DATA REPORT FOR THE PRELIMINARY INVESTIGATION OF AMPHIBIAN BREEDING HABITAT AND SCREENING OF BREEDING POOL SEDIMENTS FOR POLYCHLORINATED BIPHENYL CONTAMINATION, HUDSON RIVER, NEW YORK

HUDSON RIVER NATURAL RESOURCE DAMAGE ASSESSMENT

HUDSON RIVER NATURAL RESOURCE TRUSTEES

STATE OF NEW YORK

U.S. DEPARTMENT OF COMMERCE

U.S. DEPARTMENT OF THE INTERIOR

FINAL

JANUARY 4, 2008

Available from:
U.S. Department of Commerce
National Oceanic and Atmospheric Administration
Hudson River NRDA, Lead Administrative Trustee
Assessment and Restoration Division, N/ORR3
1305 East-West Highway, Rm 10219
Silver Spring, MD 20910-3281

**Names of certain individuals and affiliations have been removed to maintain confidentiality*

TABLE OF CONTENTS

1.0 INTRODUCTION 1

2.0 SURVEYS AND SAMPLING 1

2.1 SURVEYS AND SAMPLE COLLECTION AND PROCESSING 1

2.1.1 SAMPLING SITES 1

2.1.2 CHORUS SURVEYS 2

2.1.3 SEDIMENT COLLECTION 2

2.2 SAMPLE ANALYSIS 2

2.3 QUALITY ASSURANCE/QUALITY CONTROL 3

3.0 RESULTS 4

3.1 RESULTS OF CHORUS SURVEYS 4

3.2 RESULTS OF SEDIMENT ANALYSIS 5

3.1.1 TOTAL PCB CONCENTRATIONS 6

3.1.2 PCB HOMOLOGUES AND CONGENERS 7

4.0 DISCUSSION 9

5.0 REFERENCES 9

Appendix A: Work Plan for the Preliminary Investigation of Amphibian Breeding Habitat and Screening of Breeding Pool Sediments for Polychlorinated Biphenyl Contamination

Appendix B: Modification #1 to Work Plan for the Preliminary Investigation of Amphibian Breeding Habitat and Screening of Breeding Pool Sediments for Polychlorinated Biphenyl Contamination

Appendix C: Data Quality Assessment Report, Hudson River Natural Resource Damage Assessment, Floodplain Study, Frog Pond Sediments

Appendix D: Sediment Data Table

* Figures are found at the end of the data report after the References section.

EXECUTIVE SUMMARY

Natural resources of the Hudson River have been contaminated through past and ongoing discharges of polychlorinated biphenyls (PCBs). The Hudson River Natural Resource Trustees — New York State, the U.S. Department of Commerce, and the U.S. Department of the Interior — are conducting a natural resource damage assessment (NRDA) to assess and restore those natural resources injured by PCBs.

In May 2004, the Trustees undertook a preliminary investigation to find wood frog and leopard frog breeding pools and analyze sediments from those pools for PCBs. This work was undertaken by the Trustees as part of a preliminary investigation of amphibian breeding habitat on the Hudson River to assist in determining if a full-scale study of the effects of PCBs on Hudson River amphibians should be undertaken. Information gathered during this preliminary investigation will aid in the development of potential injury studies investigating the effects of PCBs on Hudson River amphibians.

Two amphibian species — the northern leopard frog (*Rana pipiens*) and the wood frog (*Rana sylvatica)* — were the focus of this preliminary investigation. There was also opportunistic collection of data on three other amphibian species — the bullfrog (*Rana catesbeiana*), the green frog (*Rana clamitans*) and the American toad (*Bufo americanus)*. Field surveys were conducted during the breeding season to determine if suitably sized leopard and wood frog populations occur in the Hudson River study area for use in a larger, potential future injury study. The field surveys consisted of amphibian chorusing surveys.

To determine contaminant levels in sediments from known amphibian breeding areas, samples were collected at wood frog and northern leopard frog breeding sites identified during chorusing surveys of the Hudson River. Thirteen sediment composite samples were collected from the Hudson River study area (Bakers Falls at River Mile (RM) 196.9 in Hudson Falls, New York to the Federal Dam at Troy, New York at RM 153.9).

The sediment samples were analyzed for select PCB congeners, PCB homologue groups, total PCBs, and percent organic carbon. The total PCB concentrations (as sum of homologues) of sediments from the study sites ranged from 31.2 parts per billion (ppb) to 27,800 ppb.

Based on this investigation, PCB levels in sediments from known amphibian breeding areas of the Hudson River are at ecologically significant levels, suggesting the potential for injury to these organisms. However, it does not appear that the Hudson River study area contains suitably sized populations of the target species, in particular the northern leopard frog, to use in a future field-based amphibian injury study focused solely on resident frogs. Accordingly, the Trustees are investigating additional options to assess amphibian injury, including the potential conduct of a laboratory-based injury study.

1.0 INTRODUCTION

Past and continuing discharges of polychlorinated biphenyls (PCBs) have contaminated natural resources of the Hudson River. The Hudson River Natural Resource Trustees — New York State, the U.S. Department of Commerce, and the U.S. Department of the Interior — are conducting a natural resource damage assessment (NRDA) to assess and restore those natural resources injured by PCBs (Hudson River Natural Resource Trustees 2002a). This Data Report provides the results of a preliminary investigation of PCB contamination of two Hudson River amphibian species conducted pursuant to the NRDA.

The Hudson River and its habitat support many species of amphibians. These animals spend a large part of their lives in contact with potentially contaminated media – water, sediment and soil – and consume potentially contaminated prey. Frogs are an important link between trophic levels because they are important food sources for many other organisms such as herons, raccoons, snakes and other large predatory organisms. Frogs, however, play a unique role in connecting aquatic and terrestrial food webs, due to their amphibious lifestyle. Most frogs start life as aquatic tadpoles, feeding on plant and animal material in water. When they metamorphose into air-breathing adults, they carry with them some of the aquatic energy, as well as contaminants, stored in their bodies and export it onto land, where it can enter new food chains.

As part of the NRDA process, the Trustees are investigating the feasibility of using amphibians for an injury determination study. Frogs were selected as the representative amphibian species due to their presence in the Hudson River study area, reported sensitivity to PCBs, high potential for exposure due to both aquatic and terrestrial life stages, and capacity to be evaluated for reproductive and developmental metrics in the field and laboratory. Potential injuries to amphibians from PCBs could include "one of the following adverse changes in viability: death, disease, behavioral abnormalities, cancer, genetic mutations, physiological malfunctions (including malfunctions in reproduction), or physical deformations" (Title 43 of the Code of Federal Regulations Part 11.62(f)(i)).

In May 2004, the Trustees undertook a preliminary investigation to find wood frog and leopard frog breeding pools and analyze sediments from those pools for PCBs. The Trustees undertook this work as part of a preliminary investigation of amphibian breeding habitat on the Hudson River to assist in determining if a full-scale study of the effects of PCBs on Hudson River amphibians should be undertaken. This work may potentially be used to design future studies to assess the health of amphibians in the Hudson River.

2.0 SURVEYS AND SAMPLING

2.1 SURVEYS AND SAMPLE COLLECTION AND PROCESSING

The chorus surveys and the collection and processing of sediment samples were conducted in accordance with the Trustees' Work Plan for the Preliminary Investigation of Amphibian Breeding Habitat and Screening of Breeding Pool Sediments for Polychlorinated Biphenyl Contamination (Appendix A) (Hudson River Natural Resource Trustees 2004a), and Modification #1 to that Work Plan (Appendix B) (Hudson River Natural Resource Trustees 2004b).

2.1.1 SAMPLING SITES

This preliminary investigation focused on aquatic habitats adjacent to the Hudson River between Bakers Falls at River Mile (RM) 196.9 in Hudson Falls, New York and the Federal Dam at Troy, New York at (RM 153.9; Figure 1).

A combination of techniques – including review of aerial photographs, maps, available natural resource information, and preliminary field surveys – was used to identify potential sites of breeding northern leopard and/or wood frogs that were targeted for chorus surveys and potential sediment collection.

Sampling Sites used in this preliminary investigation are as follows (UTM NAD83 Zone 18N):

Site Code	Easting	Northing
1	614989	4767164
2	611945	4757373
3	611934	4757846
4	611581	4758786
5	612423	4759264
6	614679	4783585
7	614747	4783173
8	615111	4785900
9	614729	4766095
10	614874	4766577
11	613418	4761709
12	615977	4768926
13	614904	4778047

2.1.2 Chorus Surveys

Amphibian chorus surveys were conducted at the 13 sites identified as potential breeding habitat for wood frogs and northern leopard frogs (Figure 2).

The chorus surveys were accomplished in accordance with the Trustees' Standard Operating Procedure (SOP) for Chorusing Survey (Appendix 1 to Appendix A of this data report).

2.1.3 Sediment Collection

Sediments were collected from each of the 13 sites, with a focus on the collection of sediments from the breeding pools in which the frogs had laid their eggs.

Sediment collection and compositing was conducted as specified in the Trustees' Standard Operating Procedure for Sediment Collection (Appendix 2 to Appendix A of this Data Report).

One composite sediment sample was collected from each of thirteen sites. The sites were sampled along a transect across the site, with sub-samples taken at intervals ranging from 1.5 to 5 feet. The subsamples were composited into one sample per site. Sediment samples were collected between May 6, 2004 and May 13, 2004.

2.2 Sample Analysis

Chemical analyses were conducted pursuant to the Trustees' Analytical Quality Assurance Plan (Hudson River Natural Resource Trustees 2002b).

A total of thirteen sediment composites were submitted for analysis. The sediment composites were in a single analytical batch (laboratory batch number 0410065).

Sediment samples were analyzed for 47 select PCB congeners (see Table 3), PCB homologue groups, total PCBs (as sum of homologues), percent moisture (%), total organic carbon content (%) and grain size. The samples were prepped, extracted, and analyzed using laboratory Standard Operating Procedures (SOPs) approved by the Trustees prior to sample receipt. Sample analysis began on November 1, 2004, and concluded on November 19, 2004.

2.3 QUALITY ASSURANCE/QUALITY CONTROL

Data validation was based on the quality assurance/quality control (QA/QC) criteria documented in the Trustees' *Analytical Quality Assurance Plan for the Hudson River Natural Resource Damage Assessment,* Version 1.0, July 9, 2002 (Hudson River Natural Resource Trustees 2002b), and U.S. Environmental Protection Agency (USEPA) *National Functional Guidelines for Organic Data Review* (USEPA 1999), and the following laboratory SOPs:

- SOP # OP-004: Extraction of Soil, Tissue, Vegetation, and Sediment by Pressurized Fluid Extraction, Revision #2.0, 8/15/02
- SOP # O-010: Determination of PCB Homologues and Individual Congeners by GC/MS - SIM, Revision # 2.2, 10/24/02
- SOP # HR NRDA % Lipids: Percent Lipids Determination, Revision # 0.0, 9/9/02
- SOP # W-001: Percent Solids Determination, Revision # 2.1, 9/25/02
- SOP # W-028: Total Organic Carbon in Soil, Sediment and Water, Revision # 2.0, 1/22/03
- SOP # W-029: Particle Size Analysis of Soils - with and without Hydrometer, and Liquid Limit, Plastic Limit and Plasticity Index, Draft, 1/16/04
- Additional cleanup, sample handling, storage, custody SOPs as necessary.

A Standard Reference Material (SRM) was extracted and analyzed with each analytical batch. The SRM selected for the sediment analyses was 1944 - New York/New Jersey Waterway Sediment. This SRM has certified values for 28 of the target PCB congeners. One SRM analysis was submitted, for a total of 28 data points.

Laboratory QC samples were used to assess the effectiveness of homogenization procedures and to evaluate laboratory-derived contamination, laboratory performance, and sample matrix effects. Quality control samples included: method blanks, laboratory control samples (LCS), matrix spike (MS) samples, laboratory duplicate samples, and SRM analyses. Surrogates were added to each sample analyzed for PCB congeners to further assess the effects of sample matrix on accuracy.

Sample results and related QC data were received in both electronic and hard copy format. Electronic data were verified against the hard copy data package. The sediment data package received full validation, which includes the following QC elements:

- Analytical holding times
- Chain of custody and sample handling
- GC/MS tune verification (from summary forms)
- Method blank contamination (from summary forms)
- Initial and continuing calibration (from summary forms)
- Rinsate blank contamination (from sample result summaries)

- Analytical accuracy: surrogates, matrix spike samples, laboratory control samples, and standard reference material results (from summary forms)
- Analytical precision: laboratory duplicate samples (from summary forms)
- Internal standard areas (from summary forms)
- Reported detection limits (from sample result summaries)
- Compound identification (from raw data)
- Compound quantitation, transcription, and calculation checks performed at a frequency of 10% from raw data. If an error was noted, 100% of the calculations and transcriptions for that data set were verified.

The data package submitted by the laboratory was reviewed to determine whether the analytical data quality objectives (ADQO) specified in Tables 6.1a - 6.1c in the Analytical Quality Assurance Plan (Hudson River Natural Resource Trustees 2002b) were met.

Appendix C contains the Data Quality Assessment Report (Hudson River Natural Resource Trustees 2005a) for the samples.

Table 1.1 of the Trustees' Analytical Quality Assurance Plan (Hudson River Natural Resource Trustees, 2002b) specifies the target Method Detection Limits (MDLs) for PCB congeners, homologues and total PCBs. For sediment, the target MDLs are 0.1 ng/g wet weight (equivalent to 0.1 ppb wet weight) for individual congeners, and 10 ng/g (equivalent to 10 ppb) for PCB homologues and total PCBs. Actual MDLs for each PCB analyte were established by the analytical laboratory as specified in the Analytical Quality Assurance Plan. Actual MDLs are reported on Sediment Data Table (Appendix D) in the "Detection Limit" column.

Out of 832 results reported by the laboratory [13 sediment samples each with 47 congeners, 10 homologue groups, and total PCBs; percent moisture, grain size (four fractions), and total organic carbon], a total of 48 (5.8%) data points were estimated (J or NJ). Three data points were qualified as not detected (U). No data were rejected. The completeness level attained for the analysis of the field samples is 100%.

3.0 RESULTS

3.1 Results of Chorus Surveys

Chorusing surveys were conducted during the first two weeks of April 2004. Although all 13 sites were visited and chorusing and egg mass surveys were attempted during the sampling period, complete chorusing data were only obtained for 8 of the 13 sites.

Wood frogs - Of the 8 sites where data were available, wood frogs were heard chorusing at 6 sites, and wood frog egg masses were observed at 5 sites. At Site 6, wood frogs were heard, but no egg masses were found. For sites where wood frogs were heard chorusing, no adults were observed and the number of egg masses ranged from 0 to greater than 300.

Leopard frogs - Northern leopard frogs were heard chorusing at 7 of the 8 sampling sites. Leopard frog egg masses were observed at 4 of the 8 sampling sites. At three sites, Leopard frogs were heard chorusing, but no egg masses were confirmed. For sites where leopard frogs were heard chorusing, the number of adults ranged from 0 to greater than 30, and the number of egg masses ranged from 0 to 11.

Table 1. Summary of chorusing surveys conducted for wood frogs and northern leopard frogs on 8 sampling locations in the Upper Hudson River. The site was considered a breeding location if chorusing was heard and/or egg masses observed.

	Wood Frog			Northern Leopard Frog		
Site Number	Chorusing	No. of Adults Observed	No. of Egg Masses Observed	Chorusing	No. of Adults Observed	No. of Egg Masses Observed
1	N	0	0	Y	7	10
4	Y	0	> 100	Y	25-30	11
5	Y	0	> 300	Y	0	0
6	Y	0	0	Y	21	10
7	Y	0	37	Y	15-20	0
8	N	0	0	Y	6	4
10	Y	0	> 200	Y	> 30	0
11	Y	0	> 50	N	0	0

3.2 Results of Sediment Analysis

The Sediment Data Table (Appendix D) provides the results of the analyses.

The Sediment Data Table contains information that has been extracted from the Trustees' Breeding Pool Sediment Database (Hudson River Natural Resource Trustees 2005b). That complete database and the accompanying Frog Pond Sediment Database User Manual (Hudson River Natural Resource Trustees 2005c) are not included in this report due to the size of the database, but will be made available upon request.

The Sediment Data Table contains the following fields:

Sampling Date – Sampling Date (mm/dd/yy format).

Field ID –

The Field IDs were created using the following format:

YY-SED-NNN

where YY is the year the sample was collected (04 for 2004), SED represents the matrix, and NNN is the site code (for sites 1 through 13). For example, 04-SED-003 indicates a sediment composite collected in 2004 from Site 3.

Lab ID – Laboratory identification number for sample (e.g. 0410065-01)

Analyte – For the PCB congeners, the analyte names are reported using the following format:

Clx-BZ#NNN

Where Clx refers to the chlorination level, BZ# refers to the Ballschmiter and Zell number, and NNN is the congener number. For example, PCB110 (a pentachlorinated biphenyl) is reported as Cl5-BZ#110.

The total concentration of all congeners within a chlorination level (including both target and non-target congeners) is represented by the chlorination level name. For example, the total of all biphenyl rings substituted with 5 chlorine atoms is reported as Pentachlorobiphenyls.

Value, Interpretive Qualifier and Units –

Value – Analytical result (3 significant figures)

Interpretive Qualifier - This field contains the qualifier applied to each data point

The data user should use the qualifier in this field when interpreting the reported results. This field contains a combination/merge of the Lab Flag field and the DV Qualifier field reported in the Frog Pond Sediment Database. The fields were merged using the following logic:

- Data validation qualifiers always supersede laboratory flags
- If there is no data validation qualifier, the laboratory flag would be used
- If there is no data validation qualifier or laboratory flag, the field would be blank

The qualifiers are defined as follows:

U Analyte was not detected. The associated value represents the detection limit

J Estimated: The associated numerical value is an estimated quantity. The analyte was detected, but the reported value may not be accurate or precise. The "J" qualification indicates the data fell outside the QC limits, but the exceedance was not sufficient to cause rejection of the data, OR that the reported result is with a range of elevated analytical uncertainty (greater than the Method Detection Limit (MDL) value, but less than the Practical Quantitation Limit (PQL) value).

NJ The analyte was tentatively identified and the associated numerical value is an estimated quantity

Reasons for qualification are explained further in the Data Quality Assessment Report (Appendix C).

The unit of measurement of the analytical result is provided (for example, µg/kg)

Detection Limit – self-explanatory; this column includes units

A brief description of some of the features of these data follows in sections 3.1 and 3.2 of this Data Report. Please note that the unit "µg/kg" used in the Sediment Data Table is equivalent to parts per billion (ppb) used in the discussion of these data in this Data Report.

For the purpose of reporting PCB results below and in the figures attached to this report, all values flagged with a U qualifier (that is, not detected; see Appendix C) were considered to be zero. Using zero, rather than the value reported by the laboratory for the analyte, which represents the detection limit for the analysis, potentially underreports the true value, but avoids overreporting the true value. This is thus a conservative result; the actual PCB concentration could be higher.

3.1.1 Total PCB Concentrations

Total PCB concentrations (as sum of homologues) of sediments from the study sites ranged from 31.2 ppb to 27,800 ppb (Table 2, Figure 3). Values in Table 2 are reported to three significant figures.

Table 2. Summary of Total PCBs (as sum of homologues, wet weight basis) in Sediment Composite Samples.

Sampling Site	PCB Concentration (ppb)
Site 1	2400
Site 2	445
Site 3	31.2
Site 4	2140
Site 5	1030
Site 6	494
Site 7	301
Site 8	27800
Site 9	749
Site 10	921
Site 11	3720
Site 12	533
Site 13	6720

Sediment PCB concentrations at the sampling sites show lower concentrations, in general, than sediment from the main stem of the Hudson River. Habitat preferences of the target species most likely explain these results. Wood frogs prefer vernal pools where there is less likelihood of deposition of PCB contaminated sediment during normal hydrologic cycles. Leopard frogs preferred wetland areas with year round standing water, and although some of the sites where leopard frogs were observed have direct hydrologic connections to the river (e.g. culverts), substantial deposition of contaminated sediment is likely to occur only during flood events. Therefore, it is not surprising that the sites with the most direct hydrologic connection to the river (Sites 13 and 8) have the highest total PCB concentrations (6720 and 27800 ppb, respectively). Although the PCB concentrations measured in this study are lower than concentrations typically found in sediment from the mainstem of the Upper Hudson River, they could potentially injure amphibians.

3.1.2 PCB Homologues and Congeners

PCBs are synthetic (man-made) chemicals that form a group of 209 individual compounds that have similar chemical structures based on biphenyl rings with 1 to 10 chlorine atoms attached. PCBs have the generic formula $C_{12}H_{(10-x)}Cl_x$, where x is an integer from 1 to 10. Each individual PCB compound, called a congener, is identified by the unique number and location of chlorine atoms that attach to the compound's base structure. Congeners differ both in their physical properties and in their effects on fish and wildlife (Safe 1994; Van den Berg et al. 1998).

For this investigation, the sediments were analyzed for 47 specific target PCB congeners listed in Table 3. In addition, a total concentration for each homologue group was determined by summing all target and non-target congener concentrations within each homologue group. For any congener reported as not detected, zero was used in the summation.

Table 3. PCB Congener Analytes

Current Ballschmiter and Zell (1994) and IUPAC Number	IUPAC Name
8	2,4'-Dichlorobiphenyl
18	2,2',5-Trichlorobiphenyl
28/31	2,4,4'-Trichlorobiphenyl/2,4',5-Trichlorobiphenyl
44	2,2',3,5'-Tetrachlorobiphenyl
45	2,2',3,6-Tetrachlorobiphenyl
47	2,2',4,4'-Tetrachlorobiphenyl
49	2,2',4,5'-Tetrachlorobiphenyl
52	2,2',5,5'-Tetrachlorobiphenyl
56	2,3,3',4'-Tetrachlorobiphenyl
66	2,3',4,4'-Tetrachlorobiphenyl
70	2,3',4',5-Tetrachlorobiphenyl
74	2,4,4',5-Tetrachlorobiphenyl
77	3,3',4,4'-Tetrachlorobiphenyl
81	3,4,4',5-Tetrachlorobiphenyl
87	2,2',3,4,5'-Pentachlorobiphenyl
95	2,2',3,5',6-Pentachlorobiphenyl
99	2,2',4,4',5-Pentachlorobiphenyl
101	2,2',4,5,5'-Pentachlorobiphenyl
105	2,3,3',4,4'-Pentachlorobiphenyl
110	2,3,3',4',6-Pentachlorobiphenyl
114	2,3,4,4',5-Pentachlorobiphenyl
118	2,3',4,4',5-Pentachlorobiphenyl
123	2,3',4,4',5'-Pentachlorobiphenyl
126	3,3',4,4',5-Pentachlorobiphenyl
128	2,2',3,3',4,4'-Hexachlorobiphenyl
138	2,2',3,4,4',5'-Hexachlorobiphenyl
146	2,2',3,4',5,5'-Hexachlorobiphenyl
149	2,2',3,4',5',6-Hexachlorobiphenyl
151	2,2',3,5,5',6-Hexachlorobiphenyl
153	2,2',4,4',5,5'-Hexachlorobiphenyl
156	2,3,3',4,4',5-Hexachlorobiphenyl
157	2,3,3',4,4',5'-Hexachlorobiphenyl
158	2,3,3',4,4',6-Hexachlorobiphenyl
167	2,3',4,4',5,5'-Hexachlorobiphenyl
169	3,3',4,4',5,5'-Hexachlorobiphenyl
170	2,2',3,3',4,4',5-Heptachlorobiphenyl
174	2,2',3,3',4,5,6'-Heptachlorobiphenyl
177	2,2',3,3',4,5',6'-Heptachlorobiphenyl
180	2,2',3,4,4',5,5'-Heptachlorobiphenyl
183	2,2',3,4,4',5',6-Heptachlorobiphenyl
187	2,2',3,4',5,5',6-Heptachlorobiphenyl
189	2,3,3',4,4',5,5'-Heptachlorobiphenyl
194	2,2',3,3',4,4',5,5'-Octachlorobiphenyl
195	2,2',3,3',4,4',5,6-Octachlorobiphenyl
201	2,2',3,3',4,5',6,6'-Octachlorobiphenyl
206	2,2',3,3',4,4',5,5',6-Nonachlorobiphenyl
209	Decachlorobiphenyl

4.0 DISCUSSION

The goal of the preliminary investigation was to determine if a full-scale study of the effects of PCBs on amphibians in the Hudson River should be undertaken. As such, the objectives of this investigation were to:

- Establish whether the Hudson River study area (Bakers Falls at River Mile (RM) 196.9 in Hudson Falls, New York to the Federal Dam at Troy, New York at RM 153.9) contains suitably sized populations of two particular amphibian species of interest – northern leopard frog (*Rana pipiens*) and the wood frog (*Rana sylvatica)* – to sample and potentially use in an injury study in the future; and
- Determine contaminant levels in sediments from known breeding areas of the northern leopard frog and the wood frog.

Based on this investigation the Trustees have concluded that:

- The Hudson River study area does not appear to contain suitably sized populations of the target species, in particular the northern leopard frog, to use in a future field-based amphibian injury study focused solely on resident frogs.
- PCB levels in sediments from known amphibian breeding areas of the Hudson River are at ecologically significant levels, suggesting the potential for injury to these organisms. Accordingly, the Trustees are investigating additional options to assess amphibian injury, including the potential conduct of a laboratory-based injury study.

5.0 REFERENCES

Ballschmiter, K. and Zell M. 1994. Analysis of polychlorinated biphenyls (PCBs) by glass capillary gas chromatography. *Fresenius' Journal of Analytical Chemistry* 302: 20-31.

Hudson River Natural Resource Trustees. 2002a. Hudson River Natural Resource Damage Assessment Plan. September 2002. U.S. Department of Commerce, Silver Spring, MD.

Hudson River Natural Resource Trustees. 2002b. Analytical Quality Assurance Plan for the Hudson River Natural Resource Damage Assessment. Public Release Version. July 9, 2002, Version 1.0. U.S. Department of Commerce, Silver Spring, MD

Hudson River Natural Resource Trustees. 2004a. Work Plan for the Preliminary Investigation of Amphibian Breeding Habitat and Screening of Breeding Pool Sediments for Polychlorinated Biphenyl Contamination. Final. Public Release Version. April 1, 2004. U.S. Department of Commerce, Silver Spring, MD.

Hudson River Natural Resource Trustees. 2004b. Modification #1 to Work Plan for the Preliminary Investigation of Amphibian Breeding Habitat and Screening of Breeding Pool Sediments for Polychlorinated Biphenyl Contamination. Final. Public Release Version. April 30, 2004. U.S. Department of Commerce, Silver Spring, MD.

Hudson River Natural Resource Trustees. 2005a. Data Quality Assessment Report. Hudson River Natural Resource Damage Assessment. Floodplain Study. Frog Pond Sediments. Public Release Version. Version 1.0. June 24, 2005. U.S. Department of Commerce, Silver Spring, MD.

Hudson River Natural Resource Trustees. 2005b. Frog Pond Sediment Database. Version 1.0. U.S. Department of Commerce, Silver Spring, MD.

Hudson River Natural Resource Trustees. 2005c. Database User Manual for Version 1.0. Hudson River Natural Resource Damage Assessment. Floodplain Study. Frog Pond Sediments. Public Release Version. June 9, 2005. U.S. Department of Commerce, Silver Spring, MD.

Safe, S.H. 1994. Polychlorinated biphenyls (PCBs): environmental impact, biochemical and toxic responses, and implications for risk assessment. *Critical Reviews in Toxicology* 24: 87-149.

U.S. Environmental Protection Agency. 1999. USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review. Office of Emergency and Remedial Response, Washington, D.C. 20460. EPA540/R-99/008, 118 pp.

Van den Berg, M., Birnbaum, L., Bosveld, A.T.C., Brunstrom, B., Cook, P.M., Feeley, M., Giesy, J.P., Hanberg, A., Hasegawa, R., Kennedy, S.W., Kubiak, T.J., Larsen, J.C., van Leeuwen, F.X.R., Liem, A.K.D., Nolt, C., Peterson, R.E., Poellinger, L., Safe, S., Schrenk, D., Tillitt, D.E., Tysklind, M., Younes, M., Waern, F., and Zacharewski, T. 1998. Toxic Equivalency Factors (TEFs) for PCBs, PCDDs, PCDFs for humans and wildlife. *Environmental Health Perspectives* 106: 775-792.

FIGURES

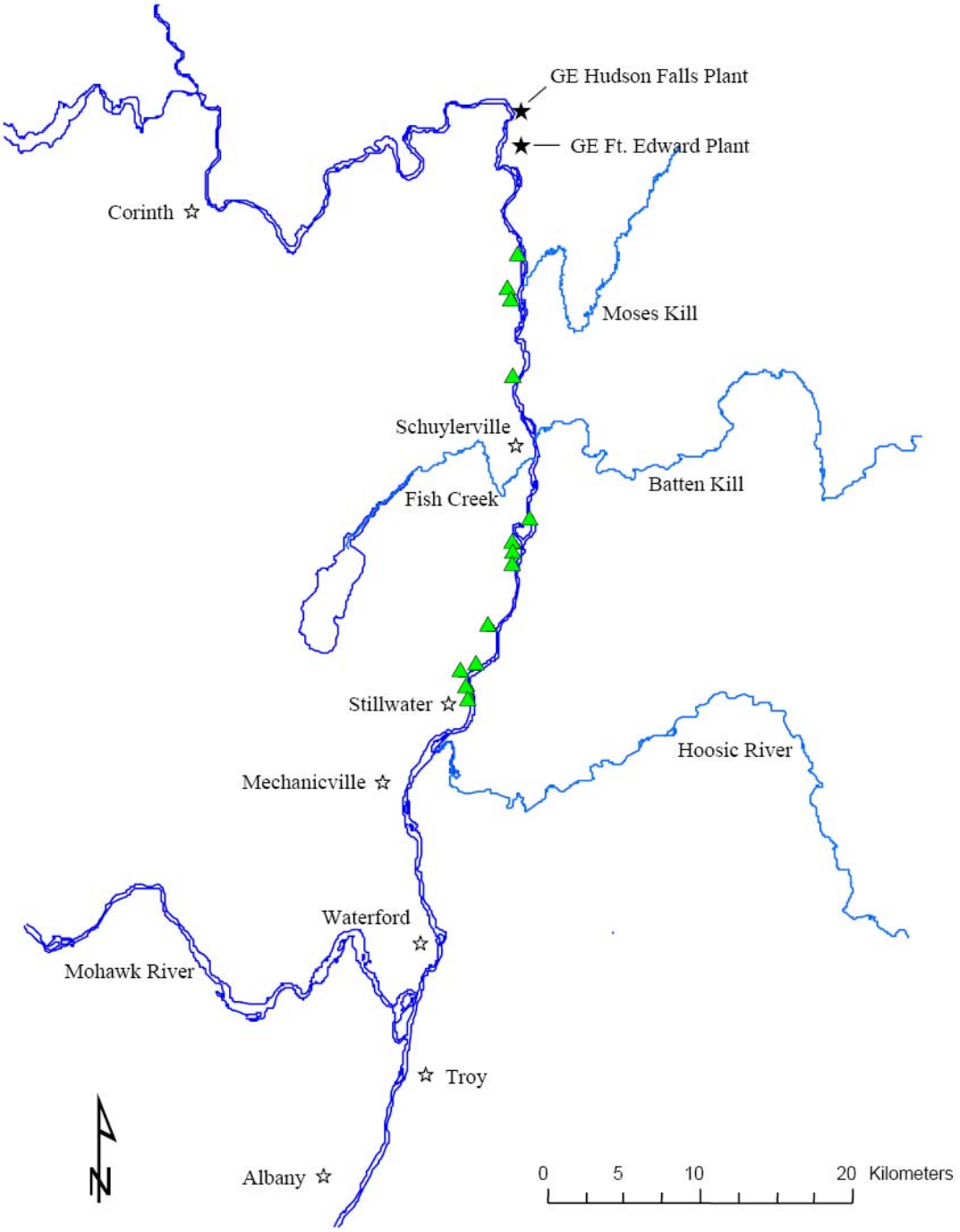

Figure 1. Hudson River study area for 2004 Preliminary Investigation of Amphibian Breeding Habitat and Screening of Breeding Pool Sediments for Polychlorinated Biphenyl Contamination.

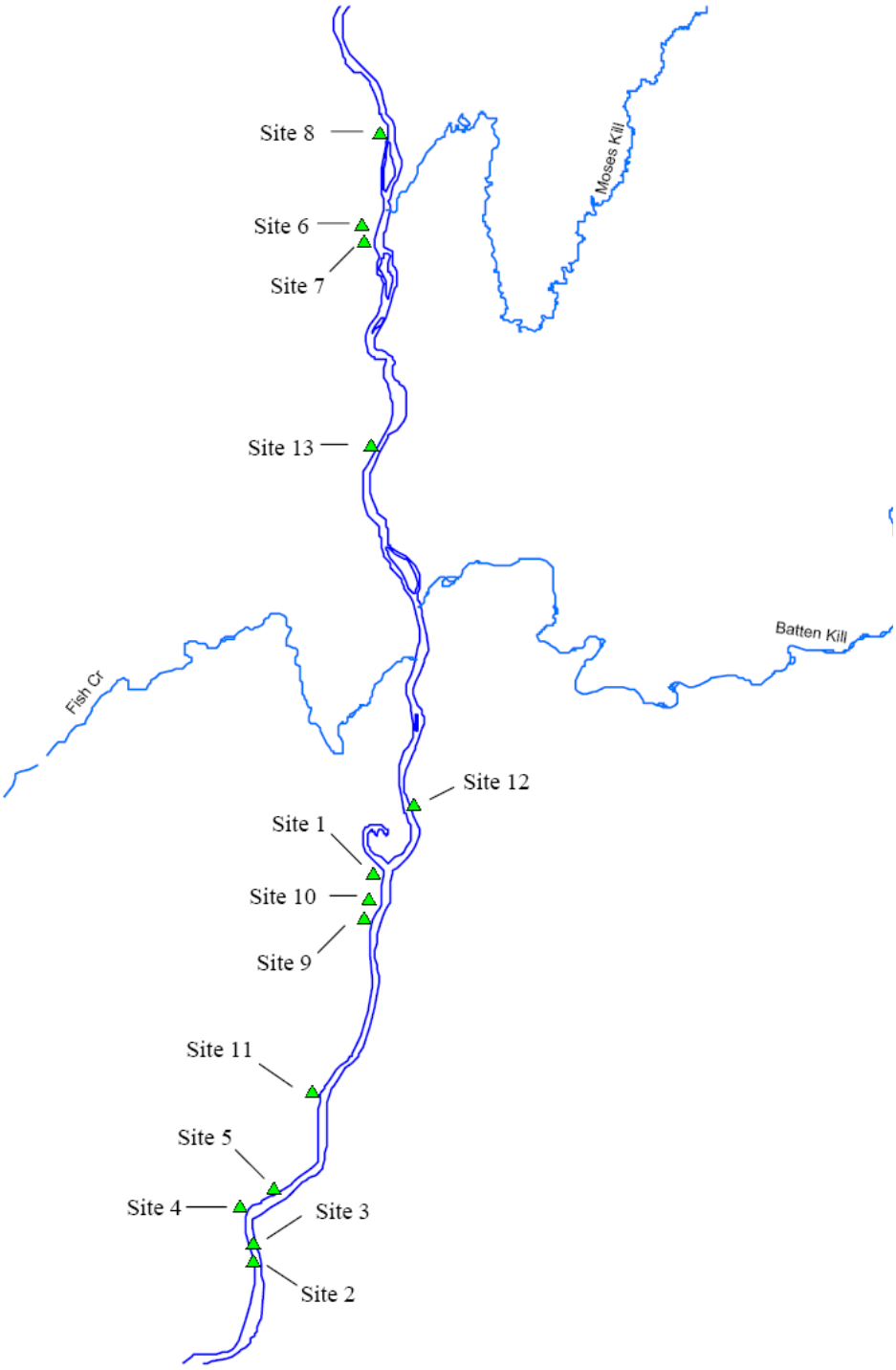

Figure 2. Thirteen sample sites identified as potential northern leopard frog and wood frog breeding habitat. Chorusing surveys and PCB sediment analysis were performed at each site.

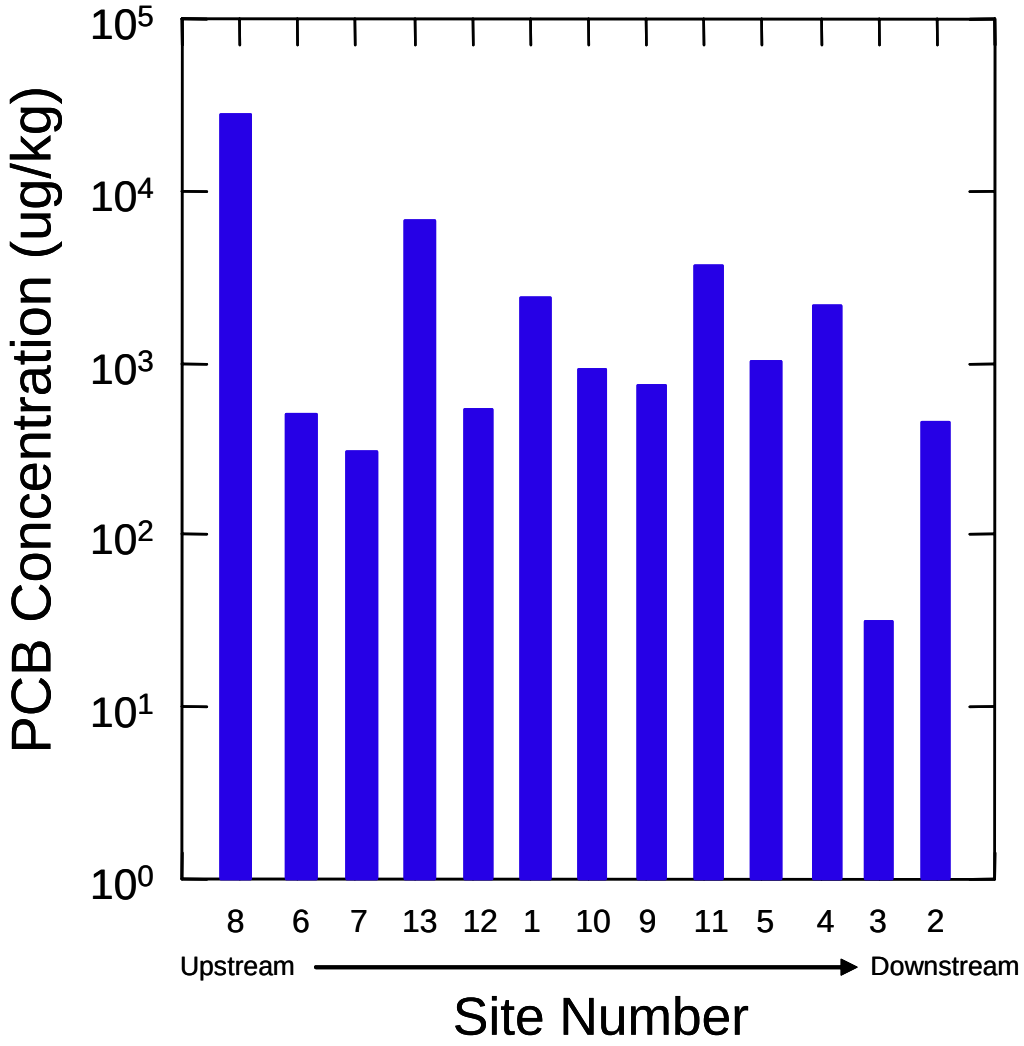

Figure 3. Sediment total PCB concentrations by site for the 13 sites identified as potential northern leopard frog and wood frog breeding habitat.

Appendix A

Work Plan for the Preliminary Investigation of Amphibian Breeding Habitat and Screening of Breeding Pool Sedimetns for Polychlorinated Biphenyl Contamination

WORK PLAN FOR THE PRELIMINARY INVESTIGATION OF

AMPHIBIAN BREEDING HABITAT AND SCREENING OF BREEDING POOL SEDIMENTS FOR POLYCHLORINATED BIPHENYL CONTAMINATION

HUDSON RIVER, NEW YORK

FINAL

April 2, 2004

Hudson River Natural Resource Damage Assessment

_____

Investigation Lead

_____

Quality Assurance Coordinator

INVESTIGATION TEAM ACKNOWLEDGEMENT OF WORK PLAN REVIEW AND COMPLIANCE

By my signature, I acknowledge that I have read this Work Plan and understand it, and will comply with it in performing this work.

Name (printed): _____ Name (printed): _____

Signature: _____ Signature: _____

Date: _____ Date: _____

Title: _____ Title: _____

Name (printed): _____ Name (printed): _____

Signature: _____ Signature: _____

Date: _____ Date: _____

Title: _____ Title: _____

Name (printed): _____ Name (printed): _____

Signature: _____ Signature: _____

Date: _____ Date: _____

Title: _____ Title: _____

Name (printed): _____ Name (printed): _____

Signature: _____ Signature: _____

Date: _____ Date: _____

Title: _____ Title: _____

Name (printed): _____ Name (printed): _____

Signature: _____ Signature: _____

Date: _____ Date: _____

Title: _____ Title: _____

Table of Contents

1.0 INTRODUCTION 1
1.1 Objectives 1
1.2 Project Approach 2
1.2.1 Species Selection 2
1.2.2 Study Overview 3
2.0 METHODS 4
2.1 Site Selection 4
2.1.1 Landscape Analysis 4
2.1.2 Preliminary Field Surveys 4
2.2 Field Sampling 5
2.2.1 Collection Permits 5
2.2.2 Chorus Surveys 5
2.2.3 Sediment Collection 5
3.0 QUALITY ASSURANCE/QUALITY CONTROL 6
3.1 Overview and Project Management 6
3.2 Project Managers Contact Information 7
3.3 Data Generation and Acquisition 8
3.3.1 Study Documentation 10
3.3.2 Chain of Custody 11
3.3.3 Personnel Experience and Training 11
3.4 Assessment and Oversight 12
3.5 Data Validation and Usability 12
4.0 DATA ENDPOINTS 13
5.0 DATA REPORT 13
6.0 SCHEDULE 13
7.0 LITERATURE CITED 13

Appendices:

Appendix 1: Chorusing Survey Standard Operating Procedure and Data Sheet
Appendix 2: Sediment Collection Standard Operating Procedure and Data Sheet
Appendix 3: Chain of Custody Form

1.0 INTRODUCTION

The General Electric Company (GE) is estimated to have discharged up to 1.3 million pounds of polychlorinated biphenyls (PCBs) into the Hudson River between the 1940s and 1977 (Baker *et al.* 2001). These PCBs have been detected in the sediment, water, and biota of the Hudson River at levels of potential ecological concern (TAMS Consultants, Inc. and Menzie-Cura & Associates, Inc. 2000). A recent study documented elevated PCB levels in Hudson River floodplain soils (S E A Consultants, Inc. 2002). More recent sediment sampling of upper Hudson River sediments has documented a median PCB concentration of 2.7 parts per million (ppm) (5,105 samples) with a range of over 10,000 ppm (USEPA 2003).

The Hudson River Natural Resource Trustee council, comprised of the U.S. Department of the Interior (DOI), represented by the U.S. Fish and Wildlife Service (USFWS) and the National Park Service (NPS); the U.S. Department of Commerce, represented by the National Oceanic and Atmospheric Administration (NOAA); and the State of New York, represented by the New York State Department of Environmental Conservation (NYDEC), is conducting a natural resource damage assessment (NRDA) for the Hudson River (Hudson River Natural Resource Trustees, 2002a).

As part of this process, the Trustees are investigating the feasibility of using amphibians for an injury determination study. Frogs were selected as the representative amphibian species due to their presence in the Hudson River study area, reported sensitivity to PCBs, high potential for exposure due to both aquatic and terrestrial life stages, and capacity to be evaluated for reproductive and developmental metrics in the field and laboratory. Potential injuries to amphibians from PCBs could include "one of the following adverse changes in viability: death, disease, behavioral abnormalities, cancer, genetic mutations, physiological malfunctions (including malfunctions in reproduction), or physical deformations" (Title 43 of the Code of Federal Regulations Part 11.62(f)(i)). This document describes the plan and methodology for a preliminary investigation to find wood frog and leopard frog breeding pools and analyze sediments from those pools for PCBs and potentially other chemicals of concern. Information gathered during this preliminary investigation will aid in the development of potential Hudson River amphibian injury studies from PCBs.

1.1 Objectives

The goal of the preliminary investigation is to determine if a full-scale study of the effects of PCBs on amphibians in the Hudson River should be undertaken. As such, the objectives of this investigation are to:

- Establish whether the Hudson River study area (Bakers Falls at River Mile (RM) 196.9 in Hudson Falls, New York to the Federal Dam at Troy, New York at RM 153.9) contains suitably sized populations of two particular amphibian species of interest – northern leopard frog (*Rana pipiens*) and the wood frog (*Rana sylvatica)* – to sample and potentially use in an injury study in the future; and

- Determine contaminant levels in sediments from known breeding areas of the northern leopard frog and the wood frog.

The two species that will be the focus of this preliminary investigation are northern leopard frogs and wood frogs. There will also be opportunistic collection of data on three other amphibian species – the bullfrog (*Rana catesbeiana*), the green frog (*Rana clamitans*) and the American toad (*Bufo americanus).*

1.2 Project Approach

This study will use a combination of field surveys and sediment analysis to achieve the project objectives. The first objective – determine if suitably sized leopard and wood frog populations occur for use in a larger, potential future injury study – will be achieved through field surveys conducted during the breeding season.

Frog populations are easiest to survey during the breeding season because they typically congregate in large numbers and vocalize while at breeding sites. Consequently, field surveys will focus effort during the breeding period (mid-March through mid-April) and during the peak of breeding activity (evening hours). Chorusing surveys will be conducted at all sites suspected to be used by the target species for breeding activities. The result will be detailed information on the distribution and seasonal habitat use of these two species in the study area, which, in turn, will be used to focus any potential future efforts of determining injury to these species from PCBs.

The second objective – determine contaminant levels in sediments from known breeding areas of the northern leopard frog and the wood frog – will be investigated through the collection of sediment samples at wood frog and northern leopard frog breeding sites identified during chorusing surveys of the Hudson River.

1.2.1 Species Selection

Several species of amphibians are known to occur in the upper Hudson River and associated floodplain wetlands. The NYDEC Amphibian and Reptile Atlas Project indicates that up to 18 species of salamanders, frogs, and toads occur in the vicinity of the river, from Glens Falls, New York to Stuyvesant, New York. Frogs and toads are the dominant species using the aquatic habitats of the river, although several species of salamanders may be found in the river, its backwaters, and floodplain pools. Should the Trustees decide to pursue amphibian injury studies, two species in particular appear suitable for use in an injury assessment for the Hudson River: the northern leopard frog and the wood frog. These species have different life history characteristics, one being the amount of time they spend in aquatic habitat.

Northern leopard frogs spend all but the summer months in the aquatic backwater habitats of the river and permanent ponds in the floodplain. They overwinter in these areas, in submerged hibernation pits excavated in the sediment (Emery *et al.* 1972), and then breed in areas with emergent vegetation and shallow water during March and April. Generally, they breed several

weeks after they emerge from hibernation, allowing a brief window of opportunity to collect them before they breed. Several weeks after breeding, leopard frogs move from these waterbodies into their summer field habitat (Hunter *et al.* 1999; Dole 1967).

Northern leopard frogs are generally abundant in the Northeast and have been observed in the Hudson River study area, although there is some uncertainty about their distribution and abundance along the Hudson River. They have a limited home range, spending a good portion of their life spans in aquatic environments. Consequently, their PCB body burdens should reflect the diet, sediment, and water column concentration in the areas from which they are collected. Also, because they lay thousands of eggs, it should be possible, if desired in a potential future investigation, to collect a sufficient number of eggs to ensure statistical power and confidence in study results. Finally, there is an established peer-reviewed methodology for *in vitro* fertilization of northern leopard frogs and culturing of their embryos in the laboratory (Dickerson 1969, Nussbaum *et al.* 1983, Carolina Biological Supply Company 1993, Fort and Stover 1996 ASTM 1998, Bantle *et al.* 1998), making them a potentially appropriate target species for a possible future laboratory investigation.

In contrast, wood frogs spend most of their adult life in terrestrial habitat, only venturing into vernal pools for a short period during the annual breeding season. They are also early season breeders, occasionally depositing egg masses in pools before all of the ice has melted. The breeding season is very brief, with most egg masses being deposited in a breeding pool within one to two weeks. In eastern New York, this typically occurs from the middle of March to the first week of April. The incubation and larval periods are also relatively brief—typically one month and two months, respectively. Wood frogs typically breed in temporary pools (vernal pools) that are fishless. However, in river floodplains they may breed in pools that have brief, seasonal connections to the river.

Wood frogs are also an abundant species in the Northeast. They have a limited home range, and breed and develop in aquatic environments, particularly vernal pools (Hunter *et al.* 1999). Because wood frogs lay thousands of eggs, it should be possible, if desired in a potential future investigation, to efficiently collect a sufficient number of eggs to ensure statistical power and confidence in study results. Finally, while no standard method specific to wood frogs has been developed, there is an established peer-reviewed methodology for ranid embryo culture in the laboratory (Dickerson 1969, Nussbaum *et al.* 1983, Carolina Biological Supply Company 1993, Nieuwkoop and Faber 1994, Fort and Stover 1996, ASTM 1998, Bantle *et al.* 1998), making them a potentially appropriate target species for a possible future laboratory investigation.

1.2.2 Study Overview

The study consists of preliminary field surveys to verify general habitat conditions of likely breeding locations, and the conduct of chorusing surveys (see Appendix 1) during the breeding seasons for these species to determine areas for sediment sampling. The Sediment Collection Standard Operating Procedure (SOP) (Appendix 2) shall be employed to collect samples representative of a given area. The goals of the preliminary investigation are to inventory known

amphibian breeding habitats, and to collect and analyze sediment samples that are representative of northern leopard and wood frog breeding pools.

2.0 METHODS

2.1 Site Selection

2.1.1 Landscape Analysis

Landscape analysis is a process by which a study area of any size is characterized using a wide variety of available information. Aerial photographs, mapping data, previous site sampling data, and other natural resource information available for a specific site is collated and is then used to identify amphibian habitats and make educated predictions on species occurrences. This process has been, and will continue to be, used to identify sites for the chorusing surveys.

2.1.1.1 Habitat Availability Analysis

Amphibian breeding habitats for each target species in the Hudson River floodplain have been identified using aerial photographs, U.S. Geological Survey topographic maps, NYSDEC regulated wetland maps, and USFWS National Wetlands Inventory maps.

2.1.1.2 Amphibian Use Database Review

The NYDEC, using volunteers, conducted a 10-year survey designed to document the geographic distribution of New York State's herpetofauna. The New York State Amphibian and Reptile Atlas Project has published data on the number of species of amphibians and reptiles found within each U.S. Geological Survey (USGS) topographic quad of the state, as well as species-by-species distribution maps, also referenced to USGS quads. That database has been reviewed to identify potential known sites for leopard frogs and wood frogs along the river.

2.1.2 Preliminary Field Surveys

In early March preliminary field surveys were conducted to verify the suitability of potential sample sites. During these surveys information was collected on ownership, access, and potential field sampling sites. This information was documented in field notebooks.

2.2 Field Sampling

2.2.1 Collection Permits

A scientific collection permit will be obtained from the National Park Service for work conducted on their lands.

2.2.2 Chorus Surveys

Chorusing surveys began as soon as such activity by frogs was detected, and will continue, as long as frogs are chorusing, until the study area has been thoroughly assessed for the species of interest.

Audio surveys will be conducted on a daily basis from late afternoon and into the night. During peak breeding activities, surveys will also be conducted during the day. Any daytime surveys will also include surveys of pools for frog and salamander egg masses. These surveys will be conducted throughout the entire study area, and used to confirm breeding pools by locating wood frog or leopard frog egg masses although effort will focus on habitats that are closely tied to the river (i.e., emergent fringes of backwaters and stream mouths or basins with permanent culvert connections or seasonal high water connections).

Chorusing surveys will be accomplished in accordance with the Chorusing Survey SOP (Appendix 1). To conduct the surveys, observers will quietly access a pond or pool and listen for 5 to 15 minutes, depending on the size and complexity of the site, for male frogs and toads to begin vocalizing. Calling rates will be classified for each species heard as: 1) none heard, 2) calls of individuals are not overlapping and individuals can be counted, 3) calls of individuals overlap but are distinguishable, and 4) full chorus with continuous and overlapping calls. If calls can be counted, the number of calls per minute will be determined for each species

Data will be recorded on a Chorusing Survey Data Sheet (see Appendix 1). Additional information, including location, date, time, observer, weather conditions, and visual observations will also be recorded. Sites surveyed will be identified using a Global Positioning Systems (GPS) Unit, and/or in Arcview GIS computer software.

2.2.3 Sediment Collection

Sediments will be collected from each site where there are confirmed wood and/or northern leopard frogs breeding. The focus will be on the collection of sediments from the breeding pools in which the frogs have laid their eggs. These data will identify PCB contamination if any, in known amphibian breeding pools, for use in designing potential injury studies or other investigations.

Approximately the top 3 centimeters of sediments will be collected, as these surficial sediments are those to which the organisms are most likely exposed. Each sediment sample will consist of

twenty-five sediment sub-samples from within each sample site that will be composited in the field. Sufficient sediment will be collected to allow a portion of the samples to be archived for possible future, further analysis should the need for such be identified at a later date.

Sediment collection will be accomplished in accordance with the SOP for Sediment Collection (Appendix 2). Photographs will be taken during sediment collection when and where determined appropriate by the Field Crew Leader. Appropriate Chain of Custody (COC) (see Section 3.3.2 and Appendix 3) will be followed.

3.0 QUALITY ASSURANCE/QUALITY CONTROL

3.1 Overview and Project Management

This study is being conducted in accordance with the Quality Assurance Management Plan for the Trustees' Hudson River NRDA (Hudson River Natural Resource Trustees 2002b). As described in that document, four general elements of quality assurance/quality control (QA/QC) must be addressed for each data collection effort: project management, data generation and acquisition, assessment and oversight, and data validation and usability.

This section describes the Quality Assurance Plan (QAP) for the Preliminary Investigation of Amphibian Breeding Habitat and Screening of Breeding Pool Sediments for Polychlorinated Biphenyl Contamination, based on these four general elements. The objectives of the study are outlined in Section 1.0. To achieve these objectives, the following types of data will be required:

- Wood and northern leopard frog breeding pool inventory: Accurate species identification is required to locate the targeted species in the study area.

- Sediment contamination levels: The laboratory performing analytical work will be contracted to follow the Trustees' Analytical Quality Assurance Plan for the Hudson River NRDA (Hudson River Natural Resource Trustees 2002b), which will be updated as necessary to include measurement quality objectives for any additional analytes.

The study is organized based on tasks and levels of responsibility to ensure good communication among all personnel. The NYSDEC Assessment Manager (Larry Gumaer) has overall project oversight and responsibility for design and implementation of the study. Responsibility for design and implementation of the study is vested with the Amphibian and Reptile Technical Working Group (TWG), subject to the approval of the Hudson River NRDA Case Management Team (CMT) to conduct and fund this project. Quality assurance (QA) will be coordinated with the Hudson River NRDA QA Coordinator. The Investigation Lead is responsible for sample collection and handling.

The Investigation Lead provides instructions to the Investigation Team on all aspects of the project, including quality assurance management. For safety reasons, the Investigation Team will consist of a minimum of two persons -- a Field Crew Leader and a Field Data Recorder.

The Investigation Lead is responsible for resolving any issues raised by the Investigation Team, in coordination with the TWG, QA Coordinator and CMT, as warranted. The Investigation Lead will work with the CMT, TWG, and QA Coordinator to ensure that the study is consistent with the overall QA objectives of the NRDA.

The Work Plan for this study was developed to provide detailed and explicit instructions for the Investigation Team to follow in collecting the study data. The Work Plan has been reviewed, commented on, and approved by key parties to the study before the beginning of sample collection. Reliance on a detailed, explicit, and fully reviewed Work Plan ensures that:

- Study objectives, methods, procedures, and details are completely thought out before sampling.
- Data will be collected in a systematic and consistent way throughout the study.
- Every member of the Investigation Team adheres to the requirements of the Work Plan. Each Investigation Team member is required to sign the "Investigation Team Acknowledgment of Work Plan Review and Compliance," affirming that he or she has read this Work Plan, understands it, and will comply with it. In particular, each Field Crew Leader must make sure that his or her team adheres to the Work Plan.

The procedures specified in this Work Plan must be considered somewhat flexible. Events can arise during field sample and data collection that require changes to the procedures being used. In these circumstances, deviations from the Work Plan will be conducted only after consultation between the Assessment Manager and Investigation Lead. Deviations from the Work Plan will be carefully documented; a detailed explanation as to why the deviations were necessary will be provided. This information will be incorporated into an Addendum to the Work Plan to be prepared at a later date.

3.2 Project Managers Contact Information

Contact information for the persons noted in section 3.1 of this Work Plan is as follows:

NYSDEC Assessment Manager:

Larry Gumaer, New York State Department of Environmental Conservation, 625 Broadway, 5th Floor, Albany, NY 12233; Phone: 518-402-8971; Fax: 518-402-9027; e-mail: lwgumaer@gw.dec.state.ny.us

Amphibian and Reptile TWG Chair:

Kathryn Jahn, U.S. Fish and Wildlife Service, 3817 Luker Road, Cortland, NY 13045;
Phone: 607-753-9334; Fax: 607-753-9699; e-mail: kathryn_jahn@fws.gov

For work on National Park Service lands:

Bill Fuchs, National Park Service, Northeast Regional Office, 222 Union Street, #411,
New Bedford, MA 02740; Phone: 508-999-4458; Fax: 508-999-4459;
e-mail: bill_fuchs@nps.gov

3.3 Data Generation and Acquisition

Data developed in this study must meet standards of precision, accuracy, completeness, representativeness, comparability, and sensitivity, and be consistent with sound scientific methodology appropriate to the data quality objectives. Table 1 notes the types of data checks that will be used and their frequency.

Precision is defined as the level of agreement of repeated independent measurements of the same characteristic. For this study, agreement between Investigation Team members regarding species identification must be obtained for verification. This will occur in the field on a daily basis as surveys are conducted. Precision may also be evaluated by assessing the degree to which surveys are consistent among sites. The frequency and type of field checks are listed in Table 1 on the following page.

Accuracy is defined as the agreement of a measurement with its true value. For the parameters unique to the field portion of this study, accuracy means that the target animal is correctly identified.

Field crews will receive explicit instructions in the execution of this Work Plan. The field crews will be instructed in the field before beginning any sampling, and the instructions will be repeated or refreshed during the sampling as necessary (Table 1). The Investigation Lead will direct the fieldwork. Field crewmembers will be provided photographs and audio recordings (and video images, if available) of adult amphibian species of interest (bullfrog, northern leopard frog, wood frog, and green frog, and American toad). Before a field crew begins work, the Investigation Lead will confirm that the field crew members can accurately identify the mating calls of adult bullfrogs, northern leopard frogs, wood frog and green frogs as well as their egg masses. Identification materials, including any recorded calls, will be filed with field collection logs.

Table 1. Data Checks and Frequency

Type of Activity	Measurement	Minimum Frequency of Check by Investigation Lead	Acceptance Criteria
Auditory or visual observations of amphibians	Portion of Chorusing Survey Data Sheet that pertains to auditory or visual observations of amphibians is filled out correctly and completely.	Preferably daily, but with no more than a 3 day interval between preparation of a sheet by a Field Data Recorder and checking of the sheet by the Investigation Lead.	Data sheets are complete, legible and accurate.
Identification of amphibian species of interest during opportunistic observations	Adult bullfrog, green frog, wood frog, and northern leopard frogs, and American toads, can be identified by sight using a field guide and/or other information for confirmation, and sound	Once before beginning of investigation. Regular discussions between field crew members are expected. Descriptive keys, photographs, slides, and/or video images of adults of amphibian species of interest will be used to check identification.	One hundred percent accuracy on identification.
Egg mass identification by sight	Egg masses can be identified by sight using a field guide and/or other information for confirmation.	Once before beginning of investigation. Regular discussions between field crew members are expected. Descriptive keys, photographs, slides, and/or video images of amphibian egg masses will be used to check identification.	One hundred percent accuracy on identification.
GPS data collection and data downloading	Field personnel can operate GPS equipment and transfer data to computers.	Once before beginning of investigation, and then as data is downloaded and verified.	GPS data collected in the field matches up to correct locations on georeferenced aerial photos of the study area.
Sediment sample collection	Sediment samples are properly labeled when collected and then transferred to the lab for homogenization and analysis.	Each day sediment samples are collected.	Each sample is correctly assigned a Sediment Sample Number.
Completion of Sediment Collection Data Sheets	Sediment Collection Data Sheets are filled out correctly and completely.	Preferably daily, but with no more than a 3 day interval between preparation of a sheet by a Field Data Recorder and checking of the sheet by the Investigation Lead.	Data sheets are complete, legible and accurate.

Completeness is defined as the percentage of the planned samples actually collected and processed. Although sample sizes cannot be predetermined, chorusing surveys and sediment sample collection can only be conducted in areas where access is granted. The full distribution of study efforts within those parameters is a measure of the completeness of this study.

Representativeness is defined as the degree to which the data accurately reflect the characteristics present at the sampling location at the time of sampling. Obtaining representative data for this study will be ensured through the establishment of a thorough literature review to identify life history characteristics, nursery habitat, and by completing field studies in a manner to determine if adults of the amphibian species of interest are present.

Comparability is defined as the measure of confidence with which results from this study may be compared to another similar data set. Because of the nature of the study, there cannot be a duplication of effort in the same area at the same time. Comparability will be attained through use of techniques that are commonly used in amphibian studies in different parts of North America.

Sensitivity is defined as the ability of a measurement technique or instrument to operate at a level sufficient to measure the parameter of interest. For data specific to this study, sensitivity will pertain to the ability to locate and identify the adults of the amphibian species of interest (particularly northern leopard frog and wood frogs). This process is a stepwise approach that requires expertise. Work will focus on potentially suitable habitats along the Hudson River. Then those specific habitats will be checked for the presence of calling and or breeding adults of the amphibian species of interest. Surveys involve using visual searches and/or listening to locate the species of interest.

3.3.1 Study Documentation

All study activities will be documented through use of the sequentially numbered Data Sheets contained within the SOPs (Appendices 1 and 2). Data sheets will be placed into a ring-binder. All information will be recorded on these pre-formatted data sheets. The use of pre-formatted data sheets is a QA/QC measure designed to:

- ensure that all necessary and relevant information is recorded for each sample and each sampling activity,
- serve as a checklist for the field crews to help ensure completeness of the data collection effort,
- assist the field crews by making data recording more efficient, and
- minimize the problem of illegible field notebook entries.

Each Investigation Team will have a designated Field Data Recorder responsible for recording information on the Data Sheets. Assigning this responsibility to a designated person will help ensure that documentation is complete and consistent; Field Data Recorders will be retained throughout the study to the extent feasible. The Field Data Recorder is also responsible for the care, custody, and disposition of the binder containing the Data Sheets.

Data Sheet entries will be made in waterproof ink and corrections made with a single line through the error accompanied by the correction date, and the corrector’s initials.

Each completed Data Sheet will be reviewed, corrected (if necessary), and initialed by the Field Data Recorder and the Field Crew Leader. Data Sheets will then be reviewed by the Investigation Lead. This review by the Investigation Lead will occur preferably daily, but with no more than a 3 day interval between preparation of a Data Sheet by a field crew or processor and checking of the data sheet by the Investigation Lead.

Following completion of the study, the original data sheets will be retained at the NYSDEC Hale Creek Laboratory.

3.3.2 Chain of Custody

Strict Chain of Custody (COC) procedures will be used throughout the study. The COC procedure will begin when a sediment sample is collected. A COC form is shown in Appendix 3. These forms will be used to maintain records of sample collection, sample transfer between personnel, sample shipment, and sample receipt for storage in a freezer, or receipt by the analytical lab. Each sample collected will be listed on the COC forms. A separate form will be used for each cooler that is shipped. The original COC will accompany the samples. The Investigation Lead will maintain a copy of the COC. The signatures of the persons shipping and receiving the samples, and the date and time of transfer, will be documented on the COC forms. An air-bill can be used to document the transfer of a sample from the Investigation Team to the shipper, and from the shipper to the analytical lab.

All sections of the COC form will be completed with information pertaining to the sample collection. All samples included in the sample catalog will be clearly listed. The time, date, location, identifier (i.e., sample ID code), type of sample, and number and size of containers will also be listed on the form. If more than one cooler is required to ship the samples, a separate form will be used listing the samples actually held in each cooler. An indication of the number of coolers per shipment (e.g., 1 of 3) will be listed on the form. Once the form is completely filled out, it will be placed in a clear plastic shipping window and securely attached to the inside of the cooler. Each cooler will be sturdy, well sealed with filament tape, and have an unbroken signed custody seal.

3.3.3 Personnel Experience and Training

The Investigation Team will receive explicit instructions in the execution of this Work Plan from the Investigation Lead. The Investigation Team will be instructed in the field by the Investigation Lead before beginning any sampling, and the instructions will be repeated or refreshed during the sampling period as necessary (Table 1). The work will be directed by the Investigation Lead. Investigation Team members will be trained to identify adult bullfrogs, northern leopard frogs, wood frogs and green frogs by sight and sound; the ability of Investigation Team members to do so will be confirmed by the Investigation Lead before beginning work.

3.4 Assessment and Oversight

Several mechanisms for internal audits of the data generation process will be used for the study.

These mechanisms include:

- A project management structure that defines clear lines of responsibility and ensures communication between field crews and with the Investigation Lead. Clear responsibilities and communication can serve as a means of providing internal audits of the sample collection process as it proceeds.

- A requirement that Data Sheets be completed daily and be reviewed by the Investigation Lead. Data Sheets will be reviewed by the Investigation Lead preferably daily, but with no more than a 3 day interval between preparation of a Data Sheet and checking of the Data Sheet by the Investigation Lead.

- The use of pre-formatted Data Sheets that serve as a checklist for sampling procedures, thereby helping to ensure that sampling is complete.

- The work will not begin until approval is received from the QA Coordinator or their designee. The QA Coordinator or their designee will conduct a field audit of procedures and documentation of the investigation to ensure that the project-specific SOPs, this Work Plan and other procedures are being properly implemented.

3.5 Data Validation and Usability

This study employs standard techniques for amphibian surveys and sediment collection. The Work Plan for this study has been reviewed for the adequacy of the sampling design and methods. The original Data Sheets will be maintained by the NYSDEC and archived for a minimum of fifteen years. Disposal of the Data Sheets will be coordinated with the DOI and NOAA after this timeframe unless a longer archive period is requested. Any final reports generated from the data can then be reviewed against the sampling records to ensure that the data presented in the reports represent complete and accurate information.

The laboratories performing analytical work will be contracted to follow the Trustees' Analytical Quality Assurance Plan for the Hudson River NRDA (Hudson River Natural Resource Trustees 2002b), which will be updated as necessary to include measurement quality objectives for any additional analytes. Laboratories will provide fully documented data packages which will enable data validation to be performed based on the criteria provided in the Analytical Quality Assurance Plan for the Hudson River NRDA, applicable laboratory Standard Operating Procedures, and the U.S. Environmental Protection Agency (1999).

The Investigation Lead performing oversight of chorusing surveys and sediment collection will validate that Investigation Team members are correctly identifying all adult amphibian species of

interest, and correctly completing Data Sheets by performing periodic checks during the study as specified in Table 1.

4.0 DATA ENDPOINTS

Data endpoints for this project will include habitat characterization parameters, and inventory of breeding habitats, and contamination levels in breeding pool sediments. The exact contaminant analyses and preparation procedures will be determined by the Trustees upon finalization of the collection, and will follow those specified in the Analytical Quality Assurance Plan for the Hudson River NRDA, updated as necessary for any additional analytes.

5.0 DATA REPORT

A summary report of the chorus surveys and sediment analytical results will be prepared. The report will include graphical (maps) and tabular summaries of the species observed at each site surveyed, as well as sediment contamination levels found at the site. A statement of the overall distribution and relative abundance of species observed will be provided. Due to the planned timing of field surveys, it is anticipated that the primary species that will be heard calling in the study area are the two target species, as well as American toads.

6.0 SCHEDULE

- Pre-collection habitat verification surveys: Work began February 9, 2004.
- Chorusing surveys: Work began mid-March 2004; anticipated to continue through mid-April 2004.
- Breeding pool sediment collection: April 15 – April 30, 2004.

7.0 LITERATURE CITED

ASTM. 1998. Standard guide for conducting the Frog Embryo Teratogenesis Assay - *Xenopus* (FETAX). E1439-91.

Baker, J.E., W.F. Bohlen, R. Bopp, B. Brownawell, T.K. Collier, K.J. Farley, W.R. Geyer, and R. Nairn. 2001. PCBs in the Upper Hudson River: The Science Behind the Dredging Controversy. A white paper prepared by for the Hudson River Foundation. 45 pp. http://www.hudsonriver.org/

Bantle, J.A., Dumont, J.N., Finch, R.A., Linder, G.L. and D.J. Fort. 1998. *Atlas of Abnormalities, A Guide for the Performance of FETAX, Second Edition*. Oklahoma State University Press, Stillwater, OK.

Carolina Biological Supply Company. 1993. *Reptiles and Amphibians: Care and Culture*. ISBN: 0-89278-040-1. Carolina Biological Supply Company, Burlington, NC.

Dickerson, M.C. 1969. *The Frog Book: North American Toads and Frogs*. Dover Publications, Inc., New York, NY.

Dole, J.W. 1967. Spring movements of adult leopard frogs, *Rana pipiens* Schreber, in northern Michigan. Ecology 46(3):236-255.

Emery, A.R., A.H. Berst, and K. Kodaira. 1972. Under-ice observations of wintering sites of leopard frogs. Copeia. 1972:123-131.

Fort, D.J. and E.L. Stover. 1996. Assessing ecological hazard to amphibian populations. In: Proceedings of the 51st Purdue Industrial Waste Conference. Ann Arbor Press, Chelsea, MI, pp 351-358.

Hudson River Natural Resource Trustees. 2002a. Hudson River Natural Resource Damage Assessment Plan. September 2002. U.S. Department of Commerce, Silver Spring, MD.

Hudson River Natural Resource Trustees. 2002b. Analytical Quality Assurance Plan, Hudson River Natural Resource Damage Assessment, July 9, 2002, Version 1.0. U.S. Department of Commerce, Silver Spring, MD.

Hunter, M.L., Jr., A.J.K. Calhoun, and M. McCollough. 1999. Maine Amphibians and Reptiles. The University of Maine Press. Orono, ME.

Nieuwkoop, P.D. and J. Faber. 1994. *Normal Table of Xenopus laevis (Daudin).* Garland Publishing Inc., New York, NY.

Nussbaum, R.A., Brodie, E.D. Jr. and R.M. Storm. 1983. *Amphibians and Reptiles of the Pacific Northwest*. University Press of Idaho, Moscow, Idaho.

S E A Consultants, Inc. 2002. Hudson River Natural Resources Damage Assessment, Floodplain Soil and Biota Screening Sampling Report. S E A Consultants, Inc., Cambridge, Mass. Report Prepared for Industrial Economics, Inc. S E A Project No. 2000416.01-A.

TAMS Consultants, Inc. and Menzie-Cura & Associates, Inc. 2000. Volume 2E – Revised Baseline Ecological Risk Assessment, Hudson River PCBs Reassessment. Report prepared for U.S. Environmental Protection Agency, Region 2 and U.S. Army Corps of Engineers, Kansas City District. 267 pp.

USEPA (U.S. Environmental Protection Agency). 1999. USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review. Office of Emergency and Remedial Response, Washington, D.C. 20460. EPA540/R-99/008, 118 pp.

USEPA (U.S. Environmental Protection Agency). 2003. Sediment Sampling Program 2002 Data Collection. Fact sheet provided online by the USEPA at: http://www.epa.gov/hudson/sed_sampling_fs10_03.pdf.

APPENDIX 1

Chorusing Survey SOP
And Data Sheet

Chorusing Survey

Standard Operating Procedure

Introduction

This standard operating procedure (SOP) has been developed as part of the Hudson River natural resource damage Trustees' data collection effort for the spring of 2004 for the preliminary investigation of amphibian breeding habitat and screening of breeding pool sediments for polychlorinated biphenyl contamination. The Work Plan for that preliminary investigation contains details on issues such as site selection, quality assurance and control, and other topics of broad relevance to this field effort. This SOP focuses on the mechanics to be followed with respect to habitat characterization and chorusing surveys. This SOP is based on SOPs developed for similar activities elsewhere (*e.g.*, Kendell 2002, Coeur d'Alene 1995).

Chorusing Survey

The frog species of primary interest are the northern leopard frog (*Rana pipiens*) and the wood frog (*Rana sylvatica*). Other species to be noted are the bullfrog (*Rana catesbeiana*), the green frog (*Rana clamitans*) and the American toad (*Bufo americanus).* These species occur in shallow emergent marsh habitat found adjacent to open water in the littoral zone of the river. Vegetation in these areas is overtopped during high flow events, which provides an opportunity for potentially contaminated sediment to settle out and become substrate. All four species of frogs use these areas for breeding and would be expected to be found breeding in the Upper Hudson River between Late March and July, depending on the species.

Chorusing adults are indicative of breeding activity. Northern leopard frogs usually mate at night when territorial males can be heard calling from groups in shallow water. Wood frogs breed soon after emergence with most eggs being laid in the course of about a week immediately following ice-out in fishless bodies of water or vernal pools. Green frogs and bullfrogs also call more frequently at night, usually from a territory. Each frog has several different calls, which are used to attract females, defend a territory, or to distract a predator.

Courtship activity and breeding behavior of early season-breeding amphibians will be monitored as soon as frog populations begin breeding. Audio surveys will be conducted on a daily basis from late afternoon and into the night. During peak breeding activities, surveys may also be conducted during the day. Daytime surveys will be conducted to confirm suspected breeding pools which were initially located at night. Such confirmation will be accomplished through identification of egg masses and sightings of adult frogs. Salamanders and their egg masses will also be noted. These surveys will be conducted throughout the entire study area. Effort will focus more on habitats that are closely tied to the river (i.e., emergent fringes of backwaters and stream mouths or basins with permanent culvert connections or seasonal high water connections).

To conduct the surveys, observers will quietly access a pond or pool and listen for male frogs and toads to begin vocalizing. Five to fifteen minutes will be spent at each site, depending on the size and complexity of the site. Calling rates will be classified for each species heard as: 1) none heard, 2) calls of individuals are not overlapping and individuals can be counted, 3) calls of individuals overlap but are distinguishable, and 4) full chorus with continuous and overlapping calls. If calls can be counted, the number of calls per minute will be determined for each species

Data will be recorded on a Chorusing Survey Data Sheet. Information recorded will include but is not limited to:

1. Date and time;
2. Site number and description;
3. GPS location;
4. Air temperature (°C) , taken approximately 1 meter above ground;
5. Water temperature (°C), taken a few inches below the surface in an area that is or that may be frequented by amphibians;
6. Cloud cover (clear, 0%, 25%, 50%, 75%, 100%);
7. Precipitation (none, light, moderate, heavy);
8. Wind (calm, light, strong);
9. Water flow (none, slow, moderate, fast);
10. Approximate water depth where the adult frogs are observed (may be a range);
11. Aquatic vegetation (none, sparse, moderate, dense); and species, if known.
12. Primary aquatic substrate (silt/mud, sand/gravel, cobble, bedrock, other);
13. Shoreline vegetation (describe type(s), density);
14. Opportunistic visual observations of amphibians;
15. Brief directions to site (optional);
16. Any other comments (special site features, evidence of human impacts to the site, logistical or other difficulties that may impact the site's usability in future studies, anecdotal observations, etc.).
17. Date and time of return visit to confirm breeding activity (through identification of egg masses and sightings of adult frogs).

Materials and Equipment

- GPS unit
- Chorusing Survey Datasheets
- Writing instruments with waterproof ink
- Bulb-based or other thermometer calibrated in °C suitable for air temperature measurements
- Bulb-based or other thermometer calibrated in °C suitable for water temperature measurements
- Camera with film (or a digital camera) with extra batteries
- Binoculars

References

Coeur d'Alene Natural Resource Damage Assessment Standard Operating Procedure. Revised May 3, 1995.

Kendell, K. 2002. Survey protocol for the northern leopard frog. Alberta Sustainable Resource Development, Fish and Wildlife Division, Alberta Species at Risk Report No. 43, Edmonton, AB. 30 pp.

Chorusing Survey Data Sheet

Site Number / Description:

_____

_____

UTM East: _____ **UTM North**: _____

Note: If GPS location cannot be provided at time of collection, other sufficient identifying information for location shall be provided in "Other Notes" section below to allow GPS coordinates to be subsequently obtained, if possible.

Film Roll #: _____ **Frame #s**: _____

Name of Field Crew Leader (print): _____

Name of Field Data Recorder (print): _____

Date: _____ - _____ - _____ **Time**: Start: _____ End: _____
Month Day Year

Return Date: _____ - _____ - _____ **Return Time**: Start: _____ End: _____
Month Day Year

Notes on Return Visit to Confirm Breeding _____

_____

_____

Air Temperature (°C): _____ Water Temperature (°C): _____
(taken 1 meter above ground) (taken a few inches below surface)

Additional Site Conditions (circle one):

Major (and surrounding) land uses:						
Cloud Cover:	clear	0%	25%	50%	75%	100%
Precipitation:	none	light	moderate	heavy		
Wind:	calm	light	strong			
Water Flow:	none	slow	moderate	fast		
Water Depth (cm):						
Aquatic Vegetation:	none	sparse	moderate	dense		
Notes:						
Primary Aquatic Substrate:	silt/mud	sand/gravel	cobble	bedrock	other (specify)	
Shoreline Vegetation:	none	sparse	moderate	dense		
Notes (*e.g.*, dominant species, etc.):						

Chorusing and Visual Observations of Amphibians:

Calling (circle one):

Wood frog	none	individual	several	full chorus	Calls per minute_____
N. leopard frog	none	individual	several	full chorus	Calls per minute_____
Green frog	none	individual	several	full chorus	Calls per minute_____
Bullfrog	none	individual	several	full chorus	Calls per minute_____
American toad	none	individual	several	full chorus	Calls per minute_____

Other:
_____

Visual observations:

Species	**Number observed**	**Number of egg masses observed**	**Habitat Type(s) Observed In (and other comments)**
Wood frog			
N. leopard frog			
Green frog			
Bullfrog			
American toad			

Directions to site (optional):

Other Notes:

Initials/Date of Field Data Recorder: _____

Initials/Date of Field Crew Leader: _____

Initials/Date of Review of Data Sheet by Investigation Lead: _____

APPENDIX 2

Sediment Collection SOP
And Data Sheet

Sediment Collection

Standard Operating Procedure

Introduction

This Standard Operating Procedure (SOP) was initially developed as part of the Hudson River natural resource damage Trustees' data collection effort focused on bullfrog tadpoles and near-shore sediments in the summer of 2003, and has been adapted for the Spring 2004 preliminary investigation of amphibian breeding habitat and screening of breeding pool sediments for polychlorinated biphenyl contamination. The Work Plan for that preliminary investigation contains details on issues such as site selection, quality assurance and control, and other topics of broad relevance to this field effort. This SOP focuses on the mechanics to be followed with respect to sediment collection and compositing, and storage, labeling and shipping of samples for chemical analysis. This SOP is based on SOPs developed for similar sediment collection activities elsewhere (*e.g.*, EPA (1994a and 1994b), EPA (2001), Coeur d' Alene (1995), PTI Environmental Services (1995), Radtke (1997), and Portland Harbor Sediment Management Plan (1999).

Collection and Compositing

To avoid disturbing the sediments prior to collection, at each site, sediments will be collected prior to any in-water activities (e.g. checking water temperature or depth). For purposes of this SOP, a sampling site is defined as an area of contiguous habitat with similar structural characteristics not more than 100 meters in diameter. In practice, the Field Crew Leader will define the specific area that constitutes a single site for sampling purposes.

A composite of approximately 500 g of sediments will be collected from each site. The composite will consist of 25 samples of approximately 10 ml each, taken from 25 separate locations within each defined site.

Sediment samples from a specific site will be collected using an interval approach and will be collected from nearshore locations that are at least five feet apart, in an area that spans the frog's breeding pool site. A rope, marked in 1- and 5-foot intervals, will be used to help delineate the sampling area. To the degree that a site is too small for 25 samples to be collected at 5-foot intervals, smaller, regular intervals will be used at the discretion of the Field Crew Leader. The approximate sampling interval used will be recorded on the Sediment Collection Data Sheet. Overall, when collecting samples, care will be taken to maintain the integrity of the site and minimize disturbance of sediments during the site evaluation and collecting process.

Following the guidance of EPA (1994b), the following procedure will be used to collect sediment using an Ekman dredge:

1. Before walking through the sample site, identify the approximate areas for sediment collection. Space them out, as described above, to sample the entire breeding pool area. Identify the route of access to each sample point and avoid or minimize sediment disruption from trampling between sample points.

2. Using an Eckman dredge, collect a sediment grab.

3. Using a fresh, chemically-clean aluminum or stainless steel spoon (or scoop or trowel), carefully remove approximately 10 ml of sediment from the dredge, removing sediment to a depth of up to 3 cm within the dredge. Avoid collecting any sediment in direct contact with the surfaces of the dredge. Take care as much as possible not to include any vegetation, roots, rocks (>0.5 cm) in the sediment sample collected from the dredge.

4. Transfer the sample into a pre-labeled, 32-ounce or larger chemically clean glass jar with a Teflon lid. Fill out the relevant portions of the Sediment Collection Data Sheet.

5. Move to the next subsite and repeat the process until a total of twenty-five sediment samples have been collected in the jar.

Approximately equal portions of about 10 ml of sediment from each of 25 subsites will be deposited into a chemically-clean glass jar with a Teflon-lined cap, leaving at least a 1/3 of the jar empty to allow for expansion if the sample is frozen. Excess water will be carefully decanted.

A fresh, chemically-clean aluminum or stainless steel spoon, scoop, or trowel (wrapped in aluminum foil after cleaning) will be used for each site.

Prior to sampling at a new site, the dredge will be well-rinsed in site water at a point somewhat removed from the anticipated specific sampling location. Care will be taken to ensure that no visible sediment, particulates, vegetation or biota from prior sites remains on the dredge when it is used at the new site.

Storage, Labeling and Shipping

Self-adhesive labels will be attached to the composite containers. When a composite is put into a container as described above, the container's label will be marked with the following information: Hudson River, sediment composite number, sampling date, and the investigator's initials. Sediment composite numbers will have the following format:

04SED-001

"04" denotes the sample was collected in 2004. "SED" stands for sediment. The set of three digits refers to the unique site number from which the sediments were collected.

After putting the composite into the labeled container, each container will be wrapped in protective material (*e.g.*, bubble wrap) and placed in a plastic bag. Bags will be placed into a cooler containing blue ice, where they will be kept until removed to another facility (*e.g.*, the Hale Creek lab facility) at the end of the collection day. Sediment samples will be kept at -20°C until transferred to the analytical laboratory.

For purposes of shipping, the bags containing the sample containers should be placed into an ice chest or cooler. Blue ice should also be placed in the cooler in sufficient quantities to ensure that the samples are kept cold until arrival at the laboratory.

Nylon-reinforced or 2-inch wide clear tape will be wrapped completely across the lid, sides and bottom of each cooler in at least two places to prevent accidental opening of the container. An overnight courier service may be used to ship containers to the chemical analysis lab. Alternately, the samples may be hand-delivered to the laboratory. Strict Chain of Custody procedures will be followed, as described in Section 3.3.2 of the Work Plan. Upon arrival at the lab, the samples will be maintained at -20°C until thawed for chemical analysis.

Materials and Equipment

FIELD COLLECTIONS

- GPS unit
- Chemically-clean aluminum or stainless steel spoons, scoops or trowels, wrapped in aluminum foil
- Chemically-clean, wide-mouth 32-ounce (or larger) glass jars with Teflon-coated lids and with self-adhesive labels attached
- Rope, marked off in 1- and 5-foot intervals
- Bubble wrap or other protective packing material
- Plastic bags for storing sampling containers protected with bubble-wrap
- Labeled coolers containing blue ice
- Chain of Custody forms
- Sediment Collection Datasheets in ring binder (write-in-the-rain paper)
- Writing instruments with waterproof ink
- Nitrile gloves

SHIPPING

- Blue ice
- Coolers
- Nylon-reinforced or 2-inch wide clear tape
- Chain of Custody forms

References

Coeur d'Alene Natural Resource Damage Assessment Standard Operating Procedure. Revised May 3, 1995.

PTI Environmental Services. 1995. Sediment Sampling and Analysis Plan Appendix: Guidance on the Development of Sediment Sampling and Analysis Plan Meeting the Requirements of the Sediment Management Standards - Chapter 173-204 WAC. Draft. Prepared for the Washington State Department of Ecology.

Portland Harbor Sediment Management Plan. 1999. Appendix G: Sediment Assessment Methodology.

Radtke, D.B. 1997. National field manual for the collection of water-quality data: U.S. Geological Survey Techniques of Water-Resources Investigations, Book 9, Chapter A8, accessed 7/8/03 at http://water.usgs.gov/owq/FieldManual/.

U.S. Environmental Protection Agency (EPA). 1994a. Sampling Equipment Decontamination. SOP #2006, Rev. #0.0. August 11, 1994.

U.S. Environmental Protection Agency (EPA). 1994b. Sediment Sampling. SOP #2016, Rev. #0.0. November 17, 1994.

U.S. Environmental Protection Agency (EPA). 2001. Methods for Collection, Storage and Manipulation of Sediments for Chemical and Toxicological Analyses: Technical Manual. EPA-823-B-01-002. October.

Sediment Collection Data Sheet

Site Number / Description:

_____
_____
_____
_____
_____

UTM East: _____ **UTM North**: _____

Note: If GPS location cannot be provided at time of collection, other sufficient identifying information for location shall be provided in "Other Notes" section below to allow GPS coordinates to be subsequently obtained, if possible.

Sampling Interval: _____

Sediment observations:

Sub-sample No.	Approximate depth of loose, flocculent, detrital material overlying sediments	Sediment color, texture, consistency
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		
16		

Sub-sample No.	Approximate depth of loose, flocculent, detrital material overlying sediments	Sediment color, texture, consistency
17		
18		
19		
20		
21		
22		
23		
24		
25		
Other Notes:		

Name of Field Crew Leader (print): _____

Name of Field Data Recorder (print): _____

Date of Collection: _____ - _____ - _____ **Time of Collection**: _____
Month Day Year

Initials/Date of Field Data Recorder: _____

Initials/Date of Field Crew Leader: _____

Initials/Date of Review of Data Sheet by Investigation Lead: _____

APPENDIX 3

Chain of Custody Form

CHAIN OF CUSTODY RECORD

Fed Ex # _____

Package # _____

Project Name: Amphibian Breeding Habitat and Screening of Breeding Pool Sediments for PCB Contamination – Preliminary Investigation	Project #: Hudson River NRDA	Container Type (e.g., padded sample carrier, cooler, etc.):

Sampler(s): Printed Name and Signature

Sample ID	Date Collected	Time Collected	Location	Jar size	Remarks

Special Instructions/Comments:

Signature	Print Name	Company/Title	Date	Time
Relinquished by:				
Received by:				
Relinquished by:				
Received by:				
Relinquished by:				
Received by:				

Appendix B

Modification #1 to Work Plan for the Preliminary Investigation of Amphibian Breeding Habitat and Screening Pool Sediments for Polychlorinated Biphenyl Contamination

MODIFICATION #1

TO

WORK PLAN FOR THE PRELIMINARY INVESTIGATION OF

AMPHIBIAN BREEDING HABITAT AND SCREENING OF BREEDING POOL SEDIMENTS FOR POLYCHLORINATED BIPHENYL CONTAMINATION

HUDSON RIVER, NEW YORK

FINAL

April 30, 2004

Hudson River Natural Resource Damage Assessment

_____

Investigation Lead

_____

Quality Assurance Coordinator

Introduction

This document addresses a modification to the work specified in the "Work Plan for the Preliminary Investigation of Amphibian Breeding Habitat and Screening of Breeding Pool Sediments for Polychlorinated Biphenyl Contamination, Hudson River." This modification (#1) pertains to the Standard Operating Procedure for Sediment Collection.

Standard Operating Procedure for Sediment Collection

Appendix 2 to the Work Plan contains the Standard Operating Procedure (SOP) for Sediment Collection. That SOP specifies the use of an Ekman dredge to collect all the sediment samples.

Based on the Principal Investigator's initial field experience collecting sediments for this investigation with an Ekman dredge, it was determined that, particularly in shallow water, use of a polycarbonate tube to collect sediment samples would better retain surficial organic matter (such as leaf litter) and ensure that sample integrity was maintained. For that reason, such a tube, of varying length (dependent on water depth) and 2 inches in diameter will be used to collect sediment cores in shallow waters. The tube will be pushed, by hand, into the sediment; the tube will be capped, then removed. The water overlying the sediment will be decanted, then the sediment extruded using a plunger device. A core measuring about 6 cm long from the top of the leaf litter down, will be collected and placed into a stainless steel bowl for subsequent compositing with other similar cores. Large (> 5mm in diameter) non-organic debris, such as rocks, and large organic (>5 mm in diameter) debris, such as sticks (leaves, small twigs will not be removed), will be manually removed from the sample.

The Work Plan also specified that a composite of approximately 500 g of sediment would be collected from each site, with the composite consisting of 25 samples of approximately 10 ml each, taken from 25 separate locations within each defined site. To gain insights into the potential contribution of the layer of leaf litter and other fine organic matter atop the sediment into a sample's PCB level, it was determined that it would be appropriate, at two sites, to collect three types of samples, as follows:

- Composites of leaf litter and other fine organic matter atop the sediment only (no soil to be included);
- Composite of soil only (no leaf litter or other fine organic matter to be included); and,
- Composites of soil with leaf litter and other fine organic matter atop the sediment.

For each of these three types of samples, 8 sub-samples (individual cores) will taken and composited, with each composite analyzed individually.

Prior to sampling at a new site, the tube will be well-rinsed in site water at a point somewhat removed from the anticipated specific sampling location. Care will be taken to ensure that no visible sediment, particulates, vegetation or biota from prior sites remains on the tube when it is used at the new site.

Appendix C

Data Quality Assessment Report, Hudson River Natural Resource Damage Assessment, Floodplain Study, Frog Pond Sediments

DATA QUALITY ASSESSMENT REPORT

HUDSON RIVER NATURAL RESOURCE DAMAGE ASSESSMENT

FLOODPLAIN STUDY
Frog Pond Sediments

Prepared for:

State of New York
Department of Environmental Conservation

U.S. Department of Commerce
National Oceanic and Atmospheric Administration

U.S. Department of Interior
Fish and Wildlife Service

June 24, 2005

Version 1.0

TABLE OF CONTENTS

1.0 INTRODUCTION 1

2.0 DATA VALIDATION PROCEDURES 1

3.0 DATA QUALITY ASSESSMENT 3

3.1 Instrument Calibration 3
3.1.1 Initial Calibration (ICAL) 3
3.1.2 Continuing Calibration (CCAL) 3

3.2 GC/MS Tune 3

3.3 Blank Analyses 3

3.4 Accuracy 4
3.4.1 Surrogate Compounds 4
3.4.2 Standard Reference Material Analyses 4
3.4.3 Laboratory Control Samples 4
3.4.4 Matrix Spike Samples 5
3.4.5 Internal Standards 5

3.5 Precision 5
3.5.1 Laboratory Duplicate Samples 5

3.6 Reporting Limits and Sample Results 6

3.7 Completeness 6

3.8 Summary of Data Usability 6

Table 1: Summary of Standard Reference Material Results - Frog Pond Sediments

Table 2: Laboratory Duplicate Relative Percent Difference Summary - Frog Pond Sediments

ATTACHMENT A Data Validation Reports by Sample Delivery Group ……. A - 1

DATA QUALITY ASSESSMENT
Hudson River Natural Resource Damage Assessment
Frog Pond Sediments

1.0 INTRODUCTION

This report documents the results of a quality assurance review of data from frog pond sediment samples collected in support of the Hudson River Natural Resource Damage Assessment. All samples were analyzed for PCB congeners, PCB homologue groups, and total PCBs. The sediment samples were also analyzed for percent moisture, total organic carbon, and grain size.

A total of 13 sediment composites were collected, one from each site. The sites were sampled along a transect across the site, with sub-samples taken at intervals ranging from 1.5 to 5 feet. The sub-samples were composited into one sample per site, and submitted for analysis. The sediment composites were in a single analytical batch (laboratory batch number 0410065).

The samples were prepped, extracted, and analyzed by the Woods Hole Group Environmental Laboratories (Raynham, Massachusetts) using laboratory Standard Operating Procedures (SOPs) that were submitted and reviewed prior to sample receipt.

2.0 DATA VALIDATION PROCEDURES

Data validation was based on the quality assurance/quality control (QA/QC) criteria documented in the *Analytical Quality Assurance Plan for the Hudson River Natural Resource Damage Assessment*, Version 1.0, July 9, 2002, and USEPA *National Functional Guidelines for Organic Data Review*, 1999, and the following laboratory SOPs:

- SOP # OP-004: Extraction of Soil, Tissue, Vegetation, and Sediment by Pressurized Fluid Extraction, Revision #2.0, 8/15/02
- SOP # O-010: Determination of PCB Homologues and Individual Congeners by GC/MS - SIM, Revision # 2.2, 10/24/02
- SOP # HR NRDA % Lipids: Percent Lipids Determination, Revision # 0.0, 9/9/02
- SOP # W-001: Percent Solids Determination, Revision # 2.1, 9/25/02
- SOP # W-028: Total Organic Carbon in Soil, Sediment and Water, Revision # 2.0, 1/22/03
- SOP # W-029: Particle Size Analysis of Soils - with and without Hydrometer, and Liquid Limit, Plastic Limit and Plasticity Index, Draft, 1/16/04
- Additional cleanup, sample handling, storage, custody SOPs as necessary.

Sample results and related QC data were received in both an electronic and hard copy format. Electronic data were verified against the hard copy data package. The sediment data package received full validation, which includes the following QC elements:

- Analytical holding times
- Chain of custody and sample handling
- GC/MS tune verification (from summary forms)
- Method blank contamination (from summary forms)
- Initial and continuing calibration (from summary forms)
- Rinsate blank contamination (from sample result summaries)
- Analytical accuracy: surrogates, matrix spike samples, laboratory control samples, and standard reference material results (from summary forms)
- Analytical precision: laboratory duplicate samples (from summary forms)
- Internal standard areas (from summary forms)
- Reported detection limits (from sample result summaries)
- Compound identification (from raw data)
- Compound quantitation, transcription, and calculation checks performed at a frequency of 10% from raw data. If an error was noted, 100% of the calculations and transcriptions for that data set were verified.

This report summarizes the results of data validation relative to the analytical data quality objectives (ADQO) for precision, accuracy, and completeness. The report also provides a quantitative and qualitative assessment of the data and identifies potential sources of error, uncertainty, and bias that may affect the overall usability.

Laboratory QC samples were used to assess the effectiveness of homogenization procedures and to evaluate laboratory-derived contamination, laboratory performance, and sample matrix effects. Quality control samples included: method blanks, laboratory control samples (LCS), matrix spike (MS) samples, laboratory duplicate samples, and standard reference material (SRM) analyses. Surrogates were added to each sample analyzed for PCB congeners to further assess the effects of sample matrix on accuracy.

Data were qualified when associated QC sample results were outside the QC limits. The following definitions provide brief explanations of the qualifiers assigned to results in the data validation process:

J **Estimated**: The associated numerical value is an estimated quantity. The analyte was detected, but the reported value may not be accurate or precise. The "J" qualification indicates the data fell outside the QC limits, but the exceedance was not sufficient to cause rejection of the data.

U **Not detected**: An analysis was performed for the compound or analyte, but it was not detected at a concentration significantly greater than the concentration in the associated laboratory blank. The associated numerical result should be considered the detection limit.

NJ **Tentatively Identified/Estimated**: The analyte was tentatively identified and the associated numerical value is an estimated quantity.

3.0 DATA QUALITY ASSESSMENT

The data package submitted by the laboratory was reviewed to determine whether the ADQO specified in Tables 6.1a - 6.1c in the *Analytical Quality Assurance Plan* were met. Each quality control element is discussed briefly below. More details are available in the individual data validation reports presented in **Attachment A**.

3.1 Instrument Calibration

3.1.1 Initial Calibration (ICAL)

The ADQO specification for the ICAL is that a minimum of a five point calibration would be performed for all analytes, and that the percent relative standard deviation (%RSD) values for all analytes are less than 20%.

All submitted ICAL data met the specified ADQO.

3.1.2 Continuing Calibration (CCAL)

The ADQO specified for the continuing (or daily) calibrations is that a CCAL must be analyzed at the beginning and end of each analytical sequence (or every 12 hours, whichever is more frequent), and that all percent difference (%D) values must be less than 20%. Up to three %D values can be greater than 20%, provided that all %D values are less than 30%.

All CCAL met the specified ADQO requirements.

3.2 GC/MS Tune

GC/MS instrument tuning verifications were performed at the proper frequency, prior to each analytical sequence. All GC/MS tunes met the acceptance criteria specified in the laboratory standard operating procedures.

3.3 Blank Analyses

Positive values for PCB31/28 and the trichlorobiphenyl homologue group were reported in the method blank. Action levels of five times the blank levels were established and the sample values were compared to these action levels. The trichlorobiphenyl homologue group concentrations were

greater than the action level in all samples; no data were qualified. Positive values for PCB31/28 were qualified as not detected (U) in Samples 04-SED-002, 04-SED-006, and 04-SED-012. Three results (0.4% of the sediment results) were qualified as not detected based on blank contamination.

3.4 Accuracy

Accuracy is evaluated by comparison of an analytical concentration to a known (true) value. Accuracy was monitored through the use of surrogate compounds in each sample and SRM, MS, and laboratory control sample (blank spike) analyses. Each QC element is discussed below. Overall, accuracy was acceptable.

3.4.1 Surrogate Compounds

Two surrogate compounds, ^{13}C-BZ#19 and ^{13}C-BZ#202, were added to each sample prior to extraction.

The ADQO specified for surrogate compounds is that all percent recovery (%R) values would be within the 50% - 125% acceptance window. The recovery value from the late eluting surrogate (^{13}C-BZ#202) is used for the quantitation of the reported target analyte concentrations.

All of the surrogate %R values were within the 50% - 125% control limits.

3.4.2 Standard Reference Material Analyses

An SRM was extracted and analyzed with each analytical batch. The SRM selected for the sediment analyses was 1944 - New York/New Jersey Waterway Sediment. This SRM has certified values for 28 of the target PCB congeners. One SRM analysis was submitted, for a total of 28 data points.

The ADQO for the SRM is that the reported value must be within ±20% of the 95% confidence interval of the true value, for analytes with values greater than five times the method detection limit (MDL). This ADQO was used by the laboratory to evaluate the reported results. However, during data validation, no data were qualified unless the reported value was greater than ±25% of the 95% confidence interval.

Overall, the SRM accuracy results were acceptable. One SRM result (3.6% of the total) was greater than the upper control limit (125% of the 95% confidence interval for an individual congener). The outlier was for the following congener: PCB52. The positive results associated with the SRM outlier were estimated (J) to indicate a potential high bias. Twelve results (1.4% of the sediment results) were estimated based on SRM outliers.

Table 1 summarizes the SRM results for this study.

3.4.3 Laboratory Control Samples

The laboratory performed LCS analyses at the required frequency of one for every 15 samples or analytical batch, whichever was more frequent. The ADQO for the LCS analyses is that all %R values must be within the acceptance limits of 75% to 125%.

All of the LCS %R values were within the 75% - 125% control limits.

3.4.4 Matrix Spike Samples

For the sediments, the laboratory analyzed an MS sample. The MS sample included 47 spiked analytes. The ADQO for MS analyses is that all %R values should be within the 50% to 125% control limits. The ADQO does not apply if the concentration in the parent sample is greater than five times the concentration in the spiking solution.

A potential high bias was indicated by 16 of the MS %R values, as the %R values were greater than 125%, ranging from 133% to 220%. These compounds were estimated (J) in the parent sample (Sample 04-SED-010). Sixteen results (1.9% of the sediment results) were estimated (J) based on the MS %R outliers.

3.4.5 Internal Standards

Internal standards were added to each field and QC sample prior to injection onto the analytical instrument. The ADQO for internal standards is that the area of the internal standards in each analysis must be within ±50% of the area of the internal standard in the associated CCAL.

All internal standard areas met the ADQO.

3.5 Precision

Precision is evaluated through replicate analyses of a sample. For this study, a laboratory duplicate sample was analyzed with each batch. Overall, precision was judged as acceptable.

3.5.1 Laboratory Duplicate Samples

For samples with positive results greater than or equal to five times the method detection limit (MDL), the AQDO specified relative percent difference (RPD) control limit for laboratory duplicates is 30%. One laboratory duplicate was submitted.

Table 2 summarizes the results of the laboratory duplicate analyses. For the PCB congeners and homologue groups, a total of 12 RPD values (out of 57 possible) were greater than 30%. For the TOC and percent moisture analyses, the RPD control limit is 15%. Precision was acceptable for TOC and percent moisture.

Target analytes associated with RPD outliers were estimated (J) in the parent sample. A total of 12 data points (1.4% of the sediment results) were estimated based on precision outliers.

3.6 Reporting Limits and Sample Results

Method detection limits (MDLs) were determined following procedures outlined in the *US Code of Federal Regulations* (40 CFR Part 136, Appendix B). The detection limits for target congeners were

generally in the range of 0.0114 µg/Kg to 0.22 µg/Kg, with a co-elution of PCB31/28 at 1.38 g/Kg. There were 14 target congeners with MDL values greater than the 0.1 µg/Kg target MDL. The PCB31/28 co-elution MDL value was elevated due to interferences which could not be resolved using the selected method.

The separation and spectral fit for any positive result for the coplanar congeners (PCB77, PCB81, PCB126, and PCB169) were evaluated. PCB77 was the only coplanar congener detected in these samples. PCB110 was found to interfere with PCB77.

For PCB77, the spectral match met general identification criteria, so the laboratory correctly reported the results as positive results. However, due to the interference, the results may be false positives or may be biased high. The potential interferences cannot be resolved without further extract cleanup (e.g., carbon column cleanup). Thus, all positive results for PCB77 were qualified as tentatively identified at an estimated concentration (NJ). PCB congener PCB77 was reported as detected in all sediment samples except 04-SED-003 and 04-SED-006, and the results were qualified NJ. A total of 11 results for PCB77 (1.3% of all sediment results) were qualified.

Chromatography and mass spectral identification were reviewed for a minimum of 10% of the other reported congeners. No other instances of potential interference were noted. All reported positive results met the identification criteria and chromatographic peak shapes were acceptable. All other reported results were judged to be accurate unless qualified for some other reason.

3.7 Completeness

Out of 832 results reported by the laboratory [13 sediment samples each with 47 congeners, 10 homologue groups, and total PCBs; percent moisture, grain size (four fractions), and total organic carbon], a total of 48 (5.8%) data points were estimated (J or NJ). Three data points were qualified as not detected (U). No data were rejected. The completeness level attained for the analysis of the field samples is 100%.

3.8 Summary of Data Usability

A total of 48 out of 832 results were estimated because laboratory quality control results were outside the ADQO. In general, the overall quality of the data is acceptable and the results, as qualified, are considered usable.

TABLE 1

Summary of Standard Reference Material Results

SDG 0410065

STANDARD REFERENCE MATERIAL 1944 - New York/New Jersey Waterway Sediment

Concentrations are ng/g, dry weight

PCB Congener	Result ng/g	True Value ng/g	Uncertainty (+/-)	± 25% Limits ng/g	
				From	To
PCB8	24.9	22.3	2.3	14.4	30.2
PCB18	65.1	51.0	2.6	35.7	66.4
PCB28/31	196	160	4.3	115	204
PCB44	47.9	60.2	2.0	43.2	77.3
PCB49	66.5	53.0	1.7	38.1	68.0
PCB52	108	79.4	2.0	57.6	101
PCB66	79.8	71.9	4.3	49.6	94.2
PCB87	23.3	29.9	4.3	18.1	41.7
PCB95	52.2	65.0	8.9	39.9	90.2
PCB99	32.9	37.5	2.4	25.7	49.3
PCB101	69.6	73.4	2.5	52.6	94.3
PCB105	25.5	24.5	1.1	17.3	31.7
PCB110	71.6	63.5	4.7	42.9	84.1
PCB118	59.0	58.0	4.3	39.2	76.8
PCB128	9.35	8.47	0.28	6.07	10.9
PCB138	74.6	62.1	3.0	43.6	80.6
PCB149	56.1	49.7	1.2	36.1	63.3
PCB151	16.9	16.9	0.36	12.3	21.5
PCB153	63.6	74.0	2.9	52.6	95.4
PCB156	7.84	6.52	0.66	4.23	8.81
PCB170	22.0	22.6	1.4	15.6	29.7
PCB180	46.0	44.3	1.2	32.0	56.6
PCB183	15.0	12.2	0.57	8.57	15.8
PCB187	27.4	25.1	1.0	17.8	32.4
PCB194	10.8	11.2	1.4	7.00	15.4
PCB195	3.30	3.75	0.39	2.42	5.08
PCB206	8.66	9.21	0.51	6.40	12.0
PCB209	7.03	6.81	0.33	4.78	8.84

SDG = Sample Delivery Group, also called analytical batch.

Shaded values are outside the acceptance criteria

TABLE 2
Laboratory Duplicate Relative Percent Difference Summary
SDG 0410065

PCB Congener	Sample 04-SED-010
PCB 8	34
PCB 18	26
PCB 31/28	29
PCB 44	26
PCB 45	25
PCB 47	28
PCB 49	28
PCB 52	28
PCB 56	80
PCB 66	29
PCB 70	29
PCB 74	27
PCB 77	33
PCB 87	31
PCB 95	26
PCB 99	27
PCB 101	28
PCB 105	30
PCB 110	31
PCB 118	30
PCB 128	16
PCB 138	30
PCB 146	19
PCB 149	27
PCB 151	26
PCB 153	26
PCB 156	27
PCB 157	32
PCB 158	21
PCB 167	5
PCB 174	33
PCB 177	23
PCB 180	33
PCB 183	17
PCB 187	25
PCB 194	200*
PCB 209	10
Dichlorobiphenyls	37
Trichlorobiphenyls	35
Tetrachlorobiphenyls	42
Pentachlorobiphenyls	34
Hexachlorobiphenyls	24
Heptachlorobiphenyls	25
Nonachlorobiphenyls	21
Octachlorobiphenyls	200*
Decachlorobiphenyl	10

SDG = Sample Delivery Group
Note: RPD outliers are presented in **bold**. The RPD control limit for PCBs is 30%
* Value is less than 5x the MDL - RPD limit does not apply

ATTACHMENT A

Data Validation Reports by Sample Data Group (SDG)

DATA VALIDATION REPORT - FULL REVIEW
Hudson River
Polychlorinated Biphenyl Congeners, Total Organic Carbon, Grain Size, and Total Solids
SDG: 0410065
Woods Hole Group

This report documents the review of analytical data from the analysis of sediment samples and the associated laboratory quality control samples. Samples were analyzed by Woods Hole Group Environmental Laboratories, Raynham, Massachusetts. The following table lists the samples reviewed.

Field ID	Laboratory ID
04-SED-001	0410065-01
04-SED-002	0410065-02
04-SED-003	0410065-03
04-SED-004	0410065-04
04-SED-005	0410065-05
04-SED-006	0410065-06
04-SED-007	0410065-07

Field ID	Laboratory ID
04-SED-008	0410065-08
04-SED-009	0410065-09
04-SED-010	0410065-10
04-SED-011	0410065-11
04-SED-012	0410065-12
04-SED-013	0410065-13

I. DATA PACKAGE COMPLETENESS

All required deliverables were submitted by the laboratory, with the exceptions noted below. The laboratory followed adequate corrective action processes, and all anomalies were discussed in the case narrative.

The raw data for the total solids analysis and the quality control (QC) summaries for the total organic carbon (TOC) were not submitted. The laboratory was contacted and the data were submitted 1/20/05. No further action was necessary.

II. TECHNICAL DATA VALIDATION

The QC requirements that were reviewed are listed below.

	GC/MS Instrument Performance Check	2	Standard Reference Material (SRM)
	Initial Calibration (ICAL)	2	Laboratory Duplicate
	Continuing Calibration (CCAL)		Internal Standards
2	Blanks	2	Compound Identification
	Surrogate Compounds	1	Calculation Verification
2	Matrix Spike (MS)	1	Reporting Limits and Sample Results
	Laboratory Control Samples (LCS)		EDD Transcription Check

[1] ***Quality control results are discussed below, but no data were qualified.***
[2] ***Quality control outliers that impact the reported data were noted. Data qualifiers were issued as discussed below.***

Blanks

Positive values for PCB31/28 and the trichlorobiphenyl homologue group were reported in the method blank. Action levels of five times the blank levels were established and the sample values were compared to these action levels. The trichlorobiphenyl homologue group concentrations were greater than the action level in all samples; no data were qualified. Positive values for PCB31/28 were qualified as not detected (U-7) in Samples 04-SED-002, 04-SED-006, and 04-SED-012.

Matrix Spike (MS)

Matrix spike analysis was performed using Sample 04-SED-010. The recovery values for 16 analytes were greater than the upper control limit of 125%. The values for these analytes were estimated (J-8) in the parent sample only.

Standard Reference Material (SRM)

The laboratory analyzed SRM1944 - New York/New Jersey Waterway Sediment. This SRM has certified values for 28 of the target PCB congeners. The reported concentrations for PCB18, PCB49, and PCB52 were greater than the acceptance window upper control limit (±20% of the 95% confidence interval). Since the recoveries of these compounds were acceptable in the laboratory control sample (LCS) analyses, no action was taken unless the reported concentrations were also outside a wider control limit of ±25% of the 95% confidence interval.

The reported value for PCB52 was also greater than the +25% upper control limit, and positive values for this congener was estimated (J-12) in all samples. As the SRM results indicate a potential high bias, no action was taken if this congener was not detected.

Laboratory Duplicate

The PCB laboratory duplicate analysis was performed using Sample 04-SED-010. The relative percent difference (RPD) values for eight congeners and four homologue groups were greater than the control limit of 30%. The values for these analytes were estimated (J-9) in the parent sample only.

For TOC and total solids, the laboratory duplicate analyses were performed using Sample 04-SED-009 for the TOC and Sample 04-SED-001 for total solids. Laboratory precision was acceptable for these analyses.

Laboratory duplicate analysis was not performed for the grain size analysis.

Compound Identification

The separation and spectral fit for any positive result for the coplanar congeners (PCB77, PCB81, PCB126, and PCB169) were evaluated. PCB77 was the only coplanar congener detected in these samples. PCB110 was found to interfere with PCB77.

For PCB77, the spectral match met general identification criteria, so the laboratory correctly reported the results as positive results. However, due to the interference, the results may be false positives or may be biased high. The potential interferences cannot be resolved without further extract cleanup (e.g., carbon column cleanup). Thus, all positive results for PCB77 were qualified as tentatively identified at an estimated concentration (NJ-21). PCB congener PCB77 was reported as detected in all samples except 04-SED-003 and 04-SED-006.

Although not a coplanar congener, interference was also noted for PCB157. For PCB157, the peak co-elutes with the non-target PCB200. However, the quantitation ions for PCB157 (a hexachlorobiphenyl) and PCB200 (an octachlorobiphenyl) are sufficiently different that each congener can be resolved despite the co-elution. No action was taken for the PCB157 results.

Chromatography and mass spectral identification were reviewed for a minimum of 10% of all other reported congeners. No other instances of potential interference were noted. All reported positive results met the identification criteria and chromatographic peak shapes were acceptable.

Calculation Verification

An error in the calculation of the amounts for the pentachlorobiphenyl homologue groups was found. The laboratory was contacted and the data were resubmitted 1/20/05 with the correct values. No further action was necessary.

Reporting Limits and Sample Results

For GCMS-SIM analysis, response factors are generated for each congener during the calibration process. The relative area of a peak is divided by the appropriate response factor to calculate the

concentration of the congener. For the homologue groups (monochlorobiphenyl, dichlorobiphenyl, etc.), a representative response factor is used. For example, the response factor for PCB29 is used as the representative response factor for all trichlorobiphenyls.

In several samples, the reported trichlorobiphenyl and/or heptachlorobiphenyl homologue group total values were less than the sum of the individual congeners. This occurs because the representative response factor is sufficiently different from the target congener response factors generated during the calibration. For example, the response factor for the PCB31/28 co-elution (detected in most samples) is lower than the trichlorobiphenyl representative response factor. Since the areas are divided by the response factors, this results in a lower concentration for the total trichlorobiphenyls, even if PCB31/28 is the only detected congener in the chlorination level.

Unless all 209 congeners are calibrated, any reported total for a chlorination level will have some inherent variability. The differences for the Total Homologue values are all less than 1.0%. This is within the variability of the method, thus no action was taken.

III. Overall Assessment

As was determined by this evaluation, the laboratory followed the specified analytical methods. Accuracy was acceptable, as demonstrated by the surrogate, LCS, SRM, and MS percent recovery values, with the exceptions noted above. Precision was acceptable as demonstrated by the relative percent difference values for the laboratory duplicate analyses, with the exceptions noted above.

Data were estimated due to MS and SRM recovery outliers and laboratory duplicate precision outliers. Data were qualified as tentatively identified due to potential interference. Data were qualified as not detected due to contamination in the associated blank.

All data, as qualified, are acceptable for use.

Appendix D

Sediment Data Table

Sediment Data Table

SAMPLING DATE	FIELD ID	EASTING (NAD83 UTM18N)	NORTHING (NAD83 UTM18N)	SITE NUMBER	LAB ID	ANALYTE[1]	VALUE, INTERPRETIVE QUALIFIER[2], AND UNITS[3]	DETECTION LIMIT[3]
5/6/2004	04-SED-001	614989	4767164	001	0410065-01	Cl2-BZ#8	117 µg/Kg	0.415 µg/Kg
5/6/2004	04-SED-001	614989	4767164	001	0410065-01	Cl3-BZ#18	49.5 µg/Kg	0.296 µg/Kg
5/6/2004	04-SED-001	614989	4767164	001	0410065-01	Cl3-BZ#31/#28	205 µg/Kg	0.140 µg/Kg
5/6/2004	04-SED-001	614989	4767164	001	0410065-01	Cl4-BZ#44	40.4 µg/Kg	0.179 µg/Kg
5/6/2004	04-SED-001	614989	4767164	001	0410065-01	Cl4-BZ#45	12.4 µg/Kg	0.0700 µg/Kg
5/6/2004	04-SED-001	614989	4767164	001	0410065-01	Cl4-BZ#47	63.8 µg/Kg	0.114 µg/Kg
5/6/2004	04-SED-001	614989	4767164	001	0410065-01	Cl4-BZ#49	70.5 µg/Kg	0.200 µg/Kg
5/6/2004	04-SED-001	614989	4767164	001	0410065-01	Cl4-BZ#52	88.0 J µg/Kg	0.0726 µg/Kg
5/6/2004	04-SED-001	614989	4767164	001	0410065-01	Cl4-BZ#56	35.4 µg/Kg	0.319 µg/Kg
5/6/2004	04-SED-001	614989	4767164	001	0410065-01	Cl4-BZ#66	45.4 µg/Kg	0.114 µg/Kg
5/6/2004	04-SED-001	614989	4767164	001	0410065-01	Cl4-BZ#70	46.7 µg/Kg	0.259 µg/Kg
5/6/2004	04-SED-001	614989	4767164	001	0410065-01	Cl4-BZ#74	30.4 µg/Kg	0.0726 µg/Kg
5/6/2004	04-SED-001	614989	4767164	001	0410065-01	Cl4-BZ#77	9.55 NJ µg/Kg	0.140 µg/Kg
5/6/2004	04-SED-001	614989	4767164	001	0410065-01	Cl4-BZ#81	0.150 U µg/Kg	0.150 µg/Kg
5/6/2004	04-SED-001	614989	4767164	001	0410065-01	Cl5-BZ#87	11.4 µg/Kg	0.0882 µg/Kg
5/6/2004	04-SED-001	614989	4767164	001	0410065-01	Cl5-BZ#95	25.1 µg/Kg	0.0337 µg/Kg
5/6/2004	04-SED-001	614989	4767164	001	0410065-01	Cl5-BZ#99	11.8 µg/Kg	0.0493 µg/Kg
5/6/2004	04-SED-001	614989	4767164	001	0410065-01	Cl5-BZ#101	21.0 µg/Kg	0.0596 µg/Kg
5/6/2004	04-SED-001	614989	4767164	001	0410065-01	Cl5-BZ#105	10.0 µg/Kg	0.0882 µg/Kg
5/6/2004	04-SED-001	614989	4767164	001	0410065-01	Cl5-BZ#110	28.0 µg/Kg	0.0596 µg/Kg
5/6/2004	04-SED-001	614989	4767164	001	0410065-01	Cl5-BZ#114	1.16 µg/Kg	0.0259 µg/Kg
5/6/2004	04-SED-001	614989	4767164	001	0410065-01	Cl5-BZ#118	20.7 µg/Kg	0.158 µg/Kg
5/6/2004	04-SED-001	614989	4767164	001	0410065-01	Cl5-BZ#123	0.0882 U µg/Kg	0.0882 µg/Kg
5/6/2004	04-SED-001	614989	4767164	001	0410065-01	Cl5-BZ#126	0.0674 U µg/Kg	0.0674 µg/Kg
5/6/2004	04-SED-001	614989	4767164	001	0410065-01	Cl6-BZ#128	2.63 µg/Kg	0.233 µg/Kg
5/6/2004	04-SED-001	614989	4767164	001	0410065-01	Cl6-BZ#138	14.4 µg/Kg	0.124 µg/Kg
5/6/2004	04-SED-001	614989	4767164	001	0410065-01	Cl6-BZ#146	3.58 µg/Kg	0.0519 µg/Kg
5/6/2004	04-SED-001	614989	4767164	001	0410065-01	Cl6-BZ#149	9.86 µg/Kg	0.0830 µg/Kg
5/6/2004	04-SED-001	614989	4767164	001	0410065-01	Cl6-BZ#151	5.16 µg/Kg	0.101 µg/Kg
5/6/2004	04-SED-001	614989	4767164	001	0410065-01	Cl6-BZ#153	8.74 µg/Kg	0.150 µg/Kg
5/6/2004	04-SED-001	614989	4767164	001	0410065-01	Cl6-BZ#156	0.187 U µg/Kg	0.187 µg/Kg
5/6/2004	04-SED-001	614989	4767164	001	0410065-01	Cl6-BZ#157	0.182 U µg/Kg	0.182 µg/Kg
5/6/2004	04-SED-001	614989	4767164	001	0410065-01	Cl6-BZ#158	1.22 µg/Kg	0.0493 µg/Kg

[1]BZ# = PCB congener Ballschmiter & Zell number
[2]U = Not detected at the detection limit (DL)
J/UJ = Estimated result or DL
NJ = Tentative identification
[3]PCB results & DL on a dry weight basis

SAMPLING DATE	FIELD ID	EASTING (NAD83 UTM18N)	NORTHING (NAD83 UTM18N)	SITE NUMBER	LAB ID	ANALYTE[1]	VALUE, INTERPRETIVE QUALIFIER[2], AND UNITS[3]		DETECTION LIMIT[3]
5/6/2004	04-SED-001	614989	4767164	001	0410065-01	Cl6-BZ#167	1.13	µg/Kg	0.0648 µg/Kg
5/6/2004	04-SED-001	614989	4767164	001	0410065-01	Cl6-BZ#169	0.192 U	µg/Kg	0.192 µg/Kg
5/6/2004	04-SED-001	614989	4767164	001	0410065-01	Cl7-BZ#170	6.98	µg/Kg	0.0933 µg/Kg
5/6/2004	04-SED-001	614989	4767164	001	0410065-01	Cl7-BZ#174	2.52	µg/Kg	0.0622 µg/Kg
5/6/2004	04-SED-001	614989	4767164	001	0410065-01	Cl7-BZ#177	1.76	µg/Kg	0.0415 µg/Kg
5/6/2004	04-SED-001	614989	4767164	001	0410065-01	Cl7-BZ#180	4.19	µg/Kg	0.0856 µg/Kg
5/6/2004	04-SED-001	614989	4767164	001	0410065-01	Cl7-BZ#183	1.16	µg/Kg	0.0830 µg/Kg
5/6/2004	04-SED-001	614989	4767164	001	0410065-01	Cl7-BZ#189	0.0985 U	µg/Kg	0.0985 µg/Kg
5/6/2004	04-SED-001	614989	4767164	001	0410065-01	Cl7-BZ#187	5.11	µg/Kg	0.0856 µg/Kg
5/6/2004	04-SED-001	614989	4767164	001	0410065-01	Cl8-BZ#194	0.0933 U	µg/Kg	0.0933 µg/Kg
5/6/2004	04-SED-001	614989	4767164	001	0410065-01	Cl8-BZ#195	0.0933 U	µg/Kg	0.0933 µg/Kg
5/6/2004	04-SED-001	614989	4767164	001	0410065-01	Cl8-BZ#201	0.112 U	µg/Kg	0.112 µg/Kg
5/6/2004	04-SED-001	614989	4767164	001	0410065-01	Cl9-BZ#206	0.143 U	µg/Kg	0.143 µg/Kg
5/6/2004	04-SED-001	614989	4767164	001	0410065-01	Cl10-BZ#209	0.0389 U	µg/Kg	0.0389 µg/Kg
5/6/2004	04-SED-001	614989	4767164	001	0410065-01	Monochlorobiphenyls	152	µg/Kg	0.0674 µg/Kg
5/6/2004	04-SED-001	614989	4767164	001	0410065-01	Dichlorobiphenyls	477	µg/Kg	0.415 µg/Kg
5/6/2004	04-SED-001	614989	4767164	001	0410065-01	Trichlorobiphenyls	604	µg/Kg	0.117 µg/Kg
5/6/2004	04-SED-001	614989	4767164	001	0410065-01	Tetrachlorobiphenyls	827	µg/Kg	0.189 µg/Kg
5/6/2004	04-SED-001	614989	4767164	001	0410065-01	Pentachlorobiphenyls	240	µg/Kg	0.0882 µg/Kg
5/6/2004	04-SED-001	614989	4767164	001	0410065-01	Hexachlorobiphenyls	81.4	µg/Kg	0.158 µg/Kg
5/6/2004	04-SED-001	614989	4767164	001	0410065-01	Heptachlorobiphenyls	29.3	µg/Kg	0.0545 µg/Kg
5/6/2004	04-SED-001	614989	4767164	001	0410065-01	Octachlorobiphenyls	1.61	µg/Kg	0.0778 µg/Kg
5/6/2004	04-SED-001	614989	4767164	001	0410065-01	Nonachlorobiphenyls	5.77	µg/Kg	0.143 µg/Kg
5/6/2004	04-SED-001	614989	4767164	001	0410065-01	Decachlorobiphenyl	2.72	µg/Kg	0.0389 µg/Kg
5/6/2004	04-SED-001	614989	4767164	001	0410065-01	Total Homologues	2400	µg/Kg	0.415 µg/Kg
5/6/2004	04-SED-001	614989	4767164	001	0410065-01	Percent Moisture	65	%	0.10 %
5/6/2004	04-SED-001	614989	4767164	001	0410065-01	Total Organic Carbon	3.7	%	0.01 %
5/6/2004	04-SED-001	614989	4767164	001	0410065-01	Gravel	0.03	%	0.01 %
5/6/2004	04-SED-001	614989	4767164	001	0410065-01	Coarse Sand	1.75	%	0.01 %
5/6/2004	04-SED-001	614989	4767164	001	0410065-01	Medium Sand	13.73	%	0.01 %
5/6/2004	04-SED-001	614989	4767164	001	0410065-01	Fine Sand	38.10	%	0.01 %
5/6/2004	04-SED-001	614989	4767164	001	0410065-01	Silt/Clay	46.28	%	0.01 %
5/11/2004	04-SED-002	611945	4757373	002	0410065-02	Cl2-BZ#8	2.80 J	µg/Kg	0.564 µg/Kg

[1]BZ# = PCB congener Ballschmiter & Zell number
[2]U = Not detected at the detection limit (DL)
J/UJ = Estimated result or DL
NJ = Tentative identification
[3]PCB results & DL on a dry weight basis

SAMPLING DATE	FIELD ID	EASTING (NAD83 UTM18N)	NORTHING (NAD83 UTM18N)	SITE NUMBER	LAB ID	ANALYTE[1]	VALUE, INTERPRETIVE QUALIFIER[2], AND UNITS[3]	DETECTION LIMIT[3]
5/11/2004	04-SED-002	611945	4757373	002	0410065-02	Cl3-BZ#18	0.916 J µg/Kg	0.402 µg/Kg
5/11/2004	04-SED-002	611945	4757373	002	0410065-02	Cl3-BZ#31/#28	17.2 U µg/Kg	0.190 µg/Kg
5/11/2004	04-SED-002	611945	4757373	002	0410065-02	Cl4-BZ#44	2.31 µg/Kg	0.243 µg/Kg
5/11/2004	04-SED-002	611945	4757373	002	0410065-02	Cl4-BZ#45	0.423 J µg/Kg	0.0951 µg/Kg
5/11/2004	04-SED-002	611945	4757373	002	0410065-02	Cl4-BZ#47	5.36 µg/Kg	0.155 µg/Kg
5/11/2004	04-SED-002	611945	4757373	002	0410065-02	Cl4-BZ#49	9.89 µg/Kg	0.271 µg/Kg
5/11/2004	04-SED-002	611945	4757373	002	0410065-02	Cl4-BZ#52	7.89 J µg/Kg	0.0987 µg/Kg
5/11/2004	04-SED-002	611945	4757373	002	0410065-02	Cl4-BZ#56	50.3 µg/Kg	0.433 µg/Kg
5/11/2004	04-SED-002	611945	4757373	002	0410065-02	Cl4-BZ#66	12.6 µg/Kg	0.155 µg/Kg
5/11/2004	04-SED-002	611945	4757373	002	0410065-02	Cl4-BZ#70	13.5 µg/Kg	0.352 µg/Kg
5/11/2004	04-SED-002	611945	4757373	002	0410065-02	Cl4-BZ#74	2.97 µg/Kg	0.0987 µg/Kg
5/11/2004	04-SED-002	611945	4757373	002	0410065-02	Cl4-BZ#77	2.07 NJ µg/Kg	0.190 µg/Kg
5/11/2004	04-SED-002	611945	4757373	002	0410065-02	Cl4-BZ#81	0.204 U µg/Kg	0.204 µg/Kg
5/11/2004	04-SED-002	611945	4757373	002	0410065-02	Cl5-BZ#87	3.74 µg/Kg	0.120 µg/Kg
5/11/2004	04-SED-002	611945	4757373	002	0410065-02	Cl5-BZ#95	5.36 µg/Kg	0.0458 µg/Kg
5/11/2004	04-SED-002	611945	4757373	002	0410065-02	Cl5-BZ#99	5.79 µg/Kg	0.0669 µg/Kg
5/11/2004	04-SED-002	611945	4757373	002	0410065-02	Cl5-BZ#101	6.34 µg/Kg	0.0810 µg/Kg
5/11/2004	04-SED-002	611945	4757373	002	0410065-02	Cl5-BZ#105	5.07 µg/Kg	0.120 µg/Kg
5/11/2004	04-SED-002	611945	4757373	002	0410065-02	Cl5-BZ#110	9.12 µg/Kg	0.0810 µg/Kg
5/11/2004	04-SED-002	611945	4757373	002	0410065-02	Cl5-BZ#114	0.0352 U µg/Kg	0.0352 µg/Kg
5/11/2004	04-SED-002	611945	4757373	002	0410065-02	Cl5-BZ#118	9.75 µg/Kg	0.215 µg/Kg
5/11/2004	04-SED-002	611945	4757373	002	0410065-02	Cl5-BZ#123	0.120 U µg/Kg	0.120 µg/Kg
5/11/2004	04-SED-002	611945	4757373	002	0410065-02	Cl5-BZ#126	0.0916 U µg/Kg	0.0916 µg/Kg
5/11/2004	04-SED-002	611945	4757373	002	0410065-02	Cl6-BZ#128	1.28 J µg/Kg	0.317 µg/Kg
5/11/2004	04-SED-002	611945	4757373	002	0410065-02	Cl6-BZ#138	5.71 µg/Kg	0.169 µg/Kg
5/11/2004	04-SED-002	611945	4757373	002	0410065-02	Cl6-BZ#146	1.38 µg/Kg	0.0705 µg/Kg
5/11/2004	04-SED-002	611945	4757373	002	0410065-02	Cl6-BZ#149	4.36 µg/Kg	0.113 µg/Kg
5/11/2004	04-SED-002	611945	4757373	002	0410065-02	Cl6-BZ#151	1.83 µg/Kg	0.137 µg/Kg
5/11/2004	04-SED-002	611945	4757373	002	0410065-02	Cl6-BZ#153	4.36 µg/Kg	0.204 µg/Kg
5/11/2004	04-SED-002	611945	4757373	002	0410065-02	Cl6-BZ#156	0.719 J µg/Kg	0.254 µg/Kg
5/11/2004	04-SED-002	611945	4757373	002	0410065-02	Cl6-BZ#157	0.423 J µg/Kg	0.247 µg/Kg
5/11/2004	04-SED-002	611945	4757373	002	0410065-02	Cl6-BZ#158	0.437 µg/Kg	0.0669 µg/Kg
5/11/2004	04-SED-002	611945	4757373	002	0410065-02	Cl6-BZ#167	0.296 J µg/Kg	0.0881 µg/Kg

[1]BZ# = PCB congener Ballschmiter & Zell number
[2]U = Not detected at the detection limit (DL)
J/UJ = Estimated result or DL
NJ = Tentative identification
[3]PCB results & DL on a dry weight basis

SAMPLING DATE	FIELD ID	EASTING (NAD83 UTM18N)	NORTHING (NAD83 UTM18N)	SITE NUMBER	LAB ID	ANALYTE[1]	VALUE, INTERPRETIVE QUALIFIER[2], AND UNITS[3]		DETECTION LIMIT[3]
5/11/2004	04-SED-002	611945	4757373	002	0410065-02	Cl6-BZ#169	0.261 U	µg/Kg	0.261 µg/Kg
5/11/2004	04-SED-002	611945	4757373	002	0410065-02	Cl7-BZ#170	4.28	µg/Kg	0.127 µg/Kg
5/11/2004	04-SED-002	611945	4757373	002	0410065-02	Cl7-BZ#174	0.817	µg/Kg	0.0846 µg/Kg
5/11/2004	04-SED-002	611945	4757373	002	0410065-02	Cl7-BZ#177	0.789	µg/Kg	0.0564 µg/Kg
5/11/2004	04-SED-002	611945	4757373	002	0410065-02	Cl7-BZ#180	1.93	µg/Kg	0.116 µg/Kg
5/11/2004	04-SED-002	611945	4757373	002	0410065-02	Cl7-BZ#183	0.916	µg/Kg	0.113 µg/Kg
5/11/2004	04-SED-002	611945	4757373	002	0410065-02	Cl7-BZ#189	0.134 U	µg/Kg	0.134 µg/Kg
5/11/2004	04-SED-002	611945	4757373	002	0410065-02	Cl7-BZ#187	1.64	µg/Kg	0.116 µg/Kg
5/11/2004	04-SED-002	611945	4757373	002	0410065-02	Cl8-BZ#194	0.127 U	µg/Kg	0.127 µg/Kg
5/11/2004	04-SED-002	611945	4757373	002	0410065-02	Cl8-BZ#195	0.127 U	µg/Kg	0.127 µg/Kg
5/11/2004	04-SED-002	611945	4757373	002	0410065-02	Cl8-BZ#201	0.152 U	µg/Kg	0.152 µg/Kg
5/11/2004	04-SED-002	611945	4757373	002	0410065-02	Cl9-BZ#206	0.194 U	µg/Kg	0.194 µg/Kg
5/11/2004	04-SED-002	611945	4757373	002	0410065-02	Cl10-BZ#209	0.0529 U	µg/Kg	0.0529 µg/Kg
5/11/2004	04-SED-002	611945	4757373	002	0410065-02	Monochlorobiphenyls	4.07	µg/Kg	0.0916 µg/Kg
5/11/2004	04-SED-002	611945	4757373	002	0410065-02	Dichlorobiphenyls	21.9	µg/Kg	0.564 µg/Kg
5/11/2004	04-SED-002	611945	4757373	002	0410065-02	Trichlorobiphenyls	42.3	µg/Kg	0.159 µg/Kg
5/11/2004	04-SED-002	611945	4757373	002	0410065-02	Tetrachlorobiphenyls	224	µg/Kg	0.257 µg/Kg
5/11/2004	04-SED-002	611945	4757373	002	0410065-02	Pentachlorobiphenyls	110	µg/Kg	0.120 µg/Kg
5/11/2004	04-SED-002	611945	4757373	002	0410065-02	Hexachlorobiphenyls	40.7	µg/Kg	0.215 µg/Kg
5/11/2004	04-SED-002	611945	4757373	002	0410065-02	Heptachlorobiphenyls	11.0	µg/Kg	0.0740 µg/Kg
5/11/2004	04-SED-002	611945	4757373	002	0410065-02	Octachlorobiphenyls	0.106 U	µg/Kg	0.106 µg/Kg
5/11/2004	04-SED-002	611945	4757373	002	0410065-02	Nonachlorobiphenyls	0.194 U	µg/Kg	0.194 µg/Kg
5/11/2004	04-SED-002	611945	4757373	002	0410065-02	Decachlorobiphenyl	0.0529 U	µg/Kg	0.0529 µg/Kg
5/11/2004	04-SED-002	611945	4757373	002	0410065-02	Total Homologues	445	µg/Kg	0.564 µg/Kg
5/11/2004	04-SED-002	611945	4757373	002	0410065-02	Percent Moisture	71	%	0.10 %
5/11/2004	04-SED-002	611945	4757373	002	0410065-02	Total Organic Carbon	7.4	%	0.01 %
5/11/2004	04-SED-002	611945	4757373	002	0410065-02	Gravel	5.27	%	0.01 %
5/11/2004	04-SED-002	611945	4757373	002	0410065-02	Coarse Sand	12.78	%	0.01 %
5/11/2004	04-SED-002	611945	4757373	002	0410065-02	Medium Sand	29.24	%	0.01 %
5/11/2004	04-SED-002	611945	4757373	002	0410065-02	Fine Sand	20.32	%	0.01 %
5/11/2004	04-SED-002	611945	4757373	002	0410065-02	Silt/Clay	31.58	%	0.01 %
5/11/2004	04-SED-003	611934	4757846	003	0410065-03	Cl2-BZ#8	0.297 U	µg/Kg	0.297 µg/Kg
5/11/2004	04-SED-003	611934	4757846	003	0410065-03	Cl3-BZ#18	0.212 U	µg/Kg	0.212 µg/Kg

[1]BZ# = PCB congener Ballschmiter & Zell number
[2]U = Not detected at the detection limit (DL)
J/UJ = Estimated result or DL
NJ = Tentative identification
[3]PCB results & DL on a dry weight basis

SAMPLING DATE	FIELD ID	EASTING (NAD83 UTM18N)	NORTHING (NAD83 UTM18N)	SITE NUMBER	LAB ID	ANALYTE[1]	VALUE, INTERPRETIVE QUALIFIER[2], AND UNITS[3]	DETECTION LIMIT[3]
5/11/2004	04-SED-003	611934	4757846	003	0410065-03	Cl3-BZ#31/#28	0.100 U µg/Kg	0.100 µg/Kg
5/11/2004	04-SED-003	611934	4757846	003	0410065-03	Cl4-BZ#44	0.128 U µg/Kg	0.128 µg/Kg
5/11/2004	04-SED-003	611934	4757846	003	0410065-03	Cl4-BZ#45	0.0502 U µg/Kg	0.0502 µg/Kg
5/11/2004	04-SED-003	611934	4757846	003	0410065-03	Cl4-BZ#47	0.0818 U µg/Kg	0.0818 µg/Kg
5/11/2004	04-SED-003	611934	4757846	003	0410065-03	Cl4-BZ#49	0.143 U µg/Kg	0.143 µg/Kg
5/11/2004	04-SED-003	611934	4757846	003	0410065-03	Cl4-BZ#52	0.0520 U µg/Kg	0.0520 µg/Kg
5/11/2004	04-SED-003	611934	4757846	003	0410065-03	Cl4-BZ#56	13.0 µg/Kg	0.228 µg/Kg
5/11/2004	04-SED-003	611934	4757846	003	0410065-03	Cl4-BZ#66	0.357 J µg/Kg	0.0818 µg/Kg
5/11/2004	04-SED-003	611934	4757846	003	0410065-03	Cl4-BZ#70	0.186 U µg/Kg	0.186 µg/Kg
5/11/2004	04-SED-003	611934	4757846	003	0410065-03	Cl4-BZ#74	0.543 µg/Kg	0.0520 µg/Kg
5/11/2004	04-SED-003	611934	4757846	003	0410065-03	Cl4-BZ#77	0.100 U µg/Kg	0.100 µg/Kg
5/11/2004	04-SED-003	611934	4757846	003	0410065-03	Cl4-BZ#81	0.108 U µg/Kg	0.108 µg/Kg
5/11/2004	04-SED-003	611934	4757846	003	0410065-03	Cl5-BZ#87	0.981 µg/Kg	0.0632 µg/Kg
5/11/2004	04-SED-003	611934	4757846	003	0410065-03	Cl5-BZ#95	0.0242 U µg/Kg	0.0242 µg/Kg
5/11/2004	04-SED-003	611934	4757846	003	0410065-03	Cl5-BZ#99	0.379 µg/Kg	0.0353 µg/Kg
5/11/2004	04-SED-003	611934	4757846	003	0410065-03	Cl5-BZ#101	0.163 J µg/Kg	0.0427 µg/Kg
5/11/2004	04-SED-003	611934	4757846	003	0410065-03	Cl5-BZ#105	0.602 µg/Kg	0.0632 µg/Kg
5/11/2004	04-SED-003	611934	4757846	003	0410065-03	Cl5-BZ#110	0.260 µg/Kg	0.0427 µg/Kg
5/11/2004	04-SED-003	611934	4757846	003	0410065-03	Cl5-BZ#114	0.0186 U µg/Kg	0.0186 µg/Kg
5/11/2004	04-SED-003	611934	4757846	003	0410065-03	Cl5-BZ#118	0.113 U µg/Kg	0.113 µg/Kg
5/11/2004	04-SED-003	611934	4757846	003	0410065-03	Cl5-BZ#123	0.0632 U µg/Kg	0.0632 µg/Kg
5/11/2004	04-SED-003	611934	4757846	003	0410065-03	Cl5-BZ#126	0.0483 U µg/Kg	0.0483 µg/Kg
5/11/2004	04-SED-003	611934	4757846	003	0410065-03	Cl6-BZ#128	0.167 U µg/Kg	0.167 µg/Kg
5/11/2004	04-SED-003	611934	4757846	003	0410065-03	Cl6-BZ#138	0.632 µg/Kg	0.0892 µg/Kg
5/11/2004	04-SED-003	611934	4757846	003	0410065-03	Cl6-BZ#146	0.0372 U µg/Kg	0.0372 µg/Kg
5/11/2004	04-SED-003	611934	4757846	003	0410065-03	Cl6-BZ#149	0.0595 U µg/Kg	0.0595 µg/Kg
5/11/2004	04-SED-003	611934	4757846	003	0410065-03	Cl6-BZ#151	0.0725 U µg/Kg	0.0725 µg/Kg
5/11/2004	04-SED-003	611934	4757846	003	0410065-03	Cl6-BZ#153	0.520 J µg/Kg	0.108 µg/Kg
5/11/2004	04-SED-003	611934	4757846	003	0410065-03	Cl6-BZ#156	0.134 U µg/Kg	0.134 µg/Kg
5/11/2004	04-SED-003	611934	4757846	003	0410065-03	Cl6-BZ#157	0.130 U µg/Kg	0.130 µg/Kg
5/11/2004	04-SED-003	611934	4757846	003	0410065-03	Cl6-BZ#158	0.0353 U µg/Kg	0.0353 µg/Kg
5/11/2004	04-SED-003	611934	4757846	003	0410065-03	Cl6-BZ#167	0.0465 U µg/Kg	0.0465 µg/Kg
5/11/2004	04-SED-003	611934	4757846	003	0410065-03	Cl6-BZ#169	0.138 U µg/Kg	0.138 µg/Kg

[1]BZ# = PCB congener Ballschmiter & Zell number
[2]U = Not detected at the detection limit (DL)
J/UJ = Estimated result or DL
NJ = Tentative identification
[3]PCB results & DL on a dry weight basis

SAMPLING DATE	FIELD ID	EASTING (NAD83 UTM18N)	NORTHING (NAD83 UTM18N)	SITE NUMBER	LAB ID	ANALYTE[1]	VALUE, INTERPRETIVE QUALIFIER[2], AND UNITS[3]		DETECTION LIMIT[3]
5/11/2004	04-SED-003	611934	4757846	003	0410065-03	Cl7-BZ#170	0.0669 U	µg/Kg	0.0669 µg/Kg
5/11/2004	04-SED-003	611934	4757846	003	0410065-03	Cl7-BZ#174	0.0446 U	µg/Kg	0.0446 µg/Kg
5/11/2004	04-SED-003	611934	4757846	003	0410065-03	Cl7-BZ#177	0.0297 U	µg/Kg	0.0297 µg/Kg
5/11/2004	04-SED-003	611934	4757846	003	0410065-03	Cl7-BZ#180	0.788	µg/Kg	0.0613 µg/Kg
5/11/2004	04-SED-003	611934	4757846	003	0410065-03	Cl7-BZ#183	0.0595 U	µg/Kg	0.0595 µg/Kg
5/11/2004	04-SED-003	611934	4757846	003	0410065-03	Cl7-BZ#189	0.0706 U	µg/Kg	0.0706 µg/Kg
5/11/2004	04-SED-003	611934	4757846	003	0410065-03	Cl7-BZ#187	0.0613 U	µg/Kg	0.0613 µg/Kg
5/11/2004	04-SED-003	611934	4757846	003	0410065-03	Cl8-BZ#194	0.0669 U	µg/Kg	0.0669 µg/Kg
5/11/2004	04-SED-003	611934	4757846	003	0410065-03	Cl8-BZ#195	0.0669 U	µg/Kg	0.0669 µg/Kg
5/11/2004	04-SED-003	611934	4757846	003	0410065-03	Cl8-BZ#201	0.0799 U	µg/Kg	0.0799 µg/Kg
5/11/2004	04-SED-003	611934	4757846	003	0410065-03	Cl9-BZ#206	0.102 U	µg/Kg	0.102 µg/Kg
5/11/2004	04-SED-003	611934	4757846	003	0410065-03	Cl10-BZ#209	0.0279 U	µg/Kg	0.0279 µg/Kg
5/11/2004	04-SED-003	611934	4757846	003	0410065-03	Monochlorobiphenyls	0.0483 U	µg/Kg	0.0483 µg/Kg
5/11/2004	04-SED-003	611934	4757846	003	0410065-03	Dichlorobiphenyls	0.297 U	µg/Kg	0.297 µg/Kg
5/11/2004	04-SED-003	611934	4757846	003	0410065-03	Trichlorobiphenyls	0.0836 U	µg/Kg	0.0836 µg/Kg
5/11/2004	04-SED-003	611934	4757846	003	0410065-03	Tetrachlorobiphenyls	25.8	µg/Kg	0.136 µg/Kg
5/11/2004	04-SED-003	611934	4757846	003	0410065-03	Pentachlorobiphenyls	3.63	µg/Kg	0.0632 µg/Kg
5/11/2004	04-SED-003	611934	4757846	003	0410065-03	Hexachlorobiphenyls	2.15	µg/Kg	0.113 µg/Kg
5/11/2004	04-SED-003	611934	4757846	003	0410065-03	Heptachlorobiphenyls	0.0390 U	µg/Kg	0.0390 µg/Kg
5/11/2004	04-SED-003	611934	4757846	003	0410065-03	Octachlorobiphenyls	0.0557 U	µg/Kg	0.0557 µg/Kg
5/11/2004	04-SED-003	611934	4757846	003	0410065-03	Nonachlorobiphenyls	0.102 U	µg/Kg	0.102 µg/Kg
5/11/2004	04-SED-003	611934	4757846	003	0410065-03	Decachlorobiphenyl	0.0279 U	µg/Kg	0.0279 µg/Kg
5/11/2004	04-SED-003	611934	4757846	003	0410065-03	Total Homologues	31.2	µg/Kg	0.297 µg/Kg
5/11/2004	04-SED-003	611934	4757846	003	0410065-03	Percent Moisture	46	%	0.10 %
5/11/2004	04-SED-003	611934	4757846	003	0410065-03	Total Organic Carbon	2.9	%	0.01 %
5/11/2004	04-SED-003	611934	4757846	003	0410065-03	Gravel	3.13	%	0.01 %
5/11/2004	04-SED-003	611934	4757846	003	0410065-03	Coarse Sand	18.29	%	0.01 %
5/11/2004	04-SED-003	611934	4757846	003	0410065-03	Medium Sand	34.41	%	0.01 %
5/11/2004	04-SED-003	611934	4757846	003	0410065-03	Fine Sand	21.25	%	0.01 %
5/11/2004	04-SED-003	611934	4757846	003	0410065-03	Silt/Clay	22.92	%	0.01 %
5/11/2004	04-SED-004	611581	4758786	004	0410065-04	Cl2-BZ#8	7.36	µg/Kg	0.587 µg/Kg
5/11/2004	04-SED-004	611581	4758786	004	0410065-04	Cl3-BZ#18	54.2	µg/Kg	0.418 µg/Kg
5/11/2004	04-SED-004	611581	4758786	004	0410065-04	Cl3-BZ#31/#28	163	µg/Kg	0.198 µg/Kg

[1]BZ# = PCB congener Ballschmiter & Zell number
[2]U = Not detected at the detection limit (DL)
J/UJ = Estimated result or DL
NJ = Tentative identification
[3]PCB results & DL on a dry weight basis

SAMPLING DATE	FIELD ID	EASTING (NAD83 UTM18N)	NORTHING (NAD83 UTM18N)	SITE NUMBER	LAB ID	ANALYTE[1]	VALUE, INTERPRETIVE QUALIFIER[2], AND UNITS[3]	DETECTION LIMIT[3]
5/11/2004	04-SED-004	611581	4758786	004	0410065-04	Cl4-BZ#44	71.6 µg/Kg	0.253 µg/Kg
5/11/2004	04-SED-004	611581	4758786	004	0410065-04	Cl4-BZ#45	14.2 µg/Kg	0.0990 µg/Kg
5/11/2004	04-SED-004	611581	4758786	004	0410065-04	Cl4-BZ#47	82.9 µg/Kg	0.161 µg/Kg
5/11/2004	04-SED-004	611581	4758786	004	0410065-04	Cl4-BZ#49	103 µg/Kg	0.282 µg/Kg
5/11/2004	04-SED-004	611581	4758786	004	0410065-04	Cl4-BZ#52	125 J µg/Kg	0.103 µg/Kg
5/11/2004	04-SED-004	611581	4758786	004	0410065-04	Cl4-BZ#56	89.6 µg/Kg	0.451 µg/Kg
5/11/2004	04-SED-004	611581	4758786	004	0410065-04	Cl4-BZ#66	69.7 µg/Kg	0.161 µg/Kg
5/11/2004	04-SED-004	611581	4758786	004	0410065-04	Cl4-BZ#70	40.0 µg/Kg	0.367 µg/Kg
5/11/2004	04-SED-004	611581	4758786	004	0410065-04	Cl4-BZ#74	49.4 µg/Kg	0.103 µg/Kg
5/11/2004	04-SED-004	611581	4758786	004	0410065-04	Cl4-BZ#77	4.65 NJ µg/Kg	0.198 µg/Kg
5/11/2004	04-SED-004	611581	4758786	004	0410065-04	Cl4-BZ#81	0.213 U µg/Kg	0.213 µg/Kg
5/11/2004	04-SED-004	611581	4758786	004	0410065-04	Cl5-BZ#87	20.3 µg/Kg	0.125 µg/Kg
5/11/2004	04-SED-004	611581	4758786	004	0410065-04	Cl5-BZ#95	33.7 µg/Kg	0.0477 µg/Kg
5/11/2004	04-SED-004	611581	4758786	004	0410065-04	Cl5-BZ#99	19.2 µg/Kg	0.0697 µg/Kg
5/11/2004	04-SED-004	611581	4758786	004	0410065-04	Cl5-BZ#101	36.1 µg/Kg	0.0843 µg/Kg
5/11/2004	04-SED-004	611581	4758786	004	0410065-04	Cl5-BZ#105	17.8 µg/Kg	0.125 µg/Kg
5/11/2004	04-SED-004	611581	4758786	004	0410065-04	Cl5-BZ#110	46.3 µg/Kg	0.0843 µg/Kg
5/11/2004	04-SED-004	611581	4758786	004	0410065-04	Cl5-BZ#114	1.36 µg/Kg	0.0367 µg/Kg
5/11/2004	04-SED-004	611581	4758786	004	0410065-04	Cl5-BZ#118	34.8 µg/Kg	0.224 µg/Kg
5/11/2004	04-SED-004	611581	4758786	004	0410065-04	Cl5-BZ#123	0.125 U µg/Kg	0.125 µg/Kg
5/11/2004	04-SED-004	611581	4758786	004	0410065-04	Cl5-BZ#126	0.0953 U µg/Kg	0.0953 µg/Kg
5/11/2004	04-SED-004	611581	4758786	004	0410065-04	Cl6-BZ#128	4.22 µg/Kg	0.330 µg/Kg
5/11/2004	04-SED-004	611581	4758786	004	0410065-04	Cl6-BZ#138	22.1 µg/Kg	0.176 µg/Kg
5/11/2004	04-SED-004	611581	4758786	004	0410065-04	Cl6-BZ#146	3.56 µg/Kg	0.0733 µg/Kg
5/11/2004	04-SED-004	611581	4758786	004	0410065-04	Cl6-BZ#149	13.2 µg/Kg	0.117 µg/Kg
5/11/2004	04-SED-004	611581	4758786	004	0410065-04	Cl6-BZ#151	3.50 µg/Kg	0.143 µg/Kg
5/11/2004	04-SED-004	611581	4758786	004	0410065-04	Cl6-BZ#153	13.6 µg/Kg	0.213 µg/Kg
5/11/2004	04-SED-004	611581	4758786	004	0410065-04	Cl6-BZ#156	1.89 µg/Kg	0.264 µg/Kg
5/11/2004	04-SED-004	611581	4758786	004	0410065-04	Cl6-BZ#157	0.455 J µg/Kg	0.257 µg/Kg
5/11/2004	04-SED-004	611581	4758786	004	0410065-04	Cl6-BZ#158	1.55 µg/Kg	0.0697 µg/Kg
5/11/2004	04-SED-004	611581	4758786	004	0410065-04	Cl6-BZ#167	0.909 µg/Kg	0.0917 µg/Kg
5/11/2004	04-SED-004	611581	4758786	004	0410065-04	Cl6-BZ#169	0.271 U µg/Kg	0.271 µg/Kg
5/11/2004	04-SED-004	611581	4758786	004	0410065-04	Cl7-BZ#170	4.41 µg/Kg	0.132 µg/Kg

[1]BZ# = PCB congener Ballschmiter & Zell number
[2]U = Not detected at the detection limit (DL)
J/UJ = Estimated result or DL
NJ = Tentative identification
[3]PCB results & DL on a dry weight basis

SAMPLING DATE	FIELD ID	EASTING (NAD83 UTM18N)	NORTHING (NAD83 UTM18N)	SITE NUMBER	LAB ID	ANALYTE[1]	VALUE, INTERPRETIVE QUALIFIER[2], AND UNITS[3]		DETECTION LIMIT[3]
5/11/2004	04-SED-004	611581	4758786	004	0410065-04	Cl7-BZ#174	3.30	µg/Kg	0.0880 µg/Kg
5/11/2004	04-SED-004	611581	4758786	004	0410065-04	Cl7-BZ#177	1.67	µg/Kg	0.0587 µg/Kg
5/11/2004	04-SED-004	611581	4758786	004	0410065-04	Cl7-BZ#180	6.16	µg/Kg	0.121 µg/Kg
5/11/2004	04-SED-004	611581	4758786	004	0410065-04	Cl7-BZ#183	1.26	µg/Kg	0.117 µg/Kg
5/11/2004	04-SED-004	611581	4758786	004	0410065-04	Cl7-BZ#189	0.139 U	µg/Kg	0.139 µg/Kg
5/11/2004	04-SED-004	611581	4758786	004	0410065-04	Cl7-BZ#187	3.27	µg/Kg	0.121 µg/Kg
5/11/2004	04-SED-004	611581	4758786	004	0410065-04	Cl8-BZ#194	1.39	µg/Kg	0.132 µg/Kg
5/11/2004	04-SED-004	611581	4758786	004	0410065-04	Cl8-BZ#195	0.132 U	µg/Kg	0.132 µg/Kg
5/11/2004	04-SED-004	611581	4758786	004	0410065-04	Cl8-BZ#201	1.35	µg/Kg	0.158 µg/Kg
5/11/2004	04-SED-004	611581	4758786	004	0410065-04	Cl9-BZ#206	0.202 U	µg/Kg	0.202 µg/Kg
5/11/2004	04-SED-004	611581	4758786	004	0410065-04	Cl10-BZ#209	0.0550 U	µg/Kg	0.0550 µg/Kg
5/11/2004	04-SED-004	611581	4758786	004	0410065-04	Monochlorobiphenyls	6.06	µg/Kg	0.0953 µg/Kg
5/11/2004	04-SED-004	611581	4758786	004	0410065-04	Dichlorobiphenyls	72.7	µg/Kg	0.587 µg/Kg
5/11/2004	04-SED-004	611581	4758786	004	0410065-04	Trichlorobiphenyls	414	µg/Kg	0.165 µg/Kg
5/11/2004	04-SED-004	611581	4758786	004	0410065-04	Tetrachlorobiphenyls	1180	µg/Kg	0.268 µg/Kg
5/11/2004	04-SED-004	611581	4758786	004	0410065-04	Pentachlorobiphenyls	360	µg/Kg	0.125 µg/Kg
5/11/2004	04-SED-004	611581	4758786	004	0410065-04	Hexachlorobiphenyls	96.5	µg/Kg	0.224 µg/Kg
5/11/2004	04-SED-004	611581	4758786	004	0410065-04	Heptachlorobiphenyls	27.6	µg/Kg	0.0770 µg/Kg
5/11/2004	04-SED-004	611581	4758786	004	0410065-04	Octachlorobiphenyls	14.2	µg/Kg	0.110 µg/Kg
5/11/2004	04-SED-004	611581	4758786	004	0410065-04	Nonachlorobiphenyls	0.202 U	µg/Kg	0.202 µg/Kg
5/11/2004	04-SED-004	611581	4758786	004	0410065-04	Decachlorobiphenyl	0.0550 U	µg/Kg	0.0550 µg/Kg
5/11/2004	04-SED-004	611581	4758786	004	0410065-04	Total Homologues	2140	µg/Kg	0.587 µg/Kg
5/11/2004	04-SED-004	611581	4758786	004	0410065-04	Percent Moisture	69	%	0.10 %
5/11/2004	04-SED-004	611581	4758786	004	0410065-04	Total Organic Carbon	5.7	%	0.01 %
5/11/2004	04-SED-004	611581	4758786	004	0410065-04	Gravel	0.88	%	0.01 %
5/11/2004	04-SED-004	611581	4758786	004	0410065-04	Coarse Sand	9.32	%	0.01 %
5/11/2004	04-SED-004	611581	4758786	004	0410065-04	Medium Sand	32.11	%	0.01 %
5/11/2004	04-SED-004	611581	4758786	004	0410065-04	Fine Sand	24.68	%	0.01 %
5/11/2004	04-SED-004	611581	4758786	004	0410065-04	Silt/Clay	33.06	%	0.01 %
5/11/2004	04-SED-005	612423	4759264	005	0410065-05	Cl2-BZ#8	7.30	µg/Kg	0.664 µg/Kg
5/11/2004	04-SED-005	612423	4759264	005	0410065-05	Cl3-BZ#18	19.1	µg/Kg	0.473 µg/Kg
5/11/2004	04-SED-005	612423	4759264	005	0410065-05	Cl3-BZ#31/#28	64.9	µg/Kg	0.224 µg/Kg
5/11/2004	04-SED-005	612423	4759264	005	0410065-05	Cl4-BZ#44	28.1	µg/Kg	0.286 µg/Kg

[1]BZ# = PCB congener Ballschmiter & Zell number
[2]U = Not detected at the detection limit (DL)
J/UJ = Estimated result or DL
NJ = Tentative identification
[3]PCB results & DL on a dry weight basis

SAMPLING DATE	FIELD ID	EASTING (NAD83 UTM18N)	NORTHING (NAD83 UTM18N)	SITE NUMBER	LAB ID	ANALYTE[1]	VALUE, INTERPRETIVE QUALIFIER[2], AND UNITS[3]	DETECTION LIMIT[3]
5/11/2004	04-SED-005	612423	4759264	005	0410065-05	Cl4-BZ#45	5.41 µg/Kg	0.112 µg/Kg
5/11/2004	04-SED-005	612423	4759264	005	0410065-05	Cl4-BZ#47	34.4 µg/Kg	0.183 µg/Kg
5/11/2004	04-SED-005	612423	4759264	005	0410065-05	Cl4-BZ#49	39.3 µg/Kg	0.319 µg/Kg
5/11/2004	04-SED-005	612423	4759264	005	0410065-05	Cl4-BZ#52	52.3 J µg/Kg	0.116 µg/Kg
5/11/2004	04-SED-005	612423	4759264	005	0410065-05	Cl4-BZ#56	53.8 µg/Kg	0.510 µg/Kg
5/11/2004	04-SED-005	612423	4759264	005	0410065-05	Cl4-BZ#66	32.8 µg/Kg	0.183 µg/Kg
5/11/2004	04-SED-005	612423	4759264	005	0410065-05	Cl4-BZ#70	33.9 µg/Kg	0.415 µg/Kg
5/11/2004	04-SED-005	612423	4759264	005	0410065-05	Cl4-BZ#74	17.7 µg/Kg	0.116 µg/Kg
5/11/2004	04-SED-005	612423	4759264	005	0410065-05	Cl4-BZ#77	5.96 NJ µg/Kg	0.224 µg/Kg
5/11/2004	04-SED-005	612423	4759264	005	0410065-05	Cl4-BZ#81	0.241 U µg/Kg	0.241 µg/Kg
5/11/2004	04-SED-005	612423	4759264	005	0410065-05	Cl5-BZ#87	10.2 µg/Kg	0.141 µg/Kg
5/11/2004	04-SED-005	612423	4759264	005	0410065-05	Cl5-BZ#95	16.8 µg/Kg	0.0539 µg/Kg
5/11/2004	04-SED-005	612423	4759264	005	0410065-05	Cl5-BZ#99	9.56 µg/Kg	0.0788 µg/Kg
5/11/2004	04-SED-005	612423	4759264	005	0410065-05	Cl5-BZ#101	17.9 µg/Kg	0.0954 µg/Kg
5/11/2004	04-SED-005	612423	4759264	005	0410065-05	Cl5-BZ#105	10.4 µg/Kg	0.141 µg/Kg
5/11/2004	04-SED-005	612423	4759264	005	0410065-05	Cl5-BZ#110	23.7 µg/Kg	0.0954 µg/Kg
5/11/2004	04-SED-005	612423	4759264	005	0410065-05	Cl5-BZ#114	0.979 µg/Kg	0.0415 µg/Kg
5/11/2004	04-SED-005	612423	4759264	005	0410065-05	Cl5-BZ#118	19.5 µg/Kg	0.253 µg/Kg
5/11/2004	04-SED-005	612423	4759264	005	0410065-05	Cl5-BZ#123	0.141 U µg/Kg	0.141 µg/Kg
5/11/2004	04-SED-005	612423	4759264	005	0410065-05	Cl5-BZ#126	0.108 U µg/Kg	0.108 µg/Kg
5/11/2004	04-SED-005	612423	4759264	005	0410065-05	Cl6-BZ#128	2.70 µg/Kg	0.373 µg/Kg
5/11/2004	04-SED-005	612423	4759264	005	0410065-05	Cl6-BZ#138	13.4 µg/Kg	0.199 µg/Kg
5/11/2004	04-SED-005	612423	4759264	005	0410065-05	Cl6-BZ#146	1.94 µg/Kg	0.0830 µg/Kg
5/11/2004	04-SED-005	612423	4759264	005	0410065-05	Cl6-BZ#149	7.27 µg/Kg	0.133 µg/Kg
5/11/2004	04-SED-005	612423	4759264	005	0410065-05	Cl6-BZ#151	2.06 µg/Kg	0.162 µg/Kg
5/11/2004	04-SED-005	612423	4759264	005	0410065-05	Cl6-BZ#153	8.30 µg/Kg	0.241 µg/Kg
5/11/2004	04-SED-005	612423	4759264	005	0410065-05	Cl6-BZ#156	1.28 J µg/Kg	0.299 µg/Kg
5/11/2004	04-SED-005	612423	4759264	005	0410065-05	Cl6-BZ#157	0.465 J µg/Kg	0.290 µg/Kg
5/11/2004	04-SED-005	612423	4759264	005	0410065-05	Cl6-BZ#158	1.08 µg/Kg	0.0788 µg/Kg
5/11/2004	04-SED-005	612423	4759264	005	0410065-05	Cl6-BZ#167	0.647 µg/Kg	0.104 µg/Kg
5/11/2004	04-SED-005	612423	4759264	005	0410065-05	Cl6-BZ#169	0.307 U µg/Kg	0.307 µg/Kg
5/11/2004	04-SED-005	612423	4759264	005	0410065-05	Cl7-BZ#170	2.64 µg/Kg	0.149 µg/Kg
5/11/2004	04-SED-005	612423	4759264	005	0410065-05	Cl7-BZ#174	1.26 µg/Kg	0.0996 µg/Kg

[1]BZ# = PCB congener Ballschmiter & Zell number
[2]U = Not detected at the detection limit (DL)
J/UJ = Estimated result or DL
NJ = Tentative identification
[3]PCB results & DL on a dry weight basis

SAMPLING DATE	FIELD ID	EASTING (NAD83 UTM18N)	NORTHING (NAD83 UTM18N)	SITE NUMBER	LAB ID	ANALYTE[1]	VALUE, INTERPRETIVE QUALIFIER[2], AND UNITS[3]		DETECTION LIMIT[3]
5/11/2004	04-SED-005	612423	4759264	005	0410065-05	Cl7-BZ#177	1.14	µg/Kg	0.0664 µg/Kg
5/11/2004	04-SED-005	612423	4759264	005	0410065-05	Cl7-BZ#180	4.42	µg/Kg	0.137 µg/Kg
5/11/2004	04-SED-005	612423	4759264	005	0410065-05	Cl7-BZ#183	0.813	µg/Kg	0.133 µg/Kg
5/11/2004	04-SED-005	612423	4759264	005	0410065-05	Cl7-BZ#189	0.158 U	µg/Kg	0.158 µg/Kg
5/11/2004	04-SED-005	612423	4759264	005	0410065-05	Cl7-BZ#187	2.09	µg/Kg	0.137 µg/Kg
5/11/2004	04-SED-005	612423	4759264	005	0410065-05	Cl8-BZ#194	0.149 U	µg/Kg	0.149 µg/Kg
5/11/2004	04-SED-005	612423	4759264	005	0410065-05	Cl8-BZ#195	0.149 U	µg/Kg	0.149 µg/Kg
5/11/2004	04-SED-005	612423	4759264	005	0410065-05	Cl8-BZ#201	0.178 U	µg/Kg	0.178 µg/Kg
5/11/2004	04-SED-005	612423	4759264	005	0410065-05	Cl9-BZ#206	0.228 U	µg/Kg	0.228 µg/Kg
5/11/2004	04-SED-005	612423	4759264	005	0410065-05	Cl10-BZ#209	0.0622 U	µg/Kg	0.0622 µg/Kg
5/11/2004	04-SED-005	612423	4759264	005	0410065-05	Monochlorobiphenyls	7.20	µg/Kg	0.108 µg/Kg
5/11/2004	04-SED-005	612423	4759264	005	0410065-05	Dichlorobiphenyls	47.3	µg/Kg	0.664 µg/Kg
5/11/2004	04-SED-005	612423	4759264	005	0410065-05	Trichlorobiphenyls	204	µg/Kg	0.187 µg/Kg
5/11/2004	04-SED-005	612423	4759264	005	0410065-05	Tetrachlorobiphenyls	513	µg/Kg	0.303 µg/Kg
5/11/2004	04-SED-005	612423	4759264	005	0410065-05	Pentachlorobiphenyls	200	µg/Kg	0.141 µg/Kg
5/11/2004	04-SED-005	612423	4759264	005	0410065-05	Hexachlorobiphenyls	57.6	µg/Kg	0.253 µg/Kg
5/11/2004	04-SED-005	612423	4759264	005	0410065-05	Heptachlorobiphenyls	22.7	µg/Kg	0.0871 µg/Kg
5/11/2004	04-SED-005	612423	4759264	005	0410065-05	Octachlorobiphenyls	0.124 U	µg/Kg	0.124 µg/Kg
5/11/2004	04-SED-005	612423	4759264	005	0410065-05	Nonachlorobiphenyls	0.228 U	µg/Kg	0.228 µg/Kg
5/11/2004	04-SED-005	612423	4759264	005	0410065-05	Decachlorobiphenyl	0.0622 U	µg/Kg	0.0622 µg/Kg
5/11/2004	04-SED-005	612423	4759264	005	0410065-05	Total Homologues	1030	µg/Kg	0.664 µg/Kg
5/11/2004	04-SED-005	612423	4759264	005	0410065-05	Percent Moisture	74	%	0.10 %
5/11/2004	04-SED-005	612423	4759264	005	0410065-05	Total Organic Carbon	11	%	0.01 %
5/11/2004	04-SED-005	612423	4759264	005	0410065-05	Gravel	9.91	%	0.01 %
5/11/2004	04-SED-005	612423	4759264	005	0410065-05	Coarse Sand	13.47	%	0.01 %
5/11/2004	04-SED-005	612423	4759264	005	0410065-05	Medium Sand	23.24	%	0.01 %
5/11/2004	04-SED-005	612423	4759264	005	0410065-05	Fine Sand	18.87	%	0.01 %
5/11/2004	04-SED-005	612423	4759264	005	0410065-05	Silt/Clay	33.68	%	0.01 %
5/12/2004	04-SED-006	614679	4783585	006	0410065-06	Cl2-BZ#8	0.744 U	µg/Kg	0.744 µg/Kg
5/12/2004	04-SED-006	614679	4783585	006	0410065-06	Cl3-BZ#18	0.530 U	µg/Kg	0.530 µg/Kg
5/12/2004	04-SED-006	614679	4783585	006	0410065-06	Cl3-BZ#31/#28	19.2 U	µg/Kg	0.251 µg/Kg
5/12/2004	04-SED-006	614679	4783585	006	0410065-06	Cl4-BZ#44	0.321 U	µg/Kg	0.321 µg/Kg
5/12/2004	04-SED-006	614679	4783585	006	0410065-06	Cl4-BZ#45	1.58	µg/Kg	0.125 µg/Kg

[1]BZ# = PCB congener Ballschmiter & Zell number
[2]U = Not detected at the detection limit (DL)
J/UJ = Estimated result or DL
NJ = Tentative identification
[3]PCB results & DL on a dry weight basis

SAMPLING DATE	FIELD ID	EASTING (NAD83 UTM18N)	NORTHING (NAD83 UTM18N)	SITE NUMBER	LAB ID	ANALYTE[1]	VALUE, INTERPRETIVE QUALIFIER[2], AND UNITS[3]	DETECTION LIMIT[3]
5/12/2004	04-SED-006	614679	4783585	006	0410065-06	Cl4-BZ#47	9.97 µg/Kg	0.205 µg/Kg
5/12/2004	04-SED-006	614679	4783585	006	0410065-06	Cl4-BZ#49	9.28 µg/Kg	0.358 µg/Kg
5/12/2004	04-SED-006	614679	4783585	006	0410065-06	Cl4-BZ#52	15.3 J µg/Kg	0.130 µg/Kg
5/12/2004	04-SED-006	614679	4783585	006	0410065-06	Cl4-BZ#56	58.9 µg/Kg	0.572 µg/Kg
5/12/2004	04-SED-006	614679	4783585	006	0410065-06	Cl4-BZ#66	4.05 µg/Kg	0.205 µg/Kg
5/12/2004	04-SED-006	614679	4783585	006	0410065-06	Cl4-BZ#70	7.49 µg/Kg	0.465 µg/Kg
5/12/2004	04-SED-006	614679	4783585	006	0410065-06	Cl4-BZ#74	1.10 µg/Kg	0.130 µg/Kg
5/12/2004	04-SED-006	614679	4783585	006	0410065-06	Cl4-BZ#77	0.251 U µg/Kg	0.251 µg/Kg
5/12/2004	04-SED-006	614679	4783585	006	0410065-06	Cl4-BZ#81	0.270 U µg/Kg	0.270 µg/Kg
5/12/2004	04-SED-006	614679	4783585	006	0410065-06	Cl5-BZ#87	4.67 µg/Kg	0.158 µg/Kg
5/12/2004	04-SED-006	614679	4783585	006	0410065-06	Cl5-BZ#95	5.63 µg/Kg	0.0604 µg/Kg
5/12/2004	04-SED-006	614679	4783585	006	0410065-06	Cl5-BZ#99	6.36 µg/Kg	0.0883 µg/Kg
5/12/2004	04-SED-006	614679	4783585	006	0410065-06	Cl5-BZ#101	10.4 µg/Kg	0.107 µg/Kg
5/12/2004	04-SED-006	614679	4783585	006	0410065-06	Cl5-BZ#105	5.02 µg/Kg	0.158 µg/Kg
5/12/2004	04-SED-006	614679	4783585	006	0410065-06	Cl5-BZ#110	11.7 µg/Kg	0.107 µg/Kg
5/12/2004	04-SED-006	614679	4783585	006	0410065-06	Cl5-BZ#114	0.0465 U µg/Kg	0.0465 µg/Kg
5/12/2004	04-SED-006	614679	4783585	006	0410065-06	Cl5-BZ#118	12.0 µg/Kg	0.284 µg/Kg
5/12/2004	04-SED-006	614679	4783585	006	0410065-06	Cl5-BZ#123	0.158 U µg/Kg	0.158 µg/Kg
5/12/2004	04-SED-006	614679	4783585	006	0410065-06	Cl5-BZ#126	0.121 U µg/Kg	0.121 µg/Kg
5/12/2004	04-SED-006	614679	4783585	006	0410065-06	Cl6-BZ#128	2.23 µg/Kg	0.418 µg/Kg
5/12/2004	04-SED-006	614679	4783585	006	0410065-06	Cl6-BZ#138	11.1 µg/Kg	0.223 µg/Kg
5/12/2004	04-SED-006	614679	4783585	006	0410065-06	Cl6-BZ#146	1.54 µg/Kg	0.0930 µg/Kg
5/12/2004	04-SED-006	614679	4783585	006	0410065-06	Cl6-BZ#149	5.78 µg/Kg	0.149 µg/Kg
5/12/2004	04-SED-006	614679	4783585	006	0410065-06	Cl6-BZ#151	1.02 µg/Kg	0.181 µg/Kg
5/12/2004	04-SED-006	614679	4783585	006	0410065-06	Cl6-BZ#153	7.46 µg/Kg	0.270 µg/Kg
5/12/2004	04-SED-006	614679	4783585	006	0410065-06	Cl6-BZ#156	1.10 J µg/Kg	0.335 µg/Kg
5/12/2004	04-SED-006	614679	4783585	006	0410065-06	Cl6-BZ#157	0.335 J µg/Kg	0.325 µg/Kg
5/12/2004	04-SED-006	614679	4783585	006	0410065-06	Cl6-BZ#158	0.762 µg/Kg	0.0883 µg/Kg
5/12/2004	04-SED-006	614679	4783585	006	0410065-06	Cl6-BZ#167	0.484 J µg/Kg	0.116 µg/Kg
5/12/2004	04-SED-006	614679	4783585	006	0410065-06	Cl6-BZ#169	0.344 U µg/Kg	0.344 µg/Kg
5/12/2004	04-SED-006	614679	4783585	006	0410065-06	Cl7-BZ#170	4.72 µg/Kg	0.167 µg/Kg
5/12/2004	04-SED-006	614679	4783585	006	0410065-06	Cl7-BZ#174	1.64 µg/Kg	0.112 µg/Kg
5/12/2004	04-SED-006	614679	4783585	006	0410065-06	Cl7-BZ#177	1.17 µg/Kg	0.0744 µg/Kg

[1]BZ# = PCB congener Ballschmiter & Zell number
[2]U = Not detected at the detection limit (DL)
J/UJ = Estimated result or DL
NJ = Tentative identification
[3]PCB results & DL on a dry weight basis

SAMPLING DATE	FIELD ID	EASTING (NAD83 UTM18N)	NORTHING (NAD83 UTM18N)	SITE NUMBER	LAB ID	ANALYTE[1]	VALUE, INTERPRETIVE QUALIFIER[2], AND UNITS[3]		DETECTION LIMIT[3]
5/12/2004	04-SED-006	614679	4783585	006	0410065-06	Cl7-BZ#180	5.48	µg/Kg	0.153 µg/Kg
5/12/2004	04-SED-006	614679	4783585	006	0410065-06	Cl7-BZ#183	0.595 J	µg/Kg	0.149 µg/Kg
5/12/2004	04-SED-006	614679	4783585	006	0410065-06	Cl7-BZ#189	0.177 U	µg/Kg	0.177 µg/Kg
5/12/2004	04-SED-006	614679	4783585	006	0410065-06	Cl7-BZ#187	1.56	µg/Kg	0.153 µg/Kg
5/12/2004	04-SED-006	614679	4783585	006	0410065-06	Cl8-BZ#194	0.167 U	µg/Kg	0.167 µg/Kg
5/12/2004	04-SED-006	614679	4783585	006	0410065-06	Cl8-BZ#195	0.167 U	µg/Kg	0.167 µg/Kg
5/12/2004	04-SED-006	614679	4783585	006	0410065-06	Cl8-BZ#201	0.200 U	µg/Kg	0.200 µg/Kg
5/12/2004	04-SED-006	614679	4783585	006	0410065-06	Cl9-BZ#206	0.256 U	µg/Kg	0.256 µg/Kg
5/12/2004	04-SED-006	614679	4783585	006	0410065-06	Cl10-BZ#209	0.0697 U	µg/Kg	0.0697 µg/Kg
5/12/2004	04-SED-006	614679	4783585	006	0410065-06	Monochlorobiphenyls	0.121 U	µg/Kg	0.121 µg/Kg
5/12/2004	04-SED-006	614679	4783585	006	0410065-06	Dichlorobiphenyls	0.744 U	µg/Kg	0.744 µg/Kg
5/12/2004	04-SED-006	614679	4783585	006	0410065-06	Trichlorobiphenyls	138	µg/Kg	0.209 µg/Kg
5/12/2004	04-SED-006	614679	4783585	006	0410065-06	Tetrachlorobiphenyls	195	µg/Kg	0.339 µg/Kg
5/12/2004	04-SED-006	614679	4783585	006	0410065-06	Pentachlorobiphenyls	106	µg/Kg	0.158 µg/Kg
5/12/2004	04-SED-006	614679	4783585	006	0410065-06	Hexachlorobiphenyls	45.5	µg/Kg	0.284 µg/Kg
5/12/2004	04-SED-006	614679	4783585	006	0410065-06	Heptachlorobiphenyls	20.5	µg/Kg	0.0976 µg/Kg
5/12/2004	04-SED-006	614679	4783585	006	0410065-06	Octachlorobiphenyls	0.140 U	µg/Kg	0.140 µg/Kg
5/12/2004	04-SED-006	614679	4783585	006	0410065-06	Nonachlorobiphenyls	0.256 U	µg/Kg	0.256 µg/Kg
5/12/2004	04-SED-006	614679	4783585	006	0410065-06	Decachlorobiphenyl	0.0697 U	µg/Kg	0.0697 µg/Kg
5/12/2004	04-SED-006	614679	4783585	006	0410065-06	Total Homologues	494	µg/Kg	0.744 µg/Kg
5/12/2004	04-SED-006	614679	4783585	006	0410065-06	Percent Moisture	76	%	0.10 %
5/12/2004	04-SED-006	614679	4783585	006	0410065-06	Total Organic Carbon	6.5	%	0.01 %
5/12/2004	04-SED-006	614679	4783585	006	0410065-06	Gravel	1.25	%	0.01 %
5/12/2004	04-SED-006	614679	4783585	006	0410065-06	Coarse Sand	12.31	%	0.01 %
5/12/2004	04-SED-006	614679	4783585	006	0410065-06	Medium Sand	39.49	%	0.01 %
5/12/2004	04-SED-006	614679	4783585	006	0410065-06	Fine Sand	22.38	%	0.01 %
5/12/2004	04-SED-006	614679	4783585	006	0410065-06	Silt/Clay	24.98	%	0.01 %
5/12/2004	04-SED-007	614747	4783173	007	0410065-07	Cl2-BZ#8	0.559 U	µg/Kg	0.559 µg/Kg
5/12/2004	04-SED-007	614747	4783173	007	0410065-07	Cl3-BZ#18	1.26 J	µg/Kg	0.399 µg/Kg
5/12/2004	04-SED-007	614747	4783173	007	0410065-07	Cl3-BZ#31/#28	27.5	µg/Kg	0.189 µg/Kg
5/12/2004	04-SED-007	614747	4783173	007	0410065-07	Cl4-BZ#44	1.44	µg/Kg	0.241 µg/Kg
5/12/2004	04-SED-007	614747	4783173	007	0410065-07	Cl4-BZ#45	0.0944 U	µg/Kg	0.0944 µg/Kg
5/12/2004	04-SED-007	614747	4783173	007	0410065-07	Cl4-BZ#47	4.69	µg/Kg	0.154 µg/Kg

[1]BZ# = PCB congener Ballschmiter & Zell number
[2]U = Not detected at the detection limit (DL)
J/UJ = Estimated result or DL
NJ = Tentative identification
[3]PCB results & DL on a dry weight basis

SAMPLING DATE	FIELD ID	EASTING (NAD83 UTM18N)	NORTHING (NAD83 UTM18N)	SITE NUMBER	LAB ID	ANALYTE[1]	VALUE, INTERPRETIVE QUALIFIER[2], AND UNITS[3]	DETECTION LIMIT[3]
5/12/2004	04-SED-007	614747	4783173	007	0410065-07	Cl4-BZ#49	5.82 µg/Kg	0.269 µg/Kg
5/12/2004	04-SED-007	614747	4783173	007	0410065-07	Cl4-BZ#52	6.21 J µg/Kg	0.0979 µg/Kg
5/12/2004	04-SED-007	614747	4783173	007	0410065-07	Cl4-BZ#56	30.8 µg/Kg	0.430 µg/Kg
5/12/2004	04-SED-007	614747	4783173	007	0410065-07	Cl4-BZ#66	8.00 µg/Kg	0.154 µg/Kg
5/12/2004	04-SED-007	614747	4783173	007	0410065-07	Cl4-BZ#70	7.52 µg/Kg	0.350 µg/Kg
5/12/2004	04-SED-007	614747	4783173	007	0410065-07	Cl4-BZ#74	2.52 µg/Kg	0.0979 µg/Kg
5/12/2004	04-SED-007	614747	4783173	007	0410065-07	Cl4-BZ#77	2.01 NJ µg/Kg	0.189 µg/Kg
5/12/2004	04-SED-007	614747	4783173	007	0410065-07	Cl4-BZ#81	0.203 U µg/Kg	0.203 µg/Kg
5/12/2004	04-SED-007	614747	4783173	007	0410065-07	Cl5-BZ#87	5.88 µg/Kg	0.119 µg/Kg
5/12/2004	04-SED-007	614747	4783173	007	0410065-07	Cl5-BZ#95	3.54 µg/Kg	0.0455 µg/Kg
5/12/2004	04-SED-007	614747	4783173	007	0410065-07	Cl5-BZ#99	5.50 µg/Kg	0.0664 µg/Kg
5/12/2004	04-SED-007	614747	4783173	007	0410065-07	Cl5-BZ#101	6.59 µg/Kg	0.0804 µg/Kg
5/12/2004	04-SED-007	614747	4783173	007	0410065-07	Cl5-BZ#105	5.83 µg/Kg	0.119 µg/Kg
5/12/2004	04-SED-007	614747	4783173	007	0410065-07	Cl5-BZ#110	7.58 µg/Kg	0.0804 µg/Kg
5/12/2004	04-SED-007	614747	4783173	007	0410065-07	Cl5-BZ#114	0.0350 U µg/Kg	0.0350 µg/Kg
5/12/2004	04-SED-007	614747	4783173	007	0410065-07	Cl5-BZ#118	11.2 µg/Kg	0.213 µg/Kg
5/12/2004	04-SED-007	614747	4783173	007	0410065-07	Cl5-BZ#123	0.119 U µg/Kg	0.119 µg/Kg
5/12/2004	04-SED-007	614747	4783173	007	0410065-07	Cl5-BZ#126	0.0909 U µg/Kg	0.0909 µg/Kg
5/12/2004	04-SED-007	614747	4783173	007	0410065-07	Cl6-BZ#128	1.57 J µg/Kg	0.315 µg/Kg
5/12/2004	04-SED-007	614747	4783173	007	0410065-07	Cl6-BZ#138	7.78 µg/Kg	0.168 µg/Kg
5/12/2004	04-SED-007	614747	4783173	007	0410065-07	Cl6-BZ#146	1.10 µg/Kg	0.0699 µg/Kg
5/12/2004	04-SED-007	614747	4783173	007	0410065-07	Cl6-BZ#149	3.41 µg/Kg	0.112 µg/Kg
5/12/2004	04-SED-007	614747	4783173	007	0410065-07	Cl6-BZ#151	0.797 µg/Kg	0.136 µg/Kg
5/12/2004	04-SED-007	614747	4783173	007	0410065-07	Cl6-BZ#153	5.32 µg/Kg	0.203 µg/Kg
5/12/2004	04-SED-007	614747	4783173	007	0410065-07	Cl6-BZ#156	0.909 J µg/Kg	0.252 µg/Kg
5/12/2004	04-SED-007	614747	4783173	007	0410065-07	Cl6-BZ#157	0.252 J µg/Kg	0.245 µg/Kg
5/12/2004	04-SED-007	614747	4783173	007	0410065-07	Cl6-BZ#158	0.504 µg/Kg	0.0664 µg/Kg
5/12/2004	04-SED-007	614747	4783173	007	0410065-07	Cl6-BZ#167	0.378 J µg/Kg	0.0874 µg/Kg
5/12/2004	04-SED-007	614747	4783173	007	0410065-07	Cl6-BZ#169	0.259 U µg/Kg	0.259 µg/Kg
5/12/2004	04-SED-007	614747	4783173	007	0410065-07	Cl7-BZ#170	3.64 µg/Kg	0.126 µg/Kg
5/12/2004	04-SED-007	614747	4783173	007	0410065-07	Cl7-BZ#174	1.06 µg/Kg	0.0839 µg/Kg
5/12/2004	04-SED-007	614747	4783173	007	0410065-07	Cl7-BZ#177	0.587 µg/Kg	0.0560 µg/Kg
5/12/2004	04-SED-007	614747	4783173	007	0410065-07	Cl7-BZ#180	2.94 µg/Kg	0.115 µg/Kg

[1]BZ# = PCB congener Ballschmiter & Zell number
[2]U = Not detected at the detection limit (DL)
J/UJ = Estimated result or DL
NJ = Tentative identification
[3]PCB results & DL on a dry weight basis

SAMPLING DATE	FIELD ID	EASTING (NAD83 UTM18N)	NORTHING (NAD83 UTM18N)	SITE NUMBER	LAB ID	ANALYTE[1]	VALUE, INTERPRETIVE QUALIFIER[2], AND UNITS[3]		DETECTION LIMIT[3]
5/12/2004	04-SED-007	614747	4783173	007	0410065-07	Cl7-BZ#183	0.559 J	µg/Kg	0.112 µg/Kg
5/12/2004	04-SED-007	614747	4783173	007	0410065-07	Cl7-BZ#189	0.133 U	µg/Kg	0.133 µg/Kg
5/12/2004	04-SED-007	614747	4783173	007	0410065-07	Cl7-BZ#187	1.13	µg/Kg	0.115 µg/Kg
5/12/2004	04-SED-007	614747	4783173	007	0410065-07	Cl8-BZ#194	0.126 U	µg/Kg	0.126 µg/Kg
5/12/2004	04-SED-007	614747	4783173	007	0410065-07	Cl8-BZ#195	0.126 U	µg/Kg	0.126 µg/Kg
5/12/2004	04-SED-007	614747	4783173	007	0410065-07	Cl8-BZ#201	0.150 U	µg/Kg	0.150 µg/Kg
5/12/2004	04-SED-007	614747	4783173	007	0410065-07	Cl9-BZ#206	0.192 U	µg/Kg	0.192 µg/Kg
5/12/2004	04-SED-007	614747	4783173	007	0410065-07	Cl10-BZ#209	0.0525 U	µg/Kg	0.0525 µg/Kg
5/12/2004	04-SED-007	614747	4783173	007	0410065-07	Monochlorobiphenyls	0.839	µg/Kg	0.0909 µg/Kg
5/12/2004	04-SED-007	614747	4783173	007	0410065-07	Dichlorobiphenyls	19.2	µg/Kg	0.559 µg/Kg
5/12/2004	04-SED-007	614747	4783173	007	0410065-07	Trichlorobiphenyls	40.4	µg/Kg	0.157 µg/Kg
5/12/2004	04-SED-007	614747	4783173	007	0410065-07	Tetrachlorobiphenyls	126	µg/Kg	0.255 µg/Kg
5/12/2004	04-SED-007	614747	4783173	007	0410065-07	Pentachlorobiphenyls	77.8	µg/Kg	0.119 µg/Kg
5/12/2004	04-SED-007	614747	4783173	007	0410065-07	Hexachlorobiphenyls	32.5	µg/Kg	0.213 µg/Kg
5/12/2004	04-SED-007	614747	4783173	007	0410065-07	Heptachlorobiphenyls	11.9	µg/Kg	0.0734 µg/Kg
5/12/2004	04-SED-007	614747	4783173	007	0410065-07	Octachlorobiphenyls	0.105 U	µg/Kg	0.105 µg/Kg
5/12/2004	04-SED-007	614747	4783173	007	0410065-07	Nonachlorobiphenyls	0.192 U	µg/Kg	0.192 µg/Kg
5/12/2004	04-SED-007	614747	4783173	007	0410065-07	Decachlorobiphenyl	0.0525 U	µg/Kg	0.0525 µg/Kg
5/12/2004	04-SED-007	614747	4783173	007	0410065-07	Total Homologues	301	µg/Kg	0.559 µg/Kg
5/12/2004	04-SED-007	614747	4783173	007	0410065-07	Percent Moisture	68	%	0.10 %
5/12/2004	04-SED-007	614747	4783173	007	0410065-07	Total Organic Carbon	8.1	%	0.01 %
5/12/2004	04-SED-007	614747	4783173	007	0410065-07	Gravel	2.25	%	0.01 %
5/12/2004	04-SED-007	614747	4783173	007	0410065-07	Coarse Sand	8.32	%	0.01 %
5/12/2004	04-SED-007	614747	4783173	007	0410065-07	Medium Sand	24.61	%	0.01 %
5/12/2004	04-SED-007	614747	4783173	007	0410065-07	Fine Sand	40.11	%	0.01 %
5/12/2004	04-SED-007	614747	4783173	007	0410065-07	Silt/Clay	24.84	%	0.01 %
5/12/2004	04-SED-008	615111	4785900	008	0410065-08	Cl2-BZ#8	1430	µg/Kg	2.94 µg/Kg
5/12/2004	04-SED-008	615111	4785900	008	0410065-08	Cl3-BZ#18	644	µg/Kg	2.10 µg/Kg
5/12/2004	04-SED-008	615111	4785900	008	0410065-08	Cl3-BZ#31/#28	2230	µg/Kg	0.993 µg/Kg
5/12/2004	04-SED-008	615111	4785900	008	0410065-08	Cl4-BZ#44	269	µg/Kg	1.27 µg/Kg
5/12/2004	04-SED-008	615111	4785900	008	0410065-08	Cl4-BZ#45	159	µg/Kg	0.496 µg/Kg
5/12/2004	04-SED-008	615111	4785900	008	0410065-08	Cl4-BZ#47	951	µg/Kg	0.809 µg/Kg
5/12/2004	04-SED-008	615111	4785900	008	0410065-08	Cl4-BZ#49	1130	µg/Kg	1.42 µg/Kg

[1]BZ# = PCB congener Ballschmiter & Zell number
[2]U = Not detected at the detection limit (DL)
J/UJ = Estimated result or DL
NJ = Tentative identification
[3]PCB results & DL on a dry weight basis

SAMPLING DATE	FIELD ID	EASTING (NAD83 UTM18N)	NORTHING (NAD83 UTM18N)	SITE NUMBER	LAB ID	ANALYTE[1]	VALUE, INTERPRETIVE QUALIFIER[2], AND UNITS[3]	DETECTION LIMIT[3]
5/12/2004	04-SED-008	615111	4785900	008	0410065-08	Cl4-BZ#52	1410 J µg/Kg	0.515 µg/Kg
5/12/2004	04-SED-008	615111	4785900	008	0410065-08	Cl4-BZ#56	198 µg/Kg	2.26 µg/Kg
5/12/2004	04-SED-008	615111	4785900	008	0410065-08	Cl4-BZ#66	326 µg/Kg	0.809 µg/Kg
5/12/2004	04-SED-008	615111	4785900	008	0410065-08	Cl4-BZ#70	295 µg/Kg	1.84 µg/Kg
5/12/2004	04-SED-008	615111	4785900	008	0410065-08	Cl4-BZ#74	307 µg/Kg	0.515 µg/Kg
5/12/2004	04-SED-008	615111	4785900	008	0410065-08	Cl4-BZ#77	102 NJ µg/Kg	0.993 µg/Kg
5/12/2004	04-SED-008	615111	4785900	008	0410065-08	Cl4-BZ#81	1.07 U µg/Kg	1.07 µg/Kg
5/12/2004	04-SED-008	615111	4785900	008	0410065-08	Cl5-BZ#87	113 µg/Kg	0.625 µg/Kg
5/12/2004	04-SED-008	615111	4785900	008	0410065-08	Cl5-BZ#95	288 µg/Kg	0.239 µg/Kg
5/12/2004	04-SED-008	615111	4785900	008	0410065-08	Cl5-BZ#99	159 µg/Kg	0.349 µg/Kg
5/12/2004	04-SED-008	615111	4785900	008	0410065-08	Cl5-BZ#101	204 µg/Kg	0.423 µg/Kg
5/12/2004	04-SED-008	615111	4785900	008	0410065-08	Cl5-BZ#105	87.9 µg/Kg	0.625 µg/Kg
5/12/2004	04-SED-008	615111	4785900	008	0410065-08	Cl5-BZ#110	308 µg/Kg	0.423 µg/Kg
5/12/2004	04-SED-008	615111	4785900	008	0410065-08	Cl5-BZ#114	11.9 µg/Kg	0.184 µg/Kg
5/12/2004	04-SED-008	615111	4785900	008	0410065-08	Cl5-BZ#118	196 µg/Kg	1.12 µg/Kg
5/12/2004	04-SED-008	615111	4785900	008	0410065-08	Cl5-BZ#123	0.625 U µg/Kg	0.625 µg/Kg
5/12/2004	04-SED-008	615111	4785900	008	0410065-08	Cl5-BZ#126	0.478 U µg/Kg	0.478 µg/Kg
5/12/2004	04-SED-008	615111	4785900	008	0410065-08	Cl6-BZ#128	26.8 µg/Kg	1.65 µg/Kg
5/12/2004	04-SED-008	615111	4785900	008	0410065-08	Cl6-BZ#138	161 µg/Kg	0.882 µg/Kg
5/12/2004	04-SED-008	615111	4785900	008	0410065-08	Cl6-BZ#146	24.8 µg/Kg	0.368 µg/Kg
5/12/2004	04-SED-008	615111	4785900	008	0410065-08	Cl6-BZ#149	114 µg/Kg	0.588 µg/Kg
5/12/2004	04-SED-008	615111	4785900	008	0410065-08	Cl6-BZ#151	56.0 µg/Kg	0.717 µg/Kg
5/12/2004	04-SED-008	615111	4785900	008	0410065-08	Cl6-BZ#153	91.3 µg/Kg	1.07 µg/Kg
5/12/2004	04-SED-008	615111	4785900	008	0410065-08	Cl6-BZ#156	15.9 µg/Kg	1.32 µg/Kg
5/12/2004	04-SED-008	615111	4785900	008	0410065-08	Cl6-BZ#157	3.53 J µg/Kg	1.29 µg/Kg
5/12/2004	04-SED-008	615111	4785900	008	0410065-08	Cl6-BZ#158	10.7 µg/Kg	0.349 µg/Kg
5/12/2004	04-SED-008	615111	4785900	008	0410065-08	Cl6-BZ#167	5.88 µg/Kg	0.460 µg/Kg
5/12/2004	04-SED-008	615111	4785900	008	0410065-08	Cl6-BZ#169	1.36 U µg/Kg	1.36 µg/Kg
5/12/2004	04-SED-008	615111	4785900	008	0410065-08	Cl7-BZ#170	27.9 µg/Kg	0.662 µg/Kg
5/12/2004	04-SED-008	615111	4785900	008	0410065-08	Cl7-BZ#174	21.3 µg/Kg	0.441 µg/Kg
5/12/2004	04-SED-008	615111	4785900	008	0410065-08	Cl7-BZ#177	16.8 µg/Kg	0.294 µg/Kg
5/12/2004	04-SED-008	615111	4785900	008	0410065-08	Cl7-BZ#180	42.6 µg/Kg	0.607 µg/Kg
5/12/2004	04-SED-008	615111	4785900	008	0410065-08	Cl7-BZ#183	11.5 µg/Kg	0.588 µg/Kg

[1]BZ# = PCB congener Ballschmiter & Zell number
[2]U = Not detected at the detection limit (DL)
J/UJ = Estimated result or DL
NJ = Tentative identification
[3]PCB results & DL on a dry weight basis

SAMPLING DATE	FIELD ID	EASTING (NAD83 UTM18N)	NORTHING (NAD83 UTM18N)	SITE NUMBER	LAB ID	ANALYTE[1]	VALUE, INTERPRETIVE QUALIFIER[2], AND UNITS[3]		DETECTION LIMIT[3]
5/12/2004	04-SED-008	615111	4785900	008	0410065-08	Cl7-BZ#189	0.698 U	µg/Kg	0.698 µg/Kg
5/12/2004	04-SED-008	615111	4785900	008	0410065-08	Cl7-BZ#187	42.0	µg/Kg	0.607 µg/Kg
5/12/2004	04-SED-008	615111	4785900	008	0410065-08	Cl8-BZ#194	12.9	µg/Kg	0.662 µg/Kg
5/12/2004	04-SED-008	615111	4785900	008	0410065-08	Cl8-BZ#195	5.51	µg/Kg	0.662 µg/Kg
5/12/2004	04-SED-008	615111	4785900	008	0410065-08	Cl8-BZ#201	19.4	µg/Kg	0.790 µg/Kg
5/12/2004	04-SED-008	615111	4785900	008	0410065-08	Cl9-BZ#206	9.41	µg/Kg	1.01 µg/Kg
5/12/2004	04-SED-008	615111	4785900	008	0410065-08	Cl10-BZ#209	3.60	µg/Kg	0.276 µg/Kg
5/12/2004	04-SED-008	615111	4785900	008	0410065-08	Monochlorobiphenyls	1400	µg/Kg	0.478 µg/Kg
5/12/2004	04-SED-008	615111	4785900	008	0410065-08	Dichlorobiphenyls	5450	µg/Kg	2.94 µg/Kg
5/12/2004	04-SED-008	615111	4785900	008	0410065-08	Trichlorobiphenyls	7760	µg/Kg	0.827 µg/Kg
5/12/2004	04-SED-008	615111	4785900	008	0410065-08	Tetrachlorobiphenyls	9700	µg/Kg	1.34 µg/Kg
5/12/2004	04-SED-008	615111	4785900	008	0410065-08	Pentachlorobiphenyls	2580	µg/Kg	0.625 µg/Kg
5/12/2004	04-SED-008	615111	4785900	008	0410065-08	Hexachlorobiphenyls	851	µg/Kg	1.12 µg/Kg
5/12/2004	04-SED-008	615111	4785900	008	0410065-08	Heptachlorobiphenyls	187	µg/Kg	0.386 µg/Kg
5/12/2004	04-SED-008	615111	4785900	008	0410065-08	Octachlorobiphenyls	63.7	µg/Kg	0.551 µg/Kg
5/12/2004	04-SED-008	615111	4785900	008	0410065-08	Nonachlorobiphenyls	36.8	µg/Kg	1.01 µg/Kg
5/12/2004	04-SED-008	615111	4785900	008	0410065-08	Decachlorobiphenyl	3.60	µg/Kg	0.276 µg/Kg
5/12/2004	04-SED-008	615111	4785900	008	0410065-08	Total Homologues	27800	µg/Kg	2.94 µg/Kg
5/12/2004	04-SED-008	615111	4785900	008	0410065-08	Percent Moisture	74	%	0.10 %
5/12/2004	04-SED-008	615111	4785900	008	0410065-08	Total Organic Carbon	3.1	%	0.01 %
5/12/2004	04-SED-008	615111	4785900	008	0410065-08	Gravel	1.05	%	0.01 %
5/12/2004	04-SED-008	615111	4785900	008	0410065-08	Coarse Sand	0.94	%	0.01 %
5/12/2004	04-SED-008	615111	4785900	008	0410065-08	Medium Sand	7.68	%	0.01 %
5/12/2004	04-SED-008	615111	4785900	008	0410065-08	Fine Sand	41.28	%	0.01 %
5/12/2004	04-SED-008	615111	4785900	008	0410065-08	Silt/Clay	49.06	%	0.01 %
5/12/2004	04-SED-009	614729	4766095	009	0410065-09	Cl2-BZ#8	3.42	µg/Kg	0.365 µg/Kg
5/12/2004	04-SED-009	614729	4766095	009	0410065-09	Cl3-BZ#18	2.46	µg/Kg	0.260 µg/Kg
5/12/2004	04-SED-009	614729	4766095	009	0410065-09	Cl3-BZ#31/#28	49.4	µg/Kg	0.123 µg/Kg
5/12/2004	04-SED-009	614729	4766095	009	0410065-09	Cl4-BZ#44	6.50	µg/Kg	0.158 µg/Kg
5/12/2004	04-SED-009	614729	4766095	009	0410065-09	Cl4-BZ#45	0.786	µg/Kg	0.0617 µg/Kg
5/12/2004	04-SED-009	614729	4766095	009	0410065-09	Cl4-BZ#47	8.18	µg/Kg	0.101 µg/Kg
5/12/2004	04-SED-009	614729	4766095	009	0410065-09	Cl4-BZ#49	17.3	µg/Kg	0.176 µg/Kg
5/12/2004	04-SED-009	614729	4766095	009	0410065-09	Cl4-BZ#52	29.7 J	µg/Kg	0.0640 µg/Kg

[1]BZ# = PCB congener Ballschmiter & Zell number
[2]U = Not detected at the detection limit (DL)
J/UJ = Estimated result or DL
NJ = Tentative identification
[3]PCB results & DL on a dry weight basis

SAMPLING DATE	FIELD ID	EASTING (NAD83 UTM18N)	NORTHING (NAD83 UTM18N)	SITE NUMBER	LAB ID	ANALYTE[1]	VALUE, INTERPRETIVE QUALIFIER[2], AND UNITS[3]	DETECTION LIMIT[3]
5/12/2004	04-SED-009	614729	4766095	009	0410065-09	Cl4-BZ#56	20.6 µg/Kg	0.281 µg/Kg
5/12/2004	04-SED-009	614729	4766095	009	0410065-09	Cl4-BZ#66	36.3 µg/Kg	0.101 µg/Kg
5/12/2004	04-SED-009	614729	4766095	009	0410065-09	Cl4-BZ#70	31.4 µg/Kg	0.228 µg/Kg
5/12/2004	04-SED-009	614729	4766095	009	0410065-09	Cl4-BZ#74	15.6 µg/Kg	0.0640 µg/Kg
5/12/2004	04-SED-009	614729	4766095	009	0410065-09	Cl4-BZ#77	4.03 NJ µg/Kg	0.123 µg/Kg
5/12/2004	04-SED-009	614729	4766095	009	0410065-09	Cl4-BZ#81	0.132 U µg/Kg	0.132 µg/Kg
5/12/2004	04-SED-009	614729	4766095	009	0410065-09	Cl5-BZ#87	13.4 µg/Kg	0.0777 µg/Kg
5/12/2004	04-SED-009	614729	4766095	009	0410065-09	Cl5-BZ#95	17.1 µg/Kg	0.0297 µg/Kg
5/12/2004	04-SED-009	614729	4766095	009	0410065-09	Cl5-BZ#99	18.8 µg/Kg	0.0434 µg/Kg
5/12/2004	04-SED-009	614729	4766095	009	0410065-09	Cl5-BZ#101	31.2 µg/Kg	0.0525 µg/Kg
5/12/2004	04-SED-009	614729	4766095	009	0410065-09	Cl5-BZ#105	15.3 µg/Kg	0.0777 µg/Kg
5/12/2004	04-SED-009	614729	4766095	009	0410065-09	Cl5-BZ#110	33.3 µg/Kg	0.0525 µg/Kg
5/12/2004	04-SED-009	614729	4766095	009	0410065-09	Cl5-BZ#114	1.03 µg/Kg	0.0228 µg/Kg
5/12/2004	04-SED-009	614729	4766095	009	0410065-09	Cl5-BZ#118	36.2 µg/Kg	0.139 µg/Kg
5/12/2004	04-SED-009	614729	4766095	009	0410065-09	Cl5-BZ#123	0.0777 U µg/Kg	0.0777 µg/Kg
5/12/2004	04-SED-009	614729	4766095	009	0410065-09	Cl5-BZ#126	0.0594 U µg/Kg	0.0594 µg/Kg
5/12/2004	04-SED-009	614729	4766095	009	0410065-09	Cl6-BZ#128	5.84 µg/Kg	0.206 µg/Kg
5/12/2004	04-SED-009	614729	4766095	009	0410065-09	Cl6-BZ#138	30.0 µg/Kg	0.110 µg/Kg
5/12/2004	04-SED-009	614729	4766095	009	0410065-09	Cl6-BZ#146	3.74 µg/Kg	0.0457 µg/Kg
5/12/2004	04-SED-009	614729	4766095	009	0410065-09	Cl6-BZ#149	15.1 µg/Kg	0.0731 µg/Kg
5/12/2004	04-SED-009	614729	4766095	009	0410065-09	Cl6-BZ#151	3.37 µg/Kg	0.0891 µg/Kg
5/12/2004	04-SED-009	614729	4766095	009	0410065-09	Cl6-BZ#153	18.6 µg/Kg	0.132 µg/Kg
5/12/2004	04-SED-009	614729	4766095	009	0410065-09	Cl6-BZ#156	3.11 µg/Kg	0.164 µg/Kg
5/12/2004	04-SED-009	614729	4766095	009	0410065-09	Cl6-BZ#157	0.566 J µg/Kg	0.160 µg/Kg
5/12/2004	04-SED-009	614729	4766095	009	0410065-09	Cl6-BZ#158	1.86 µg/Kg	0.0434 µg/Kg
5/12/2004	04-SED-009	614729	4766095	009	0410065-09	Cl6-BZ#167	1.24 µg/Kg	0.0571 µg/Kg
5/12/2004	04-SED-009	614729	4766095	009	0410065-09	Cl6-BZ#169	0.169 U µg/Kg	0.169 µg/Kg
5/12/2004	04-SED-009	614729	4766095	009	0410065-09	Cl7-BZ#170	4.70 µg/Kg	0.0822 µg/Kg
5/12/2004	04-SED-009	614729	4766095	009	0410065-09	Cl7-BZ#174	2.33 µg/Kg	0.0548 µg/Kg
5/12/2004	04-SED-009	614729	4766095	009	0410065-09	Cl7-BZ#177	1.35 µg/Kg	0.0365 µg/Kg
5/12/2004	04-SED-009	614729	4766095	009	0410065-09	Cl7-BZ#180	4.53 µg/Kg	0.0754 µg/Kg
5/12/2004	04-SED-009	614729	4766095	009	0410065-09	Cl7-BZ#183	0.932 µg/Kg	0.0731 µg/Kg
5/12/2004	04-SED-009	614729	4766095	009	0410065-09	Cl7-BZ#189	0.0868 U µg/Kg	0.0868 µg/Kg

[1]BZ# = PCB congener Ballschmiter & Zell number
[2]U = Not detected at the detection limit (DL)
J/UJ = Estimated result or DL
NJ = Tentative identification
[3]PCB results & DL on a dry weight basis

SAMPLING DATE	FIELD ID	EASTING (NAD83 UTM18N)	NORTHING (NAD83 UTM18N)	SITE NUMBER	LAB ID	ANALYTE[1]	VALUE, INTERPRETIVE QUALIFIER[2], AND UNITS[3]		DETECTION LIMIT[3]
5/12/2004	04-SED-009	614729	4766095	009	0410065-09	Cl7-BZ#187	2.82	µg/Kg	0.0754 µg/Kg
5/12/2004	04-SED-009	614729	4766095	009	0410065-09	Cl8-BZ#194	0.0822 U	µg/Kg	0.0822 µg/Kg
5/12/2004	04-SED-009	614729	4766095	009	0410065-09	Cl8-BZ#195	0.0822 U	µg/Kg	0.0822 µg/Kg
5/12/2004	04-SED-009	614729	4766095	009	0410065-09	Cl8-BZ#201	0.0982 U	µg/Kg	0.0982 µg/Kg
5/12/2004	04-SED-009	614729	4766095	009	0410065-09	Cl9-BZ#206	0.126 U	µg/Kg	0.126 µg/Kg
5/12/2004	04-SED-009	614729	4766095	009	0410065-09	Cl10-BZ#209	0.0343 U	µg/Kg	0.0343 µg/Kg
5/12/2004	04-SED-009	614729	4766095	009	0410065-09	Monochlorobiphenyls	4.70	µg/Kg	0.0594 µg/Kg
5/12/2004	04-SED-009	614729	4766095	009	0410065-09	Dichlorobiphenyls	22.7	µg/Kg	0.365 µg/Kg
5/12/2004	04-SED-009	614729	4766095	009	0410065-09	Trichlorobiphenyls	78.0	µg/Kg	0.103 µg/Kg
5/12/2004	04-SED-009	614729	4766095	009	0410065-09	Tetrachlorobiphenyls	276	µg/Kg	0.167 µg/Kg
5/12/2004	04-SED-009	614729	4766095	009	0410065-09	Pentachlorobiphenyls	260	µg/Kg	0.0777 µg/Kg
5/12/2004	04-SED-009	614729	4766095	009	0410065-09	Hexachlorobiphenyls	116	µg/Kg	0.139 µg/Kg
5/12/2004	04-SED-009	614729	4766095	009	0410065-09	Heptachlorobiphenyls	20.8	µg/Kg	0.0480 µg/Kg
5/12/2004	04-SED-009	614729	4766095	009	0410065-09	Octachlorobiphenyls	0.0685 U	µg/Kg	0.0685 µg/Kg
5/12/2004	04-SED-009	614729	4766095	009	0410065-09	Nonachlorobiphenyls	0.126 U	µg/Kg	0.126 µg/Kg
5/12/2004	04-SED-009	614729	4766095	009	0410065-09	Decachlorobiphenyl	0.0343 U	µg/Kg	0.0343 µg/Kg
5/12/2004	04-SED-009	614729	4766095	009	0410065-09	Total Homologues	749	µg/Kg	0.365 µg/Kg
5/12/2004	04-SED-009	614729	4766095	009	0410065-09	Percent Moisture	49	%	0.10 %
5/12/2004	04-SED-009	614729	4766095	009	0410065-09	Total Organic Carbon	5.5	%	0.01 %
5/12/2004	04-SED-009	614729	4766095	009	0410065-09	Gravel	0.70	%	0.01 %
5/12/2004	04-SED-009	614729	4766095	009	0410065-09	Coarse Sand	17.70	%	0.01 %
5/12/2004	04-SED-009	614729	4766095	009	0410065-09	Medium Sand	36.79	%	0.01 %
5/12/2004	04-SED-009	614729	4766095	009	0410065-09	Fine Sand	21.66	%	0.01 %
5/12/2004	04-SED-009	614729	4766095	009	0410065-09	Silt/Clay	23.04	%	0.01 %
5/12/2004	04-SED-010	614874	4766577	010	0410065-10	Cl2-BZ#8	16.3 J	µg/Kg	0.436 µg/Kg
5/12/2004	04-SED-010	614874	4766577	010	0410065-10	Cl3-BZ#18	10.4	µg/Kg	0.311 µg/Kg
5/12/2004	04-SED-010	614874	4766577	010	0410065-10	Cl3-BZ#31/#28	81.6 J	µg/Kg	0.147 µg/Kg
5/12/2004	04-SED-010	614874	4766577	010	0410065-10	Cl4-BZ#44	13.9 J	µg/Kg	0.188 µg/Kg
5/12/2004	04-SED-010	614874	4766577	010	0410065-10	Cl4-BZ#45	3.56	µg/Kg	0.0736 µg/Kg
5/12/2004	04-SED-010	614874	4766577	010	0410065-10	Cl4-BZ#47	29.2 J	µg/Kg	0.120 µg/Kg
5/12/2004	04-SED-010	614874	4766577	010	0410065-10	Cl4-BZ#49	35.3 J	µg/Kg	0.210 µg/Kg
5/12/2004	04-SED-010	614874	4766577	010	0410065-10	Cl4-BZ#52	39.8 J	µg/Kg	0.0763 µg/Kg
5/12/2004	04-SED-010	614874	4766577	010	0410065-10	Cl4-BZ#56	21.8 J	µg/Kg	0.335 µg/Kg

[1]BZ# = PCB congener Ballschmiter & Zell number
[2]U = Not detected at the detection limit (DL)
J/UJ = Estimated result or DL
NJ = Tentative identification
[3]PCB results & DL on a dry weight basis

SAMPLING DATE	FIELD ID	EASTING (NAD83 UTM18N)	NORTHING (NAD83 UTM18N)	SITE NUMBER	LAB ID	ANALYTE[1]	VALUE, INTERPRETIVE QUALIFIER[2], AND UNITS[3]	DETECTION LIMIT[3]
5/12/2004	04-SED-010	614874	4766577	010	0410065-10	Cl4-BZ#66	22.9 J µg/Kg	0.120 µg/Kg
5/12/2004	04-SED-010	614874	4766577	010	0410065-10	Cl4-BZ#70	19.6 J µg/Kg	0.273 µg/Kg
5/12/2004	04-SED-010	614874	4766577	010	0410065-10	Cl4-BZ#74	12.3 J µg/Kg	0.0763 µg/Kg
5/12/2004	04-SED-010	614874	4766577	010	0410065-10	Cl4-BZ#77	4.80 NJ µg/Kg	0.147 µg/Kg
5/12/2004	04-SED-010	614874	4766577	010	0410065-10	Cl4-BZ#81	0.158 U µg/Kg	0.158 µg/Kg
5/12/2004	04-SED-010	614874	4766577	010	0410065-10	Cl5-BZ#87	6.77 J µg/Kg	0.0927 µg/Kg
5/12/2004	04-SED-010	614874	4766577	010	0410065-10	Cl5-BZ#95	12.8 J µg/Kg	0.0354 µg/Kg
5/12/2004	04-SED-010	614874	4766577	010	0410065-10	Cl5-BZ#99	8.35 J µg/Kg	0.0518 µg/Kg
5/12/2004	04-SED-010	614874	4766577	010	0410065-10	Cl5-BZ#101	12.1 J µg/Kg	0.0627 µg/Kg
5/12/2004	04-SED-010	614874	4766577	010	0410065-10	Cl5-BZ#105	6.47 µg/Kg	0.0927 µg/Kg
5/12/2004	04-SED-010	614874	4766577	010	0410065-10	Cl5-BZ#110	17.5 J µg/Kg	0.0627 µg/Kg
5/12/2004	04-SED-010	614874	4766577	010	0410065-10	Cl5-BZ#114	0.633 µg/Kg	0.0273 µg/Kg
5/12/2004	04-SED-010	614874	4766577	010	0410065-10	Cl5-BZ#118	13.6 J µg/Kg	0.166 µg/Kg
5/12/2004	04-SED-010	614874	4766577	010	0410065-10	Cl5-BZ#123	0.0927 U µg/Kg	0.0927 µg/Kg
5/12/2004	04-SED-010	614874	4766577	010	0410065-10	Cl5-BZ#126	0.0709 U µg/Kg	0.0709 µg/Kg
5/12/2004	04-SED-010	614874	4766577	010	0410065-10	Cl6-BZ#128	1.91 µg/Kg	0.245 µg/Kg
5/12/2004	04-SED-010	614874	4766577	010	0410065-10	Cl6-BZ#138	10.8 J µg/Kg	0.131 µg/Kg
5/12/2004	04-SED-010	614874	4766577	010	0410065-10	Cl6-BZ#146	1.93 µg/Kg	0.0545 µg/Kg
5/12/2004	04-SED-010	614874	4766577	010	0410065-10	Cl6-BZ#149	6.64 µg/Kg	0.0873 µg/Kg
5/12/2004	04-SED-010	614874	4766577	010	0410065-10	Cl6-BZ#151	1.92 µg/Kg	0.106 µg/Kg
5/12/2004	04-SED-010	614874	4766577	010	0410065-10	Cl6-BZ#153	6.30 µg/Kg	0.158 µg/Kg
5/12/2004	04-SED-010	614874	4766577	010	0410065-10	Cl6-BZ#156	1.12 J µg/Kg	0.196 µg/Kg
5/12/2004	04-SED-010	614874	4766577	010	0410065-10	Cl6-BZ#157	0.251 J µg/Kg	0.191 µg/Kg
5/12/2004	04-SED-010	614874	4766577	010	0410065-10	Cl6-BZ#158	0.687 J µg/Kg	0.0518 µg/Kg
5/12/2004	04-SED-010	614874	4766577	010	0410065-10	Cl6-BZ#167	0.513 µg/Kg	0.0682 µg/Kg
5/12/2004	04-SED-010	614874	4766577	010	0410065-10	Cl6-BZ#169	0.202 U µg/Kg	0.202 µg/Kg
5/12/2004	04-SED-010	614874	4766577	010	0410065-10	Cl7-BZ#170	2.06 µg/Kg	0.0982 µg/Kg
5/12/2004	04-SED-010	614874	4766577	010	0410065-10	Cl7-BZ#174	1.58 J µg/Kg	0.0654 µg/Kg
5/12/2004	04-SED-010	614874	4766577	010	0410065-10	Cl7-BZ#177	1.02 µg/Kg	0.0436 µg/Kg
5/12/2004	04-SED-010	614874	4766577	010	0410065-10	Cl7-BZ#180	2.99 J µg/Kg	0.0900 µg/Kg
5/12/2004	04-SED-010	614874	4766577	010	0410065-10	Cl7-BZ#183	0.643 µg/Kg	0.0873 µg/Kg
5/12/2004	04-SED-010	614874	4766577	010	0410065-10	Cl7-BZ#189	0.196 J µg/Kg	0.104 µg/Kg
5/12/2004	04-SED-010	614874	4766577	010	0410065-10	Cl7-BZ#187	2.01 µg/Kg	0.0900 µg/Kg

[1]BZ# = PCB congener Ballschmiter & Zell number
[2]U = Not detected at the detection limit (DL)
J/UJ = Estimated result or DL
NJ = Tentative identification
[3]PCB results & DL on a dry weight basis

SAMPLING DATE	FIELD ID	EASTING (NAD83 UTM18N)	NORTHING (NAD83 UTM18N)	SITE NUMBER	LAB ID	ANALYTE[1]	VALUE, INTERPRETIVE QUALIFIER[2], AND UNITS[3]		DETECTION LIMIT[3]
5/12/2004	04-SED-010	614874	4766577	010	0410065-10	Cl8-BZ#194	0.0982 U	µg/Kg	0.0982 µg/Kg
5/12/2004	04-SED-010	614874	4766577	010	0410065-10	Cl8-BZ#195	0.0982 U	µg/Kg	0.0982 µg/Kg
5/12/2004	04-SED-010	614874	4766577	010	0410065-10	Cl8-BZ#201	0.117 U	µg/Kg	0.117 µg/Kg
5/12/2004	04-SED-010	614874	4766577	010	0410065-10	Cl9-BZ#206	1.95	µg/Kg	0.150 µg/Kg
5/12/2004	04-SED-010	614874	4766577	010	0410065-10	Cl10-BZ#209	1.00	µg/Kg	0.0409 µg/Kg
5/12/2004	04-SED-010	614874	4766577	010	0410065-10	Monochlorobiphenyls	14.3	µg/Kg	0.0709 µg/Kg
5/12/2004	04-SED-010	614874	4766577	010	0410065-10	Dichlorobiphenyls	86.3 J	µg/Kg	0.436 µg/Kg
5/12/2004	04-SED-010	614874	4766577	010	0410065-10	Trichlorobiphenyls	217 J	µg/Kg	0.123 µg/Kg
5/12/2004	04-SED-010	614874	4766577	010	0410065-10	Tetrachlorobiphenyls	400 J	µg/Kg	0.199 µg/Kg
5/12/2004	04-SED-010	614874	4766577	010	0410065-10	Pentachlorobiphenyls	140 J	µg/Kg	0.0927 µg/Kg
5/12/2004	04-SED-010	614874	4766577	010	0410065-10	Hexachlorobiphenyls	45.9	µg/Kg	0.166 µg/Kg
5/12/2004	04-SED-010	614874	4766577	010	0410065-10	Heptachlorobiphenyls	13.7	µg/Kg	0.0573 µg/Kg
5/12/2004	04-SED-010	614874	4766577	010	0410065-10	Octachlorobiphenyls	0.0818 U	µg/Kg	0.0818 µg/Kg
5/12/2004	04-SED-010	614874	4766577	010	0410065-10	Nonachlorobiphenyls	14.7	µg/Kg	0.150 µg/Kg
5/12/2004	04-SED-010	614874	4766577	010	0410065-10	Decachlorobiphenyl	1.00	µg/Kg	0.0409 µg/Kg
5/12/2004	04-SED-010	614874	4766577	010	0410065-10	Total Homologues	921	µg/Kg	0.436 µg/Kg
5/12/2004	04-SED-010	614874	4766577	010	0410065-10	Percent Moisture	58	%	0.10 %
5/12/2004	04-SED-010	614874	4766577	010	0410065-10	Total Organic Carbon	2.7	%	0.01 %
5/12/2004	04-SED-010	614874	4766577	010	0410065-10	Gravel	4.10	%	0.01 %
5/12/2004	04-SED-010	614874	4766577	010	0410065-10	Coarse Sand	23.45	%	0.01 %
5/12/2004	04-SED-010	614874	4766577	010	0410065-10	Medium Sand	33.24	%	0.01 %
5/12/2004	04-SED-010	614874	4766577	010	0410065-10	Fine Sand	19.53	%	0.01 %
5/12/2004	04-SED-010	614874	4766577	010	0410065-10	Silt/Clay	19.57	%	0.01 %
5/13/2004	04-SED-011	613418	4761709	011	0410065-11	Cl2-BZ#8	48.7	µg/Kg	0.488 µg/Kg
5/13/2004	04-SED-011	613418	4761709	011	0410065-11	Cl3-BZ#18	16.4	µg/Kg	0.348 µg/Kg
5/13/2004	04-SED-011	613418	4761709	011	0410065-11	Cl3-BZ#31/#28	405	µg/Kg	0.165 µg/Kg
5/13/2004	04-SED-011	613418	4761709	011	0410065-11	Cl4-BZ#44	39.1	µg/Kg	0.211 µg/Kg
5/13/2004	04-SED-011	613418	4761709	011	0410065-11	Cl4-BZ#45	7.16	µg/Kg	0.0824 µg/Kg
5/13/2004	04-SED-011	613418	4761709	011	0410065-11	Cl4-BZ#47	69.8	µg/Kg	0.134 µg/Kg
5/13/2004	04-SED-011	613418	4761709	011	0410065-11	Cl4-BZ#49	142	µg/Kg	0.235 µg/Kg
5/13/2004	04-SED-011	613418	4761709	011	0410065-11	Cl4-BZ#52	165 J	µg/Kg	0.0854 µg/Kg
5/13/2004	04-SED-011	613418	4761709	011	0410065-11	Cl4-BZ#56	75.6	µg/Kg	0.375 µg/Kg
5/13/2004	04-SED-011	613418	4761709	011	0410065-11	Cl4-BZ#66	167	µg/Kg	0.134 µg/Kg

[1]BZ# = PCB congener Ballschmiter & Zell number
[2]U = Not detected at the detection limit (DL)
J/UJ = Estimated result or DL
NJ = Tentative identification
[3]PCB results & DL on a dry weight basis

SAMPLING DATE	FIELD ID	EASTING (NAD83 UTM18N)	NORTHING (NAD83 UTM18N)	SITE NUMBER	LAB ID	ANALYTE[1]	VALUE, INTERPRETIVE QUALIFIER[2], AND UNITS[3]	DETECTION LIMIT[3]
5/13/2004	04-SED-011	613418	4761709	011	0410065-11	Cl4-BZ#70	153 µg/Kg	0.305 µg/Kg
5/13/2004	04-SED-011	613418	4761709	011	0410065-11	Cl4-BZ#74	64.5 µg/Kg	0.0854 µg/Kg
5/13/2004	04-SED-011	613418	4761709	011	0410065-11	Cl4-BZ#77	28.7 NJ µg/Kg	0.165 µg/Kg
5/13/2004	04-SED-011	613418	4761709	011	0410065-11	Cl4-BZ#81	0.177 U µg/Kg	0.177 µg/Kg
5/13/2004	04-SED-011	613418	4761709	011	0410065-11	Cl5-BZ#87	45.1 µg/Kg	0.104 µg/Kg
5/13/2004	04-SED-011	613418	4761709	011	0410065-11	Cl5-BZ#95	69.0 µg/Kg	0.0397 µg/Kg
5/13/2004	04-SED-011	613418	4761709	011	0410065-11	Cl5-BZ#99	53.0 µg/Kg	0.0580 µg/Kg
5/13/2004	04-SED-011	613418	4761709	011	0410065-11	Cl5-BZ#101	77.8 µg/Kg	0.0702 µg/Kg
5/13/2004	04-SED-011	613418	4761709	011	0410065-11	Cl5-BZ#105	48.8 µg/Kg	0.104 µg/Kg
5/13/2004	04-SED-011	613418	4761709	011	0410065-11	Cl5-BZ#110	118 µg/Kg	0.0702 µg/Kg
5/13/2004	04-SED-011	613418	4761709	011	0410065-11	Cl5-BZ#114	3.50 µg/Kg	0.0305 µg/Kg
5/13/2004	04-SED-011	613418	4761709	011	0410065-11	Cl5-BZ#118	96.5 µg/Kg	0.186 µg/Kg
5/13/2004	04-SED-011	613418	4761709	011	0410065-11	Cl5-BZ#123	0.104 U µg/Kg	0.104 µg/Kg
5/13/2004	04-SED-011	613418	4761709	011	0410065-11	Cl5-BZ#126	0.0793 U µg/Kg	0.0793 µg/Kg
5/13/2004	04-SED-011	613418	4761709	011	0410065-11	Cl6-BZ#128	11.0 µg/Kg	0.275 µg/Kg
5/13/2004	04-SED-011	613418	4761709	011	0410065-11	Cl6-BZ#138	62.1 µg/Kg	0.146 µg/Kg
5/13/2004	04-SED-011	613418	4761709	011	0410065-11	Cl6-BZ#146	11.1 µg/Kg	0.0610 µg/Kg
5/13/2004	04-SED-011	613418	4761709	011	0410065-11	Cl6-BZ#149	34.5 µg/Kg	0.0976 µg/Kg
5/13/2004	04-SED-011	613418	4761709	011	0410065-11	Cl6-BZ#151	11.2 µg/Kg	0.119 µg/Kg
5/13/2004	04-SED-011	613418	4761709	011	0410065-11	Cl6-BZ#153	36.2 µg/Kg	0.177 µg/Kg
5/13/2004	04-SED-011	613418	4761709	011	0410065-11	Cl6-BZ#156	6.45 µg/Kg	0.220 µg/Kg
5/13/2004	04-SED-011	613418	4761709	011	0410065-11	Cl6-BZ#157	1.35 µg/Kg	0.213 µg/Kg
5/13/2004	04-SED-011	613418	4761709	011	0410065-11	Cl6-BZ#158	4.17 µg/Kg	0.0580 µg/Kg
5/13/2004	04-SED-011	613418	4761709	011	0410065-11	Cl6-BZ#167	2.50 µg/Kg	0.0763 µg/Kg
5/13/2004	04-SED-011	613418	4761709	011	0410065-11	Cl6-BZ#169	0.226 U µg/Kg	0.226 µg/Kg
5/13/2004	04-SED-011	613418	4761709	011	0410065-11	Cl7-BZ#170	9.87 µg/Kg	0.110 µg/Kg
5/13/2004	04-SED-011	613418	4761709	011	0410065-11	Cl7-BZ#174	7.60 µg/Kg	0.0732 µg/Kg
5/13/2004	04-SED-011	613418	4761709	011	0410065-11	Cl7-BZ#177	5.33 µg/Kg	0.0488 µg/Kg
5/13/2004	04-SED-011	613418	4761709	011	0410065-11	Cl7-BZ#180	14.9 µg/Kg	0.101 µg/Kg
5/13/2004	04-SED-011	613418	4761709	011	0410065-11	Cl7-BZ#183	3.81 µg/Kg	0.0976 µg/Kg
5/13/2004	04-SED-011	613418	4761709	011	0410065-11	Cl7-BZ#189	0.116 U µg/Kg	0.116 µg/Kg
5/13/2004	04-SED-011	613418	4761709	011	0410065-11	Cl7-BZ#187	11.1 µg/Kg	0.101 µg/Kg
5/13/2004	04-SED-011	613418	4761709	011	0410065-11	Cl8-BZ#194	4.05 µg/Kg	0.110 µg/Kg

[1]BZ# = PCB congener Ballschmiter & Zell number
[2]U = Not detected at the detection limit (DL)
J/UJ = Estimated result or DL
NJ = Tentative identification
[3]PCB results & DL on a dry weight basis

SAMPLING DATE	FIELD ID	EASTING (NAD83 UTM18N)	NORTHING (NAD83 UTM18N)	SITE NUMBER	LAB ID	ANALYTE[1]	VALUE, INTERPRETIVE QUALIFIER[2], AND UNITS[3]		DETECTION LIMIT[3]
5/13/2004	04-SED-011	613418	4761709	011	0410065-11	Cl8-BZ#195	1.60	µg/Kg	0.110 µg/Kg
5/13/2004	04-SED-011	613418	4761709	011	0410065-11	Cl8-BZ#201	7.08	µg/Kg	0.131 µg/Kg
5/13/2004	04-SED-011	613418	4761709	011	0410065-11	Cl9-BZ#206	6.61	µg/Kg	0.168 µg/Kg
5/13/2004	04-SED-011	613418	4761709	011	0410065-11	Cl10-BZ#209	2.04	µg/Kg	0.0458 µg/Kg
5/13/2004	04-SED-011	613418	4761709	011	0410065-11	Monochlorobiphenyls	37.6	µg/Kg	0.0793 µg/Kg
5/13/2004	04-SED-011	613418	4761709	011	0410065-11	Dichlorobiphenyls	241	µg/Kg	0.488 µg/Kg
5/13/2004	04-SED-011	613418	4761709	011	0410065-11	Trichlorobiphenyls	710	µg/Kg	0.137 µg/Kg
5/13/2004	04-SED-011	613418	4761709	011	0410065-11	Tetrachlorobiphenyls	1600	µg/Kg	0.223 µg/Kg
5/13/2004	04-SED-011	613418	4761709	011	0410065-11	Pentachlorobiphenyls	850	µg/Kg	0.104 µg/Kg
5/13/2004	04-SED-011	613418	4761709	011	0410065-11	Hexachlorobiphenyls	259	µg/Kg	0.186 µg/Kg
5/13/2004	04-SED-011	613418	4761709	011	0410065-11	Heptachlorobiphenyls	61.4	µg/Kg	0.0641 µg/Kg
5/13/2004	04-SED-011	613418	4761709	011	0410065-11	Octachlorobiphenyls	23.7	µg/Kg	0.0915 µg/Kg
5/13/2004	04-SED-011	613418	4761709	011	0410065-11	Nonachlorobiphenyls	19.0	µg/Kg	0.168 µg/Kg
5/13/2004	04-SED-011	613418	4761709	011	0410065-11	Decachlorobiphenyl	2.04	µg/Kg	0.0458 µg/Kg
5/13/2004	04-SED-011	613418	4761709	011	0410065-11	Total Homologues	3720	µg/Kg	0.488 µg/Kg
5/13/2004	04-SED-011	613418	4761709	011	0410065-11	Percent Moisture	62	%	0.10 %
5/13/2004	04-SED-011	613418	4761709	011	0410065-11	Total Organic Carbon	4.8	%	0.01 %
5/13/2004	04-SED-011	613418	4761709	011	0410065-11	Gravel	0.62	%	0.01 %
5/13/2004	04-SED-011	613418	4761709	011	0410065-11	Coarse Sand	4.15	%	0.01 %
5/13/2004	04-SED-011	613418	4761709	011	0410065-11	Medium Sand	22.01	%	0.01 %
5/13/2004	04-SED-011	613418	4761709	011	0410065-11	Fine Sand	28.87	%	0.01 %
5/13/2004	04-SED-011	613418	4761709	011	0410065-11	Silt/Clay	44.39	%	0.01 %
5/13/2004	04-SED-012	615977	4768926	012	0410065-12	Cl2-BZ#8	2.75	µg/Kg	0.500 µg/Kg
5/13/2004	04-SED-012	615977	4768926	012	0410065-12	Cl3-BZ#18	2.27	µg/Kg	0.356 µg/Kg
5/13/2004	04-SED-012	615977	4768926	012	0410065-12	Cl3-BZ#31/#28	20.9 U	µg/Kg	0.169 µg/Kg
5/13/2004	04-SED-012	615977	4768926	012	0410065-12	Cl4-BZ#44	7.54	µg/Kg	0.215 µg/Kg
5/13/2004	04-SED-012	615977	4768926	012	0410065-12	Cl4-BZ#45	1.09	µg/Kg	0.0843 µg/Kg
5/13/2004	04-SED-012	615977	4768926	012	0410065-12	Cl4-BZ#47	12.8	µg/Kg	0.137 µg/Kg
5/13/2004	04-SED-012	615977	4768926	012	0410065-12	Cl4-BZ#49	18.1	µg/Kg	0.240 µg/Kg
5/13/2004	04-SED-012	615977	4768926	012	0410065-12	Cl4-BZ#52	17.6 J	µg/Kg	0.0874 µg/Kg
5/13/2004	04-SED-012	615977	4768926	012	0410065-12	Cl4-BZ#56	12.5	µg/Kg	0.384 µg/Kg
5/13/2004	04-SED-012	615977	4768926	012	0410065-12	Cl4-BZ#66	19.9	µg/Kg	0.137 µg/Kg
5/13/2004	04-SED-012	615977	4768926	012	0410065-12	Cl4-BZ#70	22.6	µg/Kg	0.312 µg/Kg

[1]BZ# = PCB congener Ballschmiter & Zell number
[2]U = Not detected at the detection limit (DL)
J/UJ = Estimated result or DL
NJ = Tentative identification
[3]PCB results & DL on a dry weight basis

SAMPLING DATE	FIELD ID	EASTING (NAD83 UTM18N)	NORTHING (NAD83 UTM18N)	SITE NUMBER	LAB ID	ANALYTE[1]	VALUE, INTERPRETIVE QUALIFIER[2], AND UNITS[3]	DETECTION LIMIT[3]
5/13/2004	04-SED-012	615977	4768926	012	0410065-12	Cl4-BZ#74	6.26 µg/Kg	0.0874 µg/Kg
5/13/2004	04-SED-012	615977	4768926	012	0410065-12	Cl4-BZ#77	3.95 NJ µg/Kg	0.169 µg/Kg
5/13/2004	04-SED-012	615977	4768926	012	0410065-12	Cl4-BZ#81	0.181 U µg/Kg	0.181 µg/Kg
5/13/2004	04-SED-012	615977	4768926	012	0410065-12	Cl5-BZ#87	6.42 µg/Kg	0.106 µg/Kg
5/13/2004	04-SED-012	615977	4768926	012	0410065-12	Cl5-BZ#95	8.10 µg/Kg	0.0406 µg/Kg
5/13/2004	04-SED-012	615977	4768926	012	0410065-12	Cl5-BZ#99	9.78 µg/Kg	0.0593 µg/Kg
5/13/2004	04-SED-012	615977	4768926	012	0410065-12	Cl5-BZ#101	11.0 µg/Kg	0.0718 µg/Kg
5/13/2004	04-SED-012	615977	4768926	012	0410065-12	Cl5-BZ#105	6.97 µg/Kg	0.106 µg/Kg
5/13/2004	04-SED-012	615977	4768926	012	0410065-12	Cl5-BZ#110	16.3 µg/Kg	0.0718 µg/Kg
5/13/2004	04-SED-012	615977	4768926	012	0410065-12	Cl5-BZ#114	0.0312 U µg/Kg	0.0312 µg/Kg
5/13/2004	04-SED-012	615977	4768926	012	0410065-12	Cl5-BZ#118	14.7 µg/Kg	0.191 µg/Kg
5/13/2004	04-SED-012	615977	4768926	012	0410065-12	Cl5-BZ#123	0.106 U µg/Kg	0.106 µg/Kg
5/13/2004	04-SED-012	615977	4768926	012	0410065-12	Cl5-BZ#126	0.0812 U µg/Kg	0.0812 µg/Kg
5/13/2004	04-SED-012	615977	4768926	012	0410065-12	Cl6-BZ#128	1.96 µg/Kg	0.281 µg/Kg
5/13/2004	04-SED-012	615977	4768926	012	0410065-12	Cl6-BZ#138	9.97 µg/Kg	0.150 µg/Kg
5/13/2004	04-SED-012	615977	4768926	012	0410065-12	Cl6-BZ#146	1.56 µg/Kg	0.0624 µg/Kg
5/13/2004	04-SED-012	615977	4768926	012	0410065-12	Cl6-BZ#149	5.77 µg/Kg	0.0999 µg/Kg
5/13/2004	04-SED-012	615977	4768926	012	0410065-12	Cl6-BZ#151	1.41 µg/Kg	0.122 µg/Kg
5/13/2004	04-SED-012	615977	4768926	012	0410065-12	Cl6-BZ#153	6.34 µg/Kg	0.181 µg/Kg
5/13/2004	04-SED-012	615977	4768926	012	0410065-12	Cl6-BZ#156	0.924 J µg/Kg	0.225 µg/Kg
5/13/2004	04-SED-012	615977	4768926	012	0410065-12	Cl6-BZ#157	0.287 J µg/Kg	0.219 µg/Kg
5/13/2004	04-SED-012	615977	4768926	012	0410065-12	Cl6-BZ#158	0.674 µg/Kg	0.0593 µg/Kg
5/13/2004	04-SED-012	615977	4768926	012	0410065-12	Cl6-BZ#167	0.412 µg/Kg	0.0781 µg/Kg
5/13/2004	04-SED-012	615977	4768926	012	0410065-12	Cl6-BZ#169	0.231 U µg/Kg	0.231 µg/Kg
5/13/2004	04-SED-012	615977	4768926	012	0410065-12	Cl7-BZ#170	2.71 µg/Kg	0.112 µg/Kg
5/13/2004	04-SED-012	615977	4768926	012	0410065-12	Cl7-BZ#174	1.55 µg/Kg	0.0749 µg/Kg
5/13/2004	04-SED-012	615977	4768926	012	0410065-12	Cl7-BZ#177	1.09 µg/Kg	0.0500 µg/Kg
5/13/2004	04-SED-012	615977	4768926	012	0410065-12	Cl7-BZ#180	2.68 µg/Kg	0.103 µg/Kg
5/13/2004	04-SED-012	615977	4768926	012	0410065-12	Cl7-BZ#183	0.674 µg/Kg	0.0999 µg/Kg
5/13/2004	04-SED-012	615977	4768926	012	0410065-12	Cl7-BZ#189	0.119 U µg/Kg	0.119 µg/Kg
5/13/2004	04-SED-012	615977	4768926	012	0410065-12	Cl7-BZ#187	1.69 µg/Kg	0.103 µg/Kg
5/13/2004	04-SED-012	615977	4768926	012	0410065-12	Cl8-BZ#194	0.112 U µg/Kg	0.112 µg/Kg
5/13/2004	04-SED-012	615977	4768926	012	0410065-12	Cl8-BZ#195	0.112 U µg/Kg	0.112 µg/Kg

[1]BZ# = PCB congener Ballschmiter & Zell number
[2]U = Not detected at the detection limit (DL)
J/UJ = Estimated result or DL
NJ = Tentative identification
[3]PCB results & DL on a dry weight basis

SAMPLING DATE	FIELD ID	EASTING (NAD83 UTM18N)	NORTHING (NAD83 UTM18N)	SITE NUMBER	LAB ID	ANALYTE[1]	VALUE, INTERPRETIVE QUALIFIER[2], AND UNITS[3]		DETECTION LIMIT[3]
5/13/2004	04-SED-012	615977	4768926	012	0410065-12	Cl8-BZ#201	0.134 U	µg/Kg	0.134 µg/Kg
5/13/2004	04-SED-012	615977	4768926	012	0410065-12	Cl9-BZ#206	1.09	µg/Kg	0.172 µg/Kg
5/13/2004	04-SED-012	615977	4768926	012	0410065-12	Cl10-BZ#209	0.0468 U	µg/Kg	0.0468 µg/Kg
5/13/2004	04-SED-012	615977	4768926	012	0410065-12	Monochlorobiphenyls	5.32	µg/Kg	0.0812 µg/Kg
5/13/2004	04-SED-012	615977	4768926	012	0410065-12	Dichlorobiphenyls	25.2	µg/Kg	0.500 µg/Kg
5/13/2004	04-SED-012	615977	4768926	012	0410065-12	Trichlorobiphenyls	93.0	µg/Kg	0.140 µg/Kg
5/13/2004	04-SED-012	615977	4768926	012	0410065-12	Tetrachlorobiphenyls	228	µg/Kg	0.228 µg/Kg
5/13/2004	04-SED-012	615977	4768926	012	0410065-12	Pentachlorobiphenyls	126	µg/Kg	0.106 µg/Kg
5/13/2004	04-SED-012	615977	4768926	012	0410065-12	Hexachlorobiphenyls	42.4	µg/Kg	0.191 µg/Kg
5/13/2004	04-SED-012	615977	4768926	012	0410065-12	Heptachlorobiphenyls	12.1	µg/Kg	0.0656 µg/Kg
5/13/2004	04-SED-012	615977	4768926	012	0410065-12	Octachlorobiphenyls	0.0937 U	µg/Kg	0.0937 µg/Kg
5/13/2004	04-SED-012	615977	4768926	012	0410065-12	Nonachlorobiphenyls	13.2	µg/Kg	0.172 µg/Kg
5/13/2004	04-SED-012	615977	4768926	012	0410065-12	Decachlorobiphenyl	0.0468 U	µg/Kg	0.0468 µg/Kg
5/13/2004	04-SED-012	615977	4768926	012	0410065-12	Total Homologues	533	µg/Kg	0.500 µg/Kg
5/13/2004	04-SED-012	615977	4768926	012	0410065-12	Percent Moisture	63	%	0.10 %
5/13/2004	04-SED-012	615977	4768926	012	0410065-12	Total Organic Carbon	3.9	%	0.01 %
5/13/2004	04-SED-012	615977	4768926	012	0410065-12	Gravel	2.48	%	0.01 %
5/13/2004	04-SED-012	615977	4768926	012	0410065-12	Coarse Sand	14.44	%	0.01 %
5/13/2004	04-SED-012	615977	4768926	012	0410065-12	Medium Sand	31.09	%	0.01 %
5/13/2004	04-SED-012	615977	4768926	012	0410065-12	Fine Sand	21.65	%	0.01 %
5/13/2004	04-SED-012	615977	4768926	012	0410065-12	Silt/Clay	29.39	%	0.01 %
5/13/2004	04-SED-013	614904	4778047	013	0410065-13	Cl2-BZ#8	58.0	µg/Kg	0.435 µg/Kg
5/13/2004	04-SED-013	614904	4778047	013	0410065-13	Cl3-BZ#18	87.9	µg/Kg	0.310 µg/Kg
5/13/2004	04-SED-013	614904	4778047	013	0410065-13	Cl3-BZ#31/#28	797	µg/Kg	0.147 µg/Kg
5/13/2004	04-SED-013	614904	4778047	013	0410065-13	Cl4-BZ#44	213	µg/Kg	0.188 µg/Kg
5/13/2004	04-SED-013	614904	4778047	013	0410065-13	Cl4-BZ#45	41.7	µg/Kg	0.0734 µg/Kg
5/13/2004	04-SED-013	614904	4778047	013	0410065-13	Cl4-BZ#47	218	µg/Kg	0.120 µg/Kg
5/13/2004	04-SED-013	614904	4778047	013	0410065-13	Cl4-BZ#49	280	µg/Kg	0.209 µg/Kg
5/13/2004	04-SED-013	614904	4778047	013	0410065-13	Cl4-BZ#52	348 J	µg/Kg	0.0761 µg/Kg
5/13/2004	04-SED-013	614904	4778047	013	0410065-13	Cl4-BZ#56	164	µg/Kg	0.334 µg/Kg
5/13/2004	04-SED-013	614904	4778047	013	0410065-13	Cl4-BZ#66	257	µg/Kg	0.120 µg/Kg
5/13/2004	04-SED-013	614904	4778047	013	0410065-13	Cl4-BZ#70	254	µg/Kg	0.272 µg/Kg
5/13/2004	04-SED-013	614904	4778047	013	0410065-13	Cl4-BZ#74	161	µg/Kg	0.0761 µg/Kg

[1]BZ# = PCB congener Ballschmiter & Zell number
[2]U = Not detected at the detection limit (DL)
J/UJ = Estimated result or DL
NJ = Tentative identification
[3]PCB results & DL on a dry weight basis

SAMPLING DATE	FIELD ID	EASTING (NAD83 UTM18N)	NORTHING (NAD83 UTM18N)	SITE NUMBER	LAB ID	ANALYTE[1]	VALUE, INTERPRETIVE QUALIFIER[2], AND UNITS[3]	DETECTION LIMIT[3]
5/13/2004	04-SED-013	614904	4778047	013	0410065-13	Cl4-BZ#77	35.7 NJ µg/Kg	0.147 µg/Kg
5/13/2004	04-SED-013	614904	4778047	013	0410065-13	Cl4-BZ#81	0.158 U µg/Kg	0.158 µg/Kg
5/13/2004	04-SED-013	614904	4778047	013	0410065-13	Cl5-BZ#87	67.1 µg/Kg	0.0924 µg/Kg
5/13/2004	04-SED-013	614904	4778047	013	0410065-13	Cl5-BZ#95	113 µg/Kg	0.0353 µg/Kg
5/13/2004	04-SED-013	614904	4778047	013	0410065-13	Cl5-BZ#99	70.6 µg/Kg	0.0517 µg/Kg
5/13/2004	04-SED-013	614904	4778047	013	0410065-13	Cl5-BZ#101	107 µg/Kg	0.0625 µg/Kg
5/13/2004	04-SED-013	614904	4778047	013	0410065-13	Cl5-BZ#105	63.4 µg/Kg	0.0924 µg/Kg
5/13/2004	04-SED-013	614904	4778047	013	0410065-13	Cl5-BZ#110	152 µg/Kg	0.0625 µg/Kg
5/13/2004	04-SED-013	614904	4778047	013	0410065-13	Cl5-BZ#114	6.55 µg/Kg	0.0272 µg/Kg
5/13/2004	04-SED-013	614904	4778047	013	0410065-13	Cl5-BZ#118	117 µg/Kg	0.166 µg/Kg
5/13/2004	04-SED-013	614904	4778047	013	0410065-13	Cl5-BZ#123	0.0924 U µg/Kg	0.0924 µg/Kg
5/13/2004	04-SED-013	614904	4778047	013	0410065-13	Cl5-BZ#126	0.0707 U µg/Kg	0.0707 µg/Kg
5/13/2004	04-SED-013	614904	4778047	013	0410065-13	Cl6-BZ#128	12.5 µg/Kg	0.245 µg/Kg
5/13/2004	04-SED-013	614904	4778047	013	0410065-13	Cl6-BZ#138	65.5 µg/Kg	0.131 µg/Kg
5/13/2004	04-SED-013	614904	4778047	013	0410065-13	Cl6-BZ#146	11.2 µg/Kg	0.0544 µg/Kg
5/13/2004	04-SED-013	614904	4778047	013	0410065-13	Cl6-BZ#149	38.7 µg/Kg	0.0870 µg/Kg
5/13/2004	04-SED-013	614904	4778047	013	0410065-13	Cl6-BZ#151	10.4 µg/Kg	0.106 µg/Kg
5/13/2004	04-SED-013	614904	4778047	013	0410065-13	Cl6-BZ#153	38.7 µg/Kg	0.158 µg/Kg
5/13/2004	04-SED-013	614904	4778047	013	0410065-13	Cl6-BZ#156	7.10 µg/Kg	0.196 µg/Kg
5/13/2004	04-SED-013	614904	4778047	013	0410065-13	Cl6-BZ#157	1.41 µg/Kg	0.190 µg/Kg
5/13/2004	04-SED-013	614904	4778047	013	0410065-13	Cl6-BZ#158	5.67 µg/Kg	0.0517 µg/Kg
5/13/2004	04-SED-013	614904	4778047	013	0410065-13	Cl6-BZ#167	2.52 µg/Kg	0.0680 µg/Kg
5/13/2004	04-SED-013	614904	4778047	013	0410065-13	Cl6-BZ#169	0.201 U µg/Kg	0.201 µg/Kg
5/13/2004	04-SED-013	614904	4778047	013	0410065-13	Cl7-BZ#170	8.67 µg/Kg	0.0979 µg/Kg
5/13/2004	04-SED-013	614904	4778047	013	0410065-13	Cl7-BZ#174	6.92 µg/Kg	0.0652 µg/Kg
5/13/2004	04-SED-013	614904	4778047	013	0410065-13	Cl7-BZ#177	4.56 µg/Kg	0.0435 µg/Kg
5/13/2004	04-SED-013	614904	4778047	013	0410065-13	Cl7-BZ#180	13.4 µg/Kg	0.0897 µg/Kg
5/13/2004	04-SED-013	614904	4778047	013	0410065-13	Cl7-BZ#183	3.30 µg/Kg	0.0870 µg/Kg
5/13/2004	04-SED-013	614904	4778047	013	0410065-13	Cl7-BZ#189	0.103 U µg/Kg	0.103 µg/Kg
5/13/2004	04-SED-013	614904	4778047	013	0410065-13	Cl7-BZ#187	8.48 µg/Kg	0.0897 µg/Kg
5/13/2004	04-SED-013	614904	4778047	013	0410065-13	Cl8-BZ#194	2.74 µg/Kg	0.0979 µg/Kg
5/13/2004	04-SED-013	614904	4778047	013	0410065-13	Cl8-BZ#195	1.17 µg/Kg	0.0979 µg/Kg
5/13/2004	04-SED-013	614904	4778047	013	0410065-13	Cl8-BZ#201	3.66 µg/Kg	0.117 µg/Kg

[1]BZ# = PCB congener Ballschmiter & Zell number
[2]U = Not detected at the detection limit (DL)
J/UJ = Estimated result or DL
NJ = Tentative identification
[3]PCB results & DL on a dry weight basis

SAMPLING DATE	FIELD ID	EASTING (NAD83 UTM18N)	NORTHING (NAD83 UTM18N)	SITE NUMBER	LAB ID	ANALYTE[1]	VALUE, INTERPRETIVE QUALIFIER[2], AND UNITS[3]		DETECTION LIMIT[3]	
5/13/2004	04-SED-013	614904	4778047	013	0410065-13	Cl9-BZ#206	2.11	µg/Kg	0.149	µg/Kg
5/13/2004	04-SED-013	614904	4778047	013	0410065-13	Cl10-BZ#209	0.544	µg/Kg	0.0408	µg/Kg
5/13/2004	04-SED-013	614904	4778047	013	0410065-13	Monochlorobiphenyls	30.0	µg/Kg	0.0707	µg/Kg
5/13/2004	04-SED-013	614904	4778047	013	0410065-13	Dichlorobiphenyls	300	µg/Kg	0.435	µg/Kg
5/13/2004	04-SED-013	614904	4778047	013	0410065-13	Trichlorobiphenyls	1560	µg/Kg	0.122	µg/Kg
5/13/2004	04-SED-013	614904	4778047	013	0410065-13	Tetrachlorobiphenyls	3440	µg/Kg	0.199	µg/Kg
5/13/2004	04-SED-013	614904	4778047	013	0410065-13	Pentachlorobiphenyls	1150	µg/Kg	0.0924	µg/Kg
5/13/2004	04-SED-013	614904	4778047	013	0410065-13	Hexachlorobiphenyls	271	µg/Kg	0.166	µg/Kg
5/13/2004	04-SED-013	614904	4778047	013	0410065-13	Heptachlorobiphenyls	50.0	µg/Kg	0.0571	µg/Kg
5/13/2004	04-SED-013	614904	4778047	013	0410065-13	Octachlorobiphenyls	11.4	µg/Kg	0.0816	µg/Kg
5/13/2004	04-SED-013	614904	4778047	013	0410065-13	Nonachlorobiphenyls	11.2	µg/Kg	0.149	µg/Kg
5/13/2004	04-SED-013	614904	4778047	013	0410065-13	Decachlorobiphenyl	0.544	µg/Kg	0.0408	µg/Kg
5/13/2004	04-SED-013	614904	4778047	013	0410065-13	Total Homologues	6720	µg/Kg	0.435	µg/Kg
5/13/2004	04-SED-013	614904	4778047	013	0410065-13	Percent Moisture	59	%	0.10	%
5/13/2004	04-SED-013	614904	4778047	013	0410065-13	Total Organic Carbon	4.6	%	0.01	%
5/13/2004	04-SED-013	614904	4778047	013	0410065-13	Gravel	0.35	%	0.01	%
5/13/2004	04-SED-013	614904	4778047	013	0410065-13	Coarse Sand	3.86	%	0.01	%
5/13/2004	04-SED-013	614904	4778047	013	0410065-13	Medium Sand	19.23	%	0.01	%
5/13/2004	04-SED-013	614904	4778047	013	0410065-13	Fine Sand	34.35	%	0.01	%
5/13/2004	04-SED-013	614904	4778047	013	0410065-13	Silt/Clay	41.76	%	0.01	%

[1]BZ# = PCB congener Ballschmiter & Zell number
[2]U = Not detected at the detection limit (DL)
J/UJ = Estimated result or DL
NJ = Tentative identification
[3]PCB results & DL on a dry weight basis