MONITORING AND RESEARCH DEPARTMENT

REPORT NO. 12-35

WATER AND SEDIMENT QUALITY ALONG THE ILLINOIS WATERWAY FROM THE LOCKPORT LOCK TO THE PEORIA LOCK DURING 2011

August 2012

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August 2012

TABLE OF CONTENTS

	Page
LIST OF TABLES	iv
LIST OF FIGURES	ix
ACKNOWLEDGMENT	x
DISCLAIMER	x
SUMMARY	xi
Water Quality	xi
Sediment Quality	xii
INTRODUCTION	1
DESCRIPTION OF THE STUDY AREA	2
Illinois Waterway	2
Monitoring Stations	2
MATERIALS AND METHODS	7
Field Monitoring and Laboratory Analysis	7
Water	7
Chemical Constituents	7
Bacteria	7
Chlorophyll *a*	7
Sediment	7
Chemical Constituents	7

TABLE OF CONTENTS (Continued)

	Page
RESULTS AND DISCUSSION	11
Water Quality	11
Spatial Variability Along the Illinois Waterway	11
Total Suspended Solids	11
Dissolved Oxygen	17
Ammonia Nitrogen	17
Total Nitrogen	17
Total Phosphorus	17
Fecal Coliform	17
Trace Metals	17
Waterway Use Designations	26
Water Quality Standards	26
Dissolved Oxygen	26
Fecal Coliform	26
Total Mercury	26
Sediment Quality	26
APPENDICES	
Water Quality at Station 1 in the Chicago Sanitary and Ship Canal During May, August, and October 2011	AI
Water Quality at Stations 2–4 in the Chicago Sanitary and Ship Canal and the Des Plaines River During May, August, and October 2011	AII

TABLE OF CONTENTS (Continued)

	Page
Water Quality at Stations 5–11 in the Des Plaines River and the Illinois River During May, August, and October 2011	AIII
Water Quality at Stations 12–21 in the Illinois River During May, August, and October 2011	AIV
Water Quality at Stations 22–27 in the Illinois River During May, August, and October 2011	AV
Water Quality at Stations 28–41 in the Illinois River During May, August, and October 2011	AVI
Water Quality at Stations 42–49 in the Illinois River During May, August, and October 2011	AVII

LIST OF TABLES

Table No.		Page
1	Illinois Waterway Navigational Pools	2
2	Monitoring Stations Along the Illinois Waterway From Lockport Lock to Peoria Lock	5
3	Constituents Analyzed, Sample Containers, and Preservation Methods for Water Samples Collected From the Illinois Waterway Study Area	8
4	Constituents Analyzed, Sample Containers, and Preservation Methods for Sediment Samples Collected From the Illinois Waterway Study Area	10
5	Summary of Water Quality From the Lockport, Brandon Road, Dresden Island, Marseilles, Starved Rock, and Peoria Pools of the Illinois Waterway During May, August, and October 2011	12
6	Summary of Metals Concentrations From the Lockport, Brandon Road, Dresden Island, Marseilles, Starved Rock, and Peoria Pools of the Illinois Waterway During May, August, and October 2011	23
7	Chemical Characteristics of Sediment Collected From Monitoring Stations in the Lockport, Brandon Road, Dresden Island, Marseilles, Starved Rock, and Peoria Pools of the Illinois Waterway, October 2011	27
8	Trace Metals in Sediment Collected From Monitoring Stations in the Lockport, Brandon Road, Dresden Island, Marseilles, Starved Rock, and Peoria Pools of the Illinois Waterway, October 2011	28
AI-1	Water Quality at Station 1 in the Chicago Sanitary and Ship Canal During May, August, and October 2011	AI-1
AII-1	Water Quality at Station 2 in the Chicago Sanitary and Ship Canal During May, August, and October 2011	AII-1
AII-2	Water Quality at Station 3 in the Des Plaines River During May, August, and October 2011	AII-2

LIST OF TABLES (Continued)

Table No.		Page
AII-3	Water Quality at Station 4 in the Des Plaines River During May, August, and October 2011	AII-3
AIII-1	Water Quality at Station 5 in the Des Plaines River During May, August, and October 2011	AIII-1
AIII-2	Water Quality at Station 6 in the Des Plaines River During May, August, and October 2011	AIII-2
AIII-3	Water Quality at Station 7 in the Des Plaines River During May, August, and October 2011	AIII-3
AIII-4	Water Quality at Station 8 in the Des Plaines River During May, August, and October 2011	AIII-4
AIII-5	Water Quality at Station 9 in the Des Plaines River During May, August, and October 2011	AIII-5
AIII-6	Water Quality at Station 10 in the Des Plaines River During May, August, and October 2011	AIII-6
AIII-7	Water Quality at Station 11 in the Illinois River During May, August, and October 2011	AIII-7
AIV-1	Water Quality at Station 12 in the Illinois River During May, August, and October 2011	AIV-1
AIV-2	Water Quality at Station 13 in the Illinois River During May, August, and October 2011	AIV-2
AIV-3	Water Quality at Station 14 in the Illinois River During May, August, and October 2011	AIV-3
AIV-4	Water Quality at Station 15 in the Illinois River During May, August, and October 2011	AIV-4
AIV-5	Water Quality at Station 16 in the Illinois River During May, August, and October 2011	AIV-5

LIST OF TABLES (Continued)

Table No.		Page
AIV-6	Water Quality at Station 17 in the Illinois River During May, August, and October 2011	AIV-6
AIV-7	Water Quality at Station 18 in the Illinois River During May, August, and October 2011	AIV-7
AIV-8	Water Quality at Station 19 in the Illinois River During May, August, and October 2011	AIV-8
AIV-9	Water Quality at Station 20 in the Illinois River During May, August, and October 2011	AIV-9
AIV-10	Water Quality at Station 21 in the Illinois River During May, August, and October 2011	AIV-10
AV-1	Water Quality at Station 22 in the Illinois River During May, August, and October 2011	AV-1
AV-2	Water Quality at Station 23 in the Illinois River During May, August, and October 2011	AV-2
AV-3	Water Quality at Station 24 in the Illinois River During May, August, and October 2011	AV-3
AV-4	Water Quality at Station 25 in the Illinois River During May, August, and October 2011	AV-4
AV-5	Water Quality at Station 26 in the Illinois River During May, August, and October 2011	AV-5
AV-6	Water Quality at Station 27 in the Illinois River During May, August, and October 2011	AV-6
AVI-1	Water Quality at Station 28 in the Illinois River During May, August, and October 2011	AVI-1
AVI-2	Water Quality at Station 29 in the Illinois River During May, August, and October 2011	AVI-2

LIST OF TABLES (Continued)

Table No.		Page
AVI-3	Water Quality at Station 30 in the Illinois River During May, August, and October 2011	AVI-3
AVI-4	Water Quality at Station 31 in the Illinois River During May, August, and October 2011	AVI-4
AVI-5	Water Quality at Station 32 in the Illinois River During May, August, and October 2011	AVI-5
AVI-6	Water Quality at Station 33 in the Illinois River During May, August, and October 2011	AVI-6
AVI-7	Water Quality at Station 34 in the Illinois River During May, August, and October 2011	AVI-7
AVI-8	Water Quality at Station 35 in the Illinois River During May, August, and October 2011	AVI-8
AVI-9	Water Quality at Station 36 in the Illinois River During May, August, and October 2011	AVI-9
AVI-10	Water Quality at Station 37 in the Illinois River During May, August, and October 2011	AVI-10
AVI-11	Water Quality at Station 38 in the Illinois River During May, August, and October 2011	AVI-11
AVI-12	Water Quality at Station 39 in the Illinois River During May, August, and October 2011	AVI-12
AVI-13	Water Quality at Station 40 in the Illinois River During May, August, and October 2011	AVI-13
AVI-14	Water Quality at Station 41 in the Illinois River During May, August, and October 2011	AVI-14
AVII-1	Water Quality at Station 42 in the Illinois River During May, August, and October 2011	AVII-1

LIST OF TABLES (Continued)

Table No.		Page
AVII-2	Water Quality at Station 43 in the Illinois River During May, August, and October 2011	AVII-2
AVII-3	Water Quality at Station 44 in the Illinois River During May, August, and October 2011	AVII-3
AVII-4	Water Quality at Station 45 in the Illinois River During May, August, and October 2011	AVII-4
AVII-5	Water Quality at Station 46 in the Illinois River During May, August, and October 2011	AVII-5
AVII-6	Water Quality at Station 47 in the Illinois River During May, August, and October 2011	AVII-6
AVII-7	Water Quality at Station 48 in the Illinois River During May, August, and October 2011	AVII-7
AVII-8	Water Quality at Station 49 in the Illinois River During May, August, and October 2011	AVII-8

LIST OF FIGURES

Figure No.		Page
1	Map of the Illinois Waterway From Lockport to Marseilles Showing Sampling Stations 1 to 21	3
2	Map of Illinois Waterway From Ottawa to Peoria Showing Sampling Stations 22 to 49	4
3	Total Suspended Solids Concentration at 49 Stations Along the Illinois Waterway From the Lockport Lock to the Peoria Lock During May, August, and October 2011	16
4	Dissolved Oxygen Concentration at 49 Stations Along the Illinois Waterway From the Lockport Lock to the Peoria Lock During May, August, and October 2011	18
5	Ammonia Nitrogen Concentration at 49 Stations Along the Illinois Waterway From the Lockport Lock to the Peoria Lock During May, August, and October 2011	19
6	Total Nitrogen Concentration at 49 Stations Along the Illinois Waterway From the Lockport Lock to the Peoria Lock During May, August, and October 2011	20
7	Total Phosphorus Concentration at 49 Stations Along the Illinois Waterway From the Lockport Lock to the Peoria Lock During May, August, and October 2011	21
8	Fecal Coliform Concentration at 49 Stations Along the Illinois Waterway From the Lockport Lock to the Peoria Lock During May, August, and October 2011	22

ACKNOWLEDGMENT

The authors wish to acknowledge the Industrial Waste Division staff for collecting water samples along the Illinois Waterway in 2011.

For sample preparation and collection, thanks are extended to Ms. Colleen Joyce, Mr. Nicholas Kollias, Mr. Michael Burke, and Mr. Panu Lansiri of the Aquatic Ecology and Water Quality Monitoring Section.

We are grateful to the Analytical Laboratory Division for performing sample analyses.

Many thanks to Ms. Coleen Maurovich, Principal Office Support Specialist, for her assistance in formatting and organizing this report.

DISCLAIMER

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

SUMMARY

During May, August, and October 2011, the Metropolitan Water Reclamation District of Greater Chicago (District) conducted water quality surveys at 49 monitoring stations along a 133 nautical mile reach of the Illinois Waterway from the Lockport Lock to the Peoria Lock. Based on results from the 2011 surveys, the following conclusions can be made concerning the water quality along the study reach:

Water Quality

During 2011, the mean concentration of total suspended solids (TSS) generally increased in the downstream direction along the Illinois Waterway from the Lockport Pool (9 mg/L) to the lower Peoria Pool (32 mg/L).

The mean concentration of five-day biochemical oxygen demand remained equal to or less than 3 mg/L throughout each of the sampled pools.

The mean dissolved oxygen (DO) concentration increased along the waterway from the Lockport Pool (5.2 mg/L) to the upper Peoria Pool (9.4 mg/L). In the lower Peoria Pool, mean DO fell slightly (8.1 mg/L).

There was an increase in the mean pH from the Lockport Pool (6.6) to the lower Peoria Pool (7.8).

The mean ammonia nitrogen (NH_4-N) concentration decreased between the Lockport Pool (0.58 mg/L) and the Starved Rock Pool (0.14 mg/L), and then remained roughly the same in the Peoria Pools.

There was an overall increase in the mean concentration of un-ionized ammonia (NH_3-N) between the Lockport Pool (0.001 mg/L) and the lower Peoria Pool (0.005 mg/L). This was due largely to the increase in water pH that occurs along this reach.

Mean nitrite plus nitrate nitrogen (NO_2+NO_3-N) and total nitrogen (TN) values remained relatively similar throughout the Illinois Waterway sampling reach.

The mean total Kjeldahl nitrogen (TKN) concentration decreased from the Lockport Pool (1.06 mg/L) to the Marseilles Pool (0.74 mg/L) and then increased to a mean of 1.00 mg/L in the upper Peoria Pool.

There was a considerable decrease in the mean total phosphorus (TP) concentration along the Illinois Waterway from the Lockport Pool (0.80 mg/L) to the lower Peoria Pool (0.46 mg/L).

Mean chlorophyll *a* concentration increased along the Illinois Waterway from the Brandon Road Pool (6 µg/L) to the upper Peoria Pool (37 µg/L) and then decreased (23 µg/L) in the lower Peoria Pool.

The mean concentration of total cyanide was 0.005 mg/L throughout the Illinois Waterway sampling reach.

The mean concentration of phenols was less than 0.005 mg/L from the Lockport Pool to the upper Peoria Pool and was 0.005 mg/L in the lower Peoria Pool.

After peaking in the Brandon Road Pool, there were dramatic drops in the geometric mean density of fecal coliform (FC) and *E. coli* (EC) through the Dresden Island Pool down to the Peoria Pools.

Mean total concentrations of arsenic, cadmium, chromium, copper, lead, mercury, nickel, silver, and zinc remained relatively constant from the Lockport Pool to the lower Peoria Pool. The mean total iron and manganese concentrations increased progressively from 0.4 and 0.031 mg/L, respectively, in the Lockport Pool to 1.5 and 0.076 mg/L, respectively, in the lower Peoria Pool.

Sediment Quality

Total solids (TS) percentage in sediment fluctuated throughout the Illinois Waterway and was highest in the Upper Peoria Pool.

The percentage of total volatile solids (TVS) was highest at Station 2 in the Brandon Road Pool (16 percent), decreased and remained relatively constant for the remainder of the sampling reach until Station 41 and Station 44 in the Lower Peoria Pool (10 and 9 percent, respectively).

NH_4-N in sediment substantially decreased from a peak of 59 mg/kg in the Brandon Road Pool to 2 mg/kg in the Upper Peoria Pool. NH_4-N increased again in the Lower Peoria Pool to 48 mg/kg at Station 48.

The concentrations of TKN and TP fluctuated widely along the Illinois Waterway sampling reach, and NO_2+NO_3-N concentrations ranged between 5 and 45 mg/kg.

The concentration of phenols in the sediment was highest in the upper Peoria Pool (0.372 mg/kg) and lowest at another station in the upper Peoria Pool (0.116 mg/kg).

Although the concentrations of the 11 trace metals measured in the sediment were variable among the 14 monitoring stations, considerably higher levels of chromium, copper, iron, lead, nickel, and zinc were measured between the Lockport and Dresden Island Pools compared to the remaining pools. There were also relatively higher levels of most trace metals in the sediment from the Lower Peoria Pool.

INTRODUCTION

The Illinois Waterway provides a water resource for agricultural and urban drainage, commercial and recreational navigation, electric power generation, fishing, industrial and public water supply, and other recreational activities. A principal function of this waterway is for stormwater and treated wastewater conveyance. At the upstream end of the Illinois Waterway, the District operates three major water reclamation plants (WRPs) in Cook County, Illinois, whose treated discharges make up approximately 90 percent of all point source treated wastewater flows entering the Illinois Waterway at Lockport. These three WRPs provided wastewater treatment for an average flow of 1,261 million gallons per day in 2011.

The District first began monitoring the Illinois Waterway in 1977. With the exception of 1998, the District has conducted annual water quality surveys from the Lockport Lock to the Peoria Lock, a distance of 133 river miles, since 1983. Forty-nine monitoring stations in six navigational pools were selected for study. The primary purpose of the monitoring program is to assess water quality changes downstream of the District's major point source wastewater discharges. A secondary objective is to characterize the sediment chemistry at selected monitoring stations.

This report presents the results from the water quality surveys conducted during 2011. Data from previous years have been compiled in formal annual reports for 1977 and 1983, 1984–1985, 1989, 1991, and the individual years of 2002–2010.

DESCRIPTION OF THE STUDY AREA

Illinois Waterway

The Illinois Waterway extends from Grafton, Illinois, located on the Mississippi River upstream of St. Louis, Missouri, to Lake Michigan in Chicago, Illinois. The 327-mile waterway is composed of a series of eight navigational pools (Lockport, Brandon Road, Dresden Island, Marseilles, Starved Rock, Peoria, LaGrange, and Alton) whose lengths and United States Army Corps of Engineers waterway mile-point designations are presented in Table 1.

The pools were created in the 1930s by lock and dam structures to maintain the water depths required for commercial navigation. The present study area is a 133-mile reach of the Illinois Waterway extending from the Lockport Lock to the Peoria Lock (Figures 1 and 2).

TABLE 1: ILLINOIS WATERWAY NAVIGATIONAL POOLS

Navigational Pool	Inclusive Waterway Mile-Points	Length (Miles)
Lockport	327.2 - 291.0	36.2
Brandon Road	291.0 - 286.0	5.0
Dresden Island	286.0 - 271.5	14.5
Marseilles	271.5 – 244.5	27.0
Starved Rock	244.5 - 231.0	13.5
Peoria	231.0 - 157.6	73.4
LaGrange	157.6 - 80.2	77.4
Alton	80.2 - 0.0	80.2

Monitoring Stations

Forty-nine monitoring stations were selected for the study (Figures 1 and 2). Two stations were located on the Chicago Sanitary and Ship Canal (CSSC), eight on the Des Plaines River, and 39 stations on the Illinois River. Table 2 lists the locations of the 49 monitoring stations.

FIGURE 1: MAP OF THE ILLINOIS WATERWAY FROM LOCKPORT TO MARSEILLES SHOWING SAMPLING STATIONS 1 TO 21

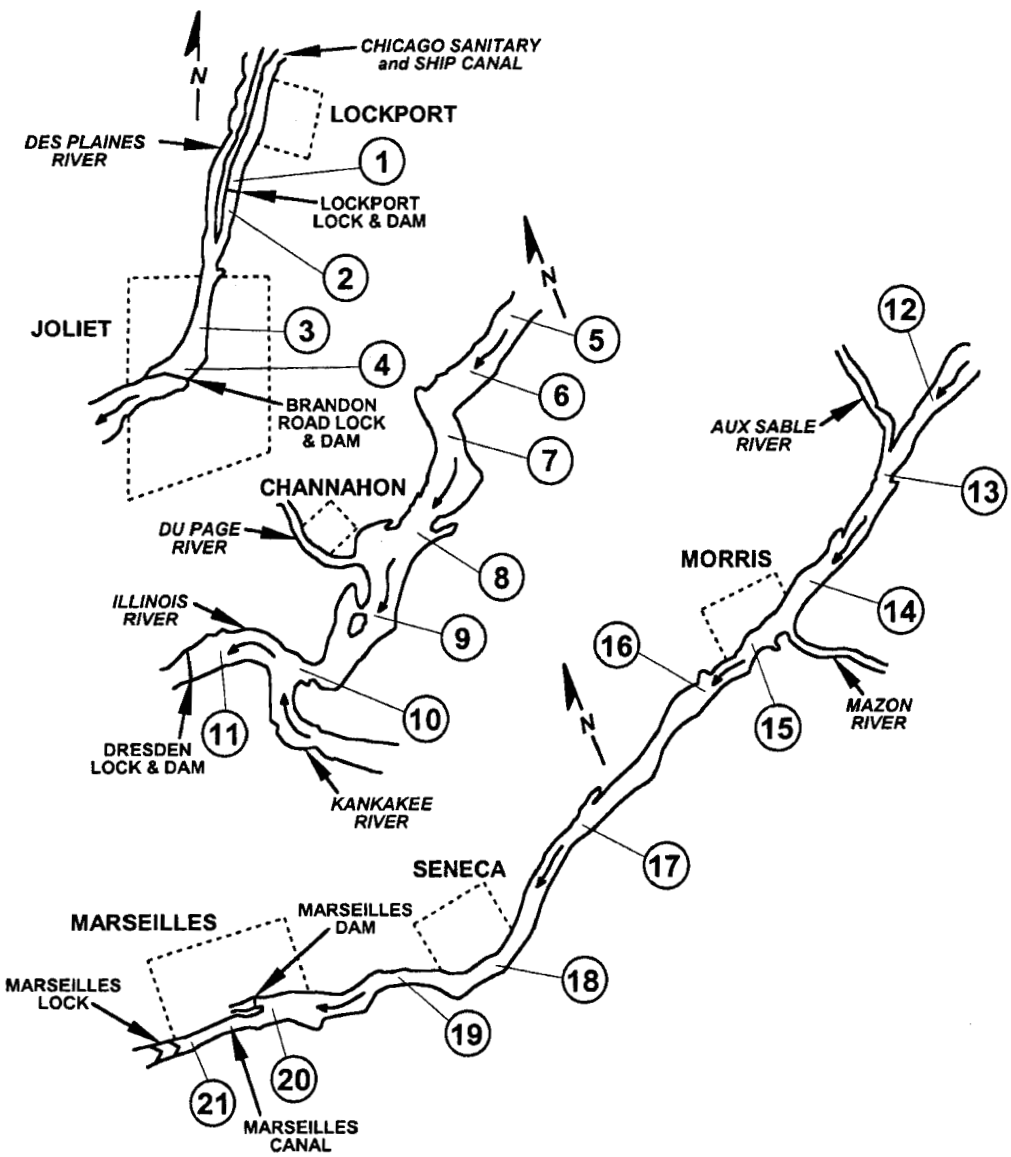


FIGURE 2: MAP OF ILLINOIS WATERWAY FROM OTTAWA TO PEORIA SHOWING SAMPLING STATIONS 22 TO 49

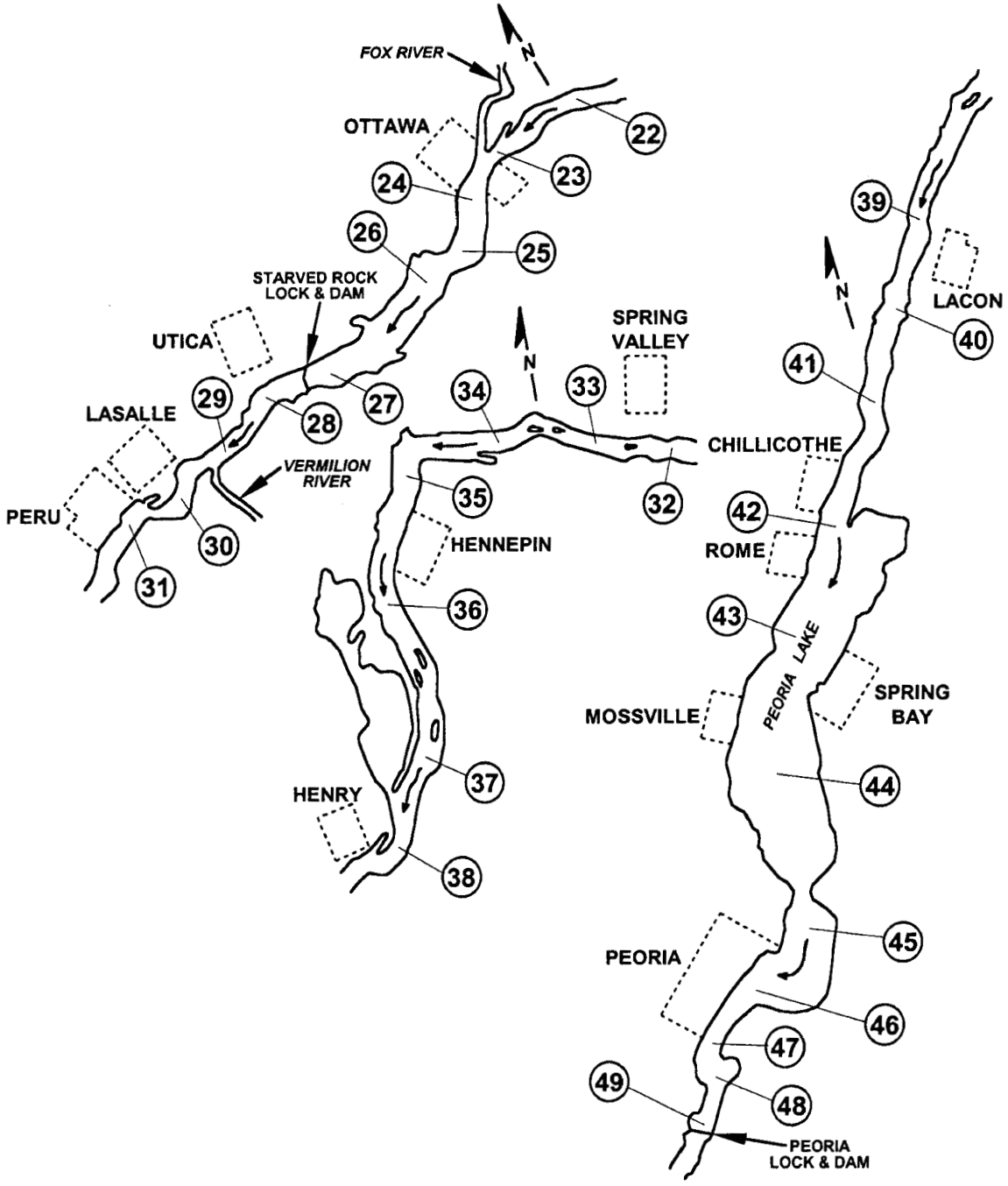


TABLE 2: MONITORING STATIONS ALONG THE ILLINOIS WATERWAY FROM LOCKPORT LOCK TO PEORIA LOCK

Station Number	Waterway	Waterway Mile-Point Location	Navigational Pool
1	Chicago Sanitary and Ship Canal	291.5	Lockport
2	Chicago Sanitary and Ship Canal	290.5	Brandon Road
3	Des Plaines River	287.3	Brandon Road
4	Des Plaines River	286.5	Brandon Road
5	Des Plaines River	285.0	Dresden Island
6	Des Plaines River	282.8	Dresden Island
7	Des Plaines River	280.5	Dresden Island
8	Des Plaines River	278.0	Dresden Island
9	Des Plaines River	276.1	Dresden Island
10	Des Plaines River	274.0	Dresden Island
11	Illinois River	272.4	Dresden Island
12	Illinois River	270.0	Marseilles
13	Illinois River	267.2	Marseilles
14	Illinois River	265.0	Marseilles
15	Illinois River	263.0	Marseilles
16	Illinois River	261.6	Marseilles
17	Illinois River	256.0	Marseilles
18	Illinois River	253.0	Marseilles
19	Illinois River	250.0	Marseilles
20	Illinois River	247.5	Marseilles
21	Illinois River	246.0	Marseilles
22	Illinois River	243.7	Starved Rock
23	Illinois River	240.6	Starved Rock
24	Illinois River	238.5	Starved Rock
25	Illinois River	236.8	Starved Rock
26	Illinois River	234.5	Starved Rock
27	Illinois River	231.7	Starved Rock

TABLE 2 (Continued): MONITORING STATIONS ALONG THE ILLINOIS WATERWAY FROM LOCKPORT LOCK TO PEORIA LOCK

Station Number	Waterway	Waterway Mile-Point Location	Navigational Pool
28	Illinois River	229.6	Peoria
29	Illinois River	226.9	Peoria
30	Illinois River	224.7	Peoria
31	Illinois River	222.6	Peoria
32	Illinois River	219.8	Peoria
33	Illinois River	217.1	Peoria
34	Illinois River	213.4	Peoria
35	Illinois River	209.4	Peoria
36	Illinois River	205.0	Peoria
37	Illinois River	200.4	Peoria
38	Illinois River	196.9	Peoria
39	Illinois River	190.0	Peoria
40	Illinois River	186.4	Peoria
41	Illinois River	183.2	Peoria
42	Illinois River	179.0	Peoria
43	Illinois River	174.9	Peoria
44	Illinois River	170.9	Peoria
45	Illinois River	165.3	Peoria
46	Illinois River	162.8	Peoria
47	Illinois River	160.6	Peoria
48	Illinois River	159.4	Peoria
49	Illinois River	158.2	Peoria

MATERIALS AND METHODS

Field Monitoring and Laboratory Analysis

Water. *Chemical Constituents.* Water samples for chemical analyses were collected from the 49 monitoring stations on May 2–5, August 1–4, and October 3–6, 2011. Samples were collected at a depth of three feet below the water surface in the center of the waterway with a submersible drainage pump. Except for FC and EC, all water samples were transported to the Cecil Lue-Hing R&D Laboratory in iced, insulated chests within 24 hours of collection. Samples for FC and EC analysis were transported to PDC Laboratories in Peoria, Illinois.

The constituents analyzed in water, sample containers used, and preservation methods are presented in Table 3. Water temperature, turbidity, conductivity, DO, and pH were measured in the field using a calibrated YSI Incorporated, Model 6600 water quality monitor. In the laboratory, all constituents were analyzed using procedures established by the United States Environmental Protection Agency (USEPA), except for suspended solids, five-day biochemical oxygen demand, total cyanide, total metals, and total mercury, which are described in the 20th edition of Standard Methods for the Examination of Water and Wastewater (Standard Methods, 1998). The concentration of NH_3-N was calculated using the equation given by the Illinois Environmental Protection Agency in Section 302.407 of Title 35.

When an analytical result was less than the limit of quantitation (LOQ), the LOQ value was used to calculate the mean. The LOQ is the point at which the results can be reported with the highest degree of quantitative certainty and ranges from five to ten times the method detection limit.

Bacteria. Water samples for FC and EC analyses were collected from the 49 stations concurrently with samples for analysis of chemical constituents. Samples were collected with a submersible drainage pump at a depth of three feet below the water surface in the center of the waterway. The sample was poured into a sterile, 175-mL plastic bottle containing 0.3 mL of a 15 percent solution of sodium thiosulfate and 0.1 mL of a 10 percent solution of ethylenediaminetetraacetic acid. The bacteria samples were kept cool in iced, insulated chests. The analyses were performed within 24 hours by membrane filter analysis as described in Standard Methods, 1998.

Chlorophyll a. Water samples for chlorophyll analysis were collected at 22 selected monitoring stations (2, 3, 5, 7, 10, 11, 15, 18, 20, 22, 25, 27, 28, 31, 34, 36, 38, 41, 42, 44, 45, and 48) in the same manner as described for chemical constituents. The sample was poured into a 1-liter, wide-mouth, amber plastic bottle containing 1 mg of magnesium carbonate. The water samples were stored in iced, insulated chests. In the laboratory, the water samples were analyzed for chlorophyll *a*, *b*, and *c* using methods described in Standard Methods, 1998.

Sediment. *Chemical Constituents.* Sediment samples were collected during the 2011 survey at 14 of the 49 monitoring stations (1, 2, 5, 8, 12, 18, 23, 28, 32, 35, 38, 41, 44, and 48).

TABLE 3: CONSTITUENTS ANALYZED, SAMPLE CONTAINERS, AND PRESERVATION METHODS FOR WATER SAMPLES COLLECTED FROM THE ILLINOIS WATERWAY STUDY AREA

Constituent and Abbreviation	Units of Measure	Sample Container	Preservative
Water Temperature	°C	NA	Measured in Field
Total Suspended Solids (TSS)	mg/L	Plastic	Cool, 4°C
Turbidity	NTU	NA	Measured in Field
Conductivity	µS/cm	NA	Measured in Field
Five-Day Biochemical Oxygen Demand (BOD_5)	mg/L	Plastic	Cool, 4°C
Dissolved Oxygen	mg/L	NA	Measured in Field
pH	units	NA	Measured in Field
Ammonia Nitrogen (NH_4-N)	mg/L	Plastic	Cool, 4°C, H_2SO_4 to pH <2
Un-ionized Ammonia (NH_3-N)*	mg/L	---	---
Total Kjeldahl Nitrogen (TKN)	mg/L	Plastic	Cool, 4°C, H_2SO_4 to pH <2
Nitrite plus Nitrate Nitrogen (NO_2+NO_3-N)	mg/L	Plastic	Cool, 4°C, H_2SO_4 to pH <2
Total Phosphorus (TP)	mg/L	Plastic	Cool, 4°C
Chlorophyll *a*	µg/L	Plastic, Amber	Cool, 4°C, $MgCO_3$
Total Cyanide (TCN)	mg/L	Plastic	NaOH to pH 12
Phenols		mg/L	GlassH_2SO_4 to pH <2
Total Metals (Arsenic, Cadmium, Chromium, Copper, Iron, Lead, Manganese, Mercury, Nickel, Silver, and Zinc)	mg/L	Plastic	HNO_3 to pH <2
Fecal Coliform (FC)	cfu/100 mL	Sterile Plastic	Cool, 4°C, EDTA**, and Thiosulfate
E. coli	cfu/100 mL	Sterile Plastic and Thiosulfate	Cool, 4°C, EDTA,

NA = Not Applicable.
*Determined by calculation using water temperature, pH and NH_4-N.
**Ethylenediaminetetraacetic acid

Over the period of October 3-6, 2011, one sediment sample was taken with a 6- x 6-inch Ponar grab sampler from each of the 14 stations. The sediment sample was transferred to a wide-mouth, quart glass jar and analyzed for TS, TVS, ammonia, TKN, NO_2+NO_3-N, TP, phenols, arsenic, cadmium, chromium, copper, iron, lead, manganese, mercury, nickel, silver, and zinc. Total cyanide analysis was not performed on sediment samples during 2011. The constituents analyzed, sample containers, and preservation methods are summarized in Table 4. All constituents were analyzed according to USEPA procedures except TS, TVS, and total metals, which are from Standard Methods, 1998.

TABLE 4: CONSTITUENTS ANALYZED, SAMPLE CONTAINERS, AND PRESERVATION METHODS FOR SEDIMENT SAMPLES COLLECTED FROM THE ILLINOIS WATERWAY STUDY AREA

Constituent and Abbreviation	Units of Measure[1]	Sample Container	Preservative
Total Solids (TS)	percent	Glass	Cool, 4°C
Total Volatile Solids (TVS)	percent	Glass	Cool, 4°C
Ammonia Nitrogen (NH_4-N)	mg/kg	Glass	Cool, 4°C
Total Kjeldahl Nitrogen (TKN)	mg/kg	Glass	Cool, 4°C
Nitrite plus Nitrate Nitrogen (NO_2+NO_3-N)	mg/kg	Glass	Cool, 4°C
Total Phosphorus (TP)	mg/kg	Glass	Cool, 4°C
Phenols	mg/kg	Glass	Cool, 4°C
Total and Soluble Metals (Arsenic, Cadmium, Chromium Copper, Iron, Lead, Manganese, Mercury, Nickel, Silver, and Zinc)	mg/kg	Glass	Cool, 4°C

[1]Expressed on a dry weight basis.

RESULTS AND DISCUSSION

Water Quality

Water quality in lotic ecosystems can be evaluated by assessing a combination of biological, chemical, and physical parameters, including bacterial levels, the concentrations of dissolved gases, dissolved and suspended inorganic and organic compounds, nutrients, water temperature, and rate of flow. Methods for measuring the biological and chemical constituents and the physical properties of water are well defined, and they have considerable precision. While sediment data can reflect long-term conditions, water samples are indicative of the water quality only at the time of monitoring.

In order to describe water quality in the Illinois Waterway, the 133-mile study area was divided by navigational pool:

1. Lockport (Station 1).
2. Brandon Road (Stations 2–4).
3. Dresden Island (Stations 5–11).
4. Marseilles (Stations 12–21).
5. Starved Rock (Stations 22–27).
6. Peoria, upper Peoria (Stations 28–41), and lower Peoria (Stations 42–49).

The Peoria Pool was subdivided based on geo-morphological differences between the upper and lower reaches.

The concentrations of the 29 constituents measured at each of the 49 monitoring stations, including calculated values for NH_3-N and TN, are presented in Appendices AI through AVII. The water quality data for selected parameters are summarized by navigational pool in Table 5.

Spatial Variability Along the Illinois Waterway. *Total Suspended Solids.* As shown in Figure 3, TSS was generally similar between Lockport and the Peoria Pool. The elevated concentration of TSS during August may have been related to a storm event that occurred during sampling. There was an increase in TSS in the lower Peoria Pool, which has been observed in previous years.

TABLE 5: SUMMARY OF WATER QUALITY FROM THE LOCKPORT, BRANDON ROAD, DRESDEN ISLAND, MARSEILLES, STARVED ROCK, AND PEORIA POOLS OF THE ILLINOIS WATERWAY DURING MAY, AUGUST, AND OCTOBER 2011

Navigational Pool	Constituents[a]	Range	Average
Lockport	Water Temperature (°C)[b]	15.2 – 27.9	21.3
	TSS	6 – 15	9
	Turbidity (NTU)[b]	8 – 15	11
	Conductivity (µS/cm)[b]	751 – 1103	871
	BOD_5	<2 – <2	<2
	Dissolved Oxygen (DO)[b]	3.0 – 6.3	5.2
	pH (units)[b]	6.3 – 6.9	6.6
	NH_4-N	0.32 – 0.81	0.58
	NH_3-N	<0.001 – 0.002	0.001
	TKN	0.82 – 1.32	1.06
	NO_2+NO_3-N	3.09 – 5.69	4.28
	TN	4.14 – 6.51	5.35
	TP	0.64 – 1.09	0.80
	Chlorophyll *a* (µg/L)	No Data	No Data
	Total Cyanide	<0.005 – 0.006	0.005
	Phenols	<0.005 – <0.005	<0.005
	FC (cfu/100 mL)	140 – 2,100	395[c]
	E. coli (cfu/100 mL)	130 – 1,400	331[c]
Brandon Road	Water Temperature (°C)[b]	14.3 – 28.0	20.6
	TSS	12 – 32	19
	Turbidity (NTU)[b]	9 – 192	36
	Conductivity (µS/cm)[b]	687 – 1105	860
	BOD_5	<2 – 3	3
	Dissolved Oxygen (DO)[b]	3.4 – 8.7	6.3
	pH (units)[b]	5.8 – 7.3	6.7
	NH_4-N	0.26 – 0.87	0.42
	NH_3-N	<0.001 – 0.003	0.001
	TKN	0.70 – 1.90	1.10
	NO_2+NO_3-N	2.18 – 5.74	3.83
	TN	3.27 – 6.55	4.93
	TP	0.41 – 1.18	0.73
	Chlorophyll *a* (µg/L)	2 – 9	6
	Total Cyanide	<0.005 – 0.006	0.005
	Phenols	<0.005 – <0.005	<0.005
	FC (cfu/100 mL)	170 – 3,100	623[c]
	E. coli (cfu/100 mL)	110 – 1,400	350[c]

TABLE 5 (Continued): SUMMARY OF WATER QUALITY FROM THE LOCKPORT, BRANDON ROAD, DRESDEN ISLAND, MARSEILLES, STARVED ROCK, AND PEORIA POOLS OF THE ILLINOIS WATERWAY DURING MAY, AUGUST, AND OCTOBER 2011

Navigational Pool	Constituents[a]	Range	Average
Dresden Island	Water Temperature (°C)[b]	12.9 – 32.6	21.8
	TSS	8 – 44	15
	Turbidity (NTU)[b]	9 – 64	17
	Conductivity (µS/cm)[b]	464 – 1097	822
	BOD_5	<2 – 3	2
	Dissolved Oxygen (DO)[b]	6.3 – 10.8	8.7
	pH (units)[b]	4.9 – 7.8	7.1
	NH_4-N	0.10 – 0.43	0.27
	NH_3-N	<0.001 – 0.006	0.003
	TKN	0.66 – 1.08	0.91
	NO_2+NO_3-N	2.12 – 5.89	3.61
	TN	3.08 – 6.78	4.52
	TP	0.22 – 1.06	0.62
	Chlorophyll *a* (µg/L)	5 – 14	9
	Total Cyanide	<0.005 – 0.006	0.005
	Phenols	<0.005 – <0.005	<0.005
	FC (cfu/100 mL)	81 – 1,000	434[c]
	E. coli (cfu/100 mL)	36 – 560	238[c]
Marseilles	Water Temperature (°C)[b]	13.3 – 30.8	20.8
	TSS	7 – 52	24
	Turbidity (NTU)[b]	6 – 76	30
	Conductivity (µS/cm)[b]	576 – 812	670
	BOD_5	<2 – 3	3
	Dissolved Oxygen (DO)[b]	6.7 – 10.6	9.0
	pH (units)[b]	6.8 – 7.9	7.6
	NH_4-N	0.09 – 0.32	0.20
	NH_3-N	0.001 – 0.010	0.004
	TKN	0.36 – 1.03	0.74
	NO_2+NO_3-N	1.57 – 5.90	3.77
	TN	2.25 – 6.77	4.51
	TP	0.23 – 0.68	0.44
	Chlorophyll *a* (µg/L)	4 – 28	11
	Total Cyanide	<0.005 – 0.007	0.005
	Phenols	<0.005 – <0.005	<0.005
	FC (cfu/100 mL)	10 – 240	76[c]
	E. coli (cfu/100 mL)	<1 – 180	53[c]

TABLE 5 (Continued): SUMMARY OF WATER QUALITY FROM THE LOCKPORT, BRANDON ROAD, DRESDEN ISLAND, MARSEILLES, STARVED ROCK, AND PEORIA POOLS OF THE ILLINOIS WATERWAY DURING MAY, AUGUST, AND OCTOBER 2011

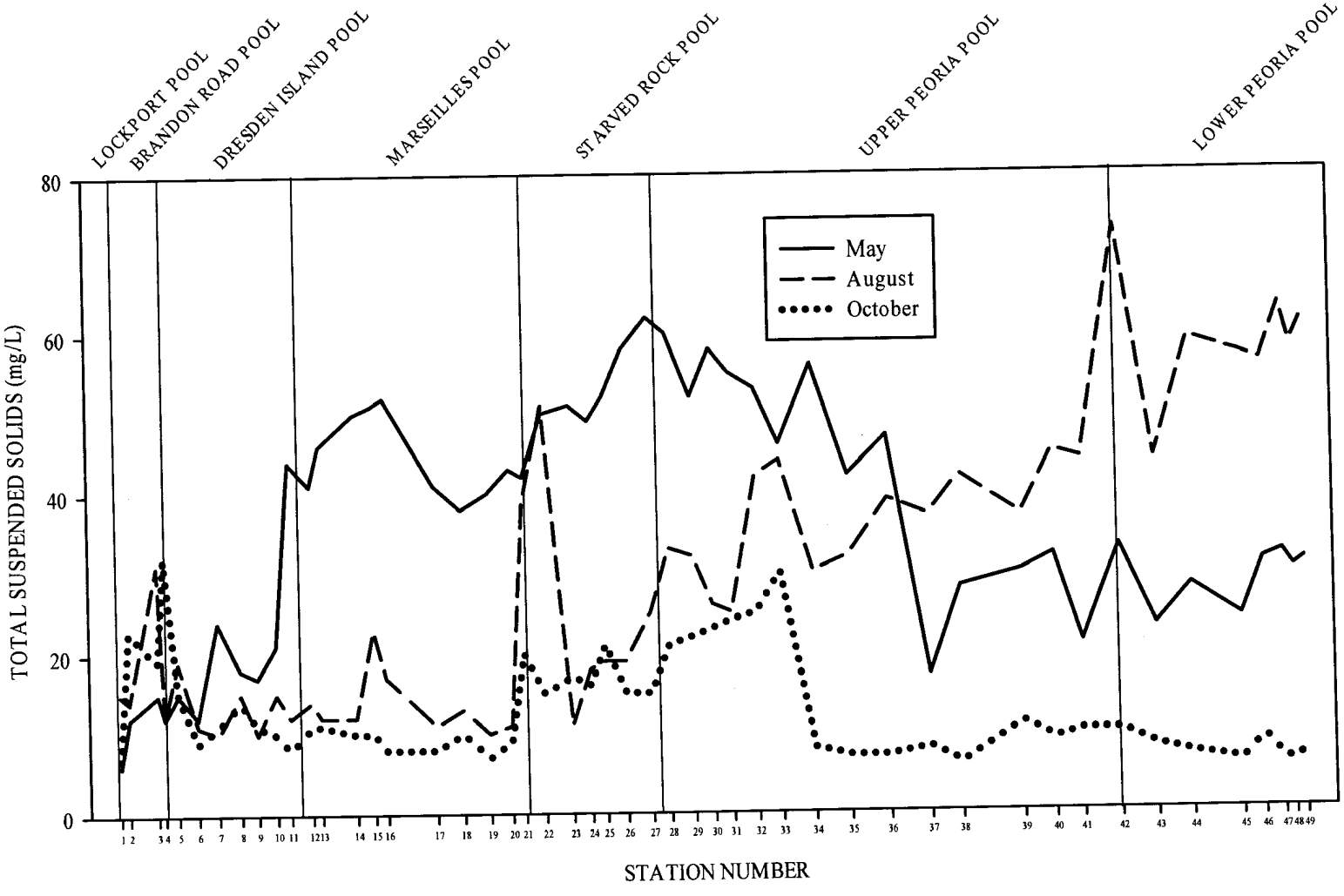
Navigational Pool	Constituents[a]	Range	Average
Starved Rock	Water Temperature (°C)[b]	12.6 – 31.1	20.8
	TSS	11 – 62	31
	Turbidity (NTU)[b]	7 – 73	34
	Conductivity (µS/cm)[b]	582 – 824	700
	BOD_5	<2 – 6	3
	Dissolved Oxygen (DO)[b]	6.8 – 11.3	9.8
	pH (units)[b]	5.4 – 8.3	7.3
	NH_4-N	0.04 – 0.32	0.14
	NH_3-N	<0.001 – 0.019	0.004
	TKN	0.54 – 1.22	0.89
	NO_2+NO_3-N	1.36 – 5.87	3.56
	TN	2.20 – 6.86	4.45
	TP	0.24 – 0.65	0.42
	Chlorophyll *a* (µg/L)	6 – 62	31
	Total Cyanide	<0.005 – 0.007	0.005
	Phenols	<0.005 – <0.005	<0.005
	FC (cfu/100 mL)	<10 – 600	70[c]
	E. coli (cfu/100 mL)	<1 – 450	26[c]
Upper Peoria	Water Temperature (°C)[b]	12.7 – 31.3	20.6
	TSS	6 – 60	31
	Turbidity (NTU)[b]	17 – 84	38
	Conductivity (µS/cm)[b]	608 – 828	716
	BOD_5	<2 – 5	3
	Dissolved Oxygen (DO)[b]	6.2 – 11.5	9.4
	pH (units)[b]	6.9 – 8.5	7.9
	NH_4-N	0.02 – 0.24	0.11
	NH_3-N	<0.001 – 0.031	0.006
	TKN	0.39 – 2.07	1.00
	NO_2+NO_3-N	1.32 – 6.58	3.64
	TN	2.20 – 7.42	4.63
	TP	0.18 – 0.71	0.45
	Chlorophyll *a* (µg/L)	9 – 72	37
	Total Cyanide	<0.005 – 0.005	0.005
	Phenols	<0.005 – <0.005	<0.005
	FC (cfu/100 mL)	<10 – 300	43[c]
	E. coli (cfu/100 mL)	<1 – 81	12[c]

TABLE 5 (Continued): SUMMARY OF WATER QUALITY FROM THE LOCKPORT, BRANDON ROAD, DRESDEN ISLAND, MARSEILLES, STARVED ROCK, AND PEORIA POOLS OF THE ILLINOIS WATERWAY DURING MAY, AUGUST, AND OCTOBER 2011

Navigational Pool	Constituents[a]	Range	Average
Lower Peoria	Water Temperature (°C)[b]	13.1 – 31.0	20.7
	TSS	6 – 73	32
	Turbidity (NTU)[b]	33 – 72	47
	Conductivity (µS/cm)[b]	615 – 844	735
	BOD_5	<2 – 9	3
	Dissolved Oxygen (DO)[b]	5.9 – 9.7	8.1
	pH (units)[b]	6.6 – 8.2	7.8
	NH_4-N	0.07 – 0.35	0.14
	NH_3-N	<0.001 – 0.021	0.005
	TKN	0.69 – 1.17	0.93
	NO_2+NO_3-N	1.68 – 7.05	4.02
	TN	2.68 – 8.10	4.95
	TP	0.18 – 0.81	0.46
	Chlorophyll *a* (µg/L)	7 – 37	23
	Total Cyanide	<0.005 – 0.007	0.005
	Phenols	<0.005 – 0.005	0.005
	FC (cfu/100 mL)	<10 – 390	47[c]
	E. coli (cfu/100 mL)	<1 – 72	7[c]

[a]Expressed in mg/L except where noted.
[b]Field measurement.
[c]Geometric mean.

FIGURE 3: TOTAL SUSPENDED SOLIDS CONCENTRATION AT 49 STATIONS ALONG THE ILLINOIS WATERWAY FROM THE LOCKPORT LOCK TO THE PEORIA LOCK DURING MAY, AUGUST, AND OCTOBER 2011



Dissolved Oxygen. DO concentration trends along the Illinois Waterway are shown in Figure 4. The dramatic increase in DO between Stations 4 and 5 is directly attributable to the natural re-aeration resulting from water passing over the Brandon Road Dam. The DO concentration along the Illinois Waterway remained above 5.9 mg/L below the Dresden Island Lock and Dam to the end of the sampling reach.

Ammonia Nitrogen. Ammonia nitrogen generally decreased from the Lockport Pool through the upper Peoria Pool (Figure 5), then increased slightly in the lower Peoria Pool.

Total Nitrogen. As shown in Figure 6, there was a general decrease in TN concentration from the Lockport Pool to the Marseilles Pool except in May. TN concentration remained relatively stable throughout the rest of the sampling reach. The sharp change in TN between Stations 10 and 12 may be attributable to the confluence of the Kankakee River with the Des Plaines River.

Total Phosphorus. Concentrations of TP decreased along the Illinois Waterway from the Lockport Pool through the Starved Rock Pool and then remained relatively constant through the remaining sampling reach, as shown in Figure 7. The sharp decrease in TP between Stations 10 and 12 may be attributable to the confluence of the Kankakee River with the Des Plaines River.

Fecal Coliform. During August and October, the FC concentration peaked in the Brandon Road Pool, decreased nearly ten fold down to the Marseilles Pool, and then remained rather uniform along the Illinois Waterway through the lower Peoria Pool (Figure 8).

Trace Metals. The total concentrations of arsenic, copper, lead, mercury, silver, and zinc remained consistently low (below the LOQ) from the Lockport Pool to the lower Peoria Pool (Table 6). Total iron and manganese increased progressively downstream. All water samples were below respective LOQs for cadmium, chromium, and nickel with the following four exceptions: sampling Site 6 in October (Ni = 0.028) and sampling Site 47 in May (Cd = 0.012, Cr = 0.01, Ni = 0.015).

FIGURE 4: DISSOLVED OXYGEN CONCENTRATION AT 49 STATIONS ALONG THE ILLINOIS WATERWAY FROM THE LOCKPORT LOCK TO THE PEORIA LOCK DURING MAY, AUGUST, AND OCTOBER 2011

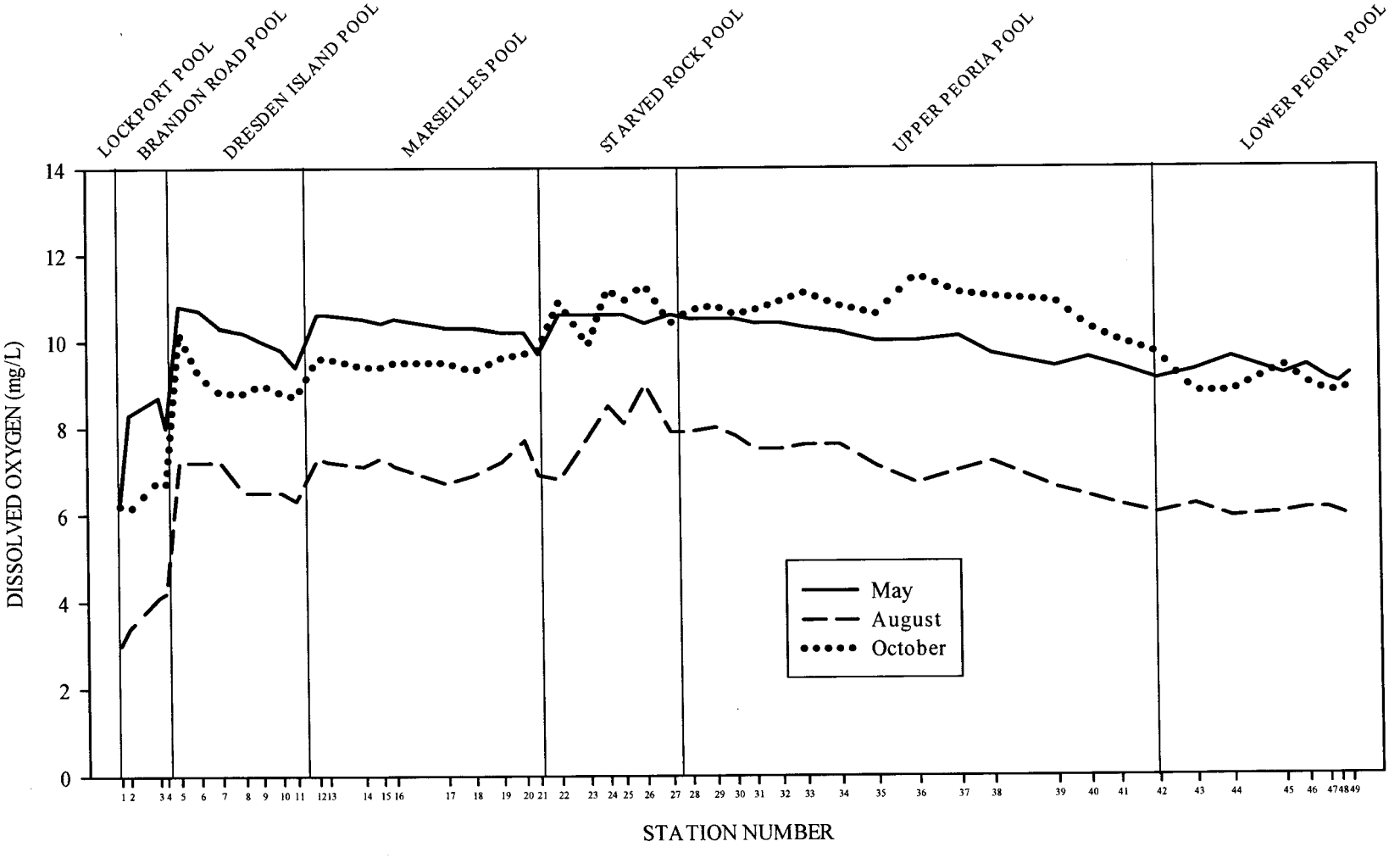


FIGURE 5: AMMONIA NITROGEN CONCENTRATION AT 49 STATIONS ALONG THE ILLINOIS WATERWAY FROM THE LOCKPORT LOCK TO THE PEORIA LOCK DURING MAY, AUGUST, AND OCTOBER 2011

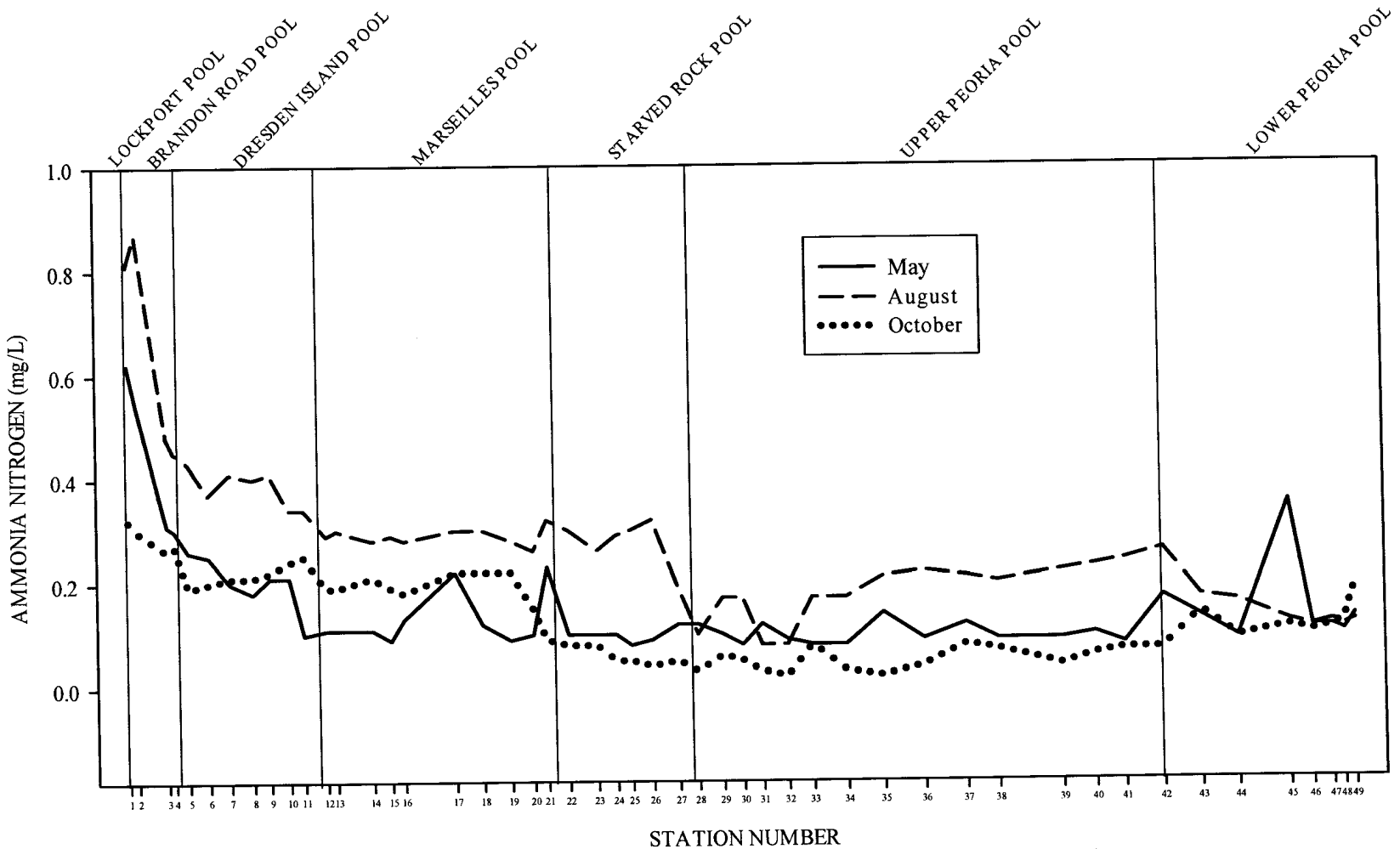


FIGURE 6: TOTAL NITROGEN CONCENTRATION AT 49 STATIONS ALONG THE ILLINOIS WATERWAY FROM THE LOCKPORT LOCK TO THE PEORIA LOCK DURING MAY, AUGUST, AND OCTOBER 2011

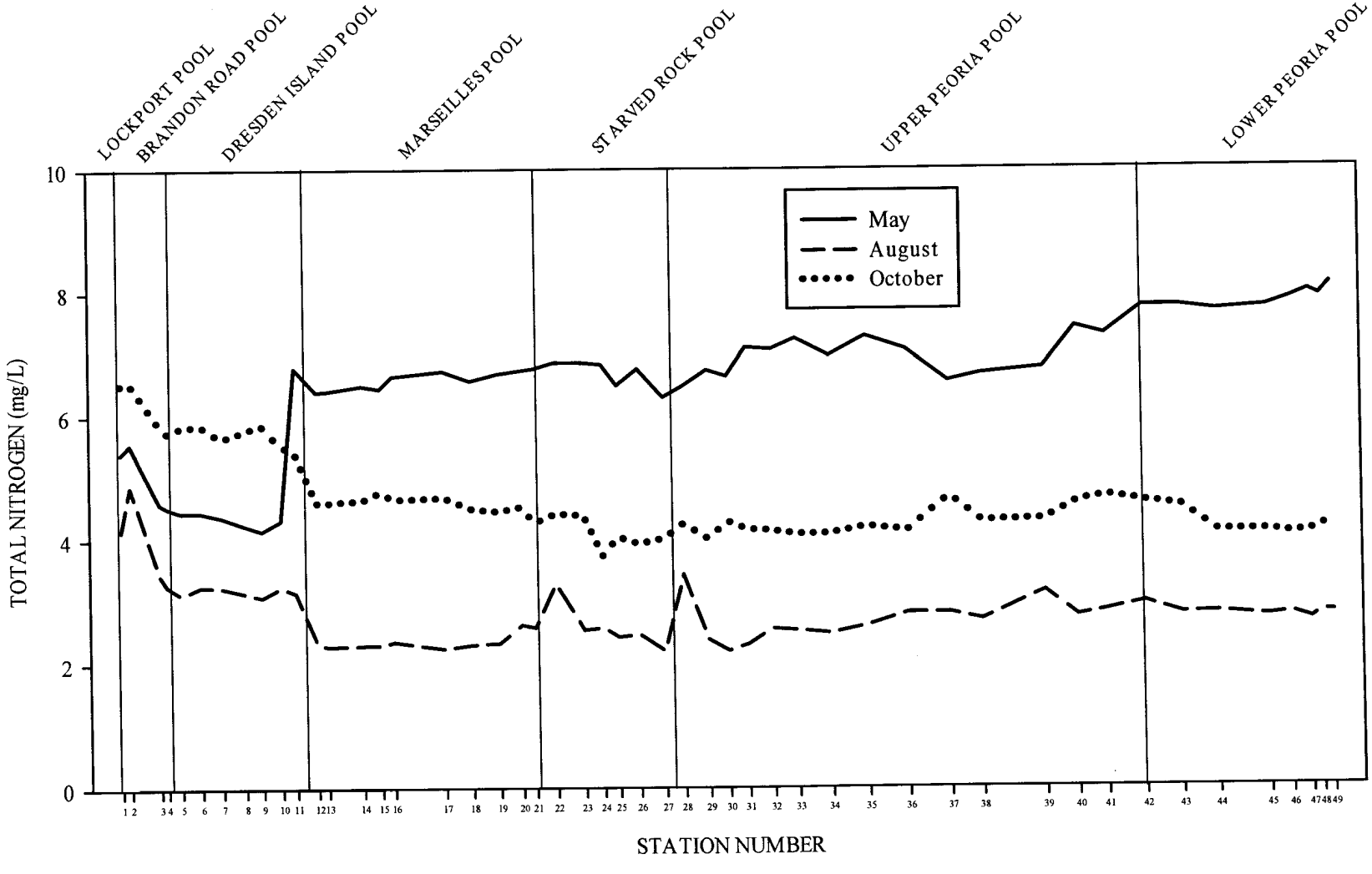


FIGURE 7: TOTAL PHOSPHORUS CONCENTRATION AT 49 STATIONS ALONG THE ILLINOIS WATERWAY FROM THE LOCKPORT LOCK TO THE PEORIA LOCK DURING MAY, AUGUST, AND OCTOBER 2011

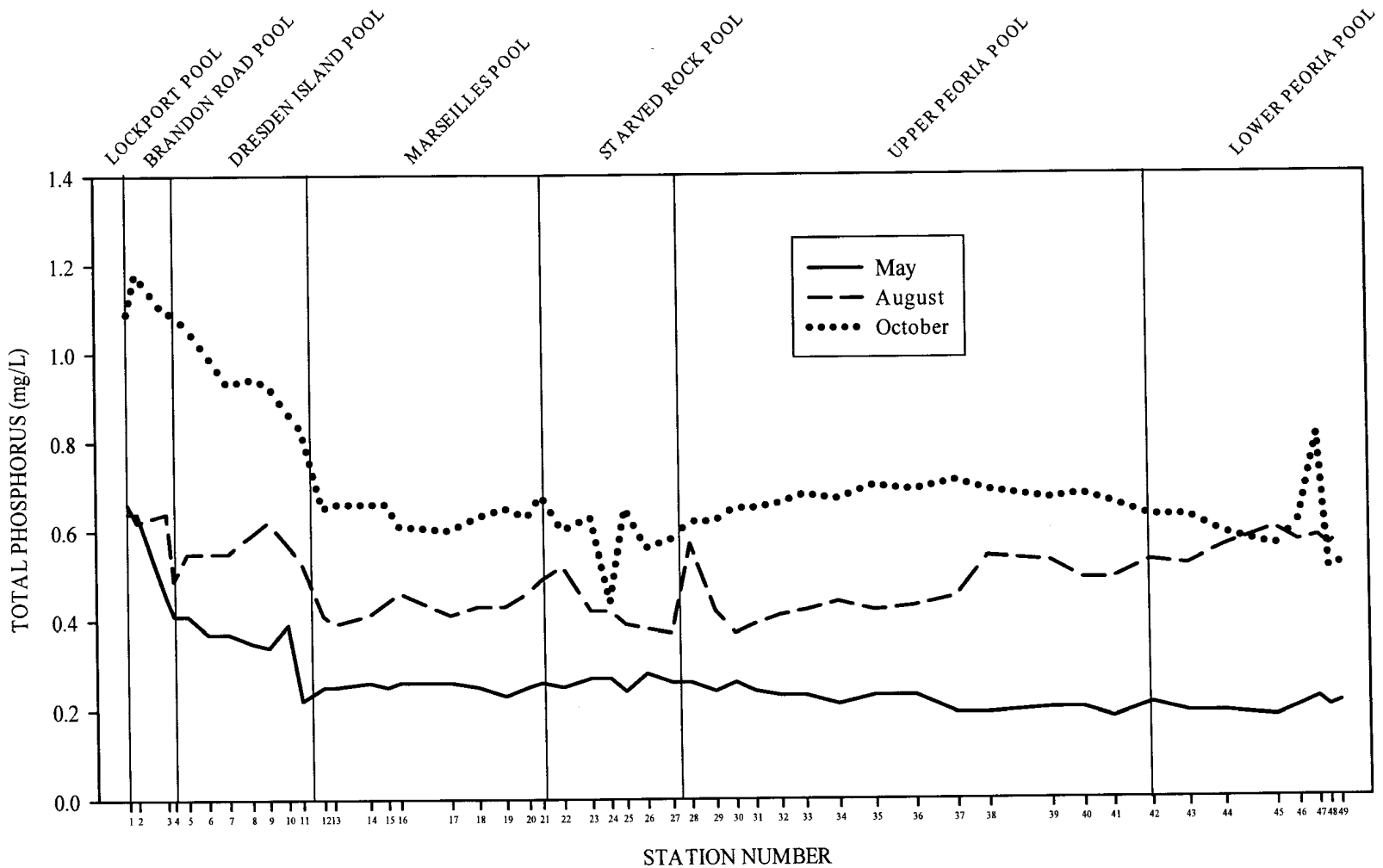


FIGURE 8: FECAL COLIFORM CONCENTRATION AT 49 STATIONS ALONG THE ILLINOIS WATERWAY FROM THE LOCKPORT LOCK TO THE PEORIA LOCK DURING MAY, AUGUST, AND OCTOBER 2011

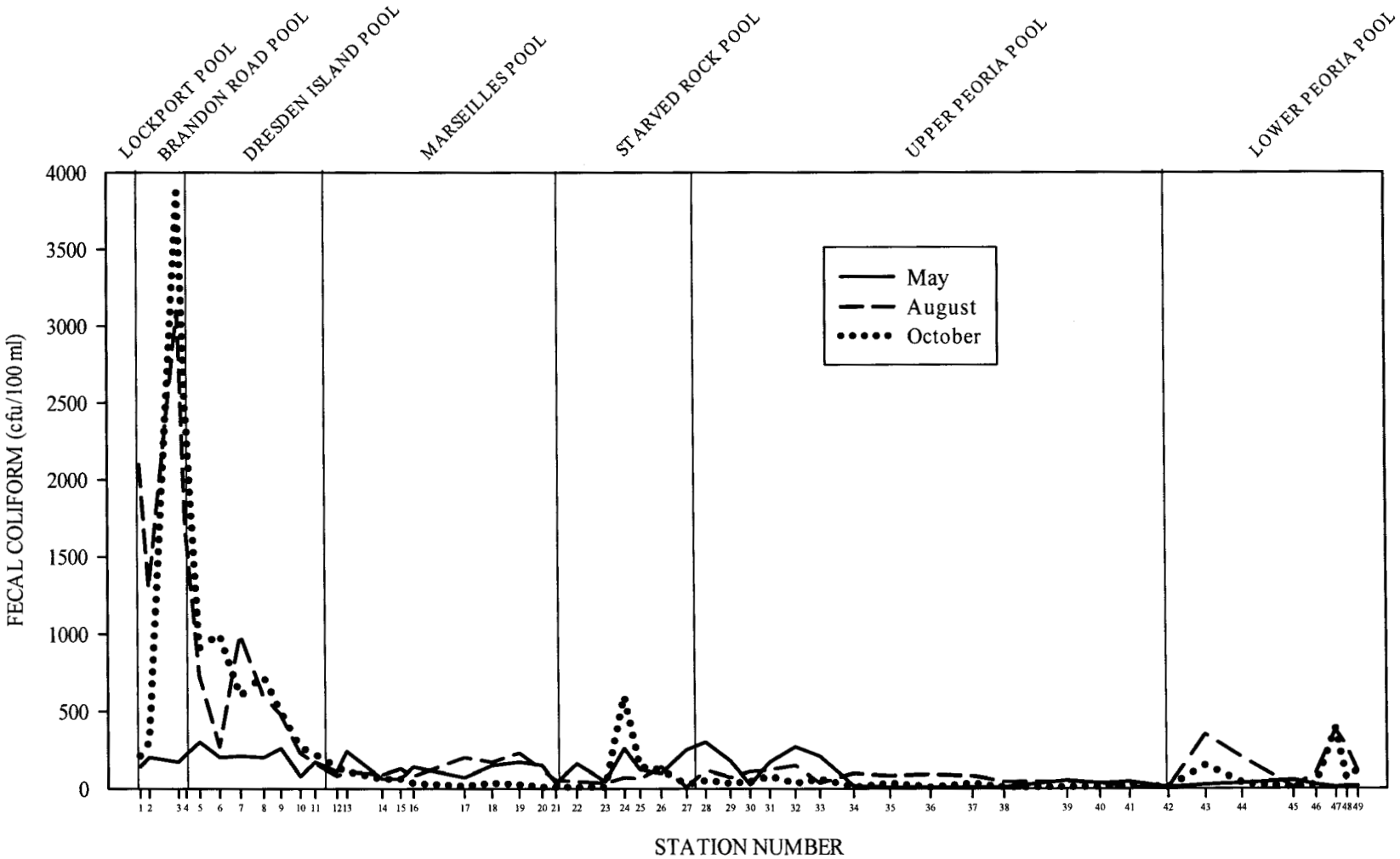


TABLE 6: SUMMARY OF METALS CONCENTRATIONS FROM THE LOCKPORT, BRANDON ROAD, DRESDEN ISLAND, MARSEILLES, STARVED ROCK, AND PEORIA POOLS OF THE ILLINOIS WATERWAY DURING MAY, AUGUST, AND OCTOBER 2011

Navigational Pool	Constituents[a]	Range	Average
Lockport	Total Arsenic	All values <0.05	<0.05
	Total Cadmium	All values <0.001	<0.001
	Total Chromium	All values <0.01	<0.01
	Total Copper	All values <0.02	<0.02
	Total Iron	0.3 – 0.5	0.4
	Total Lead	All values <0.03	<0.03
	Total Manganese	0.021 – 0.043	0.031
	Total Mercury (µg/L)	All values <0.2	<0.2
	Total Nickel	All values <0.008	<0.008
	Total Silver	All values <0.004	<0.004
	Total Zinc	All values <0.06	<0.06
Brandon Road	Total Arsenic	All values <0.05	<0.05
	Total Cadmium	All values <0.001	<0.001
	Total Chromium	All values <0.01	<0.01
	Total Copper	All values <0.02	<0.02
	Total Iron	0.4 – 1.1	0.6
	Total Lead	All values <0.03	<0.03
	Total Manganese	0.029 – 0.061	0.037
	Total Mercury (µg/L)	All values <0.2	<0.2
	Total Nickel	All values <0.008	<0.008
	Total Silver	All values <0.004	<0.004
	Total Zinc	All values <0.06	<0.06
Dresden Island	Total Arsenic	All values <0.05	<0.05
	Total Cadmium	All values <0.001	<0.001
	Total Chromium	All values <0.01	<0.01
	Total Copper	All values <0.02	<0.02
	Total Iron	0.2 – 2.3	0.6
	Total Lead	All values <0.03	<0.03
	Total Manganese	0.023 – 0.078	0.035
	Total Mercury (µg/L)	All values <0.2	<0.2
	Total Nickel	<0.008 – 0.029	0.009
	Total Silver	All values <0.004	<0.004
	Total Zinc	All values <0.06	<0.06

TABLE 6 (Continued): SUMMARY OF METALS CONCENTRATIONS FROM THE LOCKPORT, BRANDON ROAD, DRESDEN ISLAND, MARSEILLES, STARVED ROCK, AND PEORIA POOLS OF THE ILLINOIS WATERWAY DURING MAY, AUGUST, AND OCTOBER 2011

Navigational Pool	Constituents[a]	Range	Average
Marseilles	Total Arsenic	All values <0.05	<0.05
	Total Cadmium	All values <0.001	<0.001
	Total Chromium	All values <0.01	<0.01
	Total Copper	All values <0.02	<0.02
	Total Iron	0.2 – 2.5	1.0
	Total Lead	All values <0.03	<0.03
	Total Manganese	0.024 – 0.078	0.049
	Total Mercury (µg/L)	All values <0.2	<0.2
	Total Nickel	All values <0.008	<0.008
	Total Silver	All values <0.004	<0.004
	Total Zinc	All values <0.06	<0.06
Starved Rock	Total Arsenic	All values <0.05	<0.05
	Total Cadmium	All values <0.001	<0.001
	Total Chromium	All values <0.01	<0.01
	Total Copper	All values <0.02	<0.02
	Total Iron	0.3 – 2.7	1.1
	Total Lead	All values <0.03	<0.03
	Total Manganese	0.030 – 0.086	0.053
	Total Mercury (µg/L)	All values <0.2	<0.2
	Total Nickel	All values <0.008	<0.008
	Total Silver	All values <0.004	<0.004
	Total Zinc	All values <0.06	<0.06
Upper Peoria	Total Arsenic	All values <0.05	<0.05
	Total Cadmium	All values <0.001	<0.001
	Total Chromium	All values <0.01	<0.01
	Total Copper	All values <0.02	<0.02
	Total Iron	0.5 – 2.4	1.2
	Total Lead	All values <0.03	<0.03
	Total Manganese	0.029 – 0.108	0.060
	Total Mercury (µg/L)	All values <0.2	<0.2
	Total Nickel	All values <0.008	<0.008
	Total Silver	All values <0.004	<0.004
	Total Zinc	All values <0.06	<0.06

TABLE 6 (Continued): SUMMARY OF METALS CONCENTRATIONS FROM THE LOCKPORT, BRANDON ROAD, DRESDEN ISLAND, MARSEILLES, STARVED ROCK, AND PEORIA POOLS OF THE ILLINOIS WATERWAY DURING MAY, AUGUST, AND OCTOBER 2011

Navigational Pool	Constituents[a]	Range	Average
Lower Peoria	Total Arsenic	All values <0.05	<0.05
	Total Cadmium	<0.001 – 0.012	0.001
	Total Chromium	<0.01 – 0.01	0.01
	Total Copper	All values <0.02	<0.02
	Total Iron	0.8 – 2.5	1.5
	Total Lead	All values <0.03	<0.03
	Total Manganese	0.034 – 0.146	0.076
	Total Mercury (µg/L)	All values <0.2	<0.2
	Total Nickel	<0.008 – 0.015	0.008
	Total Silver	All values <0.004	<0.004
	Total Zinc	All values <0.06	<0.06

[a]Expressed in mg/L except where noted.

Waterway Use Designations

The Illinois Pollution Control Board has designated water uses for particular waters within the State of Illinois. The CSSC and the Des Plaines River from its confluence with the CSSC to the Interstate Highway 55 (I-55) bridge are classified as Secondary Contact and Indigenous Aquatic Life waters (Stations 1–8). The Des Plaines River downstream of the I-55 bridge (Station 9) and the Illinois River are General Use waters (Stations 10–49).

Water Quality Standards. *Dissolved Oxygen.* The Indigenous Aquatic Life Use minimum DO standard is 4.0 mg/L. The Indigenous Aquatic Life Use Standard was consistently achieved during each of the sampling periods. The General Use minimum DO standard is 5.0 mg/L during March – July, and 3.5 mg/L during August – February, and it was achieved for all sampling periods throughout the sampling reach. The General Use DO standards also include a 7-day mean of minima and a 30-day mean of means, which cannot be assessed with the limited DO data that was collected for this study.

Fecal Coliform. During May all samples exhibited FC counts below the General Use Standard. During August FC counts exceeded the General Use Standard of 400 cfu/100 mL at Station 9 (480 cfu/100 mL). During October FC counts exceeded the General Use Standard of 400 cfu/100 mL at Stations 9 (500 cfu/100 mL) and 24 (600 cfu/100 mL). The Secondary Contact Use waters have no FC standard.

Total Mercury. The Water Quality Standard for the Protection of Human Health for total mercury in General Use waters is 0.012 µg/L. The total mercury values for all dates at all of the stations were less than the LOQ (0.20 µg/L), but compliance with the Human Health Standard for mercury cannot be assessed.

Sediment Quality

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 seven general chemistry constituents measured in sediment at each of the 14 selected monitoring stations are presented in Table 7. Sediment from the Lockport and Brandon Road Pool stations generally contained the highest levels of TKN, NO_2+NO_3-N, and TP. TKN and TP concentrations were relatively elevated in portions of the Dresden Island and Peoria Pools. Higher concentrations of phenols were detected between the Lockport and Brandon Road Pools and again in the upper and lower Peoria Pools.

The concentrations of 11 measured trace metals for the same 14 selected stations are presented in Table 8. Arsenic concentrations were below the LOQ at all of the sediment

TABLE 7: CHEMICAL CHARACTERISTICS OF SEDIMENT COLLECTED FROM MONITORING STATIONS IN THE LOCKPORT, BRANDON ROAD, DRESDEN ISLAND, MARSEILLES, STARVED ROCK, AND PEORIA POOLS OF THE ILLINOIS WATERWAY, OCTOBER 2011

Station No.	Navigational Pool	Constituents (Expressed on a dry weight basis)						
		Total Solids (%)	Total Volatile Solids (% of Total)	Ammonia Nitrogen (mg/kg)	Total Kjeldahl Nitrogen (mg/kg)	Nitrite + Nitrate Nitrogen (mg/kg)	Total Phos-phorus (mg/kg)	Phenols (mg/kg)
1	Lockport	38	13	43	3,374	45	5,300	0.259
2	Brandon Road	47	16	59	2,268	25	8,058	0.346
5*	Dresden Island	NA	NA	NA	NA	NA	NA	NA
8	Dresden Island	53	11	29	2,339	23	2,430	0.158
12	Marseilles	77	1	3	255	7	1,170	0.232
18	Marseilles	64	4	12	1,079	17	1,122	0.235
23	Starved Rock	74	1	7	351	9	482	0.132
28	Peoria	76	3	3	242	5	279	0.372
32	Peoria	80	3	2	82	5	118	0.200
35	Peoria	73	2	4	331	8	337	0.116
38	Peoria	71	3	7	394	7	608	0.189
41	Peoria	48	10	29	1,926	16	1,309	0.240
44	Peoria	37	9	41	2,532	43	1,458	0.258
48	Peoria	59	5	48	1,006	19	672	0.221

NA = Not Available
*Station 5 sample bottle broken in transit.

TABLE 8: TRACE METALS IN SEDIMENT COLLECTED FROM MONITORING STATIONS IN THE LOCKPORT, BRANDON ROAD, DRESDEN ISLAND, MARSEILLES, STARVED ROCK, AND PEORIA POOLS OF THE ILLINOIS WATERWAY, OCTOBER 2011

Station No.	Navigational Pool	Arsenic	Cadmium	Chromium	Copper	Iron	Lead	Manganese	Mercury	Nickel	Silver	Zinc
		(mg/kg dry weight)										
1	Lockport	<10	22.3	202	204	25,312	215	334	1.01	53	9.8	905
2	Brandon Road	<10	5.2	62	111	32,302	124	845	0.48	29	2.5	491
5*	Dresden Island	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
8	Dresden Island	<10	3.0	33	61	20,157	57	441	0.62	22	1.5	225
12	Marseilles	<10	0.5	10	7	7,830	14	266	<0.25	6	<0.7	50
18	Marseilles	<10	1.0	16	20	10,887	21	332	<0.25	10	1.0	88
23	Starved Rock	<10	0.3	8	8	9,316	11	192	<0.25	8	<0.7	54
28	Peoria	<10	<0.2	5	4	5,679	14	140	<0.25	4	<0.7	34
32	Peoria	<10	<0.2	4	<3	7,614	11	181	<0.25	6	<0.7	53
35	Peoria	<10	0.2	8	6	9,430	8	226	<0.25	8	<0.7	36
38	Peoria	<10	0.4	7	5	8,932	10	248	<0.25	7	<0.7	63
41	Peoria	<10	1.3	18	22	15,429	22	472	<0.25	14	0.9	117
44	Peoria	<10	1.6	26	32	19,621	27	559	0.26	19	0.8	142
48	Peoria	<10	0.7	13	16	12,592	20	418	<0.25	14	<0.7	73

ND = No Data
*Station 5 sample bottle broken in transit.

sampling stations. Mercury was above the LOQ at four stations with the highest concentration in the Lockport Pool (1.01 mg/kg). Silver was below the LOQ for approximately half of the stations. The highest silver concentration was in the Lockport Pool (9.8 mg/kg). Concentrations of cadmium, chromium, copper, lead, nickel, and zinc were highest in the Lockport Pool. The Brandon Road Pool contained the most elevated concentrations of iron and manganese.

APPENDIX AI

WATER QUALITY AT STATION 1 IN THE CHICAGO SANITARY AND SHIP CANAL DURING MAY, AUGUST, AND OCTOBER 2011

TABLE AI-1: WATER QUALITY AT STATION 1 IN THE CHICAGO SANITARY AND SHIP CANAL DURING MAY, AUGUST, AND OCTOBER 2011

Constituents[a]	May	August	October
Water Temperature (°C)[b]	15.2	27.9	20.8
Total Suspended Solids	6	15	7
Turbidity (NTU)[b]	8	15	9
Conductivity (µS/cm)[b]	1,103	751	758
Five-Day BOD	<2	<2	<2
Dissolved Oxygen[b]	6.3	3.0	6.2
pH (units)[b]	6.9	6.6	6.3
Ammonia Nitrogen	0.62	0.81	0.32
Un-ionized Ammonia	0.001	0.002	<0.001
Total Kjeldahl Nitrogen	1.32	1.05	0.82
Nitrite plus Nitrate Nitrogen	4.07	3.09	5.69
Total Nitrogen	5.39	4.14	6.51
Total Phosphorus	0.64	0.66	1.09
Chlorophyll *a* (µg/L)	No Data	No Data	No Data
Total Cyanide	0.005	<0.005	0.006
Phenols	<0.005	<0.005	<0.005
Total Arsenic	<0.05	<0.05	<0.05
Total Cadmium	<0.001	<0.001	<0.001
Total Chromium	<0.01	<0.01	<0.01
Total Copper	<0.02	<0.02	<0.02
Total Iron	0.4	0.5	0.3
Total Lead	<0.03	<0.03	<0.03
Total Manganese	0.029	0.043	0.021
Total Mercury (µg/L)	<0.2	<0.2	<0.2
Total Nickel	<0.008	<0.008	<0.008
Total Silver	<0.004	<0.004	<0.004
Total Zinc	<0.06	<0.06	<0.06
Fecal Coliform (cfu/100 mL)	140	2,100	210
E. coli (cfu/100 mL)	130	1,400	200

[a]Expressed in mg/L except where noted.
[b]Field measurement.

APPENDIX AII

WATER QUALITY AT STATIONS 2–4 IN THE CHICAGO SANITARY AND SHIP CANAL AND THE DES PLAINES RIVER DURING MAY, AUGUST, AND OCTOBER 2011

TABLE AII-1: WATER QUALITY AT STATION 2 IN THE CHICAGO SANITARY AND SHIP CANAL DURING MAY, AUGUST, AND OCTOBER 2011

Constituents[a]	May	August	October
Water Temperature (°C)[b]	15.0	28.0	20.9
Total Suspended Solids	12	14	23
Turbidity (NTU)[b]	13	10	23
Conductivity (µS/cm)[b]	1,105	742	762
Five-Day BOD	3	<2	3
Dissolved Oxygen[b]	8.3	3.4	6.1
pH (units)[b]	7.1	6.5	6.3
Ammonia Nitrogen	0.54	0.87	0.30
Un-ionized Ammonia	0.002	0.002	<0.001
Total Kjeldahl Nitrogen	1.31	1.90	0.81
Nitrite plus Nitrate Nitrogen	4.23	2.96	5.74
Total Nitrogen	5.54	4.86	6.55
Total Phosphorus	0.64	0.62	1.18
Chlorophyll *a* (µg/L)	2	9	3
Total Cyanide	0.006	<0.005	0.005
Phenols	<0.005	<0.005	<0.005
Total Arsenic	<0.05	<0.05	<0.05
Total Cadmium	<0.001	<0.001	<0.001
Total Chromium	<0.01	<0.01	<0.01
Total Copper	<0.02	<0.02	<0.02
Total Iron	0.5	0.5	0.7
Total Lead	<0.03	<0.03	<0.03
Total Manganese	0.031	0.040	0.029
Total Mercury (µg/L)	<0.2	<0.2	<0.2
Total Nickel	<0.008	<0.008	<0.008
Total Silver	<0.004	<0.004	<0.004
Total Zinc	<0.06	<0.06	<0.06
Fecal Coliform (cfu/100 mL)	200	1,300	300
E. coli (cfu/100 mL)	160	820	130

[a]Expressed in mg/L except where noted.
[b]Field measurement.

TABLE AII-2: WATER QUALITY AT STATION 3 IN THE DES PLAINES RIVER DURING MAY, AUGUST, AND OCTOBER 2011

Constituents[a]	May	August	October
Water Temperature (°C)[b]	14.5	27.6	18.9
Total Suspended Solids	15	31	19
Turbidity (NTU)[b]	12	20	192
Conductivity (µS/cm)[b]	1,081	698	792
Five-Day BOD	3	<2	3
Dissolved Oxygen[b]	8.7	4.1	6.8
pH (units)[b]	7.3	6.7	5.8
Ammonia Nitrogen	0.31	0.48	0.26
Un-ionized Ammonia	0.002	0.002	<0.001
Total Kjeldahl Nitrogen	1.10	1.17	0.72
Nitrite plus Nitrate Nitrogen	3.49	2.28	5.15
Total Nitrogen	4.59	3.45	5.87
Total Phosphorus	0.45	0.64	1.09
Chlorophyll *a* (µg/L)	9	9	6
Total Cyanide	<0.005	<0.005	0.005
Phenols	<0.005	<0.005	<0.005
Total Arsenic	<0.05	<0.05	<0.05
Total Cadmium	<0.001	<0.001	<0.001
Total Chromium	<0.01	<0.01	<0.01
Total Copper	<0.02	<0.02	<0.02
Total Iron	0.6	1.1	0.7
Total Lead	<0.03	<0.03	<0.03
Total Manganese	0.033	0.061	0.035
Total Mercury (µg/L)	<0.2	<0.2	<0.2
Total Nickel	<0.008	<0.008	<0.008
Total Silver	<0.004	<0.004	<0.004
Total Zinc	<0.06	<0.06	<0.06
Fecal Coliform (cfu/100 mL)	170	3,100	370
E. coli (cfu/100 mL)	110	1,400	350

[a]Expressed in mg/L except where noted.
[b]Field measurement.

TABLE AII-3: WATER QUALITY AT STATION 4 IN THE DES PLAINES RIVER DURING MAY, AUGUST, AND OCTOBER 2011

Constituents[a]	May	August	October
Water Temperature (°C)[b]	14.3	27.6	18.6
Total Suspended Solids	12	12	32
Turbidity (NTU)[b]	13	9	30
Conductivity (µS/cm)[b]	1,081	687	796
Five-Day BOD	3	<2	3
Dissolved Oxygen[b]	8.0	4.2	6.7
pH (units)[b]	7.3	6.9	6.0
Ammonia Nitrogen	0.30	0.45	0.27
Un-ionized Ammonia	0.002	0.003	<0.001
Total Kjeldahl Nitrogen	1.11	1.09	0.70
Nitrite plus Nitrate Nitrogen	3.42	2.18	5.04
Total Nitrogen	4.53	3.27	5.74
Total Phosphorus	0.41	0.49	1.09
Chlorophyll *a* (µg/L)	No Data	No Data	No Data
Total Cyanide	<0.005	<0.005	0.005
Phenols	<0.005	<0.005	<0.005
Total Arsenic	<0.05	<0.05	<0.05
Total Cadmium	<0.001	<0.001	<0.001
Total Chromium	<0.01	<0.01	<0.01
Total Copper	<0.02	<0.02	<0.02
Total Iron	0.5	0.4	0.9
Total Lead	<0.03	<0.03	<0.03
Total Manganese	0.031	0.038	0.038
Total Mercury (µg/L)	<0.2	<0.2	<0.2
Total Nickel	<0.008	<0.008	<0.008
Total Silver	<0.004	<0.004	<0.004
Total Zinc	<0.06	<0.06	<0.06
Fecal Coliform (cfu/100 mL)	220	1,700	2,500
E. coli (cfu/100 mL)	130	600	1,100

[a]Expressed in mg/L except where noted.
[b]Field measurement.

APPENDIX AIII

WATER QUALITY AT STATIONS 5–11 IN THE DES PLAINES RIVER AND THE ILLINOIS RIVER DURING MAY, AUGUST, AND OCTOBER 2011

TABLE AIII-1: WATER QUALITY AT STATION 5 IN THE DES PLAINES RIVER DURING MAY, AUGUST, AND OCTOBER 2011

Constituents[a]	May	August	October
Water Temperature (°C)[b]	14.4	28.0	19.4
Total Suspended Solids	15	19	15
Turbidity (NTU)[b]	14	13	14
Conductivity (µS/cm)[b]	1,080	676	806
Five-Day BOD	3	<2	3
Dissolved Oxygen[b]	10.8	7.2	10.2
pH (units)[b]	7.4	6.3	4.9
Ammonia Nitrogen	0.26	0.43	0.19
Un-ionized Ammonia	0.002	0.001	<0.001
Total Kjeldahl Nitrogen	1.08	0.96	0.66
Nitrite plus Nitrate Nitrogen	3.37	2.15	5.16
Total Nitrogen	4.45	3.11	5.82
Total Phosphorus	0.41	0.55	1.06
Chlorophyll *a* (µg/L)	10	11	5
Total Cyanide	<0.005	<0.005	0.006
Phenols	<0.005	<0.005	<0.005
Total Arsenic	<0.05	<0.05	<0.05
Total Cadmium	<0.001	<0.001	<0.001
Total Chromium	<0.01	<0.01	<0.01
Total Copper	<0.02	<0.02	<0.02
Total Iron	0.6	0.6	0.4
Total Lead	<0.03	<0.03	<0.03
Total Manganese	0.032	0.043	0.028
Total Mercury (µg/L)	<0.2	<0.2	<0.2
Total Nickel	<0.008	<0.008	<0.008
Total Silver	<0.004	<0.004	<0.004
Total Zinc	<0.06	<0.06	<0.06
Fecal Coliform (cfu/100 mL)	300	730	910
E. coli (cfu/100 mL)	210	560	410

[a]Expressed in mg/L except where noted.
[b]Field measurement.

TABLE AIII-2: WATER QUALITY AT STATION 6 IN THE DES PLAINES RIVER DURING MAY, AUGUST, AND OCTOBER 2011

Constituents[a]	May	August	October
Water Temperature (°C)[b]	15.2	32.6	24.6
Total Suspended Solids	12	11	9
Turbidity (NTU)[b]	14	10	13
Conductivity (µS/cm)[b]	1,082	689	798
Five-Day BOD	3	<2	3
Dissolved Oxygen[b]	10.7	7.2	9.2
pH (units)[b]	7.5	7.2	7.1
Ammonia Nitrogen	0.25	0.37	0.20
Un-ionized Ammonia	0.002	0.006	0.001
Total Kjeldahl Nitrogen	1.01	1.02	0.84
Nitrite plus Nitrate Nitrogen	3.44	2.24	5.02
Total Nitrogen	4.45	3.26	5.86
Total Phosphorus	0.37	0.55	1.00
Chlorophyll *a* (µg/L)	No Data	No Data	No Data
Total Cyanide	<0.005	<0.005	0.005
Phenols	<0.005	<0.005	<0.005
Total Arsenic	<0.05	<0.05	<0.05
Total Cadmium	<0.001	<0.001	<0.001
Total Chromium	<0.01	<0.01	<0.01
Total Copper	<0.02	<0.02	<0.02
Total Iron	0.5	0.4	0.8
Total Lead	<0.03	<0.03	<0.03
Total Manganese	0.030	0.035	0.029
Total Mercury (µg/L)	<0.2	<0.2	<0.2
Total Nickel	<0.008	<0.008	0.029
Total Silver	<0.004	<0.004	<0.004
Total Zinc	<0.06	<0.06	<0.06
Fecal Coliform (cfu/100 mL)	200	270	1,000
E. coli (cfu/100 mL)	170	230	310

[a]Expressed in mg/L except where noted.
[b]Field measurement.

TABLE AIII-3: WATER QUALITY AT STATION 7 IN THE DES PLAINES RIVER DURING MAY, AUGUST, AND OCTOBER 2011

Constituents[a]	May	August	October
Water Temperature (°C)[b]	14.8	30.4	21.0
Total Suspended Solids	24	10	11
Turbidity (NTU)[b]	23	9	14
Conductivity (µS/cm)[b]	1,074	676	786
Five-Day BOD	3	<2	3
Dissolved Oxygen[b]	10.3	7.2	8.8
pH (units)[b]	7.5	7.0	6.7
Ammonia Nitrogen	0.20	0.41	0.21
Un-ionized Ammonia	0.002	0.004	<0.001
Total Kjeldahl Nitrogen	1.01	0.89	0.74
Nitrite plus Nitrate Nitrogen	3.36	2.35	4.90
Total Nitrogen	4.37	3.24	5.64
Total Phosphorus	0.37	0.55	0.93
Chlorophyll *a* (µg/L)	11	14	9
Total Cyanide	<0.005	<0.005	0.006
Phenols	<0.005	<0.005	<0.005
Total Arsenic	<0.05	<0.05	<0.05
Total Cadmium	<0.001	<0.001	<0.001
Total Chromium	<0.01	<0.01	<0.01
Total Copper	<0.02	<0.02	<0.02
Total Iron	0.7	0.4	0.3
Total Lead	<0.03	<0.03	<0.03
Total Manganese	0.035	0.037	0.030
Total Mercury (µg/L)	<0.2	<0.2	<0.2
Total Nickel	<0.008	<0.008	<0.008
Total Silver	<0.004	<0.004	<0.004
Total Zinc	<0.06	<0.06	<0.06
Fecal Coliform (cfu/100 mL)	210	1,000	600
E. coli (cfu/100 mL)	99	330	360

[a]Expressed in mg/L except where noted.
[b]Field measurement.

TABLE AIII-4: WATER QUALITY AT STATION 8 IN THE DES PLAINES RIVER DURING MAY, AUGUST, AND OCTOBER 2011

Constituents[a]	May	August	October
Water Temperature (°C)[b]	15.0	30.4	20.8
Total Suspended Solids	18	15	14
Turbidity (NTU)[b]	17	12	17
Conductivity (µS/cm)[b]	1,055	667	768
Five-Day BOD	3	<2	<2
Dissolved Oxygen[b]	10.2	6.5	8.8
pH (units)[b]	7.6	7.1	6.8
Ammonia Nitrogen	0.18	0.40	0.21
Un-ionized Ammonia	0.002	0.004	0.001
Total Kjeldahl Nitrogen	0.90	0.98	0.94
Nitrite plus Nitrate Nitrogen	3.34	2.17	4.82
Total Nitrogen	4.24	3.15	5.76
Total Phosphorus	0.35	0.59	0.94
Chlorophyll *a* (µg/L)	No Data	No Data	No Data
Total Cyanide	<0.005	<0.005	0.005
Phenols	<0.005	<0.005	<0.005
Total Arsenic	<0.05	<0.05	<0.05
Total Cadmium	<0.001	<0.001	<0.001
Total Chromium	<0.01	<0.01	<0.01
Total Copper	<0.02	<0.02	<0.02
Total Iron	0.7	0.5	0.4
Total Lead	<0.03	<0.03	<0.03
Total Manganese	0.036	0.038	0.028
Total Mercury (µg/L)	<0.2	<0.2	<0.2
Total Nickel	<0.008	<0.008	<0.008
Total Silver	<0.004	<0.004	<0.004
Total Zinc	<0.06	<0.06	<0.06
Fecal Coliform (cfu/100 mL)	170	1,000	240
E. coli (cfu/100 mL)	<10	270	81

[a]Expressed in mg/L except where noted.
[b]Field measurement.

TABLE AIII-5: WATER QUALITY AT STATION 9 IN THE DES PLAINES RIVER DURING MAY, AUGUST, AND OCTOBER 2011

Constituents[a]	May	August	October
Water Temperature (°C)[b]	14.9	30.0	20.2
Total Suspended Solids	17	10	11
Turbidity (NTU)[b]	17	15	14
Conductivity (µS/cm)[b]	1,065	692	786
Five-Day BOD	3	<2	3
Dissolved Oxygen[b]	10.0	6.5	9.0
pH (units)[b]	7.6	7.1	6.0
Ammonia Nitrogen	0.21	0.41	0.22
Un-ionized Ammonia	0.002	0.004	<0.001
Total Kjeldahl Nitrogen	0.90	0.96	0.98
Nitrite plus Nitrate Nitrogen	3.25	2.12	4.88
Total Nitrogen	4.15	3.08	5.86
Total Phosphorus	0.34	0.62	0.93
Chlorophyll *a* (µg/L)	No Data	No Data	No Data
Total Cyanide	<0.005	<0.005	0.005
Phenols	<0.005	<0.005	<0.005
Total Arsenic	<0.05	<0.05	<0.05
Total Cadmium	<0.001	<0.001	<0.001
Total Chromium	<0.01	<0.01	<0.01
Total Copper	<0.02	<0.02	<0.02
Total Iron	0.6	0.4	0.2
Total Lead	<0.03	<0.03	<0.03
Total Manganese	0.033	0.033	0.026
Total Mercury (µg/L)	<0.2	<0.2	<0.2
Total Nickel	<0.008	<0.008	<0.008
Total Silver	<0.004	<0.004	<0.004
Total Zinc	<0.06	<0.06	<0.06
Fecal Coliform (cfu/100 mL)	260	480	500
E. coli (cfu/100 mL)	140	140	350

[a]Expressed in mg/L except where noted.
[b]Field measurement.

TABLE AIII-6: WATER QUALITY AT STATION 10 IN THE DES PLAINES RIVER DURING MAY, AUGUST, AND OCTOBER 2011

Constituents[a]	May	August	October
Water Temperature (°C)[b]	14.1	30.2	19.7
Total Suspended Solids	21	15	10
Turbidity (NTU)[b]	23	13	13
Conductivity (µS/cm)[b]	1,097	709	804
Five-Day BOD	3	<2	<2
Dissolved Oxygen[b]	9.8	6.5	8.8
pH (units)[b]	7.6	7.3	7.7
Ammonia Nitrogen	0.21	0.34	0.24
Un-ionized Ammonia	0.002	0.006	0.005
Total Kjeldahl Nitrogen	0.95	0.86	0.78
Nitrite plus Nitrate Nitrogen	3.37	2.38	4.75
Total Nitrogen	4.32	3.24	5.53
Total Phosphorus	0.39	0.57	0.87
Chlorophyll *a* (µg/L)	11	8	5
Total Cyanide	<0.005	<0.005	0.005
Phenols	<0.005	<0.005	<0.005
Total Arsenic	<0.05	<0.05	<0.05
Total Cadmium	<0.001	<0.001	<0.001
Total Chromium	<0.01	<0.01	<0.01
Total Copper	<0.02	<0.02	<0.02
Total Iron	0.8	0.5	0.3
Total Lead	<0.03	<0.03	<0.03
Total Manganese	0.042	0.034	0.025
Total Mercury (µg/L)	<0.2	<0.2	<0.2
Total Nickel	<0.008	<0.008	<0.008
Total Silver	<0.004	<0.004	<0.004
Total Zinc	<0.06	<0.06	<0.06
Fecal Coliform (cfu/100 mL)	81	230	270
E. coli (cfu/100 mL)	81	240	130

[a]Expressed in mg/L except where noted.
[b]Field measurement.

TABLE AIII-7: WATER QUALITY AT STATION 11 IN THE ILLINOIS RIVER DURING MAY, AUGUST, AND OCTOBER 2011

Constituents[a]	May	August	October
Water Temperature (°C)[b]	12.9	30.0	19.3
Total Suspended Solids	44	12	8
Turbidity (NTU)[b]	64	9	12
Conductivity (µS/cm)[b]	464	696	791
Five-Day BOD	<2	<2	<2
Dissolved Oxygen[b]	9.4	6.3	8.7
pH (units)[b]	7.7	7.3	7.8
Ammonia Nitrogen	0.10	0.34	0.25
Un-ionized Ammonia	0.001	0.006	0.006
Total Kjeldahl Nitrogen	0.89	0.91	0.77
Nitrite plus Nitrate Nitrogen	5.89	2.24	4.64
Total Nitrogen	6.78	3.15	5.41
Total Phosphorus	0.22	0.53	0.83
Chlorophyll *a* (µg/L)	5	10	5
Total Cyanide	<0.005	<0.005	0.005
Phenols	<0.005	<0.005	<0.005
Total Arsenic	<0.05	<0.05	<0.05
Total Cadmium	<0.001	<0.001	<0.001
Total Chromium	<0.01	<0.01	<0.01
Total Copper	<0.02	<0.02	<0.02
Total Iron	2.3	0.4	0.2
Total Lead	<0.03	<0.03	<0.03
Total Manganese	0.078	0.035	0.023
Total Mercury (µg/L)	<0.2	<0.2	<0.2
Total Nickel	<0.008	<0.008	<0.008
Total Silver	<0.004	<0.004	<0.004
Total Zinc	<0.06	<0.06	<0.06
Fecal Coliform (cfu/100 mL)	170	160	220
E. coli (cfu/100 mL)	36	140	150

[a]Expressed in mg/L except where noted.
[b]Field measurement.

APPENDIX AIV

WATER QUALITY AT STATIONS 12–21 IN THE ILLINOIS RIVER DURING MAY, AUGUST, AND OCTOBER 2011

TABLE AIV-1: WATER QUALITY AT STATION 12 IN THE ILLINOIS RIVER DURING MAY, AUGUST, AND OCTOBER 2011

Constituents[a]	May	August	October
Water Temperature (°C)[b]	13.3	30.8	18.4
Total Suspended Solids	41	14	11
Turbidity (NTU)[b]	63	10	15
Conductivity (µS/cm)[b]	607	641	756
Five-Day BOD	<2	3	<2
Dissolved Oxygen[b]	10.6	7.3	9.6
pH (units)[b]	7.8	7.6	7.9
Ammonia Nitrogen	0.11	0.29	0.19
Un-ionized Ammonia	0.002	0.010	0.005
Total Kjeldahl Nitrogen	1.03	0.76	0.74
Nitrite plus Nitrate Nitrogen	5.37	1.57	3.86
Total Nitrogen	6.40	2.33	4.60
Total Phosphorus	0.25	0.41	0.65
Chlorophyll *a* (µg/L)	No Data	No Data	No Data
Total Cyanide	<0.005	<0.005	0.005
Phenols	<0.005	<0.005	<0.005
Total Arsenic	<0.05	<0.05	<0.05
Total Cadmium	<0.001	<0.001	<0.001
Total Chromium	<0.01	<0.01	<0.01
Total Copper	<0.02	<0.02	<0.02
Total Iron	2.1	0.4	0.4
Total Lead	<0.03	<0.03	<0.03
Total Manganese	0.071	0.056	0.029
Total Mercury (µg/L)	<0.2	<0.2	<0.2
Total Nickel	<0.008	<0.008	<0.008
Total Silver	<0.004	<0.004	<0.004
Total Zinc	<0.06	<0.06	<0.06
Fecal Coliform (cfu/100 mL)	110	81	140
E. coli (cfu/100 mL)	81	120	110

[a]Expressed in mg/L except where noted.
[b]Field measurement.

TABLE AIV-2: WATER QUALITY AT STATION 13 IN THE ILLINOIS RIVER DURING MAY, AUGUST, AND OCTOBER 2011

Constituents[a]	May	August	October
Water Temperature (°C)[b]	13.3	30.7	18.3
Total Suspended Solids	46	12	11
Turbidity (NTU)[b]	62	9	15
Conductivity (µS/cm)[b]	593	646	756
Five-Day BOD	3	<2	<2
Dissolved Oxygen[b]	10.6	7.2	9.6
pH (units)[b]	7.8	7.5	7.9
Ammonia Nitrogen	0.11	0.30	0.19
Un-ionized Ammonia	0.002	0.008	0.005
Total Kjeldahl Nitrogen	0.95	0.64	0.69
Nitrite plus Nitrate Nitrogen	5.46	1.64	3.92
Total Nitrogen	6.41	2.28	4.61
Total Phosphorus	0.25	0.39	0.66
Chlorophyll *a* (µg/L)	No Data	No Data	No Data
Total Cyanide	<0.005	<0.005	0.005
Phenols	<0.005	<0.005	<0.005
Total Arsenic	<0.05	<0.05	<0.05
Total Cadmium	<0.001	<0.001	<0.001
Total Chromium	<0.01	<0.01	<0.01
Total Copper	<0.02	<0.02	<0.02
Total Iron	2.2	0.4	0.3
Total Lead	<0.03	<0.03	<0.03
Total Manganese	0.075	0.047	0.025
Total Mercury (µg/L)	<0.2	<0.2	<0.2
Total Nickel	<0.008	<0.008	<0.008
Total Silver	<0.004	<0.004	<0.004
Total Zinc	<0.06	<0.06	<0.06
Fecal Coliform (cfu/100 mL)	240	110	110
E. coli (cfu/100 mL)	54	90	54

[a]Expressed in mg/L except where noted.
[b]Field measurement.

TABLE AIV-3: WATER QUALITY AT STATION 14 IN THE ILLINOIS RIVER DURING MAY, AUGUST, AND OCTOBER 2011

Constituents[a]	May	August	October
Water Temperature (°C)[b]	13.4	30.5	18.0
Total Suspended Solids	50	12	10
Turbidity (NTU)[b]	67	6	13
Conductivity (µS/cm)[b]	588	646	752
Five-Day BOD	3	<2	3
Dissolved Oxygen[b]	10.5	7.1	9.4
pH (units)[b]	7.8	7.5	7.8
Ammonia Nitrogen	0.11	0.28	0.21
Un-ionized Ammonia	0.002	0.008	0.005
Total Kjeldahl Nitrogen	0.98	0.63	0.67
Nitrite plus Nitrate Nitrogen	5.51	1.67	3.97
Total Nitrogen	6.49	2.30	4.64
Total Phosphorus	0.26	0.41	0.66
Chlorophyll *a* (µg/L)	No Data	No Data	No Data
Total Cyanide	<0.005	<0.005	<0.005
Phenols	<0.005	<0.005	<0.005
Total Arsenic	<0.05	<0.05	<0.05
Total Cadmium	<0.001	<0.001	<0.001
Total Chromium	<0.01	<0.01	<0.01
Total Copper	<0.02	<0.02	<0.02
Total Iron	2.2	0.4	0.3
Total Lead	<0.03	<0.03	<0.03
Total Manganese	0.074	0.045	0.026
Total Mercury (µg/L)	<0.2	<0.2	<0.2
Total Nickel	<0.008	<0.008	<0.008
Total Silver	<0.004	<0.004	<0.004
Total Zinc	<0.06	<0.06	<0.06
Fecal Coliform (cfu/100 mL)	63	90	63
E. coli (cfu/100 mL)	72	90	54

[a]Expressed in mg/L except where noted.
[b]Field measurement.

TABLE AIV-4: WATER QUALITY AT STATION 15 IN THE ILLINOIS RIVER DURING MAY, AUGUST, AND OCTOBER 2011

Constituents[a]	May	August	October
Water Temperature (°C)[b]	13.5	30.6	18.0
Total Suspended Solids	51	23	10
Turbidity (NTU)[b]	62	7	15
Conductivity (µS/cm)[b]	592	644	750
Five-Day BOD	<2	3	3
Dissolved Oxygen[b]	10.4	7.3	9.4
pH (units)[b]	7.8	7.5	7.7
Ammonia Nitrogen	0.09	0.29	0.19
Un-ionized Ammonia	0.001	0.008	0.003
Total Kjeldahl Nitrogen	0.96	0.64	0.82
Nitrite plus Nitrate Nitrogen	5.49	1.66	3.96
Total Nitrogen	6.45	2.30	4.78
Total Phosphorus	0.25	0.44	0.66
Chlorophyll *a* (µg/L)	6	14	4
Total Cyanide	<0.005	<0.005	0.006
Phenols	<0.005	<0.005	<0.005
Total Arsenic	<0.05	<0.05	<0.05
Total Cadmium	<0.001	<0.001	<0.001
Total Chromium	<0.01	<0.01	<0.01
Total Copper	<0.02	<0.02	<0.02
Total Iron	2.3	0.5	0.4
Total Lead	<0.03	<0.03	<0.03
Total Manganese	0.077	0.050	0.026
Total Mercury (µg/L)	<0.2	<0.2	<0.2
Total Nickel	<0.008	<0.008	<0.008
Total Silver	<0.004	<0.004	<0.004
Total Zinc	<0.06	<0.06	<0.06
Fecal Coliform (cfu/100 mL)	63	130	63
E. coli (cfu/100 mL)	81	90	18

[a]Expressed in mg/L except where noted.
[b]Field measurement.

TABLE AIV-5: WATER QUALITY AT STATION 16 IN THE ILLINOIS RIVER DURING MAY, AUGUST, AND OCTOBER 2011

Constituents[a]	May	August	October
Water Temperature (°C)[b]	13.5	30.5	18.1
Total Suspended Solids	52	17	8
Turbidity (NTU)[b]	62	7	15
Conductivity (µS/cm)[b]	584	647	755
Five-Day BOD	3	<2	3
Dissolved Oxygen[b]	10.5	7.1	9.5
pH (units)[b]	7.8	7.5	7.6
Ammonia Nitrogen	0.13	0.28	0.18
Un-ionized Ammonia	0.002	0.008	0.003
Total Kjeldahl Nitrogen	1.00	0.65	0.66
Nitrite plus Nitrate Nitrogen	5.65	1.71	4.00
Total Nitrogen	6.65	2.36	4.66
Total Phosphorus	0.26	0.46	0.61
Chlorophyll *a* (µg/L)	No Data	No Data	No Data
Total Cyanide	<0.005	<0.005	<0.005
Phenols	<0.005	<0.005	<0.005
Total Arsenic	<0.05	<0.05	<0.05
Total Cadmium	<0.001	<0.001	<0.001
Total Chromium	<0.01	<0.01	<0.01
Total Copper	<0.02	<0.02	<0.02
Total Iron	2.2	0.4	0.4
Total Lead	<0.03	<0.03	<0.03
Total Manganese	0.074	0.043	0.028
Total Mercury (µg/L)	<0.2	<0.2	<0.2
Total Nickel	<0.008	<0.008	<0.008
Total Silver	<0.004	<0.004	<0.004
Total Zinc	<0.06	<0.06	<0.06
Fecal Coliform (cfu/100 mL)	140	81	36
E. coli (cfu/100 mL)	130	81	27

[a]Expressed in mg/L except where noted.
[b]Field measurement.

TABLE AIV-6: WATER QUALITY AT STATION 17 IN THE ILLINOIS RIVER DURING MAY, AUGUST, AND OCTOBER 2011

Constituents[a]	May	August	October
Water Temperature (°C)[b]	13.6	30.6	18.0
Total Suspended Solids	41	11	8
Turbidity (NTU)[b]	60	7	15
Conductivity (µS/cm)[b]	587	641	772
Five-Day BOD	<2	<2	3
Dissolved Oxygen[b]	10.3	6.7	9.5
pH (units)[b]	7.8	7.5	7.5
Ammonia Nitrogen	0.22	0.30	0.22
Un-ionized Ammonia	0.004	0.008	0.002
Total Kjeldahl Nitrogen	0.94	0.57	0.68
Nitrite plus Nitrate Nitrogen	5.79	1.68	4.00
Total Nitrogen	6.73	2.25	4.68
Total Phosphorus	0.26	0.41	0.60
Chlorophyll *a* (µg/L)	No Data	No Data	No Data
Total Cyanide	<0.005	<0.005	0.005
Phenols	<0.005	<0.005	<0.005
Total Arsenic	<0.05	<0.05	<0.05
Total Cadmium	<0.001	<0.001	<0.001
Total Chromium	<0.01	<0.01	<0.01
Total Copper	<0.02	<0.02	<0.02
Total Iron	2.4	0.4	0.3
Total Lead	<0.03	<0.03	<0.03
Total Manganese	0.076	0.041	0.025
Total Mercury (µg/L)	<0.2	<0.2	<0.2
Total Nickel	<0.008	<0.008	<0.008
Total Silver	<0.004	<0.004	<0.004
Total Zinc	<0.06	<0.06	<0.06
Fecal Coliform (cfu/100 mL)	72	200	18
E. coli (cfu/100 mL)	18	180	18

[a]Expressed in mg/L except where noted.
[b]Field measurement.

TABLE AIV-7: WATER QUALITY AT STATION 18 IN THE ILLINOIS RIVER DURING MAY, AUGUST, AND OCTOBER 2011

Constituents[a]	May	August	October
Water Temperature (°C)[b]	13.7	30.6	17.6
Total Suspended Solids	38	13	10
Turbidity (NTU)[b]	61	9	14
Conductivity (µS/cm)[b]	597	642	781
Five-Day BOD	<2	<2	<2
Dissolved Oxygen[b]	10.3	6.9	9.3
pH (units)[b]	7.8	7.4	6.9
Ammonia Nitrogen	0.12	0.30	0.22
Un-ionized Ammonia	0.002	0.007	0.001
Total Kjeldahl Nitrogen	0.86	0.58	0.46
Nitrite plus Nitrate Nitrogen	5.71	1.73	4.04
Total Nitrogen	6.57	2.31	4.50
Total Phosphorus	0.25	0.43	0.63
Chlorophyll *a* (µg/L)	6	15	8
Total Cyanide	<0.005	<0.005	<0.005
Phenols	<0.005	<0.005	<0.005
Total Arsenic	<0.05	<0.05	<0.05
Total Cadmium	<0.001	<0.001	<0.001
Total Chromium	<0.01	<0.01	<0.01
Total Copper	<0.02	<0.02	<0.02
Total Iron	2.3	0.3	0.4
Total Lead	<0.03	<0.03	<0.03
Total Manganese	0.073	0.039	0.030
Total Mercury (µg/L)	<0.2	<0.2	<0.2
Total Nickel	<0.008	<0.008	<0.008
Total Silver	<0.004	<0.004	<0.004
Total Zinc	<0.06	<0.06	<0.06
Fecal Coliform (cfu/100 mL)	150	170	36
E. coli (cfu/100 mL)	81	140	18

[a]Expressed in mg/L except where noted.
[b]Field measurement.

TABLE AIV-8: WATER QUALITY AT STATION 19 IN THE ILLINOIS RIVER DURING MAY, AUGUST, AND OCTOBER 2011

Constituents[a]	May	August	October
Water Temperature (°C)[b]	13.7	30.7	17.9
Total Suspended Solids	40	10	7
Turbidity (NTU)[b]	61	7	12
Conductivity (µS/cm)[b]	593	642	786
Five-Day BOD	3	3	3
Dissolved Oxygen[b]	10.2	7.2	9.6
pH (units)[b]	7.7	6.8	7.1
Ammonia Nitrogen	0.09	0.28	0.22
Un-ionized Ammonia	0.001	0.002	0.001
Total Kjeldahl Nitrogen	0.93	0.59	0.36
Nitrite plus Nitrate Nitrogen	5.75	1.74	4.09
Total Nitrogen	6.68	2.33	4.45
Total Phosphorus	0.23	0.43	0.65
Chlorophyll *a* (µg/L)	No Data	No Data	No Data
Total Cyanide	<0.005	<0.005	0.005
Phenols	<0.005	<0.005	<0.005
Total Arsenic	<0.05	<0.05	<0.05
Total Cadmium	<0.001	<0.001	<0.001
Total Chromium	<0.01	<0.01	<0.01
Total Copper	<0.02	<0.02	<0.02
Total Iron	2.3	0.3	0.2
Total Lead	<0.03	<0.03	<0.03
Total Manganese	0.074	0.036	0.024
Total Mercury (µg/L)	<0.2	<0.2	<0.2
Total Nickel	<0.008	<0.008	<0.008
Total Silver	<0.004	<0.004	<0.004
Total Zinc	<0.06	<0.06	<0.06
Fecal Coliform (cfu/100 mL)	170	230	27
E. coli (cfu/100 mL)	99	160	<1

[a]Expressed in mg/L except where noted.
[b]Field measurement.

TABLE AIV-9: WATER QUALITY AT STATION 20 IN THE ILLINOIS RIVER DURING MAY, AUGUST, AND OCTOBER 2011

Constituents[a]	May	August	October
Water Temperature (°C)[b]	13.8	30.8	17.8
Total Suspended Solids	43	11	9
Turbidity (NTU)[b]	66	7	31
Conductivity (µS/cm)[b]	584	658	794
Five-Day BOD	<2	3	3
Dissolved Oxygen[b]	10.2	7.7	9.7
pH (units)[b]	7.8	7.3	7.1
Ammonia Nitrogen	0.10	0.26	0.15
Un-ionized Ammonia	0.002	0.005	0.001
Total Kjeldahl Nitrogen	0.88	0.79	0.61
Nitrite plus Nitrate Nitrogen	5.86	1.84	3.92
Total Nitrogen	6.74	2.63	4.53
Total Phosphorus	0.25	0.46	0.63
Chlorophyll *a* (µg/L)	6	28	11
Total Cyanide	<0.005	<0.005	0.005
Phenols	<0.005	<0.005	<0.005
Total Arsenic	<0.05	<0.05	<0.05
Total Cadmium	<0.001	<0.001	<0.001
Total Chromium	<0.01	<0.01	<0.01
Total Copper	<0.02	<0.02	<0.02
Total Iron	2.5	0.3	0.4
Total Lead	<0.03	<0.03	<0.03
Total Manganese	0.078	0.039	0.028
Total Mercury (µg/L)	<0.2	<0.2	<0.2
Total Nickel	<0.008	<0.008	<0.008
Total Silver	<0.004	<0.004	<0.004
Total Zinc	<0.06	<0.06	<0.06
Fecal Coliform (cfu/100 mL)	150	120	10
E. coli (cfu/100 mL)	110	72	10

[a]Expressed in mg/L except where noted.
[b]Field measurement.

TABLE AIV-10: WATER QUALITY AT STATION 21 IN THE ILLINOIS RIVER DURING MAY, AUGUST, AND OCTOBER 2011

Constituents[a]	May	August	October
Water Temperature (°C)[b]	14.3	30.7	18.5
Total Suspended Solids	42	39	20
Turbidity (NTU)[b]	76	32	14
Conductivity (µS/cm)[b]	576	674	812
Five-Day BOD	<2	<2	3
Dissolved Oxygen[b]	9.7	6.9	9.8
pH (units)[b]	7.8	7.4	7.4
Ammonia Nitrogen	0.23	0.32	0.09
Un-ionized Ammonia	0.004	0.007	0.001
Total Kjeldahl Nitrogen	0.87	0.60	0.51
Nitrite plus Nitrate Nitrogen	5.90	1.98	3.76
Total Nitrogen	6.77	2.58	4.27
Total Phosphorus	0.26	0.49	0.68
Chlorophyll *a* (µg/L)	No Data	No Data	No Data
Total Cyanide	<0.005	<0.005	0.007
Phenols	<0.005	<0.005	<0.005
Total Arsenic	<0.05	<0.05	<0.05
Total Cadmium	<0.001	<0.001	<0.001
Total Chromium	<0.01	<0.01	<0.01
Total Copper	<0.02	<0.02	<0.02
Total Iron	2.5	1.2	0.4
Total Lead	<0.03	<0.03	<0.03
Total Manganese	0.065	0.074	0.026
Total Mercury (µg/L)	<0.2	<0.2	<0.2
Total Nickel	<0.008	<0.008	<0.008
Total Silver	<0.004	<0.004	<0.004
Total Zinc	<0.06	<0.06	<0.06
Fecal Coliform (cfu/100 mL)	36	54	10
E. coli (cfu/100 mL)	54	90	18

[a]Expressed in mg/L except where noted.
[b]Field measurement.

APPENDIX AV

WATER QUALITY AT STATIONS 22–27 IN THE ILLINOIS RIVER DURING MAY, AUGUST, AND OCTOBER 2011

TABLE AV-1: WATER QUALITY AT STATION 22 IN THE ILLINOIS RIVER DURING MAY, AUGUST, AND OCTOBER 2011

Constituents[a]	May	August	October
Water Temperature (°C)[b]	13.9	30.8	18.7
Total Suspended Solids	50	51	15
Turbidity (NTU)[b]	67	34	17
Conductivity (µS/cm)[b]	586	742	787
Five-Day BOD	<2	<2	3
Dissolved Oxygen[b]	10.6	6.8	10.9
pH (units)[b]	7.8	6.6	5.4
Ammonia Nitrogen	0.10	0.30	0.08
Un-ionized Ammonia	0.002	0.001	<0.001
Total Kjeldahl Nitrogen	0.99	0.91	0.54
Nitrite plus Nitrate Nitrogen	5.87	2.39	3.88
Total Nitrogen	6.86	3.30	4.42
Total Phosphorus	0.25	0.52	0.60
Chlorophyll *a* (µg/L)	6	25	12
Total Cyanide	<0.005	<0.005	0.006
Phenols	<0.005	<0.005	<0.005
Total Arsenic	<0.05	<0.05	<0.05
Total Cadmium	<0.001	<0.001	<0.001
Total Chromium	<0.01	<0.01	<0.01
Total Copper	<0.02	<0.02	<0.02
Total Iron	2.7	1.4	0.4
Total Lead	<0.03	<0.03	<0.03
Total Manganese	0.080	0.082	0.030
Total Mercury (µg/L)	<0.2	<0.2	<0.2
Total Nickel	<0.008	<0.008	<0.008
Total Silver	<0.004	<0.004	<0.004
Total Zinc	<0.06	<0.06	<0.06
Fecal Coliform (cfu/100 mL)	160	45	10
E. coli (cfu/100 mL)	36	<1	10

[a]Expressed in mg/L except where noted.
[b]Field measurement.

TABLE AV-2: WATER QUALITY AT STATION 23 IN THE ILLINOIS RIVER DURING MAY, AUGUST, AND OCTOBER 2011

Constituents[a]	May	August	October
Water Temperature (°C)[b]	14.0	31.1	18.2
Total Suspended Solids	51	11	17
Turbidity (NTU)[b]	73	12	18
Conductivity (µS/cm)[b]	582	653	790
Five-Day BOD	<2	<2	3
Dissolved Oxygen[b]	10.6	7.8	9.9
pH (units)[b]	7.8	6.9	6.3
Ammonia Nitrogen	0.10	0.26	0.08
Un-ionized Ammonia	0.002	0.002	<0.001
Total Kjeldahl Nitrogen	0.99	0.70	0.57
Nitrite plus Nitrate Nitrogen	5.87	1.85	3.82
Total Nitrogen	6.86	2.55	4.39
Total Phosphorus	0.27	0.42	0.63
Chlorophyll *a* (µg/L)	No Data	No Data	No Data
Total Cyanide	<0.005	<0.005	<0.005
Phenols	<0.005	<0.005	<0.005
Total Arsenic	<0.05	<0.05	<0.05
Total Cadmium	<0.001	<0.001	<0.001
Total Chromium	<0.01	<0.01	<0.01
Total Copper	<0.02	<0.02	<0.02
Total Iron	1.4	0.3	0.5
Total Lead	<0.03	<0.03	<0.03
Total Manganese	0.033	0.033	0.033
Total Mercury (µg/L)	<0.2	<0.2	<0.2
Total Nickel	<0.008	<0.008	<0.008
Total Silver	<0.004	<0.004	<0.004
Total Zinc	<0.06	<0.06	<0.06
Fecal Coliform (cfu/100 mL)	45	36	<10
E. coli (cfu/100 mL)	54	10	18

[a]Expressed in mg/L except where noted.
[b]Field measurement.

TABLE AV-3: WATER QUALITY AT STATION 24 IN THE ILLINOIS RIVER DURING MAY, AUGUST, AND OCTOBER 2011

Constituents[a]	May	August	October
Water Temperature (°C)[b]	14.0	30.7	17.6
Total Suspended Solids	49	18	16
Turbidity (NTU)[b]	70	7	16
Conductivity (µS/cm)[b]	593	681	824
Five-Day BOD	<2	3	4
Dissolved Oxygen[b]	10.6	8.5	11.2
pH (units)[b]	7.8	7.6	6.4
Ammonia Nitrogen	0.10	0.29	0.05
Un-ionized Ammonia	0.002	0.010	<0.001
Total Kjeldahl Nitrogen	1.03	1.04	0.88
Nitrite plus Nitrate Nitrogen	5.80	1.54	2.86
Total Nitrogen	6.83	2.58	3.74
Total Phosphorus	0.27	0.42	0.44
Chlorophyll *a* (µg/L)	No Data	No Data	No Data
Total Cyanide	<0.005	<0.005	0.007
Phenols	<0.005	<0.005	<0.005
Total Arsenic	<0.05	<0.05	<0.05
Total Cadmium	<0.001	<0.001	<0.001
Total Chromium	<0.01	<0.01	<0.01
Total Copper	<0.02	<0.02	<0.02
Total Iron	2.6	0.3	0.3
Total Lead	<0.03	<0.03	<0.03
Total Manganese	0.082	0.043	0.040
Total Mercury (µg/L)	<0.2	<0.2	<0.2
Total Nickel	<0.008	<0.008	<0.008
Total Silver	<0.004	<0.004	<0.004
Total Zinc	<0.06	<0.06	<0.06
Fecal Coliform (cfu/100 mL)	260	72	600
E. coli (cfu/100 mL)	63	10	450

[a]Expressed in mg/L except where noted.
[b]Field measurement.

TABLE AV-4: WATER QUALITY AT STATION 25 IN THE ILLINOIS RIVER DURING MAY, AUGUST, AND OCTOBER 2011

Constituents[a]	May	August	October
Water Temperature (°C)[b]	14.0	30.6	17.6
Total Suspended Solids	52	19	21
Turbidity (NTU)[b]	65	11	27
Conductivity (µS/cm)[b]	621	677	813
Five-Day BOD	<2	3	6
Dissolved Oxygen[b]	10.6	8.1	10.9
pH (units)[b]	7.9	7.8	6.3
Ammonia Nitrogen	0.08	0.30	0.05
Un-ionized Ammonia	0.002	0.016	<0.001
Total Kjeldahl Nitrogen	1.15	0.78	0.77
Nitrite plus Nitrate Nitrogen	5.34	1.65	3.27
Total Nitrogen	6.49	2.43	4.04
Total Phosphorus	0.24	0.39	0.65
Chlorophyll *a* (µg/L)	17	62	37
Total Cyanide	<0.005	<0.005	<0.005
Phenols	<0.005	<0.005	<0.005
Total Arsenic	<0.05	<0.05	<0.05
Total Cadmium	<0.001	<0.001	<0.001
Total Chromium	<0.01	<0.01	<0.01
Total Copper	<0.02	<0.02	<0.02
Total Iron	2.4	0.3	0.5
Total Lead	<0.03	<0.03	<0.03
Total Manganese	0.082	0.042	0.043
Total Mercury (µg/L)	<0.2	<0.2	<0.2
Total Nickel	<0.008	<0.008	<0.008
Total Silver	<0.004	<0.004	<0.004
Total Zinc	<0.06	<0.06	<0.06
Fecal Coliform (cfu/100 mL)	120	63	140
E. coli (cfu/100 mL)	72	27	27

[a]Expressed in mg/L except where noted.
[b]Field measurement.

TABLE AV-5: WATER QUALITY AT STATION 26 IN THE ILLINOIS RIVER DURING MAY, AUGUST, AND OCTOBER 2011

Constituents[a]	May	August	October
Water Temperature (°C)[b]	13.9	30.8	17.8
Total Suspended Solids	58	19	15
Turbidity (NTU)[b]	72	9	17
Conductivity (µS/cm)[b]	596	687	812
Five-Day BOD	<2	3	5
Dissolved Oxygen[b]	10.4	9.0	11.3
pH (units)[b]	7.9	7.6	6.8
Ammonia Nitrogen	0.09	0.32	0.04
Un-ionized Ammonia	0.002	0.011	<0.001
Total Kjeldahl Nitrogen	1.06	0.92	0.69
Nitrite plus Nitrate Nitrogen	5.70	1.55	3.24
Total Nitrogen	6.76	2.47	3.93
Total Phosphorus	0.28	0.38	0.56
Chlorophyll *a* (µg/L)	No Data	No Data	No Data
Total Cyanide	<0.005	<0.005	0.005
Phenols	<0.005	<0.005	<0.005
Total Arsenic	<0.05	<0.05	<0.05
Total Cadmium	<0.001	<0.001	<0.001
Total Chromium	<0.01	<0.01	<0.01
Total Copper	<0.02	<0.02	<0.02
Total Iron	2.7	0.3	0.3
Total Lead	<0.03	<0.03	<0.03
Total Manganese	0.086	0.042	0.034
Total Mercury (µg/L)	<0.2	<0.2	<0.2
Total Nickel	<0.008	<0.008	<0.008
Total Silver	<0.004	<0.004	<0.004
Total Zinc	<0.06	<0.06	<0.06
Fecal Coliform (cfu/100 mL)	99	140	120
E. coli (cfu/100 mL)	18	18	120

[a]Expressed in mg/L except where noted.
[b]Field measurement.

TABLE AV-6: WATER QUALITY AT STATION 27 IN THE ILLINOIS RIVER DURING MAY, AUGUST, AND OCTOBER 2011

Constituents[a]	May	August	October
Water Temperature (°C)[b]	12.6	30.8	17.4
Total Suspended Solids	62	25	15
Turbidity (NTU)[b]	57	14	23
Conductivity (µS/cm)[b]	672	670	820
Five-Day BOD	3	<2	3
Dissolved Oxygen[b]	10.6	7.9	10.4
pH (units)[b]	8.0	8.1	8.3
Ammonia Nitrogen	0.12	0.19	0.05
Un-ionized Ammonia	0.003	0.019	0.003
Total Kjeldahl Nitrogen	1.22	0.84	0.90
Nitrite plus Nitrate Nitrogen	5.07	1.36	3.11
Total Nitrogen	6.29	2.20	4.01
Total Phosphorus	0.26	0.37	0.58
Chlorophyll *a* (µg/L)	18	62	47
Total Cyanide	<0.005	<0.005	0.005
Phenols	<0.005	<0.005	<0.005
Total Arsenic	<0.05	<0.05	<0.05
Total Cadmium	<0.001	<0.001	<0.001
Total Chromium	<0.01	<0.01	<0.01
Total Copper	<0.02	<0.02	<0.02
Total Iron	2.1	0.5	0.3
Total Lead	<0.03	<0.03	<0.03
Total Manganese	0.084	0.051	0.038
Total Mercury (µg/L)	<0.2	<0.2	<0.2
Total Nickel	<0.008	<0.008	<0.008
Total Silver	<0.004	<0.004	<0.004
Total Zinc	<0.06	<0.06	<0.06
Fecal Coliform (cfu/100 mL)	250	10	27
E. coli (cfu/100 mL)	99	10	18

[a]Expressed in mg/L except where noted.
[b]Field measurement.

APPENDIX AVI

WATER QUALITY AT STATIONS 28–41 IN THE ILLINOIS RIVER DURING MAY, AUGUST, AND OCTOBER 2011

TABLE AVI-1: WATER QUALITY AT STATION 28 IN THE ILLINOIS RIVER DURING MAY, AUGUST, AND OCTOBER 2011

Constituents[a]	May	August	October
Water Temperature (°C)[b]	12.7	30.6	17.6
Total Suspended Solids	60	33	21
Turbidity (NTU)[b]	61	21	22
Conductivity (µS/cm)[b]	657	675	812
Five-Day BOD	3	<2	4
Dissolved Oxygen[b]	10.5	7.9	10.7
pH (units)[b]	8.1	8.4	8.5
Ammonia Nitrogen	0.12	0.10	0.03
Un-ionized Ammonia	0.004	0.018	0.003
Total Kjeldahl Nitrogen	1.17	2.07	1.06
Nitrite plus Nitrate Nitrogen	5.30	1.36	3.19
Total Nitrogen	6.47	3.43	4.25
Total Phosphorus	0.26	0.57	0.62
Chlorophyll *a* (µg/L)	15	72	42
Total Cyanide	<0.005	<0.005	<0.005
Phenols	<0.005	<0.005	<0.005
Total Arsenic	<0.05	<0.05	<0.05
Total Cadmium	<0.001	<0.001	<0.001
Total Chromium	<0.01	<0.01	<0.01
Total Copper	<0.02	<0.02	<0.02
Total Iron	2.4	0.7	0.5
Total Lead	<0.03	<0.03	<0.03
Total Manganese	0.087	0.062	0.040
Total Mercury (µg/L)	<0.2	<0.2	<0.2
Total Nickel	<0.008	<0.008	<0.008
Total Silver	<0.002	<0.002	<0.002
Total Zinc	<0.06	<0.06	<0.06
Fecal Coliform (cfu/100 mL)	300	120	54
E. coli (cfu/100 mL)	45	27	45

[a]Expressed in mg/L except where noted.
[b]Field measurement.

TABLE AVI-2: WATER QUALITY AT STATION 29 IN THE ILLINOIS RIVER DURING MAY, AUGUST, AND OCTOBER 2011

Constituents[a]	May	August	October
Water Temperature (°C)[b]	12.7	30.5	17.6
Total Suspended Solids	52	32	22
Turbidity (NTU)[b]	59	20	26
Conductivity (µS/cm)[b]	635	682	812
Five-Day BOD	3	3	4
Dissolved Oxygen[b]	10.5	8.0	10.8
pH (units)[b]	8.0	8.4	8.3
Ammonia Nitrogen	0.10	0.17	0.06
Un-ionized Ammonia	0.002	0.031	0.004
Total Kjeldahl Nitrogen	1.17	1.06	0.82
Nitrite plus Nitrate Nitrogen	5.57	1.32	3.18
Total Nitrogen	6.74	2.38	4.00
Total Phosphorus	0.24	0.42	0.62
Chlorophyll *a* (µg/L)	No Data	No Data	No Data
Total Cyanide	<0.005	<0.005	0.005
Phenols	<0.005	<0.005	<0.005
Total Arsenic	<0.05	<0.05	<0.05
Total Cadmium	<0.001	<0.001	<0.001
Total Chromium	<0.01	<0.01	<0.01
Total Copper	<0.02	<0.02	<0.02
Total Iron	2.3	0.7	0.5
Total Lead	<0.03	<0.03	<0.03
Total Manganese	0.074	0.063	0.041
Total Mercury (µg/L)	<0.2	<0.2	<0.2
Total Nickel	<0.008	<0.008	<0.008
Total Silver	<0.004	<0.004	<0.004
Total Zinc	<0.06	<0.06	<0.06
Fecal Coliform (cfu/100 mL)	180	72	36
E. coli (cfu/100 mL)	81	45	36

[a]Expressed in mg/L except where noted.
[b]Field measurement.

TABLE AVI-3: WATER QUALITY AT STATION 30 IN THE ILLINOIS RIVER DURING MAY, AUGUST, AND OCTOBER 2011

Constituents[a]	May	August	October
Water Temperature (°C)[b]	12.7	30.5	17.6
Total Suspended Solids	58	26	23
Turbidity (NTU)[b]	59	17	25
Conductivity (µS/cm)[b]	636	686	811
Five-Day BOD	3	3	4
Dissolved Oxygen[b]	10.5	7.8	10.6
pH (units)[b]	8.0	8.4	8.3
Ammonia Nitrogen	0.08	0.17	0.05
Un-ionized Ammonia	0.002	0.031	0.003
Total Kjeldahl Nitrogen	1.01	0.84	1.13
Nitrite plus Nitrate Nitrogen	5.62	1.36	3.16
Total Nitrogen	6.63	2.20	4.29
Total Phosphorus	0.26	0.37	0.65
Chlorophyll *a* (µg/L)	No Data	No Data	No Data
Total Cyanide	<0.005	<0.005	0.005
Phenols	<0.005	<0.005	<0.005
Total Arsenic	<0.05	<0.05	<0.05
Total Cadmium	<0.001	<0.001	<0.001
Total Chromium	<0.01	<0.01	<0.01
Total Copper	<0.02	<0.02	<0.02
Total Iron	2.2	0.5	0.6
Total Lead	<0.03	<0.03	<0.03
Total Manganese	0.079	0.056	0.043
Total Mercury (µg/L)	<0.2	<0.2	<0.2
Total Nickel	<0.008	<0.008	<0.008
Total Silver	<0.004	<0.004	<0.004
Total Zinc	<0.06	<0.06	<0.06
Fecal Coliform (cfu/100 mL)	27	110	45
E. coli (cfu/100 mL)	63	36	27

[a]Expressed in mg/L except where noted.
[b]Field measurement.

TABLE AVI-4: WATER QUALITY AT STATION 31 IN THE ILLINOIS RIVER DURING MAY, AUGUST, AND OCTOBER 2011

Constituents[a]	May	August	October
Water Temperature (°C)[b]	12.8	30.6	17.5
Total Suspended Solids	55	25	24
Turbidity (NTU)[b]	58	20	26
Conductivity (µS/cm)[b]	632	689	809
Five-Day BOD	3	<2	4
Dissolved Oxygen[b]	10.4	7.5	10.7
pH (units)[b]	8.0	8.3	8.4
Ammonia Nitrogen	0.12	0.08	0.03
Un-ionized Ammonia	0.003	0.012	0.002
Total Kjeldahl Nitrogen	1.09	0.88	1.02
Nitrite plus Nitrate Nitrogen	6.01	1.43	3.14
Total Nitrogen	7.10	2.31	4.16
Total Phosphorus	0.24	0.39	0.65
Chlorophyll *a* (µg/L)	12	68	47
Total Cyanide	<0.005	<0.005	0.005
Phenols	<0.005	<0.005	<0.005
Total Arsenic	<0.05	<0.05	<0.05
Total Cadmium	<0.001	<0.001	<0.001
Total Chromium	<0.01	<0.01	<0.01
Total Copper	<0.02	<0.02	<0.02
Total Iron	2.1	0.6	0.6
Total Lead	<0.03	<0.03	<0.03
Total Manganese	0.072	0.060	0.043
Total Mercury (µg/L)	<0.2	<0.2	<0.2
Total Nickel	<0.008	<0.008	<0.008
Total Silver	<0.004	<0.004	<0.004
Total Zinc	<0.06	<0.06	<0.06
Fecal Coliform (cfu/100 mL)	170	120	81
E. coli (cfu/100 mL)	72	45	18

[a]Expressed in mg/L except where noted.
[b]Field measurement.

TABLE AVI-5: WATER QUALITY AT STATION 32 IN THE ILLINOIS RIVER DURING MAY, AUGUST, AND OCTOBER 2011

Constituents[a]	May	August	October
Water Temperature (°C)[b]	12.9	30.7	17.5
Total Suspended Solids	53	42	25
Turbidity (NTU)[b]	57	27	25
Conductivity (µS/cm)[b]	631	693	806
Five-Day BOD	3	3	4
Dissolved Oxygen[b]	10.4	7.5	10.9
pH (units)[b]	8.0	8.2	8.0
Ammonia Nitrogen	0.09	0.08	0.02
Un-ionized Ammonia	0.002	0.010	0.001
Total Kjeldahl Nitrogen	1.04	1.05	1.04
Nitrite plus Nitrate Nitrogen	6.03	1.51	3.10
Total Nitrogen	7.07	2.56	4.14
Total Phosphorus	0.23	0.41	0.66
Chlorophyll *a* (µg/L)	No Data	No Data	No Data
Total Cyanide	<0.005	<0.005	<0.005
Phenols	<0.005	<0.005	<0.005
Total Arsenic	<0.05	<0.05	<0.05
Total Cadmium	<0.001	<0.001	<0.001
Total Chromium	<0.01	<0.01	<0.01
Total Copper	<0.02	<0.02	<0.02
Total Iron	2.1	0.9	0.6
Total Lead	<0.03	<0.03	<0.03
Total Manganese	0.073	0.071	0.044
Total Mercury (µg/L)	<0.2	<0.2	<0.2
Total Nickel	<0.008	<0.008	<0.008
Total Silver	<0.004	<0.00	<0.004
Total Zinc	<0.06	<0.06	<0.06
Fecal Coliform (cfu/100 mL)	270	150	36
E. coli (cfu/100 mL)	27	10	10

[a]Expressed in mg/L except where noted.
[b]Field measurement.

TABLE AVI-6: WATER QUALITY AT STATION 33 IN THE ILLINOIS RIVER DURING MAY, AUGUST, AND OCTOBER 2011

Constituents[a]	May	August	October
Water Temperature (°C)[b]	13.1	30.8	17.5
Total Suspended Solids	46	44	30
Turbidity (NTU)[b]	51	21	28
Conductivity (µS/cm)[b]	629	700	802
Five-Day BOD	3	3	5
Dissolved Oxygen[b]	10.3	7.6	11.1
pH (units)[b]	8.0	8.2	8.2
Ammonia Nitrogen	0.08	0.17	0.08
Un-ionized Ammonia	0.002	0.021	0.004
Total Kjeldahl Nitrogen	1.21	1.01	1.01
Nitrite plus Nitrate Nitrogen	6.03	1.52	3.07
Total Nitrogen	7.24	2.53	4.08
Total Phosphorus	0.23	0.42	0.68
Chlorophyll *a* (µg/L)	No Data	No Data	No Data
Total Cyanide	<0.005	<0.005	0.005
Phenols	<0.005	<0.005	<0.005
Total Arsenic	<0.05	<0.05	<0.05
Total Cadmium	<0.001	<0.001	<0.001
Total Chromium	<0.01	<0.01	<0.01
Total Copper	<0.02	<0.02	<0.02
Total Iron	2.0	1.3	0.8
Total Lead	<0.03	<0.03	<0.03
Total Manganese	0.068	0.081	0.049
Total Mercury (µg/L)	<0.2	<0.2	<0.2
Total Nickel	<0.008	<0.008	<0.008
Total Silver	<0.004	<0.004	<0.004
Total Zinc	<0.06	<0.06	<0.06
Fecal Coliform (cfu/100 mL)	210	36	63
E. coli (cfu/100 mL)	36	63	36

[a]Expressed in mg/L except where noted.
[b]Field measurement.

TABLE AVI-7: WATER QUALITY AT STATION 34 IN THE ILLINOIS RIVER DURING MAY, AUGUST, AND OCTOBER 2011

Constituents[a]	May	August	October
Water Temperature (°C)[b]	13.2	30.9	17.2
Total Suspended Solids	56	30	8
Turbidity (NTU)[b]	84	22	30
Conductivity (µS/cm)[b]	622	709	798
Five-Day BOD	3	3	4
Dissolved Oxygen[b]	10.2	7.6	10.8
pH (units)[b]	8.0	8.1	7.9
Ammonia Nitrogen	0.08	0.17	0.03
Un-ionized Ammonia	0.002	0.017	0.001
Total Kjeldahl Nitrogen	0.82	0.93	1.04
Nitrite plus Nitrate Nitrogen	6.14	1.55	3.04
Total Nitrogen	6.96	2.48	4.08
Total Phosphorus	0.21	0.44	0.67
Chlorophyll *a* (µg/L)	12	54	50
Total Cyanide	<0.005	<0.005	0.005
Phenols	<0.005	<0.005	<0.005
Total Arsenic	<0.05	<0.05	<0.05
Total Cadmium	<0.001	<0.001	<0.001
Total Chromium	<0.01	<0.01	<0.01
Total Copper	<0.02	<0.02	<0.02
Total Iron	2.2	0.6	0.6
Total Lead	<0.03	<0.03	<0.03
Total Manganese	0.075	0.056	0.045
Total Mercury (µg/L)	<0.2	<0.2	<0.2
Total Nickel	<0.008	<0.008	<0.008
Total Silver	<0.004	<0.004	<0.004
Total Zinc	<0.06	<0.06	<0.06
Fecal Coliform (cfu/100 mL)	18	99	<10
E. coli (cfu/100 mL)	<1	45	10

[a]Expressed in mg/L except where noted.
[b]Field measurement.

TABLE AVI-8: WATER QUALITY AT STATION 35 IN THE ILLINOIS RIVER DURING MAY, AUGUST, AND OCTOBER 2011

Constituents[a]	May	August	October
Water Temperature (°C)[b]	13.3	31.0	18.0
Total Suspended Solids	42	32	7
Turbidity (NTU)[b]	54	27	32
Conductivity (µS/cm)[b]	617	723	792
Five-Day BOD	3	3	4
Dissolved Oxygen[b]	10.0	7.1	10.6
pH (units)[b]	8.0	7.9	7.6
Ammonia Nitrogen	0.14	0.21	0.02
Un-ionized Ammonia	0.003	0.014	<0.001
Total Kjeldahl Nitrogen	1.07	0.95	1.09
Nitrite plus Nitrate Nitrogen	6.20	1.66	3.11
Total Nitrogen	7.27	2.61	4.20
Total Phosphorus	0.23	0.42	0.70
Chlorophyll *a* (µg/L)	No Data	No Data	No Data
Total Cyanide	<0.005	<0.005	<0.005
Phenols	<0.005	<0.005	<0.005
Total Arsenic	<0.05	<0.05	<0.05
Total Cadmium	<0.001	<0.001	<0.001
Total Chromium	<0.01	<0.01	<0.01
Total Copper	<0.02	<0.02	<0.02
Total Iron	2.1	0.8	0.8
Total Lead	<0.03	<0.03	<0.03
Total Manganese	0.069	0.065	0.050
Total Mercury (µg/L)	<0.2	<0.2	<0.2
Total Nickel	<0.008	<0.008	<0.008
Total Silver	<0.004	<0.004	<0.004
Total Zinc	<0.06	<0.06	<0.06
Fecal Coliform (cfu/100 mL)	<10	81	36
E. coli (cfu/100 mL)	18	18	10

[a]Expressed in mg/L except where noted.
[b]Field measurement.

TABLE AVI-9: WATER QUALITY AT STATION 36 IN THE ILLINOIS RIVER DURING MAY, AUGUST, AND OCTOBER 2011

Constituents[a]	May	August	October
Water Temperature (°C)[b]	13.5	30.9	18.2
Total Suspended Solids	47	39	7
Turbidity (NTU)[b]	53	33	29
Conductivity (µS/cm)[b]	615	738	794
Five-Day BOD	3	3	5
Dissolved Oxygen[b]	10.0	6.7	11.5
pH (units)[b]	7.9	7.8	7.6
Ammonia Nitrogen	0.09	0.22	0.04
Un-ionized Ammonia	0.002	0.012	0.001
Total Kjeldahl Nitrogen	0.87	1.01	1.01
Nitrite plus Nitrate Nitrogen	6.19	1.80	3.12
Total Nitrogen	7.06	2.81	4.13
Total Phosphorus	0.23	0.43	0.69
Chlorophyll *a* (µg/L)	14	45	49
Total Cyanide	<0.005	<0.005	<0.005
Phenols	<0.005	<0.005	<0.005
Total Arsenic	<0.05	<0.05	<0.05
Total Cadmium	<0.001	<0.001	<0.001
Total Chromium	<0.01	<0.01	<0.01
Total Copper	<0.02	<0.02	<0.02
Total Iron	2.0	1.2	0.7
Total Lead	<0.03	<0.03	<0.03
Total Manganese	0.062	0.079	0.044
Total Mercury (µg/L)	<0.2	<0.2	<0.2
Total Nickel	<0.008	<0.008	<0.008
Total Silver	<0.004	<0.004	<0.004
Total Zinc	<0.06	<0.06	<0.06
Fecal Coliform (cfu/100 mL)	<10	90	10
E. coli (cfu/100 mL)	10	<1	10

[a]Expressed in mg/L except where noted.
[b]Field measurement.

TABLE AVI-10: WATER QUALITY AT STATION 37 IN THE ILLINOIS RIVER DURING MAY, AUGUST, AND OCTOBER 2011

Constituents[a]	May	August	October
Water Temperature (°C)[b]	13.7	31.3	18.0
Total Suspended Solids	17	37	8
Turbidity (NTU)[b]	32	28	35
Conductivity (µS/cm)[b]	616	744	799
Five-Day BOD	3	<2	5
Dissolved Oxygen[b]	10.1	7.0	11.1
pH (units)[b]	7.9	7.9	7.4
Ammonia Nitrogen	0.12	0.21	0.08
Un-ionized Ammonia	0.002	0.014	0.001
Total Kjeldahl Nitrogen	0.39	0.91	1.51
Nitrite plus Nitrate Nitrogen	6.16	1.90	3.18
Total Nitrogen	6.55	2.81	4.69
Total Phosphorus	0.19	0.45	0.71
Chlorophyll *a* (µg/L)	No Data	No Data	No Data
Total Cyanide	<0.005	<0.005	<0.005
Phenols	<0.005	<0.005	<0.005
Total Arsenic	<0.05	<0.05	<0.05
Total Cadmium	<0.001	<0.001	<0.001
Total Chromium	<0.01	<0.01	<0.01
Total Copper	<0.02	<0.02	<0.02
Total Iron	1.1	1.0	1.2
Total Lead	<0.03	<0.03	<0.03
Total Manganese	0.029	0.069	0.061
Total Mercury (µg/L)	<0.2	<0.2	<0.2
Total Nickel	<0.008	<0.008	<0.008
Total Silver	<0.004	<0.004	<0.004
Total Zinc	<0.06	<0.06	<0.06
Fecal Coliform (cfu/100 mL)	<10	81	36
E. coli (cfu/100 mL)	27	<1	<1

[a]Expressed in mg/L except where noted.
[b]Field measurement.

TABLE AVI-11: WATER QUALITY AT STATION 38 IN THE ILLINOIS RIVER DURING MAY, AUGUST, AND OCTOBER 2011

Constituents[a]	May	August	October
Water Temperature (°C)[b]	13.3	31.2	18.1
Total Suspended Solids	28	42	6
Turbidity (NTU)[b]	46	38	54
Conductivity (µS/cm)[b]	608	748	803
Five-Day BOD	<2	<2	5
Dissolved Oxygen[b]	9.7	7.2	11.0
pH (units)[b]	7.9	7.9	7.0
Ammonia Nitrogen	0.09	0.20	0.07
Un-ionized Ammonia	0.002	0.014	<0.001
Total Kjeldahl Nitrogen	0.43	0.84	0.98
Nitrite plus Nitrate Nitrogen	6.23	1.85	3.30
Total Nitrogen	6.66	2.69	4.28
Total Phosphorus	0.19	0.54	0.69
Chlorophyll *a* (µg/L)	10	44	46
Total Cyanide	<0.005	<0.005	<0.005
Phenols	<0.005	<0.005	<0.005
Total Arsenic	<0.05	<0.05	<0.05
Total Cadmium	<0.001	<0.001	<0.001
Total Chromium	<0.01	<0.01	<0.01
Total Copper	<0.02	<0.02	<0.02
Total Iron	1.6	1.2	0.7
Total Lead	<0.03	<0.03	<0.03
Total Manganese	0.041	0.075	0.045
Total Mercury (µg/L)	<0.2	<0.2	<0.2
Total Nickel	<0.008	<0.008	<0.008
Total Silver	<0.004	<0.004	<0.004
Total Zinc	<0.06	<0.06	<0.06
Fecal Coliform (cfu/100 mL)	<10	45	10
E. coli (cfu/100 mL)	10	27	<1

[a]Expressed in mg/L except where noted.
[b]Field measurement.

TABLE AVI-12: WATER QUALITY AT STATION 39 IN THE ILLINOIS RIVER DURING MAY, AUGUST, AND OCTOBER 2011

Constituents[a]	May	August	October
Water Temperature (°C)[b]	13.3	31.1	18.9
Total Suspended Solids	30	37	11
Turbidity (NTU)[b]	42	34	39
Conductivity (µS/cm)[b]	614	752	807
Five-Day BOD	3	<2	5
Dissolved Oxygen[b]	9.4	6.6	10.9
pH (units)[b]	7.7	7.6	7.0
Ammonia Nitrogen	0.09	0.22	0.04
Un-ionized Ammonia	0.001	0.008	<0.001
Total Kjeldahl Nitrogen	0.40	1.30	0.92
Nitrite plus Nitrate Nitrogen	6.36	1.86	3.39
Total Nitrogen	6.76	3.16	4.31
Total Phosphorus	0.20	0.53	0.67
Chlorophyll *a* (µg/L)	No Data	No Data	No Data
Total Cyanide	<0.005	<0.005	0.005
Phenols	<0.005	<0.005	<0.005
Total Arsenic	<0.05	<0.05	<0.05
Total Cadmium	<0.001	<0.001	<0.001
Total Chromium	<0.01	<0.01	<0.01
Total Copper	<0.02	<0.02	<0.02
Total Iron	1.6	1.2	0.9
Total Lead	<0.03	<0.03	<0.03
Total Manganese	0.044	0.085	0.054
Total Mercury (µg/L)	<0.2	<0.2	<0.2
Total Nickel	<0.008	<0.008	<0.008
Total Silver	<0.004	<0.004	<0.004
Total Zinc	<0.06	<0.06	<0.06
Fecal Coliform (cfu/100 mL)	54	45	10
E. coli (cfu/100 mL)	<1	10	36

[a]Expressed in mg/L except where noted.
[b]Field measurement.

TABLE AVI-13: WATER QUALITY AT STATION 40 IN THE ILLINOIS RIVER DURING MAY, AUGUST, AND OCTOBER 2011

Constituents[a]	May	August	October
Water Temperature (°C)[b]	13.3	31.0	18.9
Total Suspended Solids	32	45	9
Turbidity (NTU)[b]	45	43	40
Conductivity (µS/cm)[b]	617	745	820
Five-Day BOD	<2	<2	4
Dissolved Oxygen[b]	9.6	6.4	10.3
pH (units)[b]	7.6	7.5	6.9
Ammonia Nitrogen	0.10	0.23	0.06
Un-ionized Ammonia	0.001	0.006	<0.001
Total Kjeldahl Nitrogen	0.94	1.02	0.98
Nitrite plus Nitrate Nitrogen	6.48	1.73	3.61
Total Nitrogen	7.42	2.75	4.59
Total Phosphorus	0.20	0.49	0.68
Chlorophyll *a* (µg/L)	No Data	No Data	No Data
Total Cyanide	<0.005	<0.005	0.005
Phenols	<0.005	<0.005	<0.005
Total Arsenic	<0.05	<0.05	<0.05
Total Cadmium	<0.001	<0.001	<0.001
Total Chromium	<0.01	<0.01	<0.01
Total Copper	<0.02	<0.02	<0.02
Total Iron	1.5	1.4	1.1
Total Lead	<0.03	<0.03	<0.03
Total Manganese	0.038	0.106	0.053
Total Mercury (µg/L)	<0.2	<0.2	<0.2
Total Nickel	<0.008	<0.008	<0.008
Total Silver	<0.004	<0.004	<0.004
Total Zinc	<0.06	<0.06	<0.06
Fecal Coliform (cfu/100 mL)	36	36	<10
E. coli (cfu/100 mL)	18	10	<1

[a]Expressed in mg/L except where noted.
[b]Field measurement.

TABLE AVI-14: WATER QUALITY AT STATION 41 IN THE ILLINOIS RIVER DURING MAY, AUGUST, AND OCTOBER 2011

Constituents[a]	May	August	October
Water Temperature (°C)[b]	13.3	30.9	18.8
Total Suspended Solids	21	44	10
Turbidity (NTU)[b]	36	43	37
Conductivity (µS/cm)[b]	618	744	828
Five-Day BOD	<2	3	5
Dissolved Oxygen[b]	9.4	6.2	10.0
pH (units)[b]	7.8	7.6	7.0
Ammonia Nitrogen	0.08	0.24	0.07
Un-ionized Ammonia	0.001	0.008	<0.001
Total Kjeldahl Nitrogen	0.71	1.07	0.99
Nitrite plus Nitrate Nitrogen	6.58	1.77	3.70
Total Nitrogen	7.29	2.84	4.69
Total Phosphorus	0.18	0.49	0.66
Chlorophyll *a* (µg/L)	9	48	29
Total Cyanide	<0.005	<0.005	0.005
Phenols	<0.005	<0.005	<0.005
Total Arsenic	<0.05	<0.05	<0.05
Total Cadmium	<0.001	<0.001	<0.001
Total Chromium	<0.01	<0.01	<0.01
Total Copper	<0.02	<0.02	<0.02
Total Iron	1.2	1.4	0.8
Total Lead	<0.03	<0.03	<0.03
Total Manganese	0.032	0.108	0.046
Total Mercury (µg/L)	<0.2	<0.2	<0.2
Total Nickel	<0.008	<0.008	<0.008
Total Silver	<0.004	<0.004	<0.004
Total Zinc	<0.06	<0.06	<0.06
Fecal Coliform (cfu/100 mL)	45	<10	27
E. coli (cfu/100 mL)	10	<1	<1

[a]Expressed in mg/L except where noted.
[b]Field measurement.

APPENDIX AVII

WATER QUALITY AT STATIONS 42–49 IN THE ILLINOIS RIVER DURING MAY, AUGUST, AND OCTOBER 2011

TABLE AVII-1: WATER QUALITY AT STATION 42 IN THE ILLINOIS RIVER DURING MAY, AUGUST, AND OCTOBER 2011

Constituents[a]	May	August	October
Water Temperature (°C)[b]	13.1	31.0	18.4
Total Suspended Solids	33	73	10
Turbidity (NTU)[b]	42	64	36
Conductivity (µS/cm)[b]	618	747	831
Five-Day BOD	3	3	4
Dissolved Oxygen[b]	9.1	6.0	9.7
pH (units)[b]	7.7	7.4	6.6
Ammonia Nitrogen	0.17	0.26	0.07
Un-ionized Ammonia	0.002	0.006	<0.001
Total Kjeldahl Nitrogen	0.98	1.17	1.00
Nitrite plus Nitrate Nitrogen	6.77	1.80	3.59
Total Nitrogen	7.75	2.97	4.59
Total Phosphorus	0.21	0.53	0.63
Chlorophyll *a* (µg/L)	9	35	31
Total Cyanide	<0.005	<0.005	<0.005
Phenols	<0.005	<0.005	<0.005
Total Arsenic	<0.05	<0.05	<0.05
Total Cadmium	<0.001	<0.001	<0.001
Total Chromium	<0.01	<0.01	<0.01
Total Copper	<0.02	<0.02	<0.02
Total Iron	1.5	2.5	0.9
Total Lead	<0.03	<0.03	<0.03
Total Manganese	0.041	0.139	0.049
Total Mercury (µg/L)	<0.2	<0.2	<0.2
Total Nickel	<0.008	<0.008	<0.008
Total Silver	<0.004	<0.004	<0.004
Total Zinc	<0.06	<0.06	<0.06
Fecal Coliform (cfu/100 mL)	10	<10	<10
E. coli (cfu/100 mL)	<1	10	<1

[a]Expressed in mg/L except where noted.
[b]Field measurement.

TABLE AVII-2: WATER QUALITY AT STATION 43 IN THE ILLINOIS RIVER DURING MAY, AUGUST, AND OCTOBER 2011

Constituents[a]	May	August	October
Water Temperature (°C)[b]	13.2	30.6	18.3
Total Suspended Solids	23	44	8
Turbidity (NTU)[b]	38	50	51
Conductivity (µS/cm)[b]	615	752	830
Five-Day BOD	<2	4	9
Dissolved Oxygen[b]	9.3	6.2	8.8
pH (units)[b]	7.9	8.2	8.1
Ammonia Nitrogen	0.13	0.17	0.14
Un-ionized Ammonia	0.003	0.021	0.006
Total Kjeldahl Nitrogen	1.04	1.06	0.79
Nitrite plus Nitrate Nitrogen	6.71	1.72	3.72
Total Nitrogen	7.75	2.78	4.51
Total Phosphorus	0.19	0.52	0.63
Chlorophyll *a* (µg/L)	No Data	No Data	No Data
Total Cyanide	0.007	<0.005	<0.005
Phenols	<0.005	<0.005	<0.005
Total Arsenic	<0.05	<0.05	<0.05
Total Cadmium	<0.001	<0.001	<0.001
Total Chromium	<0.01	<0.01	<0.01
Total Copper	<0.02	<0.02	<0.02
Total Iron	1.3	1.8	1.4
Total Lead	<0.03	<0.03	<0.03
Total Manganese	0.038	0.112	0.062
Total Mercury (µg/L)	<0.2	<0.2	<0.2
Total Nickel	<0.008	<0.008	<0.008
Total Silver	<0.004	<0.004	<0.004
Total Zinc	<0.06	<0.06	<0.06
Fecal Coliform (cfu/100 mL)	27	350	150
E. coli (cfu/100 mL)	18	<1	<1

[a]Expressed in mg/L except where noted.
[b]Field measurement.

TABLE AVII-3: WATER QUALITY AT STATION 44 IN THE ILLINOIS RIVER DURING MAY, AUGUST, AND OCTOBER 2011

Constituents[a]	May	August	October
Water Temperature (°C)[b]	13.2	29.7	18.5
Total Suspended Solids	28	59	7
Turbidity (NTU)[b]	38	63	43
Conductivity (µS/cm)[b]	618	748	831
Five-Day BOD	<2	3	3
Dissolved Oxygen[b]	9.6	5.9	8.8
pH (units)[b]	8.0	8.2	8.0
Ammonia Nitrogen	0.09	0.16	0.09
Un-ionized Ammonia	0.002	0.019	0.003
Total Kjeldahl Nitrogen	0.88	1.12	0.69
Nitrite plus Nitrate Nitrogen	6.79	1.68	3.41
Total Nitrogen	7.67	2.80	4.10
Total Phosphorus	0.19	0.56	0.59
Chlorophyll *a* (µg/L)	9	37	22
Total Cyanide	<0.005	<0.005	<0.005
Phenols	<0.005	<0.005	0.005
Total Arsenic	<0.05	<0.05	<0.05
Total Cadmium	<0.001	<0.001	<0.001
Total Chromium	<0.01	<0.01	<0.01
Total Copper	<0.02	<0.02	<0.02
Total Iron	1.3	1.9	1.3
Total Lead	<0.03	<0.03	<0.03
Total Manganese	0.036	0.130	0.061
Total Mercury (µg/L)	<0.2	<0.2	<0.2
Total Nickel	<0.008	<0.008	<0.008
Total Silver	<0.004	<0.004	<0.004
Total Zinc	<0.06	<0.06	<0.06
Fecal Coliform (cfu/100 mL)	36	200	36
E. coli (cfu/100 mL)	10	<1	18

[a]Expressed in mg/L except where noted.
[b]Field measurement.

TABLE AVII-4: WATER QUALITY AT STATION 45 IN THE ILLINOIS RIVER DURING MAY, AUGUST, AND OCTOBER 2011

Constituents[a]	May	August	October
Water Temperature (°C)[b]	13.3	30.1	18.9
Total Suspended Solids	24	57	6
Turbidity (NTU)[b]	35	62	43
Conductivity (µS/cm)[b]	621	753	825
Five-Day BOD	<2	4	3
Dissolved Oxygen[b]	9.2	6.0	9.4
pH (units)[b]	7.8	8.0	7.7
Ammonia Nitrogen	0.35	0.12	0.11
Un-ionized Ammonia	0.006	0.009	0.002
Total Kjeldahl Nitrogen	0.75	1.04	0.72
Nitrite plus Nitrate Nitrogen	6.98	1.69	3.38
Total Nitrogen	7.73	2.73	4.10
Total Phosphorus	0.18	0.60	0.56
Chlorophyll *a* (µg/L)	7	35	28
Total Cyanide	<0.005	<0.005	<0.005
Phenols	<0.005	<0.005	<0.005
Total Arsenic	<0.05	<0.05	<0.05
Total Cadmium	<0.001	<0.001	<0.001
Total Chromium	<0.01	<0.01	<0.01
Total Copper	<0.02	<0.02	<0.02
Total Iron	1.2	2.2	1.0
Total Lead	<0.03	<0.03	<0.03
Total Manganese	0.034	0.146	0.053
Total Mercury (µg/L)	<0.2	<0.2	<0.2
Total Nickel	<0.008	<0.008	<0.008
Total Silver	<0.004	<0.004	<0.004
Total Zinc	<0.06	<0.06	<0.06
Fecal Coliform (cfu/100 mL)	54	<10	10
E. coli (cfu/100 mL)	18	10	<1

[a]Expressed in mg/L except where noted.
[b]Field measurement.

TABLE AVII-5: WATER QUALITY AT STATION 46 IN THE ILLINOIS RIVER DURING MAY, AUGUST, AND OCTOBER 2011

Constituents[a]	May	August	October
Water Temperature (°C)[b]	13.2	30.3	18.5
Total Suspended Solids	31	56	9
Turbidity (NTU)[b]	40	61	43
Conductivity (µS/cm)[b]	617	765	826
Five-Day BOD	<2	3	3
Dissolved Oxygen[b]	9.4	6.1	9.0
pH (units)[b]	8.0	8.0	7.6
Ammonia Nitrogen	0.11	0.11	0.10
Un-ionized Ammonia	0.003	0.009	0.001
Total Kjeldahl Nitrogen	0.85	0.96	0.77
Nitrite plus Nitrate Nitrogen	7.00	1.82	3.29
Total Nitrogen	7.85	2.78	4.06
Total Phosphorus	0.20	0.57	0.61
Chlorophyll *a* (µg/L)	No Data	No Data	No Data
Total Cyanide	<0.005	<0.005	0.005
Phenols	<0.005	<0.005	<0.005
Total Arsenic	<0.05	<0.05	<0.05
Total Cadmium	<0.001	<0.001	<0.001
Total Chromium	<0.01	<0.01	<0.01
Total Copper	<0.02	<0.02	<0.02
Total Iron	1.4	2.1	1.4
Total Lead	<0.03	<0.03	<0.03
Total Manganese	0.041	0.132	0.054
Total Mercury (µg/L)	<0.2	<0.2	<0.2
Total Nickel	<0.008	<0.008	<0.008
Total Silver	<0.004	<0.004	<0.004
Total Zinc	<0.06	<0.06	<0.06
Fecal Coliform (cfu/100 mL)	27	99	27
E. coli (cfu/100 mL)	10	10	18

[a]Expressed in mg/L except where noted.
[b]Field measurement.

TABLE AVII-6: WATER QUALITY AT STATION 47 IN THE ILLINOIS RIVER DURING MAY, AUGUST, AND OCTOBER 2011

Constituents[a]	May	August	October
Water Temperature (°C)[b]	13.2	30.2	18.8
Total Suspended Solids	32	63	6
Turbidity (NTU)[b]	42	63	38
Conductivity (µS/cm)[b]	618	753	829
Five-Day BOD	<2	3	3
Dissolved Oxygen[b]	9.1	6.1	8.8
pH (units)[b]	7.9	8.0	7.6
Ammonia Nitrogen	0.11	0.12	0.11
Un-ionized Ammonia	0.002	0.010	0.002
Total Kjeldahl Nitrogen	1.00	0.97	0.81
Nitrite plus Nitrate Nitrogen	6.98	1.71	3.28
Total Nitrogen	7.98	2.68	4.09
Total Phosphorus	0.22	0.58	0.81
Chlorophyll *a* (µg/L)	No Data	No Data	No Data
Total Cyanide	<0.005	<0.005	0.005
Phenols	<0.005	<0.005	0.005
Total Arsenic	<0.05	<0.05	<0.05
Total Cadmium	0.012	<0.001	<0.001
Total Chromium	0.01	<0.01	<0.01
Total Copper	<0.02	<0.02	<0.02
Total Iron	1.5	2.3	0.8
Total Lead	<0.03	<0.03	<0.03
Total Manganese	0.056	0.133	0.046
Total Mercury (µg/L)	<0.2	<0.2	<0.2
Total Nickel	0.015	<0.008	<0.008
Total Silver	<0.004	<0.004	<0.004
Total Zinc	<0.06	<0.06	<0.06
Fecal Coliform (cfu/100 mL)	<10	380	390
E. coli (cfu/100 mL)	18	72	18

[a]Expressed in mg/L except where noted.
[b]Field measurement.

TABLE AVII-7: WATER QUALITY AT STATION 48 IN THE ILLINOIS RIVER DURING MAY, AUGUST, AND OCTOBER 2011

Constituents[a]	May	August	October
Water Temperature (°C)[b]	13.1	30.3	19.0
Total Suspended Solids	30	58	6
Turbidity (NTU)[b]	40	59	38
Conductivity (µS/cm)[b]	619	754	844
Five-Day BOD	<2	4	4
Dissolved Oxygen[b]	9.0	6.0	8.8
pH (units)[b]	7.9	8.0	7.7
Ammonia Nitrogen	0.10	0.11	0.12
Un-ionized Ammonia	0.002	0.009	0.002
Total Kjeldahl Nitrogen	0.87	1.08	0.92
Nitrite plus Nitrate Nitrogen	7.03	1.72	3.28
Total Nitrogen	7.90	2.80	4.20
Total Phosphorus	0.20	0.56	0.51
Chlorophyll *a* (µg/L)	8	26	30
Total Cyanide	<0.005	<0.005	<0.005
Phenols	<0.005	<0.005	<0.005
Total Arsenic	<0.05	<0.05	<0.05
Total Cadmium	<0.001	<0.001	<0.001
Total Chromium	<0.01	<0.01	<0.01
Total Copper	<0.02	<0.02	<0.02
Total Iron	1.4	2.1	0.9
Total Lead	<0.03	<0.03	<0.03
Total Manganese	0.041	0.127	0.050
Total Mercury (µg/L)	<0.2	<0.2	<0.2
Total Nickel	<0.008	<0.008	<0.008
Total Silver	<0.004	<0.004	<0.004
Total Zinc	<0.06	<0.06	<0.06
Fecal Coliform (cfu/100 mL)	18	270	54
E. coli (cfu/100 mL)	<1	18	10

[a]Expressed in mg/L except where noted.
[b]Field measurement.

TABLE AVII-8: WATER QUALITY AT STATION 49 IN THE ILLINOIS RIVER DURING MAY, AUGUST, AND OCTOBER 2011

Constituents[a]	May	August	October
Water Temperature (°C)[b]	13.3	30.5	19.0
Total Suspended Solids	31	61	7
Turbidity (NTU)[b]	41	72	33
Conductivity (µS/cm)[b]	622	761	837
Five-Day BOD	<2	3	3
Dissolved Oxygen[b]	9.2	5.9	8.9
pH (units)[b]	7.9	7.9	7.2
Ammonia Nitrogen	0.13	0.12	0.19
Un-ionized Ammonia	0.003	0.008	0.001
Total Kjeldahl Nitrogen	1.05	1.06	0.76
Nitrite plus Nitrate Nitrogen	7.05	1.73	3.33
Total Nitrogen	8.10	2.79	4.09
Total Phosphorus	0.21	0.58	0.52
Chlorophyll *a* (µg/L)	No Data	No Data	No Data
Total Cyanide	<0.005	<0.005	0.005
Phenols	<0.005	<0.005	0.005
Total Arsenic	<0.05	<0.05	<0.05
Total Cadmium	<0.001	<0.001	<0.001
Total Chromium	<0.01	<0.01	<0.01
Total Copper	<0.02	<0.02	<0.02
Total Iron	1.4	2.4	0.9
Total Lead	<0.03	<0.03	<0.03
Total Manganese	0.041	0.142	0.052
Total Mercury (µg/L)	<0.2	<0.2	<0.2
Total Nickel	<0.008	<0.008	<0.008
Total Silver	<0.004	<0.004	<0.004
Total Zinc	<0.06	<0.06	<0.06
Fecal Coliform (cfu/100 mL)	18	110	120
E. coli (cfu/100 mL)	<1	36	27

[a]Expressed in mg/L except where noted.
[b]Field measurement.