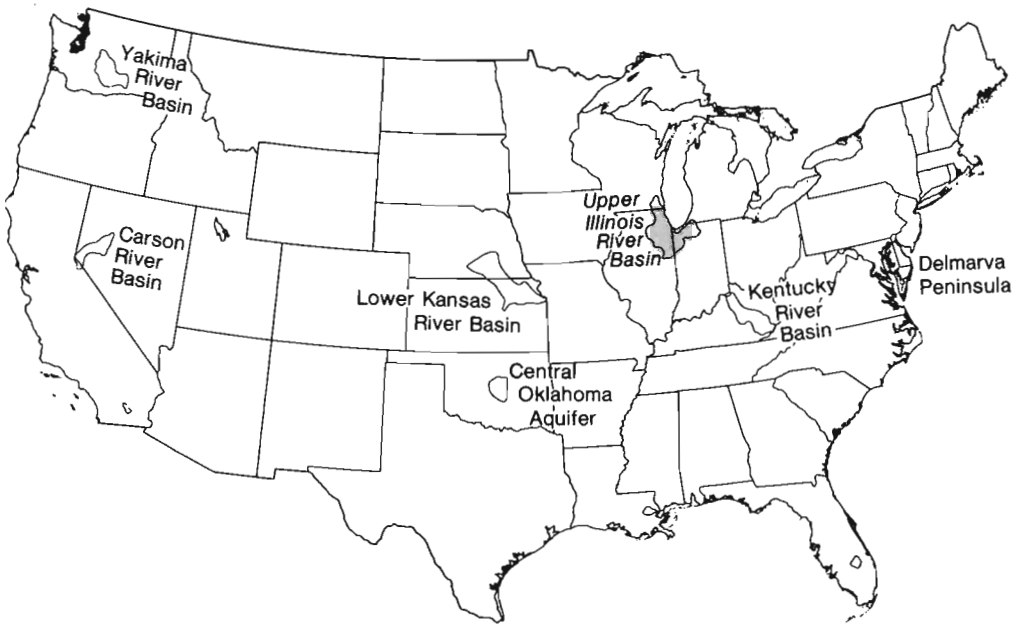
SURFACE-WATER-QUALITY ASSESSMENT OF THE UPPER ILLINOIS RIVER BASIN IN ILLINOIS, INDIANA, AND WISCONSIN: DATA ON MANMADE NONAGRICULTURAL VOLATILE AND SEMIVOLATILE ORGANIC CHEMICALS IN WATER, MAY 1988 THROUGH MARCH 1990

by Faith A. Fitzpatrick and John A. Colman



U.S. GEOLOGICAL SURVEY
Open-File Report 92—467

1993

U.S. DEPARTMENT OF THE INTERIOR
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U.S. GEOLOGICAL SURVEY
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CONVERSION FACTORS AND ABBREVIATED WATER-QUALITY UNITS

Multiply	By	To Obtain
foot (ft)	0.3048	meter
square mile (mi^2)	2.590	square kilometer

ADDITIONAL CONVERSIONS

In this report, certain units of measurement, by convention, are reported as International System units of measurement--

Multiply	By	To Obtain
milligram (mg)	15.43	grain
milliliter (mL)	0.03382	ounce, fluid
liter (L)	0.2642	gallon
microgram per liter ($\mu g/L$)	1.0	part per billion

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degrees Celsius (°C) $\quad °F = 1.8 \times °C + 32 \quad$ degrees Fahrenheit (°F)

SURFACE-WATER-QUALITY ASSESSMENT OF THE UPPER ILLINOIS RIVER BASIN IN ILLINOIS, INDIANA, AND WISCONSIN: DATA ON MANMADE NONAGRICULTURAL VOLATILE AND SEMIVOLATILE ORGANIC CHEMICALS IN WATER, MAY 1988 THROUGH MARCH 1990

by **Faith A. Fitzpatrick and John A. Colman**

ABSTRACT

This report contains data from the survey of manmade nonagricultural volatile and semivolatile organic chemicals in surface water in the upper Illinois River basin from May 1988 through March 1990. In addition to the data, sampling methods and quality-assurance procedures are described. The survey was part of the upper Illinois River basin pilot project of the National Water-Quality Assessment program conducted by the U.S. Geological Survey. The organic chemicals analyzed from the water samples were those expected to be associated primarily with effluent from point sources in urban areas. A low-flow synoptic investigation of 52 volatile and 54 semivolatile organic chemicals was conducted at 31 sites in July 1988. Additional samples were collected monthly at two sites to continue to test for the presence of 43 volatile organic chemicals from December 1988 through March 1990, and of 11 semivolatile organic chemicals at two sites from August through September 1988.

INTRODUCTION

The pilot phase of the National Water-Quality Assessment (NAWQA) program was initiated by the U.S. Geological Survey (USGS) in 1986 to test and refine concepts for a nationwide survey of surface- and ground-water quality. The upper Illinois River basin is one of four surface-water basins that were selected as pilot projects. The NAWQA program has the following long-term goals: (1) to provide a nationally consistent description of current water-quality conditions for a large part of the Nation's water resources; (2) to define long-term trends in water quality; and (3) to identify, describe, and explain the major factors that affect observed water-quality conditions and trends (Cohen and others, 1988; Hirsch and others, 1988).

A specific NAWQA program objective is to determine the occurrence and relative distribution of manmade organic chemicals in streams. In the pilot study of the upper Illinois River basin, this objective was met by four surveys: (1) an analysis of manmade nonagricultural organic chemicals in the water column, (2) an analysis of manmade agricultural organic chemicals in the water column during runoff events, (3) an analysis of organic chemicals in streambed sediment, and (4) an analysis of manmade agricultural and nonagricultural organic chemicals in biota. Results from the first survey are reported here.

Manmade organic chemicals in water, sediment, and biota are important components for assessment of aquatic environments because of their potential toxicity, carcinogenicity, and mutagenicity (Commoner, 1979); their tendency to accumulate in food webs; and their widespread introduction into the environment from industrial, domestic, and agricultural practices (Smith and others, 1988). The sources, cycling, and effects of organic chemicals in aquatic environments are less understood than those of the major ion constituents, nutrients, and trace elements. Part of the complexity of understanding the effects of organic chemicals comes from the sheer number of manmade chemicals potentially present in the environment. About 60,000 known manmade organic chemicals are used in manufacturing, in addition to an unknown number of manufacturing byproducts and degradation products (Shackelford and Cline, 1986). Other complexities include limited availability of analytical techniques to measure small but environmentally important concentrations of organic chemicals (Wells, 1988), uncertain physical constants for the aqueous solubility of many organic chemicals (Moore and Ramamoorthy, 1984, p. 4), complex degradation pathways, and unknown and complex effects of organic chemicals on biota (Elder, 1990).

Ideally, the NAWQA survey of manmade organic chemicals would report on all nonagricultural organic chemicals present in the water. However, those chemicals actually reported are restricted because of limitations in chemical analytical techniques (Shackelford and Cline, 1986). The most powerful survey technique available, gas chromatography coupled with mass spectrometry (GC/MS), was used in this survey. However, this technique measures fewer than half of the manmade organic chemicals actually present in a given surface-water sample. Losses of organic chemicals occur during sample preparation (extraction) and during passage of the sample through the gas chromatograph (GC). The spectra of some chemicals are not identified because of the limited number of chemicals for which standard spectra are available for comparison. Although the extent of the limitations imposed by sample preparation and GC are largely unknown, those imposed by undefined standards can be evaluated by recording the number of unidentified peaks separated during passage through the GC.

Agricultural pesticides generally were not detected in this survey partly because samples were not collected during rainfall events, when chemicals applied to fields might be flushed into streams, and partly because of analytical methodology. Methods used to identify the agricultural chemicals are more specialized and have sensitivities that are two to three orders of magnitude greater than those used in this survey to identify nonagricultural chemicals.

Purpose and Scope

This report presents the investigative design, methodology, and analytical results from the sampling for manmade nonagricultural volatile and semivolatile organic chemicals in water from the upper Illinois River basin. The chemicals reported here include the U.S. Environmental Protection Agency priority pollutants, which were compared with standards to confirm their identification, and other chemicals detected but only tentatively identified. The water samples were collected by the USGS from May 1988 through March 1990. Methods of sample collection, preparation, and analysis are described in detail, and quality-assurance methods and results are documented.

Types and Sources of Surveyed Chemicals

Manmade nonagricultural organic chemicals included in this survey are grouped by method of analysis as volatile or semivolatile organic chemicals. Included among the volatile organic chemicals are short-chain, halogenated aliphatic hydrocarbons (open-chain structure) and monocyclic aromatic hydrocarbons (single benzene ring). These chemicals are produced by numerous manufacturers in the upper Illinois River basin. Aliphatic hydrocarbons are used as solvents, degreasing agents, and fumigants and are also used in the production of plastics, textiles, fluorocarbons, and refrigerants. Monocyclic aromatic hydrocarbons are used as degreasing and cleaning agents; solvents for industrial extraction; lubricants; moth repellents; wood preservatives; and as intermediates in the synthesis of pharmaceuticals, detergents, pesticides, and other chemicals.

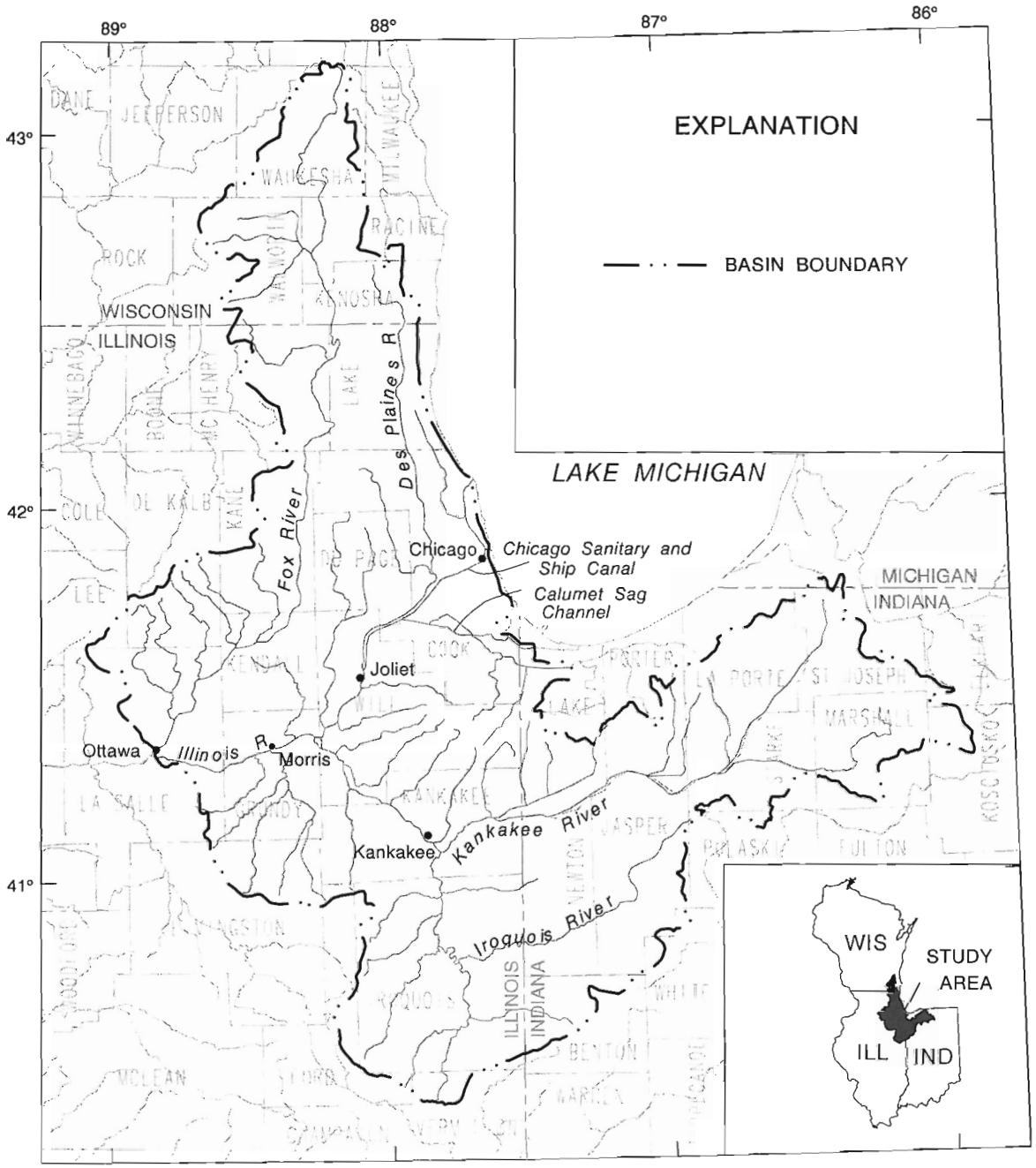
Among the semivolatile organic chemicals are polycyclic aromatic hydrocarbons (fused compounds built on benzene rings) and phenols (benzene ring with one or more hydroxyl groups). Polycyclic aromatic hydrocarbons are used as paper impregnants, as moth repellents, in oil additives and automobile capacitors, and in the manufacture of other chemicals used as solvents, lubricants, pesticides, and dyes. They also are a byproduct of coal combustion. Phenols are used in resins, nylon, plasticizers, antioxidants, oil additives, polyurethane, drugs, pesticides, explosives, dyes, and gasoline additives (Moore and Ramamoorthy, 1984).

Entry into streams for most manmade nonagricultural volatile and semivolatile organic chemicals is gained primarily through industrial effluent and municipal wastewater (Moore and Ramamoorthy, 1984). Chlorinated aliphatic hydrocarbons frequently are found in effluent from industries and wastewater-treatment plants using chlorination as part of their process chemistry. Domestic wastewater and urban runoff may contain higher concentrations of polycyclic aromatic hydrocarbons than effluents from user industries (Moore and Ramamoorthy, 1984). Monocyclic and polycyclic aromatic hydrocarbons also may enter surface water from nonpoint sources, such as leaks from industries and storage tanks, oil spills, atmospheric deposition, and runoff from roadways.

Solubility considerations dictate that the volatile chemicals are more likely to be found in the water column than in streambed sediments. The sources of the more soluble volatile chemicals were expected to be domestic and industrial discharges. The polycyclic aromatic hydrocarbons and phenols are more likely to be found in streambed sediments; however, they also are occasionally detected in water in low concentrations.

Description of the Study Area

The upper Illinois River basin drains 10,949 mi^2 and is located in parts of four States: northeastern Illinois, northwestern Indiana, southeastern Wisconsin, and southwestern Michigan (fig. 1). A detailed description of the physiographic and hydrologic characteristics of the study area can be found in Mades (1987). Three principal streams in the upper Illinois River basin are the Kankakee and the Des Plaines Rivers, which join near Morris, Illinois, to form the Illinois River; and the Fox River, which discharges to the Illinois River at



Base from U.S. Geological Survey
1:100,000 Digital Line Graphs
Albers Equal-Area Conic projection
Standard parallels 33° and 45°, central meridian -89°

Figure 1.--Location of the upper Illinois River basin.

the southwestern boundary of the basin near Ottawa, Illinois. Two canals in the Chicago, Illinois, area--the Chicago Sanitary and Ship Canal and the Calumet Sag Channel--provide a navigable link between the basin and Lake Michigan.

Agricultural and urban land uses predominate in the upper Illinois River basin (fig. 2) (Feagas and others, 1983; Anderson and others, 1976). Agricultural land accounts for approximately 75 percent of the basin and mainly consists of cropland; the principal crops produced are corn and soybeans. Urban and other built-up land accounts for approximately 18 percent of the basin, mainly in the vicinity of Chicago, Illinois. Other land cover in the basin includes forest (6 percent) and wetland (1 percent). Urban land use in the basin is estimated to be about 8 percent industrial, 58 percent residential, 19 percent commercial, and 15 percent undetermined (Feagas and others, 1983). These percentages are based on land-use data from 1975 through 1982. Since then, the urban area surrounding Chicago has grown considerably in a westward direction into land that was previously described as forested and agricultural.

The population of the upper Illinois River basin is about 7.5 million (estimated from data of U.S. Bureau of Census 1980 decennial census files, adjusted to the 1985 U.S. Bureau of Census data for county populations). Cook County (fig. 1) contains approximately 6 million people, or about 65 percent of the population in the basin, and is drained mainly by the Des Plaines River, the Chicago Sanitary and Ship Canal, and the Calumet Sag Channel.

Over 750 point sources (figs. 3-5) have permits to discharge into streams of the upper Illinois River basin (based on the Illinois State Water Use Data base, John LaTour, U.S. Geological Survey, written commun., 1988; and Industrial Facilities Discharge data base, Phillip Taylor, U.S. Environmental Protection Agency, oral commun., 1988). The area surrounding Chicago has the greatest density of point sources, especially along the Des Plaines River and its tributaries, as would be expected from its urban land use and large population. Three types of point sources constitute nearly 90 percent of the total number in the basin. Municipal wastewater-treatment facilities account for about 35 percent (fig. 3), industrial sources account for about 31 percent (fig. 4), and commercial sources account for about 22 percent (fig. 5). Many different industries discharge to streams in the basin, including canneries, foundries, leather tanneries, and manufacturers of automobile and farm machinery, petroleum products, explosives, electronics, metals, plastics, and rubber.

METHODS

A total of 34 sites were sampled--32 sites for volatile organic chemicals and 27 sites for semivolatile organic chemicals (fig. 6). Characteristics of the sites and sampling periods are listed in table 1 (all tables are at the end of the report). Seven sites (2, 6, 14, 19, 23, 28, and 34) also were part of the upper Illinois River basin NAWQA project fixed-station sampling network (D.J. Sullivan, U.S. Geological Survey, written commun., 1992).

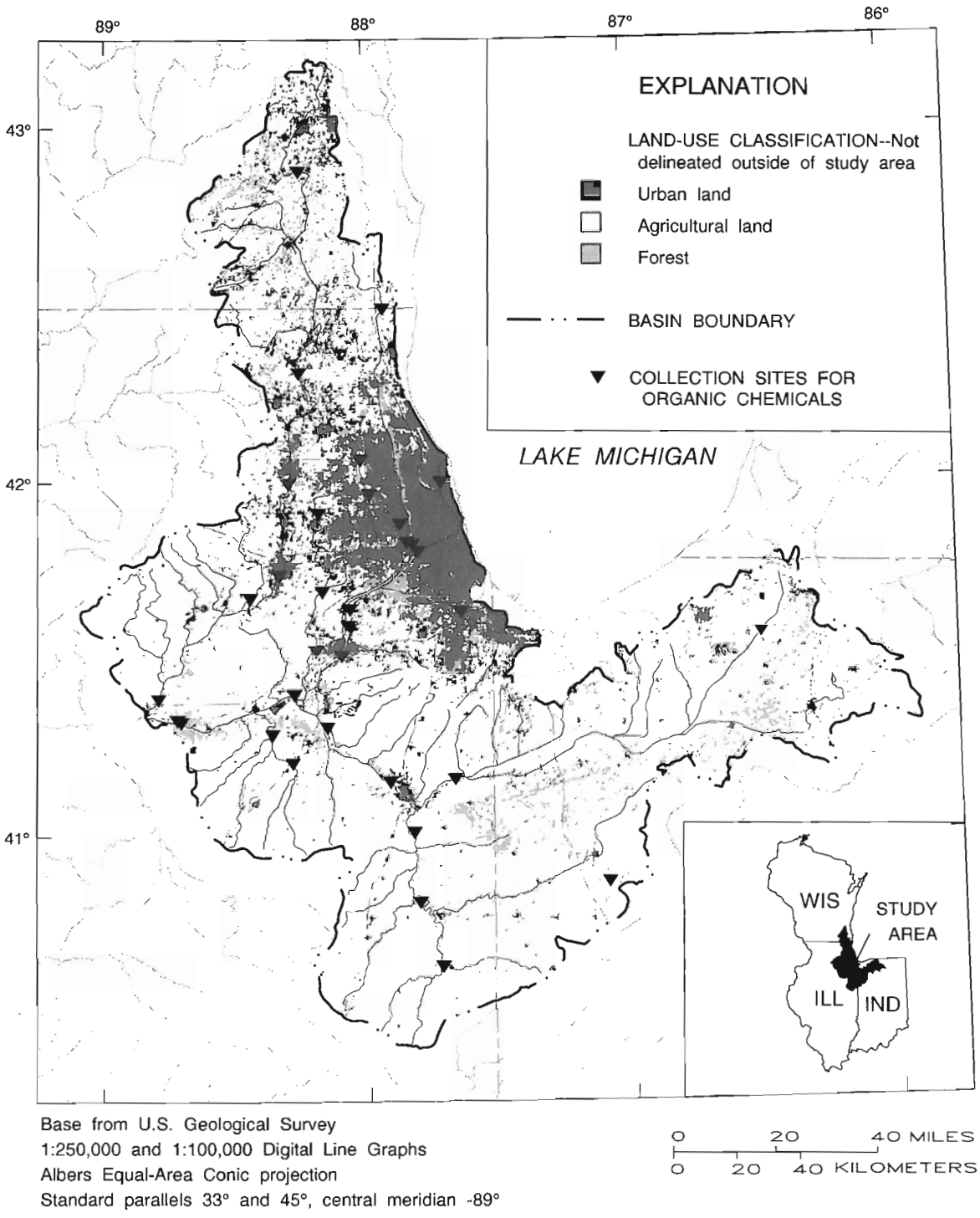


Figure 2.--Land use in the upper Illinois River basin.

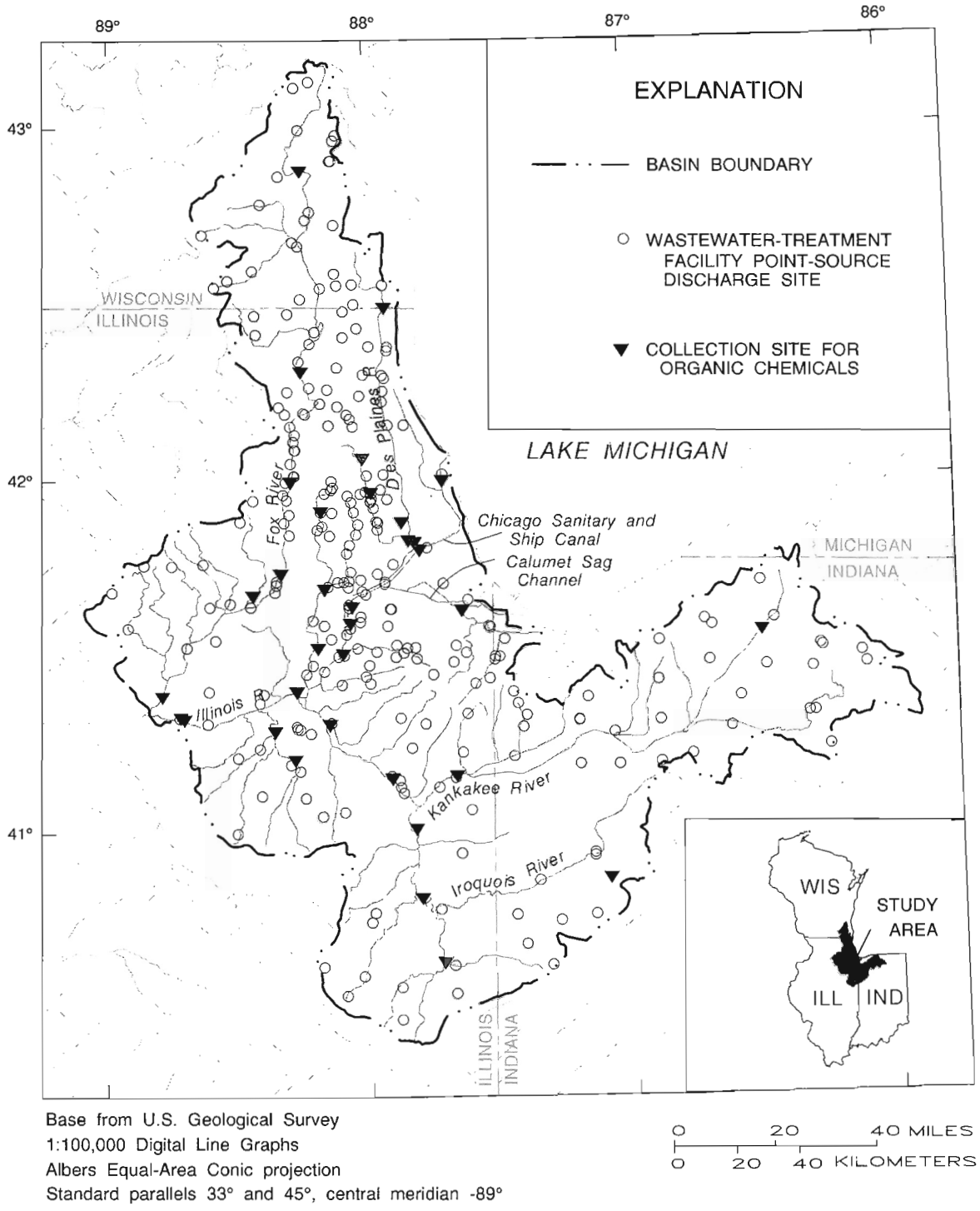
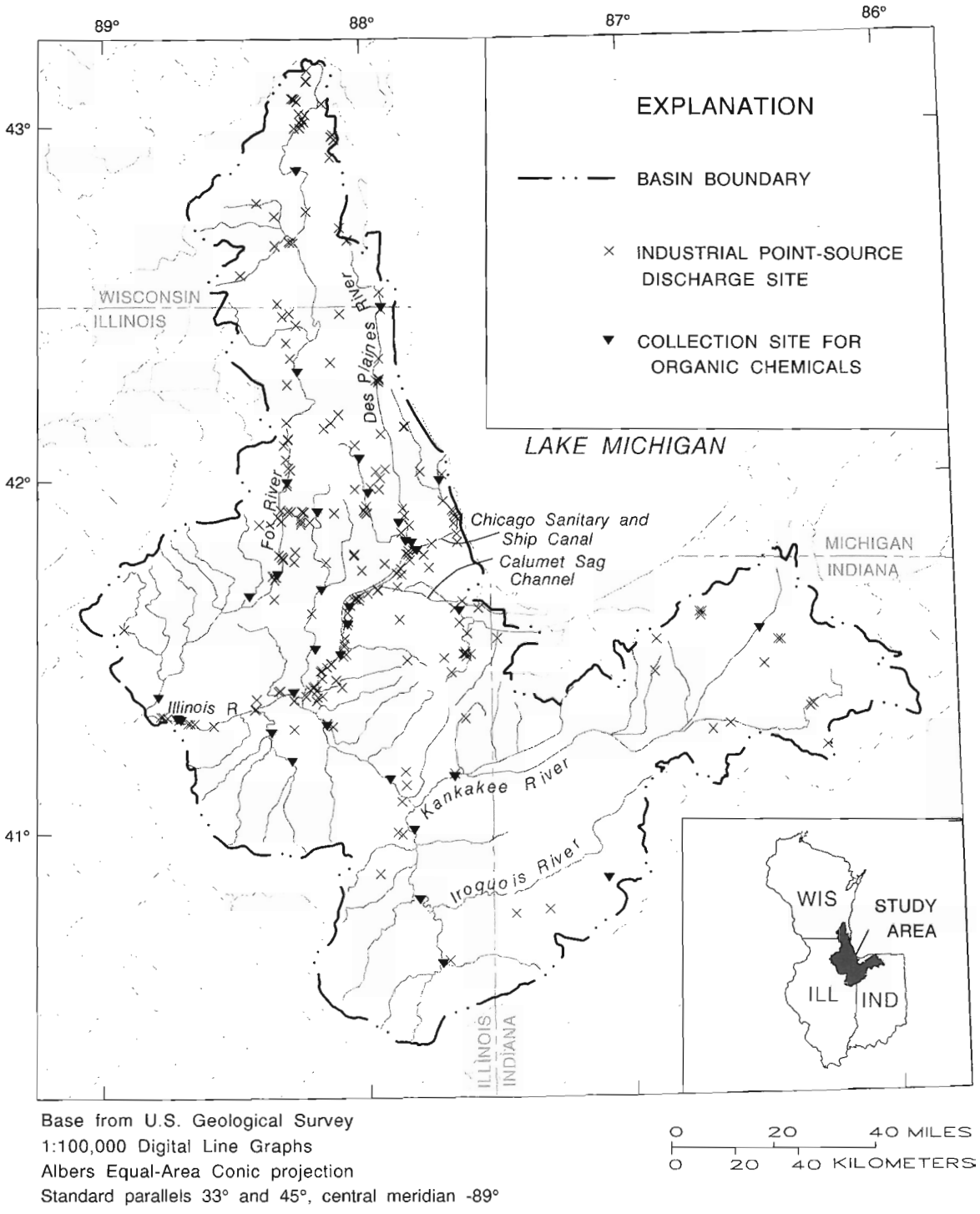


Figure 3.--Location of wastewater-treatment facilities in the upper Illinois River basin (based on the Illinois State Water Use data base, John LaTour, U.S. Geological Survey, written commun., 1988; and Industrial Facilities Discharge data base, Phillip Taylor, U.S. Environmental Protection Agency, oral commun., 1988).



Base from U.S. Geological Survey
1:100,000 Digital Line Graphs
Albers Equal-Area Conic projection
Standard parallels 33° and 45°, central meridian -89°

Figure 4.--Location of industrial point sources into stream water in the upper Illinois River basin (based on the Illinois State Water Use data base, John LaTour, U.S. Geological Survey, written commun., 1988; and Industrial Facilities Discharge data base, Phillip Taylor, U.S. Environmental Protection Agency, oral commun., 1988).

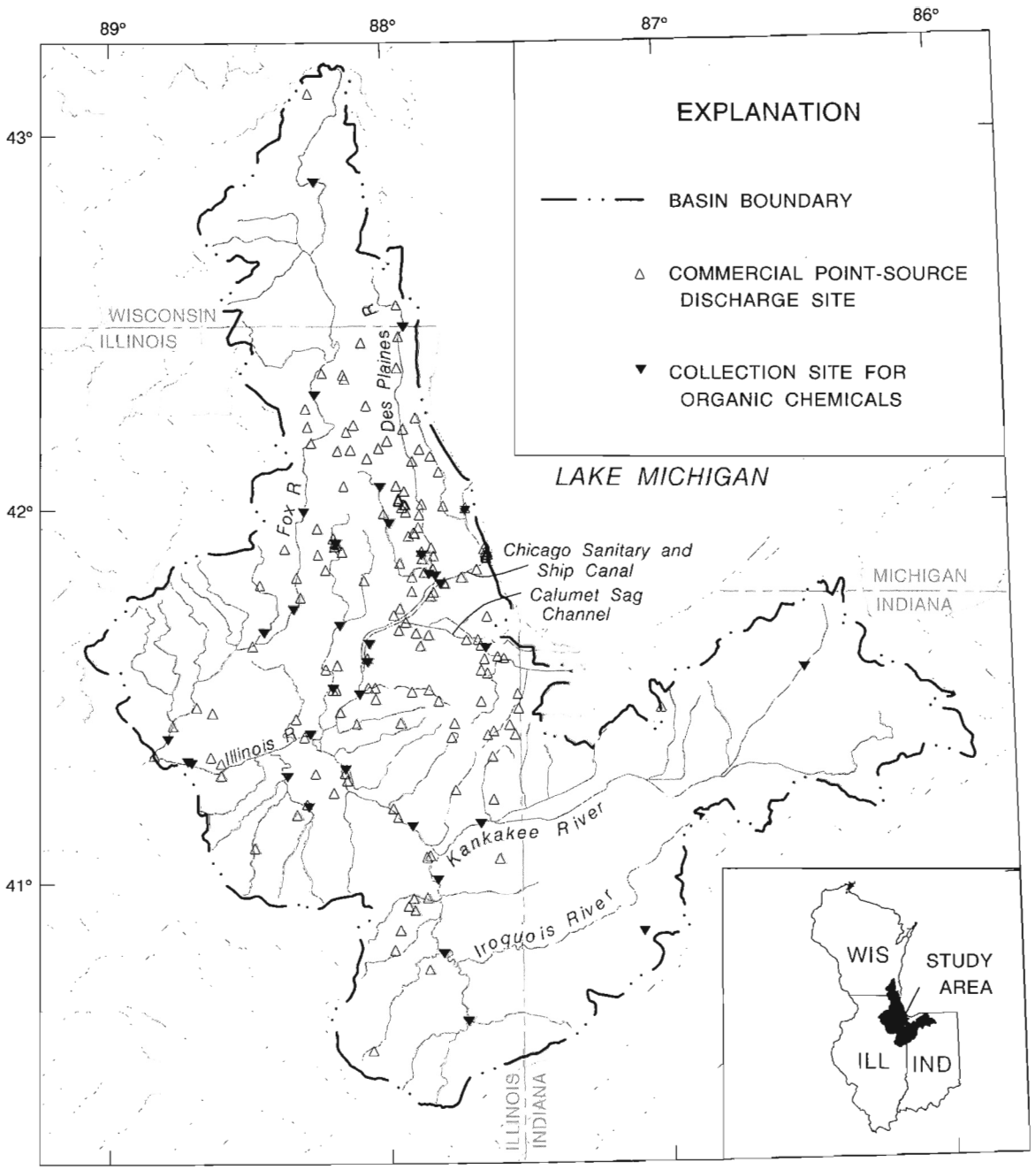


Figure 5.--Location of commercial point sources into stream water in the upper Illinois River basin (based on the Illinois State Water Use data base, John LaTour, U.S. Geological Survey, written commun., 1988; and Industrial Facilities Discharge data base, Phillip Taylor, U.S. Environmental Protection Agency, oral commun., 1988).

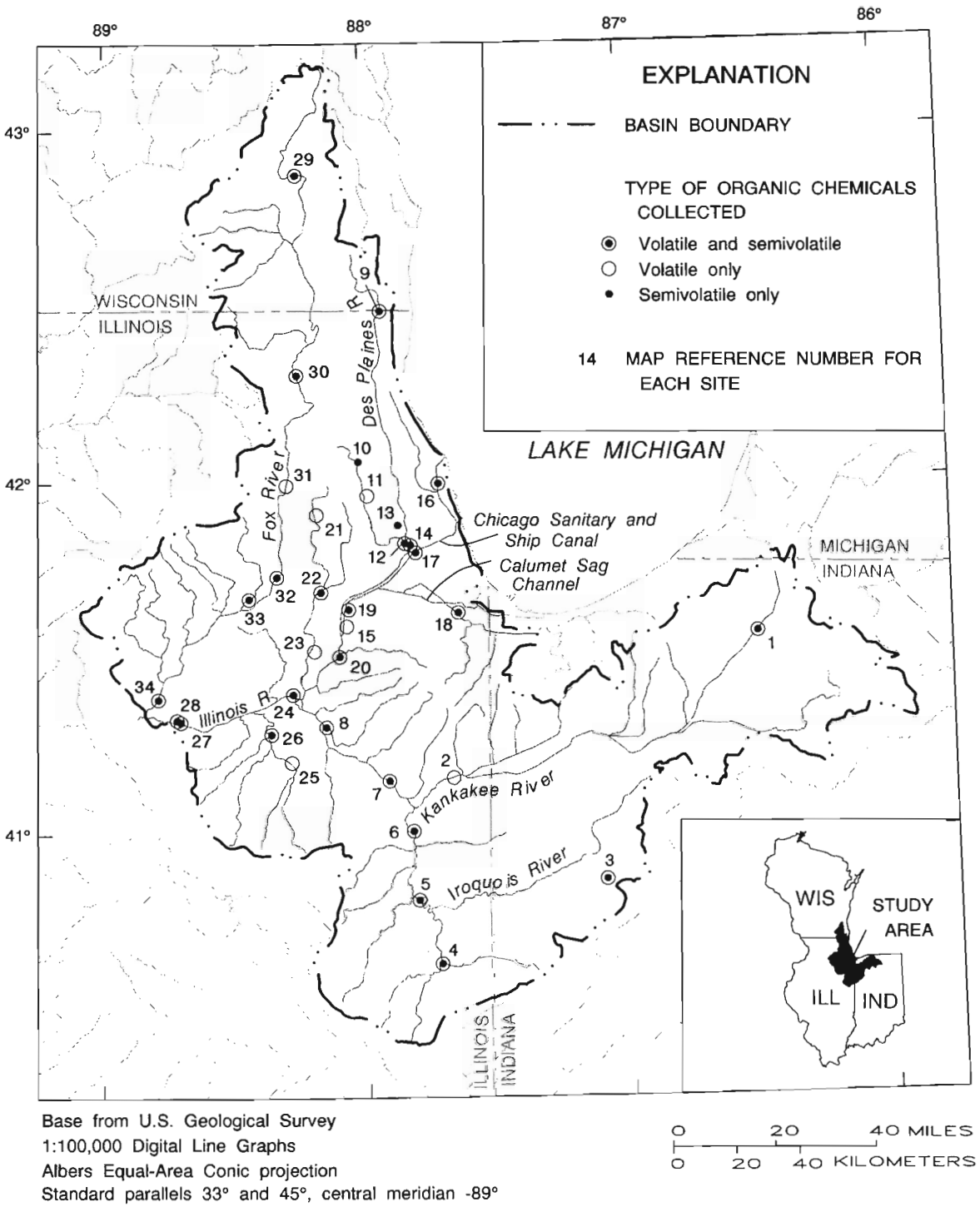


Figure 6.--Sampling sites for manmade nonagricultural volatile and semivolatile organic chemicals in stream water in the upper Illinois River basin.

Survey Design

The survey design was influenced by the lack of previous surveys of nonagricultural organic chemicals in surface water in the upper Illinois River basin and by the high cost of analysis for organic chemicals. To keep costs to a minimum without restricting the range of the chemicals surveyed, a detailed synoptic investigation of many sites was conducted during low streamflow to determine the spatial distribution of manmade organic chemicals in the basin. The largest concentrations of nonagricultural organic chemicals in water were expected to be found during low streamflow, when point sources contribute their greatest proportion of total streamflow. The investigation was followed by continued monitoring for chemicals detected in the synoptic investigation in order to document fluctuations in the concentration of these chemicals over time and during a variety of hydrologic conditions.

Before the synoptic investigation was done, several preliminary samples were collected during low-flow conditions from May through July 1988, to test sample collection methods and analysis techniques. Water was collected at three sites (14, 19, and 33) and analyzed for 52 volatile organic chemicals. Water was collected at four sites (4, 14, 19, and 33) and analyzed for 11 acid-extractable semivolatile organic chemicals. Sites 14 and 19 were selected because domestic and industrial wastewater were expected to be the major sources of the more soluble chemicals and point sources in urban and industrial areas upstream of the sites contribute a large portion of the flow of the Des Plaines River and Chicago Sanitary and Ship Canal. Sites 4 and 33 are in rural locations and were not expected to contain any manmade nonagricultural organic chemicals. Site 33 was sampled at both the beginning and the end of each sampling run to determine whether cleaning of sampling equipment between sampling sites was effective.

The intensive low-flow synoptic investigation was conducted during the last 2 weeks of July 1988 during severe drought conditions. Sampling sites were selected primarily on main stems in or just downstream from urban areas where point sources were common. Since manmade organic chemicals may be found where they are not expected, some sampling was done in areas thought to be pristine. Agricultural sites not near any known upstream point sources were selected to quantify background concentrations in the basin. Other sites were selected at the mouths of major tributaries and at intervals of approximately 50 mi along the main stems of the major streams and rivers. These sites are referred to as minimum resolution sites. Thirty-one sites were sampled for 52 volatile organic chemicals (sites 10, 13, and 33 were not sampled for volatile organic chemicals during the synoptic investigation). Semivolatile organic chemicals are less likely to be detected in water because they are not as soluble, in general, as volatile organic chemicals. Results from the preliminary sampling at sites 14 and 19 indicated that semivolatile organic chemicals probably would not be detected in water samples. With this in mind, sampling for semivolatile organic chemicals during the synoptic investigation was limited to 21 sites. Some sites in agricultural areas were included in this subset to confirm that no semivolatile organic chemicals were likely to be found in rural areas. Sites 2, 4, 10, 11, 13, 14, 15, 19, 21, 24, 25, 31, and 33 were not sampled for semivolatile organic chemicals during the synoptic investigation.

The followup monitoring involved a more intensive investigation of the temporal variation in concentrations of volatile organic chemicals. Sites 14 and 19 were sampled monthly from August 1988 through March 1990 during a wide variety of flow conditions. Samples were analyzed for 52 volatile organic chemicals from August through September 1988, for 35 volatile organic chemicals from December 1988 through March 1989, and for 43 volatile organic chemicals from April 1989 through March 1990. The number of volatile organic chemicals that were analyzed for changed because of (1) a change in the laboratory that performed the analyses in December 1988 (from Ohio Environmental Protection Agency (OEPA) to the USGS National Water-Quality Laboratory (NWQL)), and (2) an improvement to analytical techniques at the NWQL in April 1989, which allowed more volatile organic chemicals to be analyzed. Samples were collected only twice for analysis of 11 semivolatile chemicals (phenols) during the followup monitoring because samples previously collected at all 21 sites during the synoptic investigation contained no concentrations of semivolatile organic chemicals that exceeded the detection limits.

Samples for analysis of 54 semivolatile organic chemicals also were collected at sites 10 and 13 during the survey of manmade agricultural organic chemicals in the water column during runoff events in 1989 in the upper Illinois River basin. The data from the analysis of semivolatile organic chemicals in these samples also are included here.

Sample Collection

Sample collection at each site was initiated by checking the chlorine content of the stream water with an orthotolidine-based testing kit. Samples were collected most often from bridges but sometimes were collected by wading, if the stream was shallow enough. Samplers were lowered into the apparent center of streamflow with a nylon rope.

Samples for analysis of volatile organic chemicals were collected with a biological-oxygen-demand (BOD) type sampler (American Public Health Association and others, 1985, p. 417; fig. 7). The stainless-steel sampler was constructed to hold three 50-mL sampling vials. The sampler was designed to flush the vials with approximately three volumes of stream water before retaining water for analysis. The nylon rope was connected to the sampler with a 6-ft section of steel chain. The sample was collected by holding the sampler stationary in the stream about 1 ft below the surface of the water. Each amber glass vial was removed from the sampler with a convex meniscus of sample at the mouth of the vial. The vials were sealed with Teflon[1]-lined caps. The vials were inverted after sealing and examined for air bubbles to ensure no air was present in the samples.

[1]Reference to trade names or commercial products in this report is for identification purposes only and does not constitute endorsement by the U.S. Geological Survey.

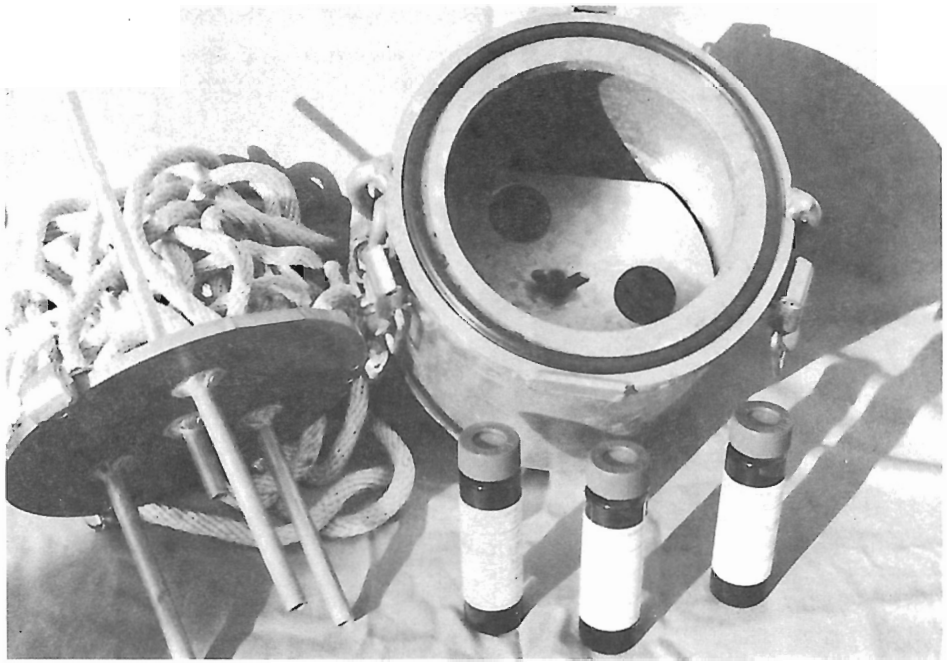


Figure 7.--Water sampler used to collect volatile organic chemicals.

Water samples for analyses for semivolatile organic chemicals were collected with a weighted open-mouthed bottle sampler (Ward and Harr, 1990; fig. 8). The sampler consisted of an unpainted steel frame that held a small-mouthed 1-L bottle upright in the water. The amber glass bottles used in the sampler were previously baked at 300°C. The small-mouthed bottles filled slowly and collected a depth-integrated sample as they were lowered through the water column. After the samples were retrieved, the bottles were sealed with Teflon-lined caps. Removal of air from samples was not as important for semivolatile organic chemicals as for volatile organic chemicals because semivolatile organic chemicals are not known to be present in significant quantities in air and are not known to be volatile enough to be lost to any great extent in the air space above a sample.

The samplers were stored separately in plastic bags to keep them clean between sites. The sampler for volatile organic chemicals was washed at each site immediately before sampling by scrubbing with a brush and phosphorus-free laboratory detergent followed by three rinses with organic-chemical-free water. Organic-chemical-free water was prepared by filtering tap water (ground-water source) through a carbon-block filter. The organic-chemical-free rinse water was prepared before each sampling trip and stored in glass bottles for later use. It was not necessary to wash the open-mouthed bottle sampler between samples because a clean bottle was used at each site.

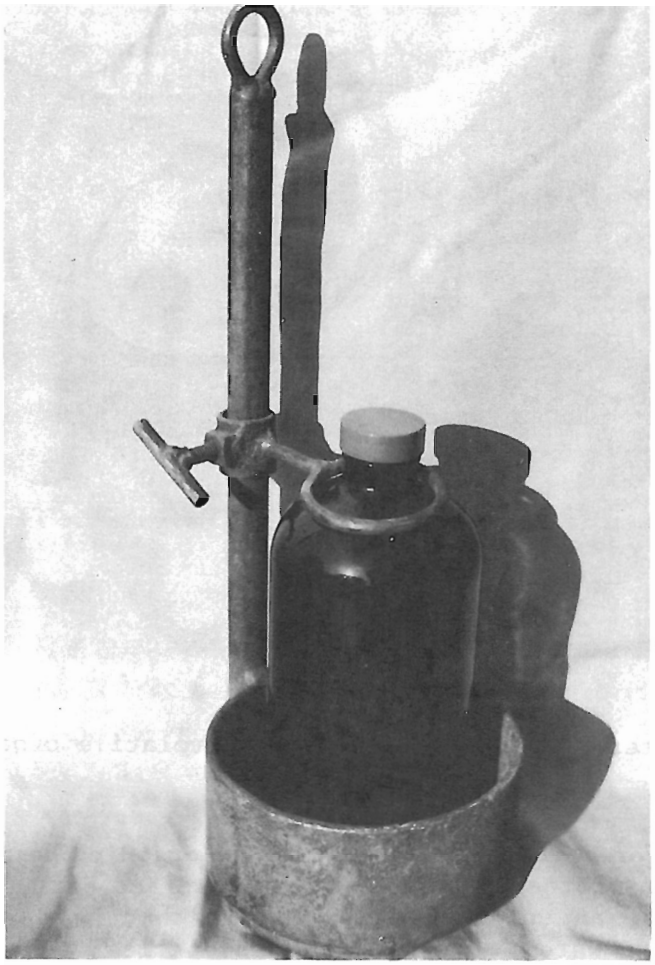


Figure 8.--Open-mouthed bottle sampler used to collect semivolatile organic chemicals.

Sample Preparation

After the samples were collected, they immediately were prepared for storage and shipment. The samples were not filtered. If chlorine was detected, it was reduced to chloride by the addition of either 25 mg of ascorbic acid (to the samples to be analyzed for volatile organic chemicals) or 80 mg of sodium thiosulfate (to the samples to be analyzed for semivolatile organic chemicals). The detection limit for chlorine was approximately 0.4 ppm. Chlorine was detected twice at site 14 during preliminary sample collection and once at site 31 during the synoptic investigation. Before capping, samples for analysis of volatile organic chemicals were preserved with three drops (approximately 0.15 mL) of 50-percent hydrochloric acid to help prevent biodegradation. No preservatives were added to the sample bottles for analysis of semivolatile organic chemicals. Both types of samples were stored at 4°C and shipped on ice within 24 hours to the NWQL or the water-quality laboratory at the OEPA.

Sample Analysis

Two laboratories conducted analyses of the water samples. The OEPA laboratory analyzed the water samples for volatile organic chemicals collected during the preliminary sampling, the low-flow synoptic investigation, and the followup monitoring from August through September 1988. The NWQL conducted the analysis of volatile organic chemicals from water samples collected during the followup monitoring from December 1988 through March 1990. The NWQL also analyzed all the samples that were collected for the determination of semivolatile organic chemicals during the preliminary sampling, low-flow synoptic investigation, followup monitoring, and runoff events.

Volatile organic chemicals were isolated and concentrated from the whole water sample with a purge and trap device (Wershaw and others, 1987) in both laboratories. The chemicals were separated on a GC, and detected and quantified with a mass spectrometer (MS). The mass spectra obtained by the GC coupled with MS were compared with spectra from reference standards and identified (Wershaw and others, 1987). Standards used in the investigations were sufficient to identify virtually all of the volatile chemicals that eluted from the GC, because no tentatively identified chemicals[2] were reported by either laboratory. Table 2 lists the target chemicals analyzed, minimum reporting levels for each constituent, and the laboratory that performed the analysis.

Semivolatile organic chemicals were isolated and concentrated by extraction from the whole water sample with methylene chloride and methanol (Wershaw and others, 1987). The concentrated semivolatile chemicals were identified and quantified using the GC/MS method described above. Available reference standards were not sufficient to identify all the semivolatile organic chemicals that eluted. Table 3 lists the target chemicals analyzed and minimum reporting levels for each constituent. Acid-extractable semivolatile chemicals (phenolic compounds) are listed separately from base- and neutral-extractable semivolatile chemicals. Table 3 also lists other semivolatile organic chemicals that were tentatively identified but for which no reference standards were available.

Quality Assurance

Quality-control procedures, as directed by Mattraw and others (1989), were conducted during both the collection and the analysis of nonagricultural volatile and semivolatile organic chemicals. Quality-assurance terminology used here is consistent with American Society of Quality Control (1987). Duplicate samples were collected and trip-blank samples and blind samples were submitted to the laboratories along with the collected water samples. In addition, laboratory

[2]Data for tentatively identified organic chemicals (TIOC's) in this report are based on comparison of sample spectra followed by visual examination by GC/MS analysts. The TIOC data have not been confirmed by direct comparison with reference standards. Therefore, TIOC identification is tentative.

quality-control procedures are conducted regularly at the NWQL and the OEPA laboratory. The NWQL regularly analyzes blind samples, internal reference samples, and surrogates and calibrates their instruments (Friedman and Erdmann, 1982; Jones, 1987). The OEPA laboratory participates in the U.S. Environmental Protection Agency's quality-assurance programs and the USGS blind-sample program.

Duplicate samples were collected for both volatile and semivolatile chemicals at five sites during the synoptic investigation and at two sites during the followup monitoring (table 4). The duplicate samples were collected separately, one immediately following the other, at the same position in the stream and by the same person. The sampler for volatile chemicals was washed in the standard way between samples. Each duplicate sample was processed as a separate sample with a unique identification number. This procedure was used as a check for sample-collection techniques and for fluctuations in concentration that occur normally in streams.

Trip blanks, composed of organic-chemical-free water, were submitted along with the water samples for analyses for volatile organic chemicals (table 4). The source of the organic-chemical-free water for the trip blanks was the same as that used for the sampler rinse water. The trip blanks were filled directly from the carbon-block filter before the sampling trip. The trip blanks were stored with the water samples in the same containers during the sampling trip and during shipment to the laboratory. Preservatives were added to the trip blanks using the same techniques as were used for the water samples. The trip blanks were submitted to check for contamination in the preservatives, in the organic-chemical-free rinse water, and during storage and shipping. No trip blanks were submitted for semivolatile chemicals, because semivolatile organic chemicals from air are not likely to contaminate the samples.

In order to check the accuracy of the OEPA laboratory analyses, a double blind sample with 11 volatile organic chemicals was prepared by the NWQL and sent to the OEPA laboratory with the preliminary samples (table 4). The sample was labeled to appear as an actual stream sample so that the OEPA laboratory would not know the sample was for quality control.

Reference samples were analyzed once during preliminary sample collection by the OEPA laboratory for each of the 52 volatile organic chemicals included in their analysis (table 4). No blind samples or reference samples were sent to the NWQL.

Care was taken to not transport contaminating organic chemicals (especially gasoline) with the sampling apparatus, sample containers, coolers, and samples. The vehicle was turned off during sample collection and preparation in order to minimize contamination from its exhaust system.

The results of quality-control procedures are presented in tables 5, 6, and 7. Table 5 contains the results from analysis of duplicate samples. Table 6 contains the results of the analysis of the trip blanks. The volatile organic chemicals most commonly detected in the trip blanks were bromoform, methylene chloride, toluene, and xylene. Methylene chloride, benzene, and chloroform commonly are used in laboratories as solvents (Wershaw and others, 1987, p. 68). Halogenated volatile organic chemicals sometimes occur in trip-blank water, and toluene and xylene commonly are found in the adhesive used on tape and labels.

Table 7 lists the results of the double-blind sample and internal reference samples analyzed by OEPA. The double-blind sample was 18 days old when it was analyzed by OEPA, and the storage life of the double-blind sample was only 20 days. This may be the cause of the apparent degradation of some of the chemicals in the sample (table 7).

DATA ON NONAGRICULTURAL VOLATILE AND SEMIVOLATILE ORGANIC CHEMICALS

The results of analyses of water samples collected in the upper Illinois River basin for concentrations of volatile and semivolatile organic chemicals are presented in tables 8-10 (at end of report). The results are grouped by chemical group and analyzing agency and are listed in alphabetical order. Table 8 contains the results of the analysis of volatile organic chemicals by the OEPA laboratory from June through September 1988. Table 9 contains the results of the analysis of volatile organic chemicals by NWQL from December 1988 through March 1990. All results of the analysis of semivolatile organic chemicals (table 10) were below the detection limits listed in table 2, except for the detection of bis-(2-ethylhexyl)phthalate in three water samples at site 10 during the survey of agricultural organic chemicals during runoff events. Bis-(2-ethylhexyl)-phthalate is a common plasticizer that often contaminates samples during collection, preparation, and laboratory analysis (M.P. Schroeder, National Water-Quality Laboratory, oral commun., 1991). The following information is included to aid in the interpretation of the data in tables 8, 9, and 10.

Time.--The sample-collection time indicated is expressed in 24-hour local standard time. For example, 12:30 a.m. is written as 0030, and 1:30 p.m. is written as 1330.

Missing data.--Missing data appear in the data tables as dashed lines.

Parameter code.--Each column heading has a number in parentheses that is used in either the USGS National Water Data Storage and Retrieval System (WATSTORE) (Hutchinson, 1975), or the U.S. Environmental Protection Agency's Storage and Retrieval System (STORET) (U.S. Environmental Protection Agency, 1982), to refer to parameters related to water quality. If the chemical was only identified by the OEPA laboratory, the code is from STORET. If the chemical was identified by NWQL or by OEPA and NWQL, the code is from WATSTORE.

Remark code--A < preceding a concentration value means that the actual concentration is known to be less than the value shown, which is the minimum reporting level for the analytical equipment. This means that the chemical may or may not be present below the given concentration.

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TABLES 1-10

Table 1.--Description of sampling sites for manmade nonagricultural

[km, kilometers; °, degrees; ', minutes; ", seconds;

Type of data: UR, urban; AG, agricultural; MR, minimum

Stage of survey: PRE, preliminary sampling; SYN, low-flow STO, survey of agricultural organic chemicals during

Chemical group analyzed: V, water sample analyzed for for semivolatile organic chemicals.

Number of observations: First number describes the number chemicals, and second number describes the number of chemicals. For example, 18,5 means that 18 volatile

Map reference number	Station number	Station name	Latitude
1	05515000	Kankakee River near North Liberty, Ind.	41°33'50"
2	05520500	Kankakee River at Momence, Ill.	41°09'36"
3	05523000	Bice Ditch near South Marion, Ind.	40°52'00"
4	05525500	Sugar Creek at Milford, Ill.	40°37'50"
5	05525540	Iroquois River near Watseka, Ill.	40°48'44"
6	05526000	Iroquois River near Chebanse, Ill.	41°00'32"
7	05526130	Kankakee River near Bourbonnais, Ill.	41°09'08"
8	05527500	Kankakee River near Wilmington, Ill.	41°20'48"
9	05527800	Des Plaines River at Russell, Ill.	42°29'22"
10	05530990	Salt Creek at Rolling Meadows, Ill.	42°03'37"
11	05531175	Salt Creek at Wood Dale, Ill.	41°57'51"
12	05531500	Salt Creek at Western Springs, Ill.	41°49'35"
13	05532000	Addison Creek at Bellwood, Ill.	41°52'48"
14	05532500	Des Plaines River at Riverside, Ill.	41°49'20"
15	05534050	Des Plaines River at Lockport, Ill.	41°35'47"

organic chemicals in water in the upper Illinois River basin

<, less than; dashes indicate no data]

resolution.

synoptic investigation; FOL, followup monitoring;
storms events.

volatile organic chemicals; S, water sample analyzed

of samples collected for anlaysis of volatile organic
samples collected for analysis of semivolatile organic
samples and 5 semivolatile samples were collected.

Longitude	Distance to nearest point source (km)	Type of site	Stage of survey	Chemical group analyzed	Sampling period	Number of observations
86°29'50"	6	AG,MR	SYN	V,S	07-22-88	1,1
87°40'07"	1	AG,MR	SYN	V	07-18-88	1,0
87°05'32"	--	AG	SYN	V,S	07-18-88	1,1
87°43'25"	3	AG,MR	PRE	S	05-02-88	0,1
			SYN	V	07-18-88	1,0
87°48'25"	13	AG	SYN	V,S	07-18-88	1,1
87°49'27"	12	AG,MR	SYN	V,S	07-18-88	1,1
87°54'49"	1	UR	SYN	V,S	07-18-88	1,1
88°11'11"	1	UR,MR	SYN	V,S	07-18-88	1,1
87°55'32"	7	AG,MR	SYN	V,S	07-21-88	1,1
88°00'59"	--	UR	STO	S	08-17-88 to 06-22-89	0,8
87°59'03"	<1	UR	SYN	V	07-20-88	1,0
87°54'00"	3	UR,MR	SYN	V,S	07-19-88	2,2
87°52'07"	1	UR	STO	S	06-20-88 to 07-13-88	0,9
87°49'15"	3	UR,MR	PRE	V,S	05-03-88 to 07-06-88	2,3
			SYN	V	07-19-88	1,0
			FOL	V,S	08-10-88 to 03-08-90	18,3
88°04'07"	<1	UR	SYN	V	07-19-88	1,0

Table 1.--Description of sampling sites for manmade nonagricultural

Map reference number	Station number	Station name	Latitude
16	05536108	North Shore Channel at Devon Avenue at Chicago, Ill.	41°59'51"
17	05536142	Chicago Sanitary and Ship Canal at Forest View, Ill.	41°48'04"
18	055363252	Little Calumet River at Halsted Avenue at Harvey, Ill.	41°37'45"
19	05536995	Chicago Sanitary and Ship Canal at Romeoville, Ill.	41°38'26"
20	05538008	Des Plaines River above Brandon Road Dam at Joliet, Ill.	41°30'24"
21	05539900	West Branch Du Page River near West Chicago, Ill.	41°54'39"
22	05540290	Du Page River near Naperville, Ill.	41°41'24"
23	05540500	Du Page River at Shorewood, Ill.	41°31'20"
24	05541498	Illinois River above Dresden Island Dam near Minooka, Ill.	41°23'58"
25	05541745	Mazon River near Gardner, Ill.	41°12'22"
26	05542000	Mazon River near Coal City, Ill.	41°17'10"
27	05543484	Illinois River above Marseilles Dam at Marseilles, Ill.	41°19'19"
28	05543500	Illinois River at Marseilles, Ill.	41°19'40"
29	05544315	Fox River near Big Bend, Wis.	42°52'38"
30	[1]05549500	Fox River near McHenry, Ill.	42°18'35"
31	05551000	Fox River at South Elgin, Ill.	41°59'40"
32	05551540	Fox River at Montgomery, Ill.	41°43'46"
33	05551700	Blackberry Creek near Yorkville, Ill.	41°40'18"
34	05552500	Fox River at Dayton, Ill.	41°23'12"

[1]Sample collected downstream from dam; stream-gaging stations is 300 ft upstream from dam.

organic chemicals in water in the upper Illinois River basin--Continued

Longitude	Distance to nearest point source (km)	Type of site	Stage of survey	Chemical group analyzed	Sampling period	Number of observations
87°42'38"	1	UR	SYN	V,S	07-21-88	2,2
87°48'06"	<1	UR	SYN	V,S	07-19-88	2,1
87°38'30"	7	UR	SYN	V,S	07-20-88	2,2
88°03'38"	<1	UR,MR	PRE	V,S	05-03-88 to 07-06-88	2,3
			SYN	V	07-19-88	1,0
			FOL	V,S	08-10-88 to 09-13-88	19,3
88°05'49"	3	UR,MR	SYN	V,S	07-27-88	1,1
88°10'44"	<1	UR	SYN	V	07-20-88	1,0
88°09'58"	2	UR	SYN	V,S	07-22-88	2,2
88°11'35"	8	UR,MR	SYN	V	07-18-88	1,0
88°16'35"	<1	UR,MR	SYN	V,S	07-28-88	1,1
88°17'01"	4	AG,MR	SYN	V	07-18-88	1,0
88°21'35"	9	AG,MR	SYN	V,S	07-22-88	1,1
88°42'19"	2	UR,MR	SYN	V,S	07-29-88	1,1
88°43'10"	<1	UR,MR	SYN	V,S	07-19-88	1,1
88°14'53"	25	AG,MR	SYN	V,S	07-21-88	1,1
88°15'05"	4	UR,MR	SYN	V,S	07-22-88	1,1
88°17'40"	<1	UR	SYN	V	07-21-88	1,0
88°20'19"	6	UR,MR	SYN	V,S	07-20-88	1,1
88°26'29"	20	AG	PRE	V,S	05-04-88 to 06-08-88	2,3
88°47'26"	5	AG,MR	SYN	V,S	07-19-88	1,1

Table 2.--Volatile organic chemicals analyzed for and their minimum reporting levels

[µg/L, micrograms per liter; dashes indicate no data]

Parameter code (WATSTORE or STORET code): WATSTORE, U.S. Geological Survey National Water Data Storage and Retrieval System; STORET, U.S. Environmental Protection Agency Storage and Retrieval System. WATSTORE codes are available only for chemicals identified by the U.S. Geological Survey National Water-Quality Laboratory; for chemicals only identified by the Ohio Environmental Protection Agency Laboratory, a STORET code is given.

Analyzing agency: NWQL, U.S. Geological Survey National Water-Quality Laboratory; OEPA, Ohio Environmental Protection Agency.

Stage of survey: PRE, preliminary sampling; SYN, low-flow synoptic investigation; FOL, followup monitoring.

Constituent	Parameter code	Minimum reporting level (µg/L)	Analyzing agency	Stage of survey
Benzene, total	34030	0.2	NWQL,OEPA	PRE,SYN,FOL
Bromobenzene, water, whole, total	81555	.2	NWQL,OEPA	PRE,SYN,FOL
Bromochloromethane, total	77297	.2	OEPA	PRE,SYN,FOL
Bromoform, total	32104	.2	NWQL,OEPA	PRE,SYN,FOL
n-Butylbenzene, water, whole, recoverable	77342	.2	OEPA	PRE,SYN,FOL
sec-Butylbenzene, water, whole, recoverable	77350	.2	OEPA	PRE,SYN,FOL
tert-Butylbenzene, water, whole, recoverable	77353	.2	OEPA	PRE,SYN,FOL
Carbon tetrachloride, total	32102	.2	NWQL,OEPA	PRE,SYN,FOL
Chlorobenzene, total	34301	.2	NWQL,OEPA	PRE,SYN,FOL
Chlorodibromomethane, total	32105	.2	NWQL,OEPA	PRE,SYN,FOL
Chloroethane, total	34311	.2	NWQL	FOL
Chloroform, total	32106	.2	NWQL,OEPA	PRE,SYN,FOL
ortho-Chlorotoluene, water, whole, total	77275	.2	NWQL,OEPA	PRE,SYN,FOL
para-Chlorotoluene, water, whole, total	77277	.2	NWQL,OEPA	PRE,SYN,FOL
1,2-Dibromo-3-chloropropane, total	--	.2	OEPA	PRE,SYN,FOL
1,2-Dibromoethane, water, whole, total	77651	.2	NWQL,OEPA	PRE,SYN,FOL
Dibromomethane, water, whole, recoverable	30217	.2	NWQL,OEPA	PRE,SYN,FOL
Dichlorobromomethane, total	32101	.2	NWQL,OEPA	PRE,SYN,FOL
1,2-Dichlorobenzene, total	34536	.2	NWQL,OEPA	PRE,SYN,FOL
1,3-Dichlorobenzene, total	34566	.2	NWQL,OEPA	PRE,SYN,FOL

Table 2.--Volatile organic chemicals analyzed for and their minimum reporting levels--Continued

Constituent	Parameter code	Minimum reporting level (µg/L)	Analyzing agency	Stage of survey
1,4-Dichlorobenzene, total	34571	0.2	NWQL,OEPA	PRE,SYN,FOL
Dichlorodifluoromethane, total	34668	.2	NWQL	FOL
1,1-Dichloroethane, total	34496	.2	NWQL,OEPA	PRE,SYN,FOL
1,2-Dichloroethane, total	32103	.2	NWQL,OEPA	PRE,SYN,FOL
1,2-Dichloroethene, water, whole, recoverable	45617	.2	NWQL	FOL
cis-1,2-Dichloroethene, total	81686	.2	OEPA	PRE,SYN,FOL
trans-1,2-Dichloroethene, total	34546	.2	OEPA	PRE,SYN,FOL
1,1-Dichloroethylene, total	34501	.2	NWQL,OEPA	PRE,SYN,FOL
1,2-Dichloropropane, total	34541	.2	NWQL,OEPA	PRE,SYN,FOL
1,3-Dichloropropane, water, whole, total	77173	.2	NWQL,OEPA	PRE,SYN,FOL
2,2-Dichloropropane, water, whole, total	77170	.2	NWQL,OEPA	PRE,SYN,FOL
cis-1,3-Dichloropropene, total	34704	.2	NWQL	FOL
trans-1,3-Dichloropropene, total	34699	.2	NWQL	FOL
1,1-Dichloropropene, water, whole, total	77168	.2	NWQL,OEPA	PRE,SYN,FOL
Ethylbenzene, total	34371	.2	NWQL,OEPA	PRE,SYN,FOL
Hexachlorobutadiene, total	39702	.2	OEPA	PRE,SYN,FOL
Isopropylbenzene, water, whole, recoverable	77223	.2	OEPA	PRE,SYN,FOL
1,4-Isopropyltoluene, total	--	.2	OEPA	PRE,SYN,FOL
Methylbromide (Bromomethane), total	34413	.2	NWQL	FOL
Methylchloride (Chloromethane), total	34418	.2	NWQL	FOL
Methylene chloride, total	34423	[1].2	NWQL,OEPA	PRE,SYN,FOL
Naphthalene, total	34696	.2	OEPA	PRE,SYN,FOL
n-Propylbenzene, water, whole, recoverable	77224	.2	OEPA	PRE,SYN,FOL
Styrene, total	77128	.2	NWQL,OEPA	PRE,SYN,FOL
1,1,1,2-Tetrachloroethane, water, whole, total	77562	.2	NWQL,OEPA	PRE,SYN,FOL

Table 2.--Volatile organic chemicals analyzed for and their minimum reporting levels--Continued

Constituent	Parameter code	Minimum reporting level (µg/L)	Analyzing agency	Stage of survey
1,1,2,2-Tetrachloroethane, total	34516	0.2	NWQL,OEPA	PRE,SYN,FOL
Tetrachloroethylene, total	34475	.2	NWQL,OEPA	PRE,SYN,FOL
Toluene, total	34010	.2	NWQL,OEPA	PRE,SYN,FOL
1,2,3-Trichlorobenzene, water, whole, recoverable	77613	.2	OEPA	PRE,SYN,FOL
1,2,4-Trichlorobenzene, total	34551	.2	OEPA	PRE,SYN,FOL
1,1,1-Trichloroethane, total	34506	.2	NWQL,OEPA	PRE,SYN,FOL
1,1,2-Trichloroethane, total	34511	.2	NWQL,OEPA	PRE,SYN,FOL
Trichloroethylene, total	39180	.2	NWQL,OEPA	PRE,SYN,FOL
Trichlorofluoromethane, total	34488	.2	NWQL	FOL
1,2,3-Trichloropropane, water, whole, total	77443	.2	NWQL,OEPA	PRE,SYN,FOL
1,2,4-Trimethylbenzene, water, whole, recoverable	77222	.2	OEPA	PRE,SYN,FOL
1,3,5-Trimethylbenzene, water, whole, recoverable	77226	.2	OEPA	PRE,SYN,FOL
Vinyl chloride, total	39175	.2	NWQL	FOL
1,2-Xylene, total	--	.2	OEPA	PRE,SYN,FOL
1,3-Xylene, total	77134	.2	OEPA	PRE,SYN,FOL
1,4-Xylene, total	77133	.2	OEPA	PRE,SYN,FOL
Xylene, total, water, whole, total recoverable	81551	.2	NWQL	FOL

[1]Minimum reporting level for Ohio Environmental Protection Agency Laboratory was 1.8 µg/L.

Table 3.--Semivolatile organic chemicals analyzed for and their minimum reporting levels

[µg/L, micrograms per liter; dashes indicate no data]

All samples were analyzed by the U.S. Geological Survey National Water-Quality Laboratory.

WATSTORE code: WATSTORE, U.S. Geological Survey National Water Data Storage and Retrieval System.

Stage of survey: PRE, preliminary sampling; SYN, low-flow synoptic investigation; FOL, followup monitoring; STO, survey of agricultural organic chemicals during storm events; ALL, all of the above stages (PRE, SYN, FOL, STO).

Data for tentatively identified organic compounds (TIOC's) in this report are based on comparison of sample spectra with library spectra followed by visual examination by gas chromatography coupled with mass spectrometry (GC/MS) analysts. TIOC data have not been confirmed by direct comparison with reference standards. Therefore, TIOC identification is tentative.

Constituent	WATSTORE code	Minimum reporting level (µg/L)	Stage of survey
(Phenolic) acid-extractable			
2-Chlorophenol, total	34586	5.0	ALL
2,4-Dichlorophenol, total	34601	5.0	ALL
2,4-Dimethylphenol, total	34606	5.0	ALL
4,6-Dinitro-ortho-cresol, total	34657	30.0	ALL
2,4-Dinitrophenol, total	34616	20.0	ALL
2-Nitrophenol, total	34591	5.0	ALL
4-Nitrophenol, total	34646	30.0	ALL
Parachlorometa-cresol, total	34452	30.0	ALL
Pentachlorophenol, total	39032	30.0	ALL
Phenol (C_6H_5OH), total	34694	5.0	ALL
2,4,6-Trichlorophenol, total	34621	20.0	ALL
Base- and neutral-extractable			
Acenaphthylene, total	34200	5.0	SYN,STO
Acenaphthene, total	34205	5.0	SYN,STO
Anthracene, total	34220	5.0	SYN,STO
Benzo(A)anthracene, total	34526	5.0	SYN,STO
Benzo(B)fluoranthene, total	34230	10.0	SYN,STO

Table 3.--Semivolatile organic chemicals analyzed for and their minimum reporting levels--Continued

Constituent	WATSTORE code	Minimum reporting level (µg/L)	Stage of survey
Base- and neutral-extractable--Continued			
Benzo(K)fluoranthene, total	34242	10.0	SYN,STO
Benzo(GHI)perylene, total	34521	10.0	SYN,STO
Benzo(A)pyrene, total	34247	10.0	SYN,STO
bis-(2-Chloroethyl)ether, total	34273	5.0	SYN,STO
bis-(2-Chloroethoxy)methane, total	34278	5.0	SYN,STO
bis-(2-Chloroisopropyl)ether, total	34283	5.0	SYN,STO
bis-(2-ethylhexyl)phthalate, water, whole	39100	variable[1]	SYN,STO
4-Bromophenylphenylether, total	34636	5.0	SYN,STO
N-butylbenzylphthalate, total	34292	5.0	SYN,STO
2-Chloronaphthalene, total	34581	5.0	SYN,STO
4-Chlorophenylphenylether, total	34641	5.0	SYN,STO
Chrysene, total	34320	10.0	SYN,STO
1,2,5,6-Dibenzanthracene, total	34556	10.0	SYN,STO
1,2-Dichlorobenzene, total	34536	5.0	SYN,STO
1,3-Dichlorobenzene, total	34566	5.0	SYN,STO
1,4-Dichlorobenzene, total	34571	5.0	SYN,STO
Diethylphthalate, total	34336	5.0	SYN,STO
Dimethylphthalate, total	34341	5.0	SYN,STO
Di-n-butylphthalate, total	39110	5.0	SYN,STO
2,4-Dinitrotoluene, total	34611	5.0	SYN,STO
2,6-Dinitrotoluene, total	34626	5.0	SYN,STO
Di-n-octylphthalate, total	34596	10.0	SYN,STO
Fluoranthene, total	34376	5.0	SYN,STO
Fluorene, total	34381	5.0	SYN,STO
Hexachlorobenzene, total	39700	5.0	SYN,STO
Hexachlorobutadiene, total	39702	5.0	SYN,STO
Hexachlorocyclopentadiene, total	34386	5.0	SYN,STO
Hexachloroethane, total	34396	5.0	SYN,STO
Indeno(1,2,3-CD)pyrene, total	34403	10.0	SYN,STO
Isophorone, total	34408	5.0	SYN,STO
Naphthalene, total	34696	5.0	SYN,STO
N-nitrosodi-n-propylamine, total	34428	5.0	SYN,STO
N-nitrosodiphenylamine, total	34433	5.0	SYN,STO
N-nitrosodimethylamine, total	34438	5.0	SYN,STO
Nitrobenzene, total	34447	5.0	SYN,STO
Phenanthrene, total	34461	5.0	SYN,STO
Pyrene, total	34469	5.0	SYN,STO
1,2,4-Trichlorobenzene, total	34551	5.0	SYN,STO

Table 3.--Semivolatile organic chemicals analyzed for and their minimum reporting levels--Continued

Constituent	WATSTORE code	Minimum reporting level (µg/L)	Stage of survey
Tentatively identified semivolatile chemicals			
Alcohol	--	--	SYN
Aldehyde	--	--	SYN
1,2-Benzenedicarboxylic acid, diheptyl ester	--	--	SYN
1-Butoxy-2-propanol	--	--	SYN
1-Butoxy-2-propanol	--	--	SYN
2-Butoxy (Ethanol)	--	--	SYN
Caprolactam	--	--	SYN
Carboxycylic acid isomer	--	--	SYN
Chlorinated hydrocarbon	--	--	SYN
Cyclohexanone	--	--	SYN
2-cyclohexen-1-1,2-methyl-5-(1-methylethyenyl)-,(s)-isomer	--	--	SYN
2,2-Dimethyl-1,3-propanediol	--	--	SYN
n,n,-Dimethylacetamide	--	--	SYN
Hexadecanoic acid	--	--	SYN
9-Hexadecenoic acid	--	--	SYN
Hexadecenoic acid, hexadecyl ester isomer	--	--	SYN
Hexanedioic acid, mono (2-ethylhexyl) isomer	--	--	SYN
2-[1-(4-Hydroxyphenyl)-1-methylethyl]-phenol	--	--	SYN
1-(1-Methylpropoxy)-butane	--	--	SYN
1-Methyl-2-pyrrolidinone	--	--	SYN
Nonanoic acid	--	--	SYN
Oxygenated hydrocarbon	--	--	SYN
Saturated hydrocarbon	--	--	SYN
1,2,3,3-Tetrachloro-1-propene	--	--	SYN
Tetradecanoic acid	--	--	SYN

[1]Detection of bis-(2-ethylhexyl)phthalate is dependent on the concentration in laboratory blank samples; the detection limit is determined at the time of analysis. Bis-(2-ethylhexyl)phthalate is a common plasticizer that frequently contaminates samples during collection, preparation, and laboratory analysis.

Table 4.--Quality-control activities for the collection and analysis of nonagricultural volatile and semivolatile organic chemicals

[N/A, not applicable]

Stage of survey: PRE, preliminary sampling; SYN, low-flow synoptic investigation; FOL, followup monitoring.

Chemical group analyzed: V, water sample analyzed for volatile organic chemicals; S, water sample analyzed for semivolatile organic chemicals.

Analyzing agency: NWQL, U.S. Geological Survey National Water-Quality Laboratory; OEPA, Ohio Environmental Protection Agency.

Double blind samples made by U.S. Geological Survey National Water-Quality Laboratory; reference samples made by Ohio Environmental Protection Agency.

Activity	Stage of survey	Chemical group analyzed	Analyzing agency	Map reference number of sites sampled
Duplicate samples	SYN,FOL	V,S	OEPA	12, 16, 17, 18, 22
Trip blanks	PRE,SYN,FOL	V	OEPA,NWQL	See table 6
Double blind samples	PRE	V	OEPA	N/A
Reference samples	PRE	V	OEPA	N/A

Table 5.--Results from analysis of duplicate samples

[µg/L, micrograms per liter; <, less than. Concentrations of all 54 semivolatile organic chemicals were below the minimum reporting level at all 5 sites (12, 16, 17, 18, and 22). Only volatile organic chemicals with concentrations above minimum reporting levels are listed below. Twenty-one out of fifty-two chemicals were above the minimum reporting level at five possible sites; minimum reporting levels are listed in table 2]

Map reference number	Date	Constituent	Analysis result WATSTORE parameter code	Analysis result original sample (µg/L)	Analysis result duplicate sample (µg/L)	Difference (µg/L)
		Synoptic Investigation				
12	07-22-88	Chloroform	32106	0.5	0.5	0
12	07-22-88	Tetrachloroethylene	34475	.4	.7	.3
12	07-22-88	Trichloroethylene	39180	.3	.3	0
16	07-20-88	Dichlorobromomethane	32101	.6	.6	0
16	07-20-88	Chloroform	32106	1.5	1.5	0
16	07-20-88	Chlorodibromomethane	32105	.5	.6	.1
16	07-20-88	1,4-Dichlorobenzene	34571	1.1	1.0	.1
16	07-20-88	1,1-Dichloroethane	34496	.6	.6	0
16	07-20-88	1,2-Dichloroethane	32103	.8	.8	0
16	07-20-88	1,2-Dichloroethene	45617	.6	.5	.1
16	07-20-88	Tetrachloroethylene	34475	2.3	2.2	.1
16	07-20-88	1,1,1-Trichloroethane	34506	37.8	39.1	1.3
16	07-20-88	Trichloroethylene	39180	1.8	1.7	.1
17	07-19-88	Dichlorobromomethane	32101	.4	.4	0
17	07-19-88	n-Butylbenzene	77342	.5	.4	.1
17	07-19-88	Chloroform	32106	1.0	1.0	0
17	07-19-88	Chlorodibromomethane	32105	.4	.4	0
17	07-19-88	1,4-Dichlorobenzene	34571	.9	1.0	.1
17	07-19-88	1,1-Dichloroethane	34496	.3	.3	0
17	07-19-88	cis-1,2-Dichloroethene	81686	.5	.6	.1

Table 5.--Results from analysis of duplicate samples--Continued

Map reference number	Date	Constituent	Analysis result WATSTORE parameter code	Analysis result original sample (µg/L)	Analysis result duplicate sample (µg/L)	Difference (µg/L)
		Synoptic Investigation--Continued				
17	07-19-88	Ethylbenzene	34371	0.3	0.3	0
17	07-19-88	1,4-Isopropyltoluene	--	.3	.4	.1
17	07-19-88	Methylene chloride	34423	10.2	10.6	.4
17	07-19-88	Naphthalene	34696	.5	.5	0
17	07-19-88	n-Propylbenzene	77224	.3	.4	.1
17	07-19-88	Tetrachloroethylene	34475	4.5	4.5	0
17	07-19-88	Toluene	34010	.3	.3	0
17	07-19-88	1,1,1-Trichloroethane	34506	2.2	2.6	.4
17	07-19-88	Trichloroethylene	39180	2.2	2.3	.1
17	07-19-88	1,2,4-Trimethylbenzene	77222	1.0	1.2	.2
17	07-19-88	1,3,5-Trimethylbenzene	77226	.6	.7	.1
17	07-19-88	1,2-Xylene	--	.5	.6	.1
17	07-19-88	1,3-Xylene + 1,4-Xylene	77134 + 77133	1.3	1.3	0
18	07-20-88	Chloroform	32106	.4	.4	0
18	07-20-88	1,4-Dichlorobenzene	34571	.2	<.2	<.2
18	07-20-88	1,2-Dichloroethane	32103	.7	.7	0
18	07-20-88	Methylene chloride	34423	3.2	2.9	.3
18	07-20-88	Tetrachloroethylene	34475	.5	.5	0
18	07-20-88	1,1,1-Trichloroethane	34506	.7	.6	.1
22	07-22-88	Dichlorobromomethane	32101	.3	.2	.1
22	07-22-88	Chloroform	32106	.7	.7	0
22	07-22-88	Naphthalene	34696	.6	.7	.1

Table 5.--Results from analysis of duplicate samples--Continued

Map reference number	Date	Constituent	Analysis result WATSTORE parameter code	Analysis result original sample (µg/L)	Analysis result duplicate sample (µg/L)	Difference (µg/L)
			Followup Monitoring			
[Only volatile organic chemicals with concentrations above the detection limit are listed below. Fifteen out of fifty-two chemical were above the detection limit at sites 14 and 19. Concentrations of all 11 phenolic chemicals (acid-extractable semivolatile chemicals) were below the detection limit at boths sites.]						
14	08-10-88	Chloroform	32106	0.4	0.4	0
14	08-10-88	Naphthalene	34696	.3	.3	0
14	08-10-88	Tetrachloroethylene	34475	3.4	2.5	.9
14	08-10-88	Toluene	34010	1.7	1.6	.1
14	08-10-88	1,1,1-Trichloroethane	34506	.9	.9	0
14	08-10-88	1,2,4-Trimethylbenzene	77222	.4	.3	.1
14	08-10-88	1,3,5-Trimethylbenzene	77226	.3	.2	.1
14	08-10-88	1,2-Xylene	--	.2	.2	0
14	08-10-88	1,3 + 1,4-Xylene	77134 + 77133	.6	.5	.1
19	08-10-88	Dichlorobromomethane	32101	.2	.3	.1
19	08-10-88	Chloroform	32106	1.0	1.0	0
19	08-10-88	Chlorodibromomethane	32105	.2	.3	.1
19	08-10-88	1,4-Dichlorobenzene	34571	.6	.6	0
19	08-10-88	1,2-Dichloroethane	32103	3.9	3.9	0
19	08-10-88	Methylene chloride	34423	15.9	15.7	.2
19	08-10-88	Tetrachloroethylene	34475	2.1	2.1	0
19	08-10-88	1,1,1-Trichloroethane	34506	2.4	2.4	0
19	08-10-88	Trichloroethylene	39180	3.4	3.3	.1
19	08-10-88	1,2-Xylene	--	.2	.2	0
19	08-10-88	1,3 + 1,4-Xylene	77134 + 77133	.5	.4	.1

Table 6.--Results of quality control on field methods--analysis of trip blanks

[µg/L, micrograms per liter; <, less than; dashes indicate no data; only those chemicals with concentrations greater than the detection limit are listed]

Analyzing agency: OEPA, Ohio Environmental Protection Agency; NWQL, U.S. Geological Survey National Water-Quality Laboratory.

Trip blanks were only collected for analysis of volatile organic chemicals.

Date	Site(s)	Analyzing agency	Constituent	Concentration (µg/L)		Special notes
				Blank water	Sample	
			Preliminary Sampling			
06-03-88	14 19 33	OEPA	--	--	--	No chemical detected.
07-06-88	14 19 33	OEPA	--	--	--	No chemical detected.
			Synoptic Investigation			
07-18-88	2-8 11-15 18-19 21 23 25 28 32-34	OEPA	--	--	--	No chemical detected.

Table 6.--Results of quality control on field methods--analysis of trip blanks--Continued

Date	Site(s)	Analyzing agency	Constituent	Concentration (µg/L) Blank water	Concentration (µg/L) Sample	Special notes
			Synoptic Investigation--Continued			
07-20-88	1 9 16 22 26 29 30 31	OEPA	--	--	--	No chemicals detected.
07-27-88	20 24 27	OEPA	--	--	--	Results missing.
			Followup Monitoring			
08-10-88	14 19	OEPA	--	--	--	No chemicals detected.
09-12-88	14	OEPA	Toluene	0.4	2.3	
			Toluene	.9	2.3	
		OEPA	1,2,4-Trimethylbenzene	.3	2.3	
		OEPA	1,2-Xylene	.3	1.4	
		OEPA	1,3 + 1,4-Xylene	.6	2.9	
09-12-88	19	OEPA	Toluene	.4	<.2	
		OEPA	Toluene	.6	<.2	
		OEPA	1,3 + 1,4-Xylene	.3	<.2	
12-07-88	14 19	NWQL	--	--	--	Results missing.

Table 6.--Results of quality control on field methods--analysis of trip blanks--Continued

Date	Site(s)	Analyzing agency	Constituent	Concentration (µg/L) Blank water	Concentration (µg/L) Sample	Special notes
			Followup Monitoring--Continued			
01-09-89	14	NWQL	Methylene chloride	0.6	0.6	
01-09-89	19	NWQL	Methylene chloride	.5	9.9	No trip blank analyzed for site 14.
02-07-89	19	NWQL	Bromoform	.2	<.2	
		NWQL	Methylene chloride	.4	9.6	
03-06-89	[1]14	NWQL	Bromoform	.2	.6	
03-06-89	[2]14	NWQL	--	--	--	No chemicals detected, no preservatives added.
03-06-89	[1]19	NWQL	Bromoform	.2	<.2	
03-06-89	[2]19	NWQL	--	--	--	No chemicals detected, no preservatives added.
04-05-89	14	NWQL	--	--	--	No chemicals detected.
	19					
05-10-89	14	NWQL	Bromoform	.6	<.2	
	19	NWQL	Bromoform	.6	<.2	
06-02-89	14	NWQL	--	--	--	No chemicals detected.
	19					
07-07-89	14	NWQL	Bromoform	.6	<.2	
		NWQL	Chlorodibromomethane	.3	<.2	
		NWQL	Bromobenzene	.2	<.2	
	19	NWQL	Bromoform	.6	<.2	
		NWQL	Chlorodibromomethane	.3	.2	
		NWQL	Bromobenzene	.2	<.2	
08-07-89	14	NWQL	Methylene chloride	.6	.3	
	19	NWQL	Methylene chloride	.6	5.1	

Table 6.--Results of quality control on field methods--analysis of trip blanks--Continued

Date	Site(s)	Analyzing agency	Constituent	Concentration (µg/L) Blank water	Concentration (µg/L) Sample	Special notes
			Followup Monitoring--Continued			
08-28-89	14	NWQL	Methylene chloride	0.5	0.2	
	19	NWQL	Methylene chloride	.5	8.0	
10-02-89	14	NWQL	Methylene chloride	.4	.2	
	19	NWQL	Methylene chloride	.4	.7	
10-30-89	14	NWQL	Methylene chloride	.5	.2	
	19	NWQL	Methylene chloride	.5	2.9	
12-04-89	14	NWQL	Methylene chloride	.5	.6	
	19	NWQL	Methylene chloride	.5	12.0	
01-08-90	14	NWQL	Bromoform	.4	1.7	
	19	NWQL	Bromoform	.4	<.2	
02-08-90	14	NWQL	Bromoform	.2	1.1	
		NWQL	Methylene chloride	.3	.6	
	19	NWQL	Bromoform	.2	<.2	
		NWQL	Methylene chloride	.3	12.0	
03-07-90	14	NWQL	Bromoform	.5	.6	
		NWQL	Methylene chloride	.3	.5	
	19	NWQL	Bromoform	.5	<.2	
		NWQL	Methylene chloride	.3	15.0	

[1]Trip blank sample submitted with hydrochloric acid added as preservative.
[2]Trip blank sample submitted without preservative added.

Table 7.--Results of quality control on laboratory methods--analysis of double-blind sample and reference samples for volatile organic chemicals

[µg/L, micrograms per liter; dashes indicate no data. Double blind sample and standard reference samples analyzed by Ohio Environmental Protection Agency laboratory]

Date of analysis	Constituent	Concentration (µg/L) True value	Concentration (µg/L) Measured value	Difference	Percent recovery	Special notes
		Double-blind sample				
07-06-88	Bromoform	20	18	-2	90	
07-06-88	Chloroform	40	28	-12	70	
07-06-88	Dichlorobromomethane	12	9.1	-3	76	
07-06-88	1,2-Dichloroethane	12	8.5	-4	71	
07-06-88	1,1,2,2-Tetrachloroethane	20	20	0	100	
07-06-88	Tetrachloroethylene	24	17	-7	71	
07-06-88	Toluene	24	8.7	-15	36	
07-06-88	1,1,1-Trichloroethane	20	19	-1	95	
07-06-88	Benzylchloride	40	--	--	--	Tentatively identified
07-06-88	1,1,1,2-Tetrachloroethane	40	33	-7	83	
		Reference samples				
07-08-88	Benzene	10	8.0	-2	80	Sample prepared by OEPA
07-08-88	Bromobenzene	10	7.9	-2	79	
07-08-88	Bromochloromethane	10	8.1	-2	81	
07-08-88	Bromodichloromethane	10	8.8	-1	88	
07-08-88	Bromoform	10	9.5	0	95	
07-08-88	n-Butylbenzene	10	7.4	-3	74	
07-08-88	sec-Butylbenzene	10	7.9	-2	79	
07-08-88	tert-Butylbenzene	10	7.8	-2	78	
07-08-88	Carbon tetrachloride + 1,1-DCP	20	17	-3	85	
07-08-88	Chlorobenzene	10	7.9	-2	79	

Table 7.--Results of quality control on laboratory methods--analysis of double-blind sample and reference samples for volatile organic chemicals--Continued

Date of analysis	Constituent	Concentration (µg/L) True value	Concentration (µg/L) Measured value	Difference	Percent recovery	Special notes
	Reference samples--Continued					
07-08-88	Chloroform	10	8.4	-2	84	
07-08-88	2-Chlorotoluene	10	7.7	-2	77	
07-08-88	4-Chlorotoluene	10	8.1	-2	81	
07-08-88	Dibromochloromethane	10	8.7	-1	87	
07-08-88	1,2-Dibromo-3-chloropropane	10	9.3	-1	93	
07-08-88	1,2-Dibromoethane	10	8.7	-1	87	
07-08-88	Dibromomethane	10	9.0	-1	90	
07-08-88	1,2-Dichlorobenzene	10	7.5	-2	75	
07-08-88	1,3-Dichlorobenzene	10	7.6	-2	76	
07-08-88	1,4-Dichlorobenzene	10	8.0	-2	80	
07-08-88	1,1-Dichloroethane	10	7.4	-3	74	
07-08-88	1,2-Dichloroethane	10	8.6	-1	86	
07-08-88	1,1-Dichloroethene	10	9.2	-1	92	
07-08-88	cis-1,2-Dichloroethene	10	7.9	-2	79	
07-08-88	trans-1,2-Dichloroethene	10	6.5	-4	65	
07-08-88	1,2-Dichloropropane	10	8.7	-1	87	
07-08-88	1,3-Dichloropropane + Tetrachloroethene	20	18	-2	90	
07-08-88	2,2-Dichloropropane + cis-1,2-DCE	20	17	-3	85	
07-08-88	1,1-Dichloropropene	10	8.2	-2	82	
07-08-88	Ethylbenzene	10	8.0	-2	80	
07-08-88	Hexachlorobutadiene	10	8.2	-2	82	
07-08-88	Isopropylbenzene	10	7.9	-2	79	
07-08-88	1,4-Isopropyltoluene + 1,4-DCB	20	15	-5	75	
07-08-88	Methylene chloride	10	8.6	-1	86	
07-08-88	Naphthalene + Hexachlorobutadiene	20	16	-4	80	

Table 7.--Results of quality control on laboratory methods--analysis of double-blind sample and reference samples for volatile organic chemicals--Continued

Date of analysis	Constituent	Concentration (µg/L) True value	Concentration (µg/L) Measured value	Difference	Percent recovery	Special notes
	Reference samples--Continued					
07-08-88	n-Propylbenzene	10	7.7	-2	77	
07-08-88	1,1,1,2-Tetrachloroethane	10	8.3	-2	83	
07-08-88	1,1,2,2-Tetrachloroethane	10	8.5	-2	85	
07-08-88	Tetrachloroethene	10	8.2	-2	82	
07-08-88	Toluene	10	8.7	-1	87	
07-08-88	1,2,3-Trichlorobenzene	10	7.9	-2	79	
07-08-88	1,2,4-Trichlorobenzene	10	7.7	-2	77	
07-08-88	1,1,1-Trichloroethane	10	8.4	-2	84	
07-08-88	1,1,2-Trichloroethane	10	9.0	-1	90	
07-08-88	Trichloroethene	10	9.5	0	95	
07-08-88	1,2,3-Trichloropropane	10	8.8	-1	88	
07-08-88	1,2,4-Trimethylbenzene	10	7.6	-2	76	
07-08-88	1,3,5-Trimethylbenzene + 4-CT	20	16	-4	80	
07-08-88	1,2-Xylene + Styrene	20	15	-5	75	
07-08-99	1,3 + 1,4-Xylene	20	16	-4	80	

Table 8.--Concentration of volatile organic chemicals in stream water in the upper Illinois River basin from preliminary sampling, the low-flow synoptic investigation, and followup monitoring from August through September 1988

[All analysis conducted by the Ohio Environmental Protection Agency laboratory; all concentrations in micrograms per liter]

Map reference number	Date	Time	Benzene, total (34030)	Bromobenzene, water, whole, total (81555)	Bromochloromethane, total (77297)	Bromoform, total (32104)	n-Butylbenzene, water, whole, recoverable (77342)	sec-Butylbenzene, water, whole, recoverable (77350)
1	07-22-88	2014	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
2	07-18-88	1458	< .2	< .2	< .2	< .2	< .2	< .2
3	07-18-88	1231	< .2	< .2	< .2	< .2	< .2	< .2
4	07-18-88	0925	< .2	< .2	< .2	< .2	< .2	< .2
5	07-18-88	1035	< .2	< .2	< .2	< .2	< .2	< .2
6	07-18-88	1405	< .2	< .2	< .2	< .2	< .2	< .2
7	07-18-88	1625	< .2	< .2	< .2	< .2	< .2	< .2
8	07-18-88	1808	< .2	< .2	< .2	< .2	< .2	< .2
9	07-21-88	1051	< .2	< .2	< .2	< .2	< .2	< .2
11	07-20-88	1609	< .2	< .2	< .2	< .2	< .2	< .2
12	07-19-88	1659	< .2	< .2	< .2	< .2	< .2	< .2
12	07-19-88	1748	< .2	< .2	< .2	< .2	< .2	< .2
14	06-08-88	0940	< .2	< .2	< .2	.2	< .2	< .2
14	07-06-88	1431	< .2	< .2	< .2	< .2	< .2	< .2
14	07-19-88	1647	< .2	< .2	< .2	< .2	< .2	< .2
14	08-10-88	1610	< .2	< .2	< .2	< .2	< .2	< .2
14	08-10-88	1615	< .2	< .2	< .2	< .2	< .2	< .2
14	09-12-88	1600	< .2	< .2	< .2	< .2	< .2	< .2
15	07-19-88	1232	< .2	< .2	< .2	< .2	< .2	< .2
16	07-20-88	2109	< .2	< .2	< .2	< .2	< .2	< .2
16	07-20-88	2109	< .2	< .2	< .2	< .2	< .2	< .2
17	07-19-88	1422	< .2	< .2	< .2	< .2	.4	< .2
17	07-19-88	1457	< .2	< .2	< .2	< .2	.5	< .2
18	07-20-88	1113	< .2	< .2	< .2	< .2	< .2	< .2
18	07-20-88	1400	< .2	< .2	< .2	< .2	< .2	< .2
19	06-07-88	1505	< .2	< .2	< .2	< .2	< .2	< .2
19	07-06-88	1031	< .2	< .2	< .2	< .2	< .2	< .2
19	07-19-88	1333	< .2	< .2	< .2	< .2	< .2	< .2
19	08-10-88	1320	< .2	< .2	< .2	< .2	< .2	< .2
19	08-10-88	1330	< .2	< .2	< .2	< .2	< .2	< .2
19	09-12-88	1000	< .2	< .2	< .2	< .2	< .2	< .2
20	07-27-88	0622	< .2	< .2	< .2	< .2	< .2	< .2
21	07-20-88	1501	< .2	< .2	< .2	< .2	< .2	< .2
22	07-22-88	0958	< .2	< .2	< .2	< .2	< .2	< .2
22	07-22-88	0958	< .2	< .2	< .2	< .2	< .2	< .2
23	07-18-88	1930	< .2	< .2	< .2	< .2	< .2	< .2
24	07-28-88	0545	< .2	< .2	< .2	< .2	< .2	< .2
25	07-18-88	1720	< .2	< .2	< .2	< .2	< .2	< .2
26	07-22-88	1645	< .2	< .2	< .2	< .2	< .2	< .2
27	07-29-88	0815	< .2	< .2	< .2	< .2	< .2	< .2
28	07-19-88	0925	< .2	< .2	< .2	< .2	< .2	< .2
29	07-21-88	1324	< .2	< .2	< .2	< .2	< .2	< .2
30	07-22-88	1325	< .2	< .2	< .2	< .2	< .2	< .2
31	07-20-88	1923	< .2	< .2	< .2	< .2	< .2	< .2
32	07-20-88	1332	< .2	< .2	< .2	< .2	< .2	< .2
33	06-07-88	1030	< .2	< .2	< .2	< .2	< .2	< .2
33	06-08-88	1540	< .2	< .2	< .2	< .2	< .2	< .2
34	07-19-88	0738	< .2	< .2	< .2	< .2	< .2	< .2

Table 8.--Concentration of volatile organic chemicals in stream water in the upper Illinois River basin from preliminary sampling, the low-flow synoptic investigation, and followup monitoring from August through September 1988--Continued

Map reference number	Date	Time	tert-Butyl-benzene, water, whole, recoverable (77353)	Carbon, tetra-chloride, total (32102)	Chloro-benzene, total (34301)	Chloro-dibromo-methane, total (32105)	Chloro-form, total (32106)	ortho-Chloro-toluene, water, whole, total (77275)
1	07-22-88	2014	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
2	07-18-88	1458	< .2	< .2	< .2	< .2	< .2	< .2
3	07-18-88	1231	< .2	< .2	< .2	< .2	< .2	< .2
4	07-18-88	0925	< .2	< .2	< .2	< .2	< .2	< .2
5	07-18-88	1035	< .2	< .2	< .2	< .2	< .2	< .2
6	07-18-88	1405	< .2	< .2	< .2	< .2	< .2	< .2
7	07-18-88	1625	< .2	< .2	< .2	< .2	< .2	< .2
8	07-18-88	1808	< .2	< .2	< .2	< .2	< .2	< .2
9	07-21-88	1051	< .2	< .2	< .2	< .2	< .2	< .2
11	07-20-88	1609	< .2	< .2	< .2	.8	1.5	< .2
12	07-19-88	1659	< .2	< .2	< .2	< .2	< .2	.5
12	07-19-88	1748	< .2	< .2	< .2	< .2	.5	< .2
14	06-08-88	0940	< .2	< .2	< .2	< .2	.3	< .2
14	07-06-88	1431	< .2	< .2	< .2	< .2	.2	< .2
14	07-19-88	1647	< .2	< .2	< .2	< .2	.4	< .2
14	08-10-88	1610	< .2	< .2	< .2	< .2	.4	< .2
14	08-10-88	1615	< .2	< .2	< .2	< .2	.4	< .2
14	09-12-88	1600	< .2	< .2	< .2	< .2	.4	< .2
15	07-19-88	1232	< .2	< .2	< .2	< .2	< .2	< .2
16	07-20-88	2109	< .2	< .2	< .2	.5	1.5	< .2
16	07-20-88	2109	< .2	< .2	< .2	.6	1.5	< .2
17	07-19-88	1422	< .2	< .2	< .2	< .2	1.0	< .2
17	07-19-88	1457	< .2	< .2	< .2	.4	1.0	< .2
18	07-20-88	1113	< .2	< .2	< .2	< .2	.4	< .2
18	07-20-88	1400	< .2	< .2	< .2	< .2	.4	< .2
19	06-07-88	1505	< .2	< .2	< .2	< .2	.8	< .2
19	07-06-88	1031	< .2	< .2	< .2	< .2	.8	< .2
19	07-19-88	1333	< .2	< .2	< .2	< .2	.6	< .2
19	08-10-88	1320	< .2	< .2	< .2	.2	1.0	< .2
19	08-10-88	1330	< .2	< .2	< .2	.3	1.0	< .2
19	09-12-88	1000	< .2	< .2	< .2	< .2	.4	< .2
20	07-27-88	0622	< .2	< .2	< .2	< .2	.8	< .2
21	07-20-88	1501	< .2	< .2	< .2	< .2	.5	< .2
22	07-22-88	0958	< .2	< .2	< .2	< .2	.7	< .2
22	07-22-88	0958	< .2	< .2	< .2	< .2	.7	< .2
23	07-18-88	1930	< .2	< .2	< .2	< .2	< .2	< .2
24	07-28-88	0545	< .2	< .2	< .2	< .2	.6	< .2
25	07-18-88	1720	< .2	< .2	< .2	< .2	< .2	< .2
26	07-22-88	1645	< .2	< .2	< .2	< .2	< .2	< .2
27	07-29-88	0815	< .2	< .2	< .2	< .2	.4	< .2
28	07-19-88	0925	< .2	< .2	< .2	< .2	< .2	< .2
29	07-21-88	1324	< .2	< .2	< .2	< .2	< .2	< .2
30	07-22-88	1325	< .2	< .2	< .2	< .2	< .2	< .2
31	07-20-88	1923	< .2	< .2	< .2	< .2	.5	< .2
32	07-20-88	1332	< .2	< .2	< .2	< .2	< .2	< .2
33	06-07-88	1030	< .2	< .2	< .2	< .2	< .2	< .2
33	06-08-88	1540	< .2	< .2	< .2	< .2	< .2	< .2
34	07-19-88	0738	< .2	< .2	< .2	< .2	< .2	< .2

Table 8.--Concentration of volatile organic chemicals in stream water in the upper Illinois River basin from preliminary sampling, the low-flow synoptic investigation, and followup monitoring from August through September 1988--Continued

Map reference number	Date	Time	para-Chloro-toluene, water, whole, total (77277)	1,2-di-bromo-3-chloro-propane, total (-----)	1,2-di-bromo-ethane, water, whole, total (77651)	Dibromo-methane, water, whole, recover-able (30217)	Dichloro-bromo-methane, total (32101)	1,2-di-chloro-benzene, total (34536)
1	07-22-88	2014	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
2	07-18-88	1458	< .2	< .2	< .2	< .2	< .2	< .2
3	07-18-88	1231	< .2	< .2	< .2	< .2	< .2	< .2
4	07-18-88	0925	< .2	< .2	< .2	< .2	< .2	< .2
5	07-18-88	1035	< .2	< .2	< .2	< .2	< .2	< .2
6	07-18-88	1405	< .2	< .2	< .2	< .2	< .2	< .2
7	07-18-88	1625	< .2	< .2	< .2	< .2	< .2	< .2
8	07-18-88	1808	< .2	< .2	< .2	< .2	< .2	< .2
9	07-21-88	1051	< .2	< .2	< .2	< .2	< .2	< .2
11	07-20-88	1609	< .2	< .2	< .2	< .2	1.2	< .2
12	07-19-88	1659	< .2	< .2	< .2	< .2	< .2	< .2
12	07-19-88	1748	< .2	< .2	< .2	< .2	< .2	< .2
14	06-08-88	0940	< .2	< .2	< .2	< .2	< .2	< .2
14	07-06-88	1431	< .2	< .2	< .2	< .2	< .2	< .2
14	07-19-88	1647	< .2	< .2	< .2	< .2	< .2	< .2
14	08-10-88	1610	< .2	< .2	< .2	< .2	< .2	< .2
14	08-10-88	1615	< .2	< .2	< .2	< .2	< .2	< .2
14	09-12-88	1600	< .2	< .2	< .2	< .2	< .2	< .2
15	07-19-88	1232	< .2	< .2	< .2	< .2	< .2	< .2
16	07-20-88	2109	< .2	< .2	< .2	< .2	.6	< .2
16	07-20-88	2109	< .2	< .2	< .2	< .2	.6	< .2
17	07-19-88	1422	< .2	< .2	< .2	< .2	.4	< .2
17	07-19-88	1457	< .2	< .2	< .2	< .2	.5	< .2
18	07-20-88	1113	< .2	< .2	< .2	< .2	< .2	< .2
18	07-20-88	1400	< .2	< .2	< .2	< .2	< .2	< .2
19	06-07-88	1505	< .2	< .2	< .2	< .2	.2	< .2
19	07-06-88	1031	< .2	< .2	< .2	< .2	< .2	< .2
19	07-19-88	1333	< .2	< .2	< .2	< .2	< .2	< .2
19	08-10-88	1320	< .2	< .2	< .2	< .2	.2	< .2
19	08-10-88	1330	< .2	< .2	< .2	< .2	.3	< .2
19	09-12-88	1000	< .2	< .2	< .2	< .2	< .2	< .2
20	07-27-88	0622	< .2	< .2	< .2	< .2	< .2	< .2
21	07-20-88	1501	< .2	< .2	< .2	< .2	< .2	< .2
22	07-22-88	0958	< .2	< .2	< .2	< .2	.2	< .2
22	07-22-88	0958	< .2	< .2	< .2	< .2	.3	< .2
23	07-18-88	1930	< .2	< .2	< .2	< .2	< .2	< .2
24	07-28-88	0545	< .2	< .2	< .2	< .2	< .2	< .2
25	07-18-88	1720	< .2	< .2	< .2	< .2	< .2	< .2
26	07-22-88	1645	< .2	< .2	< .2	< .2	< .2	< .2
27	07-29-88	0815	< .2	< .2	< .2	< .2	< .2	< .2
28	07-19-88	0925	< .2	< .2	< .2	< .2	< .2	< .2
29	07-21-88	1324	< .2	< .2	< .2	< .2	< .2	< .2
30	07-22-88	1325	< .2	< .2	< .2	< .2	< .2	< .2
31	07-20-88	1923	< .2	< .2	< .2	< .2	< .2	< .2
32	07-20-88	1332	< .2	< .2	< .2	< .2	< .2	< .2
33	06-07-88	1030	< .2	< .2	< .2	< .2	< .2	< .2
33	06-08-88	1540	< .2	< .2	< .2	< .2	< .2	< .2
34	07-19-88	0738	< .2	< .2	< .2	< .2	< .2	< .2

Table 8.--Concentration of volatile organic chemicals in stream water in the upper Illinois River basin from preliminary sampling, the low-flow synoptic investigation, and followup monitoring from August through September 1988--Continued

Map reference number	Date	Time	1,3-di-chloro-benzene, total (34566)	1,4-di-chloro-benzene, total (34571)	1,1-Di-chloro-ethane, total (34496)	1,2-Di-chloro-ethane, total (32103)	cis-1,2-Di-chloro-ethene, total (81686)	trans-1,2-Di-chloro-ethene, total (34546)
1	07-22-88	2014	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
2	07-18-88	1458	< .2	< .2	< .2	< .2	< .2	< .2
3	07-18-88	1231	< .2	< .2	< .2	< .2	< .2	< .2
4	07-18-88	0925	< .2	< .2	< .2	< .2	< .2	< .2
5	07-18-88	1035	< .2	< .2	< .2	< .2	< .2	< .2
6	07-18-88	1405	< .2	< .2	< .2	< .2	< .2	< .2
7	07-18-88	1625	< .2	< .2	< .2	< .2	< .2	< .2
8	07-18-88	1808	< .2	< .2	< .2	< .2	< .2	< .2
9	07-21-88	1051	< .2	< .2	< .2	< .2	< .2	< .2
11	07-20-88	1609	< .2	< .2	< .2	< .2	< .2	< .2
12	07-19-88	1659	< .2	< .2	< .2	< .2	< .2	< .2
12	07-19-88	1748	< .2	< .2	< .2	< .2	< .2	< .2
14	06-08-88	0940	< .2	< .2	< .2	< .2	< .2	< .2
14	07-06-88	1431	< .2	< .2	< .2	< .2	< .2	< .2
14	07-19-88	1647	< .2	< .2	< .2	< .2	.4	< .2
14	08-10-88	1610	< .2	< .2	< .2	< .2	< .2	< .2
14	08-10-88	1615	< .2	< .2	< .2	< .2	< .2	< .2
14	09-12-88	1600	< .2	.6	< .2	< .2	1.3	< .2
15	07-19-88	1232	< .2	< .2	< .2	< .2	< .2	< .2
16	07-20-88	2109	< .2	1.1	.6	.8	.6	< .2
16	07-20-88	2109	< .2	1.0	.6	.8	.5	< .2
17	07-19-88	1422	< .2	1.0	.3	< .2	.6	< .2
17	07-19-88	1457	< .2	.9	.3	< .2	.5	< .2
18	07-20-88	1113	< .2	.2	< .2	.7	< .2	< .2
18	07-20-88	1400	< .2	< .2	< .2	.7	< .2	< .2
19	06-07-88	1505	< .2	.2	< .2	2.2	< .2	< .2
19	07-06-88	1031	< .2	.2	< .2	2.5	< .2	< .2
19	07-19-88	1333	< .2	.3	< .2	< .2	.4	< .2
19	08-10-88	1320	< .2	.6	< .2	3.9	< .2	< .2
19	08-10-88	1330	< .2	.6	< .2	3.9	< .2	< .2
19	09-12-88	1000	< .2	< .2	< .2	< .2	< .2	< .2
20	07-27-88	0622	< .2	.2	.3	.6	< .2	< .2
21	07-20-88	1501	< .2	< .2	< .2	< .2	< .2	< .2
22	07-22-88	0958	< .2	< .2	< .2	< .2	< .2	< .2
22	07-22-88	0958	< .2	< .2	< .2	< .2	< .2	< .2
23	07-18-88	1930	< .2	< .2	< .2	< .2	< .2	< .2
24	07-28-88	0545	< .2	< .2	< .2	< .2	< .2	< .2
25	07-18-88	1720	< .2	< .2	< .2	< .2	< .2	< .2
26	07-22-88	1645	< .2	< .2	< .2	< .2	< .2	< .2
27	07-29-88	0815	< .2	< .2	< .2	< .2	< .2	< .2
28	07-19-88	0925	< .2	< .2	< .2	< .2	< .2	< .2
29	07-21-88	1324	< .2	< .2	< .2	< .2	< .2	< .2
30	07-22-88	1325	< .2	< .2	< .2	< .2	< .2	< .2
31	07-20-88	1923	< .2	< .2	< .2	< .2	< .2	< .2
32	07-20-88	1332	< .2	< .2	< .2	< .2	< .2	< .2
33	06-07-88	1030	< .2	< .2	< .2	< .2	< .2	< .2
33	06-08-88	1540	< .2	< .2	< .2	< .2	< .2	< .2
34	07-19-88	0738	< .2	< .2	< .2	< .2	< .2	< .2

Table 8.--Concentration of volatile organic chemicals in stream water in the upper Illinois River basin from preliminary sampling, the low-flow synoptic investigation, and followup monitoring from August through September 1988--Continued

Map reference number	Date	Time	1,1-Dichloroethylene, total (34501)	1,2-Dichloropropane, total (34541)	1,3-Dichloropropane, water, whole, total (77173)	2,2-Dichloropropane, water, whole, total (77170)	1,1-Dichloropropene, water, whole, total (77168)	Ethylbenzene, total (34371)
1	07-22-88	2014	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
2	07-18-88	1458	< .2	< .2	< .2	< .2	< .2	< .2
3	07-18-88	1231	< .2	< .2	< .2	< .2	< .2	< .2
4	07-18-88	0925	< .2	< .2	< .2	< .2	< .2	< .2
5	07-18-88	1035	< .2	< .2	< .2	< .2	< .2	< .2
6	07-18-88	1405	< .2	< .2	< .2	< .2	< .2	< .2
7	07-18-88	1625	< .2	< .2	< .2	< .2	< .2	< .2
8	07-18-88	1808	< .2	< .2	< .2	< .2	< .2	< .2
9	07-21-88	1051	< .2	< .2	< .2	< .2	< .2	< .2
11	07-20-88	1609	< .2	< .2	< .2	< .2	< .2	< .2
12	07-19-88	1659	< .2	< .2	< .2	< .2	< .2	< .2
12	07-19-88	1748	< .2	< .2	< .2	< .2	< .2	< .2
14	06-08-88	0940	< .2	< .2	< .2	< .2	< .2	< .2
14	07-06-88	1431	< .2	< .2	< .2	< .2	< .2	< .2
14	07-19-88	1647	< .2	< .2	< .2	< .2	< .2	< .2
14	08-10-88	1610	< .2	< .2	< .2	< .2	< .2	< .2
14	08-10-88	1615	< .2	< .2	< .2	< .2	< .2	< .2
14	09-12-88	1600	< .2	< .2	< .2	< .2	< .2	.6
15	07-19-88	1232	< .2	< .2	< .2	< .2	< .2	< .2
16	07-20-88	2109	< .2	< .2	< .2	< .2	< .2	< .2
16	07-20-88	2109	< .2	< .2	< .2	< .2	< .2	< .2
17	07-19-88	1422	< .2	< .2	< .2	< .2	< .2	.3
17	07-19-88	1457	< .2	< .2	< .2	< .2	< .2	.3
18	07-20-88	1113	< .2	< .2	< .2	< .2	< .2	< .2
18	07-20-88	1400	< .2	< .2	< .2	< .2	< .2	< .2
19	06-07-88	1505	< .2	< .2	< .2	< .2	< .2	< .2
19	07-06-88	1031	< .2	< .2	< .2	< .2	< .2	< .2
19	07-19-88	1333	< .2	< .2	< .2	< .2	< .2	< .2
19	08-10-88	1320	< .2	< .2	< .2	< .2	< .2	< .2
19	08-10-88	1330	< .2	< .2	< .2	< .2	< .2	< .2
19	09-12-88	1000	< .2	< .2	< .2	< .2	< .2	< .2
20	07-27-88	0622	< .2	< .2	< .2	< .2	< .2	< .2
21	07-20-88	1501	< .2	< .2	< .2	< .2	< .2	< .2
22	07-22-88	0958	< .2	< .2	< .2	< .2	< .2	< .2
22	07-22-88	0958	< .2	< .2	< .2	< .2	< .2	< .2
23	07-18-88	1930	< .2	< .2	< .2	< .2	< .2	< .2
24	07-28-88	0545	< .2	< .2	< .2	< .2	< .2	< .2
25	07-18-88	1720	< .2	< .2	< .2	< .2	< .2	< .2
26	07-22-88	1645	< .2	< .2	< .2	< .2	< .2	< .2
27	07-29-88	0815	< .2	< .2	< .2	< .2	< .2	< .2
28	07-19-88	0925	< .2	< .2	< .2	< .2	< .2	< .2
29	07-21-88	1324	< .2	< .2	< .2	< .2	< .2	< .2
30	07-22-88	1325	< .2	< .2	< .2	< .2	< .2	< .2
31	07-20-88	1923	< .2	< .2	< .2	< .2	< .2	< .2
32	07-20-88	1332	< .2	< .2	< .2	< .2	< .2	< .2
33	06-07-88	1030	< .2	< .2	< .2	< .2	< .2	< .2
33	06-08-88	1540	< .2	< .2	< .2	< .2	< .2	< .2
34	07-19-88	0738	< .2	< .2	< .2	< .2	< .2	< .2

Table 8.--Concentration of volatile organic chemicals in stream water in the upper Illinois River basin from preliminary sampling, the low-flow synoptic investigation, and followup monitoring from August through September 1988--Continued

Map reference number	Date	Time	Hexachlorobutadiene, total (39702)	Isopropylbenzene, water, whole, recoverable (77223)	1,4-Isopropyltoluene, total (-----)	Methylene chloride, total (34423)	Naphthalene, total (34696)	n-Propylbenzene, water, whole, recoverable (77224)
1	07-22-88	2014	<0.2	<0.2	<0.2	<1.8	<0.2	<0.2
2	07-18-88	1458	< .2	< .2	< .2	<1.8	< .2	< .2
3	07-18-88	1231	< .2	< .2	< .2	<1.8	< .2	< .2
4	07-18-88	0925	< .2	< .2	< .2	<1.8	< .2	< .2
5	07-18-88	1035	< .2	< .2	< .2	<1.8	< .2	< .2
6	07-18-88	1405	< .2	< .2	< .2	<1.8	< .2	< .2
7	07-18-88	1625	< .2	< .2	< .2	<1.8	< .2	< .2
8	07-18-88	1808	< .2	< .2	< .2	<1.8	< .2	< .2
9	07-21-88	1051	< .2	< .2	< .2	<1.8	< .2	< .2
11	07-20-88	1609	< .2	< .2	< .2	<1.8	< .2	< .2
12	07-19-88	1659	< .2	< .2	< .2	<1.8	< .2	< .2
12	07-19-88	1748	< .2	< .2	< .2	<1.8	< .2	< .2
14	06-08-88	0940	< .2	< .2	< .2	<1.8	< .2	< .2
14	07-06-88	1431	< .2	< .2	< .2	<1.8	< .2	< .2
14	07-19-88	1647	< .2	< .2	< .2	<1.8	.3	< .2
14	08-10-88	1610	< .2	< .2	< .2	<1.8	.3	< .2
14	08-10-88	1615	< .2	< .2	< .2	<1.8	.3	< .2
14	09-12-88	1600	< .2	.2	.6	<1.8	1.7	.5
15	07-19-88	1232	< .2	< .2	< .2	<1.8	< .2	< .2
16	07-20-88	2109	< .2	< .2	< .2	<1.8	< .2	< .2
16	07-20-88	2109	< .2	< .2	< .2	<1.8	< .2	< .2
17	07-19-88	1422	< .2	< .2	.4	11	.5	.4
17	07-19-88	1457	< .2	< .2	.3	10	.5	.3
18	07-20-88	1113	< .2	< .2	< .2	3.2	< .2	< .2
18	07-20-88	1400	< .2	< .2	< .2	2.9	< .2	< .2
19	06-07-88	1505	< .2	< .2	< .2	3.3	< .2	< .2
19	07-06-88	1031	< .2	< .2	< .2	4.1	< .2	< .2
19	07-19-88	1333	< .2	< .2	< .2	<1.8	< .2	< .2
19	08-10-88	1320	< .2	< .2	< .2	16	< .2	< .2
19	08-10-88	1330	< .2	< .2	< .2	16	< .2	< .2
19	09-12-88	1000	< .2	< .2	< .2	<1.8	< .2	< .2
20	07-27-88	0622	< .2	< .2	< .2	2.7	< .2	< .2
21	07-20-88	1501	< .2	< .2	< .2	<1.8	< .2	< .2
22	07-22-88	0958	< .2	< .2	< .2	<1.8	.7	< .2
22	07-22-88	0958	< .2	< .2	< .2	<1.8	.6	< .2
23	07-18-88	1930	< .2	< .2	< .2	<1.8	< .2	< .2
24	07-28-88	0545	< .2	< .2	< .2	<1.8	< .2	< .2
25	07-18-88	1720	< .2	< .2	< .2	<1.8	< .2	< .2
26	07-22-88	1645	< .2	< .2	< .2	<1.8	< .2	< .2
27	07-29-88	0815	< .2	< .2	< .2	<1.8	< .2	< .2
28	07-19-88	0925	< .2	< .2	< .2	<1.8	< .2	< .2
29	07-21-88	1324	< .2	< .2	< .2	<1.8	< .2	< .2
30	07-22-88	1325	< .2	< .2	< .2	<1.8	< .2	< .2
31	07-20-88	1923	< .2	< .2	< .2	<1.8	< .2	< .2
32	07-20-88	1332	< .2	< .2	< .2	<1.8	< .2	< .2
33	06-07-88	1030	< .2	< .2	< .2	<1.8	< .2	< .2
33	06-08-88	1540	< .2	< .2	< .2	<1.8	< .2	< .2
34	07-19-88	0738	< .2	< .2	< .2	<1.8	< .2	< .2

Table 8.--Concentration of volatile organic chemicals in stream water in the upper Illinois River basin from preliminary sampling, the low-flow synoptic investigation, and followup monitoring from August through September 1988--Continued

Map reference number	Date	Time	Styrene, total (77128)	1,1,1,2-Tetrachloroethane, water, whole total (77562)	1,1,2,2-Tetrachloroethane total (34516)	Tetrachloroethylene total (34475)	Toluene total (34010)	1,2,3-Trichlorobenzene, water, whole, total (77613)
1	07-22-88	2014	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
2	07-18-88	1458	< .2	< .2	< .2	< .2	.2	< .2
3	07-18-88	1231	< .2	< .2	< .2	< .2	.4	< .2
4	07-18-88	0925	< .2	< .2	< .2	< .2	< .2	< .2
5	07-18-88	1035	< .2	< .2	< .2	< .2	< .2	< .2
6	07-18-88	1405	< .2	< .2	< .2	< .2	< .2	< .2
7	07-18-88	1625	< .2	< .2	< .2	< .2	< .2	< .2
8	07-18-88	1808	< .2	< .2	< .2	< .2	< .2	< .2
9	07-21-88	1051	< .2	< .2	< .2	< .2	< .2	< .2
11	07-20-88	1609	< .2	< .2	< .2	< .2	1.0	< .2
12	07-19-88	1659	< .2	< .2	< .2	< .7	< .2	< .2
12	07-19-88	1748	< .2	< .2	< .2	.4	< .2	< .2
14	06-08-88	0940	< .2	< .2	< .2	< .2	.2	< .2
14	07-06-88	1431	< .2	< .2	< .2	< .2	< .2	< .2
14	07-19-88	1647	< .2	< .2	< .2	.9	< .2	< .2
14	08-10-88	1610	< .2	< .2	< .2	3.4	1.7	< .2
14	08-10-88	1615	< .2	< .2	< .2	2.5	1.6	< .2
14	09-12-88	1600	< .2	< .2	< .2	1.1	2.3	< .2
15	07-19-88	1232	< .2	< .2	< .2	5.5	< .2	< .2
16	07-20-88	2109	< .2	< .2	< .2	2.3	< .2	< .2
16	07-20-88	2109	< .2	< .2	< .2	2.2	< .2	< .2
17	07-19-88	1422	< .2	< .2	< .2	4.5	.3	< .2
17	07-19-88	1457	< .2	< .2	< .2	4.5	.3	< .2
18	07-20-88	1113	< .2	< .2	< .2	.5	< .2	< .2
18	07-20-88	1400	< .2	< .2	< .2	.5	< .2	< .2
19	06-07-88	1505	< .2	< .2	< .2	.4	< .2	< .2
19	07-06-88	1031	< .2	< .2	< .2	.3	< .2	< .2
19	07-19-88	1333	< .2	< .2	< .2	1.9	< .2	< .2
19	08-10-88	1320	< .2	< .2	< .2	2.1	< .2	< .2
19	08-10-88	1330	< .2	< .2	< .2	2.1	< .2	< .2
19	09-12-88	1000	< .2	< .2	< .2	.3	< .2	< .2
20	07-27-88	0622	< .2	< .2	< .2	.6	< .2	< .2
21	07-20-88	1501	< .2	< .2	< .2	< .2	< .2	< .2
22	07-22-88	0958	< .2	< .2	< .2	< .2	< .2	< .2
22	07-22-88	0958	< .2	< .2	< .2	< .2	< .2	< .2
23	07-18-88	1930	< .2	< .2	< .2	< .2	< .2	< .2
24	07-28-88	0545	< .2	< .2	< .2	.3	.6	< .2
25	07-18-88	1720	< .2	< .2	< .2	< .2	.2	< .2
26	07-22-88	1645	< .2	< .2	< .2	< .2	< .2	< .2
27	07-29-88	0815	< .2	< .2	< .2	< .2	< .2	< .2
28	07-19-88	0925	< .2	< .2	< .2	< .2	< .2	< .2
29	07-21-88	1324	< .2	< .2	< .2	< .2	< .2	< .2
30	07-22-88	1325	< .2	< .2	< .2	< .2	< .2	< .2
31	07-20-88	1923	< .2	< .2	< .2	< .2	< .2	< .2
32	07-20-88	1332	< .2	< .2	< .2	< .2	< .2	< .2
33	06-07-88	1030	< .2	< .2	< .2	< .2	< .2	< .2
33	06-08-88	1540	< .2	< .2	< .2	< .2	< .2	< .2
34	07-19-88	0738	< .2	< .2	< .2	< .2	< .2	< .2

Table 8.--Concentration of volatile organic chemicals in stream water in the upper Illinois River basin from preliminary sampling, the low-flow synoptic investigation, and followup monitoring from August through September 1988--Continued

Map reference number	Date	Time	1,2,4-Trichlorobenzene, total (34551)	1,1,1-Trichloroethane, total (34506)	1,1,2-Trichloroethane, total (34511)	Trichloroethylene, total (39180)	1,2,3-Trichloropropane, water, whole, total (77443)	1,2,4-Trimethylbenzene, water, whole total (77222)
1	07-22-88	2014	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
2	07-18-88	1458	< .2	< .2	< .2	< .2	< .2	< .2
3	07-18-88	1231	< .2	< .2	< .2	< .2	< .2	< .2
4	07-18-88	0925	< .2	< .2	< .2	< .2	< .2	< .2
5	07-18-88	1035	< .2	< .2	< .2	< .2	< .2	< .2
6	07-18-88	1405	< .2	< .2	< .2	< .2	< .2	< .2
7	07-18-88	1625	< .2	< .2	< .2	< .2	< .2	< .2
8	07-18-88	1808	< .2	< .2	< .2	< .2	< .2	< .2
9	07-21-88	1051	< .2	< .2	< .2	< .2	< .2	< .2
11	07-20-88	1609	< .2	< .2	< .2	< .2	< .2	< .2
12	07-19-88	1659	< .2	< .2	< .2	.3	< .2	< .2
12	07-19-88	1748	< .2	< .2	< .2	.3	< .2	< .2
14	06-08-88	0940	< .2	< .2	< .2	< .2	< .2	< .2
14	07-06-88	1431	< .2	< .2	< .2	.2	< .2	< .2
14	07-19-88	1647	< .2	.4	< .2	2.3	< .2	< .2
14	08-10-88	1610	< .2	.9	< .2	< .2	< .2	.4
14	08-10-88	1615	< .2	.9	< .2	< .2	< .2	.3
14	09-12-88	1600	< .2	1.4	< .2	12	< .2	2.3
15	07-19-88	1232	< .2	.7	< .2	2.4	< .2	< .2
16	07-20-88	2109	< .2	38	< .2	1.8	< .2	< .2
16	07-20-88	2109	< .2	39	< .2	1.7	< .2	< .2
17	07-19-88	1422	< .2	2.6	< .2	2.3	< .2	1.2
17	07-19-88	1457	< .2	2.2	< .2	2.2	< .2	1.0
18	07-20-88	1113	< .2	.7	< .2	< .2	< .2	< .2
18	07-20-88	1400	< .2	.6	< .2	< .2	< .2	< .2
19	06-07-88	1505	< .2	.7	< .2	< .2	< .2	< .2
19	07-06-88	1031	< .2	.9	< .2	.5	< .2	< .2
19	07-19-88	1333	< .2	.9	< .2	.5	< .2	< .2
19	08-10-88	1320	< .2	2.4	< .2	3.4	< .2	< .2
19	08-10-88	1330	< .2	2.4	< .2	3.3	< .2	< .2
19	09-12-88	1000	< .2	.5	< .2	< .2	< .2	< .2
20	07-27-88	0622	< .2	1.5	< .2	.4	< .2	< .2
21	07-20-88	1501	< .2	< .2	< .2	< .2	< .2	< .2
22	07-22-88	0958	< .2	< .2	< .2	< .2	< .2	< .2
22	07-22-88	0958	< .2	< .2	< .2	< .2	< .2	< .2
23	07-18-88	1930	< .2	< .2	< .2	< .2	< .2	< .2
24	07-28-88	0545	< .2	.8	< .2	.2	< .2	.2
25	07-18-88	1720	< .2	< .2	< .2	< .2	< .2	< .2
26	07-22-88	1645	< .2	< .2	< .2	< .2	< .2	< .2
27	07-29-88	0815	< .2	.2	< .2	< .2	< .2	< .2
28	07-19-88	0925	< .2	< .2	< .2	< .2	< .2	< .2
29	07-21-88	1324	< .2	< .2	< .2	< .2	< .2	< .2
30	07-22-88	1325	< .2	< .2	< .2	< .2	< .2	< .2
31	07-20-88	1923	< .2	< .2	< .2	< .2	< .2	< .2
32	07-20-88	1332	< .2	< .2	< .2	< .2	< .2	< .2
33	06-07-88	1030	< .2	< .2	< .2	< .2	< .2	< .2
33	06-08-88	1540	< .2	< .2	< .2	< .2	< .2	< .2
34	07-19-88	0738	< .2	< .2	< .2	< .2	< .2	< .2

Table 8.--Concentration of volatile organic chemicals in stream water in the upper Illinois River basin from preliminary sampling, the low-flow synoptic investigation, and followup monitoring from August through September 1988--Continued

Map reference number	Date	Time	1,3,5-Trimethylbenzene, water, whole, total (77226)	1,2-Xylene, total (-----)	1,3-Xylene, total (77134)	1,4-Xylene, total (77133)	1,3-Xylene + 1,4-xylene, total (-----)
1	07-22-88	2014	<0.2	<0.2	<0.2	<0.2	--
2	07-18-88	1458	< .2	< .2	< .2	< .2	--
3	07-18-88	1231	< .2	< .2	< .2	< .2	--
4	07-18-88	0925	< .2	< .2	< .2	< .2	--
5	07-18-88	1035	< .2	.2	--	--	0.5
6	07-18-88	1405	< .2	< .2	< .2	< .2	--
7	07-18-88	1625	< .2	< .2	< .2	< .2	--
8	07-18-88	1808	< .2	< .2	< .2	< .2	--
9	07-21-88	1051	< .2	< .2	< .2	< .2	--
11	07-20-88	1609	< .2	< .2	< .2	< .2	--
12	07-19-88	1659	< .2	< .2	< .2	< .2	--
12	07-19-88	1748	< .2	< .2	< .2	< .2	--
14	06-08-88	0940	< .2	< .2	< .2	< .2	--
14	07-06-88	1431	< .2	< .2	< .2	< .2	--
14	07-19-88	1647	< .2	< .2	< .2	< .2	--
14	08-10-88	1610	.3	.2	--	--	.6
14	08-10-88	1615	.2	.2	--	--	.5
14	09-12-88	1600	1.1	1.4	--	--	2.9
15	07-19-88	1232	< .2	< .2	< .2	< .2	--
16	07-20-88	2109	< .2	< .2	< .2	< .2	--
16	07-20-88	2109	< .2	< .2	< .2	< .2	--
17	07-19-88	1422	.7	.6	--	--	1.3
17	07-19-88	1457	.6	.5	--	--	1.3
18	07-20-88	1113	< .2	< .2	< .2	< .2	--
18	07-20-88	1400	< .2	< .2	< .2	< .2	--
19	06-07-88	1505	< .2	< .2	< .2	< .2	--
19	07-06-88	1031	< .2	< .2	< .2	< .2	--
19	07-19-88	1333	< .2	< .2	--	--	.2
19	08-10-88	1320	< .2	.2	--	--	.5
19	08-10-88	1330	< .2	.2	--	--	.4
19	09-12-88	1000	< .2	< .2	< .2	< .2	--
20	07-27-88	0622	< .2	< .2	< .2	< .2	--
21	07-20-88	1501	< .2	< .2	< .2	< .2	--
22	07-22-88	0958	< .2	< .2	< .2	< .2	--
22	07-22-88	0958	< .2	< .2	< .2	< .2	--
23	07-18-88	1930	< .2	< .2	< .2	< .2	--
24	07-28-88	0545	< .2	< .2	--	--	.3
25	07-18-88	1720	< .2	< .2	< .2	< .2	--
26	07-22-88	1645	< .2	< .2	< .2	< .2	--
27	07-29-88	0815	< .2	< .2	< .2	< .2	--
28	07-19-88	0925	< .2	< .2	< .2	< .2	--
29	07-21-88	1324	< .2	< .2	< .2	< .2	--
30	07-22-88	1325	< .2	< .2	< .2	< .2	--
31	07-20-88	1923	< .2	< .2	< .2	< .2	--
32	07-20-88	1332	< .2	< .2	< .2	< .2	--
33	06-07-88	1030	< .2	< .2	< .2	< .2	--
33	06-08-88	1540	< .2	< .2	< .2	< .2	--
34	07-19-88	0738	< .2	< .2	< .2	< .2	--

Table 9.--Concentration of volatile organic chemicals in stream water in the upper Illinois River basin from the followup monitoring, December 1988 through March 1990

[All samples analyzed by the U.S. Geological Survey National Water-Quality Laboratory; all concentrations in micrograms per liter]

Map reference number	Date	Benzene, total (34030)	Bromobenzene, water, whole, total (81555)	Bromoform, total (32104)	Carbon tetrachloride, total (32102)	Chlorobenzene, total (34301)	Chlorodibromomethane, total (32105)	Chloroethane, total (34311)	Chloroform, total (32106)	ortho-Chlorotoluene, water, whole, total (77275)
14	12-07-88	<0.2	--	<0.2	<0.2	<0.20	<0.2	<0.2	0.7	--
14	01-11-89	< .2	--	< .2	< .2	< .20	< .2	< .2	.9	--
14	03-08-89	< .2	--	.7	< .2	< .20	.2	< .2	.6	--
14	04-05-89	< .2	--	< .2	< .2	< .20	.2	< .2	.2	--
14	05-11-89	< .2	<0.2	< .2	< .2	< .20	.3	< .2	.4	<0.2
14	06-06-89	< .2	< .2	< .2	< .2	< .20	.2	< .2	< .2	< .2
14	07-11-89	< .2	< .2	< .2	< .2	< .20	< .2	< .2	.4	< .2
14	08-09-89	< .2	< .2	< .2	< .2	< .20	< .2	< .2	.6	< .2
14	08-31-89	< .2	< .2	.2	< .2	< .20	< .2	< .2	.5	< .2
14	10-04-89	< .2	< .2	.4	< .2	< .20	.2	< .2	.5	< .2
14	11-01-89	< .2	< .2	< .2	< .2	< .20	< .2	< .2	.5	< .2
14	12-06-89	< .2	< .2	1.4	< .2	< .20	.5	< .2	.7	< .2
14	01-10-90	< .2	< .2	1.7	< .2	< .20	.3	< .2	.7	< .2
14	02-10-90	< .2	< .2	1.1	< .2	< .20	.3	< .2	.5	< .2
14	03-08-90	< .2	< .2	.6	< .2	< .20	.2	< .2	.4	< .2
19	12-07-88	< .2	--	< .2	< .2	< .20	.2	< .2	1.2	--
19	01-12-89	.3	--	< .2	< .2	< .20	< .2	< .2	1.2	--
19	02-08-89	.3	--	< .2	< .2	< .20	.3	< .2	1.5	--
19	03-09-89	.4	--	< .2	< .2	< .20	.3	< .2	1.7	--
19	04-06-89	< .2	--	< .2	< .2	< .20	.3	< .2	1.0	--
19	05-12-89	< .2	< .2	< .2	< .2	< .20	< .2	< .2	1.1	< .2
19	06-07-89	< .2	< .2	< .2	< .2	< .20	< .2	< .2	1.0	< .2
19	07-12-89	< .2	< .2	< .2	< .2	< .20	.2	< .2	1.3	< .2
19	08-09-89	< .2	< .2	< .2	< .2	< .20	.2	< .2	1.0	< .2
19	08-31-89	< .2	< .2	< .2	< .2	< .20	< .2	< .2	1.1	< .2
19	10-04-89	< .2	< .2	< .2	< .2	< .20	.2	< .2	.7	< .2
19	11-02-89	< .2	< .2	< .2	< .2	< .20	< .2	< .2	.7	< .2
19	12-06-89	< .2	< .2	< .2	< .2	< .20	.2	< .2	.9	< .2
19	01-10-90	.2	< .2	< .2	< .2	< .20	.3	< .2	1.3	< .2
19	02-10-90	.2	< .2	< .2	.7	< .20	.3	< .2	< .2	< .2
19	03-08-90	.3	< .2	< .2	< .2	< .20	.2	< .2	1.3	< .2

Table 9.--Concentration of volatile organic chemicals in stream water in the upper Illinois River basin from the followup monitoring, December 1988 through March 1990--Continued

Map reference number	Date	para-Chloro-toluene, water, whole, total (77277)	Dibromo-methane, water, whole, recover-able (30217)	1,2-Dibromo-ethane, water, whole, total (77651)	Dichloro-bromo-methane, total (32101)	1,2-Dichloro-benzene, total (34536)	1,3-Dichloro-benzene, total (34566)	1,4-Dichloro-benzene, total (34571)	Dichloro-difluoro-methane, total (34668)	1,1-di-chloro-ethane, total (34496)
14	12-07-88	--	<0.2	<0.2	0.4	<0.2	<0.2	<0.2	<0.2	<0.2
14	01-11-89	--	< .2	< .2	.5	< .2	< .2	< .2	< .2	< .2
14	03-08-89	--	< .2	< .2	.4	< .2	< .2	< .2	< .2	< .2
14	04-05-89	--	< .2	< .2	.2	< .2	< .2	< .2	< .2	< .2
14	05-11-89	<0.2	< .2	< .2	.2	< .2	< .2	< .2	< .2	< .2
14	06-06-89	< .2	< .2	< .2	.2	< .2	< .2	< .2	< .2	< .2
14	07-11-89	< .2	< .2	< .2	< .2	< .2	< .2	< .2	< .2	< .2
14	08-09-89	< .2	< .2	< .2	.4	< .2	< .2	< .2	< .2	< .2
14	08-31-89	< .2	< .2	< .2	.2	< .2	< .2	< .2	< .2	< .2
14	10-04-89	< .2	< .2	< .2	.2	< .2	< .2	< .2	< .2	< .2
14	11-01-89	< .2	< .2	< .2	.2	< .2	< .2	< .2	< .2	< .2
14	12-06-89	< .2	< .2	< .2	.4	< .2	< .2	< .2	< .2	< .2
14	01-10-90	< .2	< .2	< .2	.3	< .2	< .2	< .2	< .2	< .2
14	02-10-90	< .2	< .2	< .2	.4	< .2	< .2	< .2	< .2	< .2
14	03-08-90	< .2	< .2	< .2	.2	< .2	< .2	< .2	< .2	< .2
19	12-07-88	--	< .2	< .2	.3	< .2	< .2	.2	< .2	< .2
19	01-12-89	--	< .2	< .2	.4	.3	< .2	.3	< .2	.2
19	02-08-89	--	< .2	< .2	.5	< .2	< .2	.5	< .2	.2
19	03-09-89	--	< .2	< .2	.4	< .2	< .2	.7	< .2	< .2
19	04-06-89	--	< .2	< .2	.4	< .2	< .2	.9	< .2	< .2
19	05-12-89	< .2	< .2	< .2	.3	< .2	< .2	.5	< .2	< .2
19	06-07-89	< .2	< .2	< .2	.3	.2	< .2	.9	< .2	.2
19	07-12-89	< .2	< .2	< .2	.3	.2	< .2	.3	< .2	< .2
19	08-09-89	< .2	< .2	< .2	.3	< .2	< .2	.3	< .2	< .2
19	08-31-89	< .2	< .2	< .2	.3	.2	< .2	.5	1.0	< .2
19	10-04-89	< .2	< .2	< .2	.2	< .2	< .2	< .2	< .2	< .2
19	11-02-89	< .2	< .2	< .2	.2	< .2	< .2	.2	< .2	< .2
19	12-06-89	< .2	< .2	< .2	.3	< .2	< .2	.2	< .2	< .2
19	01-10-90	< .2	< .2	< .2	.4	< .2	< .2	.5	< .2	< .2
19	02-10-90	< .2	< .2	< .2	.5	< .2	< .2	.7	< .2	.2
19	03-08-90	< .2	< .2	< .2	.4	.4	< .2	.5	< .2	< .2

Table 9.--Concentration of volatile organic chemicals in stream water in the upper Illinois River basin from the followup monitoring, December 1988 through March 1990--Continued

Map reference number	Date	1,2-Dichloroethane, total (32103)	1,2-Dichloroethene, water, whole, recoverable (45617)	1,1-dichloroethylene, total (34501)	1,2-Dichloropropane, total (34541)	1,3-Dichloropropane, water, whole, total (77173)	2,2-Dichloropropane, water, whole, total (77170)	cis-1,3-Dichloropropene, total (34704)	trans-1,3-Dichloropropene, total (34699)	1,1-Dichloropropene, water, whole, total (77168)
14	12-07-88	<0.2	--	<0.2	<0.2	--	--	<0.2	<0.2	--
14	01-11-89	< .2	--	< .2	< .2	--	--	< .2	< .2	--
14	03-08-89	.2	--	< .2	< .2	--	--	< .2	< .2	--
14	04-05-89	< .2	--	< .2	< .2	--	--	< .2	< .2	--
14	05-11-89	< .2	<0.2	< .2	< .2	<0.2	<0.2	< .2	< .2	<0.2
14	06-06-89	< .2	.2	< .2	< .2	< .2	< .2	< .2	< .2	< .2
14	07-11-89	< .2	< .2	< .2	< .2	< .2	< .2	< .2	< .2	< .2
14	08-09-89	< .2	.2	< .2	< .2	< .2	< .2	< .2	< .2	< .2
14	08-31-89	< .2	< .2	< .2	< .2	< .2	< .2	< .2	< .2	< .2
14	10-04-89	< .2	.2	< .2	< .2	< .2	< .2	< .2	< .2	< .2
14	11-01-89	< .2	.2	< .2	< .2	< .2	< .2	< .2	< .2	< .2
14	12-06-89	.3	.2	< .2	< .2	< .2	< .2	< .2	< .2	< .2
14	01-10-90	.3	.2	< .2	< .2	< .2	< .2	< .2	< .2	< .2
14	02-10-90	.2	< .2	< .2	< .2	< .2	< .2	< .2	< .2	< .2
14	03-08-90	< .2	.2	< .2	< .2	< .2	< .2	< .2	< .2	< .2
19	12-07-88	2.8	--	< .2	< .2	--	--	< .2	< .2	--
19	01-12-89	1.8	--	.2	< .2	--	--	< .2	< .2	--
19	02-08-89	2.0	--	< .2	< .2	--	--	< .2	< .2	--
19	03-09-89	5.8	--	< .2	< .2	--	--	< .2	< .2	--
19	04-06-89	7.0	--	< .2	.2	--	--	< .2	< .2	--
19	05-12-89	1.6	.6	< .2	< .2	< .2	< .2	< .2	< .2	< .2
19	06-07-89	3.5	.5	< .2	< .2	< .2	< .2	< .2	< .2	< .2
19	07-12-89	2.1	.2	< .2	< .2	< .2	< .2	< .2	< .2	< .2
19	08-09-89	< .2	.3	< .2	< .2	< .2	< .2	< .2	< .2	< .2
19	08-31-89	.9	.2	< .2	< .2	< .2	< .2	< .2	< .2	< .2
19	10-04-89	.3	< .2	< .2	< .2	< .2	< .2	< .2	< .2	< .2
19	11-02-89	1.2	< .2	< .2	< .2	< .2	< .2	< .2	< .2	< .2
19	12-06-89	< .2	< .2	< .2	.3	< .2	< .2	< .2	< .2	< .2
19	01-10-90	.6	.2	< .2	< .2	< .2	< .2	< .2	< .2	< .2
19	02-10-90	.4	.2	< .2	< .2	< .2	< .2	< .2	< .2	< .2
19	03-08-90	.2	.3	< .2	.6	< .2	< .2	< .2	< .2	< .2

Table 9.--Concentration of volatile organic chemicals in stream water in the upper Illinois River basin from the followup monitoring, December 1988 through March 1990--Continued

Map reference number	Date	Ethyl-benzene, total (34371)	Methyl-bromide, total (34413)	Methyl-chloride, total (34418)	Methylene-chloride, total (34423)	Styrene, total (77128)	1,1,1,2-Tetra-chloro-ethane, water, whole, total (77562)	1,1,2,2-Tetra-chloro-ethane, total (34516)	Tetra-chloro-ethylene, total (34475)	Toluene, total (34010)
14	12-07-88	<0.2	<0.2	<0.2	0.5	<0.2	--	<0.2	<0.2	0.3
14	01-11-89	< .2	< .2	< .2	.6	< .2	--	< .2	.3	.4
14	03-08-89	< .2	< .2	< .2	.6	< .2	--	< .2	.3	1.4
14	04-05-89	< .2	< .2	< .2	< .2	< .2	--	< .2	< .2	.2
14	05-11-89	< .2	< .2	< .2	.4	< .2	<0.2	< .2	.2	.3
14	06-06-89	< .2	< .2	< .2	.4	< .2	< .2	< .2	.4	.3
14	07-11-89	< .2	< .2	< .2	< .2	< .2	< .2	< .2	< .2	.2
14	08-09-89	< .2	< .2	< .2	.3	< .2	< .2	< .2	.2	< .2
14	08-31-89	< .2	< .2	< .2	.2	< .2	< .2	< .2	< .2	.3
14	10-04-89	< .2	< .2	< .2	.2	< .2	< .2	< .2	.7	.2
14	11-01-89	< .2	< .2	< .2	.2	< .2	< .2	< .2	.2	.2
14	12-06-89	< .2	< .2	< .2	.6	< .2	< .2	< .2	.2	.6
14	01-10-90	< .2	< .2	< .2	.8	< .2	< .2	< .2	< .2	.3
14	02-10-90	< .2	< .2	< .2	.6	< .2	< .2	< .2	< .2	< .2
14	03-08-90	< .2	< .2	< .2	.5	< .2	< .2	< .2	.3	.7
19	12-07-88	< .2	< .2	< .2	4.0	< .2	--	< .2	2.5	< .2
19	01-12-89	< .2	< .2	< .2	9.9	< .2	--	< .2	2.7	.4
19	02-08-89	< .2	< .2	< .2	9.6	< .2	--	< .2	2.1	.5
19	03-09-89	< .2	< .2	< .2	15	.2	--	< .2	2.2	3.1
19	04-06-89	< .2	< .2	< .2	14	< .2	--	< .2	3.3	.4
19	05-12-89	< .2	< .2	< .2	3.0	< .2	< .2	< .2	1.4	< .2
19	06-07-89	< .2	< .2	< .2	11	.4	< .2	< .2	4.1	< .2
19	07-12-89	< .2	< .2	< .2	1.1	< .2	< .2	< .2	.3	< .2
19	08-09-89	< .2	< .2	< .2	5.1	< .2	< .2	< .2	.8	< .2
19	08-31-89	< .2	< .2	< .2	8.0	< .2	< .2	< .2	1.0	< .2
19	10-04-89	< .2	< .2	< .2	.7	< .2	< .2	< .2	.4	< .2
19	11-02-89	< .2	< .2	< .2	2.9	< .2	< .2	< .2	.8	< .2
19	12-06-89	< .2	< .2	< .2	12	< .2	< .2	< .2	.8	< .2
19	01-10-90	< .2	< .2	< .2	6.4	< .2	< .2	< .2	1.3	< .2
19	02-10-90	< .2	< .2	< .2	12	< .2	< .2	< .2	1.3	< .2
19	03-08-90	< .2	< .2	< .2	15	1.0	< .2	< .2	2.4	.4

Table 9.--Concentration of volatile organic chemicals in stream water in the upper Illinois River basin from the followup monitoring, December 1988 through March 1990--Continued

Map reference number	Date	1,1,1-Trichloroethane, total (34506)	1,1,2-Trichloroethane, total (34511)	Trichloroethylene, total (39180)	Trichlorofluoromethane, total (34488)	1,2,3-Trichloropropane, water, whole, total (77443)	Vinylchloride, total (39175)	Xylene, total, water, whole, recoverable (81551)
14	12-07-88	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
14	01-11-89	.2	< .2	.2	< .2	< .2	< .2	.2
14	03-08-89	1.3	< .2	.2	< .2	< .2	< .2	.3
14	04-05-89	< .2	< .2	< .2	< .2	< .2	< .2	< .2
14	05-11-89	< .2	< .2	< .2	< .2	< .2	< .2	< .2
14	06-06-89	.2	< .2	< .2	< .2	< .2	< .2	.2
14	07-11-89	< .2	< .2	< .2	< .2	< .2	< .2	< .2
14	08-09-89	< .2	< .2	< .2	< .2	< .2	< .2	< .2
14	08-31-89	< .2	< .2	< .2	< .2	< .2	< .2	.2
14	10-04-89	< .2	< .2	.2	< .2	< .2	< .2	.3
14	11-01-89	.2	< .2	< .2	< .2	< .2	< .2	.4
14	12-06-89	< .2	< .2	.2	< .2	< .2	< .2	.2
14	01-10-90	.2	< .2	.2	< .2	< .2	< .2	.2
14	02-10-90	< .2	< .2	.2	< .2	< .2	< .2	< .2
14	03-08-90	6.1	< .2	.3	< .2	< .2	< .2	.5
19	12-07-88	.7	< .2	.9	< .2	< .2	< .2	< .2
19	01-12-89	1.7	< .2	1.2	< .2	< .2	< .2	< .2
19	02-08-89	1.4	< .2	1.6	< .2	< .2	< .2	< .2
19	03-09-89	2.4	< .2	1.4	< .2	< .2	< .2	.3
19	04-06-89	1.1	< .2	.8	< .2	< .2	< .2	< .2
19	05-12-89	1.6	< .2	< .2	< .2	< .2	< .2	< .2
19	06-07-89	.9	< .2	1.2	< .2	< .2	< .2	< .2
19	07-12-89	.8	< .2	.3	< .2	< .2	< .2	< .2
19	08-09-89	.5	< .2	.6	< .2	< .2	< .2	< .2
19	08-31-89	.5	< .2	.5	< .2	< .2	< .2	< .2
19	10-04-89	.3	< .2	< .2	< .2	< .2	< .2	< .2
19	11-02-89	.6	< .2	.3	< .2	< .2	< .2	< .2
19	12-06-89	3.0	< .2	.3	< .2	< .2	< .2	< .2
19	01-10-90	1.5	< .2	.5	< .2	< .2	< .2	< .2
19	02-10-90	4.9	< .2	1.0	< .2	< .2	< .2	< .2
19	03-08-90	2.8	< .2	.9	< .2	< .2	< .2	< .2

Table 10.--Concentration of base-, neutral-, and acid-extractable semivolatile organic chemicals in stream water in the upper Illinois River basin during the preliminary sampling, synoptic investigation, followup monitoring, and runoff events.

[All samples analyzed by the U.S. Geological Survey National Water-Quality Laboratory; all concentrations in micrograms per liter]

Map reference number	Date	Time	Acenaphthylene, total (34200)	Acenaphthene, total (34205)	Anthracene, total (34220)	Benzo (A) anthracene, total (34526)	Benzo (B) fluoranthene, total (34230)	Benzo (K) fluoranthene, total (34242)	Benzo (GHI) perylene, total (34521)	Benzo (A) pyrene, total (34247)
1	07-22-88	2014	<5.0	<5.0	<5.0	<5.0	<10.0	<10.0	<10.0	<10.0
3	07-18-88	1231	<5.0	<5.0	<5.0	<5.0	<10.0	<10.0	<10.0	<10.0
4	05-02-88	1015	--	--	--	--	--	--	--	--
5	07-18-88	1035	<5.0	<5.0	<5.0	<5.0	<10.0	<10.0	<10.0	<10.0
6	07-18-88	1405	<5.0	<5.0	<5.0	<5.0	<10.0	<10.0	<10.0	<10.0
7	07-18-88	1625	<5.0	<5.0	<5.0	<5.0	<10.0	<10.0	<10.0	<10.0
8	07-18-88	1808	<5.0	<5.0	<5.0	<5.0	<10.0	<10.0	<10.0	<10.0
9	07-21-88	1051	<5.0	<5.0	<5.0	<5.0	<10.0	<10.0	<10.0	<10.0
10	08-17-88	2115	--	--	--	--	--	--	--	--
10	08-18-88	0215	--	--	--	--	--	--	--	--
10	04-25-89	1230	<5.0	<5.0	<5.0	<5.0	<10.0	<10.0	<10.0	<10.0
10	05-19-89	1415	<5.0	<5.0	<5.0	<5.0	<10.0	<10.0	<10.0	<10.0
10	05-19-89	1915	<5.0	<5.0	<5.0	<5.0	<10.0	<10.0	<10.0	<10.0
10	05-20-89	0016	<5.0	<5.0	<5.0	<5.0	<10.0	<10.0	<10.0	<10.0
10	05-20-89	0017	<5.0	<5.0	<5.0	<5.0	<10.0	<10.0	<10.0	<10.0
10	06-22-89	1020	<5.0	<5.0	<5.0	<5.0	<10.0	<10.0	<10.0	<10.0
12	07-19-88	1659	<5.0	<5.0	<5.0	<5.0	<10.0	<10.0	<10.0	<10.0
12	07-19-88	1748	<5.0	<5.0	<5.0	<5.0	<10.0	<10.0	<10.0	<10.0
13	06-20-88	0755	--	--	--	--	--	--	--	--
13	06-21-88	0155	--	--	--	--	--	--	--	--
13	06-21-88	0555	--	--	--	--	--	--	--	--
13	06-28-88	1130	--	--	--	--	--	--	--	--
13	06-29-88	0430	--	--	--	--	--	--	--	--
13	06-29-88	0930	--	--	--	--	--	--	--	--
13	07-13-88	1015	--	--	--	--	--	--	--	--
13	05-01-89	1045	<5.0	<5.0	<5.0	<5.0	<10.0	<10.0	<10.0	<10.0
13	06-22-89	1130	<5.0	<5.0	<5.0	<5.0	<10.0	<10.0	<10.0	<10.0
14	05-03-88	1431	--	--	--	--	--	--	--	--
14	06-08-88	1030	--	--	--	--	--	--	--	--
14	07-06-88	1401	--	--	--	--	--	--	--	--

Table 10.--Concentration of base-, neutral-, and acid-extractable semivolatile organic chemicals in stream water in the upper Illinois River basin during the preliminary sampling, synoptic investigation, followup monitoring, and runoff events--Continued

Map reference number	Date	Time	Acenaphthylene, total (34200)	Acenaphthene, total (34205)	Anthracene, total (34220)	Benzo (A) anthracene, total (34526)	Benzo (B) fluoranthene, total (34230)	Benzo (K) fluoranthene, total (34242)	Benzo (GHI) perylene, total (34521)	Benzo (A) pyrene, total (34247)
14	08-10-88	1610	--	--	--	--	--	--	--	--
14	08-10-88	1615	--	--	--	--	--	--	--	--
14	09-12-88	1600	--	--	--	--	--	--	--	--
16	07-21-88	2109	<5.0	<5.0	<5.0	<5.0	<10.0	<10.0	<10.0	<10.0
16	07-21-88	2109	<5.0	<5.0	<5.0	<5.0	<10.0	<10.0	<10.0	<10.0
17	07-19-88	1422	<5.0	<5.0	<5.0	<5.0	<10.0	<10.0	<10.0	<10.0
17	07-19-88	1457	<5.0	<5.0	<5.0	<5.0	<10.0	<10.0	<10.0	<10.0
18	07-20-88	1113	<5.0	<5.0	<5.0	<5.0	<10.0	<10.0	<10.0	<10.0
18	07-20-88	1400	<5.0	<5.0	<5.0	<5.0	<10.0	<10.0	<10.0	<10.0
19	05-03-88	1300	--	--	--	--	--	--	--	--
19	06-07-88	1520	--	--	--	--	--	--	--	--
19	07-06-88	1031	--	--	--	--	--	--	--	--
19	08-10-88	1320	--	--	--	--	--	--	--	--
19	08-10-88	1330	--	--	--	--	--	--	--	--
19	09-13-88	1000	--	--	--	--	--	--	--	--
20	07-27-88	0622	<5.0	<5.0	<5.0	<5.0	<10.0	<10.0	<10.0	<10.0
22	07-22-88	0958	<5.0	<5.0	<5.0	<5.0	<10.0	<10.0	<10.0	<10.0
22	07-22-88	0958	<5.0	<5.0	<5.0	<5.0	<10.0	<10.0	<10.0	<10.0
23	07-18-88	1930	<5.0	<5.0	<5.0	<5.0	<10.0	<10.0	<10.0	<10.0
24	07-28-88	0545	<5.0	<5.0	<5.0	<5.0	<10.0	<10.0	<10.0	<10.0
26	07-22-88	1645	<5.0	<5.0	<5.0	<5.0	<10.0	<10.0	<10.0	<10.0
27	07-29-88	0815	<5.0	<5.0	<5.0	<5.0	<10.0	<10.0	<10.0	<10.0
28	07-19-88	0925	<5.0	<5.0	<5.0	<5.0	<10.0	<10.0	<10.0	<10.0
29	07-21-88	1324	<5.0	<5.0	<5.0	<5.0	<10.0	<10.0	<10.0	<10.0
30	07-22-88	1325	<5.0	<5.0	<5.0	<5.0	<10.0	<10.0	<10.0	<10.0
32	07-20-88	1332	<5.0	<5.0	<5.0	<5.0	<10.0	<10.0	<10.0	<10.0
33	05-04-88	1015	--	--	--	--	--	--	--	--
33	06-07-88	1030	--	--	--	--	--	--	--	--
33	06-08-88	1540	--	--	--	--	--	--	--	--
34	07-19-88	0738	<5.0	<5.0	<5.0	<5.0	<10.0	<10.0	<10.0	<10.0

Table 10.--Concentration of base-, neutral-, and acid-extractable semivolatile organic chemicals in stream water in the upper Illinois River basin during the preliminary sampling, synoptic investigation, followup monitoring, and runoff events--Continued

Map reference number	Date	Time	bis-(2-Chloro-ethyl) ether, total (34273)	bis-(2-Chloro-ethoxy) methane, total (34278)	bis-(2-Chloro-isopropyl) ether, total (34283)	bis-(2-ethyl-hexyl) phthalate, water, whole (39100)	4-Bromo-phenyl-phenyl-ether, total (34636)	N-butyl-benzyl-phthalate, total (34292)	2-Chloro-naph-thalene, total (34581)	2-Chloro-phenol, total (34586)
1	07-22-88	2014	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
3	07-18-88	1231	<5.0	<5.0	<5.0	6.0	<5.0	<5.0	<5.0	<5.0
4	05-02-88	1015	--	--	--	--	--	--	--	<5.0
5	07-18-88	1035	<5.0	<5.0	<5.0	7.0	<5.0	<5.0	<5.0	<5.0
6	07-18-88	1405	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
7	07-18-88	1625	<5.0	<5.0	<5.0	6.0	<5.0	<5.0	<5.0	<5.0
8	07-18-88	1808	<5.0	<5.0	<5.0	7.0	<5.0	<5.0	<5.0	<5.0
9	07-21-88	1051	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
10	08-17-88	2115	--	--	--	--	--	--	--	<5.0
10	08-18-88	0215	--	--	--	--	--	--	--	<5.0
10	04-25-89	1230	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
10	05-19-89	1415	<5.0	<5.0	<5.0	6.0	<5.0	<5.0	<5.0	<5.0
10	05-19-89	1915	<5.0	<5.0	<5.0	7.0	<5.0	<5.0	<5.0	<5.0
10	05-20-89	0016	<5.0	<5.0	<5.0	12.0	<5.0	<5.0	<5.0	<5.0
10	05-20-89	0017	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
10	06-22-89	1020	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
12	07-19-88	1659	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
12	07-19-88	1748	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
13	06-20-88	0755	--	--	--	--	--	--	--	<5.0
13	06-21-88	0155	--	--	--	--	--	--	--	<5.0
13	06-21-88	0555	--	--	--	--	--	--	--	<5.0
13	06-28-88	1130	--	--	--	--	--	--	--	<5.0
13	06-29-88	0430	--	--	--	--	--	--	--	<5.0
13	06-29-88	0930	--	--	--	--	--	--	--	<5.0
13	07-13-88	1015	--	--	--	--	--	--	--	<5.0
13	05-01-89	1045	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
13	06-22-89	1130	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
14	05-03-88	1431	--	--	--	--	--	--	--	<5.0
14	06-08-88	1030	--	--	--	--	--	--	--	<5.0
14	07-06-88	1401	--	--	--	--	--	--	--	<5.0

Table 10.--Concentration of base-, neutral-, and acid-extractable semivolatile organic chemicals in stream water in the upper Illinois River basin during the preliminary sampling, synoptic investigation, followup monitoring, and runoff events--Continued

Map reference number	Date	Time	bis-(2-Chloroethyl) ether, total (34273)	bis-(2-Chloroethoxy) methane, total (34278)	bis-(2-Chloroisopropyl) ether, total (34283)	bis-(2-ethylhexyl) phthalate, water, whole (39100)	4-Bromophenyl-phenyl-ether, total (34636)	N-butylbenzyl-phthalate, total (34292)	2-Chloronaphthalene, total (34581)	2-Chlorophenol, total (34586)
14	08-10-88	1610	--	--	--	--	--	--	--	<5.0
14	08-10-88	1615	--	--	--	--	--	--	--	<5.0
14	09-12-88	1600	--	--	--	--	--	--	--	<5.0
16	07-21-88	2109	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
16	07-21-88	2109	<5.0	<5.0	<5.0	6.0	<5.0	<5.0	<5.0	<5.0
17	07-19-88	1422	<5.0	<5.0	<5.0	7.0	<5.0	<5.0	<5.0	<5.0
17	07-19-88	1457	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
18	07-20-88	1113	<5.0	<5.0	<5.0	6.0	<5.0	<5.0	<5.0	<5.0
18	07-20-88	1400	<5.0	<5.0	<5.0	7.0	<5.0	<5.0	<5.0	<5.0
19	05-03-88	1300	--	--	--	--	--	--	--	<5.0
19	06-07-88	1520	--	--	--	--	--	--	--	<5.0
19	07-06-88	1031	--	--	--	--	--	--	--	<5.0
19	08-10-88	1320	--	--	--	--	--	--	--	<5.0
19	08-10-88	1330	--	--	--	--	--	--	--	<5.0
19	09-13-88	1000	--	--	--	--	--	--	--	<5.0
20	07-27-88	0622	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
22	07-22-88	0958	<5.0	<5.0	<5.0	6.0	<5.0	<5.0	<5.0	<5.0
22	07-22-88	0958	<5.0	<5.0	<5.0	7.0	<5.0	<5.0	<5.0	<5.0
23	07-18-88	1930	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
24	07-28-88	0545	<5.0	<5.0	<5.0	6.0	<5.0	<5.0	<5.0	<5.0
26	07-22-88	1645	<5.0	<5.0	<5.0	7.0	<5.0	<5.0	<5.0	<5.0
27	07-29-88	0815	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
28	07-19-88	0925	<5.0	<5.0	<5.0	6.0	<5.0	<5.0	<5.0	<5.0
29	07-21-88	1324	<5.0	<5.0	<5.0	7.0	<5.0	<5.0	<5.0	<5.0
30	07-22-88	1325	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
32	07-20-88	1332	<5.0	<5.0	<5.0	6.0	<5.0	<5.0	<5.0	<5.0
33	05-04-88	1015	--	--	--	--	--	--	--	<5.0
33	06-07-88	1030	--	--	--	--	--	--	--	<5.0
33	06-08-88	1540	--	--	--	--	--	--	--	<5.0
34	07-19-88	0738	<5.0	<5.0	<5.0	7.0	<5.0	<5.0	<5.0	<5.0

Table 10.--Concentration of base-, neutral-, and acid-extractable semivolatile organic chemicals in stream water in the upper Illinois River basin during the preliminary sampling, synoptic investigation, followup monitoring, and runoff events--Continued

Map reference number	Date	Time	4-Chloro-phenyl-phenyl-ether, total (34641)	Chrysene, total (34320)	1,2,5,6-Dibenz-anthra-cene, total (34556)	1,2-Dichloro-benzene, total (34536)	1,3-Dichloro-benzene, total (34566)	1,4-Dichloro-benzene, total (34571)	2,4-Dichloro-phenol, total (34601)	Diethyl-phthalate, total (34336)
1	07-22-88	2014	<5.0	<10.0	<10.0	<5.0	<5.0	<5.0	<5.0	<5.0
3	07-18-88	1231	<5.0	<10.0	<10.0	<5.0	<5.0	<5.0	<5.0	<5.0
4	05-02-88	1015	--	--	--	--	--	--	<5.0	--
5	07-18-88	1035	<5.0	<10.0	<10.0	<5.0	<5.0	<5.0	<5.0	<5.0
6	07-18-88	1405	<5.0	<10.0	<10.0	<5.0	<5.0	<5.0	<5.0	<5.0
7	07-18-88	1625	<5.0	<10.0	<10.0	<5.0	<5.0	<5.0	<5.0	<5.0
8	07-18-88	1808	<5.0	<10.0	<10.0	<5.0	<5.0	<5.0	<5.0	<5.0
9	07-21-88	1051	<5.0	<10.0	<10.0	<5.0	<5.0	<5.0	<5.0	<5.0
10	08-17-88	2115	--	--	--	--	--	--	<5.0	--
10	08-18-88	0215	--	--	--	--	--	--	<5.0	--
10	04-25-89	1230	<5.0	<10.0	<10.0	<5.0	<5.0	<5.0	<5.0	<5.0
10	05-19-89	1415	<5.0	<10.0	<10.0	<5.0	<5.0	<5.0	<5.0	<5.0
10	05-19-89	1915	<5.0	<10.0	<10.0	<5.0	<5.0	<5.0	<5.0	<5.0
10	05-20-89	0016	<5.0	<10.0	<10.0	<5.0	<5.0	<5.0	<5.0	<5.0
10	05-20-89	0017	<5.0	<10.0	<10.0	<5.0	<5.0	<5.0	<5.0	<5.0
10	06-22-89	1020	<5.0	<10.0	<10.0	<5.0	<5.0	<5.0	<5.0	<5.0
12	07-19-88	1659	<5.0	<10.0	<10.0	<5.0	<5.0	<5.0	<5.0	<5.0
12	07-19-88	1748	<5.0	<10.0	<10.0	<5.0	<5.0	<5.0	<5.0	<5.0
13	06-20-88	0755	--	--	--	--	--	--	<5.0	--
13	06-21-88	0155	--	--	--	--	--	--	<5.0	--
13	06-21-88	0555	--	--	--	--	--	--	<5.0	--
13	06-28-88	1130	--	--	--	--	--	--	<5.0	--
13	06-29-88	0430	--	--	--	--	--	--	<5.0	--
13	06-29-88	0930	--	--	--	--	--	--	<5.0	--
13	07-13-88	1015	--	--	--	--	--	--	<5.0	--
13	05-01-89	1045	<5.0	<10.0	<10.0	<5.0	<5.0	<5.0	<5.0	<5.0
13	06-22-89	1130	<5.0	<10.0	<10.0	<5.0	<5.0	<5.0	<5.0	<5.0
14	05-03-88	1431	--	--	--	--	--	--	<5.0	--
14	06-08-88	1030	--	--	--	--	--	--	<5.0	--
14	07-06-88	1401	--	--	--	--	--	--	<5.0	--

Table 10.--Concentration of base-, neutral-, and acid-extractable semivolatile organic chemicals in stream water in the upper Illinois River basin during the preliminary sampling, synoptic investigation, followup monitoring, and runoff events--Continued

Map reference number	Date	Time	4-Chloro-phenyl-phenyl-ether, total (34641)	Chrysene, total (34320)	1,2,5,6-Dibenz-anthra-cene, total (34556)	1,2-Dichloro-benzene, total (34536)	1,3-Dichloro-benzene, total (34566)	1,4-Dichloro-benzene, total (34571)	2,4-Dichloro-phenol, total (34601)	Diethyl-phthalate, total (34336)
14	08-10-88	1610	--	--	--	--	--	--	<5.0	--
14	08-10-88	1615	--	--	--	--	--	--	<5.0	--
14	09-12-88	1600	--	--	--	--	--	--	<5.0	--
16	07-21-88	2109	<5.0	<10.0	<10.0	<5.0	<5.0	<5.0	<5.0	<5.0
16	07-21-88	2109	<5.0	<10.0	<10.0	<5.0	<5.0	<5.0	<5.0	<5.0
17	07-19-88	1422	<5.0	<10.0	<10.0	<5.0	<5.0	<5.0	<5.0	<5.0
17	07-19-88	1457	<5.0	<10.0	<10.0	<5.0	<5.0	<5.0	<5.0	<5.0
18	07-20-88	1113	<5.0	<10.0	<10.0	<5.0	<5.0	<5.0	<5.0	<5.0
18	07-20-88	1400	<5.0	<10.0	<10.0	<5.0	<5.0	<5.0	<5.0	<5.0
19	05-03-88	1300	--	--	--	--	--	--	<5.0	--
19	06-07-88	1520	--	--	--	--	--	--	<5.0	--
19	07-06-88	1031	--	--	--	--	--	--	<5.0	--
19	08-10-88	1320	--	--	--	--	--	--	<5.0	--
19	08-10-88	1330	--	--	--	--	--	--	<5.0	--
19	09-13-88	1000	--	--	--	--	--	--	<5.0	--
20	07-27-88	0622	<5.0	<10.0	<10.0	<5.0	<5.0	<5.0	<5.0	<5.0
22	07-22-88	0958	<5.0	<10.0	<10.0	<5.0	<5.0	<5.0	<5.0	<5.0
22	07-22-88	0958	<5.0	<10.0	<10.0	<5.0	<5.0	<5.0	<5.0	<5.0
23	07-18-88	1930	<5.0	<10.0	<10.0	<5.0	<5.0	<5.0	<5.0	<5.0
24	07-28-88	0545	<5.0	<10.0	<10.0	<5.0	<5.0	<5.0	<5.0	<5.0
26	07-22-88	1645	<5.0	<10.0	<10.0	<5.0	<5.0	<5.0	<5.0	<5.0
27	07-29-88	0815	<5.0	<10.0	<10.0	<5.0	<5.0	<5.0	<5.0	<5.0
28	07-19-88	0925	<5.0	<10.0	<10.0	<5.0	<5.0	<5.0	<5.0	<5.0
29	07-21-88	1324	<5.0	<10.0	<10.0	<5.0	<5.0	<5.0	<5.0	<5.0
30	07-22-88	1325	<5.0	<10.0	<10.0	<5.0	<5.0	<5.0	<5.0	<5.0
32	07-20-88	1332	<5.0	<10.0	<10.0	<5.0	<5.0	<5.0	<5.0	<5.0
33	05-04-88	1015	--	--	--	--	--	--	<5.0	--
33	06-07-88	1030	--	--	--	--	--	--	<5.0	--
33	06-08-88	1540	--	--	--	--	--	--	<5.0	--
34	07-19-88	0738	<5.0	<10.0	<10.0	<5.0	<5.0	<5.0	<5.0	<5.0

Table 10.--Concentration of base-, neutral-, and acid-extractable semivolatile organic chemicals in stream water in the upper Illinois River basin during the preliminary sampling, synoptic investigation, followup monitoring, and runoff events--Continued

Map reference number	Date	Time	2,4-Dimethyl-phenol, total (34606)	Dimethyl-phthalate, total (34341)	Di-n-butyl-phthalate, total (39110)	4,6-Dinitro-ortho-cresol, total (34657)	2,4-Dinitro-phenol, total (34616)	2,4-Dinitro-toluene, total (34611)	2,6-Dinitro-toluene, total (34626)	Di-n-octyl-phthalate, total (34596)
1	07-22-88	2014	<5.0	<5.0	<5.0	<30.0	<20.0	<5.0	<5.0	<10.0
3	07-18-88	1231	<5.0	<5.0	<5.0	<30.0	<20.0	<5.0	<5.0	<10.0
4	05-02-88	1015	<5.0	--	--	<30.0	<20.0	--	--	--
5	07-18-88	1035	<5.0	<5.0	<5.0	<30.0	<20.0	<5.0	<5.0	<10.0
6	07-18-88	1405	<5.0	<5.0	<5.0	<30.0	<20.0	<5.0	<5.0	<10.0
7	07-18-88	1625	<5.0	<5.0	<5.0	<30.0	<20.0	<5.0	<5.0	<10.0
8	07-18-88	1808	<5.0	<5.0	<5.0	<30.0	<20.0	<5.0	<5.0	<10.0
9	07-21-88	1051	<5.0	<5.0	<5.0	<30.0	<20.0	<5.0	<5.0	<10.0
10	08-17-88	2115	<5.0	--	--	<30.0	<20.0	--	--	--
10	08-18-88	0215	<5.0	--	--	<30.0	<20.0	--	--	--
10	04-25-89	1230	<5.0	<5.0	<5.0	<30.0	<20.0	<5.0	<5.0	<10.0
10	05-19-89	1415	<5.0	<5.0	<5.0	<30.0	<20.0	<5.0	<5.0	<10.0
10	05-19-89	1915	<5.0	<5.0	<5.0	<30.0	<20.0	<5.0	<5.0	<10.0
10	05-20-89	0016	<5.0	<5.0	<5.0	<30.0	<20.0	<5.0	<5.0	<10.0
10	05-20-89	0017	<5.0	<5.0	<5.0	<30.0	<20.0	<5.0	<5.0	<10.0
10	06-22-89	1020	<5.0	<5.0	<5.0	<30.0	<20.0	<5.0	<5.0	<10.0
12	07-19-88	1659	<5.0	<5.0	<5.0	<30.0	<20.0	<5.0	<5.0	<10.0
12	07-19-88	1748	<5.0	<5.0	<5.0	<30.0	<20.0	<5.0	<5.0	<10.0
13	06-20-88	0755	<5.0	--	--	<30.0	<20.0	--	--	--
13	06-21-88	0155	<5.0	--	--	<30.0	<20.0	--	--	--
13	06-21-88	0555	<5.0	--	--	<30.0	<20.0	--	--	--
13	06-28-88	1130	<5.0	--	--	<30.0	<20.0	--	--	--
13	06-29-88	0430	<5.0	--	--	<30.0	<20.0	--	--	--
13	06-29-88	0930	<5.0	--	--	<30.0	<20.0	--	--	--
13	07-13-88	1015	<5.0	--	--	<30.0	<20.0	--	--	--
13	05-01-89	1045	<5.0	<5.0	<5.0	<30.0	<20.0	<5.0	<5.0	<10.0
13	06-22-89	1130	<5.0	<5.0	<5.0	<30.0	<20.0	<5.0	<5.0	<10.0
14	05-03-88	1431	<5.0	--	--	<30.0	<20.0	--	--	--
14	06-08-88	1030	<5.0	--	--	<30.0	<20.0	--	--	--
14	07-06-88	1401	<5.0	--	--	<30.0	<20.0	--	--	--

Table 10.--Concentration of base-, neutral-, and acid-extractable semivolatile organic chemicals in stream water in the upper Illinois River basin during the preliminary sampling, synoptic investigation, followup monitoring, and runoff events--Continued

Map reference number	Date	Time	2,4-Dimethyl-phenol, total (34606)	Dimethyl-phthalate, total (34341)	Di-n-butyl-phthalate, total (39110)	4,6-Dinitro-ortho-cresol, total (34657)	2,4-Dinitro-phenol, total (34616)	2,4-Dinitro-toluene, total (34611)	2,6-Dinitro-toluene, total (34626)	Di-n-octyl-phthalate, total (34596)
14	08-10-88	1610	<5.0	--	--	<30.0	<20.0	--	--	--
14	08-10-88	1615	<5.0	--	--	<30.0	<20.0	--	--	--
14	09-12-88	1600	<5.0	--	--	<30.0	<20.0	--	--	--
16	07-21-88	2109	<5.0	<5.0	<5.0	<30.0	<20.0	<5.0	<5.0	<10.0
16	07-21-88	2109	<5.0	<5.0	<5.0	<30.0	<20.0	<5.0	<5.0	<10.0
17	07-19-88	1422	<5.0	<5.0	<5.0	<30.0	<20.0	<5.0	<5.0	<10.0
17	07-19-88	1457	<5.0	<5.0	<5.0	<30.0	<20.0	<5.0	<5.0	<10.0
18	07-20-88	1113	<5.0	<5.0	<5.0	<30.0	<20.0	<5.0	<5.0	<10.0
18	07-20-88	1400	<5.0	<5.0	<5.0	<30.0	<20.0	<5.0	<5.0	<10.0
19	05-03-88	1300	<5.0	--	--	<30.0	<20.0	--	--	--
19	06-07-88	1520	<5.0	--	--	<30.0	<20.0	--	--	--
19	07-06-88	1031	<5.0	--	--	<30.0	<20.0	--	--	--
19	08-10-88	1320	<5.0	--	--	<30.0	<20.0	--	--	--
19	08-10-88	1330	<5.0	--	--	<30.0	<20.0	--	--	--
19	09-13-88	1000	<5.0	--	--	<30.0	<20.0	--	--	--
20	07-27-88	0622	<5.0	<5.0	<5.0	<30.0	<20.0	<5.0	<5.0	<10.0
22	07-22-88	0958	<5.0	<5.0	<5.0	<30.0	<20.0	<5.0	<5.0	<10.0
22	07-22-88	0958	<5.0	<5.0	<5.0	<30.0	<20.0	<5.0	<5.0	<10.0
23	07-18-88	1930	<5.0	<5.0	<5.0	<30.0	<20.0	<5.0	<5.0	<10.0
24	07-28-88	0545	<5.0	<5.0	<5.0	<30.0	<20.0	<5.0	<5.0	<10.0
26	07-22-88	1645	<5.0	<5.0	<5.0	<30.0	<20.0	<5.0	<5.0	<10.0
27	07-29-88	0815	<5.0	<5.0	<5.0	<30.0	<20.0	<5.0	<5.0	<10.0
28	07-19-88	0925	<5.0	<5.0	<5.0	<30.0	<20.0	<5.0	<5.0	<10.0
29	07-21-88	1324	<5.0	<5.0	<5.0	<30.0	<20.0	<5.0	<5.0	<10.0
30	07-22-88	1325	<5.0	<5.0	<5.0	<30.0	<20.0	<5.0	<5.0	<10.0
32	07-20-88	1332	<5.0	<5.0	<5.0	<30.0	<20.0	<5.0	<5.0	<10.0
33	05-04-88	1015	<5.0	--	--	<30.0	<20.0	--	--	--
33	06-07-88	1030	<5.0	--	--	<30.0	<20.0	--	--	--
33	06-08-88	1540	<5.0	--	--	<30.0	<20.0	--	--	--
34	07-19-88	0738	<5.0	<5.0	<5.0	<30.0	<20.0	<5.0	<5.0	<10.0

Table 10.--Concentration of base-, neutral-, and acid-extractable semivolatile organic chemicals in stream water in the upper Illinois River basin during the preliminary sampling, synoptic investigation, followup monitoring, and runoff events--Continued

Map reference number	Date	Time	Fluoranthene, total (34376)	Fluorene, total (34381)	Hexachlorobenzene, total (39700)	Hexachlorobutadiene, total (39702)	Hexachlorocyclopentadiene, total (34386)	Hexachloroethane, total (34396)	Indeno (1,2,3-CD) pyrene, total (34403)	Isophorone, total (34408)
1	07-22-88	2014	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<10.0	<5.0
3	07-18-88	1231	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<10.0	<5.0
4	05-02-88	1015	--	--	--	--	--	--	--	--
5	07-18-88	1035	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<10.0	<5.0
6	07-18-88	1405	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<10.0	<5.0
7	07-18-88	1625	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<10.0	<5.0
8	07-18-88	1808	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<10.0	<5.0
9	07-21-88	1051	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<10.0	<5.0
10	08-17-88	2115	--	--	--	--	--	--	--	--
10	08-18-88	0215	--	--	--	--	--	--	--	--
10	04-25-89	1230	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<10.0	<5.0
10	05-19-89	1415	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<10.0	<5.0
10	05-19-89	1915	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<10.0	<5.0
10	05-20-89	0016	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<10.0	<5.0
10	05-20-89	0017	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<10.0	<5.0
10	06-22-89	1020	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<10.0	<5.0
12	07-19-88	1659	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<10.0	<5.0
12	07-19-88	1748	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<10.0	<5.0
13	06-20-88	0755	--	--	--	--	--	--	--	--
13	06-21-88	0155	--	--	--	--	--	--	--	--
13	06-21-88	0555	--	--	--	--	--	--	--	--
13	06-28-88	1130	--	--	--	--	--	--	--	--
13	06-29-88	0430	--	--	--	--	--	--	--	--
13	06-29-88	0930	--	--	--	--	--	--	--	--
13	07-13-88	1015	--	--	--	--	--	--	--	--
13	05-01-89	1045	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<10.0	<5.0
13	06-22-89	1130	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<10.0	<5.0
14	05-03-88	1431	--	--	--	--	--	--	--	--
14	06-08-88	1030	--	--	--	--	--	--	--	--
14	07-06-88	1401	--	--	--	--	--	--	--	--

Table 10.--Concentration of base-, neutral-, and acid-extractable semivolatile organic chemicals in stream water in the upper Illinois River basin during the preliminary sampling, synoptic investigation, followup monitoring, and runoff events--Continued

Map reference number	Date	Time	Fluor-anthene, total (34376)	Fluorene, total (34381)	Hexa-chloro-benzene, total (39700)	Hexa-chloro-butadiene, total (39702)	Hexa-chloro-cyclo-pentadiene, total (34386)	Hexa-chloro-ethane, total (34396)	Indeno (1,2,3-CD) pyrene, total (34403)	Isophorone, total (34408)
14	08-10-88	1610	--	--	--	--	--	--	--	--
14	08-10-88	1615	--	--	--	--	--	--	--	--
14	09-12-88	1600	--	--	--	--	--	--	--	--
16	07-21-88	2109	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<10.0	<5.0
16	07-21-88	2109	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<10.0	<5.0
17	07-19-88	1422	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<10.0	<5.0
17	07-19-88	1457	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<10.0	<5.0
18	07-20-88	1113	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<10.0	<5.0
18	07-20-88	1400	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<10.0	<5.0
19	05-03-88	1300	--	--	--	--	--	--	--	--
19	06-07-88	1520	--	--	--	--	--	--	--	--
19	07-06-88	1031	--	--	--	--	--	--	--	--
19	08-10-88	1320	--	--	--	--	--	--	--	--
19	08-10-88	1330	--	--	--	--	--	--	--	--
19	09-13-88	1000	--	--	--	--	--	--	--	--
20	07-27-88	0622	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<10.0	<5.0
22	07-22-88	0958	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<10.0	<5.0
22	07-22-88	0958	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<10.0	<5.0
23	07-18-88	1930	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<10.0	<5.0
24	07-28-88	0545	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<10.0	<5.0
26	07-22-88	1645	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<10.0	<5.0
27	07-29-88	0815	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<10.0	<5.0
28	07-19-88	0925	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<10.0	<5.0
29	07-21-88	1324	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<10.0	<5.0
30	07-22-88	1325	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<10.0	<5.0
32	07-20-88	1332	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<10.0	<5.0
33	05-04-88	1015	--	--	--	--	--	--	--	--
33	06-07-88	1030	--	--	--	--	--	--	--	--
33	06-08-88	1540	--	--	--	--	--	--	--	--
34	07-19-88	0738	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<10.0	<5.0

Table 10.--Concentration of base-, neutral-, and acid-extractable semivolatile organic chemicals in stream water in the upper Illinois River basin during the preliminary sampling, synoptic investigation, followup monitoring, and runoff events--Continued

Map reference number	Date	Time	Naphthalene, total (34696)	N-nitrosodi-n-propylamine, total (34428)	N-nitrosodiphenylamine, total (34433)	N-nitrosodimethylamine, total (34438)	Nitrobenzene, total (34447)	2-Nitrophenol, total (34591)	4-Nitrophenol, total (34646)	Parachloro-metacresol, total (34452)
1	07-22-88	2014	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<30.0	<30.0
3	07-18-88	1231	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<30.0	<30.0
4	05-02-88	1015	--	--	--	--	--	<5.0	<30.0	<30.0
5	07-18-88	1035	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<30.0	<30.0
6	07-18-88	1405	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<30.0	<30.0
7	07-18-88	1625	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<30.0	<30.0
8	07-18-88	1808	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<30.0	<30.0
9	07-21-88	1051	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<30.0	<30.0
10	08-17-88	2115	--	--	--	--	--	<5.0	<30.0	<30.0
10	08-18-88	0215	--	--	--	--	--	<5.0	<30.0	<30.0
10	04-25-89	1230	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<30.0	<30.0
10	05-19-89	1415	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<30.0	<30.0
10	05-19-89	1915	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<30.0	<30.0
10	05-20-89	0016	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<30.0	<30.0
10	05-20-89	0017	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<30.0	<30.0
10	06-22-89	1020	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<30.0	<30.0
12	07-19-88	1659	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<30.0	<30.0
12	07-19-88	1748	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<30.0	<30.0
13	06-20-88	0755	--	--	--	--	--	<5.0	<30.0	<30.0
13	06-21-88	0155	--	--	--	--	--	<5.0	<30.0	<30.0
13	06-21-88	0555	--	--	--	--	--	<5.0	<30.0	<30.0
13	06-28-88	1130	--	--	--	--	--	<5.0	<30.0	<30.0
13	06-29-88	0430	--	--	--	--	--	<5.0	<30.0	<30.0
13	06-29-88	0930	--	--	--	--	--	<5.0	<30.0	<30.0
13	07-13-88	1015	--	--	--	--	--	<5.0	<30.0	<30.0
13	05-01-89	1045	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<30.0	<30.0
13	06-22-89	1130	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<30.0	<30.0
14	05-03-88	1431	--	--	--	--	--	<5.0	<30.0	<30.0
14	06-08-88	1030	--	--	--	--	--	<5.0	<30.0	<30.0
14	07-06-88	1401	--	--	--	--	--	<5.0	<30.0	<30.0

Table 10.--Concentration of base-, neutral-, and acid-extractable semivolatile organic chemicals in stream water in the upper Illinois River basin during the preliminary sampling, synoptic investigation, followup monitoring, and runoff events--Continued

Map reference number	Date	Time	Naphthalene, total (34696)	N-nitrosodi-n-propylamine, total (34428)	N-nitrosodiphenylamine, total (34433)	N-nitrosodimethylamine, total (34438)	Nitrobenzene, total (34447)	2-Nitrophenol, total (34591)	4-Nitrophenol, total (34646)	Parachloro-metacresol, total (34452)
14	08-10-88	1610	--	--	--	--	--	<5.0	<30.0	<30.0
14	08-10-88	1615	--	--	--	--	--	<5.0	<30.0	<30.0
14	09-12-88	1600	--	--	--	--	--	<5.0	<30.0	<30.0
16	07-21-88	2109	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<30.0	<30.0
16	07-21-88	2109	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<30.0	<30.0
17	07-19-88	1422	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<30.0	<30.0
17	07-19-88	1457	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<30.0	<30.0
18	07-20-88	1113	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<30.0	<30.0
18	07-20-88	1400	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<30.0	<30.0
19	05-03-88	1300	--	--	--	--	--	<5.0	<30.0	<30.0
19	06-07-88	1520	--	--	--	--	--	<5.0	<30.0	<30.0
19	07-06-88	1031	--	--	--	--	--	<5.0	<30.0	<30.0
19	08-10-88	1320	--	--	--	--	--	<5.0	<30.0	<30.0
19	08-10-88	1330	--	--	--	--	--	<5.0	<30.0	<30.0
19	09-13-88	1000	--	--	--	--	--	<5.0	<30.0	<30.0
20	07-27-88	0622	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<30.0	<30.0
22	07-22-88	0958	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<30.0	<30.0
22	07-22-88	0958	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<30.0	<30.0
23	07-18-88	1930	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<30.0	<30.0
24	07-28-88	0545	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<30.0	<30.0
26	07-22-88	1645	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<30.0	<30.0
27	07-29-88	0815	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<30.0	<30.0
28	07-19-88	0925	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<30.0	<30.0
29	07-21-88	1324	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<30.0	<30.0
30	07-22-88	1325	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<30.0	<30.0
32	07-20-88	1332	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<30.0	<30.0
33	05-04-88	1015	--	--	--	--	--	<5.0	<30.0	<30.0
33	06-07-88	1030	--	--	--	--	--	<5.0	<30.0	<30.0
33	06-08-88	1540	--	--	--	--	--	<5.0	<30.0	<30.0
34	07-19-88	0738	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<30.0	<30.0

Table 10.--Concentration of base-, neutral-, and acid-extractable semivolatile organic chemicals in stream water in the upper Illinois River basin during the preliminary sampling, synoptic investigation, followup monitoring, and runoff events--Continued

Map reference number	Date	Time	Penta-chloro-phenol, total (39032)	Phen-anthrene, total (34461)	Phenol (C_6H_5OH), total (34694)	Pyrene, total (34469)	1,2,4-Trichloro-benzene, total (34551)	2,4,6-Trichloro-phenol, total (34621)
1	07-22-88	2014	<30.0	<5.0	<5.0	<5.0	<5.0	<20.0
3	07-18-88	1231	<30.0	<5.0	<5.0	<5.0	<5.0	<20.0
4	05-02-88	1015	<30.0	--	<5.0	--	--	<20.0
5	07-18-88	1035	<30.0	<5.0	<5.0	<5.0	<5.0	<20.0
6	07-18-88	1405	<30.0	<5.0	<5.0	<5.0	<5.0	<20.0
7	07-18-88	1625	<30.0	<5.0	<5.0	<5.0	<5.0	<20.0
8	07-18-88	1808	<30.0	<5.0	<5.0	<5.0	<5.0	<20.0
9	07-21-88	1051	<30.0	<5.0	<5.0	<5.0	<5.0	<20.0
10	08-17-88	2115	<30.0	--	<5.0	--	--	<20.0
10	08-18-88	0215	<30.0	--	<5.0	--	--	<20.0
10	04-25-89	1230	<30.0	<5.0	<5.0	<5.0	<5.0	<20.0
10	05-19-89	1415	<30.0	<5.0	<5.0	<5.0	<5.0	<20.0
10	05-19-89	1915	<30.0	<5.0	<5.0	<5.0	<5.0	<20.0
10	05-20-89	0016	<30.0	<5.0	<5.0	<5.0	<5.0	<20.0
10	05-20-89	0017	<30.0	<5.0	<5.0	<5.0	<5.0	<20.0
10	06-22-89	1020	<30.0	<5.0	<5.0	<5.0	<5.0	<20.0
12	07-19-88	1659	<30.0	<5.0	<5.0	<5.0	<5.0	<20.0
12	07-19-88	1748	<30.0	<5.0	<5.0	<5.0	<5.0	<20.0
13	06-20-88	0755	<30.0	--	<5.0	--	--	<20.0
13	06-21-88	0155	<30.0	--	<5.0	--	--	<20.0
13	06-21-88	0555	<30.0	--	<5.0	--	--	<20.0
13	06-28-88	1130	<30.0	--	<5.0	--	--	<20.0
13	06-29-88	0430	<30.0	--	<5.0	--	--	<20.0
13	06-29-88	0930	<30.0	--	<5.0	--	--	<20.0
13	07-13-88	1015	<30.0	--	<5.0	--	--	<20.0
13	05-01-89	1045	<30.0	<5.0	<5.0	<5.0	<5.0	<20.0
13	06-22-89	1130	<30.0	<5.0	<5.0	<5.0	<5.0	<20.0
14	05-03-88	1431	<30.0	--	<5.0	--	--	<20.0
14	06-08-88	1030	<30.0	--	<5.0	--	--	<20.0
14	07-06-88	1401	<30.0	--	<5.0	--	--	<20.0

Table 10.--Concentration of base-, neutral-, and acid-extractable semivolatile organic chemicals in stream water in the upper Illinois River basin during the preliminary sampling, synoptic investigation, followup monitoring, and runoff events--Continued

Map reference number	Date	Time	Penta-chloro-phenol, total (39032)	Phen-anthrene, total (34461)	Phenol (C_6H_5OH), total (34694)	Pyrene, total (34469)	1,2,4-Trichloro-benzene, total (34551)	2,4,6-Trichloro-phenol, total (34621)
14	08-10-88	1610	<30.0	--	<5.0	--	--	<20.0
14	08-10-88	1615	<30.0	--	<5.0	--	--	<20.0
14	09-12-88	1600	<30.0	--	<5.0	--	--	<20.0
16	07-21-88	2109	<30.0	<5.0	<5.0	<5.0	<5.0	<20.0
16	07-21-88	2109	<30.0	<5.0	<5.0	<5.0	<5.0	<20.0
17	07-19-88	1422	<30.0	<5.0	<5.0	<5.0	<5.0	<20.0
17	07-19-88	1457	<30.0	<5.0	<5.0	<5.0	<5.0	<20.0
18	07-20-88	1113	<30.0	<5.0	<5.0	<5.0	<5.0	<20.0
18	07-20-88	1400	<30.0	<5.0	<5.0	<5.0	<5.0	<20.0
19	05-03-88	1300	<30.0	--	<5.0	--	--	<20.0
19	06-07-88	1520	<30.0	--	<5.0	--	--	<20.0
19	07-06-88	1031	<30.0	--	<5.0	--	--	<20.0
19	08-10-88	1320	<30.0	--	<5.0	--	--	<20.0
19	08-10-88	1330	<30.0	--	<5.0	--	--	<20.0
19	09-13-88	1000	<30.0	--	<5.0	--	--	<20.0
20	07-27-88	0622	<30.0	<5.0	<5.0	<5.0	<5.0	<20.0
22	07-22-88	0958	<30.0	<5.0	<5.0	<5.0	<5.0	<20.0
22	07-22-88	0958	<30.0	<5.0	<5.0	<5.0	<5.0	<20.0
23	07-18-88	1930	<30.0	<5.0	<5.0	<5.0	<5.0	<20.0
24	07-28-88	0545	<30.0	<5.0	<5.0	<5.0	<5.0	<20.0
26	07-22-88	1645	<30.0	<5.0	<5.0	<5.0	<5.0	<20.0
27	07-29-88	0815	<30.0	<5.0	<5.0	<5.0	<5.0	<20.0
28	07-19-88	0925	<30.0	<5.0	<5.0	<5.0	<5.0	<20.0
29	07-21-88	1324	<30.0	<5.0	<5.0	<5.0	<5.0	<20.0
30	07-22-88	1325	<30.0	<5.0	<5.0	<5.0	<5.0	<20.0
32	07-20-88	1332	<30.0	<5.0	<5.0	<5.0	<5.0	<20.0
33	05-04-88	1015	<30.0	--	<5.0	--	--	<20.0
33	06-07-88	1030	<30.0	--	<5.0	--	--	<20.0
33	06-08-88	1540	<30.0	--	<5.0	--	--	<20.0
34	07-19-88	0738	<30.0	<5.0	<5.0	<5.0	<5.0	<20.0

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