,3,4,7,8-PeCDF	J	J	J+		
Total PeCDF		J	J		J
1,2,3,7,8-PeCDD	J	J	J	J	
Total PeCDD	J	J	J		J
1,2,3,4,7,8-HxCDF	J		J	R	
1,2,3,6,7,8-HxCDF	J		J	J	
2,3,4,6,7,8-HxCDF	J	J	J	J	
1,2,3,7,8,9-HxCDF	J	J		J+	
Total HxCDF		J			J
1,2,3,4,7,8-HxCDD	J	J+	J+	J	
1,2,3,6,7,8-HxCDD	J	J	J		J
1,2,3,7,8,9-HxCDD	J	J	J	J	J
Total HxCDD					J
1,2,3,4,6,7,8-HpCDF		J	J		J
1,2,3,4,7,8,9-HpCDF	J	J+	J	J-	
Total HpCDF		J	J	J-	J
1,2,3,4,6,7,8-HpCDD					J
Total HpCDD					
OCDF	J	J-	J	J-	J
OCDD		J-		J-	

DATA VALIDATION SUMMARY TABLE					
Compound	MBDS-U19-C01	MBDS-U20-R01	MBDS-U20-R02	MBDS-U20-C01	MBDS-U18-R01
2,3,7,8-TCDF	J+	J	J	J	J
Total TCDF					
2,3,7,8-TCDD				J+	J
Total TCDD			J		
1,2,3,7,8-PeCDF	R	R	J+	R	R
2,3,4,7,8-PeCDF	J	J		J+	J
Total PeCDF	J	J			
1,2,3,7,8-PeCDD		J+		J	J
Total PeCDD	J	J		J	
1,2,3,4,7,8-HxCDF	J+	J		J	J
1,2,3,6,7,8-HxCDF	J	J		J	J
2,3,4,6,7,8-HxCDF	J	J		J	J
1,2,3,7,8,9-HxCDF				J	J
Total HxCDF			J		
1,2,3,4,7,8-HxCDD	J+	J		J	J
1,2,3,6,7,8-HxCDD	J	J	J+		
1,2,3,7,8,9-HxCDD	J	J	J	J	
Total HxCDD			J		
1,2,3,4,6,7,8-HpCDF	J	J	J		
1,2,3,4,7,8,9-HpCDF		J			J
Total HpCDF	J	J	J		
1,2,3,4,6,7,8-HpCDD					
Total HpCDD					
OCDF		J	J-		
OCDD			J-		

DATA VALIDATION SUMMARY TABLE		
Compound	MBDS-U18-I01	MBDS-U18-C01
2,3,7,8-TCDF	J	J
Total TCDF		
2,3,7,8-TCDD		J
Total TCDD		
1,2,3,7,8-PeCDF	R	R
2,3,4,7,8-PeCDF	J	J
Total PeCDF		
1,2,3,7,8-PeCDD	J	J
Total PeCDD	J	
1,2,3,4,7,8-HxCDF	J	J
1,2,3,6,7,8-HxCDF	J	J
2,3,4,6,7,8-HxCDF	J	J
1,2,3,7,8,9-HxCDF	J	J
Total HxCDF		
1,2,3,4,7,8-HxCDD	J	J
1,2,3,6,7,8-HxCDD	J	J
1,2,3,7,8,9-HxCDD	J	J
Total HxCDD		
1,2,3,4,6,7,8-HpCDF		
1,2,3,4,7,8,9-HpCDF	J	J+
Total HpCDF		
1,2,3,4,6,7,8-HpCDD		
Total HpCDD		
OCDF		
OCDD		

Data Validation Summary Table Qualifier Codes

U = Result is a non-detect.

UJ = Result is a non-detect, but is estimated due to QC issues.

J = Result was detected, but is estimated with an undetermined bias due to QC issues.

J+ = Result was detected, but is likely overestimated due to QC issues.

J- = Result was detected, but is likely underestimated due to QC issues.

R = Result is rejected and is highly questionable for use as a quantitative value due to significant QC issues.

6. REFERENCES

Contract Laboratory Program National Functional Guidelines for Organic Data Review, EPA 540/R-99/008, October 1999, U.S. Environmental Protection Agency, Cincinnati, Ohio.

USEPA Analytical Operations / Data Quality Center, *National Functional Guidelines for Chlorinated Dioxin / Furan Data Review*, EPA 540-R-02-003, August 2002.

USEPA, *Methods for the Analysis of Wastes, High Resolution Gas Chromatography / Mass Spectrometry*, SW-846, July 2002.

USEPA Test Methods for Evaluating Solid Waste Physical/Chemical Methods, Doc. No. SW-846, 3rd Ed., Method 8290, Polychlorinated Dibenzodioxins (PCDDs) and Polychlorinated Dibenzofurans (PCDFs) by High Resolution Gas Chromatography/High Resolution Mass Spectrometry (HRGC/HRMS), Revision 0, September 1994.

9. ATTACHMENTS

The following items are included as an attachment to this L&V report:

- A. Qualified reported results (Form I)

Attachment A
Qualified Reported Results



Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612-607-6444

Method 8290 Sample Analysis Results

Client - Montana Dept. Of Env. Quality

Client's Sample ID	MBDS-U17-R01		
Lab Sample ID	1071797001		
Filename	F80515A_09		
Injected By	SMT		
Total Amount Extracted	13.1 g	Matrix	Soil
% Moisture	20.9	Dilution	NA
Dry Weight Extracted	10.3 g	Collected	04/17/2008
ICAL ID	F80318	Received	04/19/2008
CCal Filename(s)	F80515A_02 & F80515A_19	Extracted	05/08/2008
Method Blank ID	BLANK-16289	Analyzed	05/15/2008 17:47

Native Isomers	Conc ng/Kg	EMPC ng/Kg	RL ng/Kg	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	0.58	—	0.040	2,3,7,8-TCDF-13C	2.00	74
Total TCDF	6.90	—	0.040	2,3,7,8-TCDD-13C	2.00	66
				1,2,3,7,8-PeCDF-13C	2.00	58
2,3,7,8-TCDD	—	0.18	0.056	2,3,4,7,8-PeCDF-13C	2.00	63
Total TCDD	2.00	—	0.056	1,2,3,7,8-PeCDD-13C	2.00	69
				1,2,3,4,7,8-HxCDF-13C	2.00	69
1,2,3,7,8-PeCDF	—	0.47	0.082	1,2,3,6,7,8-HxCDF-13C	2.00	74
2,3,4,7,8-PeCDF	1.20	—	0.100	2,3,4,6,7,8-HxCDF-13C	2.00	69
Total PeCDF	10.00	—	0.093	1,2,3,7,8,9-HxCDF-13C	2.00	67
				1,2,3,4,7,8-HxCDD-13C	2.00	68
1,2,3,7,8-PeCDD	0.60	—	0.130	1,2,3,6,7,8-HxCDD-13C	2.00	80
Total PeCDD	2.30	—	0.130	1,2,3,4,6,7,8-HpCDF-13C	2.00	64
				1,2,3,4,7,8,9-HpCDF-13C	2.00	54
1,2,3,4,7,8-HxCDF	1.30	—	0.150	1,2,3,4,6,7,8-HpCDD-13C	2.00	62
1,2,3,6,7,8-HxCDF	1.30	—	0.160	OCDD-13C	4.00	46
2,3,4,6,7,8-HxCDF	1.60	—	0.140			
1,2,3,7,8,9-HxCDF	0.81	—	0.140	1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	11.00	—	0.150	1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	0.45	—	0.130	2,3,7,8-TCDD-37Cl4	0.20	71
1,2,3,6,7,8-HxCDD	0.68	—	0.170			
1,2,3,7,8,9-HxCDD	0.77	—	0.110			
Total HxCDD	6.50	—	0.140			
1,2,3,4,6,7,8-HpCDF	5.20	—	0.110	Total 2,3,7,8-TCDD		
1,2,3,4,7,8,9-HpCDF	1.20	—	0.120	Equivalence: 1.9 ng/Kg		
Total HpCDF	7.30	—	0.110	(Using ITE Factors)		
1,2,3,4,6,7,8-HpCDD	9.40	—	0.340			
Total HpCDD	18.00	—	0.340			
OCDF	6.30	—	0.180			
OCDD	52.00	—	0.170			

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
EMPC = Estimated Maximum Possible Concentration
RL = Reporting Limit.

ND = Not Detected
NA = Not Applicable
NC = Not Calculated

Results reported on a dry weight basis and are valid to no more than 2 significant figures.

J = Value below calibration range

I = Interference present

AS
6/10/08

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc.

7 of 23

Report No.....1071797_8290



Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612-607-6444

Method 8290 Sample Analysis Results

Client - Montana Dept. Of Env. Quality

Client's Sample ID	MBDS-U17-I01		
Lab Sample ID	1071797002		
Filename	F80514A_10		
Injected By	BAL		
Total Amount Extracted	11.0 g	Matrix	Soil
% Moisture	7.1	Dilution	NA
Dry Weight Extracted	10.2 g	Collected	04/17/2008
ICAL ID	F80318	Received	04/19/2008
CCal Filename(s)	F80514A_07 & F80514A_22	Extracted	05/08/2008
Method Blank ID	BLANK-16289	Analyzed	05/14/2008 20:59

Native Isomers	Conc ng/Kg	EMPC ng/Kg	RL ng/Kg	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	0.27	—	0.10	J		
Total TCDF	0.83	—	0.10	J	2.00	63
					2.00	50
2,3,7,8-TCDD	ND	—	0.20		2.00	50
Total TCDD	0.59	—	0.20	J	2.00	55
					2.00	57
1,2,3,7,8-PeCDF	—	0.66	0.22	E R	2.00	56
2,3,4,7,8-PeCDF	0.31	—	0.24	J	2.00	66
Total PeCDF	1.10	—	0.23	J	2.00	58
					2.00	54
1,2,3,7,8-PeCDD	0.27	—	0.26	J	2.00	54
Total PeCDD	0.62	—	0.26	J	2.00	67
					2.00	52
1,2,3,4,7,8-HxCDF	ND	—	0.23		2.00	41
1,2,3,6,7,8-HxCDF	ND	—	0.22		2.00	47
2,3,4,6,7,8-HxCDF	0.25	—	0.19	J	4.00	36 P
1,2,3,7,8,9-HxCDF	0.30	—	0.20	J		
Total HxCDF	2.40	—	0.21	J	2.00	NA
					2.00	NA
1,2,3,4,7,8-HxCDD	—	0.38	0.22	J		
1,2,3,6,7,8-HxCDD	0.60	—	0.24	J	0.20	56
1,2,3,7,8,9-HxCDD	0.72	—	0.26	J		
Total HxCDD	5.20	—	0.24	J		
1,2,3,4,6,7,8-HpCDF	1.30	—	0.18	J		
1,2,3,4,7,8,9-HpCDF	—	0.22	0.21	J		
Total HpCDF	3.60	—	0.19	J		
1,2,3,4,6,7,8-HpCDD	9.00	—	0.37			
Total HpCDD	19.00	—	0.37			
OCDF	4.80	—	0.33	J		
OCDD	71.00	—	0.25	J		

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
EMPC = Estimated Maximum Possible Concentration
RL = Reporting Limit.

ND = Not Detected
NA = Not Applicable
NC = Not Calculated

Results reported on a dry weight basis and are valid to no more than 2 significant figures.

J = Value below calibration range

P = Recovery outside target range

E = PCDE Interference

i = Interference present

AS
6/11/08

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc.



Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612-607-6444

Method 8290 Sample Analysis Results

Client - Montana Dept. Of Env. Quality

Client's Sample ID	MBDS-U17-C01		
Lab Sample ID	1071797003		
Filename	F80514A_11		
Injected By	BAL		
Total Amount Extracted	13.2 g	Matrix	Soil
% Moisture	20.2	Dilution	NA
Dry Weight Extracted	10.5 g	Collected	04/17/2008
ICAL ID	F80318	Received	04/19/2008
CCal Filename(s)	F80514A_07 & F80514A_22	Extracted	05/08/2008
Method Blank ID	BLANK-16289	Analyzed	05/14/2008 21:44

Native Isomers	Conc ng/Kg	EMPC ng/Kg	RL ng/Kg	Internal Standards	ng's Added	Percent Recovery	
2,3,7,8-TCDF	—	0.27	0.10	† J†	2,3,7,8-TCDF-13C	2.00	73
Total TCDF	1.90	—	0.10		2,3,7,8-TCDD-13C	2.00	63
					1,2,3,7,8-PeCDF-13C	2.00	57
2,3,7,8-TCDD	ND	—	0.17		2,3,4,7,8-PeCDF-13C	2.00	60
Total TCDD	0.87	—	0.17	‡ J	1,2,3,7,8-PeCDD-13C	2.00	64
					1,2,3,4,7,8-HxCDF-13C	2.00	62
1,2,3,7,8-PeCDF	—	0.67	0.15	ER	1,2,3,6,7,8-HxCDF-13C	2.00	73
2,3,4,7,8-PeCDF	—	0.35	0.15	† J†	2,3,4,6,7,8-HxCDF-13C	2.00	65
Total PeCDF	1.90	—	0.15	‡ J	1,2,3,7,8,9-HxCDF-13C	2.00	63
					1,2,3,4,7,8-HxCDD-13C	2.00	63
1,2,3,7,8-PeCDD	0.30	—	0.17	‡ J	1,2,3,6,7,8-HxCDD-13C	2.00	70
Total PeCDD	1.70	—	0.17	‡ J	1,2,3,4,6,7,8-HpCDF-13C	2.00	57
					1,2,3,4,7,8,9-HpCDF-13C	2.00	45
1,2,3,4,7,8-HxCDF	0.59	—	0.26	‡ J	1,2,3,4,6,7,8-HpCDD-13C	2.00	53
1,2,3,6,7,8-HxCDF	0.28	—	0.19	‡ J	OCDD-13C	4.00	41
2,3,4,6,7,8-HxCDF	—	0.22	0.19	† J†			
1,2,3,7,8,9-HxCDF	ND	—	0.22		1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	5.70	—	0.22		1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	0.56	—	0.35	‡ J	2,3,7,8-TCDD-37Cl4	0.20	74
1,2,3,6,7,8-HxCDD	1.30	—	0.37	‡ ↓			
1,2,3,7,8,9-HxCDD	1.20	—	0.25	‡ ↓			
Total HxCDD	10.00	—	0.33				
1,2,3,4,6,7,8-HpCDF	3.30	—	0.18	‡ J	Total 2,3,7,8-TCDD		
1,2,3,4,7,8,9-HpCDF	0.31	—	0.26	‡ ↓	Equivalence: 1.2 ng/Kg		
Total HpCDF	3.60	—	0.22	‡ ↓	(Using ITE Factors)		
1,2,3,4,6,7,8-HpCDD	36.00	—	0.27				
Total HpCDD	64.00	—	0.27				
OCDF	6.80	—	0.19	‡ J			
OCDD	220.00	—	0.39				

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
EMPC = Estimated Maximum Possible Concentration
RL = Reporting Limit.

ND = Not Detected
NA = Not Applicable
NC = Not Calculated

Results reported on a dry weight basis and are valid to no more than 2 significant figures.

J = Value below calibration range

E = PCDE Interference

I = Interference present

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc.
9 of 23

Report No.....1071797_8290


Pace Analytical™

 Pace Analytical Services, Inc.
 1700 Elm Street - Suite 200
 Minneapolis, MN 55414

 Tel: 612-607-1700
 Fax: 612-607-6444

Method 8290 Sample Analysis Results

Client - Montana Dept. Of Env. Quality

Client's Sample ID	MBDS-U19-R01		
Lab Sample ID	1071797004		
Filename	F80514A_12		
Injected By	BAL		
Total Amount Extracted	12.3 g	Matrix	Soil
% Moisture	17.4	Dilution	NA
Dry Weight Extracted	10.2 g	Collected	04/17/2008
ICAL ID	F80318	Received	04/19/2008
CCal Filename(s)	F80514A_07 & F80514A_22	Extracted	05/08/2008
Method Blank ID	BLANK-16289	Analyzed	05/14/2008 22:28

Native Isomers	Conc ng/Kg	EMPC ng/Kg	RL ng/Kg	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	—	0.58	0.33 + J	2,3,7,8-TCDF-13C	2.00	64
Total TCDF	15.00	—	0.33	2,3,7,8-TCDD-13C	2.00	50
				1,2,3,7,8-PeCDF-13C	2.00	52
2,3,7,8-TCDD	ND	—	0.12	2,3,4,7,8-PeCDF-13C	2.00	58
Total TCDD	1.20	—	0.12	1,2,3,7,8-PeCDD-13C	2.00	60
				1,2,3,4,7,8-HxCDF-13C	2.00	60
1,2,3,7,8-PeCDF	—	210.00	0.32 E R	1,2,3,6,7,8-HxCDF-13C	2.00	66
2,3,4,7,8-PeCDF	5.20	—	0.34	2,3,4,6,7,8-HxCDF-13C	2.00	57
Total PeCDF	50.00	—	0.33	1,2,3,7,8,9-HxCDF-13C	2.00	57
				1,2,3,4,7,8-HxCDD-13C	2.00	56
1,2,3,7,8-PeCDD	0.99	—	0.24 + J	1,2,3,6,7,8-HxCDD-13C	2.00	65
Total PeCDD	5.80	—	0.24	1,2,3,4,6,7,8-HpCDF-13C	2.00	49
				1,2,3,4,7,8,9-HpCDF-13C	2.00	39 P
1,2,3,4,7,8-HxCDF	—	3.10	0.42 E R	1,2,3,4,6,7,8-HpCDD-13C	2.00	44
1,2,3,6,7,8-HxCDF	1.30	—	0.39 J J R	OCDD-13C	4.00	33 P
2,3,4,6,7,8-HxCDF	1.50	—	0.29 J J R			
1,2,3,7,8,9-HxCDF	—	0.70	0.29 + J	1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	26.00	—	0.35	1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	1.70	—	0.29 + J	2,3,7,8-TCDD-37C14	0.20	53
1,2,3,6,7,8-HxCDD	5.20	—	0.37			
1,2,3,7,8,9-HxCDD	3.90	—	0.38 + J			
Total HxCDD	41.00	—	0.35			
1,2,3,4,6,7,8-HpCDF	8.90	—	0.33	Total 2,3,7,8-TCDD		
1,2,3,4,7,8,9-HpCDF	0.76	—	0.64 + J	Equivalence: 7.1 ng/Kg		
Total HpCDF	9.60	—	0.48 J	(Using ITE Factors)		
1,2,3,4,6,7,8-HpCDD	160.00	—	0.84			
Total HpCDD	270.00	—	0.84			
OCDF	25.00	—	0.46 J			
OCDD	920.00	—	0.47 J			

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
 EMPC = Estimated Maximum Possible Concentration
 RL = Reporting Limit.

ND = Not Detected
 NA = Not Applicable
 NC = Not Calculated

Results reported on a dry weight basis and are valid to no more than 2 significant figures.
 J = Value below calibration range
 P = Recovery outside target range
 E = PCDE Interference
 I = Interference present

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
 without the written consent of Pace Analytical Services, Inc.
 10 of 23

Report No. 1071797_8290


Pace Analytical™

 Pace Analytical Services, Inc.
 1700 Elm Street - Suite 200
 Minneapolis, MN 55414

 Tel: 612-607-1700
 Fax: 612-607-6444

Method 8290 Sample Analysis Results

Client - Montana Dept. Of Env. Quality

Client's Sample ID	MBDS-U19-R02		
Lab Sample ID	1071797005		
Filename	F80514A_13		
Injected By	BAL		
Total Amount Extracted	11.4 g	Matrix	Soil
% Moisture	7.1	Dilution	NA
Dry Weight Extracted	10.6 g	Collected	04/17/2008
ICAL ID	F80318	Received	04/19/2008
CCal Filename(s)	F80514A_07 & F80514A_22	Extracted	05/08/2008
Method Blank ID	BLANK-16289	Analyzed	05/14/2008 23:13

Native Isomers	Conc ng/Kg	EMPC ng/Kg	RL ng/Kg	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	—	0.18	0.084 + J	2,3,7,8-TCDF-13C	2.00	76
Total TCDF	0.28	—	0.084 B+U	2,3,7,8-TCDD-13C	2.00	63
				1,2,3,7,8-PeCDF-13C	2.00	66
2,3,7,8-TCDD	ND	—	0.130	2,3,4,7,8-PeCDF-13C	2.00	70
Total TCDD	ND	—	0.130	1,2,3,7,8-PeCDD-13C	2.00	73
				1,2,3,4,7,8-HxCDF-13C	2.00	70
1,2,3,7,8-PeCDF	—	0.75	0.160 E+R	1,2,3,6,7,8-HxCDF-13C	2.00	81
2,3,4,7,8-PeCDF	ND	—	0.180	2,3,4,6,7,8-HxCDF-13C	2.00	71
Total PeCDF	0.60	—	0.170 + J	1,2,3,7,8,9-HxCDF-13C	2.00	64
				1,2,3,4,7,8-HxCDD-13C	2.00	68
1,2,3,7,8-PeCDD	ND	—	0.160	1,2,3,6,7,8-HxCDD-13C	2.00	81
Total PeCDD	0.24	—	0.160 + J	1,2,3,4,6,7,8-HpCDF-13C	2.00	63
				1,2,3,4,7,8,9-HpCDF-13C	2.00	49
1,2,3,4,7,8-HxCDF	ND	—	0.150	1,2,3,4,6,7,8-HpCDD-13C	2.00	56
1,2,3,6,7,8-HxCDF	ND	—	0.170	OCDD-13C	4.00	42
2,3,4,6,7,8-HxCDF	ND	—	0.140			
1,2,3,7,8,9-HxCDF	ND	—	0.170	1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	1.10	—	0.160 + J	1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	ND	—	0.220	2,3,7,8-TCDD-37Cl4	0.20	72
1,2,3,6,7,8-HxCDD	0.20	—	0.190 + J			
1,2,3,7,8,9-HxCDD	0.22	—	0.190 + J			
Total HxCDD	1.20	—	0.200 + J			
1,2,3,4,6,7,8-HpCDF	0.87	—	0.180 + J	Total 2,3,7,8-TCDD		
1,2,3,4,7,8,9-HpCDF	ND	—	0.320	Equivalence: 0.11 ng/Kg		
Total HpCDF	2.20	—	0.250 + J	(Using ITE Factors)		AB
						6/10/08
1,2,3,4,6,7,8-HpCDD	3.30	—	0.310 + J			
Total HpCDD	6.80	—	0.310			
OCDF	1.70	—	0.460 + J			
OCDD	27.00	—	0.420			

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
 EMPC = Estimated Maximum Possible Concentration
 RL = Reporting Limit.

ND = Not Detected
 NA = Not Applicable
 NC = Not Calculated

Results reported on a dry weight basis and are valid to no more than 2 significant figures.

J = Value below calibration range

B = Less than 10x higher than method blank level

E = PCDE Interference

I = Interference present

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
 without the written consent of Pace Analytical Services, Inc.

11 of 23

Report No. 1071797_8290


Pace Analytical™

 Pace Analytical Services, Inc.
 1700 Elm Street - Suite 200
 Minneapolis, MN 55414

 Tel: 612-607-1700
 Fax: 612-607-6444

Method 8290 Sample Analysis Results

Client - Montana Dept. Of Env. Quality

Client's Sample ID	MBDS-U19-C01		
Lab Sample ID	1071797006		
Filename	F80514A_14		
Injected By	BAL		
Total Amount Extracted	13.5 g	Matrix	Soil
% Moisture	25.7	Dilution	NA
Dry Weight Extracted	10.0 g	Collected	04/17/2008
ICAL ID	F80318	Received	04/19/2008
CCal Filename(s)	F80514A_07 & F80514A_22	Extracted	05/08/2008
Method Blank ID	BLANK-16289	Analyzed	05/14/2008 23:59

Native Isomers	Conc ng/Kg	EMPC ng/Kg	RL ng/Kg	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	—	0.30	0.13	+ J	2,3,7,8-TCDF-13C	76
Total TCDF	3.00	—	0.13		2,3,7,8-TCDD-13C	64
					1,2,3,7,8-PeCDF-13C	61
2,3,7,8-TCDD	ND	—	0.12		2,3,4,7,8-PeCDF-13C	67
Total TCDD	1.50	—	0.12		1,2,3,7,8-PeCDD-13C	70
					1,2,3,4,7,8-HxCDF-13C	66
1,2,3,7,8-PeCDF	—	0.74	0.22	ER	1,2,3,6,7,8-HxCDF-13C	74
2,3,4,7,8-PeCDF	0.41	—	0.15	J	2,3,4,6,7,8-HxCDF-13C	67
Total PeCDF	3.20	—	0.18	J	1,2,3,7,8,9-HxCDF-13C	66
					1,2,3,4,7,8-HxCDD-13C	61
1,2,3,7,8-PeCDD	ND	—	0.22	J	1,2,3,6,7,8-HxCDD-13C	75
Total PeCDD	1.10	—	0.22	J	1,2,3,4,6,7,8-HpCDF-13C	55
					1,2,3,4,7,8,9-HpCDF-13C	46
1,2,3,4,7,8-HxCDF	—	0.39	0.22	J	1,2,3,4,6,7,8-HpCDD-13C	53
1,2,3,6,7,8-HxCDF	0.23	—	0.23	J	OCDD-13C	40
2,3,4,6,7,8-HxCDF	0.28	—	0.20	J		
1,2,3,7,8,9-HxCDF	ND	—	0.19		1,2,3,4-TCDD-13C	NA
Total HxCDF	5.30	—	0.21		1,2,3,7,8,9-HxCDD-13C	NA
1,2,3,4,7,8-HxCDD	—	0.37	0.21	J	2,3,7,8-TCDD-37Cl4	73
1,2,3,6,7,8-HxCDD	0.96	—	0.29	J		
1,2,3,7,8,9-HxCDD	0.61	—	0.27	J		
Total HxCDD	6.80	—	0.26	J		
1,2,3,4,6,7,8-HpCDF	3.40	—	0.22	J	Total 2,3,7,8-TCDD	
1,2,3,4,7,8,9-HpCDF	ND	—	0.32		Equivalence: 0.87 ng/Kg	
Total HpCDF	3.40	—	0.27	J	(Using ITE Factors)	
1,2,3,4,6,7,8-HpCDD	23.00	—	0.56			
Total HpCDD	42.00	—	0.56			
OCDF	10.00	—	0.23			
OCDD	180.00	—	0.32			

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
 EMPC = Estimated Maximum Possible Concentration
 RL = Reporting Limit.

ND = Not Detected
 NA = Not Applicable
 NC = Not Calculated

Results reported on a dry weight basis and are valid to no more than 2 significant figures.

J = Value below calibration range

E = PCDE Interference

I = Interference present

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
 without the written consent of Pace Analytical Services, Inc.

12 of 23

Report No.....1071797_8290


Pace Analytical™

 Pace Analytical Services, Inc.
 1700 Elm Street - Suite 200
 Minneapolis, MN 55414

 Tel: 612-607-1700
 Fax: 612-607-6444

Method 8290 Sample Analysis Results

Client - Montana Dept. Of Env. Quality

Client's Sample ID	MBDS-U20-R01		
Lab Sample ID	1071797007		
Filename	F80514A_15		
Injected By	BAL		
Total Amount Extracted	13.1 g	Matrix	Soil
% Moisture	22.3	Dilution	NA
Dry Weight Extracted	10.2 g	Collected	04/17/2008
ICAL ID	F80318	Received	04/19/2008
CCal Filename(s)	F80514A_07 & F80514A_22	Extracted	05/08/2008
Method Blank ID	BLANK-16289	Analyzed	05/15/2008 00:44

Native Isomers	Conc ng/Kg	EMPC ng/Kg	RL ng/Kg	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	0.23	—	0.085	2,3,7,8-TCDF-13C	2.00	94
Total TCDF	2.80	—	0.085	2,3,7,8-TCDD-13C	2.00	82
				1,2,3,7,8-PeCDF-13C	2.00	75
2,3,7,8-TCDD	ND	—	0.180	2,3,4,7,8-PeCDF-13C	2.00	82
Total TCDD	1.20	—	0.180	1,2,3,7,8-PeCDD-13C	2.00	85
				1,2,3,4,7,8-HxCDF-13C	2.00	80
1,2,3,7,8-PeCDF	—	1.30	0.160	1,2,3,6,7,8-HxCDF-13C	2.00	89
2,3,4,7,8-PeCDF	0.46	—	0.120	2,3,4,6,7,8-HxCDF-13C	2.00	82
Total PeCDF	4.90	—	0.140	1,2,3,7,8,9-HxCDF-13C	2.00	86
				1,2,3,4,7,8-HxCDD-13C	2.00	75
1,2,3,7,8-PeCDD	—	0.26	0.160	1,2,3,6,7,8-HxCDD-13C	2.00	92
Total PeCDD	1.20	—	0.160	1,2,3,4,6,7,8-HpCDF-13C	2.00	68
				1,2,3,4,7,8,9-HpCDF-13C	2.00	61
1,2,3,4,7,8-HxCDF	0.27	—	0.160	1,2,3,4,6,7,8-HpCDD-13C	2.00	65
1,2,3,6,7,8-HxCDF	0.28	—	0.150	OCDD-13C	4.00	52
2,3,4,6,7,8-HxCDF	0.36	—	0.110			
1,2,3,7,8,9-HxCDF	ND	—	0.120	1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	5.40	—	0.140	1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	0.32	—	0.260	2,3,7,8-TCDD-37C4	0.20	84
1,2,3,6,7,8-HxCDD	0.93	—	0.270			
1,2,3,7,8,9-HxCDD	0.61	—	0.240			
Total HxCDD	6.30	—	0.260			
1,2,3,4,6,7,8-HpCDF	3.30	—	0.180	Total 2,3,7,8-TCDD		
1,2,3,4,7,8,9-HpCDF	0.33	—	0.180	Equivalence: 0.98 ng/Kg		
Total HpCDF	3.60	—	0.180	(Using ITE Factors)		
1,2,3,4,6,7,8-HpCDD	23.00	—	0.320			
Total HpCDD	40.00	—	0.320			
OCDF	9.30	—	0.170			
OCDD	170.00	—	0.380			

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
 EMPC = Estimated Maximum Possible Concentration
 RL = Reporting Limit.

ND = Not Detected
 NA = Not Applicable
 NC = Not Calculated

Results reported on a dry weight basis and are valid to no more than 2 significant figures.

J = Value below calibration range

B = Less than 10x higher than method blank level

E = PCDE Interference

I = Interference present

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
 without the written consent of Pace Analytical Services, Inc.

13 of 23

Report No.....1071797_8290


Pace Analytical™

 Pace Analytical Services, Inc.
 1700 Elm Street - Suite 200
 Minneapolis, MN 55414

 Tel: 612-607-1700
 Fax: 612-607-6444

Method 8290 Sample Analysis Results

Client - Montana Dept. Of Env. Quality

Client's Sample ID	MBDS-U20-R02	Matrix	Soil
Lab Sample ID	1071797008	Dilution	NA
Filename	U80521A_22	Collected	04/17/2008
Injected By	SMT	Received	04/19/2008
Total Amount Extracted	10.5 g	Extracted	05/08/2008
% Moisture	4.1	Analyzed	05/22/2008 03:55
Dry Weight Extracted	10.1 g		
ICAL ID	U80521		
CCal Filename(s)	U80521A_12 & U80521A_28		
Method Blank ID	BLANK-16289		

Native Isomers	Conc ng/Kg	EMPC ng/Kg	RL ng/Kg	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	0.40	—	0.22	2,3,7,8-TCDF-13C	2.00	78
Total TCDF	3.00	—	0.22	2,3,7,8-TCDD-13C	2.00	73
				1,2,3,7,8-PeCDF-13C	2.00	78
2,3,7,8-TCDD	ND	—	0.31	2,3,4,7,8-PeCDF-13C	2.00	82
Total TCDD	0.42	—	0.31	1,2,3,7,8-PeCDD-13C	2.00	82
				1,2,3,4,7,8-HxCDF-13C	2.00	106
1,2,3,7,8-PeCDF	—	0.50	0.43	1,2,3,6,7,8-HxCDF-13C	2.00	79
2,3,4,7,8-PeCDF	ND	—	0.41	2,3,4,6,7,8-HxCDF-13C	2.00	79
Total PeCDF	ND	—	0.42	1,2,3,7,8,9-HxCDF-13C	2.00	76
				1,2,3,4,7,8-HxCDD-13C	2.00	91
1,2,3,7,8-PeCDD	ND	—	0.60	1,2,3,6,7,8-HxCDD-13C	2.00	62
Total PeCDD	ND	—	0.60	1,2,3,4,6,7,8-HpCDF-13C	2.00	50
				1,2,3,4,7,8,9-HpCDF-13C	2.00	42
1,2,3,4,7,8-HxCDF	ND	—	0.24	1,2,3,4,6,7,8-HpCDD-13C	2.00	54
1,2,3,6,7,8-HxCDF	ND	—	0.34	OCDD-13C	4.00	29 P
2,3,4,6,7,8-HxCDF	ND	—	0.27			
1,2,3,7,8,9-HxCDF	ND	—	0.32	1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	2.20	—	0.29	1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	ND	—	0.38	2,3,7,8-TCDD-37Cl4	0.20	75
1,2,3,6,7,8-HxCDD	—	0.63	0.38			
1,2,3,7,8,9-HxCDD	0.45	—	0.40			
Total HxCDD	0.91	—	0.39			
1,2,3,4,6,7,8-HpCDF	2.70	—	0.52	Total 2,3,7,8-TCDD		
1,2,3,4,7,8,9-HpCDF	ND	—	1.00	Equivalence: 0.35 ng/Kg		
Total HpCDF	3.70	—	0.76	(Using ITE Factors)		
1,2,3,4,6,7,8-HpCDD	12.00	—	0.49			
Total HpCDD	21.00	—	0.49			
OCDF	4.80	—	1.40			
OCDD	110.00	—	0.93			

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
 EMPC = Estimated Maximum Possible Concentration
 RL = Reporting Limit.

ND = Not Detected
 NA = Not Applicable
 NC = Not Calculated

Results reported on a dry weight basis and are valid to no more than 2 significant figures.

J = Value below calibration range
 P = Recovery outside target range
 I = Interference present

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
 without the written consent of Pace Analytical Services, Inc.

14 of 23

Report No.....1071797_8290


Pace Analytical™

 Pace Analytical Services, Inc.
 1700 Elm Street - Suite 200
 Minneapolis, MN 55414

 Tel: 612-607-1700
 Fax: 612-607-6444

Method 8290 Sample Analysis Results

Client - Montana Dept. Of Env. Quality

Client's Sample ID	MBDS-U20-C01		
Lab Sample ID	1071797009		
Filename	F80520B_04		
Injected By	SMT		
Total Amount Extracted	13.0 g	Matrix	Soil
% Moisture	23.0	Dilution	NA
Dry Weight Extracted	10.0 g	Collected	04/17/2008
ICAL ID	F80318	Received	04/19/2008
CCal Filename(s)	F80520B_01 & F80520B_18	Extracted	05/08/2008
Method Blank ID	BLANK-16289	Analyzed	05/21/2008 01:19

Native Isomers	Conc ng/Kg	EMPC ng/Kg	RL ng/Kg	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	0.36	—	0.076	2,3,7,8-TCDF-13C	2.00	72
Total TCDF	4.40	—	0.076	2,3,7,8-TCDD-13C	2.00	66
2,3,7,8-TCDD	—	0.17	0.070	1,2,3,7,8-PeCDF-13C	2.00	58
Total TCDD	3.00	—	0.070	2,3,4,7,8-PeCDF-13C	2.00	67
1,2,3,7,8-PeCDF	—	2.10	0.130	1,2,3,7,8-PeCDD-13C	2.00	71
2,3,4,7,8-PeCDF	—	0.91	0.120	1,2,3,4,7,8-HxCDF-13C	2.00	70
Total PeCDF	12.00	—	0.130	1,2,3,6,7,8-HxCDF-13C	2.00	77
1,2,3,7,8-PeCDD	0.57	—	0.210	2,3,4,6,7,8-HxCDF-13C	2.00	69
Total PeCDD	1.00	—	0.210	1,2,3,7,8,9-HxCDF-13C	2.00	71
1,2,3,4,7,8-HxCDF	3.70	—	0.270	1,2,3,4,7,8-HxCDD-13C	2.00	70
1,2,3,6,7,8-HxCDF	2.10	—	0.350	1,2,3,6,7,8-HxCDD-13C	2.00	78
2,3,4,6,7,8-HxCDF	1.40	—	0.210	1,2,3,4,6,7,8-HpCDF-13C	2.00	63
1,2,3,7,8,9-HxCDF	0.51	—	0.240	1,2,3,4,7,8,9-HpCDF-13C	2.00	53
Total HxCDF	40.00	—	0.270	1,2,3,4,6,7,8-HpCDD-13C	2.00	61
1,2,3,4,7,8-HxCDD	1.30	—	0.340	OCDD-13C	4.00	52
1,2,3,6,7,8-HxCDD	7.90	—	0.330	1,2,3,4-TCDD-13C	2.00	NA
1,2,3,7,8,9-HxCDD	2.70	—	0.230	1,2,3,7,8,9-HxCDD-13C	2.00	NA
Total HxCDD	37.00	—	0.300	2,3,7,8-TCDD-37Cl4	0.20	70
1,2,3,4,6,7,8-HpCDF	78.00	—	0.510			
1,2,3,4,7,8,9-HpCDF	13.00	—	0.750	Total 2,3,7,8-TCDD		
Total HpCDF	320.00	—	0.630	Equivalence: 10 ng/Kg		
				(Using ITE Factors)		
1,2,3,4,6,7,8-HpCDD	250.00	—	0.930			
Total HpCDD	430.00	—	0.930			
OCDF	390.00	—	0.340			
OCDD	4200.00	—	0.320			

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
 EMPC = Estimated Maximum Possible Concentration
 RL = Reporting Limit.

ND = Not Detected
 NA = Not Applicable
 NC = Not Calculated

Results reported on a dry weight basis and are valid to no more than 2 significant figures.

J = Value below calibration range

E = PCDE Interference

I = Interference present

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
 without the written consent of Pace Analytical Services, Inc.
 15 of 23

Report No.1071797_8290


Pace Analytical™

 Pace Analytical Services, Inc.
 1700 Elm Street - Suite 200
 Minneapolis, MN 55414

 Tel: 612-607-1700
 Fax: 612-607-6444

Method 8290 Sample Analysis Results

Client - Montana Dept. Of Env. Quality

Client's Sample ID	MBDS-U18-R01		
Lab Sample ID	1071797010		
Filename	F80515A_11		
Injected By	SMT		
Total Amount Extracted	11.0 g	Matrix	Soil
% Moisture	6.9	Dilution	NA
Dry Weight Extracted	10.3 g	Collected	04/17/2008
ICAL ID	F80318	Received	04/19/2008
CCal Filename(s)	F80515A_02 & F80515A_19	Extracted	05/08/2008
Method Blank ID	BLANK-16289	Analyzed	05/15/2008 19:17

Native Isomers	Conc ng/Kg	EMPC ng/Kg	RL ng/Kg	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	0.97	—	0.081	2,3,7,8-TCDF-13C	2.00	81
Total TCDF	19.00	—	0.081	2,3,7,8-TCDD-13C	2.00	75
2,3,7,8-TCDD	0.37	—	0.066	1,2,3,7,8-PeCDF-13C	2.00	61
Total TCDD	6.20	—	0.066	2,3,4,7,8-PeCDF-13C	2.00	68
1,2,3,7,8-PeCDF	—	1.9	0.100	1,2,3,7,8-PeCDD-13C	2.00	74
2,3,4,7,8-PeCDF	2.40	—	0.250	1,2,3,4,7,8-HxCDF-13C	2.00	70
Total PeCDF	27.00	—	0.180	2,3,4,6,7,8-HxCDF-13C	2.00	75
1,2,3,7,8-PeCDD	2.10	—	0.230	1,2,3,7,8,9-HxCDF-13C	2.00	72
Total PeCDD	17.00	—	0.230	1,2,3,4,7,8-HxCDD-13C	2.00	74
1,2,3,4,7,8-HxCDF	0.89	—	0.190	1,2,3,6,7,8-HxCDD-13C	2.00	73
1,2,3,6,7,8-HxCDF	1.30	—	0.310	1,2,3,4,6,7,8-HpCDF-13C	2.00	78
2,3,4,6,7,8-HxCDF	1.30	—	0.170	1,2,3,4,6,7,8-HpCDD-13C	2.00	61
1,2,3,7,8,9-HxCDF	0.55	—	0.170	OCDD-13C	4.00	54
Total HxCDF	24.00	—	0.210	1,2,3,4-TCDD-13C	2.00	63
1,2,3,4,7,8-HxCDD	3.10	—	0.400	1,2,3,7,8,9-HxCDD-13C	2.00	53
1,2,3,6,7,8-HxCDD	7.50	—	0.390	2,3,7,8-TCDD-37Cl4	0.20	80
1,2,3,7,8,9-HxCDD	6.20	—	0.300			
Total HxCDD	77.00	—	0.360			
1,2,3,4,6,7,8-HpCDF	18.00	—	0.170	Total 2,3,7,8-TCDD		
1,2,3,4,7,8,9-HpCDF	1.60	—	0.170	Equivalence: 8.5 ng/Kg		
Total HpCDF	20.00	—	0.170	(Using ITE Factors)		
1,2,3,4,6,7,8-HpCDD	220.00	—	0.830			
Total HpCDD	410.00	—	0.830			
OCDF	39.00	—	0.330			
OCDD	1300.00	—	2.700			

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
 EMPC = Estimated Maximum Possible Concentration
 RL = Reporting Limit.

ND = Not Detected
 NA = Not Applicable
 NC = Not Calculated

Results reported on a dry weight basis and are valid to no more than 2 significant figures.

J = Value below calibration range
 E = PCDE Interference

AB
6/11/08

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
 without the written consent of Pace Analytical Services, Inc.
 16 of 23

Report No.... 1071797_8290

Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612-607-6444



Pace AnalyticalTM

Method 8290 Sample Analysis Results

Client - Montana Dept. Of Env. Quality

Client's Sample ID	MBDS-U18-I01				
Lab Sample ID	1071797011				
Filename	F80515A_12				
Injected By	SMT				
Total Amount Extracted	11.1 g	Matrix	Soil		
% Moisture	8.7	Dilution	NA		
Dry Weight Extracted	10.1 g	Collected	04/17/2008		
ICAL ID	F80318	Received	04/19/2008		
CCal Filename(s)	F80515A_02 & F80515A_19	Extracted	05/08/2008		
Method Blank ID	BLANK-16289	Analyzed	05/15/2008 20:01		

Native Isomers	Conc ng/Kg	EMPC ng/Kg	RL ng/Kg	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	0.41	—	0.11	2,3,7,8-TCDF-13C	2.00	75
Total TCDF	3.80	—	0.11	2,3,7,8-TCDD-13C	2.00	70
				1,2,3,7,8-PeCDF-13C	2.00	59
2,3,7,8-TCDD	1.30	—	0.10	2,3,4,7,8-PeCDF-13C	2.00	64
Total TCDD	3.40	—	0.10	1,2,3,7,8-PeCDD-13C	2.00	69
				1,2,3,4,7,8-HxCDF-13C	2.00	65
1,2,3,7,8-PeCDF	—	1.1	0.13	1,2,3,6,7,8-HxCDF-13C	2.00	69
2,3,4,7,8-PeCDF	0.88	—	0.16	2,3,4,6,7,8-HxCDF-13C	2.00	65
Total PeCDF	8.40	—	0.15	1,2,3,7,8,9-HxCDF-13C	2.00	69
				1,2,3,4,7,8-HxCDD-13C	2.00	67
1,2,3,7,8-PeCDD	0.60	—	0.13	1,2,3,6,7,8-HxCDD-13C	2.00	71
Total PeCDD	3.50	—	0.13	1,2,3,4,6,7,8-HpCDF-13C	2.00	60
				1,2,3,4,7,8,9-HpCDF-13C	2.00	54
1,2,3,4,7,8-HxCDF	0.96	—	0.23	1,2,3,4,6,7,8-HpCDD-13C	2.00	64
1,2,3,6,7,8-HxCDF	0.90	—	0.18	OCDD-13C	4.00	55
2,3,4,6,7,8-HxCDF	0.71	—	0.20			
1,2,3,7,8,9-HxCDF	0.29	—	0.15	1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	17.00	—	0.19	1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	1.10	—	0.24	2,3,7,8-TCDD-37Cl4	0.20	77
1,2,3,6,7,8-HxCDD	3.90	—	0.24			
1,2,3,7,8,9-HxCDD	2.10	—	0.34			
Total HxCDD	25.00	—	0.27			
1,2,3,4,6,7,8-HpCDF	26.00	—	0.27	Total 2,3,7,8-TCDD		
1,2,3,4,7,8,9-HpCDF	2.80	—	0.36	Equivalence: 7.1 ng/Kg		
Total HpCDF	67.00	—	0.31	(Using ITE Factors)		
1,2,3,4,6,7,8-HpCDD	170.00	—	0.56			
Total HpCDD	290.00	—	0.56			
OCDF	160.00	—	0.22			
OCDD	1900.00	—	0.33			

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
EMPC = Estimated Maximum Possible Concentration
RL = Reporting Limit.

ND = Not Detected
NA = Not Applicable
NC = Not Calculated

Results reported on a dry weight basis and are valid to no more than 2 significant figures.

J = Value below calibration range

E = PCDE Interference

AB
6/11/08

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc.

17 of 23

Report No.....1071797_8290

Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612-607-6444



Pace AnalyticalTM

Method 8290 Sample Analysis Results

Client - Montana Dept. Of Env. Quality

Client's Sample ID	MBDS-U18-C01			
Lab Sample ID	1071797012			
Filename	F80515A_13			
Injected By	SMT			
Total Amount Extracted	13.6 g	Matrix	Soil	
% Moisture	25.2	Dilution	NA	
Dry Weight Extracted	10.1 g	Collected	04/17/2008	
ICAL ID	F80318	Received	04/19/2008	
CCal Filename(s)	F80515A_02 & F80515A_19	Extracted	05/08/2008	
Method Blank ID	BLANK-16289	Analyzed	05/15/2008 20:46	

Native Isomers	Conc ng/Kg	EMPC ng/Kg	RL ng/Kg	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	0.95	—	0.130	2,3,7,8-TCDF-13C	2.00	73
Total TCDF	5.80	—	0.130	2,3,7,8-TCDD-13C	2.00	69
				1,2,3,7,8-PeCDF-13C	2.00	57
2,3,7,8-TCDD	0.15	—	0.140	2,3,4,7,8-PeCDF-13C	2.00	62
Total TCDD	3.90	—	0.140	1,2,3,7,8-PeCDD-13C	2.00	68
				1,2,3,4,7,8-HxCDF-13C	2.00	67
1,2,3,7,8-PeCDF	—	6.40	0.220	1,2,3,6,7,8-HxCDF-13C	2.00	70
2,3,4,7,8-PeCDF	1.40	—	0.140	2,3,4,6,7,8-HxCDF-13C	2.00	67
Total PeCDF	8.00	—	0.180	1,2,3,7,8,9-HxCDF-13C	2.00	74
				1,2,3,4,7,8-HxCDD-13C	2.00	68
1,2,3,7,8-PeCDD	0.52	—	0.350	1,2,3,6,7,8-HxCDD-13C	2.00	70
Total PeCDD	15.00	—	0.350	1,2,3,4,6,7,8-HpCDF-13C	2.00	56
				1,2,3,4,7,8,9-HpCDF-13C	2.00	50
1,2,3,4,7,8-HxCDF	1.30	—	0.260	1,2,3,4,6,7,8-HpCDD-13C	2.00	57
1,2,3,6,7,8-HxCDF	0.72	—	0.230	OCDD-13C	4.00	46
2,3,4,6,7,8-HxCDF	0.69	—	0.130			
1,2,3,7,8,9-HxCDF	0.43	—	0.098	1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	10.00	—	0.180	1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	0.44	—	0.240	2,3,7,8-TCDD-37Cl4	0.20	74
1,2,3,6,7,8-HxCDD	3.00	—	0.210			
1,2,3,7,8,9-HxCDD	0.99	—	0.190			
Total HxCDD	21.00	—	0.210			
1,2,3,4,6,7,8-HpCDF	11.00	—	0.590	Total 2,3,7,8-TCDD		
1,2,3,4,7,8,9-HpCDF	—	0.92	0.520	Equivalence: 4.0 ng/Kg		
Total HpCDF	11.00	—	0.550	(Using ITE Factors)		
1,2,3,4,6,7,8-HpCDD	94.00	—	0.200			
Total HpCDD	170.00	—	0.200			
OCDF	35.00	—	0.340			
OCDD	950.00	—	0.290			

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
EMPC = Estimated Maximum Possible Concentration
RL = Reporting Limit.

ND = Not Detected
NA = Not Applicable
NC = Not Calculated

Results reported on a dry weight basis and are valid to no more than 2 significant figures.

J = Value below calibration range

E = PCDE Interference

I = Interference present

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc.
18 of 23

Report No.....1071797_8290

Montana Background Dioxin Study

1. **SDG Number:** 1072782
2. **Number of Samples:** (6)
3. **Sample Matrix:** (6) Soil
4. **Applicable Analytes:** PCDD/PCDF
5. **Reporting Tier:** Level 3
6. **Analysis Method** USEPA SW-846 Method 8290
7. **Laboratory:** Pace Analytical
8. **Validation Level:** III
9. **Validator Affiliation:** Portage Environmental, Inc.
10. **Project:** Montana Background Dioxin Study

Validator's Signature: *Amber Brindley*

Date: 06/16/08

Reviewed By:

Date: 06/16/08

1. INTRODUCTION

Six (6) soil samples were collected and analyzed for Dioxins/Furans by Pace Analytical using USEPA SW-846 Method 8290, *Polychlorinated Dibenzodioxins (PCDDs) and Polychlorinated Dibenzofurans (PCDFs) by High Resolution Gas Chromatography/High Resolution Mass Spectrometry (HRGC/HRMS)*. The data were validated to a Level III.

2. SAMPLE IDENTIFICATION

A sample cross-reference and holding time table is presented below.

Montana Background Dioxin Study SDG Number 1072782								
Field ID	Lab ID	Matrix	Sample Collection Date	Date Received	Date Extracted	Collection to Extraction Holding Time	Analysis Date	Extraction to Analysis Holding Time
MBDS-U09-R01	1072782001	Soil	05/05/08	05/07/08	05/09/08	4	05/17/08	8
MBDS-U09-C01	1072782002	Soil	05/05/08	05/07/08	05/09/08	4	05/17/08	8
MBDS-U09-I01	1072782003	Soil	05/05/08	05/07/08	05/09/08	4	05/18/08	9
MBDS-U08-I01	1072782004	Soil	05/05/08	05/07/08	05/09/08	4	05/18/08	9
MBDS-U08-R01	1072782005	Soil	05/05/08	05/07/08	05/09/08	4	05/18/08	9
MBDS-U08-C01	1072782006	Soil	05/05/08	05/07/08	05/09/08	4	05/18/08	9

A '*' denotes an exceeded holding time.

3. DATA LIMITATION OVERVIEW

The target compound analyses, dioxin/furan, for soil samples from Montana Background Dioxin Study showed compliance with the QC requirements set forth by USEPA SW-846 Method 8290. The data are valid and acceptable with the following exceptions:

MBDS-U09-R01:

- 2,3,7,8-TCDF has been qualified with a 'U' validation flag to denote the reported concentration in non-detect due to positive detection in the method blank (see CTR comment#6).
- Total TCDD, 2,3,4,7,8-PeCDF, 1,2,3,7,8-PeCDD, total PeCDD, 1,2,3,4,7,8-HxCDF, 1,2,3,6,7,8-HxCDF, 2,3,4,6,7,8-HxCDF, 1,2,3,6,7,8-HxCDD, 1,2,3,7,8,9-HxCDD, and 1,2,3,4,7,8,9-HpCDF have been qualified with a 'J' validation flag to denote the reported concentrations are estimates with an undetermined bias as they were reported below the quantitation limit (see CTR comment #10).
- 1,2,3,7,8,9-HxCDF and 1,2,3,4,7,8-HxCDD have been reported at an EMPC and have been qualified with a 'J+' validation flag to denote the reported

concentration is likely overestimated due to possible interference in the sample (see CTR comment #10).

- 1,2,3,7,8-PeCDF has been qualified with an 'R' validation due to interference from polychlorinated diphenyl ethers (PCDE) (see CTR comment #10).
- OCDF and OCDD have been qualified with a 'J+' validation flag to denote the reported concentration is likely overestimated due to high LCS recovery (see CTR comment #8).

MBDS-U09-C01:

- 2,3,7,8-TCDF has been qualified with a 'U' validation flag to denote the reported concentration in non-detect due to positive detection in the method blank (see CTR comment#6).
- Total TCDD, 2,3,4,7,8-PeCDF, total PeCDD, 1,2,3,6,7,8-HxCDF, 2,3,4,6,7,8-HxCDF, 1,2,3,6,7,8-HxCDD, 1,2,3,7,8,9-HxCDD, and 1,2,3,4,7,8,9-HpCDF have been qualified with a 'J' validation flag to denote the reported concentrations are estimates with undetermined bias as they were reported below the quantitation limit (see CTR comment #10).
- 1,2,3,7,8-PeCDD, 1,2,3,4,7,8-HxCDF, 1,2,3,7,8,9-HxCDF, and 1,2,3,4,7,8-HxCDD have been reported at an EMPC and have been qualified with a 'J+' validation flag to denote the reported concentration is likely overestimated due to possible interference in the sample (see CTR comment #10).
- 1,2,3,7,8-PeCDF has been qualified with an 'R' validation due to interference from polychlorinated diphenyl ethers (PCDE) (see CTR comment #10).
- OCDF and OCDD have been qualified with a 'J+' validation flag to denote the reported concentration is likely overestimated due to high LCS recovery (see CTR comment #8).

MBDS-U09-I01:

- 2,3,7,8-TCDF has been qualified with a 'U' validation flag to denote the reported concentration in non-detect due to positive detection in the method blank (see CTR comment#6).
- 1,2,3,7,8-PeCDF has been qualified with an 'R' validation due to interference from polychlorinated diphenyl ethers (PCDE) (see CTR comment #10).

- 2,3,4,7,8-PeCDF, total PeCDD, 1,2,3,4,7,8-HxCDF, 2,3,4,6,7,8-HxCDF, 1,2,3,7,8,9-HxCDF, 1,2,3,6,7,8-HxCDD, and 1,2,3,4,7,8,9-HpCDF have been qualified with a 'J' validation flag to denote the reported concentrations are estimates with an undetermined bias as they were reported below the quantitation limit (see CTR comment #10).
- 1,2,3,7,8-PeCDD, 1,2,3,6,7,8-HxCDF, 1,2,3,4,7,8-HxCDD, and 1,2,3,7,8,9-HxCDD have been reported at an EMPC and have been qualified with a 'J+' validation flag to denote the reported concentration is likely overestimated due to possible interference in the sample (see CTR comment #10).
- OCDF has been qualified with a 'J+' validation flag to denote the reported concentration is likely overestimated as it was reported below the quantitation limit and due to high LCS recoveries (see CTR comment #10 and 8).
- OCDD has been qualified with a 'J+' validation flag to denote the reported concentration is likely overestimated due to high LCS recovery (see CTR comment #8).

MBDS-U08-I01:

- 2,3,7,8-TCDF, 2,3,4,7,8-PeCDF, 1,2,3,7,8-PeCDD, 1,2,3,4,7,8-HxCDF, 1,2,3,6,7,8-HxCDF, 2,3,4,6,7,8-HxCDF, 1,2,3,7,8,9-HxCDF, 1,2,3,4,7,8-HxCDD, 1,2,3,6,7,8-HxCDD, 1,2,3,7,8,9-HxCDD, and 1,2,3,4,7,8,9-HpCDF have been qualified with a 'J' validation flag to denote the reported concentrations are estimates with an undetermined bias as they were reported below the quantitation limit (see CTR comment #10).
- 1,2,3,7,8-PeCDF has been qualified with an 'R' validation due to interference from polychlorinated diphenyl ethers (PCDE) (see CTR comment #10).
- OCDF has been qualified with a 'J+' validation flag to denote the reported concentration is likely overestimated as it was reported below the quantitation limit and due to high LCS recoveries (see CTR comment #10 and 8).
- OCDD has been qualified with a 'J+' validation flag to denote the reported concentration is likely overestimated due to high LCS recovery (see CTR comment #8).

MBDS-U08-R01:

- 2,3,7,8-TCDF has been qualified with a 'U' validation flag to denote the reported concentration in non-detect due to positive detection in the method blank (see CTR comment#6).

- Total TCDD, 2,3,4,7,8-PeCDF, total PeCDF, total PeCDD, 1,2,3,4,7,8-HxCDF, 1,2,3,6,7,8-HxCDF, 2,3,4,6,7,8-HxCDF, 1,2,3,7,8,9-HxCDF, total HxCDF, 1,2,3,6,7,8-HxCDD, total HxCDD, and 1,2,3,4,6,7,8-HpCDF have been qualified with a 'J' validation flag to denote the reported concentrations are estimates with an undetermined bias as they were reported below the quantitation limit (see CTR comment #10).
- 1,2,3,7,8-PeCDF has been qualified with an 'R' validation due to interference from polychlorinated diphenyl ethers (PCDE) (see CTR comment #10).
- 1,2,3,7,8-PeCDD, 1,2,3,4,7,8-HxCDD, and 1,2,3,7,8,9-HxCDD have been reported at an EMPC and have been qualified with a 'J+' validation flag to denote the reported concentration is likely overestimated due to possible interference in the sample (see CTR comment #10).
- OCDF has been qualified with a 'J+' validation flag to denote the reported concentration is likely overestimated as it was reported below the quantitation limit and due to high LCS recoveries (see CTR comment #10 and 8).
- OCDD has been qualified with a 'J+' validation flag to denote the reported concentration is likely overestimated due to high LCS recovery (see CTR comment #8).

MBDS-U08-C01:

- 2,3,7,8-TCDF has been qualified with a 'U' validation flag to denote the reported concentration in non-detect due to positive detection in the method blank (see CTR comment #6).
- 2,3,7,8-TCDD, 2,3,4,7,8-PeCDF, 1,2,3,7,8-PeCDD, 1,2,3,4,7,8-HxCDF, 1,2,3,6,7,8-HxCDF, 2,3,4,6,7,8-HxCDF, 1,2,3,7,8,9-HxCDF, 1,2,3,4,7,8-HxCDD, 1,2,3,6,7,8-HxCDD, 1,2,3,7,8,9-HxCDD, and 1,2,3,4,7,8,9-HpCDF have been qualified with a 'J' validation flag to denote the reported concentrations are estimates with an undetermined bias as they were reported below the quantitation limit (see CTR comment #10).
- 1,2,3,7,8-PeCDF has been qualified with an 'R' validation due to interference from polychlorinated diphenyl ethers (PCDE) (see CTR comment #10).
- OCDF and OCDD have been qualified with a 'J+' validation flag to denote the reported concentration is likely overestimated due to high LCS recovery (see CTR comment #8).

4. CONTRACT AND TECHNICAL REVIEW (CTR)

Project Name: Montana Background Dioxin Study

Laboratory Name: Pace Analytical

SDG#: 1073422

Type of Analysis: USEPA SW-846 Method 8290

1. Data Completeness

The data has undergone a Level III validation.

2. Sample Integrity

No action was taken as sample integrity was compliant.

3. Sample Holding Times

No action was taken as sample holding times were met.

4. Instrument Performance

No action was taken as instrument performance was compliant.

5. Initial and Continuing Calibrations

The initial and continuing calibration forms were not included in the data package as it was a level III. No action was taken as the case narrative indicated that the acceptance criteria for the initial and continuing calibrations were met.

6. Method and Field Blank Contamination

Method Blank. Positive detections were noted in the method blank for 1,2,3,7,8-PeCDF, total PeCDF, total HxCDF, 1,2,3,4,6,7,8-HpCDF, total HpCDF, 1,2,3,4,6,7,8-HpCDD, total HpCDD, OCDF, and OCDD and estimated maximum possible concentrations (EMPC) were noted for 2,3,7,8-TCDF, 2,3,4,7,8-PeCDF, 1,2,3,4,7,8-HxCDF, and 2,3,4,6,7,8-HxCDF. 2,3,7,8-TCDF in MBDS-U09-R01, MBDS-U09-C01, MBDS-U09-I01, MBDS-U08-R01, and MBDS-U08-C01 have been qualified with a 'U' validation flag due to positive detections less than five times the blank value. The remaining 2,3,7,8-TCDF result and all 1,2,3,7,8-PeCDF, total PeCDF, total HxCDF, 1,2,3,4,6,7,8-HpCDF, total HpCDF, 1,2,3,4,6,7,8-HpCDD, total HpCDD, OCDF, OCDD, 2,3,4,7,8-PeCDF, 1,2,3,4,7,8-HxCDF, and 2,3,4,6,7,8-HxCDF warrant no qualification as sample results were greater than five times the method blank concentration.

7. Matrix Spike/Matrix Spike Duplicate (MS/MSD)

The laboratory did not analyze a matrix spike or matrix spike duplicate for this SDG. Instead a laboratory control sample (LCS) and laboratory control sample duplicate (LCSD) were analyzed to ensure accuracy and precision. No action was taken.

8. Laboratory Control Sample (LCS)

In the laboratory control sample (LCS) OCDF (144%) and OCDD (131%) were outside of the 70-130% acceptance criteria. All OCDF and OCDD results were positive and have been qualified with a 'J+' validation flag due to high LCS recoveries indicating that the reported concentrations have been overestimated.

9. Internal Standards (IS) Performance

The internal standard OCDD-13C in the LCS (30%) and LCSD (35%) was outside of the 40-135% acceptance criteria. Associated analytes OCDF and OCDD had high LCS recoveries and all OCDF and OCDD results have been qualified with a 'J+' validation flag indicating the reported concentrations have been overestimated. No further action was taken.

10. Target Compound Identification and Quantitation

In MBDS-U09-R01, total TCDD, 2,3,4,7,8-PeCDF, 1,2,3,7,8-PeCDD, total PeCDD, 1,2,3,4,7,8-HxCDF, 1,2,3,6,7,8-HxCDF, 2,3,4,6,7,8-HxCDF, 1,2,3,6,7,8-HxCDD, 1,2,3,7,8,9-HxCDD, and 1,2,3,4,7,8,9-HpCDF exhibited positive detections below the quantitation limit. They have been qualified with a 'J' validation flag as the reported result is an estimate with an undetermined bias. 1,2,3,7,8,9-HxCDF and 1,2,3,4,7,8-HxCDD were reported at an EMPC due to interference in the sample. They have been qualified with a 'J+' validation flag as the reported result is likely overestimated. 1,2,3,7,8-PeCDF was reported at an EMPC and has been qualified with an 'R' validation flag due to due to interference from polychlorinated diphenyl ethers (PCDE).

In MBDS-U09-C01, Total TCDD, 2,3,4,7,8-PeCDF, total PeCDD, 1,2,3,6,7,8-HxCDF, 2,3,4,6,7,8-HxCDF, 1,2,3,6,7,8-HxCDD, 1,2,3,7,8,9-HxCDD, and 1,2,3,4,7,8,9-HpCDF exhibited positive detections below the quantitation limit. They have been qualified with a 'J' validation flag as the reported result is an estimate with an undetermined bias. 1,2,3,7,8-PeCDD, 1,2,3,4,7,8-HxCDF, 1,2,3,7,8,9-HxCDF, and 1,2,3,4,7,8-HxCDD were reported at an EMPC due to interference in the sample. They have been qualified with a 'J+' validation flag as the reported results are likely overestimated. 1,2,3,7,8-PeCDF was reported at an EMPC and has been qualified with an 'R' validation flag due to due to interference from polychlorinated diphenyl ethers (PCDE).

In MBDS-U09-I01, 2,3,4,7,8-PeCDF, total PeCDD, 1,2,3,4,7,8-HxCDF, 2,3,4,6,7,8-HxCDF, 1,2,3,7,8,9-HxCDF, 1,2,3,6,7,8-HxCDD, 1,2,3,4,7,8,9-HpCDF, and OCDF exhibited positive detections below the quantitation limit. OCDF has been qualified with a 'J+' validation flag as the reported result is likely overestimated due to high LCS recovery and warrants no further qualification. 2,3,4,7,8-PeCDF, total PeCDD, 1,2,3,4,7,8-HxCDF, 2,3,4,6,7,8-HxCDF, 1,2,3,7,8,9-HxCDF, 1,2,3,6,7,8-HxCDD, 1,2,3,4,7,8,9-HpCDF have been qualified with a 'J' validation flag as the reported results were an estimate with an undetermined bias. 1,2,3,7,8-PeCDD, 1,2,3,6,7,8-HxCDF, 1,2,3,4,7,8-HxCDD, and 1,2,3,7,8,9-HxCDD were reported at an EMPC due to interference in the sample. They have been qualified with a 'J+' validation flag as the reported results are likely overestimated. 1,2,3,7,8-PeCDF was reported at an EMPC and has been qualified with an 'R' validation flag due to due to interference from polychlorinated diphenyl ethers (PCDE).

In MBDS-U08-I01, 2,3,7,8-TCDF, 2,3,4,7,8-PeCDF, 1,2,3,7,8-PeCDD, 1,2,3,4,7,8-HxCDF, 1,2,3,6,7,8-HxCDF, 2,3,4,6,7,8-HxCDF, 1,2,3,7,8,9-HxCDF, 1,2,3,4,7,8-HxCDD, 1,2,3,6,7,8-HxCDD, 1,2,3,7,8,9-HxCDD, 1,2,3,4,7,8,9-HpCDF, and OCDF exhibited positive detections below the quantitation limit. OCDF has been qualified with a 'J+' validation flag as the reported result is likely overestimated due to high LCS recovery and warrants no further qualification.

2,3,7,8-TCDF, 2,3,4,7,8-PeCDF, 1,2,3,7,8-PeCDD, 1,2,3,4,7,8-HxCDF, 1,2,3,6,7,8-HxCDF, 2,3,4,6,7,8-HxCDF, 1,2,3,7,8,9-HxCDF, 1,2,3,4,7,8-HxCDD, 1,2,3,6,7,8-HxCDD, 1,2,3,7,8,9-HxCDD, 1,2,3,4,7,8,9-HpCDF have been qualified with a 'J' validation flag as the reported results are estimates with an undetermined bias. 1,2,3,7,8-PeCDF was reported at an EMPC and has been qualified with an 'R' validation flag due to due to interference from polychlorinated diphenyl ethers (PCDE).

In MBDS-U08-R01, total TCDD, 2,3,4,7,8-PeCDF, total PeCDF, total PeCDD, 1,2,3,4,7,8-HxCDF, 1,2,3,6,7,8-HxCDF, 2,3,4,6,7,8-HxCDF, 1,2,3,7,8,9-HxCDF, total HxCDF, 1,2,3,6,7,8-HxCDD, total HxCDD, 1,2,3,4,6,7,8-HpCDF, and OCDF exhibited positive detections below the quantitation limit. OCDF has been qualified with a 'J+' validation flag as the reported result is likely overestimated due to high LCS recovery and warrants no further qualification. Total TCDD, 2,3,4,7,8-PeCDF, total PeCDF, total PeCDD, 1,2,3,4,7,8-HxCDF, 1,2,3,6,7,8-HxCDF, 2,3,4,6,7,8-HxCDF, 1,2,3,7,8,9-HxCDF, total HxCDF, 1,2,3,6,7,8-HxCDD, total HxCDD, and 1,2,3,4,6,7,8-HpCDF have been qualified with a 'J' validation flag as the reported results are estimates with an undetermined bias. 1,2,3,7,8-PeCDD, 1,2,3,4,7,8-HxCDD, and 1,2,3,7,8,9-HxCDD were reported at an EMPC due to interference in the sample. They have been qualified with a 'J+' validation flag as the reported results are likely overestimated. 1,2,3,7,8-PeCDF was reported at an EMPC and has been qualified with an 'R' validation flag due to due to interference from polychlorinated diphenyl ethers (PCDE).

In MBDS-U08-C01, 2,3,7,8-TCDD, 2,3,4,7,8-PeCDF, 1,2,3,7,8-PeCDD, 1,2,3,4,7,8-HxCDF, 1,2,3,6,7,8-HxCDF, 2,3,4,6,7,8-HxCDF, 1,2,3,7,8,9-HxCDF, 1,2,3,4,7,8-HxCDD, 1,2,3,6,7,8-HxCDD, 1,2,3,7,8,9-HxCDD, and 1,2,3,4,7,8,9-HpCDF exhibited positive detections below the quantitation limit. They have been qualified with a 'J' validation flag as the reported results are estimates with an undetermined bias. 1,2,3,7,8-PeCDF was reported at an EMPC and has been qualified with an 'R' validation flag due to due to interference from polychlorinated diphenyl ethers (PCDE).

11. Chromatogram Quality

No comments relating to chromatogram quality.

5. SUMMARY OF DATA USABILITY

The data validation summary flag table shows that qualifiers were applied to the target analytes for SDG# 1072782.

DATA VALIDATION SUMMARY TABLE				
Compound	MBDS-U09-R01	MBDS-U09-C01	MBDS-U09-I01	MBDS-U08-I01
2,3,7,8-TCDF	U	U	U	J
Total TCDF				
2,3,7,8-TCDD				
Total TCDD	J	J		
1,2,3,7,8-PeCDF	R	R	R	R
2,3,4,7,8-PeCDF	J	J	J	J
Total PeCDF				
1,2,3,7,8-PeCDD	J	J+	J+	J
Total PeCDD	J	J	J	
1,2,3,4,7,8-HxCDF	J	J+	J	J
1,2,3,6,7,8-HxCDF	J	J	J+	J
2,3,4,6,7,8-HxCDF	J	J	J	J
1,2,3,7,8,9-HxCDF	J+	J+	J	J
Total HxCDF				
1,2,3,4,7,8-HxCDD	J+	J+	J+	J
1,2,3,6,7,8-HxCDD	J	J	J	J
1,2,3,7,8,9-HxCDD	J	J	J+	J
Total HxCDD				
1,2,3,4,6,7,8-HpCDF				
1,2,3,4,7,8,9-HpCDF	J	J	J	J
Total HpCDF				
1,2,3,4,6,7,8-HpCDD				
Total HpCDD				
OCDF	J+	J+	J+	J+
OCDD	J+	J+	J+	J+

DATA VALIDATION SUMMARY TABLE		
Compound	MBDS-U08-R01	MBDS-U08-C01
2,3,7,8-TCDF	U	U
Total TCDF		
2,3,7,8-TCDD		J
Total TCDD	J	
1,2,3,7,8-PeCDF	R	R
2,3,4,7,8-PeCDF	J	J
Total PeCDF	J	
1,2,3,7,8-PeCDD	J+	J
Total PeCDD	J	
1,2,3,4,7,8-HxCDF	J	J
1,2,3,6,7,8-HxCDF	J	J
2,3,4,6,7,8-HxCDF	J	J
1,2,3,7,8,9-HxCDF	J	J
Total HxCDF	J	
1,2,3,4,7,8-HxCDD	J+	J
1,2,3,6,7,8-HxCDD	J	J
1,2,3,7,8,9-HxCDD	J+	J
Total HxCDD	J	
1,2,3,4,6,7,8-HpCDF	J	
1,2,3,4,7,8,9-HpCDF		J
Total HpCDF		
1,2,3,4,6,7,8-HpCDD		
Total HpCDD		
OCDF	J+	J+
OCDD	J+	J+

Data Validation Summary Table Qualifier Codes

U = Result is a non-detect.

UJ = Result is a non-detect, but is estimated due to QC issues.

J = Result was detected, but is an estimate with undetermined bias due to QC issues.

J+ = Result was detected, but is likely overestimated due to QC issues.

J- = Result was detected, but is likely underestimated due to QC issues.

R = Result is rejected and is highly questionable for use as a quantitative value due to significant QC issues.

6. REFERENCES

Contract Laboratory Program National Functional Guidelines for Organic Data Review, EPA 540/R-99/008, October 1999, U.S. Environmental Protection Agency, Cincinnati, Ohio.

USEPA Analytical Operations / Data Quality Center, *National Functional Guidelines for Chlorinated Dioxin / Furan Data Review*, EPA 540-R-02-003, August 2002.

USEPA, *Methods for the Analysis of Wastes, High Resolution Gas Chromatography / Mass Spectrometry*, SW-846, July 2002.

USEPA Test Methods for Evaluating Solid Waste Physical/Chemical Methods, Doc. No. SW-846, 3rd Ed., Method 8290, Polychlorinated Dibenzodioxins (PCDDs) and Polychlorinated Dibenzofurans (PCDFs) by High Resolution Gas Chromatography/High Resolution Mass Spectrometry (HRGC/HRMS), Revision 0, September 1994.

9. ATTACHMENTS

The following items are included as an attachment to this L&V report:

- A. Qualified reported results (Form I)

Attachment A
Qualified Reported Results



Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612-607-6444

Method 8290 Sample Analysis Results

Client - Montana Dept. Of Env. Quality

Client's Sample ID	MBDS-U09-R01	Matrix	Solid
Lab Sample ID	1072782001	Dilution	NA
Filename	F80517A_15	Collected	05/05/2008
Injected By	BAL	Received	05/07/2008
Total Amount Extracted	10.6 g	Extracted	05/09/2008
% Moisture	15.2	Analyzed	05/17/2008 12:15
Dry Weight Extracted	8.99 g		
ICAL ID	F80318		
CCal Filename(s)	F80516B_17 & F80517A_18		
Method Blank ID	BLANK-16309		

Native Isomers	Conc ng/Kg	EMPC ng/Kg	RL ng/Kg	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	0.28	—	0.094	2,3,7,8-TCDF-13C	2.00	79
Total TCDF	4.20	—	0.094	2,3,7,8-TCDD-13C	2.00	68
				1,2,3,7,8-PeCDF-13C	2.00	65
2,3,7,8-TCDD	ND	—	0.160	2,3,4,7,8-PeCDF-13C	2.00	72
Total TCDD	0.28	—	0.160	1,2,3,7,8-PeCDD-13C	2.00	77
				1,2,3,4,7,8-HxCDF-13C	2.00	72
1,2,3,7,8-PeCDF	—	2.30	0.140	1,2,3,6,7,8-HxCDF-13C	2.00	77
2,3,4,7,8-PeCDF	0.75	—	0.130	2,3,4,6,7,8-HxCDF-13C	2.00	71
Total PeCDF	7.70	—	0.130	1,2,3,7,8,9-HxCDF-13C	2.00	69
				1,2,3,4,7,8-HxCDD-13C	2.00	72
1,2,3,7,8-PeCDD	0.34	—	0.200	1,2,3,6,7,8-HxCDD-13C	2.00	79
Total PeCDD	2.30	—	0.200	1,2,3,4,6,7,8-HpCDF-13C	2.00	65
				1,2,3,4,7,8,9-HpCDF-13C	2.00	56
1,2,3,4,7,8-HxCDF	0.60	—	0.210	1,2,3,4,6,7,8-HpCDD-13C	2.00	65
1,2,3,6,7,8-HxCDF	0.48	—	0.190	OCDD-13C	4.00	52
2,3,4,6,7,8-HxCDF	0.40	—	0.180			
1,2,3,7,8,9-HxCDF	—	0.20	0.180	1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	11.00	—	0.190	1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	—	0.58	0.240	2,3,7,8-TCDD-37Cl4	0.20	73
1,2,3,6,7,8-HxCDD	1.80	—	0.230			
1,2,3,7,8,9-HxCDD	1.00	—	0.170			
Total HxCDD	14.00	—	0.210			
1,2,3,4,6,7,8-HpCDF	11.00	—	0.200	Total 2,3,7,8-TCDD		
1,2,3,4,7,8,9-HpCDF	0.61	—	0.320	Equivalence: 1.9 ng/Kg		
Total HpCDF	21.00	—	0.260	(Using ITE Factors)		
1,2,3,4,6,7,8-HpCDD	44.00	—	0.210			
Total HpCDD	84.00	—	0.210			
OCDF	29.00	—	0.240			
OCDD	340.00	—	0.340			

AB
6/12/08

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
EMPC = Estimated Maximum Possible Concentration
RL = Reporting Limit
Results reported on a dry weight basis and are valid to no more than 2 significant figures.
J = Value below calibration range
E = PCDE Interference
I = Interference present
ND = Not Detected
NA = Not Applicable
NC = Not Calculated

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc.
7 of 16

Report No.....1072782_8290



Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612-607-6444

Method 8290 Sample Analysis Results

Client - Montana Dept. Of Env. Quality

Client's Sample ID	MBDS-U09-C01		
Lab Sample ID	1072782002		
Filename	F80517A_16		
Injected By	BAL		
Total Amount Extracted	10.6 g	Matrix	Solid
% Moisture	7.4	Dilution	NA
Dry Weight Extracted	9.77 g	Collected	05/05/2008
ICAL ID	F80318	Received	05/07/2008
CCal Filename(s)	F80516B_17 & F80517A_18	Extracted	05/09/2008
Method Blank ID	BLANK-16309	Analyzed	05/17/2008 13:00

Native Isomers	Conc ng/Kg	EMPC ng/Kg	RL ng/Kg	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	0.21	—	0.056	J U	2,3,7,8-TCDF-13C	90
Total TCDF	2.20	—	0.056		2,3,7,8-TCDD-13C	81
2,3,7,8-TCDD	ND	—	0.098		1,2,3,7,8-PeCDF-13C	70
Total TCDD	0.44	—	0.098	+ J	2,3,4,7,8-PeCDF-13C	76
1,2,3,7,8-PeCDF	—	3.60	0.160	E R	1,2,3,7,8-PeCDD-13C	83
2,3,4,7,8-PeCDF	0.55	—	0.140	J S	1,2,3,4,7,8-HxCDF-13C	77
Total PeCDF	6.60	—	0.150		1,2,3,6,7,8-HxCDF-13C	84
1,2,3,7,8-PeCDD	—	0.23	0.130	+ J	2,3,4,6,7,8-HxCDF-13C	78
Total PeCDD	0.83	—	0.130	+ J	1,2,3,7,8,9-HxCDF-13C	81
1,2,3,4,7,8-HxCDF	—	0.68	0.230	+ J	1,2,3,4,7,8-HxCDD-13C	76
1,2,3,6,7,8-HxCDF	0.50	—	0.170	+ J	1,2,3,6,7,8-HxCDD-13C	86
2,3,4,6,7,8-HxCDF	0.43	—	0.160	+ J	1,2,3,4,6,7,8-HpCDF-13C	69
1,2,3,7,8,9-HxCDF	—	0.27	0.170	+ J	1,2,3,4,7,8,9-HpCDF-13C	61
Total HxCDF	14.00	—	0.180	+ J	1,2,3,4,6,7,8-HpCDD-13C	70
1,2,3,4,7,8-HxCDD	—	0.38	0.230	+ J	OCDD-13C	54
1,2,3,6,7,8-HxCDD	2.10	—	0.220	+ J	1,2,3,4-TCDD-13C	NA
1,2,3,7,8,9-HxCDD	0.98	—	0.180	+ J	1,2,3,7,8,9-HxCDD-13C	NA
Total HxCDD	9.70	—	0.210	+ J	2,3,7,8-TCDD-37Cl4	89
1,2,3,4,6,7,8-HpCDF	8.60	—	0.170			
1,2,3,4,7,8,9-HpCDF	0.66	—	0.320	+ J	Total 2,3,7,8-TCDD	
Total HpCDF	16.00	—	0.250		Equivalence: 1.8 ng/Kg	
					(Using ITE Factors)	
1,2,3,4,6,7,8-HpCDD	49.00	—	0.220			
Total HpCDD	84.00	—	0.220			
OCDF	15.00	—	0.220	J +		
OCDD	480.00	—	0.260	J +		

AB
6/12/08

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
EMPC = Estimated Maximum Possible Concentration
RL = Reporting Limit.
ND = Not Detected
NA = Not Applicable
NC = Not Calculated

Results reported on a dry weight basis and are valid to no more than 2 significant figures.
J = Value below calibration range
E = PCDE Interference
I = Interference present

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc.
8 of 16

Report No.....1072782_8290



Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612-607-6444

Method 8290 Sample Analysis Results

Client - Montana Dept. Of Env. Quality

Client's Sample ID	MBDS-U09-I01			
Lab Sample ID	1072782003			
Filename	F80518A_13			
Injected By	BAL			
Total Amount Extracted	11.1 g			
% Moisture	10.8		Matrix	Solid
Dry Weight Extracted	9.86 g		Dilution	NA
ICAL ID	F80318		Collected	05/05/2008
CCal Filename(s)	F80517B_18 & F80518A_19		Received	05/07/2008
Method Blank ID	BLANK-16309		Extracted	05/09/2008
			Analyzed	05/18/2008 13:36

Native Isomers	Conc ng/Kg	EMPC ng/Kg	RL ng/Kg	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	0.36	—	0.082	J U	2,3,7,8-TCDF-13C	88
Total TCDF	2.90	—	0.082		2,3,7,8-TCDD-13C	77
2,3,7,8-TCDD	ND	—	0.085		1,2,3,7,8-PeCDF-13C	70
Total TCDD	ND	—	0.085		2,3,4,7,8-PeCDF-13C	76
					1,2,3,7,8-PeCDD-13C	80
1,2,3,7,8-PeCDF	—	1.50	0.140	E R	1,2,3,4,7,8-HxCDF-13C	79
2,3,4,7,8-PeCDF	0.52	—	0.130	J J	1,2,3,6,7,8-HxCDF-13C	90
Total PeCDF	5.20	—	0.130		2,3,4,6,7,8-HxCDF-13C	81
					1,2,3,7,8,9-HxCDF-13C	81
1,2,3,7,8-PeCDD	—	0.14	0.130	+ J	1,2,3,4,7,8-HxCDD-13C	77
Total PeCDD	0.39	—	0.130	+ J	1,2,3,6,7,8-HxCDD-13C	91
					1,2,3,4,6,7,8-HpCDF-13C	68
1,2,3,4,7,8-HxCDF	0.54	—	0.160	+ J	1,2,3,4,7,8,9-HpCDF-13C	58
1,2,3,6,7,8-HxCDF	—	0.31	0.170	+ J	1,2,3,4,6,7,8-HpCDD-13C	67
2,3,4,6,7,8-HxCDF	0.54	—	0.120	+ J	OCDD-13C	53
1,2,3,7,8,9-HxCDF	0.28	—	0.140	J J	1,2,3,4-TCDD-13C	NA
Total HxCDF	7.00	—	0.150		1,2,3,7,8,9-HxCDD-13C	NA
1,2,3,4,7,8-HxCDD	—	0.21	0.130	+ J	2,3,7,8-TCDD-37Cl4	83
1,2,3,6,7,8-HxCDD	1.00	—	0.160	+ J		
1,2,3,7,8,9-HxCDD	—	0.47	0.150	+ J		
Total HxCDD	5.90	—	0.150	+ J		
1,2,3,4,6,7,8-HpCDF	6.20	—	0.190		Total 2,3,7,8-TCDD	
1,2,3,4,7,8,9-HpCDF	0.52	—	0.170	+ J	Equivalence: 1.2 ng/Kg	
Total HpCDF	11.00	—	0.180		(Using ITE Factors)	
1,2,3,4,6,7,8-HpCDD	26.00	—	0.110			
Total HpCDD	45.00	—	0.110			
OCDF	10.00	—	0.180	+ J		
OCDD	300.00	—	0.220	+ J		

AB
4/12/08

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
EMPC = Estimated Maximum Possible Concentration
RL = Reporting Limit
Results reported on a dry weight basis and are valid to no more than 2 significant figures.
J = Value below calibration range
E = PCDE Interference
I = Interference present
ND = Not Detected
NA = Not Applicable
NC = Not Calculated

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc.
9 of 16

Report No....1072782_8290



Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612-607-6444

Method 8290 Sample Analysis Results

Client - Montana Dept. Of Env. Quality

Client's Sample ID	MBDS-U08-I01		
Lab Sample ID	1072782004		
Filename	F80518A_14		
Injected By	BAL		
Total Amount Extracted	10.9 g	Matrix	Solid
% Moisture	16.0	Dilution	NA
Dry Weight Extracted	9.13 g	Collected	05/05/2008
ICAL ID	F80318	Received	05/07/2008
CCal Filename(s)	F80517B_18 & F80518A_19	Extracted	05/09/2008
Method Blank ID	BLANK-16309	Analyzed	05/18/2008 14:20

Native Isomers	Conc ng/Kg	EMPC ng/Kg	RL ng/Kg	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	0.91	—	0.12	2,3,7,8-TCDF-13C	2.00	75
Total TCDF	15.00	—	0.12	2,3,7,8-TCDD-13C	2.00	65
				1,2,3,7,8-PeCDF-13C	2.00	61
2,3,7,8-TCDD	ND	—	0.19	2,3,4,7,8-PeCDF-13C	2.00	64
Total TCDD	5.10	—	0.19	1,2,3,7,8-PeCDD-13C	2.00	70
				1,2,3,4,7,8-HxCDF-13C	2.00	68
1,2,3,7,8-PeCDF	—	4.1	0.15	1,2,3,6,7,8-HxCDF-13C	2.00	79
2,3,4,7,8-PeCDF	2.10	—	0.21	2,3,4,6,7,8-HxCDF-13C	2.00	68
Total PeCDF	29.00	—	0.18	1,2,3,7,8,9-HxCDF-13C	2.00	64
				1,2,3,4,7,8-HxCDD-13C	2.00	64
1,2,3,7,8-PeCDD	0.51	—	0.15	1,2,3,6,7,8-HxCDD-13C	2.00	80
Total PeCDD	7.50	—	0.15	1,2,3,4,6,7,8-HpCDF-13C	2.00	62
				1,2,3,4,7,8,9-HpCDF-13C	2.00	46
1,2,3,4,7,8-HxCDF	1.10	—	0.26	1,2,3,4,6,7,8-HpCDD-13C	2.00	56
1,2,3,6,7,8-HxCDF	1.00	—	0.24	OCDD-13C	4.00	41
2,3,4,6,7,8-HxCDF	1.30	—	0.21			
1,2,3,7,8,9-HxCDF	0.37	—	0.20	1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	22.00	—	0.23	1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	0.74	—	0.20	2,3,7,8-TCDD-37Cl4	0.20	84
1,2,3,6,7,8-HxCDD	3.40	—	0.29			
1,2,3,7,8,9-HxCDD	1.30	—	0.27			
Total HxCDD	22.00	—	0.26			
1,2,3,4,6,7,8-HpCDF	7.00	—	0.19	Total 2,3,7,8-TCDD		
1,2,3,4,7,8,9-HpCDF	0.41	—	0.34	Equivalence: 3.4 ng/Kg		
Total HpCDF	11.00	—	0.27	(Using ITE Factors)		
1,2,3,4,6,7,8-HpCDD	56.00	—	0.30			
Total HpCDD	110.00	—	0.30			
OCDF	7.40	—	0.32			
OCDD	480.00	—	0.20			

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
EMPC = Estimated Maximum Possible Concentration
RL = Reporting Limit.

ND = Not Detected
NA = Not Applicable
NC = Not Calculated

Results reported on a dry weight basis and are valid to no more than 2 significant figures.
J = Value below calibration range
E = PCDE Interference

AB
6/12/08

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc.
10 of 16

Report No.....1072782_8290


Pace Analytical™

 Pace Analytical Services, Inc.
 1700 Elm Street - Suite 200
 Minneapolis, MN 55414

 Tel: 612-607-1700
 Fax: 612-607-6444

Method 8290 Sample Analysis Results

Client - Montana Dept. Of Env. Quality

Client's Sample ID	MBDS-U08-R01	Matrix	Solid
Lab Sample ID	1072782005	Dilution	NA
Filename	F80518A_15	Collected	05/05/2008
Injected By	BAL	Received	05/07/2008
Total Amount Extracted	10.7 g	Extracted	05/09/2008
% Moisture	13.7	Analyzed	05/18/2008 15:05
Dry Weight Extracted	9.26 g		
ICAL ID	F80318		
CCal Filename(s)	F80517B_18 & F80518A_19		
Method Blank ID	BLANK-16309		

Native Isomers	Conc ng/Kg	EMPC ng/Kg	RL ng/Kg	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	0.29	—	0.067	2,3,7,8-TCDF-13C	2.00	86
Total TCDF	4.10	—	0.067	2,3,7,8-TCDD-13C	2.00	79
				1,2,3,7,8-PeCDF-13C	2.00	67
2,3,7,8-TCDD	ND	—	0.094	2,3,4,7,8-PeCDF-13C	2.00	71
Total TCDD	0.87	—	0.094	1,2,3,7,8-PeCDD-13C	2.00	77
				1,2,3,4,7,8-HxCDF-13C	2.00	73
1,2,3,7,8-PeCDF	—	0.77	0.140	1,2,3,6,7,8-HxCDF-13C	2.00	85
2,3,4,7,8-PeCDF	0.48	—	0.150	2,3,4,6,7,8-HxCDF-13C	2.00	76
Total PeCDF	3.40	—	0.140	1,2,3,7,8,9-HxCDF-13C	2.00	74
				1,2,3,4,7,8-HxCDD-13C	2.00	72
1,2,3,7,8-PeCDD	—	0.23	0.130	1,2,3,6,7,8-HxCDD-13C	2.00	86
Total PeCDD	0.29	—	0.130	1,2,3,4,6,7,8-HpCDF-13C	2.00	66
				1,2,3,4,7,8,9-HpCDF-13C	2.00	52
1,2,3,4,7,8-HxCDF	0.51	—	0.170	1,2,3,4,6,7,8-HpCDD-13C	2.00	63
1,2,3,6,7,8-HxCDF	0.39	—	0.190	OCDD-13C	4.00	45
2,3,4,6,7,8-HxCDF	0.54	—	0.092			
1,2,3,7,8,9-HxCDF	0.17	—	0.150	1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	5.10	—	0.150	1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	—	0.23	0.140	2,3,7,8-TCDD-37Cl4	0.20	89
1,2,3,6,7,8-HxCDD	0.67	—	0.270			
1,2,3,7,8,9-HxCDD	—	0.30	0.210			
Total HxCDD	4.50	—	0.210			
1,2,3,4,6,7,8-HpCDF	3.00	—	0.130	Total 2,3,7,8-TCDD		
1,2,3,4,7,8,9-HpCDF	ND	—	0.280	Equivalence: 0.73 ng/Kg		
Total HpCDF	7.00	—	0.200	(Using ITE Factors)		
1,2,3,4,6,7,8-HpCDD	11.00	—	0.610			
Total HpCDD	21.00	—	0.610			
OCDF	4.10	—	0.290			
OCDD	92.00	—	0.370			

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
 EMPC = Estimated Maximum Possible Concentration
 RL = Reporting Limit.

ND = Not Detected
 NA = Not Applicable
 NC = Not Calculated

Results reported on a dry weight basis and are valid to no more than 2 significant figures.

J = Value below calibration range

E = PCDE Interference

I = Interference present

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
 without the written consent of Pace Analytical Services, Inc.

11 of 16

Report No.....1072782_8290



Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612-607-8444

Method 8290 Sample Analysis Results

Client - Montana Dept. Of Env. Quality

Client's Sample ID	MBDS-U08-C01		
Lab Sample ID	1072782006		
Filename	F80518A_16		
Injected By	BAL		
Total Amount Extracted	10.9 g	Matrix	Solid
% Moisture	18.9	Dilution	NA
Dry Weight Extracted	8.84 g	Collected	05/05/2008
ICAL ID	F80318	Received	05/07/2008
CCal Filename(s)	F80517B_18 & F80518A_19	Extracted	05/09/2008
Method Blank ID	BLANK-16309	Analyzed	05/18/2008 15:49

Native Isomers	Conc ng/Kg	EMPC ng/Kg	RL ng/Kg	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	0.55	—	0.066	U	2,3,7,8-TCDF-13C	88
Total TCDF	12.00	—	0.066		2,3,7,8-TCDD-13C	77
					1,2,3,7,8-PeCDF-13C	70
2,3,7,8-TCDD	0.36	—	0.065	J	2,3,4,7,8-PeCDF-13C	76
Total TCDD	3.50	—	0.065		1,2,3,7,8-PeCDD-13C	83
					1,2,3,4,7,8-HxCDF-13C	80
1,2,3,7,8-PeCDF	—	4.0	0.150	E R	1,2,3,6,7,8-HxCDF-13C	91
2,3,4,7,8-PeCDF	2.20	—	0.120	J	2,3,4,6,7,8-HxCDF-13C	81
Total PeCDF	25.00	—	0.130		1,2,3,7,8,9-HxCDF-13C	78
					1,2,3,4,7,8-HxCDD-13C	79
1,2,3,7,8-PeCDD	1.00	—	0.140	J	1,2,3,6,7,8-HxCDD-13C	92
Total PeCDD	5.80	—	0.140		1,2,3,4,6,7,8-HpCDF-13C	73
					1,2,3,4,7,8,9-HpCDF-13C	60
1,2,3,4,7,8-HxCDF	1.60	—	0.160	J	1,2,3,4,6,7,8-HpCDD-13C	69
1,2,3,6,7,8-HxCDF	1.70	—	0.150	J	OCDD-13C	54
2,3,4,6,7,8-HxCDF	2.30	—	0.160	J		
1,2,3,7,8,9-HxCDF	0.49	—	0.150	J	1,2,3,4-TCDD-13C	NA
Total HxCDF	26.00	—	0.160		1,2,3,7,8,9-HxCDD-13C	NA
1,2,3,4,7,8-HxCDD	0.96	—	0.200	J	2,3,7,8-TCDD-37Cl4	83
1,2,3,6,7,8-HxCDD	1.90	—	0.250	J		
1,2,3,7,8,9-HxCDD	1.60	—	0.170	J		
Total HxCDD	20.00	—	0.200			
1,2,3,4,6,7,8-HpCDF	16.00	—	0.260		Total 2,3,7,8-TCDD	
1,2,3,4,7,8,9-HpCDF	0.97	—	0.180	J	Equivalence: 3.9 ng/Kg	
Total HpCDF	22.00	—	0.220		(Using ITE Factors)	
1,2,3,4,6,7,8-HpCDD	34.00	—	0.180			
Total HpCDD	68.00	—	0.180			
OCDF	25.00	—	0.190	J+		
OCDD	260.00	—	0.180	J+		

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
EMPC = Estimated Maximum Possible Concentration
RL = Reporting Limit.

ND = Not Detected
NA = Not Applicable
NC = Not Calculated

Results reported on a dry weight basis and are valid to no more than 2 significant figures.
J = Value below calibration range
E = PCDE Interference

AB
6/12/08

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc.
12 of 16

Report No.....1072782_8290

Montana Background Dioxin Study

1. **SDG Number:** 1073422
2. **Number of Samples:** (11)
3. **Sample Matrix:** (11) Soil
4. **Applicable Analytes:** PCDD/PCDF
5. **Reporting Tier:** Level 3
6. **Analysis Method** USEPA SW-846 Method 8290
7. **Laboratory:** Pace Analytical
8. **Validation Level:** III
9. **Validator Affiliation:** Portage Environmental, Inc.
10. **Project:** Montana Background Dioxin Study

Validator's Signature: *Amber Brandy*

Date: 06/16/08

Reviewed By:

Date: 06/16/08

1. INTRODUCTION

Eleven (11) soil samples were collected and analyzed for Dioxins/Furans by Pace Analytical using USEPA SW-846 Method 8290, *Polychlorinated Dibenzodioxins (PCDDs) and Polychlorinated Dibenzofurans (PCDFs) by High Resolution Gas Chromatography/High Resolution Mass Spectrometry (HRGC/HRMS)*. The data were validated to a Level III.

2. SAMPLE IDENTIFICATION

A sample cross-reference and holding time table is presented below.

Montana Background Dioxin Study SDG Number 1073422								
Field ID	Lab ID	Matrix	Sample Collection Date	Date Received	Date Extracted	Collection to Extraction Holding Time	Analysis Date	Extraction to Analysis Holding Time
MBDS-R19-D01	1073422001	Soil	05/13/08	05/16/08	06/02/08	20	06/04/08	2
MBDS-R19-D02	1073422002	Soil	05/14/08	05/16/08	06/02/08	19	06/04/08	2
MBDS-R19-F01	1073422003	Soil	05/14/08	05/16/08	06/02/08	19	06/04/08	2
MBDS-R20-A01	1073422004	Soil	05/14/08	05/16/08	06/02/08	19	06/04/08	2
MBDS-R20-A04	1073422005	Soil	05/14/08	05/16/08	06/02/08	19	06/04/08	2
MBDS-R20-A05 (Trip Blank)	1073422006	Soil	05/14/08	05/16/08	06/02/08	19	06/04/08	2
MBDS-R20-F01	1073422007	Soil	05/14/08	05/16/08	06/02/08	19	06/04/08	2
MBDS-R20-O01	1073422008	Soil	05/14/08	05/16/08	06/02/08	19	06/04/08	2
MBDS-R14-O01	1073422009	Soil	05/14/08	05/16/08	06/02/08	19	06/05/08	3
MBDS-R14-A01	1073422010	Soil	05/14/08	05/16/08	06/02/08	19	06/05/08	3
MBDS-R14-F01	1073422011	Soil	05/15/08	05/16/08	06/02/08	18	06/05/08	3

A '**' denotes an exceeded holding time.

3. DATA LIMITATION OVERVIEW

The target compound analyses, dioxin/furan, for soil samples from Montana Background Dioxin Study showed compliance with the QC requirements set forth by USEPA SW-846 Method 8290. The data are valid and acceptable with the following exceptions:

MBDS-R19-D01:

- 2,3,7,8-TCDF has been qualified with a 'U' validation flag to denote the reported concentration is non-detect due to detections in the trip blank (see CTR comment #6).
- Total HpCDF has been qualified with a 'U' validation flag to denote the reported concentration is non-detect due to detections in the method blank (see CTR comment #6).

- Total TCDD, total HxCDF, 1,2,3,4,6,7,8-HpCDF, 1,2,3,4,6,7,8-HpCDD, total HpCDD, and OCDF have been qualified with a 'J' validation flag to denote the reported concentrations are estimates with an undetermined bias as they were reported below the quantitation limit (see CTR comment #10).

MBDS-R19-D02:

- 2,3,7,8-TCDF was reported at an EMPC and has been qualified with a 'UJ' validation flag to denote the reported concentration is non-detect, and the sample quantitation is an estimate due to positive detection in the trip blank and possible interference in the sample (see CTR comments #6 and 10).
- Total HpCDF has been qualified with a 'U' validation flag to denote the reported concentration is non-detect due to detections in the method blank (see CTR comment #6).
- 1,2,3,4,6,7,8-HpCDF, 1,2,3,4,6,7,8-HpCDD, total HpCDD, and OCDF have been qualified with a 'J' validation flag to denote the reported concentrations are estimates with an undermined bias as they were reported below the quantitation limit (see CTR comment #10).
- OCDD was reported at an EMPC and has been qualified with a 'J+' validation flag to denote the reported result is likely overestimated due to possible interference in the sample (see CTR comment #10).

MBDS-R19-F01:

- Total HpCDF has been qualified with a 'U' validation flag to denote the reported concentration is non-detect due to detections in the method blank (see CTR comment #6).
- 1,2,3,4,6,7,8-HpCDD was reported at an EMPC and has been qualified with a 'UJ' validation flag to denote the reported concentration is non-detect, and the sample quantitation is an estimate due to positive detection in the method blank and possible interference in the sample (see CTR comments #6 and 10).
- 1,2,3,4,6,7,8-HpCDF and total HpCDD have been qualified with a 'J' validation flag to denote the reported concentrations are estimates with an undetermined bias as they were reported below the quantitation limit (see CTR comment #10).
- OCDF and OCDD were reported at an EMPC and have been qualified with a 'J+' validation flag to denote the reported results are likely overestimated due to possible interference in the sample (see CTR comment #10).

MBDS-R20-A01:

- Total HpCDF has been qualified with a 'U' validation flag to denote the reported concentration is non-detect due to detections in the method blank (see CTR comment #6).
- Total TCDF, total HxCDD, 1,2,3,4,6,7,8-HpCDF, 1,2,3,4,6,7,8-HpCDD, and total HpCDD have been qualified with a 'J' validation flag to denote the reported concentrations are estimates with an undetermined bias as they were reported below the quantitation limit (see CTR comment #10).
- OCDF was reported at an EMPC and has been qualified with a 'J+' validation flag to denote the reported result is likely overestimated due to possible interference in the sample (see CTR comment #10).

MBDS-R20-A04:

- 1,2,3,4,6,7,8-HpCDD has been qualified with a 'U' validation flag to denote the reported concentration is non-detect due to detections in the method blank (see CTR comment #6).
- Total HpCDD has been qualified with a 'J' validation flag to denote the reported concentration is an estimate with an undetermined bias as it was reported below the quantitation limit (see CTR comment #10).
- 1,2,3,4,6,7,8-HpCDF, and OCDF were reported at an EMPC and have been qualified with a 'J+' validation flag to denote the reported results are likely overestimated due to possible interference in the sample (see CTR comment #10).

MBDS-R20-A05 (Trip Blank):

- 2,3,7,8-TCDF was reported at an EMPC and has been qualified with a 'J+' validation flag to denote the reported result is likely overestimated due to possible interference in the sample (see CTR comment #10).
- OCDD was reported at an EMPC and has been qualified with a 'UJ' validation flag to denote the reported concentration is non-detect, and the sample quantitation is an estimate due to positive detection in the method blank and possible interference in the sample (see CTR comments #6 and 10).

MBDS-R20-F01:

- 2,3,7,8-TCDF has been qualified with a 'U' validation flag to denote the reported concentration is non-detect due to detections in the trip blank (see CTR comment #6).
- Total HpCDF and 1,2,3,4,6,7,8-HpCDD have been qualified with a 'U' validation flag to denote the reported concentrations are non-detect due to detections in the method blank (see CTR comment #6).
- 2,3,4,7,8-PeCDF, 1,2,3,6,7,8-HxCDD, 1,2,3,7,8,9-HxCDD, and 1,2,3,4,6,7,8-HpCDF were reported at an EMPC and have been qualified with a 'J+' validation flag to denote the reported results are likely overestimated due to possible interference in the sample (see CTR comment #10).
- Total PeCDF, total PeCDD, 1,2,3,4,7,8-HxCDF, total HxCDF, 1,2,3,4,7,8-HxCDD, total HxCDD, total HpCDD, OCDF, and OCDD have been qualified with a 'J' validation flag to denote the reported concentrations are estimates with an undetermined bias as they were reported below the quantitation limit (see CTR comment #10).

MBDS-R20-O01:

- 2,3,7,8-TCDF has been qualified with a 'U' validation flag to denote the reported concentration is non-detect due to detections in the trip blank (see CTR comment #6).
- 1,2,3,4,6,7,8-HpCDD has been qualified with a 'U' validation flag to denote the reported concentration is non-detect due to detections in the method blank (see CTR comment #6).
- Total TCDF, total PeCDF, 1,2,3,4,7,8-HxCDF, total HxCDF, total HxCDD, total HpCDD, and OCDD have been qualified with a 'J' validation flag to denote the reported concentrations are estimates with an undetermined bias as they were reported below the quantitation limit (see CTR comment #10).
- 1,2,3,4,6,7,8-HpCDF, and OCDF were reported at an EMPC and have been qualified with a 'J+' validation flag to denote the reported results are likely overestimated due to possible interference in the sample (see CTR comment #10).

MBDS-R14-O01:

- 2,3,7,8-TCDF has been qualified with a 'U' validation flag to denote the reported concentration is non-detect due to detections in the trip blank (see CTR comment #6).

- Total TCDD, 2,3,4,7,8-PeCDF, total PeCDF, total PeCDD, 1,2,3,4,7,8-HxCDF, 1,2,3,6,7,8-HxCDF, total HxCDF, 1,2,3,6,7,8-HxCDD, total HxCDD, 1,2,3,4,6,7,8-HpCDF, total HpCDF, and OCDF have been qualified with a 'J' validation flag to denote the reported concentrations are estimates with an undetermined bias as they were reported below the quantitation limit (see CTR comment #10).
- 2,3,4,6,7,8-HxCDF, 1,2,3,4,7,8-HxCDD, and 1,2,3,7,8,9-HxCDD were reported at an EMPC and have been qualified with a 'J+' validation flag to denote the reported results are likely overestimated due to possible interference in the sample (see CTR comment #10).

MBDS-R14-A01:

- 2,3,7,8-TCDF has been qualified with a 'U' validation flag to denote the reported concentration is non-detect due to detections in the trip blank (see CTR comment #6).
- 1,2,3,4,6,7,8-HpCDD has been qualified with a 'U' validation flag to denote the reported concentration is non-detect due to detections in the method blank (see CTR comment #6).
- Total TCDF, total TCDD, total PeCDF, total HpCDD, and OCDD have been qualified with a 'J' validation flag to denote the reported concentrations are estimates with an undetermined bias as they were reported below the quantitation limit (see CTR comment #10).
- 2,3,4,7,8-PeCDF, 1,2,3,6,7,8-HxCDD, 1,2,3,7,8,9-HxCDD, 1,2,3,4,6,7,8-HpCDF, and OCDF were reported at an EMPC and have been qualified with a 'J+' validation flag to denote the reported results are likely overestimated due to possible interference in the sample (see CTR comment #10).

MBDS-R14-F01:

- 2,3,7,8-TCDF was reported at an EMPC and has been qualified with a 'UJ' validation flag to denote the reported concentration is non-detect, and the sample quantitation is an estimate due to positive detection in the trip blank and possible interference in the sample (see CTR comments #6 and 10).
- Total HpCDF and 1,2,3,4,6,7,8-HpCDD have been qualified with a 'U' validation flag to denote the reported concentrations are non-detect due to detections in the method blank (see CTR comment #6).

- 1,2,3,4,7,8-HxCDD was reported at an EMPC and has been qualified with a 'J+' validation flag to denote the reported result is likely overestimated due to possible interference in the sample (see CTR comment #10).
- 1,2,3,4,6,7,8-HpCDF, total HpCDD, OCDF, and OCDD have been qualified with a 'J' validation flag to denote the reported concentrations are estimates with an undetermined bias as they were reported below the quantitation limit (see CTR comment #10).

4. **CONTRACT AND TECHNICAL REVIEW (CTR)**

Project Name: Montana Background Dioxin Study

Laboratory Name: Pace Analytical

SDG#: 1073422

Type of Analysis: USEPA SW-846 Method 8290

1. Data Completeness

The data has undergone a Level III validation.

2. Sample Integrity

No action was taken as sample integrity was compliant.

3. Sample Holding Times

No action was taken as sample holding times were met.

4. Instrument Performance

No action was taken as instrument performance was compliant.

5. Initial and Continuing Calibrations

The initial and continuing calibration forms were not included in the data package as it was a level III. No action was taken as the case narrative indicated that the acceptance criteria for the initial and continuing calibrations were met.

6. Method and Field Blank Contamination

Method Blank. Positive detections were noted in the method blank for 1,2,3,4,7,8,9-HpCDF, total HpCDF, and OCDD and estimated maximum possible concentration (EMPC) result was noted for 1,2,3,4,6,7,8-HpCDD. Total HpCDF in MBDS-R19-D01, MBDS-R19-D02, MBDS-R19-F01, MBDS-R20-A01, MBDS-R20-F01, and MBDS-R14-F01 exhibited positive detection and have been qualified with a 'U' validation flag as the reported concentrations were less than five times the blank value. 1,2,3,4,6,7,8-HpCDD in MBDS-R20-A04, MBDS-R20-F01, MBDS-R20-O01, MBDS-R14-A01, and MBDS-R14-F01 F01 exhibited positive detection and have been qualified with a 'U' validation flag as the reported concentrations were less than five times the blank value. 1,2,3,4,6,7,8-HpCDD in MBDS-R19-F01 and OCDD in MBDS-R20-A05 was reported at an EMPC and has been qualified with a 'UJ' validation flag as the reported result was less than five times the blank value and due to interference in the sample. The remaining 1,2,3,4,7,8,9-HpCDF, total HpCDF, OCDD, and 1,2,3,4,6,7,8-HpCDD results were either non-detect or greater than five times the blank value and warrant no qualification.

Trip Blank (MBDS-R20-A05). It was noted that 2,3,7,8-TCDF and OCDD were reported at an EMPC in the trip blank. OCDD has been qualified with a 'UJ' validation flag due to positive detection in the method blank and possible interference in the sample. No further qualification is warranted. 2,3,7,8-TCDF in MBDS-R19-D01, MBDS-R20-F01, MBDS-R20-O01, MBDS-R14-O01, and MBDS-R14-A01 has been qualified with a 'U' validation flag due to positive detections less than five times the trip blank value. 2,3,7,8-TCDF in MBDS-R19-D02 and MBDS-R14-F01 were reported at an EMPC result and have been qualified with a 'UJ' validation flag as the reported concentrations were less than five times the trip blank value and due to interference in the sample. The remaining 2,3,7,8-TCDF results were either non-detect or had concentrations greater than five times the trip blank value and no qualification is warranted.

7. Matrix Spike/Matrix Spike Duplicate (MS/MSD)

The laboratory did not provide acceptance limits for the MS/MSD analysis. In the professional judgment of the validator, the acceptance limit of 50-150% for MS/MSD recovery and a 35% RPD for soil samples and has been used for validation purposes.

The laboratory indicated that the MS recoveries for 1,2,3,7,8-PeCDF (139%), 2,3,4,7,8-PeCDF (131%), and 1,2,3,6,7,8-HxCDF (136%) and the MSD recovery for 1,2,3,7,8-PeCDF (133%) were outside of the acceptance criteria. However, they were within the validator applied acceptance criteria of 50-150% and no action was taken. The remaining MS/MSD recoveries and all precision criteria were within the 50-150% recovery and 35% RPD criteria for soil samples.

8. Laboratory Control Sample (LCS)

No action was taken as all LCS recoveries were within the acceptance criteria.

9. Internal Standards (IS) Performance

No action was taken as all internal standards (IS) were within the 40-135% acceptance criteria, per USEPA SW-846 Method 8290.

10. Target Compound Identification and Quantitation

In MBDS-R19-D01, total TCDD, total HxCDF, 1,2,3,4,6,7,8-HpCDF, 1,2,3,4,6,7,8-HpCDD, total HpCDD, and OCDF were reported below the quantitation limit. They have been qualified with a 'J' validation flag as the reported results were estimates with an undetermined bias.

In MBDS-R19-D02, 1,2,3,4,6,7,8-HpCDF, 1,2,3,4,6,7,8-HpCDD, total HpCDD, and OCDF were reported below the quantitation limit. They have been qualified with a 'J' validation flag as the reported results were estimates with an undetermined bias. 2,3,7,8-TCDF and OCDD have been reported at an EMPC due to interference in the sample. 2,3,7,8-TCDF has been qualified with a 'UJ' validation flag due to detection in the trip blank and interference in the sample. OCDD has been qualified with a 'J+' validation flag as the reported result is likely overestimated.

In MBDS-R19-F01, 1,2,3,4,6,7,8-HpCDF and total HpCDD were reported below the quantitation limit. They have been qualified with a 'J' validation flag as the reported results were estimates with an undetermined bias. 1,2,3,4,6,7,8-HpCDD, OCDF, and OCDD have been reported at an EMPC due to interference in the sample. 1,2,3,4,6,7,8-HpCDD has been qualified with a 'UJ' validation flag due to detection in the method blank and interference in the sample. OCDF and OCDD have been qualified with a 'J+' validation flag as the reported results are likely overestimated.

In MBDS-R20-A01, total TCDF, total HxCDD, 1,2,3,4,6,7,8-HpCDF, 1,2,3,4,6,7,8-HpCDD, and total HpCDD were reported below the quantitation limit. They have been qualified with a 'J' validation flag as the reported results were estimates with an undetermined bias. OCDF has been reported at an EMPC due to interference in the sample and has been qualified with a 'J+' validation flag as the reported result is likely overestimated.

In MBDS-R20-A04, total HpCDD was reported below the quantitation limit. It has been qualified with a 'J' validation flag as the reported result is an estimated with an undetermined bias. 1,2,3,4,6,7,8-HpCDF and OCDF were reported at an EMPC due to interference in the sample and have been qualified with a 'J+' validation flag as the reported results are likely overestimated.

In MBDS-R20-A05, 2,3,7,8-TCDF and OCDD were reported at an EMPC due to interference in the sample. 2,3,7,8-TCDF has been qualified with a 'J+' validation flag as the reported result is likely overestimated. OCDD has been qualified with a 'UJ' validation flag due to detection in the method blank and interference in the sample.

In MBDS-R20-F01, total PeCDF, total PeCDD, 1,2,3,4,7,8-HxCDF, total HxCDF, 1,2,3,4,7,8-HxCDD, total HxCDD, total HpCDD, OCDF, and OCDD exhibited positive detections below the quantitation limit. They have been qualified with a 'J' validation flag as the reported results were estimates with an undetermined bias. 2,3,4,7,8-PeCDF, 1,2,3,6,7,8-HxCDD, 1,2,3,7,8,9-HxCDD, and 1,2,3,4,6,7,8-HpCDF OCDD have been reported at an EMPC due to interference in the sample. They have been qualified with a 'J+' validation flag as the reported results are likely overestimated.

In MBDS-R20-O01, total TCDF, total PeCDF, 1,2,3,4,7,8-HxCDF, total HxCDF, total HxCDD, total HpCDD, and OCDD exhibited positive detections below the quantitation limit. They have been qualified with a 'J' validation flag as the reported results were estimates with an undetermined bias. 1,2,3,4,6,7,8-HpCDF and OCDF were reported at an EMPC due to interferences in the sample. They have been qualified with a 'J+' validation flag as the reported results are likely overestimated.

In MBDS-R14-O01, total TCDD, 2,3,4,7,8-PeCDF, total PeCDF, total PeCDD, 1,2,3,4,7,8-HxCDF, 1,2,3,6,7,8-HxCDF, total HxCDF, 1,2,3,6,7,8-HxCDD, total HxCDD, 1,2,3,4,6,7,8-HpCDF, total HpCDF, and OCDF exhibited positive detections below the quantitation limit. They have been qualified with a 'J' validation flag as the reported results were estimates with an undetermined bias. 2,3,4,6,7,8-HxCDF, 1,2,3,4,7,8-HxCDD, and 1,2,3,7,8,9-HxCDD were reported at an EMPC due to interferences in the sample. They have been qualified with a 'J+' validation flag as the reported results are likely overestimated.

In MBDS-R14-A01, total TCDF, total TCDD, total PeCDF, total HpCDD, and OCDD exhibited positive detections below the quantitation limit. They have been qualified with a 'J' validation flag as the reported results were estimates with an undetermined bias. 2,3,4,7,8-PeCDF, 1,2,3,6,7,8-HxCDD, 1,2,3,7,8,9-HxCDD, 1,2,3,4,6,7,8-HpCDF, and OCDF were reported at an EMPC due to interferences in the sample. They have been qualified with a 'J+' validation flag as the reported results are likely overestimated.

In MBDS-R14-F01, 1,2,3,4,6,7,8-HpCDF, total HpCDD, OCDF, and OCDD exhibited positive detections below the quantitation limit. They have been qualified with a 'J' validation flag as the reported results were estimates with an undetermined bias. 2,3,7,8-TCDF and 1,2,3,4,7,8-HxCDD were reported at an EMPC due to interferences in the sample. 2,3,7,8-TCDF has been qualified with a 'UJ' validation flag due to detection in the trip blank and interference in the sample. 1,2,3,4,7,8-HxCDD has been qualified with a 'J+' validation flag as the reported result is likely overestimated.

11. Chromatogram Quality

No comments relating to chromatogram quality.

5. SUMMARY OF DATA USABILITY

The data validation summary flag table shows that qualifiers were applied to the target analytes for SDG# 1073422.

DATA VALIDATION SUMMARY TABLE					
Compound	MBDS-R19-D01	MBDS-R19-D02	MBDS-R19-F01	MBDS-R20-A01	MBDS-R20-A04
2,3,7,8-TCDF	U	UJ			
Total TCDF				J	
2,3,7,8-TCDD					
Total TCDD	J				
1,2,3,7,8-PeCDF					
2,3,4,7,8-PeCDF					
Total PeCDF					
1,2,3,7,8-PeCDD					
Total PeCDD					
1,2,3,4,7,8-HxCDF					
1,2,3,6,7,8-HxCDF					
2,3,4,6,7,8-HxCDF					
1,2,3,7,8,9-HxCDF					
Total HxCDF	J				
1,2,3,4,7,8-HxCDD					
1,2,3,6,7,8-HxCDD					
1,2,3,7,8,9-HxCDD					
Total HxCDD				J	
1,2,3,4,6,7,8-HpCDF	J	J	J	J	J+
1,2,3,4,7,8,9-HpCDF					
Total HpCDF	U	U	U	U	
1,2,3,4,6,7,8-HpCDD	J	J	UJ	J	U
Total HpCDD	J	J	J	J	J
OCDF	J	J	J+	J+	J+
OCDD		J+	J+		

DATA VALIDATION SUMMARY TABLE					
Compound	MBDS-R20-A05 (Trip Blank)	MBDS-R20-F01	MBDS-R20-O01	MBDS-R14-O01	MBDS-R14-A01
2,3,7,8-TCDF	J+	U	U	U	U
Total TCDF			J		J
2,3,7,8-TCDD					
Total TCDD				J	J
1,2,3,7,8-PeCDF					
2,3,4,7,8-PeCDF		J+		J	J+
Total PeCDF		J	J	J	J
1,2,3,7,8-PeCDD					
Total PeCDD		J		J	
1,2,3,4,7,8-HxCDF		J	J	J	
1,2,3,6,7,8-HxCDF				J	
2,3,4,6,7,8-HxCDF				J+	
1,2,3,7,8,9-HxCDF					
Total HxCDF		J	J	J	
1,2,3,4,7,8-HxCDD		J		J+	
1,2,3,6,7,8-HxCDD		J+		J	J+
1,2,3,7,8,9-HxCDD		J+		J+	J+
Total HxCDD		J	J	J	
1,2,3,4,6,7,8-HpCDF		J+	J+	J	J+
1,2,3,4,7,8,9-HpCDF					
Total HpCDF		U		J	
1,2,3,4,6,7,8-HpCDD		U	U		U
Total HpCDD		J	J		J
OCDF		J	J+	J	J+
OCDD	UJ	J	J		J

DATA VALIDATION SUMMARY TABLE	
Compound	MBDS-R14-F01
2,3,7,8-TCDF	UJ
Total TCDF	
2,3,7,8-TCDD	
Total TCDD	
1,2,3,7,8-PeCDF	
2,3,4,7,8-PeCDF	
Total PeCDF	
1,2,3,7,8-PeCDD	
Total PeCDD	
1,2,3,4,7,8-HxCDF	
1,2,3,6,7,8-HxCDF	
2,3,4,6,7,8-HxCDF	
1,2,3,7,8,9-HxCDF	
Total HxCDF	
1,2,3,4,7,8-HxCDD	J+
1,2,3,6,7,8-HxCDD	
1,2,3,7,8,9-HxCDD	
Total HxCDD	
1,2,3,4,6,7,8-HpCDF	J
1,2,3,4,7,8,9-HpCDF	
Total HpCDF	U
1,2,3,4,6,7,8-HpCDD	U
Total HpCDD	J
OCDF	J
OCDD	J

Data Validation Summary Table Qualifier Codes

U = Result is a non-detect.

UJ = Result is a non-detect, but is estimated due to QC issues.

J = Result was detected, but is an estimate with an undetermined bias due to QC issues.

J+ = Result was detected, but is likely overestimated due to QC issues.

J- = Result was detected, but is likely underestimated due to QC issues.

R = Result is rejected and is highly questionable for use as a quantitative value due to significant QC issues.

6. REFERENCES

Contract Laboratory Program National Functional Guidelines for Organic Data Review, EPA 540/R-99/008, October 1999, U.S. Environmental Protection Agency, Cincinnati, Ohio.

USEPA Analytical Operations / Data Quality Center, *National Functional Guidelines for Chlorinated Dioxin / Furan Data Review*, EPA 540-R-02-003, August 2002.

USEPA, *Methods for the Analysis of Wastes, High Resolution Gas Chromatography / Mass Spectrometry*, SW-846, July 2002.

USEPA Test Methods for Evaluating Solid Waste Physical/Chemical Methods, Doc. No. SW-846, 3rd Ed., Method 8290, Polychlorinated Dibenzodioxins (PCDDs) and Polychlorinated Dibenzofurans (PCDFs) by High Resolution Gas Chromatography/High Resolution Mass Spectrometry (HRGC/HRMS), Revision 0, September 1994.

9. ATTACHMENTS

The following items are included as an attachment to this L&V report:

- A. Qualified reported results (Form I)

Attachment A
Qualified Reported Results



Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612-607-6444

Method 8290 Sample Analysis Results

Client - Montana Dept. Of Env. Quality

Client's Sample ID	MBDS-R19-D01	Matrix	Solid
Lab Sample ID	1073422001	Dilution	NA
Filename	U90604A_08	Collected	05/13/2008
Injected By	SMT	Received	05/16/2008
Total Amount Extracted	14.0 g	Extracted	06/02/2008
% Moisture	24.6	Analyzed	06/04/2008 13:38
Dry Weight Extracted	10.5 g		
ICAL ID	U80521		
CCal Filename(s)	U80604A_01 & U80604A_17		
Method Blank ID	BLANK-16522		

Native Isomers	Conc ng/Kg	EMPC ng/Kg	RL ng/Kg	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	0.32	—	0.23	2,3,7,8-TCDF-13C	2.00	96
Total TCDF	1.40	—	0.23	2,3,7,8-TCDD-13C	2.00	79
2,3,7,8-TCDD	ND	—	0.40	1,2,3,7,8-PeCDF-13C	2.00	108
Total TCDD	0.78	—	0.40	2,3,4,7,8-PeCDF-13C	2.00	113
1,2,3,7,8-PeCDF	ND	—	0.26	1,2,3,7,8-PeCDD-13C	2.00	108
2,3,4,7,8-PeCDF	ND	—	0.30	1,2,3,4,7,8-HxCDF-13C	2.00	93
Total PeCDF	ND	—	0.28	1,2,3,6,7,8-HxCDF-13C	2.00	93
1,2,3,7,8-PeCDD	ND	—	0.66	2,3,4,6,7,8-HxCDF-13C	2.00	92
Total PeCDD	ND	—	0.66	1,2,3,7,8,9-HxCDF-13C	2.00	90
1,2,3,4,7,8-HxCDF	ND	—	0.24	1,2,3,4,7,8-HxCDD-13C	2.00	83
1,2,3,6,7,8-HxCDF	ND	—	0.21	1,2,3,6,7,8-HxCDD-13C	2.00	88
2,3,4,6,7,8-HxCDF	ND	—	0.18	1,2,3,4,6,7,8-HpCDF-13C	2.00	79
1,2,3,7,8,9-HxCDF	ND	—	0.29	1,2,3,4,7,8,9-HpCDF-13C	2.00	71
Total HxCDF	0.38	—	0.23	1,2,3,4,6,7,8-HpCDD-13C	2.00	82
1,2,3,4,7,8-HxCDD	ND	—	0.34	OCDD-13C	4.00	77
1,2,3,6,7,8-HxCDD	ND	—	0.38	1,2,3,4-TCDD-13C	2.00	NA
1,2,3,7,8,9-HxCDD	ND	—	0.27	1,2,3,7,8,9-HxCDD-13C	2.00	NA
Total HxCDD	ND	—	0.33	2,3,7,8-TCDD-37Cl4	0.20	83
1,2,3,4,6,7,8-HpCDF	1.00	—	0.84	Total 2,3,7,8-TCDD		
1,2,3,4,7,8,9-HpCDF	ND	—	0.60	Equivalence: 0.083 ng/Kg		
Total HpCDF	1.00	—	0.72	(Using ITE Factors)		
1,2,3,4,6,7,8-HpCDD	2.20	—	0.70			
Total HpCDD	4.10	—	0.70			
OCDF	2.00	—	0.94			
OCDD	17.00	—	1.50			

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
EMPC = Estimated Maximum Possible Concentration
RL = Reporting Limit.

ND = Not Detected
NA = Not Applicable
NC = Not Calculated

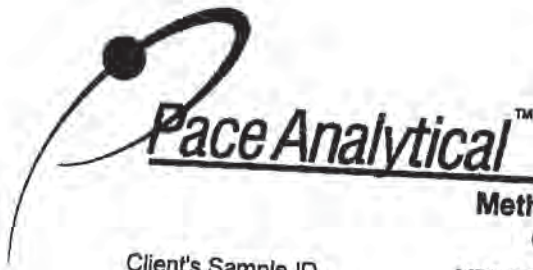
Results reported on a dry weight basis and are valid to no more than 2 significant figures.
J = Value below calibration range
B = Less than 10x higher than method blank level

AS
6/12/08

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc.
7 of 22

Report No....1073422_8290



Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612-607-6444

Method 8290 Sample Analysis Results

Client - Montana Dept. Of Env. Quality

Client's Sample ID	MBDS-R19-D02	Matrix	Solid
Lab Sample ID	1073422002	Dilution	NA
Filename	U80604A_09	Collected	05/14/2008
Injected By	SMT	Received	05/16/2008
Total Amount Extracted	12.8 g	Extracted	06/02/2008
% Moisture	20.7	Analyzed	06/04/2008 14:24
Dry Weight Extracted	10.1 g		
ICAL ID	U80521		
CCal Filename(s)	U80604A_01& U80604A_17		
Method Blank ID	BLANK-16522		

Native Isomers	Conc ng/Kg	EMPC ng/Kg	RL ng/Kg	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	—	0.24	0.20 +UJ	2,3,7,8-TCDF-13C	2.00	101
Total TCDF	ND	—	0.20	2,3,7,8-TCDD-13C	2.00	86
2,3,7,8-TCDD	ND	—	0.30	1,2,3,7,8-PeCDF-13C	2.00	112
Total TCDD	ND	—	0.30	2,3,4,7,8-PeCDF-13C	2.00	116
1,2,3,7,8-PeCDF	ND	—	0.37	1,2,3,7,8-PeCDD-13C	2.00	110
2,3,4,7,8-PeCDF	ND	—	0.33	1,2,3,4,7,8-HxCDF-13C	2.00	91
Total PeCDF	ND	—	0.35	1,2,3,6,7,8-HxCDF-13C	2.00	94
1,2,3,7,8-PeCDD	ND	—	1.10	2,3,4,6,7,8-HxCDF-13C	2.00	94
Total PeCDD	ND	—	1.10	1,2,3,7,8,9-HxCDF-13C	2.00	97
1,2,3,4,7,8-HxCDF	ND	—	0.23	1,2,3,4,7,8-HxCDD-13C	2.00	88
1,2,3,6,7,8-HxCDF	ND	—	0.17	1,2,3,6,7,8-HxCDD-13C	2.00	91
2,3,4,6,7,8-HxCDF	ND	—	0.15	1,2,3,4,6,7,8-HpCDF-13C	2.00	80
1,2,3,7,8,9-HxCDF	ND	—	0.20	1,2,3,4,7,8,9-HpCDF-13C	2.00	75
Total HxCDF	ND	—	0.19	1,2,3,4,6,7,8-HpCDD-13C	2.00	87
1,2,3,4,7,8-HxCDD	ND	—	0.44	OCDD-13C	4.00	84
1,2,3,6,7,8-HxCDD	ND	—	0.35	1,2,3,4-TCDD-13C	2.00	NA
1,2,3,7,8,9-HxCDD	ND	—	0.33	1,2,3,7,8,9-HxCDD-13C	2.00	NA
Total HxCDD	ND	—	0.37	2,3,7,8-TCDD-37Cl4	0.20	88
1,2,3,4,6,7,8-HpCDF	0.73	—	0.42 +J			
1,2,3,4,7,8,9-HpCDF	ND	—	0.45			
Total HpCDF	0.73	—	0.43 +UJ	Total 2,3,7,8-TCDD		
				Equivalence: 0.023 ng/Kg		
				(Using ITE Factors)		
1,2,3,4,6,7,8-HpCDD	1.50	—	0.66 +J			
Total HpCDD	2.60	—	0.66 +J			
OCDF	0.93	—	0.63 +J			
OCDD	—	7.50	0.92 +J+			

AS
6/12/08

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
EMPC = Estimated Maximum Possible Concentration
RL = Reporting Limit.
ND = Not Detected
NA = Not Applicable
NC = Not Calculated

Results reported on a dry weight basis and are valid to no more than 2 significant figures.
J = Value below calibration range
B = Less than 10x higher than method blank level
I = Interference present

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc.
8 of 22

Report No.....1073422_8290



Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612-607-6444

Method 8290 Sample Analysis Results

Client - Montana Dept. Of Env. Quality

Client's Sample ID	MBDS-R19-F01	Matrix	Solid
Lab Sample ID	1073422003	Dilution	NA
Filename	U80604A_10	Collected	05/14/2008
Injected By	SMT	Received	05/16/2008
Total Amount Extracted	12.8 g	Extracted	06/02/2008
% Moisture	20.8	Analyzed	06/04/2008 15:10
Dry Weight Extracted	10.2 g		
ICAL ID	U80521		
CCal Filename(s)	U80604A_01 & U80604A_17		
Method Blank ID	BLANK-16522		

Native Isomers	Conc ng/Kg	EMPC ng/Kg	RL ng/Kg	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	ND	—	0.32	2,3,7,8-TCDF-13C	2.00	97
Total TCDF	ND	—	0.32	2,3,7,8-TCDD-13C	2.00	85
2,3,7,8-TCDD	ND	—	0.47	1,2,3,7,8-PeCDF-13C	2.00	107
Total TCDD	ND	—	0.47	2,3,4,7,8-PeCDF-13C	2.00	111
1,2,3,7,8-PeCDF	ND	—	0.55	1,2,3,7,8-PeCDD-13C	2.00	105
2,3,4,7,8-PeCDF	ND	—	0.49	1,2,3,4,7,8-HxCDF-13C	2.00	94
Total PeCDF	ND	—	0.52	1,2,3,6,7,8-HxCDF-13C	2.00	92
1,2,3,7,8-PeCDD	ND	—	0.95	2,3,4,6,7,8-HxCDF-13C	2.00	95
Total PeCDD	ND	—	0.95	1,2,3,7,8,9-HxCDF-13C	2.00	100
1,2,3,4,7,8-HxCDF	ND	—	0.43	1,2,3,4,7,8-HxCDD-13C	2.00	84
1,2,3,6,7,8-HxCDF	ND	—	0.44	1,2,3,6,7,8-HxCDD-13C	2.00	92
2,3,4,6,7,8-HxCDF	ND	—	0.32	1,2,3,4,6,7,8-HpCDF-13C	2.00	82
1,2,3,7,8,9-HxCDF	ND	—	0.36	1,2,3,4,7,8,9-HpCDF-13C	2.00	76
Total HxCDF	ND	—	0.39	1,2,3,4,6,7,8-HpCDD-13C	2.00	89
1,2,3,4,7,8-HxCDD	ND	—	0.61	OCDD-13C	4.00	87
1,2,3,6,7,8-HxCDD	ND	—	0.53	1,2,3,4-TCDD-13C	2.00	NA
1,2,3,7,8,9-HxCDD	ND	—	0.60	1,2,3,7,8,9-HxCDD-13C	2.00	NA
Total HxCDD	ND	—	0.58	2,3,7,8-TCDD-37Cl4	0.20	94
1,2,3,4,6,7,8-HpCDF	0.66	—	0.50 + J	Total 2,3,7,8-TCDD Equivalence: 0.0066 ng/Kg (Using ITE Factors)		
1,2,3,4,7,8,9-HpCDF	ND	—	0.70			
Total HpCDF	0.66	—	0.60 B+U			
1,2,3,4,6,7,8-HpCDD	—	1.30	0.58 + U J			
Total HpCDD	1.80	—	0.58 J			
OCDF	—	0.78	0.73 + J +			
OCDD	—	11.00	0.57 + J +			

H/S
6/12/08

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
EMPC = Estimated Maximum Possible Concentration
RL = Reporting Limit
ND = Not Detected
NA = Not Applicable
NC = Not Calculated
Results reported on a dry weight basis and are valid to no more than 2 significant figures.
J = Value below calibration range
B = Less than 10x higher than method blank level
I = Interference present

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc.
9 of 22

Report No.....1073422_8290



Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612-607-8444

Method 8290 Sample Analysis Results

Client - Montana Dept. Of Env. Quality

Client's Sample ID	MBDS-R20-A01	Matrix	Solid
Lab Sample ID	1073422004	Dilution	NA
Filename	U80604A_11	Collected	05/14/2008
Injected By	SMT	Received	05/16/2008
Total Amount Extracted	13.3 g	Extracted	06/02/2008
% Moisture	21.3	Analyzed	06/04/2008 15:57
Dry Weight Extracted	10.5 g		
ICAL ID	U80521		
CCal Filename(s)	U80604A_01 & U80604A_17		
Method Blank ID	BLANK-16522		

Native Isomers	Conc ng/Kg	EMPC ng/Kg	RL ng/Kg	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	ND	—	0.37	2,3,7,8-TCDF-13C	2.00	98
Total TCDF	0.38	—	0.37 + J	2,3,7,8-TCDD-13C	2.00	84
2,3,7,8-TCDD	ND	—	0.56	1,2,3,7,8-PeCDF-13C	2.00	103
Total TCDD	ND	—	0.56	2,3,4,7,8-PeCDF-13C	2.00	106
1,2,3,7,8-PeCDF	ND	—	0.67	1,2,3,7,8-PeCDD-13C	2.00	103
2,3,4,7,8-PeCDF	ND	—	0.55	1,2,3,4,7,8-HxCDF-13C	2.00	84
Total PeCDF	ND	—	0.61	1,2,3,6,7,8-HxCDF-13C	2.00	87
1,2,3,7,8-PeCDD	ND	—	1.00	2,3,4,6,7,8-HxCDF-13C	2.00	83
Total PeCDD	ND	—	1.00	1,2,3,7,8,9-HxCDF-13C	2.00	90
1,2,3,4,7,8-HxCDF	ND	—	0.25	1,2,3,4,7,8-HxCDD-13C	2.00	79
1,2,3,6,7,8-HxCDF	ND	—	0.36	1,2,3,6,7,8-HxCDD-13C	2.00	83
2,3,4,6,7,8-HxCDF	ND	—	0.25	1,2,3,4,6,7,8-HpCDF-13C	2.00	74
1,2,3,7,8,9-HxCDF	ND	—	0.31	1,2,3,4,7,8,9-HpCDF-13C	2.00	69
Total HxCDF	ND	—	0.29	1,2,3,4,6,7,8-HpCDD-13C	2.00	79
1,2,3,4,7,8-HxCDD	ND	—	0.51	OCDD-13C	4.00	76
1,2,3,6,7,8-HxCDD	ND	—	0.38	1,2,3,4-TCDD-13C	2.00	NA
1,2,3,7,8,9-HxCDD	ND	—	0.30	1,2,3,7,8,9-HxCDD-13C	2.00	NA
Total HxCDD	0.42	—	0.40 + J	2,3,7,8-TCDD-37Cl4	0.20	91
1,2,3,4,6,7,8-HpCDF	0.73	—	0.31 + J			
1,2,3,4,7,8,9-HpCDF	ND	—	0.45 + J	Total 2,3,7,8-TCDD		
Total HpCDF	0.73	—	0.38 + J	Equivalence: 0.038 ng/Kg		
				(Using ITE Factors)		
1,2,3,4,6,7,8-HpCDD	2.00	—	0.38 + J			
Total HpCDD	2.00	—	0.38 + J			
OCDF	—	0.52	0.42 + J			
OCDD	11.00	—	0.56 + J			

HS
6/12/08

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
EMPC = Estimated Maximum Possible Concentration
RL = Reporting Limit.

ND = Not Detected
NA = Not Applicable
NC = Not Calculated

Results reported on a dry weight basis and are valid to no more than 2 significant figures.
J = Value below calibration range
B = Less than 10x higher than method blank level
I = Interference present

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc.
10 of 22

Report No.....1073422_8290



Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612-607-6444

Method 8290 Sample Analysis Results

Client - Montana Dept. Of Env. Quality

Client's Sample ID	MBDS-R20-A04				
Lab Sample ID	1073422005				
Filename	U80604A_12				
Injected By	SMT				
Total Amount Extracted	13.1 g			Matrix	Solid
% Moisture	21.7			Dilution	NA
Dry Weight Extracted	10.3 g			Collected	05/14/2008
ICAL ID	U80521			Received	05/16/2008
CCal Filename(s)	U80604A_01 & U80604A_17			Extracted	06/02/2008
Method Blank ID	BLANK-16522			Analyzed	06/04/2008 16:43

Native Isomers	Conc ng/Kg	EMPC ng/Kg	RL ng/Kg	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	ND	---	0.39	2,3,7,8-TCDF-13C	2.00	100
Total TCDF	ND	---	0.39	2,3,7,8-TCDD-13C	2.00	84
2,3,7,8-TCDD	ND	---	0.79	1,2,3,7,8-PeCDF-13C	2.00	108
Total TCDD	ND	---	0.79	2,3,4,7,8-PeCDF-13C	2.00	109
1,2,3,7,8-PeCDF	ND	---	0.47	1,2,3,7,8-PeCDD-13C	2.00	107
2,3,4,7,8-PeCDF	ND	---	0.45	1,2,3,4,7,8-HxCDF-13C	2.00	87
Total PeCDF	ND	---	0.46	1,2,3,6,7,8-HxCDF-13C	2.00	92
1,2,3,7,8-PeCDD	ND	---	1.10	2,3,4,6,7,8-HxCDF-13C	2.00	89
Total PeCDD	ND	---	1.10	1,2,3,7,8,9-HxCDF-13C	2.00	91
1,2,3,4,7,8-HxCDF	ND	---	0.24	1,2,3,4,7,8-HxCDD-13C	2.00	81
1,2,3,6,7,8-HxCDF	ND	---	0.24	1,2,3,6,7,8-HxCDD-13C	2.00	81
2,3,4,6,7,8-HxCDF	ND	---	0.25	1,2,3,4,6,7,8-HpCDF-13C	2.00	74
1,2,3,7,8,9-HxCDF	ND	---	0.19	1,2,3,4,6,7,8-HpCDD-13C	2.00	85
Total HxCDF	ND	---	0.23	OCDD-13C	4.00	84
1,2,3,4,7,8-HxCDD	ND	---	0.45	1,2,3,4-TCDD-13C	2.00	NA
1,2,3,6,7,8-HxCDD	ND	---	0.42	1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,7,8,9-HxCDD	ND	---	0.37	2,3,7,8-TCDD-37Cl4	0.20	88
Total HxCDD	ND	---	0.41			
1,2,3,4,6,7,8-HpCDF	---	0.55	0.43 + J+	Total 2,3,7,8-TCDD		
1,2,3,4,7,8,9-HpCDF	ND	---	0.53	Equivalence: 0.024 ng/Kg		
Total HpCDF	ND	---	0.48	(Using ITE Factors)		
1,2,3,4,6,7,8-HpCDD	1.3	---	0.55 J+			
Total HpCDD	3.0	---	0.55 J+			
OCDF	---	0.86	0.61 J+			
OCDD	11.0	---	0.85			

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
EMPC = Estimated Maximum Possible Concentration
RL = Reporting Limit.

ND = Not Detected
NA = Not Applicable
NC = Not Calculated

Results reported on a dry weight basis and are valid to no more than 2 significant figures.
J = Value below calibration range
I = Interference present

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc.
11 of 22

Report No.....1073422_8290



Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612-607-6444

Method 8290 Sample Analysis Results

Client - Montana Dept. Of Env. Quality

Client's Sample ID	MBDS-R20-A05	Matrix	Solid
Lab Sample ID	1073422006	Dilution	NA
Filename	U80604A_13	Collected	05/14/2008
Injected By	SMT	Received	05/16/2008
Total Amount Extracted	10.0 g	Extracted	06/02/2008
% Moisture	0.2	Analyzed	06/04/2008 17:30
Dry Weight Extracted	10.0 g		
ICAL ID	U80521		
CCal Filename(s)	U80604A_01 & U80604A_17		
Method Blank ID	BLANK-16522		

Native Isomers	Conc ng/Kg	EMPC ng/Kg	RL ng/Kg	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	ND	0.76	0.43 + I	2,3,7,8-TCDF-13C	2.00	78
Total TCDF	ND	—	0.43	2,3,7,8-TCDD-13C	2.00	72
2,3,7,8-TCDD	ND	—	0.55	1,2,3,7,8-PeCDF-13C	2.00	86
Total TCDD	ND	—	0.55	2,3,4,7,8-PeCDF-13C	2.00	86
1,2,3,7,8-PeCDF	ND	—	0.49	1,2,3,7,8-PeCDD-13C	2.00	86
2,3,4,7,8-PeCDF	ND	—	0.60	1,2,3,4,7,8-HxCDF-13C	2.00	67
Total PeCDF	ND	—	0.54	1,2,3,6,7,8-HxCDF-13C	2.00	72
1,2,3,7,8-PeCDD	ND	—	0.86	2,3,4,6,7,8-HxCDF-13C	2.00	69
Total PeCDD	ND	—	0.86	1,2,3,7,8,9-HxCDF-13C	2.00	69
1,2,3,4,7,8-HxCDF	ND	—	0.32	1,2,3,4,7,8-HxCDD-13C	2.00	67
1,2,3,6,7,8-HxCDF	ND	—	0.21	1,2,3,6,7,8-HxCDD-13C	2.00	55
2,3,4,6,7,8-HxCDF	ND	—	0.29	1,2,3,4,6,7,8-HpCDF-13C	2.00	69
1,2,3,7,8,9-HxCDF	ND	—	0.34	OCDD-13C	4.00	65
Total HxCDF	ND	—	0.29	1,2,3,4-TCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	ND	—	0.61	1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,6,7,8-HxCDD	ND	—	0.55	2,3,7,8-TCDD-37Cl4	0.20	101
1,2,3,7,8,9-HxCDD	ND	—	0.50			
Total HxCDD	ND	—	0.55			
1,2,3,4,6,7,8-HpCDF	ND	—	0.40	Total 2,3,7,8-TCDD		
1,2,3,4,7,8,9-HpCDF	ND	—	0.60	Equivalence: 0.00 ng/Kg		
Total HpCDF	ND	—	0.50	(Using ITE Factors)		
1,2,3,4,6,7,8-HpCDD	ND	—	0.54			
Total HpCDD	ND	—	0.54			
OCDF	ND	—	0.74			
OCDD	—	1.00	0.61 + UJ			

AS
6/12/08

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
EMPC = Estimated Maximum Possible Concentration
RL = Reporting Limit
Results reported on a dry weight basis and are valid to no more than 2 significant figures.
I = Interference present
ND = Not Detected
NA = Not Applicable
NC = Not Calculated

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc.
12 of 22

Report No.....1073422_8290



Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612-607-6444

Method 8290 Sample Analysis Results

Client - Montana Dept. Of Env. Quality

Client's Sample ID	MBDS-R20-F01	Matrix	Solid
Lab Sample ID	1073422007	Dilution	NA
Filename	P80604B_04	Collected	05/14/2008
Injected By	BAL	Received	05/16/2008
Total Amount Extracted	13.8 g	Extracted	06/02/2008
% Moisture	26.4	Analyzed	06/04/2008 22:25
Dry Weight Extracted	10.2 g		
ICAL ID	P80601		
CCal Filename(s)	P80604B_01 & P80604B_16		
Method Blank ID	BLANK-16522		

Native Isomers	Conc ng/Kg	EMPC ng/Kg	RL ng/Kg	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	0.310	—	0.091	2,3,7,8-TCDF-13C	2.00	93
Total TCDF	1.100	—	0.091	2,3,7,8-TCDD-13C	2.00	95
2,3,7,8-TCDD	ND	—	0.094	1,2,3,7,8-PeCDF-13C	2.00	95
Total TCDD	ND	—	0.094	2,3,4,7,8-PeCDF-13C	2.00	96
1,2,3,7,8-PeCDF	ND	—	0.090	1,2,3,7,8-PeCDD-13C	2.00	107
2,3,4,7,8-PeCDF	—	0.120	0.058	1,2,3,4,7,8-HxCDF-13C	2.00	82
Total PeCDF	0.270	—	0.074	1,2,3,6,7,8-HxCDF-13C	2.00	89
1,2,3,7,8-PeCDD	ND	—	0.078	1,2,3,7,8,9-HxCDF-13C	2.00	83
Total PeCDD	0.160	—	0.078	1,2,3,4,7,8-HxCDD-13C	2.00	81
1,2,3,4,7,8-HxCDF	0.130	—	0.078	1,2,3,6,7,8-HxCDD-13C	2.00	87
1,2,3,6,7,8-HxCDF	ND	—	0.078	1,2,3,4,6,7,8-HpCDF-13C	2.00	94
2,3,4,6,7,8-HxCDF	ND	—	0.076	1,2,3,4,7,8,9-HpCDF-13C	2.00	87
1,2,3,7,8,9-HxCDF	ND	—	0.078	1,2,3,4,6,7,8-HpCDD-13C	2.00	69
Total HxCDF	0.320	—	0.091	OCDD-13C	4.00	88
1,2,3,4,7,8-HxCDD	0.098	—	0.081	1,2,3,4-TCDD-13C	2.00	97 Y
1,2,3,6,7,8-HxCDD	—	0.120	0.071	1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,7,8,9-HxCDD	—	0.082	0.084	2,3,7,8-TCDD-37Cl4	0.20	NA
Total HxCDD	0.670	—	0.079			99
1,2,3,4,6,7,8-HpCDF	—	0.570	0.078			
1,2,3,4,7,8,9-HpCDF	ND	—	0.094	Total 2,3,7,8-TCDD		
Total HpCDF	0.370	—	0.130	Equivalence: 0.078 ng/Kg		
1,2,3,4,6,7,8-HpCDD	1.300	—	0.110	(Using ITE Factors)		
Total HpCDD	2.700	—	0.140			
OCDF	0.920	—	0.140			
OCDD	9.700	—	0.100			

AB
6/16/08

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
EMPC = Estimated Maximum Possible Concentration
RL = Reporting Limit.

ND = Not Detected
NA = Not Applicable
NC = Not Calculated

Results reported on a dry weight basis and are valid to no more than 2 significant figures.

J = Value below calibration range
B = Less than 10x higher than method blank level
I = Interference present
Y = Calculated using average of daily RFs

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc.
13 of 22

Report No.....1073422_8290


Pace Analytical™

 Pace Analytical Services, Inc.
 1700 Elm Street - Suite 200
 Minneapolis, MN 55414

 Tel: 612-607-1700
 Fax: 612-607-6444

Method 8290 Sample Analysis Results

Client - Montana Dept. Of Env. Quality

Client's Sample ID	MBDS-R20-O01		
Lab Sample ID	1073422008		
Filename	P80604B_05		
Injected By	BAL		
Total Amount Extracted	11.7 g	Matrix	Solid
% Moisture	10.1	Dilution	NA
Dry Weight Extracted	10.5 g	Collected	05/14/2008
ICAL ID	P80601	Received	05/16/2008
CCal Filename(s)	P80604B_01 & P80604B_16	Extracted	06/02/2008
Method Blank ID	BLANK-16522	Analyzed	06/04/2008 23:13

Native Isomers	Conc ng/Kg	EMPC ng/Kg	RL ng/Kg	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	0.280	—	0.097	2,3,7,8-TCDF-13C	2.00	87
Total TCDF	0.280	—	0.097	2,3,7,8-TCDD-13C	2.00	93
				1,2,3,7,8-PeCDF-13C	2.00	94
2,3,7,8-TCDD	ND	—	0.091	2,3,4,7,8-PeCDF-13C	2.00	94
Total TCDD	ND	—	0.091	1,2,3,7,8-PeCDD-13C	2.00	110
				1,2,3,4,7,8-HxCDF-13C	2.00	76
1,2,3,7,8-PeCDF	ND	—	0.110	1,2,3,6,7,8-HxCDF-13C	2.00	86
2,3,4,7,8-PeCDF	ND	—	0.084	2,3,4,6,7,8-HxCDF-13C	2.00	79
Total PeCDF	0.140	—	0.098	1,2,3,7,8,9-HxCDF-13C	2.00	75
				1,2,3,4,7,8-HxCDD-13C	2.00	84
1,2,3,7,8-PeCDD	ND	—	0.088	1,2,3,6,7,8-HxCDD-13C	2.00	95
Total PeCDD	ND	—	0.088	1,2,3,4,6,7,8-HpCDF-13C	2.00	89
				1,2,3,4,7,8,9-HpCDF-13C	2.00	63
1,2,3,4,7,8-HxCDF	0.081	—	0.080	1,2,3,4,6,7,8-HpCDD-13C	2.00	87
1,2,3,6,7,8-HxCDF	ND	—	0.065	OCDD-13C	4.00	97 Y
2,3,4,6,7,8-HxCDF	ND	—	0.083			
1,2,3,7,8,9-HxCDF	ND	—	0.092	1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	0.200	—	0.080	1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	ND	—	0.100	2,3,7,8-TCDD-37Cl4	0.20	98
1,2,3,6,7,8-HxCDD	ND	—	0.130			
1,2,3,7,8,9-HxCDD	ND	—	0.110			
Total HxCDD	0.460	—	0.110			
1,2,3,4,6,7,8-HpCDF	—	0.18	0.079	Total 2,3,7,8-TCDD		
1,2,3,4,7,8,9-HpCDF	ND	—	0.081	Equivalence: 0.049 ng/Kg		
Total HpCDF	ND	—	0.080	(Using ITE Factors)		
1,2,3,4,6,7,8-HpCDD	0.770	—	0.099			
Total HpCDD	1.800	—	0.099			
OCDF	—	0.60	0.120			
OCDD	5.100	—	0.110			

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
 EMPC = Estimated Maximum Possible Concentration
 RL = Reporting Limit.

ND = Not Detected
 NA = Not Applicable
 NC = Not Calculated

Results reported on a dry weight basis and are valid to no more than 2 significant figures.

J = Value below calibration range

B = Less than 10x higher than method blank level

I = Interference present

Y = Calculated using average of daily RFs

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
 without the written consent of Pace Analytical Services, Inc.

14 of 22

Report No. 1073422_8290



Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612-607-6444

Method 8290 Sample Analysis Results

Client - Montana Dept. Of Env. Quality

Client's Sample ID	MBDS-R14-O01		
Lab Sample ID	1073422009		
Filename	P80604B_06		
Injected By	BAL		
Total Amount Extracted	14.5 g	Matrix	Solid
% Moisture	29.5	Dilution	NA
Dry Weight Extracted	10.2 g	Collected	05/14/2008
ICAL ID	P80601	Received	05/16/2008
CCal Filename(s)	P80604B_01 & P80604B_16	Extracted	06/02/2008
Method Blank ID	BLANK-16522	Analyzed	06/05/2008 00:00

Native Isomers	Conc ng/Kg	EMPC ng/Kg	RL ng/Kg	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	0.28	—	0.110	2,3,7,8-TCDF-13C	2.00	96
Total TCDF	1.20	—	0.110	2,3,7,8-TCDD-13C	2.00	96
				1,2,3,7,8-PeCDF-13C	2.00	99
2,3,7,8-TCDD	ND	—	0.099	2,3,4,7,8-PeCDF-13C	2.00	102
Total TCDD	0.13	—	0.099	1,2,3,7,8-PeCDD-13C	2.00	112
				1,2,3,4,7,8-HxCDF-13C	2.00	86
1,2,3,7,8-PeCDF	ND	—	0.097	1,2,3,6,7,8-HxCDF-13C	2.00	85
2,3,4,7,8-PeCDF	0.16	—	0.100	2,3,4,6,7,8-HxCDF-13C	2.00	85
Total PeCDF	1.70	—	0.100	1,2,3,7,8,9-HxCDF-13C	2.00	86
				1,2,3,4,7,8-HxCDD-13C	2.00	91
1,2,3,7,8-PeCDD	ND	—	0.062	1,2,3,6,7,8-HxCDD-13C	2.00	93
Total PeCDD	0.26	—	0.062	1,2,3,4,6,7,8-HpCDF-13C	2.00	85
				1,2,3,4,7,8,9-HpCDF-13C	2.00	72
1,2,3,4,7,8-HxCDF	0.18	—	0.086	1,2,3,4,6,7,8-HpCDD-13C	2.00	89
1,2,3,6,7,8-HxCDF	0.14	—	0.085	OCDD-13C	4.00	97 Y
2,3,4,6,7,8-HxCDF	—	0.11	0.092			
1,2,3,7,8,9-HxCDF	ND	—	0.100	1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	1.20	—	0.091	1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	—	0.14	0.099	2,3,7,8-TCDD-37Cl4	0.20	98
1,2,3,6,7,8-HxCDD	0.27	—	0.100			
1,2,3,7,8,9-HxCDD	—	0.20	0.089			
Total HxCDD	2.50	—	0.097			
1,2,3,4,6,7,8-HpCDF	1.10	—	0.073	Total 2,3,7,8-TCDD		
1,2,3,4,7,8,9-HpCDF	ND	—	0.099	Equivalence: 0.27 ng/Kg		
Total HpCDF	2.00	—	0.086	(Using ITE Factors)		
1,2,3,4,6,7,8-HpCDD	5.00	—	0.089			
Total HpCDD	9.70	—	0.089			
OCDF	1.80	—	0.140			
OCDD	36.00	—	0.160			

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
EMPC = Estimated Maximum Possible Concentration
RL = Reporting Limit.

ND = Not Detected
NA = Not Applicable
NC = Not Calculated

Results reported on a dry weight basis and are valid to no more than 2 significant figures.

J = Value below calibration range

B = Less than 10x higher than method blank level

I = Interference present

Y = Calculated using average of daily RFs

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc.
15 of 22

Report No.....1073422_8290



Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612-607-6444

Method 8290 Sample Analysis Results

Client - Montana Dept. Of Env. Quality

Client's Sample ID	MBDS-R14-A01		
Lab Sample ID	1073422010		
Filename	P80604B_07		
Injected By	BAL		
Total Amount Extracted	12.3 g	Matrix	Solid
% Moisture	17.0	Dilution	NA
Dry Weight Extracted	10.2 g	Collected	05/14/2008
ICAL ID	P80601	Received	05/16/2008
CCal Filename(s)	P80604B_01 & P80604B_16	Extracted	06/02/2008
Method Blank ID	BLANK-16522	Analyzed	06/05/2008 00:47

Native Isomers	Conc ng/Kg	EMPC ng/Kg	RL ng/Kg	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	0.35	—	0.078	JU	2,3,7,8-TCDF-13C	86
Total TCDF	0.89	—	0.078	JJ	2,3,7,8-TCDD-13C	92
					1,2,3,7,8-PeCDF-13C	92
2,3,7,8-TCDD	ND	—	0.070		2,3,4,7,8-PeCDF-13C	91
Total TCDD	0.25	—	0.070	JJ	1,2,3,7,8-PeCDD-13C	107
					1,2,3,4,7,8-HxCDF-13C	77
1,2,3,7,8-PeCDF	ND	—	0.078		1,2,3,6,7,8-HxCDF-13C	84
2,3,4,7,8-PeCDF	—	0.093	0.064	JJ	2,3,4,6,7,8-HxCDF-13C	77
Total PeCDF	0.17	—	0.071	JJ	1,2,3,7,8,9-HxCDF-13C	73
					1,2,3,4,7,8-HxCDD-13C	87
1,2,3,7,8-PeCDD	ND	—	0.062		1,2,3,6,7,8-HxCDD-13C	92
Total PeCDD	ND	—	0.062		1,2,3,4,6,7,8-HpCDF-13C	86
					1,2,3,4,7,8,9-HpCDF-13C	60
1,2,3,4,7,8-HxCDF	ND	—	0.081		1,2,3,4,6,7,8-HpCDD-13C	84
1,2,3,6,7,8-HxCDF	ND	—	0.074		OCDD-13C	91 Y
2,3,4,6,7,8-HxCDF	ND	—	0.083			
1,2,3,7,8,9-HxCDF	ND	—	0.082		1,2,3,4-TCDD-13C	NA
Total HxCDF	ND	—	0.080		1,2,3,7,8,9-HxCDD-13C	NA
1,2,3,4,7,8-HxCDD	ND	—	0.052		2,3,7,8-TCDD-37Cl4	93
1,2,3,6,7,8-HxCDD	—	0.060	0.050	JJ+		
1,2,3,7,8,9-HxCDD	—	0.063	0.061	JJ+		
Total HxCDD	ND	—	0.054			
1,2,3,4,6,7,8-HpCDF	—	0.110	0.041	JJ+	Total 2,3,7,8-TCDD	
1,2,3,4,7,8,9-HpCDF	ND	—	0.092		Equivalence: 0.044 ng/Kg	
Total HpCDF	ND	—	0.066		(Using ITE Factors)	
1,2,3,4,6,7,8-HpCDD	0.59	—	0.086	JU		
Total HpCDD	1.20	—	0.086	JJ		
OCDF	—	0.330	0.170	JJ+		
OCDD	3.50	—	0.140	JJ		

AKS
6/12/08

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
EMPC = Estimated Maximum Possible Concentration
RL = Reporting Limit.

ND = Not Detected
NA = Not Applicable
NC = Not Calculated

Results reported on a dry weight basis and are valid to no more than 2 significant figures.
J = Value below calibration range
B = Less than 10x higher than method blank level
I = Interference present
Y = Calculated using average of daily RFs

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc.
16 of 22

Report No.....1073422_8290



Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612-607-6444

Method 8290 Sample Analysis Results

Client - Montana Dept. Of Env. Quality

Client's Sample ID	MBDS-R14-F01		
Lab Sample ID	1073422011		
Filename	P80604B_08		
Injected By	BAL		
Total Amount Extracted	11.9g	Matrix	Solid
% Moisture	11.6	Dilution	NA
Dry Weight Extracted	10.5 g	Collected	05/15/2008
ICAL ID	P80601	Received	05/16/2008
CCal Filename(s)	P80604B_01 & P80604B_16	Extracted	06/02/2008
Method Blank ID	BLANK-16522	Analyzed	06/05/2008 01:35

Native Isomers	Conc ng/Kg	EMPC ng/Kg	RL ng/Kg	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	—	0.190	0.089 + U	2,3,7,8-TCDF-13C	2.00	88
Total TCDF	ND	—	0.089	2,3,7,8-TCDD-13C	2.00	90
				1,2,3,7,8-PeCDF-13C	2.00	93
2,3,7,8-TCDD	ND	—	0.081	2,3,4,7,8-PeCDF-13C	2.00	94
Total TCDD	ND	—	0.081	1,2,3,7,8-PeCDD-13C	2.00	108
				1,2,3,4,7,8-HxCDF-13C	2.00	79
1,2,3,7,8-PeCDF	ND	—	0.100	1,2,3,6,7,8-HxCDF-13C	2.00	83
2,3,4,7,8-PeCDF	ND	—	0.090	2,3,4,6,7,8-HxCDF-13C	2.00	79
Total PeCDF	ND	—	0.097	1,2,3,7,8,9-HxCDF-13C	2.00	75
				1,2,3,4,7,8-HxCDD-13C	2.00	83
1,2,3,7,8-PeCDD	ND	—	0.079	1,2,3,6,7,8-HxCDD-13C	2.00	94
Total PeCDD	ND	—	0.079	1,2,3,4,6,7,8-HpCDF-13C	2.00	86
				1,2,3,4,7,8,9-HpCDF-13C	2.00	62
1,2,3,4,7,8-HxCDF	ND	—	0.084	1,2,3,4,6,7,8-HpCDD-13C	2.00	84
1,2,3,6,7,8-HxCDF	ND	—	0.079	OCDD-13C	4.00	93 Y
2,3,4,6,7,8-HxCDF	ND	—	0.063			
1,2,3,7,8,9-HxCDF	ND	—	0.086	1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	ND	—	0.078	1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	—	0.068	0.064 + J	+ 2,3,7,8-TCDD-37Cl4	0.20	95
1,2,3,6,7,8-HxCDD	ND	—	0.088			
1,2,3,7,8,9-HxCDD	ND	—	0.083			
Total HxCDD	ND	—	0.078			
1,2,3,4,6,7,8-HpCDF	0.23	—	0.090 + J	Total 2,3,7,8-TCDD		
1,2,3,4,7,8,9-HpCDF	ND	—	0.110	Equivalence: 0.018 ng/Kg		
Total HpCDF	0.23	—	0.100 BJL (Using ITE Factors)			
1,2,3,4,6,7,8-HpCDD	0.92	—	0.130 + U			
Total HpCDD	1.80	—	0.130 + J			
OCDF	1.10	—	0.200 + J			
OCDD	5.40	—	0.160 BJL			

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
EMPC = Estimated Maximum Possible Concentration
RL = Reporting Limit.

ND = Not Detected
NA = Not Applicable
NC = Not Calculated

Results reported on a dry weight basis and are valid to no more than 2 significant figures.

J = Value below calibration range

B = Less than 10x higher than method blank level

I = Interference present

Y = Calculated using average of daily RFs

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc.

17 of 22

Report No.1073422_8290

Montana Background Dioxin Study

1. **SDG Number:** 1074005
2. **Number of Samples:** (22)
3. **Sample Matrix:** (22) Soil
4. **Applicable Analytes:** PCDD/PCDF
5. **Reporting Tier:** Level 3
6. **Analysis Method** USEPA SW-846 Method 8290
7. **Laboratory:** Pace Analytical
8. **Validation Level:** III
9. **Validator Affiliation:** Portage Environmental, Inc.
10. **Project:** Montana Background Dioxin Study

Validator's Signature: *Amber Brindley*

Date: 07/24/08

Reviewed By:

Date: 08/04/08

1. INTRODUCTION

Twenty-two (22) soil samples were collected and analyzed for Dioxins/Furans by Pace Analytical using USEPA SW-846 Method 8290, *Polychlorinated Dibenzodioxins (PCDDs) and Polychlorinated Dibenzofurans (PCDFs) by High Resolution Gas Chromatography/High Resolution Mass Spectrometry (HRGC/HRMS)*. The data were validated to a Level III.

2. SAMPLE IDENTIFICATION

A sample cross-reference and holding time table is presented below.

Montana Background Dioxin Study SDG Number 1074005								
Field ID	Lab ID	Matrix	Sample Collection Date	Date Received	Date Extracted	Collection to Extraction Holding Time	Analysis Date	Extraction to Analysis Holding Time
MBDS-R12-O01	1074005001	Soil	05/24/08	05/28/08	06/09/08	16	06/14/08	5
MBDS-R12-F01	1074005002	Soil	05/24/08	05/28/08	06/09/08	16	06/14/08	5
MBDS-R12-F04	1074005003	Soil	05/24/08	05/28/08	06/09/08	16	06/14/08	5
MBDS-R12-F05 (Trip Blank)	1074005004	Soil	05/24/08	05/28/08	06/09/08	16	06/14/08	5
MBDS-R05-F01	1074005005	Soil	05/24/08	05/28/08	06/09/08	16	06/14/08	5
MBDS-R05-O01	1074005006	Soil	05/24/08	05/28/08	06/09/08	16	06/14/08	5
MBDS-R05-A01	1074005007	Soil	05/24/08	05/28/08	06/09/08	16	06/14/08	5
MBDS-R06-A01	1074005008	Soil	05/24/08	05/28/08	06/09/08	16	06/14/08	5
MBDS-R13-O01	1074005009	Soil	05/25/08	05/28/08	06/09/08	15	06/14/08	5
MBDS-R06-O01	1074005010	Soil	05/25/08	05/28/08	06/09/08	15	06/14/08	5
MBDS-R06-F01	1074005011	Soil	05/25/08	05/28/08	06/09/08	15	06/14/08	5
MBDS-R07-F01	1074005012	Soil	05/25/08	05/28/08	06/09/08	15	06/14/08	5
MBDS-R07-O01	1074005013	Soil	05/25/08	05/28/08	06/09/08	15	06/14/08	5
MBDS-R07-O04	1074005014	Soil	05/25/08	05/28/08	06/09/08	15	06/15/08	6
MBDS-R07-O05 (Trip Blank)	1074005015	Soil	05/25/08	05/28/08	06/09/08	15	06/15/08	6
MBDS-R07-A01	1074005016	Soil	05/25/08	05/28/08	06/09/08	15	06/15/08	6
MBDS-R13-F01	1074005017	Soil	05/25/08	05/28/08	06/09/08	15	06/15/08	6
MBDS-R13-A01	1074005018	Soil	05/25/08	05/28/08	06/09/08	15	06/15/08	6
MBDS-R18-A01	1074005019	Soil	05/26/08	05/28/08	06/09/08	14	06/15/08	6
MBDS-R18-F01	1074005020	Soil	05/26/08	05/28/08	06/09/08	14	06/15/08	6
MBDS-R18-O01	1074005021	Soil	05/26/08	05/28/08	06/06/08	11	06/12/08	6
MBDS-R12-A01	1074005022	Soil	05/26/08	05/28/08	06/06/08	11	06/15/08	9

A '**' denotes an exceeded holding time.

3. DATA LIMITATION OVERVIEW

The target compound analyses, dioxin/furan, for soil samples from Montana Background Dioxin Study showed compliance with the QC requirements set forth by USEPA SW-846 Method 8290. The data are valid and acceptable with the following exceptions:

MBDS-R12-O01:

- Total HpCDD has been qualified with a 'U' validation flag to denote the reported concentration in non-detect due to positive detection in the trip blank (see CTR comment#6).
- 1,2,3,4,7,8-HxCDF, 1,2,3,6,7,8-HxCDF, 1,2,3,7,8,9-HxCDF, total HxCDF, 1,2,3,6,7,8-HxCDD, total HxCDD, 1,2,3,4,7,8-HpCDF, total HpCDF, and OCDF have been qualified with a 'U' validation flag to denote the reported concentrations are non-detect due to positive detection in the method blank (see CTR comment #6).
- 2,3,4,6,7,8-HxCDF has been reported at an EMPC and has been qualified with a 'UJ' validation flag to denote the reported concentration is non-detect, and the sample quantitation limit is an estimate due to positive detection in the method blank and possible interference in the sample (see CTR comments #6 and 10).
- 1,2,3,4,6,7,8-HpCDD has been qualified with a 'J' validation flag to denote the reported concentration is an estimate with an undetermined bias as it was reported below the quantitation limit (see CTR comment #10).

MBDS-R12-F01:

- 2,3,7,8-TCDF, total TCDF, total PeCDF, and total HpCDD have been qualified with a 'U' validation flag to denote the reported concentrations are non-detect due to positive detection in the trip blank (see CTR comment #6).
- 2,3,7,8-TCDD has been reported at an EMPC and has been qualified with a 'J+' validation flag to denote the reported concentration is likely overestimated due to possible interference in the sample (see CTR comment #10).
- 2,3,4,7,8-PeCDF, OCDF, and OCDD were reported at an EMPC and have been qualified with a 'UJ' validation flag to denote the reported concentration is non-detect, and the sample quantitation limits are estimates due to positive detection in the method blank and possible interference in the sample (see CTR comments #6 and 10).

- 1,2,3,4,7,8-HxCDF, 1,2,3,6,7,8-HxCDF, 2,3,4,6,7,8-HxCDF, 1,2,3,7,8,9-HxCDF, total HxCDF, 1,2,3,4,6,7,8-HpCDF, total HpCDF, and 1,2,3,4,6,7,8-HpCDD have been qualified with a 'U' validation flag to denote the reported concentrations are non-detect due to positive detection in the method blank (see CTR comment #6).

MBDS-R12-F04:

- 2,3,7,8-TCDD and 1,2,3,7,8-PeCDD have been reported at an EMPC and have been qualified with a 'J+' validation flag to denote the reported concentrations are likely estimated due to possible interference in the sample (see CTR comment #10).
- 1,2,3,7,8-PeCDF has been qualified with a 'J' validation flag to denote the reported concentration is an estimate with an undetermined bias as it was reported below the quantitation limit (see CTR comment #10).
- 2,3,4,7,8-PeCDF, 1,2,3,6,7,8-HxCDF, 2,3,4,6,7,8-HxCDF, 1,2,3,4,6,7,8-HpCDF, and OCDF were reported at an EMPC and have been qualified with a 'UJ' validation flag to denote the reported concentration is non-detect, and the sample quantitation limits are estimates due to positive detection in the method blank and possible interference in the sample (see CTR comments #6 and 10).
- Total PeCDF and total HpCDD have been qualified with a 'U' validation flag to denote the reported concentrations are non-detect due to positive detection in the trip blank (see CTR comment #6).
- 1,2,3,4,7,8-HxCDF, 1,2,3,7,8,9-HxCDF, total HxCDF, 1,2,3,4,6,7,8-HpCDD, and OCDD have been qualified with a 'U' validation flag to denote the reported concentrations are non-detect due to positive detection in the method blank (see CTR comment #6).

MBDS-R12-F05 (Trip Blank):

- 2,3,4,7,8-PeCDF, 1,2,3,4,7,8-HxCDF, 1,2,3,6,7,8-HxCDF, total HxCDF, total HpCDF, 1,2,3,4,6,7,8-HpCDD, and OCDD have been qualified with a 'U' validation flag to denote the reported concentrations are non-detect due to positive detection in the method blank (see CTR comment #6).
- Total PeCDF and total HpCDD have been qualified with a 'J' validation flag to denote the reported concentrations are estimates with an undetermined bias as they were reported below the quantitation limit (see CTR comment #10).

- 2,3,4,6,7,8-HxCDF, 1,2,3,7,8,9-HxCDF, 1,2,3,6,7,8-HxCDD, 1,2,3,4,6,7,8-HpCDF, and OCDF were reported at an EMPC and have been qualified with a 'UJ' validation flag to denote the reported concentration is non-detect, and the sample quantitation limits are estimates due to positive detection in the method blank and possible interference in the sample (see CTR comments #6 and 10).

MBDS-R05-F01:

- Total TCDD, total HxCDD, and OCDD have been qualified with a 'J' validation flag to denote the reported concentrations are estimates with an undetermined bias as they were reported below the quantitation limit (see CTR comment #10).
- 2,3,4,7,8-PeCDF, 1,2,3,7,8,9-HxCDF, total HxCDF, 1,2,3,4,7,8-HxCDD, 1,2,3,7,8,9-HxCDD, 1,2,3,4,6,7,8-HpCDF, total HpCDF, and OCDF have been qualified with a 'U' validation flag to denote the reported concentration is non-detect due to positive detection in the method blank (see CTR comment #6).
- 2,3,7,8-TCDF, total TCDF, total PeCDF, and total PeCDD has been qualified with a 'U' validation flag to denote the reported concentration is non-detect due to positive detection in the trip blank (see CTR comment #6).
- 1,2,3,6,7,8-HxCDF and 2,3,4,6,7,8-HxCDF were reported at an EMPC and have been qualified with a 'UJ' validation flag to denote the reported concentration is non-detect, and the sample quantitation limits are estimates due to positive detection in the method blank and possible interference in the sample (see CTR comments #6 and 10).
- 1,2,3,4,6,7,8-HpCDD has been reported at an EMPC and has been qualified with a 'J+' validation flag to denote the reported concentration is likely overestimated due to possible interference in the sample (see CTR comment #10).

MBDS-R05-O01:

- 2,3,7,8-TCDF, total TCDF, and total PeCDD have been qualified with a 'U' validation flag to denote the reported concentrations are non-detect due to positive detection in the trip blanks (see CTR comment #6).
- Total TCDD, total PeCDF, total HxCDF, 1,2,3,4,7,8-HxCDD, 1,2,3,6,7,8-HxCDD, 1,2,3,7,8,9-HxCDD, 1,2,3,4,6,7,8-HpCDF, total HpCDF, and OCDF have been qualified with a 'J' validation flag to denote the reported concentrations are estimates with an undetermined bias as they were reported below the quantitation limit (see CTR comment #10).

- 1,2,3,7,8-PeCDF and 1,2,3,7,8-PeCDD has been reported at an EMPC and has been qualified with a 'J+' validation flag to denote the reported concentration is likely overestimated due to possible interference in the sample (see CTR comment #10).
- 2,3,4,7,8-PeCDF, 2,3,4,6,7,8-HxCDF, and 1,2,3,7,8,9-HxCDF were reported at an EMPC and have been qualified with a 'UJ' validation flag to denote the reported concentration is non-detect, and the sample quantitation limits are estimates due to positive detection in the method blank and possible interference in the sample (see CTR comments #6 and 10).
- 1,2,3,4,7,8-HxCDF and 1,2,3,6,7,8-HxCDF have been qualified with a 'U' validation flag to denote the reported concentration is non-detect due to positive detection in the method blank (see CTR comment #6).

MBDS-R05-A01:

- Total TCDD and total HxCDD have been qualified with a 'J' validation flag to denote the reported concentrations are estimates with an undetermined bias as they were reported below the quantitation limit (see CTR comment #10).
- 1,2,3,7,8-PeCDF has been reported at an EMPC and has been qualified with a 'J+' validation flag to denote the reported concentration is likely overestimated due to possible interference in the sample (see CTR comment #10).
- Total PeCDF, total PeCDD, and total HpCDD have been qualified with a 'U' validation flag to denote the reported concentration is non-detect due to positive detection in the trip blank (see CTR comment #6).
- 2,3,4,7,8-PeCDF, 1,2,3,4,7,8-HxCDF, total HxCDF, 1,2,3,7,8,9-HxCDD, 1,2,3,4,6,7,8-HpCDF, total HpCDF, 1,2,3,4,6,7,8-HpCDD, OCDD, and OCDF have been qualified with a 'U' validation flag to denote the reported concentration is non-detect due to positive detection in the method blank (see CTR comment #6).
- 1,2,3,6,7,8-HxCDF, 1,2,3,7,8,9-HxCDF, and 1,2,3,6,7,8-HxCDD were reported at an EMPC and have been qualified with a 'UJ' validation flag to denote the reported concentrations are non-detect, and the sample quantitation limits are estimates due to positive detections in the method blank and possible interference in the sample (see CTR comments #6 and 10).

MBDS-R06-A01:

- 2,3,7,8-TCDF was reported at an EMPC and has been qualified with a 'UJ' validation flag to denote the reported concentration is non-detect, and the sample quantitation limits are an estimate due to positive detections in the trip blank and possible interference in the sample (see CTR comments #6 and 10).
- 1,2,3,4,7,8-HxCDD and 1,2,3,7,8,9-HxCDD have been reported at an EMPC and have been qualified with a 'J+' validation flag to denote the reported concentrations are likely overestimated due to possible interference in the sample (see CTR comment #10).
- 2,3,7,8-TCDD, 1,2,3,7,8-PeCDD, total HxCDF, and 1,2,3,6,7,8-HxCDD have been qualified with a 'J' validation flag to denote the reported concentrations are estimates with an undetermined bias as they were reported below the quantitation limit (see CTR comment #10).
- Total TCDF and total PeCDF have been qualified with a 'U' validation flag to denote the reported concentrations are non-detect due to positive detections in the trip blanks (see CTR comment #6).
- 2,3,4,7,8-PeCDF, 1,2,3,4,7,8-HxCDF, 1,2,3,6,7,8-HxCDF, 2,3,4,6,7,8-HxCDF, 1,2,3,4,6,7,8-HpCDF, 1,2,3,4,7,8,9-HpCDF, total HpCDF, and OCDF have been qualified with a 'U' validation flag to denote the reported concentration is non-detect due to positive detection in the method blank (see CTR comment #6).
- 1,2,3,7,8,9-HxCDF was reported at an EMPC and has been qualified with a 'UJ' validation flag to denote the reported concentration is non-detect, and the sample quantitation limits are an estimate due to positive detections in the method blank and possible interference in the sample (see CTR comments #6 and 10).

MBDS-R13-O01:

- 1,2,3,7,8-PeCDF and OCDD have been qualified with a 'J' validation flag to denote the reported concentrations are estimates with an undetermined bias as they were reported below the quantitation limit (see CTR comment #10).
- 2,3,4,7,8-PeCDF, 2,3,4,6,7,8-HxCDF, 1,2,3,7,8,9-HxCDF, and 1,2,3,7,8,9-HxCDD were reported at an EMPC and have been qualified with a 'UJ' validation flag to denote the reported concentrations are non-detect, and the sample quantitation limits are estimates due to positive detections in the method blank and possible interference in the sample (see CTR comments #6 and 10).
- Total TCDF, total PeCDF, total PeCDD and total HpCDD have been qualified with a 'U' validation flag to denote the reported concentrations are non-detect due to positive detections in the trip blank (see CTR comment #6).

- 1,2,3,4,7,8-HxCDF, 1,2,3,6,7,8-HxCDF, total HxCDF, 1,2,3,4,6,7,8-HpCDF, total HpCDF, 1,2,3,4,5,7,8-HpCDD, and OCDF have been qualified with a 'U' validation flag to denote the reported concentrations are non-detect due to positive detections in the method blank (see CTR comment #6).

MBDS-R06-O01:

- 1,2,3,7,8-PeCDF, 1,2,3,7,8-PeCDD, total PeCDD, total HxCDD, 1,2,3,4,6,7,8-HpCDD, total HpCDD, and OCDD have been qualified with a 'J' validation flag to denote the reported concentrations are estimates with an undetermined bias as they were reported below the quantitation limit (see CTR comment #10).
- 2,3,7,8-TCDD was reported at an EMPC and has been qualified with a 'J+' validation flag to denote the reported concentration is likely overestimated due to possible interference in the sample (see CTR comment #10).
- 2,3,4,7,8-PeCDF, 2,3,4,6,7,8-HxCDF, 1,2,3,6,7,8-HxCDD, and 1,2,3,6,7,8-HxCDD were reported at an EMPC and have been qualified with a 'UJ' validation flag to denote the reported concentrations are non-detect, and the sample quantitation limits are estimates due to positive detections in the method blank and possible interference in the sample (see CTR comments #6 and 10).
- Total TCDF and total PeCDF has been qualified with a 'U' validation flag to denote the reported concentration is non-detect due to positive detections in the trip blank (see CTR comment #6).
- 1,2,3,7,8,9-HxCDF, total HxCDF, 1,2,3,4,6,7,8-HpCDF, total HpCDF, and OCDF have been qualified with a 'U' validation flag to denote the reported concentrations are non-detect due to positive detections in the method blank (see CTR comment #6).

MBDS-R06-F01:

- total HxCDF, 1,2,3,7,8,9-HxCDD, 1,2,3,4,6,7,8-HpCDF, total HpCDF, 1,2,3,4,6,7,8-HpCDD, OCDF, and OCDD have been qualified with a 'U' validation flag to denote the reported concentrations are non-detect due to positive detections in the method blank (see CTR comment #6).
- 2,3,7,8-TCDF, total TCDF, and total HpCDD have been qualified with a 'U' validation flag to denote the reported concentrations are non-detect due to positive detections in the trip blank (see CTR comment #6).

- 2,3,4,7,8-PeCDF, 1,2,3,6,7,8-HxCDF, 2,3,4,6,7,8-HxCDF, and 1,2,3,6,7,8-HxCDD were reported at an EMPC and have been qualified with a 'UJ' validation flag to denote the reported concentrations are non-detect, and the sample quantitation limits are estimates due to positive detections in the method blank and possible interference in the sample (see CTR comments #6 and 10).

MBDS-R07-F01:

- 2,3,7,8-TCDF has been qualified with a 'U' validation flag to denote the reported concentration is non-detect due to positive detection in the trip blank (see CTR comment #6).
- 2,3,4,7,8-PeCDF has been qualified with a 'U' validation flag to denote the reported concentration is non-detect due to positive detection in the method blank (see CTR comment #6).
- 1,2,3,7,8-PeCDF, 1,2,3,6,7,8-HxCDF, 2,3,4,6,7,8-HxCDF, 1,2,3,6,7,8-HxCDD, 1,2,3,7,8,9-HxCDD, total HpCDF, and OCDF have been qualified with a 'J' validation flag to denote the reported concentrations are estimates with an undetermined bias as they were reported below the quantitation limit (see CTR comment #10).
- 1,2,3,7,8-PeCDD and 1,2,3,4,7,8-HxCDD were reported at an EMPC and have been qualified with a 'J+' validation flag to denote the reported concentrations are likely overestimated due to possible interference in the sample (see CTR comment #10).
- 1,2,3,4,7,8-HxCDF was reported at an EMPC and has been qualified with a 'UJ' validation flag to denote the reported concentration is non-detect, and the sample quantitation limit is an estimate due to positive detections in the method blank and possible interference in the sample (see CTR comments #6 and 10).
- 1,2,3,4,6,7,8-HpCDF has been qualified with an 'R' validation due to interference from polychlorinated diphenyl ethers (PCDE) (see CTR comment #10).

MBDS-R07-O01:

- 2,3,4,7,8-PeCDF, 1,2,3,4,7,8-HxCDF, 2,3,4,6,7,8-HxCDF, 1,2,3,6,7,8-HxCDD, 1,2,3,7,8,9-HxCDD, 1,2,3,4,6,7,8-HpCDF, and total HpCDF have been qualified with a 'U' validation flag to denote the reported concentrations are non-detect due to positive detections in the method blank (see CTR comment #6).

- Total PeCDF, total PeCDD, total HxCDF, 1,2,3,4,7,8-HxCDD, 1,2,3,4,6,7,8-HpCDD, and OCDF have been qualified with a 'J' validation flag to denote the reported concentrations are estimates with an undetermined bias as they were reported below the quantitation limit (see CTR comment #10).
- 1,2,3,4,7,8-HxCDF was reported at an EMPC and has been qualified with a 'UJ' validation flag to denote the reported concentration is non-detect, and the sample quantitation limit is an estimate due to positive detections in the method blank and possible interference in the sample (see CTR comments #6 and 10).

MBDS-R07-O04:

- 2,3,4,7,8-PeCDF, 2,3,4,6,7,8-HxCDF, 1,2,3,6,7,8-HxCDD, 1,2,3,7,8,9-HxCDD, 1,2,3,4,6,7,8-HpCDF, and OCDF were reported at an EMPC and have been qualified with a 'UJ' validation flag to denote the reported concentrations are non-detect, and the sample quantitation limits are estimates due to positive detections in the method blank and possible interference in the sample (see CTR comments #6 and 10).
- Total PeCDF, 1,2,3,7,8-PeCDD, total PeCDD, 1,2,3,6,7,8-HxCDF, total HxCDF, and 1,2,3,4,6,7,8-HpCDD have been qualified with a 'J' validation flag to denote the reported concentrations are estimates with an undetermined bias as they were reported below the quantitation limit (see CTR comment #10).
- Total HpCDF has been qualified with a 'U' validation flag to denote the reported concentration is non-detect due to positive detection in the method blank (see CTR comment #6).

MBDS-R07-005 (Trip Blank):

- 2,3,7,8-TCDF, total TCDF, and total PeCDD have been qualified with a 'J' validation flag to denote the reported concentrations are estimates with an undetermined bias as they were reported below the quantitation limit (see CTR comment #10).
- 1,2,3,4,7,8-HxCDF, 1,2,3,6,7,8-HxCDF, OCDF, and OCDD were reported at an EMPC and have been qualified with a 'UJ' validation flag to denote the reported concentrations are non-detect, and the sample quantitation limits are estimates due to positive detections in the method blank and possible interference in the sample (see CTR comments #6 and 10).
- 2,3,4,6,7,8-HxCDF, total HxCDF, 1,2,3,4,6,7,8-HpCDF, total HpCDF, and 1,2,3,4,6,7,8-HpCDD have been qualified with a 'U' validation flag to denote the reported concentrations are non-detect due to positive detections in the method blank (see CTR comment #6).

- Total HpCDD has been qualified with a 'U' validation flag to denote the reported concentration is an estimate due to positive detection in the trip blank (see CTR comment #6).

MBDS-R07-A01:

- Total TCDF, total PeCDF, and total HpCDD have been qualified with a 'U' validation flag to denote the reported concentrations are non-detect due to positive detections in the trip blank (see CTR comment #6).
- 2,3,4,7,8-PeCDF, 1,2,3,4,7,8-HxCDF, 1,2,3,7,8,9-HxCDF, total HxCDF, 1,2,3,4,6,7,8-HpCDF, total HpCDF, 1,2,3,4,6,7,8-HpCDF, OCDF, and OCDD have been qualified with a 'U' validation flag to denote the reported concentrations are non-detect due to positive detections in the method blank (see CTR comment #6).
- 1,2,3,6,7,8-HxCDF, 2,3,4,6,7,8-HxCDF, and 1,2,3,4,7,8-HxCDD were reported at an EMPC and have been qualified with a 'UJ' validation flag to denote the reported concentrations are non-detect, and the sample quantitation limits are estimates due to positive detections in the method blank and possible interference in the sample (see CTR comments #6 and 10).

MBDS-R13-F01:

- 2,3,7,8-TCDF, total PeCDF, total PeCDD, and total HpCDD have been qualified with a 'U' validation flag to denote the reported concentrations are non-detect due to positive detections in the trip blank (see CTR comment #6).
- 2,3,4,7,8-PeCDF, 1,2,3,4,7,8-HxCDF, total HxCDF, 1,2,3,7,8,9-HxCDD, total HpCDF, and OCDF have been qualified with a 'U' validation flag to denote the reported concentrations are non-detect due to positive detections in the trip blank (see CTR comment #6).
- 1,2,3,6,7,8-HxCDF, 2,3,4,6,7,8-HxCDF, 1,2,3,6,7,8-HxCDD, and 1,2,3,4,6,7,8-HpCDF were reported at an EMPC and have been qualified with a 'UJ' validation flag to denote the reported concentrations are non-detect, and the sample quantitation limits are estimates due to positive detections in the method blank and possible interference in the sample (see CTR comments #6 and 10).
- 1,2,3,4,7,8-HxCDD and 1,2,3,4,6,7,8-HpCDD were reported at an EMPC and have been qualified with a 'J+' validation flag to denote the reported concentrations are likely overestimated due to possible interference in the sample (see CTR comment #10).

- Total HxCDD has been qualified with a 'J' validation flag to denote the reported concentration is an estimate with an undetermined bias as it was reported below the quantitation limit (see CTR comment #10).

MBDS-R13-A01:

- 2,3,7,8-TCDF, total TCDF, total PeCDF, and total PeCDD have been qualified with a 'U' validation flag to denote the reported concentrations are non-detect due to positive detections in the trip blank (see CTR comment #6).
- 2,3,4,7,8-PeCDF, 2,3,4,6,7,8-HxCDF, total HxCDF, and total HxCDD have been qualified with a 'U' validation flag to denote the reported concentrations are non-detect due to positive detections in the method blank (see CTR comment #6).
- 1,2,3,7,8-PeCDD, 1,2,3,4,6,7,8-HpCDD, and total HpCDD have been qualified with a 'J' validation flag to denote the reported concentrations are estimates with an undetermined bias as they were reported below the quantitation limit (see CTR comment #10).
- 1,2,3,4,7,8-HxCDF, 1,2,3,6,7,8-HxCDF, 1,2,3,6,7,8-HxCDD, 1,2,3,7,8,9-HxCDD, and OCDF were reported at an EMPC and have been qualified with a 'UJ' validation flag to denote the reported concentrations are non-detect, and the sample quantitation limits are estimates due to positive detections in the method blank and possible interference in the sample (see CTR comments #6 and 10).
- 1,2,3,4,6,7,8-HpCDF has has been qualified with an 'R' validation due to interference from polychlorinated diphenyl ethers (PCDE) (see CTR comment #10).

MBDS-R13-A01:

- Total TCDF and total PeCDF have been qualified with a 'U' validation flag to denote the reported concentrations are non-detect due to positive detections in the trip blank (see CTR comment #6).
- Total TCDD, 1,2,3,4,6,7,8-HpCDD, total HpCDD, and OCDD have been qualified with a 'J' validation flag to denote the reported concentrations are estimates with an undetermined bias as they were reported below the quantitation limit (see CTR comment #10).
- 2,3,4,7,8-PeCDF, 1,2,3,6,7,8-HxCDD, and OCDF were reported at an EMPC and have been qualified with a 'UJ' validation flag to denote the reported concentrations are non-detect, and the sample quantitation limits are estimates due to positive detections in the method blank and possible interference in the sample (see CTR comments #6 and 10).

- 1,2,3,6,7,8-HxCDF, total HxCDF, total HxCDD, 1,2,3,4,6,7,8-HpCDF, total HpCDF have been qualified with a 'U' validation flag to denote the reported concentrations are non-detect due to positive detections in the method blank (see CTR comment #6).

MBDS-R18-F01:

- Total TCDF and total HpCDD have been qualified with a 'U' validation flag to denote the reported concentrations are non-detect due to positive detections in the trip blank (see CTR comment #6).
- 2,3,7,8-TCDF, 1,2,3,4,7,8-HxCDF, 1,2,3,4,6,7,8-HpCDD, and OCDF were reported at an EMPC and have been qualified with a 'UJ' validation flag to denote the reported concentrations are non-detect, and the sample quantitation limits are estimates due to positive detections in the method blank and possible interference in the sample (see CTR comments #6 and 10).
- 2,3,4,6,7,8-HxCDF, total HxCDF, 1,2,3,6,7,8-HxCDD, 1,2,3,7,8,9-HxCDD, total HxCDD, 1,2,3,4,6,7,8-HpCDF, total HpCDF, and OCDD have been qualified with a 'U' validation flag to denote the reported concentrations are non-detect due to positive detections in the method blank (see CTR comment #6).

MBDS-R18-O01:

- 2,3,7,8-TCDF and total TCDF have been qualified with a 'U' validation flag to denote the reported concentrations are non-detect due to positive detections in the method and trip blanks (see CTR comment #6).
- Total PeCDF and total PeCDD have been qualified with a 'U' validation flag to denote the reported concentrations are non-detect due to positive detections in the trip blank (see CTR comment #6).
- 1,2,3,7,8-PeCDD, 1,2,3,6,7,8-HxCDF, 1,2,3,6,7,8-HxCDD, total HxCDD, 1,2,3,4,6,7,8-HpCDF, 1,2,3,4,6,7,8-HpCDD, and total HpCDD have been qualified with a 'J' validation flag to denote the reported concentrations are estimates with an undetermined bias as they were reported below the quantitation limit (see CTR comment #10).
- 1,2,3,4,7,8-HxCDF and total HxCDF have been qualified with a 'U' validation flag to denote the reported concentrations are non-detect due to positive detections in the method blank (see CTR comment #6).
- 1,2,3,4,7,8,9-HpCDF was reported at an EMPC and has been qualified with a 'J+' validation flag to denote the reported concentration is likely overestimated due to possible interference in the sample (see CTR comment #10).

MBDS-R12-A01:

- 2,3,7,8-TCDF and total TCDF have been qualified with a 'U' validation flag to denote the reported concentrations are non-detect due to positive detections in the method and trip blanks (see CTR comment #6).
- 2,3,4,7,8-PeCDF, 2,3,4,6,7,8-HxCDF, and 1,2,3,7,8,9-HxCDD were reported at an EMPC and have been qualified with a 'J+' validation flag to denote the reported concentrations are likely overestimated due to possible interference in the sample (see CTR comment #10).
- Total PeCDF and total PeCDD have been qualified with a 'U' validation flag to denote the reported concentrations are non-detect due to positive detections in the trip blanks (see CTR comment #6).
- 1,2,3,7,8-PeCDD, 1,2,3,6,7,8-HxCDF, 1,2,3,6,7,8-HxCDD, total HxCDD, 1,2,3,4,7,8,9-HpCDF, total HpCDF, 1,2,3,4,6,7,8-HpCDD, and total HpCDD have been qualified with a 'J' validation flag to denote the reported concentrations are estimates with an undetermined bias as they were reported below the quantitation limit (see CTR comment #10).
- 1,2,3,4,7,8-HxCDF and 1,2,3,4,6,7,8-HpCDF were reported at an EMPC and have been qualified with a 'UJ' validation flag to denote the reported concentrations are non-detect, and the sample quantitation limits are estimates due to positive detections in the method blank and possible interference in the sample (see CTR comments #6 and 10).
- Total HxCDF and OCDF have been qualified with a 'U' validation flag to denote the reported concentrations are non-detect due to positive detections in the method blank (see CTR comment #6).

4. CONTRACT AND TECHNICAL REVIEW (CTR)

Project Name: Montana Background Dioxin Study

Laboratory Name: Pace Analytical

SDG#: 1073422

Type of Analysis: USEPA SW-846 Method 8290

1. Data Completeness

The data has undergone a Level III validation.

2. Sample Integrity

No action was taken as sample integrity was compliant.

3. Sample Holding Times

No action was taken as sample holding times were met.

4. Instrument Performance

No action was taken as instrument performance was compliant.

5. Initial and Continuing Calibrations

The initial and continuing calibration forms were not included in the data package as it was a level III. No action was taken as the case narrative indicated that the acceptance criteria for the initial and continuing calibrations were met.

6. Method and Field Blank Contamination

Method Blank 16571. Positive detections were noted in the method blank for 1,2,3,4,7,8-HxCDF, 1,2,3,6,7,8-HxCDF, 2,3,4,6,7,8-HxCDF, total HxCDF, 1,2,3,7,8,9-HxCDD, total HxCDD, 1,2,3,4,6,7,8-HpCDF, total HpCDF, OCDF and OCDD. EMPC results were reported for 2,3,4,7,8-PeCDF, 1,2,3,7,8,9-HxCDF, 1,2,3,6,7,8-HxCDD, 1,2,3,4,7,8,9-HpCDF, and 1,2,3,4,6,7,8-HpCDD.

In sample MBDS-R12-O01, 1,2,3,4,7,8-HxCDF, 1,2,3,6,7,8-HxCDF, 1,2,3,7,8,9-HxCDF, total HxCDF, 1,2,3,6,7,8-HxCDD, total HxCDD, 1,2,3,4,6,7,8-HpCDF, total HpCDF, and OCDF have been qualified with a 'U' validation flag as the reported concentration was less than five times the blank value. 2,3,4,6,7,8-HxCDF was reported at an EMPC and has been qualified with a 'UJ' validation flag as the reported concentration was less than five times the blank value and due to possible interference in the sample.

In sample MBDS-R12-F01, 1,2,3,4,7,8-HxCDF, 1,2,3,6,7,8-HxCDF, 2,3,4,6,7,8-HxCDF, 1,2,3,7,8,9-HxCDF, total HxCDF, 1,2,3,4,6,7,8-HpCDF, total HpCDF, and 1,2,3,4,6,7,8-HpCDD have been qualified with a 'U' validation flag as the reported concentration was less than five times the blank value. 2,3,4,7,8-PeCDF, OCDF, and OCDD were reported an EMPC and have been qualified with a 'UJ' validation flag as the reported concentration was less than five times the blank value and due to possible interference in the sample.

In sample MBDS-R12-F04, 1,2,3,4,7,8-HxCDF, 1,2,3,7,8,9-HxCDF, total HxCDF, 1,2,3,4,6,7,8-HpCDD, and OCDD have been qualified with a 'U' validation flag as the reported concentration was less than five times the blank value. 2,3,4,7,8-PeCDF, 1,2,3,6,7,8-HxCDF, 2,3,4,6,7,8-HxCDF, 1,2,3,4,6,7,8-HpCDF, and OCDF were reported an EMPC and have been qualified with a 'UJ' validation flag as the reported concentration was less than five times the blank value and due to possible interference in the sample.

In sample MBDS-R12-F05, 2,3,4,7,8-PeCDF, 1,2,3,4,7,8-HxCDF, 1,2,3,7,8,9-HxCDF, total HxCDF, total HpCDF, 1,2,3,4,6,7,8-HpCDD, and OCDD have been qualified with a 'U' validation flag as the reported concentrations were less than five times the blank value. 1,2,3,6,7,8-HxCDF, 2,3,4,6,7,8-HxCDF, 1,2,3,6,7,8-HxCDD, 1,2,3,4,6,7,8-HpCDF, and OCDF were reported an EMPC and have been qualified with a 'UJ' validation flag as the reported concentration was less than five times the blank value and due to possible interference in the sample.

In sample MBDS-R05-F01, 1,2,3,7,8,9-HxCDF, total HxCDF, 1,2,3,6,7,8-HxCDD, 1,2,3,7,8,9-HxCDD, 1,2,3,4,6,7,8-HpCDF, total HpCDF, and OCDF have been qualified with a 'U' validation flag as the reported concentrations were less than five times the blank value. 1,2,3,6,7,8-HxCDF and 2,3,4,6,7,8-HxCDF were reported an EMPC and have been qualified with a 'UJ' validation flag as the reported concentration was less than five times the blank value and due to possible interference in the sample.

In sample MBDS-R05-O01, 1,2,3,4,7,8-HxCDF and 1,2,3,6,7,8-HxCDF have been qualified with a 'U' validation flag as the reported concentrations were less than five times the blank value. 2,3,4,7,8-PeCDF, 2,3,4,6,7,8-HxCDF, and 1,2,3,7,8,9-HxCDF HxCDF were reported an EMPC and have been qualified with a 'UJ' validation flag as the reported concentration was less than five times the blank value and due to possible interference in the sample.

In sample MBDS-R05-A01, 2,3,4,7,8-PeCDF, 1,2,3,4,7,8-HxCDF, total HxCDF, 1,2,3,7,8,9-HxCDD, 1,2,3,4,6,7,8-HpCDF, total HpCDF, 1,2,3,4,6,7,8-HpCDD, OCDF, and OCDD have been qualified with a 'U' validation flag as the reported concentrations were less than five times the blank value. 1,2,3,6,7,8-HxCDF, 1,2,3,7,8,9-HxCDF, and 1,2,3,6,7,8-HxCDD were reported an EMPC and have been qualified with a 'UJ' validation flag as the reported concentrations were less than five times the blank value and due to possible interference in the sample.

In sample MBDS-R06-A01, 2,3,4,7,8-PeCDF, 1,2,3,4,7,8-HxCDF, 1,2,3,6,7,8-HxCDF, 2,3,4,6,7,8-HxCDF, 1,2,3,4,6,7,8-HpCDF, 1,2,3,4,7,8,9-HpCDF, total HpCDF, and OCDF have been qualified with a 'U' validation flag as the reported concentrations were less than five times the blank value. 1,2,3,7,8,9-HxCDF was reported at an EMPC and has been qualified with a 'UJ' validation flag as the reported concentration was less than five times the blank value and due to possible interference in the sample.

In sample MBDS-R13-O01, 1,2,3,4,7,8-HxCDF, 1,2,3,6,7,8-HxCDF, total HxCDF, 1,2,3,4,6,7,8-HpCDF, total HpCDF, 1,2,3,4,6,7,8-HpCDD, and OCDF have been qualified with a 'U' validation flag as the reported concentrations were less than five times the blank value. 2,3,4,7,8-PeCDF, 2,3,4,6,7,8-HxCDF, 1,2,3,7,8,9-HxCDF, and 1,2,3,7,8,9-HxCDD were reported an EMPC and have been qualified with a 'UJ' validation flag as the reported concentrations were less than five times the blank value and due to possible interference in the sample.

In sample MBDS-R06-O01, 1,2,3,7,8,9-HxCDF, total HxCDF, 1,2,3,4,6,7,8-HpCDF, total HpCDF, and OCDF have been qualified with a 'U' validation flag as the reported concentrations were less than five times the blank value. 2,3,4,7,8-PeCDF, 2,3,4,6,7,8-HxCDF, 1,2,3,6,7,8-HxCDD, and 1,2,3,7,8,9-HxCDD were reported an EMPC and have been qualified with a 'UJ' validation flag as the reported concentrations were less than five times the blank value and due to possible interference in the sample.

In sample MBDS-R06-F01, total HxCDF, 1,2,3,7,8,9-HxCDD, 1,2,3,4,6,7,8-HpCDF, total HpCDF, 1,2,3,4,6,7,8-HpCDD, OCDF, and OCDD have been qualified with a 'U' validation flag as the reported concentrations were less than five times the blank value. 2,3,4,7,8-PeCDF, 1,2,3,6,7,8-HxCDF, 2,3,4,6,7,8-HxCDF, and 1,2,3,6,7,8-HxCDD were reported an EMPC and have been qualified with a 'UJ' validation flag as the reported concentrations were less than five times the blank value and due to possible interference in the sample.

In sample MBDS-R07-F01, 2,3,4,7,8-PeCDF has been qualified with a 'U' validation flag as the reported concentration was less than five times the method blank value. 1,2,3,4,7,8-HxCDF was reported at an EMPC and has been qualified with a 'UJ' validation flag as the reported concentration was less than five times the blank value and due to possible interference in the sample.

In sample MBDS-R07-O01, 2,3,4,7,8-PeCDF, 1,2,3,6,7,8-HxCDF, 2,3,4,6,7,8-HxCDF, 1,2,3,6,7,8-HxCDD, 1,2,3,7,8,9-HxCDD, 1,2,3,4,6,7,8-HpCDF, and total HpCDF have been qualified with a 'U' validation flag as the reported concentrations were less than five times the blank value. 1,2,3,4,7,8-HxCDF was reported at an EMPC and has been qualified with a 'UJ' validation flag as the reported concentration was less than five times the blank value and due to possible interference in the sample.

In sample MBDS-R07-O04, total HpCDF has been qualified with a 'U' validation flag as the reported concentration was less than five times the blank value. 2,3,4,7,8-PeCDF, 2,3,4,6,7,8-HxCDF, 1,2,3,6,7,8-HxCDD, 1,2,3,7,8,9-HxCDD, 1,2,3,4,6,7,8-HpCDF, and OCDF were reported an EMPC and have been qualified with a 'UJ' validation flag as the reported concentrations were less than five times the blank value and due to possible interference in the sample.

In sample MBDS-R07-O05, 2,3,4,6,7,8-HxCDF, total HxCDF, 1,2,3,4,6,7,8-HpCDF, total HpCDF, and 1,2,3,4,6,7,8-HpCDD have been qualified with a 'U' validation flag as the reported concentrations were less than five times the blank value. 1,2,3,4,7,8-HxCDF, 1,2,3,6,7,8-HxCDF, OCDF, and OCDD were reported an EMPC and have been qualified with a 'UJ' validation flag as the reported concentrations were less than five times the blank value and due to possible interference in the sample.

In sample MBDS-R07-A01, 2,3,4,7,8-PeCDF, 1,2,3,4,7,8-HxCDF, 1,2,3,7,8,9-HxCDF, total HxCDF, 1,2,3,4,6,7,8-HpCDF, total HpCDF, 1,2,3,4,6,7,8-HpCDD, OCDF, and OCDD have been qualified with a 'U' validation flag as the reported concentrations were less than five times the blank value. 1,2,3,6,7,8-HxCDF, 2,3,4,6,7,8-HxCDF, and 1,2,3,6,7,8-HxCDD were reported an EMPC and have been qualified with a 'UJ' validation flag as the reported concentrations were less than five times the blank value and due to possible interference in the sample.

In sample MBDS-R13-F01, 2,3,4,7,8-PeCDF, 1,2,3,4,7,8-HxCDF, total HxCDF, 1,2,3,7,8,9-HxCDD, total HpCDF, and OCDF have been qualified with a 'U' validation flag as the reported concentrations were less than five times the blank value. 1,2,3,6,7,8-HxCDF, 2,3,4,6,7,8-HxCDF, 1,2,3,4,7,8-HxCDD, and 1,2,3,4,6,7,8-HpCDF were reported an EMPC and have been qualified with a 'UJ' validation flag as the reported concentrations were less than five times the blank value and due to possible interference in the sample.

In sample MBDS-R13-A01, 2,3,4,7,8-PeCDF, 2,3,4,6,7,8-HxCDF, total HxCDF, and total HxCDD have been qualified with a 'U' validation flag as the reported concentrations were less than five times the blank value. 1,2,3,4,7,8-HxCDF, 1,2,3,6,7,8-HxCDF, 1,2,3,6,7,8-HxCDD, 1,2,3,7,8,9-HxCDD, and OCDF were reported an EMPC and have been qualified with a 'UJ' validation flag as the reported concentrations were less than five times the blank value and due to possible interference in the sample.

In sample MBDS-R18-A01, 1,2,3,6,7,8-HxCDF, total HxCDF, total HxCDD, 1,2,3,4,6,7,8-HpCDF, and total HpCDF have been qualified with a 'U' validation flag as the reported concentrations were less than five times the blank value. 2,3,4,7,8-PeCDF, 1,2,3,6,7,8-HxCDD, and OCDF were reported an EMPC and have been qualified with a 'UJ' validation flag as the reported concentrations were less than five times the blank value and due to possible interference in the sample.

In sample MBDS-R18-F01, 2,3,4,6,7,8-HxCDF, total HxCDF, 1,2,3,6,7,8-HxCDD, 1,2,3,7,8,9-HxCDD, total HxCDD, 1,2,3,4,6,7,8-HpCDF, total HpCDF, and OCDD have been qualified with a 'U' validation flag as the reported concentrations were less than five times the blank value. 1,2,3,4,7,8-HxCDF, 1,2,3,4,6,7,8-HpCDD, and OCDF were reported an EMPC and have been qualified with a 'UJ' validation flag as the reported concentrations were less than five times the blank value and due to possible interference in the sample.

The remaining 1,2,3,4,7,8-HxCDF, 1,2,3,6,7,8-HxCDF, 2,3,4,6,7,8-HxCDF, total HxCDF, 1,2,3,7,8,9-HxCDD, total HxCDD, 1,2,3,4,6,7,8-HpCDF, total HpCDF, OCDF, OCDD, 2,3,4,7,8-PeCDF, 1,2,3,7,8,9-HxCDF, 1,2,3,6,7,8-HxCDD, 1,2,3,4,7,8,9-HpCDF, and 1,2,3,4,6,7,8-HpCDD were either non-detect or greater than five times the method blank value and warrant no qualification.

Method Blank 16581. Positive detections were noted in the method blank for total TCDF, 1,2,3,4,7,8-HxCDF, total HxCDF, 1,2,3,4,6,7,8-HpCDD, total HpCDD, and OCDD. 2,3,7,8-TCDF, 1,2,3,4,6,7,8-HpCDF, and OCDF were reported at an EMPC.

In sample MBDS-R18-O01, 2,3,7,8-TCDF, total TCDF, 1,2,3,4,7,8-HxCDF, and total HxCDF have been qualified with a 'U' validation flag as the reported concentrations were less than five times the blank value.

In sample MBDS-R12-A01, 2,3,7,8-TCDF, total TCDF, total HxCDF, and OCDF have been qualified with a 'U' validation flag as the reported concentrations were less than five times the blank value. 1,2,3,4,7,8-HxCDF and 1,2,3,4,6,7,8-HpCDF were reported an EMPC and have been qualified with a 'UJ' validation flag as the reported concentrations were less than five times the blank value and due to possible interference in the sample.

The remaining total TCDF, 1,2,3,4,7,8-HxCDF, total HxCDF, 1,2,3,4,6,7,8-HpCDD, total HpCDD, OCDD, 2,3,7,8-TCDF, 1,2,3,4,6,7,8-HpCDF, and OCDF results were either non-detect or greater than five times the method blank value and warrant no qualification.

Trip Blanks (MBDS-R12-F05 and MBDS-R07-O05). In trip blank MBDS-R12-F05, positive detections were noted for 2,3,4,7,8-PeCDF, total PeCDF, 1,2,3,4,7,8-HxCDF, 1,2,3,6,7,8-HxCDF, total HxCDF, total HpCDF, 1,2,3,4,6,7,8-HpCDD, total HpCDD, and OCDD. EMPC results were reported for 2,3,4,6,7,8-HxCDF, 1,2,3,7,8,9-HxCDF, 1,2,3,6,7,8-HxCDD, 1,2,3,4,6,7,8-HpCDF, and OCDF. 2,3,4,7,8-PeCDF, 1,2,3,4,7,8-HxCDF, 1,2,3,6,7,8-HxCDF, total HxCDF, total HpCDF, 1,2,3,4,6,7,8-HpCDD, and OCDD have been qualified with a 'U' validation flag due to positive detection in the method blank. 2,3,4,6,7,8-HxCDF, 1,2,3,7,8,9-HxCDF, 1,2,3,6,7,8-HxCDD, 1,2,3,4,6,7,8-HpCDF, and OCDF have been qualified with a 'UJ' validation flag due to positive detection in the method blank and possible interference in the samples. No further qualification is warranted for these compounds.

In trip blank MBDS-R07-O05, positive detections were noted for 2,3,7,8-TCDF, total TCDF, total PeCDD, 2,3,4,6,7,8-HxCDF, total HxCDF, 1,2,3,4,6,7,8-HpCDF, total HpCDF, and total HpCDD. EMPC results were noted for 1,2,3,4,7,8-HxCDF, 1,2,3,6,7,8-HxCDF, OCDF, and OCDD. 2,3,4,6,7,8-HxCDF, total HxCDF, 1,2,3,4,6,7,8-HpCDF, total HpCDF, and total HpCDD have been qualified with a 'U' validation flag due to positive detection in the method blank. 1,2,3,4,7,8-HxCDF, 1,2,3,6,7,8-HxCDF, OCDF, and OCDD have been qualified with a 'UJ' validation flag due to positive detection in the method blank and possible interference in the samples. No further qualification is warranted for these compounds.

2,3,7,8-TCDF in MBDS-R12-F01, MBDS-R05-F01, MBDS-R05-O01, MBDS-R06-F01, MBDS-R07-F01, MBDS-R13-A01, MBDS-R18-O01, and MBDS-R12-A01 have been qualified with a 'U' validation flag as the reported concentrations were less than five times the trip blank value. 2,3,7,8-TCDF in MBDS-R06-A01 and MBDS-R18-O01 was reported at an EMPC and has been qualified with a 'UJ' validation flag due to positive detection in the trip blank and possible interference in the sample.

Total TCDF in MBDS-R12-F01, MBDS-R05-F01, MBDS-R05-O01, MBDS-R06-A01, MBDS-R13-O01, MBDS-R06-O01, MBDS-R06-F01, MBDS-R07-A01, MBDS-R13-F01, MBDS-R13-A01, MBDS-R18-A01, MBDS-R18-F01, MBDS-R18-O01, and MBDS-R12-A01 have been qualified with a 'U' validation flag as the reported concentrations were less than five times the trip blank value.

Total PeCDF in MBDS-R12-F01, MBDS-R12-F04, MBDS-R05-F01, MBDS-R05-A01, MBDS-R06-A01, MBDS-R13-O01, MBDS-R06-O01, MBDS-R07-A01, MBDS-R13-F01, MBDS-R13-A01, MBDS-R18-A01, MBDS-R18-O01, and MBDS-R12-A01 have been qualified with a 'U' validation flag as the reported concentrations were less than five times the trip blank value.

Total PeCDD in MBDS-R05-F01, MBDS-R05-O01, MBDS-R05-A01, MBDS-R13-O01, MBDS-R13-F01, MBDS-R13-A01, MBDS-R18-O01, and MBDS-R12-A01 have been qualified with a 'U' validation flag as the reported concentrations were less than five times the trip blank value.

Total HpCDD in MBDS-R12-O01, MBDS-R12-F01, MBDS-R12-F04, MBDS-R05-A01, MBDS-R13-O01, MBDS-R07-O05, MBDS-R07-A01, MBDS-R13-F01, MBDS-R18-F01 have been qualified with a 'U' validation flag as the reported concentrations were less than five times the trip blank value.

7. Matrix Spike/Matrix Spike Duplicate (MS/MSD)

The matrix spike (MS) and matrix spike duplicate (MSD) recovery and precision criteria were met.

8. Laboratory Control Sample (LCS)

All laboratory control sample (LCS) recoveries were within the acceptance criteria.

9. Internal Standards (IS) Performance

No action was taken as all internal standard recoveries were within the acceptance criteria.

10. Target Compound Identification and Quantitation

In sample MBDS-R12-O01, 1,2,3,4,6,7,8-HpCDD exhibited a positive detection below the quantitation limit. It has been qualified with a 'J' validation flag as the reported result is an estimate with an undetermined bias. 2,3,4,6,7,8-HxCDF was reported at an EMPC and has been qualified with a 'UJ' validation flag due to possible interference in the sample and positive detection in the method blank.

In sample MBDS-R12-F01, 2,3,7,8-TCDD, 2,3,4,7,8-PeCDF, OCDF, and OCDD were reported at an EMPC. 2,3,7,8-TCDD has been qualified with a 'J+' validation flag as the reported result is likely overestimated due to possible interference in the sample. 2,3,4,7,8-PeCDF, OCDF, and OCDD have been qualified with a 'UJ' validation flag due to possible interference in the sample and positive detection in the method blank.

In sample MBDS-R12-F04, 2,3,7,8-TCDD, 2,3,4,7,8-PeCDF, 1,2,3,7,8-PeCDD, 1,2,3,6,7,8-HxCDF, 2,3,4,6,7,8-HxCDF, 1,2,3,4,6,7,8-HpCDF, and OCDF were reported at an EMPC. 2,3,7,8-TCDD and 1,2,3,7,8-PeCDD have been qualified with a 'J+' validation flag as the reported results are likely overestimated due to possible interference in the sample. 2,3,4,7,8-PeCDF, 1,2,3,6,7,8-HxCDF, 2,3,4,6,7,8-HxCDF, 1,2,3,4,6,7,8-HpCDF, and OCDF have been qualified with a 'UJ' validation flag due to possible interference in the sample and positive detection in the method blank. 1,2,3,7,8-PeCDF exhibited a positive detection below the quantitation limit. It has been qualified with a 'J' validation flag as the reported result is an estimated with an undetermined bias.

In sample MBDS-R12-F05, total PeCDF and total HpCDD exhibited positive detections below the quantitation limits. They have been qualified with a 'J' validation flag as the reported result is an estimated with an undetermined bias. 1,2,3,6,7,8-HxCDF, 2,3,4,6,7,8-HxCDF, 1,2,3,6,7,8-HxCDD, 1,2,3,4,6,7,8-HpCDF, and OCDF were reported at an EMPC. They have been qualified with a 'UJ' validation flag due to possible interference in the sample and positive detection in the method blank.

In sample MBDS-R05-F01, total TCDD, total HxCDD, and OCDD exhibited a positive detection below the quantitation limit. It has been qualified with a 'J' validation flag as the reported result is an estimated with an undetermined bias. 1,2,3,6,7,8-HxCDF, 2,3,4,6,7,8-HxCDF, and 1,2,3,4,6,7,8-HpCDD were reported at an EMPC. 1,2,3,4,6,7,8-HpCDD has been qualified with a 'J+' validation flag as the reported result is likely overestimated due to possible interference in the sample. 1,2,3,6,7,8-HxCDF and 2,3,4,6,7,8-HxCDF have been qualified with a 'UJ' validation flag due to possible interference in the sample and positive detection in the method blank.

In sample MBDS-R05-O01, total TCDD, total PeCDF, total HxCDF, 1,2,3,4,7,8-HxCDD, 1,2,3,6,7,8-HxCDD, 1,2,3,7,8,9-HxCDD, 1,2,3,4,6,7,8-HpCDF, total HpCDF, and OCDF exhibited positive detections below the quantitation limit. They have been qualified with a 'J' validation flag as the reported result is an estimated with an undetermined bias. 1,2,3,7,8-PeCDF, 2,3,4,7,8-PeCDF, 1,2,3,7,8-PeCDD, 2,3,4,6,7,8-HxCDF, and 1,2,3,7,8,9-HxCDF were reported at an EMPC. 1,2,3,7,8-PeCDF, and 1,2,3,7,8-PeCDD have been qualified with a 'J+' validation flag as the reported results are likely overestimated due to possible interference in the sample. 2,3,4,7,8-PeCDF, 2,3,4,6,7,8-HxCDF, and 1,2,3,7,8,9-HxCDF have been qualified with a 'UJ' validation flag due to possible interference in the sample and positive detection in the method blank.

In sample MBDS-R05-A01, total TCDD and total HxCDD exhibited positive detections below the quantitation limit. They have been qualified with a 'J' validation flag as the reported result is an estimated with an undetermined bias. 1,2,3,7,8-PeCDF, 1,2,3,6,7,8-HxCDF, 1,2,3,7,8,9-HxCDF, and 1,2,3,6,7,8-HxCDD were reported at an EMPC. 1,2,3,7,8-PeCDF has been qualified with a 'J+' validation flag as the reported result is likely overestimated due to possible interference in the sample. 1,2,3,6,7,8-HxCDF, 1,2,3,7,8,9-HxCDF, and 1,2,3,6,7,8-HxCDD have been qualified with a 'UJ' validation flag due to possible interference in the sample and positive detection in the method blank.

In sample MBDS-R06-A01, 2,3,7,8-TCDD, 1,2,3,7,8-PeCDD, total HxCDF, and 1,2,3,6,7,8-HxCDD exhibited positive detections below the quantitation limit. They have been qualified with a 'J' validation flag as the reported result is an estimated with an undetermined bias. 2,3,7,8-TCDF was reported at an EMPC and has been qualified with a 'UJ' validation flag due to possible interference in the sample and positive detection in the trip blank. 1,2,3,7,8,9-HxCDF, 1,2,3,4,7,8-HxCDD, and 1,2,3,7,8,9-HxCDD were reported at an EMPC. 1,2,3,4,7,8-HxCDD and 1,2,3,7,8,9-HxCDD have been qualified with a 'J+' validation flag as the reported results are likely overestimated due to possible interference in the sample. 1,2,3,7,8,9-HxCDF has been qualified with a 'UJ' validation flag due to possible interference in the sample and positive detection in the method blank.

In sample MBDS-R13-O01, 1,2,3,7,8-PeCDF and OCDD exhibited positive detections below the quantitation limit. They have been qualified with a 'J' validation flag as the reported result is an estimated with an undetermined bias. 2,3,4,7,8-PeCDF, 2,3,4,6,7,8-HxCDF, 1,2,3,7,8,9-HxCDF, and 1,2,3,7,8,9-HxCDD were reported at an EMPC. They have been qualified with a 'UJ' validation flag due to possible interference in the sample and positive detection in the method blank.

In sample MBDS-R06-O01, 1,2,3,7,8-PeCDF, 1,2,3,7,8-PeCDD, total PeCDD, total HxCDD, 1,2,3,4,6,7,8-HpCDD, total HpCDD, and OCDD exhibited positive detections below the quantitation limit. They have been qualified with a 'J' validation flag as the reported result is an estimated with an undetermined bias. 2,3,7,8-TCDD, 2,3,4,7,8-PeCDF, 2,3,4,6,7,8-HxCDF, 1,2,3,6,7,8-HxCDD, and 1,2,3,7,8,9-HxCDD were reported at an EMPC. 2,3,7,8-TCDD has been qualified with a 'J+' validation flag and the reported results are likely overestimated due to possible interference in the sample. 2,3,4,7,8-PeCDF, 2,3,4,6,7,8-HxCDF, 1,2,3,6,7,8-HxCDD, and 1,2,3,7,8,9-HxCDD have been qualified with a 'UJ' validation flag due to possible interference in the sample and positive detection in the method blank.

In sample MBDS-R06-F01, 2,3,4,7,8-PeCDF, 1,2,3,6,7,8-HxCDF, 2,3,4,6,7,8-HxCDF, and 1,2,3,6,7,8-HxCDD were reported at an EMPC. They have been qualified with a 'UJ' validation flag due to possible interference in the sample and positive detection in the method blank.

In sample MBDS-R07-F01, 1,2,3,7,8-PeCDF, 1,2,3,6,7,8-HxCDF, 2,3,4,6,7,8-HxCDF, 1,2,3,6,7,8-HxCDD, 1,2,3,7,8,9-HxCDD, total HpCDF, and OCDF were reported below the quantitation limit. They have been qualified with a 'J' validation flag as the reported result is an estimated with an undetermined bias. 1,2,3,7,8-PeCDD, 1,2,3,4,7,8-HxCDF, and 1,2,3,4,7,8-HxCDD were reported at an EMPC. 1,2,3,7,8-PeCDD and 1,2,3,4,7,8-HxCDD have been qualified with a 'J+' validation flag as the reported result is likely overestimated due to possible interference in the sample. 1,2,3,4,7,8-HxCDF has been qualified with a 'UJ' validation flag due to possible interference in the sample and positive detection in the method blank. 1,2,3,4,6,7,8-HpCDF was reported at an EMPC and has been qualified with an 'R' validation flag due to due to interference from polychlorinated diphenyl ethers (PCDE).

In sample MBDS-R07-O01, total PeCDF, total PeCDD, total HxCDF, 1,2,3,4,7,8-HxCDD, 1,2,3,4,6,7,8-HpCDD, and OCDF were reported below the quantitation limit. They have been qualified with a 'J' validation flag as the reported result is an estimated with an undetermined bias. 1,2,3,4,7,8-HxCDF has been reported at an EMPC and has been qualified with a 'UJ' validation flag due to possible interference in the sample and positive detection in the method blank.

In sample MBDS-R07-O04, total PeCDF, 1,2,3,7,8-PeCDD, total PeCDD, 1,2,3,6,7,8-HxCDF, total HxCDF, and 1,2,3,4,6,7,8-HpCDD exhibited positive detections below the quantitation limit. They have been qualified with a 'J' validation flag as the reported result is an estimated with an undetermined bias. 2,3,4,7,8-PeCDF, 2,3,4,6,7,8-HxCDF, 1,2,3,6,7,8-HxCDD, 1,2,3,7,8,9-HxCDD, 1,2,3,4,6,7,8-HpCDF, and OCDF were reported at an EMPC. They have been qualified with a 'UJ' validation flag due to possible interference in the sample and positive detection in the method blank.

In sample MBDS-R07-O05, 2,3,7,8-TCDF, total TCDF, and total PeCDD exhibited positive detections below the quantitation limit. They have been qualified with a 'J' validation flag as the reported result is an estimated with an undetermined bias. 1,2,3,4,7,8-HxCDF, 1,2,3,6,7,8-HxCDF, OCDF, and OCDD were reported at an EMPC. They have been qualified with a 'UJ' validation flag due to possible interference in the sample and positive detection in the method blank.

In sample MBDS-R07-A01, 1,2,3,6,7,8-HxCDF, 2,3,4,6,7,8-HxCDF, and 1,2,3,6,7,8-HxCDD were reported at an EMPC. They have been qualified with a 'UJ' validation flag due to possible interference in the sample and positive detection in the method blank.

In sample MBDS-R13-F01, total HxCDD exhibited a positive detection below the quantitation limit. It has been qualified with a 'J' validation flag as the reported result is an estimated with an undetermined bias. 1,2,3,6,7,8-HxCDF, 2,3,4,6,7,8-HxCDF, 1,2,3,4,7,8-HxCDD, 1,2,3,6,7,8-HxCDD, 1,2,3,4,6,7,8-HpCDF, and 1,2,3,4,6,7,8-HpCDD were reported at an EMPC. 1,2,3,4,7,8-HxCDD and 1,2,3,4,6,7,8-HpCDD has been qualified with a 'J+' validation flag as the reported results are likely overestimated due to possible interference in the sample. 1,2,3,6,7,8-HxCDF, 2,3,4,6,7,8-HxCDF, 1,2,3,6,7,8-HxCDD, and 1,2,3,4,6,7,8-HpCDF have been qualified with a 'UJ' validation flag due to possible interference in the sample and positive detection in the method blank.

In sample MBDS-R13-A01, 1,2,3,7,8-PeCDD, 1,2,3,4,6,7,8-HpCDD, and total HpCDD exhibited positive detections below the quantitation limit. They have been qualified with a 'J' validation flag as the reported result is an estimated with an undetermined bias. 1,2,3,4,7,8-HxCDF, 1,2,3,6,7,8-HxCDF, 1,2,3,6,7,8-HxCDD, 1,2,3,7,8,9-HxCDD, and OCDF were reported at an EMPC. They have been qualified with a 'UJ' validation flag due to possible interference in the sample and positive detection in the method blank. 1,2,3,4,6,7,8-HpCDF was reported at an EMPC and has been qualified with an 'R' validation flag due to due to interference from polychlorinated diphenyl ethers (PCDE).

In sample MBDS-R18-A01, total TCDD, 1,2,3,4,6,7,8-HpCDD, total HpCDD, and OCDD exhibited positive detections below the quantitation limit. They have been qualified with a 'J' validation flag as the reported result is an estimated with an undetermined bias. 2,3,4,7,8-PeCDF, 1,2,3,6,7,8-HxCDD and OCDF were reported at an EMPC. They have been qualified with a 'J+' validation flag as the reported results are likely overestimated due to possible interference in the sample.

In sample MBDS-R18-F01, 2,3,7,8-TCDF was reported at an EMPC. It has been qualified with a 'UJ' validation flag due to possible interference in the sample and positive detection in the trip blank. 1,2,3,4,7,8-HxCDF, 1,2,3,4,6,7,8-HpCDD, and OCDF were reported at an EMPC. They have been qualified with a 'UJ' validation flag due to possible interference in the sample and positive detection in the method blank.

In sample MBDS-R18-O01, 1,2,3,7,8-PeCDD, 1,2,3,6,7,8-HxCDF, 1,2,3,6,7,8-HxCDD, total HxCDD, 1,2,3,4,6,7,8-HpCDF, 1,2,3,4,6,7,8-HpCDD and total HpCDD exhibited positive detections below the quantitation limit. They have been qualified with a 'J' validation flag as the reported result is an estimated with an undetermined bias. 1,2,3,4,7,8,9-HpCDF was reported at an EMPC and has been qualified with a 'J+' validation flag as the reported result is likely overestimated due to possible interference in the sample.

In sample MBDS-R12-A01, 1,2,3,7,8-PeCDD, 1,2,3,6,7,8-HxCDF, 1,2,3,6,7,8-HxCDD, total HxCDD, 1,2,3,4,7,8,9-HpCDF, total HpCDF, 1,2,3,4,6,7,8-HpCDD, and total HpCDD exhibited positive detections below the quantitation limit. They have been qualified with a 'J' validation flag as the reported result is an estimated with an undetermined bias. 2,3,4,7,8-PeCDF, 1,2,3,4,7,8-HxCDF, 2,3,4,6,7,8-HxCDF, 1,2,3,7,8,9-HxCDD, and 1,2,3,4,6,7,8-HpCDF were reported at an EMPC. 2,3,4,7,8-PeCDF, 2,3,4,6,7,8-HxCDF, and 1,2,3,4,6,7,8-HxCDF have been qualified with a 'J+' validation flag as the reported results are likely overestimated due to possible interference in the sample. 1,2,3,4,7,8-HxCDF and 1,2,3,4,6,7,8-HpCDF have been qualified with a 'UJ' validation flag due to possible interference in the sample and positive detection in the method blank.

11. Chromatogram Quality

No comments relating to chromatogram quality.

5. SUMMARY OF DATA USABILITY

The data validation summary flag table shows that qualifiers were applied to the target analytes for SDG# 1074005.

DATA VALIDATION SUMMARY TABLE						
Compound	MBDS-R12-O01	MBDS-R12-F01	MBDS-R12-F04	MBDS-R12-F05	MBDS-R05-F01	MBDS-R05-O01
2,3,7,8-TCDF		U			U	U
Total TCDF		U			U	U
2,3,7,8-TCDD		J+	J+			
Total TCDD					J	J
1,2,3,7,8-PeCDF			J			J+
2,3,4,7,8-PeCDF		UJ	UJ	U	U	UJ
Total PeCDF		U	U	J	U	J
1,2,3,7,8-PeCDD			J+			J+
Total PeCDD					U	U
1,2,3,4,7,8-HxCDF	U	U	U	U		U
1,2,3,6,7,8-HxCDF	U	U	UJ	U	UJ	U
2,3,4,6,7,8-HxCDF	UJ	U	UJ	UJ	UJ	UJ
1,2,3,7,8,9-HxCDF	U	U	U	UJ	U	UJ
Total HxCDF	U	U	U	U	U	J
1,2,3,4,7,8-HxCDD						J
1,2,3,6,7,8-HxCDD	U			UJ	U	J
1,2,3,7,8,9-HxCDD					U	J
Total HxCDD	U				J	
1,2,3,4,6,7,8-HpCDF	U	U	UJ	UJ	U	J
1,2,3,4,7,8,9-HpCDF						
Total HpCDF	U	U		U	U	J
1,2,3,4,6,7,8-HpCDD	J	U	U	U	J+	
Total HpCDD	U	U	U	J		
OCDF	U	UJ	UJ	UJ	U	J
OCDD		UJ	J	U	J	

DATA VALIDATION SUMMARY TABLE						
Compound	MBDS-R05-A01	MBDS-R06-A01	MBDS-R13-O01	MBDS-R06-O01	MBDS-R06-F01	MBDS-R07-F01
2,3,7,8-TCDF		UJ			U	U
Total TCDF		U	U	U	U	
2,3,7,8-TCDD		J		J+		
Total TCDD	J					
1,2,3,7,8-PeCDF	J+		J	J		J
2,3,4,7,8-PeCDF	U	U	UJ	UJ	UJ	U
Total PeCDF	U	U	U	U		
1,2,3,7,8-PeCDD		J		J		J+
Total PeCDD	U		U	J		
1,2,3,4,7,8-HxCDF	U	U	U			UJ
1,2,3,6,7,8-HxCDF	UJ	U	U		UJ	J
2,3,4,6,7,8-HxCDF		U	UJ	UJ	UJ	J
1,2,3,7,8,9-HxCDF	UJ	UJ	UJ	U		
Total HxCDF	U	J	U	U	U	
1,2,3,4,7,8-HxCDD		J+				J+
1,2,3,6,7,8-HxCDD	UJ	J		UJ	UJ	J
1,2,3,7,8,9-HxCDD	U	J+	UJ	UJ	U	J
Total HxCDD	J			J		
1,2,3,4,6,7,8-HpCDF	U	U	U	U	U	R
1,2,3,4,7,8,9-HpCDF		U				
Total HpCDF	U	U	U	U	U	J
1,2,3,4,6,7,8-HpCDD	U		U	J	U	
Total HpCDD	U		U	J	U	
OCDF	U	U	U	U	U	J
OCDD	U		J	J	U	

DATA VALIDATION SUMMARY TABLE						
Compound	MBDS-R07-O01	MBDS-R07-O04	MBDS-R07-O05	MBDS-R07-A01	MBDS-R13-F01	MBDS-R13-A01
2,3,7,8-TCDF			J			U
Total TCDF			J	U	U	U
2,3,7,8-TCDD						
Total TCDD						
1,2,3,7,8-PeCDF						
2,3,4,7,8-PeCDF	U	UJ		U	U	U
Total PeCDF	J	J		U	U	U
1,2,3,7,8-PeCDD		J				J
Total PeCDD	J	J	J		U	U
1,2,3,4,7,8-HxCDF	UJ		UJ	U	U	UJ
1,2,3,6,7,8-HxCDF	U	J	UJ	UJ	UJ	UJ
2,3,4,6,7,8-HxCDF	U	UJ	U	UJ	UJ	U
1,2,3,7,8,9-HxCDF				U		
Total HxCDF	J	J	U	U	U	U
1,2,3,4,7,8-HxCDD	J				J+	
1,2,3,6,7,8-HxCDD	U	UJ		UJ	UJ	UJ
1,2,3,7,8,9-HxCDD	U	UJ			U	UJ
Total HxCDD					J	U
1,2,3,4,6,7,8-HpCDF	U	UJ	U	U	UJ	R
1,2,3,4,7,8,9-HpCDF						
Total HpCDF	U	U	U	U	U	
1,2,3,4,6,7,8-HpCDD	J	J	U	U	J+	J
Total HpCDD			U	U	U	J
OCDF	J	UJ	UJ	U	U	UJ
OCDD			UJ	U		

DATA VALIDATION SUMMARY TABLE				
Compound	MBDS-R18-A01	MBDS-R18-F01	MBDS-R18-O01	MBDS-R12-A01
2,3,7,8-TCDF		UJ	U	U
Total TCDF	U	U	U	U
2,3,7,8-TCDD				
Total TCDD	J			
1,2,3,7,8-PeCDF				
2,3,4,7,8-PeCDF	UJ			J+
Total PeCDF	U		U	U
1,2,3,7,8-PeCDD			J	J
Total PeCDD			U	U
1,2,3,4,7,8-HxCDF		UJ	U	UJ
1,2,3,6,7,8-HxCDF	U		J	J
2,3,4,6,7,8-HxCDF		U		J+
1,2,3,7,8,9-HxCDF				
Total HxCDF	U	U	U	U
1,2,3,4,7,8-HxCDD				
1,2,3,6,7,8-HxCDD	UJ	U	J	J
1,2,3,7,8,9-HxCDD		U		J+
Total HxCDD	U	U	J	J
1,2,3,4,6,7,8-HpCDF	U	U	J	UJ
1,2,3,4,7,8,9-HpCDF			J+	J
Total HpCDF	U	U		J
1,2,3,4,6,7,8-HpCDD	J	UJ	J	J
Total HpCDD	J	U	J	J
OCDF	UJ	UJ		U
OCDD	J	U		

Data Validation Summary Table Qualifier Codes

U = Result is a non-detect.

UJ = Result is a non-detect, but is estimated due to QC issues.

J = Result was detected, but is estimated with an undetermined bias due to QC issues.

J+ = Result was detected, but is likely overestimated due to QC issues.

J- = Result was detected, but is likely underestimated due to QC issues.

R = Result is rejected and is highly questionable for use as a quantitative value due to significant QC issues.

6. REFERENCES

Contract Laboratory Program National Functional Guidelines for Organic Data Review, EPA 540/R-99/008, October 1999, U.S. Environmental Protection Agency, Cincinnati, Ohio.

USEPA Analytical Operations / Data Quality Center, *National Functional Guidelines for Chlorinated Dioxin / Furan Data Review*, EPA 540-R-02-003, August 2002.

USEPA, *Methods for the Analysis of Wastes, High Resolution Gas Chromatography / Mass Spectrometry*, SW-846, July 2002.

USEPA Test Methods for Evaluating Solid Waste Physical/Chemical Methods, Doc. No. SW-846, 3rd Ed., Method 8290, Polychlorinated Dibenzodioxins (PCDDs) and Polychlorinated Dibenzofurans (PCDFs) by High Resolution Gas Chromatography/High Resolution Mass Spectrometry (HRGC/HRMS), Revision 0, September 1994.

9. ATTACHMENTS

The following items are included as an attachment to this L&V report:

- A. Qualified reported results (Form I)

Attachment A
Qualified Reported Results



Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612-607-6444

Method 8290 Sample Analysis Results

Client - Montana Dept. Of Env. Quality

Client's Sample ID	MBDS-R12-001		
Lab Sample ID	1074005001		
Filename	F80614A_12		
Injected By	BAL		
Total Amount Extracted	15.9 g	Matrix	Soil
% Moisture	32.7	Dilution	NA
Dry Weight Extracted	10.7 g	Collected	05/24/2008
ICAL ID	F80613	Received	05/28/2008
CCal Filename(s)	F80613A_32 & F80615A_13	Extracted	06/09/2008
Method Blank ID	BLANK-16571	Analyzed	06/14/2008 23:30

Native Isomers	Conc ng/Kg	EMPC ng/Kg	RL ng/Kg	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	ND	—	0.095	2,3,7,8-TCDF-13C	2.00	96
Total TCDF	ND	—	0.095	2,3,7,8-TCDD-13C	2.00	97
				1,2,3,7,8-PeCDF-13C	2.00	96
2,3,7,8-TCDD	ND	—	0.170	2,3,4,7,8-PeCDF-13C	2.00	98
Total TCDD	ND	—	0.170	1,2,3,7,8-PeCDD-13C	2.00	114
				1,2,3,4,7,8-HxCDF-13C	2.00	79
1,2,3,7,8-PeCDF	ND	—	0.110	1,2,3,6,7,8-HxCDF-13C	2.00	74
2,3,4,7,8-PeCDF	ND	—	0.073	2,3,4,6,7,8-HxCDF-13C	2.00	75
Total PeCDF	ND	—	0.093	1,2,3,7,8,9-HxCDF-13C	2.00	86
				1,2,3,4,7,8-HxCDD-13C	2.00	84
1,2,3,7,8-PeCDD	ND	—	0.100	1,2,3,6,7,8-HxCDD-13C	2.00	78
Total PeCDD	ND	—	0.100	1,2,3,4,6,7,8-HpCDF-13C	2.00	73
				1,2,3,4,7,8,9-HpCDF-13C	2.00	73
1,2,3,4,7,8-HxCDF	0.062	—	0.037	1,2,3,4,6,7,8-HpCDD-13C	2.00	77
1,2,3,6,7,8-HxCDF	0.100	—	0.044	OCDD-13C	4.00	71
2,3,4,6,7,8-HxCDF	—	0.082	0.059			
1,2,3,7,8,9-HxCDF	0.064	—	0.052	1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	0.230	—	0.048	1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	ND	—	0.083	2,3,7,8-TCDD-37Cl4	0.20	105
1,2,3,6,7,8-HxCDD	0.098	—	0.084			
1,2,3,7,8,9-HxCDD	ND	—	0.055			
Total HxCDD	0.098	—	0.074			
1,2,3,4,6,7,8-HpCDF	0.440	—	0.140	Total 2,3,7,8-TCDD		
1,2,3,4,7,8,9-HpCDF	ND	—	0.290	Equivalence: 0.064 ng/Kg		
Total HpCDF	1.100	—	0.210	(Using ITE Factors)		
1,2,3,4,6,7,8-HpCDD	1.200	—	0.120			
Total HpCDD	1.200	—	0.120			
OCDF	1.100	—	0.140			
OCDD	14.000	—	0.190			

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).

EMPC = Estimated Maximum Possible Concentration

RL = Reporting Limit.

ND = Not Detected

NA = Not Applicable

NC = Not Calculated

Results reported on a dry weight basis and are valid to no more than 2 significant figures.

J = Value below calibration range

B = Less than 10x higher than method blank level

I = Interference present

AS
7/24/08

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc.

8 of 36

Report No..... 1074005_8290



Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612-607-6444

Method 8290 Sample Analysis Results

Client - Montana Dept. Of Env. Quality

Client's Sample ID	MBDS-R12-F01		
Lab Sample ID	1074005002		
Filename	F80613A_25		
Injected By	BAL		
Total Amount Extracted	14.6 g	Matrix	Soil
% Moisture	30.6	Dilution	NA
Dry Weight Extracted	10.2 g	Collected	05/24/2008
ICAL ID	F80613	Received	05/28/2008
CCal Filename(s)	F80613A_16 & F80613A_32	Extracted	06/09/2008
Method Blank ID	BLANK-16571	Analyzed	06/14/2008 07:48

Native Isomers	Conc ng/Kg	EMPC ng/Kg	RL ng/Kg	Internal Standards	ng's Added	Percent Recovery	
2,3,7,8-TCDF	0.130	—	0.090	+U	2,3,7,8-TCDF-13C	2.00	93
Total TCDF	0.130	—	0.090	+U	2,3,7,8-TCDD-13C	2.00	94
					1,2,3,7,8-PeCDF-13C	2.00	92
2,3,7,8-TCDD	—	0.130	0.089	+J+	2,3,4,7,8-PeCDF-13C	2.00	92
Total TCDD	8.300	—	0.089		1,2,3,7,8-PeCDD-13C	2.00	107
					1,2,3,4,7,8-HxCDF-13C	2.00	82
1,2,3,7,8-PeCDF	ND	—	0.076		1,2,3,6,7,8-HxCDF-13C	2.00	75
2,3,4,7,8-PeCDF	—	0.084	0.052	+UJ	2,3,4,6,7,8-HxCDF-13C	2.00	77
Total PeCDF	0.110	—	0.064	+U	1,2,3,7,8,9-HxCDF-13C	2.00	85
					1,2,3,4,7,8-HxCDD-13C	2.00	83
1,2,3,7,8-PeCDD	ND	—	0.078		1,2,3,6,7,8-HxCDD-13C	2.00	80
Total PeCDD	5.700	—	0.078		1,2,3,4,6,7,8-HpCDF-13C	2.00	71
					1,2,3,4,7,8,9-HpCDF-13C	2.00	71
1,2,3,4,7,8-HxCDF	0.100	—	0.056	B+U	1,2,3,4,6,7,8-HpCDD-13C	2.00	79
1,2,3,6,7,8-HxCDF	0.130	—	0.048	B+U	OCDD-13C	4.00	75
2,3,4,6,7,8-HxCDF	0.110	—	0.053	B+U			
1,2,3,7,8,9-HxCDF	0.072	—	0.059	+U	1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	0.570	—	0.054	B+U	1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	ND	—	0.120		2,3,7,8-TCDD-37Cl4	0.20	101
1,2,3,6,7,8-HxCDD	ND	—	0.160				
1,2,3,7,8,9-HxCDD	ND	—	0.150				
Total HxCDD	8.000	—	0.140				
1,2,3,4,6,7,8-HpCDF	0.270	—	0.120	B+U	Total 2,3,7,8-TCDD		
1,2,3,4,7,8,9-HpCDF	ND	—	0.140		Equivalence: 0.061 ng/Kg		
Total HpCDF	0.270	—	0.130	B+U	(Using ITE Factors)		
1,2,3,4,6,7,8-HpCDD	0.520	—	0.120	+U			
Total HpCDD	0.520	—	0.120	+U			
OCDF	—	0.290	0.120	+UJ			
OCDD	—	2.300	0.240	+UJ			

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
EMPC = Estimated Maximum Possible Concentration
RL = Reporting Limit.

ND = Not Detected
NA = Not Applicable
NC = Not Calculated

Results reported on a dry weight basis and are valid to no more than 2 significant figures.

J = Value below calibration range

B = Less than 10x higher than method blank level

I = Interference present

MJ
7/24/08

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc.

9 of 36

Report No.1074005_8290



Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612-607-6444

Method 8290 Sample Analysis Results

Client - Montana Dept. Of Env. Quality

Client's Sample ID	MBDS-R12-F04		
Lab Sample ID	1074005003		
Filename	F80613A_26		
Injected By	BAL		
Total Amount Extracted	15.2 g	Matrix	Soil
% Moisture	31.0	Dilution	NA
Dry Weight Extracted	10.5 g	Collected	05/24/2008
ICAL ID	F80613	Received	05/28/2008
CCal Filename(s)	F80613A_16 & F80613A_32	Extracted	06/09/2008
Method Blank ID	BLANK-16571	Analyzed	06/14/2008 08:37

Native Isomers	Conc ng/Kg	EMPC ng/Kg	RL ng/Kg	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	ND	—	0.110	2,3,7,8-TCDF-13C	2.00	97
Total TCDF	ND	—	0.110	2,3,7,8-TCDD-13C	2.00	96
				1,2,3,7,8-PeCDF-13C	2.00	98
2,3,7,8-TCDD	—	0.170	0.110 + J	2,3,4,7,8-PeCDF-13C	2.00	102
Total TCDD	17.000	—	0.110	1,2,3,7,8-PeCDD-13C	2.00	116
				1,2,3,4,7,8-HxCDF-13C	2.00	82
1,2,3,7,8-PeCDF	0.097	—	0.069 + J	1,2,3,6,7,8-HxCDF-13C	2.00	76
2,3,4,7,8-PeCDF	—	0.091	0.055 + UJ	2,3,4,6,7,8-HxCDF-13C	2.00	78
Total PeCDF	0.270	—	0.062 + U	1,2,3,7,8,9-HxCDF-13C	2.00	87
				1,2,3,4,7,8-HxCDD-13C	2.00	86
1,2,3,7,8-PeCDD	—	0.200	0.077 + J	1,2,3,6,7,8-HxCDD-13C	2.00	82
Total PeCDD	15.000	—	0.077	1,2,3,4,6,7,8-HpCDF-13C	2.00	73
				1,2,3,4,7,8,9-HpCDF-13C	2.00	75
1,2,3,4,7,8-HxCDF	0.088	—	0.051 + U	1,2,3,4,6,7,8-HpCDD-13C	2.00	83
1,2,3,6,7,8-HxCDF	—	0.058	0.051 + UJ	OCDD-13C	4.00	68
2,3,4,6,7,8-HxCDF	—	0.110	0.061 + UJ			
1,2,3,7,8,9-HxCDF	0.100	—	0.051 + U	1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	0.370	—	0.054 + U	1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	ND	—	0.120	2,3,7,8-TCDD-37Cl4	0.20	105
1,2,3,6,7,8-HxCDD	ND	—	0.110			
1,2,3,7,8,9-HxCDD	ND	—	0.130			
Total HxCDD	15.000	—	0.120			
1,2,3,4,6,7,8-HpCDF	—	0.350	0.110 + UJ	Total 2,3,7,8-TCDD		
1,2,3,4,7,8,9-HpCDF	ND	—	0.130	Equivalence: 0.034 ng/Kg		
Total HpCDF	ND	—	0.120	(Using ITE Factors)		
1,2,3,4,6,7,8-HpCDD	0.620	—	0.130 + U			
Total HpCDD	1.500	—	0.130 + U			
OCDF	—	0.340	0.140 + UJ			
OCDD	3.800	—	0.150 + U			

Conc = Concentration (Totals include 2,3,7,8-substituted isomers)
EMPC = Estimated Maximum Possible Concentration
RL = Reporting Limit.

ND = Not Detected
NA = Not Applicable
NC = Not Calculated

Results reported on a dry weight basis and are valid to no more than 2 significant figures.

J = Value below calibration range

B = Less than 10x higher than method blank level

I = Interference present

AB
7/24/08

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc.



Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612-607-6444

Method 8290 Sample Analysis Results

Client - Montana Dept. Of Env. Quality

Client's Sample ID	MBDS-R12-F05		
Lab Sample ID	1074005004		
Filename	F80613A_27		
Injected By	BAL		
Total Amount Extracted	4.48 g	Matrix	Soil
% Moisture	0.0	Dilution	NA
Dry Weight Extracted	4.48 g	Collected	05/24/2008
ICAL ID	F80613	Received	05/28/2008
C-Cal Filename(s)	F80613A_16 & F80613A_32	Extracted	06/09/2008
Method Blank ID	BLANK-16571	Analyzed	06/14/2008 09:27

Native Isomers	Conc ng/Kg	EMPC ng/Kg	RL ng/Kg	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	ND	—	0.240	2,3,7,8-TCDF-13C	2.00	97
Total TCDF	ND	—	0.240	2,3,7,8-TCDD-13C	2.00	97
				1,2,3,7,8-PeCDF-13C	2.00	101
2,3,7,8-TCDD	ND	—	0.330	2,3,4,7,8-PeCDF-13C	2.00	104
Total TCDD	ND	—	0.330	1,2,3,7,8-PeCDD-13C	2.00	117
				1,2,3,4,7,8-HxCDF-13C	2.00	82
1,2,3,7,8-PeCDF	ND	—	0.180	1,2,3,6,7,8-HxCDF-13C	2.00	77
2,3,4,7,8-PeCDF	0.20	—	0.110	+U 2,3,4,6,7,8-HxCDF-13C	2.00	79
Total PeCDF	0.20	—	0.140	+J 1,2,3,7,8,9-HxCDF-13C	2.00	89
				1,2,3,4,7,8-HxCDD-13C	2.00	87
1,2,3,7,8-PeCDD	ND	—	0.170	1,2,3,6,7,8-HxCDD-13C	2.00	84
Total PeCDD	ND	—	0.170	1,2,3,4,6,7,8-HpCDF-13C	2.00	76
				1,2,3,4,7,8,9-HpCDF-13C	2.00	76
1,2,3,4,7,8-HxCDF	0.15	—	0.110	B+U 1,2,3,4,6,7,8-HpCDD-13C	2.00	86
1,2,3,6,7,8-HxCDF	0.10	—	0.078	B+U OCDD-13C	4.00	80
2,3,4,6,7,8-HxCDF	—	0.14	0.092	+UJ		
1,2,3,7,8,9-HxCDF	—	0.17	0.140	+UJ 1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	0.25	—	0.100	B+U 1,2,3,7,8,9-HxCDD-13C	2.00	NA
				2,3,7,8-TCDD-37Cl4	0.20	104
1,2,3,4,7,8-HxCDD	ND	—	0.160			
1,2,3,6,7,8-HxCDD	—	0.17	0.150	+UJ		
1,2,3,7,8,9-HxCDD	ND	—	0.180			
Total HxCDD	ND	—	0.160			
1,2,3,4,6,7,8-HpCDF	—	0.23	0.140	+UJ Total 2,3,7,8-TCDD		
1,2,3,4,7,8,9-HpCDF	ND	—	0.200	Equivalence: 0.13 ng/Kg		
Total HpCDF	0.17	—	0.170	B+U (Using ITE Factors)		
1,2,3,4,6,7,8-HpCDD	0.35	—	0.120	+U		
Total HpCDD	0.35	—	0.120	+J		
OCDF	—	0.44	0.240	+UJ		
OCDD	1.70	—	0.360	B+U		

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
EMPC = Estimated Maximum Possible Concentration
RL = Reporting Limit.

ND = Not Detected
NA = Not Applicable
NC = Not Calculated

Results reported on a dry weight basis and are valid to no more than 2 significant figures.

J = Value below calibration range

B = Less than 10x higher than method blank level

I = Interference present

*KB
7/24/08*

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc.



Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612-607-6444

Method 8290 Sample Analysis Results

Client - Montana Dept. Of Env. Quality

Client's Sample ID	MBDS-R05-F01				
Lab Sample ID	1074005005				
Filename	F80613A_28				
Injected By	BAL				
Total Amount Extracted	16.6 g	Matrix	Soil		
% Moisture	35.4	Dilution	NA		
Dry Weight Extracted	10.7 g	Collected	05/24/2008		
ICAL ID	F80613	Received	05/28/2008		
CCal Filename(s)	F80613A_16 & F80613A_32	Extracted	06/09/2008		
Method Blank ID	BLANK-16571	Analyzed	06/14/2008 10:16		

Native Isomers	Conc ng/Kg	EMPC ng/Kg	RL ng/Kg	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	0.110	—	0.100	+U 2,3,7,8-TCDF-13C	2.00	96
Total TCDF	0.110	—	0.100	+U 2,3,7,8-TCDD-13C	2.00	96
				1,2,3,7,8-PeCDF-13C	2.00	98
2,3,7,8-TCDD	ND	—	0.140	2,3,4,7,8-PeCDF-13C	2.00	101
Total TCDD	0.170	—	0.140	+J 1,2,3,7,8-PeCDD-13C	2.00	114
				1,2,3,4,7,8-HxCDF-13C	2.00	80
1,2,3,7,8-PeCDF	ND	—	0.066	1,2,3,6,7,8-HxCDF-13C	2.00	75
2,3,4,7,8-PeCDF	0.072	—	0.039	+U 2,3,4,6,7,8-HxCDF-13C	2.00	76
Total PeCDF	0.150	—	0.052	+U 1,2,3,7,8,9-HxCDF-13C	2.00	85
				1,2,3,4,7,8-HxCDD-13C	2.00	86
1,2,3,7,8-PeCDD	ND	—	0.076	1,2,3,6,7,8-HxCDD-13C	2.00	80
Total PeCDD	0.120	—	0.076	+U 1,2,3,4,6,7,8-HpCDF-13C	2.00	72
				1,2,3,4,7,8,9-HpCDF-13C	2.00	73
1,2,3,4,7,8-HxCDF	ND	—	0.061	1,2,3,4,6,7,8-HpCDD-13C	2.00	79
1,2,3,6,7,8-HxCDF	—	0.075	0.057	+UJ OGDD-13C	4.00	74
2,3,4,6,7,8-HxCDF	—	0.072	0.046	+UJ		
1,2,3,7,8,9-HxCDF	0.100	—	0.068	+U 1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	0.100	—	0.058	+U 1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	ND	—	0.063	2,3,7,8-TCDD-37Cl4	0.20	105
1,2,3,6,7,8-HxCDD	0.120	—	0.081	+U		
1,2,3,7,8,9-HxCDD	0.150	—	0.085	+U		
Total HxCDD	0.910	—	0.077	+J		
1,2,3,4,6,7,8-HpCDF	0.290	—	0.052	+U Total 2,3,7,8-TCDD		
1,2,3,4,7,8,9-HpCDF	ND	—	0.089	Equivalence: 0.097 ng/Kg		
Total HpCDF	0.290	—	0.070	+U (Using ITE Factors)		
1,2,3,4,6,7,8-HpCDD	—	1,000	0.094	+J+		
Total HpCDD	ND	—	0.094			
OCDF	0.500	—	0.110	+U		
OCDD	9.000	—	0.089	+J		

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
EMPC = Estimated Maximum Possible Concentration
RL = Reporting Limit.

ND = Not Detected
NA = Not Applicable
NC = Not Calculated

Results reported on a dry weight basis and are valid to no more than 2 significant figures.

J = Value below calibration range

B = Less than 10x higher than method blank level

I = Interference present

JS
7/24/08

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc.

12 of 36

Report No.....1074005_8290



Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612-607-6444

Method 8290 Sample Analysis Results

Client - Montana Dept. Of Env. Quality

Client's Sample ID	MBDS-R05-001		
Lab Sample ID	1074005006		
Filename	F80613A_29		
Injected By	BAL		
Total Amount Extracted	14.6 g	Matrix	Soil
% Moisture	29.8	Dilution	NA
Dry Weight Extracted	10.3 g	Collected	05/24/2008
ICAL ID	F80613	Received	05/28/2008
CCal Filename(s)	F80613A_16 & F80613A_32	Extracted	06/09/2008
Method Blank ID	BLANK-16571	Analyzed	06/14/2008 11:08

Native Isomers	Conc ng/Kg	EMPC ng/Kg	RL ng/Kg	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	0.11	—	0.081	+U 2,3,7,8-TCDF-13C	2.00	93
Total TCDF	0.96	—	0.081	+U 2,3,7,8-TCDD-13C	2.00	93
				1,2,3,7,8-PeCDF-13C	2.00	94
2,3,7,8-TCDD	ND	—	0.086	2,3,4,7,8-PeCDF-13C	2.00	94
Total TCDD	0.10	—	0.086	+J 1,2,3,7,8-PeCDD-13C	2.00	109
				1,2,3,4,7,8-HxCDF-13C	2.00	79
1,2,3,7,8-PeCDF	—	0.088	0.052	+J+ 1,2,3,6,7,8-HxCDF-13C	2.00	75
2,3,4,7,8-PeCDF	—	0.150	0.041	+UJ 2,3,4,6,7,8-HxCDF-13C	2.00	76
Total PeCDF	1.10	—	0.046	+J 1,2,3,7,8,9-HxCDF-13C	2.00	84
				1,2,3,4,7,8-HxCDD-13C	2.00	83
1,2,3,7,8-PeCDD	—	0.160	0.075	+J+ 1,2,3,6,7,8-HxCDD-13C	2.00	77
Total PeCDD	0.38	—	0.075	+U 1,2,3,4,6,7,8-HpCDF-13C	2.00	71
				1,2,3,4,7,8,9-HpCDF-13C	2.00	75
1,2,3,4,7,8-HxCDF	0.19	—	0.078	B+U 1,2,3,4,6,7,8-HpCDD-13C	2.00	81
1,2,3,6,7,8-HxCDF	0.29	—	0.073	B+U OCDD-13C	4.00	75
2,3,4,6,7,8-HxCDF	—	0.190	0.079	+UJ 1,2,3,4-TCDD-13C	2.00	NA
1,2,3,7,8,9-HxCDF	—	0.062	0.029	+UJ 1,2,3,7,8,9-HxCDD-13C	2.00	NA
Total HxCDF	2.50	—	0.065	+J 2,3,7,8-TCDD-37Cl4	0.20	103
1,2,3,4,7,8-HxCDD	0.35	—	0.052	+J 1,2,3,4,6,7,8-HpCDF		
1,2,3,6,7,8-HxCDD	0.74	—	0.074	+J 1,2,3,4,7,8,9-HpCDF		
1,2,3,7,8,9-HxCDD	0.74	—	0.065	B+J Total 2,3,7,8-TCDD		
Total HxCDD	5.60	—	0.064	Equivalence: 0.45 ng/Kg		
				(Using ITE Factors)		
1,2,3,4,6,7,8-HpCDF	1.80	—	0.100	B+J 1,2,3,4,6,7,8-HpCDD		
1,2,3,4,7,8,9-HpCDF	ND	—	0.120			
Total HpCDF	3.30	—	0.110			
1,2,3,4,6,7,8-HpCDD	11.00	—	0.092			
Total HpCDD	22.00	—	0.092			
OCDF	1.90	—	0.068	B+J		
OCDD	75.00	—	0.160			

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
EMPC = Estimated Maximum Possible Concentration
RL = Reporting Limit.

ND = Not Detected
NA = Not Applicable
NC = Not Calculated

Results reported on a dry weight basis and are valid to no more than 2 significant figures.

J = Value below calibration range

B = Less than 10x higher than method blank level

I = Interference present

MS
4/10/08

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc.

Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612-607-6444



Pace AnalyticalTM

Method 8290 Sample Analysis Results

Client - Montana Dept. Of Env. Quality

Client's Sample ID	MBDS-R05-A01		
Lab Sample ID	1074005007		
Filename	F80613A_30		
Injected By	BAL		
Total Amount Extracted	11.7 g	Matrix	Soil
% Moisture	13.8	Dilution	NA
Dry Weight Extracted	10.1 g	Collected	05/24/2008
ICAL ID	F80613	Received	05/28/2008
CCal Filename(s)	F80613A_16 & F80613A_32	Extracted	06/09/2008
Method Blank ID	BLANK-16571	Analyzed	06/14/2008 11:56

Native Isomers	Conc ng/Kg	EMPC ng/Kg	RL ng/Kg	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	ND	—	0.077	2,3,7,8-TCDF-13C	2.00	97
Total TCDF	2.600	—	0.077	2,3,7,8-TCDD-13C	2.00	96
				1,2,3,7,8-PeCDF-13C	2.00	97
2,3,7,8-TCDD	ND	—	0.140	2,3,4,7,8-PeCDF-13C	2.00	99
Total TCDD	0.810	—	0.140	+ J 1,2,3,7,8-PeCDD-13C	2.00	113
				1,2,3,4,7,8-HxCDF-13C	2.00	79
1,2,3,7,8-PeCDF	—	0.078	0.072	+ J+ 1,2,3,6,7,8-HxCDF-13C	2.00	74
2,3,4,7,8-PeCDF	0.096	—	0.064	+ U 2,3,4,6,7,8-HxCDF-13C	2.00	74
Total PeCDF	0.096	—	0.068	+ U 1,2,3,7,8,9-HxCDF-13C	2.00	83
				1,2,3,4,7,8-HxCDD-13C	2.00	83
1,2,3,7,8-PeCDD	ND	—	0.075	1,2,3,6,7,8-HxCDD-13C	2.00	80
Total PeCDD	0.130	—	0.075	+ U 1,2,3,4,6,7,8-HpCDF-13C	2.00	67
				1,2,3,4,7,8,9-HpCDF-13C	2.00	68
1,2,3,4,7,8-HxCDF	0.072	—	0.061	+ U 1,2,3,4,6,7,8-HpCDD-13C	2.00	75
1,2,3,6,7,8-HxCDF	—	0.079	0.050	+ U J OCDD-13C	4.00	69
2,3,4,6,7,8-HxCDF	ND	—	0.050			
1,2,3,7,8,9-HxCDF	—	0.059	0.046	+ U J 1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	0.280	—	0.052	+ U 1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	ND	—	0.077	2,3,7,8-TCDD-37Cl4	0.20	107
1,2,3,6,7,8-HxCDD	—	0.110	0.080	+ U J		
1,2,3,7,8,9-HxCDD	0.120	—	0.076	+ U		
Total HxCDD	0.700	—	0.078	+ J		
1,2,3,4,6,7,8-HpCDF	0.380	—	0.078	+ U Total 2,3,7,8-TCDD		
1,2,3,4,7,8,9-HpCDF	ND	—	0.079	Equivalence: 0.083 ng/Kg		
Total HpCDF	0.380	—	0.079	+ U (Using ITE Factors)		
1,2,3,4,6,7,8-HpCDD	0.820	—	0.100	+ U		
Total HpCDD	1.600	—	0.100	+ U		
OCDF	0.350	—	0.062	+ U		
OCDD	3.400	—	0.140	+ U		

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
EMPC = Estimated Maximum Possible Concentration
RL = Reporting Limit.

ND = Not Detected
NA = Not Applicable
NC = Not Calculated

Results reported on a dry weight basis and are valid to no more than 2 significant figures.

J = Value below calibration range

B = Less than 10x higher than method blank level

I = Interference present

Handwritten: AS 7/27/08

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc.

14 of 36

Report No.....1074005_8290

Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612-607-6444



Pace Analytical™

Method 8290 Sample Analysis Results

Client - Montana Dept. Of Env. Quality

Client's Sample ID	MBDS-R06-A01		
Lab Sample ID	1074005008		
Filename	F80614A_06		
Injected By	BAL		
Total Amount Extracted	13.1 g	Matrix	Soil
% Moisture	22.2	Dilution	NA
Dry Weight Extracted	10.2 g	Collected	05/24/2008
ICAl ID	F80613	Received	05/28/2008
CCal Filename(s)	F80613A_32 & F80615A_13	Extracted	06/09/2008
Method Blank ID	BLANK-16571	Analyzed	06/14/2008 18:35

Native Isomers	Conc ng/Kg	EMPC ng/Kg	RL ng/Kg	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	—	0.120	0.076 +UJ	2,3,7,8-TCDF-13C	2.00	93
Total TCDF	0.34	—	0.076 +U	2,3,7,8-TCDD-13C	2.00	91
				1,2,3,7,8-PeCDF-13C	2.00	95
2,3,7,8-TCDD	0.56	—	0.097 +J	2,3,4,7,8-PeCDF-13C	2.00	98
Total TCDD	24.00	—	0.097	1,2,3,7,8-PeCDD-13C	2.00	112
				1,2,3,4,7,8-HxCDF-13C	2.00	75
1,2,3,7,8-PeCDF	ND	—	0.065	1,2,3,6,7,8-HxCDF-13C	2.00	70
2,3,4,7,8-PeCDF	0.15	—	0.051 +U	2,3,4,6,7,8-HxCDF-13C	2.00	71
Total PeCDF	0.56	—	0.058 +U	1,2,3,7,8,9-HxCDF-13C	2.00	81
				1,2,3,4,7,8-HxCDD-13C	2.00	80
1,2,3,7,8-PeCDD	0.67	—	0.110 +J	1,2,3,6,7,8-HxCDD-13C	2.00	77
Total PeCDD	21.00	—	0.110	1,2,3,4,6,7,8-HpCDF-13C	2.00	70
				1,2,3,4,7,8,9-HpCDF-13C	2.00	72
1,2,3,4,7,8-HxCDF	0.13	—	0.041 +U	1,2,3,4,6,7,8-HpCDD-13C	2.00	81
1,2,3,6,7,8-HxCDF	0.16	—	0.065 +U	OCDD-13C	4.00	73
2,3,4,6,7,8-HxCDF	0.13	—	0.080 +U			
1,2,3,7,8,9-HxCDF	—	0.075	0.055 +UJ	1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	1.50	—	0.060 +UJ	1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	—	0.270	0.058 +J	2,3,7,8-TCDD-37Cl4	0.20	100
1,2,3,6,7,8-HxCDD	0.62	—	0.065 +J			
1,2,3,7,8,9-HxCDD	—	0.620	0.100 +J			
Total HxCDD	21.00	—	0.074			
1,2,3,4,6,7,8-HpCDF	0.43	—	0.098 +U	Total 2,3,7,8-TCDD		
1,2,3,4,7,8,9-HpCDF	0.18	—	0.120 +U	Equivalence: 1.2 ng/Kg		
Total HpCDF	1.50	—	0.110 +U	(Using ITE Factors)		
1,2,3,4,6,7,8-HpCDD	5.40	—	0.150			
Total HpCDD	13.00	—	0.150			
OCDF	1.50	—	0.096 +U			
OCDD	36.00	—	0.180			

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
EMPC = Estimated Maximum Possible Concentration
RL = Reporting Limit.

ND = Not Detected
NA = Not Applicable
NC = Not Calculated

Results reported on a dry weight basis and are valid to no more than 2 significant figures.

J = Value below calibration range
B = Less than 10x higher than method blank level
I = Interference present

Handwritten signature
7/12/08

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc.
15 of 36

Report No.....1074005_8290



Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612-607-6444

Method 8290 Sample Analysis Results

Client - Montana Dept. Of Env. Quality

Client's Sample ID	MBDS-R13-001		
Lab Sample ID	1074005009		
Filename	F80614A_07		
Injected By	BAL		
Total Amount Extracted	12.6 g	Matrix	Soil
% Moisture	18.8	Dilution	NA
Dry Weight Extracted	10.2 g	Collected	05/25/2008
ICAL ID	F80613	Received	05/28/2008
CCal Filename(s)	F80613A_32 & F80615A_13	Extracted	06/09/2008
Method Blank ID	BLANK-16571	Analyzed	06/14/2008 19:24

Native Isomers	Conc ng/Kg	EMPC ng/Kg	RL ng/Kg	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	ND	—	0.070	2,3,7,8-TCDF-13C	2.00	100
Total TCDF	0.200	—	0.070	2,3,7,8-TCDD-13C	2.00	98
				1,2,3,7,8-PeCDF-13C	2.00	101
2,3,7,8-TCDD	ND	—	0.087	2,3,4,7,8-PeCDF-13C	2.00	104
Total TCDD	ND	—	0.087	1,2,3,7,8-PeCDD-13C	2.00	118
				1,2,3,4,7,8-HxCDF-13C	2.00	80
1,2,3,7,8-PeCDF	0.067	—	0.047	1,2,3,6,7,8-HxCDF-13C	2.00	74
2,3,4,7,8-PeCDF	—	0.071	0.044	2,3,4,6,7,8-HxCDF-13C	2.00	78
Total PeCDF	0.067	—	0.046	1,2,3,7,8,9-HxCDF-13C	2.00	86
				1,2,3,4,7,8-HxCDD-13C	2.00	86
1,2,3,7,8-PeCDD	ND	—	0.057	1,2,3,6,7,8-HxCDD-13C	2.00	79
Total PeCDD	0.084	—	0.057	1,2,3,4,6,7,8-HpCDF-13C	2.00	72
				1,2,3,4,7,8,9-HpCDF-13C	2.00	71
1,2,3,4,7,8-HxCDF	0.095	—	0.040	1,2,3,4,6,7,8-HpCDD-13C	2.00	80
1,2,3,6,7,8-HxCDF	0.046	—	0.039	OCDD-13C	4.00	71
2,3,4,6,7,8-HxCDF	—	0.066	0.039			
1,2,3,7,8,9-HxCDF	—	0.044	0.043	1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	0.220	—	0.040	1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	ND	—	0.080	2,3,7,8-TCDD-37Cl4	0.20	108
1,2,3,6,7,8-HxCDD	ND	—	0.079			
1,2,3,7,8,9-HxCDD	—	0.071	0.069			
Total HxCDD	ND	—	0.076			
1,2,3,4,6,7,8-HpCDF	0.270	—	0.057	Total 2,3,7,8-TCDD		
1,2,3,4,7,8,9-HpCDF	ND	—	0.094	Equivalence: 0.035 ng/Kg		
Total HpCDF	0.270	—	0.075	(Using ITE Factors)		
1,2,3,4,6,7,8-HpCDD	0.820	—	0.081			
Total HpCDD	1.700	—	0.081			
OCDF	0.580	—	0.098			
OCDD	6.400	—	0.099			

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
EMPC = Estimated Maximum Possible Concentration
RL = Reporting Limit.

ND = Not Detected
NA = Not Applicable
NC = Not Calculated

Results reported on a dry weight basis and are valid to no more than 2 significant figures.

J = Value below calibration range

B = Less than 10x higher than method blank level

I = Interference present

MB
7/24/08

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc.

16 of 36

Report No.....1074005_8290



Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612-607-6444

Method 8290 Sample Analysis Results

Client - Montana Dept. Of Env. Quality

Client's Sample ID	MBDS-R06-001		
Lab Sample ID	1074005010		
Filename	F80614A_08		
Injected By	BAL		
Total Amount Extracted	14.0 g	Matrix	Soil
% Moisture	24.5	Dilution	NA
Dry Weight Extracted	10.6 g	Collected	05/25/2008
ICAL ID	F80613	Received	05/28/2008
CCal Filename(s)	F80613A_32 & F80615A_13	Extracted	06/09/2008
Method Blank ID	BLANK-16571	Analyzed	06/14/2008 20:13

Native Isomers	Conc ng/Kg	EMPC ng/Kg	RL ng/Kg	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	ND	—	0.075	2,3,7,8-TCDF-13C	2.00	100
Total TCDF	0.470	—	0.075	2,3,7,8-TCDD-13C	2.00	101
				1,2,3,7,8-PeCDF-13C	2.00	102
2,3,7,8-TCDD	—	0.160	0.100	2,3,4,7,8-PeCDF-13C	2.00	104
Total TCDD	3.400	—	0.100	1,2,3,7,8-PeCDD-13C	2.00	118
				1,2,3,4,7,8-HxCDF-13C	2.00	81
1,2,3,7,8-PeCDF	0.079	—	0.047	1,2,3,6,7,8-HxCDF-13C	2.00	76
2,3,4,7,8-PeCDF	—	0.050	0.038	2,3,4,6,7,8-HxCDF-13C	2.00	78
Total PeCDF	0.079	—	0.043	1,2,3,7,8,9-HxCDF-13C	2.00	86
				1,2,3,4,7,8-HxCDD-13C	2.00	84
1,2,3,7,8-PeCDD	0.190	—	0.079	1,2,3,6,7,8-HxCDD-13C	2.00	84
Total PeCDD	2.400	—	0.079	1,2,3,4,6,7,8-HpCDF-13C	2.00	71
				1,2,3,4,7,8-HpCDF-13C	2.00	72
1,2,3,4,7,8-HxCDF	ND	—	0.050	1,2,3,4,6,7,8-HpCDD-13C	2.00	80
1,2,3,6,7,8-HxCDF	ND	—	0.057	OCDD-13C	4.00	62
2,3,4,6,7,8-HxCDF	—	0.075	0.050			
1,2,3,7,8,9-HxCDF	0.076	—	0.068	1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	0.190	—	0.056	1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	ND	—	0.094	2,3,7,8-TCDD-37Cl4	0.20	109
1,2,3,6,7,8-HxCDD	—	0.160	0.081			
1,2,3,7,8,9-HxCDD	—	0.140	0.073			
Total HxCDD	3.400	—	0.083			
1,2,3,4,6,7,8-HpCDF	0.310	—	0.082	Total 2,3,7,8-TCDD		
1,2,3,4,7,8,9-HpCDF	ND	—	0.071	Equivalence: 0.13 ng/Kg		
Total HpCDF	0.510	—	0.076	(Using ITE Factors)		
1,2,3,4,6,7,8-HpCDD	1.100	—	0.096			
Total HpCDD	2.900	—	0.096			
OCDF	0.480	—	0.100			
OCDD	7.200	—	0.190			

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
EMPC = Estimated Maximum Possible Concentration
RL = Reporting Limit.

ND = Not Detected
NA = Not Applicable
NC = Not Calculated

Results reported on a dry weight basis and are valid to no more than 2 significant figures.

J = Value below calibration range

B = Less than 10x higher than method blank level

I = Interference present

Handwritten signature
7/24/08

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc.
17 of 36

Report No.....1074005_8290



Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612-607-6444

Method 8290 Sample Analysis Results

Client - Montana Dept. Of Env. Quality

Client's Sample ID	MBDS-R06-F01		
Lab Sample ID	1074005011		
Filename	F80614A_09		
Injected By	BAL		
Total Amount Extracted	16.6 g	Matrix	Soil
% Moisture	39.8	Dilution	NA
Dry Weight Extracted	10.0 g	Collected	05/25/2008
ICAL ID	F80613	Received	05/28/2008
CCal Filename(s)	F80613A_32 & F80615A_13	Extracted	06/09/2008
Method Blank ID	BLANK-16571	Analyzed	06/14/2008 21:02

Native Isomers	Conc ng/Kg	EMPC ng/Kg	RL ng/Kg	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	0.086	—	0.082	2,3,7,8-TCDF-13C	2.00	97
Total TCDF	0.290	—	0.082	2,3,7,8-TCDD-13C	2.00	96
				1,2,3,7,8-PeCDF-13C	2.00	98
2,3,7,8-TCDD	ND	—	0.065	2,3,4,7,8-PeCDF-13C	2.00	101
Total TCDD	160.000	—	0.065	1,2,3,7,8-PeCDD-13C	2.00	114
				1,2,3,4,7,8-HxCDF-13C	2.00	79
1,2,3,7,8-PeCDF	ND	—	0.053	1,2,3,6,7,8-HxCDF-13C	2.00	68
2,3,4,7,8-PeCDF	—	0.063	0.047	2,3,4,6,7,8-HxCDF-13C	2.00	76
Total PeCDF	ND	—	0.050	1,2,3,7,8,9-HxCDF-13C	2.00	85
				1,2,3,4,7,8-HxCDD-13C	2.00	85
1,2,3,7,8-PeCDD	ND	—	0.110	1,2,3,6,7,8-HxCDD-13C	2.00	80
Total PeCDD	36.000	—	0.110	1,2,3,4,6,7,8-HpCDF-13C	2.00	73
				1,2,3,4,7,8,9-HpCDF-13C	2.00	72
1,2,3,4,7,8-HxCDF	ND	—	0.049	1,2,3,4,6,7,8-HpCDD-13C	2.00	82
1,2,3,6,7,8-HxCDF	—	0.059	0.058	OCDD-13C	4.00	72
2,3,4,6,7,8-HxCDF	—	0.060	0.039			
1,2,3,7,8,9-HxCDF	ND	—	0.054	1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	0.071	—	0.050	1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	ND	—	0.110	2,3,7,8-TCDD-37Cl4	0.20	105
1,2,3,6,7,8-HxCDD	—	0.110	0.110			
1,2,3,7,8,9-HxCDD	0.150	—	0.071			
Total HxCDD	9.500	—	0.096			
1,2,3,4,6,7,8-HpCDF	0.250	—	0.068	Total 2,3,7,8-TCDD		
1,2,3,4,7,8,9-HpCDF	ND	—	0.072	Equivalence: 0.037 ng/Kg		
Total HpCDF	0.250	—	0.070	(Using ITE Factors)		
1,2,3,4,6,7,8-HpCDD	0.710	—	0.100			
Total HpCDD	1.500	—	0.100			
OCDF	0.270	—	0.087			
OCDD	3.300	—	0.140			

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
EMPC = Estimated Maximum Possible Concentration
RL = Reporting Limit

ND = Not Detected
NA = Not Applicable
NC = Not Calculated

Results reported on a dry weight basis and are valid to no more than 2 significant figures.

J = Value below calibration range

B = Less than 10x higher than method blank level

I = Interference present

*AS
7/24/08*

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc.

18 of 36

Report No.....1074005_8290

Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612-607-6444



Pace Analytical™

Method 8290 Sample Analysis Results

Client - Montana Dept. Of Env. Quality

Client's Sample ID	MBDS-R07-F01		
Lab Sample ID	1074005012		
Filename	F80614A_10		
Injected By	BAL		
Total Amount Extracted	11.6 g	Matrix	Soil
% Moisture	12.6	Dilution	NA
Dry Weight Extracted	10.1 g	Collected	05/25/2008
ICAL ID	F80613	Received	05/28/2008
CCal Filename(s)	F80613A_32 & F80615A_13	Extracted	06/09/2008
Method Blank ID	BLANK-16571	Analyzed	06/14/2008 21:52

Native Isomers	Conc ng/Kg	EMPC ng/Kg	RL ng/Kg	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	0.21	—	0.085	+U 2,3,7,8-TCDF-13C	2.00	99
Total TCDF	10.00	—	0.085	2,3,7,8-TCDD-13C	2.00	103
				1,2,3,7,8-PeCDF-13C	2.00	104
2,3,7,8-TCDD	ND	—	0.093	2,3,4,7,8-PeCDF-13C	2.00	105
Total TCDD	11.00	—	0.093	1,2,3,7,8-PeCDD-13C	2.00	119
				1,2,3,4,7,8-HxCDF-13C	2.00	83
1,2,3,7,8-PeCDF	0.27	—	0.160	+J 1,2,3,6,7,8-HxCDF-13C	2.00	78
2,3,4,7,8-PeCDF	0.73	—	0.046	+U 2,3,4,6,7,8-HxCDF-13C	2.00	80
Total PeCDF	28.00	—	0.100	1,2,3,7,8,9-HxCDF-13C	2.00	90
				1,2,3,4,7,8-HxCDD-13C	2.00	89
1,2,3,7,8-PeCDD	—	0.17	0.130	+J+ 1,2,3,6,7,8-HxCDD-13C	2.00	86
Total PeCDD	9.90	—	0.130	1,2,3,4,6,7,8-HpCDF-13C	2.00	74
				1,2,3,4,7,8,9-HpCDF-13C	2.00	77
1,2,3,4,7,8-HxCDF	—	0.19	0.070	+U 1,2,3,4,6,7,8-HpCDD-13C	2.00	88
1,2,3,6,7,8-HxCDF	0.32	—	0.072	+J 2,3,4,6,7,8-HxCDF-13C	4.00	81
2,3,4,6,7,8-HxCDF	1.00	—	0.054	+J OCDD-13C		
1,2,3,7,8,9-HxCDF	ND	—	0.081	1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	14.00	—	0.069	1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	—	0.13	0.100	+J+ 2,3,7,8-TCDD-37Cl4	0.20	106
1,2,3,6,7,8-HxCDD	0.50	—	0.130	+J		
1,2,3,7,8,9-HxCDD	0.49	—	0.100	+J		
Total HxCDD	9.90	—	0.110	+J		
1,2,3,4,6,7,8-HpCDF	—	2.50	0.077	+R Total 2,3,7,8-TCDD		
1,2,3,4,7,8,9-HpCDF	ND	—	0.110	Equivalence: 0.76 ng/Kg		
Total HpCDF	2.20	—	0.094	+J (Using ITE Factors)		
1,2,3,4,6,7,8-HpCDD	7.40	—	0.095			
Total HpCDD	14.00	—	0.095			
OCDF	2.50	—	0.089	+J		
OCDD	55.00	—	0.130	+J		

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
EMPC = Estimated Maximum Possible Concentration
RL = Reporting Limit.

ND = Not Detected
NA = Not Applicable
NC = Not Calculated

Results reported on a dry weight basis and are valid to no more than 2 significant figures.

J = Value below calibration range

B = Less than 10x higher than method blank level

E = PCDE Interference

I = Interference present

AB
7/12/08

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc.

19 of 36

Report No.....1074005_8290



Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612-607-6444

Method 8290 Sample Analysis Results

Client - Montana Dept. Of Env. Quality

Client's Sample ID	MBDS-R07-001		
Lab Sample ID	1074005013		
Filename	F80614A_11		
Injected By	BAL		
Total Amount Extracted	13.3 g	Matrix	Soil
% Moisture	24.1	Dilution	NA
Dry Weight Extracted	10.1 g	Collected	05/25/2008
ICAL ID	F80613	Received	05/28/2008
CCal Filename(s)	F80613A_32 & F80615A_13	Extracted	06/09/2008
Method Blank ID	BLANK-16571	Analyzed	06/14/2008 22:41

Native Isomers	Conc ng/Kg	EMPC ng/Kg	RL ng/Kg	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	ND	—	0.120	2,3,7,8-TCDF-13C	2.00	105
Total TCDF	2.30	—	0.120	2,3,7,8-TCDD-13C	2.00	103
				1,2,3,7,8-PeCDF-13C	2.00	104
2,3,7,8-TCDD	ND	—	0.140	2,3,4,7,8-PeCDF-13C	2.00	107
Total TCDD	4.70	—	0.140	1,2,3,7,8-PeCDD-13C	2.00	123
				1,2,3,4,7,8-HxCDF-13C	2.00	84
1,2,3,7,8-PeCDF	ND	—	0.053	1,2,3,6,7,8-HxCDF-13C	2.00	77
2,3,4,7,8-PeCDF	0.25	—	0.072	2,3,4,6,7,8-HxCDF-13C	2.00	80
Total PeCDF	4.30	—	0.062	1,2,3,7,8,9-HxCDF-13C	2.00	89
				1,2,3,4,7,8-HxCDD-13C	2.00	89
1,2,3,7,8-PeCDD	ND	—	0.120	1,2,3,6,7,8-HxCDD-13C	2.00	85
Total PeCDD	4.90	—	0.120	1,2,3,4,6,7,8-HpCDF-13C	2.00	75
				1,2,3,4,7,8,9-HpCDF-13C	2.00	75
1,2,3,4,7,8-HxCDF	—	0.085	0.052	1,2,3,4,6,7,8-HpCDD-13C	2.00	85
1,2,3,6,7,8-HxCDF	0.14	—	0.033	OCDD-13C	4.00	78
2,3,4,6,7,8-HxCDF	0.25	—	0.034			
1,2,3,7,8,9-HxCDF	ND	—	0.035	1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	1.40	—	0.039	1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	0.11	—	0.053	2,3,7,8-TCDD-37Cl4	0.20	112
1,2,3,6,7,8-HxCDD	0.19	—	0.068			
1,2,3,7,8,9-HxCDD	0.20	—	0.035			
Total HxCDD	7.20	—	0.052			
1,2,3,4,6,7,8-HpCDF	0.99	—	0.170	Total 2,3,7,8-TCDD		
1,2,3,4,7,8,9-HpCDF	ND	—	0.250	Equivalence: 0.28 ng/Kg		
Total HpCDF	0.99	—	0.210	(Using ITE Factors)		
1,2,3,4,6,7,8-HpCDD	2.70	—	0.071			
Total HpCDD	5.86	—	0.071			
OCDF	2.90	—	0.090			
OCDD	23.00	—	0.092			

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
EMPC = Estimated Maximum Possible Concentration
RL = Reporting Limit.

ND = Not Detected
NA = Not Applicable
NC = Not Calculated

Results reported on a dry weight basis and are valid to no more than 2 significant figures.

J = Value below calibration range

B = Less than 10x higher than method blank level

I = Interference present

As
7/24/08

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc.

20 of 36

Report No.....1074005_8290



Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612-607-6444

Method 8290 Sample Analysis Results

Client - Montana Dept. Of Env. Quality

Client's Sample ID	MBDS-R07-004		
Lab Sample ID	1074005014		
Filename	F80615B_03		
Injected By	BAL		
Total Amount Extracted	13.6 g	Matrix	Soil
% Moisture	25.0	Dilution	NA
Dry Weight Extracted	10.2 g	Collected	05/25/2008
ICAL ID	F80613	Received	05/28/2008
CCal Filename(s)	F80615A_13 & F80615B_16	Extracted	06/09/2008
Method Blank ID	BLANK-16571	Analyzed	06/15/2008 15:55

Native Isomers	Conc ng/Kg	EMPC ng/Kg	RL ng/Kg	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	ND	—	0.150	2,3,7,8-TCDF-13C	2.00	60
Total TCDF	2.00	—	0.150	2,3,7,8-TCDD-13C	2.00	59
				1,2,3,7,8-PeCDF-13C	2.00	61
2,3,7,8-TCDD	ND	—	0.180	2,3,4,7,8-PeCDF-13C	2.00	63
Total TCDD	5.80	—	0.180	1,2,3,7,8-PeCDD-13C	2.00	71
				1,2,3,4,7,8-HxCDF-13C	2.00	48
1,2,3,7,8-PeCDF	ND	—	0.140	1,2,3,6,7,8-HxCDF-13C	2.00	45
2,3,4,7,8-PeCDF	—	0.15	0.088 +UJ	2,3,4,6,7,8-HxCDF-13C	2.00	47
Total PeCDF	2.50	—	0.110 +J	1,2,3,7,8,9-HxCDF-13C	2.00	53
				1,2,3,4,7,8-HxCDD-13C	2.00	52
1,2,3,7,8-PeCDD	0.26	—	0.190 +J	1,2,3,6,7,8-HxCDD-13C	2.00	48
Total PeCDD	3.80	—	0.190 +J	1,2,3,4,6,7,8-HpCDF-13C	2.00	45
				1,2,3,4,7,8,9-HpCDF-13C	2.00	46
1,2,3,4,7,8-HxCDF	ND	—	0.200	1,2,3,4,6,7,8-HpCDD-13C	2.00	52
1,2,3,6,7,8-HxCDF	0.31	—	0.220 +J	OCDD-13C	4.00	48
2,3,4,6,7,8-HxCDF	—	0.31	0.190 +UJ			
1,2,3,7,8,9-HxCDF	ND	—	0.120	1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	2.00	—	0.180 +J	1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	ND	—	0.120	2,3,7,8-TCDD-37Cl4	0.20	66
1,2,3,6,7,8-HxCDD	—	0.16	0.130 +UJ			
1,2,3,7,8,9-HxCDD	—	0.34	0.130 +UJ			
Total HxCDD	5.40	—	0.130			
1,2,3,4,6,7,8-HpCDF	—	0.93	0.240 +UJ	Total 2,3,7,8-TCDD		
1,2,3,4,7,8,9-HpCDF	ND	—	0.230	Equivalence: 0.21 ng/Kg		
Total HpCDF	1.00	—	0.240 +UJ	(Using ITE Factors)		
1,2,3,4,6,7,8-HpCDD	2.90	—	0.170 +J			
Total HpCDD	6.10	—	0.170			
OCDF	—	1.40	0.180 +UJ			
OCDD	19.00	—	0.250			

Conc = Concentration (Totals include 2,3,7,8-substituted isomers),
EMPC = Estimated Maximum Possible Concentration
RL = Reporting Limit.

ND = Not Detected
NA = Not Applicable
NC = Not Calculated

Results reported on a dry weight basis and are valid to no more than 2 significant figures.

J = Value below calibration range

B = Less than 10x higher than method blank level

I = Interference present

Handwritten: 113/124/08

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc.

21 of 36

Report No..... 1074005_8290



Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612-607-6444

Method 8290 Sample Analysis Results

Client - Montana Dept. Of Env. Quality

Client's Sample ID	MBDS-R07-005		
Lab Sample ID	1074005015		
Filename	F80615B_04		
Injected By	BAL		
Total Amount Extracted	10.2 g	Matrix	Soil
% Moisture	0.2	Dilution	NA
Dry Weight Extracted	10.2 g	Collected	05/25/2008
ICAL ID	F80613	Received	05/28/2008
CCal Filename(s)	F80615A_13 & F80615B_16	Extracted	06/09/2008
Method Blank ID	BLANK-16571	Analyzed	06/15/2008 16:45

Native Isomers	Conc ng/Kg	EMPC ng/Kg	RL ng/Kg	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	0.120	—	0.075	+ J 2,3,7,8-TCDF-13C	2.00	98
Total TCDF	0.270	—	0.075	+ J 2,3,7,8-TCDD-13C	2.00	99
				1,2,3,7,8-PeCDF-13C	2.00	100
2,3,7,8-TCDD	ND	—	0.120	2,3,4,7,8-PeCDF-13C	2.00	103
Total TCDD	ND	—	0.120	1,2,3,7,8-PeCDD-13C	2.00	116
				1,2,3,4,7,8-HxCDF-13C	2.00	82
1,2,3,7,8-PeCDF	ND	—	0.071	1,2,3,6,7,8-HxCDF-13C	2.00	78
2,3,4,7,8-PeCDF	ND	—	0.065	2,3,4,6,7,8-HxCDF-13C	2.00	79
Total PeCDF	ND	—	0.068	1,2,3,7,8,9-HxCDF-13C	2.00	90
				1,2,3,4,7,8-HxCDD-13C	2.00	89
1,2,3,7,8-PeCDD	ND	—	0.062	1,2,3,6,7,8-HxCDD-13C	2.00	84
Total PeCDD	0.083	—	0.062	+ J 1,2,3,4,6,7,8-HpCDF-13C	2.00	76
				1,2,3,4,7,8,9-HpCDF-13C	2.00	77
1,2,3,4,7,8-HxCDF	—	0.080	0.061	+ UJ 1,2,3,4,6,7,8-HpCDD-13C	2.00	82
1,2,3,6,7,8-HxCDF	—	0.069	0.054	+ UJ OCDD-13C	4.00	78
2,3,4,6,7,8-HxCDF	0.110	—	0.058	B+U		
1,2,3,7,8,9-HxCDF	ND	—	0.057	1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	0.230	—	0.058	B+U 1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	ND	—	0.055	2,3,7,8-TCDD-37CM	0.20	109
1,2,3,6,7,8-HxCDD	ND	—	0.062			
1,2,3,7,8,9-HxCDD	ND	—	0.062			
Total HxCDD	ND	—	0.060			
1,2,3,4,6,7,8-HpCDF	0.220	—	0.072	B+U Total 2,3,7,8-TCDD		
1,2,3,4,7,8,9-HpCDF	ND	—	0.140	Equivalence: 0.025 ng/Kg		
Total HpCDF	0.220	—	0.110	(Using ITE Factors)		
1,2,3,4,6,7,8-HpCDD	—	0.180	0.096	+ U		
Total HpCDD	0.230	—	0.096	+ U		
OCDF	—	0.210	0.120	+ UJ		
OCDD	—	0.830	0.130	+ UJ		

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
EMPC = Estimated Maximum Possible Concentration
RL = Reporting Limit.

ND = Not Detected
NA = Not Applicable
NC = Not Calculated

Results reported on a dry weight basis and are valid to no more than 2 significant figures.

J = Value below calibration range

B = Less than 10x higher than method blank level

I = Interference present

AS
7/24/08

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc.

22 of 36

Report No. 1074005_8290



Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612-607-6444

Method 8290 Sample Analysis Results

Client - Montana Dept. Of Env. Quality

Client's Sample ID	MBDS-R07-A01		
Lab Sample ID	1074005016		
Filename	F80615B_05		
Injected By	BAL		
Total Amount Extracted	12.6 g	Matrix	Soil
% Moisture	19.0	Dilution	NA
Dry Weight Extracted	10.2 g	Collected	05/25/2008
ICAL ID	F80613	Received	05/28/2008
CCal Filename(s)	F80615A_13 & F80615B_16	Extracted	06/09/2008
Method Blank ID	BLANK-16571	Analyzed	06/15/2008 17:34

Native Isomers	Conc ng/Kg	EMPC ng/Kg	RL ng/Kg	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	ND	—	0.057	2,3,7,8-TCDF-13C	2.00	98
Total TCDF	0.250	—	0.057	2,3,7,8-TCDD-13C	2.00	98
				1,2,3,7,8-PeCDF-13C	2.00	103
2,3,7,8-TCDD	ND	—	0.150	2,3,4,7,8-PeCDF-13C	2.00	104
Total TCDD	ND	—	0.150	1,2,3,7,8-PeCDD-13C	2.00	118
				1,2,3,4,7,8-HxCDF-13C	2.00	82
1,2,3,7,8-PeCDF	ND	—	0.057	1,2,3,6,7,8-HxCDF-13C	2.00	76
2,3,4,7,8-PeCDF	0.060	—	0.047	2,3,4,6,7,8-HxCDF-13C	2.00	78
Total PeCDF	0.060	—	0.052	1,2,3,7,8,9-HxCDF-13C	2.00	88
				1,2,3,4,7,8-HxCDD-13C	2.00	88
1,2,3,7,8-PeCDD	ND	—	0.064	1,2,3,6,7,8-HxCDD-13C	2.00	80
Total PeCDD	ND	—	0.064	1,2,3,4,6,7,8-HpCDF-13C	2.00	73
				1,2,3,4,7,8,9-HpCDF-13C	2.00	73
1,2,3,4,7,8-HxCDF	0.059	—	0.039	1,2,3,4,6,7,8-HpCDD-13C	2.00	83
1,2,3,6,7,8-HxCDF	—	0.073	0.048	OCDD-13C	4.00	78
2,3,4,6,7,8-HxCDF	—	0.089	0.041			
1,2,3,7,8,9-HxCDF	0.074	—	0.049	1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	0.260	—	0.044	1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	ND	—	0.059	2,3,7,8-TCDD-37Cl4	0.20	105
1,2,3,6,7,8-HxCDD	—	0.100	0.072			
1,2,3,7,8,9-HxCDD	ND	—	0.061			
Total HxCDD	ND	—	0.064			
1,2,3,4,6,7,8-HpCDF	0.310	—	0.086	Total 2,3,7,8-TCDD		
1,2,3,4,7,8,9-HpCDF	ND	—	0.110	Equivalence: 0.054 ng/Kg		
Total HpCDF	0.310	—	0.100	(Using ITE Factors)		
1,2,3,4,6,7,8-HpCDD	0.410	—	0.086			
Total HpCDD	0.840	—	0.086			
OCDF	0.820	—	0.140			
OCDD	2.600	—	0.230			

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
EMPC = Estimated Maximum Possible Concentration
RL = Reporting Limit.

ND = Not Detected
NA = Not Applicable
NC = Not Calculated

Results reported on a dry weight basis and are valid to no more than 2 significant figures.
J = Value below calibration range

B = Less than 10x higher than method blank level
I = Interference present

MB
7/24/08

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc.

23 of 36

Report No.....1074005_8290



Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612-607-6444

Method 8290 Sample Analysis Results

Client - Montana Dept. Of Env. Quality

Client's Sample ID	MBDS-R13-F01		
Lab Sample ID	1074005017		
Filename	F80615B_06		
Injected By	BAL		
Total Amount Extracted	13.9 g	Matrix	Soil
% Moisture	24.8	Dilution	NA
Dry Weight Extracted	10.4 g	Collected	05/25/2008
ICAL ID	F80613	Received	05/28/2008
CCal Filename(s)	F80615A_13 & F80615B_16	Extracted	06/09/2008
Method Blank ID	BLANK-16571	Analyzed	06/15/2008 18:23

Native Isomers	Conc ng/Kg	EMPC ng/Kg	RL ng/Kg	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	ND	—	0.091	2,3,7,8-TCDF-13C	2.00	95
Total TCDF	0.160	—	0.091	2,3,7,8-TCDD-13C	2.00	95
				1,2,3,7,8-PeCDF-13C	2.00	99
2,3,7,8-TCDD	ND	—	0.120	2,3,4,7,8-PeCDF-13C	2.00	100
Total TCDD	ND	—	0.120	1,2,3,7,8-PeCDD-13C	2.00	116
				1,2,3,4,7,8-HxCDF-13C	2.00	77
1,2,3,7,8-PeCDF	ND	—	0.079	1,2,3,6,7,8-HxCDF-13C	2.00	74
2,3,4,7,8-PeCDF	0.087	—	0.082	2,3,4,6,7,8-HxCDF-13C	2.00	74
Total PeCDF	0.180	—	0.081	1,2,3,7,8,9-HxCDF-13C	2.00	81
				1,2,3,4,7,8-HxCDD-13C	2.00	84
1,2,3,7,8-PeCDD	ND	—	0.060	1,2,3,6,7,8-HxCDD-13C	2.00	77
Total PeCDD	0.089	—	0.060	1,2,3,4,6,7,8-HpCDF-13C	2.00	74
				1,2,3,4,7,8,9-HpCDF-13C	2.00	68
1,2,3,4,7,8-HxCDF	0.093	—	0.065	1,2,3,4,6,7,8-HpCDD-13C	2.00	81
1,2,3,6,7,8-HxCDF	—	0.110	0.062	OCDD-13C	4.00	68
2,3,4,6,7,8-HxCDF	—	0.091	0.057			
1,2,3,7,8,9-HxCDF	ND	—	0.068	1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	0.500	—	0.063	1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	—	0.090	0.060	2,3,7,8-TCDD-37Cl4	0.20	105
1,2,3,6,7,8-HxCDD	—	0.140	0.082			
1,2,3,7,8,9-HxCDD	0.120	—	0.072			
Total HxCDD	0.920	—	0.071			
1,2,3,4,6,7,8-HpCDF	—	0.340	0.085	Total 2,3,7,8-TCDD		
1,2,3,4,7,8,9-HpCDF	ND	—	0.150	Equivalence: 0.079 ng/Kg		
Total HpCDF	0.690	—	0.120	(Using ITE Factors)		
1,2,3,4,6,7,8-HpCDD	—	1.800	0.130			
Total HpCDD	1.700	—	0.130			
OCDF	1.100	—	0.100			
OCDD	13.000	—	0.160			

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
EMPC = Estimated Maximum Possible Concentration
RL = Reporting Limit.

ND = Not Detected
NA = Not Applicable
NC = Not Calculated

Results reported on a dry weight basis and are valid to no more than 2 significant figures.

J = Value below calibration range

B = Less than 10x higher than method blank level

I = Interference present

AS
7/24/08

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc.
24 of 36

Report No.....1074005_8290

Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612-607-6444



Pace AnalyticalTM

Method 8290 Sample Analysis Results

Client - Montana Dept. Of Env. Quality

Client's Sample ID	MBDS-R13-A01		
Lab Sample ID	1074005018		
Filename	F80615B_07		
Injected By	BAL		
Total Amount Extracted	13.4 g	Matrix	Soil
% Moisture	20.5	Dilution	NA
Dry Weight Extracted	10.7 g	Collected	05/25/2008
ICAL ID	F80613	Received	05/28/2008
CCal Filename(s)	F80615A_13 & F80615B_16	Extracted	06/09/2008
Method Blank ID	BLANK-16571	Analyzed	06/15/2008 19:12

Native Isomers	Conc ng/Kg	EMPC ng/Kg	RL ng/Kg	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	0.080	—	0.063	J U 2,3,7,8-TCDF-13C	2.00	95
Total TCDF	0.250	—	0.063	J U 2,3,7,8-TCDD-13C	2.00	94
				1,2,3,7,8-PeCDF-13C	2.00	102
2,3,7,8-TCDD	ND	—	0.092	2,3,4,7,8-PeCDF-13C	2.00	102
Total TCDD	ND	—	0.092	1,2,3,7,8-PeCDD-13C	2.00	118
				1,2,3,4,7,8-HxCDF-13C	2.00	78
1,2,3,7,8-PeCDF	ND	—	0.056	1,2,3,6,7,8-HxCDF-13C	2.00	74
2,3,4,7,8-PeCDF	0.073	—	0.044	J U 2,3,4,6,7,8-HxCDF-13C	2.00	75
Total PeCDF	0.270	—	0.050	J U 1,2,3,7,8,9-HxCDF-13C	2.00	84
				1,2,3,4,7,8-HxCDD-13C	2.00	83
1,2,3,7,8-PeCDD	0.068	—	0.041	J J 1,2,3,6,7,8-HxCDD-13C	2.00	80
Total PeCDD	0.150	—	0.041	J U 1,2,3,4,6,7,8-HpCDF-13C	2.00	74
				1,2,3,4,7,8,9-HpCDF-13C	2.00	72
1,2,3,4,7,8-HxCDF	—	0.067	0.061	+ U J 1,2,3,4,6,7,8-HpCDD-13C	2.00	81
1,2,3,6,7,8-HxCDF	—	0.075	0.043	+ U J OCDD-13C	4.00	61
2,3,4,6,7,8-HxCDF	0.097	—	0.067	B+U		
1,2,3,7,8,9-HxCDF	ND	—	0.057	1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	0.170	—	0.057	B+U 1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	ND	—	0.097	2,3,7,8-TCDD-37Cl4	0.20	103
1,2,3,6,7,8-HxCDD	—	0.110	0.072	+ U J		
1,2,3,7,8,9-HxCDD	—	0.096	0.075	+ U J		
Total HxCDD	0.120	—	0.081	B+U		
1,2,3,4,6,7,8-HpCDF	—	0.560	0.120	E R Total 2,3,7,8-TCDD		
1,2,3,4,7,8,9-HpCDF	ND	—	0.100	Equivalence: 0.12 ng/Kg		
Total HpCDF	ND	—	0.110	(Using ITE Factors)		
1,2,3,4,6,7,8-HpCDD	1.900	—	0.077	J J		
Total HpCDD	3.400	—	0.077	J J		
OCDF	—	0.750	0.170	+ U J		
OCDD	9.800	—	0.240	B		

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
EMPC = Estimated Maximum Possible Concentration
RL = Reporting Limit.

ND = Not Detected
NA = Not Applicable
NC = Not Calculated

Results reported on a dry weight basis and are valid to no more than 2 significant figures.

J = Value below calibration range

B = Less than 10x higher than method blank level

E = PCDE Interference

I = Interference present

AS
7/14/08

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc.



Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612-607-6444

Method 8290 Sample Analysis Results

Client - Montana Dept. Of Env. Quality

Client's Sample ID	MBDS-R18-A01		
Lab Sample ID	1074005019		
Filename	F80615B_08		
Injected By	BAL		
Total Amount Extracted	13.3 g	Matrix	Soil
% Moisture	21.5	Dilution	NA
Dry Weight Extracted	10.4 g	Collected	05/26/2008
ICAL ID	F80613	Received	05/28/2008
CCal Filename(s)	F80615A_13 & F80615B_16	Extracted	06/09/2008
Method Blank ID	BLANK-16571	Analyzed	06/15/2008 20:01

Native Isomers	Conc ng/Kg	EMPC ng/Kg	RL ng/Kg	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	ND	—	0.089	2,3,7,8-TCDF-13C	2.00	99
Total TCDF	0.510	—	0.089	2,3,7,8-TCDD-13C	2.00	101
				1,2,3,7,8-PeCDF-13C	2.00	105
2,3,7,8-TCDD	ND	—	0.100	2,3,4,7,8-PeCDF-13C	2.00	106
Total TCDD	0.450	—	0.100	1,2,3,7,8-PeCDD-13C	2.00	125
				1,2,3,4,7,8-HxCDF-13C	2.00	81
1,2,3,7,8-PeCDF	ND	—	0.082	1,2,3,6,7,8-HxCDF-13C	2.00	79
2,3,4,7,8-PeCDF	—	0.071	0.063	2,3,4,6,7,8-HxCDF-13C	2.00	80
Total PeCDF	0.200	—	0.072	1,2,3,7,8,9-HxCDF-13C	2.00	87
				1,2,3,4,7,8-HxCDD-13C	2.00	93
1,2,3,7,8-PeCDD	ND	—	0.085	1,2,3,6,7,8-HxCDD-13C	2.00	85
Total PeCDD	ND	—	0.085	1,2,3,4,6,7,8-HpCDF-13C	2.00	78
				1,2,3,4,7,8,9-HpCDF-13C	2.00	74
1,2,3,4,7,8-HxCDF	ND	—	0.064	1,2,3,4,6,7,8-HpCDD-13C	2.00	82
1,2,3,6,7,8-HxCDF	0.074	—	0.053	OCDD-13C	4.00	75
2,3,4,6,7,8-HxCDF	ND	—	0.069			
1,2,3,7,8,9-HxCDF	ND	—	0.067	1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	0.270	—	0.063	1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	ND	—	0.086	2,3,7,8-TCDD-37Cl4	0.20	108
1,2,3,6,7,8-HxCDD	—	0.098	0.092			
1,2,3,7,8,9-HxCDD	ND	—	0.068			
Total HxCDD	0.270	—	0.082			
1,2,3,4,6,7,8-HpCDF	0.380	—	0.079	Total 2,3,7,8-TCDD		
1,2,3,4,7,8,9-HpCDF	ND	—	0.120	Equivalence: 0.028 ng/Kg		
Total HpCDF	0.740	—	0.100	(Using ITE Factors)		
1,2,3,4,6,7,8-HpCDD	1.100	—	0.120			
Total HpCDD	2.000	—	0.120			
OCDF	—	0.530	0.100			
OCDD	6.100	—	0.130			

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
EMPC = Estimated Maximum Possible Concentration
RL = Reporting Limit

ND = Not Detected
NA = Not Applicable
NC = Not Calculated

Results reported on a dry weight basis and are valid to no more than 2 significant figures.

J = Value below calibration range

B = Less than 10x higher than method blank level

I = Interference present

Handwritten signature and date: J/S 7/12/08

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc.
26 of 36

Report No.....1074005_8290



Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612-607-6444

Method 8290 Sample Analysis Results

Client - Montana Dept. Of Env. Quality

Client's Sample ID	MBDS-R18-F01		
Lab Sample ID	1074005020		
Filename	F80615B_09		
Injected By	BAL		
Total Amount Extracted	14.4 g	Matrix	Soil
% Moisture	27.2	Dilution	NA
Dry Weight Extracted	10.5 g	Collected	05/26/2008
ICAL ID	F80613	Received	05/28/2008
CCal Filename(s)	F80615A_13 & F80615B_16	Extracted	06/09/2008
Method Blank ID	BLANK-16571	Analyzed	06/15/2008 20:50

Native Isomers	Conc ng/Kg	EMPC ng/Kg	RL ng/Kg	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	—	0.076	0.049 +UJ	2,3,7,8-TCDF-13C	2.00	94
Total TCDF	0.210	—	0.049 +U	2,3,7,8-TCDD-13C	2.00	99
				1,2,3,7,8-PeCDF-13C	2.00	102
2,3,7,8-TCDD	ND	—	0.087	2,3,4,7,8-PeCDF-13C	2.00	103
Total TCDD	ND	—	0.087	1,2,3,7,8-PeCDD-13C	2.00	119
				1,2,3,4,7,8-HxCDF-13C	2.00	80
1,2,3,7,8-PeCDF	ND	—	0.062	1,2,3,6,7,8-HxCDF-13C	2.00	76
2,3,4,7,8-PeCDF	ND	—	0.059	2,3,4,6,7,8-HxCDF-13C	2.00	76
Total PeCDF	ND	—	0.061	1,2,3,7,8,9-HxCDF-13C	2.00	84
				1,2,3,4,7,8-HxCDD-13C	2.00	89
1,2,3,7,8-PeCDD	ND	—	0.061	1,2,3,6,7,8-HxCDD-13C	2.00	81
Total PeCDD	ND	—	0.061	1,2,3,4,6,7,8-HpCDF-13C	2.00	78
				1,2,3,4,7,8,9-HpCDF-13C	2.00	73
1,2,3,4,7,8-HxCDF	—	0.041	0.033 +UJ	1,2,3,4,6,7,8-HpCDD-13C	2.00	86
1,2,3,6,7,8-HxCDF	ND	—	0.042	OCDD-13C	4.00	70
2,3,4,6,7,8-HxCDF	0.056	—	0.040 B+U			
1,2,3,7,8,9-HxCDF	ND	—	0.061	1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	0.280	—	0.044 B+U	1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	ND	—	0.050	2,3,7,8-TCDD-37Cl4	0.20	105
1,2,3,6,7,8-HxCDD	0.081	—	0.056 +U			
1,2,3,7,8,9-HxCDD	0.054	—	0.054 B+U			
Total HxCDD	0.140	—	0.053 B+U			
1,2,3,4,6,7,8-HpCDF	0.230	—	0.035 B+U	Total 2,3,7,8-TCDD		
1,2,3,4,7,8,9-HpCDF	ND	—	0.061	Equivalence: 0.026 ng/Kg		
Total HpCDF	0.320	—	0.048 B+U	(Using ITE Factors)		
1,2,3,4,6,7,8-HpCDD	—	0.550	0.054 +UJ			
Total HpCDD	0.600	—	0.054 +U			
OCDF	—	0.360	0.094 +UJ			
OCDD	4.400	—	0.130 B+U			

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
EMPC = Estimated Maximum Possible Concentration
RL = Reporting Limit.

ND = Not Detected
NA = Not Applicable
NC = Not Calculated

Results reported on a dry weight basis and are valid to no more than 2 significant figures.

J = Value below calibration range

B = Less than 10x higher than method blank level

I = Interference present

MS
7/24/08

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc.

27 of 36

Report No....1074005_8290



Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612-607-6444

Method 8290 Sample Analysis Results

Client - Montana Dept. Of Env. Quality

Client's Sample ID	MBDS-R18-001		
Lab Sample ID	1074005021		
Filename	P80611B_10		
Injected By	AE		
Total Amount Extracted	12.5 g	Matrix	Soil
% Moisture	18.2	Dilution	NA
Dry Weight Extracted	10.2 g	Collected	05/26/2008
ICAL ID	P80601	Received	05/28/2008
CCal Filename(s)	P80611A_16 & P80611B_18	Extracted	06/06/2008
Method Blank ID	BLANK-16581	Analyzed	06/12/2008 07:08

Native Isomers	Conc ng/Kg	EMPC ng/Kg	RL ng/Kg	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	0.077	—	0.069	+ U 2,3,7,8-TCDF-13C	2.00	81
Total TCDF	0.077	—	0.069	B U 2,3,7,8-TCDD-13C	2.00	85
				1,2,3,7,8-PeCDF-13C	2.00	91
2,3,7,8-TCDD	ND	—	0.047	2,3,4,7,8-PeCDF-13C	2.00	98
Total TCDD	ND	—	0.047	1,2,3,7,8-PeCDD-13C	2.00	109
				1,2,3,4,7,8-HxCDF-13C	2.00	81
1,2,3,7,8-PeCDF	ND	—	0.065	1,2,3,6,7,8-HxCDF-13C	2.00	68 Y
2,3,4,7,8-PeCDF	ND	—	0.036	2,3,4,6,7,8-HxCDF-13C	2.00	82
Total PeCDF	0.150	—	0.050	+ U 1,2,3,7,8,9-HxCDF-13C	2.00	82
				1,2,3,4,7,8-HxCDD-13C	2.00	84
1,2,3,7,8-PeCDD	0.067	—	0.050	+ J 1,2,3,6,7,8-HxCDD-13C	2.00	71 Y
Total PeCDD	0.067	—	0.050	+ U 1,2,3,4,6,7,8-HpCDF-13C	2.00	83
				1,2,3,4,7,8,9-HpCDF-13C	2.00	106 Y
1,2,3,4,7,8-HxCDF	0.085	—	0.045	B U 1,2,3,4,6,7,8-HpCDD-13C	2.00	94
1,2,3,6,7,8-HxCDF	0.070	—	0.058	+ J OCDD-13C	4.00	106 Y
2,3,4,6,7,8-HxCDF	ND	—	0.038			
1,2,3,7,8,9-HxCDF	ND	—	0.047	1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	0.530	—	0.047	B U 1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	ND	—	0.050	2,3,7,8-TCDD-37Cl4	0.20	87
1,2,3,6,7,8-HxCDD	0.110	—	0.062	+ J		
1,2,3,7,8,9-HxCDD	ND	—	0.042			
Total HxCDD	0.280	—	0.051	+ J		
1,2,3,4,6,7,8-HpCDF	1.700	—	0.031	+ J Total 2,3,7,8-TCDD		
1,2,3,4,7,8,9-HpCDF	—	0.14	0.066	+ J+ Equivalence: 0.14 ng/Kg		
Total HpCDF	11.000	—	0.049	(Using ITE Factors)		
1,2,3,4,6,7,8-HpCDD	2.300	—	0.035	+ J		
Total HpCDD	3.600	—	0.035	+ J		
OCDF	14.000	—	0.110			
OCDD	15.000	—	0.120			

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
EMPC = Estimated Maximum Possible Concentration
RL = Reporting Limit.

ND = Not Detected
NA = Not Applicable
NC = Not Calculated

Results reported on a dry weight basis and are valid to no more than 2 significant figures.

J = Value below calibration range

B = Less than 10x higher than method blank level

I = Interference present

Y = Calculated using average of daily RFs

Handwritten signature: JB 7/24/08

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc.

28 of 36

Report No....1074005_8290

Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612-607-6444



Pace Analytical™

Method 8290 Sample Analysis Results

Client - Montana Dept. Of Env. Quality

Client's Sample ID	MBDS-R12-A01		
Lab Sample ID	1074005022		
Filename	F80615B_10		
Injected By	BAL		
Total Amount Extracted	12.0 g	Matrix	Soil
% Moisture	16.0	Dilution	NA
Dry Weight Extracted	10.1 g	Collected	05/26/2008
ICAL ID	F80613	Received	05/28/2008
CCal Filename(s)	F80615A_13 & F80615B_16	Extracted	06/06/2008
Method Blank ID	BLANK-16581	Analyzed	06/15/2008 21:39

Native Isomers	Conc ng/Kg	EMPC ng/Kg	RL ng/Kg	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	0.097	—	0.079	+ U 2,3,7,8-TCDF-13C	2.00	96
Total TCDF	0.250	—	0.079	Bd U 2,3,7,8-TCDD-13C	2.00	94
				1,2,3,7,8-PeCDF-13C	2.00	100
2,3,7,8-TCDD	ND	—	0.100	2,3,4,7,8-PeCDF-13C	2.00	105
Total TCDD	ND	—	0.100	1,2,3,7,8-PeCDD-13C	2.00	115
				1,2,3,4,7,8-HxCDF-13C	2.00	77
1,2,3,7,8-PeCDF	ND	—	0.066	1,2,3,6,7,8-HxCDF-13C	2.00	72
2,3,4,7,8-PeCDF	—	0.097	0.049	+ J+ 2,3,4,6,7,8-HxCDF-13C	2.00	76
Total PeCDF	0.450	—	0.057	+ U 1,2,3,7,8,9-HxCDF-13C	2.00	86
				1,2,3,4,7,8-HxCDD-13C	2.00	83
1,2,3,7,8-PeCDD	0.082	—	0.052	+ J 1,2,3,6,7,8-HxCDD-13C	2.00	79
Total PeCDD	0.082	—	0.052	+ U 1,2,3,4,6,7,8-HpCDF-13C	2.00	74
				1,2,3,4,7,8,9-HpCDF-13C	2.00	74
1,2,3,4,7,8-HxCDF	—	0.096	0.067	+ U 1,2,3,4,6,7,8-HpCDD-13C	2.00	82
1,2,3,6,7,8-HxCDF	0.098	—	0.056	+ J 1,2,3,4,6,7,8-HpCDD-13C	2.00	75
2,3,4,6,7,8-HxCDF	—	0.076	0.041	+ J+ OCDD-13C	4.00	75
1,2,3,7,8,9-HxCDF	ND	—	0.041	1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	0.098	—	0.051	Bd U 1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	ND	—	0.055	2,3,7,8-TCDD-37Cl4	0.20	105
1,2,3,6,7,8-HxCDD	0.160	—	0.075			
1,2,3,7,8,9-HxCDD	—	0.071	0.051	+ J+ hhh+		
Total HxCDD	0.580	—	0.061	+ U hhh+		
1,2,3,4,6,7,8-HpCDF	—	0.420	0.046	+ U Total 2,3,7,8-TCDD		
1,2,3,4,7,8,9-HpCDF	0.100	—	0.056	+ J Equivalence: 0.11 ng/Kg		
Total HpCDF	0.450	—	0.051	+ J (Using ITE Factors)		
1,2,3,4,6,7,8-HpCDD	1.800	—	0.110	+ J		
Total HpCDD	3.800	—	0.110	+ U		
OCDF	0.720	—	0.067	+ U		
OCDD	11.000	—	0.100			

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
EMPC = Estimated Maximum Possible Concentration
RL = Reporting Limit.

ND = Not Detected
NA = Not Applicable
NC = Not Calculated

Results reported on a dry weight basis and are valid to no more than 2 significant figures.

J = Value below calibration range
B = Less than 10x higher than method blank level
I = Interference present

Handwritten signature
7/24/08

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc.

Montana Background Dioxin Study

1. **SDG Number:** 1074382
2. **Number of Samples:** (6)
3. **Sample Matrix:** (6) Soil
4. **Applicable Analytes:** PCDD/PCDF
5. **Reporting Tier:** Level 3
6. **Analysis Method** USEPA SW-846 Method 8290
7. **Laboratory:** Pace Analytical
8. **Validation Level:** III
9. **Validator Affiliation:** Portage Environmental, Inc.
10. **Project:** Montana Background Dioxin Study

Validator's Signature: *Amber Brinly*

Date: 08/01/08

Reviewed By:

Date: 08/06/08

1. INTRODUCTION

Six (6) soil samples were collected and analyzed for Dioxins/Furans by Pace Analytical using USEPA SW-846 Method 8290, *Polychlorinated Dibenzodioxins (PCDDs) and Polychlorinated Dibenzofurans (PCDFs)* by *High Resolution Gas Chromatography/High Resolution Mass Spectrometry (HRGC/HRMS)*. The data were validated to a Level III.

2. SAMPLE IDENTIFICATION

A sample cross-reference and holding time table is presented below.

Montana Background Dioxin Study SDG Number 1074382								
Field ID	Lab ID	Matrix	Sample Collection Date	Date Received	Date Extracted	Collection to Extraction Holding Time	Analysis Date	Extraction to Analysis Holding Time
MBDS-U07-I01	1074382001	Soil	05/30/08	06/03/08	06/13/08	14	06/20/08	7
MBDS-U07-C01	1074382002	Soil	05/30/08	06/03/08	06/13/08	14	06/20/08	7
MBDS-U07-R01	1074382003	Soil	05/30/08	06/03/08	06/13/08	14	06/20/08	7
MBDS-U06-C01	1074382004	Soil	05/30/08	06/03/08	06/13/08	14	06/20/08	7
MBDS-U06-I01	1074382005	Soil	05/30/08	06/03/08	06/13/08	14	06/20/08	7
MBDS-U06-R01	1074382006	Soil	05/30/08	06/03/08	06/13/08	14	06/20/08	7

A '**' denotes an exceeded holding time.

3. DATA LIMITATION OVERVIEW

The target compound analyses, dioxin/furan, for soil samples from Montana Background Dioxin Study showed compliance with the QC requirements set forth by USEPA SW-846 Method 8290. The data are valid and acceptable with the following exceptions:

MBDS-U07-I01:

- 2,3,7,8-TCDF and 1,2,3,7,8-PeCDF has been qualified with a 'U' validation flag to denote the reported concentration is non-detect due to positive detection in the method blank (see CTR comment #6).
- 2,3,4,7,8-PeCDF, total PeCDD, 1,2,3,4,7,8-HxCDF, 2,3,4,6,7,8-HxCDF, 1,2,3,7,8,9-HxCDF, 1,2,3,4,7,8-HxCDD, 1,2,3,6,7,8-HxCDD, 1,2,3,7,8,9-HxCDD, 1,2,3,4,6,7,8-HpCDF, and 1,2,3,4,7,8,9-HpCDF have been qualified with a 'J' validation flag to denote the reported concentrations are estimates with an undetermined bias as they were reported below the quantitation limit (see CTR comment #10).
- 1,2,3,7,8-PeCDD was reported at an EMPC and has been qualified with a 'J+' validation flag to denote the reported concentration is likely overestimated as it was reported below the quantitation limit (see CTR comment #10).

- 1,2,3,6,7,8-HxCDF was reported at an EMPC and has been qualified with an 'R' validation flag due to PCDE interference (see CTR comment #10).

MBDS-U07-C01:

- Total TCDF, 1,2,3,7,8-PeCDF, 2,3,4,7,8-PeCDF, and 1,2,3,6,7,8-HxCDD has been qualified with a 'U' validation flag to denote the reported concentration is non-detect due to positive detection in the method blank (see CTR comment #6).
- Total TCDD, total PeCDF, total PeCDD, 2,3,4,6,7,8-HxCDF, total HxCDF, 1,2,3,7,8,9-HxCDD, total HxCDD, 1,2,3,4,6,7,8-HpCDF, total HpCDF, and OCDF have been qualified with a 'J' validation flag to denote the reported concentrations are estimates with an undetermined bias as they were reported below the quantitation limit (see CTR comment #10).
- 1,2,3,4,7,8-HxCDF, 1,2,3,6,7,8-HxCDF, and 1,2,3,4,7,8-HxCDD were reported at an EMPC and have been qualified with a 'J+' validation flag to denote the reported concentration is likely overestimated due to possible interference in the sample (see CTR comment #10).

MBDS-U07-R01:

- Total TCDF has been qualified with a 'U' validation flag to denote the reported concentration is non-detect due to positive detection in the method blank (see CTR comment #6).
- 2,3,4,7,8-PeCDF was reported at an EMPC and has been qualified with a 'UJ' validation flag to denote the reported concentration is non-detect, and the sample quantitation limit is an estimate due to positive detection in the method blank and possible interference in the sample (see CTR comment #6 and 10).
- Total TCDD, total PeCDF, total PeCDD, 1,2,3,4,7,8-HxCDF, 1,2,3,6,7,8-HxCDF, 2,3,4,6,7,8-HxCDF, 1,2,3,7,8,9-HxCDF, total HxCDF, 1,2,3,4,7,8-HxCDD, 1,2,3,7,8,9-HxCDD, total HxCDD, 1,2,3,4,6,7,8-HpCDF, 1,2,3,4,7,8,9-HpCDF, total HpCDF, and OCDF have been qualified with a 'J' validation flag to denote the reported concentrations are estimates with an undetermined bias as they were reported below the quantitation limit (see CTR comment #10).
- 1,2,3,7,8-PeCDD was reported at an EMPC and has been qualified with a 'J+' validation flag to denote the reported concentration is likely overestimated due to possible interference in the sample (see CTR comment #10).

MBDS-U06-C01:

- Total TCDF has been qualified with a 'U' validation flag to denote the reported concentration is non-detect due to positive detection in the method blank (see CTR comment #6).
- 2,3,4,7,8-PeCDF was reported at an EMPC and has been qualified with a 'U' validation flag to denote the reported concentration is non-detect, and the sample quantitation limit is an estimate due to positive detection in the method blank and possible interference in the sample (see CTR comment #6 and 10).
- 1,2,3,4,6,7,8-HpCDF was reported at an EMPC and has been qualified with an 'R' validation flag due to PCDE interference (see CTR comment #10).
- 1,2,3,7,8-PeCDD was reported at an EMPC and has been qualified with a 'J+' validation flag to denote the reported concentration is likely overestimated due to possible interference in the sample (see CTR comment #10).
- Total PeCDF, total PeCDD, 1,2,3,4,7,8-HxCDF, 1,2,3,6,7,8-HxCDF, 2,3,4,6,7,8-HxCDF, total HxCDF, 1,2,3,4,7,8-HxCDD, 1,2,3,6,7,8-HxCDD, 1,2,3,7,8,9-HxCDD, total HxCDD, and total HpCDF have been qualified with a 'J' validation flag to denote the reported concentrations are estimates with an undetermined bias as they were reported below the quantitation limit (see CTR comment #10).

MBDS-U06-I01:

- 2,3,7,8-TCDF, total TCDF, 1,2,3,6,7,8-HxCDD, total HpCDF, and OCDF have been qualified with a 'U' validation flag to denote the reported concentration is non-detect due to positive detection in the method blank (see CTR comment #6).
- 2,3,4,7,8-PeCDF and 1,2,3,4,6,7,8-HpCDF were reported at an EMPC and have been qualified with a 'UJ' validation flag to denote the reported concentrations are non-detect, and the sample quantitation limits are estimates due to positive detection in the method blank and possible interference in the sample (see CTR comment #6 and 10).
- 1,2,3,6,7,8-HxCDF was reported at an EMPC and has been qualified with a 'J+' validation flag to denote the reported concentration is likely overestimated due to possible interference in the sample (see CTR comment #10).

- Total PeCDF, total PeCDD, 1,2,3,4,7,8-HxCDF, 2,3,4,6,7,8-HxCDF, total HxCDF, 1,2,3,4,7,8-HxCDD, 1,2,3,7,8,9-HxCDD, total HxCDD, and 1,2,3,4,6,7,8-HpCDD have been qualified with a 'J' validation flag to denote the reported concentrations are estimates with an undetermined bias as they were reported below the quantitation limit (see CTR comment #10).

MBDS-U06-R01:

- 2,3,4,7,8-PeCDF, total HpCDF, and OCDF have been qualified with a 'U' validation flag to denote the reported concentration is non-detect due to positive detection in the method blank (see CTR comment #6).
- Total PeCDF, total HxCDF, total HxCDD, 1,2,3,4,6,7,8-HpCDD, total HpCDD, and OCDD have been qualified with a 'J' validation flag to denote the reported concentrations are estimates with an undetermined bias as they were reported below the quantitation limit (see CTR comment #10).
- 1,2,3,7,8,9-HxCDD was reported at an EMPC and has been qualified with a 'J+' validation flag to denote the reported concentration is likely overestimated due to possible interference in the sample (see CTR comment #10).
- 1,2,3,6,7,8-HxCDD was reported at an EMPC and has been qualified with a 'UJ' validation flag to denote the reported concentration is non-detect, and the sample quantitation limit is an estimate due to positive detection in the method blank and possible interference in the sample (see CTR comment #6 and 10).
- 1,2,3,4,6,7,8-HpCDF was reported at an EMPC and has been qualified with an 'R' validation flag due to PCDE interference (see CTR comment #10).

4. CONTRACT AND TECHNICAL REVIEW (CTR)

Project Name: Montana Background Dioxin Study

Laboratory Name: Pace Analytical

SDG#: 1074382

Type of Analysis: USEPA SW-846 Method 8290

1. Data Completeness

The data has undergone a Level III validation.

2. Sample Integrity

No action was taken as sample integrity was compliant.

3. Sample Holding Times

No action was taken as sample holding times were met.

4. Instrument Performance

No action was taken as instrument performance was compliant.

5. Initial and Continuing Calibrations

The initial and continuing calibration forms were not included in the data package as it was a level III. No action was taken as the case narrative indicated that the acceptance criteria for the initial and continuing calibrations were met.

6. Method and Field Blank Contamination

Method Blank. Positive detections were noted in the method blank for 2,3,7,8-TCDF, total TCDF, total PeCDF, 1,2,3,4,6,7,8-HpCDF, total HpCDF, 1,2,3,4,6,7,8-HpCDD, total HpCDD, OCDF, and OCDD and EMPC results were reported for 1,2,3,7,8-PeCDF, 2,3,4,7,8-PeCDF, and 1,2,3,6,7,8-HxCDD.

In sample MBDS-U07-I01, 2,3,7,8-TCDF and 1,2,3,7,8-PeCDF have been qualified with a 'U' validation flag as the reported concentration was less than five times the method blank concentration.

In sample MBDS-U07-C01, total TCDF, 1,2,3,7,8-PeCDF, 2,3,4,7,8-PeCDF, 1,2,3,6,7,8-HxCDD have been qualified with a 'U' validation flag as the reported concentration was less than five times the method blank concentration.

In sample MBDS-U07-R01, total TCDF and 1,2,3,6,7,8-HxCDD have been qualified with a 'U' validation flag as the reported concentration was less than five times the method blank concentration. 2,3,4,7,8-PeCDF was reported at an EMPC and has been qualified with a 'UJ' validation flag as the reported concentration was less than five times the method blank concentration and due to possible interference in the sample.

In sample MBDS-U06-C01, total TCDF has been qualified with a 'U' validation flag as the reported concentration was less than five times the method blank concentration. 2,3,4,7,8-PeCDF was reported at an EMPC and has been qualified with a 'UJ' validation flag as the reported concentration was less than five times the method blank concentration and due to possible interference in the sample.

In sample MBDS-U06-I01, 2,3,7,8-TCDF, total TCDF, 1,2,3,6,7,8-HxCDD, total HpCDF, and OCDF have been qualified with a 'U' validation flag as the reported concentration was less than five times the method blank concentration. 2,3,4,7,8-PeCDF and 1,2,3,4,6,7,8-HpCDF were reported at a EMPC and have been qualified with a 'UJ' validation flag as the reported concentrations were less than five times the method blank concentration and due to possible interference in the sample.

In sample MBDS-U06-R01, 2,3,4,7,8-PeCDF, total HpCDF, and OCDF have been qualified with a 'U' validation flag as the reported concentration was less than five times the method blank concentration. 1,2,3,6,7,8-HxCDD was reported at an EMPC and has been qualified with a 'UJ' validation flag as the reported concentration was less than five times the method blank concentration and due to possible interference in the sample.

7. Matrix Spike/Matrix Spike Duplicate (MS/MSD)

The laboratory did not provide acceptance limits for the MS/MSD analysis. In the professional judgment of the validator, the acceptance limit of 50-150% for MS/MSD recovery and a 35% RPD for soil samples and has been used for validation purposes.

OCDD (225% and 192%) in the MS and MSD respectively was outside of the 50-150% acceptance criteria. The background subtracted MS/MSD recoveries were within the acceptance criteria. No action was taken as qualifications are not made based on MS/MSD data alone.

8. Laboratory Control Sample (LCS)

No action was taken as all LCS recoveries were within the acceptance criteria.

9. Internal Standards (IS) Performance

No action was taken as all internal standard recoveries were within the 40-135% acceptance criteria, per USEPA SW-846 Method 8290.

10. Target Compound Identification and Quantitation

In sample MBDS-U07-I01, 2,3,4,7,8-PeCDF, total PeCDD, 1,2,3,4,7,8-HxCDF, 2,3,4,6,7,8-HxCDF, 1,2,3,7,8,9-HxCDF, 1,2,3,4,7,8-HxCDD, 1,2,3,6,7,8-HxCDD, 1,2,3,7,8,9-HxCDD, 1,2,3,4,6,7,8-HpCDF, and 1,2,3,4,7,8,9-HpCDF were reported below the quantitation limit. They have been qualified with a 'J' validation flag as the reported concentrations are estimates with an undetermined bias. 1,2,3,7,8-PeCDF was reported at an EMPC and has been qualified with a 'J+' validation flag as the reported result is likely overestimated due to possible interference in the sample. 1,2,3,6,7,8-HxCDF was reported at an EMPC and has been qualified with an 'R' validation flag due to the interference of polychlorinated diphenyl ethers.

In sample MBDS-U07-C01, total TCDD, total PeCDF, total PeCDD, 2,3,4,6,7,8-HxCDF, total HxCDF, 1,2,3,7,8,9-HxCDD, total HxCDD, 1,2,3,4,6,7,8-HpCDF, total HpCDF, and OCDF were reported below the quantitation limit. They have been qualified with a 'J' validation flag as the reported concentrations are estimates with an undetermined bias. 1,2,3,4,7,8-HxCDF, 1,2,3,6,7,8-HxCDF, and 1,2,3,4,7,8-HxCDD were reported at an EMPC and have been qualified with a 'J+' validation flag as the reported result is likely overestimated due to possible interference in the sample.

In sample MBDS-U07-R01, total TCDD, total PeCDF, total PeCDD, 1,2,3,4,7,8-HxCDF, 1,2,3,6,7,8-HxCDF, 2,3,4,6,7,8-HxCDF, 1,2,3,7,8,9-HxCDF, total HxCDF, 1,2,3,4,7,8-HxCDD, 1,2,3,7,8,9-HxCDD, total HxCDD, 1,2,3,4,6,7,8-HpCDF, 1,2,3,4,7,8,9-HpCDF, total HpCDF and OCDF were reported below the quantitation limit. They have been qualified with a 'J' validation flag as the reported concentrations are estimates with an undetermined bias. 1,2,3,7,8-PeCDD was reported at an EMPC and has been qualified with a 'J+' validation flag as the reported concentration is likely overestimated due to possible interference in the sample. 2,3,4,7,8-PeCDF was reported at an EMPC and has been qualified with a 'UJ' validation flag due to positive detection in the method blank and possible interference in the sample.

In sample MBDS-U06-C01, total PeCDF, total PeCDD, 1,2,3,4,7,8-HxCDF, 1,2,3,6,7,8-HxCDF, 2,3,4,6,7,8-HxCDF, total HxCDF, 1,2,3,4,7,8-HxCDD, 1,2,3,6,7,8-HxCDD, 1,2,3,7,8,9-HxCDD, total HxCDD, and total HpCDF were reported below the quantitation limit. They have been qualified with a 'J' validation flag as the reported concentrations are estimates with an undetermined bias. 1,2,3,7,8-PeCDD was reported at an EMPC and has been qualified with a 'J+' validation flag as the reported result is likely overestimated due to possible interference in the sample. 2,3,4,7,8-PeCDF was reported at an EMPC and has been qualified with a 'UJ' validation flag due to positive detection in the method blank and possible interference in the sample. 1,2,3,4,6,7,8-HpCDF was reported at an EMPC and has been qualified with an 'R' validation flag due to the interference of polychlorinated diphenyl ethers.

In sample MBDS-U06-I01, total PeCDF, total PeCDD, 1,2,3,4,7,8-HxCDF, 2,3,4,6,7,8-HxCDF, total HxCDF, 1,2,3,4,7,8-HxCDD, 1,2,3,7,8,9-HxCDD, total HxCDD, and 1,2,3,4,6,7,8-HpCDD were reported below the quantitation limit. They have been qualified with a 'J' validation flag as the reported concentrations are estimates with an undetermined bias. 1,2,3,6,7,8-HxCDF was reported at an EMPC and has been qualified with a 'J+' validation flag as the reported concentration is likely overestimated due to possible interference in the sample. 2,3,4,7,8-PeCDF and 1,2,3,4,6,7,8-HpCDF were reported at a EMPC and have been qualified with a 'UJ' validation flag due to positive detection in the method blank and possible interference in the sample.

In sample MBDS-U06-R01, total PeCDF, total HxCDF, total HxCDD, 1,2,3,4,6,7,8-HpCDD, total HpCDD, and OCDD were reported below the quantitation limit. They have been qualified with a 'J-' validation flag as the reported concentrations are estimates with an undetermined bias. 1,2,3,7,8,9-HxCDD was reported at a EMPC and has been qualified with a 'J+' validation flag as the reported concentration is likely overestimated due to possible interference in the sample. 1,2,3,6,7,8-HxCDD was reported at a EMPC and has been qualified with a 'UJ' validation flag due to positive detection in the sample and possible interference in the sample. 1,2,3,4,6,7,8-HpCDF was reported at an EMPC and has been qualified with an 'R' validation flag due to the interference of polychlorinated diphenyl ethers.

11. Chromatogram Quality

No comments relating to chromatogram quality.

5. SUMMARY OF DATA USABILITY

The data validation summary flag table shows that qualifiers were applied to the target analytes for SDG# 1074382.

DATA VALIDATION SUMMARY TABLE						
Compound	MBDS-U07-I01	MBDS-U07-C01	MBDS-U07-R01	MBDS-U06-C01	MBDS-U06-I01	MBDS-U06-R01
2,3,7,8-TCDF	U				U	
Total TCDF		U	U	U	U	
2,3,7,8-TCDD						
Total TCDD		J	J			
1,2,3,7,8-PeCDF	U	U				
2,3,4,7,8-PeCDF	J	U	UJ	UJ	UJ	U
Total PeCDF		J	J	J	J	J
1,2,3,7,8-PeCDD	J+		J+	J+		
Total PeCDD	J	J	J	J	J	
1,2,3,4,7,8-HxCDF	J	J+	J	J	J	
1,2,3,6,7,8-HxCDF	R	J+	J	J	J+	
2,3,4,6,7,8-HxCDF	J	J	J	J	J	
1,2,3,7,8,9-HxCDF	J		J			
Total HxCDF		J	J	J	J	J
1,2,3,4,7,8-HxCDD	J	J+	J	J	J	
1,2,3,6,7,8-HxCDD	J	U	U	J	U	UJ
1,2,3,7,8,9-HxCDD	J	J	J	J	J	J+
Total HxCDD		J	J	J	J	J
1,2,3,4,6,7,8-HpCDF	J	J	J	R	UJ	R
1,2,3,4,7,8,9-HpCDF	J		J			
Total HpCDF		J	J	J	U	U
1,2,3,4,6,7,8-HpCDD		J			J	J
Total HpCDD		J				J
OCDF		J	J		U	U
OCDD		J				J

Data Validation Summary Table Qualifier Codes

U = Result is a non-detect.

UJ = Result is a non-detect, but is estimated due to QC issues.

J = Result was detected, but is an estimated with undetermined bias due to QC issues.

J+ = Result was detected, but is likely overestimated due to QC issues.

J- = Result was detected, but is likely underestimated due to QC issues.

R = Result is rejected and is highly questionable for use as a quantitative value due to significant QC issues.

6. REFERENCES

Contract Laboratory Program National Functional Guidelines for Organic Data Review, EPA 540/R-99/008, October 1999, U.S. Environmental Protection Agency, Cincinnati, Ohio.

USEPA Analytical Operations / Data Quality Center, *National Functional Guidelines for Chlorinated Dioxin / Furan Data Review*, EPA 540-R-02-003, August 2002.

USEPA, *Methods for the Analysis of Wastes, High Resolution Gas Chromatography / Mass Spectrometry*, SW-846, July 2002.

USEPA Test Methods for Evaluating Solid Waste Physical/Chemical Methods, Doc. No. SW-846, 3rd Ed., Method 8290, Polychlorinated Dibenzodioxins (PCDDs) and Polychlorinated Dibenzofurans (PCDFs) by High Resolution Gas Chromatography/High Resolution Mass Spectrometry (HRGC/HRMS), Revision 0, September 1994.

9. ATTACHMENTS

The following items are included as an attachment to this L&V report:

- A. Qualified reported results (Form I)

Attachment A
Qualified Reported Results

Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612-607-6444



Pace AnalyticalTM

Method 8290 Sample Analysis Results

Client - Montana Dept. Of Env. Quality

Client's Sample ID	MBDS-U07-I01		
Lab Sample ID	1074382001		
Filename	P80620A_08		
Injected By	BAL		
Total Amount Extracted	13.1 g	Matrix	Soil
% Moisture	21.6	Dilution	NA
Dry Weight Extracted	10.3 g	Collected	05/30/2008
ICAL ID	P80617	Received	06/03/2008
CCal Filename(s)	P80619B_17 & P80620A_11	Extracted	06/13/2008
Method Blank ID	BLANK-16620	Analyzed	06/20/2008 13:57

Native Isomers	Conc ng/Kg	EMPC ng/Kg	RL ng/Kg	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	0.18	—	0.087	BT U	2,3,7,8-TCDF-13C	88
Total TCDF	3.20	—	0.087	B	2,3,7,8-TCDD-13C	86
					1,2,3,7,8-PeCDF-13C	98
2,3,7,8-TCDD	ND	—	0.082		2,3,4,7,8-PeCDF-13C	98
Total TCDD	1.50	—	0.082		1,2,3,7,8-PeCDD-13C	109
					1,2,3,4,7,8-HxCDF-13C	82
1,2,3,7,8-PeCDF	0.14	—	0.086	U U	1,2,3,6,7,8-HxCDF-13C	77
2,3,4,7,8-PeCDF	0.37	—	0.110	J J	2,3,4,6,7,8-HxCDF-13C	79
Total PeCDF	5.90	—	0.098		1,2,3,7,8,9-HxCDF-13C	76
					1,2,3,4,7,8-HxCDD-13C	92
1,2,3,7,8-PeCDD	—	0.13	0.060	+ J J	1,2,3,6,7,8-HxCDD-13C	77
Total PeCDD	0.44	—	0.060	+ J J	1,2,3,4,6,7,8-HpCDF-13C	73
					1,2,3,4,7,8,9-HpCDF-13C	61
1,2,3,4,7,8-HxCDF	0.31	—	0.130	+ J J	1,2,3,4,6,7,8-HpCDD-13C	82
1,2,3,6,7,8-HxCDF	—	0.50	0.130	+ J J	OCDD-13C	67
2,3,4,6,7,8-HxCDF	0.34	—	0.085	+ J J		
1,2,3,7,8,9-HxCDF	0.16	—	0.095	+ J J	1,2,3,4-TCDD-13C	NA
Total HxCDF	6.00	—	0.110		1,2,3,7,8,9-HxCDD-13C	NA
1,2,3,4,7,8-HxCDD	0.29	—	0.078	+ J J	2,3,7,8-TCDD-37Cl4	90
1,2,3,6,7,8-HxCDD	0.83	—	0.062	+ J J		
1,2,3,7,8,9-HxCDD	0.55	—	0.085	+ J J		
Total HxCDD	5.50	—	0.075			
1,2,3,4,6,7,8-HpCDF	4.20	—	0.140	+ J J	Total 2,3,7,8-TCDD	
1,2,3,4,7,8,9-HpCDF	0.43	—	0.180	+ J J	Equivalence: 0.90 ng/Kg	
Total HpCDF	13.00	—	0.160		(Using ITE Factors)	
1,2,3,4,6,7,8-HpCDD	19.00	—	0.086			
Total HpCDD	34.00	—	0.086			
OCDF	12.00	—	0.066			
OCDD	190.00	—	0.290			

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
EMPC = Estimated Maximum Possible Concentration
RL = Reporting Limit.

ND = Not Detected
NA = Not Applicable
NC = Not Calculated

Results reported on a dry weight basis and are valid to no more than 2 significant figures.

J = Value below calibration range
B = Less than 10x higher than method blank level
E = PCDE Interference
I = Interference present

8/14/08

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc.

7 of 17

Report No.....1074382_8290

Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612-607-6444



Pace AnalyticalTM

Method 8290 Sample Analysis Results

Client - Montana Dept. Of Env. Quality

Client's Sample ID	MBDS-U07-C01		
Lab Sample ID	1074382002		
Filename	P80619B_11		
Injected By	BAL		
Total Amount Extracted	13.1 g	Matrix	Soil
% Moisture	17.3	Dilution	NA
Dry Weight Extracted	10.9 g	Collected	05/30/2008
ICAL ID	P80617	Received	06/03/2008
CCal Filename(s)	P80619B_01 & P80619B_17	Extracted	06/13/2008
Method Blank ID	BLANK-16620	Analyzed	06/20/2008 02:41

Native Isomers	Conc ng/Kg	EMPC ng/Kg	RL ng/Kg	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	ND	—	0.140	2,3,7,8-TCDF-13C	2.00	90
Total TCDF	1.50	—	0.140	2,3,7,8-TCDD-13C	2.00	91
				1,2,3,7,8-PeCDF-13C	2.00	88
2,3,7,8-TCDD	ND	—	0.076	2,3,4,7,8-PeCDF-13C	2.00	91
Total TCDD	0.86	—	0.076	1,2,3,7,8-PeCDD-13C	2.00	99
				1,2,3,4,7,8-HxCDF-13C	2.00	84
1,2,3,7,8-PeCDF	0.13	—	0.079	1,2,3,6,7,8-HxCDF-13C	2.00	81
2,3,4,7,8-PeCDF	0.27	—	0.097	2,3,4,6,7,8-HxCDF-13C	2.00	81
Total PeCDF	4.60	—	0.088	1,2,3,7,8,9-HxCDF-13C	2.00	78
				1,2,3,4,7,8-HxCDD-13C	2.00	93
1,2,3,7,8-PeCDD	ND	—	0.081	1,2,3,6,7,8-HxCDD-13C	2.00	82
Total PeCDD	0.41	—	0.081	1,2,3,4,6,7,8-HpCDF-13C	2.00	73
				1,2,3,4,7,8,9-HpCDF-13C	2.00	58
1,2,3,4,7,8-HxCDF	—	0.100	0.075	+1,2,3,4,6,7,8-HpCDD-13C	2.00	80
1,2,3,6,7,8-HxCDF	—	0.120	0.077	+OCDD-13C	4.00	66
2,3,4,6,7,8-HxCDF	0.26	—	0.076			
1,2,3,7,8,9-HxCDF	ND	—	0.120	1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	1.40	—	0.087	1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	—	0.086	0.056	+2,3,7,8-TCDD-37Cl4	0.20	94
1,2,3,6,7,8-HxCDD	0.31	—	0.054			
1,2,3,7,8,9-HxCDD	0.21	—	0.050			
Total HxCDD	2.20	—	0.054			
1,2,3,4,6,7,8-HpCDF	1.60	—	0.120	Total 2,3,7,8-TCDD		
1,2,3,4,7,8,9-HpCDF	ND	—	0.130	Equivalence: 0.34 ng/Kg		
Total HpCDF	4.30	—	0.120	(Using ITE Factors)		
1,2,3,4,6,7,8-HpCDD	4.80	—	0.049			
Total HpCDD	9.00	—	0.049			
OCDF	8.50	—	0.150			
OCDD	42.00	—	0.100			

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
EMPC = Estimated Maximum Possible Concentration
RL = Reporting Limit.

ND = Not Detected
NA = Not Applicable
NC = Not Calculated

Results reported on a dry weight basis and are valid to no more than 2 significant figures.

J = Value below calibration range
B = Less than 10x higher than method blank level
I = Interference present

Handwritten signature
8/14/08

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc.
8 of 17

Report No.....1074382_8290

Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612-607-6444



Pace AnalyticalTM

Method 8290 Sample Analysis Results

Client - Montana Dept. Of Env. Quality

Client's Sample ID	MBDS-U07-R01		
Lab Sample ID	1074382003		
Filename	P80619B_12		
Injected By	BAL		
Total Amount Extracted	14.5 g	Matrix	Soil
% Moisture	30.3	Dilution	NA
Dry Weight Extracted	10.1 g	Collected	05/30/2008
ICAL ID	P80617	Received	06/03/2008
CCal Filename(s)	P80619B_01 & P80619B_17	Extracted	06/13/2008
Method Blank ID	BLANK-16620	Analyzed	06/20/2008 03:29

Native Isomers	Conc ng/Kg	EMPC ng/Kg	RL ng/Kg	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	ND	—	0.110	2,3,7,8-TCDF-13C	2.00	92
Total TCDF	1.200	—	0.110	2,3,7,8-TCDD-13C	2.00	94
				1,2,3,7,8-PeCDF-13C	2.00	93
2,3,7,8-TCDD	ND	—	0.087	2,3,4,7,8-PeCDF-13C	2.00	94
Total TCDD	0.340	—	0.087	1,2,3,7,8-PeCDD-13C	2.00	105
				1,2,3,4,7,8-HxCDF-13C	2.00	86
1,2,3,7,8-PeCDF	ND	—	0.110	1,2,3,6,7,8-HxCDF-13C	2.00	82
2,3,4,7,8-PeCDF	—	0.19	0.098	2,3,4,6,7,8-HxCDF-13C	2.00	83
Total PeCDF	3.100	—	0.100	1,2,3,7,8,9-HxCDF-13C	2.00	79
				1,2,3,4,7,8-HxCDD-13C	2.00	94
1,2,3,7,8-PeCDD	—	0.11	0.083	1,2,3,6,7,8-HxCDD-13C	2.00	85
Total PeCDD	0.250	—	0.083	1,2,3,4,6,7,8-HpCDF-13C	2.00	74
				1,2,3,4,7,8,9-HpCDF-13C	2.00	59
1,2,3,4,7,8-HxCDF	0.210	—	0.079	1,2,3,4,6,7,8-HpCDD-13C	2.00	82
1,2,3,6,7,8-HxCDF	0.260	—	0.082	OCDD-13C	4.00	66
2,3,4,6,7,8-HxCDF	0.230	—	0.100			
1,2,3,7,8,9-HxCDF	0.099	—	0.094	1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	2.000	—	0.089	1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	0.160	—	0.088	2,3,7,8-TCDD-37Cl4	0.20	97
1,2,3,6,7,8-HxCDD	0.250	—	0.090			
1,2,3,7,8,9-HxCDD	0.230	—	0.075			
Total HxCDD	2.700	—	0.084			
1,2,3,4,6,7,8-HpCDF	1.500	—	0.170	Total 2,3,7,8-TCDD		
1,2,3,4,7,8,9-HpCDF	0.240	—	0.190	Equivalence: 0.35 ng/Kg		
Total HpCDF	3.100	—	0.180	(Using ITE Factors)		
1,2,3,4,6,7,8-HpCDD	6.300	—	0.063			
Total HpCDD	13.000	—	0.063			
OCDF	3.800	—	0.160			
OCDD	120.000	—	0.160			

Conc = Concentration (Totals Include 2,3,7,8-substituted isomers).
EMPC = Estimated Maximum Possible Concentration
RL = Reporting Limit.

ND = Not Detected
NA = Not Applicable
NC = Not Calculated

Results reported on a dry weight basis and are valid to no more than 2 significant figures.

J = Value below calibration range
B = Less than 10x higher than method blank level
I = Interference present

AB
2/4/08

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc.
9 of 17

Report No.....1074382_8290

Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612-607-6444



Pace AnalyticalTM

Method 8290 Sample Analysis Results

Client - Montana Dept. Of Env. Quality

Client's Sample ID	MBDS-U06-C01		
Lab Sample ID	1074382004		
Filename	P80619B_13		
Injected By	BAL		
Total Amount Extracted	14.3 g	Matrix	Soil
% Moisture	23.0	Dilution	NA
Dry Weight Extracted	11.0 g	Collected	05/30/2008
ICAL ID	P80617	Received	06/03/2008
CCal Filename(s)	P80619B_01 & P80619B_17	Extracted	06/13/2008
Method Blank ID	BLANK-16620	Analyzed	06/20/2008 04:18

Native Isomers	Conc ng/Kg	EMPC ng/Kg	RL ng/Kg	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	ND	—	0.078	2,3,7,8-TCDF-13C	2.00	81
Total TCDF	1.10	—	0.078	2,3,7,8-TCDD-13C	2.00	80
				1,2,3,7,8-PeCDF-13C	2.00	85
2,3,7,8-TCDD	ND	—	0.083	2,3,4,7,8-PeCDF-13C	2.00	84
Total TCDD	ND	—	0.083	1,2,3,7,8-PeCDD-13C	2.00	96
				1,2,3,4,7,8-HxCDF-13C	2.00	77
1,2,3,7,8-PeCDF	ND	—	0.092	1,2,3,6,7,8-HxCDF-13C	2.00	74
2,3,4,7,8-PeCDF	—	0.17	0.070	2,3,4,6,7,8-HxCDF-13C	2.00	74
Total PeCDF	2.60	—	0.081	1,2,3,7,8,9-HxCDF-13C	2.00	72
				1,2,3,4,7,8-HxCDD-13C	2.00	91
1,2,3,7,8-PeCDD	—	0.13	0.070	1,2,3,6,7,8-HxCDD-13C	2.00	74
Total PeCDD	0.73	—	0.070	1,2,3,4,6,7,8-HpCDF-13C	2.00	70
				1,2,3,4,7,8,9-HpCDF-13C	2.00	54
1,2,3,4,7,8-HxCDF	0.15	—	0.120	1,2,3,4,6,7,8-HpCDD-13C	2.00	75
1,2,3,6,7,8-HxCDF	0.24	—	0.120	OCDD-13C	4.00	59
2,3,4,6,7,8-HxCDF	0.27	—	0.110			
1,2,3,7,8,9-HxCDF	ND	—	0.140	1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	3.10	—	0.120	1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	0.23	—	0.100	2,3,7,8-TCDD-37Cl4	0.20	85
1,2,3,6,7,8-HxCDD	0.49	—	0.091			
1,2,3,7,8,9-HxCDD	0.34	—	0.110			
Total HxCDD	4.40	—	0.100			
1,2,3,4,6,7,8-HpCDF	—	2.90	0.097	Total 2,3,7,8-TCDD		
1,2,3,4,7,8,9-HpCDF	ND	—	0.260	Equivalence: 0.36 ng/Kg		
Total HpCDF	3.50	—	0.180	(Using ITE Factors)		
1,2,3,4,6,7,8-HpCDD	9.30	—	0.075			
Total HpCDD	18.00	—	0.075			
OCDF	9.30	—	0.084			
OCDD	85.00	—	0.150			

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
EMPC = Estimated Maximum Possible Concentration
RL = Reporting Limit.

ND = Not Detected
NA = Not Applicable
NC = Not Calculated

Results reported on a dry weight basis and are valid to no more than 2 significant figures.

J = Value below calibration range
B = Less than 10x higher than method blank level
E = PCDE Interference
I = Interference present

AS
8/14/08

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc.
10 of 17

Report No.....1074382_8290



Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612-607-6444

Method 8290 Sample Analysis Results

Client - Montana Dept. Of Env. Quality

Client's Sample ID	MBDS-U06-I01		
Lab Sample ID	1074382005		
Filename	P80619B_14		
Injected By	BAL		
Total Amount Extracted	13.4 g	Matrix	Soil
% Moisture	22.9	Dilution	NA
Dry Weight Extracted	10.3 g	Collected	05/30/2008
ICAL ID	P80617	Received	06/03/2008
CCal Filename(s)	P80619B_01 & P80619B_17	Extracted	06/13/2008
Method Blank ID	BLANK-16620	Analyzed	06/20/2008 05:06

Native Isomers	Conc ng/Kg	EMPC ng/Kg	RL ng/Kg	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	0.14	—	0.080	B+U 2,3,7,8-TCDF-13C	2.00	87
Total TCDF	0.53	—	0.080	B+U 2,3,7,8-TCDD-13C	2.00	81
				1,2,3,7,8-PeCDF-13C	2.00	95
2,3,7,8-TCDD	ND	—	0.100	2,3,4,7,8-PeCDF-13C	2.00	98
Total TCDD	ND	—	0.100	1,2,3,7,8-PeCDD-13C	2.00	107
				1,2,3,4,7,8-HxCDF-13C	2.00	81
1,2,3,7,8-PeCDF	ND	—	0.075	1,2,3,6,7,8-HxCDF-13C	2.00	77
2,3,4,7,8-PeCDF	—	0.10	0.086	+UJ 2,3,4,6,7,8-HxCDF-13C	2.00	79
Total PeCDF	1.00	—	0.081	B+J 1,2,3,7,8,9-HxCDF-13C	2.00	78
				1,2,3,4,7,8-HxCDD-13C	2.00	91
1,2,3,7,8-PeCDD	ND	—	0.073	1,2,3,6,7,8-HxCDD-13C	2.00	81
Total PeCDD	0.12	—	0.073	+J 1,2,3,4,6,7,8-HpCDF-13C	2.00	73
				1,2,3,4,7,8,9-HpCDF-13C	2.00	61
1,2,3,4,7,8-HxCDF	0.12	—	0.089	+J 1,2,3,4,6,7,8-HpCDD-13C	2.00	83
1,2,3,6,7,8-HxCDF	—	0.12	0.120	+J+OCDD-13C	4.00	69
2,3,4,6,7,8-HxCDF	0.13	—	0.089	+J 1,2,3,4-TCDD-13C	2.00	NA
1,2,3,7,8,9-HxCDF	ND	—	0.110	+J 1,2,3,7,8,9-HxCDD-13C	2.00	NA
Total HxCDF	1.30	—	0.100	+J 2,3,7,8-TCDD-37Cl4	0.20	86
1,2,3,4,7,8-HxCDD	0.10	—	0.062	+J 1,2,3,6,7,8-HxCDD		
1,2,3,6,7,8-HxCDD	0.22	—	0.062	+U 1,2,3,7,8,9-HxCDD		
1,2,3,7,8,9-HxCDD	0.17	—	0.043	+J 1,2,3,4,6,7,8-HpCDF		
Total HxCDD	1.50	—	0.055	+J Total 2,3,7,8-TCDD		
1,2,3,4,6,7,8-HpCDF	—	0.45	0.190	+UJ Equivalence: 0.14 ng/Kg		
1,2,3,4,7,8,9-HpCDF	ND	—	0.200	B+U (Using ITE Factors)		
Total HpCDF	0.77	—	0.190			
1,2,3,4,6,7,8-HpCDD	3.00	—	0.045	+J		
Total HpCDD	5.80	—	0.045			
OCDF	1.20	—	0.130	B+U		
OCDD	20.00	—	0.120			

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
EMPC = Estimated Maximum Possible Concentration
RL = Reporting Limit.

ND = Not Detected
NA = Not Applicable
NC = Not Calculated

Results reported on a dry weight basis and are valid to no more than 2 significant figures.

J = Value below calibration range

B = Less than 10x higher than method blank level

I = Interference present

As
8/4/08

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc.
11 of 17

Report No.....1074382_8290



Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612-607-6444

Method 8290 Sample Analysis Results

Client - Montana Dept. Of Env. Quality

Client's Sample ID	MBDS-U06-R01		
Lab Sample ID	1074382006		
Filename	P80619B_15		
Injected By	BAL		
Total Amount Extracted	14.5 g	Matrix	Soil
% Moisture	28.6	Dilution	NA
Dry Weight Extracted	10.3 g	Collected	05/30/2008
ICAL ID	P80617	Received	06/03/2008
CCal Filename(s)	P80619B_01 & P80619B_17	Extracted	06/13/2008
Method Blank ID	BLANK-16620	Analyzed	06/20/2008 05:54

Native Isomers	Conc ng/Kg	EMPC ng/Kg	RL ng/Kg	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	ND	—	0.088	2,3,7,8-TCDF-13C	2.00	83
Total TCDF	ND	—	0.088	2,3,7,8-TCDD-13C	2.00	83
				1,2,3,7,8-PeCDF-13C	2.00	86
2,3,7,8-TCDD	ND	—	0.074	2,3,4,7,8-PeCDF-13C	2.00	92
Total TCDD	ND	—	0.074	1,2,3,7,8-PeCDD-13C	2.00	99
				1,2,3,4,7,8-HxCDF-13C	2.00	77
1,2,3,7,8-PeCDF	ND	—	0.092	1,2,3,6,7,8-HxCDF-13C	2.00	74
2,3,4,7,8-PeCDF	0.099	—	0.083	2,3,4,6,7,8-HxCDF-13C	2.00	76
Total PeCDF	1.200	—	0.088	1,2,3,7,8,9-HxCDF-13C	2.00	76
				1,2,3,4,7,8-HxCDD-13C	2.00	87
1,2,3,7,8-PeCDD	ND	—	0.082	1,2,3,6,7,8-HxCDD-13C	2.00	77
Total PeCDD	ND	—	0.082	1,2,3,4,6,7,8-HpCDF-13C	2.00	72
				1,2,3,4,7,8,9-HpCDF-13C	2.00	61
1,2,3,4,7,8-HxCDF	ND	—	0.110	1,2,3,4,6,7,8-HpCDD-13C	2.00	82
1,2,3,6,7,8-HxCDF	ND	—	0.094	OCDD-13C	4.00	67
2,3,4,6,7,8-HxCDF	ND	—	0.097			
1,2,3,7,8,9-HxCDF	ND	—	0.100	1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	0.510	—	0.100	1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	ND	—	0.062	2,3,7,8-TCDD-37Cl4	0.20	88
1,2,3,6,7,8-HxCDD	—	0.083	0.057			
1,2,3,7,8,9-HxCDD	—	0.084	0.058			
Total HxCDD	0.330	—	0.059			
1,2,3,4,6,7,8-HpCDF	—	0.440	0.170	Total 2,3,7,8-TCDD		
1,2,3,4,7,8,9-HpCDF	ND	—	0.210	Equivalence: 0.065 ng/Kg		
Total HpCDF	0.420	—	0.190	(Using ITE Factors)		
1,2,3,4,6,7,8-HpCDD	0.940	—	0.076			
Total HpCDD	1.800	—	0.076			
OCDF	0.780	—	0.140			
OCDD	5.200	—	0.110			

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
EMPC = Estimated Maximum Possible Concentration
RL = Reporting Limit.

ND = Not Detected
NA = Not Applicable
NC = Not Calculated

Results reported on a dry weight basis and are valid to no more than 2 significant figures.

J = Value below calibration range
B = Less than 10x higher than method blank level
E = PCDE Interference
I = Interference present

AB
8/14/08

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc.
12 of 17

Report No.1074382_8290

Montana Background Dioxin Study

1. **SDG Number:** 1075595
2. **Number of Samples:** (9)
3. **Sample Matrix:** (9) Soil/Solid
4. **Applicable Analytes:** PCDD/PCDF
5. **Reporting Tier:** Level 3
6. **Analysis Method** USEPA SW-846 Method 8290
7. **Laboratory:** Pace Analytical
8. **Validation Level:** III
9. **Validator Affiliation:** Portage Environmental, Inc.
10. **Project:** Montana Background Dioxin Study

Validator's Signature: *Amber Brinkley*

Date: 08/01/08

Reviewed By:

Date: 08/06/08

1. INTRODUCTION

Nine (9) soil/solid samples were collected and analyzed for Dioxins/Furans by Pace Analytical using USEPA SW-846 Method 8290, *Polychlorinated Dibenzodioxins (PCDDs) and Polychlorinated Dibenzofurans (PCDFs) by High Resolution Gas Chromatography/High Resolution Mass Spectrometry (HRGC/HRMS)*. The data were validated to a Level III.

2. SAMPLE IDENTIFICATION

A sample cross-reference and holding time table is presented below.

Montana Background Dioxin Study SDG Number 1075595								
Field ID	Lab ID	Matrix	Sample Collection Date	Date Received	Date Extracted	Collection to Extraction Holding Time	Analysis Date	Extraction to Analysis Holding Time
MBDS-R11-O01	1075595001	Soil/Solid	06/16/08	06/20/08	06/26/08	10	06/29/08	3
MBDS-R11-A01	1075595002	Soil/Solid	06/16/08	06/20/08	06/26/08	10	06/30/08	4
MBDS-R04-A01	1075595003	Soil/Solid	06/17/08	06/20/08	06/26/08	9	06/29/08	3
MBDS-R04-F01	1075595004	Soil/Solid	06/17/08	06/20/08	06/26/08	9	06/29/08	3
MBDS-R04-O01	1075595005	Soil/Solid	06/17/08	06/20/08	06/26/08	9	06/30/08	4
MBDS-R03-F01	1075595006	Soil/Solid	06/17/08	06/20/08	06/26/08	9	06/30/08	4
MBDS-R03-O01	1075595007	Soil/Solid	06/17/08	06/20/08	06/26/08	9	06/30/08	4
MBDS-R03-A01	1075595008	Soil/Solid	06/18/08	06/20/08	06/26/08	8	06/30/08	4
MBDS-R10-A01	1075525009	Soil/Solid	06/18/08	06/20/08	06/26/08	8	06/30/08	4

A '**' denotes an exceeded holding time.

3. DATA LIMITATION OVERVIEW

The target compound analyses, dioxin/furan, for soil/solid samples from Montana Background Dioxin Study showed compliance with the QC requirements set forth by USEPA SW-846 Method 8290. The data are valid and acceptable with the following exceptions:

MBDS-R11-O01:

- Total TCDF, total PeCDF, total HxCDF, 1,2,3,4,7,8-HxCDD, and 1,2,3,7,8,9-HxCDD have been qualified with a 'J' validation flag to denote the reported concentrations are estimates with an undetermined bias as they were reported below the quantitation limit (see CTR comment #10).
- 1,2,3,6,7,8-HxCDF and 1,2,3,6,7,8-HxCDD were reported were reported at an EMPC and have been qualified with a 'J+' validation flag to denote the reported results are likely overestimated due to possible interference in the sample (see CTR comment #10).

MBDS-R11-A01:

- 1,2,3,6,7,8-HxCDF, total HxCDF, total HxCDD, 1,2,3,4,6,7,8-HpCDF, 1,2,3,4,6,7,8-HpCDD, and OCDF have been qualified with a 'J' validation flag to denote the reported concentrations are estimates with an undetermined bias as they were reported below the quantitation limit (see CTR comment #10).

MBDS-R04-A01:

- 1,2,3,4,6,7,8-HpCDF, total HpCDF, 1,2,3,4,6,7,8-HpCDD, and total HpCDD have been qualified with a 'J' validation flag to denote the reported concentrations are estimates with an undetermined bias as they were reported below the quantitation limit (see CTR comment #10).
- OCDF was reported at an EMPC and has been qualified with a 'J+' validation flag to denote the reported result is likely overestimated due to possible interference in the sample (see CTR comment #10).

MBDS-R04-F01:

- OCDF has been qualified with a 'U' validation flag to denote the reported concentration is non-detect due to detections in the method blank (see CTR comment #6).
- Total HpCDD and OCDD have been qualified with a 'J' validation flag to denote the reported concentrations are estimates with an undetermined bias as they were reported below the quantitation limit (see CTR comment #10).
- 1,2,3,4,6,7,8-HpCDD was reported at an EMPC and has been qualified with a 'J+' validation flag to denote the reported result is likely overestimated due to possible interference in the sample (see CTR comment #10).

MBDS-R04-O01:

- Total TCDF, 1,2,3,4,6,7,8-HpCDF, total HpCDF, 1,2,3,4,6,7,8-HpCDD, total HpCDD, and OCDD have been qualified with a 'J' validation flag to denote the reported concentrations are estimates with an undetermined bias as they were reported below the quantitation limit (see CTR comment #10).
- OCDF was reported at an EMPC and has been qualified with a 'UJ' validation flag to denote the reported concentration is non-detect, and the sample quantitation is an estimate due to positive detection in the method blank and possible interference in the sample (see CTR comments #6 and 10).

MBDS-R03-F01:

- 2,3,4,6,7,8-HxCDF, 1,2,3,4,6,7,8-HpCDF, and OCDD were reported at an EMPC and have been qualified with a 'J+' validation flag to denote the reported results are likely overestimated due to possible interference in the sample (see CTR comment #10).
- 1,2,3,4,6,7,8-HpCDD, total HpCDD, and OCDF have been qualified with a 'J' validation flag to denote the reported concentrations are estimates with an undetermined bias as they were reported below the quantitation limit (see CTR comment #10).

MBDS-R03-O01:

- Total HxCDF, 1,2,3,4,6,7,8-HpCDF, total HpCDF, 1,2,3,4,6,7,8-HpCDD, total HpCDD, and OCDF have been qualified with a 'J' validation flag to denote the reported concentrations are estimates with an undetermined bias as they were reported below the quantitation limit (see CTR comment #10).

MBDS-R03-A01:

- 1,2,3,4,6,7,8-HpCDF has been qualified with a 'U' validation flag to denote the reported concentration is non-detect due to detections in the method blank (see CTR comment #6).
- Total TCDF, total PeCDF, total HxCDF, total HpCDF, 1,2,3,4,6,7,8-HpCDD, total HpCDD, and OCDD have been qualified with a 'J' validation flag to denote the reported concentrations are estimates with an undetermined bias as they were reported below the quantitation limit (see CTR comment #10).
- OCDF was reported at an EMPC and has been qualified with a 'UJ' validation flag to denote the reported concentration is non-detect, and the sample quantitation is an estimate due to positive detection in the method blank and possible interference in the sample (see CTR comments #6 and 10).

MBDS-R10-A01:

- Total TCDD, total PeCDF, and total HxCDF have been qualified with a 'J' validation flag to denote the reported concentrations are estimates with an undetermined bias as they were reported below the quantitation limit (see CTR comment #10).

- 1,2,3,7,8-PeCDD, 1,2,3,4,7,8-HxCDF, 1,2,3,6,7,8-HxCDF, 2,3,4,6,7,8-HxCDF, 1,2,3,4,6,7,8-HpCDF, and 1,2,3,4,6,7,8-HpCDD were reported at an EMPC and have been qualified with a 'J+' validation flag to denote the reported results are likely overestimated due to possible interference in the sample (see CTR comment #10).

4. CONTRACT AND TECHNICAL REVIEW (CTR)

Project Name: Montana Background Dioxin Study

Laboratory Name: Pace Analytical

SDG#: 1075595

Type of Analysis: USEPA SW-846 Method 8290

1. Data Completeness

The data has undergone a Level III validation.

2. Sample Integrity

No action was taken as sample integrity was compliant.

3. Sample Holding Times

No action was taken as sample holding times were met.

4. Instrument Performance

No action was taken as instrument performance was compliant.

5. Initial and Continuing Calibrations

The initial and continuing calibration forms were not included in the data package as it was a level III. No action was taken as the case narrative indicated that the acceptance criteria for the initial and continuing calibrations were met.

6. Method and Field Blank Contamination

Method Blank. Positive detections were noted in the method blank for OCDF and OCDD and estimated maximum possible concentration (EMPC) results were noted for 1,2,3,7,8-PeCDF, 1,2,3,4,6,7,8-HpCDF, and 1,2,3,4,6,7,8-HpCDD. OCDF in MBDS-R04-F01 and 1,2,3,4,6,7,8-HpCDF in MBDS-R03-A01 have been qualified with a 'U' validation flag as the reported concentrations were less than five times the blank value. OCDF in MBDS-R04-O01 and MBDS-R03-A01 were reported at an EMPC and have been qualified with a 'UJ' validation flag as the reported concentrations were less than five times the blank value and due to possible interference in the sample. The remaining OCDF, OCDD, 1,2,3,7,8-PeCDF, 1,2,3,4,6,7,8-HpCDF, and 1,2,3,4,6,7,8-HpCDD warrant no qualification as the reported results were non-detect or greater than five times the blank value.

7. Matrix Spike/Matrix Spike Duplicate (MS/MSD)

The laboratory did not provide acceptance limits for the MS/MSD analysis. In the professional judgment of the validator, the acceptance limit of 50-150% for MS/MSD recovery and a 35% RPD for soil samples and has been used for validation purposes. No action was taken as all MS/MSD recovery and precision criteria were met.

8. Laboratory Control Sample (LCS)

No action was taken as all LCS recoveries were within the acceptance criteria.

9. Internal Standards (IS) Performance

The internal standards 1,2,3,4,7,8,9-HpCDF-13C (39%) and OCDD-13 (36%) in the LCS were outside the 40-135% acceptance criteria, per USEPA SW-846 Method 8290. No action was taken as all LCS recoveries were within the acceptance criteria. The remaining internal standards were within the 40-135% acceptance criteria.

10. Target Compound Identification and Quantitation

In MBDS-R11-O01, total TCDF, total PeCDF, total HxCDF, 1,2,3,4,7,8-HxCDD, and 1,2,3,7,8,9-HxCDD were reported below the quantitation limit. They have been qualified with a 'J' validation flag as the reported results are estimates with an undetermined bias. 1,2,3,6,7,8-HxCDF and 1,2,3,6,7,8-HxCDD were reported at an EMPC and have been qualified with a 'J+' validation flag as the reported results have likely been overestimated due to possible interference in the sample.

In MBDS-R11-A01, 1,2,3,6,7,8-HxCDF, total HxCDF, total HxCDD, 1,2,3,4,6,7,8-HpCDF, 1,2,3,4,6,7,8-HpCDD, and OCDF were reported below the quantitation limit. They have been qualified with a 'J' validation flag as the reported results are estimates with an undetermined bias.

In MBDS-R04-A01, 1,2,3,4,6,7,8-HpCDF, total HpCDF, 1,2,3,4,6,7,8-HpCDD, and total HpCDD were reported below the quantitation limit. They have been qualified with a 'J' validation flag. OCDF was reported at an EMPC and has been qualified with a 'J+' validation flag as the reported results are likely overestimated due to possible interference in the sample.

In MBDS-R04-F01, total HpCDD and OCDD were reported below the quantitation limit. They have been qualified with a 'J' validation flag as the reported results are estimates with an undetermined bias. 1,2,3,4,6,7,8-HpCDD was reported an EMPC and has been qualified with a 'J+' validation flag as the reported result has likely been overestimated due to possible interference in the sample.

In MBDS-R04-O01, total TCDF, 1,2,3,4,6,7,8-HpCDF, total HpCDF, 1,2,3,4,6,7,8-HpCDD, total HpCDD, and OCDD were reported below the quantitation limit. They have been qualified with a 'J' validation flag as the reported results are estimates with an undetermined bias. OCDF was reported at an EMPC and has been qualified with a 'UJ' validation flag as the sample result was less than five times the blank value and due to possible interference in the sample.

In MBDS-R03-F01, 1,2,3,4,6,7,8-HpCDD, total HpCDD, and OCDF were reported below the quantitation limit. They have been qualified with a 'J' validation flag as the reported results are estimates with an undetermined bias. 2,3,4,6,7,8-HxCDF, 1,2,3,4,6,7,8-HpCDF, and OCDD were reported at an EMPC and have been qualified with a 'J+' validation flag as the reported concentrations are likely overestimated due to possible interference in the sample.

In MBDS-R03-O01, total HxCDF, 1,2,3,4,6,7,8-HpCDF, total HpCDF, 1,2,3,4,6,7,8-HpCDD, total HpCDD, and OCDF were reported below the quantitation limit. They have been qualified with a 'J' validation flag as the reported results are estimates with an undetermined bias.

In MBDS-R03-A01, total TCDF, total PeCDF, total HxCDF, total HpCDF, 1,2,3,4,6,7,8-HpCDD, total HpCDD, and OCDD were reported below the quantitation limit. They have been qualified with a 'J' validation flag as the reported results are estimates with an undetermined bias. OCDF was reported at an EMPC and has been qualified with a 'UJ' validation flag as the sample result was less than five times the blank value and due to possible interference in the sample.

In MBDS-R10-A01, total TCDD, total PeCDF, and total HxCDF were reported below the quantitation limit. They have been qualified with a 'J' validation flag as the reported results are estimates with an undetermined bias. 1,2,3,7,8-PeCDD, 1,2,3,4,7,8-HxCDF, 1,2,3,6,7,8-HxCDF, 2,3,4,6,7,8-HxCDF, 1,2,3,4,6,7,8-HpCDF, and 1,2,3,4,6,7,8-HpCDD were reported at an EMPC and have been qualified with a 'J+' validation flag as the reported results are likely overestimated due to possible interference in the sample.

11. Chromatogram Quality

No comments relating to chromatogram quality.

5. SUMMARY OF DATA USABILITY

The data validation summary flag table shows that qualifiers were applied to the target analytes for SDG# 1075595.

DATA VALIDATION SUMMARY TABLE					
Compound	MBDS-R11-001	MBDS-R11-A01	MBDS-R04-A01	MBDS-R04-F01	MBDS-R04-O01
2,3,7,8-TCDF					
Total TCDF	J				J
2,3,7,8-TCDD					
Total TCDD					
1,2,3,7,8-PeCDF					
2,3,4,7,8-PeCDF					
Total PeCDF	J				
1,2,3,7,8-PeCDD					
Total PeCDD					
1,2,3,4,7,8-HxCDF					
1,2,3,6,7,8-HxCDF	J+	J			
2,3,4,6,7,8-HxCDF					
1,2,3,7,8,9-HxCDF					
Total HxCDF	J	J			
1,2,3,4,7,8-HxCDD	J				
1,2,3,6,7,8-HxCDD	J+				
1,2,3,7,8,9-HxCDD	J				
Total HxCDD		J			
1,2,3,4,6,7,8-HpCDF		J	J		J
1,2,3,4,7,8,9-HpCDF					
Total HpCDF			J		J
1,2,3,4,6,7,8-HpCDD		J	J	J+	J
Total HpCDD			J	J	J
OCDF		J	J+	U	UJ
OCDD				J	J

DATA VALIDATION SUMMARY TABLE				
Compound	MBDS-R03-F01	MBDS-R03-O01	MBDS-R03-A01	MBDS-R10-A01
2,3,7,8-TCDF				
Total TCDF			J	
2,3,7,8-TCDD				
Total TCDD				J
1,2,3,7,8-PeCDF				
2,3,4,7,8-PeCDF				
Total PeCDF			J	J
1,2,3,7,8-PeCDD				J+
Total PeCDD				
1,2,3,4,7,8-HxCDF				J+
1,2,3,6,7,8-HxCDF				J+
2,3,4,6,7,8-HxCDF	J+			J+
1,2,3,7,8,9-HxCDF				
Total HxCDF		J	J	J
1,2,3,4,7,8-HxCDD				
1,2,3,6,7,8-HxCDD				
1,2,3,7,8,9-HxCDD				
Total HxCDD				
1,2,3,4,6,7,8-HpCDF	J+	J	U	J+
1,2,3,4,7,8,9-HpCDF				
Total HpCDF		J	J	
1,2,3,4,6,7,8-HpCDD	J	J	J	J+
Total HpCDD	J	J	J	
OCDF	J	J	UJ	
OCDD	J+		J	

Data Validation Summary Table Qualifier Codes

U = Result is a non-detect.

UJ = Result is a non-detect, but is estimated due to QC issues.

J = Result was detected, but is an estimate with an undetermined bias due to QC issues.

J+ = Result was detected, but is likely overestimated due to QC issues.

J- = Result was detected, but is likely underestimated due to QC issues.

R = Result is rejected and is highly questionable for use as a quantitative value due to significant QC issues.

6. REFERENCES

Contract Laboratory Program National Functional Guidelines for Organic Data Review, EPA 540/R-99/008, October 1999, U.S. Environmental Protection Agency, Cincinnati, Ohio.

USEPA Analytical Operations / Data Quality Center, *National Functional Guidelines for Chlorinated Dioxin / Furan Data Review*, EPA 540-R-02-003, August 2002.

USEPA, *Methods for the Analysis of Wastes, High Resolution Gas Chromatography / Mass Spectrometry*, SW-846, July 2002.

USEPA Test Methods for Evaluating Solid Waste Physical/Chemical Methods, Doc. No. SW-846, 3rd Ed., Method 8290, Polychlorinated Dibenzodioxins (PCDDs) and Polychlorinated Dibenzofurans (PCDFs) by High Resolution Gas Chromatography/High Resolution Mass Spectrometry (HRGC/HRMS), Revision 0, September 1994.

9. ATTACHMENTS

The following items are included as an attachment to this L&V report:

- A. Qualified reported results (Form I)

Attachment A
Qualified Reported Results

Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612-607-6444



Pace Analytical™

Method 8290 Sample Analysis Results

Client - Montana Dept. Of Env. Quality

Client's Sample ID	MBDS-R11-001		
Lab Sample ID	1075595001		
Filename	U80629B_03		
Injected By	BAL		
Total Amount Extracted	12.8 g	Matrix	Soil
% Moisture	18.9	Dilution	NA
Dry Weight Extracted	10.4 g	Collected	06/16/2008
ICAL ID	U80622	Received	06/20/2008
CCal Filename(s)	U80629A_16 & U80629B_15	Extracted	06/26/2008
Method Blank ID	BLANK-16796	Analyzed	06/29/2008 22:14

Native Isomers	Conc ng/Kg	EMPC ng/Kg	RL ng/Kg	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	ND	—	0.59	2,3,7,8-TCDF-13C	2.00	78
Total TCDF	0.77	—	0.59	2,3,7,8-TCDD-13C	2.00	75
				1,2,3,7,8-PeCDF-13C	2.00	76
				2,3,4,7,8-PeCDF-13C	2.00	74
2,3,7,8-TCDD	ND	—	0.62	1,2,3,7,8-PeCDD-13C	2.00	72
Total TCDD	ND	—	0.62	1,2,3,4,7,8-HxCDF-13C	2.00	83
				1,2,3,6,7,8-HxCDF-13C	2.00	81
1,2,3,7,8-PeCDF	ND	—	0.58	2,3,4,6,7,8-HxCDF-13C	2.00	76
2,3,4,7,8-PeCDF	ND	—	0.34	1,2,3,7,8,9-HxCDF-13C	2.00	78
Total PeCDF	0.77	—	0.46	1,2,3,4,7,8-HxCDD-13C	2.00	80
				1,2,3,6,7,8-HxCDD-13C	2.00	70
1,2,3,7,8-PeCDD	ND	—	0.59	1,2,3,4,6,7,8-HpCDF-13C	2.00	59
Total PeCDD	ND	—	0.59	1,2,3,4,7,8,9-HpCDF-13C	2.00	52
				1,2,3,4,6,7,8-HpCDD-13C	2.00	62
1,2,3,4,7,8-HxCDF	ND	—	0.48	OCDD-13C	4.00	50
1,2,3,6,7,8-HxCDF	—	1.50	0.34			
2,3,4,6,7,8-HxCDF	ND	—	0.39			
1,2,3,7,8,9-HxCDF	ND	—	0.37	1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	1.90	—	0.40	1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	0.67	—	0.49	2,3,7,8-TCDD-37Cl4	0.20	76
1,2,3,6,7,8-HxCDD	—	0.69	0.67			
1,2,3,7,8,9-HxCDD	0.80	—	0.52			
Total HxCDD	5.10	—	0.56			
1,2,3,4,6,7,8-HpCDF	6.20	—	0.61	Total 2,3,7,8-TCDD		
1,2,3,4,7,8,9-HpCDF	ND	—	0.64	Equivalence: 0.57 ng/Kg		
Total HpCDF	21.00	—	0.62	(Using ITE Factors)		
1,2,3,4,6,7,8-HpCDD	16.00	—	0.93			
Total HpCDD	31.00	—	0.93			
OCDF	22.00	—	1.30			
OCDD	170.00	—	1.20			

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
EMPC = Estimated Maximum Possible Concentration
RL = Reporting Limit.

ND = Not Detected
NA = Not Applicable
NC = Not Calculated

Results reported on a dry weight basis and are valid to no more than 2 significant figures.
J = Value below calibration range
I = Interference present

JB
8/4/08

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc.
7 of 20

Report No.....1075595_8290

Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612-607-6444



Pace AnalyticalTM

Method 8290 Sample Analysis Results

Client - Montana Dept. Of Env. Quality

Client's Sample ID	MBDS-R11-A01		
Lab Sample ID	1075595002		
Filename	U80629B_11		
Injected By	BAL		
Total Amount Extracted	12.2 g	Matrix	Soil
% Moisture	16.1	Dilution	NA
Dry Weight Extracted	10.3 g	Collected	06/16/2008
ICAL ID	U80622	Received	06/20/2008
CCal Filename(s)	U80629A_16 & U80629B_15	Extracted	06/26/2008
Method Blank ID	BLANK-16796	Analyzed	06/30/2008 04:55

Native Isomers	Conc ng/Kg	EMPC ng/Kg	RL ng/Kg	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	ND	—	0.29	2,3,7,8-TCDF-13C	2.00	78
Total TCDF	ND	—	0.29	2,3,7,8-TCDD-13C	2.00	76
				1,2,3,7,8-PeCDF-13C	2.00	74
2,3,7,8-TCDD	ND	—	0.38	2,3,4,7,8-PeCDF-13C	2.00	74
Total TCDD	ND	—	0.38	1,2,3,7,8-PeCDD-13C	2.00	74
				1,2,3,4,7,8-HxCDF-13C	2.00	83
1,2,3,7,8-PeCDF	ND	—	0.21	1,2,3,6,7,8-HxCDF-13C	2.00	75
2,3,4,7,8-PeCDF	ND	—	0.20	2,3,4,6,7,8-HxCDF-13C	2.00	77
Total PeCDF	ND	—	0.20	1,2,3,7,8,9-HxCDF-13C	2.00	76
				1,2,3,4,7,8-HxCDD-13C	2.00	77
1,2,3,7,8-PeCDD	ND	—	0.33	1,2,3,6,7,8-HxCDD-13C	2.00	66
Total PeCDD	ND	—	0.33	1,2,3,4,6,7,8-HpCDF-13C	2.00	57
				1,2,3,4,7,8,9-HpCDF-13C	2.00	51
1,2,3,4,7,8-HxCDF	ND	—	0.23	1,2,3,4,6,7,8-HpCDD-13C	2.00	55
1,2,3,6,7,8-HxCDF	0.24	—	0.23	OCDD-13C	4.00	48
2,3,4,6,7,8-HxCDF	ND	—	0.22			
1,2,3,7,8,9-HxCDF	ND	—	0.29	1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	1.60	—	0.24	1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	ND	—	0.27	2,3,7,8-TCDD-37Cl4	0.20	85
1,2,3,6,7,8-HxCDD	ND	—	0.28			
1,2,3,7,8,9-HxCDD	ND	—	0.29			
Total HxCDD	0.32	—	0.28			
1,2,3,4,6,7,8-HpCDF	1.80	—	0.31	Total 2,3,7,8-TCDD		
1,2,3,4,7,8,9-HpCDF	ND	—	0.40	Equivalence: 0.13 ng/Kg		
Total HpCDF	5.00	—	0.35	(Using ITE Factors)		
1,2,3,4,6,7,8-HpCDD	3.90	—	0.72			
Total HpCDD	6.30	—	0.72			
OCDF	6.50	—	0.87			
OCDD	40.00	—	0.51			

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
EMPC = Estimated Maximum Possible Concentration
RL = Reporting Limit.

ND = Not Detected
NA = Not Applicable
NC = Not Calculated

Results reported on a dry weight basis and are valid to no more than 2 significant figures.
J = Value below calibration range

JLB
8/14/08

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc.
8 of 20

Report No.....1075595_8290

Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612-607-6444



Pace Analytical™

Method 8290 Sample Analysis Results

Client - Montana Dept. Of Env. Quality

Client's Sample ID	MBDS-R04-A01		
Lab Sample ID	1075595003		
Filename	U80629B_04		
Injected By	BAL		
Total Amount Extracted	12.6 g	Matrix	Soil
% Moisture	17.4	Dilution	NA
Dry Weight Extracted	10.4 g	Collected	06/17/2008
ICAL ID	U80622	Received	06/20/2008
CCal Filename(s)	U80629A_16 & U80629B_15	Extracted	06/26/2008
Method Blank ID	BLANK-16796	Analyzed	06/29/2008 23:04

Native Isomers	Conc ng/Kg	EMPC ng/Kg	RL ng/Kg	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	ND	—	0.40	2,3,7,8-TCDF-13C	2.00	76
Total TCDF	ND	—	0.40	2,3,7,8-TCDD-13C	2.00	74
				1,2,3,7,8-PeCDF-13C	2.00	76
2,3,7,8-TCDD	ND	—	0.49	2,3,4,7,8-PeCDF-13C	2.00	74
Total TCDD	ND	—	0.49	1,2,3,7,8-PeCDD-13C	2.00	76
				1,2,3,4,7,8-HxCDF-13C	2.00	87
1,2,3,7,8-PeCDF	ND	—	0.20	1,2,3,6,7,8-HxCDF-13C	2.00	79
2,3,4,7,8-PeCDF	ND	—	0.22	2,3,4,6,7,8-HxCDF-13C	2.00	78
Total PeCDF	ND	—	0.21	1,2,3,7,8,9-HxCDF-13C	2.00	81
				1,2,3,4,7,8-HxCDD-13C	2.00	80
1,2,3,7,8-PeCDD	ND	—	0.39	1,2,3,6,7,8-HxCDD-13C	2.00	71
Total PeCDD	ND	—	0.39	1,2,3,4,6,7,8-HpCDF-13C	2.00	61
				1,2,3,4,7,8,9-HpCDF-13C	2.00	55
1,2,3,4,7,8-HxCDF	ND	—	0.20	1,2,3,4,6,7,8-HpCDD-13C	2.00	61
1,2,3,6,7,8-HxCDF	ND	—	0.21	OCDD-13C	4.00	50
2,3,4,6,7,8-HxCDF	ND	—	0.26			
1,2,3,7,8,9-HxCDF	ND	—	0.26	1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	ND	—	0.23	1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	ND	—	0.45	2,3,7,8-TCDD-37C14	0.20	79
1,2,3,6,7,8-HxCDD	ND	—	0.45			
1,2,3,7,8,9-HxCDD	ND	—	0.42			
Total HxCDD	ND	—	0.44			
1,2,3,4,6,7,8-HpCDF	0.61	—	0.50	+	J	Total 2,3,7,8-TCDD
1,2,3,4,7,8,9-HpCDF	ND	—	0.68			Equivalence: 0.033 ng/Kg
Total HpCDF	0.61	—	0.59	+	J	(Using ITE Factors)
1,2,3,4,6,7,8-HpCDD	1.50	—	0.75	+	J	
Total HpCDD	1.50	—	0.75	+	J	
OCDF	—	1.5	0.61	+	J+	
OCDD	12.00	—	0.67			

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
EMPC = Estimated Maximum Possible Concentration
RL = Reporting Limit.

ND = Not Detected
NA = Not Applicable
NC = Not Calculated

Results reported on a dry weight basis and are valid to no more than 2 significant figures.
J = Value below calibration range
I = Interference present

AB
5/19/08

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc.
9 of 20

Report No....1075595_8290

Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612-607-6444



Pace Analytical™

Method 8290 Sample Analysis Results

Client - Montana Dept. Of Env. Quality

Client's Sample ID	MBDS-R04-F01		
Lab Sample ID	1075595004		
Filename	U80629B_05		
Injected By	BAL		
Total Amount Extracted	12.0 g	Matrix	Soil
% Moisture	17.0	Dilution	NA
Dry Weight Extracted	10.00 g	Collected	06/17/2008
ICAL ID	U80622	Received	06/20/2008
CCal Filename(s)	U80629A_16 & U80629B_15	Extracted	06/26/2008
Method Blank ID	BLANK-16796	Analyzed	06/29/2008 23:54

Native Isomers	Conc ng/Kg	EMPC ng/Kg	RL ng/Kg	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	ND	—	0.43	2,3,7,8-TCDF-13C	2.00	74
Total TCDF	ND	—	0.43	2,3,7,8-TCDD-13C	2.00	70
				1,2,3,7,8-PeCDF-13C	2.00	71
2,3,7,8-TCDD	ND	—	0.56	2,3,4,7,8-PeCDF-13C	2.00	71
Total TCDD	ND	—	0.56	1,2,3,7,8-PeCDD-13C	2.00	73
				1,2,3,4,7,8-HxCDF-13C	2.00	83
1,2,3,7,8-PeCDF	ND	—	0.23	1,2,3,6,7,8-HxCDF-13C	2.00	76
2,3,4,7,8-PeCDF	ND	—	0.26	2,3,4,6,7,8-HxCDF-13C	2.00	76
Total PeCDF	ND	—	0.24	1,2,3,7,8,9-HxCDF-13C	2.00	76
				1,2,3,4,7,8-HxCDD-13C	2.00	77
1,2,3,7,8-PeCDD	ND	—	0.45	1,2,3,6,7,8-HxCDD-13C	2.00	67
Total PeCDD	ND	—	0.45	1,2,3,4,6,7,8-HpCDF-13C	2.00	55
				1,2,3,4,7,8,9-HpCDF-13C	2.00	50
1,2,3,4,7,8-HxCDF	ND	—	0.21	1,2,3,4,6,7,8-HpCDD-13C	2.00	56
1,2,3,6,7,8-HxCDF	ND	—	0.25	OCDD-13C	4.00	48
2,3,4,6,7,8-HxCDF	ND	—	0.24			
1,2,3,7,8,9-HxCDF	ND	—	0.29	1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	ND	—	0.25	1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	ND	—	0.36	2,3,7,8-TCDD-37Cl4	0.20	76
1,2,3,6,7,8-HxCDD	ND	—	0.36			
1,2,3,7,8,9-HxCDD	ND	—	0.32			
Total HxCDD	ND	—	0.35			
1,2,3,4,6,7,8-HpCDF	ND	—	0.33	Total 2,3,7,8-TCDD		
1,2,3,4,7,8,9-HpCDF	ND	—	0.68	Equivalence: 0.0075 ng/Kg		
Total HpCDF	ND	—	0.51	(Using ITE Factors)		
1,2,3,4,6,7,8-HpCDD	—	1.2	0.52 + J+			
Total HpCDD	1.3	—	0.52 + J			
OCDF	1.1	—	0.82 B+ U			
OCDD	6.4	—	1.40 B+ J			

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
EMPC = Estimated Maximum Possible Concentration
RL = Reporting Limit.

ND = Not Detected
NA = Not Applicable
NC = Not Calculated

Results reported on a dry weight basis and are valid to no more than 2 significant figures.

J = Value below calibration range

B = Less than 10x higher than method blank level

I = Interference present

JB
8/4/08

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc.
10 of 20

Report No.....1075595_8290

Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612-607-6444



Pace AnalyticalTM

Method 8290 Sample Analysis Results

Client - Montana Dept. Of Env. Quality

Client's Sample ID	MBDS-R04-001		
Lab Sample ID	1075595005		
Filename	U80629B_06		
Injected By	BAL		
Total Amount Extracted	11.1 g	Matrix	Soil
% Moisture	9.3	Dilution	NA
Dry Weight Extracted	10.1 g	Collected	06/17/2008
ICAL ID	U80622	Received	06/20/2008
CCal Filename(s)	U80629A_16 & U80629B_15	Extracted	06/26/2008
Method Blank ID	BLANK-16796	Analyzed	06/30/2008 00:44

Native Isomers	Conc ng/Kg	EMPC ng/Kg	RL ng/Kg	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	ND	—	0.23	2,3,7,8-TCDF-13C	2.00	77
Total TCDF	0.91	—	0.23 + J	2,3,7,8-TCDD-13C	2.00	76
				1,2,3,7,8-PeCDF-13C	2.00	75
2,3,7,8-TCDD	ND	—	0.40	2,3,4,7,8-PeCDF-13C	2.00	76
Total TCDD	ND	—	0.40	1,2,3,7,8-PeCDD-13C	2.00	77
				1,2,3,4,7,8-HxCDF-13C	2.00	84
1,2,3,7,8-PeCDF	ND	—	0.27	1,2,3,6,7,8-HxCDF-13C	2.00	78
2,3,4,7,8-PeCDF	ND	—	0.18	2,3,4,6,7,8-HxCDF-13C	2.00	76
Total PeCDF	ND	—	0.22	1,2,3,7,8,9-HxCDF-13C	2.00	77
				1,2,3,4,7,8-HxCDD-13C	2.00	78
1,2,3,7,8-PeCDD	ND	—	0.37	1,2,3,6,7,8-HxCDD-13C	2.00	67
Total PeCDD	ND	—	0.37	1,2,3,4,6,7,8-HpCDF-13C	2.00	58
				1,2,3,4,7,8,9-HpCDF-13C	2.00	52
1,2,3,4,7,8-HxCDF	ND	—	0.20	1,2,3,4,6,7,8-HpCDD-13C	2.00	58
1,2,3,6,7,8-HxCDF	ND	—	0.18	OCDD-13C	4.00	51
2,3,4,6,7,8-HxCDF	ND	—	0.21			
1,2,3,7,8,9-HxCDF	ND	—	0.23	1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	ND	—	0.20	1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	ND	—	0.37	2,3,7,8-TCDD-37Cl4	0.20	81
1,2,3,6,7,8-HxCDD	ND	—	0.31			
1,2,3,7,8,9-HxCDD	ND	—	0.28			
Total HxCDD	ND	—	0.32			
1,2,3,4,6,7,8-HpCDF	0.53	—	0.32 + J	Total 2,3,7,8-TCDD		
1,2,3,4,7,8,9-HpCDF	ND	—	0.48	Equivalence: 0.023 ng/Kg		
Total HpCDF	0.53	—	0.40 + J	(Using ITE Factors)		
1,2,3,4,6,7,8-HpCDD	1.10	—	0.52 + J			
Total HpCDD	1.10	—	0.52 + J			
OCDF	—	0.65	0.41 + UJ			
OCDD	6.80	—	1.20 B J			

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
EMPC = Estimated Maximum Possible Concentration
RL = Reporting Limit.

ND = Not Detected
NA = Not Applicable
NC = Not Calculated

Results reported on a dry weight basis and are valid to no more than 2 significant figures.

J = Value below calibration range

B = Less than 10x higher than method blank level

I = Interference present

Handwritten signature
8/1/08

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc.

11 of 20

Report No.....1075595_8290

Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612-607-6444



Method 8290 Sample Analysis Results

Client - Montana Dept. Of Env. Quality

Client's Sample ID	MBDS-R03-F01		
Lab Sample ID	1075595006		
Filename	U80629B_07		
Injected By	BAL	Matrix	Soil
Total Amount Extracted	11.4 g	Dilution	NA
% Moisture	8.1	Collected	06/17/2008
Dry Weight Extracted	10.4 g	Received	06/20/2008
ICAL ID	U80622	Extracted	06/26/2008
CCal Filename(s)	U80629A_16 & U80629B_15	Analyzed	06/30/2008 01:35
Method Blank ID	BLANK-16796		

Native Isomers	Conc ng/Kg	EMPC ng/Kg	RL ng/Kg	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	ND	—	0.28	2,3,7,8-TCDF-13C	2.00	80
Total TCDF	ND	—	0.28	2,3,7,8-TCDD-13C	2.00	75
				1,2,3,7,8-PeCDF-13C	2.00	78
2,3,7,8-TCDD	ND	—	0.56	2,3,4,7,8-PeCDF-13C	2.00	78
Total TCDD	ND	—	0.56	1,2,3,7,8-PeCDD-13C	2.00	77
				1,2,3,4,7,8-HxCDF-13C	2.00	87
1,2,3,7,8-PeCDF	ND	—	0.28	1,2,3,6,7,8-HxCDF-13C	2.00	81
2,3,4,7,8-PeCDF	ND	—	0.23	2,3,4,6,7,8-HxCDF-13C	2.00	79
Total PeCDF	ND	—	0.26	1,2,3,7,8,9-HxCDF-13C	2.00	81
				1,2,3,4,7,8-HxCDD-13C	2.00	82
1,2,3,7,8-PeCDD	ND	—	0.37	1,2,3,6,7,8-HxCDD-13C	2.00	71
Total PeCDD	ND	—	0.37	1,2,3,4,6,7,8-HpCDF-13C	2.00	59
				1,2,3,4,7,8,9-HpCDF-13C	2.00	54
1,2,3,4,7,8-HxCDF	ND	—	0.20	1,2,3,4,6,7,8-HpCDD-13C	2.00	58
1,2,3,6,7,8-HxCDF	ND	—	0.19	OCDD-13C	4.00	52
2,3,4,6,7,8-HxCDF	—	0.19	0.18 + J			
1,2,3,7,8,9-HxCDF	ND	—	0.28	1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	ND	—	0.21	1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	ND	—	0.28	2,3,7,8-TCDD-37Cl4	0.20	83
1,2,3,6,7,8-HxCDD	ND	—	0.29			
1,2,3,7,8,9-HxCDD	ND	—	0.37			
Total HxCDD	ND	—	0.31			
1,2,3,4,6,7,8-HpCDF	—	0.51	0.34 + J	Total 2,3,7,8-TCDD		
1,2,3,4,7,8,9-HpCDF	ND	—	0.53	Equivalence: 0.016 ng/Kg		
Total HpCDF	ND	—	0.44	(Using ITE Factors)		
1,2,3,4,6,7,8-HpCDD	1.2	—	0.62 + J			
Total HpCDD	1.2	—	0.62 + J			
OCDF	4.6	—	0.80 + J			
OCDD	—	4.70	0.97 + J			

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
EMPC = Estimated Maximum Possible Concentration
RL = Reporting Limit.

ND = Not Detected
NA = Not Applicable
NC = Not Calculated

Results reported on a dry weight basis and are valid to no more than 2 significant figures.
J = Value below calibration range
I = Interference present

*JB
8/14/08*

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc.
12 of 20

Report No.....1075595_8290


Pace Analytical™

 Pace Analytical Services, Inc.
 1700 Elm Street - Suite 200
 Minneapolis, MN 55414

 Tel: 612-607-1700
 Fax: 612-607-6444

Method 8290 Sample Analysis Results

Client - Montana Dept. Of Env. Quality

Client's Sample ID	MBDS-R03-O01				
Lab Sample ID	1075595007				
Filename	U80629B_08				
Injected By	BAL				
Total Amount Extracted	11.3 g			Matrix	Soil
% Moisture	8.3			Dilution	NA
Dry Weight Extracted	10.4 g			Collected	06/17/2008
ICAL ID	U80622			Received	06/20/2008
CCal Filename(s)	U80629A_16 & U80629B_15			Extracted	06/26/2008
Method Blank ID	BLANK-16796			Analyzed	06/30/2008 02:25

Native Isomers	Conc ng/Kg	EMPC ng/Kg	RL ng/Kg	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	ND	—	0.26	2,3,7,8-TCDF-13C	2.00	85
Total TCDF	1.30	—	0.26	2,3,7,8-TCDD-13C	2.00	83
2,3,7,8-TCDD	ND	—	0.44	1,2,3,7,8-PeCDF-13C	2.00	85
Total TCDD	ND	—	0.44	2,3,4,7,8-PeCDF-13C	2.00	83
1,2,3,7,8-PeCDF	ND	—	0.25	1,2,3,7,8-PeCDD-13C	2.00	85
2,3,4,7,8-PeCDF	ND	—	0.23	1,2,3,4,7,8-HxCDF-13C	2.00	91
Total PeCDF	ND	—	0.24	1,2,3,6,7,8-HxCDF-13C	2.00	82
1,2,3,7,8-PeCDD	ND	—	0.34	2,3,4,6,7,8-HxCDF-13C	2.00	84
Total PeCDD	ND	—	0.34	1,2,3,7,8,9-HxCDF-13C	2.00	83
1,2,3,4,7,8-HxCDF	ND	—	0.17	1,2,3,4,7,8-HxCDD-13C	2.00	84
1,2,3,6,7,8-HxCDF	ND	—	0.19	1,2,3,6,7,8-HxCDD-13C	2.00	71
2,3,4,6,7,8-HxCDF	ND	—	0.24	1,2,3,4,6,7,8-HpCDF-13C	2.00	64
1,2,3,7,8,9-HxCDF	ND	—	0.23	1,2,3,4,7,8,9-HpCDF-13C	2.00	53
Total HxCDF	0.34	—	0.21	1,2,3,4,6,7,8-HpCDD-13C	2.00	60
1,2,3,4,7,8-HxCDD	ND	—	0.34	OCDD-13C	4.00	53
1,2,3,6,7,8-HxCDD	ND	—	0.30	1,2,3,4-TCDD-13C	2.00	NA
1,2,3,7,8,9-HxCDD	ND	—	0.34	1,2,3,7,8,9-HxCDD-13C	2.00	NA
Total HxCDD	ND	—	0.32	2,3,7,8-TCDD-37Cl4	0.20	80
1,2,3,4,6,7,8-HpCDF	0.86	—	0.29	Total 2,3,7,8-TCDD		
1,2,3,4,7,8,9-HpCDF	ND	—	0.45	Equivalence: 0.039 ng/Kg		
Total HpCDF	0.86	—	0.37	(Using ITE Factors)		
1,2,3,4,6,7,8-HpCDD	1.60	—	0.55			
Total HpCDD	3.60	—	0.55			
OCDF	1.40	—	0.47			
OCDD	13.00	—	0.99			

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
 EMPC = Estimated Maximum Possible Concentration
 RL = Reporting Limit.

ND = Not Detected
 NA = Not Applicable
 NC = Not Calculated

Results reported on a dry weight basis and are valid to no more than 2 significant figures.

J = Value below calibration range

B = Less than 10x higher than method blank level

AB
8/4/08

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
 without the written consent of Pace Analytical Services, Inc.
 13 of 20

Report No.....1075595_8290


Pace Analytical™

 Pace Analytical Services, Inc.
 1700 Elm Street - Suite 200
 Minneapolis, MN 55414

 Tel: 612-607-1700
 Fax: 612-607-6444

Method 8290 Sample Analysis Results

Client - Montana Dept. Of Env. Quality

Client's Sample ID	MBDS-R03-A01		
Lab Sample ID	1075595008		
Filename	U80629B_09		
Injected By	BAL		
Total Amount Extracted	14.7 g	Matrix	Soil
% Moisture	18.1	Dilution	NA
Dry Weight Extracted	12.0 g	Collected	06/18/2008
ICAL ID	U80622	Received	06/20/2008
CCal Filename(s)	U80629A_16 & U80629B_15	Extracted	06/26/2008
Method Blank ID	BLANK-16796	Analyzed	06/30/2008 03:15

Native Isomers	Conc ng/Kg	EMPC ng/Kg	RL ng/Kg	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	ND	—	0.38	2,3,7,8-TCDF-13C	2.00	75
Total TCDF	0.40	—	0.38 + J	2,3,7,8-TCDD-13C	2.00	73
				1,2,3,7,8-PeCDF-13C	2.00	73
2,3,7,8-TCDD	ND	—	0.46	2,3,4,7,8-PeCDF-13C	2.00	73
Total TCDD	ND	—	0.46	1,2,3,7,8-PeCDD-13C	2.00	72
				1,2,3,4,7,8-HxCDF-13C	2.00	81
1,2,3,7,8-PeCDF	ND	—	0.24	1,2,3,6,7,8-HxCDF-13C	2.00	75
2,3,4,7,8-PeCDF	ND	—	0.21	2,3,4,6,7,8-HxCDF-13C	2.00	72
Total PeCDF	0.43	—	0.22 + J	1,2,3,7,8,9-HxCDF-13C	2.00	75
				1,2,3,4,7,8-HxCDD-13C	2.00	76
1,2,3,7,8-PeCDD	ND	—	0.35	1,2,3,6,7,8-HxCDD-13C	2.00	66
Total PeCDD	ND	—	0.35	1,2,3,4,6,7,8-HpCDF-13C	2.00	57
				1,2,3,4,7,8,9-HpCDF-13C	2.00	49
1,2,3,4,7,8-HxCDF	ND	—	0.17	1,2,3,4,6,7,8-HpCDD-13C	2.00	55
1,2,3,6,7,8-HxCDF	ND	—	0.16	OCDD-13C	4.00	48
2,3,4,6,7,8-HxCDF	ND	—	0.16			
1,2,3,7,8,9-HxCDF	ND	—	0.24	1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	0.25	—	0.18 + J	1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	ND	—	0.27	2,3,7,8-TCDD-37Cl4	0.20	75
1,2,3,6,7,8-HxCDD	ND	—	0.29			
1,2,3,7,8,9-HxCDD	ND	—	0.24			
Total HxCDD	ND	—	0.27			
1,2,3,4,6,7,8-HpCDF	0.43	—	0.32 + U	Total 2,3,7,8-TCDD		
1,2,3,4,7,8,9-HpCDF	ND	—	0.46	Equivalence: 0.021 ng/Kg		
Total HpCDF	0.43	—	0.39 + J	(Using ITE Factors)		
1,2,3,4,6,7,8-HpCDD	1.00	—	0.49 + J			
Total HpCDD	2.10	—	0.49 + J			
OCDF	—	0.76	0.53 + U J			
OCDD	6.20	—	1.00 + U J			

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
 EMPC = Estimated Maximum Possible Concentration
 RL = Reporting Limit.

ND = Not Detected
 NA = Not Applicable
 NC = Not Calculated

Results reported on a dry weight basis and are valid to no more than 2 significant figures.

J = Value below calibration range

B = Less than 10x higher than method blank level

I = Interference present

AS
8/4/08

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
 without the written consent of Pace Analytical Services, Inc.
 14 of 20

Report No.....1075595_8290



Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612-607-6444

Method 8290 Sample Analysis Results

Client - Montana Dept. Of Env. Quality

Client's Sample ID	MBDS-R10-A01			
Lab Sample ID	1075595009			
Filename	U80629B_10			
Injected By	BAL			
Total Amount Extracted	15.0 g	Matrix	Soil	
% Moisture	20.6	Dilution	NA	
Dry Weight Extracted	11.9 g	Collected	06/18/2008	
ICAL ID	U80622	Received	06/20/2008	
CCal Filename(s)	U80629A_16 & U80629B_15	Extracted	06/26/2008	
Method Blank ID	BLANK-16796	Analyzed	06/30/2008 04:05	

Native Isomers	Conc ng/Kg	EMPC ng/Kg	RL ng/Kg	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	ND	—	0.38	2,3,7,8-TCDF-13C	2.00	78
Total TCDF	ND	—	0.38	2,3,7,8-TCDD-13C	2.00	77
2,3,7,8-TCDD	ND	—	0.54	1,2,3,7,8-PeCDF-13C	2.00	75
Total TCDD	0.58	—	0.54 + J	2,3,4,7,8-PeCDF-13C	2.00	74
				1,2,3,7,8-PeCDD-13C	2.00	75
1,2,3,7,8-PeCDF	ND	—	0.45	1,2,3,4,7,8-HxCDF-13C	2.00	86
2,3,4,7,8-PeCDF	ND	—	0.31	1,2,3,6,7,8-HxCDF-13C	2.00	81
Total PeCDF	4.00	—	0.38 + J	2,3,4,6,7,8-HxCDF-13C	2.00	81
				1,2,3,7,8,9-HxCDF-13C	2.00	82
1,2,3,7,8-PeCDD	—	0.49	0.39 + J+	1,2,3,4,7,8-HxCDD-13C	2.00	82
Total PeCDD	ND	—	0.39	1,2,3,6,7,8-HxCDD-13C	2.00	72
				1,2,3,4,6,7,8-HpCDF-13C	2.00	64
1,2,3,4,7,8-HxCDF	—	0.29	0.29 + J+	1,2,3,4,7,8,9-HpCDF-13C	2.00	53
1,2,3,6,7,8-HxCDF	—	0.80	0.31 + J+	1,2,3,4,6,7,8-HpCDD-13C	2.00	61
2,3,4,6,7,8-HxCDF	—	0.50	0.25 + J+	OCDD-13C	4.00	52
1,2,3,7,8,9-HxCDF	ND	—	0.33			
Total HxCDF	2.40	—	0.30 + J	1,2,3,4-TCDD-13C	2.00	NA
				1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	ND	—	0.62	2,3,7,8-TCDD-37Cl4	0.20	82
1,2,3,6,7,8-HxCDD	ND	—	0.56			
1,2,3,7,8,9-HxCDD	ND	—	0.75			
Total HxCDD	ND	—	0.64			
1,2,3,4,6,7,8-HpCDF	—	4.60	0.43 + J+	Total 2,3,7,8-TCDD		
1,2,3,4,7,8,9-HpCDF	ND	—	0.50	Equivalence: 0.096 ng/Kg		
Total HpCDF	4.50	—	0.46	(Using ITE Factors)		
1,2,3,4,6,7,8-HpCDD	—	4.20	0.73 + J+			
Total HpCDD	9.40	—	0.73			
OCDF	24.00	—	0.90			
OCDD	72.00	—	0.85			

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
EMPC = Estimated Maximum Possible Concentration
RL = Reporting Limit.

ND = Not Detected
NA = Not Applicable
NC = Not Calculated

Results reported on a dry weight basis and are valid to no more than 2 significant figures.
J = Value below calibration range
I = Interference present

AB
8/14/08

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc.
15 of 20

Report No.....1075595_8290

Montana Background Dioxin Study

1. **SDG Number:** 1076008
2. **Number of Samples:** (2)
3. **Sample Matrix:** (2) Soil
4. **Applicable Analytes:** PCDD/PCDF
5. **Reporting Tier:** Level 3
6. **Analysis Method** USEPA SW-846 Method 8290
7. **Laboratory:** Pace Analytical
8. **Validation Level:** III
9. **Validator Affiliation:** Portage Environmental, Inc.
10. **Project:** Montana Background Dioxin Study

Validator's Signature: *Amber Brandy*

Date: 08/05/08

Reviewed By:

Date: 08/06/08

1. INTRODUCTION

Two (2) soil samples were collected and analyzed for Dioxins/Furans by Pace Analytical using USEPA SW-846 Method 8290, *Polychlorinated Dibenzodioxins (PCDDs) and Polychlorinated Dibenzofurans (PCDFs)* by *High Resolution Gas Chromatography/High Resolution Mass Spectrometry (HRGC/HRMS)*. The data were validated to a Level III.

2. SAMPLE IDENTIFICATION

A sample cross-reference and holding time table is presented below.

Montana Background Dioxin Study SDG Number 1076008								
Field ID	Lab ID	Matrix	Sample Collection Date	Date Received	Date Extracted	Collection to Extraction Holding Time	Analysis Date	Extraction to Analysis Holding Time
MBDS-R17-F01	1076008001	Soil	06/24/08	06/27/08	07/09/08	15	07/21/08	12
MBDS-R17-O01	1076008002	Soil	06/25/08	06/27/08	07/09/08	14	07/21/08	12

A '*' denotes an exceeded holding time.

3. DATA LIMITATION OVERVIEW

The target compound analyses, dioxin/furan, for soil samples from Montana Background Dioxin Study showed compliance with the QC requirements set forth by USEPA SW-846 Method 8290. The data are valid and acceptable with the following exceptions:

MBDS-R17-F01:

- Total TCDD has been qualified with a 'U' validation flag to denote the reported concentration is non-detect due to positive detection in the method blank (see CTR comment #6).
- 1,2,3,4,7,8,9-HpCDF has been qualified with a 'UJ' validation flag to denote the reported concentration is non-detect, and the sample quantitation is an estimate due to low internal standard recovery (see CTR comment #9).
- Total HpCDF has been qualified with a 'J-' validation flag to denote the reported concentration is likely an underestimated result due to low internal standard recovery and as it was reported below the quantitation limit (see CTR comment #9 and 10).

- Total TCDF 1,2,3,6,7,8-HxCDD, 1,2,3,7,8,9-HxCDD, total HxCDD, 1,2,3,4,6,7,8-HpCDF, 1,2,3,4,6,7,8-HpCDD, total HpCDD, and OCDF have been qualified with a 'J' validation flag to denote the reported concentration is an estimate with an undetermined bias as it was reported below the quantitation limit (see CTR comment #10).
- 1,2,3,4,7,8-HxCDF was reported at an EMPC and has been qualified with a 'J+' validation flag to denote the reported concentration is likely an overestimate result due to possible interference in the sample (see CTR comment #10).

MBDS-R17-O01:

- Total TCDD has been qualified with a 'U' validation flag to denote the reported concentration is non-detect due to positive detection in the method blank (see CTR comment #6).
- 1,2,3,4,6,7,8-HpCDF and 1,2,3,4,7,8,9-HpCDF were reported at an EMPC and has been qualified with a 'UJ' validation flag to denote the reported concentration is non-detect, and the quantitation limit is an estimate due to positive detection in the method blank and possible interference in the sample (see CTR comments #6 and 10).
- Total TCDF, total HxCDD, 1,2,3,4,6,7,8-HpCDD, total HpCDD, OCDF, and OCDD have been qualified with a 'J' validation flag to denote the reported concentration is an estimate with an undetermined bias, as it was reported below the quantitation limit (see CTR comment #10).
- 1,2,3,6,7,8-HxCDD was reported at an EMPC and has been qualified with a 'J+' validation flag to denote the reported concentration is likely an overestimated result due to possible interference in the sample (see CTR comment #10).

4. CONTRACT AND TECHNICAL REVIEW (CTR)

Project Name: Montana Background Dioxin Study

Laboratory Name: Pace Analytical

SDG#: 1076008

Type of Analysis: USEPA SW-846 Method 8290

1. Data Completeness

The data has undergone a Level III validation.

2. Sample Integrity

No action was taken as sample integrity was compliant.

3. Sample Holding Times

No action was taken as sample holding times were met.

4. Instrument Performance

No action was taken as instrument performance was compliant.

5. Initial and Continuing Calibrations

The initial and continuing calibration forms were not included in the data package as it was a level III. No action was taken as the case narrative indicated that the acceptance criteria for the initial and continuing calibrations were met.

6. Method and Field Blank Contamination

Method Blank. Positive detections were noted in the method blank for total TCDD, 1,2,3,4,7,8-HxCDF, 1,2,3,6,7,8-HxCDF, total HxCDF, 1,2,3,4,6,7,8-HpCDF, 1,2,3,4,7,8,9-HpCDF, total HpCDF, total HpCDD, OCDF, and OCDD and EMPC results were reported for 1,2,3,7,8-PeCDF, 2,3,4,6,7,8-HxCDF, 1,2,3,7,8,9-HxCDF, 1,2,3,6,7,8-HxCDD, and 1,2,3,4,6,7,8-HpCDD.

All total TCDD have been qualified with a 'U' validation flag as the reported concentration was less than five times the blank value. 1,2,3,4,7,8,9-HpCDF and 1,2,3,4,6,7,8-HpCDF in MBDS-R17-O01 were reported at an EMPC and have been qualified with a 'UJ' validation flag as the reported concentrations were less than five times the method blank concentration and due to possible interference in the sample. The remaining 1,2,3,4,7,8-HxCDF, 1,2,3,6,7,8-HxCDF, total HxCDF, 1,2,3,4,6,7,8-HpCDF, 1,2,3,4,7,8,9-HpCDF, total HpCDF, total HpCDD, OCDF, OCDD, 1,2,3,7,8-PeCDF, 2,3,4,6,7,8-HxCDF, 1,2,3,7,8,9-HxCDF, 1,2,3,6,7,8-HxCDD, and 1,2,3,4,6,7,8-HpCDD results warrant no qualification as sample results were either non-detect or greater than five times the blank value.

7. Matrix Spike/Matrix Spike Duplicate (MS/MSD)

The laboratory did not provide acceptance limits for the MS/MSD analysis. In the professional judgment of the validator, the acceptance limit of 50-150% for MS/MSD recovery and a 35% RPD for soil samples and has been used for

validation purposes. No action was taken as all MS/MSD recovery and precision criteria were met.

8. Laboratory Control Sample (LCS)

No action was taken as all LCS recoveries were within the acceptance criteria.

9. Internal Standards (IS) Performance

The internal standard 1,2,3,4,7,8,9-HpCDF-13C (36%) in MBDS-R17-F01 and OCDD-13C (38% and 38%) in the MS and MSD were outside of the 40-135% acceptance criteria, per USEPA SW-846 Method 8290. 1,2,3,4,7,8,9-HpCDF in MBDS-R17-F01 was non-detect and has been qualified with a 'UJ' validation flag due to low internal standard recovery. Total HpCDF in MBDS-R17-F01 exhibited a positive detection and has been qualified with a 'J-' validation flag due to low internal standard recovery resulting in a likely underestimate result. No action was taken due to low internal standard OCDD-13C recovery in the MS/MSD as qualification is not made based on MS/MSD data alone.

10. Target Compound Identification and Quantitation

In sample MBDS-R17-F01, total TCDF, 1,2,3,6,7,8-HxCDD, 1,2,3,7,8,9-HxCDD, total HxCDD, 1,2,3,4,6,7,8-HpCDF, 1,2,3,4,6,7,8-HpCDD, total HpCDD, and OCDF were reported below the quantitation limit. They have been qualified with a 'J' validation flag as the reported result is an estimate with an undetermined bias. 1,2,3,4,7,8-HxCDF was reported at an EMPC and has been qualified with a 'J+' validation flag due to possible interference in the sample resulting in a likely overestimated result. Total HpCDF was reported below the quantitation limit and has been qualified with a 'J-' validation flag as the reported result is likely underestimate due to low internal standard recovery.

In sample MBDS-R17-O01, total TCDF, total HxCDD, 1,2,3,4,6,7,8-HpCDD, total HpCDD, OCDF, and OCDD were reported below the quantitation limit. They have been qualified with a 'J' validation flag as the reported result is an estimate with an undetermined bias. 1,2,3,6,7,8-HxCDD was reported at an EMPC and has been qualified with a 'J+' validation flag due to possible interference in the sample resulting in a likely overestimated result. 1,2,3,4,6,7,8-HpCDF and 1,2,3,4,7,8,9-HpCDF were reported at an EMPC and have been qualified with a 'UJ' validation flag due to positive detection in the method blank and possible interference in the sample.

11. Chromatogram Quality

No comments relating to chromatogram quality.

5. SUMMARY OF DATA USABILITY

The data validation summary flag table shows that qualifiers were applied to the target analytes for SDG# 1076008.

DATA VALIDATION SUMMARY TABLE		
Compound	MBDS-R17-F01	MBDS-R17-O01
2,3,7,8-TCDF		
Total TCDF	J	J
2,3,7,8-TCDD		
Total TCDD	U	U
1,2,3,7,8-PeCDF		
2,3,4,7,8-PeCDF		
Total PeCDF		
1,2,3,7,8-PeCDD		
Total PeCDD		
1,2,3,4,7,8-HxCDF	J+	
1,2,3,6,7,8-HxCDF		
2,3,4,6,7,8-HxCDF		
1,2,3,7,8,9-HxCDF		
Total HxCDF		
1,2,3,4,7,8-HxCDD		
1,2,3,6,7,8-HxCDD	J	J+
1,2,3,7,8,9-HxCDD	J	
Total HxCDD	J	J
1,2,3,4,6,7,8-HpCDF	J	UJ
1,2,3,4,7,8,9-HpCDF	UJ	UJ
Total HpCDF	J-	
1,2,3,4,6,7,8-HpCDD	J	J
Total HpCDD	J	J
OCDF	J	J
OCDD		J

Data Validation Summary Table Qualifier Codes

U = Result is a non-detect.

UJ = Result is a non-detect, but is estimated due to QC issues.

J = Result was detected, but is an estimate with undetermined bias due to QC issues.

J+ = Result was detected, but is likely overestimated due to QC issues.

J- = Result was detected, but is likely underestimated due to QC issues.

R = Result is rejected and is highly questionable for use as a quantitative value due to significant QC issues.

6. REFERENCES

Contract Laboratory Program National Functional Guidelines for Organic Data Review, EPA 540/R-99/008, October 1999, U.S. Environmental Protection Agency, Cincinnati, Ohio.

USEPA Analytical Operations / Data Quality Center, *National Functional Guidelines for Chlorinated Dioxin / Furan Data Review*, EPA 540-R-02-003, August 2002.

USEPA, *Methods for the Analysis of Wastes, High Resolution Gas Chromatography / Mass Spectrometry*, SW-846, July 2002.

USEPA Test Methods for Evaluating Solid Waste Physical/Chemical Methods, Doc. No. SW-846, 3rd Ed., Method 8290, Polychlorinated Dibenzodioxins (PCDDs) and Polychlorinated Dibenzofurans (PCDFs) by High Resolution Gas Chromatography/High Resolution Mass Spectrometry (HRGC/HRMS), Revision 0, September 1994.

9. ATTACHMENTS

The following items are included as an attachment to this L&V report:

- A. Qualified reported results (Form I)

Attachment A
Qualified Reported Results



Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612-607-6444

Method 8290 Sample Analysis Results

Client - Montana Dept. Of Env. Quality

Client's Sample ID	MBDS-R17-F01	Matrix	Soil
Lab Sample ID	1076008001	Dilution	NA
Filename	U80721A_07	Collected	06/24/2008
Injected By	SMT	Received	06/27/2008
Total Amount Extracted	13.5 g	Extracted	07/09/2008
% Moisture	24.7	Analyzed	07/21/2008 15:27
Dry Weight Extracted	10.2 g		
ICAL ID	U80622		
CCal Filename(s)	U80721A_03 & U80721A_08		
Method Blank ID	BLANK-16856		

Native Isomers	Conc ng/Kg	EMPC ng/Kg	RL ng/Kg	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	ND	---	0.14	2,3,7,8-TCDF-13C	2.00	74
Total TCDF	0.89	---	0.14	2,3,7,8-TCDD-13C	2.00	75
2,3,7,8-TCDD	ND	---	0.11	1,2,3,7,8-PeCDF-13C	2.00	67
Total TCDD	1.30	---	0.11	2,3,4,7,8-PeCDF-13C	2.00	69
1,2,3,7,8-PeCDF	ND	---	0.14	1,2,3,7,8-PeCDD-13C	2.00	74
2,3,4,7,8-PeCDF	ND	---	0.10	1,2,3,4,7,8-HxCDF-13C	2.00	69
Total PeCDF	ND	---	0.12	1,2,3,6,7,8-HxCDF-13C	2.00	65
1,2,3,7,8-PeCDD	ND	---	0.14	2,3,4,6,7,8-HxCDF-13C	2.00	68
Total PeCDD	ND	---	0.14	1,2,3,7,8,9-HxCDF-13C	2.00	71
1,2,3,4,7,8-HxCDF	---	0.32	0.26	1,2,3,4,7,8-HxCDD-13C	2.00	78
1,2,3,6,7,8-HxCDF	ND	---	0.22	1,2,3,6,7,8-HxCDD-13C	2.00	59
2,3,4,6,7,8-HxCDF	ND	---	0.21	1,2,3,4,6,7,8-HpCDF-13C	2.00	54
1,2,3,7,8,9-HxCDF	ND	---	0.21	1,2,3,4,7,8,9-HpCDF-13C	2.00	36 P
Total HxCDF	ND	---	0.23	1,2,3,4,6,7,8-HpCDD-13C	2.00	53
1,2,3,4,7,8-HxCDD	ND	---	0.19	OCDD-13C	4.00	52
1,2,3,6,7,8-HxCDD	0.28	---	0.23	1,2,3,4-TCDD-13C	2.00	NA
1,2,3,7,8,9-HxCDD	0.33	---	0.22	1,2,3,7,8,9-HxCDD-13C	2.00	NA
Total HxCDD	1.80	---	0.21	2,3,7,8-TCDD-37Cl4	0.20	73
1,2,3,4,6,7,8-HpCDF	0.92	---	0.16			
1,2,3,4,7,8,9-HpCDF	ND	---	0.48	Total 2,3,7,8-TCDD		
Total HpCDF	2.10	---	0.32	Equivalence: 0.12 ng/Kg		
				(Using ITE Factors)		
1,2,3,4,6,7,8-HpCDD	2.80	---	0.33			
Total HpCDD	4.50	---	0.33			
OCDF	2.50	---	0.22			
OCDD	17.00	---	0.37			

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
EMPC = Estimated Maximum Possible Concentration
RL = Reporting Limit.

ND = Not Detected
NA = Not Applicable
NC = Not Calculated

Results reported on a dry weight basis and are valid to no more than 2 significant figures.

J = Value below calibration range
B = Less than 10x higher than method blank level
P = Recovery outside target range
I = Interference present

AP
8/15/08

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc.



Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612-607-6444

Method 8290 Sample Analysis Results

Client - Montana Dept. Of Env. Quality

Client's Sample ID	MBDS-R17-001		
Lab Sample ID	1076008002		
Filename	U80721A_06		
Injected By	SMT		
Total Amount Extracted	10.5 g	Matrix	Soil
% Moisture	1.2	Dilution	NA
Dry Weight Extracted	10.3 g	Collected	06/25/2008
ICAL ID	U80622	Received	06/27/2008
CCal Filename(s)	U80721A_03 & U80721A_08	Extracted	07/09/2008
Method Blank ID	BLANK-16856	Analyzed	07/21/2008 14:37

Native Isomers	Conc ng/Kg	EMPC ng/Kg	RL ng/Kg	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	ND	---	0.12	2,3,7,8-TCDF-13C	2.00	84
Total TCDF	0.48	---	0.12	2,3,7,8-TCDD-13C	2.00	87
2,3,7,8-TCDD	ND	---	0.15	1,2,3,7,8-PeCDF-13C	2.00	77
Total TCDD	0.66	---	0.15	2,3,4,7,8-PeCDF-13C	2.00	76
1,2,3,7,8-PeCDF	ND	---	0.15	1,2,3,7,8-PeCDD-13C	2.00	84
2,3,4,7,8-PeCDF	ND	---	0.14	1,2,3,4,7,8-HxCDF-13C	2.00	96
Total PeCDF	ND	---	0.14	2,3,4,6,7,8-HxCDF-13C	2.00	77
1,2,3,7,8-PeCDD	ND	---	0.17	1,2,3,7,8,9-HxCDF-13C	2.00	81
Total PeCDD	ND	---	0.17	1,2,3,4,7,8-HxCDD-13C	2.00	83
1,2,3,4,7,8-HxCDF	ND	---	0.25	1,2,3,6,7,8-HxCDD-13C	2.00	91
1,2,3,6,7,8-HxCDF	ND	---	0.27	1,2,3,4,6,7,8-HpCDF-13C	2.00	70
2,3,4,6,7,8-HxCDF	ND	---	0.28	1,2,3,4,7,8,9-HpCDF-13C	2.00	66
1,2,3,7,8,9-HxCDF	ND	---	0.21	1,2,3,4,6,7,8-HpCDD-13C	2.00	57
Total HxCDF	ND	---	0.25	OCDD-13C	4.00	67
1,2,3,4,7,8-HxCDD	ND	---	0.13	1,2,3,4-TCDD-13C	2.00	NA
1,2,3,6,7,8-HxCDD	---	0.22	0.18	1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,7,8,9-HxCDD	ND	---	0.15	2,3,7,8-TCDD-37Cl4	0.20	81
Total HxCDD	0.46	---	0.15			
1,2,3,4,6,7,8-HpCDF	---	0.36	0.16	Total 2,3,7,8-TCDD		
1,2,3,4,7,8,9-HpCDF	---	0.22	0.20	Equivalence: 0.017 ng/Kg		
Total HpCDF	ND	---	0.18	(Using ITE Factors)		
1,2,3,4,6,7,8-HpCDD	0.94	---	0.26			
Total HpCDD	0.94	---	0.26			
OCDF	1.30	---	0.21			
OCDD	5.90	---	0.35			

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
EMPC = Estimated Maximum Possible Concentration
RL = Reporting Limit.

ND = Not Detected
NA = Not Applicable
NC = Not Calculated

Results reported on a dry weight basis and are valid to no more than 2 significant figures.
J = Value below calibration range
B = Less than 10x higher than method blank level
I = Interference present

AS
8/5/08

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc.
8 of 13

Report No.....1076008_8290

Montana Background Dioxin Study

1. **SDG Number:** 1076133
2. **Number of Samples:** (1)
3. **Sample Matrix:** (1) Soil
4. **Applicable Analytes:** PCDD/PCDF
5. **Reporting Tier:** Level 3
6. **Analysis Method** USEPA SW-846 Method 8290
7. **Laboratory:** Pace Analytical
8. **Validation Level:** III
9. **Validator Affiliation:** Portage Environmental, Inc.
10. **Project:** Montana Background Dioxin Study

Validator's Signature: *Amber Brindy*

Date: 08/05/08

Reviewed By:

Date: 08/06/08

1. INTRODUCTION

One (1) soil sample was collected and analyzed for Dioxins/Furans by Pace Analytical using USEPA SW-846 Method 8290, *Polychlorinated Dibenzodioxins (PCDDs) and Polychlorinated Dibenzofurans (PCDFs)* by *High Resolution Gas Chromatography/High Resolution Mass Spectrometry (HRGC/HRMS)*. The data were validated to a Level III.

2. SAMPLE IDENTIFICATION

A sample cross-reference and holding time table is presented below.

Montana Background Dioxin Study SDG Number 1076133								
Field ID	Lab ID	Matrix	Sample Collection Date	Date Received	Date Extracted	Collection to Extraction Holding Time	Analysis Date	Extraction to Analysis Holding Time
MBDS-R17-A01	1076133001	Soil	06/29/08	07/01/08	07/16/08	17	07/22/08	6

A '**' denotes an exceeded holding time.

3. DATA LIMITATION OVERVIEW

The target compound analyses, dioxin/furan, for soil samples from Montana Background Dioxin Study showed compliance with the QC requirements set forth by USEPA SW-846 Method 8290. The data are valid and acceptable with the following exceptions:

MBDS-R17-A01:

- Total TCDF, total PeCDF, 2,3,4,6,7,8-HxCDF, 1,2,3,7,8,9-HxCDF, total HxCDF, total HxCDD, 1,2,3,4,6,7,8-HpCDF, total HpCDF, 1,2,3,4,6,7,8-HpCDD, and total HpCDD have been qualified with a 'U' validation flag to denote the reported concentration is non-detect due to positive detection in the method blank (see CTR comment #6).
- 2,3,7,8-TCDF, 1,2,3,7,8-PeCDF, 2,3,4,7,8-PeCDF, 1,2,3,4,7,8-HxCDF, 1,2,3,6,7,8-HxCDF, 1,2,3,7,8,9-HxCDD, 1,2,3,4,7,8,9-HpCDF, OCDF, and OCDD were reported at an EMPC and have been qualified with a 'UJ' validation flag to denote the reported concentration is non-detect, and the sample quantitation limit is an estimate due to positive detection in the method blank and possible interference in the sample (see CTR comment #6 and 10).

4. CONTRACT AND TECHNICAL REVIEW (CTR)

Project Name: Montana Background Dioxin Study

Laboratory Name: Pace Analytical

SDG#: 1076133

Type of Analysis: USEPA SW-846 Method 8290

1. Data Completeness

The data has undergone a Level III validation.

2. Sample Integrity

No action was taken as sample integrity was compliant.

3. Sample Holding Times

No action was taken as sample holding times were met.

4. Instrument Performance

No action was taken as instrument performance was compliant.

5. Initial and Continuing Calibrations

The initial and continuing calibration forms were not included in the data package as it was a level III. The case narrative noted that compounds affected by continuing calibrations outside of the acceptance criteria were qualified with a 'Y' laboratory flag. Internal standards 1,2,3,7,8-PeCDD-13C in MBDS-R17-A01 and method blank, 1,2,3,4,7,8,9-HpCDF-13C and OCDD-13C in the LCS were affected by continuing calibrations. No action was taken as all internal standard recoveries were within the acceptance criteria.

6. Method and Field Blank Contamination

Method Blank. Positive detections were noted in the method blank for 2,3,7,8-TCDF, total TCDF, 2,3,4,7,8-PeCDF, total PeCDF, 1,2,3,7,8-PeCDD, total PeCDD, 1,2,3,4,7,8-HxCDF, 1,2,3,6,7,8-HxCDF, 2,3,4,6,7,8-HxCDF, total HxCDF, 1,2,3,4,7,8-HxCDD, 1,2,3,6,7,8-HxCDD, 1,2,3,7,8,9-HxCDD, total HxCDD, 1,2,3,4,6,7,8-HpCDF, 1,2,3,4,7,8,9-HpCDF, total HpCDF, 1,2,3,4,6,7,8-HpCDD, total HpCDD, and OCDD and EMPC results were noted for 1,2,3,7,8-PeCDF, 1,2,3,7,8,9-HxCDF, and OCDF.

Total TCDF, total PeCDF, 2,3,4,6,7,8-HxCDF, 1,2,3,7,8,9-HxCDF, total HxCDF, total HxCDD, 1,2,3,4,6,7,8-HpCDF, total HpCDF, 1,2,3,4,6,7,8-HpCDD, and total HpCDD have been qualified with a 'U' validation flag as the reported concentration is less than five times the blank value. 2,3,7,8-TCDF, 1,2,3,7,8-PeCDF, 2,3,4,7,8-PeCDF, 1,2,3,4,7,8-HxCDF, 1,2,3,6,7,8-HxCDF, 1,2,3,7,8,9-HxCDD, 1,2,3,4,7,8,9-HpCDF, OCDF, and OCDD were reported at an EMPC result and have been qualified with a 'UJ' validation flag as the reported concentration was less than five times the blank value and due to possible interference in the sample. The remaining results were either non-detect or greater than five times the method blank and warrant no qualification.

7. Matrix Spike/Matrix Spike Duplicate (MS/MSD)

A MS/MSD analysis was not performed for the sample within this SDG. A LCS analysis was performed instead and no qualification is warranted.

8. Laboratory Control Sample (LCS)

No action was taken as all LCS recoveries were within the acceptance criteria.

The 2,3,7,8-TCDD^{37Cl4} cleanup standard, was inadvertently omitted from the preparation of the LCS. The reported value was identified as NC, not calculated. No action was taken as all remaining QA/QC was within the acceptance criteria.

9. Internal Standards (IS) Performance

No action was taken as all internal standard recoveries were within the 40-135% acceptance criteria, per USEPA SW-846 Method 8290.

10. Target Compound Identification and Quantitation

2,3,7,8-TCDF, 1,2,3,7,8-PeCDF, 2,3,4,7,8-PeCDF, 1,2,3,4,7,8-HxCDF, 1,2,3,6,7,8-HxCDF, 1,2,3,7,8,9-HxCDD, 1,2,3,4,7,8,9-HpCDF, OCDF, and OCDD were reported at an EMPC and have been qualified with a 'UJ' validation flag due to positive detections in the method blank and possible contamination in the sample.

11. Chromatogram Quality

No comments relating to chromatogram quality.

5. SUMMARY OF DATA USABILITY

The data validation summary flag table shows that qualifiers were applied to the target analytes for SDG# 1076133.

DATA VALIDATION SUMMARY TABLE	
Compound	MBDS-R17-A01
2,3,7,8-TCDF	UJ
Total TCDF	U
2,3,7,8-TCDD	
Total TCDD	
1,2,3,7,8-PeCDF	UJ
2,3,4,7,8-PeCDF	UJ
Total PeCDF	U
1,2,3,7,8-PeCDD	
Total PeCDD	
1,2,3,4,7,8-HxCDF	UJ
1,2,3,6,7,8-HxCDF	UJ
2,3,4,6,7,8-HxCDF	U
1,2,3,7,8,9-HxCDF	U
Total HxCDF	U
1,2,3,4,7,8-HxCDD	
1,2,3,6,7,8-HxCDD	
1,2,3,7,8,9-HxCDD	UJ
Total HxCDD	U
1,2,3,4,6,7,8-HpCDF	U
1,2,3,4,7,8,9-HpCDF	UJ
Total HpCDF	U
1,2,3,4,6,7,8-HpCDD	U
Total HpCDD	U
OCDF	UJ
OCDD	UJ

Data Validation Summary Table Qualifier Codes

U = Result is a non-detect.

UJ = Result is a non-detect, but is estimated due to QC issues.

J = Result was detected, but is estimated with an undetermined bias due to QC issues.

J+ = Result was detected, but is likely overestimated due to QC issues.

J- = Result was detected, but is likely underestimated due to QC issues.

R = Result is rejected and is highly questionable for use as a quantitative value due to significant QC issues.

6. REFERENCES

Contract Laboratory Program National Functional Guidelines for Organic Data Review, EPA 540/R-99/008, October 1999, U.S. Environmental Protection Agency, Cincinnati, Ohio.

USEPA Analytical Operations / Data Quality Center, *National Functional Guidelines for Chlorinated Dioxin / Furan Data Review*, EPA 540-R-02-003, August 2002.

USEPA, *Methods for the Analysis of Wastes, High Resolution Gas Chromatography / Mass Spectrometry*, SW-846, July 2002.

USEPA Test Methods for Evaluating Solid Waste Physical/Chemical Methods, Doc. No. SW-846, 3rd Ed., Method 8290, Polychlorinated Dibenzodioxins (PCDDs) and Polychlorinated Dibenzofurans (PCDFs) by High Resolution Gas Chromatography/High Resolution Mass Spectrometry (HRGC/HRMS), Revision 0, September 1994.

9. ATTACHMENTS

The following items are included as an attachment to this L&V report:

- A. Qualified reported results (Form I)

Attachment A
Qualified Reported Results

**Pace Analytical**TM**Method 8290 Sample Analysis Results**

Client - Montana Dept. Of Env. Quality

Client's Sample ID	MBDS-R17-A01			
Lab Sample ID	1076133001			
Filename	F80721A_17			
Injected By	SMT			
Total Amount Extracted	13.6 g	Matrix	Water	
% Moisture	25.3	Dilution	NA	
Dry Weight Extracted	10.1 g	Collected	06/29/2008	
ICAL ID	F80721	Received	07/01/2008	
CCal Filename(s)	F80721A_09 & F80721A_24	Extracted	07/16/2008	
Method Blank ID	BLANK-16953	Analyzed	07/22/2008 00:46	

Native Isomers	Conc ng/Kg	EMPC ng/Kg	RL ng/Kg	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	—	0.090	0.087	+ UJ 2,3,7,8-TCDF-13C	2.00	83
Total TCDF	0.20	—	0.087	B+U 2,3,7,8-TCDD-13C	2.00	80
				1,2,3,7,8-PeCDF-13C	2.00	88
2,3,7,8-TCDD	ND	—	0.095	2,3,4,7,8-PeCDF-13C	2.00	92
Total TCDD	ND	—	0.095	1,2,3,7,8-PeCDD-13C	2.00	86 Y
				1,2,3,4,7,8-HxCDF-13C	2.00	74
1,2,3,7,8-PeCDF	—	0.091	0.080	+ UJ 1,2,3,6,7,8-HxCDF-13C	2.00	70
2,3,4,7,8-PeCDF	—	0.097	0.057	+ UJ 2,3,4,6,7,8-HxCDF-13C	2.00	73
Total PeCDF	0.12	—	0.069	B+U 1,2,3,7,8,9-HxCDF-13C	2.00	76
				1,2,3,4,7,8-HxCDD-13C	2.00	80
1,2,3,7,8-PeCDD	ND	—	0.095	1,2,3,6,7,8-HxCDD-13C	2.00	75
Total PeCDD	ND	—	0.095	1,2,3,4,6,7,8-HpCDF-13C	2.00	75
				1,2,3,4,7,8,9-HpCDF-13C	2.00	73
1,2,3,4,7,8-HxCDF	—	0.064	0.055	+ UJ 1,2,3,4,6,7,8-HpCDD-13C	2.00	83
1,2,3,6,7,8-HxCDF	—	0.060	0.058	+ UJ OCDD-13C	4.00	77
2,3,4,6,7,8-HxCDF	0.11	—	0.059	B+U		
1,2,3,7,8,9-HxCDF	0.14	—	0.079	+ U 1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	0.47	—	0.063	B+U 1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	ND	—	0.059	2,3,7,8-TCDD-37Cl4	0.20	83
1,2,3,6,7,8-HxCDD	ND	—	0.075			
1,2,3,7,8,9-HxCDD	—	0.110	0.086	+ UJ		
Total HxCDD	0.11	—	0.074	B+U		
1,2,3,4,6,7,8-HpCDF	0.19	—	0.058	B+U Total 2,3,7,8-TCDD		
1,2,3,4,7,8,9-HpCDF	—	0.100	0.067	+ UJ Equivalence: 0.031 ng/Kg		
Total HpCDF	0.19	—	0.062	B+U (Using ITE Factors)		
1,2,3,4,6,7,8-HpCDD	0.40	—	0.092	B+U		
Total HpCDD	0.80	—	0.092	B+U		
OCDF	—	0.420	0.096	+ UJ		
OCDD	—	1.400	0.100	+ UJ		

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
EMPC = Estimated Maximum Possible Concentration
RL = Reporting Limit.

ND = Not Detected
NA = Not Applicable
NC = Not Calculated

Results reported on a dry weight basis and are valid to no more than 2 significant figures.

J = Value below calibration range

B = Less than 10x higher than method blank level

I = Interference present

Y = Calculated using average of daily RFs

AS
8/5/08

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc.
8 of 10

Report No.....1076133_8290