DORMITORY AUTHORITY OF THE STATE OF NEW YORK
Albany, New York

REMEDIAL INVESTIGATION
OF
AREA 6 PCB SITE
AT
HUDSON RIVER PSYCHIATRIC CENTER

TOWN OF POUGHKEEPSIE, DUTCHESS COUNTY

Site I.D. No. 3-167-063
DASNY Project No. 56302

March 1996

LMSE-96/0231&659/102

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CHAPTER 1

EXECUTIVE SUMMARY

The Hudson River Psychiatric Center (HRPC) site occupies an area of approximately 700 acres on Route 9, just north of the City of Poughkeepsie in Dutchess County, New York (Figure 1-1). Except for a portion owned privately, it is owned and operated by the New York State Office of Mental Health (OMH). The site is an active psychiatric complex, consisting of numerous in-patient and support buildings, recreation areas, and undeveloped land. The main part of the site is bordered on the west by the Hudson River and Route 9; on the east by Route 9G and some residences; on the north by a residential area; and on the south by the Children's Home, some residences, and a shopping center under construction. Another large, undeveloped area to the east of Route 9G is also part of the site.

There are six waste disposal sites on the HRPC property which have been investigated extensively. One of the disposal areas, Area 6, is the subject of this investigation. Area 6 is located near Ryon Hall in the southwest corner of the HRPC facility. It is bordered on the north by Ryon Drive, on the west by Winslow Gate Road, on the east by a parking lot, and on the south by an unnamed tributary to the Hudson River (Figures 1-2 and 1-3).

In 1986, EA Science and Technology (EA) prepared a Phase I investigation of the six disposal areas for the New York State Department of Environmental Conservation (NYSDEC). The investigation determined that because of the lack of sampling data a Phase II investigation (now called a Preliminary Site Assessment) was needed (LMS 1991).

NUS Corporation (NUS) conducted an offsite and onsite reconnaissance of three of the disposal areas on the HRPC property in 1986 and 1987 for the U.S. Environmental Protection Agency (EPA). Some samples of soil, surface water, and sediment were collected and analyzed for target compound list (TCL) organics and target analyte list (TAL) inorganics (LMS 1991). The results found hazardous levels of polychlorinated biphenyls (PCBs) in sediment from an unnamed stream that runs alongside Area 6.

LMS was retained by NYSDEC to conduct the Phase II investigation starting in 1989. All six separate disposal sites on the HRPC property were investigated. The investigation determined that all areas but one (Area 6) had no indication of hazardous waste disposal. The Phase II Investigation found PCBs in sediment samples collected from the stream adjacent to Area 6. The PCBs were detected above 50 mg/kg, which is the level at which PCBs are considered hazardous in New York. The Phase II investigation verified the findings of NUS, i.e., elevated

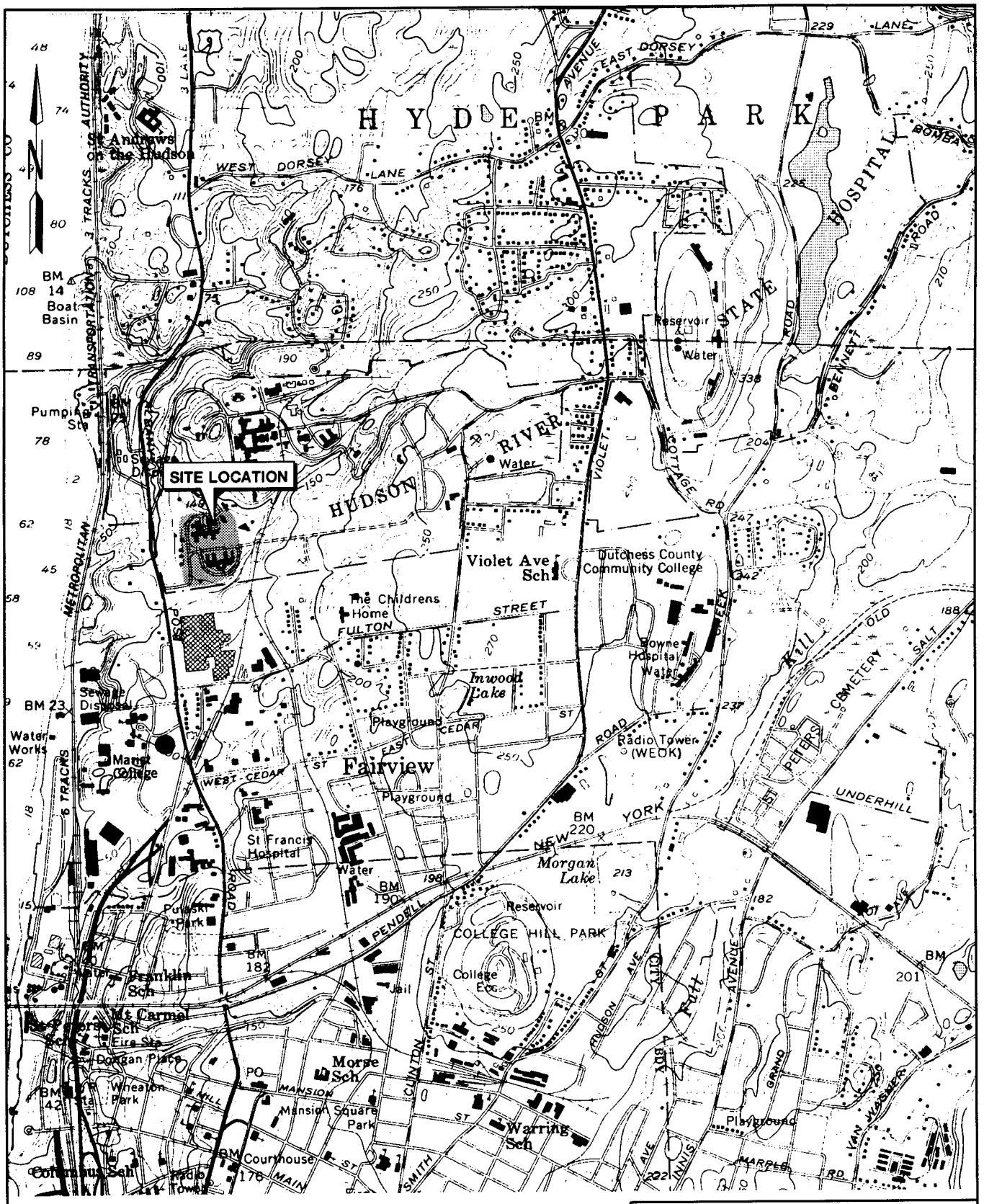

Figure 1-1

Site Location

NYSDEC I.D. No. 314063
HUDSON RIVER PSYCHIATRIC CENTER

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One Blue Hill Plaza • Pearl River, New York 10965
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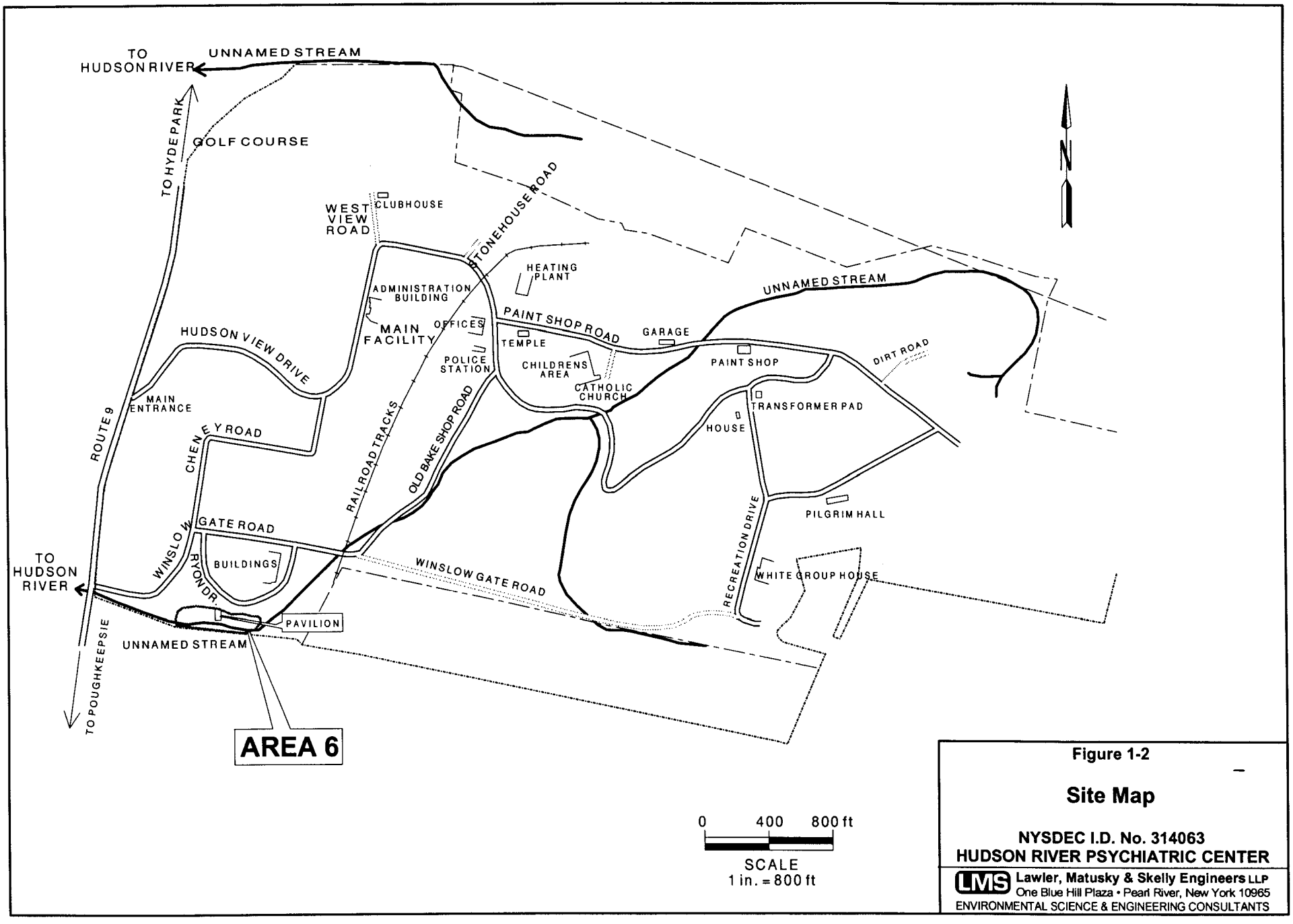

Figure 1-2

Site Map

NYSDEC I.D. No. 314063
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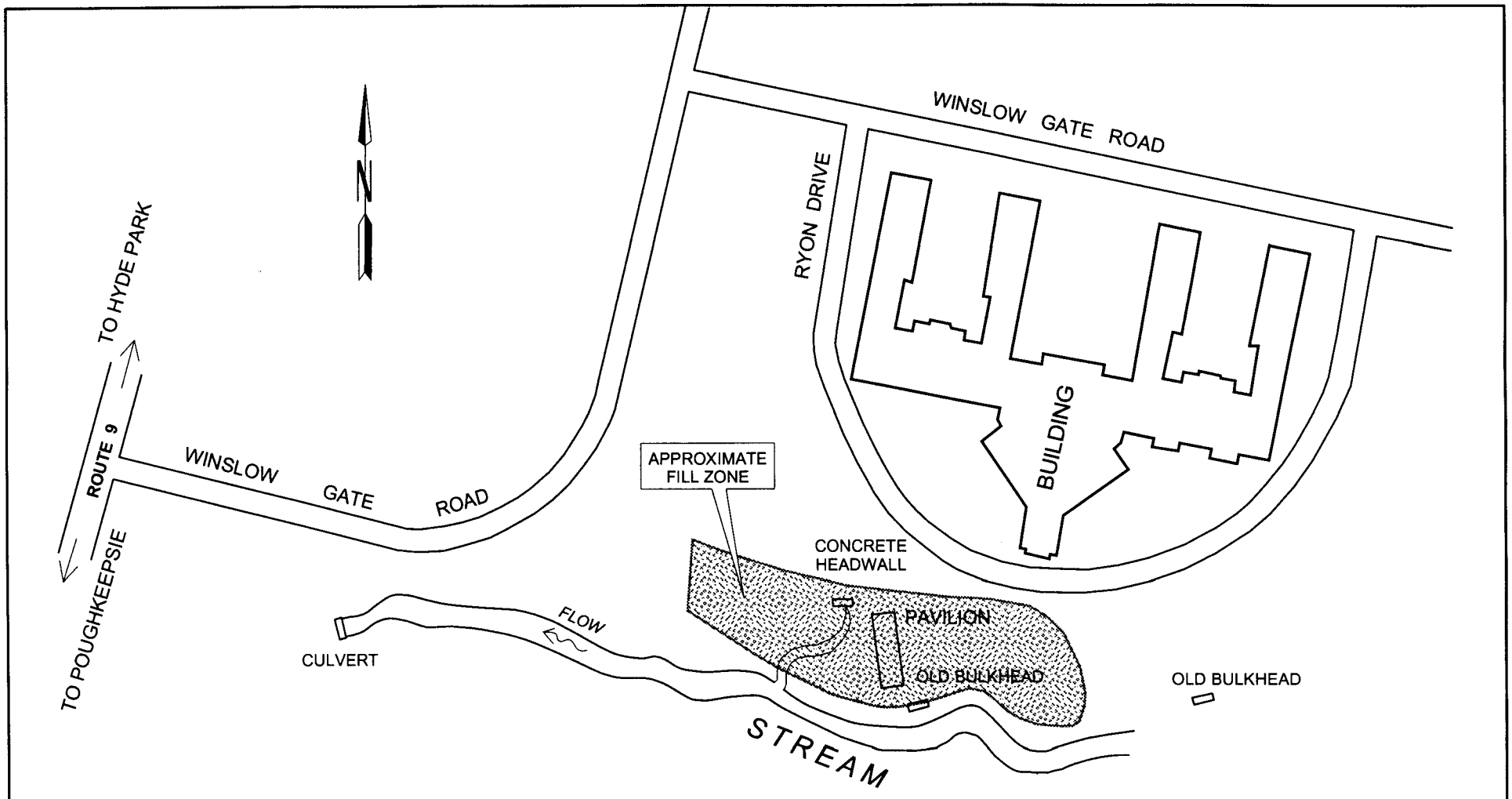

Figure 1-3

Area 6 Site Map

NYSDEC I.D. No. 314063
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SCALE IN FEET

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levels of PCBs in the stream sediments. At the time of the Phase II investigation, the source of the PCBs appeared to be from the storm drain that discharges into the stream.

Based on the results of the Phase II investigation, in March 1993 NYSDEC classified Area 6 as a Class 2 site on the Registry (Site I.D. No. 314063). A Class 2 site is defined as one which poses a significant threat to the public health or environment (LMS 1995a).

In 1993, LMS was retained by the former Facilities Development Corporation (FDC), now the Dormitory Authority of the State of New York (DASNY), to conduct an investigation to locate the source of the PCBs. The results of the investigation showed that the Cheney Building transformer vault room floor drain contained sediment with as high as 200,000 mg/kg of PCBs and that sediment in the manhole from the storm drain also had high concentrations of PCBs.

In January 1994, LMS was retained by DASNY to prepare plans for a remedial investigation/feasibility study (RI/FS) for the PCB contaminated sediment in the floor drain and storm drains in the vicinity of the Cheney Building and the stream. In August 1994, OMH entered into a Consent Order (CO) with NYSDEC to conduct an RI/FS. As part of the CO, interim remedial measures (IRMs) could be conducted on an as-needed basis prior to the completion of the RI/FS. Based on the results of the source investigation it was determined that an IRM would be needed to immediately control additional releases of PCBs into the stream and sediment. The IRM was needed to remove the PCBs prior to conducting the RI fieldwork (LMS 1995). Since the source investigation did not provide all the necessary design parameters, IRM investigations were conducted to: (1) verify the connection of the Cheney Building vault room floor drain to the storm sewer, (2) accurately map the storm drain system near Area 6, and (3) determine the extent and magnitude of contamination of the storm drain system and vault room. These investigations mapped a portion of the storm drain, quantified the amount of contamination found throughout the storm drain system, verified the connection of the Cheney Building vault room floor drain to the storm sewer, and determined that the storm drain pipeline from the Cheney Building vault room to the first manhole had collapsed and/or separated (LMS 1995).

In September 1994, LMS developed the plans and specifications for the IRM for DASNY. The proposed IRM consisted of cleaning and televising (a video record of the condition of the inside of the sewer) of the storm drain from the first manhole outside of the Cheney Building vault room to the outfall at the stream near Area 6. In addition, the IRM included excavating, removing, and replacing the pipeline from the Cheney Building vault room floor drain to the first manhole. Republic Environmental Systems was selected as the contractor to conduct the

IRM. The site work began on 27 July 1995 and the PCB cleanup was completed on 31 October 1995.

The field work for the RI was initiated in November 1995 and completed in December 1995. The investigation consisted of the collection of 154 shallow sediment samples along 13 transects across the unnamed stream to delineate the horizontal extent of PCB contamination above 1 mg/kg. In addition, core samples were collected at 25 locations to delineate the extent of vertical PCB contamination above 1 mg/kg. The samples were analyzed on site by a mobile laboratory operated by Commonwealth Analytical (CA). Ten percent of the samples analyzed by the mobile laboratory were analyzed by an outside laboratory, Energy & Environmental Engineering, Inc. (E3I), as a check on the mobile laboratory results and to analyze the samples for total organic carbon (TOC).

This investigation provided an estimate of the PCB contamination of the surface sediment in the stream, banks, and islands within the site area. However, because of sample recovery problems during the coring of deeper samples, the delineation of PCB contamination deeper than 6 in. is considered approximate only. In addition, this investigation was not designed to detect pockets of PCB contamination that may have resulted from varying sedimentation patterns; these finer levels of delineation will occur during the actual remediation activities.

The results showed that an area of PCB contamination of $\geq$ 1 mg/kg exists over an area of less than one acre and covers the distance from the storm drain outfall channel into the stream to the culvert. The total volume of PCB-contaminated sediments $\geq$ 1 mg/kg is about 54,900 ft^3. Since the PCB contamination exists up to the culvert, it was suspected that some contamination moved beyond the culverted areas. However, no PCB contamination $>$ 1 mg/kg was found in samples taken from the outlet at Marist College to the Hudson River. The highest PCB concentration, i.e. $\geq$ 500 mg/kg, was found just below the storm drain outfall and on the southern bank. It is presumed that during periods of high rain when the storm drain would discharge large volumes of water, the channel would overflow onto the bank and deposit the contaminated sediments on the bank. The quantity of sediment with PCB contamination $\geq$ 500 mg/kg is approximately 900 ft^3. A volume of about 4300 ft^3 of sediment is contaminated with PCB levels of $\geq$ 50 mg/kg but $<$ 500 mg/kg, and this area extends from just below the outfall to about 180 ft upstream of the culvert.

TOC was analyzed for selected samples sent to the outside laboratory. These data were used to assess the risk posed by the contamination to the environment. The risk assessment calculations showed that the PCB sediment criteria for protection against bioaccumulation in

wildlife is 0.072 mg/kg and for chronic toxicity to benthic organism is 1.0 mg/kg. The Area 6 cleanup will be assessed based on site data and impacted organisms.

A second part of the field investigation consisted of resampling of the Phase II monitoring wells for PCBs using a low-level detection method. The results showed no detectable PCBs at a detection limit of 0.09 μg/l, which is below the groundwater standard of 0.1 μg/l.

A third part of the investigation consisted of the collection of concrete cores from the Cheney Building vault room floor. Prior to the RI work, the IRM contractor collected 32 shallow cores to determine the extent of shallow PCB contamination. The results showed that most of the floor is contaminated with PCBs at an average concentration of approximately 1500 mg/kg, with a maximum concentration of 30,000 mg/kg in one location. The core sampling consisted of the collection of five samples at three locations, with samples collected in 1-in. intervals from 0-5 in. The results showed that the PCB contamination extends to a depth of at least 5 in. into the concrete.

CHAPTER 2

INTRODUCTION AND BACKGROUND

2.1 SITE LOCATION AND DESCRIPTION

The Hudson River Psychiatric Center (HRPC) site occupies an area of approximately 700 acres on Route 9, just north of the City of Poughkeepsie in Dutchess County, New York (Figure 1-1). Except for a portion owned privately, it is owned and operated by the New York State Office of Mental Health (OMH). The site is an active psychiatric complex, consisting of numerous in-patient and support buildings, recreation areas, and undeveloped land. The main part of the site is bordered on the west by the Hudson River and Route 9; on the east by Route 9G and some residences; on the north by a residential area; and on the south by the Children's Home, some residences, and a shopping center under construction. Another large, undeveloped area to the east of Route 9G is also part of the site.

Six waste disposal sites on the HRPC property have been investigated extensively. One of the disposal areas, Area 6, is the subject of this investigation. Area 6 is located near Ryon Hall in the southwest corner of the HRPC facility. It is bordered on the north by Ryon Drive, on the west by Winslow Gate Road, on the east by a parking lot, and on the south by an unnamed tributary to the Hudson River (Figures 1-2 and 1-3).

2.2 SITE HISTORY

According to NYSDEC and the New York State Department of Health (NYSDOH), the six disposal areas on the HRPC property were inspected a number of times by the Dutchess County Department of Health (DCDOH) from the mid- to late 1960s to early 1970s, with no further disposal occurring after 1974 (LMS 1991). Although the disposal areas reportedly received only municipal garbage and construction and demolition (C&D) waste, there was some concern that hazardous wastes may have been disposed of at one or more of the disposal areas. For this reason the six areas were placed on the New York State Registry of Inactive Hazardous Waste Disposal Sites (the Registry) in December 1984 and classified as a Class 2a site. A Class 2a site is one for which there is insufficient evidence to classify the site elsewhere on the list.

In 1986 EA Science and Technology (EA) prepared a Phase I investigation for the New York State Department of Environmental Conservation (NYSDEC). The Phase I investigation consisted of a site visit and an extensive literature search. The investigation determined that

because of the lack of sampling data a Phase II investigation (now called a Preliminary Site Assessment [PSA]) was needed (LMS 1991).

NUS Corporation (NUS) conducted an off-site and on-site reconnaissance of three of the disposal areas on the HRPC property in 1986 and 1987 for the U.S. Environmental Protection Agency (EPA). Some samples of soil, surface water, and sediment were collected and analyzed for target compound list (TCL) organics and target analyte list (TAL) inorganics (LMS 1991).

In 1989 LMS was retained by NYSDEC to conduct a Phase II investigation of the HRPC site. All six separate disposal sites on the HRPC property were investigated. The investigation determined that all areas but one (Area 6) had no indication of hazardous waste disposal. The Phase II investigation found polychlorinated biphenyls (PCBs) in sediment samples collected from the stream adjacent to Area 6. The PCBs were detected above 50 mg/kg, which is the level at which PCBs are considered hazardous in New York. At the time of the Phase II investigation, the source of the PCBs appeared to be from the storm drain that discharges into the stream.

Based on the results of the Phase II investigation, in March 1993 NYSDEC classified Area 6 as a Class 2 site on the Registry (Site I.D. No. 314063). A Class 2 site is defined as one that poses a significant threat to the public health or environment (LMS 1995). HRPC fenced off the area containing the contaminated sediments to prevent direct contact by on-site personnel (LMS 1995).

Although OMH owns and operates the HRPC site, OMH contracts environmental investigations through the Dormitory Authority of the State of New York (DASNY), formerly known as the Facilities Development Corporation (FDC). In 1993 LMS was retained by DASNY to conduct an investigation to locate the source of the PCBs. The results of the investigation showed that the Cheney Building transformer vault room floor drain contained sediment with up to 200,000 mg/kg of PCBs. A sediment sample from the storm drain near the Cheney Building that connects to the stream outfall contained 33 mg/kg of PCBs. Available maps of this storm drain showed that this drain ended before the vault room; however, HRPC staff indicated that the vault room floor drain was connected to this storm drain. The concentration of PCBs in the floor drain suggested that it was the major source for the PCBs in the stream. Samples collected from various locations, including the soil around the picnic pavilion, did not contain substantial PCB contamination and did not indicate the existence of another source of PCBs (LMS 1995). Since the soil sample around the picnic pavilion indicated no PCBs, the fence was removed from the picnic pavilion and reinstalled alongside the stream.

LMS was retained by DASNY in January 1994 to prepare plans for a remedial investigation/feasibility study (RI/FS) for the PCB-contaminated sediment in the floor and storm drains in the vicinity of the Cheney Building and the stream. (An RI determines the nature and extent of contamination and an FS identifies and evaluates remedial alternatives.) In August 1994 OMH entered into a Consent Order (CO) with NYSDEC to conduct the RI/FS. As part of the CO, interim remedial measures (IRMs) could be conducted on an as-needed basis prior to the completion of the RI/FS. Based on the results of the source investigation it was determined that an IRM would be needed to immediately control additional releases of PCBs into the stream and sediment. The IRM was needed to remove the PCBs prior to conducting the RI fieldwork (LMS 1995). As the source investigation did not provide all the necessary design parameters, IRM investigations were conducted to: (1) verify the connection of the Cheney Building vault room floor drain to the storm sewer, (2) accurately map the storm drain system near Area 6, and (3) determine the extent and magnitude of contamination of the storm drain system and vault room. These investigations mapped a portion of the storm drain, quantified the amount of contamination found throughout the storm drain system, verified the connection of the Cheney Building vault room floor drain to the storm sewer, and determined that the storm drain pipeline from the Cheney Building vault room to the first manhole had collapsed and/or separated (LMS 1995).

In September 1994 LMS developed the plans and specifications for the IRM for DASNY. The proposed IRM consisted of cleaning and televising (a video record of the condition of the inside of the sewer) the storm drain from the first manhole outside of the Cheney Building vault room to the outfall at the stream near Area 6. In addition, the IRM included excavating, removing, and replacing the pipeline from the Cheney Building vault room floor drain to the first manhole. A work plan describing the sampling and analysis requirements of the IRM was prepared in December 1994. Republic Environmental Systems, Inc. (RES) was selected as the contractor to conduct the IRM. Site work began on 27 July 1995 and the PCB cleanup was completed by 31 October 1995; final site restoration will be completed in spring 1996. LMS was the on-site engineer and conducted all sampling required by the IRM (LMS 1995). A draft report describing the IRM, the samples collected, and analyses performed was submitted to DASNY in February 1996 (LMS 1996).

In May 1994 LMS prepared the RI work plan documents, including:

- A field sampling plan (FSP)
- A health and safety plan (HASP)
- A quality assurance project plan (QAPjP)
- A citizens participation plan (CPP)

The RI/FS work plan documents were approved by NYSDEC in October 1994. The FSP is a detailed document that describes the procedures utilized to collect the samples, the number of samples collected, analyses to be performed, and location of the samples. The HASP describes steps to be taken during the investigation primarily to protect workers during the investigation activities. The QAPjP outlines the specific analytical procedures and also includes the field sampling protocol. The CPP outlines the procedure for keeping the public informed of the investigation's progress and findings and includes the location of document repositories and a mailing list.

LMS conducted a file search of the NYSDEC Region 3 files to review the information on the property immediately adjacent to the south side of the Area 6 stream that is being developed into the MidHudson Center, a shopping center. An RI/FS conducted by the Chazen Company found elevated levels, i.e > 100 mg/l of volatile organic compounds (VOCs) in the groundwater in the southeastern corner of the property (Chazen 1995b); a finding that does not impact the Area 6 investigation. The proposed plans for the shopping center show that Winslow Gate Road will be used as an entrance to the shopping center with a bridge constructed over the stream (Chazen 1994). In addition, the plans call for filling in of approximately 0.5 acres of the 1.7 acre wetland that encompasses Area 6 (Chazen 1995a). These proposed construction items may significantly impact on Area 6 because proposed fill areas may be contaminated with PCBs and/or the fill may be undermined by the remedial construction in the area, and must be addressed as part of the remedial plan.

2.3 REPORT ORGANIZATION

This report presents the results of the RI/FS conducted for the HRPC site. The field investigation activities that constituted the RI were conducted in November and December 1995 and included the collection of 202 sediment samples, 15 concrete samples from three cores, and groundwater samples from three wells.

Chapters 3 through 6 constitute the RI portion of this report. Chapter 3 includes the field investigation procedures employed during the RI. The physical characteristics of the site identified during the field investigation are presented in Chapter 4. The nature and extent of site contamination as determined by the sampling and analyses conducted is discussed in Chapter 5. The RI's conclusions are summarized in Chapter 6. Recommendations for additional investigations are also presented in Chapter 6. Appendix A contains the groundwater sampling sheets, Appendix B contains the analytical data summary sheets, and Appendix C contains the data validation and usability report. The report is copied single sided; however, in order to fit in one volume, the appendices are copied double sided.

The focused feasibility study (FFS) for the HRPC site is presented in Chapters 7 through 11, which will be presented in a separate volume. Chapter 7 includes the identification of applicable or relevant and appropriate requirements as related to site remediation and Chapter 8 identifies the contaminants of concern and determines the quantity of contaminated media. In Chapter 9 screening of potential remedial technologies for the site is performed. The technologies successfully passing the screening stage are combined into a range of appropriate site-wide remedial alternatives. These remedial alternatives are further defined and evaluated in detail in Chapter 9. Based on this evaluation, the most cost-effective alternatives were selected and presented as the preferred alternatives for remediation of the site in Chapter 11.

CHAPTER 3

FIELD INVESTIGATION PROCEDURES

3.1 INTRODUCTION

The RI for the HRPC Area 6 PCB site consisted of the following three elements:

- Sampling and analysis of stream sediment for PCBs to delineate the horizontal and vertical extent of contamination.
- Resampling of the three existing monitoring wells installed as part of the Phase II investigation for PCBs using a low level method (NYSDEC ASP 91-3) to document that PCBs are not impacting the groundwater.
- Collection of concrete cores from the Cheney Building vault room floor to delineate the extent of PCB contamination in the concrete.

The following sections describe the methods used to collect the samples. All activities followed the project HASP.

3.2 STREAM SEDIMENT SAMPLING

Prior to collection of the stream sediments a total of seven transects were marked in the field using a combination of stakes, line, and flagging. A day after installation, the transect locations were surveyed by YEC, Inc., and the locations placed onto the surveyed base map of Area 6. The transects were placed to accurately locate sample points, without surveying every point.

The sediments in the unnamed stream were collected from 8 to 17 November 1995. There were a total of 202 samples collected to delineate the area in 157 different locations. Samples were labeled in the field with date and time, and location measured from known points along the transects and marked on a scaled site map. Six additional transects, for a total of 13, were laid out in the field to better delineate the contamination. Samples were sent to the on-site Commonwealth Analytical (CA) mobile laboratory for PCB analysis using a modification of EPA Method SW846-8080. The modification is described in Appendix C of the project's QAPjP (LMS 1994b). One in every 10 samples collected was split and sent to Energy and Environmental Engineering, Inc. (E3I) for confirmatory PCB analysis using EPA Method SW-846 8080. These samples were also analyzed for total organic carbon (TOC). The samples were sent via overnight courier under chain of custody documentation.

Stream sediment samples were collected by one of two methods. The first method, for samples collected from 0-6 in., was accomplished using a dedicated stainless steel spoon. Sediment was removed using the spoon at each location and placed in a dedicated jar. Shallow sediment samples were first collected from north to south along each transect line. The samples were analyzed within 4 hrs, and the results were placed on the site map. In locations where the results were above 1 mg/kg PCB (wet weight) additional sample points were added along transects until the limit of contamination, i.e., ≤ 1 mg/kg (wet weight), was found.

To delineate the vertical extent of contamination, deeper samples were collected at various locations, including in the stream bed and the edge of the 1 mg/kg surface delineation along transects. Samples were attempted in 6 in. increments using a Geoprobe direct push macro-core sampling device or similar instrument with a soft core catcher. Samples were collected in 6-in. intervals to a depth of 2 ft, if possible. Plate 1 shows the locations of the sediment samples.

3.2.1 Stream Sampling

Sampling was attempted within the stream sediments to a depth of 2 ft. Attempts were made using the direct push method described above. The tube was driven using a hand hammer to a depth of 6 in., extracted from the sediment, and any soil was collected. Due to saturated soil conditions, samples often had poor recovery. Sediments were very silty and loose, with characteristics of liquid at most locations. Because of the looseness of the sediments, most of the sediment fell out of the tube. After trying similar tube methods that failed a core catcher device was employed to collect samples. A core catcher is a small plastic device with teeth that is able to catch loose sediments. This device was able to get better recoveries from subsequent stream samples, but some sediments were still lost. In some instances, due to the loose consistency of the material, discrete 6-in. to 2-ft sample intervals could not be recovered, so samples were collected within a successful distance of recovery (e.g., 6-24 in., 6-18 in.). Soils consisted of gray silt over organic dark brown to black clay silt and fine sand.

3.2.2 Bank Sampling

Along steep banks a stainless steel split spoon was used to collect soil from the 0-6 in. interval. Soil was collected from the sides and bottom of the hole, the hole being 6 in. down into the slope. Any debris was cleared away prior to sampling.

After collecting the first 6-in. interval by hand, a Geoprobe macro-core device was utilized as described above to collect soil in subsequent 6-in. increments that were labeled with date, time, and sample depth. Samples on banks had better recoveries and in most cases a full (i.e., 2 ft)

delineation was done. In locations where the deeper samples were below the water table, sample recoveries were also poor, similar to the stream samples.

3.2.3 Island Sampling

Soil samples on islands within the stream corridor were collected using one of two methods, depending on the depth of the sample. Surface 0-6 in. samples were collected with a dedicated stainless steel spoon. After debris was removed a small measured 6-in. hole was dug and the sediment from the sides and bottom were collected. Deeper soils were collected in 6-in. intervals using a Geoprobe macro-core direct-push soil sampler. In areas with groundwater, sediments were looser and the core catcher was employed inside the tube to increase sample recoveries. In some instances, due to the poor consistency of sediments, 6-in. intervals were not possible so samples were collected within the full distance of recovery.

3.2.4 Hudson River/Downstream Sampling

Several sediment samples were collected downstream of the site. After the stream is culverted through Marist College, it outfalls to the south of the facility where it then flows west along a rocky creek to the railroad where it is again culverted and outfalls to the Hudson River.

The closest downstream sample (SSD-142) was collected at 0-6 in. with a stainless steel spoon along the rocky stream where sediments were found, south of the Marist College facility (see Figure 3-1). A stainless steel spoon was used to collect an additional three samples (see Figure 3-1) of soil from 0-6 in. from inside the culvert in an area of low water flow in three locations horizontal across the culvert from wall to wall (SSD-116, SSD-117, and SSD-118).

At low tide there is an approximately 20-ft alluvial fanout from the culvert under the railroad before water is encountered. Sediments here ranged from sand to gravel with a little silt in the culvert and alluvial fan. Dedicated stainless steel spoons were used to collect sediment in three locations (see Figure 3-1) in an arc across the outfall to ensure all possible water flow directions were sampled (SSD-142, SSD-144, and SSD-145). All sediments were sampled to 6 in. in depth. Low tide was determined from tide tables for the area.

3.3 GROUNDWATER SAMPLING

Groundwater samples from wells MWHR-6-16, MWHR6-17, and MWHR-6-19 (see Figure 3-2) in Area 6 were collected on 5 December 1995. Samples were sent via overnight courier to E3I for analysis under chain-of-custody documentation. The samples were analyzed for PCBs using

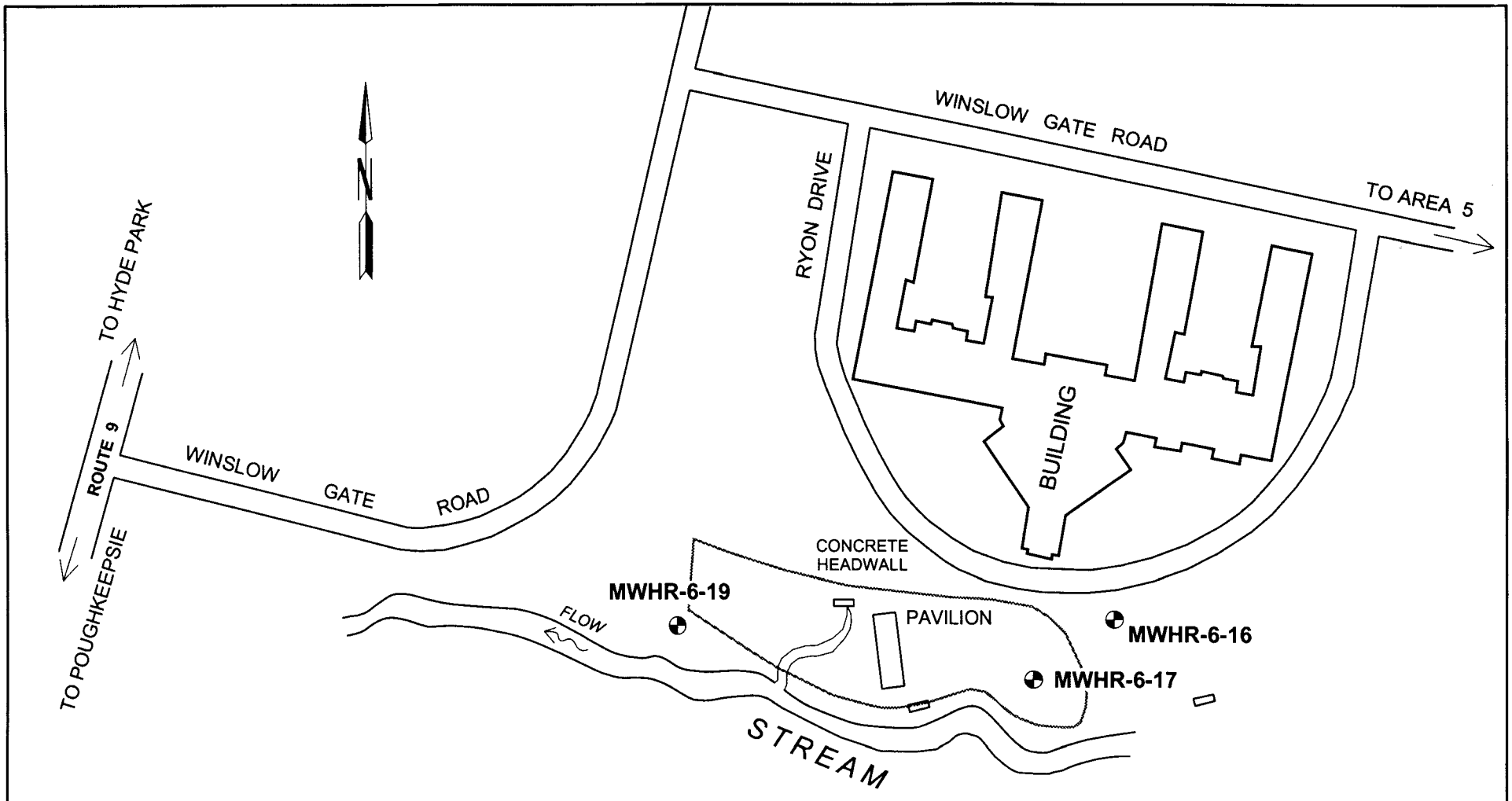

Figure 3-2

AREA 6
Monitoring Well Sampling Locations

NYSDEC I.D. No. 314063
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0 200
SCALE IN FEET

LEGEND

Surface water sample location

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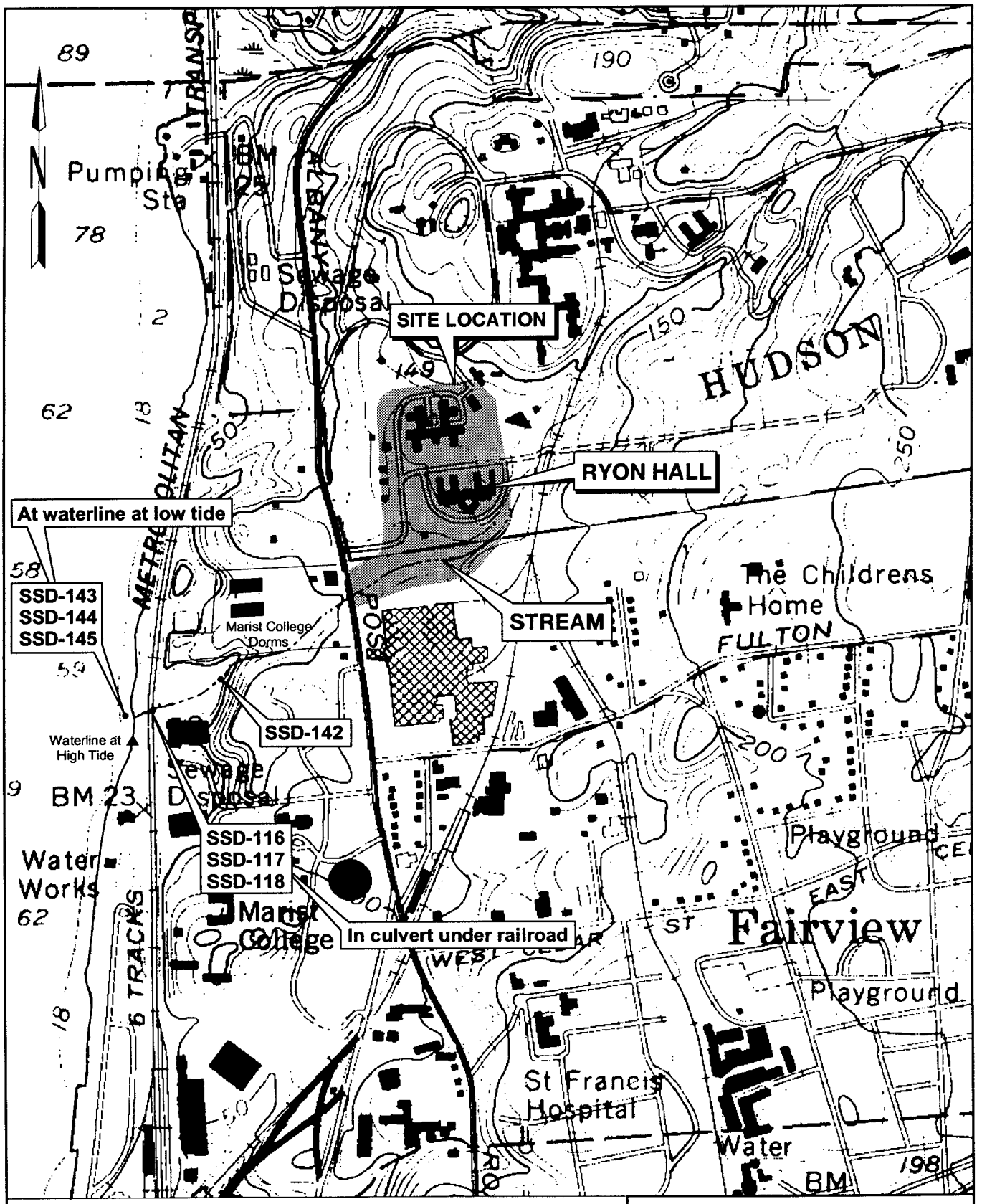

Map source: USGS Topographic map, Poughkeepsie, NY, 1957, photorevised 1982

\USGS-DET.ds4

Figure 3-1
Off-site Sediment Sampling Locations

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a modification of low level method NYSDEC ASP 91-3. The modification employed by the laboratory is described in the data usability report presented in Appendix C.

LMS and NYSDEC standard procedures for monitoring well sampling included measurement of initial static water level and bottom-of-well depths. These levels and depths were compared with the well completion logs to determine if filling, silting, or damage to well screens had occurred. All wells were within 0.5% of the original 1990 depth. The volume of water within the casing and borehole was then calculated to determine the required purge volume. Each well was purged using a Grunfos submersible pump with dedicated polyethylene tubing.

Polyethylene tubing and pump were lowered to the well bottom to remove accumulated fines from the well casing. Purging rates were adjusted for specific well conditions. The well was surged periodically along the length of water column by moving the pump and tubing up and down the column to create turbulence and purge any remaining stagnant water from the well. During purging, the pump rates were estimated and field chemistries (temperature, pH, conductivity, and turbidity) were recorded at regular intervals.

When the required quantity of groundwater was removed and either the turbidity was lowered to a targeted level (50 NTU) or the well was pumped dry, pumping was stopped and a final groundwater level measurement was taken.

Sampling was performed when the water table recovered at least 90% of its original height. A dedicated (one bailer per well) polyethylene bailer was used to sample each monitoring well. Field chemistries were collected at the beginning and end of each sample period. Laboratory supplied bottles were used to contain groundwater samples from each well. Each bottle was labeled with date and time of sampling and well identification number. After samples were collected, they were packed in ice and at the end of the day shipped to a E3I. Figure 3-2 shows the location of the monitoring wells. Groundwater sample logs are in Appendix A.

3.3.1 MWHR-6-16

Well MWHR-6-16 was in good condition. The static water level was 10.75 ft from top of casing (TOC) and the total depth of the well was approximately 40.3 ft. The purge estimate for three well volumes was 93.08 gal. The well was purged of 95 gal as described above. Water purged was black and silty but cleared quickly and had no odor. The well was surged along the water column at every 5 gal. Water silted up but cleared quickly and had a slight swampy odor. After purging, the well was allowed to recover at least 90% before sampling. The well was sampled with a bailer at mid-screen depth. A matrix spike/matrix spike duplicate

(MS/MSD) sample was collected from this location. The well lock was replaced when sampling was completed.

3.3.2 MWHR-6-17

MWHR-6-17 was intact; however, the old worn lock was replaced after completion of sampling. The static water level was measured at 8.2 ft and the bottom depth was 57.1 ft, both from top of casing. The purge estimate for three well volumes was only 80 gal due to the smaller diameter of the well. The well was purged at approximately 2-3 gpm. The water was orange and cloudy at first but cleared quickly. The well was purged the full 80 gal and allowed to recover at least 90% before sampling. The sample was collected from mid-screen using a dedicated polyethylene bailer.

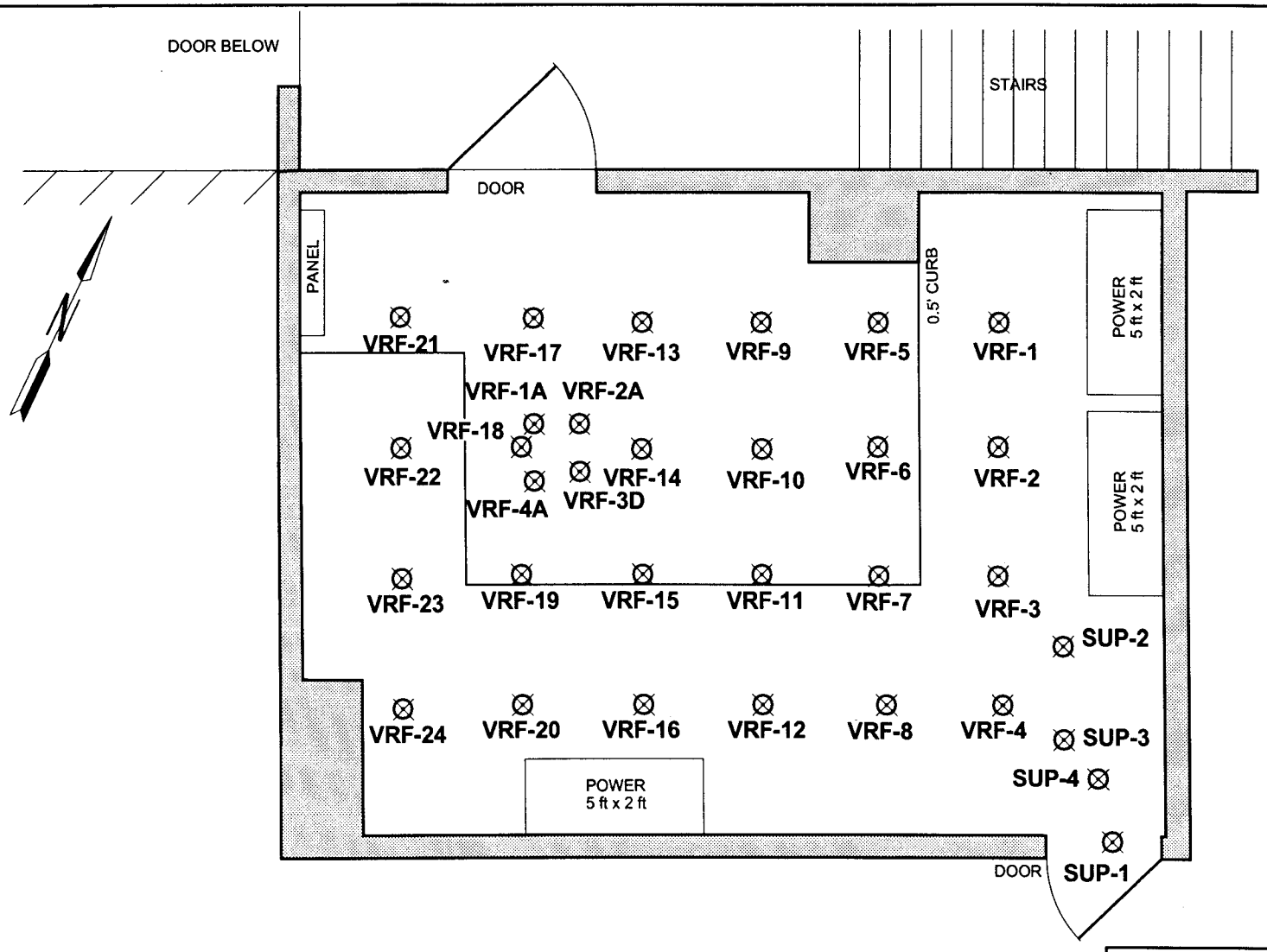
3.3.3 MWHR-6-19

MWHR-6-19 was intact; however, the old worn lock was replaced. The static water level was 10.5 ft and the total depth of the well was 38 ft from top of casing. The purge estimate for three well volumes was 45 gal. Even during purging the water was relatively clear. The yield in this well was lower than the others and was pumped dry at about 22 gal at a rate of approximately 2 gpm. After purging dry, the well was allowed to recover at least 90% before sampling. The sample was collected at mid-screen with a dedicated polyethylene bailer

3.4 VAULT ROOM CONCRETE CORE SAMPLING

During the IRM construction, RES, in affiliation with Nature's Way Environmental Technology, Inc. (NWET), suggested that bioremediation of the Cheney Building vault room concrete floor was possible. On 31 October and 1 November 1995 RES collected 32 shallow concrete cores from the vault room floor. The samples were analyzed for PCBs by CA using EPA Method SW846 8080. The method of sample collection was not documented by RES, although it was believed that the samples were collected by use of a rotohammer, drilling down approximately 1-2 in. from the surface and compositing the sample. Figure 3-3 shows the location of the RES concrete samples.

Three concrete core samples were collected from the Cheney Building vault room floor on 14 and 15 December 1995 to determine the depth of PCB contamination. The cores were taken in the three highest areas of PCB contamination found during the RES sampling. Cores were sampled using a rotohammer and chisels in 1-in. increments. The surface of the area was vacuumed free of dust and debris using a wet-vac. The rotohammer was used to chip



LEGEND

⊗ Sample location

0 3 ft

APPROXIMATE SCALE IN FEET

\659103CH.ds4

NOTE: Samples taken by Republic Environmental Systems, Inc.

Figure 3-3

Concrete Sample Locations
Cheney Building Vault Room

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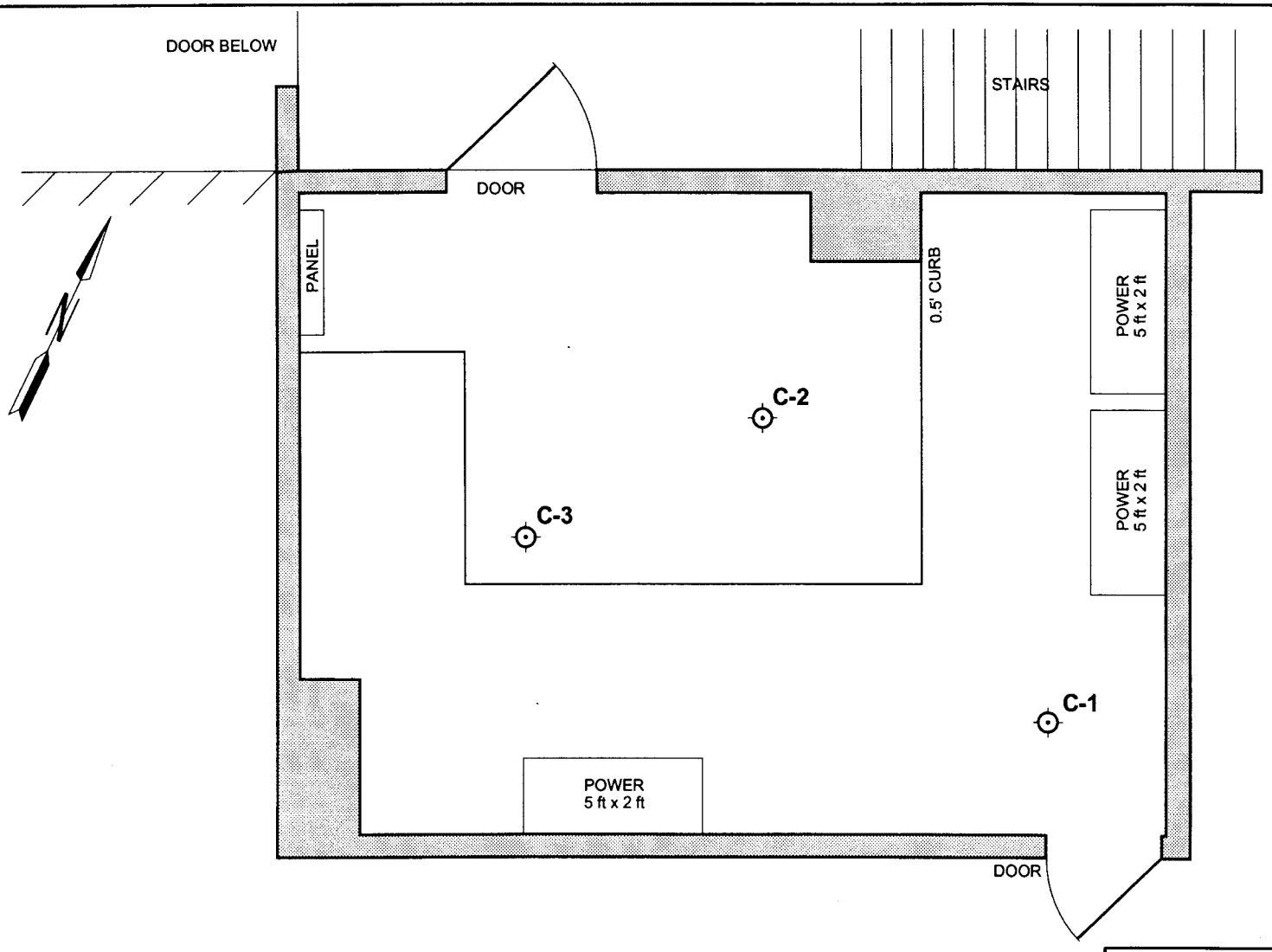

LEGEND

C-3 ⊙ Concrete core sample location

0 3 ft

APPROXIMATE
SCALE IN FEET

\659103CH.ds4

Figure 3-4

Concrete Core Sample Locations
Cheney Building Vault Room

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approximate 1 in. deep areas in close locations to one another within a 5 x 5 in. grid. The dust from the interval was placed in a jar and labeled with date and time of sampling, and a core identification number. The 5 x 5 x 1 in. hole was then chipped clean and free of dust. The process continued at approximately one inch intervals from 2 in. to 5 in. in depth at each of three locations. Figure 3-4 shows the location of the concrete cores.

The rotohammer drill bits and chisels were wiped with hexane and allowed to dry before each 1 in. interval was drilled to prevent cross-contamination. The holes were drilled to only 5 in. to avoid drilling through the floor into the sub-basement which contains conduits carrying utilities. All the coreholes were backfilled with cement after a thorough decon of the floor with a vacuum.

3.5 DECONTAMINATION/WASTE COLLECTED

For stream sampling personal protective equipment was taken back to Nyack lab for disposal or placed in a drum with other personal protective equipment and disposed of with IRM waste material properly. All equipment used was cleaned and washed after each day for reuse.

During concrete coring all dust was collected after completion each day's activities in a wet/dry vacuum. The vacuum was dedicated for this collection and not utilized after sampling. Dust collected was drummed along with the vacuum. Personal protective equipment, including tyvek, booties, nitrile gloves and filters, was disposed of at LMS' Nyack laboratory. All doors to the vault room were verified as being locked before leaving, and keys were turned over to the HRPC security staff.

3.6 HEALTH AND SAFETY

Work conducted in the streambed was done using level D personnel protective equipment including steel-toed boots, nitrile gloves, and a hard hat. In addition, chest waders were used to keep sampling personnel warm and dry while working in the stream. Samples collected in the Hudson River were also done with chest waders and life jackets. Safety ropes were also on hand if needed.

The concrete cores were collected using Level C personnel protective equipment that included a full-face respirator with HEPA filters, tyvek, nitrile gloves, steel-toed boots, booties, and hard hat. The room was posted for restricted access during sampling activities, and no one was allowed in without proper protection. When complete, protective equipment was taken to LMS' Nyack laboratory for proper disposal.

CHAPTER 4

PHYSICAL CHARACTERISTICS

4.1 TOPOGRAPHY

The HRPC is located in an area of varied topography generally described as a rolling upland of moderate elevation, caused in part by the nature and structure of the underlying rock formations as affected by erosion and in part by the mantle of glacial deposits. Specifically at Area 6, the elevation of the fill area is approximately from 100 to 110 ft above mean sea level (MSL). The land generally slopes downward in a westerly direction towards the Hudson River. Groundwater flow in the area is to the west.

4.2 SURFACE WATER

An unnamed stream runs through the HRPC property and passes by Area 6. The stream becomes a wetland area in the vicinity of Area 6 and the stream is culverted from just prior to where the stream passes underneath Route 9 to underneath most of Marist College until its discharge to the Hudson River. The Hudson River is situated approximately 800 ft to the west of Area 6. The elevation of the streambed ranges between 99.80 and 87.05 ft above MSL in the vicinity of Area 6.

4.3 DEMOGRAPHY AND LAND USE

The HRPC is owned and operated by the OMH and is used as a psychiatric hospital. It is located in the Town of Poughkeepsie, Dutchess County, New York, approximately one mile north of the City of Poughkeepsie. The 1990 population of the Town of Poughkeepsie was 40,143 (NYSDED 1990).

The site is located in an area of mixed commercial and residential development. Marist College is located across Route 9 from the HRPC site. A commuter and long distance railroad line runs along the east shore of the Hudson River, approximately 700 ft from Route 9. There are approximately 225 households and 2100 people within a 1-mile area of the site. Ryon Hall and Cheney Building, which are located just to the north of Area 6, are used as patient residences and treatment centers. The projected 1994 census for Ryon Hall and Cheney was 163 and 379, respectively, for a total residential population of 542 (OMH 1990).

4.4 ECOLOGY

Dutchess County is located in the southeastern portion of the state on the Connecticut border and is within the New England and Eastern New York Upland, Southern Part land resource region. The area along the Hudson River is mostly rolling upland broken by deep stream valleys. Mountains extend along the eastern border of the county with 1000 to 1200 ft elevations and generally steep and sometimes rocky slopes. The northern part of the county is characterized by rolling hills with ridges gradually becoming steeper as they move toward the southern part of the county. Most of the county has deep acid soils over hilly terrain and shallow acid soils over steep terrain on glacial till. The county lies within the oak and oak-northern hardwood natural vegetation zones. The forests range from scrubby, poor-form pioneer species including gray birch, soft maple, and red cedar to stands of old-growth oaks and other hardwoods. Hickories are common and, on better soils, wooded areas include white ash, tulip popular, basswood, sugar maple, black cherry, hemlock, white pine and red oak with oak types most common on drier sites. In the Hudson Valley, many portions of the land are about 50% wooded (Clements 1989).

On the HRPC site much of the area is wooded. The unnamed stream (H-118), which flows past Area 6, also flows through an unnamed Federally regulated wetland area. The mapped area of the wetland is approximately 1.7 acres (Chazen 1995a). The unnamed stream discharges to the Hudson River approximately 800 ft to the west of the site.

4.5 CLIMATOLOGY

Poughkeepsie is within the New York Hudson Valley climatological region with a primarily continental climate moderated somewhat by maritime influences. The climate is characterized by cold, snowy winters and warm, humid summers. The average annual temperature is 48.9°F, ranging from an average low of 23.8°F in January to an average high of 72.2°F in July. The average annual precipitation is 46 in. (NOAA 1994). The average humidity is 73% at 7 am and 67% at 7 pm. Annual snowfall averages 42 in. Prevailing winds are from the northwest during the winter and from the south during the summer (Clements 1989).

4.6 GEOLOGY

4.6.1 Regional Geology

Most of the predominate surface features in Dutchess County are of glacial origin, especially in and around Poughkeepsie. Areas in and around the Hudson River also contain alluvium

deposits of varying composition and size. Northern areas of Poughkeepsie are underlain by consolidated mid-late ordovician rocks of the Hudson River formation. The formation thickness in the site area ranges between several hundred and several thousand ft. The main rocks in the formation consist of shale and slate which is generally gray to black, but whose color may also vary. Shale and/or slate may be layered with areas of limestone, limestone conglomerate, chert, and graywacke. The graywacke is the result of turbidity flows during the Taconic Orogeny (Chazen 1995a). These rocks may be metamorphosed to some degree, and may include amounts of phyllite, slate, and schist. Bedrock surface elevation can change dramatically over a short distance, due to glacial reworking and erosion. Metamorphism is commonly found in the formation and reformation has been noted to increase to the northeast. Therefore, the rock type will change from shale in the southwest to phyllite and slate, dolomite, and marble in the northeast.

Unconsolidated materials overlying the bedrock consist of sand, gravel, lacustrine, and till deposits. Glacially derived sediments consist of unstratified till deposits up to approximately 100 ft in depth. Other glacial material includes lacustrine deposits which consist primarily of silts and clays, and have their origins from small to moderately sized glacial lakes. Glacial outwash deposits consist of sands and gravels are found in some of the remaining areas. Recent post glacial deposits of alluvium, including a wide range of sediments from present streams lakes, swamps, and flood plains can be found throughout the area. This material is some of the more common unconsolidated sediments found in close proximity to existing rivers, streams and water courses.

4.6.2 Study Area Geology

The stream bed in Area 6 appears to be located on a more weathered area of the bedrock which may be the result of a geologic contact or faulting as the result of metamorphic compression. The stream, flows along this path down to the Hudson River. Bedrock in and around HRPC consists of Hudson River Formation. Unconsolidated deposits are composed of glacially derived outwash sands and gravels and alluvium. Some manmade fill areas have also been located throughout the facility.

Most of the areas, immediately adjacent to building foundations consist to some degree of sand and gravel fill. In the IRM trench investigation the man-made fill consisted of sand, gravel, logs, a few boulders, and small amounts of concrete, brick, creosote-coated timber, and glass. A silty clay layer in the trench was found underlying the fill, and partially confined the saturated grey moderate to well sorted fine sands and silts below (LMS 1996).

In and around the stream channel, sediments consisted of shallow sand and gravel fill, and alluvium of recent stream wash. Construction occurring south of the site in the southern portions of the stream has caused partial burial of native stream sediments along the south side of the stream. Within the stream, sediment cores to 2 ft revealed sediments of fine-medium sand grading to silt and near clay with areas of organic deposits. Sediments were the consistency of liquid in some areas while in other areas having greater water velocity, fine and medium sands were present in a more cohesive mixture. Bedrock elevation may have a significant effect on the amount of sediment in specific locations. Bedrock is highly variable along the stream channel as one moves from west to east. In western portions of the streambed shale and phyllite bedrock is generally shallow (<3 ft) and even outcrops in the southwest. In some places there are thin fractures filled with either a quartz or calcite crystal.

Farther east along the stream, between transects 4 and 6 in the center of the stream channel, lies a bedrock ridge of mostly shale and phyllite. This ridge is approximated on the cross sections (Figures 6-8 to 6-10) and is shown where it outcrops on the surface.

Along the northern side of the streambed, a second bedrock ridge climbs out of the stream channel. Near the pavilion and outfall, bedrock is estimated to be approximately 5-8 ft below ground surface (BGS). Bedrock outcrops along the ledge below the pavilion, and below the outfall. The depth to bedrock along the ledge, west of the pavilion and outfall is approximately 5-8 ft BGS becoming shallower further west.

4.7 SOILS

Two separate and distinct surfacial soil types were found in Area 6. Stream sediments are classified as Wayland silt loam. These soils are formed in recent alluvium considered very deep, level, poorly drained, and poorly sorted. They have roughly 0-3 ft slopes. These areas are subject to frequent brief to long flooding from November to June. Permeability of the soil is moderate in the surface to slow in the subsurface and substratum. The water table is at or near the surface, and the area is considered hydric. Hydric conditions have been verified by visual locations of springs within the stream sediments (USDA 1991).

The soil area around the Ryon and Cheney buildings are classified as Hoosic-Urban Land Complex. This is 40% Hoosic soil with urban features covering most of the area. Hoosic soils are very deep, excessively drained, sandy over gravelly soils formed in outwash. Permeability here is greater than in the Wayland silt loam and is moderately rapid in the surface and very rapid in the substratum (USDA 1991). During the IRM these soil conditions were confirmed.

4.8 HYDROGEOLOGY

4.8.1 Regional Hydrogeology

Groundwater occurs throughout the entire region of Dutchess County in both consolidated and unconsolidated materials. Almost all groundwater is derived from the local precipitation. Groundwater levels will fluctuate seasonally in Dutchess County. Some of the main factors relating to the fluctuation include seasonal precipitation variations, vegetative respiration, additional community usage in the spring and summer, and most of any snow pack following winter.

Water can be bound molecularly to soils in the zone of aeration. The amount of available water generally increases with depths down to the zone of saturation where both the piezometric surface is equal to atmospheric pressure, and 100 % of the pore space around the soil is saturated. Water in the saturated zone can be either confined (under pressure from a impermeable or semipermeable layer) or unconfined (at normal pressure with surface at atmosphere pressure). In Dutchess County both confined and unconfined groundwater units are known to exist; however, the cases of free confined water are not as numerous as those where unconfined water is available. An example of this was found in somewhat dated but accurate USGS reference where 675 known wells are listed and out of these, only 20 have been measured to indicate artesian (confined) conditions (USGS 1961).

Unconsolidated soils of varying hydraulic properties overlie bedrock throughout the country. Till in upland areas consists of a mixture of clay, silt, sand, and boulders, pebbles, cobbles, and is generally found in stratified or in stratified deposits. As a rule, till is a poor producer of water. Wells drilled in till may have a larger inside diameter than wells installed in more permeable sediments. This larger size allows infiltration greater from the lower yielding materials. The average yield in the county for wells documented to have been installed in till is approximately 3 gpm (USGS 1961).

In low lying valley areas, thicker sediments may accumulate and include not only till, but sand and gravel or lacustrine deposits. Sand and gravel deposits are the highest documented producers of groundwater in the County, and underly many of the valley areas. These layers tend to be mixed with smaller deposits of intermixed silts and clays. Although the thickness of the more permeable deposits vary widely according to surface variation and bedrock profile, however in areas where wells are installed, they are generally 25-30 ft thick. Wells in these areas average approximately 318 gpm (USGS 1961). Lacustrine deposits may contain areas of

with them. The majority of these deposits in the county are found in valleys where silts and clays were deposited from ancient glacial lakes and ponds. Yields are moderate at best and highly variable due to clay and silt content and extent of the perched conditions caused by these sediments.

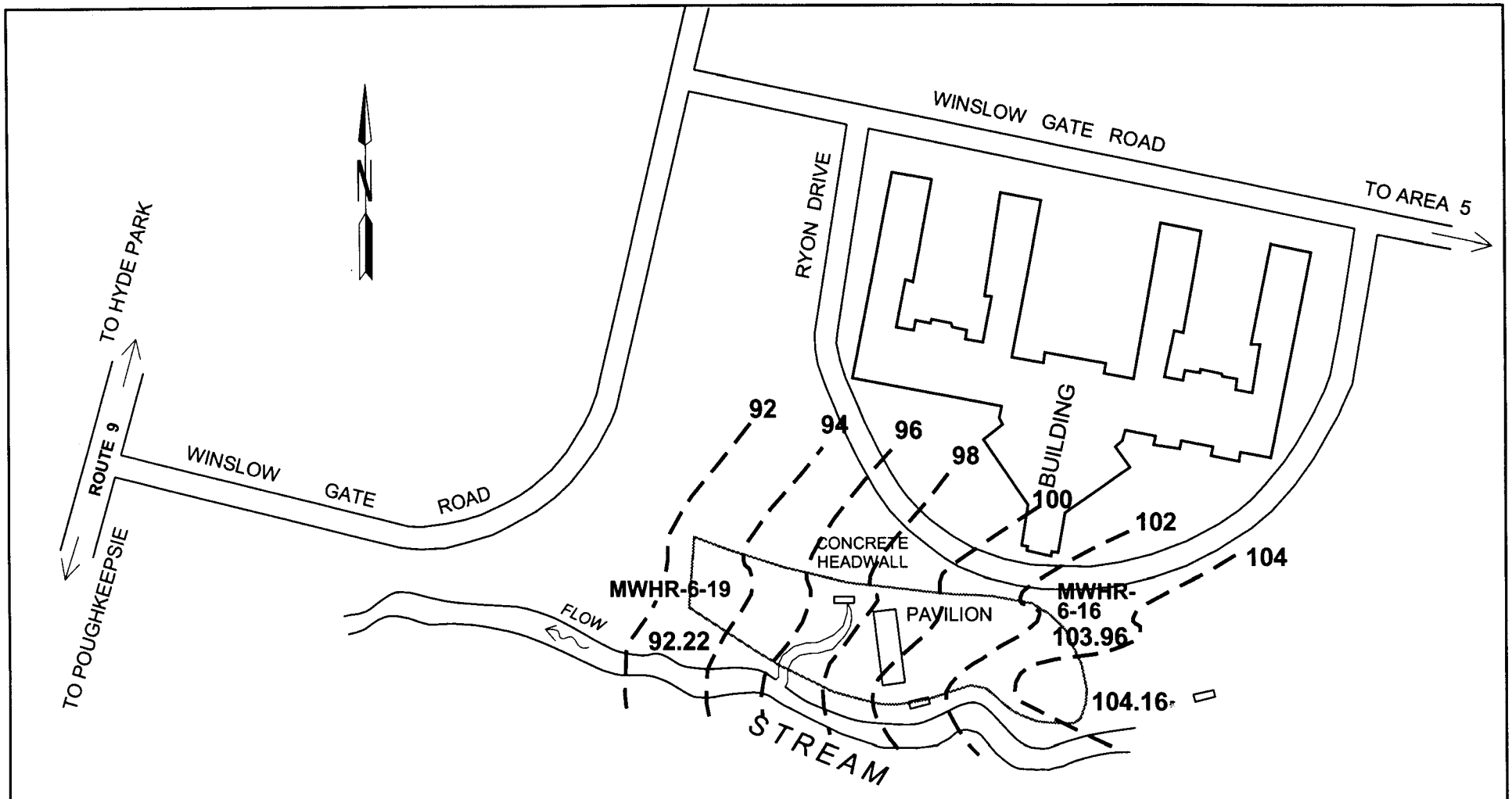
Groundwater found in consolidated bedrock is derived from joints, fractures, faults and primarily folds in rock or in general areas of weakness. Bedrock yields vary greatly over the area formation due to the availability of these winter bearing zones. Breaks in limestone units tend to have the highest yields whereas availability of water in gneiss and granite is less. In Dutchess County, wells tapping the Stockbridge Limestone unit averaged 22 gpm, whereas wells located in granite and gneiss what formation were recorded at half of this (USGS 1961). Wells installed in shale, phyllite and slate, typical of those installed at the site, have recorded average yields of 16 gpm, these fall between the high yield limestone and the lower yielding granite. Factors that effect well yields in consolidated deposits include depth, diameter, and location of the well, the number of fractures located over its water bearing zone and the overall permeability of the formation. Wells in Dutchess County located in valleys show higher yields and more joints, fractures, and faults than those not. This is due primarily to a northeast trending weakness in bedrock through county valleys (USGS 1961).

4.8.2 Study Area Hydrogeology

Throughout the site unconfined groundwater is found in both unconsolidated and consolidated deposits. There are also areas of confined (artesian) groundwater near the stream to the south. Groundwater near the stream is very shallow (< 1 ft below surface in most cases) and in some cases it was found free flowing at the ground surface. Groundwater flow direction directly in the streambed and surrounding Area 6 soils is roughly parallel to the direction of the stream discharge, which is west-southwest (Figure 4-1).

Groundwater over the area generally flows to the south and west. Data from several wells from the Phase II NYSDEC report groundwater flows west-southwest into the stream and eventually the Hudson River (LMS 1991) (see Figure 4-1). During the Phase II, slug test performed on nearby bedrock wells showed, hydraulic conductivities to range between 8.5 m/day and 0.1 m/day. These values indicate that flow rates through the fractioned rock are moderate but consistent.

The streambed itself has been singled out from the surrounding area as having entirely different soil and hydraulic properties (USDA 1991). The presence of wetlands, swampy terrain, and



LEGEND

MWHR-6-17
103.08
Monitoring well location
(Groundwater elevation in feet, approx. USGS datum)

Groundwater contour line
Contour interval 2 ft
Dashed line indicates inferred contour

0 200
SCALE IN FEET

Figure 4-1

AREA 6
1995 Groundwater Contour Map

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natural springs found in the south side of stream verify the published soil survey accounts that indicate soils to be hydric.

A comparison between the rest of the Area 6 soils and those in the streambed show that there are distinct variations in soil and hydrogeologic properties.

Prior to actual remediation, further investigation of hydraulic conditions within the streambed may be warranted. For example, to determine the proper method for dewatering, additional information on hydraulic conductivity, hydraulic gradients, soil classification, and bedrock location may be required.

CHAPTER 5

NATURE AND EXTENT OF CONTAMINATION

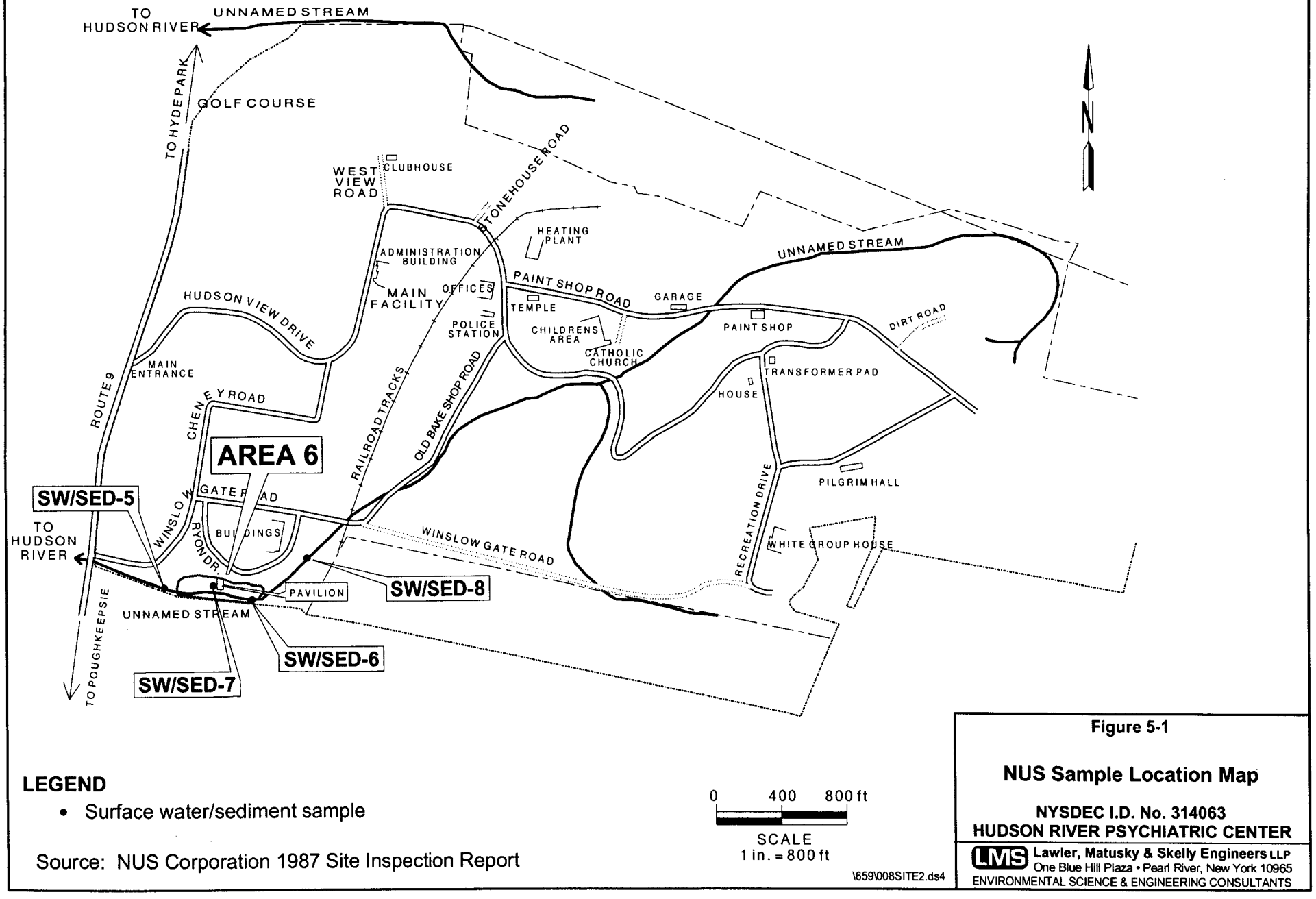
5.1 PREVIOUS INVESTIGATIONS

Several previous investigations were conducted at Area 6. A description of these investigations, a summary of the data collected, and an assessment of the data are provided in this section.

5.1.1 NUS Corporation On-site Reconnaissance

On 26 February 1987 NUS conducted a site reconnaissance of the HRPC property and collected four surface water and four sediment samples in the vicinity of Area 6 (Figure 5-1). SW5 and SW-8 were taken downstream and upstream, respectively, of Area 6, SW6 was taken from a pond near the picnic shelter at Area 6, and SW-7 was taken from a small stream draining through Area 6 near the picnic shelter. The data are provided on Tables 5-1 and 5-2 for the surface water and sediment samples, respectively. The stream that passes through Area 6 is classified as a Class D surface water; therefore, Class D standards are provided on Table 5-1 (NYSDEC 1993a). The iron concentrations in the samples from upstream (SW-8) and downstream (SW-5) exceeded the surface water standard of 300 μg/l. The pond sample (SW-6) contained 0.06, 0.05, and 0.01 μg/l of 4,4'-DDE, -DDD, and -DDT, respectively, with all values above the standard of 0.001 μg/l. The standards for iron and copper (45.2 μg/l) were also exceeded in sample SW-6. The small stream near Area 6 had no detectable concentrations of organics or metals above the Class D standard (LMS 1991). The antimony and mercury data for all four samples were unusable due to laboratory quality assurance/quality control problems.

Sediment samples were collected from the same locations as the surface water samples. The sediment samples contained no detectable volatile organic compounds (VOCs) with the exception of 0.009 mg/kg of chlorobenzene in SED-8. Sample SED-5 contained 2.89 mg/kg of polynuclear aromatic hydrocarbons (PAHs). Compounds classified as PAHs include: benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, phenanthrene, and pyrene. Sample SED-8 contained no PAHs, suggesting a source of PAHs between the two samples, most likely the pond (from which sample SED-6 was taken), which contained 12 mg/kg of PAHs. The stream sample from the parking lot (SED-7) also contained 17 mg/kg of PAHs. Phthalate acid esters (PAEs) were found in both the pond and downstream sediment samples. PAEs, used in plastics and plasticizers, are common landfill contaminants. PAEs are bis(2-ethylhexyl)-phthalate and butylbenzyl phthalate. No pesticides/PCBs were detected in the upstream sediment sample, but small quantities (0.21, 0.25, 0.17 mg/kg) of pesticides (4,4'-DDD, -DDE,



LEGEND

- Surface water/sediment sample

Source: NUS Corporation 1987 Site Inspection Report

0 400 800 ft

SCALE
1 in. = 800 ft

\659\008SITE2.ds4

Figure 5-1

NUS Sample Location Map

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TABLE 5-1 (Page 1 of 2)

1987 NUS CORPORATION SURFACE WATER DATA

NYSDEC I.D. No. 314063

Hudson River Psychiatric Center

PARAMETER	SW-6 26-Feb	SW-6 26-Feb	SW-7 26-Feb	SW-8 26-Feb	TRIP BLANK 26-Feb	NYSDEC CLASS D SURFACE WATER STANDARDS (h)
VOLATILES (µg/l)						
Acetone	ND	ND	ND	ND	36*	NS
Toluene	NU	ND	ND	NU	NU	NS
SEMIVOLATILES (µg/l)						
bis(2-Ethylhexyl)phthalate	ND	ND	ND	ND	17*	NS
PESTICIDES/PCBs (µg/l)						
4,4'-DDE	ND	**0.06 j**	ND	ND	ND	0.001
4,4'-DDD	ND	**0.05 j**	ND	ND	ND	0.001
4,4'-DDT	ND	**0.01 j**	ND	ND	ND	0.001

Note: Bold numbers exceed standard.

* - Indicates field or laboratory contamination.
(h) - Hardness: 270 mg equivalent CaCO3/l.
j - Estimated concentration; compound present below quantitation limit.
ND - Not detected at analytical detection limit.
NS - No standard.
NU - Not usable; data do not meet QA/QC requirements.

TABLE 5-1 (Page 2 of 2)

1987 NUS CORPORATION SURFACE WATER DATA

NYSDEC I.D. No. 314063

Hudson River Psychiatric Center

PARAMETER	SW-5 26-Feb	SW-6 26-Feb	SW-7 26-Feb	SW-8 26-Feb	Trip Blank 26-Feb	NYSDEC CLASS D SURFACE WATER STANDARDS (h)
METALS (µg/l)						
Aluminum	612 E	2,030 E	20 E	20 E	20 E	NS
Antimony	NU	NU	NU	NU	NU	NS
Arsenic	ND	8.0 B	ND	ND	ND	360
Barium	48 B	244	25 B	41 B	ND	NS
Calcium	93,600	108,000	79,400	91,800	ND	NS
Chromium	ND	15	ND	ND	ND	3,917
Copper	ND	**65**	ND	ND	ND	45.2
Iron	**4,500**	**145,000**	82 B	**1,680**	ND	300
Lead	14	55	2.0 B	1.0 B	ND	291
Magnesium	11,600	13,100	11,900	11,100	ND	NS
Manganese	415	3,780	31	507	ND	NS
Mercury	NU	NU	NU	NU	NU	0.2 GV
Potassium	2,510	2,260	1,280 B	2,580 B	ND	NS
Silver	ND	ND	10	ND	ND	22.4
Sodium	49,000 E	50,000 E	44,000 E	49,000 E	NU	NS
Thallium	ND	ND	ND	ND	2.0 B	20
Vanadium	ND	27 B	ND	ND	ND	190
Zinc	25	298	13 B	ND	14 B	733

Note: Bold numbers exceed standard.

(h) - Hardness: 270 mg equivalent CaCO3/l.
B - Value is less than the contract-required detection limit but greater than the instrument detection limit.
E - Value estimated due to interference.
GV - Guidance value.
ND - Not detected at analytical detection limit.
NU - Not usable; data do not meet QA/QC requirements.
NS - No standard.

TABLE 5-2 (Page 1 of 2)

1987 NUS CORPORATION SEDIMENT DATA SUMMARY

NYSDEC I.D. No. 314063

Hudson River Psychiatric Center

PARAMETER	SED-5 26-Feb	SED-6 26-Feb	SED-7 26-Feb	SED-8 26-Feb
VOLATILES (mg/kg)				
Acetone	NU	ND	ND	NU
Chlorobenzene	ND	ND	ND	0.009
Toluene	ND	NU	NU	ND
SEMIVOLATILES (mg/kg)				
Benzo(a)anthracene	0.42 j	1.2 j	ND	ND
Benzo(a)pyrene	ND	1.3	ND	ND
Benzo(b)fluoranthene	ND	3.1	ND	ND
bis(2-Ethylhexyl)phthalate	1.78	2.2	ND	NU
Butylbenzylphthalate	0.22 j	ND	ND	ND
Chrysene	0.6	1.7 j	ND	ND
Fluoranthene	0.74 j	2.6	6.4 j	ND
Phenanthrene	0.42 j	ND	5.5 j	ND
Pyrene	0.71 j	2.1	6.0 j	ND
PESTICIDES/PCBs (mg/kg)				
Aldrin	ND	ND	NU	ND
Aroclor-1248	1.7 j	ND	ND	ND
Aroclor-1260	1.6	ND	1,700	ND
4,4'-DDD	ND	0.21	ND	ND
4,4'-DDE	0.1	0.25	ND	ND
4,4'-DDT	ND	0.17	ND	ND

j - Estimated concentration; compound present below quantitation limit.
NU - Not usable; data do not meet QA/QC requirements.
ND - Not detected at analytical detection limit.

TABLE 5-2 (Page 2 of 2)

1987 NUS CORPORATION SEDIMENT DATA SUMMARY

NYSDEC I.D. No. 314063

Hudson River Psychiatric Center

PARAMETER	SED-5 26-Feb	SED-6 26-Feb	SED-7 26-Feb	SED-8 26-Feb
METALS (mg/kg)				
Aluminum	12,500	9,980	9,220	17,300
Antimony	13 E	38 E	9.4 E	9.8 E
Arsenic	16 E	17 E	4.6 E	5.4 E
Barium	104	243 B	44 B	65
Beryllium	ND	6.4	ND	1.6
Cadmium	ND	105	ND	1.3
Calcium	5,620	19,200	16,200	3,260
Chromium	ND	105	22	14
Cobalt	ND	13	3.2	ND
Copper	56	289	175	33
Iron	50,100	58,900	25,800	36,800
Lead	223	169	228	111
Magnesium	5,180	4,740	7,630	7,820
Manganese	907	6,660	413	199
Mercury	0.3	0.83	1.1	0.2
Nickel	ND	26	11 B	11 B
Potassium	2,840 B	1,190 B	1,140 B	782 B
Silver	ND	ND	3.2	ND
Sodium	1,550	1,790 B	NU	NU
Thallium	ND	ND	ND	ND
Vanadium	84	141	29	26
Zinc	802	794	413	104

B - Value is less than the contract-required detection limit but greater than the instrument detection limit.
E - Value estimated due to interference.
ND - Not detected at analytical detection limit.
NU - Not usable; data do not meet QA/QC requirements.

and -DDT, respectively) were found in the pond sample. The small stream sediment sample (SED-8) near the picnic area and parking lot contained no pesticides but did contain a high concentration of the PCB Aroclor 1260 (1700 mg/kg). The downstream sediment sample (SED-5) contained only one pesticide, 4,4'-DDE at 0.1 mg/kg, Aroclor 1260 at 1.6 mg/kg, and Aroclor 1248 at 1.7 mg/kg (LMS 1991).

The concentrations of iron, manganese, vanadium, and zinc were all higher in the downstream sediment sample (SED-5) than in the upstream sample (SED-8). All other metals were similar in concentration in both upstream and downstream sediment samples. The pond sediment sample (SED-7) contained high levels of zinc (802 mg/kg); the small stream sample (SED-6) contained high levels of iron (58,900 mg/kg), manganese (4740 mg/kg), vanadium (141 mg/kg), and zinc (794 mg/kg) (LMS 1991).

5.1.2 **Phase II Investigation**

From 1989 to 1991 LMS conducted a Phase II investigation of the HRPC site for NYSDEC. A total of six separate disposal areas were investigated, including Area 6. At Area 6, three monitoring wells were installed and sampled and two surface water samples, 10 sediment samples, and one leachate sample were collected and analyzed. The following sections describe the resulting data.

5.1.2.1 ***Groundwater.*** Table 5-3 summarizes the data collected from the three monitoring wells and Figure 5-2 graphically presents the data. The Class GA groundwater standards are shown on the table (NYSDEC 1993a) as well as the natural ambient groundwater ranges for metals (Dragun 1988). Several tentatively identified compounds (TICs), one volatile organic compound (VOC), and four semivolatile organic compounds (SVOCs) were detected in the upgradient well and in one of the downgradient wells (LMS 1991). The presence of chlorodifluoromethane and 2-pentanone, 4-hydroxy-4-met are not considered representative of the samples analyzed; they are common laboratory contaminants and were appropriately qualified by the laboratory, with no corrective action required.

Iron increased slightly in concentration from the upgradient well to the first downgradient well and approximately doubled to the next downgradient well, indicating that iron was leaching out of the fill material and into the groundwater. All three samples were above the groundwater standard of 300 μg/l for iron. Sodium, magnesium, aluminum, and barium also increased in the same manner as iron. Manganese, however, decreased from the upgradient well to the downgradient wells, with the upgradient and one of downgradient wells exceeding the groundwater standard of 300 μg/l. Sodium exceeded the groundwater standard of 20,000 μg/l

TABLE 5-3 (Page 1 of 2)

1990 LMS GROUNDWATER DATA SUMMARY

NYSDEC I.D. No. 314063

Hudson River Psychiatric Center

PARAMETER	MWHR 6-16	MWHR 6-17	MWHR 6-19	MWHR FIELD BLANK	MWHR TRIP BLANK	NYSDEC GROUNDWATER CLASS GA STANDARDS
VOLATILES (µg/l)	ND	ND	ND	ND	ND	-
Tentatively Identified Compounds						
Chlorodifluoromethane	22 b j	13 b j	23 b j	23 b j	ND	50
SEMIVOLATILES (µg/l)	ND	ND	ND	ND	ND	-
Tentatively Identified Compounds						
2-Pentanone, 4-hydroxy-4-met	14 a b j	15 a b j	**56 a b j**	14 a b j	ND	50
Unknown siloxane	ND	56 (3) j	ND	ND	ND	50
Unknown	72 (4) j	ND	ND	ND	ND	50
Caprolactam	12 j	ND	ND	ND	ND	50
PESTICIDES/PCBs (µg/l)	ND	ND	ND	ND	ND	-
OTHER PARAMETERS:						
Conductivity (umhos/cm)	653	655	717	♦	♦	NS
Total dissolved solids (mg/l)	405	400	437	♦	♦	NS
Total suspended solids (mg/l)	19	15	29	♦	♦	NS
Chemical oxygen demand (mg/l)	13	5.0	7.1	♦	♦	NS
pH (std. units)	7.2	7.3	7.3	♦	♦	6.5 - 8.5

Note: Bold numbers exceed standards.

♦ - Not analyzed.
( ) - Number of compounds in total.
a - Suspected aldol condensation product.
b - Found in associated blanks.
j - Estimated concentration; compound present below quantitation limit.
ND - Not detected at analytical detection limit.
NS - No standard.

TABLE 5-3 (Page 2 of 2)

1990 LMS GROUNDWATER DATA SUMMARY

NYSDEC I.D. No. 314063

Hudson River Psychiatric Center

PARAMETER	MWHR 6-16	MWHR 6-17	MWHR 6-19	MWHR FIELD BLANK	NYSDEC CLASS GA STANDARDS	NATURAL AMBIENT GROUNDWATER RANGE (n)
METALS (µg/l)						
Aluminum	335	ND	799	ND	NS	<5.0 - 1,000
Antimony	ND	ND	ND W	ND	3.0 GV	N/A
Arsenic	ND W	ND	ND	ND	25	<1.0 - 30
Barium	ND	ND	233	ND	1,000	10 - 500
Beryllium	ND	ND	ND	ND	3.0 GV	<10
Cadmium	ND	ND	ND	ND	10	<1.0
Calcium	114,000	99,400	96,800	ND	NS	1,000 - 150,000
Chromium	ND	ND	ND	ND	50	<1.0 - 5.0
Cobalt	ND	ND	ND	ND	NS	<10
Copper	ND	ND	ND	ND	200	<1.0 - 30
Iron	**886**	**907**	**1,610**	ND	300 (m)	10 - 10,000
Lead	ND W	ND W	ND W	ND	25	<15
Magnesium	12,400	13,800	17,800	ND	35,000 GV	1,000 - 50,000
Manganese	**630**	**436**	150	ND E	300 (m)	<1.0 - 1,000
Mercury	ND	ND	ND	ND	2.0	<1.0
Nickel	ND	ND	ND	ND	NS	<10 - 50
Potassium	ND	ND	ND	ND	NS	1,000 - 10,000
Selenium	ND W	ND W	ND W	ND	10	<1.0 - 10
Silver	ND	ND	ND	ND	50	<5.0
Sodium	12,700	16,500	**33,000**	ND	20,000	500 - 120,000
Thallium	ND W	ND W	ND W	ND	4.0 GV	N/A
Vanadium	ND	ND	ND	ND	NS	<1.0 - 10
Zinc	ND	ND	ND	ND	300	<10 - 2,000
Cyanide	ND	ND	ND	ND	100	N/A

Note: Bold numbers exceed standard.

(m) - Iron and manganese not to exceed 500 µg/l.

(n) - Dragun, J., The Soil Chemistry of Hazardous Materials.

E - Value estimated due to interference.

W - Post-digestion spike out of control limits; sample absorbance is less than 50% of spike absorbance.

GV - Guidance value.

N/A - Not available.

ND - Not detected at analytical detection limit.

NS - No standard.

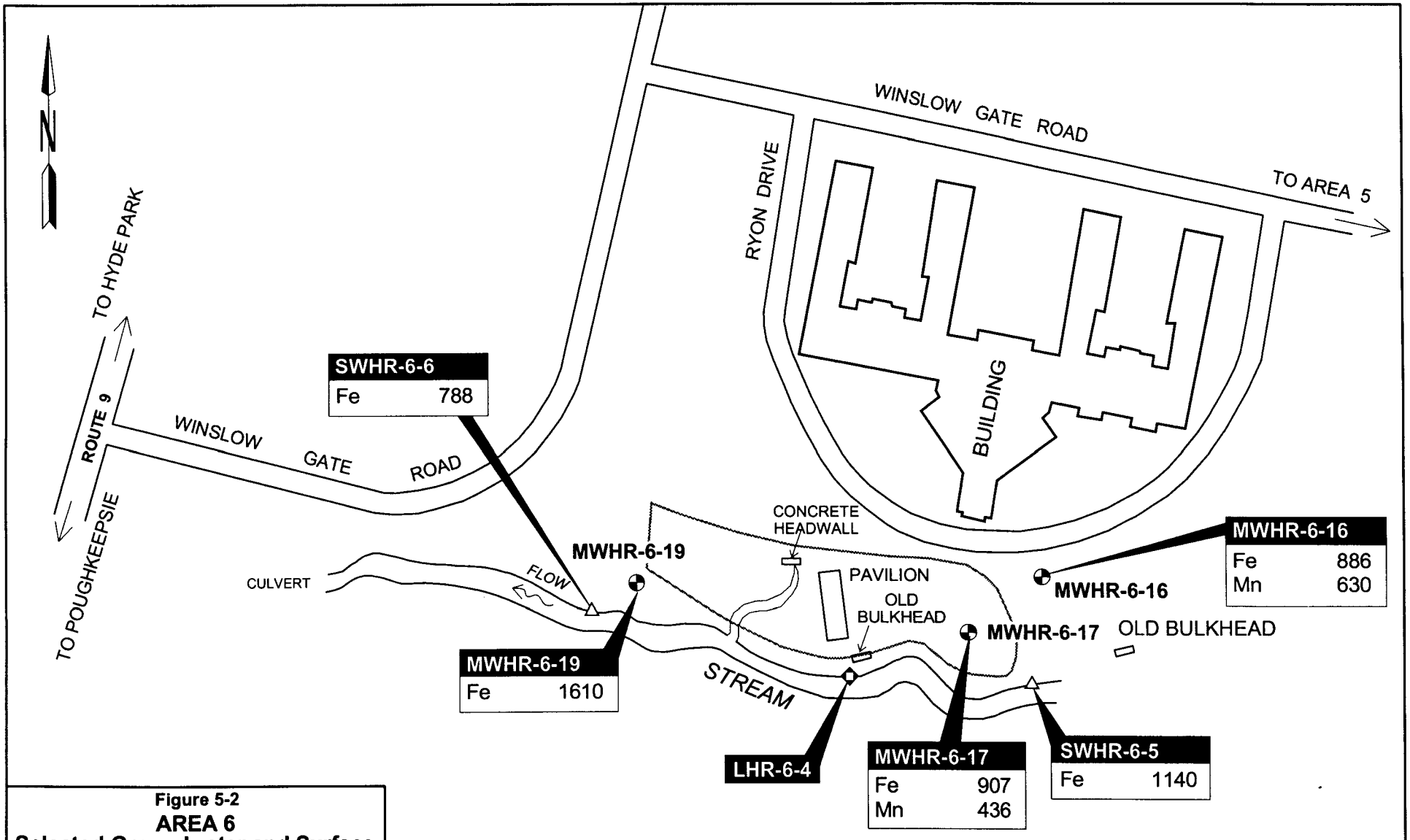

Figure 5-2

AREA 6
Selected Groundwater and Surface Water Contaminant Concentrations and Leachate Sample Locations

NYSDEC I.D. No. 314063
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in the farthest downgradient well, which was also located closest to the road. The source of the sodium was most likely road salt (LMS 1991). None of the metals detected were outside of the ambient groundwater range.

5.1.2.2 ***Surface Water.*** Table 5-4 summarizes the data collected from the two surface water samples and Figure 5-2 graphically presents the data. The stream that runs by Area 6 is classified as a Class D surface water. The organic compounds detected in both the up- and downgradient samples were also found in the method blank, suggesting laboratory contamination. As discussed previously, the presence of chlorodifluoromethane and 2-pentanone, 4-hydroxy-4-met are not considered representative of the samples analyzed; they are common laboratory contaminants and were appropriately qualified by the laboratory, with no corrective action required. All metals were in approximately the same concentration in both the upstream and downstream samples. Iron was the only metal that exceeded the Class D surface water standard of 300 μg/l (LMS 1991).

5.1.2.3 ***Sediment.*** Table 5-5 summarizes the data collected from the 10 sediment samples and Figure 5-3 graphically presents the data. Two sediment samples (SDHR-6-5 and SDHR-6-6) were collected initially and analyzed for the full TCL organics and target analyte list (TAL) inorganics, and eight sediment samples (labeled with "E" to differentiate them from previous samples) were collected later and analyzed for PCBs only. Methylene chloride, acetone and chlorodifluoromethane were the only TCL VOCs found in the sediment samples; however, these compounds were also detected in the method blank, indicating laboratory contamination. Their presence is not considered representative of the samples analyzed and the results were appropriately qualified by the laboratory; no corrective action was required. No TCL SVOCs were detected in the upstream sediment sample; however, high quantities of PAHs (29.05 mg/kg) were found in the downstream sample. The initial sediment sampling found 340 mg/kg of Aroclor 1260 in the downstream sediment sample but none in the upstream sediment sample. This level exceeds the NYSDEC guideline of 50 mg/kg, above which PCBs are considered hazardous in New York (NYCRR 1982). After the finding of the 340 mg/kg of Aroclor 1260, NYSDEC requested that LMS collect and analyze additional sediments for PCBs only. The eight samples ranged in concentration from a low of 0.419 mg/kg of total PCBs at SDHR-6-17E to a high of 390 mg/kg at SDHR-6-14E. SDHR-6-17E was located just downstream of the upgradient sediment sample, and SDHR-14E was collected near the storm drain discharge culvert. Most of the metals found in the sediments increased in concentration in the downstream sample. These metals included arsenic, barium, cadmium, copper, iron, lead, manganese, vanadium, and zinc. Most of the metals increased in concentration from two to four times between the upstream and downstream samples (LMS 1991).

TABLE 5-4 (Page 1 of 2)

1990 LMS SURFACE WATER DATA SUMMARY

NYSDEC I.D. No. 314063

Hudson River Psychiatric Center

PARAMETER	SWHR 6-5	SWHR MS 6-5	SWHR MSD 6-5	SWHR 6-6	NYSDEC CLASS D SURFACE WATER STANDARDS
VOLATILES (µg/l)	ND	ND	ND	ND	-
Tentatively Identified Compounds					
Chlorodifluoromethane	11 b j	♦	♦	11 b j	NS
SEMIVOLATILES (µg/l)	ND	ND	ND	ND	-
Tentatively Identified Compounds					
2-Pentanone, 4-hydroxy-4-met	15 a b j	♦	♦	16 a b j	NS
PESTICIDES/PCBs (µg/l)	ND	ND	ND	ND	-
OTHER PARAMETERS:					
Conductivity (umhos/cm)	827	♦	♦	793	NS
Total dissolved solids (mg/l)	800	♦	♦	449	NS
Total suspended solids (mg/l)	2.4	♦	♦	2.4	NARR
Chemical oxygen demand (mg/l)	6.3	♦	♦	< 5.0	-
pH (std. units)	7.5	♦	♦	7.7	6.0 - 9.5

♦ - Not analyzed.
a - Suspected aldol condensation product.
b - Found in associated blanks.
j - Estimated concentration; compound present below quantitation limit.
MS - Matrix spike.
ND - Not detected at analytical detection limit.
NS - No standard.
MSD - Matrix spike duplicate.
NARR - Narrative standard.

TABLE 5-4 (Page 2 of 2)

1990 LMS SURFACE WATER DATA SUMMARY

NYSDEC I.D. No. 314063

Hudson River Psychiatric Center

PARAMETER	SWHR 6-5	SWHR DUP 6-5	SWHR DUP 6-6	NYSDEC CLASS D STANDARDS (h)
METALS (µg/l)				
Aluminum	ND	ND	ND	NS
Antimony	ND	ND	ND	NS
Arsenic	ND W	ND W	ND W	360
Barium	ND	ND	ND	NS
Beryllium	ND	ND	ND	NS
Cadmium	ND	ND	ND	12
Calcium	91,100	87,600	81,600	NS
Chromium	ND	ND	ND	3,917
Cobalt	ND	ND	ND	110 GV
Copper	ND	ND	ND	45.2
Iron	**1,140**	**1,090**	**788**	300
Lead	ND	ND	ND	291
Magnesium	11,200	10,700	9,900	NS
Manganese	174	170	187	NS
Mercury	ND	ND	ND	0.2 GV
Nickel	ND	ND	ND	3,924
Potassium	ND	ND	ND	NS
Selenium	ND	ND	ND	NS
Silver	ND	ND	ND	22.4
Sodium	65,700	64,500	58,500	NS
Thallium	ND W	ND W	ND W	20.0
Vanadium	ND	ND	ND	190
Zinc	ND	ND	ND	733
Cyanide	ND	ND	ND	22 (f)

Note: Bold numbers exceed standard.

(f) - Free cyanide, sum of HCN + CN^-.
(h) - Hardness: 270 mg equivalent CaCO3/l.
W - Post-digestion spike out of control limits; sample absorbance is less than 50% of spike absorbance.
GV - Guidance value.
ND - Not detected at analytical detection limit.
NS - No standard.
DUP - Duplicate sample analysis.

TABLE 5-5 (Page 1 of 3)

1990 LMS SEDIMENT DATA SUMMARY

NYSDEC I.D. No. 314063

Hudson River Psychiatric Center

PARAMETER	SDHR 6-5	SDHR MS 6-5	SDHR MSD 6-5	SDHR 6-6	SDHR DL 6-6 [DL: 100]
VOLATILES (mg/kg)					
Methylene chloride	0.009 b j	0.012 b	0.012 b	0.026 b j	♦
Acetone	ND	ND	ND	0.045 b j	♦
Tentatively Identified Compounds					
Chlorodifluoromethane	0.036 b j	♦	♦	0.12 b j	♦
SEMIVOLATILES (mg/kg)					
Acenaphthene	ND	ND	ND	0.34 j	♦
Fluorene	ND	ND	ND	0.38 j	♦
Phenanthrene	ND	ND	ND	4.6	♦
Anthracene	ND	ND	ND	0.73 j	♦
Di-n-butyl-phthalate	ND	ND	ND	ND	♦
Fluoranthene	ND	ND	ND	5.8	♦
Pyrene	ND	ND	ND	4.8	♦
Benzo(a)anthracene	ND	ND	ND	2.1	♦
Chrysene	ND	ND	ND	2.4	♦
Benzo(b)fluoranthene	ND	ND	ND	2.0 j	♦
Benzo(k)fluoranthene	ND	ND	ND	1.3 j	♦
Benzo(a)pyrene	ND	ND	ND	1.9 j	♦
Indeno(1,2,3-c,d)pyrene	ND	ND	ND	1.1 j	♦
Benzo(g,h,i)perylene	ND	ND	ND	1.1 j	♦
Tentatively Identified Compounds					
Unknown	2.69 (3) j	♦	♦	90.9 (13) j	♦
Unknown alkane	0.54 j	♦	♦	53.1 (4) j	♦
Unknown aldehyde	ND	♦	♦	5.2 (2) j	♦
Unknown trichlorobenzene	ND	♦	♦	ND	♦
Benzaldehyde	ND	♦	♦	ND	♦
2-Pentanone, 4-hydroxy-4-met	5.3 a b j	♦	♦	ND	♦
Benzo(e)pyrene	ND	♦	♦	3.2 j	♦
PESTICIDES/PCBs (mg/kg)					
4,4'-DDE	ND	ND	ND	ND	ND
Aroclor 1242	ND	ND	ND	ND	ND
Aroclor 1260	ND	ND	ND	180 x	340 d

( ) - Number of compounds in total.
♦ - Not analyzed.
a - Suspected aldol condensation product.
b - Found in associated blanks.
c - Pesticide/PCB result confirmed by GC/MS analysis.
d - Concentration recovered from diluted sample.
j - Estimated concentration; compound present below quantitation limit.
x - Derived from an instrument response outside the calibration range.
DL - Diluted sample analysis.
MS - Matrix spike.
ND - Not detected at analytical detection limit.
MSD - Matrix spike duplicate.

1990 LMS SEDIMENT DATA SUMMARY

NYSDEC I.D. No. 314063

Hudson River Psychiatric Center

PARAMETER	SDHR DL 6-6E	SDHR DL 6-6E	SDHR DL 6-11E	SDHR DL 6-11E	SDHR DL 6-12E	SDHR DL 6-12E	SDHR DL 6-13E	SDHR DL 6-13E	SDHR DL 6-14E
	[DL: 100]	[DL: 1000]	[DL: 2.0]	[DL: 20]	[DL: 50]	[DL: 500]	[DL: 100]	[DL: 1000]	[DL: 200]
PESTICIDES/PCBs (mg/kg)									
Percent solids (%)	40	39	42	42	34	34	47	47	48
Aroclor 1248	ND	ND	4.2 c x	4.5 c d	ND	ND	ND	ND	ND
Aroclor 1260	85 c x	140 c d	1.3 c x	1.4 c d y	74 c x	79 c d	100 c x	150 c d	330 c x

PARAMETER	SDHR DL 6-14E	SDHR DL 6-15E	SDHR DL 6-15E	SDHR DL 6-16E	SDHR DL 6-16E	SDHR 6-17E	SDHR MS 6-17E	SDHR MSD 6-17E
	[DL: 2000]	[DL: 10]	[DL: 100]	[DL: 1]	[DL: 10]			
PESTICIDES/PCBs (mg/kg)								
Percent solids (%)	48	69	69	47	47	44	45	45
Aroclor 1248	ND	ND	ND	0.64 x	0.64 d y	0.36	0.31	0.36
Aroclor 1260	390 c d	3.7 c x	4.0 c d y	0.17	0.18 d y	0.059 y	ND	ND

c - Pesticide/PCB result confirmed by GC/MS analysis.
d - Concentration recovered from diluted sample.
x - Derived from an instrument response outside the calibration range.
y - Compound present below below adjusted contract-required detection limit.
DL - Diluted sample analysis.

ND - Not detected at analytical detection limit.
MS - Matrix spike.
MSD - Matrix spike duplicate.

TABLE 5-5 (Page 3 of 3)

1990 LMS SEDIMENT DATA SUMMARY

NYSDEC I.D. No. 314063

Hudson River Psychiatric Center

PARAMETER	SDHR 6-5	SDHR DUP 6-5	SDHR 6-6
METALS (mg/kg)			
Aluminum	6,320 R	3,890 R	8,330 R
Antimony	ND N	ND N	ND N
Arsenic	6.3 SA R N	9.8 SA R N	19 SA R N
Barium	50	24 B	195
Beryllium	ND	ND	ND
Cadmium	4.4 R	1.9 B R	10 R
Calcium	41,500 R	4,730 R	14,500 R
Chromium	10 E R	5.2 E R	18 E R
Cobalt	ND	ND	ND
Copper	25 R	12 R	96 R
Iron	39,400 R	17,700 R	86,200 R
Lead	21 SA	21 SA	167 SA
Magnesium	25,100 R	4,070 R	5,510 R
Manganese	1,340 R	429 R	5,760 R
Mercury	ND	ND	ND
Nickel	15 R	7.9 B R	24 R
Potassium	ND	ND	ND
Selenium	ND W N	ND W N	ND W N
Silver	ND	ND	ND
Sodium	ND	ND	ND
Thallium	ND	ND	ND
Vanadium	13	7.4 B	44
Zinc	89 R	50 R	335 R
Cyanide	ND	ND	ND
Percent solids (%)	78	78	32

B - Value is less than the contract-required detection limit but greater than the instrument detection limit.
E - Value estimated due to interference.
N - Spiked sample recovery is not within control limits.
R - Duplicate analysis not within control limits.
W - Post-digestion spike out of control limits; sample absorbance is less than 50% of spike absorbance.
NC - No criteria.
ND - Not detected at analytical detection limit.
SA - Value determined by the method of standard addition.
DUP - Duplicate sample analysis.

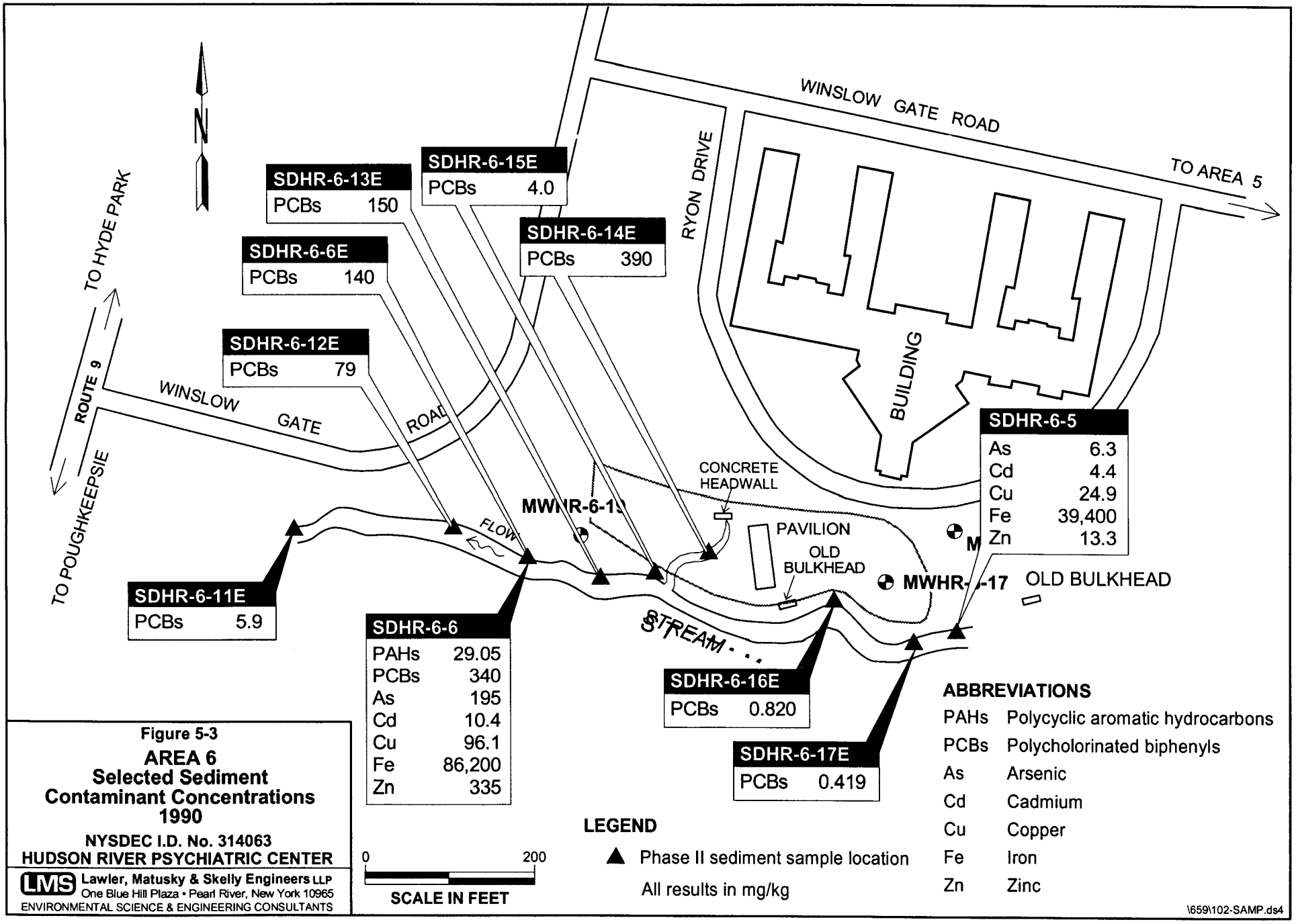

Figure 5-3

AREA 6
Selected Sediment Contaminant Concentrations 1990

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5.1.2.4 ***Leachate.*** Table 5-6 summarizes the results from the one leachate sample collected from Area 6 and Figure 5-2 shows the location of the sample. None of the data exceeded any of the extraction procedure (EP) toxicity limits for either metals or organics (LMS 1991).

5.1.3 1993 Source Investigation

In 1993 LMS was retained by FDC, now DASNY, to conduct a source investigation at Area 6. The objective was to locate the source of the high levels of PCBs found in the stream sediments along Area 6 during the Phase II investigation. In September 1993 three surface soil, four surface water, six sediment, four concrete chip, and one wipe sample were collected and analyzed for PCBs.

The soil sample locations are shown on Figure 5-4 and the data are summarized on Table 5-7. These samples were collected to determine whether the Area 6 landfill was the source of the PCBs in the stream sediment. Low levels of PCBs were found in the three soil samples, (0.035-0.62 mg/kg); the highest concentration of 1.4 mg/kg at HRSS-1 may have been due to carryover during the laboratory analysis (resampling of location HRSS-1 showed only 0.14 mg/kg of PCBs). The low level of PCBs found in the surface soils were attributed to tracking from people and animals from the stream sediments onto the soil. An aerial photograph investigation conducted at the same time indicated that the fill area under the picnic pavilion was completed prior to the early 1950s, i.e., prior to the widespread use of PCBs in electrical equipment. Based on the data collected and the aerial photograph investigation, it was concluded that the fill was not the source of the PCBs. The PCBs found in the soil were below the NYSDEC recommended cleanup objective of 1 mg/kg for surface soils (NYSDEC 1994), therefore, it was recommended that the fence that had been placed around the picnic pavilion be moved to alongside the stream (LMS 1993).

The surface water sample locations are shown on Figure 5-4 and the data summarized on Table 5-7. Samples HRSW-2 and -3 had detectable levels of PCBs at 9.8 and 0.23 μg/l, respectively. These values exceeded the Class D surface water standard of 0.001 μg/l for PCBs. The PCBs in the water were most likely due to PCB-contaminated sediments from the stream present in the water samples (LMS 1993).

One wipe sample was collected from the visibly stained portion of the wall in the hallway outside the electrical vault room in the Poucher Home building. The data are shown in Table 5-7, which indicates that no PCBs were detected (LMS 1993).

TABLE 5-6

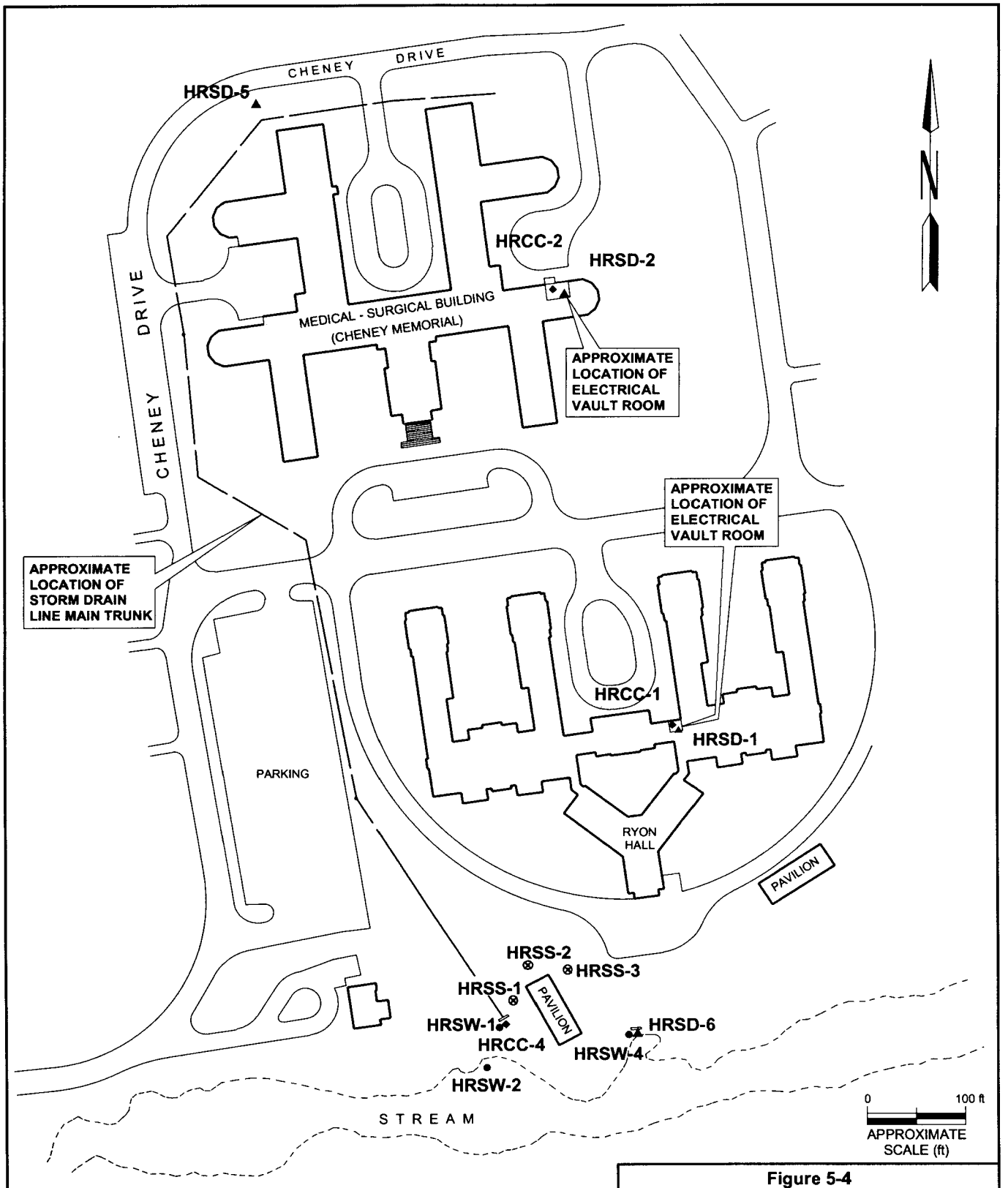
1990 LMS LEACHATE DATA SUMMARY

NYSDEC I.D. No. 314063

Hudson River Psychiatric Center

PARAMETER	LHR5-4	EPA EP TOXICITY STANDARDS
EP TOX METALS (mg/l)		
Arsenic	< 0.1	5.0
Barium, total	< 10	100
Cadmium, total	< 0.1	1.0
Chromium, total	< 1.0	5.0
Lead, total	< 1.0	5.0
Mercury, total	< 0.04	0.2
Selenium, total	< 0.1	1.0
Silver, total	< 1.0	5.0
EP TOX HERB/PEST (mg/l)		
Endrine	< 0.005	0.02
Lindane	< 0.1	0.1
Methoxychlor	< 1.0	10
Toxaphene	< 0.1	0.5
2,4-D	< 1.0	10
2,4,5-TP (Silvex)	< 0.1	1.0

< - Compound not detected at method detection limit.



LEGEND

- ⊗ Soil sample location
- ▲ Sediment sample location
- ● Surface water location
- ◆ Chip sample location

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Figure 5-4

AREA 6
1993 Sampling Locations

NYSDEC I.D. No. 314063
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TABLE 5-7

1993 LMS PCB SOURCE INVESTIGATION DATA SUMMARY

NYSDEC I.D. No. 314063

Hudson River Psychiatric Center Area 6

MATRIX	SAMPLE NAME	SAMPLE LOCATION	PARAMETER	ANALYTICAL RESULTS
Chip	HRCC-1	Ryon Hall vault room	PCBs - Aroclor 1260[1]	0.78 mg/kg
	HRCC-2	Cheney Building vault room	PCBs - Aroclor 1260[1]	710 mg/kg
	HRCC-3	Poucher Home vault room	PCBs - Aroclor 1260[1]	0.40 mg/kg
	⊗HRCC-4	Storm drain outfall	PCBs - Aroclor 1260[1]	0.32 mg/kg
Wipe	HRWS-1	Poucher Home wall	PCBs	ND
Sediment	HRSD-1	Ryon Hall vault floor drain	PCBs - Aroclor 1260[1]	12 mg/kg
			PAHs:	
			Acenaphthene	3,700 mg/kg
			Anthracene	5,300 mg/kg
			Benzo(a)anthracene	3,800 mg/kg
			Benzo(b)fluoranthene	1,800 mg/kg
			Benzo(k)fluoranthene	2,100 mg/kg
			Benzo(a)pyrene	1,400 mg/kg
			Chrysene	2,800 mg/kg
			Fluoranthene	9,100 mg/kg
			Fluorene	5,600 mg/kg
			Naphthalene	780 mg/kg
			Phenanthrene	15,000 mg/kg
			Pyrene	7,200 mg/kg
	HRSD-2	Cheney Building vault floor drain	PCBs - Aroclor 1260[1]	200,000 mg/kg
	HRSD-3	Poucher Home vault floor drain	PCBs	ND
	HRSD-4	Staff 18 Building machine	PCBs	ND
	HRSD-5	Storm drain manhole	PCBs - Aroclor 1260[1]	33 mg/kg
	⊗ HRSD-6	Below old concrete headwall	PCBs	ND
Water	HRSW-1	Storm drain outfall	PCBs	ND
			Total and free chlorine	ND
	HRSW-2	Confluence of creek and stream	PCBs - Aroclor 1260[1]	9.8 µg/l
	HRSW-3	Entrance of culvert under Rt. 9	PCBs - Aroclor 1260[1]	0.23 µg/l
	⊗ HRSW-4	Below old concrete headwall	PCBs	ND
Soil	HRSS-1	East of picnic pavilion	PCBs - Aroclor 1260[1]	1.4 mg/kg
	HRSS-IRS	Additional sample collected at HRSS-1 location	PCBs - Aroclor 1260[1]	0.14 mg/kg
	HRSS-2	In front of picnic pavilion	PCBs - Aroclor 1260[1]	0.44 mg/kg
	HRSS-2RE	Reanalyzed sample	PCBs - Aroclor 1260[1]	0.035 mg/kg
	HRSS-3	West of picnic pavilion	PCBs - Aroclor 1260[1]	0.62 mg/kg
	HRSS-3RE	Reanalyzed sample	PCBs - Aroclor 1260[1]	0.042 mg/kg

1 - All other PCB Aroclors analyzed for were not detected.
ND - Not detected.

Four concrete chip samples were collected and their locations are shown on Figure 5-4; Table 5-7 summarizes the data. The concrete chip sample from the Cheney Building vault room (HRCC-2) had 710 mg/kg of PCBs. The chip samples obtained from the other three locations showed low levels (<0.78 mg/kg) of PCBs (LMS 1993).

Six sediment samples were also collected (see Figure 5-4). The data are summarized on Table 5-7. PCBs were analyzed on all samples and the sample from Ryon Hall (HRSD-1) was also analyzed for PAHs due to its tar-like consistency. A total of 15,000 mg/kg of PAHs was detected in this sample. The PCB analyses indicated 200,000 mg/kg of PCBs in the sediment in the floor drain from the Cheney Building vault room (HRSD-2). The sample from the Ryon Hall vault room floor drain (HRSD-1) had 12 mg/kg of PCBs, and the sample from one of the manholes in the storm drain system adjacent to the northwest corner of the Cheney Building (HRSD-5) had 33 mg/kg of PCBs. The results of the concrete chip and sediment sampling in the Cheney Building vault room indicated that a release of PCB-containing fluid probably occurred in the vault room at some time in the past. The finding of PCBs in the storm sewer, which ultimately discharges to the stream alongside Area 6, indicated that the source of the PCBs in the stream was apparently a spill in the Cheney Building vault room; however, no maps were found indicating that the vault room floor drain connected to the storm sewer (LMS 1993).

5.2 INTERIM REMEDIAL MEASURE

5.2.1 1994 Interim Remedial Measure Investigation

In January 1994 FDC (now DASNY) retained LMS to prepare plans to conduct an RI/FS of the Area 6 stream sediments. The plans were prepared, transmitted to NYSDEC, and approved by NYSDEC in November 1994. LMS recommended that prior to proceeding with the RI an investigation was needed to (1) verify the connection of the Cheney Building vault room floor drain to the storm sewer, (2) map the storm drain system near Area 6, and (3) determine the extent and magnitude of contamination of the storm drain system and vault room. The findings of this investigation would determine whether an IRM would be needed immediately to control additional releases of PCBs into the stream and sediment and to prevent contact with humans. LMS prepared a work plan in February 1994 for an IRM investigation of the storm drain system near Area 6 (LMS 1994a).

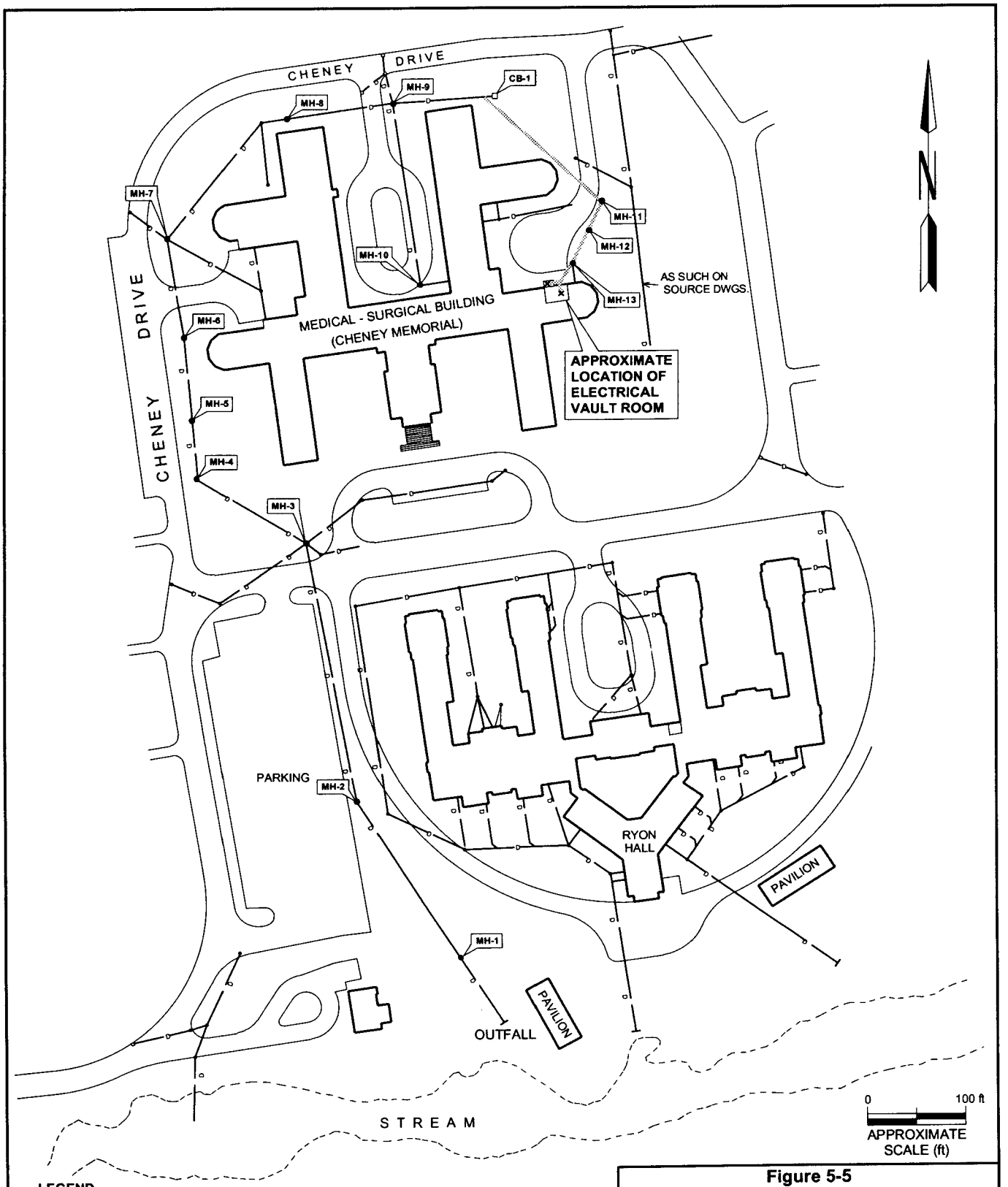
On 22-23 June and 11 August 1994 LMS investigated the storm sewer that discharges into the stream alongside Area 6. At each manhole a sediment and/or wipe sample was collected from inside the pipe. A portable PCB Dtech field test kit was used to test each sediment sample and,

if positive, the sample was sent to a laboratory for confirmation. Wipe samples were collected at the bottom of the pipe just above the water line; the samples were sent to a laboratory for analysis. Wipe samples were also collected from the Cheney Building vault room floor and wall. Although concrete core samples from the vault room floor were to have been collected, they could not be because a subbasement was found beneath the vault room. Utility conduits, access problems, and asbestos contamination in the subbasement made any coring of this floor a major construction project. Alternatively, a wipe sample was taken from the area around the floor drain pipe and a soil sample was collected just beneath the P-trap from the subbasement floor. A sediment sample was collected from the stairwell drain outside the vault room and, as the pipe was broken, a soil sample was taken from beneath the pipeline that connected the Cheney Building vault room floor drain to Manhole 13.

Figure 5-5 shows the location of the manholes sampled within the storm drain system and Figure 5-6 shows the vault room samples. The portable PCB test kit results and sediment and wipe test results from the manholes are provided on Table 5-8. The results ranged from a high of 1410 mg/kg PCBs in Manhole 8 to a low of 6.9 mg/kg PCBs in Manhole 6. The soil beneath the P-trap (Subbasement 1) had 3.6 mg/kg of PCBs and the soil beneath the pipe connecting the vault room floor drain to Manhole 13 (DRSS-13) had 1090 mg/kg of PCBs. The wipe samples from the storm drain ranged in concentration from ND at Manhole 1 to 110 $\mu g/100\ cm^2$ at Manhole 8 (LMS 1994c).

Table 5-9 summarizes the wipe sample data collected from the vault room. The wall samples ranged from a low of ND at VRWS-1 to a high of 0.84 $\mu g/100\ cm^2$ PCBs at VRWS-2. The floor samples ranged from a low of 2.4 $\mu g/100\ cm^2$ PCBs at VRWS-19 to a high of 210 $\mu g/100\ cm^2$ PCBs at VRWS-12. The wipe sample taken from around the pipe in the subbasement (SBWS-1) had 12 $\mu g/100\ cm^2$ PCBs (LMS 1994c).

A combination of smoke testing, dye testing, and audio signals was used to confirm that the Cheney Building vault room floor drain was connected to the storm drain that discharges to the stream alongside Area 6. Based on the results of the IRM investigation, LMS recommended that an IRM be conducted immediately to prevent further discharge of PCB-laden sediment to the stream near Area 6. The IRM consisted of the cleaning of all sediment from the storm sewer from Manhole 13 to the discharge at the stream, televising the storm sewer after cleaning to ensure that the sewer was adequately cleaned and that there were no broken pipes or slipped joints, and excavating, removing, and replacing the pipe from the Cheney Building vault room floor drain to Manhole 13 (LMS 1994c).



\AREA6.ds4

Figure 5-5

AREA 6

Storm Drain Sampling Locations 1994

NYSDEC I.D. No. 314063

HUDSON RIVER PSYCHIATRIC CENTER

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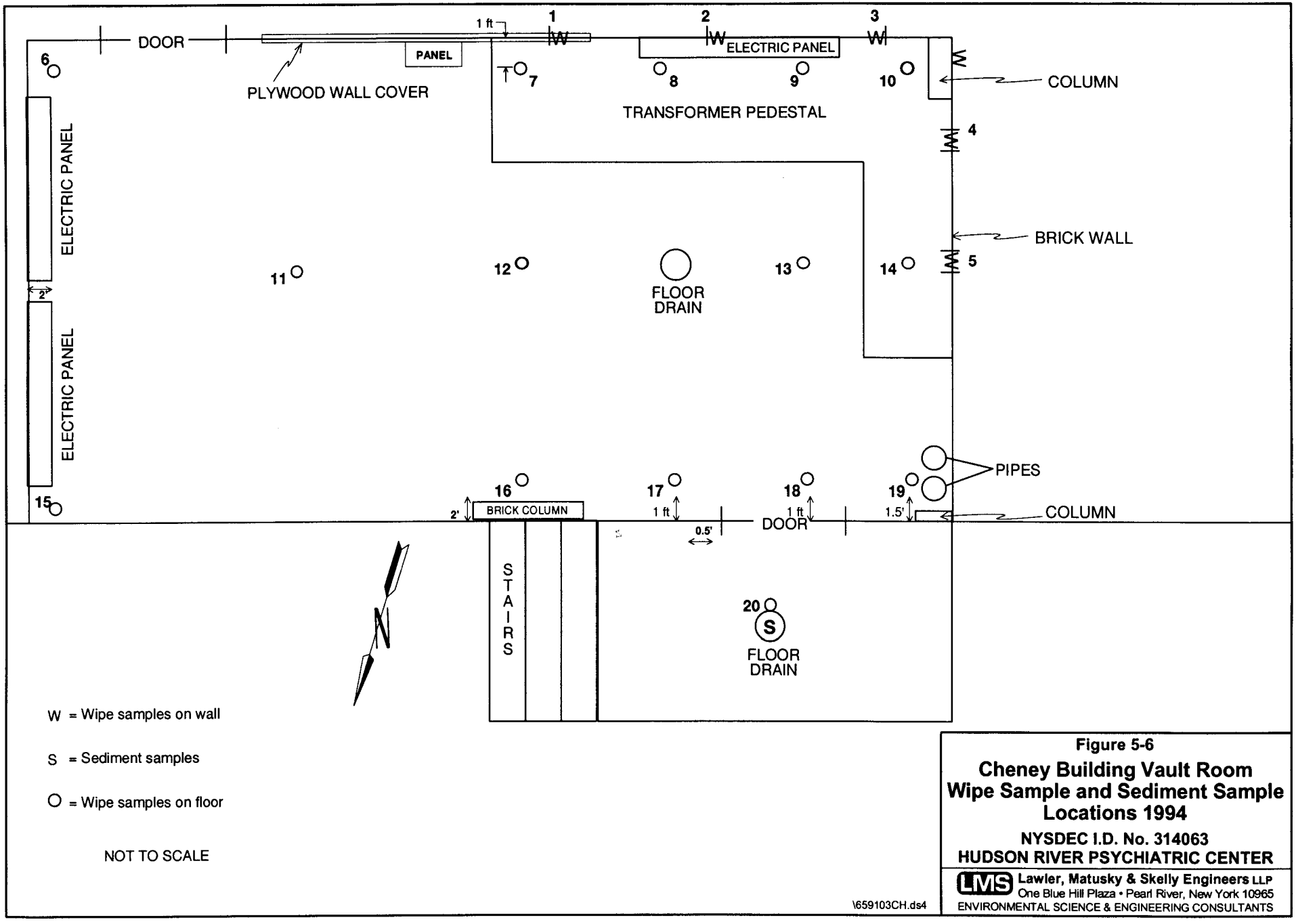
ENVIRONMENTAL SCIENCE & ENGINEERING CONSULTANTS



\659103CH.ds4

Figure 5-6

Cheney Building Vault Room Wipe Sample and Sediment Sample Locations 1994

NYSDEC I.D. No. 314063

HUDSON RIVER PSYCHIATRIC CENTER

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ENVIRONMENTAL SCIENCE & ENGINEERING CONSULTANTS

TABLE 5-8

1994 LMS IRM STORM DRAIN INVESTIGATION RESULTS
NYSDEC I.D. No. 314063

LOCATION	SEDIMENT DTECH PCBs, mg/kg	SEDIMENT PCBs, mg/kg	PIPE WIPES, µ/100 CM^2
Manhole 1	0 - 1	NS	ND
Manhole 2	4 - 15	20	100
Manhole 3	4 - 15	92	4.5
Manhole 4	15 - 50	160	15
Manhole 5	NS	NS	4.1
Manhole 6	4 - 15	6.9	3.4
Manhole 7	NS	NS	9.1
Manhole 8	15 - 50	1410	110
Manhole 9	15 - 50	690	38
Manhole10	0 - 1	NS	2.3
Manhole11	1 - 4	63	1.7
Manhole12	NS	680	0.37
Manhole13	NS	680	17
Catch Basin 1	0 - 1	NS	NS
Floor Drain 1	15 - 50	140	NS
Subbasement1 (Soil)	0 - 1	3.6	12
Drainpipe 13 (Soil)	NS	1,090	NS

ND - Not detected.
NS - No sample.

TABLE 5-9

1994 LMS IRM VAULT ROOM INVESTIGATION
WIPE SAMPLE DATA SUMMARY
NYSDEC I.D. No. 314063

Hudson River Psychiatric Center

PARAMETER	VRWS-1	VRWS-2	VRWS-3	VRWS-4	VRWS-5	VRWS-6	VRWS-7
PCBs (µg/ 100 cm²)							
Aroclor 1260	ND	0.84 j	0.53 j p	0.56 j	0.57 j	25	6.3

PARAMETER	VRWS-8	VRWS-9	VRWS-10	VRWS-11	VRWS-12	VRWS-12 [DL 20:1]	VRWS-13
PCBs (µg/ 100 cm²)							
Aroclor 1260	12	11 p	3.4	20	49 e p	210 p	25

PARAMETER	VRWS-14	VRWS-15	VRWS-16	VRWS-17	VRWS-18	VRWS-19	VRWS-20
PCBs (µg/ 100 cm²)							
Aroclor 1260	3.4	22	12	5.3	5.2	2.4	4.5

e - Estimated concentration; exceeds GC/MS calibration range.
j - Estimated concentration; compound present below quantitation limit.
p - Pesticide/Aroclor target analyte has >25% difference for the detected concentrations between the two GC columns.
DL - Diluted sample analysis.
ND - Not detected at analytical detection limit.

5.2.2 1995 Interim Remedial Measure Construction

LMS, under contract to FDC (DASNY), prepared the plans and specifications for the IRM in September 1994. The IRM was conducted by Republic Environmental Systems, Inc. (RES) from July to December 1995, with LMS providing on-site resident engineering. During construction the sediment was removed from each of the storm drain manholes and placed into drums. Samples were collected and analyzed from each of the drums to determine the method of disposal of the sediment. During excavation of the pipeline from Manhole 13 to the Cheney Building vault room floor drain, the soil was removed in lifts and placed into rolloffs for sampling and analysis to determine appropriate disposal. After the pipeline was removed the bottom of the excavation was sampled to confirm that the PCB cleanup level (10 mg/kg) had been achieved. The wastewater collected as a result of cleaning of the sewer and from dewatering the excavation was filtered and sampled to determine appropriate disposal. The soil and sediment samples were analyzed by an on-site mobile laboratory (Commonwealth Analytical [CA]) and 10% of the samples were sent to Energy & Environmental Engineering, Inc.'s (E3I) laboratory for confirmatory PCB analysis. The wastewater samples were also analyzed by E3I. All data are contained in the IRM report (LMS 1996) and are not included in this section as the data do not impact the RI/FS.

5.3 REMEDIAL INVESTIGATION ANALYTICAL RESULTS

The RI field work was initiated in November 1995 after the sediment from the storm drain had been removed and the storm drain cleaned as part of the IRM. The RI field investigation consisted of the collection and analysis of sediment samples to delineate the extent of PCB contamination in the stream sediments, collection of groundwater samples from each of the existing on-site Area 6 wells and analysis for low-level PCBs, and collection of concrete cores from the vault room floor to determine the depth of PCB contamination. The following sections discuss the results; the raw data reports are contained in Appendix B and the data validation and usability report are found in Appendix C.

5.3.1 Sediment Sampling Data

As described in Section 3.2, seven transects were marked in the field and surveyed prior to sample collection. The locations of the transects were laid out in the Field Sampling Plan and were positioned to best be able to define the lateral extent of contamination. Six additional transects were added in the field on an as-needed basis to better define the extent of contamination. Figure 5-7 shows the locations of the 13 transects.

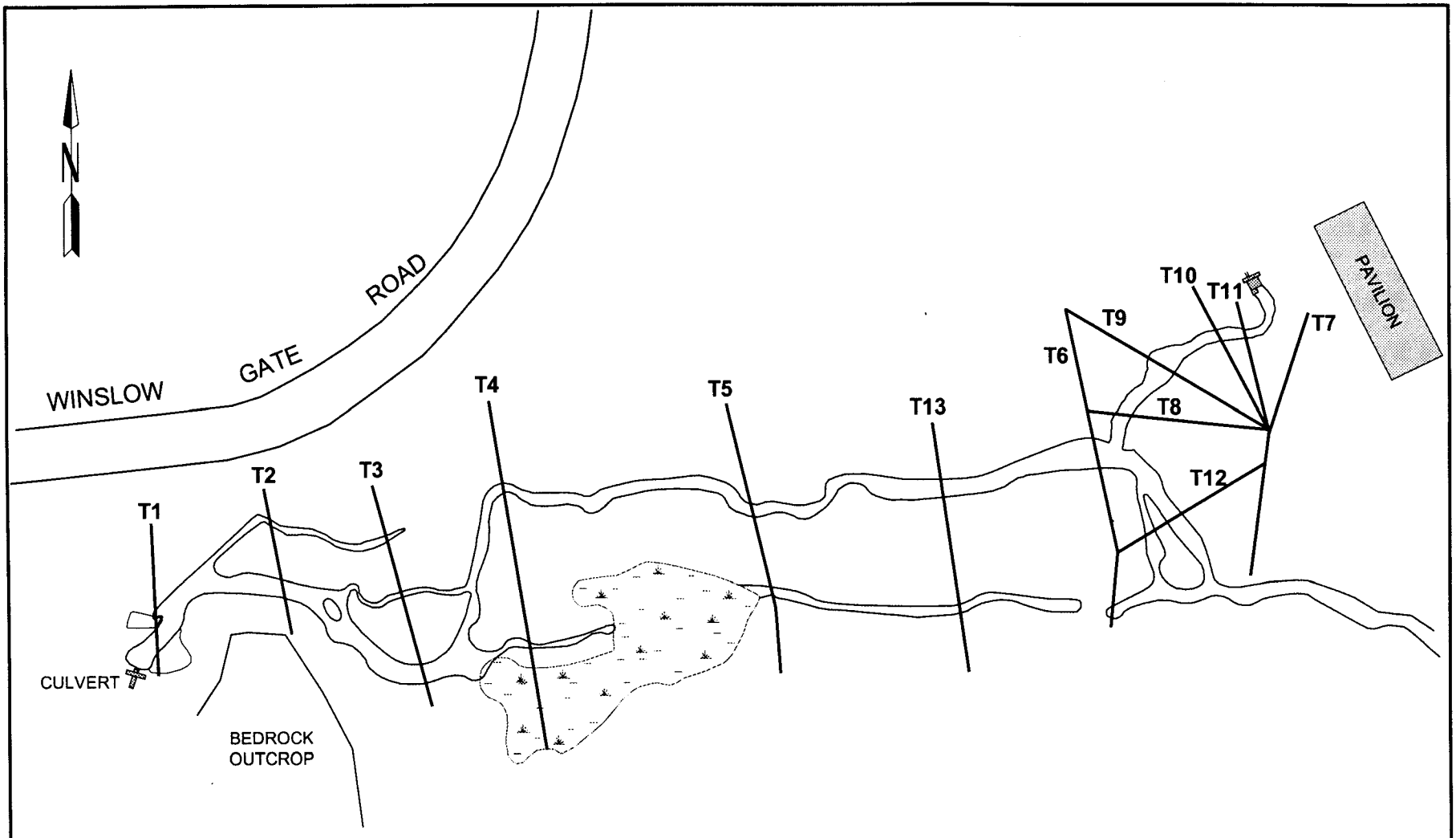

Figure 5-7

Location of Sediment Sampling Transects

NYSDEC I.D. No. 314063
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A total of 154 surficial (0-6 in.) sediment samples were collected along 13 transects at the stream alongside Area 6 from 8 to 17 November 1995. At 25 locations core samples to a depth of 2 ft were collected in an attempt to determine the depth of contamination. Each core was to be divided into 6-in. intervals and each interval analyzed separately. However, due to poor recoveries, a sample from each interval could not always be sampled, in which case sample intervals were combined. At the 25 locations a total of 45 samples were collected and analyzed (excluding any surface samples); therefore, the total number of samples collected was 199. All but seven samples were analyzed by the on-site mobile laboratory operated by CA. These seven samples were shipped off-site to E3I for analysis because the mobile laboratory had been demobilized by the time these samples were collected. Fifteen other samples were sent to E3I laboratory as a quality control check of the mobile laboratory analysis. The samples sent to E3I were also analyzed for total organic carbon (TOC). The mobile laboratory results are provided on Table 5-10 and the E3I results are shown on Table 5-11.

The CA mobile laboratory results were analyzed on a wet-weight basis; these results are provided in Appendix C. CA also sent a portion of their samples to their off-site laboratory for confirmatory PCB analysis. Percent solids were analyzed on the E3I samples and the CA confirmatory samples. The percent solids were averaged and the result used to adjust the mobile laboratory results so that they were reported on a dry-weight basis. Where an individual percent solids value existed for a specific sample point, the actual value was used to adjust the result rather than the average. Therefore, all PCB concentrations provided on Tables 5-10 and 5-11 have been adjusted to reflect a dry-weight basis. Plate 1 (located in the back of the report) shows the sediment sample locations and data collected. Where a confirmatory analysis was available, those data were reported on the plate rather than the mobile laboratory result.

A total of nine surficial sediment samples (SSD-1, -2, -33, -46, -47, -81, -82, -103, and -105) were collected in the vicinity of Transect 1, which is located closest to the stream culvert underneath Route 9. The PCB results ranged from not detected (ND), at a detection limit of 0.85 mg/kg, at SSD-103 and -105 to 16 mg/kg at SSD-46, with an average concentration of 5.3 mg/kg. The highest PCB concentration was located approximately 10 ft east of Transect 1, which was south of the streambed. Three core samples were collected in the vicinity of Transect 1. At SSD-103 in addition to the surface sample, a 6-12 in. sample was also collected and had no detectable PCBs. At SSD-105 the 6-12 in. sample also had no detectable PCBs. At SSD-136 only the 6-12 in. and 12-24 in. samples were collected, i.e., there was no surface sample. The PCB concentrations in these samples were 3.4 and 1.7 mg/kg for the 6-12 and 12-24 in. samples, respectively.

MOBILE LABORATORY SEDIMENT SAMPLE DATA SUMMARY (NOVEMBER 1995)

DASNY - Hudson River Psychiatric Center

PARAMETER	SSD-1	SSD-2	SSD-3	SSD-4	SSD-5	SSD-6	SSD-7	SSD-8	SSD-9	SSD-10	SSD-11
PCBs (mg/kg)											
Aroclor 1260	1.2	13	6.6	6.1	ND	7.1	4.8	16	19	4.1	ND
% Solids	♦	♦	♦	♦	69	♦	♦	♦	♦	♦	♦

PARAMETER	SSD-12	SSD-13	SSD-14	SSD-15	SSD-16	SSD-17	SSD-18	SSD-19	SSD-20	SSD-21	SSD-22
PCBs (mg/kg)									[DL: 10:1]		
Aroclor 1260	9.2	26	34	1.4	ND	0.85	ND	5.4	91	26	ND
% Solids	♦	♦	♦	♦	♦	♦	♦	♦	39	♦	♦

PARAMETER	SSD-23	SSD-24	SSD-25	SSD-26	SSD-27	SSD-28	SSD-29	SSD-30	SSD-31	SSD-32	SSD-33
PCBs (mg/kg)											
Aroclor 1260	ND	ND	7.1	ND	ND	ND	ND	ND	31	29	1.0
% Solids	♦	♦	♦	♦	♦	♦	♦	♦	58	♦	♦

Sediment data are in mg/kg, dry weight.
♦ - Not analyzed.
DL - Diluted sample analysis.
ND - Not detected at analytical detection limit.

MOBILE LABORATORY SEDIMENT SAMPLE DATA SUMMARY (NOVEMBER 1995)

DASNY - Hudson River Psychiatric Center

PARAMETER	SSD-34	SSD-35	SSD-36	SSD-37	SSD-38	SSD-39	SSD-40	SSD-41	SSD-42	SSD-43	SSD-44
PCBs (mg/kg)				[DL: 100:1]	[DL: 10:1]		[DL: 100:1]	[DL: 1,000:1]	[DL: 100:1]	[DL: 100:1]	[DL: 100:1]
Aroclor 1260	3.4	25	9.9	425	70	ND	408	4,676	1,327	1,480	612
% Solids	♦	39	♦	♦	♦	♦	♦	66	♦	♦	♦

PARAMETER	SSD-45	SSD-46	SSD-47	SSD-48	SSD-49	SSD-50	SSD-51	SSD-52	SSD-53	SSD-54	SSD-55
PCBs (mg/kg)	[DL: 100:1]										
Aroclor 1260	935	16	4.8	3.2	4.9	8.0	9.5	ND	3.2	5.4	7.5

PARAMETER	SSD-56	SSD-57	SSD-58	SSD-59	SSD-60	SSD-61	SSD-62	SSD-63	SSD-64	SSD-65	SSD-66
PCBs (mg/kg)											
Aroclor 1260	32	9.5	0.85	ND	ND	27	9.5	32	ND	0.85	ND
% Solids	♦	♦	♦	♦	♦	♦	44	♦	♦	♦	♦

Sediment data are in mg/kg, dry weight.
♦ - Not analyzed.
DL - Diluted sample analysis.
ND - Not detected at analytical detection limit.

MOBILE LABORATORY SEDIMENT SAMPLE DATA SUMMARY (NOVEMBER 1995)

DASNY - Hudson River Psychiatric Center

PARAMETER	SSD-67	SSD-68	SSD-69	SSD-70	SSD-71	SSD-72	SSD-73	SSD-74	SSD-75	SSD-76	SSD-77
PCBs (mg/kg)				[DL: 100:1]	[DL: 100:1]	[DL: 100:1]		[DL: 100:1]	[DL: 100:1]	[DL: 100:1]	[DL: 1,000:1]
Aroclor 1260	ND	ND	ND	714	374	799	17	646	1,054	655	6,463
% Solids	♦	♦	♦	♦	♦	♦	43	♦	♦	57	♦

PARAMETER	SSD-78	SSD-79	SSD-80	SSD-81	SSD-82	SSD-83	SSD-84	SSD-85	SSD-86	SSD-87	SSD-88
PCBs (mg/kg)	[DL: 1,000:1]	[DL: 100:1]	[DL: 100:1]								
Aroclor 1260	5,272	493	221	1.5	12	1.9	6.5	3.7	1.2	1.0	9.2
% Solids	♦	♦	♦	♦	27	♦	♦	♦	♦	♦	♦

PARAMETER	SSD-89	SSD-90	SSD-91	SSD-92	SSD-93	SSD-94	SSD-95	SSD-96	SSD-97	SSD-98	SSD-99
PCBs (mg/kg)					[DL: 1,000:1]	[DL: 100:1]	[DL: 100:1]	[DL: 4,100:1]			
Aroclor 1260	24	ND	ND	2.2	9,694	204	560	697	26	16	4.1
% Solids	♦	♦	♦	♦	♦	♦	64	♦	♦	♦	♦

Sediment data are in mg/kg, dry weight.
♦ - Not analyzed.
DL - Diluted sample analysis.
ND - Not detected at analytical detection limit.

MOBILE LABORATORY SEDIMENT SAMPLE DATA SUMMARY (NOVEMBER 1995)

DASNY - Hudson River Psychiatric Center

PARAMETER	SSD-100	SSD-101 (0 - 6")	SSD-101 (6 - 12")	SSD-101 (12 - 18")	SSD-102 (0 - 6")	SSD-102 (12 - 18")	SSD-102 (18 - 24")	SSD-103 (0 - 6")	SSD-103 (6 - 12")	SSD-104 (0 - 6")	SSD-104 (6 - 24")
PCBs (mg/kg)	[DL: 10:1]										
Aroclor 1260	84	0.85	ND	ND	4.8	1.2	1.4	ND	ND	ND	0.85
% Solids	57	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦

PARAMETER	SSD-105 (0 - 6")	SSD-105 (6 - 12")	SSD-106 (0 - 6")	SSD-107 (0 - 6")	SSD-107 (6 - 12")	SSD-108	SSD-109	SSD-110	SSD-111	SSD-112	SSD-113
PCBs (mg/kg)						[DL: 10:1]	[DL: 100:1]	[DL: 100:1]	[DL: 100:1]	[DL: 100:1]	[DL: 100:1]
Aroclor 1260	ND	ND	ND	ND	ND	170	2,211	459	221	814	391
% Solids	♦	♦	♦	♦	♦	♦	♦	♦	♦	59	♦

PARAMETER	SSD-114	SSD-115	SSD-116	SSD-117	SSD-118	SSD-119	SSD-120	SSD-121 (0 - 6")	SSD-121 (6 - 12")	SSD-122	SSD-123 (0 - 6")
PCBs (mg/kg)											
Aroclor 1260	41	2.6	ND	1.0	ND	2.0	2.4	ND	ND	2.2	ND
% Solids	♦	♦	♦	♦	♦	♦	53	43	♦	♦	64

Sediment data are in mg/kg, dry weight.
♦ - Not analyzed.
DL - Diluted sample analysis.
ND - Not detected at analytical detection limit.

MOBILE LABORATORY SEDIMENT SAMPLE DATA SUMMARY (NOVEMBER 1995)

DASNY - Hudson River Psychiatric Center

PARAMETER	SSD-123 (6 - 12")	SSD-124	SSD-125	SSD-126 (0 - 6")	SSD-126 (12 - 24")	SSD-127	SSD-128	SSD-129 (6 - 12")	SSD-129 (12 - 18")	SSD-129 (18 - 24")	SSD-130 (6 - 12")
PCBs (mg/kg)			[DL: 100:1]			[DL: 100:1]					[DL: 10:1]
Aroclor 1260	ND	3.1	221	6.0	ND	306	1.0	ND	3.1	1.4	68

PARAMETER	SSD-130 (12 - 18")	SSD-130 (18 - 24")	SSD-131 (0 - 6")	SSD-131 (6 - 12")	SSD-131 (12 - 18")	SSD-132 (0 - 6")	SSD-132 (6 - 12")	SSD-133	SSD-134 (0 - 6")	SSD-134 (6 - 12")	SSD-135
PCBs (mg/kg)											
Aroclor 1260	12	8.8	ND	ND	ND	ND	ND	ND	ND	ND	ND
% Solids	♦	♦	♦	♦	71	♦	♦	♦	♦	♦	♦

PARAMETER	SSD-136 (6 - 12")	SSD-136 (12 - 24")	SSD-137 (0 - 6")	SSD-137 (6 - 12")	SSD-138 (0 - 12")	SSD-138 (2.5 - 3 ft)	SSD-139 (0 - 6")	SSD-139 (6 - 12")	SSD-139 (12 - 24")	SSD-140 (0 - 6")	SSD-140 (6 - 12")
PCBs (mg/kg)	[DL: 100:1]						[DL: 100:1]			[DL: 10:1]	
Aroclor 1260	3.4	1.7	ND	ND	ND	0.85	221	ND	3.7	80	ND
% Solids	♦	♦	56	♦	♦	♦	♦	♦	♦	♦	♦

Sediment data are in mg/kg, dry weight.
♦ - Not analyzed.
DL - Diluted sample analysis.
ND - Not detected at analytical detection limit.

MOBILE LABORATORY SEDIMENT SAMPLE DATA SUMMARY (NOVEMBER 1995)

DASNY - Hudson River Psychiatric Center

PARAMETER	SSD-140 (12 - 18")	SSD-141 (0 - 6")	SSD-141 (6 - 12")	SSD-141 (12 - 18")	SSD-141 (2.8 ft)	SSD-142	SSD-143	SSD-144	SSD-145	SSD-146	SSD-147
PCBs (mg/kg)	[DL: 10:1]	[DL: 100:1]									
Aroclor 1260	56	136	12	1.4	ND	ND	ND	0.85	ND	4.4	2.7
% Solids	77	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦

PARAMETER	SSD-148	SSD-149 (0 - 6")	SSD-149 (6 - 12")	SSD-149 (12 - 18")	SSD-149 (18 - 24")	SSD-150	SSD-151	SSD-152	SSD-153	SSD-154 (0 - 6")	SSD-154 (6 - 12")
PCBs (mg/kg)								[DL: 100:1]			
Aroclor 1260	1.0	2.4	ND	ND	ND	1.5	ND	357	13	ND	ND
% Solids	♦	♦	♦	♦	♦	♦	♦	♦	69	♦	♦

PARAMETER	SSD-154 (12 - 18")	SSD-154 (18 - 24")	SSD-155 (0 - 6")	SSD-155 (6 - 12")	SSD-155 (12 - 18")	SSD-155 (18 - 24")	SSD-156 (0 - 6")	SSD-156 (6 - 12")	SSD-157 (12 - 18")	SSD-157 (18 - 24")
PCBs (mg/kg)			[DL: 100:1]				[DL: 10:1]	[DL: 10:1]		
Aroclor 1260	ND	ND	306	7.3	ND	ND	41	442	ND	ND
% Solids	♦	♦	♦	55	♦	♦	♦	♦	♦	♦

Sediment data are in mg/kg, dry weight.
♦ - Not analyzed.
DL - Diluted sample analysis.
ND - Not detected at analytical detection limit.

TABLE 5-11

SEDIMENT SAMPLE DATA SUMMARY (NOVEMBER 1995)

NYSDEC I.D. No. 314063

Hudson River Psychiatric Center

PARAMETER	SSD-34 (1 - 2 ft)	SSD-36 (1 - 2 ft)	SSD-39 (1 - 2 ft)	SSD-81	SSD-82	SSD-85	SSD-93	SSD-94	SSD-96	SSD-149 (0 - 6 in.)	SSD-150
	[DL: 30:1]	[DL: 20:1]			[DL: 10:1]		[DL: 50,000:1]	[DL: 1,000:1]	[DL: 200:1]	[DL: 10:1]	[DL: 6:1]
PESTICIDES/PCBs (mg/kg)											
Aroclor 1232	ND	ND[2]	ND	ND	ND	ND	ND	ND	ND	ND	ND
Aroclor 1254	ND	ND	0.21	ND	ND	ND	ND	ND	ND	ND	ND
Aroclor 1260	11	ND	ND	0.75	9.0	2.1	16,000 x	490 x	87	2.7	1.5
CONVENTIONALS											
% Solids	70	57	47	69	28	46	66	59	59	81	81
Total organic carbon (mg/kg)	37,000	34,000	34,000	39,000	10,000	91,000	71,000	61,000	53,000	30,000	16,000

PARAMETER	SSD-151	SSD-152	SSD-153	SSD-154	SSD-155 (0 - 6 in.)	SSD-156 (0 - 6 in.)	SSD-156 (6 - 12 in.)	SSD-156 (12 - 18 in.)	SSD-156 (18 - 24 in.)	SSD-157 (0 - 6 in.)	SSD-157 (6 - 12 in.)
		[DL: 2,000:1]	[DL: 20:1]	[DL: 10:1]	[DL: 300:1]	[DL: 600:1]	[DL: 2,000:1]	[DL: 10:1]		[DL: 50:1]	
PESTICIDES/PCBs (mg/kg)											
Aroclor 1260	1.5	910 x	9.4	5.2	180 p	170 x	560 x	2.7	0.22[1]	17	0.018 j p[1]
CONVENTIONALS											
% Solids	52	44	66	49	51	66	69	67	81	68	60
Total organic carbon (mg/kg)	150,000	115,000	34,000	170,000	59,000	23,000	20,000	12,000	6,100	45,000	23,000

1 - Value suspect, possibly the result of sample congener.
2 - Due to poor congener correlation the detection limit was raised to the reported concentration.
j - Estimated concentration; compound present below quantitation limit.
p - Pesticide/Aroclor target analyte has >25% difference for the detected concentrations between the two GC columns.

x - Estimated due to QC problems.
DL - Diluted sample analysis.
ND - Not detected at analytical detection limit.

A total of 14 surficial sediment samples (SSD-3, -4, -5, -6, -34, -48, -49, -50, -51, -83, -84, -104, -106, and -137) were collected in the vicinity of Transect 2. Transect 2 was located approximately 50 ft east of Transect 1 and traversed two stream segments. The results ranged from ND at SSD-5, -104, -106, and -137 to 9.5 mg/kg at SSD-51, with an average of 4.3 mg/kg. The highest concentration was found on the transect just south of the southern stream. Three core samples were also taken along Transect 2. At SSD-104 the 6-24 in. sample had 0.85 mg/kg PCBs and at SD-137 the 6-12 in. sample had no detectable PCBs.

At Transect 3, a total of 13 surficial sediment samples (SSD-7, -8, -9, -10, -11, -35, -52, -53, -54, -55, -56, -57, and -107) were collected, ranging in concentration from ND at SSD-11 and -107 to 32 mg/kg at SSD-56, with an average concentration of 9.9 mg/kg of PCBs. Transect 3 was located about 40 ft east of Transect 2 and traversed three stream segments. The highest PCB concentration was found on the northern edge of the southern stream segment. Three surficial sediment samples (SSD-58, -59, and -138) located in the southern segment of the stream between Transect 3 and 4 had PCBs ranging from ND at SSD-59 to 0.85 mg/kg at SSD-58. Two core samples were collected at Transect 3, with the 6-12 in. sample from SSD-107 having no detectable PCBs and the 2.5-3 ft core at SSD-138 having 0.85 mg/kg of PCBs.

A total of 14 surficial sediment samples (SSD-12, -13, -14, -15, -16, -17, -18, -36, -60, -61, -85, -86, -102, and -139) were collected in the vicinity of Transect 4, ranging in PCB concentration from ND at SSD-16 and -18 to 221 mg/kg at SSD-139, with an average concentration of 24.3 mg/kg. Transect 4 was located approximately 50 ft east of Transect 3 and traversed two stream segments and a portion of the wetland. The highest PCB concentration was found in the middle of the northern stream segment to the east of the transect. Three core samples were taken in the area of highest PCB concentration, with SSD-36 having no detectable PCBs at 1-2 ft, SSD-102 having 1.2 and 1.4 mg/kg PCBs at 12-18 and 18-24 in., respectively, and SSD-139 having no detectable PCBs at 6-12 in. and 3.7 mg/kg PCB at 12-24 in., respectively.

A total of 13 surficial sediment samples (SSD-19, -20, -21, -22, -23, -37, -62, -63, -64, -87, -101, -131, and -140) were collected at Transect 5, ranging in PCB concentration from ND at SSD-22 -23, -64, and -131 to 425 mg/kg at SSD-37, with an average concentration of 51.9 mg/kg. Transect 5 was located about 90 ft east of Transect 5 and traversed two stream segments. The highest PCB concentration was found between the two stream segments. Three core samples were collected, with SSD-101 and -131 having no detectable PCBs at both the 6-12 in. and 12-18 in. intervals and SSD-140 having < 0.85 mg/kg at the 6-12 in. interval and 56 mg/kg PCBs at the 12-18 in. interval.

At Transect 6 a total of nine surficial sediment samples (SSD-24, -25, -26, -27, -38, -65, -126, -134, -141) were analyzed, ranging in PCB concentration from ND at SSD-24, -26, -27, and -134 to 136 mg/kg at SSD-141, with an average of 24.8 mg/kg of PCBs. Transect 6 was located about 140 ft east of Transect 5 and traversed two stream segments; it crossed the northernmost stream branch just below the confluence with the storm drain outlet channel. The highest PCB concentration was found in the middle of the northern stream. Two core samples were collected, with SSD-134 having no detectable PCBs at 6-12 in. and SSD-141 having 12 and 1.4 mg/kg and ND at 6-12 in., 12-18 in., and at 2.8 ft, respectively.

Four surficial sediment samples (SSD-28, -29, -30, and -39) were collected along Transect 7, with all samples having no detectable PCBs. One core sample collected at SSD-39 at 1-2 ft had a concentration of 0.21 mg/kg of PCBs. This transect was located upstream of the storm drain discharge channel about 60 ft east of Transect 6. A total of 12 additional surficial sediment samples (SSD-112, -113, -114, -115, -120, -121, -122, -123, -146, -147, -148 and -149) were collected and analyzed for PCBs to the east of Transect 7. These samples averaged 105.5 mg/kg PCBS, ranging in concentration from ND at SSD-121 and -123 to 814 mg/kg at SSD-112. The highest PCB concentration was found 5 ft to the east of Transect 7 and 43 ft south southeast of the storm drain culvert. Two core samples were collected, with SSD-121 and -123 at 6-12 in. having no detectable PCBs.

The seven transect locations described above were surveyed in the field by YEC, Inc. An additional six transects were set up in the field during sample collection; their locations were measured from the existing seven transects. Transect 8 connected Transects 6 and 7 and traversed the storm drain outlet channel just to the north of the stream. A total of nine surficial sediment samples (SSD-31, -32, -70, -71, -72, -96, -97, -100, and -127) were collected in the vicinity of Transect 8, ranging in PCB concentration from 26 mg/kg at SSD-97 to 799 mg/kg at SSD-72, with an average of 272.2 mg/kg. The highest PCB concentration was found 25 ft to the east of the storm drain outlet channel along the transect. No core samples were collected along this transect.

Transect 9 was also placed between Transects 6 and 7 and traversed the storm drain outlet channel about 25 ft to the north of Transect 8. A total of 12 surficial sediment samples (SSD-40, -41, -73, -74, -75, -76, -77, -95, -99, -110, -128, and -151) were collected, ranging in PCB concentration from 1.0 mg/kg at SSD-128 to 6463 mg/kg at SSD-77, with an average of 1245 mg/kg of PCBs. The highest concentration was found 15 ft to the southeast of the stream along the transect. One core sample was collected at SSD-130 (no surficial sample was collected as it was taken at the same location as SSD-41), with PCB concentrations of 68 mg/kg

for the 6-12 in. interval, 12 mg/kg for the 12-18 in. interval, and 8.8 mg/kg for the 18-24 in. interval.

Transect 10 was placed about halfway between Transects 9 and 7 and traversed the storm drain channel. A total of 11 surficial sediment samples (SSD-42, -43, -78, -79, -94, -98, -109, -111, -124, -125, and -150) were collected and analyzed and ranged in PCB concentration from 16 mg/kg at SSD-98 to 5272 mg/kg at SSD-78, with an average of 1067 mg/kg. The highest PCB concentration was found about 5 ft to the south-southeast of the storm drain outlet along the transect. One core sample was collected at SSD-129 at the same location as SSD-109. The PCB concentrations in this core sample were ND at 6-12 in., 3.1 mg/kg at 12-18 in., and 1.4 mg/kg at 18-24 in.

Transect 11 was placed between Transects 10 and 7 just to the west of the storm drain culvert and traversed the storm drain outlet channel. A total of five surficial sediment samples (SSD-44, -45, 80, -93, and -108) were collected; the concentration of PCBs in these samples ranged from 100 at SSD-170 to 16,000 at SSD-93, with an average of 3468 mg/kg. The highest PCB concentration was found approximately 7 ft south of the storm drain outlet channel along the transect. No core samples were collected at this location.

Transect 12 connected Transects 6 and 7 and traversed the mainstream channel upstream of the storm drain outlet channel confluence with the stream. Four surficial sediment samples (SSD-66, -67, -68, and -69) were collected, and no samples had detectable concentrations of PCBs. A total of seven additional surficial sediment samples (SSD-119, -152, -153, -154, -155, -156, and -157) were collected in the area between Transects 6, 7, 8, and 12. The samples ranged in PCB concentration from 2.0 mg/kg at SSD-119 to 910 mg/kg at SSD-152, with an average concentration of 184.8 mg/kg. The highest PCB concentration was found along the northern edge of the stream, approximately 3 ft east of the confluence with the storm drain outlet channel. Four core samples were collected in this area, with PCB concentrations of: SSD-154 (ND at 6-12 in., 12-18 in., and 18-24 in.); SSD-155 (7.3 mg/kg at 6-12 in. and ND at the 12-18 in. and 18-24 in. intervals); SSD-156 (560 mg/kg at 6-12 in., 2.7 mg/kg at 12-18 in., and 0.22 mg/kg at 18-24 in.); and SSD-157 (0.018 mg/kg at 6-12 in. and ND at 12-18 in. and 18-24 in.).

Transect 13 was placed halfway between Transects 5 and 6 and traversed the main stream channel. Seven surficial sediment samples (SSD-88, -89, -90, -91, -92, -132, and -135 were collected and ranged in PCB concentration from ND at SSD-90, -91, -132, and -135) to 24 mg/kg at SSD-89, with an average PCB concentration of 5.5 mg/kg. The highest PCB concentration was found along the southern edge of the northern stream segment. The one core

sample collected at SSD-132 had no detectable PCBs in the 6-12 in. interval. One additional surficial sediment sample (SSD-133) was collected between Transect 13 and Transect 6 and also had no detectable PCBs.

On the western side of Route 9 the stream is culverted underneath Marist College and then passes over a waterfall to a small channel to the Hudson River. One surficial sediment sample was collected downstream of the outfall from Marist College (SSD-142) and had no detectable PCBs. Three surficial sediment samples (SSD-116, -117, and -118) were collected just west of the railroad bridge within the stream channel before entering the Hudson River; sample SSD-117 had 1.0 mg/kg of PCBs and the other two samples had no detectable PCBs. Three surficial sediment samples (SSD-143, -144, and -145) were collected in the Hudson River just beyond where the stream enters the river; SSD-144 had 0.85 mg/kg of PCBs and the other two samples had no detectable PCBs.

A total of 22 sediment samples were analyzed for TOC; the results ranged from a low of 6100 mg/kg to a high of 170,000 mg/kg, with an average concentration of 51,505 mg/kg.

5.3.2 Groundwater Sampling Data

The three existing Area 6 monitoring wells were resampled on 5 December 1995 for PCB analysis using a low-level method (modified NYSDEC ASP Method 91-3). The modification employed by the laboratory is described in the data usability report presented in Appendix C. Table 5-12 summarizes the data and Figure 5-7 is a graphical summary of the data. Note that the data provided in Appendices B and C present the wells as MWHR16-6, 17-6, and 19-6, whereas the correct nomenclature (MWHR6-16, 6-17, and 6-19) is shown on Table 5-12 and Figure 5-8. No PCBs were detected in any of the samples.

5.3.3 Concrete Core Sampling Data

During the IRM construction RES, in affiliation with Nature's Way Environmental Technology, Inc. (NWET), suggested that bioremediation of the vault room concrete floor may remove the PCBs. To assess the effectiveness of possible bioremediation, concrete core samples were taken to determine initial concentration of PCBs. On 31 October and 1 November 1995 RES took 28 samples from the concrete floor and had them analyzed for PCBs by the on-site mobile laboratory (CA). An additional four samples were taken on 2 November 1995 to delineate the concentration of PCBs in the southeastern area of the vault room. The results of the PCB analyses are shown on Table 5-13 and Figure 5-9 graphically presents the data. The PCB concentrations in these samples ranged in concentration from a low of 0.9 mg/kg in the

TABLE 5-12

GROUNDWATER SAMPLING DATA SUMMARY (DECEMBER 1995)

NYSDEC I.D. No. 314063

Hudson River Psychiatric Center

PARAMETER	MWHR6-16	MWHR6-17	MWHR6-19	FIELD BLANK	NYSDEC GROUNDWATER STANDARDS
PESTICIDES/PCBs (µg/l)	ND	ND	ND	ND	-

ND - Not detected at analytical detection limit.

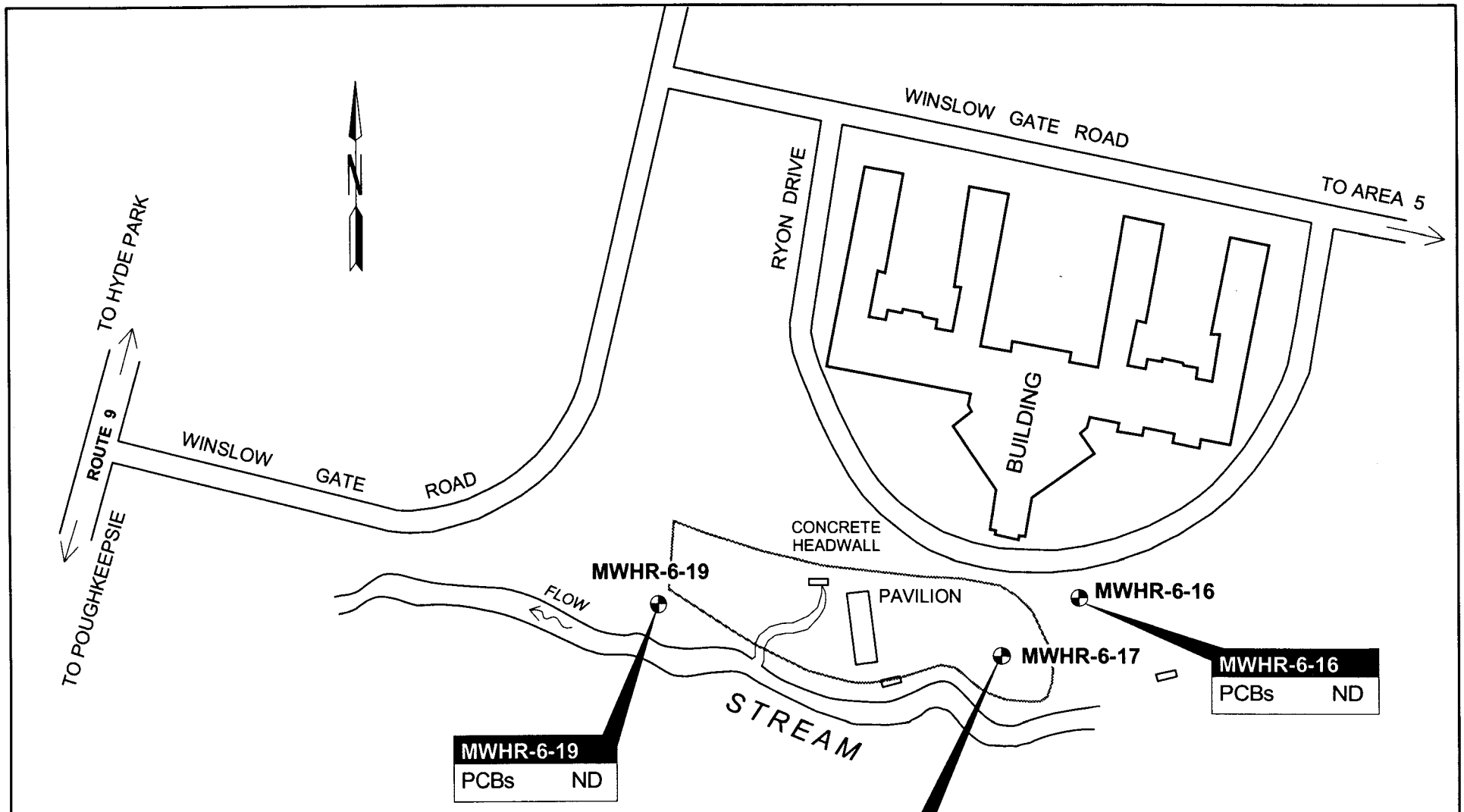

Figure 5-8

AREA 6
Groundwater PCB Concentrations
1995

NYSDEC I.D. No. 314063
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TABLE 5-13

RES CONCRETE CORE SAMPLE DATA SUMMARY (OCTOBER AND NOVEMBER 1995)

DASNY - Hudson River Psychiatric Center

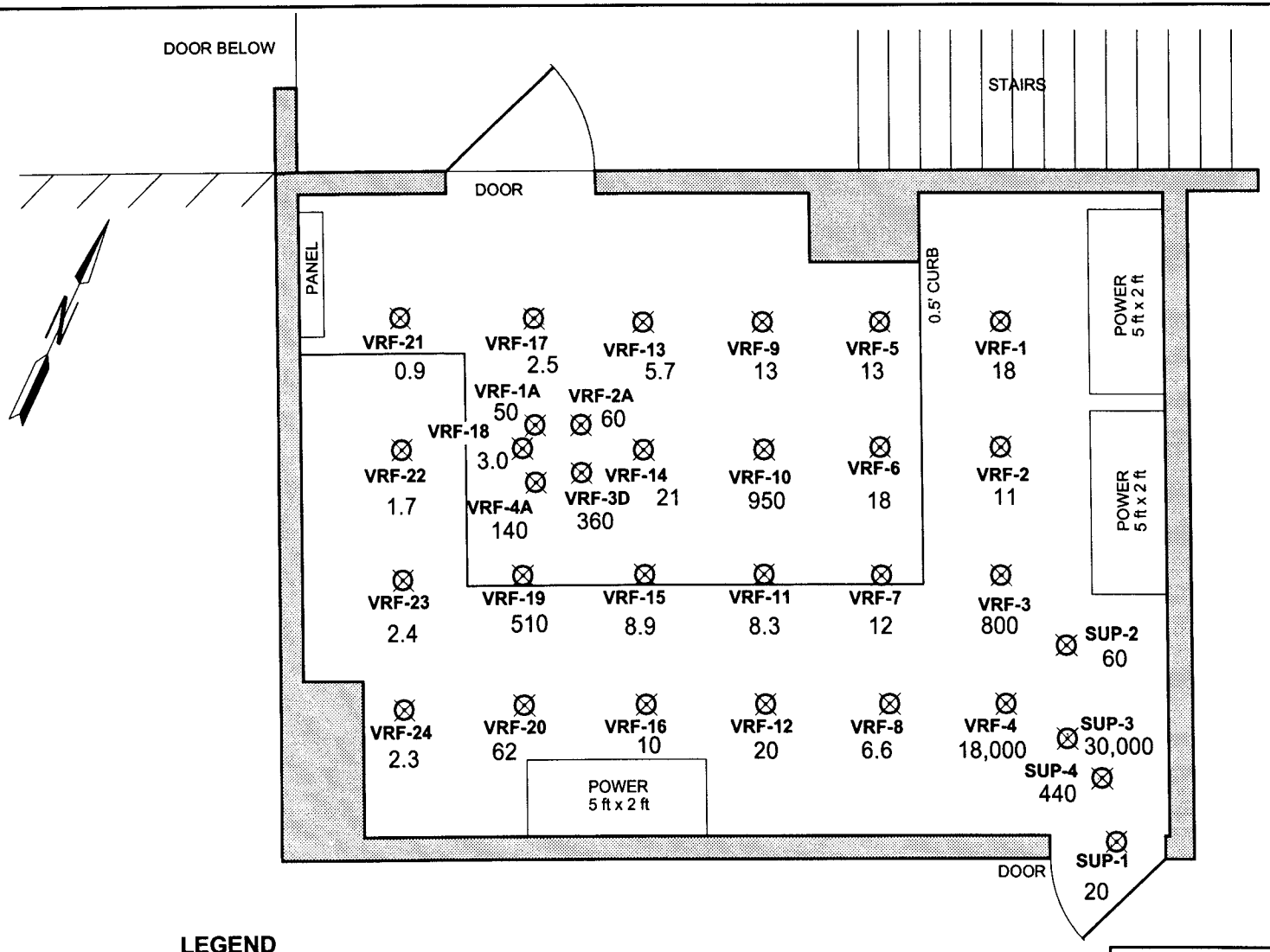
PARAMETER	VRF-1	VRF-1A	VRF-2	VRF-2A	VRF-3	VRF-3A	VRF-4	VRF-4A
PCBs (mg/kg)		[DL 10:1]		[DL 10:1]	[DL 100:1]	[DL 100:1]	[DL 10,000:1]	[DL 100:1]
Aroclor 1260	18	50	11	60	800	360	18,000	140

PARAMETER	VRF-5	VRF-6	VRF-7	VRF-8	VRF-9	VRF-10	VRF-11	VRF-12
PCBs (mg/kg)	[DL 10:1]					[DL 100:1]		
Aroclor 1260	13	18	12	6.6	13	950	8.3	20

PARAMETER	VRF-13	VRF-14	VRF-15	VRF-16	VRF-17	VRF-18	VRF-19	VRF-20
PCBs (mg/kg)							[DL 100:1]	[DL 10:1]
Aroclor 1260	5.7	21	8.9	10	2.5	3.0	510	62

PARAMETER	VRF-21	VRF-22	VRF-23	VRF-24	SUP-1	SUP-2	SUP-3	SUP-4
PCBs (mg/kg)					[DL 10:1]	[DL 10:1]	[DL 10,000:1]	[DL 100:1]
Aroclor 1260	0.9	1.7	2.4	2.3	20	60	30,000	440

DL - Diluted sample.



LEGEND

⊗ Sample location

NOTE:

All concentrations in mg/kg

NOTE: Samples taken by Republic Environmental Systems, Inc.

0 3 ft

APPROXIMATE SCALE IN FEET

\659103CH.ds4

Figure 5-9

PCB Concentrations on Cheney Building Vault Room Floor November 1995

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northwest corner to a high of 30,000 mg/kg in the southeastern area of the floor, with an average concentration of 1613 mg/kg.

Concrete cores were also collected by LMS from three locations on the Cheney Building vault room floor to assess the depth of the PCB contamination. The samples were collected on 14 and 15 December 1995. At each location samples were collected from 0-1, 1-2, 2-3, 3-4, and 4-5 in., with each interval analyzed separately by CA. The data are provided on Table 5-14 and the results are shown graphically on Figure 5-10. The PCB concentrations in these concrete samples ranged from a low of 1.8 mg/kg at the 1-2 in. interval in C-3 to a high of 7300 mg/kg at the 1-2 in. interval in C-1, with an average concentration of 757 mg/kg.

TABLE 5-14

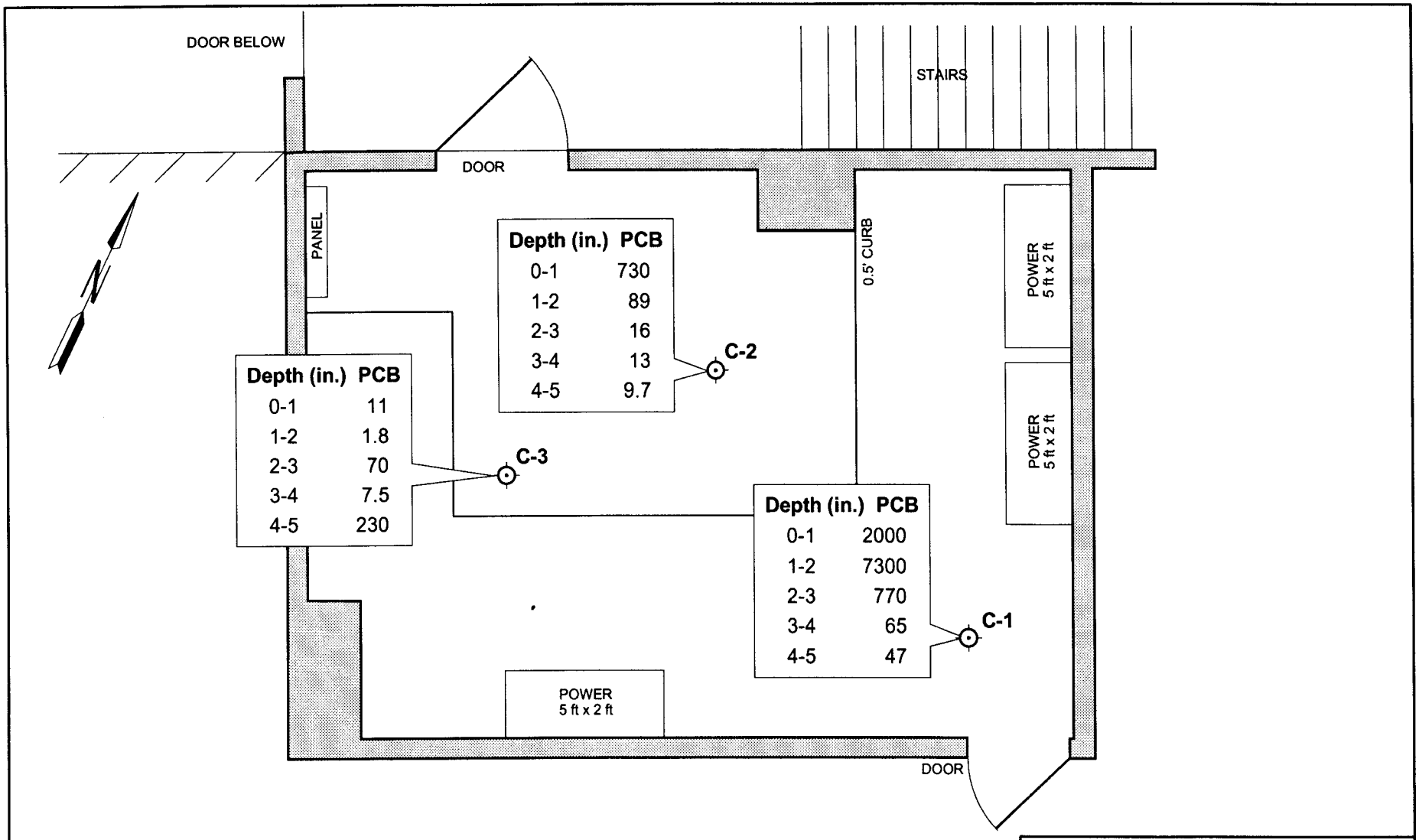
CONCRETE CORE SAMPLE DATA SUMMARY (DECEMBER 1995)

DASNY - Hudson River Psychiatric Center

PARAMETER	C-1 (0-1 in)	C-1 (1-2 in)	C-1 (2-3 in)	C-1 (3-4 in)	C-1 (4-5 in)	C-2 (0-1 in)	C-2 (1-2 in)	C-2 (2-3 in)
PCBs (mg/kg)	[DL 200:1]	[DL 400:1]	[DL 200:1]	[DL 10:1]	[DL 10:1]	[DL 100:1]	[DL 100:1]	
Aroclor 1260	2,000	7,300	770	65	47	730	89	16

PARAMETER	C-2 (3-4 in)	C-2 (4-5 in)	C-3 (0-1 in)	C-3 (1-2 in)	C-3 (2-3 in)	C-3 (3-4 in)	C-3 (4-5 in)
PCBs (mg/kg)					[DL 50:1]		[DL 200:1]
Aroclor 1260	13	9.7	1.1	1.8	70	7.5	230

DL - Diluted sample.



LEGEND

C-3 ⊙ Concrete core sample location

0 3 ft

APPROXIMATE SCALE IN FEET

\659103CH.ds4

Figure 5-10

PCB Concentrations in Concrete Cores From Cheney Building Vault Room December 1995

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CHAPTER 6

REMEDIAL INVESTIGATION SUMMARY AND CONCLUSIONS

6.1 FIELD INVESTIGATION

The field investigation for the remedial investigation of the HRPC Area 6 PCB site consisted of three elements: sediment sampling, groundwater sampling, and concrete core sampling. In addition a wetland survey was conducted to delineate the boundary of the wetland.

6.1.1 Sediment

A total of 199 samples were collected from the sediment in the stream to delineate the horizontal and vertical extent of contamination. The samples were analyzed for PCBs by the on-site mobile laboratory. In addition, approximately 10% of the samples were sent to an off-site laboratory for confirmatory PCB analysis and TOC analysis. The horizontal extent of contamination was delineated using 154 locations and the vertical extent of contamination was delineated using core samples collected at 25 locations.

6.1.2 Groundwater

Groundwater samples were collected from the three existing Area 6 monitoring wells and analyzed for PCBs using a modification to low level method NYSDEC ASP 91-3. The samples were collected to determine whether PCBs were impacting the groundwater in the vicinity of Area 6.

6.1.3 Concrete Cores

RES collected 32 shallow core samples from the Cheney Building vault room floor and had them analyzed for PCBs by the on-site mobile laboratory. The data were used to determine the horizontal extent of contamination of the vault room floor. LMS collected five concrete depth samples at three locations in the Cheney Building vault room floor and had them analyzed for PCBs. The data were used to determine the vertical extent of contamination of the vault room floor.

6.2 DATA INTERPRETATION

6.2.1 Sediment

6.2.1.1 *PCBs*

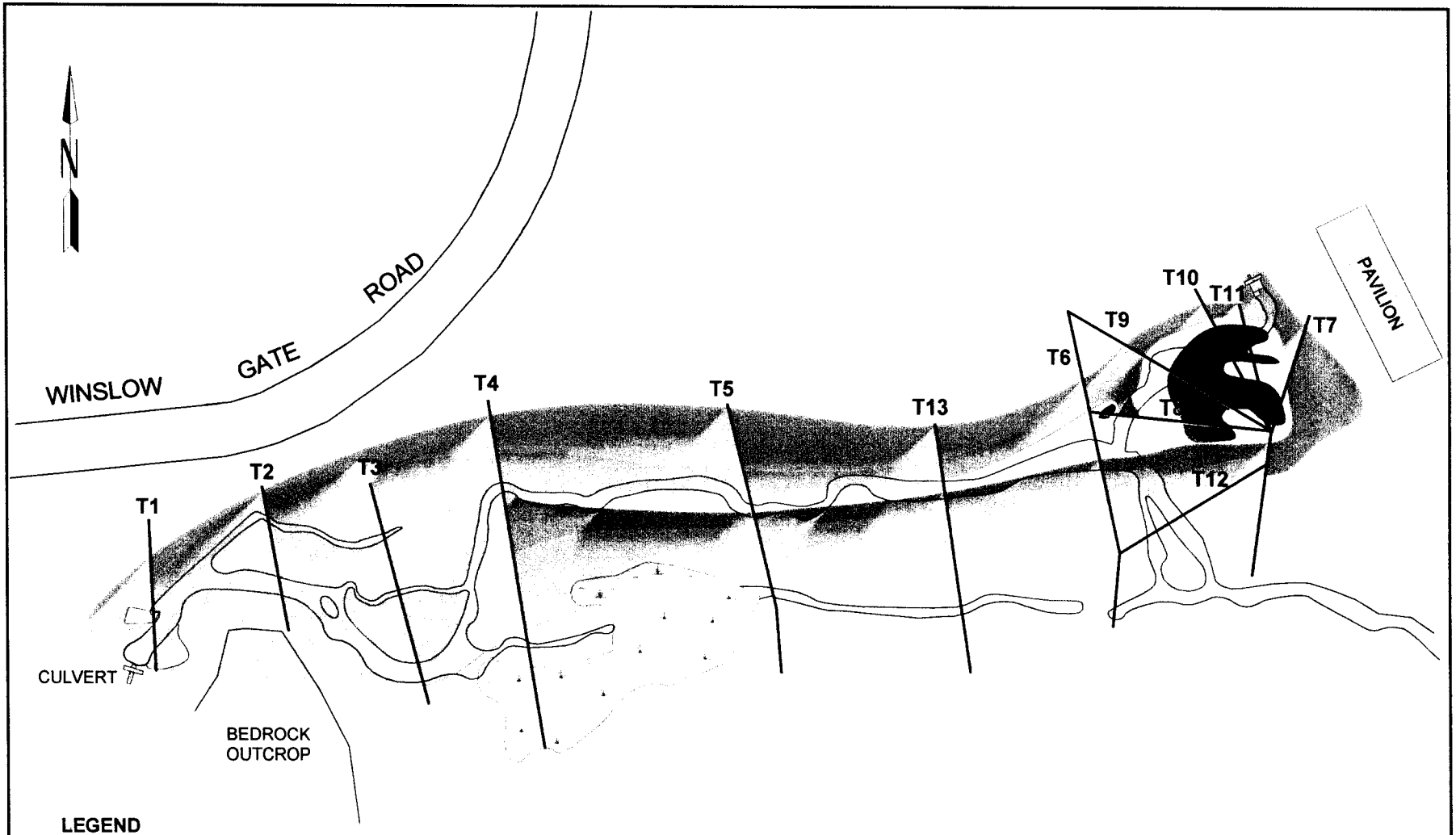
6.2.1.1.1 *Surface Distribution.* Figure 6-1 shows the horizontal distribution of PCBs in the surface sediment in the site area. The surface represents the top 6 in. of the sediment in the stream, on the banks, on the islands, or in the marshy areas. The area between the storm drain outfall and the culvert has significant levels of PCB contamination. Downstream of the culvert, sampling did not indicate any PCBs in the sediments. As there are no existing remedial controls in the stream, some of the contaminated sediment may be shifted with stream/storm runoff. However, the overall pattern of the PCB distribution (i.e., high concentrations near the outfall, decreasing significantly by the culvert) and the lack of downstream PCBs, indicate that the PCB contamination may not be migrating out of Area 6.

Figure 6-1 shows the plan view of surficial sediments contaminated with PCBs according to levels of concentrations. The area with concentrations $\geq$ 1 mg/kg encompasses the entire northern stream segment, a portion of the southern stream segment and ponded area, and the entire outfall channel. The area of contamination extends for an average width of about 75 ft for a length of 490 ft or an area of less than 1 acre.

The area with concentrations $\geq$ 5 mg/kg is similar in shape to the $\geq$ 1 mg/kg area, but slightly narrower in width and shorter in length. The area encompasses the northern stream segment except for the area immediately in front of the culvert and just downstream of the outfall. The average width is about 50 ft and the area extends for a distance of 470 ft for an area of about 23,500 ft^2.

The sediment with concentrations $\geq$ 50 mg/kg covers a wide area just downstream of the outfall. The contamination generally falls along the northern stream segment to about 180 ft upstream of the culvert. The area just downstream from the outfall is about 2500 ft^2, whereas the remainder covers an area of about 3300 ft^2, for a total area of 5800 ft^2.

The area with concentrations $\geq$ 500 mg/kg is located just downstream of the outfall and covers an area to the south along the bank and is about 1175 ft^2. A small area of about 25 ft^2 exists to the northeast of the outfall channel for a total area of contamination of 1200 ft^2.



LEGEND

- Area of PCB contamination ≥ 500 mg/kg dry weight
- Area of PCB contamination ≥ 50 mg/kg dry weight
- Area of PCB contamination ≥ 5 mg/kg dry weight
- Area of PCB contamination ≥ 1 mg/kg dry weight

0 60 ft

Approximate Scale
1 in. = 60 ft

/659/CONC-DXF.ds4

Figure 6-1

All Areas of Surficial PCB Contamination

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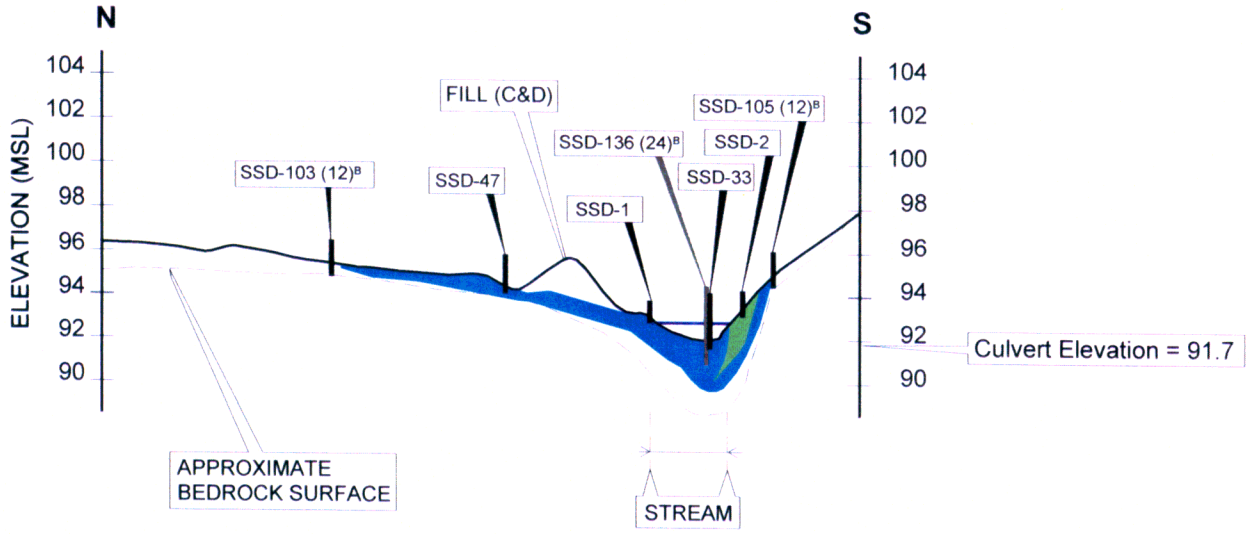
6.2.1.1.2 *Vertical Distribution.* Figures 6-2 to 6-8 show the vertical distribution of the PCB data. These illustrations are interpolated from the core samples taken at 25 locations. Because of the limited number of samples collected with depth and the problems encountered in obtaining discrete, representative samples, the distribution patterns and calculated volumes of PCB-contaminated sediments at depths greater than 6 in. are rough approximations. In general the data provide a good indication of the decrease in PCB levels with depth. However, pockets of PCB-contaminated sediment may be present in some areas where undefined sedimentation patterns may have resulted in burial of contaminated sediments in cleaner sediments. In addition to the difficulty in obtaining a representative sample in areas with standing water, finding such discrete packets of contamination is problematical and may be discovered only during actual remediation. In some areas where sediment deposition may be deep, the PCB levels at the 6-in. level were extrapolated to account for the potential of PCB contamination in these sediments.

Transect 1 (Figure 6-2) is located the farthest west approximately 10 ft from the culvert, which is at an elevation of 91.7 ft above mean sea level (MSL). A layer of PCB contamination between 1 and 5 mg/kg exists from the surface to about 6 in. deep for about 14 ft to the north of the stream. Beneath the stream the PCB contamination extends to about 2 ft deep. On the southern bank of the stream in an area of sediment deposition it is believed that the measured contamination of 5 to 50 mg/kg PCB in the top 6 in. may extend deeper. The total width of the sediments contaminated with PCBs greater than 1.0 mg/kg is about 16.5 ft.

Transect 2 (Figure 6-3) is located approximately 50 ft east of Transect 1. Three areas of PCB contamination exist in this transect with concentrations between 5 and 50 mg/kg; all areas are approximately 1 ft deep. The first area of PCB contamination lies directly underneath the northern stream branch and is about 3.5 ft wide. An area of PCB contamination between the two stream branches is about 18 ft wide and the area to the south of the southern stream branch is about 16 ft wide. An area about 62 ft wide by a maximum of 1.5 ft deep containing PCBs between 1 and 5 mg/kg exists in the transect.

Transect 3 (Figure 6-4) is situated about 40 ft east of Transect 2. The stream in this transect is split into three sections. The top 12 in. of sediment for a width of 44 ft is contaminated with PCB concentrations between 5 and 50 mg/kg, including beneath the two southern stream segments. PCBs at concentrations between 1 and 5 mg/kg exist about 6 in. beneath the upper contaminated layer but extends about another 10 ft further in width than the more contaminated sediments to the south and 44 ft to the north.

Transect 4 (Figure 6-5) is located approximately 50 ft east of Transect 3. Directly underneath the northern stream segment is a layer of PCB contamination about 6 in. deep and about 5 ft



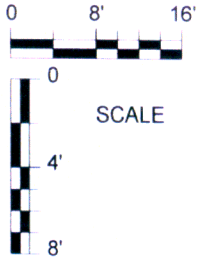
LEGEND

- <0.85 mg/kg
- ≥1 but <5 mg/kg
- ≥5 but < 50 mg/kg
- ≥50 but <500 mg/kg
- ≥500 mg/kg

NOTE:

Values are from dry weight calculations for PCB.

[B]Indicates bedrock contact (depth, in.)



\XSCT11IN.ds4

Figure 6-2

PCB Contamination in Cross Section Along Transect No. 1

NYSDEC I.D. No. 314063
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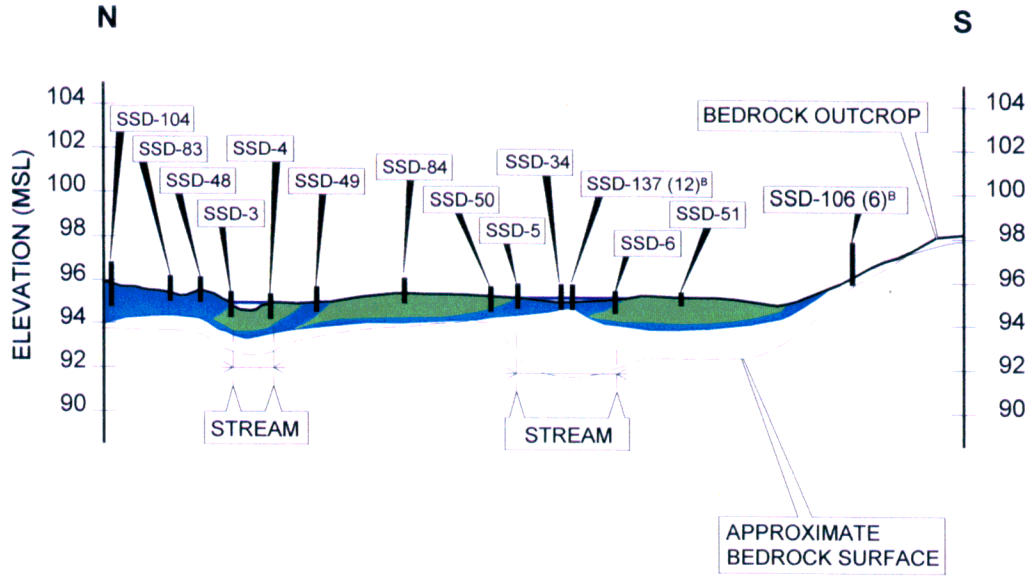


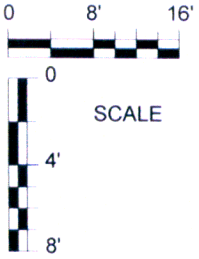
LEGEND

- <0.85 mg/kg
- ≥1 but <5 mg/kg
- ≥5 but < 50 mg/kg
- ≥50 but <500 mg/kg
- ≥500 mg/kg

NOTE:

Values are from dry weight calculations for PCB.

[B]Indicates bedrock contact (depth, in.)



\XSCT11IN.ds4

Figure 6-3

PCB Contamination in Cross Section Along Transect No. 2

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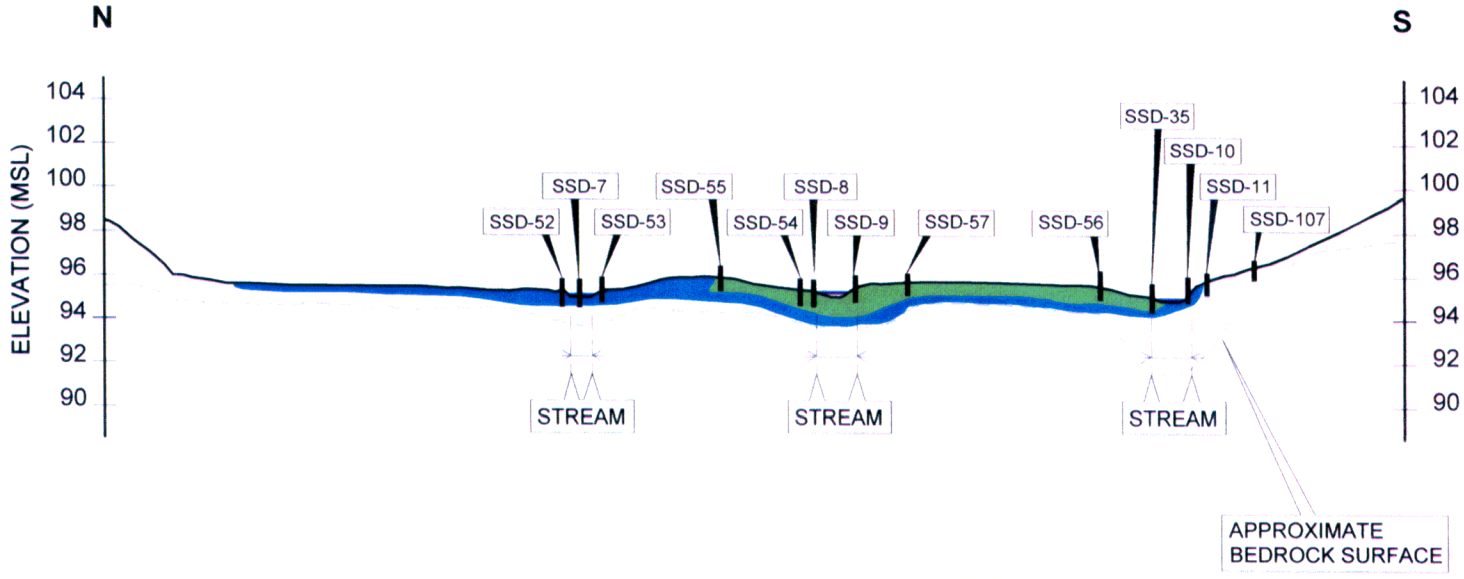
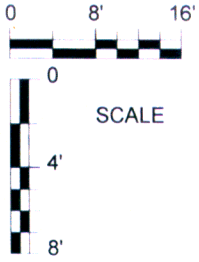


LEGEND

- <0.85 mg/kg
- ≥1 but <5 mg/kg
- ≥5 but < 50 mg/kg
- ≥50 but <500 mg/kg
- ≥500 mg/kg

NOTE:
Values are from dry weight calculations for PCB.



\XSCT11IN.ds4

Figure 6-4

PCB Contamination in Cross Section Along Transect No. 3

NYSDEC I.D. No. 314063
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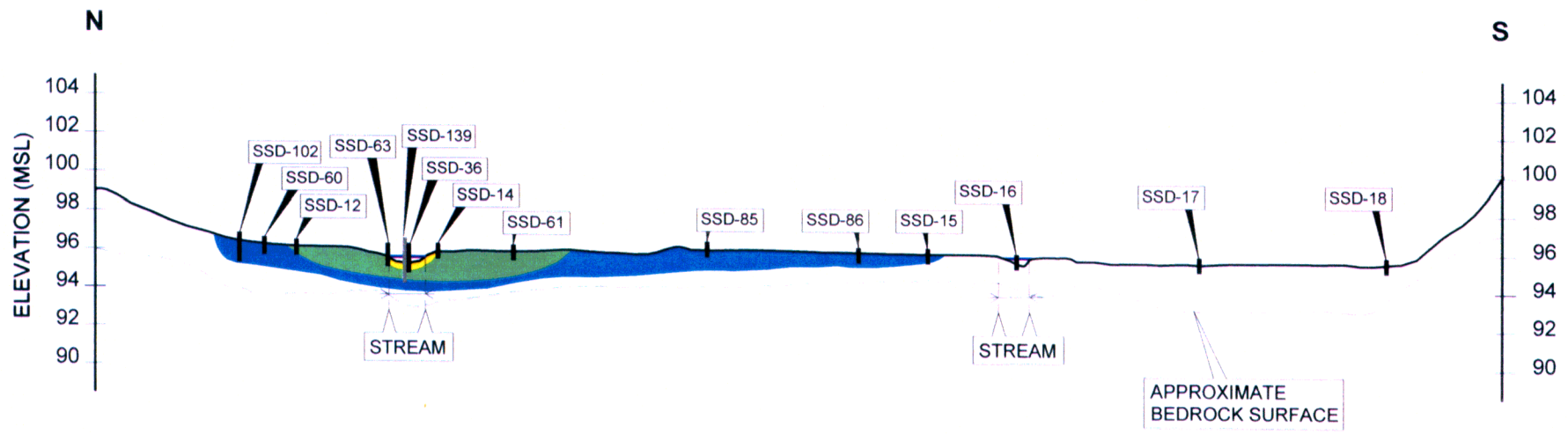

LEGEND

- <0.85 mg/kg
- ≥1 but <5 mg/kg
- ≥5 but < 50 mg/kg
- ≥50 but <500 mg/kg
- ≥500 mg/kg

NOTE:
Values are from dry weight calculations for PCB.

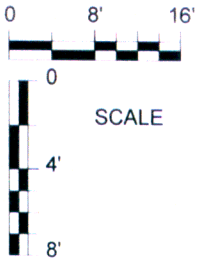

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Figure 6-5

PCB Contamination in Cross Section Along Transect No. 4

NYSDEC I.D. No. 314063
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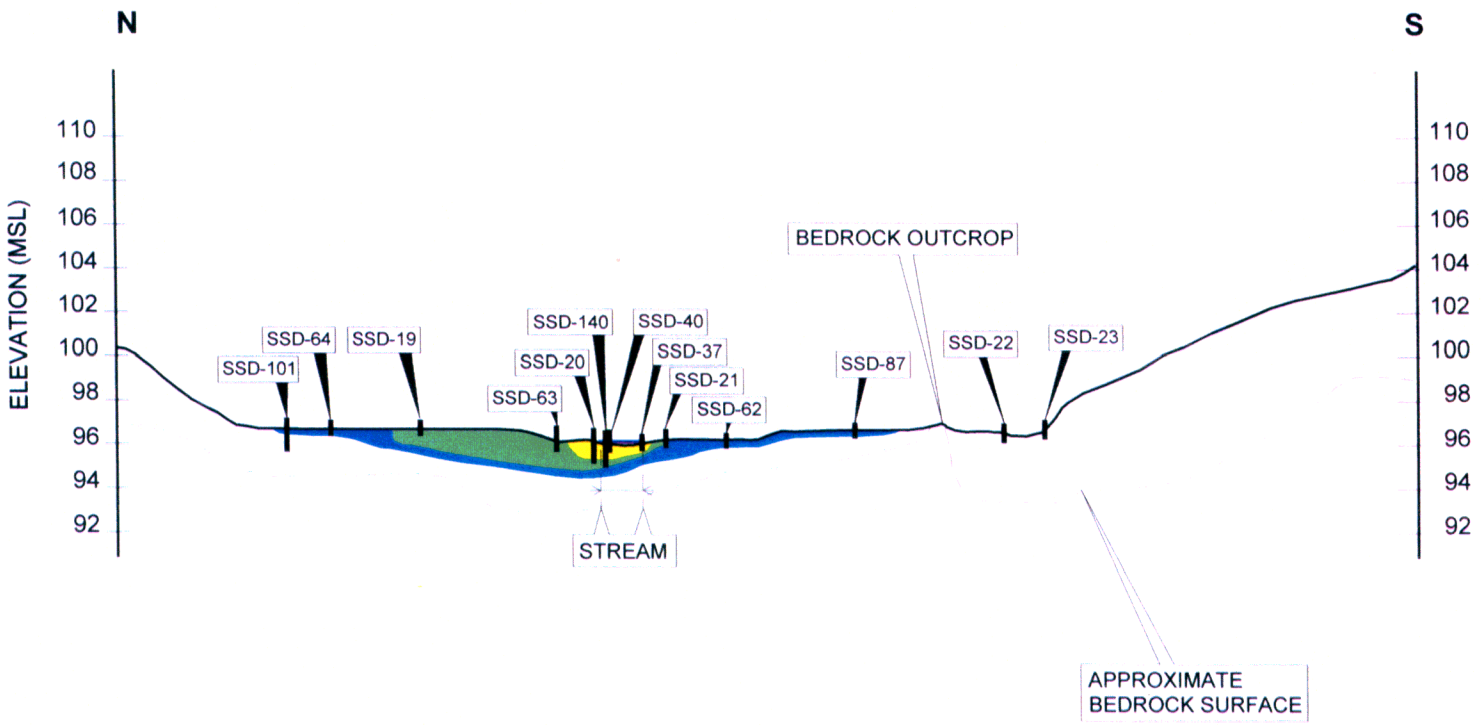

LEGEND

- <0.85 mg/kg
- ≥1 but <5 mg/kg
- ≥5 but < 50 mg/kg
- ≥50 but <500 mg/kg
- ≥500 mg/kg

NOTE:
Values are from dry weight calculations for PCB.

0 8' 16'
0
SCALE
4'
8'

\XSCT11IN.ds4

Figure 6-6
PCB Contamination in Cross Section Along Transect No. 5

NYSDEC I.D. No. 314063
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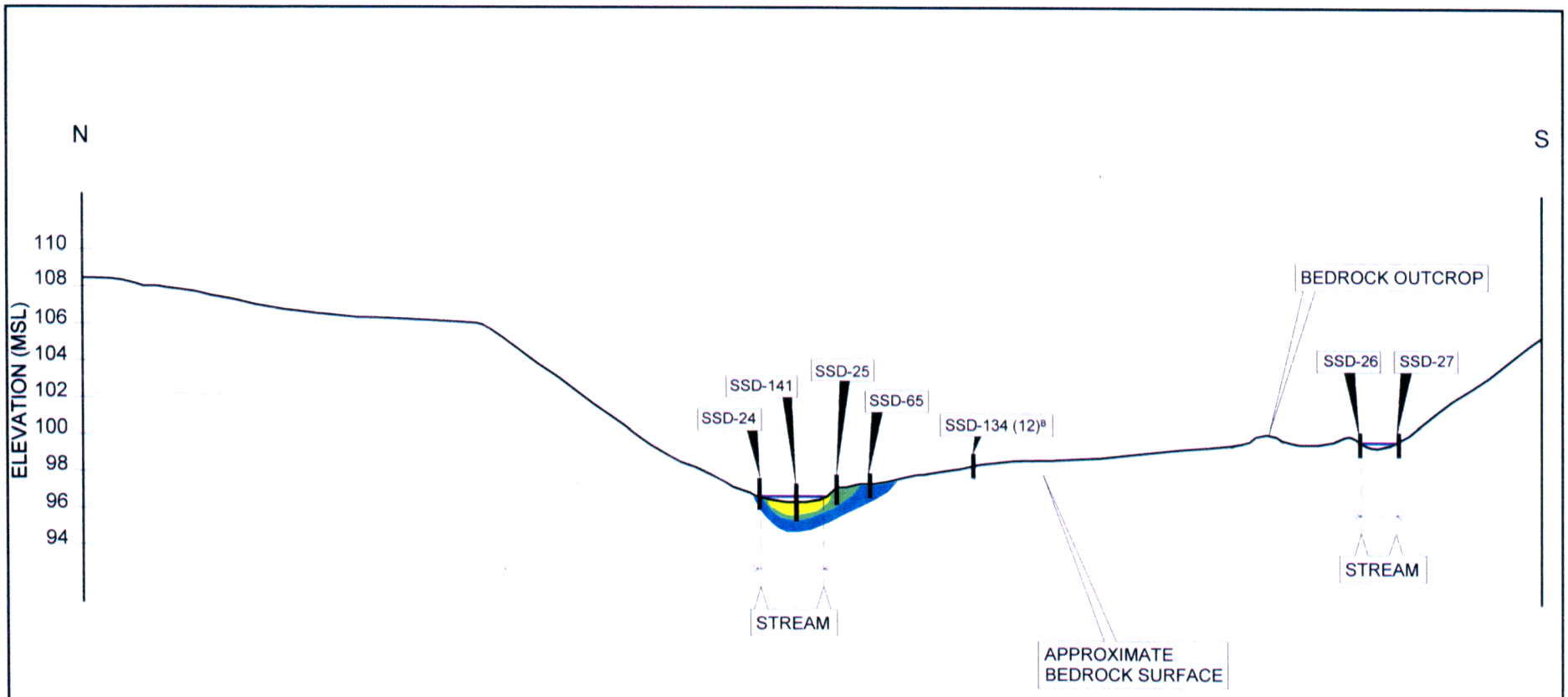

LEGEND

- <0.85 mg/kg
- ≥1 but <5 mg/kg
- ≥5 but < 50 mg/kg
- ≥50 but <500 mg/kg
- ≥500 mg/kg

NOTE:

Values are from dry weight calculations for PCB.

[B]Indicates bedrock contact (depth, in.)

0 8' 16'

0

SCALE

4'

8'

\XSCT11IN.ds4

Figure 6-7

PCB Contamination in Cross Section Along Transect No. 6

NYSDEC I.D. No. 314063
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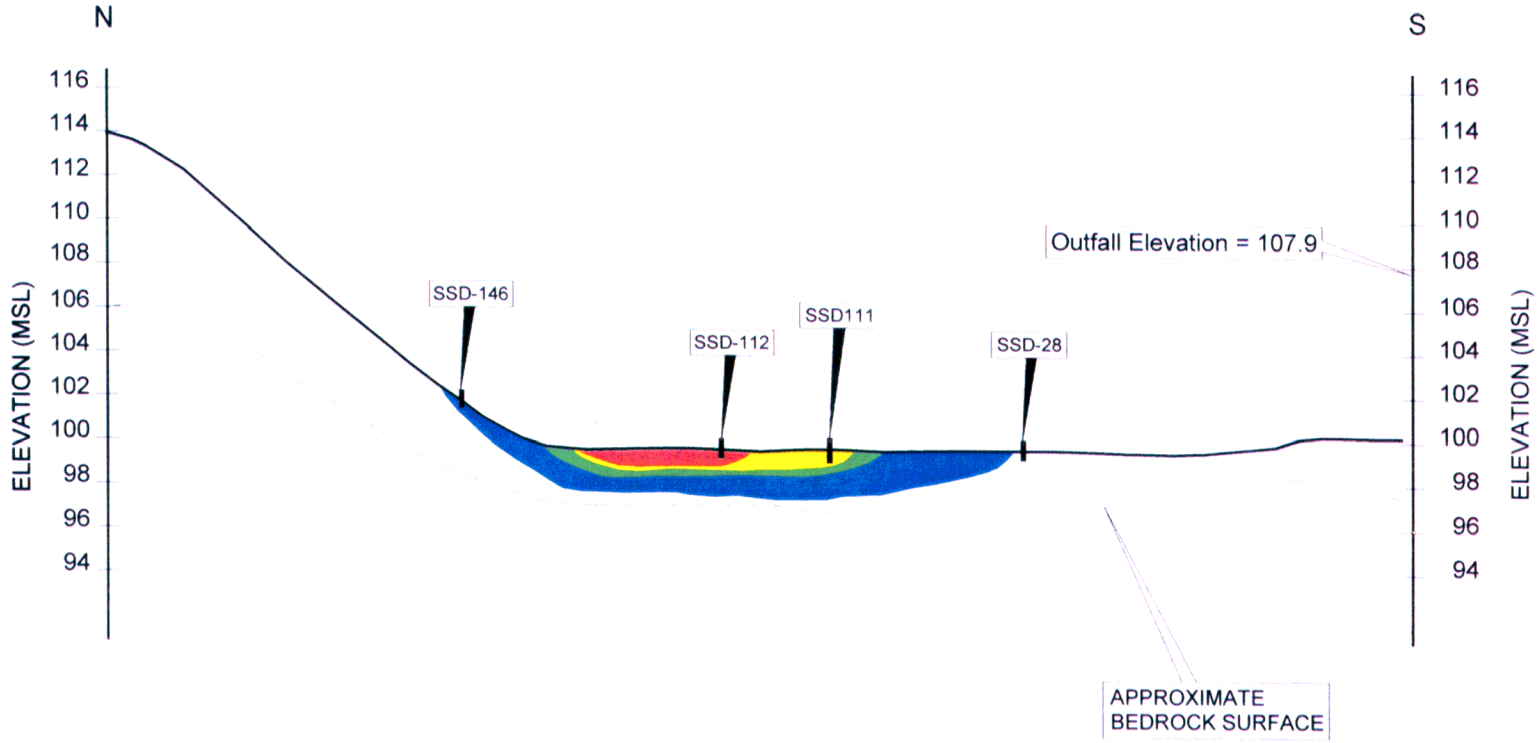

LEGEND

- <0.85 mg/kg
- ≥1 but <5 mg/kg
- ≥5 but < 50 mg/kg
- ≥50 but <500 mg/kg
- ≥500 mg/kg

NOTE:
Values are from dry weight calculations for PCB.

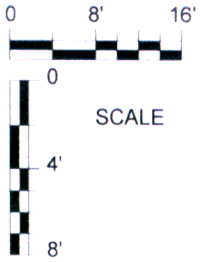

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Figure 6-8

PCB Contamination in Cross Section Along Transect No. 7

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wide of PCBs at concentrations between 50 and 500 mg/kg, the level at which PCBs are considered hazardous by the State of New York. A layer of PCB-contaminated sediments with concentrations between 5 and 50 mg/kg PCBs exists about 30 ft to either side of the stream at an average depth of about 1.75 ft. A 6-in.-deep layer of PCB contamination at concentrations between 1 and 5 mg/kg exists underneath the northern stream segment and extends to within 7 ft of the southern stream segment, where PCBs were not detected. The total width of all contaminated sediments in this transect is about 75 ft.

Transect 5 (Figure 6-6) is located about 90 ft east of Transect 5 and traverses two stream segments. Beneath the stream and to the north lies an area about 1 ft deep by 6 ft wide of PCB contamination at concentrations between 50 and 500 mg/kg. A 6-in.-deep layer of PCB contamination at concentrations between 5 and 50 mg/kg exists underneath this layer and extends north, where it reaches a depth of 1.75 ft for a total width of about 25 ft. A bottom 6-in. layer of PCB contamination between 1 and 5 mg/kg exists for a distance of about 62 ft underneath the 5-50 mg/kg contaminated layer extending to the north and south.

Transect 6 (Figure 6-7) is located about 140 ft east of Transect 5 and traverses two stream segments, crossing the northernmost stream branch just below the confluence with the storm drain outlet channel. The sediments in the southern stream segment had no detectable PCBs. A layer of 50-500 mg/kg PCB contamination about 6 in. deep by 6 ft wide exists beneath the northern stream segment. A shallower layer about 6 in. deep of 5-50 mg/kg of PCB contamination exists beneath the highly contaminated layer and a 12 in. layer of PCB contamination between 1 and 5 mg/kg exists beneath both layers. The total width of contamination is only about 14 ft. The sediment directly above the bedrock has no detectable PCBs.

Transect 7 (Figure 6-8) is located upstream of the storm drain discharge channel about 60 ft east of Transect 6. The storm drain outfall is at elevation 107.9 ft above MSL, or about 11 ft above the stream elevation. This transect did not cross the stream or the outfall channel but still had sediments with the highest levels of PCBs. A sediment layer about 0-6 in. and possibly up to 12 in. deep by 10 ft wide exists of PCB contamination over 500 mg/kg. A 1-ft layer of 50 to 500 mg/kg PCB-contaminated sediment lies south of the over 500 mg/kg layer and extends for a distance of 25 ft. A shallow layer, < 6 in. deep, of PCB-contaminated sediment exists beneath the 50 to 500 layer for a distance of 32 ft. The 1 to 5 mg/kg PCB-contaminated sediment layer is about 1.5 ft deep and extends for a distance of 53 ft.

The total area of PCB-contaminated sediment encompasses approximately 36,600 ft^2 and averages about 1.5 ft deep for a total volume of about 54,900 ft^3. The area of PCB-

contaminated sediment ≥ 500 mg/kg is 1200 ft^2 by about 0.75 ft deep for a total volume of 900 ft^3. The volume of PCB contamination ≥ 50 but ≤ 500 mg/kg is about 4300 ft^3, and the volume of PCB contamination < 50 but ≥ 1 mg/kg is 49,700 ft^3.

6.2.1.2 ***Total Organic Carbon.*** A total of 22 samples were analyzed for TOC. Sediment criteria have been established by NYSDEC for the purpose of assessing the risk posed by contamination to the environment (NYSDEC 1993b). The criteria were derived using the equilibrium partitioning approach. This approach estimates the biological impacts a contaminant may cause based on its affinity to sorb to organic carbon in the sediment. The concentration of biologically available contaminant is predicted and related to its potential toxicity and bioaccumulation by using existing criteria established for water quality. The existing water quality criteria for PCBs for protection from bioaccumulation in piscivorous wildlife is 0.001 μg/l and for chronic toxicity in benthic aquatic life is 0.014 μg/l. The octanol/water partitioning coefficient (K_{ow}) for PCBs is 1,380,384.3 l/kg. The K_{ow} multiplied by the water quality criteria (using the appropriate conversion factors) yields the normalized organic carbon PCB sediment criteria (SC_{oc}) of 1.4 μg/g of TOC for bioaccumulation in wildlife and 19.3 μg/g of TOC for chronic toxicity. The TOC value multiplied by the SC_{oc} value (and using the appropriate conversion factors) yields the site-specific PCB sediment criterion (SC).

Multiplying the average concentration of TOC of 51,505 mg/kg found in the sediments by 1.4 and 19.3 and using the appropriate conversion factor yields maximum allowable concentrations of 0.072 and 1.0 mg/kg of PCBs in the sediments for protection of aquatic life.

The NYSDEC guidance document (NYSDEC 1993b) also lists other criteria for human health bioaccumulation and acute benthic toxicity. The human health criterion was not calculated because Area 6 water is not used as a source of drinking water and the stream classification (D) prohibits the use of it as potable water. The stream does not enter the Hudson River at a location where the river is used as a drinking water source; however, the data did not show PCB sediment contamination downstream of Area 6. The use of the chronic toxicity criterion is more conservative than acute toxicity.

The NYSDEC document also list qualifications for sediment criteria, including a 1/5 to 5 times "grey" area, i.e., at concentrations between 1/5 and 5 times a sediment criterion, observable impacts may or may not occur. Because of the range of impacts, it is also suggested that aquatic testing be conducted at sites exceeding criteria to more accurately determine the impact and need for remediation. For Area 6, PCB concentrations are significantly high enough to warrant remediation; however, the development of the cleanup criterion will require additional assessment.

6.2.2 Groundwater

The three on-site existing monitoring wells were sampled by LMS in December 1995 and analyzed for PCBs using the low-level method cited. The results showed that no PCBs were detected in the groundwater in the monitoring wells at Area 6.

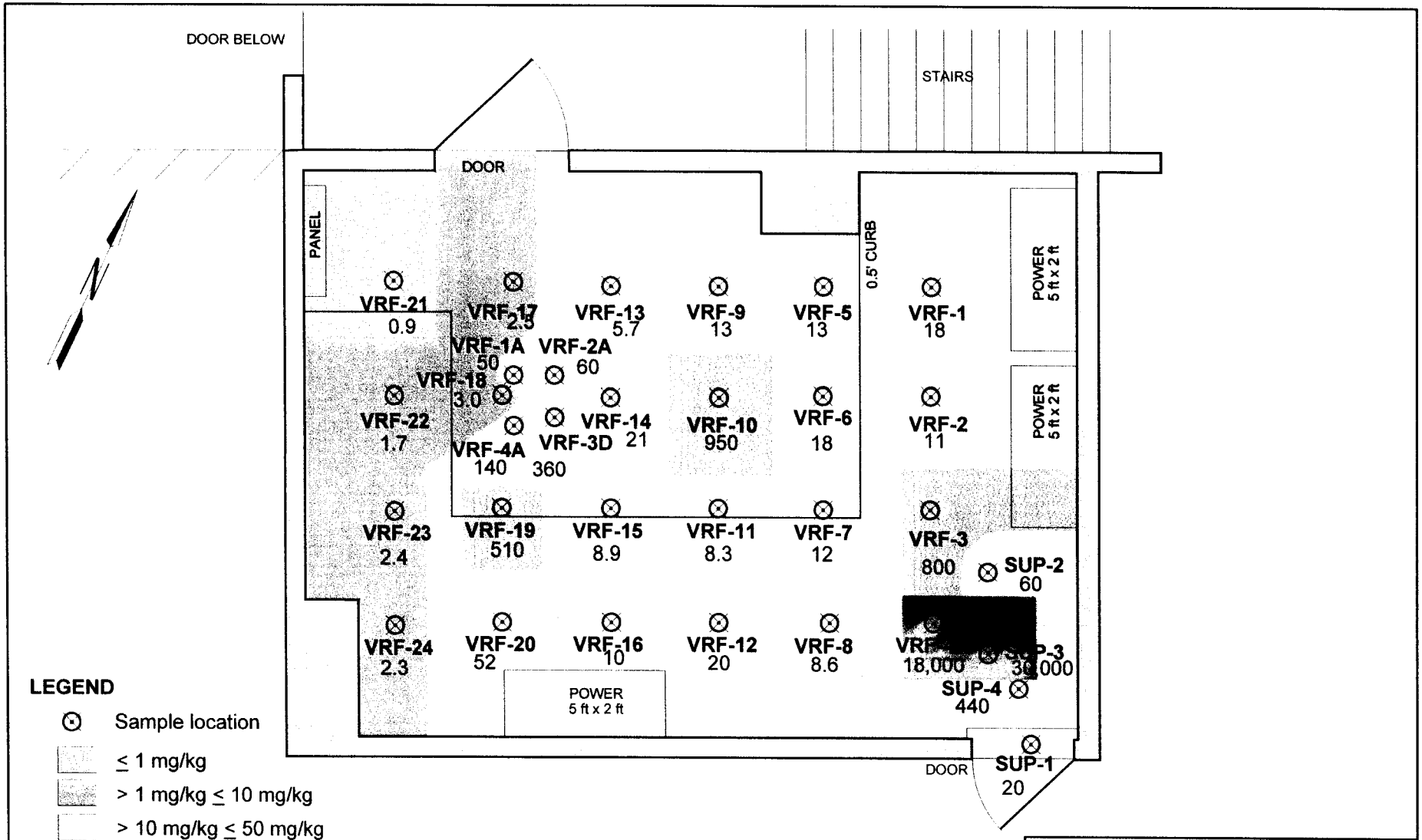
6.2.3 Concrete

The surficial concrete core samples collected by RES showed PCB contamination throughout the surface of the Cheney Building vault room concrete floor. Figure 6-9 graphically delineates the horizontal extent of contamination. As can be seen on the figure, a 35-ft^2 area in the southeastern corner of the floor has PCB concentrations greater than 50 mg/kg, with approximately 22 ft^2 of this area exceeding 500 mg/kg of PCBs. Around the vault room floor drain there is an area of approximately 4 ft^2 that has concentrations of PCBs in excess of 500 mg/kg. In the southwestern portion of the floor there is an approximately 24-ft^2 area that has PCB concentrations greater than 50 mg/kg; within this area is a smaller area of about 3 ft^2 with concentrations exceeding 500 mg/kg.

The results of the depth samples collected by LMS show substantial contamination with depth. Generally, the concentration of PCBs decreased with increasing depth. However, at core location 1 the highest concentration found of 7300 mg/kg was detected from the sample from the 1-2 in. interval, and at core location 3 the highest PCB concentration (230 mg/kg) found was from the deepest interval (4-5 in.). The surface interval (0-1 in.) ranged in concentration from 11 to 2000 mg/kg, the 1-2 in. interval ranged from 1.8 to 7300 mg/kg, the 2-3 in. interval ranged from 16 to 770 mg/kg, the 3-4 in. interval ranged from 7.5 to 65 mg/kg, and the bottom interval (4-5 in.) ranged from 9.7 to 230 mg/kg. The average concentration for each depth interval was as follows: 914 mg/kg (1500 mg/kg with all data) for 0-1 in., 2464 mg/kg for 1-2 in., 285 mg/kg for 2-3 in., 27 mg/kg for 3-4 in., and 96 mg/kg for 4-5 in.

6.3 RECOMMENDATIONS FOR ADDITIONAL STUDIES

This investigation has satisfied its objective to delineate the extent of the PCB contamination in the stream sediments and vault room floor and rechecked the possibility of any groundwater contamination. The sediment core sampling did not provide detailed delineation with depth because liquefied sediments prevented accurate sampling. However, detailed delineation with depth is not necessary to proceed with the feasibility study and selection of a remedial alternative, and can be accomplished during the remediation. Also, except for an elaborate



NOTE: Samples taken by Republic Environmental Systems, Inc.

Figure 6-9

Horizontal Distribution of PCBs on Cheney Building Vault Room Floor

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sampling program, pockets of buried PCB-contaminated sediments will not be found; these will be easier handled during the remediation.

The liquefied sediments indicate the need for more information concerning the hydrology of the stream and the ability to dewater or lower the water level for remediation. Any additional studies will depend on the remedial alternatives selected, e.g., an excavation alternative may need some dewatering investigations to design the dewatering scheme. These studies will be conducted as predesign investigations.

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APPENDIX A

GROUNDWATER SAMPLING SHEETS

WELL SAMPLING LOG

Date: 5 DECEMBER 1995
Crew: JE; VC
Job No: 659102
Project: DASNY Well Sample
Project Site: ~~HUDSON~~ PSYCH. CENTER
Hudson River

Well ID No: MW HR 16-6
Well Condition: GOOD, CUT LOCK OFF REPLACED W/ #2246
Well Depth/Diameter: 40.3 / 2"
Well Casing Type: PVC
Screened Interval: bottom 13'
Casing Ht/Lock No: STEEL: 2.60 PVC: 2.48 / 2246
Reference Pt: TOC (PVC)
Depth to Water (DTW): 10.75
Water Column; Ht/Vol: (29.55 x 1.05) 3 vols =
Purge Est: 93.08 gals
Purge Date/Time(s): 12.5.95 (1315 - 1400)
Purge Method: Submersible pump
Depth(s): Surface - mid screen
Rates (gpm): 2.6 gpm
Purged Volume: 95 GALLONS
DTW After Purging:

Yield Rate: L-M-(H)
Purge Observations: H2O black & silty @ beginning, clearing quickly. no odor.

PURGE CHEMISTRIES

VOL.	TEMP. (°C)	pH	SP. COND.	TURB.
10 gal	14.2	7.4	.609	7100
35 ~~30~~ gal	14.0	7.3	.699	<50
60 gal	13.8	7.1	.684	<50
90 gal	13.8	7.3	.686	<50

Comments: surged well every 5 gallons silted up & cleared quickly
H2O has slight swampy odor.

METERS USED
Temp: TLC #10
pH: Cole Parmer #204222 jm
Cond: TLC #10
Turb: DRT 15CE

DTW Before Sampling:
Sample Date/Time(s): 12.5.95 - 1405
Sampling Method: Bailer
Sampling Depth(s): Mid-screene
DTW After Sampling:
Sampling Observations: water slightly silty
Chain-of-Custody No(s):
Analytical Lab(s): E3I

SAMPLE CHEMISTRIES

	Temp. (°C)	pH	Sp. Cond.	Turb.
Start	13.8	7.3	686	<50
End	13.4	7.6	1674	750 <100

SAMPLE ANALYSES

Parameters	# BOTTLES ~~Inv.~~ Nr.	Pres. Meth.	Filt. (Y/N)
PCBs	2/1 liter glass	4°C	N

EPA METHOD: 91-3
2/1 LITER SAMPLE
2/1 LITER MS
2/1 LITER MSD

Air Temp: 40°s
Weather Conditions: clear, sunny cool

Crew Chief Signature: Jennifer Glass
Date: 12.5.95

WELL SAMPLING LOG

Date: 5 DECEMBER 1995
Crew: VC JE
Job No: 6659 102
Project: DASNY WELL SAMPLE
Project Site: DASNY HRPC

Well ID No: HRMW-17-6
Well Condition: GOOD - HAD TO CUT OLD LOCK OFF
Well Depth/Diameter: 57.10 / 3"
Well Casing Type: STEEL / PVC
Screened Interval: BOTTOM 10'
Casing Ht/Lock No: 2246
Reference Pt: TOC (PVC)
Depth to Water (DTW): 8.20 ft
Water Column; Ht/Vol: 48.90
Purge Est: 80 gallons
Purge Date/Time(s): 12.5.95 (1645-)
Purge Method: submersible pump
Depth(s): screened interval
Rates (gpm): 2-3 gpm
Purged Volume: 80 gallons
DTW After Purging:

Yield Rate: L-M-H
Purge Observations: water orange, cloudy clearing quickly

METERS USED

Temp: TLC #10
pH: Lole Palmer 222
Cond: TLC #1
Turb:

DTW Before Sampling:
Sample Date/Time(s): 12.5.95 /
Sampling Method: Bailer
Sampling Depth(s): MIDSCREEN
DTW After Sampling:
Sampling Observations:
Chain-of-Custody No(s):
Analytical Lab(s): E3I

SAMPLE CHEMISTRIES

	Temp. (°C)	pH	Sp. Cond.	Turb.
Start				
End				

SAMPLE ANALYSES

Parameters	Inv. No.	Pres. Meth.	Filt. (Y/N)
PCBs	2/1	4°C	N
Method 93-1	Liter glass	↓	↓

PURGE CHEMISTRIES

VOL.	TEMP. (°C)	pH	SP. COND.	TURB.
10	11.5	7.8	710	<50
20	13.5	8.0	.702	50-100
40	13.7	8.0	.698	50-100
60	13 7	8.0	.700	<50
80	13.6	8.0	.702	<50

Comments:
ITS COLD + DARK!

Air Temp: 30°s
Weather Conditions: COLD, CLOUDY

Crew Chief Signature: Vincent M Calvano Date: 12/5/95

WELL SAMPLING LOG

Date: 5 DECEMBER 1995
Crew: JE, VC
Job No: 659102
Project: DASNY WEZ SAMPLE
Project Site: DASNY HRPC

METERS USED
Temp: TLC #10
pH: CORNING #~~20A~~ 222
Cond: TLC #10
Turb: DRTSCE

Well ID No: HRMW19-6
Well Condition: GOOD HAD TO BREAK OFF OLD LOCK
Well Depth/Diameter: 38' / 3" well
Well Casing Type: Steel / PVC
Screened Interval: bottom 10'
Casing Ht/Lock No: 2246
Reference Pt: TOC (PVC)
Depth to Water (DTW): 10.5
Water Column; Ht/Vol: 27.5
Purge Est: 45 gals
Purge Date/Time(s): 12.5.95 (1535-1600)
Purge Method: submersible pump
Depth(s): mid screen
Rates (gpm): ~2 gpm
Purged Volume: 45 gals
DTW After Purging:

Yield Rate: (L)-M-H
Purge Observations: water not silty even when surging, pumped dry

DTW Before Sampling:
Sample Date/Time(s): 12.5.95 - 1610
Sampling Method:
Sampling Depth(s):
DTW After Sampling:
Sampling Observations:
Chain-of-Custody No(s):
Analytical Lab(s): E3I

PURGE CHEMISTRIES

VOL.	TEMP. (°C)	pH	SP. COND.	TURB.
10	10.8	7.8	695	50-80
20	11.8	5.0	651	
30				
40				

SAMPLE CHEMISTRIES

	Temp. (°C)	pH	Sp. Cond.	Turb.
Start				
End	10.9	8	710	450

SAMPLE ANALYSES

Parameters	# BOTTLES ~~Inv.~~ Ne.	Pres. Meth.	Filt. (Y/N)
PCB's	2	4°C	N
FB-1	2	↓	↓

1 LITER GLASS

1610

METHOD: 91-3

Comments:
22 g dry

Air Temp: 30's
Weather Conditions: CLOUDY, COLD

Crew Chief Signature: Stephen Mark Date: 12-5-95

APPENDIX B

ANALYTICAL DATA SUMMARY SHEETS

SEDIMENT SAMPLES

MOBILE LABORATORY RESULTS

Commonwealth Analytical

2 January 1996
P-295

Mr. Edward Maikish
LMS Engineers
One Blue Hill Plaza
Pearl River, NY 10965

RE:
Field Analytical Report
Hudson River Psychiatric Ctr. Remedial Inv.
Poughkeepsie, NY
November 8-17, 1995

Dear Mr. Maikish:

Enclosed please find the final results and report on the soil investigation conducted at the above-mentioned site. This five section report includes a narrative, analytical results, quality control results, confirmation results and chain of custody forms.

It was a pleasure working with LMS Engineers on this project and we look forward to working together again. If you have any questions on the report, please do not hesitate to contact me.

Very truly yours,
COMMONWEALTH ANALYTICAL

Stephen L. Knollmeyer
Laboratory Director

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11/8/95 **LMS Engineers/ HRPC Project.**

Client Sample ID	FRAC	DATE REC	DATE ANAL	ARC.1254 Mg/kg	ARC.1260 Mg/Kg	Dilution
SSD-1	01A	11/8/95	11/8/95	<0.5	0.7	
SSD-2	02A	11/8/95	11/8/95	<0.5	7.90	
SSD-3	03A	11/8/95	11/8/95	<0.5	3.9	
SSD-4	04A	11/8/95	11/8/95	<0.5	3.6	
SSD-5	05A	11/8/95	11/8/95	<0.5	<0.5	
SSD-6	06A	11/8/95	11/8/95	<0.5	4.2	
SSD-7	07A	11/8/95	11/8/95	<0.5	2.8	
SSD-8	08A	11/8/95	11/8/95	<0.5	9.4	
SSD-9	09A	11/8/95	11/8/95	<0.5	11	
SSD-10	10A	11/8/95	11/8/95	<0.5	2.4	
SSD-11	11A	11/8/95	11/8/95	<0.5	<0.5	
SSD-12	12A	11/8/95	11/8/95	<0.5	5.40	
SSD-13	13A	11/8/95	11/8/95	<0.5	15	
SSD-14	14A	11/8/95	11/8/95	<0.5	20	
SSD-15	15A	11/8/95	11/8/95	<0.5	0.80	
SSD-16	16A	11/8/95	11/8/95	<0.5	<0.5	
SSD-17	17A	11/8/95	11/8/95	<0.5	0.50	
SSD-18	18A	11/8/95	11/8/95	<0.5	<0.5	
SSD-19	19A	11/8/95	11/8/95	<0.5	3.20	
SSD-20	20A	11/8/95	11/9/95	<0.5	36	10
SSD-21	21A	11/8/95	11/9/95	<0.5	15	
SSD-22	22A	11/8/95	11/9/95	<0.5	<0.5	
SSD-23	23A	11/8/95	11/9/95	<0.5	<0.5	
SSD-24	24A	11/8/95	11/9/95	<0.5	<0.5	
SSD-25	25A	11/8/95	11/9/95	<0.5	4.20	
SSD-26	26A	11/8/95	11/9/95	<0.5	<0.5	
SSD-27	27A	11/8/95	11/9/95	<0.5	<0.5	
SSD-28	28A	11/8/95	11/9/95	<0.5	<0.5	
SSD-29	29A	11/8/95	11/9/95	<0.5	<0.5	
SSD-30	30A	11/8/95	11/9/95	<0.5	<0.5	
SSD-31	31A	11/8/95	11/9/95	<0.5	18	
SSD-32	32A	11/8/95	11/9/95	<0.5	17	

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11/9/95 **LMS Engineers/ HRPC Project.**

Client Sample ID	FRAC	DATE REC	DATE ANAL	ARC.1254 Mg/kg	ARC.1260 Mg/Kg	Dilution
SSD-33	01A	11/9/95	11/9/95	<0.5	0.6	
SSD-34	02A	11/9/95		<0.5	2	
SSD-35	03A	11/9/95		<0.5	9.8	
SSD-36	04A	11/9/95		<0.5	5.8	
SSD-37	05A	11/9/95		<0.5	250	100
SSD-38	06A	11/9/95		<0.5	41	10
SSD-39	07A	11/9/95		<0.5	<0.5	
SSD-40	08A	11/9/95		<0.5	240	100
SSD-41	09A	11/9/95		<0.5	3100	1000
SSD-42	10A	11/9/95		<0.5	780	100
SSD-43	11A	11/9/95		<0.5	870	100
SSD-44	12A	11/9/95		<0.5	360	100
SSD-45	13A	11/9/95		<0.5	550	100
SSD-46	14A	11/9/95		<0.5	9.6	
SSD-47	15A	11/9/95		<0.5	2.80	
SSD-48	16A	11/9/95		<0.5	1.90	
SSD-49	17A	11/9/95		<0.5	2.90	
SSD-50	18A	11/9/95		<0.5	4.70	
SSD-51	19A	11/9/95		<0.5	5.60	
SSD-52	20A	11/9/95		<0.5	<0.5	
SSD-53	21A	11/9/95		<0.5	1.90	
SSD-54	22A	11/9/95		<0.5	3.20	

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11/10/95 **LMS Engineers/ HRPC Project.**

Client Sample ID	FRAC	DATE REC	DATE ANAL.	ARC.1254 Mg/kg	ARC.1260 Mg/Kg	Dilution
SSD-55	01A	11/10/95	11/10/95	<0.5	4.4	
SSD-56	02A	11/10/95	11/10/95	<0.5	19	
SSD-57	03A	11/10/95	11/10/95	<0.5	5.6	
SSD-58	04A	11/10/95	11/10/95	<0.5	0.5	
SSD-59	05A	11/10/95	11/10/95	<0.5	<0.5	
SSD-60	06A	11/10/95	11/10/95	<0.5	<0.5	
SSD-61	07A	11/10/95	11/10/95	<0.5	16	
SSD-62	08A	11/10/95	11/10/95	<0.5	4.2	
SSD-63	09A	11/10/95	11/10/95	<0.5	19	
SSD-64	10A	11/10/95	11/10/95	<0.5	<0.5	
SSD-65	11A	11/10/95	11/10/95	<0.5	0.5	
SSD-66	12A	11/10/95	11/10/95	<0.5	<0.5	
SSD-67	13A	11/10/95	11/10/95	<0.5	<0.5	
SSD-68	14A	11/10/95	11/11/95	<0.5	<0.5	
SSD-69	15A	11/10/95	11/11/95	<0.5	<0.5	
SSD-70	16A	11/10/95	11/13/95	<0.5	420	100
SSD-71	17A	11/10/95	11/13/95	<0.5	220	100
SSD-72	18A	11/10/95	11/13/95	<0.5	470	100
SSD-73	19A	11/10/95	11/11/95	<0.5	7.3	
SSD-74	20A	11/10/95	11/13/95	<0.5	380	100
SSD-75	21A	11/10/95	11/13/95	<0.5	620	100
SSD-76	22A	11/10/95	11/13/95	<0.5	370	100
SSD-77	23A	11/10/95	11/14/95	<0.5	3800	1000
SSD-78	24A	11/10/95	11/13/95	<0.5	3100	1000
SSD-79	25A	11/10/95	11/14/95	<0.5	290	100
SSD-80	26A	11/10/95	11/14/95	<0.5	130	100

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11/13/95 **LMS Engineers/ HRPC Project.**

Client Sample ID	FRAC	DATE REC	DATE ANAL	ARC.1254 Mg/kg	ARC.1260 Mg/Kg	Dilution
SSD- 81	01A	11/13/95	11/13/95	<0.5	0.9	
SSD- 82	02A	11/13/95	11/13/95	<0.5	3.30	
SSD- 83	03A	11/13/95	11/13/95	<0.5	1.1	
SSD- 84	04A	11/13/95	11/13/95	<0.5	3.8	
SSD- 85	05A	11/13/95	11/13/95	<0.5	2.2	
SSD- 86	06A	11/13/95	11/13/95	<0.5	0.7	
SSD- 87	07A	11/13/95	11/13/95	<0.5	0.6	
SSD- 88	08A	11/13/95	11/14/95	<0.5	5.4	
SSD- 89	09A	11/13/95	11/14/95	<0.5	14	
SSD- 90	10A	11/13/95	11/14/95	<0.5	<0.5	
SSD- 91	11A	11/13/95	11/14/95	<0.5	<0.5	
SSD- 92	12A	11/13/95	11/14/95	<0.5	1.3	
SSD- 93	13A	11/13/95	11/14/95	<0.5	5700	1000
SSD- 94	14A	11/13/95	11/14/95	<0.5	120	100
SSD- 95	15A	11/13/95	11/14/95	<0.5	360	100
SSD- 96	16A	11/13/95	11/14/95	<0.5	410	4100
SSD- 97	17A	11/13/95	11/14/95	<0.5	15	
SSD- 98	18A	11/13/95	11/14/95	<0.5	9.30	
SSD- 99	19A	11/13/95	11/14/95	<0.5	2.4	
SSD- 100	20A	11/13/95	11/14/95	<0.5	48	10
SSD-101-0-6	21A	11/13/95	11/14/95	<0.5	0.50	
SSD-101-6-12	22A	11/13/95	11/14/95	<0.5	<0.5	
SSD-101-12-18	23A	11/13/95	11/14/95	<0.5	<0.5	
SSD-102-0-6	24A	11/13/95	11/14/95	<0.5	2.80	
SSD-102-12-18	25A	11/13/95	11/14/95	<0.5	0.70	
SSD-102-18-24	26A	11/13/95	11/14/95	<0.5	0.80	

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11/14/95 **LMS Engineers/ HRPC Project.**

Client Sample ID	FRAC	DATE REC	DATE ANAL.	ARC.1254 Mg/kg	ARC.1260 Mg/Kg	Dilution
SSD-103-0-6	01A	11/14/95	11/14/95	<0.5	<0.5	
SSD-103-6-12	02A	11/14/95	11/14/95	<0.5	<0.5	
SSD-104-0-6	03A	11/14/95	11/14/95	<0.5	<0.5	
SSD-104-6-24	04A	11/14/95	11/14/95	<0.5	0.5	
SSD-105-0-6	05A	11/14/95	11/14/95	<0.5	<0.5	
SSD-105-6-12	06A	11/14/95	11/14/95	<0.5	<0.5	
SSD-106-0-6	07A	11/14/95	11/14/95	<0.5	<0.5	
SSD-107-0-6	08A	11/14/95	11/14/95	<0.5	<0.5	
SSD-107-6-12	09A	11/14/95	11/14/95	<0.5	<0.5	
SSD-108	10A	11/14/95	11/15/95	<0.5	100	10
SSD-109	11A	11/14/95	11/15/95	<0.5	1300	100
SSD-110	12A	11/14/95	11/15/95	<0.5	270	100
SSD-111	13A	11/14/95	11/15/95	<0.5	130	100
SSD-112	14A	11/14/95	11/15/95	<0.5	480	100
SSD-113	15A	11/14/95	11/15/95	<0.5	230	100
SSD-114	16A	11/14/95	11/15/95	<0.5	24	
SSD-115	17A	11/14/95	11/15/95	<0.5	1.50	
SSD-116	18A	11/14/95	11/15/95	<0.5	<0.5	
SSD-117	19A	11/14/95	11/15/95	<0.5	0.60	
SSD-118	20A	11/14/95	11/15/95	<0.5	<0.5	

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11/15/95 **LMS Engineers/ HRPC Project.**

Client Sample ID	FRAC	DATE REC	DATE ANAL	ARC 1254 Mg/kg	ARC 1260 Mg/Kg	Dilution
SSD-119	01A	11/15/95	11/15/95	<0.5	1.2	
SSD-120	02A	11/15/95	11/15/95	<0.5	1.30	
SSD-121-0-6	03A	11/15/95	11/15/95	<0.5	<0.5	
SSD-121-6-12	04A	11/15/95	11/15/95	<0.5	<0.5	
SSD-122	05A	11/15/95	11/16/95	<0.5	1.3	
SSD-123-0-6	06A	11/15/95	11/16/95	<0.5	<0.5	
SSD-123-6-12	07A	11/15/95	11/16/95	<0.5	<0.5	
SSD-124	08A	11/15/95	11/16/95	<0.5	1.8	
SSD-125	09A	11/15/95	11/16/95	<0.5	130	100
SSD-126-0-6	10A	11/15/95	11/16/95	<0.5	3.5	
SSD-126-12-24	11A	11/15/95	11/16/95	<0.5	<0.5	
SSD-127	12A	11/15/95	11/16/95	<0.5	180	100
SSD-128	13A	11/15/95	11/16/95	<0.5	0.60	
SSD-129-6-12	14A	11/15/95	11/16/95	<0.5	<0.5	
SSD-129-12-18	15A	11/15/95	11/16/95	<0.5	1.80	
SSD-129-18-24	16A	11/15/95	11/16/95	<0.5	0.80	
SSD-130-6-12	17A	11/15/95	11/16/95	<0.5	40	10
SSD-130-12-18	18A	11/15/95	11/16/95	<0.5	7.10	
SSD-130-18-24	19A	11/15/95	11/16/95	<0.5	5.2	
SSD-131-0-6	20A	11/15/95	11/16/95	<0.5	<0.5	
SSD-131-6-12	21A	11/15/95	11/16/95	<0.5	<0.5	
SSD-131-12-18	22A	11/15/95	11/16/95	<0.5	<0.5	
SSD-132-0-6	23A	11/15/95	11/16/95	<0.5	<0.5	
SSD-132-6-12	24A	11/15/95	11/16/95	<0.5	<0.5	
SSD-133	25A	11/15/95	11/16/95	<0.5	<0.5	
SSD-134-0-6	26A	11/15/95	11/16/95	<0.5	<0.5	
SSD-134-6-12	27A	11/15/95	11/16/95	<0.5	<0.5	
SSD-135	28A	11/15/95	11/16/95	<0.5	<0.5	

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11/16/95 **LMS Engineers/ HRPC Project.**

Client Sample ID	FRAC	DATE REC	DATE ANAL.	ARC 1254 Mg/kg	ARC 1260 Mg/Kg	Dilution
SSD-136-6-12	01A	11/16/95	11/17/95	<0.5	2	100
SSD-136-12-24	02A	11/16/95	11/17/95	<0.5	1	
SSD-137-0-6	03A	11/16/95	11/17/95	<0.5	<0.5	
SSD-137-6-12	04A	11/16/95	11/17/95	<0.5	<0.5	
SSD-138-0-12	05A	11/16/95	11/17/95	<0.5	<0.5	
SSD-138-2.5-3	06A	11/16/95	11/17/95	<0.5	0.5	
SSD-139-0-6	07A	11/16/95	11/127/95	<0.5	130	100
SSD-139-6-12	08A	11/16/95	11/17/*5	<0.5	<0.5	
SSD-139-12-24	09A	11/16/95	11/17/95	<0.5	2.20	
SSD-140-0-6	10A	11/16/95	11/17/95	<0.5	47	10
SSD-140-6-12	11A	11/16/95	11/17/95	<0.5	<0.5	
SSD-140-12-18	12A	11/16/95	11/17/95	<0.5	43	10
SSD-141-0-6	13A	11/16/95	11/17/95	<0.5	80	100
SSD-141-6-12	14A	11/16/95	11/17/95	<0.5	7.1	
SSD-141-12-18	15A	11/16/95	11/17/95	<0.5	0.80	
SSD-141-2.8	16A	11/16/95	11/17/95	<0.5	<0.5	
SSD-142	17A	11/16/95	11/17/95	<0.5	<0.5	
SSD-143	18A	11/16/95	11/17/95	<0.5	<0.5	
SSD-144	19A	11/16/95	11/17/95	<0.5	0.5	
SSD-145	20A	11/16/95	11/17/95	<0.5	<0.5	
SSD-146	21A	11/16/95	11/17/95	<0.5	2.60	
SSD-147	22A	11/16/95	11/17/95	<0.5	1.60	
SSD-148	23A	11/16/95	11/17/95	<0.5	0.60	

Commonwealth Analytical

11/17/95 **LMS Engineers/ HRPC Project.**

Client Sample ID	FRAC	DATE REC	DATE ANAL	ARC 1254 Mg/kg	ARC 1260 Mg/Kg	Dilution
SSD-149-0-6	01A	11/17/95	11/17/95	<0.5	1.4	
SSD-149-6-12	02A	11/17/95	11/18/95	<0.5	<0.5	
SSD-149-12-18	03A	11/17/95	11/18/95	<0.5	<0.5	
SSD-149-18-24	04A	11/17/95	11/18/95	<0.5	<0.5	
SSD-150	05A	11/17/95	11/18/95	<0.5	0.9	
SSD-151	06A	11/17/95	11/18/95	<0.5	<0.5	
SSD-152	07A	11/17/95	11/18/95	<0.5	210	100
SSD-153	08A	11/17/95	11/18/95	<0.5	8.8	
SSD-154-0-6	09A	11/17/95	11/18/95	<0.5	<0.5	
SSD-154-6-12	10A	11/17/95	11/18/95	<0.5	<0.5	
SSD-154-12-18	11A	11/17/95	11/18/95	<0.5	<0.5	
SSD-154-18-24	12A	11/17/95	11/18/95	<0.5	<0.5	
SSD-155-0-6	13A	11/17/95	11/18/95	<0.5	180	100
SSD-155-6-12	14A	11/17/95	11/18/95	<0.5	4.00	
SSD-155-12-18	15A	11/17/95	11/18/95	<0.5	<0.5	
SSD-155-18-24	16A	11/17/95	11/18/95	<0.5	<0.5	
SSD-156-0-6	17A	11/17/95	11/18/95	<0.5	24	10
SSD-156-6-12	18A	11/17/95	11/18/95	<0.5	260	10
SSD-157-12-18	19A	11/17/95	11/18/95	<0.5	<0.5	
SSD-157-18-24	20A	11/17/95	11/18/95	<0.5	<0.5	

SEDIMENT SAMPLES

SDG No. SSD34

To be included with all lab data and with each workplan

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

SAMPLE IDENTIFICATION AND ANALYTICAL REQUIREMENT SUMMARY

Customer Sample Code	Laboratory Sample Code	Analytical Requirements					
		VOA GC/MS Method #	BNA GC/MS Method #	VOA GC Method #	~~Pest~~ PCBs Method #	Metals	Other
SSD-34(1-2)	960244-1				✓		
SSD-36(1-2)	960244-2				✓		
SSD-39(1-2)	960244-3				✓		
SSD-81	960255-1				✓		
SSD-82	960255-2				✓		
SSD-85	960255-3				✓		
SSD-93	960256-1				✓		
SSD-94	960256-2				✓		
SSD-96	960256-3				✓		
SSD-155	960240-1				✓		
SSD-149(0-6)	290-2				✓		
SSD-153	290-3				✓		
SSD-157(0-6)	290-4				✓		
SSD-152	290-5				✓		
SSD-152(6-12)	290-6				✓		
SSD-157	290-7				✓		
SSD-156(0-6)	290-8				✓		
SSD-154	290-9				✓		
SSD-150	290-10				✓		
SSD-156(12-18)	290-11				✓		
SSD-156(18-24)	290-12				✓		
SSD-157(6-12)	290-13				✓		

1 G

PCB ANALYSIS DATA SHEET

Client Sample ID: SSD-34(1-2)

Lab Name:	E3I	Case No.:	DASNY RI		
Lab Code:	E3I	SDG:	SSD34		
Matrix:	Soil			Lab Sample ID:	960244-1
Extraction:	Sonication			Lab File ID:	31OCT353.D
% Moisture:	30.0			Date Received:	11/10/95
Decanted:				Date Extracted:	11/14/95
				Date Analyzed:	11/17/95
Sample Size:	30.0	g			
Extract Volume:	10.0	mL		Dilution Factor:	30.0
Injection Volume:	1.0	uL		pH:	7.5
GPC Cleanup:	N			Sulfur Cleanup:	Y

CAS No.	Compound	Concentration Units: (UG/KG)	Q
12674-11-2	Aroclor-1016	1400	U
11104-28-2	Aroclor-1221	2900	U
11141-16-5	Aroclor-1232	1400	U
53469-21-9	Aroclor-1242	1400	U
12672-29-6	Aroclor-1248	1400	U
11097-69-1	Aroclor-1254	1400	U
11096-82-5	Aroclor-1260	11000	

(Q) - Qualifiers:

U: Analyzed for but not detected.
B: Found in associated blank as well as sample.
J: Estimated value, below quantitation limit.
P: %D for concentrations between two GC columns is >25%.
C: Confirmed by GC/MS.

1 G
PCB ANALYSIS DATA SHEET

Client Sample ID: SSD-36(1-2)

Lab Name:	E3I	Case No.:	DASNY RI		
Lab Code:	E3I	SDG:	SSD34		
Matrix:	Soil			Lab Sample ID:	960244-2
Extraction:	Sonication			Lab File ID:	31OCT354.D
% Moisture:	43.0			Date Received:	11/10/95
Decanted:				Date Extracted:	11/14/95
				Date Analyzed:	11/17/95
Sample Size:	30.0	g			
Extract Volume:	10.0	mL		Dilution Factor:	20.0
Injection Volume:	1.0	uL		pH:	8.0
GPC Cleanup:	N			Sulfur Cleanup:	Y

CAS No.	Compound	Concentration Units: (UG/KG)	Q
12674-11-2	Aroclor-1016	1200	U
11104-28-2	Aroclor-1221	2300	U
11141-16-5	Aroclor-1232	8600	
53469-21-9	Aroclor-1242	1200	U
12672-29-6	Aroclor-1248	1200	U
11097-69-1	Aroclor-1254	1200	U
11096-82-5	Aroclor-1260	1200	U

(Q) - Qualifiers:

U: Analyzed for but not detected.
B: Found in associated blank as well as sample.
J: Estimated value, below quantitation limit.
P: %D for concentrations between two GC columns is >25%.
C: Confirmed by GC/MS.

1 G

PCB ANALYSIS DATA SHEET

Client Sample ID: SSD-39(1-2)

Lab Name:	E3I	Case No.:	DASNY RI
Lab Code:	E3I	SDG:	LMS
Matrix:	Soil	Lab Sample ID:	960244-3
Extraction:	Sonication	Lab File ID:	31OCT338.D
% Moisture:	53.0	Date Received:	11/10/95
Decanted:		Date Extracted:	11/14/95
		Date Analyzed:	11/17/95
Sample Size:	30.0 g		
Extract Volume:	10.0 mL	Dilution Factor:	1.0
Injection Volume:	1.0 uL	pH:	7.5
GPC Cleanup:	N	Sulfur Cleanup:	Y

CAS No.	Compound	Concentration Units: (UG/KG)	Q
12674-11-2	Aroclor-1016	71	U
11104-28-2	Aroclor-1221	140	U
11141-16-5	Aroclor-1232	71	U
53469-21-9	Aroclor-1242	71	U
12672-29-6	Aroclor-1248	71	U
11097-69-1	Aroclor-1254	210	
11096-82-5	Aroclor-1260	71	U

(Q) - Qualifiers:

U: Analyzed for but not detected.
B: Found in associated blank as well as sample.
J: Estimated value, below quantitation limit.
P: %D for concentrations between two GC columns is >25%.
C: Confirmed by GC/MS.

000013

1 G
PCB ANALYSIS DATA SHEET

Client Sample ID: SSD-81

Lab Name:	E3I	Case No.:	DASNY HRPC
Lab Code:	E3I	SDG:	SSD34
Matrix:	Soil	Lab Sample ID:	960255-1
Extraction:	Sonication	Lab File ID:	20NOV093.D
% Moisture:	31.0	Date Received:	11/14/95
Decanted:		Date Extracted:	11/20/95
		Date Analyzed:	11/21/95
Sample Size:	30.0 g		
Extract Volume:	10.0 mL	Dilution Factor:	3.0
Injection Volume:	1.0 uL	pH:	7.5
GPC Cleanup:	N	Sulfur Cleanup:	Y

CAS No.	Compound	Concentration Units: (UG/KG)	Q
12674-11-2	Aroclor-1016	140	U
11104-28-2	Aroclor-1221	290	U
11141-16-5	Aroclor-1232	140	U
53469-21-9	Aroclor-1242	140	U
12672-29-6	Aroclor-1248	140	U
11097-69-1	Aroclor-1254	140	U
11096-82-5	Aroclor-1260	750	

(Q) - Qualifiers:

U: Analyzed for but not detected.
B: Found in associated blank as well as sample.
J: Estimated value, below quantitation limit.
P: %D for concentrations between two GC columns is >25%.
C: Confirmed by GC/MS.

1 G

PCB ANALYSIS DATA SHEET

Client Sample ID: SSD-82

Lab Name:	E3I	Case No.:	DASNY HRPC		
Lab Code:	E3I	SDG:	SSD34		
Matrix:	Soil			Lab Sample ID:	960255-2
Extraction:	Sonication			Lab File ID:	20NOV31.D
% Moisture:	72.0			Date Received:	11/14/95
Decanted:				Date Extracted:	11/20/95
				Date Analyzed:	11/21/95
Sample Size:	30.0	g			
Extract Volume:	10.0	mL		Dilution Factor:	10.0
Injection Volume:	1.0	uL		pH:	8.0
GPC Cleanup:	N			Sulfur Cleanup:	Y

CAS No.	Compound	Concentration Units: (UG/KG)	Q
12674-11-2	Aroclor-1016	1200	U
11104-28-2	Aroclor-1221	2400	U
11141-16-5	Aroclor-1232	1200	U
53469-21-9	Aroclor-1242	1200	U
12672-29-6	Aroclor-1248	1200	U
11097-69-1	Aroclor-1254	1200	U
11096-82-5	Aroclor-1260	9000	

(Q) - Qualifiers:

U: Analyzed for but not detected.
B: Found in associated blank as well as sample.
J: Estimated value, below quantitation limit.
P: %D for concentrations between two GC columns is >25%.
C: Confirmed by GC/MS.

1 G

PCB ANALYSIS DATA SHEET

Client Sample ID: SSD-85

Lab Name:	E3I	Case No.:	DASNY HRPC
Lab Code:	E3I	SDG:	SSD34
Matrix:	Soil	Lab Sample ID:	960255-3
Extraction:	Sonication	Lab File ID:	20NOV55.DD
% Moisture:	54.0	Date Received:	11/14/95
Decanted:		Date Extracted:	11/20/95
		Date Analyzed:	11/22/95
Sample Size:	30.0 g		
Extract Volume:	10.0 mL	Dilution Factor:	5.0
Injection Volume:	1.0 uL	pH:	7.5
GPC Cleanup:	N	Sulfur Cleanup:	Y

CAS No.	Compound	Concentration Units: (UG/KG)	Q
12674-11-2	Aroclor-1016	360	U
11104-28-2	Aroclor-1221	720	U
11141-16-5	Aroclor-1232	360	U
53469-21-9	Aroclor-1242	360	U
12672-29-6	Aroclor-1248	360	U
11097-69-1	Aroclor-1254	360	U
11096-82-5	Aroclor-1260	2100	

(Q) - Qualifiers:

U: Analyzed for but not detected.
B: Found in associated blank as well as sample.
J: Estimated value, below quantitation limit.
P: %D for concentrations between two GC columns is >25%.
C: Confirmed by GC/MS.

1 G
PCB ANALYSIS DATA SHEET

Client Sample ID: SSD-93

Lab Name:	E3I	Case No.:	DASNY HRPC
Lab Code:	E3I	SDG:	SSD34
Matrix:	Soil	Lab Sample ID:	960256-1
Extraction:	Sonication	Lab File ID:	31OCT359.D
% Moisture:	34.0	Date Received:	11/14/95
Decanted:		Date Extracted:	11/14/95
		Date Analyzed:	11/17/95
Sample Size:	30.0 g		
Extract Volume:	10.0 mL	Dilution Factor:	50000
Injection Volume:	1.0 uL	pH:	7.5
GPC Cleanup:	N	Sulfur Cleanup:	Y

CAS No.	Compound	Concentration Units: (UG/KG)	Q
12674-11-2	Aroclor-1016	2500000	U
11104-28-2	Aroclor-1221	5000000	U
11141-16-5	Aroclor-1232	2500000	U
53469-21-9	Aroclor-1242	2500000	U
12672-29-6	Aroclor-1248	2500000	U
11097-69-1	Aroclor-1254	2500000	U
11096-82-5	Aroclor-1260	16000000	

(Q) - Qualifiers:

U: Analyzed for but not detected.
B: Found in associated blank as well as sample.
J: Estimated value, below quantitation limit.
P: %D for concentrations between two GC columns is >25%.
C: Confirmed by GC/MS.

1 G
PCB ANALYSIS DATA SHEET

Client Sample ID: SSD-94

Lab Name:	E3I	Case No.:	DASNY HRPC
Lab Code:	E3I	SDG:	SSD34
Matrix:	Soil	Lab Sample ID:	960256-2
Extraction:	Sonication	Lab File ID:	31OCT346.D
% Moisture:	41.0	Date Received:	11/14/95
Decanted:		Date Extracted:	11/14/95
		Date Analyzed:	11/17/95
Sample Size:	30.0 g		
Extract Volume:	10.0 mL	Dilution Factor:	1000.0
Injection Volume:	1.0 uL	pH:	7.5
GPC Cleanup:	N	Sulfur Cleanup:	Y

CAS No.	Compound	Concentration Units: (UG/KG)	Q
12674-11-2	Aroclor-1016	56000	U
11104-28-2	Aroclor-1221	110000	U
11141-16-5	Aroclor-1232	56000	U
53469-21-9	Aroclor-1242	56000	U
12672-29-6	Aroclor-1248	56000	U
11097-69-1	Aroclor-1254	56000	U
11096-82-5	Aroclor-1260	490000	

(Q) - Qualifiers:

U: Analyzed for but not detected.
B: Found in associated blank as well as sample.
J: Estimated value, below quantitation limit.
P: %D for concentrations between two GC columns is >25%.
C: Confirmed by GC/MS.

000018

1 G

PCB ANALYSIS DATA SHEET

Client Sample ID: SSD-96

Lab Name:	E3I	Case No.:	DASNY HRPC
Lab Code:	E3I	SDG:	SSD34
Matrix:	Soil	Lab Sample ID:	960256-3
Extraction:	Sonication	Lab File ID:	31OCT356.D
% Moisture:	41.0	Date Received:	11/14/95
Decanted:		Date Extracted:	11/14/95
		Date Analyzed:	11/17/95
Sample Size:	30.0 g		
Extract Volume:	10.0 mL	Dilution Factor:	200.0
Injection Volume:	1.0 uL	pH:	7.5
GPC Cleanup:	N	Sulfur Cleanup:	Y

CAS No.	Compound	Concentration Units: (UG/KG)	Q
12674-11-2	Aroclor-1016	11000	U
11104-28-2	Aroclor-1221	23000	U
11141-16-5	Aroclor-1232	11000	U
53469-21-9	Aroclor-1242	11000	U
12672-29-6	Aroclor-1248	11000	U
11097-69-1	Aroclor-1254	11000	U
11096-82-5	Aroclor-1260	87000	

(Q) - Qualifiers:

U: Analyzed for but not detected.
B: Found in associated blank as well as sample.
J: Estimated value, below quantitation limit.
P: %D for concentrations between two GC columns is >25%.
C: Confirmed by GC/MS.

1 G

PCB ANALYSIS DATA SHEET

Client Sample ID: SSD-155

Lab Name:	E3I	Case No.:	DASNY HRPC
Lab Code:	E3I	SDG:	SSD34
Matrix:	Soil	Lab Sample ID:	960290-1
Extraction:	Sonication	Lab File ID:	20NOV56.D
% Moisture:	49.0	Date Received:	11/18/95
Decanted:		Date Extracted:	11/20/95
		Date Analyzed:	11/22/95
Sample Size:	30.0 g		
Extract Volume:	10.0 mL	Dilution Factor:	300.0
Injection Volume:	1.0 uL	pH:	5.3
GPC Cleanup:	N	Sulfur Cleanup:	Y

CAS No.	Compound	Concentration Units: (UG/KG)	Q
12674-11-2	Aroclor-1016	20000	U
11104-28-2	Aroclor-1221	39000	U
11141-16-5	Aroclor-1232	20000	U
53469-21-9	Aroclor-1242	20000	U
12672-29-6	Aroclor-1248	20000	U
11097-69-1	Aroclor-1254	20000	U
11096-82-5	Aroclor-1260	180000	P

(Q) - Qualifiers:

U: Analyzed for but not detected.
B: Found in associated blank as well as sample.
J: Estimated value, below quantitation limit.
P: %D for concentrations between two GC columns is >25%.
C: Confirmed by GC/MS.

1 G

PCB ANALYSIS DATA SHEET

Client Sample ID: SSD-149(0-6)

Lab Name:	E3I	Case No.:	DASNY HRPC		
Lab Code:	E3I	SDG:	SSD34		
Matrix:	Soil			Lab Sample ID:	960290-2
Extraction:	Sonication			Lab File ID:	20NOV57.D
% Moisture:	19.0			Date Received:	11/18/95
Decanted:				Date Extracted:	11/20/95
				Date Analyzed:	11/22/95
Sample Size:	30.0	g			
Extract Volume:	10.0	mL		Dilution Factor:	10.0
Injection Volume:	1.0	uL		pH:	4.7
GPC Cleanup:	N			Sulfur Cleanup:	Y

CAS No.	Compound	Concentration Units: (UG/KG)	Q
12674-11-2	Aroclor-1016	410	U
11104-28-2	Aroclor-1221	820	U
11141-16-5	Aroclor-1232	410	U
53469-21-9	Aroclor-1242	410	U
12672-29-6	Aroclor-1248	410	U
11097-69-1	Aroclor-1254	410	U
11096-82-5	Aroclor-1260	2700	

(Q) - Qualifiers:

U: Analyzed for but not detected.
B: Found in associated blank as well as sample.
J: Estimated value, below quantitation limit.
P: %D for concentrations between two GC columns is >25%.
C: Confirmed by GC/MS.

000021

1 G
PCB ANALYSIS DATA SHEET

Client Sample ID: SSD-153

Lab Name:	E3I	Case No.:	DASNY HRPC		
Lab Code:	E3I	SDG:	SSD34		
Matrix:	Soil			Lab Sample ID:	960290-3
Extraction:	Sonication			Lab File ID:	20NOV58.D
% Moisture:	34.0			Date Received:	11/18/95
Decanted:				Date Extracted:	11/20/95
				Date Analyzed:	11/22/95
Sample Size:	30.0	g			
Extract Volume:	10.0	mL		Dilution Factor:	20.0
Injection Volume:	1.0	uL		pH:	5.5
GPC Cleanup:	N			Sulfur Cleanup:	Y

CAS No.	Compound	Concentration Units: (UG/KG)	Q
12674-11-2	Aroclor-1016	1000	U
11104-28-2	Aroclor-1221	2000	U
11141-16-5	Aroclor-1232	1000	U
53469-21-9	Aroclor-1242	1000	U
12672-29-6	Aroclor-1248	1000	U
11097-69-1	Aroclor-1254	1000	U
11096-82-5	Aroclor-1260	9400	

(Q) - Qualifiers:

U: Analyzed for but not detected.
B: Found in associated blank as well as sample.
J: Estimated value, below quantitation limit.
P: %D for concentrations between two GC columns is >25%.
C: Confirmed by GC/MS.

1 G

PCB ANALYSIS DATA SHEET

Client Sample ID: SSD-157(0-6)

Lab Name:	E3I	Case No.:	DASNY HRPC
Lab Code:	E3I	SDG:	SSD34
Matrix:	Soil	Lab Sample ID:	960290-4
Extraction:	Sonication	Lab File ID:	20NOV59.D
% Moisture:	32.0	Date Received:	11/18/95
Decanted:		Date Extracted:	11/20/95
		Date Analyzed:	11/22/95
Sample Size:	30.0 g		
Extract Volume:	10.0 mL	Dilution Factor:	50.0
Injection Volume:	1.0 uL	pH:	5.5
GPC Cleanup:	N	Sulfur Cleanup:	Y

CAS No.	Compound	Concentration Units: (UG/KG)	Q
12674-11-2	Aroclor-1016	2500	U
11104-28-2	Aroclor-1221	4900	U
11141-16-5	Aroclor-1232	2500	U
53469-21-9	Aroclor-1242	2500	U
12672-29-6	Aroclor-1248	2500	U
11097-69-1	Aroclor-1254	2500	U
11096-82-5	Aroclor-1260	17000	

(Q) - Qualifiers:

U: Analyzed for but not detected.
B: Found in associated blank as well as sample.
J: Estimated value, below quantitation limit.
P: %D for concentrations between two GC columns is >25%.
C: Confirmed by GC/MS.

1 G

PCB ANALYSIS DATA SHEET

Client Sample ID: SSD-152

Lab Name:	E3I	Case No.:	DASNY HRPC		
Lab Code:	E3I	SDG:	SSD34		
Matrix:	Soil			Lab Sample ID:	960290-5
Extraction:	Sonication			Lab File ID:	20NOV88.D
% Moisture:	56.0			Date Received:	11/18/95
Decanted:				Date Extracted:	11/20/95
				Date Analyzed:	11/24/95
Sample Size:	30.0	g			
Extract Volume:	10.0	mL		Dilution Factor:	2000.0
Injection Volume:	1.0	uL		pH:	5.5
GPC Cleanup:	N			Sulfur Cleanup:	Y

CAS No.	Compound	Concentration Units: (UG/KG)	Q
12674-11-2	Aroclor-1016	150000	U
11104-28-2	Aroclor-1221	300000	U
11141-16-5	Aroclor-1232	150000	U
53469-21-9	Aroclor-1242	150000	U
12672-29-6	Aroclor-1248	150000	U
11097-69-1	Aroclor-1254	150000	U
11096-82-5	Aroclor-1260	910000	

(Q) - Qualifiers:

U: Analyzed for but not detected.
B: Found in associated blank as well as sample.
J: Estimated value, below quantitation limit.
P: %D for concentrations between two GC columns is >25%.
C: Confirmed by GC/MS.

000024

1 G
PCB ANALYSIS DATA SHEET

Client Sample ID: SSD-156(6-12)

Lab Name:	E3I	Case No.:	DASNY HRPC		
Lab Code:	E3I	SDG:	SSD34		
Matrix:	Soil			Lab Sample ID:	960290-6
Extraction:	Sonication			Lab File ID:	20NOV89.D
% Moisture:	31.0			Date Received:	11/18/95
Decanted:				Date Extracted:	11/20/95
				Date Analyzed:	11/24/95
Sample Size:	30.0	g			
Extract Volume:	10.0	mL		Dilution Factor:	2000.0
Injection Volume:	1.0	uL		pH:	5.8
GPC Cleanup:	N			Sulfur Cleanup:	Y

CAS No.	Compound	Concentration Units: (UG/KG)	Q
12674-11-2	Aroclor-1016	97000	U
11104-28-2	Aroclor-1221	190000	U
11141-16-5	Aroclor-1232	97000	U
53469-21-9	Aroclor-1242	97000	U
12672-29-6	Aroclor-1248	97000	U
11097-69-1	Aroclor-1254	97000	U
11096-82-5	Aroclor-1260	560000	

(Q) - Qualifiers:

U: Analyzed for but not detected.
B: Found in associated blank as well as sample.
J: Estimated value, below quantitation limit.
P: %D for concentrations between two GC columns is >25%.
C: Confirmed by GC/MS.

1 G

PCB ANALYSIS DATA SHEET

Client Sample ID: SSD-151

Lab Name:	E3I	Case No.:	DASNY HRPC		
Lab Code:	E3I	SDG:	SSD34		
Matrix:	Soil			Lab Sample ID:	960290-7
Extraction:	Sonication			Lab File ID:	20NOV62.D
% Moisture:	48.0			Date Received:	11/18/95
Decanted:				Date Extracted:	11/20/95
				Date Analyzed:	11/24/95
Sample Size:	30.0	g			
Extract Volume:	10.0	mL		Dilution Factor:	5.0
Injection Volume:	1.0	uL		pH:	5.5
GPC Cleanup:	N			Sulfur Cleanup:	Y

CAS No.	Compound	Concentration Units: (UG/KG)	Q
12674-11-2	Aroclor-1016	320	U
11104-28-2	Aroclor-1221	640	U
11141-16-5	Aroclor-1232	320	U
53469-21-9	Aroclor-1242	320	U
12672-29-6	Aroclor-1248	320	U
11097-69-1	Aroclor-1254	320	U
11096-82-5	Aroclor-1260	1500	P

(Q) - Qualifiers:

U: Analyzed for but not detected.
B: Found in associated blank as well as sample.
J: Estimated value, below quantitation limit.
P: %D for concentrations between two GC columns is >25%.
C: Confirmed by GC/MS.

1 G

PCB ANALYSIS DATA SHEET

Client Sample ID: SSD-156(0-6)

Lab Name:	E3I	Case No.:	DASNY HRPC		
Lab Code:	E3I	SDG:	SSD34		
Matrix:	Soil			Lab Sample ID:	960290-8
Extraction:	Sonication			Lab File ID:	20NOV90.D
% Moisture:	34.0			Date Received:	11/18/95
Decanted:				Date Extracted:	11/20/95
				Date Analyzed:	11/24/95
Sample Size:	30.0	g			
Extract Volume:	10.0	mL		Dilution Factor:	600.0
Injection Volume:	1.0	uL		pH:	5.8
GPC Cleanup:	N			Sulfur Cleanup:	Y

CAS No.	Compound	Concentration Units: (UG/KG)	Q
12674-11-2	Aroclor-1016	30000	U
11104-28-2	Aroclor-1221	61000	U
11141-16-5	Aroclor-1232	30000	U
53469-21-9	Aroclor-1242	30000	U
12672-29-6	Aroclor-1248	30000	U
11097-69-1	Aroclor-1254	30000	U
11096-82-5	Aroclor-1260	170000	

(Q) - Qualifiers:

U: Analyzed for but not detected.
B: Found in associated blank as well as sample.
J: Estimated value, below quantitation limit.
P: %D for concentrations between two GC columns is >25%.
C: Confirmed by GC/MS.

000027

1 G
PCB ANALYSIS DATA SHEET

Client Sample ID: SSD-154

Lab Name:	E3I	Case No.:	DASNY HRPC		
Lab Code:	E3I	SDG:	SSD34		
Matrix:	Soil			Lab Sample ID:	960290-9
Extraction:	Sonication			Lab File ID:	20NOV64.D
% Moisture:	51.0			Date Received:	11/18/95
Decanted:				Date Extracted:	11/20/95
				Date Analyzed:	11/24/95
Sample Size:	30.0	g			
Extract Volume:	10.0	mL		Dilution Factor:	10.0
Injection Volume:	1.0	uL		pH:	5.0
GPC Cleanup:	N			Sulfur Cleanup:	Y

CAS No.	Compound	Concentration Units: (UG/KG)	Q
12674-11-2	Aroclor-1016	680	U
11104-28-2	Aroclor-1221	1400	U
11141-16-5	Aroclor-1232	680	U
53469-21-9	Aroclor-1242	680	U
12672-29-6	Aroclor-1248	680	U
11097-69-1	Aroclor-1254	680	U
11096-82-5	Aroclor-1260	5200	

(Q) - Qualifiers:

U: Analyzed for but not detected.
B: Found in associated blank as well as sample.
J: Estimated value, below quantitation limit.
P: %D for concentrations between two GC columns is >25%.
C: Confirmed by GC/MS.

1 G

PCB ANALYSIS DATA SHEET

Client Sample ID: SSD-150

Lab Name:	E3I	Case No.:	DASNY HRPC		
Lab Code:	E3I	SDG:	SSD34		
Matrix:	Soil			Lab Sample ID:	960290-10
Extraction:	Sonication			Lab File ID:	20NOV65.D
% Moisture:	19.0			Date Received:	11/18/95
Decanted:				Date Extracted:	11/20/95
				Date Analyzed:	11/24/95
Sample Size:	30.0	g			
Extract Volume:	10.0	mL		Dilution Factor:	6.0
Injection Volume:	1.0	uL		pH:	4.7
GPC Cleanup:	N			Sulfur Cleanup:	Y

CAS No.	Compound	Concentration Units: (UG/KG)	Q
12674-11-2	Aroclor-1016	250	U
11104-28-2	Aroclor-1221	490	U
11141-16-5	Aroclor-1232	250	U
53469-21-9	Aroclor-1242	250	U
12672-29-6	Aroclor-1248	250	U
11097-69-1	Aroclor-1254	250	U
11096-82-5	Aroclor-1260	1500	

(Q) - Qualifiers:

U: Analyzed for but not detected.
B: Found in associated blank as well as sample.
J: Estimated value, below quantitation limit.
P: %D for concentrations between two GC columns is >25%.
C: Confirmed by GC/MS.

1 G
PCB ANALYSIS DATA SHEET

Client Sample ID: SSD-156(12-18)

Lab Name:	E3I	Case No.:	DASNY HRPC		
Lab Code:	E3I	SDG:	SSD34		
Matrix:	Soil			Lab Sample ID:	960290-11
Extraction:	Sonication			Lab File ID:	20NOV66.D
% Moisture:	33.0			Date Received:	11/18/95
Decanted:				Date Extracted:	11/20/95
				Date Analyzed:	11/24/95
Sample Size:	30.0	g			
Extract Volume:	10.0	mL		Dilution Factor:	10.0
Injection Volume:	1.0	uL		pH:	5.5
GPC Cleanup:	N			Sulfur Cleanup:	Y

CAS No.	Compound	Concentration Units: (UG/KG)	Q
12674-11-2	Aroclor-1016	500	U
11104-28-2	Aroclor-1221	1000	U
11141-16-5	Aroclor-1232	500	U
53469-21-9	Aroclor-1242	500	U
12672-29-6	Aroclor-1248	500	U
11097-69-1	Aroclor-1254	500	U
11096-82-5	Aroclor-1260	2700	

(Q) - Qualifiers:

U: Analyzed for but not detected.
B: Found in associated blank as well as sample.
J: Estimated value, below quantitation limit.
P: %D for concentrations between two GC columns is >25%.
C: Confirmed by GC/MS.

1 G
PCB ANALYSIS DATA SHEET

Client Sample ID: SSD-156(18-24)

Lab Name:	E3I	Case No.:	DASNY HRPC		
Lab Code:	E3I	SDG:	SSD34		
Matrix:	Soil			Lab Sample ID:	960290-12
Extraction:	Sonication			Lab File ID:	20NOV67.D
% Moisture:	19.0			Date Received:	11/18/95
Decanted:				Date Extracted:	11/20/95
				Date Analyzed:	11/24/95
Sample Size:	30.0	g			
Extract Volume:	10.0	mL		Dilution Factor:	1.0
Injection Volume:	1.0	uL		pH:	5.0
GPC Cleanup:	N			Sulfur Cleanup:	Y

CAS No.	Compound	Concentration Units: (UG/KG)	Q
12674-11-2	Aroclor-1016	41	U
11104-28-2	Aroclor-1221	82	U
11141-16-5	Aroclor-1232	41	U
53469-21-9	Aroclor-1242	41	U
12672-29-6	Aroclor-1248	41	U
11097-69-1	Aroclor-1254	41	U
11096-82-5	Aroclor-1260	220	

(Q) - Qualifiers:

U: Analyzed for but not detected.
B: Found in associated blank as well as sample.
J: Estimated value, below quantitation limit.
P: %D for concentrations between two GC columns is >25%.
C: Confirmed by GC/MS.

1 G
PCB ANALYSIS DATA SHEET

Client Sample ID: SSD-157(6-12)

Lab Name:	E3I	Case No.:	DASNY HRPC		
Lab Code:	E3I	SDG:	SSD34		
Matrix:	Soil			Lab Sample ID:	960290-13
Extraction:	Sonication			Lab File ID:	20NOV68.D
% Moisture:	40.0			Date Received:	11/18/95
Decanted:				Date Extracted:	11/20/95
				Date Analyzed:	11/24/95
Sample Size:	30.0	g			
Extract Volume:	10.0	mL		Dilution Factor:	1.0
Injection Volume:	1.0	uL		pH:	5.5
GPC Cleanup:	N			Sulfur Cleanup:	Y

CAS No.	Compound	Concentration Units: (UG/KG)	Q
12674-11-2	Aroclor-1016	56	U
11104-28-2	Aroclor-1221	110	U
11141-16-5	Aroclor-1232	56	U
53469-21-9	Aroclor-1242	56	U
12672-29-6	Aroclor-1248	56	U
11097-69-1	Aroclor-1254	56	U
11096-82-5	Aroclor-1260	18	JP

(Q) - Qualifiers:

U: Analyzed for but not detected.
B: Found in associated blank as well as sample.
J: Estimated value, below quantitation limit.
P: %D for concentrations between two GC columns is >25%.
C: Confirmed by GC/MS.

000032

E3I ENVIRONMENTAL LABORATORY

TOTAL ORGANIC CARBON

Date Received: 11/10/95
Date Analyzed: 11/29/95

E3I ID:	Client ID:	Concentration, mg/kg
960244-1	SSD-34(1-2)	37,000
960244-2	SSD-36(1-2)	34,000
960244-3	SSD-39(1-2)	34,000
S1129BK1	Soil Blank	< 500
S1129SB1	---------	108 % Recovery
S1129SB2	---------	106 % Recovery

Comment
"<" means that the parameter was not detected and that its concentration is less than the indicated value.

E3I ENVIRONMENTAL LABORATORY

TOTAL ORGANIC CARBON

Date Received: 11/14/95
Date Analyzed: 11/29/95

E3I ID:	Client ID:	Concentration, mg/kg
960255-1	SSD-81	39,000
960255-2	SSD-82	10,000
960255-3	SSD-85	91,000
S1129BK1	Soil Blank	< 500
S1129SB1	---------	108 % Recovery
S1129SB2	---------	106 % Recovery

Comment
"<" means that the parameter was not detected and that its concentration is less than the indicated value.

E3I ENVIRONMENTAL LABORATORY

TOTAL ORGANIC CARBON

Date Received: 11/14/95
Date Analyzed: 11/29/95

E3I ID:	Client ID:	Concentration, mg/kg
960256-1	SSD-93	71,000
S1129BK1	Soil Blank	< 500
S1129SB1	--------	108 % Recovery
S1129SB2	--------	106 % Recovery

Date Analyzed: 11/30/95

E3I ID:	Client ID:	Concentration, mg/kg
960256-2	SSD-94	61,000
960256-3	SSD-96	53,000
S1130BK1	Soil Blank	< 500
S1130SB1	---------	105 % Recovery
S1130SB2	---------	111 % Recovery

Comment
"<" means that the parameter was not detected and that its concentration is less than the indicated value.

E3I ENVIRONMENTAL LABORATORY

TOTAL ORGANIC CARBON

Date Received: 11/18/95
Date Analyzed: 11/30/95

E3I ID:	Client ID:		Concentration, mg/kg
960290-1	SSD-155		59,000
960290-2	SSD-149(0-6)		30,000
960290-3	SSD-153		34,000
960290-4	SSD-157(0-6)		45,000
960290-5	SSD-152		115,000
960290-6	SSD-156(6-12)		20,000
S1130BK1	Soil Blank	<	500
S1130SB1	---------		105 % Recovery
S1130SB2	---------		111 % Recovery

Date Analyzed: 12/01/95

960290-7	SSD-151		150,000
960290-8	SSD-156(0-6)		23,000
960290-9	SSD-154		170,000
960290-10	SSD-150		16,000
960290-11	SSD-156(12-18)		12,000
960290-12	SSD-156(18-24)		6,100
960290-13	SSD-157(6-12)		23,000
S1201BK1	Soil Blank	<	500
S1201SB1	------		103 % Recovery
S1201SB2	------		112 % Recovery

Comment
"<" means that the parameter was not detected and that its concentration is less than the indicated value.

GROUNDWATER SAMPLES

SDG No. HRMW-176

To be included with all lab data and with each workplan

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

SAMPLE IDENTIFICATION AND ANALYTICAL REQUIREMENT SUMMARY

Customer Sample Code	Laboratory Sample Code	Analytical Requirements					
		*VOA GC/MS Method #	*BNA GC/MS Method #	*VOA GC Method #	*Pest PCBs Method #	*Metals	*Other
MWHR-16-6	96C367-1						
HRMW19-6	367-2						
HRMW17-6	367-3						
FB-1	367-4						

000001C

1 G

PCB ANALYSIS DATA SHEET

Client Sample ID: MWHR-16-6

Lab Name:	E3I	Case No.:	DASNY HRPC		
Lab Code:	E3I	SDG:	HRMW176		
Matrix:	Water			Lab Sample ID:	960367-1
Extraction:	SepF			Lab File ID:	20NOV328.D
% Solid:	0.0			Date Received:	12/06/95
Decanted:				Date Extracted:	12/07/95
				Date Analyzed:	12/12/95
Sample Size:	1000.0	mL			
Extract Volume:	1.0	mL		Dilution Factor:	1.0
Injection Volume:	1.0	uL		pH:	6
GPC Cleanup:	N			Sulfur Cleanup:	Y

CAS No.	Compound	Concentration Units: (ug/L)	Q
12674-11-2	Aroclor-1016	0.090	U
11104-28-2	Aroclor-1221	0.18	U
11141-16-5	Aroclor-1232	0.090	U
53469-21-9	Aroclor-1242	0.090	U
12672-29-6	Aroclor-1248	0.090	U
11097-69-1	Aroclor-1254	0.090	U
11096-82-5	Aroclor-1260	0.090	U

(Q) - Qualifiers:

U: Analyzed for but not detected.
B: Found in associated blank as well as sample.
J: Estimated value, below quantitation limit.
P: %D for concentrations between two GC columns is >25%.
C: Confirmed by GC/MS.

000006

1 G

PCB ANALYSIS DATA SHEET

Client Sample ID: HRMW-19-6

Lab Name:	E3I	Case No.:	DASNY HRPC		
Lab Code:	E3I	SDG:	HRMW176		
Matrix:	Water			Lab Sample ID:	960367-2
Extraction:	SepF			Lab File ID:	20NOV329.D
% Solid:	0.0			Date Received:	12/06/95
Decanted:				Date Extracted:	12/07/95
				Date Analyzed:	12/12/95
Sample Size:	1000.0	mL			
Extract Volume:	1.0	mL		Dilution Factor:	1.0
Injection Volume:	1.0	uL		pH:	6
GPC Cleanup:	N			Sulfur Cleanup:	Y

CAS No	Compound	Concentration Units: (ug/L)	Q
12674-11-2	Aroclor-1016	0.090	U
11104-28-2	Aroclor-1221	0.18	U
11141-16-5	Aroclor-1232	0.090	U
53469-21-9	Aroclor-1242	0.090	U
12672-29-6	Aroclor-1248	0.090	U
11097-69-1	Aroclor-1254	0.090	U
11096-82-5	Aroclor-1260	0.090	U

(Q) - Qualifiers:

U: Analyzed for but not detected.
B: Found in associated blank as well as sample.
J: Estimated value, below quantitation limit.
P: %D for concentrations between two GC columns is >25%.
C: Confirmed by GC/MS.

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1 G

PCB ANALYSIS DATA SHEET

Client Sample ID: HRMW-19-6 RE

Lab Name:	E3I	Case No.:	DASNY HRPC
Lab Code:	E3I	SDG:	HRMW176
Matrix:	Water	Lab Sample ID:	960367-2RE
Extraction:	SepF	Lab File ID:	14DEC082.D
% Solid:	0.0	Date Received:	12/06/95
Decanted:		Date Extracted:	12/15/95
		Date Analyzed:	12/20/95
Sample Size:	1000.0 mL		
Extract Volume:	1.0 mL	Dilution Factor:	1.0
Injection Volume:	1.0 uL	pH:	6
GPC Cleanup:	N	Sulfur Cleanup:	Y

CAS No.	Compound	Concentration Units: (ug/L)	Q
12674-11-2	Aroclor-1016	0.090	U
11104-28-2	Aroclor-1221	0.18	U
11141-16-5	Aroclor-1232	0.090	U
53469-21-9	Aroclor-1242	0.090	U
12672-29-6	Aroclor-1248	0.090	U
11097-69-1	Aroclor-1254	0.090	U
11096-82-5	Aroclor-1260	0.036	J

(Q) - Qualifiers:

U: Analyzed for but not detected.
B: Found in associated blank as well as sample.
J: Estimated value, below quantitation limit.
P: %D for concentrations between two GC columns is >25%.
C: Confirmed by GC/MS.

1 G
PCB ANALYSIS DATA SHEET

Client Sample ID: HRMW-17-6

Lab Name:	E3I	Case No.:	DASNY HRPC		
Lab Code:	E3I	SDG:	HRMW176		
Matrix:	Water		Lab Sample ID:	960367-3	
Extraction:	SepF		Lab File ID:	20NOV330.D	
% Solid:	0.0		Date Received:	12/06/95	
Decanted:			Date Extracted:	12/07/95	
			Date Analyzed:	12/12/95	
Sample Size:	1000.0	mL			
Extract Volume:	1.0	mL	Dilution Factor:	1.0	
Injection Volume:	1.0	uL	pH:	6	
GPC Cleanup:	N		Sulfur Cleanup:	Y	

CAS No.	Compound	Concentration Units: (ug/L)	Q
12674-11-2	Aroclor-1016	0.090	U
11104-28-2	Aroclor-1221	0.18	U
11141-16-5	Aroclor-1232	0.090	U
53469-21-9	Aroclor-1242	0.090	U
12672-29-6	Aroclor-1248	0.090	U
11097-69-1	Aroclor-1254	0.090	U
11096-82-5	Aroclor-1260	0.090	U

(Q) - Qualifiers:

U: Analyzed for but not detected.
B: Found in associated blank as well as sample.
J: Estimated value, below quantitation limit.
P: %D for concentrations between two GC columns is >25%.
C: Confirmed by GC/MS.

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1 G

PCB ANALYSIS DATA SHEET

Client Sample ID: FB-1

Lab Name:	E3I	Case No.:	DASNY HRPC		
Lab Code:	E3I	SDG:	HRMW176		
Matrix:	Water		Lab Sample ID:	960367-4	
Extraction:	SepF		Lab File ID:	20NOV331.D	
% Solid:	0.0		Date Received:	12/06/95	
Decanted:			Date Extracted:	12/07/95	
			Date Analyzed:	12/12/95	
Sample Size:	1000.0	mL			
Extract Volume:	1.0	mL	Dilution Factor:	1.0	
Injection Volume:	1.0	uL	pH:	6	
GPC Cleanup:	N		Sulfur Cleanup:	Y	

CAS No.	Compound	Concentration Units: (ug/L)	Q
12674-11-2	Aroclor-1016	0.090	U
11104-28-2	Aroclor-1221	0.18	U
11141-16-5	Aroclor-1232	0.090	U
53469-21-9	Aroclor-1242	0.090	U
12672-29-6	Aroclor-1248	0.090	U
11097-69-1	Aroclor-1254	0.090	U
11096-82-5	Aroclor-1260	0.090	U

(Q) - Qualifiers:

U: Analyzed for but not detected.
B: Found in associated blank as well as sample.
J: Estimated value. below quantitation limit.
P: %D for concentrations between two GC columns is >25%.
C: Confirmed by GC/MS.

000010

CONCRETE CORE SAMPLES

Commonwealth [illegible]

10 January 1996
P-295

LAWLER, MATUSKY & SKELLY
ENGINEERS

JAN 12 1996

Mr. Edward Maikish
LMS Engineers
One Blue Hill Plaza
Pearl River, NY 10965

RE:
Field Analytical Report
Hudson River Psychiatric Ctr.
Concrete Core Samples
Poughkeepsie, NY
December 11, 14 & 15, 1995

Dear Mr. Maikish:

Enclosed please find the final results and report on the concrete core investigation conducted at the above-mentioned site. This four section report includes a narrative, analytical results, quality control results and chain of custody forms.

It was a pleasure working with LMS Engineers on this project and we look forward to working together again. If you have any questions on the report, please do not hesitate to contact me.

Very truly yours,
COMMONWEALTH ANALYTICAL

Stephen L. Knollmeyer
Laboratory Director

Drinking Water • Wastewater • Hazardous Waste • Toxicity Testing • Mobile Laboratory
Westfield Executive Park • 53 Southampton Road • Westfield, MA 01085-5308 • Tel 413·572·3200 • Fax 413·572·3215
12020 Sunrise Valley Drive • Suite 100 • Reston, VA 22091-3429 • Tel 703·391·2770 • Fax 703·391·2766

LMS ENGINEERS/HRPC Project - 12/15/95

Concrete Core Samples

Client Sample ID	FRAC	DATE REC	DATE ANAL.	ARC.1254 mg/kg wet weight	ARC.1260 mg/kg wet weight	Dilution
C-1 (0-1)	01A	12/18/95	12/27/95	<0.5	2000	200
C-1 (1-2)	02A	12/18/95	12/27/95	<0.5	7,300	400
C-1 (2-3)	03A	12/18/95	12/27/95	<0.5	770	200
C-1 (3-4)	04A	12/18/95	12/27/95	<0.5	65	10
C-1 (4-5)	05A	12/18/95	12/27/95	<0.5	47	10
C-2 (0-1)	06A	12/18/95	12/27/95	<0.5	730	100
C-2 (1-2)	07A	12/18/95	12/27/95	<0.5	89	100
C-2 (2-3)	08A	12/18/95	12/27/95	<0.5	16	1
C-2 (3-4)	09A	12/18/95	12/27/95	<0.5	13	1
C-2 (4-5)	10A	12/18/95	12/27/95	<0.5	9.7	1
C-3 (0-1)	11A	12/18/95	12/27/95	<0.5	11	1
C-3 (1-2)	12A	12/18/95	12/27/95	<0.5	1.8	1
C-3 (2-3)	13A	12/18/95	12/27/95	<0.5	70	50
C-3 (3-4)	14A	12/18/95	12/27/95	<0.5	7.5	1
C-3 (4-5)	15A	12/18/95	12/27/95	<0.5	230	200
RC-1	16A	12/18/95	12/27/95	<0.5	580	100

APPENDIX C

DATA VALIDATION AND USABILITY REPORTS

Data Validation Services

Cobble Creek Road P. O. Box 208
North Creek, N. Y. 12853
Phone 518-251-4429

LAWLER, MATUSKY & SKELLY
ENGINEERS

JAN 19 1996

January 18, 1996

Maria Heincz
LMS Engineers
One Blue Hill Plaza
Pearl River, NY 10965

RE: Validation of DASNY Site Data Packages
E3I SDG No. SSD34

Dear Ms. Heincz:

Review has been completed for the data packages generated by E3I Laboratory, pertaining to samples collected at the DASNY Site. Twenty two soil field samples were analysed for Aroclor mixtures. The methodology utilized was a modification of the EPA-8080.

Data validation was performed with guidance from the most current editions of the USEPA CLP National Functional Guidelines for Organic Data Review and the USEPA SOP HW-6. The following items were reviewed:

* Data Completeness
* Custody Documentation
* Holding Times
* Surrogate Recoveries
* Matrix Spike Recoveries/Duplicate Correlations
* Preparation/Calibration Blanks
* Control Spikes
* Calibration Standards
* Instrument IDLs
* Method Compliance
* Sample Result Verification

Those items showing deficiencies are discussed in the following sections of this report. All others were found to be acceptable as outlined in the above-mentioned validation procedures, and as applicable for the methodology. Unless noted specifically in the following text, reported results are substantiated by the raw data, and generated in compliance with protocol requirements.

In summary, numerous errors in reporting were observed, but after inclusion of the edits from resubmissions, the reported results of the samples are substantiated by the raw data. Resubmission communications are attached to this narrative, and should be reviewed in conjunction with this text. Copies of the laboratory case narrative, a compliancy chart, and laboratory NYSDEC Sample Preparation and Analysis Summary Forms are also included with this report.

Data Completeness

Please see the attached resubmissions, which include corrections to sample reported results, and miscellaneous raw data items. The prevalence of errors in the reporting of these samples lends concern as to the laboratory package review.

PCB Analyses

Due to transcription errors, the following sample reported results are to be edited as outlined (resubmitted Forms 1 are attached):

Sample ID	Incorrect, original result	Corrected Reporting
SSD34(1-2)	Aroclor 1254 = 11,000 ug/kg	Aroclor 1254 = 1400 U
	Aroclor 1260 = 1400 U	Aroclor 1260 = 11,000 ug/kg
SSD-93*	Aroclor 1260 = 1,600,000 ug/kg	Aroclor 1260 = 16,000,000 ug/kg
SSD-156(6-12)	Aroclor 1260 = 590,000 ug/kg	Aroclor 1260 = 560,000 ug/kg
SSD-154	Aroclor 1260 = 6,100 ug/kg	Aroclor 1260 = 5,200 ug/kg
SSD-150**	Aroclor 1260 = 15,000 ug/kg	Aroclor 1260 = 1,500 ug/kg

* -the dilution factor on the Form 1 should be 50,000, not 5000.
**-the dilution factor on the Form 1 should be 6, not 60

Due to the possibility of the high concentration of PCBs exceeding the solvency of the extraction, the reported results (detection limits and values) for SSD-93, SSD-94, SSD-15S, SSD-152, SSD-156(6-12), SSD-156(0-6), should be considered estimated, possibly biased low. In addition to the solvency issue, evaluation of surrogate recoveries on these samples is not possible due to excessive dilutions (1:300 to 1:50,000).

Because of the extreme concentrations of PCBs in some of these batch samples (six samples have concentrations exceeding 100,000 ug/kg, up to 16,000,000 ug/kg), the possiblity of carryover is high, even with the most conscientious sample handling. This can be illustrated by the fact that contact of a 10 mL extract of a clean sample by only 1 uL of SSD-93 extract would produce a reading of 1100 ug/kg in the clean sample. Cross contamination can also occur in these situations from many normal, and acceptable, lab practices. Therefore, the reported detections of lower concentration Aroclors should be viewed with extreme caution. It would be appropriate to confirm any critical (relatively) lower concentration value with additional sampling/analysis.

As discussed in the resubmission communications, the laboratory reports only the predominant Aroclor mixture present (to avoid falsely elevated values which can result from reporting multiple mixtures using common isomers). Although sample SSD-39(1-2) reports only Aroclor 1254, it is evident from review of the chromatogram that Aroclor 1260 is also present, at a low level that cannot be determined from the software output provided. Therefore the reported detection limit for Aroclor 1260 in the sample should be considered estimated.

Due to poor correlation of individual PCB congeners, the reported identity of Aroclor 1232 in SSD-36(1-2) should be considered tentative, and estimated in value ("N" and "J" flags). The chromatogram shows many extraneous peaks/interferences, and although responses are present which correlate to the desired retention times, qualification of the patterns as Aroclor 1232 is presumptive.

Due to poor dual column quantitative correlation, Aroclor mixtures qualified by the laboratory as "P" should be considered estimated in value.

Technical holding times were met; all samples were extracted within seven days of collection. Surrogate recoveries were acceptable, when not diluted beyond evaluation.

No sample matrix spikes were performed for these project samples. Therefore no evaluation of matrix effect on sample recoveries is possible. This should be considered by the end-user of the data.

Sample analysis was performed with a methodology in which PCB Aroclor mixtures were utilized for evaluations of linearity and daily consistency of response. Standard levels and responses were acceptable. Aroclor responses were consistent, although certain of the surrogate TCX responses were elevated. Sample reported results are unaffected.

Please do not hesitate to contact me if questions or comments arise during your review of this report.

Very truly yours,

Judy Harry

COMPLIANCY CHART

Project: LMS Engineers DASNY Site

SDG Nos. E3I SDG No. SSD34

Protocol: Modified EPA-8080

Rec. Date	Sample ID	Matrix	PCB	Noncompliancy
11-10-95	SSD-34(1-2)	Soil	OK	
11-10-95	SSD-36(1-2)	Soil	OK	
11-10-95	SSD-39(1-2)	Soil	OK	
11-14-95	SSD-81	Soil	OK	
11-14-95	SSD-82	Soil	OK	
11-14-95	SSD-85	Soil	OK	
11-14-95	SSD-93	Soil	OK	
11-14-95	SSD-94	Soil	OK	
11-14-95	SSD-96	Soil	OK	
11-18-95	SSD-155	Soil	OK	
11-18-95	SSD-149(0-6)	Soil	OK	
11-18-95	SSD-153	Soil	OK	
11-18-95	SSD-157(0-6)	Soil	OK	
11-18-95	SSD-152	Soil	OK	
11-18-95	SSD-156(0-6)	Soil	OK	
11-18-95	SSD-154	Soil	OK	
11-18-95	SSD-150	Soil	OK	
11-18-95	SSD-156(12-18)	Soil	OK	
11-18-95	SSD-156(18-24)	Soil	OK	
11-18-95	SSD-157(6-12)	Soil	OK	
11-18-95	SSD-151	Soil	OK	
11-18-95	SSD-156(6-12)	Soil	OK	

Data Validation Services

Cobble Creek Road P. O. Box 208
North Creek, NY 12853
Phone and Fax (518) 251-4429

January 1, 1996

Steve Mattingly
E3I
35 Medford St.
Somerville, MA 02143

RE: LMS Engineers DASNY Project
E3I SDG No. SSD34

Dear Steve:

Review of the above-mentioned data package is in progress. The following items are needed prior to completion of the validation report:

1. No support raw data for the solids/moisture determinations were provided in the data package. Please submit for review.
2. No internal chain-of-custody documentation was provided. Please forward for review.
3. The calibration factors for the low level ("a") initial calibration standard for Aroclor 1232, which are reported on the Forms 6I, do not reflect the raw data (true for both columns). Therefore the mean factor, which is used in the calculation of the result for sample SSD-36(1-2), is incorrect. Please submit corrected Forms 6I and Forms 1 (for the sample).
4. Sample SSD-34(1-2) reports detection of Aroclor 1254, although the raw data shows Aroclor 1260. Please verify the reporting error, and resubmit a Form 1 for the sample.
5. The result for SSD-93 reflects an applied dilution factor of 1:5000 (as stated on the Form 1). However, the raw data show a dilution factor of 1:50,000. Please verify the reporting error, and resubmit a Form 1 for the sample, reflecting a tenfold difference in values.
6. The result for SSD-150 reflects an applied dilution factor of 1:60 (as stated on the Form 1). However, the raw data show a dilution factor of 1:6. Please verify the reporting error, and resubmit a Form 1 for the sample, reflecting a tenfold difference in values.
7. Sample SSD-39(1-2) produces responses (per review of the chromatogram) which imply the presence of Aroclor 1260, as well as that of the Aroclor 1254 which was reported. However, with the edited/abbreviated software output provided for this sample, verification/evaluation is not possible. Please review the sample result, provide an unedited output which allows evaluation of congener responses, and forward a corrected Form 1 (or comment on the reason for rejection of the detection).
8. Please verify that the Aroclor 1260 results for SSD-156(6-12) and SSD-154 are incorrect, and should reflect the lower of the dual column determinations. Please provide corrected Forms 1 for the samples.

Please copy Maria Heincz at LMS Engineers with all communications. Do not hesitate to contact me if you wish to discuss these issues. Thank you for your prompt attention to this matter.

Very truly yours,

Judy Harry
cc: Maria Heincz

E3I Environmental Laboratory

35 Medford Street
Somerville, MA 02143
Tel. (617) 666-5500

P.O. Box 410215
E. Cambridge, MA 02141
Fax (617) 666-5802

January 11, 1996

Ms. Judith Harry
Data Validation Services
Cobble Creek Road
PO Box 208
North Creek, NY 12853

RE: LMS DASNY Project SDG No. SSD34

Dear Ms. Harry:

This submission constitutes the response to your comments of 2 January 1996.

Comment.

1. Raw data for percent solids are enclosed.
2. Internal C-O-C documents are enclosed.
3. Calibration factors are correct as reported originally.
4. Corrections for sample SSD-34 are enclosed.
5. Corrections for sample SSD-93 are enclosed.
6. Corrections for sample SSD-150 are enclosed.
7. The Aroclor for sample SSD-39(1-2) is correct as reported originally. Although congeners of AR1260 may be present, AR1254 is the predominant Aroclor. Since no error-free method exists for separating the two Aroclors without "double-counting", only the dominant Aroclor is quantitated.
8. Corrections for sample SSD-156(6-12) and SSD-154 are enclosed.

Please call me if you have any further questions or comments.

Sincerely,

Stephen Emsbo-Mattingly
Laboratory Director

cc: Maria Heincz, LMS

1 G
PCB ANALYSIS DATA SHEET

Client Sample ID: SSD-34(1-2)

Lab Name: E3I
Lab Code: E3I
Case No.: DASNY RI
SDG: SSD34

Matrix: Soil
Extraction: Sonication

% Moisture: 30.0
Decanted:

Sample Size: 30.0 g
Extract Volume: 10.0 mL
Injection Volume: 1.0 uL

GPC Cleanup: N

Lab Sample ID: 960244-1
Lab File ID: 31OCT353.D

Date Received: 11/10/95
Date Extracted: 11/14/95
Date Analyzed: 11/17/95

Dilution Factor: 30.0
pH: 7.5

Sulfur Cleanup: Y

CAS No.	Compound	Concentration Units: (UG/KG)	Q
12674-11-2	Aroclor-1016	1400	U
11104-28-2	Aroclor-1221	2900	U
11141-16-5	Aroclor-1232	1400	U
53469-21-9	Aroclor-1242	1400	U
12672-29-6	Aroclor-1248	1400	U
11097-69-1	Aroclor-1254	1400	U
11096-82-5	Aroclor-1260	11000	

(Q) - Qualifiers:

U: Analyzed for but not detected.
B: Found in associated blank as well as sample.
J: Estimated value, below quantitation limit.
P: %D for concentrations between two GC columns is >25%.
C: Confirmed by GC/MS.

1 G
PCB ANALYSIS DATA SHEET

Client Sample ID
SSD-93

Lab Name:	E3I	Case No.:	DASNY HRPC		
Lab Code:	E3I	SDG:	SSD34		
Matrix:	Soil			Lab Sample ID:	960256-1
Extraction:	Sonication			Lab File ID:	31OCT359.D
% Moisture:	34.0			Date Received:	11/14/95
Decanted:				Date Extracted:	11/14/95
				Date Analyzed:	11/17/95
Sample Size:	30.0 g				
Extract Volume:	10.0 mL			Dilution Factor:	50000
Injection Volume:	1.0 uL			pH:	7.5
GPC Cleanup:	N			Sulfur Cleanup:	Y

CAS No.	Compound	Concentration Units: (UG/KG)	Q
12674-11-2	Aroclor-1016	2500000	U
11104-28-2	Aroclor-1221	5000000	U
11141-16-5	Aroclor-1232	2500000	U
53469-21-9	Aroclor-1242	2500000	U
12672-29-6	Aroclor-1248	2500000	U
11097-69-1	Aroclor-1254	2500000	U
11096-82-5	Aroclor-1260	16000000	

(Q) - Qualifiers:

U: Analyzed for but not detected.
B: Found in associated blank as well as sample.
J: Estimated value, below quantitation limit.
P: %D for concentrations between two GC columns is >25%.
C: Confirmed by GC/MS.

10C
PCB IDENTIFICATION SUMMARY

Lab Name: E3I Case No.: DASNY HRPC
Lab Code: E3I SDG No.: SSD34

Client Sample ID: SSD-93

Lab Sample ID: 960256-1
Date Analyzed (1): 11/17/95
Instrument ID (1): HP5890A 0:C
GC Column (1): DB608
Inner Diameter (1): 0.53 (mm)

Date Analyzed (2): 11/17/95
Instrument ID (2): HP5890A 0:C
GC Column (2): RTX1701
Inner Diameter (2): 0.53 (mm)

Aroclor	Column	Peak	RT	RT Window From	RT Window To	Total Concentration	%D
AR1260	(1)	1	16.19	16.12	16.26	16000000	12.5
		2	16.44	16.37	16.51		
		3	18.96	18.89	19.03		
		4	19.35	19.28	19.42		
		5	20.81	20.74	20.88		
	(2)	1	17.53	17.45	17.59	18000000	
		2	18.19	18.11	18.25		
		3	19.24	19.16	19.30		
		4	21.24	21.15	21.29		
		5	22.60	22.51	22.65		
	(1)	1					
		2					
		3					
		4					
		5					
	(2)	1					
		2					
		3					
		4					
		5					
	(1)	1					
		2					
		3					
		4					
		5					
	(2)	1					
		2					
		3					
		4					
		5					

A minimum of 3 peaks is required for identification of multicomponent analytes.
* : These peaks were not used for quantitation due to co-elution with target and/or non-target compunds.

FORM X PCB

1 G

PCB ANALYSIS DATA SHEET

Client Sample ID: SSD-150

Lab Name:	E3I	Case No.:	DASNY HRPC		
Lab Code:	E3I	SDG:	SSD34		
Matrix:	Soil			Lab Sample ID:	960290-10
Extraction:	Sonication			Lab File ID:	20NOV65.D
% Moisture:	19.0			Date Received:	11/18/95
Decanted:				Date Extracted:	11/20/95
				Date Analyzed:	11/24/95
Sample Size:	30.0	g			
Extract Volume:	10.0	mL		Dilution Factor:	6.0
Injection Volume:	1.0	uL		pH:	4.7
GPC Cleanup:	N			Sulfur Cleanup:	Y

CAS No.	Compound	Concentration Units: (UG/KG)	Q
12674-11-2	Aroclor-1016	250	U
11104-28-2	Aroclor-1221	490	U
11141-16-5	Aroclor-1232	250	U
53469-21-9	Aroclor-1242	250	U
12672-29-6	Aroclor-1248	250	U
11097-69-1	Aroclor-1254	250	U
11096-82-5	Aroclor-1260	1500	

(Q) - Qualifiers:

U: Analyzed for but not detected.
B: Found in associated blank as well as sample.
J: Estimated value, below quantitation limit.
P: %D for concentrations between two GC columns is >25%.
C: Confirmed by GC/MS.

10C

PCB IDENTIFICATION SUMMARY

Client Sample ID: SSD-150

Lab Name: E3I
Lab Code: E3I
Case No.: DASNY HRPC
SDG No.: SSD34

Lab Sample ID: 960290-10
Date Analyzed (1): 11/24/95
Instrument ID (1): HP5890A 0:C
GC Column (1): DB608
Inner Diameter (1): 0.53 (mm)

Date Analyzed (2): 11/24/95
Instrument ID (2): HP5890A 0:C
GC Column (2): RTX1701
Inner Diameter (2): 0.53 (mm)

Aroclor	Column	Peak	RT	RT Window From	RT Window To	Total Concentration	%D
AR1260	(1)	1	16.18	16.12	16.26	1500	6.7
		2	16.44	16.37	16.51		
		3	18.95	18.89	19.03		
		4	19.35	19.28	19.42		
		5	20.80	20.74	20.88		
	(2)	1	17.54	17.45	17.59	1600	
		2	18.20	18.11	18.25		
		3	19.24	19.16	19.30		
		4	21.24	21.15	21.29		
		5	22.61	22.51	22.65		
	(1)	1					
		2					
		3					
		4					
		5					
	(2)	1					
		2					
		3					
		4					
		5					
	(1)	1					
		2					
		3					
		4					
		5					
	(2)	1					
		2					
		3					
		4					
		5					

A minimum of 3 peaks is required for identification of multicomponent analytes.

* : These peaks were not used for quantitation due to co-elution with target and/or non-target compunds.

FORM X PCB

1 G
PCB ANALYSIS DATA SHEET

Client Sample ID: SSD-156(6-12)

Lab Name:	E3I	Case No.:	DASNY HRPC		
Lab Code:	E3I	SDG:	SSD34		
Matrix:	Soil			Lab Sample ID:	960290-6
Extraction:	Sonication			Lab File ID:	20NOV89.D
% Moisture:	31.0			Date Received:	11/18/95
Decanted:				Date Extracted:	11/20/95
				Date Analyzed:	11/24/95
Sample Size:	30.0	g			
Extract Volume:	10.0	mL		Dilution Factor:	2000.0
Injection Volume:	1.0	uL		pH:	5.8
GPC Cleanup:	N			Sulfur Cleanup:	Y

CAS No.	Compound	Concentration Units: (UG/KG)	Q
12674-11-2	Aroclor-1016	97000	U
11104-28-2	Aroclor-1221	190000	U
11141-16-5	Aroclor-1232	97000	U
53469-21-9	Aroclor-1242	97000	U
12672-29-6	Aroclor-1248	97000	U
11097-69-1	Aroclor-1254	97000	U
11096-82-5	Aroclor-1260	560000	

(Q) - Qualifiers:

U: Analyzed for but not detected.
B: Found in associated blank as well as sample.
J: Estimated value, below quantitation limit.
P: %D for concentrations between two GC columns is >25%.
C: Confirmed by GC/MS.

1 G

PCB ANALYSIS DATA SHEET

Client Sample ID: SSD-154

Lab Name:	E3I	Case No.:	DASNY HRPC		
Lab Code:	E3I	SDG:	SSD34		
Matrix:	Soil			Lab Sample ID:	960290-9
Extraction:	Sonication			Lab File ID:	20NOV64.D
% Moisture:	51.0			Date Received:	11/18/95
Decanted:				Date Extracted:	11/20/95
				Date Analyzed:	11/24/95
Sample Size:	30.0	g			
Extract Volume:	10.0	mL		Dilution Factor:	10.0
Injection Volume:	1.0	uL		pH:	5.0
GPC Cleanup:	N			Sulfur Cleanup:	Y

CAS No.	Compound	Concentration Units: (UG/KG)	Q
12674-11-2	Aroclor-1016	680	U
11104-28-2	Aroclor-1221	1400	U
11141-16-5	Aroclor-1232	680	U
53469-21-9	Aroclor-1242	680	U
12672-29-6	Aroclor-1248	680	U
11097-69-1	Aroclor-1254	680	U
11096-82-5	Aroclor-1260	5200	

(Q) - Qualifiers:

U: Analyzed for but not detected.
B: Found in associated blank as well as sample.
J: Estimated value, below quantitation limit.
P: %D for concentrations between two GC columns is >25%.
C: Confirmed by GC/MS.

SDG NARRATIVE

LAB NAME: E3I Environmental Laboratory

CASE NO.: DASNY

SDG: SSD34

E3I Project: 960244, 960255, 960256, 960290

Statement of Work: These results are in accordance with NYSDEC ASP 12/91 modified. These results are reported according to ASP Superfund Category "B".

SAMPLE NO.: SSD-34(1-2), SSD-36(1-2), SSD-39(1-2), SSD-81, SSD-82, SSD-85, SSD-93, SSD-94, SSD-96, SSD-149(0-6), SSD-150, SSD-151, SSD-152, SSD-153, SSD-154, SSD-155, SSD-156(0-6), SSD-156(6-12), SSD-156(12-18), SSD-156(18-24), SSD-157(0-6), SSD-157(6-12)

PCBs: Sample SSD-36(1-2) was analyzed at a 1:20 dilution due to the high concentration of AR1232.

The folowing samples were analyzed at dilutions due to the high concentration of AR1260. The dilution factors are being reported.

SSD-34(1-2)	30	SSD-151	5
SSD-81	3	SSD-152	2000
SSD-82	10	SSD-153	20
SSD-85	5	SSD-154	10
SSD-93	50,000	SSD-155	300
SSD-94	1,000	SSD-156(0-6)	600
SSD-96	200	SSD-156(6-12)	2000
SSD-149(0-6)	10	SSD-156(12-18)	10
SSD-150	6	SSD-157(0-6)	50

The surrogates were diluted out in samples SSD-93, SSD-94, SSD-96, SSD-155, SSD-157(0-6), SSD-152, SSD-156(6-12), SSD-156(0-6).

Recovery of the surrogate DCB is outside the advisory QC limit on the DB608 column for sample SSD-151.

For the analytical sequence beginning 10/31/95 on the DB608 column:
- AR1254L27 - %RPD >15 for AR1254
- AR1254L28- %RPD >15 for AR1254 and >25 for TCX
- AR1254L29 - %RPD >15 for AR1254

- AR1254L31 - %RPD >15 for AR1254
- AR1254L32 - %RPD >15 for AR1254

For the analytical sequence beginning 10/31/95 on the RTX1701 column:
- AR1254L21C- %RPD >15 for AR1254 and >25 for TCX
- AR1254L22C- %RPD >25 for TCX and DCB
- AR1254L27C- %RPD >25 for TCX and DCB
- AR1254L28C- %RPD >15 for AR1254 and >25 for TCX and DCB
- AR1254L29C- %RPD >15 for AR1254 and >25 for TCX and DCB
- AR1254L31C- %RPD >15 for AR1254 and >25 for TCX and DCB
- AR1254L32C- %RPD >15 for AR1254 and >25 for TCX and DCB

No Form 10 was reported for samples SSD-34(1-2) and SSD-36(1-2) due to corrupted data files and therefore extended reports are unavailable.

No extended report is available for Resolution Check therefore no Form 6G is being reported.

"I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hardcopy data package has been authorized by the Laboratory Manager or his designee, as verified by the following signature."

Mervelina Saturno-Condon

Mervelina Saturno-Condon
Project Manager

December 12, 1995

To be included with all lab data and with each workplan

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

SAMPLE IDENTIFICATION AND ANALYTICAL REQUIREMENT SUMMARY

Customer Sample Code	Laboratory Sample Code	Analytical Requirements					
		VOA GC/MS Method #	BNA GC/MS Method #	VOA GC Method #	~~Pest~~ PCBs Method #	Metals	Other
SSD-34(1-2)	960244-1				✓		
SSD-36(1-2)	960244-2				✓		
SSD-39(1-2)	960244-3				✓		
SSD-81	960255-1				✓		
SSD-82	960255-2				✓		
SSD-85	960255-3				✓		
SSD-93	960252-1				✓		
SSD-94	960252-2				✓		
SSD-96	960252-3				✓		
SSD-155	960240-1				✓		
SSD-149(0-6)	290-2				✓		
SSD-153	290-3				✓		
SSD-157(0-6)	290-4				✓		
SSD-152	290-5				✓		
SSD-152(6-12)	290-6				✓		
SSD-157	290-7				✓		
SSD-152(0-6)	290-8				✓		
SSD-152	290-9				✓		
SSD-150	290-10				✓		
SSD-152(12-18)	290-11				✓		
SSD-156(18-24)	290-12				✓		
SSD-157(6-12)	290-13				✓		

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

SAMPLE PREPARATION AND ANALYSIS SUMMARY
~~PESTICIDE~~/PCB
ANALYSES

Laboratory Sample ID	Matrix	Date Collected	Date Rec'd at Lab	Date Extracted	Date Analyzed
960244-1	Soil	11/9/95	11/10/95	11/14/95	11/[illegible]/95
960244-2	↓	↓	↓	↓	↓
960244-3	↓	↓	↓	↓	↓
960255-1	Soil	11/13/95	11/14/95	11/20/95	11/21/95
960255-2	↓	↓	↓	↓	↓
960255-3	↓	↓	↓	↓	11/22/95
960256-1	Soil	11/13/95	11/14/95	11/14/95	11/17/95
960256-2	↓	↓	↓	↓	↓
960256-3	↓	↓	↓	↓	↓
960290-1	Soil	11/17/95	11/18/95	11/20/95	11/22/95
290-2	↓	↓	↓	↓	↓
290-3	↓	↓	↓	↓	↓
290-4	↓	↓	↓	↓	↓
290-5	↓	↓	↓	↓	11/24/95
290-6	↓	↓	↓	↓	↓
290-7	↓	↓	↓	↓	↓
290-8	↓	↓	↓	↓	↓
290-9	↓	↓	↓	↓	↓
290-10	↓	↓	↓	↓	↓
290-11	↓	↓	↓	↓	11/24/95
290-12	↓	↓	↓	↓	↓
290-13	↓	↓	↓	↓	↓

000004

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

SAMPLE PREPARATION AND ANALYSIS SUMMARY

~~PESTICIDE~~/PCB

ANALYSES

Laboratory Sample ID	Matrix	Analytical Protocol	Extraction Method	Auxiliary Cleanup	DF/Conc Factor
960244-1	Sand	91-3 Mod	Sonicator	Sulfur	30
-2					20
-3					1
960258-1					3
-2					10
-3					5
960256-1					50,000
-2					1,000
-3					200
960290-1					300
-2					10
-3					20
-4					50
-5					2,000
-6					2,000
-7					5
-8					600
-9					10
-10					6
-11					10
-12					1
-13	✓	✓	✓	✓	1

Data Validation Services

Cobble Creek Road P. O. Box 208
North Creek, N. Y. 12853
Phone 518-251-4429

January 18, 1996

Maria Heincz
LMS Engineers
One Blue Hill Plaza
Pearl River, NY 10965

RE: Validation of DASNY Site Data Packages
E3I SDG No. HRMW176

Dear Ms. Heincz:

Review has been completed for the data packages generated by E3I Laboratory, pertaining to samples collected at the DASNY Site. Three aqueous field samples and a field blank were analysed for low level Aroclor mixtures. Matrix spikes/duplicates were processed. The methodology utilized was a modification of the 1991 NYSDEC ASP 91-3.

Data validation was performed with guidance from the most current editions of the USEPA CLP National Functional Guidelines for Organic Data Review and the USEPA SOP HW-6. The following items were reviewed:

* Data Completeness
* Custody Documentation
* Holding Times
* Surrogate Recoveries
* Matrix Spike Recoveries/Duplicate Correlations
* Preparation/Calibration Blanks
* Control Spikes
* Calibration Standards
* Instrument IDLs
* Method Compliance
* Sample Result Verification

Those items showing deficiencies are discussed in the following sections of this report. All others were found to be acceptable as outlined in the above-mentioned validation procedures, and as applicable for the methodology. Unless noted specifically in the following text, reported results are substantiated by the raw data, and generated in compliance with protocol requirements.

In summary, after inclusion of the information/edits from resubmissions, the reported results of the samples are substantiated by the raw data. Resubmission communications are attached to this narrative, and should be reviewed in conjunction with this text. Copies of the laboratory case narrative, a compliancy chart, and laboratory NYSDEC Sample Preparation and Analysis Summary Forms are also included with this report.

Data Completeness

Please see the attached resubmissions.

PCB Analyses

In order to provide low detection limits, the samples were concentrated to 1.0 mL (rather than the usual protocol level of 10 mL). It was noted that the extraction log provided for the reextraction of sample HRMW-19-6 showed a 10 mL final volume; the resubmitted log was edited to 1 mL four weeks after the extraction occurred. Upon request, a memorandum supporting the edit was provided (attached).

Sample analysis was performed with a methodology in which PCB Aroclor mixtures were utilized for evaluations of linearity and daily consistency of response. Standard levels and responses were acceptable.

Sample surrogate recoveries were generally acceptable; some recoveries were below the recommended limit of 60%, but were above 45%, and above the action level for qualification of data.

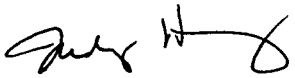
As discussed in the case narrative and resubmission communications, the initial analysis of HRMW-19-6 produced no response for surrogates. The laboratory has indicated that this was due to lack of surrogate spike (although the extraction logs show spike witness initials). The lack of response observed throughout the chromatogram can also indicate failed injection or extraction partitioning. Therefore, the nondetection of Aroclors in the initial extract cannot be assumed to indicate lack of sample constituency. The sample was reextracted at 9 days from sample receipt (within the allowable reextraction holding time), and produced low (below CRDL) response for Aroclor 1260. The originally reported method blank did not show contamination, but upon request for clarification, the lab submitted data supporting an associated blank with similar levels of Aroclor 1260.

In summary, the reanalysis of the sample HRMW-19-6 should be used, with all reported results considered estimated due to holding time. The detection of Aroclor 1260 in the sample (which was originally misreported as being Aroclor 1254 --see resubmitted Form 1 for the reanalysis results of the sample) should be rejected (due to copresence in the blank), and the result for Aroclor 1260 in the sample edited to reflect nondetection at the sample CRDL of 0.090 ug/L.

Sample matrix spikes were performed on HR-16-6. The initially reported values were incorrectly determined, and compared to incorrect matrix spike added values. Upon request for clarification, data and summary forms were provided to document tenfold lower results for spike amount added and recovered. Recovery values are as reported originally, and are acceptable. The matrix spikes were spiked at about the reported detection limit, and recovered at 72% and 77%.

Please do not hesitate to contact me if questions or comments arise during your review of this report.

Very truly yours,



Judy Harry

COMPLIANCY CHART

Project: LMS Engineers DASNY Site

SDG Nos. E3I SDG No. HRMW176

Protocol: Modified 1991 NYSDEC ASP 91-3

Rec. Date	Sample ID	Matrix	PCB	Noncompliancy
12-06-95	HRMW176	Aqueous	OK	
12-06-95	HRMW196	Aqueous	OK	
12-06-95	MWHR166	Aqueous	OK	
12-06-95	FB-1	Aqueous	OK	

Data Validation Services

Cobble Creek Road P. O. Box 208
North Creek, NY 12853
Phone and Fax (518) 251-4429

January 2, 1996

Steve Mattingly
E3I
35 Medford St.
Somerville, MA 02143

RE: LMS Engineers DASNY Project
E3I SDG No. HRMW176

Dear Steve:

Review of the above-mentioned data package is in progress. The following items are needed prior to completion of the validation report:

1. No internal chain-of-custody documentation was provided. Please forward for review.

2. The case narrative comments that the Aroclor 1260 observed in the reextract of HRMW-19-6 was a result of contamination. However, the associated method blank was not contaminated and the extraction logs do not show other samples coextracted. In addition, review of the initial extract chromatogram shows only a singular peak (with none of the usual matrix responses) , indicating either a poor injection, or the extract of a failed extraction (which is in keeping with the lack of surrogate recovery). Please discuss the rational for contamination rather than actual sample constituency.
In addition, although the raw data shows Aroclor 1260 for this sample, the report form shows Aroclor 1254. Please provide a corrected Form 1 for the sample with your discussion.

3. Please discuss the concentrations of the sample matrix spikes for this delivery group. Although the extraction log and Form 1 show a 1 mL extract, the reported result for these spikes was generated with an additional tenfold dilution factor (which would apply to a 10 mL extract). The raw data for the spikes shows response at about the detection limit, which is in keeping with tenfold lower values. Surrogate recoveries for the spikes are in keeping with 1 mL extract volumes.The actual values of these spikes (0.077 and 0.072 ug/L) therefore reflect recoveries of less than 10% against the reported spike levels. Actual spike levels cannot be verified by the extraction log (in addition to lack of specific concentrations provided for spike solutions, the submitted extractions log is too faint to be legible). Please provide specific statements regarding/clarifying this issue, legible copies of the extraction log, and corrected Forms 1 and 3 for these spikes.

Please copy Maria Heincz at LMS Engineers with all communications. Do not hesitate to contact me if you wish to discuss these issues. Thank you for your prompt attention to this matter.

Very truly yours,

Judy Harry

cc: Maria Heincz

E3I Environmental Laboratory

:5 Medford Street
Somerville, MA 02143
Tel. (617) 666-5500

P.O. Box 410215
E. Cambridge, MA 02141
Fax (617) 666-5802

January 12, 1996

Ms. Judith Harry
Data Validation Services
Cobble Creek Road
PO Box 208
North Creek, NY 12853

RE: LMS DASNY Project SDG No. HRMW176

Dear Ms. Harry

This submission constitutes the response to your comments of 2 January 1996

Comment

1. Internal C-O-C documents are enclosed.
2. Although the original extraction was not spiked with surrogate, the data is submitted because it demonstrates the absence of Aroclor congeners. The re-extracted sample was properly spiked with surrogate. The AR1260 congeners detected in the re-extracted HRMW-19-6 were detected at similar concentrations (J-value range = "estimated") in the method blank. The original data package contained the incorrect method blank for the re-extracted sample Taking the original and re-extracted analyses into consideration, the sample can be considered devoid of significant Aroclors. Corrected forms are enclosed.
3. Corrected sample spike concentrations and affiliated forms are enclosed.

Please call me if you have any further questions or comments.

Sincerely,

Stephen Emsbo-Mattingly
Laboratory Director

cc: Maria Heincz, LMS

E3I SAMPLE CONTROL FORM

E3I SAMPLE ID #			FRIDGE	# PER SAMPLE	LOGGED IN BY	DATE RECEIVED	REMOVED BY	DATE REMOVED	RETURNED BY	DATE RETURNED
* * CLP2				AH R-645						
960367	1	A	6091	2	AGS	12/06/95	RS	12-7-95	RS	12-7-95 (E)
960367	1	B	6091	2	AGS	12/06/95				
960367	1	C	6091	2	AGS	12/06/95				
960367	2	A	6091	2	AGS	12/06/95				
960367	3	A	6091	2	AGS	12/06/95				
960367	4	A	6091	2	AGS	12/06/95				

2H
SOIL PCB SURROGATE RECOVERY

Lab Name:	E3I	Case No.:	DASNY HRPC
Lab Code:	E3I	SDG No.:	HRMW176
GC Column (1):	DB608	GC Column (2):	RTX1701
Inner Diameter:	0.53 (mm)	Inner Diameter:	0.53 (mm)

	Client Sample No.	TCX (1) %REC	#	TCX (2) %REC	#	DCB (1) %REC	#	DCB (2) %REC	#	Total Out
1	ABLK1207	60		65		85		70		0
2	MWHR-16-6	50	*	55	*	65		50	*	3
3	MWHR-16-6 MS	45	*	55	*	65		75		2
4	MWHR-16-6 MSD	50	*	60		65		65		1
5	HRMW-17-6	60		55	*	105		75		1
6	FB-1	50	*	55	*	75		60		2
7	HRMW-19-6	0	*	0	*	0	*	0	*	4
8	ABLK1215	52	*	44	*	62		58	*	3
9	HRMW-19-6 RE	41	*	40	*	62		58	*	3
10										
11										
12										
13										
14										
15										
16										
17										
18										
19										
20										
21										
22										
23										
24										
25										
26										
27										

Advisory QC Limits
(60-150)
(60-150)

S1 (TCX) = Tetrachloro-m-xylene
S2 (DCB) = Decachlorobiphenyl
* Values outside of QC limits.
\# Column used to flag recovery values.
D Surrogates diluted out.

FORM II PCB 2

006

4D

PCB METHOD BLANK SUMMARY

Client Sample ID: **ABLK1215**

Lab Name:	E3I	Case No.:	DASNY HRPC
Lab Code:	E3I	SDG No.:	HRMW176
Lab Sample ID:	WA1215BK1	Lab File ID:	14DEC083.D
Matrix:	Water	Extraction:	SepF
Sulfur Cleanup:	Y	Date Extracted:	12/15/95
GPC Cleanup:	N		
Date Analyzed (1):	12/20/95	Date Analyzed (2):	12/20/95
Time Analyzed (1):	13:57	Time Analyzed (2):	14:34
Instrument ID (1):	HP5890A 0:C	Instrument ID (2):	HP5890A 0:C
GC Column (1):	DB608	GC Column (2):	RTX1701
Inner Diameter (1):	0.53 (mm)	Inner Diameter (2):	0.53 (mm)

This method blank applies to the following samples and QC spikes:

	Client Sample No.	Lab Sample ID	Date Analyzed (1)	Date Analyzed (2)
1	HRMW-19-6 RE	960367-2RE	12/20/95	12/20/95
2				
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				
13				
14				
15				
16				
17				
18				
19				
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21				
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23				
24				
25				
26				
27				
28				

009

1 G
PCB ANALYSIS DATA SHEET

Client Sample ID: HRMW-19-6 RE

Lab Name:	E3I	Case No.:	DASNY HRPC
Lab Code:	E3I	SDG:	HRMW176
Matrix:	Water	Lab Sample ID:	960367-2RE
Extraction:	SepF	Lab File ID:	14DEC082.D
% Solid:	0.0	Date Received:	12/06/95
Decanted:		Date Extracted:	12/15/95
		Date Analyzed:	12/20/95
Sample Size:	1000.0 mL		
Extract Volume:	1.0 mL	Dilution Factor:	1.0
Injection Volume:	1.0 uL	pH:	6
GPC Cleanup:	N	Sulfur Cleanup:	Y

CAS No.	Compound	Concentration Units: (ug/L)	Q
12674-11-2	Aroclor-1016	0.090	U
11104-28-2	Aroclor-1221	0.18	U
11141-16-5	Aroclor-1232	0.090	U
53469-21-9	Aroclor-1242	0.090	U
12672-29-6	Aroclor-1248	0.090	U
11097-69-1	Aroclor-1254	0.090	U
11096-82-5	Aroclor-1260	0.036	J

(Q) - Qualifiers:

U: Analyzed for but not detected.
B: Found in associated blank as well as sample.
J: Estimated value, below quantitation limit.
P: %D for concentrations between two GC columns is >25%.
C: Confirmed by GC/MS.

8E

PCB ANALYTICAL SEQUENCE

Lab Name:	E3I	Case No.	DASNY HRPC
Lab Code:	E3I	SDG No.:	HRMW176
Instrument ID:	HP5890A 0:C	Initial Calibration Start Date:	10/31/95
GC Column:	DB608	Initial Calibration End Date:	11/01/95
Inner Diameter:	0.53 (mm)		

The analytical sequence of standards, samples, blanks and QC spikes is given below:

Mean Surrogate RT from Initial Calibration:
TCX: 6.12 DCB: 25.94

	Client Sample ID	E3I Sample ID	Date Analyzed	Time Analyzed	TCX RT	#	DCB RT	#
1	AR1248bL		11/01/95	11:41	6.14		25.97	
2	AR1248cL		11/01/95	12:19	6.13		25.97	
3	AR1248dL		11/01/95	12:55	6.13		25.96	
4	AR1248eL		11/01/95	13:34	6.14		25.98	
5	PIBLKL52		12/12/95	10:37	6.13		25.91	
6	AR1254bL52		12/12/95	11:13	6.11		25.90	
7	MWHR-16-6	960367-1	12/12/95	18:25	6.13		25.93	
8	HRMW-19-6	960367-2	12/12/95	19:01		*		*
9	HRMW-17-6	960367-3	12/12/95	19:37	6.12		25.90	
10	FB-1	960367-4	12/12/95	20:12	6.13		25.92	
11	PIBLKL53		12/13/95	02:07	6.12		25.90	
12	AR1254bL53		12/13/95	02:43	6.12		25.90	
13	PIBLKL54		12/14/95	11:56	6.14		25.92	
14	AR1254bL54		12/14/95	13:54	6.14		25.92	
15	MWHR-16-6MS	960367-1MS	12/14/95	15:39	6.12		25.90	
16	MWHR-16 6MSD	960367-1MSD	12/14/95	16:15	6.12		25.91	
17	ABLK1207	WA1207BK2	12/14/95	17:26	6.12		25.90	
18	PIBLKL55		12/14/95	19:12	6.12		25.91	
19	AR1254bL55		12/14/95	19:47	6.12		25.91	
20	RS1254	REFERENCE STD	12/19/95	10:01	6.13			
21	RS1660	REFERENCE STD	12/19/95	10:35	612			
22	PIBLKL61		12/20/95	11:36	6.14		25.91	
23	AR1254bL61		12/20/95	12:11	6.13		25.89	
24	HRMW-19-6RE	960367-2RE	12/20/95	13:22	6.13		25.92	
25	ABLK1215	WA1215BK1	12/20/95	13:57	6.13		25.91	
26	PIBLKL62		12/20/95	17:32	6.14		25.91	
27	AR1254bL62		12/20/95	18:08	6.14		25.91	

QC Limits
(+/- 0.05 minutes)
(+/- 0.10 minutes)

TCX = Tetrachloro-m-xylene
DCB = Decachlorobiphenyl
# Column used to flag values outside QC limits with an asterix.
* Values outside of QC limits.

8E

PCB ANALYTICAL SEQUENCE

Lab Name: E3I
Lab Code: E3I

Case No. DASNY HRPC
SDG No.: HRMW176

Instrument ID: HP5890A 0:C
GC Column: RTX1701
Inner Diameter: 0.53 (mm)

Initial Calibration Start Date: 10/31/95
Initial Calibration End Date: 11/01/95

The analytical sequence of standards, samples, blanks and QC spikes is given below:

Mean Surrogate RT from Initial Calibration:
TCX: 7.61 DCB: 27.86

	Client Sample ID	E3I Sample ID	Date Analyzed	Time Analyzed	TCX RT	#	DCB RT	#
1	AR1248bLC	CONFIRM	11/01/95	12:19	7.62		27.88	
2	AR1248cLC	CONFIRM	11/01/95	12:55	7.64		27.95	
3	AR1248dLC	CONFIRM	11/01/95	13:34	7.62		0.00	
4	AR1248eLC	CONFIRM	11/01/95	14:11	7.62		27.89	
5	PIBLKL52C		12/12/95	11:13	7.62		27.87	
6	AR1254bL52C		12/12/95	11:48	7.62		27.88	
7	MWHR-16-6	960367-1	12/12/95	19:01	7.63		27.91	
8	HRMW-19-6	960367-2	12/12/95	19:37				
9	HRMW-17-6	960367-3	12/12/95	20:12	7.63		27.91	
10	FB-1	960367-4	12/12/95	20:48	7.64		27.93	
11	PIBLKL53C		12/13/95	02:43	7.64		27.94	
12	AR1254bL53C		12/13/95	03:18	7.65		27.94	
13	PIBLKL54C		12/14/95	13:54	7.62		27.86	
14	AR1254bL54C		12/14/95	14:29	7.60		27.81	
15	MWHR-16-6MS	960367-1MS	12/14/95	16:15	7.63		27.92	
16	MWHR-16-6MSD	960367-1MSD	12/14/95	16:51	7.63		27.92	
17	ABLK1207	WA1207BK2	12/14/95	18:01	7.64		27.91	
18	PIBLKL55C		12/14/95	19:47	7.63		27.91	
19	AR1254bL55C		12/14/95	20:22	7.62		27.88	
20	RS1254	REFERENCE STD	12/19/95	10:35	7.61		27.82	
21	RS1660	REFERENCE STD	12/19/95	11:42	7.62		27.86	
22	PIBLKL61C		12/20/95	12:11	7.61		27.82	
23	AR1254bL61C		12/20/95	12:46	7.61		27.81	
24	HRMW-19-6RE	960367-2RE	12/20/95	13:57	7.60		27.81	
25	ABLK1215	WA1215BK1	12/20/95	14:34	7.61		27.85	
26	PIBLKL62C		12/20/95	18:08	7.62		27.85	
27	AR1254bL62C		12/20/95	18:43	7.61		27.82	

* Values outside of QC limits.

QC Limits
(+/- 0.05 minutes)
(+/- 0.10 minutes)

10C
PCB IDENTIFICATION SUMMARY

				Client Sample ID
Lab Name:	E3I	Case No.:	DASNY RI	ABLK1215
Lab Code:	E3I	SDG No.:	SSD34	

Lab Sample ID:	WA1215BK1		
Date Analyzed (1):	12/20/95	Date Analyzed (2):	12/20/95
Instrument ID (1):	HP5890A 0:C	Instrument ID (2):	HP5890A 0:C
GC Column (1):	DB608	GC Column (2):	RTX1701
Inner Diameter (1):	0.53 (mm)	Inner Diameter (2):	0.53 (mm)

Aroclor	Column	Peak	RT	RT Window From	RT Window To	Total Concentration	%D
AR1260	(1)	1	16.19	16.12	16.26	0.035	2.4
		2	16.44	16.37	16.51		
		3	18.95	18.89	19.03		
		4	19.35	19.28	19.42		
		5	20.80	20.74	20.88		
	(2)	1	17.52	17.45	17.59	0.036	
		2	18.17	18.11	18.25		
		3	19.22	19.16	19.30		
		4	21.21	21.15	21.29		
		5	22.57	22.51	22.65		
	(1)	1					
		2					
		3					
		4					
		5					
	(2)	1					
		2					
		3					
		4					
		5					
	(1)	1					
		2					
		3					
		4					
		5					
	(2)	1					
		2					
		3					
		4					
		5					

A minimum of 3 peaks is required for identification of multicomponent analytes.

* These peaks were not used for quantitation due to co-elution with target and/or non-target compunds.

052B

1 G

PCB ANALYSIS DATA SHEET

Client Sample ID: ABLK1215

Lab Name:	E3I	Case No.:	DASNY RI
Lab Code:	E3I	SDG:	SSD34
Matrix:	Water	Lab Sample ID:	WA1215BK1
Extraction:	SepF	Lab File ID:	14DEC083.D
% Solid:	0.0	Date Received:	
Decanted:		Date Extracted:	12/15/95
		Date Analyzed:	12/20/95
Sample Size:	1000.0 mL		
Extract Volume:	1.0 mL	Dilution Factor:	1.0
Injection Volume:	1.0 uL	pH:	5
GPC Cleanup:	N	Sulfur Cleanup:	Y

CAS No	Compound	Concentration Units: (ug/L)	Q
12674-11-2	Aroclor-1016	0.090	U
11104-28-2	Aroclor-1221	0.18	U
11141-16-5	Aroclor-1232	0.090	U
53469-21-9	Aroclor-1242	0.090	U
12672-29-6	Aroclor-1248	0.090	U
11097-69-1	Aroclor-1254	0.090	U
11096-82-5	Aroclor-1260	0.035	J

(Q) - Qualifiers:

U: Analyzed for but not detected.
B: Found in associated blank as well as sample.
J: Estimated value, below quantitation limit.
P: %D for concentrations between two GC columns is >25%.
C: Confirmed by GC/MS.

Quantitation Report

Data File : C:\HPCHEM\6\DATA\14DEC083.D
Acq On : 20 Dec 95 01:57 PM
Sample : WA1215BK1
Misc :

Vial: 16
Operator: RMF/RQ
Inst : GC2
Multiplr: 1.00

Data File : C:\HPCHEM\6\DATA\14DEC083.D\CONFIRM.D
Acq On : 20 Dec 95 02:34 PM
Sample : WA1215BK1
Misc :
Quant Time: Dec 20 15:07 1995

Vial: 16
Operator: RMF/RQ
Inst : GC2
Multiplr: 1.00

Method : C:\HPCHEM\6\METHODS\31OCTGC2.M
Title : 91CLPPEST / OLM01.8
Last Update : Wed Dec 06 14:49:38 1995
Response via : Multiple Level Calibration

Volume Inj. : 1.0uL
Signal #1 Phase : DB-608
Signal #1 Info : 0.53mm

Signal #2 Phase: RTx-1701
Signal #2 Info : 0.53mm

Compound	RT#1	RT#2	Resp#1	Resp#2	pg#1	pg#2
System Monitoring Compounds						
1) SAB Tetrachloro-m-xylen	6.13	7.61	961773	994830	0.104	0.088
			Recovery	=	520.00%	440.00%
2) SAB Decachlorobiphenyl	25.91f	27.85	1132165	1437273	0.123	0.115
			Recovery	=	615.00%	575.00%
Target Compounds						
3) L1 Aroclor-1016{1}	0.00	0.00	0	0	N.D.	N.D.
4) L1 Aroclor-1016{2}	0.00	0.00	0	0	N.D.	N.D.
5) L1 Aroclor-1016{3}	0.00	12.02	0	15535	N.D.	0.014 #
6) L1 Aroclor-1016{4}	11.62	12.40f	12271	8215	0.027	0.017 #
7) L1 Aroclor-1016{5}	0.00	13.84f	0	14331	N.D.	0.030 #
Total Aroclor-1016{1}			12271	38080	0.027	0.061
Average Aroclor-1016{1}					0.027	0.020
8) L2 Aroclor-1221{1}	0.00	0.00	0	0	N.D.	N.D.
9) L2 Aroclor-1221{2}	0.00	9.14f	0	11999	N.D.	0.113 #
10) L2 Aroclor-1221{3}	0.00	0.00	0	0	N.D.	N.D.
11) L2 Aroclor-1221{4}	0.00	0.00	0	0	N.D.	N.D.
12) L2 Aroclor-1221{5}	0.00	0.00	0	0	N.D.	N.D.
Total Aroclor-1221{1}			0	11999	N.D.	0.113
Average Aroclor-1221{1}					0.000	0.113
13) L3 Aroclor-1232{1}	0.00	0.00	0	0	N.D.	N.D.
14) L3 Aroclor-1232{2}	0.00	0.00	0	0	N.D.	N.D.
15) L3 Aroclor-1232{3}	0.00	12.02	0	15535	N.D.	0.032 #
16) L3 Aroclor-1232{4}	0.00	0.00	0	0	N.D.	N.D.
17) L3 Aroclor-1232{5}	0.00	0.00	0	0	N.D.	N.D.
Total Aroclor-1232{1}			0	15535	N.D.	0.032
Average Aroclor-1232{1}					0.000	0.032
18) L4 Aroclor-1242{1}	0.00	0.00	0	0	N.D.	N.D.
19) L4 Aroclor-1242{2}	0.00	0.00	0	0	N.D.	N.D.

Quantitation Report

Data File : C:\HPCHEM\6\DATA\14DEC083.D
Acq On : 20 Dec 95 01:57 PM
Sample : WA1215BK1
Misc :

Vial: 16
Operator: RMF/RQ
Inst : GC2
Multiplr: 1.00

Data File : C:\HPCHEM\6\DATA\14DEC083.D\CONFIRM.D
Acq On : 20 Dec 95 02:34 PM
Sample : WA1215BK1
Misc :
Quant Time: Dec 20 15:07 1995

Vial: 16
Operator: RMF/RQ
Inst : GC2
Multiplr: 1.00

Method : C:\HPCHEM\6\METHODS\31OCTGC2.M
Title : 91CLPPEST / OLM01.8
Last Update : Wed Dec 06 14:49:38 1995
Response via : Multiple Level Calibration

Volume Inj. : 1.0uL
Signal #1 Phase : DB-608
Signal #1 Info : 0.53mm

Signal #2 Phase: RTx-1701
Signal #2 Info : 0.53mm

Compound	RT#1	RT#2	Resp#1	Resp#2	pg#1	pg#2
20) L4 Aroclor-1242{3}	0.00	12.02	0	15535	N.D.	0.017 #
21) L4 Aroclor-1242{4}	0.00	12.40f	0	8215	N.D.	0.021 #
22) L4 Aroclor-1242{5}	0.00	13.84f	0	14331	N.D.	0.035 #
Total Aroclor-1242{1}			0	38080	N.D.	0.073
Average Aroclor-1242{1}					0.000	0.024
23) L5 Aroclor-1248{1}	0.00	0.00	0	0	N.D.	N.D.
24) L5 Aroclor-1248{2}	0.00	12.02	0	15535	N.D.	0.027 #
25) L5 Aroclor-1248{3}	0.00	0.00	0	0	N.D.	N.D.
26) L5 Aroclor-1248{4}	0.00	13.84f	0	14331	N.D.	0.022 #
27) L5 Aroclor-1248{5}	0.00	0.00	0	0	N.D.	N.D.
Total Aroclor-1248{1}			0	29865	N.D.	0.049
Average Aroclor-1248{1}					0.000	0.024
28) L6 Aroclor-1254{1}	0.00	0.00	0	0	N.D.	N.D.
29) L6 Aroclor-1254{2}	0.00	0.00	0	0	N.D.	N.D.
30) L6 Aroclor-1254{3}	0.00	17.09	0	12165	N.D.	0.015 #
31) L6 Aroclor-1254{4}	15.64	17.52	11813	16507	0.016	0.042 #
32) L6 Aroclor-1254{5}	0.00	0.00	0	0	N.D.	N.D.
Total Aroclor-1254{1}			11813	28672	0.016	0.057
Average Aroclor-1254{1}					0.016	0.028
33) L7 Aroclor-1260{1}	16.19	17.52	23629	16507	0.035	0.028
34) L7 Aroclor-1260{2}	16.44	18.17	28546	24948	0.041	0.035
35) L7 Aroclor-1260{3}	18.95	19.22	9859	33045	0.026	0.037 #
36) L7 Aroclor-1260{4}	19.35	21.21	33781	35536	0.036	0.038
37) L7 Aroclor-1260{5}	20.80	22.57	19787	34332	0.046	0.044
Total Aroclor-1260{1}			115603	144369	0.183	0.181
Average Aroclor-1260{1}					0.037	0.036

Quantitation Report

Data File : C:\HPCHEM\6\DATA\14DEC083.D
Acq On : 20 Dec 95 01:57 PM
Sample : WA1215BK1
Misc :

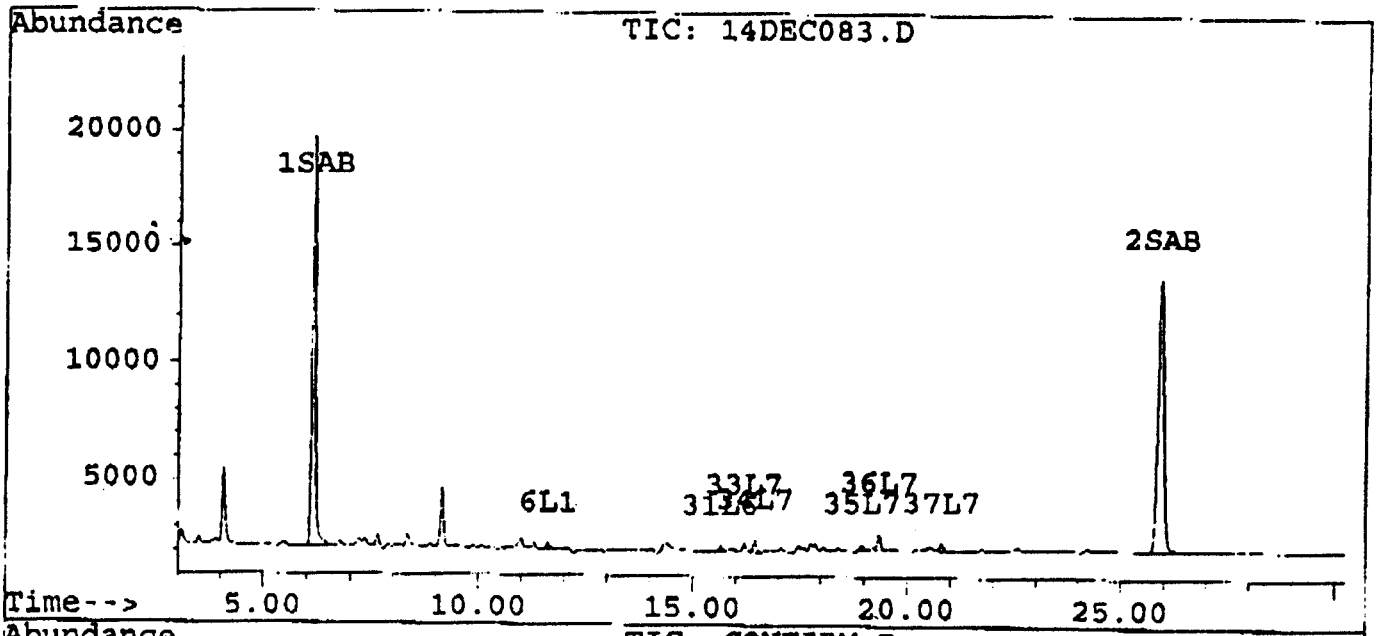
Vial: 16
Operator: RMF/RQ
Inst : GC2
Multiplr: 1.00

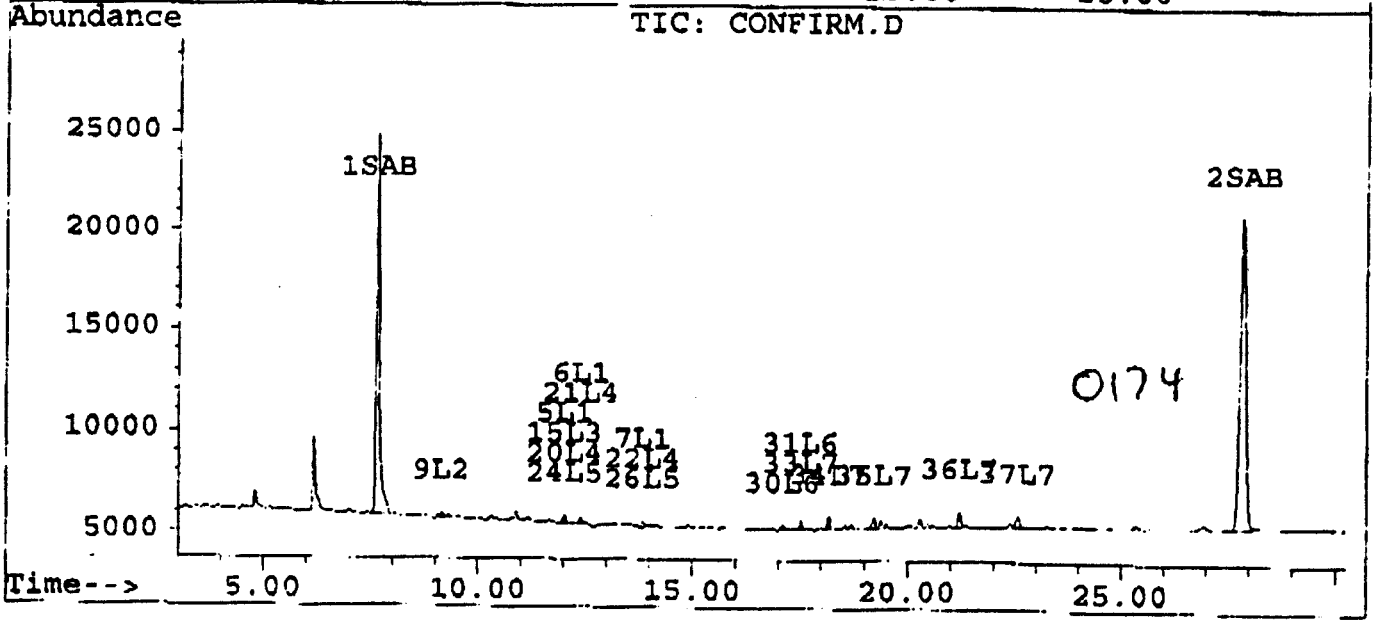
Data File : C:\HPCHEM\6\DATA\14DEC083.D\CONFIRM.D
Acq On : 20 Dec 95 02:34 PM
Sample : WA1215BK1
Misc :
Quant Time: Dec 20 15:07 1995

Vial: 16
Operator: RMF/RQ
Inst : GC2
Multiplr: 1.00

Method : C:\HPCHEM\6\METHODS\31OCTGC2.M
Title : 91CLPPEST / OLM01.8
Last Update : Wed Dec 06 14:49:38 1995
Response via : Multiple Level Calibration

Volume Inj. : 1.0uL
Signal #1 Phase : DB-608
Signal #1 Info : 0.53mm
Signal #2 Phase: RTx-1701
Signal #2 Info : 0.53mm





3I

PCB WATER MATRIX SPIKE/ SPIKE DUPLICATE RECOVERY

Lab Name: E3I Case No.: DASNY HRPC
Lab Code: E3I SDG No.: HRMW176

Matrix Spike on Client Sample No.: **MWHR-16-6**

Compound	Spike Added (UG/L)	Sample Concentration (UG/L)	MS Concentration (UG/L)	MS % REC	#	QC Limits REC	QC Limits REC
AR1254	0.10	0	0.077	77		29-131	29-131

Compound	Spike Added (UG/L)	MSD Concentration (UG/L)	MSD % REC	#	% RPD	#	QC Limits RPD	#	QC Limits REC
AR1254	0.10	0.072	72		7		50		29-131

: Column to be used to flag recovery and RPD values with an asterisk.
* : Values outside of QC limits.
RPD : 0 out of 1 outside advisory QC limits.
Spike Recovery: 0 out of 2 outside advisory QC limits.

Comments:

10C
PCB IDENTIFICATION SUMMARY

Client Sample ID: MWHR-16-6 MS

Lab Name: E3I
Lab Code: E3I
Case No.: DASNY HRPC
SDG No.: HRMW176

Lab Sample ID: 960367-1MS
Date Analyzed (1): 12/14/95
Instrument ID (1): HP5890A 0:C
GC Column (1): DB608
Inner Diameter (1): 0.53 (mm)

Date Analyzed (2): 12/14/95
Instrument ID (2): HP5890A 0:C
GC Column (2): RTX1701
Inner Diameter (2): 0.53 (mm)

Aroclor	Column	Peak	RT	RT Window From	RT Window To	Total Concentration	%D
AR1254	(1)	1	13.85	13.79	13.93	0.077	2.6
		2	14.04	13.99	14.13		
		3	15.31	15.25	15.39		
		4	15.64	15.58	15.72		
		5	16.06	15.95	16.09		
	(2)	1	15.15	15.06	15.20	0.079	
		2	15.69	15.60	15.74		
		3	17.09	16.99	17.13		
		4	17.55	17.46	17.60		
		5	17.80	17.71	17.85		
	(1)	1					
		2					
		3					
		4					
		5					
	(2)	1					
		2					
		3					
		4					
		5					
	(1)	1					
		2					
		3					
		4					
		5					
	(2)	1					
		2					
		3					
		4					
		5					

A minimum of 3 peaks is required for identification of multicomponent analytes.
* : These peaks were not used for quantitation due to co-elution with target and/or non-target compunds.

FORM X PCB

051

10C
PCB IDENTIFICATION SUMMARY

				Client Sample ID
Lab Name:	E3I	Case No.:	DASNY HRPC	MWHR-16-6 MSD
Lab Code:	E3I	SDG No.:	HRMW176	

Lab Sample ID:	960367-1MSD		
Date Analyzed (1):	12/14/95	Date Analyzed (2):	12/14/95
Instrument ID (1):	HP5890A 0:C	Instrument ID (2):	HP5890A 0:C
GC Column (1):	DB608	GC Column (2):	RTX1701
Inner Diameter (1):	0.53 (mm)	Inner Diameter (2):	0.53 (mm)

Aroclor	Column	Peak	RT	RT Window From	RT Window To	Total Concentration	%D
AR1254	(1)	1	13.85	13.79	13.93	0.072	8.5
		2	14.04	13.99	14.13		
		3	15.31	15.25	15.39		
		4	15.64	15.58	15.72		
		5	16.00	15.95	16.09		
	(2)	1	15.15	15.06	15.20	0.078	
		2	15.69	15.60	15.74		
		3	17.09	16.99	17.13		
		4	17.56	17.46	17.60		
		5	19.26	17.71	17.85		
	(1)	1					
		2					
		3					
		4					
		5					
	(2)	1					
		2					
		3					
		4					
		5					
	(1)	1					
		2					
		3					
		4					
		5					
	(2)	1					
		2					
		3					
		4					
		5					

A minimum of 3 peaks is required for identification of multicomponent analytes.

* : These peaks were not used for quantitation due to co-elution with target and/or non-target compunds.

FORM X PCB

052

1 G

PCB ANALYSIS DATA SHEET

Client Sample ID: MWHR-16-6 MS

Lab Name:	E3I	Case No.:	DASNY HRPC		
Lab Code:	E3I	SDG:	HRMW176		
Matrix:	Water			Lab Sample ID:	960367-1MS
Extraction:	SepF			Lab File ID:	14DEC005.D
% Solid:	0.0			Date Received:	12/06/95
Decanted:				Date Extracted:	12/15/95
				Date Analyzed:	12/14/95
Sample Size:	1000.0	mL			
Extract Volume:	1.0	mL		Dilution Factor:	1.0
Injection Volume:	1.0	uL		pH:	6.0
GPC Cleanup:	N			Sulfur Cleanup:	Y

CAS No.	Compound	Concentration Units: (ug/L)	Q
12674-11-2	Aroclor-1016	0.10	U
11104-28-2	Aroclor-1221	0.20	U
11141-16-5	Aroclor-1232	0.10	U
53469-21-9	Aroclor-1242	0.10	U
12672-29-6	Aroclor-1248	0.10	U
11097-69-1	Aroclor-1254	0.077	J
11096-82-5	Aroclor-1260	0.10	U

(Q) - Qualifiers:

U: Analyzed for but not detected.
B: Found in associated blank as well as sample.
J: Estimated value, below quantitation limit.
P: %D for concentrations between two GC columns is >25%.
C: Confirmed by GC/MS.

1 G

PCB ANALYSIS DATA SHEET

Client Sample ID: MWHR-16-6 MSD

Lab Name:	E3I	Case No.:	DASNY HRPC	Lab Sample ID:	960367-1MSD
Lab Code:	E3I	SDG:	HRMW176	Lab File ID:	14DEC006.D
Matrix:	Water			Date Received:	12/06/95
Extraction:	SepF			Date Extracted:	12/07/95
% Solid:	0.0			Date Analyzed:	12/14/95
Decanted:					
Sample Size:	1000.0	mL		Dilution Factor:	1.0
Extract Volume:	1.0	mL		pH:	6
Injection Volume:	1.0	uL			
GPC Cleanup:	N			Sulfur Cleanup:	Y

CAS No.	Compound	Concentration Units: (ug/L)	Q
12674-11-2	Aroclor-1016	0.090	U
11104-28-2	Aroclor-1221	0.18	U
11141-16-5	Aroclor-1232	0.090	U
53469-21-9	Aroclor-1242	0.090	U
12672-29-6	Aroclor-1248	0.090	U
11097-69-1	Aroclor-1254	0.072	J
11096-82-5	Aroclor-1260	0.090	U

(Q) - Qualifiers:

U: Analyzed for but not detected.
B: Found in associated blank as well as sample.
J: Estimated value, below quantitation limit.
P: %D for concentrations between two GC columns is >25%.
C: Confirmed by GC/MS.

FORM I PCB

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E3I Organic Preparation Laboratory Notebook

PCB SEPARATORY FUNNEL EXTRACTION

PREP028

EXTRACTION START DATE: 12-15-95
CHEMIST: (MB)

ASSOCIATED BLANKS: WA1215BK-1,2
ASSOCIATED BATCH QC: WA1215SB1,2
SPIKE WITNESS: RS

TRANSFERRED

E3I ID	CLIENT ID	SAMPLE SIZE (mL)	pH / ADJ pH	SURR (mL) ID: ASPEST 43	MS (mL) ID: J. WCCBNS 11	KD INIT/DATE	N2 INIT/DATE*	H2SO4 CLEANUP INIT/DATE	TBA CLEANUP INIT/DATE	EXTRACT FINAL VOL	COMMENTS	SAMPLE TRANSFER INIT/DATE	RECEIVED FOR LAB INIT/DATE
				← PKS 1/11/96		NC	NC	NC	NC			PKS	RB
WA1215BK-1,2		1l	5	0.1ml	↓	12/18/95	12/18/95	12/15/95	12/15/95	~~1L ml~~	← 1ml PKS 1/11/96	12/19/95	12/19/95
WA1215SB1,2		↓	↓		0.1ml								
0367-2RE	HRMW-19-6	↓	6	↓		↓	↓	↓	↓	↓		↓	↓

*CONVERT TO HEXANE - 3X

REVIEWER/DATE: PKS DEC 27 1995

QA REVIEWER/DATE:

0213

E3I Environmental Laboratory

35 Medford Street
Somerville, MA 02143
Tel. (617) 666-5500

P.O. Box 410215
E. Cambridge, MA 02141
Fax (617) 666-5802

January 18, 1996

Ms. Judith Harry
Data Validation Services
Cobble Creek Road
PO Box 208
North Creek, NY 12853

RE: LMS DASNY Project SDG No. HRMW176

Dear Ms. Harry:

This submission constitutes a response to your verbal inquiry of 18 January 1996 concerning raw data corrections submitted to you on 12 January 1996.

Comment:

1. The PCB sample preparation logbook page is resubmitted due to the illegibility of the previously submitted copy.
2. All adjusted sample preparation logbooks reflect accurately the memory of the analyst, all analytical data and the volume of existing extract in the laboratory. There is no mistake that the adjusted volumes are correct.
3. Please note that the correct spike concentrations are presented on the Form 3 submitted on 12 January 1996.

Please call me if you have any further questions or comments.

Sincerely,

Stephen Emsbo-Mattingly
Laboratory Director

cc: Maria Heincz, LMS

E3i Organic Preparation Laboratory Notebook

PCB SEPARATORY FUNNEL EXTRACTION

PREP'D

TRANSFERRED

ASSOCIATED BLANKS: WA1207BS-1,2 ✓

ASSOCIATED BATCH QC: WA1205SB1,2 ✓

EXTRACTION START DATE: 12-7-95

CHEMIST: DB/RS

SPIKE WITNESS: RS

SAMPLE ID	CLIENT ID	SAMPLE SIZE (mL)	pH ADJ pH	SURR (mL) Aroclors 4,3	MS/MSD Aroclors 11	SURR ADDED	MS ADDED	EXTRACT CLEANUP INITIATED	TBA CLEANUP INITIATED	TBA EXTRACT FINAL VOL	COMMENTS	SAMPLE TRANSFER INITIATED	REVIEWED FOR LC WITNESS
WA1207BS-1,2		1L	5	0.1 ml	0.1 ml	RS 12/8/95	PKS 12/8/95	NC 12/11/95	NC 12/11/95	1ml Hexane	PKS 12/18/96	PKS 12/11/95	RMF 12/11/95 RS
WA1207SB1,2			↓										
0367-1	MW3R-16-6		6		0.1 ml								
-1MS	↓				↓								
-1MSD	HBMW-19-6												
-2	↓ -17-6												
-3	FB-1												
-4													

REVIEWER/DATE: PKS DEC 27 1995

QA REVIEWER/DATE:

012

P.04

SDG NARRATIVE

LAB NAME: E3I Environmental Laboratory

CASE NO.: DASNY

SDG: HRMW176

E3I Project: 960367

Statement of Work: These results are in accordance with NYSDEC ASP 91-3 modified. These results are reported according to ASP Superfund Category "B".

SAMPLE NO.: MWHR-16-6, HRMW-19-6, HRMW-17-6, FB-1

PCBs: As per client request, the samples were extracted at 1L and concentrated at 1.0 ml to meet the required quantitation limit.

Sample HRMW-19-6 was reextracted due to low surrogate recoveries in the initial extraction. The extract in the second extraction was contaminated with AR1260 which is less than the CRQL.

Recovery of the surrogate TCX is outside the advisory QC limit on the DB608 column for samples MWHR-16-6, MWHR-16-6MS, MWHR16-6MSD, FB-1, HRMW19-6, ABLK1215 and HRMW-19-6RE.

Recovery of the surrogate TCX is outside the advisory QC limit on the RTX1701 column for samples MWHR-16-6, MWHR-16-6MS, HRMW-17-6, FB-1, HRMW19-6, ABLK1215 and HRMW-19-6RE.

Recovery of the surrogate DCB is outside the advisory QC limit on the DB608 column for sample HRMW-19-6.

Recovery of the surrogate DCB is outside the advisory QC limit on the RTX1701 column for samples MWHR-16-6, HRMW-19-6 and HRMW-19-6.

For the analytical sequence on the DB608 column:
- AR1254bL52 - %RPD >15 for AR1254
- AR1254bL61- %RPD >15 for AR1254
- AR1254bL62 - %RPD >15 for AR1254

000001A

For the analytical sequence beginning on the RTX1701 column:
- AR1254bL52C- %RPD >25 for TCX
- AR1254bL53C- %RPD >25 for TCX
- AR1254bL55C- %RPD >25 for TCX
- AR1254bL61C- %RPD >25 for DCB
- AR1254bL62C- %RPD >25 for TCX and >15 for AR1254

"I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hardcopy data package has been authorized by the Laboratory Manager or his designee, as verified by the following signature."

Mervelina Saturno-Condon

Mervelina Saturno-Condon
Project Manager

December 22, 1995

To be included with all lab data and with each workplan

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

SAMPLE IDENTIFICATION AND ANALYTICAL REQUIREMENT SUMMARY

Customer Sample Code	Laboratory Sample Code	Analytical Requirements					
		*VOA GC/MS Method 1	*BNA GC/MS Method 1	*VOA GC Method 1	*Pest PCBs Method 2	*Metals	*Other
MWHR-16-6	960367-1						
HRMW-19-6	367-2						
HRMW17-6	367-3						
FB-1	367-4						

000001C

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

SAMPLE PREPARATION AND ANALYSIS SUMMARY
~~PESTICIDE~~/PCB
ANALYSES

Laboratory Sample ID	Matrix	Date Collected	Date Rec'd at Lab	Date Extracted	Date Analyzed
960367-1	H_2O	12/5/95	12/6/95	12/7/95	12/12/95
960367-2	↓	↓	↓	↓	↓
-3	↓	↓	↓	↓	↓
-4	↓	↓	↓	↓	↓
-2RE	↓	↓	↓	12/15/95	12/20/95

000002

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

SAMPLE PREPARATION AND ANALYSIS SUMMARY

~~PESTICIDE~~/PCB

ANALYSES

Laboratory Sample ID	Matrix	Analytical Protocol	Extraction Method	Auxiliary Cleanup	DF/Conc Factor
960367-1	H_2O	ASP 91-3	Sep F	Florosil	1:1
-2	↓	↓	↓	& Sulfur	↓
-3	↓	↓	↓	↓	↓
-4	↓	↓	↓	↓	↓
~~-2RE~~1	↓	↓	↓		

000003

DATA USEABILITY REPORT

This useability report covers the analytical results, submitted by Energy & Environmental Engineering Inc. (E3I), for the stream sediment and groundwater investigation, conducted by Lawler, Matusky & Skelly Engineers LLP (LMS) during November and December 1995 at the Hudson River Psychiatric Center Area 6 PCB site in Poughkeepsie, New York. The analytical report submitted by E3I for sample designation groups (SDG) SSD34 and HRMW176 were validated by Data Validation Services (DVS). LMS reviewed the data validator's final report and assessed the analytical data against the project data quality objectives (DQOs) in preparation of this report. Where resulting quality control (QC) data did not fall within protocol requirements the reported data have been appropriately qualified. Overall, the data submitted by E3I met the project DQOs and are useable to characterize the extent of contamination in samples collected from the Hudson River Psychiatric Center site.

A total of 22 sediment samples were collected from Area 6 and analyzed for polychlorinated biphenyls (PCBs) in accordance with modified EPA Method 8080. In addition, three groundwater samples and a field blank were collected and analyzed for PCBs in accordance with a modified NYSDEC ASP Method 91-3. Both methods were modified by replacing the multilevel pesticides calibration with a five-point calibration for PCBs. In addition, groundwater samples were concentrated to 1.0 mL (rather than the usual protocol level of 10.0 mL) to achieve a detection limit of 0.1 μg/l. All of the analyses were conducted in accordance with the most recent version of New York State Department of Environmental Conservation (NYSDEC) Analytical Services Protocol (ASP), 1993 revision.

The analytical data submitted by E3I were compliant with the established protocols. LMS has prepared this report to discuss any useability limitations associated with the reported values as a result of issues raised by the data validator.

Sediment Samples

PCB Analyses

PCB concentrations in the field samples were determined according to a modified Method 8080. The affect of QC issues addressed by the data validator on data useability are discussed below.

1. A number of samples contained PCBs at levels that may have exceeded the solvency of the extraction. In addition, surrogate recoveries for these samples could not be evaluated because of excessive sample dilution. As a consequence, analytical results may be biased slightly low and are considered estimated. The results of affected samples SSD-93, -94, -152, 155, -156(0-6), and -156(6-12) are useable to show that elevated levels of PCBs were detected and to estimate the overall magnitude of contamination in the samples analyzed.

2. The validator noted that because of the elevated PCB levels, sample carryover may have occurred between successive sample analyses. Samples reported with low-level PCBs may, therefore, be biased high. The resulting PCB 1260 values reported below 1 mg/kg are considered suspect and possibly the result of carryover and have been appropriately qualified.

3. The identification of Aroclor 1232 in sample SSD-36(1-2) is considered tentative and estimated due to poor correlation of individual PCB congeners. The lack of Aroclor 1232 detections in any other sediment samples collected for analyses indicates that Aroclor 1232 was not present, therefore the detection limit for Aroclor 1232 in sample SSD-36(1-2) has been raised to the concentration reported.

4. Concentrations of PCBs having a "p" qualifier (reflecting poor confirmation analysis) should be considered estimated. Concentrations of PCBs detected below the CRQL (qualified with a "j") and also having a "p" qualifier (reflecting poor confirmation analysis) should be considered estimated, and possible not representative.

5. Matrix Spikes were not performed with the associated SDG. This does not affect useability, the results are useable with the limitations noted.

Groundwater Samples

PCB Analyses

PCB concentrations in the field samples were determined according to modified ASP Method 91-3. The affect of QC issues addressed by the data validator and the data useability are discussed below.

1. Sample results for the reextraction of HRMW-19-6, originally misreported as Aroclor 1254 instead of 1260, has been corrected to indicate non-detect at the sample contract required detection limit of 0.09 μg/l. Aroclor 1260 was detected in an associated blank at levels similar to those detected in the sample. The remaining PCB data for this sample is unaffected and is useable without qualification.