# HUDSON RIVER NATURAL RESOURCES DAMAGE ASSESSMENT
# FLOODPLAIN SOIL AND BIOTA SCREENING
# SAMPLING REPORT

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prepared for
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by

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# 1. INTRODUCTION

Sampling of soil and biota within the floodplain of the Hudson River between Fort Edward, New York and the Saratoga Battlefield National Historical Park in Stillwater, New York was conducted during September and October, 2000. The purpose of the soil and biota screening was to assist the Hudson River Natural Resources Damage Assessment Trustees in determining whether soil and biota containing polychlorinated biphenyls (PCBs) are present in the floodplain of the Hudson River between Fort Edward and Stillwater, New York, and to determine if additional pathway and injury assessment studies should be conducted. Other than one extensive data set collected from Rogers Island in Fort Edward, (United States Environmental Protection Agency, 1999), there is currently a shortage of data on floodplain soil and biota PCB levels in the Upper Hudson River valley.

S E A Consultants, Inc. (S E A) was retained by Industrial Economics, Inc., to collect floodplain soil samples from eleven sites along the Hudson River. Soil samples were analyzed for Total PCBs, Total Organic Carbon (TOC) and grain size. Concurrent with soil sampling activities, the New York State Department of Environmental Conservation (NYSDEC) conducted biota sampling of small mammals and earthworms at ten of the soil sampling locations and at one additional site. Whole body tissue of short-tailed shrews (*Blarina brevicauda*) was analyzed for Total PCBs and percent lipids, and earthworms were frozen and archived. This Sampling Report details the soil and biota sampling program that was executed by S E A and NYSDEC during September and October 2000.

## *1.1 Site Selection*

United States Geological Survey (USGS) topographic quadrangle maps of the floodplain areas between Fort Edward, New York and the Saratoga Battlefield National Historical Park in Stillwater, New York were reviewed to identify potential floodplain soil and biota sampling locations. This review focused on areas of level ground near the river with ground cover of wetland, woody wetland, deciduous or mixed forest, not separated by roads from the river and that appeared natural and wooded. Site selection was targeted towards publicly owned properties. S E A and NYSDEC staff conducted a site reconnaissance visit on August 22 and 23, 2000 to select targeted sampling sites and to obtain owner permission for sampling privately owned properties. Based on the map review and the site reconnaissance, a total of eleven soil sampling sites and eleven biota sampling sites (with ten common sites) were selected that satisfied as many of the selection criteria as possible. The sampling sites are described briefly below, and locations are shown on Figure 1.

**Table 1-1: Sampling Site Descriptions**

| Site No. | Descriptive Name | Location / Description | Samples Collected |
|---|---|---|---|
| 1 | Southern Park | West bank of Hudson River in southern corner of Saratoga Battlefield National Historic Park. A wide low-lying area of undisturbed wooded wetland. | soil, shrew, worm |
| 2 | Battlefield Meadow | West bank of Hudson River near Saratoga Battlefield National Historic Park entrance. The site is a wet meadow separated from the Hudson River by an old roadbed and receives floodwaters via a culvert during high river stage. | soil, shrew, worm |
| 3 | River Road | West bank of the Hudson River, along River Road just upstream of the Saratoga Battlefield National Historic Park. The sampling site is a small low lying, wooded wetland area adjacent to an open water scrub-shrub wetland. The site is located west of River Road and is apparently flooded via a narrow culvert (approximately 18 inch diameter) under the road. | soil, shrew, worm |
| 4 | Fishing Hole | A large low-lying wooded wetland on the west bank of the Hudson River, south of Coveville. The site is accessed by a small boat ramp approximately 100 m south of Hanehan Road. The site is generally undisturbed, with the exception of an all-terrain vehicle (ATV) path which cuts through along the riverbank. The site appears to be frequently flooded. | soil, shrew, worm |
| 5 | Opposite Coveville | East bank of Hudson River, off Rt. 113 opposite Coveville. The site is an undisturbed, low-lying wooded wetland area with large quantities of debris apparently deposited from flooding events. | soil, shrew, worm |
| 6 | Schuylerville | A wide, low-lying undisturbed mature wooded wetland site on the west bank of the Hudson River. The site is accessed through a large cornfield south of Schuylerville, just south of Schuyler Street. | soil, shrew, worm |
| 7 | Near River Mile 187 | A low-lying site on the bank of the Hudson River. Half of the site is wooded, with a strip of grass adjacent to the river on the other half. The specific location of the study area has not been included in order to protect the privacy of the property owner. | soil, shrew, worm |

| Site No. | Descriptive Name | Location / Description | Samples Collected |
|---|---|---|---|
| 8 | Peters Rd. / Floodgates | West bank of the Hudson River, just upstream of Thompson Island. The site is just south of Peters Rd. and adjacent to a large wetland area. The eastern half of the soil sampling transect is flooded directly by the Hudson. The western half of the transect is located west of County Route 29, extending into the wooded wetland area. The wetland area regularly receives floodwaters via a pair of 48-inch culverts (formerly iron floodgates) that go under Route 29. These culverts are of sufficient size and invert elevation such that flooding from the river appears to be essentially unrestricted. | soil, shrew, worm |
| 9 | Near River Mile 191 | This small area is apparently flooded via a culvert that goes under a road, connecting the site with the Hudson River. The culvert invert was several feet above the river level at the time of sampling, and was somewhat constricted with debris. The specific location of the study area has not been included in order to protect the privacy of the property owner. | soil |
| 10 | Canal Corp. | East bank of the Hudson River, south of Fort Edward, and just north of Black House Rd. The site is a low-lying wooded wetland adjacent to a small stream channel. | soil, shrew, worm |
| 11 | Rogers Island | East bank of Rogers Island, approximately 0.1 miles south of railroad trestle. The site is a disturbed deciduous forested area slightly elevated above the river. Soil samples previously collected on Rogers Island by the United States Environmental Protection Agency (USEPA, 1999) indicated that soils were contaminated with PCBs. | soil, worm |
| 12 | Rogers Island South | East bank of Rogers Island near the southern end of the island. The site is slightly elevated above the Hudson River (bank approximately 4 feet above river). Site is forested near the riverbank and adjacent to an old meadow. Soil samples previously collected on Rogers Island by the United States Environmental Protection Agency (USEPA, 1999) indicated that soils were contaminated with PCBs. This site was added for shrew collection as it provided more suitable habitat than at Site 11. | shrew |

# 2. FLOODPLAIN SOIL SAMPLING

Floodplain soil sampling was conducted by S E A field scientists at the Upper Hudson River Sites 1 through 11 described in Table 1-1 between September 5 and September 12, 2000. Sampling was conducted in accordance with procedures established in the September 2000 Sampling and Analysis Plan (SAP) prepared by S E A and NYSDEC (S E A, 2000). A total of 179 soil samples were collected for Total PCBs, Total Organic Carbon, and grain size analyses. At each sampling site, a transect was established beginning at the bank of the Hudson River, or culvert opening that connects the floodplain area to the river, and extending away from the river towards the edge of the floodplain. Along each transect, between 5 and 9 sampling locations were marked in the field using a tape measure and pin flags. The number of sampling locations was chosen based on the overall width of the floodplain area and locations were generally evenly spaced along the transect, depending on site-specific conditions. The position of each sampling location was recorded using a Trimble Coordinate System Pro XRS Global Positioning System (GPS) unit. At each site, a field sampling log sheet was used to record all sampling activities and photographs were taken with a digital camera. Site photographs are provided in Appendix A and the completed field logs are provided in Appendix B.

The sampling methodology, sample handling and chain of custody, and site-specific observations are described in detail below.

## *2.1 Soil Sampling Methodology*

At each location along a transect, a surface sample was collected from the interval between ground surface and 15 cm deep. A stainless steel trowel was used to dig a small hole to 15 cm, and soil was collected from the sides of the hole and transferred directly to a labeled, certified-clean, 8-ounce glass sample jar. The soil was mixed within the jar to homogenize the sample. The trowels were decontaminated after each use following the procedures outlined in the Quality Assurance/Quality Control (QA/QC) Plan appended to Part I of the September 2000 SAP prepared by S E A (S E A, 2000). Decontamination consisted of a tap water rinse, scrubbing with a brush and mixture of deionized water and Liquinox soap, followed by a rinse with deionized water and drying with a clean paper towel.

At two locations along each transect, the interval between 15 cm and 55 cm was sampled at 10-cm intervals using a hand-coring device. The coring locations were chosen by the S E A field scientists from locations that were representative of most of the transect, where the ground surface was level, and where

tree roots were not present, to allow for penetration of the coring device. The coring device consisted of a 24-inch (61 cm) long stainless steel barrel (2-inch diameter) with a tapered cutting edge that was driven into the soil by hand using an attached slide hammer. Prior to initial sampling, the corer was decontaminated following the procedures described above. Before taking a core sample at each location, the barrel was fitted with a new disposable plastic liner, which had been triple-rinsed with deionized water. The plastic liners were longitudinally cut on one side to allow the retrieval of the sediment core. The corer was placed into the 15-cm deep hole left from the surface sampling and driven to a depth of 55 cm. After removing the corer from the hole, the liner tube with the undisturbed sample inside was removed from the core barrel and the appropriate 10-cm sample intervals were transferred to labeled certified-clean 8-ounce glass sample jars and homogenized within the jars.

Samples were identified by a numbering system as follows:

##-1-A##

in which the first one or two digits indicate the site number (1 through 11), the third digit represents the transect number (1, in all cases for this sampling task), the fourth digit is a letter indicating a sampling location along the transect ("A" stands for the location closest to the river, or point of flooding, followed by "B", "C", etc.), and the final two digits indicate the lower bound of the depth interval sampled (in centimeters).

Field quality assurance / quality control samples were collected to assess accuracy and precision of sampling techniques. Field duplicates, approximately one per site, for a total of ten, were collected at selected sample locations from the 0 to 15-cm interval to assess overall field and lab precision. Samples and their co-located duplicates were collected by scraping the hole sidewalls and transferring soil to sample jars in the same manner as described above. A summary of QA/QC samples is provided below in Table 2-1. The field duplicates were "blind" duplicates, that were named generically (i.e., DUP-1, DUP-2, etc.) to prevent any laboratory bias. Equipment rinsate blanks were collected at the rate of one per day of sampling to assess the effectiveness of field decontamination procedures for PCBs. Rinsate blanks were collected by decontaminating sampling equipment following the procedures described above, and then collecting laboratory grade reagent water (Fisher Chemical Environmental Grade) that was poured across the sampling equipment into a certified-clean sampling jar.

**Table 2-1**
**Summary of Field QA/QC Samples**

| Field Duplicates | | Field Rinsate Blanks | |
|---|---|---|---|
| **Duplicate ID** | **Co-located Sample** | **Field Blank ID** | **Collection Date** |
| DUP-1 | 3-1-D15 | FB090500 | 9/5/00 |
| DUP-2 | 4-1-D15 | FB090600 | 9/6/00 |
| DUP-3 | 6-1-H15 | FB090700 | 9/7/00 |
| DUP-4 | 1-1-I15 | FB090800 | 9/8/00 |
| DUP-5 | 5-1-A15 | FB091100 | 9/11/00 |
| DUP-6 | 9-1-C15 | FB091200 | 9/12/00 |
| DUP-7 | 8-1-C15 | | |
| DUP-8 | 7-1-D15 | | |
| DUP-9 | 10-1-A15 | | |
| DUP-10 | 11-1-D15 | | |

## *2.2 Soil Sample Handling and Chain of Custody*

Following collection, the soil samples and field rinsate blanks were each affixed with individual custody seals and held on ice in coolers. The ice was changed daily until samples were shipped to the laboratory, which occurred within 2 to 5 days of sample collection. Prior to shipping, samples were individually wrapped in bubble wrap and packed in the hard-sided coolers with double-bagged ice. Signed chain-of-custody forms were placed in the coolers and custody seals were placed across the cooler lids. The coolers were then shipped to Mississippi State University Laboratory (MSU) via Federal Express Priority Overnight.

MSU was initially selected for soil sample analyses based on an existing contract relationship between NYSDEC and MSU. As it was determined that MSU would be unable to expedite the necessary analyses within the time frame required by this project, another laboratory, Woods Hole Group Environmental Laboratories (WHG) of Raynham, Massachusetts was contracted to perform all soil analyses. Upon receiving sample shipments, MSU maintained the soil samples under chain of custody in a walk-in cooler. MSU shipped the soil samples, on ice, under chain of custody, to WHG via overnight delivery on September 28, 2000.

## *2.3 Soil Sampling Observations*

Soil sampling procedures were carried out in accordance with Part I (Soil Screening) of the September 2000 SAP prepared by S E A (S E A, 2000). The only exception to sampling protocols was the use of a

hand auger for the collection of sample 2-1-E55 at Site 2 (Battlefield Meadow), location E, from a depth of 45 to 55 cm below ground surface (bgs). At this location, stiff gray clay was encountered at 45 cm. The auger was necessary to retrieve the deeper (45 to 55-cm) sample. The stainless steel auger was fully decontaminated prior to use following the methods described above in Section 2.1.

Along the transects, each sample location was marked with a pin flag and its approximate distance along the transect from the riverbank was recorded from a tape measure. Each sample location was also recorded with a Trimble GPS unit to an accuracy of within 0.6 to 1.5 meters. At Site 10, heavy tree cover limited the accuracy to ± 3 meters. Sample location coordinates were recorded by the GPS unit using US State Plane 1983, New York Central 3102 coordinate system, NAD 1983 Conus datum, GEOID 96 Conus, in meters. Sketches of each sampling transect, showing approximate distances between samples, are shown in the field logs in Appendix B. Each soil sample was described in detail and given a Unified Soil Classification designation (ASTM, 1998). The following table provides a summary of site-specific sampling information and observations. Detailed descriptions of individual soil samples and Unified Soil Classifications are provided in the field logs in Appendix B.

**Table 2-2**

**Summary of Soil Sampling Locations**

| Site No. | Site Name | Sampling Locations | Deep Sample Locations (to 55cm) | Soil Analytes | Generalized Soil Descriptions and Observations |
|---|---|---|---|---|---|
| 1 | Southern Park | A,B,C,D,E,F,G,H,I | B, D | PCBs, TOC, Grain size | Surface soil (0-15 cm) is brown organic silt w/ some clay; becoming sandy 35 to 55 cm deep. |
| 2 | Battlefield Meadow | A,B,C,D,E,F, Culvert | D, E | PCBs, TOC, Grain size | Surface samples C,D,E organic silt and clay (low-lying) while A, B, F (higher ground) are sandy loam. Deep samples at D, E grade to gray stiff organic clay. |
| 3 | River Road | A,B,C,D,E | C, E | PCBs, TOC, Grain size | Surface is brown organic clay with silt, grading to silty or sandy clay with depth. |
| 4 | Fishing Hole | A,B,C,D,E,F,G,H,I | E, H | PCBs, TOC, Grain size | Surface to 55 cm is brown to gray organic silt with some clay and fine roots. |
| 5 | Opposite Coveville | A,B,C,D,E,F,G,H | D, F | PCBs, TOC, Grain size | Surface is brown organic silt, trace to some clay, some fine-medium sand. Gray medium sand w/ some coarse sand and fine gravel present 25 to 55 cm. Area is covered with flood-related debris. |

| Site No. | Site Name | Sampling Locations | Deep Sample Locations (to 55cm) | Soil Analytes | Generalized Soil Descriptions and Observations |
|---|---|---|---|---|---|
| 6 | Schuylerville | A,B,C,D,E,F,G,H,I | C, G | PCBs, TOC, Grain size | Surface is brown organic silt, little to some clay, abundant fine roots. Fine gray sand and silt begins between 17 and 35 cm to 55 cm. |
| 7 | Near River Mile 187 | A,B,C,D,E,F,G | B, F | PCBs, TOC, Grain size | Brown organic silt w/ fine sand and roots, very dry, blocky, surface to 55 cm. |
| 8 | Peters Rd./ Floodgates | A,B,C,D,E,F,G,H | B, F | PCBs, TOC, Grain size | Surface is dark brown organic silt w/ fine sand and fine roots, loose; becoming more gray, with some clay and rusty mottles with depth. |
| 9 | Near River Mile 191 | A,B,C,D,E,F | B, D | PCBs, TOC, Grain size | Surface is brown-tan organic silt with some clay, trace-some fine roots, soft. Grades w/ depth to gray-brown silty clay, medium stiff, w/ redox features (oxidized root channels). |
| 10 | Canal Corp. | A,B,C,D,E,F,G | B, F | PCBs, TOC, Grain size | Sampling transect located along a natural flood drainage channel. Soil is gray to brown organic silt with variable amounts of sand and clay. |
| 11 | Rogers Island | A,B,C,D,E,F | A, C | PCBs, TOC, Grain size | At locations A and B (close to river) surface soil is brown-black sandy silt and silty sand w/ shale fragments. Soil farther inland is fill consisting of sand, ash, shale fragments, gravel and brick to 55 cm. |

# 3. FLOODPLAIN BIOTA SAMPLING

Floodplain biota sampling was conducted by a NYSDEC field biologist between September 5, 2000 and October 5, 2000, to provide data on PCB levels in animal tissue of floodplain species. Sampling was conducted in accordance with Part II (Biota Screening) of the September 2000 SAP (S E A, 2000), which was prepared by NYSDEC. The biota sampling was conducted in close proximity to the soil sampling transects. Small mammal traps were set and checked daily, and earthworms were collected near the sampling transects (following mammal collection) and archived. The short-tailed shrew (*Blarina brevicauda*) was chosen for whole body tissue analysis for PCBs and percent lipids because it consumes mainly invertebrates that live in or on floodplain soils such as earthworms and snails, and because it was the most abundant species trapped. Due to its diet and habitat, the short-tailed shrew would be likely to exhibit bioaccumulation of PCBs if these contaminants were present in floodplain soils.

## *3.1 Biota Sampling Methodology*

Shrews were collected for PCB tissue analysis concurrently with floodplain soil sampling from 10 of the 11 floodplain soil sampling sites, and from an additional site on the southern portion of Rogers Island. Shrews were not collected at soil sampling Site 9 because the habitat was not ideal due to a lack of ground cover vegetation and the relatively small potentially flooded area. The Rogers Island shrew site at the southern tip of the island (Site 12) was included to sample an area of previously documented PCB contamination in soils (USEPA, 1999).

Shrews were collected using both snap traps and pitfall traps. The snap traps result in the immediate death of the specimen, and were baited with a mixture of peanut butter and oatmeal and placed on the ground in locations of probable shrew activity. The pitfall traps were set along natural or man made drift fences (e.g., fallen logs or aluminum flashing staked upright) and consisted of cans with at least one inch of water in them to drown the specimen. Shrew traps were set within 45 meters of the soil sampling transects and at elevations as similar as possible to the elevations of the transect (determined by visual estimation).

The traps were checked on a daily basis, and short-tailed shrews collected from the traps were placed in 60-ml wide-mouth laboratory-provided and certified clean sample jars with Teflon-lined lids. One shrew was placed in each jar, which was then labeled and held on ice. The short-tailed shrews that were sent for analysis were each assigned a unique sample identification number that was formatted as follows:

##-##-mmddyy-##-S/P-STS

The first two digits indicate the site number and the next two the sequential shrew number for that site, followed by the date of collection. Following the date, the next two digits indicate the distance (in meters) between the soil sampling transect and the shrew sample location (if applicable), or for Site 12, the distance from the river's edge. After the distance, the letter S or P indicates the type of trap used (snap or pitfall), and "STS" stands for the short-tailed shrew species. For example, sample number 07-02-091200-35-S-STS was collected at Site 7, was the second one to be collected at that site, was collected on 9/12/00, 35 meters from the soil sample transect in a snap trap, and was a short-tailed shrew. Other species of small mammals collected from the traps were archived at the Hale Creek Field Station in a secure freezer. The incidental small mammal catch is described further in Section 3.3.

Earthworms were collected between October 3, 2000 and October 5, 2000 by digging from the surface soil in the vicinity of the soil sample transects. Earthworms were not abundant enough to allow for collection within 5 meters of the soil transects at every site, as described in Part II of the September 2000 SAP, Post-Sampling Addendum (S E A, 2000). Earthworms were instead collected within 50 meters of the soil transects.

## *3.2 Biota Sample Handling and Chain of Custody*

At the end of each day of sampling, the shrew weights were recorded and the samples were stored in a secure walk-in freezer (-20° F) at the NYSDEC Hale Creek Field Station. Each sample jar was affixed with a signed chain of custody seal. Once sampling was completed, shrew samples were shipped to Woods Hole Group Environmental Laboratories. For sample shipping, the jars were secured in the original sample jar boxes to prevent breakage, and were placed in a bio-mailer with dry ice and signed chain-of-custody forms. The samples were shipped via FedEx overnight, weekday delivery to the laboratory and arrived intact at WHG on October 4, 2000.

Woods Hole Group shipped the samples to Aquatec Biological Sciences of Vermont (under subcontract to Woods Hole Group), to be sexed and homogenized. Samples were maintained frozen and under chain of custody. The frozen homogenized tissue samples were then shipped by Aquatec to WHG for extraction and analysis for PCBs and percent lipids. Proper sample handling, holding temperatures, and chain of custody were maintained at all times.

### *3.3 Biota Sampling Observations*

Shrews were trapped at 10 of the soil sampling sites, as well as an additional site on Rogers Island (Site 12). Most of the shrews trapped were short-tailed shrews, with a few individuals of other shrew species (masked and pygmy, undifferentiated) also caught. The speciation between masked and pygmy shrews requires microscopic examination, and was not done at the time of archiving. The following table summarizes the number of traps set and the number of shrews caught at each site.

**Table 3-1**
**Summary of Shrews Caught at Sampling Locations**

| Site | Number of Traps Set | | Number of Shrews Caught | |
|---|---|---|---|---|
| | Snap | Pitfall | Short-tailed (*Blarina brevicauda*) | Masked (*Sorex cinereus*) and Pygmy (*Microsorex hoyi*), Undifferentiated |
| 1 | 20 | 5 | 3S, 0P | 0S, 0P |
| 2 | 15 | 6 | 5S, 0P | 0S, 3P |
| 3 | 10 | 6 | 4S, 0P | 1S, 1P |
| 4 | 18 | 5 | 2S, 2P | 0S, 2P |
| 5 | 13 | 8 | 5S, 0P | 0S, 5P |
| 6 | 15 | 6 | 1S, 1P | 0S, 0P |
| 7 | 24 | 5 | 4S, 0P | 0S, 1P |
| 8 | 20 | 7 | 5S, 0P | 0S, 0P |
| 9 | ns | ns | ns | ns |
| 10 | 20 | 5 | 4S, 1P | 0S, 4P |
| 11 | 14 | 0 | 1S, 0P | 0S, 0P |
| 12 | 21 | 0 | 5S, 0P | 0S, 0P |
| TOTALS | | | 39 S, 4P | 1S, 16P |

Notes: S = snap trap
P= pitfall trap
ns = not sampled

While the traps were set no further than 45 meters from the soil sample transects at the 10 soil sampling sites, most (86%) of the 43 short-tailed shrews were collected within 20 meters of the corresponding soil sample transect. At the additional Rogers Island site, Site 12, five short-tailed shrews were collected at

distances of between two and eight meters from the river's edge. All 43 of the short-tailed shrews were sent to WHG for tissue analysis for PCBs. The remaining masked and pygmy shrews were archived in labeled sample jars in a tamper proof, sealed box in the secure walk-in freezer (at -20° F) at the NYSDEC Hale Creek Field Station. Prior to tissue analysis for PCBs, sex determination was performed on the short-tailed shrews by Aquatec Biological Sciences. It was determined that 20 of the shrews were male and 13 were female. It was not possible to accurately determine the sex of the remaining 10 shrews, due to either their immaturity, degree of decomposition or damage resulting from the traps. The weights and results of shrew sex determination are presented with shrew PCB analytical data in Appendix E.

Other species of small mammals were also caught in the traps. The majority of the incidental catch consisted of white-footed mice (*Peromyscus leucopus*) and deer mice (*Peromyscus maniculatus*), which are virtually indistinguishable, and are hereafter collectively referred to as *Peromyscus* spp. Other species trapped included meadow voles (*Microtus pennsylvanicus*), woodland jumping mice (*Napaeozapus insignis*), an eastern chipmunk (*Tamias striatus*), and star-nosed moles (*Condylura cristata*). Some of the bycatch was archived at the NYSDEC Hale Creek Field Station secure freezer. The incidental small mammal catch is summarized below on Table 3-2.

**Table 3-2**

**Summary of Additional Small Mammal Incidental Catch**

| Site | Number of Animals Caught / Number of Animals Archived | | | | |
|---|---|---|---|---|---|
| | *Peromyscus* spp. | *M. pennsylvanicus* | *N. insignis* | *T. striatus* | *C. cristata* |
| 1 | 8 / 1 | 2 | 1 | 0 | 0 |
| 2 | 0 | 1 | 0 | 0 | 0 |
| 3 | 10 / 1 | 0 | 0 | 0 | 0 |
| 4 | 8 / 2 | 0 | 0 | 0 | 0 |
| 5 | 6 | 0 | 0 | 0 | 0 |
| 6 | 4 | 0 | 0 | 0 | 0 |
| 7 | 3 | 2 | 0 | 1 | 0 |
| 8 | 6 | 0 | 0 | 0 | 1 / 1 |
| 9 | NA | NA | NA | NA | NA |
| 10 | 8 | 2 | 0 | 0 | 0 |

| Site | Number of Animals Caught / Number of Animals Archived | | | | |
|---|---|---|---|---|---|
| | *Peromyscus* spp. | *M. pennsylvanicus* | *N. insignis* | *T. striatus* | *C. cristata* |
| 11 | 3 / 2 | 0 | 0 | 0 | 0 |
| 12 | 3 | 7 | 1 | 0 | 0 |

Earthworms were collected at all of the sampling sites except Site 9 and Site 12. At each earthworm sampling site, a composite sample of more than 20 worms was collected. The earthworms were collected in labeled sample jars, which were archived at the Hale Creek Field Station in the secure walk-in freezer.

# 4. SOIL ANALYTICAL RESULTS

## *4.1 Laboratory Analytical Procedures*

Soil samples were received intact at Woods Hole Group Environmental Laboratories (WHG) on September 29, 2000, with cooler temperatures of between 3 and 4 degrees Celsius. Samples were frozen immediately upon receipt pending extraction and analyses. All soil samples were analyzed for total PCBs (as total Aroclors) by WHG. Aliquots of a subset of 10 soil samples were shipped from WHG under chain-of-custody to Axys Analytical Laboratories, Ltd. (Axys) for reanalysis of total PCBs using a congener approach (Appendix G). WHG also analyzed soil samples for TOC, using a modified EPA SW-846 Method 9060 (USEPA, 1996; WHG, 2000a). WHG subcontracted the grain size analyses to Applied Marine Sciences, Inc., (AMS) of League City, Texas. Aliquots of each soil sample were shipped under chain-of-custody to AMS for grain size analysis by ASTM Method D422 (ASTM, 1970).

The soil samples were extracted for PCBs using EPA SW-846 Method 3545, Pressurized Fluid Extraction (USEPA, 1996). The PCB analyses for both soil and shrew tissue extracts were conducted using a modified SW-846 EPA Method 8082 (USEPA, 1996). The method was in accordance with WHG's Standard Operating Procedure (SOP) for Method 8082 (WHG, 2000b) with project-specific modifications based on established data quality objectives. A discussion of the data quality objectives (DQOs) and project-specific analytical procedures is provided in Appendix C. Although Aroclor-type patterns were detected in the samples, it was not possible to discern between overlapping patterns using the established project method described in Appendix C. Therefore, samples were quantified based on the total Aroclor initial calibration (Approach B as described in Appendix C) and reported as Total Aroclors. In the case that Aroclor-type patterns were detected, but were below the reporting limit, they were also quantified from the total-Aroclor curve (Approach B). In a few samples, Aroclor-type patterns were not detected, and Approach A (see Appendix C) was used, quantifying from the regular Aroclor 1016/1260 curve. The reporting limits (RLs) are derived from the low calibration standard, the final extract volume, the initial sample weight, the percent solid and the dilution factor. For this reason, RLs can change from sample to sample.

Each analytical sample batch for PCBs consisted of a maximum of 20 field samples, as well as the following QC samples:

- 1 Method Blank (MB), consisting of diatomaceous earth
- 1 Laboratory Control Sample (LCS), consisting of diatomaceous earth spiked with Aroclor 1016/1260 mixture
- 1 Matrix Spike (MS), consisting of an aliquot of field sample spiked with Aroclor 1016/1260
- 1 Matrix Spike Duplicate (MSD), consisting of a duplicate aliquot of field sample spiked with Aroclor 1016/1260.

All field samples and QC samples were spiked with two surrogate compounds, decachlorobiphenyl (DCB) and 2, 4, 5, 6 tetrachloro-m-xylene (TMX), prior to extraction. Surrogate recoveries are reported for each sample for QA/QC purposes. Sample results are not adjusted for surrogate percent recovery.

### *4.2 Laboratory Quality Assurance / Quality Control Results*

The analytical laboratory, WHG, was selected based on a review of its SOPs (WHG, 2000a and 2000b) and quality assurance program plan (QAPP: WHG, 1998) to assure the established data quality objectives (Appendix C) would be met. All analyses were conducted in accordance with the QAPP and with the SOPs, as modified by the project-specific methods described in Appendix C. Data packages provided by WHG included sample narratives, complete calibration and QA sample reports, and chromatograms.

All laboratory method blanks were below the detection limit of 0.010 mg/kg for individual and total Aroclors, and below the detection limit of 100 mg/kg for TOC. PCB laboratory control sample (LCS) percent recoveries were all between 68 and 100%, falling within the QC acceptance range of 38 to 158 %. PCB surrogate recoveries were within QC acceptance limits, with the exception of three samples. Field samples 8-1-B25, 8-1-B35, and 11-1-A25 had elevated PCB levels that required high dilution factors (1:100, 1:250, and 1:80, respectively), and the surrogates were consequently diluted out. The TMX and DCB recoveries for these samples were flagged as "DL" for having been diluted below detection limits. All PCB matrix spike and matrix spike duplicate pairs were within QC acceptance limits defined in the Data Quality Objectives (Appendix C).

The analytical holding times for PCBs in soil specified under EPA Method 8082 (USEPA, 1996) and in the September 2000 Sampling and Analysis Plan (S E A, 2000) are 14 days to extraction and 40 days to analysis. All analyses were completed within the 40 day holding time following extraction. The soil samples were continuously maintained on ice following collection and were frozen by WHG within 17 to

24 days of collection. However, the 14 day holding time before extraction was exceeded. Despite the holding time exceedance, the data quality objectives established for this screening level project have been fully met. PCBs are highly resistant to degradation and persist within the environment (Erickson, 1997), and we do not anticipate that the concentration of PCBs in each sample was affected by extending the holding time. The only expected effect of expired holding times would be a decrease in PCB levels, not an increase, and therefore the analytical results are a conservative measure of PCB concentrations in the Hudson River floodplain soil. The EPA is currently considering a modification to the holding time requirements of SW846 Method 8082 (USEPA, 1996) to allow for extended holding times.

### *4.3 Soil Sample Results*

PCBs were detected in soil above reporting limits at all of the sites sampled. A summary table of the PCB and TOC sample results is provided in Appendix D. Soil PCB concentrations are also shown on Figures 2 and 3.

The total PCB dry weight results were TOC-normalized as follows:

[(Concentration, dry weight in mg/kg) X (100)] / (%TOC in the sample)

The general assumption behind this adjustment is that the chemical and physical properties of PCBs cause them to bind strongly to the organic matter (specifically, the organic carbon) fraction of soils. Adjusting (normalizing) PCB concentration for the percent TOC in soil is one way to account for the variability associated with organic carbon content.

Detected PCB concentrations ranged from a minimum of 0.018 mg/kg dry weight at Site 1 in sample 1-1-D55, to a maximum of 360 mg/kg dry weight at Site 8 in sample 8-1-B35. PCB results were also normalized to corresponding TOC concentrations and are presented in Appendix D. TOC-normalized detected PCB results ranged from a minimum of 0.75 mg PCB / kg TOC at Site 2 in sample 2-Culvert, to a maximum of 10,435 mg PCB / kg TOC at Site 8 in sample 8-1-B35. The second highest soil concentrations for PCBs and TOC-normalized PCBs were found at Site 11 in sample 11-1-A25, with concentrations of 150 mg/kg dry weight and 5,000 mg PCB / kg TOC, respectively. By depth interval, the highest soil PCB levels are summarized in the following table:

**Table 4-1**

**Summary of Maximum Soil PCB Concentrations by Sample Depth Interval (Non-normalized and TOC-normalized)**

| Depth Interval | Sample ID | Maximum Total PCBs, Non-normalized (mg/kg dry wt.) | Maximum TOC-Normalized Total PCBs (mg PCB / kg TOC) |
|---|---|---|---|
| 0 – 15 cm | 10-1-B15 | 69 | 2,556 |
| 15 – 25 cm | 11-1-A25 | 150 | 5,000 |
| 25 – 35 cm | 8-1-B35 | 360 | 10,435 |
| 35 – 45 cm | 11-1-C45 | 10 | na |
| | 5-1-D45 | na | 425 |
| 45 – 55 cm | 11-1-A55 | 16 | 653 |

Note: Maximum normalized and non-normalized concentrations for each depth interval were found in the same sample, except as noted for the 35 to 45 cm depth interval.
na = not applicable

Samples in which PCBs were not detected above reporting limits are labeled by the laboratory with a "U" qualifier. Four samples were flagged with a "P" qualifier, indicating a greater than 40% relative percent difference between two instrument columns, with the higher value being reported. The "P" qualified samples were 2-1-E25, 3-1-E25, 6-1-G45, and 11-1-A45. None of the samples were flagged as "E", estimated values, outside of the instrument calibration range. Field duplicate pairs were in close agreement, with relative percent differences ranging from 0 to 32 percent for samples with Total PCBs above detection limits. Field rinsate blank sample results were all not detected above the detection limit of 0.20 ug/L.

There were no data quality issues associated with the field soil samples, with one exception. Sample DUP-2 (field duplicate of sample 4-1-D15) was extracted on November 19, 2000 and had a 26% recovery of the surrogate TMX, which was outside the QC criteria of 30%. MS and MSD samples extracted concurrently associated with DUP-2 had acceptable surrogate recoveries. The Total PCB result of the original DUP-2 extraction was 7.5 mg/kg. DUP-2 was re-extracted on December 5, 2000 along with an associated MS/MSD, and the re-extracted Total PCB result was 17 mg/kg. Both sets of extraction data were reported by the laboratory. The re-extracted result may be less accurate because only 5 grams of soil was available for extraction, as opposed to 20 g of soil used in the initial extraction. The initial result of 7.5 mg/kg Total PCBs has been reported in the summary table in Appendix D. The validity of this result is supported by evaluating the MS/MSD pairs for both sets of extractions. Subtracting the

spike concentrations from the MS/MSDs yields estimated sample concentrations ranging from 3.49 to 9.04 mg/kg, of the same order of magnitude as the original DUP-2 result. Furthermore, the original result of 7.5 mg/kg is supported by the paired sample result of 7 mg/kg at 4-1-D15.

In general, soil PCB levels were highest at low lying sites directly adjacent to the Hudson River (Sites 4, 5, 6, 8, and 10), and at Site 11, Rogers Island, where high concentrations of PCBs in soil have been previously documented (32 mg/kg; USEPA, 1999). At individual sites, PCB concentrations were usually highest closest to the river, and generally in soils between 0 and 25 cm deep. Figures F-1, F-2, and F-3 in Appendix F are summary plots of the relationship of soil PCBs with lateral distance, and with depth.

For the sites directly adjacent to the Hudson River, PCB levels generally decreased with distance downstream of Fort Edward (Figure 2, Figure 3, Figure F-3). PCB levels were lowest at the three furthest downstream sites (Sites 1, 2, and 3) and at Site 9. Sites 2, 3, and 9 receive flood waters from the Hudson River indirectly via culverts. It appears that the culverts may restrict direct flooding of these sites by the river, resulting in lower PCB levels compared to other nearby sites that are flooded directly.

Most of the soil samples were fine grained, with the majority of the sample in the very fine sand and silt and clay size fractions. Nearly 80% of the samples were composed of greater than 50% silt and clay. A table of grain size results is presented in Appendix D. Total Organic Carbon (TOC) results ranged from 1,100 mg/kg to 89,500 mg/kg dry weight. TOC results are also summarized in Appendix D.

# 5. BIOTA ANALYTICAL RESULTS

## *5.1 Laboratory Analytical Procedures*

The shrew whole body tissue samples were extracted for PCBs using EPA SW-846 Method 3545, Pressurized Fluid Extraction (USEPA, 1996). The shrew tissue samples were analyzed for Total PCBs by Woods Hole Group Environmental Laboratories using a modified SW846 EPA Method 8082 (USEPA, 1996). The method was in accordance with WHG's Standard Operating Procedure (SOP) for Method 8082 (WHG, 2000b) with project-specific modifications based on established data quality objectives. A complete discussion of the data quality objectives (DQOs) and project-specific analytical procedures is provided in Appendix C.

## *5.2 Laboratory Quality Assurance / Quality Control Results*

As discussed above in Section 4, WHG's standard operating procedures (WHG, 2000a and 2000b) and quality assurance program plan (WHG, 1998) were reviewed to assure that established data quality objectives would be met. All analyses were conducted in accordance with the QAPP and with the SOPs, except where modified by the project-specific methods described in Appendix C. Shrew analytical data packages provided by WHG included sample narratives, complete calibration and QA sample reports, and chromatograms.

All laboratory method blanks were below the detection limit of 0.004 mg/kg for individual and Total Aroclors. Laboratory control sample (LCS) percent recoveries ranged from 57 to 109%, within the QC acceptance range of 38 to 158%. PCB surrogate recoveries were within QC acceptance limits, with the exception of three samples. Field samples 05-07-091000-17-S-STS, 12-01-092900-3-S-STS, and 6-01-091200-P-STS had elevated PCB levels that required high dilution factors (1:50, 1:100, and 1:50, respectively), and the surrogates were consequently diluted out. The TMX and DCB recoveries for these samples were flagged as "DL" for having been diluted below detection limits. Some DCB surrogate recoveries were outside of the QC acceptance range due to possible matrix interferences. This occurred in samples 02-08-091000-0-S-STS, 10-06-091600-11-P-STS, 12-02-092900-2-S-STS, 12-04-093000-8-S-STS, and 12-05-10-0100-S-STS.

Due to limited sample volumes, matrix spike and matrix spike duplicates were not performed. This allowed the preservation and archiving of the samples. Quality assurance of laboratory precision was provided by the analysis of laboratory duplicates. Duplicate extractions were analyzed for samples 03-03-091400-S-STS, 08-02-091200-6-S-STS, and 12-02-092900-2-S-STS and good agreement was found between duplicates (39%, 7%, and 11% relative percent difference, respectively).

### *5.3 Biota Analytical Results*

Forty-three (43) short-tailed shrews (*Blarina brevicauda*) were analyzed for Total PCBs and lipid content. There were no data quality problems with any of the field samples. The data are presented on a summary table in Appendix E and discussed below. The shrew PCB results are also shown on Figures 2 and 3.

The Total PCB wet weight results were lipid adjusted as follows:

[(Concentration, Wet weight in mg/kg) X (100)] / (% Lipid in the sample)

The general assumption behind this adjustment is that the PCBs in a given animal will reside in the fatty tissue of that animal. By adjusting the shrew tissue PCB concentration for the percent of lipid in the tissue, the animals can be compared to evaluate their relative exposure levels.

PCBs were detected in all shrew tissue samples from all sites, ranging from a non-adjusted minimum of 0.048 mg/kg (wet weight) PCBs at Site 3 to a non-adjusted maximum of 38 mg/kg wet weight at Site 12. Lipid-adjusted PCB concentrations ranged from a minimum of 3.1 mg PCB / kg lipids at Site 3 to a maximum of 1,642 mg PCB / kg lipids at Site 12. The concentration of 1,642 mg PCB / kg lipids is an average of sample 12-02-092900-2-S-STS and its lab replicate (with concentrations of 1,583 and 1,700 mg PCB / kg lipids, respectively). The second-highest shrew non-adjusted and lipid adjusted PCB concentrations were found at Site 7 (29 mg/kg wet weight) and at Site 12 (1,438 mg PCB / kg lipids), respectively.

In general, lipid-adjusted shrew whole body tissue PCB levels were highest at Site 12, Rogers Island South, where PCB-contaminated soil has been previously documented (USEPA, 1999). PCB levels in shrew tissue were also high at Sites 1, 4, 6, 7, 8, and 10, all of which are subject to unrestricted flooding

over the banks of the Hudson River. PCB shrew tissue concentrations generally decreased downriver from Fort Edward, as seen on Figures 2 and 3 and on Figure F-4 in Appendix F. At Sites 2 and 3, culvert outfall inverts (the lowest sections of the culvert) were observed to be at least 12 inches above the average level of the river during sampling. This prevents regular flooding and sediment deposition at these sites, and may explain why shrews captured at Sites 2 and 3 have lower PCB levels than shrews captured at sites subject to unrestricted flooding.

All shrews collected at sites 1-11 showed detectable levels of PCBs, indicating that PCBs in floodplain soil are bioavailable to higher level organisms (no soil data was collected at Site 12) (Figure F-5, Appendix F).

# 6. SUMMARY AND CONCLUSIONS

During September and October, 2000, soil and biota sampling was conducted at floodplain sites along the Upper Hudson River between the Saratoga Battlefield National Historical Park in Stillwater, New York, and Rogers Island in Fort Edward, New York. A total of 179 soil samples were collected from eleven sites and analyzed for Total PCBs, Total Organic Carbon, and grain size. A total of 43 Short tailed shrews (*Blarina brevicauda*) were collected from ten of the soil sampling sites, and at one additional site on the southern portion of Rogers Island. Shrew whole body tissue was analyzed for Total PCBs and percent lipids. Earthworm samples were collected from ten of the sites and archived. Other small mammals trapped at the shrew sampling sites were also archived. The findings of the sampling program are summarized as follows:

- PCBs were found at detectable levels at all of the eleven soil sampling transects, with non-normalized PCB concentrations ranging from 0.018 mg/kg dry weight to 360 mg/kg dry weight, and TOC-normalized concentrations ranging from 0.75 mg PCB / kg TOC to 10,435 mg PCB / kg TOC. The highest non-normalized and TOC-normalized concentrations were found at Site 8 in sample 8-1-B35.
- In general, PCB soil levels were highest at low-lying sites directly adjacent to the Hudson River (Sites 4, 5, 6, 8, and 10) and at Site 11 (Rogers Island) where high soil concentrations of PCBs have been previously documented (32 ppm; USEPA, 1999).
- At individual sites, PCB soil concentrations were usually highest closest to the river, and generally in soils between 0 and 25 cm deep.
- PCBs were detected in all shrew tissue samples, with non-adjusted wet weight concentrations ranging from 0.048 mg/kg to 38 mg/kg wet weight PCBs, and lipid-adjusted concentrations ranging from 3.1 mg PCB / kg lipids to 1642 mg PCB / kg lipids (1642 mg/kg is an average of the concentration in the sample and its analytical duplicate). The highest concentrations, both non-adjusted and lipid-adjusted, were found at Site 12.
- Lipid-adjusted shrew whole body tissue PCB levels were highest at Site 12, Rogers Island South, where PCB-contaminated soil has been previously documented (USEPA, 1999). PCB levels in shrew tissue were also high at Sites 1, 4, 6, 7, 8, and 10, all of which are subject to unrestricted flooding over the banks of the Hudson River.

- For the sites directly adjacent to the Hudson River, both soil and shrew PCB levels generally decreased with distance downriver from Fort Edward towards the Saratoga Battlefield National Historical Park in Stillwater.

The results of this floodplain soil and biota tissue sampling program indicate that floodplain soil in the Upper Hudson River valley between Stillwater, New York and Fort Edward, New York is contaminated by detectable levels of PCBs. In addition, the detection of PCBs in short tailed shrew (*Blarina brevicauda*) tissue indicates the bioavailability of soil PCBs to higher level organisms.

# 7. REFERENCES

ASTM (American Society for Testing and Materials). 1970. Standard Test Method for Particle-Size Analysis of Soils. ASTM D422-63(R1998).

ASTM. 1998. Standard Practice for Classification of Soils for Engineering Purposes (Unified Soil Classification System). ASTM D2487-98.

Erickson, M.D. 1997. Analytical Chemistry of PCBs. Second Edition. Lewis Publishers, New York.

S E A (S E A Consultants, Inc). 2000. Sampling and Analysis Plan, Hudson River Floodplain, Natural Resources Damage Assessment. September.

USEPA (United States Environmental Protection Agency). 1996. Test Methods for Evaluating Solid Wastes, SW-846, Third Edition. December.

USEPA. 1999. Action Memorandum: Request for removal action for the Rogers Island Site, Fort Edward, Washington County, New York, by Jack D. Harmon, On-scene Coordinator, Removal Action Branch. September 28.

WHG (Woods Hole Group Environmental Laboratories). 1998. Quality Assurance Program Plan. Revision 1.1. December 3.

WHG. 2000a. Total Organic Carbon in Soil/Sediment Modified from EPA Method 9060. Revision 1.2. April 4.

WHG. 2000b. Method 8082 Polychlorinated Biphenyls (PCBs) as Aroclors or Congeners by Gas Chromatography/Electron Capture Detection (GC/ECD). Revision 1.0. March 3.

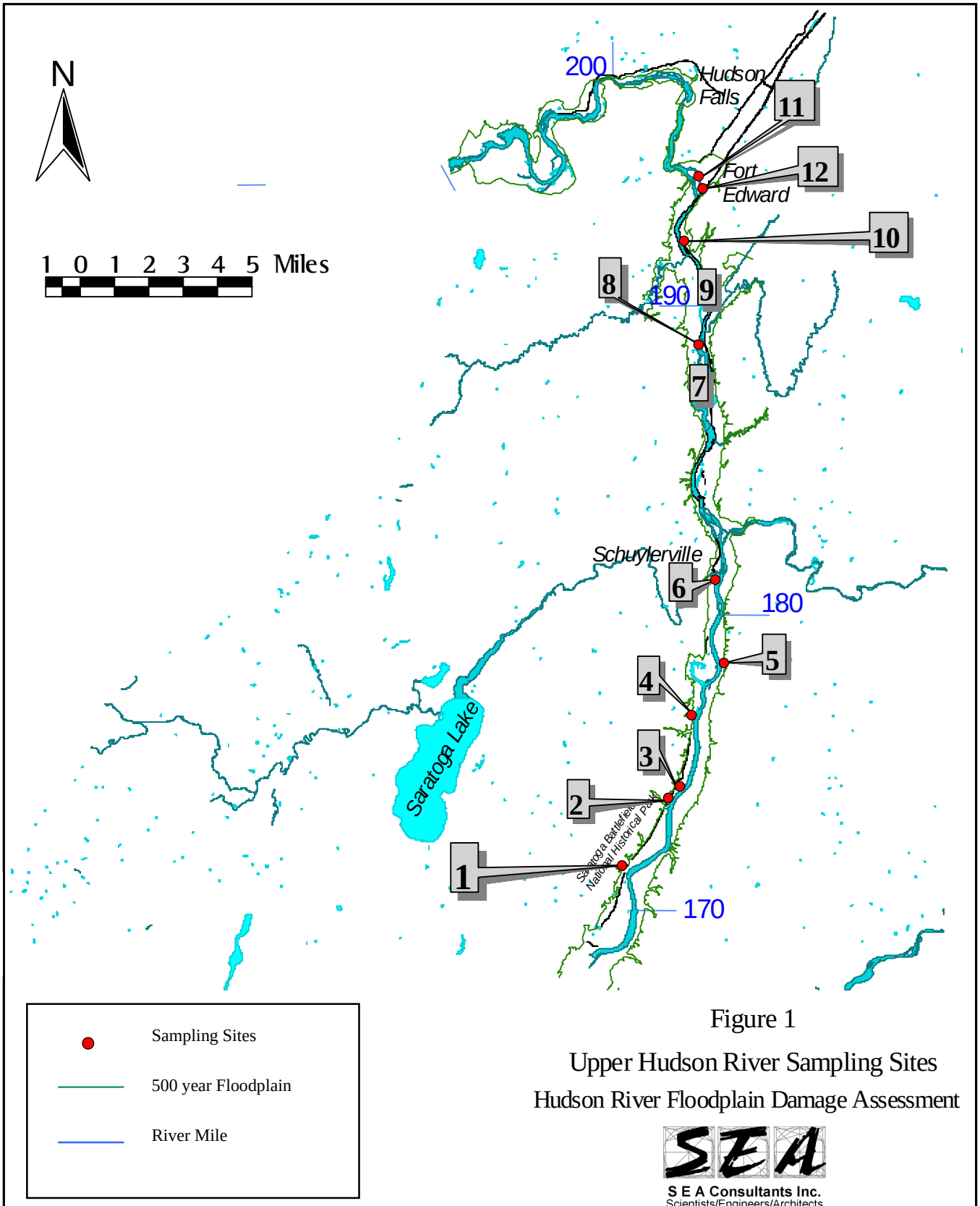


Figure 1

Upper Hudson River Sampling Sites

Hudson River Floodplain Damage Assessment

S E A Consultants Inc.
Scientists/Engineers/Architects

Specific locations of Sites 7 and 9 have not been included in order to protect privacy of property owner.

# LEGEND / NOTES

Soil PCB values (mg/kg dry weight) in columns representing sampling locations along floodplain transects perpendicular to the Hudson River. For sites on west bank, data closest to the river starts in the far right column. For sites on the east bank, data closest to river starts in far left column. The transect at Site 3 was not perpendicular to river bank. Specific locations of Sites 7 and 9 have not been included in order to protect privacy of property owners.

Sampling location separation distance not to scale. First row of values is for 0-15 cm depth interval. Locations with a column of values represent deeper samples (15-25, 25-35, 35-45, 45-55 cm). Values marked with ' < ' were non-detected at the reporting limit shown (U-qualified).

soil
0.048 0.04 0.04 < 0.015
< 0.013
< 0.014
< 0.013
< 0.012
shrews 0.14, 0.11, 0.05

PCB whole body tissue results for short-tailed shrews (mg/kg wet weight) collected at each sampling site are listed below soil results.

Italicized value indicates average of results for sample and analytical duplicate.

Field and laboratory replicates not reported on this figure.

500-year floodplain

Sampling Sites

River Mile
170

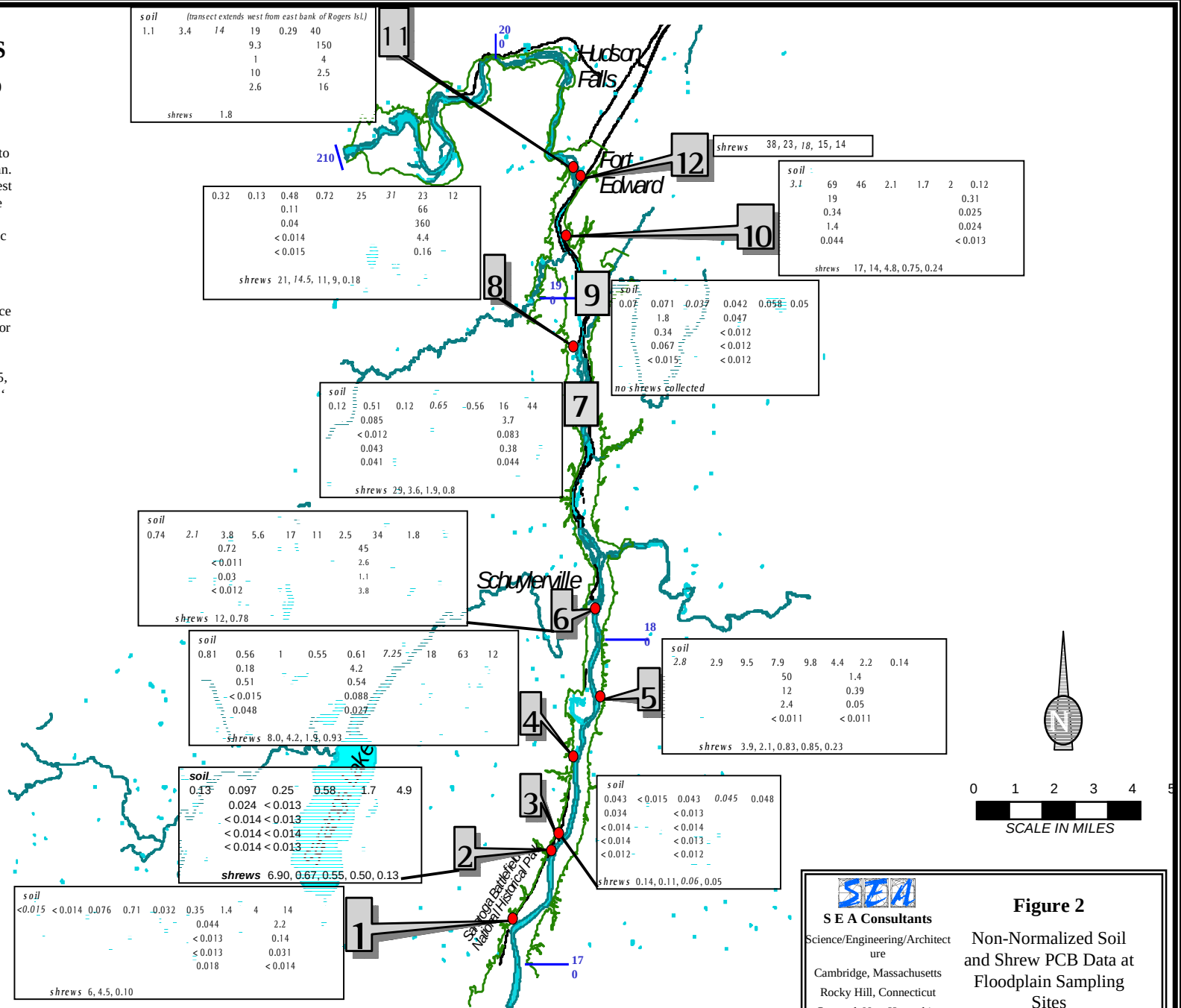


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**Figure 2**

Non-Normalized Soil and Shrew PCB Data at Floodplain Sampling Sites

# LEGEND / NOTES

TOC- normalized soil PCB values (mg PCB/kg TOC) in columns representing sampling locations along floodplain transects perpendicular to the Hudson River. For sites on west bank, data closest to the river starts in the far right column. For sites on the east bank, data closest to the river starts in the far left column. The transect at Site 3 was not perpendicular to river bank. Specific locations of Sites 7 and 9 have not been included in order to protect privacy of property owners.

Sampling location separation distance not to scale. First row of values is for 0-15 cm depth interval. Locations with a column of values represent deeper samples (15-25, 25-35, 35-45, 45-55 cm). Values marked with ' < ' were calculated from non-detected PCB values (U-qualified).

Lipid-adjusted PCB whole body tissue results for short-tailed shrews (mg PCB/kg lipids) collected at each sampling site are listed below soil results.

Italicized value indicates average of results for sample and analytical duplicate.

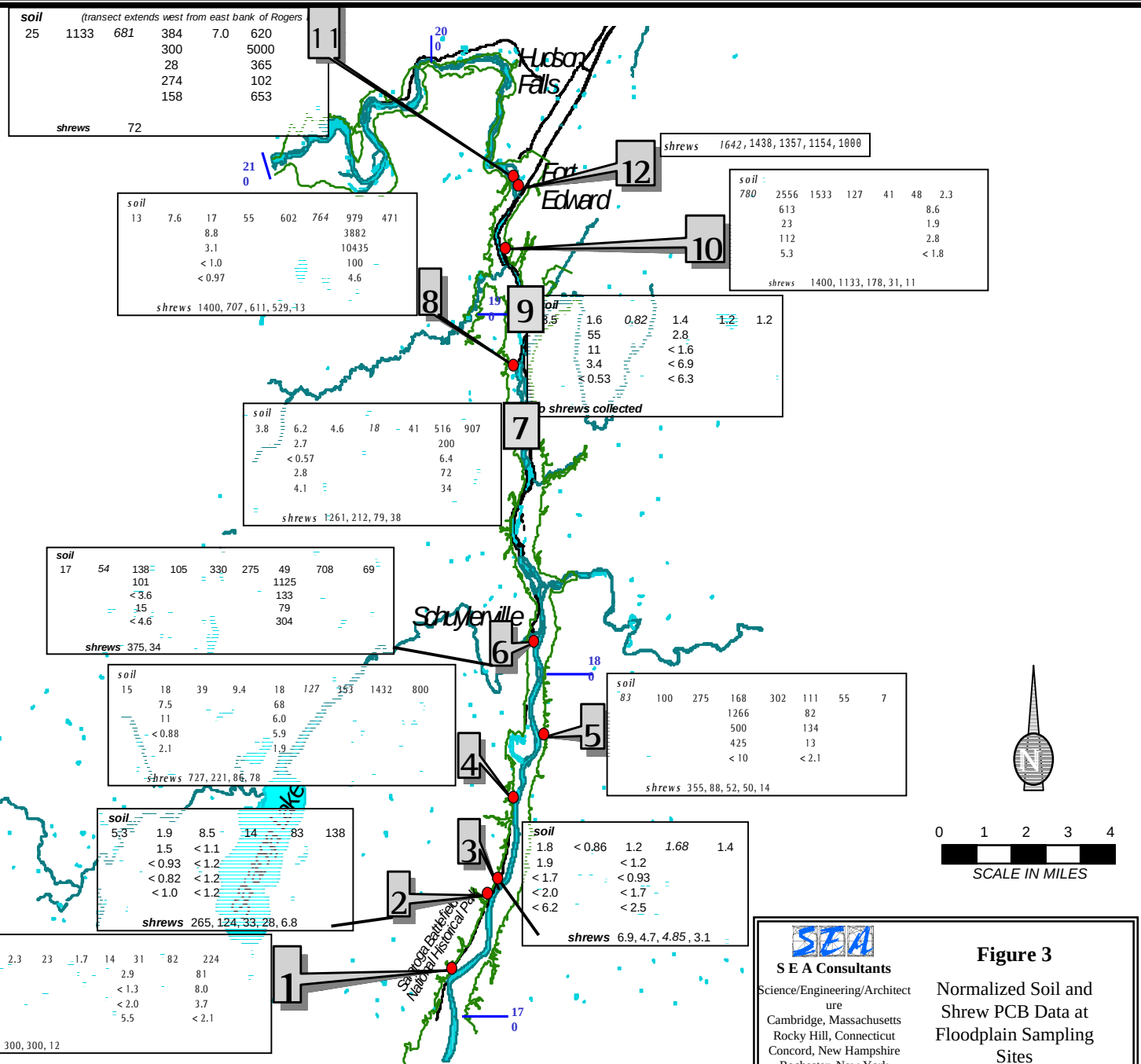
Field and laboratory replicates not reported on this figure.

500-year floodplain

Sampling Sites

River Mile

170

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Rochester, New York

**Figure 3**

Normalized Soil and Shrew PCB Data at Floodplain Sampling Sites

# APPENDIX A

## SOIL SAMPLING PHOTOGRAPHS

**Site 1: Southern Park**

Westward view of sampling transect, locations A and B visible.

East view of transect and Hudson River.

**Site 2: Battlefield Meadow**

West view along transect towards Rt. 4.

Site 2 “culvert”. Sampling wetland west of Rt. 4 connected to Hudson River via culvert.

**Site 3: River Road**

View southwest along sampling transect.

**Site 4: Fishing Hole**

Westward view of transect and sampling location flags.

**Site 4: Fishing Hole (continued)**

View east, towards Hudson River, along transect.

**Site 5: Opposite Coveville**

View west, along transect towards Hudson River.

**Site 5: Opposite Coveville (continued)**

View of representative intact sediment core, site 5.

**Site 6: Schuylerville**

View west (towards upland) of sampling transect (in line with S E A field scientist).

**Site 7: Near River Mile 187**

View along eastern half of sampling transect. Western portion of transect extends into a wooded area (not shown).

**Site 8: Peters Road/Floodgates**

View east, towards Hudson River, along sampling transect east of Rt. 29.

**Site 8: Peters Road/Floodgates (continued)**

View west along transect to the west of Route 29.

**Site 9: Near River Mile 191**

View west along transect towards culvert (indicated by arrow) that exchanges with Hudson River.

**Site 10: Canal Corporation**

View along transect towards Hudson River (west).

View east along sampling transect.

**Site 11: Rogers Island**

View (east-northeast) of sampling location A, on a high bank adjacent to Hudson River.

View of sampling transect extending west to the road.

# APPENDIX B

## SOIL SAMPLING FIELD LOGS

**HUDSON RIVER FLOODPLAIN SOIL SCREENING**



**FIELD SAMPLING DATA SHEET**

DATE 9/7/00

WEATHER warm, clear

SAMPLERS JCNS, SJW

SITE NO. 1

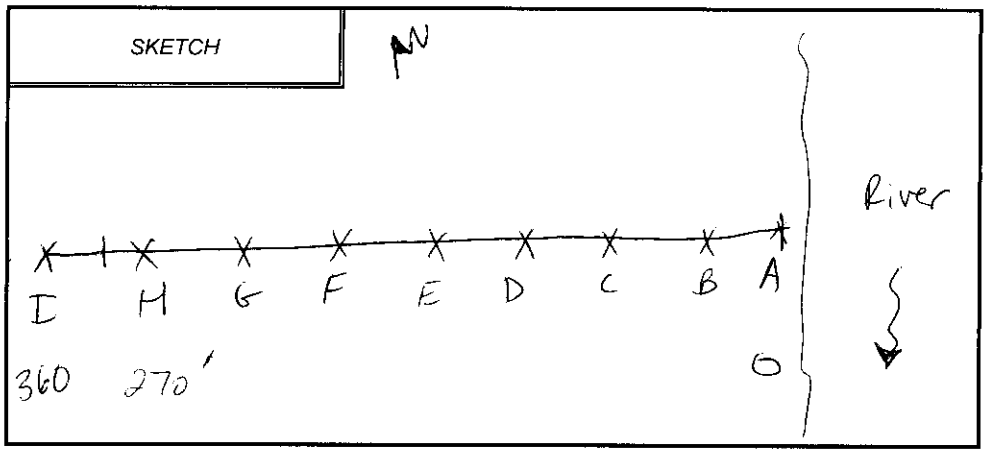
TRANSECT NO. 1

NAME: Southern Park

*NOTES (QA samples, etc):*

DUP-4 @ 1-1-I15

*SKETCH*




| | SAMPLE LOCATION | DISTANCE FROM START OF TRANSECT ~~(m)~~ ft | SAMPLE DEPTH (cm) | SAMPLE ID | SOIL DESCRIPTION / CLASSIFICATION | ANALYSES |
|---|---|---|---|---|---|---|
| 09:00 | A | 0 | 0-15 | 1-1-A15 | OL - org. SILT, some clay, fine roots, brown, moist, v. soft | PCBs, TOC, gr. size |
| | B | 37 | 0-15 | 1-1-B15 | same as A15 | |
| | | | 15-25 | 1-1-B25 | OL organic SILT tr. clay fine roots, brown-gray soft moist | |
| | | | 25-35 | 1-1-B35 | Same as above, moist-wet | |
| | | | 35-45 | 1-1-B45 | Same as B25, some fine sand | |
| | | | 45-55 | 1-1-B55 | OH - organic SILT w/ fine sand, brown-gray, tr. f. roots, rusty mottles, soft, wet | |
| | C | 77 | 0-15 ~~1-1-C15~~ | 1-1-C15 | OL - organic SILT, some clay, f. roots, dk brown, moist v. soft | |
| | D | 115 | 0-15 | 1-1-D15 | OL - org. SILT, some clay dk. brown, soft, damp | |
| | E | 155 | 0-15 | 1-1-E15 | Same as F15 | |
| | F | 194 | 0-15 | 1-1-F15 | OL - org SILT, tr. clay roots, brown, soft, damp | |

**HUDSON RIVER FLOODPLAIN SOIL SCREENING**

**FIELD SAMPLING DATA SHEET**

DATE 9/7/00

WEATHER _____

SAMPLERS _____

SITE NO. 1

NAME: S. Park

TRANSECT NO. 1

*NOTES (QA samples, etc):*

*SKETCH*

see p. 1

| SAMPLE LOCATION | DISTANCE FROM START OF TRANSECT ~~(m)~~ ft | SAMPLE DEPTH (cm) | SAMPLE ID | SOIL DESCRIPTION / CLASSIFICATION | ANALYSES |
|---|---|---|---|---|---|
| G | 232 | 0-15 | 1-1-G15 | OL - org. SILT w/clay, fine roots, brown, soft, damp | PCBs TOC gr. size |
| H | 270 | 0-15 | 1-1-H15 | OL - org. SILT w/ clay, f. roots, brown-gray, soft, wet. | |
| D | 115 | 15-25 | 1-1-D25 | OL-OH org. SILT, some f. Sand, tr. f. roots w/ orange streaks, gray-brown, soft, moist | |
| | | 25-35 | 1-1-D35 | SM - Gray-brown fine sandy SILT, tr. f. roots (oxidized) soft, moist | |
| | | 35-45 | 1-1-D45 | Same as above | |
| ↓ | ↓ | 45-55 | 1-1-D55 | same as above | ↓ |
| I | 360 | 0-15 | 1-1-I15 | | |
| I | 360 | 0-15 | DUP-4 | | |
| | | | | | |
| | | | | | |

**HUDSON RIVER FLOODPLAIN SOIL SCREENING**



**FIELD SAMPLING DATA SHEET**

DATE 9/5/00

WEATHER 70, breezy sunny

SAMPLERS KS, SW

SITE NO. 2

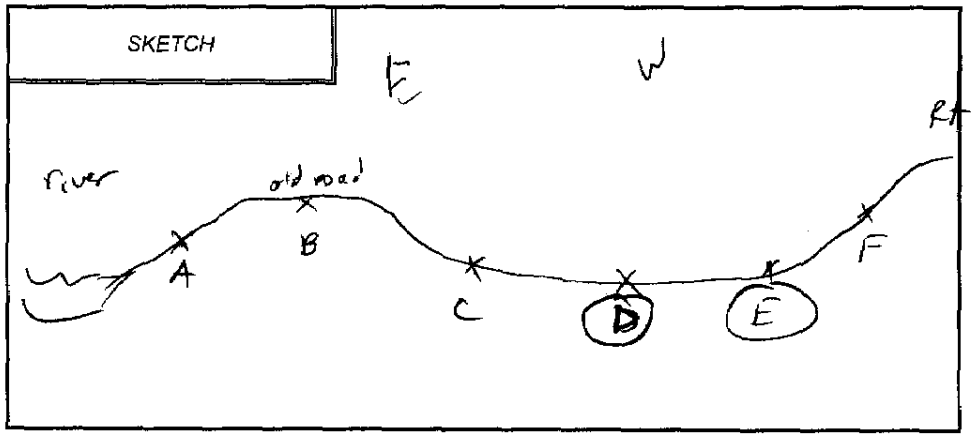
TRANSECT NO. 1

NAME: Battlefield Meadow

*NOTES (QA samples, etc):*

collected Field blank
FB-090500
@ 18:00

SKETCH




| SAMPLE LOCATION | DISTANCE FROM START OF TRANSECT (m) ~~ft~~ | SAMPLE DEPTH (cm) | SAMPLE ID | SOIL DESCRIPTION / CLASSIFICATION | ANALYSES |
|---|---|---|---|---|---|
| A | 0 | 0-15 | 21A15 | SM - Sandy loam - dark brown fine roots, (topsoil) - damp | PCB TOC gr.size |
| B | 20 | 0-15 | 21B15 | SM. F-m sandy loam DK brown, fine roots, dry | " |
| C | 63 | 0-15 | 21C15 | ~~Sand~~ OL- F-m ~~silt~~ organic silt, roots, crumbly, soft, damp | " |
| D | 97 | 0-15 | 2-1-D15 | OH- Organic silt, some clay fine roots, gray brown w/ orange mottling, med. stiff, damp | " |
| | | 15-25 | 2-1D25 | OH org. Silt + Clay fine roots, soft, moist | " |
| | | 25-35 | 2-1D35 | Same as 15-25 | " |
| | | 35-45 | 2-1D45 | OL-OH- Organic CLAY - gray brown, fine roots, orange mottles, stiff, dry-damp | " |
| | | 45-55 | 2-1D55 | same as above | " |
| F | 159 | 0-15 | 2-1-F15 | SM- Fine Sandy Loam DK brown, fine roots, soft - moist | " |
| | | | | | |

**HUDSON RIVER FLOODPLAIN SOIL SCREENING**

**FIELD SAMPLING DATA SHEET**

DATE 9/6/00

WEATHER Sunny, 60°, clear

SITE NO. 2
TRANSECT NO. 1

NAME: Battlefield Meadow

SAMPLERS KS, SW
L. Rosman on site

NOTES (QA samples, etc):

finishing transect from yesterday

SKETCH

See p 1

| SAMPLE LOCATION | DISTANCE FROM START OF TRANSECT (~~m~~ ft) | SAMPLE DEPTH (cm) | SAMPLE ID | SOIL DESCRIPTION / CLASSIFICATION | ANALYSES |
|---|---|---|---|---|---|
| E | 125 | 0-15 | 2-1-E15 | OH - Gray-brown organic CLAY w/ silt, lots of roots, very soft moist | PCB, TOC gr. size |
| ↓ | ↓ | 15-25 | 2-1-E25 | OH same as above, Med. stiff damp | |
| | | 25-35 | 2-1-E35 | same as above med stiff | |
| | | 35-45 | 2-1-E45 | OH - Gray org. CLAY, fine roots orange & roots, stiff | |
| | | 45-55 | 2-1-E55 | same as above stiff | |
| ↳ used hand auger - | | | | | |
| culvert | — | 0-15 | 2-culvert | | |
| | | | | | |
| | | | | | |
| | | | | | |

**HUDSON RIVER FLOODPLAIN SOIL SCREENING**



**FIELD SAMPLING DATA SHEET**

DATE 9/5/00

WEATHER clear, 85-70 breezy

SAMPLERS KNS, SJW

SITE NO. 3

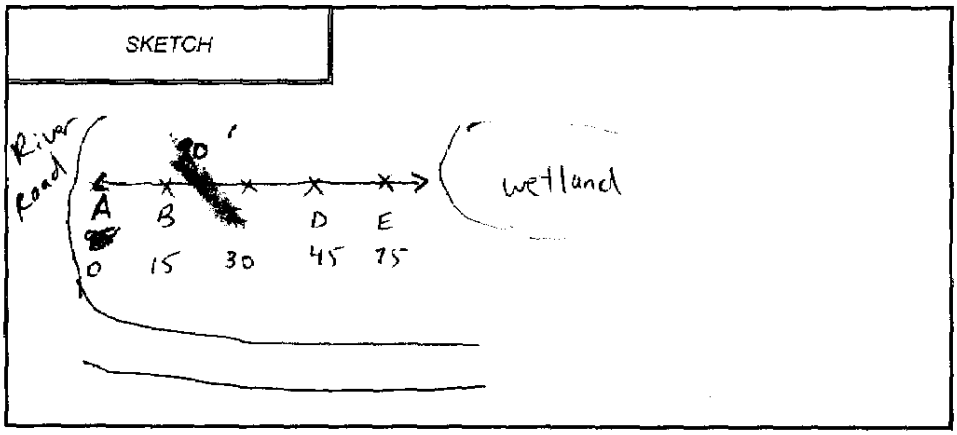
TRANSECT NO. 1

NAME: River Road

NOTES (QA samples, etc):

Dup-1 collected @ 031D15

SKETCH




| SAMPLE LOCATION | DISTANCE FROM START OF TRANSECT ~~(m)~~ ft | SAMPLE DEPTH (cm) | SAMPLE ID | SOIL DESCRIPTION / CLASSIFICATION | ANALYSES |
|---|---|---|---|---|---|
| A | 0 | 0-15 | 03-1A015 | OH - Organic Clay, fine roots, some silt, very soft, moist, red-brown. | PCB TOC Gr. Size |
| B | 15 | 0-15 | 03-1B015 | OH - Organic CLAY, some silt, tr. f. Sand, fine roots, very soft, moist, red-brown w/ faint gray mottles | " |
| C | 30 | 15-25 | 031C25 | OH-OL Organic silty CLAY, tr. f. sand, fine roots, ~~very~~ soft, moist gray-brown w/ orange mottling | " |
| C | | 25-35 | 031C35 | same as above | " |
| C | | 35-45 | 031C45 | OL organic CLAY + silt, soft, moist, gray-brown w/ orange mottles fine roots | " |
| C | | 45-55 | 031C55 | OH-ML Gray-brown SILT w/ ~~fine~~ sand + clay, wet, ~~very~~ soft, somewhat plastic | " |
| C | | 0-15 | 031C15 | See C25 | " |
| D | 45 | 0-15 | 031D15/ DUP-1 | OH - Organic CLAY, some silt, tr. f. sand, very soft, moist, Gray-brown w/ orange mottles | " |
| E | 75 | 0-15 | 031E15 | OL-OH organic clay + silt, soft, moist, Greg brown | " |
| | | 15-25 | 3-1-E25 | OL soft - m. stiff moist | " |
| | | 25-35 | 3-1-E35 | OL silty clay, m. stiff moist - wet | |

travel

travel

core

Dup-1

***HUDSON RIVER FLOODPLAIN SOIL SCREENING***



**FIELD SAMPLING DATA SHEET**

DATE 9/5/00

WEATHER

SAMPLERS KS, SW

SITE NO. 3

TRANSECT NO. 1

NAME: River Rd

*NOTES (QA samples, etc):*

*SKETCH*

see p 1

| SAMPLE LOCATION | DISTANCE FROM START OF TRANSECT (~~m~~ ft) | SAMPLE DEPTH (cm) | SAMPLE ID | SOIL DESCRIPTION / CLASSIFICATION | ANALYSES |
|---|---|---|---|---|---|
| E | 75 | 35-45 | 031E45 | OH - Sandy CLAY, stiff, wet, gray-brown w/ orange mottles along root traces | PCB, TOC, gr. size |
| E | 75 | 45-55 | 031E55 | OH Same as above. | " |
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**HUDSON RIVER FLOODPLAIN SOIL SCREENING**

**FIELD SAMPLING DATA SHEET**



DATE 9/6/00

WEATHER

SAMPLERS SJW + KNS

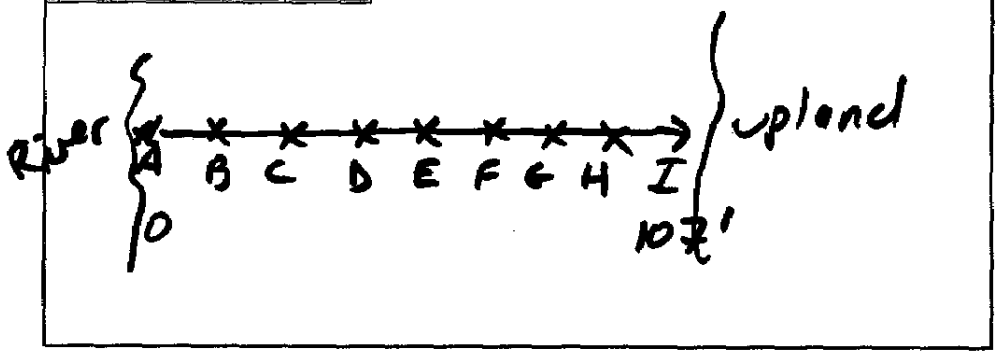
SITE NO. ~~2~~ 4
TRANSECT NO. 1

NAME: ~~Bobby~~ Fishing Hole

*NOTES (QA samples, etc):*

Dup 2 @ 4-1-D

SKETCH




| SAMPLE LOCATION | DISTANCE FROM START OF TRANSECT ~~(m)~~ ft | SAMPLE DEPTH (cm) | SAMPLE ID | SOIL DESCRIPTION / CLASSIFICATION | ANALYSES |
|---|---|---|---|---|---|
| A | 0 | 0-15 | 4-1-A15 | OL - organic silt w/ fine roots Dk Brown, very soft + damp | PCB TOC Grain Size |
| B | 16 | 15 | 4-1-B15 @ ~~4-1-B15~~ | OL - organic silt w/ fine sand Dk Brown, dry | PCB TOC Grn Size |
| C | 29 | 15 | 4-1-C15 | OL-OH - organic silt w/ some clay, fine roots, dk brown, damp, soft | PCB TOC grain size |
| D | 42 | 15 | 4-1-D15 | OH- Organic silt w/ some clay fine roots, dk brown, moist, soft | PCB TOC grain size |
| D | 42 | 15 | Dup 2 | OH - organic silt w/ some clay, fine roots, dk brown, moist, soft | PCB TOC grain size |
| E | 55 | 15 | 4-1-E15 | OH - organic SILT, some clay, fine roots, tr. sand, very soft, moist | " |
| F | 68 | 15 | 4-1-F15 | OL-OH Organic Silt + Clay, roots + decayed wood, Brown-gray, very soft, wet | " |
| G | 81 | 15 | 4-1-G15 | OH - ORGANIC CLAY, some roots Brown, very soft, WET | " |
| H | 94 | 0-15 | 4-1-H15 | OL-OH organic SILT, some clay, roots, Brown very soft, wet | " |
| E | 55 | 15-25 | 4-1-E25 | OL- org SILT some clay, lots of roots V. soft, wet | |
| | | 25-35 | 4-1-E35 | same as ↑ | |

*HUDSON RIVER FLOODPLAIN SOIL SCREENING*



**FIELD SAMPLING DATA SHEET**

DATE 9/6/00

WEATHER

SAMPLERS

SITE NO. 4
TRANSECT NO. 1

NAME: Fishing Hole

*NOTES (QA samples, etc):*

*SKETCH*

| SAMPLE LOCATION | DISTANCE FROM START OF TRANSECT (~~m~~ ft) | SAMPLE DEPTH (cm) | SAMPLE ID | SOIL DESCRIPTION / CLASSIFICATION | ANALYSES |
|---|---|---|---|---|---|
| E | 55 | 35-45 | 4-1-E45 | Same as 35cm - less roots, wet. | PCB TOC gr. size |
| ↓ | ↓ | 45-55 | 4-1-E55 | OH - org. SILT, some clay, fr. roots (orange mottling), v. soft, wet, gray-brown | " |
| I | 107' | 0-15 | 4-1-I15 | OL - org. SILT, fine roots, gray, soft, crumbly, dry | " |
| H | 94 | 15-25 | 4-1-H25 | OL - org. SILT, some clay, f. roots, gray-brown, v. soft, wet | " |
| ↓ | ↓ | 25-35 | 4-1-H35 | Same as above | " |
| ↓ | ↓ | 35-45 | 4-1-H45 | " | " |
| ↓ | ↓ | 45-55 | 4-1-H55 | " | " |
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**HUDSON RIVER FLOODPLAIN SOIL SCREENING**

**FIELD SAMPLING DATA SHEET**



DATE 9/8/00

WEATHER Sunny, clear, 60°F

SAMPLERS KWS, SJW

SITE NO. 5

TRANSECT NO. 1

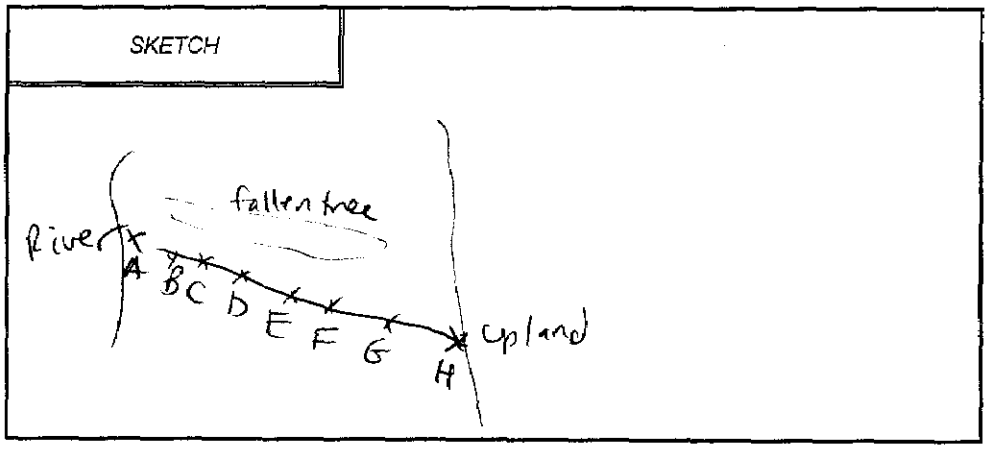
NAME: Opposite Coveville

NOTES (QA samples, etc):

DUP-5 collected @ A15

lots of debris + wrack, garbage everywhere. Saw a large chunk of waxy resin (1ft³)

SKETCH




| SAMPLE LOCATION | DISTANCE FROM START OF TRANSECT (m) ~~ft~~ | SAMPLE DEPTH (cm) | SAMPLE ID | SOIL DESCRIPTION / CLASSIFICATION | ANALYSES |
|---|---|---|---|---|---|
| DUP-5 = A | 0 (-3) | 0-15 | S-1-A15 | OH - organic SILT (muck), Black - roots, very soft, wet - Bottom 5cm is m-c SAND, some gravel wet | PLB TOC grainsize |
| B | 14 | 0-15 | S-1-B15 | OL, organic SILT, tr. clay, some f-m sand, fine roots, Brown, soft, moist | " |
| C | 28 | 0-15 | S-1-C15 | OL - organic SILT w/ Sand + gravel in lower 10cm, Brown, roots, damp | " |
| D | 42 | 1-15 | S-1-D15 | OL - organic SILT w some f-m Sand, Brown, some clay, f. roots very soft, damp | |
| E | 56 | 0-15 | S-1-E15 | OL - organic SILT ~~some~~ tr. Clay roots, Brown, soft, damp-moist | |
| F | 70 | 0-15 | S-1-F15 | OL - organic SILT TR. CLAY ROOTS, BROWN, SOFT, DAMP-MOIST | |
| G | 84 | 0-15 | S-1-G15 | OL - organic SILT w/ some f-m sand, tr clay, fine roots, Brown soft | |
| H | 100 | 0-15 | S-1-H15 | SM - silty f-c SAND, some roots dry, loose Brown. damp | |
| D | 42 | 15-25 | S-1-D25 | OL-OH organic SILT w/ f-m sand, Brown, rusty mottles occ. f. gravel, soft, wet, wood chunks | |
| D | ↓ | 25-35 | S-1-D35 | same as above | |

**HUDSON RIVER FLOODPLAIN SOIL SCREENING**



**FIELD SAMPLING DATA SHEET**

DATE 9/8/00

WEATHER

SAMPLERS KNS, SJW

SITE NO. 5
TRANSECT NO. 1

NAME: Opposite Coreville

*NOTES (QA samples, etc):*

*SKETCH*

see p 1

| SAMPLE LOCATION | DISTANCE FROM START OF TRANSECT (m) ~~ft~~ | SAMPLE DEPTH (cm) | SAMPLE ID | SOIL DESCRIPTION / CLASSIFICATION | ANALYSES |
|---|---|---|---|---|---|
| D | 42 | 35-45 | S-1-D45 | SM-SP SAND (med), some C sand, some silt, occ. fi gravel, Gray, loose, wet | |
| D | 42 | 45-55 | S-1-D55 | SP - med SAND, some C. Sand, some f. gravel, gray, loose wet | |
| F | 70 | 15-25 | S-1-F25 | SM - ~~coarse~~ med ~~SAND~~ SAND some coarse GRAY Loose, moist | |
| F | ↓ | 25-35 | S-1-F35 | SM - med ~~coarse~~ SAND, occ. fine gravel (0.5-1 cm), Gray, some C. sand, loose, wet | |
| F | | 35-45 | S-1-F45 | SM - med-C. SAND occ. f. gravel gray, loose, wet | |
| F | | 45-55 | S-1-F55 | SM med-C SAND, some f. gravel, Gray, lousε-firm wet | |
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**HUDSON RIVER FLOODPLAIN SOIL SCREENING**

**FIELD SAMPLING DATA SHEET**



DATE 9/6/00

WEATHER

SAMPLERS KNS, SJW

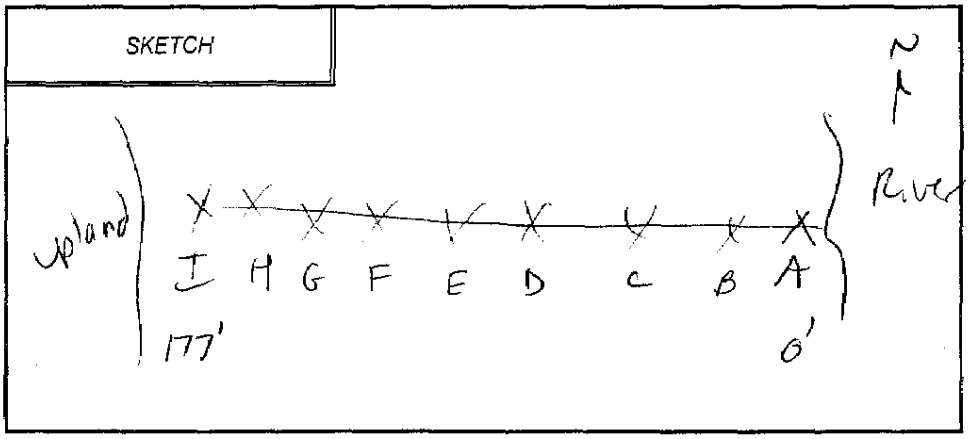
SITE NO. 6
TRANSECT NO. 1

NAME: Schuylerville Cornfield

NOTES (QA samples, etc):

DUP-3 @ H

SKETCH




| SAMPLE LOCATION | DISTANCE FROM START OF TRANSECT (m) ~~ft~~ | SAMPLE DEPTH (cm) | SAMPLE ID | SOIL DESCRIPTION / CLASSIFICATION | ANALYSES | |
|---|---|---|---|---|---|---|
| A | 0 | 0-15 | 6-1-A15 | OL Organic SILT + clay, lots of roots, some f. sand Brown, moist, v. soft | PCB TOC grain size | |
| B | ~~22~~ | 0-15 | 6-1-B15 | same as A | " | |
| C | 44 | 0-15 | 6-1-C15 | same as A - less roots. | " | |
| D | 66 | 0-15 | 6-1-D15 | OL - Organic silt, little clay f-f. sand abundant roots Brown, damp, v. soft | | |
| E | 88 | 0-15 | 6-1-E15 | Same as D | | |
| F | 110 | 0-15 | 6-1-F15 | OL - organic SILT, little clay lots of roots, Brown dry-damp v. soft. | | |
| G | 132 | 0-15 | 6-1-G15 | same as F | | |
| H | 155 | 0-15 | 6-1-H15 | OL - organic SILT, roots Brown, soft, dry. | | |
| I | 177 | 0-15 | 6-1-I15 | Same as above | | |
| C | 44 | 15-25 | 6-1-C25 | OL - organic SILT, some clay some roots, soft, moist | | |
| | | 25-35 | 6-1-C35 | Same as 15-25 | | |

worms

worms

DUP-3

**HUDSON RIVER FLOODPLAIN SOIL SCREENING**

**FIELD SAMPLING DATA SHEET**



DATE 9/6/00

WEATHER

SAMPLERS ICAS / SJW

SITE NO. 6

TRANSECT NO. 1

NAME: cornfield

NOTES (QA samples, etc):

Field Blank
FB90600
@ 16:30

SKETCH

see p 1

| SAMPLE LOCATION | DISTANCE FROM START OF TRANSECT (m) ~~ft~~ | SAMPLE DEPTH (cm) | SAMPLE ID | SOIL DESCRIPTION / CLASSIFICATION | ANALYSES |
|---|---|---|---|---|---|
| C | 44 | 35-45 | 6-1-C45 | MH-SM SILT w/ fine SAND gray, soft, tr. f roots w/ rusty mottles, wet. | PCB TOC grs) |
| C | 44 | 45-55 | 6-1-C55 | same as above | " |
| ~~H~~ H | 155 | 0-15 | DUP-3 | see H 0-15 | " |
| G | 132 | 15-25 | 6-1-G25 | Top 2cm - organic sand + silt rest is f. SAND, ~~silt~~ silt gray-brown, loose, damp | " |
| ↓ | ↓ | 25-35 | 6-1-G35 | SW - Fine SAND, Tan-gray, loose, damp | " |
| | | 35-45 | 6-1-G45 | SW Fine SAND - Tan-gray loose, damp. Dark gray in tip | " |
| ↓ | ↓ | 45-55 | 6-1-G55 | SW Fine SAND, gray, loose, damp. | |
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**HUDSON RIVER FLOODPLAIN SOIL SCREENING**

**FIELD SAMPLING DATA SHEET**



DATE 9/11/00

WEATHER muggy, cloudy ~70°F

SAMPLERS JLNS / SJW

SITE NO. 7

TRANSECT NO. 1

NAME: Near River Mile 187

NOTES (QA samples, etc):

DUP-B collected at 7-1-D15

SKETCH

N

Specific location of study area has not been included in order to protect privacy of property owner

| SAMPLE LOCATION | DISTANCE FROM START OF TRANSECT (m) ft | SAMPLE DEPTH (cm) | SAMPLE ID | SOIL DESCRIPTION / CLASSIFICATION | ANALYSES |
|---|---|---|---|---|---|
| A | 0 | 0-15 | 7-1-A15 | OL - organic SILT + FINE SAND, LOOSE, CRUMBLY DRY DK BROWN | PCBs TOC gr. size |
| B | 25 | 0-15 | 7-1-B15 | OL - ORGANIC SILT w FINE SAND, LOOSE + CRUMBLY DRY DK. BROWN | |
| C | 50 | 0-15 | 7-1-C15 | OL - ORGANIC SILT + FINE SAND, LOOSE, CRUMBLY DRY DK BROWN | |
| DUP B → D | 75 | 0-15 | 7-1-D15 | OL - Organic SILT + fine Sand, Dark brown, loose, crumbly, dry. | |
| E | 100 | 0-15 | 7-1-E15 | OL ORGANIC SILT, FINE ROOTS VERY DRY & CRUMBLY/BLOCKY DK BROWN, loose | |
| F | 125 | 0-15 | 7-1-F15 | OL organic SILT, fine roots, very dry + crumbly / blocky & DK brown, loose | |
| G | 150 | 0-15 | 7-1-G15 | OL - ORGANIC SILT, ROOTS, DK BROWN, DRY, LOOSE | |
| F | | 15-25 | 7-1-F25 | OL/ML ORGANIC SILT, VERY DRY CRUMBLY / BROWN / LOOSE | |
| F | | 25-35 | 7-1-F35 | " med. stiff | |
| F | | 35-45 | 7-1-F45 | med. stiff | |
| | | 45-55 | 7-1-F55 | " | |

**HUDSON RIVER FLOODPLAIN SOIL SCREENING**

**FIELD SAMPLING DATA SHEET**



DATE 9/11/00

WEATHER

SAMPLERS

SITE NO. 7
TRANSECT NO. 1

NAME: Near River Mile 187

*NOTES (QA samples, etc):*

*SKETCH*

Specific location of study area has not been included in order to protect privacy of property owner

| SAMPLE LOCATION | DISTANCE FROM START OF TRANSECT (~~m~~) ft | SAMPLE DEPTH (cm) | SAMPLE ID | SOIL DESCRIPTION / CLASSIFICATION | ANALYSES |
|---|---|---|---|---|---|
| B | 25 | 15-25 | 7-1-B25 | OL organic sandy SILT Brown-gray - dry crumbly, loose fine roots. | |
| | ↓ | 25-35 | 7-1-B35 | Same as above | |
| | | 35-45 | 7-1-B45 | ↓ | |
| | | 45-55 | 7-1-B55 | | |
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**HUDSON RIVER FLOODPLAIN SOIL SCREENING**

**FIELD SAMPLING DATA SHEET**



DATE 9/11/00

WEATHER 80°, partly sunny humid

SAMPLERS KNS / SJW

SITE NO. 8

TRANSECT NO. 1

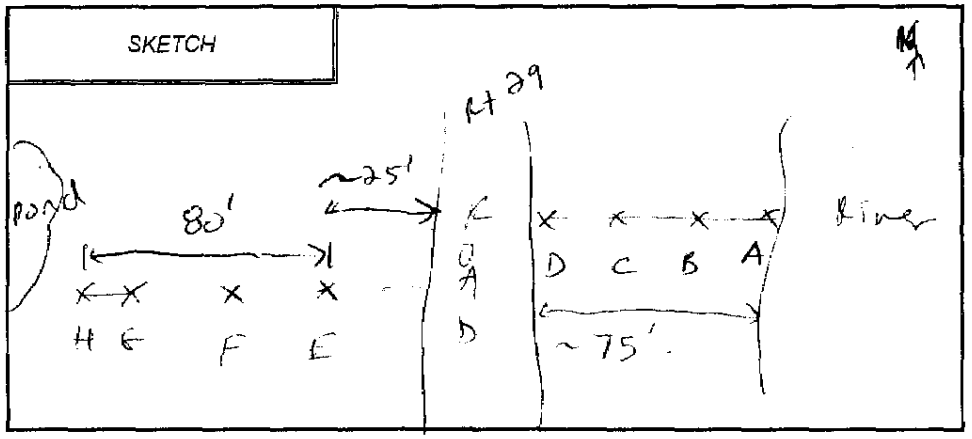
NAME: Peters Rd / floodgates

NOTES (QA samples, etc):

DUP - ~~6~~ 7 @ 8-1-C15

photos 33, 31, 30

SKETCH




| SAMPLE LOCATION | DISTANCE FROM START OF TRANSECT (m) ~~FT~~ | SAMPLE DEPTH (cm) | SAMPLE ID | SOIL DESCRIPTION / CLASSIFICATION | ANALYSES | |
|---|---|---|---|---|---|---|
| A | 0 | 0-15 | 8-1-A15 | OL/SM Organic silt, w/ f. sand, fine roots, loose, dry Dark brown | PCB TPC | 0 |
| B | 23 | 0-15 | 8-1-B15 | same as above | grain size | 0 |
| C | 46 | 0-15 | 8-1-C15 DUP-6 | same as above - damp | " | 0 |
| East of Rt 29 D | 64 | 0-15 | 8-1-D15 | same as above - damp | " | 0 |
| B | 23 | 15-25 | 8-1-B25 | fine sandy SILT, organic fine roots, damp. | " | 0 |
| | | 25-35 | 8-1-35 | same as above Dark-brown-gray | " | 0 |
| | ↓ | 35-45 | 8-1-45 | OL organic SILT, fine sand roots Dark brown-gray, rusty mottles | " | 0 |
| | | 45-55 | 8-1-55 | same as above | " | 0 |
| WEST OF ROAD ↓ E | 80 | 0-15 | 8-1-E15 | OL/SM organic SILT, FINE SAND ROOTS, DK. BROWN SOIL, LOOSE DRY | | 0 |
| F | 26 | 0-15 | 8-1-F15 | OL, SILT, FINE SAND ROOTS, DK BROWN, ROOTS DAMP | | 0 |

**HUDSON RIVER FLOODPLAIN SOIL SCREENING**



**FIELD SAMPLING DATA SHEET**

DATE 9/11/00

WEATHER

SAMPLERS KNS / JW

SITE NO. 8

TRANSECT NO. 1

NAME: Peters Rd / Floodgate

NOTES (QA samples, etc):

SKETCH

see p. 1

| SAMPLE LOCATION | DISTANCE FROM START OF TRANSECT (~~m~~ ft) | SAMPLE DEPTH (cm) | SAMPLE ID | SOIL DESCRIPTION / CLASSIFICATION | ANALYSES |
|---|---|---|---|---|---|
| G | | 0-15 | 8-1-G15 | OL - ORGANIC SILT, FINE SAND ROOTS, DK. BROWN damp LOOSE | PCB TOC Grn Size |
| H | | 0-15 | 8-1-H15 | OL - ORGANIC SILT, FINE SAND ROOTS DK BROWN, damp | " |
| F | 26 | 15-25 | 8-1-F25 | | |
| | ↓ | 25-35 | 8-1-F35 | OL organic SILT, some f. sand tr. clay, roots, DK brown, soft, damp. | |
| | | 35-45 | 8-1-F45 | OL-OH organic SILT, some f. sand, some clay, DK brown-gray w/ rust mottles, moist | |
| | ↓ | 45-55 | 8-1-F55 | same as above OH Brown clayey SILT, tr f. sand, very soft, wet. | |
| | | | | L 55-60 → Gray SILT w/ fine sand) | |
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**HUDSON RIVER FLOODPLAIN SOIL SCREENING**

**FIELD SAMPLING DATA SHEET**



DATE 9/8/00

WEATHER 80° humid partly cloudy

SAMPLERS KNS / SJW

SITE NO. 9

TRANSECT NO. 1

NAME: Near River Mile 191

NOTES (QA samples, etc):

DUP-6 collected

Field Blank FB090800

SKETCH

specific location of study area has not been included in order to protect privacy of property owner.

| SAMPLE LOCATION | DISTANCE FROM START OF TRANSECT (~~m~~ ft) | SAMPLE DEPTH (cm) | SAMPLE ID | SOIL DESCRIPTION / CLASSIFICATION | ANALYSES |
|---|---|---|---|---|---|
| A | 0 | 0-15 | 9-1-A15 | OL - organic SILT some clay tr. f. roots, Brown, tr. soft, moist | PCBs TOC Gran. Size |
| B | 24 | 0-15 | 9-1-B15 | OL - organic SILT, some clay, tr. f. roots, Brown, soft, wet | |
| DUP-6 C | 48 | 0-15 | 9-1-C15 | OL - ORGANIC SILT, SOME CLAY TRACE FINE ROOTS, DK BROWN SOFT - WET | |
| D | 72 | 0-15 | 9-1-D15 | OL - ORGANIC SILT, SOME CLAY TR. FINE SAND, FINE ROOTS SOFT & MOIST | |
| E | 96 | 0-15 | 9-1-E15 | OL organic SILT, tr-sandy clay, fine roots, Tan-brown, soft, damp | |
| F | 120 | 0 15 | 9-1-F15 | OL - organic SILT, fine roots, Tan-brown soft, crumbly damp | |
| D | 72 | 15-25 | 9-1-D25 | Same as 0-15 | |
| ↓ | ↓ | 25-35 | 9-1-D35 | OL-ML Brown-gray, clayey SILT, some m. sand, iron nodules damp. | |
| | | 35-45 | 9-1-D45 | OL-CL Grayish-brown silty CLAY, crumbly, rust mottles abundant, dry, med. stiff | |
| ↓ | ↓ | 45-55 | 9-1-D55 | Same as above | |

**HUDSON RIVER FLOODPLAIN SOIL SCREENING**

**FIELD SAMPLING DATA SHEET**



DATE 9/8/00

WEATHER

SAMPLERS ILNS / SJW

SITE NO. 9

TRANSECT NO. 1

NAME: Near River Mile 191

*NOTES (QA samples, etc):*

*SKETCH*

Specific location of study area has not been included in order to protect privacy of property owner.

| SAMPLE LOCATION | DISTANCE FROM START OF TRANSECT (m) ~~ft~~ | SAMPLE DEPTH (cm) | SAMPLE ID | SOIL DESCRIPTION / CLASSIFICATION | ANALYSES |
|---|---|---|---|---|---|
| B | 24 | 15-25 | 9-1-B25 | OL-OH Org. SILT, some clay, brown-gray soft, moist | |
| ↓ | ↓ | 15-35 | 9-1-B35 | same as above | |
| | | 35-45 | 9-1-B45 | OH-CH – silty CLAY, oxidized root channels, soft – m. stiff gray. wet | |
| ↓ | ↓ | 45-55 | 9-1-B55 | same as above less silt wet | |
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**HUDSON RIVER FLOODPLAIN SOIL SCREENING**



**FIELD SAMPLING DATA SHEET**

DATE 9/12/00

WEATHER 70°F, light rain

SAMPLERS ICNS, SJW

SITE NO. 10

TRANSECT NO. 1

NAME: Canal Corp Spoils Site

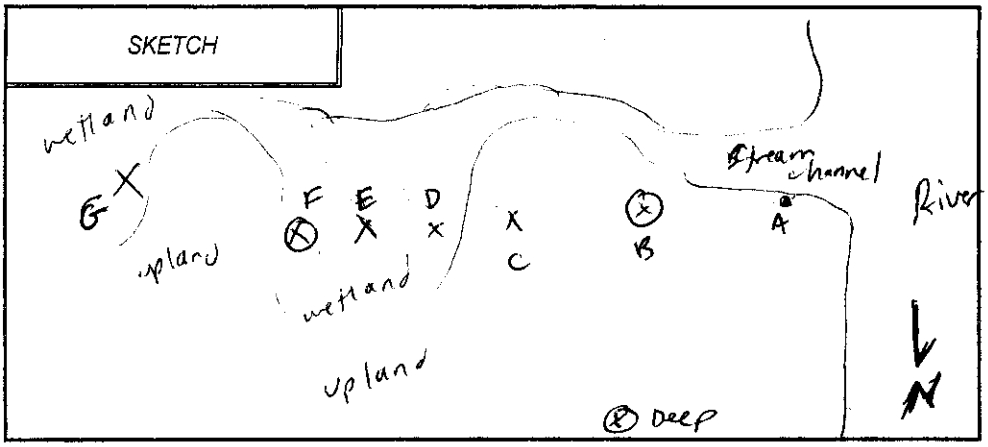
*NOTES (QA samples, etc):*

DUP 9 @ 10-1-A15

Field Blank

FB 91200

SKETCH




| SAMPLE LOCATION | DISTANCE FROM START OF TRANSECT (m) ~~ft~~ | SAMPLE DEPTH (cm) | SAMPLE ID | SOIL DESCRIPTION / CLASSIFICATION | ANALYSES |
|---|---|---|---|---|---|
| A | 0 | 0-15 | 10-1-A15 | SM - organic silty SAND, gray-black, moist, loose | PCB, TOC, grain size |
| B | 21 | 0-15 | 10-1-B15 | OL - Sandy (f) organic SILT w/ roots, org. matter, soft, moist | " |
| C | 42 | 0-15 | 10-1-C15 | Same as B | " |
| D | 78 | 0-15 | 10-1-D15 | OH - Gray clayey organic SILT some f. sand, org matter, very soft, wet | " |
| E | 99 | 0-15 | 10-1-E15 | " | " |
| F | 120 | 0-15 | 10-1-F15 | " | " |
| G | 196 | 0-15 | 10-1-G15 | OL-OH Organic SILT, some clay, gray-brown, V. soft wet | " |
| B | 21 | 15-25 | 10-1-B25 | OL - organic SILT, fine roots some f. sand, Brown, soft, moist | " |
| ↓ | ↓ | 25-35 | 10-1-B35 | " | " |
| | | 35-45 | 10-1-B45 | OL-OH ~~clay~~ organic SILT some clay, some f. sand, very soft, moist - wet | " |
| | | MS-55 | 10-1-B55 | " | " |

**HUDSON RIVER FLOODPLAIN SOIL SCREENING**

**FIELD SAMPLING DATA SHEET**

DATE 9/12/00

WEATHER

SAMPLERS KNS / SJW

SITE NO. 10
TRANSECT NO. 1

NAME: Canal corp spoil site

*NOTES (QA samples, etc):*

*SKETCH*

see p 1

| SAMPLE LOCATION | DISTANCE FROM START OF TRANSECT (~~m~~ ft) | SAMPLE DEPTH (cm) | SAMPLE ID | SOIL DESCRIPTION / CLASSIFICATION | ANALYSES |
|---|---|---|---|---|---|
| F | | 15-25 | 10-1-F25 | OL-OH Gray organic SILT, some clay, some fine sand, orange mottles, soft, wet | PCB TOC Gr. Size |
| ↓ | | 25-35 | 10-1-F35 | " | " |
| ↓ | | 35-45 | 10-1-F45 | OH-MH - f. sandy ~~clayey~~ SILT, some org. matter, some clay, soft, wet | " |
| ↓ | | 45-55 | 10-1-F55 | " | " |
| | | | | | |
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| | | | | | |

**HUDSON RIVER FLOODPLAIN SOIL SCREENING**



**FIELD SAMPLING DATA SHEET**

DATE 9/12/00

WEATHER pt'ly cloudy, breezy 75°F

SAMPLERS

SITE NO. 11

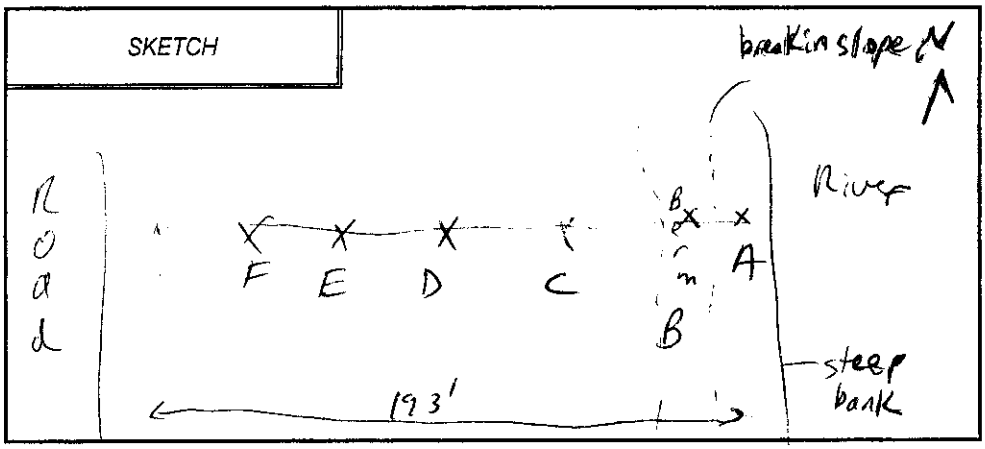
TRANSECT NO. 1

NAME: Rogers Island

NOTES (QA samples, etc):

Dup-10 @ D15

SKETCH




| SAMPLE LOCATION | DISTANCE FROM START OF TRANSECT (m or ft) | SAMPLE DEPTH (cm) | SAMPLE ID | SOIL DESCRIPTION / CLASSIFICATION | ANALYSES |
|---|---|---|---|---|---|
| A | 0 | 0-15 | 11-1-A15 | OL SM Organic sandy SILT, Brown very fine, lots of roots, dry, loose | |
| B | 13 | 0-15 | 11-1-B15 | OL-SM sandy SILT w/ roots, shale fragments, Black, moist loose | |
| C | 37 | 0-15 | 11-1-C15 | Fill- f. sand, ash, shale dust, some roots, brown - black dry - loose. | |
| D | ~~73~~ 73 | 0-15 | 11-1-D15 | Same as C15 | |
| E | 115 | 0-15 | 11-1-E15 | Fill - Sand, ash, some roots Brown, black, dry, loose | |
| F | 154 | 0-15 | 11-1-F15 | Same as above | |
| Dup-10 (AT D) | | 0-15 | Dup-10 | "SAME AS D" | |
| A | | 15-25 | 11-1-A25 | Same as A15 | |
| | | 25-35 | 11-1-A35 | SM Brown silty SAND ~~roots~~, shale frags, dry, loose | |
| | | 35-45 | 11-1-A45 | Same as 35 but w/ more shale | |
| | | 45-55 | 11-1-A55 | Same as 45 | |

**HUDSON RIVER FLOODPLAIN SOIL SCREENING**

**FIELD SAMPLING DATA SHEET**

DATE 9/12/00

WEATHER

SAMPLERS KVB/SJW

SITE NO. 11

TRANSECT NO. 1

NAME: Rogers Island

*NOTES (QA samples, etc):*

*SKETCH*

| SAMPLE LOCATION | DISTANCE FROM START OF TRANSECT (~~m~~ ft) | SAMPLE DEPTH (cm) | SAMPLE ID | SOIL DESCRIPTION / CLASSIFICATION | ANALYSES |
|---|---|---|---|---|---|
| C | 37 | 15-25 | 11-1-C25 | Fill - Brown-black sand silt, ash, sm. gravel, brick loose, damp | |
| ↓ | ↓ | 25-35 | 11-1-C35 | " | |
| | | 35-45 | 11-1-C45 | " | |
| ↓ | ↓ | 45-55 | 11-1-C55 | same as above - bottom 2 cm - Tan silty sand (looks like clean Fill) | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |

# APPENDIX C

## ANALYTICAL DATA QUALITY OBJECTIVES

## Analytical Data Quality Objectives for Hudson River Total PCB Project

Data Quality Objectives (DQOs) for the floodplain screening project were developed by New Environmental Horizons, Inc. (NEH), of Skilman, New Jersey and Woods Hole Group Environmental Laboratories of Raynham, Massachusetts in consultation with Industrial Economics, Inc. NEH was contracted by S E A Consultants, Inc. to provide PCB technical analytical support services. In developing project-specific DQOs, the following EPA guidance documents were utilized:


USEPA (United States Environmental Protection Agency). 1992. Guidance for Data Usability in Risk Assessment (Part A) Final. 9285.7-09A. April.

USEPA. 1994. Guidance for Data Quality Objective Process, EPA QA/G-4, USEPA Office of Research and Development. EPA600-R-96/055. September.

USEPA. 1996. Test Methods for Evaluating Solid Wastes, SW-846, Third Edition. December.

USEPA. 1999. National Functional Guidelines for Organic Data Review. October.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Extraction of soils and tissue will occur using SW-846 Method 3545, Pressurized Fluid Extraction. Each analytical extraction batch will contain:

≤ 20 field samples
1 Method Blank (diatomaceous earth)
1 LCS (diatomaceous earth spiked with Aroclor 1016/1260)
1 MS (aliquot of field sample spiked with Aroclor 1016/1260)
1 MSD (aliquot of field sample spiked with Aroclor 1016/1260)

Each field sample and QC sample (MB, LCS, MS/MSD) will be spiked with TCMX and DCB surrogates prior to extraction.

In general, soil extraction will involve 20g of soil extracted with methylene chloride, exchanged to hexane with a final volume prior to analysis of 2 mL. Tissue extraction will involve 10g of homogenized tissue extracted with methylene chloride, exchanged to hexane with a final volume of 2 mL prior to analysis. If warranted, GPC Cleanup (SW-846 Method 3640A) of the tissue extracts may be required to reduce interferences in the analysis. All tissue extracts, and soil extracts as needed, will undergo acid cleanup (SW-846 Method 3665) to remove further interferences for analysis.

Analysis will occur using a modified SW-846 Method 8082 approach.

a) A five-level calibration will be performed using the Aroclor 1016/1260 mix. The concentration of the standards analyzed will be 0.02/0.05, 0.1, 0.5, 1.0, 2.5, and 5 µg/mL in each of these two Aroclors. A single point calibration will be performed for Aroclors 1242, 1248, and 1254 at 0.1 µg/mL. Calibration factors will be developed using 3-5 distinct peaks of each Aroclor.
b) A five-level calibration of a mixed Aroclor standard will be performed (Aroclors 1242, 1248, 1254, and 1260) at 0.1, 0.5, 1.0, 2.5, and 5.0 µg/mL for the combined Aroclors. For this calibration, the area of all peaks will be summed and a Calibration factor for Total PCBs obtained for each of the calibration runs.

The calibrations for approach A will be used if the samples are non-detect in any Aroclor type peaks or if a distinct Aroclor pattern is evident in the chromatogram.[1] Based on the extraction methods above, the Reporting Limit for soils, assuming 100% solids and no GPC cleanup, is 10 µg/Kg. The data would be reported for each Aroclor (1016, 1242, 1248, 1254, and 1260) along with a Total PCB result. The Total PCB result is the sum of the 5 Aroclors detected. If none of the Aroclors are detected, Total PCBs will be at a reporting limit of 10 µg/Kg. For Tissues, the Aroclor reporting limits, assuming GPC, are 40 µg/Kg.

The calibrations for approach B will be used if no distinct Aroclor pattern is discernable and the chromatogram does indicate the possible presence of aroclor-type peaks.[2] Total PCBs would be calculated by determining the area under the various peaks of the resulting chromatogram. This type of evaluation results in a conservative estimate of PCB contamination. The data would be reported as Total PCBs with a reporting limit for soils of 40 µg/Kg and for tissues of 160 µg/Kg.

[1] No analyses were conducted using approach A, as the trustees determined that quantification of total PCBs was more useful for a screening study than an Aroclor-based analysis.
[2] Approach B was used for all soil and shrew samples in this study.

## Analytical Data Quality Objectives for Hudson River PCB Screening Project

| PARAMETER | Matrix | QC COMPOUNDS | FD OR MD PRECISION (RPD) | BLANKS | LCS& MS ACCURACY (% REC) | SURROGATE ACCURACY (% REC) |
|---|---|---|---|---|---|---|
| Total PCBs | Soil | Total PCBs<br>AR 1016/1260<br>tetrachloro-m-xylene<br>decachlorobiphenyl | ≤50 | < RL | 38-158 | 30-150<br>30-150 |
| Total PCBs | Biota | Total PCBs<br>AR1016/1260<br>tetrachloro-m-xylene<br>decachlorobiphenyl | ≤50 | < RL | 38-158 | 30-150<br>30-150 |

# APPENDIX D

## SOIL SAMPLING ANALYTICAL RESULTS

## *Floodplain Soil Sampling Analytical Results*
## *PCBs and Total Organic Carbon*

| Site No. | Site Name | Sample ID | Bottom Depth | Date Sampled | Total PCBs mg/kg (dry wt.) | Q | % Solids | Total Organic Carbon mg/kg (dry wt.) | TOC adjusted Total PCBs mg PCBs / kg TOC |
|---|---|---|---|---|---|---|---|---|---|
| 1 | Southern Park | 1-1-A15 | 15 | 09/07/2000 | 14 | | 56 | 62500 | 224 |
| | | 1-1-B15 | 15 | 09/07/2000 | 4 | | 57 | 49000 | 82 |
| | | 1-1-B25 | 25 | 09/07/2000 | 2.2 | | 58 | 27000 | 81 |
| | | 1-1-B35 | 35 | 09/07/2000 | 0.14 | | 69 | 17500 | 8.0 |
| | | 1-1-B45 | 45 | 09/07/2000 | 0.031 | | 71 | 8400 | 3.7 |
| | | 1-1-B55 | 55 | 09/07/2000 | < 0.014 | U | 72 | 6800 | < 2.1 |
| | | 1-1-C15 | 15 | 09/07/2000 | 1.4 | | 53 | 45500 | 31 |
| | | 1-1-D15 | 15 | 09/07/2000 | 0.35 | | 67 | 24500 | 14 |
| | | 1-1-D25 | 25 | 09/07/2000 | 0.044 | | 70 | 15000 | 2.9 |
| | | 1-1-D35 | 35 | 09/07/2000 | < 0.013 | U | 71 | 10400 | < 1.3 |
| | | 1-1-D45 | 45 | 09/07/2000 | < 0.013 | U | 74 | 6650 | < 2.0 |
| | | 1-1-D55 | 55 | 09/07/2000 | 0.018 | | 76 | 3300 | 5.5 |
| | | 1-1-E15 | 15 | 09/07/2000 | 0.032 | | 62 | 19000 | 1.7 |
| | | 1-1-F15 | 15 | 09/07/2000 | 0.71 | | 59 | 31500 | 23 |
| | | 1-1-G15 | 15 | 09/07/2000 | 0.076 | | 62 | 32500 | 2.3 |
| | | 1-1-H15 | 15 | 09/07/2000 | < 0.014 | U | 63 | 23000 | < 0.61 |
| | | 1-1-I15 | 15 | 09/07/2000 | < 0.014 | U | 65 | 42500 | < 0.33 |
| | | *1-1-I15-FD* | *15* | 09/07/2000 | < 0.016 | U | 58 | 52500 | < 0.30 |
| 2 | Battlefield Meadow | 2-1-A15 | 15 | 09/05/2000 | 4.9 | | 65 | 35500 | 138 |
| | | 2-1-B15 | 15 | 09/05/2000 | 1.7 | | 92 | 20500 | 83 |
| | | 2-1-C15 | 15 | 09/05/2000 | 0.58 | | 64 | 40500 | 14 |
| | | 2-1-D15 | 15 | 09/05/2000 | 0.25 | | 69 | 29500 | 8.5 |
| | | 2-1-D25 | 25 | 09/05/2000 | < 0.013 | U | 75 | 12000 | < 1.1 |
| | | 2-1-D35 | 35 | 09/05/2000 | < 0.013 | U | 72 | 11000 | < 1.2 |
| | | 2-1-D45 | 45 | 09/05/2000 | < 0.014 | U | 74 | 12000 | < 1.2 |
| | | 2-1-D55 | 55 | 09/05/2000 | < 0.013 | U | 74 | 10500 | < 1.2 |
| | | 2-1-E15 | 15 | 09/06/2000 | 0.097 | | 58 | 50500 | 1.9 |
| | | 2-1-E25 | 25 | 09/06/2000 | 0.024 | P | 72 | 16000 | 1.5 |
| | | 2-1-E35 | 35 | 09/06/2000 | < 0.014 | U | 70 | 15000 | < 0.93 |
| | | 2-1-E45 | 45 | 09/06/2000 | < 0.014 | U | 69 | 17000 | < 0.82 |
| | | 2-1-E55 | 55 | 09/06/2000 | < 0.014 | U | 70 | 14000 | < 1.0 |
| | | 2-1-F15 | 15 | 09/05/2000 | 0.13 | | 87 | 24500 | 5.3 |
| | | 2-CULVERT | 15 | 09/06/2000 | 0.028 | | 68 | 37500 | 0.75 |
| 3 | River Road | 3-1-A15 | 15 | 09/05/2000 | 0.048 | | 63 | 34500 | 1.4 |
| | | 3-1-B15 | 15 | 09/05/2000 | 0.04 | | 70 | 16000 | 2.5 |
| | | 3-1-C15 | 15 | 09/05/2000 | 0.043 | | 63 | 34500 | 1.2 |
| | | 3-1-C25 | 25 | 09/05/2000 | < 0.013 | U | 75 | 11000 | < 1.2 |
| | | 3-1-C35 | 35 | 09/05/2000 | < 0.014 | U | 72 | 15000 | < 0.93 |
| | | 3-1-C45 | 45 | 09/05/2000 | < 0.013 | U | 76 | 7550 | < 1.7 |
| | | 3-1-C55 | 55 | 09/05/2000 | < 0.012 | U | 79 | 4800 | < 2.5 |
| | | 3-1-D15 | 15 | 09/05/2000 | < 0.015 | U | 64 | 17500 | < 0.86 |
| | | *3-1-D15-FD* | *15* | 09/05/2000 | 0.048 | | 68 | 19000 | 2.5 |
| | | 3-1-E15 | 15 | 09/05/2000 | 0.043 | | 67 | 23500 | 1.8 |
| | | 3-1-E25 | 25 | 09/05/2000 | 0.034 | P | 68 | 17500 | 1.9 |
| | | 3-1-E35 | 35 | 09/05/2000 | < 0.014 | U | 70 | 8350 | < 1.7 |
| | | 3-1-E45 | 45 | 09/05/2000 | < 0.014 | U | 69 | 7000 | < 2.0 |
| | | 3-1-E55 | 55 | 09/05/2000 | < 0.012 | U | 82 | 1950 | < 6.2 |

## *Floodplain Soil Sampling Analytical Results*
## *PCBs and Total Organic Carbon*

| Site No. | Site Name | Sample ID | Bottom Depth | Date Sampled | Total PCBs mg/kg (dry wt.) | Q | % Solids | Total Organic Carbon mg/kg (dry wt.) | TOC adjusted Total PCBs mg PCBs / kg TOC |
|---|---|---|---|---|---|---|---|---|---|
| 4 | Fishing Hole | 4-1-A15 | 15 | 09/06/2000 | 12 | | 73 | 15000 | 800 |
| | | 4-1-B15 | 15 | 09/06/2000 | 63 | | 68 | 44000 | 1432 |
| | | 4-1-C15 | 15 | 09/06/2000 | 18 | | 57 | 51000 | 353 |
| | | 4-1-D15 | 15 | 09/06/2000 | 7 | | 53 | 54000 | 130 |
| | | *4-1-D15-FD* | *15* | 09/06/2000 | 7.5 | | 48 | 60500 | 124 |
| | | 4-1-E15 | 15 | 09/06/2000 | 0.61 | | 61 | 33500 | 18 |
| | | 4-1-E25 | 25 | 09/08/2000 | 4.2 | | 43 | 62000 | 68 |
| | | 4-1-E35 | 35 | 09/08/2000 | 0.54 | | 57 | 89500 | 6.0 |
| | | 4-1-E45 | 45 | 09/08/2000 | 0.088 | | 67 | 15000 | 5.9 |
| | | 4-1-E55 | 55 | 09/06/2000 | 0.027 | | 67 | 14000 | 1.9 |
| | | 4-1-F15 | 15 | 09/06/2000 | 0.55 | | 56 | 58500 | 9.4 |
| | | 4-1-G15 | 15 | 09/06/2000 | 1 | | 40 | 25500 | 39 |
| | | 4-1-H15 | 15 | 09/06/2000 | 0.56 | | 58 | 32000 | 18 |
| | | 4-1-H25 | 25 | 09/06/2000 | 0.18 | | 66 | 24000 | 7.5 |
| | | 4-1-H35 | 35 | 09/06/2000 | 0.51 | | 58 | 47000 | 11 |
| | | 4-1-H45 | 45 | 09/06/2000 | < 0.015 | U | 66 | 17000 | < 0.88 |
| | | 4-1-H55 | 55 | 09/06/2000 | 0.048 | | 54 | 22500 | 2.1 |
| | | 4-1-I15 | 15 | 09/06/2000 | 0.81 | | 57 | 55500 | 15 |
| 5 | Opposite Coveville | 5-1-A15 | 15 | 09/08/2000 | 3.1 | | 44 | 34000 | 91 |
| | | *5-1-A15-FD* | *15* | 09/08/2000 | 2.5 | | 46 | 33500 | 75 |
| | | 5-1-B15 | 15 | 09/08/2000 | 2.9 | | 63 | 29000 | 100 |
| | | 5-1-C15 | 15 | 09/08/2000 | 9.5 | | 64 | 34500 | 275 |
| | | 5-1-D15 | 15 | 09/08/2000 | 7.9 | | 49 | 47000 | 168 |
| | | 5-1-D25 | 25 | 09/08/2000 | 50 | | 57 | 39500 | 1266 |
| | | 5-1-D35 | 35 | 09/08/2000 | 12 | | 56 | 24000 | 500 |
| | | 5-1-D45 | 45 | 09/08/2000 | 2.4 | | 85 | 5650 | 425 |
| | | 5-1-D55 | 55 | 09/08/2000 | < 0.011 | U | 86 | 1100 | < 10 |
| | | 5-1-E15 | 15 | 09/08/2000 | 9.8 | | 55 | 32500 | 302 |
| | | 5-1-F15 | 15 | 09/08/2000 | 4.4 | | 61 | 39500 | 111 |
| | | 5-1-F25 | 25 | 09/08/2000 | 1.4 | | 78 | 17000 | 82 |
| | | 5-1-F35 | 35 | 09/08/2000 | 0.39 | | 84 | 2900 | 134 |
| | | 5-1-F45 | 45 | 09/08/2000 | 0.054 | | 86 | 4100 | 13 |
| | | 5-1-F55 | 55 | 09/08/2000 | < 0.011 | U | 86 | 5350 | < 2.1 |
| | | 5-1-G15 | 15 | 09/08/2000 | 2.2 | | 62 | 40000 | 55 |
| | | 5-1-H15 | 15 | 09/08/2000 | 0.14 | | 72 | 20000 | 7 |
| 6 | Schuylerville | 6-1-A15 | 15 | 09/06/2000 | 1.8 | | 51 | 26000 | 69 |
| | | 6-1-B15 | 15 | 09/06/2000 | 34 | | 51 | 48000 | 708 |
| | | 6-1-C15 | 15 | 09/06/2000 | 2.5 | | 51 | 51000 | 49 |
| | | 6-1-C25 | 25 | 09/06/2000 | 45 | | 56 | 40000 | 1125 |
| | | 6-1-C35 | 35 | 09/06/2000 | 2.6 | | 59 | 19500 | 133 |
| | | 6-1-C45 | 45 | 09/06/2000 | 1.1 | | 63 | 14000 | 79 |
| | | 6-1-C55 | 55 | 09/06/2000 | 3.8 | | 73 | 12500 | 304 |
| | | 6-1-D15 | 15 | 09/06/2000 | 11 | | 58 | 40000 | 275 |
| | | 6-1-E15 | 15 | 09/06/2000 | 17 | | 62 | 51500 | 330 |
| | | 6-1-F15 | 15 | 09/06/2000 | 5.6 | | 63 | 53500 | 105 |
| | | 6-1-G15 | 15 | 09/06/2000 | 3.8 | | 70 | 27500 | 138 |
| | | 6-1-G25 | 25 | 09/06/2000 | 0.72 | | 81 | 7100 | 101 |

## *Floodplain Soil Sampling Analytical Results*
## *PCBs and Total Organic Carbon*

| Site No. | Site Name | Sample ID | Bottom Depth | Date Sampled | Total PCBs mg/kg (dry wt.) | Q | % Solids | Total Organic Carbon mg/kg (dry wt.) | TOC adjusted Total PCBs mg PCBs / kg TOC |
|---|---|---|---|---|---|---|---|---|---|
| 6 | Schuylerville (continued) | 6-1-G35 | 35 | 09/06/2000 | < 0.011 | U | 86 | 3050 | < 3.6 |
| | | 6-1-G45 | 45 | 09/06/2000 | 0.032 | P | 84 | 2150 | 15 |
| | | 6-1-G55 | 55 | 09/06/2000 | < 0.012 | U | 82 | 2600 | < 4.6 |
| | | 6-1-H15 | 15 | 09/06/2000 | 2.2 | | 69 | 40000 | 55 |
| | | *6-1-H15-FD* | *15* | 09/06/2000 | 2 | | 65 | 37500 | 53 |
| | | 6-1-I15 | 15 | 09/06/2000 | 0.74 | | 65 | 43000 | 17 |
| 7 | Near River Mile 187* | 7-1-A15 | 15 | 09/11/2000 | 44 | | 57 | 48500 | 907 |
| | | 7-1-B15 | 15 | 09/11/2000 | 16 | | 73 | 31000 | 516 |
| | | 7-1-B25 | 25 | 09/11/2000 | 3.7 | | 76 | 18500 | 200 |
| | | 7-1-B35 | 35 | 09/11/2000 | 0.083 | | 80 | 13000 | 6.4 |
| | | 7-1-B45 | 45 | 09/11/2000 | 0.38 | | 83 | 5250 | 72 |
| | | 7-1-B55 | 55 | 09/11/2000 | 0.044 | | 81 | 1300 | 34 |
| | | 7-1-C15 | 15 | 09/11/2000 | 0.56 | | 78 | 13500 | 41 |
| | | 7-1-D15 | 15 | 09/11/2000 | 0.71 | | 74 | 35500 | 20 |
| | | *7-1-D15-FD* | *15* | 09/11/2000 | 0.59 | | 73 | 36500 | 16 |
| | | 7-1-E15 | 15 | 09/11/2000 | 0.12 | | 75 | 26000 | 4.6 |
| | | 7-1-F15 | 15 | 09/11/2000 | 0.51 | | 68 | 82000 | 6.2 |
| | | 7-1-F25 | 25 | 09/11/2000 | 0.085 | | 75 | 32000 | 2.7 |
| | | 7-1-F35 | 35 | 09/11/2000 | < 0.012 | U | 79 | 21000 | < 0.57 |
| | | 7-1-F45 | 45 | 09/11/2000 | 0.043 | | 80 | 15500 | 2.8 |
| | | 7-1-F55 | 55 | 09/11/2000 | 0.041 | | 81 | 10000 | 4.1 |
| | | 7-1-G15 | 15 | 09/11/2000 | 0.12 | | 75 | 32000 | 3.8 |
| 8 | Peters Rd/ Floodgates | 8-1-A15 | 15 | 09/11/2000 | 12 | | 66 | 25500 | 471 |
| | | 8-1-B15 | 15 | 09/11/2000 | 23 | | 70 | 23500 | 979 |
| | | 8-1-B25 | 25 | 09/11/2000 | 66 | | 74 | 17000 | 3882 |
| | | 8-1-B35 | 35 | 09/11/2000 | 360 | | 61 | 34500 | 10435 |
| | | 8-1-B45 | 45 | 09/11/2000 | 4.4 | | 62 | 44000 | 100 |
| | | 8-1-B55 | 55 | 09/11/2000 | 0.16 | | 59 | 34500 | 4.6 |
| | | 8-1-C15 | 15 | 09/11/2000 | 26 | | 59 | 40000 | 650 |
| | | *8-1-C15-FD* | *15* | 09/11/2000 | 36 | | 56 | 41000 | 878 |
| | | 8-1-D15 | 15 | 09/11/2000 | 25 | | 55 | 41500 | 602 |
| | | 8-1-E15 | 15 | 09/11/2000 | 0.72 | | 74 | 13000 | 55 |
| | | 8-1-F15 | 15 | 09/11/2000 | 0.48 | | 66 | 28000 | 17 |
| | | 8-1-F25 | 25 | 09/11/2000 | 0.11 | | 73 | 12500 | 8.8 |
| | | 8-1-F35 | 35 | 09/11/2000 | 0.04 | | 74 | 13000 | 3.1 |
| | | 8-1-F45 | 45 | 09/11/2000 | < 0.014 | U | 72 | 14000 | < 1.0 |
| | | 8-1-F55 | 55 | 09/11/2000 | < 0.015 | U | 69 | 15500 | < 0.97 |
| | | 8-1-G15 | 15 | 09/11/2000 | 0.13 | | 73 | 17000 | 7.6 |
| | | 8-1-H15 | 15 | 09/11/2000 | 0.32 | | 68 | 24500 | 13 |
| 9 | Near River Mile 191* | 9-1-A15 | 15 | 09/08/2000 | 0.07 | | 71 | 20000 | 3.5 |
| | | 9-1-B15 | 15 | 09/08/2000 | 0.071 | | 51 | 43500 | 1.6 |
| | | 9-1-B25 | 25 | 09/08/2000 | 1.8 | | 58 | 33000 | 55 |
| | | 9-1-B35 | 35 | 09/08/2000 | 0.34 | | 65 | 30500 | 11 |
| | | 9-1-B45 | 45 | 09/08/2000 | 0.067 | | 66 | 20000 | 3.4 |
| | | 9-1-B55 | 55 | 09/08/2000 | < 0.015 | U | 65 | 28500 | < 0.53 |
| | | 9-1-C15 | 15 | 09/08/2000 | < 0.021 | U | 47 | 48000 | < 0.44 |
| | | *9-1-C15-FD* | *15* | 09/08/2000 | 0.053 | | 47 | 45000 | 1.2 |

## *Floodplain Soil Sampling Analytical Results*
## *PCBs and Total Organic Carbon*

| Site No. | Site Name | Sample ID | Bottom Depth | Date Sampled | Total PCBs mg/kg (dry wt.) | Q | % Solids | Total Organic Carbon mg/kg (dry wt.) | TOC adjusted Total PCBs mg PCBs / kg TOC |
|---|---|---|---|---|---|---|---|---|---|
| 9 | Near River Mile 191* (continued) | 9-1-D15 | 15 | 09/08/2000 | 0.042 | | 65 | 30500 | 1.4 |
| | | 9-1-D25 | 25 | 09/08/2000 | 0.047 | | 72 | 16500 | 2.8 |
| | | 9-1-D35 | 35 | 09/08/2000 | < 0.012 | U | 79 | 7400 | < 1.6 |
| | | 9-1-D45 | 45 | 09/08/2000 | < 0.012 | U | 81 | 1750 | < 6.9 |
| | | 9-1-D55 | 55 | 09/08/2000 | < 0.012 | U | 81 | 1900 | < 6.3 |
| | | 9-1-E15 | 15 | 09/08/2000 | 0.058 | | 61 | 49000 | 1.2 |
| | | 9-1-F15 | 15 | 09/08/2000 | 0.049 | | 63 | 42500 | 1.2 |
| 10 | Canal Corp. | 10-1-A15 | 15 | 09/12/2000 | 3.1 | | 76 | 4050 | 765 |
| | | *10-1-A15-FD* | *15* | 09/12/2000 | 3.1 | | 76 | 3900 | 795 |
| | | 10-1-B15 | 15 | 09/12/2000 | 69 | | 60 | 27000 | 2556 |
| | | 10-1-B25 | 25 | 09/12/2000 | 19 | | 58 | 31000 | 613 |
| | | 10-1-B35 | 35 | 09/12/2000 | 0.34 | | 64 | 14500 | 23 |
| | | 10-1-B45 | 45 | 09/12/2000 | 1.4 | | 66 | 12500 | 112 |
| | | 10-1-B55 | 55 | 09/12/2000 | 0.044 | | 70 | 8350 | 5.3 |
| | | 10-1-C15 | 15 | 09/12/2000 | 46 | | 55 | 30000 | 1533 |
| | | 10-1-D15 | 15 | 09/12/2000 | 2.1 | | 54 | 16500 | 127 |
| | | 10-1-E15 | 15 | 09/12/2000 | 1.7 | | 48 | 41000 | 41 |
| | | 10-1-F15 | 15 | 09/12/2000 | 2 | | 49 | 41500 | 48 |
| | | 10-1-F25 | 25 | 09/12/2000 | 0.31 | | 53 | 36000 | 8.6 |
| | | 10-1-F35 | 35 | 09/12/2000 | 0.025 | | 68 | 13000 | 1.9 |
| | | 10-1-F45 | 45 | 09/12/2000 | 0.024 | | 68 | 8550 | 2.8 |
| | | 10-1-F55 | 55 | 09/12/2000 | < 0.013 | U | 74 | 7150 | < 1.8 |
| | | 10-1-G15 | 15 | 09/12/2000 | 0.12 | | 51 | 51500 | 2.3 |
| 11 | Rogers Island | 11-1-A15 | 15 | 09/12/2000 | 40 | | 76 | 64500 | 620 |
| | | 11-1-A25 | 25 | 09/12/2000 | 150 | | 75 | 30000 | 5000 |
| | | 11-1-A35 | 35 | 09/12/2000 | 4 | | 95 | 10950 | 365 |
| | | 11-1-A45 | 45 | 09/12/2000 | 2.5 | P | 53 | 24500 | 102 |
| | | 11-1-A55 | 55 | 09/12/2000 | 16 | | 87 | 24500 | 653 |
| | | 11-1-B15 | 15 | 09/12/2000 | 0.29 | | 83 | 41500 | 7.0 |
| | | 11-1-C15 | 15 | 09/12/2000 | 19 | | 75 | 49500 | 384 |
| | | 11-1-C25 | 25 | 09/12/2000 | 9.3 | | 79 | 31000 | 300 |
| | | 11-1-C35 | 35 | 09/12/2000 | 1 | | 70 | 36000 | 28 |
| | | 11-1-C45 | 45 | 09/12/2000 | 10 | | 81 | 36500 | 274 |
| | | 11-1-C55 | 55 | 09/12/2000 | 2.6 | | 72 | 16500 | 158 |
| | | 11-1-D15 | 15 | 09/12/2000 | 16 | | 80 | 28500 | 561 |
| | | *11-1-D15-FD* | *15* | 09/12/2000 | 12 | | 88 | 15000 | 800 |
| | | 11-1-E15 | 15 | 09/12/2000 | 3.4 | | 92 | 3000 | 1133 |
| | | 11-1-F15 | 15 | 09/12/2000 | 1.1 | | 66 | 44000 | 25 |

Bs analyzed using modified SW846 Method 8082; all results reported as dry weight.

Notes:

Total Organic Carbon analyzed by Method 9060; reported value is mean of two lab replicates

Q= Data Qualifiers:

U = Compound not detected

P = > 40% relative percent difference (RPD) between two instrument columns, higher value is reported (see laboratory narrative)

*FD* = Co-located field duplicate sample

< indicates that TOC-adjusted value is based on a non-detected total PCB result (U qualifier)

* Specific location of study area has not been included in order to protect privacy of property owner.

# *Floodplain Soil Sampling Analytical Results*
# *Grain Size*

| Site No. | Site Name | Sample ID | Date Sampled | Grain Size Distribution / Sieve Size Passed | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | Gravel #4 | Coarse Sand #10 | Medium Sand #40 | V. Fine Sand #200 | Silt/Clay >#200 |
| | | | | % | % | % | % | % |
| 1 | Southern Park | 1-1-A15 | 09/07/00 | 0.00 | 0.00 | 0.42 | 9.28 | 90.30 |
| | | 1-1-B15 | 09/07/00 | 0.00 | 0.00 | 0.09 | 9.17 | 90.74 |
| | | 1-1-B25 | 09/07/00 | 0.00 | 0.00 | 0.10 | 14.24 | 85.66 |
| | | 1-1-B35 | 09/07/00 | 0.00 | 0.00 | 0.02 | 18.45 | 81.53 |
| | | 1-1-B45 | 09/07/00 | 0.00 | 0.00 | 0.02 | 28.79 | 71.18 |
| | | 1-1-B55 | 09/07/00 | 0.00 | 0.00 | 0.00 | 31.52 | 68.48 |
| | | 1-1-C15 | 09/07/00 | 0.00 | 0.00 | 0.06 | 5.45 | 94.49 |
| | | 1-1-D15 | 09/07/00 | 0.00 | 0.00 | 0.03 | 12.96 | 87.01 |
| | | 1-1-D25 | 09/07/00 | 0.00 | 0.00 | 0.02 | 11.03 | 88.95 |
| | | 1-1-D35 | 09/07/00 | 0.00 | 0.00 | 0.02 | 19.62 | 80.36 |
| | | 1-1-D45 | 09/07/00 | 0.00 | 0.00 | 0.00 | 38.59 | 61.41 |
| | | 1-1-D55 | 09/07/00 | 0.00 | 0.00 | 0.00 | 39.80 | 60.20 |
| | | 1-1-E15 | 09/07/00 | 0.00 | 0.00 | 0.02 | 10.45 | 89.52 |
| | | 1-1-F15 | 09/07/00 | 0.00 | 0.00 | 0.06 | 8.86 | 91.08 |
| | | 1-1-G15 | 09/07/00 | 0.00 | 0.00 | 0.09 | 11.76 | 88.14 |
| | | 1-1-H15 | 09/07/00 | 0.00 | 0.00 | 0.06 | 14.63 | 85.32 |
| | | 1-1-I15 | 09/07/00 | 26.61 | 7.67 | 3.53 | 7.45 | 54.74 |
| | | *1-1-I15-FD* | 09/07/00 | 39.50 | 6.98 | 3.39 | 6.75 | 43.48 |
| | | *1-1-I15-LD* | 09/07/00 | 42.75 | 6.71 | 3.73 | 6.31 | 40.50 |
| 2 | Battlefield Meadow | 2-1-A15 | 09/05/00 | 0.00 | 0.00 | 1.95 | 39.09 | 58.95 |
| | | 2-1-B15 | 09/05/00 | 5.18 | 12.79 | 49.85 | 24.25 | 7.93 |
| | | 2-1-C15 | 09/05/00 | 0.00 | 0.03 | 0.37 | 11.17 | 88.43 |
| | | 2-1-D15 | 09/05/00 | 0.00 | 0.00 | 0.93 | 8.28 | 90.79 |
| | | 2-1-D25 | 09/05/00 | 0.00 | 0.00 | 0.40 | 4.55 | 95.05 |
| | | 2-1-D35 | 09/05/00 | 0.00 | 0.00 | 0.02 | 0.30 | 99.68 |
| | | 2-1-D45 | 09/05/00 | 0.00 | 0.00 | 0.00 | 0.27 | 99.73 |
| | | 2-1-D55 | 09/05/00 | 0.00 | 0.00 | 0.01 | 0.10 | 99.89 |
| | | 2-1-E15 | 09/06/00 | 0.00 | 0.00 | 0.48 | 7.56 | 91.95 |
| | | 2-1-E25 | 09/06/00 | 0.00 | 0.00 | 0.05 | 3.40 | 96.55 |
| | | 2-1-E35 | 09/06/00 | 0.00 | 0.00 | 0.02 | 0.25 | 99.73 |
| | | 2-1-E45 | 09/06/00 | 0.00 | 0.00 | 0.01 | 0.07 | 99.63 |
| | | 2-1-E55 | 09/06/00 | 0.00 | 0.00 | 0.02 | 0.25 | 99.73 |
| | | 2-1-F15 | 09/05/00 | 14.03 | 13.23 | 22.13 | 17.98 | 32.62 |
| | | 2-CULVERT | 09/06/00 | 0.00 | 0.00 | 0.49 | 5.20 | 94.31 |
| 3 | River Road | 3-1-A15 | 09/05/00 | 0.00 | 0.00 | 0.39 | 8.00 | 91.61 |
| | | 3-1-B15 | 09/05/00 | 0.00 | 0.00 | 0.42 | 9.14 | 90.44 |
| | | 3-1-C15 | 09/05/00 | 0.00 | 0.00 | 0.95 | 9.65 | 89.40 |
| | | *3-1-C15-LD* | 09/05/00 | 0.00 | 0.00 | 0.90 | 9.75 | 89.36 |
| | | 3-1-C25 | 09/05/00 | 0.00 | 0.16 | 1.38 | 12.54 | 85.92 |
| | | 3-1-C35 | 09/05/00 | 0.00 | 0.00 | 1.10 | 9.81 | 89.09 |
| | | 3-1-C45 | 09/05/00 | 0.00 | 0.00 | 2.66 | 32.53 | 64.80 |
| | | 3-1-C55 | 09/05/00 | 0.00 | 0.00 | 4.59 | 46.67 | 48.74 |
| | | 3-1-D15 | 09/05/00 | 0.00 | 0.00 | 0.82 | 8.47 | 90.71 |
| | | *3-1-D15-FD* | 09/05/00 | 0.00 | 0.00 | 0.84 | 8.05 | 91.11 |
| | | *3-1-D15-LD* | 09/05/00 | 0.00 | 0.00 | 1.06 | 8.15 | 90.79 |
| | | 3-1-E15 | 09/05/00 | 0.00 | 0.00 | 0.71 | 8.26 | 91.03 |
| | | 3-1-E25 | 09/05/00 | 0.00 | 0.00 | 0.39 | 8.34 | 91.26 |
| | | 3-1-E35 | 09/05/00 | 0.00 | 0.00 | 0.44 | 7.86 | 91.71 |
| | | 3-1-E45 | 09/05/00 | 0.00 | 0.20 | 3.88 | 19.76 | 76.16 |
| | | 3-1-E55 | 09/05/00 | 0.00 | 0.22 | 7.10 | 23.92 | 68.75 |

# *Floodplain Soil Sampling Analytical Results*
# *Grain Size*

| Site No. | Site Name | Sample ID | Date Sampled | Grain Size Distribution / Sieve Size Passed | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | Gravel #4 | Coarse Sand #10 | Medium Sand #40 | V. Fine Sand #200 | Silt/Clay >#200 |
| | | | | % | % | % | % | % |
| 4 | Fishing Hole | 4-1-A15 | 09/06/00 | 0.00 | 0.00 | 0.18 | 33.44 | 66.37 |
| | | 4-1-B15 | 09/06/00 | 0.00 | 0.00 | 0.03 | 12.45 | 87.51 |
| | | 4-1-C15 | 09/06/00 | 0.00 | 0.00 | 0.13 | 5.90 | 93.97 |
| | | 4-1-D15 | 09/06/00 | 0.00 | 0.00 | 0.22 | 2.69 | 97.09 |
| | | *4-1-D15-FD* | 09/06/00 | 0.00 | 0.00 | 0.64 | 2.61 | 96.75 |
| | | 4-1-E15 | 09/06/00 | 0.00 | 0.00 | 0.15 | 12.58 | 87.27 |
| | | 4-1-E25 | 09/08/00 | 0.00 | 0.00 | 0.04 | 1.17 | 98.79 |
| | | 4-1-E35 | 09/08/00 | 0.00 | 0.00 | 0.10 | 5.28 | 94.62 |
| | | 4-1-E45 | 09/08/00 | 0.00 | 0.00 | 0.06 | 11.00 | 88.95 |
| | | 4-1-E55 | 09/06/00 | 0.00 | 0.00 | 0.03 | 7.91 | 92.06 |
| | | 4-1-F15 | 09/06/00 | 0.00 | 0.00 | 0.01 | 0.65 | 99.35 |
| | | 4-1-G15 | 09/06/00 | 0.00 | 0.00 | 0.02 | 0.13 | 99.85 |
| | | 4-1-H15 | 09/06/00 | 0.00 | 0.00 | 0.08 | 0.24 | 99.68 |
| | | 4-1-H25 | 09/06/00 | 0.00 | 0.00 | 0.04 | 0.18 | 99.77 |
| | | 4-1-H35 | 09/06/00 | 0.00 | 0.00 | 0.48 | 2.21 | 97.32 |
| | | 4-1-H45 | 09/06/00 | 0.00 | 0.00 | 0.02 | 2.35 | 97.62 |
| | | 4-1-H55 | 09/06/00 | 0.00 | 0.00 | 0.19 | 2.93 | 96.88 |
| | | 4-1-I15 | 09/06/00 | 0.00 | 0.00 | 1.49 | 7.19 | 91.32 |
| 5 | Opposite Coveville | 5-1-A15 | 09/08/00 | 22.65 | 12.45 | 35.70 | 14.55 | 14.65 |
| | | *5-1-A15-FD* | 09/08/00 | 11.80 | 12.64 | 35.91 | 16.49 | 23.15 |
| | | 5-1-B15 | 09/08/00 | 13.01 | 4.62 | 23.09 | 21.35 | 37.93 |
| | | 5-1-C15 | 09/08/00 | 17.84 | 8.35 | 32.91 | 15.35 | 25.55 |
| | | 5-1-D15 | 09/08/00 | 12.86 | 3.08 | 15.76 | 18.40 | 49.90 |
| | | 5-1-D25 | 09/08/00 | 17.92 | 1.12 | 11.53 | 11.90 | 57.52 |
| | | 5-1-D35 | 09/08/00 | 0.00 | 0.05 | 4.11 | 16.92 | 78.91 |
| | | 5-1-D45 | 09/08/00 | 3.43 | 6.58 | 52.27 | 28.10 | 9.62 |
| | | 5-1-D55 | 09/08/00 | 6.30 | 5.40 | 58.72 | 25.87 | 3.71 |
| | | 5-1-E15 | 09/08/00 | 11.60 | 5.12 | 21.59 | 19.81 | 41.88 |
| | | 5-1-F15 | 09/08/00 | 0.00 | 0.15 | 12.02 | 28.50 | 59.33 |
| | | 5-1-F25 | 09/08/00 | 0.67 | 9.58 | 49.49 | 21.80 | 18.47 |
| | | 5-1-F35 | 09/08/00 | 4.52 | 9.16 | 49.77 | 28.92 | 7.63 |
| | | 5-1-F45 | 09/08/00 | 6.33 | 10.74 | 57.82 | 17.89 | 7.22 |
| | | 5-1-F55 | 09/08/00 | 10.48 | 7.80 | 50.37 | 23.59 | 7.76 |
| | | 5-1-G15 | 09/08/00 | 0.00 | 0.00 | 8.86 | 29.62 | 61.52 |
| | | *5-1-G15-LD* | 09/08/00 | 0.00 | 0.00 | 9.92 | 28.34 | 61.74 |
| | | 5-1-H15 | 09/08/00 | 0.63 | 2.52 | 21.36 | 32.77 | 42.72 |
| 6 | Schuylerville | 6-1-A15 | 09/06/00 | 0.00 | 0.00 | 2.98 | 27.60 | 69.42 |
| | | 6-1-B15 | 09/06/00 | 0.00 | 0.00 | 0.94 | 20.14 | 78.93 |
| | | 6-1-C15 | 09/06/00 | 0.00 | 0.00 | 0.04 | 4.68 | 95.28 |
| | | 6-1-C25 | 09/06/00 | 0.00 | 0.00 | 0.04 | 8.01 | 91.95 |
| | | 6-1-C35 | 09/06/00 | 0.00 | 0.00 | 0.30 | 31.38 | 68.32 |
| | | 6-1-C45 | 09/06/00 | 0.00 | 0.00 | 0.08 | 23.85 | 76.07 |
| | | 6-1-C55 | 09/06/00 | 0.00 | 0.00 | 0.10 | 9.11 | 90.78 |
| | | *6-1-C55-LD* | 09/06/00 | 0.00 | 0.00 | 0.11 | 8.11 | 91.78 |
| | | 6-1-D15 | 09/06/00 | 0.00 | 0.00 | 0.41 | 13.58 | 86.01 |
| | | 6-1-E15 | 09/06/00 | 0.00 | 0.00 | 0.31 | 9.71 | 89.98 |
| | | 6-1-F15 | 09/06/00 | 0.00 | 0.16 | 2.29 | 18.96 | 78.59 |
| | | 6-1-G15 | 09/06/00 | 0.00 | 0.00 | 2.85 | 31.45 | 65.69 |
| | | 6-1-G25 | 09/06/00 | 0.00 | 0.84 | 8.74 | 50.40 | 40.03 |
| | | 6-1-G35 | 09/06/00 | 1.98 | 1.73 | 12.20 | 72.51 | 11.59 |

# *Floodplain Soil Sampling Analytical Results*
# *Grain Size*

| Site No. | Site Name | Sample ID | Date Sampled | Grain Size Distribution / Sieve Size Passed<br>Gravel #4<br>% | Coarse Sand #10<br>% | Medium Sand #40<br>% | V. Fine Sand #200<br>% | Silt/Clay >#200<br>% |
|---|---|---|---|---|---|---|---|---|
| 6 | Schuylerville | 6-1-G45 | 09/06/00 | 0.00 | 2.02 | 15.12 | 77.10 | 5.77 |
| | (continued) | 6-1-G55 | 09/06/00 | 0.00 | 0.14 | 1.58 | 82.31 | 15.98 |
| | | 6-1-H15 | 09/06/00 | 0.65 | 1.04 | 7.51 | 27.72 | 63.08 |
| | | *6-1-H15-LD* | 09/06/00 | 0.82 | 1.27 | 7.99 | 29.12 | 60.80 |
| | | *6-1-H15-FD* | 09/06/00 | 0.00 | 0.44 | 5.42 | 28.49 | 65.65 |
| | | 6-1-I15 | 09/06/00 | 0.00 | 0.65 | 4.39 | 21.11 | 73.85 |
| 7 | Near River | 7-1-A15 | 09/11/00 | 0.00 | 0.00 | 0.05 | 22.39 | 77.56 |
| | Mile 187* | 7-1-B15 | 09/11/00 | 0.00 | 0.00 | 0.07 | 24.79 | 75.14 |
| | | 7-1-B25 | 09/11/00 | 0.00 | 0.00 | 0.14 | 32.43 | 67.43 |
| | | 7-1-B35 | 09/11/00 | 0.00 | 0.00 | 0.94 | 40.80 | 58.26 |
| | | 7-1-B45 | 09/11/00 | 0.00 | 0.00 | 0.20 | 26.51 | 73.29 |
| | | 7-1-B55 | 09/11/00 | 0.00 | 0.00 | 0.04 | 3.47 | 96.49 |
| | | 7-1-C15 | 09/11/00 | 0.00 | 0.00 | 0.57 | 29.88 | 69.55 |
| | | 7-1-D15 | 09/11/00 | 0.00 | 0.20 | 1.39 | 18.85 | 79.56 |
| | | *7-1-D15-FD* | 09/11/00 | 0.00 | 0.24 | 0.27 | 18.14 | 81.34 |
| | | 7-1-E15 | 09/11/00 | 0.00 | 0.11 | 1.70 | 14.64 | 83.55 |
| | | 7-1-F15 | 09/11/00 | 0.00 | 0.00 | 0.33 | 1.69 | 97.98 |
| | | 7-1-F25 | 09/11/00 | 0.00 | 0.00 | 0.01 | 3.27 | 96.72 |
| | | 7-1-F35 | 09/11/00 | 0.00 | 0.00 | 0.14 | 7.62 | 92.24 |
| | | 7-1-F45 | 09/11/00 | 0.00 | 0.00 | 0.48 | 9.58 | 89.94 |
| | | 7-1-F55 | 09/11/00 | 0.00 | 0.00 | 0.21 | 11.85 | 87.94 |
| | | 7-1-G15 | 09/11/00 | 0.00 | 0.00 | 0.03 | 3.23 | 96.74 |
| 8 | Peters Rd./ | 8-1-A15 | 09/11/00 | 0.00 | 0.00 | 0.36 | 43.12 | 56.52 |
| | Floodgates | 8-1-B15 | 09/11/00 | 0.00 | 0.00 | 0.27 | 44.67 | 55.07 |
| | | 8-1-B25 | 09/11/00 | 0.00 | 0.00 | 0.09 | 54.00 | 45.90 |
| | | 8-1-B35 | 09/11/00 | 0.00 | 0.00 | 0.46 | 45.15 | 54.39 |
| | | 8-1-B45 | 09/11/00 | 0.00 | 0.00 | 0.17 | 28.95 | 70.89 |
| | | *8-1-B45-LD* | 09/11/00 | 0.00 | 0.00 | 0.19 | 30.47 | 69.35 |
| | | 8-1-B55 | 09/11/00 | 0.00 | 0.00 | 2.45 | 24.57 | 72.98 |
| | | 8-1-C15 | 09/11/00 | 0.00 | 0.00 | 0.38 | 26.33 | 73.29 |
| | | *8-1-C15-FD* | 09/11/00 | 0.00 | 0.00 | 0.73 | 28.81 | 70.47 |
| | | 8-1-D15 | 09/11/00 | 0.00 | 0.06 | 0.91 | 15.75 | 83.28 |
| | | 8-1-E15 | 09/11/00 | 0.00 | 0.00 | 0.47 | 21.34 | 78.19 |
| | | 8-1-F15 | 09/11/00 | 0.00 | 0.00 | 0.47 | 12.93 | 86.66 |
| | | 8-1-F25 | 09/11/00 | 0.00 | 0.00 | 0.56 | 17.70 | 81.75 |
| | | 8-1-F35 | 09/11/00 | 0.00 | 0.00 | 0.10 | 13.14 | 86.75 |
| | | 8-1-F45 | 09/11/00 | 0.00 | 0.00 | 0.27 | 20.10 | 79.63 |
| | | 8-1-F55 | 09/11/00 | 0.00 | 0.00 | 0.05 | 10.68 | 89.28 |
| | | 8-1-G15 | 09/11/00 | 0.00 | 0.00 | 1.94 | 16.73 | 81.33 |
| | | 8-1-H15 | 09/11/00 | 0.00 | 0.00 | 1.31 | 25.95 | 72.74 |
| 9 | Near River | 9-1-A15 | 09/08/00 | 0.00 | 0.31 | 7.32 | 32.74 | 59.63 |
| | Mile 191* | 9-1-B15 | 09/08/00 | 0.00 | 0.00 | 0.42 | 3.14 | 96.44 |
| | | 9-1-B25 | 09/08/00 | 0.00 | 0.00 | 1.44 | 14.98 | 83.57 |
| | | 9-1-B35 | 09/08/00 | 0.00 | 0.00 | 0.62 | 11.29 | 88.09 |
| | | 9-1-B45 | 09/08/00 | 0.00 | 0.00 | 0.28 | 12.79 | 86.93 |
| | | 9-1-B55 | 09/08/00 | 0.00 | 0.00 | 0.63 | 16.96 | 82.41 |
| | | 9-1-C15 | 09/08/00 | 0.00 | 0.00 | 0.17 | 3.43 | 96.40 |
| | | *9-1-C15-FD* | 09/08/00 | 0.00 | 0.00 | 0.44 | 5.13 | 94.43 |
| | | 9-1-D15 | 09/08/00 | 0.00 | 0.00 | 0.45 | 8.65 | 90.90 |
| | | 9-1-D25 | 09/08/00 | 0.00 | 0.00 | 2.01 | 10.64 | 87.35 |

## *Floodplain Soil Sampling Analytical Results*
## *Grain Size*

| Site No. | Site Name | Sample ID | Date Sampled | Grain Size Distribution / Sieve Size Passed<br>Gravel #4 % | Coarse Sand #10 % | Medium Sand #40 % | V. Fine Sand #200 % | Silt/Clay >#200 % |
|---|---|---|---|---|---|---|---|---|
| 9 | Near River Mile 191* (continued) | *9-1-D25-LD* | 09/08/00 | 0.00 | 0.00 | 2.01 | 10.18 | 87.81 |
| | | 9-1-D35 | 09/08/00 | 0.00 | 0.00 | 1.15 | 17.67 | 81.17 |
| | | 9-1-D45 | 09/08/00 | 0.00 | 0.00 | 0.24 | 16.11 | 83.66 |
| | | 9-1-D55 | 09/08/00 | 0.00 | 0.00 | 0.77 | 16.09 | 83.14 |
| | | 9-1-E15 | 09/08/00 | 0.00 | 0.00 | 0.86 | 3.35 | 95.79 |
| | | 9-1-F15 | 09/08/00 | 0.00 | 0.00 | 0.31 | 3.57 | 96.12 |
| 10 | Canal Corp. | 10-1-A15 | 09/12/00 | 2.29 | 1.90 | 11.75 | 71.83 | 12.24 |
| | | *10-1-A15-FD* | 09/12/00 | 0.58 | 1.48 | 12.18 | 85.31 | 0.45 |
| | | 10-1-B15 | 09/12/00 | 0.00 | 0.00 | 1.75 | 18.89 | 79.35 |
| | | 10-1-B25 | 09/12/00 | 0.00 | 0.00 | 6.66 | 93.08 | 0.26 |
| | | 10-1-B35 | 09/12/00 | 0.00 | 0.02 | 0.77 | 37.07 | 62.14 |
| | | 10-1-B45 | 09/12/00 | 0.00 | 0.05 | 0.25 | 37.16 | 62.54 |
| | | 10-1-B55 | 09/12/00 | 0.00 | 0.00 | 0.11 | 33.66 | 66.23 |
| | | 10-1-C15 | 09/12/00 | 0.00 | 0.00 | 0.72 | 43.01 | 56.27 |
| | | 10-1-D15 | 09/12/00 | 0.00 | 0.00 | 0.52 | 28.61 | 70.88 |
| | | 10-1-E15 | 09/12/00 | 0.00 | 0.00 | 0.27 | 4.93 | 94.80 |
| | | 10-1-F15 | 09/12/00 | 0.00 | 0.00 | 0.13 | 3.39 | 96.48 |
| | | 10-1-F25 | 09/12/00 | 0.00 | 0.00 | 0.96 | 11.28 | 87.76 |
| | | 10-1-F35 | 09/12/00 | 0.00 | 0.00 | 0.57 | 26.92 | 72.51 |
| | | 10-1-F45 | 09/12/00 | 0.00 | 0.00 | 0.14 | 25.66 | 74.20 |
| | | *10-1-F45-LD* | 9/21/200 | 0.00 | 0.00 | 0.11 | 24.59 | 75.30 |
| | | 10-1-F55 | 09/12/00 | 0.00 | 0.00 | 0.12 | 39.10 | 60.77 |
| | | 10-1-G15 | 09/12/00 | 0.00 | 0.00 | 0.05 | 4.00 | 95.95 |
| 11 | Rogers Island | 11-1-A15 | 09/12/00 | 6.94 | 1.65 | 2.07 | 33.65 | 55.70 |
| | | 11-1-A25 | 09/12/00 | 4.29 | 3.30 | 7.74 | 53.72 | 30.95 |
| | | 11-1-A35 | 09/12/00 | 0.06 | 1.38 | 11.92 | 76.92 | 9.73 |
| | | 11-1-A45 | 09/12/00 | 0.00 | 0.27 | 21.30 | 65.47 | 12.96 |
| | | 11-1-A55 | 09/12/00 | 36.04 | 18.43 | 13.42 | 23.82 | 8.29 |
| | | 11-1-B15 | 09/12/00 | 22.44 | 28.94 | 22.57 | 16.01 | 10.04 |
| | | 11-1-C15 | 09/12/00 | 5.22 | 10.09 | 26.89 | 38.54 | 19.26 |
| | | 11-1-C25 | 09/12/00 | 13.29 | 20.31 | 43.85 | 15.99 | 6.56 |
| | | 11-1-C35 | 09/12/00 | 3.78 | 6.08 | 28.53 | 38.11 | 23.49 |
| | | 11-1-C45 | 09/12/00 | 10.41 | 16.94 | 49.15 | 22.22 | 1.28 |
| | | 11-1-C55 | 09/12/00 | 17.22 | 12.47 | 25.53 | 40.67 | 4.11 |
| | | 11-1-D15 | 09/12/00 | 4.00 | 11.75 | 42.55 | 32.46 | 9.24 |
| | | *11-1-D15-FD* | 09/12/00 | 5.62 | 15.05 | 39.67 | 35.71 | 3.95 |
| | | 11-1-E15 | 09/12/00 | 5.58 | 8.63 | 32.83 | 50.60 | 2.35 |
| | | 11-1-F15 | 09/12/00 | 5.83 | 10.87 | 21.49 | 39.69 | 22.11 |

Notes: Grain size analysis conducted using ASTM Method D422

*FD* = co-located field duplicate

*LD* = laboratory duplicate

* Specific location of study area has not been included in order to protect privacy of property owner.

# APPENDIX E

## BIOTA TISSUE ANALYTICAL RESULTS

# *Floodplain Shrew Sampling Analytical Results*
# *Whole Body Tissue, Total PCBs*

| Site No. | Site Name | Sample ID | Live weight (g) | Sex* | Total PCBs mg/kg (wet wt.) | Percent Lipids | Lipid Adjusted Total PCBs (mg PCB / kg Lipids) |
|---|---|---|---|---|---|---|---|
| 1 | Southern Park | 01-01-091000-10-S-STS | 24.20 | M | 6 | 2.0 | 300 |
| | | 01-02-091300-15-S-STS | 18.11 | F | 4.5 | 1.5 | 300 |
| | | 01-03-091300-10-S-STS | 19.98 | M | 0.1 | 0.83 | 12 |
| 2 | Battlefield Meadow | 02-01-090800-0-S-STS | 23.75 | F | 0.67 | 0.54 | 124 |
| | | 02-02-090800-15-S-STS | 19.26 | I | 0.13 | 1.9 | 6.8 |
| | | 02-06-090900-15-S-STS | 17.26 | I | 0.5 | 1.5 | 33 |
| | | 02-07-091000-15-S-STS | 17.55 | I | 0.55 | 2.0 | 28 |
| | | 02-08-091000-0-S-STS | 18.58 | I | 6.9 | 2.6 | 265 |
| 3 | River Road | 03-01-090900-20-S-STS | 22.35 | I | 0.14 | 3.0 | 4.7 |
| | | 03-03-091400-5-S-STS | 26.23 | M | 0.048 | 1.2 | 4.0 |
| | | *03-03-091400-5-S-STS-LD* | 26.23 | M | 0.071 | 1.9 | 3.7 |
| | | 03-04-091500-5-S-STS | 25.02 | M | 0.11 | 1.6 | 6.9 |
| | | 03-06-091600-5-S-STS | 21.46 | F | 0.049 | 1.6 | 3.1 |
| 4 | Fishing Hole | 04-01-091000-7-P-STS | 18.42 | M | 4.2 | 1.9 | 221 |
| | | 04-04-091400-18-S-STS | 20.38 | M | 8 | 1.1 | 727 |
| | | 04-05-091500-7-P-STS | 18.87 | M | 0.93 | 1.2 | 78 |
| | | 04-06-091600-18-S-STS | 17.20 | F | 1.9 | 2.2 | 86 |
| 5 | Opposite Coveville | 05-06-090900-19-S-STS | 18.46 | I | 0.23 | 1.7 | 14 |
| | | 05-07-091000-17-S-STS | 18.61 | I | 3.9 | 1.1 | 355 |
| | | 05-08-091000-9-S-STS | 16.26 | F | 2.1 | 2.4 | 88 |
| | | 05-09-091000-15-S-STS | 19.42 | I | 0.83 | 1.6 | 52 |
| | | 05-10-091000-19-S-STS | 22.22 | M | 0.85 | 1.7 | 50 |
| 6 | Schuylerville | 06-01-091200-25-P-STS | 18.28 | F | 12 | 3.2 | 375 |
| | | 06-02-091300-45-S-STS | 22.15 | M | 0.78 | 2.3 | 34 |
| 7 | Near River Mile 187** | 07-01-091200-35-S-STS | 23.12 | M | 0.8 | 2.1 | 38 |
| | | 07-02-091200-35-S-STS | 21.75 | M | 1.9 | 2.4 | 79 |
| | | 07-03-091200-17-S-STS | 21.67 | F | 3.6 | 1.7 | 212 |
| | | 07-04-091200-8-S-STS | 18.46 | M | 29 | 2.3 | 1261 |
| 8 | Peters Rd/ Floodgates | 08-01-091200-33-S-STS | 23.94 | M | 11 | 1.8 | 611 |
| | | 08-02-091200-6-S-STS | 27.54 | F | 15 | 2.1 | 714 |
| | | *08-02-091200-6-S-STS-LD* | 27.54 | F | 14 | 2.0 | 700 |
| | | 08-03-091200-3-S-STS | 16.94 | M | 0.18 | 1.4 | 13 |
| | | 08-04-091300-33-S-STS | 21.77 | M | 21 | 1.5 | 1400 |
| | | 08-05-091300-6-S-STS | 19.95 | F | 9 | 1.7 | 529 |
| 10 | Canal Corp. | 10-03-091500-7-S-STS | 21.87 | I | 4.8 | 2.7 | 178 |
| | | 10-04-091500-6-S-STS | 24.53 | M | 0.24 | 2.2 | 11 |
| | | 10-06-091600-11-P-STS | 19.96 | F | 17 | 1.5 | 1133 |
| | | 10-07-091600-6-S-STS | 19.26 | F | 14 | 1.0 | 1400 |
| | | 10-08-091600-6-S-STS | 19.35 | M | 0.75 | 2.4 | 31 |
| 11 | Rogers Island | 11-01-091500-7-S-STS | 21.80 | M | 1.8 | 2.5 | 72 |
| 12 | Rogers Island South | 12-01-092900-3-S-STS | 21.92 | I | 38 | 2.8 | 1357 |
| | | 12-02-092900-2-S-STS | 25.55 | M | 19 | 1.2 | 1583 |
| | | *12-02-092900-2-S-STS-LD* | 25.55 | M | 17 | 1.0 | 1700 |
| | | 12-03-093900-2-S-STS | 20.80 | F | 14 | 1.4 | 1000 |
| | | 12-04-093000-8-S-STS | 23.62 | F | 23 | 1.6 | 1438 |
| | | 12-05-100100-2-S-STS | 20.05 | M | 15 | 1.3 | 1154 |

Notes: PCBs analyzed using modified SW846 Method 8082

* "I", indeterminate, indicates shrew immaturity or damage prevented sex determination

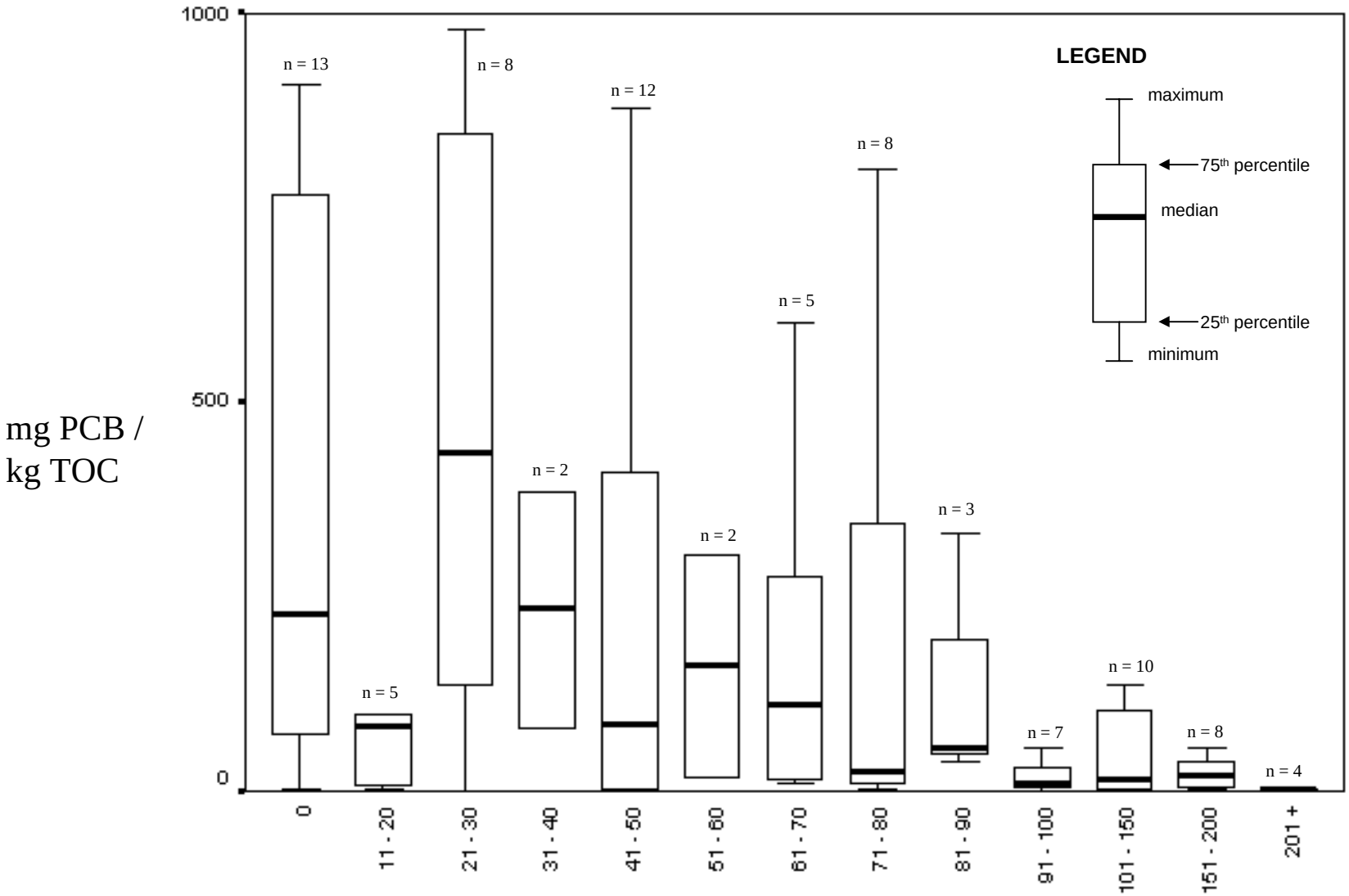
**Specific location of study area has not been included in order to protect privacy of property owner.

*LD* = Laboratory duplicate

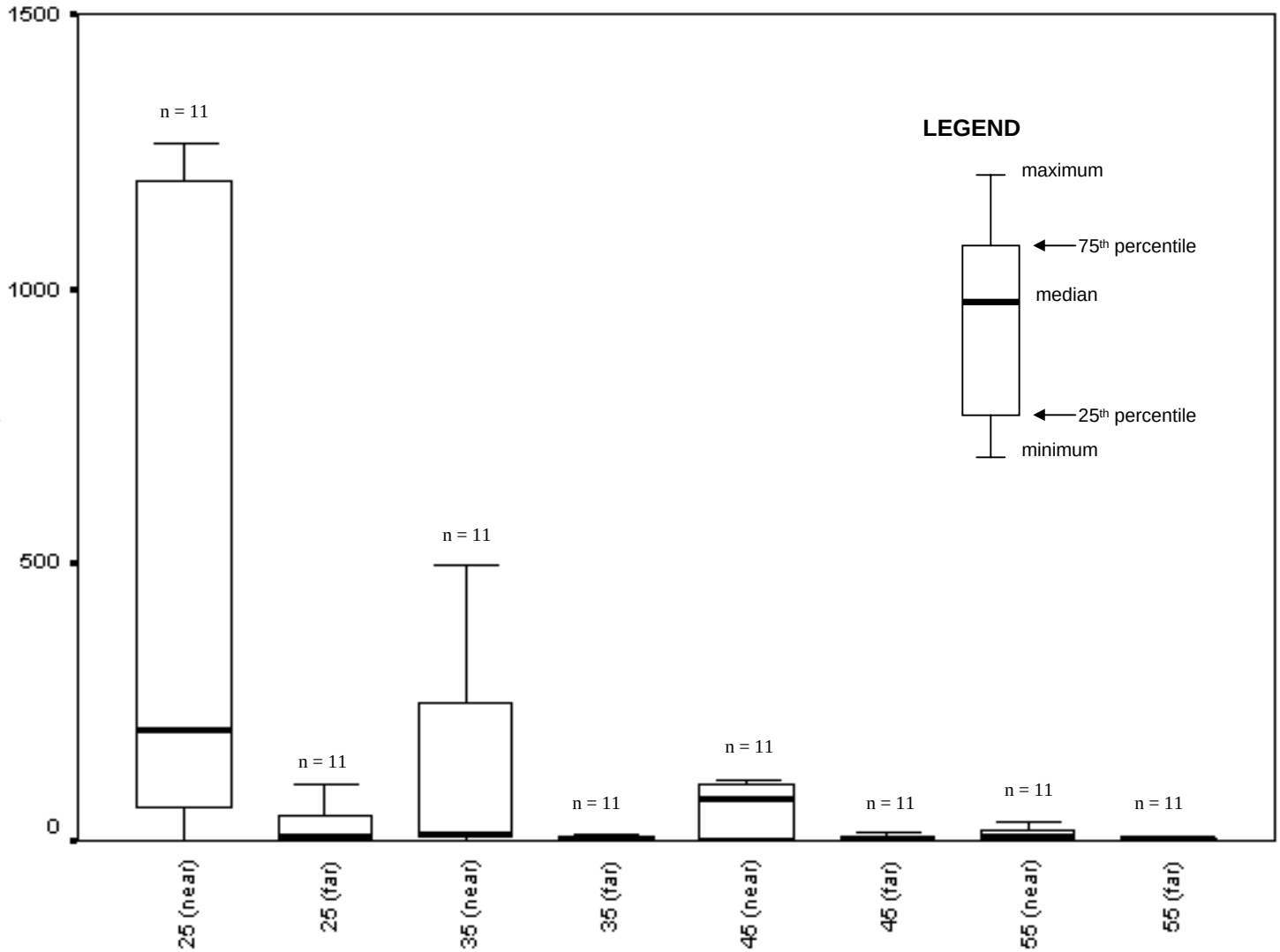
# APPENDIX F

## DATA SUMMARY PLOTS OF SOIL AND SHREW RESULTS

# Figure F-1: Median Soil PCB Concentration at Distinct Distances from the Start of Each Transect



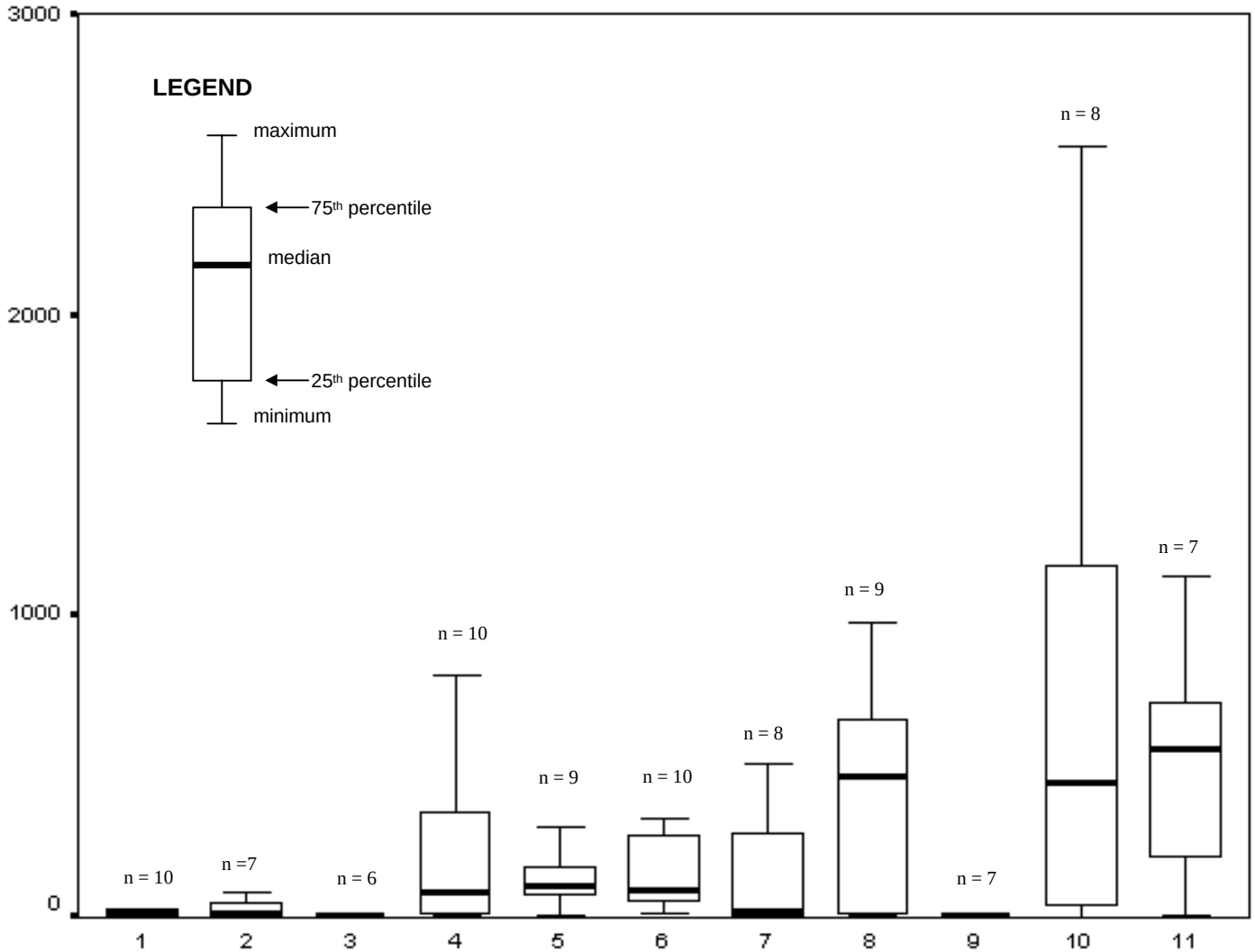
# Figure F-2: Median Soil PCB Concentration at Depth for Cores Nearer to or Farther From the River




mg PCB / kg TOC

Depth (cm)

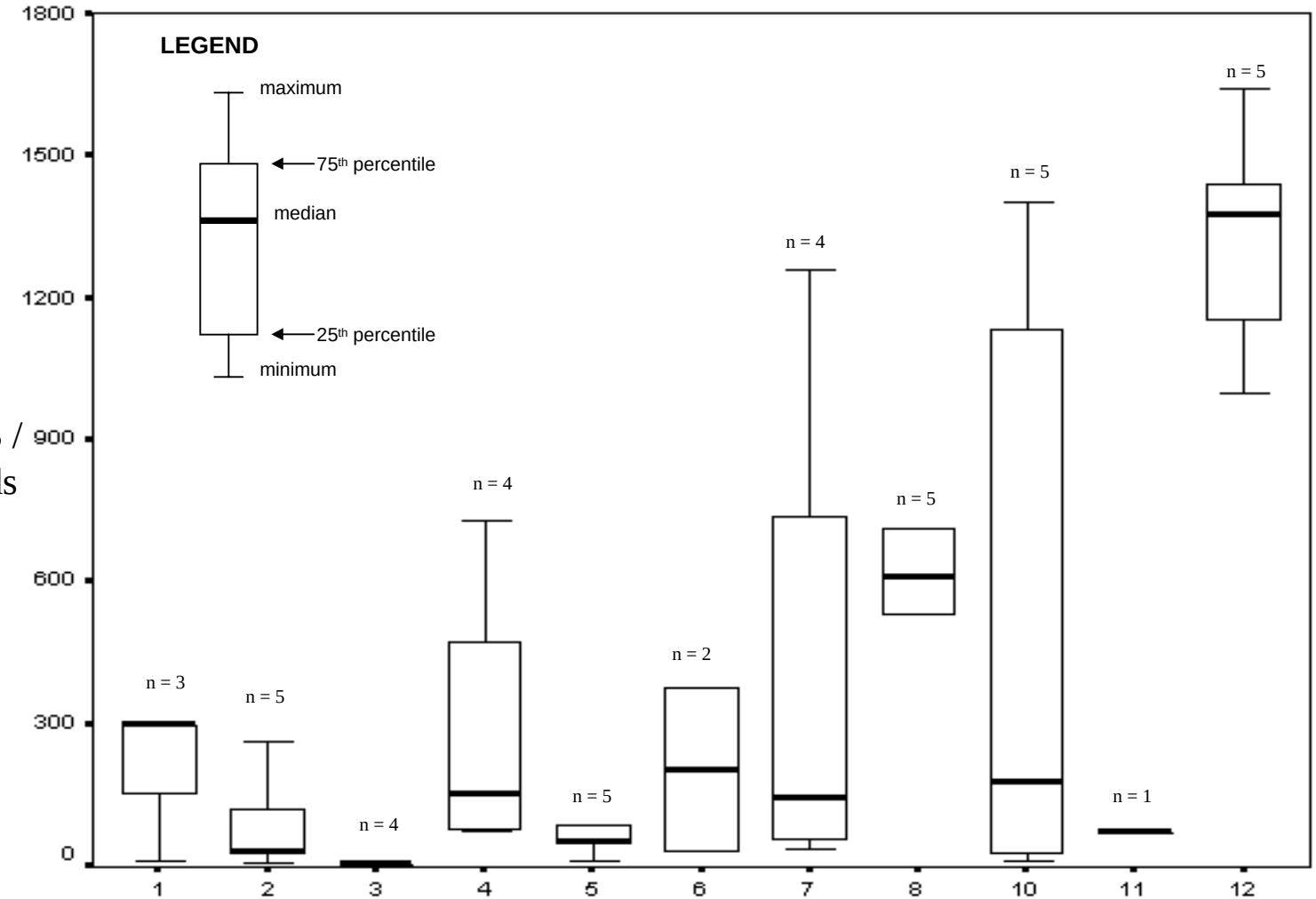
# Figure F-3: Median PCB Concentration in Top 15 cm of Floodplain Soil




mg PCB / kg TOC

Site Number

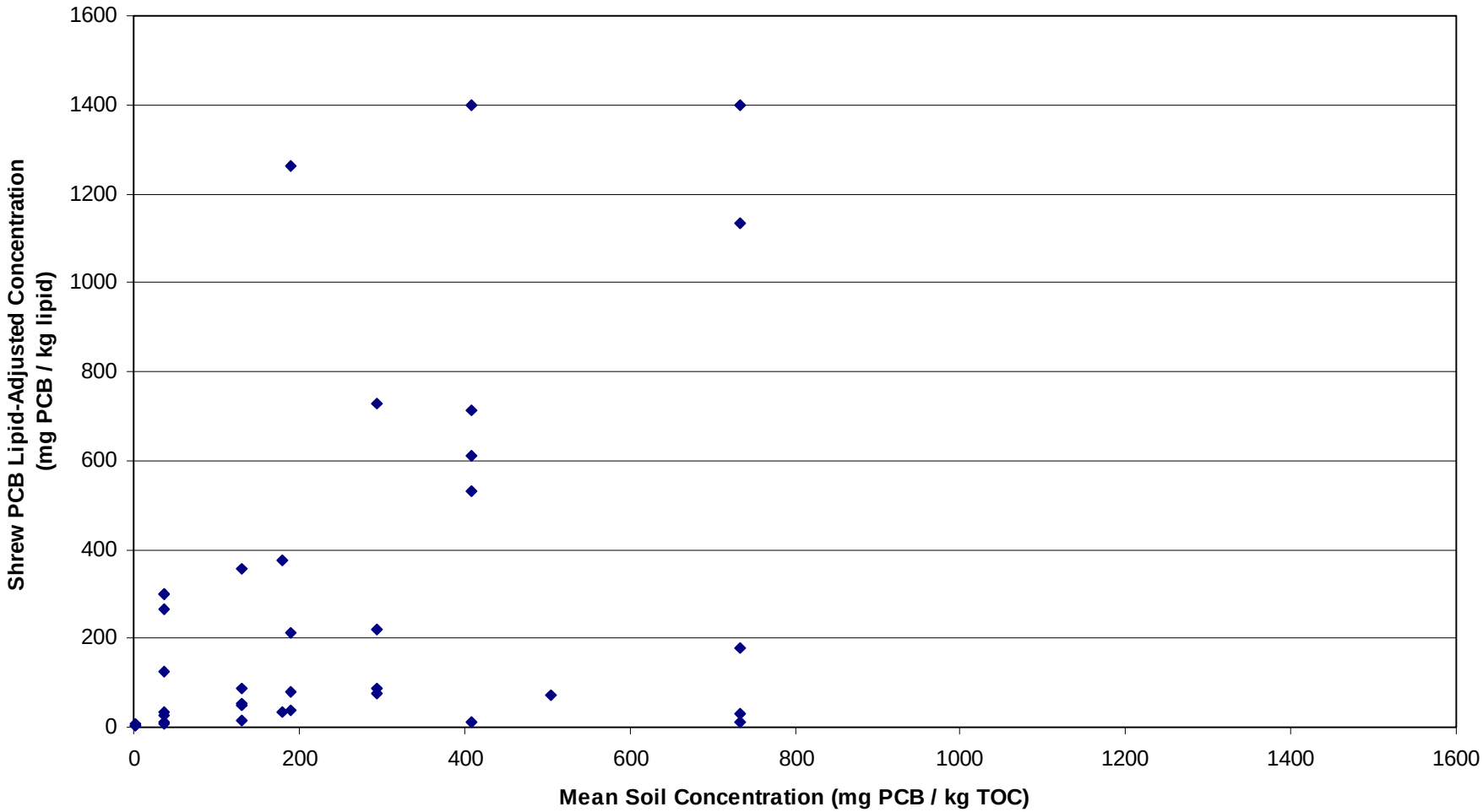
# Figure F-4: Median Short tailed Shrew Whole Body PCB Concentration (Lipid-Adjusted)




mg PCB / kg Lipids

Site Number

**Figure F- 5: Comparison of Mean Surface Soil PCB Concentration (0-15 cm) and Individual Shrew Lipid-Adjusted PCB Concentrations**



**APPENDIX G**

# COMPARISON OF TOTAL PCB RESULTS FOR FLOODPLAIN SOIL SAMPLES USING TWO METHODS

## Comparison of Total PCB Results for Floodplain Soil Samples Using Two Methods

As described in Section 4.1 of this document, the floodplain soil samples were analyzed by Woods Hole Group Environmental Laboratories for total PCBs by gas chromatography with electron capture detector (GC/ECD) using a mixture of Aroclors as standards. The results from these Aroclor-based PCB analyses were checked against a congener approach, which potentially affords greater quantitative accuracy (USEPA, 1998). Out of the original 179 soil samples analyzed by Woods Hole Group, ten were selected for comparative analysis. The ten samples were selected to represent a range of locations and PCB concentrations. The selected samples were sent to Axys Analytical Services for PCB congener analysis by gas chromatography with low resolution mass spectrometry detection (GC/LRMS), and then quantitated for total PCBs by summing homolog groups.

Both laboratories also analyzed a "blind" certified reference material of spiked soil prepared by Environmental Resource Associates (ERA).

**Results:** Results from the two laboratories are listed in Table G-1. Both sets of data were internally consistent. Upon comparison, the results from the GC/ECD Aroclor method were typically lower than the results obtained using GC/LRMS (Figure G-1). Values reported from both laboratories for the "blind" material, however, are within the 95% confidence interval for acceptable data as determined by ERA.

Representative data packages were evaluated from both laboratories. Quality control results (e.g., surrogates, internal standards) for both laboratories indicated that results generally met analytical data quality objectives. Woods Hole Group was requested to analyze a series of additional spiked extracts of mixed Aroclors and quantitate the results against the mixed Aroclor standards. These results indicated the methodology used by Woods Hole to quantitate total PCBs resulted in a low bias ranging from 61% to 82% recovery depending on the Aroclor mix in the spiked extracts.

**Conclusion:** Overall, the data comparisons indicate that the Woods Hole Aroclor-based PCB results for the 2000 floodplain work are generally biased low as compared to the congener-based method used by Axys Laboratories, which uses the sum of PCB homologs. The bias seen between the two methods employed by the laboratories can most likely be attributed to the range in sensitivities that the GC/ECD method has for the various PCB congeners. In general, the higher the chlorination of the congener the greater the GC/ECD sensitivity. By summing the response for all congeners and using one average response factor, the GC/ECD screening method introduces a low bias because the samples contain congeners with an on-average lower chlorination level than the standards used for quantitation. However, both sets of data meet the

analytical quality control criteria specified for the project, and provide internally-consistent estimates of total PCB content.

**References:**

USEPA. 1998. *Test Methods for Evaluating Solid Waste SW846, Method 8082A, Revision 1*, Office of Solid Waste and Emergency Response, Washington, DC.

| Table G-1. Comparison of Total PCBs in Soil Samples | | | |
|---|---|---|---|
| **Sample ID** | **Woods Hole Result (mg/Kg dry wt.)** | **Axys Result (mg/Kg dry wt.)** | **Relative Percent Difference (%)[1]** |
| **5-1-D55** | 0.011 | 0.0148 | 29.5% |
| **3-1-A15** | 0.048 | 0.021 | 78.3% |
| **9-1-B25** | 1.8 | 6.43 | 112.5% |
| **2-1-A15** | 4.9 | 6.7 | 31.0% |
| **1-1-A15** | 14 | 32 | 78.3% |
| **6-1-B15** | 34 | 130 | 117.1% |
| **10-1-B15** | 69 | 136 | 65.4% |
| **11-1-A25** | 150 | 170 | 12.5% |
| **8-1-B35** | 360 | 770 | 72.6% |
| **7-1-F35** | < 0.012 | < 0.00167 | NA |
| **ERA Spiked Soil[2]** | 14 | 17 | 19.4% |
| **ERA %R value** | 67% | 81% | NA |

ERA = Environmental Resource Associates
%R = Percent Recovery
NA = Not Applicable

[1] Relative Percent Difference = $\frac{|\text{Result A} - \text{Result B}|}{(A+B)/2}$ x 100

[2] Soil spiked with 20.9 mg/Kg of Aroclor 1248. Mean recoveries by other laboratories using standard EPA methods was 86.6% or 18.1 mg/Kg. Performance Acceptance Limits based on 95% confidence interval for peer laboratories are 9.99 to 26.2 mg/Kg.

Figure G-1. Comparison of Axys (GC/LRMS) vs. Woods Hole (GC/ECD) PCB Results