

December 20, 2010

Mr. Ron Morony
Project Officer
Program Assessment and Outreach Branch
U.S. Environmental Protection Agency
1301 Constitution Ave., Room 4355-W
Washington, D.C. 20004

Contract No. EP-W-09-024
Work Assignment No. 1-05
PCB Disposal Demonstration Sample Results

Dear Ron:

Enclosed please find a summary report documenting the analytical results for the baseline samples collected as part of the *in situ* ozonation PCB Disposal Demonstration conducted the week of September 20, 2010. The summary report is a deliverable under Task 3 of the work assignment statement of work. The summary report provides the PCB Aroclor analysis results of the soil and ground water samples, as well as a summary of the Quality Assurance/Quality Control (QA/QC) procedures and the final analytical data tables. If additional information on the analysis of the samples is required, a full laboratory data package can be provided.

If you have any questions, please contact me at (614) 424-4547. Questions of a technical nature should be directed to Mike Rectanus, Battelle's Work Assignment Leader, at (614) 424-7552.

Sincerely,



Bruce E. Buxton, Ph.D. *per*
Sr. Program Manager

BEB:cms
Enclosure

cc: Winston Lue, EPA WAM
Amy Hensley, Alternate EPA WAM

***In Situ* Ozonation PCB Disposal Demonstration
Baseline Soil and Ground Water Samples
Analytical Results Summary**

A baseline sampling event for the *in situ* ozonation PCB Disposal Demonstration was conducted the week of September 20, 2010. Three ground water samples and three soil samples were collected on September 21 and 22. The samples were received at the Battelle Duxbury analytical laboratory on September 23 and were immediately logged into the Battelle Laboratory Information Management System.

The soil samples were extracted by manual Soxhlet Method 3540C. All sample extracts were analyzed for PCB Aroclors by electron capture detector (ECD) in accordance with EPA Method 8082. Table 1 provides a summary of the analytical results in units of µg/g (ppm) for the Aroclor analysis of the soil samples (BL SOIL #), and Table 2 provides the analytical results in units of µg/L (ppb) for the ground water samples (BL WATER #).

Attachment A provides a narrative of the extraction and analysis procedures performed on the demonstration samples and the Quality Assurance/Quality Control (QA/QC) documents related to sample receipt and handling. Attachment B provides the final analytical data tables for the demonstration samples, which were created from a direct transfer of the authorized Laboratory Information Management System data. A full laboratory data package related to the analysis of the PCB Disposal Demonstration samples is available upon request.

In addition to the analysis of the PCB Disposal Demonstration samples, two QA performance evaluation samples were provided to the EPA Work Assignment Manager (WAM) with the demonstration sampling kit. The two QA performance evaluation samples were prepared based on the EPA WAM's instructions of one sample at a concentration of less than 2 ppm PCB and one at a concentration between 4,000 and 5,000 ppm PCB. Both QA performance evaluation samples were comprised of Aroclor 1242. Attachment C provides the certification documentation of the QA performance evaluation samples.

Table 1. Summary of the Soil Sample Results

Client ID	BL SOIL 1	BL SOIL 2	BL SOIL 3
Date Collected:	9/22/2010	9/22/2010	9/22/2010
Date Extracted:	10/05/2010	10/05/2010	10/05/2010
Date Analyzed:	11/03/2010	11/03/2010	11/03/2010
Extraction Method:	Soxhlet	Soxhlet	Soxhlet
Matrix:	Solid	Solid	Solid
Sample Wt/Vol:	1.84 g	1.91 g	1.99 g
Percent Moisture:	11.11	5.99	4.32
Concentration Unit:	µg/g	µg/g	µg/g
Aroclor 1242	721 D	0.6 J	2.0 DJ

D: diluted

J: below detection limit

Table 2. Summary of the Ground Water Sample Results

Client ID	BL WATER 1	BL WATER 2	BL WATER 3
Date Collected:	9/21/2010	9/21/2010	9/22/2010
Date Extracted:	9/28/2010	9/28/2010	9/28/2010
Date Analyzed:	11/02/2010	11/02/2010	11/02/2010
Matrix:	Water	Water	Water
Sample Wt/Vol:	0.29 L	0.45 L	0.22 L
Percent Moisture:	NA	NA	NA
Concentration Unit:	µg/L	µg/L	µg/L
Aroclor 1242	ND	34.9 D	55.6 D

NA: not applicable

ND: not detected

D: diluted

ATTACHMENT A

SAMPLE ANALYSIS NARRATIVE AND QA/QC DOCUMENTS

PCB – Soil QA/QC Summary

Batch 10-0319

PROJECT: PCB Disposal Demonstrations
PARAMETER: Aroclor
LABORATORY: Battelle, Duxbury, MA
MATRIX: Soil
SAMPLE CUSTODY: Three ground water and three soil samples were received at Battelle Duxbury on 09/23/2010. Samples were received at ambient temperature. Samples were logged into the Battelle Laboratory Information Management System (LIMS) and were assigned unique identification numbers. The samples were stored in the walk-in refrigerator at 4° C until sample preparation could begin.

	Reference Method	Method Blank	Surrogate Recovery	LCS/MS Recovery	Sample Replicate Relative Precision	Detection Limits (ng/g)
PCB Aroclors	3540C	<5 x ss-	40-120%	40-120%	≤30% RPD (for analytes >5x MDL)	MDL: ~0.9 – 3.2
	8082A	MDL	Recovery	Recovery		

(target spike must be >5 x native conc.)

METHOD: Soil samples were extracted for PCB following Battelle SOP 5-309 “Soxhlet Extraction of Solid or Semisolid Samples for Semi-Volatile Contaminant Analysis” based on EPA SW-846 Method 3540C. Approximately 2 grams of soil was spiked with surrogates and extracted in methylene chloride using Soxhlet apparatus. The extract was dried over anhydrous sodium sulfate and concentrated over a water bath. The extracts were cleaned with copper (for sulfur removal), then processed through forisil cleanup column, and concentrated. The samples were fortified with internal standards (IS) just prior to analysis. Extracts intended for PCB analysis were analyzed using gas chromatography/electron capture detection (GC/ECD), following Battelle SOP 5-128, which is based on key components described in EPA Method 8082A. Sample data were quantified by the method of internal standards, using the IS compounds. Data were reported on a nanogram per gram (ng/g) dry weight basis and evaluated against 2010 method detection limits (MDLs).

Note: Extracts were diluted prior to analysis based on the expected concentrations provided by EPA. Further dilutions were prepared based on initial analysis.

HOLDING TIMES: Field samples were prepared for analysis in one analytical batch and were extracted within 7 days of sample collection and analyzed within 40 days of extraction.

Batch	Extraction Date	Analysis Date
10-0319	10/05/2010	11/02/2010 – 11/03/2010; 11/11/2010 (re-runs/dilutions)

BLANKS A procedural blank (PB) was prepared with the analytical batch. Blanks are analyzed to ensure the sample extraction and analysis methods were free of contamination.

10-0319 – No exceedences noted.

Comments – None.

PCB – Soil QA/QC Summary
Batch 10-0319

LABORATORY CONTROL SAMPLE: A laboratory control sample (LCS) was prepared with the analytical batch. The percent recoveries of target analytes were calculated to measure data quality in terms of accuracy.

10-0319 – No exceedences noted.

Comments – All target analytes were recovered within the specified laboratory control limits (40-120%).

MATRIX SPIKE A matrix spike (MS) sample was prepared with the analytical batch. The percent recoveries of target Aroclors were calculated to measure data quality in terms of accuracy.

10-0319 – Two exceedences noted.

Comments – Aroclors 1016 and 1260 were both recovered at levels outside the control criteria (40 – 120%). High concentrations of Aroclor in the background sample masked the spiked concentration causing apparent over-recovery. No corrective action taken.

REPLICATES: Replicate (duplicate) samples were prepared with the analytical batch. The relative percent difference (RPD) between concentrations is calculated to measure data quality in terms of precision.

10-0319 – No exceedences noted.

Comments – None.

SURROGATES: Two surrogate compounds were added prior to extraction, including PCB 34 and PCB 152. The recovery of each surrogate compound was calculated to measure data quality in terms of accuracy (extraction efficiency).

10-0319 – One exceedence noted.

Comments – PCB152 was recovered outside the control criteria (40-120%) in one field sample (P3442). The exceedence was caused by an interfering peak near PCB 152. This recovery is “ME” qualified indicating matrix interference. This same sample was used for the background for the Matrix Spike sample; the surrogate recovery for PCB 152 is “ME” qualified in the MS also. PCB 34 was recovered within criteria in this sample. No further corrective actions taken.

PCB – Soil QA/QC Summary
Batch 10-0319

CALIBRATION: The GC/ECD instrument is calibrated with a 6-level calibration. The co-efficient of determination for the initial calibration (ICAL) must be > 0.995 . Continuing calibration verification (CCV) samples are analyzed minimally every 24 hours. The percent difference for the CCV samples must be $\leq 20\%$. Additionally an Instrument Calibration Check (ICC) sample is run after each ICAL. The percent difference for the ICC also must be $\leq 20\%$.

10-0319 – No ICAL exceedence noted.
No CCV exceedences noted.
Two ICC exceedences noted.

Comments – The surrogate compounds were outside the range. All surrogates pass in the CCV extracts, and the targets pass in the ICC. Therefore no corrective action was taken.

PCB – Water QA/QC Summary
Batch 10-0300

PROJECT: PCB Disposal Demonstrations
PARAMETER: Aroclor
LABORATORY: Battelle, Duxbury, MA
MATRIX: Ground water
SAMPLE CUSTODY: Three ground water and three soil samples were received at Battelle Duxbury on 09/23/2010. Samples were received at ambient temperature. Samples were logged into the Battelle Laboratory Information Management System (LIMS) and were assigned unique identification numbers. The samples were stored in the walk-in refrigerator at 4° C until sample preparation could begin.

	Reference Method	Method Blank	Surrogate Recovery	LCS/MS Recovery	Sample Replicate Relative Precision	Detection Limits (ng/L)
PCB Aroclors	General NS&T/ 8082A	<5 x ss- MDL	40-120% Recovery	40-120% Recovery	≤30% RPD (target spike must be >5 x native conc.)	MDL: ~0.4 (for analytes >5x MDL)

METHOD: Water samples were extracted for PCB following general National Status and Trends (NS&T) methods. Approximately 0.5 liter of water was spiked with surrogates and extracted three times with methylene chloride using separatory funnel techniques. The combined extract was dried over anhydrous sodium sulfate and concentrated over a water bath. The extracts were then processed through an alumina cleanup column, and concentrated again on a water bath. The samples were fortified with internal standards (IS) and concentrated to approximately 500 microliters. Extracts intended for PCB analysis were analyzed using gas chromatography/electron capture detection (GC/ECD), following Battelle SOP 5-128, which is based on key components described in EPA Method 8082A. Sample data were quantified by the method of internal standards, using the IS compounds. Data were reported on a nanogram per liter (ng/L) basis and evaluated against 2010 method detection limits (MDLs).

HOLDING TIMES: Field samples were prepared for analysis in one analytical batch and were extracted within 7 days of sample collection and analyzed within 40 days of extraction.

<u>Batch</u>	<u>Extraction Date</u>	<u>Analysis Date</u>
10-0300	9/28/2010	11/02/2010; 11/11/2010 (re-runs/dilutions)

BLANK: A procedural blank (PB) was prepared with the analytical batch. Blanks are analyzed to ensure the sample extraction and analysis methods were free of contamination.

10-0300 – No exceedences noted.

Comments – None.

PCB – Water QA/QC Summary
Batch 10-0300

LABORATORY CONTROL SAMPLE: A laboratory control sample (LCS) was prepared with the analytical batch. The percent recoveries of target analytes were calculated to measure data quality in terms of accuracy.

10-0300 – No exceedences noted.

Comments – All target analytes were recovered within the specified laboratory control limits (40-120%).

MATRIX SPIKE A matrix spike (MS) sample was prepared with the analytical batch. The percent recoveries of target Aroclors were calculated to measure data quality in terms of accuracy.

10-0300 – No exceedences noted.

Comments – Aroclors 1016 and 1260 were recovered at levels within the control criteria (40 – 120%).

REPLICATES: Replicate (duplicate) samples were prepared with the analytical batch. The relative percent difference (RPD) between concentrations is calculated to measure data quality in terms of precision.

10-0300 – No exceedences noted.

Comments – None.

SURROGATES: Two surrogate compounds were added prior to extraction, including PCB 34 and PCB 152. The recovery of each surrogate compound was calculated to measure data quality in terms of accuracy (extraction efficiency).

10-0300 – Two exceedences noted.

Comments – PCB34 was recovered outside the control criteria (40-120%) in two instances. The exceedences were related to elevated levels of Aroclor 1242 in the samples; interference from the high PCB concentration in that range of the chromatograms was responsible for the exceedences. The recoveries are qualified with “ME” indicating matrix interference. The second surrogate in these samples, PCB 152 was recovered within criteria, and the area response of the two internal standards were within criteria, indicating the analysis was in control. No further corrective actions taken.

PCB – Water QA/QC Summary
Batch 10-0300

CALIBRATION: The GC/ECD instrument is calibrated with a 6-level calibration. The co-efficient of determination for the initial calibration (ICAL) must be > 0.995 . Continuing calibration verification (CCV) samples are analyzed minimally every 24 hours. The percent difference for the CCV samples must be $\leq 20\%$. Additionally an Instrument Calibration Check (ICC) sample is run after each ICAL. The percent difference for the ICC also must be $\leq 20\%$.

10-0300 – No ICAL exceedence noted.
No CCV exceedences noted.
Two ICC exceedences noted.

Comments – The surrogate compounds were outside the range. All surrogates pass in the CCV extracts, and the targets pass in the ICC. Therefore no corrective action was taken.

Sample Receipt Form

Approved: Authorized

Project Number: _____ **Client:** EPA
Received by: Schumitz, Matt **Date/Time Received:** Thursday, September 23, 2010 10:00 AM
No. of Shipping Containers: 1

SHIPMENT

Method of Delivery: Commercial Carrier **Tracking Number:** 854605448933
COC Forms: Shipped with samples No Forms

Cooler(s)/Box(es)

Cntr	Type	Tracking No.	Seal	Seal Condition	Container Condition	Temp C	Smpls
1 of 1	Cooler	854605448933	Tape	Intact	Intact	22.0	6

Samples

Sample Labels: Sample labels agree with COC forms
 Discrepancies (see Sample Custody Corrective Action Form)

Container Seals: Tape Custody Seals Other Seals (See sample Log)
 Seals intact for each shipping container
 Seals broken (See sample log for impacted samples)

Condition of Samples: Sample containers intact
 Sample containers broken/leaking (See Custody Corrective Action Form)

Temperature upon receipt (°C): 22 Temperature Blank used Yes No
(Note: If temperature upon receipt differs from required conditions, see sample log comment field)

Samples Acidified: Yes No Unknown

Initial pH 5-9?: Yes No NA
If no, individual sample adjustments on the Auxiliary Sample Receipt Form

Total Residual Chlorine Present?: Yes No NA
If yes, individual sample adjustments on the Auxiliary Sample Receipt Form

Head Space <1% in samples for water VOC analysis: Yes No NA
Individual sample deviations noted on sample log

Samples Containers:
 Samples returned in PC-grade jars: Yes No Unknown /Lot No.: UnKnown

Storage Location: Chem South: Refrigerator - R0003 (Upper Cold) **BDO IDs Assigned:** P3437 - P3442

Samples logged in by: Schumitz, Matt **Date/Time:** 09/23/2010 10:00 AM

Approved By: _____ **Approved On:** _____

Authorized By: _____ **Authorized On:** _____

Sample Receipt Form Details

Battelle Project No:

Approved: Authorized

Project Number:

Client: EPA

Received by:

Schumitz, Matt

Date/Time Received:

Thursday, September 23, 2010 10:00 AM

No. of Shipping Containers: **1**

BDO Id:	Client Sample ID:	Collection Date:	Login Date:	Ctrs:	Matrix:	Temp:	pH:	TRC:	VOC:	Stored In:	Loc:	No:	Comments:
P3437	BL WATER 1	09/21/10 14:06	09/23/10 13:34	1	WATER	22	NA	NA	NA	R0003 (Upper C			
P3438	BL WATER 2	09/21/10 15:00	09/23/10 13:35	1	WATER	22	NA	NA	NA	R0003 (Upper C			
P3439	BL WATER 3	09/22/10 13:00	09/23/10 13:36	1	WATER	22	NA	NA	NA	R0003 (Upper C			
P3440	BL SOIL 1	09/22/10 10:40	09/23/10 13:37	1	SEDIMENT	22	NA	NA	NA	R0003 (Upper C			
P3441	BL SOIL 2	09/22/10 11:15	09/23/10 13:38	1	SEDIMENT	22	NA	NA	NA	R0003 (Upper C			
P3442	BL SOIL 3	09/22/10 12:05	09/23/10 13:38	1	SEDIMENT	22	NA	NA	NA	R0003 (Upper C			

Total Samples: 6

Report Corrective Actions

Corrective Action No: 1 of 1
Authorized Approved:

COC Client: EPA
COC Project: BLUE LIGHTNING
COC Date: 9/23/2010 1:27:0

	Description of Problem:	Explanation:
Custody	Jars and C-O-C do not match for time/date	Sample P3437 (BL Water 1) collection time on COC states 1406 and time on sample container list 1406. Collection time entered into LIMS as listed on COC.
Temperature and Preservation	Receipt temperature outside of acceptability	Cooler received with Blue Ice packs that were no longer frozen or cold. Samples received at ambient temperature.

Documentation of project manager notification

Sample Custodian: Hargis, Michael **Date:** 9/23/2010 4:08:00 PM
Laboratory Manager: _____ **Date:** _____
Project Manager: _____ **Date:** _____

Documentation of client notification (should be completed by project manager within 24 hrs):

On _____ **I contacted** _____ **at** _____

Results of communication with client (Describe any corrective action directed by the client):

Date this form was received back to the custodian: _____
Reference Number: _____

Proj. No		Proj. Name		ANALYSIS REQUESTED → "NUMBER OF CONTAINERS"	SAMPLE DESCRIPTION	PEST	PCB	TPH FINGERPRINT	PAH	VOA	TBT	METALS	OTHER	ACIDIFIED	PRESERVED	Total Number of Containers
DATE	TIME	BATTELLE ID	CLIENT ID													
9-21-10	1406	P 3437	BL Water 1		BL water 1, Groundwater		X									
9-21-10	1500	P 3438	BL Water 2		BL Water 2, Groundwater		X									
9-22-10	1300	P 3439	BL Water 3		BL water 3, Groundwater		X									
9-22-10	1040	P 3440	BL Soil 1		soil vadose saturated zone		X									
9-22-10	1115	P 3441	BL Soil 2		soil vadose zone		X									
9-22-10	1205pm	P 3442	BL Soil 3		soil saturated vadose zone		X									
Relinquished by: <i>amy hewley</i> Date/Time: 9-22-10 4:35pm Received by: <i>[Signature]</i> Date/Time: 9/23/10 10:00																
Relinquished by: _____ Date/Time: _____ Received by: _____ Date/Time: _____																
Comments: PCBs in solids approx 4000ppm PCBs in water approx <100ppb																

ATTACHMENT B
FINAL ANALYTICAL DATA TABLES



The Business of Innovation

Project Client: Battelle Columbus Operations

Project Name: PCB Disposal Demonstrations

Project Number: G939105-01

Client ID	BL SOIL 1	BL SOIL 2	BL SOIL 3
Battelle ID	P3440-P	P3441-P	P3442-P
Sample Type	SA	SA	SA
Collection Date	09/22/10	09/22/10	09/22/10
Extraction Date	10/05/10	10/05/10	10/05/10
Analysis Date	11/03/10	11/03/10	11/03/10
Analytical Instrument	ECD	ECD	ECD
% Moisture	11.11	5.99	4.32
% Lipid	NA	NA	NA
Matrix	SOIL	SOIL	SOIL
Sample Size	1.84	1.91	1.99
Size Unit-Basis	G_DRY	G_DRY	G_DRY
Units	NG/G_DRY	NG/G_DRY	NG/G_DRY
Aroclor 1016	3.2 U	3.2 U	3.2 U
Aroclor 1221	3.2 U	3.2 U	3.2 U
Aroclor 1232	3.2 U	3.2 U	3.2 U
Aroclor 1242	721374.46 D	567.14 J	2041.67 DJ
Aroclor 1248	0.9 U	0.9 U	0.9 U
Aroclor 1254	0.9 U	0.9 U	0.9 U
Aroclor 1260	0.9 U	0.9 U	0.9 U

Surrogate Recoveries (%)

Cl3(34)	104	77	119
Cl6(152)	113	86	159 NME



The Business of Innovation

Project Client: Battelle Columbus Operations

Project Name: PCB Disposal Demonstrations

Project Number: G939105-01

Client ID Procedural Blank

Battelle ID	BP536PB-P
Sample Type	PB
Collection Date	10/05/10
Extraction Date	10/05/10
Analysis Date	11/02/10
Analytical Instrument	ECD
% Moisture	7.14
% Lipid	NA
Matrix	SOIL
Sample Size	1.84
Size Unit-Basis	G_DRY
Units	NG/G_DRY

Aroclor 1016	3.2 U
Aroclor 1221	3.2 U
Aroclor 1232	3.2 U
Aroclor 1242	3.2 U
Aroclor 1248	0.9 U
Aroclor 1254	0.9 U
Aroclor 1260	0.9 U

Surrogate Recoveries (%)

Cl3(34)	104
Cl6(152)	111

Battelle

The Business of Innovation

Project Client: Battelle Columbus Operations

Project Name: PCB Disposal Demonstrations

Project Number: G939105-01

Client ID	090827-01: Sand, White Quartz			
Battelle ID	BP537LCS-P			
Sample Type	LCS			
Collection Date	10/05/10			
Extraction Date	10/05/10			
Analysis Date	11/03/10			
Analytical Instrument	ECD			
% Moisture	NA			
% Lipid	NA			
Matrix	SOIL			
Sample Size	2.12			
Size Unit-Basis	G_DRY			
Units	NG/G_DRY	Target	% Recovery	Qualifier
Aroclor 1016	866.03	J	943.40	92
Aroclor 1221	3.2	U		
Aroclor 1232	3.2	U		
Aroclor 1242	3.2	U		
Aroclor 1248	0.9	U		
Aroclor 1254	0.9	U		
Aroclor 1260	864.99	J	943.40	92

Surrogate Recoveries (%)

Cl3(34)	111
Cl6(152)	111

Battelle

The Business of Innovation

Project Client: Battelle Columbus Operations

Project Name: PCB Disposal Demonstrations

Project Number: G939105-01

Client ID	BL SOIL 1	BL SOIL 1		
Battelle ID	P3440-P	P3440DUP-P		
Sample Type	SA	QADU		
Collection Date	09/22/10	9/22/2010		
Extraction Date	10/05/10	10/5/2010		
Analysis Date	11/03/10	11/3/2010		
Analytical Instrument	ECD	ECD		
% Moisture	11.11	11.52		
% Lipid	NA	NA		
Matrix	SOIL	SOIL		
Sample Size	1.84	1.84		
Size Unit-Basis	G_DRY	G_DRY		
Units	NG/G_DRY	NG/G_DRY	RPD	Qualifier
Aroclor 1016	3.2 U	3.2 U		NA
Aroclor 1221	3.2 U	3.2 U		NA
Aroclor 1232	3.2 U	3.2 U		NA
Aroclor 1242	721374.46 D	650931.41 D		10.3
Aroclor 1248	0.9 U	0.9 U		NA
Aroclor 1254	0.9 U	0.9 U		NA
Aroclor 1260	0.9 U	0.9 U		NA

Surrogate Recoveries (%)

Cl3(34)	104	101
Cl6(152)	113	102

Battelle

The Business of Innovation

Project Client: Battelle Columbus Operations

Project Name: PCB Disposal Demonstrations

Project Number: G939105-01

Client ID	BL SOIL 3	BL SOIL 3			
Battelle ID	P3442-P	P3442MS-P			
Sample Type	SA	MS			
Collection Date	09/22/10	9/22/2010			
Extraction Date	10/05/10	10/5/2010			
Analysis Date	11/03/10	11/3/2010			
Analytical Instrument	ECD	ECD			
% Moisture	4.32	4.23			
% Lipid	NA	NA			
Matrix	SOIL	SOIL			
Sample Size	1.99	0.99			
Size Unit-Basis	G_DRY	G_DRY			
Units	NG/G_DRY	NG/G_DRY	Target	% Recovery	Qualifier
Aroclor 1016	3.2 U	51104.36	10101.01	506	N
Aroclor 1221	3.2 U	3.2 U			
Aroclor 1232	3.2 U	3.2 U			
Aroclor 1242	2041.67 DJ	3.2 U			
Aroclor 1248	0.9 U	0.9 U			
Aroclor 1254	0.9 U	0.9 U			
Aroclor 1260	0.9 U	12553.17	10101.01	124	N

Surrogate Recoveries (%)

Cl3(34)	119	94
Cl6(152)	159 NME	117 ME



The Business of Innovation

Project Client: Battelle Columbus Operations

Project Name: PCB Disposal Demonstrations

Project Number: G939105-01

Client ID	BL WATER 1	BL WATER 2	BL WATER 3
Battelle ID	P3437-P	P3438-P	P3439-P
Sample Type	SA	SA	SA
Collection Date	09/21/10	09/21/10	09/22/10
Extraction Date	09/28/10	09/28/10	09/28/10
Analysis Date	11/02/10	11/02/10	11/02/10
Analytical Instrument	ECD	ECD	ECD
% Moisture	NA	NA	NA
% Lipid	NA	NA	NA
Matrix	WATER	WATER	WATER
Sample Size	0.29	0.45	0.22
Size Unit-Basis	L_LIQUID	L_LIQUID	L_LIQUID
Units	NG/L_LIQUID	NG/L_LIQUID	NG/L_LIQUID
Aroclor 1016	0.35 U	0.35 U	0.35 U
Aroclor 1221	0.35 U	0.35 U	0.35 U
Aroclor 1232	0.35 U	0.35 U	0.35 U
Aroclor 1242	0.35 U	34946.18 D	55582.95 D
Aroclor 1248	0.39 U	0.39 U	0.39 U
Aroclor 1254	0.39 U	0.39 U	0.39 U
Aroclor 1260	0.39 U	0.39 U	0.39 U

Surrogate Recoveries (%)

Cl3(34)	107	51	0 NME
Cl6(152)	110	99	81

Battelle

The Business of Innovation

Project Client: Battelle Columbus Operations

Project Name: PCB Disposal Demonstrations

Project Number: G939105-01

Client ID Procedural Blank

Battelle ID	BP404PB-P
Sample Type	PB
Collection Date	09/28/10
Extraction Date	09/28/10
Analysis Date	11/02/10
Analytical Instrument	ECD
% Moisture	NA
% Lipid	NA
Matrix	WATER
Sample Size	0.50
Size Unit-Basis	L_LIQUID
Units	NG/L_LIQUID

Aroclor 1016	0.35 U
Aroclor 1221	0.35 U
Aroclor 1232	0.35 U
Aroclor 1242	0.35 U
Aroclor 1248	0.39 U
Aroclor 1254	0.39 U
Aroclor 1260	0.39 U

Surrogate Recoveries (%)

Cl3(34)	73
Cl6(152)	80

Battelle

The Business of Innovation

Project Client: Battelle Columbus Operations

Project Name: PCB Disposal Demonstrations

Project Number: G939105-01

Client ID	Laboratory Control Sample			
Battelle ID	BP405LCS-P			
Sample Type	LCS			
Collection Date	09/28/10			
Extraction Date	09/28/10			
Analysis Date	11/02/10			
Analytical Instrument	ECD			
% Moisture	NA			
% Lipid	NA			
Matrix	WATER			
Sample Size	0.50			
Size Unit-Basis	L_LIQUID			
Units	NG/L_LIQUID		Target % Recovery	Qualifier
Aroclor 1016	704.54		800.00	88
Aroclor 1221	0.35	U		
Aroclor 1232	0.35	U		
Aroclor 1242	0.35	U		
Aroclor 1248	0.39	U		
Aroclor 1254	0.39	U		
Aroclor 1260	772.58		800.00	97

Surrogate Recoveries (%)

Cl3(34)	79
Cl6(152)	83

Battelle

The Business of Innovation

Project Client: Battelle Columbus Operations

Project Name: PCB Disposal Demonstrations

Project Number: G939105-01

Client ID	BL WATER 1	BL WATER 1			
Battelle ID	P3437-P	P3437MS-P			
Sample Type	SA	MS			
Collection Date	09/21/10	9/21/2010			
Extraction Date	09/28/10	9/28/2010			
Analysis Date	11/02/10	11/2/2010			
Analytical Instrument	ECD	ECD			
% Moisture	NA	NA			
% Lipid	NA	NA			
Matrix	WATER	WATER			
Sample Size	0.29	0.125			
Size Unit-Basis	L_LIQUID	L_LIQUID			
Units	NG/L_LIQUID	NG/L_LIQUID	Target	% Recovery	Qualifier
Aroclor 1016	0.35 U	3744.93	3200.00	117	
Aroclor 1221	0.35 U	0.35 U			
Aroclor 1232	0.35 U	0.35 U			
Aroclor 1242	0.35 U	0.35 U			
Aroclor 1248	0.39 U	0.39 U			
Aroclor 1254	0.39 U	0.39 U			
Aroclor 1260	0.39 U	3199.05	3200.00	100	

Surrogate Recoveries (%)

Cl3(34)	107	85
Cl6(152)	110	87

Battelle

The Business of Innovation

Project Client: Battelle Columbus Operations

Project Name: PCB Disposal Demonstrations

Project Number: G939105-01

Client ID	BL WATER 3	BL WATER 3		
Battelle ID	P3439-P	P3439DUP-P		
Sample Type	SA	QADU		
Collection Date	09/22/10	9/22/2010		
Extraction Date	09/28/10	9/28/2010		
Analysis Date	11/02/10	11/2/2010		
Analytical Instrument	ECD	ECD		
% Moisture	NA	NA		
% Lipid	NA	NA		
Matrix	WATER	WATER		
Sample Size	0.22	0.22		
Size Unit-Basis	L_LIQUID	L_LIQUID		
Units	NG/L_LIQUID	NG/L_LIQUID	RPD	Qualifier
Aroclor 1016	0.35 U	0.35 U		NA
Aroclor 1221	0.35 U	0.35 U		NA
Aroclor 1232	0.35 U	0.35 U		NA
Aroclor 1242	55582.95 D	64623.09 D		15.0
Aroclor 1248	0.39 U	0.39 U		NA
Aroclor 1254	0.39 U	0.39 U		NA
Aroclor 1260	0.39 U	0.39 U		NA

Surrogate Recoveries (%)

Cl3(34)	0 NME	0 NME
Cl6(152)	81	118

Glossary of Data Qualifiers

Flag: Application:

- B Analyte concentration found in the sample at a concentration <5x the level found in the procedural blank.
- D Dilution Run. Initial run outside linear range of instrument.
- E Estimate, result is greater than the highest concentration level in the calibration.
- H Surrogate diluted out. Used when surrogate recovery is affected by excessive dilution of the sample extract.
- J Analyte detected below the sample-specific Reporting Limit (RL).
- ME Significant Matrix Interference - Estimated value.
- MI Significant Matrix Interference - value could not be determined or estimated.
- n Quality Control (QC) value is outside the accuracy or precision Data Quality Objective (DQO), but meets the contingency criteria.
- N Quality Control (QC) value is outside the accuracy or precision Data Quality Objective (DQO)
- NA Not applicable
- T Holding Time (HT) exceeded.
- U Analyte not detected at 3:1 signal:noise ratio. The method detection limit (MDL) reported.

ATTACHMENT C

**QA PERFORMANCE EVALUATION SAMPLES
CERTIFICATION DOCUMENTATION**



A Waters Company

Battelle Memorial Institute

Catalog No. 093 Custom Standard

Account No. B583157

Sample ID # 0831-10-05.1

Aroclor 1242 in Soil

<u>Parameter</u>	<u>Certified Value (mg/kg)</u>	<u>Performance Acceptance Limits™ (mg/kg)</u>
Aroclor 1242	1.03	0.338 - 1.29

Standard Preparation Instructions: Sample is ready for preparation and analysis as received.

Preservative: None

The **Certified Values** are equal to 100% of the "made to" values as determined by volumetric and/or gravimetric measurements used during the manufacture of this product.

The **Performance Acceptance Limits (PALs™)** are based on actual historical data collected in ERA's Proficiency Testing program. The PALs™ reflect any inherent biases in the methods used to establish the limits and closely approximate the 95% confidence interval of the performance that experienced laboratories should achieve using accepted environmental methods. Use the PALs™ to realistically evaluate your performance against your peers. If your result falls outside of the PALs™, ERA recommends that you investigate potential sources of error in your preparation and/or analytical procedures. For further technical assistance, call ERA at 1-800-372-0122.

Prepared by: ASC
Date: 9/21/10

Reviewed by: JML
Date: 9/21/10





A Waters Company

Battelle Memorial Institute

Catalog No. 093 Custom Standard

Account No. B583157

Sample ID # 0831-10-05.2

Aroclor 1242 in Soil

<u>Parameter</u>	<u>Certified Value (mg/kg)</u>	<u>Performance Acceptance Limits™ (mg/kg)</u>
Aroclor 1242	4010	1310 - 5010

Standard Preparation Instructions: Sample is ready for preparation and analysis as received.

Preservative: None

The **Certified Values** are equal to 100% of the "made to" values as determined by volumetric and/or gravimetric measurements used during the manufacture of this product.

The **Performance Acceptance Limits (PALs™)** are based on actual historical data collected in ERA's Proficiency Testing program. The PALs™ reflect any inherent biases in the methods used to establish the limits and closely approximate the 95% confidence interval of the performance that experienced laboratories should achieve using accepted environmental methods. Use the PALs™ to realistically evaluate your performance against your peers. The PALs™ listed for this project may not be applicable since the final concentration is outside of ERA's normal concentration ranges for which the PALs™ have been developed. If your result falls outside of the PALs™, ERA recommends that you investigate potential sources of error in your preparation and/or analytical procedures. For further technical assistance, call ERA at 1-800-372-0122.

Prepared by: AJC

Reviewed by: JML

Date: 9/21/10

Date: 9/21/10

