AECOM
6200 S. Quebec Street
Greenwood Village, CO 80111
303.694.2770 tel

Data Validation Report

Project:	Portland Harbor Pre-Remedial Design Investigation and Baseline Sampling	
Laboratory:	SGS AXYS, Sydney, British Columbia Canada	
Service Request:	WG65124	
Analyses/Method:	Chlorinated Biphenyls by HRGC/HRMS / E1668A	
Validation Level:	Stage 4	
AECOM Project Number:	60566335.2.12	
Prepared by:	Sheri Fling/AECOM	Completed on: 01/16/2019
Reviewed by:	Larry Brook/AECOM	File Name: WG65124 DVR

SUMMARY

The samples listed below were collected by AECOM in Portland Harbor in Portland, OR on August 13, 14, and 15, 2018.

Sample ID	Matrix/Sample Type
PDI-TF-SMB125	Fish Tissue
PDI-TF-SMB114	Fish Tissue
PDI-TF-SMB073	Fish Tissue
PDI-TF-SMB126	Fish Tissue
PDI-TF-SMB127	Fish Tissue
PDI-TF-SMB123	Fish Tissue
PDI-TF-SMB134	Fish Tissue
PDI-TF-SMB116	Fish Tissue
PDI-TF-SMB063	Fish Tissue
PDI-TF-SMB131	Fish Tissue
PDI-TF-SMB124	Fish Tissue
PDI-TF-SMB115	Fish Tissue
PDI-TF-SMB121	Fish Tissue
PDI-TF-SMB122	Fish Tissue
PDI-TF-SMB135	Fish Tissue
PDI-TF-SMB118	Fish Tissue

Data validation activities were conducted with reference to:

- *EPA Method 1668A: Chlorinated Biphenyl Congeners in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS* (USEPA, August 2003),
- EPA Method 1668B: Chlorinated Biphenyl Congeners in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS (USEPA, November 2008),

- EPA Method 1668C: Chlorinated Biphenyl Congeners in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS (USEPA, April 2010),
- *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
✓	GC/MS performance checks
✓	Initial calibration/continuing calibration verification
✗	Laboratory blanks/equipment blanks
NA	Matrix spike (MS) and/or matrix spike duplicate (MSD) results
	Duplicate
✓	Ongoing precision and recovery results
NA	Field duplicate results
✗	Labeled compounds and labeled clean-up standard recoveries
✗	Laboratory Duplicate
✗	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 or negated 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.

Holding Times and Sample Preservation

Sample preservation and preparation/analysis holding times were reviewed for conformance with method criteria. The samples were shipped on dry ice and then stored at -20°C in the dark prior to extraction and analysis. The method QC acceptance criteria were met.

GC/MS Performance Checks

The data were reviewed to evaluate whether

- the perfluorokerosene (PFK) molecular leak was performed at the correct frequency and method acceptance criteria were met;
- the method acceptance criteria were met in the diluted combined 209 congener standard for the chromatographic resolution on the SPB-octyl column of the congener pairs PCB-34 and PCB-23, and PCB-187 and PCB-182;
- the method acceptance criteria was met in the diluted combined 209 congener standard for the co-elution of the congener pair PCB-156 and PCB-157 within 2 seconds of the peak maximum on the SPB-octyl column; and
- the retention time for decachlorobiphenyl (PCB 209) was greater than 55 minutes as required by the method.

The method QC acceptance criteria were met and qualification of data was not required.

Initial Calibration/Continuing Calibration Verification

The data were reviewed to evaluate whether

- the absolute and relative retention time, signal/noise (S/N), and ion abundance ratio method acceptance criteria were met for native toxics/level of chlorination (LOC) congeners and labeled toxics/LOC/window-defining congeners (as summarized by the laboratory);
- the initial calibration percent relative standard deviation (%RSD) method acceptance criteria were met for native toxic/LOC congeners, and labeled toxics/LOC/window-defining congeners; and that performance was technically acceptable in the absence of method criteria for additional congeners in the standards; and
- the calibration verification standard (VER) method acceptance criteria were met for native toxic/LOC congeners, and labeled toxics/LOC/window-defining congeners, and that performance was technically acceptable in the absence of method criteria for additional congeners in the standards.

The method QC acceptance criteria were met and qualification of data was not required.

Laboratory Blanks/Equipment Blanks

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

Target compounds were detected in the laboratory method blank associated with the sample in this data set. An equipment blank was not submitted with this data set.

The NFG guidance stipulates that a conservative approach should be taken with regards to qualification of PCB congeners 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 method blank result:

- When the sample results were < the method blank result, the sample result was qualified as nondetect (U) at the sample result.
- When the sample result was $\geq$ the method 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. Method blank detected compounds are summarized in Attachment A, Table A-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.

Ongoing Precision and Recovery (OPR)

The OPR percent recoveries (%Rs) and/or relative percent differences (RPDs) were reviewed for conformance with the method QC acceptance criteria. The method QC acceptance criteria were met.

Field Duplicate Results

A field duplicate was not submitted with this data set.

Labeled Compounds and Labeled Clean-up Standard Recoveries

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

Laboratory Duplicate Analysis

A laboratory duplicate was performed on sample PDI-TF-SMB073.

Professional judgement was applied to use a relative percent difference criterion of <40% for results greater than five times the quantitation limit. The laboratory duplicate results satisfied the evaluation criterion.

Sample Results/Reporting Issues

Samples PDI-TF-SMB126, PDI-TF-SMB116, and PDI-TF-SMB131 were reanalyzed for possible carry-over in the initial analysis. The-re-analysis results confirmed the original results and original results were reported by the laboratory.

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

Compound Identification

The data were reviewed to evaluate whether

- the retention time, relative retention time (RRT), ion abundance ratios, ion co-maximization, and S/N method acceptance criteria were met for compound identification.

Samples were qualified as follows:

Actions: (Based on NFG 2016 and AECOM professional judgment)

Criteria	Actions
RRT falls outside of method limits and RT falls outside of window defining mix windows	If there is no peak, consider the analyte as nondetect (U) at the reported EDL for World Health Organization (WHO) Toxic Congeners. Non-WHO Toxic congeners are considered ND at the PQL.[2]
S/N criteria not met	Consider the analyte as nondetect (U) at the reported EDL for WHO Toxics congeners[2]
Ion co-maximization and/or ion abundance ratios are outside of QC limits for a PCB congener	Report result as an EMPC and qualify as estimated (JN).[1]
Ion co-maximization and/or ion abundance ratios are outside QC limits for a Labeled compound	Qualify associated positive and nondetect results as estimated (J/UJ).[1]
[1]Based on AECOM professional judgment. [2]Based on NFG 2016 guidance.	

Qualified sample results are summarized in Table 1.

The laboratory qualified sample results with a "K" to indicate that the ion abundance ratio was outside of the QC acceptance limits; the result should be considered as an Estimated Maximum Possible Concentration (EMPC). These results were qualified as estimated and tentatively identified (JN). Qualified sample results are summarized in Table 1.

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

The RRTs for the PCB-79, PCB-196, and/or PCB-35 for several samples reported in this package were slightly outside the RRT controls limits. However, the compounds are determined to present based on the comparison of chromatographic patterns between the samples and calibration data; results were qualified “JN” based on RRT exceedances. Nonconformances are summarized in Attachment A, Table A-2.

Lock Mass Interferences

For the samples reported in this data package, disturbance of the lock mass was observed at the retention times corresponding to some PCB congeners or labelled surrogates. For PCB 66 and/or PCB coelution 86/87/97/108/119/125 the source of the interferences was determined to be the labeled

surrogate used for pesticide quantification. The laboratory qualified the sample results with “G”. These results were qualified as estimated (J). In addition, other results were qualified as “G” by the laboratory indicating lock mass interferences and these results were also qualified as estimated (J). Nonconformances are summarized in Attachment A, Table A-3. Qualified sample results are summarized in Table 1.

The laboratory reported co-eluting results as one result. For example, PCB 12 and 13 for sample PDI-TF-SMB125 is reported singularly as PCB-12 at a concentration of 0.680 pg/g with a laboratory flag of C on the data sheet. PCB 13 is reported with just a laboratory flag of C12 on the data sheet, and in the data validation assistant (DVA) is reported as PCB 12/13 at a concentration of 0.680 pg/g with a laboratory flag of C.

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

Lipids

The percent lipids data were reviewed. The PCB results were reported on a wet basis and not adjusted for percent lipids; an approach consistent with Method 1668A. Data were not qualified on the basis of percent lipids.

QUALIFICATION ACTIONS

Sample results qualified as a result of validation actions are summarized in Table 1. The 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	EDL	Units	Validation Qualifiers	Validation Reason
PDI-TF-SMB063	TA	PCB-123	113	7.95	pg/g	JN	k
PDI-TF-SMB063	TA	PCB-126	12.0	7.72	pg/g	JN	k
PDI-TF-SMB063	TA	PCB-58	13.2	1.13	pg/g	JN	k
PDI-TF-SMB063	TA	PCB-81	4.00	1.10	pg/g	JN	k
PDI-TF-SMB063	TA	PCB-86/87/97/108/119/125	3640	3.74	pg/g	J	q
PDI-TF-SMB073	TA	PCB-123	99.3	6.62	pg/g	JN	k
PDI-TF-SMB073	TA	PCB-126	24.5	7.22	pg/g	JN	k
PDI-TF-SMB073	TA	PCB-196	1580	0.102	pg/g	JN	q
PDI-TF-SMB073	TA	PCB-3	2.67	0.102	pg/g	J+	bl
PDI-TF-SMB073	TA	PCB-34	5.25	0.758	pg/g	JN	k
PDI-TF-SMB073	TA	PCB-58	13.6	6.72	pg/g	JN	k
PDI-TF-SMB073	TA	PCB-66	2420	6.27	pg/g	J	q
PDI-TF-SMB073	TA	PCB-86/87/97/108/119/125	3000	3.65	pg/g	J	q
PDI-TF-SMB114	TA	PCB-1	1.26	0.0784	pg/g	J+	bl
PDI-TF-SMB114	TA	PCB-104	0.190	0.0756	pg/g	JN	k
PDI-TF-SMB114	TA	PCB-111	4.79	0.416	pg/g	JN	k
PDI-TF-SMB114	TA	PCB-12/13	1.07	0.154	pg/g	JN	k
PDI-TF-SMB114	TA	PCB-122	18.0	5.73	pg/g	JN	k
PDI-TF-SMB114	TA	PCB-123	56.4	4.42	pg/g	JN	k
PDI-TF-SMB114	TA	PCB-145	0.391	0.0756	pg/g	JN	k
PDI-TF-SMB114	TA	PCB-2	0.733	0.103	pg/g	J+	bl
PDI-TF-SMB114	TA	PCB-204	1.27	0.0756	pg/g	JN	k
PDI-TF-SMB114	TA	PCB-3	2.13	0.0925	pg/g	J+	bl
PDI-TF-SMB114	TA	PCB-5	0.326	0.164	pg/g	JN	k
PDI-TF-SMB114	TA	PCB-54	0.448	0.0756	pg/g	JN	k
PDI-TF-SMB114	TA	PCB-66	707	2.92	pg/g	J	q
PDI-TF-SMB114	TA	PCB-79	13.8	2.55	pg/g	JN	q
PDI-TF-SMB114	TA	PCB-86/87/97/108/119/125	863	0.480	pg/g	J	q
PDI-TF-SMB114	TA	PCB-94	1.13	0.611	pg/g	JN	k
PDI-TF-SMB115	TA	PCB-104	0.919	0.166	pg/g	JN	k
PDI-TF-SMB115	TA	PCB-12/13	1.17	0.147	pg/g	JN	k
PDI-TF-SMB115	TA	PCB-123	45.6	2.64	pg/g	JN	k
PDI-TF-SMB115	TA	PCB-126	5.57	2.79	pg/g	JN	k
PDI-TF-SMB115	TA	PCB-145	0.432	0.219	pg/g	JN	k
PDI-TF-SMB115	TA	PCB-188	7.82	0.750	pg/g	JN	k
PDI-TF-SMB115	TA	PCB-2	0.915	0.119	pg/g	J+	bl
PDI-TF-SMB115	TA	PCB-204	1.71	0.198	pg/g	JN	k
PDI-TF-SMB115	TA	PCB-3	1.97	0.133	pg/g	J+	bl

Sample ID	Matrix	Compound	Result	EDL	Units	Validation Qualifiers	Validation Reason
PDI-TF-SMB115	TA	PCB-58	4.32	0.484	pg/g	JN	k
PDI-TF-SMB115	TA	PCB-81	1.80	0.448	pg/g	JN	k
PDI-TF-SMB115	TA	PCB-86/87/97/108/119/125	919	1.95	pg/g	J	q
PDI-TF-SMB116	TA	PCB-1	1.12	0.0938	pg/g	J+	bl
PDI-TF-SMB116	TA	PCB-10	0.393	0.226	pg/g	JN	k
PDI-TF-SMB116	TA	PCB-104	0.281	0.115	pg/g	JN	k
PDI-TF-SMB116	TA	PCB-123	1010	49.2	pg/g	JN	k
PDI-TF-SMB116	TA	PCB-126	60.1	50.4	pg/g	JN	k
PDI-TF-SMB116	TA	PCB-196	1560	0.194	pg/g	JN	q
PDI-TF-SMB116	TA	PCB-2	0.664	0.132	pg/g	J+	bl
PDI-TF-SMB116	TA	PCB-24	0.707	0.0745	pg/g	JN	k
PDI-TF-SMB116	TA	PCB-3	1.53	0.116	pg/g	JN	bl,k
PDI-TF-SMB116	TA	PCB-34	1.73	0.352	pg/g	JN	k
PDI-TF-SMB116	TA	PCB-39	2.42	0.317	pg/g	JN	k
PDI-TF-SMB116	TA	PCB-43	25.9	0.131	pg/g	JN	k
PDI-TF-SMB116	TA	PCB-67	14.7	9.26	pg/g	JN	k
PDI-TF-SMB116	TA	PCB-81	10.3	8.39	pg/g	JN	k
PDI-TF-SMB116	TA	PCB-86/87/97/108/119/125	15700	22.7	pg/g	J	q
PDI-TF-SMB116	TA	PCB-9	1.29	0.219	pg/g	JN	k
PDI-TF-SMB118	TA	PCB-104	0.421	0.154	pg/g	JN	k
PDI-TF-SMB118	TA	PCB-111	9.40	1.78	pg/g	JN	k
PDI-TF-SMB118	TA	PCB-12/13	1.05	0.187	pg/g	JN	k
PDI-TF-SMB118	TA	PCB-121	2.74	1.87	pg/g	JN	k
PDI-TF-SMB118	TA	PCB-123	88.5	5.24	pg/g	JN	k
PDI-TF-SMB118	TA	PCB-127	13.0	8.59	pg/g	JN	k
PDI-TF-SMB118	TA	PCB-145	0.460	0.212	pg/g	JN	k
PDI-TF-SMB118	TA	PCB-165	5.82	4.64	pg/g	JN	k
PDI-TF-SMB118	TA	PCB-182	14.8	0.411	pg/g	JN	k
PDI-TF-SMB118	TA	PCB-184	12.9	0.310	pg/g	JN	k
PDI-TF-SMB118	TA	PCB-194	542	0.404	pg/g	J	q
PDI-TF-SMB118	TA	PCB-197/200	81.3	0.325	pg/g	JN	k
PDI-TF-SMB118	TA	PCB-2	0.945	0.0950	pg/g	J+	bl
PDI-TF-SMB118	TA	PCB-204	1.64	0.332	pg/g	JN	k
PDI-TF-SMB118	TA	PCB-23	0.342	0.132	pg/g	JN	k
PDI-TF-SMB118	TA	PCB-24	1.43	0.0779	pg/g	JN	k
PDI-TF-SMB118	TA	PCB-3	1.74	0.103	pg/g	J+	bl
PDI-TF-SMB118	TA	PCB-38	0.672	0.125	pg/g	JN	k
PDI-TF-SMB118	TA	PCB-5	0.251	0.202	pg/g	JN	k
PDI-TF-SMB118	TA	PCB-7	1.21	0.182	pg/g	JN	k
PDI-TF-SMB118	TA	PCB-81	2.21	1.88	pg/g	JN	k
PDI-TF-SMB118	TA	PCB-	1500	2.03	pg/g	J	q

Sample ID	Matrix	Compound	Result	EDL	Units	Validation Qualifiers	Validation Reason
		86/87/97/108/119/125					
PDI-TF-SMB118	TA	PCB-9	2.81	0.179	pg/g	JN	k
PDI-TF-SMB118	TA	PCB-96	4.20	0.232	pg/g	JN	k
PDI-TF-SMB121	TA	PCB-104	0.994	0.145	pg/g	JN	k
PDI-TF-SMB121	TA	PCB-111	6.78	2.30	pg/g	JN	k
PDI-TF-SMB121	TA	PCB-12/13	1.05	0.0980	pg/g	JN	k
PDI-TF-SMB121	TA	PCB-123	102	5.45	pg/g	JN	k
PDI-TF-SMB121	TA	PCB-126	8.66	5.68	pg/g	JN	k
PDI-TF-SMB121	TA	PCB-194	600	0.593	pg/g	J	q
PDI-TF-SMB121	TA	PCB-2	0.819	0.0699	pg/g	J+	bl
PDI-TF-SMB121	TA	PCB-204	1.00	0.187	pg/g	JN	k
PDI-TF-SMB121	TA	PCB-3	1.23	0.0699	pg/g	J+	bl
PDI-TF-SMB121	TA	PCB-34	4.65	0.866	pg/g	JN	k
PDI-TF-SMB121	TA	PCB-35	2.20	0.813	pg/g	JN	k,q
PDI-TF-SMB121	TA	PCB-54	3.27	0.0699	pg/g	JN	k
PDI-TF-SMB121	TA	PCB-86/87/97/108/119/125	2590	2.89	pg/g	J	q
PDI-TF-SMB122	TA	PCB-104	0.147	0.0699	pg/g	JN	k
PDI-TF-SMB122	TA	PCB-12/13	0.698	0.134	pg/g	JN	bl,k
PDI-TF-SMB122	TA	PCB-123	72.8	7.04	pg/g	JN	k
PDI-TF-SMB122	TA	PCB-188	4.26	0.553	pg/g	JN	k
PDI-TF-SMB122	TA	PCB-194	348	0.720	pg/g	J	q
PDI-TF-SMB122	TA	PCB-2	0.628	0.0699	pg/g	J+	bl
PDI-TF-SMB122	TA	PCB-204	0.803	0.122	pg/g	JN	k
PDI-TF-SMB122	TA	PCB-24	0.465	0.0699	pg/g	JN	k
PDI-TF-SMB122	TA	PCB-3	1.07	0.0699	pg/g	J+	bl
PDI-TF-SMB122	TA	PCB-43	5.90	0.0699	pg/g	JN	k
PDI-TF-SMB122	TA	PCB-58	1.61	0.523	pg/g	JN	k
PDI-TF-SMB122	TA	PCB-81	1.40	0.468	pg/g	JN	k
PDI-TF-SMB122	TA	PCB-86/87/97/108/119/125	690	1.21	pg/g	J	q
PDI-TF-SMB122	TA	PCB-94	1.45	0.301	pg/g	JN	k
PDI-TF-SMB123	TA	PCB-10	0.870	0.243	pg/g	JN	k
PDI-TF-SMB123	TA	PCB-105	487	4.58	pg/g	J	q
PDI-TF-SMB123	TA	PCB-111	3.52	0.606	pg/g	JN	k
PDI-TF-SMB123	TA	PCB-12/13	1.66	0.242	pg/g	JN	k
PDI-TF-SMB123	TA	PCB-122	9.01	5.49	pg/g	JN	k
PDI-TF-SMB123	TA	PCB-123	31.2	4.30	pg/g	JN	k
PDI-TF-SMB123	TA	PCB-126	4.91	4.58	pg/g	JN	k
PDI-TF-SMB123	TA	PCB-152	0.942	0.213	pg/g	JN	k
PDI-TF-SMB123	TA	PCB-181	7.47	0.185	pg/g	JN	k
PDI-TF-SMB123	TA	PCB-194	216	0.236	pg/g	J	q
PDI-TF-SMB123	TA	PCB-196	164	0.102	pg/g	JN	q

Sample ID	Matrix	Compound	Result	EDL	Units	Validation Qualifiers	Validation Reason
PDI-TF-SMB123	TA	PCB-204	0.928	0.0804	pg/g	JN	k
PDI-TF-SMB123	TA	PCB-24	1.02	0.0730	pg/g	JN	k
PDI-TF-SMB123	TA	PCB-3	1.16	0.108	pg/g	J+	bl
PDI-TF-SMB123	TA	PCB-34	1.88	0.326	pg/g	JN	k
PDI-TF-SMB123	TA	PCB-5	0.287	0.264	pg/g	JN	k
PDI-TF-SMB123	TA	PCB-57	1.64	1.33	pg/g	JN	k
PDI-TF-SMB123	TA	PCB-58	2.23	1.39	pg/g	JN	k
PDI-TF-SMB123	TA	PCB-66	540	1.30	pg/g	J	q
PDI-TF-SMB123	TA	PCB-7	1.16	0.242	pg/g	JN	k
PDI-TF-SMB123	TA	PCB-81	1.47	1.05	pg/g	JN	k
PDI-TF-SMB123	TA	PCB-86/87/97/108/119/125	654	0.697	pg/g	J	q
PDI-TF-SMB124	TA	PCB-104	0.490	0.119	pg/g	JN	k
PDI-TF-SMB124	TA	PCB-107/124	59.5	7.42	pg/g	JN	k
PDI-TF-SMB124	TA	PCB-111	3.18	1.17	pg/g	JN	k
PDI-TF-SMB124	TA	PCB-12/13	0.766	0.121	pg/g	JN	bl,k
PDI-TF-SMB124	TA	PCB-121	2.83	1.22	pg/g	JN	k
PDI-TF-SMB124	TA	PCB-123	58.7	3.50	pg/g	JN	k
PDI-TF-SMB124	TA	PCB-126	4.89	3.95	pg/g	JN	k
PDI-TF-SMB124	TA	PCB-127	7.98	7.37	pg/g	JN	k
PDI-TF-SMB124	TA	PCB-181	12.4	0.379	pg/g	JN	k
PDI-TF-SMB124	TA	PCB-182	10.7	0.369	pg/g	JN	k
PDI-TF-SMB124	TA	PCB-184	15.1	0.278	pg/g	JN	k
PDI-TF-SMB124	TA	PCB-197/200	59.2	0.306	pg/g	JN	k
PDI-TF-SMB124	TA	PCB-2	0.884	0.0968	pg/g	J+	bl
PDI-TF-SMB124	TA	PCB-204	0.672	0.312	pg/g	JN	k
PDI-TF-SMB124	TA	PCB-24	0.507	0.0719	pg/g	JN	k
PDI-TF-SMB124	TA	PCB-3	1.55	0.115	pg/g	J+	bl
PDI-TF-SMB124	TA	PCB-34	0.640	0.137	pg/g	JN	k
PDI-TF-SMB124	TA	PCB-5	0.191	0.129	pg/g	JN	k
PDI-TF-SMB124	TA	PCB-86/87/97/108/119/125	863	1.33	pg/g	J	q
PDI-TF-SMB124	TA	PCB-89	3.07	1.69	pg/g	JN	k
PDI-TF-SMB124	TA	PCB-96	2.72	0.223	pg/g	JN	k
PDI-TF-SMB125	TA	PCB-10	0.363	0.141	pg/g	JN	k
PDI-TF-SMB125	TA	PCB-104	0.124	0.0719	pg/g	JN	k
PDI-TF-SMB125	TA	PCB-111	1.91	0.323	pg/g	JN	k
PDI-TF-SMB125	TA	PCB-12/13	0.680	0.144	pg/g	JN	bl,k
PDI-TF-SMB125	TA	PCB-123	23.0	1.73	pg/g	JN	k
PDI-TF-SMB125	TA	PCB-126	1.91	1.72	pg/g	JN	k
PDI-TF-SMB125	TA	PCB-145	0.129	0.0719	pg/g	JN	k
PDI-TF-SMB125	TA	PCB-152	0.507	0.0719	pg/g	JN	k
PDI-TF-SMB125	TA	PCB-194	166	0.211	pg/g	J	q

Sample ID	Matrix	Compound	Result	EDL	Units	Validation Qualifiers	Validation Reason
PDI-TF-SMB125	TA	PCB-197/200	18.3	0.0719	pg/g	J	q
PDI-TF-SMB125	TA	PCB-2	0.719	0.0719	pg/g	JN	bl,k
PDI-TF-SMB125	TA	PCB-204	0.510	0.0719	pg/g	JN	k
PDI-TF-SMB125	TA	PCB-207	8.80	0.0832	pg/g	J	q
PDI-TF-SMB125	TA	PCB-24	0.370	0.0719	pg/g	JN	k
PDI-TF-SMB125	TA	PCB-3	1.01	0.0719	pg/g	J+	bl
PDI-TF-SMB125	TA	PCB-54	0.295	0.0719	pg/g	JN	k
PDI-TF-SMB125	TA	PCB-57	0.684	0.461	pg/g	JN	k
PDI-TF-SMB125	TA	PCB-66	299	0.470	pg/g	J	q
PDI-TF-SMB125	TA	PCB-7	0.457	0.142	pg/g	JN	k
PDI-TF-SMB125	TA	PCB-79	5.53	0.410	pg/g	JN	q
PDI-TF-SMB125	TA	PCB-81	0.631	0.388	pg/g	JN	k
PDI-TF-SMB125	TA	PCB-86/87/97/108/119/125	287	0.373	pg/g	J	q
PDI-TF-SMB125	TA	PCB-9	0.590	0.138	pg/g	JN	k
PDI-TF-SMB125	TA	PCB-94	0.763	0.475	pg/g	JN	k
PDI-TF-SMB126	TA	PCB-123	335	21.8	pg/g	JN	k
PDI-TF-SMB126	TA	PCB-145	0.728	0.258	pg/g	JN	k
PDI-TF-SMB126	TA	PCB-194	639	0.442	pg/g	J	q
PDI-TF-SMB126	TA	PCB-2	0.816	0.0975	pg/g	JN	bl,k
PDI-TF-SMB126	TA	PCB-24	0.507	0.0787	pg/g	JN	k
PDI-TF-SMB126	TA	PCB-3	1.58	0.0847	pg/g	J+	bl
PDI-TF-SMB126	TA	PCB-57	5.38	3.57	pg/g	JN	k
PDI-TF-SMB126	TA	PCB-66	2300	3.48	pg/g	J	q
PDI-TF-SMB126	TA	PCB-81	3.47	2.80	pg/g	JN	k
PDI-TF-SMB126	TA	PCB-86/87/97/108/119/125	5580	1.62	pg/g	J	q
PDI-TF-SMB126	TA	PCB-89	4.13	2.05	pg/g	JN	k
PDI-TF-SMB127	TA	PCB-12/13	0.924	0.198	pg/g	JN	k
PDI-TF-SMB127	TA	PCB-123	27.0	2.31	pg/g	JN	k
PDI-TF-SMB127	TA	PCB-126	3.38	2.59	pg/g	JN	k
PDI-TF-SMB127	TA	PCB-145	0.285	0.271	pg/g	JN	k
PDI-TF-SMB127	TA	PCB-152	0.625	0.255	pg/g	JN	k
PDI-TF-SMB127	TA	PCB-196	152	0.0903	pg/g	JN	q
PDI-TF-SMB127	TA	PCB-2	0.800	0.109	pg/g	J+	bl
PDI-TF-SMB127	TA	PCB-24	0.427	0.0819	pg/g	JN	k
PDI-TF-SMB127	TA	PCB-3	1.42	0.0910	pg/g	J+	bl
PDI-TF-SMB127	TA	PCB-39	0.737	0.167	pg/g	JN	k
PDI-TF-SMB127	TA	PCB-66	293	1.02	pg/g	J	q
PDI-TF-SMB127	TA	PCB-86/87/97/108/119/125	344	0.472	pg/g	J	q
PDI-TF-SMB127	TA	PCB-96	1.10	0.201	pg/g	JN	k
PDI-TF-SMB131	TA	PCB-12/13	1.10	0.124	pg/g	JN	k

Sample ID	Matrix	Compound	Result	EDL	Units	Validation Qualifiers	Validation Reason
PDI-TF-SMB131	TA	PCB-123	45.9	2.60	pg/g	JN	k
PDI-TF-SMB131	TA	PCB-126	4.80	2.92	pg/g	JN	k
PDI-TF-SMB131	TA	PCB-152	1.10	0.226	pg/g	JN	k
PDI-TF-SMB131	TA	PCB-182	7.72	0.438	pg/g	JN	k
PDI-TF-SMB131	TA	PCB-188	3.51	0.336	pg/g	JN	k
PDI-TF-SMB131	TA	PCB-19	8.20	0.254	pg/g	JN	k
PDI-TF-SMB131	TA	PCB-191	34.5	0.376	pg/g	JN	k
PDI-TF-SMB131	TA	PCB-194	314	0.423	pg/g	J	q
PDI-TF-SMB131	TA	PCB-204	1.23	0.321	pg/g	JN	k
PDI-TF-SMB131	TA	PCB-24	0.786	0.256	pg/g	JN	k
PDI-TF-SMB131	TA	PCB-3	1.19	0.0932	pg/g	J+	bl
PDI-TF-SMB131	TA	PCB-34	0.933	0.697	pg/g	JN	k
PDI-TF-SMB131	TA	PCB-39	1.21	0.665	pg/g	JN	k
PDI-TF-SMB131	TA	PCB-80	0.605	0.355	pg/g	JN	k
PDI-TF-SMB131	TA	PCB-81	1.56	0.380	pg/g	JN	k
PDI-TF-SMB131	TA	PCB-86/87/97/108/119/125	876	2.10	pg/g	J	q
PDI-TF-SMB134	TA	PCB-104	0.345	0.141	pg/g	JN	k
PDI-TF-SMB134	TA	PCB-123	85.8	4.24	pg/g	JN	k
PDI-TF-SMB134	TA	PCB-126	5.80	4.52	pg/g	JN	k
PDI-TF-SMB134	TA	PCB-150	2.51	0.138	pg/g	JN	k
PDI-TF-SMB134	TA	PCB-152	0.957	0.134	pg/g	JN	k
PDI-TF-SMB134	TA	PCB-194	312	0.260	pg/g	J	q
PDI-TF-SMB134	TA	PCB-2	0.983	0.0944	pg/g	JN	bl,k
PDI-TF-SMB134	TA	PCB-24	0.413	0.0811	pg/g	JN	k
PDI-TF-SMB134	TA	PCB-3	2.21	0.0849	pg/g	J+	bl
PDI-TF-SMB134	TA	PCB-34	0.645	0.183	pg/g	JN	k
PDI-TF-SMB134	TA	PCB-38	0.237	0.172	pg/g	JN	k
PDI-TF-SMB134	TA	PCB-54	0.596	0.0811	pg/g	JN	k
PDI-TF-SMB134	TA	PCB-66	559	1.99	pg/g	J	q
PDI-TF-SMB134	TA	PCB-86/87/97/108/119/125	416	0.332	pg/g	J	q
PDI-TF-SMB134	TA	PCB-94	1.85	0.444	pg/g	JN	k
PDI-TF-SMB135	TA	PCB-12/13	1.24	0.160	pg/g	JN	k
PDI-TF-SMB135	TA	PCB-123	67.1	6.22	pg/g	JN	k
PDI-TF-SMB135	TA	PCB-127	13.2	7.79	pg/g	JN	k
PDI-TF-SMB135	TA	PCB-152	2.64	0.102	pg/g	JN	k
PDI-TF-SMB135	TA	PCB-182	19.6	0.273	pg/g	JN	k
PDI-TF-SMB135	TA	PCB-184	21.5	0.206	pg/g	JN	k
PDI-TF-SMB135	TA	PCB-194	777	0.493	pg/g	J	q
PDI-TF-SMB135	TA	PCB-2	0.933	0.0818	pg/g	J+	bl
PDI-TF-SMB135	TA	PCB-204	1.16	0.253	pg/g	JN	k
PDI-TF-SMB135	TA	PCB-24	0.614	0.0702	pg/g	JN	k

Sample ID	Matrix	Compound	Result	EDL	Units	Validation Qualifiers	Validation Reason
PDI-TF-SMB135	TA	PCB-3	1.52	0.0860	pg/g	J+	bl
PDI-TF-SMB135	TA	PCB-38	0.411	0.191	pg/g	JN	k
PDI-TF-SMB135	TA	PCB-67	5.47	0.407	pg/g	JN	k
PDI-TF-SMB135	TA	PCB-79	11.8	0.416	pg/g	JN	q
PDI-TF-SMB135	TA	PCB-81	1.39	0.449	pg/g	JN	k
PDI-TF-SMB135	TA	PCB-86/87/97/108/119/125	1030	1.22	pg/g	J	q
PDI-TF-SMB135	TA	PCB-94	2.27	1.56	pg/g	JN	k

Attachment A

Nonconformance Summary Tables

Table A-1 – Laboratory Blanks

Blank ID	Compound	Result	QL	Unit	BAL	Associated Samples
WG65124-101	PCB-1	0.263	0.593	pg/g	1.315	PDI-TF-SMB125 PDI-TF-SMB114 PDI-TF-SMB073 PDI-TF-SMB126 PDI-TF-SMB127 PDI-TF-SMB123 PDI-TF-SMB134 PDI-TF-SMB116 PDI-TF-SMB063 PDI-TF-SMB131 PDI-TF-SMB124 PDI-TF-SMB115 PDI-TF-SMB121 PDI-TF-SMB122 PDI-TF-SMB135 PDI-TF-SMB118
	PCB-105	0.266	0.593	pg/g	1.33	
	PCB-11	3.23	0.593	pg/g	16.15	
	PCB-110/115	0.777	0.593	pg/g	3.885	
	PCB-118	0.719	0.593	pg/g	3.595	
	PCB-12/13	0.181	0.593	pg/g	0.905	
	PCB-128/166	0.163	0.593	pg/g	0.815	
	PCB-129/138/160/163	1.24	0.593	pg/g	6.2	
	PCB-132	0.164	0.593	pg/g	0.82	
	PCB-135/151/154	0.248	0.593	pg/g	1.24	
	PCB-137	0.082	0.593	pg/g	0.41	
	PCB-141	0.185	0.593	pg/g	0.925	
	PCB-146	0.231	0.593	pg/g	1.155	
	PCB-147/149	0.585	0.593	pg/g	2.925	
	PCB-15	0.387	0.593	pg/g	1.935	
	PCB-153/168	1.15	0.593	pg/g	5.75	
	PCB-156/157	0.129	1.19	pg/g	0.645	
	PCB-158	0.078	0.593	pg/g	0.39	
	PCB-16	0.302	0.593	pg/g	1.51	
	PCB-167	0.081	0.593	pg/g	0.405	
	PCB-17	0.288	0.593	pg/g	1.44	
	PCB-170	0.340	0.593	pg/g	1.7	
	PCB-171/173	0.096	0.593	pg/g	0.48	
	PCB-174	0.178	0.593	pg/g	0.89	
	PCB-177	0.116	0.593	pg/g	0.58	
	PCB-18/30	0.552	0.593	pg/g	2.76	
	PCB-180/193	1.04	0.593	pg/g	5.2	
	PCB-183/185	0.225	0.593	pg/g	1.125	
	PCB-187	0.380	0.593	pg/g	1.9	
	PCB-190	0.094	0.593	pg/g	0.47	
	PCB-194	0.162	0.593	pg/g	0.81	
	PCB-198/199	0.121	0.593	pg/g	0.605	
	PCB-2	0.212	0.593	pg/g	1.06	
	PCB-20/28	1.24	0.593	pg/g	6.2	
	PCB-203	0.091	0.593	pg/g	0.455	
	PCB-206	0.083	0.593	pg/g	0.415	
	PCB-209 (decachlorobiphenyl)	0.164	0.593	pg/g	0.82	
	PCB-21/33	0.491	0.593	pg/g	2.455	
	PCB-22	0.353	0.593	pg/g	1.765	
	PCB-25	0.116	0.593	pg/g	0.58	
	PCB-26/29	0.200	0.593	pg/g	1	
	PCB-3	0.594	0.593	pg/g	2.97	

Blank ID	Compound	Result	QL	Unit	BAL	Associated Samples
	PCB-31	0.897	0.593	pg/g	4.485	
	PCB-32	0.205	0.593	pg/g	1.025	
	PCB-35	0.085	0.593	pg/g	0.425	
	PCB-37	0.232	0.593	pg/g	1.16	
	PCB-4	0.191	0.593	pg/g	0.955	
	PCB-40/41/71	0.300	0.593	pg/g	1.5	
	PCB-42	0.179	0.593	pg/g	0.895	
	PCB-44/47/65	1.07	0.593	pg/g	5.35	
	PCB-45/51	0.162	0.593	pg/g	0.81	
	PCB-48	0.123	0.593	pg/g	0.615	
	PCB-49/69	0.378	0.593	pg/g	1.89	
	PCB-50/53	0.103	0.593	pg/g	0.515	
	PCB-52	0.793	0.593	pg/g	3.965	
	PCB-56	0.222	0.593	pg/g	1.11	
	PCB-6	0.227	0.593	pg/g	1.135	
	PCB-60	0.150	0.593	pg/g	0.75	
	PCB-61/70/74/76	1.08	0.593	pg/g	5.4	
	PCB-64	0.320	0.593	pg/g	1.6	
	PCB-66	0.620	0.593	pg/g	3.1	
	PCB-68	0.163	0.593	pg/g	0.815	
	PCB-77	0.078	0.593	pg/g	0.39	
	PCB-8	0.696	0.593	pg/g	3.48	
	PCB-83/99	0.591	0.593	pg/g	2.955	
	PCB-84	0.118	0.593	pg/g	0.59	
	PCB-85/116/117	0.240	0.593	pg/g	1.2	
	PCB-86/87/97/108/119/125	0.589	0.593	pg/g	2.945	
	PCB-88/91	0.097	0.593	pg/g	0.485	
	PCB-9	0.075	0.593	pg/g	0.375	
	PCB-90/101/113	0.662	0.593	pg/g	3.31	
	PCB-92	0.154	0.593	pg/g	0.77	
	PCB-93/95/98/100/102	0.463	0.593	pg/g	2.315	

Table A-2– Relative Retention Time Exceedances

Sample ID	PCB Congener	RRT	Lower Limit	Upper Limit
PDI-TF-SMB125	PCB-79	0.968	0.969	0.972
PDI-TF-SMB114	PCB-79	0.968	0.969	0.972
PDI-TF-SMB073	PCB-196	0.914	0.915	0.917
PDI-TF-SMB127	PCB-196	0.914	0.915	0.917
PDI-TF-SMB123	PCB-196	0.914	0.915	0.917
PDI-TF-SMB116	PCB-196	0.914	0.915	0.917
PDI-TF-SMB121	PCB-35	0.988	0.984	0.987
PDI-TF-SMB135	PCB-79	0.968	0.969	0.972

Table A-3– Lock Mass Interferences

Sample ID	PCB Congeners or Labeled Surrogates
PDI-TF-SMB125	PCB-66 PCB-86/87/97/108/119/125,PCB-194,PCB-197/200,PCB-207
PDI-TF-SMB114	PCB-66, PCB-86/87/97/108/119/125
PDI-TF-SMB073	PCB-66, PCB-86/87/97/108/119/125
PDI-TF-SMB126	PCB-66,194, PCB-86/87/97/108/119/125
PDI-TF-SMB127	PCB-66, PCB-86/87/97/108/119/125
PDI-TF-SMB123	PCB-86/87/97/108/119/125,PCB-105, PCB-66, PCB-194
PDI-TF-SMB134	PCB-66, PCB-86/87/97/108/119/125, PCB-194
PDI-TF-SMB116	PCB-86/87/97/108/119/125
PDI-TF-SMB063	PCB-86/87/97/108/119/125
PDI-TF-SMB131	PCB-86/87/97/108/119/125, PCB-194
PDI-TF-SMB124	PCB-86/87/97/108/119/125
PDI-TF-SMB115	PCB-86/87/97/108/119/125
PDI-TF-SMB121	PCB-194, PCB-86/87/97/108/119/125
PDI-TF-SMB122	PCB-194, PCB-86/87/97/108/119/125
PDI-TF-SMB135	PCB-86/87/97/108/119/125, PCB-194
PDI-TF-SMB118	PCB-194, PCB-86/87/97/108/119/125

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
ma	Multiple analyses. Sample analyzed more than once, a value from another analysis should be used.
md	Matrix spike/matrix spike duplicate RPDs
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