Protecting Our Water Environment

Metropolitan Water Reclamation District of Greater Chicago

RESEARCH AND DEVELOPMENT DEPARTMENT

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AMBIENT WATER QUALITY MONITORING IN THE CHICAGO AREA WATERWAY SYSTEM: A SUMMARY OF BIOLOGICAL, HABITAT, AND SEDIMENT QUALITY DATA BETWEEN 2001 AND 2004

January 2008

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AMBIENT WATER QUALITY MONITORING IN THE CHICAGO AREA WATERWAY SYSTEM:

A SUMMARY OF BIOLOGICAL, HABITAT, AND SEDIMENT QUALITY DATA BETWEEN 2001 AND 2004

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DISCLAIMER

Mention of proprietary equipment and chemicals in this report does not constitute endorsement by the Metropolitan Water Reclamation District of Greater Chicago.

SUMMARY AND CONCLUSION

The biological portion of the Ambient Water Quality Monitoring (AWQM) Program operates on a 4-year cycle, with a primary focus each year on a different portion of the Chicago Area Waterway System (CAWS). Biological assessments were performed at each of the 59 stations within the 4-year cycle of 2001–2004. Physical habitat and sediment characterizations were added to the protocol in 2002. Fifteen of the 59 stations were monitored annually based on their proximity to Metropolitan Water Reclamation District of Greater Chicago (District) facilities and other considerations. Chlorophyll *a* was measured monthly at each of the 59 AWQM stations. The following summarizes findings for biological, physical habitat, and sediment parameters measured during 2001–2004.

Chlorophyll

Chlorophyll *a* concentrations decreased directly downstream of water treatment plants due to dilution of the waterway with effluent. In the Chicago River System, chlorophyll *a* means ranged from 1 µg/L at Touhy Avenue on the North Shore Channel to 25 µg/L at Dundee Road on the West Fork North Branch Chicago River. The highest recorded chlorophyll *a* concentration during 2001–2004 was 118 µg/L, also at Dundee Road.

Mean chlorophyll *a* values in the Calumet River System ranged from 2 µg/L (Ewing Avenue, Calumet River) to 40 µg/L (Burnham Avenue, Grand Calumet River). The maximum concentration measured 313 µg/L at Burnham Avenue.

The range of chlorophyll *a* concentrations in the Des Plaines River System was 3 µg/L (Wille Road, Higgins Creek) to 46 µg/L (Material Service Road, Des Plaines River). The maximum concentration measured in this system was 299 µg/L at Stephen Street in the Des Plaines River.

Habitat

During the biological collection events, staff biologists assessed physical habitat at the beginning and end of each sampling reach and calculated a Qualitative Habitat Evaluation Index (QHEI) score using this information. The QHEI was developed for wadeable streams and may not be appropriate for deep-draft channels in CAWS. However, no physical habitat index is currently available for such waterways. Physical habitat assessments were not performed during the first year of the 4-year biological collection cycle. Therefore, habitat data in the northern region of the Chicago River System is limited to the annually sampled stations.

The habitat ratings assigned to stations assessed in the Chicago River System during 2002–2004 ranged from very poor to poor (27–42). Negative habitat features in this system included channelization, limited flow, limited instream cover, and excess silt in sediments.

In the Calumet River System, QHEI ratings ranged from poor to fair (32–55). The limiting factors in this system appeared to be lack of instream cover, silty substrates, and channelization.

Habitat ratings ranged from very poor to good (23–64) in the Des Plaines System. Some stations in the Des Plaines River and Salt Creek had instream habitat for fish, as well as adequate canopy cover, and comparably better channel morphology and land use than found in other systems. However, stations in Higgins Creek and the Calumet-Sag Channel were limited by channelization, silt-dominated sediments, and lack of canopy or in stream cover.

Fish

Fish were collected from deep-draft waterways using boat electrofishing methods and from wadeable waterways employing a backpack electrofisher and a bag seine. Sampling length was generally 400 meters or 40 meters on each bank for deep and wadeable waterways, respectively. Fish were generally identified, weighed, measured, and checked for abnormalities in the field before being released.

A total of 56 fish species and 4 hybrids were collected from CAWS between 2001–2004. Index of Biotic Integrity (IBI) scores indicated a "fair" rating at most of the 59 stations, although a few were considered "poor." Carp and gizzard shad were among the most frequently collected species of fish in the Chicago and Calumet River Systems, while various sunfish were most abundant in the Des Plaines River System.

Benthic Invertebrates

Benthic invertebrate samples were collected using petite ponar grab and Hester Dendy larval plate samplers. The samples yielded 193 total benthic invertebrate taxa (73 identified to species level) during 2001–2004. Comprehensive benthic invertebrate data have been published in two other Research and Development (R&D) Reports available on the District Website (www.mwrd.org) under the "Biological Reports" heading. They are entitled, R&D Report No. 04-4, "A Study of the Benthic Macroinvertebrate Community in Selected Chicago Metropolitan Area Waterways During 2001 and 2002," and Report No. 07-47, "A Study of the Benthic Macroinvertebrate Community in Selected Chicago Metropolitan Area Waterways During 2003 and 2004."

Sediment Chemistry

During 2002–2004, sediment samples were collected from the side and center of the waterway at 40 stations (sediment chemistry was not analyzed in 2001). Sediment samples were analyzed for 8 general chemistry constituents, 11 trace metals, and a total of 111 total organic priority pollutants. In addition, a contracted lab performed acid volatile sulfide/simultaneously extracted metals (AVS/SEM), total organic carbon (TOC), and particle size determination.

Sediment Toxicity

Ten-day toxicity tests were performed on Chironumus tentans in sediment samples collected from 40 stations during 2002–2004. Forty-eight percent of stations contained sediment that was not suitable for Chironumus tentans survival. Forty-eight percent of stations also contained sediment unsuitable for Chironumus tentans growth.

INTRODUCTION

The District began monitoring for the AWQM Program at 59 sampling stations on 21 waterways in 2001. While water samples were collected monthly to assess water quality, this report focus is on the biological, habitat, and sediment quality at these sampling stations from 2001–2004.

The biological monitoring portion of the AWQM Program operates on a 4-year cycle, with a primary focus each year on a different portion of the CAWS. Table 1 displays the field monitoring schedule for biological, physical habitat, and sediment quality assessments throughout the 4-year cycle. Fifteen of the 59 stations are monitored annually, based on their proximity to District water reclamation plants (WRPs) or municipal boundaries.

Characterization of physical habitat, fish, and benthic invertebrate populations, along with sediment toxicity and chemistry, are among the most crucial components for a comprehensive evaluation of a waterway. Each parameter represents a piece of the overall picture that is necessary to identify problem areas, make regulatory decisions, and determine plausible attainable uses for a waterway.

In addition to analyzing the AWQM Program data in order to assess and manage the impact of the District's WRPs, our data is often shared with other government agencies, non-governmental organizations, and academic institutions. For instance, the AWQM Program data is shared with the Illinois Environmental Protection Agency (IEPA) to support their efforts to make regulatory decisions, prepare the 305(b) reports in accordance with the Clean Water Act, and perform Use Attainability Analyses (UAA).

TABLE 1: AMBIENT WATER QUALITY PROGRAM SAMPLING STATIONS AND BIOLOGICAL SAMPLING YEAR

Station No.	Sampling Station	Waterway	Year Sampled
106	Dundee Road	West Fork North Branch	2001
103	Golf Road	West Fork North Branch	2001
31	Lake-Cook Road	Middle Fork North Branch	2001
32	Lake-Cook Road	Skokie River	2001
105	Frontage Road	Skokie River	2001
104	Glenview Road	North Branch Chicago River	2001
34	Dempster Street	North Branch Chicago River	2001
96	Albany Avenue	North Branch Chicago River	Annually
35	Central Street	North Shore Channel	2001
102	Oakton Street	North Shore Channel	2001
36	Touhy Avenue	North Shore Channel	Annually
101	Foster Avenue	North Shore Channel	2001
37	Wilson Avenue	North Branch Chicago River	2001
73	Diversey Parkway	North Branch Chicago River	2001
46	Grand Avenue	North Branch Chicago River	Annually
74	Lake Shore Drive	Chicago River	2002
100	Wells Street	Chicago River	2002
39	Madison Street	South Branch Chicago River	2002
108	Loomis Street	South Branch Chicago River	2002
99	Archer Avenue	South Fork South Branch	2002
40	Damen Avenue	Chicago Sanitary and Ship Canal	2002
75	Cicero Avenue	Chicago Sanitary and Ship Canal	Annually
41	Harlem Avenue	Chicago Sanitary and Ship Canal	Annually
42	Route 83	Chicago Sanitary and Ship Canal	2002
48	Stephen Street	Chicago Sanitary and Ship Canal	2002
92	Lockport	Chicago Sanitary and Ship Canal	Annually
49	Ewing Avenue	Calumet River	2003
55	130^{th} Street	Calumet River	Annually
50	Burnham Avenue	Wolf Lake	2003
86	Burnham Avenue	Grand Calumet River	2003
56	Indiana Avenue	Little Calumet River	2003
76	Halsted Street	Little Calumet River	Annually
52	Wentworth Avenue	Little Calumet River	2003
54	Joe Orr Road	Thorn Creek	2003
97	170^{th} Street	Thorn Creek	2003

TABLE 1 (Continued): AMBIENT WATER QUALITY PROGRAM SAMPLING STATIONS AND BIOLOGICAL SAMPLING YEAR

Station No.	Sampling Station	Waterway	Year Sampled
57	Ashland Avenue	Little Calumet River	2003
58	Ashland Avenue	Calumet-Sag Channel	2003
59	Cicero Avenue	Calumet-Sag Channel	Annually
43	Route 83	Calumet-Sag Channel	2003
90	Route 19	Poplar Creek	2004
110	Springinsguth Road	West Branch DuPage River	2004
89	Walnut Lane	West Branch DuPage River	2004
64	Lake Avenue	West Branch DuPage River	Annually
79	Higgins Road	Salt Creek	2004
80	Arlington Heights Rd.	Salt Creek	2004
18	Devon Avenue	Salt Creek	Annually
24	Wolf Road	Salt Creek	2004
109	Brookfield Avenue	Salt Creek	2004
77	Elmhurst Road	Higgins Creek	2004
78	Wille Road	Higgins Creek	Annually
12	Lake-Cook Road	Buffalo Creek	2004
13	Lake-Cook Road	Des Plaines River	Annually
17	Oakton Street	Des Plaines River	2004
19	Belmont Avenue	Des Plaines River	2004
20	Roosevelt Road	Des Plaines River	2004
22	Ogden Avenue	Des Plaines River	Annually
23	Willow Springs Rd.	Des Plaines River	2004
29	Stephen Street	Des Plaines River	2004
91	Material Service Rd.	Des Plaines River	Annually

DESCRIPTION OF THE STUDY AREA

Chicago Area Waterway System

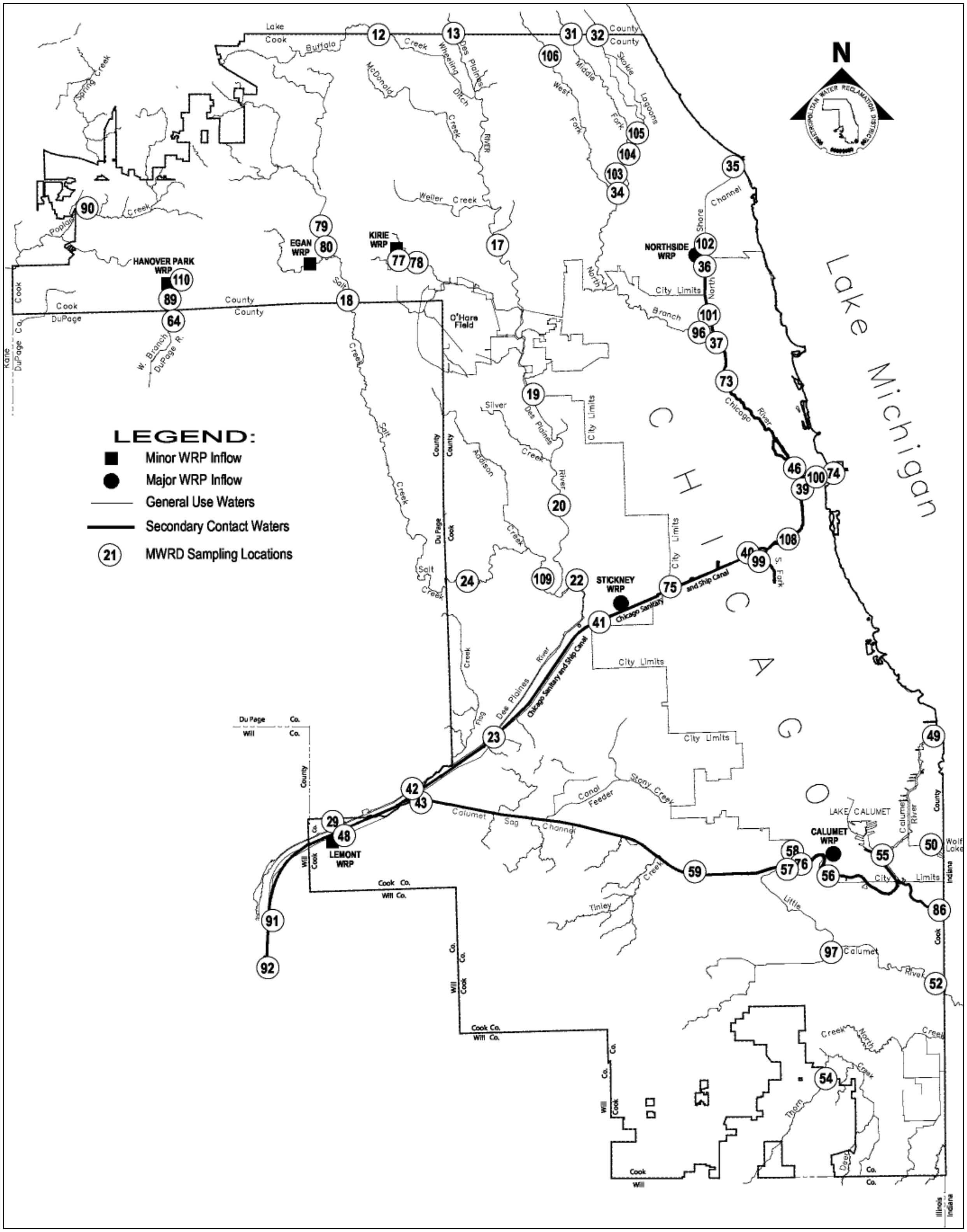
The CAWS consists of man-made canals, as well as natural streams, which have been altered to varying degrees. Some natural waterways have been deepened, straightened, and/or widened to such an extent that reversion to their natural state would be impossible. The waterways serve the Chicago area by draining urban storm water runoff and treated municipal wastewater effluent and allowing commercial navigation in the deep-draft portions.

The primary man-made waterways are the North Shore Channel, connecting Lake Michigan at Wilmette to the North Branch of the Chicago River; the Chicago Sanitary and Ship Canal (CSSC), extending from Damen Avenue to the Lockport Powerhouse; and the Calumet-Sag Channel, connecting the Little Calumet River with the CSSC. The primary natural waterways include the Chicago River System, branches flowing south from Lake County into the North Branch of the Chicago River; the Des Plaines River System, flowing south from Lake County and joining with the discharge from the CSSC downstream of the Lockport Powerhouse; and the Calumet River System, flowing south and west into the Calumet-Sag Channel.

Sampling Stations

The sampling stations for the AWQM Program are located on natural and man-made waterways throughout the District's service area. A map of the CAWS including the 59 sampling stations and the District's WRPs is shown in Figure 1. Stations were primarily selected such that there was at least one monitoring station on the lower end of an IEPA 303(d) impaired waterway segment. Secondary criteria for selecting sampling locations included: (1) above and below major point sources of pollution, (2) below Lake Michigan diversion points, (3) above junction of two major waterways, (4) below county municipal boundaries, and (5) in areas of environmental concern.

FIGURE 1: AMBIENT WATER QUALITY MONITORING PROGRAM
SAMPLING STATIONS



MATERIALS AND METHODS

Chlorophyll

Sample Collection. Surface water grab samples for chlorophyll analysis were collected using a stainless steel bucket. The bucket was lowered into the waterway generally from the upstream side of the bridge at the most central location. The bucket was submerged, filled, and then raised to the top of the bridge. An aliquot was poured into an amber, plastic, one-liter bottle that was pre-preserved with 1-mg magnesium carbonate, leaving 1/2-inch airspace at the top. Samples were then placed in a cooler with ice and returned to lab for processing.

Laboratory Analysis. *Filtration.* Prior to filtering samples, water was mixed by rapidly inverting sample bottles 25 times before the first pour. Samples were filtered through Whatman type GF/F glass-fiber filters (0.7 micrometers) using Millipore filtration equipment and vacuum pressure. The water samples were filtered until the rate of flow decreased, but before it became clogged. Following filtration, sample filters were folded and wrapped with aluminum foil and extracted the following day.

Extraction. Filters were placed in glass extraction tubes with 5 mL of 90 percent aqueous acetone solution. Using a motorized tissue grinder set at 500 rpm and a pestle, the top layer of the filter was separated. Samples were then transferred to centrifuge tubes and additional acetone was added until the total volume equaled 10 mL. These tubes were inverted 5 times and then placed at 4°C for approximately 24 hours to steep.

Spectrophotometric Analysis. After removing samples from refrigeration, they were centrifuged for 20 minutes at 2,500 rpm. Three ml of the supernatant was transferred into a spectrophotometric cell and the absorbance read at 750, 664, 647, and 630 nm. To correct for the degradation product, pheophyton, 0.1 mL of 1 percent hydrochloric acid was added and after one minute, absorbance was read again at 750 and 665 nm. The spectrophotometer was programmed to calculate corrected chlorophyll *a, b*, and *c* values based on the volumes filtered and used to extract samples.

Quality Control. A reagent blank of 90 percent acetone was placed in the spectrophotometer every tenth sample and read between -0.1 and 0.1 µg/L. A method blank of distilled water was prepared for each group of samples and run through the entire laboratory procedure. One duplicate sample was chosen randomly for each group of samples and would have to be within 20 relative percent difference of the original sample. Chlorophyll *a* and *b* standards from spinach were also analyzed every 20 samples and displayed at least a 90 percent recovery.

Habitat

Data Collection. Physical habitat assessment data sheets (Figure 2) were completed by a staff biologist in the field at each station starting in 2002. Habitat evaluation had not yet been implemented in the AWQM Program during 2001 when the focus of sampling was in the North Shore Channel and the North Branch Chicago River. Assessments made in the field included weather conditions, channel morphology, bank erosion, shore cover, aquatic vegetation, man-made structures, floatable materials, riparian land use, sediment composition, sediment color and odor, depth of fines, and presence of oil in sediment. Channel width was determined using a Yardage Pro 800 rangefinder in the non-wadable waterways. A fiberglass telescoping leveling rod was used to measure water depth and depth of fines (in sediment). The smallest extension of the round leveling rod (1-inch diameter) was pushed into the sediment with reasonable force as far as possible to determine depth of fines in feet. A 6- X 6-inch petite Ponar grab sampler was used to collect sediment for analysis. Staff biologists estimated the percent composition of plant debris, clay, inorganic silt, organic sludge, sand (0.06-2 mm diameter), gravel (<2-64 mm diameter), cobble (>64-256 mm diameter), boulder (>256 mm diameter), or bedrock/concrete in the sediment. Sediment color and odor was recorded, as well as the appearance of oil in the sample.

Assessment Locations. Physical habitat was evaluated at the beginning and end of the fishing range in the center and on one side of the waterway at each station. The range was 40 meters for wadable sites, 100 meters for sites in which the small boat electrofisher was employed, and 400 meters for deep-draft waterways.

Calculating Qualitative Habitat Evaluation Index. The QHEI was created by the Ohio Environmental Protection Agency (OEPA) to determine the suitability of a stretch of waterway to fish and macroinvertebrates based on physical habitat characteristics (Rankin, 1989). The index was developed to assess wadeable streams, not deep-draft channels such as CAWS. However, no appropriate index was available for these waterways. Habitat scores were calculated for each of the stations visited between 2002 and 2004 using the OEPA QHEI procedures. Stations were then classified as excellent, good, fair, poor, or very poor based on their ability to support aquatic life in reference to habitat (CDM, 2004). The classification ranges were as follows:

<=75	Excellent
60-74	Good
46-59	Fair
30-45	Poor
<30	Very Poor

FIGURE 2: METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO PHYSICAL HABITAT ASSESSMENT FIELD DATA SHEET

Date ________ **Time** ________ **Station Number** ________

Station Name ________ **Latitude** ________

Waterbody ________ **Longitude** ________

Assessment Observer (s) ________

Weather Conditions SUNNY CLOUDY RAIN (circle one)

Stream Order ________ **Assessment Location** BEGINNING END (circle one)

Assessment Location Facing Upstream LEFT CENTER RIGHT (circle one)

Channel Habitat POOL RUN RIFFLE (circle one)

Water Depth (ft) ________ **Channel Width** (ft) ________

Water Level LOW NORMAL HIGH FLOODED (circle one)

Man-made Structures DAM RIPRAP BRIDGE LEVEE ISLAND
OUTFALL SHEET PILING OTHER ________ (Specify) (circle all applicable)

Channelization YES NO (circle one)

Bank Erosion NONE SLIGHT MODERATE SEVERE (circle one)

Floatable Materials YES NO (circle one)
If YES, characterize (circle all applicable)
STREET LITTER SANITARY SEWAGE VEGETATIVE MATERIAL

Aquatic Vegetation YES NO (circle one)
If YES, is vegetation (circle all applicable)
ROOTED EMERGENT ROOTED SUBMERGENT ROOTED FLOATING
ATTACHED ALGAE FLOATING ALGAE OTHER ________ (Specify)

Instream Cover for Fish (circle all applicable)
AQUATIC VEGETATION BOULDERS BRUSH-DEBRIS JAMS LOGS
SUBMERGED TREE ROOTS SUBMERGED TERRESTRIAL VEGETATION
UNDER CUT BANK ROCK LEDGE OTHER ________ (Specify)

Canopy Cover OPEN PARTLY SHADED SHADED (circle one)

Immediate Shore Cover		**Riparian Land Use**	
DENUDED	____ %	GRASSLAND	____ %
GRASSES	____ %	URBAN RESIDENTIAL	____ %
SHRUBS	____ %	URBAN COMMERCIAL/INDUSTRIAL	____ %
TREES	____ %	WETLAND	____ %
OTHER (Specify)		FOREST	____ %
________	____ %	ROW CROPS	____ %
		OTHER ________ (Specify)	____ %

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FIGURE 2 (Continued): METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO PHYSICAL HABITAT ASSESSMENT FIELD DATA SHEET

Station Number ____________

Sediment Compostion

Plant Debris	________	%
Clay	________	%
Inorganic Silt	________	%
Organic Sludge	________	%
Sand (0.06 mm to 2 mm diameter)	________	%
Gravel (>2 mm to 64 mm diameter)	________	%
Cobble (>64 mm to 256 mm diameter)	________	%
Boulder (>256 mm diameter)	________	%
Bedrock or Concrete	________	%

Sediment Color ________________________ **Sediment Odor** ____________________

Oil in Sediment NONE LIGHT MODERATE HEAVY (circle one)

Embeddedness NONE NORMAL MODERATE EXTENSIVE (circle one)

Sinuosity NONE LOW MODERATE HIGH (circle one)

Depth of Fines (In feet using 1 inch diameter probe) ____________________

Photo Numbers Looking Upstream ______________ Looking Downstream ____________

Site Location/Map (Draw a map of the site and indicate the area assessed)

Additional Remarks ____

____

____

____

____

____

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Fish

Boatable Stream Sampling. Fish were collected at each sample station with a boat mounted electrofisher. The electrofisher was powered by a direct current (DC) generator. Stunned fish were picked out of the water with long handled dip nets by either of two netters who were positioned on the bow of the boat. In most cases, the section of canal sampled extended for 400 meters. Whenever possible, both sides of this canal section were electrofished.

Wadeable Stream Sampling. Fish were collected at each sample station using a backpack electrofisher and a bag seine. A DC backpack electrofisher was employed to electrify the water with 0.7 to 1.0 amps of current, stunning the fish. In most instances, two 40-meter long backpack electrofisher collections were conducted at each station. A 40-meter reach of the creek was electrified by moving upstream parallel to the bank. Additional personnel followed the electrofisher collecting the stunned fish with dip nets. Following the first collection, a second 40-meter electrofishing survey was conducted on the opposite bank. If the creek was less than five meters wide, electrofishing occurred only once along a 40-meter reach. The total electrofishing time during each 40-meter collection was noted.

A 15-foot bag seine with 3/16-inch mesh was also used to collect fish. Staff pulled the seine for 40 meters traveling upstream parallel to the bank. In most instances, a separate 40-meter seine collection occurred along each bank.

The total area monitored varied with the width of the creek. For example, a location 20 meters wide sampled with two 40-meter electrofisher collections and two 40-meter seine collections would equate to a monitoring area of 800 square meters. Conductivity and temperature (°C) were recorded before each sample collection.

Fish Processing. In the field, most fish were identified to species, weighed to the nearest gram or nearest 0.1 gram (depending on size), measured for standard and total length to the nearest millimeter, and examined for the incidence of disease, parasites, or other anomalies. Following processing, these fish were returned live to the river. Minnows and other small fish that were difficult to identify were preserved in 10 percent (v/v) formalin and returned to the laboratory for further analysis. These small fish were processed in a similar manner to the field-measured fish, except that they were weighed to the nearest 0.01 gram.

Index of Biotic Integrity. Biological integrity of aquatic ecosystems has been defined as the ability to support and maintain a balanced, integrated, and adaptive community having a species composition, diversity, and a functional organization comparable to that of a natural habitat (Karr et al., 1986). Karr's 1986 IBI was used to analyze fish data from 2001–2004. The limitations of using this tool, which was meant to apply to wadable streams, for some of the man-made, channelized waterways in CAWS should be recognized. Karr's IBI integrates information from 12 fish community metrics that fall into three major categories: (1) species richness and composition, (2) trophic composition, and (3) fish abundance and condition. Each metric is scored as a 1, 3, or 5 based on whether its evaluation deviates strongly, deviates somewhat, or approximates expectations, respectively, as compared to an undisturbed site located in a similar geographical region and on a stream of comparable size. Individual metrics are added to calculate a total IBI score. A high IBI indicates high biological integrity or health and low disturbance or lack of perturbations. A low IBI indicates low biological integrity and high disturbance or degradation. Separate IBI metric scores were determined based on the relative abundance of fish collected with each fishing gear. IBI categories of good (IBI 41-60), fair (IBI 21-40), or poor (IBI <21), as derived by the IEPA (IEPA, 1996) were determined and reported.

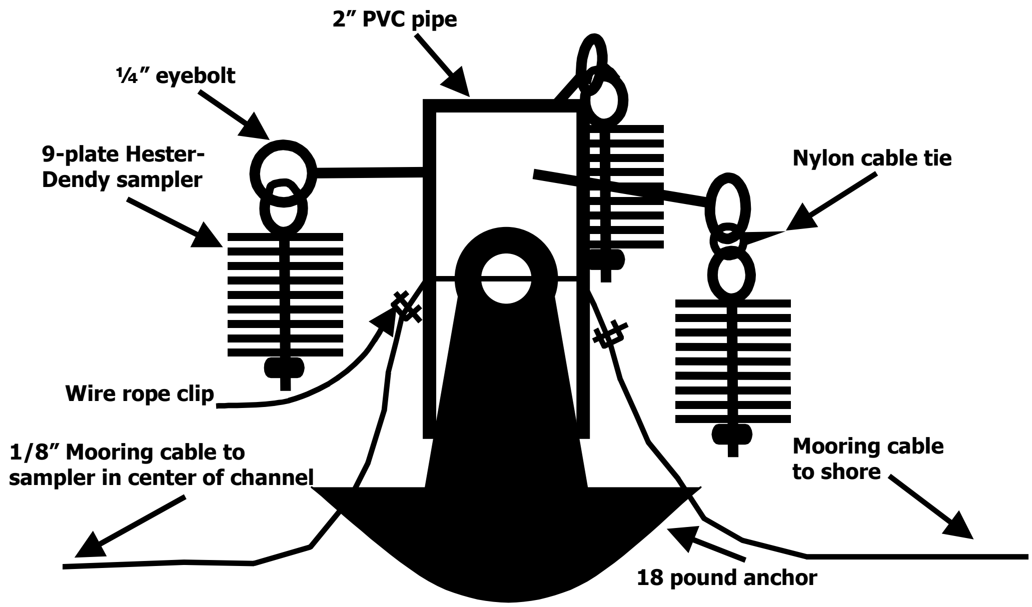
Benthic Invertebrates

Ponar Sediment Sampling. Triplicate sediment samples were collected with a petite Ponar Grab (0.023 m^2) from the center and one side of the deep-draft and wadeable waterway stations. Grab samples were taken at locations upstream from any prior sampling disturbance, such as Hester Dendy retrievals (see description in next section) to avoid collecting disturbed sediment. An appropriate area for ponar sampling was chosen by a staff biologist to avoid any obvious obstructions such as large rocks or plants. The sediment samples were sieved in the field using a field sieving bucket with 250-micrometer (µm) openings. The sieved material was poured into one-gallon plastic containers, preserved to 10 percent formalin concentration, and brought back to the laboratory for analysis. All samples were stored at 4ºC until processed.

Artificial Substrate Sampling. Hester Dendy artificial substrate samplers were deployed at each station between May and June. Figure 3 shows a diagram of the plate configuration that was assembled prior to deployment in the waterways. In all, 27, 3- X 3-inch sampling plates were attached to 2, 18-pound river anchors, connected to an object on shore (usually a tree) by a cable, and then placed on the bottom of the waterway in the center and on one side. These substrates were left in the waterway between 7 and 14 weeks and then retrieved concurrent to other biological sampling. Hester Dendy set-ups were located and the anchors were lifted out of the waterway with a 250-micron mesh plankton net underneath to avoid organism loss. Then, plates were cut from the anchors and placed into a one-gallon bucket with a secure leak-proof lid. Invertebrates from the plankton net reservoir were also rinsed into the buckets, which were then filled with river water and brought to a 10 percent final concentration of formalin.

Benthic Invertebrate Processing. In the laboratory, the ponar sediment samples were gently washed and screened through a U.S. Standard number 60 mesh sieve (250 µm openings). The formalin mixture in which the Hester Dendy plates were immersed was also sieved through a number 60 mesh sieve, and then the sampling bucket was filled with tap water to cover the plates. Each plate was removed from the sampler and gently brushed with a paintbrush on both sides while running under a slow stream of water in order to rinse the attached invertebrates into the sieve. Rinsings from both ponar and Hester Dendy sampling containers were thoroughly sieved. The sieved material was examined in small batches under a compound microscope in a 100- X 50-mm glass crystallizing dish filled about 1 cm high. Laboratory technicians then

FIGURE 3: CONFIGURATION OF HESTER DENDY LARVAL PLATE SAMPLER



counted oligochaete worms and removed all other invertebrates from the finer residual material. In situations where large numbers of worms were encountered (>1000), estimates of their abundance were made by using a subsampling device. Invertebrates other than worms were sent to a consultant (EA Engineering) for identification to genus or species when possible.

Sediment Chemistry

Sample Collection. Prior to sample collection the Ponar grab sampler and the metal and plastic pans and scoops were cleaned with hot water and laboratory detergent, rinsed with deionized water and allowed to air dry. The Ponar and metal pans and scoops were then rinsed with acetone, allowed to air dry, and dried in an oven at 105°C for one hour. When dry and cool, each set was placed in a plastic bag and sealed to prevent contamination until ready for use. Sediment samples were collected from the center and side of the waterway using separate cleaned 6- X 6-inch Ponar grab samplers. The sediment samples were transferred into either plastic or metal pans and then put into the appropriate container using plastic or metal scoops. The constituents analyzed in sediment, sample containers used, and preservation methods are summarized in Table 2. Metal scoops and pans were used for samples collected in glass containers, whereas plastic scoops and pans were used for sediment collected in plastic containers. After being filled, sample containers were placed on ice until they could be refrigerated.

Sample Analyses. The sediment samples were analyzed for total solids (TS), total volatile solids (TVS), ammonia nitrogen (NH_3-N), nitrate plus nitrite nitrogen (NO_2+NO_3), total Kjeldahl nitrogen (TKN), total phosphorus (TP), total cyanide (TCN), phenols, total metals (including arsenic, cadmium, chromium, copper, iron, lead, manganese, mercury, nickel, silver, and zinc), and Organic Priority Pollutants listed in Table 3 by the District's Analytical Laboratory Division (ALD). Sediment samples were sent on ice to a contractor laboratory for AVS/SEM, TOC, and particle size. In the laboratory, all constituents were analyzed using procedures established by the United States Environmental Protection Agency (USEPA) or described in Standard Methods for the Examination of Water and Wastewater (19^{th} edition, 1998).

Sediment Toxicity

Sediment samples were collected using a 6- X 6-inch Ponar grab sampler from the center and side of the waterways, and scooped into 1-gallon plastic buckets (at least 1/2 full). Buckets were kept on ice until they could be refrigerated. These samples were sent in coolers on ice to a contractor for ten-day Chironumus tentans toxicity testing (USEPA 2000 Test Method 100.2). Tests were performed within 14 days of sediment collection.

TABLE 2: CONSTITUENTS ANALYZED, SAMPLE CONTAINERS, AND PRESERVATION METHODS FOR SEDIMENT SAMPLES COLLECTED FOR THE AMBIENT WATER QUALITY MONITORING PROGRAM DURING 2002–2004

Constituents	Units of Measure[1]	Sample Container	Preservative
Total Solids (TS)	percent	Glass	Cool, 4°C
Total Volatile Solids (TVS)	percent	Glass	Cool, 4°C
Un-ionized Ammonia (NH_3-N)	mg/kg	Glass	Cool, 4°C
Nitrite plus Nitrate Nitrogen (NO_2+NO_3)	mg/kg	Glass	Cool, 4°C
Total Kjeldahl Nitrogen (TKN)	mg/kg	Glass	Cool, 4°C
Total Phosphorus (TP)	mg/kg	Glass	Cool, 4°C
Phenols	mg/kg	Glass	Cool, 4°C
Total Cyanide (TCN)	mg/kg	Glass	Cool, 4°C
Acid Volatile Sulfide (AVS)	µmoles/g	Plastic	Cool, 4°C
Simultaneously Extracted Metal (SEM)	µmoles/g	Plastic	Cool, 4°C
Total Organic Carbon (TOC)	mg/kg	Glass	Cool, 4°C
Particle Size	percent	Plastic	Cool, 4°C
Toxicity (survival)	percent	Plastic	Cool, 4°C
Toxicity (growth)	mg/org	Plastic	Cool, 4°C
Total Metals: (Arsenic, Cadmium, Chromium Copper, Iron, Lead, Manganese, Mercury, Nickel, Silver, and Zinc)	mg/kg	Glass	Cool, 4°C
Organic Priority Pollutants: (Volatile Organic Compounds, Polynuclear Aromatic Hydrocarbons, Polychlorinated Biphenyls, Pesticides)	µg/kg	Glass	Cool, 4°C

[1]Expressed on a dry weight basis.

TABLE 3: LIST OF ORGANIC PRIORITY POLLUTANTS ANALYZED IN SEDIMENT SAMPLES COLLECTED FOR THE AMBIENT WATER QUALITY MONITORING PROGRAM BETWEEN 2002–2004

Volatile Organic Compounds	Acid Extractables	Base/Neutral Extractables	Pesticides and PCBs
Acrolein	2-Chlorophenol	Acenaphthene	Aldrin
Acrylonitrile	2,4-Dichlorophenol	Acenaphthylene	a-BHC-alpha
Benzene	2,4-Dimethylphenol	Anthracene	b-BHC-beta
Bromoform	4,6-Dinitro-o-cresol	Benzidine	BHC-gamma
Carbon tetrachloride	2,4-Dinitrophenol	Benzo(a)anthracene	BHC-delta
Chlorobenzene	2-Nitrophenol	Benzo(a)pyrene	Chlordane
Chlorodibromomethane	4-Nitrophenol	3,4-Benzofluoranthene	4,4'-DDT
Chloroethane	Parachlorometacresol	Benzo(ghi)perylene	4,4'-DDE
2-Chloroethylvinyl ether	Pentachlorophenol	Benzo(k)fluoranthene	4,4'-DDD
Chloroform	Phenol	Bis(2-chloroethoxy)methane	Dieldrin
Dichlorobromomethane	2,4,6-Trichlorophenol	Bis(2-chloroethyl)ether	a-Endosulfan-alpha
1,1-Dichloroethane		Bis(2-chloroisopropyl)ether	b-Endosulfan-beta
1,2-Dichloroethane		Bis(2-ethylhexyl)phthalate	Endosulfan sulfate
1,1-Dichloroethylene		4-Bromophenyl phenyl ether	Endrin
1,2-Dichloropropane		Butylbenzyl phthalate	Endrin aldehyde
1,3-Dichloropropene		2-Chloronaphthalene	Heptachlor
Ethyl benzene		4-Chlorophenyl phenyl ether	Heptachlor epoxide
Methyl bromide		Chrysene	PCB-1242
Methyl chloride		Dibenzo(a,h)anthracene	PCB-1254
Methylene chloride		1,2-Dichlorobenzene	PCB-1221
1,1,2,2-Tetrachloroethane		1,3-Dichlorobenzene	PCB-1232
Tetrachloroethylene		1,4-Dichlorobenzene	PCB-1248
Toluene		3,3'-Dichlorobenzidine	PCB-1260

TABLE 3 (Continued): LIST OF ORGANIC PRIORITY POLLUTANTS ANALYZED IN SEDIMENT SAMPLES COLLECTED FOR THE AMBIENT WATER QUALITY MONITORING PROGRAM BETWEEN 2002–2004

Volatile Organic Compounds	Acid Extractables	Base/Neutral Extractables	Pesticides and PCBs
1,2-trans-Dichloroethylene		Diethyl phthalate	PCB-1016
1,1,1-Trichloroethane		Dimethyl phthalate	Toxaphene
1,1,2-Trichloroethane		Di-n-butyl phthalate	
Trichloroethylene		2,4-Dinitrotoluene	
Vinyl chloride		2,6-Dinitrotoluene	
Trichlorofluoromethane		Di-n-octyl phthalate	
		1,2-Diphenylhydrazine	
		Fluoranthene	
		Fluorene	
		Hexachlorobenzene	
		Hexachlorobutadiene	
		Hexachlorocyclopentadiene	
		Hexachloroethane	
		Indeno(1,2,3-cd)pyrene	
		Isophorone	
		Naphthalene	
		Nitrobenzene	
		N-Nitrosodimethylamine	
		N-Nitrosodi-n-propylamine	
		N-Nitrosodiphenylamine	
		Phenanthrene	
		Pyrene	
		1,2,4-Trichlorobenzene	

RESULTS AND DISCUSSION

Chlorophyll

As a photosynthetic component of all algae cells, the determination of chlorophyll *a* is an accepted way of quantifying algal biomass in lakes and streams. Chlorophyll values are of interest to regulatory agencies since it is also widely accepted that high algae concentrations may indicate nutrient impairment. The IEPA is cooperating with other state and local agencies to develop regional water quality criteria for nutrients and possibly chlorophyll. In light of this consideration, the District began monitoring chlorophyll on a monthly basis in August 2001 as part of the AWQM Program. Results are shown in Table 4.

Chicago River System. During 2001–2004, the highest mean chlorophyll *a* value in the Chicago River System was at Dundee Road on the West Fork North Branch Chicago River (25 µg/L). The lowest mean chlorophyll *a* concentration throughout the system was 1 µg/L at Touhy Avenue on the North Shore Channel.

Calumet River System. Mean chlorophyll *a* concentrations ranged from 2 µg/L at Ewing Avenue on the Calumet River to 40 µg/L at Burnham Avenue on the Grand Calumet River.

Des Plaines River System. The highest mean chlorophyll concentrations in the Des Plaines River System were calculated at Stephen Street (41 µg/L) and Material Service Road (46 µg/L) on the Des Plaines River. Wille Road on Higgins Creek had the lowest mean chlorophyll *a* concentration throughout this system (3 µg/L).

Habitat

Habitat is one of the most crucial factors limiting aquatic life in urban environments such as CAWS. Channelization, limited instream and canopy cover, siltation, erosion, and lack of adequate flood plain area are some of the physical characteristics that challenge waterways in the Chicago area. The QHEI was developed by OEPA as a method to quantify and assess wadeable aquatic habitats for their ability to support aquatic life. Since this metric was designed to analyze wadeable streams, the limitations to its application in man-made channel portions of CAWS should be considered. Metrics include: substrate, instream cover, channel quality, riparian zone/erosion, pool and riffle quality, and stream gradient. Narrative designations were assigned to QHEI score ranges so that waterway reaches could be categorized as excellent, good, fair, poor, or very poor based on the ability of the habitat to support aquatic life. Table 5 displays the QHEI score and rating for each of the stations assessed in 2002–2004.

Chicago River System. The habitat ratings assigned to stations assessed in the Chicago River System during 2002–2004 ranged from very poor to poor (27–42). Negative habitat

TABLE 4: RANGE AND MEAN CHLOROPHYLL *a* VALUES IN THE CHICAGO AREA WATERWAY SYSTEM BETWEEN AUGUST 2001 AND DECEMBER 2004

Station No.	Station Name	Waterway	N*	Mean µg/L	Minimum µg/L	Maximum µg/L	Standard Deviation µg/L
106	Dundee Road	West Fork North Branch Chicago River	18	25	4	118	31
103	Golf Road	West Fork North Branch Chicago River	34	18	2	96	18
31	Lake-Cook Road	Middle Fork North Branch Chicago River	33	9	<1	35	8
32	Lake-Cook Road	Skokie River	33	14	1	91	17
105	Frontage Road	Skokie River	41	22	2	80	17
104	Glenview Road	North Branch Chicago River	29	18	1	47	12
34	Dempster Street	North Branch Chicago River	40	16	1	39	10
96	Albany Avenue	North Branch Chicago River	37	17	2	61	15
35	Central Street	North Shore Channel	32	7	<1	91	18
102	Oakton Street	North Shore Channel	38	11	<1	65	18
36	Touhy Avenue	North Shore Channel	40	1	<1	5	1
101	Foster Avenue	North Shore Channel	40	3	<1	31	5
37	Wilson Avenue	North Branch Chicago River	41	4	<1	18	4
73	Diversey Avenue	North Branch Chicago River	41	4	<1	12	3
46	Grand Avenue	North Branch Chicago River	41	5	1	20	5
74	Lake Shore Dr.	Chicago River	36	3	1	18	4
100	Wells Street	Chicago River	37	3	1	16	3
39	Madison Street	South Branch Chicago River	39	4	1	16	4
108	Loomis Street	South Branch Chicago River	41	5	<1	26	6
99	Archer Avenue	South Fork South Branch Chicago River	41	15	<1	90	20
107	Western Avenue[1]	Chicago Sanitary and Ship Canal	17	3	1	7	2
40	Damen Avenue	Chicago Sanitary and Ship Canal	24	7	1	25	7
75	Cicero Avenue	Chicago Sanitary and Ship Canal	41	7	1	25	7
41	Harlem Avenue	Chicago Sanitary and Ship Canal	41	3	1	8	2
42	Route 83	Chicago Sanitary and Ship Canal	41	4	<1	24	4

TABLE 4 (Continued): RANGE AND MEAN CHLOROPHYLL *a* VALUES IN THE CHICAGO AREA WATERWAY SYSTEM BETWEEN AUGUST 2001 AND DECEMBER 2004

Station No.	Station Name	Waterway	N*	Mean μg/L	Minimum μg/L	Maximum μg/L	Standard Deviation μg/L
48	Stephen Street	Chicago Sanitary and Ship Canal	41	5	1	20	4
92	Lockport	Chicago Sanitary and Ship Canal	171	5	<1	37	5
49	Ewing Avenue	Calumet River	38	2	1	5	1
55	130th Street	Calumet River	37	7	1	22	5
50	Burnham Avenue	Wolf Lake	40	6	<1	18	5
86	Burnham Avenue	Grand Calumet River	33	40	3	313	69
56	Indiana Avenue	Little Calumet River	37	20	3	64	14
76	Halsted Street	Little Calumet River	39	7	<1	29	7
52	Wentworth Avenue	Little Calumet River	35	7	1	40	7
54	Joe Orr Road	Thorn Creek	21	7	1	33	8
97	170th Street	Thorn Creek	38	10	2	32	7
57	Ashland Avenue	Little Calumet River	35	10	2	43	9
58	Ashland Avenue	Calumet-Sag Channel	41	10	1	35	10
59	Cicero Avenue	Calumet-Sag Channel	40	11	1	56	12
43	Route 83	Calumet-Sag Channel	38	14	<1	93	18
90	Route 19	Poplar Creek	34	12	1	32	8
63	Longmeadow Lane[2]	West Branch DuPage River	2	17	8	25	13
110	Springinsguth Road	West Branch DuPage River	10	11	1	23	7
89	Walnut Lane	West Branch DuPage River	38	6	1	31	7
64	Lake Street	West Branch DuPage River	40	23	5	103	19
79	Higgins Road	Salt Creek	32	36	10	114	23
80	Arlington Hts. Road	Salt Creek	38	15	2	41	11
18	Devon Avenue	Salt Creek	38	17	4	45	9
24	Wolf Road	Salt Creek	39	10	1	49	11
21	First Avenue[3]	Salt Creek	9	11	2	46	14
109	Brookfield Avenue	Salt Creek	25	13	<1	50	14

TABLE 4 (Continued): RANGE AND MEAN CHLOROPHYLL *a* VALUES IN THE CHICAGO AREA WATERWAY SYSTEM BETWEEN AUGUST 2001 AND DECEMBER 2004

Station No.	Station Name	Waterway	N*	Mean µg/L	Minimum µg/L	Maximum µg/L	Standard Deviation µg/L
77	Elmhurst Road	Higgins Creek	22	12	4	23	5
78	Wille Road	Higgins Creek	40	3	<1	15	3
12	Lake-Cook Road	Buffalo Creek	27	28	7	65	13
13	Lake-Cook Road	Des Plaines River	39	27	7	105	20
17	Oakton Street	Des Plaines River	35	27	2	108	24
19	Belmont Avenue	Des Plaines River	39	19	<1	91	23
20	Roosevelt Road	Des Plaines River	34	15	<1	81	19
22	Ogden Avenue	Des Plaines River	32	18	1	94	23
23	Willow Springs Road	Des Plaines River	35	25	1	161	34
29	Stephen Street	Des Plaines River	38	41	1	299	62
91	Material Services Road	Des Plaines River	39	46	3	214	51

*N=Number of Observations.
[1]Samples were taken at Western Avenue instead of Damen Avenue during 2001–2002 due to bridge construction.
[2]Longmeadow Avenue Station on West Branch DuPage River was replaced by Springinsguth Road in January 2004 due to low flow.
[3]First Avenue Station on Salt Creek was replaced by Brookfield Avenue in July 2002 due to low flow.

TABLE 5: QUALITATIVE HABITAT EVALUATION INDEX SCORES IN THE CHICAGO AREA WATERWAY SYSTEM MEASURED BETWEEN 2002 AND 2004

Station No.	Station Name	Waterway	QHEI* Score	Habitat Rating
96	Albany Avenue	North Branch Chicago River	33	Poor
36	Touhy Avenue	North Shore Channel	40	Poor
46	Grand Avenue	North Branch Chicago River	29	Very Poor
74	Lake Shore Drive	Chicago River	29	Very Poor
100	Wells Street	Chicago River	28	Very Poor
39	Madison Street	South Branch Chicago River	27	Very Poor
108	Loomis Street	South Branch Chicago River	32	Poor
99	Archer Avenue	South Fork South Branch Chicago River	42	Poor
40	Damen Avenue	Chicago Sanitary and Ship Canal	34	Poor
75	Cicero Avenue	Chicago Sanitary and Ship Canal	32	Poor
41	Harlem Avenue	Chicago Sanitary and Ship Canal	35	Poor
42	Route 83	Chicago Sanitary and Ship Canal	38	Poor
48	Stephen Street	Chicago Sanitary and Ship Canal	37	Poor
92	Lockport	Chicago Sanitary and Ship Canal	40	Poor
49	Ewing Avenue	Calumet River	32	Poor
55	130th Street	Calumet River	51	Fair
50	Burnham Avenue	Wolf Lake Drain	47	Fair
86	Burnham Avenue	Grand Calumet River	36	Poor
56	Indiana Avenue	Little Calumet River	47	Fair
76	Halsted Street	Little Calumet River	55	Fair
52	Wentworth Avenue	Little Calumet River	40	Poor
54	Joe Orr Road	Thorn Creek	55	Fair
97	170th Street	Thorn Creek	41	Poor
57	Ashland Avenue	Little Calumet River	51	Fair
58	Ashland Avenue	Calumet-Sag Channel	39	Poor
59	Cicero Avenue	Calumet-Sag Channel	37	Poor
43	Route 83	Calumet-Sag Channel	41	Poor
90	Route 19	Poplar Creek	52	Fair
110	Springinsguth Road	West Branch DuPage River	31	Poor
89	Walnut Lane	West Branch DuPage River	47	Fair
64	Lake Street	West Branch DuPage River	49	Fair
79	Higgins Road	Salt Creek	63	Good
80	Arlington Heights Rd.	Salt Creek	64	Good
18	Devon Avenue	Salt Creek	55	Fair
24	Wolf Road	Salt Creek	49	Fair
109	Brookfield Avenue	Salt Creek	47	Fair
77	Elmhurst Road	Higgins Creek	23	Very Poor

TABLE 5 (Continued): QUALITATIVE HABITAT EVALUATION INDEX SCORES IN THE CHICAGO AREA WATERWAYS MEASURED BETWEEN 2002 AND 2004

Station No.	Station Name	Waterway	QHEI* Score	Habitat Rating
78	Wille Road	Higgins Creek	27	Very Poor
12	Lake-Cook Road	Buffalo Creek	43	Poor
13	Lake-Cook Road	Des Plaines River	49	Fair
17	Oakton Street	Des Plaines River	51	Fair
19	Belmont Avenue	Des Plaines River	51	Fair
20	Roosevelt Road	Des Plaines River	47	Fair
22	Ogden Avenue	Des Plaines River	53	Fair
23	Willow Springs Rd.	Des Plaines River	46	Fair
29	Stephen Street	Des Plaines River	46	Fair
91	Material Services Rd.	Des Plaines River	64	Good

*QHEI=Qualitative Habitat Evaluation Index.

features in this system included channelization throughout most of the evaluated waterways, limited flow especially in the North Shore Channel, limited instream cover, and excess silt in sediments. The highest QHEI score in the analyzed portion of this system (42) was assigned to Archer Avenue on the South Fork South Branch Chicago River, despite its extremely silty substrate. Positive attributes at Archer Avenue included moderate instream and canopy cover along the waterway reach and the lack of channel walls. It is important to note that there were stations in non-channelized portions of the Main, West, and Middle Forks of the North Branch Chicago River and Skokie River that were likely to have higher QHEI scores but were not assessed for habitat quality in 2001. These sampling stations will be evaluated for habitat in 2005 and reported upon subsequently.

Calumet River System. In the Calumet River System, QHEI ratings ranged from poor to fair (32–55). The limiting factors in this system were a lack of instream cover, silty substrates, and channelization throughout reaches of the Calumet River and the Calumet-Sag Channel. The stations with the best habitat scores were located at Halsted Street on the Little Calumet River and Joe Orr Road on Thorn Creek. These locations had more instream cover, less silt in the sediment, and better channel development than the other stations in the Calumet River System.

Des Plaines River System. Habitat varied most widely amongst waterway reaches in the Des Plaines River System, ratings ranged from very poor to good (23–64). Some stations in the Des Plaines River and Salt Creek had attractive instream habitat for fish, as well as adequate canopy cover, and comparably better channel morphology and land use than found in other systems. Arlington Heights Road and Higgins Road on Salt Creek were both located in highly forested areas which provided tree cover and good flood plain quality. However, stations on Higgins Creek and the Calumet-Sag Channel were limited by channelization, silt-dominated sediments, and lack of canopy or instream cover. Wille Road on Higgins Creek had concrete banks and an artificial streambed, while the Elmhurst Road Station on the same creek was intermittent and had sludge in the sediments.

Fish

The common and scientific names of the fishes collected in CAWS between 2001 and 2004 are listed in Table 6, organized by family. The number of individuals, total species, and game species collected, as well as catch weight from each station, can be referenced in Table 7. In addition, Table 8 displays the calculated IBI score and descriptive category for various collection methods employed at each station. Comprehensive fish data for each station are also available on the District Website at www.mwrd.org under the "Biological Data" heading.

Chicago River System. The most abundant species collected from the wadeable portion of the Chicago River System included carp, largemouth bass, green sunfish, and bluegill, while carp, gizzard shad, and largemouth bass were the most frequently collected species in the deep-draft portion. The IBI scores generally indicated fair conditions in the wadeable portion and poor to fair conditions in the deep draft.

TABLE 6: COMMON AND SCIENTIFIC NAMES OF FISHES COLLECTED IN THE CHICAGO AREA WATERWAY SYSTEM BETWEEN 2001 AND 2004

Common Name	Scientific Name
BOWFIN FAMILY	AMIIDAE
Bowfin	*Amia calva*
HERRING FAMILY	CLUPEIDAE
Skipjack herring	*Alosa chrysochloris*
Alewife	*Alosa pseudoharengus*
Gizzard shad	*Dorosoma cepedianum*
TROUT FAMILY	SALMONIDAE
Chinook salmon*	*Oncorhynchus tshawytscha*
PIKE FAMILY	ESOCIDAE
Grass pickerel	*Esox americanus*
Northern pike*	*Esox lucius*
MINNOW FAMILY	CYPRINIDAE
Goldfish	*Carassius auratus*
Common carp	*Cyprinus carpio*
Grass carp	*Ctenopharyngodon idella*
Carp x Goldfish Hybrid	*Cyprinus carpio x Carrassius auratus*
Spotfin shiner	*Cyprinella spiloptera*
Hornyhead chub	*Nocomis biguttatus*
Golden shiner	*Notemigonus crysoleucas*
Emerald shiner	*Notropis atherinoides*
Bigmouth shiner	*Notropis dorsalis*
Spottail shiner	*Notropis hudsonius*
Ozark minnow	*Notropis nubilus*
Sand shiner	*Notropis stramineus*
Mimic shiner	*Notropis volucellus*
Bluntnose minnow	*Pimephales notatus*
Fathead minnow	*Pimephales promelas*
Creek chub	*Semotilus atromaculatus*
SUCKER FAMILY	CATOSTOMIDAE
Quillback	*Carpiodes cyprinus*
White sucker	*Catostomus commersonii*
Black buffalo	*Ictiobus niger*
Spotted sucker	*Minytrema melanops*
Golden redhorse	*Moxostoma erythrurum*

TABLE 6 (Continued): COMMON AND SCIENTIFIC NAMES OF FISHES COLLECTED IN THE CHICAGO AREA WATERWAY SYSTEM BETWEEN 2001 AND 2004

Common Name	Scientific Name
CATFISH FAMILY	ICTALURIDAE
Black bullhead*	*Ameiurus melas*
Yellow bullhead*	*Ameiurus natalis*
Channel catfish*	*Ictalurus punctatus*
Tadpole madtom	*Noturus gyrinus*
PIRATE PERCH FAMILY	APHREDODERIDAE
Pirate perch	*Aphredoderus sayanus*
KILLIFISH FAMILY	FUNDULIDAE
Blackstripe topminnow	*Fundulus notatus*
LIVEBEARER FAMILY	POECILIIDAE
Western mosquitofish	*Gambusia affinis*
STICKLEBACK FAMILY	GASTEROSTEIDAE
Brook stickleback	*Culaea inconstans*
TEMPERATE BASS FAMILY	MORONIDAE
White perch*	*Morone americana*
White bass*	*Morone chrysops*
Yellow bass*	*Morone mississippiensis*
GOBY FAMILY	GOBIIDAE
Round goby	*Neogobius melanostomus*
SUNFISH FAMILY	CENTRARCHIDAE
Rock bass*	*Ambloplites rupestris*
Green sunfish*	*Lepomis cyanellus*
Pumpkinseed*	*Lepomis gibbosus*
Warmouth*	*Lepomis gulosus*
Orangespotted sunfish*	*Lepomis humilis*
Bluegill*	*Lepomis macrochirus*
Longear sunfish*	*Lepomis megalotis*
Green sunfish x Pumpkinseed Hybrid	*L.cyanellus x L.gibbosus*
Green sunfish x Bluegill Hybrid	*L. cyanellus x L. macrochirus*
Pumpkinseed x Bluegill Hybrid	*L. gibbosus x L. macrochirus*

TABLE 6 (Continued): COMMON AND SCIENTIFIC NAMES OF FISHES COLLECTED IN THE CHICAGO AREA WATERWAY SYSTEM BETWEEN 2001 AND 2004

Common Name	Scientific Name
SUNFISH FAMILY (Continued)	CENTRARCHIDAE
Smallmouth bass*	*Micropterus dolomieu*
Largemouth bass*	*Micropterus salmoides*
White crappie*	*Pomoxis annularis*
Black crappie*	*Pomoxis nigromaculatus*
PERCH FAMILY	PERCIDAE
Johnny darter	*Etheostoma nigrum*
Yellow perch	*Perca flavescens*
Blackside darter	*Percina maculata*
Sauger*	*Sander canadensis*
Walleye*	*Sander vitreus*
DRUM FAMILY	SCIAENIDAE
Freshwater drum	*Aplodinotus grunniens*

*Game fish species.

TABLE 7: NUMBER, WEIGHT, AND NUMBER OF SPECIES FOR FISH COLLECTED IN THE CHICAGO AREA WATERWAY SYSTEM BETWEEN 2001 AND 2004

Station No.	Station Name	Year	Sample Gear[1]	Number of Fish	Weight in Grams	Number of Species Total	Number of Species Game	Most Abundant Species
				West Fork North Branch Chicago River				
106	Dundee Road	2001	BP/S	9	108	3	1	Carp
103	Golf Road	2001	BP/S	16	65	6	3	Largemouth bass
				Middle Fork North Branch Chicago River				
31	Lake-Cook Road	2001	BP/S	7	26	4	2	Largemouth bass
				Skokie River				
32	Lake-Cook Road	2001	BP/S	9	32	2	2	Bluegill
105	Frontage Road	2001	BP/S	34	422	3	3	Green sunfish
				North Branch Chicago River (Wadeable Portion)				
104	Glenview Road	2001	BP	5	37	3	3	Green sunfish & Largemouth bass
34	Dempster Street	2001	BP/S	5	57	3	2	Bluegill
96	Albany Avenue[2]	2001	BP	2	3	2	1	Green sunfish & Brook stickleback
	Albany Avenue[2]	2002	BP	2	10	1	1	Green sunfish
	Albany Avenue[2]	2003	BP	6	66	3	1	Green sunfish
	Albany Avenue[2]	2004	BP	6	31	2	1	Green sunfish & White sucker
				North Shore Channel				
35	Central Street	2001	EFB-L	132	3,449	12	8	Bluegill
102	Oakton Street	2001	EFB-L	2	4	2	1	Golden shiner & Largemouth bass
36	Touhy Avenue[2]	2001	EFB-L	596	84,454	11	6	Gizzard shad
	Touhy Avenue[2]	2002	EFB-L	147	146,480	12	8	Gizzard shad
	Touhy Avenue[2]	2003	EFB-L	335	102,261	14	6	Gizzard shad
	Touhy Avenue[2]	2004	EFB-L	249	141,700	11	5	Gizzard shad

TABLE 7 (Continued): NUMBER, WEIGHT, AND NUMBER OF SPECIES FOR FISH COLLECTED IN THE CHICAGO AREA WATERWAY SYSTEM BETWEEN 2001 AND 2004

Station No.	Station Name	Year	Sample Gear[1]	Number of Fish	Weight in Grams	Number of Species Total	Number of Species Game	Most Abundant Species
				North Shore Channel (Continued)				
101	Foster Avenue	2001	EFB-L	179	45,309	15	8	Largemouth bass
				North Branch Chicago River (Deep Portion)				
37	Wilson Avenue	2001	EFB-L	75	79,777	13	6	Carp
73	Diversey Parkway	2001	EFB-L	58	23,733	7	2	Gizzard shad
46	Grand Avenue[2]	2001	EFB-L	53	43,553	9	6	Carp
	Grand Avenue[2]	2002	EFB-L	28	22,066	7	3	Carp
	Grand Avenue[2]	2003	EFB-L	67	17,359	8	4	Gizzard shad
	Grand Avenue[2]	2004	EFB-L	88	19,722	9	4	Gizzard shad
				Chicago River				
74	Outer Drive	2002	EFB-L	22	11,087	8	5	Gizzard shad & Largemouth bass
100	Wells Street	2002	EFB-L	136	104,017	11	7	Gizzard shad
				South Branch Chicago River				
39	Madison Street	2002	EFB-L	138	25,700	10	3	Emerald shiner
108	Loomis Street	2002	EFB-L	76	77,763	10	5	Carp
				Bubbly Creek (South Fork South Branch Chicago River)				
99	Archer Avenue	2002	EFB-L	21	3,812	5	2	Gizzard shad
				Chicago Sanitary and Ship Canal				
40	Damen Avenue	2002	EFB-L	148	153,355	10	4	Carp
75	Cicero Avenue[2]	2001	EFB-L	188	183,269	11	4	Carp
	Cicero Avenue[2]	2002	EFB-L	136	160,509	10	3	Carp

TABLE 7 (Continued): NUMBER, WEIGHT, AND NUMBER OF SPECIES FOR FISH COLLECTED IN THE CHICAGO AREA WATERWAY SYSTEM BETWEEN 2001 AND 2004

Station No.	Station Name	Year	Sample Gear[1]	Number of Fish	Weight in Grams	Number of Species Total	Number of Species Game	Most Abundant Species
				Chicago Sanitary and Ship Canal (Continued)				
75	Cicero Avenue[2]	2003	EFB-L	138	34,260	9	3	Gizzard shad
	Cicero Avenue[2]	2004	EFB-L	191	98,526	13	4	Carp
41	Harlem Avenue[2]	2001	EFB-L	88	51,515	9	3	Gizzard shad
	Harlem Avenue[2]	2002	EFB-L	188	114,024	11	3	Gizzard shad
	Harlem Avenue[2]	2003	EFB-L	225	47,000	9	3	Bluntnose minnow
	Harlem Avenue[2]	2004	EFB-L	193	99,601	13	3	Gizzard shad
42	Route 83	2002	EFB-L	32	1,264	5	2	Mosquitofish
48	Stephen Street	2002	EFB-L	24	1,940	4	0	Bluntnose minnow
92	Lockport[2]	2001	EFB-L	77	97,313	2	0	Gizzard shad
	Lockport[2]	2002	EFB-L	67	41,250	6	2	Gizzard shad
	Lockport[2]	2003	EFB-L	67	17,248	7	4	Carp
	Lockport[2]	2004	EFB-L	22	44,259	4	2	Carp
				Calumet River				
49	Ewing Avenue	2003	EFB-L	13	4,754	3	2	Rock bass
55	130th Street[2]	2001	EFB-L	157	62,258	13	6	Gizzard shad
	130th Street[2]	2002	EFB-L	261	54,688	12	6	Bluntnose minnow
	130th Street[2]	2003	EFB-L	182	68,404	8	3	Gizzard shad
	130th Street[2]	2004	EFB-L	360	95,951	14	6	Gizzard shad
				Wolf Lake Outlet				
50	Burnham Avenue	2003	BP/S	16	194	6	5	Longear sunfish
				Grand Calumet River				
86	Burnham Avenue	2003	BP	0	0	0	0	NA

TABLE 7 (Continued): NUMBER, WEIGHT, AND NUMBER OF SPECIES FOR FISH COLLECTED IN THE CHICAGO AREA WATERWAY SYSTEM BETWEEN 2001 AND 2004

Station No.	Station Name	Year	Sample Gear[1]	Number of Fish	Weight in Grams	Number of Species Total	Number of Species Game	Most Abundant Species
				Little Calumet River (Deep Portion)				
56	Indiana Avenue	2003	EFB-L	452	234,592	17	11	Gizzard shad
76	Halsted Street[2]	2001	EFB-L	210	128,546	16	8	Gizzard shad
	Halsted Street[2]	2002	EFB-L	163	106,079	17	7	Carp
	Halsted Street[2]	2003	EFB-L	219	47,350	13	6	Gizzard shad
	Halsted Street[2]	2004	EFB-L	207	116,705	17	9	Largemouth bass
				Thorn Creek				
54	Joe Orr Road	2003	BP	19	164	3	2	Creek chub & Green sunfish
97	170th Street	2003	EFB-S	5	1,726	4	1	White sucker
				Little Calumet River (Wadeable Portion)				
52	Wentworth Avenue	2003	BP	1	26	1	0	Carp
57	Ashland Avenue	2003	EFB-S	12	24,255	2	1	Carp
				Calumet-Sag Channel				
58	Ashland Avenue	2003	EFB-L	95	80,244	13	8	Gizzard shad
59	Cicero Avenue[2]	2001	EFB-L	127	52,583	10	4	Gizzard shad
	Cicero Avenue[2]	2002	EFB-L	174	47,808	13	6	Bluntnose minnow
	Cicero Avenue[2]	2003	EFB-L	56	27,815	12	6	Bluntnose minnow & Green sunfish
	Cicero Avenue[2]	2004	EFB-L	147	70,642	10	5	Gizzard shad
43	Route 83	2003	EFB-L	43	31,450	7	3	Carp
				Buffalo Creek				
12	Lake-Cook Road	2004	BP/S	48	890	8	6	Bluegill

TABLE 7 (Continued): NUMBER, WEIGHT, AND NUMBER OF SPECIES FOR FISH COLLECTED IN THE CHICAGO AREA WATERWAY SYSTEM BETWEEN 2001 AND 2004

Station No.	Station Name	Year	Sample Gear[1]	Number of Fish	Weight in Grams	Number of Species Total	Number of Species Game	Most Abundant Species
				Higgins Creek				
77	Elmhurst Road	2004	NS	0	0	0	0	NA
78	Wille Road[2]	2001	BP/S	323	442	7	1	Fathead minnow
	Wille Road[2]	2002	BP	2	7	2	1	Largemouth bass & Spotfin shiner
	Wille Road[2]	2003	BP	1	3	1	1	Bluegill
	Wille Road[2]	2004	BP	3	249	2	0	White sucker
				Des Plaines River				
13	Lake-Cook Road[2]	2001	BP/S	67	742	4	3	Spotfin shiner
	Lake-Cook Road[2]	2002	BP/S	62	659	8	5	Green sunfish
	Lake-Cook Road[2]	2003	BP/S	133	6,994	13	8	Green sunfish
	Lake-Cook Road[2]	2004	BP/S	165	4,642	11	6	Green sunfish
17	Oakton Street	2004	EFB-S	22	11,878	11	7	Spotted sucker
19	Belmont Avenue	2004	EFB-S	15	1,854	8	3	Green sunfish
20	Roosevelt Road	2004	EFB-S	12	8,356	5	1	White sucker
22	Ogden Avenue[2]	2001	BP	112	196	13	4	Spottail Shiner
	Ogden Avenue[2]	2002	BP	11	1,567	7	5	Bluegill
	Ogden Avenue[2]	2003	BP	14	128	5	2	Green sunfish
	Ogden Avenue[2]	2004	BP	37	7,623	12	6	Bluegill, Green & Orangespotted sunfish
23	Willow Springs Road	2004	EFB-S	45	26,385	14	9	Carp
29	Stephen Street	2004	BP	58	2,875	10	7	Green sunfish
91	Material Services Road[2]	2001	BP/S	81	3,069	14	3	Bluntnose minnow
	Material Services Road[2]	2002	BP/S	36	457	11	3	Bluntnose minnow
	Material Services Road[2]	2003	BP/S	24	102	6	1	Blackstripe topminnow
	Material Services Road[2]	2004	BP/S	48	15,036	9	3	Green sunfish

TABLE 7 (Continued): NUMBER, WEIGHT, AND NUMBER OF SPECIES FOR FISH COLLECTED IN THE CHICAGO AREA WATERWAY SYSTEM BETWEEN 2001 AND 2004

Station No.	Station Name	Year	Sample Gear[1]	Number of Fish	Weight in Grams	Number of Species		Most Abundant Species
						Total	Game	
				Salt Creek				
79	Higgins Road	2004	EFB-S	114	20,329	8	7	Bluegill
80	Arlington Heights Road	2004	BP	38	969	7	6	Bluegill
18	Devon Avenue[2]	2001	BP	17	87	6	3	Spotfin shiner
	Devon Avenue[2]	2002	BP	104	5,172	10	6	Spotfin shiner
	Devon Avenue[2]	2003	BP	23	6,869	6	3	Green sunfish
	Devon Avenue[2]	2004	BP	26	1,369	5	4	Green sunfish
24	Wolf Road	2004	BP/S	41	13,278	6	2	Spotfin shiner
109	Brookfield Avenue	2004	BP/S	35	757	9	3	Creek chub
				West Branch DuPage River				
110	Springinsguth Road	2004	BP/S	3	32	2	2	Pumpkinseed sunfish
89	Walnut Lane	2004	BP	14	295	4	3	Green sunfish
64	Lake Street[2]	2001	BP/S	65	3,232	8	5	Green sunfish
	Lake Street[2]	2002	BP/S	73	3,148	8	5	Green sunfish
	Lake Street[2]	2003	BP/S	70	7,829	8	5	Green sunfish
	Lake Street[2]	2004	BP/S	81	3,668	8	6	Green sunfish
				Poplar Creek				
90	Route 19	2004	BP/S	38	549	8	2	Green sunfish

[1]Sample Gear: BP, backpack electrofisher; BP/S, backpack electrofisher and minnow seine, EFB-L, large electrofishing boat, EFB-S, small electrofishing boat.
[2]Annual collections.

TABLE 8: INDEX OF BIOTIC INTEGRITY SCORE AND CATEGORY CALCULATED FOR THE CHICAGO AREA WATERWAY SYSTEM BETWEEN 2001 AND 2004

Station No.	Station Name	Waterway	Year	Sample Gear	IBI* Score	IBI* Category
32	Lake-Cook Road	Skokie River	2001	BP	34	Fair
	Lake-Cook Road	Skokie River	2001	Seine	30	Fair
105	Frontage Road	Skokie River	2001	BP	32	Fair
	Frontage Road	Skokie River	2001	Seine	34	Fair
31	Lake-Cook Road	Middle Fork North Branch Chicago River	2001	BP	30	Fair
	Lake-Cook Road	Middle Fork North Branch Chicago River	2001	Seine	28	Fair
104	Glenview Road	North Branch Chicago River	2001	BP	24	Fair
106	Dundee Road	West Fork North Branch Chicago River	2001	BP	22	Fair
	Dundee Road	West Fork North Branch Chicago River	2001	Seine	24	Fair
103	Golf Road	West Fork North Branch Chicago River	2001	BP	32	Fair
	Golf Road	West Fork North Branch Chicago River	2001	Seine	28	Fair
34	Dempster Street	North Branch Chicago River	2001	BP	26	Fair
	Dempster Street	North Branch Chicago River	2001	Seine	28	Fair
96	Albany Avenue	North Branch Chicago River	2001	BP	24	Fair
	Albany Avenue	North Branch Chicago River	2002	BP	24	Fair
	Albany Avenue	North Branch Chicago River	2003	BP	20	Poor
	Albany Avenue	North Branch Chicago River	2004	BP	24	Fair
35	Central Street	North Shore Channel	2001	Large EF Boat	30	Fair
102	Oakton Street	North Shore Channel	2001	Large EF Boat	28	Fair
36	Touhy Avenue	North Shore Channel	2001	Large EF Boat	34	Fair
	Touhy Avenue	North Shore Channel	2002	Large EF Boat	32	Fair
	Touhy Avenue	North Shore Channel	2003	Large EF Boat	30	Fair
	Touhy Avenue	North Shore Channel	2004	Large EF Boat	30	Fair
101	Foster Avenue	North Shore Channel	2001	Large EF Boat	30	Fair
37	Wilson Avenue	North Branch Chicago River	2001	Large EF Boat	28	Fair
73	Diversey Parkway	North Branch Chicago River	2001	Large EF Boat	20	Poor
46	Grand Avenue	North Branch Chicago River	2001	Large EF Boat	30	Fair

TABLE 8 (Continued): INDEX OF BIOTIC INTEGRITY SCORE AND CATEGORY CALCULATED FOR THE CHICAGO AREA WATERWAY SYSTEM BETWEEN 2001 AND 2004

Station No.	Station Name	Waterway	Year	Sample Gear	IBI* Score	IBI* Category
46	Grand Avenue	North Branch Chicago River	2002	Large EF Boat	20	Poor
	Grand Avenue	North Branch Chicago River	2003	Large EF Boat	32	Fair
	Grand Avenue	North Branch Chicago River	2004	Large EF Boat	28	Fair
74	Lake Shore Drive	Chicago River	2002	Large EF Boat	30	Fair
100	Wells Street	Chicago River	2002	Large EF Boat	30	Fair
39	Madison Street	South Branch Chicago River	2002	Large EF Boat	34	Fair
108	Loomis Street	South Branch Chicago River	2002	Large EF Boat	26	Fair
99	Archer Avenue	South Fork South Branch Chicago River	2002	Large EF Boat	26	Fair
40	Damen Avenue	Chicago Sanitary and Ship Canal	2002	Large EF Boat	28	Fair
75	Cicero Avenue	Chicago Sanitary and Ship Canal	2001	Large EF Boat	20	Poor
	Cicero Avenue	Chicago Sanitary and Ship Canal	2002	Large EF Boat	22	Fair
	Cicero Avenue	Chicago Sanitary and Ship Canal	2003	Large EF Boat	22	Fair
	Cicero Avenue	Chicago Sanitary and Ship Canal	2004	Large EF Boat	22	Fair
41	Harlem Avenue	Chicago Sanitary and Ship Canal	2001	Large EF Boat	24	Fair
	Harlem Avenue	Chicago Sanitary and Ship Canal	2002	Large EF Boat	26	Fair
	Harlem Avenue	Chicago Sanitary and Ship Canal	2003	Large EF Boat	24	Fair
	Harlem Avenue	Chicago Sanitary and Ship Canal	2004	Large EF Boat	26	Fair
42	Route 83	Chicago Sanitary and Ship Canal	2002	Large EF Boat	26	Fair
48	Stephen Street	Chicago Sanitary and Ship Canal	2002	Large EF Boat	20	Poor
92	Lockport	Chicago Sanitary and Ship Canal	2001	Large EF Boat	20	Poor
	Lockport	Chicago Sanitary and Ship Canal	2002	Large EF Boat	22	Fair
	Lockport	Chicago Sanitary and Ship Canal	2003	Large EF Boat	24	Fair
	Lockport	Chicago Sanitary and Ship Canal	2004	Large EF Boat	24	Fair
52	Wentworth Avenue	Little Calumet River	2003	BP	24	Fair
54	Joe Orr Road	Thorn Creek	2003	BP	32	Fair
97	170^{th} Street	Thorn Creek	2003	Small EF Boat	24	Fair
57	Ashland Avenue	Little Calumet River	2003	Small EF Boat	18	Poor

TABLE 8 (Continued): INDEX OF BIOTIC INTEGRITY SCORE AND CATEGORY CALCULATED FOR THE CHICAGO AREA WATERWAY SYSTEM BETWEEN 2001 AND 2004

Station No.	Station Name	Waterway	Year	Sample Gear	IBI* Score	IBI* Category
49	Ewing Avenue	Calumet River	2003	Large EF Boat	34	Fair
50	Burnham Avenue	Wolf Lake Outlet	2003	BP	32	Fair
	Burnham Avenue	Wolf Lake Outlet	2003	Seine	28	Fair
55	130th Street	Calumet River	2001	Large EF Boat	32	Fair
	130th Street	Calumet River	2002	Large EF Boat	34	Fair
	130th Street	Calumet River	2003	Large EF Boat	30	Fair
	130th Street	Calumet River	2004	Large EF Boat	36	Fair
86	Burnham Avenue	Grand Calumet River	2003	BP	NA	NA
56	Indiana Avenue	Little Calumet River	2003	Large EF Boat	34	Fair
76	Halsted Street	Little Calumet River	2001	Large EF Boat	34	Fair
	Halsted Street	Little Calumet River	2002	Large EF Boat	34	Fair
	Halsted Street	Little Calumet River	2003	Large EF Boat	36	Fair
	Halsted Street	Little Calumet River	2004	Large EF Boat	36	Fair
58	Ashland Avenue	Calumet-Sag Channel	2003	Large EF Boat	22	Fair
59	Cicero Avenue	Calumet-Sag Channel	2001	Large EF Boat	28	Fair
	Cicero Avenue	Calumet-Sag Channel	2002	Large EF Boat	28	Fair
	Cicero Avenue	Calumet-Sag Channel	2003	Large EF Boat	24	Fair
	Cicero Avenue	Calumet-Sag Channel	2004	Large EF Boat	28	Fair
43	Route 83	Calumet-Sag Channel	2003	Large EF Boat	22	Fair
12	Salt Creek	Buffalo Creek	2004	BP	22	Fair
	Salt Creek	Buffalo Creek	2004	Seine	28	Fair
13	Lake-Cook Road	Des Plaines River	2001	BP	28	Fair
	Lake-Cook Road	Des Plaines River	2001	Seine	32	Fair
	Lake-Cook Road	Des Plaines River	2002	BP	24	Fair
	Lake-Cook Road	Des Plaines River	2002	Seine	34	Fair
	Lake-Cook Road	Des Plaines River	2003	BP	32	Fair
	Lake-Cook Road	Des Plaines River	2003	Seine	32	Fair

TABLE 8 (Continued): INDEX OF BIOTIC INTEGRITY SCORE AND CATEGORY CALCULATED FOR THE CHICAGO AREA WATERWAY SYSTEM BETWEEN 2001 AND 2004

Station No.	Station Name	Waterway	Year	Sample Gear	IBI* Score	IBI* Category
13	Lake-Cook Road	Des Plaines River	2004	BP	30	Fair
	Lake-Cook Road	Des Plaines River	2004	Seine	32	Fair
17	Oakton Street	Des Plaines River	2004	Small EF Boat	36	Fair
77	Elmhurst Road	Higgins Creek	2004	BP/Seine	NA	NA
78	Wille Road	Higgins Creek	2001	BP	28	Fair
	Wille Road	Higgins Creek	2001	Seine	30	Fair
	Wille Road	Higgins Creek	2002	BP	36	Fair
	Wille Road	Higgins Creek	2003	BP	30	Fair
	Wille Road	Higgins Creek	2004	BP	26	Fair
19	Belmont Avenue	Des Plaines River	2004	Small EF Boat	30	Fair
20	Roosevelt Road	Des Plaines River	2004	Small EF Boat	20	Poor
79	Higgins Road	Salt Creek	2004	Small EF Boat	36	Fair
80	Arlington Heights Road	Salt Creek	2004	BP	26	Fair
18	Devon Avenue	Salt Creek	2001	BP	26	Fair
	Devon Avenue	Salt Creek	2001	Seine	32	Fair
	Devon Avenue	Salt Creek	2002	BP	34	Fair
	Devon Avenue	Salt Creek	2002	Seine	30	Fair
	Devon Avenue	Salt Creek	2003	BP	22	Fair
	Devon Avenue	Salt Creek	2003	Seine	32	Fair
	Devon Avenue	Salt Creek	2004	BP	24	Fair
24	Wolf Road	Salt Creek	2004	BP	20	Poor
	Wolf Road	Salt Creek	2004	Seine	32	Fair
109	Brookfield Avenue	Salt Creek	2004	BP	32	Fair
	Brookfield Avenue	Salt Creek	2004	Seine	32	Fair
22	Ogden Avenue	Des Plaines River	2001	BP	32	Fair
	Ogden Avenue	Des Plaines River	2001	Seine	32	Fair
	Ogden Avenue	Des Plaines River	2002	BP	26	Fair

TABLE 8 (Continued): INDEX OF BIOTIC INTEGRITY SCORE AND CATEGORY CALCULATED FOR THE CHICAGO AREA WATERWAY SYSTEM BETWEEN 2001 AND 2004

Station No.	Station Name	Waterway	Year	Sample Gear	IBI* Score	IBI* Category
22	Ogden Avenue	Des Plaines River	2003	BP	26	Fair
	Ogden Avenue	Des Plaines River	2004	BP	28	Fair
23	Willow Springs Road	Des Plaines River	2004	Small EF Boat	32	Fair
29	Stephen Street	Des Plaines River	2004	BP	28	Fair
91	Material Services Road	Des Plaines River	2001	BP	26	Fair
	Material Services Road	Des Plaines River	2001	Seine	24	Fair
	Material Services Road	Des Plaines River	2002	BP	26	Fair
	Material Services Road	Des Plaines River	2002	Seine	28	Fair
	Material Services Road	Des Plaines River	2003	BP	26	Fair
	Material Services Road	Des Plaines River	2003	Seine	28	Fair
	Material Services Road	Des Plaines River	2004	BP	24	Fair
	Material Services Road	Des Plaines River	2004	Seine	24	Fair
110	Springinsguth Road	West Branch DuPage River	2004	BP	28	Fair
89	Walnut Lane	West Branch DuPage River	2004	BP	22	Fair
64	Lake Street	West Branch DuPage River	2001	BP	30	Fair
	Lake Street	West Branch DuPage River	2001	Seine	40	Fair
	Lake Street	West Branch DuPage River	2002	BP	22	Fair
	Lake Street	West Branch DuPage River	2002	Seine	35	Fair
	Lake Street	West Branch DuPage River	2003	BP	28	Fair
	Lake Street	West Branch DuPage River	2003	Seine	34	Fair
	Lake Street	West Branch DuPage River	2004	BP	24	Fair
	Lake Street	West Branch DuPage River	2004	Seine	34	Fair
90	Route 19	Poplar Creek	2004	BP	32	Fair
	Route 19	Poplar Creek	2004	Seine	32	Fair

*IBI=Index of Biotic Integrity.

Calumet River System. Carp and gizzard shad were also among the most abundant species collected from the Calumet River System (deep draft and wadeable). All but one collection from this system, which was considered poor, yielded a fair IBI rating.

Des Plaines River System. Various sunfish were abundant in the Des Plaines River System, including, green sunfish, bluegill, orangespotted sunfish, and pumpkinseed sunfish. Bluntnose minnows and spotfin shiners were also prevalent in this system. IBI scores were generally associated with fair ratings, with the exception of two stations.

Benthic Invertebrates

A list of benthic invertebrate taxa collected by the two sampling methods between 2001–2004 can be found in Table 9. Research and Development Department reports regarding benthic invertebrate sampling during these years have been published separately and posted on the District Website at www.mwrd.org under the "Biological Reports" heading. (R&D Report No. 04-4, "A Study of the Benthic Macroinvertebrate Community in Selected Chicago Metropolitan Area Waterways During 2001 and 2002," and Report No. 07-47, "A Study of the Benthic Macroinvertebrate Community in Selected Chicago Metropolitan Area Waterways During 2003 and 2004"). The complete benthic invertebrate data set from 2001–2004 including number of organisms from each species collected in petite ponar samplers, as well as Hester Dendy artificial plate samplers, is available in spreadsheet form on the District Website at the following address: http://www.mwrdgc.dst.il.us/RD/IEPA_Reports/Waterways/Biological%20Data/Benthic%20Invertebrate%20Data%20Chicago%20Area%20Waterways%202001-2004.xls .

North Branch Chicago River System. There was considerable variability among benthic communities analyzed in the waterways within this system. Oligochaeta was the dominant taxon collected from the North Shore Channel and the deep draft portion of the North Branch Chicago River. In general, benthic communities appeared less stressed in the shallow portion of the North Branch Chicago River than in the deep draft. Benthic invertebrate assemblages in the upstream portions of the West Fork North Branch Chicago River, Skokie River, and North Branch Chicago River were more balanced and included higher species and EPT richness than downstream stations. With a few exceptions, head capsule deformities were rarely observed in the samples from this system. Approximately 13 percent of midge specimens collected and examined from Grand Avenue in the North Branch Chicago River during 2002 exhibited head capsule deformities, but 2003 and 2004 samples from this station yielded only one specimen with a similar deformity. A small number (1-2 percent) of midges collected by Hester Dendy samplers from both stations in the Skokie River during 2001 also exhibited head capsule deformities.

South Branch Chicago River System. Tolerant taxa, primarily Oligochaeta, comprised a majority of the benthic invertebrate samples from most of the stations in this system. The benthic communities ranged from moderately stressed in the South Branch Chicago River and Lockport in the CSSC, to highly stressed in the rest of the CSSC and Bubbly Creek. There were occurrences of head capsule deformities at multiple stations throughout this system, but they

TABLE 9: LIST OF BENTHIC INVERTEBRATE TAXA COLLECTED IN HESTER DENDY AND PONAR SAMPLES FROM THE CHICAGO AREA WATERWAY SYSTEM BETWEEN 2001 AND 2004

Taxa
COELENTERATA (Hydroids)
Hydra
NEMATODA
PLATYHELMINTHES (Flat worms)
Turbellaria
ENTOPROCTA (Moss Animalcules)
Urnatella gracilis
ECTOPROCTA (Bryozoans)
Plumatella
ANNELLIDA
Oligochaeta (Aquatic Worms)
Hirudinea (Leeches)
Glossiphoniidae[1]
Helobdella[1]
Helobdella papillata
Helobdella stagnalis
Helobdella triserialis
Placobdella
Placobdella pediculata
Erpobdella punctata punctata
Mooreobdella bucera
Mooreobdella microstoma
CRUSTACEA
Ostracoda (Seed Shrimp)
Isopoda (Sow Bugs)
Caecidotea
Amphipoda (Side Swimmers)
Crangonyx
Gammarus[1]
Gammarus fasciatus
Hyalella azteca

Taxa (Continued)
CRUSTACEA (Continued)
Decapoda (Crayfish)
Cambarus bartonii
Orconectes
Orconectes immunis
Orconectes virilis
ARACHNOIDEA
Hydracarina (Water Mites)
INSECTA
Ephemeroptera (Mayflies)
Isonychia
Baetis[1]
Baetis flavistriga
Baetis intercalaris
Callibaetis
Pseudocloeon ephippiatum
Heptageniidae[1]
Heptagenia
Leucrocuta
Stenacron
Stenonema
Stenonema exiguum
Stenonema integrum
Stenonema terminatum
Tricorythodes
Caenis
Anthopotamus myops grp.
Hexagenia
Hexagenia bilineata
Hexagenia limbata
Plecoptera
Perlesta

TABLE 9 (Continued): LIST OF BENTHIC INVERTEBRATE TAXA COLLECTED IN HESTER DENDY AND PONAR SAMPLES THE FROM THE CHICAGO AREA WATERWAY SYSTEM BETWEEN 2001 AND 2004

Taxa (Continued)	Taxa (Continued)
INSECTA (Continued)	INSECTA (Continued)
Odonata (Damselflies and Dragonflies)	Coleoptera (Beetles)
Calopteryx	*Macronychus glabratus*
Coenagrionidae	*Stenelmis*[1]
Argia	*Stenelmis crenata* grp.
Enallagma	*Peltodytes*
Lestes	*Paracymus*
Libellulidae	*Tropisternus*
Somatochlora	*Berosus*
Stylurus	*Ectopria*
Hemiptera (True Bugs)	Diptera (True Flies)
Trepobates	*Chaoborus*
Corixidae	Ceratopogonidae
Palmacorixa	*Atrichopogon*
Megaloptera (Dobson flies)	*Bezzia*
Corydalus cornutus	*Ceratopogon*
Sialis	*Culicoides*
Trichoptera (Caddisflies)	*Serromyia*
Cyrnellus fraternus	Culicidae
Hydropsychidae[1]	*Hemerodromia*
Ceratopsyche morosa	*Rhamphomyia*
Cheumatopsyche	*Pericoma*
Hydropsyche	Simulidae
Hydropsyche betteni	*Simulium*
Hydropsych bidens	Tipulidae
Hydropsyche orris	*Tipula*
Hydropsyche simulans	Chironomidae (Midges) [1]
Potamyia flava	*Ablabesmyia*
Hydroptila	*Ablabesmyia mallochi*
Ocecetis	*Clinotanypus*
Lepidoptera (Aquatic Moths)	C*oelotanypus*
Petrophila	*Natarsia* sp. A
Coleoptera (Beetles)	*Nilotanypus fimbriatus*
Agabus	*Procladius (Holotanypus)*
Copelatus	*Tanypus*
Laccophilus maculosus	*Psectrotanypus dyari*
Ancyronyx variegata	*Thienemannimyia grp.*
Dubiraphia	

TABLE 9 (Continued): LIST OF BENTHIC INVERTEBRATE TAXA COLLECTED IN HESTER DENDY AND PONAR SAMPLES THE FROM THE CHICAGO AREA WATERWAY SYSTEM BETWEEN 2001 AND 2004

Taxa (Continued)	Taxa (Continued)
INSECTA (Continued)	INSECTA (Continued)
Diptera (True Flies)	Diptera (True Flies)
Corynoneura	*Parachironomus*
Corynoneura lobata	*Paracladopelma*
Cricotopus	*Paratendipes*
Cricotopus bicinctus grp.	*Phaenopsectra*
Cricotopus sylvestris grp.	*Phaenopsectra punctipes*
Cricotopus tremulus grp.	*Polypedilum fallax* grp.
Cricotopus trifascia grp.	*Polypedilum flavum*
Cricotopus/Orthocladius	*Polypedilum illinoense*
Euryhapsis	*Polypedilum scalanum* grp.
Heterotrissocladius	*Pseudochironomus*
Nanocladius[1]	*Saetheria*
Nanocladius crassicornus/rectinervis	*Stenochironomus*
Nanocladius distinctus	*Stictochironomus*
Orthocladius	*Tribelos fusciorne*
Parakiefferiella	*Xenochironomus xenolabis*
Rheocricotopus robacki	*Cladotanytarus*[1]
Thienemanniella n. sp. 3	*Cladotanytarsus mangus* grp.
Thienemanniella similis	*Cladotanytarsus vanderwulpi* grp.
Thienemanniella xena	*Paratanytarsus*
Tvetenia discoloripes grp.	*Rheotanytarsus*
Chironomini	*Tanytarsus*
Chironomus	*Tanytarsus glabrescens* grp.
Cladopelma	*Tanytarsus guerlus* grp.
Cryptochironomus	
Cryptotendipes	GASTROPODA (Snails)
Cryptotendipes sp. 15	*Amnicola*
Dicrotendipes[1]	*Campeloma decisum*
Dicrotendipes fumidus	*Ferrissia*
Dicrotendipes neomodestus	*Physa*
Dicrotendipes simpsoni	*Gyraulus*
Endochironomus nigricans	Helisoma
Glyptotendipes	*Menetus dilatatus*
Harnishia	*Planorbella*
Microchironomus	*Pleurocera*
Micropsectra	*Valvata*
Microtendipes	*Viviparus*

TABLE 9 (Continued): LIST OF BENTHIC INVERTEBRATE TAXA COLLECTED IN HESTER DENDY AND PONAR SAMPLES FROM THE CHICAGO AREA WATERWAY SYSTEM BETWEEN 2001 AND 2004

Taxa (Continued)	Taxa (Continued)
PELECYPODA (Mussels and Clams)[1]	PELECYPODA (Mussels and Clams)[1]
Corbicula fluminea	*Pisidium compressum*
Dreissena polymorpha	*Pisidium nitidum*
Sphaeriidae[1]	*Sphaerium*
Musculium	*Sphaerium simile*
Musculium transversum	*Lasmigona complanata*
Pisidium	

[1]Not counted as a discreet taxon.

generally constituted a low percentage of the overall number of organisms. However, five percent of midges collected from Loomis Street on the South Branch Chicago River in 2002 exhibited deformities.

Calumet River System. The benthic samples from the Calumet River System largely consisted of tolerant taxa, indicating communities were moderately to highly stressed. EPT taxa richness was low throughout, especially in the Grand Calumet River, Calumet-Sag Channel, and the Calumet River. Head capsule deformities were observed at a rate generally less than two percent, except for at Cicero Avenue on the Calumet-Sag Channel, where approximately ten percent of midge specimen collected exhibited head capsule deformities during 2003.

Des Plaines River System. The Des Plaines River System had relatively high total benthic invertebrate and EPT richness compared to other watersheds. However, there was substantial variability between and within some of the waterways in this system. Benthic communities at sampling stations within the Des Plaines River System ranged from slightly to highly stressed, but head capsule deformities were rare. The Des Plaines River had the highest total richness value in this system overall, although total taxa and EPT richness indicated a decreasing downstream trend in benthic community quality. Based on taxa and EPT richness, Salt Creek stations ranged from slightly to moderately stressed, but no downstream trend was identified.

Sediment Chemistry

Sediment quality can considerably impact overlying water quality, benthic community structure, food chain dynamics, and other elements of freshwater ecosystems. Since sediment acts as a reservoir for persistent or bioaccumulative contaminants, sediment data reflects a long-term record of quality.

The concentrations of the eight general chemistry constituents measured in sediment at each of the 40 sampled stations are presented in Table 10. The 11 measured trace metal concentrations for these stations can be found in Table 11. Table 12 contains the AVS, SEM, TOC, and particle size data for the 40 sampling stations. There were 111 total organic priority pollutants analyzed for each sample collected (listed in Table 3). Thirty-four out of the 111 priority pollutants were detected at least once in the samples, and 65 out of the 73 samples analyzed detected at least one of these organic priority pollutants. Tables 13–23 presents the concentrations of organic priority pollutants detected at each of the sampling stations.

Sediment Toxicity

The results from the Chironumus tentans ten-day toxicity tests for each sediment sample collected are presented in Table 24. A significant difference in Chironumus survival from the control indicates that the sediment is an unsuitable habitat for Chironumus survival. Significant differences in Chironumus dried weight and/or Chironumus ash-free dried weight compared to

TABLE 10: CHEMICAL CHARACTERISTICS OF SEDIMENT COLLECTED FROM THE CHICAGO AREA WATERWAY SYSTEM BETWEEN 2001 AND 2004

Station No.	Station Name	Point[1]	Waterway	Year	Constituents (Expressed on a dry weight basis)							
					TS (%)	TVS (%)	NH_3-N (mg/kg)	NO_2+NO_3 (mg/kg)	TKN (mg/kg)	TP (mg/kg)	Phenols (mg/kg)	TCN (mg/kg)
74	Lake Shore Dr.	C	Chicago River	2002	34.5	14	38	<0.02	3,901	2,750	0.016	1.690
	Lake Shore Dr.	S	Chicago River	2002	50.2	15	8	<0.02	2,279	1,370	0.008	0.532
100	Wells St.	C	Chicago River	2002	42.6	9	47	<0.02	3,282	2,106	0.011	0.695
	Wells St.	S	Chicago River	2002	39.2	10	76	<0.02	3,714	2,274	0.012	1.678
39	Madison St.	C	S Branch Chicago River	2002	34.0	14	35	<0.02	3,231	3,451	0.029	1.658
108	Loomis St.	C	S Branch Chicago River	2002	56.6	11	6	<0.02	1,317	1,383	0.012	2.988
	Loomis St.	S	S Branch Chicago River	2002	55.1	9	8	<0.02	847	938	0.006	0.481
99	Archer Ave.	C	S Fork S Branch Chgo. River	2002	35.3	18	228	ND	4,790	2,636	0.033	2.704
	Archer Ave.	S	S Fork S Branch Chgo. River	2002	38.0	15	353	ND	4,151	2,415	0.022	1.616
40	Damen Ave.	C	CSSC[2]	2002	41.1	15	96	ND	3,165	4,100	0.022	2.614
	Damen Ave.	S	CSSC[2]	2002	40.6	15	95	ND	3,797	4,234	0.020	3.397
75	Cicero Ave.	C	CSSC[2]	2002	54.4	14	13	ND	2,109	2,595	0.013	3.337
	Cicero Ave.	S	CSSC[2]	2002	78.4	7	39	ND	590	505	0.007	0.191
41	Harlem Ave.	C	CSSC[2]	2002	69.5	6	15	ND	638	675	0.007	0.906
	Harlem Ave.	S	CSSC[2]	2002	75.8	4	6	ND	629	687	0.004	0.492
92	Lockport Powerhouse	C	CSSC[2]	2002	53.9	10	4	0.39	2,421	ND	0.007	4.198
	Lockport Powerhouse	S	CSSC[2]	2002	68.0	7	2	0.25	839	1,318	0.005	0.848
52	Wentworth Ave.	S	Little Calumet River	2003	45.6	10	99	0.88	3,429	1,920	1.170	0.272
54	Joe Orr Rd.	C	Thorn Creek	2003	88.4	ND	4	4.90	100	118	0.018	0.020
	Joe Orr Rd.	S	Thorn Creek	2003	76.3	ND	6	3.43	150	115	0.033	0.043
97	170th St.	C	Thorn Creek	2003	67.7	5	5	0.82	611	1,344	0.080	0.047
	170th St.	S	Thorn Creek	2003	47.7	8	13	0.89	1,857	1,401	0.130	0.193
57	Ashland Ave.	S	Little Calumet River	2003	27.5	ND	36	2.28	1,948	1,845	0.316	0.178
49	Ewing Ave.	S	Calumet River	2003	62.3	5	25	1.24	971	387	0.586	0.156
50	Burnham Ave.	C	Wolf Lake	2003	36.2	8	7	0.64	492	91	0.116	0.149
	Burnham Ave.	S	Wolf Lake	2003	67.5	3	13	1.28	1,411	121	0.033	0.068

TABLE 10 (Continued): CHEMICAL CHARACTERISTICS OF SEDIMENT COLLECTED FROM THE CHICAGO AREA WATERWAY SYSTEM BETWEEN 2001 AND 2004

Station No.	Station Name	Point[1]	Waterway	Year	Constituents (Expressed on a dry weight basis)							
					TS (%)	TVS (%)	NH_3-N (mg/kg)	NO_2+NO_3 (mg/kg)	TKN (mg/kg)	TP (mg/kg)	Phenols (mg/kg)	TCN (mg/kg)
55	130th St.	C	Calumet River	2003	45.7	ND	27	1.52	1,472	617	0.593	0.123
	130th St.	S	Calumet River	2003	65.2	ND	14	1.79	410	214	0.072	0.031
86	Burnham Ave.	C	Grand Calumet River	2003	49.6	10	142	8.48	3,507	3,855	1.911	0.256
	Burnham Ave.	S	Grand Calumet River	2003	21.9	24	84	4.49	8,494	5,923	3.342	0.412
56	Indiana Ave.	C	Little Calumet River	2003	44.3	8	64	1.15	2,070	1,796	0.458	0.120
	Indiana Ave.	S	Little Calumet River	2003	61.7	4	12	1.41	619	824	0.424	0.089
76	Halsted St.	C	Little Calumet River	2003	68.6	19	40	1.64	1,664	1,173	0.325	0.124
	Halsted St.	S	Little Calumet River	2003	78.5	3	6	1.28	250	561	0.414	0.043
58	Ashland Ave.	C	Calumet-Sag Channel	2003	40.7	10	210	1.57	3,476	3,056	3.331	0.317
	Ashland Ave.	S	Calumet-Sag Channel	2003	56.2	5	59	1.94	1,694	1,761	2.852	0.226
59	Cicero Ave.	C	Calumet-Sag Channel	2003	48.9	15	57	1.31	2,371	3,760	1.627	0.198
	Cicero Ave.	S	Calumet-Sag Channel	2003	57.5	7	30	0.89	1,599	5,393	2.168	0.282
43	Route 83	C	Calumet-Sag Channel	2003	40.9	9	175	0.88	3,034	7,471	2.059	0.232
	Route 83	S	Calumet-Sag Channel	2003	49.9	8	65	1.04	2,473	4,706	3.136	0.122
12	Lake Cook Rd.	C	Buffalo Creek	2004	73.9	3	21	2.58	177	166	0.046	0.057
	Lake Cook Rd.	S	Buffalo Creek	2004	74.5	3	55	4.54	548	234	0.148	0.066
13	Lake Cook Rd.	C	Des Plaines River	2004	78.7	1	23	2.32	133	191	0.093	0.008
	Lake Cook Rd.	S	Des Plaines River	2004	33.6	15	111	6.31	3,882	1,512	0.262	0.384
17	Oakton St.	C	Des Plaines River	2004	77.5	2	25	3.20	272	383	0.071	0.015
	Oakton St.	S	Des Plaines River	2004	62.6	5	54	4.04	1,174	945	0.114	0.114
77	Elmhurst Rd.	C	Higgins Creek	2004	70.5	4	52	8.38	1,189	385	0.074	0.109
	Elmhurst Rd.	S	Higgins Creek	2004	56.5	6	41	2.95	1,611	391	0.083	0.133
19	Belmont Ave.	C	Des Plaines River	2004	69.8	4	16	3.65	496	316	0.153	0.057
	Belmont Ave.	S	Des Plaines River	2004	40.0	10	131	6.23	3,840	1,319	0.317	0.482
20	Roosevelt Rd.	C	Des Plaines River	2004	58.0	13	16	2.59	1,133	551	0.198	0.059
	Roosevelt Rd.	S	Des Plaines River	2004	45.2	13	118	7.71	3,151	1,698	0.148	0.363

TABLE 10 (Continued): CHEMICAL CHARACTERISTICS OF SEDIMENT COLLECTED FROM THE CHICAGO AREA WATERWAY SYSTEM BETWEEN 2001 AND 2004

Station No.	Station Name	Point[1]	Waterway	Year	Constituents (Expressed on a dry weight basis)							
					TS (%)	TVS (%)	NH_3-N (mg/kg)	NO_2+NO_3 (mg/kg)	TKN (mg/kg)	TP (mg/kg)	Phenols (mg/kg)	TCN (mg/kg)
79	Higgins Rd.	C	Salt Creek	2004	37.7	9	77	0.83	3,274	841	0.159	0.324
80	Arlington Hts. Rd.	C	Salt Creek	2004	81.3	3	19	4.18	427	126	0.060	0.028
	Arlington Hts. Rd.	S	Salt Creek	2004	84.4	2	7	3.41	189	161	0.071	0.019
18	Devon Ave.	C	Salt Creek	2004	69.9	2	19	5.19	571	516	0.074	0.056
	Devon Ave.	S	Salt Creek	2004	73.2	ND	14	4.13	481	468	0.085	0.049
24	Wolf Rd.	S	Salt Creek	2004	44.3	8	45	5.13	2,641	2,114	0.142	0.275
109	Brookfield Ave.	C	Salt Creek	2004	71.3	2	3	2.50	371	410	0.000	0.079
	Brookfield Ave.	S	Salt Creek	2004	63.5	6	110	0.49	2,253	992	0.129	0.441
22	Ogden Ave.	C	Des Plaines River	2004	88.2	3	3	2.47	197	241	0.135	0.036
	Ogden Ave.	S	Des Plaines River	2004	33.6	19	134	9.45	4,819	2,878	0.128	0.602
23	Willow Springs Rd.	C	Des Plaines River	2004	42.8	12	104	10.10	1,946	1,946	0.124	0.367
	Willow Springs Rd.	S	Des Plaines River	2004	41.1	14	174	9.91	2,632	2,993	0.109	0.316
29	Stephen St.	C	Des Plaines River	2004	82.2	14	6	1.71	526	737	0.123	<0.003
	Stephen St.	S	Des Plaines River	2004	32.4	18	174	10.40	4,314	2,996	0.377	0.160
110	Springinsguth Rd.	C	W Branch DuPage River	2004	71.0	4	23	1.33	764	162	0.100	0.082
	Springinsguth Rd.	S	W Branch DuPage River	2004	76.6	3	19	1.00	613	169	0.076	0.050
89	Walnut Lane.	C	W Branch DuPage River	2004	82.5	2	8	5.10	280	201	0.103	0.050
	Walnut Lane	S	W Branch DuPage River	2004	74.6	2	17	2.06	530	236	0.142	0.042
64	Lake St.	C	W Branch DuPage River	2004	81.8	2	18	0.82	376	405	0.062	0.016
	Lake St.	S	W Branch DuPage River	2004	68.4	3	37	2.14	908	609	0.094	0.039
90	Route 19	S	Poplar Creek	2004	73.0	3	30	1.21	669	406	0.144	<0.003

[1]C=Center, S=Side.
[2]Chicago Sanitary and Ship Canal.
ND=No data.

TABLE 11: TRACE METALS IN SEDIMENT COLLECTED FROM THE CHICAGO AREA WATERWAY SYSTEM BETWEEN 2002 AND 2004

Station No.	Station Name	Point[1]	Waterway	Year	As	Cd	Cr	Cu	Fe	Pb	Mn	Hg	Ni	Ag	Zn
					(mg/kg dry weight)										
74	Lake Shore Dr.	C	Chicago River	2002	<1	8.3	105	247	22,861	258	377	0.5600	43	4.8	701
	Lake Shore Dr.	S	Chicago River	2002	<1	2.9	61	115	21,727	143	374	0.6000	31	<0.1	345
100	Wells St.	C	Chicago River	2002	<1	6.5	99	284	33,700	996	367	0.9200	38	0.6	685
	Wells St.	S	Chicago River	2002	<1	15.4	177	233	27,800	808	366	0.9800	63	9.7	666
39	Madison St.	C	S Branch Chicago River	2002	<1	13.7	240	349	29,600	619	381	0.4500	99	5.8	848
108	Loomis St.	C	S Branch Chicago River	2002	<1	3.6	68	87	17,600	226	257	0.4300	34	3.9	288
	Loomis St.	S	S Branch Chicago River	2002	<1	2.5	61	88	20,300	344	351	0.2000	35	<0.1	593
99	Archer Ave.	C	S Fork S Branch Chgo. River	2002	<1	4.1	95	161	17,000	419	248	0.5000	50	4.0	630
	Archer Ave.	S	S Fork S Branch Chgo. River	2002	<1	3.6	85	181	19,600	354	286	0.7300	40	3.3	665
40	Damen Ave.	C	CSSC[2]	2002	<1	8.4	131	250	25,100	443	363	0.9900	58	3.7	825
	Damen Ave.	S	CSSC[2]	2002	<1	10.3	157	244	23,700	439	346	0.6500	60	4.9	810
75	Cicero Ave.	C	CSSC[2]	2002	<1	10.2	293	399	28,648	270	408	0.7500	88	<0.1	926
	Cicero Ave.	S	CSSC[2]	2002	<1	2.2	75	100	49,047	123	354	0.2700	55	<0.1	215
41	Harlem Ave.	C	CSSC[2]	2002	<1	5.8	92	123	20,467	110	261	0.3900	99	<0.1	440
	Harlem Ave.	S	CSSC[2]	2002	<1	2.4	46	54	18,314	49	301	0.1400	77	<0.1	254
92	Lockport Powerhouse	C	CSSC[2]	2002	<1	11.2	146	125	22,623	140	392	0.5300	68	<0.1	615
	Lockport Powerhouse	S	CSSC[2]	2002	<1	11.1	146	126	22,329	139	392	0.2500	68	<0.1	613
52	Wentworth Ave.	S	Little Calumet River	2003	<1	1.1	79	58	22,165	87	415	0.2770	43	1.6	319
54	Joe Orr Rd.	C	Thorn Creek	2003	<1	0.2	6	4	8,178	14	209	0.0648	5	<0.3	138
	Joe Orr Rd.	S	Thorn Creek	2003	<1	<0.1	5	2	6,852	11	123	0.1530	5	<0.3	313
97	170th St.	C	Thorn Creek	2003	<1	0.5	40	35	14,277	71	321	0.1730	22	0.6	197
	170th St.	S	Thorn Creek	2003	<1	0.1	33	27	12,335	33	340	0.3080	24	<0.3	93
57	Ashland Ave.	S	Little Calumet River	2003	<1	0.6	43	35	17,100	62	433	0.1060	29	0.6	230
49	Ewing Ave.	S	Calumet River	2003	<1	0.9	36	64	51,809	112	894	0.0612	26	0.7	296
50	Burnham Ave.	C	Wolf Lake	2003	ND	ND	ND	ND	ND	ND	ND	0.3510	ND	ND	ND
	Burnham Ave.	S	Wolf Lake	2003	<1	0.9	33	26	8,616	129	678	0.0833	8	<0.3	258

TABLE 11 (Continued): TRACE METALS IN SEDIMENT COLLECTED FROM THE CHICAGO AREA WATERWAY SYSTEM BETWEEN 2002 AND 2004

Station No.	Station Name	Point[1]	Waterway	Year	As	Cd	Cr	Cu	Fe	Pb	Mn	Hg	Ni	Ag	Zn
					(mg/kg dry weight)										
55	130th St.	C	Calumet River	2003	<1	1.5	61	61	32,459	137	929	0.0839	37	0.5	514
	130th St.	S	Calumet River	2003	<1	0.3	15	12	12,246	96	503	0.0668	10	0.4	139
86	Burnham Ave.	C	Grand Calumet River	2003	<1	6.1	116	224	16,395	340	209	1.0910	30	4.2	1,097
	Burnham Ave.	S	Grand Calumet River	2003	<1	13.4	232	637	35,469	669	734	1.9070	49	10.0	2,427
56	Indiana Ave.	C	Little Calumet River	2003	<1	1.7	58	96	25,922	145	598	0.6520	32	1.7	404
	Indiana Ave.	S	Little Calumet River	2003	<1	1.5	49	53	34,576	346	607	6.3970	26	1.0	526
76	Halsted St.	C	Little Calumet River	2003	<1	1.4	51	58	36,008	163	562	0.3500	38	0.8	372
	Halsted St.	S	Little Calumet River	2003	<1	0.5	143	64	35,547	120	3,167	0.1070	21	0.5	265
58	Ashland Ave.	C	Calumet-Sag Channel	2003	<1	1.6	49	71	22,218	139	495	0.2770	26	1.2	465
	Ashland Ave.	S	Calumet-Sag Channel	2003	<1	2.3	61	67	21,773	218	398	0.4010	30	1.0	456
59	Cicero Ave.	C	Calumet-Sag Channel	2003	<1	2.0	54	71	23,923	184	474	0.2120	23	1.1	628
	Cicero Ave.	S	Calumet-Sag Channel	2003	<1	4.0	76	79	31,211	278	529	0.3300	28	1.8	1,322
43	Route 83	C	Calumet-Sag Channel	2003	<1	3.9	91	81	34,216	223	595	0.3160	34	2.3	785
	Route 83	S	Calumet-Sag Channel	2003	<1	5.8	114	84	36,406	337	509	0.3490	42	2.1	1,359
12	Lake Cook Rd.	C	Buffalo Creek	2004	11	0.7	46	12	31,010	15	5,041	0.1028	36	<0.3	50
	Lake Cook Rd.	S	Buffalo Creek	2004	6	0.3	27	13	16,898	14	784	0.0636	18	<0.3	43
13	Lake Cook Rd.	C	Des Plaines River	2004	<1	<0.1	34	3	7,382	6	453	<0.00002	18	<0.3	31
	Lake Cook Rd.	S	Des Plaines River	2004	1	0.8	44	35	19,627	26	625	0.0035	25	<0.3	163
17	Oakton St.	C	Des Plaines River	2004	<1	0.2	32	7	10,456	13	438	<0.00002	21	<0.3	50
	Oakton St.	S	Des Plaines River	2004	<1	0.6	27	22	10,710	47	325	0.1413	13	1.2	94
77	Elmhurst Rd.	C	Higgins Creek	2004	6	1.0	33	29	21,388	62	413	0.1113	28	3.5	123
	Elmhurst Rd.	S	Higgins Creek	2004	3	1.9	79	45	15,897	52	314	0.0839	37	1.9	192
19	Belmont Ave.	C	Des Plaines River	2004	<1	5.9	88	39	12,793	48	555	0.0693	48	<0.3	185
	Belmont Ave.	S	Des Plaines River	2004	8	1.8	54	81	21,098	79	520	0.1630	45	<0.3	285
20	Roosevelt Rd.	C	Des Plaines River	2004	<1	1.2	93	51	19,508	92	509	0.6865	46	0.7	204
	Roosevelt Rd.	S	Des Plaines River	2004	4	3.3	88	115	24,957	120	554	0.1920	50	<0.3	407

TABLE 11 (Continued): TRACE METALS IN SEDIMENT COLLECTED FROM THE CHICAGO AREA WATERWAY SYSTEM BETWEEN 2002 AND 2004

Station No.	Station Name	Point[1]	Waterway	Year	As	Cd	Cr	Cu	Fe	Pb	Mn	Hg	Ni	Ag	Zn
					(mg/kg dry weight)										
79	Higgins Rd.	C	Salt Creek	2004	6	1.2	32	44	22,948	41	441	0.0628	29	<0.3	184
80	Arlington Hts. Rd.	C	Salt Creek	2004	5	0.4	18	11	16,155	10	264	0.0194	16	3.5	44
	Arlington Hts. Rd.	S	Salt Creek	2004	2	0.3	18	11	10,548	9	400	<0.00002	14	<0.3	36
18	Devon Ave.	C	Salt Creek	2004	4	0.2	25	11	11,787	14	329	0.0556	17	<0.3	79
	Devon Ave.	S	Salt Creek	2004	4	0.2	23	13	11,819	15	271	0.0891	14	<0.3	66
24	Wolf Rd.	S	Salt Creek	2004	3	1.2	34	50	17,937	60	422	0.1164	22	<0.3	180
109	Brookfield Ave.	C	Salt Creek	2004	3	0.5	59	17	13,821	31	434	<0.00002	27	<0.3	84
	Brookfield Ave.	S	Salt Creek	2004	5	10.7	61	58	23,093	99	434	0.1900	48	<0.3	4,573
22	Ogden Ave.	C	Des Plaines River	2004	<1	0.6	87	17	13,986	42	608	<0.00002	51	1.7	88
	Ogden Ave.	S	Des Plaines River	2004	2	3.4	74	98	22,320	117	670	0.2316	31	<0.3	366
23	Willow Springs Rd.	C	Des Plaines River	2004	4	2.4	64	71	24,564	73	887	0.2294	36	<0.3	295
	Willow Springs Rd.	S	Des Plaines River	2004	4	2.5	71	85	23,362	81	704	0.3497	44	<0.3	333
29	Stephen St.	C	Des Plaines River	2004	<1	0.4	13	6	7,292	15	333	0.0240	8	<0.3	50
	Stephen St.	S	Des Plaines River	2004	6	2.5	59	81	23,536	75	704	0.2922	30	<0.3	333
110	Springinsguth Rd.	C	W Branch DuPage River	2004	4	0.6	28	27	17,394	45	229	0.0172	22	<0.3	133
	Springinsguth Rd.	S	W Branch DuPage River	2004	2	0.4	23	23	15,088	45	246	<0.00002	18	4.1	103
89	Walnut Lane	C	W Branch DuPage River	2004	5	0.4	21	10	15,254	13	422	<0.00002	16	<0.3	56
	Walnut Lane	C	W Branch DuPage River	2004	<1	0.2	14	9	8,071	14	228	<0.00002	10	<0.3	46
64	Lake St.	C	W Branch DuPage River	2004	4	0.4	21	13	14,246	14	567	0.0185	15	<0.3	57
	Lake St.	S	W Branch DuPage River	2004	12	0.5	24	16	19,665	19	472	0.0727	17	<0.3	80
90	Route 19	S	Poplar Creek	2004	2	0.2	31	17	17,842	13	487	<0.00002	24	<0.3	61

[1]C=Center, S=Side.
[2]Chicago Sanitary and Ship Canal.
ND=No data.

TABLE 12: ACID VOLATILE SULFIDE, SIMULTANEOUSLY EXTRACTED METALS, TOTAL ORGANIC CARBON, AND PARTICLE SIZE SEDIMENT DATA FROM THE CHICAGO AREA WATERWAY SYSTEM BETWEEN 2002 AND 2004

Station No.	Station Name	Point[1]	Waterway	Year	AVS[2] (µmoles/g)	SEM[3] (µmoles/g)	SEM/AVS	TOC[4] (mg/kg)	Particle Size (Percent) Gravel	Sand	Silt	Clay
74	Lake Shore Drive	C	Chicago River	2002	7.23	7.70	1.07	51,800	1.5	27.4	38.2	32.8
	Lake Shore Drive	S	Chicago River	2002	BDL	10.66	2.26	43,000	6.3	41.7	26.3	25.7
100	Wells St.	C	Chicago River	2002	16.20	13.07	0.81	46,900	8.7	38.3	30.6	22.4
	Wells St.	S	Chicago River	2002	11.80	12.02	1.02	58,900	0.0	7.4	47.8	44.9
39	Madison St.	C	S Branch Chicago River	2002	BDL	9.45	1.40	63,000	0.9	32.1	39.0	28.0
108	Loomis St.	C	S Branch Chicago River	2002	9.84	5.35	0.54	47,200	35.8	48.5	8.3	7.4
	Loomis St.	S	S Branch Chicago River	2002	6.51	5.84	0.90	43,400	1.8	70.4	17.9	9.9
99	Archer Ave.	C	S Fork S Branch Chgo. River	2002	80.50	13.57	0.17	84,200	0.2	47.9	35.6	16.3
	Archer Ave.	S	S Fork S Branch Chgo. River	2002	124.00	10.41	0.08	71,700	0.3	53.4	31.1	15.3
40	Damen Ave.	C	CSSC[5]	2002	16.40	12.31	0.75	124,000	0.1	27.1	50.6	22.2
	Damen Ave.	S	CSSC[5]	2002	8.66	9.22	1.06	99,800	3.8	28.2	45.6	22.4
75	Cicero Ave.	C	CSSC[5]	2002	12.00	11.36	0.95	86,100	1.8	63.5	19.9	14.8
	Cicero Ave.	S	CSSC[5]	2002	BDL	3.64	1.22	43,100	3.1	80.2	7.8	8.9
41	Harlem Ave.	C	CSSC[5]	2002	8.23	3.77	0.46	36,000	16.5	74.3	4.9	4.2
	Harlem Ave.	S	CSSC[5]	2002	BDL	2.21	0.74	33,700	15.9	75.2	3.9	5.1
92	Lockport Powerhouse	C	CSSC[5]	2002	30.10	10.84	0.36	64,500	2.3	56.6	24.6	16.6
	Lockport Powerhouse	S	CSSC[5]	2002	7.11	3.15	0.44	40,000	0.7	85.9	6.5	7.0
52	Wentworth Ave.	S	Little Calumet River	2003	38.05	4.82	0.13	930	8.0	42.0	45.0	5.0
54	Joe Orr Rd.	C	Thorn Creek	2003	8.47	1.43	0.17	5,800	37.0	61.0	1.0	1.0
	Joe Orr Rd.	S	Thorn Creek	2003	33.54	3.23	0.10	4,200	0.0	93.0	6.0	1.0
97	170th St.	C	Thorn Creek	2003	0.50	1.29	2.58	8,900	3.0	80.0	12.0	5.0
	170th St.	S	Thorn Creek	2003	58.29	3.62	0.06	80,000	3.0	62.0	27.0	8.0
57	Ashland Ave.	S	Little Calumet River	2003	3.81	6.06	1.59	24,000	14.0	44.0	36.0	6.0
49	Ewing Ave.	S	Calumet River	2003	3.36	4.05	1.21	25,000	9.0	58.0	22.0	11.0
50	Burnham Ave.	C	Wolf Lake	2003	24.98	2.12	0.08	5,800	2.0	84.0	11.0	3.0
	Burnham Ave.	S	Wolf Lake	2003	12.50	3.48	0.28	120,000	10.0	12.0	75.0	3.0
55	130th St.	C	Calumet River	2003	0.24	5.51	22.96	33,000	0.0	40.0	41.0	19.0
	130th St.	S	Calumet River	2003	BDL	0.95	ND	6,100	1.0	84.0	12.0	3.0

TABLE 12 (Continued): ACID VOLATILE SULFIDE, SIMULTANEOUSLY EXTRACTED METALS, TOTAL ORGANIC CARBON, AND PARTICLE SIZE SEDIMENT DATA FROM THE CHICAGO AREA WATERWAY SYSTEM BETWEEN 2002 AND 2004

Station No.	Station Name	Point[1]	Waterway	Year	AVS[2] (µmoles/g)	SEM[3] (µmoles/g)	SEM/AVS	TOC[4] (mg/kg)	Particle Size (Percent) Gravel	Sand	Silt	Clay
86	Burnham Ave.	C	Grand Calumet River	2003	55.43	7.84	0.14	1,000	0.0	85.0	12.0	3.0
	Burnham Ave.	S	Grand Calumet River	2003	273.40	6.27	0.02	3,900	0.0	60.0	37.0	3.0
56	Indiana Ave.	C	Little Calumet River	2003	7.31	4.62	0.63	24,000	1.0	26.0	59.0	14.0
	Indiana Ave.	S	Little Calumet River	2003	32.60	17.85	0.55	9,800	12.0	70.0	15.0	3.0
76	Halsted St.	C	Little Calumet River	2003	12.07	6.65	0.55	17,000	0.0	35.0	53.0	11.0
	Halsted St.	S	Little Calumet River	2003	7.67	4.38	0.57	7,100	5.0	85.0	7.0	3.0
58	Ashland Ave.	C	Calumet-Sag Channel	2003	27.04	17.02	0.63	1,300	0.0	36.0	55.0	9.0
	Ashland Ave.	S	Calumet-Sag Channel	2003	56.26	30.22	0.54	440	0.0	70.0	27.0	3.0
59	Cicero Ave.	C	Calumet-Sag Channel	2003	12.00	8.53	0.71	37,000	1.0	22.0	58.0	19.0
	Cicero Ave.	S	Calumet-Sag Channel	2003	40.80	25.27	0.62	23,000	0.0	51.0	38.0	11.0
43	Route 83	C	Calumet-Sag Channel	2003	28.83	11.30	0.39	86,000	0.0	12.0	63.0	25.0
	Route 83	S	Calumet-Sag Channel	2003	43.80	24.20	0.55	43,000	1.0	9.0	42.0	48.0
12	Lake Cook Rd.	C	Buffalo Creek	2004	BDL	0.39	4.88	23,200	55.0	45.0	0.0	0.0
	Lake Cook Rd.	S	Buffalo Creek	2004	BDL	0.48	6.00	19,000	28.0	66.0	4.0	2.0
13	Lake Cook Rd.	C	Des Plaines River	2004	BDL	0.31	3.88	<1000	13.0	87.0	0.0	0.0
	Lake Cook Rd.	S	Des Plaines River	2004	7.48	2.51	0.34	65,300	0.0	26.0	52.0	22.0
17	Oakton St.	C	Des Plaines River	2004	BDL	0.55	6.88	20,500	12.0	88.0	0.0	0.0
	Oakton St.	S	Des Plaines River	2004	2.56	2.40	0.94	29,800	0.0	79.0	13.0	8.0
77	Elmhurst Rd.	C	Higgins Creek	2004	12.00	1.33	0.11	32,700	14.0	49.0	19.0	18.0
	Elmhurst Rd.	S	Higgins Creek	2004	14.00	3.11	0.22	47,900	4.0	30.0	44.0	22.0
19	Belmont Ave.	C	Des Plaines River	2004	BDL	1.53	19.13	29,800	23.0	75.0	1.0	1.0
	Belmont Ave.	S	Des Plaines River	2004	8.80	5.41	0.61	56,700	0.0	16.0	52.0	32.0
20	Roosevelt Rd.	C	Des Plaines River	2004	0.37	3.36	9.08	30,300	10.0	76.0	10.0	4.0
	Roosevelt Rd.	S	Des Plaines River	2004	3.18	7.57	2.38	65,600	0.0	22.0	51.0	27.0
79	Higgins Rd.	C	Salt Creek	2004	14.00	3.39	0.24	38,800	0.0	8.0	58.0	34.0
80	Arlington Hts. Rd.	C	Salt Creek	2004	BDL	0.10	1.25	34,100	12.0	88.0	0.0	0.0
	Arlington Hts. Rd.	S	Salt Creek	2004	0.29	0.23	0.79	25,500	40.0	55.0	3.0	2.0

TABLE 12 (Continued): ACID VOLATILE SULFIDE, SIMULTANEOUSLY EXTRACTED METALS, TOTAL ORGANIC CARBON, AND PARTICLE SIZE SEDIMENT DATA FROM THE CHICAGO AREA WATERWAY SYSTEM BETWEEN 2002 AND 2004

Station No.	Station Name	Point[1]	Waterway	Year	AVS[2] (µmoles/g)	SEM[3] (µmoles/g)	SEM/AVS	TOC[4] (mg/kg)	Particle Size (Percent) Gravel	Sand	Silt	Clay
18	Devon Ave.	C	Salt Creek	2004	BDL	0.51	6.38	9,480	0.0	99.0	1.0	0.0
	Devon Ave.	S	Salt Creek	2004	BDL	0.46	5.75	14,600	3.0	96.0	1.0	0.0
24	Wolf Rd.	S	Salt Creek	2004	10.50	5.52	0.53	48,800	0.0	23.0	41.0	36.0
109	Brookfield Ave.	C	Salt Creek	2004	0.14	1.20	8.57	38,600	11.0	88.0	1.0	0.0
	Brookfield Ave.	S	Salt Creek	2004	2.71	3.18	1.17	42,900	0.0	44.0	32.0	24.0
22	Ogden Ave.	C	Des Plaines River	2004	0.20	0.54	2.70	38,000	59.0	41.0	0.0	0.0
	Ogden Ave.	S	Des Plaines River	2004	1.28	5.79	4.52	79,400	0.0	52.0	37.0	11.0
23	Willow Springs Rd.	C	Des Plaines River	2004	1.51	7.59	5.03	59,700	0.0	34.0	45.0	21.0
	Willow Springs Rd.	S	Des Plaines River	2004	0.92	BDL	0.22	72,900	0.0	10.0	65.0	25.0
29	Stephen St.	C	Des Plaines River	2004	BDL	0.88	11.00	88,600	72.0	28.0	0.0	0.0
	Stephen St.	S	Des Plaines River	2004	6.60	7.82	1.18	91,500	0.0	18.0	58.0	24.0
110	Springinsguth Rd.	C	W Branch DuPage River	2004	27.00	1.47	0.05	43,400	5.0	69.0	17.0	9.0
	Springinsguth Rd.	S	W Branch DuPage River	2004	0.62	0.26	0.42	31,900	22.0	63.0	9.0	6.0
89	Walnut Lane	C	W Branch DuPage River	2004	BDL	0.10	1.25	43,600	42.0	58.0	0.0	0.0
	Walnut Lane	S	W Branch DuPage River	2004	BDL	0.22	2.75	35,200	17.0	82.0	1.0	0.0
64	Lake St.	C	W Branch DuPage River	2004	0.16	0.19	1.19	13,100	48.0	48.0	2.0	2.0
	Lake St.	S	W Branch DuPage River	2004	BDL	0.43	5.38	15,300	21.0	52.0	14.0	13.0
90	Route 19	S	Poplar Creek	2004	0.51	0.92	1.80	31,100	9.0	27.0	33.0	31.0

[1]C=Center, S=Side.
[2]Acid Volatile Sulfide.
[3]Simultaneously Extracted Metals.
[4]Total Organic Carbon.
[5]Chicago Sanitary and Ship Canal.
BDL=Below detection limit.
ND=No data.

TABLE 13: ORGANIC PRIORITY POLLUTANTS DETECTED IN SEDIMENT COLLECTED FROM THE CHICAGO RIVER DURING 2002

Compound[1]	Chicago River 2002			
	74 center	74 side	100 center	100 side
Chlorobenzene	ND	ND	ND	ND
Methylene chloride	ND	ND	ND	ND
Toluene	ND	ND	ND	ND
Acenaphthene	ND	ND	133,636	ND
Acenaphthylene	ND	ND	ND	ND
Anthracene	ND	ND	197,597	ND
Benzo(a)anthracene	3,566	4,958	320,609	5,495
Benzo(a)pyrene	ND	ND	263,107	ND
3,4-Benzofluoranthene	4,011	5,318	237,613	ND
Benzo(ghi)perylene	1,796	2,130	90,603	ND
Benzo(k)fluoranthene	4,850	5,993	271,756	ND
Bis(2-ethylhexyl)phthalate	ND	ND	ND	ND
Butylbenzyl phthalate	ND	ND	ND	ND
Chrysene	4,570	5,936	354,511	6,925
Dibenzo(a,h)anthracene	ND	ND	ND	ND
Di-n-butyl phthalate	ND	ND	ND	ND
Di-n-octyl phthalate	ND	ND	ND	ND
Fluoranthene	8,117	10,101	969,568	11,804
Fluorene	ND	ND	142,392	ND
Indeno(1,2,3-cd)pyrene	ND	2,032	87,800	ND
Naphthalene	ND	ND	5,691	ND
Phenanthrene	4,490	4,704	1,005,339	7,621
Pyrene	7,210	9,167	701,548	10,164
Aldrin	ND	ND	ND	ND
4,4'-DDT	31	36	29	63
4,4'-DDE	52	41	59	49
4,4'-DDD	75	68	75	79
Dieldrin	ND	ND	ND	ND
Endosulfan sulfate	ND	ND	ND	ND
PCB-1254	ND	ND	ND	ND
PCB-1232	1,314	1,388	1,495	2,166
PCB-1248	ND	ND	ND	ND
PCB-1260	372	497	534	1,656
PCB-1016	ND	ND	ND	ND

[1]Concentrations expressed as μg/kg dry weight.
ND=Not detectable.

TABLE 14: ORGANIC PRIORITY POLLUTANTS DETECTED IN SEDIMENT COLLECTED FROM THE SOUTH BRANCH CHICAGO RIVER AND SOUTH FORK SOUTH BRANCH CHICAGO RIVER DURING 2002

Compound[1]	South Branch Chicago River 2002			South Fork South Branch Chicago River 2002	
	39 center	108 center	108 side	99 center	99 side
Chlorobenzene	ND	ND	ND	ND	ND
Methylene chloride	ND	ND	ND	ND	ND
Toluene	ND	ND	ND	42	ND
Acenaphthene	11,541	ND	4,898	ND	ND
Acenaphthylene	ND	ND	ND	ND	ND
Anthracene	16,513	5,386	12,524	ND	ND
Benzo(a)anthracene	37,272	12,767	16,187	3,628	ND
Benzo(a)pyrene	42,585	9,578	11,945	ND	ND
3,4-Benzofluoranthene	35,059	8,448	9,804	ND	ND
Benzo(ghi)perylene	16,189	ND	5,440	ND	ND
Benzo(k)fluoranthene	47,795	10,599	14,274	ND	ND
Bis(2-ethylhexyl)phthalate	68,074	ND	ND	ND	ND
Butylbenzyl phthalate	ND	ND	ND	ND	ND
Chrysene	43,896	13,865	15,433	4,803	2,097
Dibenzo(a,h)anthracene	ND	ND	ND	ND	ND
Di-n-butyl phthalate	ND	ND	ND	ND	ND
Di-n-octyl phthalate	ND	ND	ND	ND	ND
Fluoranthene	109,024	33,205	52,652	8,589	3,974
Fluorene	13,782	ND	6,886	ND	ND
Indeno(1,2,3-cd)pyrene	15,200	ND	ND	ND	ND
Naphthalene	6,620	ND	ND	ND	ND
Phenanthrene	102,265	24,197	55,045	7,157	2,598
Pyrene	90,056	27,357	38,535	7,058	3,222
Aldrin	ND	ND	ND	ND	ND
4,4'-DDT	ND	ND	ND	ND	55
4,4'-DDE	53	70	58	130	61
4,4'-DDD	143	70	57	137	77
Dieldrin	ND	ND	ND	32	17
Endosulfan sulfate	ND	33	24	ND	ND
PCB-1254	ND	ND	ND	1,471	1,015
PCB-1232	ND	ND	ND	ND	ND
PCB-1248	2,149	1,501	1,022	1,703	556
PCB-1260	327	1,157	ND	1,319	1,668
PCB-1016	ND	ND	ND	ND	ND

[1]Concentrations expressed as µg/kg dry weight.
ND=Not detectable.

TABLE 15: ORGANIC PRIORITY POLLUTANTS DETECTED IN SEDIMENT COLLECTED FROM THE CHICAGO SANITARY AND SHIP CANAL DURING 2002

Compound[1]	Chicago Sanitary and Ship Canal 2002							
	40 center	40 side	75 center	75 side	41 center	41 side	92 center	92 side
Chlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND
Methylene chloride	ND	ND	ND	ND	ND	ND	ND	ND
Toluene	ND	ND	ND	ND	ND	ND	ND	ND
Acenaphthene	ND	ND	2,359	ND	ND	ND	ND	ND
Acenaphthylene	ND	ND	ND	ND	ND	ND	ND	ND
Anthracene	ND	ND	4,182	ND	3,629	2,601	ND	ND
Benzo(a)anthracene	2,802	ND	14,984	ND	6,558	4,567	2,076	1,616
Benzo(a)pyrene	2,538	ND	14,490	ND	5,779	3,760	2,215	1,854
3,4-Benzofluoranthene	2,701	ND	15,149	ND	5,333	3,499	2,052	1,711
Benzo(ghi)perylene	ND	ND	5,238	ND	2,679	1,584	1,155	ND
Benzo(k)fluoranthene	3,245	ND	18,042	ND	6,842	4,769	2,551	2,090
Bis(2-ethylhexyl)phthalate	ND	ND	ND	ND	ND	ND	ND	ND
Butylbenzyl phthalate	ND	ND	ND	ND	ND	ND	ND	ND
Chrysene	3,654	3,282	18,657	ND	7,663	6,176	2,783	2,322
Dibenzo(a,h)anthracene	ND	ND	ND	ND	ND	ND	ND	ND
Di-n-butyl phthalate	ND	ND	ND	ND	ND	ND	ND	ND
Di-n-octyl phthalate	ND	ND	ND	ND	ND	ND	ND	ND
Fluoranthene	6,769	6,369	45,788	1,781	18,790	14,295	4,176	3,352
Fluorene	ND	ND	2,488	ND	2,441	1,879	ND	ND
Indeno(1,2,3-cd)pyrene	ND	ND	4,820	ND	2,375	1,454	ND	ND
Naphthalene	ND	ND	ND	ND	ND	ND	ND	ND
Phenanthrene	3,838	3,409	29,916	2,050	15,402	15,893	2,131	1,501
Pyrene	5,795	5,529	37,160	1,533	14,331	11,857	4,485	3,824
Aldrin	ND	14	ND	ND	ND	ND	ND	ND
4,4’-DDT	105	67	ND	ND	ND	ND	9	8
4,4’-DDE	105	100	ND	ND	47	ND	21	20
4,4’-DDD	151	136	103	7	71	35	15	11
Dieldrin	9	ND	7	ND	ND	ND	ND	ND
Endosulfan sulfate	ND	ND	ND	ND	ND	7	9	8
PCB-1254	ND	ND	3,057	ND	767	333	ND	ND
PCB-1232	ND	ND	ND	ND	ND	ND	ND	ND
PCB-1248	1,581	1,153	7,945	392	1,756	864	542	452
PCB-1260	2,209	1,976	2,720	64	354	127	212	218
PCB-1016	ND	ND	ND	ND	ND	ND	ND	ND

[1]Concentrations expressed as µg/kg dry weight.
ND=Not detectable.

TABLE 16: ORGANIC PRIORITY POLLUTANTS DETECTED IN SEDIMENT COLLECTED FROM THE CALUMET RIVER AND THE GRAND CALUMET RIVER DURING 2003

Compound[1]	Calumet River 2003		Grand Calumet River 2003	
	49 side	55 center	86 center	86 side
Chlorobenzene	ND	ND	ND	ND
Methylene chloride	ND	ND	ND	ND
Toluene	ND	ND	ND	ND
Acenaphthene	ND	ND	ND	ND
Acenaphthylene	ND	ND	3,825	1,939
Anthracene	ND	ND	2,126	ND
Benzo(a)anthracene	ND	ND	11,459	5,530
Benzo(a)pyrene	1,475	ND	12,919	7,369
3,4-Benzofluoranthene	1,346	ND	10,689	5,905
Benzo(ghi)perylene	ND	ND	ND	ND
Benzo(k)fluoranthene	1,245	ND	8,594	5,776
Bis(2-ethylhexyl)phthalate	36,031	ND	32,660	121,266
Butylbenzyl phthalate	ND	ND	ND	33,280
Chrysene	1,596	ND	15,259	7,434
Dibenzo(a,h)anthracene	ND	ND	ND	ND
Di-n-butyl phthalate	ND	ND	ND	ND
Di-n-octyl phthalate	ND	ND	ND	81,255
Fluoranthene	2,131	ND	13,383	9,780
Fluorene	ND	ND	ND	ND
Indeno(1,2,3-cd)pyrene	ND	ND	ND	ND
Naphthalene	ND	ND	ND	ND
Phenanthrene	2,108	ND	3,967	3,725
Pyrene	2,639	ND	17,855	13,754
Aldrin	ND	ND	ND	ND
4,4'-DDT	ND	17	51	536
4,4'-DDE	ND	ND	60	32
4,4'-DDD	ND	ND	91	81
Dieldrin	ND	ND	ND	25
Endosulfan sulfate	ND	ND	ND	ND
PCB-1254	366	657	ND	1,196
PCB-1232	ND	ND	ND	ND
PCB-1248	366	1,357	ND	ND
PCB-1260	ND	ND	821	ND
PCB-1016	296	1,138	682	ND

[1]Concentrations expressed as µg/kg dry weight.
ND=Not detectable.

TABLE 17: ORGANIC PRIORITY POLLUTANTS DETECTED IN SEDIMENT COLLECTED FROM THORN CREEK AND WOLF LAKE DURING 2003

Compound[1]	Thorn Creek 2003			Wolf Lake 2003	
	54 center	97 center	97 side	50 center	50 side
Chlorobenzene	ND	ND	ND	ND	ND
Methylene chloride	ND	ND	ND	ND	ND
Toluene	ND	ND	ND	ND	ND
Acenaphthene	ND	ND	ND	ND	ND
Acenaphthylene	ND	ND	ND	ND	ND
Anthracene	ND	286	ND	ND	ND
Benzo(a)anthracene	ND	745	896	248	427
Benzo(a)pyrene	ND	597	977	201	394
3,4-Benzofluoranthene	ND	803	1,258	171	460
Benzo(ghi)perylene	ND	222	463	95	ND
Benzo(k)fluoranthene	ND	560	1,119	224	362
Bis(2-ethylhexyl)phthalate	ND	ND	4,828	2,706	ND
Butylbenzyl phthalate	6,059	ND	2,278	ND	ND
Chrysene	ND	970	1,319	243	511
Dibenzo(a,h)anthracene	ND	ND	ND	ND	ND
Di-n-butyl phthalate	ND	ND	ND	ND	ND
Di-n-octyl phthalate	10,591	ND	ND	ND	ND
Fluoranthene	ND	2,766	2,716	526	1,047
Fluorene	ND	ND	ND	ND	ND
Indeno(1,2,3-cd)pyrene	ND	256	587	103	182
Naphthalene	ND	ND	ND	ND	ND
Phenanthrene	ND	1,399	1,240	318	483
Pyrene	ND	2,486	2,213	454	900
Aldrin	ND	8	17	ND	ND
4,4'-DDT	ND	19	29	ND	69
4,4'-DDE	ND	ND	ND	ND	ND
4,4'-DDD	ND	63	32	ND	28
Dieldrin	ND	46	44	ND	ND
Endosulfan sulfate	ND	ND	ND	ND	ND
PCB-1254	ND	2,373	2,063	ND	ND
PCB-1232	ND	ND	ND	ND	ND
PCB-1248	ND	ND	ND	ND	ND
PCB-1260	ND	ND	ND	ND	ND
PCB-1016	ND	2,606	944	ND	ND

[1]Concentrations expressed as µg/kg dry weight.
ND=Not detectable.

TABLE 18: ORGANIC PRIORITY POLLUTANTS DETECTED IN SEDIMENT COLLECTED FROM THE LITTLE CALUMET RIVER DURING 2003

Compound[1]	Little Calumet River 2003					
	52 side	57 side	56 center	56side	76 center	76 side
Chlorobenzene	ND	ND	ND	ND	ND	ND
Methylene chloride	ND	ND	ND	ND	ND	ND
Toluene	ND	ND	ND	ND	ND	ND
Acenaphthene	ND	ND	ND	ND	ND	ND
Acenaphthylene	ND	ND	ND	ND	ND	ND
Anthracene	ND	ND	ND	ND	2,410	ND
Benzo(a)anthracene	ND	ND	ND	3,539	3,312	1,364
Benzo(a)pyrene	ND	ND	1,444	2,889	2,485	1,231
3,4-Benzofluoranthene	5,019	ND	1,820	2,959	2,211	1,469
Benzo(ghi)perylene	ND	ND	ND	1,203	ND	ND
Benzo(k)fluoranthene	5,751	ND	1,804	2,544	2,023	1,318
Bis(2-ethylhexyl)phthalate	ND	ND	ND	ND	ND	ND
Butylbenzyl phthalate	ND	ND	ND	ND	ND	ND
Chrysene	5,784	ND	1,898	3,924	3,383	1,534
Dibenzo(a,h)anthracene	ND	ND	ND	ND	ND	ND
Di-n-butyl phthalate	ND	ND	ND	ND	ND	ND
Di-n-octyl phthalate	ND	ND	ND	ND	4,370	41,071
Fluoranthene	11,351	3,404	2,302	8,455	7,541	3,703
Fluorene	ND	ND	ND	ND	ND	ND
Indeno(1,2,3-cd)pyrene	ND	ND	ND	1,347	ND	ND
Naphthalene	ND	ND	ND	ND	ND	ND
Phenanthrene	4,517	ND	ND	5,604	7,800	1,883
Pyrene	8,379	2,756	2,771	7,098	7,286	3,152
Aldrin	ND	ND	ND	ND	ND	ND
4,4'-DDT	ND	20	13	ND	ND	8
4,4'-DDE	ND	20	ND	ND	ND	ND
4,4'-DDD	17	25	ND	10	ND	ND
Dieldrin	ND	19	ND	ND	ND	ND
Endosulfan sulfate	ND	ND	ND	ND	ND	ND
PCB-1254	405	618	416	ND	ND	ND
PCB-1232	ND	ND	ND	ND	ND	ND
PCB-1248	ND	ND	ND	ND	ND	ND
PCB-1260	ND	ND	ND	ND	ND	ND
PCB-1016	ND	ND	396	ND	232	ND

[1]Concentrations expressed as µg/kg dry weight.
ND=Not detectable.

TABLE 19: ORGANIC PRIORITY POLLUTANTS DETECTED IN SEDIMENT COLLECTED FROM THE CALUMET-SAG CHANNEL DURING 2003

Compound[1]	Calumet-Sag Channel 2003					
	58 center	58 side	59 center	59 side	43 center	43 side
Chlorobenzene	ND	ND	116	ND	ND	ND
Methylene chloride	ND	ND	ND	ND	ND	ND
Toluene	ND	ND	ND	ND	ND	ND
Acenaphthene	ND	ND	2,586	ND	ND	ND
Acenaphthylene	ND	ND	ND	ND	ND	ND
Anthracene	ND	ND	1,970	ND	ND	ND
Benzo(a)anthracene	2,045	2,529	3,371	2,676	ND	ND
Benzo(a)pyrene	ND	ND	ND	3,117	1,770	1,646
3,4-Benzofluoranthene	ND	ND	ND	3,529	2,286	2,109
Benzo(ghi)perylene	ND	ND	ND	1,487	ND	ND
Benzo(k)fluoranthene	ND	ND	ND	3,398	2,370	1,480
Bis(2-ethylhexyl)phthalate	ND	25,380	83,059	38,962	130,010	74,650
Butylbenzyl phthalate	ND	ND	ND	2,847	ND	ND
Chrysene	2,989	3,228	4,944	3,722	2,061	2,346
Dibenzo(a,h)anthracene	ND	ND	ND	ND	ND	ND
Di-n-butyl phthalate	ND	3,088	ND	ND	ND	ND
Di-n-octyl phthalate	ND	ND	ND	ND	ND	ND
Fluoranthene	5,492	5,432	7,144	5,925	2,994	3,079
Fluorene	ND	ND	ND	ND	ND	ND
Indeno(1,2,3-cd)pyrene	ND	ND	ND	1,504	ND	ND
Naphthalene	ND	ND	ND	ND	ND	ND
Phenanthrene	2,162	2,069	10,655	2,684	ND	ND
Pyrene	4,484	4,821	8,472	5,565	3,268	3,935
Aldrin	ND	ND	318	ND	ND	15
4,4'-DDT	ND	ND	ND	25	ND	ND
4,4'-DDE	17	23	131	27	39	65
4,4'-DDD	ND	ND	59	31	29	26
Dieldrin	16	12	ND	12	ND	ND
Endosulfan sulfate	ND	ND	ND	ND	ND	ND
PCB-1254	486	767	3,791	676	698	1,928
PCB-1232	ND	ND	ND	ND	ND	ND
PCB-1248	ND	ND	3,748	ND	ND	ND
PCB-1260	ND	ND	1,162	237	274	528
PCB-1016	390	668	2,718	558	548	2,192

[1]Concentrations expressed as µg/kg dry weight.
ND=Not detectable.

TABLE 20: ORGANIC PRIORITY POLLUTANTS DETECTED IN SEDIMENT COLLECTED FROM BUFFALO CREEK AND HIGGINS CREEK DURING 2004

Compound[1]	Buffalo Creek 2004	Higgins Creek 2004	
	12 side	77 center	77 side
Chlorobenzene	ND	ND	ND
Methylene chloride	ND	19	29
Toluene	ND	ND	ND
Acenaphthene	ND	ND	ND
Acenaphthylene	ND	ND	ND
Anthracene	ND	1,224	ND
Benzo(a)anthracene	ND	2,696	2,171
Benzo(a)pyrene	ND	2,695	2,947
3,4-Benzofluoranthene	ND	2,543	3,767
Benzo(ghi)perylene	ND	1,092	1,385
Benzo(k)fluoranthene	ND	3,227	3,914
Bis(2-ethylhexyl)phthalate	ND	9,383	ND
Butylbenzyl phthalate	ND	ND	ND
Chrysene	ND	3,180	3,609
Dibenzo(a,h)anthracene	ND	ND	ND
Di-n-butyl phthalate	ND	ND	ND
Di-n-octyl phthalate	ND	5,900	ND
Fluoranthene	431	8,893	7,947
Fluorene	ND	ND	ND
Indeno(1,2,3-cd)pyrene	ND	1,067	1,563
Naphthalene	ND	ND	ND
Phenanthrene	ND	4,574	1,388
Pyrene	318	6,711	5,819
Aldrin	ND	ND	ND
4,4'-DDT	ND	ND	11
4,4'-DDE	ND	13	24
4,4'-DDD	ND	16	21
Dieldrin	ND	ND	ND
Endosulfan sulfate	ND	ND	ND
PCB-1254	ND	ND	ND
PCB-1232	ND	ND	ND
PCB-1248	ND	ND	ND
PCB-1260	ND	ND	ND
PCB-1016	ND	ND	ND

[1]Concentrations expressed as µg/kg dry weight.
ND=Not detectable.

TABLE 21: ORGANIC PRIORITY POLLUTANTS DETECTED IN SEDIMENT COLLECTED FROM THE DES PLAINES RIVER DURING 2004

Compound[1]	Des Plaines River 2004						
	13 side	17 center	17 side	19 center	19 side	20 center	20 side
Chlorobenzene	ND	ND	ND	ND	ND	ND	ND
Methylene chloride	ND	ND	ND	ND	ND	ND	ND
Toluene	ND	ND	ND	ND	ND	ND	ND
Acenaphthene	ND	ND	ND	ND	ND	ND	ND
Acenaphthylene	ND	ND	ND	ND	ND	ND	ND
Anthracene	ND	ND	632	ND	ND	ND	3,056
Benzo(a)anthracene	2,019	522	2,927	371	2,579	1,352	3,293
Benzo(a)pyrene	2,419	612	3,310	365	3,415	1,647	4,155
3,4-Benzofluoranthene	3,078	755	3,679	361	5,077	2,477	6,460
Benzo(ghi)perylene	1,161	312	1,612	ND	1,667	812	2,143
Benzo(k)fluoranthene	2,565	788	3,800	461	4,621	2,484	5,075
Bis(2-ethylhexyl)phthalate	ND	ND	ND	ND	ND	ND	9,479
Butylbenzyl phthalate	ND	ND	ND	ND	ND	ND	ND
Chrysene	3,182	843	3,838	477	4,292	2,135	5,718
Dibenzo(a,h)anthracene	ND	ND	ND	ND	ND	ND	ND
Di-n-butyl phthalate	ND	ND	ND	ND	ND	ND	ND
Di-n-octyl phthalate	ND	ND	ND	ND	ND	ND	16,158
Fluoranthene	7,494	1,895	9,034	1,041	8,389	4,280	11,537
Fluorene	ND	ND	ND	ND	ND	ND	ND
Indeno(1,2,3-cd)pyrene	1,186	337	1,626	ND	1,904	882	2,429
Naphthalene	ND	ND	ND	ND	ND	ND	ND
Phenanthrene	2,893	756	4,327	668	2,901	1,897	3,607
Pyrene	5,399	1,393	6,697	817	6,218	3429	8,852
Aldrin	ND	ND	ND	ND	ND	ND	ND
4,4’-DDT	ND	ND	34	ND	37	30	29
4,4’-DDE	ND	ND	26	ND	39	36	37
4,4’-DDD	ND	14	96	16	77	85	104
Dieldrin	ND	ND	ND	ND	ND	ND	ND
Endosulfan sulfate	ND	ND	ND	ND	ND	ND	ND
PCB-1254	ND	ND	ND	ND	ND	ND	ND
PCB-1232	ND	ND	ND	ND	ND	ND	ND
PCB-1248	ND	ND	ND	ND	ND	ND	ND
PCB-1260	ND	ND	331	ND	ND	ND	ND
PCB-1016	ND	ND	ND	ND	ND	ND	ND

TABLE 21 (Continued): ORGANIC PRIORITY POLLUTANTS DETECTED IN SEDIMENT COLLECTED FROM THE DES PLAINES RIVER DURING 2004

Compound[1]	Des Plaines River 2004				
	22 center	22 side	23 center	23 side	29 side
Chlorobenzene	ND	ND	ND	ND	ND
Methylene chloride	ND	ND	ND	ND	ND
Toluene	ND	ND	ND	ND	ND
Acenaphthene	ND	ND	ND	ND	ND
Acenaphthylene	ND	ND	ND	ND	ND
Anthracene	ND	ND	ND	ND	ND
Benzo(a)anthracene	ND	4,365	1,112	2,476	1,765
Benzo(a)pyrene	ND	5,160	1,506	3,495	2,534
3,4-Benzofluoranthene	ND	6,627	2,217	5,018	3,990
Benzo(ghi)perylene	ND	2,271	794	1,855	1,281
Benzo(k)fluoranthene	ND	6,894	2,181	4,281	3,529
Bis(2-ethylhexyl)phthalate	ND	ND	ND	ND	ND
Butylbenzyl phthalate	ND	ND	ND	ND	ND
Chrysene	ND	6627	2,027	4,384	3,215
Dibenzo(a,h)anthracene	ND	ND	ND	ND	ND
Di-n-butyl phthalate	ND	ND	ND	ND	ND
Di-n-octyl phthalate	ND	ND	ND	ND	ND
Fluoranthene	ND	13,141	3,818	7,821	5,440
Fluorene	ND	ND	ND	ND	ND
Indeno(1,2,3-cd)pyrene	ND	2,616	889	2,074	1,488
Naphthalene	ND	ND	ND	ND	ND
Phenanthrene	ND	4,243	1,154	2,282	1,555
Pyrene	ND	10,383	3,033	6,029	4,296
Aldrin	ND	ND	ND	ND	ND
4,4'-DDT	7	108	14	30	20
4,4'-DDE	11	113	81	51	61
4,4'-DDD	41	296	158	80	98
Dieldrin	ND	ND	ND	ND	ND
Endosulfan sulfate	ND	ND	ND	ND	ND
PCB-1254	ND	ND	ND	ND	ND
PCB-1232	ND	ND	ND	ND	ND
PCB-1248	ND	ND	ND	ND	ND
PCB-1260	ND	ND	ND	ND	ND
PCB-1016	ND	ND	ND	ND	ND

[1]Concentrations expressed as µg/kg dry weight.
ND=Not detectable.

TABLE 22: ORGANIC PRIORITY POLLUTANTS DETECTED IN SEDIMENT COLLECTED FROM SALT CREEK DURING 2004

Compound[1]	Salt Creek 2004					
	79 center	18 center	18 side	24 side	109 center	109 side
Chlorobenzene	ND	ND	ND	ND	ND	ND
Methylene chloride	47	20	22	ND	ND	ND
Toluene	ND	ND	ND	ND	ND	ND
Acenaphthene	ND	ND	ND	ND	ND	8,775
Acenaphthylene	ND	ND	ND	ND	ND	ND
Anthracene	ND	ND	ND	ND	ND	5,118
Benzo(a)anthracene	1,053	762	747	1,369	ND	16,179
Benzo(a)pyrene	2,107	1,032	975	1,953	ND	7,239
3,4-Benzofluoranthene	2,516	679	709	2,287	ND	10,973
Benzo(ghi)perylene	1,040	ND	306	781	ND	1,855
Benzo(k)fluoranthene	2,344	790	712	2,218	ND	8,240
Bis(2-ethylhexyl)phthalate	ND	ND	ND	ND	ND	ND
Butylbenzyl phthalate	ND	ND	ND	ND	ND	ND
Chrysene	2,352	802	921	1,996	ND	11,988
Dibenzo(a,h)anthracene	ND	ND	ND	ND	ND	532
Di-n-butyl phthalate	ND	ND	ND	ND	ND	ND
Di-n-octyl phthalate	ND	ND	ND	ND	ND	ND
Fluoranthene	4,151	2,263	2,189	4,219	447	94,679
Fluorene	ND	ND	ND	ND	ND	8,503
Indeno(1,2,3-cd)pyrene	988	292	293	916	ND	2,322
Naphthalene	ND	ND	ND	ND	ND	2,354
Phenanthrene	814	1,219	819	1,361	ND	62,258
Pyrene	3,017	1,722	1,650	3,129	413	62,892
Aldrin	ND	ND	ND	ND	ND	ND
4,4'-DDT	ND	ND	ND	394	ND	89
4,4'-DDE	18	ND	ND	43	27	96
4,4'-DDD	18	10	9	97	126	326
Dieldrin	ND	ND	ND	ND	ND	ND
Endosulfan sulfate	ND	ND	ND	ND	ND	ND
PCB-1254	ND	ND	ND	ND	ND	ND
PCB-1232	ND	ND	ND	ND	ND	ND
PCB-1248	ND	ND	ND	ND	ND	ND
PCB-1260	ND	ND	ND	ND	ND	ND
PCB-1016	ND	ND	ND	ND	ND	ND

[1]Concentrations expressed as µg/kg dry weight.
ND=Not detectable.

TABLE 23: ORGANIC PRIORITY POLLUTANTS DETECTED IN SEDIMENT COLLECTED FROM THE WEST BRANCH DUPAGE RIVER DURING 2004

Compound[1]	West Branch DuPage River 2004					
	110 center	110 side	89 center	89 side	64 center	64 side
Chlorobenzene	ND	ND	ND	ND	ND	ND
Methylene chloride	ND	ND	ND	ND	ND	ND
Toluene	ND	ND	ND	ND	ND	ND
Acenaphthene	ND	ND	ND	ND	ND	ND
Acenaphthylene	ND	ND	ND	ND	ND	ND
Anthracene	ND	ND	ND	457	ND	ND
Benzo(a)anthracene	928	835	ND	1,014	ND	ND
Benzo(a)pyrene	1,024	929	266	962	ND	ND
3,4-Benzofluoranthene	1,363	991	359	1,007	ND	ND
Benzo(ghi)perylene	584	ND	ND	341	ND	ND
Benzo(k)fluoranthene	1,311	1,271	409	1,268	ND	ND
Bis(2-ethylhexyl)phthalate	ND	ND	ND	ND	ND	ND
Butylbenzyl phthalate	ND	ND	ND	ND	ND	ND
Chrysene	1,251	1,179	292	1,128	ND	ND
Dibenzo(a,h)anthracene	ND	ND	ND	ND	ND	ND
Di-n-butyl phthalate	ND	ND	ND	ND	ND	ND
Di-n-octyl phthalate	ND	ND	ND	ND	3,762	ND
Fluoranthene	3,079	3,100	629	3,027	ND	ND
Fluorene	ND	ND	ND	ND	ND	ND
Indeno(1,2,3-cd)pyrene	583	ND	ND	310	ND	ND
Naphthalene	ND	ND	ND	ND	ND	ND
Phenanthrene	1,781	1,804	342	2,202	ND	ND
Pyrene	2,125	2,245	487	2,233	ND	ND
Aldrin	ND	ND	ND	ND	ND	ND
4,4’-DDT	ND	ND	ND	ND	ND	12
4,4’-DDE	ND	ND	ND	ND	ND	ND
4,4’-DDD	11	14	ND	ND	ND	ND
Dieldrin	ND	ND	ND	ND	ND	ND
Endosulfan sulfate	ND	ND	ND	ND	ND	8
PCB-1254	ND	ND	ND	ND	ND	ND
PCB-1232	ND	ND	ND	ND	ND	ND
PCB-1248	ND	ND	ND	ND	ND	ND
PCB-1260	ND	ND	ND	ND	ND	233
PCB-1016	ND	ND	ND	ND	ND	ND

[1]Concentrations expressed as µg/kg dry weight.
ND=Not detectable.

TABLE 24: TOXICITY DATA FOR SEDIMENT COLLECTED FROM THE CHICAGO AREA WATERWAY SYSTEM BETWEEN 2002 AND 2004

Station No.	Station Name	Point[1]	Waterway	Year	(*Chironumus tentans* 10-Day Test Data) Survival (Percent)	Dried Weight (mg/org)	Ash-free Dried Weight (mg/org)
74	Lake Shore Dr.	C	Chicago River	2002	94	1.09	0.79
	Lake Shore Dr.	S	Chicago River	2002	99	1.07	0.76
100	Wells St.	C	Chicago River	2002	94	0.97	0.67[a]
	Wells St.	S	Chicago River	2002	99	0.90	0.64[a]
39	Madison St.	C	South Branch Chicago River	2002	91	0.83[a]	0.62[a]
108	Loomis St.	C	South Branch Chicago River	2002	90	0.70[a]	0.53[c]
	Loomis St.	S	South Branch Chicago River	2002	83	0.86	0.61[a]
99	Archer Ave.	C	South Fork South Branch Chicago River	2002	14[c]	0.24[c]	0.14[c]
	Archer Ave.	S	South Fork South Branch Chicago River	2002	59[c]	0.25[c]	0.16[c]
40	Damen Ave.	C	Chicago Sanitary and Ship Canal	2002	76	0.62[c]	0.44[c]
	Damen Ave.	S	Chicago Sanitary and Ship Canal	2002	80	0.67[c]	0.48[c]
75	Cicero Ave.	C	Chicago Sanitary and Ship Canal	2002	93	0.64[c]	0.46[c]
	Cicero Ave.	S	Chicago Sanitary and Ship Canal	2002	93	1.17[b]	0.81[a]
41	Harlem Ave.	C	Chicago Sanitary and Ship Canal	2002	91	1.48	1.16
	Harlem Ave.	S	Chicago Sanitary and Ship Canal	2002	89	1.53	1.04
92	Lockport Powerhouse	C	Chicago Sanitary and Ship Canal	2002	90	0.58[c]	0.43[c]
	Lockport Powerhouse	S	Chicago Sanitary and Ship Canal	2002	98	1.28	0.95[a]
52	Wentworth Ave.	S	Little Calumet River	2003	40[a]	1.18	0.98
54	Joe Orr Rd.	C	Thorn Creek	2003	95	1.19	0.92
	Joe Orr Rd.	S	Thorn Creek	2003	94	0.92	0.63
97	170th St.	C	Thorn Creek	2003	40[a]	0.58	0.45
	170th St.	S	Thorn Creek	2003	18[a]	0.42[a]	0.32[a]
57	Ashland Ave.	S	Little Calumet River	2003	84	0.84[a]	0.68[a]
49	Ewing Ave.	S	Calumet River	2003	8[a]	0.63	0.36[a]
50	Burnham Ave.	C	Wolf Lake	2003	19[a]	0.65	0.55
	Burnham Ave.	S	Wolf Lake	2003	36[a]	0.45[a]	0.18[a]

TABLE 24 (Continued): TOXICITY DATA FOR SEDIMENT COLLECTED FROM THE CHICAGO AREA WATERWAY SYSTEM BETWEEN 2002 AND 2004

Station No.	Station Name	Point[1]	Waterway	Year	(*Chironumus tentans* 10-Day Test Data) Survival (Percent)	Dried Weight (mg/org)	Ash-free Dried Weight (mg/org)
55	130th St.	C	Calumet River	2003	95	1.33	0.99
	130th St.	S	Calumet River	2003	98	1.61	1.10
86	Burnham Ave.	C	Grand Calumet River	2003	86	0.51[a]	0.46[a]
	Burnham Ave.	S	Grand Calumet River	2003	25[a]	0.19[a]	0.19[a]
56	Indiana Ave.	C	Little Calumet River	2003	58[a]	0.38[a]	0.30[a]
	Indiana Ave.	S	Little Calumet River	2003	55[d]	0.29[a]	0.21[a]
76	Halsted St.	C	Little Calumet River	2003	3[a]	0.25[a]	0.17[a]
	Halsted St.	S	Little Calumet River	2003	89	0.34[a]	0.25[a]
58	Ashland Ave.	C	Calumet-Sag Channel	2003	84	0.54[a]	0.47[a]
	Ashland Ave.	S	Calumet-Sag Channel	2003	19[a]	0.14[a]	0.11[a]
59	Cicero Ave.	C	Calumet-Sag Channel	2003	9[a]	1.06	0.65
	Cicero Ave.	S	Calumet-Sag Channel	2003	0[a]	NA	NA
43	Route 83	C	Calumet-Sag Channel	2003	11[a]	0.83	0.52
	Route 83	S	Calumet-Sag Channel	2003	0[a]	NA	NA
12	Lake Cook Rd.	C	Buffalo Creek	2004	38[a]	1.78	0.95
	Lake Cook Rd.	S	Buffalo Creek	2004	11[a]	1.54	0.51
13	Lake Cook Rd.	C	Des Plaines River	2004	48[a]	1.45	1.03
	Lake Cook Rd.	S	Des Plaines River	2004	28[a]	0.99	0.58
17	Oakton St.	C	Des Plaines River	2004	70	1.11	0.75
	Oakton St.	S	Des Plaines River	2004	38[a]	1.72	0.88
77	Elmhurst Rd.	C	Higgins Creek	2004	85	1.27	0.80[a]
	Elmhurst Rd.	S	Higgins Creek	2004	88	0.98[a]	0.65[a]
19	Belmont Ave.	C	Des Plaines River	2004	73	0.69[d]	0.51[d]
	Belmont Ave.	S	Des Plaines River	2004	98	1.26	0.78[a]
20	Roosevelt Rd.	C	Des Plaines River	2004	96	1.48	0.88
	Roosevelt Rd.	S	Des Plaines River	2004	64[a]	0.48[a]	0.37[a]

TABLE 24 (Continued): TOXICITY DATA FOR SEDIMENT COLLECTED FROM THE CHICAGO AREA WATERWAY SYSTEM BETWEEN 2002 AND 2004

Station No.	Station Name	Point[1]	Waterway	Year	(*Chironumus tentans* 10-Day Test Data) Survival (Percent)	Dried Weight (mg/org)	Ash-free Dried Weight (mg/org)
79	Higgins Rd.	C	Salt Creek	2004	86	1.42	1.02
80	Arlington Hts. Rd.	C	Salt Creek	2004	86	1.10	0.75
	Arlington Hts. Rd.	S	Salt Creek	2004	78	1.38	0.80
18	Devon Ave.	C	Salt Creek	2004	94	1.27	0.72[a]
	Devon Ave.	S	Salt Creek	2004	86	1.14[a]	0.72[a]
24	Wolf Rd.	S	Salt Creek	2004	90	1.73	1.26
109	Brookfield Ave.	C	Salt Creek	2004	95	0.97	0.66
	Brookfield Ave.	S	Salt Creek	2004	83	0.82	0.53
22	Ogden Ave.	C	Des Plaines River	2004	40[a]	0.58	0.45
	Ogden Ave.	S	Des Plaines River	2004	90	1.17	0.79
23	Willow Springs Rd.	C	Des Plaines River	2004	100	1.38	0.85
	Willow Springs Rd.	S	Des Plaines River	2004	98	1.45	0.91
29	Stephen St.	C	Des Plaines River	2004	100	1.25	0.85
	Stephen St.	S	Des Plaines River	2004	100	1.25	0.79[a]
110	Springinsguth Rd.	C	West Branch DuPage River	2004	84	1.12	0.79
	Springinsguth Rd.	S	West Branch DuPage River	2004	44[a]	1.11	0.73
89	Walnut Lane	C	West Branch DuPage River	2004	60[a]	1.40	0.94
	Walnut Lane	S	West Branch DuPage River	2004	60[a]	1.38	0.92
64	Lake St.	C	West Branch DuPage River	2004	78	1.60	0.88
	Lake St.	S	West Branch DuPage River	2004	76	1.31	0.78
90	Route 19	S	Poplar Creek	2004	47[a]	1.11	0.75

[1]C=Center, S=Side.
[a]Significantly different than the West Bearskin Lake control results.
[b]Significantly different than the Negative Control-Sand control results.
[c]Significantly different than the West Bearskin Lake and Negative Control-Sand control results.
[d]Not statistically different due to high variability among replicates.
NA=Not applicable as all of the organisms died.

the control sediment indicate that sediments constitute an unsuitable habitat for optimal Chironumus growth.

Chicago River System. Station 99 in the South Fork of the South Branch of the Chicago River had percent survival rates that were significantly different than the control stations indicating that the sediment was unsuitable for Chironumus survival. Seven out of the nine stations sampled showed either dried weight and or ash-free dried weight that were significantly different than control stations indicating that these sediments are unsuitable for optimal Chironumus growth.

Calumet River System. Ten out of the thirteen stations sampled had percent survival rates that were significantly different than the control stations indicating that the sediment was unsuitable for Chironumus survival. Eight out of the thirteen stations sampled showed either dried weight and or ash-free dried weight that were significantly different than control stations indicating that these sediments are unsuitable for optimal Chironumus growth.

Des Plaines River System. Eight out of the eighteen stations sampled had percent survival rates that were significantly different than the control stations indicating that the sediment was unsuitable for Chironumus survival. Five out of the eighteen stations sampled showed either dried weight and or ash-free dried weight that were significantly different than control stations indicating that these sediments are unsuitable for optimal Chironumus growth.

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