TIERRA SOLUTIONS, INC. SM

Transmitted Via Electronic Mail

June 23, 2016

Ms. Alice Yeh
Remedial Project Manager
U.S. Environmental Protection Agency, Region II
Emergency and Remedial Response Division
290 Broadway, 19th Floor
New York, NY 10007-1866

Re: Combined Sewer Overflow/Stormwater Outfall Program Phase I, Data Quality and Usability and Assessment Report

Dear Ms. Yeh:

Please find enclosed the *CSO/SWO Phase I Data Quality Usability and Assessment Report (DQUAR), Revision 2* dated June 23, 2016 and prepared in accordance with Worksheet #33 of the Combined Sewer Overflow (CSO) /Stormwater Outfall (SWO) Quality Assurance Project Plan (QAPP). Revision 2 of the DQUAR incorporates changes resulting from comments contained in the following documents:

- *Phase I Data Usability Report Aug. 2014- EPA Comments* - USEPA provided initial comments on the DQUAR on August 6th, 2015.
- *Tierra Responses to USEPA Comments on DQUAR_Final 09.18.15* – Tierra submitted a Response to Comment (RTC) document on September 18, 2015, which provided responses to USEPA comments received on August 6th, 2015.
- *CDM Smith Comments_CSO-SWO Phase I Tierra Response to Comments* – CDM Smith (EPA Contractor) submitted final comments to the DQUAR on November 12, 2015.
- *Revised Report Review 5/6/2016*- CDM Smith submitted comments on Revision 1 of the DQUAR submitted April 1, 2016.

If you have any questions regarding the attached report, please feel free to contact me at 732-246-5920.

Sincerely,

Brian Mikucki

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East Brunswick, NJ 08816

Senior Environmental Scientist
On behalf of Occidental Chemical Corporation
(as successor to Diamond Shamrock Chemicals Company)

Enclosures

Cc: Enrique Castro, Tierra Solutions, Inc.
Diane Waldschmidt, Environmental Data Services

p l Ip l f

Lower Passaic River Study Area

Phase I Data Quality Usability Assessment Report

Prepared For

p If
East Brunswick, NJ

Prepared By

b a p Ii

June 2016

Revision 2

TABLE OF CONTENTS

1 Background 1
2 Introduction 1
3 Data Quality Parameters Overview 1
3.1 Precision 2
3.2 Accuracy/Bias Contamination 4
3.3 Overall Accuracy/Bias 5
3.4 Sensitivity 6
3.5 Representativeness 15
3.6 Comparability 16
3.7 Completeness 17
4 Phase I CSO/SWO Investigation Data Verification/Validation 21
4.1 Data Quality Issues 21
4.1.1 Whole Water Samples Data Quality Issues 22
4.1.2 Whole Water Samples Systematic and Random Data Quality Issues by Analytical Group 22
4.1.3 Low Solids Mass Samples Systematic Data Quality Issues 30
4.1.4 Low Solids Mass Samples Systematic and Random Data Quality Issues by Analytical Group 31
4.1.5 High Solids Mass Samples Systematic Data Quality Issues 41
4.1.6 High Solids Mass Samples Systematic and Random Data Quality Issues by Analytical Group 41
4.1.7 Grab Water Samples Systematic Data Quality Issues 57
4.1.8 Grab Water Samples Systematic and Random Data Quality Issues by Analytical Group 57
5 Total Tetrachlorinated Debenzo-p-Dioxin Verification 60
6 Conclusions 61
7 References 61

1

In 2013 the United States Environmental Protection Agency (USEPA) approved a Quality Assurance Project Plan (QAPP) prepared by Tierra Solutions, Inc. (Tierra) for the investigation and characterization of combined sewer overflows (CSOs) and storm water outfalls (SWOs). The CSO/SWO Investigation QAPP, Revision 3 (Tierra, 2013) (hereafter referred to as the QAPP) outlined a two phased program – Phase I being a limited sampling effort with the objective of evaluating alternative sampling approaches and Phase II being a more fulsome sampling effort incorporating more overflows and outfalls.

The Phase I activities, conducted between June 10th, 2013 and May 5th, 2014, consisted of the collection and analysis of two CSO effluent samples using three approaches to sample collection: low solids mass (LSM), high solids mass (HSM) and whole water. Data collected will be evaluated to inform the selection of the most appropriate sampling approach to quantify contaminants in the solid (particulate), dissolved, and whole water-phases during Phase II. The Phase I CSO effluent samples were collected at the Clay Street CSO location (described in Table 3-1 of the QAPP) and distributed to multiple laboratories for analyses. Validation of the sample analytical results was completed on July 14th, 2014. According to Worksheet #33 of the QAPP, (Tierra, 2013) a Data Quality Usability Assessment Report (DQUAR) must be completed within 40 days of the conclusion of validation tasks.

2 f

In accordance with requirements of the QAPP, the data quality usability assessment was conducted on both verified and validated data; this DQUAR provides a summary of the documentation and evaluation of data quality and usability for sample data collected during the implementation of Phase I of the CSO/SWO Investigation. The data verification and data validation processes are described respectively in Worksheets #34 and #35 of the QAPP. The information presented in this document will be used as part of the final Phase I evaluation that will determine the sampling method for each analytical group that will provide the greatest percentage of useable data to meet program data use and data quality objectives.

Worksheet #37 of the QAPP provides description of the components of the DQUAR. These components are described in detail in subsequent sections of this report.

3 a n m l

To assess whether the analytical data obtained were consistent with the objectives of the QAPP, seven data quality parameters were evaluated. In the event that the data verification/validation process identified an instance where any of the data quality parameters did not meet the objectives established in the QAPP, the affected sample results were evaluated in accordance with the data verification/validation protocols specified in Worksheet #35 of the QAPP and documented accordingly. A detailed narrative describing the verification/validation assessments and findings can be found within the data verification/validation data assessment narratives prepared for each data package.

The seven data quality parameters assessed included the following:

- precision;
- accuracy/bias contamination;
- overall accuracy/bias;
- sensitivity;
- representativeness;
- comparability; and
- completeness.

Each of these data quality parameters, as it relates to Phase I of the QAPP program, is discussed below.

3 1 m

Precision is the measure of variability between individual sample measurements of the same property under similar conditions. During the CSO/SWO Investigation program, precision was evaluated through the analysis of two types of duplicate samples. Field and laboratory duplicates were analyzed at regular, specified intervals throughout the CSO/SWO Investigation program.

Field duplicates consisted of samples that were collected in the field at the frequency specified in the QAPP in order to determine the precision of field sampling methods. These samples were homogenized (except for those to be analyzed for volatile organic compounds [VOCs]), split into two distinct samples, and submitted "blind" to the analytical laboratories for analysis (i.e., the sample identification did not reveal the sample with which its field duplicate was associated).

Relative percent differences (RPDs) between the field sample results and the field duplicate results provide an estimate of the overall sampling and analytical precision.

Laboratory duplicates are two portions of a single homogeneous sample that are analyzed for the same parameter in order to determine the precision of the analytical system. Two types of laboratory duplicates were prepared. Laboratory duplicates without known analyte spikes added were analyzed to monitor laboratory precision for cyanide, total organic carbon (TOC), total suspended solids (TSS), and total dissolved solids (TDS) analyses, while matrix spike (MS) and matrix spike duplicate (MSD) evaluations were performed to monitor laboratory precision for the remaining analysis types. Laboratory duplicates were analyzed at the frequency specified in QAPP. The RPD between results obtained for a given laboratory duplicate pair provides an estimate of analytical precision.

The precision assessment for field and laboratory duplicate analyses is expressed as the RPD:

$$RPD = \frac{|S - D|}{\frac{S + D}{2}} \times 100$$

where: S = original sample concentration
D = duplicate sample concentration

Acceptance criteria for field and laboratory duplicates are pro vided in Worksheet #12 of the QAPP. Conformance to laboratory duplicate frequency requirements, aswell as acceptability of the resulting RPD values, were evaluated and considered during data validation.

Although laboratory duplicate analyses are used as indicators of relative precision of the analytical systems, the degree of homogeneity of the contaminants in the sample medum can also affect the reproducibility of a particular measurement. For example, pieces of decayed wood debris, chunks of asphalt, glass, free product, etc., can increase sample heterogeneity and thereforecan reduce the laboratory technician's ability to create homogeneous duplicate samples with which to measure p recision. Since the sample matrix characteristics can affect the way precision is measured, the s ample matrix should be considered by the validator.

With respect to the results of th e Phase I CSO/SWO Investigatio n data, there are no limitations on data usage based on precision quality acceptance criteria. The following table summarizes the Phase I precision quality evaluation by analytical group and sampling technique. The "x" designation indicates that an issue was identified however, such issue does not infer that the data is unusable. A more detailed discussion of this data quality parameter evaluation is provided in Section 4.1 of this report.

m				
d	t t	i pj	e pj	d t
Semivolatile Organics	x	x	x	-
Volatile Organics (trace)		-	x	-
Aroclor PCBs				-
Organochlorine Pesticides		x	x	-
Semivolatile Organics (SIM)		x	x	-
Metals		-	-	x
Mercury	x	-	-	
Methylmercury		-	-	
Cyanide		-	x	-
PCDD/PCDFs	x	x	x	-
PCB Congeners	x	x	x	-
Chlorinated Herbicides	x	x	x	-
TOC/POC/DOC				-
TEPH	x	-	x	-
TSS	x		x	
TDS				
Grain Size		-	-	-

- = analysis was not performed for this analytical group
x = data qualified during validation for this analytical group

3 2 L

Accuracy parameters were also assessed with respect to contamin ation through the use of field and laboratory blanks. Any contamin ation present in field or labor atory blanks reflects the potential for contamination in associated samples. Measurement performance criteria for accuracy/bias contamination are outlined in Worksheet #12 of the QAPP. Acceptability of quality control (QC) results for accuracy/bias contamination and conformance to field and laboratory QC samplefrequency requirements were evaluated and considered during the data verification/validation.

With respect to the results of the Phase I CSO/SWO Investigation data, there are no limitations on the data usage based on accuracy/bias contamination acceptance criteria. The following table summarizes the Phase I accuracy/bias contamination quality evaluation by analytical group and sampling technique. The "x" designation indicates that an issue was identified however, suc h issue does not infer that the data is unusable. A more detailed discussion of this data quality parameter evaluation is provided in Section 4.1 of this report.

L				
d	t t	i pj	e pj	d t
Semivolatile Organics	x	x	x	-
Volatile Organics (trace)		-	x	-
Aroclor PCBs				-
Organochlorine Pesticides	x	x	x	-
Semivolatile Organics (SIM)	x	x	x	-
Metals	x	-	-	x
Mercury		-	-	
Methylmercury		-	-	
Cyanide	x	-	x	-
PCDD/PCDFs	x	x	x	-
PCB Congeners	x	x	x	-
Chlorinated Herbicides	x	x	x	-
TOC/POC/DOC	x	x	x	-
TEPH		-	x	-
TSS			x	
TDS	x		x	
Grain Size		-	-	-

- = analysis was not performed for this analytical group
x = data qualified during validation for this analytical group

3 3 1 L

Accuracy is a measure of the bias and precision in a system, and is defined as the agreement between a measurement and an accepted reference or true value. Pre-mobilization performance evaluation samples were analyzed prior to initiating field work. Documentation of successful analysis of the performance evaluation samples was provided to the United States Environmental Protection Agency (USEPA) by Tierra Solutions, Inc, in letters dated May 25 and October 31, 2012. Accuracy was monitored during the CSO/SWO Investigation program through the analysis of MSs, surrogate spikes, and laboratory control samples (LCSs) (performed at regular, specified intervals).

As outlined in the QAPP, the analysis of MS samples and LCSs provide laboratory results that may be compared to their associated known values to monitor potential bias. The MS and surrogate spike evaluations were used to assess bias by monitoring the actual recovery of a known quantity of a chemical, added to the native sample, versus the expected recovery. The LCS evaluations were used to assess bias by monitoring the actual recovery of a known quantity of a chemical, added to a blank, versus the expected recovery.

Acceptance criteria for each of the Accuracy evaluations described above are provided in Worksheet #12 of the QAPP. Conformance to laboratory QC sample frequency requirements, as well as acceptability of QC results for accuracy, were evaluated and considered during data verification/validation.

Data for several analytical groups associated with multiple sampling techniques was determined to be unusable due to severe accuracy/bias issues. The following table summarizes the Phase I overall accuracy/bias quality evaluation by analytical group and sampling technique. The "x" designation indicates that an issue was identified however, such issue does not infer that the data is unusable. A more detailed discussion of this data quality parameter evaluation is provided in Section 4.1 of this report.

l L f				
d	t t	i pj	e pj	d t
Semivolatile Organics	x	x	x	-
Volatile Organics (trace)		-	x	-
Aroclor PCBs	x		x	-
Organochlorine Pesticides	x	x	x	-
Semivolatile Organics (SIM)	x	x	x	-
Metals		-	-	
Mercury		-	-	
Methylmercury		-	-	
Cyanide		-	x	-
PCDD/PCDFs	x	x	x	-
PCB Congeners	x	x	x	-
Chlorinated Herbicides	x	x	x	-
TOC/POC/DOC			x	-
TEPH	x	-	x	-
TSS				
TDS				
Grain Size		-	-	-

- = analysis was not performed for this analytical group
x = data qualified during validation for this analytical group

3 4 p

Sensitivity is related to the ability to compare analytical res ults with project quantitation limits (PQLs). Analytical detection limits should be at or below the PQLs to a llow effective comparisons. All sample analytical results reported during Phase I of the CSO/SWO Inves tigation were evaluated to determine if adequate sensitivity was achieved. The results for each analyt e were cross-checked against the PQLs presented in Worksheet #15 of the QAPP. The tables in Section 3.4.1 below summarize the percent of sample results that did not meet the data quality objectives as defined by the QAPP. The percentages expressed in these tables indicate the fraction of the total nu mber of results reported for each analytical group and sampling technique where reporting limits exceeded the PQLs.

With respect to the results of the Phase I CSO/SWO Investigation data, there are no limitations on the data usage based on sensitivity accep tance criteria. A more detaile d discussion of this data quality parameter evaluation is provided in Section 3.4.1.

3 4 1 p

The fact that data obtained for a particular sample type/collection technique failed to meet established PQLs for specific analytical groups as indicated in the tables below, may have impacted the number of positive results identified in those samples, thereby potentially impacting the data evaluation process. Following each table is a discussion of the analytical groups for which failure to meet the PQLs, may have impacted the Phase I data evaluation process.

t t

3 1
m 1 p n b t t p

d	k o o	k mi d a pl lpt l n mm	a o j ai (bai) b mi	m o a n l a pl lpt l n mmmi
Polychlorinated dibenzo-*p*-dioxins and dibenzofurans (PCDD/PCDFs)	102	7	42	48
Polychlorinated biphenyl (PCB) Congeners	1,008	423	77	50
Organochlorine Pesticides	112	4	8	11
Semivolatile Organics (SVOC) Selective Ion Monitoring (SIM)	120	4	4	6.7
Semivolatile Organics	200	180	7	94
Metals	92	0	7	7.6
Mercury	4	0	0	0
Methyl Mercury	4	0	0	0
VOCs	24	0	4	17
Aroclor PCBs	36	0	0	0
Chlorinated Herbicides	24	0	2	8.3
Cyanide	4	0	0	0
TOC	4	0	0	0
Total Extractable Petroleum Hydrocarbons (TEPH)	4	0	0	0
TSS	4	0	0	0
TDS	4	0	0	0

Each analyte group was further evaluated to determine when and if the failure to meet the PQLs may have impacted the number of positive results used to determine the r ecommended sample collection method during the Phase I evaluation process. For all analytical group s, the detected results between the method detection limit/estimated detection limit (MDL/EDL) and the ele vated PQL were included as positive results when determining the recommended sample collection method. Therefore, although the established PQLs were not met in those cases, there is no impact to the outcome of the data evaluation process.

For the whole water (WW) PCDD/PCDF results, PQLs identified in Table 3-1 above as greater than those defined in the QAPP, all seven non-detected results were obtained from Event #1, Attempt #1, which was not included in the sample evaluation process. Therefore there was no impact on the recommended sample collection method determination.

For the WW PCB Congener results, PQLs identified in Table 3-1 above as greater than those defined in the QAPP were only marginally exceeded due to either sample dilution prior to analyses or slightly less than targeted sample volume used for analysis. A total of 258 non-detected results were reported above the PQL for Event #2, Attempt #2 and Event #1, Attempt #3, 20 of which were contaminants of potential concern/contaminants of potential ecological concern (COPCs/COPECs). Detection of COPCs/COPECs is prioritized when determining the recommended sample collection method, therefore these non-detected results may have impacted the number of positive COPCs/COPECs results identified, and could have affected the selection of a sample collection method. The remaining non-detected results reported above the PQL were obtained from Event #1, Attempt #1 and were not included in the evaluation process.

For the WW Organochlorine Pesticide results, PQLs identified in Table 3-1 above as greater than those defined in the QAPP were only marginally exceeded due to either sample dilution prior to analyses or slightly less than targeted sample volume used for analysis. A total of four non-detected results were reported above the PQL, all from Event #1, Attempt #2. None of these non-detected results were COPCs/COPECs, further, had the four results been positive it would not have made a significant difference in the total number of positive analytes detected. Therefore, the non-detected results did not influence the selection of a sample collection method.

For the WW SVOC SIM results, PQLs identified in Table 3-1 above as greater than those defined in the QAPP were marginally exceeded due to sample dilution prior to analysis. A total of four non-detected results were reported above the PQL for Event #1, Attempt #2 and Event #2, Attempt #2. Had the four results been positive it would not have made a significant difference in the total number of positive results reported (COPCs/COPECs or otherwise) and therefore the selection of a sample collection method was not impacted.

For the WW SVOC results, PQLs identified in Table 3-1 above as greater than those defined in the QAPP were exceeded to varying degrees, due to either sample dilution prior to analysis, or use of less than targeted sample volume for analysis. A total of 90 non-detected results were reported above the PQL due to sample dilution for Event #1, Attempt #2. Samples collected during this event were analyzed at a dilution which resulted in a significant increase in the PQL obtained for these samples, this may have impacted the number of positive results detected, and therefore may have affected the selection of a sample collection method. The 90 non-detected SVOC results that were only marginally above the PQL due to sample volume used during the analyses for Event #2, Attempt #2, did not likely impact the number of positive results reported for that event, and therefore did not affect the selection of a sample collection method.

i p j a

3 2
m 1 p n b i p j a p

d	k o o	k o mi d a pl lpt l n mm	a o j ai (bai) b mi	m o a n l a pl lpt l n mmmi
PCDD/PCDFs	102	0	22	22
PCB Congeners	1,008	453	154	60
Organochlorine Pesticides	112	9	13	20
Semivolatile Organics SIM	120	19	18	31
Semivolatile Organics	200	7	8	7.5
Aroclor PCB	36	0	0	0
Chlorinated Herbicide	24	0	1	4.2
TOC/DOC/POC	4	0	0	0
TSS	6	1	0	17
TDS	6	0	0	0

Each analyte group was further evaluated to determine when and if the failure to meet the PQLs may have impacted the number of positive results used to determine the recommended sample collection method during the Phase I evaluation process. For all analytical groups the detected results between the MDL/EDL and the elevated PQL were included as positive results when determining the recommended sample collection method. Therefore, although the established PQLs were not met in those cases, there is no impact to the outcome of the data evaluation process.

For the low solids mass (LSM) dissolved PCB Congener results, PQLs identified in Table 3-2 above as greater than those defined in the QAPP were only marginally exceeded due to either sample dilution prior to analyses or slightly less than targeted sample volume used for analysis. A total of 269 non-detected results were reported above the PQL for Event #2, Attempt #2 and Event #1, Attempt #3, 24 of which were COPCs/COPECs. Detection of COPCs/COPECs is prioritized when determining the recommended sample collection method. Therefore, these non-detected results may have impacted the number of positive COPC/COPECs results identified and could have affected the selection of a sample collection method. The remaining non-detected results reported above the PQL were obtained from Event #1, Attempt #1 and were not used in the sample collection evaluation process.

For the LSM dissolved Organochlorine Pesticide results, PQLs identified in Table 3-2 above as greater than those defined in the QAPP were only marginally exceeded due to either sample dilution prior to analysis or slightly less than targeted sample volume used for analysis. A total of nine non-detected results were reported above the PQL for Event #1, Attempt #2 and Event #2, Attempt #2, none of these non-detected results were COPCs/COPECs. Further, had those nine results been positive, it would not have made a significant difference in the total number of positive results identified. Therefore, the non-detected results did not influence the selection of a sample collection method.

For the LSM dissolved SVOC SIM results, PQLs identified in Table 3-2 above as greater than those defined in the QAPP were only marginally exceeded due to either sample dilution prior to analysis or less than targeted sample volume used for analysis. A total of 18 non-detected results were reported above the PQL for Event #1, Attempt #2, 10 of which were COPCs/COPECs. Detection of COPCs/COPECs is prioritized when determining the recommended sample collection method, therefore these non-detected results may have impacted the number of positive COPCs/COPECs results identified and could have affected the selection of a sample collection method. The non-detected result reported above the PQL for Event #2, Attempt #2 was not a COPC/COPEC, further had it been positive, it would not have made a significant difference in the total number of positive results reported.
Therefore the selection of a sample collection method was not influenced in this case.

For the LSM dissolved SVOC results, PQLs identified in Table 3-2 above as greater than those defined in the QAPP were only marginally exceeded due to a less than targeted sample volume used for analysis. The seven non-detected SVOC results that were only slightly above the PQL for Event #2, Attempt #2, did not likely impact the number of positive results reported for that event, and therefore did not affect the selection of a sample collection method.

For the LSM dissolved TSS results, the PQL identified in Table 3-2 above as greater than that defined in the QAPP, has no impact on the recommended sample collection method determination, since TSS measurements are not used in the sample collection evaluation process.

i p j m

3 3
m 1 p n b i p j m p

d	k o o	k o mni d a pl lpt l n mm	a o j ai (bai) b mni	m o a n l a pl lpt l n mmmni
PCDD/PCDFs	102	0	56	55
PCB Congeners	1,008	337	155	49
Organochlorine Pesticides	112	34	13	42
Semivolatile Organic SIM	120	23	8	26
Semivolatile Organics	200	97	3	50
Aroclor PCBs	36	18	0	50
Chlorinated Herbicides	24	16	0	67
TOC/DOC/POC	4	0	0	0

Each analyte group was further evaluated to determine when and if the failure to meet the PQLs may have impacted the number of positive results used to determine the recommended sample collection method during the Phase I evaluation process. For all analytical groups the detected results between the MDL/EDL and the elevated PQL were included as positive results when determining the recommended sample collection method. Therefore, although the established PQLs were not met in those cases, there is no impact to the outcome of the data evaluation process.

For the LSM particulate PCB Congener results, PQLs identified in Table 3-3 above as greater than those defined in the QAPP were exceeded due to both sample dilution prior to analysis and significantly less than targeted sample mass available for analysis. A total of 261 non-detected results were reported above the PQL for Event #2, Attempt #2 and Event #1, Attempt #3, with 14 of the 261 non-detected results consisting of COPCs/COPECs. Detection of COPCs/COPECs is prioritized when determining the recommended sample collection method, therefore these non-detected results may have impacted the number of positive COPCs/COPECs results identified, and could have affected the selection of a sample collection method. The remaining samples exhibiting non-detected results reported above the PQL were obtained from Event #1, Attempt #1 and were not included in the sample collection method evaluation process.

For the LSM particulate Organochlorine Pesticide results, PQLs identified in Table 3-3 above as greater than those defined in the QAPP were exceeded due to sample dilution prior to analysis and/or significantly less than targeted sample mass available for analysis. A total of 34 non-detected results were reported above the PQL for Event #1, Attempt #2 and Event #2, Attempt #2. If the 34 results had been positive it may have made a significant difference in the total number of positive results identified and therefore could have had an impact on the selection of a sample collection method.

For the LSM particulate SVOC SIM results, PQLs identified in Table 3-3 above as greater than those defined in the QAPP were exceeded due to sample dilution prior to analysis and/or significantly less than targeted sample mass available for analysis. A total of 18 non-detected results were reported above the PQL for Event #1, Attempt #2, in which nine were COPCs/COPECs. Detection of COPCs/COPECs is prioritized when determining the recommended sample collection method, therefore these non-detected results may have impacted the number of positive COPCs/COPECs results identified, and could have affected the selection of a sample collection method. The five non-detected results reported above the PQL for Event #2, Attempt #2 were not COPC/COPECs, Further, had they been positive it would not have made a significant difference in the total number of positive results reported. Therefore, the selection of a sample collection method was not influenced in this case.

For the LSM particulate SVOC results, PQLs identified in Table 3-3 above as greater than those defined in the QAPP were exceeded due to significantly less than targeted sample mass available for analysis. A total of 97 non-detected results were reported above the PQL all from Event #2, Attempt #2. Had the 97 results been positive it may have made a significant difference in the total number of positive results identified and therefore could have had an impact on the selection of a sample collection method.

For the LSM particulate Aroclor PCB results, PQLs identified in Table 3-3 above as greater than those defined in the QAPP were exceeded due to significantly less than targeted sample mass available for analysis. A total of 18 non-detected results were reported above the PQL all from Event #2, Attempt #2, 16 of which were COPCs/COPECs. Detection of COPCs/COPECs is prioritized when determining the recommended sample collection method, therefore these non-detected results may have impacted the number of positive COPCs/COPECs results identified, and could have affected the selection of a sample collection method.

For the LSM particulate Herbicide results, PQLs identified in Table 3-3 above as greater than those defined in the QAPP were exceeded due to significantly less than targeted sample mass available for analysis. A total of 16 non-detected results were reported above the PQL for Event #2, Attempt #2 and Event #1, Attempt #3. Had the 16 results been positive it may have made a significant difference in the total number of positive results identified and therefore could have had an impact on the selection of a sample collection method.

e p j a

3 4
m 1 p n b e p j a p

d	k o o	k mmi d a pl lpt l n mm	a o j ai (bai) b mmi	m o a n l a pl lpt l n mmmmi
PCDD/PCDFs	102	0	48	47
PCB Congeners	1,008	446	128	57
Organochlorine Pesticides	112	4	18	20
Semivolatile Organics SIM	120	0	6	5.0
Semivolatile Organics	200	140	7	74
VOCs	24	0	4	17
Aroclor PCBs	36	0	0	0
Chlorinated Herbicides	24	3	3	25
Cyanide	4	0	0	0
TOC	4	0	0	0
TEPH	4	0	0	0
TSS	8	0	0	0
TDS	8	0	0	0

Each analyte group was further evaluated to determine when and if the failure to meet the PQLs may have impacted the number of positive results used to determine the recommended sample collection method during the Phase I evaluation process. For all analytical groups the detected results between the MDL/EDL and the elevated PQL were included as positive results when determining the recommended sample collection method. Therefore, although the established PQLs were not met in those cases, there is no impact to the outcome of the data evaluation process.

For the high solids mass (HSM) dissolved PCB Congener results, PQLs identified in Table 3-4 above as greater than those defined in the QAPP were exceeded due to sample dilution prior to analysis and/or use of slightly less than targeted sample volume for analysis. A total of 293 non-detected results were reported above the PQL for Event #2, Attempt #2 and Event #1, Attempt #3, 23 of which were COPCs/COPECs. Detection of COPCs/COPECs is prioritized when determining the recommended sample collection method, therefore these non-detected results may have impacted the number of positive COPCs/COPECs results identified, and could have affected the selection of a sample collection method. The remaining non-detected results reported above the PQL were obtained from Event #1, Attempt #1 and were not included in the evaluation process.

For the HSM dissolved Organochlorine Pesticide results, PQLs id entified in Table 3-4 above as greater than those defined in the QAPP were exceeded due to sample diltion prior to analysis and/or use of slightly less than targeted sample volume for analysis. A total of foumon-detected results were reported above the PQL for Event #1, Attempt #2 and Event #2, Attempt #2, none of which were COPCs/COPECs. Further, had the four results been positive it would not have made a sig nificant difference in the total number of positive analytes detected. Therefore, the non-detected results did not influence the selection of a sample collection method.

For the HSM dissolved SVOC results, PQLs identified in Table 3-4 above as greater than those defined in the QAPP were exceeded due to sa mple dilution prior to analysis and/or use of slightly less than targeted sample volume for analysis. The 51 non-detected results reported above the PQL for Event #1, Attempt #2 did not affect the selection of the sample collection method, a both the primary and duplicate samples were eliminated from consideration because more than ten percent of the results reported were rejected during data validation. A total of 89 non-detected results were reported above the PQL for Event #2, Attempt #2.

For the HSM dissolved Herbicide results, PQLs identified in Table 3-4 above as greater than those defined in the QAPP were exceeded due to use of less than targeted samp le volume for analysis. A total of three non-detected results were reported above the PQL all from Event #1, Attempt #2. Had the three results been positive it may have made a significant difference in the total number of positive results identified and therefore could have had an impact on the selection of a sample collection method.

e p j m

3 5
m 1 p n b e p j m p

d	k o o	k mi d a pl lpt l n mm	a o j ai (bai) b mi	m o a k j a n l a pl lpt l n mmmi
PCDD/PCDFs	102	5	12	17
PCB Congeners	1,008	308	79	38
Organochlorine Pesticides	112	38	10	43
SVOC SIM	120	13	1	12
SVOC	200	178	10	94
VOCs	42	28	11	93
Aroclor PCBs	36	26	5	86
Chlorinated Herbicides	24	0	16	67
Cyanide	6	0	0	0
TOC	6	0	0	0
TEPH	4	0	0	0

EDL = estimated detection limit
MDL = method detection limit

Each analyte group was further evaluated to determine when and if the failure to meet the PQLs may have impacted the number of positive results used to determine the r ecommended sample collection method during the Phase I evaluation process. For all analytical groups the detected results between the MDL/EDL

and the elevated PQL were included as positive results when determining the recommended sample collection method. Therefore, although the established PQLs were not met in those cases, there is no impact to the outcome of the data evaluation process.

For the HSM particulate PCDD/PCDFs results, PQLs identified in Table 3-5 above as greater than those defined in the QAPP were exceeded due to sample dilution prior to analysis, and/or less than targeted sample mass used for analysis. A total of three non-detected results were reported above the PQL for Event #2, Attempt #2. Since a significantly greater number of positive COPCs/COPECs were already identified in the HSM sample than others, had the three results been positive it would not have made a significant difference in the selection of a sample collection method. One non-detected result for Event #1, Attempt #3 was a COPC/COPEC. Detection of COPCs/COPECs is prioritized when determining the recommended sample collection method, therefore this non-detected result may have impacted the number of positive COPCs/COPECs results identified, and could have affected the selection of a sample collection method.

For the HSM particulate PCB Congener results, PQLs identified in Table 3-5 above as greater than those defined in the QAPP were exceeded due to sample dilution prior to analysis, and/or less than targeted sample mass used for analysis. A total of 212 non-detected results were reported above the PQL for Event #2, Attempt #2 and Event #1, Attempt #3, nine of which were COPCs/COPECs. Since a significantly greater number of positive COPCs/COPECs were already identified in the HSM sample than others, had the nine results been positive it would not have made a significant difference in the selection of a sample collection method. The remaining non-detected results reported above the PQL were obtained from Event #1, Attempt #1 and were not included in the sample collection method evaluation process.

For the HSM particulate Organochlorine Pesticide results, PQLs identified in Table 3-5 above as greater than those defined in the QAPP were exceeded due to sample dilution prior to analysis, and/or less than targeted sample mass used for analysis. A total of 38 non-detected results were reported above the PQL for Event #1, Attempt #2 and Event #2, Attempt #2, none of which were COPCs/COPECs. Since a significantly greater number of positive COPCs/COPECs were already identified in the HSM sample than others, had the 38 results been positive it would not have madea significant difference in the selection of a sample collection method.

For the HSM particulate SVOC SIM results, PQLs identified in Table 3-5 above as greater than those defined in the QAPP were marginally exceeded due to sample dilution prior to analysis, less than targeted sample mass used for analysis and/or the percent solids of the samples. A total of 13 non-detected results were reported above the PQL for Event #1, Attempt #2 and Event #2, Attempt #2, five of which were COPCs/COPECs. Detection of COPCs/COPECs is prioritized when determining the recommended sample collection method, therefore these non-detected results may have impacted the number of positive COPCs/COPECs results identified, and could have affected the selection of a sample collection method.

For the HSM particulate SVOC results, PQLs identified in Table3-5 above as greater than those defined in the QAPP were exceeded due to sample dilution prior to analysis, less than targeted sample mass used for analysis and/or the percent solids of the samples. A total of 86 non-detected results were reported above the PQL for Event #2, Attempt #2. Had the 86 results been positive it may have made a significant difference in the total number of positive results identified and therefore could have had an impact on the selection of a sample collection method. Quality control issues identified in the primary and duplicate analyses of Event #1, Attempt #2, HSM dissolved analyses eliminated the HSM sample collection method from consideration, resulting in an inconclusive overall determination for that Event/Attempt. Therefore

the 92 PQLs exceeded with non-detected results in the HSM particulate component of Event #1, Attempt #2, would have had no impact on selection of a sample collection method.

For the HSM particulate VOC results, PQLs identified in Table 3-5 above as greater than those defined in the QAPP were marginally exceeded due to less than targeted sample mass available for analysis and/or the percent solids of the samples. The non-detected results reported above the PQL for Event #1, Attempt #2 and Event #2, Attempt #1, did not affect the selection of a sample collection method as the high solids mass samples had a significant amount of rejected data (see Section 4.1.6 for a description of rejected data), and were eliminated from consideration on that basis.

For the HSM particulate Aroclor PCB results, PQLs identified in Table 3-5 above as greater than those defined in the QAPP were exceeded due to the percent solids of the samples. A total of seven non-detected results were reported above the PQL for Event #2, Attempt #2 (original sample), all of which were COPCs/COPECs. Detection of COPCs/COPECs is prioritized when determining the recommended sample collection method, therefore these non-detected results may have impacted the number of positive COPCs/COPECs results identified, and could have affected the selection of a sample collection method. The 19 non-detected results above the PQL for Event #1, Attempt #2 and Event #2, Attempt #2 (field duplicate only) did not likely impact the selection of a sample collection method, since a larger number of positive COPC/COPECs were already identified in the HSM sample collected during these events than other sample collection methods.

3 5 o

Representativeness is the degree to which a data set accurately represents the characteristics of a population, parameter conditions at a sample point, or an environmental condition. Data are representative when all sampling and analyses are performed in compliance with appropriate procedures. Performing sample analyses within the specified holding times and adhering to sample handling and storage requirements are also critical elements in obtaining representative sample data. These elements were evaluated and considered during data verification/validation. Acceptance criteria for sample handling, storage and holding times are provided in Worksheets #19-1 of the QAPP.

With respect to the results of the Phase I CSO/SWO Investigation data, there are no limitations on the data usage based on representativeness acceptance criteria. The following table summarizes the Phase I representativeness quality evaluation by analytical group and sampling technique. The "x" designation indicates that an issue was identified however, such issue does not infer that the data is unusable. A more detailed discussion of this data quality parameter evaluation is provided in Section 4.1 of this report.

e s				
d	t t	i pj	e pj	d t
Semivolatile Organics			x	-
Volatile Organics (trace)		-		-
Aroclor PCBs	x	x		-
Organochlorine Pesticides			x	-
Semivolatile Organics (SIM)	x		x	-
Metals		-	-	
Mercury	x	-	-	
Methylmercury		-	-	
Cyanide		-		-
PCDD/PCDFs		x		-
PCB Congeners				-
Chlorinated Herbicides		x		-
TOC/POC/DOC		x		-
TEPH		-	x	-
TSS				x
TDS				x
Grain Size		-	-	-

- = analysis was not performed for this analytical group
x = data qualified during validation for this analytical group

3 6

Comparability expresses the confidence with which one set of data can be compared to another to measure the same property. Data can be compared to the degree that their accuracy, precision, and representativeness are known and documented. Data are comparab le if QC measures such as collection techniques, measurement procedures, analytical methods, and reporting units are equivalent for the samples within a sample set. Data subject to established quality assur ance/quality control (QA/QC) measures are deemed more reliable and, therefore, more comparable, than data generated without such measures.

Consistent application of prescribed procedures was monitored t hroughout Phase I of the CSO/SWO Investigation program. Likewise, specific data verification/validation protocols were consistently applied to all data generated under this program to understand and document accuracy/bias, accuracy/bias contamination, precision, sensitivity and representativeness, thereby establishing comparability as defined above.

During data validation activities, analytical data were evaluat ed using a defined set of guidelines and acceptance criteria. In addition, data validation qualifiers were consistently applied to the analytical data generated during the Phase I CSO/SWO Investigation program. Th e data validation process serves to increase the degree of data comparability achieved.

With respect to the results of the Phase I CSO/SWO Investigation data, there are no limitations on the data usage based on representativeness acceptance criteria.

3 7 c

There are two measures of completeness defined for the CSO/SWO Investigation program: field completeness and analytical completeness. Field completeness i s defined as the ratio of the number of samples received in acceptable condition by the laboratories to the number of samples planned to be collected as specified in the QAPP. Analytical completeness is defined as the ratio of total analytical data results reported to the total number of analytical results requested on samples submitted for analysis. The formulas used to compute field and analytical completeness are presented below.

% Field Completeness = [illegible] 100

% Analytical Completeness = [illegible] 100

The targeted field and analytical completeness goals were 90% for the CSO/SWO Investigation program; these goals were met, or exceeded, as summarized below.

pl Ipt l f	b d pl Ipt l f n mm	m f pl Ipt l f
Field Completeness (Overall)	90%	100%
Analytical Completeness (Overall)	90%	100%

m f pl lpt l f c j

d	k p p				k p	k p m	(B)
	t t	i pj [1]	e pj [1]	d t [2]			
Semivolatile Organics	4	8	8	-	20	20	100
Volatile Organics	4	-	8	-	12	12	100
Aroclor PCBs	4	8	8		20	20	100
Organochlorine Pesticides	4	8	8	-	20	20	100
Semivolatile Organics (SIM)	4	8	8	-	20	20	100
Metals	4	-	-	8	12	12	100
Mercury	4	-	-	8	12	12	100
Methylmercury	4	-	-	8	12	12	100
Cyanide	4	-	8	-	12	12	100
PCDD/PCDFs	4	8	8	-	20	20	100
PCB Congeners	4	8	8	-	20	20	100
Chlorinated Herbicides	6	12	12	-	30	20	150
TOC/POC/DOC[3]	4	8	8	-	20	20	100
TEPH	4	-	8	-	12	12	100
TSS	6	6	6	-	18	12	150
TDS	6	6	6	-	18	12	150
Grain Size	4	-	-	-	4	4	100

1 – Particulate and dissolved samples
2 – Total and dissolved samples
3 – TOC, POC and DOC analyses are mutually exclusive. Therefore, only one of the three analyses is performed per sample type.

m 1 pl lpt l f j

t t

d	p f	p	o	o o	
Semivolatile Organics	4	50	200	0	100%
Volatile Organics	6	6	36	0	100%
Aroclor PCBs	4	9	36	0	100%
Organochlorine Pesticides	4	28	112	0	100%
Semivolatile Organics (SIM)	4	30	120	0	100%
Metals	3	23	69	0	100%
Mercury	3	1	3	0	100%
Methyl mercury	3	1	3	0	100%
Cyanide	4	1	4	0	100%
PCDD/PCDFs	6	17	102	0	100%

PCB Congeners	6	168	1008	0	100%
Chlorinated Herbicides	6	4	24	0	100%
TOC	4	1	4	0	100%
TEPH	4	1	4	0	100%
Grain Size	4	85	340	0	100%
TSS	6	1	6	0	100%
TDS	6	1	6	0	100%

i pj m

d	p f	p	o	o o	
Semivolatile Organics	4	50	200	10	95%
Aroclor PCBs	4	9	36	0	100%
Organochlorine Pesticides	4	28	112	1	99%
Semivolatile Organics (SIM)	4	30	120	0	100%
PCDD/PCDFs	6	17	102	0	100%
PCB Congeners	6	168	1008	0	100%
Chlorinated Herbicides	6	4	24	0	100%
POC	4	1	4	0	100%

i pj a

d	p f	p	o	o o	
Semivolatile Organics	4	50	200	1	99.5%
Aroclor PCBs	4	9	36	0	100%
Organochlorine Pesticides	4	28	112	0	100%
Semivolatile Organics (SIM)	4	30	120	0	100%
PCDD/PCDFs	6	17	102	0	100%
PCB Congeners	6	168	1008	0	100%
Chlorinated Herbicides	6	4	24	0	100%
DOC	4	1	4	0	100%
TSS	4	1	4	0	100%
TDS	4	1	4	0	100%

e pj m

d	p f	p	o	o o	
Semivolatile Organics	4	50	200	2	99%
Volatile Organics	9	6	54	25	53.7%
Aroclor PCBs	4	9	36	0	100%
Organochlorine Pesticides	4	28	112	6	94.6%
Semivolatile Organics (SIM)	4	30	120	0	100%
Cyanide	4	1	4	0	100%
PCDD/PCDFs	6	17	102	0	100%
PCB Congeners	6	168	1008	0	100%
Chlorinated Herbicides	6	4	24	0	100%
TOC	4	1	4	0	100%
TEPH	4	1	4	0	100%

e pj a

d	p f	p	o	o o	
Semivolatile Organics	4	50	200	16	92%
Volatile Organics	6	6	36	0	100%
Aroclor PCBs	4	9	36	0	100%
Organochlorine Pesticides	4	28	112	0	100%
Semivolatile Organics (SIM)	4	30	120	0	100%
Cyanide	4	1	4	0	100%
PCDD/PCDFs	6	17	102	0	100%
PCB Congeners	6	168	1008	0	100%
Chlorinated Herbicides	6	4	24	0	100%
DOC	4	1	4	0	100%
TEPH	4	1	4	0	100%
TSS	8	1	8	0	100%
TDS	8	1	8	0	100%

d p

d	p f	p	o	o o	
Metals	12	23	276	0	99.5%
Mercury	12	1	12	0	100%
Methylmercury	12	1	12	0	100%
TSS	2	1	2	0	100%
TDS	1	1	1	0	100%

4 m f pl Ipt l f a s Is

Phase I CSO/SWO Investigation analytical results were provided by the laboratories both electronically and in hard copy format. Upon receipt from the laboratory, results for specific analytical groups described below were verified or validated by Environmental Data Services, Ltd. (EDS) using the following procedures:

Semivolatile Organics	USEPA Region 2 SOP HW-35, Revision 1
Volatile Organics (trace)	USEPA Region 2 SOP HW-34, Revision 1
Aroclor PCBs	USEPA Region 2 SOP HW-37, Revision 1
Organochlorine Pesticides	EDS SOP: Organochlorine Pesticides by HRGC/HRMS USEPA 1699, Rev .0, 7/10
Semivolatile Organics (SIM)	USEPA Region 2 HW-35, Revision 1
Metals	EDS SOP: Metals by ICP/MS USEPA 1638, Rev.0, 7/10
Mercury	EDS SOP: Mercury by CVAFS USEPA 1631, Rev.0, 7/10
Methylmercury	EDS SOP: Methyl Mercury by CVAFS USEPA 1630, Rev.0, 7/10
Cyanide	USEPA Region 2 SOP HW-2, Revision 13
PCDD/PCDFs	USEPA Region 2 SOP HW-25, Revision 3
PCB Congeners	EDS SOP: Congener PCB, Rev. 3, 7/10
Chlorinated Herbicides	USEPA Region 2 SOP HW-17, Revision 3
TOC (solid/liquid)/DOC/POC	EDS SOP:TOC-01 Rev.2, 7/10
TEPH	EDS SOP:TEPH-01 Rev. 3, 7/07
TSS	EDS SOP: TSS by Gravimetric SM 2540D, Rev. 0, 7/10
TDS	EDS SOP: TDS by Gravimetric SM 2540C, Rev. 0, 7/10
Grain Size	SOP-14, Revision 2 – Verification/Validation Geotechnical Data

The verification/validation standard operating procedures (SOPs), as referenced above, are provided in Appendix C of the QAPP. The data verification/validation process is detailed in Worksheets #34, 35, and 36 of the QAPP.

4 1 a n f

Two types of data quality issues are discussed in this section; systematic data quality issues and random data quality issues. Systematic data quality issues are those that are identified as having a consistent impact on the quality of results reported (i.e., data quality of all samples and/or analytical groups are affected by a single data quality issue), due to a common circumstance or procedural application. Systematic data quality issues are described in Sections 4.1.1, 4.1.3, 4.1.5, and 4.1.7 as well as incorporated into Sections 4.1.2, 4.1.4, 4.1.6, and 4.1.8. Random data quality issues are those that do not have a consistent impact the quality of results (i.e., data quality for a specific sample(s) and/or analyte(s) are affected by the data quality issue). Random data quality issues are presented in Sections 4.1.2, 4.1.4, 4.1.6, and 4.1.8.

Sections 4.1.2, 4.1.4, 4.1.6, and 4.1.8 summarizes the data val idation findings related to systematic and random data quality issues for each analytical group. These va lidation findings have been separated into two distinct categories, major data quality issues and minor data quality issues. Major data quality issues are those that result in the qualification of the analytical value reported as "R", or rejected. This occurs due to the presence of significant QA/QC problems that render the a nalysis invalid and the results unusable. Minor data quality issues include all other QA/QC problems iden tified during the data validation process that require sample results to be qualified, indicating some level of uncertainty associated with the reported result. Qualifiers applied to sample results were assigned bas ed on the validation protocols specified in Worksheet #36 of the QAPP.

Conclusions based on the information presented in these summaries can be found in Section 5 of this report.

4 1 1 t t p p a n f

Four systematic data quality issues were identified during thePhase I CSO/SWO Investigation data whole water sample validation task. These systematic data quality issues are summarized below:

- All internal standard recoveries for 13C-PCB-205 were outside the quality control limits. All results for PCB-205 were qualified as estimated.
- All field blanks contained hexachlorobenzene, 2,4'-DDE, 4,4'-DDE, 2,4'-DDD, 2,4'-DDT, 4,4'-DDD and 4,4'-DDT resulting in the positive results being qualified non-detected "U".
- All field blanks contained butylbenzylphthalate resulting in the positive results being qualified non-detected "U".
- All surrogate recoveries for Decachlorobiphenyl were outside the quality control limit. All non-detected results for Aroclors were qualified as estimated.

4 1 2 t t p p o a n f d

p l

The Phase I CSO/SWO Investigation whole water sample SVOC dataset is comprised of four samples with 200 associated results.

No major data quality issues were identified during validation of the Phase I CSO/SWO Investigation SVOC analyses.

Five minor data quality issues were identified in the Phase I CSO/SWO Investigation whole water SVOC dataset. The identified minor data quality issues are described in the table below.

j a n f					
p t t	a n m	k o o	k p	k o	B ps l o
Field blank contamination	Accuracy/Bias Contamination	200	4	4	2.0
Non-compliant continuing calibration percent difference	Overall Accuracy/Bias	200	4	6	3.0
Non-compliant internal standard recovery	Overall Accuracy/Bias	200	1	1	0.50
Non-compliant method surrogate recovery	Overall Accuracy/Bias	200	3	9	4.5
Non-compliant project specific surrogate recovery, as specified by USEPA Region 2	Overall Accuracy/Bias	200	4	14	7.0

s l ( )

The Phase I CSO/SWO Investigation whole water VOC (trace) dataset is comprised of four samples with 24 associated results.

No major or minor data quality issues were identified during va lidation of the Phase I CSO/SWO Investigation VOC (trace) analyses.

m

The Phase I CSO/SWO Investigation whole water Aroclor PCB dataset is comprised of four samples with 36 associated results.

No major data quality issues were identified during validation of the Phase I CSO/SWO Investigation Aroclor PCB analyses.

Three minor data quality issues were identified in the Phase I CSO/SWO Investigation whole water Aroclor PCB dataset. The identified minor data quality issues are described in the table below.

j a n f					
m t t	a n m	k o o	k p	k o	B m o
Non-compliant holding time	Representativeness	36	2	18	50.0
Non-compliant continuing calibration percent difference	Overall Accuracy/Bias	36	2	2	5.6
Non-compliant method surrogate recovery	Overall Accuracy/Bias	36	4	36	100

l m

The Phase I CSO/SWO Investigation whole water Organochlorine Pe sticide dataset is comprised of four samples with 112 associated results.

No major data quality issues were identified during validation of the Phase I CSO/SWO Investigation Organochlorine Pesticide analyses.

Six minor data quality issues were identified in the Phase I CSO/SWO Investigation whole water Organochlorine Pesticide dataset. The identified minor data quality issues are described in the table below.

j a n f					
l m t t	**a n m**	**k o o**	**k p**	**k o**	**B l m o**
Field blank contamination	Accuracy/Bias Contamination	112	4	29	25.9
Non-compliant qualitative requirements	Overall Accuracy/Bias	112	1	1	0.9
Non-compliant matrix spike/matrix spike duplicate relative percent difference	Precision	112	2	6	5.4
Non-compliant field duplicate relative percent difference	Precision	112	2	2	1.8
Non-compliant internal standard recovery	Overall Accuracy/Bias	112	3	74	66.1
Non-complaint project specific surrogate recovery, as specified by USEPA Region 2	Overall Accuracy/Bias	112	4	22	19.6

p l p f j

The Phase I CSO/SWO Investigation whole water SVOCs SIM dataset is comprised of four samples with 120 associated results.

No major data quality issues were identified during validation of the Phase I CSO/SWO Investigation SVOCs SIM analyses.

Six minor data quality issues were identified in the Phase I CSO/SWO Investigation whole water SVOCs SIM dataset. The identified minor data quality issues are described in the table below.

j a n f					
p pfj t t	a n m	k o o	k p	k o	B ps l pfj o
Non-compliant holding time	Representativeness	120	2	60	50.0
Method blank contamination	Accuracy/Bias Contamination	120	2	2	1.7
Field blank contamination	Accuracy/Bias Contamination	120	3	23	19.2
Non-compliant initial calibration relative standard deviation	Overall Accuracy/Bias	120	2	2	1.7
Non-compliant project specific surrogate recovery, as specified by USEPA Region 2	Overall Accuracy/Bias	120	1	7	5.8
Non-compliant field duplicate relative percent difference	Precision	120	4	64	53.3

j

The Phase I CSO/SWO Investigation whole water Metals dataset is comprised of four samples with 92 associated results.

No major data quality issues were identified during validation of the Phase I CSO/SWO Investigation Metals analyses.

Two minor data quality issues were identified in the Phase I CSO/SWO Investigation whole water Metals dataset. The identified minor data quality issues are described in the table below.

j a n f					
j t t	a n m	k o o	k p	k o	B j o
Field blank contamination	Accuracy/Bias Contamination	92	4	6	6.5
Continuing calibration blank contamination	Accuracy/Bias Contamination	92	2	4	4.4

j

The Phase I CSO/SWO Investigation whole water Mercury dataset is comprised of four samples with four associated results.

No major data quality issues were identified during validation of the Phase I CSO/SWO Investigation Mercury analyses.

Two minor data quality issues were identified in the Phase I CSO/SWO Investigation whole water Mercury dataset. The identified minor data quality issues are described in the table below.

j a n f					
j t t	a n m	k o o	k p	k o	B j o
Non-compliant holding time	Representativeness	4	4	4	100
Non-compliant field duplicate relative percent difference	Precision	4	4	4	100

j j

The Phase I CSO/SWO Investigation whole water Methyl Mercury data set is comprised of four samples with four associated results.

No major or minor data quality issues were identified during validation of the Phase I CSO/SWO Investigation Methyl Mercury analyses.

The Phase I CSO/SWO Investigation whole water Cyanide dataset is comprised of four samples with four associated results.

No major data quality issues were identified during validation of the Phase I CSO/SWO Investigation Cyanide analyses.

One minor data quality issue was identified in the Phase I CSO/ SWO Investigation whole water Cyanide dataset. The identified minor data quality issue is described in the table below.

j a n f					
t t	a n m	k o o	k p	k o	B o
Field blank contamination	Accuracy/Bias Contamination	4	2	2	50.0

m a Lm a

The Phase I CSO/SWO Investigation whole water PCDD/PCDFs dataset is comprised of six samples with 102 associated results.

No major data quality issues were identified during validation of the Phase I CSO/SWO Investigation PCDD/PCDF analyses.

Five minor data quality issues were identified in the Phase I C SO/SWO Investigation whole water PCDD/PCDF dataset. The identified minor data quality issues are described in the table below.

j a n f					
m a a Im a c t t	a n m	k o o	k p	k o	B m a a Im a c o
Field blank contamination	Accuracy/Bias Contamination	102	2	7	6.9
Non-compliant matrix spike/matrix spike duplicate recovery	Overall Accuracy/Bias	102	1	1	1.0
Non-compliant matrix spike/matrix spike duplicate relative percent difference	Precision	102	1	1	1.08
Non-compliant field duplicate relative percent difference	Precision	102	4	10	9.8
Non-complaint project specific labeled analog recovery, as specified by USEPA Region 2	Overall Accuracy/Bias	102	4	17	16.7

m

The Phase I CSO/SWO Investigation whole water PCB Congener dataset is comprised of six samples with 1,008 associated results.

No major data quality issues were identified during validationof the Phase I CSO/SWO Investigation PCB Congener analyses.

Four minor data quality issues were identified in the Phase I C SO/SWO Investigation whole water PCB Congener dataset. The identified minor data quality issues are described in the table below.

j a n f					
m t t	a n m	k o o	k p	k o	B m o
Field blank contamination	Accuracy/Bias Contamination	1,008	5	123	12.2
Non-compliant field duplicate relative percent difference	Precision	1,008	6	266	26.4
Non-compliant internal standard recovery	Overall Accuracy/Bias	1,008	6	308	30.6
Non-complaint project specific labeled analog recovery, as specified by USEPA Region 2	Overall Accuracy/Bias	1,008	2	58	5.8

e

The Phase I CSO/SWO Investigation whole water Chlorinated Herbi cide dataset is comprised of six samples with 24 associated results.

No major data quality issues were identified during validation of the Phase I CSO/SWO Investigation Chlorinated Herbicide analyses.

Four minor data quality issues were identified in the Phase I C SO/SWO Investigation whole water Chlorinated Herbicide dataset. The indentified minor data quality issues are described in the table below.

j a n f					
e t t	**a n m**	**k o o**	**k p**	**k o**	**B e o**
Method blank contamination	Accuracy/Bias Contamination	24	2	2	8.3
Field blank contamination	Accuracy/Bias Contamination	24	4	7	29.2
Non-compliant continuing calibration percent difference	Overall Accuracy/Bias	24	2	2	8.3
Non-compliant dual column analysis percent difference	Precision	24	4	9	37.5

l

The Phase I CSO/SWO Investigation whole water TOC dataset is co mprised of four samples with four associated results.

No major data quality issues were identified during validationof the Phase I CSO/SWO Investigation TOC analyses.

One minor data quality issue was identified in the Phase I CSO/ SWO Investigation whole water TOC dataset. The identified minor data quality issue is describedin the table below.

j a n f					
l t t	**a n m**	**k o o**	**k p**	**k o**	**B l o**
Field blank contamination	Accuracy/Bias Contamination	4	2	2	50.0

b m e

The Phase I CSO/SWO Investigation whole water TEPH dataset is c omprised of four samples with four associated results.

No major data quality issues were identified during validation of the Phase I CSO/SWO TEPH Investigation analyses.

Three minor data quality issues were identified in the Phase I CSO/SWO Investigation whole water TEPH data set. The identified minor data quality issues are described in the table below.

j a n f					
b me t t	**a n m**	**k o o**	**k p**	**k o**	**B b me o**
Non-compliant initial calibration relative standard deviation	Overall Accuracy/Bias	4	2	2	50.0
Non-compliant continuing calibration percent difference	Overall Accuracy/Bias	4	2	2	50.0
Non-compliant field duplicate relative percent difference	Precision	4	4	4	100

p p

The Phase I CSO/SWO Investigation whole water TSS dataset is co mprised of four samples with four associated results.

No major data quality issues were identified during validation of the Phase I CSO/SWO Investigation TSS analyses.

One minor data quality issue was identified in the Phase I CSO/ SWO Investigation whole water TSS dataset. The identified minor data quality issue is described in the table below.

j a n f					
pp t t	**a n m**	**k o o**	**k p**	**k o**	**B pp o**
Non-compliant field duplicate relative percent difference	Precision	4	4	4	100

a p

The Phase I CSO/SWO Investigation whole water TDS dataset is co mprised of four samples with four associated results.

No major data quality issues were identified during validationof the Phase I CSO/SWO Investigation TDS analyses.

One minor data quality issue was identified in the Phase I CSO/ SWO Investigation whole water TDS dataset. The identified minor data quality issue is describedin the table below.

j a n f					
a p t t	**a n m**	**k o o**	**k p**	**k o**	**B a p o**
Field blank contamination	Accuracy/Bias Contamination	4	2	2	50.0

d

The Phase I CSO/SWO Investigation Whole Water grain size datase t is comprised of four samples with 340 associated results.

No major or minor data quality issues were identified during th e verification of the Phase I CSO/SWO Investigation grain size analyses.

4 1 3 i p j p p a n f

Four systematic data quality issue was identified during the Ph ase I CSO/SWO Investigation data LSM sample validation task. These systematic data quality issues are summarized below:

- Field blanks associated with all samples contained hexachlorobenzene, 4,4'-DDE, 2,4'-DDD, 2,4'-DDT, 4,4'-DDD and 4,4'-DDT resulting in the positive results being qualified non-detected "U".

- All closing continuing calibration percent differences for Di-n-octylphthalate were outside the quality control limit. All results for Di-n-octylphthalate were qualified as estimated.

- All field blanks contained PCB-11, PCB-16/32, PCB-17, PCB-18, PCB-19, PCB-20/21/33 and PCB-22 resulting in the positive results being qualified non-detected "U".

- Due to actual TSS values being lower than estimated, LSM Particulate sample masses were much lower than anticipated. This resulted in all analytical groups having reporting limits well in excess of project quantitation limits stated in the QAPP.

4 1 4 i p j p p o a n f d

i p j a

p l

The Phase I CSO/SWO Investigation LSM dissolved sample SVOC dat aset is comprised of four samples with 200 associated results.

One major data quality issue was identified during validation of the Phase I CSO/SWO Investigation LSM dissolved SVOC analyses. The internal standard perylene-d12 ex hibited a recovery below the quality control limit for sample PR1CSOCLYLD-01B for n-octylphthalate. The identi fied major data quality issue is described in the table below.

j a n f					
p i pj a	**a n m**	**k o o**	**k p**	**k o**	**B ps l o**
Extremely poor internal standard recovery	Overall Accuracy/Bias	200	1	1	0.50

Five minor data quality issues were identified in the Phase I CSO/SWO Investigation LSM dissolved SVOC dataset. The identified minor data quality issues are described in the table below.

j a n f					
p i pj a	**a n m**	**k o o**	**k p**	**k o**	**B ps l o**
Field blank contamination	Accuracy/Bias Contamination	200	3	4	2.0
Non-compliant continuing calibration percent difference	Overall Accuracy/Bias	200	4	8	4.0
Non-compliant method surrogate recovery	Overall Accuracy/Bias	200	2	6	3.0
Non-compliant project specific surrogate recovery, as specified by USEPA Region 2	Overall Accuracy/Bias	200	4	23	11.5
Non-compliant field duplicate relative percent difference	Precision	200	2	4	2.0

m

The Phase I CSO/SWO Investigation LSM dissolved sample Aroclor PCB dataset is comprised of four samples with 36 associated results.

No major data quality issues were identified during validation of the Phase I CSO/SWO Investigation Aroclor PCB analyses.

One minor data quality issue was identified in the Phase I CSO/SWO Investigation LSM dissolved Aroclor PCB dataset. The identified minor data quality issue is described in the table below.

j a n f					
m i pj a	**a n m**	**k o o**	**k p**	**k o**	**B m o**
Non-compliant holding time	Representativeness	36	2	18	50.0

l m

The Phase I CSO/SWO Investigation LSM dissolved sample Organochlorine Pesticide dataset is comprised of four samples with 112 associated results.

No major data quality issues were identified during validation of the Phase I CSO/SWO Investigation Organochlorine Pesticide analyses.

Four minor data quality issues were identified in the Phase I CSO/SWO Investigation LSM dissolved Organochlorine Pesticide dataset. The identified minor data quality issues are described in the table below.

j a n f					
l m i pj a	**a n m**	**k o o**	**k p**	**k o**	**B l m o**
Field blank contamination	Accuracy/Bias Contamination	112	4	30	26.8
Non-compliant internal standard recovery	Overall Accuracy/Bias	112	2	44	39.3
Non-compliant project specific labeled analog recovery, as specified by USEPA Region 2	Overall Accuracy/Bias	112	4	18	16.1
Non-compliant field duplicate relative percent difference	Precision	112	2	2	1.8

p l p f j

The Phase I CSO/SWO Investigation LSM dissolved sample SVOCs SI M dataset is comprised of four samples with 120 associated results.

No major data quality issues were identified during validation of the Phase I CSO/SWO Investigation SVOCs SIM analyses.

Seven minor data quality issues were identified in the Phase I CSO/SWO Investigation LSM dissolved SVOCs SIM dataset. The identified minor data quality issues are described in the table below.

j a n f					
p pfj i pj a	**a n m**	**k o o**	**k p**	**k o**	**B ps l pfj o**
Field blank contamination	Accuracy/Bias Contamination	120	4	26	21.7
Non-compliant initial calibration relative standard deviation	Overall Accuracy/Bias	120	2	2	1.7
Non-compliant continuing calibration percent difference	Overall Accuracy/Bias	120	2	2	1.7
Non-compliant method surrogate recovery	Overall Accuracy/Bias	120	1	16	13.3
Non-compliant project specific surrogate recovery, as specified by USEPA Region 2	Overall Accuracy/Bias	120	1	16	13.3
Non-compliant matrix spike/matrix spike duplicate recovery	Overall Accuracy/Bias	120	1	12	10.0
Non-compliant field duplicate relative percent difference	Precision	120	2	14	11.7

m a Lm a

The Phase I CSO/SWO Investigation LSM dissolved sample PCDD/PCD Fs dataset is comprised of six samples with 102 associated results.

No major data quality issues were identified during validation of the Phase I CSO/SWO Investigation PCDD/PCDFs analyses.

Three minor data quality issues were identified in the Phase I CSO/SWO Investigation LSM dissolved PCDD/PCDFs dataset. The identified minor data quality issues are described in the table below.

j a n f					
m a a Im a c i pj a	a n m	k o o	k p	k o	B m a a Im a c o
Non-compliant holding time	Representativeness	102	2	34	33.3
Field blank contamination	Accuracy/Bias Contamination	102	4	10	9.8
Non-compliant project specific labeled analog recovery, as specified by USEPA Region 2	Overall Accuracy/Bias	102	6	63	61.8

m

The Phase I CSO/SWO Investigation LSM dissolved PCB Congener da taset is comprised of six samples with 1,008 associated results.

No major data quality issues were identified during validationof the Phase I CSO/SWO Investigation PCB Congener analyses.

Three minor data quality issues were identified in the Phase ICSO/SWO Investigation LSM dissolved PCB Congener dataset. The identified minor data quality issues aredescribed in the table below.

j a n f					
m i pj a	a n m	k o o	k p	k o	B m o
Method blank contamination	Accuracy/Bias Contamination	1,008	2	2	0.20
Field blank contamination	Accuracy/Bias Contamination	1,008	6	366	36.3
Non-compliant project specific labeled analog recovery, as specified by USEPA Region 2	Overall Accuracy/Bias	1,008	3	58	5.8

e

The Phase I CSO/SWO Investigati on LSM dissolved Chlorinated Her bicide dataset is comprised of six samples with 24 associated results.

No major data quality issues were identified during validation of the Phase I CSO/SWO Investigation Chlorinated Herbicide analyses.

Six minor data quality issues were identified in the Phase I CS O/SWO Investigation LSM dissolved Chlorinated Herbicide dataset. The identified minor data quality issues are described in the table below.

j a n f					
e i pj a	a n m	k o o	k p	k o	B e o
Non-compliant holding time	Representativeness	24	2	8	33.3
Method blank contamination	Accuracy/Bias Contamination	24	1	2	8.3
Field blank contamination	Accuracy/Bias Contamination	24	4	9	37.5
Non-compliant surrogate recovery	Overall Accuracy/Bias	24	1	2	8.3
Non-compliant column percent difference	Overall Accuracy/Bias	24	4	9	37.5
Non-compliant field duplicate relative percent difference	Precision	24	2	2	8.3

a l

The Phase I CSO/SWO Investigation LSM dissolved DOC dataset is comprised of four samples with four associated results.

No major data quality issues were identified during validation of the Phase I CSO/SWO Investigation DOC analyses.

Two minor data quality issues were identified in the Phase I CSO/SWO Investigation LSM dissolved DOC dataset. The identified minor data quality issues are described in the table below.

j a n f					
a l i pj a	a n m	k o o	k p	k o	B a l o
Non-compliant holding time	Representativeness	4	2	2	50.0
Field blank contamination	Accuracy/Bias Contamination	4	4	4	100

p p

The Phase I CSO/SWO Investigation LSM dissolved TSS dataset is comprised of six samples with six associated results.

No major or minor data quality issues were identified during validation of the Phase I CSO/SWO Investigation TSS analyses.

a p

The Phase I CSO/SWO Investigati on LSM dissolved TDS dataset is comprised of six samples with six associated results.

No major or minor data quality issues were identified during va lidation of the CSO/SWO Investigation TDS analyses.

i p j m

p l

The Phase I CSO/SWO Investigatio n LSM particulate SVOC dataset is comprised of four samples with 200 associated results.

One major data quality issue was identified during validation of the Phase I CSO/SWO Investigation LSM particulate SVOC analyses. The internal standards phenanthrene -d10, chrysene-d12 and/or perylene-d12 exhibited recoveries below the quality control limit. Two samples and ten results are associated with these non-compliant internal standard recoveries.

The following samples and results are associated with these non-compliant internal standard recoveries:

p k	
PR1CSOCLYLP-01B	4,6-Dinitro-2-methylphenol
	N-nitrosodiphenylamine
	4-Bromophenyl-phenylether
	Hexachlorobenzene
	Atrazine
	Pentachlorophenol
	Carbazole
	3,3'-Dichlorobenzidine
	Di-n-octylphthalate
PR1LPDUP-01B	Di-n-octylphthalate

The identified major data quality issues are described in the table below.

j a n f					
p i pj m	**a n m**	**k o o**	**k p**	**k o**	**B ps l o**
Extremely poor internal standard recovery	Overall Accuracy/Bias	200	2	10	5.0

Five minor data quality issues were identified in the Phase I C SO/SWO Investigation LSM particulate SVOC dataset. The identified minor data quality issues are described in the table below.

j a n f					
p i pj m	a n m	k o o	k p	k o	B ps l o
Method blank contamination	Accuracy/Bias Contamination	200	2	4	2.0
Field blank contamination	Accuracy/Bias Contamination	200	3	5	2.5
Non-compliant continuing calibration percent difference	Overall Accuracy/Bias	200	4	7	3.5
Non-compliant project specific surrogate recovery, as specified by USEPA Region 2	Overall Accuracy/Bias	200	4	31	15.5
Non-compliant internal standard recovery	Overall Accuracy/Bias	200	1	2	1.0

m (m)

The Phase I CSO/SWO Investigation LSM particulate Aroclor PCB d ataset is comprised of four samples with 368 associated results.

No major or minor data quality issues were identified during va lidation of the Phase I CSO/SWO Investigation Aroclor PCB analyses.

l m

The Phase I CSO/SWO Investigation LSM particulate Organochlorin e Pesticide dataset is comprised of four samples with 112 associated results.

One major data quality issue was identified during validation of the Phase I CSO/SWO Investigation LSM particulate Organochlorine Pesticide analyses. The labeled ana log 13C12-endrin aldehyde exhibited recoveries below the method quality control limit for sample PRICSOCLYLP-02B affecting the associated endrin aldehyde sample result. The identified major data quality issues are described in the table below.

j a n f					
l m i pj m	a n m	k o o	k p	k o	B l m o
Extremely poor method labeled analog recovery	Overall Accuracy/Bias	112	1	1	0.89

Five minor data quality issues were identified in the Phase I CSO/SWO Investigation LSM particulate Organochlorine Pesticide dataset. The identified minor data quality issues are described in the table below.

j a n f					
l m i pj m	**a n m**	**k o o**	**k p**	**k o**	**B l m o**
Field blank contamination	Accuracy/Bias Contamination	112	4	33	29.5
Non-compliant matrix spike/matrix spike duplicate relative percent difference	Precision	112	1	3	2.7
Non-compliant internal standard recovery	Overall Accuracy/Bias	112	4	80	71.4
Non-compliant method labeled analog recovery	Overall Accuracy/Bias	112	1	1	0.89
Non-compliant project specific labeled analog recovery, as specified by USEPA Region 2	Overall Accuracy/Bias	112	4	16	14.3

p l p f j

The Phase I CSO/SWO Investigation LSM particulate SVOCs SIM dat aset is comprised of four samples with 120 associated results.

No major data quality issues were identified during validation of the Phase I CSO/SWO Investigation SVOCs SIM analyses.

Seven minor data quality issues were identified in the Phase I CSO/SWO Investigation LSM particulate SVOCs SIM dataset. The identified minor data quality issues are described in the table below.

j a n f					
p pfj i pj m	a n m	k o o	k p	k o	B ps l pfj o
Field blank contamination	Accuracy/Bias Contamination	120	4	28	23.3
Non-compliant initial calibration relative standard deviation recovery	Overall Accuracy/Bias	120	2	2	1.7
Non-compliant project specific surrogate recovery, as specified by USEPA Region 2	Overall Accuracy/Bias	120	1	11	9.2
Non-compliant matrix spike/matrix spike duplicate recovery	Overall Accuracy/Bias	120	1	13	10.8
Non-compliant matrix spike/matrix spike duplicate relative percent difference	Precision	120	1	17	14.2
Non-compliant internal standard recovery	Overall Accuracy/Bias	120	2	6	5.0
Non-compliant field duplicate relative percent difference	Precision	120	4	60	50.0

m a Lm a

The Phase I CSO/SWO Investigation LSM particulate PCDD/PCDFs da taset is comprised of six samples with 102 associated results.

No major data quality issues were identified during validation of the Phase I CSO/SWO Investigation PCDD/PCDFs analyses.

Three minor data quality issues were identified in the Phase I CSO/SWO Investigation LSM particulate PCDD/PCDF dataset. The identified minor data quality issues are described in the table below.

j a n f					
m a a Im a c i pj m	a n m	k o o	k p	k o	B m a a Im a c o
Field blank contamination	Accuracy/Bias Contamination	102	3	8	7.84
Non-compliant matrix spike/matrix spike duplicate relative percent difference	Precision	102	1	1	0.98
Non-compliant field duplicate relative percent difference	Precision	102	4	12	11.8

m

The Phase I CSO/SWO Investigation LSM particulate PCB Congener dataset is comprised of six samples with 1,008 associated results.

No major data quality issues were identified during validationof the Phase I CSO/SWO Investigation PCB Congener analyses.

Six minor data quality issues were identified in the Phase I CSO/SWO Investigation LSM particulate PCB Congener dataset. The identified minor data quality issues are described in the table below.

j a n f					
m i pj m	**a n m**	**k o o**	**k p**	**k o**	**B m o**
Method blank contamination	Accuracy/Bias Contamination	1,008	2	5	0.50
Field blank contamination	Accuracy/Bias Contamination	1,008	6	275	27.3
Non-compliant matrix spike/matrix spike duplicate relative percent difference	Precision	1,008	1	1	0.10
Non-compliant internal standard recovery	Overall Accuracy/Bias	1,008	4	150	14.9
Non-compliant project specific labeled analog recovery, as specified by USEPA Region 2	Overall Accuracy/Bias	1,008	3	8	0.79
Non-compliant field duplicate relative percent difference	Precision	1,008	19	19	0.88

e

The Phase I CSO/SWO Investigation LSM particulate Chlorinated H erbicide dataset is comprised of six samples with 24 associated results.

No major data quality issues were identified during validation of the Phase 1 CSO/SWO Investigation Chlorinated Herbicide analyses.

One minor data quality issue was identified in the Phase I CSO/ SWO Investigation LSM particulate Chlorinated Herbicide dataset. The identified minor data quality issue is described in the table below.

j a n f					
e i pj m	a n m	k o o	k p	k o	B e o
Non-compliant continuing calibration percent difference	Overall Accuracy/Bias	24	2	2	8.3

m l

The Phase I CSO/SWO Investigation LSM particulate POC dataset is comprised of four samples with four associated results.

No major or minor data quality issues were identified during va lidation of the Phase I CSO/SWO Investigation POC analyses.

4 1 5 e p j p p a n f

Two systematic data quality issues were identified during the Phase I CSO/SWO Investigation High Solids Mass data validation task. These systematic data quality issues are summarized below:

- All field blanks contained 2,4'-DDE, 2,4'-DDD, 2,4'-DDT and 4,4'-DDT resulting in the positive results being qualified non-detected "U".

- All closing continuing calibration percent differences for Di-n-octylphthalate were outside the quality control limit. All results for Di-n-octylphthalate were qualified as estimated.

4 1 6 e p j p p o a n f
d

e p j a

p l

The Phase I CSO/SWO Investigation HSM dissolved sample SVOC dataset is comprised of four samples with 200 associated results.

One major data quality issue was identified during validation of the Phase I CSO/SWO Investigation HSM dissolved SVOC analyses. The internal standards phenanthrene-d10 and perylene-d12 exhibited recoveries below the quality control limit. The following samples and r esults are associated with these non-compliant internal standard recoveries:

p k	
PR1CSOCLYHD-01B PR1HDDUP-01B	4,6-Dinitro-2-methylphenol
	N-nitrosodiphenylamine
	4-Bromophenyl-phenylether
	Hexachlorobenzene
	Atrazine
	Pentachlorophenol
	Carbazole
	Di-n-octylphthalate

The identified major data quality issues are described in the table below.

j a n f					
p e pj a	a n m	k o o	k p	k o	B ps l o
Extremely poor internal standard recovery	Overall Accuracy/Bias	200	2	16	8.0

Seven minor data quality issues were identified in the Phase I CSO/SWO Investigation HSM dissolved SVOC dataset. The identified minor data quality issues are described in the table below.

j a n f					
p e pj a	a n m	k o o	k p	k o	B ps l o
Field blank contamination	Accuracy/Bias Contamination	200	3	4	2.0
Non-compliant continuing calibration percent difference	Overall Accuracy/Bias	200	4	14	7.0
Non-complaint surrogate recovery	Overall Accuracy/Bias	200	4	10	5.0
Non-compliant matrix spike/matrix spike duplicate relative percent difference	Precision	200	1	7	3.5
Non-compliant internal standard recovery	Overall Accuracy/Bias	200	2	2	1.0
Non-compliant field duplicate relative percent difference	Precision	200	2	4	2.0
Non-compliant other quality issues	Overall Accuracy/Bias	200	1	1	0.50

s l (s l)

The Phase I CSO/SWO Investigation HSM dissolved VOC dataset is comprised of four samples with 24 associated results.

No major or minor data quality issues were identified during va lidation of the Phase I CSO/SWO Investigation VOCs analyses.

m

The Phase I CSO/SWO Investigation HSM dissolved Aroclor PCB dat aset is comprised of four samples with 36 associated results.

No major data quality issues were identified during validation of the Phase I CSO/SWO Investigation Aroclor PCB analyses.

One minor data quality issue was identified in the Phase I CSO/SWO Investigation HSM dissolved Aroclor PCB dataset. The identified minor data quality issue is described in the table below.

j a n f					
m e pj a	**a n m**	**k o o**	**k p**	**k o**	**B m o**
Non-compliant surrogate recovery	Overall Accuracy/Bias	36	2	18	50.0

l m

The Phase I CSO/SWO Investigation HSM dissolved Organochlorine Pesticide dataset is comprised of four samples with 112 associated results.

No major data quality issues were identified during validation of the Phase I CSO/SWO Investigation Organochlorine Pesticide analyses.

Six minor data quality issues were identified in the Phase I CS O/SWO Investigation HSM dissolved Organochlorine Pesticide dataset. The identified minor data quality issues are described in the table below.

j a n f					
l m e pj a	a n m	k o o	k p	k o	B l m o
Field blank contamination	Accuracy/Bias Contamination	112	4	32	28.6
Non-compliant qualitative requirements	Overall Accuracy/Bias	112	1	1	0.89
Non-compliant matrix spike/matrix spike duplicate relative percent difference	Precision	112	2	6	5.4
Non-compliant internal standards	Overall Accuracy/Bias	112	4	103	92.0
Non-complaint project specific labeled analog recovery as specified by USEPA Region 2	Overall Accuracy/Bias	112	4	20	17.9
Non-compliant field duplicate relative percent difference	Precision	112	4	10	8.9

p l p f j

The Phase I CSO/SWO Investigation HSM dissolved SVOCs-SIM datas et is comprised of four samples with 120 associated results.

No major data quality issues were identified during validation of the Phase I CSO/SWO Investigation SVOC SIM analyses.

Six minor data quality issues were identified in the Phase I CSO/SWO Investigation HSM dissolved SVOCs SIM dataset. The identified minor data quality issues are described in the table below.

j a n f					
p pfj e pj a	a n m	k o o	k p	k o	B ps l pfj o
Non-compliant holding time	Representativeness	120	2	60	50.0
Method blank contamination	Accuracy/Bias Contamination	120	2	3	2.5
Field blank contamination	Accuracy/Bias Contamination	120	4	35	29.2
Non-compliant initial calibration relative standard deviation	Overall Accuracy/Bias	120	2	2	1.7
Non-compliant project specific surrogate recovery as specified by USEPA Region 2	Overall Accuracy/Bias	120	1	16	13.3
Non-compliant field duplicate relative percent difference	Precision	120	2	4	3.3

The Phase I CSO/SWO Investigation HSM dissolved Cyanide dataset is comprised of four samples with four associated results.

No major data quality issues were identified during validation of the Phase I CSO/SWO Investigation Cyanide analyses.

One minor data quality issue was identified in the Phase I CSO/SWO Investigation HSM dissolved Cyanide dataset. The identified minor data quality issues, and is described in the table below.

j a n f					
e pj a	a n m	k o o	k p	k o	B o
Non-compliant field duplicate relative percent difference	Precision	4	2	2	50.0

m a Lm a

The Phase I CSO/SWO Investigation HSM dissolved PCDD/PCDFs data set is comprised of six samples with 102 associated results.

No major data quality issues were identified during validation of the Phase I CSO/SWO Investigation PCDD/PCDFs analyses.

Five minor data quality issues were identified in the Phase I CSO/SWO Investigation HSM dissolved PCDD/PCDF dataset. The identified minor data quality issues are described in the table below.

j a n f					
m a a Lm a c e pj a	a n m	k o o	k p	k o	B m a a Lm a c o
Field blank contamination	Accuracy/Bias Contamination	102	2	9	8.8
Non-compliant matrix spike/matrix spike duplicate recovery	Overall Accuracy/Bias	102	2	2	2.0
Non-compliant matrix spike/matrix spike duplicate relative percent difference	Precision	102	1	1	0.98
Non-complaint project specific labeled analog recovery as specified by USEPA Region 2	Overall Accuracy/Bias	102	6	41	40.2
Non-compliant field duplicate relative percent difference	Precision	102	4	12	11.8

m

The Phase I CSO/SWO Investigation HSM dissolved PCB Congener da taset is comprised of six samples with 1,008 associated results.

No major data quality issues were identified during validationof the Phase I CSO/SWO Investigation PCB Congener analyses.

Four minor data quality issues were identified in the Phase I CSO/SWO Investigation HSM dissolved PCB Congener dataset. The identified minor data quality issues are described in the table below.

j a n f					
m e pj a	**a n m**	**k o o**	**k p**	**k o**	**B m o**
Method blank contamination	Accuracy/Bias Contamination	1,008	2	2	0.20
Field blank contamination	Accuracy/Bias Contamination	1,008	6	305	30.3
Non-compliant internal standards	Overall Accuracy/Bias	1,008	6	400	39.7
Non-complaint project specific labeled analog recovery as specified by USEPA Region 2	Overall Accuracy/Bias	1,008	4	72	7.1

e

The Phase I CSO/SWO Investigati on HSM dissolved Chlorinated Her bicide dataset is comprised of six samples with 24 associated results.

No major data quality issues were identified during validation of the Phase I CSO/SWO Investigation Chlorinated Herbicides analyses.

Three minor data quality issues were identified in the Phase I CSO/SWO Investigation HSM dissolved Chlorinated Herbicide dataset. The identified minor data quality issues are described in the table below.

j a n f					
e pj a e	**a n m**	**k o o**	**k p**	**k o**	**B e o**
Method blank contamination	Accuracy/Bias Contamination	24	1	1	4.2
Field blank contamination	Accuracy/Bias Contamination	24	2	7	29.2
Non-compliant continuing calibration percent difference	Overall Accuracy/Bias	24	6	13	54.2

l

The Phase I CSO/SWO Investigation HSM dissolved TOC dataset is comprised of four samples with four associated results.

No major data quality issues were identified during validationof the Phase I CSO/SWO Investigation TOC analyses.

One minor data quality issue was identified in the Phase I CSO/ SWO Investigation HSM dissolved TOC dataset. The identified minor data quality issue is describedin the table below.

j a n f					
l e pj a	**a n m**	**k o o**	**k p**	**k o**	**B l o**
Field blank contamination	Accuracy/Bias Contamination	4	2	2	50.0

b m e

The Phase I CSO/SWO Investigation HSM dissolved TEPH dataset iscomprised of four samples with four associated results.

No major data quality issues were identified during validation of the CSO/SWO Investigation TEPH analyses.

Three minor data quality issues were identified in the Phase I CSO/SWO Investigation HSM dissolved TEPH dataset. The identified minor data quality issues are described in the table below.

j a n f					
b me e pj a	**a n m**	**k o o**	**k p**	**k o**	**B b me o**
Field blank contamination	Accuracy/Bias Contamination	4	2	2	50.0
Non-compliant initial calibration relative standard deviation	Overall Accuracy/Bias	4	2	2	50.0
Non-compliant continuing calibration percent difference	Overall Accuracy/Bias	4	2	2	50.0

p p

The Phase I CSO/SWO Investigation HSM dissolved TSS dataset iscomprised of eight samples with eight associated results.

No major data quality issues were identified during validationof the Phase I CSO/SWO Investigation TSS analyses.

Two minor data quality issues were identified in the Phase I CSO/SWO Investigation HSM dissolved TSS dataset. The identified minor data quality issues are described in the table below.

j a n f					
pp e pj a	**a n m**	**k o o**	**k p**	**k o**	**B pp o**
Field blank contamination	Accuracy/Bias Contamination	8	2	2	25.0
Non-compliant field duplicate relative percent difference	Precision	8	4	4	50.0

a p

The Phase I CSO/SWO Investigation HSM dissolved TDS dataset iscomprised of eight samples with eight associated results.

No major data quality issues were identified during validationof the Phase I CSO/SWO Investigation TDS analyses.

One minor data quality issue was identified in the Phase I CSO/ SWO Investigation HSM dissolved TDS dataset. The identified minor data quality issue is describedin the table below.

j a n f					
a p e pj a	**a n m**	**k o o**	**k p**	**k o**	**B a p o**
Field blank contamination	Accuracy/Bias Contamination	8	2	2	25.0

e p j m

p l

The Phase I CSO/SWO Investigation HSM particulate SVOC dataset is comprised of four samples with 200 associated results.

One major data quality issue was identified during validation of the Phase I CSO/SWO Investigation HSM particulate SVOC analyses. The internal standard perylene-d12 exhibited recoveries below the quality control limit for samples PR1CSOCLYHP-01B and PR1HPDUP-01B associated with di-n-octylphthalate.

The identified major data quality issue is described in the table below.

j a n f					
p e pj m	a n m	k o o	k p	k o	B ps l o
Extremely poor internal standard recovery	Overall Accuracy/Bias	200	2	2	1.0

Eight minor data quality issues were identified in the Phase I CSO/SWO Investigation HSM particulate SVOC dataset. The identified minor data quality issues are described in the table below.

j a n f					
p e pj m	a n m	k o o	k p	k o	B ps l o
Non-compliant holding time	Representativeness	200	2	2	1.0
Field blank contamination	Accuracy/Bias Contamination	200	1	2	1.0
Non-compliant continuing calibration percent difference	Overall Accuracy/Bias	200	4	12	6.0
Non-compliant internal standard recovery	Overall Accuracy/Bias	200	2	2	1.0
Non-compliant method surrogate recovery	Overall Accuracy/Bias	200	3	9	4.5
Non-complaint project specific surrogate recovery as specified by USEPA Region 2	Overall Accuracy/Bias	200	4	12	6.0
Percent moisture between 50-90%	Overall Accuracy/Bias	200	4	200	100
Non-compliant linear range exceedance	Overall Accuracy/Bias	200	1	2	1.0

s l

The Phase I CSO/SWO Investigation HSM particulate VOC dataset is comprised of seven samples with 42 associated results.

One major data quality issue was identified during validation of the Phase I CSO/SWO Investigation HSM dissolved VOC analyses. The internal standards chlorobenzene-d5 and 1,4-dichlorobenzene-d4 exhibited recoveries below the quality control limit. The following samples and results are associated with these non-compliant internal standard recoveries:

p k	
PR1CSOCLYHP-01B	1,3-Dichlorobenzene
	1,2-Dichlorobenzene
	1,2,4-Trichlorobenzene
	1,2,3-Trichlorobenzene
PR1HPDUP-01B	1,3-Dichlorobenzene
	1,2-Dichlorobenzene
	1,2,4-Trichlorobenzene
	1,2,3-Trichlorobenzene
PR1CSOCLYHP-01B-DEB	1,3-Dichlorobenzene
	1,2-Dichlorobenzene
	1,2,4-Trichlorobenzene
	1,2,3-Trichlorobenzene
PR1CSOCLYHP-02A1	1,3-Dichlorobenzene
	1,2-Dichlorobenzene
	1,2,4-Trichlorobenzene
	1,2,3-Trichlorobenzene
PR1CSOCLYHP-02A2	Chlorobenzene
	1,3-Dichlorobenzene
	1,2-Dichlorobenzene
	1,2,4-Trichlorobenzene
	1,2,3-Trichlorobenzene
PR1HPDUP-02A2	1,3-Dichlorobenzene
	1,2-Dichlorobenzene
	1,2,4-Trichlorobenzene
	1,2,3-Trichlorobenzene

The identified major data quality issue is described in the table below.

j a n f					
s e pj m	a n m	k o o	k p	k o	B s l o
Extremely poor internal standard recovery	Overall Accuracy/Bias	42	6	25	59.5

Six minor data quality issues wereidentified in the Phase I CSO/SWO Investigation HSM particulate VOC dataset. The identified minor data quality issues are described in the table below.

j a n f					
s e pj m	a n m	k o o	k p	k o	B s l o
Method blank contamination	Accuracy/Bias Contamination	42	5	7	16.7
Non-compliant internal standard recovery	Overall Accuracy/Bias	42	6	10	23.8
Non-compliant surrogate recovery	Overall Accuracy/Bias	42	1	6	14.3
Non-compliant matrix spike/matrix spike duplicate recovery	Overall Accuracy/Bias	42	2	4	9.5
Non-compliant matrix spike/matrix spike duplicate relative percent difference	Precision	42	2	6	14.3
Percent moisture between 50-90%	Overall Accuracy/Bias	42	7	42	100

m (m)

The Phase I CSO/SWO Investigation HSM particulate Aroclor PCB dataset is comprised of four samples with 36 associated results.

No major data quality issues were identified during validation of the Phase I CSO/SWO Investigation Aroclor PCB analyses.

Two minor data quality issues were identified in the Phase I CS O/SWO Investigation HSM particulate Aroclor PCB dataset. The identified minor data quality issues are described in the table below.

j a n f					
m e pj m	a n m	k o o	k p	k o	B m o
Non-compliant column percent difference	Overall Accuracy/Bias	36	4	6	16.7
Percent moisture between 50-90%	Overall Accuracy/Bias	36	4	36	100

l m

The Phase I CSO/SWO Investigation HSM particulate Organochlorin e Pesticide dataset is comprised of four samples with 112 associated results.

One major data quality issue was identified during validation of the Phase I CSO/SWO Investigation HSM dissolved Organochlorine Pesticide analyses. The labeled analog method recoveries for 13C6-Hexachlorobenzene, 13C6-alpha-BHC, 13C6-Lindane (gamma BHC), 13C6-beta-BHC, 13C12-2,4'-DDD, 13C6-delta-BHC and/or 13C12-4,4'-DDT exhibited recoveries below the quality control limit. Two samples and six results are associated with these non-compliant labeled analog method recoveries. The following samples and results are associated with these non-compliant internal standard recoveries:

p k	
PR1CSOCLYHP-01B	4,4'Methoxychlor
	Mirex
	Endrin Aldehyde
	Endrin Keytone
PR1HPDUP-01B	4,4'Methoxychlor
	Endrin Aldehyde

The identified major data quality issue is described in the table below.

j a n f					
l m e pj m	a n m	k o o	k p	k o	B l m o
Extremely poor labeled analog method recoveries	Overall Accuracy/Bias	112	2	6	5.4

Twelve minor data quality issues were identified in the Phase I CSO/SWO Investigation HSM particulate Organochlorine Pesticide dataset. The identified minor data quality issues are described in the table below.

j a n f					
l m e pj m	a n m	k o o	k p	k o	B l m o
Non-compliant holding time	Representativeness	112	2	56	50.0
Field blank contamination	Accuracy/Bias Contamination	112	4	20	17.9
Method blank contamination	Accuracy/Bias Contamination	112	2	2	1.8
Non-compliant internal standard recovery	Overall Accuracy/Bias	112	4	97	86.6
Non-compliant matrix spike/matrix spike duplicate recovery	Overall Accuracy/Bias	112	1	2	1.8
Non-compliant matrix spike/matrix spike duplicate relative percent difference	Precision	112	1	5	4.46
Non-compliant method labeled analog recovery	Overall Accuracy/Bias	112	4	8	7.1

Non-complaint project specific labeled analog recovery as specified by USEPA Region 2	Overall Accuracy/Bias	112	4	44	39.3
Non-compliant qualitative requirements	Overall Accuracy/Bias	112	2	2	1.8
Non-compliant linear range exceedance	Overall Accuracy/Bias	112	2	4	3.6
Percent moisture between 50-90%	Overall Accuracy/Bias	112	4	112	100
Non-compliant field duplicate relative percent difference	Precision	112	4	34	30.4

p l p f j

The Phase I CSO/SWO Investigation HSM particulate SVOCs SIM dat aset is comprised of four samples with 120 associated results.

No major data quality issues were identified during validation of the Phase I CSO/SWO Investigation SVOCs SIM analyses.

Five minor data quality issues were identified in the Phase I C SO/SWO Investigation HSM particulate SVOCs SIM dataset. The identified minor data quality issues are described in the table below.

j a n f					
p pfj e pj m	**a n m**	**k o o**	**k p**	**k o**	**B ps l pfj o**
Non-compliant holding time	Representativeness	120	2	60	50.0
Field blank contamination	Accuracy/Bias Contamination	120	2	8	6.7
Non-compliant initial calibration relative standard deviation	Overall Accuracy/Bias	120	2	2	1.7
Percent moisture between 50-90%	Overall Accuracy/Bias	120	4	120	100
Non-compliant field duplicate relative percent difference	Precision	120	4	12	10.0

The Phase I CSO/SWO Investigation HSM particulate Cyanide dataset is comprised of four samples with four associated results.

No major data quality issues were identified during validation of the Phase I CSO/SWO Investigation Cyanide analyses.

Three minor data quality issues were identified in the Phase I CSO/SWO Investigation HSM particulate Cyanide dataset. The identified minor data quality issues are described in the table below.

j a n f					
e pj m	a n m	k o o	k p	k o	B o
Field blank contamination	Accuracy/Bias Contamination	4	3	3	75.0
Non-compliant matrix spike/matrix spike duplicate recovery	Overall Accuracy/Bias	4	1	1	25.0
Percent moisture between 50-90%	Overall Accuracy/Bias	4	4	4	100

m a Lm a

The Phase I CSO/SWO Investigation HSM particulate PCDD/PCDFs dataset is comprised of six samples with 102 associated results.

No major data quality issues were identified during validation of the Phase I CSO/SWO Investigation PCDD/PCDFs analyses.

Four minor data quality issues were identified in the Phase I C SO/SWO Investigation HSM particulate PCDD/PCDFs dataset. The identified minor data quality issues are described in the table below.

j a n f					
m a a Im a c e pj m	a n m	k o o	k p	k o	B m a a Im a c o
Field blank contamination	Accuracy/Bias Contamination	102	3	5	4.9
Non-compliant internal standard recovery	Overall Accuracy/Bias	102	2	20	19.6
Percent moisture between 50-90%	Overall Accuracy/Bias	102	4	68	66.7
Non-compliant field duplicate relative percent difference	Precision	102	2	4	3.9

m

The Phase I CSO/SWO Investigation HSM particulate PCB Congener dataset is comprised of six samples with 1,008 associated results.

No major data quality issues were identified during validationof the Phase I CSO/SWO Investigation PCB Congeners analyses.

Eight minor data quality issues were identified in the Phase I CSO/SWO Investigation HSM particulate PCB Congener dataset. The identified minor data quality issues are described in the table below.

j a n f					
m e pj m	a n m	k o o	k p	k o	B m o
Method blank contamination	Accuracy/Bias Contamination	1,008	4	10	0.99
Field blank contamination	Accuracy/Bias Contamination	1,008	3	22	2.2
Non-compliant matrix spike/matrix spike duplicate relative percent difference	Precision	1,008	1	1	0.10
Non-compliant internal standard recovery	Overall Accuracy/Bias	1,008	5	413	41.0
Non-compliant method labeled analog recovery	Overall Accuracy/Bias	1,008	1	1	0.10
Non-complaint project specific labeled analog recovery as specified by USEPA Region 2	Overall Accuracy/Bias	1,008	5	49	4.9
Percent moisture between 50-90%	Overall Accuracy/Bias	1,008	4	672	66.7
Non-compliant field duplicate relative percent difference	Precision	1,008	4	40	4.0

e

The Phase I CSO/SWO Investigation HSM particulate Chlorinated H erbicide dataset is comprised of six samples with 24 associated results.

No major data quality issues were identified during validation of the Phase I CSO/SWO Investigation Chlorinated Herbicides analyses.

Eight minor data quality issues were identified in the Phase I CSO/SWO Investigation HSM particulate Chlorinated Herbicide dataset. The identified minor data quality issues are described in the table below.

j a n f					
e e pj m	a n m	k o o	k p	k o	B e o
Method blank contamination	Accuracy/Bias Contamination	24	3	4	16.7
Field blank contamination	Accuracy/Bias Contamination	24	6	10	42.0

Non-compliant matrix spike/matrix spike duplicate recovery	Overall Accuracy/Bias	24	3	11	45.8
Non-compliant matrix spike/matrix spike duplicate relative percent difference	Precision	24	3	7	29.2
Non-compliant surrogate recovery	Overall Accuracy/Bias	24	1	4	16.7
Non-compliant laboratory control standard recovery	Overall Accuracy/Bias	24	2	4	16.7
Non-compliant column percent difference	Overall Accuracy/Bias	24	4	10	41.7
Percent moisture between 50-90%	Overall Accuracy/Bias	24	6	24	100

l

The Phase I CSO/SWO Investigation HSM particulate TOC dataset i s comprised of six samples with six associated results.

No major data quality issues were identified during validation of the Phase I CSO/SWO Investigation TOC analyses.

One minor data quality issue was identified in the Phase I CSO/SWO Investigation HSM particulate TOC dataset. The identified minor data quality issue is described in the table below.

j a n f					
l e pj m	**a n m**	**k o o**	**k p**	**k o**	**B l o**
Percent moisture between 50-90%	Overall Accuracy/Bias	6	6	6	100

m e

The Phase I CSO/SWO Investigation HSM particulate TEPH dataset is comprised of four samples with four associated results.

No major data quality issues were identified during validation of the Phase I CSO/SWO Investigation TEPH analyses.

Five minor data quality issue was identified in the Phase I CSO/SWO Investigation HSM particulate TEPH dataset. The identified minor data quality issues are described in the table below.

j a n f					
b me e pj m	a n m	k o o	k p	k o	B b me o
Non-compliant holding time	Representativeness	4	2	2	50.0
Non-compliant initial calibration relative standard deviation	Overall Accuracy/Bias	4	2	2	50.0
Non-compliant continuing calibration percent difference	Overall Accuracy/Bias	4	2	2	50.0
Percent moisture between 50-90%	Overall Accuracy/Bias	4	4	4	100
Non-compliant field duplicate relative percent difference	Precision	4	2	2	50.0

4 1 7 d t p p a n f

No systematic data quality issues were identified during the Ph ase I CSO/SWO Investigation data grab water sample validation task.

4 1 8 d t p p o a n f d

d t

j

The Phase I CSO/SWO Investigation grab water sample Metals dataset is comprised of four samples with 92 associated results.

No major data quality issues were identified during validation of the Phase I CSO/SWO Investigation Metals analyses.

Two minor data quality issues were identified in the Phase I CS O/SWO Investigation grab water Metals dataset. The identified minor data quality issues are described in the table below.

j a n f					
j d t	a n m	k o o	k p	k o	B j o
Continuing calibration blank contamination	Accuracy/Bias Contamination	92	2	6	6.5
Non-compliant field duplicate relative percent difference	Precision	92	2	8	8.7

j

The Phase I CSO/SWO Investigation grab water sample Mercury dataset is comprised of four samples with four associated results.

No major or minor data quality issues were identified during va lidation of the Phase I CSO/SWO Investigation Mercury analyses.

j j

The Phase I CSO/SWO Investigation grab water sample Methyl Merc ury dataset is comprised of four samples with four associated results.

No major or minor data quality issues were identified during va lidation of the Phase I CSO/SWO Investigation Methyl Mercury analyses.

p p

The Phase I CSO/SWO Investigation grab water sample TSS dataset is comprised of 45 samples with 45 associated results.

No major data quality issues were identified during validation of the Phase I CSO/SWO Investigation TSS analyses.

One minor data quality issue was identified in the Phase I CSO/SWO Investigation grab water TSS dataset. The identified minor data quality issue is described in the table below.

j a n f					
pp d t	**a n m**	**k o o**	**k p**	**k o**	**B pp o**
Non-compliant holding time	Representativeness	45	8	8	17.8

a p

The Phase I CSO/SWO Investigation grab water sample TDS dataset is comprised of 45 samples with 45 associated results.

No major data quality issues were identified during validation of the Phase I CSO/SWO Investigation TDS analyses.

One minor data quality issue was identified in the Phase I CSO/SWO Investigation grab water TDS dataset. The identified minor data quality issue is described in the table below.

j a n f					
a p d t	a n m	k o o	k p	k o	B a p o
Non-compliant holding time	Representativeness	45	8	8	17.8

d t a

j

The Phase I CSO/SWO Investigation grab water dissolved sample Metals dataset is comprised of four samples with 92 associated results.

No major data quality issues were identified during validation of the Phase I CSO/SWO Investigation Metals analyses.

Three minor data quality issues were identified in the Phase I CSO/SWO Investigation dissolved grab water Metals dataset. The identified minor data quality issues are described in the table below.

j a n f					
j d t a	a n m	k o o	k p	k o	B j o
Field blank contamination	Accuracy/Bias Contamination	92	4	8	8.7
Continuing calibration blank contamination	Accuracy/Bias Contamination	92	4	9	9.8
Non-compliant field duplicate relative percent difference	Precision	92	2	2	2.2

j

The Phase I CSO/SWO Investigation grab water dissolved sample Mercury dataset is comprised of four samples with four associated results.

No major or minor data quality issues were identified during validation of the Phase I CSO/SWO Investigation Mercury analyses.

j j

The Phase I CSO/SWO Investigation grab water dissolved sample Methyl Mercury dataset is comprised of four samples with four associated results.

No major or minor data quality issues were identified during va lidation of the Phase I CSO/SWO Investigation Methyl Mercury analyses.

5 a s

This verification procedure was implemented as an evaluation ofTotal Tetrachlorinated Dibenzo-p-Dioxin (TCDD) results since these values were not evaluated during theisomer specific data validation task. This process is used to assess both the completeness and accuracy of the total TCDD data set.

Total TCDD results were verified for each sample having total T CDD results reported in Phase I of the CSO/SWO Investigation. In cases where multiple analyses were performed by the laboratory for 2,3,7,8-TCDD (example: multiple dilutions due to elevated target analyt e concentrations or re-analysis based on failed quality control criteria), EDS staff made certain that the total TCDD value reported in the data base, as well as hardcopy data, was based on the same analysis used to derive the 2,3,7,8-TCDD value reported.

Procedure Acceptance Criteria:

- Selected ion current profiles (SICPs) for ions 319.8965 and 321.8936 representing all non 2,3,7,8-substituted tetra chlorinated dibenzo-p-dioxins and 2,3,7,8-substituted tetra chlorinated dibenzo-p-dioxin are reported for each sample.
- Integrated areas are present for both the primary and confirmation ions for all peaks and are 2.5 times above background noise in each sample SICP.
- Instrument quantitation reports containing relative response factors for 2,3,7,8-TCDD, area counts for the 2,3,7,8 –TCDD labeled analog and sample preparation information are present for each sample.

Calculation Acceptance Criteria:

- The retention time of each non 2,3,7,8-substituted compound identified as present in the sample was within the window established by the window defining mixture, for the tetra chlorinated homologue.
- The integrated ion current of each non 2,3,7,8-substituted compound identified as present in the sample was at least 2.5 times background noise.
- All peaks meeting the requirements described above were included in the laboratory's calculation of Total TCDD.
- A minimum of one non 2,3,7,8-substituted compound identified was verified and the concentration recalculated.
- Recalculate the sum of all non 2,3,7,8-substituted tetra chlorinated dibenzo-p-dioxins and 2,3,7,8-substituted tetra chlorinated dibenzo-p-dioxin identified in each sample.

Results of Verification:

All 53 total TCDD results, reported during implementation of the Phase I CSO/SWO Investigation, were evaluated during this task. Of the 53 samples evaluated for this program, four of the results are recommended for editing based on the results of the total T CDD result verification task. The affected samples and associated results are provided in Table 5-1 below. Total TCDD results for

these samples have been corrected in both the laboratory hardcopy data reports and United States Environmental Protection Agency (USEPA) Region 2 Main Electronic Data Deliverable (MEDD).

5 1

Sample Identification	Result Units	Existing Result Value	Data Qualifiers	New Result Value	Data Qualifiers
PR1LPDUP-01A	pg/g	11.5	EMPC	9.72	EMPC
PR1CSOCLYHP-02B	pg/g	14.0		12.8	
PR1HPDUP-02B	pg/g	13.8	EMPC	12.1	EMPC
PR1CSOCLYHP-01C	pg/g	19.4	EMPC	17.8	EMPC

6

The data usability evaluations outlined in this report provides details regarding the relationship of data quality issues to associated samples and sample results. Ninety-nine percent of the data validated and reported are suitable for their intended use. A total of 29 sample results for the SVOC analyses and 25 sample results for the VOC analyses were rejected due to internal standard recoveries. A total of seven sample results for the organochlorine pesticide analyses were rejected due to method labeled analog recoveries. Sample results that were rejected are not suitable for project use. Sample results that are qualified as estimated due to multiple minor data quality issues as detailed in this report are suitable for project use. The achievement of the completeness goals for number of samples collected and the number of samples accepted for use provides sufficient quality data to support project decisions.

7 o

Tierra 2013. Combined Sewer Overflow/Stormwater Outfall Investigation Quality Assurance Project Plan, Revision 3, September.