

November 12, 2012

Ms. Amy Hensley
Work Assignment Manager
Office of Resource Conservation and Recovery
U.S. Environmental Protection Agency
1200 Pennsylvania Ave. NW
Washington, D.C. 20460

Contract No. EP-W-09-024
Work Assignment No. 3-05
Blue Lightning PCB Sample Results

Dear Amy:

Enclosed please find a summary report documenting the analytical results for the soil samples collected during the sampling event conducted on August 30, 2012, as part of the Blue Lightning PCB Disposal Demonstration. The summary report is a deliverable under Task 3 of the work assignment statement of work. The summary report provides the PCB analysis results of the soil 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) 424-5547.

Sincerely,



Kenneth Cowen

Enclosure

cc: Cynthia Bowie (EPA Project Officer)
Gail Hansen (Alternate EPA WAM)
Bruce Buxton (Battelle Program Manager)

**Blue Lightning PCB Disposal Demonstration
Intermediate Soil Sampling Event
Analytical Results Summary**

An intermediate sampling event for the Blue Lightning PCB Disposal Demonstration was conducted on August 30, 2012. Four soil samples were collected during the sampling event. The samples were received at the Battelle Duxbury analytical laboratory on September 1 and immediately logged into the Battelle Laboratory Information Management System (LIMS).

The soil samples were extracted by manual Soxhlet Method 3540C, and analyzed for PCB Aroclors by gas chromatography/electron capture detection (GC/ECD) in accordance with EPA Method 8082A. Table 1 provides a summary of the analytical results in units of nanogram per gram (ng/g or parts per billion [ppb]) on a dry basis for each Aroclor analyzed in the soil samples. Table 1 also provides the total PCB concentration, in units of parts per million (ppm), as the sum of the Aroclor concentrations for each sample. These results provide the most conservative total PCB concentrations for the samples. That is, for the Aroclors resulting in a non-detect, the method detection limit (MDL) for that Aroclor was used to determine the total PCB concentration for each sample shown in Table 1.

Attachment A provides a narrative of the extraction and analysis procedures performed on the soil samples. Attachment B provides the final analytical data tables for the samples, which were created from a direct transfer of the authorized LIMS data. Attachment C provides the Sample Custody Documentation related to sample receipt and handling. A full laboratory data package related to the analysis of the samples is available upon request.

TABLE 1. BLUE LIGHTNING SOIL SAMPLE RESULTS

Client ID	EPA-24-VD-S	EPA-24-SI-S	EPA-22-VS-S	EPA-23-VS-S
Battelle ID	N4923-P	N4924-P	N4925-P	N4926-P
Collection Date	08/30/12	08/30/12	08/30/12	08/30/12
Extraction Date	10/05/12	10/05/12	10/05/12	10/05/12
Analysis Date	10/18/12	10/19/12	10/19/12	10/19/12
Analytical Instrument	ECD	ECD	ECD	ECD
% Moisture	9.09	7.2	6.73	3.56
Matrix	SOIL	SOIL	SOIL	SOIL
Sample Size	4.55	0.97	4.66	4.83
Size Unit-Basis	G_DRY	G_DRY	G_DRY	G_DRY
Units	NG/G_DRY	NG/G_DRY	NG/G_DRY	NG/G_DRY
Aroclor 1016	3.2 U	3.2 U	3.2 U	3.2 U
Aroclor 1221	3.2 U	3.2 U	3.2 U	3.2 U
Aroclor 1232	3.2 U	3.2 U	3.2 U	3.2 U
Aroclor 1242	8377645.05 D	7821381.44 D	148005.77 D	113075.32 D
Aroclor 1248	0.9 U	0.9 U	0.9 U	0.9 U
Aroclor 1254	0.9 U	0.9 U	0.9 U	0.9 U
Aroclor 1260	0.9 U	0.9 U	0.9 U	0.9 U
Total (ppm)	8377.7	7821.4	148.0	113.1

U Analyte not detected at 3:1 signal:noise ratio. The method detection limit (MDL) reported.

D Dilution Run. Initial run outside linear range of instrument.

ATTACHMENT A
SAMPLE ANALYSIS NARRATIVE

**PCB Aroclor – QA/QC Summary
Batch 12-0594**

Project:	PCB Disposal Demonstrations
Parameters:	PCB Aroclor
Laboratory:	Battelle-Duxbury
Matrix:	Soil
Data Set:	DP-12-0911
Analytical SOP:	5-128
Method Reference:	EPA 8082A modified

SAMPLE CUSTODY

Collection Date	Receipt Date	Temp (°C)
8/30/2012	9/1/2012	22

Corrective Actions	<ul style="list-style-type: none"> • Collection times not noted on sample jars for EPA-24-VD-S and EPA-24-SI-S. • Samples not relinquished on COC forms. • Samples received at 22° C.
Sample Storage	The samples were stored at -10° C until extraction.
Related samples	NA

METHOD SUMMARIES

Sample Preparation	Between approximately 1 and 5 g 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 a pre-packed Forisil cleanup column, and concentrated. The samples were fortified with internal standards (IS) just prior to analysis.
Prep comments	None.

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. Calibration verification was performed at the beginning and end of each 24-hr period in which samples were analyzed. The instrument was calibrated using a multi-level Aroclor 1016:1260 solution. A single point calibration of the identified Aroclor(s) was used to quantify the samples.
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Holding Times	Extraction Date(s)		Analysis Date(s)	
		10/5/2012	-	10/18/2012

**PCB Aroclor – QA/QC Summary
Batch 12-0594**

Procedural Blank (PB)	A PB was prepared with this analytical batch to ensure the sample extraction and analysis methods were free of contamination.
<5 X MDL	No exceedences noted.
	No comments.

Laboratory Control Spike (LCS)	An LCS was prepared with this analytical batch. The percent recoveries of target analytes were calculated to measure accuracy.
40-120% recovery	No exceedences noted.
	No comments.

Matrix Spike (MS)	An MS was prepared with this analytical batch. The percent recoveries of target analytes were calculated to measure accuracy.
40-120% recovery	Two exceedences.
	The Aroclor concentration in the background sample selected for the matrix spike was significantly higher than the Aroclor concentration added to the sample and therefore was not quantifiable. The MS is not reported.

Laboratory Duplicates	One duplicate sample was prepared with this analytical batch. The relative percent difference of each target compound was calculated to measure data quality in terms of precision (extraction efficiency).
≤30% RPD	No exceedences noted.
	No comments.

Note: RPD is the relative percent difference.

Surrogate Recoveries	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).
40 – 120%	Two exceedences noted.
	The concentration of Aroclor 1242 was extremely high in sample N4923 requiring massive dilution. The surrogates were diluted out of the reported extract and could not be quantified in either analysis (initial or dilution). The recoveries in this sample are reported as 0 and appropriately “H” qualified. No further corrective actions taken.

Initial Calibration (ICAL)	The GC/ECD was calibrated with six-level quadratic calibration curve for Aroclor 1016:1260.
R ² ≥ 0.995	No exceedences noted.
	No comments.

Note: R² is the co-efficient of determination.

**PCB Aroclor – QA/QC Summary
Batch 12-0594**

Independent Calibration Check (ICC)	The independent check was run after each initial calibration to verify the calibration. This standard is from a different source than the ICAL.
≤ 25% difference	No exceedences noted.
	No comments.

Continuing Calibration Verification (CCV)	Continuing calibration standards were run every 24 hours to ensure that initial calibration was still valid.
≤ 25% difference	No exceedences noted.
	No comments.

ATTACHMENT B
FINAL ANALYTICAL DATA TABLES

Battelle

The Business of Innovation

Project Client: Battelle Columbus Operations
Project Name: PCB Disposal Demonstrations - Blue Lightning
Project Number: 100006480-1

Client ID	EPA-24-VD-S	EPA-24-SI-S	EPA-22-VS-S	EPA-23-VS-S
Battelle ID	N4923-P	N4924-P	N4925-P	N4926-P
Sample Type	SA	SA	SA	SA
Collection Date	08/30/12	08/30/12	08/30/12	08/30/12
Extraction Date	10/05/12	10/05/12	10/05/12	10/05/12
Analysis Date	10/18/12	10/19/12	10/19/12	10/19/12
Analytical Instrument	ECD	ECD	ECD	ECD
% Moisture	9.09	7.2	6.73	3.56
% Lipid	NA	NA	NA	NA
Matrix	SOIL	SOIL	SOIL	SOIL
Sample Size	4.55	0.97	4.66	4.83
Size Unit-Basis	G_DRY	G_DRY	G_DRY	G_DRY
Units	NG/G_DRY	NG/G_DRY	NG/G_DRY	NG/G_DRY
Aroclor 1016	3.2 U	3.2 U	3.2 U	3.2 U
Aroclor 1221	3.2 U	3.2 U	3.2 U	3.2 U
Aroclor 1232	3.2 U	3.2 U	3.2 U	3.2 U
Aroclor 1242	8377645.05 D	7821381.44 D	148005.77 D	113075.32 D
Aroclor 1248	0.9 U	0.9 U	0.9 U	0.9 U
Aroclor 1254	0.9 U	0.9 U	0.9 U	0.9 U
Aroclor 1260	0.9 U	0.9 U	0.9 U	0.9 U

Surrogate Recoveries (%)

Cl3(34)	0 NH	115	78	91
Cl6(152)	0 NH	115	54	87

Battelle

The Business of Innovation

Project Client: Battelle Columbus Operations
Project Name: PCB Disposal Demonstrations - Blue Lightning
Project Number: 100006480-1

Client ID	Procedural Blank
Battelle ID	BW746PB-P
Sample Type	PB
Collection Date	10/05/12
Extraction Date	10/05/12
Analysis Date	10/18/12
Analytical Instrument	ECD
% Moisture	6.64
% Lipid	NA
Matrix	SEDIMENT
Sample Size	4.67
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)	50
Cl6(152)	71

Battelle

The Business of Innovation

Project Client: Battelle Columbus Operations

Project Name: PCB Disposal Demonstrations - Blue Lightning

Project Number: 100006480-1

Client ID	120911-03: Sand Sable			
Battelle ID	BW747LCS-P			
Sample Type	LCS			
Collection Date	10/05/12			
Extraction Date	10/05/12			
Analysis Date	10/18/12			
Analytical Instrument	ECD			
% Moisture	NA			
% Lipid	NA			
Matrix	SEDIMENT			
Sample Size	5.07			
Size Unit-Basis	G_DRY			
Units	NG/G_DRY	Target	% Recovery	Qualifier
Aroclor 1016	140.12	157.93	89	
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	152.15	158.58	96	

Surrogate Recoveries (%)

Cl3(34)	69
Cl6(152)	87

Battelle

The Business of Innovation

Project Client: Battelle Columbus Operations
Project Name: PCB Disposal Demonstrations - Blue Lightning
Project Number: 100006480-1

Client ID	EPA-24-SI-S	EPA-24-SI-S	RPD	Qualifier
Battelle ID	N4924-P	N4924DUP-P		
Sample Type	SA	QADU		
Collection Date	08/30/12	8/30/2012		
Extraction Date	10/05/12	10/5/2012		
Analysis Date	10/19/12	10/19/2012		
Analytical Instrument	ECD	ECD		
% Moisture	7.2	7.79		
% Lipid	NA	NA		
Matrix	SOIL	SOIL		
Sample Size	0.97	0.93		
Size Unit-Basis	G_DRY	G_DRY		
Units	NG/G_DRY	NG/G_DRY		
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	7821381.44 D	6730148.39 D		15.0
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)	115	108
Cl6(152)	115	110

ATTACHMENT C
SAMPLE CUSTODY DOCUMENTATION

Sample Receipt FormApproved: Authorized:

Project Number: _____ Client: _____
Received by: Hargis, Michael Date/Time Received: Saturday, September 01, 2012 12:00 PM
No. of Shipping Containers: 1

SHIPMENT

Method of Delivery: Commercial Carrier Tracking Number: 8627 4292 1097
COC Forms: Shipped with samples No Forms

Cooler(s)/Box(es)

Cntr	Type	Tracking No.	Seal	Seal Condition	Container Condition	Temp C	Smps
1 of 1	Cooler	8627 4292 1097	Tape	Intact	Intact	22.0	4

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 North: Freezer - F0002 (Walk-in) BDO IDs Assigned: N4923 - N4926

Samples logged in by: Hargis, Michael Date/Time: 09/01/2012 12:00 PM

Approved By: _____ Approved On: _____

Authorized By: _____ Authorized On: _____

Report Corrective Actions

Corrective Action No: 1 of 1

Authorized Approved:

COC Client: _____

COC Project: _____

COC Date: 9/4/2012 4:28:00 PM

	Description of Problem:	Explanation:
Custody	Jars and C-O-C do not match for time/date	Samples EPA-24-VD-S and EPA-24-SI-S do not have collection times annotated on collection jars
	Samples not relinquished from sender	Samples not relinquished/COC not signed by sender
Temperature and Preservation	Receipt temperature outside of acceptability	Samples received at 22 C

Documentation of project manager notification

Sample Custodian: Hargis, Michael Date: 9/4/2012 4:36:00 PM

Laboratory Manager: Lizotte Jr, Robert Date: 10/31/2012 3:11:00 P

Project Manager: Peven-McCarthy, Carole Date: 10/31/2012 9:13:00 A

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

On _____ I contacted Cowen, Kenneth at Battelle Columbus Operations

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

PM contacted. Sample analysis proceeded as requested by client.

Date this form was received back to the custodian: _____

Reference Number: _____

Sample Receipt Form Details

Approved: Authorized:

Project Number: _____ Client: _____

Received by: Hargis, Michael Date/Time Received: Saturday, September 01, 2012 12:00 PM

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:
N4923	EPA-24-VD-S	08/30/12 16:00	09/04/12 16:31	1	SOIL	22	NA	NA	NA	F0002 (Walk-in)			
N4924	EPA-24-SI-S	08/30/12 16:00	09/04/12 16:31	1	SOIL	22	NA	NA	NA	F0002 (Walk-in)			
N4925	EPA-22-VS-S	08/30/12 16:43	09/04/12 16:32	1	SOIL	22	NA	NA	NA	F0002 (Walk-in)			
N4926	EPA-23-VS-S	08/30/12 17:19	09/04/12 16:32	1	SOIL	22	NA	NA	NA	F0002 (Walk-in)			

Total Samples: 4

SI

FedEx Saturday Delivery

BATTELLE DUXBURY OPS GOVT
 397 WASHINGTON ST
 DUXBURY, MA 023324546
 UNITED STATES US

TO MATT SCHUMITZ / JON THORN
 BATTELLE
 397 WASHINGTON ST
 DUXBURY, MA 02332

(US)

FedEx Express



Trk# 8627 4292 1097

PRIORITY OVERNIGHT



FedEx Express

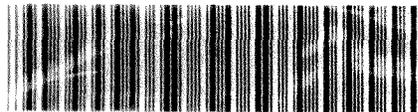
1 From
 Date: 5/31/2012
 Sender's FedEx Account Number: 1000004158

Sender's Name: MATT SCHUMITZ / JON THORN
 Phone: 508 697 1411

Address: 397 WASHINGTON ST
 City: DUXBURY State: MA ZIP: 02332

3 To
 Recipient's Name: MATT SCHUMITZ / JON THORN
 Company: BATTELLE
 Recipient's Address: 397 WASHINGTON ST
 City: DUXBURY State: MA ZIP: 02332

fedex.com 1.800.GoFedEx 1.800.463.1339



8627 4292 1097

OFFFC1303
28x14x15 IN

(781) 952-5270

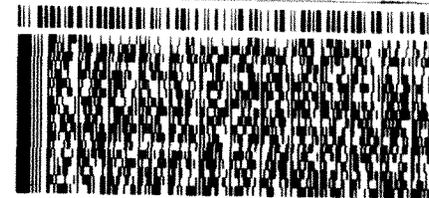
BATTELLE DUXBURY OPS GOVT
 397 WASHINGTON ST
 DUXBURY, MA 023324546
 UNITED STATES US

ACTWT: 31.8 LB
 CAD: /OFFFC1303
 DIMS: 28x14x15 IN
 BILL SENDER

TO MATT SCHUMITZ / JON THORN
 BATTELLE
 397 WASHINGTON ST

DUXBURY MA 02332
 (781) 952-5270

REF: DEPT:



FedEx Express

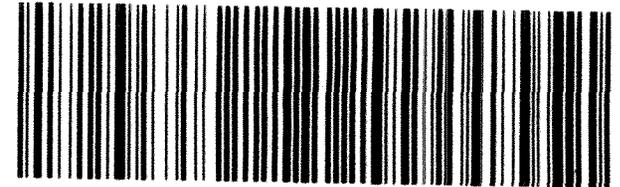


TRK# 8627 4292 1097

SATURDAY ###
PRIORITY OVERNIGHT

XO XPUA

02332
MA-US BOS



- 1 FedEx Priority
- 3 FedEx 2Day
- 4b Express Fri
- 5 Packaging
- 6 Special Handling

3 SATURDAY

Does this shipment contain dangerous goods?
 No Yes Yes
 Dangerous goods (including dry ice) cannot be shipped in FedEx packaging.

7 Payment Bill to:
 Sender Recipient Third Party Credit Card Cash/Check

Total Packages: 1
 Total Weight: 32

Our liability is limited to \$100 unless you declare a higher value. See the current FedEx Service Guide for details.

8 Residential Delivery Signature Options
 No Signature Required
 Direct Signature
 Indirect Signature

520

8627 4292 1097

28 X 4 X 15

0200

FedEx Retrieval Copy

1 From

Date: 1/11/22 Sender's FedEx Account Number: 8627 4292 1097

Sender's Name: [Handwritten] Phone: [Handwritten]

Company: [Handwritten]

Address: [Handwritten]

City: [Handwritten] State: [Handwritten] ZIP: [Handwritten]

2 Your Internal Billing Reference

3 To

Recipient's Name: [Handwritten] Phone: [Handwritten]

Company: [Handwritten]

Recipient's Address: [Handwritten]

Address: [Handwritten] City: [Handwritten] State: [Handwritten] ZIP: [Handwritten]



8627 4292 1097

4a Express Package Service

FedEx Priority Overnight (Next business day by 10:30 AM Monday-Friday, Saturday if delivery is guaranteed unless SATURDAY Delivery is selected)

FedEx Standard Overnight (Next business day by 3:00 PM Monday-Friday, Saturday if selected)

FedEx 2Day (Second business day by 12:00 PM Monday-Friday, Saturday if selected unless SATURDAY Delivery is selected)

FedEx Express Saver (Next business day by 5:00 PM Monday-Friday)

Packages up to 150 lbs.

4b Express Freight Service

FedEx 1Day Freight* (Next business day by 10:30 AM Monday-Friday, Saturday if selected unless SATURDAY Delivery is selected)

FedEx 2Day Freight (Second business day by 12:00 PM Monday-Friday, Saturday if selected unless SATURDAY Delivery is selected)

Packages over 150 lbs.

5 Packaging

FedEx Envelope* FedEx Pak* FedEx Box FedEx Tube Other

6 Special Handling

SATURDAY Delivery (Not available for FedEx Standard Overnight, FedEx Priority Overnight, FedEx 2Day Freight, FedEx 1Day Freight, FedEx 2Day Freight)

HOLD Weekday at FedEx Location (Not available for FedEx 1Day Freight, FedEx 2Day Freight)

HOLD Saturday at FedEx Location (Not available for FedEx 1Day Freight, FedEx 2Day Freight)

Does this shipment contain dangerous goods? One box must be checked.

No Yes (If Yes, specify in Remarks)

7 Payment Bill to: Enter FedEx Acct. No. or Credit Card No. below

Sender Recipient Third Party Credit Card Cash/Check

Total Packages: 1 Total Weight: 3.2

8 Residential Delivery Signature Options

No Signature Required (Packages of less than 5 lbs. without attaching a signature label required)

Direct Signature (Not available for packages of less than 5 lbs. without attaching a signature label required)

Robust Signature (Not available for packages of less than 5 lbs. without attaching a signature label required)

520