Data Validation Report

Project:	Portland Harbor Pre-Remedial Design Investigation and Baseline Sampling
Laboratory:	Test America, Knoxville, Tennessee
Service Request:	580-77392-3
Analyses/Method:	Chlorinated Biphenyls by HRGC/HRMS / E1668A
Validation Level:	Stage 2A
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 May 16, and 17, 2018.

Sample ID	Matrix/Sample Type
PDI-SG-S136	Sediment
PDI-SG-S137	Sediment
PDI-SG-S138	Sediment
PDI-SG-S139	Sediment
PDI-SG-S141	Sediment
PDI-SG-S146	Sediment
PDI-SG-S148	Sediment
PDI-SG-S151	Sediment
PDI-SG-S153	Sediment
PDI-SG-S165	Sediment
PDI-SG-S166	Sediment
PDI-SG-S190	Sediment
PDI-SG-S196	Sediment

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),
- *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
✗	Laboratory blanks/equipment blanks
✗	Matrix spike (MS) and/or matrix spike duplicate (MSD) results
✓	Ongoing precision and recovery results
NA	Field duplicate results
✗	Labeled compounds and labeled 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 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. All method QC acceptance criteria were met.

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Laboratory Blanks/Equipment Blanks

Method 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 blanks associated with the samples in this data set.

An equipment blank was not analyzed within this sample delivery group (SDG).

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 ≥ the method blank result and ≤ 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

The MS/MSD percent recoveries (%Rs) and relative percent differences (RPDs) were reviewed for conformance with the QC acceptance criteria.

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

Actions: (Based on AECOM professional judgment in the absence of NFG guidance)

	MS/MSD %Rs			MS/MSD RPD
Qualify results	**<10% R***	**10% R to Lower Limit**	**➤ Upper Limit**	**> QC Limit**
Detected Results	J-	J-	J+	J
Non-Detected Results	R	UJ	Accept	Accept
*AECOM professional judgment used to establish a minimum criterion of 10% R				
Notes: Qualifications should be applied to the affected compound in the unspiked sample only unless all data appear to be impacted. If the sample result is > 4x the spike added concentration, no action is taken based on AECOM professional judgment.				

Qualified sample results are shown in Table 1.

Ongoing Precision and Recovery

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

Field Duplicate Results

A field duplicate was not submitted for this sample delivery group (SDG).

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 ion abundance ratio fell outside of the QC acceptance limits for the labeled compound listed for the following sample:

PDI-SG-S153

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

Actions: (Based on NFG 2016)

Criteria		Actions	
		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
See Table 6 of method for method QC acceptance criteria[1] [2]The PCB congener 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 (or PQL) but greater than the EDL are qualified by the laboratory as estimated (J). This "J" qualifier is retained during data validation.

The laboratory qualified the sample results with a "q" 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.

<u>Percent Solids Content</u>

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 PCB congeners 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. Data were not qualified on the basis of percent solids content.

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	EDL	Units	Validation Qualifiers	Validation Reason
PDI-SG-S136	SE	PCB-1	0.0065	0.00043	ng/g	JN	k
PDI-SG-S136	SE	PCB-114	0.017	0.0020	ng/g	JN	k
PDI-SG-S136	SE	PCB-122	0.0097	0.0023	ng/g	JN	k
PDI-SG-S136	SE	PCB-123	0.010	0.0020	ng/g	JN	k
PDI-SG-S136	SE	PCB-150	0.0013	0.00030	ng/g	JN	k
PDI-SG-S136	SE	PCB-2	0.0055	0.00050	ng/g	JN	k
PDI-SG-S136	SE	PCB-24	0.0040	0.00069	ng/g	JN	k
PDI-SG-S136	SE	PCB-35	0.0022	0.0014	ng/g	JN	k
PDI-SG-S136	SE	PCB-39	0.0026	0.0013	ng/g	JN	k
PDI-SG-S136	SE	PCB-46	0.049	0.0045	ng/g	JN	k
PDI-SG-S136	SE	PCB-54	0.0022	0.000045	ng/g	JN	k
PDI-SG-S136	SE	PCB-55	0.011	0.0026	ng/g	JN	k
PDI-SG-S136	SE	PCB-59	0.055	0.0025	ng/g	JN	k
PDI-SG-S136	SE	PCB-62	0.055	0.0025	ng/g	JN	k
PDI-SG-S136	SE	PCB-63	0.017	0.0024	ng/g	JN	k
PDI-SG-S136	SE	PCB-67	0.0089	0.0023	ng/g	JN	k
PDI-SG-S136	SE	PCB-75	0.055	0.0025	ng/g	JN	k
PDI-SG-S136	SE	PCB-8	0.055	0.0028	ng/g	JN	k
PDI-SG-S136	SE	PCB-9	0.0058	0.0032	ng/g	JN	k
PDI-SG-S136	SE	PCB-96	0.0087	0.00024	ng/g	JN	k
PDI-SG-S137	SE	PCB-100	0.0079	0.00042	ng/g	JN	k
PDI-SG-S137	SE	PCB-103	0.0042	0.00042	ng/g	JN	k
PDI-SG-S137	SE	PCB-107	0.022	0.0021	ng/g	JN	k
PDI-SG-S137	SE	PCB-116	0.052	0.00036	ng/g	JN	k
PDI-SG-S137	SE	PCB-117	0.052	0.00036	ng/g	JN	k
PDI-SG-S137	SE	PCB-12	0.0088	0.0039	ng/g	JN	k
PDI-SG-S137	SE	PCB-123	0.0029	0.0020	ng/g	JN	k
PDI-SG-S137	SE	PCB-13	0.0088	0.0039	ng/g	JN	k
PDI-SG-S137	SE	PCB-137	0.014	0.0031	ng/g	JN	k
PDI-SG-S137	SE	PCB-15	0.020	0.0038	ng/g	JN	k
PDI-SG-S137	SE	PCB-16	0.024	0.00086	ng/g	JN	k
PDI-SG-S137	SE	PCB-172	0.021	0.0015	ng/g	JN	k
PDI-SG-S137	SE	PCB-19	0.020	0.00095	ng/g	JN	k
PDI-SG-S137	SE	PCB-196	0.029	0.0010	ng/g	JN	k
PDI-SG-S137	SE	PCB-198	0.088	0.0010	ng/g	JN	k
PDI-SG-S137	SE	PCB-199	0.088	0.0010	ng/g	JN	k
PDI-SG-S137	SE	PCB-201	0.0082	0.00070	ng/g	JN	k
PDI-SG-S137	SE	PCB-208	0.024	0.0030	ng/g	JN	k

Sample ID	Matrix	Compound	Result	EDL	Units	Validation Qualifiers	Validation Reason
PDI-SG-S137	SE	PCB-24	0.0015	0.00065	ng/g	JN	k
PDI-SG-S137	SE	PCB-35	0.0018	0.0013	ng/g	JN	k
PDI-SG-S137	SE	PCB-4	0.028	0.0058	ng/g	JN	k
PDI-SG-S137	SE	PCB-43	0.0052	0.0019	ng/g	JN	k
PDI-SG-S137	SE	PCB-46	0.0044	0.0025	ng/g	JN	k
PDI-SG-S137	SE	PCB-48	0.026	0.0020	ng/g	JN	k
PDI-SG-S137	SE	PCB-54	0.0035	0.00010	ng/g	JN	k
PDI-SG-S137	SE	PCB-6	0.0096	0.0038	ng/g	JN	k
PDI-SG-S137	SE	PCB-60	0.026	0.0015	ng/g	JN	k
PDI-SG-S137	SE	PCB-63	0.0042	0.0013	ng/g	JN	k
PDI-SG-S137	SE	PCB-68	0.0019	0.0013	ng/g	JN	k
PDI-SG-S137	SE	PCB-73	0.0052	0.0019	ng/g	JN	k
PDI-SG-S137	SE	PCB-82	0.028	0.00049	ng/g	JN	k
PDI-SG-S137	SE	PCB-85	0.052	0.00036	ng/g	JN	k
PDI-SG-S137	SE	PCB-93	0.0079	0.00042	ng/g	JN	k
PDI-SG-S138	SE	PCB-100	0.0088	0.00041	ng/g	JN	k
PDI-SG-S138	SE	PCB-103	0.0073	0.00041	ng/g	JN	k
PDI-SG-S138	SE	PCB-114	0.010	0.0017	ng/g	JN	k
PDI-SG-S138	SE	PCB-118	0.40	0.0016	ng/g	J+	m
PDI-SG-S138	SE	PCB-120	0.0061	0.00029	ng/g	JN	k
PDI-SG-S138	SE	PCB-122	0.0074	0.0020	ng/g	JN	k
PDI-SG-S138	SE	PCB-148	0.0027	0.00030	ng/g	JN	k
PDI-SG-S138	SE	PCB-15	0.020	0.0043	ng/g	JN	k
PDI-SG-S138	SE	PCB-150	0.0019	0.00020	ng/g	JN	k
PDI-SG-S138	SE	PCB-154	0.016	0.00024	ng/g	JN	k
PDI-SG-S138	SE	PCB-17	0.020	0.00067	ng/g	JN	k
PDI-SG-S138	SE	PCB-197	0.0057	0.00063	ng/g	JN	k
PDI-SG-S138	SE	PCB-2	0.0077	0.00041	ng/g	JN	k
PDI-SG-S138	SE	PCB-25	0.013	0.0010	ng/g	JN	k
PDI-SG-S138	SE	PCB-27	0.0038	0.00049	ng/g	JN	k
PDI-SG-S138	SE	PCB-35	0.0012	0.0012	ng/g	JN	k
PDI-SG-S138	SE	PCB-4	0.012	0.0058	ng/g	JN	k
PDI-SG-S138	SE	PCB-45	0.038	0.0023	ng/g	JN	k
PDI-SG-S138	SE	PCB-51	0.038	0.0023	ng/g	JN	k
PDI-SG-S138	SE	PCB-54	0.00039	0.000023	ng/g	JN	k
PDI-SG-S138	SE	PCB-59	0.019	0.0016	ng/g	JN	k
PDI-SG-S138	SE	PCB-62	0.019	0.0016	ng/g	JN	k
PDI-SG-S138	SE	PCB-67	0.0081	0.0014	ng/g	JN	k
PDI-SG-S138	SE	PCB-68	0.011	0.0014	ng/g	JN	k
PDI-SG-S138	SE	PCB-75	0.019	0.0016	ng/g	JN	k

Sample ID	Matrix	Compound	Result	EDL	Units	Validation Qualifiers	Validation Reason
PDI-SG-S138	SE	PCB-79	0.011	0.0014	ng/g	JN	k
PDI-SG-S138	SE	PCB-8	0.011	0.0038	ng/g	JN	k
PDI-SG-S138	SE	PCB-93	0.0088	0.00041	ng/g	JN	k
PDI-SG-S139	SE	PCB-100	0.030	0.00054	ng/g	JN	k
PDI-SG-S139	SE	PCB-114	0.019	0.0024	ng/g	JN	k
PDI-SG-S139	SE	PCB-12	0.013	0.0032	ng/g	JN	k
PDI-SG-S139	SE	PCB-122	0.015	0.0030	ng/g	JN	k
PDI-SG-S139	SE	PCB-123	0.016	0.0025	ng/g	JN	k
PDI-SG-S139	SE	PCB-13	0.013	0.0032	ng/g	JN	k
PDI-SG-S139	SE	PCB-134	0.052	0.0064	ng/g	JN	k
PDI-SG-S139	SE	PCB-143	0.052	0.0064	ng/g	JN	k
PDI-SG-S139	SE	PCB-181	0.048	0.0021	ng/g	JN	k
PDI-SG-S139	SE	PCB-197	0.010	0.0011	ng/g	JN	k
PDI-SG-S139	SE	PCB-24	0.0014	0.00061	ng/g	JN	k
PDI-SG-S139	SE	PCB-25	0.030	0.0015	ng/g	JN	k
PDI-SG-S139	SE	PCB-32	0.073	0.00050	ng/g	JN	k
PDI-SG-S139	SE	PCB-4	0.020	0.0045	ng/g	JN	k
PDI-SG-S139	SE	PCB-46	0.038	0.0043	ng/g	JN	k
PDI-SG-S139	SE	PCB-54	0.0032	0.000061	ng/g	JN	k
PDI-SG-S139	SE	PCB-55	0.0075	0.0024	ng/g	JN	k
PDI-SG-S139	SE	PCB-58	0.0057	0.0025	ng/g	JN	k
PDI-SG-S139	SE	PCB-6	0.014	0.0031	ng/g	JN	k
PDI-SG-S139	SE	PCB-67	0.015	0.0021	ng/g	JN	k
PDI-SG-S139	SE	PCB-7	0.0038	0.0032	ng/g	JN	k
PDI-SG-S139	SE	PCB-9	0.0049	0.0033	ng/g	JN	k
PDI-SG-S139	SE	PCB-93	0.030	0.00054	ng/g	JN	k
PDI-SG-S141	SE	PCB-103	0.0066	0.00033	ng/g	JN	k
PDI-SG-S141	SE	PCB-11	0.057	0.00065	ng/g	JN	k
PDI-SG-S141	SE	PCB-123	0.022	0.0031	ng/g	JN	k
PDI-SG-S141	SE	PCB-131	0.0057	0.0021	ng/g	JN	k
PDI-SG-S141	SE	PCB-144	0.023	0.00011	ng/g	JN	k
PDI-SG-S141	SE	PCB-145	0.00032	0.000084	ng/g	JN	k
PDI-SG-S141	SE	PCB-152	0.00021	0.000081	ng/g	JN	k
PDI-SG-S141	SE	PCB-154	0.0084	0.000097	ng/g	JN	k
PDI-SG-S141	SE	PCB-159	0.0060	0.0012	ng/g	JN	k
PDI-SG-S141	SE	PCB-175	0.0077	0.00024	ng/g	JN	k
PDI-SG-S141	SE	PCB-191	0.0072	0.00017	ng/g	JN	k
PDI-SG-S141	SE	PCB-207	0.0071	0.00055	ng/g	JN	k
PDI-SG-S141	SE	PCB-208	0.014	0.00060	ng/g	JN	k
PDI-SG-S141	SE	PCB-25	0.014	0.0015	ng/g	JN	k

Sample ID	Matrix	Compound	Result	EDL	Units	Validation Qualifiers	Validation Reason
PDI-SG-S141	SE	PCB-27	0.0096	0.00077	ng/g	JN	k
PDI-SG-S141	SE	PCB-3	0.0027	0.00026	ng/g	JN	k
PDI-SG-S141	SE	PCB-39	0.0022	0.0014	ng/g	JN	k
PDI-SG-S141	SE	PCB-43	0.019	0.0035	ng/g	JN	k
PDI-SG-S141	SE	PCB-46	0.025	0.0048	ng/g	JN	k
PDI-SG-S141	SE	PCB-48	0.093	0.0037	ng/g	JN	k
PDI-SG-S141	SE	PCB-54	0.0026	0.000080	ng/g	JN	k
PDI-SG-S141	SE	PCB-6	0.0050	0.00071	ng/g	JN	k
PDI-SG-S141	SE	PCB-67	0.013	0.0025	ng/g	JN	k
PDI-SG-S141	SE	PCB-72	0.0047	0.0027	ng/g	JN	k
PDI-SG-S141	SE	PCB-73	0.019	0.0035	ng/g	JN	k
PDI-SG-S141	SE	PCB-9	0.0016	0.00079	ng/g	JN	k
PDI-SG-S141	SE	PCB-94	0.0076	0.00038	ng/g	JN	k
PDI-SG-S146	SE	PCB-1	0.0068	0.00037	ng/g	JN	k
PDI-SG-S146	SE	PCB-12	0.010	0.00066	ng/g	JN	k
PDI-SG-S146	SE	PCB-126	0.0049	0.0039	ng/g	JN	k
PDI-SG-S146	SE	PCB-13	0.010	0.00066	ng/g	JN	k
PDI-SG-S146	SE	PCB-132	0.22	0.0033	ng/g	JN	k
PDI-SG-S146	SE	PCB-137	0.052	0.0027	ng/g	JN	k
PDI-SG-S146	SE	PCB-150	0.0025	0.00052	ng/g	JN	k
PDI-SG-S146	SE	PCB-152	0.0025	0.00056	ng/g	JN	k
PDI-SG-S146	SE	PCB-164	0.079	0.0022	ng/g	JN	k
PDI-SG-S146	SE	PCB-186	0.0083	0.00039	ng/g	JN	k
PDI-SG-S146	SE	PCB-197	0.012	0.0011	ng/g	JN	k
PDI-SG-S146	SE	PCB-204	0.0042	0.0012	ng/g	JN	k
PDI-SG-S146	SE	PCB-205	0.021	0.0022	ng/g	JN	k
PDI-SG-S146	SE	PCB-24	0.0017	0.00067	ng/g	JN	k
PDI-SG-S146	SE	PCB-3	0.0080	0.00048	ng/g	JN	k
PDI-SG-S146	SE	PCB-39	0.0043	0.0022	ng/g	JN	k
PDI-SG-S146	SE	PCB-43	0.057	0.0032	ng/g	JN	k
PDI-SG-S146	SE	PCB-46	0.084	0.0044	ng/g	JN	k
PDI-SG-S146	SE	PCB-55	0.052	0.0024	ng/g	JN	k
PDI-SG-S146	SE	PCB-63	0.066	0.0022	ng/g	JN	k
PDI-SG-S146	SE	PCB-67	0.032	0.0023	ng/g	JN	k
PDI-SG-S146	SE	PCB-7	0.0022	0.00068	ng/g	JN	k
PDI-SG-S146	SE	PCB-73	0.057	0.0032	ng/g	JN	k
PDI-SG-S146	SE	PCB-9	0.0029	0.00080	ng/g	JN	k
PDI-SG-S148	SE	PCB-1	0.0035	0.00037	ng/g	JN	k
PDI-SG-S148	SE	PCB-10	0.0014	0.00068	ng/g	JN	k
PDI-SG-S148	SE	PCB-103	0.0085	0.00062	ng/g	JN	k

Sample ID	Matrix	Compound	Result	EDL	Units	Validation Qualifiers	Validation Reason
PDI-SG-S148	SE	PCB-114	0.018	0.0020	ng/g	JN	k
PDI-SG-S148	SE	PCB-148	0.0014	0.00066	ng/g	JN	k
PDI-SG-S148	SE	PCB-150	0.0014	0.00044	ng/g	JN	k
PDI-SG-S148	SE	PCB-152	0.00072	0.00047	ng/g	JN	k
PDI-SG-S148	SE	PCB-17	0.039	0.00093	ng/g	JN	k
PDI-SG-S148	SE	PCB-181	0.019	0.00092	ng/g	JN	k
PDI-SG-S148	SE	PCB-190	0.044	0.00069	ng/g	JN	k
PDI-SG-S148	SE	PCB-197	0.0042	0.00090	ng/g	JN	k
PDI-SG-S148	SE	PCB-205	0.0082	0.0013	ng/g	JN	k
PDI-SG-S148	SE	PCB-206	0.14	0.0030	ng/g	JN	k
PDI-SG-S148	SE	PCB-3	0.0050	0.00049	ng/g	JN	k
PDI-SG-S148	SE	PCB-4	0.012	0.00088	ng/g	JN	k
PDI-SG-S148	SE	PCB-43	0.024	0.0033	ng/g	JN	k
PDI-SG-S148	SE	PCB-54	0.0052	0.000096	ng/g	JN	k
PDI-SG-S148	SE	PCB-59	0.048	0.0025	ng/g	JN	k
PDI-SG-S148	SE	PCB-6	0.0068	0.00063	ng/g	JN	k
PDI-SG-S148	SE	PCB-62	0.048	0.0025	ng/g	JN	k
PDI-SG-S148	SE	PCB-63	0.0089	0.0022	ng/g	JN	k
PDI-SG-S148	SE	PCB-73	0.024	0.0033	ng/g	JN	k
PDI-SG-S148	SE	PCB-75	0.048	0.0025	ng/g	JN	k
PDI-SG-S148	SE	PCB-89	0.014	0.00072	ng/g	JN	k
PDI-SG-S151	SE	PCB-1	0.0032	0.00073	ng/g	JN	k
PDI-SG-S151	SE	PCB-100	0.015	0.00091	ng/g	JN	k
PDI-SG-S151	SE	PCB-108	0.013	0.0023	ng/g	JN	k
PDI-SG-S151	SE	PCB-112	0.0013	0.00067	ng/g	JN	k
PDI-SG-S151	SE	PCB-114	0.0058	0.0021	ng/g	JN	k
PDI-SG-S151	SE	PCB-12	0.0079	0.0037	ng/g	JN	k
PDI-SG-S151	SE	PCB-122	0.0048	0.0026	ng/g	JN	k
PDI-SG-S151	SE	PCB-123	0.0059	0.0023	ng/g	JN	k
PDI-SG-S151	SE	PCB-124	0.013	0.0023	ng/g	JN	k
PDI-SG-S151	SE	PCB-13	0.0079	0.0037	ng/g	JN	k
PDI-SG-S151	SE	PCB-137	0.021	0.0060	ng/g	JN	k
PDI-SG-S151	SE	PCB-139	0.0093	0.0059	ng/g	JN	k
PDI-SG-S151	SE	PCB-140	0.0093	0.0059	ng/g	JN	k
PDI-SG-S151	SE	PCB-144	0.024	0.0015	ng/g	JN	k
PDI-SG-S151	SE	PCB-16	0.025	0.0010	ng/g	JN	k
PDI-SG-S151	SE	PCB-170	0.19	0.0038	ng/g	JN	k
PDI-SG-S151	SE	PCB-171	0.064	0.0031	ng/g	JN	k
PDI-SG-S151	SE	PCB-173	0.064	0.0031	ng/g	JN	k
PDI-SG-S151	SE	PCB-191	0.0087	0.0021	ng/g	JN	k

Sample ID	Matrix	Compound	Result	EDL	Units	Validation Qualifiers	Validation Reason
PDI-SG-S151	SE	PCB-197	0.0065	0.0014	ng/g	JN	k
PDI-SG-S151	SE	PCB-200	0.013	0.0012	ng/g	JN	k
PDI-SG-S151	SE	PCB-201	0.013	0.0013	ng/g	JN	k
PDI-SG-S151	SE	PCB-21	0.052	0.0016	ng/g	JN	k
PDI-SG-S151	SE	PCB-32	0.037	0.00065	ng/g	JN	k
PDI-SG-S151	SE	PCB-33	0.052	0.0016	ng/g	JN	k
PDI-SG-S151	SE	PCB-4	0.014	0.0054	ng/g	JN	k
PDI-SG-S151	SE	PCB-54	0.0028	0.00036	ng/g	JN	k
PDI-SG-S151	SE	PCB-55	0.0047	0.0019	ng/g	JN	k
PDI-SG-S151	SE	PCB-59	0.021	0.0018	ng/g	JN	k
PDI-SG-S151	SE	PCB-6	0.013	0.0036	ng/g	JN	k
PDI-SG-S151	SE	PCB-62	0.021	0.0018	ng/g	JN	k
PDI-SG-S151	SE	PCB-75	0.021	0.0018	ng/g	JN	k
PDI-SG-S151	SE	PCB-8	0.029	0.0033	ng/g	JN	k
PDI-SG-S151	SE	PCB-88	0.070	0.00095	ng/g	JN	k
PDI-SG-S151	SE	PCB-91	0.070	0.00095	ng/g	JN	k
PDI-SG-S151	SE	PCB-93	0.015	0.00091	ng/g	JN	k
PDI-SG-S151	SE	PCB-96	0.0050	0.00078	ng/g	JN	k
PDI-SG-S153	SE	PCB-102	0.017	0.00051	ng/g	JN	k
PDI-SG-S153	SE	PCB-103	0.0054	0.00052	ng/g	JN	k
PDI-SG-S153	SE	PCB-107	0.024	0.0023	ng/g	JN	k
PDI-SG-S153	SE	PCB-122	0.0035	0.0025	ng/g	JN	k
PDI-SG-S153	SE	PCB-123	0.0066	0.0023	ng/g	JN	k
PDI-SG-S153	SE	PCB-126		0.0018	ng/g	UJ	lc
PDI-SG-S153	SE	PCB-130	0.032	0.0045	ng/g	JN	k
PDI-SG-S153	SE	PCB-144	0.021	0.00076	ng/g	JN	k
PDI-SG-S153	SE	PCB-15	0.029	0.0060	ng/g	JN	k
PDI-SG-S153	SE	PCB-154	0.0059	0.00065	ng/g	JN	k
PDI-SG-S153	SE	PCB-16	0.027	0.0011	ng/g	JN	k
PDI-SG-S153	SE	PCB-17	0.034	0.0010	ng/g	JN	k
PDI-SG-S153	SE	PCB-175	0.0069	0.0024	ng/g	JN	k
PDI-SG-S153	SE	PCB-19	0.019	0.0012	ng/g	JN	k
PDI-SG-S153	SE	PCB-202	0.019	0.0012	ng/g	JN	k
PDI-SG-S153	SE	PCB-205	0.0097	0.0047	ng/g	JN	k
PDI-SG-S153	SE	PCB-208	0.022	0.0032	ng/g	JN	k
PDI-SG-S153	SE	PCB-25	0.013	0.0016	ng/g	JN	k
PDI-SG-S153	SE	PCB-27	0.0092	0.00073	ng/g	JN	k
PDI-SG-S153	SE	PCB-32	0.033	0.00070	ng/g	JN	k
PDI-SG-S153	SE	PCB-4	0.019	0.0078	ng/g	JN	k
PDI-SG-S153	SE	PCB-43	0.0083	0.0028	ng/g	JN	k

Sample ID	Matrix	Compound	Result	EDL	Units	Validation Qualifiers	Validation Reason
PDI-SG-S153	SE	PCB-54	0.0016	0.000086	ng/g	JN	k
PDI-SG-S153	SE	PCB-63	0.0082	0.0020	ng/g	JN	k
PDI-SG-S153	SE	PCB-73	0.0083	0.0028	ng/g	JN	k
PDI-SG-S153	SE	PCB-89	0.0070	0.00059	ng/g	JN	k
PDI-SG-S153	SE	PCB-98	0.017	0.00051	ng/g	JN	k
PDI-SG-S165	SE	PCB-116	0.12	0.00046	ng/g	JN	k
PDI-SG-S165	SE	PCB-117	0.12	0.00046	ng/g	JN	k
PDI-SG-S165	SE	PCB-122	0.0084	0.0024	ng/g	JN	k
PDI-SG-S165	SE	PCB-123	0.010	0.0020	ng/g	JN	k
PDI-SG-S165	SE	PCB-126	0.0024	0.0023	ng/g	JN	k
PDI-SG-S165	SE	PCB-131	0.011	0.0044	ng/g	JN	k
PDI-SG-S165	SE	PCB-137	0.052	0.0036	ng/g	JN	k
PDI-SG-S165	SE	PCB-139	0.012	0.0035	ng/g	JN	k
PDI-SG-S165	SE	PCB-140	0.012	0.0035	ng/g	JN	k
PDI-SG-S165	SE	PCB-144	0.027	0.00046	ng/g	JN	k
PDI-SG-S165	SE	PCB-148	0.0021	0.00049	ng/g	JN	k
PDI-SG-S165	SE	PCB-17	0.032	0.00076	ng/g	JN	k
PDI-SG-S165	SE	PCB-175	0.0076	0.00097	ng/g	JN	k
PDI-SG-S165	SE	PCB-181	0.0029	0.00096	ng/g	JN	k
PDI-SG-S165	SE	PCB-19	0.014	0.00093	ng/g	JN	k
PDI-SG-S165	SE	PCB-190	0.034	0.00070	ng/g	JN	k
PDI-SG-S165	SE	PCB-197	0.0054	0.00052	ng/g	JN	k
PDI-SG-S165	SE	PCB-200	0.0086	0.00046	ng/g	JN	k
PDI-SG-S165	SE	PCB-201	0.011	0.00047	ng/g	JN	k
PDI-SG-S165	SE	PCB-205	0.0057	0.0021	ng/g	JN	k
PDI-SG-S165	SE	PCB-206	0.070	0.0038	ng/g	JN	k
PDI-SG-S165	SE	PCB-207	0.0095	0.0023	ng/g	JN	k
PDI-SG-S165	SE	PCB-24	0.0013	0.00064	ng/g	JN	k
PDI-SG-S165	SE	PCB-4	0.021	0.0064	ng/g	JN	k
PDI-SG-S165	SE	PCB-43	0.0084	0.0028	ng/g	JN	k
PDI-SG-S165	SE	PCB-48	0.026	0.0030	ng/g	JN	k
PDI-SG-S165	SE	PCB-54	0.0032	0.000068	ng/g	JN	k
PDI-SG-S165	SE	PCB-55	0.0044	0.0022	ng/g	JN	k
PDI-SG-S165	SE	PCB-6	0.0081	0.0044	ng/g	JN	k
PDI-SG-S165	SE	PCB-63	0.0062	0.0020	ng/g	JN	k
PDI-SG-S165	SE	PCB-73	0.0084	0.0028	ng/g	JN	k
PDI-SG-S165	SE	PCB-8	0.030	0.0041	ng/g	JN	k
PDI-SG-S165	SE	PCB-85	0.12	0.00046	ng/g	JN	k
PDI-SG-S166	SE	PCB-10	0.0071	0.0032	ng/g	JN	k
PDI-SG-S166	SE	PCB-12	0.013	0.0029	ng/g	JN	k

Sample ID	Matrix	Compound	Result	EDL	Units	Validation Qualifiers	Validation Reason
PDI-SG-S166	SE	PCB-122	0.035	0.0025	ng/g	JN	k
PDI-SG-S166	SE	PCB-126	0.0026	0.0022	ng/g	JN	k
PDI-SG-S166	SE	PCB-13	0.013	0.0029	ng/g	JN	k
PDI-SG-S166	SE	PCB-139	0.054	0.0036	ng/g	JN	k
PDI-SG-S166	SE	PCB-140	0.054	0.0036	ng/g	JN	k
PDI-SG-S166	SE	PCB-145	0.0013	0.00037	ng/g	JN	bl,k
PDI-SG-S166	SE	PCB-150	0.0022	0.00035	ng/g	JN	k
PDI-SG-S166	SE	PCB-152	0.0013	0.00038	ng/g	JN	k
PDI-SG-S166	SE	PCB-181	0.0056	0.00034	ng/g	JN	k
PDI-SG-S166	SE	PCB-182	0.0047	0.00033	ng/g	JN	k
PDI-SG-S166	SE	PCB-196	0.054	0.00045	ng/g	JN	k
PDI-SG-S166	SE	PCB-200	0.013	0.00031	ng/g	JN	k
PDI-SG-S166	SE	PCB-205	0.0051	0.00082	ng/g	JN	k
PDI-SG-S166	SE	PCB-206	0.094	0.0017	ng/g	JN	k
PDI-SG-S166	SE	PCB-24	0.014	0.00047	ng/g	JN	k
PDI-SG-S166	SE	PCB-27	0.052	0.00040	ng/g	JN	k
PDI-SG-S166	SE	PCB-3	0.012	0.00039	ng/g	JN	k
PDI-SG-S166	SE	PCB-35	0.0060	0.0013	ng/g	JN	k
PDI-SG-S166	SE	PCB-39	0.0024	0.0012	ng/g	JN	k
PDI-SG-S166	SE	PCB-48	0.049	0.0038	ng/g	JN	k
PDI-SG-S166	SE	PCB-54	0.0020	0.00018	ng/g	JN	k
PDI-SG-S166	SE	PCB-55	0.014	0.0028	ng/g	JN	k
PDI-SG-S166	SE	PCB-63	0.0084	0.0026	ng/g	JN	k
PDI-SG-S166	SE	PCB-7	0.0053	0.0029	ng/g	JN	k
PDI-SG-S166	SE	PCB-89	0.014	0.00041	ng/g	JN	k
PDI-SG-S166	SE	PCB-9	0.0081	0.0030	ng/g	JN	k
PDI-SG-S166	SE	PCB-94	0.0082	0.00041	ng/g	JN	k
PDI-SG-S190	SE	PCB-1	0.0028	0.00032	ng/g	JN	k
PDI-SG-S190	SE	PCB-102	0.052	0.00043	ng/g	JN	k
PDI-SG-S190	SE	PCB-123	0.040	0.0029	ng/g	JN	k
PDI-SG-S190	SE	PCB-148	0.0029	0.00039	ng/g	JN	k
PDI-SG-S190	SE	PCB-152	0.0025	0.00028	ng/g	JN	k
PDI-SG-S190	SE	PCB-154	0.034	0.00031	ng/g	JN	k
PDI-SG-S190	SE	PCB-18	0.086	0.00053	ng/g	JN	k
PDI-SG-S190	SE	PCB-19	0.021	0.00073	ng/g	JN	k
PDI-SG-S190	SE	PCB-191	0.014	0.00048	ng/g	JN	k
PDI-SG-S190	SE	PCB-2	0.0068	0.00038	ng/g	JN	k
PDI-SG-S190	SE	PCB-200	0.014	0.00027	ng/g	JN	k
PDI-SG-S190	SE	PCB-27	0.0087	0.00044	ng/g	JN	k
PDI-SG-S190	SE	PCB-3	0.0045	0.00044	ng/g	JN	k

Sample ID	Matrix	Compound	Result	EDL	Units	Validation Qualifiers	Validation Reason
PDI-SG-S190	SE	PCB-30	0.086	0.00053	ng/g	JN	k
PDI-SG-S190	SE	PCB-35	0.0024	0.0013	ng/g	JN	k
PDI-SG-S190	SE	PCB-39	0.0013	0.0012	ng/g	JN	k
PDI-SG-S190	SE	PCB-54	0.0015	0.000028	ng/g	JN	k
PDI-SG-S190	SE	PCB-55	0.013	0.0030	ng/g	JN	k
PDI-SG-S190	SE	PCB-59	0.021	0.0029	ng/g	JN	k
PDI-SG-S190	SE	PCB-6	0.012	0.0036	ng/g	JN	k
PDI-SG-S190	SE	PCB-62	0.021	0.0029	ng/g	JN	k
PDI-SG-S190	SE	PCB-75	0.021	0.0029	ng/g	JN	k
PDI-SG-S190	SE	PCB-79	0.017	0.0027	ng/g	JN	k
PDI-SG-S190	SE	PCB-98	0.052	0.00043	ng/g	JN	k
PDI-SG-S196	SE	PCB-10	0.042	0.0069	ng/g	JN	k
PDI-SG-S196	SE	PCB-123	0.090	0.0069	ng/g	JN	k
PDI-SG-S196	SE	PCB-169	0.11	0.019	ng/g	JN	k
PDI-SG-S196	SE	PCB-23	0.011	0.0091	ng/g	JN	k
PDI-SG-S196	SE	PCB-34	0.049	0.0094	ng/g	JN	k
PDI-SG-S196	SE	PCB-36	0.011	0.0088	ng/g	JN	k
PDI-SG-S196	SE	PCB-5	0.062	0.0070	ng/g	JN	k
PDI-SG-S196	SE	PCB-54	0.090	0.000097	ng/g	JN	k
PDI-SG-S196	SE	PCB-58	0.029	0.013	ng/g	JN	k
PDI-SG-S196	SE	PCB-7	0.12	0.0063	ng/g	JN	k

Attachment A

Nonconformance Summary Tables

Table A-1 - MS/MSD Results

Sample ID	Compound	MS % Recovery	MSD % Recovery	Lower Limit	Upper Limit	RPD	RPD Limit
PDI-SG-S138	PCB-118	170	ok	50	150	ok	50
	PCB-126	ok	ok	50	150	70	50

Table A-2 - Labeled Compound and Labeled Clean-Up Standard Recoveries

Sample ID	Compound	% Recovery	Lower Limit	Upper Limit
PDI-SG-S153	PCB-126	147	30	140

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
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