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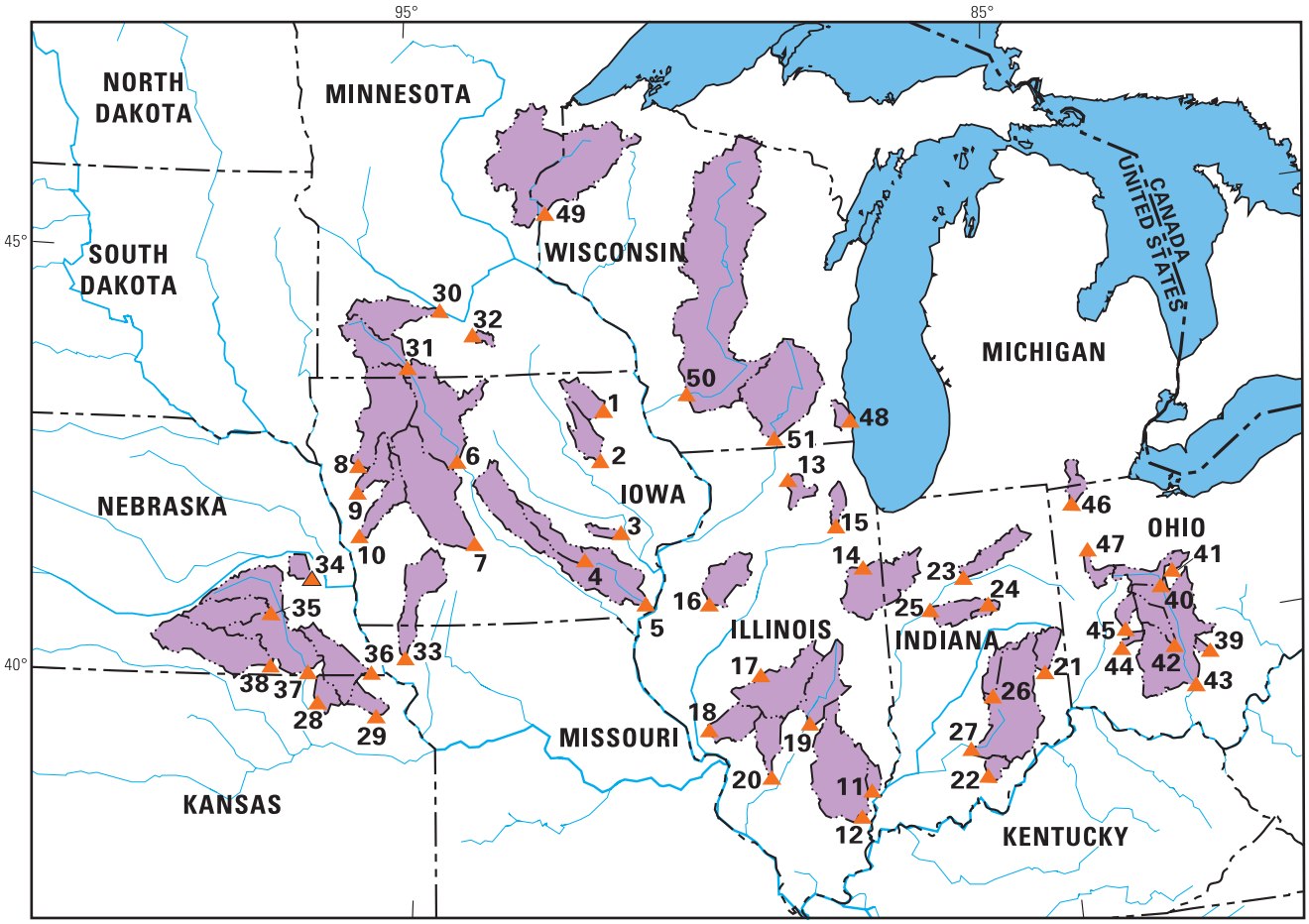
Reconnaissance Data for Glyphosate, Other Selected Herbicides, Their Degradation Products, and Antibiotics in 51 Streams in Nine Midwestern States, 2002

Open-File Report 03–217



U.S. Department of the Interior
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By ELISABETH A. SCRIBNER, WILLIAM A. BATTAGLIN, JULIE E. DIETZE, and E.M. THURMAN

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Lawrence, Kansas
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U.S. Department of the Interior

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Conversion Factors

Multiply	By	To obtain
acre	4,047	square meter (m^2)
cubic foot per second (ft^3/s)	0.02832	cubic meter per second (m^3/s)
pound (lb)	453.6	gram (g)
pound per acre (lb/acre)	1.121	kilogram per hectare (kg/ha)
square mile (mi^2)	2.590	square kilometer (km^2)

Temperature can be converted to degrees Celsius (^oC) or degrees Fahrenheit (^oF) by the equations:

$^oC = 5/9\ (^oF-32)$

$^oF = 9/5\ (^oC)+32.$

Miscellaneous Abbreviations

AMPA	aminomethylphosphonic acid
C	carbon
CAAT	didealkylatrazine
CAC	cyanazine acid
CAFO	confined animal feedlot
CAM	cyanazine amide
CEAT	deisopropylatrazine
CIAT	deethylatrazine
Cl	chloride
DCAC	deethylcyanazine acid
DCAM	deethylcyanazine amide
DEC	deethylcyanazine
DMFM	demethylfluometuron
ESA	ethanesulfonic acid
GC/MS	gas chromatography/mass spectrometry
GCS	laboratory method analysis code for U.S. Geological Survey method O–2132–99
LC	liquid chromatograph
LCAA	laboratory method analysis code for U.S. Geological Survey method O–2134–00
LCAN	laboratory method analysis code for U.S. Geological Survey method for antibiotics
LCEA	laboratory method analysis code for U.S. Geological Survey method O–2138–02
LCGY	laboratory method analysis code for U.S. Geological Survey method O–2136–01
LC/MS	liquid chromatography/mass spectrometry
MRL	method reporting limit
MS	mass spectrometer
N	nitrogen
OEAT	deisopropylhydroxyatrazine
OIAT	deethylhydroxyatrazine
OXA	oxanilic acid
SAA	sulfonylacetic acid
SPE	solid-phase extraction
USEPA	U.S. Environmental Protection Agency
USGS	U.S. Geological Survey

Abbreviated Water-Quality Units

micrograms per liter (µg/L)
micrometer (µm)
microsiemen per centimeter at 25 degrees Celsius (µS/cm)
milliliter (mL)
millimeter (mm)

Datum

Horizontal coordinate information is referenced to the North American Datum of 1983 (NAD 83).

Reconnaissance Data for Glyphosate, Other Selected Herbicides, their Degradation Products, and Antibiotics in 51 Streams in Nine Midwestern States, 2002

By Elisabeth A. Scribner, William A. Battaglin, Julie E. Dietze, *and* E.M. Thurman

Abstract

Since 1989, the U.S. Geological Survey has conducted periodic reconnaissance studies of streams in the Midwestern United States to determine the geographic and seasonal distribution of herbicide compounds. These studies have documented that large amounts of acetochlor, alachlor, atrazine, cyanazine, metolachlor, and their degradation products are flushed into streams during post-application runoff. Additional studies show that peak herbicide concentrations tend to occur during the first runoff after herbicide application and that herbicide flushes can occur during runoff for several weeks to months following application.

Since the first stream study conducted in 1989, several significant changes in herbicide use have occurred. The most substantial change is the tripling in the use of glyphosate during the past 5 years. Over this same time period (1997–2001), usage of acetochlor and atrazine increased slightly, whereas alachlor, cyanazine, and metolachlor usage decreased.

During 2002, 154 samples were collected from 51 streams in nine Midwestern States during three periods of runoff. This report provides a compilation of the analytical results of five laboratory methods. Results show that glyphosate was detected in 55 (36 percent) of the samples, and aminomethylphosphonic acid (a degradation product of glyphosate) was detected in 107 (69 percent) of the samples. Atrazine, the most frequently detected herbicide, was found in 93 percent of the samples, followed by metolachlor, found in 73 percent of the samples; metolachlor ethanesulfonic acid (ESA) and oxanilic acid (OXA) were the most frequently detected herbicide degradation products, both being found in more than 95 percent of the samples. The data presented here are valuable for comparison with results from the earlier reconnaissance studies.

INTRODUCTION

This study was conducted by the U.S. Geological Survey (USGS) as part of the Toxic Substances Hydrology Program in cooperation with the U.S. Environmental Protection Agency (USEPA). The report presents the analytical results from a study of the occurrence of glyphosate, other selected herbicides, their degradation products, and antibiotics in 51 streams in nine Midwestern States—Illinois, Indiana, Iowa, Kansas, Minnesota, Missouri, Nebraska, Ohio, and Wisconsin (fig. 1) during 2002.

Previous Studies

During 1989, the USGS conducted a reconnaissance study of 147 streams in 10 Midwestern States to determine the geographic and seasonal distribution of herbicides and their degradation products (Scribner and others, 1993). The streams were sampled in spring before application of herbicides, during the first runoff event after application of herbicides, and during a low-flow period in the fall. Results from the 1989 study showed that large amounts of alachlor, atrazine,

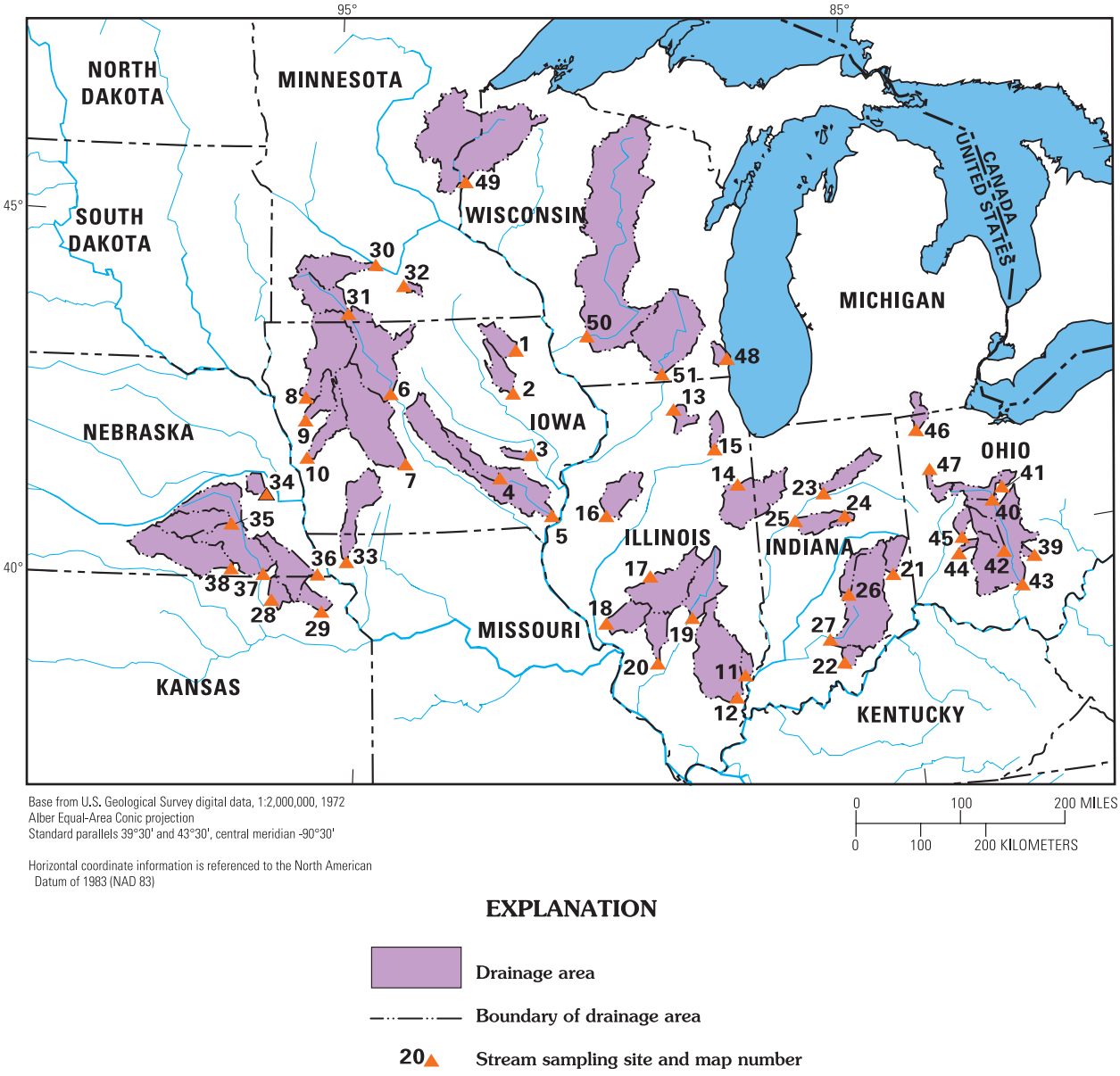

Figure 1. Location of study area, stream sampling sites, and associated drainage areas sampled during 2002.

cyanazine, metolachlor, and their degradation products were flushed into streams during the first runoff after herbicide application (Goolsby and others, 1991; Thurman and others, 1991, 1992; Goolsby and Battaglin, 1993).

A follow-up study of 53 streams was conducted in 1990 because of increased concern about the findings of high concentrations of post-emergent herbicides. The distributions of the concentrations of the major herbicides detected in 50 streams were the same for both 1989 and 1990 pre- and post-emergent periods (Goolsby and others, 1991). These results further indicated that the flush of herbicides into surface water following application is an annual occurrence. Studies by the USGS in 1990 and 1991 using automatic samplers (Thurman and others, 1992; Scribner and others, 1994) showed that the peak herbicide concentration tends to occur during the first runoff after herbicide application and that herbicide flushes can occur during runoff for several weeks to several months following application. By late summer, herbicide concentrations are generally low (less than 0.50 µg/L) and tend to remain low until the following planting season.

Recent studies of these 53 stream-site samples demonstrate that the concentrations of several herbicides in Midwestern streams have decreased since 1989 (Battaglin and Goolsby, 1999; Scribner and others, 1998, 2000). In some cases, these decreases correspond to declines in herbicide application amounts, whereas in other cases, the reason for the decrease could be changes in application practices. These studies also have documented the widespread occurrence of herbicide degradation products in Midwestern streams. In the 1998 stream reconnaissance, the median concentrations of acetochlor, alachlor, and metolachlor were all less than the median concentration of one or more of their degradation products. This would be expected later in the summer during low-flow conditions but was not expected during high-flow conditions (Battaglin and others, 2003). In previous studies at these sites, analyses were not available for glyphosate and antibiotics.

Changes in Herbicide Use Since 1989

Since the first stream reconnaissance study conducted in 1989, several significant changes have occurred in herbicide use in the nine Midwestern States shown in figure 1. Two decreases have occurred in the maximum application rate of atrazine recommended on the manufacturers' labels. In 1990, the manufacturers of atrazine voluntarily reduced the maximum recommended application rate for atrazine from 4 to 3 lb active ingredient per acre per year for corn and sorghum (USEPA, written commun., January 23, 1990). In 1992, the manufacturers of atrazine again voluntarily reduced the maximum recommended application rate of atrazine to a range of 1.6 to 2.5 lb active ingredient per acre per year depending on soil organic residue and erosion potential (USEPA, written commun., March 8, 1993).

The manufacturer of cyanazine voluntarily reduced the maximum recommended application rate in 1996 from 6.5 to 5 lb/acre, in 1997 to 3 lb/acre, and in January 1998 to 1 lb/acre. On December 31, 1999, the manufacture of cyanazine was discontinued, with distribution of existing supplies discontinued on September 30, 2002 (Tony Catka, Dupont, oral commun., September 14, 2000).

Acetochlor was approved for registration by the USEPA in 1994 for use on corn. The agency stipulated that its continued registration depended on a 5-year target of 66.3 million lb of active ingredient per acre per year cumulative reduction in adjusted usage of other corn herbicides including alachlor, atrazine, butylate, EPTC, metolachlor, and 2,4-D. The 5-year target was exceeded by about 4 million lb of active ingredient per acre per year in 1998. The 1999 usage was about 70 million lb less than in 1992 (U.S. Environmental Protection Agency, 2003).

The manufacturer of metolachlor refined its product in 1999 by producing primarily the active enantiomer (s-metolachlor), which effectively reduced the required application rates by one-third or more (Benbrook, 2001).

A rapid increase in usage for the herbicide glyphosate, also known commercially as Roundup™, is shown in figure 2. Glyphosate is a broad-spectrum herbicide used for control of grass and broadleaf weeds that was first applied to crops in the early 1970s. Between 1997 and 2001, glyphosate use more than tripled from 10.3 to 36.1 million lb per year applied in the Midwestern States (U.S. Department of Agriculture, 2002). The increase in glyphosate use can be attributed to the cultivation of genetically engineered plants that allow farmers to apply glyphosate over growing row crops, killing most weeds but leaving the crops unharmed.

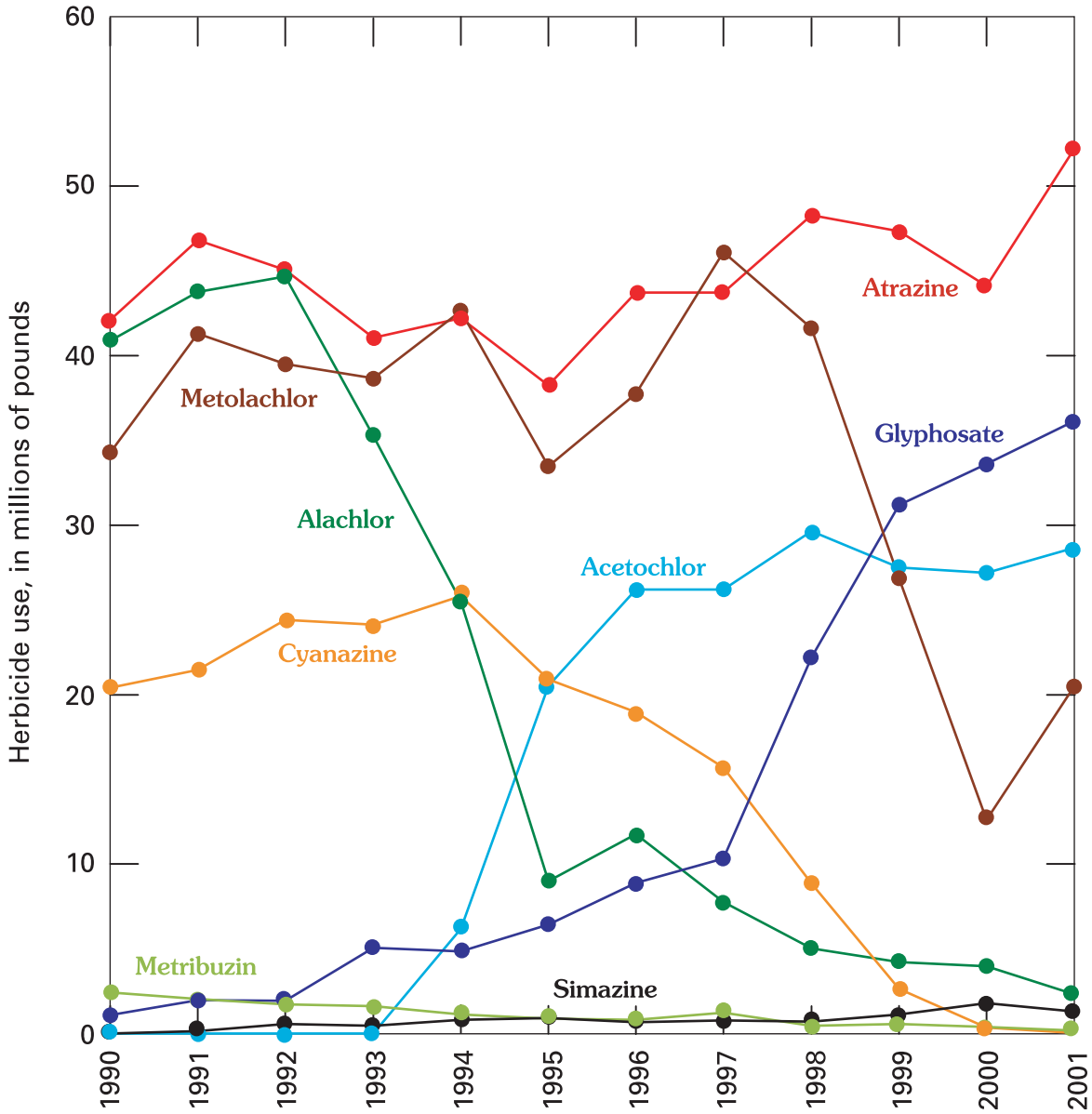

Figure 2. Herbicide use in Midwestern United States, 1990–2001 (data from U.S. Department of Agriculture, 2002).

In summary, during 1997 to 2001, the following herbicides increased in usage as follows (U.S. Department of Agriculture, 2002):

- acetochlor—26.1 to 28.7 million lb
- atrazine—43.7 to 52.27 million lb
- simazine—0.8 to 1.37 million lb

During this same time period, these herbicides decreased in usage as follows (U.S. Department of Agriculture, 2002):

- alachlor—7.8 to 2.37 million lb
- cyanazine—15.7 to 0.057 million lb
- metolachlor—46.1 to 20.57 million lb
- metribuzin—1.2 to 0.27 million lb

Herbicide Degradation Products

Previous studies have reported the widespread occurrence of herbicide degradation products (Thurman and others, 1994; Kalkhoff and others, 1998; Phillips and others, 1999; Battaglin and others, 2001). A study by Thurman and others (1994) found that parent triazine herbicides, including atrazine, cyanazine, propazine, and simazine, degrade to deethylatrazine (CIAT) and deisopropylatrazine (CEAT), both of which occur in surface water (fig. 3). It is hypothesized that the continued degradation of CIAT and CEAT will result in didealkylatrazine (CAAT). Further studies by Lerch and others (1998) discuss the

effects and contribution of hydroxylated atrazine degradation products, including hydroxyatrazine (OIET), deethylhydroxyatrazine (OIAT), and deisopropylhydroxyatrazine (OEAT), to streams in northern Missouri.

The acetamide herbicides (acetochlor, alachlor, dimethenamid, flufenacet, metolachlor, and propachlor) degrade to their ethanesulfonic acid (ESA) and oxanilic acid (OXA) degradation products in water. In samples collected in 1998 from Midwestern streams after herbicides had been applied and following the first precipitation that produced overland flow (runoff), the median concentration of acetochlor ESA and OXA, alachlor ESA, and metolachlor ESA exceeded the median concentrations of the source herbicides (Battaglin and others, 2001).

Demethylation of the phenylurea herbicides is a common degradation pathway that occurs in fluometuron to its degradation product, demethylfluometuron (DMFM) (Thurman and others, 2000). DMFM was detected in two streams during this study.

Glyphosate is a weak organic acid that consists of glycine moiety and a phosphonomethyl moiety. The primary degradation product of glyphosate is aminomethylphosphonic acid (AMPA), whose chemical structure is very similar to that of glyphosate. The main pathway of degradation of glyphosate appears to be by splitting the C-N bond to produce AMPA (World Health Organization, 1998).

Antibiotics

Recent studies have documented that antibiotics are present in selected United States streams (Kolpin and others, 2002). Several of the antibiotics found are those used in livestock production; however, the primary transport mechanisms of antibiotics to streams are not yet understood. Samples were collected during runoff in Midwestern streams to identify the dominant source of antibiotics in streams. If point sources such as sewage treatment discharges or confined animal feedlot (CAFO) discharges are the domi-

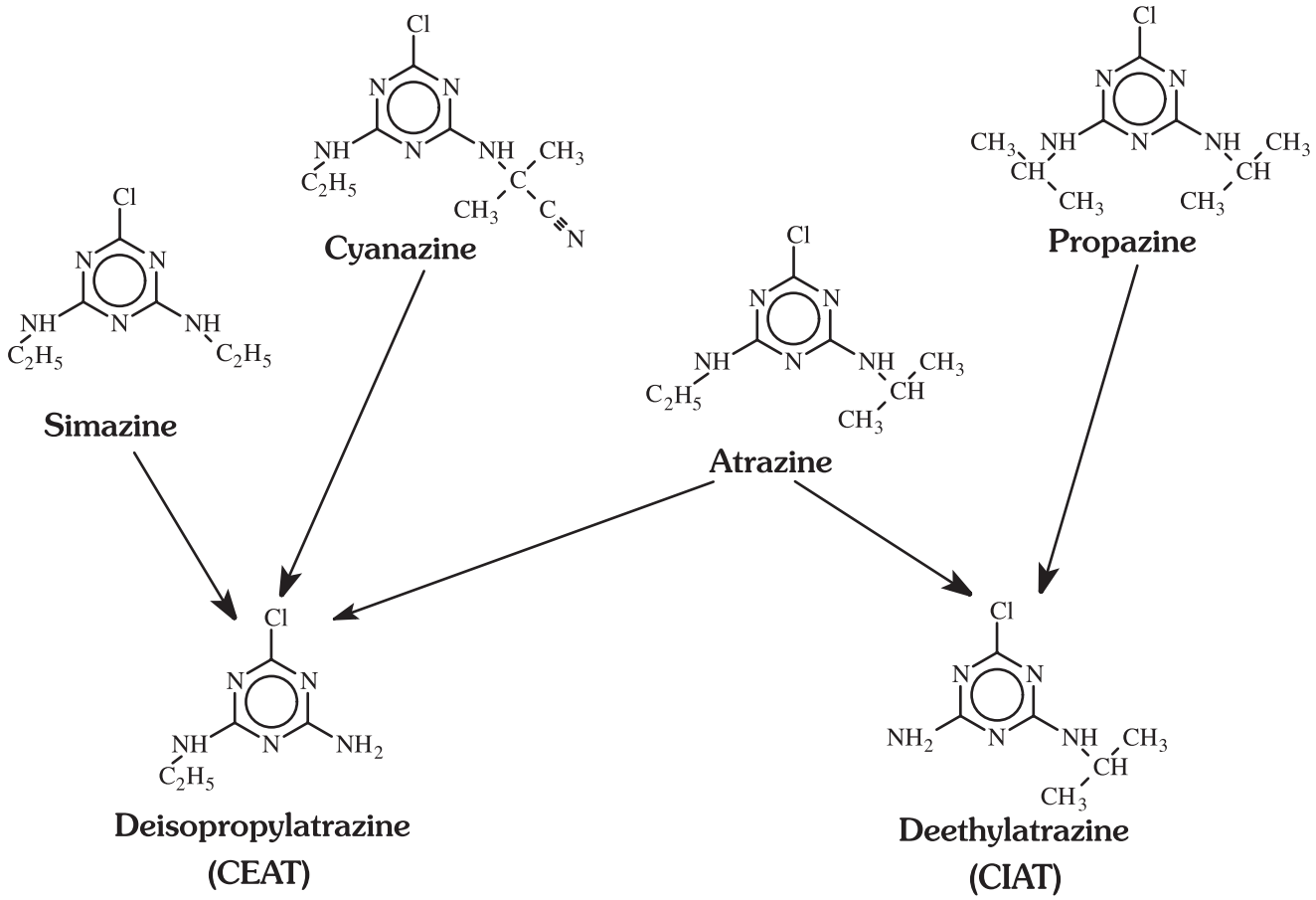

Figure 3. Pathways for degradation of atrazine, cyanazine, propazine, and simazine to deethylatrazine and deisopropylatrazine (Thurman and others, 1994).

nant source, then concentrations should be much lower during runoff than during lower flow conditions. However, if nonpoint sources (such as manure applications to fields) are dominant, then concentrations should be about the same or higher during runoff. Because manure applications also take place during the post-harvest period, fall and early winter storms may be "flushing" events for antibiotics.

Purpose and Scope of Report

This report presents the analytical results from 154 samples collected during 2002 from 51 streams in nine Midwestern States. Results are reported for 21 parent herbicides as follows: six acetamide compounds, one dinitroaniline compound, glufosinate, glyphosate, three phenylurea compounds, and nine triazine compounds. Results for 27 degradation products are reported as follows: 14 acetamide compounds, 1 glyphosate compound, 1 phenylurea compound, and 11 triazine compounds. Also, included are five classes of antibiotics, including three degradation products. This report also describes the selection of sampling sites, sample-collection and processing methods, laboratory methods, and quality-assurance procedures.

METHODS

Selection of Sampling Sites

Fifty-one streams were sampled during this study. Sampling-site names and locations are given in table 1, and the corresponding map locations are shown in figure 1. Also, included in table 1 is the drainage area for each sampling site.

Selection of the 53 sites was originally accomplished by ranking the 147 sites from the 1989 post-application sampling period (Scribner and others, 1993) from highest to lowest according to the total herbicide concentration detected. The total herbicide concentration was defined as the sum of the concentrations of all herbicides detected in each sample. The sites then were divided into three equal groups. Twenty-five sites were randomly selected from the group containing the highest concentrations. Similarly, 13 sites were randomly selected from the middle concentration group, and 12 sites were randomly selected from the low concentration group. Three additional sites were selected out of nine that were sampled in 1990 using automatic samplers to determine the temporal distribution of herbicides in several Midwestern streams (Scribner and others, 1994).

Fifty-one of these 53 sites sampled in 1990 (and again in 1994, 1995, and 1998) were sampled in 2002. Some minor changes to the site locations did occur. The site on the Turkey River at Spillville, Iowa, was moved downstream to near Eldorado, Iowa (map number 1); the site on the Rock River at Luverne, Minnesota, was replaced with a site on Little Cobb River near Beauford, Minnesota (map number 32); the White River near Nora, Indiana, was not sampled due to a log jam just upstream from the sampling site; and Salt Creek at Roca, Nebraska, was not sampled due to construction on the bridge used for sample collection.

Sample Collection

Three 125-mL samples were collected at each site during 2002. The first set of samples were collected after pre-emergence herbicides were applied (May or June) and following precipitation that produced runoff conditions and a measurable increase in streamflow. Ideally, streamflow would be at or above the 50th percentile of flow (50 percent exceeds streamflow for the period of record, published in annual USGS Water Data Reports). These samples are referred to as pre-emergence runoff samples. The second set of samples were collected after post-emergence herbicides, such as glyphosate, were applied (June or July) and again following precipitation that produced runoff conditions and streamflows at or above the 50th percentile. These samples are referred to as post-emergence runoff samples. The third set of samples was collected during or after harvest season (September through November) and following precipitation that produced runoff conditions and rising streamflows (Battaglin and others, 2003). These samples are referred to as harvest-season runoff samples.

Water samples were collected using methods described in Shelton (1994). The equal-width-increment sampling method (Edwards and Glysson, 1988) was used for collection of all samples.

Sample Processing

The water samples were filtered through a 0.7-µm pore-size baked glass-fiber filter using an aluminum

Table 1. Names, locations, and drainage areas for 51 stream sampling sites in nine Midwestern States, 2002

Map number (fig. 1)	U.S. Geological Survey site identification number	Site name	Latitude (degrees, minutes, sectionds)	Latitude (degrees, minutes, sectionds)	Drainage area (square miles)
		Iowa			
1	05411850	Turkey River near Eldorado	43°03'15"	91°48'32"	640
2	05421000	Wapsipinicon River at Independence	42°27'49"	91°53'42"	1,048
3	05455100	Old Mans Creek near Iowa City	41°36'25"	91°36'40"	201
4	05472500	North Skunk River near Sigourney	41°18'03"	92°12'16"	730
5	05474000	Skunk River at Augusta	40°45'13"	91°16'40"	4,303
6	05480500	Des Moines River at Fort Dodge	42°30'22"	94°12'04"	4,190
7	05484500	Raccoon River at Van Meter	41°32'02"	93°56'59"	3,441
8	06606600	Little Sioux River at Correctionville	42°28'20"	95°47'49"	2,500
9	06607200	Maple River at Mapleton	42°09'28"	95°48'27"	669
10	06609500	Boyer River at Logan	41°38'33"	95°46'57"	871
		Illinois			
11	03378000	Bonpas Creek at Browns	38°23'11"	87°58'32"	228
12	03381495	Little Wabash River at Carmi	38°05'32"	88°09'22"	3,088
13	05439500	South Branch Kishwaukee River at Fairdale	42°06'40"	88°54'00"	387
14	05526000	Iroquois River near Chebanese	41°00'32"	87°49'27"	2,091
15	05540500	Du Page River at Shorewood	41°31'20"	88°11'35"	324
16	05569500	Spoon River at London Mills	40°42'32"	90°16'53"	1,072
17	05576500	Sangamon River at Riverton	39°50'34"	89°32'52"	2,618
18	05587000	Macoupin Creek near Kane	39°14'03"	90°23'40"	868
19	05592100	Kaskaskia River near Cowden	39°13'50"	88°50'33"	1,330
20	05594000	Shoal Creek near Breese	38°36'35"	89°29'40"	735
		Indiana			
21	03275000	Whitewater River near Alpine	39°34'46"	85°09'29"	522
22	03302800	Blue River at Fredericksburg	38°26'02"	85°11'31"	283
23	03328500	Eel River near Logansport	40°46'55"	86°15'50"	789
24	03333450	Wildcat Creek near Jerome	40°26'29"	85°55'08"	146
25	03335000	Wildcat Creek near Lafayette	40°26'26"	86°49'45"	794
26	03362500	Sugar Creek near Edinburgh	39°21'39"	85°59'51"	474
27	03371500	East Fork White River near Bedford	38°46'10"	86°24'30"	3,861
		Kansas			
28	06885500	Black Vermillion River near Frankfort	39°41'03"	96°26'15"	410
29	06890100	Delaware River near Muscotah	39°31'17"	95°31'57"	431
		Minnesota			
30	05317000	Cottonwood River near New Ulm	44°17'29"	94°26'24"	1,280
31	05476000	Des Moines River at Jackson	43°37'10"	94°59'10"	1,220
32	05320270	Little Cobb River near Beauford	43°59'48"	93°54'30"	130

Table 1. Names, locations, and drainage areas for 51 stream sampling sites in nine Midwestern States, 2002—Continued

Map number (fig. 1)	U.S. Geological Survey site identification number	Site name	Latitude (degrees, minutes, sectionds)	Latitude (degrees, minutes, sectionds)	Drainage area (square miles)
		Missouri			
33	06817700	Nodaway River near Graham	40°12'08"	95°04'07"	1,320
		Nebraska			
34	06804000	Wahoo Creek at Ithaca	41°08'40"	96°32'10"	271
35	06880800	West Fork Big Blue River near Dorchester	40°43'52"	97°10'38"	1,206
36	06815000	Big Nemaha River at Falls City	40°02'08"	95°35'45"	1,340
37	06882000	Big Blue River at Barneston	40°02'40"	96°35'12"	4,447
38	06884000	Little Blue River near Fairbury	40°06'54"	97°10'13"	2,350
		Ohio			
39	03157000	Clear Creek near Rockbridge	39°35'18"	82°34'43"	89
40	03219500	Scioto River near Prospect	40°25'10"	83°11'50"	567
41	03223000	Olentangy River at Claridon	40°34'58"	82°59'20"	157
42	03230500	Big Darby Creek at Darbyville	39°42'02"	83°06'37"	534
43	03234500	Scioto River at Higby	39°12'44"	82°51'50"	5,131
44	03240000	Little Miami River near Oldtown	39°44'54"	83°55'53"	129
45	03267900	Mad River at Eagle City	39°57'51"	83°49'54"	310
46	04185000	Tiffin River at Stryker	41°30'16"	84°25'47"	410
47	04186500	Auglaize River near Fort Jennings	40°56'55"	84°15'58"	332
		Wisconsin			
48	04087240	Root River at Racine	42°45'05"	87°49'25"	190
49	05340500	St. Croix River at St. Croix Falls	45°24'25"	92°38'49"	6,240
50	05407000	Wisconsin River at Muscoda	43°11'54"	90°26'26"	10,400
51	05430500	Rock River at Afton	42°36'33"	89°04'14"	3,340

plate filter holder and a ceramic-piston fluid-metering pump with all Teflon tubing into precleaned 123-mL amber glass bottles. All sampling equipment was cleaned with a Liquinox/tapwater solution, rinsed thoroughly with tapwater, then rinsed with organic free, distilled, or deionized water, followed by a final rinse with methanol and organic-free water to remove traces of methanol. The equipment was then air dried. The filtrate was collected in eight heat-cleaned 125-mL amber glass bottles. The remainder of the water in the compositing container was used for onsite measurements of specific conductance, pH, and water temperature. All samples were chilled immediately and shipped to the USGS laboratory in Lawrence, Kansas, for analyses. At the USGS laboratory, samples were assigned identification numbers, logged into a database, and refrigerated at approximately 4 °C until analyzed within 7 days.

Laboratory Methods

The laboratory method analysis code, approved USGS method number, and reporting limit for chemical compounds using both gas chromatography/mass spectrometry (GC/MS) and liquid chromatography/mass spectrometry (LC/MS) are shown in table 2.

Gas Chromatography/Mass Spectrometry

Water samples were extracted and analyzed by GC/MS for six acetamide parent compounds, one dinitroaniline parent compound, nine triazine parent com-

Table 2. Chemical compounds, laboratory method analysis codes, USGS parameter codes, approved USGS method numbers, and reporting limits determined for water samples collected from 51 streams in nine Midwestern States, 2002

[USGS, U.S. Geological Survey, µg/L, micrograms per liter; --, no data]

Chemical compound	Laboratory method analysis	USGS parameter code	USGS method number	Reporting limit (µg/L)
	Parent herbicides			
Acetamides				
acetochlor	GCS	49260T	O–2132–99	0.05
alachlor	GCS	46342T	O–2132–99	.05
dimethenamid	GCS	61588T	O–2132–99	.05
flufenacet	GCS	62481T	O–2132–99	.05
metolachlor	GCS	39415T	O–2132–99	.05
propachlor	GCS	04024T	O–2132–99	.05
Dinitroaniline				
pendamethalin	GCS	82683T	O–2132–99	.05
Glyphosate	LCGY	62722T	0–2136–01	.10
Glufosinate	LCGY	62721T	0–2136–01	.10
Phenylureas				
Diuron	LCEA	50374S	O–2138–02	[1].05
	LCEA	50374S	O–2138–02	[2].20
Fluometuron	LCEA	38811S	O–2138–02	[1].05
	LCEA	38811S	O–2138–02	[2].20
Linuron	LCEA	38478S	O–2138–02	.20
Triazines				
ametryn	GCS	38401T	O–2132–99	.05
atrazine	GCS	39632T	O–2132–99	[1].05
	LCEA	39632S	O–2138–02	.05
	LCEA	39632S	O–2138–02	[2].025
cyanazine	GCS	04041T	O–2132–99	.05
	LCEA	04041S	O–2138–02	[1].05
	LCEA	04041S	O–2138–02	[2].025
metribuzin	GCS	82630T	O–2132–99	.05
prometon	GCS	04037T	O–2132–99	.05
prometryn	GCS	04036T	O–2132–99	.05
propazine	GCS	38535T	O–2132–99	.05
	LCEA	38535S	O–2138–02	[1].05
	LCEA	38535S	O–2138–02	[2].025
simazine	GCS	04035T	O–2132–99	.05
	LCEA	04035S	O–2138–02	[1].05
	LCEA	04035S	O–2138–02	[2].025
terbutryn	GCS	38888T	O–2132–99	.05
	Acetamide degradation products			
acetochlor ethanesulfonic acid (ESA)	LCAA	61029X	O–2134–00	.05
acetochlor oxanilic acid (OXA)	LCAA	61030X	O–2134–00	.05
acetochlor sulfynil acetic acid (SAA)	LCAA	62847V	O–2134–00	.05

Table 2. Chemical compounds, laboratory method analysis codes, USGS parameter codes, approved USGS method numbers, and reporting limits determined for water samples collected from 51 streams in nine Midwestern States, 2002—Continued

Chemical compound	Laboratory method analysis	USGS parameter code	USGS method number	Reporting limit (µg/L)
Acetamide degradation products—Continued				
alachlor ESA	LCAA	50009X	O–2134–00	0.05
alachlor OXA	LCAA	61031X	O–2134–00	.05
alachlor SAA	LCAA	62848V	O–2134–00	.05
dimethenamid ESA	LCAA	61951X	O–2134–00	.05
dimethenamid OXA	LCAA	62482X	O–2134–00	.05
flufenacet ESA	LCAA	61952X	O–2134–00	.05
flufenacet OXA	LCAA	62483X	O–2134–00	.05
metolachlor ESA	LCAA	61043X	O–2134–00	.05
metolachlor OXA	LCAA	61044X	O–2134–00	.05
propachlor ESA	LCAA	62766V	O–2134–00	.05
propachlor OXA	LCAA	62767V	O–2134–00	.05
Glyphosate degradation product				
aminomethylphosphonic acid (AMPA)	LCGY	62649T	0–2136–01	.10
Phenylurea degradation product				
demethylfluometuron (DMFM)	LCEA	61755S	O–2138–02	[1].05
	LCEA	61755S	O–2138–02	[2].20
Triazine degradation products				
cyanazine acid (CAC)	LCEA	61745S	O–2138–02	[1].05
	LCEA	61745S	O–2138–02	[2].025
cyanazine amide (CAM)	GCS	61709T	O–2132–99	.05
	LCEA	61709S	O–2138–02	[1].05
	LCEA	61709S	O–2138–02	[2].025
deethylatrazine (CIAT)	GCS	04040T	O–2132–99	.05
	LCEA	04040S	O–2138–02	[1].05
	LCEA	04040S	O–2138–02	[2].025
deethylcyanazine (DEC)	LCEA	61749S	O–2138–02	[1].05
	LCEA	61749S	O–2138–02	[2].20
deethylcyanazine acid (DCAC)	LCEA	61750S	O–2138–02	[1].05
	LCEA	61750S	O–2138–02	[2].20
deethylcyanazine amide (DCAM)	LCEA	61751S	O–2138–02	[1].05
	LCEA	61751S	O–2138–02	[2].025

Table 2. Chemical compounds, laboratory method analysis codes, USGS parameter codes, approved USGS method numbers, and reporting limits determined for water samples collected from 51 streams in nine Midwestern States, 2002—Continued

Chemical compound	Laboratory method analysis	USGS parameter code	USGS method number	Reporting limit (µg/L)
Triazine degradation products—Continued				
deethyldeisopropylhydroxyatrazine	LCEA	62674S	O–2138–02	[1]0.05
didealkylatrazine (CAAT)	LCEA	62674S	O–2138–02	[2].025
deethylhydroxyatrazine (OIAT)	LCEA	62676S	0–2138–02	[1].10
	LCEA	62676S	O–2138–02	[1].05
	LCEA	62676S	O–2138–02	[2].025
deisopropylatrazine (CEAT)	GCS	04038T	O–2132–99	.05
	LCEA	04038S	O–2138–02	[1].05
	LCEA	04038S	O–2138–02	[2].025
deisopropylhydroxyatrazine (OEAT)	LCEA	62678S	O–2138–02	[1].05
	LCEA	62678S	O–2138–02	[2].025
hydroxyatrazine (OIET)	LCEA	50355S	O–2138–02	[1].05
	LCEA	50355S	O–2138–02	[2].025
Antibiotics				
Beta lactams				
amoxicillin	LCAN	61743U	--	.10
ampicillin	LCAN	62889U	--	.10
cefotaxime	LCAN	62890U	--	.10
cloxacillin	LCAN	62891U	--	.10
oxacillin	LCAN	62892U	--	.10
penicillin G	LCAN	61760U	--	.10
penicillin V	LCAN	62893U	--	.10
Macrolides				
erythromycin	LCAN	62797U	--	.10
lincomycin	LCAN	62894U	--	.10
ormetoprim	LCAN	62962U	--	.10
roxithromycin	LCAN	62895U	--	.10
trimethoprim	LCAN	62023U	--	.10
tylosin	LCAN	62896U	--	.10
virginiamycin	LCAN	62897U	--	.10
Quinolines				
flumequine	LCAN	62717U	--	.10
norfloxacin	LCAN	62757U	--	.10
oxolinic Acid	LCAN	62759U	--	.10
sarafloxacin	LCAN	62771U	--	.10
ciprofloxacin	LCAN	62898U	--	.10
ofloxacin	LCAN	62899U	--	.10
lomefloxacin	LCAN	62900U	--	.10
clinafloxacin	LCAN	62901U	--	.10
Sulfonamides				
sulfachlorpyridazine	LCAN	62774U	--	.10
sulfadiazine	LCAN	62963U	--	.10

Table 2. Chemical compounds, laboratory method analysis codes, USGS parameter codes, approved USGS method numbers, and reporting limits determined for water samples collected from 51 streams in nine Midwestern States, 2002—Continued

Chemical compound	Laboratory method analysis	USGS parameter code	USGS method number	Reporting limit (μg/L)
Antibiotics—Continued				
Sulfonamides—Continued				
sulfadimethoxine	LCAN	62776U	--	.10
sulfamerazine	LCAN	62777U	--	.10
sulfamethazine	LCAN	61762U	--	.10
sulfamethoxazole	LCAN	62775U	--	.10
sulfathiazole	LCAN	62778U	--	.10
Tetracyclines				
chlorotetracycline	LCAN	61744U	--	.10
doxycycline	LCAN	62694U	--	.10
minocycline	LCAN	62751U	--	.10
oxytetracycline	LCAN	61759U	--	.10
tetracycline	LCAN	62781U	--	.10
Tetracycline degradation products				
anhydrochlortetracycline	LCAN	62650U	--	.10
anhydrotetracycline	LCAN	62651U	--	.10
demeclocycline	LCAN	62680U	--	.10

[1]Reporting limit for pre- and post-emergence samples.

[2]Reporting limit for harvest-season runoff samples.

pounds, and three triazine degradation products. The approved USGS method number is 0–2132–99 (Zimmerman and Thurman, 1999; Kish and others, 2000), and the USGS laboratory method analysis code is GCS.

Liquid Chromatography/Mass Spectrometry

Water samples were also extracted and analyzed using four different LC/MS methods as follows:

(1) Method number 0–2134–00, which was approved by the USGS in April 2000 with a second approval in February 2001 of additional compounds (Lee and others, 2001), was used to analyze 10 of the 14 acetamide degradation products. Four additional acetamide degradation products analyzed using this method are in the process of USGS approval. This method is identified by the USGS laboratory with the method analysis code of LCAA.

(2) Method number 0–2138–02 method, which was approved by the USGS in December 2002 (Lee and others, 2002b), was used to analyze four triazine parent compounds and 11 triazine degradation products plus three phenylurea parent compounds and one phenylurea degradation product (Lee and others, 2002b) and is identified by the USGS laboratory with the method analysis code of LCEA. The method reporting limit changed during the reconnaissance described herein as the method was in the process of development by the USGS laboratory.

(3) Method number 0–2136–01, which was approved by the USGS in December 2001, was used to analyze glyphosate, its degradation product, aminomethylphosphonic acid (AMPA), and glufosinate (Lee and others, 2002a, 2002c) and is identified by the USGS laboratory with the method analysis code of LCGY.

(4) A method presently (2003) under review by the USGS was used to analyze five classes of antibiotics, including beta lactams, macrolides, quinolones, sulfonamides, and tetracyclines, and is identified by the USGS laboratory with the method analysis code of LCAN. Three analyses are accomplished for the five classes of antibiotics. The LCAN method uses a Triathlon autosampler and Prospekt system for online solid-phase extraction (SPE). All three analyses use simetone as the internal standard. Tetracyclines are analyzed separately using meclocycline as a surrogate. Beta lactams and macrolides are analyzed together using

oleandomycin as a surrogate. Quinolones and sulfonamides are analyzed together using $^{13}C_6$ sulfamethazine and naladixic acid as surrogates. Ten milliliters of the sample are loaded onto the preconditioned cartridge, which is then placed into the flow path of the liquid chromatograph (LC) preceding the column. The compounds are separated by the LC column and detected by the mass spectrometer (MS). Compounds are identified by comparing retention times with analyzed standards and comparing selected fragment ions. The concentration of each compound is calculated by determining the ratio of the compound to the internal standard and deriving results from a similarly prepared calibration curve.

ANALYTICAL RESULTS

The results of sample analyses are given in tables 3–12 in the "Supplemental Information" section at the end of this report. Results are listed by analytical method as described previously and accompanied by a statistical summary of the reported concentrations. For the calculation of the statistics in these tables, all nondetections are treated as zeros. Data from this study are available in electronic form from the USGS, Organic Geochemistry Research Laboratory, in Lawrence, Kansas, E-mail ks_ogrl@usgs.gov.

Streamflow and Physical Properties

The instantaneous discharge (streamflow) estimates and physical properties associated with each sample are listed in table 3. Statistical summaries of these data are given in table 4. Discharge estimates for pre-emergence runoff samples were slightly larger than discharge estimates for post-emergence samples. Both were significantly larger than discharge estimates for harvest-season samples. A drought affected much of the Midwestern United States in 2002. The median discharge for the 2002 pre-emergence runoff samples, 605 ft^3/s, was considerably less than the median discharge for post-emergence runoff samples collected in 1989, 982 ft^3/s; 1990, 1,261 ft^3/s; 1994, 957 ft^3/s; 1995, 1,003 ft^3/s; and 1998, 748 ft^3/s (Battaglin and Goolsby, 1999). Specific conductance values for harvest-season samples were slightly larger than values for pre- or post-emergence samples. The pH of water samples did not vary significantly among the three sample-collection periods. Water temperatures were highest for post-emergence runoff samples and lowest for harvest-season runoff samples.

Results of Laboratory Method Analysis Code GCS

The results for the GCS analyses are listed in table 5. Statistical summaries of these results are given in table 6. Atrazine was the most frequently detected GCS compound, and CIAT was the most frequently detected atrazine degradation product for all three sampling periods. The median atrazine concentration in the 51 pre-emergence runoff samples of 4.2 µg/L was larger than the median concentration from pre-emergence runoff samples collected in 1994 (4.0 µg/L), but smaller than the median concentrations from 1989 (10.9 µg/L), 1990 (9.0 µg/L), 1995 (5.5 µg/L), and 1998 (4.3 µg/L) (Battaglin and Goolsby, 1999; Scribner and others, 1998, 2000). The median acetochlor concentration in the 51 pre-emergence runoff samples from 2002 (0.67 µg/L) was larger than median concentrations from pre-emergence runoff samples collected in 1994 (0.05 µg/L) and 1995 (0.42 µg/L) but smaller than the median concentration from samples collected in 1998 (0.72 µg/L). The median metolachlor concentration in pre-emergence runoff samples from 2002 (0.75 µg/L) was smaller than the median concentrations from samples collected in 1989 (2.5 µg/L), 1990 (3.1 µg/L), 1994 (1.7 µg/L), 1995 (1.7 µg/L), and 1998 (1.4 µg/L). The median cyanazine concentration in 2002 (less than 0.05 µµg/L) was smaller than the median concentration from samples collected in 1989 (2.7 µg/L), 1990 (2.2 µg/L), 1994 (1.2 µg/L), 1995 (1.4 µg/L), and 1998 (0.44 µg/L).

Ten of the 16 GCS herbicides were detected most frequently in the pre-emergence samples, less frequently in the post-emergence samples, and even less frequently in the harvest-season samples. The exceptions were ametryn and prometon, both of which were detected most frequently in the post-emergence samples. Cyanazine and pendimethalin were detected in only one or two samples from any of the three sampling periods, and prometryn, propachlor, and terbutryn were not detected in any sample. CIAT and CEAT were detected most frequently in post-emergence runoff samples and least frequently in harvest-season samples; CAM was not detected in any sample (fig. 4).

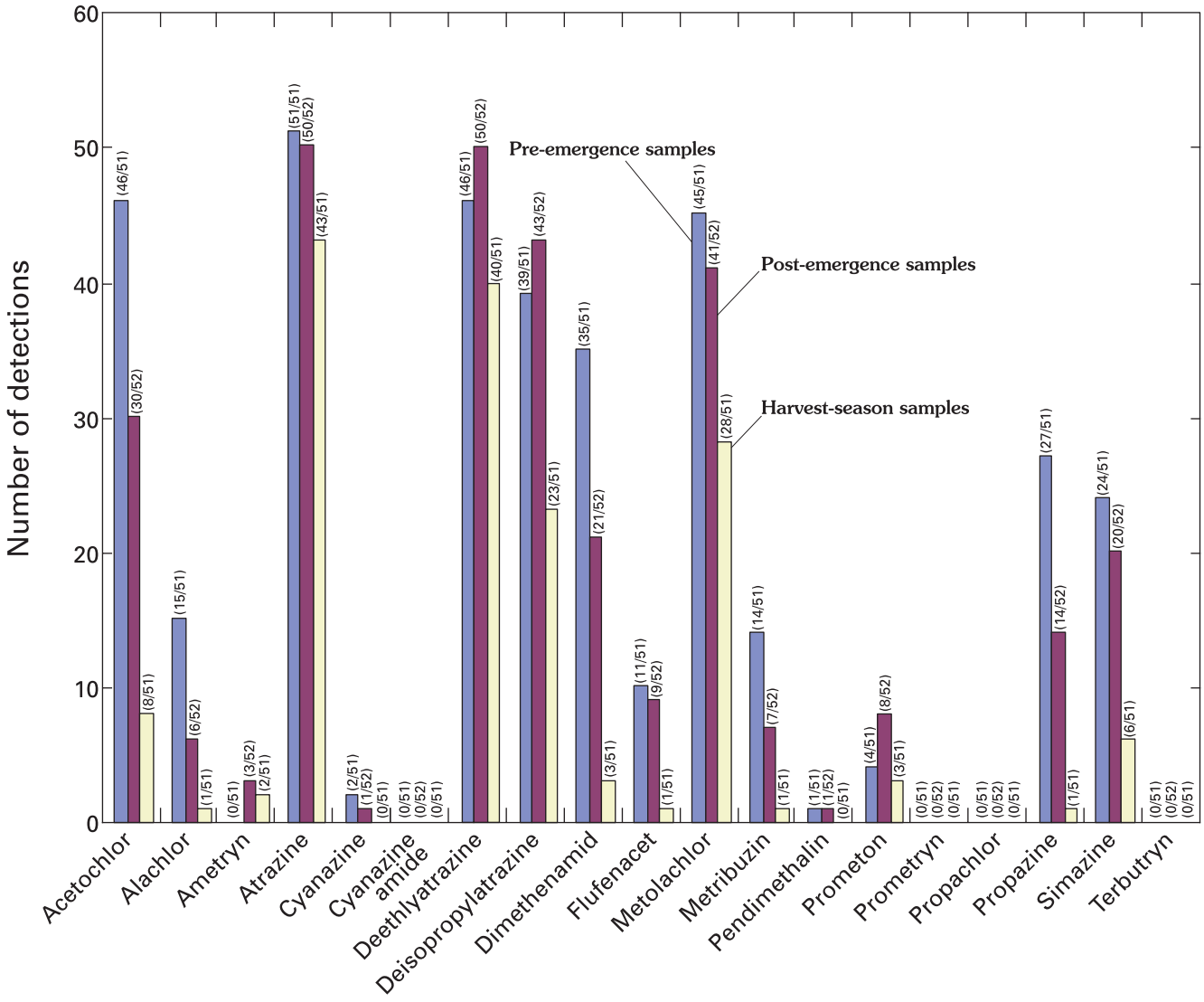

Figure 4. Number of detections for selected herbicides and degradation products determined by laboratory method analysis code GCS for pre-emergence, post-emergence, and harvest-season runoff samples collected from 51 streams in nine Midwestern States, 2002.

Results of Laboratory Method Analysis Code LCAA

The results for the LCAA analyses are listed in table 7. Statistical summaries of these results are given in table 8. Metolachlor ESA and OXA were detected most frequently, and acetochlor ESA and OXA were the second-most frequently detected herbicide degradation products for all three sampling periods. Concentrations of these four herbicide degradation products were larger in pre- and post-emergence samples than in harvest-season samples even though detection frequencies did not vary much by sampling period (fig. 5). The median metolachlor ESA concentrations in 2002 pre-emergence (0.82 µg/L) and post-emergence (0.71 µg/L) samples were less than the median concentrations in 1998 pre-emergence (1.5 µg/L) and post-emergence (1.6 µg/L) samples. The median acetochlor ESA concentrations in 2002 pre-emergence (0.37 µg/L) and post-emergence (0.38 µg/L) samples were less than the median concentrations in 1998 pre-emergence (0.70 µg/L) and post-emergence (0.88 µg/L) samples. Alachlor ESA was also detected in 85 percent or more of the samples during all three sampling periods, but the median concentration in pre-emergence runoff samples (0.13 µg/L) was considerably less than the median concentration in pre-emergence runoff sam-

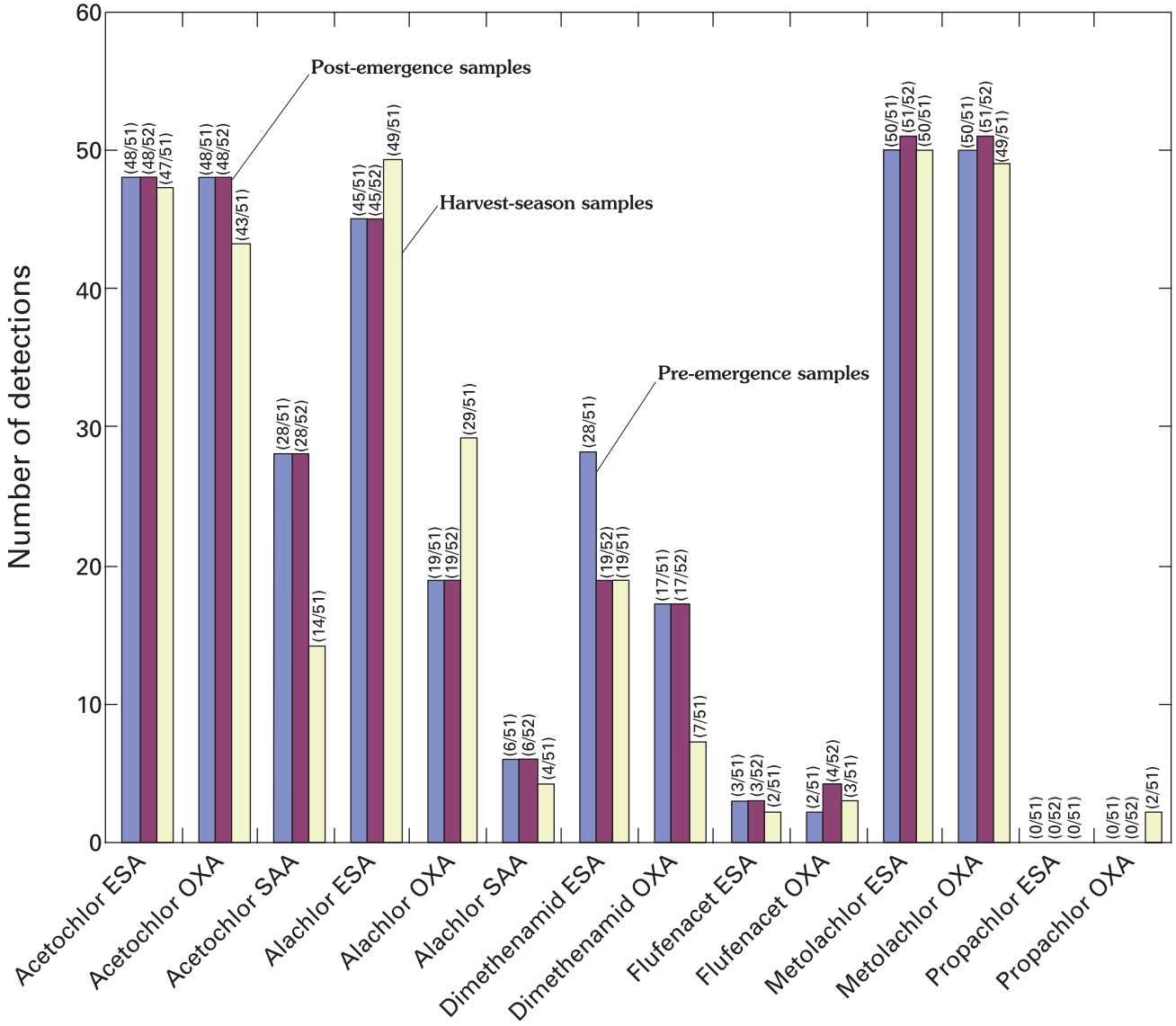

Figure 5. Number of detections for selected acetamide and degradation products determined from laboratory method analysis code LCAA for pre-emergence, post-emergence, and harvest-season runoff samples collected from 51 streams in nine Midwestern States, 2002.

ples collected in 1994 (4.8 µg/L), 1995 (1.6 µg/L), or 1998 (0.50 µg/L).

Results of Laboratory Method Analysis Code LCEA

The results for the LCEA analyses are listed in table 9. Statistical summaries of these results are given in table 10. Atrazine and its degradation products were most frequently detected during all three sampling periods. CIAT, CAAT, CEAT, and OIET were all detected in more than 90 samples collected during all three sampling periods. There were five diuron and two linuron detections of phenylurea parent compounds and one detection of DMFM (fig. 6). Samples from previous years were not analyzed for these compounds and their degradation products using this method.

Results of Laboratory Method Analysis Code LCGY

The results for the LCGY analyses are listed in table 11. Statistical summaries of these results are given in table 12. Glyphosate was detected in 55 (36 percent) of the samples, but its degradation

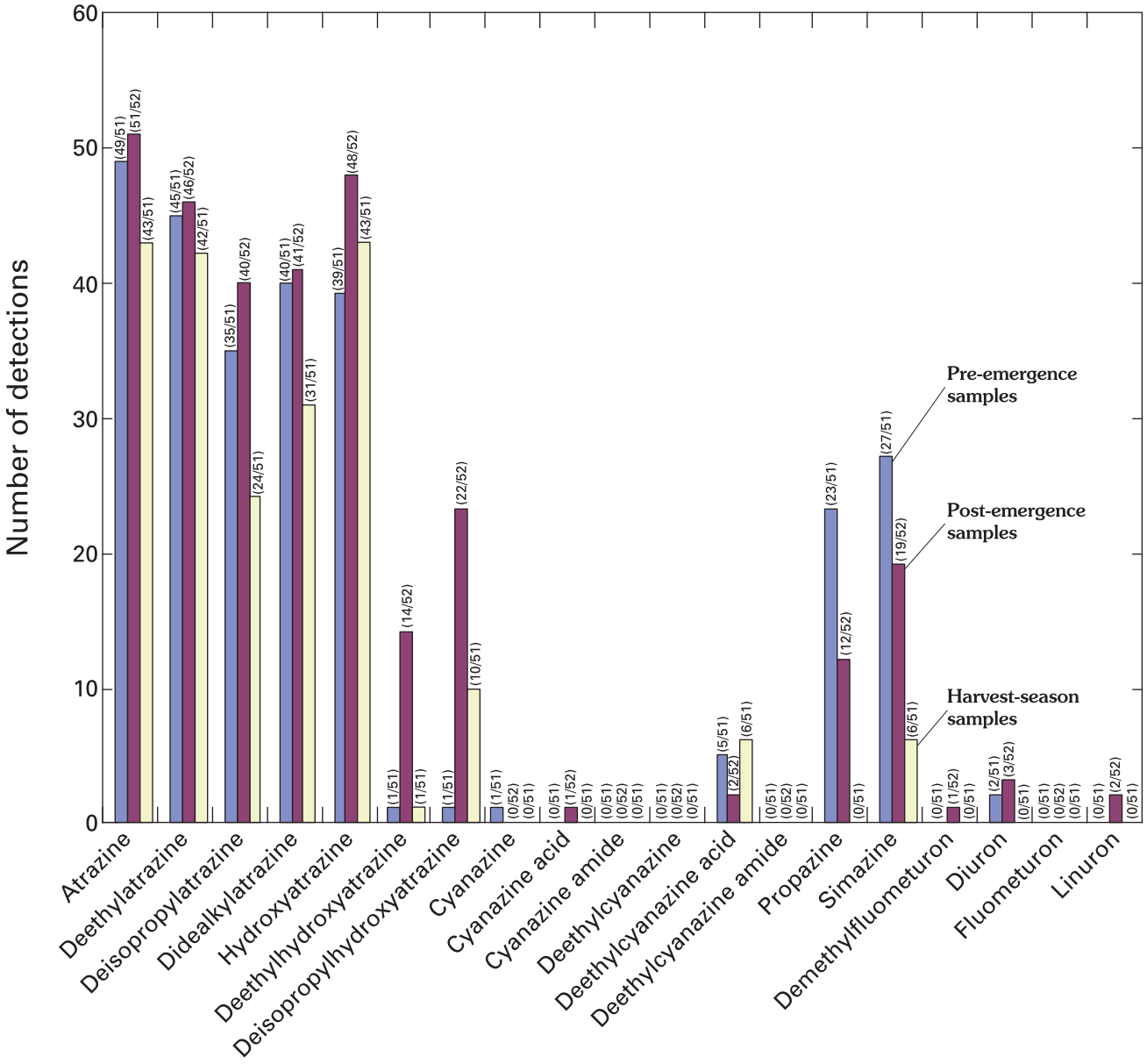

Figure 6. Number of detections for selected triazine and phenylurea herbicides and their degradation products determined by laboratory method analysis code LCEA for pre-emergence, post-emergence, and harvest-season runoff samples collected from 51 streams in nine Midwestern States, 2002.

product, AMPA, was detected in more than 100 (69 percent) of the samples collected during all three sampling periods. The detection of glyphosate in 16 (31 percent) of the harvest-season runoff samples was unexpected as it was presumed that glyphosate would degrade by this late in the growing season. There were two detections of glufosinate during the post-emergence runoff (fig. 7). Samples from previous years were not analyzed for glyphosate, AMPA, or glufosinate.

Results of Laboratory Method Analysis Code LCAN

Results of analysis and a statistical summary from the LCAN method are not provided given that there were only two detections of an antibiotic in all samples. Sulfamethoxazole was detected at a concentration of 0.14 µg/L in a sample from the Scioto River near Prospect, Ohio (map number 40, fig. 1), and at a concentration of 0.10 µg/L in a sample from the Rock River at Afton, Wisconsin (map number 51, fig. 1).

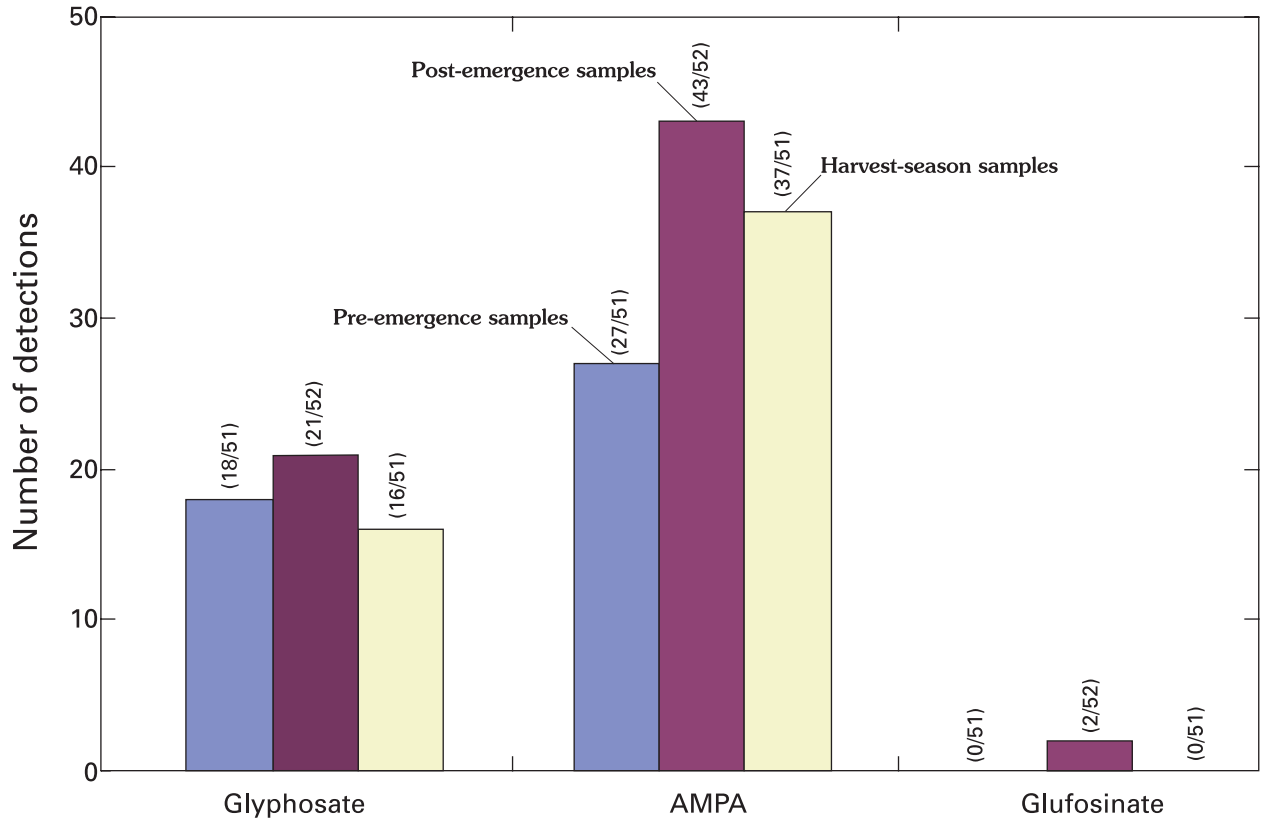

Figure 7. Number of detections of glyphosate, its degradation product, AMPA, and glufosinate determined by laboratory method analysis code LCGY for pre-emergence, post-emergence, and harvest-season runoff samples collected from 51 streams in nine Midwestern States, 2002.

Quality-Control Samples

Quality-control samples for the GCS analysis consisted of 2 field blank samples, 14 concurrent replicate samples, and 14 laboratory duplicate samples. The blank samples were free of herbicides and herbicide degradation products. The results from these samples are listed along with the results from the regular samples in table 5. Quality-control samples for the LCAA analysis consisted of 2 field blank samples, 14 concurrent replicate samples, and 16 laboratory duplicate samples. The results from these samples are listed in table 7. Quality-control samples for the LCEA analysis consisted of 2 field blank samples, 14 concurrent replicate samples, and 8 laboratory duplicate samples. The results from these samples are listed in table 9. Quality-control samples for the LCGY analysis consisted of 2 field blank samples, 14 concurrent replicate samples, and 18 laboratory duplicate samples. The field blank samples were free of glyphosate, glufosinate, and AMPA. The results of these samples are listed in table 11. Quality-control samples for the LCAN analysis consisted of 2 field blank samples, 14 concurrent replicate samples, and 20 laboratory duplicate samples. No antibiotics were detected in any of the quality-control samples.

The laboratory duplicate samples were analyzed to estimate method precision at ambient herbicide concentrations in natural matrices. Differences for each pair were calculated as the concentration in the sample minus the concentration in the laboratory duplicate. For this analysis, concentrations that were reported as less than the method reporting limit (MRL) were set to one-half of the MRL, which allowed a difference to be calculated when only one of the sample pairs had a reported concentration.

The concurrent replicate samples were analyzed to estimate method precision at ambient herbicide concentrations in the presence of sample-collection and sample-matrix interferences. Concentration differences were calculated in the same way as for the laboratory duplicate sample pairs.

The following is an example of how to calculate data for glyphosate. The mean of the absolute value of the concentration differences was 0.03 µg/L, and the

maximum was 0.21 µg/L. For AMPA, the mean of the concentration differences was 0.07 µg/L, and the maximum was 0.22 µg/L. For glufosinate, the mean of the concentration differences was 0 µg/L, and the maximum was 0.01 µg/L, but there was only one sample pair with a reported concentration. For glyphosate, the mean of the absolute value of the concentration differences was 0.20 µg/L, and the maximum was 0.92 µg/L. For AMPA, the mean of the concentration differences was 0.05 µg/L, and the maximum was 0.13 µg/L. For glufosinate, there were no sample pairs with a reported concentration. Data for other herbicides are available in the tables at the end of this report.

Duplicate Analysis of Selected Herbicides

Four triazine herbicides (atrazine, cyanazine, propazine, and simazine) and three triazine degradation products (CAM, CIAT, and CEAT) were analyzed by both GCS and LCEA methods. Differences for each concentration pair were calculated as the GCS value minus the LCEA value with all nondetections assigned a value of 0.025 µg/L. The Wilcoxon signed rank test (Helsel and Hirsch, 1992) was used to determine if concentrations determined by one of the methods were significantly different from those determined by the other method. Cyanazine and CAM were detected so infrequently in analyses by either method that a comparison was not attempted. Results indicate that the median of the differences was not significantly different (p-value less than 0.05) from zero for atrazine and CEAT and that the differences for simazine were only slightly significant at a p-value of 0.07.

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Supplemental Information

Table 3. Streamflow and physical properties determined for water samples collected from 51 streams in nine Midwestern States, 2002

[ft^3/s, cubic feet per second; ^oC, degrees Celsius, µS/cm, microsiemens per centimeter at 25 degrees Celsius; --, no data. Sample type: CR, concurrent replicate sample; FB, field blank; LD, laboratory duplicate samples; S1, sample from pre-emergence runoff; S2, sample from post-emergence runoff; S3, sample from harvest-season runoff]

Map number (fig. 1)	U.S. Geological Survey site identification number	Site name	Sample type	Date of collection (month/day/ year)	Collection time (24-hour)	Streamflow (ft^3/s)	Specific conductance (µS/cm)	pH (standard units)	Water temperature (^oC)
			Iowa						
1	05411850	Turkey River near Eldorado	S1	05/14/02	1400	520	516	8.2	14.7
			CR	05/14/02	1405	520	515	8.0	15
			S2	06/24/02	0950	615	482	7.8	23.9
			S3	10/29/02	1300	125	534	8.1	6.1
2	05421000	Wapsipinicon River at Independence	S1	05/14/02	1100	1,140	489	7.8	12.7
			S2	06/24/02	1245	1,190	417	7.9	25.1
			S3	10/29/02	0930	135	438	7.7	6.1
3	05455100	Old Mans Creek near Iowa City	S1	05/13/02	1100	428	436	7.5	10.5
			S2	06/27/02	0955	116	468	7.6	20.8
			S3	10/30/02	1140	58	554	7.4	7.1
4	05472500	North Skunk River near Sigourney	S1	05/13/02	1630	1,880	336	7.5	12.3
			S2	07/08/02	1015	340	321	7.4	25.8
			S3	10/29/02	1435	114	503	8.0	6.8
5	05474000	Skunk River at Augusta	S1	05/13/02	1230	20,800	275	7.1	12.6
			S2	06/27/02	1235	3,360	467	7.8	27.5
			S3	10/29/02	1015	493	610	8.2	6.9
6	05480500	Des Moines River at Fort Dodge	S1	05/17/02	1230	1,890	767	8.5	12.5
			S2	06/13/02	0730	3,680	735	8.3	22.5
			S3	10/30/02	1500	875	807	8.1	7.0
7	05484500	Raccoon River at Van Meter	S1	05/17/02	0930	4,600	723	8.4	14.5
			S2	06/12/02	1630	6,840	551	8.1	24.5
			CR	06/12/02	1635	6,840	551	8.1	24.5
			S3	10/30/02	1200	670	726	8.4	6.0

Table 3. Streamflow and physical properties determined for water samples collected from 51 streams in nine Midwestern States, 2002—Continued

Map number (fig. 1)	U.S. Geological Survey site identification number	Site name	Sample type	Date of collection (month/day/year)	Collection time (24-hour)	Streamflow (ft^3/s)	Specific conductance ($\mu S/cm$)	pH (standard units)	Water temperature (^oC)
		Iowa—Continued							
8	06606600	Little Sioux River at Correctionville	S1	05/17/02	1615	1,330	736	8.5	16.5
			S2	06/11/02	1100	1,250	516	8.1	23.0
			S3	10/31/02	0930	400	791	8.7	3.0
9	06607200	Maple River at Mapleton	S1	05/29/02	1200	332	675	8.5	24.5
			S2	06/11/02	1330	600	616	8.0	24.5
			S3	10/31/02	1200	170	781	8.6	4.0
10	06609500	Boyer River at Logan	S1	05/29/02	0945	426	569	8.3	22.0
			S2	06/11/02	1545	935	548	8.1	25.0
			S3	11/01/02	0900	170	734	8.7	6.0
		Illinois							
11	03378000	Bonpas Creek at Browns	S1	06/06/02	1030	14	588	7.7	22.4
			CR	06/06/02	1031	14	588	7.7	22.4
			S2	06/25/02	1300	275	374	8.3	25.0
			S3	09/25/02	1015	2	322	7.9	17.3
12	03381495	Little Wabash River at Carmi	S1	06/06/02	1230	4,400	402	7.3	25.4
			S2	06/25/02	1430	3,820	418	7.5	26.0
			CR	06/25/02	1431	3,820	418	7.5	26.0
			S3	09/25/02	0830	30	616	8.1	20.2
13	05439500	South Branch Kishwaukee River at Fairdale	S1	05/14/02	1600	2,210	593	7.7	12.3
			S2	08/02/02	1430	43	783	7.3	27.7
			S3	09/25/02	0930	33	831	8.1	14.4
14	05526000	Iroquois River near Chebanese	S1	06/06/02	0925	1,355	641	8.0	19.4
			S2	06/28/02	0910	1,802	638	7.9	25.1
			S3	09/25/02	1345	132	643	8.3	20.3

Table 3. Streamflow and physical properties determined for water samples collected from 51 streams in nine Midwestern States, 2002—Continued

Map number (fig. 1)	U.S. Geological Survey site identification number	Site name	Sample type	Date of collection (month/day/year)	Collection time (24-hour)	Streamflow (ft^3/s)	Specific conductance ($\mu S/cm$)	pH (standard units)	Water temperature (^oC)
			Illinois—Continued						
15	05540500	Du Page River at Shorewood	S1	05/15/02	1030	1,340	855	7.8	14.0
			S2	06/27/02	1240	448	702	7.7	25.5
			S3	09/25/02	1145	206	846	8.5	17.4
16	05569500	Spoon River at London Mills	S1	05/14/02	1035	8,600	392	7.7	3.3
			S2	07/30/02	1000	545	540	8.2	25.1
			S3	09/24/02	0905	52	677	8.8	15.5
17	05576500	Sangamon River at Riverton	S1	05/29/02	1015	5,334	425	7.6	18.9
			S2	07/17/02	1515	716	1,050	8.9	26.4
			S3	09/25/02	0845	431	1,252	7.0	16.7
18	05587000	Macoupin Creek near Kane	S1	06/06/02	1000	441	641	7.5	20.5
			S2	07/29/02	1115	354	354	7.8	26.5
			S3	09/24/02	1120	102	268	7.6	16.9
19	05592100	Kaskaskia River near Cowden	S1	05/29/02	0930	5,719	328	7.9	18.5
			S2	06/25/02	1200	1,617	382	7.7	18.3
			S3	09/25/02	1330	193	325	8.5	19.5
20	05594000	Shoal Creek near Breese	S1	06/06/02	1330	154	503	7.5	24.0
			S2	07/29/02	1410	108	570	8.1	28.0
			S3	09/24/02	1420	96	322	7.6	19.0
			Indiana						
21	03275000	Whitewater River near Alpine	FB	06/14/02	1145	--	--	--	--
			S1	06/14/02	1230	1,230	476	7.7	19.5
			S2	06/28/02	1205	764	521	7.9	21.3
			S3	10/29/02	1715	189	728	8.1	10.0
22	03302800	Blue River at Fredericksburg	S1	06/06/02	1130	708	287	7.5	20.0
			S2	08/21/02	1130	13	477	7.8	23.0
			S3	09/27/02	1200	2,810	183	7.4	16.4

Table 3. Streamflow and physical properties determined for water samples collected from 51 streams in nine Midwestern States, 2002—Continued

Map number (fig. 1)	U.S. Geological Survey site identification number	Site name	Sample type	Date of collection (month/day/year)	Collection time (24-hour)	Streamflow (ft^3/s)	Specific conductance ($\mu S/cm$)	pH (standard units)	Water temperature (^oC)
			Indiana—Continued						
23	03328500	Eel River near Logansport	S1	06/05/02	1200	605	614	8.1	20.0
			S2	07/30/02	1130	276	687	8.2	25.6
			S2	07/31/02	1250	383	700	8.1	26.1
			S3	12/10/02	1000	319	767	8.1	.30
24	03333450	Wildcat Creek near Jerome	S1	05/30/02	1250	219	589	7.9	16.8
			S2	08/19/02	1110	13	543	7.9	21.0
			S3	09/20/02	1316	13	529	7.9	20.8
25	03335000	Wildcat Creek near Lafayette	S1	05/30/02	1630	1,040	638	8.4	22.2
			S2	07/23/02	1000	593	676	8.0	24.7
			S3	11/12/02	1215	630	696	8.0	8.7
26	03362500	Sugar Creek near Edinburgh	S1	06/07/02	1345	617	568	7.9	18.7
			S2	06/26/02	1020	1,700	507	7.8	22.9
			CR	06/26/02	1120	1,750	361	7.6	22.9
			CR	06/26/02	1121	1,750	361	7.6	22.9
			S3	10/26/02	1340	160	673	8.0	10.5
27	03371500	East Fork White River near Bedford	S1	06/06/02	1600	7,360	398	7.6	22.6
			S2	07/23/02	1605	2,270	571	8.2	27.6
			S3	10/01/02	1140	3,459	233	7.6	19.2
			CR	10/01/02	1141	3,459	233	7.6	19.2
			Kansas						
28	06885500	Black Vermillion River near Frankfort	S1	05/07/02	1145	46	535	7.8	21.3
			CR	05/07/02	1150	46	535	7.8	21.3
			S2	08/17/02	1235	4	589	7.5	24.2
			S3	10/03/02	1135	8	436	7.2	15.5
29	06890100	Delaware River near Muscotah	S1	05/07/02	1315	405	390	7.9	21.3
			S2	06/27/02	0950	430	227	7.2	22.7
			S3	09/19/02	1110	10	551	7.7	20.5

Table 3. Streamflow and physical properties determined for water samples collected from 51 streams in nine Midwestern States, 2002—Continued

Map number (fig. 1)	U.S. Geological Survey site identification number	Site name	Sample type	Date of collection (month/day/year)	Collection time (24-hour)	Streamflow (ft^3/s)	Specific conductance (µS/cm)	pH (standard units)	Water temperature (°C)
			Minnesota						
30	05317000	Cottonwood River near New Ulm	S1	05/30/02	1350	557	1,140	8.2	25.0
			S2	06/25/02	1620	2,580	851	7.9	24.0
			S3	10/04/02	0935	74	631	7.9	12.7
31	05476000	Des Moines River at Jackson	S1	05/31/02	0720	402	801	8.0	23.0
			S2	06/25/02	1215	428	869	8.3	26.0
			CR	06/25/02	1220	428	869	8.3	26.0
			S3	10/08/02	1145	162	746	8.3	10.4
32	05320270	Little Cobb River near Beauford	S1	06/06/02	1315	102	635	7.9	17.0
			S2	06/27/02	1045	206	632	7.6	24.0
			S3	10/02/02	1105	9	457	7.3	13.9
			Missouri						
33	06817700	Nodaway River near Graham	S1	05/14/02	1230	1,760	336	7.8	15.5
			S2	07/29/02	1200	98	308	9.1	29.5
			S3	10/04/02	1215	230	308	8.3	17.5
			Nebraska						
34	06804000	Wahoo Creek at Ithaca	S1	05/13/02	1330	130	464	7.9	12.5
			S2	06/12/02	0840	78	478	7.3	23.0
			S3	10/04/02	0930	77	472	7.1	--
35	06880800	West Fork Big Blue River near Dorchester	S1	05/07/02	0900	380	325	7.6	18.0
			S2	07/26/02	1100	54	517	8.3	25.5
			S3	10/04/02	0920	207	350	7.3	13.5
36	06815000	Big Nemaha River at Falls City	S1	05/06/02	1400	4,070	350	7.6	17.5
			S2	07/12/02	1400	41	690	8.5	23.5
			S3	10/04/02	1520	161	669	7.9	18.0

Table 3. Streamflow and physical properties determined for water samples collected from 51 streams in nine Midwestern States, 2002—Continued

Map number (fig. 1)	U.S. Geological Survey site identification number	Site name	Sample type	Date of collection (month/day/year)	Collection time (24-hour)	Streamflow (ft^3/s)	Specific conductance ($\mu S/cm$)	pH (standard units)	Water temperature (^oC)
			Nebraska—Continued						
37	06882000	Big Blue River at Barneston	S1	05/07/02	1530	1,290	583	8.1	20.2
			S2	16/15/02	0900	939	700	8.0	21.0
			S3	10/04/02	1300	634	634	8.5	16.5
			CR	10/04/02	1310	634	634	8.5	16.5
38	06884000	Little Blue River near Fairbury	S1	05/07/02	1230	564	241	7.6	18.9
			S2	06/13/02	0930	1,556	157	7.7	22.5
			S3	10/02/02	2000	721	148	6.5	13.5
			Ohio						
39	03157000	Clear Creek near Rockbridge	S1	06/05/02	1115	79	471	8.0	20.0
			S2	07/29/02	1200	30	441	8.2	24.4
			S3	10/26/02	1300	78	506	8.0	11.1
40	03219500	Scioto River near Prospect	S1	06/04/02	1230	248	641	7.6	20.9
			CR	06/04/02	1231	248	641	7.6	20.9
			S2	07/31/02	0930	21	897	7.5	25.4
			S3	10/01/02	1030	188	521	7.3	18.2
41	03223000	Olentangy River at Claridon	S1	06/04/02	1100	57	620	7.7	18.6
			S2	07/31/02	1100	2	804	7.3	24.4
			S3	10/26/02	1500	5	772	7.9	8.7
42	03230500	Big Darby Creek at Darbyville	S1	06/03/02	1200	481	597	8.1	20.3
			S2	08/01/02	0930	105	699	7.6	25.7
			S3	10/01/02	1105	195	488	7.8	18.5
43	03234500	Scioto River at Higby	S1	06/04/02	1015	4,084	606	7.9	21.7
			S2	07/30/02	1100	2,230	676	7.8	26.6
			S3	10/28/02	1000	1,910	610	8.0	12.7
44	03240000	Little Miami River near Oldtown	S1	06/05/02	1320	139	705	8.2	21.1
			S2	07/17/02	1200	58	714	8.0	22.0
			S3	10/27/02	0700	149	628	7.9	9.9

Table 3. Streamflow and physical properties determined for water samples collected from 51 streams in nine Midwestern States, 2002—Continued

Map number (fig. 1)	U.S. Geological Survey site identification number	Site name	Sample type	Date of collection (month/day/year)	Collection time (24-hour)	Streamflow (ft^3/s)	Specific conductance (µS/cm)	pH (standard units)	Water temperature (°C)
			Ohio—Continued						
45	03267900	Mad River at Eagle City	S1	06/05/02	1130	460	729	8.0	17.9
			S2	07/17/02	1030	271	739	7.5	17.8
			CR	07/17/02	1031	271	739	7.5	17.8
			S3	10/27/02	0800	240	739	7.4	10.9
46	04185000	Tiffin River at Stryker	S1	05/29/02	1700	291	588	7.8	17.9
			S2	07/23/02	1530	190	705	7.9	26.7
			S3	11/06/02	1200	56	785	7.7	4.3
			CR	11/06/02	1201	56	785	7.7	4.3
47	04186500	Auglaize River near Fort Jennings	S1	05/28/02	1115	105	771	8.1	19.3
			S2	07/23/02	1100	6	1,035	7.5	26.5
			S3	10/30/02	1300	39	1,900	7.7	7.4
			Wisconsin						
48	04087240	Root River at Racine	S1	06/03/02	1350	89	825	7.8	17.6
			CR	06/03/02	1351	89	825	7.8	17.6
			S2	07/26/02	1130	23	850	6.0	24.2
			S3	09/03/02	1110	79	814	8.0	23.0
49	05340500	St. Croix River at St. Croix Falls	S1	06/20/02	1130	4,700	173	6.1	22.0
			S2	06/27/02	1130	7,220	158	7.6	24.4
			S3	09/03/02	1520	6,820	144	8.2	20.8
50	05407000	Wisconsin River at Muscoda	S1	05/28/02	1330	7,150	211	8.9	20.5
			S2	06/27/02	1215	30,500	180	7.4	24.5
			S3	09/23/02	1130	6,650	259	8.2	16.5
51	05430500	Rock River at Afton	S1	06/04/02	1300	2,608	521	7.6	17.6
			FB	07/11/02	1229	964	643	8.4	24.2
			S2	07/11/02	1230	964	643	8.4	24.4
			S3	09/20/02	0945	992	762	7.6	21.0

Table 4. Statistical summary of streamflow and physical properties determined for water samples collected from 51 streams in nine Midwestern States, 2002

[ft^3/s, cubic feet per second; degrees C, degrees Celsius; µS/cm, microsiemens per centimeter at 25 degrees Celsius]

Streamflow or physical property	Number of samples	25th percentile	Median	75th percentile	95th percentile	Maximum
Pre-emergence runoff samples						
Instantaneous discharge, in ft^3/s	51	291	605	2,210	7,360	20,800
Specific conductance, in µS/cm	51	398	569	641	825	1,140
pH, in standard units	51	7.6	7.8	8.1	8.5	8.9
Water temperature, in degrees C	51	16.5	18.9	21.3	24.5	25.4
Post-emergence runoff samples						
Instantaneous discharge in ft^3/s	52	88	429	1,403	6,840	30,500
Specific conductance, in µS/cm	52	468	571	701	897	1,050
pH, in standard units	52	7.6	7.9	8.1	8.5	9.1
Water temperature, in degrees C	52	23.0	24.5	25.9	27.7	29.5
Harvest-season runoff samples						
Instantaneous discharge, in ft^3/s	51	74	162	431	3,459	6,820
Specific conductance, in µS/cm	51	438	616	746	846	1,900
pH, in standard units	51	7.6	8.0	8.2	8.7	8.8
Water temperature, in degrees C	49	7.1	13.5	18.0	20.8	23.0

Table 5. Concentrations of selected herbicides and degradation products determined by laboratory method analysis code GCS for water samples collected from 51 streams in nine Midwestern States, 2002

[All concentrations are in micrograms per liter. <, less than. Sample type: CR, concurrent replicate sample; FB, field blank; LD, laboratory duplicate sample; S1, sample from pre-emergence runoff; S2, sample from post-emergence runoff; S3, sample from harvest-season runoff]

Map number (fig. 1)	U.S. Geological Survey site identification number	Site name	Sample type	Date of collection (month/day/year)	Collection time (24-hour)	Acetochlor	Alachlor	Ametryn	Atrazine	Deethylatrazine (CIAT)	Deisopropylatrazine (CEAT)	Cyanazine	Cyanazine amide (CAM)	Dimethenamid	Flufenacet
						Iowa									
1	05411850	Turkey River near Eldorado	S1	05/14/02	1400	0.27	<0.05	<0.05	1.1	0.20	0.06	<0.05	<0.05	0.11	<0.05
			CR	05/14/02	1405	.27	<.05	<.05	1.0	.18	.06	<.05	<.05	.10	<.05
			S2	06/24/02	0950	.11	<.05	<.05	4.3	.76	.31	<.05	<.05	.21	<.05
			S3	10/29/02	1300	<.05	<.05	<.05	.08	.18	<.05	<.05	<.05	<.05	<.05
2	05421000	Wapsipinicon River at Independence	S1	05/14/02	1100	.62	.08	<.05	1.8	.21	<.05	<.05	<.05	.33	<.05
			S2	06/24/02	1245	.42	<.05	<.05	5.4	.84	.41	<.05	<.05	.24	<.05
			S3	10/29/02	0930	<.05	<.05	<.05	.10	.14	<.05	<.05	<.05	<.05	<.05
3	05455100	Old Mans Creek near Iowa City	S1	05/13/02	1100	2.2	.17	<.05	6.0	.46	.09	<.05	<.05	.53	<.05
			S2	06/27/02	0955	.05	<.05	<.05	1.2	.40	.16	<.05	<.05	<.05	<.05
			S3	10/30/02	1140	<.05	<.05	<.05	.08	.14	<.05	<.05	<.05	<.05	<.05
4	05472500	North Skunk River near Sigourney	S1	05/13/02	1630	3.1	.05	<.05	15	.82	.19	.06	<.05	1.5	.06
			S2	07/08/02	1015	.07	<.05	<.05	1.3	.40	.25	<.05	<.05	.09	<.05
			S3	10/29/02	1435	<.05	<.05	<.05	.11	.11	<.05	<.05	<.05	<.05	<.05
			LD	10/29/02	1435	<.05	<.05	<.05	.13	.11	<.05	<.05	<.05	<.05	<.05
5	05474000	Skunk River at Augusta	S1	05/13/02	1230	4.8	<.05	<.05	26	1.8	.55	<.05	<.05	3.2	<.05
			S2	06/27/02	1235	.32	<.05	<.05	1.4	.37	.23	<.05	<.05	.08	<.05
			S3	10/29/02	1015	<.05	<.05	<.05	.17	.08	<.05	<.05	<.05	<.05	<.05
6	05480500	Des Moines River at Fort Dodge	S1	05/17/02	1230	.29	<.05	<.05	.10	.05	<.05	<.05	<.05	<.05	<.05
			S2	06/13/02	0730	.47	<.05	<.05	4.5	.29	.12	<.05	<.05	.05	.06
			LD	06/13/02	0730	.50	<.05	<.05	4.7	.27	.11	<.05	<.05	.05	.06
			S3	10/30/02	1500	<.05	<.05	<.05	<.05	<.05	<.05	<.05	<.05	<.05	<.05

Table 5. Concentrations of selected herbicides and degradation products determined by laboratory method analysis code GCS for water samples collected from 51 streams in nine Midwestern States, 2002—Continued

Map number (fig. 1)	U.S. Geological Survey site identification number	Site name	Sample type	Date of collection (month/day/year)	Collection time (24-hour)	Acetochlor	Alachlor	Ametryn	Atrazine	Deethylatrazine (CIAT)	Deisopropylatrazine (CEAT)	Cyanazine	Cyanazine amide (CAM)	Dimethenamid	Flufenacet
						Iowa—Continued									
7	05484500	Raccoon River at Van Meter	S1	05/17/02	0930	0.38	<0.05	<0.05	0.68	0.09	<0.05	<0.05	<0.05	0.13	<0.05
			S2	06/12/02	1630	.27	<.05	<.05	7.8	.51	.24	<.05	<.05	.19	.20
			CR	06/12/02	1635	.25	<.05	<.05	8.1	.46	.28	<.05	<.05	.16	.20
			S3	10/30/02	1200	<.05	<.05	<.05	.05	.06	<.05	<.05	<.05	<.05	<.05
8	06606600	Little Sioux River at Correctionville	S1	05/17/02	1615	.32	<.05	<.05	.17	.08	<.05	<.05	<.05	<.05	<.05
			S2	06/11/02	1100	.26	<.05	<.05	16	.43	.26	<.05	<.05	<.05	.67
			S3	10/31/02	0930	<.05	<.05	<.05	<.05	.05	<.05	<.05	<.05	<.05	<.05
9	06607200	Maple River at Mapleton	S1	05/29/02	1200	<.05	<.05	<.05	.16	.07	<.05	<.05	<.05	<.05	<.05
			S2	06/11/02	1330	.17	<.05	<.05	14	.58	.45	<.05	<.05	<.05	<.05
			S3	10/31/02	1200	<.05	<.05	<.05	.06	.06	<.05	<.05	<.05	<.05	<.05
10	06609500	Boyer River at Logan	S1	05/29/02	0945	4.5	<.05	<.05	6.7	.50	.27	.08	<.05	3.6	.08
			S2	06/11/02	1545	1.3	<.05	<.05	11	.99	.64	.07	<.05	.75	.25
			S3	11/01/02	0900	<.05	<.05	<.05	.12	.06	<.05	<.05	<.05	<.05	<.05
						Illinois									
11	03378000	Bonpas Creek at Browns	S1	06/06/02	1030	.12	<.05	<.05	1.5	.31	.38	<.05	<.05	<.05	<.05
			CR	06/06/02	1031	.11	<.05	<.05	1.5	.30	.36	<.05	<.05	<.05	<.05
			S2	06/25/02	1300	1.5	<.05	<.05	15	4.0	3.8	<.05	<.05	.07	.77
			S3	09/25/02	1015	.07	<.05	.05	.32	.23	.20	<.05	<.05	<.05	.13
12	03381495	Little Wabash River at Carmi	S1	06/06/02	1230	.18	<.05	<.05	4.9	.34	.27	<.05	<.05	.22	<.05
			S2	06/25/02	1430	1.3	<.05	<.05	13	3.0	2.7	<.05	<.05	.16	<.05
			CR	06/25/02	1431	1.6	<.05	<.05	15	2.8	3.5	<.05	<.05	.17	<.05
			S3	09/25/02	0830	<.05	<.05	.07	.47	.47	.26	<.05	<.05	<.05	<.05
13	05439500	South Branch Kishwaukee River at Fairdale	S1	05/14/02	1600	2.4	<.05	<.05	17	.55	.19	<.05	<.05	1.8	<.05
			S2	08/02/02	1430	<.05	<.05	<.05	.25	.15	.05	<.05	<.05	<.05	<.05
			S3	09/25/02	0930	<.05	<.05	<.05	.09	.07	.05	<.05	<.05	<.05	<.05

Table 5. Concentrations of selected herbicides and degradation products determined by laboratory method analysis code GCS for water samples collected from 51 streams in nine Midwestern States, 2002—Continued

Map number (fig. 1)	U.S. Geological Survey site identification number	Site name	Sample type	Date of collection (month/day/year)	Collection time (24-hour)	Acetochlor	Alachlor	Ametryn	Atrazine	Deethylatrazine (CIAT)	Deisopropylatrazine (CEAT)	Cyanazine	Cyanazine amide (CAM)	Dimethenamid	Flufenacet
					Illinois—Continued										
14	05526000	Iroquois River near Chebanese	S1	06/06/02	0925	0.15	<0.05	<0.05	0.96	<0.05	0.08	<0.05	<0.05	0.05	<0.05
			S2	06/28/02	0910	.17	<.05	<.05	3.3	.47	.24	<.05	<.05	.21	<.05
			S3	09/25/02	1345	<.05	<.05	<.05	.15	.06	<.05	<.05	<.05	<.05	<.05
15	05540500	Du Page River at Shorewood	S1	05/15/02	1030	1.3	<.05	<.05	2.0	.09	<.05	<.05	<.05	.06	<.05
			S2	06/27/02	1240	<.05	<.05	<.05	1.3	.22	.16	<.05	<.05	<.05	<.05
			S3	09/25/02	1145	<.05	<.05	<.05	<.05	<.05	.06	<.05	<.05	<.05	<.05
			LD	09/25/02	1145	<.05	<.05	<.05	<.05	<.05	.07	<.05	<.05	<.05	<.05
16	05569500	Spoon River at London Mills	S1	05/14/02	1035	2.8	<.05	<.05	19	1.4	.33	<.05	<.05	2.4	.16
			S2	07/30/02	1000	<.05	<.05	<.05	.88	.36	.17	<.05	<.05	<.05	<.05
			S3	09/24/02	0905	<.05	<.05	<.05	.15	.09	.07	<.05	<.05	<.05	<.05
17	05576500	Sangamon River at Riverton	S1	05/29/02	1015	1.1	.13	<.05	11	.73	.37	<.05	<.05	1.8	<.05
			S2	07/17/02	1515	<.05	<.05	<.05	.74	.42	.19	<.05	<.05	.08	<.05
			S3	09/25/02	0845	<.05	<.05	<.05	.42	.24	.21	<.05	<.05	<.05	<.05
18	05587000	Macoupin Creek near Kane	S1	06/06/02	1000	.36	<.05	<.05	3.6	.31	.16	<.05	<.05	.31	<.05
			S2	07/29/02	1115	.14	<.05	<.05	2.0	.89	.90	<.05	<.05	.12	<.05
			S3	09/24/02	1120	.05	<.05	<.05	.86	.68	.43	<.05	<.05	.05	<.05
			LD	09/24/02	1120	<.05	<.05	<.05	.90	.73	.44	<.05	<.05	.05	<.05
19	05592100	Kaskaskia River near Cowden	S1	05/29/02	0930	5.3	<.05	<.05	20	.73	.53	<.05	<.05	.37	<.05
			S2	06/25/02	1200	.89	<.05	<.05	.11	.39	.20	<.05	<.05	.08	<.05
			S3	09/25/02	1330	.23	<.05	<.05	.99	.93	.41	<.05	<.05	.05	<.05
20	05594000	Shoal Creek near Breese	S1	06/06/02	1330	.52	.06	<.05	4.4	.33	.26	<.05	<.05	.23	<.05
			S2	07/29/02	1410	<.05	<.05	.05	.89	.51	.41	<.05	<.05	<.05	<.05
			S3	09/24/02	1420	<.05	<.05	<.05	.27	.19	.17	<.05	<.05	<.05	<.05

Table 5. Concentrations of selected herbicides and degradation products determined by laboratory method analysis code GCS for water samples collected from 51 streams in nine Midwestern States, 2002—Continued

Map number (fig. 1)	U.S. Geological Survey site identification number	Site name	Sample type	Date of collection (month/day/year)	Collection time (24-hour)	Acetochlor	Alachlor	Ametryn	Atrazine	Deethylatrazine (CIAT)	Deisopropylatrazine (CEAT)	Cyanazine	Cyanazine amide (CAM)	Dimethenamid	Flufenacet
						Indiana									
21	03275000	Whitewater River near Alpine	FB	06/14/02	1145	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
			S1	06/14/02	1230	.98	6.0	<.05	18	1.6	.75	<.05	<.05	.59	<.05
			S2	06/28/02	1205	.61	1.3	<.05	4.0	1.2	.88	<.05	<.05	.06	<.05
			S3	10/29/02	1715	<.05	<.05	<.05	.05	.05	<.05	<.05	<.05	<.05	<.05
22	03302800	Blue River at Fredericksburg	S1	06/06/02	1130	.82	<.05	<.05	13	1.4	1.8	<.05	<.05	<.05	<.05
			S2	08/21/02	1130	<.05	<.05	<.05	.24	.26	.14	<.05	<.05	<.05	<.05
			S3	09/27/02	1200	<.05	<.05	<.05	.12	.10	.07	<.05	<.05	<.05	<.05
23	03328500	Eel River near Logansport	S1	06/05/02	1200	.13	<.05	<.05	1.7	.13	.08	<.05	<.05	<.05	<.05
			S2	07/30/02	1130	<.05	<.05	<.05	.21	<.05	<.05	<.05	<.05	<.05	<.05
			S2	07/31/02	1250	<.05	<.05	<.05	.22	.05	<.05	<.05	<.05	<.05	<.05
			LD	07/31/02	1250	<.05	<.05	<.05	.23	.05	<.05	<.05	<.05	<.05	<.05
			S3	12/10/02	1000	<.05	<.05	<.05	<.05	<.05	<.05	<.05	<.05	<.05	<.05
24	03333450	Wildcat Creek near Jerome	S1	05/30/02	1250	1.6	.05	<.05	4.4	.32	.15	<.05	<.05	.15	<.05
			S2	08/19/02	1110	<.05	<.05	<.05	.64	.14	.06	<.05	<.05	<.05	<.05
			S3	09/20/02	1316	<.05	<.05	<.05	.43	.15	.06	<.05	<.05	<.05	<.05
25	03335000	Wildcat Creek near Lafayette	S1	05/30/02	1630	.38	<.05	<.05	2.8	.24	.11	<.05	<.05	.10	<.05
			S2	07/23/02	1000	<.05	<.05	<.05	.38	.11	<.05	<.05	<.05	<.05	<.05
			S3	11/12/02	1215	<.05	<.05	<.05	.12	.11	.08	<.05	<.05	<.05	<.05
26	03362500	Sugar Creek near Edinburgh	S1	06/07/02	1345	1.4	<.05	<.05	9.0	.98	.62	<.05	<.05	.63	<.05
			S2	06/26/02	1020	2.1	<.05	<.05	28	1.4	1.1	<.05	<.05	.09	<.05
			CR	06/26/02	1120	3.0	<.05	<.05	37	2.3	1.9	<.05	<.05	.15	<.05
			CR	06/26/02	1121	3.0	<.05	<.05	33	2.3	1.9	<.05	<.05	.14	<.05
			S3	10/26/02	1340	<.05	<.05	<.05	.09	.06	<.05	<.05	<.05	<.05	<.05

Table 5. Concentrations of selected herbicides and degradation products determined by laboratory method analysis code GCS for water samples collected from 51 streams in nine Midwestern States, 2002—Continued

Map number (fig. 1)	U.S. Geological Survey site identification number	Site name	Sample type	Date of collection (month/day/year)	Collection time (24-hour)	Acetochlor	Alachlor	Ametryn	Atrazine	Deethylatrazine (CIAT)	Deisopropylatrazine (CEAT)	Cyanazine	Cyanazine amide (CAM)	Dimethenamid	Flufenacet
						Indiana—Continued									
27	03371500	East Fork White River near Bedford	S1	06/06/02	1600	1.2	0.18	<0.05	13	0.89	0.58	<0.05	<0.05	<0.05	<0.05
			S2	07/23/02	1605	<.05	<.05	<.05	.81	.34	.17	<.05	<.05	<.05	<.05
			LD	07/23/02	1605	<.05	<.05	<.05	.67	.30	.15	<.05	<.05	<.05	<.05
			S3	10/01/02	1140	<.05	<.05	<.05	.19	.13	.08	<.05	<.05	<.05	<.05
			CR	10/01/02	1141	<.05	<.05	<.05	.19	.13	.08	<.05	<.05	<.05	<.05
						Kansas									
28	06885500	Black Vermillion River near Frankfort	S1	05/07/02	1145	1.0	1.8	<.05	10	.51	.26	<.05	<.05	<.05	<.05
			CR	05/07/02	1150	1.2	2.2	<.05	10	.56	.26	<.05	<.05	<.05	<.05
			S2	08/17/02	1235	<.05	<.05	<.05	.19	.05	<.05	<.05	<.05	<.05	<.05
			S3	10/03/02	1135	.28	.71	<.05	1.5	.09	<.05	<.05	<.05	.08	<.05
29	06890100	Delaware River near Muscotah	S1	05/07/02	1315	2.2	.51	<.05	17	1.4	.60	<.05	<.05	.70	.25
			S2	06/27/02	0950	.84	.20	<.05	3.7	1.8	.78	<.05	<.05	.27	.16
			S3	09/19/02	1110	.28	<.05	<.05	.26	.13	<.05	<.05	<.05	<.05	<.05
						Minnesota									
30	05317000	Cottonwood River near New Ulm	S1	05/30/02	1350	.06	<.05	<.05	.09	<.05	.12	<.05	<.05	<.05	<.05
			S2	06/25/02	1620	.24	<.05	<.05	3.8	.38	.27	<.05	<.05	.18	<.05
			S3	10/04/02	0935	<.05	<.05	<.05	.08	<.05	.07	<.05	<.05	<.05	<.05
31	05476000	Des Moines River at Jackson	S1	05/31/02	0720	.05	<.05	<.05	.14	.05	<.05	<.05	<.05	<.05	<.05
			S2	06/25/02	1215	.08	<.05	<.05	1.0	.14	.08	<.05	<.05	<.05	<.05
			CR	06/25/02	1220	.09	<.05	<.05	1.1	.15	.08	<.05	<.05	<.05	<.05
			S3	10/08/02	1145	<.05	<.05	<.05	.05	<.05	<.05	<.05	<.05	<.05	<.05
32	05320270	Little Cobb River near Beauford	S1	06/06/02	1315	.38	<.05	<.05	.58	.09	<.05	<.05	<.05	<.05	<.05
			S2	06/27/02	1045	.12	<.05	<.05	1.4	.18	.05	<.05	<.05	.06	<.05
			LD	06/27/02	1045	.12	<.05	<.05	1.4	.19	.06	<.05	<.05	.06	<.05
			S3	10/02/02	1105	<.05	<.05	<.05	.09	.07	<.05	<.05	<.05	<.05	<.05
			LD	10/02/02	1105	<.05	<.05	<.05	.09	.07	<.05	<.05	<.05	<.05	<.05

Table 5. Concentrations of selected herbicides and degradation products determined by laboratory method analysis code GCS for water samples collected from 51 streams in nine Midwestern States, 2002—Continued

Map number (fig. 1)	U.S. Geological Survey site identification number	Site name	Sample type	Date of collection (month/day/year)	Collection time (24-hour)	Acetochlor	Alachlor	Ametryn	Atrazine	Deethylatrazine (CIAT)	Deisopropylatrazine (CEAT)	Cyanazine	Cyanazine amide (CAM)	Dimethenamid	Flufenacet
					Missouri										
33	06817700	Nodaway River near Graham	S1	05/14/02	1230	0.65	<0.05	<0.05	14	0.84	0.26	<0.05	<0.05	1.6	0.21
			S2	07/29/02	1200	.08	<.05	<.05	1.1	.20	.15	<.05	<.05	<.05	<.05
			S3	10/04/02	1215	.06	<.05	<.05	.21	<.05	<.05	<.05	<.05	<.05	<.05
					Nebraska										
34	06804000	Wahoo Creek at Ithaca	S1	05/13/02	1330	18	.34	<.05	34	.89	.37	<.05	<.05	.53	.93
			S2	06/12/02	0840	10	.77	<.05	55	4.1	3.3	<.05	<.05	1.6	1.6
			S3	10/04/02	0930	<.05	<.05	<.05	.42	.09	.08	<.05	<.05	<.05	<.05
35	06880800	West Fork Big Blue River near Dorchester	S1	05/07/02	0900	5.4	.38	<.05	48	2.4	.89	<.05	<.05	4.1	.39
			S2	07/26/02	1100	.05	.05	.22	.58	.51	.22	<.05	<.05	<.05	.10
			S3	10/04/02	0920	<.05	<.05	<.05	.08	.17	.10	<.05	<.05	<.05	<.05
36	06815000	Big Nemaha River at Falls City	S1	05/06/02	1400	7.6	.98	<.05	41	2.9	1.0	<.05	<.05	.29	.47
			S2	07/12/02	1400	.07	<.05	<.05	.99	.34	.16	<.05	<.05	<.05	<.05
			S3	10/04/02	1520	<.05	<.05	<.05	.13	.06	<.05	<.05	<.05	<.05	<.05
			LD	10/04/02	1520	<.05	<.05	<.05	.14	.06	<.05	<.05	<.05	<.05	<.05
37	06882000	Big Blue River at Barneston	S1	05/07/02	1530	4.2	.38	<.05	29	1.1	.45	<.05	<.05	.72	.80
			S2	06/15/02	0900	.20	.11	<.05	1.9	.82	.38	<.05	<.05	.16	.08
			S3	10/04/02	1300	<.05	<.05	<.05	.09	.09	.07	<.05	<.05	<.05	<.05
			CR	10/04/02	1310	<.05	<.05	<.05	.09	.09	.07	<.05	<.05	<.05	<.05
38	06884000	Little Blue River near Fairbury	S1	05/07/02	1230	6.4	.98	<.05	39	1.7	.69	<.05	<.05	4.7	.27
			S2	06/13/02	930	.99	1.7	<.05	20	2.4	1.5	<.05	<.05	1.0	<.05
			S3	10/02/02	2000	.06	<.05	<.05	.17	.14	.16	<.05	<.05	<.05	<.05
					Ohio										
39	03157000	Clear Creek near Rockbridge	S1	06/05/02	1115	.83	<.05	<.05	3.8	.81	.79	<.05	<.05	.05	<.05
			LD	06/05/02	1115	.84	<.05	<.05	3.8	.76	.85	<.05	<.05	.05	<.05
			S2	07/29/02	1200	<.05	<.05	<.05	.21	.08	.15	<.05	<.05	<.05	<.05
			S3	10/26/02	1300	<.05	<.05	<.05	.06	.05	<.05	<.05	<.05	<.05	<.05

Table 5. Concentrations of selected herbicides and degradation products determined by laboratory method analysis code GCS for water samples collected from 51 streams in nine Midwestern States, 2002—Continued

Map number (fig. 1)	U.S. Geological Survey site identification number	Site name	Sample type	Date of collection (month/day/year)	Collection time (24-hour)	Acetochlor	Alachlor	Ametryn	Atrazine	Deethylatrazine (CIAT)	Deisopropylatrazine (CEAT)	Cyanazine	Cyanazine amide (CAM)	Dimethenamid	Flufenacet
						Ohio—Continued									
40	03219500	Scioto River near Prospect	S1	06/04/02	1230	1.4	<0.05	<0.05	9.7	0.79	0.79	<0.05	<0.05	0.25	0.09
			CR	06/04/02	1231	1.2	<.05	<.05	9.9	.74	.72	<.05	<.05	.26	.09
			S2	07/31/02	0930	<.05	<.05	.06	7.9	.40	.24	<.05	<.05	<.05	<.05
			S3	10/01/02	1030	.05	<.05	<.05	.77	.21	.15	<.05	<.05	<.05	<.05
41	03223000	Olentangy River at Claridon	S1	06/04/02	1100	.67	<.05	<.05	3.1	.25	.20	<.05	<.05	.07	<.05
			S2	07/31/02	1100	<.05	<.05	<.05	.73	.22	.16	<.05	<.05	<.05	<.05
			S3	10/26/02	1500	<.05	<.05	<.05	.12	.05	<.05	<.05	<.05	<.05	<.05
42	03230500	Big Darby Creek at Darbyville	S1	06/03/02	1200	.83	<.05	<.05	10	.53	.38	<.05	<.05	.48	<.05
			S2	08/01/02	0930	.05	<.05	<.05	.99	.40	.18	<.05	<.05	<.05	<.05
			LD	08/01/02	0930	.05	<.05	<.05	.96	.42	.18	<.05	<.05	<.05	<.05
			S3	10/01/02	1105	<.05	<.05	<.05	.18	.22	.09	<.05	<.05	<.05	<.05
43	03234500	Scioto River at Higby	S1	06/04/02	1015	.49	<.05	<.05	4.2	.46	.41	<.05	<.05	.18	<.05
			S2	07/30/02	1100	.17	<.05	<.05	1.9	.51	<.05	<.05	<.05	<.05	<.05
			S3	10/28/02	1000	<.05	<.05	<.05	.71	.24	.15	<.05	<.05	<.05	<.05
44	03240000	Little Miami River near Oldtown	S1	06/05/02	1320	.94	<.05	<.05	2.0	.16	.09	<.05	<.05	<.05	<.05
			S2	07/17/02	1200	<.05	<.05	<.05	.25	.12	.06	<.05	<.05	<.05	<.05
			S3	10/27/02	0700	<.05	<.05	<.05	.12	.13	.06	<.05	<.05	<.05	<.05
45	03267900	Mad River at Eagle City	S1	06/05/02	1130	<.05	<.05	<.05	.48	<.05	<.05	<.05	<.05	<.05	<.05
			S2	07/17/02	1030	<.05	<.05	<.05	<.05	<.05	<.05	<.05	<.05	<.05	<.05
			CR	07/17/02	1031	<.05	<.05	<.05	<.05	<.05	<.05	<.05	<.05	<.05	<.05
			S3	10/27/02	0800	<.05	<.05	<.05	<.05	<.05	<.05	<.05	<.05	<.05	<.05

Table 5. Concentrations of selected herbicides and degradation products determined by laboratory method analysis code GCS for water samples collected from 51 streams in nine Midwestern States, 2002—Continued

Map number (fig. 1)	U.S. Geological Survey site identification number	Site name	Sample type	Date of collection (month/day/year)	Collection time (24-hour)	Acetochlor	Alachlor	Ametryn	Atrazine	Deethylatrazine (CIAT)	Deisopropylatrazine (CEAT)	Cyanazine	Cyanazine amide (CAM)	Dimethenamid	Flufenacet
						Ohio—Continued									
46	04185000	Tiffin River at Stryker	S1	05/29/02	1700	0.33	<0.05	<0.05	1.9	0.16	0.11	<0.05	<0.05	0.11	<0.05
			LD	05/29/02	1700	.35	<.05	<.05	1.9	.16	.10	<.05	<.05	.13	<.05
			S2	07/23/02	1530	<.05	<.05	<.05	.45	.08	<.05	<.05	<.05	<.05	<.05
			S3	11/06/02	1200	<.05	<.05	<.05	<.05	<.05	.06	<.05	<.05	<.05	<.05
			LD	11/06/02	1200	<.05	<.05	<.05	<.05	<.05	.06	<.05	<.05	<.05	<.05
			CR	11/06/02	1201	<.05	<.05	<.05	<.05	<.05	<.05	<.05	<.05	<.05	<.05
47	04186500	Auglaize River near Fort Jennings	S1	05/28/02	1115	.24	<.05	<.05	1.5	.16	.11	<.05	<.05	.08	<.05
			S2	07/23/02	1100	<.05	<.05	<.05	2.6	1.1	.66	<.05	<.05	<.05	<.05
			S3	10/30/02	1300	<.05	<.05	<.05	.10	<.05	<.05	<.05	<.05	<.05	<.05
						Wisconsin									
48	04087240	Root River at Racine	S1	06/03/02	1350	<.05	<.05	<.05	.22	.09	<.05	<.05	<.05	<.05	<.05
			CR	06/03/02	1351	<.05	<.05	<.05	.22	.09	.05	<.05	<.05	<.05	<.05
			S2	07/26/02	1130	<.05	<.05	<.05	.22	.09	.06	<.05	<.05	<.05	<.05
			S3	09/03/02	1110	<.05	<.05	<.05	<.05	<.05	<.05	<.05	<.05	<.05	<.05
49	05340500	St. Croix River at St. Croix Falls	S1	06/20/02	1130	<.05	<.05	<.05	.06	<.05	<.05	<.05	<.05	<.05	<.05
			S2	06/27/02	1130	<.05	<.05	<.05	.20	.05	<.05	<.05	<.05	<.05	<.05
			S3	09/03/02	1520	<.05	<.05	<.05	<.05	<.05	<.05	<.05	<.05	<.05	<.05
			LD	09/03/02	1520	<.05	<.05	<.05	<.05	<.05	<.05	<.05	<.05	<.05	<.05
50	05407000	Wisconsin River at Muscoda	S1	05/28/02	1330	<.05	<.05	<.05	.05	<.05	<.05	<.05	<.05	<.05	<.05
			S2	06/27/02	1215	.06	<.05	<.05	.27	.06	<.05	<.05	<.05	<.05	<.05
			S3	09/23/02	1130	<.05	<.05	<.05	.30	.12	<.05	<.05	<.05	<.05	<.05
51	05430500	Rock River at Afton	S1	06/04/02	1300	.08	<.05	<.05	.94	.11	.05	<.05	<.05	.05	<.05
			FB	07/11/02	1229	<.05	<.05	<.05	<.05	<.05	<.05	<.05	<.05	<.05	<.05
			S2	07/11/02	1230	<.05	<.05	<.05	.55	.23	.10	<.05	<.05	<.05	<.05
			S3	09/20/02	0945	<.05	<.05	<.05	.08	.11	<.05	<.05	<.05	<.05	<.05

Table 5. Concentrations of selected herbicides and degradation products determined by laboratory method analysis code GCS for water samples collected from 51 streams in nine Midwestern States, 2002—Continued

Map number (fig. 1)	U.S. Geological Survey site identification number	Site name	Sample type	Date of collection (month/day/year)	Collection time (24-hour)	Metolachlor	Metribuzin	Pendimethalin	Prometon	Prometryn	Propachlor	Propazine	Simazine	Terbutryn
					Iowa									
1	05411850	Turkey River near Eldorado	S1	05/14/02	1400	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
			CR	05/14/02	1405	.05	<.05	<.05	<.05	<.05	<.05	<.05	<.05	<.05
			S2	06/24/02	0950	.06	<.05	<.05	<.05	<.05	<.05	<.05	<.05	<.05
			S3	10/29/02	1300	<.05	<.05	<.05	<.05	<.05	<.05	<.05	<.05	<.05
2	05421000	Wapsipinicon River at Independence	S1	05/14/02	1100	.26	<.05	<.05	<.05	<.05	<.05	<.05	<.05	<.05
			S2	06/24/02	1245	.39	<.05	<.05	<.05	<.05	<.05	.06	<.05	<.05
			S3	10/29/02	0930	.07	<.05	<.05	<.05	<.05	<.05	<.05	<.05	<.05
3	05455100	Old Mans Creek near Iowa City	S1	05/13/02	1100	1.6	<.05	<.05	<.05	<.05	<.05	.10	<.05	<.05
			S2	06/27/02	0955	.25	<.05	<.05	<.05	<.05	<.05	<.05	<.05	<.05
			S3	10/30/02	1140	<.05	<.05	<.05	<.05	<.05	<.05	<.05	<.05	<.05
4	05472500	North Skunk River near Sigourney	S1	05/13/02	1630	8.7	.06	<.05	<.05	<.05	<.05	.17	<.05	<.05
			S2	07/08/02	1015	.39	<.05	<.05	<.05	<.05	<.05	<.05	<.05	<.05
			S3	10/29/02	1435	<.05	<.05	<.05	<.05	<.05	<.05	<.05	<.05	<.05
			LD	10/29/02	1435	<.05	<.05	<.05	<.05	<.05	<.05	<.05	<.05	<.05
5	05474000	Skunk River at Augusta	S1	05/13/02	1230	4.6	.15	<.05	<.05	<.05	<.05	.38	<.05	<.05
			S2	06/27/02	1235	.20	<.05	<.05	<.05	<.05	<.05	<.05	<.05	<.05
			S3	10/29/02	1015	.06	<.05	<.05	<.05	<.05	<.05	<.05	<.05	<.05
6	05480500	Des Moines River at Fort Dodge	S1	05/17/02	1230	.11	<.05	<.05	<.05	<.05	<.05	<.05	<.05	<.05
			S2	06/13/02	0730	.52	<.05	<.05	<.05	<.05	<.05	<.05	<.05	<.05
			LD	06/13/02	0730	.51	<.05	<.05	<.05	<.05	<.05	<.05	<.05	<.05
			S3	10/30/02	1500	.05	<.05	<.05	<.05	<.05	<.05	<.05	<.05	<.05

Table 5. Concentrations of selected herbicides and degradation products determined by laboratory method analysis code GCS for water samples collected from 51 streams in nine Midwestern States, 2002—Continued

Map number (fig. 1)	U.S. Geological Survey site identification number	Site name	Sample type	Date of collection (month/day/year)	Collection time (24-hour)	Metolachlor	Metribuzin	Pendimethalin	Prometon	Prometryn	Propachlor	Propazine	Simazine	Terbutryn
					Iowa—Continued									
7	05484500	Raccoon River at Van Meter	S1	05/17/02	0930	0.61	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
			S2	06/12/02	1630	.92	<.05	<.05	<.05	<.05	<.05	.05	<.05	<.05
			CR	06/12/02	1635	.87	<.05	<.05	<.05	<.05	<.05	.05	<.05	<.05
			S3	10/30/02	1200	.05	<.05	<.05	<.05	<.05	<.05	<.05	<.05	<.05
8	06606600	Little Sioux River at Correctionville	S1	05/17/02	1615	.16	<.05	<.05	<.05	<.05	<.05	<.05	<.05	<.05
			S2	06/11/02	1100	.59	.11	<.05	<.05	<.05	<.05	.09	<.05	<.05
			S3	10/31/02	0930	<.05	<.05	<.05	<.05	<.05	<.05	<.05	<.05	<.05
9	06607200	Maple River at Mapleton	S1	05/29/02	1200	.29	<.05	<.05	<.05	<.05	<.05	<.05	<.05	<.05
			S2	06/11/02	1330	1.1	<.05	.16	.14	<.05	<.05	.09	.05	<.05
			S3	10/31/02	1200	<.05	<.05	<.05	<.05	<.05	<.05	<.05	<.05	<.05
10	06609500	Boyer River at Logan	S1	05/29/02	0945	3.0	<.05	<.05	<.05	<.05	<.05	.06	<.05	<.05
			S2	06/11/02	1545	9.5	.10	<.05	<.05	<.05	<.05	.07	.05	<.05
			S3	11/01/02	0900	.16	<.05	<.05	<.05	<.05	<.05	<.05	<.05	<.05
					Illinois									
11	03378000	Bonpas Creek at Browns	S1	06/06/02	1030	.24	<.05	<.05	<.05	<.05	<.05	<.05	.74	<.05
			CR	06/06/02	1031	.22	<.05	<.05	<.05	<.05	<.05	<.05	.66	<.05
			S2	06/25/02	1300	5.4	.15	<.05	<.05	<.05	<.05	.22	2.7	<.05
			S3	09/25/02	1015	.28	<.05	<.05	<.05	<.05	<.05	<.05	.16	<.05
12	03381495	Little Wabash River at Carmi	S1	06/06/02	1230	1.3	.14	<.05	<.05	<.05	<.05	.06	1.6	<.05
			S2	06/25/02	1430	4.0	.05	<.05	<.05	<.05	<.05	.18	2.3	<.05
			CR	06/25/02	1431	4.2	.05	<.05	<.05	<.05	<.05	.19	2.9	<.05
			S3	09/25/02	0830	.16	<.05	<.05	<.05	<.05	<.05	<.05	.11	<.05

Table 5. Concentrations of selected herbicides and degradation products determined by laboratory method analysis code GCS for water samples collected from 51 streams in nine Midwestern States, 2002—Continued

Map number (fig. 1)	U.S. Geological Survey site identification number	Site name	Sample type	Date of collection (month/day/year)	Collection time (24-hour)	Metolachlor	Metribuzin	Pendimethalin	Prometon	Prometryn	Propachlor	Propazine	Simazine	Terbutryn
					Illinois—Continued									
13	05439500	South Branch Kishwaukee River at Fairdale	S1	05/14/02	1600	4.1	<0.05	<0.05	<0.05	<0.05	<0.05	0.17	<0.05	<0.05
			S2	08/02/02	1430	.05	<.05	<.05	.06	<.05	<.05	<.05	<.05	<.05
			S3	09/25/02	0930	<.05	<.05	<.05	.07	<.05	<.05	<.05	<.05	<.05
14	05526000	Iroquois River near Chebanese	S1	06/06/02	0925	.09	<.05	<.05	<.05	<.05	<.05	<.05	.06	<.05
			S2	06/28/02	0910	.25	<.05	<.05	<.05	<.05	<.05	<.05	<.05	<.05
			S3	09/25/02	1345	.06	<.05	<.05	<.05	<.05	<.05	<.05	<.05	<.05
15	05540500	Du Page River at Shorewood	S1	05/15/02	1030	.43	<.05	<.05	<.05	<.05	<.05	<.05	<.05	<.05
			S2	06/27/02	1240	1.4	<.05	<.05	<.05	<.05	<.05	<.05	<.05	<.05
			S3	09/25/02	1145	<.05	<.05	<.05	<.05	<.05	<.05	<.05	<.05	<.05
			LD	09/25/02	1145	<.05	<.05	<.05	<.05	<.05	<.05	<.05	<.05	<.05
16	05569500	Spoon River at London Mills	S1	05/14/02	1035	10	.28	.06	<.05	<.05	<.05	.24	<.05	<.05
			S2	07/30/02	1000	.17	<.05	<.05	<.05	<.05	<.05	<.05	.06	<.05
			S3	09/24/02	0905	.05	<.05	<.05	<.05	<.05	<.05	<.05	<.05	<.05
17	05576500	Sangamon River at Riverton	S1	05/29/02	1015	.91	<.05	<.05	<.05	<.05	<.05	.20	.07	<.05
			S2	07/17/02	1515	.13	<.05	<.05	<.05	<.05	<.05	<.05	<.05	<.05
			S3	09/25/02	0845	.06	<.05	<.05	.09	<.05	<.05	.06	<.05	<.05
18	05587000	Macoupin Creek near Kane	S1	06/06/02	1000	.27	<.05	<.05	<.05	<.05	<.05	.06	.10	<.05
			S2	07/29/02	1115	.74	<.05	<.05	.22	<.05	<.05	.05	.14	<.05
			S3	09/24/02	1120	.27	<.05	<.05	<.05	<.05	<.05	<.05	.07	<.05
			LD	09/24/02	1120	.26	<.05	<.05	<.05	<.05	<.05	<.05	.07	<.05
19	05592100	Kaskaskia River near Cowden	S1	05/29/02	0930	4.6	<.05	<.05	<.05	<.05	<.05	.22	.23	<.05
			S2	06/25/02	1200	1.1	<.05	<.05	<.05	<.05	<.05	<.05	<.05	<.05
			S3	09/25/02	1330	.44	<.05	<.05	<.05	<.05	<.05	<.05	<.05	<.05

Table 5. Concentrations of selected herbicides and degradation products determined by laboratory method analysis code GCS for water samples collected from 51 streams in nine Midwestern States, 2002—Continued

Map number (fig. 1)	U.S. Geological Survey site identification number	Site name	Sample type	Date of collection (month/day/year)	Collection time (24-hour)	Metolachlor	Metribuzin	Pendimethalin	Prometon	Prometryn	Propachlor	Propazine	Simazine	Terbutryn
					Illinois—Continued									
20	05594000	Shoal Creek near Breese	S1	06/06/02	1330	0.97	<0.05	<0.05	<.05	<0.05	<0.05	0.08	0.57	<0.05
			S2	07/29/02	1410	.39	<.05	<.05	<.05	<.05	<.05	<.05	.08	<.05
			S3	09/24/02	1420	.21	<.05	<.05	<.05	<.05	<.05	<.05	<.05	<.05
					Indiana									
21	03275000	Whitewater River near Alpine	FB	06/14/02	1145	<.05	<.05	<.05	<.05	<.05	<.05	<.05	<.05	<.05
			S1	06/14/02	1230	2.2	.05	<.05	.05	<.05	<.05	.10	.20	<.05
			S2	06/28/02	1205	.92	<.05	<.05	<.05	<.05	<.05	.05	.23	<.05
			S3	10/29/02	1715	<.05	<.05	<.05	<.05	<.05	<.05	<.05	<.05	<.05
22	03302800	Blue River at Fredericksburg	S1	06/06/02	1130	2.1	.15	<.05	<.05	<.05	<.05	.19	7.4	<.05
			S2	08/21/02	1130	<.05	<.05	<.05	<.05	<.05	<.05	<.05	.09	<.05
			S3	09/27/02	1200	.08	<.05	<.05	<.05	<.05	<.05	<.05	<.05	<.05
23	03328500	Eel River near Logansport	S1	06/05/02	1200	.10	<.05	<.05	<.05	<.05	<.05	<.05	.07	<.05
			S2	07/30/02	1130	<.05	<.05	<.05	<.05	<.05	<.05	<.05	<.05	<.05
			S2	07/31/02	1250	<.05	<.05	<.05	<.05	<.05	<.05	<.05	<.05	<.05
			LD	07/31/02	1250	<.05	<.05	<.05	<.05	<.05	<.05	<.05	<.05	<.05
			S3	12/10/02	1000	<.05	<.05	<.05	<.05	<.05	<.05	<.05	<.05	<.05
24	03333450	Wildcat Creek near Jerome	S1	05/30/02	1250	.60	<.05	<.05	<.05	<.05	<.05	.06	<.05	<.05
			S2	08/19/02	1110	.05	<.05	<.05	<.05	<.05	<.05	<.05	<.05	<.05
			S3	09/20/02	1316	.09	<.05	<.05	<.05	<.05	<.05	<.05	<.05	<.05
25	03335000	Wildcat Creek near Lafayette	S1	05/30/02	1630	.30	<.05	<.05	<.05	<.05	<.05	<.05	.13	<.05
			S2	07/23/02	1000	.07	<.05	<.05	.21	<.05	<.05	<.05	<.05	<.05
			S3	11/12/02	1215	.07	<.05	<.05	.10	<.05	<.05	<.05	<.05	<.05

Table 5. Concentrations of selected herbicides and degradation products determined by laboratory method analysis code GCS for water samples collected from 51 streams in nine Midwestern States, 2002—Continued

Map number (fig. 1)	U.S. Geological Survey site identification number	Site name	Sample type	Date of collection (month/day/year)	Collection time (24-hour)	Metolachlor	Metribuzin	Pendimethalin	Prometon	Prometryn	Propachlor	Propazine	Simazine	Terbutryn
					Indiana—Continued									
26	03362500	Sugar Creek near Edinburgh	S1	06/07/02	1345	1.3	<0.05	<0.05	0.06	<0.05	<0.05	0.06	0.86	<0.05
			S2	06/26/02	1020	6.7	<.05	<.05	<.05	<.05	<.05	.19	.56	<.05
			CR	06/26/02	1120	7.2	<.05	<.05	<.05	<.05	<.05	.28	.60	<.05
			CR	06/26/02	1121	6.3	<.05	<.05	<.05	<.05	<.05	.26	.64	<.05
			S3	10/26/02	1340	<.05	<.05	<.05	<.05	<.05	<.05	<.05	<.05	<.05
27	03371500	East Fork White River near Bedford	S1	06/06/02	1600	3.0	<.05	<.05	<.05	<.05	<.05	.08	1.1	<.05
			S2	07/23/02	1605	.22	<.05	<.05	<.05	<.05	<.05	<.05	.07	<.05
			LD	07/23/02	1605	.22	<.05	<.05	<.05	<.05	<.05	<.05	.06	<.05
			S3	10/01/02	1140	.13	<.05	<.05	<.05	<.05	<.05	<.05	<.05	<.05
			CR	10/01/02	1141	.12	<.05	<.05	<.05	<.05	<.05	<.05	<.05	<.05
					Kansas									
28	06885500	Black Vermillion River near Frankfort	S1	05/07/02	1145	2.8	<.05	<.05	<.05	<.05	<.05	.09	<.05	<.05
			CR	05/07/02	1150	3.1	<.05	<.05	<.05	<.05	<.05	.10	<.05	<.05
			S2	08/17/02	1235	<.05	<.05	<.05	.05	<.05	<.05	<.05	<.05	<.05
			S3	10/03/02	1135	.11	<.05	<.05	<.05	<.05	<.05	<.05	<.05	<.05
29	06890100	Delaware River near Muscotah	S1	05/07/02	1315	2.5	.39	<.05	<.05	<.05	<.05	.19	<.05	<.05
			S2	06/27/02	0950	.85	.08	<.05	<.05	<.05	<.05	<.05	<.05	<.05
			S3	09/19/02	1110	<.05	<.05	<.05	<.05	<.05	<.05	<.05	<.05	<.05
					Minnesota									
30	05317000	Cottonwood River near New Ulm	S1	05/30/02	1350	<.05	<.05	<.05	<.05	<.05	<.05	<.05	<.05	<.05
			S2	06/25/02	1620	.13	<.05	<.05	<.05	<.05	<.05	<.05	<.05	<.05
			S3	10/04/02	0935	<.05	<.05	<.05	<.05	<.05	<.05	<.05	<.05	<.05
31	05476000	Des Moines River at Jackson	S1	05/31/02	720	<.05	<.05	<.05	.27	<.05	<.05	<.05	<.05	<.05
			S2	06/25/02	1215	<.05	<.05	<.05	<.05	<.05	<.05	<.05	<.05	<.05
			CR	06/25/02	1220	<.05	<.05	<.05	<.05	<.05	<.05	<.05	<.05	<.05
			S3	10/08/02	1145	<.05	<.05	<.05	<.05	<.05	<.05	<.05	<.05	<.05

Table 5. Concentrations of selected herbicides and degradation products determined by laboratory method analysis code GCS for water samples collected from 51 streams in nine Midwestern States, 2002—Continued

Map number (fig. 1)	U.S. Geological Survey site identification number	Site name	Sample type	Date of collection (month/day/year)	Collection time (24-hour)	Metolachlor	Metribuzin	Pendimethalin	Prometon	Prometryn	Propachlor	Propazine	Simazine	Terbutryn
					Minnesota—Continued									
32	05320270	Little Cobb River near Beauford	S1	06/06/02	1315	0.13	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
			S2	06/27/02	1045	.05	<.05	<.05	<.05	<.05	<.05	<.05	<.05	<.05
			LD	06/27/02	1045	.05	<.05	<.05	<.05	<.05	<.05	<.05	<.05	<.05
			S3	10/02/02	1105	<.05	<.05	<.05	<.05	<.05	<.05	<.05	<.05	<.05
			LD	10/02/02	1105	<.05	<.05	<.05	<.05	<.05	<.05	<.05	<.05	<.05
					Missouri									
33	06817700	Nodaway River near Graham	S1	05/14/02	1230	3.0	<.05	<.05	<.05	<.05	<.05	.16	.05	<.05
			S2	07/29/02	1200	.25	<.05	<.05	.05	<.05	<.05	.05	<.05	<.05
			S3	10/04/02	1215	.06	<.05	<.05	<.05	<.05	<.05	<.05	<.05	<.05
					Nebraska									
34	06804000	Wahoo Creek at Ithaca	S1	05/13/02	1330	1.5	<.05	<.05	<.05	<.05	<.05	.52	.06	<.05
			S2	06/12/02	0840	3.0	.18	<.05	.07	<.05	<.05	.29	.21	<.05
			S3	10/04/02	0930	.12	<.05	<.05	<.05	<.05	<.05	<.05	<.05	<.05
35	06880800	West Fork Big Blue River near Dorchester	S1	05/07/02	0900	<.05	.11	<.05	<.05	<.05	<.05	.24	<.05	<.05
			S2	07/26/02	1100	.21	<.05	<.05	<.05	<.05	<.05	<.05	<.05	<.05
			S3	10/04/02	0920	.13	<.05	<.05	<.05	<.05	<.05	<.05	<.05	<.05
36	06815000	Big Nemaha River at Falls City	S1	05/06/02	1400	.98	.50	<.05	<.05	<.05	<.05	.26	<.05	<.05
			S2	07/12/02	1400	.14	<.05	<.05	<.05	<.05	<.05	<.05	<.05	<.05
			S3	10/04/02	1520	<.05	<.05	<.05	<.05	<.05	<.05	<.05	<.05	<.05
			LD	10/04/02	1520	<.05	<.05	<.05	<.05	<.05	<.05	<.05	<.05	<.05
37	06882000	Big Blue River at Barneston	S1	05/07/02	1530	4.3	.31	<.05	.37	<.05	<.05	.36	<.05	<.05
			S2	06/15/02	0900	1.6	.07	<.05	<.05	<.05	<.05	<.05	<.05	<.05
			S3	10/04/02	1300	<.05	<.05	<.05	<.05	<.05	<.05	<.05	<.05	<.05
			CR	10/04/02	1310	<.05	<.05	<.05	<.05	<.05	<.05	<.05	<.05	<.05

Table 5. Concentrations of selected herbicides and degradation products determined by laboratory method analysis code GCS for water samples collected from 51 streams in nine Midwestern States, 2002—Continued

Map number (fig. 1)	U.S. Geological Survey site identification number	Site name	Sample type	Date of collection (month/day/year)	Collection time (24-hour)	Metolachlor	Metribuzin	Pendimethalin	Prometon	Prometryn	Propachlor	Propazine	Simazine	Terbutryn
					Nebraska—Continued									
38	06884000	Little Blue River near Fairbury	S1	05/07/02	1230	5.8	0.17	<0.05	<0.05	<0.05	<0.05	0.28	<0.05	<0.05
			S2	06/13/02	930	5.4	<.05	<.05	<.05	<.05	<.05	.14	.08	<.05
			S3	10/02/02	2000	.21	<.05	<.05	<.05	<.05	<.05	<.05	<.05	<.05
					Ohio									
39	03157000	Clear Creek near Rockbridge	S1	06/05/02	1115	.24	<.05	<.05	<.05	<.05	<.05	.06	1.5	<.05
			LD	06/05/02	1115	.22	<.05	<.05	<.05	<.05	<.05	.06	1.6	<.05
			S2	07/29/02	1200	<.05	<.05	<.05	<.05	<.05	<.05	<.05	.09	<.05
			S3	10/26/02	1300	<.05	<.05	<.05	<.05	<.05	<.05	<.05	.14	<.05
40	03219500	Scioto River near Prospect	S1	06/04/02	1230	2.6	.23	<.05	<.05	<.05	<.05	.11	3.1	<.05
			CR	06/04/02	1231	2.5	.21	<.05	<.05	<.05	<.05	.10	2.6	<.05
			S2	07/31/02	0930	.07	<.05	<.05	<.05	<.05	<.05	.16	.16	<.05
			S3	10/01/02	1030	.44	<.05	<.05	<.05	<.05	<.05	<.05	.08	<.05
41	03223000	Olentangy River at Claridon	S1	06/04/02	1100	1.1	.16	<.05	<.05	<.05	<.05	<.05	.64	<.05
			S2	07/31/02	1100	.19	<.05	<.05	<.05	<.05	<.05	<.05	.20	<.05
			S3	10/26/02	1500	.06	<.05	<.05	<.05	<.05	<.05	<.05	<.05	<.05
42	03230500	Big Darby Creek at Darbyville	S1	06/03/02	1200	3.8	.36	<.05	<.05	<.05	<.05	.10	1.8	<.05
			S2	08/01/02	0930	.24	<.05	<.05	<.05	<.05	<.05	<.05	.05	<.05
			LD	08/01/02	0930	.25	<.05	<.05	<.05	<.05	<.05	.05	.05	<.05
			S3	10/01/02	1105	.16	<.05	<.05	<.05	<.05	<.05	<.05	<.05	<.05
43	03234500	Scioto River at Higby	S1	06/04/02	1015	.97	<.05	<.05	<.05	<.05	<.05	.06	.71	<.05
			S2	07/30/02	1100	.35	<.05	<.05	<.05	<.05	<.05	<.05	.15	<.05
			S3	10/28/02	1000	.59	<.05	<.05	<.05	<.05	<.05	<.05	.12	<.05
44	03240000	Little Miami River near Oldtown	S1	06/05/02	1320	.13	<.05	<.05	<.05	<.05	<.05	<.05	.07	<.05
			S2	07/17/02	1200	.06	<.05	<.05	<.05	<.05	<.05	<.05	<.05	<.05
			S3	10/27/02	0700	.25	.32	<.05	<.05	<.05	<.05	<.05	<.05	<.05

Table 5. Concentrations of selected herbicides and degradation products determined by laboratory method analysis code GCS for water samples collected from 51 streams in nine Midwestern States, 2002—Continued

Map number (fig. 1)	U.S. Geological Survey site identification number	Site name	Sample type	Date of collection (month/day/year)	Collection time (24-hour)	Metolachlor	Metribuzin	Pendimethalin	Prometon	Prometryn	Propachlor	Propazine	Simazine	Terbutryn
					Ohio—Continued									
45	03267900	Mad River at Eagle City	S1	06/05/02	1130	0.10	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.05	<0.05
			S2	07/17/02	1030	<.05	<.05	<.05	<.05	<.05	<.05	<.05	<.05	<.05
			CR	07/17/02	1031	<.05	<.05	<.05	<.05	<.05	<.05	<.05	<.05	<.05
			S3	10/27/02	0800	<.05	<.05	<.05	<.05	<.05	<.05	<.05	<.05	<.05
46	04185000	Tiffin River at Stryker	S1	05/29/02	1700	.32	<.05	<.05	<.05	<.05	<.05	<.05	.36	<.05
			LD	05/29/02	1700	.29	<.05	<.05	<.05	<.05	<.05	<.05	.35	<.05
			S2	07/23/02	1530	<.05	<.05	<.05	<.05	<.05	<.05	<.05	.06	<.05
			S3	11/06/02	1200	<.05	<.05	<.05	<.05	<.05	<.05	<.05	<.05	<.05
			LD	11/06/02	1200	<.05	<.05	<.05	<.05	<.05	<.05	<.05	<.05	<.05
			CR	11/06/02	1201	<.05	<.05	<.05	<.05	<.05	<.05	<.05	<.05	<.05
47	04186500	Auglaize River near Fort Jennings	S1	05/28/02	1115	.75	<.05	<.05	<.05	<.05	<.05	<.05	.20	<.05
			S2	07/23/02	1100	.17	<.05	<.05	.16	<.05	<.05	<.05	.17	<.05
			S3	10/30/02	1300	.11	<.05	<.05	<.05	<.05	<.05	<.05	<.05	<.05
					Wisconsin									
48	04087240	Root River at Racine	S1	06/03/02	1350	.06	<.05	<.05	<.05	<.05	<.05	<.05	<.05	<.05
			CR	06/03/02	1351	.06	<.05	<.05	<.05	<.05	<.05	<.05	<.05	<.05
			S2	07/26/02	1130	<.05	<.05	<.05	<.05	<.05	<.05	<.05	<.05	<.05
			S3	09/03/02	1110	<.05	<.05	<.05	<.05	<.05	<.05	<.05	<.05	<.05
49	05340500	St. Croix River at St. Croix Falls	S1	06/20/02	1130	<.05	<.05	<.05	<.05	<.05	<.05	<.05	<.05	<.05
			S2	06/27/02	1130	<.05	<.05	<.05	<.05	<.05	<.05	<.05	<.05	<.05
			S3	09/03/02	1520	<.05	<.05	<.05	<.05	<.05	<.05	<.05	<.05	<.05
			LD	09/03/02	1520	<.05	<.05	<.05	<.05	<.05	<.05	<.05	<.05	<.05
50	05407000	Wisconsin River at Muscoda	S1	05/28/02	1330	<.05	<.05	<.05	<.05	<.05	<.05	<.05	<.05	<.05
			S2	06/27/02	1215	.05	<.05	<.05	<.05	<.05	<.05	<.05	<.05	<.05
			S3	09/23/02	1130	<.05	<.05	<.05	<.05	<.05	<.05	<.05	<.05	<.05

Table 5. Concentrations of selected herbicides and degradation products determined by laboratory method analysis code GCS for water samples collected from 51 streams in nine Midwestern States, 2002—Continued

Map number (fig. 1)	U.S. Geological Survey site identification number	Site name	Sample type	Date of collection (month/day/year)	Collection time (24-hour)	Metolachlor	Metribuzin	Pendimethalin	Prometon	Prometryn	Propachlor	Propazine	Simazine	Terbutryn
					Wisconsin—Continued									
51	05430500	Rock River at Afton	S1	06/04/02	1300	0.80	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
			FB	07/11/02	1229	<.05	<.05	<.05	<.05	<.05	<.05	<.05	<.05	<.05
			S2	07/11/02	1230	<.05	<.05	<.05	<.05	<.05	<.05	<.05	<.05	<.05
			S3	09/20/02	0945	<.05	<.05	<.05	<.05	<.05	<.05	<.05	<.05	<.05

Table 6. Statistical summary of concentrations of selected herbicides and degradation products determined by laboratory method analysis code GCS for water samples collected from 51 streams in nine Midwestern States, 2002

[All concentrations in micrograms per liter. MRL, method reporting limit; <, less than]

Herbicide	Number of samples	Number at or above MRL	25th percentile	Median	75th percentile	95th percentile	Maximum
Pre-emergence runoff samples							
Acetochlor	51	46	0.24	0.67	2.2	6.4	18
Alachlor	51	15	<.05	<.05	.06	.98	6.0
Ametryn	51	0	<.05	<.05	<.05	<.05	<.05
Atrazine	51	51	.96	4.2	14	39	48
Deethylatrazine	51	46	.09	.33	.84	1.8	2.9
Deisopropylatrazine	51	39	.05	.19	.45	.89	1.8
Cyanazine	51	2	<.05	<.05	<.05	<.05	.08
Cyanazine amide	51	0	<.05	<.05	<.05	<.05	<.05
Dimethenamid	51	35	<.05	.13	.59	3.6	4.7
Flufenacet	51	11	<.05	<.05	<.05	.47	.93
Metolachlor	51	45	.13	.75	2.5	4.6	8.7
Metribuzin	51	14	<.05	<.05	.06	.36	.50
Pendimethalin	51	1	<.05	<.05	<.05	<.05	.06
Prometon	51	4	<.05	<.05	<.05	.06	.37
Prometryn	51	0	<.05	<.05	<.05	<.05	<.05
Propachlor	51	0	<.05	<.05	<.05	<.05	<.05
Propazine	51	27	<.05	.06	.16	.28	.52
Simazine	51	24	<.05	<.05	.23	1.8	7.4
Terbutryn	51	0	<.05	<.05	<.05	<.05	<.05
Post-emergence runoff samples							
Acetochlor	52	30	<.05	.07	.27	1.5	10
Alachlor	52	6	<.05	<.05	<.05	.77	1.7
Ametryn	52	3	<.05	<.05	<.05	.05	.22
Atrazine	52	50	.33	1.1	4.2	20	55
Deethylatrazine	52	50	.14	.37	.55	2.4	4.0
Deisopropylatrazine	52	43	.06	.18	.40	2.7	3.8
Cyanazine	52	1	<.05	<.05	<.05	<.05	.07
Cyanazine amide	52	0	<.05	<.05	<.05	<.05	<.05
Dimethenamid	52	21	<.05	<.05	.09	.75	1.6
Flufenacet	52	9	<.05	<.05	<.05	.67	1.6
Metolachlor	52	41	.05	.21	.80	5.4	9.5
Metribuzin	52	7	<.05	<.05	<.05	.11	.18
Pendimethalin	52	1	<.05	<.05	<.05	<.05	.16
Prometon	52	8	<.05	<.05	<.05	.16	.22
Prometryn	52	0	<.05	<.05	<.05	<.05	<.05

Table 6. Statistical summary of concentrations of selected herbicides and degradation products determined by laboratory method analysis code GCS for water samples collected from 51 streams in nine Midwestern States, 2002—Continued

Herbicide	Number of samples	Number at or above MRL	25th percentile	Median	75th percentile	95th percentile	Maximum
Post-emergence runoff samples—Continued							
Propachlor	52	0	<0.05	<0.05	<0.05	<0.05	<0.05
Propazine	52	14	<.05	<.05	.05	.19	.29
Simazine	52	20	<.05	<.05	.08	.56	2.7
Terbutryn	52	0	<.05	<.05	<.05	<.05	<.05
Harvest-season runoff samples							
Acetochlor	51	8	<.05	<.05	<.05	.23	.28
Alachlor	51	1	<.05	<.05	<.05	<.05	.71
Ametryn	51	2	<.05	<.05	<.05	<.05	.07
Atrazine	51	43	.06	.12	.26	.86	1.5
Deethylatrazine	51	40	.05	.09	.14	.47	.93
Deisopropylatrazine	51	23	<.05	<.05	.08	.26	.43
Cyanazine	51	0	<.05	<.05	<.05	<.05	<.05
Cyanazine amide	51	0	<.05	<.05	<.05	<.05	<.05
Dimethenamid	51	3	<.05	<.05	<.05	.05	.08
Flufenacet	51	1	<.05	<.05	<.05	<.05	.13
Metolachlor	51	28	<.05	.05	.13	.44	.59
Metribuzin	51	1	<.05	<.05	<.05	<.05	.32
Pendimethalin	51	0	<.05	<.05	<.05	<.05	<.05
Prometon	51	3	<.05	<.05	<.05	.07	.10
Prometryn	51	0	<.05	<.05	<.05	<.05	<.05
Propachlor	51	0	<.05	<.05	<.05	<.05	<.05
Propazine	51	1	<.05	<.05	<.05	<.05	.06
Simazine	51	6	<.05	<.05	<.05	.12	.16
Terbutryn	51	0	<.05	<.05	<.05	<.05	<.05

Table 7. Concentrations of selected acetamide degradation products determined by laboratory method analysis code LCAA for water samples collected from 51 streams in nine Midwestern States, 2002

[All concentrations are in micrograms per liter. ESA, ethanesulfonic acid; OXA, oxanilic acid; SAA, sulfanylacetic acid; <, less than. Sample type: CR, concurrent replicate sample; FB, field blank; LD, laboratory duplicate sample; S1, sample from pre-emergence runoff; S2, sample from post-emergence runoff; S3, sample from harvest-season runoff]

Map number (fig. 1)	U.S. Geological Survey site identification number	Site name	Sample type	Date of collection (month/day/year)	Collection time (24-hour)	Acetochlor ESA	Acetochlor OXA	Acetochlor SAA	Alachlor ESA	Alachlor OXA	Alachlor SAA	Dimethenamid ESA
					Iowa							
1	05411850	Turkey River near Eldorado	S1	05/14/02	1400	0.75	0.17	<0.05	1.1	<0.05	<0.05	0.05
			CR	05/14/02	1405	.82	.19	<.05	1.2	<.05	<.05	.07
			S2	06/24/02	0950	1.6	.76	.46	.99	<.05	<.05	.22
			S3	10/29/02	1300	.27	<.05	<.05	1.3	<.05	<.05	<.05
2	05421000	Wapsipinicon River at Independence	S1	05/14/02	1100	.83	.21	<.05	1.3	.06	<.05	<.05
			S2	06/24/02	1245	1.8	1.2	.38	1.1	.10	<.05	.25
			S3	10/29/02	0930	.44	.15	<.05	2.2	.12	<.05	.07
3	05455100	Old Mans Creek near Iowa City	S1	05/13/02	1100	1.0	.86	.44	.33	<.05	<.05	.10
			S2	06/27/02	0955	.54	.32	.11	.29	<.05	<.05	.10
			S3	10/30/02	1140	.25	.06	<.05	.55	.05	<.05	<.05
4	05472500	North Skunk River near Sigourney	S1	05/13/02	1630	.90	.94	.62	.19	.06	<.05	.31
			S2	07/08/02	1015	.59	.63	.13	.07	<.05	<.05	.12
			S3	10/29/02	1435	.17	.11	<.05	.23	<.05	<.05	<.05
			LD	10/29/02	1435	.14	.09	<.05	.20	<.05	<.05	<.05
5	05474000	Skunk River at Augusta	S1	05/13/02	1230	1.7	2.2	1.2	<.05	<.05	<.05	.45
			S2	06/27/02	1235	.77	.90	.27	.19	<.05	<.05	.08
			S3	10/29/02	1015	.22	.13	<.05	.32	<.05	<.05	<.05
6	05480500	Des Moines River at Fort Dodge	S1	05/17/02	1230	.28	.21	<.05	.11	<.05	<.05	<.05
			S2	06/13/02	0730	.66	.95	.22	.08	<.05	<.05	<.05
			LD	06/13/02	0730	.77	1.1	.27	.10	<.05	<.05	<.05
			S3	10/30/02	1500	.27	.15	<.05	.21	<.05	<.05	<.05

Table 7. Concentrations of selected acetamide degradation products determined by laboratory method analysis code LCAA for water samples collected from 51 streams in nine Midwestern States, 2002—Continued

Map number (fig. 1)	U.S. Geological Survey site identification number	Site name	Sample type	Date of collection (month/day/year)	Collection time (24-hour)	Acetochlor ESA	Acetochlor OXA	Acetochlor SAA	Alachlor ESA	Alachlor OXA	Alachlor SAA	Dimethenamid ESA
					Iowa—Continued							
7	05484500	Raccoon River at Van Meter	S1	05/17/02	0930	0.47	0.43	<0.05	0.07	<0.05	<0.05	0.06
			S2	06/12/02	1630	.49	.65	.17	<.05	<.05	<.05	.07
			CR	06/12/02	1635	.54	.71	.18	<.05	<.05	<.05	.08
			S3	10/30/02	1200	.20	.05	<.05	.10	<.05	<.05	<.05
8	06606600	Little Sioux River at Correctionville	S1	05/17/02	1615	.21	.13	<.05	.13	<.05	<.05	<.05
			S2	06/11/02	1100	.28	.54	.12	<.05	<.05	<.05	<.05
			S3	10/31/02	0930	.11	.05	<.05	.17	<.05	<.05	<.05
9	06607200	Maple River at Mapleton	S1	05/29/02	1200	.07	.05	<.05	.05	<.05	<.05	<.05
			S2	06/11/02	1330	.09	.18	<.05	<.05	<.05	<.05	<.05
			S3	10/31/02	1200	.07	.05	<.05	.06	<.05	<.05	<.05
10	06609500	Boyer River at Logan	S1	05/29/02	0945	.56	.92	<.05	.06	<.05	<.05	.07
			S2	06/11/02	1545	.41	.86	.20	<.05	<.05	<.05	.09
			S3	11/01/02	0900	.06	.06	<.05	.09	.05	<.05	<.05
					Illinois							
11	03378000	Bonpas Creek at Browns	S1	06/06/02	1030	.09	.06	<.05	.12	<.05	<.05	<.05
			CR	06/06/02	1031	.08	.05	<.05	.11	<.05	<.05	<.05
			S2	06/25/02	1300	.87	1.6	.59	.05	<.05	<.05	<.05
			S3	09/25/02	1015	.29	.45	.16	.06	<.05	<.05	.06
12	03381495	Little Wabash River at Carmi	S1	06/06/02	1230	.09	.14	<.05	.11	<.05	<.05	<.05
			S2	06/25/02	1430	.76	1.4	.75	.07	<.05	<.05	<.05
			LD	06/25/02	1430	.60	1.1	.58	.09	<.05	<.05	<.05
			CR	06/25/02	1431	.73	1.4	.70	.07	<.05	<.05	.06
			S3	09/25/02	0830	.17	.33	.07	.08	.05	<.05	.08

Table 7. Concentrations of selected acetamide degradation products determined by laboratory method analysis code LCAA for water samples collected from 51 streams in nine Midwestern States, 2002—Continued

Map number (fig. 1)	U.S. Geological Survey site identification number	Site name	Sample type	Date of collection (month/day/year)	Collection time (24-hour)	Acetochlor ESA	Acetochlor OXA	Acetochlor SAA	Alachlor ESA	Alachlor OXA	Alachlor SAA	Dimethenamid ESA
					Illinois—Continued							
13	05439500	South Branch Kishwaukee River at Fairdale	S1	05/14/02	1600	1.9	1.2	<0.05	0.34	0.11	<0.05	0.13
			S2	08/02/02	1430	.33	.16	<.05	.71	.08	<.05	<.05
			S3	09/25/02	0930	.25	.12	<.05	.56	.07	<.05	<.05
14	05526000	Iroquois River near Chebanese	S1	06/06/02	0925	.54	.21	.06	.97	.09	.10	.07
			S2	06/28/02	0910	1.0	.94	.29	.42	.05	<.05	.21
			S3	09/25/02	1345	.63	.25	<.05	1.8	.17	<.05	<.05
15	05540500	Du Page River at Shorewood	S1	05/15/02	1030	.21	.20	<.05	.05	<.05	<.05	<.05
			S2	06/27/02	1240	.38	.34	.08	.06	<.05	<.05	<.05
			S3	09/25/02	1145	.07	<.05	<.05	.10	<.05	<.05	<.05
			LD	09/25/02	1145	.08	<.05	<.05	.12	<.05	<.05	<.05
16	05569500	Spoon River at London Mills	S1	05/14/02	1035	.78	.86	.54	<.05	<.05	<.05	.33
			S2	07/30/02	1000	.27	.26	.08	<.05	<.05	<.05	.05
			S3	09/24/02	0905	.09	.05	<.05	.21	<.05	<.05	<.05
17	05576500	Sangamon River at Riverton	S1	05/29/02	1015	.66	.49	.33	.19	.08	<.05	.34
			S2	07/17/02	1515	.60	.26	<.05	.16	.10	<.05	.10
			S3	09/25/02	0845	.23	.25	.06	.16	.09	<.05	.13
18	05587000	Macoupin Creek near Kane	S1	06/06/02	1000	.37	.26	.13	.05	<.05	<.05	.09
			S2	07/29/02	1115	.54	.98	.30	.05	<.05	<.05	.08
			S3	09/24/02	1120	.28	.49	.13	.05	<.05	<.05	.10
			LD	09/24/02	1120	.27	.49	.12	.05	<.05	.06	.10
19	05592100	Kaskaskia River near Cowden	S1	05/29/02	0930	.58	.57	.43	<.05	<.05	<.05	<.05
			S2	06/25/02	1200	.64	.66	.32	.05	<.05	<.05	<.05
			S3	09/25/02	1330	.37	.54	.18	.05	.05	<.05	.07

Table 7. Concentrations of selected acetamide degradation products determined by laboratory method analysis code LCAA for water samples collected from 51 streams in nine Midwestern States, 2002—Continued

Map number (fig. 1)	U.S. Geological Survey site identification number	Site name	Sample type	Date of collection (month/day/year)	Collection time (24-hour)	Acetochlor ESA	Acetochlor OXA	Acetochlor SAA	Alachlor ESA	Alachlor OXA	Alachlor SAA	Dimethenamid ESA
					Illinois—Continued							
20	05594000	Shoal Creek near Breese	S1	06/06/02	1330	0.05	0.08	<0.05	0.13	<0.05	<0.05	<0.05
			S2	07/29/02	1410	.10	.14	<.05	.20	.07	<.05	<.05
			S3	09/24/02	1420	.09	.11	<.05	.09	.05	<.05	.08
					Indiana							
21	03275000	Whitewater River near Alpine	FB	06/14/02	1145	<.05	<.05	<.05	<.05	<.05	<.05	<.05
			S1	06/14/02	1230	.65	.94	.51	.86	1.1	.76	.07
			S2	06/28/02	1205	.93	1.2	.43	.79	.84	.36	<.05
			S3	10/29/02	1715	<.05	<.05	<.05	.05	<.05	<.05	<.05
22	03302800	Blue River at Fredericksburg	S1	06/06/02	1130	.37	.69	.26	<.05	<.05	<.05	<.05
			S2	08/21/02	1130	<.05	<.05	<.05	<.05	<.05	<.05	<.05
			S3	09/27/02	1200	.06	.09	<.05	.06	<.05	<.05	<.05
23	03328500	Eel River near Logansport	S1	06/05/02	1200	.16	.10	<.05	.21	.06	<.05	<.05
			S2	07/30/02	1130	.09	.08	<.05	.19	.05	<.05	<.05
			S2	07/31/02	1250	.11	.10	<.05	.17	.05	<.05	<.05
			LD	07/31/02	1250	.12	.10	<.05	.17	.05	<.05	<.05
			S3	12/10/02	1000	<.05	<.05	<.05	.11	<.05	<.05	<.05
24	03333450	Wildcat Creek near Jerome	S1	05/30/02	1250	.52	.50	.31	.15	<.05	<.05	.05
			S2	08/19/02	1110	.09	.13	<.05	.16	<.05	<.05	<.05
			S3	09/20/02	1316	.16	.23	.05	.15	.09	<.05	.08
25	03335000	Wildcat Creek near Lafayette	S1	05/30/02	1630	.26	.19	.10	.14	.05	<.05	.05
			S2	07/23/02	1000	.12	.09	<.05	.11	<.05	<.05	<.05
			S3	11/12/02	1215	.38	.45	<.05	.13	.08	<.05	.07

Table 7. Concentrations of selected acetamide degradation products determined by laboratory method analysis code LCAA for water samples collected from 51 streams in nine Midwestern States, 2002—Continued

Map number (fig. 1)	U.S. Geological Survey site identification number	Site name	Sample type	Date of collection (month/day/year)	Collection time (24-hour)	Acetochlor ESA	Acetochlor OXA	Acetochlor SAA	Alachlor ESA	Alachlor OXA	Alachlor SAA	Dimethenamid ESA
					Indiana—Continued							
26	03362500	Sugar Creek near Edinburgh	S1	06/07/02	1345	0.30	0.50	0.15	0.08	<0.05	<0.05	0.09
			S2	06/26/02	1020	.41	.48	.16	.05	<.05	<.05	<.05
			CR	06/26/02	1120	.56	.73	.25	.06	<.05	<.05	<.05
			CR	06/26/02	1121	.56	.72	.28	.05	<.05	<.05	<.05
			S3	10/26/02	1340	.19	.26	<.05	.11	.07	<.05	<.05
27	03371500	East Fork White River near Bedford	S1	06/06/02	1600	.33	.66	.20	.17	.10	.07	<.05
			S2	07/23/02	1605	.27	.24	<.05	.11	.09	<.05	<.05
			LD	07/23/02	1605	.26	.24	<.05	.12	.07	<.05	<.05
			S3	10/01/02	1140	.11	.11	.05	.09	.05	<.05	<.05
			CR	10/01/02	1141	.11	.11	.05	.09	.05	<.05	<.05
					Kansas							
28	06885500	Black Vermillion River near Frankfort	S1	05/07/02	1145	.10	.12	.07	.24	.17	.10	<.05
			CR	05/07/02	1150	.09	.13	<.05	.23	.17	<.05	<.05
			S2	08/17/02	1235	<.05	<.05	<.05	.07	<.05	<.05	<.05
			S3	10/03/02	1135	.13	.25	<.05	.29	.49	<.05	<.05
29	06890100	Delaware River near Muscotah	S1	05/07/02	1315	.83	1.1	.52	.27	.32	.21	.09
			S2	06/27/02	0950	1.1	1.9	.85	.30	.30	.23	.16
			S3	09/19/02	1110	.08	.13	<.05	.08	.07	<.05	.06
			LD	09/19/02	1110	.07	.12	<.05	.08	.07	<.05	.06
					Minnesota							
30	05317000	Cottonwood River near New Ulm	S1	05/30/02	1350	.21	.11	<.05	.17	<.05	<.05	<.05
			S2	06/25/02	1620	1.3	1.1	.32	.15	<.05	<.05	.22
			S3	10/04/02	0935	.12	.08	<.05	.16	<.05	<.05	<.05
31	05476000	Des Moines River at Jackson	S1	05/31/02	0720	.20	.19	<.05	.13	<.05	<.05	<.05
			S2	06/25/02	1215	.35	.34	.10	.09	<.05	<.05	<.05
			CR	06/25/02	1220	.38	.34	.10	.08	<.05	<.05	<.05
			S3	10/08/02	1145	.14	.10	<.05	.25	.05	<.05	<.05

Table 7. Concentrations of selected acetamide degradation products determined by laboratory method analysis code LCAA for water samples collected from 51 streams in nine Midwestern States, 2002—Continued

Map number (fig. 1)	U.S. Geological Survey site identification number	Site name	Sample type	Date of collection (month/day/year)	Collection time (24-hour)	Acetochlor ESA	Acetochlor OXA	Acetochlor SAA	Alachlor ESA	Alachlor OXA	Alachlor SAA	Dimethenamid ESA
					Minnesota—Continued							
32	05320270	Little Cobb River near Beauford	S1	06/06/02	1315	1.4	1.5	0.29	0.70	0.05	<0.05	<0.05
			S2	06/27/02	1045	1.5	1.1	.36	.30	.05	<.05	.07
			LD	06/27/02	1045	1.6	1.1	.33	.28	.06	<.05	.08
			S3	10/02/02	1105	.78	.51	<.05	.54	.20	<.05	.08
			LD	10/02/02	1105	.82	.53	<.05	.55	.20	<.05	.08
					Missouri							
33	06817700	Nodaway River near Graham	S1	05/14/02	1230	.34	.39	.27	.06	<.05	<.05	.23
			S2	07/29/02	1200	.11	.17	<.05	.11	<.05	<.05	<.05
			S3	10/04/02	1215	.12	.14	<.05	.12	.08	<.05	<.05
					Nebraska							
34	06804000	Wahoo Creek at Ithaca	S1	05/13/02	1330	.65	1.3	.57	.11	.05	.07	<.05
			S2	06/12/02	0840	1.0	1.8	.79	.15	.19	.07	.09
			S3	10/04/02	0930	.20	.22	.08	.09	<.05	<.05	.05
35	06880800	West Fork Big Blue River near Dorchester	S1	05/07/02	0900	.39	.54	.18	.12	.09	<.05	.15
			S2	07/26/02	1100	.16	.27	<.05	.27	.18	<.05	<.05
			S3	10/04/02	0920	.13	.17	.07	.15	.08	.06	<.05
36	06815000	Big Nemaha River at Falls City	S1	05/06/02	1400	1.1	1.9	.77	.19	.16	<.05	.20
			S2	07/12/02	1400	.47	1.1	<.05	.13	.14	<.05	<.05
			S3	10/04/02	1520	.11	.14	<.05	.09	.05	<.05	<.05
			LD	10/04/02	1520	.11	.14	<.05	.09	.05	<.05	<.05
37	06882000	Big Blue River at Barneston	S1	05/07/02	1530	.44	.54	.27	.17	.10	<.05	<.05
			S2	06/15/02	0900	.23	.50	.19	.29	.28	.07	<.05
			S3	10/04/02	1300	.08	.08	<.05	.16	.05	<.05	<.05
			CR	10/04/02	1310	.08	.08	<.05	.16	.05	<.05	<.05

Table 7. Concentrations of selected acetamide degradation products determined by laboratory method analysis code LCAA for water samples collected from 51 streams in nine Midwestern States, 2002—Continued

Map number (fig. 1)	U.S. Geological Survey site identification number	Site name	Sample type	Date of collection (month/day/year)	Collection time (24-hour)	Acetochlor ESA	Acetochlor OXA	Acetochlor SAA	Alachlor ESA	Alachlor OXA	Alachlor SAA	Dimethenamid ESA
					Nebraska—Continued							
38	06884000	Little Blue River near Fairbury	S1	05/07/02	1230	0.19	0.28	0.12	0.07	0.07	<0.05	0.11
			S2	06/13/02	0930	.47	1.1	.39	.23	.29	.19	.05
			S3	10/02/02	2000	.30	.48	.16	.09	.06	.06	<.05
					Ohio							
39	03157000	Clear Creek near Rockbridge	S1	06/05/02	1115	.87	.93	.40	<.05	<.05	<.05	.14
			LD	06/05/02	1115	.85	.91	.41	.09	<.05	<.05	.14
			S2	07/29/02	1200	.13	.07	<.05	.05	<.05	<.05	<.05
			S3	10/26/02	1300	.11	.07	<.05	.08	<.05	<.05	<.05
40	03219500	Scioto River near Prospect	S1	06/04/02	1230	1.3	1.6	.80	.17	.06	<.05	.13
			CR	06/04/02	1231	1.1	1.3	.76	.25	.06	<.05	.13
			S2	07/31/02	0930	.33	.25	<.05	.30	.06	<.05	<.05
			S3	10/01/02	1030	1.2	1.7	.67	.29	.17	.10	.10
41	03223000	Olentangy River at Claridon	S1	06/04/02	1100	.59	.55	.17	.24	<.05	<.05	.05
			S2	07/31/02	1100	.27	.32	<.05	.23	<.05	<.05	<.05
			S3	10/26/02	1500	.18	.18	<.05	.20	.05	<.05	.05
42	03230500	Big Darby Creek at Darbyville	S1	06/03/02	1200	.26	.48	.22	.05	<.05	<.05	.10
			S2	08/01/02	0930	.71	.92	.29	.11	<.05	<.05	.10
			LD	08/01/02	0930	.73	.88	.29	.10	<.05	<.05	.11
			S3	10/01/02	1105	.57	.76	.28	.13	.07	<.05	.15
43	03234500	Scioto River at Higby	S1	06/04/02	1015	.48	.57	.24	.09	<.05	<.05	.06
			S2	07/30/02	1100	.58	.78	.25	.09	<.05	<.05	<.05
			S3	10/28/02	1000	.19	.22	.05	.09	.05	<.05	.05
44	03240000	Little Miami River near Oldtown	S1	06/05/02	1320	.14	.10	<.05	.15	<.05	<.05	<.05
			S2	07/17/02	1200	.10	<.05	<.05	.17	<.05	<.05	<.05
			S3	10/27/02	0700	.28	.30	.06	.19	.08	.07	<.05

Table 7. Concentrations of selected acetamide degradation products determined by laboratory method analysis code LCAA for water samples collected from 51 streams in nine Midwestern States, 2002—Continued

Map number (fig. 1)	U.S. Geological Survey site identification number	Site name	Sample type	Date of collection (month/day/year)	Collection time (24-hour)	Acetochlor ESA	Acetochlor OXA	Acetochlor SAA	Alachlor ESA	Alachlor OXA	Alachlor SAA	Dimethenamid ESA
					Ohio—Continued							
45	03267900	Mad River at Eagle City	S1	06/05/02	1130	0.10	0.07	<0.05	0.18	<0.05	<0.05	<0.05
			S2	07/17/02	1030	<.05	<.05	<.05	.18	<.05	<.05	<.05
			CR	07/17/02	1031	<.05	<.05	<.05	.20	<.05	<.05	<.05
			S3	10/27/02	0800	.06	<.05	<.05	.17	<.05	<.05	<.05
46	04185000	Tiffin River at Stryker	S1	05/29/02	1700	.35	.24	<.05	.30	.05	<.05	.05
			LD	05/29/02	1700	.32	.19	<.05	.26	.06	<.05	<.05
			S2	07/23/02	1530	.19	.17	<.05	.54	.06	<.05	<.05
			S3	11/06/02	1200	.06	<.05	<.05	.23	<.05	<.05	<.05
			LD	11/06/02	1200	.06	<.05	<.05	.23	<.05	<.05	<.05
			CR	11/06/02	1201	.07	<.05	<.05	.25	<.05	<.05	<.05
47	04186500	Auglaize River near Fort Jennings	S1	05/28/02	1115	.44	.30	<.05	.13	<.05	<.05	.06
			S2	07/23/02	1100	2.2	2.9	.57	.66	.71	.27	.14
			S3	10/30/02	1300	.08	.08	<.05	.13	.05	<.05	<.05
					Wisconsin							
48	04087240	Root River at Racine	S1	06/03/02	1350	<.05	<.05	<.05	.10	<.05	<.05	.06
			CR	06/03/02	1351	.05	<.05	<.05	.09	<.05	<.05	.05
			S2	07/26/02	1130	.07	.05	<.05	.08	<.05	<.05	.06
			S3	09/03/02	1110	<.05	<.05	<.05	<.05	<.05	<.05	.05
49	05340500	St. Croix River at St. Croix Falls	S1	06/20/02	1130	<.05	<.05	<.05	<.05	<.05	<.05	<.05
			S2	06/27/02	1130	<.05	.06	<.05	<.05	<.05	<.05	<.05
			S3	09/03/02	1520	<.05	<.05	<.05	<.05	<.05	<.05	<.05
			LD	09/03/02	1520	<.05	<.05	<.05	<.05	<.05	<.05	<.05
50	05407000	Wisconsin River at Muscoda	S1	05/28/02	1330	<.05	<.05	<.05	.23	<.05	<.05	<.05
			S2	06/27/02	1215	.05	.05	<.05	.18	<.05	<.05	<.05
			S3	09/23/02	1130	.07	.07	<.05	.22	.05	<.05	.06

Table 7. Concentrations of selected acetamide degradation products determined by laboratory method analysis code LCAA for water samples collected from 51 streams in nine Midwestern States, 2002—Continued

Map number (fig. 1)	U.S. Geological Survey site identification number	Site name	Sample type	Date of collection (month/day/year)	Collection time (24-hour)	Acetochlor ESA	Acetochlor OXA	Acetochlor SAA	Alachlor ESA	Alachlor OXA	Alachlor SAA	Dimethenamid ESA
					Wisconsin—Continued							
51	05430500	Rock River at Afton	S1	06/04/02	1300	0.11	0.08	<0.05	0.43	<0.05	<0.05	<0.05
			FB	07/11/02	1229	<.05	<.05	<.05	<.05	<.05	<.05	<.05
			S2	07/11/02	1230	.36	.41	<.05	.70	<.05	<.05	<.05
			S3	09/20/02	0945	.10	.10	<.05	.67	<.05	<.05	.07

Table 7. Concentrations of selected acetamide degradation products determined by laboratory method analysis code LCAA for water samples collected from 51 streams in nine Midwestern States, 2002—Continued

Map number (fig. 1)	U.S. Geological Survey site identification number	Site name	Sample type	Date of collection (month/day/year)	Collection time (24-hour)	Dimethenamid OXA	Flufenacet ESA	Flufenacet OXA	Metolachlor ESA	Metolachlor OXA	Propachlor ESA	Propachlor OXA
					Iowa							
1	05411850	Turkey River near Eldorado	S1	05/14/02	1400	<0.05	<0.05	<0.05	1.1	0.08	<0.05	<0.05
			CR	05/14/02	1405	<.05	<.05	<.05	1.2	.11	<.05	<.05
			S2	06/24/02	0950	.09	<.05	<.05	1.2	.20	<.05	<.05
			S3	10/29/02	1300	<.05	<.05	<.05	.80	.06	<.05	<.05
2	05421000	Wapsipinicon River at Independence	S1	05/14/02	1100	<.05	<.05	<.05	3.2	.29	<.05	<.05
			S2	06/24/02	1245	.15	<.05	<.05	3.4	.67	<.05	<.05
			S3	10/29/02	0930	<.05	<.05	<.05	3.0	.35	<.05	<.05
3	05455100	Old Mans Creek near Iowa City	S1	05/13/02	1100	.10	<.05	<.05	1.5	.33	<.05	<.05
			S2	06/27/02	0955	<.05	<.05	<.05	1.4	.28	<.05	<.05
			S3	10/30/02	1140	<.05	<.05	<.05	1.4	.15	<.05	<.05
4	05472500	North Skunk River near Sigourney	S1	05/13/02	1630	.26	<.05	<.05	2.0	1.1	<.05	<.05
			S2	07/08/02	1015	.08	<.05	<.05	.79	.28	<.05	<.05
			S3	10/29/02	1435	<.05	<.05	<.05	1.5	.33	<.05	<.05
			LD	10/29/02	1435	<.05	<.05	<.05	1.4	.28	<.05	<.05
5	05474000	Skunk River at Augusta	S1	05/13/02	1230	.48	.09	.09	1.3	.93	<.05	<.05
			S2	06/27/02	1235	.05	<.05	<.05	1.3	.27	<.05	<.05
			S3	10/29/02	1015	<.05	<.05	<.05	1.8	.27	<.05	<.05
6	05480500	Des Moines River at Fort Dodge	S1	05/17/02	1230	<.05	<.05	<.05	1.8	.16	<.05	<.05
			S2	06/13/02	0730	<.05	<.05	<.05	1.8	.35	<.05	<.05
			LD	06/13/02	0730	<.05	<.05	<.05	2.0	.43	<.05	<.05
			S3	10/30/02	1500	<.05	<.05	<.05	2.0	.20	<.05	<.05

Table 7. Concentrations of selected acetamide degradation products determined by laboratory method analysis code LCAA for water samples collected from 51 streams in nine Midwestern States, 2002—Continued

Map number (fig. 1)	U.S. Geological Survey site identification number	Site name	Sample type	Date of collection (month/day/year)	Collection time (24-hour)	Dimethenamid OXA	Flufenacet ESA	Flufenacet OXA	Metolachlor ESA	Metolachlor OXA	Propachlor ESA	Propachlor OXA
					Iowa—Continued							
7	05484500	Raccoon River at Van Meter	S1	05/17/02	0930	<0.05	<0.05	<0.05	2.4	0.47	<0.05	<0.05
			S2	06/12/02	1630	.06	<.05	<.05	1.4	.35	<.05	<.05
			CR	06/12/02	1635	.07	<.05	<.05	1.5	.35	<.05	<.05
			S3	10/30/02	1200	<.05	<.05	<.05	2.5	.23	<.05	<.05
8	06606600	Little Sioux River at Correctionville	S1	05/17/02	1615	<.05	<.05	<.05	1.1	.10	<.05	<.05
			S2	06/11/02	1100	<.05	<.05	<.05	.71	.22	<.05	<.05
			S3	10/31/02	0930	<.05	<.05	<.05	.79	.11	<.05	<.05
9	06607200	Maple River at Mapleton	S1	05/29/02	1200	<.05	<.05	<.05	.51	.12	<.05	<.05
			S2	06/11/02	1330	<.05	<.05	<.05	.54	.22	<.05	<.05
			S3	10/31/02	1200	<.05	<.05	<.05	.64	.16	<.05	<.05
10	06609500	Boyer River at Logan	S1	05/29/02	0945	.08	<.05	<.05	.48	.28	<.05	<.05
			S2	06/11/02	1545	.09	<.05	<.05	.87	.80	<.05	<.05
			S3	11/01/02	0900	<.05	<.05	<.05	.59	.17	<.05	<.05
					Illinois							
11	03378000	Bonpas Creek at Browns	S1	06/06/02	1030	<.05	<.05	<.05	1.1	.19	<.05	<.05
			CR	06/06/02	1031	<.05	<.05	<.05	1.1	.15	<.05	<.05
			S2	06/25/02	1300	<.05	.08	.18	1.5	1.2	<.05	<.05
			S3	09/25/02	1015	<.05	.08	.13	.47	.58	<.05	<.05
12	03381495	Little Wabash River at Carmi	S1	06/06/02	1230	<.05	<.05	<.05	.68	.28	<.05	<.05
			S2	06/25/02	1430	.06	<.05	<.05	1.4	1.3	<.05	<.05
			LD	06/25/02	1430	.05	<.05	<.05	1.2	1.1	<.05	<.05
			CR	06/25/02	1431	.06	<.05	<.05	1.4	1.3	<.05	<.05
			S3	09/25/02	0830	.05	<.05	<.05	.32	.39	<.05	<.05

Table 7. Concentrations of selected acetamide degradation products determined by laboratory method analysis code LCAA for water samples collected from 51 streams in nine Midwestern States, 2002—Continued

Map number (fig. 1)	U.S. Geological Survey site identification number	Site name	Sample type	Date of collection (month/day/year)	Collection time (24-hour)	Dimethenamid OXA	Flufenacet ESA	Flufenacet OXA	Metolachlor ESA	Metolachlor OXA	Propachlor ESA	Propachlor OXA
					Illinois—Continued							
13	05439500	South Branch Kishwaukee River at Fairdale	S1	05/14/02	1600	0.09	<0.05	<0.05	3.1	0.99	<0.05	<0.05
			S2	08/02/02	1430	<.05	<.05	<.05	1.5	.13	<.05	<.05
			S3	09/25/02	0930	<.05	<.05	<.05	1.1	.15	<.05	<.05
14	05526000	Iroquois River near Chebanese	S1	06/06/02	0925	<.05	<.05	<.05	2.4	.56	<.05	<.05
			S2	06/28/02	0910	.15	<.05	<.05	2.1	.64	<.05	<.05
			S3	09/25/02	1345	<.05	<.05	<.05	2.3	.83	<.05	<.05
15	05540500	Du Page River at Shorewood	S1	05/15/02	1030	<.05	<.05	<.05	.35	.14	<.05	<.05
			S2	06/27/02	1240	<.05	<.05	<.05	.61	.30	<.05	<.05
			S3	09/25/02	1145	<.05	<.05	<.05	.11	.06	<.05	<.05
			LD	09/25/02	1145	<.05	<.05	<.05	.11	.07	<.05	<.05
16	05569500	Spoon River at London Mills	S1	05/14/02	1035	.28	<.05	<.05	2.2	1.7	<.05	<.05
			S2	07/30/02	1000	<.05	<.05	<.05	1.4	.27	<.05	<.05
			S3	09/24/02	0905	<.05	<.05	<.05	1.4	.15	<.05	<.05
17	05576500	Sangamon River at Riverton	S1	05/29/02	1015	.19	<.05	<.05	.91	.31	<.05	<.05
			S2	07/17/02	1515	.06	<.05	<.05	.84	.14	<.05	<.05
			S3	09/25/02	0845	.05	<.05	<.05	.43	.23	<.05	<.05
18	05587000	Macoupin Creek near Kane	S1	06/06/02	1000	.05	<.05	<.05	.76	.16	<.05	<.05
			S2	07/29/02	1115	.08	<.05	<.05	.61	.50	<.05	<.05
			S3	09/24/02	1120	.06	<.05	<.05	.42	.44	<.05	<.05
			LD	09/24/02	1120	.06	<.05	<.05	.44	.43	<.05	<.05

Table 7. Concentrations of selected acetamide degradation products determined by laboratory method analysis code LCAA for water samples collected from 51 streams in nine Midwestern States, 2002—Continued

Map number (fig. 1)	U.S. Geological Survey site identification number	Site name	Sample type	Date of collection (month/day/year)	Collection time (24-hour)	Dimethenamid OXA	Flufenacet ESA	Flufenacet OXA	Metolachlor ESA	Metolachlor OXA	Propachlor ESA	Propachlor OXA
					Illinois—Continued							
19	05592100	Kaskaskia River near Cowden	S1	05/29/02	0930	<0.05	<0.05	<0.05	0.75	0.30	<0.05	<0.05
			S2	06/25/02	1200	<.05	<.05	<.05	.92	.39	<.05	<.05
			S3	09/25/02	1330	<.05	<.05	<.05	.47	.30	<.05	<.05
20	05594000	Shoal Creek near Breese	S1	06/06/02	1330	<.05	<.05	<.05	.82	.27	<.05	<.05
			S2	07/29/02	1410	.05	<.05	<.05	.83	.41	<.05	<.05
			S3	09/24/02	1420	<.05	<.05	<.05	.48	.38	<.05	<.05
					Indiana							
21	03275000	Whitewater River near Alpine	FB	06/14/02	1145	<.05	<.05	<.05	<.05	<.05	<.05	<.05
			S1	06/14/02	1230	<.05	<.05	<.05	.41	.37	<.05	<.05
			S2	06/28/02	1205	<.05	<.05	<.05	.50	.43	<.05	<.05
			S3	10/29/02	1715	<.05	<.05	<.05	.07	<.05	<.05	<.05
22	03302800	Blue River at Fredericksburg	S1	06/06/02	1130	<.05	<.05	<.05	.57	.32	<.05	<.05
			S2	08/21/02	1130	<.05	<.05	<.05	.22	.07	<.05	<.05
			S3	09/27/02	1200	<.05	<.05	<.05	.16	.11	<.05	<.05
23	03328500	Eel River near Logansport	S1	06/05/02	1200	<.05	<.05	<.05	.42	.11	<.05	<.05
			S2	07/30/02	1130	<.05	<.05	<.05	.26	.07	<.05	<.05
			S2	07/31/02	1250	<.05	<.05	<.05	.29	.09	<.05	<.05
			LD	07/31/02	1250	<.05	<.05	<.05	.30	.09	<.05	<.05
			S3	12/10/02	1000	<.05	<.05	<.05	.23	.06	<.05	<.05
24	03333450	Wildcat Creek near Jerome	S1	05/30/02	1250	<.05	<.05	<.05	2.5	.37	<.05	<.05
			S2	08/19/02	1110	<.05	<.05	<.05	.99	.23	<.05	<.05
			S3	09/20/02	1316	<.05	<.05	.05	.80	.37	<.05	<.05
25	03335000	Wildcat Creek near Lafayette	S1	05/30/02	1630	<.05	<.05	<.05	1.4	.28	<.05	<.05
			S2	07/23/02	1000	<.05	<.05	<.05	.52	.11	<.05	<.05
			S3	11/12/02	1215	<.05	<.05	<.05	.87	.48	<.05	<.05

Table 7. Concentrations of selected acetamide degradation products determined by laboratory method analysis code LCAA for water samples collected from 51 streams in nine Midwestern States, 2002—Continued

Map number (fig. 1)	U.S. Geological Survey site identification number	Site name	Sample type	Date of collection (month/day/year)	Collection time (24-hour)	Dimethenamid OXA	Flufenacet ESA	Flufenacet OXA	Metolachlor ESA	Metolachlor OXA	Propachlor ESA	Propachlor OXA
					Indiana—Continued							
26	03362500	Sugar Creek near Edinburgh	S1	06/07/02	1345	0.08	<0.05	<0.05	0.74	0.29	<0.05	<0.05
			S2	06/26/02	1020	<.05	<.05	<.05	.84	.66	<.05	<.05
			CR	06/26/02	1120	<.05	<.05	<.05	.77	.61	<.05	<.05
			CR	06/26/02	1121	<.05	<.05	<.05	.77	.64	<.05	<.05
			S3	10/26/02	1340	<.05	<.05	<.05	.29	.17	<.05	<.05
27	03371500	East Fork White River near Bedford	S1	06/06/02	1600	<.05	<.05	<.05	.50	.28	<.05	<.05
			S2	07/23/02	1605	<.05	<.05	<.05	.43	.28	<.05	<.05
			LD	07/23/02	1605	<.05	<.05	<.05	.41	.27	<.05	<.05
			S3	10/01/02	1140	<.05	<.05	<.05	.29	.22	<.05	<.05
			CR	10/01/02	1141	<.05	<.05	<.05	.29	.22	<.05	<.05
					Kansas							
28	06885500	Black Vermillion River near Frankfort	S1	05/07/02	1145	<.05	<.05	<.05	.41	.31	<.05	<.05
			CR	05/07/02	1150	<.05	<.05	<.05	.41	.32	<.05	<.05
			S2	08/17/02	1235	<.05	<.05	<.05	.19	.14	<.05	<.05
			S3	10/03/02	1135	<.05	<.05	<.05	.10	.16	<.05	.06
29	06890100	Delaware River near Muscotah	S1	05/07/02	1315	<.05	<.05	<.05	.59	.51	<.05	<.05
			S2	06/27/02	0950	.17	.13	.18	.64	.59	<.05	<.05
			S3	09/19/02	1110	<.05	<.05	<.05	.15	.14	<.05	<.05
			LD	09/19/02	1110	<.05	<.05	<.05	.14	.13	<.05	<.05
					Minnesota							
30	05317000	Cottonwood River near New Ulm	S1	05/30/02	1350	<.05	<.05	<.05	.83	.09	<.05	<.05
			S2	06/25/02	1620	.11	<.05	<.05	.93	.22	<.05	<.05
			S3	10/04/02	0935	<.05	<.05	<.05	.21	.06	<.05	<.05
31	05476000	Des Moines River at Jackson	S1	05/31/02	0720	<.05	<.05	<.05	1.6	.14	<.05	<.05
			S2	06/25/02	1215	<.05	<.05	<.05	1.6	.14	<.05	<.05
			CR	06/25/02	1220	<.05	<.05	<.05	1.6	.12	<.05	<.05
			S3	10/08/02	1145	<.05	<.05	<.05	.55	.09	<.05	<.05

Table 7. Concentrations of selected acetamide degradation products determined by laboratory method analysis code LCAA for water samples collected from 51 streams in nine Midwestern States, 2002—Continued

Map number (fig. 1)	U.S. Geological Survey site identification number	Site name	Sample type	Date of collection (month/day/year)	Collection time (24-hour)	Dimethenamid OXA	Flufenacet ESA	Flufenacet OXA	Metolachlor ESA	Metolachlor OXA	Propachlor ESA	Propachlor OXA
					Minnesota—Continued							
32	05320270	Little Cobb River near Beauford	S1	06/06/02	1315	<0.05	<0.05	<0.05	1.9	0.26	<0.05	<0.05
			S2	06/27/02	1045	<.05	<.05	<.05	1.8	.23	<.05	<.05
			LD	06/27/02	1045	<.05	<.05	<.05	1.8	.24	<.05	<.05
			S3	10/02/02	1105	.06	<.05	<.05	1.2	.31	<.05	<.05
			LD	10/02/02	1105	.06	<.05	<.05	1.3	.32	<.05	<.05
					Missouri							
33	06817700	Nodaway River near Graham	S1	05/14/02	1230	.28	<.05	<.05	.96	.57	<.05	<.05
			S2	07/29/02	1200	<.05	<.05	<.05	.34	.18	<.05	<.05
			S3	10/04/02	1215	<.05	<.05	<.05	.25	.12	<.05	<.05
					Nebraska							
34	06804000	Wahoo Creek at Ithaca	S1	05/13/02	1330	<.05	.07	<.05	.12	.11	<.05	<.05
			S2	06/12/02	0840	.10	.09	.08	.08	.13	<.05	<.05
			S3	10/04/02	0930	<.05	<.05	<.05	.07	.07	<.05	<.05
35	06880800	West Fork Big Blue River near Dorchester	S1	05/07/02	0900	.20	<.05	<.05	.63	.65	<.05	<.05
			S2	07/26/02	1100	<.05	<.05	<.05	.28	.33	<.05	<.05
			S3	10/04/02	0920	<.05	<.05	<.05	.35	.44	<.05	<.05
36	06815000	Big Nemaha River at Falls City	S1	05/06/02	1400	.23	.06	.05	.10	.07	<.05	<.05
			S2	07/12/02	1400	<.05	<.05	<.05	.26	.25	<.05	<.05
			S3	10/04/02	1520	<.05	<.05	<.05	.09	.08	<.05	<.05
			LD	10/04/02	1520	<.05	<.05	<.05	.09	.07	<.05	<.05
37	06882000	Big Blue River at Barneston	S1	05/07/02	1530	<.05	<.05	<.05	.40	.31	<.05	<.05
			S2	06/15/02	0900	<.05	<.05	.13	.34	.35	<.05	<.05
			S3	10/04/02	1300	<.05	<.05	<.05	.16	.10	<.05	<.05
			CR	10/04/02	1310	<.05	<.05	<.05	.17	.10	<.05	<.05

Table 7. Concentrations of selected acetamide degradation products determined by laboratory method analysis code LCAA for water samples collected from 51 streams in nine Midwestern States, 2002—Continued

Map number (fig. 1)	U.S. Geological Survey site identification number	Site name	Sample type	Date of collection (month/day/year)	Collection time (24-hour)	Dimethenamid OXA	Flufenacet ESA	Flufenacet OXA	Metolachlor ESA	Metolachlor OXA	Propachlor ESA	Propachlor OXA
					Nebraska—Continued							
38	06884000	Little Blue River near Fairbury	S1	05/07/02	1230	0.11	<0.05	<0.05	0.24	0.20	<0.05	<0.05
			S2	06/13/02	0930	.08	<.05	<.05	.78	.87	<.05	<.05
			S3	10/02/02	2000	.05	<.05	<.05	.28	.41	<.05	<.05
					Ohio							
39	03157000	Clear Creek near Rockbridge	S1	06/05/02	1115	.06	<.05	<.05	.81	.24	<.05	<.05
			LD	06/05/02	1115	.06	<.05	<.05	.80	.24	<.05	<.05
			S2	07/29/02	1200	<.05	<.05	<.05	.38	.07	<.05	<.05
			S3	10/26/02	1300	<.05	<.05	<.05	.49	.12	<.05	<.05
40	03219500	Scioto River near Prospect	S1	06/04/02	1230	.11	<.05	<.05	2.2	.89	<.05	<.05
			CR	06/04/02	1231	.10	<.05	<.05	1.9	.87	<.05	<.05
			S2	07/31/02	0930	<.05	<.05	<.05	.55	.22	<.05	<.05
			S3	10/01/02	1030	.11	.07	.05	2.3	1.8	<.05	.06
41	03223000	Olentangy River at Claridon	S1	06/04/02	1100	<.05	<.05	<.05	2.8	.72	<.05	<.05
			S2	07/31/02	1100	<.05	<.05	<.05	.86	.30	<.05	<.05
			S3	10/26/02	1500	<.05	<.05	<.05	.69	.33	<.05	<.05
42	03230500	Big Darby Creek at Darbyville	S1	06/03/02	1200	.09	<.05	<.05	.91	.46	<.05	<.05
			S2	08/01/02	0930	.06	<.05	<.05	1.4	.68	<.05	<.05
			LD	08/01/02	0930	.07	<.05	<.05	1.4	.56	<.05	<.05
			S3	10/01/02	1105	.14	<.05	<.05	1.4	.90	<.05	<.05
43	03234500	Scioto River at Higby	S1	06/04/02	1015	.05	<.05	<.05	.86	.43	<.05	<.05
			S2	07/30/02	1100	<.05	<.05	<.05	.67	.34	<.05	<.05
			S3	10/28/02	1000	<.05	<.05	<.05	.37	.25	<.05	<.05
44	03240000	Little Miami River near Oldtown	S1	06/05/02	1320	<.05	<.05	<.05	.88	.18	<.05	<.05
			S2	07/17/02	1200	<.05	<.05	<.05	.80	.19	<.05	<.05
			S3	10/27/02	0700	<.05	<.05	<.05	1.3	.70	<.05	<.05

Table 7. Concentrations of selected acetamide degradation products determined by laboratory method analysis code LCAA for water samples collected from 51 streams in nine Midwestern States, 2002—Continued

Map number (fig. 1)	U.S. Geological Survey site identification number	Site name	Sample type	Date of collection (month/day/year)	Collection time (24-hour)	Dimethenamid OXA	Flufenacet ESA	Flufenacet OXA	Metolachlor ESA	Metolachlor OXA	Propachlor ESA	Propachlor OXA
					Ohio—Continued							
45	03267900	Mad River at Eagle City	S1	06/05/02	1130	<0.05	<0.05	<0.05	0.41	0.10	<0.05	<0.05
			S2	07/17/02	1030	<.05	<.05	<.05	.31	.06	<.05	<.05
			CR	07/17/02	1031	<.05	<.05	<.05	.32	.09	<.05	<.05
			S3	10/27/02	0800	<.05	<.05	<.05	.39	.12	<.05	<.05
46	04185000	Tiffin River at Stryker	S1	05/29/02	1700	<.05	<.05	<.05	.60	.20	<.05	<.05
			LD	05/29/02	1700	<.05	<.05	<.05	.53	.15	<.05	<.05
			S2	07/23/02	1530	<.05	<.05	<.05	.79	.24	<.05	<.05
			S3	11/06/02	1200	<.05	<.05	<.05	.24	.08	<.05	<.05
			LD	11/06/02	1200	<.05	<.05	<.05	.25	.08	<.05	<.05
			CR	11/06/02	1201	<.05	<.05	<.05	.25	.09	<.05	<.05
47	04186500	Auglaize River near Fort Jennings	S1	05/28/02	1115	<.05	<.05	<.05	1.2	.33	<.05	<.05
			S2	07/23/02	1100	.13	<.05	<.05	1.3	.83	<.05	<.05
			S3	10/30/02	1300	<.05	<.05	<.05	.25	.23	<.05	<.05
					Wisconsin							
48	04087240	Root River at Racine	S1	06/03/02	1350	<.05	<.05	<.05	.64	.13	<.05	<.05
			CR	06/03/02	1351	<.05	<.05	<.05	.61	.14	<.05	<.05
			S2	07/26/02	1130	<.05	<.05	<.05	.51	.20	<.05	<.05
			S3	09/03/02	1110	<.05	<.05	<.05	.26	.11	<.05	<.05
49	05340500	St. Croix River at St. Croix Falls	S1	06/20/02	1130	<.05	<.05	<.05	<.05	<.05	<.05	<.05
			S2	06/27/02	1130	<.05	<.05	<.05	<.05	<.05	<.05	<.05
			S3	09/03/02	1520	<.05	<.05	<.05	<.05	<.05	<.05	<.05
			LD	09/03/02	1520	<.05	<.05	<.05	<.05	<.05	<.05	<.05
50	05407000	Wisconsin River at Muscoda	S1	05/28/02	1330	<.05	<.05	<.05	.17	.07	<.05	<.05
			S2	06/27/02	1215	<.05	<.05	<.05	.16	.07	<.05	<.05
			S3	09/23/02	1130	<.05	<.05	<.05	.15	.09	<.05	<.05

Table 7. Concentrations of selected acetamide degradation products determined by laboratory method analysis code LCAA for water samples collected from 51 streams in nine Midwestern States, 2002—Continued

Map number (fig. 1)	U.S. Geological Survey site identification number	Site name	Sample type	Date of collection (month/day/year)	Collection time (24-hour)	Dimethenamid OXA	Flufenacet ESA	Flufenacet OXA	Metolachlor ESA	Metolachlor OXA	Propachlor ESA	Propachlor OXA
					Wisconsin—Continued							
51	05430500	Rock River at Afton	S1	06/04/02	1300	<0.05	<0.05	<0.05	0.48	0.23	<0.05	<0.05
			FB	07/11/02	1229	<.05	<.05	<.05	<.05	<.05	<.05	<.05
			S2	07/11/02	1230	<.05	<.05	<.05	.59	.24	<.05	<.05
			S3	09/20/02	0945	<.05	<.05	<.05	.37	.10	<.05	<.05

Table 8. Statistical summary of concentrations of selected acetamide degradation products determined by laboratory method analysis code LCAA for water samples collected from 51 streams in nine Midwestern States, 2002

[All concentrations are in micrograms per liter. MRL, method reporting limit; ESA ethanesulfonic acid; OXA, oxanilic acid; SAA, sulfanylacetic acid; <, less than]

Degradation product	Number of samples	Number at or above MRL	25th percentile	Median	75th percentile	95th percentile	Maximum
Pre-emergence runoff samples							
Acetochlor ESA	51	48	0.19	0.37	0.66	1.4	1.9
Acetochlor OXA	51	48	.13	.30	.69	1.6	2.2
Acetochlor SAA	51	28	<.05	.10	.31	.77	1.2
Alachlor ESA	51	45	.07	.13	.21	.97	1.3
Alachlor OXA	51	19	<.05	<.05	.06	.16	1.1
Alachlor SAA	51	6	<.05	<.05	<.05	.10	.76
Dimethenamid ESA	51	28	<.05	.05	.10	.33	.45
Dimethenamid OXA	51	17	<.05	<.05	.08	.28	.48
Flufenacet ESA	51	3	<.05	<.05	<.05	<.05	.09
Flufenacet OXA	51	2	<.05	<.05	<.05	<.05	.09
Metolachlor ESA	51	50	.48	.82	1.5	2.8	3.2
Metolachlor OXA	51	50	.14	.28	.43	.99	1.7
Propachlor ESA	51	0	<.05	<.05	<.05	<.05	<.05
Propachlor OXA	51	0	<.05	<.05	<.05	<.05	<.05
Post-emergence runoff samples							
Acetochlor ESA	52	48	.12	.38	.71	1.6	2.2
Acetochlor OXA	52	48	.16	.41	.95	1.8	2.9
Acetochlor SAA	52	28	<.05	.10	.30	.75	.85
Alachlor ESA	52	45	.06	.15	.29	.79	1.1
Alachlor OXA	52	19	<.05	<.05	.08	.30	.84
Alachlor SAA	52	6	<.05	<.05	<.05	.23	.36
Dimethenamid ESA	52	19	<.05	<.05	.08	.22	.25
Dimethenamid OXA	52	17	<.05	<.05	.06	.15	.17
Flufenacet ESA	52	3	<.05	<.05	<.05	.08	.13
Flufenacet OXA	52	4	<.05	<.05	<.05	.13	.18
Metolachlor ESA	52	51	.38	.71	1.3	1.8	3.4
Metolachlor OXA	52	51	.18	.27	.43	.87	1.3
Propachlor ESA	52	0	<.05	<.05	<.05	<.05	<.05
Propachlor OXA	52	0	<.05	<.05	<.05	<.05	<.05
Harvest-season runoff samples							
Acetochlor ESA	51	47	.08	.14	.27	.63	1.2
Acetochlor OXA	51	43	.06	.12	.25	.54	1.7
Acetochlor SAA	51	14	<.05	<.05	.05	.18	.67
Alachlor ESA	51	49	.09	.13	.23	1.3	2.2
Alachlor OXA	51	29	<.05	.05	.07	.17	.49
Alachlor SAA	51	4	<.05	<.05	<.05	.06	.10
Dimethenamid ESA	51	19	<.05	<.05	.06	.10	.15

Table 8. Statistical summary of concentrations of selected acetamide degradation products determined by laboratory method analysis code LCAA for water samples collected from 51 streams in nine Midwestern States, 2002—Continued

Degradation product	Number of samples	Number at or above MRL	25th percentile	Median	75th percentile	95th percentile	Maximum
Harvest-season runoff samples—Continued							
Dimethenamid OXA	51	7	<0.05	<0.05	<0.05	0.06	0.14
Flufenacet ESA	51	2	<.05	<.05	<.05	<.05	.08
Flufenacet OXA	51	3	<.05	<.05	<.05	.05	.13
Metolachlor ESA	51	50	.23	.43	1.1	2.3	3.0
Metolachlor OXA	51	49	.10	.17	.35	.83	1.8
Propachlor ESA	51	0	<.05	<.05	<.05	<.05	<.05
Propachlor OXA	51	2	<.05	<.05	<.05	<.05	.06

Table 9. Concentrations of selected triazine and phenylurea herbicides and their degradation products determined by laboratory method analysis code LCEA for water samples collected from 51 streams in nine Midwestern States, 2002

[All concentrations are in micrograms per liter. <, less than. Sample type: CR, concurrent replicate sample; FB, field blank; LD, laboratory duplicate sample; S1, sample from pre-emergence runoff; S2, sample from post-emergence runoff; S3, sample from harvest-season runoff]

Map number (fig. 1)	U.S. Geological Survey site identification number	Site name	Sample type	Date of collection (month/day/year)	Collection time (24-hour)	Atrazine	Deethyl-atrazine (CIAT)	Deiso-propylatrazine (CEAT)	Didealkyl-atrazine (CAAT)	Hydroxy-atrazine (OIET)	Deethyl-hydroxyatrazine (OIAT)	Deisopropyl-hydroxyatrazine (OEAT)	Cyanazine
						Iowa							
1	05411850	Turkey River near Eldorado	S1	05/14/02	1400	0.97	0.23	<0.05	0.37	<0.05	<0.10	<0.10	<0.05
			LD	05/14/02	1400	.98	.22	<.05	.44	<.05	<.10	<.10	<.05
			CR	05/14/02	1405	.95	.20	<.05	.43	<.05	<.10	<.10	<.05
			S2	06/24/02	0950	4.0	1.1	.38	.59	.19	<.05	<.05	<.05
			S3	10/29/02	1300	.07	.22	.07	.38	.06	<.025	<.025	<.025
2	05421000	Wapsipinicon River at Independence	S1	05/14/02	1100	1.7	.22	<.05	.29	<.05	<.10	<.10	<.05
			S2	06/24/02	1245	4.1	1.1	.44	.49	.28	<.05	<.05	<.05
			S3	10/29/02	0930	.11	.17	.05	.18	.11	<.025	<.025	<.025
3	05455100	Old Mans Creek near Iowa City	S1	05/13/02	1100	6.9	.52	.15	.48	.05	<.10	<.10	<.05
			S2	06/27/02	0955	1.9	.55	.21	.48	.20	<.05	.13	<.05
			S3	10/30/02	1140	.07	.16	.07	.26	.05	<.025	<.025	<.025
4	05472500	North Skunk River near Sigourney	S1	05/13/02	1630	13	.93	.33	.26	.16	<.10	<.10	<.05
			S2	07/08/02	1015	1.7	.41	.25	.54	.52	<.05	.34	<.05
			S3	10/29/02	1435	.06	.05	<.025	.13	.09	<.025	<.025	<.025
5	05474000	Skunk River at Augusta	S1	05/13/02	1230	20	1.9	.76	.44	.21	<.10	<.10	<.05
			S2	06/27/02	1235	1.5	.42	.20	.54	.48	<.05	<.05	<.05
			S3	10/29/02	1015	.18	.10	.05	.17	.09	<.025	<.025	<.025
6	05480500	Des Moines River at Fort Dodge	S1	05/17/02	1230	.06	<.05	<.05	.14	<.05	<.10	<.10	<.05
			S2	06/13/02	0730	5.4	.31	.15	.25	.10	<.05	<.05	<.05
			S3	10/30/02	1500	<.025	.08	<.025	.28	.05	<.025	<.025	<.025
			LD	10/30/02	1500	.04	.06	<.025	.25	.07	<.025	<.025	<.025

Table 9. Concentrations of selected triazine and phenylurea herbicides and their degradation products determined by laboratory method analysis code LCEA for water samples collected from 51 streams in nine Midwestern States, 2002—Continued

Map number (fig. 1)	U.S. Geological Survey site identification number	Site name	Sample type	Date of collection (month/day/year)	Collection time (24-hour)	Atrazine	Deethyl-atrazine (CIAT)	Deiso-propylatrazine (CEAT)	Didealkyl-atrazine (CAAT)	Hydroxy-atrazine (OIET)	Deethyl-hydroxyatrazine (OIAT)	Deisopropyl-hydroxyatrazine (OEAT)	Cyanazine
						Iowa—Continued							
7	05484500	Raccoon River at Van Meter	S1	05/17/02	0930	0.72	0.05	<0.05	0.18	<0.05	<0.10	<0.10	<0.05
			S2	06/12/02	1630	8.9	.57	.33	.28	.38	<.10	<.10	<.05
			CR	06/12/02	1635	8.6	.52	.30	.37	.43	<.10	<.10	<.05
			S3	10/30/02	1200	.04	.07	.05	.26	.09	<.025	<.025	<.025
8	06606600	Little Sioux River at Correctionville	S1	05/17/02	1615	.14	.05	<.05	.16	<.05	<.10	<.10	<.05
			S2	06/11/02	1100	28	.45	.25	.13	.71	<.10	<.10	<.05
			S3	10/31/02	0930	.04	.07	.04	.17	.05	<.025	<.025	<.025
9	06607200	Maple River at Mapleton	S1	05/29/02	1200	.11	.06	<.05	.17	.09	<.10	<.10	<.05
			S2	06/11/02	1330	22	.36	.25	.30	.98	<.05	.06	<.05
			S3	10/31/02	1200	.06	<.025	<.025	.30	.05	<.025	<.025	<.025
10	06609500	Boyer River at Logan	S1	05/29/02	0945	8.1	.53	.25	.26	.59	<.10	<.10	.62
			S2	06/11/02	1545	18	.71	.40	.34	.53	.66	.07	<.05
			S3	11/01/02	0900	.13	.06	.03	.22	.08	<.025	<.025	<.025
						Illinois							
11	03378000	Bonpas Creek at Browns	S1	06/06/02	1030	2.5	.38	.36	.15	.42	<.10	<.10	<.05
			CR	06/06/02	1031	2.4	.30	.35	.12	.40	<.10	<.10	<.05
			S2	06/25/02	1300	22	7.9	5.6	1.5	1.1	1.1	.42	<.05
			S3	09/25/02	1015	.24	.12	.15	<.025	.64	.16	<.025	<.025
12	03381495	Little Wabash River at Carmi	S1	06/06/02	1230	7.4	.47	.59	.20	.40	<.10	<.10	<.05
			S2	06/25/02	1430	21	6.0	4.9	.72	1.7	.42	<.05	<.05
			CR	06/25/02	1431	22	6.8	4.7	.85	1.7	.79	<.05	<.05
			S3	09/25/02	0830	.36	.31	.22	.07	.75	<.025	<.025	<.025

Table 9. Concentrations of selected triazine and phenylurea herbicides and their degradation products determined by laboratory method analysis code LCEA for water samples collected from 51 streams in nine Midwestern States, 2002—Continued

Map number (fig. 1)	U.S. Geological Survey site identification number	Site name	Sample type	Date of collection (month/day/year)	Collection time (24-hour)	Atrazine	Deethyl-atrazine (CIAT)	Deiso-propylatrazine (CEAT)	Didealkyl-atrazine (CAAT)	Hydroxy-atrazine (OIET)	Deethyl-hydroxyatrazine (OIAT)	Deisopropyl-hydroxyatrazine (OEAT)	Cyanazine
						Illinois—Continued							
13	05439500	South Branch Kishwaukee River at Fairdale	S1	05/14/02	1600	15	0.62	0.15	0.24	0.06	<0.10	<0.10	<0.05
			S2	08/02/02	1430	.22	.09	<.05	.22	.17	<.05	.09	<.05
			LD	08/02/02	1430	.21	.09	<.05	.17	.11	<.05	<.05	<.05
			S3	09/25/02	0930	.05	.06	<.025	.07	.07	<.025	<.025	<.025
			LD	09/25/02	0930	.06	<.025	<.025	.06	.06	<.025	<.025	<.025
14	05526000	Iroquois River near Chebanese	S1	06/06/02	0925	1.2	.12	.05	.15	.06	<.10	<.10	<.05
			S2	06/28/02	0910	5.2	.64	.32	.74	.26	<.05	<.05	<.05
			S3	09/25/02	1345	.10	.05	<.025	<.025	.13	<.025	<.025	<.025
15	05540500	Du Page River at Shorewood	S1	05/15/02	1030	1.9	.06	<.05	<.05	<.05	<.10	<.10	<.05
			S2	06/27/02	1240	1.5	.26	.15	.18	.24	<.05	.25	<.05
			S3	09/25/02	1145	<.025	<.025	<.025	<.025	<.025	<.025	<.025	<.025
16	05569500	Spoon River at London Mills	S1	05/14/02	1035	16	1.5	.55	.40	.18	<.10	<.10	<.05
			S2	07/30/02	1000	1.2	.27	.16	.41	.35	<.05	.19	<.05
			S3	09/24/02	0905	.08	.07	<.025	.05	.11	<.025	<.025	<.025
17	05576500	Sangamon River at Riverton	S1	05/29/02	1015	21	.84	.45	.33	.28	<.10	<.10	<.05
			S2	07/17/02	1515	.88	.33	.17	.27	.42	<.05	.12	<.05
			S3	09/25/02	0845	.33	.15	.08	<.025	.31	<.025	.09	<.025
18	05587000	Macoupin Creek near Kane	S1	06/06/02	1000	3.9	.39	.20	.11	.21	<.10	<.10	<.05
			S2	07/29/02	1115	2.9	.68	.48	.48	1.4	.42	<.05	<.05
			S3	09/24/02	1120	.79	.57	.34	.23	.23	<.025	.05	<.025
19	05592100	Kaskaskia River near Cowden	S1	05/29/02	0930	22	.67	.40	.19	.28	<.10	<.10	<.05
			S2	06/25/02	1200	.10	.46	.28	.17	.21	<.05	<.05	<.05
			S3	09/25/02	1330	.76	.61	.38	.18	.20	<.025	<.025	<.025

Table 9. Concentrations of selected triazine and phenylurea herbicides and their degradation products determined by laboratory method analysis code LCEA for water samples collected from 51 streams in nine Midwestern States, 2002—Continued

Map number (fig. 1)	U.S. Geological Survey site identification number	Site name	Sample type	Date of collection (month/day/year)	Collection time (24-hour)	Atrazine	Deethyl-atrazine (CIAT)	Deiso-propylatrazine (CEAT)	Didealkyl-atrazine (CAAT)	Hydroxy-atrazine (OIET)	Deethyl-hydroxyatrazine (OIAT)	Deisopropyl-hydroxyatrazine (OEAT)	Cyanazine
						Illinois—Continued							
20	05594000	Shoal Creek near Breese	S1	06/06/02	1330	7.5	0.36	0.22	0.08	0.19	<0.10	<0.10	<0.05
			S2	07/29/02	1410	1.1	.39	.32	.31	.86	.21	.33	<.05
			S3	09/24/02	1420	.23	.16	.10	.09	.20	<.025	<.025	<.025
						Indiana							
21	03275000	Whitewater River near Alpine	FB	06/14/02	1145	<.05	<.05	<.05	<.05	<.05	<.10	<.10	<.05
			S1	06/14/02	1230	28	2.0	.76	.60	.24	.14	.05	<.05
			S2	06/28/02	1205	5.0	1.4	.68	.89	.52	.30	.17	<.05
			S3	10/29/02	1715	.04	.05	<.025	.13	.05	<.025	<.025	<.025
22	03302800	Blue River at Fredericksburg	S1	06/06/02	1130	22	1.7	1.7	.47	.26	<.10	<.10	<.05
			S2	08/21/02	1130	.31	.26	.16	.18	.30	<.025	.06	<.025
			S3	09/27/02	1200	.08	.06	.04	<.025	<.025	<.025	<.025	<.025
23	03328500	Eel River near Logansport	S1	06/05/02	1200	2.6	.12	<.05	<.05	.08	<.10	<.10	<.05
			S2	07/30/02	1130	.24	<.05	<.05	<.05	.06	<.05	<.05	<.05
			S2	07/31/02	1250	.15	<.05	<.05	<.05	.06	<.05	<.05	<.05
			S3	12/10/02	1000	<.025	<.025	<.025	.04	.04	<.025	<.025	<.025
24	03333450	Wildcat Creek near Jerome	S1	05/30/02	1250	2.8	.36	.16	.33	.06	<.10	<.10	<.05
			S2	08/19/02	1110	1.3	.20	<.05	<.05	.32	<.05	<.05	<.05
			S3	09/20/02	1316	.30	.10	.06	.12	.16	<.025	.06	<.025
25	03335000	Wildcat Creek near Lafayette	S1	05/30/02	1630	1.9	.25	.08	.16	.05	<.10	<.10	<.05
			S2	07/23/02	1000	.47	.08	<.05	.08	.14	<.05	<.05	<.05
			S3	11/12/02	1215	.13	.06	.03	<.025	.08	<.025	<.025	<.025
26	03362500	Sugar Creek near Edinburgh	S1	06/07/02	1345	13	1.1	.55	.26	.12	<.10	<.10	<.05
			S2	06/26/02	1020	20	1.9	1.1	.35	.81	.27	<.05	<.05
			CR	06/26/02	1120	35	6.4	3.6	.50	1.3	.31	.32	<.05
			CR	06/26/02	1121	33	6.0	3.1	.55	1.0	.31	<.05	<.05
			S3	10/26/02	1340	.08	.08	<.025	<.025	.12	<.025	<.025	<.025

Table 9. Concentrations of selected triazine and phenylurea herbicides and their degradation products determined by laboratory method analysis code LCEA for water samples collected from 51 streams in nine Midwestern States, 2002—Continued

Map number (fig. 1)	U.S. Geological Survey site identification number	Site name	Sample type	Date of collection (month/day/year)	Collection time (24-hour)	Atrazine	Deethyl-atrazine (CIAT)	Deiso-propylatrazine (CEAT)	Didealkyl-atrazine (CAAT)	Hydroxy-atrazine (OIET)	Deethyl-hydroxyatrazine (OIAT)	Deisopropyl-hydroxyatrazine (OEAT)	Cyanazine
						Indiana—Continued							
27	03371500	East Fork White River near Bedford	S1	06/06/02	1600	19	1.1	0.59	0.24	0.18	<0.10	<0.10	<0.05
			S2	07/23/02	1605	.93	.31	.19	.31	.29	.14	<.05	<.05
			S3	10/01/02	1140	.14	.09	.03	<.025	.24	<.025	.09	<.025
			CR	10/01/02	1141	.16	.10	.05	<.025	.16	<.025	.06	<.025
						Kansas							
28	06885500	Black Vermillion River near Frankfort	S1	05/07/02	1145	12	.71	.31	<.05	.40	<.10	<.10	<.05
			CR	05/07/02	1150	12	.55	.45	<.05	.39	<.10	<.10	<.05
			S2	08/17/02	1235	.34	<.05	<.05	<.05	.38	<.05	<.05	<.05
			S3	10/03/02	1135	1.9	.07	.03	<.025	.29	<.025	.06	<.025
29	06890100	Delaware River near Muscotah	S1	05/07/02	1315	20	.99	.75	<.05	.41	<.10	<.10	<.05
			S2	06/27/02	0950	4.7	1.9	.77	.53	1.1	.41	<.05	<.05
			S3	09/19/02	1110	.19	.07	<.025	.06	.45	<.025	<.025	<.025
						Minnesota							
30	05317000	Cottonwood River near New Ulm	S1	05/30/02	1350	.08	<.05	<.05	.60	<.05	<.10	<.10	<.05
			S2	06/25/02	1620	4.8	.50	.32	.80	.18	<.05	<.05	<.05
			S3	10/04/02	0935	.03	<.025	<.025	.14	<.025	<.025	<.025	<.025
31	05476000	Des Moines River at Jackson	S1	05/31/02	0720	.18	<.05	<.05	<.05	.06	<.10	<.10	<.05
			S2	06/25/02	1215	1.6	.14	.08	.26	.14	<.05	<.05	<.05
			CR	06/25/02	1220	1.8	.20	<.05	.33	.12	<.05	<.05	<.05
			S3	10/08/02	1145	.04	.03	<.025	.06	<.025	<.025	<.025	<.025
32	05320270	Little Cobb River near Beauford	S1	06/06/02	1315	.78	<.05	<.05	.08	.05	<.10	<.10	<.05
			S2	06/27/02	1045	2.7	.21	.06	.20	.09	.07	.23	<.05
			S3	10/02/02	1105	.06	.04	<.025	<.025	<.025	<.025	<.025	<.025

Table 9. Concentrations of selected triazine and phenylurea herbicides and their degradation products determined by laboratory method analysis code LCEA for water samples collected from 51 streams in nine Midwestern States, 2002—Continued

Map number (fig. 1)	U.S. Geological Survey site identification number	Site name	Sample type	Date of collection (month/day/year)	Collection time (24-hour)	Atrazine	Deethyl-atrazine (CIAT)	Deiso-propylatrazine (CEAT)	Didealkyl-atrazine (CAAT)	Hydroxy-atrazine (OIET)	Deethyl-hydroxyatrazine (OIAT)	Deisopropyl-hydroxyatrazine (OEAT)	Cyanazine
						Missouri							
33	06817700	Nodaway River near Graham	S1	05/14/02	1230	13	0.86	0.26	0.26	0.12	<0.10	<0.10	<0.05
			S2	07/29/02	1200	1.2	.14	.08	.13	.57	<.05	.24	<.05
			S3	10/04/02	1215	.15	.03	<.025	<.025	.21	<.025	<.025	<.025
						Nebraska							
34	06804000	Wahoo Creek at Ithaca	S1	05/13/02	1330	32	1.1	.49	<.05	.93	<.10	<.10	<.05
			S2	06/12/02	0840	61	5.1	3.0	.92	1.8	.75	.12	<.05
			S3	10/04/02	0930	.34	.06	<.025	.09	.16	<.025	<.025	<.025
35	06880800	West Fork Big Blue River near Dorchester	S1	05/07/02	0900	51	1.8	.87	<.05	.54	<.10	<.10	<.05
			S2	07/26/02	1100	.66	.38	.17	.20	.95	.27	<.05	<.05
			S3	10/04/02	0920	.03	.09	.04	.05	.40	<.025	.06	<.025
36	06815000	Big Nemaha River at Falls City	S1	05/06/02	1400	43	2.9	1.1	.40	.46	<.10	<.10	<.05
			S2	07/12/02	1400	1.0	.30	.16	.18	.74	<.05	<.05	<.05
			S3	10/04/02	1520	.08	.04	<.025	<.025	.20	<.025	<.025	<.025
37	06882000	Big Blue River at Barneston	S1	05/07/02	1530	21	1.0	.46	<.05	.35	<.10	<.10	<.05
			S2	06/15/02	0900	2.2	.89	.43	.17	.75	<.05	<.05	<.05
			S3	10/04/02	1300	.06	.08	<.025	<.025	.26	<.025	<.025	<.025
			CR	10/04/02	1310	.06	.07	<.025	<.025	.26	<.025	<.025	<.025
38	06884000	Little Blue River near Fairbury	S1	05/07/02	1230	39	1.4	.64	.16	.47	<.10	<.10	<.05
			S2	06/13/02	0930	20	1.8	.99	.43	.54	.12	.08	<.05
			S3	10/02/02	2000	.11	.08	.08	.06	.43	<.025	<.025	<.025
			LD	10/02/02	2000	.10	.08	.07	.10	.48	<.025	.12	<.025
						Ohio							
39	03157000	Clear Creek near Rockbridge	S1	06/05/02	1115	4.3	.90	.62	.32	.19	<.10	<.10	<.05
			S2	07/29/02	1200	.24	.06	.12	<.05	.12	<.05	<.05	<.05
			S3	10/26/02	1300	.04	.03	<.025	<.025	.05	<.025	<.025	<.025

Table 9. Concentrations of selected triazine and phenylurea herbicides and their degradation products determined by laboratory method analysis code LCEA for water samples collected from 51 streams in nine Midwestern States, 2002—Continued

Map number (fig. 1)	U.S. Geological Survey site identification number	Site name	Sample type	Date of collection (month/day/year)	Collection time (24-hour)	Atrazine	Deethyl-atrazine (CIAT)	Deiso-propylatrazine (CEAT)	Didealkyl-atrazine (CAAT)	Hydroxy-atrazine (OIET)	Deethyl-hydroxyatrazine (OIAT)	Deisopropyl-hydroxyatrazine (OEAT)	Cyanazine
						Ohio—Continued							
40	03219500	Scioto River near Prospect	S1	06/04/02	1230	13	0.72	0.56	0.27	0.17	<0.10	<0.10	<0.05
			CR	06/04/02	1231	14	.83	.64	.26	.22	<.10	<.10	<.05
			S2	07/31/02	0930	8.8	.28	.15	<.05	2.3	<.05	<.05	<.05
			S3	10/01/02	1030	.61	.17	.12	.05	.32	<.025	.08	<.025
41	03223000	Olentangy River at Claridon	S1	06/04/02	1100	4.2	.26	.14	.06	.12	<.10	<.10	<.05
			S2	07/31/02	1100	.82	.16	.09	<.05	.56	<.05	<.05	<.05
			S3	10/26/02	1500	.12	.03	<.025	<.025	.16	<.025	<.025	<.025
42	03230500	Big Darby Creek at Darbyville	S1	06/03/02	1200	15	.69	.48	.43	.14	<.10	<.10	<.05
			S2	08/01/02	0930	1.2	.30	.18	.31	.29	<.05	<.05	<.05
			S3	10/01/02	1105	.12	.16	.05	.12	.22	<.025	.03	<.025
43	03234500	Scioto River at Higby	S1	06/04/02	1015	5.8	.51	.31	.22	.11	<.10	<.10	<.05
			S2	07/30/02	1100	2.4	.41	.24	.23	.34	<.05	.19	<.05
			S3	10/28/02	1000	.72	.23	.16	<.025	.21	<.025	<.025	<.025
			LD	10/28/02	1000	.74	.27	.14	<.025	.23	<.025	<.025	<.025
44	03240000	Little Miami River near Oldtown	S1	06/05/02	1320	3.3	.16	.09	.32	<.05	<.10	<.10	<.05
			LD	06/05/02	1320	3.8	.18	.10	.29	<.05	<.10	<.10	<.05
			S2	07/17/02	1200	.28	.10	.05	.50	<.05	<.05	<.05	<.05
			S3	10/27/02	0700	.09	.12	.08	.17	.08	<.025	<.025	<.025
45	03267900	Mad River at Eagle City	S1	06/05/02	1130	.62	.10	.06	.09	<.05	<.10	<.10	<.05
			S2	07/17/02	1030	<.05	<.05	<.05	.09	<.05	<.05	<.05	<.05
			CR	07/17/02	1031	<.05	<.05	<.05	.08	<.05	<.05	<.05	<.05
			S3	10/27/02	0800	<.025	<.025	<.025	.09	<.025	<.025	<.025	<.025

Table 9. Concentrations of selected triazine and phenylurea herbicides and their degradation products determined by laboratory method analysis code LCEA for water samples collected from 51 streams in nine Midwestern States, 2002—Continued

Map number (fig. 1)	U.S. Geological Survey site identification number	Site name	Sample type	Date of collection (month/day/year)	Collection time (24-hour)	Atrazine	Deethyl-atrazine (CIAT)	Deiso-propylatrazine (CEAT)	Didealkyl-atrazine (CAAT)	Hydroxy-atrazine (OIET)	Deethyl-hydroxyatrazine (OIAT)	Deisopropyl-hydroxyatrazine (OEAT)	Cyanazine
						Ohio—Continued							
46	04185000	Tiffin River at Stryker	S1	05/29/02	1700	1.5	0.12	0.06	0.05	0.11	<0.10	<0.10	<0.05
			S2	07/23/02	1530	.48	.06	<.05	<.05	.28	<.05	<.05	<.05
			S3	11/06/02	1200	<.025	<.025	<.025	<.025	.06	<.025	<.025	<.025
			CR	11/06/02	1201	<.025	<.025	<.025	<.025	<.025	<.025	<.025	<.025
47	04186500	Auglaize River near Fort Jennings	S1	05/28/02	1115	1.3	.16	.08	<.05	.05	<.10	<.10	<.05
			S2	07/23/02	1100	3.8	.83	.38	.28	.94	.23	.40	<.05
			S3	10/30/02	1300	.11	<.025	<.025	<.025	.13	<.025	<.025	<.025
						Wisconsin							
48	04087240	Root River at Racine	S1	06/03/02	1350	.21	.06	<.05	.11	<.05	<.10	<.10	<.05
			CR	06/03/02	1351	.17	<.05	<.05	.06	<.05	<.10	<.10	<.05
			S2	07/26/02	1130	.23	<.05	<.05	<.05	.14	<.05	.16	<.05
			S3	09/03/02	1110	<.025	<.025	<.025	<.025	.025	<.025	.07	<.025
49	05340500	St. Croix River at St. Croix Falls	S1	06/20/02	1130	<.05	<.05	<.05	<.05	<.05	<.05	<.05	<.05
			S2	06/27/02	1130	.26	<.05	<.05	<.05	<.05	<.05	.09	<.05
			S3	09/03/02	1520	<.025	<.025	<.025	<.025	<.025	<.025	<.025	<.025
50	05407000	Wisconsin River at Muscoda	S1	05/28/02	1330	<.05	<.05	<.05	<.05	<.05	<.10	<.10	<.05
			S2	06/27/02	1215	.31	.11	<.05	<.05	<.05	<.05	.36	<.05
			S3	09/23/02	1130	.19	.08	<.025	.08	.05	<.025	<.025	<.025
51	05430500	Rock River at Afton	S1	06/04/02	1300	1.1	.07	<.05	.19	.06	<.10	<.10	<.05
			LD	06/04/02	1300	1.1	.10	<.05	.20	<.05	<.10	<.10	<.05
			FB	07/11/02	1229	<.05	<.05	<.05	<.05	<.05	<.05	<.05	<.05
			S2	07/11/02	1230	.60	.15	<.05	.41	.15	<.05	.28	<.05
			S3	09/20/02	0945	<.025	.07	<.025	.26	.11	<.025	.06	<.025

Table 9. Concentrations of selected triazine and phenylurea herbicides and their degradation products determined by laboratory method analysis code LCEA for water samples collected from 51 streams in nine Midwestern States, 2002—Continued

Map number (fig. 1)	U.S. Geological Survey site identification number	Site name	Sample type	Date of collection (month/day/year)	Cyanazine acid (CAC)	Cyanazine amide (CAM)	Deethylcyanazine (DEC)	Deethylcyanazine acid (DCAC)	Deethylcyanazine amide (DCAM)	Propazine	Simazine
						Iowa					
1	05411850	Turkey River near Eldorado	S1	05/14/02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
			LD	05/14/02	<.05	<.05	<.05	<.05	<.05	<.05	<.05
			CR	05/14/02	<.05	<.05	<.05	<.05	<.05	<.05	<.05
			S2	06/24/02	<.05	<.05	<.05	<.05	<.05	<.05	<.05
			S3	10/29/02	<.025	<.025	<.20	<.025	<.025	<.025	<.025
2	05421000	Wapsipinicon River at Independence	S1	05/14/02	<.05	<.05	<.05	<.05	<.05	<.05	<.05
			S2	06/24/02	<.05	<.05	<.05	<.05	<.05	<.05	<.05
			S3	10/29/02	<.025	<.025	<.20	<.025	<.025	<.025	<.025
3	05455100	Old Mans Creek near Iowa City	S1	05/13/02	<.05	<.05	<.05	<.05	<.05	<.05	<.05
			S2	06/27/02	<.05	<.05	<.05	<.05	<.05	<.05	<.05
			S3	10/30/02	<.025	<.025	<.20	<.025	<.025	<.025	<.025
4	05472500	North Skunk River near Sigourney	S1	05/13/02	<.05	<.05	<.05	<.05	<.05	.13	<.05
			S2	07/08/02	<.05	<.05	<.05	<.05	<.05	<.05	<.05
			S3	10/29/02	<.025	<.025	<.20	<.025	<.025	<.025	<.025
5	05474000	Skunk River at Augusta	S1	05/13/02	<.05	<.05	<.05	<.05	<.05	.32	.07
			S2	06/27/02	<.05	<.05	<.05	<.05	<.05	<.05	<.05
			S3	10/29/02	<.025	<.025	<.20	<.025	<.025	<.025	<.025
6	05480500	Des Moines River at Fort Dodge	S1	05/17/02	<.05	<.05	<.05	.08	<.05	<.05	<.05
			S2	06/13/02	<.05	<.05	<.05	<.05	<.05	.06	<.05
			S3	10/30/02	<.025	<.025	<.20	<.025	<.025	<.025	<.025
			LD	10/30/02	<.025	<.025	<.20	<.025	<.025	<.025	<.025

Table 9. Concentrations of selected triazine and phenylurea herbicides and their degradation products determined by laboratory method analysis code LCEA for water samples collected from 51 streams in nine Midwestern States, 2002—Continued

Map number (fig. 1)	U.S. Geological Survey site identification number	Site name	Sample type	Date of collection (month/day/year)	Cyanazine acid (CAC)	Cyanazine amide (CAM)	Deethylcyanazine (DEC)	Deethylcyanazine acid (DCAC)	Deethylcyanazine amide (DCAM)	Propazine	Simazine
					Iowa—Continued						
7	05484500	Raccoon River at Van Meter	S1	05/17/02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
			S2	06/12/02	<.05	<.05	<.05	<.05	<.05	.08	<.05
			CR	06/12/02	<.05	<.05	<.05	<.05	<.05	.09	<.05
			S3	10/30/02	<.025	<.025	<.20	<.025	<.025	<.025	<.025
8	06606600	Little Sioux River at Correctionville	S1	05/17/02	<.05	<.05	<.05	.11	<.05	<.05	<.05
			S2	06/11/02	<.05	<.05	<.05	<.05	<.05	.14	<.05
			S3	10/31/02	<.025	<.025	<.20	<.025	<.025	<.025	<.025
9	06607200	Maple River at Mapleton	S1	05/29/02	<.05	<.05	<.05	.48	<.05	<.05	<.05
			S2	06/11/02	<.05	<.05	<.05	.52	<.05	.18	.05
			S3	10/31/02	<.025	<.025	<.20	.90	<.025	<.025	<.025
10	06609500	Boyer River at Logan	S1	05/29/02	<.05	<.05	<.05	.84	<.05	<.05	<.05
			S2	06/11/02	<.05	<.05	<.05	.87	<.05	.13	<.05
			S3	11/01/02	<.025	<.025	<.20	.97	<.025	<.025	<.025
					Illinois						
11	03378000	Bonpas Creek at Browns	S1	06/06/02	<.05	<.05	<.05	<.05	<.05	<.05	.91
			CR	06/06/02	<.05	<.05	<.05	<.05	<.05	<.05	.82
			S2	06/25/02	<.05	<.05	<.05	<.05	<.05	.22	5.1
			S3	09/25/02	<.025	<.025	<.20	<.025	<.025	<.025	.10
12	03381495	Little Wabash River at Carmi	S1	06/06/02	<.05	<.05	<.05	<.05	<.05	.08	2.2
			S2	06/25/02	<.05	<.05	<.05	<.05	<.05	.19	3.5
			CR	06/25/02	<.05	<.05	<.05	<.05	<.05	.24	5.1
			S3	09/25/02	<.025	<.025	<.20	<.025	<.025	<.025	.07

Table 9. Concentrations of selected triazine and phenylurea herbicides and their degradation products determined by laboratory method analysis code LCEA for water samples collected from 51 streams in nine Midwestern States, 2002—Continued

Map number (fig. 1)	U.S. Geological Survey site identification number	Site name	Sample type	Date of collection (month/day/year)	Cyanazine acid (CAC)	Cyanazine amide (CAM)	Deethylcyanazine (DEC)	Deethylcyanazine acid (DCAC)	Deethylcyanazine amide (DCAM)	Propazine	Simazine
					Illinois—Continued						
13	05439500	South Branch Kishwaukee River at Fairdale	S1	05/14/02	<0.05	<0.05	<0.05	<0.05	<0.05	0.17	<0.05
			S2	08/02/02	<.05	<.05	<.05	<.05	<.05	<.05	<.05
			LD	08/02/02	<.05	<.05	<.05	<.05	<.05	<.05	<.05
			S3	09/25/02	<.025	<.025	<.20	<.025	<.025	<.025	<.025
			LD	09/25/02	<.025	<.025	<.20	<.025	<.025	<.025	<.025
14	05526000	Iroquois River near Chebanese	S1	06/06/02	<.05	<.05	<.05	<.05	<.05	<.05	.06
			S2	06/28/02	<.05	<.05	<.05	<.05	<.05	<.05	<.05
			S3	09/25/02	<.025	<.025	<.20	.10	<.025	<.025	<.025
15	05540500	Du Page River at Shorewood	S1	05/15/02	<.05	<.05	<.05	<.05	<.05	<.05	<.05
			S2	06/27/02	<.05	<.05	<.05	<.05	<.05	<.05	<.05
			S3	09/25/02	<.025	<.025	<.20	<.025	<.025	<.025	<.025
16	05569500	Spoon River at London Mills	S1	05/14/02	<.05	<.05	<.05	<.05	<.05	.22	.28
			S2	07/30/02	<.05	<.05	<.05	<.05	<.05	<.05	.05
			S3	09/24/02	<.025	<.025	<.20	<.025	<.025	<.025	<.025
17	05576500	Sangamon River at Riverton	S1	05/29/02	<.05	<.05	<.05	<.05	<.05	.18	.07
			S2	07/17/02	<.05	<.05	<.05	<.05	<.05	<.05	<.05
			S3	09/25/02	<.025	<.025	<.20	<.025	<.025	<.025	<.025
18	05587000	Macoupin Creek near Kane	S1	06/06/02	<.05	<.05	<.05	<.05	<.05	<.05	.13
			S2	07/29/02	<.05	<.05	<.05	<.05	<.05	<.05	.13
			S3	09/24/02	<.025	<.025	<.20	<.025	<.025	<.025	.05
19	05592100	Kaskaskia River near Cowden	S1	05/29/02	<.05	<.05	<.05	<.05	<.05	.16	.19
			S2	06/25/02	<.05	<.05	<.05	<.05	<.05	<.05	<.05
			S3	09/25/02	<.025	<.025	<.20	<.025	<.025	<.025	<.025

Table 9. Concentrations of selected triazine and phenylurea herbicides and their degradation products determined by laboratory method analysis code LCEA for water samples collected from 51 streams in nine Midwestern States, 2002—Continued

Map number (fig. 1)	U.S. Geological Survey site identification number	Site name	Sample type	Date of collection (month/day/year)	Cyanazine acid (CAC)	Cyanazine amide (CAM)	Deethylcyanazine (DEC)	Deethylcyanazine acid (DCAC)	Deethylcyanazine amide (DCAM)	Propazine	Simazine
					Illinois—Continued						
20	05594000	Shoal Creek near Breese	S1	06/06/02	<0.05	<0.05	<0.05	<0.05	<0.05	0.07	0.74
			S2	07/29/02	<.05	<.05	<.05	<.05	<.05	<.05	.09
			S3	09/24/02	<.025	<.025	<.20	<.025	<.025	<.025	<.025
					Indiana						
21	03275000	Whitewater River near Alpine	FB	06/14/02	<.05	<.05	<.05	<.05	<.05	<.05	<.05
			S1	06/14/02	<.05	<.05	<.05	<.05	<.05	.19	.20
			S2	06/28/02	<.05	<.05	<.05	<.05	<.05	.06	.23
			S3	10/29/02	<.025	<.025	<.20	<.025	<.025	<.025	<.025
22	03302800	Blue River at Fredericksburg	S1	06/06/02	<.05	<.05	<.05	<.05	<.05	.21	11
			S2	08/21/02	<.025	<.025	<.05	<.025	<.025	<.025	.08
			S3	09/27/02	<.025	<.025	<.20	<.025	<.025	<.025	<.025
23	03328500	Eel River near Logansport	S1	06/05/02	<.05	<.05	<.05	<.05	<.05	<.05	.09
			S2	07/30/02	<.05	<.05	<.05	<.05	<.05	<.05	<.05
			S2	07/31/02	<.05	<.05	<.05	<.05	<.05	<.05	<.05
			S3	12/10/02	<.025	<.025	<.20	<.025	<.025	<.025	<.025
24	03333450	Wildcat Creek near Jerome	S1	05/30/02	<.05	<.05	<.05	<.05	<.05	<.05	<.05
			S2	08/19/02	<.05	<.05	<.05	<.05	<.05	<.05	<.05
			S3	09/20/02	<.025	<.025	<.20	<.025	<.025	<.025	<.025
25	03335000	Wildcat Creek near Lafayette	S1	05/30/02	<.05	<.05	<.05	<.05	<.05	<.05	.08
			S2	07/23/02	<.05	<.05	<.05	<.05	<.05	<.05	<.05
			S3	11/12/02	<.025	<.025	<.20	<.025	<.025	<.025	<.025
26	03362500	Sugar Creek near Edinburgh	S1	06/07/02	<.05	<.05	<.05	<.05	<.05	.10	1.3
			S2	06/26/02	<.05	<.05	<.05	<.05	<.05	.27	.70
			CR	06/26/02	<.05	<.05	<.05	<.05	<.05	.36	.80
			CR	06/26/02	<.05	<.05	<.05	<.05	<.05	.38	.83
			S3	10/26/02	<.025	<.025	<.20	<.025	<.025	<.025	<.025

Table 9. Concentrations of selected triazine and phenylurea herbicides and their degradation products determined by laboratory method analysis code LCEA for water samples collected from 51 streams in nine Midwestern States, 2002—Continued

Map number (fig. 1)	U.S. Geological Survey site identification number	Site name	Sample type	Date of collection (month/day/year)	Cyanazine acid (CAC)	Cyanazine amide (CAM)	Deethylcyanazine (DEC)	Deethylcyanazine acid (DCAC)	Deethylcyanazine amide (DCAM)	Propazine	Simazine
				Indiana—Continued							
27	03371500	East Fork White River near Bedford	S1	06/06/02	<0.05	<0.05	<0.05	<0.05	<0.05	0.14	2.0
			S2	07/23/02	<.05	<.05	<.05	<.05	<.05	<.05	.06
			S3	10/01/02	<.025	<.025	<.20	<.025	<.025	<.025	<.025
			CR	10/01/02	<.025	<.025	<.20	<.025	<.025	<.025	<.025
				Kansas							
28	06885500	Black Vermillion River near Frankfort	S1	05/07/02	<.05	<.05	<.05	<.05	<.05	.17	<.05
			CR	05/07/02	<.05	<.05	<.05	<.05	<.05	.14	<.05
			S2	08/17/02	<.05	<.05	<.05	<.05	<.05	<.05	<.05
			S3	10/03/02	<.025	<.025	<.20	<.025	<.025	<.025	<.025
29	06890100	Delaware River near Muscotah	S1	05/07/02	<.05	<.05	<.05	<.05	<.05	.17	<.05
			S2	06/27/02	<.05	<.05	<.05	<.05	<.05	<.05	<.05
			S3	09/19/02	<.025	<.025	<.20	<.025	<.025	<.025	<.025
				Minnesota							
30	05317000	Cottonwood River near New Ulm	S1	05/30/02	<.05	<.05	<.05	4.2	<.05	<.05	<.05
			S2	06/25/02	.07	<.05	<.05	<.05	<.05	<.05	<.05
			S3	10/04/02	<.025	<.025	<.20	.77	<.025	<.025	<.025
31	05476000	Des Moines River at Jackson	S1	05/31/02	<.05	<.05	<.05	<.05	<.05	<.05	<.05
			S2	06/25/02	<.05	<.05	<.05	<.05	<.05	<.05	<.05
			CR	06/25/02	<.05	<.05	<.05	<.05	<.05	<.05	<.05
			S3	10/08/02	<.025	<.025	<.20	<.025	<.025	<.025	<.025
32	05320270	Little Cobb River near Beauford	S1	06/06/02	<.05	<.05	<.05	<.05	<.05	<.05	<.05
			S2	06/27/02	<.05	<.05	<.05	<.05	<.05	<.05	<.05
			S3	10/02/02	<.025	<.025	<.20	<.025	<.025	<.025	<.025
				Missouri							
33	06817700	Nodaway River near Graham	S1	05/14/02	<.05	<.05	<.05	<.05	<.05	.11	<.05
			S2	07/29/02	<.05	<.05	<.05	<.05	<.05	<.05	<.05
			S3	10/04/02	<.025	<.025	<.20	<.025	<.025	<.025	<.025

Table 9. Concentrations of selected triazine and phenylurea herbicides and their degradation products determined by laboratory method analysis code LCEA for water samples collected from 51 streams in nine Midwestern States, 2002—Continued

Map number (fig. 1)	U.S. Geological Survey site identification number	Site name	Sample type	Date of collection (month/day/year)	Cyanazine acid (CAC)	Cyanazine amide (CAM)	Deethylcyanazine (DEC)	Deethylcyanazine acid (DCAC)	Deethylcyanazine amide (DCAM)	Propazine	Simazine
					Nebraska						
34	06804000	Wahoo Creek at Ithaca	S1	05/13/02	<0.05	<0.05	<0.05	<0.05	<0.05	0.38	<0.05
			S2	06/12/02	<.05	<.05	<.05	<.05	<.05	.78	.25
			S3	10/04/02	<.025	<.025	<.20	<.025	<.025	<.025	<.025
35	06880800	West Fork Big Blue River near Dorchester	S1	05/07/02	<.05	<.05	<.05	<.05	<.05	.55	.10
			S2	07/26/02	<.05	<.05	<.05	<.05	<.05	<.05	<.05
			S3	10/04/02	<.025	<.025	<.20	<.025	<.025	<.025	<.025
36	06815000	Big Nemaha River at Falls City	S1	05/06/02	<.05	<.05	<.05	<.05	<.05	.51	.11
			S2	07/12/02	<.05	<.05	<.05	<.05	<.05	<.05	<.05
			S3	10/04/02	<.025	<.025	<.20	<.025	<.025	<.025	<.025
37	06882000	Big Blue River at Barneston	S1	05/07/02	<.05	<.05	<.05	<.05	<.05	.28	<.05
			S2	06/15/02	<.05	<.05	<.05	<.05	<.05	<.05	<.05
			S3	10/04/02	<.025	<.025	<.20	.08	<.025	<.025	<.025
			CR	10/04/02	<.025	<.025	<.20	.08	<.025	<.025	<.025
38	06884000	Little Blue River near Fairbury	S1	05/07/02	<.05	<.05	<.05	<.05	<.05	.38	.08
			S2	06/13/02	<.05	<.05	<.05	<.05	<.05	.17	.07
			S3	10/02/02	<.025	<.025	<.20	<.025	<.025	<.025	<.025
			LD	10/02/02	<.025	<.025	<.20	<.025	<.025	<.025	<.025
					Ohio						
39	03157000	Clear Creek near Rockbridge	S1	06/05/02	<.05	<.05	<.05	<.05	<.05	<.05	2.4
			S2	07/29/02	<.05	<.05	<.05	<.05	<.05	<.05	.09
			S3	10/26/02	<.025	<.025	<.20	<.025	<.025	<.025	.14
40	03219500	Scioto River near Prospect	S1	06/04/02	<.05	<.05	<.05	<.05	<.05	.07	2.0
			CR	06/04/02	<.05	<.05	<.05	<.05	<.05	.08	2.0
			S2	07/31/02	<.05	<.05	<.05	<.05	<.05	.15	.10
			S3	10/01/02	<.025	<.025	<.20	<.025	<.025	<.025	.06

Table 9. Concentrations of selected triazine and phenylurea herbicides and their degradation products determined by laboratory method analysis code LCEA for water samples collected from 51 streams in nine Midwestern States, 2002—Continued

Map number (fig. 1)	U.S. Geological Survey site identification number	Site name	Sample type	Date of collection (month/day/year)	Cyanazine acid (CAC)	Cyanazine amide (CAM)	Deethylcyanazine (DEC)	Deethylcyanazine acid (DCAC)	Deethylcyanazine amide (DCAM)	Propazine	Simazine
					Ohio—Continued						
41	03223000	Olentangy River at Claridon	S1	06/04/02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.86
			S2	07/31/02	<.05	<.05	<.05	<.05	<.05	<.05	.13
			S3	10/26/02	<.025	<.025	<.20	<.025	<.025	<.025	<.025
42	03230500	Big Darby Creek at Darbyville	S1	06/03/02	<.05	<.05	<.05	<.05	<.05	.11	1.4
			S2	08/01/02	<.05	<.05	<.05	<.05	<.05	<.05	<.05
			S3	10/01/02	<.025	<.025	<.20	<.025	<.025	<.025	<.025
43	03234500	Scioto River at Higby	S1	06/04/02	<.05	<.05	<.05	<.05	<.05	.05	.99
			S2	07/30/02	<.05	<.05	<.05	<.05	<.05	<.05	.13
			S3	10/28/02	<.025	<.025	<.20	<.025	<.025	<.025	.12
			LD	10/28/02	<.025	<.025	<.20	<.025	<.025	<.025	.11
44	03240000	Little Miami River near Oldtown	S1	06/05/02	<.05	<.05	<.05	<.05	<.05	<.05	.08
			LD	06/05/02	<.05	<.05	<.05	<.05	<.05	<.05	.08
			S2	07/17/02	<.05	<.05	<.05	<.05	<.05	<.05	.05
			S3	10/27/02	<.025	<.025	<.20	<.025	<.025	<.025	<.025
45	03267900	Mad River at Eagle City	S1	06/05/02	<.05	<.05	<.05	<.05	<.05	<.05	.06
			S2	07/17/02	<.05	<.05	<.05	<.05	<.05	<.05	<.05
			CR	07/17/02	<.05	<.05	<.05	<.05	<.05	<.05	<.05
			S3	10/27/02	<.025	<.025	<.20	<.025	<.025	<.025	<.025
46	04185000	Tiffin River at Stryker	S1	05/29/02	<.05	<.05	<.05	<.05	<.05	<.05	.37
			S2	07/23/02	<.05	<.05	<.05	<.05	<.05	<.05	.06
			S3	11/06/02	<.025	<.025	<.20	<.025	<.025	<.025	<.025
			CR	11/06/02	<.025	<.025	<.20	<.025	<.025	<.025	<.025

Table 9. Concentrations of selected triazine and phenylurea herbicides and their degradation products determined by laboratory method analysis code LCEA for water samples collected from 51 streams in nine Midwestern States, 2002—Continued

Map number (fig. 1)	U.S. Geological Survey site identification number	Site name	Sample type	Date of collection (month/day/year)	Cyanazine acid (CAC)	Cyanazine amide (CAM)	Deethylcyanazine (DEC)	Deethylcyanazine acid (DCAC)	Deethylcyanazine amide (DCAM)	Propazine	Simazine
				Ohio—Continued							
47	04186500	Auglaize River near Fort Jennings	S1	05/28/02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.20
			S2	07/23/02	<.05	<.05	<.05	<.05	<.05	<.05	.16
			S3	10/30/02	<.025	<.025	<.20	<.025	<.025	<.025	<.025
				Wisconsin							
48	04087240	Root River at Racine	S1	06/03/02	<.05	<.05	<.05	<.05	<.05	<.05	<.05
			CR	06/03/02	<.05	<.05	<.05	<.05	<.05	<.05	<.05
			S2	07/26/02	<.05	<.05	<.05	<.05	<.05	<.05	<.05
			S3	09/03/02	<.025	<.025	<.20	<.025	<.025	<.025	<.025
49	05340500	St. Croix River at St. Croix Falls	S1	06/20/02	<.05	<.05	<.05	<.05	<.05	<.05	<.05
			S2	06/27/02	<.05	<.05	<.05	<.05	<.05	<.05	<.05
			S3	09/03/02	<.025	<.025	<.20	<.05	<.05	<.025	<.025
50	05407000	Wisconsin River at Muscoda	S1	05/28/02	<.05	<.05	<.05	<.05	<.05	<.05	<.05
			S2	06/27/02	<.05	<.05	<.05	<.05	<.05	<.05	<.05
			S3	09/23/02	<.025	<.025	<.20	<.025	<.025	<.025	<.025
51	05430500	Rock River at Afton	S1	06/04/02	<.05	<.05	<.05	<.05	<.05	<.05	<.05
			LD	06/04/02	<.05	<.05	<.05	<.05	<.05	<.05	<.05
			FB	07/11/02	<.05	<.05	<.05	<.05	<.05	<.05	<.05
			S2	07/11/02	<.05	<.05	<.05	<.05	<.05	<.05	<.05
			S3	09/20/02	<.025	<.025	<.20	.62	<.025	<.025	<.025

Table 9. Concentrations of selected triazine and phenylurea herbicides and their degradation products determined by laboratory method analysis code LCEA for water samples collected from 51 streams in nine Midwestern States, 2002—Continued

Map number (fig. 1)	U.S. Geological Survey site identification number	Site name	Sample type	Date of collection (month/day/year)	Collection time (24-hour)	Demethyl-fluo-meturon (DMFM)	Diuron	Fluo-meturon	Linuron
			Iowa						
1	05411850	Turkey River near Eldorado	S1	05/14/02	1400	<0.05	<0.05	<0.05	<0.20
			LD	05/14/02	1400	<.05	<.05	<.05	<.20
			CR	05/14/02	1405	<.05	<.05	<.05	<.20
			S2	06/24/02	0950	<.05	<.05	<.05	<.20
			S3	10/29/02	1300	<.20	<.20	<.20	<.20
2	05421000	Wapsipinicon River at Independence	S1	05/14/02	1100	<.05	<.05	<.05	<.20
			S2	06/24/02	1245	<.05	<.05	<.05	<.20
			S3	10/29/02	0930	<.20	<.20	<.20	<.20
3	05455100	Old Mans Creek near Iowa City	S1	05/13/02	1100	<.05	<.05	<.05	<.20
			S2	06/27/02	0955	<.05	<.05	<.05	<.20
			S3	10/30/02	1140	<.20	<.20	<.20	<.20
4	05472500	North Skunk River near Sigourney	S1	05/13/02	1630	<.05	<.05	<.05	<.20
			S2	07/08/02	1015	<.05	<.05	<.05	<.20
			S3	10/29/02	1435	<.20	<.20	<.20	<.20
5	05474000	Skunk River at Augusta	S1	05/13/02	1230	<.05	<.05	<.05	<.20
			S2	06/27/02	1235	<.05	<.05	<.05	<.20
			S3	10/29/02	1015	<.20	<.20	<.20	<.20
6	05480500	Des Moines River at Fort Dodge	S1	05/17/02	1230	<.05	<.05	<.05	<.20
			S2	06/13/02	0730	<.05	<.05	<.05	<.20
			S3	10/30/02	1500	<.20	<.20	<.20	<.20
			LD	10/30/02	1500	<.20	<.20	<.20	<.20

Table 9. Concentrations of selected triazine and phenylurea herbicides and their degradation products determined by laboratory method analysis code LCEA for water samples collected from 51 streams in nine Midwestern States, 2002—Continued

Map number (fig. 1)	U.S. Geological Survey site identification number	Site name	Sample type	Date of collection (month/day/year)	Collection time (24-hour)	Demethyl-fluo-meturon (DMFM)	Diuron	Fluo-meturon	Linuron
			Iowa—Continued						
7	05484500	Raccoon River at Van Meter	S1	05/17/02	0930	<0.05	<0.05	<0.05	<0.20
			S2	06/12/02	1630	<.05	<.05	<.05	<.20
			CR	06/12/02	1635	<.05	<.05	<.05	<.20
			S3	10/30/02	1200	<.20	<.20	<.20	<.20
8	06606600	Little Sioux River at Correctionville	S1	05/17/02	1615	<.05	<.05	<.05	<.20
			S2	06/11/02	1100	<.05	<.05	<.05	<.20
			S3	10/31/02	0930	<.20	<.20	<.20	<.20
9	06607200	Maple River at Mapleton	S1	05/29/02	1200	<.05	<.05	<.05	<.20
			S2	06/11/02	1330	<.05	.19	<.05	<.20
			S3	10/31/02	1200	<.20	<.20	<.20	<.20
10	06609500	Boyer River at Logan	S1	05/29/02	0945	<.05	<.05	<.05	<.20
			S2	06/11/02	1545	<.05	.10	<.05	<.20
			S3	11/01/02	0900	<.20	<.20	<.20	<.20
			Illinois						
11	03378000	Bonpas Creek at Browns	S1	06/06/02	1030	<.05	<.05	<.05	<.20
			CR	06/06/02	1031	<.05	<.05	<.05	<.20
			S2	06/25/02	1300	<.05	<.05	<.05	<.20
			S3	09/25/02	1015	<.20	<.20	<.20	<.20
12	03381495	Little Wabash River at Carmi	S1	06/06/02	1230	<.05	<.05	<.05	<.20
			CR	06/25/02	1430	<.05	<.05	<.05	<.20
			S2	06/25/02	1431	<.05	<.05	<.05	<.20
			S3	09/25/02	0830	<.20	<.20	<.20	<.20
13	05439500	South Branch Kishwaukee River at Fairdale	S1	05/14/02	1600	<.05	<.05	<.05	<.20
			S2	08/02/02	1430	<.05	<.05	<.05	<.20
			LD	08/02/02	1430	<.05	<.05	<.05	<.20
			S3	09/25/02	0930	<.20	<.20	<.20	<.20
			LD	09/25/02	0930	<.20	<.20	<.20	<.20

Table 9. Concentrations of selected triazine and phenylurea herbicides and their degradation products determined by laboratory method analysis code LCEA for water samples collected from 51 streams in nine Midwestern States, 2002—Continued

Map number (fig. 1)	U.S. Geological Survey site identification number	Site name	Sample type	Date of collection (month/day/year)	Collection time (24-hour)	Demethyl-fluo-meturon (DMFM)	Diuron	Fluo-meturon	Linuron
			Illinois—Continued						
14	05526000	Iroquois River near Chebanese	S1	06/06/02	0925	<0.05	<0.05	<0.05	<0.20
			S2	06/28/02	0910	<.05	<.05	<.05	<.20
			S3	09/25/02	1345	<.20	<.20	<.20	<.20
15	05540500	Du Page River at Shorewood	S1	05/15/02	1030	<.05	<.05	<.05	<.20
			S2	06/27/02	1240	<.05	<.05	<.05	1.7
			S3	09/25/02	1145	<.20	<.20	<.20	<.20
16	05569500	Spoon River at London Mills	S1	05/14/02	1035	<.05	<.05	<.05	<.20
			S2	07/30/02	1000	<.05	<.05	<.05	<.20
			S3	09/24/02	0905	<.20	<.20	<.20	<.20
17	05576500	Sangamon River at Riverton	S1	05/29/02	1015	<.05	<.05	<.05	<.20
			S2	07/17/02	1515	<.05	<.05	<.05	<.20
			S3	09/25/02	0845	<.20	<.20	<.20	<.20
18	05587000	Macoupin Creek near Kane	S1	06/06/02	1000	<.05	<.05	<.05	<.20
			S2	07/29/02	1115	<.05	<.05	<.05	<.20
			S3	09/24/02	1120	<.20	<.20	<.20	<.20
19	05592100	Kaskaskia River near Cowden	S1	05/29/02	0930	<.05	<.05	<.05	<.20
			S2	06/25/02	1200	<.05	<.05	<.05	<.20
			S3	09/25/02	1330	<.20	<.20	<.20	<.20
20	05594000	Shoal Creek near Breese	S1	06/06/02	1330	<.05	<.05	<.05	<.20
			S2	07/29/02	1410	<.05	<.05	<.05	<.20
			S3	09/24/02	1420	<.20	<.20	<.20	<.20

Table 9. Concentrations of selected triazine and phenylurea herbicides and their degradation products determined by laboratory method analysis code LCEA for water samples collected from 51 streams in nine Midwestern States, 2002—Continued

Map number (fig. 1)	U.S. Geological Survey site identification number	Site name	Sample type	Date of collection (month/day/year)	Collection time (24-hour)	Demethyl-fluo-meturon (DMFM)	Diuron	Fluo-meturon	Linuron
		Indiana							
21	03275000	Whitewater River near Alpine	FB	06/14/02	1145	<0.05	<0.05	<0.05	<0.20
			S1	06/14/02	1230	<.05	<.05	<.05	<.20
			S2	06/28/02	1205	<.05	<.05	<.05	<.20
			S3	10/29/02	1715	<.20	<.20	<.20	<.20
22	03302800	Blue River at Fredricksburg	S1	06/06/02	1130	<.05	<.05	<.05	<.20
			S2	08/21/02	1130	<.20	<.20	<.20	<.20
			S3	09/27/02	1200	<.20	<.20	<.20	<.20
23	03328500	Eel River near Logansport	S1	06/05/02	1200	<.05	<.05	<.05	<.20
			S2	07/30/02	1130	<.05	<.05	<.05	<.20
			S2	07/31/02	1250	<.05	<.05	<.05	<.20
			S3	12/10/02	1000	<.20	<.20	<.20	<.20
24	03333450	Wildcat Creek near Jerome	S1	05/30/02	1250	<.05	<.05	<.05	<.20
			S2	08/19/02	1110	<.05	<.05	<.05	<.20
			S3	09/20/02	1316	<.20	<.20	<.20	<.20
25	03335000	Wildcat Creek near Lafayette	S1	05/30/02	1630	<.05	<.05	<.05	<.20
			S2	07/23/02	1000	<.05	<.05	<.05	<.20
			S3	11/12/02	1215	<.20	<.20	<.20	<.20
26	03362500	Sugar Creek near Edinburgh	S1	06/07/02	1345	<.05	<.05	<.05	<.20
			S2	06/26/02	1020	<.05	<.05	<.05	<.20
			CR	06/26/02	1120	<.05	<.05	<.05	<.20
			CR	06/26/02	1121	<.05	<.05	<.05	<.20
			S3	10/26/02	1340	<.20	<.20	<.20	<.20
27	03371500	East Fork White River near Bedford	S1	06/06/02	1600	<.05	<.05	<.05	<.20
			S2	07/23/02	1605	<.05	<.05	<.05	<.20
			S3	10/01/02	1140	<.20	<.20	<.20	<.20
			CR	10/01/02	1141	<.20	<.20	<.20	<.20

Table 9. Concentrations of selected triazine and phenylurea herbicides and their degradation products determined by laboratory method analysis code LCEA for water samples collected from 51 streams in nine Midwestern States, 2002—Continued

Map number (fig. 1)	U.S. Geological Survey site identification number	Site name	Sample type	Date of collection (month/day/year)	Collection time (24-hour)	Demethyl-fluo-meturon (DMFM)	Diuron	Fluo-meturon	Linuron
			Kansas						
28	06885500	Black Vermillion River near Frankfort	S1	05/07/02	1145	<0.05	<0.05	<0.05	<0.20
			CR	05/07/02	1150	<.05	<.05	<.05	<.20
			S2	08/17/02	1235	<.05	<.05	<.05	<.20
			S3	10/03/02	1135	<.20	<.20	<.20	<.20
29	06890100	Delaware River near Muscotah	S1	05/07/02	1315	<.05	<.05	<.05	<.20
			S2	06/27/02	0950	<.05	<.05	<.05	<.20
			S3	09/19/02	1110	<.20	<.20	<.20	<.20
			Minnesota						
30	05317000	Cottonwood River near New Ulm	S1	05/30/02	1350	<.05	<.05	<.05	<.20
			S2	06/25/02	1620	<.05	<.05	<.05	<.20
			S3	10/04/02	0935	<.20	<.20	<.20	<.20
31	05476000	Des Moines River at Jackson	S1	05/31/02	0720	<.05	<.05	<.05	<.20
			S2	06/25/02	1215	<.05	<.05	<.05	<.20
			CR	06/25/02	1220	<.05	<.05	<.05	<.20
			S3	10/08/02	1145	<.20	<.20	<.20	<.20
32	05320270	Little Cobb River near Beauford	S1	06/06/02	1315	<.05	<.05	<.05	<.20
			S2	06/27/02	1045	<.05	<.05	<.05	<.20
			S3	10/02/02	1105	<.20	<.20	<.20	<.20
			Missouri						
33	06817700	Nodaway River near Graham	S1	05/14/02	1230	<.05	<.05	<.05	<.20
			S2	07/29/02	1200	.17	.43	<.05	<.20
			S3	10/04/02	1215	<.20	<.20	<.20	<.20
			Nebraska						
34	06804000	Wahoo Creek at Itica	S1	05/13/02	1330	<.05	<.05	<.05	<.20
			S2	06/12/02	0840	<.05	<.05	<.05	<.20
			S3	10/04/02	0930	<.20	<.20	<.20	<.20

Table 9. Concentrations of selected triazine and phenylurea herbicides and their degradation products determined by laboratory method analysis code LCEA for water samples collected from 51 streams in nine Midwestern States, 2002—Continued

Map number (fig. 1)	U.S. Geological Survey site identification number	Site name	Sample type	Date of collection (month/day/year)	Collection time (24-hour)	Demethyl-fluo-meturon (DMFM)	Diuron	Fluo-meturon	Linuron
		Nebraska—Continued							
35	06880800	West Fork Big Blue River near Dorchester	S1	05/07/02	0900	<0.05	<0.05	<0.05	<0.20
			S2	07/26/02	1100	<.05	<.05	<.05	<.20
			S3	10/04/02	0920	<.20	<.20	<.20	<.20
36	06815000	Big Nemaha River at Fall City	S1	05/06/02	1400	<.05	<.05	<.05	<.20
			S2	07/12/02	1400	<.05	<.05	<.05	<.20
			S3	10/04/02	1520	<.20	<.20	<.20	<.20
37	06882000	Big Blue River at Barneston	S1	05/07/02	1530	<.05	1.2	<.05	<.20
			S2	06/15/02	0900	<.05	<.05	<.05	<.20
			S3	10/04/02	1300	<.20	<.20	<.20	<.20
			CR	10/04/02	1310	<.20	<.20	<.20	<.20
38	06884000	Little Blue River near Fairbury	S1	05/07/02	1230	<.05	<.05	<.05	<.20
			S2	06/13/02	0930	<.05	<.05	<.05	<.20
			S3	10/02/02	2000	<.20	<.20	<.20	<.20
			LD	10/02/02	2000	<.20	<.20	<.20	<.20
		Ohio							
39	03157000	Clear Creek near Rockbridge	S1	06/05/02	1115	<.05	<.05	<.05	<.20
			S2	07/29/02	1200	<.05	<.05	<.05	<.20
			S3	10/26/02	1300	<.20	<.20	<.20	<.20
40	03219500	Scioto River near Prospect	S1	06/04/02	1230	<.05	<.05	<.05	<.20
			CR	06/04/02	1231	<.05	<.05	<.05	<.20
			S2	07/31/02	0930	<.05	<.05	<.05	<.20
			S3	10/01/02	1030	<.20	<.20	<.20	<.20
41	03223000	Olentangy River at Claridon	S1	06/04/02	1100	<.05	<.05	<.05	<.20
			S2	07/31/02	1100	<.05	<.05	<.05	<.20
			S3	10/26/02	1500	<.20	<.20	<.20	<.20

Table 9. Concentrations of selected triazine and phenylurea herbicides and their degradation products determined by laboratory method analysis code LCEA for water samples collected from 51 streams in nine Midwestern States, 2002—Continued

Map number (fig. 1)	U.S. Geological Survey site identification number	Site name	Sample type	Date of collection (month/day/year)	Collection time (24-hour)	Demethyl-fluo-meturon (DMFM)	Diuron	Fluo-meturon	Linuron
			Ohio—Continued						
42	03230500	Big Darby Creek at Darbyville	S1	06/03/02	1200	<0.05	0.22	<0.05	<0.20
			S2	08/01/02	0930	<.05	<.05	<.05	<.20
			S3	10/01/02	1105	<.20	<.20	<.20	<.20
43	03234500	Scioto River at Higby	S1	06/04/02	1015	<.05	<.05	<.05	<.20
			S2	07/30/02	1100	<.05	<.05	<.05	1.1
			S3	10/28/02	1000	<.20	<.20	<.20	<.20
			LD	10/28/02	1000	<.20	<.20	<.20	<.20
44	03240000	Little Miami River near Oldtown	S1	06/05/02	1320	<.05	<.05	<.05	<.20
			LD	06/05/02	1320	<.05	<.05	<.05	<.20
			S2	07/17/02	1200	<.05	<.05	<.05	<.20
			S3	10/27/02	0700	<.20	<.20	<.20	<.20
45	032667900	Mad River at Eagle City	S1	06/05/02	1130	<.05	<.05	<.05	<.20
			S2	07/17/02	1030	<.05	<.05	<.05	<.20
			CR	07/17/02	1031	<.05	<.05	<.05	<.20
			S3	10/27/02	0800	<.20	<.20	<.20	<.20
46	04185000	Tiffin River at Stryker	S1	05/29/02	1700	<.05	<.05	<.05	<.20
			S2	07/23/02	1530	<.05	<.05	<.05	<.20
			S3	11/06/02	1200	<.20	<.20	<.20	<.20
			CR	11/06/02	1201	<.20	<.20	<.20	<.20
47	04186500	Auglaize River near Fort Jennings	S1	05/28/02	1115	<.05	<.05	<.05	<.20
			S2	07/23/02	1100	<.05	<.05	<.05	<.20
			S3	10/30/02	1300	<.20	<.20	<.20	<.20

Table 9. Concentrations of selected triazine and phenylurea herbicides and their degradation products determined by laboratory method analysis code LCEA for water samples collected from 51 streams in nine Midwestern States, 2002—Continued

Map number (fig. 1)	U.S. Geological Survey site identification number	Site name	Sample type	Date of collection (month/day/year)	Collection time (24-hour)	Demethyl-fluo-meturon (DMFM)	Diuron	Fluo-meturon	Linuron
			Wisconsin						
48	04087240	Root River at Racine	S1	06/03/02	1350	<0.05	<0.05	<0.05	<0.20
			CR	06/03/02	1351	<.05	<.05	<.05	<.20
			S2	07/26/02	1130	<.05	<.05	<.05	<.20
			S3	09/03/02	1110	<.20	<.20	<.20	<.20
49	05340500	St. Croix River at St. Croix Falls	S1	06/20/02	1130	<.05	<.05	<.05	<.20
			S2	06/27/02	1130	<.05	<.05	<.05	<.20
			S3	09/03/02	1520	<.20	<.20	<.20	<.20
50	05407000	Wisconsin River at Muscoda	S1	05/28/02	1330	<.05	<.05	<.05	<.20
			S2	06/27/02	1215	<.05	<.05	<.05	<.20
			S3	09/23/02	1130	<.20	<.20	<.20	<.20
51	05430500	Rock River at Afton	S1	06/04/02	1300	<.05	<.05	<.05	<.20
			LD	06/04/02	1300	<.05	<.05	<.05	<.20
			FB	07/11/02	1229	<.05	<.05	<.05	<.20
			S2	07/11/02	1230	<.05	<.05	<.05	<.20
			S3	09/20/02	0945	<.20	<.20	<.20	<.20

Table 10. Statistical summary of concentrations of selected triazine and phenylurea herbicides and their degradation products determined by laboratory method analysis code LCEA for water samples collected from 51 streams in nine Midwestern States, 2002

[All concentrations are in micrograms per liter. MRL, method reporting limit; <, less than]

Herbicide	Number of samples	Number at or above MRL	25th percentile	Median	75th percentile	95th percentile	Maximum
Triazine herbicides							
			Pre-emergence runoff samples				
Atrazine	51	49	1.1	4.3	16	39	51
Deethylatrazine	51	45	.10	.39	.93	1.9	2.9
Deisopropylatrazine	51	35	<.05	.20	.55	.87	1.7
Didealkylatrazine	51	40	.06	.18	.32	.48	.60
Hydroxyatrazine	51	39	.05	.12	.26	.54	.93
Deethylhydroxyatrazine	51	1	<.10	<.10	<.10	<.10	.14
Deisopropylhydroxyatrazine	51	1	<.10	<.10	<.10	<.10	.05
Total atrazine	**51**	**49**	**1.6**	**6.3**	**19**	**42**	**54**
Cyanazine	51	1	<.05	<.05	<.05	<.05	.62
Cyanazine acid	51	0	<.05	<.05	<.05	<.05	<.05
Cyanazine amide	51	0	<.05	<.05	<.05	<.05	<.05
Deethylcyanazine	51	0	<.05	<.05	<.05	<.05	<.05
Deethylcyanazine acid	51	5	<.05	<.05	<.05	.48	4.2
Deethylcyanazine amide	51	0	<.05	<.05	<.05	<.05	<.05
Total cyanazine	**51**	**5**	**<.05**	**<.05**	**<.05**	**.48**	**4.2**
Propazine	51	23	<.05	<.05	.17	.38	.55
Simazine	51	27	<.05	.06	.28	2.2	11
			Post-emergence runoff samples				
Atrazine	52	51	.48	1.5	4.9	22	61
Deethylatrazine	52	46	.14	.32	.66	5.1	7.9
Deisopropylatrazine	52	40	.06	.18	.36	3.0	5.6
Didealkylatrazine	52	41	.11	.27	.48	.89	1.5
Hydroxyatrazine	52	48	.06	.33	.73	1.7	2.3
Deethylhydroxyatrazine	52	14	<.05	<.05	.10	.66	1.1
Deisopropylhydroxyatrazine	52	22	<.05	<.05	.15	.36	.42
Total atrazine	**52**	**52**	**1.3**	**2.9**	**7.0**	**31**	**73**
Cyanazine	52	0	<.05	<.05	<.05	<.05	<.05
Cyanazine acid	52	1	<.05	<.05	<.05	<.05	.07
Cyanazine amide	52	0	<.05	<.05	<.05	<.05	<.05
Deethylcyanazine	52	0	<.05	<.05	<.05	<.05	<.05
Deethylcyanazine acid	52	2	<.05	<.05	<.05	<.05	.87
Deethylcyanazine amide	52	0	<.05	<.05	<.05	<.05	<.05
Total cyanazine	**52**	**3**	**<.05**	**<.05**	**<.05**	**.07**	**.87**
Propazine	52	12	<.05	<.05	<.05	.22	.78
Simazine	52	19	<.05	<.05	.08	.70	5.1

Table 10. Statistical summary of concentrations of selected triazine and phenylurea herbicides and their degradation products determined by laboratory method analysis code LCEA for water samples collected from 51 streams in nine Midwestern States, 2002—Continued

Herbicide	Number of samples	Number at or above MRL	25th percentile	Median	75th percentile	95th percentile	Maximum
Triazine herbicides—Continued							
			Harvest-season runoff samples				
Atrazine	51	43	0.04	0.08	0.19	0.76	1.9
Deethylatrazine	51	42	.04	.07	.12	.31	.61
Deisopropylatrazine	51	24	<.025	<.025	.06	.22	.38
Didealkylatrazine	51	31	<.025	.06	.17	.30	.38
Hydroxyatrazine	51	43	.05	.09	.21	.45	.75
Deethylhydroxyatrazine	51	1	<.025	<.025	<.025	<.025	.16
Deisopropylhydroxyatrazine	51	10	<.025	<.025	<.025	.08	.09
Total atrazine	**51**	**49**	**.25**	**.41**	**.76**	**2.1**	**2.4**
Cyanazine	51	0	<.025	<.025	<.025	<.025	<.025
Cyanazine acid	51	0	<.025	<.025	<.025	<.025	<.025
Cyanazine amide	51	0	<.025	<.025	<.025	<.025	<.025
Deethylcyanazine	51	0	<.20	<.20	<.20	<.20	<.20
Deethylcyanazine acid	51	6	<.025	<.025	<.025	.77	.97
Deethylcyanazine amide	51	0	<.025	<.025	<.025	<.025	<.025
Total cyanazine	**51**	**6**	**<.025**	**<.025**	**<.025**	**.77**	**.97**
Propazine	51	0	<.025	<.025	<.025	<.025	<.025
Simazine	51	6	<.025	<.025	<.025	.10	.14
Phenylurea herbicides							
			Pre-emergence runoff samples				
Demethylfluometuron (DMFM)	51	0	<.05	<.05	<.05	<.05	<.05
Diuron	51	2	<.05	<.05	<.05	<.05	1.2
Fluometuron	51	0	<.05	<.05	<.05	<.05	<.05
Linuron	51	0	<.20	<.20	<.20	<.20	<.20
			Post-emergence runoff samples				
Demethylfluometuron (DMFM)	52	1	<.05	<.05	<.05	<.05	.17
Diuron	52	3	<.05	<.05	<.05	.10	.43
Fluometuron	52	0	<.05	<.05	<.05	<.05	<.05
Linuron	52	2	<.20	<.20	<.20	<.20	1.7
			Harvest-season runoff samples				
Demethylfluometuron (DMFM)	51	0	<.20	<.20	<.20	<.20	<.20
Diuron	51	0	<.20	<.20	<.20	<.20	<.20
Fluometuron	51	0	<.20	<.20	<.20	<.20	<.20
Linuron	51	0	<.20	<.20	<.20	<.20	<.20

Table 11. Concentrations of glyphosate, its degradation product, AMPA, and glufosinate determined by laboratory method analysis code LCGY for water samples collected from 51 streams in nine Midwestern States, 2002

[All concentrations are in micrograms per liter. <, less than; Sample type: CR, concurrent replicate sample; FB, field blank; LD, laboratory duplicate sample; S1, sample from pre-emergence runoff; S2, sample from post-emergence runoff; S3, sample from harvest-season runoff]

Map number (fig. 1)	U.S. Geological Survey site identification number	Site name	Sample type	Date of collection (month/day/year)	Collection time (24-hour)	Glyphosate	Aminomethyl-phosphonic acid (AMPA)	Glufosinate
			Iowa					
1	05411850	Turkey River near Eldorado	S1	05/14/02	1400	<0.10	<0.10	<0.10
			CR	05/14/02	1405	<.10	<.10	<.10
			S2	06/24/02	0950	<.10	<.10	<.10
			S3	10/29/02	1300	<.10	<.10	<.10
2	05421000	Wapsipinicon River at Independence	S1	05/14/02	1100	<.10	<.10	<.10
			S2	06/24/02	1245	<.10	<.10	<.10
			S3	10/29/02	0930	<.10	<.10	<.10
3	05455100	Old Mans Creek near Iowa City	S1	05/13/02	1100	<.10	<.10	<.10
			S2	06/27/02	0955	.46	.26	<.10
			S3	10/30/02	1140	<.10	.13	<.10
4	05472500	North Skunk River near Sigourney	S1	05/13/02	1630	<.10	<.10	<.10
			S2	07/08/02	1015	<.10	.18	<.10
			S3	10/29/02	1435	<.10	<.10	<.10
5	05474000	Skunk River at Augusta	S1	05/13/02	1230	<.10	<.10	<.10
			S2	06/27/02	1235	.36	.26	<.10
			S3	10/29/02	1015	<.10	.11	<.10
6	05480500	Des Moines River at Fort Dodge	S1	05/17/02	1230	<.10	<.10	<.10
			S2	06/13/02	0730	<.10	.19	<.10
			S3	10/30/02	1500	<.10	.10	<.10
7	05484500	Raccoon River at Van Meter	S1	05/17/02	0930	<.10	<.10	<.10
			S2	06/12/02	1630	<.10	.17	<.10
			CR	06/12/02	1635	.27	.25	<.10
			S3	10/30/02	1200	<.10	<.10	<.10
8	06606600	Little Sioux River at Correctionville	S1	05/17/02	1615	<.10	<.10	<.10
			S2	06/11/02	1100	<.10	.27	<.10
			S3	10/31/02	0930	<.10	.13	<.10
9	06607200	Maple River at Mapleton	S1	05/29/02	1200	<.10	<.10	<.10
			LD	05/29/02	1200	<.10	<.10	<.10
			S2	06/11/02	1330	.36	.64	.14
			S3	10/31/02	1200	<.10	.42	<.10
10	06609500	Boyer River at Logan	S1	05/29/02	0945	<.10	.33	<.10
			S2	06/11/02	1545	.32	.45	<.10
			S3	11/01/02	0900	.12	.20	<.10

Table 11. Concentrations of glyphosate, its degradation product, AMPA, and glufosinate determined by laboratory method analysis code LCGY for water samples collected from 51 streams in nine Midwestern States, 2002—Continued

Map number (fig. 1)	U.S. Geological Survey site identification number	Site name	Sample type	Date of collection (month/day/year)	Collection time (24-hour)	Glyphosate	Aminomethylphosphonic acid (AMPA)	Glufosinate
		Illinois						
11	03378000	Bonpas Creek at Browns	S1	06/06/02	1030	<0.10	0.33	<0.10
			CR	06/06/02	1031	<.10	.26	<.10
			S2	06/25/02	1300	4.5	.91	<.10
			S3	09/25/02	1015	.44	.55	<.10
12	03381495	Little Wabash River at Carmi	S1	06/06/02	1230	<.10	<.10	<.10
			S2	06/25/02	1430	1.4	.83	<.10
			CR	06/25/02	1431	2.3	.91	<.10
			S3	09/25/02	0830	.34	.80	<.10
13	05439500	South Branch Kishwaukee River at Fairdale	S1	05/14/02	1600	.33	.19	<.10
			S2	08/02/02	1430	<.10	.26	<.10
			S3	09/25/02	0930	<.10	.28	<.10
14	05526000	Iroquois River near Chebanese	S1	06/06/02	0925	<.10	<.10	<.10
			S2	06/28/02	0910	.19	.29	<.10
			LD	06/28/02	0910	.25	.18	<.10
			S3	09/25/02	1345	<.10	.21	<.10
15	05540500	Du Page River at Shorewood	S1	05/15/02	1030	<.10	.10	<.10
			S2	06/27/02	1240	.34	.44	<.10
			S3	09/25/02	1145	<.10	.89	<.10
16	05569500	Spoon River at London Mills	S1	05/14/02	1035	.19	.23	<.10
			S2	07/30/02	1000	<.10	.24	<.10
			S3	09/24/02	0905	<.10	.10	<.10
17	05576500	Sangamon River at Riverton	S1	05/29/02	1015	.36	.16	<.10
			S2	07/17/02	1515	<.10	.61	<.10
			LD	07/17/02	1515	<.10	.74	<.10
			S3	09/25/02	0845	<.10	1.8	<.10
			LD	09/25/02	0845	<.10	1.7	<.10
18	05587000	Macoupin Creek near Kane	S1	06/06/02	1000	<.10	<.10	<.10
			S2	07/29/02	1115	.13	.39	<.10
			S3	09/24/02	1120	<.10	.51	<.10
19	05592100	Kaskaskia River near Cowden	S1	05/29/02	0930	.20	.17	<.10
			S2	06/25/02	1200	<.10	.27	<.10
			S3	09/25/02	1330	<.10	.21	<.10
20	05594000	Shoal Creek near Breese	S1	06/06/02	1330	<.10	.22	<.10
			S2	07/29/02	1410	.17	.22	<.10
			S3	09/24/02	1420	.14	.23	<.10

Table 11. Concentrations of glyphosate, its degradation product, AMPA, and glufosinate determined by laboratory method analysis code LCGY for water samples collected from 51 streams in nine Midwestern States, 2002—Continued

Map number (fig. 1)	U.S. Geological Survey site identification number	Site name	Sample type	Date of collection (month/day/year)	Collection time (24-hour)	Glyphosate	Aminomethylphosphonic acid (AMPA)	Glufosinate
		Indiana						
21	03275000	Whitewater River near Alpine	FB	06/14/02	1145	<0.10	<0.10	<0.10
			S1	06/14/02	1230	1.0	.43	<.10
			S2	06/28/02	1205	.34	.28	<.10
			S3	10/29/02	1715	<.10	.17	<.10
22	03302800	Blue River at Fredericksburg	S1	06/06/02	1130	.34	.28	<.10
			S2	08/21/02	1130	<.10	<.10	<.10
			S3	09/27/02	1200	.26	.36	<.10
23	03328500	Eel River near Logansport	S1	06/05/02	1200	<.10	<.10	<.10
			S2	07/30/02	1130	<.10	.18	<.10
			S2	07/31/02	1250	<.10	.31	<.10
			S3	12/10/02	1000	<.10	<.10	<.10
24	03333450	Wildcat Creek near Jerome	S1	05/30/02	1250	.16	.12	<.10
			S2	08/19/02	1110	<.10	.13	<.10
			S3	09/20/02	1316	<.10	.10	<.10
			LD	09/20/02	1316	<.10	.10	<.10
25	03335000	Wildcat Creek near Lafayette	S1	05/30/02	1630	.19	.23	<.10
			S2	07/23/02	1000	<.10	.36	<.10
			S3	11/12/02	1215	<.10	.79	<.10
26	03362500	Sugar Creek near Edinburgh	S1	06/07/02	1345	.45	.34	<.10
			S2	06/26/02	1020	1.5	.38	<.10
			CR	06/26/02	1120	1.0	.51	<.10
			CR	06/26/02	1121	.58	.33	<.10
			S3	10/26/02	1340	.30	.62	<.10
27	03371500	East Fork White River near Bedford	S1	06/06/02	1600	.23	.22	<.10
			S2	07/23/02	1605	<.10	.37	<.10
			LD	07/23/02	1605	<.10	.42	<.10
			S3	10/01/02	1140	.13	.34	<.10
			CR	10/01/02	1141	.20	.33	<.10
		Kansas						
28	06885500	Black Vermillion River near Frankfort	S1	05/07/02	1145	<.10	<.10	<.10
			LD	05/07/02	1145	<.10	<.10	<.10
			CR	05/07/02	1150	<.10	<.10	<.10
			S2	08/17/02	1235	<.10	.11	<.10
			S3	10/03/02	1135	8.7	3.6	<.10
29	06890100	Delaware River near Muscotah	S1	05/07/02	1315	<.10	<.10	<.10
			S2	06/27/02	0950	1.7	.41	.26
			LD	06/27/02	0950	1.6	.63	.27
			S3	09/19/02	1110	<.10	<.10	<.10

Table 11. Concentrations of glyphosate, its degradation product, AMPA, and glufosinate determined by laboratory method analysis code LCGY for water samples collected from 51 streams in nine Midwestern States, 2002—Continued

Map number (fig. 1)	U.S. Geological Survey site identification number	Site name	Sample type	Date of collection (month/day/year)	Collection time (24-hour)	Glyphosate	Aminomethylphosphonic acid (AMPA)	Glufosinate
		Minnesota						
30	05317000	Cottonwood River near New Ulm	S1	05/30/02	1350	<0.10	<0.10	<0.10
			S2	06/25/02	1620	.77	.42	<.10
			S3	10/04/02	0935	<.10	<.10	<.10
31	05476000	Des Moines River at Jackson	S1	05/31/02	0720	<.10	<.10	<.10
			S2	06/25/02	1215	<.10	<.10	<.10
			CR	06/25/02	1220	<.10	<.10	<.10
			S3	10/08/02	1145	<.10	<.10	<.10
32	05320270	Little Cobb River near Beauford	S1	06/06/02	1315	<.10	<.10	<.10
			S2	06/27/02	1045	.30	.15	<.10
			S3	10/02/02	1105	<.10	<.10	<.10
		Missouri						
33	06817700	Nodaway River near Graham	S1	05/14/02	1230	<.10	<.10	<.10
			LD	05/14/02	1230	<.10	<.10	<.10
			S2	07/29/02	1200	<.10	.36	<.10
			S3	10/04/02	1215	<.10	.25	<.10
		Nebraska						
34	06804000	Wahoo Creek at Ithaca	S1	05/13/02	1330	<.10	.19	<.10
			S2	06/12/02	0840	<.10	.38	<.10
			S3	10/04/02	0930	<.10	.65	<.10
35	06880800	West Fork Big Blue River near Dorchester	S1	05/07/02	0900	.11	1.3	<.10
			S2	07/26/02	1100	.17	2.0	<.10
			S3	10/04/02	0920	.21	1.3	<.10
36	06815000	Big Nemaha River at Falls City	S1	05/06/02	1400	<.10	<.10	<.10
			LD	05/06/02	1400	<.10	<.10	<.10
			S2	07/12/02	1400	<.10	.19	<.10
			S3	10/04/02	1520	<.10	.34	<.10
37	06882000	Big Blue River at Barneston	S1	05/07/02	1530	.31	1.3	<.10
			S2	06/15/02	0900	.21	1.8	<.10
			S3	10/04/02	1300	.54	1.3	<.10
			CR	10/04/02	1310	.36	1.2	<.10
			LD	10/04/02	1310	.46	1.5	<.10
38	06884000	Little Blue River near Fairbury	S1	05/07/02	1230	<.10	.42	<.10
			S2	06/13/02	0930	.52	.64	<.10
			S3	10/02/02	2000	.33	.71	<.10
		Ohio						
39	03157000	Clear Creek near Rockbridge	S1	06/05/02	1115	.27	.23	<.10
			S2	07/29/02	1200	<.10	<.10	<.10
			S3	10/26/02	1300	<.10	<.10	<.10

Table 11. Concentrations of glyphosate, its degradation product, AMPA, and glufosinate determined by laboratory method analysis code LCGY for water samples collected from 51 streams in nine Midwestern States, 2002—Continued

Map number (fig. 1)	U.S. Geological Survey site identification number	Site name	Sample type	Date of collection (month/day/year)	Collection time (24-hour)	Glyphosate	Aminomethylphosphonic acid (AMPA)	Glufosinate
		Ohio—Continued						
40	03219500	Scioto River near Prospect	S1	06/04/02	1230	0.58	0.55	<0.10
			LD	06/04/02	1230	.59	.51	<.10
			CR	06/04/02	1231	.65	.67	<.10
			S2	07/31/02	0930	.48	.82	<.10
			S3	10/01/02	1030	.28	.47	<.10
41	03223000	Olentangy River at Claridon	S1	06/04/02	1100	.24	.27	<.10
			S2	07/31/02	1100	<.10	.34	<.10
			S3	10/26/02	1500	<.10	.13	<.10
42	03230500	Big Darby Creek at Darbyville	S1	06/03/02	1200	.60	.31	<.10
			S2	08/01/02	0930	<.10	.25	<.10
			LD	08/01/02	0930	<.10	.32	<.10
			S3	10/01/02	1105	.25	.34	<.10
43	03234500	Scioto River at Higby	S1	06/04/02	1015	.24	.36	<.10
			S2	07/30/02	1100	.23	.94	<.10
			S3	10/28/02	1000	.28	.89	<.10
			LD	10/28/02	1000	.29	.99	<.10
44	03240000	Little Miami River near Oldtown	S1	06/05/02	1320	<.10	<.10	<.10
			S2	07/17/02	1200	<.10	<.10	<.10
			S3	10/27/02	0700	.45	.17	<.10
45	03267900	Mad River at Eagle City	S1	06/05/02	1130	<.10	.11	<.10
			S2	07/17/02	1030	<.10	<.10	<.10
			CR	07/17/02	1031	<.10	<.10	<.10
			S3	10/27/02	0800	<.10	<.10	<.10
46	04185000	Tiffin River at Stryker	S1	05/29/02	1700	.16	<.10	<.10
			S2	07/23/02	1530	<.10	.26	<.10
			S3	11/06/02	1200	<.10	<.10	<.10
			CR	11/06/02	1201	<.10	<.10	<.10
47	04186500	Auglaize River near Fort Jennings	S1	05/28/02	1115	<.10	.28	<.10
			S2	07/23/02	1100	.17	.58	<.10
			S3	10/30/02	1300	<.10	.30	<.10
		Wisconsin						
48	04087240	Root River at Racine	S1	06/03/02	1350	<.10	.10	<.10
			CR	06/03/02	1351	<.10	.18	<.10
			S2	07/26/02	1130	<.10	.29	<.10
			LD	07/26/02	1130	<.10	.23	<.10
			S3	09/03/02	1110	.12	.35	<.10

Table 11. Concentrations of glyphosate, its degradation product, AMPA, and glufosinate determined by laboratory method analysis code LCGY for water samples collected from 51 streams in nine Midwestern States, 2002—Continued

Map number (fig. 1)	U.S. Geological Survey site identification number	Site name	Sample type	Date of collection (month/day/year)	Collection time (24-hour)	Glyphosate	Aminomethylphosphonic acid (AMPA)	Glufosinate
			Wisconsin—Continued					
49	05340500	St. Croix River at St. Croix Falls	S1	06/20/02	1130	<0.10	<0.10	<0.10
			S2	06/27/02	1130	<.10	<.10	<.10
			LD	06/27/02	1130	<.10	<.10	<.10
			S3	09/03/02	1520	<.10	<.10	<.10
			LD	09/03/02	1520	<.10	<.10	<.10
50	05407000	Wisconsin River at Muscoda	S1	05/28/02	1330	<.10	<.10	<.10
			S2	06/27/02	1215	<.10	<.10	<.10
			S3	09/23/02	1130	<.10	<.10	<.10
51	05430500	Rock River at Afton	S1	06/04/02	1300	<.10	.16	<.10
			S2	07/11/02	1229	<.10	.33	<.10
			FB	07/11/02	1230	<.10	<.10	<.10
			S3	09/20/02	0945	<.10	.41	<.10

Table 12. Statistical summary of concentrations of glyphosate, its degradation product, AMPA, and glufosinate determined by laboratory method analysis code LCGY for water samples collected from 51 streams in nine Midwestern States, 2002

[All concentrations in micrograms per liter. MRL, method reporting limit; <, less than; AMPA, aminomethylphosphonic acid]

Herbicide	Number of samples	Number at or above MRL	25th percentile	Median	75th percentile	95th percentile	Maximum
Pre-emergence runoff samples							
Glyphosate	51	18	<0.10	<0.10	0.20	0.58	1.00
AMPA	51	27	<.10	.10	.28	.55	1.8
Glufosinate	51	0	<.10	<.10	<.10	<.10	<.10
Post-emergence runoff samples							
Glyphosate	52	21	<.10	<.10	.32	1.5	4.5
AMPA	52	43	.18	.27	.42	.94	2.0
Glufosinate	52	2	<.10	<.10	<.10	<.10	.26
Harvest-season runoff samples							
Glyphosate	51	16	<.10	<.10	.14	.45	8.7
AMPA	51	37	<.10	.21	.51	1.3	3.6
Glufosinate	51	0	<.10	<.10	<.10	<.10	<.10