QUALITY OF SURFACE WATER IN THE COAL-MINING REGION, SOUTHWESTERN INDIANA, OCTOBER 1979 TO SEPTEMBER 1980

By Danny E. Renn

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FACTORS FOR CONVERTING INCH-POUND UNITS TO THE INTERNATIONAL SYSTEM OF UNITS (SI)

Multiply inch-pound units	By	To obtain SI units
inch (in.)	25.4	millimeter (mm)
foot (ft)	0.3048	meter (m)
mile (mi)	1.609	kilometer (km)
square foot (ft^2)	0.0929	square meter (m^2)
square mile (mi^2)	2.590	square kilometer (km^2)
cubic foot per second (ft^3/s)	0.02832	cubic meter per second (m^3/s)
cubic foot per second per square mile [$(ft^3/s)/mi^2$]	0.01093	cubic meter per second per square kilometer [$(m^3/s)/km^2$]

National Geodetic Vertical Datum of 1929 (NGVD): A geodetic datum derived from a general adjustment of the first order level nets of both the United States and Canada, formerly called mean sea level.

QUALITY OF SURFACE WATER IN THE COAL-MINING REGION, SOUTHWESTERN INDIANA, OCTOBER 1979 TO SEPTEMBER 1980

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ABSTRACT

The U.S. Geological Survey collected water-quality and other hydrologic data for surface water in the coal-mining region of southwestern Indiana. These data were collected at 85 sites in 19 counties during October 1979 and at 21 of the 85 sites in 12 of the 19 counties monthly from January through September 1980. The samples were collected during steady flow. Samples were also collected at 8 of the 21 monthly sites during unsteady flow caused by storms. Samples were collected prestorm; on the rising, peak, and falling stream stages; and poststorm, after flow had stabilized.

Water samples were collected at each site for determining concentrations of major ions, selected metals, nutrients, and suspended sediment. Specific conductance, pH, water temperature, dissolved oxygen, and instantaneous discharge were also determined at each site. During October 1979, streambed-material samples were collected at 74 sites for determining concentrations of acid-soluble constituents on sediment smaller than 63-micron diameter. During March 1980, streambed-material samples were collected at 14 sites for determining the quantity of coal in streambed sediments.

INTRODUCTION

The Surface Mining Control and Reclamation Act, Public Law 95-87 (the Act), was enacted on August 3, 1977, by the 95th Congress. Under Section 507(b)(11) of the Act, an appropriate Federal or State agency must provide applicants for coal-mining permits water-quality and hydrologic information on the "general area" so that the applicant can assess the probable effects of the proposed mining. This information will also assist the regulatory authority in determining the probable cumulative impacts of all anticipated mining in the general area and its effects on the hydrologic system.

To help meet the goals of the Act, the U.S. Geological Survey collected water-quality and other hydrologic data for surface water in the coal-mining region of southwestern Indiana. Data were collected from October 15, 1979, to September 4, 1980, during steady as well as unsteady flow.

STUDY AREA

The study area includes approximately 6,500 mi^2 (square miles), or about one-sixth of the State's total area (fig. 1). The area, along the east side of the Eastern Region of the Interior Province, is underlain by rocks of Pennsylvanian age (fig. 2). The rocks constitute a dominantly clastic sequence of shale, siltstone, and sandstone intermixed with thin but widespread beds of coal, clay, limestone, and black shale (Gray, 1979, p. K1). The rocks are nearly flat, blanket-like deposits that vary in continuity and thickness and dip 20 to 30 ft/mi (feet per mile) southwest toward the center of the Illinois Basin. Their maximum thickness is about 1,600 ft near the southwest corner of the State; their mean thickness is about 800 ft (Gray, 1979, p. K1).

Figure 3 is a generalized geologic column showing names and positions of series, groups, formations, and coal beds of the Pennsylvanian System in Indiana. Data indicate coal deposits in at least 45 different stratigraphic positions (Wier, 1973, p. 7) and that these deposits comprise only 3 percent of Indiana's Pennsylvanian rocks (Wier, 1973, p. 4). Indiana's highly volatile, bituminous coals contain between 11,000 and 14,000 Btu (British thermal unit) per pound (Neavel, 1961, p. 16). Chemical analyses of the coal beds show considerable variation in heat content and percentages of sulfur and ash. The variation also applies areally to single coal beds (Wier, 1973, p. 12-14).

Approximately 100,000 acres in 21 counties has been surface mined. About two-thirds of the acreage is within three counties--Warrick, Pike, and Clay (fig. 1). Within Warrick and Pike Counties, the surface-mined land amounts to about 10 percent of the area of each county: Clay County, 6 percent; and for the remaining counties, 3 percent or less. The surface-mined area is 0.4 percent of the land area of Indiana and less than 2 percent of the area of the 21 counties where coal has been surface mined. About one-half of the surface-mined land is within the nonglaciated part of the coal basin shown in figure 1 (Powell, 1972, p. 6).

About 49 percent of the coal removed by surface mining has been from the Springfield Coal Member (V); 23 percent, Hymera coal (VI) and Danville coal (VII); 17 percent, Seelyville coal (III), Survant coal (IV), and Minshall coal; and 11 percent, the two Block coals (Powell, 1972, p. 6). The north-south trending outcrop of the Seelyville, Springfield, Hymera, and Danville coals fairly well defines the area of intensive surface mining in Indiana (fig. 2).

The study area also contains three distinct physiographic units--the Wabash Lowland, Tipton Till Plain, and Crawford Upland (fig. 1). The Wabash Lowland is a broad lowland tract having an average elevation of 500 ft above the National Geodetic Vertical Datum of 1929. The unit, underlain by siltstone and shale of Pennsylvanian age, contains extensive aggraded valleys throughout and thick lacustrine, outwash, and alluvial sediments in places. The Tipton Till Plain is a nearly flat to gently rolling glacial plain, except for its extreme western edge, where tributaries to the Wabash River have cut through drift and are entrenched in narrow bedrock valleys as deep as 150 ft. The unit is underlain by siltstone and shale of Pennsylvanian age. The Crawford Upland is a deeply dissected upland area, where local relief of 300 to 350 ft is common. The unit is underlain by alternating sandstone, shale, and limestone of the

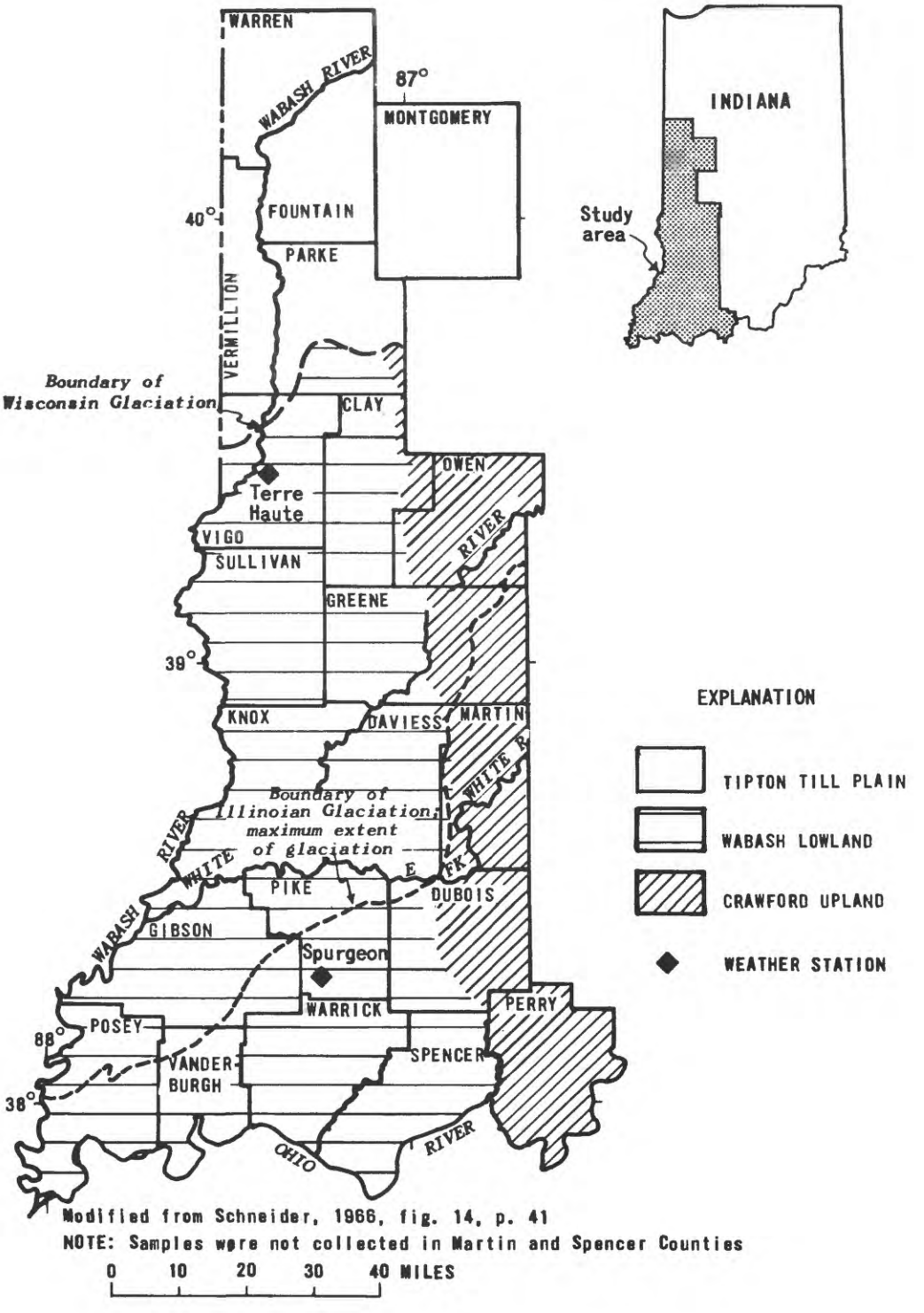
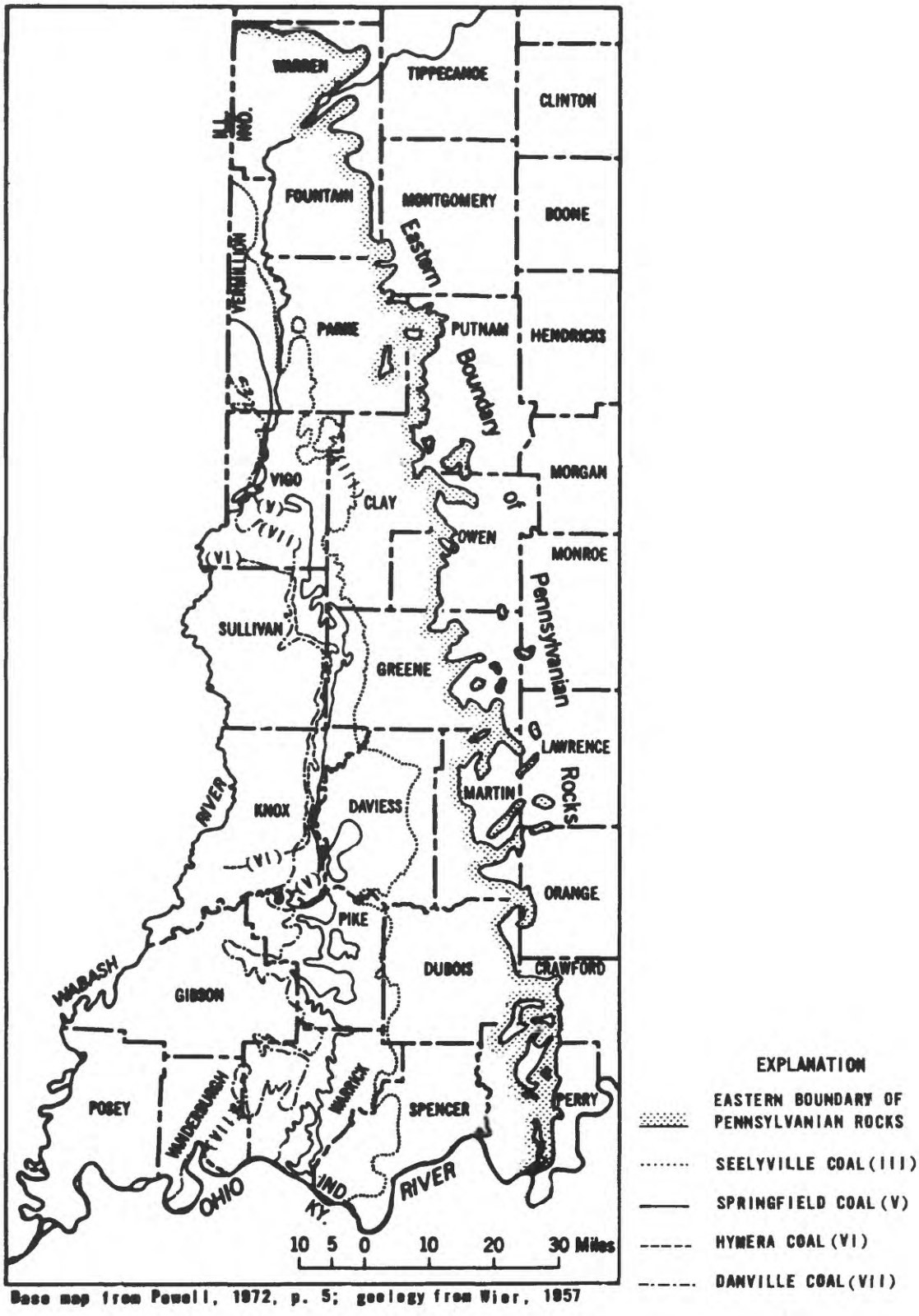
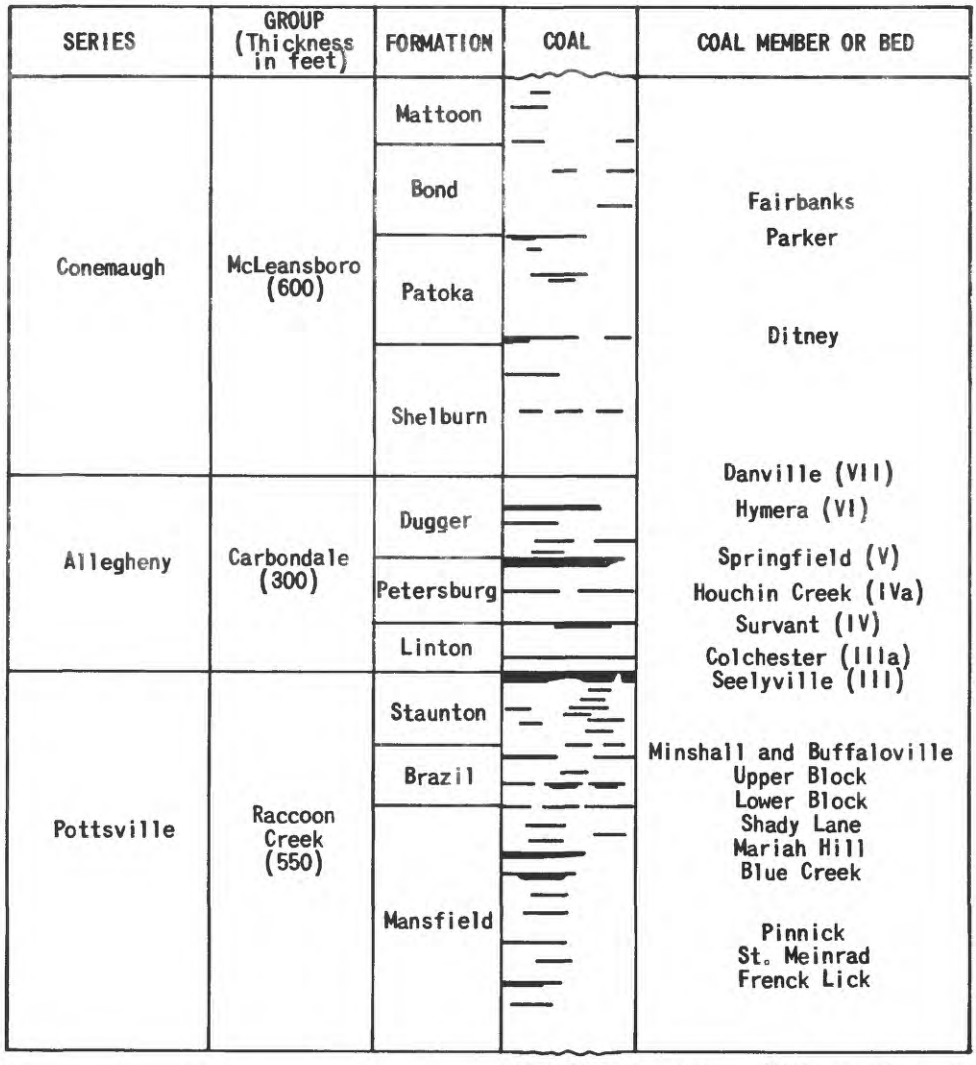


Figure 1.-- Locations of physiographic units, glacial boundaries, and weather stations.



Base map from Powell, 1972, p. 5; geology from Wier, 1957

Figure 2.— Locations of outcrops of Pennsylvanian rocks and associated coal beds.



Modified from Wier, 1973, fig.3, p. 5

Figure 3.-- Generalized geologic column of the Pennsylvanian System in Indiana.

Chesterian Series (Upper Mississippian). These rocks are unconformably overlapped by resistant sandstone and softer rocks in the Mansfield Formation of the lower Early and Middle Pennsylvanian age. During the Pleistocene Epoch, deposits of the Wisconsin and Illinoian Glaciations were left in all but the extreme southern part of the State. (See Schneider, 1966, p. 47-50.)

Land use in the 21 counties making up the coal-mining area is 65.7 percent agricultural, 26.2 percent forested, 2.3 percent residential, 0.5 percent commercial and industrial, 1.1 percent recreational and open, 0.9 percent wetlands and water, 1.1 percent surface mining and unreclaimed derelict land, and 2.2 percent other uses (Kris Kothe, State Planning Services Agency, Indiana Department of Commerce, written commun., 1979; Mark Blade, West Central Indiana Economic Development District, Inc., written commun., 1979).

SITE SELECTION

Sampling sites (figs. 4-22) were selected so that the effects of several land uses (forest, agriculture, unreclaimed mine land, reclaimed mine land, active mining, mixed land use) in the glaciated (Wisconsin and Illinoian Glaciations) and unglaciated areas and in the three physiographic units (Wabash Lowland, Tipton Till Plain, and Crawford Upland) could be determined. These sites are described in tables 1, 2, and 3.

DATA COLLECTION

Data collection follows a statistical approach so that the effects of land uses, glacial periods, physiographic units, flow, and season on water quality can be determined.

To update water quality and other hydrologic data, the author sampled 85 sites in 19 counties during October 1979 (tables 4 and 5). These same sites were also sampled in May 1979 (Renn and others, 1980). Approximately one-half of these sites were in watersheds having predominantly one land use (forest, agriculture, unreclaimed mine land, reclaimed mine land, or active mining); the rest of the sites were in watersheds having two or more land uses. The sites were sampled during steady flow.

To show the effects of season on water quality and other hydrologic data, the author sampled 21 of the 85 sites in 12 of the 19 counties monthly from January through September 1980 (table 6). Most of these sites are in watersheds having one land use (forest, agriculture, unreclaimed mine land,

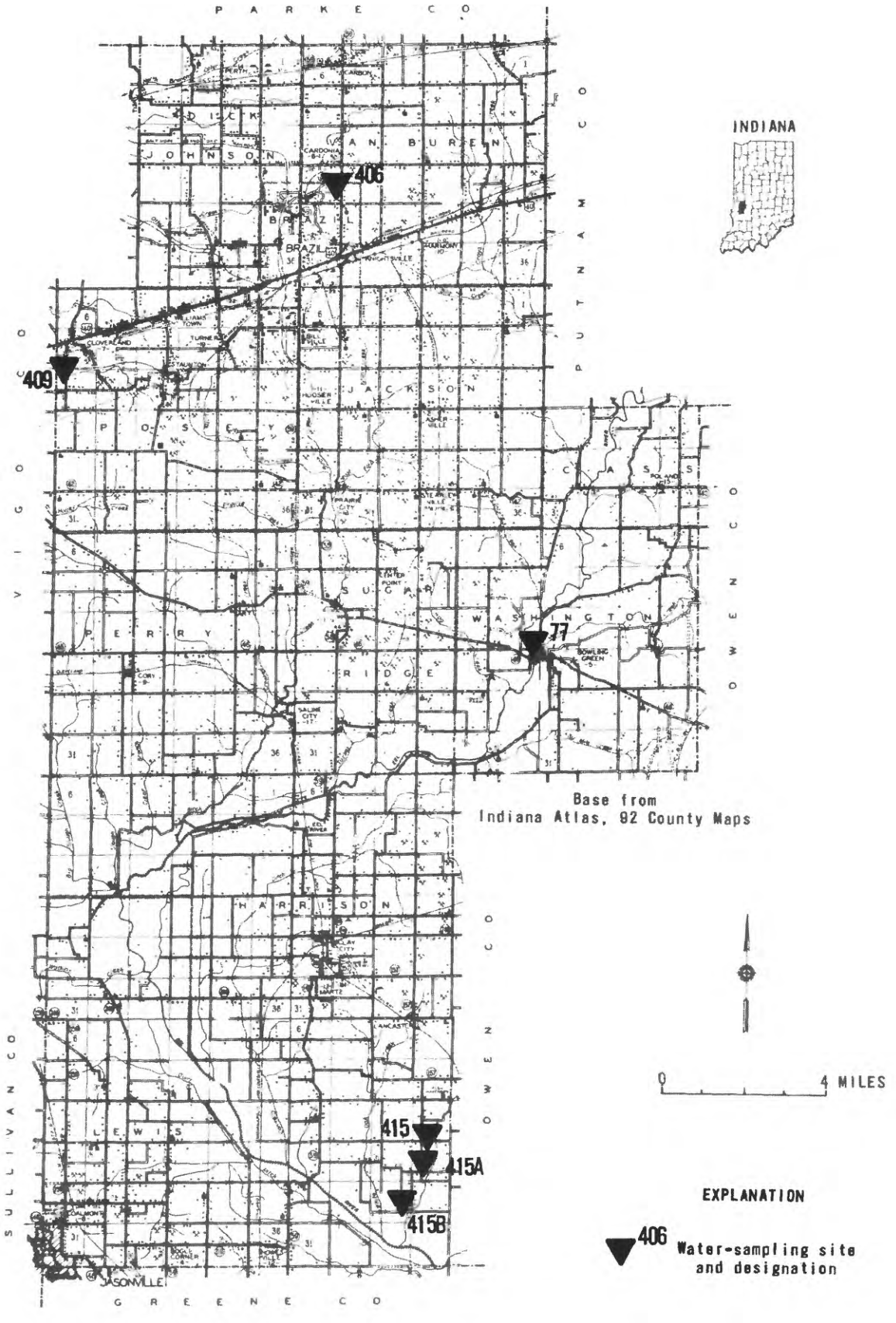


Figure 4.-- Sampling sites in Clay County.

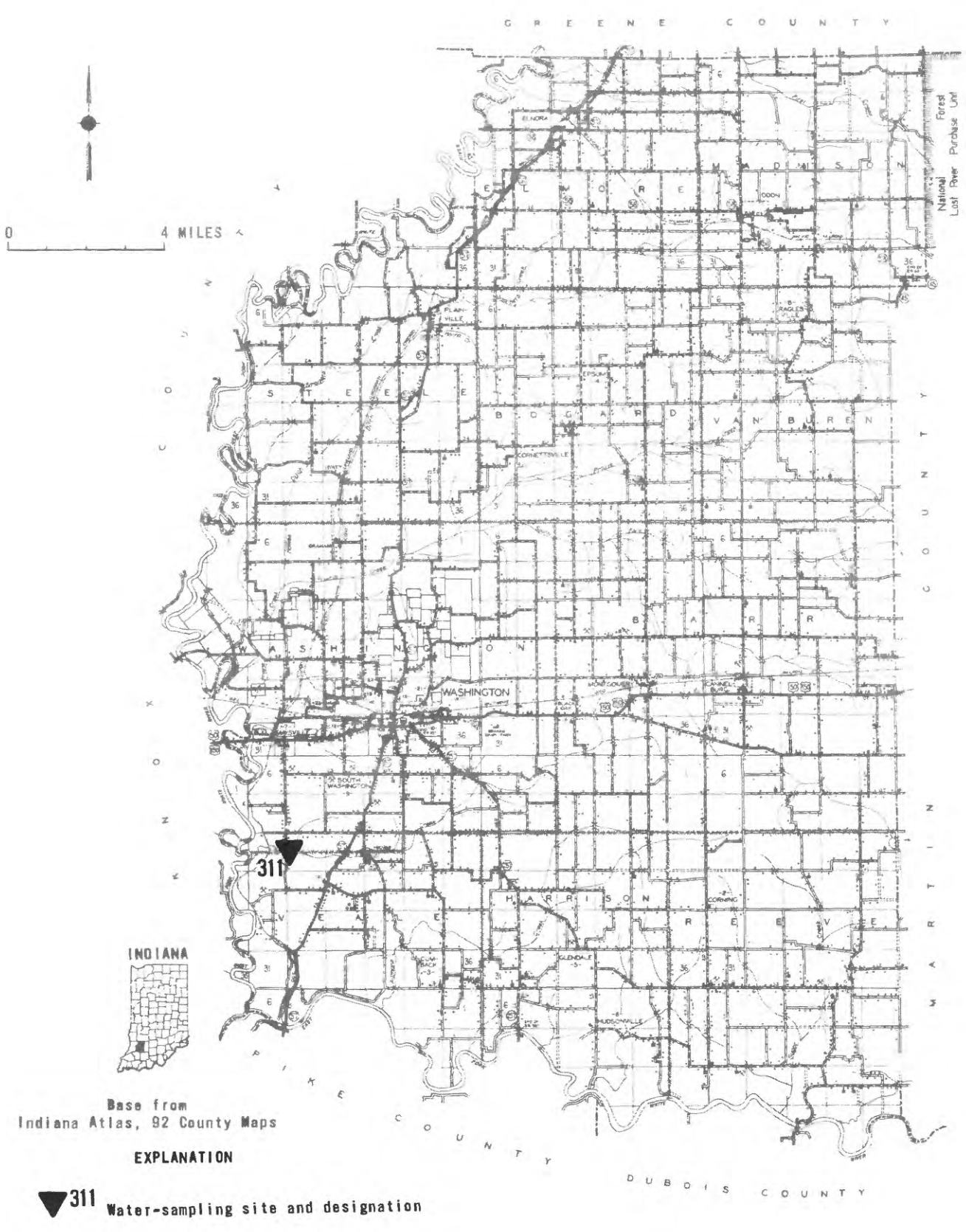


Figure 5.-- Sampling site in Daviess County.

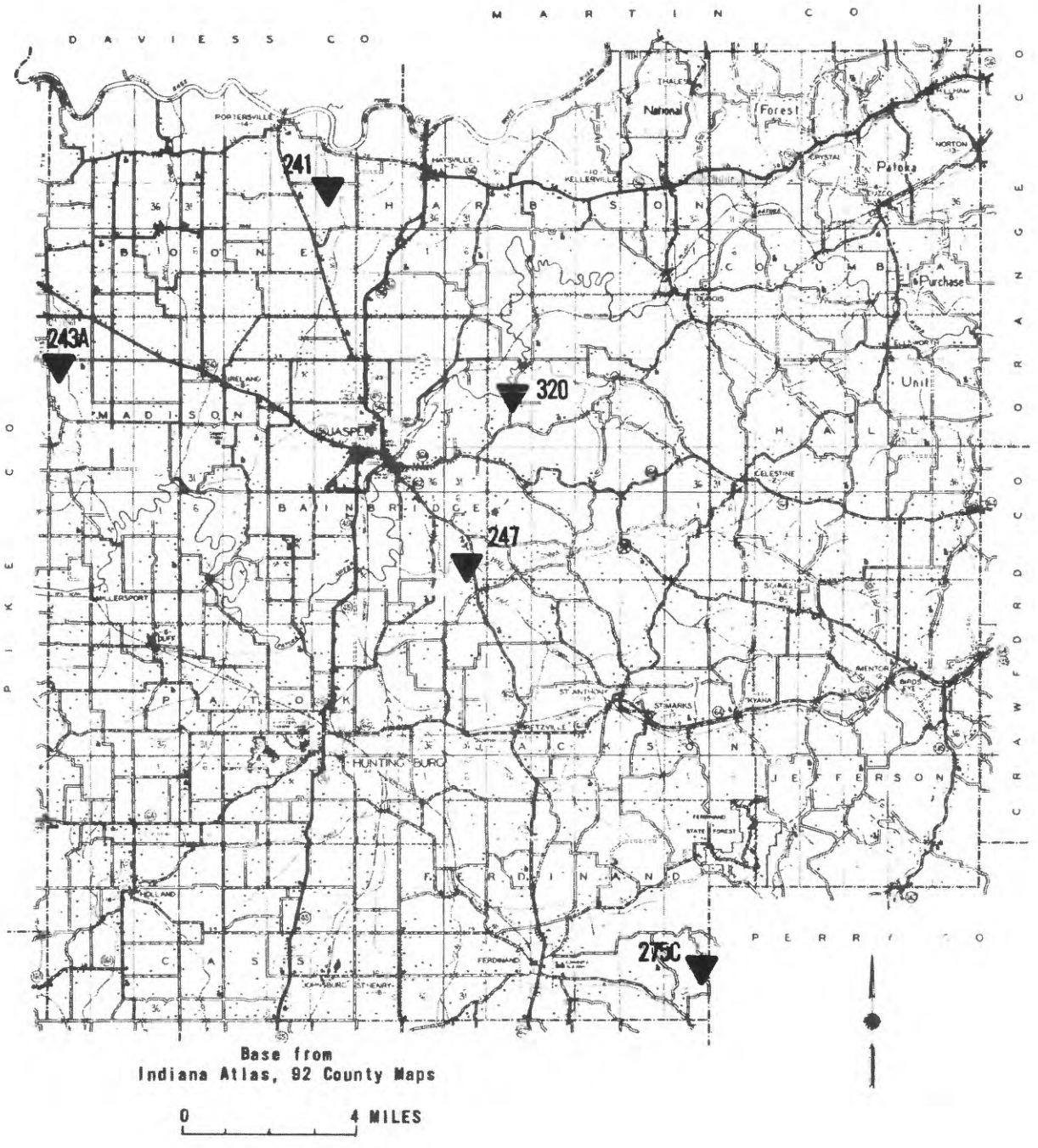


Figure 6.-- Sampling sites in Dubois County.

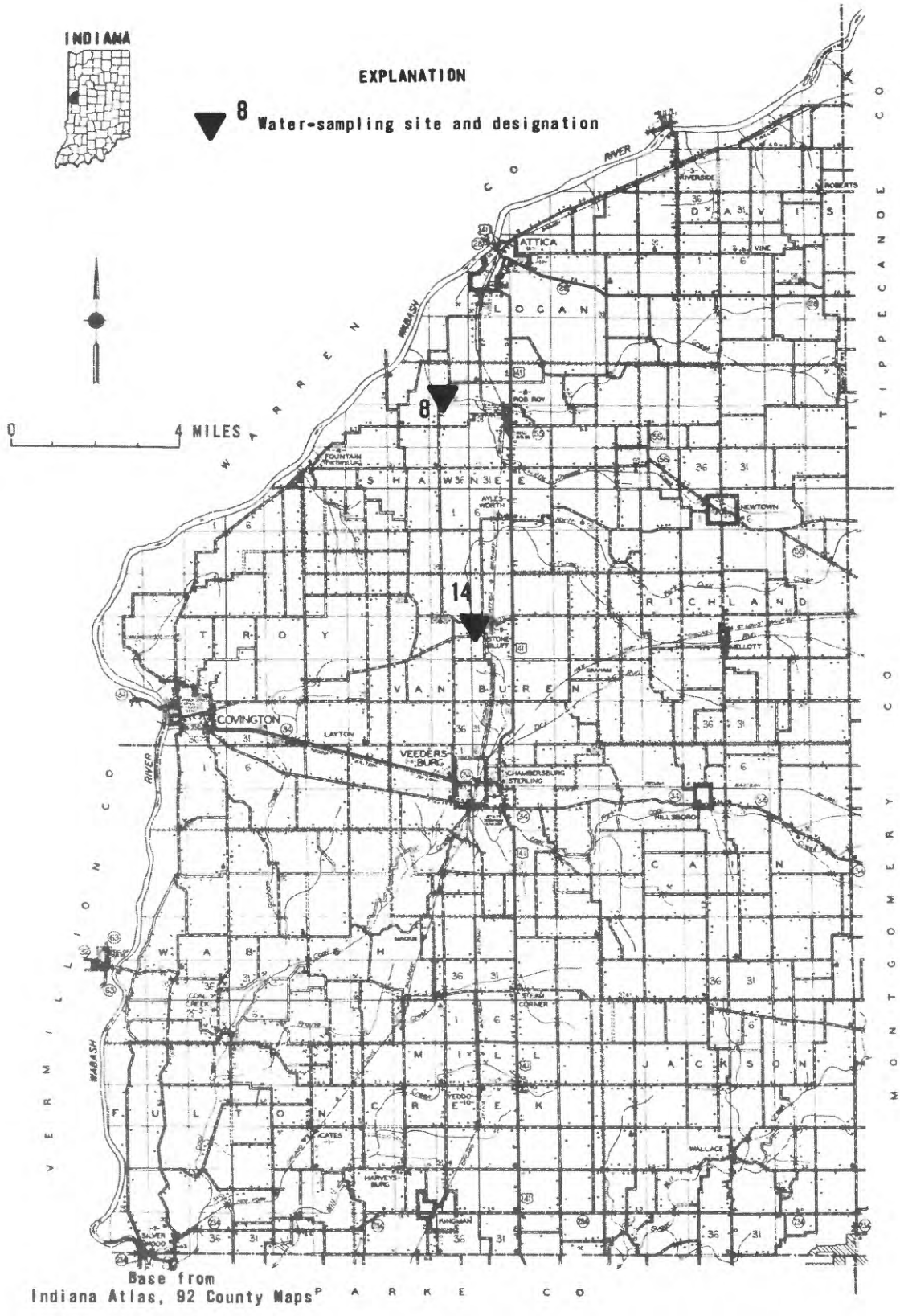


Figure 7.-- Sampling sites in Fountain County.

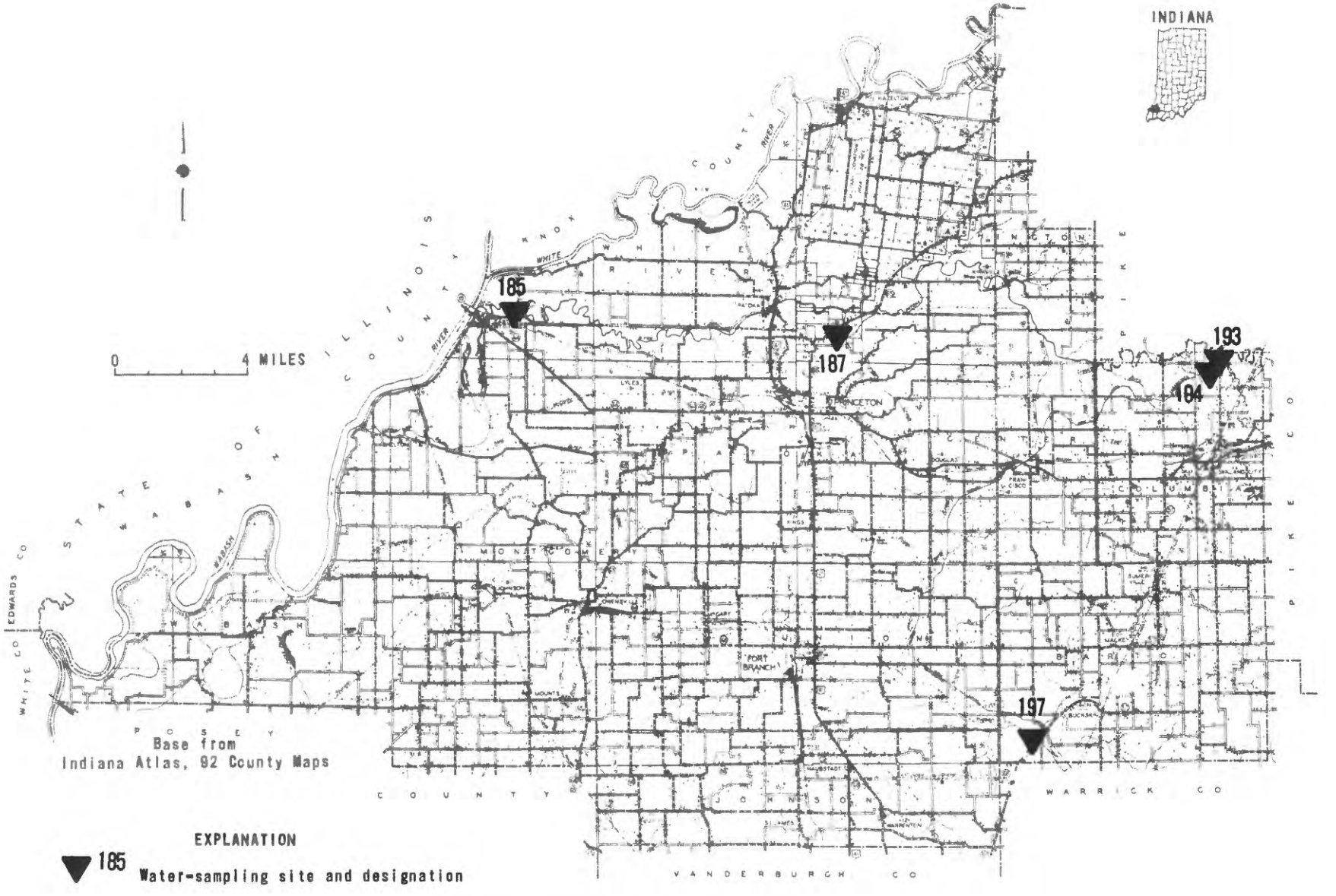


Figure 8.-- Sampling sites in Gibson County.

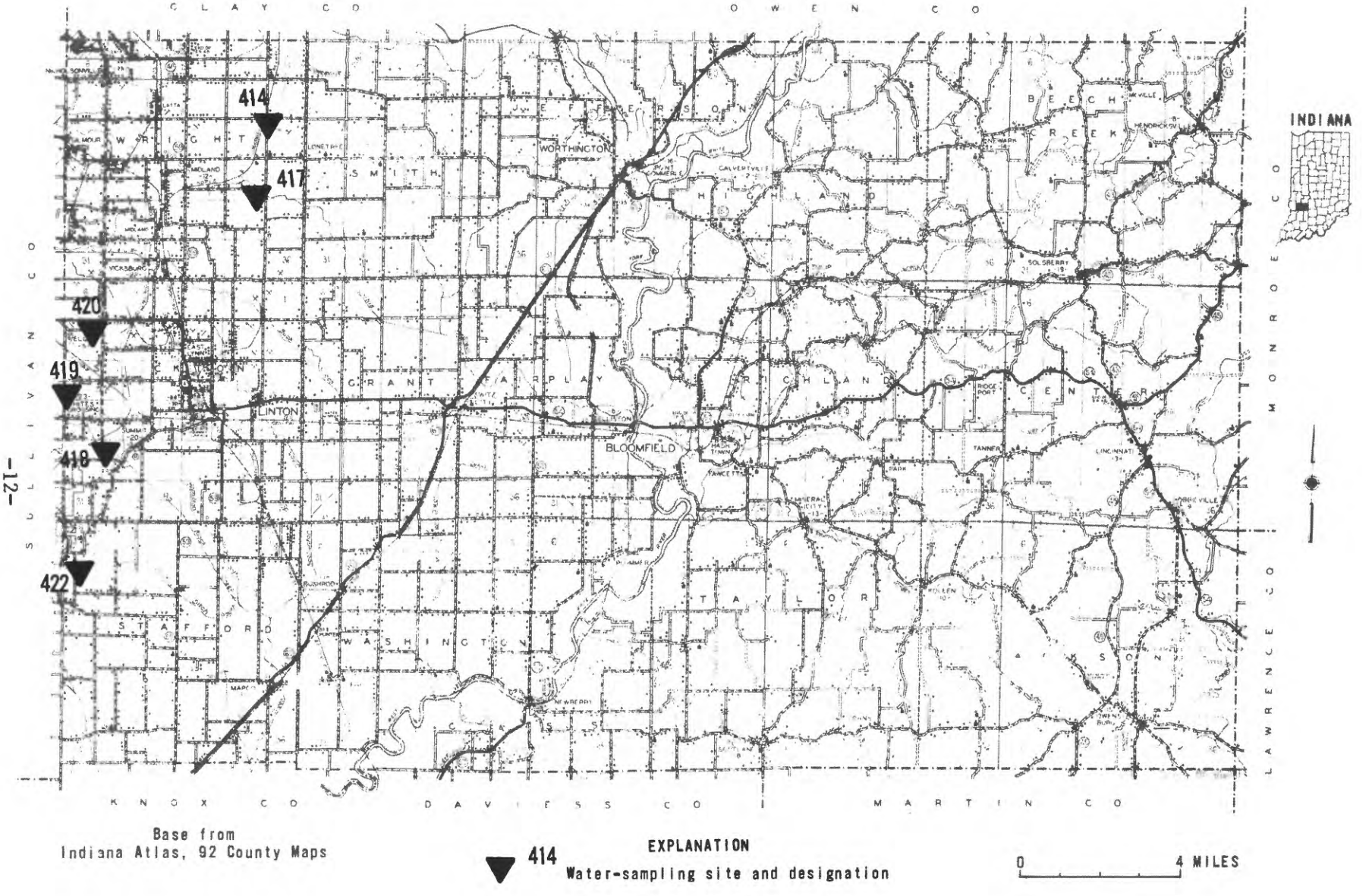


Figure 9.-- Sampling sites in Greene County.

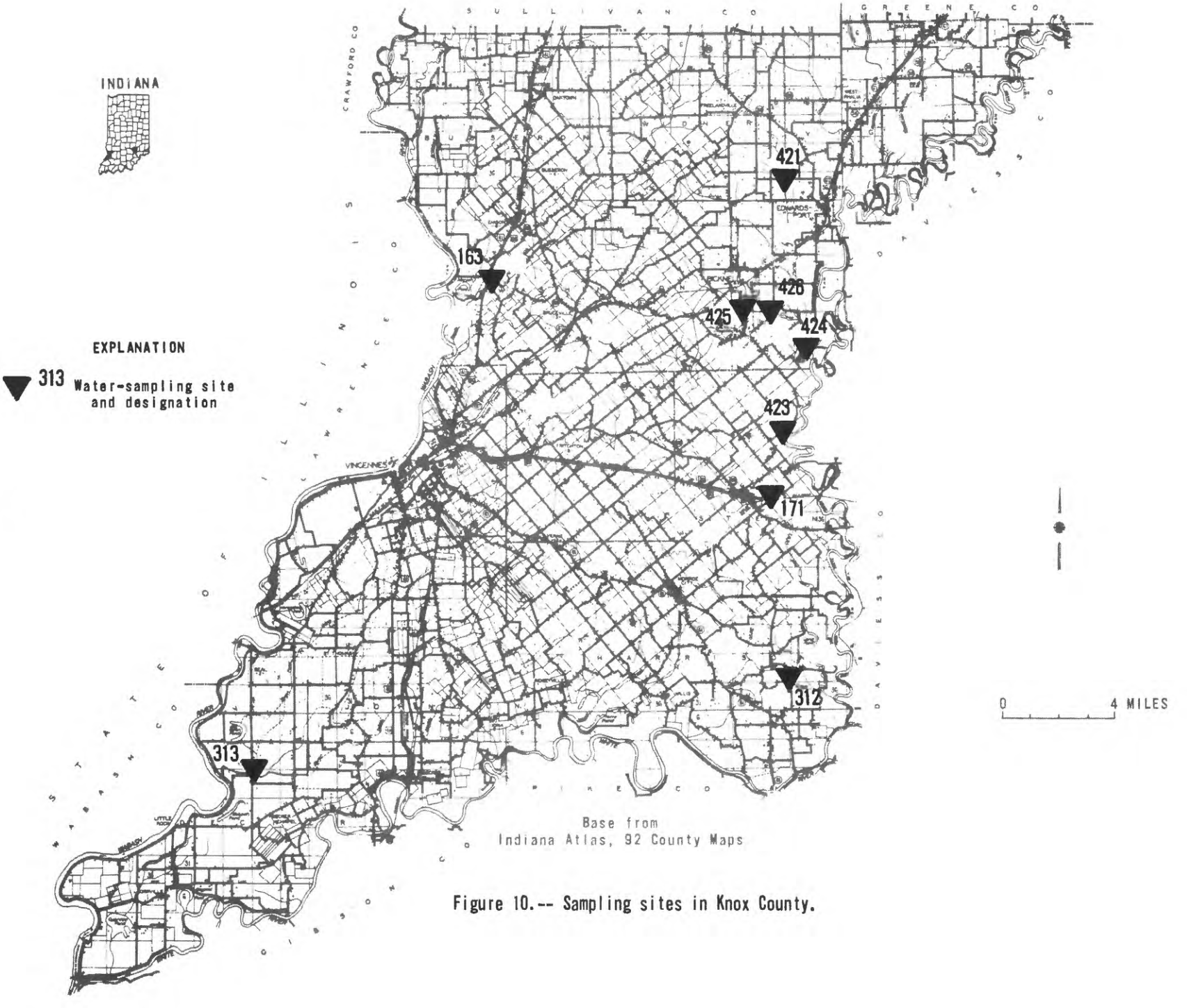


Figure 10.-- Sampling sites in Knox County.

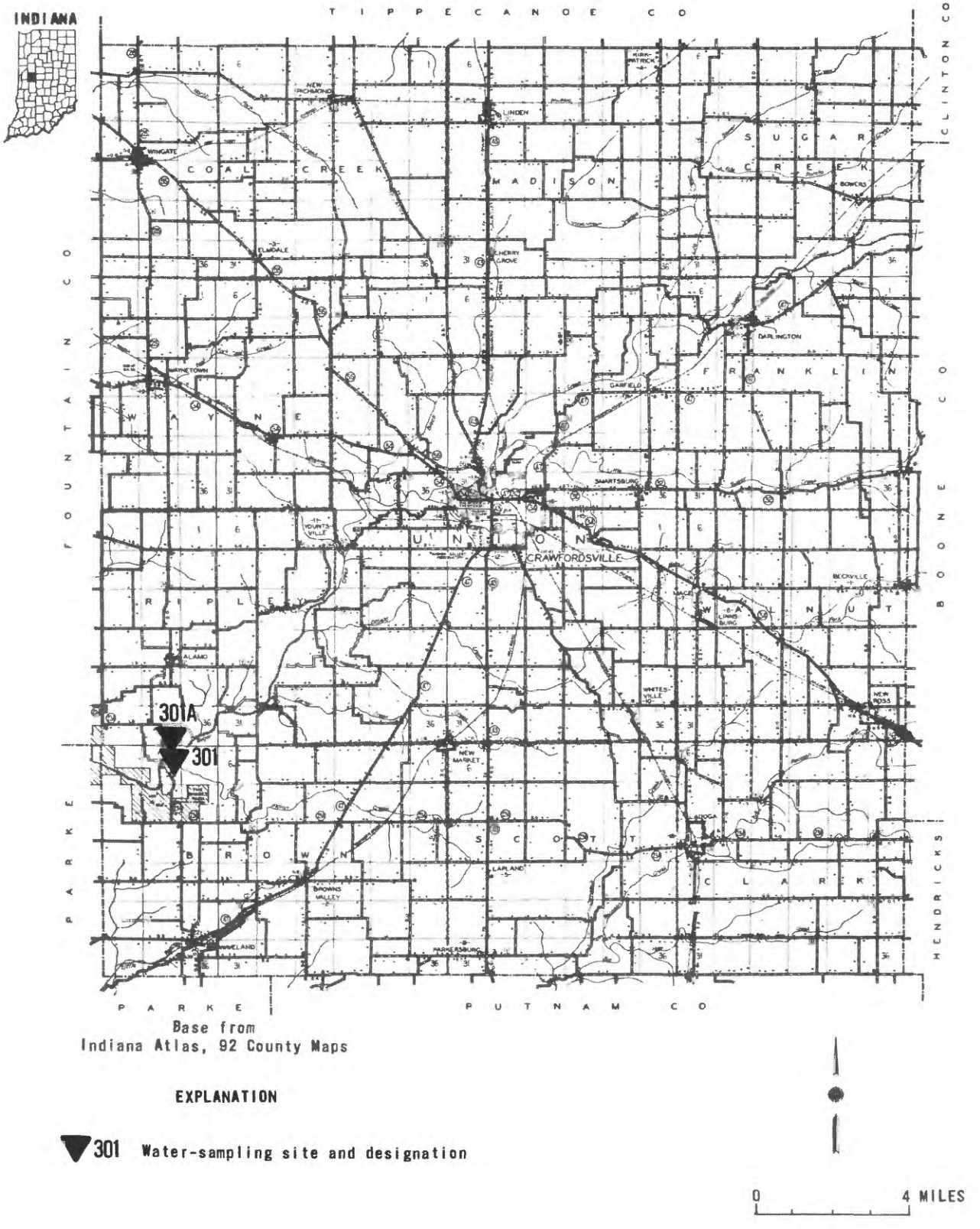


Figure 11.-- Sampling sites in Montgomery County.

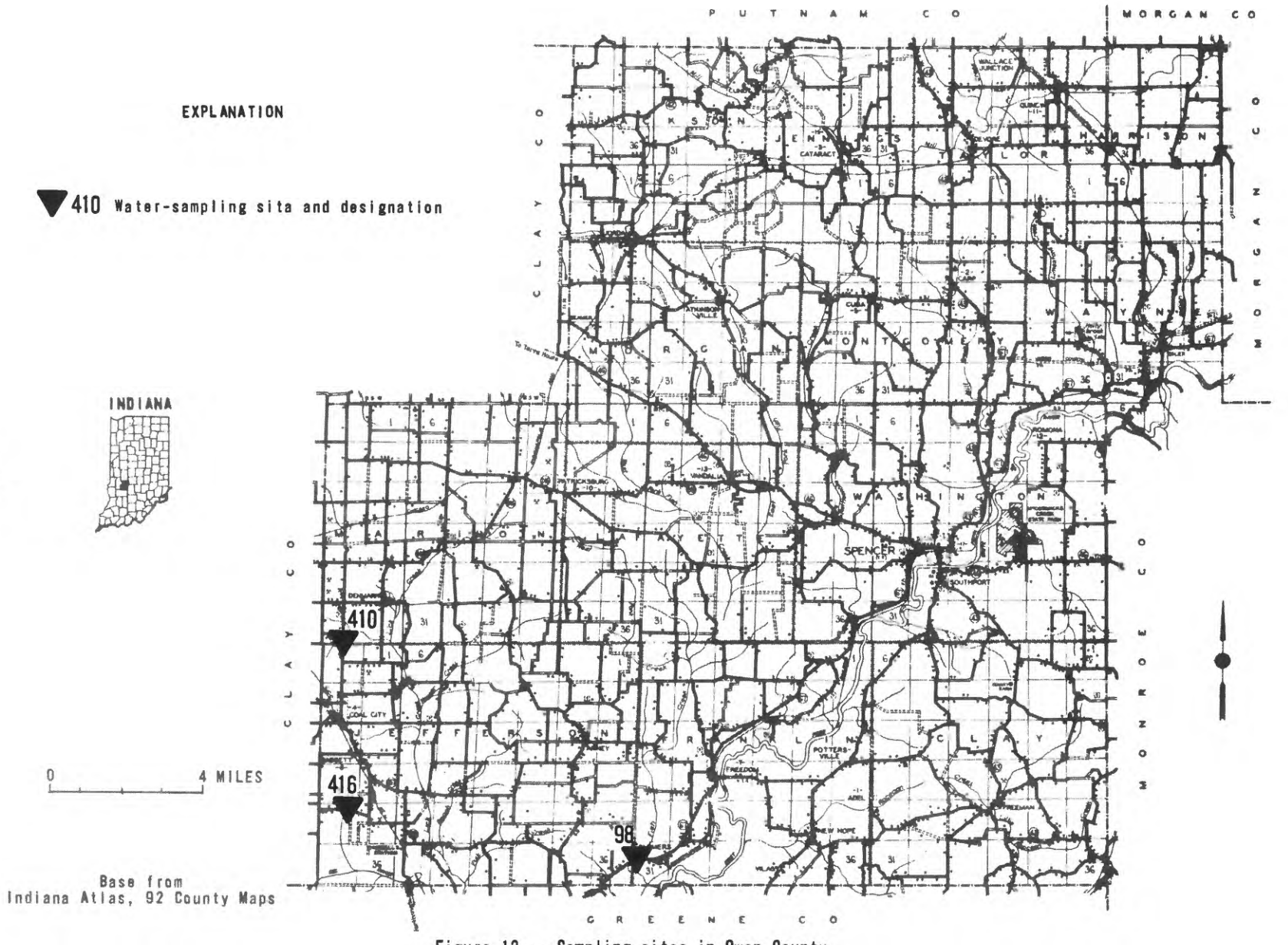


Figure 12.-- Sampling sites in Owen County.

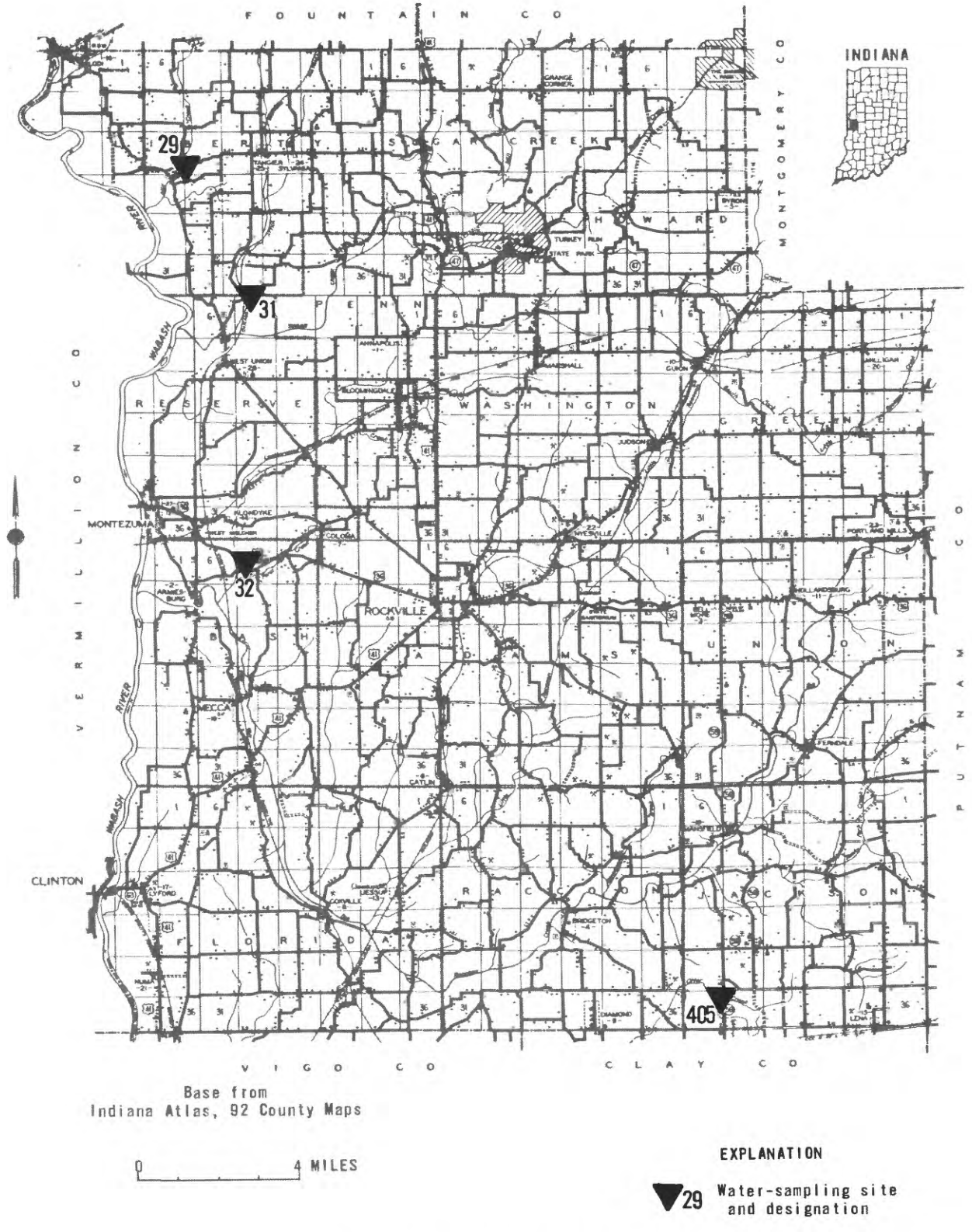


Figure 13.-- Sampling sites in Parke County.

Figure 14.-- Sampling site in Perry County.

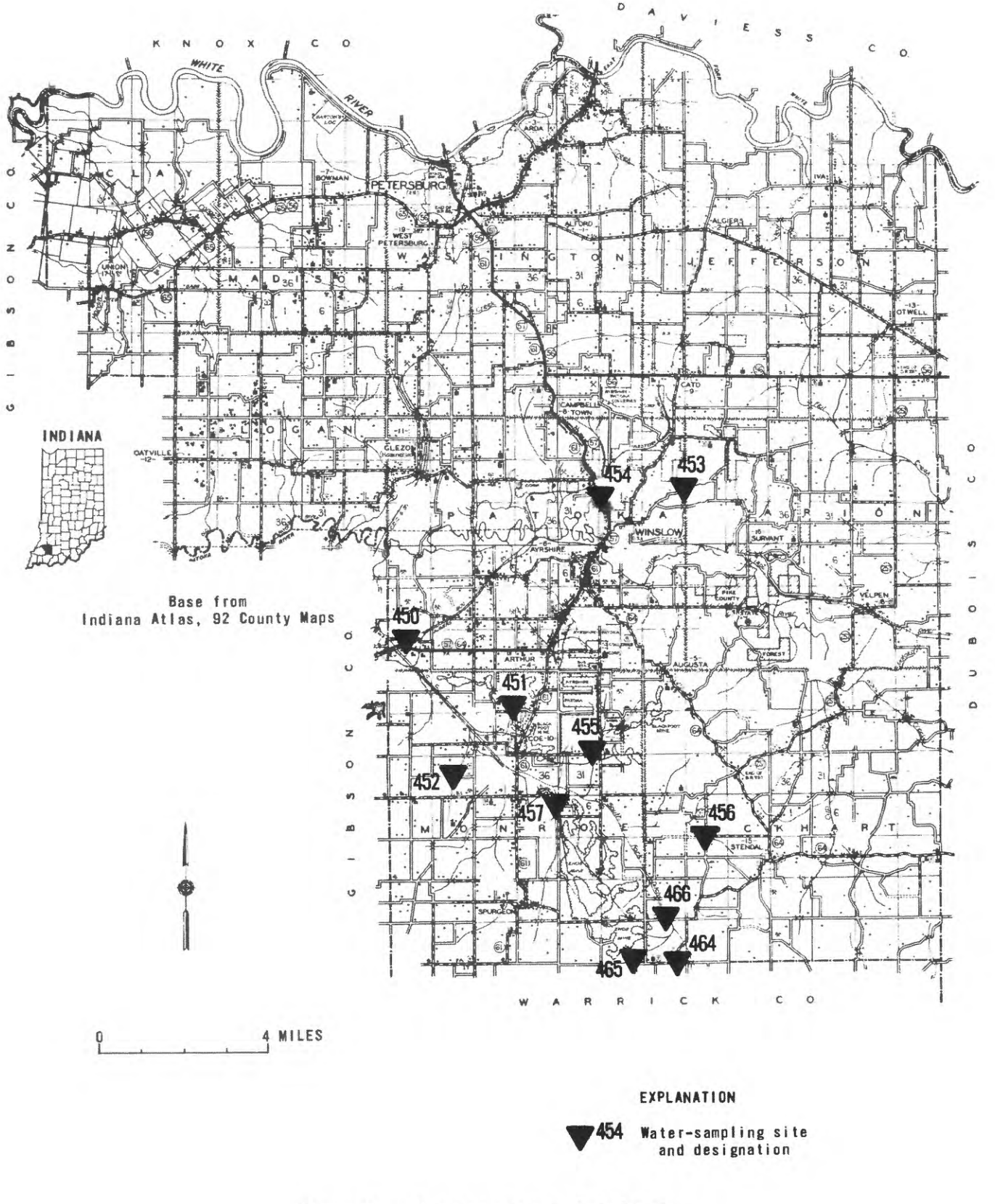


Figure 15.-- Sampling sites in Pike County.

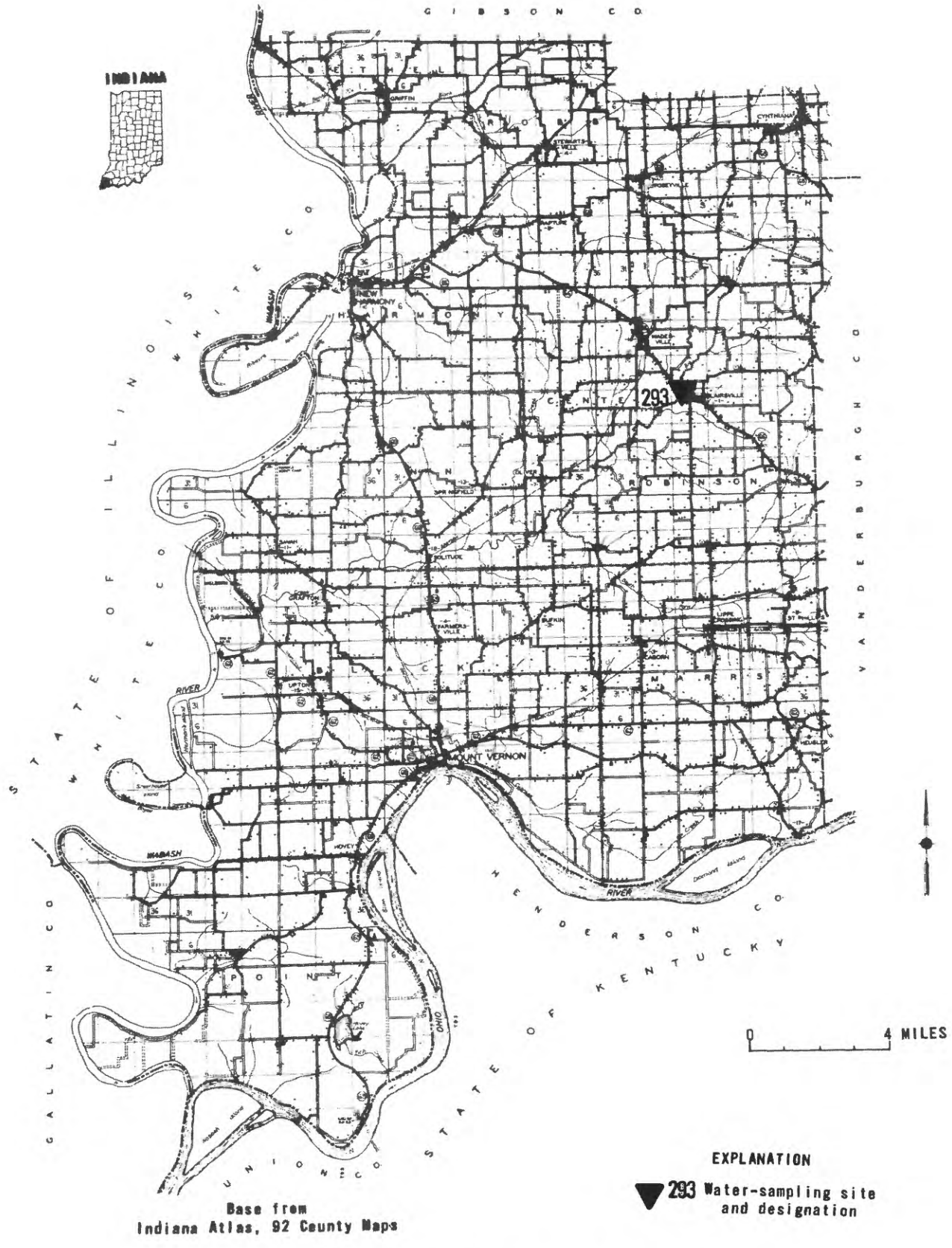


Figure 16.-- Sampling site in Posey County.

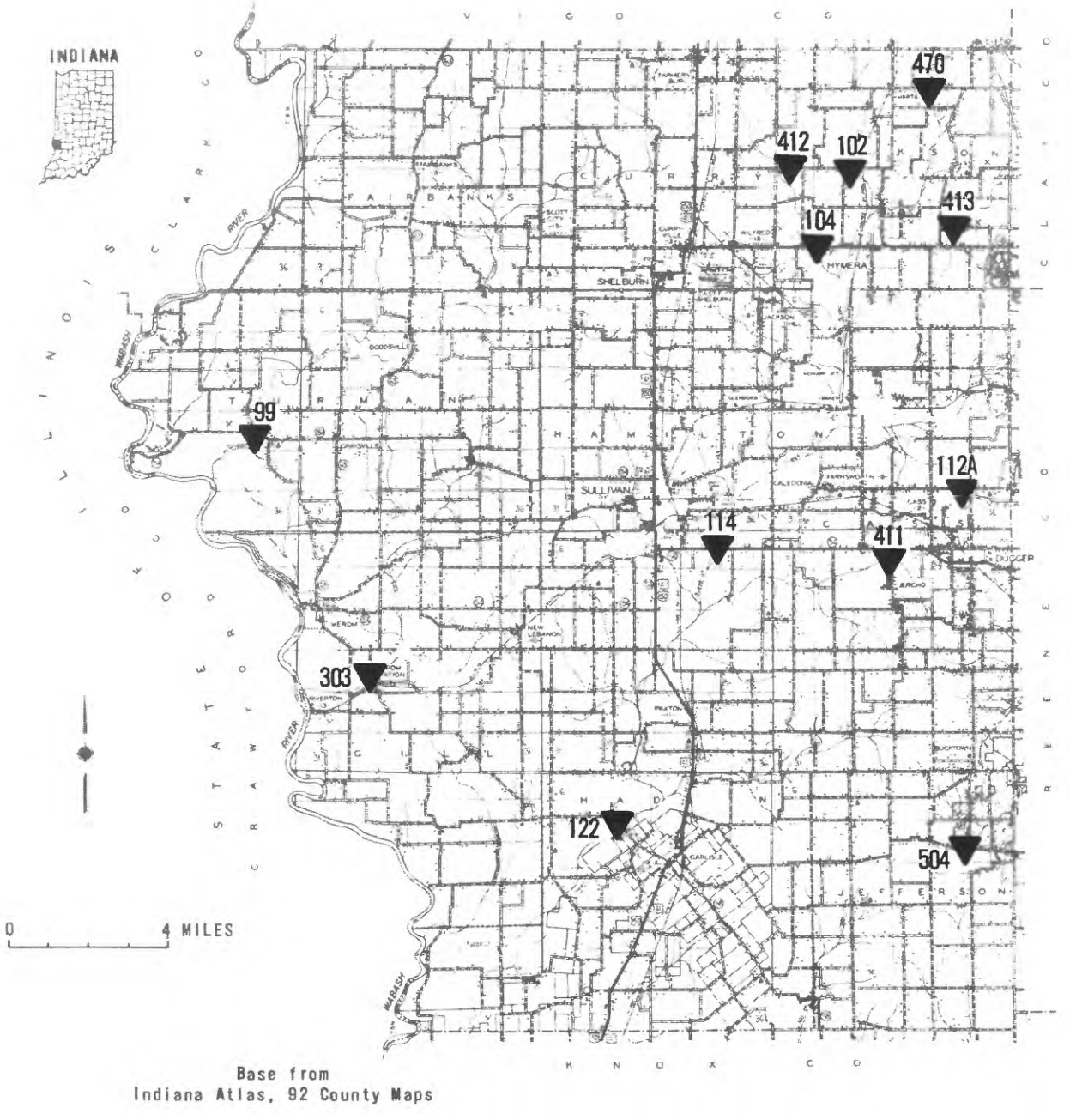


Figure 17.-- Sampling sites in Sullivan County.

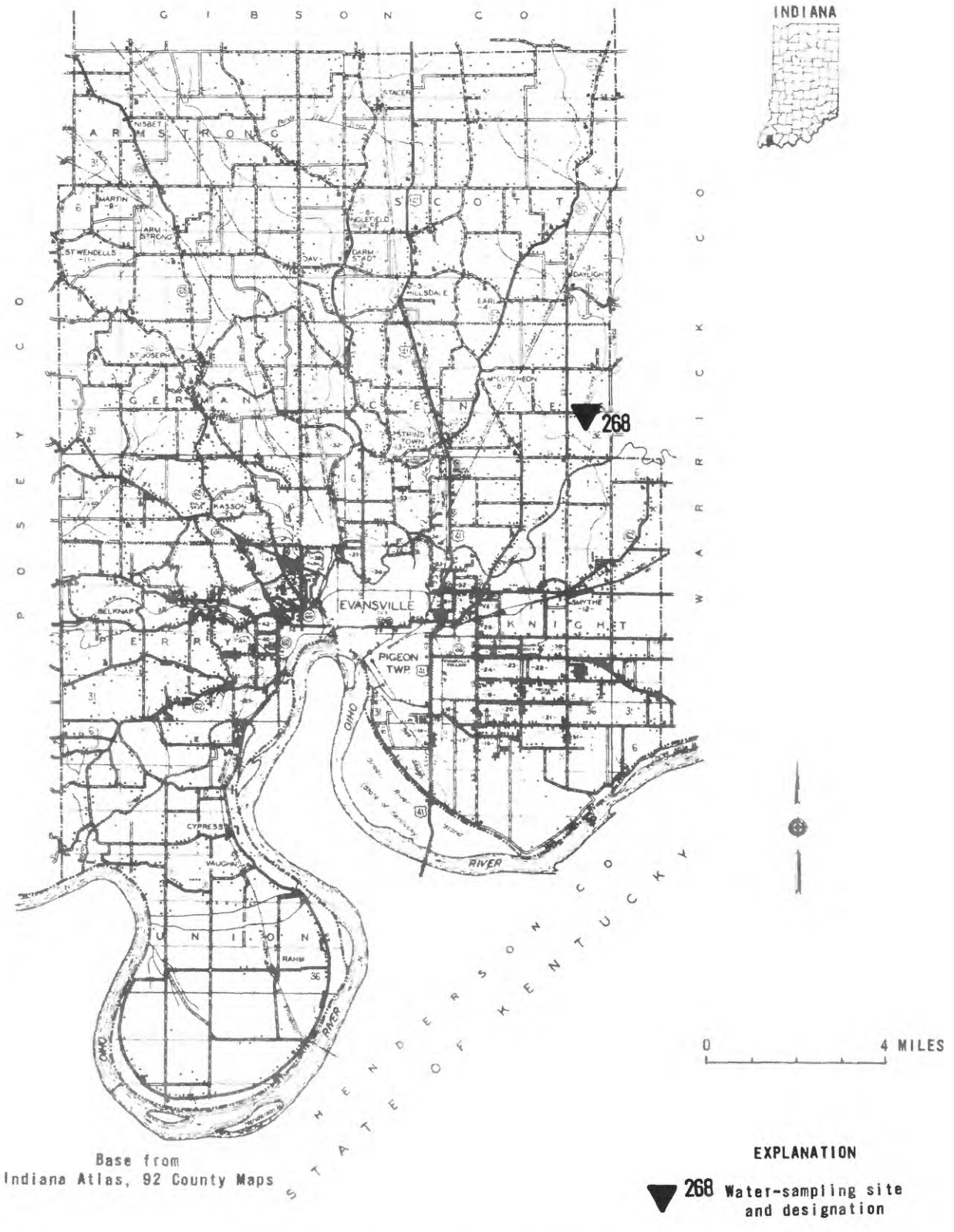


Figure 18.-- Sampling site in Vanderburgh County.

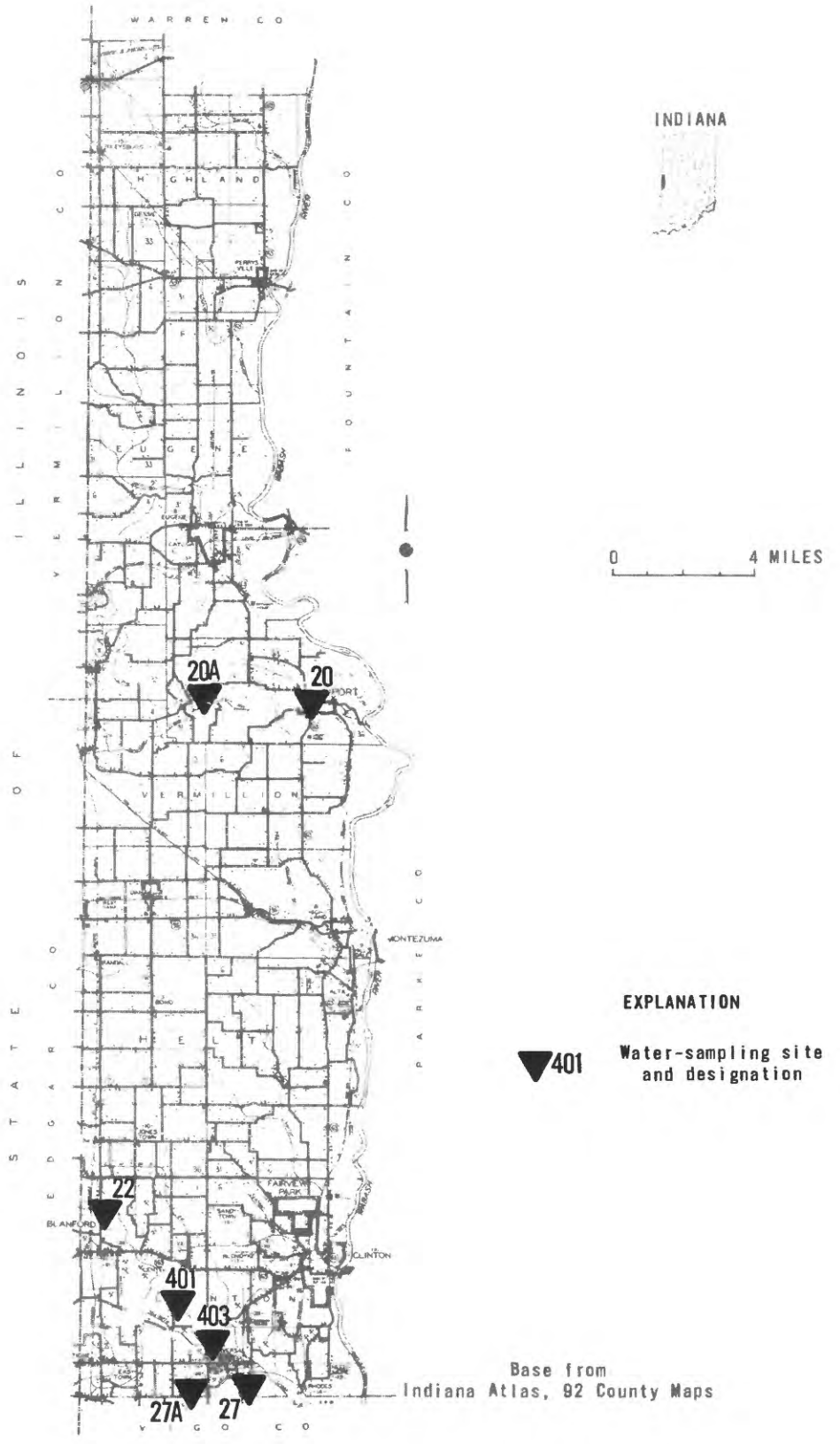


Figure 19.-- Sampling sites in Vermillion County.

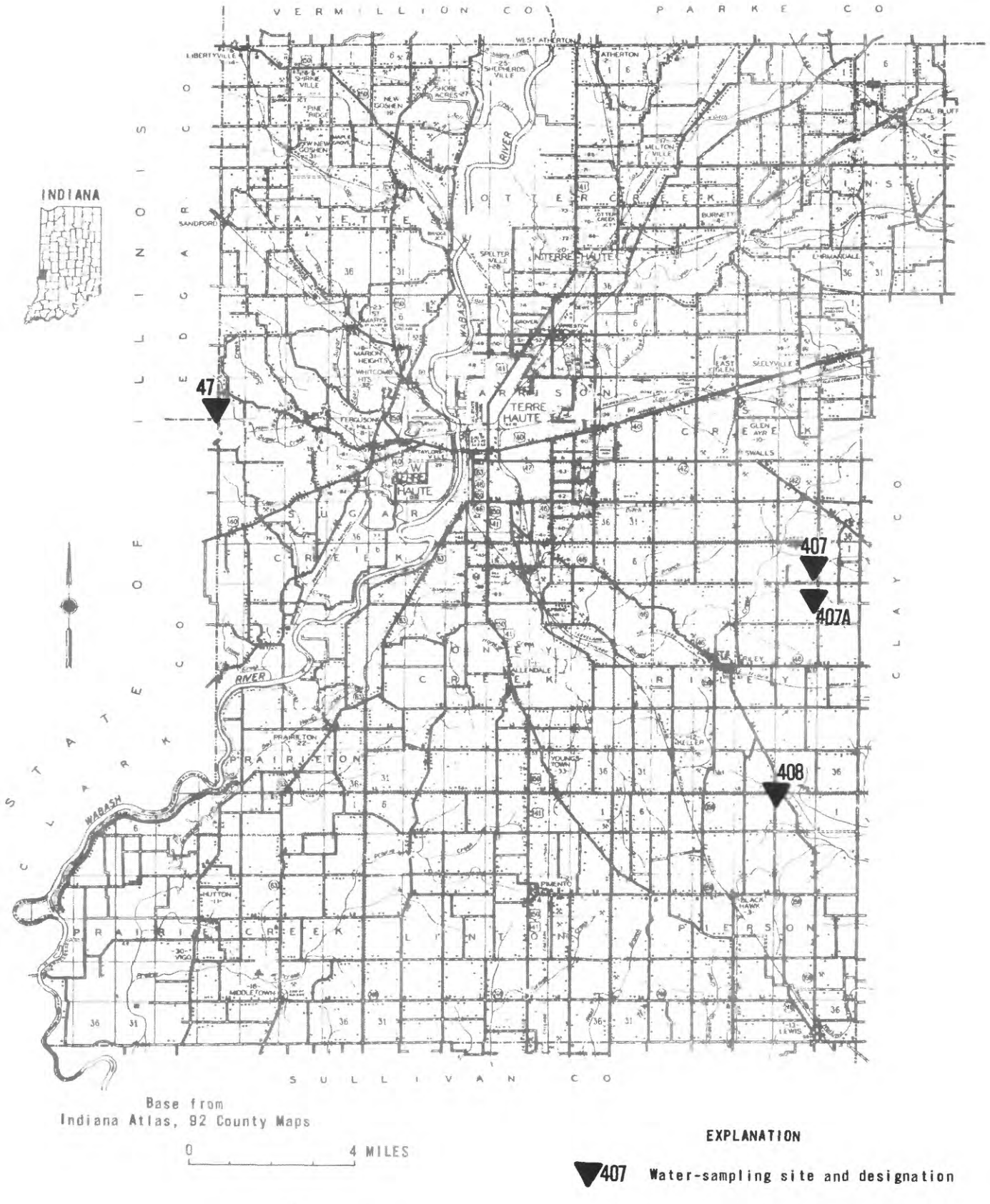


Figure 20.-- Sampling sites in Vigo County.

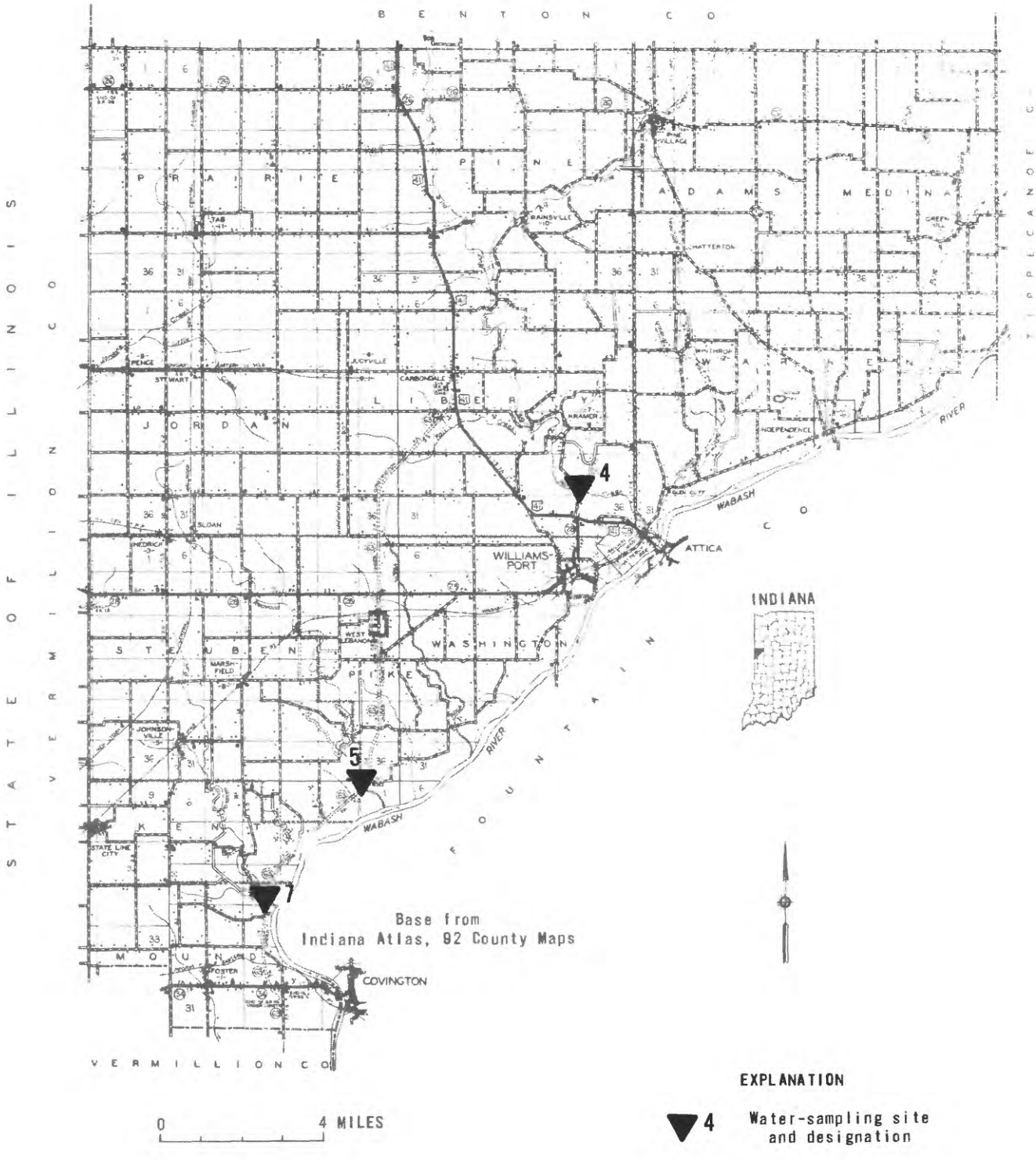


Figure 21.-- Sampling sites in Warren County.

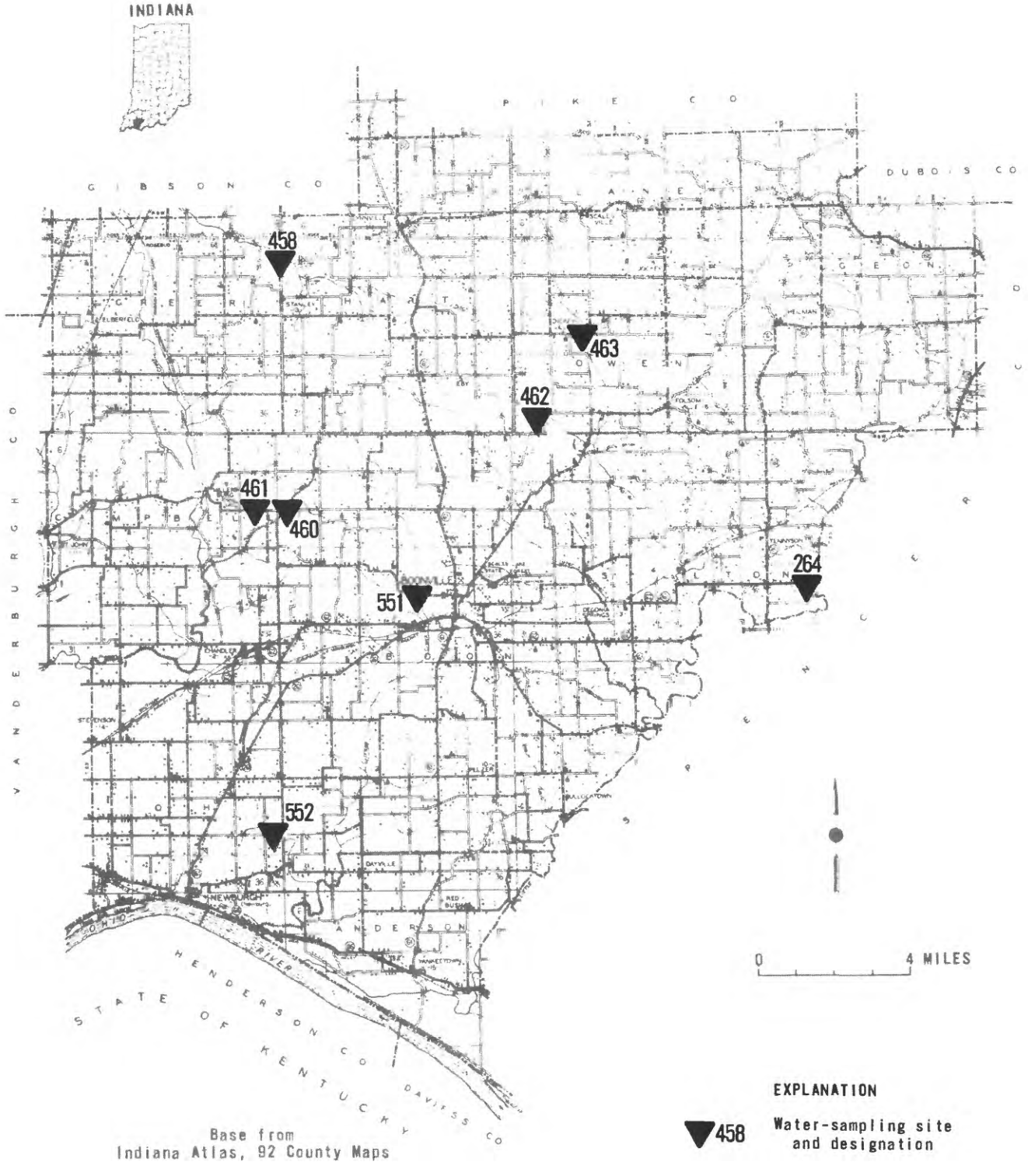


Figure 22.-- Sampling sites in Warrick County.

reclaimed mine land, or active mining). Percentages of land use for 12 of the 21 sites are given in table 7 (Charles Crawford, U.S. Geological Survey, written commun., 1982). The monthly samples were collected during steady flow.

To show the effects of flow on water quality, the author sampled 8 of the 21 monthly sites during rainstorms from March to June 1980 (table 8). These sites represent 4 land uses--forest, agriculture, unreclaimed mine land, or reclaimed mine land. Samples were collected prestorm; on the rising, peak, and falling stream stages; and poststorm, after flow had stabilized.

Water samples were collected at each site for determining water-quality properties and concentrations of constituents in the dissolved and suspended phases. Concentrations of major ions were determined, as they represent a high percentage of the dissolved inorganic constituents and indicate general water quality. Concentrations of selected metals were determined: those required by the Act (iron and manganese), ones that affect the health of people (for example, lead, arsenic, and copper), and ones that are associated with coal mining. Concentrations of nutrients (phosphorus and nitrite plus nitrate) were determined because of their relation to agriculture. Concentrations of dissolved, suspended, and total organic carbon, and suspended sediment, were determined because of their transport properties.

Specific conductance, pH, water temperature, dissolved-oxygen concentration, and instantaneous discharge were also measured at each site. In addition, streambed-material samples were collected at 74 sites during October 1979 for determining concentrations of acid-soluble constituents on sediment smaller than 63-micron diameter (tables 4 and 5). During March 1980, streambed-material samples were collected at 14 sites for determining percentages of coal fines (table 6). Methods by Skougstad and others (1979) were used for collection and analysis of the water and the streambed-material samples. All samples were analyzed by the U.S. Geological Survey.

DATA

Water-quality, streamflow, and streambed-material data collected at the 85 sites in 19 counties during October 1979 are given in tables 4 and 5. Data for the 21 monthly sampling sites in 12 of the 19 counties, January through September 1980, and the 14 sites where streambed sediments were analyzed for coal material in March 1980 are given in table 6. Percentages of land use for 12 of the 21 monthly sites are given in table 7. Data for the eight nonsteady-flow sampling sites are given in table 8. Also included in table 8 is the rainfall measured at each site during storms. Precipitation for the October 1979 to September 1980 sampling period is given in table 9, and the locations of the two weather stations where these data were obtained are given in figure 1.

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Tables 1-9

Table 1--Descriptions of sampling sites in predominantly agricultural or forested watersheds

[br, branch; Cr, creek; nr, near; R, river; trib, tributary]

Site	Name and location (County)	Physiographic unit	Drainage area (mi^2)	Comments
		Glaciated area		
		Wisconsin Stage		
4	Big Pine Cr nr Williamsport (Warren)	Tipton Till Plain	[1]322	Gaging station.
5	Redwood Cr nr Covington (Warren)	do.	[1]30	
7	Opossum Run nr Covington (Warren)	do.	[1]21	
8	Big Shawnee Cr nr Fountain (Fountain)	do.	[2]62	
14	Coal Cr at Stone Bluff (Fountain)	do.	[2]69	
20	Little Vermillion R nr Newport (Vermillion)	do.	[1]237	
20A	Unnamed trib to Little Vermillion R nr Cayuga (Vermillion)	do.	[3].56	Predominantly forest.
22	Brouilletts Cr nr St. Bernice (Vermillion)	do.	[2]259	

Table 1--Descriptions of sampling sites in predominantly agricultural or forested watersheds--Continued

Site	Name and location (County)	Physiographic unit	Drainage area (mi^2)	Comments
		Glaciated area		
		Wisconsin Stage--Continued		
29	Mill Cr nr Howard (Parke)	Tipton Till Plain	[2]31	
31	Rush Cr nr West Union (Parke)	do.	[2]16	
32	Leatherwood Cr nr Midway (Parke)	do.	[2]26	
301	Sugar Cr nr Alamo (Montgomery)	do.	[1]660	
301A	Unnamed trib to Sugar Cr nr Deer Mill (Montgomery)	do.	[3].50	Predominantly forest.
		Illinoian Stage		
47	Sugar Cr at State Line (Vigo)	do.	[2]68	Paris, Ill., in headwaters.
77	Jordon Cr at Bowling Green (Clay)	Wabash Lowland	[2]38	
98	Fish Cr nr Farmers (Owen)	do.	[2]60	
99	Turman Cr nr Graysville (Sullivan)	do.	[2]91	Thunderbird mine pond and oil wells in headwaters.

Table 1--Descriptions of sampling sites in predominantly agricultural or forested watersheds--Continued

Site	Name and location (County)	Physiographic unit	Drainage area (mi^2)	Comments
		Glaciated area		
		Illinoian Stage--Continued		
102	Busseron Cr nr Hymera (Sullivan)	Wabash Lowland	[1]17	Gaged. Soil Conservation Service reservoir in headwaters.
163	Maria Cr nr Bruceville (Knox)	do.	[1]91	May have some old mined areas in headwaters.
303	Turtle Cr nr Merom (Sullivan)	do.	[1]37	
311	Veale Cr nr Cumback (Daviess)	do.	[1]38	Washington, Ind., in headwaters.
312	Kessinger ditch nr Petersburg (Knox)	do.	[1]58	
313	Deshee R nr Decker (Knox)	do.	[2]24	
425	Indian Cr nr Johnstown (Knox)	do.	[2]10	Treated sewage drainage from Clay City, Ind., approximately 2 miles upstream.

Table 1--Descriptions of sampling sites in predominantly agricultural or forested watersheds--Continued

Site	Name and location (County)	Physio-graphic unit	Drain-age area (mi^2)	Comments
		Unglaciated area		
197	Pigeon Cr nr Buckskin (Gibson)	Wabash Lowland	[1]143	
241	Mill Cr nr Jasper (Dubois)	do.	[2]18	
243A	Little Flat Cr nr Otwell (Dubois)	do.	[3]6.6	
247	Straight R nr Huntingburg (Dubois)	do.	[1]62	
267	Little Pigeon Cr nr Tennyson (Warrick)	do.	[1]187	
268	Blue Grass Cr nr Daylight (Vanderburgh)	do.	[2]37	
275	Anderson R nr Adyeville (Perry)	Crawford Upland	[2]120	
275C	Unnamed trib to Friday Br nr St. Meinrad (Dubois)	do.	[3].10	Predominantly forest.

Table 1--Descriptions of sampling sites in predominantly agricultural or forested watersheds--Continued

Site	Name and location (County)	Physiographic unit	Drainage area (mi^2)	Comments
		Unglaciated area		
293	Big Cr nr Wadesville (Posey)	Wabash Lowland	[1]104	
320	Patoka R nr Jasper (Dubois)	do.	[1]262	

[1]From Hoggatt (1975).
[2]Estimate, based on Hoggatt (1975).
[3]Computed from U.S. Geological Survey topographic maps.

Table 2.--Descriptions of sampling sites in watersheds affected by coal mining

[Br, branch; Cr, creek; E., east; Fk, fork; nr, near; R, river; trib, tributary; N., north; S., south; W., west]

Site	Name and location (County)	Physiographic unit	Drainage area (mi^2)	Estimated area mined[1] (percent)	Comments
		Glaciated Area			
		Wisconsin Stage			
27	Gin Cr nr Universal (Vermillion)	Tipton Till Plain	[2]8.2	27	([3])
27A	Unnamed trib draining Universal Mine (Vermillion)	do.	[2]4.4	100	Reclaimed land.
401	Unnamed trib to Brouilletts Cr nr Centenary (Vermillion)	do.	[2].38	100	([4])
403	Brouilletts Cr nr Universal (Vermillion)	do.	[5]302	([6])	([4])
		Illinoian Stage			
104	W. Fk Busseron Cr nr Hymera (Sullivan)	do.	[7]14	32	Gaging station. ([3])
112A	Mud Cr nr Dugger (Sullivan)	do.	[2]8.5	---	([4])
114	Busseron Cr nr Sullivan (Sullivan)	Wabash Lowland	[7]138	([6])	Gaging station. ([3])
122	Busseron Cr nr Carlisle (Sullivan)	do.	[7]228	([6])	Do.

Table 2.--Descriptions of sampling sites in watersheds affected by coal mining--Continued

Site	Name and location (County)	Physiographic unit	Drainage area (mi^2)	Estimated area mined[1] (percent)	Comments
			Glaciated Area		
			Illinoian Stage--Continued		
171	Nimnicht Cr nr Wheatland (Knox)	Wabash Lowland	[5]1	41	Site downstream from mine-waste area.
185	Patoka R nr E. Mount Carmel (Gibson)	do.	[5]860	(6)	(3)
187	Patoka R nr Princeton (Gibson)	do.	[7]822	(6)	Gaging station. (3)
193	Patoka R nr Glezen (Gibson)	do.	[7]650	(6)	(3)
194	S. Fk Patoka R nr Glezen (Gibson)	do.	[5]76	44	(3)
405	N. Br Otter Cr nr Carbon (Parke)	do.	[5]5	2	(4)
406	Benwood Run nr Brazil (Clay)	do.	[5].2	44	(4)
407	Honey Cr trib nr Riley (Vigo)	do.	[5]3	52	Presently (1979) being mined
408	Splunge Cr nr Blackhawk (Vigo)	do.	[5]2	37	(4)

Table 2.--Descriptions of sampling sites in watersheds affected by coal mining--Continued

Site	Name and location (County)	Physiographic unit	Drainage area (mi^2)	Estimated area mined[1] (percent)	Comments
		Glaciated Area			
		Illinoian Stage--Continued			
409	Lost Cr nr Staunton (Clay)	Wabash Lowland	[2]2	39	(4)
410	Lenning Br nr Clay City (Owen)	do.	[5]2	8	(4)
411	Buttermilk Cr nr Dugger (Sullivan)	do.	[5]8	21	(4)
412	W. Fk Busseron trib nr Hymera (Sullivan)	do.	[2].6	45	(4)
413	Sulphur Cr nr Hymera (Sullivan)	do.	[5]5	9	(4)
414	Howesville ditch trib nr Jasonville (Greene)	do.	[5]4	44	(4)
415	Pond Cr nr Coal City (Clay)	do.	[2]2.3	36	(4)
416	Turkey Cr nr Coal City (Owen)	do.	[5]3	12	(4)
417	Lattas Cr nr Midland (Greene)	do.	[2]4.9	22	(4)
418	White Rose Cr nr White Rose (Greene)	Wabash Lowland	[5]5	34	(4)

Table 2.--Descriptions of sampling sites in watersheds affected by coal mining--Continued

Site	Name and location (County)	Physiographic unit	Drainage area (mi^2)	Estimated area mined[1] (percent)	Comments
		Glaciated Area			
		Illinoian Stage--Continued			
419	White Rose trib nr Victoria (Greene)	Wabash Lowland	[5]2	35	(4)
420	Black Cr trib nr Ellis (Greene)	do.	[5]1	65	(4)
421	Purdy Marsh ditch nr Edwardsport (Knox)	do.	[5]5	18	(4)
422	Spencer Cr nr Pleasantville (Greene)	do.	[5]4	29	(4)
423	Bens Cr nr Wheatland (Knox)	do.	[5]5.7	35	(4)
424	Indian Cr trib nr Ragsdale (Knox)	do.	[5]1	--	(4)
426	Indian Cr trib nr Bicknell (Knox)	do.	[5]11	38	(4)
504	Spencer Cr trib nr Pleasantville (Sullivan)	do.	[5]3	47	Presently (1979) being mined

Table 2.--Descriptions of sampling sites in watersheds affected by coal mining--Continued

Site	Name and location (County)	Physiographic unit	Drainage area[1] (mi^2)	Estimated area mined[1] (percent)	Comments
		Unglaciated Area			
450	Unnamed trib to S. Fk Patoka R nr Oakland City (Pike)	Wabash Lowland	[2].38	64	Reclaimed land
451	Hat Cr nr Oakland City (Pike)	do.	[2]2	43	([4])
452	Wheeler Cr nr Enos Corner (Pike)	do.	[5]4	11	([4])
453	Bruster Br nr Winslow (Pike)	do.	[5]4	5	([4])
454	Stone Coe Cr nr Winslow (Pike)	do.	[5]4	57	([4])
455	Unnamed trib to S. Fk. Patoka R. nr Scottsburg (Pike)	do.	[5]6	50	([4])
456	Unnamed trib to Houchin ditch nr Stendal (Pike)	do.	[2]2.8	30	([4])
457	Rough Cr nr Scottsburg (Pike)	do.	[5]10	31	([4])
458	Big Cr nr Lynneville (Warrick)	do.	[5]25	14	([3])
460	Squaw Cr nr Boonville (Warrick)	do.	[2]5.8	60	([3])

Table 2.--Descriptions of sampling sites in watersheds affected by coal mining--Continued

Site	Name and location (County)	Physiographic unit	Drainage area[1] (mi^2)	Estimated area mined[1] (percent)	Comments
		Unglaciated Area--Continued			
461	Unnamed trib to Squaw Cr nr Boonville (Warrick)	Wabash Lowland	[5]2	28	([3])
462	Ellison W. ditch nr Folsomville (Warrick)	do.	[5]5	62	([4])
463	Barren Fk nr Folsom (Warrick)	do.	[5]6	40	([4])
464	Unnamed trib to S. Fk. Patoka R. nr Scalesville (Pike)	do.	[2]1.2	33	([4])
465	Unnamed trib to S. Fk Patoka R nr Old Friendship Church (Pike)	do.	[5]4	45	([4])
466	Unnamed trib to S. Fk Patoka R nr Stendal (Pike)	do.	[5]6	74	([4])

[1]Calculation based on mined areas measured from Indiana Department of Natural Resources, Geological Survey Division maps, updated through 1977. (These percentages should be viewed conservatively. Water divides on disturbed land are difficult to define and, in fact, may no longer exist.)

[2]Computed from U.S. Geological Survey topographic maps.

[3]No predominant land use but a mixture of active mining, reclaimed, unreclaimed, and agricultural areas.

[4]Unreclaimed area, mined before 1968 State law (Indiana Code 13-4-6 as amended). Mine lands not regraded and contain spoil piles, last-cut lakes, and haul-road lakes.

[5]Estimate based on Hoggatt (1975).

[6]Accurate land-use data not available for large drainage areas.

[7]From Hoggatt (1975).

Table 3.--Descriptions of sampling sites sampled monthly from January through September 1980

[Br, branch; Cr, creek; Fk, fork; nr, near; R, river; trib, tributary; S., south; latitude/longitude, 401903 is 40°19'03" and 871726 is 87°17'26"]

Site	Name and location (County)	Physiographic unit	Drainage area[1] (mi^2)	Land use	Latitude/longitude
		Glaciated Area			
		Wisconsin Stage			
4	Big Pine Cr nr Williamsport (Warren)	Tipton Till Plain	322	Agriculture	401903 871726
20A	Unnamed trib to Little Vermillion R nr Cayuga (Vermillion)	do.	.56	Forest	395316 872810
27	Gin Cr nr Universal	do.	8.18	Active mining	393703 872633
27A	Unnamed trib draining Universal Mine (Vermillion)	do.	4.36	Reclaimed mine land	393649 872752
32	Leatherwood Cr nr Midway (Parke)	do.	26.4	Agriculture	394631 871945
301A	Unnamed trib to Sugar Cr nr Deer Mill (Montgomery)	do.	.50	Forest	395649 870319
401	Unnamed trib to Brouillette Cr nr Centenary (Vermillion)	do.	.38	Unreclaimed mine land	393845 872847

Table 3.--Descriptions of sampling sites sampled monthly from January through September 1980--Continued

Site	Name and location (County)	Physio-graphic unit	Drain-age area[1] (mi^2)	Land use	Latitude/ longitude
		Glaciated Area			
		Illinoian Stage			
77	Jordon Cr at Bowling Green (Clay)	Wabash Lowland	38.6	Agriculture	392316 870058
112A	Mud Cr nr Dugger (Sullivan)	do.	8.54	Unreclaimed mine land	390556 871545
407A	Unnamed trib to Stone Quarry branch nr Riley (Vigo)	do.	2.82	Active mining	392535 871525
415	Pond Cr nr Coal City (Clay)	do.	2.31	Unreclaimed mine land	391243 870340
415A	Pond Cr nr Daggett (Clay)	do.	2.91	Mixed land use	391205 870349
415B	Pond Cr nr Johnstown (Clay)	do.	4.16	Mixed land use	391120 870423
417	Lattas Cr nr Midland (Greene)	do.	4.92	Reclaimed mine land	390654 870902
470	Hooker Cr nr Lewis (Sullivan)	do.	2.73	Agriculture	391440 871639

Table 3.--Descriptions of sampling sites sampled monthly from January through September 1980--Continued

Site	Name and location (County)	Physio-graphic unit	Drain-age area[1] (mi^2)	Land use	Latitude/ longitude
		Unglaciated Area			
243A	Little Flat Cr nr Otwell (Dubois)	Wabash Lowland	6.56	Agriculture	382520 870406
275C	Unnamed trib to Friday branch nr St. Meinrad (Dubois)	do.	.10	Forest	381321 864751
450	Unnamed trib to S. Fk Patoka R nr Oakland City (Pike)	do.	.38	Reclaimed mine land	382028 871722
456	Unnamed trib to Houchin ditch nr Stendal (Pike)	do.	2.79	Unreclaimed mine land	381632 871029
460	Squaw Cr nr Boonville (Warrick)	do.	5.79	Active mining	380531 872112
464	Unnamed trib to S. Fk Patoka R nr Scalesville (Pike)	do.	1.16	Unreclaimed mine land	381352 871110

[1]Computed from U.S. Geological Survey topographic maps and aerial photographs.

Table 4.--Water-quality and other hydrologic data collected in predominantly agricultural or forested watersheds, October 1979

[Measurements by U.S. Geological Survey; ft^3/s, cubic foot per second; °C, degree Celsius; specific conductance, in micromho per centimeter at 25° Celsius; mg/L, milligram per liter; $CaCO_3$, calcium carbonate; µg/L, microgram per liter; µg/g, microgram per gram; T/day, ton per day; N, nitrogen]

Site	Date of sampling	Time[1]	Stream-flow, instan-taneous (ft^3/s)	Temper-ature, water (°C)	Spe-cific con-duct-ance	pH	Oxygen, dis-solved (mg/L)	Sodium, dis-solved (mg/L)	Potas-sium, dis-solved (mg/L)	Calcium, dis-solved (mg/L)	Mag-nesium, dis-solved (mg/L)
4	10-16-79	0815	28	11.5	586	8.2	10.1	8.7	2.4	76	33
5	10-17-79	1230	2.1	13.3	607	8.0	10.2	7.0	2.2	76	33
7	10-15-79	1410	.14	13.2	722	7.4	12.9	11	1.7	84	34
8	10-15-79	1715	22	11.5	618	8.0	11.9	7.7	1.5	85	30
14	10-15-79	1505	12	11.9	660	7.5	13.0	8.5	1.7	84	30
20	10-18-79	1120	12	13.4	643	7.7	9.0	12	2.0	83	36
20A	10-17-79	0835	------	11.1	610	8.3	9.4	7.0	2.5	83	33
22	10-17-79	1000	12	11.4	680	8.1	9.0	21	3.5	90	36
29	10-17-79	1535	2.3	14.6	772	7.9	9.4	8.6	2.3	89	27
31	10-17-79	1415	2.0	16.8	658	8.2	11.4	6.1	2.1	79	28
32	10-17-79	1250	7.6	12.7	698	8.4	11.6	9.2	2.6	81	32
47	10-16-79	1100	5.3	12.6	862	6.9	8.5	23	5.0	85	30
77	10-19-79	0940	9.0	15.2	280	7.3	11.1	4.7	1.9	42	10
98	10-20-79	1200	1.2	17.4	160	7.2	5.6	7.5	3.0	34	7.1
99	10-16-79	1100	.76	11.3	425	7.8	8.5	31	4.9	53	18
102	10-17-79	1430	.35	21.2	365	8.5	13.8	16	3.1	39	12
163	10-16-79	1800	11	12.0	550	7.6	11.8	7.7	1.7	80	27
197	10-16-79	1000	14	13.0	950	8.4	16.4	74	6.2	60	27
241	10-19-79	1200	4.9	15.1	240	7.8	9.1	18	2.3	34	10
243A	10-31-79	0750	.65	13.2	610	7.6	5.8	29	4.8	64	24
247	10-19-79	1030	11	14.9	190	7.1	7.4	11	3.3	26	9.1
267	10-17-79	0830	------	12.0	570	6.7	6.0	31	4.2	41	16
268	10-16-79	1430	.00	12.0	760	6.8	4.6	46	12	55	18
275	10-19-79	1500	------	14.1	160	7.0	6.8	11	2.1	26	9.2
275C	10-31-79	0940	------	15.6	90	6.7	7.0	4.1	1.3	8.1	4.1
293	10-16-79	1200	.34	14.0	740	7.9	11.5	32	4.5	58	28
301	10-18-79	1215	139	14.3	795	8.3	11.5	19	2.6	88	30
301A	10-15-79	0800	.07	8.2	770	7.7	17.0	12	2.0	85	29
303	10-16-79	1520	4.4	12.2	530	7.8	9.0	8.6	2.4	69	21
311	10-18-79	1100	2.8	14.7	560	7.8	8.6	27	4.4	69	26
312	10-18-79	1230	5.5	13.2	360	7.7	8.8	22	2.1	45	16
313	10-18-79	0930	7.2	13.6	470	8.0	8.9	9.1	2.1	67	25
320	10-19-79	1330	------	16.5	90	7.2	6.8	3.4	2.2	23	4.0
425	10-17-79	1300	.85	14.8	1,370	6.6	6.8	99	15	120	44

Table 4.--Water-quality and other hydrologic data collected in predominantly agricultural or forested watersheds, October 1979--Continued

Site	Date of sampling	Chloride, dissolved (mg/L)	Fluoride, dissolved (mg/L)	Sulfate, dissolved (mg/L)	Silica, dissolved (mg/L)	Alkalinity as $CaCO_3$ (mg/L)	Acidity as $CaCO_3$ (mg/L)	Acidity total (mg/L)	Dissolved nitrate + nitrite, as N (mg/L)	Organic carbon, dissolved (mg/L)	Organic carbon, suspended (mg/L)
4	10-16-79	16	0.2	71	3.4	250	0.0	0.0	0.19	5.5	0.2
5	10-17-79	16	.2	61	4.5	260	.0	.0	.32	7.3	.0
7	10-15-79	13	.2	46	6.3	270	.0	.0	.59	2.3	.2
8	10-15-79	16	.2	52	11	230	.0	.0	3.9	4.5	.2
14	10-15-79	16	.2	51	8.1	240	.0	.0	1.6	4.9	.3
20	10-18-79	21	.2	64	2.7	270	.0	.0	.97	11	.3
20A	10-17-79	5.6	.3	50	10	320	.0	.0	.12	4.2	.1
22	10-17-79	21	.2	53	6.1	270	.0	.0	1.1	4.8	.3
29	10-17-79	10	.2	43	7.4	290	.0	.0	.69	4.0	.2
31	10-17-79	8.1	.2	37	8.5	250	.0	.0	.75	2.0	.2
32	10-17-79	13	.2	40	8.0	260	.0	.0	1.2	11	.2
47	10-16-79	32	.3	48	5.5	260	.0	.0	4.7	5.9	.3
77	10-19-79	5.7	.1	48	13	130	.0	.0	.64	5.6	.3
98	10-20-79	5.2	.1	18	9.6	94	.0	.0	.09	9.9	.4
99	10-16-79	38	.2	29	4.3	190	.0	.0	.23	9.4	.6
102	10-17-79	8.4	.2	23	2.4	140	.0	.0	.01	5.4	.2
163	10-16-79	19	.2	43	9.6	250	.0	.0	2.0	3.0	.4
197	10-16-79	120	.2	48	9.7	200	.0	.0	6.5	6.2	.9
241	10-19-79	16	.2	9.9	19	100	.0	.0	4.6	6.8	---
243A	10-31-79	20	.3	53	16	230	.0	.0	2.6	5.2	.6
247	10-19-79	11	.1	38	7.2	50	.0	.0	2.5	2.1	---
267	10-17-79	27	.2	130	11	61	.0	.0	4.9	5.4	.4
268	10-16-79	59	.2	120	8.2	110	.0	.0	.38	6.0	.7
275	10-19-79	6.8	.1	41	7.9	58	.0	.0	.82	5.9	---
275C	10-31-79	1.5	.1	27	16	16	.0	.0	.02	5.2	.3
293	10-16-79	61	.3	44	6.3	190	.0	.0	4.5	7.3	.7
301	10-18-79	33	.3	53	3.9	260	.0	.0	1.3	15	.4
301A	10-15-79	16	.2	38	11	300	.0	.0	.00	4.1	.0
303	10-16-79	12	.2	31	11	220	.0	.0	1.1	9.9	.7
311	10-18-79	32	.2	110	14	160	.0	.0	2.1	5.3	.6
312	10-18-79	29	.3	64	17	91	.0	.0	2.5	3.3	.3
313	10-18-79	19	.2	22	12	220	.0	.0	8.0	5.8	.2
320	10-19-79	2.7	.1	11	3.5	60	.0	.0	.24	7.7	---
425	10-17-79	100	.4	380	22	130	.0	.0	8.1	8.6	4.7

Table 4.--Water-quality and other hydrologic data collected in predominantly agricultural or forested watersheds, October 1979--Continued

Site	Date of sampling	Hardness, noncarbonate as $CaCO_3$ (mg/L)	Hardness, as $CaCO_3$ (mg/L)	Aluminum, total recoverable (µg/L)	Aluminum, recoverable from streambed material (µg/g)	Arsenic, total (µg/L)	Arsenic, total on streambed material (µg/g)	Boron, total recoverable (µg/L)	Boron, recoverable from streambed material (µg/g)	Cadmium, total recoverable (µg/L)	Cadmium, recoverable from streambed material (µg/g)
4	10-16-79	76	330	20	4,100	1	1	70	10	0	<10
5	10-17-79	66	330	30	3,700	1	0	60	10	0	<10
7	10-15-79	80	350	20	3,900	1	1	60	0	0	<10
8	10-15-79	110	340	30	3,300	1	1	20	0	0	<10
14	10-15-79	93	330	50	7,000	1	1	20	0	0	<10
20	10-18-79	86	360	30	3,400	1	1	60	0	0	<10
20A	10-17-79	23	340	10	2,400	1	0	60	0	0	<10
22	10-17-79	100	370	50	4,300	1	0	30	0	0	<10
29	10-17-79	43	330	50	3,500	1	0	50	0	0	<10
31	10-17-79	63	310	20	2,300	1	1	30	0	0	<10
32	10-17-79	74	330	30	2,600	1	1	110	0	0	<10
47	10-16-79	76	340	30	-----	2	--	30	--	0	---
77	10-19-79	16	150	50	2,900	1	11	20	80	0	<10
98	10-20-79	20	110	90	3,800	1	1	40	10	0	<10
99	10-16-79	16	210	220	4,900	1	1	70	0	0	<10
102	10-17-79	7	150	50	4,700	1	2	60	20	0	<10
163	10-16-79	61	310	100	4,100	6	1	100	0	0	<10
197	10-16-79	61	260	1,400	4,700	5	1	60	0	0	<10
241	10-19-79	26	130	110	3,400	4	1	30	0	0	<10
243A	10-31-79	29	260	490	6,000	2	2	30	10	1	<10
247	10-19-79	52	100	190	3,700	3	1	30	0	0	<10
267	10-17-79	110	170	1,300	8,000	4	2	40	0	0	<10
268	10-16-79	100	210	1,100	6,300	4	1	100	0	0	<10
275	10-19-79	45	100	60	5,000	4	1	20	0	1	<10
275C	10-31-79	21	37	60	5,300	1	0	30	0	1	<10
293	10-16-79	70	260	1,300	3,800	4	0	40	0	0	<10
301	10-18-79	83	340	30	2,700	1	0	30	0	0	<10
301A	10-15-79	32	330	10	2,500	1	0	30	10	0	<10
303	10-16-79	39	260	700	430	1	2	30	0	0	<10
311	10-18-79	120	280	120	5,300	5	1	60	0	0	<10
312	10-18-79	87	180	110	5,200	4	0	20	10	0	<10
313	10-18-79	50	270	30	3,300	5	1	1,600	0	0	<10
320	10-19-79	14	74	140	5,600	4	1	20	0	0	<10
425	10-17-79	350	480	7,500	8,900	4	3	360	40	4	<10

Table 4.--Water-quality and other hydrologic data collected in predominantly agricultural or forested watersheds, October 1979--Continued

Site	Date of sampling	Cobalt, recoverable from streambed material (µg/g)	Chromium, total recoverable (µg/L)	Chromium, recoverable from streambed material (µg/g)	Copper, total recoverable (µg/L)	Copper, recoverable from streambed material (µg/g)	Iron, dissolved (µg/L)	Iron, total recoverable (µg/L)	Iron, recoverable from streambed material (µg/g)	Mercury total recoverable (µg/L)	Mercury recoverable from streambed material (µg/g)
4	10-16-79	30	20	20	3	10	40	190	9,500	0.1	0.00
5	10-17-79	<10	20	20	1	20	30	120	9,300	.2	.00
7	10-15-79	<10	20	10	1	10	30	110	11,000	.1	.00
8	10-15-79	<10	20	10	4	<10	20	150	8,100	.2	.00
14	10-15-79	<10	10	20	2	10	10	210	14,000	.2	.00
20	10-18-79	40	20	10	2	10	40	340	9,800	.1	.00
20A	10-17-79	30	20	<10	1	10	60	190	7,900	.2	.00
22	10-17-79	---	20	30	4	10	80	280	11,000	.2	.00
29	10-17-79	<10	20	<10	1	<10	60	280	10,000	.2	.00
31	10-17-79	40	20	<10	1	20	20	80	6,600	.1	.00
32	10-17-79	<10	20	20	1	<10	40	160	6,800	.3	.00
47	10-16-79	---	20	---	2	---	40	1,400	-----	.2	----
77	10-19-79	290	10	340	3	430	210	700	11,000	<.1	.00
98	10-20-79	<10	10	10	2	<10	710	1,200	11,000	<.1	.00
99	10-16-79	40	10	20	2	<10	20	560	11,000	.1	.00
102	10-17-79	40	10	10	1	<10	60	570	13,000	<.1	.00
163	10-16-79	<10	20	20	2	<10	20	1,400	9,900	<.1	.00
197	10-16-79	---	20	70	5	50	60	-----	12,000	.1	.00
241	10-19-79	30	20	<10	2	<10	60	680	7,800	.2	.00
243A	10-31-79	<10	20	10	3	10	30	30	12,000	.1	.00
247	10-19-79	<10	20	30	2	<10	70	1,500	8,700	.1	.00
267	10-17-79	20	20	10	2	10	50	1,300	16,000	.2	.00
268	10-16-79	30	20	<10	4	10	560	1,400	14,000	.1	.00
275	10-19-79	<10	20	10	2	10	330	1,400	12,000	<.1	.00
275C	10-31-79	<10	10	20	2	<10	50	30	22,000	<.1	.00
293	10-16-79	30	20	<10	4	<10	70	1,200	9,000	.1	.00
301	10-18-79	<10	20	10	8	20	20	140	7,000	.2	.00
301A	10-15-79	<10	20	10	1	<10	10	80	8,000	.2	.00
303	10-16-79	21	10	<10	3	<10	40	1,700	5,800	<.1	.00
311	10-18-79	<10	20	20	2	10	60	930	16,000	<.1	.00
312	10-18-79	<10	20	10	2	10	20	680	13,000	<.1	.00
313	10-18-79	<10	20	<10	1	<10	390	300	7,800	<.1	.00
320	10-19-79	30	20	10	4	<10	30	1,300	12,000	<.1	.00
425	10-17-79	---	30	90	22	160	150	980	12,000	.2	.00

Table 4.--Water-quality and other hydrologic data collected in predominantly agricultural or forested watersheds, October 1979--Continued

Site	Date of sampling	Lead, total recoverable (µg/L)	Lead, recoverable from streambed material (µg/g)	Manganese, dissolved (µg/L)	Manganese, suspended recoverable (µg/L)	Manganese, total recoverable (µg/L)	Manganese, recoverable from streambed material (µg/g)	Nickel, total recoverable (µg/L)	Nickel, recoverable from streambed material (µg/g)	Selenium, total (µg/L)	Selenium, total in streambed material (µg/g)
4	10-16-79	0	30	10	10	20	920	1	30	0	1
5	10-17-79	0	<10	5	5	10	570	1	<10	0	0
7	10-15-79	0	50	10	20	30	830	0	<10	0	0
8	10-15-79	0	<10	8	2	10	520	0	<10	0	1
14	10-15-79	1	<10	20	20	40	480	1	90	0	1
20	10-18-79	1	<10	90	10	100	640	1	40	0	0
20A	10-17-79	0	<10	100	10	110	3,200	1	30	0	0
22	10-17-79	2	---	150	0	50	650	1	140	0	0
29	10-17-79	1	40	70	10	80	430	1	40	0	0
31	10-17-79	0	40	10	10	20	510	0	<10	0	1
32	10-17-79	0	<10	20	10	30	900	1	<10	0	1
47	10-16-79	0	---	40	10	50	-----	1	---	0	--
77	10-19-79	1	---	160	10	170	400	2	280	0	0
98	10-20-79	1	<10	330	30	360	2,300	2	<10	0	0
99	10-16-79	0	<10	100	100	200	660	2	<10	0	0
102	10-17-79	0	<10	60	30	90	1,300	2	40	0	1
163	10-16-79	3	<10	440	30	470	1,200	1	<10	0	1
197	10-16-79	3	---	180	50	230	490	4	230	0	0
241	10-19-79	1	<10	110	10	120	780	0	<10	0	0
243A	10-31-79	4	<10	340	30	370	350	3	50	0	1
247	10-19-79	3	<10	360	20	380	440	2	<10	0	0
267	10-17-79	3	20	260	10	270	480	6	20	0	0
268	10-16-79	2	30	1,400	0	1,400	250	7	30	0	1
275	10-19-79	2	<10	290	0	290	470	2	<10	0	0
275C	10-31-79	2	40	60	0	60	1,200	1	40	0	1
293	10-16-79	3	<10	240	30	270	350	3	30	0	0
301	10-18-79	2	70	10	20	30	430	4	30	0	0
301A	10-15-79	0	20	5	5	10	550	0	20	0	0
303	10-16-79	3	<10	260	100	360	1,400	2	20	0	1
311	10-18-79	1	<10	230	20	250	530	4	<10	0	1
312	10-18-79	2	40	160	30	190	600	5	40	0	0
313	10-18-79	1	<10	190	0	170	830	0	20	0	0
320	10-19-79	4	<10	580	260	840	1,700	2	<10	0	0
425	10-17-79	5	---	3,300	0	3,300	220	94	---	0	1

Table 4.--Water-quality and other hydrologic data collected in predominantly agricultural or forested watersheds, October 1979--Continued

Site	Date of sampling	Zinc, total recoverable (µg/L)	Zinc, recoverable from streambed material (µg/g)	Solids, residue at 180° C dissolved (mg/L)	Solids, sum of constituents, dissolved (mg/L)	Solids, dissolved (tons per day)	Solids, dissolved (tons per acre ft)	Sediment, suspended (mg/L)	Sediment discharge, suspended (t/day)
4	10-16-79	0	110	373	362	28.2	0.51	14	1.1
5	10-17-79	0	220	378	358	2.10	.51	17	.09
7	10-15-79	10	50	313	361	.12	.43	6	.00
8	10-15-79	10	40	370	359	22.0	.50	6	.36
14	10-15-79	20	130	334	351	11.2	.45	8	.25
20	10-18-79	10	210	398	388	12.9	.54	18	.57
20A	10-17-79	20	140	379	384	----	.52	--	----
22	10-17-79	20	710	389	398	13.2	.53	15	.49
29	10-17-79	10	30	370	365	2.30	.50	27	.17
31	10-17-79	0	40	332	323	1.79	.45	15	.08
32	10-17-79	10	200	366	348	7.51	.50	10	.21
47	10-16-79	10	---	429	406	6.14	.58	19	.27
77	10-19-79	0	570	231	207	5.59	.31	12	.29
98	10-20-79	10	290	149	142	.47	.20	6	.02
99	10-16-79	10	40	318	294	.65	.43	14	.03
102	10-17-79	0	30	205	188	.19	.28	4	.00
163	10-16-79	20	50	357	348	10.1	.49	52	1.5
197	10-16-79	10	70	500	494	18.2	.68	35	1.3
241	10-19-79	20	30	195	190	2.59	.27	9	.12
243A	10-31-79	10	60	350	361	123	.48	24	.04
247	10-19-79	1,900	20	162	147	4.72	.22	27	.77
267	10-17-79	10	40	317	319	------	.43	26	----
268	10-16-79	10	40	416	388	.00	.57	--	----
275	10-19-79	10	40	146	143	------	.20	6	----
275C	10-31-79	10	80	67	72	------	.09	52	----
293	10-16-79	10	50	379	369	.35	.52	--	----
301	10-18-79	30	40	402	392	151	.55	19	6.9
301A	10-15-79	10	30	342	374	.06	.47	1	.00
303	10-16-79	20	50	304	293	3.59	.41	49	.57
311	10-18-79	30	40	397	388	2.97	.54	18	.13
312	10-18-79	10	150	274	261	4.09	.37	13	.19
313	10-18-79	10	30	317	325	6.16	.43	12	.23
320	10-19-79	60	80	92	88	------	.13	--	----
425	10-17-79	410	180	931	898	2.14	1.27	47	.11

[1]For example, 1410 is the same as 2:10 p.m.

Table 5.--Water-quality and other hydrologic data collected in predominantly mined watersheds, October 1979

[Measurements by U.S. Geological Survey; ft^3/s, cubic foot per second, °C, degree Celsius; specific conductance, in micromho per centimeter at 25° Celsius; mg/L, milligram per liter; $CaCO_3$, calcium carbonate; µg/L, microgram per liter; µg/g, microgram per gram]

Site	Date of sampling	Time[1]	Stream-flow, instan-taneous (ft^3/s)	Temper-ature, water (°C)	Spe-cific con-duct-ance	pH	Oxygen, dis-solved (mg/L)	Sodium, dis-solved (mg/L)	Potas-sium, dis-solved (mg/L)	Calcium, dis-solved (mg/L)	Mag-nesium, dis-solved (mg/L)	Chlo-ride, dis-solved (mg/L)	Fluo-ride, dis-solved (mg/L)	Sulfate, dis-solved (mg/L)	Silica, dis-solved (mg/L)	Alka-linity as $CaCO_3$ (mg/L)
27	10-17-79	0935	1.2	13.7	1,120	7.7	13.1	39	4.8	140	48	19	0.2	260	8.7	280
27A	10-27-79	0840	.11	8.1	1,890	6.8	11.6	38	5.4	210	88	9.9	1.8	520	8.9	340
104	10-17-79	1600	.27	14.4	1,260	7.1	4.6	88	6.9	130	67	14	.3	480	8.6	290
112A	10-26-79	0845	------	4.9	2,980	6.2	12.1	120	5.5	200	240	5.2	.5	1,900	16	1
114	10-18-79	1030	15	16.0	110	6.9	9.6	95	6.2	250	150	7.2	.3	1,200	7.2	170
122	10-16-79	1600	23	10.3	1,895	7.7	12.1	120	5.6	200	130	10	.3	1,100	5.9	170
171	10-17-79	1630	------	15.2	4,310	2.7	7.1	19	1.2	100	100	14	1.4	2,700	280	0
185	10-18-79	1200	------	14.5	670	7.1	8.3	18	2.9	53	32	12	.2	230	5.2	66
187	10-18-79	1000	620	14.5	670	7.0	8.1	15	2.9	53	33	7.5	.2	230	5.0	66
193	10-17-79	1600	------	14.5	355	7.1	7.9	5.5	2.7	32	14	4.8	.2	88	4.5	63
194	10-17-79	1400	33	15.0	4,100	7.1	8.8	180	6.9	200	350	56	.7	2,100	12	77
401	10-18-79	0720	.96	13.4	3,190	7.3	8.5	79	9.0	300	250	33	.2	2,000	9.7	190
403	10-27-79	1055	15	8.1	863	7.2	10.5	25	3.2	110	50	20	.2	170	9.5	300
405	10-16-79	1355	1.8	12.0	772	7.8	10.2	7.4	3.8	140	59	4.8	.3	290	8.7	270
406	10-16-79	1505	.83	12.8	1,000	6.7	8.1	15	4.3	120	62	9.3	.2	390	9.6	170
407	10-16-79	1640	.33	12.7	4,100	7.9	.0	430	21	220	170	5.8	.4	2,000	4.3	210
408	10-17-79	0930	.08	12.2	1,090	6.2	6.4	68	7.4	290	130	11	.2	1,200	11	37
409	10-18-79	1320	2.0	16.9	2,160	7.1	8.0	28	6.5	260	140	11	.3	1,200	13	160
410	10-19-79	1700	.10	18.2	1,100	7.9	4.5	21	5.1	89	90	3.8	.2	370	6.6	300
411	10-15-79	1530	.56	10.6	3,513	7.9	11.5	42	5.1	170	480	13	.3	2,200	12	190
412	10-16-79	1730	.13	12.5	1,000	7.6	9.1	16	3.2	110	75	3.3	.2	380	5.3	240
413	10-17-79	1300	.35	13.3	1,135	2.9	9.1	14	2.4	300	96	3.3	5.0	1,500	56	1
414	10-19-79	1130	.39	18.0	1,205	6.3	9.1	75	6.5	430	210	4.3	.2	2,000	20	21
415	10-19-79	1530	.46	19.5	2,175	7.6	8.9	22	5.5	190	210	6.6	.3	1,200	8.6	190
416	10-19-79	1415	.15	17.5	2,000	7.2	7.7	27	5.1	190	190	5.3	.4	1,100	16	110

Site	Date of sampling	Time[1]	Stream-flow, instan-taneous (ft^3/s)	Temper-ature, water (°C)	Spe-cific con-duct-ance	pH	Oxygen, dis-solved (mg/L)	Sodium, dis-solved (mg/L)	Potas-sium, dis-solved (mg/L)	Calcium, dis-solved (mg/L)	Mag-nesium, dis-solved (mg/L)	Chlo-ride, dis-solved (mg/L)	Fluo-ride, dis-solved (mg/L)	Sulfate, dis-solved (mg/L)	Silica, dis-solved (mg/L)	Alka-linity as $CaCO_3$ (mg/L)
417	10-25-79	0840	1.4	9.5	2,770	7.9	9.1	230	9.1	210	170	6.1	.3	1,500	5.3	370
418	10-25-79	1320	2.0	9.4	3,153	7.3	9.1	60	5.1	220	360	4.3	.5	2,000	14	160
419	10-18-79	1600	1.0	17.5	4,000	7.4	8.5	45	5.2	220	420	3.5	.4	2,100	14	250
420	10-18-79	1415	.16	16.5	2,340	3.3	8.9	22	3.7	210	160	2.7	1.2	1,400	30	1
421	10-17-79	0930	.45	11.9	2,050	7.7	8.3	30	5.9	230	170	7.7	.4	880	7.4	260
422	10-16-79	1300	2.3	13.0	2,030	7.7	11.2	100	5.1	190	140	6.9	.3	900	7.4	140
423	10-17-79	1500	------	11.5	540	7.8	6.0	36	3.8	51	29	79	.3	58	.2	150
424	10-17-79	1430	.10	12.5	1,090	8.1	9.4	30	3.7	120	68	30	.3	390	5.8	240
426	10-17-79	1400	.04	13.0	3,920	2.4	8.0	22	5.2	140	94	15	1.5	2,300	39	0
450	10-29-79	0840	.22	10.2	2,280	7.6	8.5	30	5.8	240	170	7.5	.4	1,200	5.4	150
451	10-15-79	1100	------	11.5	3,300	7.2	8.6	84	5.9	270	250	19	.5	1,900	13	160
452	10-15-79	1430	------	14.5	6,100	7.3	8.7	450	9.0	250	430	390	.4	2,600	11	300
453	10-18-79	1600	.61	16.7	3,050	7.5	7.9	22	5.2	210	340	4.3	.5	1,700	6.6	130
454	10-31-79	0940	3.8	13.7	4,373	7.4	8.8	48	8.1	240	480	5.5	.5	2,600	12	180
455	10-29-79	1200	5.0	11.6	4,213	3.3	10.0	24	5.0	180	440	6.6	1.9	2,600	32	0
456	10-30-79	0810	.56	10.9	2,056	5.2	9.4	34	4.5	150	160	3.3	.5	1,100	25	6
457	10-30-79	1335	8.9	15.9	4,793	7.4	11.0	260	9.5	200	460	32	.7	2,700	10	310
458	10-16-79	0800	6.0	13.0	4,500	7.8	9.6	490	9.8	180	250	21	.3	1,900	6.5	390
460	10-16-79	1700	------	15.5	3,000	8.0	11.0	310	9.2	190	150	13	.6	1,500	2.3	200
461	10-16-79	1530	.10	14.5	2,500	7.6	10.2	110	6.1	190	200	15	.3	1,300	5.8	220
462	10-17-79	0930	3.4	14.0	4,380	7.6	9.0	220	7.7	250	310	13	.3	2,000	11	330
463	10-17-79	1100	13	15.0	3,720	6.9	9.8	280	8.4	190	260	5.9	.3	1,900	5.0	110
464	10-15-79	1630	------	16.5	4,850	7.1	----	32	5.1	200	890	3.5	.7	3,000	14	280
465	10-15-79	1700	1.2	14.5	5,050	6.3	----	40	5.6	190	690	3.7	.6	3,400	16	27
466	10-15-79	1800	------	12.5	2,900	6.9	----	27	4.4	190	430	4.6	.6	2,200	15	93
504	10-16-79	1030	.06	9.8	4,370	8.0	10.2	830	6.7	58	110	44	.3	1,800	3.2	420

Table 5.--Water-quality and other hydrologic data collected in predominantly mined watersheds, October 1979--Continued

Site	Date of sampling	Acidity as $CaCO_3$ (mg/L)	Acidity total (mg/L)	Dissolved nitrate + nitrite, as N (mg/L)	Organic carbon, dissolved (mg/L)	Organic carbon, suspended (mg/L)	Hardness, noncarbonate as $CaCO_3$ (mg/L)	Hardness, as $CaCO_3$ (mg/L)	Aluminum, total recoverable (µg/L)	Aluminum, recoverable from streambed materials (µg/g)	Arsenic, total (µg/L)	Arsenic, total in streambed material (µg/g)	Boron, total recoverable (µg/L)	Boron, recoverable from streambed material (µg/g)	Cadmium, total recoverable (µg/L)
27	10-17-79	0.0	0.0	2.4	6.6	0.6	270	550	210	6,300	2	2	180	0	0
27A	10-27-79	.0	.0	4.8	3.9	.3	550	890	130	3,700	1	0	120	10	0
104	10-17-79	.0	.0	.00	7.7	.3	310	600	60	-----	1	-	290	--	0
112A	10-26-79	.0	.0	.12	4.2	.6	1,500	1,500	5,000	-----	1	-	330	--	0
114	10-18-79	.0	.0	.01	4.1	.2	1,100	1,200	150	5,500	1	1	300	20	1
122	10-16-79	.0	.0	.40	6.2	1.6	860	1,000	80	9,300	4	1	80	0	0
177	10-17-79	2,430	49	.09	6.2	.4	660	660	240,000	5,500	2	1	80	0	0
185	10-18-79	.0	.0	.83	8.5	1.1	200	260	2,400	11,000	2	2	50	0	0
187	10-18-79	.0	.0	.79	12	.9	200	270	2,400	------	2	-	40	--	0
193	10-17-79	.0	.0	.86	8.7	.3	75	140	2,400	10,000	2	3	40	0	0
194	10-17-79	.0	.0	.56	4.6	.3	1,900	1,900	3,000	------	1	-	290	--	4
401	10-18-79	.0	.0	.19	6.3	.2	1,600	1,800	900	7,500	1	3	550	10	0
403	10-27-79	.0	.0	.74	8.8	.4	180	480	150	4,800	2	1	80	0	1
405	10-16-79	.0	.0	.03	5.6	---	320	590	20	5,000	1	1	570	10	0
406	10-16-79	.0	.0	.07	10	.3	390	560	1,400	5,000	1	1	200	0	0
407	10-16-79	.0	.0	54	20	.7	1,000	1,300	40	6,700	2	1	20	0	0
408	10-17-79	.0	.0	.01	7.4	.2	1,200	1,300	300	8,200	1	1	120	0	1
409	10-18-79	.0	.0	.35	3.4	.1	1,100	1,200	0	4,500	1	1	250	10	0
410	10-19-79	.0	.0	.00	28	.2	290	590	40	4,300	1	1	140	10	0
411	10-25-79	.0	.0	.11	5.0	.3	2,200	2,400	80	5,100	1	1	130	10	0
412	10-16-79	.0	.0	.00	7.1	.2	340	580	80	7,700	1	1	70	10	0
413	10-17-79	546	11	.05	2.3	.1	1,100	1,100	48,000	5,300	0	4	180	0	200
414	10-19-79	.0	.0	.07	4.5	.4	1,900	1,900	9,000	6,700	0	0	90	0	1
415	10-19-79	.0	.0	.04	3.2	.2	1,200	1,300	60	4,200	0	0	150	0	0
416	10-19-79	.0	.0	.00	8.8	.1	1.100	1,300	80	7,900	0	0	110	0	0
417	10-25-79	.0	.0	3.8	4.1	.4	850	1,200	130	5,200	2	1	430	10	1
418	10-25-79	.0	.0	.08	4.6	.3	1,900	2,000	500	9,200	1	1	170	0	1
419	10-18-79	.0	.0	.05	4.3	.1	2,000	2,300	90	8,900	1	0	140	0	0
420	10-18-79	114	2.3	.02	13	.1	1,200	1,200	6,000	7,400	0	0	350	0	0
421	10-17-79	.0	.0	.37	3.8	.5	1,000	1,300	90	7,700	4	1	30	0	0

Site	Date of sampling	Acidity as $CaCO_3$ (mg/L)	Acidity total (mg/L)	Dissolved nitrate + nitrite, as N (mg/L)	Organic carbon, dissolved (mg/L)	Organic carbon, suspended (mg/L)	Hardness, noncarbonate as $CaCO_3$ (mg/L)	Hardness, as $CaCO_3$ (mg/L)	Aluminum, total recoverable (µg/L)	Aluminum, recoverable from streambed materials (µg/g)	Arsenic, total (µg/L)	Arsenic, total in streambed material (µg/g)	Boron, total recoverable (µg/L)	Boron, recoverable from streambed material (µg/g)	Cadmium, total recoverable (µg/L)
422	10-16-79	.0	.0	.66	6.4	1.5	910	1,100	50	-----	4	-	10	--	0
423	10-17-79	.0	.0	.04	9.5	1.7	97	250	100	7,300	4	2	60	0	0
424	10-17-79	.0	.0	.67	6.3	.5	340	580	50	7,300	4	1	70	10	0
426	10-17-79	2,580	36	.40	6.6	.6	740	740	90,000	6,400	48	1	390	0	0
450	10-29-79	.0	.0	.05	4.9	.3	1,200	1,300	130	7,400	1	2	80	0	1
451	10-15-79	.0	.0	.24	7.1	.1	1,500	1,700	1,100	7,500	3	2	190	0	1
452	10-15-79	.0	.0	.29	4.7	.3	2,100	2,400	1,300	4,300	4	1	490	0	1
453	10-18-79	.0	.0	.22	4.3	.1	1,800	1,900	20	7,500	4	1	10	0	0
454	10-31-79	.0	.0	.20	8.3	.5	2,400	2,600	400	5,400	1	0	160	0	1
455	10-29-79	397	8.0	.20	1.5	.5	2,300	2,300	37,000	3,400	0	2	180	0	13
456	10-30-79	.0	.0	.06	5.8	.3	1,000	1,000	7,000	3,600	1	0	90	0	5
457	10-30-79	.0	.0	.82	8.7	---	2,100	2,400	4,500	8,000	1	1	440	0	8
458	10-16-79	.0	.0	.32	5.4	.1	1,100	1,500	90	6,800	4	2	710	10	0
460	10-16-79	.0	.0	.91	6.5	.2	890	1,100	160	8,600	4	4	620	0	0
461	10-16-79	.0	.0	.34	3.3	.3	1,100	1,300	90	5,500	4	0	240	0	0
462	10-17-79	.0	.0	.36	4.7	.2	1,600	1,900	70	4,400	2	1	440	0	0
463	10-17-79	.0	.0	.37	5.3	.5	1,400	1,500	1,500	6,600	1	1	340	0	0
464	10-15-79	.0	.0	.02	6.9	.1	3,900	4,200	260	7,100	4	1	140	0	1
465	10-15-79	.0	.0	.00	7.1	.9	3,300	3,300	5,500	5,300	3	1	120	0	0
466	10-15-79	.0	.0	.49	8.7	.8	2,200	2,200	1,300	5,800	3	1	90	13	3
504	10-16-79	.0	.0	.02	5.5	.4	180	600	20	7,000	4	1	290	0	0

Table 5.--Water-quality and other hydrologic data collected in predominantly mined watersheds, October 1979--Continued

Site	Date of sampling	Cadmium, recoverable from streambed material (µg/g)	Cobalt, recoverable from streambed material (µg/g)	Chromium, total recoverable (µg/L)	Chromium, recoverable from streambed material (µg/g)	Copper, total recoverable (µg/L)	Copper, recoverable from streambed material (µg/g)	Iron, dissolved (µg/L)	Iron, total recoverable (µg/L)	Iron, recoverable from streambed material (µg/g)	Mercury, total recoverable (µg/L)	Mercury, recoverable from streambed material (µg/g)	Lead, total recoverable (µg/L)	Lead, recoverable from streambed material (µg/g)	Manganese, dissolved (µg/L)
27	10-17-79	<10	70	20	30	1	20	40	950	30,000	0.2	0.00	2	<10	510
27A	10-27-79	<10	50	20	<10	2	10	30	40	14,000	<.1	.00	0	<10	640
104	10-17-79	---	---	20	---	2	---	80	480	-------	.1	----	0	---	690
112A	10-26-79	---	---	20	---	8	---	48,000	50,000	-------	.1	----	0	---	15,000
114	10-18-79	<10	180	10	40	5	20	20	1,000	33,000	.2	.00	2	---	2,800
122	10-16-79	<10	<10	20	10	2	20	20	780	20,000	<.1	.00	2	20	1,100
171	10-17-79	<10	---	90	40	260	30	280,000	280,000	49,000	<.1	.00	0	---	31,000
185	10-18-79	<10	50	20	10	10	10	20	3,200	21,000	.1	.00	6	<10	830
187	10-18-79	---	---	20	---	8	---	20	3,700	-------	.1	----	12	---	1,000
193	10-17-79	<10	20	20	20	8	20	350	3,300	22,000	<.1	.00	6	20	760
194	10-17-79	---	---	20	---	8	---	580	4,500	-------	<.1	----	5	---	9,400
401	10-18-79	<10	<10	30	40	11	30	1,400	3,000	84,000	.2	.00	0	80	3,400
403	10-27-79	<10	50	20	20	3	10	60	80	16,000	<.1	.00	5	<10	130
405	10-16-79	<10	<10	20	50	1	20	40	310	19,000	.1	.00	2	100	420
406	10-16-79	<10	<10	20	20	2	20	4,800	7,900	19,000	.2	.00	3	50	3,800
407	10-16-79	<10	20	20	10	2	10	50	340	14,000	.1	.00	0	<10	1,100
408	10-17-79	<10	<10	20	30	2	20	6,000	67,000	42,000	<.1	.00	0	<10	4,800
409	10-18-79	<10	110	30	20	1	30	210	1,400	75,000	.3	.00	1	<10	1,900
410	10-19-79	<10	40	10	10	2	10	50	130	16,000	.1	.00	0	<10	150
411	10-25-79	<10	50	10	30	2	10	80	200	33,000	<.1	.00	1	50	690
412	10-16-79	<10	30	20	10	1	20	10	150	23,000	.1	.00	0	30	40
413	10-17-79	<10	40	40	40	120	20	40,000	38,000	180,000	<.1	.00	0	<10	5,700
414	10-19-79	<10	20	20	<10	4	10	1,500	17,000	29,000	.1	.00	1	40	16,000
415	10-19-79	<10	50	10	<10	2	<10	70	380	19,000	.1	.00	1	<10	5,100
416	10-19-79	<10	310	10	10	2	10	30	120	17,000	.1	.00	1	40	12,000

Site	Date of sampling	Cadmium, recoverable from streambed material (µg/g)	Cobalt, recoverable from streambed material (µg/g)	Chromium, total recoverable (µg/L)	Chromium, recoverable from streambed material (µg/g)	Copper, total recoverable (µg/L)	Copper, recoverable from streambed material (µg/g)	Iron, dissolved (µg/L)	Iron, total recoverable (µg/L)	Iron, recoverable from streambed material (µg/g)	Mercury, total recoverable (µg/L)	Mercury, recoverable from streambed material (µg/g)	Lead, total recoverable (µg/L)	Lead, recoverable from streambed material (µg/g)	Manganese, dissolved (µg/L)
417	10-25-79	<10	50	10	10	2	20	130	1,100	22,000	.1	.00	2	<10	680
418	10-25-79	<10	100	10	10	2	20	740	2,700	38,000	<.1	.00	2	<10	16,000
419	10-18-79	<10	90	10	10	2	10	90	740	31,000	.2	.00	1	<10	10,000
420	10-18-79	<10	30	10	10	2	<10	5,800	5,900	47,000	.1	.00	2	<10	19,000
421	10-17-79	<10	20	20	10	2	10	40	860	33,000	<.1	.00	2	20	2,100
422	10-16-79	--	---	30	---	2	---	30	320	--------	<.1	-----	3	---	510
423	10-17-79	<10	30	20	20	4	10	10	1,200	16,000	<.1	.00	3	<10	60
424	10-17-79	<10	<10	20	10	3	10	740	440	15,000	<.1	.00	2	<10	180
426	10-17-79	<10	<10	120	20	220	20	390,000	400,000	51,000	<.1	.00	0	20	16,000
450	10-29-79	<10	40	20	10	2	20	80	130	27,000	<.1	.00	4	40	480
451	10-15-79	<10	30	20	20	3	20	80	410	22,000	.1	.00	4	30	9,000
452	10-15-79	<10	40	20	10	5	<10	160	1,300	29,000	.2	.00	3	40	3,300
453	10-18-79	<10	50	20	10	2	20	240	620	27,000	.1	.00	33	<10	5,400
454	10-31-79	<10	100	20	10	3	20	520	550	57,000	<.1	.00	6	50	8,900
455	10-29-79	<10	30	20	20	13	10	27,000	28,000	95,000	.2	.00	0	<10	34,000
456	10-30-79	10	40	40	10	8	10	4,700	4,700	34,000	.1	.00	6	1	14,000
457	10-30-79	<10	40	20	<10	3	10	80	90	25,000	<.1	.00	3	<10	4,800
458	10-16-79	<10	50	30	40	3	20	80	380	37,000	.1	.00	1	<10	1,400
460	10-16-79	<10	40	20	20	2	20	70	360	22,000	<.1	.00	1	40	120
461	10-16-79	<10	30	20	10	2	10	60	140	19,000	<.1	.00	0	<10	590
462	10-17-79	<10	40	20	<10	2	<10	110	330	9,600	<.1	.00	2	<10	1,300
463	10-17-79	<10	40	20	10	3	30	1,400	11,000	96,000	<.1	.00	1	<10	1,500
464	10-15-79	<10	100	30	10	3	10	190	1,700	51,000	.1	.00	2	50	7,200
465	10-15-79	<10	<10	20	10	5	<10	24,000	30,000	100,000	.1	.00	0	<10	18,000
466	10-15-79	<10	<10	30	30	2	10	3,500	5,100	29,000	<.1	.00	2	<10	9,700
504	10-16-79	<10	30	20	20	1	20	50	110	27,000	<.1	.00	1	30	110

Table 5.--Water-quality and other hydrologic data collected in predominantly mined watersheds, October 1979--Continued

Site	Date of sampling	Manganese, suspended recoverable (µg/L)	Manganese, total recoverable (µg/L)	Manganese, recoverable from streambed material (µg/g)	Nickel, total recoverable (µg/L)	Nickel, recoverable from streambed material (µg/g)	Selenium, total (µg/L)	Selenium, total in streambed material (µg/g)	Zinc, total recoverable (µg/L)	Zinc, recoverable from bottom streambed material (µg/g)	Solids, residue at 180° C dissolved (mg/L)	Solids, sum of constituents, dissolved (mg/L)	Solids, dissolved (tons per day)	Solids, dissolved (tons per ac-ft)	Sediment, suspended (mg/L)	Sediment discharge suspended (tons per day)
27	10-17-79	20	530	3,400	3	70	1	1	10	300	754	699	2.44	1.03	84	0.27
27A	10-27-79	0	630	3,300	3	50	0	1	10	140	1,200	1,110	.36	1.63	112	.03
104	10-17-79	140	830	-----	5	---	0	--	0	---	1,050	970	.77	1.43	48	.03
112A	10-26-79	0	14,000	-----	80	---	0	--	520	---	2,950	2,550	------	4.01	---	----
114	10-18-79	200	3,000	8,400	26	180	0	2	50	260	2,100	1,820	85.0	2.86	13	.53
122	10-16-79	0	1,100	620	11	40	0	1	30	190	1,820	1,680	114	2.48	33	2.0
171	10-17-79	1,000	32,000	250	100	---	1	2	1,900	430	4,910	3,580	------	6.68	9	----
185	10-18-79	270	1,100	960	19	50	0	1	30	130	410	398	------	.56	114	----
187	10-18-79	200	1,300	-----	21	---	0	--	40	---	397	391	665	.54	---	----
193	10-17-79	440	1,200	740	12	20	0	1	20	80	194	195	------	.26	---	----
194	10-17-79	300	9,700	-----	170	---	0	--	3,700	---	3,970	2,960	351	5.40	49	4.3
401	10-18-79	0	3,200	1,900	7	<10	0	1	10	80	3,210	2,800	8.32	4.37	26	.07
403	10-27-79	20	150	920	2	<10	0	0	10	150	557	572	23.0	.76	36	1.5
405	10-16-79	0	410	7,400	5	10	0	2	10	470	741	677	3.60	1.01	19	.09
406	10-16-79	200	4,000	470	35	<10	1	0	40	110	784	722	1.76	1.07	124	.28
407	10-16-79	0	1,100	790	58	50	1	0	20	40	3,420	3,220	3.05	4.65	17	.01
408	10-17-79	200	5,000	550	38	<10	0	2	50	300	1,980	1,750	.43	2.69	18	.00
409	10-18-79	0	1,900	17,000	19	110	0	12	40	380	2,040	1,760	11.0	2.77	15	.08
410	10-19-79	30	180	2,200	2	40	0	1	20	230	817	766	.22	1.11	10	.00
411	10-25-79	0	690	4,100	16	50	0	1	10	170	3,940	3,040	5.99	5.36	9	.01
412	10-16-79	20	60	1,100	1	30	0	0	30	110	817	737	.29	1.11	7	.00
413	10-17-79	200	5,900	190	670	40	6	9	5,000	50	2,330	2,030	2.20	3.17	0	.00
414	10-19-79	1,000	17,000	160	180	20	0	2	280	200	2,940	2,780	3.10	4.00	104	.11
415	10-19-79	200	5,300	5,200	48	50	0	0	50	70	1,940	1,760	2.41	2.64	11	.01
416	10-19-79	0	12,000	29,000	110	260	0	1	120	610	1,770	1,610	.72	2.41	11	.00

Site	Date of sampling	Manganese, suspended recoverable (µg/L)	Manganese, total recoverable (µg/L)	Manganese, recoverable from streambed material (µg/g)	Nickel, total recoverable (µg/L)	Nickel, recoverable from streambed material (µg/g)	Selenium, total (µg/L)	Selenium, total in streambed material (µg/g)	Zinc, total recoverable (µg/L)	Zinc, recoverable from bottom streambed material (µg/g)	Solids, residue at 180° C dissolved (mg/L)	Solids, sum of constituents, dissolved (mg/L)	Solids, dissolved (tons per day)	Solids, dissolved (tons per ac-ft)	Sediment, suspended (mg/L)	Sediment discharge suspended (tons per day)
417	10-25-79	0	670	680	15	50	0	4	20	90	2,700	2,370	10.4	3.67	39	.15
418	10-25-79	0	16,000	10,000	75	50	0	1	20	150	3,510	2,780	19.2	4.77	20	.11
419	10-18-79	0	10,000	17,000	51	90	0	0	40	180	3,450	2,970	9.32	4.69	117	.31
420	10-18-79	0	18,000	310	140	30	0	1	2,000	40	2,430	1,860	1.05	3.30	2	.00
421	10-17-79	0	2,100	1,100	3	20	0	3	20	80	1,820	1,490	2.21	2.48	61	.07
422	10-16-79	30	540	------	5	--	0	--	10	---	1,760	1,440	11.0	2.39	23	.14
423	10-17-79	310	370	440	4	30	0	0	10	40	391	348	------	.53	--	----
424	10-17-79	0	170	530	3	<10	0	0	20	50	812	796	.22	1.10	34	.01
426	10-17-79	0	16,000	60	50	20	1	1	1,800	90	3,510	3,060	.37	4.77	65	.01
450	10-29-79	0	480	2,300	7	70	0	3	10	130	2,030	1,750	1.21	2.76	12	.01
451	10-15-79	0	8,700	2,800	80	60	0	2	90	30	3,000	2,650	------	4.08	---	----
452	10-15-79	0	3,200	90	23	<10	0	4	50	40	5,430	4,330	------	7.38	---	----
453	10-18-79	100	5,500	11,000	24	50	0	2	20	110	3,050	2,370	5.02	4.15	8	.01
454	10-31-79	400	9,300	11,000	48	100	0	0	50	400	4,510	3,510	46.3	6.13	31	.32
455	10-29-79	0	33,000	120	560	30	0	2	2,100	110	4,560	3,360	61.9	6.20	123	1.7
456	10-30-79	0	13,000	130	120	40	0	2	230	110	1,690	1,500	2.56	2.30	46	.07
457	10-30-79	0	4,800	1,100	130	70	0	2	350	400	4,900	3,870	118	6.66	85	2.0
458	10-16-79	0	1,400	3,300	15	50	0	1	20	120	3,910	3,100	63.3	5.32	---	----
460	10-16-79	30	150	580	6	40	0	1	0	160	2,560	2,300	------	3.48	---	----
461	10-16-79	0	570	2,300	3	30	0	1	0	40	2,160	1,960	.58	2.94	---	----
462	10-17-79	100	1,400	480	31	70	0	1	20	200	3,970	3,010	36.7	5.40	---	----
463	10-17-79	0	1,500	160	20	40	0	4	60	170	3,370	2,720	116	4.58	---	----
464	10-15-79	300	7,500	18,000	45	140	0	3	50	440	5,280	4,320	------	7.18	---	----
465	10-15-79	2,000	20,000	120	200	<10	0	3	340	110	5,690	4,400	18.4	7.74	---	----
466	10-15-79	0	9,600	870	110	<10	0	2	160	90	3,800	2,940	------	5.17	---	----
504	10-16-79	10	120	1,900	1	30	0	1	20	50	3,330	3,110	.58	4.53	21	.00

[1]For example, 1600 is the same as 4:00 p.m.

Table 6.--Water-quality and other hydrologic data collected monthly, January to September 1980

[Measurements by U.S. Geological Survey; ft^3/s, cubic foot per second; °C, degree Celsius; specific conductance, in micromho per centimeter at 25° Celsius; mg/L, milligram per liter; $CaCO_3$, calcium carbonate; µg/L, microgram per liter; µg/g, microgram per gram; ac/ft, acre foot; t/day, ton per day; g/kg, gram per kilogram; mm, millimeter; N, nitrogen; P, phosphorus; PO_4, phosphate]

Site	Date of sampling	Time[1]	Streamflow, instantaneous (ft^3/s)	Temperature, water (°C)	Specific conductance	pH	Oxygen, dissolved (mg/L)	Sodium, dissolved (mg/L)	Potassium, dissolved (mg/L)	Calcium, dissolved (mg/L)	Magnesium, dissolved (mg/L)
4	1-23-80	1200	149	0.0	690	8.7	14.4	11	1.0	92	35
	2-27-80	1400	253	1.2	610	8.2	13.0	5.7	1.3	75	25
	3-25-80	1230	748	4.0	590	7.9	12.4	9.7	1.1	72	26
	4-21-80	1245	364	14.4	640	8.0	10.3	5.6	.9	79	28
	6-23-80	1730	258	20.6	640	8.1	8.6	7.4	1.5	78	29
	7-18-80	1200	34	25.8	640	8.0	8.7	8.2	2.1	71	31
	9-04-80	1530	24	24.4	591	8.3	10.6	9.7	2.6	70	36
20A	1-23-80	1630	.14	-.2	659	8.0	13.4	9.0	1.7	90	38
	2-27-80	1700	.50	1.1	530	8.1	12.3	5.5	2.0	74	28
	3-20-80	1230	3.0	7.6	650	8.0	--	6.5	2.2	80	32
	3-25-80	1400	.64	5.3	620	7.8	11.7	7.1	2.1	78	32
	4-21-80	1400	.62	21.0	610	7.8	8.3	5.8	2.2	78	31
	5-20-80	1330	.24	18.9	630	8.0	----	8.8	1.7	65	35
	6-17-80	0900	.14	14.5	580	8.2	10.4	7.8	2.1	79	34
	8-28-80	1030	.03	22.4	615	8.1	8.5	7.7	2.3	72	33
27	1-22-80	1030	1.6	----	960	8.0	----	29	2.6	120	51
	2-27-80	1100	2.1	2.0	920	8.1	12.1	25	3.4	100	39
	3-26-80	1030	3.3	4.9	920	8.2	11.9	30	3.5	110	42
	4-22-80	1030	4.3	17.4	740	8.0	11.3	27	3.0	90	38
	5-21-80	0830	1.5	15.1	1,080	7.8	--	54	3.2	92	51
	6-17-80	1430	1.7	24.8	897	8.3	10.2	49	4.4	85	40
	7-17-80	1150	.35	24.6	1,360	7.8	9.4	67	4.4	130	56
	8-28-80	1000	.62	20.1	1,380	7.7	7.6	74	4.7	140	62
27A	1-22-80	0900	.27	1.1	1,160	8.1	12.0	21	1.7	170	67
	2-27-80	1000	.57	.4	1,010	8.0	12.2	18	3.7	120	46
	3-26-80	0930	.59	4.0	1,070	7.9	11.9	25	3.2	130	52
	4-22-80	0930	1.7	15.8	940	7.8	9.9	32	2.7	100	41
	5-21-80	0930	.39	17.8	1,580	7.8	----	85	4.5	160	72
	6-20-80	1045	.19	21.5	1,980	8.0	9.1	140	6.2	150	81
	7-17-80	1045	.10	29.0	2,330	7.8	8.1	210	9.3	140	100
	8-28-80	0800	.16	22.6	2,440	7.7	7.8	210	8.9	180	110
32	3-25-80	1500	38	5.3	620	7.8	12.2	8.5	1.6	76	29
	5-20-80	1600	13	20.7	620	8.0	----	10	1.5	64	33
	6-17-80	1145	7.8	18.9	619	8.4	10.9	9.4	2.1	74	30
	7-17-80	1350	3.1	29.7	640	8.0	9.7	8.1	2.5	75	29
	8-27-80	1600	2.6	27.8	630	8.1	10.1	7.9	2.7	76	31
77	1-22-80	1330	31	3.0	193	7.8	12.4	5.3	1.0	30	8.4
	2-28-80	1200	39	1.3	210	8.0	12.6	4.1	1.1	26	6.6
	3-25-80	1800	76	5.5	180	7.2	12.0	4.9	1.2	23	6.2
	4-21-80	1700	17	18.0	220	7.4	9.5	4.2	1.1	28	7.3
	5-22-80	0930	14	17.1	260	7.6	----	6.3	.9	30	9.6
	6-18-80	1530	8.5	22.3	230	7.8	9.2	5.0	1.4	34	9.0
	7-15-80	1045	4.3	26.6	290	7.7	7.4	5.3	1.5	38	9.9
	9-4-80	1000	7.4	22.0	257	7.3	7.7	4.0	2.7	35	9.3

Table 6.--Water-quality and other hydrologic data collected monthly, January to September 1980--Continued

Site	Date of sampling	Chloride, dissolved (mg/L)	Fluoride, dissolved (mg/L)	Sulfate, dissolved (mg/L)	Silica, dissolved (mg/L)	Alkalinity as $CaCO_3$ (mg/L)	Acidity as $CaCO_3$ (mg/L)	Acidity total (mg/L)	Dissolved nitrate + nitrite, as N (mg/L)	Total orthophosphate as PO_4 (mg/L)	Total orthophosphate, as P (mg/L)
4	1-23-80	30	0.2	63	5.5	250	0.0	0.0	6.9	0.03	0.010
	2-27-80	22	.2	57	7.4	200	.0	.0	4.5	.18	.060
	3-25-80	27	.2	48	7.4	170	10	.2	9.7	.09	.030
	4-21-80	22	.2	66	4.8	200	----	---	9.7	.00	.000
	6-23-80	19	.3	60	7.3	220	----	---	9.0	.12	.040
	7-18-80	19	.2	71	6.1	240	----	---	1.7	.03	.010
	9-4-80	17	.2	73	6.7	210	----	---	.24	.03	.010
20A	1-23-80	6.9	.2	56	9.7	310	.0	.0	.31	.00	.000
	2-27-80	5.7	.2	60	8.6	280	.0	.0	.39	.06	.020
	3-20-80	5.9	.2	57	9.8	280	.0	.0	.71	.00	.000
	3-25-80	6.1	.2	54	10	270	5.0	.1	.70	.03	.010
	4-21-80	4.6	.2	67	10	270	----	---	.18	.03	.010
	5-20-80	4.8	.2	53	10	270	----	---	.29	.00	.000
	6-17-80	5.0	.3	41	11	280	----	---	.78	.00	.000
	8-28-80	4.4	.3	39	14	240	----	---	.21	.00	.000
27	1-22-80	20	.2	220	6.6	260	.0	.0	1.9	.03	.010
	2-27-80	16	.2	200	6.6	250	.0	.0	1.8	.03	.010
	3-26-80	18	.2	230	4.9	230	5.0	.1	2.1	.00	.000
	4-22-80	15	.2	200	3.4	210	----	---	1.8	.00	.000
	5-21-80	19	.2	290	5.1	270	----	---	.86	.00	.000
	6-17-80	17	.3	230	5.5	190	----	---	.92	.03	.010
	7-17-80	29	.2	400	8.6	320	----	---	.08	.00	.000
	8-28-80	27	.3	410	11	270	----	---	.43	.00	.000
27A	1-22-80	11	.2	380	6.4	280	.0	.0	3.0	.00	.000
	2-27-80	8.1	.2	330	4.5	200	.0	.0	2.8	.00	.000
	3-26-80	8.2	.2	400	3.5	200	10	.2	3.1	.00	.000
	4-22-80	13	.2	250	2.2	210	----	---	3.4	.00	.000
	5-21-80	14	.2	600	2.7	240	----	---	2.5	.00	.000
	6-20-80	19	.3	670	3.4	260	----	---	1.4	.00	.000
	7-17-80	31	.2	1,000	4.3	230	----	---	.04	.03	.010
	8-28-80	34	.3	1,000	5.7	250	----	---	.02	.03	.010
32	3-25-80	18	.2	47	8.1	250	10	.2	4.0	.03	.010
	5-20-80	14	.2	48	5.2	240	----	---	2.6	.00	.000
	6-17-80	14	.2	42	6.9	240	----	---	1.9	.06	.020
	7-17-80	13	.2	47	9.6	270	----	---	.45	.15	.050
	8-27-80	12	.2	43	10	260	----	---	.38	.09	.030
77	1-22-80	4.5	.1	24	12	82	.0	.0	.82	.00	.000
	2-28-80	5.5	.1	27	9.5	71	.0	.0	1.0	.06	.020
	3-25-80	3.8	.1	27	11	54	5.0	.1	.89	.00	.000
	4-21-80	3.6	.1	26	10	77	----	---	.54	.03	.010
	5-22-80	3.9	.1	20	11	110	----	---	.97	.00	.000
	6-18-80	4.2	.1	13	11	110	----	---	.63	.06	.020
	7-15-80	5.0	.1	13	11	130	----	---	2.7	.06	.020
	9-4-80	4.3	.1	13	14	100	----	---	.62	.12	.040

Table 6.--Water-quality and other hydrologic data collected monthly, January to September 1980--Continued

Site	Date of sampling	Organic carbon, dissolved (mg/L)	Organic carbon, suspended (mg/L)	Organic carbon, total (mg/L)	Hardness, noncarbonate as $CaCO_3$ (mg/L)	Hardness as $CaCO_3$ (mg/L)	Aluminum, dissolved (µg/L)	Aluminum, suspended recoverable (µg/L)	Aluminum, total recoverable (µg/L)	Iron, dissolved (µg/L)	Iron, suspended recoverable (µg/L)
4	1-23-80	----	---	---	120	370	40	0	40	40	110
	2-27-80	3.0	.5	---	90	290	40	360	400	10	630
	3-25-80	2.9	2.1	---	120	290	40	1,800	1,800	0	2,300
	4-21-80	3.5	.5	---	110	310	40	460	500	10	790
	6-23-80	5.2	1.6	---	94	310	70	2,700	2,800	10	3,700
	7-18-80	2.8	.5	---	65	310	40	140	180	10	450
	9-4-80	3.1	.7	---	110	320	30	370	400	20	550
20A	1-23-80	----	---	---	71	380	30	0	30	20	170
	2-27-80	2.3	.2	---	20	300	50	150	200	20	550
	3-20-80	3.7	.1	---	52	330	20	180	200	10	310
	3-25-80	3.2	.3	---	57	330	30	270	300	30	220
	4-21-80	3.6	.2	---	52	320	40	60	100	40	200
	5-20-80	4.9	.3	---	36	310	40	160	200	40	140
	6-17-80	3.2	.1	---	57	340	50	250	300	20	320
	8-28-80	2.2	.9	---	76	320	330	0	200	10	320
27	1-22-80	----	---	---	250	510	30	110	140	30	420
	2-27-80	5.5	.2	---	160	410	40	460	500	10	890
	3-26-80	6.7	1.5	---	220	450	30	370	400	10	640
	4-22-80	11	.8	---	170	380	50	150	200	20	850
	5-21-80	5.7	.8	---	170	440	30	570	600	10	1,100
	6-17-80	6.6	.5	---	190	380	200	300	500	10	740
	7-17-80	5.5	.5	---	240	560	20	80	100	30	320
	8-28-80	2.4	1.2	---	340	610	30	370	400	10	680
27A	1-22-80	----	---	---	420	700	0	30	30	50	440
	2-27-80	6.9	.2	---	290	490	20	180	200	50	270
	3-26-80	6.1	.4	---	340	540	20	180	200	40	330
	4-22-80	4.3	.3	---	210	420	30	170	200	10	540
	5-21-80	9.7	.2	---	460	700	10	190	200	30	340
	6-20-80	8.2	.2	---	450	710	60	50	110	10	330
	7-17-80	3.9	.3	---	530	760	20	10	30	40	270
	8-28-80	2.3	1.2	---	650	900	30	170	200	40	330
32	3-25-80	3.3	.5	---	59	310	20	380	400	1	320
	5-20-80	3.1	.4	---	56	300	20	180	200	20	140
	6-17-80	2.1	.0	---	68	310	100	200	300	30	180
	7-17-80	2.4	.3	---	37	310	20	60	80	20	330
	8-27-80	2.1	.9	---	57	320	30	170	200	10	330
77	1-22-80	----	---	---	28	110	0	0	0	10	670
	2-28-80	2.5	.3	---	21	92	30	270	300	20	680
	3-25-80	2.7	.8	---	29	83	40	560	600	20	840
	4-21-80	3.2	.3	---	23	100	40	260	300	20	750
	5-22-80	3.2	.2	---	4	110	30	270	300	40	690
	6-18-80	3.0	.3	---	12	120	70	430	500	50	820
	7-15-80	4.7	.3	---	6	140	20	20	40	20	590
	9-4-80	4.5	.5	---	26	130	40	1,400	1,400	90	1,400

Table 6.--Water-quality and other hydrologic data collected monthly, January to September 1980--Continued

Site	Date of sampling	Iron, total recoverable (µg/L)	Manganese, dissolved (µg/L)	Manganese, suspended recoverable (µg/L)	Manganese, total recoverable (µg/L)	Solids, residue at 180° C dissolved (mg/L)	Solids, sum of constituents, dissolved (mg/L)	Solids, dissolved (tons/day)	Solids, dissolved (tons/ac-ft)	Sediment, suspended (mg/L)
4	1-23-80	150	20	10	30	425	419	171	0.58	85
	2-27-80	640	20	20	40	380	334	260	.52	132
	3-25-80	2,300	7	80	90	352	337	711	.48	104
	4-21-80	800	9	20	30	390	370	383	.53	70
	6-23-80	3,700	8	110	120	409	375	285	.56	204
	7-18-80	460	20	20	40	270	360	25.1	.37	28
	9-4-80	570	10	40	50	360	343	23.6	.49	50
20A	1-23-80	190	110	0	110	415	399	.16	.56	88
	2-27-80	570	90	20	110	375	354	.51	.51	179
	3-20-80	320	90	10	100	384	365	3.1	.52	---
	3-25-80	250	90	10	100	369	355	.64	.50	60
	4-21-80	240	100	0	70	324	362	.54	.44	40
	5-20-80	180	60	20	80	321	342	.21	.44	31
	6-17-80	340	110	20	130	346	352	.13	.47	109
	8-28-80	330	70	20	90	318	318	.03	.43	48
27	1-22-80	450	480	10	490	342	615	1.5	.47	89
	2-27-80	900	470	0	450	604	549	3.5	.82	179
	3-26-80	650	340	20	360	596	587	5.3	.81	59
	4-22-80	870	210	0	200	511	511	5.9	.70	123
	5-21-80	1,100	310	0	280	701	681	2.8	.95	148
	6-17-80	750	120	70	190	582	550	2.6	.79	112
	7-17-80	350	290	10	300	847	888	.79	1.2	349
	8-28-80	690	490	20	510	1,000	894	1.7	1.4	153
27A	1-22-80	490	480	0	420	916	839	.67	1.3	37
	2-27-80	320	350	0	330	702	664	1.1	.95	200
	3-26-80	370	320	0	320	785	757	1.3	1.1	58
	4-22-80	550	200	0	160	603	583	2.7	.82	81
	5-21-80	370	240	60	300	1,160	1,090	1.2	1.6	89
	6-20-80	340	270	80	350	1,400	1,230	.71	1.9	163
	7-17-80	310	90	10	100	1,950	1,630	.53	2.7	155
	8-28-80	370	310	10	320	1,950	1,700	.84	2.7	154
32	3-25-80	320	20	20	40	385	357	39.8	.52	45
	5-20-80	160	10	20	30	348	332	12.0	.47	44
	6-17-80	210	20	10	30	318	331	6.7	.43	50
	7-17-80	350	40	10	50	364	349	3.1	.50	50
	8-27-80	340	30	40	70	354	341	2.5	.48	24
77	1-22-80	680	120	0	120	145	138	12.3	.20	16
	2-28-80	700	90	0	90	144	127	15.0	.20	50
	3-25-80	860	40	30	70	124	114	25.6	.17	35
	4-21-80	770	60	10	70	129	129	5.89	.18	23
	5-22-80	730	80	40	120	147	152	5.4	.20	21
	6-18-80	870	70	20	90	139	147	3.2	.19	29
	7-15-80	610	120	30	150	180	174	2.1	.24	21
	9-4-80	1,500	110	70	180	164	146	3.28	.22	58

Table 6.--Water-quality and other hydrologic data collected monthly, January to September 1980--Continued

Site	Date of sampling	Sediment suspended (sieve diam. finer than 0.062 mm)	Sediment discharge, suspended (t/day)	Coal in streambed material (gm/kg)
4	1-23-80	--	34	----
	2-27-80	97	90	----
	3-25-80	96	210	----
	4-21-80	91	69	----
	6-23-80	97	142	----
	7-18-80	91	2.6	----
	9-4-80	90	3.3	----
20A	1-23-80	--	.03	----
	2-27-80	60	.24	----
	3-20-80	--	--	----
	3-25-80	46	.10	----
	4-21-80	85	.07	----
	5-20-80	86	.02	----
	6-17-80	91	.04	----
	8-28-80	73	.00	----
27	1-22-80	--	.38	----
	2-27-80	93	1.0	----
	3-26-80	90	.52	3.00
	4-22-80	99	1.4	----
	5-21-80	96	.58	----
	6-17-80	98	.51	----
	7-17-80	36	.33	----
	8-28-80	96	.26	----
27A	1-22-80	--	.03	----
	2-27-80	97	.31	----
	3-26-80	83	.09	1.00
	4-22-80	98	.36	----
	5-21-80	94	.09	----
	6-20-80	99	.08	----
	7-17-80	90	.04	----
	8-28-80	97	.07	----
32	3-25-80	71	4.7	.90
	5-20-80	91	1.5	----
	6-17-80	89	1.1	----
	7-17-80	92	.42	----
	8-27-80	0	.17	----
77	1-22-80	--	1.4	----
	2-28-80	99	5.2	----
	3-25-80	94	7.2	5.00
	4-21-80	93	1.0	----
	5-22-80	84	.77	----
	6-18-80	98	.67	----
	7-15-80	99	.25	----
	9-4-80	94	1.2	----

Table 6.--Water-quality and other hydrologic data collected monthly, January to September 1980--Continued

Site	Date of sampling	Time	Stream-flow, instan-taneous (ft^3/s)	Temper-ature, water (°C)	Spe-cific con-duct-ance	pH	Oxygen, dis-solved (mg/L)	Sodium, dis-solved (mg/L)	Potas-sium, dis-solved (mg/L)	Calcium, dis-solved (mg/L)	Mag-nesium, dis-solved (mg/L)
112A	1-24-80	1030	5.2	0.6	2,230	6.6	6.6	65	3.5	150	150
	2-26-80	1600	7.1	1.3	1,950	5.4	12.4	39	3.2	170	100
	3-27-80	1100	13	8.2	1,760	4.8	10.6	41	2.9	160	97
	4-23-80	1030	8.8	17.5	2,200	5.6	8.9	47	3.7	240	230
	5-22-80	2200	4.2	20.2	2,530	6.0	----	73	3.4	250	180
	6-19-80	0930	1.6	18.1	3,100	5.6	9.1	100	4.6	230	200
	7-16-80	1250	1.3	29.2	2,830	6.0	7.2	120	5.0	220	220
	8-14-80	0900	1.3	22.5	2,670	6.3	7.7	130	4.7	-----	-----
243A	1-29-80	1030	1.6	.0	783	8.1	12.7	32	1.7	63	26
	2-26-80	0930	4.3	.2	570	7.1	12.0	21	2.2	56	20
	3-27-80	1400	5.9	10.8	530	7.2	9.9	26	2.8	52	20
	4-23-80	1730	1.9	22.3	520	8.6	14.9	26	2.5	50	22
	5-29-80	0830	.75	19.2	575	7.7	----	32	1.6	57	23
	5-29-80	1630	.75	24.9	520	8.6	----	32	1.7	51	22
	6-?-80	1200	.82	23.9	460	8.3	----	26	3.2	46	17
	6-25-80	1430	2.4	24.1	500	7.6	7.4	19	5.7	54	17
	7-15-80	1600	.45	34.1	525	8.8	17.9	30	2.7	47	21
	8-13-80	1330	.13	27.3	612	8.0	8.4	28	4.5	-----	-----
275C	1-29-80	1700	.04	.6	60	7.1	12.0	3.4	.6	5.4	3.3
	2-25-80	1200	.14	2.9	60	7.3	12.3	2.6	.5	4.7	2.7
	4-23-80	1530	.07	18.3	70	7.3	8.1	2.9	.8	5.4	3.1
	6-24-80	1800	.04	18.0	40	6.6	6.0	3.9	1.1	6.8	3.7
	8-12-80	0900	.03	21.3	145	6.3	3.4	5.8	1.5	-----	-----
301A	1-21-80	1400	.23	.0	610	8.0	14.2	13	1.3	80	29
	2-27-80	1530	.62	.5	650	8.4	12.5	21	1.7	71	25
	3-25-80	1000	.62	3.3	630	8.0	12.6	18	1.5	79	27
	4-21-80	1100	.63	15.4	620	7.8	9.8	13	1.5	78	26
	5-20-80	1030	.25	14.3	630	7.9	----	19	1.3	66	30
	6-18-80	1100	.18	15.4	620	8.2	10.2	16	1.7	73	29
	7-17-80	1715	.02	26.0	460	8.0	6.8	14	2.0	56	25
	8-27-80	1000	.03	19.9	590	8.0	8.4	14	1.9	62	27
401	1-21-80	1030	.34	1.9	2,600	7.8	12.5	91	6.3	270	210
	2-27-80	1200	.77	1.1	2,150	7.7	12.4	63	5.1	190	190
	3-26-80	1130	.77	5.6	1,800	7.6	11.1	79	5.3	220	170
	4-22-80	1100	.69	17.8	2,460	7.4	9.1	75	5.5	250	190
	5-21-80	1100	.31	----	2,660	7.5	----	84	4.3	270	220
	6-17-80	1200	.18	18.8	2,450	7.2	8.0	78	4.8	230	200
	7-17-80	1250	.04	23.7	3,470	7.2	6.8	75	7.7	350	260
	8-27-80	1700	.05	25.1	3,130	7.0	6.3	88	8.2	310	240
407A	1-25-80	1200	1.3	1.2	1,550	7.7	12.9	74	6.1	160	81
	2-28-80	1100	1.9	1.9	1,110	7.4	11.9	45	5.4	100	48
	3-25-80	1700	2.6	6.4	860	6.7	11.4	30	5.1	79	36
	4-21-80	1800	.55	25.4	1,440	7.8	10.5	57	6.2	130	64
	6-20-80	1315	.35	24.7	3,040	8.2	14.2	170	11	250	200
	7-16-80	1630	.08	10.0	2,950	7.9	10.0	200	11	220	170
	8-28-80	1630	.13	29.1	4,320	7.8	7.4	540	18	220	130

Table 6.--Water-quality and other hydrologic data collected monthly, January to September 1980--Continued

Site	Date of sampling	Chloride, dissolved (mg/L)	Fluoride, dissolved (mg/L)	Sulfate, dissolved (mg/L)	Silica, dissolved (mg/L)	Alkalinity as $CaCO_3$ (mg/L)	Acidity as $CaCO_3$ (mg/L)	Acidity total (mg/L)	Dissolved nitrate + nitrate, as N (mg/L)	Total orthophosphate, as PO_4 (mg/L)	Total orthophosphate as P (mg/L)
112A	1-24-80	5.9	0.4	1,300	15	130	0.0	0.0	0.14	0.00	0.000
	2-26-80	4.6	.5	1,000	14	1	194	3.9	.21	.00	.000
	3-27-80	4.2	.5	940	15	0	89	1.8	.01	.00	.000
	4-23-80	4.4	.4	1,300	17	0	109	2.2	.09	.00	.000
	5-22-80	4.4	.4	1,500	16	1	60	1.2	.14	.00	.000
	6-19-80	6.2	.5	1,700	17	2	99	2.0	.28	.00	.000
	7-16-80	9.8	.5	1,800	19	10	129	2.6	.25	.00	.000
	8-14-80	8.2	.5	1,700	21	1	25	.5	.26	.00	.000
243A	1-29-80	17	.3	69	14	220	.0	.0	1.8	.06	.020
	2-26-80	22	.2	66	12	180	.0	.0	2.7	.21	.070
	3-27-80	19	.2	63	11	150	15	.3	3.3	.18	.060
	4-23-80	17	.3	63	7.4	170	-----	---	2.0	.18	.060
	5-29-80	17	.3	56	9.7	220	-----	---	2.0	.21	.070
	5-29-80	17	.3	56	9.2	190	-----	---	1.8	.25	.080
	6-2-80	15	.4	37	8.3	170	-----	---	1.1	.21	.070
	6-25-80	24	.3	60	11	110	-----	---	14	.37	.120
	7-15-80	14	.3	58	4.3	190	-----	---	.36	.25	.080
	8-13-80	12	.4	58	5.9	200	15	.3	.34	.43	.140
275C	1-29-80	1.4	.0	24	12	26	.0	.0	.06	.00	.000
	2-25-80	1.2	.1	20	12	13	.0	.0	.07	.09	.030
	4-23-80	1.1	.1	23	13	13	-----	---	.13	.06	.020
	6-24-80	1.6	.1	21	13	15	.0	.0	.14	.03	.010
	8-12-80	1.3	.1	23	17	47	10	.2	.34	.09	.030
301A	1-21-80	19	.2	45	7.7	260	.0	.0	.02	.03	.010
	2-27-80	35	.2	40	8.6	260	.0	.0	.23	.03	.010
	3-25-80	27	.2	39	9.5	240	10	.2	.35	.00	.000
	4-21-80	20	.2	48	9.5	250	-----	---	.06	.03	.010
	5-20-80	20	.2	40	11	260	-----	---	.21	.00	.000
	6-18-80	19	.2	31	11	260	-----	---	.31	.03	.010
	7-17-80	17	.2	37	12	230	-----	---	.21	.00	.000
	8-27-80	19	.2	35	13	230	-----	---	.16	.03	.010
401	1-21-80	11	.2	1,500	4.1	180	.0	.0	.12	.00	.000
	2-27-80	7.4	.2	1,100	3.5	140	.0	.0	.12	.00	.000
	3-26-80	6.8	.2	1,200	2.8	170	10	.2	.12	.00	.000
	4-22-80	7.0	.2	1,300	3.0	180	-----	---	.08	.00	.000
	5-21-80	7.8	.2	1,500	3.6	170	-----	---	.05	.06	.020
	6-17-80	9.4	.2	1,500	4.3	160	-----	---	.09	.00	.000
	7-17-80	22	.3	2,100	11	230	-----	---	.11	.00	.000
	8-27-80	29	.3	1,800	9.7	170	25	.5	.07	.06	.020
407A	1-25-80	15	.3	710	6.2	140	.0	.0	1.8	.00	.000
	2-28-80	13	.3	420	5.8	76	.0	.0	4.6	.00	.000
	3-25-80	11	.2	320	6.2	33	25	.5	9.7	.03	.010
	4-21-80	14	.3	540	3.4	68	-----	---	21	.03	.010
	6-20-80	8.8	.5	1,700	4.6	170	-----	---	9.5	.15	.050
	7-16-80	16	.5	1,600	4.1	170	-----	---	8.5	.00	.000
	8-28-80	22	.3	2,200	5.9	9	-----	---	24	.00	.000

Table 6.--Water-quality and other hydrologic data collected monthly, January to September 1980--Continued

Site	Date of sampling	Organic carbon, dissolved (mg/L)	Organic carbon, suspended (mg/L)	Organic carbon, total (mg/L)	Hardness, noncarbonate as $CaCO_3$ (mg/L)	Hardness as $CaCO_3$ (mg/L)	Aluminum, dissolved (µg/L)	Aluminum, suspended recoverable (µg/L)	Aluminum, total recoverable (µg/L)	Iron, dissolved (µg/L)	Iron, suspended recoverable (µg/L)
112A	1-24-80	----	----	---	860	990	100	7,500	7,600	26,000	1,000
	2-26-80	2.9	1.0	---	840	840	9,700	5,300	15,000	68,000	0
	3-27-80	----	----	3.9	800	800	5,800	3,400	9,200	39,000	9,000
	4-23-80	4.0	----	---	1,500	1,500	20	7,100	7,100	26,000	9,000
	5-22-80	----	----	---	1,400	1,400	200	5,400	5,600	18,000	5,000
	6-19-80	6.7	.4	---	1,400	1,400	100	9,900	10,000	23,000	17,000
	7-16-80	14	.5	---	1,400	1,500	0	6,500	6,500	29,000	4,000
	8-14-80	2.1	.8	---	-----	-----	200	15,000	15,000	44,000	6,000
243A	1-29-80	----	----	---	44	260	30	270	300	20	480
	2-26-80	7.7	.4	---	42	220	40	460	500	10	770
	3-27-80	----	----	4.7	62	210	40	960	1,000	10	990
	4-23-80	7.7	.4	---	45	220	60	240	300	20	500
	5-29-80	4.2	.1	---	17	240	200	100	300	40	330
	5-29-80	----	----	5.7	28	220	200	600	800	40	1,100
	6-2-80	----	----	6.8	15	180	30	100	130	40	470
	6-25-80	5.8	.2	---	95	200	70	1,600	1,700	50	1,900
	7-15-80	4.7	3.0	---	14	200	60	340	400	20	420
	8-13-80	4.6	.4	---	-----	-----	30	370	400	10	750
275C	1-29-80	----	----	---	1	27	30	70	100	20	70
	2-25-80	6.0	.4	---	10	23	40	160	200	20	140
	4-23-80	2.7	.4	---	13	26	50	150	200	30	240
	6-24-80	20	.3	---	17	32	60	240	300	70	300
	8-12-80	2.4	.6	---	--	--	30	70	100	50	570
301A	1-21-80	----	----	---	59	320	0	20	20	20	10
	2-27-80	3.9	.2	---	20	280	20	180	200	10	90
	3-25-80	4.2	.4	---	68	310	30	270	300	0	70
	4-21-80	2.0	.2	---	52	300	40	60	100	20	90
	5-20-80	2.5	.4	---	28	290	30	270	300	10	60
	6-18-80	3.2	.0	---	42	300	30	70	100	90	110
	7-17-80	2.2	.2	---	13	240	20	0	10	10	220
	8-27-80	1.4	.8	---	36	270	10	390	400	20	860
401	1-21-80	----	----	---	1,400	1,500	0	60	60	1,200	700
	2-27-80	3.3	.3	---	1,100	1,300	60	240	300	690	510
	3-26-80	2.2	.3	---	1,100	1,300	60	440	500	370	1,200
	4-22-80	2.0	.2	---	1,200	1,400	90	110	200	250	600
	5-21-80	6.4	.1	---	1,400	1,600	200	0	200	270	730
	6-17-80	7.8	1.9	---	1,200	1,400	90	210	300	250	1,500
	7-17-80	13	.4	---	1,700	1,900	30	370	400	380	14,000
	8-27-80	2.2	1.6	---	1,600	1,800	50	250	300	450	3,100
407A	1-25-80	----	----	---	590	730	0	20	20	610	1,600
	2-28-80	4.0	.4	---	370	450	200	100	300	4,300	1,800
	3-25-80	6.2	1.7	---	310	350	30	1,800	1,800	2,500	5,700
	4-21-80	2.6	.4	---	520	590	50	150	200	20	520
	6-20-80	6.1	----	---	1,300	1,400	100	300	400	60	880
	7-16-80	3.2	.3	---	1,100	1,300	40	20	60	140	340
	8-28-80	1.6	.8	---	1,100	1,100	70	230	300	30	820

Table 6.--Water-quality and other hydrologic data collected monthly, January to September 1980--Continued

Site	Date of sampling	Iron, total recoverable (µg/L)	Manganese, dissolved (µg/L)	Manganese, suspended recoverable (µg/L)	Manganese, total recoverable (µg/L)	Solids, residue at 180° C dissolved (mg/L)	Solids, sum of constituents, dissolved (mg/L)	Solids, dissolved (tons/day)	Solids, dissolved (tons/ac-ft)	Sediment, suspended (mg/L)
112A	1-24-80	27,000	10,000	0	10,000	2,050	1,800	29.0	2.79	130
	2-26-80	30,000	9,700	0	8,600	1,860	1,420	35.9	2.53	624
	3-27-80	48,000	6,100	100	6,200	1,560	1,310	53.5	2.12	197
	4-23-80	35,000	7,400	200	7,600	1,980	1,880	47.2	2.69	194
	5-22-80	23,000	7,900	300	8,200	2,350	2,060	26.3	3.20	356
	6-19-80	40,000	12,000	2,000	14,000	2,660	2,300	11.8	3.62	367
	7-16-80	33,000	15,000	0	10,000	2,720	2,450	9.84	3.70	284
	8-14-80	50,000	9,500	500	10,000	2,510	6,080	8.88	3.41	220
243A	1-29-80	500	380	20	400	365	364	1.61	.50	111
	2-26-80	780	420	10	430	355	329	4.16	.48	144
	3-27-80	1,000	320	40	360	319	299	5.06	.43	50
	5-29-80	370	80	20	100	338	338	.69	.46	56
	5-29-80	1,100	50	40	90	311	312	.63	.42	102
	6-2-80	510	10	60	70	264	260	.58	.36	---
	6-25-80	1,900	210	60	270	337	319	2.15	.46	56
	7-15-80	440	129	40	160	287	293	.35	.39	62
	8-13-80	760	400	30	430	338	111	.12	.46	57
275C	1-29-80	90	20	10	30	58	66	.01	.08	4
	2-25-80	160	20	0	10	54	52	.02	.07	33
	4-23-80	270	10	0	10	61	58	.01	.08	18
	6-24-80	370	20	0	20	60	61	.01	.08	9
	8-12-80	620	360	20	380	94	51	.01	.13	48
301A	1-21-80	30	6	4	10	358	352	.22	.49	15
	2-27-80	100	3	7	10	368	360	.62	.50	104
	3-25-80	70	6	4	10	384	347	.64	.52	26
	4-21-80	110	10	0	10	336	347	.57	.46	33
	5-20-80	70	4	6	10	342	345	.23	.47	26
	6-18-80	200	7	3	10	320	339	.16	.44	24
	7-17-80	230	3	7	10	304	302	.02	.41	44
	8-27-80	880	10	50	60	339	311	.03	.46	6
401	1-21-80	1,900	490	0	460	4,530	2,200	4.16	6.16	43
	2-27-80	1,200	370	0	350	1,860	1,650	3.87	2.53	581
	3-26-80	1,600	310	20	330	2,000	1,790	4.16	2.72	76
	4-22-80	850	240	10	250	2,200	1,940	4.10	2.99	96
	5-21-80	1,000	290	50	340	2,470	2,190	2.07	3.36	254
	6-17-80	1,700	490	30	520	2,410	2,120	1.19	3.28	298
	7-17-80	14,000	1,900	900	2,800	3,390	2,970	.36	4.61	477
	8-27-80	3,500	1,800	0	1,700	2,940	2,590	.40	4.00	137
407A	1-25-80	2,200	2,100	0	1,900	1,270	1,150	4.39	1.73	46
	2-28-80	6,100	1,400	0	1,300	802	709	4.18	1.09	260
	3-25-80	8,200	1,200	0	1,200	605	555	4.26	.82	79
	4-21-80	540	1,100	0	840	1,020	950	1.51	1.39	58
	6-20-80	940	2,000	600	2,600	2,680	2,490	2.53	3.64	206
	7-16-80	480	810	120	930	2,700	2,360	.58	3.67	210
	8-28-80	850	1,800	0	1,800	3,590	3,250	1.26	4.88	258

Table 6.--Water-quality and other hydrologic data collected monthly, January to September 1980--Continued

Site	Date of sampling	Sediment suspended (sieve diam. finer than 0.062 mm)	Sediment discharge, suspended (t/day)	Coal in streambed material (gm/kg)
112A	1-24-80	---	1.8	-----
	2-26-80	96	12	-----
	3-27-80	99	6.8	57.0
	4-23-80	99	4.7	-----
	5-22-80	82	4.0	-----
	6-19-80	100	1.6	-----
	7-16-80	83	1.0	-----
	8-14-80	96	.78	-----
243A	1-29-80	---	.49	-----
	2-26-80	98	1.7	-----
	3-27-80	98	.79	-----
	4-23-80	76	.35	-----
	5-29-80	92	.11	-----
	5-29-80	98	.21	-----
	6-02-80	---	-----	-----
	6-25-80	99	.53	-----
	7-15-80	98	.07	-----
	8-13-80	85	.02	-----
275C	1-29-80	---	.00	-----
	2-25-80	89	.01	-----
	4-23-80	86	.00	-----
	6-24-80	100	.00	-----
	8-12-80	86	.00	-----
301A	1-21-80	--	.01	-----
	2-27-80	93	.17	-----
	3-25-80	80	.04	-----
	4-21-80	97	.06	-----
	5-20-80	88	.02	-----
	6-18-80	98	.01	-----
	7-17-80	97	.00	-----
	8-27-80	--	.00	-----
401	1-21-80	--	.04	-----
	2-27-80	99	1.2	-----
	3-26-80	90	.16	73.0
	4-22-80	98	.18	-----
	5-21-80	99	.21	-----
	6-17-80	100	.15	-----
	7-17-80	64	.05	-----
	8-27-80	98	.02	-----
407A	1-25-80	--	.16	-----
	2-28-80	86	1.4	-----
	3-25-80	95	.56	8.00
	4-21-80	98	.09	-----
	6-20-80	98	.19	-----
	7-16-80	95	.05	-----
	8-28-80	100	.09	-----

Table 6.--Water-quality and other hydrologic data collected monthly, January to September 1980--Continued

Site	Date of sampling	Time	Stream-flow, instan-taneous (ft^3/s)	Temper-ature, water (°C)	Spe-cific con-duct-ance	pH	Oxygen, dis-solved (mg/L)	Sodium, dis-solved (mg/L)	Potas-sium, dis-solved (mg/L)	Calcium, dis-solved (mg/L)	Mag-nesium, dis-solved (mg/L)
415	2-28-80	1700	2.0	4.1	1,240	7.9	12.2	16	3.7	110	85
	3-26-80	1630	4.3	7.7	1,230	7.7	10.8	19	4.0	110	92
	4-22-80	1500	2.2	23.6	1,490	7.5	9.6	17	4.0	130	120
	5-21-80	1800	1.0	23.1	1,710	7.5	----	23	3.3	120	140
	6-18-80	1615	1.1	25.7	1,910	7.7	7.7	23	4.4	150	170
	7-15-80	1530	1.1	32.0	1,980	7.4	6.6	19	4.6	160	160
	8-28-80	1730	1.3	26.1	2,080	7.4	6.9	20	4.8	180	190
415A	2-28-80	1320	2.4	4.9	1,320	7.9	11.9	18	3.7	110	95
	3-26-80	1600	5.0	7.8	1,310	7.8	10.6	19	4.0	110	96
	4-22-80	1430	2.9	23.3	1,660	7.7	9.6	17	4.1	150	130
	5-21-80	1700	1.2	----	1,670	7.9	----	24	3.3	120	140
	6-18-80	1720	1.2	23.6	1,949	7.9	7.0	23	4.7	160	170
	7-15-80	1810	.77	30.2	1,870	7.7	5.9	18	5.2	160	150
	8-28-80	1800	.81	25.7	2,060	7.7	6.8	20	5.1	190	190
415B	2-28-80	1500	4.8	3.0	970	7.7	12.2	15	3.4	92	65
	3-26-80	1500	6.4	8.8	1,120	7.6	11.2	19	3.6	100	82
	4-22-80	1330	3.0	20.2	1,450	8.0	12.0	18	3.7	130	120
	5-21-80	1600	1.3	21.8	1,670	7.9	----	24	3.2	130	140
	6-18-80	1815	1.1	23.8	1,775	8.1	7.7	25	4.3	160	170
	7-15-80	1945	1.0	30.5	1,880	8.0	6.8	20	4.9	150	160
	8-28-80	1900	.87	26.3	2,100	7.9	6.9	20	5.1	180	200
417	1-24-80	1230	3.2	2.0	2,640	8.0	12.2	190	6.9	180	150
	2-26-80	1700	1.8	12.1	1,070	7.5	12.1	140	5.1	170	88
	3-27-80	0930	7.3	6.6	2,200	7.6	11.6	150	6.0	170	150
	4-23-80	1130	5.6	19.1	2,550	7.7	10.7	160	6.4	230	220
	5-22-80	1800	2.4	24.0	2,770	7.6	----	190	6.1	250	180
	6-19-80	1230	2.1	23.5	3,300	7.8	8.8	220	7.4	220	210
	7-16-80	0945	1.3	26.9	3,030	7.5	5.4	210	8.2	220	200
	7-17-80	0900	1.5	25.4	3,050	7.6	----	---	--	---	---
	8-14-80	1045	1.7	23.7	3,110	7.6	5.5	230	7.1	---	---
450	1-31-80	1245	.49	2.0	2,270	7.3	12.4	29	5.2	190	180
	2-26-80	1100	.73	.4	1,700	8.2	12.6	20	3.8	170	110
	3-27-80	1600	2.4	12.7	2,010	7.5	11.4	25	4.7	190	200
	4-24-80	1030	.69	18.6	2,270	7.7	10.4	28	5.0	260	190
	5-28-80	1600	.46	28.7	1,725	8.3	----	28	4.2	170	100
	6-25-80	1000	1.3	24.4	2,190	7.7	8.2	27	5.0	210	170
	7-16-80	1245	.44	32.4	1,970	8.3	8.7	---	---	---	---
	8-13-80	1100	.04	24.8	2,370	7.8	7.3	32	5.2	---	---
456	1-30-80	1130	.97	-.1	1,555	6.1	12.4	43	3.4	110	120
	2-26-80	1300	2.4	12.7	1,220	6.1	12.7	24	2.3	85	77
	3-27-80	1700	5.3	13.3	1,240	5.9	9.7	31	2.5	83	87
	4-24-80	1200	2.0	18.0	1,520	6.6	9.0	33	3.0	110	120
	5-28-80	1330	3.9	25.0	1,420	6.9	----	46	3.5	110	110
	6-25-80	1130	1.2	23.8	1,710	6.7	8.4	56	3.4	110	130
	7-15-80	1400	.16	30.8	1,765	3.8	6.3	45	4.1	110	130
	8-12-80	1415	.02	24.9	1,926	4.1	7.4	55	5.2	---	---

Table 6.--Water-quality and other hydrologic data collected monthly from January through September 1980--Continued

Site	Date of sampling	Chloride, dissolved (mg/L)	Fluoride, dissolved (mg/L)	Sulfate, dissolved (mg/L)	Silica, dissolved (mg/L)	Alkalinity as $CaCO_3$ (mg/L)	Acidity as $CaCO_3$ (mg/L)	Acidity total (mg/L)	Dissolved nitrate + nitrite, as N (mg/L)	Total orthophosphate as PO_4 (mg/L)	Total orthophosphate as P (mg/L)
415	2-28-80	10	.2	530	6.3	140	0.0	0.0	0.55	0.00	0.000
	3-26-80	9.8	.2	490	6.2	130	10	.2	.21	.00	.000
	4-22-80	8.1	.2	700	4.4	140	----	---	.17	.00	.000
	5-21-80	7.7	.3	820	5.4	160	----	---	.10	.00	.000
	6-18-80	7.3	.3	940	5.3	160	----	---	.13	.00	.000
	7-15-80	11	.3	970	6.9	160	----	---	.20	.00	.000
	8-28-80	7.3	.3	1,100	11	180	----	---	.37	.00	.000
415A	2-28-80	9.4	.2	530	6.6	150	.0	.0	.35	.00	.000
	3-26-80	9.9	.2	530	6.2	140	15	.3	.55	.00	.000
	4-22-80	7.6	.3	790	4.4	160	----	---	.18	.00	.000
	5-21-80	7.6	.3	830	5.5	160	----	---	.15	.00	.000
	6-18-80	7.5	.3	970	5.6	170	----	---	.19	.00	.000
	7-15-80	9.3	.3	970	6.6	160	----	---	.16	.03	.010
	8-28-80	8.5	.3	1,100	11	180	----	---	.13	.00	.000
415B	2-28-80	15	.2	390	6.8	130	.0	.0	1.8	.03	.010
	3-26-80	11	.2	450	7.0	130	15	.3	1.4	.00	.000
	4-22-80	9.1	.2	700	4.2	150	----	---	.48	.03	.010
	5-21-80	7.9	.3	820	5.8	170	----	---	.40	.00	.000
	6-18-80	7.6	.3	950	5.0	170	----	---	.20	.00	.000
	7-15-80	11	.3	960	5.2	160	----	---	.08	.09	.030
	8-28-80	6.7	.3	1,100	9.7	180	----	---	.09	.00	.000
417	1-24-80	5.9	.3	1,300	7.0	320	.0	.0	6.4	.34	.110
	2-26-80	6.6	.3	950	6.4	240	.0	.0	4.9	.00	.000
	3-27-80	5.4	.3	920	5.3	250	25	.5	.40	.06	.020
	4-23-80	5.0	.3	1,200	2.9	280	----	---	9.4	.06	.020
	5-22-80	4.0	.3	1,400	2.9	270	----	---	5.7	.06	.020
	6-19-80	4.1	.3	1,500	3.4	290	----	---	4.0	.00	.000
	7-16-80	14	.2	1,600	7.2	310	----	---	.77	.03	.010
	7-17-80	--	--	1,600	----	310	----	---	----	----	-----
	8-14-80	5.2	.3	1,600	8.0	280	----	---	.40	.09	.030
450	1-31-80	7.3	.4	1,300	6.5	130	.0	.0	.11	.00	.000
	2-26-80	5.2	.4	890	4.7	110	.0	.0	.13	.03	.010
	3-27-80	6.3	.4	990	5.9	120	15	.3	.02	.00	.000
	4-24-80	6.7	.4	1,300	4.6	150	----	---	.13	.00	.000
	5-28-80	6.5	.4	1,200	3.7	110	----	---	.07	.00	.000
	6-25-80	6.4	.5	1,200	3.7	130	----	---	.03	.00	.000
	7-16-80	8.2	.4	1,100	----	110	----	---	.02	.00	.000
	8-13-80	7.2	.4	1,200	3.6	120	----	---	.00	.03	.010
456	1-30-80	3.4	.3	820	14	27	.0	.0	.15	.00	.000
	2-26-80	3.3	.4	600	13	2	.0	.0	.19	.00	.000
	3-27-80	2.6	.3	570	11	21	10	.2	.06	.03	.010
	4-24-80	2.6	.4	780	11	36	10	.2	.09	.00	.000
	5-28-80	4.4	.4	670	5.9	82	10	.2	.67	.00	.000
	6-25-80	3.4	.4	940	12	9	20	.4	.12	.00	.000
	7-15-80	2	.4	950	19	0	89	1.8	.08	.00	.000
	8-12-80	7.0	.5	1,100	29	0	20	.4	.00	.00	.000

Table 6.--Water-quality and other hydrologic data collected monthly, January to September 1980--Continued

Site	Date of sampling	Organic carbon, dissolved (mg/L)	Organic carbon, suspended (mg/L)	Organic carbon, total (mg/L)	Hardness, noncarbonate as $CaCO_3$ (mg/L)	Hardness as $CaCO_3$ (mg/L)	Aluminum, dissolved (µg/L)	Aluminum, suspended recoverable (µg/L)	Aluminum, total recoverable (µg/L)	Iron, dissolved (µg/L)	Iron, suspended recoverable (µg/L)
415	2-28-80	2.7	0.1	---	480	620	30	370	400	50	750
	3-26-80	----	---	4.6	520	650	30	270	300	20	730
	4-22-80	4.8	.3	---	680	820	30	70	100	30	460
	5-21-80	9.9	.1	---	720	880	30	170	200	20	350
	6-18-80	5.0	.0	---	910	1,100	100	100	200	30	310
	7-15-80	6.8	.3	---	900	1,100	20	180	200	20	430
	8-28-80	6.7	1.2	---	1,100	1,200	30	170	200	50	540
415A	2-28-80	3.3	.4	---	520	670	40	160	200	10	450
	3-26-80	----	---	4.9	530	670	20	180	200	0	540
	4-22-80	3.7	.6	---	750	910	30	70	100	40	500
	5-21-80	5.3	.1	---	720	880	20	280	300	30	480
	6-18-80	3.4	.0	---	930	1,100	200	100	300	20	270
	7-15-80	2.1	.2	---	860	1,000	10	30	40	30	270
	8-28-80	2.0	.9	---	1,100	1,300	40	60	100	40	140
415B	2-28-80	3.4	.4	---	370	500	20	280	300	0	600
	3-26-80	----	---	3.9	460	590	20	380	400	1	530
	4-22-80	15	.3	---	670	820	30	170	200	20	280
	5-21-80	9.3	.1	---	730	900	20	180	200	10	210
	6-18-80	4.4	.0	---	930	1,100	100	------	---	10	---
	7-15-80	14	.3	---	870	1,000	20	20	40	30	190
	8-28-80	2.3	1.0	---	1,100	1,300	40	160	200	50	270
417	1-24-80	----	---	---	750	1,100	30	0	30	60	780
	2-26-80	9.7	.2	---	550	790	40	160	200	180	720
	3-27-80	----	---	2.8	790	1,000	30	170	200	50	520
	4-23-80	11	.4	---	1,200	1,500	60	40	100	100	310
	5-22-80	2.9	.2	---	1,100	1,400	100	100	200	170	310
	6-19-80	2.9	.3	---	1,100	1,400	70	230	300	120	550
	7-16-80	4.9	.3	---	1,100	1,400	20	0	20	330	170
	7-17-80	----	---	---	-----	-----	-----	------	---	80	700
	8-14-80	3.4	.8	---	-----	-----	30	70	100	110	990
450	1-31-80	----	---	---	1,100	1,200	50	150	200	140	590
	2-26-80	4.4	.4	---	770	880	40	160	200	70	430
	3-27-80	----	---	3.8	1,200	1,300	50	450	500	40	450
	4-24-80	4.0	.5	---	1,300	1,400	50	150	200	60	520
	5-28-80	4.8	.0	---	730	840	200	300	500	40	910
	6-25-80	3.8	.1	---	1,100	1,200	60	460	520	60	1,300
	7-16-80	8.2	.3	---	-----	-----	-----	------	200	--	-----
	8-13-80	3.7	.4	---	-----	-----	30	70	100	40	390
456	1-30-80	----	---	---	740	770	400	11,000	11,000	3,200	6,800
	2-26-80	4.2	.3	---	530	530	2,300	4,300	6,600	4,400	3,300
	3-27-80	----	---	4.4	540	570	70	3,500	3,600	2,100	2,400
	4-24-80	1.9	.2	---	730	770	70	2,700	2,800	1,400	1,000
	5-28-80	7.0	.0	---	650	730	200	1,000	1,200	70	690
	6-25-80	3.6	.0	---	800	810	300	2,700	3,000	1,500	800
	7-15-80	3.0	.2	---	810	810	2,500	500	3,000	2,400	0
	8-12-80	2.8	.3	---	-----	-----	4,000	0	4,000	2,400	1,000

Table 6.--Water-quality and other hydrologic data collected monthly, January to September 1980--Continued

Site	Date of sampling	Iron, total recoverable (µg/L)	Manganese, dissolved (µg/L)	Manganese, suspended recoverable (µg/L)	Manganese, total recoverable (µg/L)	Solids, residue at 180° C dissolved (mg/L)	Solids, sum of constituents, dissolved (mg/L)	Solids, dissolved (tons/day)	Solids, dissolved (tons/ac-ft)	Sediment, suspended (mg/L)
415	2-28-80	800	2,400	0	2,200	949	850	5.1	1.3	272
	3-26-80	750	2,500	0	2,500	982	813	11.4	1.3	60
	4-22-80	490	3,100	0	2,400	1,180	1,070	7.0	1.6	86
	5-21-80	370	2,500	300	2,800	1,390	1,220	3.8	1.9	135
	6-18-80	340	2,900	200	3,100	1,640	1,400	4.8	2.2	136
	7-15-80	450	4,000	0	4,000	1,660	1,430	5.1	2.3	104
	8-28-80	590	4,200	0	3,900	1,850	1,630	6.5	2.5	146
415A	2-28-80	460	2,600	0	2,500	1,020	867	6.7	1.4	250
	3-26-80	540	2,400	0	2,400	1,030	865	17.8	1.4	55
	4-22-80	540	2,800	0	2,400	1,300	1,200	10.1	1.8	106
	5-21-80	510	1,400	200	1,600	1,400	1,230	4.5	1.9	74
	6-18-80	290	1,800	100	1,900	1,690	1,450	5.5	2.3	127
	7-15-80	300	1,800	0	1,800	1,660	1,420	3.5	2.3	167
	8-28-80	180	1,700	0	1,600	1,790	1,640	3.9	2.4	127
415B	2-28-80	600	0	1,500	1,500	711	674	9.2	.97	202
	3-26-80	530	2,000	100	2,100	877	759	15.2	1.2	58
	4-22-80	300	1,900	0	1,600	1,180	1,080	9.6	1.6	115
	5-21-80	220	980	120	1,100	1,400	1,240	4.9	1.9	133
	6-18-80	-----	1,100	-----	--	1,630	1,430	4.9	2.2	116
	7-15-80	220	520	50	570	1,520	1,410	4.2	2.1	120
	8-28-80	320	480	10	490	1,890	1,630	4.4	2.6	175
417	1-24-80	840	1,200	0	1,200	695	2,060	6.0	.95	69
	2-26-80	900	1,200	0	1,100	1,730	1,530	8.3	2.4	540
	3-27-80	570	720	20	740	1,840	1,560	36.2	2.5	74
	4-23-80	410	670	0	650	2,010	2,040	30.6	2.7	147
	5-22-80	480	400	80	480	2,470	2,220	15.7	3.4	248
	6-19-80	670	630	0	630	2,680	2,360	15.5	3.6	350
	7-16-80	500	1,000	100	1,100	2,800	2,450	9.5	3.8	172
	7-17-80	780	-----	--	1,100	2,590	-----	10.4	3.5	---
	8-14-80	1,100	970	30	1,000	2,790	1,850	13.0	3.8	226
450	1-31-80	730	2,200	0	2,000	2,040	1,800	2.7	2.8	27
	2-26-80	500	1,500	0	1,400	1,410	1,270	2.8	1.9	376
	3-27-80	490	1,800	0	1,800	1,710	1,500	10.9	2.3	85
	4-24-80	580	180	2,200	2,400	1,720	1,890	3.2	2.3	161
	5-28-80	950	510	90	600	1,950	1,580	2.4	2.7	189
	6-25-80	1,400	590	120	710	1,980	1,700	7.0	2.7	257
	7-16-80	420	------	-----	80	1,820	1,170	2.1	2.5	160
	8-13-80	430	150	30	180	2,010	1,250	.23	2.7	158
456	1-30-80	10,000	8,200	200	8,400	1,300	1,140	3.4	1.8	98
	2-26-80	7,700	7,500	0	7,000	988	821	6.4	1.3	267
	3-27-80	4,500	4,300	0	4,200	963	807	13.7	1.3	66
	4-24-80	2,400	6,000	0	5,600	1,250	1,090	6.8	1.7	98
	5-28-80	760	2,000	300	2,300	1,170	1,010	12.2	1.6	87
	6-25-80	2,300	7,100	300	7,400	1,480	1,270	4.8	2.0	190
	7-15-80	2,400	11,000	0	10,000	1,540	1,290	.68	2.1	149
	8-12-80	3,400	15,000	0	15,000	1,580	1,220	.07	2.2	97

Table 6.--Water-quality and other hydrologic data collected monthly, January to September 1980--Continued

Site	Date of sampling	Sediment suspended (sieve diam. finer than 0.062 mm)	Sediment discharge, suspended (t/day)	Coal in streambed material (gm/kg)
415	2-28-80	99	1.5	------
	3-26-80	93	.70	2.00
	4-22-80	97	.51	------
	5-21-80	98	.37	------
	6-18-80	98	.40	------
	7-15-80	99	.32	------
	8-28-80	98	.52	------
415A	2-28-80	100	1.6	------
	3-26-80	89	.75	2.00
	4-22-80	97	.83	------
	5-21-80	96	.24	------
	6-18-80	100	.41	------
	7-15-80	96	.35	------
	8-28-80	98	.28	------
415B	2-28-80	100	2.6	------
	3-26-80	94	1.0	8.00
	4-22-80	98	.93	------
	5-21-80	98	.47	------
	6-18-80	98	.35	------
	7-15-80	99	.33	------
	8-28-80	98	.41	------
417	1-24-80	---	.60	------
	2-26-80	99	2.6	------
	3-27-80	73	1.5	20.0
	4-23-80	90	2.2	------
	5-22-80	84	1.6	------
	6-19-80	96	2.0	------
	7-16-80	193	.59	------
	7-17-80	---	----	------
	8-14-80	70	1.0	------
450	1-31-80	---	.04	------
	2-26-80	100	.74	------
	3-27-80	98	.54	160
	4-24-80	99	.30	------
	5-28-80	99	.24	------
	6-25-80	99	.91	------
	7-16-80	99	.19	------
	8-13-80	98	.02	------
456	1-30-80	---	.26	------
	2-26-80	99	1.7	------
	3-27-80	98	.94	25.0
	4-24-80	99	.53	------
	5-28-80	99	.91	------
	6-25-80	100	.61	------
	7-15-80	100	.07	------
	8-12-80	99	.00	------

Table 6.--Water-quality and other hydrologic data collected monthly, January to September 1980--Continued

Site	Date of sampling	Time	Stream-flow, instan-taneous (ft^3/s)	Temper-ature, water (°C)	Spe-cific con-duct-ance	pH	Oxygen, dis-solved (mg/L)	Sodium, dis-solved (mg/L)	Potas-sium, dis-solved (mg/L)	Calcium, dis-solved (mg/L)	Mag-nesium, dis-solved (mg/L)
460	1-28-80	1400	0.50	3.1	2,780	8.6	15.0	210	6.7	150	200
	2-25-80	1400	2.9	3.0	2,810	8.0	14.1	200	5.7	190	190
	3-27-80	1900	7.2	11.1	2,830	7.7	10.7	230	7.4	160	230
	4-24-80	1530	5.4	22.3	2,860	7.9	11.4	260	7.7	180	230
	5-29-80	1130	6.2	26.5	2,770	8.1	----	230	6.8	140	170
	6-18-80	1100	2.6	26.0	2,620	8.1	9.8	270	8.3	160	150
	7-16-80	0945	2.4	32.2	2,680	8.0	8.7	---	---	---	---
	8-13-80	0915	2.2	28.3	2,740	7.8	8.1	260	8.7	---	---
464	1-28-80	1600	.74	8.6	5,030	6.9	10.7	32	4.9	160	690
	2-25-80	1700	.82	7.0	4,850	7.2	11.2	32	4.9	200	600
	3-27-80	1800	1.1	15.8	4,620	6.8	9.2	29	55	190	580
	4-24-80	1400	1.2	21.2	5,040	7.1	9.2	31	5.0	310	600
	5-29-80	1000	.79	18.1	5,030	7.3	----	32	4.5	310	300
	6-18-80	1245	.58	20.4	5,100	7.5	8.5	35	5.1	190	700
	7-16-80	1130	.50	21.3	5,060	7.6	8.4	34	5.3	260	660
	8-12-80	1245	.32	21.5	5,300	7.5	8.7	32	5.5	---	---
470	3-26-80	1800	1.4	8.0	470	7.8	11.3	15	2.9	57	16
	4-22-80	1700	.51	22.6	480	8.0	12.9	12	2.4	59	18
	5-21-80	1900	.37	----	550	7.8	----	17	2.4	61	21

Table 6.--Water-quality and other hydrologic data collected monthly, January to September 1980--Continued

Site	Date of sampling	Chloride, dissolved (mg/L)	Fluoride, dissolved (mg/L)	Sulfate, dissolved (mg/L)	Silica, dissolved (mg/L)	Alkalinity as $CaCO_3$ (mg/L)	Acidity as $CaCO_3$ (mg/L)	Acidity total (mg/L)	Dissolved nitrate + nitrate, as N (mg/L)	Total orthophosphate, as PO_4 (mg/L)	Total orthophosphate as P (mg/L)
460	1-28-80	9.9	.4	1,500	4.7	290	.0	.0	1.8	----	.000
	2-25-80	9.6	.4	1,400	4.0	290	.0	.0	.42	.03	.010
	3-27-80	13	.4	1,400	2.8	240	15	.3	1.1	.00	.000
	4-24-80	14	.5	1,400	1.1	210	----	---	1.2	.03	.010
	5-29-80	12	.5	1,400	2.6	220	----	---	.67	.00	.000
	6-18-80	13	.5	1,300	1.9	180	----	---	1.5	.03	.010
	7-16-80	17	.5	1,300	3.1	180	----	---	.29	.00	.000
	8-13-80	16	.6	1,400	2.4	170	----	---	.06	.00	.000
464	1-28-80	3.3	.8	2,600	14	290	.0	.0	.03	.03	.010
	2-25-80	3.5	.7	3,000	13	270	.0	.0	.05	.00	.000
	3-27-80	3.0	.7	3,100	14	250	25	.5	.07	.00	.000
	4-24-80	2.8	.8	3,400	14	280	----	--	.04	.00	.000
	5-29-80	2.8	.8	3,600	14	300	----	--	.04	.00	.000
	6-18-80	3.0	.8	3,200	13	300	----	--	.06	.00	.000
	7-16-80	5.4	.8	3,600	14	310	----	--	.05	.00	.000
	8-12-80	5.4	.8	3,100	13	260	----	--	.78	.25	.080
470	3-26-80	18	.2	62	7.9	150	10	.2	1.1	.00	.000
	4-22-80	12	.2	64	3.3	170	----	--	.03	.00	.000
	5-21-80	14	.2	58	6.9	210	----	--	.53	.03	.010

Table 6.--Water-quality and other hydrologic data collected monthly, January to September 1980--Continued

Site	Date of sampling	Organic carbon, dissolved (mg/L)	Organic carbon, suspended (mg/L)	Organic carbon, total (mg/L)	Hardness, noncarbonate as $CaCO_3$ (mg/L)	Hardness as $CaCO_3$ (mg/L)	Aluminum, dissolved (µg/L)	Aluminum, suspended recoverable (µg/L)	Aluminum, total recoverable (µg/L)	Iron, dissolved (µg/L)	Iron, suspended recoverable (µg/L)
460	1-28-80	---	---	---	910	1,200	30	970	1,000	60	640
	2-25-80	4.9	0.3	---	970	1,300	40	360	400	10	750
	3-27-80	---	---	4.1	1,100	1,300	40	260	300	40	420
	4-24-80	1.9	.5	---	1,200	1,400	50	150	200	40	470
	5-29-80	---	---	6.2	830	1,100	200	600	800	20	1,400
	6-18-80	2.6	.0	---	840	1,000	100	700	800	60	1,000
	7-16-80	3.5	.6	---	-----	-----	---	-----	80	-----	-----
	8-13-80	3.5	.4	---	-----	-----	150	150	300	530	270
464	1-28-80	---	---	---	3,000	3,200	130	670	800	950	1,700
	2-25-80	5.4	.3	---	2,700	3,000	140	960	1,100	1,400	1,500
	3-27-80	---	---	4.4	2,600	2,900	130	1,200	1,300	930	1,800
	4-24-80	7.6	.3	---	3,000	3,200	140	360	500	530	1,100
	5-29-80	3.7	.1	---	1,700	2,000	300	100	400	430	870
	6-18-80	3.1	.3	---	3,100	3,400	200	100	300	110	770
	7-16-80	5.9	.2	---	3,100	3,400	20	280	300	150	1,400
	8-12-80	2.7	.4	---	-----	-----	30	70	100	80	1,000
470	3-26-80	--	---	5.5	58	210	30	470	500	10	500
	4-22-80	8.6	.3	---	51	220	40	60	100	30	210
	5-21-80	7.5	.2	---	29	240	20	180	200	20	330

Table 6.--Water-quality and other hydrologic data collected monthly, January to September 1980--Continued

Site	Date of sampling	Iron, total recoverable (µg/L)	Manganese, dissolved (µg/L)	Manganese, suspended recoverable (µg/L)	Manganese, total recoverable (µg/L)	Solids, residue at 180° C dissolved (mg/L)	Solids, sum of constituents, dissolved (mg/L)	Solids, dissolved (tons/day)	Solids, dissolved (tons/ac-ft)	Sediment, suspended (mg/L)
460	1-28-80	700	1,400	0	1,300	2,690	2,270	3.6	3.7	139
	2-25-80	760	1,400	0	1,300	2,430	2,180	18.8	3.3	624
	3-27-80	460	1,100	0	1,100	2,540	2,190	49.2	3.5	138
	4-24-80	510	310	60	370	2,440	2,230	35.2	3.3	202
	5-29-80	1,400	160	100	260	2,400	2,100	40.2	3.3	282
	6-18-80	1,100	50	80	130	2,330	2,020	16.4	3.2	206
	7-16-80	1,200	------	-----	200	2,360	-----	15.3	3.2	235
	8-13-80	800	90	30	120	2,250	1,690	13.6	3.1	214
464	1-28-80	2,600	7,000	0	5,900	5,340	3,690	10.6	7.3	195
	2-25-80	2,900	6,900	0	6,200	5,060	4,030	11.2	6.9	275
	3-27-80	2,700	6,300	300	6,600	5,160	4,130	15.7	7.0	264
	4-24-80	1,600	10	5,200	5,200	5,410	4,530	16.8	7.4	427
	5-29-80	1,300	4,200	300	4,500	5,520	4,450	11.8	7.5	339
	6-18-80	880	6,000	0	5,600	5,680	4,330	8.9	7.7	496
	7-16-80	1,500	6,600	3,200	9,800	5,550	4,770	7.5	7.6	639
	8-12-80	1,100	4,900	700	5,600	6,110	3,170	5.3	8.3	362
470	3-26-80	510	130	20	150	283	274	1.1	.38	21
	4-22-80	240	90	0	80	286	273	.39	.39	39
	5-21-80	350	70	20	90	316	309	.32	.43	52

Table 6.--Water-quality and other hydrologic data collected monthly, January to September 1980--Continued

Site	Sampling	Sediment suspended (sieve diam. finer than 0.062 mm)	Sediment discharge, suspended (t/day)	Coal in streambed material (gm/kg)
460	1-28-80	--	.19	---
	2-25-80	94	4.8	---
	3-27-80	97	2.7	---
	4-24-80	98	2.9	---
	5-29-80	99	4.7	---
	6-18-80	99	1.4	---
	7-16-80	99	1.5	---
	8-13-80	99	1.3	---
464	1-28-80	--	0.39	---
	2-25-80	98	3.0	---
	3-27-80	85	.81	120
	4-24-80	94	1.3	---
	5-29-80	94	.72	---
	6-18-80	86	.78	---
	7-16-80	91	.86	---
	8-12-80	77	.31	---
470	3-26-80	98	.08	---
	4-22-80	88	.05	---
	5-21-80	81	.05	---

[1]For example, 1400 is the same as 2:00 p.m.

Table 7.--Land use in watersheds sampled monthly, January to September 1980

Site	Agriculture (percent)	Forest (percent)	Industrial, residential, or urban (percent)	Active mining (percent)	Reclaimed mine land[1] (percent)	Unreclaimed mine land (percent)	Water cover and (or) wetlands (percent)	Last-cut lakes and (or) sediment ponds (percent)	Other (percent)
4	86.0	13.5	0.2	---	----	----	0.1	----	0.2
20A	44.2	54.0	1.4	---	----	----	.1	----	.3
27A	47.3	2.8	2.6	---	40.2	1.1	.3	3.3	2.4
77	41.2	57.7	.2	---	----	----	.8	----	.1
112A	25.6	28.6	3.2	0.2	5.6	32.9	.7	1.3	1.9
243A	80.2	11.6	4.4	---	----	----	.5	----	3.3
275C	----	98.8	---	---	----	----	---	----	1.5
301A	21.1	73.6	2.3	---	----	----	.5	----	2.5
401	4.6	.9	.6	---	----	73.5	3.3	16.7	.4
417	20.4	22.5	4.5	2.9	18.3	24.3	1.0	3.7	2.4
450	3.0	2.6	---	---	63.1	16.3	---	13.4	1.6
456	8.3	44.8	1.8	3.7	----	35.4	.2	3.7	2.1

[1]Reclaimed mine land areas mined after passage of Indiana Surface Mine Act of 1967 (Indiana code 13-4-6).

Table 8.--Water-quality and other hydrologic data collected during nonsteady flow, March to June 1980

[Measurements by U.S. Geological Survey; ft^3/s, cubic foot per second; C, degree Celsius; specific conductance, in micromho per centimeter at 25° Celsius mg/L, milligram per liter; $CaCO_3$, calcium carbonate; µg/L, microgram per liter; µg/g, microgram per gram; t/day, ton per day; (t/day)/ac ft, ton per day per acre foot; mm, millimeter; P, phosphorus; PO_4, phosphate]

Site	Date of sampling	Time[1]	Stream-flow, instan-taneous (ft^3/s)	Temper-ature, water (°C)	Spe-cific con-duct-ance	pH	Oxygen, dis-solved (mg/L)	Sodium, dis-solved (mg/L)	Potas-sium, dis-solved (mg/L)	Calcium, dis-solved (mg/L)	Mag-nesium, dis-solved (mg/L)
20A	3-28-80	0900	0.47	6.8	610	8.2	9.9	6.0	2.2	92	37
	3-28-80	1610	-----	----	---	---	----	----	---	---	----
	3-28-80	1830	-----	----	---	---	----	----	---	---	----
	3-28-80	1930	3.2	7.0	460	8.1	9.6	4.7	2.5	60	28
	3-28-80	2030	4.2	6.9	360	8.0	9.7	4.3	2.8	52	24
	3-28-80	2230	2.8	6.6	320	8.0	9.8	3.8	3.3	49	22
	3-29-80	0130	1.5	6.3	320	8.0	----	4.6	3,1	57	26
27A	3-20-80	1855	.74	7.5	930	7.8	11.5	20	2.9	120	49
	3-20-80	2210	-----	----	---	---	----	----	---	---	----
	3-21-80	0040	1.3	6.4	930	7.8	11.7	20	2.9	110	45
	3-21-80	0120	-----	----	---	---	----	----	---	---	----
	3-21-80	0210	-----	----	---	---	----	----	---	---	----
	3-21-80	0340	1.4	5.6	910	7.9	11.9	21	3.5	130	48
	3-21-80	0450	1.3	5.2	900	7.9	12.1	20	3.3	120	46
	3-21-80	0530	-----	----	---	---	----	----	---	---	----
	3-21-80	0830	-----	----	---	---	----	----	---	---	----
	3-21-80	1130	1.3	7.1	910	8.1	12.2	22	3.8	120	47
77	4-3-80	1600	78	10.7	110	7.4	10.0	4.5	1.3	25	6.7
	4-3-80	1830	-----	----	---	---	----	----	---	---	----
	4-3-80	2115	-----	----	---	---	----	----	---	---	----
	4-3-80	2210	97	10.7	105	7.3	9.7	4.1	1.3	25	6.5
	4-3-80	2335	-----	----	---	---	----	----	---	---	----
	4-4-80	0140	-----	----	---	---	----	----	---	---	----
	4-4-80	0340	-----	----	---	---	----	----	---	---	----
	4-4-80	0445	-----	----	---	---	----	----	---	---	----
	4-4-80	0630	-----	----	---	---	----	----	---	---	----
	4-4-80	0730	14	8.4	80	7.3	10.1	3.9	1.3	22	5.8
	4-4-80	0930	-----	----	---	---	----	----	---	---	----
	4-4-80	1130	-----	----	---	---	----	----	---	---	----
	4-4-80	1330	-----	----	---	---	----	----	---	---	----
	4-4-80	1430	88	7.0	80	7.4	11.0	4.6	2.2	23	6.2
	4-4-80	1630	-----	----	---	---	----	----	---	---	----
	4-4-80	1830	86	6.5	80	7.4	11.0	4.0	1.2	25	6.1
	5-12-80	1400	23	19.5	258	7.6	9.9	6.2	1.3	32	9.6
	5-12-80	1745	35	18.5	283	7.6	9.3	6.6	1.8	32	9.6
	5-12-80	2100	42	18.4	194	7.5	8.8	6.3	1.3	32	9.6
	5-12-80	2400	40	18.2	194	7.5	8.8	6.4	1.6	32	9.6

Table 8.--Water-quality and other hydrologic data collected during nonsteady flow, March to June 1980--Continued

Site	Date of sampling	Chloride, dissolved (mg/L)	Fluoride, dissolved (mg/L)	Sulfate, dissolved (mg/L)	Silica, dissolved (mg/L)	Alkalinity as $CaCO_3$ (mg/L)	Acidity as $CaCO_3$ (mg/L)	Acidity total heated (mg/L)	Dissolved nitrate + nitrate, as N (mg/L)	Total orthophosphate, as PO_4 (mg/L)	Total orthophosphate, as P (mg/L)
20A	3-28-80	5.9	0.2	54	9.3	280	0.0	0.0	0.66	0.03	0.010
	3-28-80	----	---	---	----	---	----	---	----	----	-----
	3-28-80	----	---	---	----	---	----	---	----	----	-----
	3-28-80	6.6	.2	47	8.0	200	15	.3	1.1	.06	.020
	3-28-80	6.3	.2	42	7.7	170	10	.2	1.3	.03	.010
	3-28-80	5.9	.2	40	8.2	150	10	.2	1.5	.06	.020
	3-29-80	5.8	.2	43	8.8	190	5.0	.1	1.3	.06	.020
27A	3-20-80	8.4	.2	320	3.0	---	25	.5	2.8	.00	.000
	3-20-80	----	---	---	----	---	----	---	----	----	-----
	3-21-80	7.5	.2	310	2.7	---	15	.3	2.7	.00	.000
	3-21-80	----	---	---	----	---	----	---	----	----	-----
	3-21-80	----	---	---	----	---	----	---	----	----	-----
	3-21-80	7.8	.2	340	2.9	---	15	.3	3.4	.00	.000
	3-21-80	7.8	.2	340	3.2	---	20	.4	4.0	.00	.000
	3-21-80	----	---	---	----	---	----	---	----	----	-----
	3-21-80	----	---	---	----	---	----	---	----	----	-----
	3-21-80	7.8	.2	330	3.6	---	15	.3	3.1	.00	.000
77	4-3-80	4.0	.1	23	11	60	----	---	.96	.00	.000
	4-3-80	----	---	---	----	---	----	---	----	----	-----
	4-3-80	----	---	---	----	---	----	---	----	----	-----
	4-3-80	4.0	.1	22	11	62	----	---	.86	.00	.000
	4-3-80	----	---	---	----	---	----	---	----	----	-----
	4-4-80	----	---	---	----	---	----	---	----	----	-----
	4-4-80	----	---	---	----	---	----	---	----	----	-----
	4-4-80	----	---	---	----	---	----	---	----	----	-----
	4-4-80	----	---	---	----	---	----	---	----	----	-----
	4-4-80	3.8	.1	23	11	52	----	---	.75	.00	.000
	4-4-80	----	---	---	----	---	----	---	----	----	-----
	4-4-80	----	---	---	----	---	----	---	----	----	-----
	4-4-80	----	---	---	----	---	----	---	----	----	-----
	4-4-80	5.9	.1	22	11	56	----	---	.72	.49	.160
	4-4-80	----	---	---	----	---	----	---	----	----	-----
	4-4-80	3.7	.1	22	12	27	----	---	.74	.00	.000
	5-12-80	4.2	.1	18	9.3	94	----	---	.89	.03	.010
	5-12-80	4.8	.1	19	9.3	83	----	---	1.7	.09	.030
	5-12-80	4.0	.1	18	9.8	95	----	---	.74	.03	.010
	5-12-80	4.1	.1	18	10	92	----	---	.76	.06	.020

Table 8.--Water-quality and other hydrologic data collected during nonsteady flow, March to June 1980--Continued

Site	Date of sampling	Organic carbon, dissolved (mg/L)	Organic carbon, suspended (mg/L)	Organic carbon, total (mg/L)	Hardness, noncarbonate as $CaCO_3$ (mg/L)	Hardness as $CaCO_3$ (mg/L)	Aluminum, dissolved (µg/L)	Aluminum, suspended recoverable (µg/L)	Aluminum, total recoverable (µg/L)	Iron, dissolved (µg/L)	Iron, suspended recoverable (µg/L)
20A	3-28-80	3.3	0.2	---	100	380	30	30	60	10	210
	3-28-80	-----	-----	---	---	---	---	------	------	---	------
	3-28-80	-----	-----	---	---	---	---	------	------	---	------
	3-28-80	4.4	3.1	---	65	270	30	70	100	20	6,900
	3-28-80	7.3	3.8	---	59	230	30	170	200	10	10,000
	3-28-80	5.7	1.2	---	63	210	30	1,500	1,500	20	4,800
	3-29-80	6.0	.7	---	59	250	30	820	850	20	1,900
27A	3-20-80	4.6	-----	0.3	310	500	10	130	140	30	520
	3-20-80	-----	-----	---	---	---	---	------	------	---	------
	3-21-80	6.3	-----	.5	270	460	30	1,400	1,400	20	2,400
	3-21-80	-----	-----	---	---	---	---	------	------	---	------
	3-21-80	-----	-----	---	---	---	---	------	------	---	------
	3-21-80	5.6	-----	.4	340	520	100	20,000	20,000	10	3,100
	3-21-80	6.4	-----	.4	310	490	100	40	140	20	2,200
	3-21-80	-----	-----	---	---	---	---	------	------	---	------
	3-21-80	-----	-----	---	---	---	---	------	------	---	------
	3-21-80	7.6	-----	.3	310	490	200	200	400	30	700
77	4-3-80	2.8	.4	-----	30	90	40	760	800	110	1,300
	4-3-80	-----	-----	---	---	---	---	------	------	---	------
	4-3-80	-----	-----	---	---	---	---	------	------	---	------
	4-3-80	-----	.5	---	27	89	70	1,100	1,200	200	2,000
	4-3-80	-----	-----	---	---	---	---	------	------	---	------
	4-4-80	-----	-----	---	---	---	---	------	------	---	------
	4-4-80	-----	-----	---	---	---	---	------	------	---	------
	4-4-80	-----	-----	---	---	---	---	------	------	---	------
	4-4-80	-----	-----	---	---	---	---	------	------	---	------
	4-4-80	-----	.6	---	27	79	280	920	1,200	690	1,500
	4-4-80	-----	-----	---	---	---	---	------	------	---	------
	4-4-80	-----	-----	---	---	---	---	------	------	---	------
	4-4-80	-----	-----	---	---	---	---	------	------	---	------
	4-4-80	-----	.5	---	27	83	240	460	700	690	610
	4-4-80	-----	-----	---	---	---	---	------	------	---	------
	4-4-80	5.7	.2	---	61	88	290	310	600	960	340
	5-12-80	9.0	.5	---	25	120	30	30	60	30	970
	5-12-80	5.9	.5	---	36	120	30	0	10	40	1,400
	5-12-80	5.9	.7	---	24	120	30	0	20	40	1,800
	5-12-80	5.9	.5	---	27	120	30	40	70	40	1,600

Table 8.--Water-quality and other hydrologic data collected during nonsteady flow, March to June 1980--Continued

Site	Date of sampling	Iron, total recoverable (µg/L)	Manganese, dissolved (µg/L)	Manganese, suspended recoverable (µg/L)	Manganese, total recoverable (µg/L)	Boron, total recoverable (µg/L)	Cadmium, total recoverable (µg/L)	Chromium, total recoverable (µg/L)	Copper, total recoverable (µg/L)	Lead, total recoverable (µg/L)	Nickel, total recoverable (µg/L)
20A	3-28-80	220	100	20	120	40	0	20	10	0	0
	3-28-80	------	---	---	---	--	--	--	--	---	---
	3-28-80	------	---	---	---	--	--	--	--	---	---
	3-28-80	6,900	40	270	310	60	0	20	10	0	0
	3-28-80	10,000	40	350	390	50	0	20	10	0	0
	3-28-80	4,800	50	150	200	60	0	10	10	0	0
	3-29-80	1,900	50	70	120	40	0	20	10	0	0
27A	3-20-80	550	280	40	320	90	0	10	10	0	100
	3-20-80	------	---	---	---	--	--	--	--	---	---
	3-21-80	2,400	260	80	340	80	0	10	10	0	100
	3-21-80	------	---	---	---	--	--	--	--	---	---
	3-21-80	------	---	---	---	--	--	--	--	---	---
	3-21-80	3,100	240	70	310	80	0	10	10	0	0
	3-21-80	2,200	230	60	290	80	0	10	10	100	0
	3-21-80	------	---	---	---	--	--	--	--	---	---
	3-21-80	------	---	---	---	--	--	--	--	---	---
	3-21-80	730	210	30	240	90	0	20	10	0	100
77	4-3-80	1,400	60	40	100	20	10	20	0	0	0
	4-3-80	------	---	---	---	--	--	--	--	---	---
	4-3-80	------	---	---	---	--	--	--	--	---	---
	4-3-80	2,200	50	90	140	20	10	20	0	100	100
	4-3-80	------	---	---	---	--	--	--	--	---	---
	4-4-80	------	---	---	---	--	--	--	--	---	---
	4-4-80	------	---	---	---	--	--	--	--	---	---
	4-4-80	------	---	---	---	--	--	--	--	---	---
	4-4-80	------	---	---	---	--	--	--	--	---	---
	4-4-80	2,200	50	70	120	20	0	30	10	0	---
	4-4-80	------	---	---	---	--	--	--	--	---	---
	4-4-80	------	---	---	---	--	--	--	--	---	---
	4-4-80	------	---	---	---	--	--	--	--	---	---
	4-4-80	1,300	60	0	50	10	0	20	0	0	0
	4-4-80	------	---	---	---	--	--	--	--	---	---
	4-4-80	1,300	90	0	90	20	0	20	10	0	100
	5-12-80	1,000	100	40	140	30	0	10	0	0	0
	5-12-80	1,400	100	20	120	30	0	20	0	0	0
	5-12-80	1,800	70	110	180	30	0	10	0	0	0
	5-12-80	1,600	60	90	150	30	0	10	0	0	0

Table 8.--Water-quality and other hydrologic data collected during nonsteady flow, March to June 1980--Continued

Site	Date of sampling	Zinc, total recoverable (µg/L)	Solids, residue at 180° C dissolved (mg/L)	Solids, sum of constituents, dissolved (mg/L)	Solids, dissolved (t/day)	Solids, dissolved (t/ac ft)	Sediment, suspended (mg/L)	Sediment suspended sieve diameter finer than 0.062 mm	Sediment discharge, suspended (t/day)	Cumulative rainfall fall per storm (inches)
20A	3-28-80	10	392	378	0.49	0.53	124	35	0.16	----
	3-28-80	---	---	---	-----	----	92	68	------	0.24
	3-28-80	---	---	---	-----	----	215	69	------	.40
	3-28-80	40	322	282	2.8	.44	410	76	3.5	.40
	3-28-80	150	270	248	3.1	.37	497	80	5.6	.48
	3-28-80	170	268	230	2.0	.36	217	75	1.6	.48
	3-29-80	190	313	269	1.3	.43	123	66	.51	.48
27A	3-20-80	20	729	652	1.5	.99	160	96	4.5	.02
	3-20-80	---	---	---	-----	----	-----	95	134	.09
	3-21-80	40	700	625	2.4	.95	298	98	2.0	.17
	3-21-80	---	---	---	-----	----	254	97	2.6	.18
	3-21-80	---	---	---	-----	----	257	96	4.0	.20
	3-21-80	30	751	677	2.9	1.0	280	97	2.9	.23
	3-21-80	30	720	667	2.5	.98	223	--	.78	.23
	3-21-80	---	---	---	-----	----	192	97	3.2	.23
	3-21-80	---	---	---	-----	----	164	97	2.7	.23
	3-21-80	20	755	657	2.7	1.0	212	96	3.6	.23
77	4-3-80	20	131	116	27.5	.18	97	74	20	----
	4-3-80	---	---	---	-----	----	236	38	------	.06
	4-3-80	---	---	---	-----	----	286	50	------	.18
	4-3-80	20	130	115	34.1	.18	284	--	74	.18
	4-3-80	---	---	---	-----	----	381	33	------	.18
	4-4-80	---	---	---	-----	----	339	45	------	.18
	4-4-80	---	---	---	-----	----	976	20	------	.18
	4-4-80	---	---	---	-----	----	376	47	------	.18
	4-4-80	---	---	---	-----	----	230	60	------	.18
	4-4-80	20	117	107	36.1	.16	206	64	63	.18
	4-4-80	---	---	---	-----	----	139	72	------	.18
	4-4-80	---	---	---	-----	----	141	62	------	.21
	4-4-80	---	---	---	-----	----	134	55	------	.21
	4-4-80	10	132	113	31.3	.18	121	51	29	.21
	4-4-80	---	---	---	-----	----	127	50	------	.21
	4-4-80	10	125	95	29.0	.17	100	52	23	.21
	5-12-80	10	141	141	8.6	.19	43	65	2.6	----
	5-12-80	10	152	141	14.2	.21	76	64	7.1	.19
	5-12-80	100	144	142	16.5	.20	58	80	6.6	.20
	5-12-80	10	147	141	16.0	.20	44	91	4.8	.20

Table 8.--Water-quality and other hydrologic data collected during nonsteady flow, March to June 1980--Continued

Site	Date of sampling	Time	Stream-flow, instan-taneous (ft^3/s)	Temper-ature, water (°C)	Spe-cific con-duct-ance	pH	Oxygen, dis-solved (mg/L)	Sodium, dis-solved (mg/L)	Potas-sium, dis-solved (mg/L)	Calcium, dis-solved (mg/L)	Mag-nesium, dis-solved (mg/L)
243A	4-11-80	1330	3.7	10.4	470	8.1	10.9	24	2.3	52	20
	4-11-80	1415	-----	----	---	---	----	----	---	---	----
	4-11-80	1630	-----	----	---	---	----	----	---	---	----
	4-11-80	1805	-----	----	---	---	----	----	---	---	----
	4-11-80	1945	-----	----	---	---	----	----	---	---	----
	4-11-80	2045	-----	----	---	---	----	----	---	---	----
	4-11-80	2145	17	10.6	390	7.5	8.1	20	3.7	45	17
	4-11-80	2245	-----	----	---	---	----	----	---	---	----
	4-11-80	2345	-----	----	---	---	----	----	---	---	----
	4-12-80	0045	-----	----	---	---	----	----	---	---	----
	4-12-80	0145	38	10.2	170	7.2	7.9	9.3	5.9	27	7.7
	4-12-80	0345	38	10.2	130	7.1	8.1	6.1	5.2	23	5.9
	4-12-80	0545	-----	----	--	---	----	----	---	---	----
	4-12-80	0815	16	9.7	140	7.0	8.2	7.6	5.1	25	6.9
	4-12-80	1045	-----	----	---	---	----	----	---	---	----
	4-12-80	1345	11	12.1	230	7.2	8.6	11	4.4	31	9.3
275C	4-11-80	1330	.29	9.7	60	7.2	9.8	2.8	.6	4.9	2.9
	4-11-80	1600	.35	9.5	60	6.4	10.0	2.7	.6	4.9	2.8
	4-11-80	2240	.43	9.1	60	6.3	9.8	2.6	.6	4.4	2.7
	4-12-80	0545	----	9.0	61	6.3	10.0	2.6	.7	4.5	2.8
	4-12-80	0830	.49	8.7	62	6.3	10.3	2.6	.7	4.4	2.8
401	3-20-80	1250	.80	8.0	2,060	7.6	8.6	56	4.7	190	140
	3-20-80	2220	.97	7.3	2,010	7.5	8.6	60	4.8	190	140
	3-20-80	2340	1.1	7.0	1,960	7.5	8.5	63	4.9	190	140
	3-21-80	0112	1.0	6.6	2,020	7.5	8.6	63	5.0	190	150
	3-21-80	0500	.80	5.9	2,170	7.6	8.8	72	5.2	200	160
	6-2-80	1120	.85	23.1	-----	7.4	----	60	3.1	130	110
	6-2-80	1405	1.3	23.1	2,000	4.4	----	80	1.6	180	150
	6-2-80	1435	1.7	22.6	2,160	6.6	----	56	1.6	230	160
	6-2-80	1453	1.7	22.3	2,100	6.7	----	57	4.3	210	150
	6-2-80	1700	1.5	----	2,230	7.1	----	64	1.7	230	170

Table 8.--Water-quality and other hydrologic data collected during nonsteady flow, March to June 1980--Continued

Site	Date of sampling	Chloride, dissolved (mg/L)	Fluoride, dissolved (mg/L)	Sulfate, dissolved (mg/L)	Silica, dissolved (mg/L)	Alkalinity as $CaCO_3$ (mg/L)	Acidity as $CaCO_3$ (mg/L)	Acidity total (mg/L)	Dissolved nitrate + nitrite, as N (mg/L)	Total orthophosphate, as PO_4 (mg/L)	Total orthophosphate, as P (mg/L)
243A	4-11-80	18	0.3	60	9.6	180	----	---	2.3	0.25	0.080
	4-11-80	----	---	---	----	---	----	---	----	----	-----
	4-11-80	----	---	---	----	---	----	---	----	----	-----
	4-11-80	----	---	---	----	---	----	---	----	----	-----
	4-11-80	----	---	---	----	---	----	---	----	----	-----
	4-11-80	----	---	---	----	---	----	---	----	----	-----
	4-11-80	17	.2	48	7.3	140	----	---	2.0	3.00	.980
	4-11-80	----	---	---	----	---	----	---	----	----	-----
	4-11-80	----	---	---	----	---	----	---	----	----	-----
	4-12-80	----	---	---	----	---	----	---	----	----	-----
	4-12-80	10	.2	35	4.3	74	----	---	.97	.80	.260
	4-12-80	8.3	.2	29	4.1	58	----	---	.80	.80	.260
	4-12-80	----	---	---	----	---	----	---	----	----	-----
	4-12-80	9.1	.2	34	5.4	61	15	.3	1.4	.52	.170
	4-12-80	----	---	---	----	---	----	---	----	----	-----
	4-12-80	12	.2	43	6.8	78	----	---	1.8	.34	.110
275C	4-11-80	1.0	.0	19	12	11	----	---	.06	.00	.000
	4-11-80	1.2	.0	19	12	12	5.0	.1	.07	.00	.000
	4-11-80	.9	.0	18	12	12	5.0	.1	.08	.00	.000
	4-12-80	1.0	.0	18	12	13	5.0	.1	.05	.00	.000
	4-12-80	.9	.0	18	13	16	5.0	.1	.06	.00	.000
401	3-20-80	6.5	.2	1,000	3.0	150	.0	.0	.19	.00	.000
	3-20-80	6.5	.2	1,000	2.8	150	.0	.0	.17	.00	.000
	3-20-80	6.3	.2	980	2.7	140	.0	.0	.18	.00	.000
	3-21-80	6.5	.2	1,000	2.9	150	.0	.0	.21	.00	.000
	3-21-80	6.7	.2	1,100	2.7	160	.0	.0	.11	.00	.000
	6-2-80	5.7	.2	1,300	2.2	140	30	.6	8.1	.00	.000
	6-2-80	4.8	.2	1,200	3.3	0	50	1.0	.31	.00	.000
	6-2-80	5.3	.2	1,100	4.2	110	15	.3	.23	.00	.000
	6-2-80	5.3	.2	1,100	4.1	110	15	.3	.13	.03	.010
	6-2-80	5.2	.2	1,200	3.6	130	----	---	.08	.00	.000

Table 8.--Water-quality and other hydrologic data collected during nonsteady flow, March to June, 1980--Continued

Site	Date of sampling	Organic carbon, dissolved (mg/L)	Organic carbon, suspended (mg/L)	Organic carbon, total (mg/L)	Hardness, noncarbonate as $CaCO_3$ (mg/L)	Hardness as $CaCO_3$ (mg/L)	Aluminum, dissolved (µg/L)	Aluminum, suspended recoverable (µg/L)	Aluminum, total recoverable (µg/L)	Iron, dissolved (µg/L)	Iron, suspended recoverable (µg/L)
243A	4-11-80	----	0.8	---	32	210	20	130	150	20	820
	4-11-80	----	----	---	---	---	---	------	------	---	------
	4-11-80	----	----	---	---	---	---	------	------	---	------
	4-11-80	----	----	---	---	---	---	------	------	---	------
	4-11-80	----	----	---	---	---	---	------	------	---	------
	4-11-80	----	----	---	---	---	---	------	------	---	------
	4-11-80	6.2	1.8	---	42	180	20	810	830	20	5,300
	4-11-80	----	-----	---	---	---	---	------	-----	---	------
	4-11-80	----	-----	---	---	---	---	------	-----	---	------
	4-12-80	----	-----	---	---	---	---	------	-----	---	------
	4-12-80	10	>7.0	---	25	99	30	620	650	50	13,000
	4-12-80	12	3.2	---	24	82	30	630	660	50	11,000
	4-12-80	----	-----	---	---	---	---	------	-----	---	------
	4-12-80	9.3	2.1	---	30	91	30	2,700	2,700	50	4,000
	4-12-80	----	-----	---	---	---	---	------	-----	---	------
	4-12-80	10	1.0	---	38	120	40	790	830	30	2,600
275C	4-11-80	1.3	.4	---	13	24	30	70	100	10	220
	4-11-80	7.3	.4	---	12	24	20	60	80	20	270
	4-11-80	1.7	.4	---	10	22	20	110	130	20	160
	4-12-80	3.3	.3	---	10	23	30	100	130	20	430
	4-12-80	1.3	.3	---	7	23	20	100	120	20	360
401	3-20-80	3.7	.5	---	900	1,100	60	180	240	20	6,000
	3-20-80	----	.4	---	900	1,100	50	130	180	40	3,000
	3-20-80	3.5	.1	---	910	1,100	50	270	320	190	3,600
	3-21-80	6.4	.4	---	940	1,100	60	100	160	20	2,600
	3-21-80	2.5	.6	---	1,000	1,200	70	100	170	20	1,800
	6-2-80	7.7	.3	---	640	780	800	0	300	240,000	0
	6-2-80	4.3	>10	---	1,100	1,100	1,400	3,300	4,700	5,700	72,000
	6-2-80	3.8	2.0	---	1,100	1,200	30	1,100	1,100	140	6,900
	6-2-80	3.9	1.2	---	1,000	1,100	80	520	600	370	0
	6-2-80	5.1	.4	---	1,100	1,300	90	70	160	100	1,600

Table 8.--Water-quality and other hydrologic data collected during nonsteady flow, March to June 1980--Continued

Site	Date of sampling	Iron, total recoverable (µg/L)	Manganese, dissolved (µg/L)	Manganese, suspended recoverable (µg/L)	Manganese, total recoverable (µg/L)	Boron, total recoverable (µg/L)	Cadmium, total recoverable (µg/L)	Chromium, total recoverable (µg/L)	Copper, total recoverable (µg/L)	Lead, total recoverable (µg/L)	Nickel, total recoverable (µg/L)
243A	4-11-80	840	330	20	350	50	0	30	10	100	100
	4-11-80	-------	---	---	---	--	--	--	--	---	---
	4-11-80	-------	---	---	---	--	--	--	--	---	---
	4-11-80	-------	---	---	---	--	--	--	--	---	---
	4-11-80	-------	---	---	---	--	--	--	--	---	---
	4-11-80	-------	---	---	---	--	--	--	--	---	---
	4-11-80	5,300	330	240	570	30	0	30	10	100	0
	4-11-80	-------	---	---	---	--	--	--	--	---	---
	4-11-80	-------	---	---	---	--	--	--	--	---	---
	4-12-80	-------	---	---	---	--	--	--	--	---	---
	4-12-80	13,000	220	630	850	70	0	40	30	100	0
	4-12-80	11,000	200	430	630	80	0	30	20	100	0
	4-12-80	-------	---	---	---	--	--	--	--	---	---
	4-12-80	4,000	170	170	340	70	0	30	20	100	100
	4-12-80	-------	---	---	---	--	--	--	--	---	---
	4-12-80	2,600	190	80	270	60	0	30	10	100	100
275C	4-11-80	230	10	10	20	10	0	20	0	100	100
	4-11-80	290	10	0	10	20	0	10	0	200	100
	4-11-80	180	10	10	20	20	0	20	0	100	100
	4-12-80	450	7	10	20	20	0	20	0	100	100
	4-12-80	380	8	2	10	20	0	20	0	100	100
401	3-20-80	6,000	290	140	430	350	10	<10	20	0	0
	3-20-80	3,000	270	70	340	350	10	10	20	0	0
	3-20-80	3,800	270	100	370	350	10	10	20	100	0
	3-21-80	2,600	270	60	330	340	10	10	20	0	100
	3-21-80	1,800	260	60	320	370	10	10	20	0	100
	6-02-80	1,100	1,700	0	210	550	0	<10	10	100	100
	6-02-80	78,000	400	150	550	490	0	20	20	300	100
	6-02-80	7,000	230	160	390	510	0	20	10	100	100
	6-02-80	300	210	60	270	490	0	<10	10	100	100
	6-02-80	1,700	170	40	210	510	0	10	10	100	100

Table 8.--Water-quality and other hydrologic data collected during nonsteady flow, March to June 1980--Continued

Site	Date of sampling	Zinc, total recoverable (µg/L)	Solids, residue at 180° C dissolved (mg/L)[2]	Solids, sum of constituents, dissolved (mg/L)	Solids, dissolved (t/day)	Solids, dissolved (t/ac ft)	Sediment, suspended (mg/L)	Sediment suspended sieve diameter finer than 0.062 mm	Sediment discharge, suspended (t/day)	Cumulative rainfall per storm (inches)
243A	4-11-80	10	337	305	3.4	0.46	40	--	0.40	----
	4-11-80	---	---	---	-----	----	40	96	------	.03
	4-11-80	---	---	---	-----	----	61	95	------	.15
	4-11-80	---	---	---	-----	----	78	97	------	.17
	4-11-80	---	---	---	-----	----	143	93	------	.25
	4-11-80	---	---	---	-----	----	254	96	------	.27
	4-11-80	20	282	252	12.8	.38	316	95	14	.36
	4-11-80	---	---	---	-----	----	531	96	------	.42
	4-11-80	---	---	---	-----	----	736	90	------	.50
	4-12-80	---	---	---	-----	----	812	93	------	.54
	4-12-80	70	170	148	17.6	.23	1,000	89	103	.58
	4-12-80	60	140	121	14.5	.19	708	90	73	.62
	4-12-80	---	---	---	-----	----	451	87	------	.62
	4-12-80	20	153	137	6.7	.21	274	87	12	.62
	4-12-80	---	---	---	-----	----	174	91	------	.62
	4-12-80	10	188	173	5.7	.26	143	94	4.3	.62
275C	4-11-80	10	55	50	.04	.07	10	83	.01	----
	4-11-80	10	64	51	.06	.09	10	76	.01	.07
	4-11-80	10	58	49	.07	.08	18	88	.02	.32
	4-12-80	10	62	50	-----	.08	14	83	----	.56
	4-12-80	10	61	52	.08	.08	12	75	.02	.57
401	3-20-80	60	1,790	1,490	3.8	2.4	122	96	.26	----
	3-20-80	130	1,760	1,500	4.6	2.4	115	97	.30	.07
	3-20-80	20	1,700	1,470	4.9	2.3	128	90	.37	.28
	3-21-80	90	1,790	1,510	4.8	2.4	106	97	.29	.30
	3-21-80	20	1,950	1,640	4.2	2.7	89	97	.19	.35
	6-2-80	10	2,280	1,970	5.2	3.1	395	100	.91	----
	6-2-80	80	1,980	1,630	6.8	2.7	1,210	95	4.2	.40
	6-2-80	30	1,990	1,630	9.1	2.7	435	99	2.0	.48
	6-2-80	30	1,950	1,600	8.9	2.7	162	99	.73	.48
	6-2-80	20	2,030	1,750	8.2	2.8	467	99	1.9	.48

Table 8.--Water-quality and other hydrologic data collected during nonsteady flow, March to June 1980--Continued

Site	Date of sampling	Time	Stream-flow, instan-taneous (ft^3/s)	Temper-ature, water (°C)	Spe-cific con-duct-ance	pH	Oxygen, dis-solved (mg/L)	Sodium, dis-solved (mg/L)	Potas-sium, dis-solved (mg/L)	Calcium, dis-solved (mg/L)	Mag-nesium, dis-solved (mg/L)
450	4-11-80	1325	1.82	12.7	2,070	7.8	----	31	4.7	220	160
	4-11-80	1500	----	----	-----	---	----	----	---	-----	-----
	4-11-80	1620	----	----	-----	---	----	----	---	-----	-----
	4-11-80	1800	----	----	-----	---	----	----	---	-----	-----
	4-11-80	1900	----	----	-----	---	----	----	---	-----	-----
	4-11-80	2000	----	----	-----	---	----	----	---	-----	-----
	4-11-80	2030	1.80	12.0	1,980	7.5	----	31	4.7	220	160
	4-11-80	2100	----	----	-----	---	----	----	---	-----	-----
	4-11-80	2115	----	----	-----	---	----	----	---	-----	-----
	4-11-80	2130	----	----	-----	---	----	----	---	-----	-----
	4-11-80	2200	2.85	11.6	1,800	7.4	----	24	4.5	210	130
	4-11-80	2230	3.40	11.3	1,640	7.3	----	20	4.4	200	110
	4-11-80	2300	----	----	-----	---	----	----	---	-----	-----
	4-11-80	2330	----	----	-----	---	----	----	---	-----	-----
	4-11-80	2400	----	----	-----	---	----	----	---	-----	-----
	4-12-80	0045	----	----	-----	---	----	----	---	-----	-----
	4-12-80	0130	4.12	11.1	1,400	7.2	----	16	3.8	160	87
	4-12-80	0200	----	----	-----	---	----	----	---	-----	-----
	4-12-80	0330	----	----	-----	---	----	----	---	-----	-----
	4-12-80	0500	----	----	-----	---	----	----	---	-----	-----
	4-12-80	0600	----	----	-----	---	----	----	---	-----	-----
	4-12-80	0700	----	----	-----	---	----	----	---	-----	-----
	4-12-80	0800	----	----	-----	---	----	----	---	-----	-----
	4-12-80	0900	2.70	10.7	1,700	7.4	----	23	4.1	180	120
464	4-3-80	1500	1.2	16.9	4,660	6.9	9.5	29	4.8	180	600
	4-3-80	1600	1.4	16.9	4,600	7.1	9.1	29	4.7	170	580
	4-3-80	2100	1.3	14.3	4,650	7.1	8.7	29	4.9	180	590

Table 8.--Water-quality and other hydrologic data collected during nonsteady flow, March to June 1980--Continued

Site	Date of sampling	Chloride, dissolved (mg/L)	Fluoride, dissolved (mg/L)	Sulfate, dissolved (mg/L)	Silica, dissolved (mg/L)	Alkalinity as $CaCO_3$ (mg/L)	Acidity as $CaCO_3$ (mg/L)	Acidity total (mg/L)	Dissolved nitrate + nitrite, as N (mg/L)	Total orthophosphate, as PO_4 (mg/L)	Total orthophosphate, as P (mg/L)
450	4-11-80	6.2	0.4	1,100	4.6	130	----	---	0.18	0.00	0.000
	4-11-80	----	---	-----	----	---	----	---	----	----	-----
	4-11-80	----	---	-----	----	---	----	---	----	----	-----
	4-11-80	----	---	-----	----	---	----	---	----	----	-----
	4-11-80	----	---	-----	----	---	----	---	----	----	-----
	4-11-80	----	---	-----	----	---	----	---	----	----	-----
	4-11-80	6.4	.4	1,000	4.8	130	----	---	.22	.00	.000
	4-11-80	----	---	-----	----	---	----	---	----	----	-----
	4-11-80	----	---	-----	----	---	----	---	----	----	-----
	4-11-80	----	---	-----	----	---	----	---	----	----	-----
	4-11-80	5.5	.4	940	4.6	120	----	---	1.1	.00	.000
	4-11-80	4.9	.4	830	4.6	100	----	---	.86	.00	.000
	4-11-80	----	---	-----	----	---	----	---	----	----	-----
	4-11-80	----	---	-----	----	---	----	---	----	----	-----
	4-11-80	----	---	-----	----	---	----	---	----	----	-----
	4-12-80	----	---	-----	----	---	----	---	----	----	-----
	4-12-80	3.8	.4	670	5.1	83	----	---	.46	.00	.000
	4-12-80	----	---	-----	----	---	----	---	----	----	-----
	4-12-80	----	---	-----	----	---	----	---	----	----	-----
	4-12-80	----	---	-----	----	---	----	---	----	----	-----
	4-12-80	----	---	-----	----	---	----	---	----	----	-----
	4-12-80	----	---	-----	----	---	----	---	----	----	-----
	4-12-80	----	---	-----	----	---	----	---	----	----	-----
	4-12-80	5.1	.4	840	4.9	110	----	---	.23	.00	.000
464	4-3-80	18	.2	62	7.9	150	10	.2	1.1	.00	.000
	4-3-80	12	.2	64	3.3	170	----	---	.03	.00	.000
	4-3-80	14	.2	58	6.9	210	----	---	.53	.03	.010

Table 8.--Water-quality and other hydrologic data collected during nonsteady flow, March to June, 1980--Continued

Site	Date of sampling	Organic carbon, dis-solved (mg/L)	Organic carbon, sus-pended (mg/L)	Organic carbon, total (mg/L)	Hard-ness, non-car-bonate as $CaCO_3$ (mg/L)	Hard-ness as $CaCO_3$ (mg/L)	Alum-inum, dis-solved (µg/L)	Alum-inum, sus-pended recov-erable (µg/L)	Alum-inum, total recov-erable (µg/L)	Iron, dis-solved (µg/L)	Iron, sus-pended recov-erable (µg/L)
450	4-11-80	10	0.4	---	1,100	1,200	30	60	90	10	420
	4-11-80	----	-----	---	-----	-----	-----	-----	-----	-------	------
	4-11-80	----	-----	---	-----	-----	-----	-----	-----	-------	------
	4-11-80	----	-----	---	-----	-----	-----	-----	-----	-------	------
	4-11-80	----	-----	---	-----	-----	-----	-----	-----	-------	------
	4-11-80	----	-----	---	-----	-----	-----	-----	-----	-------	------
	4-11-80	3.5	.6	---	1,100	1,200	70	300	370	50	1,100
	4-11-80	----	-----	---	-----	-----	-----	-----	-----	-------	------
	4-11-80	----	-----	---	-----	-----	-----	-----	-----	-------	------
	4-11-80	----	-----	---	-----	-----	-----	-----	-----	-------	------
	4-11-80	5.1	.9	---	940	1,100	80	460	540	30	1,700
	4-11-80	4.9	1.0	---	850	950	80	450	530	80	1,700
	4-11-80	----	-----	---	-----	-----	-----	-----	-----	-------	------
	4-11-80	----	-----	---	-----	-----	-----	-----	-----	-------	------
	4-11-80	----	-----	---	-----	-----	-----	-----	-----	-------	------
	4-12-80	----	-----	---	-----	-----	-----	-----	-----	-------	------
	4-12-80	5.7	1.1	---	670	760	60	400	460	50	1,200
	4-12-80	----	-----	---	-----	-----	-----	-----	-----	-------	------
	4-12-80	----	-----	---	-----	-----	-----	-----	-----	-------	------
	4-12-80	----	-----	---	-----	-----	-----	-----	-----	-------	------
	4-12-80	----	-----	---	-----	-----	-----	-----	-----	-------	------
	4-12-80	----	-----	---	-----	-----	-----	-----	-----	-------	------
	4-12-80	----	-----	---	-----	-----	-----	-----	-----	-------	------
	4-12-80	3.7	.7	---	830	940	50	160	210	40	900
464	4-3-80	----	.4	---	2,700	2,900	130	1,100	1,200	740	1,700
	4-3-80	4.4	1.0	---	2,600	2,800	90	2,500	2,600	1,100	4,700
	4-3-80	5.3	.3	---	2,600	2,900	140	1,300	1,400	1,100	1,400

Table 8.--Water-quality and other hydrologic data collected during nonsteady flow, March to June 1980--Continued

Site	Date of sampling	Iron, total recoverable (µg/L)	Manganese, dissolved (µg/L)	Manganese, suspended recoverable (µg/L)	Manganese, total recoverable (µg/L)	Boron, total recoverable (µg/L)	Cadmium, total recoverable (µg/L)	Chromium, total recoverable (µg/L)	Copper, total recoverable (µg/L)	Lead, total recoverable (µg/L)	Nickel, total recoverable (µg/L)
450	4-11-80	430	1,900	200	2,100	80	0	30	10	200	0
	4-11-80	------	-----	---	-----	---	--	---	--	---	---
	4-11-80	------	-----	---	-----	---	--	---	--	---	---
	4-11-80	------	-----	---	-----	---	--	---	--	---	---
	4-11-80	------	-----	---	-----	---	--	---	--	---	---
	4-11-80	------	-----	---	-----	---	--	---	--	---	---
	4-11-80	1,100	2,400	100	2,500	70	0	20	0	200	100
	4-11-80	------	-----	---	-----	---	--	---	--	---	---
	4-11-80	------	-----	---	-----	---	--	---	--	---	---
	4-11-80	------	-----	---	-----	---	--	---	--	---	---
	4-11-80	1,700	2,400	200	2,600	70	10	30	10	200	100
	4-11-80	1,800	2,200	300	2,500	70	10	20	10	300	100
	4-11-80	------	-----	---	-----	---	--	---	--	---	---
	4-11-80	------	-----	---	-----	---	--	---	--	---	---
	4-11-80	------	-----	---	-----	---	--	---	--	---	---
	4-12-80	------	-----	---	-----	---	--	---	--	---	---
	4-12-80	1,200	2,300	200	2,500	70	10	30	20	200	100
	4-12-80	------	-----	---	-----	---	--	---	--	---	---
	4-12-80	------	-----	---	-----	---	--	---	--	---	---
	4-12-80	------	-----	---	-----	---	--	---	--	---	---
	4-12-80	------	-----	---	-----	---	--	---	--	---	---
	4-12-80	------	-----	---	-----	---	--	---	--	---	---
	4-12-80	940	2,200	200	2,400	70	20	20	10	200	100
464	4-3-80	2,400	6,100	300	6,400	120	10	50	20	100	73
	4-3-80	5,800	6,500	400	6,900	120	10	60	20	100	79
	4-3-80	2,500	6,300	200	6,500	120	10	30	10	100	75

Table 8.--Water-quality and other hydrologic data collected during nonsteady flow, March to June 1980--Continued

Site	Date of sampling	Zinc, total recoverable (µg/L)	Solids, residue at 180° C dissolved (mg/L)[2]	Solids, sum of constituents, dissolved (mg/L)	Solids, dissolved (t/day)	Solids, dissolved (t/ac ft)	Sediment, suspended (mg/L)	Sediment suspended sieve diameter finer than 0.062 mm	Sediment discharge, suspended (t/day)	Cumulative rainfall per storm (inches)
450	4-11-80	10	1,890	1,610	-----	2.6	413	99	----	----
	4-11-80	---	-----	-----	-----	----	582	100	----	0.05
	4-11-80	---	-----	-----	-----	----	494	100	----	.12
	4-11-80	---	-----	-----	-----	----	475	100	----	.13
	4-11-80	---	-----	-----	-----	----	455	100	----	.15
	4-11-80	---	-----	-----	-----	----	381	100	----	.18
	4-11-80	30	1,860	1,510	-----	2.5	422	100	----	.23
	4-11-80	---	-----	-----	-----	----	458	100	----	.24
	4-11-80	---	-----	-----	-----	----	614	99	----	.28
	4-11-80	---	-----	-----	-----	----	498	100	----	.31
	4-11-80	40	1,700	1,400	-----	2.3	507	---	----	.34
	4-11-80	30	1,510	1,240	-----	2.1	516	100	----	.37
	4-11-80	---	-----	-----	-----	----	491	100	----	.39
	4-11-80	---	-----	-----	-----	----	457	100	----	.45
	4-11-80	---	-----	-----	-----	----	314	99	----	.46
	4-12-80	---	-----	-----	-----	----	296	99	----	.52
	4-12-80	30	1,230	1,000	-----	1.7	415	99	----	.52
	4-12-80	---	-----	-----	-----	----	267	99	----	.54
	4-12-80	---	-----	-----	-----	----	411	99	----	.56
	4-12-80	---	-----	-----	-----	----	432	99	----	.60
	4-12-80	---	-----	-----	-----	----	464	99	----	.60
	4-12-80	---	-----	-----	-----	----	398	99	----	.60
	4-12-80	---	-----	99	-----	.13	433	99	----	.60
	4-12-80	30	1,520	1,250	-----	2.1	449	99	----	.60
464	4-3-80	140	4,830	4,090	15.1	6.6	---	---	----	----
	4-3-80	120	4,760	4,050	17.7	6.5	---	---	----	.06
	4-3-80	90	4,820	4,180	17.2	6.6	---	---	----	.08

[1]For example, 1610 is the same as 4:10 p.m.

Table 9.--Precipitation at two southwestern Indiana weather stations, October 1, 1979, to September 30, 1980

[Data from National Oceanic and Atmospheric Administration 1979a-c and 1980a-i; precipitation in inches]

Day	Weather station	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept
1	Terre Haute	----	1.47	----	----	----	0.40	----	----	----	----	0.08	0.70
	Spurgeon	----	.91	----	----	----	(1)	----	----	0.06	----	----	.30
2	Terre Haute	1.26	----	----	----	----	----	----	----	----	----	----	----
	Spurgeon	.55	----	----	----	----	.30	----	----	----	----	----	----
3	Terre Haute	----	----	----	----	----	----	----	----	----	0.04	.26	----
	Spurgeon	.16	----	----	----	----	----	----	----	----	2.02	.26	----
4	Terre Haute	.10	----	----	----	----	----	0.16	----	----	.35	----	----
	Spurgeon	.21	----	----	(1)	----	----	.05	----	----	.17	----	----
5	Terre Haute	----	----	----	----	----	.30	----	----	----	----	----	.18
	Spurgeon	----	----	----	(1)	----	.50	----	----	----	.82	----	1.17
6	Terre Haute	----	.02	----	----	0.16	----	----	----	----	----	----	----
	Spurgeon	----	----	----	(1)	(1)	----	----	----	----	----	.02	----
7	Terre Haute	----	----	----	----	----	----	.05	----	----	----	.08	----
	Spurgeon	----	----	----	0.15	(1)	----	----	----	----	----	----	----
8	Terre Haute	----	.04	----	----	----	.12	.39	----	.42	----	----	.13
	Spurgeon	----	----	----	----	(1)	1.00	.30	----	.26	----	----	----
9	Terre Haute	----	.30	----	----	.08	----	.52	----	----	----	----	----
	Spurgeon	----	1.08	----	----	(1)	----	.23	----	----	----	----	----
10	Terre Haute	.08	.26	----	----	----	----	.21	----	----	.04	----	----
	Spurgeon	.43	.89	----	----	(1)	----	----	----	----	----	----	----
11	Terre Haute	.06	----	----	.41	----	----	----	0.31	----	.15	.54	----
	Spurgeon	.10	----	----	.95	(1)	----	----	----	----	.50	.17	----
12	Terre Haute	.02	----	0.04	----	----	----	.02	.21	----	----	----	----
	Spurgeon	----	----	.15	.01	(1)	----	.65	----	----	----	----	----
13	Terre Haute	----	----	.02	----	----	.21	----	.28	----	----	----	----
	Spurgeon	----	----	.62	----	(1)	.15	----	1.01	----	----	----	----
14	Terre Haute	----	----	----	----	----	.10	.82	----	----	----	.20	----
	Spurgeon	----	----	----	.23	(1)	----	.82	.11	----	----	.01	----
15	Terre Haute	----	----	----	.05	.30	----	.16	----	.09	----	1.30	----
	Spurgeon	----	----	----	----	(1)	----	.05	----	----	----	.56	----

Table 9.--Precipitation at two southwestern Indiana weather stations, October 1, 1979, to September 30, 1980--Continued

Day	Weather station	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept
16	Terre Haute	0.05	----	----	----	0.30	----	0.03	----	----	----	0.06	0.58
	Spurgeon	----	----	----	----	.83	----	----	----	0.16	----	.11	----
17	Terre Haute	.17	----	----	----	----	0.89	----	0.33	----	----	.64	1.67
	Spurgeon	.07	----	----	0.29	----	.25	----	.70	----	----	----	1.48
18	Terre Haute	----	----	----	----	----	.10	----	.14	----	----	.03	----
	Spurgeon	----	----	----	----	----	----	----	1.15	----	----	.12	----
19	Terre Haute	----	0.02	----	----	----	----	----	.18	----	----	.30	----
	Spurgeon	----	----	----	----	----	----	----	.06	----	----	----	----
20	Terre Haute	----	.02	----	.02	.02	----	----	----	.31	----	----	----
	Spurgeon	----	----	----	----	.22	.30	----	.04	.19	----	----	----
21	Terre Haute	----	----	----	----	.01	.53	----	----	----	0.12	----	----
	Spurgeon	----	----	----	----	----	1.02	----	----	----	----	----	----
22	Terre Haute	----	.42	0.50	.03	.21	----	----	----	----	.89	----	----
	Spurgeon	----	.59	.27	----	.13	----	----	----	----	1.66	----	----
23	Terre Haute	1.00	.60	.60	----	----	----	----	.41	----	----	----	.91
	Spurgeon	.93	1.31	.22	----	.25	----	----	.19	.40	----	----	1.10
24	Terre Haute	.01	.01	.03	----	----	.41	----	----	.50	----	----	----
	Spurgeon	----	.53	1.10	----	----	.68	----	.53	2.73	----	----	----
25	Terre Haute	----	----	.06	.13	----	.03	----	.02	----	----	----	----
	Spurgeon	----	----	.15	----	----	.45	----	----	----	----	----	----
26	Terre Haute	----	1.24	----	----	.10	----	----	----	----	----	----	----
	Spurgeon	----	1.20	----	----	.10	----	.07	----	----	----	----	----
27	Terre Haute	----	----	----	----	----	----	----	----	----	.19	----	----
	Spurgeon	----	----	----	----	----	----	----	----	----	.32	----	----
28	Terre Haute	.11	.16	----	----	.02	----	.06	----	----	.46	----	----
	Spurgeon	.03	.73	----	----	----	.05	.06	----	----	.88	----	----
29	Terre Haute	----	----	----	----	----	.47	.31	----	3.10	----	----	----
	Spurgeon	----	----	----	----	----	.22	.20	----	1.88	----	.05	----
30	Terre Haute	----	----	----	.15	----	.05	.01	.28	----	----	.10	----
	Spurgeon	----	----	.08	----	----	.23	----	.07	----	----	----	----
31	Terre Haute	.40	----	----	.15	----	1.17	----	----	----	----	----	----
	Spurgeon	----	----	----	.38	----	.52	----	----	----	----	----	----

[1]Amount included in following measurement, time distribution unknown.

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