APPENDIX 1

Quality Assurance/Quality Control (QA/QC) Summary for the California Rivers and Streams Study

The data generated for this section were evaluated in the Contaminants in Fish from California Rivers and Streams report and will be used to perform a statewide screening study of contaminant bioaccumulation in sport fish. Thorough objectives that meet or exceed those in the Surface Water Ambient Monitoring Program (SWAMP) Quality Assurance Program Plan (QAPrP) are outlined in the Rivers QAPP (Bonnema 2011). In general, data quality is demonstrated through analysis of the following quality control (QC) samples:

- Laboratory method blanks;
- Surrogate spikes;
- Matrix spikes (MSs) and matrix spike duplicates (MSDs);
- Certified reference materials (CRMs)/laboratory control spikes (LCSs); and
- Laboratory duplicates (DUP).

The results of the QC samples are used to assess the level of precision and accuracy that can be associated with the data. This information helps guide the data validation process that is used to determine whether the data help to address the questions put forth by the project. In addition, the QC information collected by the project helps pinpoint the specific areas of the overall process where problems may arise so that corrective actions can be implemented. Quality control samples prepared and analyzed by the laboratory provide information specific to the preparation and analysis of the samples.

Were the samples prepared and analyzed in a manner free from significant contamination?

The results of laboratory method blanks provide information on this.

How accurate and precise are the results of the samples?

This question is answered by assessment of a combination of QC sample results. Reference materials and laboratory control spikes provide information regarding the accuracy of the analytical protocols. The results of laboratory duplicates provide information regarding the homogeneity of the samples and consistency of laboratory analytical procedures. The results of matrix spikes provide information on the analytical bias associated with the sample matrix. Only by considering all of the pieces of QC information available as a whole can a determination of the precision and accuracy of the data (or in other words to answer the question “how good are the data?”) be made.

Following submittal from the laboratory, data are validated against the data quality requirements in the Rivers QAPP to determine whether or not the data are suitable for their intended use. Quality control samples are analyzed with a discrete batch of samples, with the results of the associated QC samples applied to each sample in the batch. Sample batches where the associated QC samples met criteria and laboratory performance indicators were within control limits are considered suitable for their intended use without further assessment.

Data associated with QC results outside of acceptance limits are not automatically considered unsuitable for use. However, the type and scope of the QC problems must be assessed during data validation. In most instances the data are found to be suitable for their intended use even

when accounting for the QC failures. Data associated with significant QC failures, or which meet the rejection criteria specified in the Rivers QAPP are unusable for the purposes of this project.

Data validation results are summarized for each QC sample type.

Data for the Rivers and Streams Study have been validated and compared against project-specific data quality objectives (DQOs). The counts in the following sections represent selenium, mercury, organochlorine pesticide, polychlorinated biphenyl as congener (PCB) and cyanotoxin results from the Rivers and Streams study and previously sampled archived tissue (for the cyanotoxins). The validation included verification of data according to SWAMP Standard Operating Procedures (SOPs) for chemistry data verification. Data were determined to be compliant with the individual measurement quality objectives (MQOs) specified in Tables 12a and 12b in the Rivers QAPP. Data were classified into one of the following classification levels:

Compliant

Data classified as "compliant" meet or exceed all of the MQOs and other data quality requirements specified in the Rivers QAPP. These data are considered usable for their intended purpose without additional scrutiny.

Qualified

Data classified as "qualified" do not meet one or more of the MQOs and other data quality requirements specified in the Rivers QAPP. These data are considered usable for their intended purpose following an additional assessment to determine the scope and impact of the quality control failure.

Estimated

Data classified as "estimated" are assigned to data batches and sample results that are not considered to be quantifiable. Included in this classification are results qualified with the following flag:

J–Estimated value (EPA Flag)

Screening

Data classified as "screening" are considered non-quantitative and marked as screening and may or may not meet the minimum data quality requirements specified in the SWAMP QAPrP. These data may not be usable for their intended purpose and require additional assessment.

Rejected

Data classified as "rejected" do not meet the minimum data quality requirements specified in the Rivers QAPP. These data are not considered usable for their intended purpose.

Not applicable

Data classified as "not applicable" were not validated since there were no project MQOs or QC requirements for the specific parameter, (e.g., age) or a failure result was reported and could not be validated.

Quality Assurance Parameter Performance Assessment

Rivers and Streams Study criteria for percent recovery (%R) of surrogates, matrix spikes, Certified Reference Materials, laboratory control samples and relative percent difference (RPD) for field and laboratory duplicates for tissues are presented in Table 1.

Screening compliance codes were applied by the laboratory to the following cyanotoxin analytes; demethyl-RR, MCY-LF, MCY-LY, and MCY-LW since they are not included in the standards for the MS/MSD and LCS/LCSD. Compound identification was based on retention time, molecular weights, qualifier ions, and ion ratios for these compounds

Laboratory Method Blanks

Laboratory method blanks are used to evaluate laboratory contamination during sample preparation and analysis. Blank samples undergo the same analytical procedure as samples with at least one blank analyzed per 20 samples. The required frequency was met for all 43 batches.

Data that met the MQO for method blanks are those with values less than the method limit (ML) for that particular analyte within each analytical batch. All 81 laboratory method blanks met the MQO.

Target analyte concentrations detected above the method detection limit (MDL) in the field samples were compared to the associated method blank concentrations. Results for target analyte concentrations in batches with blank contamination that were less than 3X the blank contamination were classified as "rejected". There were 65 rejections in the dataset. Eleven results were classified as "qualified" based on the blank contamination validation QC criteria.

Surrogate Spikes

Surrogate spikes are used to assess analyte losses during sample extraction and clean-up procedures, and must be added to every composite and quality control sample prior to extraction. Whenever possible, isotopically-labeled analogs of the analytes should be used.

All surrogate percent recoveries were within the acceptance criteria listed in Table 1, with the exception of 4 out of 287 (1.39%) surrogate percent recoveries spiked in 268 field and laboratory QA/QC samples analyzed for PCBs and organochlorine pesticides (Table 2). The associated analytes in Method Blank L-403-11_BS 659_MethodBlank and CRM L-078-12_BS 669_SRM 1946 were classified as "qualified" with regard to the MQO for surrogates. No data were rejected.

Matrix Spikes and Matrix Spike Duplicates

A laboratory-fortified sample matrix (matrix spike, or MS) and a laboratory fortified sample matrix duplicate (MSD) are both used to evaluate the effect of the sample matrix on the recovery of the target analyte(s). Individually, these samples are used to assess the bias from an environmental sample matrix plus normal method performance. In addition, these duplicate samples can be used collectively to assess analytical precision.

Aliquots of randomly selected field samples were spiked with known amounts of target analytes. The percent recovery (%R) of each spike was calculated as follows:

%R= (MS Result – Sample Result)/ (Expected Value – Sample Result) * 100

The %R acceptance criteria vary according to analyte groups (Table1).

This process was repeated on the same native samples to create a laboratory fortified sample matrix spike duplicate (MSD). MSDs were used to assess laboratory precision and accuracy. MS/MSD RPDs were calculated as follows:

RPD = (|(Value1-Value2)|/(AVERAGE(Value1+Value2)))*100

where:
Value1=matrix spike value
Value2=matrix spike duplicate value.

According to the Rivers QAPP for metal, organic, and cyanotoxin analyses, at least one MS/MSD pair should be performed per 20 samples or one per batch, whichever is more frequent. The required frequency was met for all 43 batches.

For the accuracy data validation, only samples in a quantitative range should be used for evaluation of accuracy, as non-quantitative results may be lucky passes or unlucky fails rather than true indications of the ability for the analysis to accurately determine concentrations

- For any of the accuracy QC samples, Expected Value must be at least 1xRL, otherwise it shouldn't be used.
- Additionally for MS/MSDs, the Matrix Spike Expected Value should be greater than or equal to 3x the Native Field Result.

Similar to the case for evaluating accuracy, only results in a usable quantitative range should be used to calculate precision.

- Check for each sample (pair or set) analyzed in replicate that the average result is greater than (>) 1 times the RL. If the average result is greater than (>) 1 times the RL then include RPD or RSD in lab tests submission evaluation. Otherwise that set of sample replicates is not quantitative and thus not usable.

Laboratory batches with MS/MSD %R and RPD values within the quantitative range and outside of acceptance criteria were either classified as “compliant” or “qualified” based on the number of QC elements outside the acceptance criteria. No data were rejected. In several organochlorine pesticide and PCB batches, MS/MSD %Rs and RPDs were not reported because the native concentrations were greater than 2X the spiked concentration and the lab was unable to calculate these values. Since the non-reported results were not validated, they were classified as “not applicable.” Values outside the acceptance criteria are presented in Table 3. All other MS/MSD %Rs and RPDs were within acceptance criteria.

Certified Reference Materials and Laboratory Control Samples

A CRM or LCS is analyzed to assess the accuracy of a given analytical method. As required by the Rivers QAPP, one CRM or LCS should be analyzed per 20 samples or per batch, whichever is more frequent. The required frequency was met with the exception of 2 out of 43 (4.65%) batches. An LCS was not performed for batches WPCL_L-403-484-11_BS659_T_OCH and WPCL_L-403-484-11_BS659_T_PCB. These batches were classified as “qualified” Table 4.

For the accuracy data validation, only samples in a quantitative range should be used for evaluation of accuracy, as non-quantitative results may be lucky passes or unlucky fails rather than true indications of the ability for the analysis to accurately determine concentrations

- For any of the accuracy QC samples, Expected Value must be at least 1xRL, otherwise it shouldn't be used.

Laboratory batches with CRM or LCS %R values within the quantitative range and outside of acceptance criteria were classified as “compliant” or “qualified” based on the number of QC

elements outside criteria. No data were rejected. These are presented in Table 5. All other CRM and LCS %Rs were within acceptance criteria.

Laboratory Duplicates

A laboratory duplicate (DUP) is analyzed to assess laboratory precision. As required by the Rivers QAPP, a duplicate of at least one field sample per batch was processed and analyzed. The required frequency was met with the exception of 9 out of 43 (20.9%) batches. A laboratory dup was not performed for any of the cyanotoxin batches. These batches were classified as "qualified" (Table 6).

Similar to the case for evaluating accuracy, only results in a usable quantitative range should be used to calculate precision.

- Check for each sample (pair or set) analyzed in replicate that the average result is greater than (>) 1 times the RL. If the average result is greater than (>) 1 times the RL then include RPD or RSD in lab tests submission evaluation. Otherwise that set of sample replicates is not quantitative and thus not usable.

The duplicate results reported above the method limit (ML) were compared and an RPD was calculated as described in the MS/MSD Section. Results reported below the ML or as "non-detect" in either the parent sample or duplicate were not evaluated as stated in the Rivers QAPP. All RPDs within the quantitative range were <25% and were classified as compliant as specified in the QAPP.

Holding Times

Twenty-two percent of the results (2,287 out of 10,483 total results) in 695 tissue composites were outside the holding time criteria. Of the 2,287 results, 168 were classified as "estimated" since the holding time was exceeded by more than three times. Results were from composites that were archived beyond the 1 year holding time. The analysis of these composites was approved by the project lead. The remaining 2,119 results were classified as "qualified". Fifty-eight tissue samples analyzed for organochlorine pesticides, PCBs, and cyanotoxins did not meet either the 12 month holding time criteria between collection and extraction or the 40 day holding time criteria from extraction to analysis. Five tissue samples analyzed for selenium and mercury exceeded the 12 month holding time criteria between collection and analysis.

QA/QC Summary

Were the samples prepared and analyzed in a manner free from significant contamination?

Review of lab blanks shows that 0.62% (65 out of 10,483) of the results are unusable because levels are <3X the concentration detected in the method blank. The remaining 10,418 (99.4%) results are unaffected. Overall, the samples were prepared and analyzed in a manner free from significant contamination.

How accurate and precise are the results of the samples?

Review of spiked QC samples shows that all results are usable although there were percent recovery exceedances. Review of duplicate QC samples shows that all results are usable although there were relative percent difference exceedances. Overall, 100% of the data generated by laboratories met the accuracy and precision objectives.

Overall Summary

There were 10,483 sample results for individual constituents including tissue composites and laboratory QA/QC samples. Of these:

- 6,875 (65.6%) were classified as “compliant”
- 2,801 (26.7%) were classified as “qualified”
- 168 (1.7 %) were classified as “estimated”
- 395 (3.77%) were classified as “screening”
- 65 (0.62%) were classified as “rejected”; and
- 179 (1.7%) were classified as “NA”, since either the results were not reported due to high native concentrations and could not be validated or since age results were not verified but presented for informational purposes.

Classification of this dataset is summarized as follows:

- 65 results were classified as “rejected” and 11 results were classified as “qualified” due to blank contamination values.
- 85 results were classified as “qualified” due to surrogate recovery exceedances presented in Table 2.
- 24 results were classified as “qualified” due to recovery exceedances presented in Tables 3 and 5.
- 7 results were classified as “qualified” due to the RPD exceedances presented in Table 3.
- All data presented in Tables 4 and 6 were classified as “qualified” due to insufficient QC samples performed.

- 2,119 results were classified as “qualified” due to holding time exceedances.
- 168 results were classified as “estimated” due to holding time exceedances.
- 395 results were classified as “screening” since QC standards are not available and compound identification was based on retention time, molecular weights, qualifier ions, and ion ratios.

Data that meet all MQOs as specified in the QAPP are classified as “compliant” and considered usable without further evaluation. Data that fail to meet all program MQOs specified in the Rivers QAPP were classified as qualified but considered usable for the intended purpose. Data that are >2X MQO requirements or the result of blank contamination were classified as “rejected” and considered unusable. Data batches where results were not reported and therefore not validated were classified as not applicable.

All data with the exception of the 65 rejected results were considered usable for the intended purpose. A 99% completeness level was attained, which met the 90% project completeness goal specified in the Rivers QAPP.

Table 1. Percent recovery and relative percent difference acceptance criteria for different categories of analytes in fish tissue**.**

Analyte Category	**% Surrogate Recovery Acceptance Criteria**	**% MS/MSD Recovery Acceptance Criteria**	**% CRM, LCM, & LCS Acceptance Criteria**	**Relative % Difference Criteria (MS/MSD, Laboratory Duplicate, Field Duplicate)**
Trace Metals (Including Mercury)	NA	75-125	75-125	RPD <25%; n/a if concentration of either sample <RL
Synthetic Organics (PCBs, OCHs, OPs, Triazines, Phenols, VOCs,)	50-150	50-150	50-150, if certified then 70-130	RPD <25%; n/a if concentration of either sample <RL
Algal Toxins (Cyanotoxin)	NA	50-150	CRM is not available for microcystins. 50-150% recovery for selected spiked target analytes.	RPD <25%; n/a if concentration of either sample <RL

Table 2. Surrogate recoveries that did not meet quality control acceptance criteria**.**

Surrogate	**Composite ID**	**Batch ID**	**% Recovery**	**Laboratory**
DBCE(Surrogate),Total % recovery	L-078-12_BS 669_SRM 1946	WPCL_L-078-12_BS669_T_OCH	151	DFG-WPCL
DBCE(Surrogate),Total % recovery	L-403-11_BS 659_MethodBlank	WPCL_L-403-484-11_BS659_T_OCH	166	DFG-WPCL
DDD(p,p')(Surrogate),Total % recovery	L-403-11_BS 659_MethodBlank	WPCL_L-403-484-11_BS659_T_OCH	186	DFG-WPCL
PCB 209(Surrogate),Total % recovery	L-403-11_BS 659_MethodBlank	WPCL_L-403-484-11_BS659_T_PCB	196	DFG-WPCL

Table 3. Matrix spikes (MS), matrix spike duplicates (MSD), percent recoveries (%R), and relative percent differences (RPD) that did not meet specified criteria. Boldface type indicates values that did not meet quality control criteria**.**

Analyte	Composite ID	Sample Date	Batch ID	MS %R	MSD %R	RPD	Lab
Various Analytes	C1_114LDSRORBOG 11CAR	2/2/2011	WPCL_L-478-11_BS648_T_OCH	NC	NC	NC	DFG-WPCL
Various Analytes	NPJC_NTH-SW002_DFG-WPCL	4/19/2011	WPCL_L-360-11_BS644_T_OCH	NC	NC	NC	DFG-WPCL
Endrin,Total g/g ww	C1_106TRWILCBOG 11BNT	03-Aug-11	WPCL_L-078-12_BS669_T_OCH	**34.5**	**23.5**	**39**	DFG-WPCL
Endosulfan I,Total ng/g ww	C1_114LDSRORBOG 11CAR	02-Feb-11	WPCL_L-478-11_BS648_T_OCH	**42.4**	**40.3**	5.6	DFG-WPCL
Selenium,Total ug/g ww	C1_537MCRBBBBO G11SMB	06-Sep-11	MPSL-DFG_2012Dig09_T_Se	91.4	**126**	**29.9**	MPSL-DFG
PCB 056,Total ng/g ww	NPJC_American River Trout_DFG-WPCL	12-Jul-11	WPCL_L-478-11_BS710_T_PCB	**175**	**171**	2	DFG-WPCL
PCB 060,Total ng/g ww	NPJC_American River Trout_DFG-WPCL	12-Jul-11	WPCL_L-478-11_BS710_T_PCB	**157**	**154**	0.96	DFG-WPCL
PCB 074,Total ng/g ww	NPJC_American River Trout_DFG-WPCL	12-Jul-11	WPCL_L-478-11_BS710_T_PCB	**154**	**151**	1.6	DFG-WPCL
PCB 077,Total ng/g ww	NPJC_American River Trout_DFG-WPCL	12-Jul-11	WPCL_L-478-11_BS710_T_PCB	**154**	**161**	4.8	DFG-WPCL
PCB 105,Total ng/g ww	NPJC_American River Trout_DFG-WPCL	12-Jul-11	WPCL_L-478-11_BS710_T_PCB	**172**	**16**	6.2	DFG-WPCL
PCB 114,Total ng/g ww	NPJC_American River Trout_DFG-WPCL	12-Jul-11	WPCL_L-478-11_BS710_T_PCB	146	**158**	8.3	DFG-WPCL
PCB 118,Total ng/g ww	NPJC_American River Trout_DFG-WPCL	12-Jul-11	WPCL_L-478-11_BS710_T_PCB	**178**	**178**	0.26	DFG-WPCL
PCB 126,Total ng/g ww	NPJC_American River Trout_DFG-WPCL	12-Jul-11	WPCL_L-478-11_BS710_T_PCB	**166**	**159**	3.7	DFG-WPCL
PCB 128,Total ng/g ww	NPJC_American River Trout_DFG-WPCL	12-Jul-11	WPCL_L-478-11_BS710_T_PCB	**158**	**155**	0.95	DFG-WPCL
PCB 137,Total ng/g ww	NPJC_American River Trout_DFG-WPCL	12-Jul-11	WPCL_L-478-11_BS710_T_PCB	**166**	**164**	0.92	DFG-WPCL
PCB 141,Total ng/g ww	NPJC_American River Trout_DFG-WPCL	12-Jul-11	WPCL_L-478-11_BS710_T_PCB	**153**	150	0.99	DFG-WPCL
PCB 146,Total ng/g ww	NPJC_American River Trout_DFG-WPCL	12-Jul-11	WPCL_L-478-11_BS710_T_PCB	**152**	**153**	1.3	DFG-WPCL
PCB 153,Total ng/g ww	NPJC_American River Trout_DFG-WPCL	12-Jul-11	WPCL_L-478-11_BS710_T_PCB	**161**	**159**	0.55	DFG-WPCL
PCB 158,Total ng/g ww	NPJC_American River Trout_DFG-WPCL	12-Jul-11	WPCL_L-478-11_BS710_T_PCB	**152**	**156**	3.3	DFG-WPCL
PCB 187,Total ng/g ww	NPJC_American River Trout_DFG-WPCL	12-Jul-11	WPCL_L-478-11_BS710_T_PCB	**152**	**151**	0.32	DFG-WPCL

Table 4. Batches for which reference material (CRM) or laboratory control spike (LCS) were not run.

Analyte	Batch ID	Notes	Laboratory
Organochlorine Pesticides	WPCL_L-403-484-11_BS659_T_OCH	QAO: no LCS	DFG-WPCL
Polychlorinated Biphenyls	WPCL_L-403-484-11_BS659_T_PCB	QAO: no LCS	DFG-WPCL

Table 5. Batches containing certified reference material (CRM) or laboratory control spike (LCS) outside of acceptance criteria**.**

Analyte	Composite ID	Batch ID	% Recovery	Laboratory
Chlordane, cis-,Total ng/g ww	L-078-12_BS 669_SRM 1946	WPCL_L-078-12_BS669_T_OCH	60	DFG-WPCL
Chlordane, trans-,Total ng/g ww	L-078-12_BS 669_SRM 1946	WPCL_L-078-12_BS669_T_OCH	64.2*	DFG-WPCL
DDD(p,p'),Total ng/g ww	L-078-12_BS 669_SRM 1946	WPCL_L-078-12_BS669_T_OCH	26.6	DFG-WPCL
DDT(p,p'),Total ng/g ww	L-078-12_BS 669_SRM 1946	WPCL_L-078-12_BS669_T_OCH	64.2*	DFG-WPCL
Hexachlorobenzene,Total ng/g ww	L-078-12_BS 669_SRM 1946	WPCL_L-078-12_BS669_T_OCH	61.5	DFG-WPCL
Nonachlor, cis-,Total ng/g ww	L-078-12_BS 669_SRM 1946	WPCL_L-078-12_BS669_T_OCH	58.9	DFG-WPCL
PCB 128,Total ng/g ww	L-078-12_BS 669_SRM 1946	WPCL_L-078-12_BS669_T_PCB	138*	DFG-WPCL
PCB 146,Total ng/g ww	L-078-12_BS 669_SRM 1946	WPCL_L-078-12_BS669_T_PCB	69.8*	DFG-WPCL
PCB 149,Total ng/g ww	L-078-12_BS 669_SRM 1946	WPCL_L-078-12_BS669_T_PCB	133*	DFG-WPCL
PCB 206,Total ng/g ww	L-078-12_BS 669_SRM 1946	WPCL_L-078-12_BS669_T_PCB	133*	DFG-WPCL
PCB 146,Total ng/g ww	L-248-330-11_BS 644_SRM 1946	WPCL_L-330-11_BS644_T_PCB	47.5	DFG-WPCL
Chlordane, trans-,Total ng/g ww	L-248-360-11_BS 644_SRM 1946	WPCL_L-360-11_BS644_T_OCH	55	DFG-WPCL
DDD(p,p'),Total ng/g ww	L-248-360-11_BS 644_SRM 1946	WPCL_L-360-11_BS644_T_OCH	35	DFG-WPCL
DDT(o,p'),Total ng/g ww	L-248-360-11_BS 644_SRM 1946	WPCL_L-360-11_BS644_T_OCH	30.1	DFG-WPCL
HCH, alpha ,Total ng/g ww	L-248-360-11_BS 644_SRM 1946	WPCL_L-360-11_BS644_T_OCH	64.7*	DFG-WPCL
HCH, gamma,Total ng/g ww	L-248-360-11_BS 644_SRM 1946	WPCL_L-360-11_BS644_T_OCH	51.3	DFG-WPCL
Hexachlorobenzene,Total ng/g ww	L-248-360-11_BS 644_SRM 1946	WPCL_L-360-11_BS644_T_OCH	52.8	DFG-WPCL
Mirex,Total ng/g ww	L-248-360-11_BS 644_SRM 1946	WPCL_L-360-11_BS644_T_OCH	44.8	DFG-WPCL
Nonachlor, cis-,Total ng/g ww	L-248-360-11_BS 644_SRM 1946	WPCL_L-360-11_BS644_T_OCH	69.2*	DFG-WPCL
DDD(p,p'),Total ng/g ww	L-403-11_BS 659_SRM 1946	WPCL_L-403-484-11_BS659_T_OCH	44.4	DFG-WPCL
Heptachlor epoxide,Total ng/g ww	L-403-11_BS 659_SRM 1946	WPCL_L-403-484-11_BS659_T_OCH	139	DFG-WPCL
PCB 146,Total ng/g ww	L-403-11_BS 659_SRM 1946	WPCL_L-403-484-11_BS659_T_PCB	58.5	DFG-WPCL
DDD(p,p'),Total ng/g ww	L-478-11_BS 648_SRM 1946	WPCL_L-478-11_BS648_T_OCH	47.5	DFG-WPCL
Heptachlor epoxide,Total ng/g ww	L-478-11_BS 648_SRM 1946	WPCL_L-478-11_BS648_T_OCH	142	DFG-WPCL
Mirex,Total ng/g ww	L-478-11_BS 648_SRM 1946	WPCL_L-478-11_BS648_T_OCH	61.5	DFG-WPCL
PCB 146,Total ng/g ww	L-478-11_BS	WPCL_L-478-	56.1	DFG-WPCL

Analyte	Composite ID	Batch ID	% Recovery	Laboratory
	648_SRM 1946	11_BS648_T_PCB		
PCB 095,Total ng/g ww	L-478-11_BS 710_SRM 1946	WPCL_L-478-11_BS710_T_PCB	144*	DFG-WPCL
PCB 099,Total ng/g ww	L-478-11_BS 710_SRM 1946	WPCL_L-478-11_BS710_T_PCB	139*	DFG-WPCL
PCB 105,Total ng/g ww	L-478-11_BS 710_SRM 1946	WPCL_L-478-11_BS710_T_PCB	140	DFG-WPCL
PCB 110,Total ng/g ww	L-478-11_BS 710_SRM 1946	WPCL_L-478-11_BS710_T_PCB	165	DFG-WPCL
PCB 118,Total ng/g ww	L-478-11_BS 710_SRM 1946	WPCL_L-478-11_BS710_T_PCB	131*	DFG-WPCL
PCB 128,Total ng/g ww	L-478-11_BS 710_SRM 1946	WPCL_L-478-11_BS710_T_PCB	131*	DFG-WPCL
PCB 146,Total ng/g ww	L-478-11_BS 710_SRM 1946	WPCL_L-478-11_BS710_T_PCB	67.1*	DFG-WPCL
PCB 153,Total ng/g ww	L-478-11_BS 710_SRM 1946	WPCL_L-478-11_BS710_T_PCB	135*	DFG-WPCL
PCB 156,Total ng/g ww	L-478-11_BS 710_SRM 1946	WPCL_L-478-11_BS710_T_PCB	137*	DFG-WPCL
PCB 180,Total ng/g ww	L-478-11_BS 710_SRM 1946	WPCL_L-478-11_BS710_T_PCB	64.1	DFG-WPCL
PCB 183,Total ng/g ww	L-478-11_BS 710_SRM 1946	WPCL_L-478-11_BS710_T_PCB	132*	DFG-WPCL
PCB 187,Total ng/g ww	L-478-11_BS 710_SRM 1946	WPCL_L-478-11_BS710_T_PCB	132*	DFG-WPCL
PCB 194,Total ng/g ww	L-478-11_BS 710_SRM 1946	WPCL_L-478-11_BS710_T_PCB	155	DFG-WPCL
PCB 206,Total ng/g ww	L-478-11_BS 710_SRM 1946	WPCL_L-478-11_BS710_T_PCB	151	DFG-WPCL
DDD(p,p'),Total ng/g ww	L-571-11_BS 675_SRM 1946	WPCL_L-571-11_L-024-12_BS675_T_OCH	46.8	DFG-WPCL
PCB 146,Total ng/g ww	L-571-11_BS 675_SRM 1946	WPCL_L-571-11_L-024-12_BS675_T_PCB	55.5	DFG-WPCL

Note: *%R were outside the MQO but inside the CRM manufacturer range

Table 6. Batches for which laboratory duplicate (DUP) were not run**.**

Analyte	Batch ID	Notes	Laboratory
Cyanotoxins	WPCL_L-061-12_T_CYTOX	QAO: no lab dup	DFG-WPCL
Cyanotoxins	WPCL_L-061-12MCY_T_CYTOX	QAO: no lab dup	DFG-WPCL
Cyanotoxins	WPCL_L-062-12_T_CYTOX	QAO: no lab dup	DFG-WPCL
Cyanotoxins	WPCL_L-062-12MCY_T_CYTOX	QAO: no lab dup	DFG-WPCL
Cyanotoxins	WPCL_L-078-12MCY_T_CYTOX	QAO: no lab dup	DFG-WPCL
Cyanotoxins	WPCL_L-087-12_Pg285_T_CYTOX	QAO: no lab dup	DFG-WPCL
Cyanotoxins	WPCL_L-087-12_Pg285MCY_T_CYTOX	QAO: no lab dup	DFG-WPCL
Cyanotoxins	WPCL_L-087-12_Pg286_T_CYTOX	QAO: no lab dup	DFG-WPCL
Cyanotoxins	WPCL_L-087-12_Pg286MCY_T_CYTOX	QAO: no lab dup	DFG-WPCL