EVALUATION OF THE EFFECTS OF COAL-MINE RECLAMATION ON WATER QUALITY IN BIG FOUR HOLLOW NEAR LAKE HOPE, SOUTHEASTERN OHIO

By Vance E. Nichols

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CONVERSION FACTORS

For the benefit of readers who prefer to use metric (International System) units, conversion factors for the inch-pound units used in this report are listed below:

Multiply Inch-Pound Unit	By	To Obtain Metric Unit
inch (in.)	25.40	millimeter (mm)
foot (ft)	0.3048	meter (m)
mile (mi)	1.609	kilometer (km)
square mile (mi^2)	2.590	square kilometer (km^2)
square mile (mi^2)	259	hectares (ha)
pound (lb)	0.4536	kilogram (kg)
cubic foot per second (ft^3/s)	0.02832	cubic meter per second (m^3/s)
ton	0.9072	megagram (Mg)
ton per acre-foot (ton/acre-ft)	7.35	megagram per hectare-meter (Mg/ha-m)

Temperature in degrees Fahrenheit (°F) is converted to degrees Celsius (°C) as follows:

$$°C = (°F - 32)/1.8$$

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ABSTRACT

A subsurface clay dike and mine-entrance hydraulic seals were constructed from July 1979 through May 1980 by the Ohio Department of Natural Resources, Division of Reclamation, to reduce acidic mine drainage from abandoned drift-mine complex 88 into Big Four Hollow Creek. Big Four Hollow Creek flows into Sandy Run--the major tributary to Lake Hope. A data-collection program was established in 1979 by the U.S. Geological Survey to evaluate effects of drift-mine sealing on surface-water and ground-water systems of the Big Four Hollow Creek and Sandy Run area just below the mine.

Data collected by private consultants from 1970 through 1971 near the mouth of Big Four Hollow Creek (U.S. Geological Survey station 03201700) show that pH ranged from 2.7 to 4.8, with a median of 3.1. The calculated sulfate load was 1,200 pounds per day, and the calculated iron load was 50 pounds per day.

Data collected near the mouth of Big Four Hollow Creek (station 03201700) from 1971 through 1979 (before dike construction) show the daily pH ranged from 2.1 to 6.7; the median was 3.6. The daily specific conductance ranged from 72 to 3,500 microsiemens per centimeter at 25° Celsius and averaged 770. The estimated loads of chemical constituents were: Sulfate, 1,100 pounds per day; iron. 54 pounds per day; and manganese, 12 pounds per day.

All postconstruction data collected at station 03201700 through the end of the project, May 1980 through June 30, 1983, show that the daily pH ranged from 2.4 to 7.7, with a median of 3.7. Daily specific conductance ranged from 87 to 3,200 microsiemens per centimeter and averaged 1,200. The estimated loads of chemical constituents for this period were: Sulfate, 1,000 pounds per day; iron, 44 pounds per day; and manganese, 16 pounds per day.

Standard nonparametric statistical tests were performed on the data collected before and after reclamation. Differences at the 95-percent confidence level were found in the before- and after-reclamation data sets for specific conductance, aluminum, and manganese at station 03201700. Data collected during the first 6 months after reclamation indicated moderate improvement in water quality only because no highly mineralized water was leaking from the closed mine. Later, perhaps in September 1980,

increased hydraulic head behind the clay dike caused the mine water to seep out and degrade the stream-water quality.

In order to investigate leakages, dye was injected into two wells that penetrated the closed mine complex 88. One injection revealed that the dye moved to a discharge point at a nearby mine entrance known to be connected to complex 88. No discharge of dye was detected as a result of dye injection into the other well during the project.

Acidic mine water continues to seep from the closed mine complex 88. A definitive evaluation of the effects of reclamation on the area's water quality cannot be made until the hydrologic system stabilizes.

INTRODUCTION

Background

Lake Hope, in Vinton County, Ohio, 55 miles southeast of Columbus (fig. 1), was formed in 1939 when Sandy Run was dammed 0.25 mile upstream from its mouth (Tobin and Youger, 1977). The lake is in Zaleski State Forest and is used for recreation. The Middle Kittanning ("No. 6") coal bed was mined extensively in the vicinity north of Lake Hope from the 1850's to the 1950's (Stanley Consultants, 1972, and Stout, 1927). Acidic drainage from abandoned coal drift (underground) mines and unreclaimed surface mines has affected the water quality of the lake (Harris, 1973, p. 3, and Stanley Consultants, 1969, p. 4).

Sandy Run, which has its headwaters in the northeastern corner of Vinton County, Brown Township (sections 11 and 12), drains 63 percent of the drainage area contributing to Lake Hope. Both Sandy Run and Big Four Hollow Creek, a tributary of Sandy Run, carry mine drainage (fig. 1). Sandy Run above Big Four Hollow Creek (U.S. Geological Survey station 03201600) has a drainage area of 1.01 square miles; Big Four Hollow Creek (station 03201700) has a drainage area of 0.98 square mile. Principal features of the mine area are shown in figure 2.

Acidic water develops when the minerals pyrite and marcasite (iron disulfides), which are found in coal-bearing rocks in Ohio, react with free oxygen and water in partly flooded underground mines. This reaction forms highly acidic, highly mineralized water that may eventually flow into streams. If the abandoned underground mines are completely flooded, most of the free oxygen is no longer available for the chemical reactions that produce acidic water.

Attempts have been made to decrease acidic mine drainage into Lake Hope. Mine seals, impoundment dams, powdered lime, limestone-leaching filters, mine flooding with water or inert gas, and grout curtains have been suggested or tried with varying degrees of success. None of these remedial measures had been

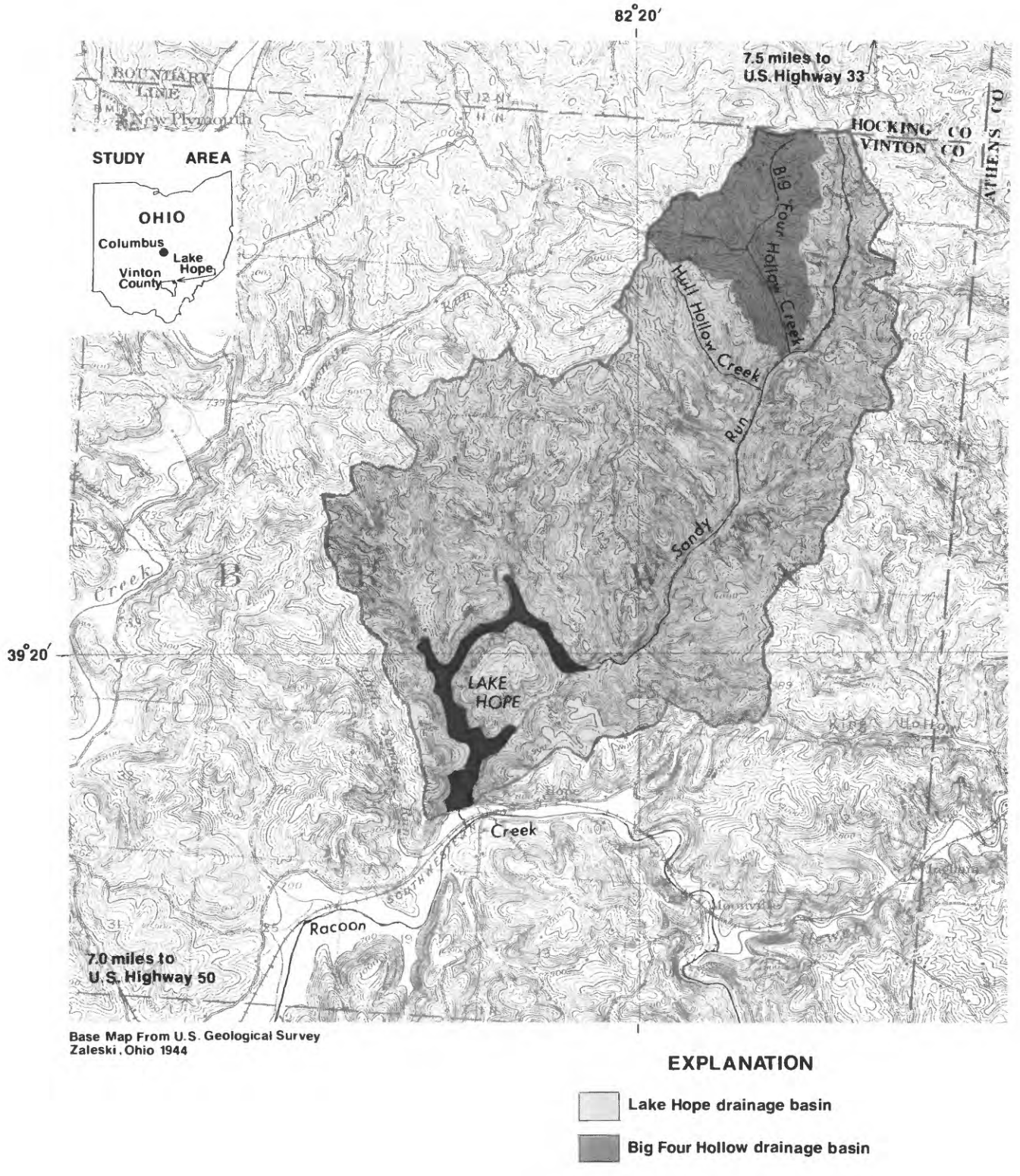

Figure 1.--Location and major hydrologic features of Lake Hope basin.

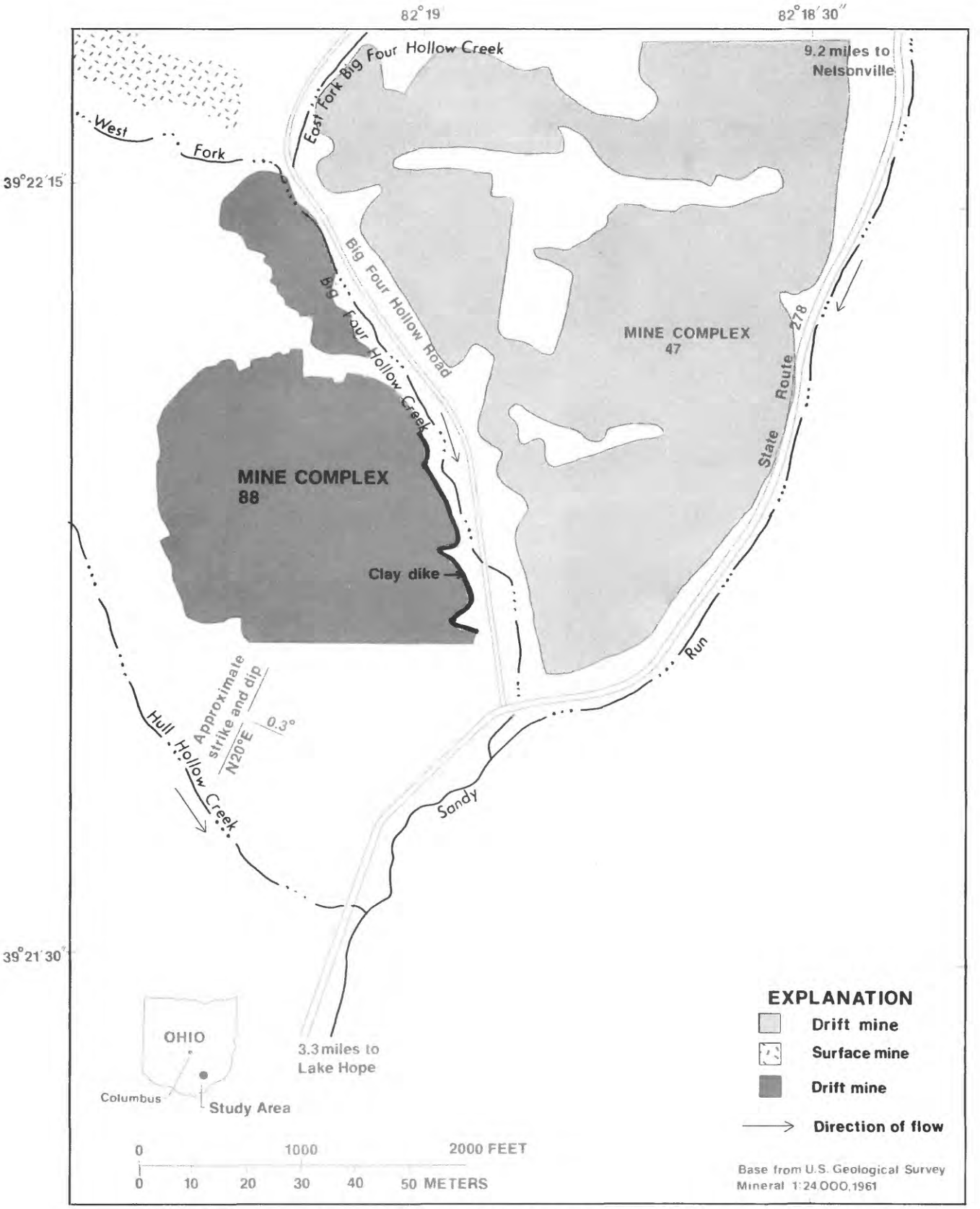

Figure 2.--Location and major hydrologic features of Big Four Hollow Creek and mine complex 88 area.

in effect in the Sandy Run area for several years prior to the late 1970's.

On June 20, 1979, the Ohio Department of Natural Resources, in cooperation with the U.S. Environmental Protection Agency, began reclamation efforts to reduce acidic mine discharge to Sandy Run. Much of the reclamation effort was devoted to drift mine complex 88 (fig. 2). Coal seams in this complex had been mined by the "room and pillar" method; acidic water was discharging from numerous entrances to the mine, all of which are above Big Four Hollow Creek.

A large underground clay dike and 35 mine seals were placed in the downdip side of the Middle Kittanning coal at mine complex 88 (fig. 3). An overflow well was drilled into the mine behind the clay dike to relieve the pressure head if the impounded water approached the top of the dike. Toe drains were installed to remove water from the outside undisturbed trench wall before the clay dike was placed in the trench. Construction was completed by the middle of April 1980.

The dike served to impound water in mine complex 88, and seals served to impound water in smaller mines in the west side of Big Four Hollow (fig. 2). When the mines have filled with water, most of the free oxygen will have been removed, thus inhibiting the production of acid and iron complexes and, theoretically, reducing the acidity of mine discharge.

A 3-acre surface mine north of the construction area (fig. 2) also was reclaimed at the same time as construction of the dike. Material that came out of the clay-dike trench was used to reclaim this surface mine.

Purpose and Scope

This report documents the quantitative and qualitative changes that have taken place in surface and ground water of Big Four Hollow and mine complex 88 as a result of the project to abate mine drainage. The investigation was conducted in cooperation with the Ohio Department of Natural Resources, Division of Reclamation. Hydrologic data were collected before, during, and after the construction of the clay dike and mine-entrance seals in order to evaluate the effect of mine sealing on the hydrologic system and the usefulness of mine sealing to reduce acidic mine drainage from abandoned drift mines.

Hydrologic data collected from October 1970 through June 1983 are discussed in this report. The data presented include water-quality and discharge data from a network of surface-water sites and a water-quality monitor (fig. 4, table 1); water-level and water-quality data from wells drilled into the drift-mine complex 88 and into the sandstone above the mine; data from an abandoned domestic well near abandoned mine complex 88 (used to observe ground-water changes related to reclamation); and results of dye-injection tests to locate leakages from the mine complex 88.

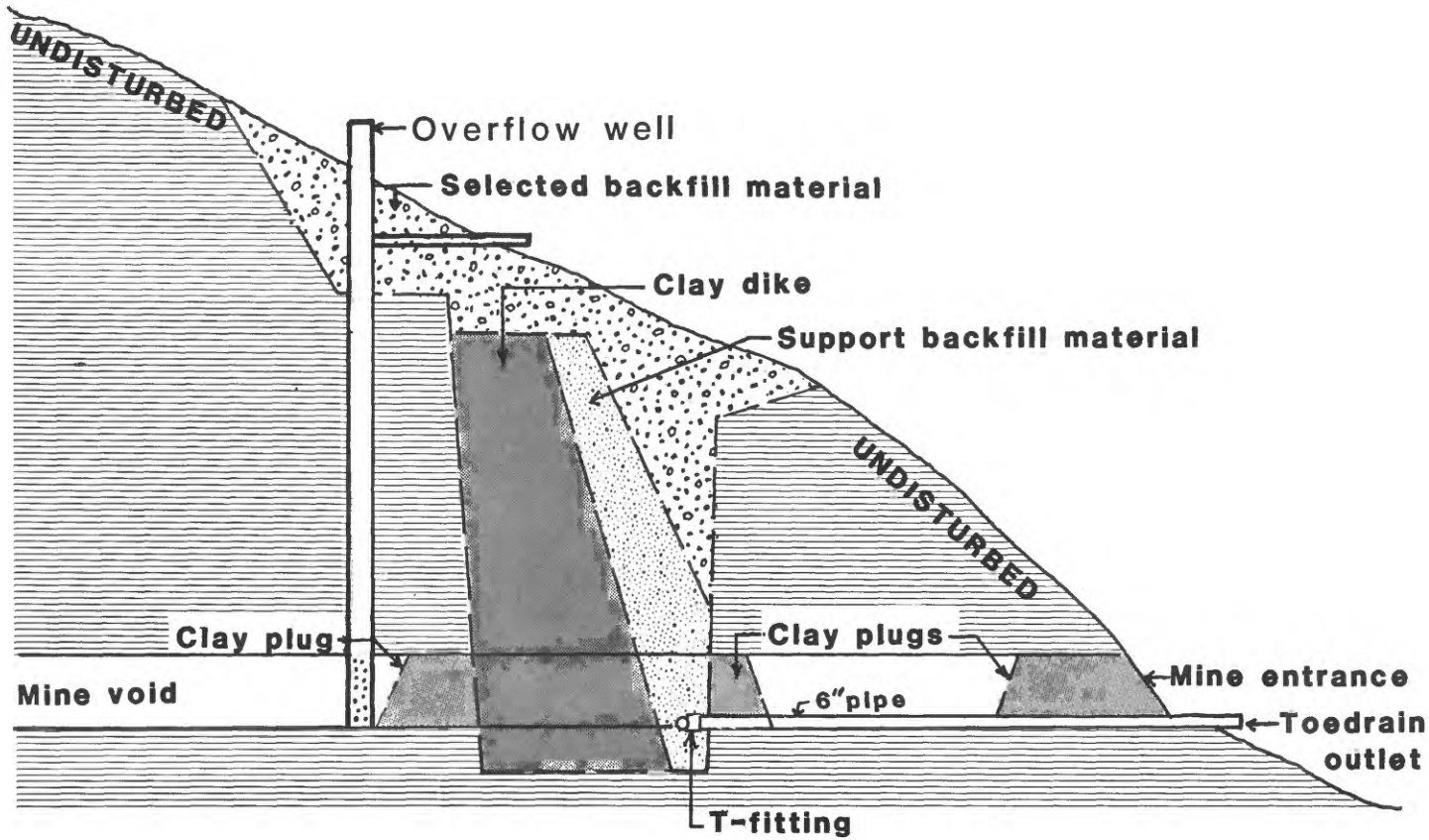

Figure 3.--Schematic cross-section of clay dike and mine-entrance seals constucted at mine complex 88 in Big Four Hollow near Lake Hope, Ohio.

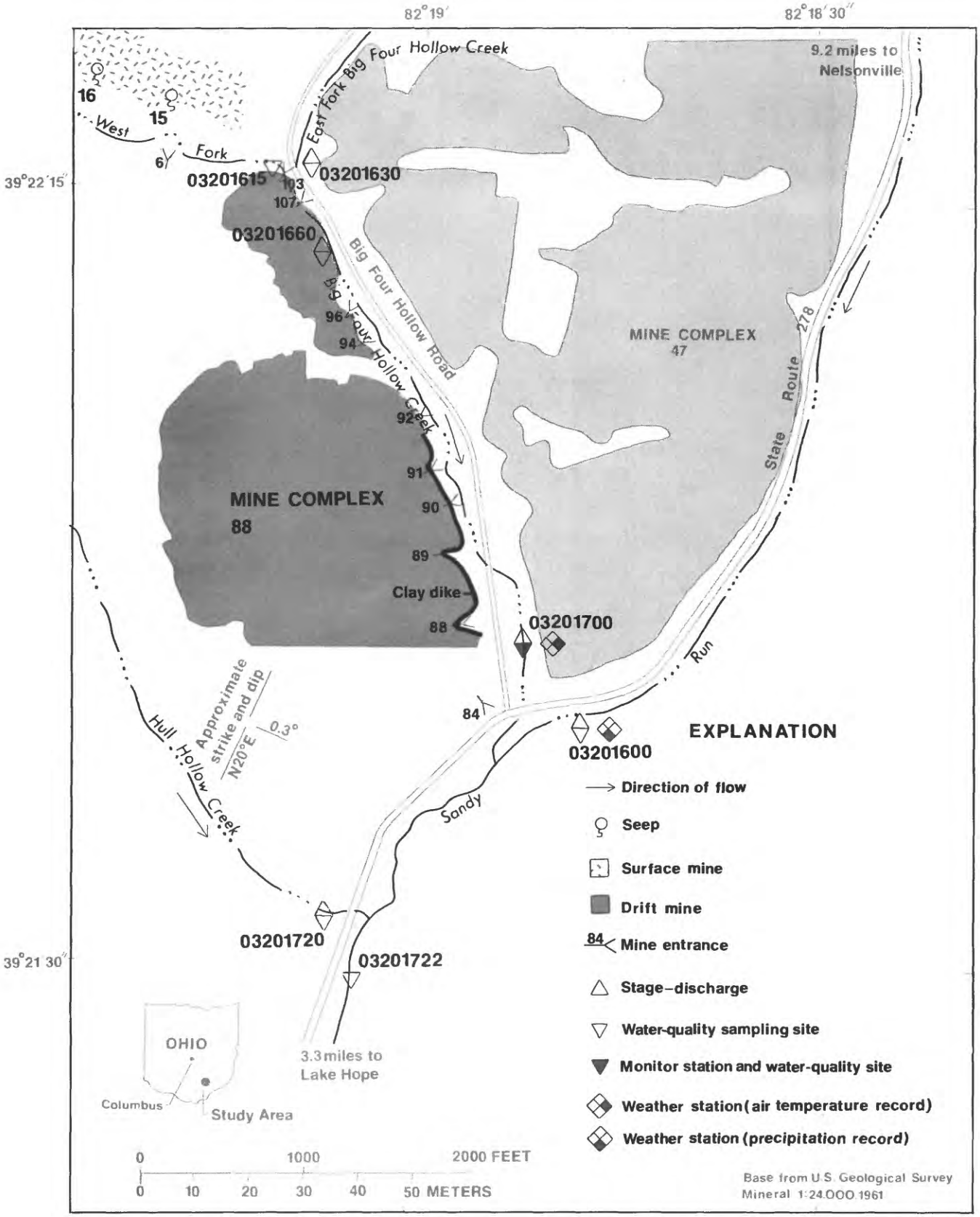

Figure 4.--Big Four Hollow surface-water-quality sampling sites.

Table 1.--Station names, numbers, and types of data collected, Sandy Run drainage basin

[Type of data: C, sampling for water quality; Q, daily discharge; M, water-quality monitor; and S, daily sediment station]

Downstream order number	Station name	Type of data	Dates
03201615	West Fork Big Four Hollow Creek near Lake Hope	C	10/78-7/79
03201630	East Fork Big Four Hollow Creek near Lake Hope	Q,C	10/78-7/79
03201660	Big Four Hollow Creek below confluence of West and East Forks	Q	10/78-9/81
03201700	Big Four Hollow Creek near Lake Hope	S,C,M	10/78-6/83
03201600	Sandy Run above Big Four Hollow Creek	Q,C	10/71-9/81
03201720	Hull Hollow Creek near Lake Hope	Q,C	10/78-9/81
03201722	Sandy Run below Hull Hollow	C	10/78-9/81

Reports from consultants and the U.S. Geological Survey Water Resources Data for Ohio, water years 1971 through 1982 (volume I, Ohio River basin) served as background for this report.

Physiography and Geology of the Lake Hope Area

The topography of the area around Lake Hope is characteristic of the unglaciated Appalachian foothills, and consists of rolling terrain deeply dissected by numerous small streams. Land-surface altitudes range from about 1,060 feet to about 680 feet above sea level in the Sandy Run basin. Sandy Run drops 54 feet in altitude from the mouth of Big Four Hollow Creek (770 feet above sea level) to Lake Hope surface altitude (716 feet above sea level) about 3.7 miles downstream.

The geologic formations that crop out in Big Four Hollow and the Lake Hope area were formed about 300 million years ago during the Pennsylvanian Period. The Allegheny Formation of Pennsylvanian age contains the Middle Kittanning coal bed, which is overlain by the Lower Freeport massive sandstone (in some places, more than 60 feet thick) and underlain by the Middle Kittanning clay, which averages about 1 foot thick. The Middle Kittanning coal is divided into three seams separated by clays and shales; the three seams together average 44 inches in thickness in mine complex 88.[1] All three seams contain the iron disulfides, marcasite and pyrite (Tucker, 1919, and Stout, 1927, p. 330). The iron disulfides are also present in the underclay. The coal crops out above Big Four Hollow Creek everywhere in Big Four Hollow and dips generally southeast at about 33 feet per mile (Harris, 1973, p. 13).

METHODS OF STUDY

Measurement of Surface-Water Quality and Discharge

Five surface-water sampling stations (03201600, 03201615, 03201630, 03201720, and 03201722; fig. 4) were established October 1, 1978, near Lake Hope as part of the data-collection network. One surface-water sampling station (03201700, fig. 4) that was established in October 1970 also was included in the network. This station was upgraded October 1, 1978, to include a water-stage Stacom[2] manometer (a well and float was used previously) and a water-quality monitor that measured water temperature, outside air temperature, specific conductance, and pH (air temperature was not measured previously). Sediment samples

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[1]The room and pillar method of mining was used in this mine complex, which left about 60 percent of the coal in place.

[2]Use of trade names in this report is for identification purposes only and does not constitute endorsement by the U.S. Geological Survey.

were collected manually at this station from a concrete weir and stainless steel flume, in order to determine changes in sediment concentration before and after reclamation. A contracted observer collected and capped the samples, which were later analyzed at the Geological Survey office in Columbus, Ohio, using techniques described by Guy (1969).

Stations 03201615 and 03201630 were discontinued July 10, 1979, and a new downstream sampling station (03201660) was established. Data collection at all surface-water sites was discontinued October 1, 1981, except for station 03201700 on Big Four Hollow Creek, which was sampled through June 30, 1983. Table 1 lists the stations and the type of data collected at each site.

Sandy Run above Big Four Hollow Creek (03201600) and Hull Hollow Creek (03201720) were selected as control sites. They are near, but not affected by, the reclamation in Big Four Hollow. Sandy Run above Big Four Hollow Creek was selected as an unreclaimed control stream containing acidic mine drainage from the Middle Kittanning coal. Hull Hollow Creek was selected as an unreclaimed control stream containing nonacidic drainage. These sites served as water-quality sampling and discharge-measuring sites for comparison with sites 03201660 and 03201700. The Hull Hollow Creek site also was selected to determine any stream-quality or discharge change due to unexpected leakage through the west side of mine complex 88 (fig. 4); no updip seals were constructed on the west side of mine complex 88.

Two surface-water sites (03201660 and 03201700)--one downstream from the reclamation site and one upstream--were selected on Big Four Hollow Creek (fig. 4). Water-quality samples were collected and discharge was measured at these sites. The upstream site (03201660) was the water-quality and discharge control site for water flowing into the reclaimed area. The downstream site (03201700) was the most important for this project because it would have been the first to show any change in water quality or discharge resulting from mine seepage or ground-water leakage from the reclaimed area.

Sandy Run below Hull Hollow (station 03201722) was selected for water-quality sampling. This site is far enough downstream from Hull Hollow Creek (200 feet) that inflow is mixed before sampling.

Stream water was sampled every 2 weeks at stations 03201600, 03201630, 03201700, and 03201722 (table 1). Stream water was also sampled monthly and quarterly for additional constituents at these four stations, and at station 03201720 on Hull Hollow Creek. Water samples were obtained in accordance with field techniques described by Rainwater and Thatcher (1960), and by Brown and others (1970; updated by Skougstad and others, 1979). All water samples were analyzed by the U.S. Geological Survey central laboratory in Doraville, Ga.

Selected chemical constituents (table 2) were deleted from the sampling schedule because they were not found at significant levels. Specific conductance, pH, dissolved oxygen, alkalinity, acidity, temperature, and discharge were measured in the field when water samples were collected. Chemical loads (in pounds per day) were calculated by multiplying the concentration of each constituent (in milligrams per liter) by the discharge (in cubic feet per second) and by a conversion factor of 5.4.

At the start of the project, acidity loads were determined by calculating the amount of base it took to raise the pH in a known sample to pH 7.0. Later, after construction, the method of acidity load calculation was changed to include heating the sample to complete the acid-base reaction. The change in method precludes comparison of acidity loads before and after construction.

Measurement of Ground-Water Levels, Quality, and Movement

Six wells were drilled to measure ground-water levels behind the clay dike. Four-inch diameter polyvinyl chloride (PVC) pipe was used as casing. All wells were cased to the bottom and the bottom 4 feet was perforated. Three of the wells (designated RM wells, fig. 5) were drilled into mine rooms and casing was set to the underclay. Automatic recorders were installed on these wells to record water levels in the mine. Well RM-3 was destroyed during construction of the dike.

Wells RM-1 and RM-2 were sampled twice a year, RM-1 from June 26, 1980, until June 29, 1983, and RM-2 from May 1, 1981, until June 29, 1983. The same chemical constituents were sampled as in the monthly surface-water samplings. A PVC point sampler was used to bail and sample the water.

When the mine complex 88 flooded, it was suspected that the ground water would saturate the sandstone above the coal seam. SS-wells (fig. 5) were drilled, one next to each RM-well, into the sandstone but not into the coal below. The SS-wells were measured periodically to detect any water that may have risen into the sandstone above the top of the coal as a result of mine flooding. Well RM-1 was drilled 5 feet deeper than well SS-1, RM-2 was 9 feet deeper than SS-2, and RM-3 was 10 feet deeper than SS-3.

A domestic well ("old house well", fig. 5) also was used in this study. It had been drilled 31 feet into the sandstone approximately 200 feet east of mine entrance 90B. The land surface at this well is about 20 feet below the mine floor. The well is finished in the sandstone that elsewhere underlies the mine complex 88 and is suspected to be downgradient from ground water beneath the mine. This well was sampled to assess the chemical quality of ground water below the coal and underclay, and to determine if any leakage from the mine pool into the lower sandstone unit occurred.

Table 2.--Chemical constituents and sampling frequencies at Big Four Hollow near Lake Hope, Ohio, October 1978 through June 1983

[mg/L, milligrams per liter; µS/cm, microsiemens per centimeter at 25°C; and ug/L, micrograms per liter. Frequency is once every two weeks unless otherwise noted]

Property or constituent	Phase	Frequency
Acidity, as H, mg/L		
Alkalinity, as $CaCO_3$, mg/L	Total	
Bicarbonate, as HCO_3, mg/L		
Carbonate, as CO_3, mg/L		
pH		
Specific conductance, µS/cm at 25°C		
Temperature, °C		
Aluminum, as Al, µg/L	Total recoverable	1,4
Antimony, as Sb, µg/L	Total recoverable	3
Arsenic, as As, µg/L	Total recoverable	3
Beryllium, as Be, µg/L	Total recoverable	3
Cadmium, as Cd, µg/L	Total recoverable	3
Calcium, as Ca, mg/L	Dissolved	
Chloride, as Cl, mg/L	Dissolved	
Chromium, as Cr, µg/L	Total recoverable	3
Copper, as Cu, µg/L	Total recoverable	3
Iron, as Fe, µg/L	Dissolved	
Iron, as Fe, µg/L	Suspended	
Iron, as Fe, µg/L	Total recoverable	
Lead, as Pb, µg/L	Total recoverable	
Magnesium, as Mg, mg/L	Dissolved	
Manganese, as Mn, µg/L	Dissolved	
Manganese, as Mn, µg/L	Suspended	
Manganese, as Mn, µg/L	Total recoverable	
Mercury, as Hg, µg/L	Total recoverable	2,6,7
Nickel, as Ni, µg/L	Total recoverable	2,6
Potassium, as K, mg/L	Dissolved	
Selenium, as Se, µg/L	Total recoverable	3
Silver, as Ag, µg/L	Total recoverable	3
Sodium, as Na, mg/L	Dissolved	
Sulfate, as SO_4, mg/L	Dissolved	
Dissolved solids, mg/L	Residue	
Zinc, as Zn, µg/L	Dissolved	
Zinc, as Zn, µg/L	Suspended	1,4
Zinc, as Zn, µg/L	Total recoverable	1,4
NO_2 + NO_3, as N, mg/L	Total	1,4
NH_4 + organics, as N, mg/L	Total	1,4
Nitrogen, as N, mg/L	Total	1,5
Nitrogen, as NO_3, mg/L	Total	1,5
Phosphorus, as P, mg/L	Total	1,4
Phosphorus, as PO_4, mg/L	Total	1,4
Organic carbon, as C, mg/L	Dissolved	1,4
Organic carbon, as C, mg/L	Suspended	1,4
Chemical oxygen demand, mg/L	Total	1,4
Phenols, µg/L	Total	3

1 Sampling frequency changed to monthly on May 9, 1980.
2 Sampling frequency changed to quarterly on May 9, 1980.
3 Sampling discontinued on May 9, 1980.
4 Sampling frequency changed to quarterly on October 1, 1981.
5 Sampling discontinued on February 24, 1982.
6 Sampling frequency changed to twice a year on October 1, 1981.
7 Sampling discontinued on October 1, 1982.

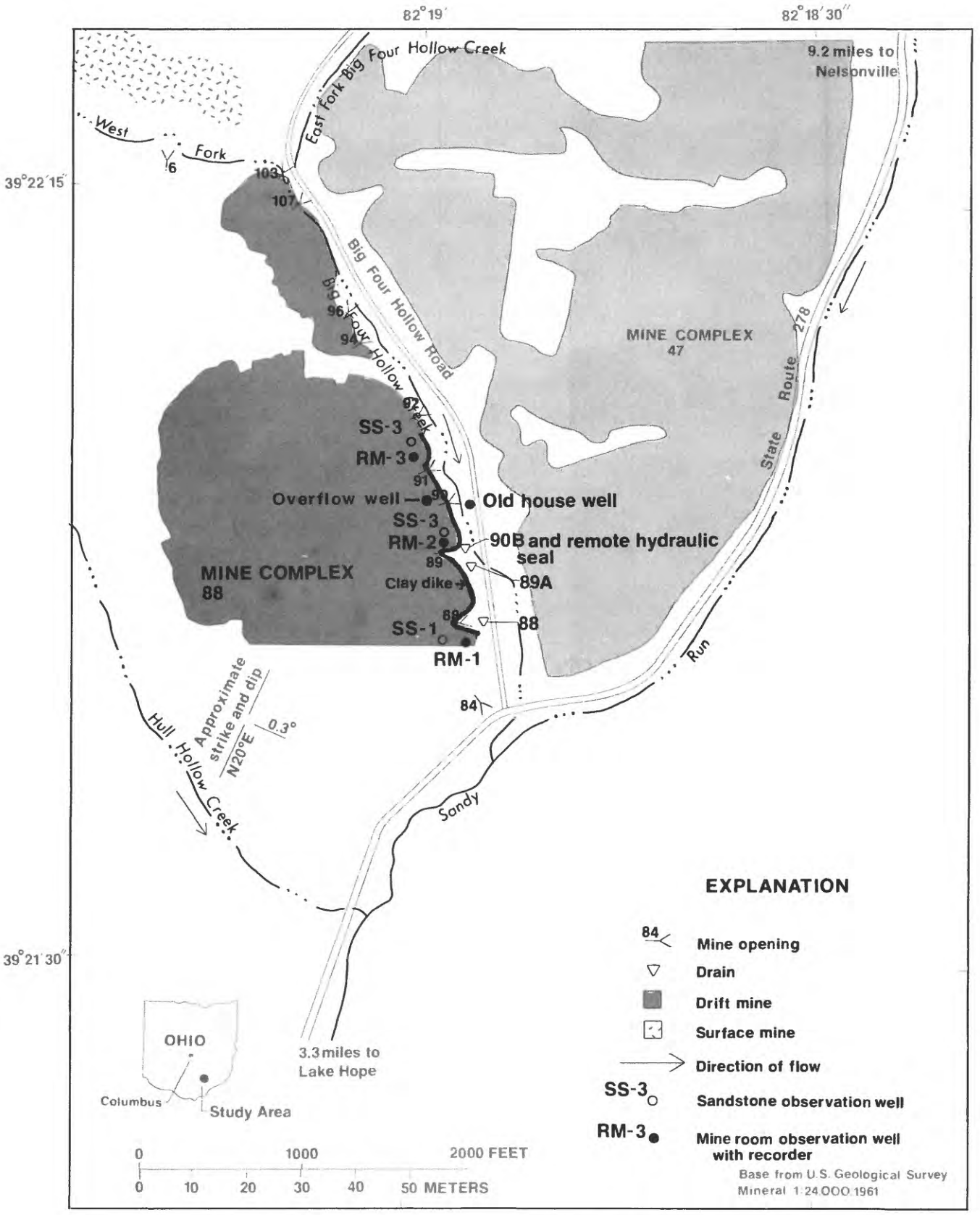

Figure 5.--Big Four Hollow ground-water-quality sampling sites.

Possible points of leakage of impounded water were investigated using a dye-tracing technique. Leakage was suspected from the mine pool in the vicinity of well RM-1 to mine entrance 84 (not connected to mine complex 88) to the south, and from the vicinity of well RM-2 to the weep holes in the mine entrance 90B (blocked by a remote hydraulic seal in the entranceway) (fig. 5). Rhodamine-WT 20 percent dye was injected into wells RM-1 and RM-2 in an attempt to detect any outflow of mine water. On November 16, 1981, at 0900 hours, about 2 1/2 liters of dye was injected into well RM-1. A 20-gallon slug of distilled water was poured in after the dye to flush it away from the well. Water samples were collected at seeps between and including mine openings 89A and 84, and also at the Big Four Hollow Creek station to detect dye and determine its concentration. These samples were collected every other day until February 1982; the sampling frequency then was changed to weekly until October 1982, then to monthly until July 1983. Three more samples were collected--one each in August and October 1983 and January 1984. No dye was detected.

On November 16, 1981, at 1000 hours, about 1 1/2 liters of dye was injected into well RM-2, and a 20-gallon slug of distilled water was used to flush the dye away from the well. Water samples were collected at the mine entrance 90B weep holes twice a day until December 20, 1981. Dye was detected at mine entrance 90B in the sample of November 25, 1981 (1000 hours), at 0.1 parts per million (ppm) concentration; the concentration increased to a maximum of 17 ppm on December 1, 1981.

Measurement of Water Quality at Mine-Entrance Drains and Seeps

Before construction of the clay dike, the area between mine entrances 6 and 84 (fig. 4) contained about 30 mine entrances and many seeps. Nearly all acidic drainage into Big Four Hollow Creek came from the mine entrances. Water seeping from mine entrances 88 and 89A (fig. 5) was sampled before the clay dike was constructed and the mine complex sealed in November 1979.

During dike construction, toe drains were installed to drain percolating ground water from the outside edge of the clay dike. Toe-drain outflows near mine entrances 88 and 89A were sampled after October 1979. There was no outflow at 90B toe drain. Mine entrance 90B was sampled after April 1980, when weep holes in the mine-entrance closure began flowing.

Seeps 15 and 16 (fig. 4) appeared after reclamation of the surface mine north of mine complex 88, perhaps in March or April 1980. They were sampled to determine any change in the seepage to West Fork Big Four Hollow Creek.

EVALUATION OF EFFECTS OF RECLAMATION ON WATER QUALITY

Surface-Water Quality

Big Four Hollow Creek near Lake Hope, Ohio (03201700)

Water-quality data for Big Four Hollow Creek near Lake Hope, Ohio (03201700), are summarized in table 3 and are presented in full in table 4 (water-quality continuous monitor data) and table 5 (water-quality analyses). (Tables 4-7 and 9-23 are at the back of this report.) The water quality at this site was expected to show the most pronounced effects of reclamation of all study sites.

Three project time periods are defined for purposes of discussion: "Before reclamation" is the period before July 1979, "during reclamation" is the period from July 1979 to May 1980, and "after reclamation" is the period from May 1980 to July 1983. "During reclamation" includes the construction of the clay dike and mine-entrance seals and the regrading and seeding of slopes of the small surface mine north of mine complex 88.

Data collected by consultants in 1970 and 1971 near the mouth of Big Four Hollow Creek (table 3) show the median pH was 3.1 and the range was from 2.7 to 4.8. The calculated daily sulfate load was 1,200 lb (pounds), and the calculated daily iron load was 50 lb (Stanley Consultants, 1971).

Before-reclamation data collected at Big Four Hollow Creek from water year 1971 through June 1979, show the median pH was 3.6 and the range was from 2.1 to 6.7. Specific conductance averaged 770 microsiemens per centimeter[1] (µS/cm) at 25°C and ranged from 72 to 3,500 µS/cm. The data indicate that estimated loads of chemical constituents were: Sulfate, 1,100 lb per day; iron, 54 lb per day; and manganese, 12 lb per day. The average discharge was 1.05 cubic feet per second (ft^3/s).

Data collected at Big Four Hollow Creek in the water year prior to reclamation (October 1978 to mid-June 1979) (table 3) show a daily pH ranging from 3.4 to 5.4 and a median pH of 4.0. The daily specific conductance ranged from 160 to 600 µS/cm and averaged 485 µS/cm. During this period, the estimated chemical loads were: Sulfate, 1,080 lb per day; iron, 55 lb per day; manganese, 9 lb per day; and aluminum, 16 lb per day. The discharge was 1.95 ft^3/s. This discharge may be biased on the high side because it does not include the months of July, August, and September, which typically have some of the lowest flows of the year.

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[1]Formerly micromhos per centimeter.

Table 3.--Yearly averages for selected properties and chemical constituents at station 03201700, Big Four Hollow Creek near Lake Hope, Ohio, 1970 through 1983

[d, day; ft^3/s, cubic feet per second; mg/L, milligrams per liter; µS/cm, microsiemens per centimeter at 25°C. All values except median pH were calculated from daily averages. A dash indicates data are not available.]

Water year	Specific conductance (µS/cm)	Median pH	Daily instantaneous load, in pounds: Sulfate, dissolved	Iron, total recoverable	Manganese, total recoverable	Aluminum, total recoverable	Water discharge (ft^3/s)	Suspended sediment: Discharge (ton/d)	Suspended sediment: Concentration (mg/L)
1970[a]	--	--	1,120	49	--	--	--	--	--
1971[b]	--	3.1	1,200	50	--	--	1.05	--	--
1971	1,320	--	987	49	14	--	1.05	--	--
1972	1,040	--	1,040	54	13	--	1.06	--	--
1973	804	--	1,130	41	11	--	1.45	--	--
1974	716	3.1	1,260	57	12	--	1.21	--	--
1975	672	3.1				--	1.31	--	--
1976	605	3.7	686[c]	11[c]	6[c]	--	0.95	--	--
1977	543	4.1				--	.53	--	--
1978	684	3.7					.83	--	--
1979[d]	485	4.0	1,080	55	9	16	1.95	0.59	110
1979[e]	551	3.9	600	36	6	10	1.12	.76	250
1980[f]	386	5.0	1,470	25	16	12	1.95	.71	130
1980[g]	449	4.7	810	13	12	7	1.08	.99	340
1981	1,840	3.1	1,000	42	18	18	1.34	1.45	400
1982	1,320	3.3	930	50	16	300[h]	.81	.15	70
1983[i]	916	3.5	1,220	60	17	4	1.44	.34	90

a Only water-quality samples and instantaneous discharges collected.
b Samples collected by Stanley Consultants (1971).
c Only five samples collected these 3 years.
d Only preconstruction data used, up to July 1979 (273 days of 1979 water year).
e Only during-construction data used, begins July 1979 (92 days of 1979 water year).
f Only during-construction data used, through April 1980 (183 days of 1980 water year).
g Only postconstruction data used, April 1980 (183 days of 1980 water year).
h Only four samples collected for aluminum determination.
i Project suspended July 1, 1983 (273 days of 1983 water year).

Data for the 1980 water year, after reclamation (April 1980 to October 1980, table 3), indicate an improvement of water quality in Big Four Hollow Creek. The median pH was 4.7 and the range was from 3.0 to 6.6. Specific conductance averaged 449 µS/cm and ranged from 120 to 1,090 µS/cm. The estimated sulfate load was 810 lb per day, and the estimated iron load was 13 lb per day. Data used to determine the yearly averages for the entire water year 1980 include some abnormally high and low values that probably are a direct result of the reclamation activity; therefore, only after-reclamation data (after April 1980) were used for calculation of these averages. The discharge for these 6 months was 1.08 ft^3/s.

Data for the 1981 water year--the first full water year after reclamation--indicate degradation of the water quality of Big Four Hollow Creek. The median pH decreased to 3.1 and the range was from 2.4 to 7.7. Specific conductance averaged 1,800 µS/cm and ranged from 87 to 3,200 µS/cm. The estimated sulfate load was 1,000 lb per day, and the estimated iron load was 42 lb per day. The discharge was 1.34 ft^3/s.

Data for the water year 1982 indicate a slight improvement in water quality compared to 1981. The median pH increased slightly to 3.3 and the range was from 2.4 to 5.9. Specific conductance averaged 1,300 µS/cm and ranged from 140 to 3,000 µS/cm. The estimated sulfate load was 930 lb per day, and the estimated iron load was 50 lb per day. The discharge was 0.81 ft^3/s.

The changes in water quality during the first 9 months of the water year 1983 (October 1982 through June 1983) were inconclusive. The median pH increased to 3.5 in 1983, and the range in 1983 was from 2.5 to 6.2. Average specific conductance decreased from 1,300 µS/cm in 1982 to 910 µS/cm in 1983, and conductance values ranged from 99 to 2,200 µS/cm in 1983. The estimated sulfate load increased from 930 lb per day in 1982 to 1,200 lb per day in 1983. The estimated iron load increased from 50 lb per day in 1982 to 60 lb per day. The discharge for 9 months was 1.44 ft^3/s.

Specific-conductance, median pH, water-discharge, and suspended-sediment data in table 3 were taken directly from annual water-resources data reports of the U.S. Geological Survey (1971-1984). If the averages (or mean in the case of pH) were not listed, then they were hand calculated from the original raw data. Data for sulfate, iron, aluminum, and manganese were determined by regression analysis of the sample data (table 5). Instantaneous discharge was used as the independent variable and the chemical constituent as the dependent variable. A regression equation was obtained for a data pair (for example, SO_4 as a function of discharge), and the mean yearly discharge was substituted to obtain a mean daily instantaneous load.

Sediment loads before reclamation were less than during the first 2 years after reclamation. Sediment loads are listed in table 6 and their averages in table 3. The slopes in the basin initially were covered with vegetation, but during and after reclamation (before new growth from seeding), the disturbed areas eroded, which increased the sediment load in the stream. As new vegetation took root, the sediment loads decreased.

A discharge hydrograph for Big Four Hollow Creek near Lake Hope (03201700) for water years 1979-83 is shown in figure 6. (Figs. 6-17 are at the back of this report.)

Other Surface-Water Sites

Data from Sandy Run below Hull Hollow Creek near Lake Hope, Ohio (03201722), indicate water-quality changes downstream from Big Four Hollow. Data from this site (table 7) indicate decreases in sulfates, aluminum, and iron and increases in specific conductance, pH, and manganese after reclamation (table 8). The data shown in table 8 were compiled using the same techniques as for table 3 (described previously). The discharge for Sandy Run below Hull Hollow Creek (03201722) was determined by adding the discharges from stations Big Four Hollow Creek (03201700), Sandy Run above Big Four Hollow Creek (03201600), and Hull Hollow Creek (03201720).

Water-quality data for the sampling station Big Four Hollow Creek below East Fork Big Four Hollow Creek near Lake Hope, Ohio (03201660), are presented in table 9 and summarized in table 8. Data for its two predecessors, Big Four Hollow Creek above East Fork Big Four Hollow Creek (03201615) and East Fork Big Four Hollow Creek (03201630), are presented in tables 10 and 11, respectively.

Water-quality data for station 03201660 (average specific conductance and median pH) did not show change from before reclamation as did the data for station 03201700. The data for station 03201660 also show little change in the median concentrations of sulfates, iron, aluminum, and manganese.

Surface-water-quality data for Sandy Run near Lake Hope, Ohio (03201600), and Hull Hollow Creek near Lake Hope, Ohio (03201720), are listed in tables 12 and 13, respectively, and summarized in table 8. Reclamation did not affect the water quality at these two sites.

Discharge hydrographs for stations 03201600, 03201630, 03201660 and 03201720 are shown in figures 7 through 10, respectively.

Table 8.--Data for selected properties and constituents at four sites near mine complex 88 in Big Four Hollow, Ohio, water years 1979-81

[lb, pound; mg/L, milligrams per liter; µS/cm, microsiemens per centimeter at 25°C. Loads are estimated.]

Water year	Specific conductance (µS/cm)	Median pH	Daily instantaneous load, in pounds: Sulfate, dissolved	Aluminum, total recoverable	Iron, total recoverable	Manganese, total recoverable	Water discharge (ft^3/s)
Sandy Run above Big Four Hollow Creek near Lake Hope, Ohio (03201600)							
1979	765	3.5	1,030	20	74	5.6	1.42
1980	634	4.1	850	19	60	4.4	1.29
1981	925	3.7	620	15	31	3.3	0.93
Big Four Hollow Creek below East Fork Big Four Hollow Creek near Lake Hope, Ohio (03201660)							
1979	275	6.6	220	1.0	4	3.5	1.13
1980	255	7.0	380	4.7	16	4.9	1.25
1981	282	6.9	460	4.9	11	5.0	.84
Hull Hollow Creek near Lake Hope, Ohio (03201720)							
1979	133	6.5	130	<0.1	1	0.1	.93
1980	138	7.2	130	.7	1	.1	.27
1981	153	7.0	60	.3	1	.1	.36
Sandy Run below Hull Hollow Creek near Lake Hope, Ohio (03201722)							
1979	571	3.7	2,120	45	66	16.4	4.09*
1980	495	4.3	1,670	63	122	16.2	3.08*
1981	801	4.0	2,040	37	60	22.7	2.63*

* Estimated

Ground-Water Quality and Water-Level Fluctuations

Ground-water sample analyses for wells RM-1, RM-2, and "old house well" are presented in tables 14 through 16. The ground-water hydrographs for RM-1 (fig. 11) and RM-2 (fig. 12) show an upward, stair-stepping trend in the water level in the mine complex 88. The water level in the mine seems to rise with the spring rains and lower in the fall.

A graph of dye concentration as a function of time at mine entrance 90B (following injection into well RM-2) is shown in figure 13; data are presented in table 17.

Water levels shown on the ground-water hydrographs represent the water level in feet below land surface. To relate these water-surface levels to a universal datum (sea level), subtract these numbers from the altitude of the top of the well casing, and then subtract the land-surface correction (how far the casing sticks up out of the ground). The following data can be used to relate ground-water levels to a common datum:

Well	Altitude of top of casing (ft)	Total depth (ft)	Land-surface correction (ft)
RM-1----------	865.23	53.8	3.8
SS-1----------	860.05	40.1	3.6
RM-2----------	854.36	44.0	3.2
SS-2----------	854.58	30.1	3.0
RM-3----------	851.76	35.6	4.0
SS-3----------	849.95	23.8	3.2
"Old house well"--	795*	31.8	1.4
Station 03201700--	776.04 (altitude at bottom of flume at Big Four Hollow Creek near Lake Hope, Ohio)		

*Estimated from topographic map

The water-level hydrograph for well RM-3 (fig. 14) shows that it was affected by reclamation. The water-level hydrographs for SS-1 (fig. 15) and SS-3 (fig. 16) show surface runoff from precipitation collecting in the wells; the recorders were discontinued, and intermittent water-level measurements were made to determine if the water level of the mine pool had reached the level of the sandstone ceiling.

The hydrograph of "old house well" (fig. 17) shows the potentiometric surface in the sandstone aquifer that elsewhere underlies the mine complex 88. It indicates a constant level of about 10 feet below land-surface datum.

Water Quality at Mine-Entrance Drains and Seeps

Water-quality samples for mine seeps 15 (table 18) and 16 (table 19) were collected after reclamation of the small surface-mine pit to the north of the mine complex 88. The seeps provided an outlet for water building up behind a slope that was constructed against a highwall. The two seeps drained into West Fork Big Four Hollow Creek for two months then ceased to flow after April 1980.

Water-quality analyses from mine entrance 88 and toe drain 88 are presented in table 20. Analyses dated before April 1980 were collected from the mine entrance 88; those listed after April 1980 were collected from the toe drain. The same format is used for the analyses for mine entrance 89A and toe drain 89A (table 21). No comparison can be made because of different sources of water.

Samples from mine entrance 90B were analyzed after reclamation (table 22). The mine entrance was closed with a block wall that had weep holes near the bottom. Weep holes released water collected between the block wall and the remote hydraulic seal located farther back in the entranceway.

Statistical Analyses of Water-Quality Data

Nonparametric statistical tests were performed on the water-quality data from station 03201700, Big Four Hollow Creek near Lake Hope, Ohio, to determine if there were any significant differences between the before- and after-reclamation periods. Testing was performed at the 95-percent confidence level in all cases.

Analysis of variance (Boardman [no date], p. 207) was used to determine if there were any significant differences in the water-quality data sets before and after reclamation. Mean-concentration data sets for aluminum, iron, manganese, and sulfate were not found to be significantly different at the 95-percent confidence level. A difference was found between the mean specific-conductance data sets before and after reclamation, but no difference was found for the median-pH data sets.

The Kruskal-Wallis, Kolmogorov-Smirnov, Cramer-Von Mises, and Median tests (Boardman [no date], p. 189, 193, 213) also were used to determine differences in water quality before and after reclamation. All but the Cramer-Von Mises test showed a difference in specific conductance, aluminum, and manganese. The Cramer-Von Mises test showed a difference only for specific conductance.

The same tests were performed on the water-quality analyses from Sandy Run below Hull Hollow Creek near Lake Hope, Ohio (03201722). All tests showed a significant difference in sulfates, aluminum, and iron at the 95-percent confidence level. The Kruskal-Wallis test also showed a difference in specific conductance.

Comparison of Water Quality Before and After Reclamation

A comparison of water-quality data from Big Four Hollow Creek (station 03201700) before reclamation (water year 1971 through mid-June 1979) and after reclamation (May 1980 through June 1983) shows the following:

Property or constituent (average unless otherwise noted)	Concentration or property	
	Before reclamation	After reclamation
pH (median)	3.6	3.7
Specific conductance (µS/cm)	770	1,250
Sulfate		
Load (lb/day)	1,100e	1,000
Concentration (mg/L)	170	160
Iron		
Load (lb/day)	54e	44
Concentration (mg/L)	8.0	6.7
Manganese		
Load (lb/day)	12e	16
Concentration (mg/L)	2.0	2.6
Aluminum		
Load (lb/day)	16e	11
Concentration (mg/L)	1.5	1.4
Discharge (ft^3/s)	1.05	1.12

e, estimated

Sediment loads increased during and after reclamation. The slopes in the basin were initially vegetated, but during and after reclamation (before new growth from seeding) the disturbed areas were eroded, which increased the sediment load in the stream. As new vegetation took root, the sediment loads began to decrease (table 3).

Chemical analyses of water samples from wells RM-1 and RM-2 show that the mine complex 88 was still very acidic and high in sulfates, aluminum, iron, manganese, and specific conductance at the end of this study. Ground-water hydrographs, however, show the mine's water level was still rising in a stair-step fashion. This suggests that the hydrologic system had not stabilized.

Two ground-water samples from the "old house well" were collected in the 1981 water year (table 16). The analyses indicate a different type of ground water than that collected from RM-1 (table 14) and RM-2 (table 15). The pH was higher in the "old house well" (about 8.2) than in RM-1 and RM-2 (3.0 and less). Specific conductance and concentrations of iron, sulfates, manganese, and aluminum were all lower in the "old house well" than in RM-1 and RM-2.

There are several reasons why the "old house well" may indicate a different type of water. Even though the well is downdip from the mine complex 88, Big Four Hollow Creek may intercept the mine-floor leakage. Another reason may be that the mine floor does not leak enough to affect the ground water 200 feet downdip, or that the ground-water flow may be too slow to show a change so soon after reclamation.

The dye-injection test at well RM-2 indicated that water in the mine pool moved from the vicinity of well RM-2 to the mine entrance 90B weep holes (table 17 and fig. 13). No evidence existed as of January 1984 that dye injected into the mine pool in the vicinity of well RM-1 moved to any seeps. It is possible that the dye in the vicinity of RM-1 was not moving fast enough to have emerged during the time frame of this study.

Water-quality analyses for seeps 15 and 16 show that the water was high in dissolved minerals. Discharge was low, however, and the effect of these seeps on the water quality of Big Four Hollow Creek was minimal.

The hydrologic system of the mine complex 88 in Big Four Hollow was assumed to be stable before reclamation; the amount of water going into the mine (horizontal and vertical percolation) was the same as the amount coming out (open mine-entrance outflow and mine-floor leakage). During the first 7 months after reclamation, water was impounded in the mine. Because mine drainage was reduced, lower specific conductance readings were found in Big Four Hollow Creek. As residence time of water in the mine increased as a result of sealing, more minerals were dissolved. After 7 months, water began to seep from the closed mine, which increased the specific conductance of Big Four Hollow Creek.

Water still slowly enters the sealed mines from precipitation and moving ground water, and may eventually flood mine complex 88 completely. New water entering the closed mines will dilute and flush out the more acidic and mineralized impounded water by way of an overflow well. Decreased oxidation of the sulfide minerals, in theory, may take place once the mines are flooded.

SUMMARY AND CONCLUSIONS

Sulfate, iron, and pH data indicate a slight improvement in the water quality of Big Four Hollow Creek since completion of the reclamation. Specific conductance, manganese and aluminum concentrations, however, indicate either no change or a degradation in the chemical quality of water below the reclaimed area. These indications do not imply that the quality of the impounded mine water or the quality of the surface water in Big Four Hollow Creek have either improved or degraded as a result of reclamation.

Water quality in Big Four Hollow Creek from its mouth to the vicinity of mine complex 88 is dominated by the still acidic and highly mineralized seepages from the reclaimed mine complex 88. The disturbed hydrologic system affected by the reclamation of mine complex 88 had not stabilized by July 1983.

Ideally, additional water-quality samples would be collected from surface-water locations upstream and downstream from the reclamation area; from wells RM-1, RM-2, SS-1, SS-2, and the "old house well"; from the toe drains; and from the weep holes in the closure at mine entrance 90B. When the hydrologic system in the reclamation area is believed to be stable again, chemical analyses of water could be compared and, possibly, a definitive statement could be made of the effects of the reclamation on the water quality of Big Four Hollow Creek.

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Table 4a.--Water-quality-monitor data, station 03201700, Big Four Hollow Creek near Lake Hope, Ohio, water years 1979 through 1983

[MAX, maximum; MIN, minimum]

TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1978 TO SEPTEMBER 1979

DAY	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN
	OCTOBER		NOVEMBER		DECEMBER		JANUARY		FEBRUARY		MARCH	
1	18.5	14.0	13.0	6.5	5.5	1.0	7.5	5.0	1.0	.5	5.5	2.5
2	17.0	11.5	12.5	5.0	6.0	2.0	5.0	.5	1.0	.0	7.0	3.5
3	16.5	10.5	13.0	5.5	8.5	4.5	1.0	.5	1.0	.0	9.5	3.0
4	15.5	12.5	13.0	6.0	9.0	5.5	1.0	.5	2.5	.0	10.5	6.5
5	15.0	10.5	13.0	6.0	6.0	4.0	1.0	.5	1.0	.5	---	---
6	12.5	11.0	12.0	6.5	6.0	3.0	1.5	1.0	1.0	.0	---	---
7	12.5	10.0	8.5	7.5	6.5	3.5	1.5	.5	.0	.0	8.5	2.0
8	11.0	8.0	10.5	5.0	---	---	1.0	.5	.5	.0	8.0	3.5
9	13.5	6.5	7.0	4.0	6.0	4.0	1.0	.5	.5	.0	6.5	2.5
10	14.0	7.0	10.0	4.5	4.0	1.0	1.0	.5	.5	.0	8.0	4.0
11	13.0	8.0	11.5	4.5	3.5	.5	1.0	.5	.5	.0	5.0	1.5
12	16.5	11.0	9.0	7.5	5.0	2.0	1.0	.5	.5	.0	9.5	2.0
13	13.5	11.5	12.0	9.0	5.0	2.0	1.0	.5	.5	.0	8.0	1.0
14	12.0	10.5	10.5	8.0	3.5	1.0	2.0	.5	.5	.0	6.5	4.5
15	11.5	9.5	9.5	7.5	4.5	1.0	1.0	.5	.5	.0	5.5	1.0
16	12.0	9.0	8.5	7.5	5.0	1.5	1.0	.5	.5	.0	7.0	1.0
17	12.0	8.0	11.5	8.5	5.0	1.5	1.5	1.0	.5	.0	9.5	.5
18	13.5	6.5	10.0	8.0	3.5	1.0	2.0	.5	.5	.0	12.0	3.5
19	13.5	9.5	9.5	5.5	3.0	2.5	1.0	.5	.5	.0	11.5	4.0
20	14.0	7.5	8.0	4.5	8.0	3.0	2.0	1.0	.5	.0	12.5	7.0
21	14.0	7.0	8.0	5.5	7.0	3.0	3.5	2.0	.0	.0	15.5	6.0
22	14.5	7.5	9.0	6.0	4.5	1.5	3.5	1.5	.5	.0	14.5	5.0
23	12.0	9.0	9.0	7.0	3.5	.5	4.0	1.0	---	---	11.5	8.0
24	12.5	7.0	8.0	5.0	3.5	1.0	3.5	1.0	---	---	9.0	6.0
25	11.5	5.5	6.5	4.0	3.5	1.5	2.0	1.0	---	---	7.5	4.0
26	12.5	10.5	5.5	4.0	3.0	1.0	2.0	1.0	---	---	5.5	3.5
27	11.5	7.5	8.0	4.5	2.5	.5	3.5	1.0	5.5	2.5	8.5	3.0
28	12.0	6.0	7.5	4.0	1.0	.5	2.5	1.5	5.5	1.0	12.0	1.5
29	12.0	6.5	5.0	3.0	1.5	.5	2.0	1.0	---	---	12.5	7.5
30	13.0	5.5	6.5	2.5	2.0	1.0	1.5	.5	---	---	15.0	8.5
31	13.5	5.5	---	---	6.5	2.0	1.5	.5	---	---	11.5	9.0
MONTH	18.5	5.5	13.0	2.5	9.0	.5	7.5	.5	5.5	.0	15.5	.5

Table 4a.--Water-quality-monitor data, station 03201700, Big Four Hollow Creek near Lake Hope, Ohio, water years 1979 through 1983--Continued

TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1978 TO SEPTEMBER 1979

DAY	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN
	APRIL		MAY		JUNE		JULY		AUGUST		SEPTEMBER	
1	9.0	8.0	19.5	6.5	19.5	14.0	18.0	14.0	24.5	19.0	22.0	17.0
2	11.5	8.5	21.5	7.0	20.0	14.0	22.5	15.0	20.5	12.5	21.0	18.0
3	11.5	7.0	14.5	12.0	18.0	14.5	25.5	14.0	23.0	16.5	23.0	18.5
4	8.5	6.5	12.0	9.0	22.5	12.0	18.5	15.5	22.5	16.5	23.5	18.0
5	10.5	7.0	16.0	7.5	23.5	13.5	20.0	12.5	24.0	17.5	21.5	18.0
6	11.5	3.5	18.5	7.5	22.5	15.0	23.0	11.5	22.5	18.5	22.5	18.5
7	9.0	2.0	21.0	9.5	22.0	15.5	23.0	12.0	24.5	18.5	22.0	14.0
8	12.0	4.5	21.5	11.0	17.5	16.0	25.0	13.5	24.5	19.5	15.5	13.0
9	8.5	5.0	23.5	12.5	19.0	15.5	17.5	17.0	26.0	18.5	18.0	11.5
10	12.5	3.5	22.0	15.0	23.0	16.0	20.0	16.0	26.0	19.5	18.5	11.5
11	10.5	4.5	23.5	14.0	20.0	14.5	22.5	15.0	20.0	17.5	18.5	12.0
12	14.0	8.0	23.5	15.0	21.5	12.5	21.5	17.5	19.5	16.5	22.0	14.0
13	13.0	9.0	16.0	12.5	18.5	13.0	19.5	15.0	20.0	14.0	18.5	15.5
14	15.0	7.0	21.5	10.5	23.0	12.5	25.0	15.0	19.5	15.0	18.5	15.0
15	9.5	7.0	20.0	12.5	24.5	14.0	25.0	18.5	19.5	14.0	16.5	13.0
16	9.0	5.5	21.5	9.5	22.5	15.0	28.5	15.0	20.5	12.0	17.0	11.5
17	14.5	5.0	21.5	9.0	23.5	16.0	27.0	18.0	21.0	12.0	18.5	10.0
18	16.5	5.0	23.0	9.5	24.0	16.5	27.0	17.0	19.5	15.5	19.0	10.0
19	17.5	4.5	23.5	10.5	25.5	15.5	25.0	15.0	21.0	17.0	18.0	13.0
20	19.0	6.0	22.0	14.0	26.0	15.0	23.5	15.0	20.0	14.5	18.0	11.0
21	17.5	7.0	23.5	15.5	19.0	17.0	25.0	18.0	19.5	17.5	15.5	15.0
22	16.5	10.5	22.5	12.5	23.5	16.0	27.0	18.5	20.5	17.5	15.0	13.5
23	15.0	11.0	16.5	15.0	21.5	16.5	21.5	11.5	20.0	18.0	15.5	12.0
24	19.5	11.0	15.5	13.5	19.5	14.5	16.0	12.0	20.5	18.0	16.5	11.0
25	20.0	12.5	13.5	10.5	23.0	11.5	18.0	14.0	19.5	17.5	16.5	12.0
26	15.0	13.0	15.5	10.0	24.0	12.0	19.5	16.0	18.5	17.0	17.5	12.0
27	16.5	10.5	12.5	11.0	23.0	13.0	20.5	16.0	19.0	17.5	15.5	12.5
28	14.5	9.0	16.0	11.0	20.5	14.5	19.0	17.0	20.5	17.0	15.5	15.0
29	14.0	7.5	19.0	9.5	18.5	14.5	22.5	18.0	20.5	18.5	17.5	15.0
30	18.5	7.0	21.0	10.5	17.5	15.5	23.5	17.0	20.5	15.5	17.5	14.0
31	---	---	16.5	14.0	---	---	24.5	18.0	22.0	16.5	---	---
MONTH	20.0	2.0	23.5	6.5	26.0	11.5	28.5	11.5	26.0	12.0	23.5	10.0
YEAR	28.5	.0										

Table 4a.--Water-quality-monitor data, station 03201700, Big Four Hollow Creek near Lake Hope, Ohio, water years 1979 through 1983--Continued

TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1979 TO SEPTEMBER 1980

DAY	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN
	OCTOBER		NOVEMBER		DECEMBER		JANUARY		FEBRUARY		MARCH	
1	17.5	14.0	13.5	10.5	4.0	2.5	2.5	2.0	1.0	.5	.5	.5
2	16.0	14.5	11.5	9.0	3.5	2.0	2.0	2.0	.5	.5	1.0	.5
3	15.0	13.5	10.0	7.0	3.0	1.0	3.0	2.0	1.0	.5	1.0	.5
4	14.0	13.0	9.0	5.5	4.0	1.5	2.5	1.0	1.0	.5	1.0	.5
5	13.0	11.0	9.0	5.0	4.5	2.0	1.5	1.0	1.0	.5	3.0	.5
6	12.5	10.0	8.5	6.0	4.5	3.5	2.0	1.0	.5	.5	6.0	2.5
7	11.5	9.5	9.5	8.5	5.0	3.0	3.0	1.0	.5	.5	5.0	2.5
8	11.5	8.5	---	---	4.5	2.5	2.5	.5	1.0	.5	9.5	4.0
9	12.0	10.5	9.5	7.0	4.0	2.0	2.5	.5	1.0	.5	8.5	3.0
10	11.0	9.0	9.5	8.0	3.5	1.5	1.5	.5	1.0	.5	8.0	2.5
11	10.0	8.5	8.0	6.0	5.5	2.0	4.5	1.0	1.0	.5	6.5	1.0
12	11.5	9.5	7.0	5.0	7.0	5.0	2.5	1.0	1.0	.5	4.5	1.0
13	10.5	8.0	7.5	6.0	6.5	5.0	3.0	1.0	1.0	.5	3.5	1.5
14	10.0	7.0	6.5	5.0	5.0	3.0	4.5	3.0	1.0	.5	4.0	1.5
15	9.0	5.5	6.0	4.5	3.5	1.5	4.5	4.0	1.0	.5	9.0	1.0
16	12.0	9.0	7.5	5.0	4.5	2.0	5.5	3.0	1.0	.5	9.5	2.0
17	13.5	10.5	7.5	3.5	3.0	.5	7.5	5.0	1.0	.5	7.5	4.5
18	14.0	10.0	8.0	4.5	2.0	.5	5.5	3.5	1.0	.5	9.5	2.5
19	14.5	10.5	8.0	4.5	3.0	1.0	5.0	2.5	1.5	.5	8.0	1.5
20	16.0	11.5	9.5	6.0	3.0	1.0	5.5	2.5	1.0	.5	8.0	4.5
21	16.5	12.0	10.0	6.5	3.0	1.0	4.0	.5	1.5	.5	8.0	4.5
22	17.0	12.5	10.0	9.0	4.0	2.5	3.5	2.5	6.5	1.5	9.5	3.5
23	14.5	10.5	11.0	9.0	5.5	4.0	2.5	.5	5.0	2.5	9.5	3.0
24	10.5	9.0	10.5	9.0	8.5	5.5	.5	.5	5.0	2.5	8.0	6.0
25	9.5	7.5	12.0	9.0	7.5	5.0	2.0	.5	5.0	.5	7.0	5.0
26	11.0	6.0	11.0	8.5	5.5	4.5	2.5	.5	3.0	.5	9.5	3.5
27	10.0	5.5	9.0	6.5	4.5	3.0	2.5	1.0	1.5	.5	12.5	2.0
28	11.5	8.5	8.0	5.5	3.0	2.0	1.5	1.0	1.5	.5	7.5	5.0
29	12.5	7.0	5.0	3.5	3.5	2.5	2.0	.5	1.5	.5	8.0	6.5
30	13.0	7.0	4.0	3.0	3.0	2.0	1.0	.5	---	---	9.5	6.0
31	14.0	8.5	---	---	2.5	2.0	1.0	.5	---	---	9.5	6.5
MONTH	17.5	5.5	13.5	3.0	8.5	.5	7.5	.5	6.5	.5	12.5	.5

Table 4a.--Water-quality-monitor data, station 03201700, Big Four Hollow Creek near Lake Hope, Ohio, water years 1979 through 1983--Continued

TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1979 TO SEPTEMBER 1980

DAY	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN
	APRIL		MAY		JUNE		JULY		AUGUST		SEPTEMBER	
1	9.0	6.0	18.0	9.0	19.5	15.5	25.0	14.0	26.0	20.0	26.0	18.5
2	14.5	5.0	18.0	8.0	19.0	15.0	28.0	16.5	27.5	19.0	26.0	19.0
3	13.0	6.0	20.5	8.5	21.0	15.0	22.5	18.5	23.5	20.0	25.0	17.0
4	9.5	6.5	23.0	9.0	21.5	14.0	25.5	18.5	26.0	19.0	25.5	17.0
5	---	---	22.5	9.5	24.0	12.0	27.5	18.0	27.5	19.0	25.5	18.5
6	---	---	20.0	10.5	22.0	14.5	27.5	17.5	20.5	19.5	25.5	18.5
7	15.0	7.5	17.0	9.5	23.0	15.5	24.5	14.0	25.5	21.0	24.5	17.5
8	13.0	7.5	14.5	6.0	22.5	18.0	31.5	17.5	28.5	20.0	24.0	16.5
9	13.5	8.0	18.0	5.0	23.5	19.0	22.0	17.5	28.0	21.0	23.5	17.0
10	8.0	6.0	20.5	6.0	23.0	20.5	20.5	17.5	28.5	20.5	22.5	16.0
11	15.0	4.0	24.5	11.5	20.0	15.0	27.0	17.0	28.0	20.5	21.5	13.0
12	10.5	7.5	19.0	14.0	22.0	10.0	21.0	18.0	24.0	19.5	22.5	13.0
13	8.0	6.0	23.0	13.0	23.5	10.5	21.5	17.0	25.5	17.5	24.0	16.0
14	10.0	6.5	15.5	11.5	25.5	12.5	24.5	15.0	26.5	19.0	24.0	18.0
15	8.0	6.0	20.5	8.5	22.5	15.5	33.0	18.0	21.5	20.0	20.0	17.5
16	13.0	5.0	21.5	9.0	20.0	13.5	34.0	25.0	23.5	17.5	21.5	15.0
17	14.0	4.5	16.0	12.0	23.0	10.5	30.5	21.0	20.0	17.5	20.0	17.0
18	16.5	5.0	18.5	12.0	24.0	12.0	28.5	18.0	22.5	18.0	20.0	15.5
19	15.5	6.0	16.5	12.5	24.5	12.0	30.0	18.5	24.5	19.0	22.0	13.5
20	19.0	6.0	14.5	12.5	23.5	13.0	31.0	19.5	20.5	18.5	23.5	14.5
21	20.5	8.0	20.5	12.5	23.0	11.5	30.5	21.0	22.5	18.5	24.0	17.0
22	18.5	7.0	22.5	12.0	25.0	11.5	20.5	18.0	21.0	18.5	22.0	18.0
23	20.0	9.5	19.0	14.5	26.0	13.5	21.5	18.0	21.0	16.5	20.0	17.0
24	19.0	7.5	23.5	14.5	21.5	17.0	24.5	16.5	23.5	16.5	19.5	14.5
25	13.5	7.0	24.0	14.0	23.5	15.0	25.0	16.0	24.0	16.5	20.0	14.5
26	11.5	7.0	23.0	11.5	27.5	15.0	25.5	17.0	24.5	17.0	18.0	13.5
27	11.0	7.0	22.5	10.0	26.5	17.5	25.0	18.5	25.5	17.0	17.5	10.0
28	11.0	6.0	23.5	11.0	29.0	17.0	22.5	19.0	26.0	18.0	18.5	11.5
29	13.0	7.5	24.5	12.5	22.5	18.5	25.5	17.5	25.5	18.5	19.0	11.5
30	13.5	8.0	22.5	15.5	22.5	15.0	25.0	17.5	24.0	18.5	16.5	11.5
31	---	---	25.0	15.5	---	---	27.0	18.0	24.5	17.5	---	---
MONTH	20.5	4.0	25.0	5.0	29.0	10.0	34.0	14.0	28.5	16.5	26.0	10.0
YEAR	34.0	.5										

Table 4a.--Water-quality-monitor data, station 03201700, Big Four Hollow Creek near Lake Hope, Ohio, water years 1979 through 1983--Continued

TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		OCTOBER			NOVEMBER			DECEMBER			JANUARY	
1	20.0	12.0		10.5	5.5		8.0	3.5		1.5	1.0	
2	17.0	13.5		10.5	3.5		7.5	3.5		2.0	1.0	
3	15.0	11.5		13.5	4.5		5.5	1.0		1.5	1.0	
4	12.5	11.0		12.5	7.5		4.0	.5		1.5	1.0	
5	13.5	8.5		7.0	5.0		5.5	3.5		---	---	
6	13.5	6.0		10.0	3.0		9.0	5.0		---	---	
7	15.5	9.5		11.5	5.0		10.5	6.5		1.0	1.0	
8	17.0	8.5		12.5	8.0		10.5	6.0		1.0	.5	
9	18.0	11.0		13.5	7.5		9.5	7.0		1.0	.5	
10	18.0	11.0		8.5	4.0		7.0	5.0		1.0	1.0	
11	14.5	11.0		8.0	2.0		5.0	4.0		1.0	1.0	
12	11.5	10.0		7.5	1.5		7.5	4.5		1.0	1.0	
13	13.0	7.0		8.0	2.0		6.0	3.0		1.0	.5	
14	12.5	7.0		8.0	4.0		4.5	1.5		1.0	.5	
15	15.0	9.0		7.0	5.5		4.0	2.0		1.0	1.0	
16	17.0	9.5		6.5	3.5		4.0	2.0		1.0	1.0	
17	15.0	10.0		5.0	3.5		4.5	1.0		1.0	1.0	
18	15.5	12.0		6.0	3.0		5.0	2.0		1.0	1.0	
19	15.5	10.0		6.5	1.0		4.0	1.0		1.0	1.0	
20	13.5	8.0		6.5	1.0		1.5	1.0		1.0	1.0	
21	15.5	9.0		6.0	1.0		1.5	1.0		1.0	.5	
22	15.0	9.0		5.0	1.0		1.5	1.0		1.5	1.0	
23	12.5	7.0		5.5	1.5		1.0	1.0		1.0	1.0	
24	13.5	7.0		6.5	3.0		1.0	1.0		2.5	.5	
25	11.0	6.5		6.5	2.0		1.0	1.0		1.5	.5	
26	7.5	5.0		4.5	1.0		1.0	1.0		3.0	.5	
27	8.0	3.5		5.5	3.0		1.0	1.0		4.0	.5	
28	8.5	7.0		5.5	4.0		1.0	1.0		4.5	.5	
29	11.0	5.0		4.0	3.5		1.0	1.0		1.5	.5	
30	11.5	3.5		7.0	2.5		1.0	1.0		1.0	.5	
31	12.0	3.5		---	---		1.5	1.0		1.0	.5	
MONTH	20.0	3.5		13.5	1.0		10.5	.5		4.5	.5	

Table 4a.--Water-quality-monitor data, station 03201700, Big Four Hollow Creek near Lake Hope, Ohio, water years 1979 through 1983--Continued

TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		FEBRUARY			MARCH			APRIL			MAY	
1	2.5	.5		8.5	7.5		---	---		12.0	9.0	
2	2.0	1.0		10.0	6.5		17.0	7.5		14.0	8.0	
3	1.0	1.0		10.0	4.5		17.0	6.0		18.5	6.5	
4	1.0	1.0		8.0	5.5		15.0	9.5		19.5	8.0	
5	1.0	.5		9.5	8.0		12.0	7.0		16.5	10.5	
6	1.0	1.0		10.0	7.5		12.0	5.5		13.0	8.5	
7	1.0	.5		10.5	7.0		14.0	4.0		17.0	7.0	
8	1.0	1.0		10.0	7.5		16.0	6.0		19.0	7.0	
9	1.0	1.0		12.0	9.0		17.5	8.5		18.5	9.0	
10	1.0	1.0		17.0	9.5		13.0	6.5		17.0	11.5	
11	1.0	.5		18.5	5.0		17.5	10.0		13.0	10.5	
12	1.0	.5		12.5	3.0		18.0	11.5		12.5	9.5	
13	1.0	.5		11.5	5.0		20.0	12.0		15.0	8.5	
14	1.0	.5		7.0	1.5		15.5	9.0		18.5	11.0	
15	1.0	.5		13.0	.0		17.5	6.5		11.5	10.5	
16	2.5	1.0		10.5	2.0		16.0	5.5		16.5	9.0	
17	4.5	2.5		5.0	.0		14.5	11.5		18.5	8.5	
18	7.5	3.5		8.0	1.0		19.5	11.0		12.0	9.5	
19	6.0	4.5		4.0	1.0		15.0	8.5		10.5	9.5	
20	5.5	5.0		5.5	1.0		16.0	7.0		16.5	8.0	
21	8.0	3.5		8.5	2.0		16.5	5.0		18.5	8.0	
22	8.5	3.0		6.5	1.0		13.5	7.0		20.0	9.0	
23	6.5	5.0		12.5	2.5		13.0	10.0		21.5	10.5	
24	5.5	3.5		12.0	1.0		10.0	7.5		23.0	12.0	
25	8.5	3.0		13.5	2.0		14.5	6.5		21.5	13.0	
26	5.5	1.5		10.0	2.0		15.0	6.0		20.0	14.0	
27	8.5	1.0		12.0	4.5		21.0	8.5		18.0	14.0	
28	9.5	5.5		4.5	2.5		22.0	10.5		14.5	13.5	
29	---	---		---	---		18.5	12.5		19.0	13.0	
30	---	---		---	---		15.5	11.5		19.0	12.5	
31	---	---		---	---		---	---		17.5	13.0	
MONTH	9.5	.5		18.5	.0		22.0	4.0		23.0	6.5	

Table 4a.--Water-quality-monitor data, station 03201700, Big Four Hollow Creek near Lake Hope, Ohio, water years 1979 through 1983--Continued

TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		JUNE			JULY			AUGUST			SEPTEMBER	
1	15.0	11.5	---	24.5	18.0	20.0	27.0	17.0	21.5	26.5	20.0	23.0
2	18.5	13.0	16.5	22.5	17.5	19.5	28.0	18.5	22.5	26.0	21.5	23.5
3	18.5	14.0	16.0	24.0	17.5	20.0	24.5	19.5	22.0	22.5	21.0	21.5
4	16.5	14.5	15.5	26.0	17.0	20.5	28.5	20.0	23.5	26.0	20.5	22.5
5	17.5	14.0	15.5	21.5	19.0	20.0	28.5	20.5	24.0	25.5	18.5	21.5
6	16.0	14.5	15.0	24.0	19.0	21.0	23.5	21.0	22.0	26.0	18.5	21.0
7	18.5	13.0	15.5	26.5	18.5	22.0	22.5	19.5	21.0	24.5	18.0	21.0
8	19.5	13.0	16.0	27.0	19.0	22.5	24.5	18.5	21.0	24.0	19.0	21.0
9	21.5	16.0	17.5	29.0	20.0	23.5	26.0	18.0	22.0	22.0	14.5	18.0
10	---	---	---	27.0	21.0	23.0	27.0	18.0	22.0	22.0	12.0	16.5
11	24.5	22.5	23.5	28.0	15.5	21.0	26.0	20.0	22.0	24.5	15.0	19.0
12	28.5	17.5	22.0	26.5	17.0	21.0	25.0	16.0	20.5	25.5	17.0	20.5
13	20.5	16.5	18.0	24.5	19.5	21.0	26.0	17.0	21.0	25.5	17.0	20.5
14	21.5	16.5	18.5	27.5	19.5	22.0	25.0	18.0	21.5	24.5	18.0	20.5
15	24.0	16.5	19.5	25.5	16.5	20.0	23.5	20.0	21.5	19.5	17.5	19.0
16	23.5	17.0	19.0	24.5	18.5	21.0	27.0	20.0	22.5	20.5	14.5	17.0
17	21.0	15.5	18.0	27.0	17.5	21.5	25.0	15.5	20.0	17.0	13.5	15.0
18	23.5	13.5	17.5	28.0	17.5	22.0	23.0	14.0	18.0	13.5	12.0	12.5
19	23.0	14.5	18.5	24.5	18.5	21.5	24.5	14.5	18.5	19.0	11.5	14.5
20	24.0	17.0	20.0	26.0	20.0	22.5	25.0	15.0	19.5	19.5	13.5	16.0
21	21.5	17.0	18.5	28.0	20.5	23.0	20.5	16.0	18.0	21.0	14.0	17.0
22	23.0	17.0	19.0	26.0	18.0	21.5	25.5	16.0	20.0	17.0	13.0	15.5
23	22.0	15.0	18.0	24.0	15.5	19.5	25.0	15.0	19.5	16.5	9.5	12.5
24	23.0	14.5	18.5	26.0	18.0	21.5	24.5	16.5	20.0	16.0	9.0	12.5
25	23.5	17.5	20.0	26.5	18.5	22.0	25.5	16.5	20.5	21.5	13.5	16.5
26	23.5	15.0	18.5	27.5	21.0	23.5	26.0	15.5	20.0	21.0	16.0	17.5
27	23.5	13.0	17.5	26.0	20.5	23.0	26.0	16.5	21.0	18.5	12.0	14.5
28	25.0	13.0	18.0	26.0	21.0	22.5	26.0	19.0	22.0	14.5	9.5	12.0
29	25.5	15.5	20.0	22.0	18.5	20.5	25.5	19.0	22.0	19.5	13.0	15.5
30	24.0	17.5	20.5	26.0	14.0	19.5	24.0	19.0	21.5	18.0	14.0	16.0
31	---	---	---	27.0	15.5	20.5	26.0	19.5	22.0	---	---	---
MONTH	28.5	11.5	18.0	29.0	14.0	21.5	28.5	14.0	21.0	26.5	9.0	18.0
YEAR	29.0	.0	19.5									

NOTE: NUMBER OF MISSING DAYS OF RECORD EXCEEDED 20% OF YEAR

Table 4a.--Water-quality-monitor data, station 03201700, Big Four Hollow Creek near Lake Hope, Ohio, water years 1979 through 1983--Continued

TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1981 TO SEPTEMBER 1982

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		OCTOBER			NOVEMBER			DECEMBER			JANUARY	
1	14.5	11.0	12.0	---	---	---	7.5	3.0	5.5	2.0	1.0	1.5
2	16.0	8.0	11.0	---	---	---	6.0	4.5	5.0	1.5	1.0	1.0
3	16.5	8.0	11.0	15.5	11.5	14.0	6.5	4.0	5.0	4.0	1.5	3.0
4	13.5	8.0	11.0	15.0	9.0	11.5	6.0	4.5	5.5	6.5	2.5	4.5
5	---	---	---	14.0	11.5	12.5	4.5	3.5	4.0	5.0	1.0	2.5
6	---	---	---	12.0	7.5	10.0	5.0	1.5	3.0	4.5	1.0	3.0
7	---	---	---	10.5	5.5	7.5	6.0	2.0	4.0	4.5	1.5	3.0
8	---	---	---	10.0	4.0	6.5	5.5	2.5	4.5	1.5	1.0	1.0
9	14.5	10.5	12.5	8.0	7.0	7.5	2.5	1.5	1.5	1.0	1.0	1.0
10	14.0	9.0	11.5	7.5	5.0	6.5	2.0	1.0	1.0	1.0	1.0	1.0
11	16.5	11.5	13.0	9.5	4.5	6.5	1.5	1.0	1.0	1.0	1.0	1.0
12	16.0	9.0	12.0	8.5	3.0	5.0	2.0	1.0	1.5	1.0	1.0	1.0
13	16.0	8.5	11.5	7.5	2.0	4.5	4.0	1.5	2.5	1.0	1.0	1.0
14	14.5	7.0	10.5	7.5	2.0	4.5	2.0	1.0	1.5	1.0	1.0	1.0
15	12.5	9.5	11.0	8.5	2.5	5.0	2.5	1.5	2.0	1.0	1.0	1.0
16	16.5	11.5	13.0	8.0	2.5	5.5	3.5	1.0	2.0	1.0	1.0	1.0
17	15.0	7.5	11.0	9.0	4.5	6.5	1.0	1.0	1.0	1.0	1.0	1.0
18	---	---	---	9.0	5.5	6.5	1.0	1.0	1.0	1.0	1.0	1.0
19	---	---	---	9.5	4.5	6.5	1.0	1.0	1.0	1.0	1.0	1.0
20	---	---	---	9.5	3.5	6.5	1.0	1.0	1.0	1.0	1.0	1.0
21	---	---	---	3.5	3.0	3.0	1.0	1.0	1.0	1.0	1.0	1.0
22	---	---	---	3.5	1.5	3.0	1.0	1.0	1.0	1.0	1.0	1.0
23	---	---	---	3.5	1.0	2.0	1.0	.5	1.0	4.5	1.0	3.0
24	---	---	---	4.5	3.0	4.0	2.0	1.0	1.5	2.0	1.0	1.0
25	---	---	---	5.5	2.0	3.5	3.0	1.0	1.5	1.0	1.0	1.0
26	---	---	---	8.5	2.0	5.0	2.5	1.0	1.5	1.0	1.0	1.0
27	---	---	---	8.5	5.0	7.5	4.0	1.0	2.0	1.0	1.0	1.0
28	---	---	---	5.0	4.0	4.5	2.5	1.0	1.5	1.5	1.0	1.0
29	---	---	---	6.5	2.5	4.0	2.5	1.0	2.0	---	---	---
30	---	---	---	3.0	1.0	2.0	1.5	1.0	1.0	---	---	---
31	---	---	---	---	---	---	1.5	1.0	1.0	---	---	---
MONTH	16.5	7.0	11.5	15.5	1.0	6.0	7.5	.5	2.0	6.5	1.0	1.5

Table 4a.--Water-quality-monitor data, station 03201700, Big Four Hollow Creek near Lake Hope, Ohio, water years 1979 through 1983--Continued

TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1981 TO SEPTEMBER 1982

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		FEBRUARY			MARCH			APRIL			MAY	
1	2.5	1.0	1.5	9.0	1.0	4.0	14.0	5.0	7.5	17.0	9.5	12.5
2	2.5	1.0	1.5	8.5	3.0	5.5	22.5	9.5	15.5	20.0	9.0	13.5
3	4.5	2.5	3.5	5.0	2.0	3.0	20.0	6.5	13.0	21.5	7.5	13.5
4	3.0	2.0	2.5	7.0	2.5	5.0	11.0	5.0	7.0	23.0	8.5	14.5
5	4.5	1.5	2.5	6.0	3.5	4.5	7.5	4.0	5.5	23.5	9.5	15.0
6	3.0	1.0	1.5	4.0	2.5	3.5	6.0	2.5	4.5	24.0	10.5	16.0
7	1.5	1.0	1.0	5.0	2.0	3.0	10.0	1.0	4.5	20.0	12.5	15.0
8	1.0	1.0	1.0	8.0	1.0	3.5	9.5	2.5	5.5	20.0	12.5	16.0
9	1.0	1.0	1.0	8.0	1.5	4.0	6.0	3.5	4.5	21.5	10.5	15.0
10	1.0	1.0	1.0	8.0	1.5	4.5	7.5	2.0	4.0	21.0	9.5	14.5
11	1.0	1.0	1.0	7.0	4.0	5.5	11.5	3.0	6.5	24.5	10.5	16.0
12	1.0	1.0	1.0	11.0	4.0	7.0	13.5	2.5	7.5	---	---	---
13	---	---	---	10.0	5.5	8.0	17.0	7.5	11.0	---	---	---
14	---	---	---	10.5	4.5	7.0	17.0	5.0	9.5	---	---	---
15	---	---	---	6.5	5.5	6.0	19.0	5.0	11.0	26.0	17.0	22.5
16	---	---	---	9.0	2.0	7.0	19.5	9.0	13.5	26.0	15.0	19.5
17	5.0	4.5	5.0	11.0	6.0	8.0	14.5	9.0	12.5	26.5	14.5	19.5
18	5.5	4.5	5.0	12.5	5.0	8.0	19.0	6.5	11.0	25.5	14.5	19.0
19	5.0	4.0	4.5	8.0	6.5	7.5	19.0	6.5	11.5	25.5	16.5	20.0
20	7.5	4.0	5.0	12.0	7.0	8.0	14.0	10.0	11.5	24.5	16.5	19.0
21	5.0	4.5	4.5	12.5	6.0	8.5	18.0	7.0	11.0	21.5	15.5	18.0
22	5.5	3.0	4.0	7.0	4.0	6.0	16.5	5.5	9.0	24.0	16.0	19.0
23	10.0	1.5	4.0	10.0	3.5	6.0	18.5	4.0	10.0	24.0	16.5	19.5
24	7.5	3.5	5.0	13.0	3.5	7.5	20.0	5.5	11.0	22.0	16.5	19.0
25	7.5	1.5	3.0	10.0	5.0	6.5	18.0	6.5	11.5	23.0	15.5	18.5
26	4.0	1.5	2.0	7.5	3.5	5.0	14.0	11.0	12.0	24.0	14.5	19.0
27	5.0	1.0	2.5	8.0	2.0	4.0	12.0	7.5	10.5	24.5	17.0	19.5
28	7.5	1.0	3.0	10.0	1.0	3.5	19.0	5.5	10.5	27.0	17.0	21.0
29	---	---	---	12.5	1.0	6.0	19.5	6.0	11.5	22.5	15.5	18.0
30	---	---	---	15.0	5.0	9.5	18.0	8.0	12.0	17.5	15.0	16.0
31	---	---	---	13.0	7.0	10.0	---	---	---	21.5	15.0	17.5
MONTH	10.0	1.0	3.0	15.0	1.0	6.0	22.5	1.0	9.5	27.0	7.5	17.5

Table 4a.--Water-quality-monitor data, station 03201700, Big Four Hollow Creek near Lake Hope, Ohio, water years 1979 through 1983--Continued

TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1981 TO SEPTEMBER 1982

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		JUNE			JULY			AUGUST			SEPTEMBER	
1	18.0	15.5	17.0	24.5	14.0	18.5	27.0	17.5	21.5	22.0	18.5	20.5
2	22.0	13.0	17.0	25.0	14.0	18.5	25.5	18.0	21.5	21.0	19.0	19.5
3	20.0	14.0	16.5	19.5	17.5	19.0	29.0	18.5	22.0	22.0	15.5	18.0
4	20.0	14.0	16.5	22.0	17.5	19.5	24.5	19.5	21.0	21.0	12.5	16.0
5	16.0	14.5	15.5	23.5	17.0	19.5	23.5	19.5	21.5	22.5	12.0	16.5
6	17.0	14.0	15.5	25.5	17.5	21.0	28.5	19.5	22.5	22.0	13.0	17.0
7	20.5	13.0	16.0	26.5	19.0	22.0	26.0	20.5	22.5	22.5	16.0	18.5
8	21.0	15.0	17.5	23.5	19.0	21.5	23.0	19.5	21.0	20.5	17.0	18.5
9	22.0	16.0	18.0	24.5	19.5	22.5	25.0	19.0	20.5	22.5	14.5	18.0
10	21.0	16.5	18.0	25.5	18.0	21.0	22.0	16.5	19.0	24.5	16.5	19.5
11	22.5	13.5	17.5	24.5	19.5	21.5	19.5	17.0	18.0	25.0	16.0	19.5
12	20.5	15.5	17.5	25.0	18.0	21.0	23.5	14.0	18.0	24.5	16.5	20.0
13	22.5	15.5	18.5	25.5	17.0	20.5	23.5	13.5	17.5	24.5	18.5	21.0
14	24.5	13.5	18.0	27.5	18.0	21.5	24.5	14.0	18.5	25.0	19.0	21.0
15	24.5	14.0	18.5	28.0	19.0	22.0	25.5	14.5	19.0	26.0	18.5	21.5
16	19.0	16.0	17.5	30.0	20.0	23.0	26.5	16.0	20.0	23.5	16.5	20.0
17	18.5	15.5	16.5	29.5	21.5	24.0	26.0	18.0	21.0	22.5	13.0	17.0
18	21.0	14.0	17.0	25.0	24.5	25.0	26.0	16.0	20.0	23.0	15.0	17.5
19	18.0	14.0	16.0	26.0	22.5	24.5	26.0	15.0	19.5	20.0	11.5	15.5
20	21.5	12.5	16.5	25.0	20.5	22.5	21.5	16.0	18.5	18.5	13.0	15.5
21	22.0	14.5	17.5	28.0	17.5	21.0	25.0	18.0	20.0	16.5	12.0	14.0
22	19.5	13.5	16.5	23.0	18.0	21.0	23.0	13.5	18.0	15.0	9.5	12.0
23	22.0	13.0	17.0	27.5	19.5	22.5	21.0	17.5	19.0	16.0	11.0	13.0
24	23.5	12.5	17.0	28.5	18.5	22.0	24.5	17.5	20.5	17.0	10.0	13.5
25	24.0	13.0	17.5	28.5	19.0	22.0	23.0	19.0	21.0	19.0	13.5	15.5
26	24.5	15.0	19.0	24.5	22.0	23.5	24.0	15.0	19.0	16.0	14.0	15.0
27	27.0	17.0	21.0	26.5	21.0	23.0	22.0	18.0	20.0	15.0	13.5	14.0
28	26.0	17.5	21.0	27.5	17.0	21.5	23.5	17.0	19.5	18.0	13.5	15.0
29	24.5	19.5	21.5	26.0	18.5	21.0	23.0	14.5	18.0	19.5	11.0	15.0
30	24.5	18.0	20.5	26.5	20.5	22.5	19.0	17.5	18.5	20.0	12.0	15.0
31	---	---	---	26.0	18.0	21.5	22.5	18.5	20.5	---	---	---
MONTH	27.0	12.5	17.5	30.0	14.0	21.5	29.0	13.5	20.0	26.0	9.5	17.0
YEAR	30.0	.5	11.5									

Table 4a.--Water-quality-monitor data, station 03201700, Big Four Hollow Creek near Lake Hope, Ohio, water years 1979 through 1983--Continued

TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1982 TO SEPTEMBER 1983

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		OCTOBER			NOVEMBER			DECEMBER			JANUARY	
1	20.5	12.0	15.5	18.0	12.5	14.5	10.5	7.5	9.0	---	---	---
2	21.5	13.0	16.5	17.0	12.0	14.0	13.0	8.0	10.0	---	---	---
3	21.0	14.0	17.0	15.0	12.5	14.5	15.0	9.0	11.0	---	---	---
4	20.0	16.0	17.5	12.5	7.0	9.5	13.5	10.0	11.5	---	---	---
5	22.5	15.0	18.0	7.0	5.5	6.0	12.5	9.5	11.0	---	---	---
6	22.0	14.5	18.0	8.5	4.5	6.0	9.5	6.5	8.5	---	---	---
7	19.5	16.0	17.5	9.0	2.5	5.5	8.5	4.5	6.0	3.5	1.5	2.5
8	22.0	17.0	18.5	7.5	3.5	4.5	8.5	3.0	5.0	3.5	1.5	2.5
9	18.5	17.0	18.0	9.5	7.5	9.5	5.5	1.5	3.5	4.5	1.5	3.0
10	22.0	17.5	19.5	11.5	6.0	8.0	4.0	1.0	3.0	6.0	4.0	5.0
11	21.0	15.0	17.5	12.0	9.0	10.5	4.5	3.0	4.0	5.0	3.0	4.5
12	16.0	13.0	14.5	12.5	8.0	10.5	3.5	.5	2.0	3.5	1.0	2.5
13	17.0	12.5	14.0	7.5	4.0	5.5	1.5	1.0	1.0	4.0	1.0	2.0
14	14.0	11.5	12.5	5.0	3.0	4.0	2.5	.5	1.5	5.0	1.0	3.0
15	15.5	10.0	12.5	7.0	2.5	4.5	7.0	2.5	4.0	2.0	1.0	1.5
16	11.0	7.5	9.5	5.0	1.0	3.5	6.5	5.0	5.5	1.5	1.0	1.0
17	12.5	5.5	8.5	7.0	3.5	5.5	5.0	2.0	4.0	1.0	1.0	1.0
18	14.5	7.0	10.0	10.0	7.0	8.0	4.0	1.0	3.0	1.5	1.0	1.0
19	15.0	7.0	10.5	10.5	6.5	8.5	4.5	3.5	4.0	1.5	1.0	1.0
20	13.0	9.0	11.0	10.5	9.5	10.0	---	---	---	1.0	1.0	1.0
21	9.5	7.5	8.5	12.0	9.5	10.5	---	---	---	1.0	1.0	1.0
22	12.0	5.5	8.0	11.5	10.5	11.0	---	---	---	1.0	.5	1.0
23	10.0	4.0	6.5	13.0	10.5	11.5	---	---	---	1.0	.5	.5
24	9.5	4.0	7.0	10.5	5.0	8.0	---	---	---	2.0	.5	1.0
25	10.0	5.5	7.5	6.5	3.0	4.5	---	---	---	2.5	2.0	2.5
26	11.5	4.0	7.0	6.5	4.0	5.5	---	---	---	2.5	2.0	2.5
27	12.5	4.5	7.5	6.5	4.0	5.0	---	---	---	3.0	2.0	2.5
28	12.5	5.0	8.0	8.0	4.0	6.0	---	---	---	4.5	2.0	2.5
29	12.5	5.5	8.5	8.0	7.5	7.5	---	---	---	5.0	2.0	3.0
30	13.5	9.0	11.0	11.0	5.5	7.5	---	---	---	5.0	3.5	4.0
31	17.0	11.0	13.0	---	---	---	---	---	---	4.5	3.0	3.5
MONTH	22.5	4.0	12.5	18.0	1.0	8.0	15.0	.5	5.5	6.0	.5	2.0

Table 4a.--Water-quality-monitor data, station 03201700, Big Four Hollow Creek near Lake Hope, Ohio, water years 1979 through 1983--Continued

TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1982 TO SEPTEMBER 1983

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		FEBRUARY			MARCH			APRIL			MAY	
1	5.0	1.0	2.5	8.0	2.0	4.5	12.5	4.5	7.5	18.5	16.0	17.0
2	7.0	4.0	5.5	11.0	1.0	5.0	12.0	7.0	10.5	21.0	17.0	19.0
3	5.5	2.5	4.5	13.0	2.5	6.5	8.0	6.5	7.5	---	---	---
4	3.5	1.5	2.5	15.5	4.5	8.5	10.0	7.0	8.5	---	---	---
5	3.0	1.0	1.5	15.5	6.0	10.0	9.5	6.0	8.0	---	---	---
6	4.0	1.5	2.5	15.5	9.0	11.0	11.5	8.0	9.5	---	---	---
7	3.0	2.0	2.5	16.5	7.5	11.0	10.5	8.5	9.5	---	---	---
8	3.5	1.5	2.0	14.5	8.5	10.5	9.0	8.5	9.0	---	---	---
9	3.5	.5	1.5	9.5	7.0	8.5	12.5	9.0	10.5	---	---	---
10	4.0	1.5	2.5	8.0	5.5	6.5	11.5	7.5	9.0	18.5	10.5	15.0
11	3.5	1.0	1.5	5.5	3.5	4.5	8.0	6.5	7.0	20.0	7.5	12.0
12	2.0	.5	1.5	11.0	3.0	5.5	8.5	4.5	5.5	21.5	9.0	14.0
13	5.5	1.0	2.0	12.0	1.5	5.5	10.5	8.0	9.0	22.5	11.5	15.5
14	6.5	1.0	2.5	14.0	4.0	8.0	14.5	9.5	11.5	22.0	14.5	17.5
15	4.5	1.0	2.5	14.5	4.0	8.0	15.0	11.0	13.0	16.0	12.0	15.0
16	7.0	1.5	3.0	14.0	4.5	8.0	16.5	7.5	13.0	14.5	10.5	12.0
17	4.5	3.5	4.0	9.0	4.5	6.5	11.5	7.5	9.0	17.0	8.5	12.5
18	6.5	3.0	4.5	10.0	6.5	8.5	11.0	6.0	8.5	16.5	10.0	13.0
19	7.5	1.5	3.5	8.5	6.5	7.5	12.5	8.0	10.0	13.0	12.5	13.0
20	7.5	2.0	4.0	12.5	6.0	8.0	16.5	9.5	12.5	16.5	12.0	14.0
21	9.5	2.5	4.5	8.0	4.0	6.0	17.0	10.0	13.5	15.0	12.5	13.5
22	9.5	3.0	5.5	6.0	2.5	4.0	20.5	12.0	15.5	16.0	13.0	14.0
23	7.5	3.0	5.5	10.5	1.5	4.5	22.5	13.0	15.5	17.5	12.5	14.5
24	7.5	2.0	4.0	8.0	1.0	3.5	13.5	10.0	12.0	---	---	---
25	4.5	1.5	3.0	11.0	1.0	4.5	17.0	8.0	11.5	---	---	---
26	6.5	1.0	2.5	10.5	1.0	5.0	20.0	8.0	13.0	---	---	---
27	5.0	1.0	2.0	13.5	5.5	8.0	22.0	10.0	15.0	---	---	---
28	8.5	1.5	3.5	7.5	5.0	6.0	20.0	12.5	16.0	---	---	---
29	---	---	---	8.0	4.0	5.5	16.5	15.0	15.5	---	---	---
30	---	---	---	11.0	2.0	5.5	19.0	15.0	16.5	---	---	---
31	---	---	---	10.0	4.5	6.0	---	---	---	17.0	12.5	15.0
MONTH	9.5	.5	3.0	16.5	1.0	7.0	22.5	4.5	11.0	22.5	7.5	14.5

Table 4a.--Water-quality-monitor data, station 03201700, Big Four Hollow Creek near Lake Hope, Ohio, water years 1979 through 1983--Continued

TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1982 TO SEPTEMBER 1983

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		JUNE			JULY			AUGUST			SEPTEMBER	
1	16.0	11.0	13.0									
2	17.0	10.0	13.5									
3	14.5	12.5	13.0									
4	16.0	12.5	14.0									
5	19.0	11.5	14.5									
6	18.5	12.5	15.0									
7	18.0	12.5	15.0									
8	20.5	11.5	15.0									
9	21.5	11.5	15.5									
10	22.5	12.5	16.5									
11	23.5	13.5	17.5									
12	24.0	14.5	18.5									
13	24.0	15.5	19.0									
14	26.0	16.5	20.0									
15	25.0	16.0	19.5									
16	24.0	16.0	19.5									
17	23.5	18.0	20.0									
18	21.0	17.5	19.0									
19	21.5	17.5	19.0									
20	24.0	17.5	20.0									
21	22.0	16.0	18.5									
22	25.0	16.0	20.0									
23	27.5	16.5	20.5									
24	26.5	17.0	21.0									
25	27.0	17.0	21.0									
26	28.0	16.5	21.5									
27	27.5	17.5	21.5									
28	25.0	20.0	21.5									
29	21.0	19.5	20.0									
30	26.0	18.0	21.0									
31	---	---	---									
MONTH	28.0	10.0	18.0									
YEAR	28.0	.5	9.0									

NOTE: NUMBER OF MISSING DAYS OF RECORD EXCEEDED 20% OF YEAR

Table 4b.--Water-quality-monitor data, station 03201700, Big Four Hollow Creek near Lake Hope, Ohio, water years 1979 through 1983

[MAX, maximum; MIN, minimum]

SPECIFIC CONDUCTANCE (MICROSIEMENS PER CENTIMETER AT 25 DEG. C), WATER YEAR OCTOBER 1978 TO SEPTEMBER 1979

DAY	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN
	OCTOBER		NOVEMBER		DECEMBER		JANUARY		FEBRUARY		MARCH	
1	1570	984	699	663	411	375	225	111	465	393	264	234
2	1350	1220	702	669	438	393	642	180	459	417	279	249
3	1370	1230	849	687	483	153	318	267	444	429	309	279
4	---	---	894	693	243	135	459	324	558	438	318	234
5	---	---	1090	741	384	228	432	354	522	471	---	---
6	1190	1150	876	735	501	363	393	351	606	474	---	---
7	1190	1110	771	741	558	240	393	258	489	468	351	276
8	1220	1120	1440	738	201	120	---	---	486	468	342	309
9	1280	1160	1180	795	288	144	---	---	498	483	348	288
10	1280	1160	1650	903	507	246	468	438	522	483	366	264
11	1340	1180	1700	804	720	294	483	441	522	507	369	231
12	1220	1060	1160	810	396	372	483	429	522	498	399	315
13	549	255	1060	855	651	381	477	255	519	498	411	375
14	---	---	903	798	471	450	294	186	528	516	408	360
15	651	630	864	567	489	435	327	276	546	459	396	348
16	747	633	564	498	567	459	354	315	465	432	414	381
17	765	738	798	204	801	462	354	267	495	459	444	402
18	858	753	906	279	525	507	390	276	507	474	432	411
19	855	777	987	423	558	504	393	321	504	468	438	420
20	822	789	699	423	564	255	360	174	519	495	447	435
21	891	798	840	489	342	240	249	162	519	267	462	444
22	918	870	534	438	519	339	288	249	264	144	486	450
23	915	828	534	492	432	426	309	291	213	153	483	297
24	879	792	666	489	804	411	306	183	225	147	318	216
25	981	888	1040	591	549	411	276	213	207	120	297	243
26	972	267	1150	549	447	435	318	279	240	147	339	303
27	951	297	540	189	534	465	339	315	273	237	375	342
28	528	513	315	225	534	468	366	327	273	240	387	363
29	1140	525	351	315	534	495	393	360	---	---	411	387
30	699	576	387	339	558	372	399	351	---	---	426	405
31	669	654	---	---	396	150	459	363	---	---	420	189
MONTH	1570	255	1700	189	804	120	642	111	606	120	486	189

Table 4b.--Water-quality-monitor data, station 03201700, Big Four Hollow Creek near Lake Hope, Ohio, water years 1979 through 1983--Continued

SPECIFIC CONDUCTANCE (MICROSIEMENS PER CENTIMETER AT 25 DEG. C), WATER YEAR OCTOBER 1978 TO SEPTEMBER 1979

DAY	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN
	APRIL		MAY		JUNE		JULY		AUGUST		SEPTEMBER	
1	252	162	438	414	405	285	459	387	972	903	453	417
2	243	174	462	432	450	405	492	444	2900	453	471	453
3	285	243	456	270	465	444	525	492	1350	1250	507	471
4	294	282	276	156	504	465	522	237	1350	1290	552	501
5	327	303	273	192	537	498	789	372	1320	1070	570	531
6	330	300	330	273	597	339	645	558	1090	519	606	558
7	321	297	366	330	558	516	582	558	1010	846	1760	564
8	336	309	390	360	450	171	600	573	1060	981	1670	1370
9	324	243	414	381	462	312	597	360	1200	1060	1370	1220
10	303	270	420	375	543	225	780	420	1530	1130	1970	1130
11	318	291	411	384	474	273	660	300	1390	213	1950	1640
12	360	321	432	384	540	471	606	600	579	279	1730	717
13	360	246	414	402	582	534	600	300	747	588	1320	396
14	279	243	438	411	606	558	618	300	837	750	594	156
15	303	279	456	435	600	516	630	600	1100	840	591	441
16	321	303	477	450	585	555	660	600	1310	1130	687	597
17	339	318	489	468	606	564	690	630	1410	1270	732	600
18	354	327	501	483	621	585	717	690	1400	1120	846	600
19	366	339	525	498	612	531	762	720	1230	192	870	807
20	378	351	537	519	624	345	732	720	2650	171	864	828
21	387	363	549	531	399	258	732	714	291	132	903	129
22	390	381	567	549	480	396	753	720	387	294	264	147
23	396	387	567	450	558	483	1540	750	411	321	354	234
24	411	396	480	429	606	558	1600	1490	420	243	429	357
25	420	405	486	387	639	597	1590	894	342	264	570	372
26	423	405	426	336	744	564	1210	1140	354	150	531	351
27	387	348	435	186	558	531	1240	1140	267	183	2750	387
28	396	372	387	243	759	543	1240	522	330	270	651	159
29	411	396	516	387	627	576	720	420	309	267	294	234
30	426	405	552	495	543	336	882	732	1860	312	339	288
31	---	---	546	255	---	---	942	870	414	375	---	---
MONTH	426	162	567	156	759	171	1600	237	2900	132	2750	129
YEAR	2900	111										

Table 4b.--Water-quality-monitor data, station 03201700, Big Four Hollow Creek near Lake Hope, Ohio, water years 1979 through 1983--Continued

SPECIFIC CONDUCTANCE (MICROSIEMENS PER CENTIMETER AT 25 DEG. C), WATER YEAR OCTOBER 1979 TO SEPTEMBER 1980

DAY	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN
	OCTOBER		NOVEMBER		DECEMBER		JANUARY		FEBRUARY		MARCH	
1	468	333	1510	609	285	273	306	300	351	333	354	324
2	1370	318	582	429	288	279	315	306	372	351	336	321
3	774	306	612	525	300	288	333	315	381	357	354	327
4	1230	312	651	543	297	291	327	315	381	360	339	288
5	504	438	657	357	303	294	321	312	384	363	276	135
6	1190	369	516	342	300	297	333	321	363	354	234	171
7	498	429	474	384	318	303	336	327	363	354	231	201
8	621	156	---	---	318	312	351	327	372	363	225	189
9	258	162	327	219	324	315	348	330	369	366	237	219
10	303	258	231	192	327	318	366	345	381	369	258	240
11	327	297	246	225	330	324	345	141	390	381	270	252
12	339	258	258	246	348	318	225	171	399	384	294	264
13	558	270	267	258	360	165	249	225	411	399	294	180
14	375	327	276	267	237	204	285	249	408	399	225	177
15	1580	303	285	273	249	237	297	258	399	363	246	225
16	357	297	297	276	264	252	315	279	363	324	258	246
17	516	303	330	285	282	267	333	288	369	348	315	189
18	624	330	303	288	297	282	327	300	399	348	243	219
19	477	426	306	294	288	279	312	306	369	327	258	243
20	477	438	312	300	306	288	312	309	342	288	276	258
21	498	465	318	306	309	303	324	312	330	264	282	114
22	717	369	318	309	306	303	318	312	273	252	216	177
23	438	387	336	315	333	303	342	318	276	258	240	219
24	918	387	336	285	348	300	357	324	279	273	270	240
25	420	381	294	258	297	264	324	267	288	273	252	240
26	411	390	228	147	264	258	297	273	324	279	267	237
27	432	402	237	219	270	264	300	294	321	291	279	249
28	417	396	252	237	279	270	306	297	339	285	318	153
29	2200	378	267	252	288	279	336	303	360	306	219	171
30	1250	408	273	267	291	285	348	321	---	---	264	156
31	801	423	---	---	300	291	330	321	---	---	213	159
MONTH	2200	156	1510	147	360	165	366	141	411	252	354	114

Table 4b.--Water-quality-monitor data, station 03201700, Big Four Hollow Creek near Lake Hope, Ohio, water years 1979 through 1983--Continued

SPECIFIC CONDUCTANCE (MICROSIEMENS PER CENTIMETER AT 25 DEG. C), WATER YEAR OCTOBER 1979 TO SEPTEMBER 1980

DAY	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN
	APRIL		MAY		JUNE		JULY		AUGUST		SEPTEMBER	
1	237	216	375	348	393	228	582	513	498	450	480	330
2	252	216	381	363	531	183	624	582	576	498	459	402
3	264	252	381	369	285	210	831	333	657	381	519	462
4	270	258	390	375	330	288	513	435	534	459	564	522
5	279	270	429	384	366	333	621	489	591	537	612	567
6	288	279	447	390	573	339	603	537	579	543	657	612
7	300	288	432	399	423	339	642	603	588	513	708	645
8	318	159	510	405	336	327	666	348	672	582	750	705
9	234	189	429	411	---	---	492	159	699	648	825	276
10	246	234	438	420	---	---	330	273	714	609	579	309
11	258	249	438	426	---	---	387	330	714	270	666	591
12	303	234	591	312	684	444	501	135	357	243	726	669
13	276	234	327	276	513	477	291	165	420	360	780	723
14	252	120	339	318	552	516	357	294	435	321	942	402
15	213	177	366	339	744	402	372	354	438	411	660	495
16	234	213	381	360	588	417	378	369	501	438	711	660
17	645	234	573	270	546	486	552	378	522	483	729	681
18	258	252	318	282	597	549	594	552	534	486	813	732
19	264	258	480	300	645	576	636	591	564	339	837	774
20	276	264	312	300	675	582	684	630	465	132	873	813
21	282	276	324	309	723	669	774	279	336	126	912	864
22	288	282	501	327	777	702	276	147	258	150	912	858
23	297	288	435	330	804	711	330	216	309	264	900	831
24	306	297	369	336	756	681	384	330	348	312	939	828
25	315	306	375	342	816	756	429	384	396	351	960	936
26	321	315	411	375	819	771	468	429	438	399	990	936
27	324	318	444	411	864	354	621	300	483	438	1010	978
28	333	324	462	438	615	480	387	297	525	474	1050	1010
29	339	327	483	462	741	345	399	342	711	432	1080	1020
30	366	339	513	411	513	303	444	402	468	240	1090	1040
31	---	---	558	429	---	---	483	447	423	330	---	---
MONTH	645	120	591	270	864	183	831	135	714	126	1090	276
YEAR	2200	114										

Table 4b.--Water-quality-monitor data, station 03201700, Big Four Hollow Creek near Lake Hope, Ohio, water years 1979 through 1983--Continued

SPECIFIC CONDUCTANCE (MICROSIEMENS PER CENTIMETER AT 25 DEG. C), WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		OCTOBER			NOVEMBER			DECEMBER			JANJARY	
1	1130	1060		1020	990		498	438		555	534	
2	1140	1020		1040	1010		528	483		579	537	
3	1090	1010		1070	1020		567	525		639	558	
4	1010	945		1080	879		615	564		750	615	
5	1050	1010		969	942		612	603		891	765	
6	1100	1040		1040	999		645	594		843	681	
7	1130	1060		1070	1010		693	474		684	615	
8	1130	1090		1070	990		564	474		735	684	
9	1160	1120		1070	954		567	258		744	729	
10	1180	1130		1080	1020		381	306		801	744	
11	1120	1050		1070	1020		423	378		819	789	
12	1130	1100		1080	1040		444	423		837	801	
13	1150	1120		1080	1030		474	432		825	780	
14	1170	1140		1090	1010		504	459		783	762	
15	1210	1130		1090	1010		519	471		783	756	
16	1250	1180		1090	1040		528	453		810	771	
17	1220	1160		1140	429		564	513		837	807	
18	1260	537		606	477		594	546		849	825	
19	1010	858		684	606		699	585		855	837	
20	1060	1010		729	687		744	675		840	807	
21	1100	1060		759	714		894	750		807	681	
22	1100	1070		798	729		822	720		675	567	
23	1140	1080		819	756		714	642		558	546	
24	1250	1110		795	558		672	618		609	486	
25	1040	603		618	558		804	672		555	417	
26	840	711		657	621		882	729		411	366	
27	912	834		774	297		762	723		432	372	
28	906	879		429	351		828	738		471	425	
29	948	897		486	420		747	636		549	438	
30	984	942		462	423		639	594		570	471	
31	1020	975		---	---		594	558		603	510	
MONTH	1260	537		1140	297		894	258		891	366	

Table 4b.--Water-quality-monitor data, station 03201700, Big Four Hollow Creek near Lake Hope, Ohio, water years 1979 through 1983--Continued

SPECIFIC CONDUCTANCE (MICROSIEMENS PER CENTIMETER AT 25 DEG. C), WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		FEBRUARY			MARCH			APRIL			MAY	
1	579	216		318	309		---	---		558	294	
2	324	219		327	318		495	480		384	336	
3	372	330		342	327		510	486		432	378	
4	438	372		348	333		534	351		480	429	
5	450	408		342	237		390	351		522	474	
6	429	417		282	258		405	246		495	348	
7	453	429		303	285		321	258		426	363	
8	468	417		318	303		366	285		477	426	
9	495	447		333	318		390	333		525	471	
10	510	387		342	333		429	366		585	378	
11	384	300		348	342		486	390		324	117	
12	396	354		348	345		426	354		303	231	
13	423	375		348	345		414	378		351	300	
14	426	393		348	345		435	399		423	198	
15	426	381		348	342		468	429		294	216	
16	432	252		348	345		489	432		348	294	
17	1120	231		345	342		498	321		405	348	
18	1480	1120		345	303		381	330		450	354	
19	1550	939		336	306		399	366		384	291	
20	1090	228		345	327		411	372		375	303	
21	264	240		357	339		453	411		435	375	
22	291	264		372	354		474	411		504	435	
23	306	210		387	366		456	237		576	504	
24	267	237		525	384		312	270		660	576	
25	288	267		543	519		357	315		738	645	
26	303	288		555	534		393	357		801	483	
27	327	300		564	423		438	393		666	189	
28	348	309		453	441		471	429		321	204	
29	---	---		---	---		504	456		420	324	
30	---	---		---	---		540	504		495	210	
31	---	---		---	---		---	---		336	267	
MONTH	1550	210		564	237		540	237		801	117	

Table 4b.--Water-quality-monitor data, station 03201700, Big Four Hollow Creek near Lake Hope, Ohio, water years 1979 through 1983--Continued

SPECIFIC CONDUCTANCE (MICROSIEMENS PER CENTIMETER AT 25 DEG. C), WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		JUNE			JULY			AUGUST			SEPTEMBER	
1	366	336	---	942	453	754	2160	2080	2120	3140	2770	3030
2	429	363	402	1080	927	1010	2220	2150	2190	3170	3040	3100
3	486	429	453	1190	1070	1120	2250	2150	2220	3120	1970	2440
4	492	135	291	1310	1160	1220	2270	2200	2230	2440	2020	2280
5	345	153	275	1280	939	1120	2330	2240	2290	2580	2410	2510
6	204	87	142	1250	1120	1180	2230	1850	2000	2730	2540	2610
7	306	207	253	1380	1220	1280	2130	2070	2110	2780	2620	2730
8	399	306	340	1440	1330	1380	2140	2070	2110	2740	2460	2640
9	450	285	333	1520	1410	1450	2300	2130	2210	2670	2550	2620
10	---	---	---	1580	1440	1500	2360	2260	2310	2770	2640	2710
11	465	381	438	1670	1530	1580	2440	2360	2390	2850	2710	2770
12	546	453	492	1730	1590	1650	2490	2400	2430	2880	2760	2810
13	558	129	416	1730	312	1300	2570	2480	2510	2900	2760	2840
14	360	204	284	1150	720	957	2640	2550	2590	2920	1420	2700
15	453	342	389	1360	1140	1230	2660	2550	2630	2190	1490	1930
16	480	309	421	1380	1240	1310	2580	2450	2520	2380	2190	2260
17	501	369	423	1500	1350	1410	2670	2530	2580	2470	2320	2410
18	600	477	530	1590	1440	1500	2760	2650	2690	2480	2450	2470
19	684	567	629	1590	1520	1560	2820	2710	2760	2510	2420	2460
20	774	678	718	1580	1490	1540	2820	2470	2740	2580	2510	2530
21	807	192	606	1740	1490	1610	2870	2740	2800	2650	2590	2610
22	495	270	371	1750	1490	1630	2840	2740	2780	2660	2640	2650
23	630	489	542	1850	1730	1780	2890	2800	2850	2680	2620	2650
24	747	606	669	1880	1780	1840	2900	2780	2860	2730	2680	2700
25	846	738	777	1920	1830	1880	2950	2860	2900	2770	2710	2730
26	963	840	883	1960	1900	1930	3040	2930	2980	2830	2770	2780
27	1060	936	987	1950	1830	1890	3050	2960	3010	2870	2810	2830
28	1150	1030	1080	1910	1570	1780	3020	2920	2980	2880	2850	2860
29	1250	1130	1160	1880	1600	1700	3080	2960	3030	2900	2800	2870
30	1280	1140	1220	2030	1890	1930	3100	3020	3060	2930	2820	2900
31	---	---	---	2100	2000	2050	3080	2990	3020	---	---	---
MONTH	1280	87	554	2100	312	1490	3100	1850	2580	3170	1420	2650
YEAR	3170	87	1840									

NOTE: NUMBER OF MISSING DAYS OF RECORD EXCEEDED 20% OF YEAR

Table 4b.--Water-quality-monitor data, station 03201700, Big Four Hollow Creek near Lake Hope, Ohio, water years 1979 through 1983--Continued

SPECIFIC CONDUCTANCE (MICROSIEMENS PER CENTIMETER AT 25 DEG. C), WATER YEAR OCTOBER 1981 TO SEPTEMBER 1982

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		OCTOBER			NOVEMBER			DECEMBER			JANUARY	
1	2940	2920	2930	---	---	---	2050	1400	1580	1120	1040	1080
2	2970	2930	2940	---	---	---	1700	1580	1650	1210	1120	1170
3	---	---	---	2480	2440	2460	1760	1700	1730	1240	1210	1220
4	---	---	---	2480	2440	2460	1770	1690	1730	1100	414	614
5	---	---	---	2470	2410	2440	1750	1700	1720	969	741	868
6	---	---	---	2410	2280	2350	1790	1750	1770	1110	972	1050
7	---	---	---	2380	2320	2340	1830	1780	1800	1160	1090	1120
8	---	---	---	2420	2330	2370	1850	1830	1850	1280	1170	1240
9	2760	2710	2730	2420	1880	2230	1860	1820	1840	1380	1280	1320
10	2790	2740	2760	2060	1880	1970	1870	1850	1860	1620	1380	1510
11	2810	2760	2780	2150	2060	2100	1920	1860	1900	1730	1630	1680
12	2810	2760	2790	2180	2070	2140	1880	1850	1870	1770	1660	1720
13	2810	2690	2790	2200	2150	2170	1940	1890	1910	1700	1610	1650
14	2820	2770	2800	2220	2180	2190	1970	1940	1950	1610	1590	1600
15	2820	2800	2810	2240	2190	2220	1980	1960	1970	1600	1590	1600
16	2840	2800	2820	2270	2180	2240	2020	1980	2000	1590	1560	1580
17	2840	2220	2610	2300	2260	2280	2030	2010	2020	1640	1570	1610
18	---	---	---	2320	2290	2310	2030	1930	1980	1650	1640	1640
19	---	---	---	2330	2290	2310	2110	2030	2080	1640	1640	1640
20	---	---	---	2300	2100	2190	2220	2120	2160	1650	1640	1640
21	---	---	---	2110	2090	2100	2360	2230	2330	1650	1470	1550
22	---	---	---	2160	2110	2130	2330	1700	2130	1470	222	1230
23	---	---	---	2180	2120	2160	1630	768	993	282	180	213
24	---	---	---	2130	1800	1930	1210	981	1100	570	291	419
25	---	---	---	1920	1790	1860	1390	1220	1320	615	558	581
26	---	---	---	2010	1910	1950	1480	1400	1450	777	627	705
27	---	---	---	2060	2020	2040	1510	1310	1440	867	786	834
28	---	---	---	2070	2050	2060	1340	1220	1300	864	810	851
29	---	---	---	2220	2060	2110	1270	1210	1240	---	---	---
30	---	---	---	2130	2080	2100	1450	1290	1360	---	---	---
31	---	---	---	---	---	---	1450	1130	1370	---	---	---
MONTH	2970	2220	2800	2480	1790	2190	2360	768	1720	1770	180	1210

Table 4b.--Water-quality-monitor data, station 03201700, Big Four Hollow Creek near Lake Hope, Ohio, water years 1979 through 1983--Continued

SPECIFIC CONDUCTANCE (MICROSIEMENS PER CENTIMETER AT 25 DEG. C), WATER YEAR OCTOBER 1981 TO SEPTEMBER 1982

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		FEBRUARY			MARCH			APRIL			MAY	
1	384	363	372	858	762	814	357	285	308	1040	1010	1020
2	480	387	438	864	822	838	---	---	---	1080	1020	1050
3	543	366	471	831	738	793	432	228	346	1130	1030	1080
4	456	366	412	843	297	649	360	294	329	1170	1090	1120
5	510	456	488	420	306	373	402	363	386	1200	1120	1160
6	729	504	572	456	420	440	393	330	360	1220	1150	1180
7	720	636	673	504	450	477	420	381	404	1220	1180	1190
8	771	672	719	579	495	533	453	420	437	645	498	570
9	786	678	711	540	486	516	450	429	439	789	651	729
10	843	729	795	546	531	540	471	432	455	885	792	840
11	894	846	870	585	270	477	504	468	485	972	882	925
12	972	900	934	354	276	321	543	498	521	972	969	970
13	---	---	---	369	183	261	582	534	557	---	---	---
14	---	---	---	339	264	303	630	585	608	---	---	---
15	---	---	---	357	219	268	666	627	646	1310	1220	1280
16	---	---	---	312	153	215	705	666	680	1380	1280	1310
17	321	291	302	264	177	229	690	618	658	1450	1340	1380
18	351	300	321	327	267	298	681	624	655	1510	1410	1450
19	381	354	367	396	258	349	711	672	692	1570	1460	1500
20	420	378	400	534	138	204	729	705	715	1450	1060	1180
21	465	417	439	258	159	224	777	714	745	1340	948	1250
22	528	468	500	315	258	290	825	768	793	1080	789	935
23	564	528	546	357	315	335	870	801	833	1260	1100	1170
24	606	558	580	411	360	386	894	825	860	1360	1260	1290
25	720	609	655	471	405	419	915	858	887	1450	1350	1380
26	765	708	735	441	417	425	900	822	859	1520	1430	1460
27	771	714	745	456	420	439	879	849	865	1560	1370	1490
28	831	720	776	495	456	481	963	873	914	1420	1190	1310
29	---	---	---	519	489	508	1010	924	963	1420	159	977
30	---	---	---	555	519	536	1040	972	1000	354	147	248
31	---	---	---	630	216	311	---	---	---	537	360	437
MONTH	972	291	576	864	138	427	1040	228	634	1570	147	1100

Table 4b.--Water-quality-monitor data, station 03201700, Big Four Hollow Creek near Lake Hope, Ohio, water years 1979 through 1983--Continued

SPECIFIC CONDUCTANCE (MICROSIEMENS PER CENTIMETER AT 25 DEG. C), WATER YEAR OCTOBER 1981 TO SEPTEMBER 1982

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		JUNE			JULY			AUGUST			SEPTEMBER	
1	606	540	565	1410	1180	1270	2070	2010	2030	2010	1730	1870
2	726	585	651	1520	1390	1420	2120	2030	2080	1960	1130	1610
3	849	732	788	1520	189	673	2140	1770	2090	1690	1310	1500
4	927	711	873	642	498	549	2150	891	1600	1810	1700	1740
5	720	201	352	756	570	659	1650	1310	1570	1900	1800	1840
6	483	339	402	921	762	835	1770	1650	1690	1920	1860	1900
7	600	486	533	1040	504	921	1830	1770	1800	1960	1910	1940
8	705	603	647	765	387	588	1860	807	1370	2000	1970	1980
9	789	705	742	609	456	520	1260	348	935	2040	1990	2020
10	732	549	654	774	615	686	1130	669	930	2100	2030	2060
11	873	735	802	903	777	831	1140	999	1050	2160	2090	2120
12	954	876	909	1060	906	963	1340	1090	1200	2200	2140	2160
13	1050	957	995	1180	1050	1100	1510	1340	1390	2240	2190	2200
14	1170	1040	1090	1390	1160	1230	1620	1470	1520	2240	2140	2220
15	1260	1150	1190	1470	1350	1400	1690	1560	1620	2200	2080	2120
16	1230	174	460	1560	1430	1490	1750	1670	1700	2180	2100	2140
17	438	243	334	1580	1400	1480	1770	1430	1690	2260	2150	2200
18	588	441	502	1450	1400	1430	1810	1610	1730	2290	2120	2230
19	669	591	625	1520	1450	1490	1890	1750	1830	2320	2250	2280
20	801	672	730	1540	921	1350	1950	1590	1860	2340	2290	2310
21	942	804	854	1470	1080	1290	1900	1570	1730	2360	2310	2340
22	1000	933	958	1520	1440	1480	2000	1890	1940	2380	2330	2360
23	1110	999	1040	1630	1500	1550	2020	1930	1990	2390	2290	2360
24	1230	1100	1140	1700	1570	1630	2040	1670	1970	2400	2330	2370
25	1310	1190	1230	1780	1650	1710	1870	1540	1710	2400	2340	2370
26	1370	1270	1300	1840	1750	1810	1970	1840	1900	2390	2190	2320
27	1380	1220	1290	1850	1780	1820	1990	1750	1870	2160	1690	1890
28	1450	1350	1390	1790	1550	1680	1940	1810	1870	1890	1670	1780
29	1450	1200	1330	1860	1520	1720	2050	1900	1990	1970	1880	1910
30	1320	711	1090	1950	1850	1880	2060	1950	2030	2040	1970	2000
31	---	---	---	2010	1960	1980	2000	1890	1960	---	---	---
MONTH	1450	174	849	2010	189	1270	2150	348	1700	2400	1130	2070
YEAR	2970	138	1310									

Table 4b.--Water-quality-monitor data, station 03201700, Big Four Hollow Creek near Lake Hope, Ohio, water years 1979 through 1983--Continued

SPECIFIC CONDUCTANCE (MICROSIEMENS PER CENTIMETER AT 25 DEG. C), WATER YEAR OCTOBER 1982 TO SEPTEMBER 1983

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		OCTOBER			NOVEMBER			DECEMBER			JANUARY	
1	2090	2020	2050	2220	2170	2200	933	684	834	---	---	---
2	2120	2060	2090	2210	2160	2190	861	732	811	---	---	---
3	2150	1790	2070	2230	1660	1980	951	861	914	---	---	---
4	2010	1850	1940	1680	1290	1460	1040	954	998	---	---	---
5	2060	1810	1930	1490	1390	1420	1070	288	847	---	---	---
6	2200	1920	2080	1630	1500	1560	609	354	508	---	---	---
7	2200	2020	2160	1700	1600	1630	762	615	692	753	705	728
8	2150	2090	2120	1690	1660	1670	858	768	818	792	726	770
9	2150	2000	2090	1730	1610	1680	954	855	933	822	780	807
10	2060	1970	2010	1770	1540	1680	993	945	976	828	576	757
11	2110	2050	2070	1800	1710	1760	1010	972	987	621	579	598
12	2110	2070	2100	1790	1460	1690	1070	870	1030	675	615	647
13	2120	2090	2110	1610	1460	1540	1180	1060	1130	708	666	693
14	2120	2080	2100	1630	1550	1590	1160	1080	1140	726	669	708
15	2120	2060	2100	1680	1540	1620	1170	189	732	717	594	693
16	2120	2060	2080	1670	1450	1620	360	174	273	825	693	739
17	2110	2050	2080	1720	1630	1670	453	360	413	774	681	729
18	2130	2060	2100	1770	1700	1730	534	423	497	876	744	804
19	2150	2060	2110	1790	1710	1760	528	273	420	1000	729	899
20	2140	2010	2080	1790	1210	1510	---	---	---	1020	744	914
21	2090	1980	2050	1230	912	1050	---	---	---	924	729	855
22	2140	2090	2110	1190	993	1110	---	---	---	858	282	552
23	2130	1930	2100	1280	417	1070	---	---	---	372	321	357
24	2140	2100	2120	933	519	769	---	---	---	429	357	396
25	2140	1890	2070	1100	942	1020	---	---	---	468	414	445
26	2130	1850	2000	1200	1090	1150	---	---	---	486	435	462
27	2100	1880	2000	1220	1110	1170	---	---	---	573	537	553
28	2150	1870	2010	1210	288	679	---	---	---	606	564	588
29	2210	1910	2070	735	477	615	---	---	---	630	585	610
30	2220	2200	2210	897	741	820	---	---	---	627	528	579
31	2230	2200	2220	---	---	---	---	---	---	573	522	547
MONTH	2230	1790	2080	2230	288	1450	1180	174	787	1020	282	657

Table 4b.--Water-quality-monitor data, station 03201700, Big Four Hollow Creek near Lake Hope, Ohio, water years 1979 through 1983--Continued

SPECIFIC CONDUCTANCE (MICROSIEMENS PER CENTIMETER AT 25 DEG. C), WATER YEAR OCTOBER 1982 TO SEPTEMBER 1983

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		FEBRUARY			MARCH			APRIL			MAY	
1	597	552	578	741	705	723	642	594	615	339	312	323
2	588	177	348	774	723	751	699	276	567	312	177	222
3	276	201	244	801	750	774	312	267	295	---	---	---
4	333	249	290	831	783	802	339	279	290	---	---	---
5	381	318	349	861	810	832	378	285	339	---	---	---
6	396	339	370	864	798	836	387	270	323	---	---	---
7	420	354	386	876	819	842	339	204	290	---	---	---
8	468	408	439	858	822	848	264	162	203	---	---	---
9	525	441	470	855	816	839	156	129	143	---	---	---
10	507	471	490	876	852	863	207	156	180	465	438	456
11	504	453	485	876	786	819	255	198	246	534	459	493
12	639	477	555	852	804	826	270	255	260	573	531	549
13	588	534	561	822	780	800	339	303	325	615	570	593
14	558	369	510	825	786	802	369	147	306	651	555	618
15	551	426	465	846	792	817	231	147	193	576	312	431
16	474	333	405	876	828	847	279	231	257	345	261	301
17	387	327	360	867	837	851	321	279	300	420	348	383
18	420	348	402	861	822	845	354	321	336	468	420	442
19	462	378	429	822	717	742	393	354	375	477	240	328
20	510	426	477	753	720	732	441	396	417	315	252	282
21	534	462	512	720	564	603	477	438	457	327	249	290
22	561	522	543	615	570	593	513	474	495	279	222	239
23	573	531	558	660	612	637	543	489	519	282	255	266
24	609	570	588	669	630	650	480	390	418	---	---	---
25	633	591	612	699	642	672	450	399	424	---	---	---
26	690	633	666	738	681	709	489	444	464	---	---	---
27	729	684	709	726	609	662	519	480	497	---	---	---
28	738	699	715	606	567	585	537	510	519	---	---	---
29	---	---	---	579	558	567	549	510	529	---	---	---
30	---	---	---	588	561	576	435	267	328	---	---	---
31	---	---	---	606	582	592	---	---	---	543	504	527
MONTH	738	177	483	876	558	743	699	129	364	651	177	397

Table 4b.--Water-quality-monitor data, station 03201700, Big Four Hollow Creek near Lake Hope, Ohio, water years 1979 through 1983--Continued

SPECIFIC CONDUCTANCE (MICROSIEMENS PER CENTIMETER AT 25 DEG. C), WATER YEAR OCTOBER 1982 TO SEPTEMBER 1983

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		JUNE			JULY			AUGUST			SEPTEMBER	
1	591	546	565									
2	651	591	619									
3	657	99	517									
4	255	126	196									
5	348	255	296									
6	411	348	373									
7	480	414	440									
8	549	483	507									
9	621	552	582									
10	699	621	653									
11	771	699	728									
12	846	768	796									
13	921	831	868									
14	1000	915	943									
15	1060	981	1010									
16	1110	1040	1070									
17	1110	996	1070									
18	1110	1100	1100									
19	1160	912	1050									
20	1090	945	1010									
21	1170	1090	1110									
22	1280	1150	1190									
23	1340	1250	1280									
24	1370	1310	1330									
25	1430	1340	1370									
26	1470	1400	1430									
27	1510	1450	1480									
28	1530	852	1430									
29	1210	894	1090									
30	1340	1210	1270									
31	---	---	---									
MONTH	1530	99	912									
YEAR	2230	99	916									

NOTE: NUMBER OF MISSING DAYS OF RECORD EXCEEDED 20% OF YEAR

Table 4c.--Water-quality-monitor data, station 03201700, Big Four Hollow Creek near Lake Hope, Ohio, water years 1979 through 1983

[MAX, maximum; MIN, minimum]

pH (STANDARD UNITS), WATER YEAR OCTOBER 1978 TO SEPTEMBER 1979

DAY	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN
	OCTOBER		NOVEMBER		DECEMBER		JANUARY		FEBRUARY		MARCH	
1	3.8	3.4	3.6	3.4	4.5	3.9	5.6	4.4	4.0	3.8	4.3	4.1
2	3.7	3.2	3.6	3.4	4.3	3.8	6.0	3.9	3.9	3.6	4.2	3.7
3	3.6	3.5	3.6	3.3	4.1	3.9	4.2	4.1	3.8	3.4	4.1	3.8
4	3.8	3.6	3.5	3.3	---	---	4.1	3.9	3.7	3.5	4.9	3.7
5	3.8	3.6	3.5	3.3	---	---	3.9	3.8	3.8	3.7	---	---
6	3.8	3.6	3.5	3.3	---	---	3.9	3.7	3.8	3.3	---	---
7	3.8	3.7	3.4	3.4	---	---	4.4	3.8	3.7	3.6	4.0	3.8
8	3.8	3.7	3.5	3.3	5.5	4.3	4.1	3.8	3.8	3.5	4.0	3.8
9	3.8	3.6	3.6	3.4	4.2	3.9	3.9	3.8	3.8	3.4	4.0	3.8
10	3.8	3.6	3.5	3.3	4.0	3.9	3.9	3.4	3.8	3.4	3.9	3.7
11	3.7	2.9	3.5	3.3	---	---	3.9	3.4	3.7	3.4	3.9	3.8
12	3.8	3.5	3.4	3.3	---	---	3.7	3.4	3.7	3.5	4.0	3.8
13	6.3	3.8	3.3	3.2	4.1	4.0	5.3	3.6	3.8	3.4	4.1	3.8
14	4.5	3.8	3.4	3.3	4.0	3.8	5.7	4.3	3.7	3.3	4.2	3.9
15	3.8	3.6	3.8	3.4	4.0	3.9	4.4	4.1	3.9	3.5	4.1	3.8
16	3.6	3.4	3.9	3.8	4.0	3.7	4.1	3.8	4.0	3.7	3.9	3.6
17	3.5	3.3	6.0	3.7	---	---	4.9	3.6	4.0	3.6	4.0	3.7
18	3.5	3.2	5.2	4.3	---	---	4.5	4.0	3.9	3.7	4.0	3.9
19	3.4	3.3	4.3	4.1	3.6	3.6	4.1	3.6	3.9	3.6	4.0	3.7
20	3.4	3.2	4.2	4.1	4.9	3.2	5.7	3.7	3.9	3.2	3.9	3.7
21	3.4	3.2	4.1	3.4	5.2	4.0	5.7	4.3	5.4	3.6	3.9	3.7
22	3.3	3.1	4.6	3.9	4.1	3.8	4.3	3.9	5.8	4.8	3.9	3.5
23	3.3	3.2	4.0	3.9	4.0	3.3	4.1	3.5	5.8	4.2	4.9	3.6
24	3.4	3.2	3.9	3.9	3.9	3.6	5.9	3.9	5.4	4.1	6.0	4.5
25	3.4	3.2	3.9	3.8	3.9	3.6	4.6	4.1	5.5	4.5	5.2	4.2
26	5.6	3.2	3.9	3.8	3.9	3.5	4.1	3.9	4.5	4.1	4.2	4.0
27	5.0	4.0	6.4	3.8	3.9	3.7	3.9	3.7	4.3	3.9	4.0	3.8
28	4.0	3.7	5.9	5.1	3.8	3.5	3.8	3.6	4.3	4.0	4.0	3.8
29	3.9	3.6	5.1	4.6	3.8	3.1	3.9	3.7	---	---	3.8	3.7
30	3.8	3.5	4.6	4.2	3.7	3.5	4.0	3.8	---	---	3.8	3.7
31	3.7	3.4	---	---	5.1	3.8	4.0	3.8	---	---	5.9	3.6
MONTH	6.3	2.9	6.4	3.2	5.5	3.1	6.0	3.4	5.8	3.2	6.0	3.5

Table 4c.--Water-quality-monitor data, station 03201700, Big Four Hollow Creek near Lake Hope, Ohio, water years 1979 through 1983--Continued

pH (STANDARD UNITS), WATER YEAR OCTOBER 1978 TO SEPTEMBER 1979

DAY	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN
	APRIL		MAY		JUNE		JULY		AUGUST		SEPTEMBER	
1	5.9	4.7	3.9	3.8	5.6	3.7	4.1	3.8	3.2	3.0	4.2	3.9
2	5.6	4.4	3.8	3.7	3.8	3.6	3.9	3.7	3.8	2.8	3.9	3.7
3	4.4	4.0	6.1	3.7	3.6	3.5	3.8	3.6	3.2	3.0	3.8	3.6
4	4.1	4.1	6.3	5.7	3.7	3.4	6.0	3.6	3.2	3.0	3.7	3.5
5	4.1	4.0	5.9	4.7	3.6	3.4	4.3	3.3	3.2	3.0	3.6	3.5
6	4.1	4.0	4.7	4.0	4.1	3.4	3.8	3.6	3.7	3.2	3.6	3.5
7	4.2	4.0	4.2	3.8	3.5	3.4	3.7	3.6	3.2	3.0	3.6	3.3
8	4.1	4.0	4.0	3.7	6.0	3.5	3.7	3.5	3.1	3.0	3.5	3.3
9	5.8	4.1	3.9	3.6	4.4	3.5	4.1	3.6	3.1	2.9	3.4	3.3
10	5.0	4.3	3.8	3.6	5.6	3.3	3.8	3.3	3.0	2.9	3.4	3.2
11	4.5	4.2	3.8	3.6	5.1	3.6	3.6	3.3	6.0	3.0	3.4	3.1
12	4.2	4.0	3.7	3.6	3.7	3.5	3.6	3.3	6.1	3.6	3.6	3.2
13	5.8	3.9	3.8	3.7	3.6	3.4	3.6	3.0	3.6	3.3	4.3	3.4
14	6.0	4.6	3.8	3.6	3.6	3.3	3.6	3.0	3.4	3.2	5.9	4.0
15	4.7	4.3	3.8	3.6	3.5	3.3	3.5	3.3	3.3	3.2	4.6	4.1
16	4.3	4.1	3.8	3.6	3.5	3.3	3.5	3.3	3.2	3.0	4.1	3.8
17	4.1	4.1	3.7	3.6	3.5	3.3	3.5	3.3	3.1	2.9	3.9	3.0
18	4.1	4.0	3.7	3.5	3.4	3.3	3.5	3.3	3.1	2.9	3.6	3.0
19	4.1	3.9	3.7	3.5	3.5	3.3	3.4	3.0	6.0	3.0	3.6	3.4
20	4.1	3.9	3.6	3.5	4.1	3.3	3.4	3.3	6.0	2.8	3.6	3.4
21	4.0	3.8	3.6	3.5	5.9	4.0	3.4	3.3	6.1	5.6	6.3	3.4
22	3.9	3.8	3.6	3.4	4.1	3.7	3.4	3.3	5.5	4.2	6.4	6.0
23	3.9	3.8	3.7	3.5	3.8	3.6	3.4	3.2	5.0	4.2	6.1	5.0
24	3.9	3.8	3.8	3.6	3.6	3.5	3.4	3.2	6.3	4.5	5.0	4.4
25	3.8	3.7	4.0	3.7	3.6	3.3	3.6	3.0	6.3	5.0	4.5	3.8
26	3.8	3.8	4.6	3.8	3.6	3.3	3.2	3.0	6.4	4.9	4.3	3.4
27	4.1	3.9	6.0	3.8	3.7	3.6	3.2	3.0	6.2	5.8	4.1	2.9
28	4.0	3.9	5.6	3.9	3.7	3.3	3.6	3.0	5.8	4.7	6.1	3.6
29	3.9	3.8	3.9	3.5	3.7	3.6	4.4	3.3	5.7	5.0	5.9	5.5
30	3.9	3.8	3.7	3.6	4.3	3.7	3.4	3.0	5.0	3.0	5.5	4.9
31	---	---	5.8	3.5	---	---	3.2	3.0	4.5	4.1	---	---
MONTH	6.0	3.7	6.3	3.4	6.0	3.3	6.0	3.0	6.4	2.8	6.4	2.9
YEAR	6.4	2.8										

Table 4c.--Water-quality-monitor data, station 03201700, Big Four Hollow Creek near Lake Hope, Ohio, water years 1979 through 1983--Continued

pH (STANDARD UNITS), WATER YEAR OCTOBER 1979 TO SEPTEMBER 1980

DAY	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN
	OCTOBER		NOVEMBER		DECEMBER		JANUARY		FEBRUARY		MARCH	
1	5.1	4.2	4.1	3.6	---	---	5.5	5.3	5.4	4.9	5.3	4.8
2	5.0	3.7	5.7	4.5	---	---	5.3	5.1	5.3	4.7	5.3	4.9
3	6.1	4.2	5.2	4.6	---	---	5.1	5.0	5.2	4.8	5.5	4.8
4	5.1	3.7	---	---	---	---	5.1	5.0	5.2	4.8	5.4	4.8
5	5.5	4.6	---	---	---	---	5.2	5.1	5.2	4.8	6.1	5.4
6	6.3	4.9	---	---	5.6	5.4	5.1	4.8	5.0	4.9	6.1	5.9
7	5.3	4.5	---	---	5.9	5.6	5.2	5.0	5.1	5.0	6.1	5.8
8	6.5	4.2	---	---	5.6	5.4	5.3	4.8	5.1	4.7	5.9	5.5
9	6.5	6.3	---	---	5.6	5.2	5.1	4.8	4.8	4.7	5.9	5.5
10	6.3	6.1	---	---	5.5	5.0	5.0	4.5	5.0	4.7	5.8	5.4
11	6.1	5.8	---	---	5.4	4.6	6.1	4.7	4.9	4.7	5.9	5.6
12	6.5	5.8	---	---	5.1	4.7	6.2	6.0	4.9	4.5	5.6	4.6
13	6.3	5.9	---	---	6.3	5.0	6.1	5.8	4.9	4.3	6.0	5.4
14	5.9	5.5	---	---	6.3	6.2	6.2	5.7	4.8	4.3	6.2	5.4
15	6.0	4.7	---	---	6.4	5.9	6.1	5.6	4.8	4.3	6.0	5.0
16	6.0	5.7	---	---	6.2	5.9	6.4	5.7	6.1	4.9	6.0	5.0
17	5.9	5.4	---	---	6.2	5.9	6.3	5.6	5.7	5.4	6.0	4.9
18	5.3	4.2	---	---	6.0	5.5	5.8	5.5	5.4	4.8	5.8	4.9
19	4.6	4.3	---	---	5.7	5.4	5.5	5.3	5.6	4.9	5.8	4.6
20	4.4	4.2	---	---	5.8	5.3	5.4	5.3	6.1	5.3	5.8	4.7
21	4.3	4.0	---	---	5.6	4.9	5.4	5.2	6.1	5.4	5.8	5.1
22	4.5	3.8	---	---	5.3	4.8	5.4	5.2	5.9	5.7	5.9	5.1
23	4.4	4.2	---	---	5.1	4.7	5.4	4.8	5.9	5.7	5.8	5.1
24	4.4	4.1	---	---	6.1	4.6	5.2	5.1	6.0	5.8	5.9	5.0
25	4.4	4.3	---	---	6.2	6.1	6.3	5.1	6.0	5.7	5.7	5.2
26	4.4	4.3	---	---	6.2	6.1	6.2	5.8	6.0	5.6	5.7	4.8
27	5.1	4.2	---	---	6.0	5.9	5.9	5.7	5.9	5.5	5.7	4.7
28	4.4	4.3	---	---	6.0	5.8	5.9	5.7	5.9	5.4	5.6	4.6
29	4.4	3.2	---	---	5.8	5.7	5.7	5.0	5.7	5.2	5.9	5.4
30	4.4	3.6	---	---	5.8	5.6	5.5	4.8	---	---	5.7	5.0
31	4.4	3.7	---	---	5.7	5.5	5.5	5.0	---	---	6.4	5.3
MONTH	6.5	3.2	5.7	3.6	6.4	4.6	6.4	4.5	6.1	4.3	6.4	4.6

Table 4c.--Water-quality-monitor data, station 03201700, Big Four Hollow Creek near Lake Hope, Ohio, water years 1979 through 1983--Continued

pH (STANDARD UNITS), WATER YEAR OCTOBER 1979 TO SEPTEMBER 1980

DAY	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN
	APRIL		MAY		JUNE		JULY		AUGUST		SEPTEMBER	
1	6.2	6.1	4.8	4.6	6.2	5.4			---	---	5.7	4.2
2	6.2	5.9	4.8	4.4	6.3	4.4			---	---	4.7	4.3
3	6.2	5.9	4.7	4.4	---	---			---	---	4.3	4.1
4	6.2	6.0	4.7	4.4	---	---			---	---	4.1	3.8
5	6.0	5.8	4.6	4.3	---	---			---	---	3.9	3.7
6	5.9	5.5	4.5	4.3	---	---			---	---	3.8	3.6
7	5.6	4.7	4.5	4.3	---	---			3.9	3.8	3.7	3.5
8	6.4	4.7	4.6	4.3	---	---			3.8	3.6	3.6	3.5
9	6.5	6.4	4.8	4.1	---	---			3.8	3.7	5.7	3.4
10	6.4	6.3	4.5	4.1	---	---			3.8	3.5	5.7	3.9
11	6.3	6.1	4.3	4.1	---	---			6.2	3.6	3.9	3.7
12	6.6	5.8	6.2	4.2	---	---			6.4	5.8	3.8	3.5
13	6.5	5.9	6.5	6.0	---	---			5.8	4.7	3.6	3.4
14	6.6	5.8	6.2	5.6	---	---			6.1	4.5	4.2	3.4
15	6.5	6.2	5.9	4.6	---	---			4.5	4.4	4.1	3.7
16	6.4	6.0	4.9	4.2	---	---			4.5	4.2	3.7	3.6
17	6.2	3.0	6.3	3.9	---	---			4.2	4.1	3.6	3.5
18	6.2	5.3	6.1	5.8	---	---			4.6	3.9	3.6	3.4
19	6.2	5.5	6.2	4.9	---	---			6.1	3.8	3.6	3.4
20	5.9	5.6	6.1	5.9	---	---			6.3	4.2	3.6	3.3
21	5.9	5.4	6.0	5.9	---	---			6.3	4.6	3.5	3.3
22	5.7	5.3	5.9	3.4	---	---			6.2	6.1	3.4	3.3
23	5.7	5.2	5.9	4.2	---	---			6.2	5.9	3.5	3.4
24	5.4	5.0	5.7	4.7	---	---			5.9	5.2	3.6	3.4
25	5.3	5.0	5.4	4.7	---	---			5.2	4.5	3.5	3.3
26	5.1	5.0	4.8	4.3	---	---			4.5	4.3	3.5	3.4
27	5.2	5.0	4.4	4.2	---	---			4.4	4.0	3.6	3.4
28	5.1	4.9	4.3	4.0	---	---			4.2	3.9	3.5	3.3
29	5.1	4.9	4.1	3.8	---	---			4.3	3.7	3.5	3.3
30	4.9	4.7	4.1	3.7	---	---			6.0	4.1	3.5	3.3
31	---	---	5.2	3.7	---	---			5.9	4.5	---	---
MONTH	6.6	3.0	6.5	3.4	6.3	4.4			6.4	3.5	5.7	3.3
YEAR	6.6	3.0										

NOTE: NUMBER OF MISSING DAYS OF RECORD EXCEEDED 20% OF YEAR

Table 4c.--Water-quality-monitor data, station 03201700, Big Four Hollow Creek near Lake Hope, Ohio, water years 1979 through 1983--Continued

pH (STANDARD UNITS), WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		OCTOBER			NOVEMBER			DECEMBER			JANUARY	
1	3.5	3.2		3.4	3.3		4.4	3.9		4.9	4.5	
2	3.5	3.4		3.5	3.0		4.3	4.0		4.9	4.8	
3	3.5	3.4		3.4	3.0		4.3	4.1		4.8	4.6	
4	3.6	3.5		3.3	3.1		4.5	3.9		4.8	4.6	
5	3.6	3.4		3.4	3.3		4.6	4.3		4.6	4.2	
6	3.6	3.4		3.5	3.2		4.4	4.1		4.4	4.1	
7	3.6	3.4		3.4	3.0		4.6	4.0		4.7	4.2	
8	3.6	3.2		3.2	3.0		4.7	4.2		4.8	4.4	
9	3.5	3.3		3.2	3.0		6.5	4.3		4.6	4.4	
10	3.4	3.4		3.3	3.2		6.4	6.1		4.5	4.4	
11	3.6	3.5		3.4	3.2		5.1	5.5		4.5	4.3	
12	3.6	3.5		3.4	3.0		5.5	5.2		4.4	4.2	
13	3.6	3.5		3.3	2.8		5.3	5.0		4.2	4.0	
14	3.6	3.5		3.2	2.9		5.0	4.9		4.3	3.8	
15	3.5	3.4		3.2	3.0		4.9	4.6		4.1	4.1	
16	3.4	3.2		3.3	3.2		4.8	4.7		4.3	4.0	
17	3.3	3.2		4.9	3.2		4.8	4.4		4.3	4.2	
18	3.8	3.3		4.5	4.0		4.5	4.1		4.3	3.9	
19	3.5	3.4		4.0	3.8		4.5	4.1		4.2	3.7	
20	3.5	3.2		3.9	3.4		4.6	4.5		4.0	3.7	
21	3.5	3.2		3.8	3.6		4.5	4.3		4.1	3.9	
22	3.5	3.4		3.8	3.3		4.5	4.1		4.3	4.1	
23	3.5	3.4		3.6	3.3		4.3	4.1		4.5	4.4	
24	3.5	3.3		3.9	3.4		4.7	4.3		5.4	4.0	
25	4.3	3.5		4.0	3.9		4.7	4.4		5.9	4.2	
26	3.9	3.7		4.0	3.8		4.5	4.1		6.0	5.4	
27	3.7	3.4		5.6	3.6		4.4	4.2		5.8	5.3	
28	3.5	3.4		5.4	4.8		4.4	3.9		5.6	5.1	
29	3.6	3.4		4.8	4.3		4.2	3.9		5.5	4.8	
30	3.6	3.2		4.7	4.3		4.4	4.2		5.2	4.9	
31	3.6	3.2		---	---		4.5	4.3		4.9	4.6	
MONTH	4.3	3.2		5.6	2.8		6.5	3.9		6.0	3.7	

Table 4c.--Water-quality-monitor data, station 03201700, Big Four Hollow Creek near Lake Hope, Ohio, water years 1979 through 1983--Continued

pH (STANDARD UNITS), WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		FEBRUARY			MARCH			APRIL			MAY	
1	6.3	4.3		5.5	5.3		---	---		6.3	4.3	---
2	6.2	6.0		5.4	5.1		4.8	4.5		5.8	5.1	---
3	6.1	5.8		5.4	5.0		4.7	4.5		5.3	4.7	---
4	5.8	5.5		5.3	5.0		5.8	4.3		4.9	4.5	---
5	5.5	5.2		6.1	5.3		5.9	5.7		4.6	4.4	---
6	5.3	5.0		5.9	5.6		6.6	5.2		6.0	4.5	---
7	5.2	4.7		5.6	5.3		5.6	5.1		5.6	4.9	---
8	5.4	5.0		5.4	5.2		5.6	4.8		5.1	4.6	---
9	5.1	4.9		5.2	5.0		5.6	4.6		4.8	4.4	---
10	5.3	4.2		5.1	4.8		4.7	4.5		5.3	4.3	---
11	6.1	5.3		5.2	4.8		4.6	4.3		6.2	5.7	---
12	6.0	5.7		5.2	4.9		4.9	4.5		6.0	5.6	---
13	5.9	5.5		5.1	4.9		4.8	4.6		5.7	5.1	---
14	5.7	4.9		5.2	5.0		4.7	4.6		6.3	4.8	---
15	5.8	4.8		5.2	4.9		4.6	4.4		6.1	5.7	---
16	5.7	5.0		5.0	4.9		4.5	4.3		5.7	5.1	---
17	6.1	5.6		5.0	4.9		5.9	4.4		5.3	4.8	---
18	5.8	5.3		5.6	4.9		5.4	4.8		5.4	4.7	---
19	5.8	5.4		5.4	5.2		5.1	4.7		6.1	5.2	---
20	5.9	5.7		5.2	4.9		5.0	4.7		5.8	4.7	---
21	5.8	5.5		4.9	4.7		4.9	4.5		4.9	4.3	---
22	5.7	5.2		4.8	4.5		4.8	4.5		4.5	4.1	---
23	6.2	5.3		4.7	4.4		5.4	4.8		4.1	3.8	---
24	6.1	5.9		4.6	4.3		6.1	5.8		3.8	3.5	---
25	6.0	5.6		4.5	4.3		5.7	5.2		3.6	3.3	---
26	5.8	5.4		4.4	4.2		5.4	4.9		3.9	3.2	---
27	5.6	5.1		5.9	4.2		5.1	4.7		6.0	3.6	---
28	5.5	5.1		5.4	5.3		4.8	4.6		5.9	5.4	---
29	---	---		---	---		4.6	4.5		5.4	4.7	---
30	---	---		---	---		4.5	4.3		---	---	---
31	---	---		---	---		---	---		3.8	3.7	3.7
MONTH	6.3	4.2		6.1	4.2		6.6	4.3		6.3	3.2	3.7

Table 4c.--Water-quality-monitor data, station 03201700, Big Four Hollow Creek near Lake Hope, Ohio, water years 1979 through 1983--Continued

pH (STANDARD UNITS), WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		JUNE			JULY			AUGUST			SEPTEMBER	
1	5.3	5.0	---	4.2	3.3	3.5	2.7	2.5	2.6	2.6	2.4	2.5
2	5.2	4.7	4.8	3.3	3.2	3.2	2.6	2.5	2.5	2.6	2.4	2.5
3	4.8	4.4	4.6	3.2	3.1	3.1	2.6	2.5	2.5	2.6	2.5	2.5
4	6.5	4.5	5.6	3.1	3.0	3.1	2.6	2.5	2.5	2.6	2.5	2.6
5	7.7	6.1	6.7	3.2	3.0	3.1	2.8	2.5	2.7	2.6	2.5	2.5
6	7.7	7.2	7.6	3.0	2.9	3.0	2.9	2.8	2.9	2.5	2.4	2.5
7	7.5	6.8	7.2	2.9	2.8	2.9	3.0	2.9	2.9	2.5	2.5	2.5
8	6.9	2.5	6.1	2.9	2.8	2.8	3.0	2.8	2.9	2.5	2.4	2.5
9	2.9	2.4	2.5	3.0	2.8	2.8	2.9	2.7	2.8	2.7	2.4	2.6
10	---	---	---	2.9	2.8	2.9	2.8	2.7	2.8	2.7	2.6	2.7
11	4.4	4.3	4.3	2.9	2.8	2.8	2.7	2.6	2.7	2.7	2.5	2.6
12	4.3	4.0	4.2	2.8	2.7	2.8	2.7	2.6	2.6	2.6	2.5	2.6
13	6.1	4.0	4.6	4.9	2.7	3.1	2.6	2.5	2.6	2.5	2.4	2.5
14	6.1	4.6	5.5	3.5	3.0	3.2	2.6	2.5	2.5	2.8	2.4	2.5
15	4.8	4.3	4.6	3.1	3.0	3.0	2.5	2.5	2.5	2.8	2.6	2.7
16	5.5	4.0	4.5	3.2	2.9	3.1	2.6	2.5	2.5	2.6	2.5	2.5
17	4.8	4.2	4.5	3.3	2.9	3.0	2.6	2.4	2.5	2.6	2.5	2.5
18	4.2	3.8	4.0	3.3	2.7	2.9	2.5	2.4	2.4	2.6	2.6	2.6
19	3.8	3.6	3.7	3.2	2.7	2.8	2.5	2.4	2.4	2.7	2.5	2.6
20	3.6	3.5	3.6	3.3	2.6	2.8	2.8	2.4	2.6	2.6	2.4	2.5
21	6.0	3.4	4.2	3.2	2.6	2.8	2.7	2.7	2.7	2.7	2.4	2.5
22	5.8	4.2	4.9	3.0	2.9	2.9	2.7	2.6	2.7	2.6	2.5	2.5
23	4.2	3.8	4.0	3.0	2.9	2.9	2.7	2.6	2.6	2.6	2.5	2.5
24	3.8	3.5	3.7	2.9	2.8	2.9	2.7	2.6	2.6	2.6	2.4	2.5
25	3.6	3.4	3.5	2.9	2.8	2.8	2.5	2.5	2.6	3.3	2.4	2.6
26	3.4	3.2	3.3	2.8	2.7	2.8	2.6	2.5	2.5	3.1	2.4	2.5
27	3.3	3.2	3.3	2.7	2.7	2.7	2.7	2.4	2.6	2.5	2.4	2.4
28	3.3	3.1	3.2	2.7	2.6	2.7	2.7	2.6	2.6	2.5	2.4	2.5
29	3.2	3.1	3.2	2.7	2.6	2.7	2.7	2.7	2.7	2.9	2.4	2.5
30	3.2	3.1	3.1	2.7	2.6	2.6	2.7	2.6	2.7	2.6	2.5	2.5
31	---	---	---	2.7	2.6	2.6	2.7	2.6	2.7	---	---	---
MONTH	7.7	2.4	4.5	4.9	2.6	2.9	3.0	2.4	2.6	3.3	2.4	2.5
YEAR	7.7	2.4	3.1									

NOTE: NUMBER OF MISSING DAYS OF RECORD EXCEEDED 20% OF YEAR

Table 4c.--Water-quality-monitor data, station 03201700, Big Four Hollow Creek near Lake Hope, Ohio, water years 1979 through 1983--Continued

pH (STANDARD UNITS), WATER YEAR OCTOBER 1981 TO SEPTEMBER 1982

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		OCTOBER			NOVEMBER			DECEMBER			JANUARY	
1	2.7	2.5	2.6	---	---	---	---	---	---	3.2	3.1	3.2
2	2.6	2.5	2.6	---	---	---	---	---	---	3.2	3.0	3.1
3	2.6	2.4	2.5	2.9	2.8	2.9	---	---	---	3.1	3.0	3.0
4	3.1	2.4	2.7	3.0	2.9	3.0	---	---	---	4.1	3.2	3.7
5	---	---	---	3.0	3.0	3.0	---	---	---	3.5	3.2	3.4
6	---	---	---	3.0	2.9	3.0	---	---	---	3.3	3.0	3.2
7	---	---	---	3.1	3.0	3.0	---	---	---	3.2	3.1	3.1
8	---	---	---	3.1	3.0	3.1	---	---	---	3.2	3.0	3.2
9	3.0	2.9	3.0	3.2	3.0	3.1	---	---	---	3.1	3.0	3.0
10	3.1	3.0	3.0	2.9	2.6	2.8	---	---	---	3.0	2.9	3.0
11	3.0	3.0	3.0	---	---	---	---	---	---	3.0	2.9	2.9
12	3.1	3.0	3.0	---	---	---	---	---	---	3.0	2.9	2.9
13	3.1	3.0	3.0	---	---	---	---	---	---	2.9	2.9	2.9
14	3.1	3.0	3.0	---	---	---	---	---	---	3.0	2.9	2.9
15	3.0	3.0	3.0	---	---	---	---	---	---	3.0	2.9	2.9
16	3.0	2.9	3.0	---	---	---	---	---	---	3.0	2.9	2.9
17	3.0	2.9	2.9	---	---	---	---	---	---	3.0	2.9	3.0
18	---	---	---	---	---	---	---	---	---	2.9	2.9	2.9
19	---	---	---	---	---	---	---	---	---	2.9	2.8	2.9
20	---	---	---	---	---	---	3.0	2.8	2.9	2.9	2.8	2.9
21	---	---	---	---	---	---	3.0	2.8	2.9	3.0	2.8	2.9
22	---	---	---	---	---	---	2.9	2.8	2.8	4.9	2.9	3.2
23	---	---	---	---	---	---	3.3	2.8	3.2	5.0	4.4	4.7
24	---	---	---	---	---	---	3.2	3.0	3.1	4.4	3.7	4.0
25	---	---	---	---	---	---	3.1	2.9	3.0	3.7	3.6	3.7
26	---	---	---	---	---	---	3.1	3.0	3.0	3.6	3.4	3.5
27	---	---	---	---	---	---	3.1	3.0	3.0	3.4	3.3	3.4
28	---	---	---	---	---	---	3.1	3.0	3.1	3.4	3.3	3.3
29	---	---	---	---	---	---	3.1	3.1	3.1	---	---	---
30	---	---	---	---	---	---	3.1	3.0	3.1	---	---	---
31	---	---	---	---	---	---	3.1	3.0	3.0	---	---	---
MONTH	3.1	2.4	2.9	3.2	2.6	3.0	3.3	2.8	3.0	5.0	2.8	3.2

Table 4c.--Water-quality-monitor data, station 03201700, Big Four Hollow Creek near Lake Hope, Ohio, water years 1979 through 1983--Continued

pH (STANDARD UNITS), WATER YEAR OCTOBER 1981 TO SEPTEMBER 1982

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		FEBRUARY			MARCH			APRIL			MAY	
1	4.2	4.1	4.1	3.5	3.3	3.3	4.2	4.1	4.2	3.1	3.0	3.1
2	4.1	3.9	4.0	3.3	3.2	3.3	---	---	---	3.1	3.0	3.1
3	4.2	3.7	3.9	3.4	3.2	3.3	4.7	3.4	4.0	3.1	3.0	3.0
4	4.2	3.9	4.0	4.8	3.2	3.6	4.2	3.9	4.1	3.1	2.9	3.0
5	3.9	3.7	3.8	4.4	3.9	4.1	4.0	3.9	3.9	3.0	2.8	3.0
6	3.7	3.4	3.6	4.0	3.8	3.9	4.1	3.9	4.0	3.0	2.9	2.9
7	3.6	3.4	3.5	3.9	3.7	3.8	4.0	3.8	3.9	3.0	2.9	2.9
8	3.5	3.4	3.4	3.8	3.6	3.7	3.8	3.7	3.8	3.6	2.6	3.5
9	3.5	3.4	3.4	3.8	3.6	3.7	3.8	3.7	3.7	3.4	3.2	3.3
10	3.4	3.3	3.3	3.7	3.6	3.7	3.8	3.7	3.8	3.2	3.1	3.2
11	3.3	3.2	3.3	5.0	3.6	4.0	3.7	3.6	3.7	3.2	3.0	3.1
12	3.2	3.2	3.2	4.6	4.1	4.3	3.7	3.5	3.6	---	---	---
13	---	---	---	5.1	3.9	4.5	3.6	3.4	3.5	---	---	---
14	---	---	---	4.4	4.1	4.3	3.5	3.4	3.4	---	---	---
15	---	---	---	5.2	4.0	4.6	3.5	3.3	3.4	2.9	2.8	2.9
16	---	---	---	5.5	4.3	4.9	3.4	3.2	3.3	2.9	2.8	2.9
17	4.4	4.3	4.4	4.9	4.4	4.6	3.4	3.3	3.3	2.9	2.7	2.8
18	4.6	4.3	4.5	4.4	4.1	4.3	3.4	3.3	3.4	2.9	2.7	2.8
19	4.3	4.2	4.3	5.1	4.0	4.1	3.4	3.2	3.3	2.9	2.8	2.8
20	4.2	4.0	4.1	5.6	3.3	5.1	3.4	3.2	3.3	3.1	2.9	3.0
21	4.1	3.9	4.0	5.3	4.4	4.7	3.4	3.3	3.3	3.1	2.9	3.0
22	3.9	3.7	3.8	4.4	4.1	4.3	---	---	---	3.2	3.0	3.1
23	3.8	3.6	3.7	4.2	4.0	4.1	---	---	---	3.0	2.9	3.0
24	3.7	3.6	3.7	4.0	3.7	3.9	---	---	---	2.9	2.9	2.9
25	3.6	3.5	3.6	3.9	3.6	3.8	---	---	---	2.9	2.8	2.9
26	3.6	3.4	3.5	3.8	3.8	3.8	---	---	---	2.9	2.8	2.9
27	3.5	3.4	3.5	3.9	3.8	3.8	3.2	3.2	3.2	2.9	2.8	2.9
28	3.5	3.3	3.4	3.8	3.6	3.7	3.2	3.1	3.2	3.0	2.9	3.0
29	---	---	---	3.7	3.6	3.7	3.2	3.1	3.2	5.7	2.9	3.5
30	---	---	---	3.6	3.5	3.6	3.2	3.1	3.1	---	---	---
31	---	---	---	5.3	3.3	4.4	---	---	---	3.8	3.7	3.7
MONTH	4.6	3.2	3.8	5.6	3.2	4.0	4.7	3.1	3.6	5.7	2.6	3.0

Table 4c.--Water-quality-monitor data, station 03201700, Big Four Hollow Creek near Lake Hope, Ohio, water years 1979 through 1983--Continued

pH (STANDARD UNITS), WATER YEAR OCTOBER 1981 TO SEPTEMBER 1982

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		JUNE			JULY			AUGUST			SEPTEMBER	
1	3.7	3.5	3.6	3.0	2.8	2.9	2.8	2.7	2.8	2.9	2.9	2.9
2	3.6	3.3	3.4	2.9	2.8	2.9	2.8	2.7	2.8	3.1	2.9	3.0
3	3.3	3.2	3.3	4.8	2.8	3.8	2.8	2.7	2.7	3.1	3.0	3.0
4	3.3	3.1	3.2	3.8	3.5	3.7	3.2	2.7	2.9	3.0	2.9	3.0
5	5.7	3.3	4.7	3.6	3.3	3.5	2.9	2.7	2.8	3.0	2.9	3.0
6	4.5	3.8	4.1	3.3	3.1	3.2	3.0	2.8	2.9	3.0	2.9	2.9
7	3.8	3.5	3.7	3.6	3.0	3.1	3.0	3.0	3.0	3.0	2.9	2.9
8	3.5	3.4	3.5	3.9	3.2	3.5	3.5	3.0	3.2	3.0	2.9	3.0
9	3.4	3.3	3.3	3.8	3.5	3.7	4.9	3.2	3.6	3.0	2.9	3.0
10	3.6	3.3	3.5	3.5	3.2	3.3	3.8	3.3	3.5	3.0	2.9	3.0
11	3.4	3.2	3.3	3.2	3.0	3.1	3.4	3.3	3.4	3.0	2.9	2.9
12	3.2	3.1	3.2	3.1	2.9	3.0	3.3	3.2	3.3	3.0	2.8	2.9
13	3.2	3.0	3.1	3.0	2.9	3.0	3.3	3.1	3.2	2.9	2.8	2.9
14	3.1	3.0	3.1	3.0	2.9	2.9	3.2	3.1	3.2	2.9	2.8	2.9
15	3.1	2.9	3.0	2.9	2.8	2.9	3.2	3.0	3.1	2.9	2.8	2.9
16	5.9	3.0	4.4	2.9	2.8	2.9	3.1	3.0	3.1	2.9	2.8	2.9
17	5.5	4.1	4.8	2.9	2.8	2.8	3.1	3.0	3.1	2.9	2.8	2.9
18	4.1	3.7	3.9	2.9	2.8	2.9	3.1	3.0	3.1	2.9	2.8	2.9
19	3.6	3.5	3.6	2.9	2.9	2.9	3.1	3.0	3.0	2.9	2.8	2.9
20	3.5	3.3	3.4	3.2	2.9	3.0	3.1	3.0	3.0	2.9	2.8	2.9
21	3.3	3.2	3.3	3.1	2.9	3.0	3.1	3.0	3.1	2.9	2.9	2.9
22	3.2	3.1	3.2	3.0	2.9	2.9	3.1	3.0	3.1	3.0	2.9	2.9
23	3.2	3.0	3.1	2.9	2.8	2.9	3.0	3.0	3.0	3.0	2.8	2.9
24	3.1	2.9	3.0	2.9	2.8	2.9	3.0	2.9	3.0	3.0	2.8	2.9
25	3.0	2.9	3.0	2.9	2.8	2.8	3.1	3.0	3.0	2.9	2.8	2.9
26	3.0	2.9	2.9	2.8	2.7	2.8	3.0	2.9	3.0	2.9	2.8	2.9
27	---	---	---	2.8	2.7	2.7	3.0	2.9	3.0	3.0	2.9	3.0
28	---	---	---	2.8	2.7	2.7	3.0	2.9	2.9	3.1	2.9	3.0
29	2.9	2.9	2.9	2.8	2.7	2.7	3.0	2.9	3.0	3.0	2.8	2.9
30	3.3	2.9	3.0	2.8	2.7	2.7	3.0	2.8	2.9	3.0	2.8	2.9
31	---	---	---	2.8	2.7	2.8	2.9	2.8	2.9	---	---	---
MONTH	5.9	2.9	3.5	4.8	2.7	3.0	4.9	2.7	3.1	3.1	2.8	2.9
YEAR	5.9	2.4	3.3									

NOTE: NUMBER OF MISSING DAYS OF RECORD EXCEEDED 20% OF YEAR

Table 4c.--Water-quality-monitor data, station 03201700, Big Four Hollow Creek near Lake Hope, Ohio, water years 1979 through 1983--Continued

pH (STANDARD UNITS), WATER YEAR OCTOBER 1982 TO SEPTEMBER 1983

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		OCTOBER			NOVEMBER			DECEMBER			JANUARY	
1	3.0	2.8	2.9	2.9	2.7	2.8	3.4	3.3	3.3	---	---	---
2	3.0	2.8	2.9	2.9	2.7	2.8	3.4	3.2	3.3	---	---	---
3	2.9	2.8	2.9	3.0	2.7	2.9	3.3	3.2	3.2	---	---	---
4	2.9	2.8	2.9	3.2	2.8	3.0	3.2	3.1	3.2	---	---	---
5	2.9	2.7	2.8	3.2	3.0	3.1	4.5	3.1	3.4	---	---	---
6	2.9	2.8	2.9	3.1	2.9	3.0	4.3	3.7	3.9	---	---	---
7	3.0	2.8	2.9	3.1	2.8	3.0	3.7	3.5	3.6	3.5	3.2	3.3
8	3.0	2.8	2.9	3.0	2.9	3.0	3.5	3.3	3.4	3.2	3.1	3.2
9	3.0	2.8	2.9	3.0	2.9	2.9	3.4	3.2	3.3	3.2	3.0	3.1
10	3.0	2.8	2.9	3.0	2.9	3.0	3.3	3.1	3.2	3.3	3.0	3.1
11	3.0	2.8	2.9	2.9	2.5	2.9	3.3	3.3	3.3	3.4	3.3	3.4
12	3.0	2.8	3.0	---	---	---	3.3	3.2	3.3	3.5	3.3	3.4
13	3.0	2.8	2.9	2.9	2.8	2.9	3.3	3.2	3.3	3.3	3.2	3.2
14	3.0	2.9	3.0	3.0	2.9	3.0	3.3	2.8	3.1	3.3	3.1	3.2
15	3.0	2.9	3.0	3.0	2.9	3.0	3.3	2.6	3.6	3.3	3.2	3.3
16	3.0	2.9	3.0	3.0	3.0	3.0	5.2	4.3	4.7	3.4	3.2	3.3
17	3.1	2.8	3.0	3.0	2.9	3.0	4.3	3.8	4.0	3.3	3.2	3.2
18	3.0	2.8	2.9	2.9	2.9	2.9	3.9	3.5	3.7	3.3	3.2	3.3
19	3.0	2.8	2.9	2.9	2.9	2.9	5.0	3.6	3.9	3.3	3.0	3.1
20	3.0	2.8	2.9	3.1	2.9	3.0	---	---	---	3.2	3.0	3.1
21	3.0	2.8	2.9	3.2	3.1	3.2	---	---	---	3.0	2.9	3.0
22	3.0	2.8	2.9	3.1	3.0	3.1	---	---	---	4.8	2.9	3.6
23	3.0	2.6	2.8	3.7	2.7	3.1	---	---	---	4.7	4.0	4.2
24	2.8	2.6	2.7	3.6	2.9	3.4	---	---	---	4.1	3.7	3.8
25	2.8	2.6	2.8	3.3	3.2	3.3	---	---	---	3.7	3.6	3.7
26	3.0	2.6	2.8	3.2	3.1	3.2	---	---	---	3.8	3.5	3.6
27	3.0	2.7	2.9	3.2	3.1	3.2	---	---	---	3.6	3.5	3.6
28	3.0	2.7	2.9	4.8	3.2	3.8	---	---	---	3.5	3.3	3.5
29	3.0	2.7	2.9	3.9	3.6	3.7	---	---	---	3.5	3.3	3.3
30	2.9	2.7	2.8	3.5	3.3	3.4	---	---	---	3.6	3.3	3.4
31	2.9	2.7	2.8	---	---	---	---	---	---	3.6	3.4	3.5
MONTH	3.1	2.6	2.9	4.8	2.5	3.1	5.3	2.6	3.5	4.8	2.9	3.4

Table 4c.--Water-quality-monitor data, station 03201700, Big Four Hollow Creek near Lake Hope, Ohio, water years 1979 through 1983--Continued

pH (STANDARD UNITS), WATER YEAR OCTOBER 1982 TO SEPTEMBER 1983

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		FEBRUARY			MARCH			APRIL			MAY	
1	3.5	3.4	3.5	3.4	3.2	3.3	3.5	3.3	3.5	(no more pH data collected this water year)		
2	3.6	3.5	4.7	3.6	3.3	3.5	6.2	3.4	4.0			
3	5.6	5.3	5.4	3.7	3.5	3.6	6.2	5.5	5.8			
4	5.4	4.8	5.1	3.6	3.4	3.5	5.2	4.9	5.0			
5	4.9	4.4	4.6	3.6	3.3	3.5	4.9	4.5	4.7			
6	4.4	4.2	4.3	3.4	3.4	3.4	5.3	4.3	4.9			
7	4.3	4.2	4.3	3.5	3.4	3.5	5.1	4.9	5.4			
8	4.2	3.9	4.1	3.5	3.4	3.5	6.1	5.4	5.9			
9	4.0	3.8	3.9	3.5	3.5	3.5	5.8	5.6	5.7			
10	3.9	3.8	3.8	3.6	3.5	3.5	5.6	5.3	5.5			
11	3.9	3.8	3.8	3.6	3.5	3.6	5.3	5.1	5.3			
12	3.9	3.6	3.8	3.6	3.5	3.6	5.2	4.9	5.1			
13	3.7	3.5	3.7	3.7	3.5	3.6	---	---	---			
14	4.2	3.6	3.8	3.6	3.4	3.5	---	---	---			
15	4.2	3.7	4.0	3.6	3.4	3.5	---	---	---			
16	4.9	4.0	4.4	3.6	3.4	3.5	---	---	---			
17	4.8	4.3	4.5	3.5	3.4	3.5	---	---	---			
18	4.3	4.0	4.2	3.5	3.4	3.5	---	---	---			
19	4.2	3.7	4.0	3.6	3.5	3.6	---	---	---			
20	4.0	3.5	3.8	3.6	3.5	3.6	---	---	---			
21	3.8	3.5	3.7	4.0	3.6	3.9	---	---	---			
22	3.8	3.4	3.6	4.0	3.9	3.9	---	---	---			
23	3.7	3.6	3.6	3.9	3.8	3.9	---	---	---			
24	3.7	3.5	3.6	3.9	3.7	3.8	---	---	---			
25	3.7	3.6	3.6	3.9	3.6	3.8	---	---	---			
26	3.7	3.4	3.6	3.8	3.6	3.7	---	---	---			
27	3.6	3.2	3.4	3.8	3.6	3.7	---	---	---			
28	3.4	3.1	3.3	3.9	3.7	3.8	---	---	---			
29	---	---	---	3.9	3.9	3.9	---	---	---			
30	---	---	---	4.0	3.7	3.9	---	---	---			
31	---	---	---	3.7	3.4	3.5	---	---	---			
MONTH	5.6	3.1	4.0	4.0	3.2	3.6	6.2	3.3	5.1			
YEAR	6.2	2.5	3.5									

NOTE: NUMBER OF MISSING DAYS OF RECORD EXCEEDED 20% OF YEAR

Table 4d.--Water-quality-monitor data, station 03201700, Big Four Hollow Creek near Lake Hope, Ohio, water years 1979 through 1983

[MAX, maximum; MIN, minimum]

TEMPERATURE, AIR (DEG. C), WATER YEAR OCTOBER 1978 TO SEPTEMBER 1979

DAY	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN
	OCTOBER		NOVEMBER		DECEMBER		JANUARY		FEBRUARY		MARCH	
1	20.5	8.5	18.5	-0.5	11.5	-8.5	15.5	-0.5	-6.0	-14.0	11.0	-2.0
2	24.0	5.0	21.5	-3.0	13.0	-4.0	-1.5	-16.5	2.0	-13.0	12.5	-0.5
3	24.0	4.0	22.5	-0.5	14.5	2.5	-7.5	-17.5	4.5	-7.0	21.0	-1.5
4	17.0	10.5	23.5	.5	15.0	1.5	-2.0	-10.0	.5	-14.5	19.0	9.0
5	21.5	4.0	25.0	1.0	10.5	-2.0	-2.5	-10.0	-4.0	-21.5	12.0	-1.5
6	13.0	5.0	24.0	1.5	13.5	-3.5	1.5	-8.5	1.0	-22.0	10.5	-3.5
7	12.5	4.5	9.0	5.5	12.0	-0.5	-1.5	-7.0	1.0	-7.0	14.0	-6.5
8	11.5	.5	13.0	-3.0	17.0	2.0	-5.5	-20.5	-1.5	-18.5	13.5	-2.0
9	18.0	-1.5	7.0	-4.0	1.5	-7.5	-5.0	-21.5	-7.0	-23.0	9.0	-5.5
10	22.5	.5	17.0	-1.5	-3.0	-12.5	-2.0	-12.0	-5.5	-23.5	6.0	-5.0
11	21.0	4.0	21.5	-0.5	4.0	-12.5	-5.0	-13.5	-4.5	-19.0	-2.5	-9.5
12	26.5	11.5	12.0	6.5	7.5	-4.0	1.5	-9.5	-2.0	-16.0	8.5	-6.5
13	16.0	9.5	20.5	7.0	8.5	-5.0	5.5	-5.5	-4.0	-23.0	18.5	-8.0
14	11.0	6.5	17.5	5.0	2.5	-8.0	5.5	-14.5	.0	-17.0	13.0	.0
15	11.0	4.0	7.0	5.0	10.0	-3.0	-6.5	-20.5	3.0	-2.0	-2.0	-11.5
16	12.5	5.0	10.0	5.0	11.0	-4.0	4.0	-8.0	.0	-16.5	9.0	-13.5
17	12.5	.0	18.5	9.5	3.5	-5.0	7.0	-6.5	-8.0	-21.0	18.5	-8.5
18	20.5	-1.5	10.5	6.0	6.0	-6.5	-1.5	-11.5	-4.0	-13.5	20.5	2.0
19	17.5	4.5	12.0	-2.0	1.5	-0.5	-0.5	-12.0	1.5	-18.0	20.5	.0
20	20.5	.0	9.0	-3.5	17.5	1.0	4.0	.5	13.5	-20.0	21.0	5.0
21	24.0	.5	8.5	2.0	6.5	-2.0	2.5	-0.5	8.5	-6.5	23.0	.5
22	27.0	2.0	14.0	1.0	7.5	-5.5	3.5	-5.5	10.0	-3.0	26.0	-1.0
23	20.0	5.5	12.5	6.0	8.0	-8.0	9.5	-7.0	10.5	2.0	19.0	6.0
24	16.0	-1.0	9.5	1.0	8.5	-5.5	3.5	-9.0	5.0	1.0	9.5	1.0
25	20.5	-3.0	5.0	-2.5	2.5	-4.0	-4.5	-9.0	3.5	1.0	4.0	-3.5
26	17.5	8.0	4.0	.0	2.5	-4.5	-2.5	-8.5	1.5	-4.0	.0	-3.5
27	17.0	-0.5	12.0	2.0	-1.0	-10.0	3.5	-3.0	7.0	-3.5	5.0	-7.0
28	21.0	-2.0	7.5	-5.0	1.0	-13.0	.0	-3.0	12.0	-6.5	19.5	-8.5
29	16.0	.0	4.0	-6.5	9.0	-8.5	-3.0	-5.5	---	---	24.5	9.5
30	23.0	-2.5	7.5	-6.0	7.5	-0.5	-1.0	-6.5	---	---	25.5	8.5
31	23.0	-0.5	---	---	15.5	5.5	-2.5	-8.5	---	---	18.5	10.0
MONTH	27.0	-3.0	25.0	-6.5	17.5	-13.0	15.5	-21.5	13.5	-23.5	26.0	-13.5

Table 4d.--Water-quality-monitor data, station 03201700, Big Four Hollow Creek near Lake Hope, Ohio, water years 1979 through 1983--Continued

TEMPERATURE, AIR (DEG. C), WATER YEAR OCTOBER 1978 TO SEPTEMBER 1979

DAY	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN
	APRIL		MAY		JUNE		JULY		AUGUST		SEPTEMBER	
1	10.5	6.0	19.0	-3.0	29.0	18.5	23.5	12.0	---	22.5	---	18.0
2	20.0	7.0	28.0	-1.0	27.5	14.0	26.5	14.5	28.5	19.0	29.5	19.5
3	11.5	.5	21.5	12.5	24.5	11.5	30.0	9.5	---	16.5	---	21.0
4	10.5	1.0	12.0	4.0	30.5	7.0	23.5	11.0	---	16.5	---	18.5
5	12.0	3.5	18.5	-1.0	31.0	11.0	23.5	7.0	---	18.5	29.5	19.0
6	11.0	-5.5	26.0	-0.5	31.5	15.0	26.5	6.0	---	19.5	30.0	19.5
7	7.5	-9.0	32.0	4.5	31.5	15.0	29.5	7.0	---	19.5	27.5	14.0
8	21.0	-1.5	---	8.5	31.5	19.5	---	10.5	---	20.5	19.0	9.5
9	11.5	-0.5	---	11.5	31.5	18.5	22.0	19.0	---	19.0	23.0	6.5
10	14.0	-4.5	32.0	16.5	---	16.0	30.0	19.0	---	22.0	28.0	8.0
11	19.0	-3.0	---	13.5	24.5	11.5	---	16.0	22.5	17.0	30.5	12.0
12	24.5	9.0	---	14.5	26.0	6.5	32.0	15.5	24.5	12.5	32.0	14.5
13	23.0	8.5	16.5	7.0	25.0	8.5	26.0	21.0	27.0	9.5	28.0	16.5
14	20.0	1.0	25.0	3.5	---	8.5	---	21.0	26.5	13.0	21.5	14.5
15	8.5	.0	23.5	6.5	---	12.0	---	20.0	21.5	8.5	20.5	8.5
16	10.0	-2.0	20.5	1.0	---	12.5	---	19.0	24.0	6.0	23.5	5.5
17	13.5	-2.0	26.0	-0.5	31.5	15.0	31.0	16.0	27.5	7.0	26.5	7.5
18	16.5	-4.0	29.5	1.5	28.0	16.0	28.0	12.5	29.0	17.0	27.5	10.0
19	19.5	-4.5	31.5	3.5	28.5	12.5	31.5	9.0	30.5	20.5	22.0	8.5
20	25.5	-2.0	---	13.0	---	12.0	32.0	10.0	29.0	21.0	26.5	6.0
21	29.0	.5	27.0	12.0	28.5	18.0	---	18.0	31.0	20.5	18.5	16.0
22	23.0	10.5	27.5	5.5	31.0	15.5	---	17.5	32.0	19.0	16.0	10.5
23	21.5	11.0	21.0	14.0	28.0	16.0	---	20.0	29.0	21.0	22.0	7.0
24	30.0	10.5	19.0	10.0	21.0	8.5	31.5	21.0	28.0	20.5	26.0	6.5
25	30.0	13.0	10.0	5.0	23.5	4.0	27.5	21.5	27.5	18.0	26.0	9.0
26	20.0	11.0	18.0	5.0	28.5	5.5	31.0	22.0	29.0	18.5	28.0	9.0
27	15.5	2.5	18.5	8.0	30.5	8.0	31.0	21.5	30.0	21.0	26.5	10.5
28	12.5	1.5	25.0	7.5	32.0	12.0	27.5	22.5	---	19.0	21.5	17.0
29	16.0	-1.0	23.5	3.0	25.0	15.5	31.5	21.0	30.0	20.0	26.0	14.5
30	19.0	-1.0	30.5	5.5	20.5	13.5	---	17.0	31.0	19.5	26.5	13.5
31	---	---	24.5	15.5	---	---	---	21.0	---	16.0	---	---
MONTH	30.0	-9.0	32.0	-3.0	32.0	4.0	32.0	6.0	32.0	6.0	32.0	5.5
YEAR	32.0	-23.5										

Table 4d.--Water-quality-monitor data, station 03201700, Big Four Hollow Creek near Lake Hope, Ohio, water years 1979 through 1983--Continued

TEMPERATURE, AIR (DEG. C), WATER YEAR OCTOBER 1979 TO SEPTEMBER 1980

DAY	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN
	OCTOBER		NOVEMBER		DECEMBER		JANUARY		FEBRUARY		MARCH	
1	27.0	13.5	25.5	9.5	4.0	-6.0	-1.0	-3.5	-5.0	-18.0	-10.5	-14.5
2	20.5	13.5	14.0	3.0	-1.5	-9.0	1.0	-2.0	-5.5	-18.0	-6.0	---
3	21.0	11.5	13.0	-2.0	4.5	-11.5	3.5	-1.0	-4.0	-17.5	2.5	---
4	15.0	10.5	12.5	-4.0	9.5	-2.5	-1.0	-4.0	-2.5	-17.0	9.0	-12.0
5	14.5	5.5	18.0	-3.0	16.5	-3.5	-2.0	-4.5	1.0	-15.0	8.0	-1.5
6	18.5	3.0	11.5	-1.0	14.0	3.0	2.0	-3.5	3.0	-4.0	7.0	-3.0
7	14.0	3.0	6.5	4.0	12.0	-3.0	4.5	-9.0	-2.0	-7.0	8.0	-2.5
8	18.5	1.5	---	---	5.5	-6.5	1.0	-9.5	3.0	-10.5	22.5	1.0
9	13.5	7.0	14.0	7.5	7.5	-6.0	1.5	-12.0	.0	-4.0	10.5	-3.0
10	11.0	2.5	11.0	3.5	12.0	-5.0	8.5	-12.5	.0	-13.0	15.5	-4.0
11	12.5	3.0	5.0	-1.5	21.0	-2.0	12.0	-1.5	1.0	-12.5	2.0	-6.5
12	15.5	8.0	8.5	-3.0	17.5	5.0	-1.0	-9.0	2.5	-18.5	2.5	-9.5
13	10.0	.0	8.5	-1.5	4.5	-1.0	8.0	-7.5	4.5	-17.5	5.5	-1.5
14	13.0	-0.5	7.0	-2.0	4.0	-5.5	7.0	2.0	6.5	-9.5	1.5	-4.5
15	14.5	-2.0	7.5	-2.0	9.0	-8.0	5.5	.0	5.5	.5	15.5	-7.5
16	19.5	10.0	9.5	-3.0	8.5	-5.5	12.5	-0.5	2.5	-13.0	22.0	-3.0
17	25.0	10.0	18.0	-5.0	-4.5	-11.5	15.0	3.0	-3.0	-16.0	14.5	.0
18	26.0	8.0	20.5	-1.5	2.5	-12.5	4.5	-2.5	4.0	-18.5	7.5	-5.5
19	27.5	7.5	20.0	-2.0	7.5	-5.0	5.5	-3.5	13.0	-8.5	15.5	-6.5
20	30.5	10.0	22.5	3.0	9.5	-7.0	5.0	-4.0	5.0	-0.5	14.5	3.5
21	31.0	10.5	23.5	3.0	12.5	-6.0	4.5	-9.5	9.5	2.5	12.5	.0
22	31.0	11.0	18.0	10.5	11.0	1.5	4.0	.0	18.5	.5	8.0	-3.5
23	15.5	4.5	22.5	9.5	13.5	5.0	.5	-10.0	8.0	1.0	15.0	-5.5
24	7.5	4.5	10.5	7.0	15.5	8.0	2.0	-11.5	4.5	-1.0	13.5	5.0
25	9.0	-0.5	22.0	7.5	7.0	1.5	8.5	-1.5	6.0	-7.0	6.0	1.5
26	9.0	-3.5	16.0	5.0	3.5	1.0	1.5	-8.0	-2.5	-11.5	6.5	-3.0
27	19.0	-3.5	17.0	.0	3.0	-4.5	2.5	-4.0	1.0	-6.0	17.5	-5.5
28	17.0	2.0	16.0	-2.0	.0	-7.0	-3.0	-5.0	.0	-16.0	12.0	3.0
29	21.5	-0.5	-0.5	-4.0	2.0	-3.5	-4.5	-12.5	-5.5	-16.5	13.0	5.0
30	24.5	1.5	-0.5	-6.5	-0.5	-5.0	-4.0	-11.5	---	---	13.0	4.5
31	26.5	5.5	---	---	-1.5	-5.0	-5.5	-13.5	---	---	11.0	2.5
MONTH	31.0	-3.5	25.5	-6.5	21.0	-12.5	15.0	-13.5	18.5	-18.5	22.5	-14.5

Table 4d.--Water-quality-monitor data, station 03201700, Big Four Hollow Creek near Lake Hope, Ohio, water years 1979 through 1983--Continued

TEMPERATURE, AIR (DEG. C), WATER YEAR OCTOBER 1979 TO SEPTEMBER 1980

DAY	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN
	APRIL		MAY		JUNE		JULY		AUGUST		SEPTEMBER	
1	11.5	.0	22.5	5.5	27.5	16.0	29.5	10.0	32.0	22.0	---	20.0
2	21.5	-1.0	22.0	2.0	28.5	18.5	---	17.0	---	19.5	---	20.5
3	22.5	.5	25.5	3.5	30.0	16.5	29.5	22.0	30.0	21.0	30.5	16.0
4	12.5	2.5	30.0	3.5	24.0	11.5	---	22.5	---	20.0	---	16.5
5	14.0	-1.0	32.0	4.0	28.0	6.0	32.0	19.5	---	20.5	---	19.0
6	21.5	-2.5	25.0	5.0	32.0	13.0	25.5	14.5	26.0	21.0	32.0	19.0
7	22.5	.0	19.0	1.0	---	18.0	30.5	10.0	32.0	23.5	29.0	16.0
8	20.5	5.0	13.5	-3.0	24.0	7.5	---	18.5	---	21.5	32.0	14.0
9	17.5	5.0	18.0	-3.5	23.5	8.0	---	21.0	---	22.5	32.0	16.0
10	9.0	.0	26.5	-0.5	20.0	7.0	31.0	21.5	---	22.0	23.0	12.0
11	20.5	-2.5	30.5	12.5	20.0	2.5	---	19.0	---	22.5	27.0	7.5
12	13.5	2.0	28.0	14.5	25.5	2.5	29.5	20.0	29.0	21.0	30.0	8.0
13	7.0	.0	31.5	16.0	30.5	5.5	30.5	17.0	32.0	16.5	---	16.0
14	16.5	3.5	21.5	8.0	---	8.5	---	12.5	---	20.0	31.5	20.5
15	5.5	1.5	22.0	2.5	31.5	16.5	---	16.5	27.0	22.5	24.0	18.0
16	8.5	-1.5	27.5	4.0	21.0	9.5	---	23.0	25.5	16.5	28.0	12.0
17	17.5	-5.5	22.0	14.0	25.0	3.5	---	19.5	24.5	17.5	26.0	17.0
18	21.0	-1.0	27.5	15.0	27.0	7.0	---	16.0	31.5	19.5	23.5	12.5
19	25.0	1.0	24.5	13.5	29.5	7.0	---	17.5	31.5	22.5	28.5	9.5
20	25.5	1.5	20.5	14.0	24.0	8.0	---	19.5	28.0	21.0	---	13.5
21	23.5	1.5	27.5	11.5	28.0	5.5	---	22.0	---	22.5	---	17.5
22	29.5	-0.5	30.0	10.5	31.5	6.5	24.5	20.5	29.5	21.0	31.0	19.5
23	23.0	3.5	27.0	16.0	---	10.5	28.5	18.5	29.5	16.0	23.5	13.5
24	22.5	1.0	30.0	16.0	30.0	16.5	29.5	14.5	31.5	16.5	24.0	11.0
25	12.0	.0	29.5	10.0	30.5	13.5	32.0	13.0	---	15.5	27.0	13.0
26	12.0	1.0	24.5	5.0	---	13.0	---	16.5	---	16.0	18.5	6.5
27	11.5	1.5	25.5	3.0	---	17.5	---	20.0	---	16.5	21.5	2.5
28	13.0	-1.0	31.0	5.5	---	17.0	29.5	20.0	---	18.0	25.0	6.5
29	16.0	4.0	34.5	8.5	28.5	18.5	30.5	17.0	---	18.5	27.0	7.0
30	17.5	4.0	32.0	16.0	25.0	11.5	31.5	17.5	31.5	19.5	24.5	8.0
31	---	---	31.0	16.0	---	---	---	17.5	---	18.0	---	---
MONTH	29.5	-5.5	34.5	-3.5	32.0	2.5	32.0	10.0	32.0	15.5	32.0	2.5
YEAR	34.5	-18.5										

Table 4d.--Water-quality-monitor data, station 03201700, Big Four Hollow Creek near Lake Hope, Ohio, water years 1979 through 1983--Continued

TEMPERATURE, AIR (DEG. C), WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		OCTOBER			NOVEMBER			DECEMBER			JANUARY	
1	27.5	9.0		14.5	-1.5		16.5	.0		1.0	-1.5	
2	19.5	9.0		14.5	-4.5		13.5	-1.0		-1.0	-10.0	
3	18.0	7.0		24.5	-2.0		1.0	-7.0		1.0	-16.5	
4	12.5	7.0		18.0	3.0		8.0	-9.0		-13.0	-20.5	
5	13.5	1.0		8.5	-1.5		8.5	3.5		-5.0	-21.5	
6	16.0	-1.5		15.0	-4.0		17.5	6.0		2.0	-14.0	
7	22.0	5.5		23.5	3.0		19.0	8.5		-1.0	-19.5	
8	27.5	3.5		18.0	4.5		19.0	4.5		-3.0	-22.0	
9	25.5	11.0		23.0	4.0		11.5	3.5		-2.5	-13.0	
10	27.0	10.0		10.0	-6.0		4.0	-0.5		-7.5	-21.0	
11	18.5	6.5		5.0	-8.0		.5	-1.0		-8.0	-19.0	
12	11.5	8.5		9.5	-9.0		10.0	.5		-6.5	-23.0	
13	15.0	1.0		19.5	-4.0		6.0	-3.0		5.0	-9.5	
14	20.0	1.5		18.0	.0		3.0	-5.0		7.5	-10.0	
15	25.0	7.0		7.5	2.0		5.5	-3.5		1.0	-3.0	
16	28.0	8.5		5.0	-2.5		1.5	-3.5		-2.0	-8.5	
17	27.5	8.5		1.0	-1.5		1.5	-7.5		-4.5	-17.5	
18	21.0	10.5		2.5	-3.5		6.0	1.0		2.5	-17.5	
19	17.5	4.0		5.0	-7.5		3.0	-14.5		10.5	-15.0	
20	16.5	.5		9.0	-8.5		-9.0	-17.5		8.0	-3.0	
21	23.0	3.5		6.5	-7.5		-3.5	-17.5		3.0	.0	
22	18.0	3.5		10.5	-8.5		3.5	-14.0		3.0	-2.5	
23	18.0	1.5		8.5	-2.5		4.0	-0.5		1.0	-0.5	
24	21.0	2.0		9.0	4.0		2.5	-13.0		8.0	-8.5	
25	11.0	3.0		3.5	-7.5		-8.0	-20.5		15.0	-8.0	
26	5.0	-2.5		2.5	-8.5		-1.5	-18.0		15.0	.0	
27	11.5	-4.5		6.5	1.0		-1.5	-11.5		6.0	-7.0	
28	9.0	4.0		4.0	.5		8.5	-12.5		5.5	-8.0	
29	9.5	-1.5		3.0	1.0		5.0	-2.5		-2.5	-11.0	
30	14.0	-4.5		12.0	-2.0		.5	-0.5		-3.5	-13.5	
31	17.5	-4.0		---	---		2.5	-0.5		3.0	-15.5	
MONTH	28.0	-4.5		24.5	-9.0		19.0	-20.5		15.0	-23.0	

Table 4d.--Water-quality-monitor data, station 03201700, Big Four Hollow Creek near Lake Hope, Ohio, water years 1979 through 1983--Continued

TEMPERATURE, AIR (DEG. C), WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		FEBRUARY			MARCH			APRIL			MAY	
1	4.5	-7.5		3.5	1.5		---	---		12.0	2.5	
2	.0	-13.5		6.0	-2.0		22.0	2.5		15.0	.5	
3	-9.0	-17.0		1.5	-7.0		27.5	.5		22.5	-2.0	
4	-7.5	-18.5		1.5	-7.5		25.5	13.0		30.0	2.0	
5	-2.0	-21.0		2.0	-0.5		13.5	3.5		27.0	9.0	
6	2.5	-7.0		1.5	-5.5		10.0	-3.0		16.0	1.0	
7	8.0	-10.5		1.0	-9.5		19.5	-6.0		18.0	-0.5	
8	2.0	-12.0		2.5	-5.0		27.0	.0		25.0	-0.5	
9	2.0	-16.0		6.5	-1.5		22.5	1.5		26.5	4.0	
10	8.5	-3.5		8.0	-1.0		21.5	-1.0		25.0	12.5	
11	11.5	-18.0		4.5	-3.5		28.0	11.5		17.5	8.5	
12	-4.5	---		12.5	-3.0		28.0	12.5		17.5	4.0	
13	4.0	-20.0		12.5	-4.0		30.0	13.0		22.0	3.0	
14	11.0	-11.5		4.0	-9.0		23.5	2.0		25.5	11.0	
15	15.0	-8.5		14.5	-9.0		13.5	-1.5		13.0	9.5	
16	9.0	-4.0		5.5	-8.5		23.0	-4.0		21.0	4.0	
17	13.0	5.0		5.0	-9.5		23.0	13.5		25.5	2.5	
18	19.5	4.0		3.5	-6.5		23.0	8.0		13.5	7.0	
19	15.0	8.0		-1.0	-6.0		19.5	2.0		12.0	5.0	
20	8.0	5.5		2.0	-4.0		11.5	-1.5		22.5	1.0	
21	12.0	-0.5		8.5	-3.0		15.5	-4.5		25.0	1.5	
22	17.5	-2.0		9.5	-5.0		21.5	.5		29.5	3.5	
23	11.0	1.5		13.0	-2.0		19.5	10.0		---	7.0	
24	3.0	-2.5		12.5	-6.0		13.0	3.0		---	10.0	
25	9.0	-5.0		12.5	-4.5		12.5	-0.5		31.5	11.5	
26	2.0	-8.0		18.5	-5.0		19.5	-2.0		32.0	13.0	
27	10.5	-9.5		12.0	-1.5		28.5	5.5		27.0	16.5	
28	12.0	-1.0		10.0	-5.0		31.5	9.5		20.0	16.0	
29	---	---		---	---		20.5	10.5		29.5	14.5	
30	---	---		---	---		19.5	9.5		31.0	11.0	
31	---	---		---	---		---	---		23.5	10.5	
MONTH	19.5	-21.0		18.5	-9.5		31.5	-6.0		32.0	-2.0	

Table 4d.--Water-quality-monitor data, station 03201700, Big Four Hollow Creek near Lake Hope, Ohio, water years 1979 through 1983--Continued

TEMPERATURE, AIR (DEG. C), WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		JUNE			JULY			AUGUST			SEPTEMBER	
1	20.5	8.5	---	30.0	19.0	23.0	---	13.5	---	---	18.0	---
2	31.0	15.0	26.0	28.5	18.0	22.5	---	16.5	---	---	21.5	---
3	29.0	18.0	23.0	30.5	18.0	23.5	---	18.0	---	27.5	22.5	24.5
4	28.5	19.5	23.5	---	16.0	---	---	20.0	---	30.0	19.0	24.5
5	32.0	17.5	24.0	28.5	20.5	24.0	---	19.5	---	29.5	14.5	21.5
6	26.0	18.0	22.0	---	21.0	---	28.0	21.5	24.5	30.0	14.0	21.0
7	30.5	11.5	20.0	---	18.5	---	28.5	18.5	23.0	30.0	14.5	21.0
8	---	10.5	---	---	19.0	---	30.0	17.0	23.5	26.0	13.5	20.0
9	29.5	18.0	24.0	---	21.0	---	31.0	16.0	23.0	24.0	7.5	15.0
10	---	---	---	32.0	15.5	23.5	---	15.5	---	28.0	4.5	15.5
11	28.0	17.5	23.0	---	10.0	---	32.0	16.0	23.5	31.5	11.5	20.5
12	---	17.5	---	---	13.5	---	32.0	11.5	21.0	32.0	13.5	21.5
13	---	20.0	---	---	19.5	---	---	13.0	---	---	13.5	---
14	---	22.5	---	31.0	16.0	25.0	---	16.0	---	32.0	14.5	22.0
15	---	20.0	---	30.5	12.5	21.5	31.0	20.0	24.5	20.0	15.0	18.5
16	---	19.0	---	30.0	18.0	23.5	30.5	16.0	23.5	23.5	10.0	16.0
17	25.0	13.5	19.5	---	16.0	---	26.5	9.0	17.0	15.5	8.5	12.5
18	32.0	10.0	20.0	---	15.5	---	29.0	7.5	17.0	13.5	6.0	10.5
19	---	12.0	---	---	17.5	---	29.5	9.5	18.0	22.0	8.0	14.0
20	---	19.5	---	---	22.5	---	30.5	10.5	19.0	24.0	11.5	17.0
21	---	17.0	---	31.5	20.0	24.5	28.0	12.0	19.0	27.0	10.0	17.0
22	30.0	16.5	24.0	28.0	15.0	21.0	31.0	14.0	20.5	20.5	5.0	14.5
23	28.5	12.0	20.0	30.0	10.5	19.5	---	10.0	---	17.5	1.5	8.5
24	---	11.5	---	---	17.0	---	31.5	12.5	21.5	24.5	.5	11.5
25	---	15.0	---	---	17.0	---	30.5	12.0	20.5	30.5	12.0	19.5
26	25.5	10.5	18.0	---	22.0	---	---	10.5	---	28.5	9.5	19.0
27	27.5	6.5	16.5	31.5	21.0	25.5	---	13.5	---	19.5	4.0	11.0
28	---	8.0	---	31.5	22.0	26.0	---	17.5	---	21.0	1.0	11.0
29	---	14.0	---	24.5	13.0	20.0	---	18.0	---	26.5	10.5	17.0
30	---	17.5	---	28.5	9.0	18.5	29.0	17.0	23.0	26.5	9.0	17.5
31	---	---	---	31.5	11.5	21.0	---	18.5	---	---	---	---
MONTH	32.0	6.5	21.5	32.0	9.0	23.0	32.0	7.5	21.5	32.0	.5	17.0
YEAR	32.0	-23.0	20.0									

NOTE: NUMBER OF MISSING DAYS OF RECORD EXCEEDED 20% OF YEAR

Table 4d.--Water-quality-monitor data, station 03201700, Big Four Hollow Creek near Lake Hope, Ohio, water years 1979 through 1983--Continued

TEMPERATURE, AIR (DEG. C), WATER YEAR OCTOBER 1981 TO SEPTEMBER 1982

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		OCTOBER			NOVEMBER			DECEMBER			JANUARY	
1	11.5	7.0	8.5	---	---	---	16.5	2.5	9.5	6.5	-5.5	.5
2	16.5	-1.5	6.5	---	---	---	9.0	1.5	5.0	7.0	-9.0	-1.0
3	26.0	-0.5	9.5	23.0	7.0	15.0	9.5	1.0	4.5	10.0	3.0	7.0
4	14.5	-0.5	5.0	26.0	4.0	12.5	5.5	2.5	4.0	15.0	-1.0	7.0
5	---	---	---	21.0	9.5	14.5	2.0	-0.5	1.0	5.5	-4.5	-0.5
6	---	---	---	12.0	5.5	8.5	6.0	-5.5	.0	11.5	-4.5	5.0
7	---	---	---	11.5	-2.0	3.5	11.0	-2.0	4.0	5.0	-5.0	-1.0
8	---	---	---	19.0	-4.0	5.0	11.0	-1.5	3.5	-0.5	-13.0	-6.0
9	19.0	3.5	11.5	8.5	3.0	6.0	-2.5	-5.0	-3.5	-3.0	-17.5	-9.0
10	22.0	4.5	13.0	8.5	-1.0	3.5	-1.5	-10.0	-4.5	-17.0	-22.5	-20.0
11	22.0	6.0	14.0	12.5	-1.0	4.5	.0	-10.0	-3.5	-13.0	-20.5	-17.0
12	21.5	3.0	10.5	10.0	-3.0	1.5	1.5	-0.5	.5	-4.0	-21.0	-12.5
13	23.5	2.5	10.0	16.0	-5.0	2.0	5.0	-3.5	.0	-2.0	-12.0	-6.5
14	23.0	-1.0	9.0	19.0	-5.0	3.0	1.5	-2.5	-1.0	-5.0	-14.0	-9.5
15	18.5	6.0	13.0	19.0	-3.5	4.0	13.0	-3.0	.5	-2.5	-17.5	-7.5
16	18.5	2.5	12.5	16.5	-3.0	4.5	2.0	-6.0	-2.0	.0	---	---
17	24.0	.5	10.0	14.5	-0.5	6.5	-2.0	-3.5	-2.5	-15.5	---	---
18	18.5	6.5	14.0	12.5	.0	5.0	-2.0	-14.0	-8.5	.5	-20.0	-10.0
19	12.0	-2.0	5.5	19.0	.0	11.0	-6.0	-11.0	-9.0	3.0	-12.0	-2.0
20	22.0	-4.0	7.0	15.0	.0	5.5	-2.5	-18.0	-10.5	7.0	-1.0	2.0
21	23.5	-1.0	9.0	1.0	-1.0	.0	1.0	-17.5	-5.5	2.0	-2.5	.0
22	22.5	7.5	13.5	1.5	-8.0	-1.5	6.0	1.5	2.5	4.5	-3.0	.0
23	11.5	-0.5	7.0	7.5	-11.0	-1.5	9.5	.5	4.0	12.0	-4.0	5.5
24	10.5	-6.5	.0	4.5	-0.5	3.0	3.0	-3.0	.0	-4.5	-13.0	-9.5
25	15.5	-5.0	6.0	5.0	-3.5	.0	7.0	-7.0	-2.0	-2.5	-13.5	-8.5
26	19.0	10.0	14.0	19.0	-5.0	9.0	5.5	-5.5	-0.5	-4.0	-21.5	-13.5
27	17.0	10.5	14.0	16.0	1.0	6.5	6.5	-4.5	1.0	4.0	-21.5	-10.5
28	18.0	8.5	11.5	4.0	.5	3.0	3.5	-2.5	.5	9.0	-9.5	3.5
29	---	---	---	6.5	-6.0	.5	.0	-8.0	-2.0	---	---	---
30	---	---	---	4.0	-8.0	-1.0	4.0	-12.0	-5.5	---	---	---
31	---	---	---	---	---	---	5.0	-6.0	.5	---	---	---
MONTH	26.0	-6.5	10.0	26.0	-11.0	5.0	16.5	-18.0	-0.5	15.0	-22.5	-4.5

Table 4d.--Water-quality-monitor data, station 03201700, Big Four Hollow Creek near Lake Hope, Ohio, water years 1979 through 1983--Continued

TEMPERATURE, AIR (DEG. C), WATER YEAR OCTOBER 1981 TO SEPTEMBER 1982

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		FEBRUARY			MARCH			APRIL			MAY	
1	.0	-7.0	-4.0	15.0	-6.5	4.0	19.5	-3.0	6.0	22.5	7.0	14.0
2	6.0	-7.0	-0.5	15.5	-1.5	5.5	26.0	-2.0	12.5	24.5	3.5	14.0
3	9.0	-1.0	4.5	1.5	-6.0	-2.0	18.0	5.0	11.5	25.5	-0.5	13.0
4	-1.0	-3.5	-2.0	16.5	-0.5	7.0	5.0	-4.0	2.0	27.5	1.5	14.5
5	5.0	-3.0	.0	4.0	-1.5	.5	8.5	-3.5	2.5	---	3.0	---
6	-1.5	-14.5	-7.5	1.5	-4.5	-0.5	6.0	-7.5	-3.0	---	5.0	---
7	1.0	-18.0	-9.5	2.5	-3.0	-1.5	2.0	-11.0	-3.5	29.5	9.5	18.5
8	4.0	-13.5	-4.5	4.5	-8.5	-1.5	8.0	-4.5	1.5	21.0	6.5	14.0
9	-1.0	-8.5	-3.0	4.5	-5.0	-0.5	2.0	-4.0	.5	24.0	4.5	14.0
10	-5.5	-22.5	-13.0	16.5	-5.0	6.0	7.5	-7.5	.0	25.5	2.0	13.5
11	3.0	-12.5	-7.0	15.5	2.0	7.0	10.5	-4.0	3.0	31.0	5.0	17.5
12	2.5	-16.0	-6.0	20.0	-1.5	8.0	20.5	-6.0	8.0	---	6.5	---
13	.0	-9.5	-4.0	18.0	4.0	12.0	22.5	2.0	15.5	---	9.0	---
14	10.5	-13.0	-3.5	14.5	-2.5	6.5	20.5	-3.0	7.5	---	9.0	---
15	15.0	-5.5	3.0	5.5	2.0	4.0	30.0	-1.0	13.5	---	10.0	---
16	9.5	3.5	6.5	21.0	2.5	9.5	32.0	10.0	19.5	---	12.0	---
17	8.0	6.5	7.5	15.5	-0.5	8.0	19.5	4.5	14.5	---	10.0	---
18	9.0	5.5	7.5	23.0	-2.0	9.0	18.0	-0.5	8.0	---	10.0	---
19	7.5	1.0	3.5	9.5	4.5	6.0	26.0	-1.0	13.0	32.0	14.5	22.0
20	14.0	2.0	5.5	19.0	5.0	9.5	18.0	5.5	13.0	30.5	15.5	21.0
21	8.0	1.5	3.0	18.5	2.5	9.0	11.5	.0	5.5	28.0	13.0	19.5
22	5.0	-2.0	1.5	6.0	-5.5	1.5	14.0	-4.0	4.0	30.0	16.5	22.5
23	18.5	-5.0	3.0	11.5	-6.0	2.5	19.5	-7.0	6.0	30.5	16.5	22.5
24	11.0	-3.5	3.0	20.5	-4.5	6.5	24.5	-3.5	9.5	26.5	17.0	21.0
25	1.0	-9.0	-4.5	14.5	-1.0	4.5	27.5	-1.5	13.5	28.0	12.5	19.5
26	5.0	-13.0	-4.5	2.5	-3.0	-0.5	18.0	9.0	14.0	---	11.5	---
27	8.0	-6.5	-0.5	.5	-9.0	-4.0	12.0	.5	8.0	---	15.5	---
28	12.0	-9.0	-1.0	9.0	-12.0	-4.0	17.0	-3.5	6.5	30.5	17.0	23.0
29	---	---	---	18.5	-8.5	4.0	23.0	-2.5	10.5	32.0	16.0	21.0
30	---	---	---	25.0	1.0	15.5	25.5	2.0	13.0	28.0	17.5	22.0
31	---	---	---	20.5	-0.5	12.0	---	---	---	---	14.5	---
MONTH	18.5	-22.5	-1.0	25.0	-12.0	4.5	32.0	-11.0	8.0	32.0	-0.5	18.5

Table 4d.--Water-quality-monitor data, station 03201700, Big Four Hollow Creek near Lake Hope, Ohio, water years 1979 through 1983--Continued

TEMPERATURE, AIR (DEG. C), WATER YEAR OCTOBER 1981 TO SEPTEMBER 1982

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		JUNE			JULY			AUGUST			SEPTEMBER	
1	23.5	12.5	19.5	28.5	7.5	17.0	---	14.5	---	30.0	19.5	24.0
2	25.0	8.0	16.5	31.5	8.5	20.0	---	15.0	---	29.5	20.0	23.5
3	27.0	11.5	18.5	30.5	18.0	24.0	---	17.0	---	24.5	10.5	17.0
4	26.5	10.5	17.5	31.0	18.0	23.5	---	19.5	---	25.5	6.0	14.5
5	21.5	15.0	18.0	---	15.5	---	31.5	20.5	25.5	28.0	7.0	15.5
6	23.0	14.0	18.5	---	16.0	---	---	19.5	---	28.5	8.0	18.0
7	28.5	9.0	19.0	---	20.5	---	---	21.0	---	30.0	15.0	21.5
8	---	16.0	---	---	19.0	---	---	18.5	---	25.5	13.5	19.0
9	32.0	16.0	22.5	---	21.5	---	31.5	17.0	24.0	30.0	11.5	19.5
10	28.0	14.0	22.5	---	19.0	---	26.5	14.0	20.5	---	15.5	---
11	28.0	8.5	17.5	---	21.5	---	23.0	14.5	18.0	---	13.5	---
12	27.5	14.5	19.5	32.0	16.0	23.0	25.5	9.5	17.0	---	15.0	---
13	31.0	13.5	20.5	---	14.5	---	28.5	8.5	17.0	---	18.5	---
14	30.5	7.5	18.5	---	17.0	---	30.5	9.5	18.5	---	19.0	---
15	---	9.5	---	---	18.0	---	---	10.5	---	---	17.0	---
16	28.0	19.0	21.5	---	19.5	---	---	13.0	---	23.5	10.0	18.5
17	25.5	14.0	20.0	---	21.5	---	---	17.0	---	27.0	7.5	15.0
18	31.0	10.5	20.0	---	29.5	---	29.0	11.5	19.0	23.5	9.5	16.5
19	25.0	11.0	18.0	---	23.5	---	32.0	10.5	19.5	23.5	6.0	14.0
20	27.5	7.5	17.5	---	17.5	---	29.5	12.0	20.5	24.5	9.5	15.5
21	28.5	12.5	20.5	---	14.0	---	25.5	11.0	20.0	18.0	6.0	12.5
22	26.5	8.5	18.0	---	16.0	---	28.0	5.5	16.5	17.0	2.5	9.5
23	26.0	8.0	17.0	32.0	17.5	24.5	29.0	15.5	21.5	20.5	6.5	12.5
24	27.5	6.5	16.5	---	17.0	---	31.5	15.0	23.0	23.5	6.5	14.0
25	---	7.5	---	---	16.5	---	26.0	13.0	22.0	24.0	11.0	17.0
26	---	12.0	---	---	20.0	---	29.5	9.0	18.5	19.5	12.5	15.5
27	---	16.5	---	---	21.0	---	28.0	17.0	21.5	17.5	12.5	14.5
28	---	17.0	---	30.5	11.5	21.0	23.5	10.0	17.5	24.5	10.0	16.0
29	30.5	19.5	25.0	31.5	17.0	22.5	25.5	5.0	14.0	27.0	7.5	15.0
30	27.0	12.0	20.5	31.5	18.0	28.0	24.0	10.0	18.0	27.5	8.5	15.5
31	---	---	---	31.5	15.5	23.0	31.0	19.5	24.0	---	---	---
MONTH	32.0	6.5	19.5	32.0	7.5	22.5	32.0	5.0	20.0	30.0	2.5	16.5
YEAR	32.0	-22.5	8.0									

Table 4d.--Water-quality-monitor data, station 03201700, Big Four Hollow Creek near Lake Hope, Ohio, water years 1979 through 1983--Continued

TEMPERATURE, AIR (DEG. C), WATER YEAR OCTOBER 1982 TO SEPTEMBER 1983

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		OCTOBER			NOVEMBER			DECEMBER			JANUARY	
1	28.5	8.5	16.5	28.0	12.5	18.5	18.5	6.0	12.0	7.5	---	---
2	31.5	11.0	18.5	28.0	11.0	17.5	26.5	7.0	13.5	4.5	-13.5	-1.5
3	29.5	12.0	19.5	23.0	10.5	16.0	28.0	9.0	15.5	2.5	---	---
4	28.0	15.0	20.0	11.0	.5	4.5	23.5	12.0	17.0	---	---	---
5	32.0	13.5	20.5	1.5	-0.5	.5	19.0	6.0	13.0	---	---	---
6	---	12.0	---	8.0	-2.5	2.0	10.0	-0.5	7.0	5.5	-5.0	1.0
7	26.5	15.0	20.0	16.0	-6.5	2.0	11.0	-4.0	1.0	5.5	-5.0	1.0
8	29.5	17.0	21.0	19.5	-3.5	5.5	13.5	-4.0	1.5	4.0	-5.0	-0.5
9	23.5	18.0	21.0	16.0	.0	6.0	3.5	-7.5	-3.0	9.0	-3.5	4.0
10	29.5	21.5	24.0	23.0	---	---	3.5	-7.5	-0.5	12.5	4.0	8.0
11	27.5	8.5	17.0	20.0	9.0	14.5	2.0	-3.0	.5	5.0	-1.0	2.5
12	19.0	8.5	13.5	21.0	3.5	13.0	-1.0	-11.5	-5.5	-1.5	-6.0	-3.5
13	20.0	7.0	13.0	2.0	-1.5	-0.5	2.0	-13.5	-7.0	3.5	-4.0	-0.5
14	17.0	7.0	12.5	5.5	-4.0	.5	10.5	-9.0	1.0	11.0	-5.5	2.5
15	21.0	3.0	12.0	3.5	-6.5	-0.5	11.0	6.5	8.5	.0	-12.0	-4.0
16	11.0	-1.0	5.5	11.0	-7.5	.0	11.0	-1.0	4.5	-3.0	-13.5	-7.0
17	16.0	-3.5	4.0	14.0	-2.0	6.0	2.0	-6.5	-1.0	-2.0	-15.0	-5.5
18	22.5	1.0	9.5	16.0	4.0	10.0	5.0	-8.5	-0.5	-6.0	-19.5	-14.0
19	25.0	.5	10.0	18.5	2.5	11.0	12.0	---	---	-4.0	-20.5	-12.5
20	19.0	6.0	11.5	15.0	10.5	13.0	1.0	---	---	-1.0	-16.5	-8.0
21	7.5	4.0	6.0	18.5	12.5	15.5	1.0	---	---	3.5	-4.5	-0.5
22	12.5	-3.5	3.5	16.0	11.5	13.5	23.5	---	---	4.5	-0.5	1.5
23	12.5	-5.0	3.0	18.5	8.0	14.5	22.5	-12.5	7.5	5.5	1.0	2.5
24	15.0	-1.5	6.0	7.5	-4.5	2.5	---	-2.5	---	3.0	1.0	2.0
25	14.5	1.0	7.5	5.0	-8.0	-2.0	---	16.5	---	2.0	.5	1.5
26	20.0	-2.5	5.5	7.0	-2.5	3.0	---	17.0	---	2.0	.0	.5
27	23.5	-2.5	6.5	5.0	-2.0	1.0	---	10.5	---	.5	-1.5	-0.5
28	24.0	-1.0	8.0	13.0	.5	7.0	---	---	---	4.5	-1.5	.5
29	23.5	-1.0	9.0	12.5	5.0	8.0	-19.5	---	---	9.5	-1.0	2.5
30	22.5	6.5	13.5	20.0	.0	7.5	-14.0	---	---	8.0	2.5	5.0
31	27.5	11.0	17.0	---	---	---	3.5	---	---	4.5	-1.0	1.5
MONTH	32.0	-5.0	12.5	28.0	-8.0	7.0	28.0	-13.5	4.5	12.5	-20.5	-1.0

Table 4d.--Water-quality-monitor data, station 03201700, Big Four Hollow Creek near Lake Hope, Ohio, water years 1979 through 1983--Continued

TEMPERATURE, AIR (DEG. C), WATER YEAR OCTOBER 1982 TO SEPTEMBER 1983

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		FEBRUARY			MARCH			APRIL			MAY	
1	8.0	-5.0	.0	15.0	-6.0	3.0	17.5	1.0	9.0	20.0	13.0	16.5
2	16.5	5.5	9.0	14.5	-4.0	7.5	19.0	4.0	10.0	26.5	15.5	19.0
3	6.0	-5.0	.5	22.5	-4.5	6.5	7.5	4.0	5.0	18.0	11.0	14.5
4	-2.0	-7.5	-5.0	27.5	-1.0	11.5	13.5	5.0	9.5	20.0	7.5	12.5
5	1.5	---	---	28.5	2.0	15.5	16.0	4.5	10.5	16.5	3.0	10.0
6	5.0	-3.5	.0	22.0	6.5	15.0	21.0	10.5	14.5	17.5	-0.5	4.0
7	1.5	-3.0	-0.5	28.0	4.0	13.5	17.5	11.0	14.5	---	---	---
8	2.5	-5.5	-3.0	20.0	6.5	11.0	10.5	6.0	7.5	---	---	---
9	5.0	-9.0	-2.5	7.0	2.0	5.0	22.0	6.5	12.5	---	---	---
10	4.0	-3.0	.5	4.5	.0	2.0	14.0	5.0	9.0	21.5	4.5	16.0
11	2.5	-3.0	-1.5	.5	-1.0	-0.5	6.0	1.5	3.5	28.0	-1.0	11.0
12	2.0	-13.5	-5.5	7.0	-5.0	.0	10.0	-3.5	.0	29.5	2.5	16.0
13	7.0	-4.5	-1.0	13.0	-8.0	1.0	15.5	5.0	9.0	---	7.5	---
14	8.5	-7.0	-1.0	21.0	-3.0	8.5	23.5	8.0	15.0	31.0	17.5	22.5
15	8.0	-6.0	.0	15.5	-3.0	5.0	6.5	1.5	4.5	22.5	7.5	16.0
16	13.5	-4.0	2.0	17.5	-0.5	6.5	10.0	-3.0	3.0	17.5	5.0	10.0
17	4.5	.0	3.0	14.0	-2.0	6.5	5.5	-2.5	2.0	21.5	.5	11.0
18	9.0	1.5	4.5	12.5	6.0	9.0	5.0	-6.5	-1.5	25.5	5.0	16.0
19	13.5	-4.0	1.0	9.5	3.5	6.0	4.0	-7.5	-1.0	18.5	12.5	16.0
20	16.5	-3.0	2.5	13.0	3.5	7.0	9.5	-6.5	1.0	26.0	11.5	18.5
21	20.5	-2.0	4.0	9.0	-2.5	2.0	15.0	-6.5	4.5	22.5	13.0	17.5
22	21.0	-0.5	7.0	.0	-6.0	-2.5	21.0	-3.0	8.5	28.0	14.5	20.5
23	8.5	-6.0	1.5	3.0	-7.5	-3.0	22.0	4.0	11.5	26.5	10.0	18.0
24	8.0	-4.5	1.5	3.0	-10.5	-3.5	11.0	-1.5	7.5	23.5	5.0	14.0
25	-1.0	-9.5	-3.5	7.0	-10.0	-2.5	15.5	-4.0	5.5	26.0	5.0	15.0
26	2.0	-11.0	-5.0	15.5	-9.0	3.5	25.5	-2.0	11.5	18.5	3.0	11.0
27	11.5	-10.5	-2.5	17.5	4.0	8.5	30.5	3.5	16.5	22.5	-0.5	10.5
28	14.5	-3.0	1.5	6.5	1.5	3.5	27.5	7.0	16.5	17.5	5.5	12.5
29	---	---	---	4.5	-5.0	1.5	20.0	12.0	15.5	25.0	11.5	17.5
30	---	---	---	9.5	-7.0	1.0	25.0	13.5	18.0	22.0	9.5	15.0
31	---	---	---	12.0	-0.5	4.5	---	---	---	23.0	9.0	15.0
MONTH	21.0	-13.5	.5	28.5	-10.5	5.0	30.5	-7.5	8.5	31.0	-1.0	14.5

Table 4d.--Water-quality-monitor data, station 03201700, Big Four Hollow Creek near Lake Hope, Ohio, water years 1979 through 1983--Continued

TEMPERATURE, AIR (DEG. C), WATER YEAR OCTOBER 1982 TO SEPTEMBER 1983

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		JUNE			JULY			AUGUST			SEPTEMBER	
1	21.5	7.5	13.5		19.5							
2	24.5	4.0	15.0		20.5							
3	19.5	11.0	15.5		20.5							
4	26.5	12.0	19.5		20.5							
5	31.5	8.0	19.0		---							
6	28.0	11.0	19.5		---							
7	24.5	9.0	17.0		---							
8	28.0	6.0	16.5		---							
9	---	7.0	---		---							
10	---	9.0	---		---							
11	---	11.0	---		---							
12	---	12.5	---		---							
13	---	14.5	---		---							
14	---	16.0	---		---							
15	---	14.0	---		---							
16	---	13.5	---		---							
17	---	19.0	---		---							
18	30.0	18.5	23.0		---							
19	30.5	19.0	23.0		---							
20	32.0	18.0	24.0		---							
21	28.5	13.0	21.0		---							
22	---	15.0	---		---							
23	---	14.0	---		---							
24	---	14.5	---		---							
25	---	13.5	---		---							
26	---	13.0	---		---							
27	---	14.5	---		---							
28	---	21.0	---		---							
29	28.0	20.5	23.5		---							
30	---	18.5	---		---							
31	---	---	---		---							
MONTH	32.0	4.0	19.0		19.5							
YEAR	32.0	-20.5	7.5									

NOTE: NUMBER OF MISSING DAYS OF RECORD EXCEEDED 20% OF YEAR

Table 5.--Water-quality data, station 03201700, Big Four Hollow Creek near Lake Hope, Ohio, water years 1979 through 1983

[MG/L, milligrams per liter; UG/L, micrograms per liter]

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (ft^3/s)	SPE-CIFIC CON-DUCT-ANCE ($\mu S/cm$)	PH FIELD (UNITS)	TEMPER-ATURE, WATER (DEG C)	OXYGEN DEMAND, CHEM-ICAL (HIGH LEVEL) (MG/L)	HARD-NESS (MG/L AS CACO3)	HARD-NESS, NONCAR-BONATE (MG/L CACO3)	ACIDITY TOTAL HEATED (MG/L AS H)	ACIDITY (MG/L AS CACO3)	CALCIUM DIS-SOLVED (MG/L AS CA)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG)
WATER YEAR 1979												
OCT												
13...	1000	4.3	280	4.8	12.5	41	97	97	.0	.0	23	9.5
24...	1400	.11	850	3.3	13.0	10	310	310	2.6	129	68	33
NOV												
06...	1600	.08	830	3.2	13.0	15	280	280	2.3	114	63	29
22...	0900	.26	490	3.5	7.0	8	180	180	1.0	50	43	18
30...	1530	.66	390	3.9	6.5	13	140	140	.6	30	31	14
DEC												
21...	1030	3.2	270	4.0	4.0	42	99	99	.5	25	23	10
JAN												
04...	1600	1.6	330	3.9	.5	17	110	110	.8	40	25	12
16...	1130	1.7	285	4.0	1.0	1	130	130	.6	30	29	13
FEB												
01...	1430	.66	395	3.6	.5	10	130	130	.8	40	30	14
14...	1030	.33	520	3.5	.5	8	160	160	1.3	65	38	17
26...	1130	11	160	4.1	2.0	12	60	60	.4	20	14	6.1
MAR												
13...	1230	.66	390	3.7	7.0	9	130	130	.8	40	31	13
26...	1530	1.2	345	3.9	5.0	10	110	110	.5	25	26	12
APR												
11...	1200	1.4	300	4.5	7.5	13	110	110	.3	15	25	11
30...	1000	.52	400	3.6	7.5	7	130	130	.5	25	32	13
MAY												
15...	1400	.39	425	3.8	20.5	25	140	140	.6	30	32	14
30...	1330	.64	520	3.7	18.0	4	150	150	1.1	55	35	16
JUN												
11...	1530	1.2	420	3.9	19.5	6	130	130	.8	40	30	13
28...	1000	.11	565	3.9	15.5	9	190	190	1.0	50	43	19
JUL												
10...	1030	.20	500	3.8	17.0	10	180	180	.8	40	43	18
26...	1400	.43	1200	3.5	19.0	16	380	380	4.6	228	86	39
AUG												
08...	1300	.16	1050	3.0	21.5	32	310	310	3.2	159	73	30
23...	1300	.88	370	4.5	19.0	35	130	130	.6	30	32	13
SEP												
05...	1600	.18	535	3.6	21.0	2	180	180	1.4	70	44	18
17...	1400	.30	755	3.7	17.0	12	230	230	2.5	124	54	23

Table 5.--Water-quality data, station 03201700, Big Four Hollow Creek near Lake Hope, Ohio, water years 1979 through 1983--Continued

DATE	SODIUM, DISSOLVED (MG/L AS NA)	SODIUM PERCENT	SODIUM ADSORPTION RATIO	SODIUM+POTASSIUM DISSOLVED (MG/L AS NA)	POTASSIUM, DISSOLVED (MG/L AS K)	BICARBONATE (MG/L AS HCO3)	CARBONATE (MG/L AS CO3)	ALKALINITY (MG/L AS CACO3)	CARBON DIOXIDE DISSOLVED (MG/L AS CO2)	SULFATE DISSOLVED (MG/L AS SO4)	CHLORIDE, DISSOLVED (MG/L AS CL)
WATER YEAR 1979											
OCT											
13...	5.4	11	.2	--	2.7	0	0	0	.0	100	4.6
24...	6.8	5	.2	--	2.7	0	0	0	.0	410	2.5
NOV											
06...	7.0	5	.2	--	2.4	0	0	0	.0	380	3.1
22...	6.2	7	.2	--	2.3	0	0	0	.0	220	4.5
30...	5.5	8	.2	--	2.0	0	0	0	.0	150	4.4
DEC											
21...	4.2	8	.2	--	1.7	0	0	0	.0	110	3.1
JAN											
04...	3.8	7	.2	--	1.5	0	0	0	.0	140	2.6
16...	4.5	7	.2	--	1.4	0	0	0	.0	130	3.3
FEB											
01...	5.0	7	.2	--	1.6	0	0	0	.0	170	4.3
14...	5.8	7	.2	--	1.7	0	0	0	.0	220	3.5
26...	2.3	7	.1	--	1.4	0	0	0	.0	71	2.9
MAR											
13...	4.8	7	.2	--	1.6	0	0	0	.0	160	3.2
26...	4.9	8	.2	--	1.7	0	0	0	.0	130	3.6
APR											
11...	4.9	9	.2	--	1.7	0	0	0	.0	120	2.7
30...	5.5	8	.2	--	1.9	0	0	0	.0	170	2.9
MAY											
15...	5.8	8	.2	--	1.9	0	0	0	.0	180	2.4
30...	5.4	7	.2	7.2	1.8	0	0	0	.0	200	2.4
JUN											
11...	4.6	7	.2	--	1.8	0	0	0	.0	150	3.1
28...	6.5	7	.2	8.5	2.0	0	0	0	.0	220	2.4
JUL											
10...	6.2	7	.2	--	2.2	0	0	0	.0	220	3.1
26...	9.7	5	.2	13	3.6	0	0	0	.0	550	2.0
AUG											
08...	7.8	5	.2	11	2.9	0	0	0	.0	430	2.9
23...	5.8	8	.2	7.9	2.1	0	0	0	.0	150	3.8
SEP											
05...	6.2	7	.2	8.6	2.4	0	0	0	.0	210	2.6
17...	6.7	6	.2	9.3	2.6	0	0	0	.0	330	3.0

Table 5.--Water-quality data, station 03201700, Big Four Hollow Creek near Lake Hope, Ohio, water years 1979 through 1983--Continued

DATE	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L)	SOLIDS, DIS-SOLVED (TONS PER AC-FT)	NITRO-GEN, NO2+NO3 TOTAL (MG/L AS N)	NITRO-GEN, AM-MONIA + ORGANIC TOTAL (MG/L AS N)	NITRO-GEN, TOTAL (MG/L AS N)	NITRO-GEN, TOTAL (MG/L AS NO3)	PHOS-PHORUS, TOTAL (MG/L AS P)	PHOS-PHORUS, ORTHOPH OSPHATE TOTAL (MG/L AS PO4)	PHOS-PHORUS, TOTAL (MG/L AS PO4)	ALUM-INUM, TOTAL RECOV-ERABLE (UG/L AS AL)	ANTI-MONY, TOTAL (UG/L AS SB)
WATER YEAR 1979											
OCT											
13...	172	.23	.55	.78	1.3	5.9	.070	--	--	540	3
24...	585	.80	.12	.13	.25	1.1	.000	--	--	10000	1
NOV											
06...	521	.71	.13	.03	.16	.71	.000	--	--	--	0
22...	340	.46	.16	.00	.16	.71	.000	--	--	4400	0
30...	252	.34	.15	.00	.15	.66	.000	--	--	3000	0
DEC											
21...	175	.24	.13	.08	.21	.93	.000	--	--	1400	0
JAN											
04...	216	.29	.12	.00	.12	.53	.000	--	--	880	0
16...	198	.27	.13	.22	.35	1.6	.000	--	--	860	0
FEB											
01...	246	.33	.11	.16	.27	1.2	.000	--	--	3100	0
14...	330	.45	.13	.25	.38	1.7	.000	--	--	3900	0
26...	117	.16	.13	.18	.31	1.4	.000	--	--	1400	0
MAR											
13...	231	.31	.13	.07	.20	.89	.000	--	--	3100	0
26...	211	.29	.11	.17	.28	1.2	.000	--	--	1900	0
APR											
11...	188	.26	.07	.14	.21	.93	.000	--	--	1900	0
30...	252	.34	.06	.17	.23	1.0	.000	.00	.00	2000	0
MAY											
15...	289	.39	.07	.11	.18	.80	.000	.00	.00	2400	0
30...	321	.44	.10	.04	.14	.62	.010	.03	.03	3600	0
JUN											
11...	271	.37	.07	.10	.17	.75	.010	.03	.03	2800	0
28...	402	.55	.07	.10	.17	.75	.000	.00	.00	4100	0
JUL											
10...	361	.49	.07	.01	.08	.35	.000	--	.00	3200	0
26...	1000	1.36	.05	.27	.32	1.4	.020	--	.06	13000	0
AUG											
08...	835	1.14	.04	.36	.40	1.8	.000	--	.00	11000	0
23...	253	.34	.10	.34	.44	1.9	.030	--	.09	2400	0
SEP											
05...	385	.52	.06	.06	.12	.53	.010	--	.03	4000	0
17...	544	.74	.09	.17	.26	1.2	.000	--	.00	5900	0

Table 5.--Water-quality data, station 03201700, Big Four Hollow Creek near Lake Hope, Ohio, water years 1979 through 1983--Continued

DATE	ARSENIC TOTAL (UG/L AS AS)	BERYLLIUM, TOTAL RECOVERABLE (UG/L AS BE)	CADMIUM TOTAL RECOVERABLE (UG/L AS CD)	CHROMIUM, TOTAL RECOVERABLE (UG/L AS CR)	COPPER, TOTAL RECOVERABLE (UG/L AS CU)	IRON, TOTAL RECOVERABLE (UG/L AS FE)	IRON, SUSPENDED RECOVERABLE (UG/L AS FE)	IRON, DISSOLVED (UG/L AS FE)	LEAD, TOTAL RECOVERABLE (UG/L AS PB)	MANGANESE, TOTAL RECOVERABLE (UG/L AS MN)	MANGANESE, SUSPENDED RECOV. (UG/L AS MN)
WATER YEAR 1979											
OCT											
13...	1	0	3	3	8	8100	--	730	26	1300	--
24...	0	10	11	1	18	2700	--	2700	100	6400	--
NOV											
06...	0	--	--	--	--	1800	--	1800	270	5500	--
22...	0	0	3	2	6	1300	--	1300	16	3300	--
30...	0	0	4	1	4	2000	--	1500	35	2400	--
DEC											
21...	1	0	6	4	5	4300	--	2300	87	860	--
JAN											
04...	0	0	2	2	5	7000	--	6000	30	1200	--
16...	1	0	7	5	3	5600	--	4000	95	1000	--
FEB											
01...	1	10	10	30	5	7200	--	6600	200	1500	--
14...	0	10	1	2	5	7800	--	7000	8	2200	--
26...	0	0	8	0	4	4400	--	3000	68	460	--
MAR											
13...	1	0	3	0	5	6400	--	4600	43	1500	--
26...	0	0	0	0	4	5000	--	3600	7	1000	--
APR											
11...	0	0	2	7	3	2700	--	1300	17	840	--
30...	0	0	15	5	6	2500	500	2000	150	1300	0
MAY											
15...	0	10	4	3	6	2300	200	2100	54	1400	100
30...	0	10	4	8	6	9100	800	8300	60	1600	0
JUN											
11...	0	0	10	9	5	10000	3700	6300	42	1100	0
28...	1	10	0	10	8	2000	1100	950	1	2000	0
JUL											
10...	1	0	0	15	8	570	0	570	5	2100	0
26...	2	10	0	9	0	66000	0	66000	0	5700	0
AUG											
08...	2	10	1	19	19	29000	10000	19000	8	6400	100
23...	2	0	1	1	11	5400	0	5400	8	2000	200
SEP											
05...	0	0	1	2	6	6800	--	5900	8	3600	300
17...	1	10	0	4	9	28000	--	23000	4	4700	400

Table 5.--Water-quality data, station 03201700, Big Four Hollow Creek near Lake Hope, Ohio, water years 1979 through 1983--Continued

DATE	MANGANESE, DISSOLVED (UG/L AS MN)	MERCURY TOTAL RECOVERABLE (UG/L AS HG)	NICKEL, TOTAL RECOVERABLE (UG/L AS NI)	SELENIUM, TOTAL (UG/L AS SE)	SILVER, TOTAL RECOVERABLE (UG/L AS AG)	ZINC, SUSPENDED RECOVERABLE (UG/L AS ZN)	ZINC, DISSOLVED (UG/L AS ZN)	ZINC, TOTAL RECOVERABLE (UG/L AS ZN)	CARBON, ORGANIC DISSOLVED (MG/L AS C)	CARBON, ORGANIC SUSPENDED (MG/L AS C)	PHENOLS (UG/L)
WATER YEAR 1979											
OCT											
13...	1200	<.5	35	0	0	--	40	60	6.9	2.5	1
24...	6400	<.5	120	0	0	--	220	230	2.5	.2	2
NOV											
06...	5500	<.5	--	0	--	--	30	260	1.1	.2	0
22...	2800	<.5	63	0	0	--	100	120	2.1	.4	0
30...	2200	<.5	46	0	0	--	70	90	1.2	.4	0
DEC											
21...	860	<.5	30	0	0	--	50	70	2.8	.7	5
JAN											
04...	1200	<.5	39	0	0	--	70	80	1.1	.2	0
16...	1000	<.5	13	0	0	--	90	90	4.3	.2	0
FEB											
01...	1500	<.5	44	0	0	--	70	100	1.3	.1	0
14...	2200	<.5	77	0	0	--	120	310	1.6	.5	2
26...	460	<.5	19	0	0	--	20	50	4.4	--	1
MAR											
13...	1400	<.5	38	0	0	--	50	80	3.2	.1	0
26...	1000	<.5	35	0	0	--	50	50	1.7	.1	0
APR											
11...	840	<.5	39	0	0	--	50	60	2.0	.1	0
30...	1300	<.5	47	0	0	10	80	90	4.2	.1	0
MAY											
15...	1300	<.5	65	0	0	0	80	80	1.8	.1	1
30...	1600	<.5	37	0	0	0	90	90	7.5	.2	0
JUN											
11...	1100	<.5	44	0	0	40	40	80	5.0	.2	0
28...	2000	<.5	55	0	0	0	170	170	7.6	.1	2
JUL											
10...	2100	<.5	82	0	0	50	220	270	2.0	.1	0
26...	5700	<.5	1	0	0	40	380	420	3.0	.0	0
AUG											
08...	6300	<.5	110	0	0	0	320	320	2.9	.1	0
23...	1800	<.5	44	0	1	0	80	80	3.3	.5	0
SEP											
05...	3300	<.5	47	0	0	10	130	140	5.2	.2	2
17...	4300	<.5	78	0	0	60	140	200	4.4	.1	170

Table 5.--Water-quality data, station 03201700, Big Four Hollow Creek near Lake Hope, Ohio, water years 1979 through 1983--Continued

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (ft^3/s)	SPE-CIFIC CON-DUCT-ANCE (µS/cm)	PH (UNITS)	TEMPER-ATURE, WATER (DEG C)	OXYGEN DEMAND, CHEM-ICAL (HIGH LEVEL) (MG/L)	HARD-NESS (MG/L AS CACO3)	HARD-NESS, NONCAR-BONATE (MG/L CACO3)	ACIDITY TOTAL HEATED (MG/L AS H)	ACIDITY (MG/L AS CACO3)	CALCIUM DIS-SOLVED (MG/L AS CA)
WATER YEAR 1980											
OCT											
02...	1030	1.4	320	5.0	15.0	6	120	120	.6	30	28
23...	1100	.30	410	4.3	12.5	17	160	160	.6	30	39
NOV											
09...	0930	.40	320	5.3	7.0	8	140	130	--	--	34
20...	1100	.42	310	5.6	7.0	0	140	140	--	--	34
DEC											
06...	1400	.70	310	5.7	4.5	1	120	120	--	--	30
20...	1000	.70	300	5.9	1.0	16	130	120	--	--	31
JAN											
10...	1300	.40	360	5.2	1.0	5	150	150	--	--	37
24...	1300	.50	335	5.3	.5	32	150	140	--	--	36
FEB											
12...	1300	.38	380	5.1	.5	34	160	160	--	--	40
28...	1000	.90	320	6.0	.5	14	140	130	--	--	33
MAR											
12...	1330	1.2	285	6.0	4.0	95	130	120	--	--	30
25...	1130	1.8	290	5.8	5.5	3	130	120	--	--	30
APR											
07...	1100	.90	300	6.0	9.0	11	120	110	--	--	28
24...	1130	.60	310	6.1	13.0	2	130	120	--	--	31
MAY											
09...	1200	.20	420	4.6	10.5	--	170	170	--	--	42
23...	1330	.95	370	6.3	17.0	15	140	130	--	--	34
JUN											
12...	1230	.20	470	4.8	22.0	--	180	180	1.2	60	44
24...	1330	.10	800	3.9	20.5	23	290	290	2.6	129	70
JUL											
10...	1115	.10	300	6.8	18.5	10	130	100	--	--	29
21...	1030	.05	690	4.0	23.0	--	250	250	1.8	89	60
AUG											
06...	1000	.20	610	3.8	21.0	--	--	--	1.2	60	--
19...	1300	.70	425	5.8	22.0	21	170	170	.4	20	40
SEP											
08...	1515	.15	720	3.4	24.5	--	280	280	1.9	94	66
22...	1230	.16	860	4.0	19.5	7	300	300	3.1	154	73

Table 5.--Water-quality data, station 03201700, Big Four Hollow Creek near Lake Hope, Ohio, water years 1979 through 1983--Continued

DATE	MAGNESIUM, DISSOLVED (MG/L AS MG)	SODIUM, DISSOLVED (MG/L AS NA)	SODIUM PERCENT	SODIUM ADSORPTION RATIO	SODIUM+POTASSIUM DISSOLVED (MG/L AS NA)	POTASSIUM, DISSOLVED (MG/L AS K)	BICARBONATE (MG/L AS HCO3)	CARBONATE (MG/L AS CO3)	ALKALINITY (MG/L AS CACO3)	CARBON DIOXIDE DISSOLVED (MG/L AS CO2)	SULFATE DISSOLVED (MG/L AS SO4)
WATER YEAR 1980											
OCT											
02...	12	5.1	8	.2	7.5	2.4	0	0	0	.0	140
23...	15	6.7	13	.2	9.9	3.2	0	0	0	.0	180
NOV											
09...	13	5.8	13	.2	8.0	2.2	12	0	10	96	140
20...	14	5.3	12	.2	7.1	1.8	4	0	3	16	140
DEC											
06...	12	4.8	12	.2	6.5	1.7	6	0	5	19	140
20...	12	5.1	12	.2	6.7	1.6	6	0	5	12	130
JAN											
10...	15	5.4	11	.2	7.4	2.0	8	0	7	81	170
24...	14	5.1	11	.2	7.0	1.9	8	0	7	64	160
FEB											
12...	15	5.5	7	.2	7.2	1.7	2	0	2	25	190
28...	13	5.6	8	.2	7.1	1.5	9	0	7	14	160
MAR											
12...	13	4.2	7	.2	5.5	1.3	6	0	5	9.6	140
25...	13	3.8	6	.1	5.5	1.7	10	0	8	25	130
APR											
07...	12	4.9	8	.2	--	1.6	14	0	11	22	130
24...	12	4.6	7	.2	--	2.1	12	0	10	15	130
MAY											
09...	17	6.3	7	.2	--	2.3	1	0	1	40	200
23...	14	5.6	8	.2	--	4.2	18	0	15	2.3	150
JUN											
12...	18	6.4	7	.2	--	2.8	3	0	2	76	210
24...	28	7.0	5	.2	--	3.5	0	0	0	.0	380
JUL											
10...	13	6.7	10	.3	--	2.3	31	0	25	3.9	110
21...	24	7.2	6	.2	--	3.9	0	0	0	.0	310
AUG											
06...	--	--	--	--	--	--	0	0	0	.0	--
19...	16	6.5	8	.2	--	2.8	1	0	1	2.5	170
SEP											
08...	27	6.7	5	.2	--	2.8	0	0	0	.0	320
22...	29	7.6	5	.2	--	3.7	0	0	0	.0	390

Table 5.--Water-quality data, station 03201700, Big Four Hollow Creek near Lake Hope, Ohio, water years 1979 through 1983--Continued

DATE	CHLORIDE, DISSOLVED (MG/L AS CL)	SOLIDS, RESIDUE AT 180 DEG. C DISSOLVED (MG/L)	SOLIDS, DISSOLVED (TONS PER AC-FT)	NITROGEN, NO2+NO3 TOTAL (MG/L AS N)	NITROGEN, AMMONIA + ORGANIC TOTAL (MG/L AS N)	NITROGEN, TOTAL (MG/L AS N)	NITROGEN, TOTAL (MG/L AS NO3)	PHOSPHORUS, TOTAL (MG/L AS P)	PHOSPHORUS, TOTAL (MG/L AS PO4)	ALUMINUM, TOTAL RECOVERABLE (UG/L AS AL)	ANTIMONY, TOTAL (UG/L AS SB)
WATER YEAR 1980											
OCT											
02...	2.4	221	.30	.12	.24	.36	1.6	.030	.09	2000	0
23...	2.6	285	.39	.05	.62	.67	3.0	.010	.03	2100	0
NOV											
09...	3.0	246	.33	.09	.16	.25	1.1	.010	.03	900	0
20...	2.8	224	.30	.08	.21	.29	1.3	.000	.00	700	0
DEC											
06...	2.9	215	.29	.15	.08	.23	1.0	.000	.00	820	0
20...	3.0	194	.26	.12	.20	.32	1.4	.010	.03	2200	0
JAN											
10...	2.6	263	.36	.16	.14	.30	1.3	.010	.03	2100	0
24...	3.3	260	.35	.11	.26	.37	1.6	.000	.00	2500	0
FEB											
12...	2.8	301	.41	.08	.60	.68	3.0	.010	.03	2000	0
28...	3.6	249	.34	.23	.20	.43	1.9	.020	.06	2200	0
MAR											
12...	2.8	196	.27	.18	.16	.34	1.5	.010	.03	480	0
25...	1.9	194	.26	.02	.20	.22	.97	.010	.03	1000	0
APR											
07...	2.5	216	.29	.15	.12	.27	1.2	.010	.03	1500	0
24...	2.2	239	.33	.10	.01	.11	.49	.010	.03	1500	0
MAY											
09...	2.8	352	.48	--	--	--	--	--	--	--	--
23...	6.7	249	.34	.15	1.4	1.6	6.9	.020	.06	1100	--
JUN											
12...	4.0	336	.46	--	--	--	--	--	--	--	--
24...	3.5	619	.84	.14	.18	.32	1.4	.000	.00	7000	--
JUL											
10...	3.2	220	.30	.21	.17	.38	1.7	.010	.03	900	--
21...	4.1	556	.76	--	--	--	--	--	--	--	--
AUG											
06...	--	--	--	--	--	--	--	--	--	--	--
19...	4.1	301	.41	.20	.11	.31	1.4	.010	.03	1400	--
SEP											
08...	3.6	540	.73	--	--	--	--	--	--	--	--
22...	3.2	690	.94	.20	.18	.38	1.7	.010	.03	--	--

Table 5.--Water-quality data, station 03201700, Big Four Hollow Creek near Lake Hope, Ohio, water years 1979 through 1983--Continued

DATE	ARSENIC TOTAL (UG/L AS AS)	BERYLLIUM, TOTAL RECOVERABLE (UG/L AS BE)	CADMIUM TOTAL RECOVERABLE (UG/L AS CD)	CHROMIUM, TOTAL RECOVERABLE (UG/L AS CR)	COPPER, TOTAL RECOVERABLE (UG/L AS CU)	IRON, TOTAL RECOVERABLE (UG/L AS FE)	IRON, SUSPENDED RECOVERABLE (UG/L AS FE)	IRON, DISSOLVED (UG/L AS FE)	LEAD, TOTAL RECOVERABLE (UG/L AS PB)	MANGANESE, TOTAL RECOVERABLE (UG/L AS MN)	MANGANESE, SUSPENDED RECOV. (UG/L AS MN)
WATER YEAR 1980											
OCT											
02...	2	10	0	10	3	8800	--	5900	1	2100	100
23...	2	0	0	11	7	2900	--	1700	3	2700	0
NOV											
09...	0	0	0	7	2	1400	--	760	0	1900	0
20...	0	0	0	8	2	1300	--	850	2	1700	0
DEC											
06...	0	10	0	12	2	1800	--	1400	0	1700	0
20...	0	10	0	5	4	1900	800	1100	0	1700	0
JAN											
10...	1	20	0	5	4	2200	700	1500	0	2400	100
24...	2	10	0	8	4	3900	1900	2000	1	2200	0
FEB											
12...	2	0	0	40	3	2200	500	1700	0	2700	0
28...	1	0	0	13	3	3000	1700	1300	4	1900	100
MAR											
12...	1	0	0	10	4	2200	1100	1100	2	1500	100
25...	0	0	0	4	2	2000	1200	830	1	1200	0
APR											
07...	2	0	0	6	5	1800	830	970	1	1700	0
24...	1	10	0	3	3	1500	790	710	2	1900	0
MAY											
09...	--	--	--	--	--	1100	300	800	0	3000	0
23...	--	--	--	--	--	2700	1400	1300	1	2100	200
JUN											
12...	--	--	--	--	--	3900	2400	1500	3	3800	0
24...	--	--	--	--	--	12000	11000	1100	5	6900	0
JUL											
10...	--	--	--	--	--	1800	1100	690	2	1900	200
21...	--	--	--	--	--	3600	0	3600	5	7500	300
AUG											
06...	--	--	--	--	--	6000	--	--	9	5500	--
19...	--	--	--	--	--	3000	900	2100	13	3200	100
SEP											
08...	--	--	--	--	--	8100	0	8100	5	7700	100
22...	--	--	--	--	--	--	--	8600	--	--	--

Table 5.--Water-quality data, station 03201700, Big Four Hollow Creek near Lake Hope, Ohio, water years 1979 through 1983--Continued

DATE	MANGANESE, DISSOLVED (UG/L AS MN)	MERCURY TOTAL RECOVERABLE (UG/L AS HG)	NICKEL, TOTAL RECOVERABLE (UG/L AS NI)	SELENIUM, TOTAL (UG/L AS SE)	SILVER, TOTAL RECOVERABLE (UG/L AS AG)	ZINC, SUSPENDED RECOVERABLE (UG/L AS ZN)	ZINC, DISSOLVED (UG/L AS ZN)	ZINC, TOTAL RECOVERABLE (UG/L AS ZN)	CARBON, ORGANIC DISSOLVED (MG/L AS C)	CARBON, ORGANIC SUSPENDED (MG/L AS C)	PHENOLS (UG/L)
WATER YEAR 1980											
OCT											
02...	2000	<.5	28	0	0	0	80	80	2.4	.5	5
23...	2700	<.1	33	0	0	0	110	110	4.3	.0	0
NOV											
09...	1900	.6	29	0	0	0	80	80	2.1	.1	0
20...	1700	.1	21	0	0	20	20	40	5.2	.2	0
DEC											
06...	1700	.2	24	0	0	0	60	60	4.3	.3	0
20...	1700	<.1	19	0	0	0	80	80	1.8	.4	0
JAN											
10...	2300	<.1	27	0	1	0	80	80	4.4	--	0
24...	2200	<.1	30	0	0	0	70	70	2.2	.4	0
FEB											
12...	2700	<.1	34	0	0	0	70	70	2.4	.0	0
28...	1800	.7	22	0	0	0	100	100	2.6	.3	0
MAR											
12...	1400	.1	22	1	0	0	50	50	5.2	.3	5
25...	1200	.1	16	0	0	0	110	110	1.2	.5	0
APR											
07...	1700	.1	24	0	0	0	80	80	14	.1	1
24...	1900	<.1	21	0	0	0	60	60	5.0	.6	3
MAY											
09...	3000	--	--	--	--	--	100	--	--	--	--
23...	1900	--	--	--	--	0	50	50	7.1	.5	--
JUN											
12...	3800	--	--	--	--	--	90	--	--	--	--
24...	6900	--	--	--	--	0	200	200	6.0	.2	--
JUL											
10...	1700	<.1	19	--	--	0	40	40	1.8	1.1	--
21...	7200	--	--	--	--	--	200	--	--	--	--
AUG											
06...	--	--	--	--	--	--	--	--	--	--	--
19...	3100	--	--	--	--	10	60	70	2.2	.4	--
SEP											
08...	7600	--	--	--	--	--	200	--	--	--	--
22...	10000	--	--	--	--	--	260	--	1.8	--	--

Table 5.--Water-quality data, station 03201700, Big Four Hollow Creek near Lake Hope, Ohio, water years 1979 through 1983--Continued

DATE	TIME	SPECIFIC CONDUCTANCE (uS/cm)	STREAMFLOW, INSTANTANEOUS (ft^3/s)	PH (STANDARD UNITS)	TEMPERATURE, AIR (DEG C)	TEMPERATURE (DEG C)	OXYGEN DEMAND, CHEMICAL (HIGH LEVEL) (MG/L)	ACIDITY (MG/L AS H)	CALCIUM DISSOLVED (MG/L AS CA)	MAGNESIUM, DISSOLVED (MG/L AS MG)	SODIUM, DISSOLVED (MG/L AS NA)	POTASSIUM, DISSOLVED (MG/L AS K)
Water Year 1981												
OCT												
07...	1100	1100	.18	3.4	15.5	10.5	--	3.2	100	41	8.8	3.5
21...	1200	1050	.03	3.6	19.0	12.0	21	3.0	110	40	8.4	3.8
NOV												
05...	1130	950	.06	3.6	8.0	7.5	--	3.1	93	38	9.1	3.6
19...	1300	740	.20	4.4	--	5.0	18	1.5	62	26	7.0	3.0
DEC												
04...	1130	610	.24	4.5	3.5	1.0	--	1.5	51	23	7.2	2.5
18...	1200	565	.30	4.4	--	4.0	6	1.0	46	20	6.6	2.1
JAN												
07...	1230	660	.28	4.4	-7.0	.5	--	1.4	58	24	6.9	2.1
22...	1230	600	.25	4.2	--	1.0	33	1.1	52	15	7.5	2.1
FEB												
05...	1400	410	1.5	5.2	-2.0	.5	--	.8	30	12	4.5	1.8
17...	1730	230	7.5	6.1	--	4.0	10	.4	17	7.8	3.6	1.7
MAR												
11...	1130	370	.77	4.9	3.5	5.0	--	.7	34	14	5.4	1.8
24...	1200	520	.60	4.6	9.1	6.5	<10	1.1	39	18	6.5	2.0
APR												
10...	1330	430	.88	4.5	--	11.5	--	1.0	37	15	5.0	2.2
22...	0930	410	.86	4.6	--	8.5	<10	1.2	41	18	5.6	2.1
MAY												
12...	1400	250	3.8	6.7	--	11.5	--	.4	24	10	4.3	1.8
26...	1230	730	.38	3.7	--	16.0	150	2.8	57	24	5.5	2.5
JUN												
03...	1100	425	1.1	4.9	--	16.5	--	1.0	37	16	5.6	2.1
22...	1230	350	1.6	5.3	--	20.5	15	.8	33	14	5.4	2.2
JUL												
09...	1330	1400	.14	3.0	--	24.5	--	6.5	96	44	6.7	4.0
21...	1200	1550	.14	3.1	--	21.5	14	8.5	82	38	5.7	3.1
AUG												
19...	1130	2700	.05	2.9	--	15.0	--	23	230	110	13	4.2
27...	1100	3000	.04	2.9	--	18.0	170	24	280	140	15	5.6
SEP												
09...	1130	2600	.11	2.9	--	14.5	--	20	240	110	13	4.6
30...	1130	2850	.10	3.2	--	13.5	<5	18	240	120	13	4.4

Table 5.--Water-quality data, station 03201700, Big Four Hollow Creek near Lake Hope, Ohio, water years 1979 through 1983--Continued

DATE	SULFATE DIS-SOLVED (MG/L AS SO4)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L)	NITRO-GEN, NO2+NO3 TOTAL (MG/L AS N)	NITRO-GEN, AMMONIA + ORGANIC TOTAL (MG/L AS N)	NITRO-GEN, TOTAL (MG/L AS N)	NITRO-GEN, TOTAL (MG/L AS NO3)	PHOS-PHORUS, TOTAL (MG/L AS P)	PHOS-PHORUS TOTAL (MG/L AS PO4)	ALUM-INUM, TOTAL RECOV-ERABLE (UG/L AS AL)	IRON, TOTAL RECOV-ERABLE (UG/L AS FE)	IRON, SUS-PENDED RECOV-ERABLE (UG/L AS FE)
Water Year 1981												
OCT												
07...	580	3.1	905	--	--	--	--	--	--	9000	17000	0
21...	500	3.3	875	.09	.29	.38	1.7	.010	.03	10000	13000	0
NOV												
05...	480	4.1	760	--	--	--	--	--	--	--	--	--
19...	320	4.0	512	1.5	.22	1.7	7.6	.000	.00	5800	5100	0
DEC												
04...	260	3.2	417	--	--	--	--	--	--	--	5600	1100
18...	240	3.6	390	.27	.28	.55	2.4	.010	.03	4100	7600	2800
JAN												
07...	280	3.9	446	--	--	--	--	--	--	5300	4900	400
22...	270	3.6	433	.26	.22	.48	2.1	<.010	<.03	4300	3900	600
FEB												
05...	180	3.1	271	--	--	--	--	--	--	--	5600	2700
17...	81	3.3	138	.48	.22	.70	3.1	.070	.21	1600	2700	2000
MAR												
11...	180	3.2	270	--	--	--	--	--	--	--	4500	1900
24...	210	3.1	330	.19	.17	.36	1.6	<.010	.03	3500	52000	48000
APR												
10...	190	2.7	246	--	--	--	--	--	--	3100	5700	1800
22...	200	2.9	333	.18	.21	.39	1.7	<.010	.03	3900	8800	2100
MAY												
12...	110	2.3	182	--	--	--	--	--	--	--	4100	1400
26...	320	2.7	555	.21	.34	.55	2.4	<.010	.03	9400	19000	2000
JUN												
03...	190	2.9	329	--	--	--	--	--	--	220	8500	300
22...	140	2.2	260	.21	.35	.56	2.5	.010	.03	0	7200	700
JUL												
09...	690	2.5	1150	--	--	--	--	--	--	--	45000	5000
21...	690	2.5	1120	.09	.37	.46	2.0	<.010	.03	27000	55000	18000
AUG												
19...	1800	3.3	2800	--	--	--	--	--	--	--	140000	0
27...	2100	12	3280	.11	.90	1.0	4.5	<.010	--	72000	150000	0
SEP												
09...	1600	6.5	2550	--	--	--	--	--	--	--	88000	1000
30...	1900	6.4	2900	.12	.81	.93	4.1	<.010	--	35000	110000	0

Table 5.--Water-quality data, station 03201700, Big Four Hollow Creek near Lake Hope, Ohio, water years 1979 through 1983--Continued

DATE	IRON, DISSOLVED (UG/L AS FE)	LEAD, TOTAL RECOVERABLE (UG/L AS PB)	MANGANESE, TOTAL RECOVERABLE (UG/L AS MN)	MANGANESE, SUSPENDED RECOV. (UG/L AS MN)	MANGANESE, DISSOLVED (UG/L AS MN)	MERCURY TOTAL RECOVERABLE (UG/L AS HG)	NICKEL, TOTAL RECOVERABLE (UG/L AS NI)	ZINC, TOTAL RECOVERABLE (UG/L AS ZN)	ZINC, SUSPENDED RECOVERABLE (UG/L AS ZN)	ZINC, DISSOLVED (UG/L AS ZN)	CARBON, ORGANIC DISSOLVED (MG/L AS C)	CARBON, ORGANIC SUSPENDED TOTAL (MG/L AS C)
Water Year 1981												
OCT												
07...	17000	--	14000	0	14000	--	--	--	--	340	--	--
21...	13000	1	15000	0	15000	<.1	160	360	0	360	1.2	.2
NOV												
05...	9600	--	--	--	12000	--	--	--	--	300	--	--
19...	5100	1	7500	0	7500	--	--	190	20	170	1.4	.2
DEC												
04...	4500	6	6200	500	5700	--	--	--	--	130	--	--
18...	4800	4	5400	200	5200	--	--	130	10	120	.8	.2
JAN												
07...	4500	--	6300	100	6200	--	--	--	--	210	--	--
22...	3300	5	5000	100	4900	<.1	62	140	40	100	3.4	.1
FEB												
05...	2900	12	3200	100	3100	--	--	--	--	100	--	--
17...	750	0	1100	190	910	--	--	40	20	20	1.8	.8
MAR												
11...	2600	4	2900	200	2700	--	--	--	--	60	--	--
24...	3700	16	3600	0	3600	--	--	110	10	100	1.8	.2
APR												
10...	3900	--	3400	100	3300	--	--	--	--	110	--	--
22...	6700	7	3500	0	3500	<.1	54	120	0	120	1.4	.4
MAY												
12...	2700	1	1600	100	1500	--	--	--	--	60	--	--
26...	17000	1	6400	100	6300	--	--	230	0	230	6.7	.1
JUN												
03...	8200	--	3200	0	3200	--	--	--	--	120	--	--
22...	6500	1	2600	0	2600	--	--	90	0	90	1.0	.8
JUL												
09...	40000	11	15000	1000	14000	--	--	--	--	520	--	--
21...	37000	79	18000	7000	11000	<.1	390	700	210	490	.8	.2
AUG												
19...	140000	16	42000	0	42000	--	--	--	--	1400	--	--
27...	150000	62	52000	0	52000	--	--	1600	0	1600	4.9	.3
SEP												
09...	87000	6	39000	0	38000	--	--	--	--	1100	--	--
30...	110000	3	40000	0	40000	--	--	1800	0	1800	2.2	.3

Table 5.--Water-quality data, station 03201700, Big Four Hollow Creek near Lake Hope, Ohio, water years 1979 through 1983--Continued

DATE	TIME	SPECIFIC CONDUCTANCE (uS/cm)	STREAMFLOW, INSTANTANEOUS (ft^3/s)	PH (STANDARD UNITS)	TEMPERATURE, AIR (DEG C)	TEMPERATURE (DEG C)	OXYGEN DEMAND, CHEMICAL (HIGH LEVEL) (MG/L)	ACIDITY (MG/L AS H)	CALCIUM DISSOLVED (MG/L AS CA)	MAGNESIUM, DISSOLVED (MG/L AS MG)	SODIUM, DISSOLVED (MG/L AS NA)	POTASSIUM, DISSOLVED (MG/L AS K)
Water Year 1982												
OCT												
13...	1400	2700	.04	3.0	20.5	14.0	48	17	210	120	12	5.0
NOV												
16...	1200	2000	.50	2.9	--	4.5	--	16	165	81	9.8	3.5
DEC												
17...	1000	2020	.50	2.9	--	1.0	--	12	160	79	10	3.4
JAN												
21...	1100	1500	.10	2.8	1.0	.5	25	9.8	112	55	9.8	2.8
FEB												
24...	1200	600	.66	3.8	--	6.5	--	2.8	43	19	5.2	2.1
MAR												
23...	1100	335	2.0	4.2	--	6.5	--	1.1	26	11	3.3	1.6
APR												
20...	1100	715	.46	3.7	15.0	11.0	--	3.4	45	22	5.6	1.9
MAY												
19...	1330	1400	.10	3.5	29.5	19.5	--	8.6	95	46	7.8	3.0
JUN												
16...	1200	480	1.6	4.3	21.0	17.5	--	2.0	39	17	6.0	2.2
JUL												
14...	1215	1200	.16	3.5	24.0	21.0	100	6.4	79	38	8.1	2.3
AUG												
12...	1000	1100	.20	3.2	18.5	15.0	--	4.4	77	37	7.8	2.5
SEP												
07...	1100	2200	.07	3.2	--	17.0	--	9.6	140	68	10	3.4

Table 5.--Water-quality data, station 03201700, Big Four Hollow Creek near Lake Hope, Ohio, water years 1979 through 1983--Continued

DATE	SULFATE DIS-SOLVED (MG/L AS SO4)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L)	NITRO-GEN, NO2+NO3 TOTAL (MG/L AS N)	NITRO-GEN, AMMONIA + ORGANIC TOTAL (MG/L AS N)	NITRO-GEN, TOTAL (MG/L AS N)	NITRO-GEN, TOTAL (MG/L AS NO3)	PHOS-PHORUS, TOTAL (MG/L AS P)	PHOS-PHORUS TOTAL (MG/L AS PO4)	ALUM-INUM, TOTAL RECOV-ERABLE (UG/L AS AL)	IRON, TOTAL RECOV-ERABLE (UG/L AS FE)	IRON, SUS-PENDED RECOV-ERABLE (UG/L AS FE)
Water Year 1982												
OCT												
13...	1700	26	2720	.13	.80	.93	4.1	.010	.03	34000	100000	0
NOV												
16...	1300	3.8	1990	--	--	--	--	--	--	--	78000	0
DEC												
17...	1500	2.1	1810	--	--	--	--	--	--	--	78000	0
JAN												
21...	840	3.0	1190	.29	.45	.74	3.3	.030	.09	7600	36000	1000
FEB												
24...	260	7.0	411	--	--	--	--	--	--	--	14000	2000
MAR												
23...	140	2.6	215	--	--	--	--	--	--	--	7200	1600
APR												
20...	340	3.0	463	<.10	.21	--	--	<.010	--	67000	22000	5000
MAY												
19...	700	.8	1160	--	--	--	--	--	--	--	49000	4000
JUN												
16...	190	3.3	357	--	--	--	--	--	--	--	8900	2400
JUL												
14...	500	7.0	857	<.10	1.30	--	--	.010	.03	11000	37000	4000
AUG												
12...	520	3.4	844	--	--	--	--	--	--	--	35000	2000
SEP												
07...	910	7.5	1610	--	--	--	--	--	--	--	63000	0

Table 5.--Water-quality data, station 03201700, Big Four Hollow Creek near Lake Hope, Ohio, water years 1979 through 1983--Continued

DATE	IRON, DIS-SOLVED (UG/L AS FE)	LEAD, TOTAL RECOV-ERABLE (UG/L AS PB)	MANGA-NESE, TOTAL RECOV-ERABLE (UG/L AS MN)	MANGA-NESE, SUS-PENDED RECOV. (UG/L AS MN)	MANGA-NESE, DIS-SOLVED (UG/L AS MN)	MERCURY TOTAL RECOV-ERABLE (UG/L AS HG)	NICKEL, TOTAL RECOV-ERABLE (UG/L AS NI)	ZINC, TOTAL RECOV-ERABLE (UG/L AS ZN)	ZINC, SUS-PENDED RECOV-ERABLE (UG/L AS ZN)	ZINC, DIS-SOLVED (UG/L AS ZN)	CARBON, ORGANIC DIS-SOLVED (MG/L AS C)	CARBON, ORGANIC SUS-PENDED TOTAL (MG/L AS C)
Water Year 1982												
OCT												
13...	100000	100	37000	0	37000	.1	200	1400	100	1300	.7	.2
NOV												
16...	78000	3	24000	0	24000	--	--	--	--	1100	--	--
DEC												
17...	78000	<1	23000	0	23000	--	--	--	--	900	--	--
JAN												
21...	35000	12	17000	1000	16000	--	--	630	80	550	.9	--
FEB												
24...	12000	2	5000	0	5000	--	--	--	--	160	--	--
MAR												
23...	5600	11	2500	100	2400	--	--	--	--	84	--	--
APR												
20...	17000	8	4800	200	4600	<.1	97	210	10	200	2.2	.2
MAY												
19...	45000	5	13000	2000	11000	--	--	--	--	560	--	--
JUN												
16...	6500	7	3100	300	2800	--	--	--	--	130	--	--
JUL												
14...	33000	10	9300	400	8900	--	--	400	0	400	4.1	.3
AUG												
12...	33000	11	9700	1000	8700	--	--	--	--	390	--	--
SEP												
07...	63000	13	20000	1000	19000	--	--	--	--	820	--	--

Table 5.--Water-quality data, station 03201700, Big Four Hollow Creek near Lake Hope, Ohio, water years 1979 through 1983--Continued

DATE	TIME	SPECIFIC CONDUCTANCE (uS/cm)	STREAMFLOW, INSTANTANEOUS (ft^3/s)	PH (STANDARD UNITS)	TEMPERATURE, AIR (DEG C)	TEMPERATURE (DEG C)	OXYGEN DEMAND, CHEMICAL (HIGH LEVEL) (MG/L)	ACIDITY (MG/L AS H)	CALCIUM DISSOLVED (MG/L AS CA)	MAGNESIUM, DISSOLVED (MG/L AS MG)	SODIUM, DISSOLVED (MG/L AS NA)	POTASSIUM, DISSOLVED (MG/L AS K)
Water Year 1983												
NOV												
09...	1700	1720	.12	3.0	16.0	10.5	--	14	140	72	12	3.4
JAN												
25...	1405	540	.76	3.9	--	2.5	12	1.3	39	17	5.3	1.8
MAR												
17...	1230	843	.31	3.4	13.0	6.9	--	3.1	55	29	7.5	2.1
MAY												
10...	1130	465	.88	3.9	15.5	12.0	--	1.6	37	15	4.6	1.8
JUN												
29...	1330	1120	.30	3.1	--	20.0	<10	5.3	82	37	7.1	3.0

DATE	SULFATE DISSOLVED (MG/L AS SO4)	CHLORIDE, DISSOLVED (MG/L AS CL)	SOLIDS, RESIDUE AT 180 DEG. C DISSOLVED (MG/L)	NITROGEN, NO2+NO3 TOTAL (MG/L AS N)	NITROGEN, AMMONIA + ORGANIC TOTAL (MG/L AS N)	NITROGEN, TOTAL (MG/L AS N)	NITROGEN, TOTAL (MG/L AS NO3)	PHOSPHORUS, TOTAL (MG/L AS P)	PHOSPHORUS TOTAL (MG/L AS PO4)	ALUMINUM, TOTAL RECOVERABLE (UG/L AS AL)	IRON, TOTAL RECOVERABLE (UG/L AS FE)	IRON, SUSPENDED RECOVERABLE (UG/L AS FE)
NOV												
09...	930	5.0	1370	--	--	--	--	--	--	--	44000	0
JAN												
25...	190	4.2	289	.10	.20	.30	1.3	.420	1.3	400	10000	0
MAR												
17...	400	5.0	564	--	--	--	--	--	--	--	24000	1000
MAY												
10...	200	2.3	299	--	--	--	--	--	--	--	10000	500
JUN												
29...	540	11	705	.10	.40	.50	2.2	<.010	--	240	21000	0

Table 5.--Water-quality data, station 03201700, Big Four Hollow Creek near Lake Hope, Ohio, water years 1979 through 1983--Continued

DATE	IRON, DISSOLVED (UG/L AS FE)	LEAD, TOTAL RECOVERABLE (UG/L AS PB)	MANGANESE, TOTAL RECOVERABLE (UG/L AS MN)	MANGANESE, SUSPENDED RECOV. (UG/L AS MN)	MANGANESE, DISSOLVED (UG/L AS MN)	NICKEL, TOTAL RECOVERABLE (UG/L AS NI)	ZINC, TOTAL RECOVERABLE (UG/L AS ZN)	ZINC, SUSPENDED RECOVERABLE (UG/L AS ZN)	ZINC, DISSOLVED (UG/L AS ZN)	CARBON, ORGANIC DISSOLVED (MG/L AS C)	CARBON, ORGANIC SUSPENDED TOTAL (MG/L AS C)
Water Year 1983											
NOV											
09...	44000	--	16000	0	16000	--	--	--	690	--	--
JAN											
25...	10000	<1	3700	100	3600	--	130	0	130	1.6	.2
MAR											
17...	23000	20	5400	0	5400	--	--	--	220	--	--
MAY											
10...	9500	20	2700	0	2700	--	--	--	210	--	--
JUN											
29...	21000	42	7500	0	7500	140	370	0	370	2.6	.2

Table 6.--Daily suspended-sediment discharge, station 03201700, Big Four Hollow Creek near Lake Hope, Ohio, water years 1979 through 1983

SEDIMENT DISCHARGE, SUSPENDED (TONS PER DAY), WATER YEAR OCTOBER 1978 TO SEPTEMBER 1979, MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.01	.02	.01	6.4	.01	.14	1.8	.00	.06	.00	.01	.08
2	.00	.01	.01	.24	.01	.12	.91	.00	.01	.00	.88	.03
3	.00	.01	6.6	.08	.01	.09	.20	.15	.01	.00	.00	.01
4	.00	.00	4.5	.04	.01	.36	.10	5.6	.01	.21	.00	.02
5	.00	.00	.15	.03	.01	.15	.04	.19	.00	.02	.00	.01
6	.00	.00	.07	.02	.01	.07	.04	.10	.19	.00	.18	.00
7	.00	.00	.15	.16	.00	.10	.02	.06	.01	.00	.01	.06
8	.00	.00	27	.03	.00	.18	.03	.03	3.7	.00	.00	.01
9	.00	.00	16	.03	.00	.08	.43	.02	.07	.01	.00	.00
10	.00	.00	.29	.02	.00	.03	.03	.01	.44	.00	.00	.01
11	.00	.00	.17	.02	.00	.03	.02	.01	.08	.00	1.9	.01
12	.00	.00	.12	.01	.00	.02	.02	.01	.04	.00	.14	.13
13	.80	.00	.10	.19	.00	.01	.26	.01	.03	.00	.05	.20
14	.27	.00	.05	2.3	.00	.02	.08	.00	.02	.00	.02	7.7
15	.01	.01	.03	.17	.00	.01	.03	.00	.01	.00	.01	.09
16	.01	.02	.04	.04	.03	.01	.02	.00	.00	.00	.01	.04
17	.01	2.6	.03	.10	.00	.01	.02	.00	.00	.00	.00	.02
18	.00	.26	.02	.13	.00	.01	.02	.00	.00	.00	.01	.01
19	.00	.00	.03	.05	.00	.01	.02	.00	.00	.00	2.0	.00
20	.00	.00	.22	.85	.01	.01	.01	.00	.04	.00	2.5	.00
21	.01	.00	.84	1.5	.04	.01	.01	.00	.51	.00	41	20
22	.00	.00	.06	.10	.54	.01	.01	.00	.01	.00	.20	3.8
23	.01	.00	.04	.06	2.2	.12	.01	.00	.01	1.3	.13	.24
24	.01	.01	.08	.29	2.1	1.1	.00	.00	.00	.38	.45	.10
25	.01	.00	.04	.11	45	.07	.00	.00	.00	.34	.06	.09
26	2.0	.00	.01	.06	4.4	.03	.01	.04	.00	.07	20	.10
27	.29	.74	.02	.03	.17	.03	.01	3.2	.00	.03	.28	1.1
28	.02	.07	.02	.02	.15	.02	.00	.08	.04	.06	2.1	7.6
29	.01	.04	.02	.01	---	.02	.00	.04	.00	.11	1.1	.19
30	.01	.04	.12	.00	---	.01	.00	.02	.03	.02	.50	.07
31	.03	---	3.0	.01	---	3.6	---	.21	---	.01	.18	---
MEAN	.11	.13	1.9	.42	2.0	.21	.14	.32	.18	.08	2.4	1.4

WTR YR 1979 MEAN .76 MAX 45 MIN .00

Table 6.--Daily suspended-sediment discharge, station 03201700, Big Four Hollow Creek near Lake Hope, Ohio, water years 1979 through 1983--Continued

SEDIMENT DISCHARGE, SUSPENDED (TONS PER DAY), WATER YEAR OCTOBER 1979 TO SEPTEMBER 1980, MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.09	.33	.03	.01	.01	.02	.23	.00	5.4	.00	.00	.05
2	.08	1.8	.02	.01	.02	.02	.14	.02	12	.00	.00	.02
3	.05	.13	.02	.00	.01	.07	.11	.03	.70	.26	.33	.00
4	.08	.11	.02	.01	.01	.03	.09	.00	.18	.00	.01	.00
5	.06	.05	.01	.01	.01	77	.15	.02	.10	.00	.01	.00
6	.11	.03	.02	.00	.01	5.3	.04	.12	1.7	.00	.00	.00
7	.05	.01	.01	.01	.01	1.1	.03	.09	.06	.00	.00	.00
8	5.8	.01	.01	.01	.00	2.2	6.0	.01	.14	.08	.00	.00
9	3.8	3.9	.00	.00	.00	.22	.66	.00	.03	5.5	.00	.69
10	.25	4.6	.00	.00	.00	.09	.11	.00	.22	.41	.00	.21
11	.13	.25	.00	36	.00	.06	.06	.00	.05	.04	2.3	.00
12	.46	.12	.02	.73	.00	.08	.36	5.6	.04	10	.23	.00
13	.17	.03	7.4	.16	.00	1.5	.17	4.4	.03	5.3	.01	.00
14	.08	.03	.18	.24	.00	1.1	9.9	4.4	.01	.33	.04	.29
15	.11	.02	.03	.36	.00	.12	.55	.05	.04	.16	.00	.01
16	.04	.02	.05	.27	.04	.07	.23	.03	.05	.09	.00	.00
17	.06	.04	.03	.17	.02	2.6	.48	5.7	.00	.01	.00	.00
18	.06	.04	.03	.12	.00	.28	.09	.55	.01	.00	.00	.00
19	.05	.03	.02	.07	.03	.10	.05	.36	.00	.00	.43	.00
20	.07	.02	.02	.06	.56	.09	.04	.08	.00	.00	15	.00
21	.03	.01	.01	.07	1.3	31	.04	.06	.00	1.8	12	.00
22	.06	.00	.01	.04	2.7	1.6	.02	.05	.00	7.3	1.8	.00
23	.04	.00	.02	.03	.46	.38	.02	.09	.03	.21	.08	.00
24	.03	.16	.14	.04	.15	.17	.02	.04	.01	.03	.03	.00
25	.00	.23	.21	1.7	.31	.09	.01	.03	.00	.01	.02	.00
26	.00	8.7	.05	.48	.21	.07	.00	.01	.00	.00	.01	.00
27	.00	.24	.03	.04	.10	.08	.02	.01	.17	.08	.00	.00
28	.00	.12	.03	.04	.03	12	.02	.00	.01	.11	.00	.00
29	.20	.14	.03	.02	.02	1.6	.02	.00	.16	.01	.12	.00
30	.03	.04	.03	.03	---	1.9	.01	.00	.22	.00	1.2	.00
31	.04	---	.02	.02	---	2.4	---	.15	---	.00	.02	---
MEAN	.39	.71	.27	1.3	.21	4.6	.66	.71	.71	1.0	1.1	.04

WTR YR 1980 MEAN .99 MAX 77 MIN .00

Table 6.--Daily suspended-sediment discharge, station 03201700, Big Four Hollow Creek near Lake Hope, Ohio, water years 1979 through 1983--Continued

SEDIMENT DISCHARGE, SUSPENDED (TONS PER DAY), WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981, MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	.00	.02	.00	57	.04	.04	.44	.25	.06	.01	.01
2	.00	.00	.02	.00	35	.04	.04	.17	.14	.04	.01	.01
3	.00	.00	.01	.00	.24	.03	.03	.10	.07	.02	.01	.04
4	.00	.00	.00	.00	.11	.04	90	.05	18	.02	.01	.01
5	.00	.00	.00	.00	.04	1.1	60	.04	2.0	.02	.01	.01
6	.00	.00	.00	.00	.02	.08	.17	.82	170	.02	.02	.01
7	.00	.00	.02	.00	.02	.05	.09	.14	1.2	.01	.02	.01
8	.00	.00	.09	.00	.02	.03	.05	.05	.65	.01	.02	.02
9	.00	.00	.41	.00	.02	.03	.05	.04	1.2	.01	.01	.01
10	.00	.00	.10	.00	.40	.02	.04	.14	1.4	.01	.01	.02
11	.00	.00	.05	.00	.53	.02	.04	7.4	.21	.00	.01	.01
12	.00	.00	.05	.00	.15	.09	.13	.85	.13	.00	.01	.01
13	.00	.00	.04	.00	.07	.17	.05	.26	9.6	1.1	.00	.00
14	.00	.00	.00	.00	.06	.12	.04	1.0	.47	.04	.00	.07
15	.00	.00	.00	.00	.06	.06	.04	.83	.10	.02	.00	.04
16	.00	.00	.00	.00	2.2	4.7	.03	.18	.84	.02	.00	.01
17	.00	2.4	.00	.00	1.0	.08	.28	.10	.10	.02	.00	.01
18	.07	.33	.00	.00	.22	.05	.08	.24	.08	.01	.00	.01
19	.00	.00	.00	.00	11	.04	.06	.89	.04	.01	.00	.01
20	.00	.00	.00	.00	12	.04	.05	.36	.03	.01	.00	.00
21	.00	.00	.00	.00	.23	.03	.17	.13	2.9	.01	.00	.01
22	.00	.00	.00	.00	.12	.03	.04	.08	.24	.01	.00	.00
23	.00	.00	.00	.00	3.6	.03	.77	.05	.06	.01	.00	.00
24	.02	.03	.00	.03	.22	.02	.19	.04	.03	.01	.00	.01
25	.27	.01	.00	.08	.15	.02	.09	.03	.03	.01	.01	.01
26	.03	.00	.00	.52	.10	.02	.06	.09	.02	.01	.01	.01
27	.00	4.5	.00	.04	.07	.31	.04	2.5	.02	.01	.01	.01
28	.00	.05	.00	.03	.07	.07	.05	.86	.02	.02	.01	.01
29	.00	.03	.00	.03	---	.08	.04	.14	.02	.02	.01	.00
30	.00	.03	.00	.02	---	.20	.03	3.4	.02	.01	.01	.01
31	.00	---	.00	.01	---	.06	---	.56	---	.01	.01	---
MEAN	.01	.25	.03	.02	4.5	.25	5.1	.71	7.0	.05	.01	.01

WTR YR 1981 MEAN 1.5 MAX 170 MIN .00

Table 6.--Daily suspended-sediment discharge, station 03201700, Big Four Hollow Creek near Lake Hope, Ohio, water years 1979 through 1983--Continued

SEDIMENT DISCHARGE, SUSPENDED (TONS PER DAY), WATER YEAR OCTOBER 1981 TO SEPTEMBER 1982, MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	.00	.04	.00	.51	.02	.11	.00	.00	.00	.00	.00
2	.00	.00	.01	.00	.09	.02	.08	.00	.03	.00	.00	.00
3	.00	.00	.01	.01	.04	.02	1.3	.00	.02	2.0	.00	.00
4	.00	.00	.01	.40	.02	.50	.15	.00	.02	.16	.03	.00
5	.01	.00	.00	.03	.02	.30	.07	.00	1.7	.07	.00	.00
6	.04	.02	.01	.02	.02	.15	.11	.00	.14	.04	.00	.00
7	.02	.00	.01	.00	.02	.10	.08	.00	.05	.04	.00	.00
8	.01	.00	.00	.00	.01	.05	.08	.05	.03	.09	.01	.00
9	.00	.01	.00	.00	.01	.04	.23	.01	.02	.07	.15	.00
10	.00	.01	.00	.00	.01	.04	.11	.00	.06	.03	.01	.00
11	.00	.00	.01	.00	.00	.31	.07	.00	.01	.02	.00	.00
12	.00	.00	.00	.00	.00	.23	.05	.00	.01	.02	.00	.00
13	.00	.00	.00	.00	.00	2.1	.04	.00	.00	.02	.00	.00
14	.00	.00	.00	.00	.00	.47	.05	.00	.00	.00	.00	.00
15	.00	.00	.00	.00	.06	1.0	.03	.00	.00	.00	.00	.00
16	.00	.00	.00	.00	.45	5.5	.04	.00	1.9	.00	.00	.00
17	.00	.00	.00	.00	.47	.73	.04	.00	.29	.00	.00	.00
18	.08	.00	.00	.00	.26	.06	.04	.00	.05	.00	.00	.00
19	.03	.00	.00	.00	.12	.11	.03	.00	.03	.00	.00	.00
20	.00	.01	.00	.00	.21	10	.03	.00	.02	.03	.00	.00
21	.00	.01	.00	.00	.08	1.6	.02	.00	.01	.01	.00	.00
22	.00	.00	.01	.07	.04	.14	.02	.02	.00	.00	.00	.00
23	.02	.00	.14	5.7	.04	.09	.01	.00	.00	.00	.00	.00
24	.00	.02	.02	.13	.03	.13	.01	.00	.00	.00	.00	.00
25	.01	.01	.00	.04	.03	.11	.00	.00	.00	.00	.00	.00
26	.01	.01	.00	.02	.02	.06	.00	.00	.00	.00	.00	.00
27	.00	.00	.00	.02	.02	.05	.00	.00	.00	.00	.00	.00
28	.00	.00	.00	.02	.02	.04	.00	.00	.00	.00	.00	.00
29	.00	.00	.00	.01	---	.04	.00	4.5	.00	.00	.00	.00
30	.00	.00	.00	.01	---	.05	.00	3.5	.02	.00	.00	.00
31	.00	---	.00	2.0	---	1.2	---	.18	---	.00	.00	---
MEAN	.01	.00	.01	.27	.09	.81	.09	.27	.15	.08	.01	.00

WTR YR 1982 MEAN .15 MAX 10 MIN .00

Table 6.--Daily suspended-sediment discharge, station 03201700, Big Four Hollow Creek near Lake Hope, Ohio, water years 1979 through 1983--Continued

SEDIMENT DISCHARGE, SUSPENDED (TONS PER DAY), WATER YEAR OCTOBER 1982 TO SEPTEMBER 1983, MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	.00	.00	.03	.03	.02	.02	.12	.07			
2	.00	.00	.00	.03	2.6	.02	.44	1.1	.03			
3	.00	.00	.00	.02	.22	.02	.23	4.0	.42			
4	.00	.00	.00	.02	.13	.02	.05	.62	1.4			
5	.00	.00	.15	.01	.07	.01	.05	.11	.10			
6	.00	.00	.06	.01	.07	.01	.11	.10	.05			
7	.00	.00	.03	.02	.06	.00	.19	.08	.05			
8	.02	.00	.00	.02	.05	.01	23	.07	.03			
9	.02	.00	.01	.02	.04	.00	35	.05	.02			
10	.00	.00	.00	.02	.04	.00	.34	.06	.00			
11	.00	.00	.00	.02	.04	.01	.19	.08	.00			
12	.00	.00	.00	.02	.03	.00	.08	.06	.00			
13	.00	.00	.00	.02	.03	.00	.09	.05	.00			
14	.00	.00	.00	.02	.04	.00	1.4	.06	.00			
15	.00	.00	2.0	.02	.05	.01	1.4	.27	.00			
16	.00	.00	.65	.01	.08	.01	.10	.50	.00			
17	.00	.00	.07	.01	.07	.01	.06	.11	.00			
18	.01	.00	.02	.00	.05	.01	.07	.08	.00			
19	.00	.00	.22	.00	.04	.02	.04	2.1	.00			
20	.00	.00	.13	.01	.03	.02	.03	.95	.00			
21	.01	.02	.04	.07	.03	.03	.04	.89	.00			
22	.02	.00	.02	.25	.03	.01	.03	1.3	.00			
23	.01	.10	.93	.06	.03	.02	.02	.48	.00			
24	.00	.04	.23	.07	.03	.00	.05	.11	.00			
25	.00	.00	.22	.04	.02	.02	.05	.09	.00			
26	.00	.00	.17	.04	.02	.02	.03	.08	.00			
27	.00	.00	.15	.03	.02	.01	.03	.07	.00			
28	.00	.46	.10	.03	.03	.01	.03	.07	.00			
29	.00	.05	.06	.03	---	.01	.03	.86	.01			
30	.00	.01	.03	.03	---	.02	.29	.16	.00			
31	.00	---	.03	.03	---	.02	---	.04	---			
MEAN	.00	.02	.17	.03	.14	.01	2.1	.47	.07			

WTR YR 1983 MEAN .34 MAX 35 MIN .00

NOTE: NUMBER OF MISSING DAYS OF RECORD EXCEEDED 20% OF YEAR

Table 7.--Water-quality data, station 03201722, Sandy Run below Hull Hollow Creek near Lake Hope, Ohio, water years 1979 through 1981

[MG/L, milligrams per liter; UG/L, micrograms per liter]

DATE	TIME	SPECIFIC CONDUCTANCE (µS/cm)	PH FIELD (UNITS)	TEMPERATURE, WATER (DEG C)	OXYGEN DEMAND, CHEMICAL (HIGH LEVEL) (MG/L)	HARDNESS (MG/L AS CACO3)	HARDNESS, NONCARBONATE (MG/L CACO3)	ACIDITY TOTAL HEATED (MG/L AS H)	ACIDITY (MG/L AS CACO3)	CALCIUM DISSOLVED (MG/L AS CA)	MAGNESIUM, DISSOLVED (MG/L AS MG)
WATER YEAR 1979											
OCT											
13...	1300	410	4.6	13.0	27	130	130	.4	20	32	13
24...	1300	1100	3.1	9.0	15	390	390	3.6	179	88	41
NOV											
06...	1500	1100	3.2	12.0	14	340	340	3.0	149	77	36
21...	1100	720	3.1	7.5	3	210	210	1.5	74	48	23
30...	1130	470	3.3	5.0	13	170	170	1.0	50	40	18
DEC											
21...	1430	275	4.1	4.5	27	94	94	.5	25	22	9.5
JAN											
04...	1430	350	3.6	1.0	25	110	110	.8	40	24	12
16...	1400	320	3.9	1.0	2	120	120	.6	30	27	13
FEB											
01...	1300	430	3.5	.5	10	140	140	.8	40	31	14
15...	1530	620	3.4	.0	4	190	190	1.8	89	42	20
27...	1400	270	3.9	5.0	13	76	76	.5	25	18	7.6
MAR											
13...	1000	450	3.5	2.5	12	140	140	1.3	65	33	15
26...	1330	350	4.1	6.0	17	110	110	.4	20	25	11
APR											
11...	1000	285	4.2	6.5	14	100	100	.4	20	24	10
30...	1100	480	3.4	10.0	9	150	150	1.0	50	35	16
MAY											
15...	1200	540	3.6	15.5	17	160	160	.9	45	36	16
30...	1230	570	3.6	14.5	4	160	160	1.0	50	36	16
JUN											
11...	1330	390	4.2	17.0	12	130	130	.6	30	31	12
28...	1330	780	3.3	18.5	10	250	250	2.5	124	55	27
JUL											
09...	1300	500	4.1	17.0	6	160	160	.5	25	37	16
26...	1100	1100	3.4	19.5	11	340	340	3.7	184	77	36
AUG											
08...	1015	1000	3.0	20.5	28	280	280	2.6	129	66	29
23...	1030	320	4.6	18.0	40	120	120	.4	20	30	12
SEP											
05...	1200	710	3.3	20.0	9	220	220	1.9	94	51	22
17...	1130	740	3.5	13.0	5	220	220	1.9	94	50	23

Table 7.--Water-quality data, station 03201722, Sandy Run below Hull Hollow Creek near Lake Hope, Ohio, water years 1979 through 1981--Continued

DATE	SODIUM, DIS-SOLVED (MG/L AS NA)	SODIUM PERCENT	SODIUM AD-SORP-TION RATIO	SODIUM+ POTAS-SIUM DIS-SOLVED (MG/L AS NA)	POTAS-SIUM, DIS-SOLVED (MG/L AS K)	BICAR-BONATE (MG/L AS HCO3)	CAR-BONATE (MG/L AS CO3)	ALKA-LINITY (MG/L AS CACO3)	CARBON DIOXIDE DIS-SOLVED (MG/L AS CO2)	SULFATE DIS-SOLVED (MG/L AS SO4)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)
WATER YEAR 1979											
OCT											
13...	9.6	13	.4	--	2.5	0	0	0	.0	160	9.0
24...	20	10	.4	--	3.2	0	0	0	.0	540	16
NOV											
06...	18	10	.4	--	2.8	0	0	0	.0	470	15
21...	12	11	.4	--	2.4	0	0	0	.0	260	13
30...	9.5	10	.3	--	2.2	0	0	0	.0	200	9.5
DEC											
21...	5.1	10	.2	--	1.7	0	0	0	.0	110	4.6
JAN											
04...	5.1	9	.2	--	1.6	0	0	0	.0	140	4.7
16...	6.0	10	.2	--	1.4	0	0	0	.0	120	5.3
FEB											
01...	8.2	12	.3	--	1.7	0	0	0	.0	170	8.4
15...	11	11	.4	--	1.9	0	0	0	.0	270	8.6
27...	5.0	12	.3	--	1.4	0	0	0	.0	94	6.8
MAR											
13...	8.4	11	.3	--	1.7	0	0	0	.0	190	9.2
26...	7.3	13	.3	--	1.4	0	0	0	.0	120	8.5
APR											
11...	6.7	12	.3	--	1.6	0	0	0	.0	110	7.4
30...	9.1	11	.3	--	2.1	0	0	0	.0	220	8.2
MAY											
15...	11	13	.4	--	2.1	0	0	0	.0	200	9.4
30...	9.1	11	.3	11	1.9	0	0	0	.0	220	8.7
JUN											
11...	7.0	11	.3	--	1.8	0	0	0	.0	150	8.4
28...	18	13	.5	20	2.3	0	0	0	.0	350	15
JUL											
09...	15	17	.5	--	2.3	0	0	0	.0	190	14
26...	16	9	.4	19	3.2	0	0	0	.0	510	10
AUG											
08...	16	11	.4	19	2.8	0	0	0	.0	400	15
23...	8.2	12	.3	10	2.0	2	0	2	80	140	7.1
SEP											
05...	14	12	.4	16	2.4	0	0	0	.0	280	13
17...	16	14	.5	18	2.1	0	0	0	.0	280	18

Table 7.--Water-quality data, station 03201722, Sandy Run below Hull Hollow Creek near Lake Hope, Ohio, water years 1979 through 1981--Continued

DATE	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L)	SOLIDS, DIS-SOLVED (TONS PER AC-FT)	NITRO-GEN, NO2+NO3 TOTAL (MG/L AS N)	NITRO-GEN, AM-MONIA + ORGANIC TOTAL (MG/L AS N)	NITRO-GEN, TOTAL (MG/L AS N)	NITRO-GEN, TOTAL (MG/L AS NO3)	PHOS-PHORUS, TOTAL (MG/L AS P)	PHOS-PHORUS, ORTHOPH OSPHATE TOTAL (MG/L AS PO4)	PHOS-PHORUS, TOTAL (MG/L AS PO4)	ALUM-INUM, TOTAL RECOV-ERABLE (UG/L AS AL)	ANTI-MONY, TOTAL (UG/L AS SB)
WATER YEAR 1979											
OCT											
13...	241	.33	.49	.30	.79	3.5	.010	--	--	2900	3
24...	794	1.08	.20	.19	.39	1.7	.120	--	--	10000	1
NOV											
06...	683	.93	.18	.09	.27	1.2	.000	--	--	12000	0
21...	404	.55	.16	.11	.27	1.2	.000	--	--	5800	0
30...	303	.41	.15	.11	.26	1.2	.010	--	--	3900	0
DEC											
21...	173	.24	.11	.07	.18	.80	.000	--	--	1600	0
JAN											
04...	219	.30	.12	.01	.13	.58	.000	--	--	3100	0
16...	193	.26	.12	.04	.16	.71	.000	--	--	1400	0
FEB											
01...	256	.35	.10	.24	.34	1.5	.000	--	--	3300	0
15...	395	.54	.19	.38	.57	2.5	.000	--	--	4500	0
27...	153	.21	.19	.07	.26	1.2	.000	--	--	2300	0
MAR											
13...	292	.40	.11	.16	.27	1.2	.000	--	--	4000	0
26...	201	.27	.12	.20	.32	1.4	.000	--	--	2400	0
APR											
11...	193	.26	.06	.12	.18	.80	.010	--	--	2700	0
30...	311	.42	.08	.20	.28	1.2	.000	.00	.00	3800	0
MAY											
15...	325	.44	.10	.16	.26	1.2	.000	.00	.00	3800	0
30...	315	.43	.08	.11	.19	.84	.000	.00	.00	4700	0
JUN											
11...	266	.36	.08	.09	.17	.75	.010	.03	.03	3000	0
28...	575	.78	.13	.08	.21	.93	.000	.00	.00	8300	0
JUL											
09...	341	.46	.14	.20	.34	1.5	.000	--	.00	2700	0
26...	839	1.14	.12	.25	.37	1.6	.030	--	.09	13000	0
AUG											
08...	647	.88	.11	.19	.30	1.3	.000	--	.00	9200	0
23...	237	.32	.10	.22	.32	1.4	.010	--	.03	2300	0
SEP											
05...	496	.67	.02	.10	.12	.53	.000	--	.00	6500	0
17...	470	.64	.12	.16	.28	1.2	.000	--	.00	7200	0

Table 7.--Water-quality data, station 03201722, Sandy Run below Hull Hollow Creek near Lake Hope, Ohio, water years 1979 through 1981--Continued

DATE	ARSENIC TOTAL (UG/L AS AS)	BERYLLIUM, TOTAL RECOVERABLE (UG/L AS BE)	CADMIUM TOTAL RECOVERABLE (UG/L AS CD)	CHROMIUM, TOTAL RECOVERABLE (UG/L AS CR)	COPPER, TOTAL RECOVERABLE (UG/L AS CU)	IRON, TOTAL RECOVERABLE (UG/L AS FE)	IRON, SUSPENDED RECOVERABLE (UG/L AS FE)	IRON, DISSOLVED (UG/L AS FE)	LEAD, TOTAL RECOVERABLE (UG/L AS PB)	MANGANESE, TOTAL RECOVERABLE (UG/L AS MN)	MANGANESE, SUSPENDED RECOV. (UG/L AS MN)
water year 1979											
OCT											
13...	0	0	7	0	6	2200	--	500	43	1600	--
24...	0	10	12	1	20	5400	--	5000	71	5600	--
NOV											
06...	0	10	14	3	12	3800	--	3500	200	4600	--
21...	0	5	3	4	7	6000	--	4500	22	3000	--
30...	0	0	3	2	4	4900	--	2800	22	1900	--
DEC											
21...	1	0	3	1	7	3500	--	1200	10	710	--
JAN											
04...	1	10	1	0	5	5500	--	3700	11	1000	--
16...	1	0	1	6	4	4700	--	2300	16	880	--
FEB											
01...	0	10	6	0	4	5900	--	3900	93	1300	--
15...	0	10	1	2	8	8400	--	7900	4	2000	--
27...	0	0	19	2	5	3900	--	2000	220	600	--
MAR											
13...	1	0	1	0	6	7700	--	7000	10	1300	--
26...	1	0	1	0	4	3800	--	1500	16	830	--
APR											
11...	0	0	7	6	3	3000	--	680	60	720	--
30...	0	0	13	6	5	6100	1800	4300	170	1300	100
MAY											
15...	1	10	4	4	5	3700	1400	2300	37	1400	0
30...	0	0	2	11	6	5700	1600	4100	16	1400	0
JUN											
11...	0	0	10	6	5	5300	3000	2300	42	1100	0
28...	1	10	0	9	9	4300	300	4000	3	2700	0
JUL											
09...	2	0	0	16	6	1200	870	330	4	1400	0
26...	2	10	0	17	0	24000	0	24000	2	5500	0
AUG											
08...	2	10	1	14	14	6100	0	6100	6	4900	300
23...	3	0	1	1	5	3800	1700	2100	6	1400	100
SEP											
05...	0	0	0	0	8	4200	--	3700	10	3000	300
17...	0	10	0	5	7	12000	--	3400	4	2000	100

Table 7.--Water-quality data, station 03201722, Sandy Run below Hull Hollow Creek near Lake Hope, Ohio, water years 1979 through 1981--Continued

DATE	MANGANESE, DISSOLVED (UG/L AS MN)	MERCURY TOTAL RECOVERABLE (UG/L AS HG)	NICKEL, TOTAL RECOVERABLE (UG/L AS NI)	SELENIUM, TOTAL (UG/L AS SE)	SILVER, TOTAL RECOVERABLE (UG/L AS AG)	ZINC, SUSPENDED RECOVERABLE (UG/L AS ZN)	ZINC, DISSOLVED (UG/L AS ZN)	ZINC, TOTAL RECOVERABLE (UG/L AS ZN)	CARBON, ORGANIC DISSOLVED (MG/L AS C)	CARBON, ORGANIC SUSPENDED (MG/L AS C)	PHENOLS (UG/L)
WATER YEAR 1979											
OCT											
13...	1600	<.5	49	0	0	--	60	90	4.3	.8	1
24...	5600	<.5	150	0	0	--	350	350	1.9	.4	0
NOV											
06...	10	<.5	150	0	0	--	310	320	1.1	.1	0
21...	2400	<.5	81	0	0	--	130	160	2.3	.3	0
30...	1900	<.5	53	0	0	--	100	100	.8	.2	4
DEC											
21...	710	<.5	36	0	0	--	50	110	3.7	.7	3
JAN											
04...	1000	<.5	44	0	0	--	90	90	1.2	.0	3
16...	880	<.5	19	0	0	--	90	110	2.9	.2	0
FEB											
01...	1300	<.5	39	0	0	--	80	80	2.2	.1	0
15...	2000	<.5	76	0	0	--	140	190	1.0	--	0
27...	600	<.5	32	0	0	--	30	60	8.7	--	0
MAR											
13...	1300	<.5	57	0	0	--	300	300	2.9	.2	4
26...	830	<.5	34	0	0	--	70	70	1.4	.2	2
APR											
11...	720	<.5	46	0	0	--	70	70	3.9	.2	0
30...	1200	<.5	70	0	0	20	120	140	1.4	.1	0
MAY											
15...	1400	<.5	76	0	0	0	120	120	4.6	.1	1
30...	1400	<.5	43	0	0	0	120	120	1.7	--	0
JUN											
11...	1100	<.5	48	0	0	10	60	70	1.8	.2	0
28...	2700	<.5	90	0	0	0	190	190	6.7	.1	0
JUL											
09...	1400	<.5	58	0	0	30	120	150	2.0	.3	0
26...	5500	<.5	0	0	0	30	330	360	3.4	.0	0
AUG											
08...	4600	<.5	100	0	0	0	260	260	1.8	.1	0
23...	1300	<.5	26	0	1	0	70	70	4.7	.5	0
SEP											
05...	2700	<.5	75	0	0	0	180	180	2.4	.1	2
17...	1900	<.5	79	0	0	40	130	170	3.8	.0	480

Table 7.--Water-quality data, station 03201722, Sandy Run below Hull Hollow Creek near Lake Hope, Ohio, water years 1979 through 1981--Continued

DATE	TIME	SPECIFIC CONDUCTANCE (µS/cm)	PH (UNITS)	TEMPERATURE, WATER (DEG C)	OXYGEN DEMAND, CHEMICAL (HIGH LEVEL) (MG/L)	HARDNESS (MG/L AS CACO3)	HARDNESS, NONCARBONATE (MG/L CACO3)	ACIDITY TOTAL HEATED (MG/L AS H)	ACIDITY (MG/L AS CACO3)	CALCIUM DISSOLVED (MG/L AS CA)	MAGNESIUM, DISSOLVED (MG/L AS MG)
WATER YEAR 1980											
OCT											
02...	1500	490	3.9	15.5	18	160	160	1.6	79	34	17
23...	1515	725	3.3	11.5	6	200	200	1.7	84	47	21
NOV											
09...	1600	245	5.6	8.0	96	97	91	--	--	24	9.1
20...	1300	475	3.8	7.5	48	150	150	.9	45	35	16
DEC											
06...	1100	460	3.9	5.5	13	150	150	1.2	60	35	16
20...	1430	340	4.5	2.5	14	130	130	.6	30	31	13
JAN											
10...	1630	460	4.0	.5	5	160	160	1.2	60	37	16
24...	1015	385	4.2	.0	13	150	150	.8	40	36	15
FEB											
12...	1130	540	3.7	.5	20	180	180	1.4	70	42	18
28...	1300	380	4.2	.5	81	140	140	.8	40	34	14
MAR											
12...	1300	270	5.0	2.0	85	110	110	--	--	27	11
25...	1030	280	5.2	5.5	6	110	110	--	--	26	11
APR											
08...	1545	370	4.5	12.0	15	130	130	.8	40	30	13
24...	1030	330	4.7	10.0	7	120	120	.5	25	29	12
MAY											
09...	1030	340	3.8	8.0	--	180	180	1.2	60	40	19
23...	1230	490	4.1	15.0	18	160	160	1.2	60	38	16
JUN											
12...	1130	490	4.2	12.5	--	170	170	1.4	70	40	18
24...	1200	890	3.4	17.5	16	280	280	2.8	139	63	29
JUL											
10...	0930	315	7.3	17.5	3	120	110	--	--	30	11
21...	1230	720	3.7	23.0	--	230	230	1.7	84	52	24
AUG											
06...	1530	690	3.5	24.0	--	--	--	1.4	70	--	--
19...	1100	420	5.8	20.0	12	160	150	.3	15	39	15
SEP											
08...	1600	750	3.4	20.0	--	270	270	2.0	99	63	28
22...	1200	830	4.0	17.0	16	260	--	2.2	109	58	27

Table 7.--Water-quality data, station 03201722, Sandy Run below Hull Hollow Creek near Lake Hope, Ohio, water years 1979 through 1981--Continued

DATE	SODIUM, DISSOLVED (MG/L AS NA)	SODIUM PERCENT	SODIUM ADSORPTION RATIO	SODIUM+POTASSIUM DISSOLVED (MG/L AS NA)	POTASSIUM, DISSOLVED (MG/L AS K)	BICARBONATE (MG/L AS HCO3)	CARBONATE (MG/L AS CO3)	ALKALINITY (MG/L AS CACO3)	CARBON DIOXIDE DISSOLVED (MG/L AS CO2)	SULFATE DISSOLVED (MG/L AS SO4)	CHLORIDE, DISSOLVED (MG/L AS CL)
WATER YEAR 1980											
OCT											
02...	7.9	10	.3	10	2.4	0	0	0	.0	200	6.1
23...	12	18	.4	15	3.2	0	0	0	.0	260	7.7
NOV											
09...	5.8	16	.3	9.2	3.4	8	0	7	32	94	3.9
20...	9.5	19	.3	11	1.8	0	0	0	.0	190	6.5
DEC											
06...	10	20	.4	12	1.8	0	0	0	.0	180	6.2
20...	7.4	17	.3	8.9	1.5	0	0	0	.0	150	5.6
JAN											
10...	8.7	17	.3	11	1.8	0	0	0	.0	210	7.5
24...	7.9	16	.3	9.7	1.8	0	0	0	.0	180	6.5
FEB											
12...	9.9	11	.3	12	1.7	0	0	0	.0	230	7.2
28...	8.7	12	.3	10	1.5	0	0	0	.0	180	7.4
MAR											
12...	5.8	10	.2	6.9	1.1	2	0	2	32	120	5.8
25...	5.4	9	.2	7.0	1.6	6	0	5	61	100	4.9
APR											
08...	7.8	12	.3	--	1.6	0	0	0	.0	160	5.1
24...	7.0	11	.3	--	2.0	0	0	0	.0	150	5.5
MAY											
09...	11	12	.4	--	2.0	0	0	0	.0	220	7.2
23...	9.4	11	.3	--	2.9	0	0	0	.0	190	7.1
JUN											
12...	11	12	.4	--	2.3	0	0	0	.0	220	9.1
24...	15	10	.4	--	2.9	0	0	0	.0	360	10
JUL											
10...	7.3	11	.3	--	2.2	18	0	15	1.4	120	5.2
21...	16	13	.5	--	3.3	0	0	0	.0	290	5.1
AUG											
06...	--	--	--	--	--	0	0	0	.0	--	--
19...	10	12	.3	--	2.5	7	0	6	18	170	7.0
SEP											
08...	13	9	.3	--	2.9	0	0	0	.0	310	9.3
22...	15	11	.4	--	3.5	--	--	--	--	370	10

Table 7.--Water-quality data, station 03201722, Sandy Run below Hull Hollow Creek near Lake Hope, Ohio, water years 1979 through 1981--Continued

DATE	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L)	SOLIDS, DIS-SOLVED (TONS PER AC-FT)	NITRO-GEN, NO2+NO3 TOTAL (MG/L AS N)	NITRO-GEN, AM-MONIA + ORGANIC TOTAL (MG/L AS N)	NITRO-GEN, TOTAL (MG/L AS N)	NITRO-GEN, TOTAL (MG/L AS NO3)	PHOS-PHORUS, TOTAL (MG/L AS P)	PHOS-PHORUS, TOTAL (MG/L AS PO4)	ALUM-INUM, TOTAL RECOV-ERABLE (UG/L AS AL)	ANTI-MONY, TOTAL (UG/L AS SB)	ARSENIC TOTAL (UG/L AS AS)
WATER YEAR 1980											
OCT											
02...	325	.44	.09	.22	.31	1.4	.030	.09	4800	0	2
23...	410	.56	.02	.35	.37	1.6	.000	.00	4200	0	1
NOV											
09...	170	.23	.20	1.4	1.6	7.1	.220	.67	10000	0	2
20...	292	.40	--	--	--	--	--	--	2900	0	1
DEC											
06...	281	.38	.15	.17	.32	1.4	.000	.00	3300	6	0
20...	236	.32	.14	.20	.34	1.5	.010	.03	3200	0	0
JAN											
10...	310	.42	.11	.13	.24	1.1	.000	.00	3900	0	0
24...	284	.39	.11	.38	.49	2.2	.010	.03	3700	0	0
FEB											
12...	372	.51	.08	.39	.47	2.1	.010	.03	4300	0	2
28...	283	.38	.19	.21	.40	1.8	.010	.03	3400	0	1
MAR											
12...	189	.26	.16	.06	.22	.97	.010	.03	290	0	1
25...	196	.27	.16	.11	.27	1.2	.010	.03	1000	0	0
APR											
08...	253	.34	.11	.14	.25	1.1	.020	.06	2900	0	1
24...	236	.32	.10	.19	.29	1.3	.010	.03	2100	0	0
MAY											
09...	392	.53	--	--	--	--	--	--	--	--	--
23...	320	.44	.13	.84	.97	4.3	.030	.09	3400	--	--
JUN											
12...	363	.49	--	--	--	--	--	--	--	--	--
24...	614	.84	.19	.13	.32	1.4	.010	.03	9000	--	--
JUL											
10...	230	.31	.20	.16	.36	1.6	.010	.03	1500	--	--
21...	508	.69	--	--	--	--	--	--	--	--	--
AUG											
06...	--	--	--	--	--	--	--	--	--	--	--
19...	303	.41	.14	.11	.25	1.1	.010	.03	610	--	--
SEP											
08...	545	.74	--	--	--	--	--	--	--	--	--
22...	625	.85	.18	.09	.27	1.2	.010	.03	--	--	--

Table 7.--Water-quality data, station 03201722, Sandy Run below Hull Hollow Creek near Lake Hope, Ohio, water years 1979 through 1981--Continued

DATE	BERYLLIUM, TOTAL RECOVERABLE (UG/L AS BE)	CADMIUM TOTAL RECOVERABLE (UG/L AS CD)	CHROMIUM, TOTAL RECOVERABLE (UG/L AS CR)	COPPER, TOTAL RECOVERABLE (UG/L AS CU)	IRON, TOTAL RECOVERABLE (UG/L AS FE)	IRON, SUSPENDED RECOVERABLE (UG/L AS FE)	IRON, DISSOLVED (UG/L AS FE)	LEAD, TOTAL RECOVERABLE (UG/L AS PB)	MANGANESE, TOTAL RECOVERABLE (UG/L AS MN)	MANGANESE, SUSPENDED RECOV. (UG/L AS MN)	MANGANESE, DISSOLVED (UG/L AS MN)
WATER YEAR 1980											
OCT											
02...	10	0	12	7	21000	--	15000	2	2000	200	1800
23...	10	1	15	7	5900	--	5400	0	2300	0	2300
NOV											
09...	0	0	20	15	25000	--	460	10	990	220	770
20...	0	0	8	4	4200	--	1800	0	1600	0	1600
DEC											
06...	10	0	6	3	5700	--	2800	0	1500	0	1500
20...	10	0	4	4	3300	2400	890	1	1300	0	1300
JAN											
10...	20	0	7	5	6000	3400	2600	2	1700	0	1700
24...	10	0	1	4	5400	4000	1400	0	1700	0	1700
FEB											
12...	10	0	53	4	4600	1200	3400	0	2100	0	2100
28...	0	2	12	3	6500	4300	2200	14	1400	0	1400
MAR											
12...	0	0	2	4	3000	2400	640	4	980	0	980
25...	0	0	4	2	2700	2000	670	0	820	0	820
APR											
08...	10	0	4	7	9100	7000	2100	0	1200	0	1200
24...	0	0	3	6	2700	2200	550	1	1300	100	1200
MAY											
09...	--	--	--	--	2200	600	1600	0	2000	0	2000
23...	--	--	--	--	6500	4600	1900	1	1900	100	1800
JUN											
12...	--	--	--	--	1900	900	1000	2	2400	0	2400
24...	--	--	--	--	3500	0	3500	6	4100	0	4100
JUL											
10...	--	--	--	--	2600	2000	630	2	1500	0	1500
21...	--	--	--	--	10000	9000	1000	0	3900	0	3900
AUG											
06...	--	--	--	--	1300	--	--	9	3600	--	--
19...	--	--	--	--	1500	840	660	6	2100	100	2000
SEP											
08...	--	--	--	--	2300	0	2300	3	4400	100	4300
22...	--	--	--	--	--	--	1600	--	--	--	5300

Table 7.--Water-quality data, station 03201722, Sandy Run below Hull Hollow Creek near Lake Hope, Ohio, water years 1979 through 1981--Continued

DATE	MERCURY TOTAL RECOV-ERABLE (UG/L AS HG)	NICKEL, TOTAL RECOV-ERABLE (UG/L AS NI)	SELE-NIUM, TOTAL (UG/L AS SE)	SILVER, TOTAL RECOV-ERABLE (UG/L AS AG)	ZINC, SUS-PENDED RECOV-ERABLE (UG/L AS ZN)	ZINC, DIS-SOLVED (UG/L AS ZN)	ZINC, TOTAL RECOV-ERABLE (UG/L AS ZN)	CARBON, ORGANIC DIS-SOLVED (MG/L AS C)	CARBON, ORGANIC SUS-PENDED (MG/L AS C)	PHENOLS (UG/L)
WATER YEAR 1980										
OCT										
02...	<.5	49	0	0	10	110	120	3.5	1.0	0
23...	<.1	60	0	0	0	160	160	1.5	.1	0
NOV										
09...	.1	35	0	0	60	40	100	6.2	100	0
20...	<.1	39	0	0	20	70	90	4.6	.2	4
DEC										
06...	1.0	45	0	0	0	130	130	4.3	.4	0
20...	.1	26	0	0	0	100	100	2.9	.2	0
JAN										
10...	<.1	39	0	0	0	110	110	4.3	.1	0
24...	.4	36	0	0	0	120	120	4.2	.5	0
FEB										
12...	<.1	48	0	0	0	130	130	1.4	--	0
28...	.3	29	0	0	0	90	90	1.9	.2	0
MAR										
12...	.1	25	0	0	0	50	50	1.2	.4	0
25...	.1	23	0	0	0	120	120	3.5	.8	7
APR										
08...	.1	31	0	0	0	70	70	2.1	.3	0
24...	<.1	25	0	0	10	50	60	4.0	.2	0
MAY										
09...	--	--	--	--	--	120	--	--	--	--
23...	--	--	--	--	0	160	160	5.5	1.0	--
JUN										
12...	--	--	--	--	--	90	--	--	--	--
24...	--	--	--	--	0	210	210	9.2	.2	--
JUL										
10...	.3	22	--	--	0	50	50	1.2	.1	--
21...	--	--	--	--	--	280	--	--	--	--
AUG										
06...	--	--	--	--	--	--	--	--	--	--
19...	--	--	--	--	10	60	70	2.9	.5	--
SEP										
08...	--	--	--	--	--	20	--	--	--	--
22...	--	--	--	--	--	230	--	1.7	--	--

Table 7.--Water-quality data, station 03201722, Sandy Run below Hull Hollow Creek near Lake Hope, Ohio, water years 1979 through 1981--Continued

DATE	TIME	SPECIFIC CONDUCTANCE (µS/cm)	PH (STANDARD UNITS)	TEMPERATURE, AIR (DEG C)	TEMPERATURE (DEG C)	OXYGEN DEMAND, CHEMICAL (HIGH LEVEL) (MG/L)	ACIDITY (MG/L AS H)	CALCIUM DISSOLVED (MG/L AS CA)	MAGNESIUM, DISSOLVED (MG/L AS MG)	SODIUM, DISSOLVED (MG/L AS NA)	POTASSIUM, DISSOLVED (MG/L AS K)	SULFATE DISSOLVED (MG/L AS SO4)
Water Year 1981												
OCT												
07...	1030	1000	3.3	--	10.0	--	2.9	76	37	18	--	450
21...	1100	1000	3.5	10.0	9.5	13	3.0	86	36	16	3.4	450
NOV												
05...	1030	1000	3.5	7.0	6.0	--	3.2	76	36	19	3.2	440
19...	1115	725	4.0	--	2.0	16	1.6	55	25	12	2.8	320
DEC												
04...	1030	660	4.2	3.0	1.0	--	1.5	47	22	12	2.3	260
18...	1600	695	3.6	--	4.0	9	1.6	46	22	11	1.9	280
JAN												
07...	1500	780	3.8	--	.5	--	2.0	62	27	12	2.3	340
22...	1115	675	3.6	--	.5	<10	1.6	50	15	12	2.0	280
FEB												
05...	1130	446	4.4	--	.5	--	1.1	31	12	6.0	1.8	190
17...	1630	225	5.6	--	4.0	14	.4	19	7.8	6.4	1.5	85
MAR												
11...	1030	435	4.0	--	3.5	--	1.0	30	14	8.0	1.7	200
24...	1100	480	4.2	--	3.5	<10	1.0	36	17	9.7	1.8	200
APR												
10...	1400	380	4.6	--	10.5	--	.7	32	13	6.7	1.9	170
22...	1300	500	4.1	--	10.0	<10	1.2	40	18	9.3	2.0	210
MAY												
12...	1330	230	5.6	--	11.0	--	.4	20	8.8	4.5	1.7	92
26...	1030	665	3.6	--	15.0	<10	1.8	44	20	14	2.4	260
JUN												
03...	1430	440	4.4	--	17.5	--	.8	34	15	8.0	2.0	180
22...	1100	360	5.2	--	18.0	<10	.7	33	14	8.6	2.2	150
JUL												
09...	1300	1010	3.3	--	22.5	--	3.1	69	30	11	3.5	350
21...	1000	1010	3.3	--	21.0	<10	4.3	89	41	15	3.9	560
AUG												
19...	1000	1250	3.4	--	16.5	--	15	130	63	20	3.5	880
27...	1300	1550	3.4	--	19.5	16	8.9	140	58	20	4.4	900
SEP												
09...	1230	1800	3.3	21.0	17.0	--	9.3	160	80	20	4.2	980
30...	1030	1900	3.5	--	13.0	24	7.6	160	78	20	3.7	1100

Table 7.--Water-quality data, station 03201722, Sandy Run below Hull Hollow Creek near Lake Hope, Ohio, water years 1979 through 1981--Continued

DATE	CHLORIDE, DISSOLVED (MG/L AS CL)	SOLIDS, RESIDUE AT 180 DEG. C DISSOLVED (MG/L)	NITROGEN, NO2+NO3 TOTAL (MG/L AS N)	NITROGEN, AMMONIA + ORGANIC TOTAL (MG/L AS N)	NITROGEN, TOTAL (MG/L AS N)	NITROGEN, TOTAL (MG/L AS NO3)	PHOSPHORUS, TOTAL (MG/L AS P)	PHOSPHORUS TOTAL (MG/L AS PO4)	ALUMINUM, TOTAL RECOVERABLE (UG/L AS AL)	IRON, TOTAL RECOVERABLE (UG/L AS FE)	IRON, SUSPENDED RECOVERABLE (UG/L AS FE)	IRON, DISSOLVED (UG/L AS FE)
Water Year 1981												
OCT												
07...	9.5	733	--	--	--	--	--	--	--	2200	--	2200
21...	9.5	756	.09	.09	.18	.80	.000	.00	13000	3100	0	3100
NOV												
05...	13	696	--	--	--	--	--	--	--	--	--	3800
19...	8.2	488	1.0	.21	1.2	5.4	.010	.03	6500	2500	600	1900
DEC												
04...	7.6	419	--	--	--	--	--	--	--	3300	1300	2000
18...	6.9	438	.20	.19	.39	1.7	.000	.00	6000	7000	2500	4500
JAN												
07...	7.6	521	--	--	--	--	--	--	8000	6900	500	6400
22...	12	453	.23	.14	.37	1.6	<.010	<.03	6000	2900	700	2200
FEB												
05...	5.7	290	--	--	--	--	--	--	--	3300	1900	1400
17...	7.7	146	.45	.15	.60	2.7	.080	.25	2000	3700	2700	1000
MAR												
11...	6.3	294	--	--	--	--	--	--	--	5600	3000	2600
24...	6.6	321	.18	.15	.33	1.5	<.010	.03	4100	4800	2500	2300
APR												
10...	5.5	254	--	--	--	--	--	--	3100	3300	1900	1400
22...	5.5	337	.13	.33	.46	2.0	<.010	.03	5000	6800	3300	3500
MAY												
12...	3.4	158	--	--	--	--	--	--	--	3300	1800	1500
26...	6.7	421	.23	.18	.41	1.8	<.010	.03	2700	6400	2900	3500
JUN												
03...	4.8	280	--	--	--	--	--	--	--	5000	2300	2700
22...	4.3	263	.20	.31	.51	2.3	.010	.03	0	4800	1800	3000
JUL												
09...	8.3	735	--	--	--	--	--	--	--	4000	600	3400
21...	8.6	900	.17	.24	.41	1.8	<.010	.03	19000	5500	800	4700
AUG												
19...	9.1	1280	--	--	--	--	--	--	--	2000	100	1900
27...	8.4	1350	.10	.30	.40	1.8	<.010	--	31000	2100	400	1700
SEP												
09...	7.8	1560	--	--	--	--	--	--	--	3900	500	3400
30...	7.8	1680	.17	.34	.51	2.3	.010	.03	30000	4100	1100	3000

Table 7.--Water-quality data, station 03201722, Sandy Run below Hull Hollow Creek near Lake Hope, Ohio, water years 1979 through 1981--Continued

DATE	LEAD, TOTAL RECOV-ERABLE (UG/L AS PB)	MANGA-NESE, TOTAL RECOV-ERABLE (UG/L AS MN)	MANGA-NESE, SUS-PENDED RECOV. (UG/L AS MN)	MANGA-NESE, DIS-SOLVED (UG/L AS MN)	MERCURY TOTAL RECOV-ERABLE (UG/L AS HG)	NICKEL, TOTAL RECOV-ERABLE (UG/L AS NI)	ZINC, TOTAL RECOV-ERABLE (UG/L AS ZN)	ZINC, SUS-PENDED RECOV-ERABLE (UG/L AS ZN)	ZINC, DIS-SOLVED (UG/L AS ZN)	CARBON, ORGANIC DIS-SOLVED (MG/L AS C)	CARBON, ORGANIC SUS-PENDED TOTAL (MG/L AS C)
Water Year 1981											
OCT											
07...	2	6900	--	6400	--	--	--	--	270	--	--
21...	1	7200	0	7200	<.1	130	320	0	320	1.6	.2
NOV											
05...	--	--	--	6800	--	--	--	--	260	--	--
19...	0	4900	0	4900	--	--	170	20	150	1.3	.2
DEC											
04...	5	4300	500	3800	--	--	--	--	140	--	--
18...	6	3700	100	3600	--	--	150	10	140	.3	.3
JAN											
07...	--	4400	0	4400	--	--	--	--	190	--	--
22...	4	3800	300	3500	.1	69	160	50	110	3.2	--
FEB											
05...	14	2400	0	2400	--	--	--	--	90	--	--
17...	2	730	20	710	--	--	50	0	50	1.7	1.0
MAR											
11...	8	1900	200	1700	--	--	--	--	70	--	--
24...	18	2300	0	2300	--	--	110	0	110	4.0	.1
APR											
10...	--	2100	100	2000	--	--	--	--	90	--	--
22...	7	2200	0	2200	<.1	56	110	0	110	3.5	.3
MAY											
12...	1	1000	60	940	--	--	--	--	40	--	--
26...	2	3500	200	3300	--	--	180	0	180	1.2	.2
JUN											
03...	1	2100	100	2000	--	--	--	--	100	--	--
22...	2	2100	0	2100	--	--	120	0	120	1.0	.3
JUL											
09...	12	7800	1000	6800	--	--	--	--	310	--	--
21...	15	9700	800	8900	<.1	260	430	20	410	1.5	.2
AUG											
19...	16	19000	0	19000	--	--	--	--	750	--	--
27...	50	20000	0	20000	--	--	650	50	610	2.1	.2
SEP											
09...	10	22000	0	22000	--	--	--	--	700	--	--
30...	6	24000	1000	23000	--	--	800	50	750	.7	.8

Table 9.--Water-quality data, station 03201660, Big Four Hollow Creek below East Fork Big Four Hollow Creek near Lake Hope, Ohio, water years 1979 through 1981

[MG/L, milligrams per liter; UG/L, micrograms per liter]

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (ft^3/s)	SPE-CIFIC CON-DUCT-ANCE (US/CM)	PH FIELD (UNITS)	TEMPER-ATURE, WATER (DEG C)	OXYGEN DEMAND, CHEM-ICAL (HIGH LEVEL) (MG/L)	HARD-NESS (MG/L AS CACO3)	HARD-NESS, NONCAR-BONATE (MG/L CACO3)	CALCIUM DIS-SOLVED (MG/L AS CA)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG)	SODIUM, DIS-SOLVED (MG/L AS NA)
WATER YEAR 1979											
NOV											
06...	1230	.96	--	--	--	--	--	--	--	--	--
20...	1230	1.6	--	--	--	--	--	--	--	--	--
30...	1500	2.0	--	--	--	--	--	--	--	--	--
DEC											
08...	1315	21	--	--	--	--	--	--	--	--	--
08...	1316	21	--	--	--	--	--	--	--	--	--
09...	1030	11	--	--	--	--	--	--	--	--	--
18...	1615	26	--	--	--	--	--	--	--	--	--
22...	1100	2.7	--	--	--	--	--	--	--	--	--
FEB											
25...	2100	16	--	--	--	--	--	--	--	--	--
MAR											
12...	1530	.42	--	--	--	--	--	--	--	--	--
APR											
02...	1400	6.2	--	--	--	--	--	--	--	--	--
MAY											
31...	1130	.19	--	--	--	--	--	--	--	--	--
JUN											
08...	1200	4.5	--	--	--	--	--	--	--	--	--
JUL											
10...	0900	.37	265	6.9	19.0	3	110	98	26	11	6.0
26...	1515	.29	300	6.5	21.0	2	110	90	26	10	5.4
AUG											
08...	1200	.25	300	6.5	22.5	41	110	100	26	11	6.0
23...	1400	.62	245	6.8	19.0	37	91	65	22	8.7	5.6
SEP											
05...	1500	.17	258	6.6	20.5	2	100	83	24	9.7	5.6
17...	1300	.81	280	6.5	15.5	6	99	81	24	9.6	5.1

Table 9.--Water-quality data, station 03201660, Big Four Hollow Creek below East Fork Big Four Hollow Creek near Lake Hope, Ohio, water years 1979 through 1981--Continued

DATE	SODIUM PERCENT	SODIUM ADSORPTION RATIO	SODIUM+POTASSIUM DISSOLVED (MG/L AS NA)	POTASSIUM, DISSOLVED (MG/L AS K)	BICARBONATE (MG/L AS HCO3)	CARBONATE (MG/L AS CO3)	ALKALINITY (MG/L AS CACO3)	CARBON DIOXIDE DISSOLVED (MG/L AS CO2)	SULFATE DISSOLVED (MG/L AS SO4)	CHLORIDE, DISSOLVED (MG/L AS CL)	SOLIDS, RESIDUE AT 180 DEG. C DISSOLVED (MG/L)
WATER YEAR 1979											
NOV											
06...	--	--	--	--	--	--	--	--	--	--	--
20...	--	--	--	--	--	--	--	--	--	--	--
30...	--	--	--	--	--	--	--	--	--	--	--
DEC											
08...	--	--	--	--	--	--	--	--	--	--	--
08...	--	--	--	--	--	--	--	--	--	--	--
09...	--	--	--	--	--	--	--	--	--	--	--
18...	--	--	--	--	--	--	--	--	--	--	--
22...	--	--	--	--	--	--	--	--	--	--	--
FEB											
25...	--	--	--	--	--	--	--	--	--	--	--
MAR											
12...	--	--	--	--	--	--	--	--	--	--	--
APR											
02...	--	--	--	--	--	--	--	--	--	--	--
MAY											
31...	--	--	--	--	--	--	--	--	--	--	--
JUN											
08...	--	--	--	--	--	--	--	--	--	--	--
JUL											
10...	10	.2	--	2.1	15	0	12	3.0	110	4.3	213
26...	10	.2	7.5	2.1	20	0	16	10	110	3.9	205
AUG											
08...	10	.2	8.1	2.1	12	0	10	6.1	110	4.0	233
23...	12	.3	7.6	2.0	32	0	26	8.1	75	4.7	148
SEP											
05...	11	.2	7.5	1.9	20	0	16	8.0	97	3.5	203
17...	10	.2	7.0	1.9	22	0	18	11	96	4.2	183

Table 9.--Water-quality data, station 03201660, Big Four Hollow Creek below East Fork Big Four Hollow Creek near Lake Hope, Ohio, water years 1979 through 1981--Continued

DATE	SOLIDS, DIS-SOLVED (TONS PER AC-FT)	NITRO-GEN, NO2+NO3 TOTAL (MG/L AS N)	NITRO-GEN, AMMONIA + ORGANIC TOTAL (MG/L AS N)	NITRO-GEN, TOTAL (MG/L AS N)	NITRO-GEN, TOTAL (MG/L AS NO3)	PHOS-PHORUS, TOTAL (MG/L AS P)	PHOS-PHORUS, TOTAL (MG/L AS PO4)	ALUM-INUM, TOTAL RECOV-ERABLE (UG/L AS AL)	ANTI-MONY, TOTAL (UG/L AS SB)	ARSENIC TOTAL (UG/L AS AS)	BERYL-LIUM, TOTAL RECOV-ERABLE (UG/L AS BE)
WATER YEAR 1979											
NOV											
06...	--	--	--	--	--	--	--	--	--	--	--
20...	--	--	--	--	--	--	--	--	--	--	--
30...	--	--	--	--	--	--	--	--	--	--	--
DEC											
08...	--	--	--	--	--	--	--	--	--	--	--
08...	--	--	--	--	--	--	--	--	--	--	--
09...	--	--	--	--	--	--	--	--	--	--	--
18...	--	--	--	--	--	--	--	--	--	--	--
22...	--	--	--	--	--	--	--	--	--	--	--
FEB											
25...	--	--	--	--	--	--	--	--	--	--	--
MAR											
12...	--	--	--	--	--	--	--	--	--	--	--
APR											
02...	--	--	--	--	--	--	--	--	--	--	--
MAY											
31...	--	--	--	--	--	--	--	--	--	--	--
JUN											
08...	--	--	--	--	--	--	--	--	--	--	--
JUL											
10...	.29	.09	.13	.22	.97	.000	.00	300	0	1	0
26...	.28	.12	.18	.30	1.3	.030	.09	700	0	1	0
AUG											
08...	.32	.08	.11	.19	.84	.000	.00	220	0	2	0
23...	.20	.09	.14	.23	1.0	.010	.03	260	0	2	0
SEP											
05...	.28	.06	.00	.06	.27	.000	.00	310	0	0	0
17...	.25	.08	.57	.65	2.9	.010	.03	800	0	1	0

Table 9.--Water-quality data, station 03201660, Big Four Hollow Creek below East Fork Big Four Hollow Creek near Lake Hope, Ohio, water years 1979 through 1981--Continued

DATE	CADMIUM TOTAL RECOV-ERABLE (UG/L AS CD)	CHRO-MIUM, TOTAL RECOV-ERABLE (UG/L AS CR)	COPPER, TOTAL RECOV-ERABLE (UG/L AS CU)	IRON, TOTAL RECOV-ERABLE (UG/L AS FE)	IRON, SUS-PENDED RECOV-ERABLE (UG/L AS FE)	IRON, DIS-SOLVED (UG/L AS FE)	LEAD, TOTAL RECOV-ERABLE (UG/L AS PB)	MANGA-NESE, TOTAL RECOV-ERABLE (UG/L AS MN)	MANGA-NESE, SUS-PENDED RECOV. (UG/L AS MN)	MANGA-NESE, DIS-SOLVED (UG/L AS MN)
WATER YEAR 1979										
NOV										
06...	--	--	--	--	--	--	--	--	--	--
20...	--	--	--	--	--	--	--	--	--	--
30...	--	--	--	--	--	--	--	--	--	--
DEC										
08...	--	--	--	--	--	--	--	--	--	--
08...	--	--	--	--	--	--	--	--	--	--
09...	--	--	--	--	--	--	--	--	--	--
18...	--	--	--	--	--	--	--	--	--	--
22...	--	--	--	--	--	--	--	--	--	--
FEB										
25...	--	--	--	--	--	--	--	--	--	--
MAR										
12...	--	--	--	--	--	--	--	--	--	--
APR										
02...	--	--	--	--	--	--	--	--	--	--
MAY										
31...	--	--	--	--	--	--	--	--	--	--
JUN										
08...	--	--	--	--	--	--	--	--	--	--
JUL										
10...	0	16	2	1600	400	1200	3	1600	0	1600
26...	0	14	0	1300	350	950	3	1600	100	1500
AUG										
08...	1	16	4	1500	400	1100	5	2000	200	1800
23...	1	19	3	1200	720	480	5	850	50	800
SEP										
05...	0	2	2	2200	--	950	5	1800	100	1700
17...	0	3	3	3000	--	1300	2	1800	100	1700

Table 9.--Water-quality data, station 03201660, Big Four Hollow Creek below East Fork Big Four Hollow Creek near Lake Hope, Ohio, water years 1979 through 1981--Continued

DATE	MERCURY TOTAL RECOV-ERABLE (UG/L AS HG)	NICKEL, TOTAL RECOV-ERABLE (UG/L AS NI)	SELE-NIUM, TOTAL (UG/L AS SE)	SILVER, TOTAL RECOV-ERABLE (UG/L AS AG)	ZINC, SUS-PENDED RECOV-ERABLE (UG/L AS ZN)	ZINC, DIS-SOLVED (UG/L AS ZN)	ZINC, TOTAL RECOV-ERABLE (UG/L AS ZN)	CARBON, ORGANIC DIS-SOLVED (MG/L AS C)	CARBON, ORGANIC SUS-PENDED (MG/L AS C)	PHENOLS (UG/L)
WATER YEAR 1979										
NOV										
06...	--	--	--	--	--	--	--	--	--	--
20...	--	--	--	--	--	--	--	--	--	--
30...	--	--	--	--	--	--	--	--	--	--
DEC										
08...	--	--	--	--	--	--	--	--	--	--
08...	--	--	--	--	--	--	--	--	--	--
09...	--	--	--	--	--	--	--	--	--	--
18...	--	--	--	--	--	--	--	--	--	--
22...	--	--	--	--	--	--	--	--	--	--
FEB										
25...	--	--	--	--	--	--	--	--	--	--
MAR										
12...	--	--	--	--	--	--	--	--	--	--
APR										
02...	--	--	--	--	--	--	--	--	--	--
MAY										
31...	--	--	--	--	--	--	--	--	--	--
JUN										
08...	--	--	--	--	--	--	--	--	--	--
JUL										
10...	<.5	37	0	0	10	20	30	3.9	.1	0
26...	<.5	2	0	0	30	30	60	2.6	.0	0
AUG										
08...	<.5	10	0	0	10	30	40	3.1	.3	0
23...	<.5	7	0	1	0	20	20	6.4	.4	0
SEP										
05...	<.5	10	0	0	0	30	30	2.9	.2	1
17...	<.5	10	0	0	30	0	30	7.0	.6	0

Table 9.--Water-quality data, station 03201660, Big Four Hollow Creek below East Fork Big Four Hollow Creek near Lake Hope, Ohio, water years 1979 through 1981--Continued

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (FT^3/S)	SPE-CIFIC CON-DUCT-ANCE (US/CM)	PH (UNITS)	TEMPER-ATURE, WATER (DEG C)	OXYGEN DEMAND, CHEM-ICAL (HIGH LEVEL) (MG/L)	HARD-NESS (MG/L AS CACO3)	HARD-NESS, NONCAR-BONATE (MG/L CACO3)	ACIDITY TOTAL HEATED (MG/L AS H)	ACIDITY (MG/L AS CACO3)	CALCIUM DIS-SOLVED (MG/L AS CA)
WATER YEAR 1980											
OCT											
02...	1130	1.1	220	7.1	15.0	3	82	55	--	--	20
23...	1400	1.1	260	6.2	11.5	20	100	84	--	--	25
NOV											
09...	1200	3.0	260	6.2	8.0	33	110	95	--	--	29
20...	1200	.50	250	6.7	8.0	8	99	79	--	--	24
DEC											
06...	1300	.50	250	6.7	6.0	15	98	74	--	--	23
20...	1200	.50	200	6.9	1.5	7	96	74	--	--	23
JAN											
10...	1000	.40	240	7.6	.5	6	110	90	--	--	27
24...	1200	.40	240	7.0	.5	63	100	77	--	--	25
FEB											
12...	1430	.40	270	7.1	.5	15	120	98	--	--	27
28...	1130	.80	230	7.0	.5	8	99	69	--	--	24
MAR											
12...	1000	1.5	190	6.6	.5	87	110	89	--	--	21
25...	1500	1.3	220	7.5	6.5	2	85	62	--	--	20
APR											
08...	1300	1.3	220	7.4	11.0	12	84	64	--	--	20
25...	1000	.60	215	6.8	9.0	8	94	73	--	--	23
MAY											
09...	1300	.30	275	6.4	13.5	--	110	96	--	--	26
23...	1430	.70	275	6.2	16.0	15	110	78	.2	10	25
JUN											
12...	1530	.30	280	7.4	18.5	--	110	83	--	--	25
24...	1430	.10	315	5.9	21.0	40	120	100	--	--	30
JUL											
10...	1230	.80	225	7.0	18.5	3	92	58	--	--	23
21...	1130	.70	310	7.2	25.0	--	120	100	--	--	28
AUG											
06...	1450	.60	290	6.7	24.0	--	--	--	.2	10	--
19...	1400	.70	290	6.7	21.5	19	120	80	.3	15	29
SEP											
08...	1430	.50	280	6.4	21.0	--	120	110	.2	10	30
22...	1300	.50	310	7.4	18.0	20	120	100	--	--	28

Table 9.--Water-quality data, station 03201660, Big Four Hollow Creek below East Fork Big Four Hollow Creek near Lake Hope, Ohio, water years 1979 through 1981--Continued

DATE	MAGNESIUM, DISSOLVED (MG/L AS MG)	SODIUM, DISSOLVED (MG/L AS NA)	SODIUM PERCENT	SODIUM ADSORPTION RATIO	SODIUM+POTASSIUM DISSOLVED (MG/L AS NA)	POTASSIUM, DISSOLVED (MG/L AS K)	BICARBONATE (MG/L AS HCO3)	CARBONATE (MG/L AS CO3)	ALKALINITY (MG/L AS CACO3)	CARBON DIOXIDE DISSOLVED (MG/L AS CO2)	SULFATE DISSOLVED (MG/L AS SO4)
WATER YEAR 1980											
OCT											
02...	7.9	4.9	11	.2	7.2	2.3	33	0	27	4.2	65
23...	9.9	5.2	15	.2	8.1	2.9	23	0	19	23	93
NOV											
09...	9.8	4.3	11	.2	8.4	4.1	22	0	18	22	97
20...	9.6	4.8	14	.2	6.4	1.6	25	0	21	8.0	96
DEC											
06...	9.9	5.7	17	.3	7.3	1.6	30	0	25	9.6	89
20...	9.3	4.7	10	.2	6.1	1.4	27	0	22	5.4	83
JAN											
10...	11	4.9	13	.2	6.5	1.6	28	0	23	1.1	110
24...	10	5.0	9	.2	6.6	1.6	33	0	27	5.3	95
FEB											
12...	12	5.7	9	.2	7.1	1.4	23	0	19	2.9	110
28...	9.6	5.0	10	.2	6.3	1.3	37	0	30	5.9	88
MAR											
12...	13	4.1	8	.2	5.2	1.1	25	0	21	10	74
25...	8.4	3.7	9	.2	5.3	1.6	28	0	23	1.4	64
APR											
08...	8.3	4.3	10	.2	--	1.6	25	0	21	1.6	76
25...	8.9	4.3	9	.2	--	1.9	26	0	21	.3	84
MAY											
09...	11	5.7	10	.2	--	1.8	17	0	14	11	110
23...	11	5.5	10	.2	--	2.2	36	0	30	36	92
JUN											
12...	11	5.7	10	.2	--	2.2	30	0	25	1.9	100
24...	12	5.5	9	.2	--	2.3	24	0	20	.6	130
JUL											
10...	8.4	4.6	10	.2	--	2.0	42	0	34	6.7	60
21...	12	5.7	9	.2	--	2.5	18	0	15	1.8	120
AUG											
06...	--	--	--	--	--	--	18	0	15	5.7	--
19...	11	6.4	10	.3	--	2.6	46	0	38	15	89
SEP											
08...	12	5.4	8	.2	--	2.3	22	0	18	14	130
22...	12	5.7	9	.2	--	2.7	18	0	15	1.1	140

Table 9.--Water-quality data, station 03201660, Big Four Hollow Creek below East Fork Big Four Hollow Creek near Lake Hope, Ohio, water years 1979 through 1981--Continued

DATE	CHLORIDE, DISSOLVED (MG/L AS CL)	SOLIDS, RESIDUE AT 180 DEG. C DISSOLVED (MG/L)	SOLIDS, DISSOLVED (TONS PER AC-FT)	NITROGEN, NO2+NO3 TOTAL (MG/L AS N)	NITROGEN, AMMONIA + ORGANIC TOTAL (MG/L AS N)	NITROGEN, TOTAL (MG/L AS N)	NITROGEN, TOTAL (MG/L AS NO3)	PHOSPHORUS, TOTAL (MG/L AS P)	PHOSPHORUS, TOTAL (MG/L AS PO4)	ALUMINUM, TOTAL RECOVERABLE (UG/L AS AL)	ANTIMONY, TOTAL (UG/L AS SB)
WATER YEAR 1980											
OCT											
02...	3.2	139	.19	.10	.06	.16	.71	.010	.03	300	0
23...	3.0	168	.23	.02	.11	.13	.58	.010	.03	300	0
NOV											
09...	3.6	177	.24	.15	1.0	1.2	5.1	.130	.40	3200	0
20...	3.0	166	.23	--	--	--	--	--	--	220	0
DEC											
06...	3.3	163	.22	.12	.17	.29	1.3	.000	.00	200	0
20...	3.0	110	.15	.11	.13	.24	1.1	.000	.00	250	0
JAN											
10...	3.4	162	.25	.13	.50	.63	2.8	.000	.00	500	0
24...	3.0	177	.24	.10	.25	.35	1.6	.000	.00	800	0
FEB											
12...	3.3	200	.27	.08	.07	.15	.66	.000	.00	4000	0
28...	3.5	163	.22	.22	.23	.45	2.0	.010	.03	500	0
MAR											
12...	3.0	146	.20	.16	.09	.25	1.1	.010	.03	150	0
25...	2.5	152	.21	.20	.09	.29	1.3	.000	.00	240	0
APR											
08...	2.6	131	.18	.13	.49	.62	2.7	.040	.12	1100	0
25...	2.4	170	.23	.08	.31	.39	1.7	.000	.00	600	0
MAY											
09...	2.7	196	.27	--	--	--	--	--	--	--	--
23...	4.2	167	.23	.13	.35	.48	2.1	.010	.03	40	--
JUN											
12...	4.0	192	.26	--	--	--	--	--	--	--	--
24...	3.8	230	.31	.19	.16	.35	1.6	.010	.03	150	--
JUL											
10...	3.2	155	.21	.20	.07	.27	1.2	.000	.00	20	--
21...	3.4	235	.32	--	--	--	--	--	--	--	--
AUG											
06...	--	--	--	--	--	--	--	--	--	--	--
19...	4.7	197	.27	.02	.12	.14	.62	.010	.03	400	--
SEP											
08...	3.5	214	.29	--	--	--	--	--	--	--	--
22...	3.4	251	.34	.19	.31	.50	2.2	.010	.03	--	--

Table 9.--Water-quality data, station 03201660, Big Four Hollow Creek below East Fork Big Four Hollow Creek near Lake Hope, Ohio, water years 1979 through 1981--Continued

DATE	ARSENIC TOTAL (UG/L AS AS)	BERYLLIUM, TOTAL RECOVERABLE (UG/L AS BE)	CADMIUM TOTAL RECOVERABLE (UG/L AS CD)	CHROMIUM, TOTAL RECOVERABLE (UG/L AS CR)	COPPER, TOTAL RECOVERABLE (UG/L AS CU)	IRON, TOTAL RECOVERABLE (UG/L AS FE)	IRON, SUSPENDED RECOVERABLE (UG/L AS FE)	IRON, DISSOLVED (UG/L AS FE)	LEAD, TOTAL RECOVERABLE (UG/L AS PB)	MANGANESE, TOTAL RECOVERABLE (UG/L AS MN)	MANGANESE, SUSPENDED RECOV. (UG/L AS MN)
WATER YEAR 1980											
OCT											
02...	2	10	0	9	0	2000	--	400	1	750	40
23...	1	0	0	11	2	1500	--	750	0	1600	0
NOV											
09...	1	0	0	10	8	12000	--	2000	3	1600	0
20...	0	0	0	20	1	2000	--	1500	0	1200	0
DEC											
06...	0	20	0	5	1	2000	--	1600	0	1100	0
20...	0	10	0	3	2	1900	200	1700	0	940	0
JAN											
10...	1	20	0	5	1	3600	600	3000	1	1600	0
24...	2	10	0	7	1	4500	1400	3100	0	1400	0
FEB											
12...	1	0	0	25	1	3900	700	3200	0	1700	0
28...	1	0	0	23	1	1900	800	1100	7	640	0
MAR											
12...	1	0	0	8	1	1800	600	1200	0	630	10
25...	0	0	0	5	1	1300	450	850	0	570	0
APR											
08...	2	0	0	4	4	5100	4400	680	3	900	0
25...	0	10	0	5	2	2500	1400	1100	0	1100	0
MAY											
09...	--	--	--	--	--	1500	400	1100	0	1400	0
23...	--	--	--	--	--	1400	1000	370	0	850	40
JUN											
12...	--	--	--	--	--	1100	640	460	2	1200	0
24...	--	--	--	--	--	2100	1200	890	2	1900	0
JUL											
10...	--	--	--	--	--	1000	570	430	3	650	0
21...	--	--	--	--	--	1500	500	1000	0	1700	100
AUG											
06...	--	--	--	--	--	1200	--	--	0	1600	--
19...	--	--	--	--	--	1700	1400	330	12	1000	20
SEP											
08...	--	--	--	--	--	1400	200	1200	0	1600	100
22...	--	--	--	--	--	--	--	1200	--	--	--

Table 9.--Water-quality data, station 03201660, Big Four Hollow Creek below East Fork Big Four Hollow Creek near Lake Hope, Ohio, water years 1979 through 1981--Continued

DATE	MANGANESE, DISSOLVED (UG/L AS MN)	MERCURY TOTAL RECOVERABLE (UG/L AS HG)	NICKEL, TOTAL RECOVERABLE (UG/L AS NI)	SELENIUM, TOTAL (UG/L AS SE)	SILVER, TOTAL RECOVERABLE (UG/L AS AG)	ZINC, SUSPENDED RECOVERABLE (UG/L AS ZN)	ZINC, DISSOLVED (UG/L AS ZN)	ZINC, TOTAL RECOVERABLE (UG/L AS ZN)	CARBON, ORGANIC DISSOLVED (MG/L AS C)	CARBON, ORGANIC SUSPENDED (MG/L AS C)	PHENOLS (UG/L)
WATER YEAR 1980											
OCT											
02...	710	<.5	4	0	0	0	20	20	2.3	.6	0
23...	1600	<.1	8	0	1	10	20	30	6.9	.2	0
NOV											
09...	1600	<.1	34	0	0	20	70	90	5.9	1.7	0
20...	1200	.1	8	0	0	10	0	10	2.8	.1	1
DEC											
06...	1100	.4	7	0	0	0	20	20	2.3	.5	0
20...	940	.1	6	0	0	0	20	20	1.9	.2	0
JAN											
10...	1600	<.1	7	0	0	0	20	20	1.3	.1	0
24...	1400	<.1	7	0	0	0	20	20	3.7	.3	0
FEB											
12...	1700	.1	12	0	0	0	20	20	5.9	.3	0
28...	640	.2	2	0	0	0	30	30	1.6	--	0
MAR											
12...	620	<.1	5	0	0	20	30	50	1.3	.2	4
25...	570	.1	2	0	0	0	20	20	4.0	.4	2
APR											
08...	900	.1	11	0	0	0	30	30	3.4	.5	1
25...	1100	<.1	3	0	0	20	5	20	9.0	.4	0
MAY											
09...	1400	--	--	--	--	--	20	--	--	--	--
23...	810	--	--	--	--	8	2	10	4.5	.3	--
JUN											
12...	1200	--	--	--	--	--	20	--	--	--	--
24...	1900	--	--	--	--	10	20	30	7.1	.4	--
JUL											
10...	650	<.1	3	--	--	0	30	30	1.8	.4	--
21...	1600	--	--	--	--	--	30	--	--	--	--
AUG											
06...	--	--	--	--	--	--	--	--	--	--	--
19...	980	--	--	--	--	10	10	20	2.2	.3	--
SEP											
08...	1500	--	--	--	--	--	30	--	--	--	--
22...	2000	--	--	--	--	--	50	--	1.9	--	--

Table 9.--Water-quality data, station 03201660, Big Four Hollow Creek below East Fork Big Four Hollow Creek near Lake Hope, Ohio, water years 1979 through 1981--Continued

DATE	TIME	SPECIFIC CONDUCTANCE (US/CM)	STREAMFLOW, INSTANTANEOUS (FT^3/S)	PH (STANDARD UNITS)	TEMPERATURE, AIR (DEG C)	TEMPERATURE (DEG C)	OXYGEN DEMAND, CHEMICAL (HIGH LEVEL) (MG/L)	ACIDITY (MG/L AS H)	CALCIUM DISSOLVED (MG/L AS CA)	MAGNESIUM, DISSOLVED (MG/L AS MG)	SODIUM, DISSOLVED (MG/L AS NA)	POTASSIUM, DISSOLVED (MG/L AS K)
WATER YEAR 1981												
OCT												
07...	1200	395	.01	6.8	--	12.5	--	.4	35	15	5.9	2.2
21...	1330	350	.01	5.5	--	12.0	10	.4	40	15	5.6	2.7
NOV												
05...	1230	390	.01	7.1	--	8.0	--	--	34	15	6.6	2.5
19...	1400	350	.10	7.7	--	4.0	10	--	29	13	6.5	2.3
DEC												
04...	1230	330	.10	7.7	4.0	2.5	--	--	27	12	6.0	1.9
18...	1400	310	.10	7.5	4.5	4.0	2	--	25	11	6.0	1.6
JAN												
07...	1400	340	--	6.3	--	.5	--	.4	32	13	5.6	1.7
22...	1330	325	--	6.3	--	.5	<10	.3	32	9.1	6.5	1.7
FEB												
05...	1500	240	--	6.4	--	.5	--	.3	20	7.3	3.2	1.5
17...	1830	170	.70	7.3	--	4.0	<10	--	14	6.2	3.9	1.4
MAR												
11...	1300	225	.56	6.5	--	6.0	--	.2	22	8.7	5.1	1.6
24...	1300	260	.56	6.5	--	8.0	51	.2	23	10	6.0	1.6
APR												
10...	1230	210	2.3	6.7	--	11.0	--	.2	21	8.5	4.3	1.8
22...	1130	240	2.3	7.0	--	9.5	<10	--	25	10	5.1	1.7
MAY												
12...	1500	185	6.4	7.2	--	11.5	--	--	16	6.8	3.8	1.7
26...	1330	270	1.1	6.3	--	18.0	<10	.8	24	9.8	5.2	2.0
JUN												
03...	1130	240	2.3	7.6	--	17.0	--	--	22	8.8	4.9	1.9
22...	1330	210	2.3	7.1	--	20.0	<10	--	20	8.0	5.5	2.0
JUL												
09...	1130	320	.42	7.0	--	22.0	--	--	27	11	4.7	2.5
22...	1130	340	.56	6.0	--	20.0	<10	.3	31	12	5.1	2.7

Table 9.--Water-quality data, station 03201660, Big Four Hollow Creek below East Fork Big Four Hollow Creek near Lake Hope, Ohio, water years 1979 through 1981--Continued

DATE	SULFATE DIS-SOLVED (MG/L AS SO4)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L)	NITRO-GEN, NO2+NO3 TOTAL (MG/L AS N)	NITRO-GEN, AM-MONIA + ORGANIC TOTAL (MG/L AS N)	NITRO-GEN, TOTAL (MG/L AS N)	NITRO-GEN, TOTAL (MG/L AS NO3)	PHOS-PHORUS, TOTAL (MG/L AS P)	PHOS-PHORUS TOTAL (MG/L AS PO4)	ALUM-INUM, TOTAL RECOV-ERABLE (UG/L AS AL)	IRON, TOTAL RECOV-ERABLE (UG/L AS FE)	IRON, SUS-PENDED RECOV-ERABLE (UG/L AS FE)
WATER YEAR 1981												
OCT												
07...	170	3.3	281	--	--	--	--	--	--	--	2100	400
21...	180	3.4	300	.09	.20	.29	1.3	.010	.03	590	1600	660
NOV												
05...	160	4.6	255	--	--	--	--	--	--	--	--	--
19...	130	4.3	224	.29	.09	.38	1.7	.000	.00	400	2700	500
DEC												
04...	120	3.6	201	--	--	--	--	--	--	--	2800	700
18...	100	3.5	184	.21	.11	.32	1.4	.000	.00	500	2800	1100
JAN												
07...	120	4.0	213	--	--	--	--	--	--	510	3200	1100
22...	130	4.3	228	.27	.20	.47	2.1	<.010	<.03	460	2300	1000
FEB												
05...	88	3.1	153	--	--	--	--	--	--	--	3200	1800
17...	53	3.7	109	.45	.20	.65	2.9	.070	.21	470	1700	1400
MAR												
11...	86	3.4	149	--	--	--	--	--	--	--	2000	1100
24...	93	3.5	164	.18	.03	.21	.93	<.010	.03	430	1700	740
APR												
10...	78	2.9	173	--	--	--	--	--	--	30	1300	630
22...	88	2.8	171	.15	.28	.43	1.9	<.010	.03	3300	1200	430
MAY												
12...	53	2.6	119	--	--	--	--	--	--	--	2200	1800
26...	95	3.4	205	.21	.38	.59	2.6	<.010	.03	300	1800	700
JUN												
03...	73	3.0	169	--	--	--	--	--	--	--	1200	750
22...	59	2.5	141	.19	.33	.52	2.3	<.010	.03	0	980	570
JUL												
09...	130	2.7	231	--	--	--	--	--	--	--	2100	700
22...	140	2.5	258	.18	.27	.45	2.0	<.010	.03	600	1800	600

Table 9.--Water-quality data, station 03201660, Big Four Hollow Creek below East Fork Big Four Hollow Creek near Lake Hope, Ohio, water years 1979 through 1981--Continued

DATE	IRON, DIS-SOLVED (UG/L AS FE)	LEAD, TOTAL RECOV-ERABLE (UG/L AS PB)	MANGA-NESE, TOTAL RECOV-ERABLE (UG/L AS MN)	MANGA-NESE, SUS-PENDED RECOV. (UG/L AS MN)	MANGA-NESE, DIS-SOLVED (UG/L AS MN)	MERCURY TOTAL RECOV-ERABLE (UG/L AS HG)	NICKEL, TOTAL RECOV-ERABLE (UG/L AS NI)	ZINC, TOTAL RECOV-ERABLE (UG/L AS ZN)	ZINC, SUS-PENDED RECOV-ERABLE (UG/L AS ZN)	ZINC, DIS-SOLVED (UG/L AS ZN)	CARBON, ORGANIC DIS-SOLVED (MG/L AS C)	CARBON, ORGANIC SUS-PENDED TOTAL (MG/L AS C)
WATER YEAR 1981												
OCT												
07...	1700	1	2100	0	2200	--	--	--	--	60	--	--
21...	940	1	3100	0	3100	<.1	19	50	0	50	1.6	.3
NOV												
05...	1700	--	--	--	2800	--	--	--	--	30	--	--
19...	2200	3	1900	0	1900	--	--	30	10	20	1.8	.3
DEC												
04...	2100	7	1700	100	1600	--	--	--	--	20	--	--
18...	1700	3	1500	200	1300	--	--	20	0	20	.3	.2
JAN												
07...	2100	--	1500	0	1500	--	--	--	--	20	--	--
22...	1300	4	1100	0	1100	<.1	11	30	0	30	3.4	.2
FEB												
05...	1400	63	710	0	710	--	--	--	--	10	--	--
17...	280	1	380	90	290	--	--	20	10	10	1.7	.5
MAR												
11...	870	2	780	60	720	--	--	--	--	8	--	--
24...	960	17	800	0	800	--	--	30	20	10	1.5	.1
APR												
10...	670	--	770	30	740	--	--	--	--	<4	--	--
22...	770	30	760	0	760	<.1	--	50	30	20	1.3	.3
MAY												
12...	450	1	530	80	450	--	--	--	--	10	--	--
26...	1100	1	1200	0	1200	--	--	40	30	10	1.0	.2
JUN												
03...	450	1	660	0	660	--	--	--	--	10	--	--
22...	410	1	570	0	570	--	--	30	0	30	1.3	.3
JUL												
09...	1400	20	1900	200	1700	--	--	--	--	30	--	--
22...	1200	6	2000	200	1800	<.1	13	40	20	20	.7	.3

Table 10.--Water-quality data, station 03201615, Big Four Hollow Creek above East Fork Big Four Hollow Creek near Lake Hope, Ohio, water year 1979

[MG/L, milligrams per liter; UG/L, micrograms per liter]

DATE	TIME	SPECIFIC CONDUCTANCE (US/CM)	PH (UNITS)	TEMPERATURE (DEG C)	OXYGEN DEMAND, CHEMICAL (HIGH LEVEL) (MG/L)	HARDNESS (MG/L AS CACO3)	HARDNESS, NONCARBONATE (MG/L CACO3)	ACIDITY TOTAL HEATED (MG/L AS H)	ACIDITY (MG/L AS CACO3)	CALCIUM DISSOLVED (MG/L AS CA)	MAGNESIUM, DISSOLVED (MG/L AS MG)
OCT											
12...	1345	380	3.6	15.0	--	110	110	.7	35	23	13
25...	1130	360	5.4	7.5	32	120	120	--	--	26	14
NOV											
06...	1100	350	5.1	9.5	16	120	120	--	--	27	13
20...	1200	280	5.9	5.0	9	110	98	--	--	26	12
30...	1430	280	5.8	5.0	16	110	110	--	--	25	12
DEC											
22...	1100	220	5.8	2.0	32	84	74	--	--	20	8.3
JAN											
04...	1030	195	5.7	.5	21	78	67	--	--	17	8.7
17...	1500	200	6.0	.5	4	85	77	--	--	20	8.6
FEB											
01...	1600	190	5.9	.5	9	82	74	--	--	19	8.5
16...	1100	260	5.9	.5	6	130	120	--	--	31	13
27...	1100	150	5.5	3.0	8	51	47	--	--	12	5.0
MAR											
12...	1200	200	5.9	5.5	12	85	34	--	--	20	8.4
26...	0930	190	6.1	4.0	12	88	80	--	--	21	8.7
APR											
10...	1200	210	6.1	11.0	13	76	61	--	--	18	7.5
27...	0900	250	6.4	11.0	10	97	82	--	--	23	9.6
MAY											
15...	1000	230	6.5	17.0	27	90	75	--	--	21	9.1
31...	0930	255	6.2	15.0	3	93	83	--	--	22	9.3
JUN											
11...	1130	232	6.8	18.0	13	88	55	--	--	22	8.1
28...	1500	275	6.2	17.0	21	91	83	--	--	20	9.9

Table 10.--Water-quality data, station 03201615, Big Four Hollow Creek above East Fork Big Four Hollow Creek near Lake Hope, Ohio, water year 1979--Continued

DATE	SODIUM, DIS-SOLVED (MG/L AS NA)	SODIUM PERCENT	SODIUM AD-SORP-TION RATIO	SODIUM+ POTAS-SIUM DIS-SOLVED (MG/L AS NA)	POTAS-SIUM, DIS-SOLVED (MG/L AS K)	BICAR-BONATE (MG/L AS HCO3)	CAR-BONATE (MG/L AS CO3)	ALKA-LINITY (MG/L AS CACO3)	CARBON DIOXIDE DIS-SOLVED (MG/L AS CO2)	SULFATE DIS-SOLVED (MG/L AS SO4)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)
OCT											
12...	5.2	9	.2	--	2.5	0	0	0	.0	140	3.0
25...	5.1	8	.2	--	2.5	0	0	0	.0	150	3.7
NOV											
06...	5.5	9	.2	--	2.0	4	0	3	51	148	4.3
20...	6.4	11	.3	--	2.2	20	0	16	40	110	6.6
30...	5.7	10	.2	--	2.0	2	0	2	5.1	100	6.3
DEC											
22...	4.5	10	.2	--	1.7	12	0	10	30	84	4.7
JAN											
04...	3.4	8	.2	--	1.4	14	0	11	45	75	3.3
17...	4.3	10	.2	--	1.3	10	0	8	16	73	5.0
FEB											
01...	4.5	10	.2	--	1.6	10	0	8	20	86	4.8
16...	5.2	8	.2	--	1.7	14	0	11	28	176	4.9
27...	2.6	10	.2	--	1.3	4	0	3	20	53	2.7
MAR											
12...	4.2	10	.2	--	1.5	1	0	1	2.0	90	4.2
26...	5.1	11	.2	--	1.4	10	0	8	13	84	4.9
APR											
10...	4.5	11	.2	--	1.6	18	0	15	23	73	4.3
27...	4.7	9	.2	--	1.8	18	0	15	11	97	3.7
MAY											
15...	4.5	10	.2	--	1.7	18	0	15	9.1	92	2.5
31...	4.5	9	.2	5.1	1.6	12	0	10	12	95	3.1
JUN											
11...	4.3	9	.2	--	1.6	28	0	23	7.1	78	3.5
28...	4.8	10	.2	5.4	1.6	10	0	8	10	100	2.4

Table 10.--Water-quality data, station 03201615, Big Four Hollow Creek above East Fork Big Four Hollow Creek near Lake Hope, Ohio, water year 1979--Continued

DATE	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L)	SOLIDS, DIS-SOLVED (TONS PER AC-FT)	NITRO-GEN, NO2+NO3 TOTAL (MG/L AS N)	NITRO-GEN, TOTAL (MG/L AS N)	NITRO-GEN, TOTAL (MG/L AS NO3)	PHOS-PHORUS, TOTAL (MG/L AS P)	PHOS-PHATE, TOTAL (MG/L AS PO4)	PHOS-PHORUS TOTAL (MG/L AS PO4)	ALUM-INUM, TOTAL RECOV-ERABLE (UG/L AS AL)	ANTI-MONY, TOTAL (UG/L AS SB)	ARSENIC TOTAL (UG/L AS AS)
OCT											
12...	225	.31	.06	.31	1.40	.01	--	--	210	3	1
25...	246	.33	.05	.43	1.9	.00	--	--	100000	1	0
NOV											
06...	241	.33	.05	.41	1.8	.00	--	--	410	0	0
20...	191	.26	.08	.26	1.2	.00	--	--	350	0	1
30...	192	.26	.05	.17	.75	.00	--	--	320	0	0
DEC											
22...	147	.20	.06	.11	.49	.00	--	--	310	0	1
JAN											
04...	135	.18	.07	.14	.62	.00	--	--	520	0	0
17...	134	.18	.11	.11	.49	.00	--	--	350	0	1
FEB											
01...	144	.20	.06	.20	.89	.00	--	--	340	0	1
16...	275	.37	.35	.64	2.8	.00	--	--	400	0	0
27...	96	.13	.25	.47	2.1	.02	--	--	350	0	0
MAR											
12...	154	.21	.07	.13	.58	.00	--	--	680	0	1
26...	151	.21	.06	.35	1.6	.00	--	--	500	0	1
APR											
10...	152	.21	.04	.33	1.5	.00	--	--	700	0	0
27...	163	.22	.04	.37	1.6	.00	.00	.00	220	0	0
MAY											
15...	179	.24	.03	.31	1.4	.00	.00	.00	300	0	0
31...	166	.23	.05	.16	.71	.01	.03	.03	400	0	0
JUN											
11...	160	.22	.02	.15	.66	.01	.03	.03	600	0	1
28...	199	.27	.05	.32	1.4	.00	.00	.00	400	0	1

Table 10.--Water-quality data, station 03201615, Big Four Hollow Creek above East Fork Big Four Hollow Creek near Lake Hope, Ohio, water year 1979--Continued

DATE	BERYLLIUM, TOTAL RECOVERABLE (UG/L AS BE)	CADMIUM TOTAL RECOVERABLE (UG/L AS CD)	CHROMIUM, TOTAL RECOVERABLE (UG/L AS CR)	COPPER, TOTAL RECOVERABLE (UG/L AS CU)	IRON, TOTAL RECOVERABLE (UG/L AS FE)	IRON, SUSPENDED RECOVERABLE (UG/L AS FE)	IRON, DISSOLVED (UG/L AS FE)	LEAD, TOTAL RECOVERABLE (UG/L AS PB)	MANGANESE, TOTAL RECOVERABLE (UG/L AS MN)	MANGANESE, SUSPENDED RECOV. (UG/L AS MN)	MANGANESE, DISSOLVED (UG/L AS MN)
OCT											
12...	0	8	0	4	7300	--	50	76	6800	--	6800
25...	0	2	1	4	14000	--	14000	45	7500	--	7500
NOV											
06...	0	0	1	3	11000	--	1100	150	6600	--	6100
20...	0	8	0	2	6900	--	6000	58	3400	--	310
30...	0	2	1	2	5000	--	4000	17	2500	--	2300
DEC											
22...	0	4	1	2	3000	--	2600	40	1500	--	1500
JAN											
04...	0	2	0	2	3100	--	2900	29	1400	--	1400
17...	0	1	5	1	2100	--	1500	20	960	--	960
FEB											
01...	0	6	0	1	3400	--	3100	150	1800	--	1700
16...	0	8	1	1	6100	--	6100	100	5600	--	5200
27...	0	18	0	2	1500	--	1200	180	800	--	800
MAR											
12...	0	1	0	2	3400	--	3000	8	1900	--	1900
26...	0	2	0	2	2700	--	2200	34	1500	--	1400
APR											
10...	0	19	5	0	1900	--	1400	150	1100	--	1100
27...	0	12	6	3	3000	600	2400	140	2000	100	1900
MAY											
15...	0	5	2	1	2700	400	2300	20	2300	0	2300
31...	0	3	6	1	4000	700	3300	30	2600	100	2500
JUN											
11...	0	1	5	1	2300	800	1500	3	1400	0	1400
28...	0	0	7	3	5300	0	5300	0	4200	0	4200

Table 10.--Water-quality data, station 03201615, Big Four Hollow Creek above East Fork Big Four Hollow Creek near Lake Hope, Ohio, water year 1979--Continued

DATE	MERCURY TOTAL RECOV-ERABLE (UG/L AS HG)	NICKEL, TOTAL RECOV-ERABLE (UG/L AS NI)	SELE-NIUM, TOTAL (UG/L AS SE)	SILVER, TOTAL RECOV-ERABLE (UG/L AS AG)	ZINC, SUS-PENDED RECOV-ERABLE (UG/L AS ZN)	ZINC, DIS-SOLVED (UG/L AS ZN)	ZINC, TOTAL RECOV-ERABLE (UG/L AS ZN)	CARBON, ORGANIC DIS-SOLVED (MG/L AS C)	CARBON, ORGANIC SUS-PENDED TOTAL (MG/L AS C)	PHENOLS (UG/L)
OCT										
12...	<.5	29	0	0	--	10	40	4.6	.4	1
25...	<.5	19	0	0	--	20	30	3.0	.7	4
NOV										
06...	<.5	34	0	0	--	20	20	1.2	.3	0
20...	<.5	0	0	0	--	30	30	2.0	.5	2
30...	<.5	21	0	0	--	20	20	1.0	.2	0
DEC										
22...	<.5	18	0	0	--	20	30	3.7	.4	2
JAN										
04...	<.5	19	0	0	--	30	40	1.3	.3	4
17...	<.5	7	0	0	--	40	40	2.0	.2	1
FEB										
01...	<.5	16	0	0	--	20	20	4.0	.2	0
16...	<.5	15	0	0	--	90	90	1.6	.2	0
27...	<.5	15	0	0	--	0	40	4.3	--	8
MAR										
12...	<.5	19	0	0	--	0	30	4.5	.2	0
26...	<.5	15	0	0	--	20	20	3.9	.0	2
APR										
10...	<.5	40	0	0	--	40	40	1.1	--	0
27...	<.5	25	0	0	30	10	40	3.7	.1	0
MAY										
15...	<.5	20	0	0	0	30	30	3.6	.1	0
31...	<.5	15	0	0	0	30	30	2.9	.6	0
JUN										
11...	<.5	22	0	0	5	2	10	8.9	.3	0
28...	<.5	27	0	0	30	20	50	3.9	.3	0

Table 11.--Water-quality data, station 03201630, East Fork Big Four Hollow Creek near Lake Hope, Ohio, water year 1979

[MG/L, milligrams per liter; UG/L, micrograms per liter]

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (FT^3/S)	SPE-CIFIC CON-DUCT-ANCE (US/CM)	PH FIELD (UNITS)	TEMPER-ATURE, WATER (DEG C)	OXYGEN DEMAND, CHEM-ICAL (HIGH LEVEL) (MG/L)	HARD-NESS (MG/L AS CACO3)	HARD-NESS, NONCAR-BONATE (MG/L CACO3)	CALCIUM DIS-SOLVED (MG/L AS CA)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG)	SODIUM, DIS-SOLVED (MG/L AS NA)
OCT											
13...	1445	1.4	220	6.5	13.0	23	86	59	22	7.6	4.4
25...	1000	.12	350	5.3	6.5	9	150	150	33	17	5.3
NOV											
06...	1200	.10	350	5.6	12.0	9	140	140	33	14	5.4
20...	1030	.25	230	6.3	7.5	9	100	77	24	10	5.5
30...	1330	.51	220	6.0	6.5	11	97	77	24	9.0	5.0
DEC											
08...	1600	19	--	--	--	--	--	--	--	--	--
09...	1000	8.2	--	--	--	--	--	--	--	--	--
22...	1000	1.9	165	6.2	2.0	43	72	54	17	7.2	4.2
JAN											
04...	0930	1.3	140	6.5	.5	26	63	47	15	6.3	3.2
17...	1400	1.7	170	6.7	1.5	0	78	61	18	8.0	4.0
FEB											
01...	1500	.25	190	6.3	.5	10	76	61	18	7.5	4.0
16...	1000	.25	210	6.6	.0	9	92	74	22	9.0	4.8
25...	2030	9.8	--	--	--	--	--	--	--	--	--
27...	1000	1.6	110	6.2	1.5	8	47	39	11	4.7	2.5
MAR											
12...	1300	.20	190	6.7	5.0	11	75	74	18	7.4	3.8
26...	1030	.60	180	6.7	4.0	8	75	57	18	7.4	4.1
APR											
02...	1300	3.0	--	--	--	--	--	--	--	--	--
10...	1500	1.2	220	6.2	11.0	10	71	55	17	7.0	4.1
27...	1000	.22	225	6.8	11.0	4	91	68	22	8.8	4.6
MAY											
15...	0900	.10	130	7.1	16.5	24	92	71	22	9.0	5.0
31...	0900	.10	235	7.2	13.0	4	91	68	22	8.8	4.6
JUN											
11...	1030	.31	190	7.1	14.5	22	80	53	20	7.4	4.1
29...	1200	.01	315	6.1	16.0	9	120	110	29	12	5.1

Table 11.--Water-quality data, station 03201630, East Fork Big Four Hollow Creek near Lake Hope, Ohio, water year 1979--Continued

DATE	SODIUM PERCENT	SODIUM ADSORPTION RATIO	SODIUM+POTASSIUM DISSOLVED (MG/L AS NA)	POTASSIUM, DISSOLVED (MG/L AS K)	BICARBONATE (MG/L AS HCO3)	CARBONATE (MG/L AS CO3)	ALKALINITY (MG/L AS CACO3)	CARBON DIOXIDE DISSOLVED (MG/L AS CO2)	SULFATE DISSOLVED (MG/L AS SO4)	CHLORIDE, DISSOLVED (MG/L AS CL)	SOLIDS, RESIDUE AT 180 DEG. C DISSOLVED (MG/L)
OCT											
13...	10	.2	--	2.4	33	0	27	17	62	2.7	130
25...	7	.2	--	2.6	0	0	0	.0	150	2.8	233
NOV											
06...	8	.2	--	2.0	6	0	5	24	140	4.4	227
20...	10	.2	--	2.0	30	0	25	24	85	5.9	158
30...	10	.2	--	1.9	24	0	20	38	71	5.2	134
DEC											
08...	--	--	--	--	--	--	--	--	--	--	--
09...	--	--	--	--	--	--	--	--	--	--	--
22...	11	.2	--	1.7	22	0	18	22	57	3.8	111
JAN											
04...	10	.2	--	1.4	20	0	16	10	58	3.0	106
17...	10	.2	--	1.3	20	0	16	6.4	56	3.7	109
FEB											
01...	10	.2	--	1.5	18	0	15	14	64	4.0	118
16...	10	.2	--	1.5	22	0	18	8.8	83	4.2	145
25...	--	--	--	--	--	--	--	--	--	--	--
27...	10	.2	--	1.3	10	0	8	10	40	2.6	81
MAR											
12...	10	.2	--	1.5	2	0	2	.6	68	3.7	120
26...	10	.2	--	1.3	22	0	18	7.0	61	3.6	123
APR											
02...	--	--	--	--	--	--	--	--	--	--	--
10...	11	.2	--	1.7	20	0	16	20	59	3.6	119
27...	10	.2	--	1.9	28	0	23	7.1	75	3.6	138
MAY											
15...	10	.2	--	1.9	26	0	21	3.3	79	3.5	164
31...	10	.2	6.5	1.9	28	0	23	2.8	77	3.3	149
JUN											
11...	10	.2	--	1.7	34	0	28	4.3	54	4.3	143
29...	8	.2	--	2.0	9	0	7	11	120	3.0	216

Table 11.--Water-quality data, station 03201630, East Fork Big Four Hollow Creek near Lake Hope, Ohio, water year 1979--Continued

DATE	SOLIDS, DIS-SOLVED (TONS PER AC-FT)	NITRO-GEN, NO2+NO3 TOTAL (MG/L AS N)	NITRO-GEN, AM-MONIA + ORGANIC TOTAL (MG/L AS N)	NITRO-GEN, TOTAL (MG/L AS N)	NITRO-GEN, TOTAL (MG/L AS NO3)	PHOS-PHORUS, TOTAL (MG/L AS P)	PHOS-PHORUS, ORTHOPH OSPHATE TOTAL (MG/L AS PO4)	PHOS-PHORUS, TOTAL (MG/L AS PO4)	ALUM-INUM, TOTAL RECOV-ERABLE (UG/L AS AL)	ANTI-MONY, TOTAL (UG/L AS SB)	ARSENIC TOTAL (UG/L AS AS)
OCT											
13...	.18	.72	.45	1.2	5.2	.020	--	--	100	3	0
25...	.32	.04	.22	.26	1.2	.050	--	--	330	1	0
NOV											
06...	.31	.06	1.5	1.6	6.9	.050	--	--	970	0	0
20...	.21	.15	.07	.22	.97	.000	--	--	350	0	0
30...	.18	.15	.05	.20	.89	.000	--	--	290	0	0
DEC											
08...	--	--	--	--	--	--	--	--	--	--	--
09...	--	--	--	--	--	--	--	--	--	--	--
22...	.15	.13	.00	.13	.58	.000	--	--	190	0	1
JAN											
04...	.14	.15	.02	.17	.75	.000	--	--	250	0	0
17...	.15	.17	.07	.24	1.1	.000	--	--	150	0	1
FEB											
01...	.16	.11	.49	.60	2.7	.000	--	--	270	0	1
16...	.20	.42	.22	.64	2.8	.000	--	--	0	0	0
25...	--	--	--	--	--	--	--	--	--	--	--
27...	.11	.24	.11	.35	1.6	.000	--	--	10	0	0
MAR											
12...	.16	.13	.07	.20	.89	.000	--	--	260	0	1
26...	.17	.12	.16	.28	1.2	.010	--	--	320	0	1
APR											
02...	--	--	--	--	--	--	--	--	--	--	--
10...	.16	.07	.13	.20	.89	.000	--	--	220	0	0
27...	.19	.04	.14	.18	.80	.000	.00	.00	230	0	0
MAY											
15...	.22	.63	.27	.90	4.0	.020	.06	.06	330	0	0
31...	.20	.12	.00	.12	.53	.010	.03	.03	370	0	0
JUN											
11...	.19	.11	.06	.17	.75	.020	.06	.06	180	0	0
29...	.29	.08	.03	.11	.49	.010	.03	.03	2300	0	1

Table 11.--Water-quality data, station 03201630, East Fork Big Four Hollow Creek near Lake Hope, Ohio, water year 1979--Continued

DATE	BERYLLIUM, TOTAL RECOVERABLE (UG/L AS BE)	CADMIUM TOTAL RECOVERABLE (UG/L AS CD)	CHROMIUM, TOTAL RECOVERABLE (UG/L AS CR)	COPPER, TOTAL RECOVERABLE (UG/L AS CU)	IRON, TOTAL RECOVERABLE (UG/L AS FE)	IRON, SUSPENDED RECOVERABLE (UG/L AS FE)	IRON, DISSOLVED (UG/L AS FE)	LEAD, TOTAL RECOVERABLE (UG/L AS PB)	MANGANESE, TOTAL RECOVERABLE (UG/L AS MN)	MANGANESE, SUSPENDED RECOV. (UG/L AS MN)	MANGANESE, DISSOLVED (UG/L AS MN)
OCT											
13...	0	3	0	4	1300	--	300	30	130	--	120
25...	0	1	0	7	7500	--	1600	25	900	--	810
NOV											
06...	0	0	4	3	6300	--	1400	21	650	--	600
20...	0	2	1	2	1100	--	390	16	160	--	140
30...	0	3	1	1	770	--	180	10	110	--	110
DEC											
08...	--	--	--	--	--	--	--	--	--	--	--
09...	--	--	--	--	--	--	--	--	--	--	--
22...	0	14	1	3	510	--	260	140	70	--	70
JAN											
04...	0	3	1	1	800	--	170	26	80	--	80
17...	0	1	5	1	180	--	180	15	70	--	70
FEB											
01...	0	10	0	1	560	--	140	170	100	--	100
16...	0	3	0	0	670	--	220	23	90	--	80
25...	--	--	--	--	--	--	--	--	--	--	--
27...	0	7	1	6	330	--	70	63	110	--	70
MAR											
12...	0	1	0	2	670	--	190	6	130	--	130
26...	0	0	0	2	770	--	190	3	90	--	90
APR											
02...	--	--	--	--	--	--	--	--	--	--	--
10...	0	1	6	1	550	--	50	9	70	--	70
27...	0	20	5	3	400	320	80	180	100	0	100
MAY											
15...	0	1	4	3	850	650	200	23	190	10	180
31...	0	9	4	0	1200	840	360	36	180	10	170
JUN											
11...	0	5	8	1	410	380	30	18	60	0	60
29...	0	0	7	5	5700	5100	630	2	550	0	550

Table 11.--Water-quality data, station 03201630, East Fork Big Four Hollow Creek near Lake Hope, Ohio, water year 1979--Continued

DATE	MERCURY TOTAL RECOV-ERABLE (UG/L AS HG)	NICKEL, TOTAL RECOV-ERABLE (UG/L AS NI)	SELE-NIUM, TOTAL (UG/L AS SE)	SILVER, TOTAL RECOV-ERABLE (UG/L AS AG)	ZINC, SUS-PENDED RECOV-ERABLE (UG/L AS ZN)	ZINC, DIS-SOLVED (UG/L AS ZN)	ZINC, TOTAL RECOV-ERABLE (UG/L AS ZN)	CARBON, ORGANIC DIS-SOLVED (MG/L AS C)	CARBON, ORGANIC SUS-PENDED (MG/L AS C)	PHENOLS (UG/L)
OCT										
13...	<.5	21	0	0	--	10	10	4.8	.7	1
25...	<.5	41	0	0	--	50	60	3.2	.5	3
NOV										
06...	<.5	48	0	0	--	40	90	2.9	.5	0
20...	<.5	21	0	0	--	10	20	4.2	.5	1
30...	<.5	13	0	0	--	10	20	1.2	.5	0
DEC										
08...	--	--	--	--	--	--	--	--	--	--
09...	--	--	--	--	--	--	--	--	--	--
22...	<.5	18	0	0	--	20	50	3.8	.4	1
JAN										
04...	<.5	15	0	0	--	20	20	2.7	.1	0
17...	<.5	5	0	0	--	20	20	5.9	.1	3
FEB										
01...	<.5	9	0	0	--	10	20	1.3	.1	0
16...	<.5	15	0	0	--	10	30	2.9	.1	0
25...	--	--	--	--	--	--	--	--	--	--
27...	<.5	7	0	0	--	0	30	4.6	--	1
MAR										
12...	<.5	17	0	0	--	20	20	4.1	.1	0
26...	<.5	11	0	0	--	10	10	1.9	.0	1
APR										
02...	--	--	--	--	--	--	--	--	--	--
10...	<.5	28	0	0	--	20	40	4.8	--	0
27...	<.5	21	0	0	30	10	40	3.1	.1	0
MAY										
15...	<.5	27	0	0	0	50	50	14	.2	0
31...	<.5	16	0	0	0	90	90	6.8	.4	0
JUN										
11...	<.5	17	0	0	20	0	20	2.6	.2	0
29...	<.5	28	0	0	10	30	40	5.7	.5	2

Table 12.--Water-quality data, station 03201600, Sandy Run above Big Four Hollow Creek near Lake Hope, Ohio, water years 1979 through 1981

[MG/L, milligrams per liter; UG/L, micrograms per liter]

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (FT^3/S)	SPE-CIFIC CON-DUCT-ANCE (US/CM)	PH FIELD (UNITS)	TEMPER-ATURE, WATER (DEG C)	OXYGEN DEMAND, CHEM-ICAL (HIGH LEVEL) (MG/L)	HARD-NESS (MG/L AS CACO3)	HARD-NESS, NONCAR-BONATE (MG/L CACO3)	ACIDITY TOTAL HEATED (MG/L AS H)	ACIDITY (MG/L AS CACO3)	CALCIUM DIS-SOLVED (MG/L AS CA)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG)
WATER YEAR 1979												
OCT												
12...	1030	.90	1800	2.7	13.0	32	600	600	7.5	372	130	67
12...	1615	.05	--	--	--	--	--	--	--	--	--	--
24...	1530	.70	1500	2.8	11.5	17	450	450	5.8	288	100	49
NOV												
06...	1000	.80	1400	2.7	10.0	13	480	480	5.5	273	110	50
22...	1000	.20	1000	2.9	7.0	6	300	300	3.3	164	69	32
30...	0930	.46	550	3.3	4.5	13	210	210	1.5	74	48	21
DEC												
08...	1400	34	--	--	--	--	--	--	--	--	--	--
09...	1145	10	--	--	--	--	--	--	--	--	--	--
21...	1330	1.6	270	4.4	4.5	27	94	94	.5	25	22	9.4
21...	1620	1.5	--	--	--	--	--	--	--	--	--	--
JAN												
04...	1500	1.4	410	3.7	1.0	17	120	120	1.0	50	26	13
16...	1500	1.3	375	3.7	2.0	1	110	110	1.0	50	26	12
FEB												
01...	1400	.59	450	3.5	.5	8	140	140	1.0	50	31	14
14...	0900	.26	640	3.2	.0	7	210	210	2.0	99	46	22
27...	1500	3.0	330	3.9	6.5	11	77	77	.6	30	18	7.8
MAR												
13...	1100	.76	675	3.3	6.0	12	190	190	2.5	124	42	20
26...	1430	1.0	355	4.0	5.0	8	110	110	.4	20	26	11
APR												
09...	1130	2.9	--	--	--	--	--	--	--	--	--	--
11...	1100	1.3	350	4.0	7.0	13	110	110	.6	30	25	11
30...	1200	.61	750	3.4	12.5	10	210	210	2.2	109	46	23
MAY												
15...	1300	.40	730	3.4	17.0	24	190	190	1.6	79	43	21
30...	1100	.61	695	3.5	12.0	0	190	190	1.6	79	42	21
JUN												
11...	1430	.59	500	4.0	18.0	3	150	150	.8	40	37	15
28...	1100	.14	1300	3.0	17.5	12	360	360	4.0	199	77	41
JUL												
10...	1130	.25	900	3.4	16.5	4	270	270	2.5	124	60	30
26...	1300	.20	1000	3.4	20.5	2	270	270	2.2	109	60	29
AUG												
08...	0845	.13	1100	2.9	18.5	50	320	320	3.3	164	73	34
23...	1200	1.0	314	5.0	18.0	39	120	110	--	--	28	11
SEP												
05...	1400	.24	950	3.1	19.0	12	300	300	3.3	164	67	32
17...	1230	.19	790	3.5	14.0	7	220	220	2.0	99	51	22

Table 12.--Water-quality data, station 03201600, Sandy Run above Big Four Hollow Creek near Lake Hope, Ohio, water years 1979 through 1981--Continued

DATE	SODIUM, DIS-SOLVED (MG/L AS NA)	SODIUM PERCENT	SODIUM AD-SORP-TION RATIO	SODIUM+ POTAS-SIUM DIS-SOLVED (MG/L AS NA)	POTAS-SIUM, DIS-SOLVED (MG/L AS K)	BICAR-BONATE (MG/L AS HCO3)	CAR-BONATE (MG/L AS CO3)	ALKA-LINITY (MG/L AS CACO3)	CARBON DIOXIDE DIS-SOLVED (MG/L AS CO2)	SULFATE DIS-SOLVED (MG/L AS SO4)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)
WATER YEAR 1979											
OCT											
12...	32	10	.6	--	3.0	0	0	0	.0	910	24
12...	--	--	--	--	--	--	--	--	--	--	--
24...	29	12	.6	--	3.0	0	0	0	.0	660	24
NOV											
06...	26	10	.5	--	3.0	0	0	0	.0	640	23
22...	20	12	.5	--	2.6	0	0	0	.0	470	17
30...	14	13	.4	--	2.3	0	0	0	.0	280	14
DEC											
08...	--	--	--	--	--	--	--	--	--	--	--
09...	--	--	--	--	--	--	--	--	--	--	--
21...	6.8	13	.3	--	1.7	0	0	0	.0	110	6.3
21...	--	--	--	--	--	--	--	--	--	--	--
JAN											
04...	6.1	10	.2	--	1.4	0	0	0	.0	170	6.4
16...	6.8	11	.3	--	1.3	0	0	0	.0	150	7.4
FEB											
01...	11	15	.4	--	1.6	0	0	0	.0	180	12
14...	15	14	.5	--	2.0	0	0	0	.0	280	14
27...	13	26	.6	--	1.4	0	0	0	.0	96	23
MAR											
13...	13	13	.4	--	2.0	0	0	0	.0	280	11
26...	9.6	16	.4	--	1.5	0	0	0	.0	130	11
APR											
09...	--	--	--	--	--	--	--	--	--	--	--
11...	8.6	15	.4	--	1.6	0	0	0	.0	130	10
30...	15	13	.5	--	2.3	0	0	0	.0	300	11
MAY											
15...	15	14	.5	--	2.2	0	0	0	.0	270	13
30...	13	13	.4	15	2.0	0	0	0	.0	260	13
JUN											
11...	11	13	.4	--	1.9	0	0	0	.0	200	14
28...	26	13	.6	29	2.7	0	0	0	.0	560	21
JUL											
10...	24	16	.6	--	2.9	0	0	0	.0	390	21
26...	25	17	.7	28	2.7	0	0	0	.0	400	23
AUG											
08...	26	15	.6	29	2.7	0	0	0	.0	480	24
23...	8.8	14	.4	11	2.0	3	0	2	48	120	7.2
SEP											
05...	20	13	.5	23	2.6	0	0	0	.0	430	15
17...	11	10	.3	13	2.4	0	0	0	.0	320	13

Table 12.--Water-quality data, station 03201600, Sandy Run above Big Four Hollow Creek near Lake Hope, Ohio, water years 1979 through 1981--Continued

DATE	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L)	SOLIDS, DIS-SOLVED (TONS PER AC-FT)	NITRO-GEN, NO2+NO3 TOTAL (MG/L AS N)	NITRO-GEN, AM-MONIA + ORGANIC TOTAL (MG/L AS N)	NITRO-GEN, TOTAL (MG/L AS N)	NITRO-GEN, TOTAL (MG/L AS NO3)	PHOS-PHORUS, TOTAL (MG/L AS P)	PHOS-PHORUS, ORTHOPH OSPHATE TOTAL (MG/L AS PO4)	PHOS-PHORUS, TOTAL (MG/L AS PO4)	ALUM-INUM, TOTAL RECOV-ERABLE (UG/L AS AL)	ANTI-MONY, TOTAL (UG/L AS SB)
WATER YEAR 1979											
OCT											
12...	1320	1.80	.08	39	39	170	.000	--	--	110	3
12...	--	--	--	--	--	--	--	--	--	--	--
24...	992	1.35	.13	.50	.63	2.8	.050	--	--	14000	1
NOV											
06...	981	1.33	.12	--	--	--	.000	--	--	15000	0
22...	671	.91	.09	.32	.41	1.8	.000	--	--	8200	0
30...	374	.51	.12	.24	.36	1.6	.000	--	--	1000	0
DEC											
08...	--	--	--	--	--	--	--	--	--	--	--
09...	--	--	--	--	--	--	--	--	--	--	--
21...	174	.24	.11	.09	.20	.89	.000	--	--	1500	0
21...	--	--	--	--	--	--	--	--	--	--	--
JAN											
04...	251	.34	.16	.07	.23	1.0	.000	--	--	4700	0
16...	233	.32	.11	.46	.57	2.5	.000	--	--	2000	0
FEB											
01...	275	.37	.09	.18	.27	1.2	.000	--	--	4000	0
14...	445	.61	.13	.49	.62	2.7	.000	--	--	5400	0
27...	185	.25	.18	.22	.40	1.8	.010	--	--	310	0
MAR											
13...	424	.58	.08	.33	.41	1.8	.000	--	--	6600	0
26...	219	.30	.09	.35	.44	1.9	.040	--	--	3500	0
APR											
09...	--	--	--	--	--	--	--	--	--	--	--
11...	213	.29	.04	.15	.19	.84	.000	--	--	4100	0
30...	453	.62	.03	.28	.31	1.4	.000	.00	.00	7200	0
MAY											
15...	470	.64	.06	.31	.37	1.6	.000	.00	.00	6200	0
30...	416	.57	.05	.00	.05	.22	.000	.00	.00	7600	0
JUN											
11...	341	.46	.06	.30	.36	1.6	.010	.03	.03	5000	0
28...	905	1.23	.11	.44	.55	2.4	.000	.00	.00	13000	0
JUL											
10...	648	.88	.09	.37	.46	2.0	.000	--	.00	8300	0
26...	620	.84	.12	.23	.35	1.6	.030	--	.09	9000	0
AUG											
08...	802	1.09	.11	.34	.45	2.0	.010	--	.03	9300	0
23...	217	.30	.07	.23	.30	1.3	.010	--	.03	2000	0
SEP											
05...	702	.95	.02	.34	.36	1.6	.000	--	.00	12000	0
17...	490	.67	.11	.81	.92	4.1	.000	--	.00	890	0

Table 12.--Water-quality data, station 03201600, Sandy Run above Big Four Hollow Creek near Lake Hope, Ohio, water years 1979 through 1981--Continued

DATE	ARSENIC TOTAL (UG/L AS AS)	BERYLLIUM, TOTAL RECOVERABLE (UG/L AS BE)	CADMIUM TOTAL RECOVERABLE (UG/L AS CD)	CHROMIUM, TOTAL RECOVERABLE (UG/L AS CR)	COPPER, TOTAL RECOVERABLE (UG/L AS CU)	IRON, TOTAL RECOVERABLE (UG/L AS FE)	IRON, SUSPENDED RECOVERABLE (UG/L AS FE)	IRON, DISSOLVED (UG/L AS FE)	LEAD, TOTAL RECOVERABLE (UG/L AS PB)	MANGANESE, TOTAL RECOVERABLE (UG/L AS MN)	MANGANESE, SUSPENDED RECOV. (UG/L AS MN)
WATER YEAR 1979											
OCT											
12...	0	100	5	4	12	90000	--	44000	39	4900	--
12...	--	--	--	--	--	--	--	--	--	--	--
24...	0	10	2	5	16	24000	--	24000	84	4200	--
NOV											
06...	0	10	1	3	10	30000	--	30000	46	3900	--
22...	0	10	5	4	6	28000	--	26000	15	2600	--
30...	0	5	77	4	3	14000	--	8200	41	1400	--
DEC											
08...	--	--	--	--	--	--	--	--	--	--	--
09...	--	--	--	--	--	--	--	--	--	--	--
21...	1	0	3	2	4	58000	--	1900	39	520	--
21...	--	--	--	--	--	--	--	--	--	--	--
JAN											
04...	0	0	0	3	6	9300	--	6600	7	850	--
16...	1	0	1	6	4	7400	--	6100	29	800	--
FEB											
01...	1	0	7	0	5	8300	--	4900	140	990	--
14...	0	10	1	4	6	12000	--	11000	11	1800	--
27...	0	0	0	1	5	1400	--	1400	0	450	--
MAR											
13...	1	10	1	0	6	19000	--	17000	12	1400	--
26...	1	0	0	0	4	5900	--	980	7	670	--
APR											
09...	--	--	--	--	--	--	--	--	--	--	--
11...	0	0	1	6	4	5700	--	830	34	630	--
30...	0	10	5	9	7	17000	4000	13000	32	1500	0
MAY											
15...	0	10	2	5	6	11000	4800	6200	25	1500	100
30...	0	0	4	12	6	12000	4700	7300	92	1400	0
JUN											
11...	1	0	7	8	6	7400	6100	1300	21	1100	0
28...	1	20	0	9	10	22000	0	22000	3	3400	300
JUL											
10...	1	10	1	17	9	15000	3000	12000	4	2100	0
26...	1	10	0	19	1	12000	6200	5800	4	2200	100
AUG											
08...	2	10	3	20	9	26000	10000	16000	5	3000	100
23...	2	0	1	13	4	5800	4600	1200	5	660	20
SEP											
05...	0	0	0	6	9	18000	--	16000	0	2800	500
17...	0	10	0	19	8	10000	--	7400	3	3800	400

Table 12.--Water-quality data, station 03201600, Sandy Run above Big Four Hollow Creek near Lake Hope, Ohio, water years 1979 through 1981--Continued

DATE	MANGANESE, DISSOLVED (UG/L AS MN)	MERCURY TOTAL RECOVERABLE (UG/L AS HG)	NICKEL, TOTAL RECOVERABLE (UG/L AS NI)	SELENIUM, TOTAL (UG/L AS SE)	SILVER, TOTAL RECOVERABLE (UG/L AS AG)	ZINC, SUSPENDED RECOVERABLE (UG/L AS ZN)	ZINC, DISSOLVED (UG/L AS ZN)	ZINC, TOTAL RECOVERABLE (UG/L AS ZN)	CARBON, ORGANIC DISSOLVED (MG/L AS C)	CARBON, ORGANIC SUSPENDED (MG/L AS C)	PHENOLS (UG/L)
WATER YEAR 1979											
OCT											
12...	4900	<.5	180	0	0	--	520	520	3.0	.3	1
12...	--	--	--	--	--	--	--	--	--	--	--
24...	4200	<.5	160	0	0	--	350	360	1.9	.1	0
NOV											
06...	3600	<.5	150	0	0	--	470	470	1.2	.3	1
22...	2300	<.5	100	0	0	--	220	2200	2.8	.6	0
30...	1400	<.5	61	0	0	--	120	120	8.3	.3	0
DEC											
08...	--	--	--	--	--	--	--	--	--	--	--
09...	--	--	--	--	--	--	--	--	--	--	--
21...	520	<.5	35	0	0	--	60	80	2.1	1.0	2
21...	--	--	--	--	--	--	--	--	--	--	--
JAN											
04...	100	<.5	48	0	0	--	1000	1000	1.8	.2	0
16...	800	<.5	26	0	0	--	110	110	1.7	.2	0
FEB											
01...	990	<.5	56	0	0	--	80	90	1.5	.1	0
14...	1800	<.5	79	0	0	--	170	170	1.6	.2	0
27...	450	<.5	4	0	0	--	50	50	4.4	--	2
MAR											
13...	1400	<.5	69	0	0	--	130	160	4.7	.2	0
26...	670	<.5	41	0	0	--	80	80	4.6	.2	0
APR											
09...	--	--	--	--	--	--	--	--	--	--	--
11...	630	<.5	57	0	0	--	80	90	1.1	.2	0
30...	1500	<.5	98	0	0	20	170	190	2.9	.1	0
MAY											
15...	1400	<.5	84	0	0	0	160	160	3.7	.2	1
30...	1400	<.5	60	0	0	0	220	220	2.0	.2	0
JUN											
11...	1100	<.5	66	0	0	30	90	120	2.0	.2	0
28...	3100	<.5	130	0	0	10	330	340	2.7	.1	2
JUL											
10...	2100	<.5	110	0	0	60	210	270	1.1	.2	0
26...	2100	<.5	0	0	0	70	200	270	3.1	.0	0
AUG											
08...	2900	<.5	110	0	0	0	250	250	1.9	.1	0
23...	640	<.5	22	0	1	0	60	60	4.1	.5	0
SEP											
05...	2300	<.5	110	0	0	60	260	320	2.0	.1	2
17...	3400	<.5	75	0	0	20	150	170	5.2	.1	2

Table 12.--Water-quality data, station 03201600, Sandy Run above Big Four Hollow Creek near Lake Hope, Ohio, water years 1979 through 1981--Continued

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (FT^3/S)	SPE-CIFIC CON-DUCT-ANCE (US/CM)	PH (UNITS)	TEMPER-ATURE, WATER (DEG C)	OXYGEN DEMAND, CHEM-ICAL (HIGH LEVEL) (MG/L)	HARD-NESS (MG/L AS CACO3)	HARD-NESS, NONCAR-BONATE (MG/L CACO3)	ACIDITY TOTAL HEATED (MG/L AS H)	ACIDITY (MG/L AS CACO3)	CALCIUM DIS-SOLVED (MG/L AS CA)
WATER YEAR 1980											
OCT											
02...	1230	1.0	525	3.6	15.0	4	160	160	1.4	70	36
23...	1600	.31	870	3.2	11.0	23	250	250	2.6	129	56
NOV											
09...	1500	7.6	220	6.5	8.5	22	82	63	--	--	20
20...	1000	.40	625	3.6	6.5	29	170	170	1.8	89	40
DEC											
06...	0930	.68	560	3.7	5.5	0	180	180	1.6	79	40
20...	1500	.65	408	4.2	3.0	15	140	140	1.0	50	32
JAN											
10...	1500	.55	710	3.5	1.5	6	220	220	2.6	129	48
24...	1400	.50	510	3.9	.5	19	160	160	2.0	99	38
FEB											
12...	1100	.29	710	3.6	.5	22	230	230	2.7	134	52
28...	1400	1.0	520	3.8	2.5	10	160	160	1.9	94	37
MAR											
12...	1100	.95	290	5.0	1.5	83	120	120	--	--	27
25...	1600	1.1	330	5.1	6.5	10	110	110	--	--	26
APR											
08...	1100	1.5	520	3.7	11.0	26	150	150	1.4	70	33
24...	0900	.81	400	4.4	9.0	5	140	140	.9	45	32
MAY											
09...	0930	.28	680	3.6	6.5	--	200	200	2.5	124	43
23...	1130	1.2	485	3.9	14.5	14	160	160	1.4	70	34
JUN											
12...	0930	.26	650	3.7	11.0	--	190	190	2.6	129	43
24...	1030	.15	1200	3.2	15.0	12	330	330	5.7	283	73
JUL											
10...	0845	1.8	300	6.7	17.5	19	110	96	.6	30	29
21...	0915	.20	1100	3.2	19.0	--	300	300	3.8	189	65
AUG											
06...	1620	.15	1000	3.1	23.0	--	--	--	3.0	149	--
19...	1000	.56	450	5.9	19.0	16	160	160	.5	25	40
SEP											
08...	1300	.11	1050	3.4	18.0	--	350	350	3.6	179	76
22...	1045	.13	1100	3.3	17.0	33	290	290	4.0	199	62

Table 12.--Water-quality data, station 03201600, Sandy Run above Big Four Hollow Creek near Lake Hope, Ohio, water years 1979 through 1981--Continued

DATE	MAGNESIUM, DISSOLVED (MG/L AS MG)	SODIUM, DISSOLVED (MG/L AS NA)	SODIUM PERCENT	SODIUM ADSORPTION RATIO	SODIUM+POTASSIUM DISSOLVED (MG/L AS NA)	POTASSIUM, DISSOLVED (MG/L AS K)	BICARBONATE (MG/L AS HCO3)	CARBONATE (MG/L AS CO3)	ALKALINITY (MG/L AS CACO3)	CARBON DIOXIDE DISSOLVED (MG/L AS CO2)	SULFATE DISSOLVED (MG/L AS SO4)
WATER YEAR 1980											
OCT											
02...	17	11	13	.4	13	2.3	0	0	0	.0	200
23...	27	17	21	.5	20	2.9	0	0	0	.0	330
NOV											
09...	7.8	7.6	24	.4	10	2.7	23	0	19	12	91
20...	18	10	18	.3	12	1.8	0	0	0	.0	250
DEC											
06...	20	13	22	.4	15	1.9	0	0	0	.0	230
20...	14	8.7	19	.3	10	1.4	0	0	0	.0	170
JAN											
10...	24	13	19	.4	15	2.2	0	0	0	.0	310
24...	16	10	18	.3	12	2.2	0	0	0	.0	210
FEB											
12...	24	14	12	.4	--	1.8	0	0	0	.0	320
28...	17	13	15	.4	15	1.6	0	0	0	.0	220
MAR											
12...	12	7.2	12	.3	8.2	1.0	2	0	2	32	120
25...	12	6.7	11	.3	8.2	1.5	5	0	4	64	110
APR											
08...	16	11	14	.4	--	1.7	0	0	0	.0	210
24...	14	8.8	12	.3	--	2.0	0	0	0	.0	180
MAY											
09...	23	14	13	.4	--	1.9	0	0	0	.0	300
23...	17	12	14	.4	--	1.8	0	0	0	.0	200
JUN											
12...	21	15	14	.5	--	1.9	0	0	0	.0	260
24...	37	21	12	.5	--	2.6	0	0	0	.0	490
JUL											
10...	10	9.7	15	.4	--	2.0	21	0	17	6.7	110
21...	34	22	14	.6	--	2.9	0	0	0	.0	500
AUG											
06...	--	--	--	--	--	--	0	0	0	.0	--
19...	15	13	15	.4	--	2.2	6	0	5	12	170
SEP											
08...	40	18	10	.4	--	2.9	0	0	0	.0	460
22...	33	21	13	.5	--	3.2	0	0	0	.0	520

Table 12.--Water-quality data, station 03201600, Sandy Run above Big Four Hollow Creek near Lake Hope, Ohio, water years 1979 through 1981--Continued

DATE	CHLORIDE, DISSOLVED (MG/L AS CL)	SOLIDS, RESIDUE AT 180 DEG. C DISSOLVED (MG/L)	SOLIDS, DISSOLVED (TONS PER AC-FT)	NITROGEN, NO2+NO3 TOTAL (MG/L AS N)	NITROGEN, AMMONIA + ORGANIC TOTAL (MG/L AS N)	NITROGEN, TOTAL (MG/L AS N)	NITROGEN, TOTAL (MG/L AS NO3)	PHOSPHORUS, TOTAL (MG/L AS P)	PHOSPHORUS, TOTAL (MG/L AS PO4)	ALUMINUM, TOTAL RECOVERABLE (UG/L AS AL)	ANTIMONY, TOTAL (UG/L AS SB)
WATER YEAR 1980											
OCT											
02...	8.1	327	.44	.06	.24	.30	1.3	.010	.03	4900	0
23...	10	513	.70	.05	.21	.26	1.2	.000	.00	6000	0
NOV											
09...	4.4	171	.23	.23	.70	.93	4.1	.060	.18	2000	0
20...	9.6	399	.54	.05	.21	.26	1.2	.000	.00	5200	0
DEC											
06...	7.8	368	.50	.12	.13	.25	1.1	.000	.00	4900	0
20...	7.0	262	.36	.07	.04	.11	.49	.000	.00	4400	0
JAN											
10...	9.1	465	.63	.07	.45	.52	2.3	.000	.00	6800	0
24...	6.5	349	.47	.08	.21	.29	1.3	.000	.00	4500	0
FEB											
12...	10	502	.68	.08	.67	.75	3.3	.000	.00	7700	0
28...	11	365	.50	.14	.71	.85	3.8	.010	.03	5300	0
MAR											
12...	8.0	208	.28	.13	.17	.30	1.3	.010	.03	500	0
25...	6.6	203	.28	.13	.34	.47	2.1	.010	.03	1300	0
APR											
08...	6.8	325	.44	.07	.20	.27	1.2	.000	.00	3700	0
24...	7.0	289	.39	.06	.29	.35	1.6	.010	.03	3500	0
MAY											
09...	9.3	470	.64	--	--	--	--	--	--	--	--
23...	7.3	317	.43	.06	.31	.37	1.6	.020	.06	4300	--
JUN											
12...	12	417	.57	--	--	--	--	--	--	--	--
24...	12	844	1.15	.10	.43	.53	2.3	.010	.03	15000	--
JUL											
10...	6.8	220	.30	.14	.18	.32	1.4	.010	.03	1900	--
21...	14	803	1.09	--	--	--	--	--	--	--	--
AUG											
06...	--	--	--	--	--	--	--	--	--	10000	--
19...	10	312	.42	.22	.26	.48	2.1	.010	.03	2300	--
SEP											
08...	11	744	1.01	.08	--	--	--	.000	.00	--	--
22...	12	792	1.08	.09	.18	.27	1.2	.010	.03	--	--

Table 12.--Water-quality data, station 03201600, Sandy Run above Big Four Hollow Creek near Lake Hope, Ohio, water years 1979 through 1981--Continued

DATE	ARSENIC TOTAL (UG/L AS AS)	BERYLLIUM, TOTAL RECOVERABLE (UG/L AS BE)	CADMIUM TOTAL RECOVERABLE (UG/L AS CD)	CHROMIUM, TOTAL RECOVERABLE (UG/L AS CR)	COPPER, TOTAL RECOVERABLE (UG/L AS CU)	IRON, TOTAL RECOVERABLE (UG/L AS FE)	IRON, SUSPENDED RECOVERABLE (UG/L AS FE)	IRON, DISSOLVED (UG/L AS FE)	LEAD, TOTAL RECOVERABLE (UG/L AS PB)	MANGANESE, TOTAL RECOVERABLE (UG/L AS MN)	MANGANESE, SUSPENDED RECOV. (UG/L AS MN)
WATER YEAR 1980											
OCT											
02...	2	10	0	10	4	13000	--	2700	1	1100	100
23...	1	10	0	16	7	15000	--	13000	0	1900	0
NOV											
09...	1	0	0	10	3	13000	--	550	2	480	100
20...	1	0	0	20	5	12000	--	6200	2	1400	100
DEC											
06...	0	20	0	30	4	12000	--	7100	0	1200	0
20...	0	20	0	2	5	6400	5000	1400	1	890	0
JAN											
10...	1	20	0	10	6	18000	0	18000	1	1600	0
24...	2	10	0	30	3	22000	5000	17000	0	1200	0
FEB											
12...	1	10	0	39	6	14000	0	14000	0	1900	0
28...	1	0	1	13	4	11000	4500	6500	12	990	20
MAR											
12...	1	0	0	13	3	5000	4500	510	1	600	10
25...	0	0	0	5	2	4400	3900	540	1	530	0
APR											
08...	1	10	0	2	4	12000	4700	7300	0	960	20
24...	0	10	0	6	4	6600	5200	1400	3	880	0
MAY											
09...	--	--	--	--	--	11000	3400	7600	0	1500	100
23...	--	--	--	--	--	14000	12000	1800	0	950	90
JUN											
12...	--	--	--	--	--	8600	4800	3800	1	1600	100
24...	--	--	--	--	--	19000	17000	1800	4	2800	0
JUL											
10...	--	--	--	--	--	10000	9100	880	2	560	0
21...	--	--	--	--	--	16000	3000	13000	9	2700	0
AUG											
06...	--	--	--	--	--	11000	--	--	9	2300	--
19...	--	--	--	--	--	5000	4300	670	19	930	50
SEP											
08...	0	--	1	20	8	16000	2000	14000	9	2900	2600
22...	--	--	--	--	--	--	--	12000	--	--	--

Table 12.--Water-quality data, station 03201600, Sandy Run above Big Four Hollow Creek near Lake Hope, Ohio, water years 1979 through 1981--Continued

DATE	MANGANESE, DISSOLVED (UG/L AS MN)	MERCURY TOTAL RECOVERABLE (UG/L AS HG)	NICKEL, TOTAL RECOVERABLE (UG/L AS NI)	SELENIUM, TOTAL (UG/L AS SE)	SILVER, TOTAL RECOVERABLE (UG/L AS AG)	ZINC, SUSPENDED RECOVERABLE (UG/L AS ZN)	ZINC, DISSOLVED (UG/L AS ZN)	ZINC, TOTAL RECOVERABLE (UG/L AS ZN)	CARBON, ORGANIC DISSOLVED (MG/L AS C)	CARBON, ORGANIC SUSPENDED (MG/L AS C)	PHENOLS (UG/L)
WATER YEAR 1980											
OCT											
02...	1000	<.5	48	0	0	0	130	130	2.2	.8	1
23...	1900	<.1	75	0	0	0	190	190	6.2	.0	0
NOV											
09...	380	<.1	17	0	0	0	40	40	4.4	--	0
20...	1300	.1	55	0	0	0	150	150	8.1	.1	0
DEC											
06...	1200	1.4	58	0	0	0	170	170	2.1	.3	0
20...	890	<.1	34	0	0	0	120	120	2.2	.2	0
JAN											
10...	1600	.2	65	0	0	0	190	190	2.5	.1	2
24...	1200	<.1	47	0	0	0	150	150	1.7	.2	0
FEB											
12...	1900	<.1	71	0	0	0	210	210	3.3	.1	0
28...	970	.6	42	0	0	0	120	120	2.0	.2	0
MAR											
12...	590	.1	28	0	0	0	60	60	0.3	.2	6
25...	530	.1	0	0	0	0	130	130	1.6	.6	3
APR											
08...	940	.1	40	0	0	0	110	110	1.2	.1	0
24...	880	<.1	31	0	0	0	100	100	1.6	.1	0
MAY											
09...	1400	--	--	--	--	--	150	--	--	--	--
23...	860	--	--	--	--	10	90	100	2.5	.6	--
JUN											
12...	1500	--	--	--	--	--	150	--	--	--	--
24...	2800	--	--	--	--	0	290	290	4.3	.0	--
JUL											
10...	560	.1	21	--	--	0	70	70	1.4	1.0	--
21...	2700	--	--	--	--	--	330	--	--	--	--
AUG											
06...	--	--	--	--	--	--	--	--	--	--	--
19...	880	--	--	--	--	0	80	80	2.3	.6	--
SEP											
08...	330	<.1	--	0	0	--	260	250	--	--	--
22...	3000	--	--	--	--	--	320	--	2.4	--	--

Table 12.--Water-quality data, station 03201600, Sandy Run above Big Four Hollow Creek near Lake Hope, Ohio, water years 1979 through 1981--Continued

DATE	TIME	SPECIFIC CONDUCTANCE (US/CM)	STREAMFLOW, INSTANTANEOUS (FT^3/S)	PH (STANDARD UNITS)	TEMPERATURE, AIR (DEG C)	TEMPERATURE (DEG C)	OXYGEN DEMAND, CHEMICAL (HIGH LEVEL) (MG/L)	ACIDITY (MG/L AS H)	CALCIUM DISSOLVED (MG/L AS CA)	MAGNESIUM, DISSOLVED (MG/L AS MG)	SODIUM, DISSOLVED (MG/L AS NA)	POTASSIUM, DISSOLVED (MG/L AS K)
WATER YEAR 1981												
OCT												
07...	0930	1650	.10	2.8	--	9.5	--	7.4	97	55	29	3.0
21...	0930	1250	.01	3.2	9.5	8.5	13	4.9	90	43	24	2.9
NOV												
05...	0930	1100	.01	3.4	6.0	5.0	--	3.9	74	37	25	2.7
19...	0930	680	.20	3.8	--	1.0	9	2.4	50	22	16	2.3
DEC												
04...	0930	655	.19	3.9	3.0	.5	--	1.7	46	21	16	2.2
19...	1100	740	.22	3.6	--	2.0	0	2.2	47	24	14	1.8
JAN												
07...	1000	990	.25	3.5	--	1.0	--	2.8	65	30	16	2.4
22...	0930	755	.25	3.7	--	1.0	<10	1.8	51	22	17	1.9
FEB												
05...	1045	450	.80	3.9	--	.5	--	1.6	28	12	7.2	1.5
17...	1900	255	5.5	5.1	--	4.0	17	.6	17	7.6	8.8	1.4
MAR												
11...	1000	565	.90	3.7	--	4.5	--	1.6	37	16	9.6	1.8
24...	0930	525	.95	3.8	--	3.0	<10	1.4	34	18	13	1.7
APR												
10...	1430	375	.70	4.5	--	11.5	--	.8	30	12	8.2	1.8
22...	1400	545	.95	3.9	--	13.0	<10	1.4	38	19	13	2.0
MAY												
12...	1530	235	3.5	5.2	--	12.0	--	.6	18	8.2	5.6	1.5
26...	1200	710	.40	3.5	--	15.0	<10	1.9	42	21	13	2.2
JUN												
03...	1030	445	1.1	3.9	--	15.5	--	1.0	34	16	11	2.0
22...	1000	390	1.4	4.6	--	17.5	<10	1.1	36	15	14	2.3
JUL												
09...	1030	1010	.16	3.1	--	18.5	--	3.5	61	30	17	3.1
21...	1100	1100	.13	3.2	--	19.0	<10	3.9	69	33	18	3.2
AUG												
06...	1000	1200	.10	3.2	24.0	19.0	--	5.6	97	35	42	3.0
19...	1100	1900	.04	3.0	--	14.5	--	22	120	68	27	2.6
27...	0930	1900	.04	3.1	23.0	15.5	<10	10	140	76	30	3.4
SEP												
09...	1000	1690	.05	3.0	18.5	15.5	--	8.6	130	70	28	3.1
30...	0900	2000	.04	2.8	--	12.5	<5	8.2	140	77	30	2.9

Table 12.--Water-quality data, station 03201600, Sandy Run above Big Four Hollow Creek near Lake Hope, Ohio, water years 1979 through 1981--Continued

DATE	SULFATE DIS-SOLVED (MG/L AS SO4)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L)	NITRO-GEN, NO2+NO3 TOTAL (MG/L AS N)	NITRO-GEN, AM-MONIA + ORGANIC TOTAL (MG/L AS N)	NITRO-GEN, TOTAL (MG/L AS N)	NITRO-GEN, TOTAL (MG/L AS NO3)	PHOS-PHORUS, TOTAL (MG/L AS P)	PHOS-PHORUS TOTAL (MG/L AS PO4)	ALUM-INUM, TOTAL RECOV-ERABLE (UG/L AS AL)	IRON, TOTAL RECOV-ERABLE (UG/L AS FE)	IRON, SUS-PENDED RECOV-ERABLE (UG/L AS FE)
WATER YEAR 1981												
OCT												
07...	840	11	1270	--	--	--	--	--	--	--	46000	0
21...	540	14	924	.02	.41	.43	1.9	.000	.00	17000	--	--
NOV												
05...	480	15	748	--	--	--	--	--	--	--	--	--
19...	280	11	450	2.0	.30	2.3	10	.000	.00	6100	8800	4300
DEC												
04...	250	11	411	--	--	--	--	--	--	--	9100	5200
19...	310	8.8	486	.15	.15	.30	1.3	.000	.00	8000	14000	4200
JAN												
07...	410	12	613	--	--	--	--	--	--	9000	18000	1000
22...	280	22	474	.21	.19	.40	1.8	<.010	<.03	7000	9400	2400
FEB												
05...	190	6.9	283	--	--	--	--	--	--	--	7800	5500
17...	88	11	158	.51	.27	.78	3.5	.090	.28	2800	5900	4400
MAR												
11...	210	7.7	344	--	--	--	--	--	--	--	11000	4100
24...	210	8.4	324	.15	.20	.35	1.5	<.010	.03	3700	7900	4100
APR												
10...	150	7.0	245	--	--	--	--	--	--	3500	6700	6000
22...	210	6.7	335	.11	.17	.28	1.2	<.010	.03	4600	10000	5700
MAY												
12...	83	3.9	156	--	--	--	--	--	--	--	4100	3300
26...	250	8.6	426	.15	.50	.65	2.9	<.010	.03	6300	9800	4800
JUN												
03...	190	6.7	319	--	--	--	--	--	--	--	7300	5400
22...	170	7.2	290	.16	.46	.62	2.7	.020	.06	0	8500	6500
JUL												
09...	430	9.7	713	--	--	--	--	--	--	--	15000	3000
21...	480	9.3	740	.13	.38	.51	2.3	<.010	.03	12000	15000	2000
AUG												
06...	540	13	863	.10	--	--	--	<.010	.03	--	14000	12000
19...	880	7.7	1480	--	--	--	--	--	--	--	33000	0
27...	920	9.7	1570	.14	.60	.74	3.3	<.010	--	32000	31000	0
SEP												
09...	860	8.6	1320	--	--	--	--	--	--	--	26000	1000
30...	830	9.0	1560	.11	.80	.91	4.0	.020	.06	26000	30000	0

Table 12.--Water-quality data, station 03201600, Sandy Run above Big Four Hollow Creek near Lake Hope, Ohio, water years 1979 through 1981--Continued

DATE	IRON, DISSOLVED (UG/L AS FE)	LEAD, TOTAL RECOVERABLE (UG/L AS PB)	MANGANESE, TOTAL RECOVERABLE (UG/L AS MN)	MANGANESE, SUSPENDED RECOV. (UG/L AS MN)	MANGANESE, DISSOLVED (UG/L AS MN)	MERCURY TOTAL RECOVERABLE (UG/L AS HG)	NICKEL, TOTAL RECOVERABLE (UG/L AS NI)	ZINC, TOTAL RECOVERABLE (UG/L AS ZN)	ZINC, SUSPENDED RECOVERABLE (UG/L AS ZN)	ZINC, DISSOLVED (UG/L AS ZN)	CARBON, ORGANIC DISSOLVED (MG/L AS C)	CARBON, ORGANIC SUSPENDED TOTAL (MG/L AS C)
WATER YEAR 1981												
OCT												
07...	46000	6	4400	0	4400	--	--	--	--	560	--	--
21...	24000	7	4000	0	4000	<.1	150	690	0	690	1.6	.2
NOV												
05...	18000	--	--	--	3000	--	--	--	--	320	--	--
19...	4500	2	1700	0	1700	--	--	160	0	160	1.0	.4
DEC												
04...	3900	6	1500	100	1400	--	--	--	--	180	--	--
19...	9800	2	1700	0	1700	--	--	170	0	170	.3	.2
JAN												
07...	17000	--	2200	0	2200	--	--	--	--	470	--	--
22...	7000	4	1600	0	1600	<.1	67	190	0	190	.9	.4
FEB												
05...	2300	25	910	0	910	--	--	--	--	120	--	--
17...	1500	1	330	50	280	--	--	50	10	40	3.6	1.2
MAR												
11...	6900	2	1000	0	1000	--	--	--	--	100	--	--
24...	3800	17	970	0	970	--	--	150	0	150	3.3	.0
APR												
10...	710	--	810	30	780	--	--	--	--	100	--	--
22...	4300	6	1000	0	1000	<.1	52	130	20	110	1.3	.3
MAY												
12...	840	1	390	50	340	--	--	--	--	40	--	--
26...	5000	4	1500	100	1400	--	--	150	10	140	.9	.1
JUN												
03...	1900	1	950	10	940	--	--	--	--	110	--	--
22...	2000	2	950	0	950	--	--	130	0	130	1.4	--
JUL												
09...	12000	10	2800	300	2500	--	--	--	--	280	--	--
21...	13000	31	3300	400	2900	<.1	120	290	20	270	1.3	.2
AUG												
06...	2000	16	3700	3500	170	<.1	--	350	--	--	--	--
19...	33000	10	6500	600	5900	--	--	--	--	560	--	--
27...	31000	10	7500	0	7500	--	--	620	0	620	<.3	.3
SEP												
09...	25000	10	6000	0	6000	--	--	--	--	510	--	--
30...	30000	5	8300	1600	6700	--	--	670	0	670	1.0	.4

Table 13.--Water-quality data, station 03201720, Hull Hollow Creek near Lake Hope, Ohio, water years 1979 through 1981

[MG/L, milligrams per liter; UG/L, micrograms per liter]

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (FT^3/S)	SPE-CIFIC CON-DUCT-ANCE (US/CM)	PH FIELD (UNITS)	TEMPER-ATURE, WATER (DEG C)	OXYGEN DEMAND, CHEM-ICAL (HIGH LEVEL) (MG/L)	HARD-NESS (MG/L AS CACO3)	HARD-NESS, NONCAR-BONATE (MG/L CACO3)	CALCIUM DIS-SOLVED (MG/L AS CA)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG)	SODIUM, DIS-SOLVED (MG/L AS NA)
WATER YEAR 1979											
NOV											
06...	1400	.15	190	5.9	12.5	11	65	50	16	6.0	2.8
21...	1000	.23	130	5.9	7.5	7	56	45	14	5.2	2.4
30...	1230	.32	150	5.8	2.5	13	56	56	14	5.2	2.6
DEC											
09...	1115	1.5	--	--	--	--	--	--	--	--	--
22...	1200	.11	130	6.0	5.0	36	48	37	12	4.4	1.8
JAN											
04...	1330	.44	110	6.2	2.5	13	44	32	11	4.0	1.6
17...	1600	.44	130	6.6	1.5	4	52	41	13	4.8	2.0
FEB											
01...	1200	.22	100	6.1	.5	14	48	39	12	4.3	1.8
15...	1630	.22	120	6.1	-1.0	3	50	40	12	4.8	2.0
27...	1300	2.2	90	6.3	5.0	7	35	30	8.7	3.3	1.2
MAR											
13...	0900	.70	95	6.3	2.0	7	45	44	11	4.3	1.6
26...	1130	1.1	115	7.0	5.5	6	49	32	12	4.6	2.1
APR											
02...	1430	3.8	--	--	--	--	--	--	--	--	--
10...	1400	1.7	120	6.3	11.5	13	49	32	12	4.5	2.0
11...	1000	1.4	--	--	--	--	--	--	--	--	--
27...	1100	1.0	150	6.9	13.5	7	57	44	14	5.3	2.3
MAY											
15...	1100	.58	135	6.3	16.5	25	50	39	12	4.9	2.3
31...	1100	.49	140	7.1	14.0	7	52	38	13	4.8	2.2
JUN											
11...	0930	.70	120	7.3	14.5	10	52	34	13	4.7	2.0
28...	1430	.27	150	7.0	19.5	9	50	36	12	4.8	2.4
JUL											
09...	1230	.44	185	6.8	17.0	8	54	39	13	5.2	2.5
26...	1030	.37	130	6.6	19.5	0	53	38	13	5.0	2.3
AUG											
08...	0945	.44	150	6.7	19.5	37	53	42	13	5.0	2.5
23...	0900	.53	129	7.1	18.0	42	52	32	13	4.7	2.2
SEP											
05...	1300	.30	160	7.1	20.0	3	49	32	12	4.5	2.2
17...	1100	.37	125	6.9	14.5	5	48	32	12	4.4	2.0

Table 13.--Water-quality data, station 03201720, Hull Hollow Creek near Lake Hope, Ohio, water years 1979 through 1981--Continued

DATE	SODIUM PERCENT	SODIUM ADSORPTION RATIO	SODIUM+POTASSIUM DISSOLVED (MG/L AS NA)	POTASSIUM, DISSOLVED (MG/L AS K)	BICARBONATE (MG/L AS HCO3)	CARBONATE (MG/L AS CO3)	ALKALINITY (MG/L AS CACO3)	CARBON DIOXIDE DISSOLVED (MG/L AS CO2)	SULFATE DISSOLVED (MG/L AS SO4)	CHLORIDE, DISSOLVED (MG/L AS CL)	SOLIDS, RESIDUE AT 180 DEG. C DISSOLVED (MG/L)
WATER YEAR 1979											
NOV											
06...	8	.2	--	2.0	18	0	15	36	57	1.6	102
21...	8	.1	--	1.8	14	0	11	28	45	1.6	93
30...	9	.2	--	1.7	1	0	1	2.5	51	1.6	90
DEC											
09...	--	--	--	--	--	--	--	--	--	--	--
22...	7	.1	--	1.5	14	0	11	22	42	1.2	85
JAN											
04...	7	.1	--	1.3	14	0	11	14	38	1.0	76
17...	8	.1	--	1.2	14	0	11	5.6	38	1.2	84
FEB											
01...	7	.1	--	1.4	10	0	8	13	42	1.4	79
15...	8	.1	--	1.4	12	0	10	15	44	1.2	85
27...	7	.1	--	1.3	6	0	5	4.8	32	.9	64
MAR											
13...	7	.1	--	1.3	1	0	1	.8	40	.9	75
26...	8	.1	--	1.3	21	0	17	3.4	40	.9	78
APR											
02...	--	--	--	--	--	--	--	--	--	--	--
10...	8	.1	--	1.6	20	0	16	16	35	.8	75
11...	--	--	--	--	--	--	--	--	--	--	--
27...	8	.1	--	1.8	16	0	13	3.2	50	1.1	98
MAY											
15...	9	.1	--	1.7	13	0	11	10	44	.7	92
31...	8	.1	3.8	1.6	17	0	14	2.2	45	.8	88
JUN											
11...	7	.1	--	1.7	22	0	18	1.8	41	.8	92
28...	9	.1	--	1.5	17	0	14	2.7	51	.9	88
JUL											
09...	9	.1	--	1.8	18	0	15	4.6	48	3.1	112
26...	8	.1	4.0	1.7	18	0	15	7.2	46	1.0	100
AUG											
08...	9	.2	4.2	1.7	13	0	11	4.2	48	.9	110
23...	8	.1	4.0	1.8	24	0	20	3.1	44	.3	85
SEP											
05...	9	.1	3.8	1.6	20	0	16	2.5	39	.9	104
17...	8	.1	3.5	1.5	20	0	16	4.0	47	1.2	86

Table 13.--Water-quality data, station 03201720, Hull Hollow Creek near Lake Hope, Ohio, water years 1979 through 1981--Continued

DATE	SOLIDS, DIS-SOLVED (TONS PER AC-FT)	NITRO-GEN, NO2+NO3 TOTAL (MG/L AS N)	NITRO-GEN, AMMONIA + ORGANIC TOTAL (MG/L AS N)	NITRO-GEN, TOTAL (MG/L AS N)	NITRO-GEN, TOTAL (MG/L AS NO3)	PHOS-PHORUS, TOTAL (MG/L AS P)	PHOS-PHORUS, ORTHOPH OSPHATE TOTAL (MG/L AS PO4)	PHOS-PHORUS, TOTAL (MG/L AS PO4)	ALUM-INUM, TOTAL RECOV-ERABLE (UG/L AS AL)	ANTI-MONY, TOTAL (UG/L AS SB)	ARSENIC TOTAL (UG/L AS AS)
WATER YEAR 1979											
NOV											
06...	.14	.03	.01	.04	.18	.000	--	--	90	0	0
21...	.13	.17	.00	.17	.75	.000	--	--	80	0	0
30...	.12	.17	.08	.25	1.1	.000	--	--	110	0	0
DEC											
09...	--	--	--	--	--	--	--	--	--	--	--
22...	.12	.08	.07	.15	.66	.000	--	--	130	0	0
JAN											
04...	.10	.09	.00	.09	.40	.000	--	--	170	0	1
17...	.11	.10	.05	.15	.66	.000	--	--	80	0	1
FEB											
01...	.11	.09	.08	.17	.75	.000	--	--	180	0	1
15...	.12	.23	.34	.57	2.5	.000	--	--	90	0	0
27...	.09	.18	.00	.18	.80	.000	--	--	170	0	1
MAR											
13...	.10	.07	.02	.09	.40	.000	--	--	50	0	1
26...	.11	.09	.15	.24	1.1	.000	--	--	130	0	1
APR											
02...	--	--	--	--	--	--	--	--	--	--	--
10...	.10	.04	.12	.16	.71	.010	--	--	130	0	0
11...	--	--	--	--	--	--	--	--	--	--	--
27...	.13	.02	.06	.08	.35	.000	.00	.00	80	0	0
MAY											
15...	.13	.03	.12	.15	.66	.010	.03	.03	90	0	0
31...	.12	.06	.14	.20	.89	.000	.00	.00	160	0	0
JUN											
11...	.13	.05	.30	.35	1.6	.010	.03	.03	130	0	0
28...	.12	.03	.12	.15	.66	.030	.09	.09	280	0	1
JUL											
09...	.15	.07	.03	.10	.44	.000	--	.00	100	0	1
26...	.14	.06	.00	.06	.27	.040	--	.12	70	0	0
AUG											
08...	.15	.03	.26	.29	1.3	.010	--	.03	90	0	2
23...	.12	.08	.10	.18	.80	.000	--	.00	150	0	2
SEP											
05...	.14	.06	.00	.06	.27	.010	--	.03	190	0	0
17...	.12	.21	.37	.58	2.6	.010	--	.03	140	0	0

Table 13.--Water-quality data, station 03201720, Hull Hollow Creek near Lake Hope, Ohio, water years 1979 through 1981--Continued

DATE	BERYLLIUM, TOTAL RECOVERABLE (UG/L AS BE)	CADMIUM TOTAL RECOVERABLE (UG/L AS CD)	CHROMIUM, TOTAL RECOVERABLE (UG/L AS CR)	COPPER, TOTAL RECOVERABLE (UG/L AS CU)	IRON, TOTAL RECOVERABLE (UG/L AS FE)	IRON, SUSPENDED RECOVERABLE (UG/L AS FE)	IRON, DISSOLVED (UG/L AS FE)	LEAD, TOTAL RECOVERABLE (UG/L AS PB)	MANGANESE, TOTAL RECOVERABLE (UG/L AS MN)	MANGANESE, SUSPENDED RECOV. (UG/L AS MN)	MANGANESE, DISSOLVED (UG/L AS MN)
WATER YEAR 1979											
NOV											
06...	0	2	0	1	130	--	130	41	130	--	110
21...	0	16	1	2	100	--	10	76	300	--	20
30...	0	4	1	2	210	--	210	24	30	--	30
DEC											
09...	--	--	--	--	--	--	--	--	--	--	--
22...	0	1	1	2	250	--	80	10	30	--	30
JAN											
04...	0	2	0	1	100	--	70	24	30	--	30
17...	0	22	3	1	100	--	90	190	30	--	30
FEB											
01...	0	68	0	1	150	--	10	900	30	--	20
15...	0	1	2	2	70	--	10	13	30	--	30
27...	0	8	0	2	210	--	30	92	30	--	30
MAR											
13...	0	2	0	1	120	--	20	19	20	--	20
26...	0	0	0	1	100	--	20	5	20	--	10
APR											
02...	--	--	--	--	--	--	--	--	--	--	--
10...	0	9	6	1	150	--	10	110	20	--	10
11...	--	--	--	--	--	--	--	--	--	--	--
27...	0	7	6	2	40	30	10	72	20	10	10
MAY											
15...	0	4	3	7	90	80	10	40	60	30	30
31...	0	6	9	1	400	400	0	38	40	10	30
JUN											
11...	0	12	9	1	100	90	10	28	20	0	20
28...	0	0	11	6	890	860	30	4	70	60	10
JUL											
09...	0	0	16	3	160	140	20	4	30	0	30
26...	0	0	5	0	250	240	10	5	10	0	10
AUG											
08...	0	1	20	3	440	420	20	5	50	30	20
23...	0	1	18	3	230	220	10	7	40	10	30
SEP											
05...	0	0	4	2	560	--	40	6	60	30	30
17...	0	0	2	3	310	--	0	1	30	0	30

Table 13.--Water-quality data, station 03201720, Hull Hollow Creek near Lake Hope, Ohio, water years 1979 through 1981--Continued

DATE	MERCURY TOTAL RECOV-ERABLE (UG/L AS HG)	NICKEL, TOTAL RECOV-ERABLE (UG/L AS NI)	SELE-NIUM, TOTAL (UG/L AS SE)	SILVER, TOTAL RECOV-ERABLE (UG/L AS AG)	ZINC, SUS-PENDED RECOV-ERABLE (UG/L AS ZN)	ZINC, DIS-SOLVED (UG/L AS ZN)	ZINC, TOTAL RECOV-ERABLE (UG/L AS ZN)	CARBON, ORGANIC DIS-SOLVED (MG/L AS C)	CARBON, ORGANIC SUS-PENDED (MG/L AS C)	PHENOLS (UG/L)
WATER YEAR 1979										
NOV										
06...	<.5	27	0	0	--	30	30	1.7	1.2	2
21...	<.5	16	0	0	--	0	0	5.4	.4	1
30...	<.5	14	0	0	--	10	10	1.6	.3	0
DEC										
09...	--	--	--	--	--	--	--	--	--	--
22...	<.5	14	0	0	--	0	30	2.9	.3	2
JAN										
04...	<.5	13	0	0	--	20	20	2.4	.2	1
17...	<.5	4	0	0	--	10	20	1.0	.1	0
FEB										
01...	<.5	5	0	0	--	10	20	2.7	.1	0
15...	<.5	18	0	0	--	10	70	1.3	1.6	4
27...	<.5	9	0	0	--	0	20	3.1	--	1
MAR										
13...	<.5	12	0	0	--	10	20	5.0	.0	0
26...	<.5	7	0	0	--	10	10	2.0	.0	5
APR										
02...	--	--	--	--	--	--	--	--	--	--
10...	<.5	23	0	0	--	10	20	7.7	.1	0
11...	--	--	--	--	--	--	--	--	--	--
27...	<.5	20	0	0	40	0	40	6.4	.1	0
MAY										
15...	<.5	30	0	0	0	30	30	3.8	.2	1
31...	<.5	15	0	0	10	10	20	11	.2	0
JUN										
11...	<.5	16	0	0	10	8	20	2.1	.1	0
28...	<.5	15	0	0	40	5	40	3.6	.3	2
JUL										
09...	<.5	24	0	0	20	6	30	3.4	.4	0
26...	<.5	0	0	0	2	8	10	3.9	.0	0
AUG										
08...	<.5	3	0	0	0	10	10	2.0	.2	0
23...	<.5	3	0	1	0	20	20	8.0	.2	0
SEP										
05...	<.5	3	0	0	110	10	120	6.1	.2	2
17...	<.5	3	0	0	20	0	20	2.9	.0	1

Table 13.--Water-quality data, station 03201720, Hull Hollow Creek near Lake Hope, Ohio, water years 1979 through 1981--Continued

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (FT^3/S)	SPE-CIFIC CON-DUCT-ANCE (US/CM)	PH (UNITS)	TEMPER-ATURE, WATER (DEG C)	OXYGEN DEMAND, CHEM-ICAL (HIGH LEVEL) (MG/L)	HARD-NESS (MG/L AS CACO3)	HARD-NESS, NONCAR-BONATE (MG/L CACO3)	ACIDITY TOTAL HEATED (MG/L AS H)	ACIDITY (MG/L AS CACO3)	CALCIUM DIS-SOLVED (MG/L AS CA)
WATER YEAR 1980											
OCT											
02...	1430	.60	130	7.1	15.5	4	51	32	--	--	13
23...	1445	.60	130	6.4	11.5	21	53	37	--	--	13
NOV											
09...	1530	4.4	125	7.0	8.5	21	55	35	--	--	14
20...	1400	.60	140	7.0	11.5	29	53	38	--	--	13
DEC											
06...	1200	.50	140	7.9	6.5	1	57	41	--	--	14
20...	1400	.50	120	7.0	5.0	4	56	38	--	--	14
JAN											
10...	1600	.40	135	7.5	1.5	4	57	43	--	--	14
24...	1000	.40	120	7.5	.5	8	56	42	--	--	14
FEB											
12...	1200	.15	140	7.6	.5	10	60	45	--	--	15
28...	1200	.30	140	6.7	.5	75	60	43	--	--	15
MAR											
12...	1200	.30	130	7.3	3.5	82	57	40	--	--	14
25...	0930	.30	125	7.8	5.5	5	56	27	--	--	14
APR											
08...	1530	.20	133	6.8	11.5	16	56	38	--	--	14
24...	0945	.20	135	7.4	11.0	0	56	39	--	--	14
MAY											
09...	1000	.03	140	7.3	8.0	--	56	39	--	--	13
23...	1200	.10	160	8.0	15.0	15	65	52	--	--	16
JUN											
24...	1130	<.01	150	8.0	17.0	8	58	24	--	--	15
JUL											
10...	1030	.80	160	6.3	17.5	9	63	34	.6	30	15
AUG											
19...	1200	.06	170	6.9	20.5	13	63	36	.2	10	16

Table 13.--Water-quality data, station 03201720, Hull Hollow Creek near Lake Hope, Ohio, water years 1979 through 1981--Continued

DATE	MAGNESIUM, DISSOLVED (MG/L AS MG)	SODIUM, DISSOLVED (MG/L AS NA)	SODIUM PERCENT	SODIUM ADSORPTION RATIO	SODIUM+POTASSIUM DISSOLVED (MG/L AS NA)	POTASSIUM, DISSOLVED (MG/L AS K)	BICARBONATE (MG/L AS HCO3)	CARBONATE (MG/L AS CO3)	ALKALINITY (MG/L AS CACO3)	CARBON DIOXIDE DISSOLVED (MG/L AS CO2)	SULFATE DISSOLVED (MG/L AS SO4)
WATER YEAR 1980											
OCT											
02...	4.6	2.0	11	.1	3.8	1.8	24	0	20	3.1	39
23...	4.9	2.2	12	.1	4.1	1.9	19	0	16	12	46
NOV											
09...	4.8	2.3	12	.1	4.7	2.4	24	0	20	3.8	39
20...	5.0	2.3	13	.1	3.7	1.4	18	0	15	2.9	45
DEC											
06...	5.4	2.7	14	.2	4.1	1.4	20	0	16	.4	46
20...	5.1	2.3	8	.1	3.6	1.3	22	0	18	3.5	45
JAN											
10...	5.4	2.2	12	.1	3.6	1.4	17	0	14	.9	52
24...	5.2	2.3	8	.1	3.7	1.4	17	0	14	.9	45
FEB											
12...	5.5	2.4	8	.1	3.6	1.2	19	0	16	.8	49
28...	5.5	2.5	8	.1	3.7	1.2	21	0	17	6.7	51
MAR											
12...	5.3	2.1	7	.1	3.1	1.0	20	0	16	1.6	44
25...	5.2	1.9	7	.1	--	1.4	36	0	30	.9	42
APR											
08...	5.1	2.4	8	.1	--	1.4	22	0	18	5.6	45
24...	5.0	2.3	8	.1	--	1.9	20	0	16	1.3	47
MAY											
09...	5.6	2.6	9	.2	--	1.5	20	0	16	1.6	51
23...	6.2	2.9	9	.2	--	1.6	17	0	14	.3	55
JUN											
24...	5.0	2.5	8	.1	--	1.6	42	0	34	.7	50
JUL											
10...	6.2	3.6	11	.2	--	2.0	35	0	29	28	42
AUG											
19...	5.7	2.9	9	.2	--	2.1	34	0	28	6.8	45

Table 13.--Water-quality data, station 03201720, Hull Hollow Creek near Lake Hope, Ohio, water years 1979 through 1981--Continued

DATE	CHLORIDE, DISSOLVED (MG/L AS CL)	SOLIDS, RESIDUE AT 180 DEG. C DISSOLVED (MG/L)	SOLIDS, DISSOLVED (TONS PER AC-FT)	NITROGEN, NO2+NO3 TOTAL (MG/L AS N)	NITROGEN, AMMONIA + ORGANIC TOTAL (MG/L AS N)	NITROGEN, TOTAL (MG/L AS N)	NITROGEN, TOTAL (MG/L AS NO3)	PHOSPHORUS, TOTAL (MG/L AS P)	PHOSPHORUS, TOTAL (MG/L AS PO4)	ALUMINUM, TOTAL RECOVERABLE (UG/L AS AL)	ANTIMONY, TOTAL (UG/L AS SB)
WATER YEAR 1980											
OCT											
02...	.4	86	.12	.04	.06	.10	.44	.000	.00	60	0
23...	.7	90	.12	.00	.14	.14	.62	.010	.03	100	0
NOV											
09...	1.3	100	.14	.14	.29	.43	1.9	.040	.12	380	0
20...	.9	93	.13	--	--	--	--	--	--	270	0
DEC											
06...	1.0	--	--	.06	.12	.18	.80	.010	.03	80	0
20...	1.4	87	.12	2.5	.19	2.7	12	.010	.03	110	0
JAN											
10...	.9	97	.13	.13	.34	.47	2.1	.000	.00	200	0
24...	1.0	96	.13	.10	.09	.19	.84	.020	.06	60	0
FEB											
12...	1.1	106	.14	.07	.00	.07	.31	.000	.00	130	0
28...	1.1	104	.14	.20	.01	.21	.93	.010	.03	60	0
MAR											
12...	1.0	98	.13	.13	.10	.23	1.0	.010	.03	50	0
25...	.9	97	.13	.11	.45	.56	2.5	.000	.00	130	0
APR											
08...	1.2	91	.12	.07	.07	.14	.62	.010	.03	200	0
24...	.8	94	.13	.05	.07	.12	.53	.000	.00	110	0
MAY											
09...	.9	106	.14	--	--	--	--	--	--	--	--
23...	1.0	104	.14	.05	.00	.05	.22	.010	.03	50	--
JUN											
24...	.8	105	.14	.05	.01	.06	.27	.010	.03	20	--
JUL											
10...	.9	105	.14	.20	.09	.29	1.3	.000	.00	30	--
AUG											
19...	.9	99	.13	.20	.04	.24	1.1	.010	.03	50	--

Table 13.--Water-quality data, station 03201720, Hull Hollow Creek near Lake Hope, Ohio, water years 1979 through 1981--Continued

DATE	ARSENIC TOTAL (UG/L AS AS)	BERYLLIUM, TOTAL RECOVERABLE (UG/L AS BE)	CADMIUM TOTAL RECOVERABLE (UG/L AS CD)	CHROMIUM, TOTAL RECOVERABLE (UG/L AS CR)	COPPER, TOTAL RECOVERABLE (UG/L AS CU)	IRON, TOTAL RECOVERABLE (UG/L AS FE)	IRON, SUSPENDED RECOVERABLE (UG/L AS FE)	IRON, DISSOLVED (UG/L AS FE)	LEAD, TOTAL RECOVERABLE (UG/L AS PB)	MANGANESE, TOTAL RECOVERABLE (UG/L AS MN)	MANGANESE, SUSPENDED RECOV. (UG/L AS MN)
WATER YEAR 1980											
OCT											
02...	1	10	0	8	1	90	--	20	0	30	0
23...	1	0	0	10	2	60	--	10	0	20	0
NOV											
09...	0	0	0	7	1	800	--	70	0	60	30
20...	0	0	0	5	1	250	--	10	0	30	10
DEC											
06...	0	10	0	3	0	50	--	10	0	20	0
20...	0	10	0	4	5	150	140	10	5	30	0
JAN											
10...	0	20	0	10	2	140	130	10	1	60	30
24...	0	10	0	2	1	20	10	10	0	30	10
FEB											
12...	2	10	0	29	1	30	20	10	0	30	0
28...	1	0	0	11	0	60	60	0	2	20	10
MAR											
12...	1	0	0	3	3	30	20	10	1	20	0
25...	0	0	0	5	0	100	90	10	0	20	0
APR											
08...	1	0	0	7	3	130	110	20	1	20	0
24...	0	0	0	3	2	80	60	20	1	20	0
MAY											
09...	--	--	--	--	--	30	10	20	0	20	10
23...	--	--	--	--	--	110	100	10	0	30	10
JUN											
24...	--	--	--	--	--	80	70	10	6	20	10
JUL											
10...	--	--	--	--	--	230	210	20	1	30	10
AUG											
19...	--	--	--	--	--	400	360	40	3	400	380

Table 13.--Water-quality data, station 03201720, Hull Hollow Creek near Lake Hope, Ohio, water years 1979 through 1981--Continued

DATE	MANGANESE, DISSOLVED (UG/L AS MN)	MERCURY TOTAL RECOVERABLE (UG/L AS HG)	NICKEL, TOTAL RECOVERABLE (UG/L AS NI)	SELENIUM, TOTAL (UG/L AS SE)	SILVER, TOTAL RECOVERABLE (UG/L AS AG)	ZINC, SUSPENDED RECOVERABLE (UG/L AS ZN)	ZINC, DISSOLVED (UG/L AS ZN)	ZINC, TOTAL RECOVERABLE (UG/L AS ZN)	CARBON, ORGANIC DISSOLVED (MG/L AS C)	CARBON, ORGANIC SUSPENDED (MG/L AS C)	PHENOLS (UG/L)
WATER YEAR 1980											
OCT											
02...	30	<.5	1	0	0	0	10	10	5.7	.1	0
23...	20	<.1	2	0	0	10	10	20	5.6	.1	2
NOV											
09...	30	.2	2	0	0	0	10	10	6.8	.8	0
20...	20	<.1	6	0	0	10	0	10	3.3	.2	0
DEC											
06...	20	<.1	3	0	0	0	20	20	4.1	.3	0
20...	30	<.1	3	0	0	0	30	30	3.0	.2	0
JAN											
10...	30	.4	2	0	0	0	20	20	1.7	.2	0
24...	20	.9	2	0	0	0	10	10	1.7	.1	0
FEB											
12...	30	<.1	3	0	0	0	10	10	1.2	.1	0
28...	10	.3	0	0	0	0	30	30	2.2	.1	0
MAR											
12...	20	<.1	28	0	0	0	10	10	3.4	.1	0
25...	20	.1	21	0	0	0	40	40	2.2	.2	2
APR											
08...	20	.1	2	0	0	7	3	10	5.8	.1	0
24...	20	<.1	1	0	0	6	4	10	11	.2	0
MAY											
09...	10	--	--	--	--	--	6	--	--	--	--
23...	20	--	--	--	--	5	5	10	11	.1	--
JUN											
24...	10	--	--	--	--	6	4	10	8.9	.4	--
JUL											
10...	20	--	--	--	--	0	10	10	1.9	.4	--
AUG											
19...	20	--	--	--	--	0	10	10	2.6	.2	--

Table 13.--Water-quality data, station 03201720, Hull Hollow Creek near Lake Hope, Ohio, water years 1979 through 1981--Continued

DATE	TIME	SPECIFIC CONDUCTANCE (US/CM)	STREAMFLOW, INSTANTANEOUS (FT^3/S)	PH (STANDARD UNITS)	TEMPERATURE, AIR (DEG C)	TEMPERATURE (DEG C)	OXYGEN DEMAND, CHEMICAL (HIGH LEVEL) (MG/L)	ACIDITY (MG/L AS H)	CALCIUM DISSOLVED (MG/L AS CA)	MAGNESIUM, DISSOLVED (MG/L AS MG)	SODIUM, DISSOLVED (MG/L AS NA)	POTASSIUM, DISSOLVED (MG/L AS K)
WATER YEAR 1981												
OCT												
21...	1115	170	.01	7.9	11.0	11.0	7	--	15	5.4	2.5	1.8
NOV												
19...	1100	170	.30	7.9	--	4.0	4	--	15	5.8	2.7	1.7
DEC												
18...	1500	153	.10	6.5	--	5.0	4	.1	14	5.6	2.6	1.3
JAN												
22...	1030	200	.11	6.0	--	1.5	<10	.1	18	6.9	2.8	1.5
FEB												
17...	1600	100	1.7	6.2	--	4.0	10	.2	9.4	3.7	1.5	1.2
MAR												
24...	1030	160	.04	6.5	--	6.0	<10	.2	13	5.5	2.8	1.4
APR												
22...	1330	150	.09	8.0	--	12.5	<10	--	15	5.5	2.4	1.7
MAY												
26...	1100	140	.03	7.4	--	14.5	<10	--	13	4.6	2.1	1.6
JUN												
22...	1145	135	.39	6.7	--	19.0	<10	.1	14	5.1	2.5	1.9

Table 13.--Water-quality data, station 03201720, Hull Hollow Creek near Lake Hope, Ohio, water years 1979 through 1981--Continued

DATE	SULFATE DIS-SOLVED (MG/L AS SO4)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L)	NITRO-GEN, NO2+NO3 TOTAL (MG/L AS N)	NITRO-GEN, AMMONIA + ORGANIC TOTAL (MG/L AS N)	NITRO-GEN, TOTAL (MG/L AS N)	NITRO-GEN, TOTAL (MG/L AS NO3)	PHOS-PHORUS, TOTAL (MG/L AS P)	PHOS-PHORUS TOTAL (MG/L AS PO4)	ALUM-INUM, TOTAL RECOV-ERABLE (UG/L AS AL)	IRON, TOTAL RECOV-ERABLE (UG/L AS FE)
WATER YEAR 1981											
OCT											
21...	51	.9	100	.05	.15	.20	.89	.010	.03	70	110
NOV											
19...	52	1.5	99	3.1	.07	3.2	14	.000	.00	70	150
DEC											
18...	46	1.1	98	.36	.12	.48	2.1	.000	.00	70	70
JAN											
22...	64	1.2	123	.35	<.10	--	--	<.010	<.03	90	190
FEB											
17...	33	.9	72	.41	.14	.55	2.4	.080	.25	270	480
MAR											
24...	51	1.3	96	.16	.01	.17	.75	<.010	.03	140	60
APR											
22...	45	1.1	107	.09	.30	.39	1.7	.010	.03	80	80
MAY											
26...	45	1.2	101	.15	.19	.34	1.5	<.010	.03	170	80
JUN											
22...	40	1.0	97	.16	.28	.44	1.9	<.010	.03	0	860

Table 13.--Water-quality data, station 03201720, Hull Hollow Creek near Lake Hope, Ohio, water years 1979 through 1981--Continued

DATE	IRON, SUSPENDED RECOVERABLE (UG/L AS FE)	IRON, DISSOLVED (UG/L AS FE)	LEAD, TOTAL RECOVERABLE (UG/L AS PB)	MANGANESE, TOTAL RECOVERABLE (UG/L AS MN)	MANGANESE, SUSPENDED RECOV. (UG/L AS MN)	MANGANESE, DISSOLVED (UG/L AS MN)	ZINC, TOTAL RECOVERABLE (UG/L AS ZN)	ZINC, SUSPENDED RECOVERABLE (UG/L AS ZN)	ZINC, DISSOLVED (UG/L AS ZN)	CARBON, ORGANIC DISSOLVED (MG/L AS C)	CARBON, ORGANIC SUSPENDED TOTAL (MG/L AS C)
WATER YEAR 1981											
OCT											
21...	80	30	0	20	10	10	10	10	0	1.7	.3
NOV											
19...	140	10	0	20	0	20	10	4	6	1.0	.2
DEC											
18...	70	0	2	20	10	10	10	4	6	1.2	.2
JAN											
22...	--	<10	0	30	20	10	40	40	5	3.0	.2
FEB											
17...	--	<10	1	30	20	10	20	10	9	2.8	.4
MAR											
24...	10	50	19	20	10	10	30	10	20	3.3	.1
APR											
22...	60	20	17	20	10	10	50	--	<4	1.7	--
MAY											
26...	--	<10	2	20	0	20	20	10	10	1.2	.2
JUN											
22...	830	30	1	50	30	20	20	10	10	1.8	2.0

Table 14.--Water-quality data, well RM-1 in Big Four Hollow near Lake Hope Ohio, June 26, 1980 through June 29, 1983

DATE	TIME	SPECIFIC CONDUCTANCE (US/CM)	PH (STANDARD UNITS)	TEMPERATURE (DEG C)	OXYGEN DEMAND, CHEMICAL (HIGH LEVEL) (MG/L)	HARDNESS (MG/L AS CACO3)	HARDNESS, NONCARBONATE (MG/L CACO3)	ACIDITY (MG/L AS H)	CALCIUM DISSOLVED (MG/L AS CA)	MAGNESIUM, DISSOLVED (MG/L AS MG)	SODIUM, DISSOLVED (MG/L AS NA)
JUN , 1980											
26...	1200	6700	2.4	18.0	190	710	720	94	39	150	18

DATE	POTASSIUM, DISSOLVED (MG/L AS K)	BICARBONATE FET-FLD (MG/L AS HCO3)	CARBON DIOXIDE DISSOLVED (MG/L AS CO2)	SULFATE DISSOLVED (MG/L AS SO4)	CHLORIDE, DISSOLVED (MG/L AS CL)	SOLIDS, RESIDUE AT 180 DEG. C DISSOLVED (MG/L)	NITROGEN, NO2+NO3 TOTAL (MG/L AS N)	NITROGEN, AMMONIA + ORGANIC TOTAL (MG/L AS N)	NITROGEN, TOTAL (MG/L AS N)	PHOSPHORUS, TOTAL (MG/L AS P)
JUN , 1980										
26...	2.2	0	.0	5300	.20	17400	.02	1.9	1.9	.290

DATE	ALUMINUM, TOTAL RECOVERABLE (UG/L AS AL)	IRON, TOTAL RECOVERABLE (UG/L AS FE)	IRON, DISSOLVED (UG/L AS FE)	LEAD, TOTAL RECOVERABLE (UG/L AS PB)	MANGANESE, TOTAL RECOVERABLE (UG/L AS MN)	MANGANESE, DISSOLVED (UG/L AS MN)	ZINC, DISSOLVED (UG/L AS ZN)	ZINC, TOTAL RECOVERABLE (UG/L AS ZN)	CARBON, ORGANIC DISSOLVED (MG/L AS C)	CARBON, ORGANIC SUSPENDED TOTAL (MG/L AS C)
JUN , 1980										
26...	180000	520000	520000	90	13000	1400	4100	4100	4.5	.80

Table 14.--Water-quality data, well RM-1 in Big Four Hollow near Lake Hope, Ohio, June 26, 1980 through June 29, 1983--Continued

DATE	TIME	SPECIFIC CONDUCTANCE (US/CM)	PH (STANDARD UNITS)	TEMPERATURE (DEG C)	OXYGEN DEMAND, CHEMICAL (HIGH LEVEL) (MG/L)	ACIDITY (MG/L AS H)	CALCIUM DISSOLVED (MG/L AS CA)	MAGNESIUM, DISSOLVED (MG/L AS MG)	SODIUM, DISSOLVED (MG/L AS NA)	POTASSIUM, DISSOLVED (MG/L AS K)	SULFATE DISSOLVED (MG/L AS SO4)	CHLORIDE, DISSOLVED (MG/L AS CL)
MAY, 1981												
01...	1300	2010	3.0	11.0	43	16	71	43	6.6	1.9	990	6.4
JUL												
21...	1330	1900	2.9	20.5	41	24	65	37	6.6	2.2	780	16

DATE	SOLIDS, RESIDUE AT 180 DEG. C DISSOLVED (MG/L)	NITROGEN, NO2+NO3 TOTAL (MG/L AS N)	NITROGEN, AMMONIA + ORGANIC TOTAL (MG/L AS N)	NITROGEN, TOTAL (MG/L AS N)	PHOSPHORUS, TOTAL (MG/L AS P)	ALUMINUM, TOTAL RECOVERABLE (UG/L AS AL)	IRON, TOTAL RECOVERABLE (UG/L AS FE)	IRON, DISSOLVED (UG/L AS FE)
MAY								
01...	1710	.04	.63	.67	.070	13000	140000	140000
JUL								
21...	1440	.26	.95	1.2	.070	1000	150000	120000

DATE	LEAD, TOTAL RECOVERABLE (UG/L AS PB)	MANGANESE, TOTAL RECOVERABLE (UG/L AS MN)	MANGANESE, DISSOLVED (UG/L AS MN)	MERCURY TOTAL RECOVERABLE (UG/L AS HG)	NICKEL, TOTAL RECOVERABLE (UG/L AS NI)	ZINC, TOTAL RECOVERABLE (UG/L AS ZN)	ZINC, DISSOLVED (UG/L AS ZN)	CARBON, ORGANIC DISSOLVED (MG/L AS C)	CARBON, ORGANIC SUSPENDED TOTAL (MG/L AS C)
MAY									
01...	61	3100	3100	.1	130	950	960	2.3	2.1
JUL									
21...	110	2600	2600	.2	210	920	920	1.4	.9

Table 14.--Water-quality data, well RM-1 in Big Four Hollow near Lake Hope, Ohio, June 26, 1980 through June 29, 1983--Continued

DATE	TIME	SPECIFIC CONDUCTANCE (US/CM)	PH (STANDARD UNITS)	TEMPERATURE (DEG C)	OXYGEN DEMAND, CHEMICAL (HIGH LEVEL) (MG/L)	ACIDITY (MG/L AS H)	CALCIUM DISSOLVED (MG/L AS CA)	MAGNESIUM, DISSOLVED (MG/L AS MG)	SODIUM, DISSOLVED (MG/L AS NA)	POTASSIUM, DISSOLVED (MG/L AS K)	SULFATE DISSOLVED (MG/L AS SO4)	CHLORIDE, DISSOLVED (MG/L AS CL)
OCT, 1981												
14...	0930	5050	2.6	11.0	140	57	140	87	8.1	2.8	2300	34
APR, 1982												
20...	1300	2750	3.2	--	110	38	140	70	16	3.7	1400	5.3

DATE	SOLIDS, RESIDUE AT 180 DEG. C DISSOLVED (MG/L)	NITROGEN, NO2+NO3 TOTAL (MG/L AS N)	NITROGEN, AMMONIA + ORGANIC TOTAL (MG/L AS N)	NITROGEN, TOTAL (MG/L AS N)	PHOSPHORUS, TOTAL (MG/L AS P)	ALUMINUM, TOTAL RECOVERABLE (UG/L AS AL)	IRON, TOTAL RECOVERABLE (UG/L AS FE)	IRON, DISSOLVED (UG/L AS FE)
OCT								
14...	3660	.14	1.70	1.8	.140	41000	780000	550000
APR								
20...	2100	<.10	2.40	--	.060	--	500000	500000

DATE	LEAD, TOTAL RECOVERABLE (UG/L AS PB)	MANGANESE, TOTAL RECOVERABLE (UG/L AS MN)	MANGANESE, DISSOLVED (UG/L AS MN)	MERCURY TOTAL RECOVERABLE (UG/L AS HG)	NICKEL, TOTAL RECOVERABLE (UG/L AS NI)	ZINC, TOTAL RECOVERABLE (UG/L AS ZN)	ZINC, DISSOLVED (UG/L AS ZN)	CARBON, ORGANIC DISSOLVED (MG/L AS C)	CARBON, ORGANIC SUSPENDED TOTAL (MG/L AS C)
OCT									
14...	300	8600	7600	.1	1000	2600	1700	2.9	.7
APR									
20...	23	8600	6800	.3	690	2300	1400	14	.7

Table 14.--Water-quality data, well RM-1 in Big Four Hollow near Lake Hope, Ohio, June 26, 1980 through June 29, 1983--Continued

DATE	TIME	SPECIFIC CONDUCTANCE (US/CM)	PH (STANDARD UNITS)	TEMPERATURE, AIR (DEG C)	TEMPERATURE (DEG C)	ACIDITY (MG/L AS H)	CALCIUM DISSOLVED (MG/L AS CA)	MAGNESIUM, DISSOLVED (MG/L AS MG)	SODIUM, DISSOLVED (MG/L AS NA)	POTASSIUM, DISSOLVED (MG/L AS K)	SULFATE DISSOLVED (MG/L AS SO4)
MAR, 1983											
17...	1140	--	3.5	55.0	13.5	23	32	18	5.5	2.5	390
JUN											
29...	1300	2610	3.0	--	--	36	110	54	7.9	5.3	1200

DATE	CHLORIDE, DISSOLVED (MG/L AS CL)	SOLIDS, RESIDUE AT 180 DEG. C DISSOLVED (MG/L)	ALUMINUM, TOTAL RECOVERABLE (UG/L AS AL)	IRON, TOTAL RECOVERABLE (UG/L AS FE)	IRON, DISSOLVED (UG/L AS FE)	LEAD, TOTAL RECOVERABLE (UG/L AS PB)	MANGANESE, TOTAL RECOVERABLE (UG/L AS MN)	MANGANESE, DISSOLVED (UG/L AS MN)	ZINC, DISSOLVED (UG/L AS ZN)
MAR									
17...	3.9	556	--	74000	74	23	1500	1500	410
JUN									
29...	.2	2140	82000	320000	240000	--	4400	3900	1100

Table 15.--Water-quality data, well RM-2 in Big Four Hollow near Lake Hope, Ohio, May 1, 1981, through June 29, 1983

[MG/L, milligrams per liter; UG/L, micrograms per liter]

DATE	TIME	SPECIFIC CONDUCTANCE (US/CM)	PH (STANDARD UNITS)	TEMPERATURE (DEG C)	OXYGEN DEMAND, CHEMICAL (HIGH LEVEL) (MG/L)	ACIDITY (MG/L AS H)	CALCIUM DISSOLVED (MG/L AS CA)	MAGNESIUM, DISSOLVED (MG/L AS MG)	SODIUM, DISSOLVED (MG/L AS NA)	POTASSIUM, DISSOLVED (MG/L AS K)	SULFATE DISSOLVED (MG/L AS SO4)	CHLORIDE, DISSOLVED (MG/L AS CL)
MAY, 1981												
01...	1500	158	5.9	9.5	18	.9	12	3.6	2.0	2.8	25	7.9
JUL												
21...	1530	225	6.1	17.0	19	1.0	17	5.3	3.7	2.5	52	6.2

DATE	LEAD, TOTAL RECOVERABLE (UG/L AS PB)	MANGANESE, TOTAL RECOVERABLE (UG/L AS MN)	MANGANESE, SUSPENDED RECOV. (UG/L AS MN)	MANGANESE, DISSOLVED (UG/L AS MN)	MERCURY TOTAL RECOVERABLE (UG/L AS HG)	NICKEL, TOTAL RECOVERABLE (UG/L AS NI)	ZINC, TOTAL RECOVERABLE (UG/L AS ZN)	ZINC, SUSPENDED RECOVERABLE (UG/L AS ZN)	ZINC, DISSOLVED (UG/L AS ZN)	CARBON, ORGANIC DISSOLVED (MG/L AS C)	CARBON, ORGANIC SUSPENDED TOTAL (MG/L AS C)
MAY											
01...	360	270	0	270	<.1	13	350	280	70	5.6	1.0
JUL											
21...	320	1400	100	1300	<.1	25	270	50	220	6.1	1.6

DATE	SOLIDS, RESIDUE AT 180 DEG. C DISSOLVED (MG/L)	NITROGEN, NO2+NO3 TOTAL (MG/L AS N)	NITROGEN, AMMONIA + ORGANIC TOTAL (MG/L AS N)	NITROGEN, TOTAL (MG/L AS N)	NITROGEN, TOTAL (MG/L AS NO3)	PHOSPHORUS, TOTAL (MG/L AS P)	PHOSPHORUS TOTAL (MG/L AS PO4)	ALUMINUM, TOTAL RECOVERABLE (UG/L AS AL)	IRON, TOTAL RECOVERABLE (UG/L AS FE)	IRON, SUSPENDED RECOVERABLE (UG/L AS FE)	IRON, DISSOLVED (UG/L AS FE)
MAY											
01...	106	.14	.63	.77	3.4	.060	.18	900	2500	900	1600
JUL											
21...	147	.22	.89	1.1	4.9	.090	.28	900	4200	2000	2200

Table 15.--Water-quality data, well RM-2 in Big Four Hollow near Lake Hope, Ohio, May 1, 1981, through June 29, 1983--Continued

DATE	TIME	SPECIFIC CONDUCTANCE (US/CM)	PH (STANDARD UNITS)	TEMPERATURE (DEG C)	OXYGEN DEMAND, CHEMICAL (HIGH LEVEL) (MG/L)	ACIDITY (MG/L AS H)	CALCIUM DISSOLVED (MG/L AS CA)	MAGNESIUM, DISSOLVED (MG/L AS MG)	SODIUM, DISSOLVED (MG/L AS NA)	POTASSIUM, DISSOLVED (MG/L AS K)	SULFATE DISSOLVED (MG/L AS SO4)	CHLORIDE, DISSOLVED (MG/L AS CL)
OCT, 1981												
14...	1100	390	5.7	11.0	56	1.0	30	11	6.5	3.2	160	4.3
APR, 1982												
20...	1600	230	5.2	--	10	1.2	19	7.1	3.7	1.8	120	40

DATE	SOLIDS, RESIDUE AT 180 DEG. C DISSOLVED (MG/L)	NITROGEN, NO2+NO3 TOTAL (MG/L AS N)	NITROGEN, AMMONIA + ORGANIC TOTAL (MG/L AS N)	NITROGEN, TOTAL (MG/L AS N)	NITROGEN, TOTAL (MG/L AS NO3)	PHOSPHORUS, TOTAL (MG/L AS P)	PHOSPHORUS TOTAL (MG/L AS PO4)	ALUMINUM, TOTAL RECOVERABLE (UG/L AS AL)	IRON, TOTAL RECOVERABLE (UG/L AS FE)	IRON, SUSPENDED RECOVERABLE (UG/L AS FE)	IRON, DISSOLVED (UG/L AS FE)
OCT											
14...	290	.17	.60	.77	3.4	.060	.18	2500	14000	1000	13000
APR											
20...	134	.13	1.40	1.5	6.8	.030	.09	<10	2600	1400	1200

DATE	LEAD, TOTAL RECOVERABLE (UG/L AS PB)	MANGANESE, TOTAL RECOVERABLE (UG/L AS MN)	MANGANESE, SUSPENDED RECOV. (UG/L AS MN)	MANGANESE, DISSOLVED (UG/L AS MN)	MERCURY TOTAL RECOVERABLE (UG/L AS HG)	NICKEL, TOTAL RECOVERABLE (UG/L AS NI)	ZINC, TOTAL RECOVERABLE (UG/L AS ZN)	ZINC, SUSPENDED RECOVERABLE (UG/L AS ZN)	ZINC, DISSOLVED (UG/L AS ZN)	CARBON, ORGANIC DISSOLVED (MG/L AS C)	CARBON, ORGANIC SUSPENDED TOTAL (MG/L AS C)
OCT											
14...	1200	2900	400	2500	.2	42	310	150	160	2.1	1.6
APR											
20...	350	1200	0	1200	.2	22	250	50	200	4.4	.4

Table 15.--Water-quality data, well RM-2 in Big Four Hollow near Lake Hope, Ohio, May 1, 1981, through June 29, 1983--Continued

DATE	TIME	SPECIFIC CONDUCTANCE (US/CM)	PH (STANDARD UNITS)	TEMPERATURE, AIR (DEG C)	TEMPERATURE (DEG C)	ACIDITY (MG/L AS H)	CALCIUM DISSOLVED (MG/L AS CA)	MAGNESIUM, DISSOLVED (MG/L AS MG)	SODIUM, DISSOLVED (MG/L AS NA)	POTASSIUM, DISSOLVED (MG/L AS K)	SULFATE DISSOLVED (MG/L AS SO4)
MAR, 1983											
17...	1110	--	6.2	13.0	12.0	3.6	14	6.2	4.7	1.8	58
JUN											
29...	1400	164	6.2	--	--	1.6	21	4.1	3.3	1.7	37

DATE	CHLORIDE, DISSOLVED (MG/L AS CL)	SOLIDS, RESIDUE AT 180 DEG. C DISSOLVED (MG/L)	IRON, TOTAL RECOVERABLE (UG/L AS FE)	IRON, SUSPENDED RECOVERABLE (UG/L AS FE)	IRON, DISSOLVED (UG/L AS FE)	LEAD, TOTAL RECOVERABLE (UG/L AS PB)	MANGANESE, TOTAL RECOVERABLE (UG/L AS MN)	MANGANESE, SUSPENDED RECOV. (UG/L AS MN)	MANGANESE, DISSOLVED (UG/L AS MN)	ZINC, DISSOLVED (UG/L AS ZN)
MAR										
17...	5.6	116	9000	0	9000	260	1300	0	1300	150
JUN										
29...	2.6	100	2600	1200	1400	200	370	10	360	290

Table 16.--Water-quality data, "old house well" in Big Hollow near Lake Hope, Ohio, May 1 and July 22, 1981

[MG/L, milligrams per liter; UG/L, micrograms per liter]

DATE	TIME	SPECIFIC CONDUCTANCE (US/CM)	PH (STANDARD UNITS)	TEMPERATURE (DEG C)	CALCIUM DISSOLVED (MG/L AS CA)	MAGNESIUM, DISSOLVED (MG/L AS MG)	SODIUM DISSOLVED (MG/L AS NA)	POTASSIUM, DISSOLVED (MG/L AS K)	SULFATE DISSOLVED (MG/L AS SO4)	CHLORIDE, DISSOLVED (MG/L AS CL)	ALUMINUM TOTAL RECOVERABLE (UG/L AS AL)	IRON TOTAL RECOVERABLE (UG/L AS FE)	IRON SUSPENDED RECOVERABLE (UG/L AS FE)
MAY													
01...	1700	400	8.2	9.5	3.8	1.1	85	2.0	2.1	13	1300	69000	69000
JULY													
22...	1100	410	8.2	14.5	7.0	2.3	91	2.3	19	13	900	27000	27000

DATE	IRON, DISSOLVED (UG/L AS FE)	NITROGEN, NO2+NO3 TOTAL (MG/L AS N)	NITROGEN, AMMONIA + ORGANIC TOTAL (MG/L AS N)	NITROGEN TOTAL (MG/L AS N)	NITROGEN TOTAL (MG/L AS NO3)	PHOSPHORUS, TOTAL (MG/L AS P)	PHOSPHORUS TOTAL (MG/L AS PO4)	MANGANESE, TOTAL RECOVERABLE (UG/L AS MN)	MANGANESE, SUSPENDED (UG/L AS MN)	MANGANESE, DISSOLVED (UG/L AS MN)	NICKEL TOTAL RECOVERABLE (UG/L AS NI)	ZINC, TOTAL RECOVERABLE (UG/L AS ZN)	ZINC, DISSOLVED (UG/L AS ZN)
MAY													
01...	30	<.01	30	--	--	1.1	3.4	130	130	5	12	6400	<4
JULY													
22...	200	.05	1.2	1.3	5.5	.24	.74	90	0	90	10	1700	20

DATE	BICARBONATE (MG/L AS HCO3)	CARBONATE (MG/L AS CO3)	OXYGEN DEMAND CHEMICAL (HIGH LEVEL) (MG/L)	HARDNESS (MG/L AS CACO3)	SOLIDS, RESIDUE AT 180 DEG.C DISSOLVED MG/L)	LEAD TOTAL RECOVERABLE (UG/L AS PB)	MERCURY TOTAL RECOVERABLE (UG/L AS HG)	CARBON, ORGANIC DISSOLVED (MG/L AS C)	CARBON ORGANIC SUSPENDED TOTAL (MG/L AS C)
MAY									
01...	272	0	69	14	252	180	<.1	1.3	3.3
JULY									
22..	250	0	<10	27	275	33	.1	1.2	5.5

Table 17.--Analyses of dye samples collected at mine entrance 90B mine seep in Big Four Hollow near Lake Hope, Ohio, water year 1981

Date (1981)	Time of sampling	Elapsed hours	Concentration (parts per million)
11-25	1000	216	0.1
	1400	220	.3
11-26	1500	245	8.7
	1800	248	6.0
11-27	1000	264	7.8
	1400	268	5.3
11-28	1000	288	6.5
	1400	292	5.5
11-29	1000	312	8.9
	1400	316	9.2
11-30	1000	336	14
	1400	340	16
12-1	1000	360	13
	1400	364	17
12-2	1000	384	8
	1400	388	14
12-3	1000	408	10
	1400	412	12
12-4	1000	432	9.5
	1300	435	10
12-5	1000	456	12
	1400	460	9.5
12-6	1000	480	6.6
	1400	484	8
12-7	1000	504	9
	1400	508	10
12-8	1000	528	9
	1400	532	8
12-9	1000	552	3.1
	1400	556	5.9
12-10	1000	576	8.5
	1400	580	4.9
12-11	1500	605	4.9
	1800	623	2.3
12-12	1000	624	4.2
	1400	628	6.8
12-13	1000	648	7
	1400	652	2.8
12-14	1000	672	3.4
	1400	676	3.6
12-15	1000	696	3
	1400	700	3
12-16	1000	720	4.3
	1400	724	2.6
12-17	1300	747	2
	1600	750	3
12-18	1000	768	2.6
	1400	772	3
12-19	1300	795	1.7
	1700	799	1.5
12-20	1400	820	1.4

Table 18.--Water-quality data, surface mine seep 15 (392218082191500), in Big Four Hollow near Lake Hope, Ohio, April 8 and 25, 1980

[MG/L, milligrams per liter; UG/L, micrograms per liter]

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (FT^3/S)	SPE-CIFIC CON-DUCT-ANCE (US/CM)	PH (UNITS)	TEMPER-ATURE, WATER (DEG C)	OXYGEN DEMAND, CHEM-ICAL (HIGH LEVEL) (MG/L)	HARD-NESS (MG/L AS CACO3)	HARD-NESS, NONCAR-BONATE (MG/L CACO3)	CALCIUM DIS-SOLVED (MG/L AS CA)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG)	SODIUM, DIS-SOLVED (MG/L AS NA)
APR											
08...	1345	--	360	6.0	8.5	43	95	13	20	11	4.0
25...	1100	.01	310	5.9	9.5	23	89	8	20	9.4	3.7

DATE	SODIUM PERCENT	SODIUM AD-SORP-TION RATIO	POTAS-SIUM, DIS-SOLVED (MG/L AS K)	BICAR-BONATE (MG/L AS HCO3)	CAR-BONATE (MG/L AS CO3)	ALKA-LINITY (MG/L AS CACO3)	CARBON DIOXIDE DIS-SOLVED (MG/L AS CO2)	SULFATE DIS-SOLVED (MG/L AS SO4)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L)
APR										
08...	8	.2	4.6	100	0	82	160	110	1.6	194
25...	8	.2	4.4	98	0	80	197	85	1.3	178

DATE	SOLIDS, DIS-SOLVED (TONS PER AC-FT)	NITRO-GEN, NO2+NO3 TOTAL (MG/L AS N)	NITRO-GEN, AM-MONIA + ORGANIC TOTAL (MG/L AS N)	NITRO-GEN, TOTAL (MG/L AS N)	NITRO-GEN, TOTAL (MG/L AS NO3)	PHOS-PHORUS, TOTAL (MG/L AS P)	PHOS-PHORUS, TOTAL (MG/L AS PO4)	ALUM-INUM, TOTAL RECOV-ERABLE (UG/L AS AL)	ANTI-MONY, TOTAL (UG/L AS SB)	ARSENIC TOTAL (UG/L AS AS)
APR										
08...	.26	.00	.49	.49	2.2	.910	2.8	900	0	5
25...	.24	.00	.40	.40	1.8	.160	.49	300	0	4

Table 18.--Water-quality data, surface mine seep 15 (392218082191500), in Big Four Hollow near Lake Hope, Ohio, April 8 and 25, 1980--Continued

DATE	BERYLLIUM, TOTAL RECOVERABLE (UG/L AS BE)	CADMIUM TOTAL RECOVERABLE (UG/L AS CD)	CHROMIUM, TOTAL RECOVERABLE (UG/L AS CR)	COPPER, TOTAL RECOVERABLE (UG/L AS CU)	IRON, TOTAL RECOVERABLE (UG/L AS FE)	IRON, SUSPENDED RECOVERABLE (UG/L AS FE)	IRON, DISSOLVED (UG/L AS FE)	LEAD, TOTAL RECOVERABLE (UG/L AS PB)	MANGANESE, TOTAL RECOVERABLE (UG/L AS MN)	MANGANESE, SUSPENDED RECOV. (UG/L AS MN)
APR										
08...	0	0	7	5	33000	0	33000	2	7600	0
25...	0	0	4	0	26000	0	26000	2	6700	0

DATE	MANGANESE, DISSOLVED (UG/L AS MN)	MERCURY TOTAL RECOVERABLE (UG/L AS HG)	NICKEL, TOTAL RECOVERABLE (UG/L AS NI)	SELENIUM, TOTAL (UG/L AS SE)	SILVER, TOTAL RECOVERABLE (UG/L AS AG)	ZINC, SUSPENDED RECOVERABLE (UG/L AS ZN)	ZINC, DISSOLVED (UG/L AS ZN)	ZINC, TOTAL RECOVERABLE (UG/L AS ZN)	CARBON, ORGANIC DISSOLVED (MG/L AS C)	PHENOLS (UG/L)
APR										
08...	7600	.2	10	0	0	30	0	30	8.6	7
25...	6700	.1	5	0	0	9	1	10	3.1	2

Table 19.--Water-quality data, surface-mine seep 16 (392218082191600) near Lake Hope, Ohio, March 17 and April 8 and 25, 1980

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (FT3/S)	SPE-CIFIC CON-DUCT-ANCE (US/CM)	PH (STAND-ARD UNITS)	TEMPER-ATURE (DEG C)	OXYGEN DEMAND, CHEM-ICAL (HIGH LEVEL) (MG/L)	HARD-NESS (MG/L AS CACO3)	HARD-NESS, NONCAR-BONATE (MG/L CACO3)
MAR								
17...	1100	.01	400	6.2	9.5	36	140	0
APR								
08...	1330	--	450	6.1	9.5	48	160	43
25...	1200	(.01	335	6.1	10.0	40	160	15

DATE	CALCIUM DIS-SOLVED (MG/L AS CA)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG)	SODIUM, DIS-SOLVED (MG/L AS NA)	POTAS-SIUM, DIS-SOLVED (MG/L AS K)	BICAR-BONATE FET-FLD (MG/L AS HCO3)	CARBON DIOXIDE DIS-SOLVED (MG/L AS CO2)	SULFATE DIS-SOLVED (MG/L AS SO4)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L)
MAR									
17...	36	13	3.9	4.7	180	177	85	1.5	226
APR									
08...	39	16	3.7	6.3	150	189	110	2.0	265
25...	39	14	3.3	6.3	170	215	89	1.7	279

DATE	NITRO-GEN, NO2+NO3 TOTAL (MG/L AS N)	NITRO-GEN, AM-MONIA + ORGANIC TOTAL (MG/L AS N)	NITRO-GEN, TOTAL (MG/L AS N)	PHOS-PHORUS, TOTAL (MG/L AS P)	ALUM-INUM, TOTAL RECOV-ERABLE (UG/L AS AL)	ANTI-MONY, TOTAL (UG/L AS SB)	ARSENIC TOTAL (UG/L AS AS)	BERYL-LIUM, TOTAL RECOV-ERABLE (UG/L AS BE)
MAR								
17...	.03	.67	.70	.060	1500	0	2	0
APR								
08...	0							
25...	.00	.56	.56	.050	200	0	1	0

Table 19.--Water-quality data, surface mine seep 16 (392218082191600) near Lake Hope, Ohio, March 17 and April 8 and 25, 1980--Continued

DATE	CADMIUM TOTAL RECOV-ERABLE (UG/L AS CD)	CHRO-MIUM, TOTAL RECOV-ERABLE (UG/L AS CR)	COPPER, TOTAL RECOV-ERABLE (UG/L AS CU)	IRON, TOTAL RECOV-ERABLE (UG/L AS FE)		IRON, DIS-SOLVED (UG/L AS FE)	LEAD, TOTAL RECOV-ERABLE (UG/L AS PB)	MANGA-NESE, TOTAL RECOV-ERABLE (UG/L AS MN)		MANGA-NESE, DIS-SOLVED (UG/L AS MN)
MAR										
17...	0	10	1	32000		32000	3	4900		4900
APR										
08...	0	3	5	29000		29000	1	6600		6600
25...	0	4	1	23000		23000	0	6800		6800

DATE	MERCURY TOTAL RECOV-ERABLE (UG/L AS HG)	NICKEL, TOTAL RECOV-ERABLE (UG/L AS NI)	SELE-NIUM, TOTAL (UG/L AS SE)	SILVER, TOTAL RECOV-ERABLE (UG/L AS AG)		ZINC, DIS-SOLVED (UG/L AS ZN)	ZINC, TOTAL RECOV-ERABLE (UG/L AS ZN)	CARBON, ORGANIC DIS-SOLVED (MG/L AS C)	CARBON, ORGANIC SUS-PENDED (MG/L AS C)	PHENOLS (UG/L)
MAR										
17...	.2	9	0	0	0	30	30	8.0	2.2	0
APR										
08...	.1	3	0	0	10	0	10	5.3	.5	0
25...	.2	1	0	0	7	3	10	8.1	.5	0

Table 20.--Water quality, mine entrance 88 above Big Four Hollow Creek near Lake Hope, Ohio, water years 1979 and 1980

DATE	TIME	SPECIFIC CONDUCTANCE (uS/cm)	PH FIELD (UNITS)	TEMPERATURE, WATER (DEG C)	OXYGEN DEMAND, CHEMICAL (HIGH LEVEL) (MG/L)	HARDNESS (MG/L AS CACO3)	HARDNESS, NONCARBONATE (MG/L CACO3)	ACIDITY TOTAL HEATED (MG/L AS H)	ACIDITY (MG/L AS CACO3)	CALCIUM DISSOLVED (MG/L AS CA)	MAGNESIUM, DISSOLVED (MG/L AS MG)
WATER YEAR 1979											
OCT 12...	1500	4000	2.5	15.0	--	1500	1500	56	2780	290	190
OCT 25...	1300	--	2.2	11.0	130	1700	1700	39	1940	320	230
JAN 04...	1700	2500	2.9	10.5	36	800	800	16	794	180	86
MAR 13...	1500	2300	2.8	11.0	53	1000	1000	21	1040	200	130
MAY 30...	1430	5400	2.8	11.0	85	1100	1100	36	1790	58	230

DATE	SODIUM, DISSOLVED (MG/L AS NA)	SODIUM PERCENT	SODIUM ADSORPTION RATIO	POTASSIUM, DISSOLVED (MG/L AS K)	BICARBONATE (MG/L AS HCO3)	CARBONATE (MG/L AS CO3)	ALKALINITY (MG/L AS CACO3)	CARBON DIOXIDE DISSOLVED (MG/L AS CO2)	SULFATE DISSOLVED (MG/L AS SO4)	CHLORIDE, DISSOLVED (MG/L AS CL)	SOLIDS, RESIDUE AT 180 DEG. C DISSOLVED (MG/L)
OCT 12...	21	3	.2	2.2	0	0	0	.0	3200	1.3	4990
OCT 25...	21	3	.2	2.6	0	0	0	.0	3400	1.5	5760
JAN 04...	15	4	.2	3.2	0	0	0	.0	1500	1.4	2240
MAR 13...	16	3	.2	2.6	0	0	0	.0	1800	1.1	3080
MAY 30...	21	4	.3	1.5	0	0	0	.0	3700	1.5	6050

Table 20.--Water-quality, mine entrance 88, above Big Four Hollow Creek near Lake Hope, Ohio

water years 1979 and 1980--Continued

DATE	SOLIDS, DISSOLVED (TONS PER AC-FT)	NITROGEN, NO2+NO3 TOTAL (MG/L AS N)	NITROGEN, AMMONIA + ORGANIC TOTAL (MG/L AS N)	NITROGEN, TOTAL (MG/L AS N)	NITROGEN, TOTAL (MG/L AS NO3)	PHOSPHORUS, TOTAL (MG/L AS P)	PHOSPHORUS, ORTHOPHOSPHATE TOTAL (MG/L AS PO4)	PHOSPHORUS, TOTAL (MG/L AS PO4)	ALUMINUM, TOTAL RECOVERABLE (UG/L AS AL)	ANTIMONY, TOTAL (UG/L AS SB)	ARSENIC TOTAL (UG/L AS AS)
WATER YEAR 1979											
OCT 12...	6.79	.01	1.4	1.4	6.2	.020	--	--	0	1	1
OCT 25...	7.83	.00	1.5	1.5	6.6	.090	--	--	14000	1	1
JAN 04...	3.05	.00	.74	.74	3.3	.020	--	--	32000	0	1
MAR 13...	4.19	.00	.84	.84	3.7	.010	--	--	53000	0	2
MAY 30...	8.23	.00	1.3	1.3	5.8	.030	.09	.09	110000	0	2

DATE	BERYLLIUM, TOTAL RECOVERABLE (UG/L AS BE)	CADMIUM TOTAL RECOVERABLE (UG/L AS CD)	CHROMIUM, TOTAL RECOVERABLE (UG/L AS CR)	COPPER, TOTAL RECOVERABLE (UG/L AS CU)	IRON, TOTAL RECOVERABLE (UG/L AS FE)	IRON, SUSPENDED RECOVERABLE (UG/L AS FE)	IRON, DISSOLVED (UG/L AS FE)	LEAD, TOTAL RECOVERABLE (UG/L AS PB)	MANGANESE, TOTAL RECOVERABLE (UG/L AS MN)	MANGANESE, SUSPENDED RECOV. (UG/L AS MN)	MANGANESE, DISSOLVED (UG/L AS MN)
OCT 12..	600	2	3	61	460000	--	440000	9	19000	--	19000
OCT 25...	70	1	2	95	730000	--	720000	23	1600	--	1600
JAN 04...	30	0	0	32	230000	--	230000	0	6600	--	6600
MAR 13...	40	0	2	44	310000	--	310000	22	8800	--	8800
MAY 30...	80	1	18	210	630000	0	630000	0	17000	0	17000

Table 20.--Water quality, mine entrance 88 above Big Four Hollow Creek near Lake Hope, Ohio, water years 1979 and 1980--Continued

DATE	MERCURY TOTAL RECOVERABLE (UG/L AS HG)	NICKEL, TOTAL RECOVERABLE (UG/L AS NI)	SELENIUM, TOTAL (UG/L AS SE)	SILVER, TOTAL RECOVERABLE (UG/L AS AG)	ZINC, SUSPENDED RECOVERABLE (UG/L AS ZN)	ZINC, DISSOLVED (UG/L AS ZN)	ZINC, TOTAL RECOVERABLE (UG/L AS ZN)	CARBON, ORGANIC DISSOLVED (MG/L AS C)	CARBON, ORGANIC SUSPENDED (MG/L AS C)	PHENOLS (UG/L)
WATER YEAR 1979										
OCT 12...	<.5	100	0	0	--	2000	2000	.2	.8	1
OCT 25...	<.5	81	2	0	--	300	300	3.5	.3	0
JAN 04...	.6	110	0	0	--	760	760	1.4	.3	2
MAR 13...	<.5	66	0	0	--	1100	1100	2.1	.2	0
MAY 30...	<.5	39	2	0	0	2500	2500	9.4	.2	0

DATE	TIME	SPECIFIC CONDUCTANCE (uS/cm)	PH (UNITS)	TEMPERATURE, WATER (DEG C)	OXYGEN DEMAND, CHEMICAL (HIGH LEVEL) (MG/L)	HARDNESS (MG/L AS CACO3)	HARDNESS, NONCARBONATE (MG/L CACO3)	ACIDITY TOTAL HEATED (MG/L AS H)	ACIDITY (MG/L AS CACO3)	CALCIUM DISSOLVED (MG/L AS CA)	MAGNESIUM, DISSOLVED (MG/L AS MG)
WATER YEAR 1980											
NOV 20...	1500	4500	2.9	12.0	160	1100	1100	64	3180	140	190
MAR 14...	1330	5200	4.5	7.0	300	1200	1200	43	2140	72	250
25...	1300	5600	3.6	8.0	240	1700	1700	46	2280	170	310
APR 07...	1300	5400	3.5	9.0	230	1600	1600	49	2430	150	290
24...	1300	5500	3.6	8.5	230	2500	2500	50	2480	190	490
MAY 02...	1430	5600	3.6	9.0	--	--	--	62	3080	--	--
22...	1430	5500	3.5	11.0	--	--	--	58	2880	--	--

Table 20.--Water quality, mine entrance 88 above Big Four Hollow Creek near Lake Hope, Ohio

water years 1979 and 1980--Continued

DATE	SODIUM, DIS-SOLVED (MG/L AS NA)	SODIUM PERCENT	SODIUM AD-SORP-TION RATIO	SODIUM+ POTAS-SIUM DIS-SOLVED (MG/L AS NA)	POTAS-SIUM, DIS-SOLVED (MG/L AS K)	BICAR-BONATE (MG/L AS HCO3)	CAR-BONATE (MG/L AS CO3)	ALKA-LINITY (MG/L AS CACO3)	CARBON DIOXIDE DIS-SOLVED (MG/L AS CO2)	SULFATE DIS-SOLVED (MG/L AS SO4)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)
WATER YEAR 1980											
NOV											
20...	25	13	.3	27	2.2	0	0	0	.0	3300	.1
MAR											
14...	24	4	.3	32	8.2	0	0	0	.0	4700	.6
25...	24	3	.3	--	8.6	0	0	0	.0	4600	.6
APR											
07...	24	3	.3	--	8.7	0	0	0	.0	4800	.8
24...	23	2	.2	--	8.1	0	0	0	.0	5500	.3
MAY											
02...	--	--	--	--	--	0	0	0	.0	5300	--
22...	--	--	--	--	--	0	0	0	.0	5200	--

DATE	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L)	SOLIDS, DIS-SOLVED (TONS PER AC-FT)	NITRO-GEN, NO2+NO3 TOTAL (MG/L AS N)	NITRO-GEN, AMMONIA + ORGANIC TOTAL (MG/L AS N)	NITRO-GEN, TOTAL (MG/L AS N)	NITRO-GEN, TOTAL (MG/L AS NO3)	PHOS-PHORUS, TOTAL (MG/L AS P)	PHOS-PHORUS, TOTAL (MG/L AS PO4)	ALUM-INUM, TOTAL RECOV-ERABLE (UG/L AS AL)	ANTI-MONY, TOTAL (UG/L AS SB)	ARSENIC TOTAL (UG/L AS AS)
NOV											
20...	5110	6.95	.04	1.4	1.4	6.4	.730	2.2	73000	0	16
MAR											
14...	7960	10.8	.04	2.4	2.4	11	.050	.15	110000	0	2
25...	7900	10.7	.18	1.9	2.1	9.2	.120	.37	120000	0	2
APR											
07...	8020	10.9	.09	1.8	1.9	8.4	.060	.18	100000	0	16
24...	8330	<11.3	.15	2.2	2.4	10	.060	.18	120000	0	3
MAY											
02...	--	--	--	--	--	--	--	--	--	--	--
22...	--	--	--	--	--	--	--	--	--	--	--

Table 20.--Water-quality, mine entrance 88, above Big Four Hollow Creek near Lake Hope, Ohio, water years 1979 and 1980--Continued

DATE	BERYLLIUM, TOTAL RECOVERABLE (UG/L AS BE)	CADMIUM TOTAL RECOVERABLE (UG/L AS CD)	CHROMIUM, TOTAL RECOVERABLE (UG/L AS CR)	COPPER, TOTAL RECOVERABLE (UG/L AS CU)	IRON, TOTAL RECOVERABLE (UG/L AS FE)	IRON, DISSOLVED (UG/L AS FE)	LEAD, TOTAL RECOVERABLE (UG/L AS PB)	MANGANESE, TOTAL RECOVERABLE (UG/L AS MN)	MANGANESE, SUSPENDED RECOV. (UG/L AS MN)	MANGANESE, DISSOLVED (UG/L AS MN)
WATER YEAR 1980										
NOV										
20...	90	0	90	5	50000	30000	7	18000	0	18000
MAR										
14...	120	0	70	250	1100000	320000	1	45000	4000	41000
25...	80	0	3	370	950000	950000	0	73000	0	73000
APR										
07...	80	0	2	310	1200000	93000	0	53000	0	53000
24...	90	0	2	270	1100000	1100000	0	66000	8000	58000
MAY										
02...	--	--	--	--	1300000	1300000	--	55000	0	55000
22...	--	--	--	--	1100000	1100000	--	42000	0	42000

DATE	MERCURY TOTAL RECOVERABLE (UG/L AS HG)	NICKEL, TOTAL RECOVERABLE (UG/L AS NI)	SELENIUM, TOTAL (UG/L AS SE)	SILVER, TOTAL RECOVERABLE (UG/L AS AG)	ZINC, SUSPENDED RECOVERABLE (UG/L AS ZN)	ZINC, DISSOLVED (UG/L AS ZN)	ZINC, TOTAL RECOVERABLE (UG/L AS ZN)	CARBON, ORGANIC DISSOLVED (MG/L AS C)	CARBON, ORGANIC SUSPENDED (MG/L AS C)	PHENOLS (UG/L)
NOV										
20...	2.0	520	1	0	0	3700	3700	5.2	.2	0
MAR										
14...	.1	97	0	0	0	4900	4900	5.8	.1	0
25...	.1	2400	3	0	0	6700	6700	1.9	.3	0
APR										
07...	.2	120	4	0	0	6100	6100	8.4	.1	1
24...	<.1	110	9	0	0	5500	5500	7.6	.3	0
MAY										
02...	--	--	--	--	--	--	--	--	--	--
22...	--	--	--	--	--	--	--	--	--	--

Table 21.--Water-quality data, mine entrance 89A above Big Four Hollow Creek near Lake Hope, Ohio, water years 1979 and 1980

DATE	TIME	SPECIFIC CONDUCTANCE (uS/cm)	PH FIELD (UNITS)	TEMPERATURE, WATER (DEG C)	OXYGEN DEMAND, CHEMICAL (HIGH LEVEL) (MG/L)	HARDNESS (MG/L AS CACO3)	HARDNESS, NONCARBONATE (MG/L CACO3)	ACIDITY TOTAL HEATED (MG/L AS H)	ACIDITY (MG/L AS CACO3)	CALCIUM DISSOLVED (MG/L AS CA)
WATER YEAR 1979										
MAR 13...	1600	1300	3.0	9.5	15	370	370	5.6	278	89

DATE	MAGNESIUM, DISSOLVED (MG/L AS MG)	SODIUM, DISSOLVED (MG/L AS NA)	SODIUM PERCENT	SODIUM ADSORPTION RATIO	POTASSIUM, DISSOLVED (MG/L AS K)	BICARBONATE (MG/L AS HCO3)	CARBONATE (MG/L AS CO3)	ALKALINITY (MG/L AS CACO3)	CARBON DIOXIDE DISSOLVED (MG/L AS CO2)	SULFATE DISSOLVED (MG/L AS SO4)
MAR 13...	35	10	6	.2	2.8	0	0	0	.0	560

DATE	CHLORIDE, DISSOLVED (MG/L AS CL)	SOLIDS, RESIDUE AT 180 DEG. C DISSOLVED (MG/L)	SOLIDS, DISSOLVED (TONS PER AC-FT)	NITROGEN, NO2+NO3 TOTAL (MG/L AS N)	NITROGEN, AMMONIA + ORGANIC TOTAL (MG/L AS N)	NITROGEN, TOTAL (MG/L AS N)	NITROGEN, TOTAL (MG/L AS NO3)	PHOSPHORUS, TOTAL (MG/L AS P)	ALUMINUM, TOTAL RECOVERABLE (UG/L AS AL)	ANTIMONY, TOTAL (UG/L AS SB)
MAR 13...	1.1	897	1.22	.03	.35	.38	1.7	.000	9600	0

DATE	ARSENIC TOTAL (UG/L AS AS)	BERYLLIUM, TOTAL RECOVERABLE (UG/L AS BE)	CADMIUM TOTAL RECOVERABLE (UG/L AS CD)	CHROMIUM, TOTAL RECOVERABLE (UG/L AS CR)	COPPER, TOTAL RECOVERABLE (UG/L AS CU)	IRON, TOTAL RECOVERABLE (UG/L AS FE)	IRON, DISSOLVED (UG/L AS FE)	LEAD, TOTAL RECOVERABLE (UG/L AS PB)	MANGANESE, TOTAL RECOVERABLE (UG/L AS MN)	MANGANESE, DISSOLVED (UG/L AS MN)
MAR 13...	1	10	0	0	10	41000	41000	91	2200	2100

Table 21.--Water-quality data, mine entrance 89A above Big Four Hollow Creek near Lake Hope, Ohio, water years 1979 and 1980--Continued

DATE	MERCURY TOTAL RECOVERABLE (UG/L AS HG)	NICKEL, TOTAL RECOVERABLE (UG/L AS NI)	SELENIUM, TOTAL (UG/L AS SE)	SILVER, TOTAL RECOVERABLE (UG/L AS AG)	ZINC, DISSOLVED (UG/L AS ZN)	ZINC, TOTAL RECOVERABLE (UG/L AS ZN)	CARBON, ORGANIC DISSOLVED (MG/L AS C)	CARBON, ORGANIC SUSPENDED (MG/L AS C)	PHENOLS (UG/L)
WATER YEAR 1979									
MAR									
13...	<.5	83	0	0	240	240	1.1	.1	0

DATE	TIME	STREAMFLOW, INSTANTANEOUS (ft3/s)	SPECIFIC CONDUCTANCE (uS/cm)	PH (UNITS)	TEMPERATURE, WATER (DEG C)	OXYGEN DEMAND, CHEMICAL (HIGH LEVEL) (MG/L)	HARDNESS (MG/L AS CACO3)	HARDNESS, NONCARBONATE (MG/L CACO3)	ACIDITY TOTAL HEATED (MG/L AS H)	ACIDITY (MG/L AS CACO3)	CALCIUM DISSOLVED (MG/L AS CA)
WATER YEAR 1980											
MAR											
14...	1430	.01	3410	3.3	6.5	97	1000	1000	22	1090	190
25...	1400	--	3100	3.4	7.5	110	1500	1500	16	794	340
APR											
07...	1400	--	3300	3.4	8.0	130	1600	1600	19	943	330
24...	1330	<.01	3200	4.7	9.0	120	1200	1200	12	596	200
MAY											
02...	1400	--	3050	5.6	9.5	--	--	--	--	--	--
22...	1500	<.01	2400	4.8	9.0	--	--	--	10	497	--

DATE	MAGNESIUM, DISSOLVED (MG/L AS MG)	SODIUM, DISSOLVED (MG/L AS NA)	SODIUM PERCENT	SODIUM ADSORPTION RATIO	SODIUM+POTASSIUM DISSOLVED (MG/L AS NA)	POTASSIUM, DISSOLVED (MG/L AS K)	BICARBONATE (MG/L AS HCO3)	CARBONATE (MG/L AS CO3)	ALKALINITY (MG/L AS CACO3)	CARBON DIOXIDE DISSOLVED (MG/L AS CO2)	SULFATE DISSOLVED (MG/L AS SO4)
MAR											
14...	130	11	2	.2	16	5.2	0	0	0	.0	2200
25...	150	13	2	.1	--	6.3	0	0	0	.0	1800
APR											
07...	190	17	2	.2	--	8.4	0	0	0	.0	2600
24...	180	17	3	.2	--	8.5	0	0	0	.0	2300
MAY											
02...	--	--	--	--	--	--	33	0	27	133	2600
22...	--	--	--	--	--	--	26	0	21	659	1700

Table 21.--Water-quality data, mine entrance 89A above Big Four Hollow Creek near Lake Hope, Ohio, water years 1979 and 1980--Continued

DATE	CHLORIDE, DISSOLVED (MG/L AS CL)	SOLIDS, RESIDUE AT 180 DEG. C DISSOLVED (MG/L)	SOLIDS, DISSOLVED (TONS PER AC-FT)	NITROGEN, NO2+NO3 TOTAL (MG/L AS N)	NITROGEN, AMMONIA + ORGANIC TOTAL (MG/L AS N)	NITROGEN, TOTAL (MG/L AS N)	NITROGEN, TOTAL (MG/L AS NO3)	PHOSPHORUS, TOTAL (MG/L AS P)	PHOSPHORUS, TOTAL (MG/L AS PO4)	ALUMINUM, TOTAL RECOVERABLE (UG/L AS AL)	ANTIMONY, TOTAL (UG/L AS SB)
WATER YEAR 1980											
MAR											
14...	2.5	3490	4.75	.33	.95	1.3	5.7	.030	.09	54000	0
25...	2.0	3050	4.15	.15	.82	.97	4.3	.100	.31	3700	0
APR											
07...	2.9	4160	5.66	.27	.93	1.2	5.3	.110	.34	37000	0
24...	2.7	3870	<5.26	.33	1.2	1.5	6.8	.010	.03	19000	0
MAY											
02...	--	--	--	--	--	--	--	--	--	--	--
22...	--	--	--	--	--	--	--	--	--	--	--

DATE	ARSENIC TOTAL (UG/L AS AS)	BERYLLIUM, TOTAL RECOVERABLE (UG/L AS BE)	CADMIUM TOTAL RECOVERABLE (UG/L AS CD)	CHROMIUM, TOTAL RECOVERABLE (UG/L AS CR)	COPPER, TOTAL RECOVERABLE (UG/L AS CU)	IRON, TOTAL RECOVERABLE (UG/L AS FE)	IRON, SUSPENDED RECOVERABLE (UG/L AS FE)	IRON, DISSOLVED (UG/L AS FE)	LEAD, TOTAL RECOVERABLE (UG/L AS PB)	MANGANESE, TOTAL RECOVERABLE (UG/L AS MN)	MANGANESE, SUSPENDED RECOV. (UG/L AS MN)
MAR											
14...	19	50	0	30	200	390000	130000	260000	3	63000	2000
25...	17	30	0	3	10	160000	0	160000	0	71000	0
APR											
07...	16	30	0	8	150	190000	40000	150000	0	88000	0
24...	4	20	5	2	66	170000	30000	140000	0	86000	12000
MAY											
02...	--	--	--	--	--	180000	10000	170000	--	82000	2000
22...	--	--	--	--	--	900000	0	900000	--	42000	0

DATE	MANGANESE, DISSOLVED (UG/L AS MN)	MERCURY TOTAL RECOVERABLE (UG/L AS HG)	NICKEL, TOTAL RECOVERABLE (UG/L AS NI)	SELENIUM, TOTAL (UG/L AS SE)	SILVER, TOTAL RECOVERABLE (UG/L AS AG)	ZINC, SUSPENDED RECOVERABLE (UG/L AS ZN)	ZINC, DISSOLVED (UG/L AS ZN)	ZINC, TOTAL RECOVERABLE (UG/L AS ZN)	CARBON, ORGANIC DISSOLVED (MG/L AS C)	CARBON, ORGANIC SUSPENDED (MG/L AS C)	PHENOLS (UG/L)
MAR											
14...	61000	.1	230	0	0	0	4700	4700	2.9	.1	3
25...	71000	.1	1600	0	0	0	4500	4500	5.9	.2	0
APR											
07...	88000	.2	460	2	0	0	4900	4900	3.7	.1	0
24...	74000	.1	690	1	0	0	4000	4000	2.0	.7	0
MAY											
02...	80000	--	--	--	--	--	--	--	--	--	--
22...	42000	--	--	--	--	--	--	--	--	--	--

Table 22.--Water-quality data, mine entrance 90B near Lake Hope, Ohio, May 2 and 22, 1980

[MG/L, milligrams per liter; UG/L, micrograms per liter]

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (FT^3/S)	SPE-CIFIC CON-DUCT-ANCE (US/CM)	PH (UNITS)	TEMPER-ATURE, WATER (DEG C)	ACIDITY TOTAL HEATED (MG/L AS H)	ACIDITY (MG/L AS CACO3)	BICAR-BONATE (MG/L AS HCO3)	CAR-BONATE (MG/L AS CO3)
MAY									
02...	1330	--	1200	3.4	12.0	6.0	298	0	0
22...	1530	.05	1750	3.2	10.5	10	497	0	0

DATE	ALKA-LINITY (MG/L AS CACO3)	CARBON DIOXIDE DIS-SOLVED (MG/L AS CO2)	SULFATE DIS-SOLVED (MG/L AS SO4)	IRON, TOTAL RECOV-ERABLE (UG/L AS FE)	IRON, SUS-PENDED RECOV-ERABLE (UG/L AS FE)	IRON, DIS-SOLVED (UG/L AS FE)	MANGA-NESE, TOTAL RECOV-ERABLE (UG/L AS MN)	MANGA-NESE, SUS-PENDED RECOV. (UG/L AS MN)	MANGA-NESE, DIS-SOLVED (UG/L AS MN)
MAY									
02...	0	.0	810	74000	6000	68000	3500	500	3000
22...	0	.0	1200	110000	10000	100000	3700	0	3700

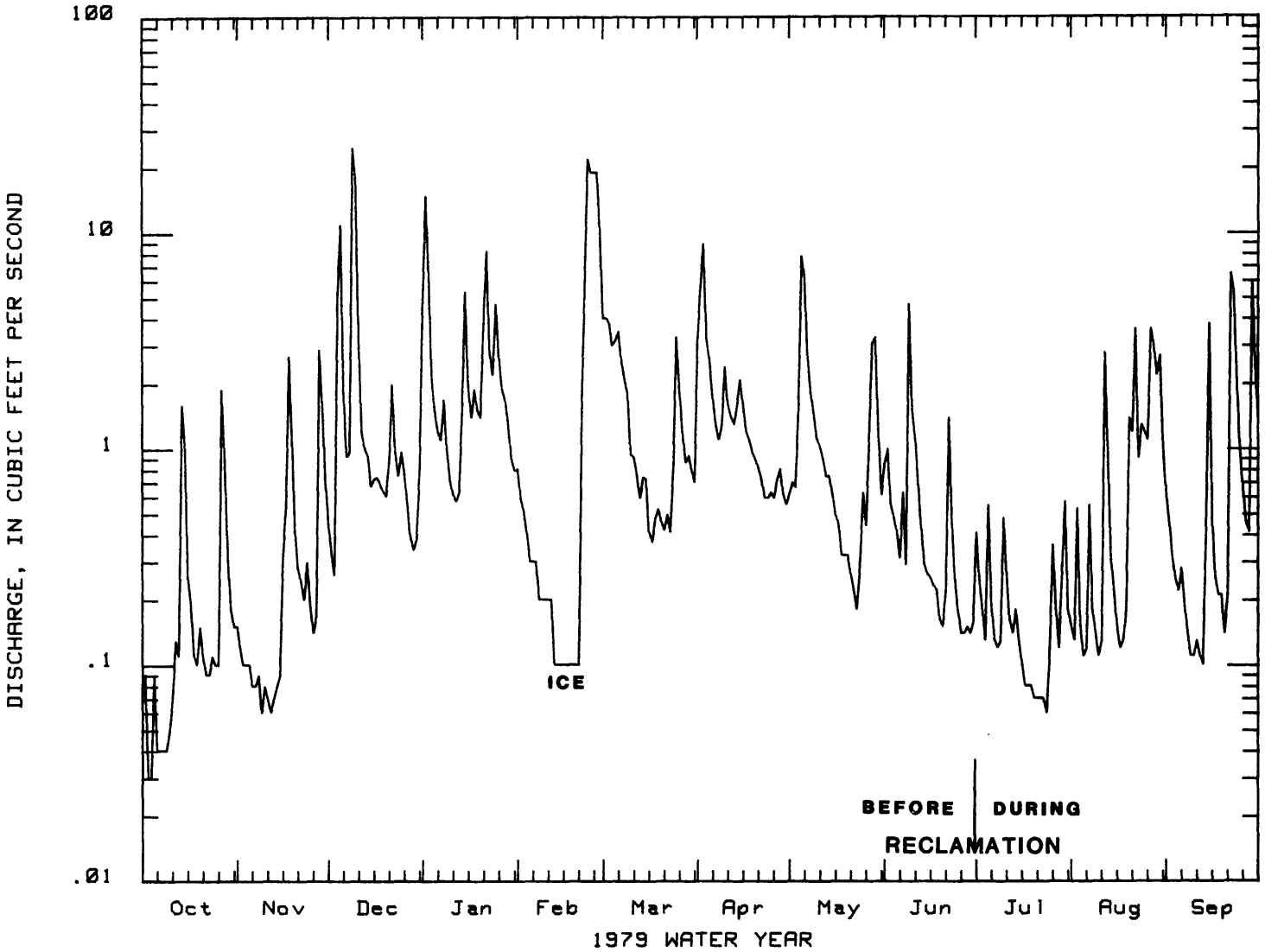

Figure 6.--Discharge, station 03201600, Sandy Run above Big Four Hollow Creek near Lake Hope, Ohio, water years 1979 through 1981.

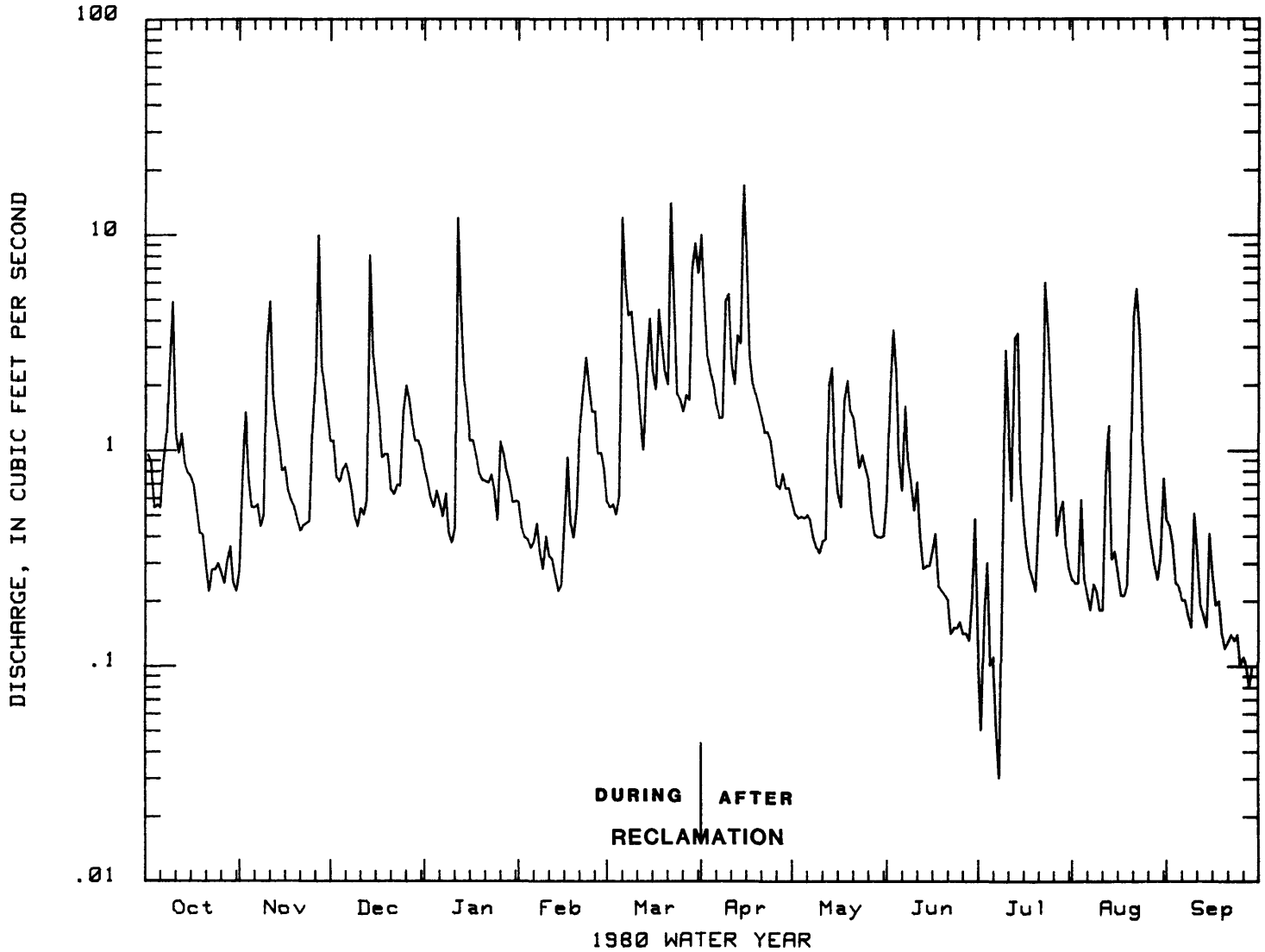

Figure 6.--Discharge, station 03201600, Sandy Run above Big Four Hollow Creek near Lake Hope, Ohio, water years 1979 through 1981--Continued.

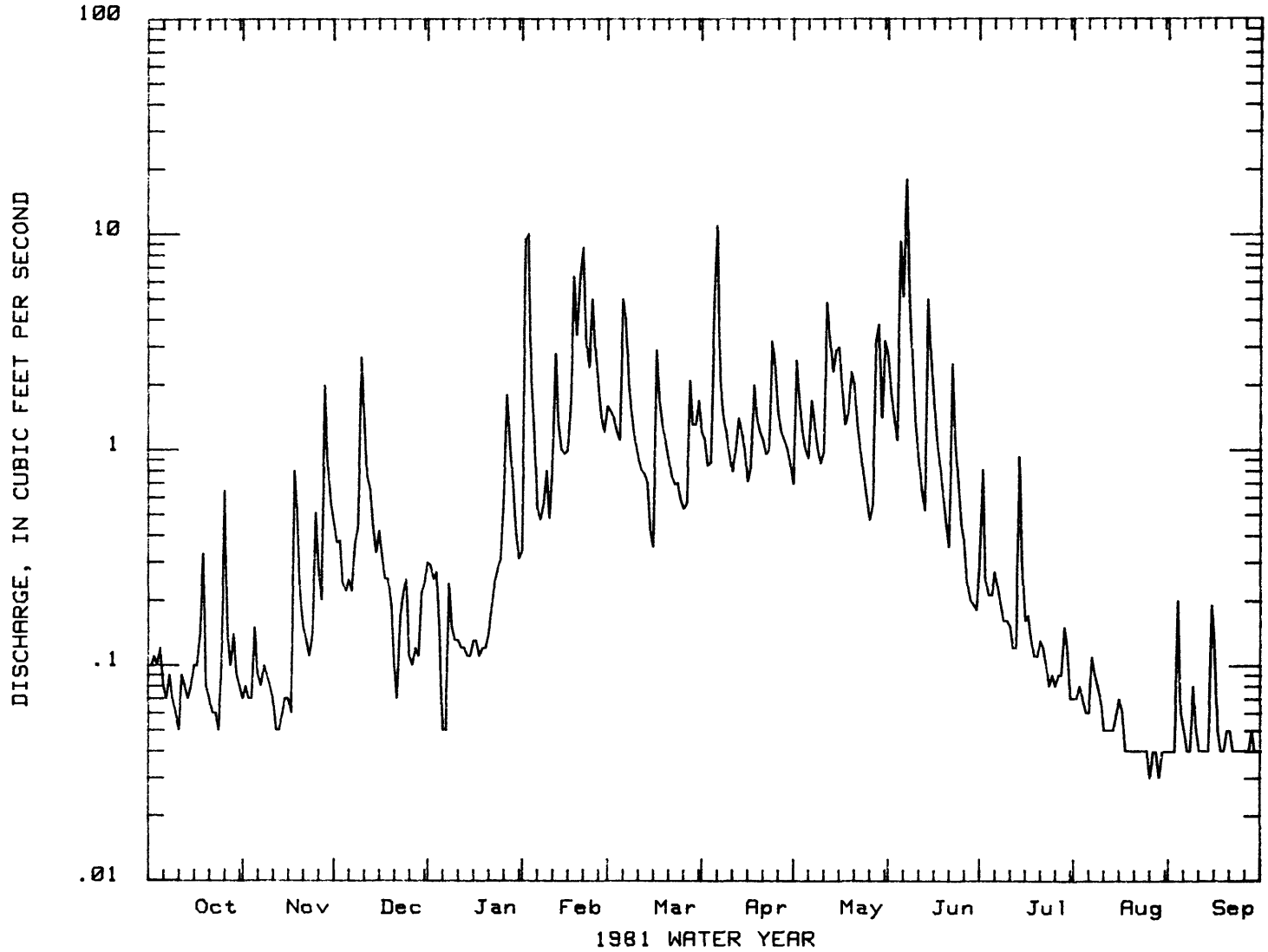

Figure 6.--Discharge, station 03201600, Sandy Run above Big Four Hollow Creek near Lake Hope, Ohio, water years 1979 through 1981--Continued.

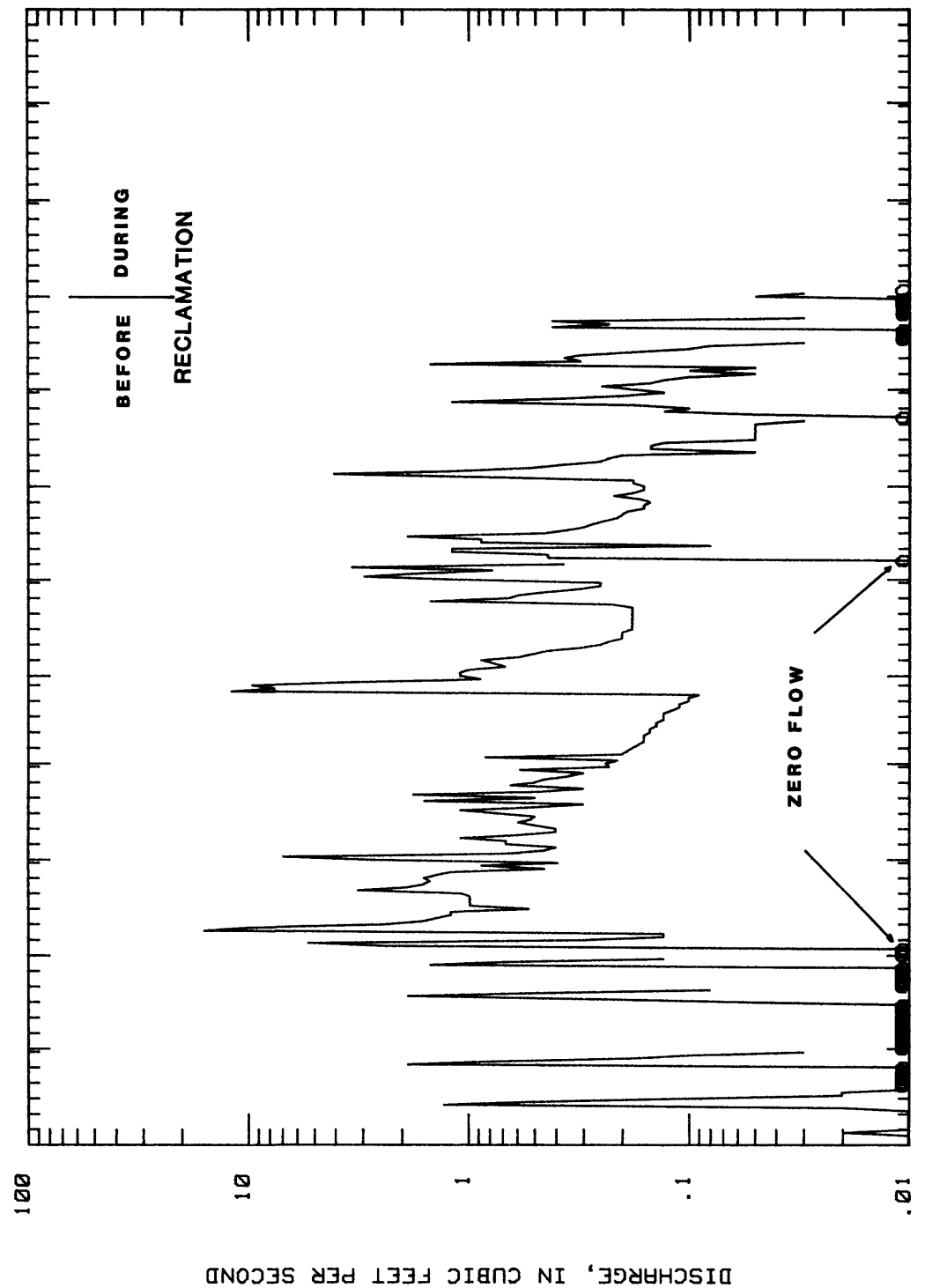

Figure 7.--Discharge, station 03201630, East Fork Big Four Hollow Creek near Lake Hope, Ohio, water year 1979.

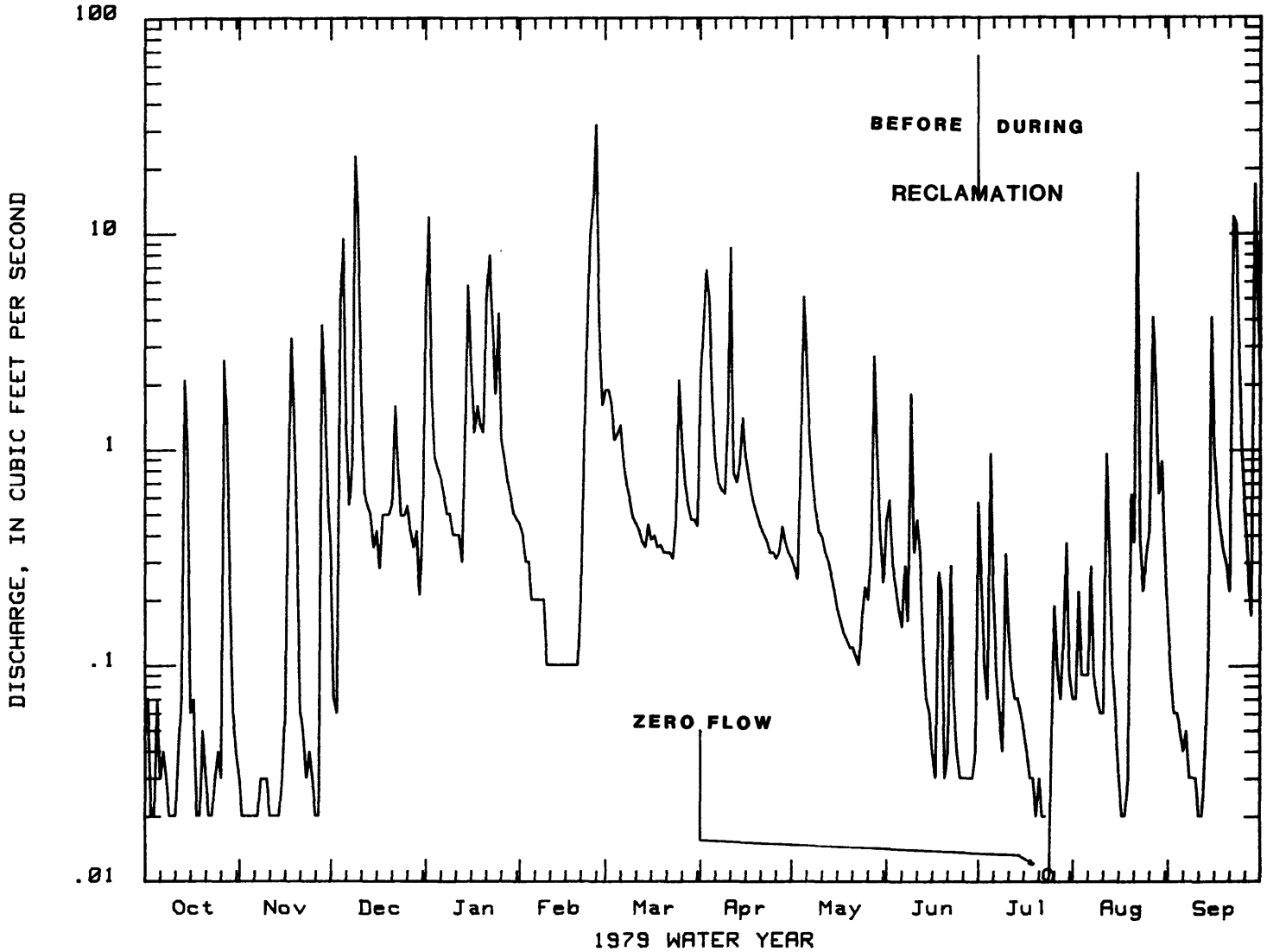

Figure 8.--Discharge, station 03201660, Big Four Hollow Creek below East Fork Big Four Hollow Creek near Lake Hope, Ohio, water years 1979 through 1981.

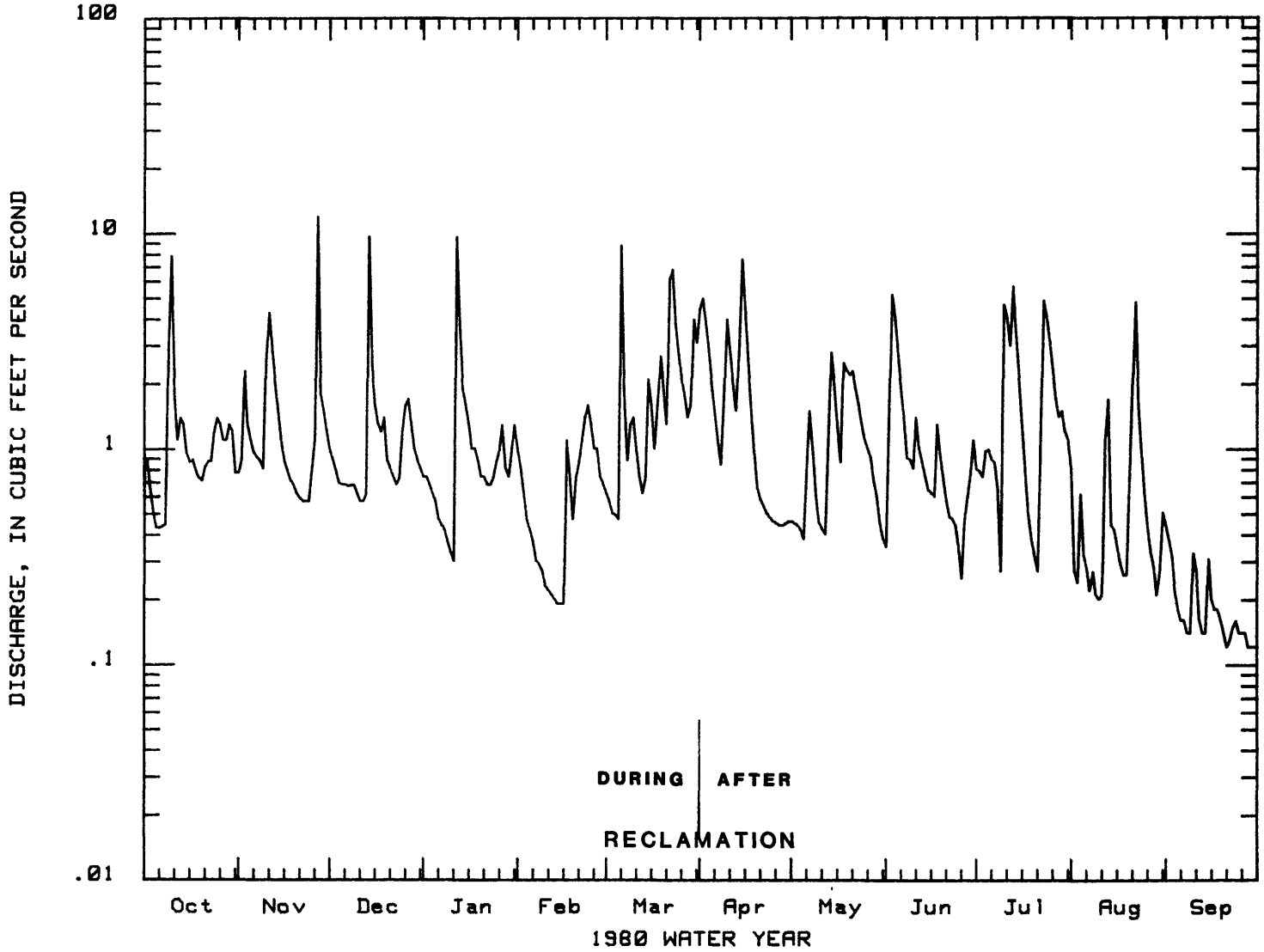

Figure 8.--Discharge, station 03201660, Big Four Hollow Creek below East Fork Big Four Hollow Creek near Lake Hope, Ohio, water years 1979 through 1981--Continued.

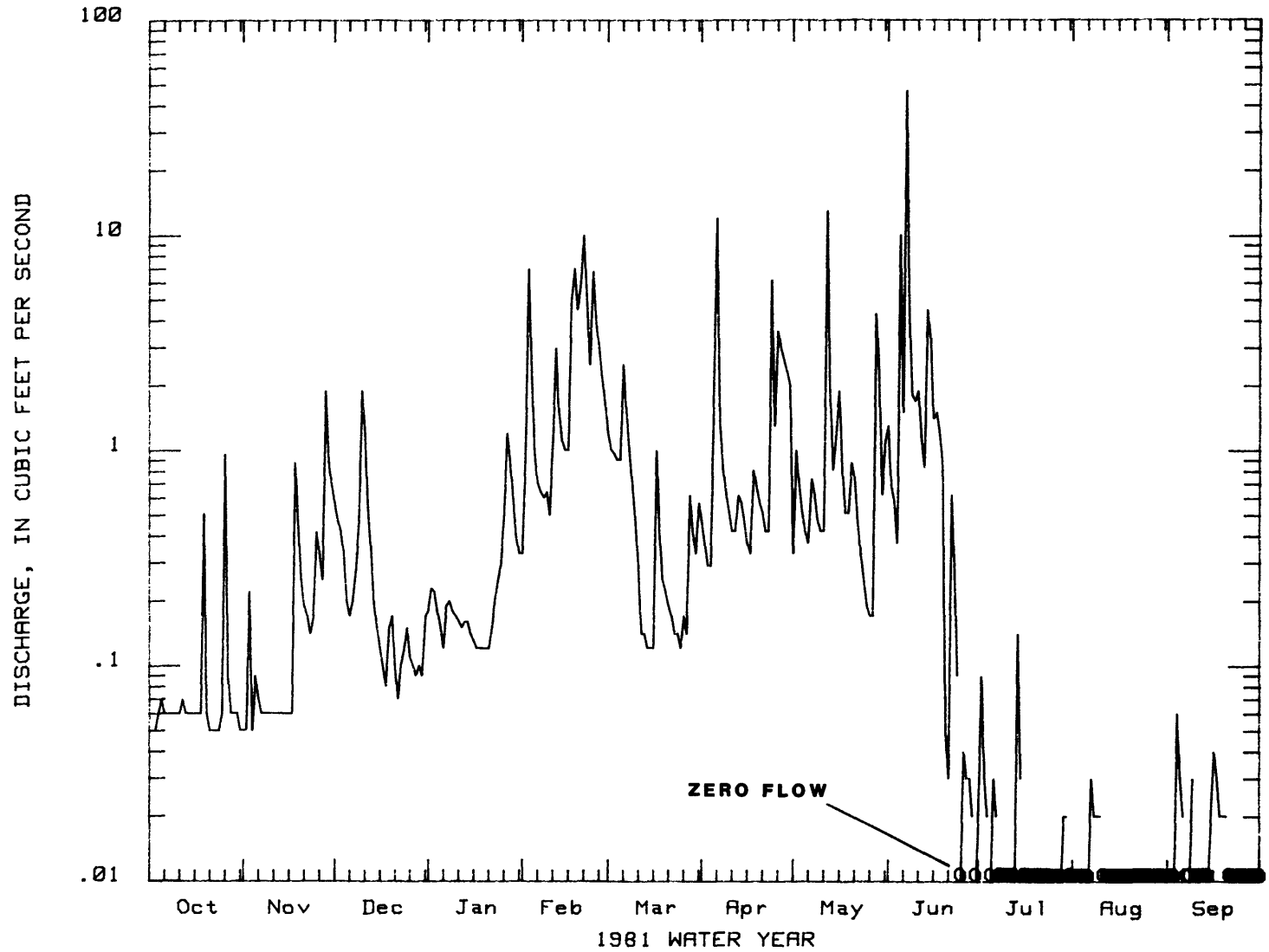

Figure 8.--Discharge, station 03201660, Big Four Hollow Creek below East Fork Big Four Hollow Creek near Lake Hope, Ohio, water years 1979 through 1981--Continued.

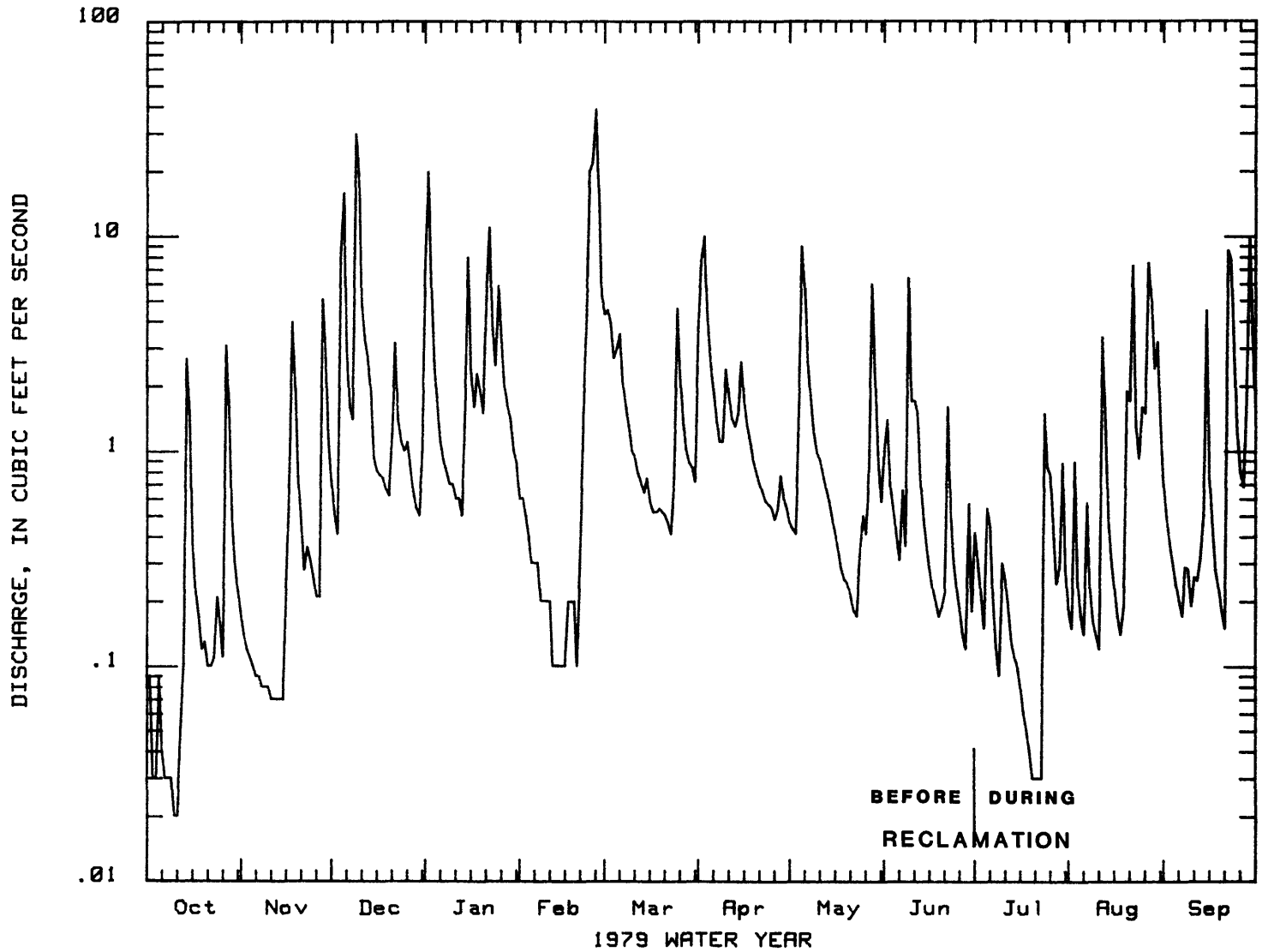

Figure 9.--Discharge, station 03201700, Big Four Hollow Creek near Lake Hope, Ohio, water years 1979 through 1983.

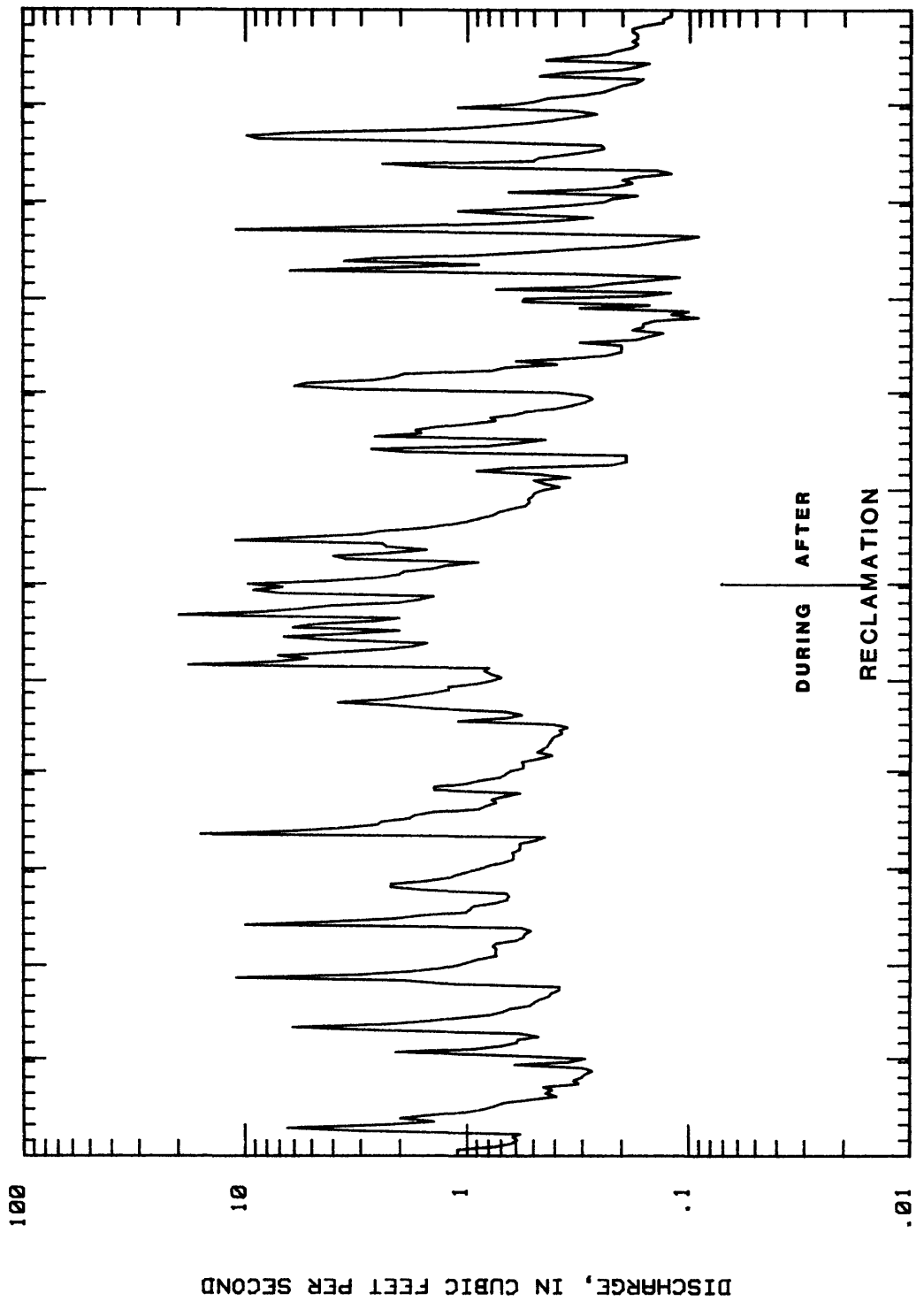

Figure 9.--Discharge, station 03201700, Big Four Hollow Creek near Lake Hope, Ohio, water years 1979 through 1983--Continued.

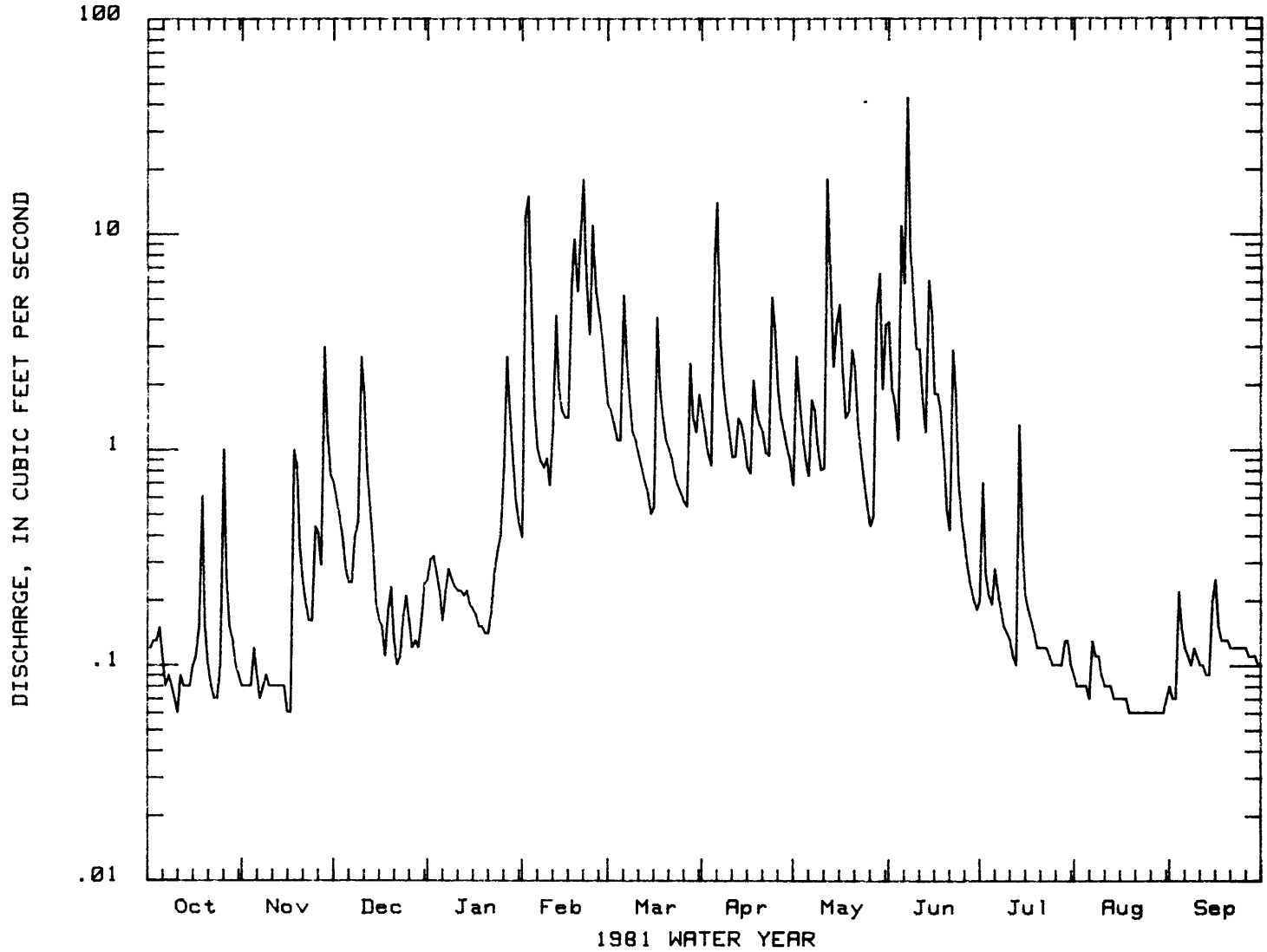

Figure 9.--Discharge, station 03201700, Big Four Hollow Creek near Lake Hope, Ohio, water years 1979 through 1983--Continued.

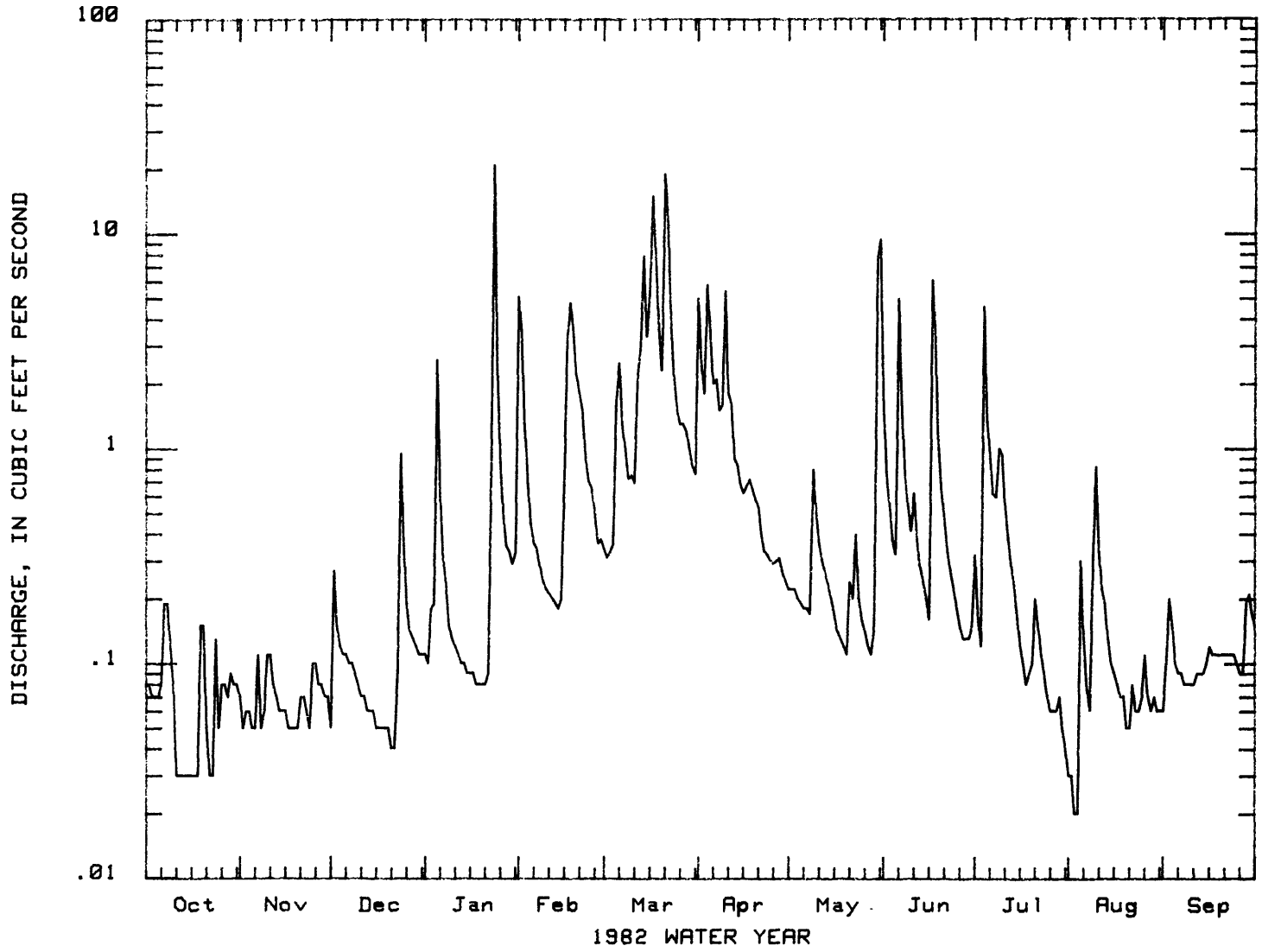

Figure 9.--Discharge, station 03201700, Big Four Hollow Creek near Lake Hope, Ohio, water years 1979 through 1983--Continued.

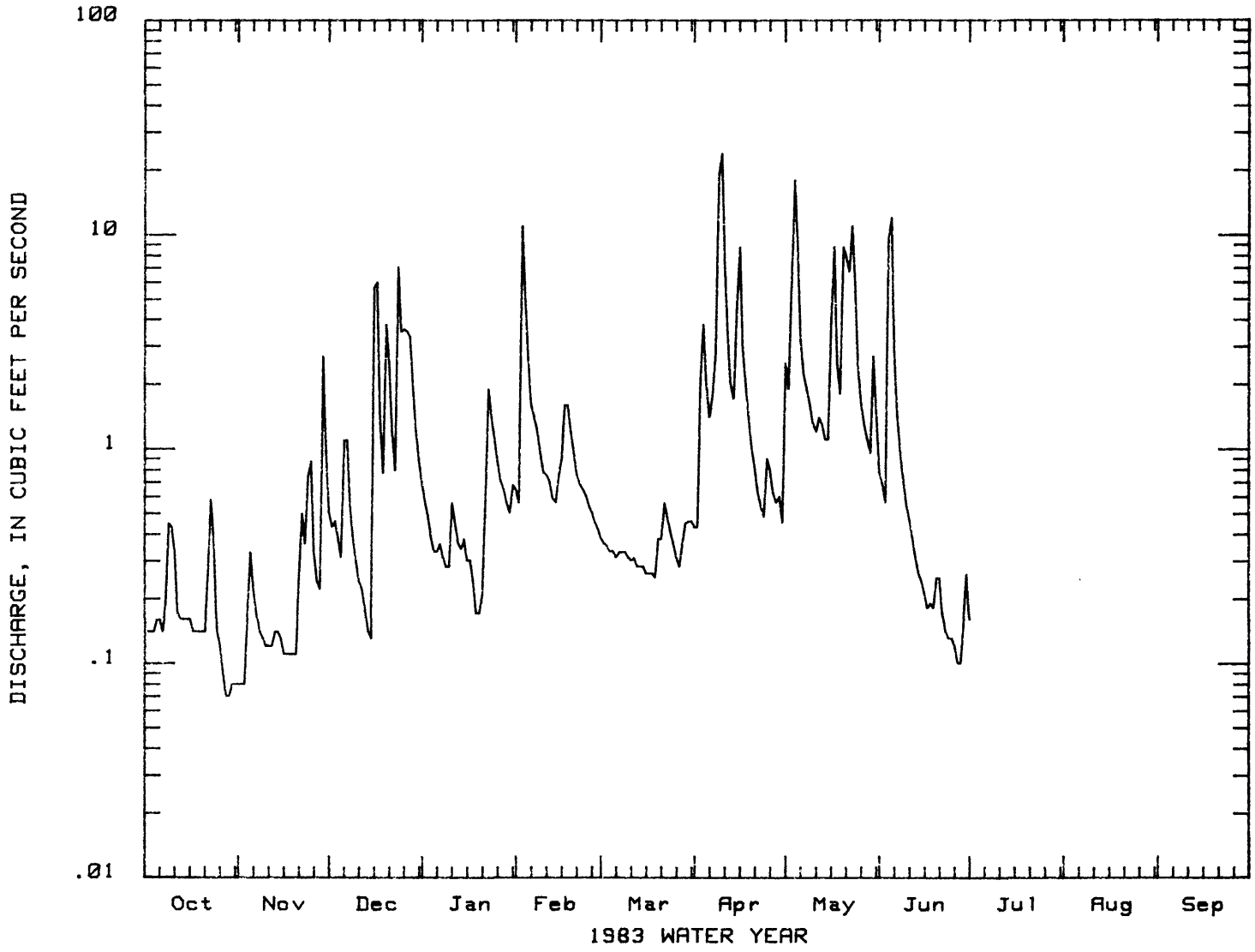

Figure 9.--Discharge, station 03201700, Big Four Hollow Creek near Lake Hope, Ohio, water years 1979 through 1983--Continued.

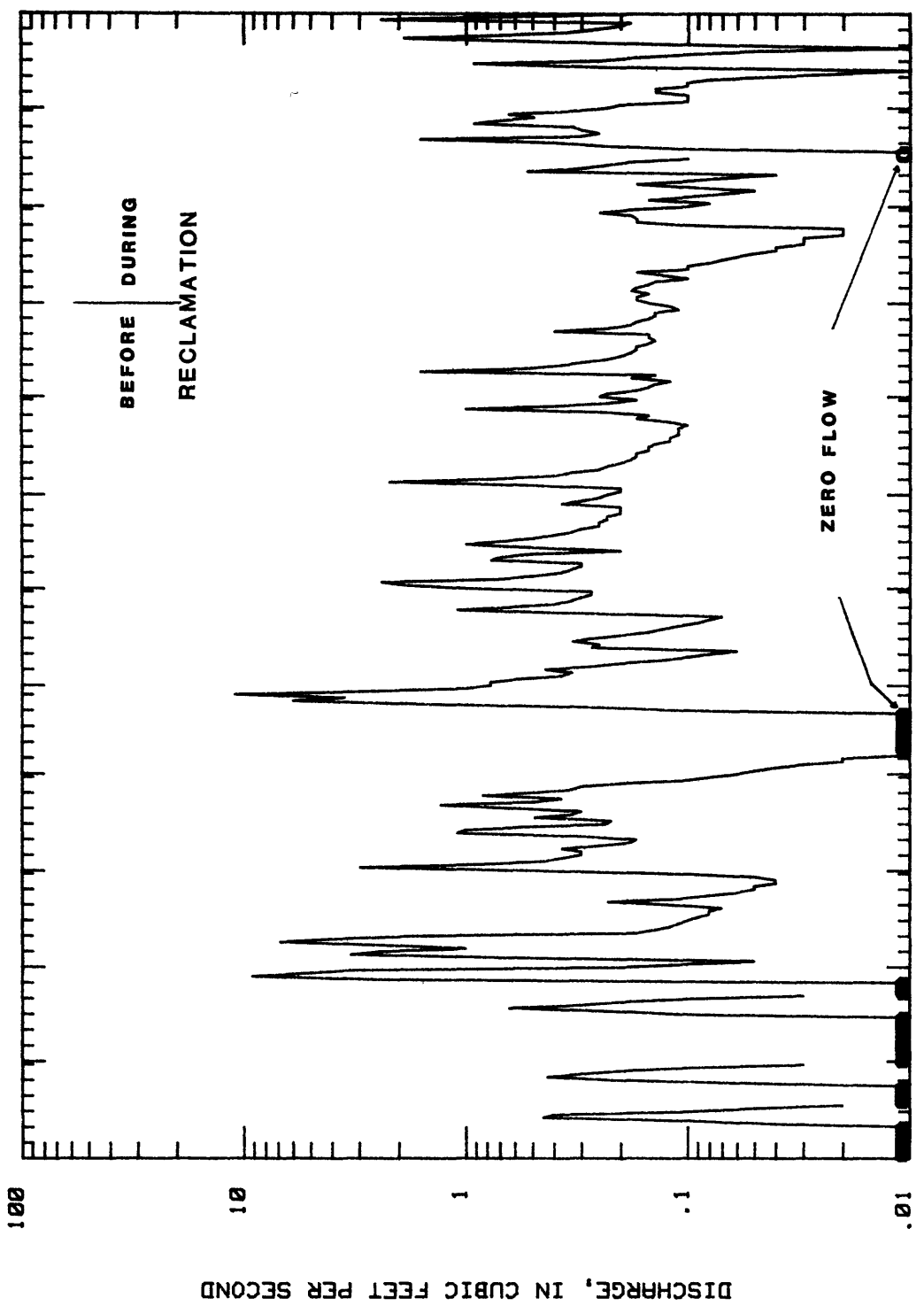

Figure 10.--Discharge, station 03201720, Hull Hollow Creek near Lake Hope, Ohio, water years 1979 through 1981

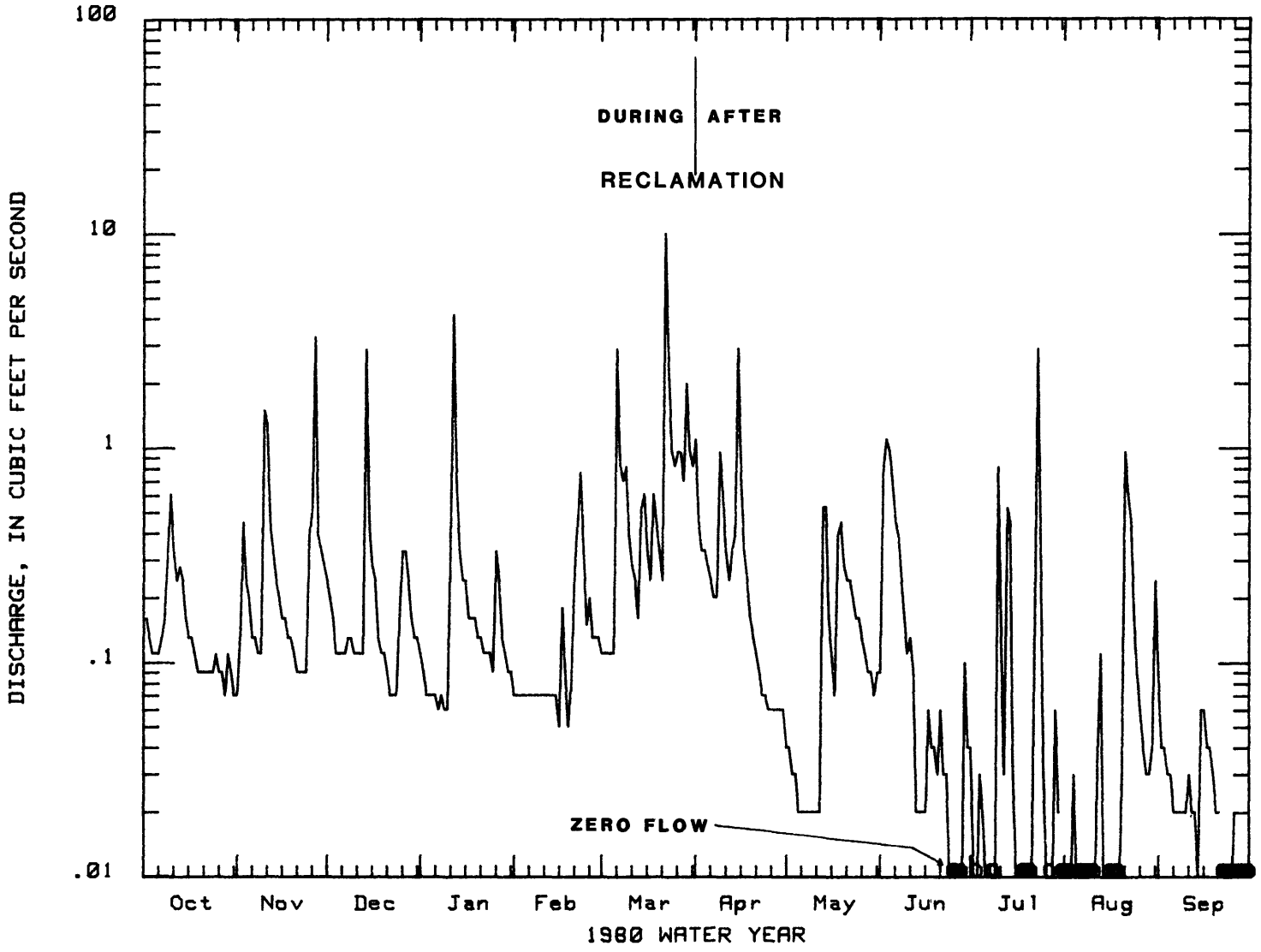

Figure 10.--Discharge, station 03201720, Hull Hollow Creek near Lake Hope, Ohio, water years 1979 through 1981--Continued.

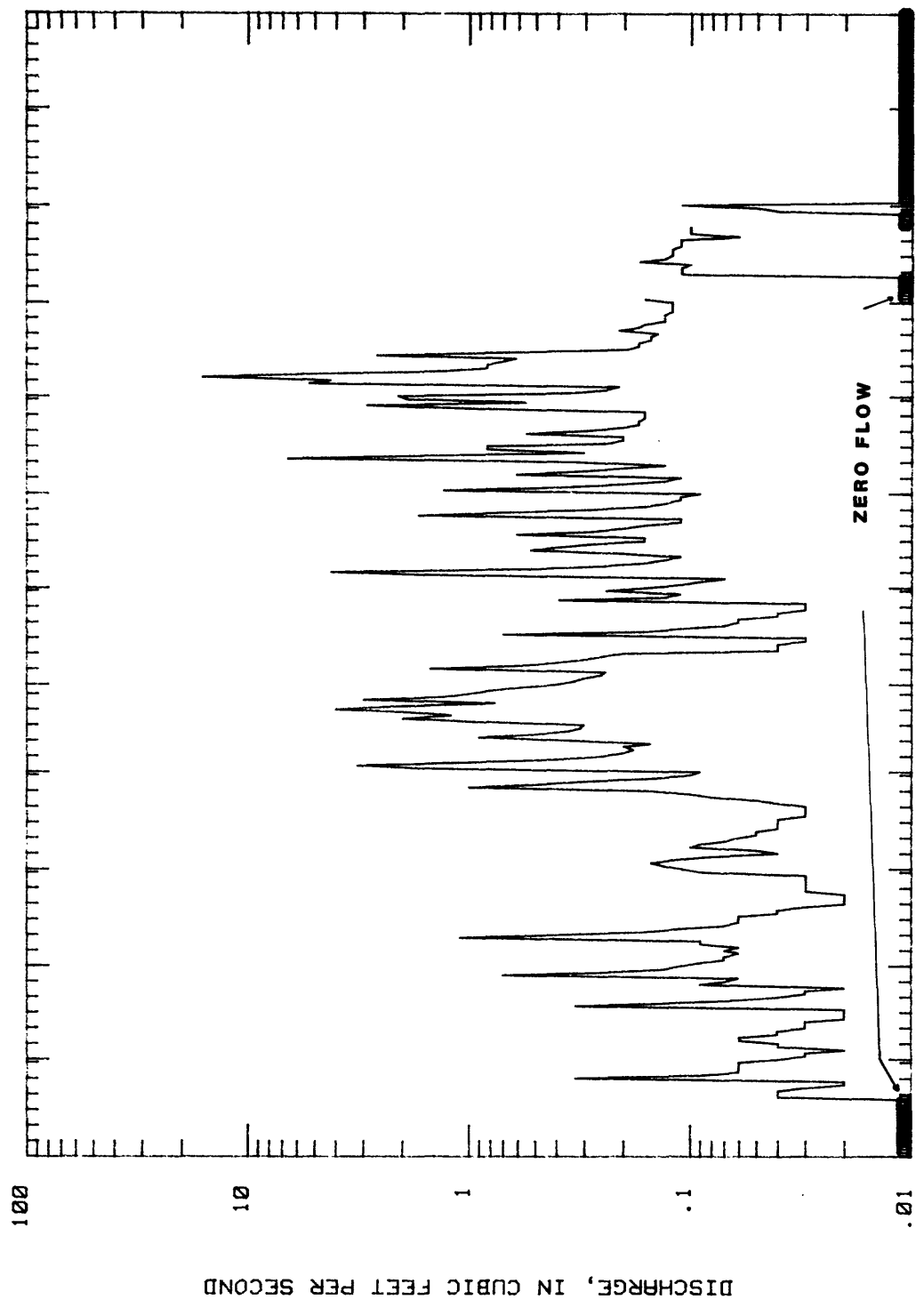

Figure 10.--Discharge, station 03201720, Hull Hollow Creek near Lake Hope, Ohio, water years 1979 through 1981--Continued.

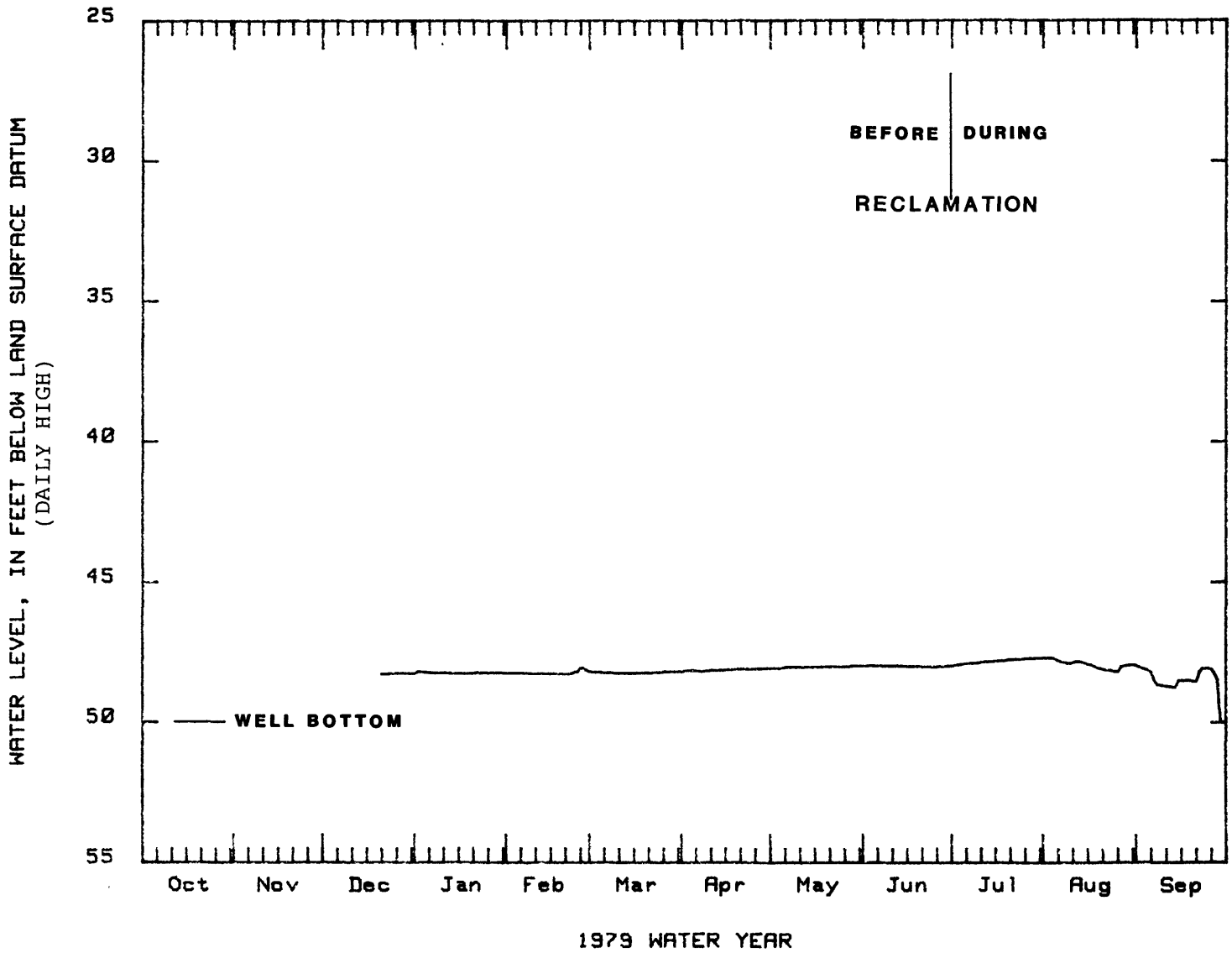

Figure 11.--Water levels in well RM-1 near Lake Hope, Ohio, water years 1979 through 1983.

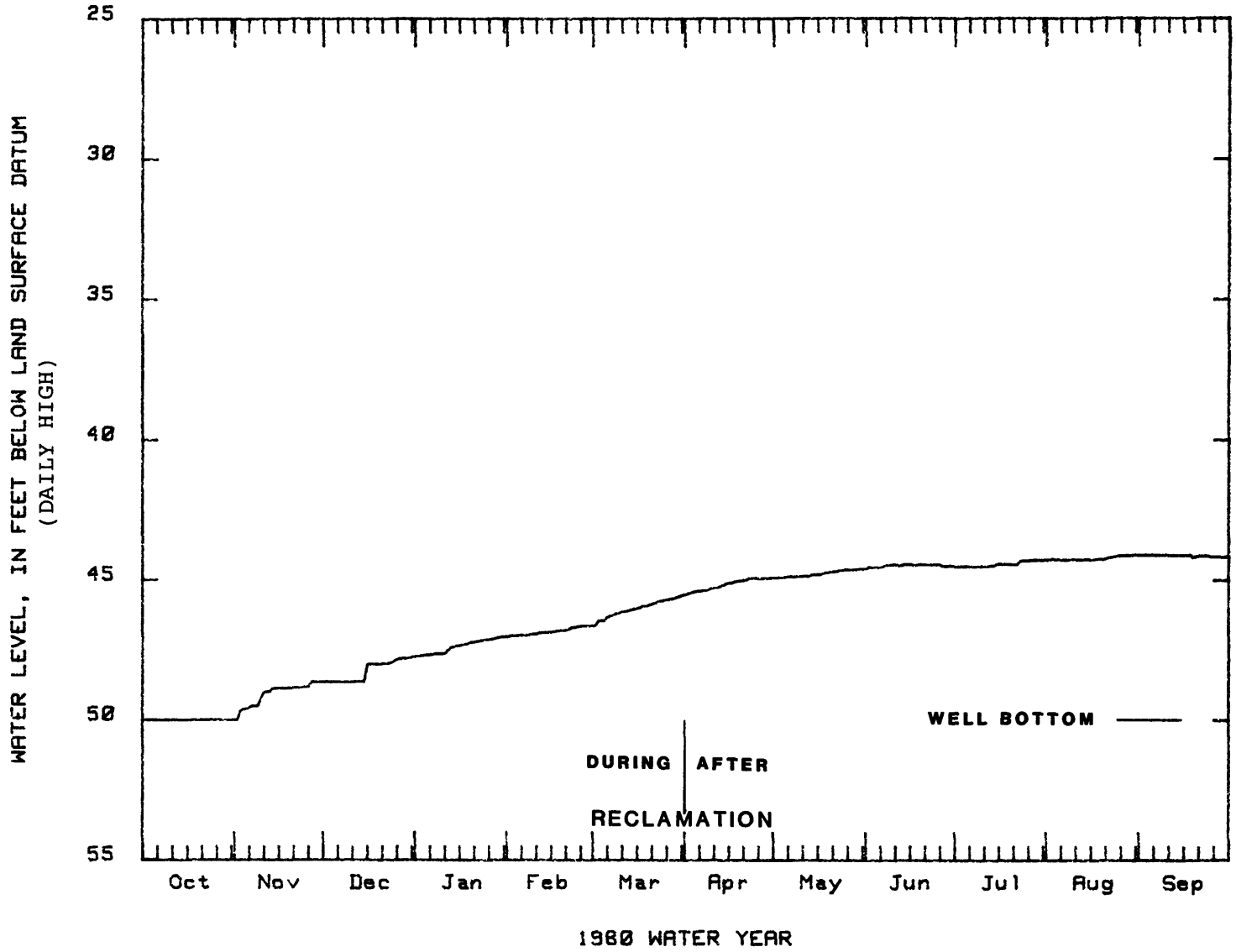

Figure 11.--Water levels in well RM-1 near Lake Hope, Ohio, water years 1979 through 1983--Continued.

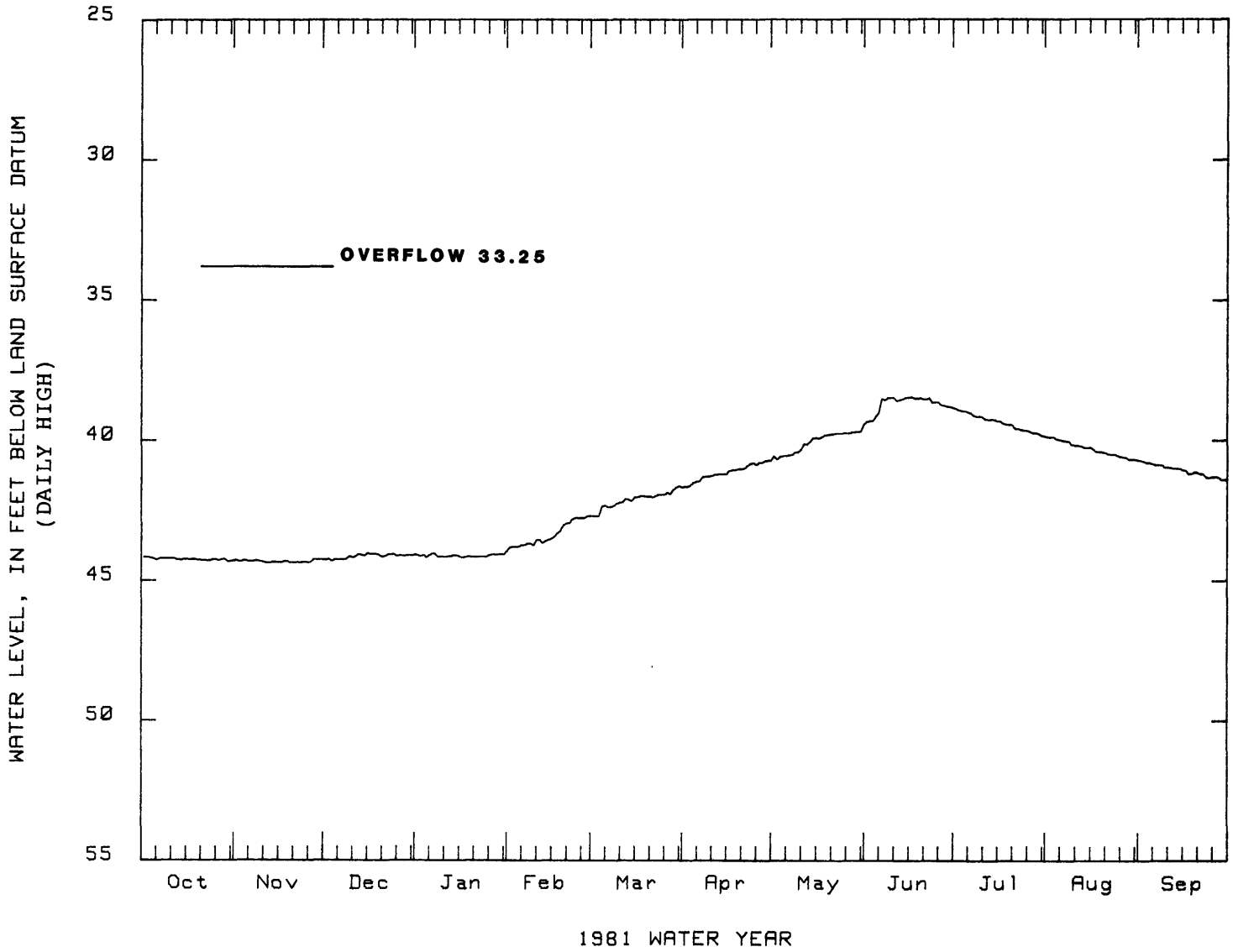

Figure 11.--Water levels in well RM-1 near Lake Hope, Ohio, water years 1979 through 1983--Continued.

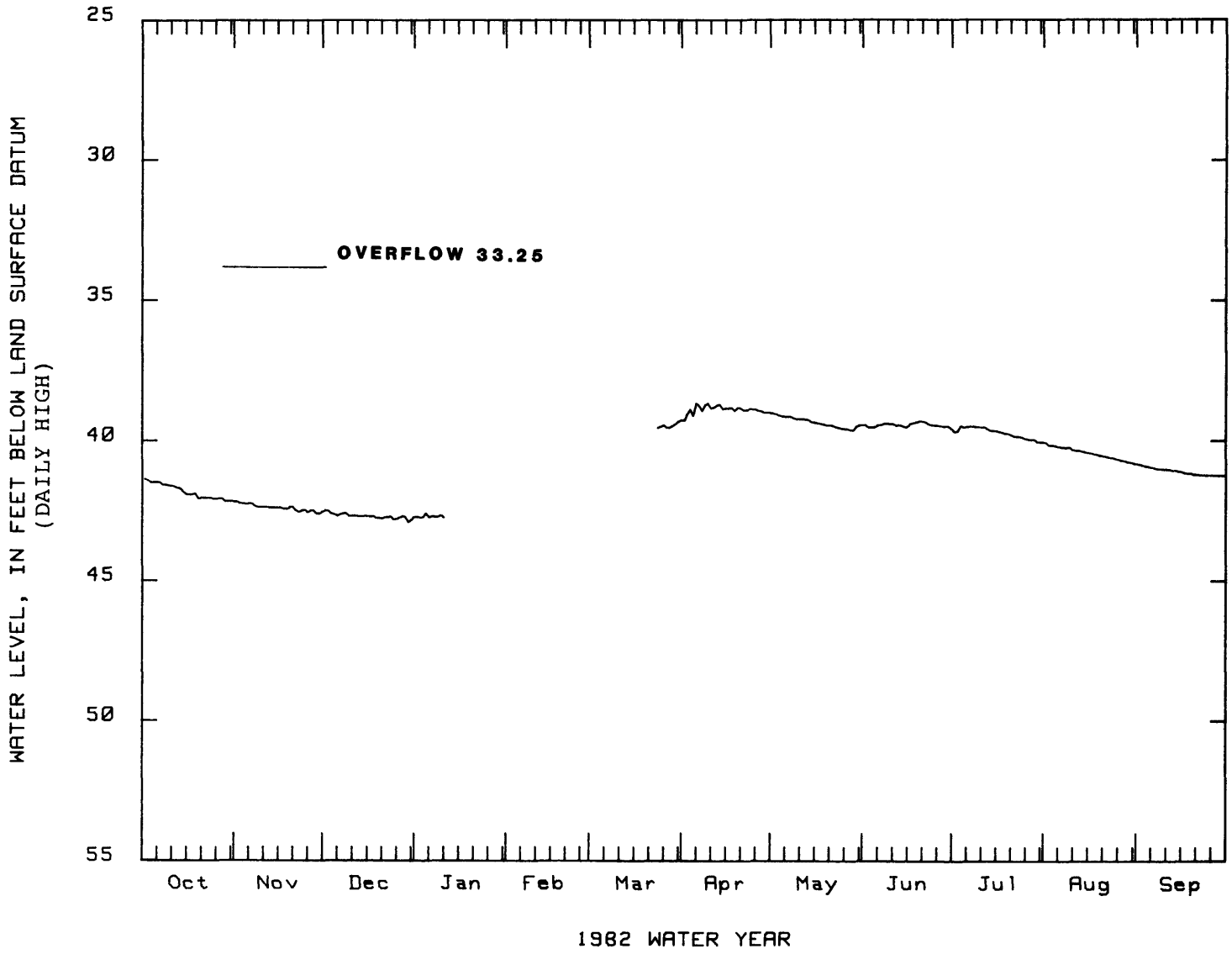

Figure 11.--Water levels in well RM-1 near Lake Hope, Ohio, water years 1979 through 1983--Continued.

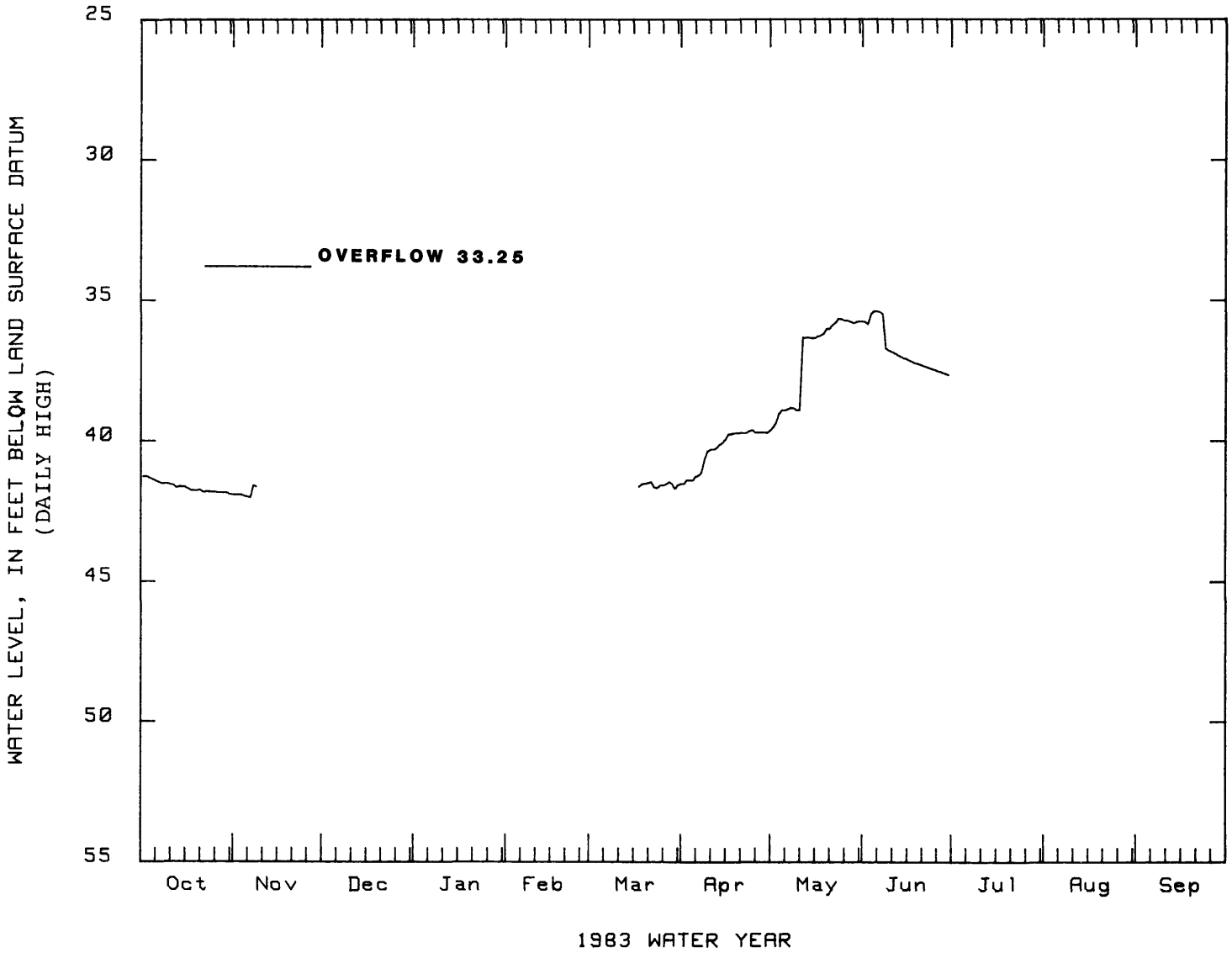

Figure 11.--Water levels in well RM-1 near Lake Hope, Ohio, water years 1979 through 1983--Continued.

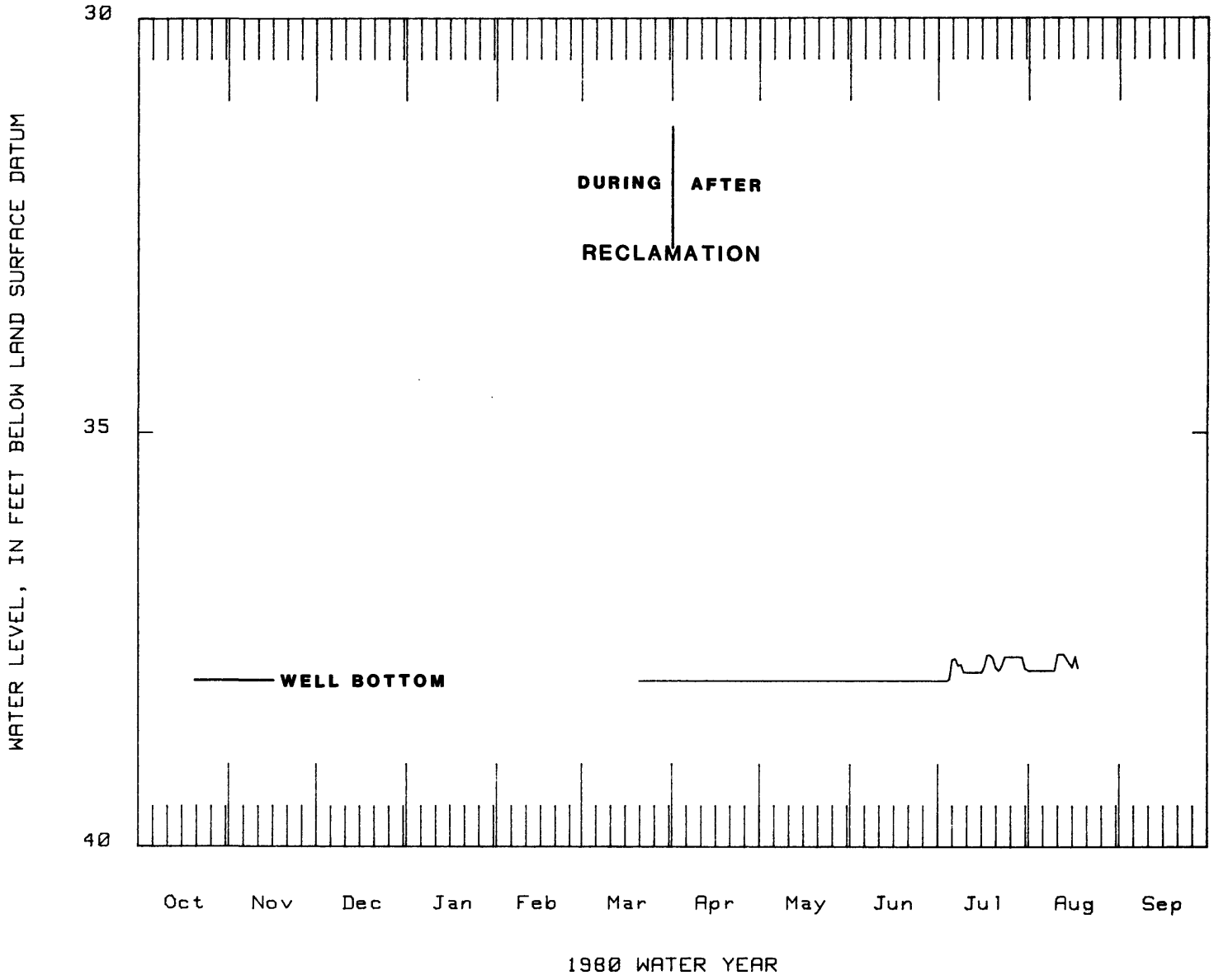

Figure 12.--Water levels in well RM-2 near Lake Hope, Ohio, water years 1980 through 1983.

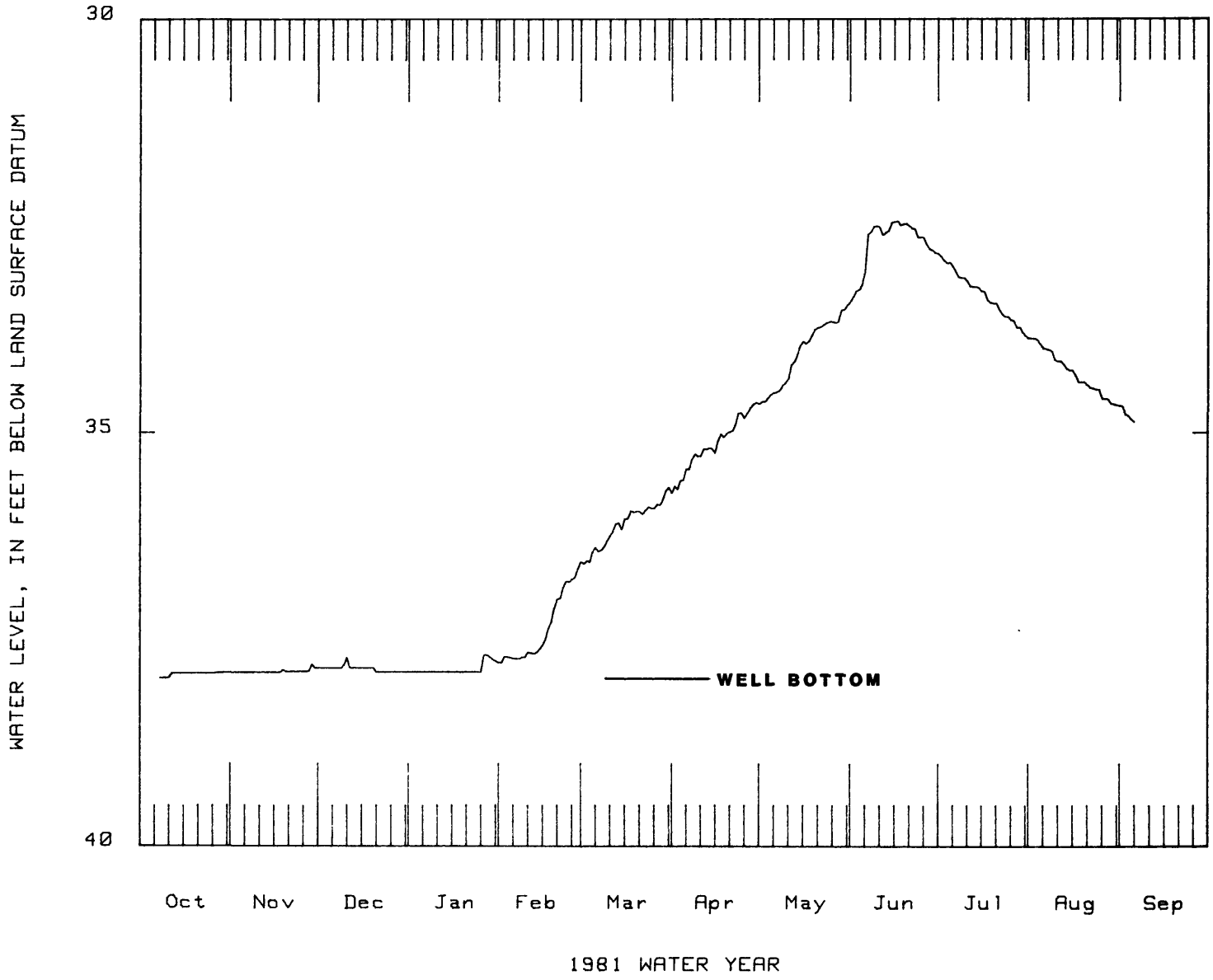

Figure 12.--Water levels in well RM-2 near Lake Hope, Ohio, water years 1980 through 1983--Continued.

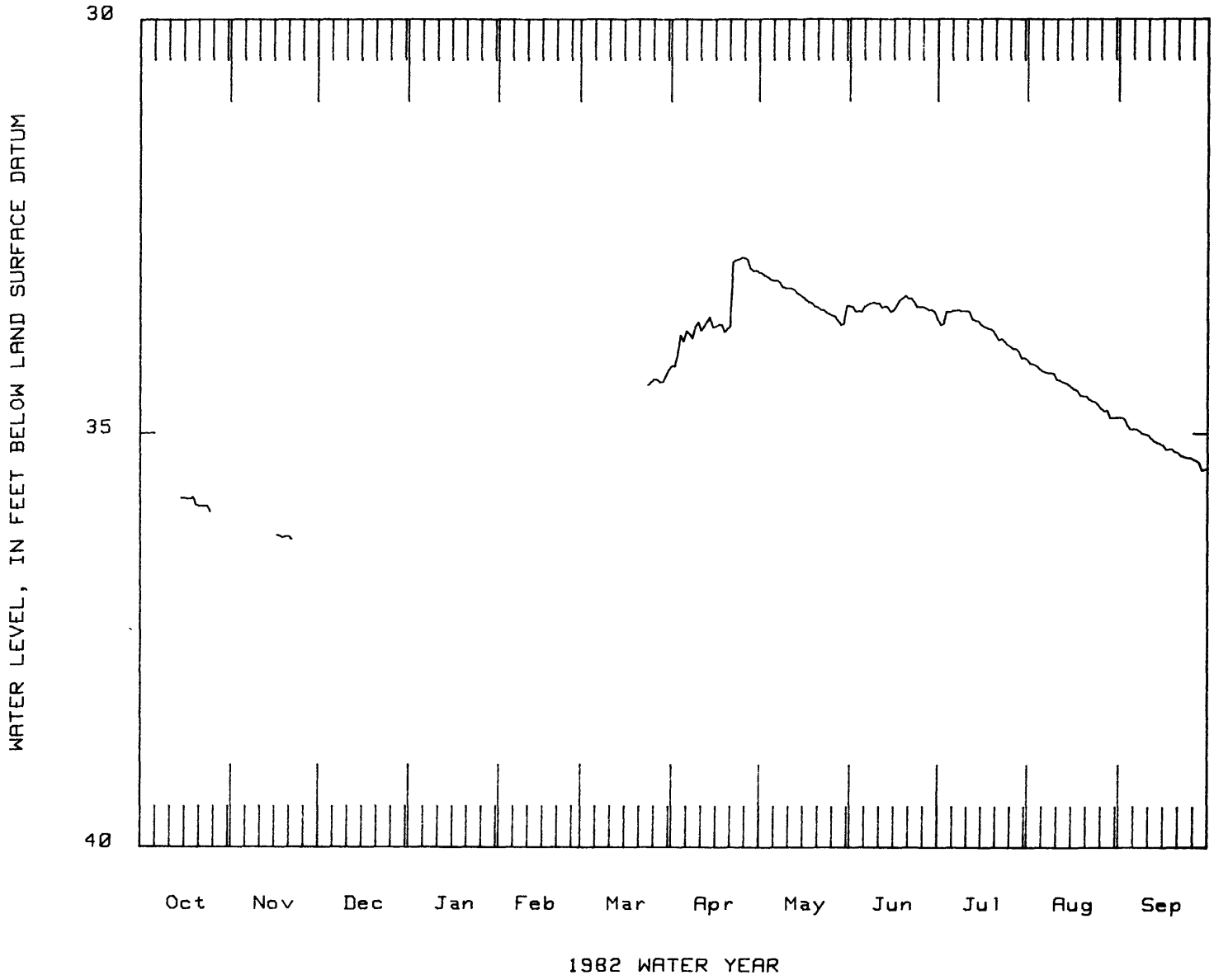

Figure 12.--Water levels in well RM-2 near Lake Hope, Ohio, water years 1980 through 1983--Continued.

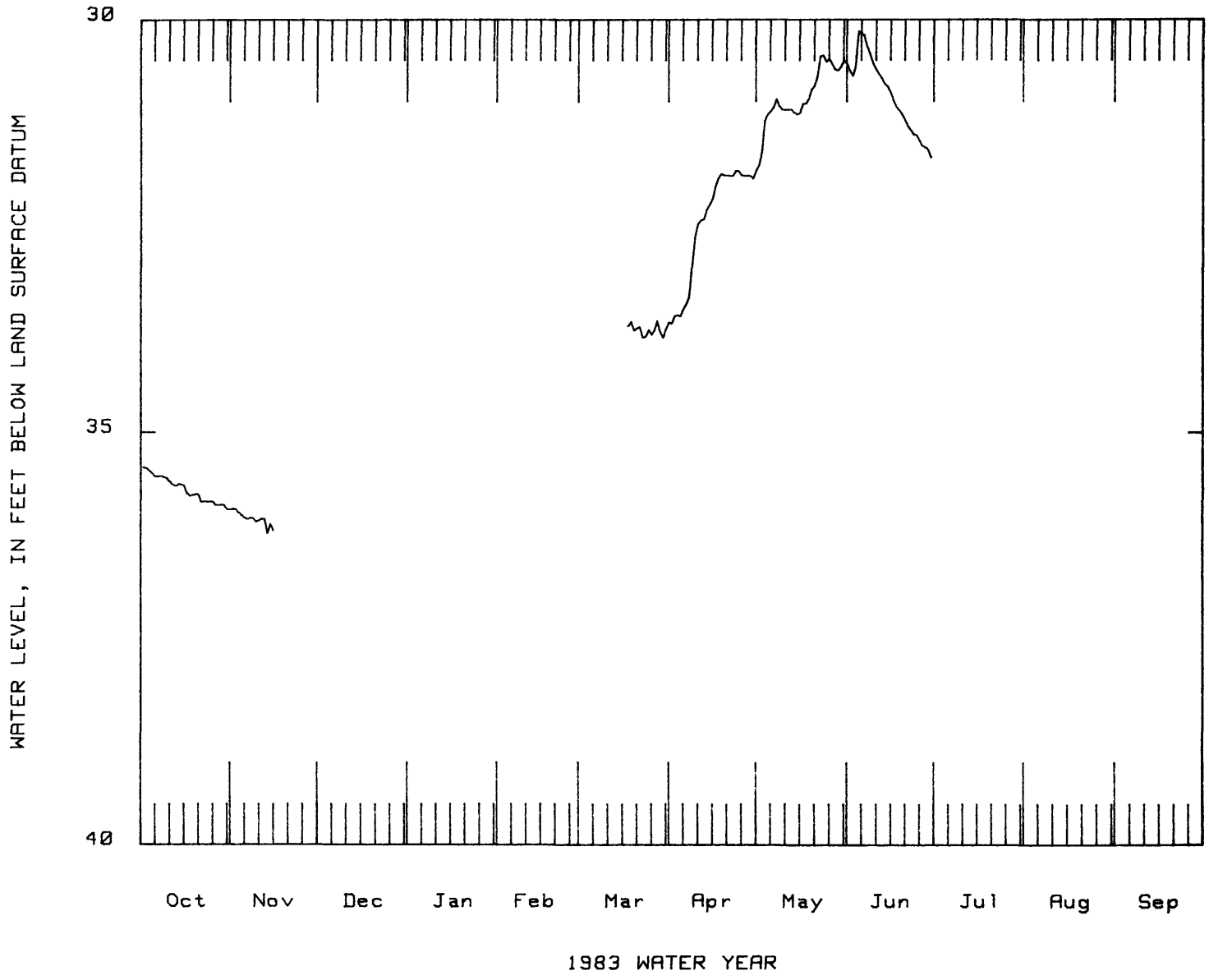

Figure 12.--Water levels in well RM-2 near Lake Hope, Ohio, water years 1980 through 1983--Continued.

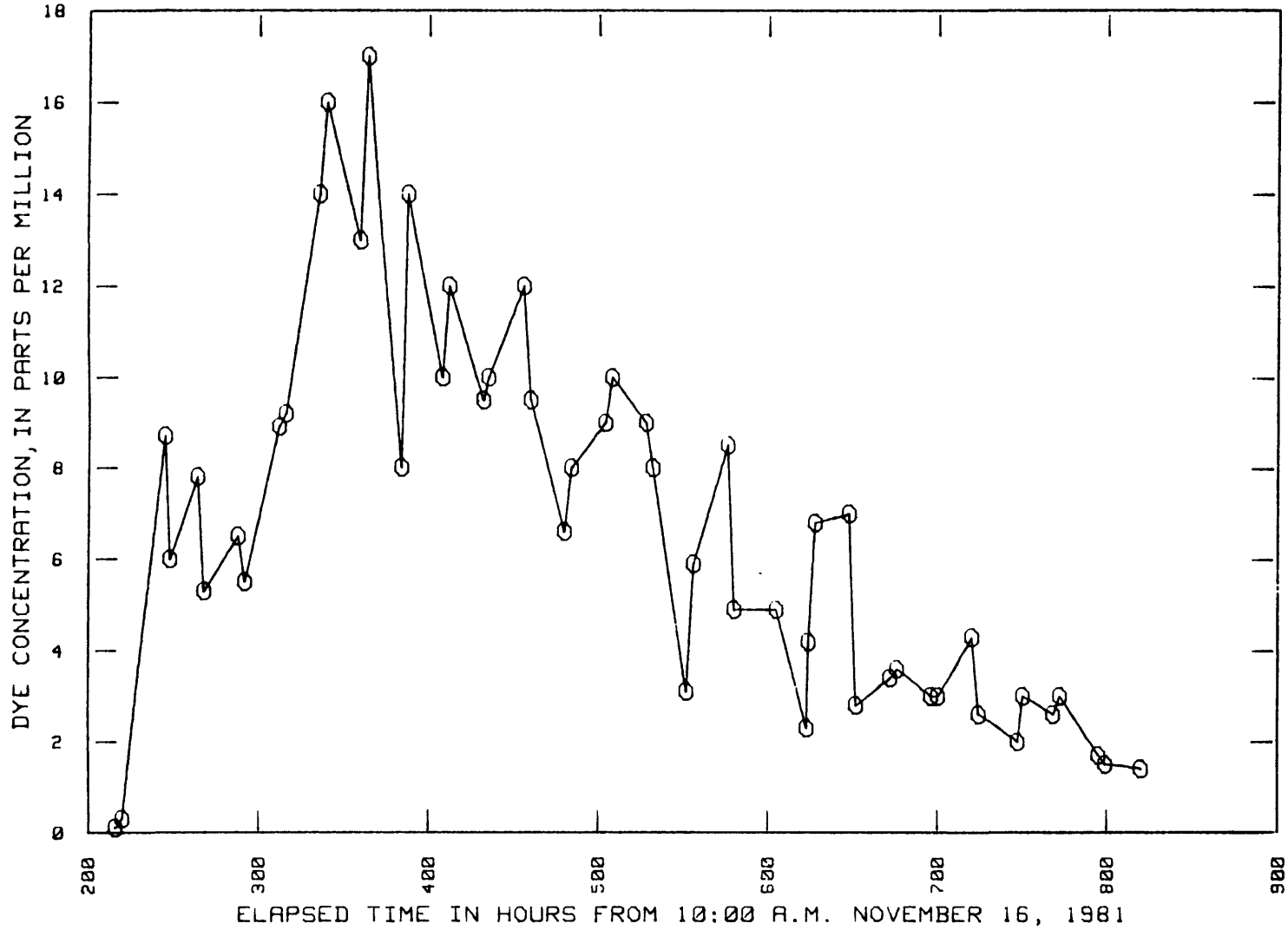

Figure 13.--Dye concentration in samples from mine entrance 90B in Big Four Hollow near Lake Hope, Ohio, November 16 through December 20, 1981.

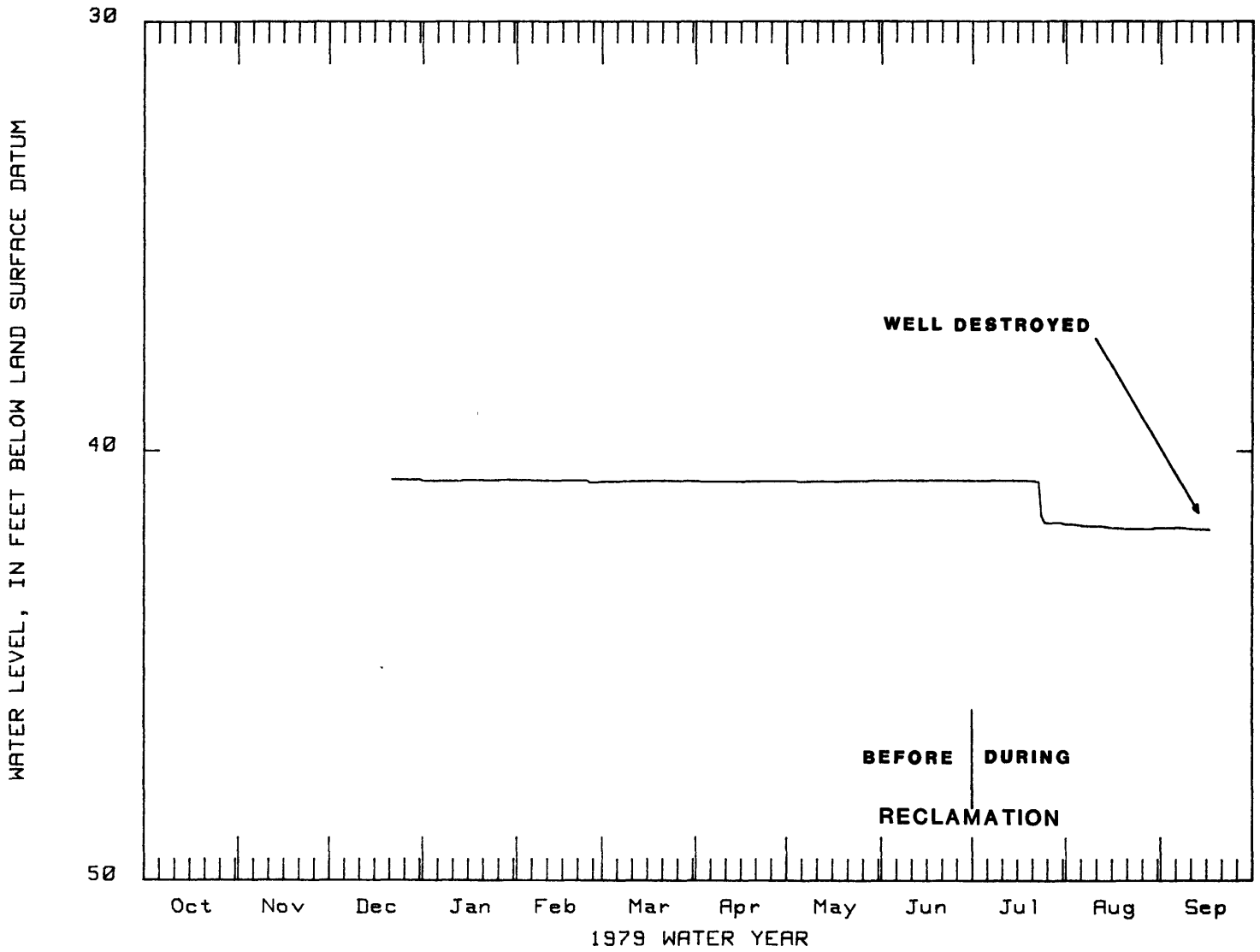

Figure 14 .--Water levels in well RM-3 near Lake Hope, Ohio, water year 1979.

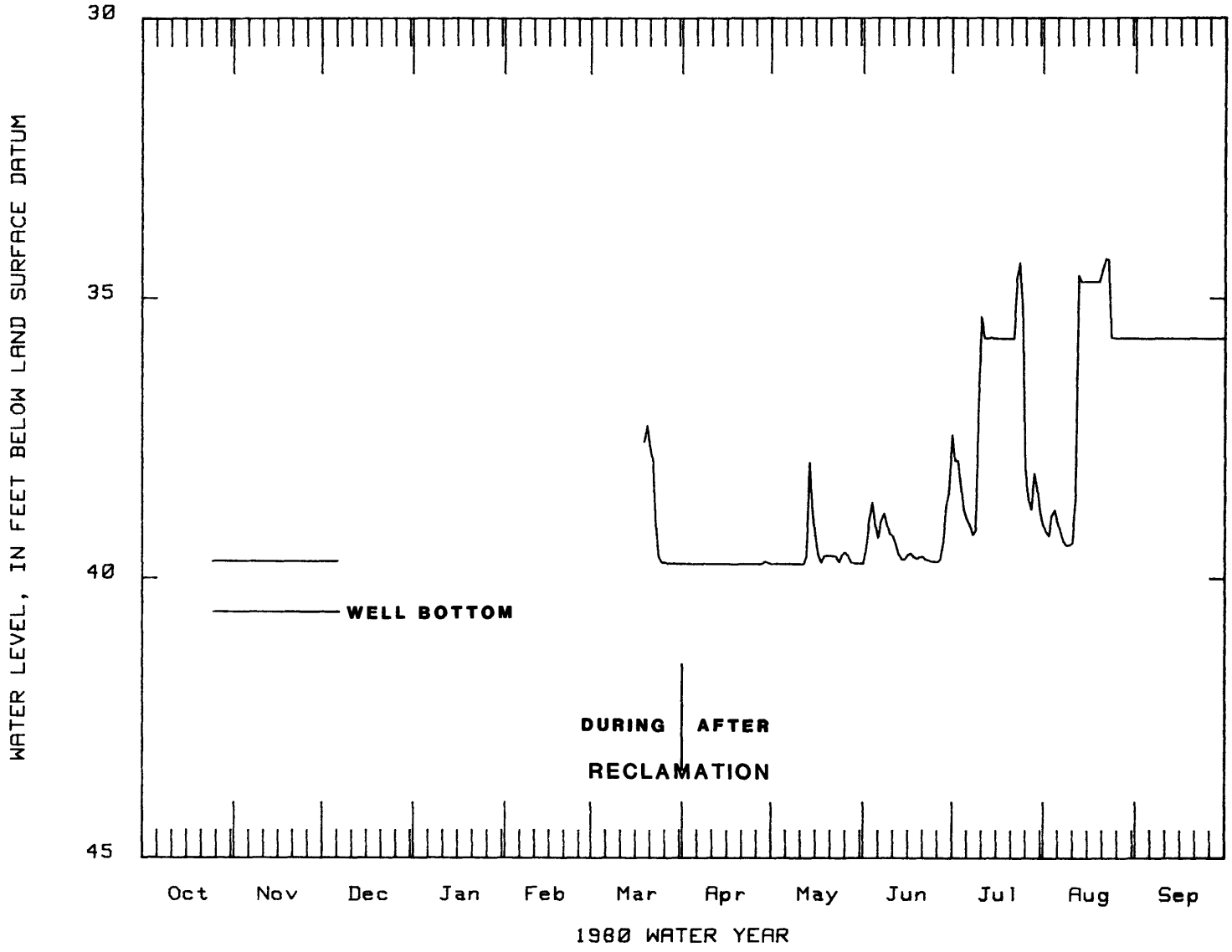

Figure 15.--Water levels in well SS-1 near Lake Hope, Ohio, water years 1980 and 1981.

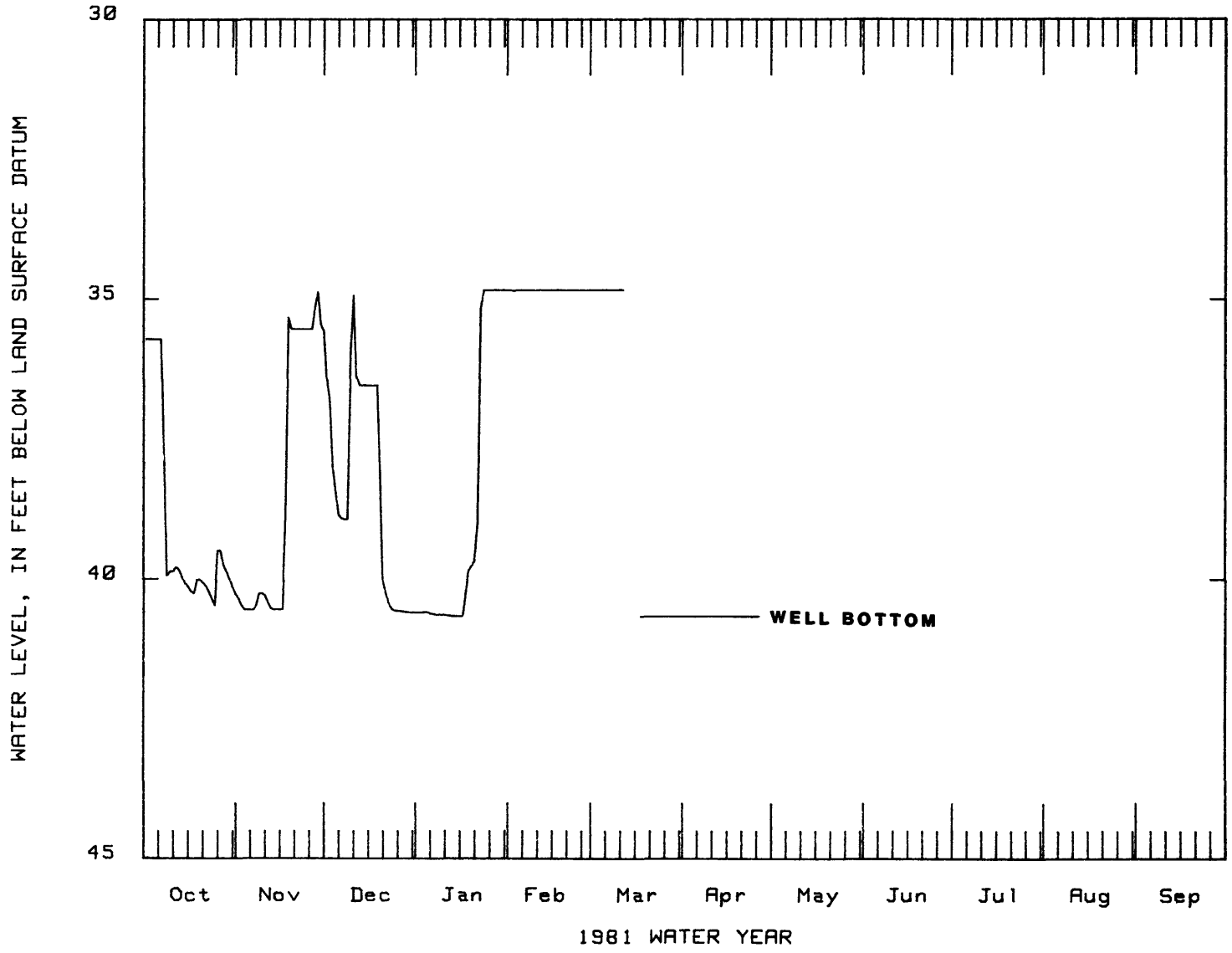

Figure 15.--Water levels in well SS-1 near Lake Hope, Ohio, water years 1980 and 1981 --Continued.

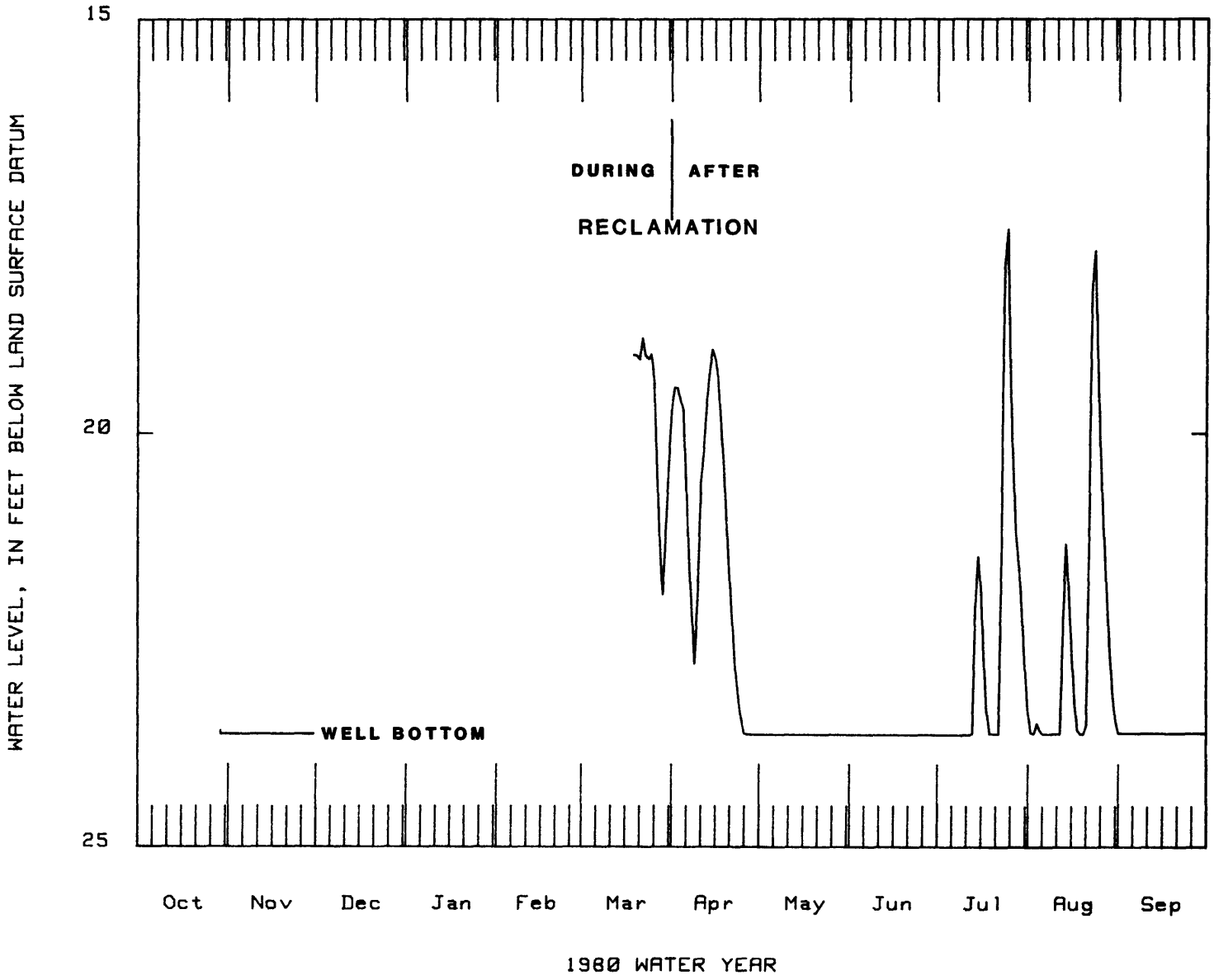

Figure 16.--Water levels in well SS-3 near Lake Hope, Ohio, water years 1980 and 1981.

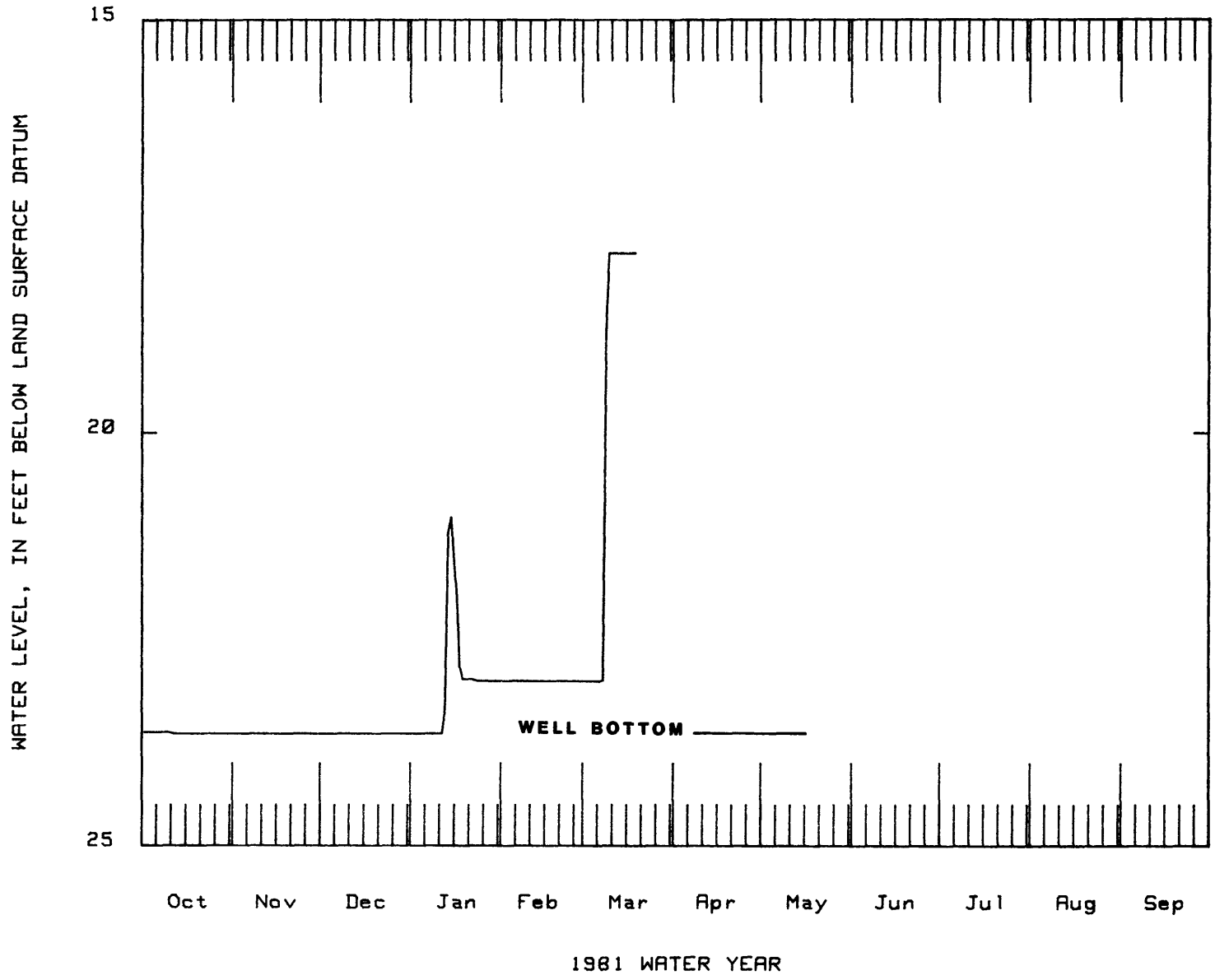

Figure 16.--Water levels in well SS-3 near Lake Hope, Ohio, water years 1980 and 1981 --Continued.

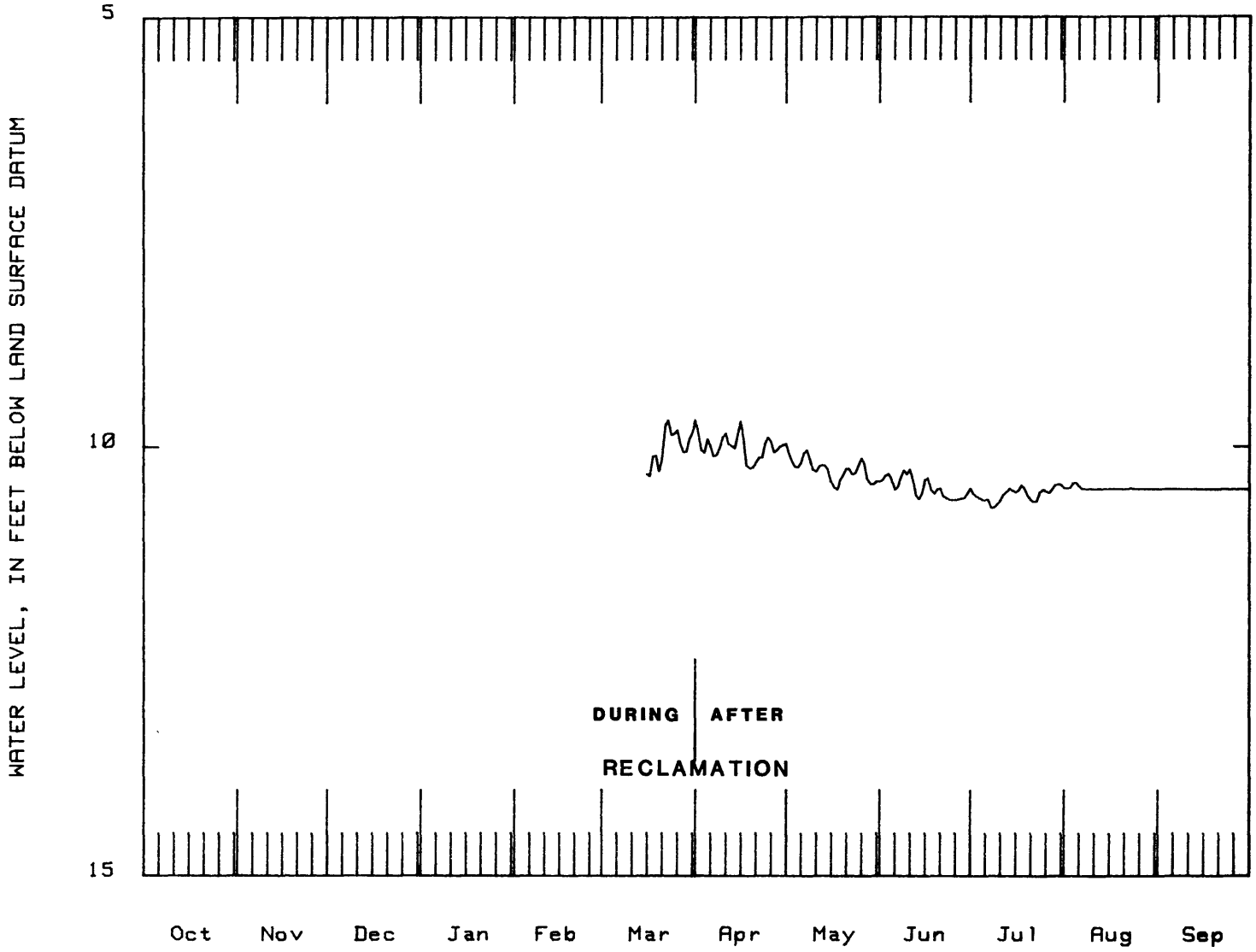

Figure 17.--Water levels in "Old house well" near Lake Hope, Ohio, water years 1980 and 1981.

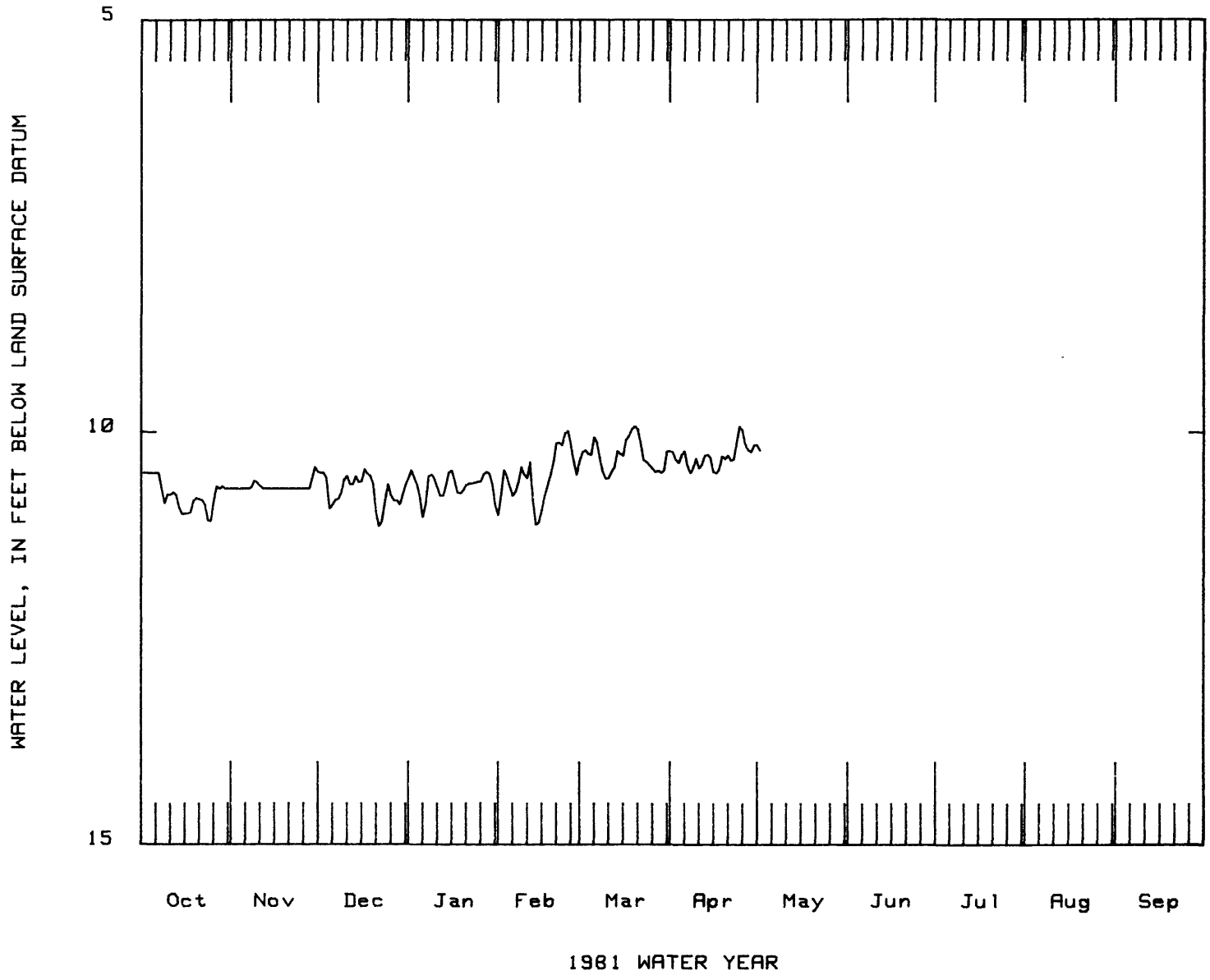

Figure 17.--Water levels in "Old house well" near Lake Hope, Ohio, water years 1980 and 1981--Continued.