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Data Validation Report

Project:	Portland Harbor Pre-Remedial Design Investigation and Baseline Sampling	
Laboratory:	Test America, West Sacramento, California	
Laboratory Group:	580-79672-2	
Analyses/Method:	Clean Water Act - Dioxins and Furans / CWA1613B	
Validation Level:	Stage 2A and Stage 4 [PDI-SC-S113(A)-2.2TO4.6 and Field Duplicate]	
AECOM Project Number:	60566335.2.12	
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SUMMARY

The samples listed below were collected by AECOM in Portland Harbor in Portland, OR on August 15, 16, and 17, 2018.

Sample ID	Matrix/Sample Type
PDI-RB-SS-180816-1110	Equipment Blank
PDI-RB-SS-180817	Equipment Blank
PDI-SC-S053-0TO2	Sediment
PDI-SC-S053-10TO12.4	Sediment
PDI-SC-S053-2TO4	Sediment
PDI-SC-S053-4TO6	Sediment
PDI-SC-S053-6TO8	Sediment
PDI-SC-S053-8TO10	Sediment
PDI-SC-S108-0TO1.9	Sediment
PDI-SC-S108-1.9TO3	Sediment
PDI-SC-S108-3TO4.7	Sediment
PDI-SC-S108-4.7TO6.7	Sediment
PDI-SC-S108-6.7TO8.8	Sediment
PDI-SC-S108-6.7TO8.8D	Field Duplicate of PDI-SC-S108-6.7TO8.8
PDI-SC-S108-8.8TO9.8	Sediment
PDI-SC-S109-0TO2	Sediment
PDI-SC-S109-10TO11.3	Sediment
PDI-SC-S109-2TO4	Sediment
PDI-SC-S109-4TO6	Sediment
PDI-SC-S109-6TO8	Sediment

Sample ID	Matrix/Sample Type
PDI-SC-S109-8TO10	Sediment
PDI-SC-S113(A)-0TO2.2	Sediment
PDI-SC-S113(A)-2.2TO4.6	Sediment
PDI-SC-S113(A)-2.2TO4.6D	Field Duplicate of PDI-SC-S113(A)-2.2TO4.6
PDI-SC-S113(B)-10TO12	Sediment
PDI-SC-S113(B)-12TO13.8	Sediment
PDI-SC-S113(B)-3.6TO5.6	Sediment
PDI-SC-S113(B)-5.6TO7.4	Sediment
PDI-SC-S113(B)-7.4TO10	Sediment
PDI-SC-S131-0TO2	Sediment
PDI-SC-S131-2TO4	Sediment
PDI-SC-S131-4TO6	Sediment
PDI-SC-S131-6TO8	Sediment
PDI-SC-S157-0TO2	Sediment
PDI-SC-S157-10TO12.4	Sediment
PDI-SC-S157-12.4TO14	Sediment
PDI-SC-S157-14TO15.9	Sediment
PDI-SC-S157-2TO3.7	Sediment
PDI-SC-S157-3.7TO6	Sediment
PDI-SC-S157-6TO8	Sediment
PDI-SC-S157-8TO10	Sediment
PDI-SC-S232-0TO2	Sediment
PDI-SC-S232-2TO4	Sediment
PDI-SC-S232-4TO6.2	Sediment
PDI-SC-S256-0TO2	Sediment
PDI-SC-S256-2TO4	Sediment
PDI-SC-S256-2TO4D	Field Duplicate of PDI-SC-S256-2TO4
PDI-SC-S256-4TO6	Sediment
PDI-SC-S256-6TO8.7	Sediment
PDI-SC-S256-8.7TO9.7	Sediment
PDI-SC-S256-9.7TO10.7	Sediment
PDI-SC-S263-0TO2	Sediment
PDI-SC-S263-2TO3.8	Sediment
PDI-SC-S263-3.8TO5.9	Sediment

Data validation activities were conducted with reference to:

- EPA Method 1613B: *Tetra- through Octa-Chlorinated Dioxins and Furans by Isotope Dilution HRGC/HRMS (October 1994),*

- *USEPA Contract Laboratory Program National Functional Guidelines for High Resolution Superfund Methods Data Review (April 2016),*
- *Quality Assurance Project Plan, Portland Harbor Pre-Remedial Design Investigation and Baseline Sampling, Portland Harbor Superfund Site (March 2018),* and the
- laboratory quality control (QC) limits.

The National Functional Guidelines were modified to accommodate the non-CLP methodologies. In the absence of method-specific information, laboratory QC limits, project-specific requirements and/or AECOM professional judgment were used as appropriate.

REVIEW ELEMENTS

The data were evaluated based on the following parameters (where applicable to the method):

✓	Data completeness [chain-of-custody (COC)/sample integrity]
✓	Holding times and sample preservation
✓	Mass resolution/ window defining mix (WDM)/isomer specificity check (ISC) results
✓	Initial calibration/continuing calibration verification
✗	Laboratory blanks/equipment blanks
NA	Matrix spike (MS) and/or matrix spike duplicate (MSD) results
✓	Ongoing precision and recovery (OPR) results
✓	Field duplicate results
✗	Labeled compound and clean-up standard recoveries
✗	Sample results/reporting issues

The symbol (✓) indicates that no validation qualifiers were applied based on this parameter. An NA indicates that the parameter was not included as part of this data set or was not applicable to this validation and therefore not reviewed. The symbol (✗) indicates that a QC nonconformance resulted in the qualification of data. Any QC nonconformance that resulted in the qualification of data is discussed below. In addition, nonconformances or other issues that were noted during validation, but did not result in qualification of data, may be discussed for informational purposes only.

The data appear valid as qualified and may be used for decision making purposes. Select data points were qualified as estimated due to nonconformances of certain QC criteria (see discussion below). Qualified sample results are presented in Table 1.

RESULTS

Data Completeness (COC)/Sample Integrity

The data package was reviewed and found to meet acceptance criteria for completeness:

- The COCs were reviewed for completeness of information relevant to the samples and requested analyses, and for signatures indicating transfer of sample custody;
- The laboratory sample login sheet(s) were reviewed for issues potentially affecting sample integrity, including the condition of sample containers upon receipt at the laboratory;
- Completeness of analyses was verified by comparing the reported results to the COC requests.

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Holding Times and Sample Preservation

Sample preservation and preparation/analysis holding times were reviewed for conformance with method criteria. All method QC acceptance criteria were met.

Mass Resolution/ WDM/ISC Results

The data were reviewed to ensure that:

- the perfluorokerosene (PFK) molecular leak was performed at the correct frequency (at the beginning and end of a 12-hour shift) and the mass resolution was at a resolving power of > 10,000;
- the window defining mix (WDM) containing the first and last eluting isomers in each homologous series was analyzed at the correct frequency;
- the isomer specificity check (ISC) standard criteria were met for the chromatographic resolution of 2,3,7,8-TCDD on the DB-5 column and of 2,3,7,8-TCDF on the DB-225 column.

All method QC acceptance criteria were met.

Initial Calibration/Continuing Calibration Verification

The data were reviewed to ensure that:

- the absolute and relative retention time, signal/noise (S/N), and ion abundance ratio method acceptance criteria were met (as summarized by the laboratory);
- the initial calibration percent relative standard deviation (%RSD) method acceptance criteria were met for all native and labeled compounds;
- The calibration verification standard (CCV) method acceptance criteria were met.

It should be noted that according to Section 17.1 of the laboratory's SOP, the following method modification was noted:

Section 10.2.4 of Method 1613 reads "The absolute retention time of 13C-1,2,3,4-TCDD shall exceed 25.0 minutes on the DB-5 column, and the retention time of 13C-1,2,3,4-TCDD shall exceed 15.0 minutes on the DB-225 column; otherwise the GC temperature program shall be adjusted and this test repeated until the above-stated minimum retention time criteria are met."

Our retention time on both columns deviate from the above method, but using section 1.5 of Method 1613 "the analyst is permitted to modify the method to lower the cost of measurements, provided that all performance criteria in this method are met," we have modified the GC program to provide a shorter runtime while still meeting method performance criteria thus lowering the cost of analysis.

No data validation actions were taken on this basis.

Professional judgment was used to take no action in instances where the labeled compounds were not within the relative retention time (RRT) criterion since the required RRT criteria were met for all native compounds.

Additionally, professional judgment was used to take no action in instances where the recovery standard RT in the CCV was not within $\pm$ 15 seconds of the RT in the mid-level standard of the associated ICAL. These nonconformances result from routine column maintenance. A WDM is

analyzed daily prior to sample analysis and retention times are adjusted accordingly; thus, data are not adversely impacted.

Laboratory Blanks/Equipment Blanks

Laboratory method blanks and equipment blank results are evaluated as to whether there are contaminants detected above the estimated detection limit (EDL).

Target compounds were detected in the method blanks and the equipment blank associated with the samples in this data set. The equipment blank contamination, after laboratory method blank actions were applied, is summarized below for informational purposes only. Equipment blank contamination was not used to qualify field samples.

Blank ID	Compound	Result	EDL	Units
PDI-RB-SS-180816-1110	1,2,3,4,6,7,8-HpCDD	5.6	0.19	pg/L
PDI-RB-SS-180816-1110	1,2,3,4,7,8-HxCDD	1.4	0.23	pg/L
PDI-RB-SS-180816-1110	2,3,4,6,7,8-HxCDF	0.33	0.24	pg/L
PDI-RB-SS-180816-1110	2,3,7,8-TCDD	2.1	0.16	pg/L
PDI-RB-SS-180816-1110	OCDD	110	0.25	pg/L
PDI-RB-SS-180816-1110	OCDF	6.1	0.15	pg/L
PDI-RB-SS-180817	1,2,3,4,6,7,8-HpCDF	1.4	0.15	pg/L
PDI-RB-SS-180817	1,2,3,4,7,8-HxCDF	0.90	0.23	pg/L
PDI-RB-SS-180817	2,3,4,6,7,8-HxCDF	0.26	0.18	pg/L
PDI-RB-SS-180817	2,3,7,8-TCDD	1.5	0.19	pg/L
PDI-RB-SS-180817	OCDD	9.6	0.15	pg/L
PDI-RB-SS-180817	OCDF	2.4	0.15	pg/L

The NFG guidance stipulates that a conservative approach should be taken with regards to qualification of PCDD/PCDFs due to the toxicity of these compounds and the reporting of false negative results should be avoided.

Therefore, in order to avoid the reporting of false negative results, professional judgment was used to qualify the data in the following manner. As allowed in the NFG, a blank action limit (BAL) was determined as 5 times the blank result:

- When the sample results were < the blank result, the sample result was qualified as nondetect (U) at the sample result.
- When the sample result was $\geq$ the blank result and $\leq$ the BAL, the sample result was qualified as estimated and potentially biased high (J+).
- When the sample result was > the BAL, sample result was not qualified.

Qualified sample results are summarized in Table 1.

MS/MSD Results

MS/MSD analyses were not performed on a sample in this data set. No data validation actions were taken on this basis.

OPR Results

The OPR %Rs and/or RPDs were reviewed for conformance with the method QC acceptance criteria

The laboratory control sample was greater than the QC limit for 1,2,3,6,7,8-HxCDF. Since the associated samples were non-detection, no qualification was added to the sample results.

Field Duplicate Results

Field duplicate RPDs were reviewed for conformance with the AECOM QC acceptance criteria of ≤ 50% [if one or both results were greater than five times the quantitation limit (QL)] for solid matrices and ≤ 30% [if one or both results were greater than five times the QL] for aqueous matrices. All method QC acceptance criteria were met.

Labeled Compound and Clean-up Standard Recoveries

The labeled compounds and labeled clean-up standard %Rs were reviewed for conformance with the QC acceptance criteria.

Nonconformances are summarized in Attachment A in Table A-1 and Table A-2. Samples were qualified as follows:

Actions: (Based on NFG 2016)

Criteria[1]		Actions[2]	
		Detected	Nondetected
%R > Upper Acceptance Limit		J	UJ
%R >10% but < Lower Acceptance Limit		J	UJ
%R <10%		See below	
<10% and S/N >10:1		J	R
<10% and S/N <10:1		R	R
Ion abundance ratio criteria not met	Calibration compliant	J	UJ
	Calibration non-compliant	J	R
Clean-up Standard Recovery < Lower Acceptance Limit		J	UJ

[1]See Table 7 in method 1613B for acceptance criteria

[2]The dioxin method is performed using isotope dilution technique; therefore, professional judgment was applied and bias codes were not included in data qualification.

Qualified sample results are summarized in Table 1.

Sample Results/Reporting Issues

All sample results detected at concentrations less than the lowest calibration standard but greater than the EDL are qualified by the laboratory as estimated (J). This “J” qualifier is retained during data validation.

PFK Lock Mass

The laboratory confirmed that a lock mass is monitored for each instrument descriptor.

Compound Identification

The data were reviewed to ensure that:

- the retention time, relative retention time, ion abundance ratios, SIM ion co-maximization, and S/N method acceptance criteria were met for compound identification; and
- the quantitative determination of PCDFs were not affected by the presence of polychlorinated diphenyl ether (PCDPE) interferences detected above the 2.5:1 S/N ratio limit.

All QC acceptance criteria were met with the following exceptions. Sample results which don't meet all of the method stipulated qualitative identification criteria are considered to be Estimated Maximum Possible Concentrations (EMPCs). Details concerning sample results in this data set which did not meet these identification criteria are noted below along with any data qualifications, as applicable.

The laboratory qualified all EMPC sample results with a "q" laboratory qualifier to indicate that the ion ratio criterion was not met. All ion ratios were verified and affected sample results which did not meet the ion ratio criteria were qualified as estimated and tentatively identified (JN). Qualified sample results are shown in Table 1.

It should be noted that the "JN" qualifier was retained rather than replacement with the conventional overall "J" qualifier in instances where sample results were qualified for multiple quality control nonconformances.

Quantitation

Sample results detected at concentrations greater than the highest calibration standard, qualified by the laboratory with an “E”, require secondary dilutions in order to bring the concentrations down within the linear range of calibration, per Method 1613B. This was not done by the laboratory.

It should be noted that according to Section 12.1.7 of the laboratory’s SOP, unless the affected peak saturates the instrument detector, secondary dilutions are not performed. Furthermore, *“Historic data indicates that for the isotope dilution method, dilution and re-injection will not produce significantly different results from those reported with the “E” qualifier.”*

Despite the laboratory’s SOP, NFG guidance stipulates that if a sample is not properly diluted to bring the results within the linear range of calibration, then the results are qualified “J”.

Qualified sample results are summarized in Table 1.

Chromatographic Interference

Samples exhibiting elevated background noise or matrix interference resulting in elevation of EDLs are qualified with a “G” by the laboratory. Professional judgement was used to qualify affected results “J”.

Qualified sample results are summarized in Table 1.

Second Column Confirmation (2,3,7,8-TCDF)

The sample data were reviewed to ensure that results for 2,3,7,8-TCDF when analyzed on a DB-5 (or equivalent) column were confirmed on a second column (i.e., DB-225 or equivalent) when isomer specificity is not achieved. All sample results requiring confirmation were confirmed and results were reported from the confirmation column.

It should be noted that according to Section 11.3.5 of the laboratory's SOP, *"Any sample which 2,3,7,8-TCDF is identified above the lower calibration limit must be confirmed on a DB-225 column, SP-2331, or equivalent GC column."* This suggests that 2,3,7,8-TCDF results detected below the lower calibration limit (i.e., "J" values) are not confirmed on a secondary column by the laboratory. Professional judgment was used to take no action in instances where 2,3,7,8-TCDF was detected as "J" values on the primary column (i.e., DB-5).

Percent Solids Content

The percent solids data were reviewed since the amount of moisture in a solid sample may have an impact on data representativeness. Due to the extremely low solubility of dioxins and furans in water, these analytes should be contained in the solid phase. Consequently, the NFG guidance does not stipulate a percent solids criterion. If applicable, EPA Regional guidance is used when assessing percent solids content. In the absence of EPA Regional guidance, AECOM uses 30% solids (from the NFG semivolatile guidance) as a benchmark to evaluate the percent solids content and professional judgment is used to determine the necessity to qualify data. Qualification on this basis was not required.

Verification of calculations was performed on a subset of the data as deemed appropriate. No discrepancies were noted.

Dilutions

Sample ID	Compound	Dilution Factor
PDI-SC-S109-0TO2	All results	20
PDI-SC-S109-10TO11.3	All results	20
PDI-SC-S109-4TO6	All results	20

QUALIFICATION ACTIONS

Sample results qualified as a result of validation actions are summarized in Table 1. All actions are described above.

ATTACHMENTS

Attachment A: Nonconformance Summary Tables

Attachment B: Qualifier Codes and Explanations

Attachment C: Reason Codes and Explanations

Table 1 - Data Validation Summary of Qualified Data

Sample ID	Matrix	Compound	Result	RDL	EDL	Units	Validation Qualifiers	Validation Reason
PDI-RB-SS-180816-1110	WQ	1,2,3,4,6,7,8-HpCDD	5.6	0.19	0.19	pg/L	J+	bl
PDI-RB-SS-180816-1110	WQ	1,2,3,4,6,7,8-HpCDF		1.2	0.31	pg/L	U	bl
PDI-RB-SS-180816-1110	WQ	1,2,3,4,7,8,9-HpCDF		0.92	0.35	pg/L	U	bl
PDI-RB-SS-180816-1110	WQ	1,2,3,4,7,8-HxCDD	1.4	0.23	0.23	pg/L	J+	bl
PDI-RB-SS-180816-1110	WQ	1,2,3,6,7,8-HxCDD		0.30	0.21	pg/L	U	bl
PDI-RB-SS-180816-1110	WQ	1,2,3,7,8,9-HxCDF		1.9	0.14	pg/L	U	bl
PDI-RB-SS-180816-1110	WQ	2,3,7,8-TCDD	2.1	0.16	0.16	pg/L	JN	k
PDI-RB-SS-180816-1110	WQ	2,3,7,8-TCDF		0.81	0.091	pg/L	U	bl
PDI-RB-SS-180816-1110	WQ	OCDD	110	0.25	0.25	pg/L	J+	bl
PDI-RB-SS-180816-1110	WQ	OCDF	6.1	0.15	0.15	pg/L	J+	bl
PDI-RB-SS-180817	WQ	1,2,3,4,6,7,8-HpCDD		1.2	0.11	pg/L	U	bl
PDI-RB-SS-180817	WQ	1,2,3,4,6,7,8-HpCDF	1.4	0.15	0.15	pg/L	J+	bl
PDI-RB-SS-180817	WQ	1,2,3,4,7,8,9-HpCDF		3.2	0.19	pg/L	U	bl
PDI-RB-SS-180817	WQ	1,2,3,4,7,8-HxCDD		1.2	0.13	pg/L	U	bl
PDI-RB-SS-180817	WQ	1,2,3,4,7,8-HxCDF	0.90	0.23	0.23	pg/L	J+	bl
PDI-RB-SS-180817	WQ	1,2,3,6,7,8-HxCDD		0.41	0.13	pg/L	U	bl
PDI-RB-SS-180817	WQ	1,2,3,6,7,8-HxCDF		0.64	0.23	pg/L	U	bl
PDI-RB-SS-180817	WQ	1,2,3,7,8,9-HxCDD		0.42	0.12	pg/L	U	bl
PDI-RB-SS-180817	WQ	1,2,3,7,8,9-HxCDF		9.4	0.17	pg/L	U	bl
PDI-RB-SS-180817	WQ	1,2,3,7,8-PeCDF		1.5	0.21	pg/L	U	bl
PDI-RB-SS-180817	WQ	2,3,4,6,7,8-HxCDF	0.26	0.18	0.18	pg/L	JN	k
PDI-RB-SS-180817	WQ	2,3,7,8-TCDD	1.5	0.19	0.19	pg/L	JN	k
PDI-RB-SS-180817	WQ	2,3,7,8-TCDF		0.28	0.093	pg/L	U	bl
PDI-RB-SS-180817	WQ	OCDD	9.6	0.15	0.15	pg/L	J+	bl
PDI-RB-SS-180817	WQ	OCDF	2.4	0.15	0.15	pg/L	J+	bl
PDI-SC-S053-0TO2	SE	2,3,7,8-TCDD	0.00015	0.000040	0.000040	ug/kg	JN	k
PDI-SC-S053-0TO2	SE	1,2,3,4,7,8,9-HpCDF	0.0017	0.00028	0.00028	ug/kg	J+	bl
PDI-SC-S053-0TO2	SE	1,2,3,4,7,8-HxCDD	0.00079	0.000050	0.000050	ug/kg	J+	bl
PDI-SC-S053-0TO2	SE	1,2,3,7,8,9-HxCDF	0.00092	0.000053	0.000053	ug/kg	J+	bl
PDI-SC-S053-10TO12.4	SE	1,2,3,4,6,7,8-HpCDF	0.0016	0.00058	0.00058	ug/kg	J	lc
PDI-SC-S053-10TO12.4	SE	1,2,3,4,7,8-HxCDD		0.00038	0.00038	ug/kg	UJ	lc
PDI-SC-S053-10TO12.4	SE	OCDF	0.0038	0.0014	0.0014	ug/kg	J	lc
PDI-SC-S053-10TO12.4	SE	1,2,3,4,7,8,9-HpCDF	0.0012	0.00061	0.00061	ug/kg	JN	bl,k
PDI-SC-S053-10TO12.4	SE	1,2,3,7,8,9-HxCDF	0.0017	0.00022	0.00022	ug/kg	J+	bl
PDI-SC-S053-10TO12.4	SE	OCDD	0.050	0.0012	0.0012	ug/kg	J	lc
PDI-SC-S053-2TO4	SE	2,3,7,8-TCDD	0.00059	0.000049	0.000049	ug/kg	JN	k
PDI-SC-S053-2TO4	SE	1,2,3,4,7,8-HxCDD	0.0019	0.00015	0.00015	ug/kg	J+	bl
PDI-SC-S053-2TO4	SE	1,2,3,7,8,9-HxCDF	0.0025	0.00036	0.00036	ug/kg	J+	bl

Sample ID	Matrix	Compound	Result	RDL	EDL	Units	Validation Qualifiers	Validation Reason
PDI-SC-S053-2TO4	SE	OCDD	3.6	0.0014	0.0014	ug/kg	J	q
PDI-SC-S053-4TO6	SE	1,2,3,7,8,9-HxCDF	0.0011	0.00036	0.00036	ug/kg	J+	bl
PDI-SC-S053-6TO8	SE	1,2,3,4,6,7,8-HpCDF	0.0029	0.000070	0.000070	ug/kg	J	lc
PDI-SC-S053-6TO8	SE	1,2,3,4,7,8,9-HpCDF	0.00057	0.00011	0.00011	ug/kg	J+	bl,lc
PDI-SC-S053-6TO8	SE	1,2,3,4,6,7,8-HpCDD	0.0032	0.000073	0.000073	ug/kg	J	lc
PDI-SC-S053-6TO8	SE	1,2,3,4,7,8-HxCDF	0.00030	0.000064	0.000064	ug/kg	JN	k
PDI-SC-S053-6TO8	SE	1,2,3,4,7,8-HxCDD		0.00012	0.000042	ug/kg	UJ	bl,lc
PDI-SC-S053-6TO8	SE	OCDF	0.0026	0.00010	0.00010	ug/kg	J	lc
PDI-SC-S053-6TO8	SE	1,2,3,7,8,9-HxCDF	0.0011	0.000043	0.000043	ug/kg	J+	bl
PDI-SC-S053-6TO8	SE	1,2,3,7,8-PeCDF	0.00031	0.000044	0.000044	ug/kg	J+	bl
PDI-SC-S053-6TO8	SE	2,3,7,8-TCDF		0.00035	0.000020	ug/kg	U	bl
PDI-SC-S053-6TO8	SE	OCDD	0.036	0.00012	0.00012	ug/kg	J	lc
PDI-SC-S053-8TO10	SE	1,2,3,4,6,7,8-HpCDF	0.00014	0.000015	0.000015	ug/kg	JN	bl,k
PDI-SC-S053-8TO10	SE	1,2,3,4,7,8,9-HpCDF		0.00029	0.000017	ug/kg	U	bl
PDI-SC-S053-8TO10	SE	1,2,3,4,7,8-HxCDD		0.00015	0.000022	ug/kg	U	bl
PDI-SC-S053-8TO10	SE	2,3,4,6,7,8-HxCDF	0.000039	0.000017	0.000017	ug/kg	JN	k
PDI-SC-S053-8TO10	SE	1,2,3,7,8,9-HxCDF		0.00085	0.000016	ug/kg	U	bl
PDI-SC-S053-8TO10	SE	1,2,3,7,8-PeCDF	0.00016	0.000016	0.000016	ug/kg	J+	bl
PDI-SC-S053-8TO10	SE	2,3,7,8-TCDF		0.00023	0.000012	ug/kg	U	bl
PDI-SC-S108-0TO1.9	SE	2,3,7,8-TCDD	0.00056	0.000051	0.000051	ug/kg	JN	k
PDI-SC-S108-0TO1.9	SE	1,2,3,7,8,9-HxCDF	0.00057	0.00044	0.00044	ug/kg	JN	bl,k
PDI-SC-S108-0TO1.9	SE	OCDD	4.2	0.00094	0.00094	ug/kg	J	q
PDI-SC-S108-1.9TO3	SE	OCDD	7.0	0.0020	0.0020	ug/kg	J	q
PDI-SC-S108-3TO4.7	SE	1,2,3,7,8,9-HxCDF	0.00085	0.00083	0.00083	ug/kg	J+	bl
PDI-SC-S108-3TO4.7	SE	OCDD	6.0	0.0015	0.0015	ug/kg	J	q
PDI-SC-S108-4.7TO6.7	SE	2,3,7,8-TCDD	0.00051	0.000047	0.000047	ug/kg	JN	k
PDI-SC-S108-4.7TO6.7	SE	1,2,3,7,8,9-HxCDF	0.0010	0.00086	0.00086	ug/kg	JN	bl,k
PDI-SC-S108-4.7TO6.7	SE	OCDD	5.6	0.0012	0.0012	ug/kg	J	q
PDI-SC-S108-6.7TO8.8	SE	1,2,3,4,7,8,9-HpCDF	0.00031	0.000087	0.000087	ug/kg	J+	bl
PDI-SC-S108-6.7TO8.8	SE	1,2,3,4,7,8-HxCDD	0.00021	0.000027	0.000027	ug/kg	J+	bl
PDI-SC-S108-6.7TO8.8	SE	1,2,3,7,8,9-HxCDF	0.00037	0.000036	0.000036	ug/kg	J+	bl
PDI-SC-S108-6.7TO8.8	SE	2,3,4,7,8-PeCDF	0.00024	0.000031	0.000031	ug/kg	J+	bl
PDI-SC-S108-6.7TO8.8	SE	2,3,7,8-TCDF		0.00057	0.000024	ug/kg	U	bl
PDI-SC-S108-6.7TO8.8D	SE	1,2,3,4,7,8,9-HpCDF	0.00030	0.000094	0.000094	ug/kg	J+	bl
PDI-SC-S108-6.7TO8.8D	SE	1,2,3,4,7,8-HxCDD	0.00021	0.000023	0.000023	ug/kg	J+	bl
PDI-SC-S108-6.7TO8.8D	SE	1,2,3,7,8,9-HxCDF		0.00032	0.000043	ug/kg	U	bl
PDI-SC-S108-6.7TO8.8D	SE	1,2,3,7,8-PeCDF	0.00020	0.000029	0.000029	ug/kg	J+	bl
PDI-SC-S108-6.7TO8.8D	SE	2,3,4,7,8-PeCDF		0.00012	0.000030	ug/kg	U	bl
PDI-SC-S108-6.7TO8.8D	SE	2,3,7,8-TCDF		0.00044	0.000015	ug/kg	U	bl
PDI-SC-S108-6.7TO8.8D	SE	1,2,3,7,8-PeCDD	0.000039	0.000026	0.000026	ug/kg	JN	k

Sample ID	Matrix	Compound	Result	RDL	EDL	Units	Validation Qualifiers	Validation Reason
PDI-SC-S108-8.8TO9.8	SE	1,2,3,4,6,7,8-HpCDF	0.0039	0.00024	0.00024	ug/kg	J	i
PDI-SC-S108-8.8TO9.8	SE	1,2,3,4,7,8,9-HpCDF		0.00037	0.00026	ug/kg	U	bl
PDI-SC-S108-8.8TO9.8	SE	1,2,3,4,7,8-HxCDD	0.00031	0.00014	0.00014	ug/kg	J+	bl
PDI-SC-S108-8.8TO9.8	SE	1,2,3,7,8,9-HxCDF		0.00066	0.000098	ug/kg	U	bl
PDI-SC-S108-8.8TO9.8	SE	1,2,3,7,8-PeCDF	0.00017	0.000082	0.000082	ug/kg	JN	bl,k
PDI-SC-S108-8.8TO9.8	SE	1,2,3,7,8,9-HxCDD	0.00026	0.00013	0.00013	ug/kg	JN	k
PDI-SC-S108-8.8TO9.8	SE	2,3,7,8-TCDF		0.00022	0.000052	ug/kg	U	bl
PDI-SC-S108-8.8TO9.8	SE	1,2,3,6,7,8-HxCDF	0.00042	0.00011	0.00011	ug/kg	JN	k
PDI-SC-S108-8.8TO9.8	SE	1,2,3,6,7,8-HxCDD	0.00021	0.00015	0.00015	ug/kg	JN	k
PDI-SC-S108-8.8TO9.8	SE	1,2,3,4,7,8-HxCDF	0.00027	0.00012	0.00012	ug/kg	JN	k
PDI-SC-S109-0TO2	SE	1,2,3,7,8-PeCDD	0.00055	0.00027	0.00027	ug/kg	JN	k
PDI-SC-S109-0TO2	SE	1,2,3,4,7,8-HxCDD	0.00058	0.00022	0.00022	ug/kg	JN	bl,k
PDI-SC-S109-10TO11.3	SE	1,2,3,4,6,7,8-HpCDD	0.068	0.0049	0.0049	ug/kg	J	lc
PDI-SC-S109-10TO11.3	SE	1,2,3,4,6,7,8-HpCDF	0.032	0.0026	0.0026	ug/kg	J	lc
PDI-SC-S109-10TO11.3	SE	1,2,3,4,7,8,9-HpCDF	0.043	0.0050	0.0050	ug/kg	J	lc,i
PDI-SC-S109-10TO11.3	SE	1,2,3,4,7,8-HxCDF	0.0018	0.00092	0.00092	ug/kg	J	lc
PDI-SC-S109-10TO11.3	SE	1,2,3,4,7,8-HxCDD		0.0012	0.0012	ug/kg	UJ	lc
PDI-SC-S109-10TO11.3	SE	1,2,3,6,7,8-HxCDD		0.0012	0.0012	ug/kg	UJ	lc
PDI-SC-S109-10TO11.3	SE	1,2,3,7,8,9-HxCDD	0.0056	0.0011	0.0011	ug/kg	JN	k
PDI-SC-S109-10TO11.3	SE	2,3,4,6,7,8-HxCDF		0.0013	0.0013	ug/kg	UJ	lc
PDI-SC-S109-10TO11.3	SE	1,2,3,6,7,8-HxCDF	0.0022	0.00081	0.00081	ug/kg	J	lc
PDI-SC-S109-10TO11.3	SE	1,2,3,7,8,9-HxCDF	0.0064	0.00061	0.00061	ug/kg	J	lc
PDI-SC-S109-10TO11.3	SE	2,3,7,8-TCDF	0.0014	0.00032	0.00032	ug/kg	JN	k
PDI-SC-S109-10TO11.3	SE	OCDD	1.3	0.017	0.017	ug/kg	J	lc,i
PDI-SC-S109-10TO11.3	SE	OCDF	0.092	0.012	0.012	ug/kg	J	lc,i
PDI-SC-S109-2TO4	SE	1,2,3,4,7,8,9-HpCDF	0.00027	0.00011	0.00011	ug/kg	J+	bl
PDI-SC-S109-2TO4	SE	1,2,3,4,7,8-HxCDD	0.00026	0.000051	0.000051	ug/kg	JN	bl,k
PDI-SC-S109-2TO4	SE	1,2,3,7,8,9-HxCDF	0.00016	0.000041	0.000041	ug/kg	JN	bl,k
PDI-SC-S109-2TO4	SE	1,2,3,6,7,8-HxCDD	0.00085	0.000052	0.000052	ug/kg	JN	k
PDI-SC-S109-2TO4	SE	2,3,4,6,7,8-HxCDF	0.000084	0.000042	0.000042	ug/kg	JN	k
PDI-SC-S109-2TO4	SE	2,3,7,8-TCDF	0.00059	0.000055	0.000055	ug/kg	J+	bl
PDI-SC-S109-4TO6	SE	1,2,3,7,8,9-HxCDD	0.00053	0.000094	0.000094	ug/kg	JN	bl,k
PDI-SC-S109-4TO6	SE	2,3,7,8-TCDF	0.00041	0.000068	0.000068	ug/kg	J+	bl
PDI-SC-S109-4TO6	SE	1,2,3,6,7,8-HxCDF	0.00033	0.00012	0.00012	ug/kg	JN	k
PDI-SC-S109-4TO6	SE	2,3,4,6,7,8-HxCDF	0.00013	0.000085	0.000085	ug/kg	JN	k
PDI-SC-S109-4TO6	SE	1,2,3,4,7,8-HxCDF	0.00095	0.00012	0.00012	ug/kg	JN	k
PDI-SC-S109-6TO8	SE	1,2,3,4,7,8,9-HpCDF		0.00081	0.000053	ug/kg	U	bl
PDI-SC-S109-6TO8	SE	1,2,3,4,7,8-HxCDD		0.00016	0.000020	ug/kg	U	bl
PDI-SC-S109-6TO8	SE	1,2,3,7,8,9-HxCDD	0.00028	0.000018	0.000018	ug/kg	JN	k
PDI-SC-S109-6TO8	SE	1,2,3,7,8-PeCDD	0.000055	0.000022	0.000022	ug/kg	JN	k

Sample ID	Matrix	Compound	Result	RDL	EDL	Units	Validation Qualifiers	Validation Reason
PDI-SC-S109-6TO8	SE	1,2,3,6,7,8-HxCDF	0.00030	0.000028	0.000028	ug/kg	J+	bl
PDI-SC-S109-6TO8	SE	1,2,3,7,8,9-HxCDF		0.00062	0.000019	ug/kg	U	bl
PDI-SC-S109-6TO8	SE	1,2,3,7,8-PeCDF	0.00047	0.000025	0.000025	ug/kg	J+	bl
PDI-SC-S109-6TO8	SE	2,3,4,6,7,8-HxCDF	0.00011	0.000023	0.000023	ug/kg	J+	bl
PDI-SC-S109-6TO8	SE	2,3,4,7,8-PeCDF	0.00022	0.000027	0.000027	ug/kg	J+	bl
PDI-SC-S109-8TO10	SE	1,2,3,4,7,8,9-HpCDF	0.0023	0.0016	0.0016	ug/kg	J+	bl
PDI-SC-S109-8TO10	SE	1,2,3,4,7,8-HxCDD	0.00045	0.000064	0.000064	ug/kg	J+	bl
PDI-SC-S109-8TO10	SE	2,3,7,8-TCDD	0.00012	0.000030	0.000030	ug/kg	JN	k
PDI-SC-S109-8TO10	SE	1,2,3,7,8,9-HxCDF	0.0011	0.00023	0.00023	ug/kg	J+	bl
PDI-SC-S109-8TO10	SE	1,2,3,7,8-PeCDF	0.00040	0.00021	0.00021	ug/kg	JN	bl,k
PDI-SC-S109-8TO10	SE	2,3,7,8-TCDF	0.00032	0.00020	0.00020	ug/kg	JN	k
PDI-SC-S113(A)-0TO2.2	SE	2,3,7,8-TCDD	0.00038	0.000028	0.000028	ug/kg	JN	k
PDI-SC-S113(A)-2.2TO4.6	SE	2,3,7,8-TCDD	0.000071	0.000010	0.000010	ug/kg	JN	k
PDI-SC-S113(A)-2.2TO4.6	SE	1,2,3,4,7,8-HxCDD	0.00018	0.0000099	0.0000099	ug/kg	J+	bl
PDI-SC-S113(A)-2.2TO4.6	SE	2,3,7,8-TCDF	0.00091	0.000047	0.000047	ug/kg	J+	bl
PDI-SC-S113(A)-2.2TO4.6D	SE	1,2,3,4,7,8,9-HpCDF	0.0011	0.000034	0.000034	ug/kg	J+	bl
PDI-SC-S113(A)-2.2TO4.6D	SE	1,2,3,4,7,8-HxCDD	0.00018	0.000019	0.000019	ug/kg	J+	bl
PDI-SC-S113(A)-2.2TO4.6D	SE	1,2,3,7,8,9-HxCDF		0.00082	0.000038	ug/kg	U	bl
PDI-SC-S113(A)-2.2TO4.6D	SE	1,2,3,7,8-PeCDD	0.00010	0.000018	0.000018	ug/kg	JN	k
PDI-SC-S113(B)-10TO12	SE	1,2,3,4,7,8-HxCDD	0.00041	0.000033	0.000033	ug/kg	J+	bl
PDI-SC-S113(B)-10TO12	SE	2,3,7,8-TCDD	0.000091	0.0000087	0.0000087	ug/kg	JN	k
PDI-SC-S113(B)-12TO13.8	SE	1,2,3,4,7,8-HxCDD	0.00040	0.000026	0.000026	ug/kg	J+	bl
PDI-SC-S113(B)-12TO13.8	SE	2,3,7,8-TCDD	0.000094	0.000011	0.000011	ug/kg	JN	k
PDI-SC-S113(B)-12TO13.8	SE	OCDF		0.00013	0.000015	ug/kg	U	bl
PDI-SC-S113(B)-7.4TO10	SE	1,2,3,4,7,8-HxCDD	0.00048	0.000039	0.000039	ug/kg	J+	bl
PDI-SC-S113(B)-7.4TO10	SE	2,3,7,8-TCDD	0.00012	0.000015	0.000015	ug/kg	JN	k
PDI-SC-S131-0TO2	SE	1,2,3,4,7,8,9-HpCDF	0.0027	0.00043	0.00043	ug/kg	J+	bl
PDI-SC-S131-0TO2	SE	1,2,3,6,7,8-HxCDF	0.0017	0.00024	0.00024	ug/kg	JN	k
PDI-SC-S131-0TO2	SE	2,3,7,8-TCDD	0.00031	0.000085	0.000085	ug/kg	JN	k
PDI-SC-S131-0TO2	SE	1,2,3,7,8,9-HxCDF	0.0013	0.00017	0.00017	ug/kg	J+	bl
PDI-SC-S131-0TO2	SE	2,3,7,8-TCDF	0.00084	0.00025	0.00025	ug/kg	JN	k
PDI-SC-S131-2TO4	SE	1,2,3,7,8,9-HxCDF	0.0014	0.00045	0.00045	ug/kg	J+	bl
PDI-SC-S131-2TO4	SE	OCDD	5.2	0.0012	0.0012	ug/kg	J	q
PDI-SC-S131-4TO6	SE	1,2,3,4,6,7,8-HpCDD	1.4	0.0048	0.0048	ug/kg	J	d
PDI-SC-S131-4TO6	SE	1,2,3,7,8,9-HxCDF	0.0021	0.00076	0.00076	ug/kg	J+	bl
PDI-SC-S131-4TO6	SE	OCDD	12	0.0043	0.0043	ug/kg	J	q
PDI-SC-S131-6TO8	SE	1,2,3,7,8,9-HxCDF	0.0031	0.0023	0.0023	ug/kg	J+	bl
PDI-SC-S157-0TO2	SE	1,2,3,4,7,8,9-HpCDF	0.0012	0.00060	0.00060	ug/kg	JN	bl,k
PDI-SC-S157-0TO2	SE	1,2,3,4,7,8-HxCDD	0.00055	0.00051	0.00051	ug/kg	JN	bl,k
PDI-SC-S157-0TO2	SE	1,2,3,7,8,9-HxCDF	0.0016	0.00023	0.00023	ug/kg	JN	bl,k

Sample ID	Matrix	Compound	Result	RDL	EDL	Units	Validation Qualifiers	Validation Reason
PDI-SC-S157-0TO2	SE	2,3,7,8-TCDF	0.0014	0.00012	0.00012	ug/kg	J+	bl
PDI-SC-S157-0TO2	SE	2,3,7,8-TCDD	0.00023	0.00016	0.00016	ug/kg	JN	k
PDI-SC-S157-0TO2	SE	1,2,3,7,8,9-HxCDD	0.0014	0.00046	0.00046	ug/kg	JN	k
PDI-SC-S157-10TO12.4	SE	1,2,3,4,7,8,9-HpCDF		0.00031	0.000069	ug/kg	U	bl
PDI-SC-S157-10TO12.4	SE	1,2,3,7,8,9-HxCDF		0.00075	0.000050	ug/kg	U	bl
PDI-SC-S157-10TO12.4	SE	1,2,3,7,8-PeCDF	0.00016	0.000062	0.000062	ug/kg	JN	bl,k
PDI-SC-S157-12.4TO14	SE	1,2,3,4,7,8,9-HpCDF		0.00027	0.00021	ug/kg	U	bl
PDI-SC-S157-12.4TO14	SE	1,2,3,7,8,9-HxCDF		0.00088	0.000051	ug/kg	U	bl
PDI-SC-S157-12.4TO14	SE	1,2,3,7,8-PeCDF	0.00015	0.000060	0.000060	ug/kg	J+	bl
PDI-SC-S157-12.4TO14	SE	2,3,7,8-TCDF		0.00017	0.000046	ug/kg	U	bl
PDI-SC-S157-12.4TO14	SE	1,2,3,4,6,7,8-HpCDD	0.0013	0.00027	0.00027	ug/kg	JN	k
PDI-SC-S157-12.4TO14	SE	1,2,3,4,6,7,8-HpCDF		0.00017	0.00017	ug/kg	UJ	lc
PDI-SC-S157-14TO15.9	SE	1,2,3,7,8,9-HxCDF		0.00043	0.000034	ug/kg	U	bl
PDI-SC-S157-14TO15.9	SE	1,2,3,7,8,9-HxCDD	0.00025	0.00010	0.00010	ug/kg	JN	k
PDI-SC-S157-14TO15.9	SE	1,2,3,4,6,7,8-HpCDD	0.0012	0.00024	0.00024	ug/kg	JN	k
PDI-SC-S157-14TO15.9	SE	1,2,3,6,7,8-HxCDF	0.00010	0.000044	0.000044	ug/kg	JN	k
PDI-SC-S157-14TO15.9	SE	1,2,3,4,6,7,8-HpCDF		0.00011	0.00011	ug/kg	UJ	lc
PDI-SC-S157-2TO3.7	SE	1,2,3,4,7,8,9-HpCDF	0.00070	0.00033	0.00033	ug/kg	JN	bl,k
PDI-SC-S157-2TO3.7	SE	1,2,3,4,7,8-HxCDD	0.00036	0.00017	0.00017	ug/kg	J+	bl
PDI-SC-S157-2TO3.7	SE	1,2,3,7,8,9-HxCDF		0.00081	0.00011	ug/kg	U	bl
PDI-SC-S157-2TO3.7	SE	2,3,7,8-TCDD	0.00012	0.000061	0.000061	ug/kg	JN	k
PDI-SC-S157-2TO3.7	SE	1,2,3,7,8,9-HxCDD	0.00069	0.00015	0.00015	ug/kg	JN	k
PDI-SC-S157-2TO3.7	SE	1,2,3,6,7,8-HxCDF	0.0016	0.00013	0.00013	ug/kg	JN	k
PDI-SC-S157-2TO3.7	SE	2,3,4,6,7,8-HxCDF	0.00036	0.00010	0.00010	ug/kg	JN	k
PDI-SC-S157-2TO3.7	SE	2,3,7,8-TCDF	0.0019	0.000081	0.000081	ug/kg	J+	bl
PDI-SC-S157-3.7TO6	SE	1,2,3,4,6,7,8-HpCDF	0.00045	0.00016	0.00016	ug/kg	J+	bl,lc
PDI-SC-S157-3.7TO6	SE	1,2,3,4,7,8,9-HpCDF	0.00045	0.00015	0.00015	ug/kg	JN	bl,k
PDI-SC-S157-3.7TO6	SE	1,2,3,7,8,9-HxCDF	0.0016	0.000072	0.000072	ug/kg	J+	bl
PDI-SC-S157-3.7TO6	SE	1,2,3,4,6,7,8-HpCDD	0.0025	0.00041	0.00041	ug/kg	JN	k
PDI-SC-S157-3.7TO6	SE	1,2,3,7,8,9-HxCDD	0.00047	0.00016	0.00016	ug/kg	JN	k
PDI-SC-S157-3.7TO6	SE	OCDF	0.00090	0.00036	0.00036	ug/kg	J	lc
PDI-SC-S157-3.7TO6	SE	1,2,3,7,8-PeCDF	0.00030	0.000081	0.000081	ug/kg	J+	bl
PDI-SC-S157-3.7TO6	SE	2,3,7,8-TCDF		0.000093	0.000037	ug/kg	U	bl
PDI-SC-S157-3.7TO6	SE	OCDD	0.048	0.00075	0.00075	ug/kg	J	lc
PDI-SC-S157-6TO8	SE	1,2,3,4,6,7,8-HpCDF	0.00023	0.00017	0.00017	ug/kg	JN	bl,lc,k
PDI-SC-S157-6TO8	SE	1,2,3,4,7,8,9-HpCDF	0.00068	0.00018	0.00018	ug/kg	J+	bl
PDI-SC-S157-6TO8	SE	1,2,3,7,8,9-HxCDF	0.0017	0.000063	0.000063	ug/kg	J+	bl
PDI-SC-S157-6TO8	SE	1,2,3,7,8,9-HxCDD	0.00031	0.00012	0.00012	ug/kg	JN	k
PDI-SC-S157-6TO8	SE	1,2,3,7,8-PeCDF	0.00020	0.000080	0.000080	ug/kg	JN	bl,k
PDI-SC-S157-6TO8	SE	1,2,3,6,7,8-HxCDF	0.00015	0.000079	0.000079	ug/kg	JN	k

Sample ID	Matrix	Compound	Result	RDL	EDL	Units	Validation Qualifiers	Validation Reason
PDI-SC-S157-6TO8	SE	2,3,7,8-TCDF		0.00022	0.000054	ug/kg	U	bl
PDI-SC-S157-8TO10	SE	1,2,3,4,6,7,8-HpCDF	0.00033	0.00011	0.00011	ug/kg	J+	bl,lc
PDI-SC-S157-8TO10	SE	1,2,3,4,7,8,9-HpCDF	0.00045	0.00013	0.00013	ug/kg	J+	bl
PDI-SC-S157-8TO10	SE	1,2,3,7,8,9-HxCDF	0.0012	0.000058	0.000058	ug/kg	J+	bl
PDI-SC-S157-8TO10	SE	1,2,3,7,8,9-HxCDD	0.00036	0.00013	0.00013	ug/kg	JN	k
PDI-SC-S157-8TO10	SE	1,2,3,4,6,7,8-HpCDD	0.0014	0.00019	0.00019	ug/kg	JN	k
PDI-SC-S157-8TO10	SE	2,3,7,8-TCDF		0.00016	0.000066	ug/kg	U	bl
PDI-SC-S157-8TO10	SE	OCDD	0.014	0.00033	0.00033	ug/kg	JN	k
PDI-SC-S232-0TO2	SE	1,2,3,7,8,9-HxCDF	0.0012	0.00063	0.00063	ug/kg	J+	bl
PDI-SC-S232-0TO2	SE	OCDD	5.8	0.0014	0.0014	ug/kg	J	q
PDI-SC-S232-2TO4	SE	1,2,3,4,7,8,9-HpCDF	0.0040	0.00079	0.00079	ug/kg	J+	bl
PDI-SC-S232-2TO4	SE	1,2,3,7,8,9-HxCDF		0.00084	0.00039	ug/kg	U	bl
PDI-SC-S232-4TO6.2	SE	2,3,7,8-TCDD	0.00012	0.000025	0.000025	ug/kg	JN	k
PDI-SC-S232-4TO6.2	SE	1,2,3,4,7,8,9-HpCDF	0.00096	0.00015	0.00015	ug/kg	J+	bl
PDI-SC-S232-4TO6.2	SE	1,2,3,4,7,8-HxCDD	0.00027	0.000032	0.000032	ug/kg	J+	bl
PDI-SC-S232-4TO6.2	SE	1,2,3,4,7,8-HxCDF	0.00052	0.00010	0.00010	ug/kg	J+	bl
PDI-SC-S232-4TO6.2	SE	1,2,3,7,8,9-HxCDF		0.00068	0.000072	ug/kg	U	bl
PDI-SC-S232-4TO6.2	SE	1,2,3,7,8-PeCDF	0.00022	0.000092	0.000092	ug/kg	J+	bl
PDI-SC-S232-4TO6.2	SE	2,3,4,6,7,8-HxCDF	0.00030	0.000079	0.000079	ug/kg	JN	k
PDI-SC-S256-0TO2	SE	1,2,3,4,6,7,8-HpCDF	0.015	0.00027	0.00027	ug/kg	JN	k
PDI-SC-S256-0TO2	SE	1,2,3,4,7,8,9-HpCDF	0.0013	0.00031	0.00031	ug/kg	J+	bl
PDI-SC-S256-0TO2	SE	1,2,3,7,8,9-HxCDF		0.00070	0.000098	ug/kg	U	bl
PDI-SC-S256-0TO2	SE	1,2,3,7,8-PeCDF	0.00029	0.00011	0.00011	ug/kg	J+	bl
PDI-SC-S256-2TO4	SE	1,2,3,4,7,8,9-HpCDF	0.0028	0.00073	0.00073	ug/kg	J+	bl
PDI-SC-S256-2TO4	SE	2,3,7,8-TCDD	0.00025	0.000033	0.000033	ug/kg	JN	k
PDI-SC-S256-2TO4	SE	1,2,3,7,8,9-HxCDF		0.00074	0.00019	ug/kg	U	bl
PDI-SC-S256-2TO4	SE	1,2,3,7,8-PeCDF	0.00058	0.00017	0.00017	ug/kg	JN	bl,k
PDI-SC-S256-2TO4D	SE	1,2,3,4,6,7,8-HpCDF	0.037	0.00056	0.00056	ug/kg	JN	k
PDI-SC-S256-2TO4D	SE	1,2,3,4,7,8,9-HpCDF	0.0029	0.00080	0.00080	ug/kg	J+	bl
PDI-SC-S256-2TO4D	SE	2,3,7,8-TCDD	0.00026	0.000030	0.000030	ug/kg	JN	k
PDI-SC-S256-2TO4D	SE	1,2,3,7,8,9-HxCDF		0.00067	0.00020	ug/kg	U	bl
PDI-SC-S256-4TO6	SE	1,2,3,4,6,7,8-HpCDF	0.035	0.00051	0.00051	ug/kg	JN	k
PDI-SC-S256-4TO6	SE	1,2,3,4,7,8,9-HpCDF	0.0027	0.00075	0.00075	ug/kg	J+	bl
PDI-SC-S256-4TO6	SE	2,3,7,8-TCDD	0.00028	0.000031	0.000031	ug/kg	JN	k
PDI-SC-S256-4TO6	SE	1,2,3,7,8,9-HxCDF		0.00070	0.00023	ug/kg	U	bl
PDI-SC-S256-6TO8.7	SE	1,2,3,4,7,8,9-HpCDF	0.0040	0.00094	0.00094	ug/kg	J+	bl
PDI-SC-S256-6TO8.7	SE	1,2,3,7,8,9-HxCDF		0.00070	0.00032	ug/kg	U	bl
PDI-SC-S256-6TO8.7	SE	1,2,3,7,8-PeCDF	0.00091	0.00049	0.00049	ug/kg	JN	k
PDI-SC-S256-8.7TO9.7	SE	1,2,3,4,7,8,9-HpCDF	0.0035	0.00073	0.00073	ug/kg	J+	bl
PDI-SC-S256-8.7TO9.7	SE	1,2,3,7,8,9-HxCDF		0.00081	0.00027	ug/kg	U	bl

Sample ID	Matrix	Compound	Result	RDL	EDL	Units	Validation Qualifiers	Validation Reason
PDI-SC-S256-9.7TO10.7	SE	1,2,3,7,8,9-HxCDF		0.00085	0.00038	ug/kg	U	bl
PDI-SC-S256-9.7TO10.7	SE	2,3,7,8-TCDD	0.00066	0.000048	0.000048	ug/kg	JN	k
PDI-SC-S256-9.7TO10.7	SE	OCDD	3.4	0.00097	0.00097	ug/kg	J	q
PDI-SC-S263-0TO2	SE	1,2,3,4,6,7,8-HpCDF	0.0026	0.000068	0.000068	ug/kg	JN	k
PDI-SC-S263-0TO2	SE	1,2,3,4,7,8,9-HpCDF		0.00056	0.00013	ug/kg	U	bl
PDI-SC-S263-0TO2	SE	1,2,3,4,7,8-HxCDD	0.00024	0.000037	0.000037	ug/kg	J+	bl
PDI-SC-S263-0TO2	SE	1,2,3,4,7,8-HxCDF	0.00028	0.000051	0.000051	ug/kg	JN	bl,k
PDI-SC-S263-0TO2	SE	1,2,3,6,7,8-HxCDF	0.00021	0.000046	0.000046	ug/kg	J+	bl
PDI-SC-S263-0TO2	SE	1,2,3,7,8,9-HxCDF		0.00055	0.000036	ug/kg	U	bl
PDI-SC-S263-0TO2	SE	1,2,3,7,8-PeCDF	0.00019	0.000025	0.000025	ug/kg	J+	bl
PDI-SC-S263-0TO2	SE	2,3,4,6,7,8-HxCDF	0.00010	0.000040	0.000040	ug/kg	JN	bl,k
PDI-SC-S263-0TO2	SE	2,3,4,7,8-PeCDF	0.00012	0.000026	0.000026	ug/kg	J+	bl
PDI-SC-S263-0TO2	SE	2,3,7,8-TCDF	0.00022	0.000016	0.000016	ug/kg	J+	bl
PDI-SC-S263-2TO3.8	SE	1,2,3,4,7,8,9-HpCDF	0.0014	0.000095	0.000095	ug/kg	J+	bl
PDI-SC-S263-2TO3.8	SE	1,2,3,4,7,8-HxCDD	0.00043	0.000047	0.000047	ug/kg	J+	bl
PDI-SC-S263-2TO3.8	SE	1,2,3,4,7,8-HxCDF	0.00057	0.000072	0.000072	ug/kg	J+	bl
PDI-SC-S263-2TO3.8	SE	1,2,3,7,8,9-HxCDF		0.00072	0.000049	ug/kg	U	bl
PDI-SC-S263-2TO3.8	SE	1,2,3,7,8-PeCDF	0.00021	0.000042	0.000042	ug/kg	J+	bl
PDI-SC-S263-2TO3.8	SE	2,3,4,7,8-PeCDF	0.00019	0.000043	0.000043	ug/kg	J+	bl
PDI-SC-S263-3.8TO5.9	SE	1,2,3,4,7,8,9-HpCDF	0.0013	0.00023	0.00023	ug/kg	J+	bl
PDI-SC-S263-3.8TO5.9	SE	1,2,3,4,7,8-HxCDD	0.00080	0.000072	0.000072	ug/kg	J+	bl
PDI-SC-S263-3.8TO5.9	SE	1,2,3,7,8,9-HxCDF		0.00074	0.000070	ug/kg	U	bl
PDI-SC-S263-3.8TO5.9	SE	1,2,3,7,8-PeCDF	0.00036	0.000087	0.000087	ug/kg	J+	bl
PDI-SC-S263-3.8TO5.9	SE	2,3,7,8-TCDD	0.00034	0.000025	0.000025	ug/kg	JN	k

Attachment A

Nonconformance Summary Tables

Table A-1 - Labeled Compound Recoveries

Sample ID	Labeled Compound	% Recovery	Lower Limit	Upper Limit
PDI-SC-S053-10TO12.4	13C-1,2,3,4,6,7,8-HpCDF	20	28	143
PDI-SC-S053-10TO12.4	13C-1,2,3,4,7,8-HxCDD	31	32	141
PDI-SC-S053-10TO12.4	13C-OCDD*	16	17	157
PDI-SC-S053-6TO8	13C-1,2,3,4,6,7,8-HpCDD	22	23	140
PDI-SC-S053-6TO8	13C-1,2,3,4,6,7,8-HpCDF	18	28	143
PDI-SC-S053-6TO8	13C-1,2,3,4,7,8,9-HpCDF	16	26	138
PDI-SC-S053-6TO8	13C-1,2,3,4,7,8-HxCDD	31	32	141
PDI-SC-S053-6TO8	13C-OCDD*	16	17	157
PDI-SC-S109-10TO11.3	13C-1,2,3,4,6,7,8-HpCDD	5	23	140
PDI-SC-S109-10TO11.3	13C-1,2,3,4,6,7,8-HpCDF	6	28	143
PDI-SC-S109-10TO11.3	13C-1,2,3,4,7,8,9-HpCDF	3	26	138
PDI-SC-S109-10TO11.3	13C-1,2,3,4,7,8-HxCDD	17	32	141
PDI-SC-S109-10TO11.3	13C-1,2,3,4,7,8-HxCDF	24	26	152
PDI-SC-S109-10TO11.3	13C-1,2,3,6,7,8-HxCDD	17	28	130
PDI-SC-S109-10TO11.3	13C-1,2,3,7,8,9-HxCDF	26	29	147
PDI-SC-S109-10TO11.3	13C-2,3,4,6,7,8-HxCDF	13	28	136
PDI-SC-S109-10TO11.3	13C-OCDD*	2	17	157
PDI-SC-S157-12.4TO14	13C-1,2,3,4,6,7,8-HpCDF	24	28	143
PDI-SC-S157-14TO15.9	13C-1,2,3,4,6,7,8-HpCDF	27	28	143
PDI-SC-S157-3.7TO6	13C-1,2,3,4,6,7,8-HpCDF	18	28	143
PDI-SC-S157-3.7TO6	13C-OCDD*	16	17	157
PDI-SC-S157-6TO8	13C-1,2,3,4,6,7,8-HpCDF	20	28	143
PDI-SC-S157-8TO10	13C-1,2,3,4,6,7,8-HpCDF	27	28	143

*The %R of 13C-OCDD is used to qualify both OCDD and OCDF

Table A-2 - Labeled Compound Ion Abundance Ratios

Sample ID	Labeled Compound	Ion Abundance Ratio	Lower Limit	Upper Limit
PDI-SC-S108-8.8TO9.8	13C-1,2,3,4,6,7,8-HpCDF	0.52	0.37	0.51
PDI-SC-S109-10TO11.3	13C-1,2,3,4,7,8,9-HpCDF	0.61	0.37	0.51
PDI-SC-S109-10TO11.3	13C-OCDD*	0.71	0.76	1.02

*The mass ion ratio of 13C-OCDD is used to qualify both OCDD and OCDF

Attachment B

Qualifier Codes and Explanations

Qualifier	Explanation
J	The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.
J-	The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample with a potential low bias.
J+	The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample with a potential high bias.
JN	The analyte was tentatively identified; the associated numerical value is the approximate concentration of the analyte in the sample.
UJ	The analyte was not detected above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.
U	The analyte was analyzed for, but was not detected above the reported sample quantitation limit.
R	The sample results are rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria. The presence or absence of the analyte cannot be verified.

Attachment C

Reason Codes and Explanations

Reason Code	Explanation
be	Equipment blank contamination
bf	Field blank contamination
bl	Laboratory blank contamination
c	Calibration issue
cl	Clean-up standard recovery
d	Reporting limit raised due to chromatographic interference
fd	Field duplicate RPDs
h	Holding times
i	Internal standard areas
k	Estimated Maximum Possible Concentration (EMPC)
l	LCS or OPR recoveries
lc	Labeled compound recovery
ld	Laboratory duplicate RPDs
lp	Laboratory control sample/laboratory control sample duplicate RPDs
m	Matrix spike recovery
md	Matrix spike/matrix spike duplicate RPDs
ma	Multiple analyses, sample analyzed more than once, a value from another analysis should be used
nb	Negative laboratory blank contamination
p	Chemical preservation issue
r	Dual column RPD
q	Quantitation issue
s	Surrogate recovery
su	Ion suppression
t	Temperature preservation issue
x	Percent solids
y	Serial dilution results
z	ICS results