

**Remedial Investigation Report
Cumberland Bay Sludge Bed - Wilcox Dock
Operable Unit No. 2**

Work Assignment No. D002520-32

Prepared for:



**SUPERFUND STANDBY PROGRAM
New York State
Department of Environmental Conservation
50 Wolf Road
Albany, New York 12233**

Prepared by:

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Albany, New York 12233-7010**

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Public and Private Beaches on Cumberland Bay: Beaches included in OU-2 begin at sampling point SL-8 and continue north, including private and city beaches and a significant portion of the Cumberland Bay State Park Beach (see Figure 2). Also included is the beach located south of the Wilcox Dock breakwater, also shown on Figure 2.

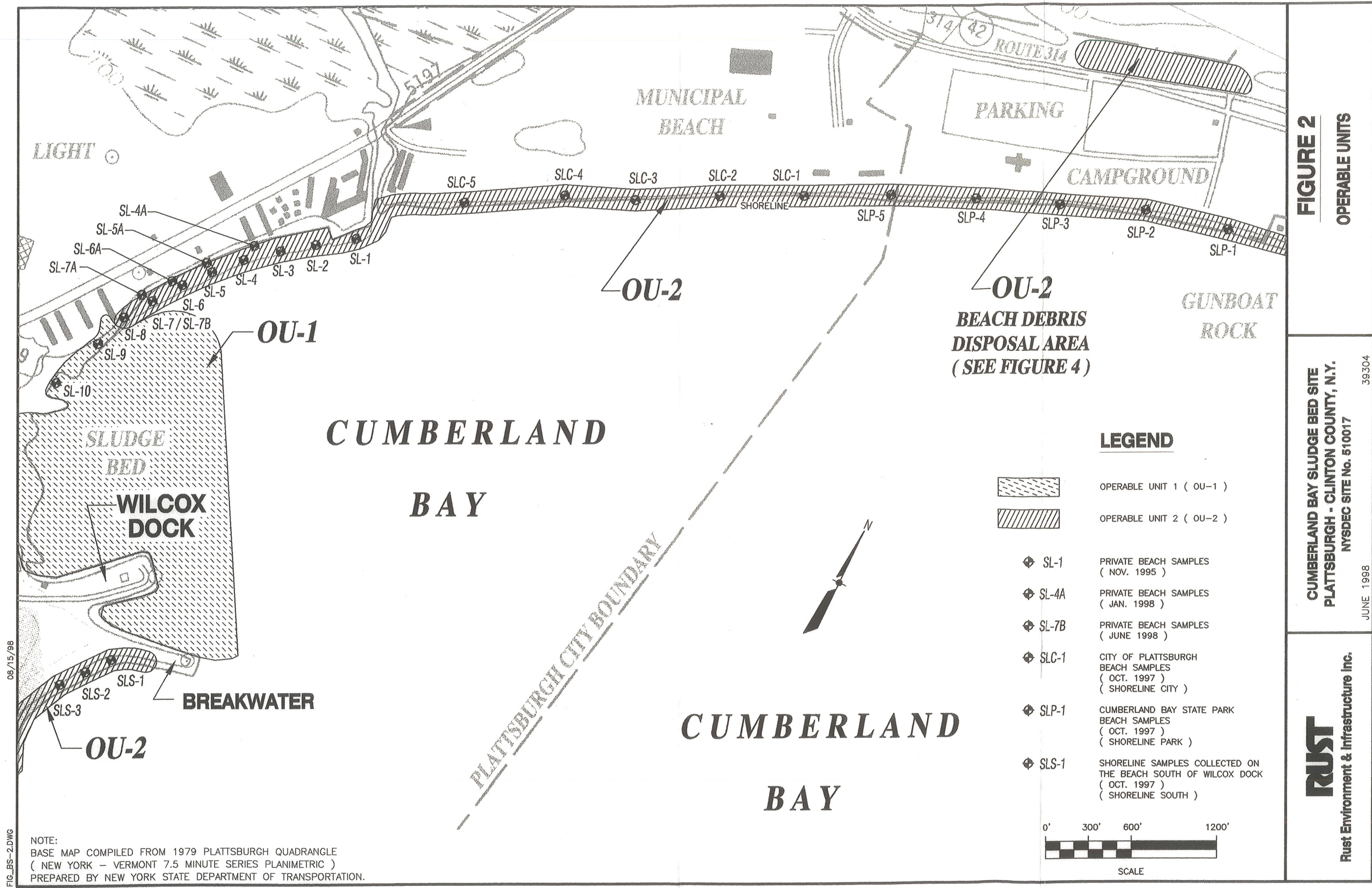
Environmental sampling performed as described in the SC Report (samples SL-1 through SL-10, shown on Figure 2) and by the NYSDEC and NYS Department of Health (DOH), have revealed the presence of wood chips and other debris (e.g., sludge) originating from the sludge bed which have been deposited immediately off-shore and onto the beach areas to the north of the sludge bed. The known presence of these materials prompted the NYSDEC to initiate an Interim Remedial Measure (IRM) to periodically remove the impacted materials from usable beaches north and south of the sludge bed. However, the presence of the sludge bed provides a continuous source of wood chips/debris resulting in a potential for contact with these materials on the beaches. Therefore, the potential for direct contact with these materials exists due to the recreational uses of the beaches to the north including walking, sun bathing, and swimming.

Due to these potential risk, the beaches north and south of the site were identified as part of OU-2. As part of the RI for OU-2, the NYSDEC tasked Rust to perform an investigation to characterize the vertical and horizontal extent of PCB contamination along these beaches. This investigation is described in Section 2.1.

Beach Debris Disposal Area: From the mid-70's to the mid 90's the Cumberland Bay State Park disposed of beach material resulting from storm and spring clean-up operations in an area within the Park boundaries. The disposal area (shown on Figure 2) is located on the north side of NY Route 314, opposite the Cumberland Bay State Park Camper's Entrance. The material was deposited in a lowland area north of the developed park area. Once PCBs were detected in the material washing up on the beaches and upon initiation of the beach cleaning IRM, use of the disposal area was discontinued. The NYSDEC considered the beach debris disposal area an area potentially impacted by material originating from the sludge bed and therefore identified it a part of OU-2. As part of the RI for OU-2, the NYSDEC tasked Rust to perform an investigation to determine if beach spoils contaminated with PCBs are present in the disposal area. This investigation is described in Section 2.2.

The beach debris disposal area (shown on Figures 2) is approximately 1 to 1.25 acres in size. It consists of a level fill area bounded by mature trees. The fill area drops off 4 to 6 vertical feet to the apparent native lowland. A sandy gravel traffic course is present over vehicle traffic areas, with grass and shrubs growing near the edges of the slopes. Along the edges of the disposal area large boulders, concrete and timber rubble, and soil can be observed. Current use of the disposal area by the State Park maintenance crews includes staging of recyclable materials and trash containers.

Cumberland Bay and Lake Champlain: The impact of the sludge bed on Cumberland Bay and Lake Champlain is currently being studied as part of a larger study of the Lake Champlain Basin. This larger study is being performed by members of the Lake Champlain Basin Program including the NYSDEC Department of Water. This report does not address this area of OU-2.



1.3 Site History

Historically, land deeded to Willard G. Wilcox by the State of New York in the late 1800's was reappropriated back to the State of New York Department of Public Works in 1914, during which time a barge canal terminal was envisioned, planned, designed and constructed. Completion of construction occurred circa 1920 with the beginning of commercial traffic to the dock facility.

Industries in the area at the turn of the century and early 1900's included the Lozier Automobile Company, Saranac Pulp and Paper Company, Standard Pulp and Products Company, and Borst-Forest-Dixiel. Several oil companies, including Colonial Beacon, Standard, Shell and Sucony Vacuum Oil Company maintained pipe lines from Wilcox Dock to storage facilities inland from the bay. In 1935 and in 1951, the NYS Division of Canals and Waterways dredged the canal access along the dock to accommodate larger fuel bearing vessels. The Diamond Match Company (1944), Vanity Fair (1955), and ultimately, the Georgia Pacific Company (1963-present) occupied property adjacent to the Site.

Records indicate that for several decades wastes from some local industries were discharged to local streams which ultimately discharge into Cumberland Bay or were directly discharged into the bay. Sawmills on the Saranac River discharged wastes into Cumberland Bay, where prevailing winds and currents in the summer dispersed the solids against the beach areas at the north end of the bay. Also, pulp and paper mills on the shore of the bay near Dead Creek disposed of solids and organic materials (Frederic R. Harris, Inc., 1979). Untreated waste disposal ended in the early 1970's when the Plattsburgh Sewage Treatment Plant began treating wastes from the local industries. Over the years, wave action and water currents eroded the sludge bed and transported wood chips and organic debris along the shorelines and beaches to the north as well as to other areas within Cumberland Bay. For several years, the Site was considered a public nuisance, emitting unpleasant odors and hampering boating and swimming activities in the area. Environmental sampling from 1992 through 1994 confirmed the presence of polychlorinated biphenyls (PCBs), and to a lesser extent polychlorinated dibenzodioxins (dioxins) and dibenzofurans (furans) within the sludge and along the shoreline and beach areas.

At the present time, there is a health advisory in effect for several species of fish within Lake Champlain and Cumberland Bay due to elevated PCB levels in the fish; the advisory specifies, "eat no more than one meal per month". In addition, the commercial sale of yellow perch from Cumberland Bay is prohibited due to PCB concentrations in the fish, which exceed the US Food and Drug Administration (FDA) marketplace standard of 2 ppm.

1.4 Scope of Work

Investigations have been undertaken by Rust to further define the conditions in the areas identified as OU-2. This report specifically pertains to the sampling programs performed by Rust, including a description of methods used and summary of results.

Rust's investigations were performed under Work Assignment No. D002520-32 of the State Superfund Standby contract between the NYSDEC and Rust and its subconsultant TAMS Consultants, Inc. (TAMS). The scope of work included:

- Collection of core samples on municipal and state beaches north and east of the site,
- Collection of core samples on a beach south of the Wilcox Dock breakwater,
- Sediment sampling at a beach debris disposal area in the Cumberland Bay State Park, and
- Report preparation.

These sampling programs were performed in accordance with Section 2.1 of *Work Plan Amendment No. 1* dated July 1996, Section 2.1 of *Work Plan Amendment No. 2* dated December 15, 1997, the *Health and Safety Plan* (HASP) dated July 1995 and *Sampling and Analysis Plan* (SAP) dated August 1995. The HASP and SAP were prepared by Rust as companion documents to the original Work Plan. A description of the Site and its history is provided in the *Site Characterization Report* dated November 1995 and will not be repeated in this report.

2.0 OU-2 INVESTIGATIONS

2.1 Remedial Investigation of Beach Areas

2.1.1 Purpose

The purpose of the remedial investigation of the beach areas under OU-2 is to characterize the vertical and horizontal extent of PCB contamination along the city and state park beaches north and east of the sludge bed and along the beach south of the Wilcox Dock breakwater (south beach), by supplementing the data collected in the 1995 SC Report. Two additional sampling events were conducted to supplement the data collected in 1995. In October 1997, beach samples were collected throughout OU-2. In January and June 1998, beach samples were collected near specific sampling locations from the 1995 investigations to verify the positive results obtained in 1995. The results will be used to determine if additional remedial action is required for the Cumberland Bay beaches.

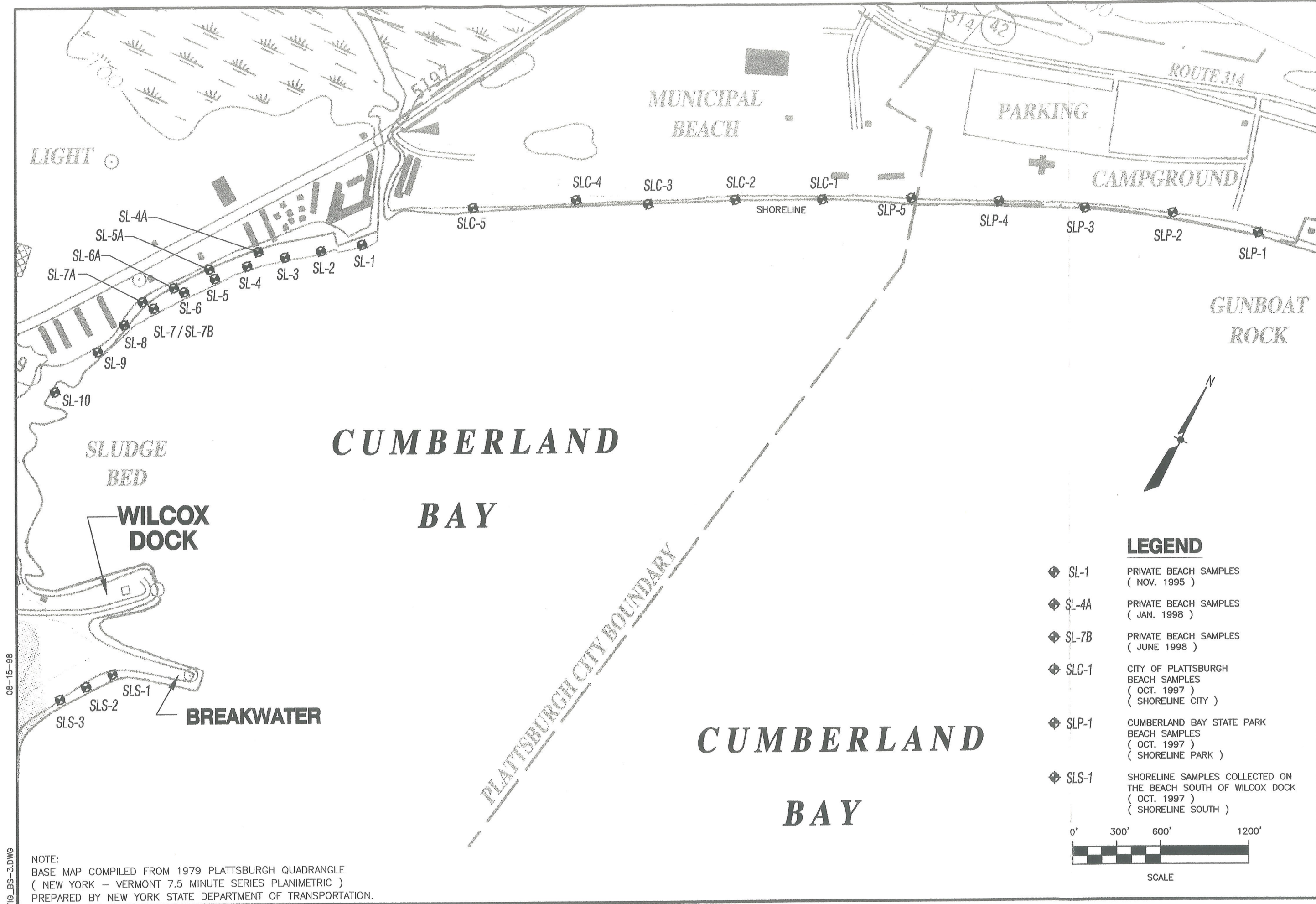
2.1.2 Sampling Method

SL Series (SL-1 to SL-10)

The sampling and analytical methods used to collect ten (10) samples from the beaches north of the sludge bed (SL-1 through SL-10; shown on Figure 3) in 1995 are described in the SC Report and not repeated herein. However for comparison, copy of the core logs presented in the SC Report are provided in Appendix A of this report.

A total of five (5) additional samples were collected on January 30, 1998 in the vicinity of SL-4, SL-5, SL-6 and SL-7 to verify PCB concentrations in areas with positive test kit results. The new samples were identified as SL-4A (0-12" and 12-24"), SL-5A (0-12"), SL-6A (0-12") and SL-7A (0-12"). Three additional samples were collected in the vicinity of SL-7 (SL-7B0-6", SL-7B6-12" and SL-7B 12-23") on June 4, 1998 to verify the results of the January sampling. The sample locations are shown on Figure 3. These samples were collected by NYSDEC and Rust personnel.

In January 1998, the elevation of the surface of the ice covered bay was three to four feet higher than the average lake elevation of 95 feet. As such, the locations of the former beach samples were covered with several feet of water and ice. The samples were to be collected with a hand auger which could not retain sample if drawn through water. The sampling locations were moved shoreward from the original locations to a place where the ice was in direct contact with the sand (see Figure 3). A 4-inch diameter ice auger was used to drill a hole through the ice. A 2-inch stainless steel hand auger was used to removed beach sand to a depth of one foot. The sand was composited on a dedicated sheet of plastic using a clean, dedicated, stainless steel hand trowel. A composite sample was placed in a bottle for PCB analysis at the NYSDEC laboratory. The intent was to collect two samples at each location, one from 0-12 inches and another 12-24 inches. This was performed at location SL-4A but was not possible at the remaining locations due to water saturating the sand and closing the hole after 12-inches of material was removed. The hand auger was decontaminated with liquinox and hexane between samples.



In June 1998 the sample at SL-7B was collected by pushing a core tube at the sample location to a depth of two feet below the ground surface. Three samples were collected from this core and sent to Scilab Albany, Inc. for PCB analysis.

SLC, SLP and SLS Series

A total of thirteen (13) beach cores were collected on October 20 and 21, 1997 at the locations shown on Figure 3, by NYSDEC and Rust personnel. Five (5) samples (SLC-1 through 5) were collected along the city beaches east of the Plattsburgh Chamber of Commerce Building. Five (5) samples (SLP-1 through 5) were collected along the NY State Park beach. Three (3) samples SLS-1 through 3 were collected south of the breakwater. The beach cores were collected approximately 5 feet from shore.

At each sample location, a 2.25-inch diameter clear, polybuterate core liner was driven with a sledge hammer approximately 3 feet below grade. The core liner was pre-drilled to allow a 3/8-inch metal rod to be used to torque the casing during core extraction. Once the core was extracted it was capped, labeled, sealed with tape, and delivered to the sample preparation area at the Rust Environment and Infrastructure, Albany office. The samples were logged on October 22 and 23, 1997.

Each core was cut in half along its longitudinal axis and visually inspected. A log was prepared for each core and samples were collected for PCB test kit or laboratory analysis. The sample depth intervals were generally 0-6", 6-12", 12-24" and 24-36". These intervals varied according to natural breaks in the stratigraphy within the cores. The core logs are provided in Appendix B. The samples were transported (on October 29, 1997) to the NYSDEC Analytical Laboratory in Saratoga Springs, New York, for PCB analysis and PCB immunoassay test kit screening.

2.1.3 Sampling Results

SL Series (SL-1 to SL-10)

The results of PCB test kit and laboratory analysis of samples SL-1 through SL-10, collected in 1995, are provided on Table 1. The results indicate that PCB concentrations in the beach cores, particularly in the surface samples, increase towards the sludge bed, diminishing to below 2 ppm to the north.

The laboratories analyzed the additional samples SL-4A through SL-7A, collected January 1998 and SL-7B, collected in June 1998, for PCBs according to NYSDEC ASP Method 95-3. The results of the analyses are also provided on Table 1. SL-4A through SL-7A all contained PCB concentrations less than 2 ppm. These results indicate that the PCB concentrations in the previous 1995 samples north of SL-7 were likely also below or near the detection limit of the test kit. The core collected at SL-7B contained a layer of wood chips between 6 and 12 inches and 15 to 18 inches which had not been noted previously at this location. These wood chips are likely the source of the PCB concentration detected in the SL-7B samples below 6 inches. The variation in wood chip thickness noted in this area indicates that the environment is dynamic with both erosive and depositional forces acting to pick up and redeposit sludge and woodchips.

Table 1

Beach Samples (from SC Report)
PCB Test Kit and Laboratory Analytical Results
Cumberland Bay Sludge Bed Site

Sample Location		PCB Test Kit (mg/kg)		PCBs (mg/kg) - Aquatec Laboratory			
		Negative Result	Positive Result	Aroclor -1242	Aroclor -1248	Aroclor -1254	Aroclor - 1260
Beach/shoreline cores							
SL-1	0" - 6"	<2					
SL-1	6" - 12"	<2					
SL-1	12" - 20"	<2					
SL-1	20" - 30"	<2					
SL-2	0" - 7"	<2					
SL-2	7" -14"	<2					
SL-2	14" - 23"		>2				
SL-2	23" - 30"		>2				
SL-2	30" - 34		<2				
SL-3	0" - 7"	<2					
SL-3	7" -14"	<2					
SL-3	14" - 22"		>2	0.12	--	--	--
SL-3	22" - 30"	<2					
SL-3	30" - 34	<2					
SL-4	0" - 6"		>2				
SL-4A	0" - 12"	--	--	--	0.21	--	--
SL-4	6" - 13"		>2				
SL4A	12" - 24"	--	--	--	0.093	--	--
SL-4	13" - 24"		>2				
SL-4	24" - 28"	<2					
SL-5	0" - 6"		>2				
SL-5A	0" - 12"	--	--	--	0.11	--	--
SL-5	6" - 12"		>2				
SL-5	12" - 18"		>2				
SL-5	18" - 38"		<2				
SL-6	0" - 6"		>2				
SL-6A	0" - 12"	--	--	--	0.12	--	--
SL-6	6" - 12"		>2				
SL-6	12" - 24"		>2	1.4	--	0.28 J	--
SL-6	24" - 38"	<2					
SL-7	0" - 6"		>2				
SL-7A	0" - 12"	--	--	--	1.8	--	--
SL-7B	0" - 6"	--	--	--	--	--	--
SL-7	6" - 12"		>2				
SL-7B	6" - 12"	--	--	20	--	19	--
SL-7	12" - 24"	<2		0.29	--	--	--
SL-7B	12" - 23"	--	--	12	--	14	--
SL-7	24" - 36"		~2				
SL-7	36" - 42"		>2				
SL-8	0" - 6"		~2				
SL-8	6" - 12"		>2	12 CY/14CY*	--/- -*	--/- -*	0.48 JP/- -*
SL-8	12" - 24"		~2				
SL-8	24" - 32"		>2				
SL-9	0" - 7"		>2	2.7 C	--	0.47 J	--
SL-9	7" -14"		>2				
SL-9	14" - 21"		>2				
SL-9	21" - 29"		>2				
SL-10	0" - 12"		>2				
SL-10	12" - 24"		>2				
SL-10	24" - 35"		>2				

Note: Concentrations are in parts per million (ppm).

-- = Not detected. * = field duplicate sample

J = Estimated value.

P = Percent difference between the two analytical columns is greater than 25%.

C = Compound identification has been qualitatively confirmed by GC/MS.

Y = The result was an estimated concentration from a response that exceeded the calibration range.

SL = Shoreline sample collected in 1995 along city beaches

The analysis of samples for PCBs using immunoassay technology is a screening procedure to provide an estimate of the concentration of PCBs present in a sample or information on the presence/absence of PCBs at a specific reporting limit. The immunoassay test kit PCB analyses were performed to provide information on the presence/absence of PCBs, primarily Aroclor 1242, at a reporting limit of 2 ppm. The minimum detection level of the PCB test kit used for Aroclor 1242 was 2 ppm.

It is not unusual for the immunoassay test kits to exhibit false positive results for samples when the sample PCB concentration is below the minimum detection limit of the immunoassay test kit. The USEPA, SW-846 Test Methods For Evaluating Solid Waste, Physical/Chemical Methods, Method 4020 (Screening For Polychlorinated Biphenyls by Immunoassay) reported that the test kit assignment of ">" results for a soil sample can be inaccurate as the sample concentration approaches that of the testing level. Therefore, a percentage of false positives will be reported as the sample concentration approaches the minimum detection level of the test kit.

In a study of immunoassay test kit results verses laboratory results at a USEPA Superfund SITE demonstration, samples were analyzed by immunoassay (SW-846 method 4020) and by a laboratory (SW-846 method 8082 PCBs by gas chromatography). The test kit reporting limit was 10 ppm. The laboratory data indicated that the PCB concentration in 127 samples was less than 10 ppm and of these 127 samples the immunoassay test kits indicated that 37 of these were above 10 ppm, which is a false positive rate of 29 percent.

SLC, SLP and SLS Series

The NYSDEC laboratory analyzed samples from the SLC and the SLP series (city and State Park beaches) using PCB immunoassay test kits. The NYSDEC laboratory generated a calibration curve for use with the test kits allowing for quantified screening results. The NYSDEC laboratory analyzed the complete SLS series of samples (from the south beach) for PCBs according to NYSDEC ASP Method 95-3. The city and State Park beach results are summarized on Table 2 and south beach results are summarized on Table 3.

Three of the samples from the city and State Park beaches contained greater than 1 ppm of PCBs according to the test kit screening. Test kit analysis of samples SLC-2 (12-24 inches), SLC-3 (12-23 inches) and SLP-4 (31-33 inches) contained 1.36 ppm, 1.01 ppm and 1.14 ppm of PCBs, respectively.

One sample from the beach south of Wilcox Dock contained greater than 1 ppm of PCBs. SLS-2, collected at a depth of 18 to 24 inches contained 3.2 ppm of PCBs.

2.2 Beach Debris Disposal Area

2.2.1 Purpose

The purpose of the sediment sampling activities at the beach debris disposal area is to determine if beach spoils contaminated with PCBs originating from the sludge bed are present in the disposal area. This data will be used to determine if remedial actions are necessary in the beach debris disposal area.

Table 2

Beach Samples (City and State Parks)

PCB Immunoassay Test Kit Results

Cumberland Bay Sludge Bed Site

Sample Location		PCB Test Kit (mg/kg)		Sample Location		PCB Test Kit (mg/kg)	
		Negative Result	Positive Result			Negative Result	Positive Result
Beach/shoreline cores				Beach/shoreline cores			
SLC-1	0" - 6"	<1	1.36	SLP-1	0" - 6"	<1	1.14
SLC-1	6" - 12"	<1		SLP-1	6" - 12"	<1	
SLC-1	12" - 18"	<1		SLP-1	12" - 22"	<1	
SLC-1	18" - 24"	<1		SLP-1	22" - 30"	<1	
SLC-1	24" - 34"	<1		SLP-2	0" - 6"	<1	
SLC-2	0" - 6"	<1	1.01	SLP-2	6" - 12"	<1	
SLC-2	6" - 12"	<1		SLP-2	12" - 22"	<1	
SLC-2	12" - 24"			SLP-2	22" - 30"	<1	
SLC-2	24" - 32"	<1		SLP-3	0" - 6"	<1	
SLC-3	0" - 6"	<1		SLP-3	6" - 12"	<1	
SLC-3	6" - 12"	<1	1.14	SLP-3	12" - 24"	<1	
SLC-3	12" - 23"			SLP-3	24" - 31"	<1	
SLC-3	23" - 31"	<1		SLP-3	31" - 33"		
SLC-4	0" - 6"	<1		SLP-4	0" - 6"	<1	
SLC-4	6" - 12"	<1		SLP-4	6" - 12"	<1	
SLC-4	12" - 21"	<1		SLP-4	12" - 22"	<1	
SLC-4	21" - 28"	<1		SLP-4	22" - 30"	<1	
SLC-5	0" - 6"	<1		SLP-5	0" - 6"	<1	
SLC-5	6" - 12"	<1		SLP-5	6" - 12"	<1	
SLC-5	12" - 22"	<1		SLP-5	12" - 23"	<1	
SLC-5	22" - 31"	<1		SLP-5	23" - 28"	<1	

Note: Concentrations are in parts per million (ppm)
 PCB test kit analysis performed at the NYSDEC laboratory
 SLC = Shoreline samples collected along the city beaches (1997)
 SLP = Shoreline samples collected along the state park beaches (1997)

Table 3

Beach Samples (South of Wilcox Dock Breakwater)

PCB Laboratory Analytical Results

Cumberland Bay Sludge Bed Site

Sample Location		PCBs (mg/kg) - NYSDEC Laboratory	
		Aroclor -1242	Aroclor -1254
Beach/shoreline cores			
SLS-1	0" - 6"	0.014 J	0.033 J
SLS-1	6" - 12"	0.014 J	0.075
SLS-1	12" - 18"	0.13	0.15
SLS-1	18" - 27"	0.29	0.3
SLS-1	27" - 36"	--	--
SLS-2	0" - 6"	0.0059 J	0.017 J
SLS-2	6" - 12"	0.13	0.2
SLS-2	12"-18"	0.28	0.26
SLS-2	18" - 24"	1.4	1.8
SLS-2	24" - 32"	--	--
SLS-3	0"- 6"	0.045 J	0.075 P
SLS-3	6" - 12"	0.051 J	0.088
SLS-3	12" - 22"	--	--
SLS-3	22" - 28"	--	--
SLS-3	28" - 35"	--	--

Note: Concentrations are in parts per million (ppm).

-- = Not detected.

J = Estimated value.

P = Percent difference between the two analytical columns is greater than 100%.

SLS = Shoreline sample collected in 1997 along beach south of Wilcox Dock

2.2.2 Sampling Method

The investigation was performed in two phases. During the first phase, ten boring locations were selected throughout the area which appeared to have received fill material. The boring locations (shown on Figure 4) were determined in the field based on the judgement of the NYSDEC representative and TAMS' field geologist. At each of the 10 phase 1 soil borings, 2-foot continuous split-spoon samples were collected from 0 to 8 feet below ground surface. A total of 40 samples were collected and analyzed by PCB immunoassay test kits. Six of these samples (four which has positive PCB results based on the test kit screening) were sent to Inchcape Analytical Laboratory for PCB analysis following NYSDEC ASP Method 95-3 to verify the quality of test kit. Two samples broke in shipping.

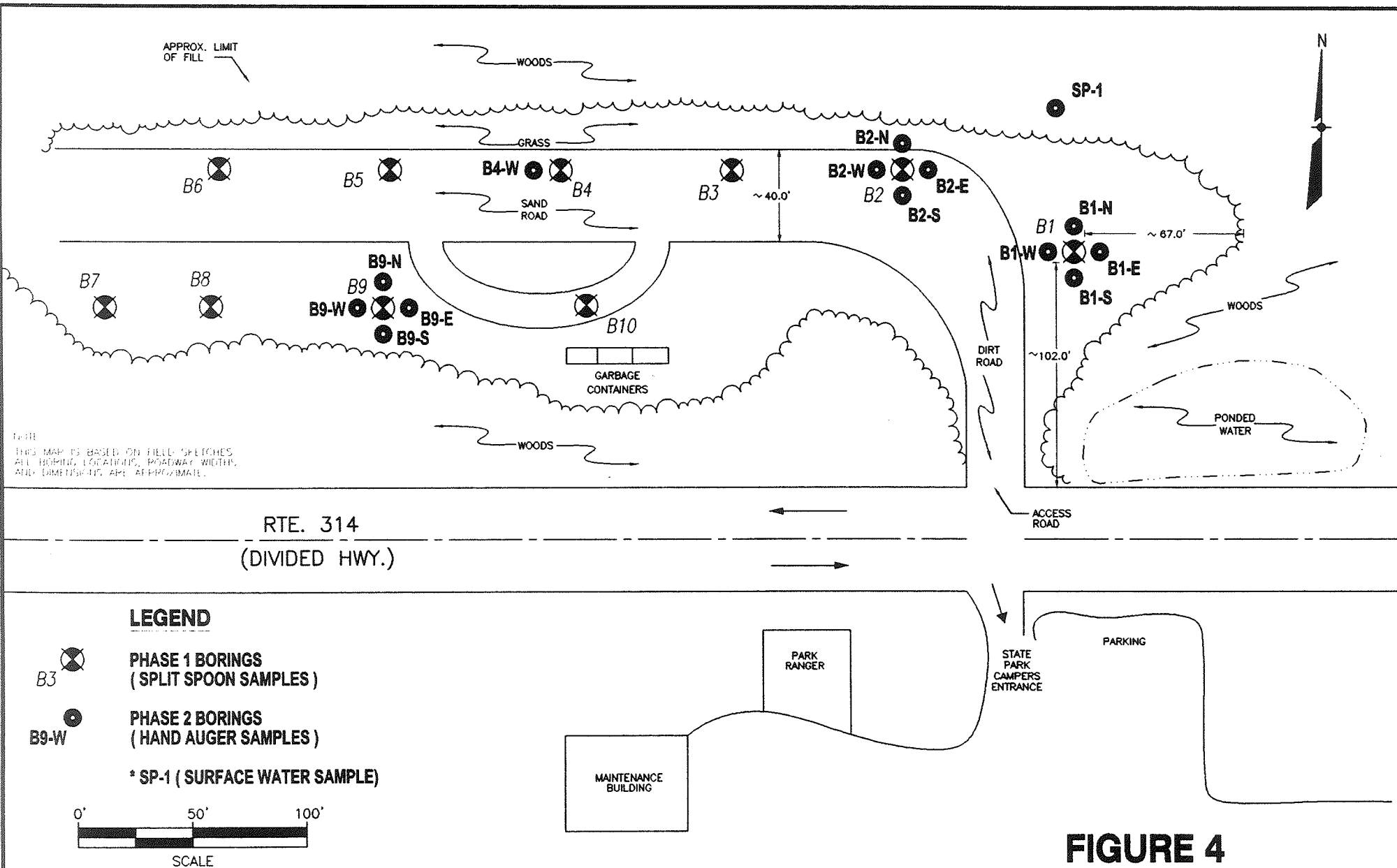
Phase 2 of the investigation involved collection of additional samples at the four boring locations which tested positive during PCB immunoassay screening (B1, B2, B4 and B9). Samples were collected to replace those broken in shipping and four additional samples were collected at an approximate 15 foot offset from each of the four original boring locations (one in each compass direction as shown on Figure 4), at the depth interval which tested positive for PCBs. The additional samples were collected using a stainless steel hand auger. A total of 17 samples were collected and screened using the PCB test kit. Twelve of the samples were sent to the laboratory for confirmatory analysis.

One surface water sample (SP-1) was collected in the northeast corner of the landfill area for PCB analysis at the NYSDEC laboratory. The approximate location of this sample is shown of Figure 4.

On October 15, 1996, under subcontract to Rust, SJB Services, Inc. (Latham, NY) mobilized a Central Mine Equipment (CME) Model 850 all-terrain drilling rig to the Cumberland Bay State Park disposal area. Also present for the sampling program was the NYSDEC Project Manager and two TAMS personnel. The boring program was conducted on October 15 and 16, 1996. Samples were collected from ten borings in accordance with Work Plan Amendment No. 1.

The drilling rig and associated drilling tools and equipment were pressure washed prior to use. Drilling water was obtained from a potable source at the Cumberland Bay State Park maintenance garage. Field sampling equipment, including split spoon samplers, were field decontaminated by scrubbing in a deionized water and phosphate free liquid soap solution, followed by a deionized water rinse. The split spoon samplers were field decontaminated in this manner between each sampling interval.

At each sampling location, SJB advanced borings using 2.5-inch hollow stem augers. Continuous 2-foot split spoon samples were collected from the ground surface to eight feet below grade. On occasion, refusal of the augers was encountered prior to the final depth of the boring. When this occurred, the drillers moved a short distance from the original boring and re-started. Split spoon samples were not collected over any interval which had already been sampled. Upon completion, each borehole was backfilled with drill cuttings and the area was restored to its original condition.



Each boring was logged by TAMS personnel and evaluated for the presence of fill material, presence of wood chips or wood pulp, and interface with native soils. The boring logs are presented in Appendix A. The fill/native soil interface was observed between 2.5 and 6.8 feet in each boring. Typical fill materials included sand and gravel, timber, concrete rubble, cinders, and occasional refuse (possibly picnic wastes from the Park's picnic areas). Native materials included organic peat, and fine sand.

In accordance with the Work Plan Amendment No. 1, a representative soil/fill sample was collected over each two-foot interval for PCB immunoassay test kit screening. The samples were collected from the open split spoon using disposable plastic spoons, and were transferred to laboratory cleaned amber glass jars. Soil samples were screened in the field for the presence of volatile organic chemicals using an HNu Model PI-101 photoionization detector. Elevated HNu readings were not encountered within any sample interval.

As the samples were collected, they were placed on ice. After the drilling program was complete (October 17, 1996) the samples were delivered to Rust's Albany office for PCB test kit screening. Five of the samples (from four of the borings) had positive test kit results indicating the presence of PCBs above the 2 ppm detection limit for the test kit. Four of these samples, as well as several non-detect samples, were sent to Inchcape Analytical Laboratory for PCB analysis following NYSDEC ASP Method 95-3 to verify the quality of test kit results and to define the extent of potential PCB impact at the four borings. Two samples broke in shipping and the remainder were analyzed outside of the holding time. Resampling of the locations where positive test kit results were detected was performed.

TAMS re-mobilized to the State Park landfill on October 29, 1996 to collect additional samples at the four boring locations which tested positive during PCB immunoassay screening. Based on discussions between Rust and NYSDEC, four additional samples (one in each compass direction) were to be collected at an approximate 15 foot offset from each boring location and at the depth interval which tested positive for PCBs. The additional samples were collected using a stainless steel hand auger.

The stainless steel hand augers were field decontaminated as described above prior to use. In general, a pilot auger hole was advanced to the sampling depth using a pilot auger. When the desired sampling depth had been reached, a second field decontaminated auger was used for sample collection to minimize the potential for cross contamination from shallower depths. The soil/fill was placed in a field decontaminated stainless steel bowl for homogenization and transfer to laboratory cleaned amber glass jars. At locations B-1 and B-4, the field crew experienced great difficulty advancing the auger holes to between four and six feet below grade. As a result, several of the perimeter samples were not collected, or were collected from four to less than six feet. Of the 20 samples planned for collection, 17 samples were successfully obtained. Each sample was maintained in the field in a dedicated sample cooler on ice until delivery to Rust's Albany office for PCB immunoassay test kit screening on October 29, 1996. Twelve of the 17 samples (including any positive test kit hits) were sent to Inchcape for laboratory analysis.

2.2.3 Sampling Results

Qualitative screening of the 56 soil/fill samples from the State Park landfill area was performed using PCB immunoassay test kits. The test kits (Model PCB RIS® Soil Test System Part Number 70200) were supplied by ENSYS Environmental Products, Inc, Research Triangle Park, North Carolina. These PCB test kits are capable of a 2 ppm detection limit in soil for Aroclor 1242. Test kit results are summarized in Table 4.

The samples from the initial boring program were screened on October 21, 1996. The screening indicated that the following five samples (locations shown on Figure 4) contained greater than 2 ppm of PCBs:

- B1-S3 (4-6');
- B2-S1 (0-2');
- B2-S2 (2-4');
- B4-S3 (4-6'); and
- B9-S2 (2-4').

The samples from the resampling program were screened on October 30, 1996. The screening indicated that the following 2 samples contained greater than 2 ppm of PCBs:

- B2-S1A (0-1');
- B9-S2A (2-4').

The samples sent to Inchcape for confirmatory analysis following ASP Method 95-3 are shown on Table 4. The laboratory analyses indicated that although PCBs were detected in several of the samples, none were at concentrations greater than 1 ppm. These trace amounts of PCBs were detected in the vicinity of Borings 1, 2, 4 and 9.

As discussed in Section 2.1.3, it is not unusual for the immunoassay test kits to exhibit false positive results for samples when the sample PCB concentration is below the minimum detection limit of the immunoassay test kit.

The results of the surface water sample (SP-1) collected north east of the beach debris disposal area indicated that no PCBs are present at detectable levels.

TABLE 4
Beach Debris Disposal Area Sampling Results
OU-2 Remedial Investigation
Cumberland Bay Sludge Bed Site

Boring Location	Sample ID	Sampling Interval	PCB Test Kit (mg/kg)*		Laboratory PCB Results (mg/kg)		
			Negative Result	Positive Result	Aroclor - 1242	Aroclor - 1248	Aroclor - 1254
B1	S1	0-2'	<2				
	S2	2-4'	<2				
	S3	4-6'		>2	0.14 PV	--	0.055 J
	B1-S3A	4-5'	<2		--	0.26	0.19
	B1-S3A-S	4-4.5'	<2				
	B1-S3A-N	4-4.5'	<2				
	B1-S3A-E	4-6'	<2		--	0.11	0.062
	B1-S3A-W	4-4.5'	<2				
	S4	6-8'	<2				
B2	S1	0-2'		>2			
	B2-S1A	0-1'		>2	--	0.1	0.048 PV
	B2-S1A-S	0-2'	<2				
	B2-S1A-N	0-2'	<2				
	B2-S1A-E	0-1'	<2		--	0.19	0.14
	B2-S1A-W	0-2'	<2		0.32	--	--
	S2	2-4'		>2			
	S3	4-6'	<2				
	S4	6-8'	<2				
B3	S1	0-2'	<2				
	S2	2-4'	<2				
	S3	4-6'	<2				
	S4	6-8'	<2				
B4	S1	0-2'	<2				
	S2	2-4'	<2		--	--	0.041 PV
	S3	4-6'		>2			
	B4-S3A	4-6'	<2		--	0.17	1.6 D
	B4-S3A-W	4-6'	<2		--	0.1	--
	S4	4-8'	<2				
B5	S1	0-2'	<2				
	S3	4-6'	<2				
	S4	6-8'	<2				

* PCB test kit is capable of a 2 ppm detection limit in soil for Aroclor 1242.

ND = Not detected.

N = Indicates presumptive evidence for compound identification.

P = Indicates that the percent difference between the results from the two analytical columns is greater than 25%.

D = Reported value is from the analysis of a diluted sample.

V = The reported value is considered estimated due to variance from the quality control criteria.

TABLE 4
Beach Debris Disposal Area Sampling Results
OU-2 Remedial Investigation
Cumberland Bay Sludge Bed Site

Boring Location	Sample ID	Sampling Interval	PCB Test Kit (mg/kg)*		Laboratory PCB Results (mg/kg)		
			Negative Result	Positive Result	Aroclor - 1242	Aroclor - 1248	Aroclor - 1254
B6	S1	0-2'	<2				
	S2	2-4'	<2				
	S3	4-6'	<2		--	--	--
	S4	6-8'	<2				
B7	S1	0-2'	<2				
	S2	2-4'	<2				
	S3	4-6'	<2				
	S4	6-8'	<2				
B8	S1	0-2'	<2				
	S2	2-4'	<2				
	S3	4-6'	<2				
	S4	6-8'	<2				
B9	S1	0-2'	<2				
	S2	2-4'		>2	--	--	0.042 PV
	B9-S2A	2-4'		>2	--	--	--
	B9-S2A-N	2-4'	<2		--	0.071	0.2
	B9-S2A-S	2-4'	<2		--	0.1	0.1
	B9-S2A-E	2-4'	<2		--	0.35	0.11 PVN
	B9-S2A-W	2-3'	<2		--	--	--
	S3	4-6'	<2				
	S4	6-8'	<2				
B10	S1	0-2'	<2				
	S2	2-4'	<2				
	S3	4-6'	<2				
	S4	6-8'	<2				

* PCB test kit is capable of a 2 ppm detection limit in soil for Aroclor 1242.

-- = Not detected.

N = Indicates presumptive evidence for compound identification.

P = Indicates that the percent difference between the results from the two analytical columns is greater than 25%.

D = Reported value is from the analysis of a diluted sample.

V = The reported value is considered estimated due to variance from the quality control criteria.

3.0 RISK ASSESSMENT

3.1 Introduction

A Health Risk Assessment (HRA) and a Fish and Wildlife Impact Analysis (FWIA) have been performed for OU-2, using the analytical data collected as part of the OU-2 investigation and information and assumptions from the SC Report (Addendum No. 1, dated May 15, 1997), a Health Risk Assessment (HRA) and a Fish and Wildlife Impact Analysis (FWIA) prepared for the Cumberland Bay Sludge Bed (OU-1).

The purpose of the HRA is to characterize the potential for human exposure and the possibility of health effects associated with exposure to PCBs at the Site and surrounding area. The purpose of the FWIA is to determine if the PCBs present in the sludge bed represent a potential threat to fish and wildlife resources.

3.2. Health Risk Assessment

The basic assumptions for evaluating human health risks under OU-2 site conditions are essentially the same as those used for the beach use scenario under OU-1 (Recreational use of Beach Areas North of Sludge Bed). The conclusions of the OU-1 HRA are appropriately applied to OU-2 because no PCBs were detected in surface samples (0-1 foot below ground surface) during the OU-2 investigation at concentrations greater than the average concentration used to assess risk in the HRA.

The conclusions from the OU-1 HRA (SC Report Amendment No. 1) which apply to the beach scenario are as follows:

The beach areas and immediate surrounding area are currently used primarily for recreational activities including boating, fishing and swimming. Recreational fishing is common in this area although a fish advisory has been issued by the NYSDEC limiting fish consumption. Commercial fishing has been banned. It is expected that the beach areas will continue to be used for these purposes in the future. Therefore, the HRA evaluated the potential exposure of nearby residents and area visitors to PCBs present in environmental media and biota at the Site and immediate surrounding area (i.e., beach areas to the north of the sludge). The evaluation of potential future exposures assumes that the levels of chemical contaminants will not change over time.

The results of the health risk assessment of the beach scenario (Recreational use of Beach Areas North of Sludge Bed) indicate that no potential long-term health concern is associated with this scenario. Since the assumptions are the same for the OU-2 beaches, the conclusion would be the same.

Based on the exposure pathways presented in the baseline HRA for OU-1 (which include recreational use of the beaches), there are two current and potential future exposure scenarios that may pose a potential long-term health concern. These exposure pathways are:

- direct contact with sludge bed and surface water while wading in the sludge bed near Wilcox Dock; and

- ingesting of Cumberland Bay fish obtained through recreational fishing.

Each of these exposure pathways may pose a risk of chronic systemic effects and risk of developing cancer due to the presence of PCBs.

These two exposure pathways are not present at the OU-2 areas and therefore no potential long-term health concerns have been identified for OU-2 that will not be addressed through continued beach cleaning.

3.3 Fish and Wildlife Impact Analysis

This section presents the findings of a focused FWIA performed for OU-2. The FWIA was generally performed following the NYSDEC FWIA procedures presented in the NYSDEC, Division of Fish and Wildlife, "Fish and Wildlife Impact Analysis for Inactive Hazardous Waste Sites" (dated June 18, 1991). The results of the Step I (Site Description) and applicable sections of the Step II (Contaminant-Specific Impact Analysis) sections of the FWIA are presented.

The objective of the Step I site description is to identify the fish and wildlife resources, land-use and habitat types that exist in the vicinity of the Site. In addition, fish and wildlife species that may utilize habitats that could potentially be impacted by site-related contaminants are identified. This information is necessary to allow identification of potential pathways of contaminant migration that could impact fish and wildlife resources.

The objective of the Step II contaminant specific impact is to determine the impacts, if any, of site-related contaminants on fish and wildlife resources. The pathway analysis evaluates and identifies potential contaminants of concern, sources of contaminants, potential pathways of contaminant migration and potential for fish and wildlife resources to be impacted by site-related contaminants. The criteria-specific analysis determines if reported chemical concentrations represent a potential threat to aquatic life and wildlife. The toxic effect analysis attempts to determine or predict what effects the chemicals of concern will have on fish and wildlife and on the use of fish and wildlife by humans.

The purpose of this analysis is to determine if the PCB concentrations detected in soil samples from OU-2 represent a potential threat to fish and wildlife resources. The document does not attempt to determine the exact magnitude of any impact or what the complete effect any potential impact will have on individual animals, species, populations or ecosystems, which is beyond the scope of this analysis and could not be performed with the available data. However, the beach and soil boring sample PCB concentrations are compared to published numerical criteria and an estimate of potential effects, if any, of the reported PCB concentrations on fish and wildlife is presented.

3.3.1 Baseline Assessment

This section documents the landuse and natural resources located in the vicinity of OU-2. A description of the land use and ecological communities located adjacent to OU-2 and the fish and wildlife resources potentially associated with the ecological communities located adjacent to OU-2 is provided. The general quality of the fish/wildlife habitats adjacent to OU-2 is also discussed.

3.3.1.1 Land Use/Major Ecological Communities

The description of the land use/ecological communities located adjacent to OU-2 is based on interpretation and evaluation of aerial photographs (May 1991), topographic maps and NYSDEC wetland maps. A field survey was performed to verify the information obtained from these sources. The cover types within a half mile of the Site were classified using a combination of the New York Heritage Program Classification System (NHPCS, Reschke, 1990) and the U.S. Geological Survey Classification System (Anderson, 1976).

Where access was possible during the field survey, the dominant vegetation in each community was identified for areas classified as terrestrial natural (TN) and palustrine (P). The determination of dominance was qualitative, based on visual estimates. Vegetative plots and transects were not used in determining dominance. These methods are beyond the scope of a Step I analysis.

As previously described, OU-2 consists of the beach/shoreline located east of OU-1, the shore line located on the southern edge of the breakwater south of Wilcox Dock, and the former beach debris disposal area. The beach/shoreline area of OU-2 extends from the north eastern edge of OU-1 to the eastern end of the NYS Office of Parks and Recreation campground. The breakwater section of OU-2 extends from the shore of Lake Champlain out along the southern banks of the breakwater. The former beach debris disposal area is located on the North side of Route 314, across from the NYS Office of Parks and Recreation campground parking area.

Public and Private Beaches on Cumberland Bay

The shore line associated with the beaches east of OU-1 and along the breakwater south of Wilcox Dock, represent terrestrial communities that are consistent with the Ecological Communities of New York State (Reschke, March 1990) Sand Beach classification. Sand beaches occur on unstable sandy shores of large freshwater lakes. The shore is formed and continually modified by erosion from wave action and wind. Characteristic plant species include knotweed (*Polygonum* spp.), beggar-ticks (*Bidens* spp.), silverweed (*Potentilla anserina*) and panic grass (*Panicum* spp.).

The land use on the upland side (north) of the beach zone between OU-1 and Scotion Creek is a mixture of commercial and residential housing. There are no undeveloped terrestrial habitats adjacent to the beach in this area.

East of Scotion Creek for approximately 2,100 feet, the plant community or wildlife habitats on the upland (north) side of the beaches consist of successional field, deciduous forest and forested wetland. These areas occur between the sand beach and Route 9 to the north, which varies from approximately 500 feet to 1,750 feet from the sand beach. The remainder of the land use north of the beaches located east of Scotion Creek within OU-2 is developed recreational and does not represent viable wildlife habitat.

The primary plants species in the successional field and the deciduous forest include common cottonwood (*Populus deltoides*) boxelder (*Acer negundo*), ash species (*Fraxinus* spp.), grass species, knotweed (*Polygonum* species) and goldenrod species (*Solidago* species).

In the deciduous forested wetland, the primary species are American elm (*Ulmus americana*), willow species (*Salix* species) and common cottonwood (*Populus deltoides*). This wetland is part of NYSDEC registered wetland PB-5, which is a Class I wetland.

The upland area adjacent to the beach located on the south shore of the break water (South of Wilcox Dock) consists primarily of a mixture of successional old field and deciduous forest. The dominant plant species are common cottonwood and boxelder.

The two principle aquatic habitats located adjacent to OU-2 beaches are Cumberland Bay and Scotion Creek. Cumberland Bay is a small, somewhat rectangular part of the west side of Lake Champlain. Depths in the Bay can exceed 50 feet but water depths in the vicinity of the Site do not exceed 17 feet and are generally under 10 feet. The City of Plattsburgh is located on the west side of the Bay, where the Scotion Creek flows into the Bay. The north shoreline of Cumberland Bay is occupied by the Plattsburgh Municipal Beach, a NYS Office of Parks and Recreation campground, and numerous motels and restaurants. On the east side, Cumberland Head, a large peninsula, extends into the Bay.

The waters of Lake Champlain in Cumberland Bay in the vicinity of the Site are designated as Class "B" by NYSDEC. Scotion Creek is designated as a Class "C" stream from the mouth of the Creek at Lake Champlain to one mile upstream.

Beach Debris Disposal Area

The former beach debris disposal area is approximately 1 to 1.25 acres in size. It consists of a level fill area bounded by mature trees. The fill area drops off 4 to 6 vertical feet to the apparent native lowland. A sandy gravel traffic course is present over vehicle traffic areas, with grass and shrubs growing near the edges of the slopes. Along the edges of the disposal area large boulders, concrete and timber rubble, and soil can be observed. Current use of the disposal area by the State Park maintenance crews includes staging of recyclable materials and trash containers.

The former disposal area itself does not represent a viable wildlife habitat. However, the area adjacent to and north of the disposal area is a NYSDEC registered wetland (PB-2) and is classified by the NYSDEC as a Class I wetland. Wetland PB-2 is a coniferous forested wetland, vegetation includes northern white cedar (*Thuja occidentalis*), speckled alder (*Alnus rugosa*) and sensitive fern (*Onoclea sensibilis*).

As previously discussed, NYSDEC wetland PB-5 is the only NYSDEC regulated wetland located within a one-half mile radius of the Site and it is designated a Class I wetland. The NYSDEC wetland classification system is based on a numerical rating of I to IV, with Class I wetlands representing the most significant wetlands. A wetland is considered Class I if it exhibits at least one of seven characteristics detailed in the Freshwater Wetlands Maps and Classification Regulations (6NYCRR Part 664), which are summarized below:

3.3.1.2 Wetlands

There are two wetlands located adjacent to OU-2. NYSDEC wetland PB-5 is located north of the sandy beach immediately east of Scotion Creek. Wetland PB-2 is located adjacent to and north of the former beach debris disposal area. Both these wetlands have been classified by NYSDEC as Class I. A Class I wetland is defined as having at least one of the following characteristics:

1. Is a classic kettlehole bog;
2. Resident habitat of an endangered or threatened animal Species;
3. Contains an endangered or threatened plant Species;
4. Supports an animal species in abundance or diversity unusual for the state or the region;
5. Provides significant flood control benefits for a substantially developed area;
6. Adjacent or contiguous to an aquifer or reservoir used for public water supply; and,
7. Contains four or more Class II wetland characteristics.

Although the majority of wetland PB-5 is connected directly to Cumberland Bay via Scotion Creek, the section of wetland PB-5 located north of the sandy beach is isolated from the main part of wetland PB-5 by Route 9. Wetland PB-2 is not directly connected to Cumberland Bay.

3.3.1.3 Streams and Related Surface Water Bodies Adjacent to OU-2

Scotion Creek is the only stream located adjacent to OU-2. Scotion Creek is designated as a Class "C" stream from the mouth of the Creek at Lake Champlain to one mile upstream. NYSDEC Water Quality Regulations, Title 6, Chapter X, Parts 700- 705 define the best usage of Class C streams as fishing. Class C waters shall be suitable for fish propagation and survival. The Class C water quality shall be suitable for primary and secondary contact recreation.

Lake Champlain is the primary aquatic habitat in the area. The waters of Lake Champlain in Cumberland Bay in the vicinity of the Site are designated as Class "B" by NYSDEC. The best usage of Class B waters are primary and secondary contact recreation and fishing. These waters shall be suitable for fish propagation and survival.

3.3.2 Resource Characterization

Resource characterization consists of determining the wildlife species that may potentially utilize, or have been determined to utilize, the plant communities or habitats identified in the previous sections as existing in the immediate vicinity of OU-2. Also, any known species of concern (i.e., endangered, threatened, etc.) or significant habitats that may exist in the immediate vicinity have been identified based on review of available information. Additionally, the general quality of the habitats and their ability to provide for the needs of the species that may utilize the habitats is discussed. Areas of observed vegetative stress, leachate seeps, documented evidence of fish and/or wildlife mortality and any known population impacts related to site-related contaminants are presented.

3.3.2.1 Endangered, Threatened or Special Concern Fish and Wildlife or Plant Species or Significant Habitats

The United States Fish and Wildlife Service (USFWS), the NYSDEC Wildlife Resources Center and the NYSDEC Region 5 Office were contacted regarding the known occurrence of endangered, threatened, or special concern species or habitats located within a two mile radius of the Site. The USFWS indicated that there are no known occurrences of federal endangered or threatened wildlife or plant species located within a two mile radius of the Site.

A review of the New York State Natural Heritage Program files by the New York State Department of Environmental Conservation, Wildlife Resources Center, indicated that there were no known species of concern located within the boundaries of the Site.

Two plant species, with a New York State status as rare, were identified within a two-mile radius of the Site. Marsh horsetail (*Equisetum palustre*) was identified as occurring approximately 10,000 feet south of the Site. Handsome sedge (*Carex formosa*) was identified as occurring approximately 11,000 feet east of the Site. Rare species are considered to have 20 to 30 extant sites or 3,000 to 5,000 individuals statewide. One species, Champlain beach grass (*Ammophila champlainensis*) was identified as occurring on the beach approximately 2,000 feet north northeast of the Site. This species is unprotected in New York, but is considered by the Natural Heritage Program as being especially vulnerable in New York State. The Autumnal Water-Starwort (*Callitriche hermaphroditica*), last observed in 1929, was believed to occur in Cumberland Bay, potentially within the vicinity of the Site. This species is unprotected in New York State. It is believed to be historically present in the State but has not been observed in the past 15 years. Considering the known locations of these species, Site activities are not expected to have an impact on them.

Personal communication with the NYSDEC Region 5 wildlife biologist, revealed that Osprey (*Pandion haliaetus*) have been observed nesting north of I-87 within wetland PB-5. The Osprey is classified as a threatened species in New York State. Bald Eagles have been observed in Cumberland Bay, most likely representing migrating birds. The bald eagle is an endangered species in New York State.

3.3.2.2 Fish and Wildlife Species Potentially Using Habitats Adjacent To And Within One-Half Mile Of OU-2

Mammals, amphibians and reptiles, and fish, and bird species that could potentially utilize the habitats within a one-half mile radius of OU-2, for at least a portion of their life cycle, are listed in Tables 5, 6 and 7, respectively. All species that could potentially utilize the habitats within a one-half mile radius of the Site are not included on these lists. Also these lists are not meant to indicate that these species can always be found, or that all will be present at one time within one-half mile of the Site. These lists were prepared following a limited field evaluation of the habitats and review of available literature. These lists are not the result of a site-specific population survey. Actual population surveys are complex and time intensive and are beyond the scope of a Step I baseline evaluation.

Table 5
NYSDEC Cumberland Bay Site
Mammal/Amphibian/Reptile Species That Could Potentially Utilize Habitats
Within One-Half Mile of the Site

COMMON NAME	GENUS AND SPECIES
<u>Mammals</u>	
Big Brown Bat	Eptesicus fuscus
Beaver	Custor canadensis
Eastern Cottontail	Sylvilagus floridanus
White-tailed Deer	Odocoileus virginiana
Ermine	Mustella erminea
Red Fox	Vulpes vulpes
Mink	Mustella vison
Hairy-tailed Mole	Parascalops breweri
Star-nosed Mole	Condylura cristata
Deer Mouse	Peromyscus maniculatus
House Mouse	Mus musculus
Meadow Jumping Mouse	Zapus hudsonius
Woodland Jumping Mouse	Napaeozapus insignis
Muskrat	Ondatra zibethica
Keen's Myotis	Myotis keenii
Little Brown Myotis	Myotis lucifugus
Virginia Opossum	Didelphis virginiana
Raccoon	Procyon lotor
Norway Rat	Rattus norvegicus
Northern Short-tailed Shrew	Blarina brevicauda
Striped Skunk	Mephitis mephitis
Gray Squirrel	Sciurus carolinensis
Meadow Vole	Microtus pennsylvanicus
Southern Red-backed Vole	Clethrionomys gapperi
Woodland Vole	Microtus pinetorum
Long-tailed Weasel	Mustella frenata
Woodchuck	Marmota monax

Table 5
NYSDEC Cumberland Bay Site
Mammal/Amphibian/Reptile Species That Could Potentially Utilize Habitats
Within One-Half Mile of the Site

COMMON NAME	GENUS AND SPECIES
<u>Amphibians/Reptiles</u>	
Bull Frog	Rana catesbeiana
Green Frog	Rana clamitans
Pickerel Frog	Rana palustris
Wood Frog	Rana sylvatica
Eastern Newt	Notophthalmus viridescens
Spring Peeper	Hyla crucifer
Four-Toed Salamander	Ambystoma maculatum
Brown Snake	Storeria dekayi
Eastern Ribbon Snake	Thamnophis sauritus
Northern Water Snake	Nerodia sipedon
Redbelly Snake	Storeria occipitomaculata
Bog Turtle	Clemmys muhlenbergi
Painted Turtle	Chrysemys picta
Snapping Turtle	Chelydra serpentina
Spotted Turtle	Clemmys guttata

Table 6
NYSDEC Cumberland Bay
Fish Species That Could Potentially Utilize Habitats Within One-
Half Mile of the Site

COMMON NAME	GENUS AND SPECIES
Atlantic Salmon	Salmo salar
Banded Killfish	Fundulus diaphanus
Blacknose Shiner	Notropis heterolepis
Blacknose Dace	Rhinichthys atratulus
Bluegill	Lepomis macrochirus
Bluntnose Minnow	Pimephales notatus
Brook Trout	Salvelinus fontinalis
Brook Stickleback	Culaea inconstans
Brown Bullhead	Ictalurus nebulosus
Brown Trout	Salmo trutta
Burbot	Lota lota
Chain Pickerel	Esox niger
Common Shiner	Notropis cornutus
Creek Chub	Semotilus atromaculatus
Fantail Darter	Etheostoma flabellare
Fathead Minnow	Pimephales promelas
Golden Shiner	Notemigonus crysoleucas
Lake Trout	Salmo namaycush
Largemouth Bass	Micropterus salmoides
Longnose Dace	Rhinichtys cataractae
Pearl Dace	Semotilus margarita
Pumpkinseed	Lepomis gibbosus
Rainbow Trout	Salmo gairdneri
Rock Bass	Ambloplites rupestris
Smallmouth Bass	Micropterus dolomieu
Spottail Shiner	Notropis hudsonius
White Sucker	Catostomus commersoni
Yellow Perch	Perca flavescens

Table 7
NYSDEC Cumberland Bay
Bird Species
That Could Potentially Utilize Habitats Within One-Half Mile of the
Site

COMMON NAME	GENUS AND SPECIES
American Goldfinch	Carduelis trustis
American Kestrel	Falco sparverius
American Crow	Corvus brachyrhynchos
American Black Duck	Anas rubripes
American Robin	Turdus migratorius
Bald Eagle	Haliaeetus leucocaphalus
Barn Swallow	Hirundo rustica
Black-capped Chickadee	Parus atricapillus
Blue Jay	Cyanocitta cristata
Blue-winged Teal	Anas discors
Brown-headed Cowbird	Molothrus ater
Bufflehead	Bucephala albeola
Canada Goose	Branta canadensis
Cedar Waxwing	Bonaparteia cedrorum
Chimney Swift	Chaetura pelagica
Common Merganser	Mergus merganser americanus
Common Yellowthroat	Geothlypis trichas
Common Barn Owl	Tyto alba
Common Nighthawk	Chordeiles minor
Common Grackle	Quiscalus quiscula
Copper's Hawk	Accipiter cooperii
Downy Woodpecker	Picoides pubescens
Eastern Phoebe	Sayornis phoebe
European Starling	Sturnus vulgaris
Great Blue Heron	Ardea herodias
Great-horned Owl	Bubo virginianus
Greater Scaup	Aythya marila mariloides
Green-Backed Heron	Butorides striatus
Hooded Merganser	Mergus cucullatus
House Wren	Troglodytes aedon
House Sparrow	Passer domesticus
Killdeer	Charadrius vociferus
Lesser Scaup	Aythya affinis
Mallard	Anas platyrhynchos
Mourning Dove	Zenaidura macroura
Northern Cardinal	Cardinalis cardinalis
Osprey	Pandion haliaetus
Pileated Wood-Pecker	Dryocopus pileatus
Red-tailed Hawk	Buteo jamaicensis
Red-winged Blackbird	Agelaius phoeniceus

Table 7
NYSDEC Cumberland Bay
Bird Species
That Could Potentially Utilize Habitats Within One-Half Mile of the
Site

COMMON NAME	GENUS AND SPECIES
Ring-Billed Gull	Larus delawarensis
Rock Dove	Columba livia
Rough-winged Swallow	Stelgidopteryx ruficollis
Ruby-throated Hummingbird	Archilochus colubris
Ruffed Grouse	Bonasa umbellus
Screech Owl	Otus asio
Song Sparrow	Melospiza melodia
Spotted Sandpiper	Actitis macularia
White-breasted Nuthatch	Sitta carolinensis
Wild Turkey	Meleagris gallopavo
Wood Duck	Axis sponsa
Yellow Warbler	Dendroica petechia

Many wildlife species are mobile and generally require a range of habitat types to meet their life cycle requirements. In addition, many species will only use the area within one-half mile of the Site for a portion of their life requisites. Thus, all the species identified on these lists were not actually observed within a one-half mile radius of the Site.

During the field checking of the cover type map on March 23, 1997, the species listed below or sign of these species were observed on or within one-half mile of OU-2

- Black-capped Chickadee
- Cardinal
- Common Crow
- Red-tailed Hawk
- Hooded Merganser
- Beaver
- Blue-jay
- Canada Goose
- Mallard Duck
- White-tailed Deer
- Pileated Wood-Pecker
- Ring-billed Gull

The NYSDEC Region 5 biologist (personal communication) indicated that diving ducks such as Greater Scaup (*Aythya marila mariloides*), Lesser Scaup (*Aythya affinis*), Bufflehead (*Bucephala albeola*) Common Merganser (*Mergus merganser americanus*) and Hooded Merganser (*Mergus cucullatus*) utilize the Cumberland Bay as wintering habitat until ice-up of the Bay. There are Great Blue Heron (*Ardea herodias*) and Ring-Billed Gulls (*Larus delawarensis*) located on islands south of Cumberland Bay (Four Brothers and Valcour Island). However, both these species would utilize wetland and shallow water areas in Cumberland Bay as foraging areas.

Species actually utilizing the habitats associated with the sand beaches and immediately adjacent upland habitats would primarily be limited to small mammals and birds. The wetland areas adjacent to the former beach disposal area would be utilized by a wider variety of mammals, amphibians and birds due to the size of the area and the variety of associated cover types. However, the former disposal area itself does not represent a significant habitat because of the heavy use of the area by State Park maintenance crews.

3.3.2.3 General Habitat Quality Within and Adjacent To OU-2

Sand beach areas are typically used by migratory shorebird and waterfowl species as resting sites. They are also used as nesting habitat for shore birds such as the spotted sandpiper. However, the public access and high recreational use of the OU-2 sand beaches east of Scotion Creek limit wildlife use in this area. The OU-2 sand beaches located west of Scotion Creek up to OU-1 represent marginal habitat. The beaches in this area are restricted in size and located directly adjacent to commercial and residential development.

The successional field/deciduous forest and deciduous forested wetland habitats located north of the beaches east of Scotion Creek are generally poor to moderate quality habitats. The relatively small size of these areas and their juxtaposition relative to the developed residential, commercial and industrial areas limits the value of these areas as wildlife habitat. However, the main section of wetland PB-5 located north of Route 9, represents a high quality natural habitat. The variety of habitat types, emergent wetland, shrub wetland, deciduous forested wetland and the Scotion Creek aquatic habitat, located within the wetland represent a diversity of habitats available to

wildlife. This area is also of sufficient size to represent a high quality habitat. It is a common ecological tenant that large blocks of undisturbed areas can support a greater number of species than smaller areas. This is partially related to the fact that larger areas will typically contain a wider variety of habitat types. Areas with diverse habitat types are more likely to contain the range of resources necessary to support a given species life cycle requirements. The greater number of habitat types the wider the diversity of plant communities. Animal species are ultimately dependent upon plants for survival, either directly in the case of herbivores, or indirectly with respect to animal species that use plants for shelter or feed on herbivores.

Scomotion Creek also represents an important aquatic resource (the Creek and adjacent wetland habitat represent valuable fish spawning and nursery areas and important feeding and resting area for semi-aquatic mammals and aquatic birds). However, this area is not part of OU-2 and potential wildlife impacts associated with use of this resource were evaluated in the OU-1 Site Characterization Report (Addendum No. 1, May 1997).

Cumberland Bay represents a viable fishery. However, the value of this fishery is impaired by the presence of PCBs in the sludge bed located in the western edge of the Bay. Historically, Cumberland Bay was part of the commercial yellow perch fishery in Lake Champlain. However, due to elevated PCB concentrations detected in yellow perch from the Bay, there is currently a ban on the sale of yellow perch. There is also a recreational health advisory on consumption of fish from Cumberland Bay. The fish PCB levels also represent a potential threat to piscivorous wildlife that are sensitive to PCBs. Because of the propensity for PCBs to bioaccumulate, the PCBs in prey species represents a potential threat to predators species. However, this area is not part of OU-2 and potential wildlife impacts associated with use of this resource were evaluated in the OU-1 Site Characterization Report (Addendum No. 1, May 1997).

3.3.3 Contaminant-Specific Impact Analysis

This section evaluates pathways through which wildlife could potentially be exposed to site related contaminants. This evaluation includes the identification of habitats that could potentially be impacted by site contaminants, the possible food chain contamination pathways, and impact to fish/wildlife, if any. Media contaminant concentrations are compared to published toxicity criteria. A toxic effects analysis on representative sensitive species is performed to determine if reported media concentration pose a potential threat to wildlife populations.

The analysis presented in this section focuses specifically on the media associated with OU-2. This consists of the sand beach soils and the soils at the former beach debris disposal area. A focused Fish and Wildlife Impact analysis on impacts of the sludge bed on consumption of fish by piscivorous wildlife has been previously presented in the OU-1 Site Characterization Report (Addendum No. 1, May 1997).

3.3.3.1 Pathway Analysis

In order for fish and wildlife to be affected by chemical constituents from a site, two conditions must exist. There first must be an avenue by which fish and wildlife can be exposed to chemical constituents, referred to as a completed exposure pathway. In addition, the chemical concentrations

within the completed exposure pathway must be of sufficient magnitude to cause an impact. Potential fish and wildlife PCB exposure pathways include ingestion of plants, animals or water, or direct contact with water, soil or sediments which contain PCBs. However, this FWIA evaluates potential exposure pathways associated strictly with OU-2, the beaches and former beach debris disposal area. The only pathway of significance is incidental ingestion of sand/wood chips containing PCBs, during feeding along the beach.

Public and Private Beaches on Cumberland Bay

Any PCBs present in the OU-2 sand beaches resulted primarily from the deposition onto the beach of PCB contaminated wood chips. The wood chips were mobilized from the sludge bed in Cumberland Bay (OU-1) via wave and wind action. The beaches are routinely cleaned of the wood chips each year, therefore, the quantity of wood chips, and therefore the concentrations of PCBs in the sand, would be limited to residual wood chips incorporated into the beach sand.

Exposure to PCBs at the sand beach habitats would be primarily associated with incidental ingestion during feeding along the beach by shore birds. Although direct contact with woodchips/sand containing PCBs is possible, dermal adsorption is not considered a significant concern. Birds are the most likely species to utilize the beach habitats and the feathers provide a measure of protection from direct contact with the beach material. Considering the most likely limited use of the sand beach areas by wildlife, the duration of any exposure is limited. Section 3.3.3.2 evaluates potential dietary intake of PCBs from incidental ingestion with available no observable adverse effect levels (NOAEL) published in the literature.

Beach Debris Disposal Area

The former beach debris disposal area is approximately 1 to 1.25 acres in size. It consists of a level fill area bounded by mature trees. The fill area drops off 4 to 6 vertical feet to the apparent native lowland. A sandy gravel traffic course is present over vehicle traffic areas, with grass and shrubs growing near the edges of the slopes. Along the edges of the disposal area large boulders, concrete and timber rubble, and soil can be observed. Current use of the disposal area by the State Park maintenance crews includes staging of recyclable materials and trash containers.

The former disposal area itself does not represent a viable wildlife habitat. Wildlife use would be limited to transient movement across the area. There is no significant exposure pathway for wildlife exposure to PCBs at the former beach debris disposal area and without a completed exposure pathway there is not potential impact to wildlife. Therefore, no further evaluation of the former beach debris disposal area is required.

3.3.3.2 Toxicity/Criteria-Specific Analysis

This section compares available analytical data from media which represent potential fish and wildlife exposure pathways to available fish and wildlife toxicity data. The pathway analysis in the preceding section indicated that incidental ingestion of contaminated woodchips/sand by shorebirds feeding along the shore of Lake Champlain represents a potential route of exposure.

Research has indicated that reproductive impairment is one of the most significant impacts related to ingestion of PCBs in the diet of bird species. Bird egg PCB concentrations have been correlated with embryotoxicity. Hoffman et.al (1996) reported that PCB concentrations from 8 to 25 ppm (mg/kg) in eggs of terns, commorants, doves and eagles resulted in decreased hatching success. Harris (1993) calculated a NOAEL of 40 to 84 ug/kg/day of PCBs for reproductive success of Forster's Terns.

An analysis of potential impacts on reproductive success of the spotted sandpiper from incidental ingestion of woodchips/sand contaminated with PCBs is estimated by calculating a hazard quotient. The spotted sandpiper is a common bird species which would be expected to feed along the sand beaches in OU-2. Sandpipers in feed on mud-dwelling invertebrates and has been reported to have a high soil/ingestion rate and therefore represents a conservative species for this analysis. The average percentage of soil/sediment in the diet of four sandpiper species was 18 percent (USEPA, 1993).

The hazard quotient is determined by dividing the estimated average potential daily dose (APDD) of PCBs by a NOAEL. The analysis uses the NOAEL of 40-84 ug/kg/day estimated by Harris (1993) for Forster's Terns. The APDD for soil/sediment ingestion was calculated following the procedures detailed in the USEPA Wildlife Exposure Factors Handbook (December 1993). The APDD calculation is detailed below:

$$APDD = (C \times FS \times IR \times FR) / BW$$

APDD = Average Potential Daily Dose

C = Average contaminant concentration in soils (mg/kg)

FS = Fraction of soil in diet

IR = food ingestion rate (kg/day)

FR = Fraction of food intake from the sand beach area

BW = Body weight

The available analytical data from the OU-2 beaches is summarized in Table 1 through Table 3. An average PCB concentration was determined using the data in Tables 1 through 3. In Table 1, only the Aquatec laboratory analytical data was used in the determination of the average concentration. For the immunoassay data in Table 2 half the detection limit (0.5 mg/kg) was used in calculating the average PCB concentration. From Table 3 only the samples with PCB detections were used in the calculation of the average PCB concentration. The average PCB concentration in the sand beach samples was calculated as 0.82 mg/kg.

The fraction of soil in the diet (18 percent) and the estimated average female Spotted Sandpiper body weight (0.047 kg) were obtained from the USEPA Exposure Factor Handbook (1993). The food ingestion rate (0.0105 kg/day) was calculated using the formula presented in the USEPA Exposure Factor Handbook (1993). The fraction of food intake from the beach area was assumed to be 100 percent of the Sandpiper diet which represents an overly conservative estimate. Spotted Sandpiper are migratory and it was assumed that they utilize the sand beaches for six months of the year, which results in an estimated FR of 0.5.

$$\text{APDD} = [\text{C}(0.82\text{mg/kg}) \times \text{FS} (0.18) \times \text{IR} (0.0105 \text{ kg/day}) \times \text{FR} (0.5)]/\text{BW} (0.047 \text{ kg})$$

$$\text{APDD} = 0.016 \text{ mg/kg/day}$$

$$\text{APDD} = 16 \text{ ug/kg/day}$$

The hazard quotient (HQ) is calculated by dividing the APDD by the NOAEL

$$\text{HQ} = \text{APDD} (16 \text{ ug/kg/day})/40 \text{ ug/kg/day}$$

$$\text{HQ} = 0.4$$

Hazard quotients greater than 1.0 indicate a potential negative impact on reproductive success of shorebirds that utilize the beaches within OU-2. The calculated hazard quotient of 0.4 indicates that there is most likely no significant impact. This analysis was based on a number of assumptions (listed below) due to the limited available data:

- The estimated average PCB concentration in the sand beach soils is an accurate representation of the average PCB concentration;
- The NOAEL of 40 ug/kg/day estimated for the Forster's Tern by Harris (1993) is representative of the NOAEL for a spotted sandpiper and other shorebirds.
- The estimated food ingestion rate is applicable to shorebirds.

This assessment is based solely on the potential risk associated with incidental ingestion of PCB contaminated soil from the sandy beach areas in OU-2. It does not address PCB uptake from food sources. The PCBs present in the food source of shorebirds using the OU-2 sand beaches would be related to uptake from the sludge bed in Cumberland Bay. Potential risk to wildlife associated with the sludge bed were evaluated in the OU-1 Site Characterization Report Addendum No.1 (May 1997).

3.3.4 Summary and Conclusions

The baseline assessment revealed the former beach debris disposal area does not represent a significant wildlife habitat and that there is no significant wildlife exposure pathway at this area. Without a completed exposure pathway there is no threat to wildlife associated with PCBs detected at the former beach disposal area.

The sand beaches associated with OU-2 could potentially be used by shorebirds and waterfowl as feeding and resting areas. The most significant exposure pathway to PCBs would be incidental ingestion of woodchips/sand containing PCBs while feeding. Sandpipers feed on mud dwelling invertebrates and have been reported to have a high rate of incidental soil ingestion (18%). Spotted Sandpipers are common in New York State and are a potential common resident of the beaches within OU-2. The toxicity assessment on the potential risk associated with incidental ingestion of

PCB contaminated soil by sandpipers while feeding on the sandy beaches in OU-2, indicate that there is no significant impact. The calculated hazard quotient was 0.4.

The assessment is based solely on the potential risk associated with incidental ingestion of PCB contaminated soil from the sandy beach areas in OU-2. It does not address PCB uptake from food sources. The PCBs present in the food source of shorebirds using the OU-2 sand beaches would be related to uptake from the sludge bed in Cumberland Bay. Potential risk to wildlife associated with the sludge bed were evaluated in the OU-1 Site Characterization Report Addendum No.1 (May 1997).

The toxicity analysis was based on a number of assumptions (listed below) including the following:

- The estimated average PCB concentration in the sand beach soils is an accurate representation of the average PCB concentration;
- The NOAEL of 40 ug/kg/day estimated for the Forster's Tern by Harris (1993) is representative of the NOAEL for a spotted sandpiper and other shorebirds.
- The estimated food ingestion rate is applicable to shorebirds.

3.3.5 References

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3.4 Risk Assessment Conclusions

Human Health Risk Assessment

The results of the health risk assessment for the "recreational use of beach areas north of the sludge bed" scenario provided in the SC Report for OU-1 (Addendum No. 1 - Health Risk Assessment [HRA] and a Fish and Wildlife Impact Analysis [FWIA]; dated May 15, 1997) indicate that no potential long-term health concern is associated with this scenario. Since the assumptions used to draw this conclusion are the same for the OU-2 beaches north and south of the sludge bed, the conclusion would be the same.

Fish and Wildlife Assessment

The sand beaches associated with OU-2 could potentially be used by shorebirds and waterfowl as feeding and resting areas. The most significant exposure pathway to PCBs would be incidental ingestion of woodchips/sand containing PCBs while feeding. Sandpipers feed on mud dwelling invertebrates and have been reported to have a high rate of incidental soil ingestion (18%). Spotted Sandpipers are common in New York State and are a potential common resident of the beaches within OU-2. The toxicity assessment on the potential risk associated with incidental ingestion of PCB contaminated soil by sandpipers while feeding on the sandy beaches in OU-2, indicate that there is no significant impact. The calculated hazard quotient was 0.4.

The baseline assessment revealed the former beach debris disposal area does not represent a significant wildlife habitat and that there is no significant wildlife exposure pathway at this area. Without a completed exposure pathway there is no threat to wildlife associated with PCBs detected at the former beach disposal area.

4.0 CONCLUSIONS AND RECOMENDATIONS

4.1 Conclusions

To evaluate the off-site impact to nearby beaches caused by the sludge bed in Cumberland Bay, the results of this investigation have been compared to the soil cleanup levels for PCBs provided in the Technical and Administrative Guidance Memorandum (TAGM) HWR-94-4046; "Determination of Soil Cleanup Objectives and Cleanup Levels" (dated January 1994; revised April 1995). The soil cleanup levels are 1 ppm for surface soils (0-12 inches below ground surface) and 10 ppm for subsurface soils (greater than 12 inches below ground surface).

Beaches

Based on the test kit and laboratory analysis of samples collected on the private beaches north of the sludge bed (SL-1 through SL-10, SL-4A through SL-7A and SL-7B), no PCBs above the soil cleanup level of 1 ppm were detected in surface soils north of and including sample location SL-6. The positive test kit samples are likely false positive based on the low levels of PCBs detected in the fraction of samples confirmed in the laboratory. No subsurface samples at these locations (north of and including SL-6) contained PCBs above the soil cleanup level of 10 ppm.

Samples closer to the sludge bed (SL-7, SL-7A, SL-7B, SL-8, SL-9 and SL-10) contained concentrations above soil cleanup levels. Surface sample SL-7A (0-12") contained 1.8 ppm of PCBs, SL-7B (6-12") contained 39 ppm of PCBs and subsurface sample SL-7B (12-23") contained 26 ppm of PCBs. The concentrations are likely associated with the presence of sludge/wood chips within the first two feet of sand in this area. Surface sample SL-8 (6-12") contained 14.48 ppm of PCBs. Surface sample SL-9 (0-7") contained 3.17 ppm of PCBs. The test kit results in all of the sampling intervals for these sample locations were positive for PCBs and due to the higher concentrations detected in the fraction of samples sent for laboratory confirmation, these positive test kit hits are likely representative of sample containing greater than 2 ppm of PCBs.

For the test kits performed on State beach samples (SLP Series) and city beach samples (SLC Series), no PCBs were detected in surface soils. PCBs were detected by test kits in three subsurface samples located at SLC-2 (12-24"), SLC-4 (12-23") and SLP-3 (31-33"). The PCB levels ranged between 1.01 to 1.36 ppm, all less than the soil cleanup level of 10 ppm.

Based on the laboratory analysis of samples collected on the south beach, PCBs were detected in surface soils at locations SLS-1 (0-6" and 6-12"), SLS-2 (0-6" and 6-12") and SLS-3 (0-6" and 6-12") at levels between 0.023 and 0.33 ppm, less than the soil cleanup level of 1 ppm. For subsurface soils at the south beach, PCBs were detected at locations SLS-1 (12-18" and 18-27") and SLS-2 (12-18" and 18-24") at levels between 0.28 and 3.2 ppm, all less than the soil cleanup level of 10 ppm.

Cumberland Bay State Park Beach Debris Disposal Area

Based on the test kit results of surface soils, the only positive presence of PCBs was detected at location B-2. The confirmatory laboratory analysis performed at this location detected PCBs at

0.148 ppm (B2-S1A), 0.33 ppm (B2-S1A-E) and 0.32 (B2-S1A-W) which are all less than the NYSDEC soil cleanup level of 1 ppm.

Based on the test kit results of subsurface soils, PCBs were detected at locations B1 (4-6'), B4 (2-4'), B4 (4-6') and B9 (2-4'). The confirmatory laboratory analysis performed at these locations detected PCBs ranging from 0.041 to 1.77 ppm which are all less than the NYSDEC soil cleanup level of 10 ppm.

No PCBs were detected in the surface water located adjacent to the fill area.

4.2 Recommendations

Aside from the ongoing beach cleaning IRM, which reduces the potential for significant concentrations of PCBs to be present on the public and private beaches nearby the Cumberland Bay Sludge Bed Site, no further action is recommended for the beaches south of the Wilcox Dock breakwater and the beaches north of the sludge bed (north of sample SL-7), and for the beach debris disposal area. Sludge on the beach areas south of SL-7 will be removed as part of OU-1. Since it has been observed that the amount of sludge in the vicinity of SL-7 varies over time, upon completion of the sludge removal under OU-1, it is recommended that the beach in the area of SL-7 be evaluated and the sludge present at that time be removed as part of the beach cleaning IRM.

Once complete, the results of the Lake Champlain Basin Study will be used to evaluate the impact of the Cumberland Bay Sludge Bed on Cumberland Bay and Lake Champlain.

APPENDICES

APPENDIX A

Beach Cores Logs (SL-1 to SL-10) 1995 Site Characterization Report

PROJECT: CUMBERLAND BAY IRM				CONTRACTOR: RUST E&I	PAGE 1 OF 1
PROJECT NO.: 5799-212				LOCATION: Cumberland Bay, Plattsburgh, NY	DATE: 8/14/95
WATER ELEVATION: 95.24 feet				DATUM: Lake Champlain - Ferry Dock	TAMS REP.: J. Kaczor
Depth from ML (Inches)	PCB Field Screen	Stratum	Recovered Thickness (Inches)	SAMPLE DESCRIPTION, REMARKS, AND STRATUM CHANGES	
				Water Column = 0.0 feet	
				Mud Line (ML)	
- 3		beach sand	12	Tan fine SAND, little Silt, wet.	
- 6	0 - 6"				
- 9					
- 12	6 - 12"			1.0'	
- 15		banded sand	8	Grey medium to fine SAND, trace Silt, thin wood chip layers at 13", 16", and 19", occasional darker fine sand laminae.	
- 18	12 - 20"				
- 21			10	Light Grey fine SAND, little Silt, note coarse Sand and wood chips at 27", thin wood chip laminae at 22" and 23".	
- 24					
- 27					
- 30	20 - 29"			2.5'	
- 33				Bottom of recovery at 30". Sample collected along shoreline above waterline. Sample location selected 8/14/95 as previously staked location was lost. Perform PCB field screen on all four intervals (0-29"); all four intervals found negative for PCBs. Drive = 3.0' = 36" Recovery = 2.5' = 30"	
- 36					
- 39					
- 42					
- 45					
- 48					
- 51					
- 54					
- 57					
- 60					

PROJECT: CUMBERLAND BAY IRM				CONTRACTOR: RUST E&I	PAGE 1 OF 1
PROJECT NO.: 5799-212				LOCATION: Cumberland Bay, Plattsburgh, NY	DATE: 8/14/95
WATER ELEVATION: 95.24 feet				DATUM: Lake Champlain - Ferry Dock	TAMS REP.: J. Kaczor
Depth from ML (Inches)	PCB Field Screen	Stratum	Recovered Thickness (Inches)	SAMPLE DESCRIPTION, REMARKS, AND STRATUM CHANGES	
				Water Column = 0.0 feet	
				Mud Line (ML)	
- 3	0 - 7"	beach sand	14	Light brown fine SAND, little Silt, wet.	
- 6					
- 9	7 - 14"				
- 12					
- 15	14 - 23"	banded sand	9	Light brown fine SAND, little Silt, thin wood chip layers at 15", 16", 17", 18", and 19", wet.	
- 18					
- 21			7	Light grey fine SAND, little Silt, wood chip layers at 22", 23", 24-27", and 28-29"; occasional fine gravel in soft silt lens 29-30".	
- 24					
- 27	23 - 30"				
- 30					
- 33	30 - 34"	'native' sand	4	Dark grey fine SAND, little Silt, wet; note single piece of coarse gravel at 34".	
- 36					
- 39				Bottom of recovery at 34".	
- 42				Sample collected along shoreline above waterline.	
- 45				Perform PCB field screen on all five intervals (0-34"); intervals 1, 2, and 5 (0-14" and 30-34") negative for PCBs, intervals 3 and 4 (14-23") positive for PCB field screen.	
- 48					
- 51					
- 54					
- 57				Drive = 3.0' = 36"	
- 60				Recovery = 2.8' = 34"	

PROJECT: CUMBERLAND BAY IRM				CONTRACTOR: RUST E&I		PAGE 1 OF 1	
PROJECT NO.: 5799-212				LOCATION: Cumberland Bay, Plattsburgh, NY		DATE: 8/14/95	
WATER ELEVATION: 95.24 feet				DATUM: Lake Champlain - Ferry Dock		TAMS REP.: J. Kaczor	
Depth from ML (Inches)	PCB Field Screen	Stratum	Recovered Thickness (Inches)	SAMPLE DESCRIPTION, REMARKS, AND STRATUM CHANGES			
				Water Column = 0.0 feet			
				Mud Line (ML)			
- 3		beach sand	5	Tan fine SAND, little Silt, trace organics, moist.			
- 6	0 - 7"		10	Light brown fine SAND, little Silt, occasional darker medium Sand laminae, wet.			
- 9							
- 12	7 - 14"						
- 15		banded sand		1.3'			
- 18			14 - 22"	Grey fine SAND, little Silt, wood chip layers at 18", 19", 20" and 25"; note fine gravel layer at 30".			
- 21							
- 24							
- 27							
- 30	22 - 30"		4	Light brown fine SAND, little Silt, wet; very thin wood chip layer at 33".			
- 33	30 - 34"						
- 36							
- 39			Bottom of recovery at 34".				
- 42			Sample collected along shoreline above waterline.				
- 45			Perform PCB field screen on all five intervals (0-34"); intervals 1, 2, 4, and 5 (0-14" and 22-34") negative for PCBs, interval 3 (14-22") positive for PCB field screen.				
- 48							
- 51			Interval 3 (22-30") sent for CLP analytical laboratory PCB analysis.				
- 54			Drive = 3.0' = 36"				
- 57			Recovery = 2.8' = 34"				
- 60							

PROJECT: CUMBERLAND BAY IRM				CONTRACTOR: RUST E&I	PAGE 1 OF 1
PROJECT NO.: 5799-212				LOCATION: Cumberland Bay, Plattsburgh, NY	DATE: 8/10/95
WATER ELEVATION: 95.12 feet				DATUM: Lake Champlain - Ferry Dock	TAMS REP.: J. Kaczor
Depth from ML (Inches)	PCB Field Screen	Stratum	Recovered Thickness (Inches)	SAMPLE DESCRIPTION, REMARKS, AND STRATUM CHANGES	
				Water Column = 0.0 feet	
				Mud Line (ML)	
- 3		beach sand	4	Light brown medium to fine SAND, little Silt, wet; organics top 1/2".	
- 6	0 - 6"				
- 9			9	Grey fine SAND, little Silt, occasional root, wood chip lenses at 6" and 12" to 13".	
- 12	6 - 13"				
- 15		banded sand			
- 18			15	Grey brown fine SAND, some Silt, numerous wood pulp laminae from 16" to 23" in fine Sand matrix, wet.	
- 21					
- 24	13 - 24"				
- 27					
- 30	24 - 28"				
- 33					
- 36					
- 39				Sample collected along shoreline above water line.	
- 42				Bottom of recovery at 28".	
- 45					
- 48				Perform PCB field screen on all four intervals (0-28"); intervals 1,2 and 3 (0-24") positive for PCB field screen test, interval 4 (24-28") negative.	
- 51					
- 54				Drive = 3.0' = 36"	
- 57				Recovery = 2.3' = 28"	
- 60					

PROJECT: CUMBERLAND BAY IRM				CONTRACTOR: RUST E&I	PAGE 1 OF 1
PROJECT NO.: 5799-212				LOCATION: Cumberland Bay, Plattsburgh, NY	DATE: 8/10/95
WATER ELEVATION: 95.12 feet				DATUM: Lake Champlain - Ferry Dock	TAMS REP.: J. Kaczor
Depth from ML (Inches)	PCB Field Screen	Stratum	Recovered Thickness (Inches)	SAMPLE DESCRIPTION, REMARKS, AND STRATUM CHANGES	
				Water Column = 0.0 feet	
				Mud Line (ML)	
- 3		banded sand	11	Light brown fine SAND, little Silt, thin wood pulp lense at 0-1", 3" and 5", very thin wood chip laminae at 6" and 8", thick wood chip layer from 11" to 12", wet.	
- 6	0 - 6"				
- 9					
- 12	6 - 12"				
- 15		'native' sand	4	Grey medium SAND, trace Silt, wood chip layer from 14" to 15", wet.	
- 18			4	Light brown fine SAND, little Silt, bark lenses at 17" and 19", wet.	
- 21				1.6'	
- 24	12 - 24"				
- 27			17	Light brown fine SAND, little Silt, occasional fine dark Sand laminae, bark or driftwood fragments at 30", wet.	
- 30					
- 33					
- 36	24 - 36"			3.0'	
- 39				Sample collected along shoreline above water line.	
- 42				Bottom of recovery at 36".	
- 45					
- 48				Perform PCB field screen on all four intervals (0-28"); intervals 1,2 and 3 (0-24") positive for PCB field screen test, interval 4 (24-36") negative.	
- 51					
- 54				Drive = 3.0' = 36"	
- 57				Recovery = 3.0' = 36"	
- 60					

PROJECT: CUMBERLAND BAY IRM				CONTRACTOR: RUST E&I	PAGE 1 OF 1
PROJECT NO.: 5799-212				LOCATION: Cumberland Bay, Plattsburgh, NY	DATE: 8/9/95
WATER ELEVATION: 95.10 feet				DATUM: Lake Champlain - Ferry Dock	TAMS REP.: J. Kaczor
Depth from ML (Inches)	PCB Field Screen	Stratum	Recovered Thickness (Inches)	SAMPLE DESCRIPTION, REMARKS, AND STRATUM CHANGES	
				Water Column = 0.0 feet	
				Mud Line (ML)	
- 3		beach sand	12	Tan fine SAND, little Silt, note very thin wood chip layer at 9", moist.	
- 6	0 - 6"				
- 9					
- 12	6 - 12"	banded sand	13	Grey fine SAND, some Silt, wood chip layers at 13", 15", 18", 23" and 23.5", wet.	
- 15					
- 18					
- 21					
- 24	12 - 24"	'native' sand	13	Light brown fine SAND, little Silt, occasional twig, wet.	
- 27					
- 30					
- 33					
- 36	24 - 38"			Bottom of recovery at 38". Sample collected along shoreline above waterline. Perform PCB field screen on all four intervals (0-38"); top three intervals (0-24") positive for PCB field screen test, bottom interval (24-38") negative. Interval 3 (12-24") sent for CLP laboratory PCB analysis. Drive = 5.0' = 60" Recovery = 3.2' = 38"	
- 39					
- 42					
- 45					
- 48					
- 51					
- 54					
- 57					
- 60					

PROJECT: CUMBERLAND BAY IRM				CONTRACTOR: RUST E&I	PAGE 1 OF 1
PROJECT NO.: 5799-212				LOCATION: Cumberland Bay, Plattsburgh, NY	DATE: 8/9/95
WATER ELEVATION: 95.10 feet				DATUM: Lake Champlain - Ferry Dock	TAMS REP.: J. Kaczor
Depth from ML (Inches)	PCB Field Screen	Stratum	Recovered Thickness (Inches)	SAMPLE DESCRIPTION, REMARKS, AND STRATUM CHANGES	
				Water Column = 0.0 feet	
				Mud Line (ML)	
- 3		beach sand	7	Tan fine SAND, little Silt, note very thin wood chip layer at 3", moist.	
- 6	0 - 6"				
- 9		banded sand	16	Grey fine SAND, some Silt, wood chip layers at 9" (bark?), 15", and 23", wet.	
- 12	6 - 12"				
- 15					
- 18					
- 21		'native' sand	19	Light brown fine SAND, little Silt, very thin wood chip layer at 36", note faint dark, fine sand laminae bottom 14".	
- 24	12 - 24"				
- 27					
- 30					
- 33					
- 36	24 - 36"				
- 39					
- 42	36 - 42"				
- 45					
- 48				Bottom of recovery at 42".	
- 51				Sample collected along shoreline above waterline.	
- 54				Perform PCB field screen on all five intervals (0-42"); intervals 0-6", 6-12", 24-36", and 36-42" positive for PCB field screen test, interval 12-24" negative.	
- 57				Interval 3 (12-24") sent for CLP laboratory PCB analysis for confirmation of negative field screen result.	
- 60				Drive = 5.0' = 60" Recovery = 3.5' = 42"	

PROJECT: CUMBERLAND BAY IRM				CONTRACTOR: RUST E&I	PAGE 1 OF 1
PROJECT NO.: 5799-212				LOCATION: Cumberland Bay, Plattsburgh, NY	DATE: 8/9/95
WATER ELEVATION: 95.10 feet				DATUM: Lake Champlain - Ferry Dock	TAMS REP.: J. Kaczor
Depth from ML (Inches)	PCB Field Screen	Stratum	Recovered Thickness (Inches)	SAMPLE DESCRIPTION, REMARKS, AND STRATUM CHANGES	
				Water Column = 0.0 feet	
				Mud Line (ML)	
- 3	0 - 6"	beach sand	7	Tan fine SAND, little Silt, occasional wood pulp/fibers, fine driftwood pieces top 1", dry.	
- 6					
- 9	6 - 12"	wood pulp sand	5	Brown to black fine Sandy WOOD PULP, some Silt bottom 1", wet.	
- 12					
- 15	12 - 24"	banded sand	20	Light brown fine SAND, some Silt, wood chip layers at 17", 18", several 20-23", 26", and 30" (bark?), wet.; note faint, dark fine sand laminae 12-20".	
- 18					
- 21					
- 24					
- 27	24-32"				
- 30					
- 33				Bottom of recovery at 32". Sample collected along shoreline above waterline. Perform PCB field screen on all four intervals (0-32"); all four intervals positive for PCB field screen test. Interval 2 (6-12") sent for CLP laboratory PCB analysis. Drive = 5.0' = 60" Recovery = 2.7' = 32"	
- 36					
- 39					
- 42					
- 45					
- 48					
- 51					
- 54					
- 57					
- 60					

PROJECT: CUMBERLAND BAY IRM				CONTRACTOR: RUST E&I	PAGE 1 OF 1
PROJECT NO.: 5799-100				LOCATION: Cumberland Bay, Plattsburgh, NY	DATE: 8/9/95
WATER ELEVATION: 95.10 feet				DATUM: Lake Champlain - Ferry Dock	TAMS REP.: J. Kaczor
Depth from ML (Inches)	PCB Field Screen	Stratum	Recovered Thickness (Inches)	SAMPLE DESCRIPTION, REMARKS, AND STRATUM CHANGES	
		water		Water Column = 0.2 feet	
				Mud Line (ML)	
- 3	0 - 7"	wood pulp and sand	9	Brown wood pulp SLUDGE, and Grey fine SAND, alternating layers 1/4" to 1" thick, some Silt in sand layers, wet. (10 wood pulp/chip layers) 0.75'	
- 6					
- 9					
- 12	7 - 14"	banded sand	14	Grey brown fine SAND, some Silt, apparent bark seam at 14", occasional fibers, wet. (1 wood chip layer) 1.9'	
- 15					
- 18					
- 21	14 - 21"				
- 24	21 - 29"		6	Grey fine SAND, little Silt and wood chips, alternating layers 1/4" to 1/2" thick, wet. (6 wood chip layers) 2.4'	
- 27					
- 30					
- 33				Bottom of recovery at 29".	
- 36				Sample collected along shoreline at waterline.	
- 39				Perform PCB field screen on all four intervals (0 - 29"); all four intervals positive for PCB field screen.	
- 42				Interval 1(0 - 7") sent for CLP laboratory PCB analysis.	
- 45					
- 48					
- 51					
- 54				Drive = 5.0' = 60"	
- 57				Recovery = 2.4' = 29"	
- 60					

PROJECT: CUMBERLAND BAY IRM		CONTRACTOR: RUST E&I		PAGE 1 OF 1
PROJECT NO.: 5799-100		LOCATION: Cumberland Bay, Plattsburgh, NY		DATE: 8/9/95
WATER ELEVATION: 95.10 feet		DATUM: Lake Champlain - Ferry Dock		TAMS REP.: J. Kaczor
Depth from ML (Inches)	PCB Field Screen	Stratum	Recovered Thickness (Inches)	SAMPLE DESCRIPTION, REMARKS, AND STRATUM CHANGES
				Water Column = 0.0 feet
				Mud Line (ML)
- 3 - 6 - 9		wood pulp and sand	11	Brown wood pulp SLUDGE and Brown fine SAND, some Silt, organics, pulp primarily from 2" to 9", moist.
- 12	0 - 12"			(Sample wet at 12")
- 15 - 18 - 21 - 24 - 27	12 - 24"	banded sand	18	Brown grey fine SAND, some Silt, wood chip layers at 17", 18", 20", 23", and 25", wet.
- 30	24 - 30"			
- 33 - 36 - 39 - 42 - 45 - 48 - 51 - 54 - 57 - 60				Bottom of recovery at 30". Sample collected along shoreline above waterline. Perform PCB field screen on all three intervals (0 - 29"); all three intervals positive for PCB field screen. Drive = 4.0 = 48" Recovery = 2.5' = 30"

APPENDIX B

**Beach Core Logs
1997 OU-2 Investigation**

RUST E&I Albany, NY (518) 458-1313		Test Boring Log			Boring No. SLS-1
PROJECT: Cumberland Bay Beach Coring					Sheet 1 of 2
CLIENT: New York State Department of Environmental Conservation - SSP					Job No. 39304.10006
DRILLING CONTRACTOR: Rust/NYSDEC					Meas. Pt. Elev.: --
PURPOSE: Beach Sampling and Investigation					Ground Elev.: --
DRILLING METHOD: --		SAMPLE	CORE	CASING	Datum: --
DRILL RIG TYPE: --	TYPE	--	Lexan	--	Date Started: 10/20/97
GROUNDWATER DEPTH: --	DIAM.	--	2 1/2 inch	--	Date Finished: 10/20/97
MEAS. PT.: --	WEIGHT	--			Driller: D. Foti
DATE OF MEAS.: --	FALL	--			Inspector: B. Edwards

Depth (Inch)	Sample Number	Blow Count	Unified Classification	GRAPHIC LOG	GEOLOGIC DESCRIPTION	REMARKS
1	S-1		SP		Br cmf(-) S, t(-) \$.	Rec = 36"
2						
3						
4						
5						
6	S-2		SP		Brtn c(+)m S, t(+) wood chips & f G.	Wood is black organic
7						
8						
9						
10						
11	S-3		SM		Br c(-)mf S, l \$, t mf G.	1/2" small fine wood chips
12						
13						
14						
15						
16	S-4		FILL		Interlayered seams of wood chips & Gr cmf S, t \$.	Gravel is rounded
17						
18						
19						
20						

RUST E&I Albany, NY (518) 458-1313				Test Boring Log		Boring No. SLS-1	
PROJECT: Cumberland Bay Beach Coring						Sheet 2 of 2	
CLIENT: New York State Department of Environmental Conservation - SSP						Job No. 39304.10006	
Depth (Inch)	Sample Number	Blow Counts	Unified Classif- ication	Visual Log Description	Geologic Description	Remarks	
21	S-4 (cont.)		SP			23-24" sand is coarse	
22							
23							
24							
25							
26	S-5		SM- FILL		Gr f S. 25.5"	Pulp/chip layers at: 27-28" 30.5-32" 33" 34-36"	
27							27"
28					Gr f S interlayered w/ seams of fibrous pulp/sludge with wood chips.		
29							
30							
31							
32							
33							
34							
35							
36							
					End at 36"		

RUST E&I Albany, NY (518) 458-1313		Test Boring Log			Boring No. SLS-2
PROJECT: Cumberland Bay Beach Coring					Sheet 1 of 2
CLIENT: New York State Department of Environmental Conservation - SSP					Job No. 39304.10006
DRILLING CONTRACTOR: Rust/NYSDEC					Meas. Pt. Elev.: --
PURPOSE: Beach Sampling and Investigation					Ground Elev.: --
DRILLING METHOD: --		SAMPLE	CORE	CASING	Datum: --
DRILL RIG TYPE: --	TYPE	--	Lexan	--	Date Started: 10/20/97
GROUNDWATER DEPTH: --	DIAM.	--	2 1/2 inch	--	Date Finished: 10/20/97
MEAS. PT.: --	WEIGHT	--			Driller: D. Foti
DATE OF MEAS.: --	FALL	--			Inspector: B. Edwards

Depth (Inch)	Sample Number	Blow Count	Unified Classification	GRAPHIC LOG	GEOLOGIC DESCRIPTION	REMARKS
1	S-1		SP		Br mf S, t(-) \$. ----- 5.5"	Rec = 32"
2						
3						
4						
5						
6	S-2		SW-GW		C(+)m S, l(+) G. grades to	
7						
8						
9						
10						
11	S-3				C(+)mf S, t(-) \$, l G, t org. 1/4" seam of wood chips @ 16"	Glass at 15" Wood chips are fine black and tan
12						
13						
14						
15						
16	S-4		SP		Gr mf(+) S, t org (roots), t wood chips (black).	Slight odor
17						
18						
19						
20						

RUST E&I Albany, NY (518) 458-1313			Test Boring Log		Boring No. SLS-2		
PROJECT: Cumberland Bay Beach Coring					Sheet 2 of 2		
CLIENT: New York State Department of Environmental Conservation - SSP					Job No. 39304.10006		
Depth (Inch)	Sample Number	Blow Counts	Unified Classif- ication	Visual Log Description	Geologic Description	Remarks	
21	S-4 (cont.)		SP- FILL		21.5" Bk sludge (fibrous).	Wood chips are fine, black, tan and brown	
22		22.5" Tnbk c(+)m S, t \$, org, wood chips.					
23		24"					
24							
25	S-5				Gr f S.		Layers of Bktn wood chips @ 26.5-27.5" and 29".
26							
27							
28							
29							
30		FILL			30"		
31					Grades to all wood chips.		
32					32"		
				End at 32"			

RUST E&I Albany, NY (518) 458-1313		Test Boring Log			Boring No. SLS-3
PROJECT: Cumberland Bay Beach Coring					Sheet 1 of 2
CLIENT: New York State Department of Environmental Conservation - SSP					Job No. 39304.10006
DRILLING CONTRACTOR: Rust/NYSDEC					Meas. Pt. Elev.: --
PURPOSE: Beach Sampling and Investigation					Ground Elev.: --
DRILLING METHOD: --		SAMPLE	CORE	CASING	Datum: --
DRILL RIG TYPE: --	TYPE	--	Lexan	--	Date Started: 10/20/97
GROUNDWATER DEPTH: --	DIAM.	--	2 1/2 inch	--	Date Finished: 10/20/97
MEAS. PT.: --	WEIGHT	--			Driller: D. Foti
DATE OF MEAS.: --	FALL	--			Inspector: B. Edwards

Depth (Inch)	Sample Number	Blow Count	Unified Classif- ication	GRAPHIC LOG	GEOLOGIC DESCRIPTION	REMARKS
1	S-1		SP		Br mf S, t(-) \$.	Rec = ~35"
2						
3					----- 3"	
4					cmf(-) S, t \$. ----- 4"	
5	S-2		SP- FILL		Seam cm S, s(-) org (bk fine wd chips).	Seam at 4.5-5"
6						
7					grades to	
8					Grbr cmf S, t(+) \$, t(+) mf G.	
9	S-3		SW			Wood is degraded
10						
11						
12						
13	S-3		SP		----- 14"	Wood is degraded
14						
15					Dkgr f S.	
16					----- 16"	
17	S-3		FILL		Bk org (wood, root).	Wood is degraded
18						
19					----- 18"	
20					Dkgr f S, t(+) \$, t f G.	

RUST E&I Albany, NY (518) 458-1313			Test Boring Log		Boring No. SLS-3	
PROJECT: Cumberland Bay Beach Coring					Sheet 2 of 2	
CLIENT: New York State Department of Environmental Conservation - SSP					Job No. 39304.10006	
Depth (Inch)	Sample Number	Blow Counts	Unified Classif- ication	Visual Log Description	Geologic Description	Remarks
21	S-3 (cont.)		SP-SW		V fine bk org seams at 21-22".	Strong odor @ 25-26", slight luminance
22					22"	
23			FILL		Bkbr wood chips.	
24					Dkgr f S, t \$. 23.5"	
25	S-4				24"	
26						
27					Pulp/fibrous @ 26-28".	
28						
29						
30					Coarse pulp/chips, little bk org/wood @ 29-32".	
31	S-5					
32						
33					Gr f S, l(-) \$ @ 32.5-34.5".	
34			SP-SM		34.5"	
35					End at 34.5"	

RUST E&I Albany, NY (518) 458-1313			Test Boring Log			Boring No. SLC-1		
PROJECT: Cumberland Bay Beach Coring						Sheet 1 of 2		
CLIENT: New York State Department of Environmental Conservation - SSP						Job No. 39304.10006		
DRILLING CONTRACTOR: Rust/NYSDEC						Meas. Pt. Elev.: --		
PURPOSE: Beach Sampling and Investigation						Ground Elev.: --		
DRILLING METHOD: --				SAMPLE	CORE	CASING	Datum: --	
DRILL RIG TYPE: --		TYPE	--	Lexan	--	Date Started: 10/21/97		
GROUNDWATER DEPTH: --		DIAM.	--	2 1/2 inch	--	Date Finished: 10/21/97		
MEAS. PT.: --		WEIGHT	--			Driller: D. Foti		
DATE OF MEAS.: --		FALL	--			Inspector: B. Edwards		
Depth (Inch)	Sample Number	Blow Count	Unified Classification	GRAPHIC LOG	GEOLOGIC DESCRIPTION		REMARKS	
1	S-1		SP		Ltbr mf(+) S, t(-) \$.		Rec = 34"	
2								
3								
4								
5								
6	S-2				Grades to Dkgr mf(+) S, t(-) \$.			
7								
8								
9								
10								
11	S-3		Grades to Tnbr mf(+) S, t(-) \$.					
12								
13								
14								
15								
16	S-4		Parting of Br wood chips@ 15.5".					
17								
18								
19								
20								
			FILL		17.5"		Seam at 19-20"	
					Br fine wood chips.			
					Tnbr f S seam.		20"	

RUST E&I Albany, NY (518) 458-1313				Test Boring Log		Boring No. SLC-1
PROJECT: Cumberland Bay Beach Coring						Sheet 2 of 2
CLIENT: New York State Department of Environmental Conservation - SSP						Job No. 39304.10006
Depth (Inch)	Sample Number	Blow Counts	Unified Classif- ication	Visual Log Description	Geologic Description	Remarks
21	S-4 (cont.)		SP		Tnbr mf(+) S, t(-) \$.	
22						
23						
24	S-5		FILL		Br wood chips (fine).	23.5"
25					24"	
26			SP		Tnbr mf(+) S, t(-) \$.	
27						
28						
29						
30						
31						
32						
33						
34						
					Wood chip seam @ 30".	
						34"
					End at 34"	

RUST E&I Albany, NY (518) 458-1313				Test Boring Log			Boring No. SLC-2	
PROJECT: Cumberland Bay Beach Coring							Sheet 1 of 2	
CLIENT: New York State Department of Environmental Conservation - SSP							Job No. 39304.10006	
DRILLING CONTRACTOR: Rust/NYSDEC							Meas. Pt. Elev.: --	
PURPOSE: Beach Sampling and Investigation							Ground Elev.: --	
DRILLING METHOD: --				SAMPLE	CORE	CASING	Datum: --	
DRILL RIG TYPE: --		TYPE	--	Lexan	--	Date Started: 10/21/97		
GROUNDWATER DEPTH: --		DIAM.	--	2 1/2 inch	--	Date Finished: 10/21/97		
MEAS. PT.: --		WEIGHT	--				Driller: D. Foti	
DATE OF MEAS.: --		FALL	--				Inspector: B. Edwards	
Depth (Inch)	Sample Number	Blow Count	Unified Classification	GRAPHIC LOG	GEOLOGIC DESCRIPTION		REMARKS	
1	S-1		SP		Ltbr mf(+) S, t(-) \$.		Rec = 32"	
2								
3								
4								
5								
6	S-2		SP		Grades to Dkgr mf(+) S, t(-) \$.		Parting dark laminated fine sand @ 3-4"	
7								
8								
9								
10								
11	S-3		SP		Gr c(+)m S, t(-) \$, t org.		Org ~ coarse black wood	
12								
13								
14								
15								
16					18.5"			
17					20"			
18								
19								
20								

RUST E&I Albany, NY (518) 458-1313				Test Boring Log		Boring No. SLC-2
PROJECT: Cumberland Bay Beach Coring						Sheet 2 of 2
CLIENT: New York State Department of Environmental Conservation - SSP						Job No. 39304.10006
Depth (Inch)	Sample Number	Blow Counts	Unified Classif- ication	Visual Log Description	Geologic Description	Remarks
21	S-3 (cont.)		SP		Ltbr mf(+) S, t(-) \$.	
22						
23						
24	S-4					
25						
26						
27						
28						
29						
30						
31						
32						
					End at 32"	

RUST E&I Albany, NY (518) 458-1313				Test Boring Log			Boring No. SLC-3	
PROJECT: Cumberland Bay Beach Coring							Sheet 1 of 2	
CLIENT: New York State Department of Environmental Conservation - SSP							Job No. 39304.10006	
DRILLING CONTRACTOR: Rust/NYSDEC							Meas. Pt. Elev.: --	
PURPOSE: Beach Sampling and Investigation							Ground Elev.: --	
DRILLING METHOD: --				SAMPLE	CORE	CASING	Datum: --	
DRILL RIG TYPE: --		TYPE	--	Lexan	--	Date Started: 10/21/97		
GROUNDWATER DEPTH: --		DIAM.	--	2 1/2 inch	--	Date Finished: 10/21/97		
MEAS. PT.: --		WEIGHT	--				Driller: D. Foti	
DATE OF MEAS.: --		FALL	--				Inspector: B. Edwards	
Depth (Inch)	Sample Number	Blow Count	Unified Classification	GRAPHIC LOG	GEOLOGIC DESCRIPTION		REMARKS	
1	S-1		SP		Ltbr mf S, t(-) org, \$.		Rec = ~31" Leaf @ 1-2"	
2								
3								
4								
5								
6	S-2		SP		----- 9.5" Grades to Gr to Dkgr mf(+) S, t org.		Brbl lamination @ 6.5"	
7								
8								
9								
10								
11	S-3		SP-SW		----- 15.5" Ltgr to Ltbr cmf S.		Organic seam @ 11" Weathered fine leaves-wood	
12								
13								
14								
15								
16							Sand is finer @ 17-19"	
17								
18								
19								
20								

RUST E&I Albany, NY (518) 458-1313				Test Boring Log		Boring No. SLC-3
PROJECT: Cumberland Bay Beach Coring						Sheet 2 of 2
CLIENT: New York State Department of Environmental Conservation - SSP						Job No. 39304.10006
Depth (Inch)	Sample Number	Blow Counts	Unified Classif- ication	Visual Log Description	Geologic Description	Remarks
21	S-3 (cont.)		SP			Predominantly quartz grains organic ~ very fine wood, leaves, etc.
22						
23					23"	
24	S-4		FILL	Br c(+)m S.	24"	
25				Org (wd) and m S seam.	24.5"	
26			SP	Tn mf S, t \$ and org.		
27						
28						
29						
30						
31				31"		
					End at 31"	

RUST E&I Albany, NY (518) 458-1313				Test Boring Log		Boring No. SLC-4
PROJECT: Cumberland Bay Beach Coring						Sheet 2 of 2
CLIENT: New York State Department of Environmental Conservation - SSP						Job No. 39304.10006
Depth (Inch)	Sample Number	Blow Counts	Unified Classif- ication	Visual Log Description	Geologic Description	Remarks
21	S-3 (cont.)		SP		21"	Organic ~ black and brown medium wood chunks
22	S-4				Ltbr mf S, t(-) \$.	
23					Org seam @ 23.5".	
24						
25						
26						
27						
28						
					End at 28"	

RUST E&I Albany, NY (518) 458-1313		Test Boring Log			Boring No. SLC-5	
PROJECT: Cumberland Bay Beach Coring					Sheet 1 of 2	
CLIENT: New York State Department of Environmental Conservation - SSP					Job No. 39304.10006	
DRILLING CONTRACTOR: Rust/NYSDEC					Meas. Pt. Elev.: --	
PURPOSE: Beach Sampling and Investigation					Ground Elev.: --	
DRILLING METHOD: --		SAMPLE	CORE	CASING	Datum: --	
DRILL RIG TYPE: --	TYPE	--	Lexan	--	Date Started: 10/21/97	
GROUNDWATER DEPTH: --	DIAM.	--	2 1/2 inch	--	Date Finished: 10/21/97	
MEAS. PT.: --	WEIGHT	--			Driller: D. Foti	
DATE OF MEAS.: --	FALL	--			Inspector: B. Edwards	
Depth (Inch)	Sample Number	Blow Count	Unified Classif- ication	GRAPHIC LOG	GEOLOGIC DESCRIPTION	REMARKS
1	S-1		SP		Ltbr mf S, t(-) \$.	Rec = 31"
2						
3						
4						
5	S-2		SP		Dkgr mf S, t(-) \$ and f G.	Rounded medium gravel @ 9"
6						
7						
8						
9	S-3		SP		Tnbr mf S, t(-) \$.	Organic/wood is black and brown, fine chips
10						
11						
12						
13	S-3		SP		1/4" wood chip seam @ 12".	Black medium/fine wood chips/degradated wood
14						
15						
16						
17	S-3		SP		Org seam @ 19".	Black medium/fine wood chips/degradated wood
18						
19						
20						

RUST E&I Albany, NY (518) 458-1313				Test Boring Log		Boring No. SLC-5
PROJECT: Cumberland Bay Beach Coring						Sheet 2 of 2
CLIENT: New York State Department of Environmental Conservation - SSP						Job No. 39304.10006
Depth (Inch)	Sample Number	Blow Counts	Unified Classif- ication	Visual Log Description	Geologic Description	Remarks
21	S-3 (cont.)		SP- FILL		Org seam @ 26", 28", 30", 31".	Black fine degradated wood chips
22						
23						
24						
25						
26						
27						
28						
29						
30						
31						
					End at 31"	

RUST E&I Albany, NY (518) 458-1313			Test Boring Log			Boring No. SLP-1								
PROJECT: Cumberland Bay Beach Coring						Sheet 1 of 2								
CLIENT: New York State Department of Environmental Conservation - SSP						Job No. 39304.10006								
DRILLING CONTRACTOR: Rust/NYSDEC						Meas. Pt. Elev.: --								
PURPOSE: Beach Sampling and Investigation						Ground Elev.: --								
DRILLING METHOD: --				SAMPLE	CORE	CASING	Datum: --							
DRILL RIG TYPE: --		TYPE	--	Lexan	--	Date Started: 10/20/97								
GROUNDWATER DEPTH: --		DIAM.	--	2 1/2 inch	--	Date Finished: 10/20/97								
MEAS. PT.: --		WEIGHT	--			Driller: D. Foti								
DATE OF MEAS.: --		FALL	--			Inspector: B. Edwards								
Depth (Inch)	Sample Number	Blow Count	Unified Classif- ication	GRAPHIC LOG	GEOLOGIC DESCRIPTION		REMARKS							
1	S-1		SP-SW		Ltbr c(-)mf S.		Rec = 30"							
2														
3														
4														
5														
6														
7														
8														
9														
10														
11														
12	S-2		SP		mf G @ 12" grades to Tnbr mf S, t(-) \$ @ 13".									
13														
14														
15														
16														
17														
18														
19														
20														
12	S-3								SP-SM		Org parting @ 18". ----- 18.5" Br mf S, l(-) \$, cm G.		Organic ~ black fine	
13														
14														
15														
16														
17														
18														
19														
20														

RUST E&I Albany, NY (518) 458-1313				Test Boring Log		Boring No. SLP-1
PROJECT: Cumberland Bay Beach Coring						Sheet 2 of 2
CLIENT: New York State Department of Environmental Conservation - SSP						Job No. 39304.10006
Depth (Inch)	Sample Number	Blow Counts	Unified Classif- ication	Visual Log Description	Geologic Description	Remarks
21	S-3 (cont.)		SP-SW		20.5" Dkbr c(-)mf S.	Gravel/silt @ 20-21"
22						
23						
24						
25	S-4		SP-FILL		25" Brbl cm S, l(-) org, t \$, t(-) mf G.	Gravel @ 24"
26					Organic ~ fine black wood chips	
27						
28						
29						
30					30" End at 30"	

RUST E&I Albany, NY (518) 458-1313		Test Boring Log			Boring No. SLP-2
PROJECT: Cumberland Bay Beach Coring					Sheet 1 of 2
CLIENT: New York State Department of Environmental Conservation - SSP					Job No. 39304.10006
DRILLING CONTRACTOR: Rust/NYSDEC					Meas. Pt. Elev.: --
PURPOSE: Beach Sampling and Investigation					Ground Elev.: --
DRILLING METHOD: --		SAMPLE	CORE	CASING	Datum: --
DRILL RIG TYPE: --	TYPE	--	Lexan	--	Date Started: 10/20/97
GROUNDWATER DEPTH: --	DIAM.	--	2 1/2 inch	--	Date Finished: 10/20/97
MEAS. PT.: --	WEIGHT	--			Driller: D. Foti
DATE OF MEAS.: --	FALL	--			Inspector: B. Edwards

Depth (Inch)	Sample Number	Blow Count	Unified Classif- ication	GRAPHIC LOG	GEOLOGIC DESCRIPTION	REMARKS
1	S-1		SP-SW		Ltbr cmf(-) S.	Rec = 30"
2						
3						
4						
5						
6	S-2		SW-FILL		Interlayered cmf S and Bk org seams.	Organic ~ black fine wood chips
7						
8						
9						
10						
11	S-3		SP		Tnbr mf S, t(-) \$.	
12						
13						
14						
15						
16			SP-SW		Cmf(-) S, t \$, t(+) mf G, org (wood).	Wood is coarse Black chunks at 20"
17						
18						
19						
20						

RUST E&I Albany, NY (518) 458-1313				Test Boring Log		Boring No. SLP-2
PROJECT: Cumberland Bay Beach Coring						Sheet 2 of 2
CLIENT: New York State Department of Environmental Conservation - SSP						Job No. 39304.10006
Depth (Inch)	Sample Number	Blow Counts	Unified Classif- ication	Visual Log Description	Geologic Description	Remarks
21	S-3 (cont.)		FILL SP-SW FILL SP-SW FILL		Seams and layers of fine bk & tn wood chips @ 22-24".	Seam @ 26.5"
22						
23	S-4				3/4" wood chips.	
24					Tngr c(-)mf S.	
25					Brbk mf wood chips. Tngr mf S seam.	
26						
27						
28					Tngr c(-)mf S.	
29					Brbk mf wood chips.	
30					30"	
				End at 30"		

RUST E&I Albany, NY (518) 458-1313		Test Boring Log			Boring No. SLP-3
PROJECT: Cumberland Bay Beach Coring					Sheet 1 of 2
CLIENT: New York State Department of Environmental Conservation - SSP					Job No. 39304.10006
DRILLING CONTRACTOR: Rust/NYSDEC					Meas. Pt. Elev.: --
PURPOSE: Beach Sampling and Investigation					Ground Elev.: --
DRILLING METHOD: --		SAMPLE	CORE	CASING	Datum: --
DRILL RIG TYPE: --	TYPE	--	Lexan	--	Date Started: 10/21/97
GROUNDWATER DEPTH: --	DIAM.	--	2 1/2 inch	--	Date Finished: 10/21/97
MEAS. PT.: --	WEIGHT	--			Driller: D. Foti
DATE OF MEAS.: --	FALL	--			Inspector: B. Edwards

Depth (Inch)	Sample Number	Blow Count	Unified Classif- ication	GRAPHIC LOG	GEOLOGIC DESCRIPTION	REMARKS							
1	S-1		SP		Tnbr mf S, t(-) \$.	Rec = 33" magnetite partings at 1"-3"							
2													
3													
4													
5													
6	S-2				Grades to Dkgrbr mf S, t(-) \$, t(+) org @ 9".	1/2" seam Tnbr cmf S @ 12".	Wood is black brown fine chips						
7													
8													
9													
10													
11								Wood chip seam @ 14".					
12													
13													
14													
15													
16	S-3												
17													
18													
19													
20													

RUST E&I Albany, NY (518) 458-1313				Test Boring Log		Boring No. SLP-3	
PROJECT: Cumberland Bay Beach Coring						Sheet 2 of 2	
CLIENT: New York State Department of Environmental Conservation - SSP						Job No. 39304.10006	
Depth (Inch)	Sample Number	Blow Counts	Unified Classif- ication	Visual Log Description	Geologic Description	Remarks	
21	S-3 (cont.)		SP- FILL			Organic parting @ 27.5"	
22							
23							
24					24"		
25	S-4				Interlayered Tnbr mf S and Bkbr fine wood chips.		25"
26					Tnbr mf S, t(+) org.		
27							
28							
29					29"		
30					Gr f S, l \$, l(-) wood chips.		30"
31	S-5		FILL		Coarse wood chunks and all wood chips @ 30-33"		
32				Wood chips.			
33				33"			
End at 33"							

RUST E&I Albany, NY (518) 458-1313			Test Boring Log			Boring No. SLP-4	
PROJECT: Cumberland Bay Beach Coring						Sheet 1 of 2	
CLIENT: New York State Department of Environmental Conservation - SSP						Job No. 39304.10006	
DRILLING CONTRACTOR: Rust/NYSDEC						Meas. Pt. Elev.: --	
PURPOSE: Beach Sampling and Investigation						Ground Elev.: --	
DRILLING METHOD: --			SAMPLE	CORE	CASING	Datum: --	
DRILL RIG TYPE: --		TYPE	--	Lexan	--	Date Started: 10/20/97	
GROUNDWATER DEPTH: --		DIAM.	--	2 1/2 inch	--	Date Finished: 10/20/97	
MEAS. PT.: --		WEIGHT	--			Driller: D. Foti	
DATE OF MEAS.: --		FALL	--			Inspector: B. Edwards	
Depth (Inch)	Sample Number	Blow Count	Unified Classif- ication	GRAPHIC LOG	GEOLOGIC DESCRIPTION	REMARKS	
1	S-1		SP		Ltbr mf S, t(-) \$.	Rec = 30"	
2							
3							
4							
5							
6	S-2		SP-SW		Br cmf(-) S seam @ 8.5". grades to Gr mf S, t(-) \$ @ 10.5".	Organics ~ black fine wood	
7							
8							
9							
10							
11	S-3		SP		Org seams @ 12", 14" and 15.5". Coarse wood chunk, bk, hd @ 20".	Medium gravel (rounded) at 19"	
12							
13							
14							
15							
16							
17							
18							
19							
20							

RUST E&I Albany, NY (518) 458-1313				Test Boring Log		Boring No. SLP-4
PROJECT: Cumberland Bay Beach Coring						Sheet 2 of 2
CLIENT: New York State Department of Environmental Conservation - SSP						Job No. 39304.10006
Depth (Inch)	Sample Number	Blow Counts	Unified Classif- ication	Visual Log Description	Geologic Description	Remarks
21	S-3 (cont.)					
22						
23						
24			FILL		24"	
25			SP-SW		Wood chip seam. 24.5"	
26	S-4		FILL		Br cmf S. 25.5"	Wood chips are brown black fine chips
27					Bkbr med fine wood chips. 27"	
28			SP		Tngr mf S, t(-) \$, t org.	
29						
30					30"	
End at 30"						

RUST E&I Albany, NY (518) 458-1313			Test Boring Log			Boring No. SLP-5				
PROJECT: Cumberland Bay Beach Coring						Sheet 1 of 2				
CLIENT: New York State Department of Environmental Conservation - SSP						Job No. 39304.10006				
DRILLING CONTRACTOR: Rust/NYSDEC						Meas. Pt. Elev.: --				
PURPOSE: Beach Sampling and Investigation						Ground Elev.: --				
DRILLING METHOD: --				SAMPLE	CORE	CASING	Datum: --			
DRILL RIG TYPE: --		TYPE	--	Lexan	--	Date Started: 10/20/97				
GROUNDWATER DEPTH: --		DIAM.	--	2 1/2 inch	--	Date Finished: 10/20/97				
MEAS. PT.: --		WEIGHT	--			Driller: D. Foti				
DATE OF MEAS.: --		FALL	--			Inspector: B. Edwards				
Depth (Inch)	Sample Number	Blow Count	Unified Classification	GRAPHIC LOG	GEOLOGIC DESCRIPTION	REMARKS				
1	S-1		SP		Ltbr mf S.	Rec = 28"				
2										
3										
4										
5										
6	S-2				Grades to Gr-Dkgr mf S, t(-) \$, t org @ 9".	Organic ~ black very fine degraded material.				
7										
8										
9										
10										
11							Org seam @ 13" and 16".			
12										
13										
14										
15										
16	S-3								Grades to Dkgr f S, t(-) \$ and org.	Sand becomes finer at 18"
17										
18										
19										
20										

RUST E&I Albany, NY (518) 458-1313				Test Boring Log		Boring No. SLP-5
PROJECT: Cumberland Bay Beach Coring						Sheet 2 of 2
CLIENT: New York State Department of Environmental Conservation - SSP						Job No. 39304.10006
Depth (Inch)	Sample Number	Blow Counts	Unified Classif- ication	Visual Log Description	Geologic Description	Remarks
21	S-3 (cont.)		SP-FILL			
22					22.5"	
23					Interlayered Dkgr f S and Bkbr fine wood chips. 24"	
24	S-4		FILL		Bkbr fine wood chips. 25"	
25						
26			SP		Dkgr f S Wood chip seam @ 26.5". 27.5"	
27						
28			FILL		Wood chips. 28"	
End at 28"						

APPENDIX C

**Cumberland Bay State Park
Beach Debris Disposal Area
Core Logs**

PROJECT: CUMBERLAND BAY IRM				CONTRACTOR: SJB Services, Inc.			PAGE 1 OF 1	
PROJECT NO.: 5799-600				LOCATION: Cumberland Bay, Plattsburgh, NY			DATE: 10/15/96	
ELEVATION: feet				DATUM:			TAMS REP.: J. Kaczor	
WATER LEVELS				DRILLING AND SAMPLING				
Date	Time	Depth	Casing		Casing	Sampler	Core	Tube
				Type	Hollow Stem Auger	Split Spoon	---	---
				I.D.	2.5 inch	1-3/8 inch	---	---
				WT/Fall	140 lbs./30 inches	n/a	---	---
Depth Below Grade	Sample Number	Blows on Sampler	Recovery (Inches)	SAMPLE DESCRIPTION, REMARKS, AND STRATUM CHANGES				
--		6						
-- 1	S-1	6	13	Grey brown medium to fine SAND, little Silt, trace organics (leaves), moist.				
--		8						
-- 2		3						
--		1						
--		1		Same top 6"; Wood fragments next 1";				
-- 3	S-2	5	11	Dark brown fine SAND, little Silt, moist.				
--		4						
-- 4		2		(Imported Fill) 4.0'				
--		2						
-- 5	S-3	13	19	Dark brown organic PEAT, wood fragment in sampler, moist.				
--		46						
-- 6		6		Brown SILT, some fine Sand, twigs, moist; (Peat) 6.3'				
--		7		grades to				
-- 7	S-4	8	6	Tan fine SAND, trace Silt, moist.				
--		9						
-- 8				(Native Sand) 8.0'				
--				Boring terminated at 8 feet below grade.				
--				Boring backfilled with native cuttings.				
--								
--								

PROJECT: CUMBERLAND BAY IRM				CONTRACTOR: SJB Services, Inc.			PAGE 1 OF 1	
PROJECT NO.: 5799-600				LOCATION: Cumberland Bay, Plattsburgh, NY			DATE: 10/15/96	
ELEVATION: feet				DATUM:			TAMS REP.: J. Kaczor	
WATER LEVELS				DRILLING AND SAMPLING				
Date	Time	Depth	Casing		Casing	Sampler	Core	Tube
10/15	1400	6'	HSA	Type	Hollow Stem Auger	Split Spoon	---	---
				I.D.	2.5 inch	1-3/8 inch	---	---
				WT/Fall	140 lbs./30 inches	n/a	---	---
Depth Below Grade	Sample Number	Blows on Sampler	Recovery (Inches)	SAMPLE DESCRIPTION, REMARKS, AND STRATUM CHANGES				
--		6						
-- 1	S-1	10	4	Brown and grey fine SAND and SILT, trace fine rounded gravel and angular limestone fragments, wood fragments, moist.				
--		20						
-- 2		2		(Hit obstruction at 2', move boring one foot west; continue from 2' bg.)				
--		1						
-- 3	S-2	4	11	Brown medium to fine SAND, little Silt, occasional concrete and wood fragments, moist.				
--		3						
-- 4		2						
--		4		(Imported Fill) 4.0'				
--		2						
-- 5	S-3	3	13	Dark brown organic PEAT, occasional thin Silt lens, moist.				
--		4						
-- 6		4		Same top 3", saturated; grades to (Peat) 6.3'				
--		5						
-- 7	S-4	5	15	Tan to grey fine SAND, little Silt, wet.				
--		4						
-- 8				(Native Sand) 8.0'				
--				Boring terminated at 8 feet below grade.				
--				Boring backfilled with native cuttings.				
--								
--								
--								

PROJECT: CUMBERLAND BAY IRM				CONTRACTOR: SJB Services, Inc.			PAGE 1 OF 1	
PROJECT NO.: 5799-600				LOCATION: Cumberland Bay, Plattsburgh, NY			DATE: 10/15/96	
ELEVATION: feet				DATUM:			TAMS REP.: J. Kaczor	
WATER LEVELS				DRILLING AND SAMPLING				
Date	Time	Depth	Casing		Casing	Sampler	Core	Tube
10/15	1435	6'	HSA	Type	Hollow Stem Auger	Split Spoon	---	---
				I.D.	2.5 inch	1-3/8 inch	---	---
				WT/Fall	140 lbs./30 inches	n/a	---	---
Depth Below Grade	Sample Number	Blows on Sampler	Recovery (Inches)	SAMPLE DESCRIPTION, REMARKS, AND STRATUM CHANGES				
--		2						
-- 1	S-1	3	15	Brown medium to fine SAND, little Silt, trace Gravel, trace organics top 2", moist.				
--		4						
-- 2		4						
--		7						
-- 3	S-2	4	10	Brown and tan medium to fine SAND, occasional bands of wood fragments, wood fragment blocking sampler tip, moist.				
--		7						
-- 4		27						
--		WOH/12"						
-- 5	S-3A	--	8	Brown medium to fine SAND, little Silt, moist.				
--		1/12"						
-- 6		--		(Imported Fill) 6.0				
--		WOH		Top 6" - Brown organic PEAT, saturated. (Peat) 6.5				
-- 7	S-4A	3	13	Tan medium to fine SAND, little Silt, wet.				
--		3						
-- 8		4		(Native Sand) 8.0				
--				Boring terminated at 8 feet below grade.				
--				Boring backfilled with native cuttings.				
--				Note: No recovery was achieved for sample nos. S-3 and S-4 on initial attempt; sampler blows were 32/42/16/24 and 3/6/5/5, respectively . Moved boring location approx. 2' west and resampled as S-3A and S-4A, as shown above.				
--								

Boring No.: B-4

PROJECT: CUMBERLAND BAY IRM				CONTRACTOR: SJB Services, Inc.			PAGE 1 OF 1	
PROJECT NO.: 5799-600				LOCATION: Cumberland Bay, Plattsburgh, NY			DATE: 10/15/96	
ELEVATION: feet				DATUM:			TAMS REP.: J. Kaczor	
WATER LEVELS				DRILLING AND SAMPLING				
Date	Time	Depth	Casing	Type	Casing	Sampler	Core	Tube
10/15	1455	5.5'	HSA		Hollow Stem Auger	Split Spoon	---	---
				I.D.	2.5 inch	1-3/8 inch	---	---
				WT/Fall	140 lbs./30 inches	n/a	---	---
Depth Below Grade	Sample Number	Blows on Sampler	Recovery (Inches)	SAMPLE DESCRIPTION, REMARKS, AND STRATUM CHANGES				
--		5						
-- 1	S-1	4	15	Banded grey, brown, tan medium to fine SAND, little Silt, trace fine Gravel, occasional wood fragments, moist.				
--		3						
-- 2		4						
--		4		Same top 5";				
--				(Imported Fill) 2.5'				
-- 3	S-2	7	11	Brown organic PEAT, moist.				
--		5						
-- 4		4		(Peat) 4.0'				
--		1						
-- 5	S-3	1	12	Dark brown medium to fine SAND, little Silt, moist to wet.				
--		1						
-- 6		2						
--		3						
-- 7	S-4	4	12	Gey to brown medium to fine SAND, little Silt, wet; note 3" lens of organic Silt.				
--		4						
-- 8		5		(Native Sand) 8.0'				
--				Boring terminated at 8 feet below grade.				
--				Boring backfilled with native cuttings.				
--								
--								
--								

TAMS CONSULTANTS, Inc.

BORING LOG

Boring No.:

B-5

PROJECT: CUMBERLAND BAY IRM				CONTRACTOR: SJB Services, Inc.			PAGE 1 OF 1	
PROJECT NO.: 5799-600				LOCATION: Cumberland Bay, Plattsburgh, NY			DATE: 10/15/96	
ELEVATION: feet				DATUM:			TAMS REP.: J. Kaczor	
WATER LEVELS				DRILLING AND SAMPLING				
Date	Time	Depth	Casing		Casing	Sampler	Core	Tube
10/15	1530	4.2'	HSA	Type	Hollow Stem Auger	Split Spoon	---	---
				I.D.	2.5 inch	1-3/8 inch	---	---
				WT/Fall	140 lbs./30 inches	n/a	---	---
Depth Below Grade	Sample Number	Blows on Sampler	Recovery (Inches)	SAMPLE DESCRIPTION, REMARKS, AND STRATUM CHANGES				
--		4		0 to 3" - Tan SILT, trace fine Sand, stiff, dry;				
-- 1	S-1	5	20	3 to 17" - Grey to black medium to fine SAND, little Silt, two thin wood fragment lenses bottom 6", moist.				
--		7						
-- 2		4						
--		3						
-- 3	S-2	2	NR					
--		2						
-- 4		1		0 to 2" - Brown to dark grey medium to fine SAND, some Silt, moist;				
--		4		(Imported Fill) 4.2'				
--				2 to 6" - Brown organic PEAT, wet. (Peat) 4.5'				
-- 5	S-3	8	9	Brown medium to fine SAND, some Silt, wet.				
--		7						
--		6						
-- 6		5		Brown medium to fine SAND, little Silt, wet.				
--		5						
-- 7	S-4	5	19					
--		7						
--		7						
-- 8				(Native Sand) 8.0'				
--				Boring terminated at 8 feet below grade.				
--				Boring backfilled with native cuttings.				
--								
--								
--								

PROJECT: CUMBERLAND BAY IRM				CONTRACTOR: SJB Services, Inc.			PAGE 1 OF 1	
PROJECT NO.: 5799-600				LOCATION: Cumberland Bay, Plattsburgh, NY			DATE: 10/15/96	
ELEVATION: feet				DATUM:			TAMS REP.: J. Kaczor	
WATER LEVELS				DRILLING AND SAMPLING				
Date	Time	Depth	Casing		Casing	Sampler	Core	Tube
10/15	1605	4.8'	HSA	Type	Hollow Stem Auger	Split Spoon	---	---
				I.D.	2.5 inch	1-3/8 inch	---	---
				WT/Fall	140 lbs./30 inches	n/a	---	---
Depth Below Grade	Sample Number	Blows on Sampler	Recovery (Inches)	SAMPLE DESCRIPTION, REMARKS, AND STRATUM CHANGES				
--		4		0 to 9" - Dark brown SILT, some medium to fine Sand, dry;				
-- 1	S-1	4	14	9 to 11" - Wood and organic material, moist;				
--		4		11 to 14" - White to yellow fine SAND, little Silt, moist.				
-- 2		5						
--		12		Brown SILT and Wood fragments, little Sand, large wood fragment blocking sampler tip, moist.				
-- 3	S-2	6	4					
--		6						
-- 4		2		(Imported Fill) 4.1'				
--		2		(Native Material)				
--		3		0 to 3" - White to tan fine SAND, little Silt, moist;				
-- 5	S-3	3	13	grades to				
--		3		10 to 13" - Red brown fine SAND, some Silt, wet.				
-- 6		6						
--		12						
-- 7	S-4	9	20	Red brown fine SAND, some Silt, wet; grades to Light brown fine SAND, little Silt.				
--		9						
-- 8		12						
--				Boring terminated at 8 feet below grade.				
--				Boring backfilled with native cuttings.				
--								
--								
--								

PROJECT: CUMBERLAND BAY IRM				CONTRACTOR: SJB Services, Inc.			PAGE 1 OF 1	
PROJECT NO.: 5799-600				LOCATION: Cumberland Bay, Plattsburgh, NY			DATE: 10/16/96	
ELEVATION: feet				DATUM:			TAMS REP.: J. Kaczor	
WATER LEVELS				DRILLING AND SAMPLING				
Date	Time	Depth	Casing		Casing	Sampler	Core	Tube
				Type	Hollow Stem Auger	Split Spoon	---	---
				I.D.	2.5 inch	1-3/8 inch	---	---
				WT/Fall	140 lbs./30 inches	n/a	---	---
Depth Below Grade	Sample Number	Blows on Sampler	Recovery (Inches)	SAMPLE DESCRIPTION, REMARKS, AND STRATUM CHANGES				
--		1		0 to 6" - Dark brown fine Sandy SILT, moist;				
-- 1	S-1	3	15	6 to 12" - Brown organic PEAT, moist;				
--		4		12 to 15" - Tan to white medium to fine SAND, little Silt, moist.				
-- 2		3						
--		3		Tan to white medium to fine SAND, little Silt, moist; and alternating bands of Brown organic PEAT, moist; average thickness of bands 3".				
-- 3	S-2	3	16					
--		4						
-- 4		4						
--		2		0 to 2" - Tan to white medium SAND, little Silt, moist;				
-- 5	S-3	2	16	2 to 16" - Brown organic PEAT, moist.				
--		1						
-- 6		2						
--		3		0 to 7" - Brown organic PEAT, moist.				
-- 7	S-4	5	22	7 to 10" - White to grey medium to fine SAND, trace Silt, moist. (PEAT) 6.8'				
--		8		10 to 22" - Red brown medium to fine SAND, little SILT, moist.				
-- 8		8		(Native Sand) 8.0'				
--				Boring terminated at 8 feet below grade.				
--				Boring backfilled with native cuttings.				
--								
--								
--								

PROJECT: CUMBERLAND BAY IRM				CONTRACTOR: SJB Services, Inc.			PAGE 1 OF 1	
PROJECT NO.: 5799-600				LOCATION: Cumberland Bay, Plattsburgh, NY			DATE: 10/16/96	
ELEVATION: feet				DATUM:			TAMS REP.: J. Kaczor	
WATER LEVELS				DRILLING AND SAMPLING				
Date	Time	Depth	Casing		Casing	Sampler	Core	Tube
10/16	0835	7.3'	HSA	Type	Hollow Stem Auger	Split Spoon	---	---
				I.D.	2.5 inch	1-3/8 inch	---	---
				WT/Fall	140 lbs./30 inches	n/a	---	---
Depth Below Grade	Sample Number	Blows on Sampler	Recovery (Inches)	SAMPLE DESCRIPTION, REMARKS, AND STRATUM CHANGES				
--	S-1	7	16	Brown fine Sandy SILT, concrete fragments, coarse gravel fragments, occasional silty organic layer, moist.				
-- 1		7						
--		8						
-- 2	S-2	27	12	(Move approx 2' east off rubble area.)				
--		5		Brown and tan fine SAND, some Silt, occasional lens of wood fragments and wood chips, moist.				
-- 3		3						
--	3							
-- 4	S-3	3	13	0 to 7" - Same as S-2; 7 to 8" - Black organic CLAY, moist; 8 to 11" - Grey medium to fine SAND, little Silt, moist.				
--		2						
-- 5		1						
--	S-4	1	22	0 to 9" - Grey medium to fine SAND, little Silt, some wood chips, moist; (Imported Fill) 6.8'				
-- 6		4						
--		10						
-- 7		9		9 to 15" - Red brown medium to fine SAND, little Silt, moist; 15 to 22" - Light brown medium to fine SAND, little Silt, wet. (Native Sand) 8.0'				
--		8						
-- 8		7						
--				Boring terminated at 8 feet below grade.				
--				Boring backfilled with native cuttings.				
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PROJECT: CUMBERLAND BAY IRM				CONTRACTOR: SJB Services, Inc.			PAGE 1 OF 1	
PROJECT NO.: 5799-600				LOCATION: Cumberland Bay, Plattsburgh, NY			DATE: 10/16/96	
ELEVATION: feet				DATUM:			TAMS REP.: J. Kaczor	
WATER LEVELS				DRILLING AND SAMPLING				
Date	Time	Depth	Casing		Casing	Sampler	Core	Tube
10/16	0900	6.0'	HSA	Type	Hollow Stem Auger	Split Spoon	---	---
				I.D.	2.5 inch	1-3/8 inch	---	---
				WT/Fall	140 lbs./30 inches	n/a	---	---
Depth Below Grade	Sample Number	Blows on Sampler	Recovery (Inches)	SAMPLE DESCRIPTION, REMARKS, AND STRATUM CHANGES				
--		2		0 to 2" - Light brown Sandy SILT, roots, grass, dry;				
-- 1	S-1	2	15	2 to 13" - Tan medium to fine SAND, little Silt, occasional organic lens, moist.				
--		2						
-- 2		2						
--		3		0 to 4" - Tan medium to fine SAND, little Silt, moist;				
-- 3	S-2	4	13	4 to 9" - Black cinders and ash, brick fragments, charred wood fragments, moist.				
--		3						
-- 4		3						
--		2		0 to 2" - Black cinders and ash, moist;				
--		1		2 to 11" - Banded light brown medium to fine SAND and wood chips, moist;				
-- 5	S-3	4	21	(Imported Fill) 5.0'				
--		6		11 to 14" - Brown Silty PEAT, moist; (Peat) 5.3'				
--		6		14 to 18" - White to tan medium to fine SAND, little Silt, moist;				
-- 6		6		18 to 21" - Red brown medium to fine SAND, little Silt, moist.				
--		6		0 to 4" - Dark brown organic fine Sandy SILT, wet;				
-- 7	S-4	6	22	4 to 6" - White to tan medium to fine SAND, little Silt, wet;				
--		4		6 to 22" - Red brown medium to fine SAND, little Silt, wet.				
--		4						
-- 8				(Native Sand) 8.0'				
--				Boring terminated at 8 feet below grade.				
--				Boring backfilled with native cuttings.				
--								
--								
--								

PROJECT: CUMBERLAND BAY IRM				CONTRACTOR: SJB Services, Inc.			PAGE 1 OF 1	
PROJECT NO.: 5799-600				LOCATION: Cumberland Bay, Plattsburgh, NY			DATE: 10/16/96	
ELEVATION: feet				DATUM:			TAMS REP.: J. Kaczor	
WATER LEVELS				DRILLING AND SAMPLING				
Date	Time	Depth	Casing		Casing	Sampler	Core	Tube
10/16	0940	6.0'	HSA	Type	Hollow Stem Auger	Split Spoon	---	---
				I.D.	2.5 inch	1-3/8 inch	---	---
				WT/Fall	140 lbs./30 inches	n/a	---	---
Depth Below Grade	Sample Number	Blows on Sampler	Recovery (Inches)	SAMPLE DESCRIPTION, REMARKS, AND STRATUM CHANGES				
--		2		0 to 6" - Dark brown fine Sandy SILT, moist;				
-- 1	S-1	3	18	6 to 18" - Tan medium to fine SAND, trace Silt, occasional organics and fine Gravel, 1" wood lens at bottom, moist.				
--		3						
-- 2		5						
--		3						
-- 3	S-2	1	5	Grey medium to fine SAND and Wood fragments, little Silt, moist.				
--		2						
-- 4		1						
--		1		0 to 2" - Same; (Imported Fill) 4.2'				
-- 5	S-3	1	9	2 to 5" - Brown organic PEAT, moist;				
--		2		5 to 9" - White to tan medium to fine SAND, moist.				
-- 6		5						
--		4		0 to 8" - Dark brown organic Sandy SILT, wet;				
-- 7	S-4	5	22	(Peat) 6.7'				
--		3		8 to 14" - Brown to red brown medium to fine SAND, little Silt, wet.				
-- 8		6		(Native Sand) 8.0'				
--				Boring terminated at 8 feet below grade.				
--				Boring backfilled with native cuttings.				
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APPENDIX D

**Beach Core Log (SL-7B)
June 1998 Investigation**

RUST E&I Albany, NY (518) 458-1313		Test Boring Log			Boring No. SL-7B
PROJECT: Cumberland Bay					Sheet 1 of 1
CLIENT: New York State Department of Environmental Conservation					Job No.
DRILLING CONTRACTOR: Rust Environment & Infrastructure					Meas. Pt. Elev.:
PURPOSE: Beach Investigation					Ground Elev.:
DRILLING METHOD: Hand Driven		SAMPLE	CORE	CASING	Datum:
DRILL RIG TYPE:	TYPE				Date Started: 6/4/98
GROUNDWATER DEPTH:	DIAM.				Date Finished: 6/4/98
MEAS. PT.:	WEIGHT				Driller: Foti
DATE OF MEAS.:	FALL				Inspector: Edwards

Depth (Feet)	Sample Number	Blow Count	Casing Blow	Recovery	GEOLOGIC DESCRIPTION	REMARKS
0.25	S-1				Grbr mf S, t(-) \$; wet, firm. ----- 0.25'	Odors ↓
					Dkbr mf(+) S, l(-) \$, t(+) cm G, l(-) organic matter; wet; firm. ----- 0.4'	
0.5					Grbr mf S, t(-) \$; wet, firm. ----- 0.55'	
0.75	S-2				Dkbr c(-)mf wood chips, t(+) mf S, l(-) \$; wet; loose. Seams of ltbr mf S @ 0.85', 0.9' and 1.0'.	
1.0					----- 1.1'	
1.25					Gr mf S, t \$, l(-) organic matter; wet. ----- 1.3'	
1.5	S-3				Br cmf wood chips, s(-) fibrous sludge, t f S, l(-) \$; wet; loose. ----- 1.5'	
1.75					Grbr mf S, t(-) \$, t(+) organic matter; moist; med firm. ----- 1.9'	
2					Bottom of Core @ 1.9'	
					Note 1-2" core tube loss at bottom/removal.	
					PCB samples collected at intervals: 0-6", 6-12", 12-23"	