



**MEMORANDUM**

**Date:** 23 May 02

**To:** Dave Sawicki, Project Manager, Tetra Tech EM Inc. (Tetra Tech)  
Superfund Technical Assessment and Response Team (START) for Region 5

**From:** Nancy McDonald, Chemist, Tetra Tech START for Region 5

**Subject:** Data Validation for  
St. Clair Shores Site  
St. Clair Shores, Michigan  
Analytical Technical Direction Document (TDD) No. S05-0203-003  
Project TDD No. S05-0203-002

Laboratory: AAC Trinity (AACT), Farmington Hills, Michigan  
Work Order No. 02-0676  
Polychlorinated Biphenyl (PCB) and Resource Conservation and Recovery Act (RCRA)  
Metals Analysis of One Water Sample and PCB Analysis of One Wipe Sample

**1.0 INTRODUCTION**

The Tetra Tech START for Region 5 validated PCB and RCRA metals analytical data for one water sample as well as PCB analytical data for one wipe sample collected on 12 Mar 02 during a site assessment of the St. Clair Shores site in St. Clair Shores, Michigan. The water and wipe samples were analyzed under the above-referenced work order by AACT using U.S. Environmental Protection Agency (U.S. EPA) SW-846 Method 8082 for PCB analysis. The water sample was analyzed for RCRA metals using SW-846 Methods 6020 (all metals except chromium and mercury), 7191 (chromium), and 7470A (mercury). START identified several inconsistencies between the metals analytical method numbers listed in the AACT sample result summary sheets and those listed in the analytical data package. For this reason, START contacted AACT and verified which methods were actually used to analyze the samples

discussed herein. All methods listed in the case narrative are correct with the exception of the water methods for the barium and mercury analyses.

The organic and inorganic data were evaluated in general accordance with U.S. EPA's "Contract Laboratory Program National Functional Guidelines for Organic Data Review" dated Oct 99 and "Contract Laboratory Program National Functional Guidelines for Inorganic Data Review" dated Feb 94, respectively. Organic data validation consisted of a review of the following quality control (QC) parameters: holding times, initial and continuing calibrations, blank results, matrix spike and matrix spike duplicate (MS/MSD) results, surrogate recovery results, laboratory control sample (LCS) results, and sample quantitation. Inorganic data validation consisted of a review of the following QC parameters: holding times, initial and continuing calibrations, blank results, MS/MSD and method duplicate results, LCS results, interference check sample (ICS) results, and sample quantitation.

Section 2.0 discusses the results of the organic data validation, Section 3.0 discusses the results of the inorganic data validation, and Section 4.0 presents an overall assessment of the data. The attachment contains AACT's summary of sample analytical results as well as START's handwritten data qualifications where warranted.

## **2.0 ORGANIC DATA VALIDATION RESULTS**

The results of START's data validation for the organic analyses are summarized below in terms of the QC parameters reviewed. The data qualifier below was applied to the sample analytical results where warranted (see the attachment).

- U - The analyte was not detected. The reported numerical value is the sample detection limit.

## 2.1 HOLDING TIMES

The wipe sample was analyzed within the holding time limits of 14 days to extraction and 40 days from extraction to analysis, and the water sample was analyzed within the holding time limits of 7 days to extraction and 40 days from extraction to analysis.

## 2.2 INITIAL AND CONTINUING CALIBRATIONS

All correlation coefficients for the initial calibration results met the QC limit of greater than 0.99. All continuing calibration results for the quantitation and confirmation columns were within the QC limit of 15 percent difference.

## 2.3 BLANK RESULTS

A method blank was run with each analytical batch in the proper sequence. Low-level concentrations of Aroclors 1248 and 1254 were detected in the water method blank. The results below were qualified "U" as not detected because the PCBs were detected at less than five times the associated blank result.

<u>Analyte</u>	<u>Blank Result</u> <u>(microgram/liter)</u>	<u>Matrix</u>	<u>Sample Qualified</u>
Aroclor 1248	1.848	Water	M4406-SW
Aroclor 1254	0.37875	Water	M4406-SW

## 2.4 MS/MSD RESULTS

No water or wipe MS or MSD was analyzed. No qualification is warranted for this data gap.

## **2.5 SURROGATE RECOVERY RESULTS**

Surrogate recovery results were within laboratory-established QC limits for all samples.

## **2.6 LCS RESULTS**

An LCS was analyzed on the day of sample analysis, and the LCS result was within the laboratory-established QC limits.

## **2.7 SAMPLE QUANTITATION**

Sample quantitation was manually verified for one sample of each medium (water sample M4406-SW and wipe sample M4406-W). In each case, sample quantitation was performed correctly.

None of the environmental sample chromatograms were good matches with the Aroclor standards. Therefore, AACT used its best judgment in deciding which Aroclor or Aroclors should be used for quantitation. The Aroclors chosen for quantitation are acceptable, but different choices would have yielded different quantitative results. Whether those results would be higher or lower and how much higher or lower depends on (1) the exact nature of the environmental sample (which congeners are present at what concentrations), (2) which Aroclor or Aroclors were chosen by the laboratory for quantitation, and (3) which peaks in each chosen Aroclor are used for quantitation.

## **3.0 INORGANIC DATA VALIDATION RESULTS**

The results of START's data validation for the inorganic analyses are summarized below in terms of the QC parameters reviewed. The data qualifiers below were applied to the sample analytical results where warranted (see the attachment).

- UJ - The analyte was not detected. The reported sample detection limit is considered

estimated for QC reasons.

- J - The analyte was detected. The reported numerical value is considered estimated for QC reasons.

### **3.1 HOLDING TIMES**

The samples were analyzed within the holding time limits of 28 days for mercury and 6 months for all other metals.

### **3.2 INITIAL AND CONTINUING CALIBRATIONS**

Initial and continuing calibrations were performed as required by the analytical methods. The percent recoveries for initial and continuing calibrations were within the QC limit of 90 to 110 percent.

### **3.3 BLANK RESULTS**

Blanks were analyzed with each analytical batch. A low-level concentration of chromium (2.1 micrograms per liter) was detected in the water method blank. No qualifications are required because the sample result was greater than five times the associated method blank target analyte result.

### **3.4 MS/MSD AND METHOD DUPLICATE RESULTS**

MS/MSD analyses were performed as required, and all results except the following were within the laboratory-established QC limits. AACT performed the MS/MSD analysis on water samples M6976-SW and M4238-SW (from Work Order No. 02-0674) from the St. Clair Shores site. The barium concentration in the original (unspiked) sample was more than four times the barium spiking level; therefore, the MS/MSD results for barium were not usable. No qualifications are warranted for this data gap. Sample results were qualified "J" or "UJ," as appropriate, as shown below because MS/MSD

recoveries were outside the QC limit of 75 to 125 percent.

<u>Sample</u>	<u>Analyte</u>	<u>MS/MSD Recoveries</u>	<u>Matrix</u>	<u>Samples Qualified</u>
M6976-SW	Cadmium	91.4/-3.55	Water	M4406-SW
M4238-SW	Mercury	62/73	Water	M4406-SW

In addition, the relative percent differences (RPD) between the MS and MSD results for all metals were within the QC limit of 20 or less except for barium, which had an RPD of 22.1. No qualification is warranted for this discrepancy because the barium MS/MSD results are considered unusable as discussed above.

Method duplicate analyses were not performed by AACT for both the aqueous and wipe samples. However, the method duplicate analysis is not required; therefore, no qualifications are warranted for this data gap.

### 3.5 LCS RESULTS

An LCS was analyzed with each analytical batch, and all LCS results were within the laboratory-established QC limits.

### 3.6 ICS RESULTS

ICS analyses were not performed by AACT for this work order. However, no qualification is warranted for this data gap.

### 3.7 SAMPLE QUANTITATION

Sample quantitation was manually verified for water sample M4406-SW. In all cases, the calculations

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were performed correctly. The positive sample result for selenium was below the sample reporting limit, which corresponds to the lowest calibration standard. This extrapolation was flagged “J” as an estimate by the laboratory and is accepted.

#### **4.0 OVERALL ASSESSMENT OF DATA**

All sample analytical data generated by AACT are acceptable for use as qualified.

**ATTACHMENT**

**AACT SUMMARY OF SAMPLE ANALYTICAL RESULTS**

(Two Sheets)

# AAC Trinity

Date: 15-Mar-02

CLIENT: Tetra Tech EM, Inc.  
 Lab Order: 02-0676  
 Project: S050203002/St. Clair Shores  
 Lab ID: 02-0676-01

Client Sample ID: M4406-SW  
 Collection Date: 3/12/2002 5:40:00 PM  
 Matrix: AQUEOUS

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
<b>METALS - EPA 6020 (TOTAL)</b>		<b>EPA6020</b>				Analyst: AV
Arsenic	8.4	5.0		µg/L	1	3/14/2002
Barium	140	100		µg/L	1	3/14/2002
Cadmium	2.6 J	0.50		µg/L	1	3/14/2002
Chromium	22	5.0		µg/L	1	3/14/2002
Lead	16	3.0		µg/L	1	3/14/2002
Selenium	2.0 J	5.0	J	µg/L	1	3/14/2002
Silver	ND	0.50		µg/L	1	3/14/2002
<b>MERCURY - EPA 7470 (TOTAL)</b>		<b>EPA7470</b>				Analyst: JMK
Mercury	ND UJ	0.20		µg/L	1	3/14/2002
<b>POLYCHLORINATED BIPHENYLS</b>		<b>EPA8082</b>				Analyst: MB
Aroclor 1016	ND	0.10		µg/L	1	3/13/2002 10:32:22 PM
Aroclor 1221	ND	0.10		µg/L	1	3/13/2002 10:32:22 PM
Aroclor 1232	ND	0.10		µg/L	1	3/13/2002 10:32:22 PM
Aroclor 1242	ND	0.10		µg/L	1	3/13/2002 10:32:22 PM
Aroclor 1248	0.91 U	0.10	U	µg/L	1	3/13/2002 10:32:22 PM
Aroclor 1254	0.14 U	0.10		µg/L	1	3/13/2002 10:32:22 PM
Aroclor 1260	ND	0.10		µg/L	1	3/13/2002 10:32:22 PM
Surr: Decachlorobiphenyl	33.0	10-144		%REC	1	3/13/2002 10:32:22 PM
Surr: Tetrachloro-m-xylene	37.9	10-120		%REC	1	3/13/2002 10:32:22 PM

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Qualifiers: ND - Not Detected at the Reporting Limit  
 J - Analyte detected below quantitation limits  
 B - Analyte detected in the associated Method Blank  
 \* - Value exceeds Maximum Contaminant Level  
 S - Spike Recovery outside accepted recovery limits  
 R - RPD outside accepted recovery limits  
 E - Value above quantitation range  
 RL - Reporting Limit if used

**AAC Trinity**

Date: 15-Mar-02

CLIENT: Tetra Tech EM, Inc.  
 Lab Order: 02-0676  
 Project: S050203002/St. Clair Shores  
 Lab ID: 02-0676-02

Client Sample ID: M4406-W  
 Collection Date: 3/12/2002 5:40:00 PM  
 Matrix: WIPE

Analyses	Result	RL	Qual Units	DF	Date Analyzed
<b>POLYCHLORINATED BIPHENYLS - EPA 8082</b>		<b>EPA8082</b>			Analyst: MB
Aroclor 1016	ND	0.50	µg/Kg	1	3/14/2002 3:05:07 AM
Aroclor 1221	ND	0.50	µg/Kg	1	3/14/2002 3:05:07 AM
Aroclor 1232	ND	0.50	µg/Kg	1	3/14/2002 3:05:07 AM
Aroclor 1242	ND	0.50	µg/Kg	1	3/14/2002 3:05:07 AM
Aroclor 1248	1.7	0.50	µg/Kg	1	3/14/2002 3:05:07 AM
Aroclor 1254	ND	0.50	µg/Kg	1	3/14/2002 3:05:07 AM
Aroclor 1260	ND	0.50	µg/Kg	1	3/14/2002 3:05:07 AM
Surr: Decachlorobiphenyl	95.8	43-137	%REC	1	3/14/2002 3:05:07 AM
Surr: Tetrachloro-m-xylene	60.9	45-120	%REC	1	3/14/2002 3:05:07 AM

Qualifiers: ND - Not Detected at the Reporting Limit  
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S - Spike Recovery outside accepted recovery limits  
 R - RPD outside accepted recovery limits  
 E - Value above quantitation range  
 RL - Reporting Limit if used

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