Selected Water-Quality Data For The Toppenish Creek Basin, Yakima Indian Reservation, Washington, 1989

By K. L. Payne and S. S. Sumioka

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CONVERSION FACTORS AND VERTICAL DATUM

Multiply	By	To obtain
inch (in.)	25.4	millimeter
foot (ft)	0.3048	meter
mile (mi)	1.609	kilometer
acre	0.4047	hectare
	4.047	square meter
square mile (mi^2)	2.590	square kilometer
	259.9	hectare
cubic foot per second (ft^3/s)	0.028317	cubic meter per second

degree Celsius (°C) to degree Fahrenheit (°F): °F = 9/5 °C + 32

Sea level: In this report "sea level" refers to the National Geodetic Vertical Datum of 1929 (NGVD of 1929)--a geodetic datum derived from a general adjustment of the first-order level nets of both the United States and Canada, formerly called Sea Level Datum of 1929.

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ABSTRACT

As part of a long-term study of ground-water quality in the Toppenish Creek Basin in south-central Washington, water samples were collected from 487 wells and from 50 sites on creeks and surface drains during the summer and fall of 1989. This report presents water-quality data and analytical results for samples collected from ground-water and surface-water sites. Nitrite-plus-nitrate nitrogen concentrations ranged from less than 0.1 milligram per liter (mg/L) to 23 mg/L in ground-water samples, and from less than 0.1 mg/L to 6.0 mg/L in surface-water samples. Bacteria were detected in samples from 66 ground-water sites and in samples from all of the surface-water sites.

INTRODUCTION

People in the Toppenish Creek Basin in south-central Washington rely exclusively on ground water derived predominantly from unconsolidated sediments for potable water. Available ground-water-quality data indicate that water from some wells in the basin contains concentrations of nitrate-nitrogen that exceed drinking water standards. There is concern that water supplies might also contain other compounds derived from agriculture, food processing, domestic wastes, and the few light industries in the basin.

In 1989, the U.S. Geological Survey (USGS), in cooperation with the Yakima Indian Nation, began a study to

(1) determine the ground-water quality in the basin,
(2) identify existing and potential water-quality problems,
(3) relate ground-water-quality conditions to geohydrology, and
(4) attempt to identify source areas and flow paths of contaminants causing current and potential water-quality problems.

The study was conducted in five phases: (1) determine water and land use, and population density and distribution in the Toppenish Creek Basin; (2) sample 500 wells and 50 surface-water sites for concentrations of nitrogen and for fecal-coliform, fecal-streptococcal, and *Escherichia coli* (*E. coli*) bacterial concentrations; (3) sample 20 wells every 6 weeks for 1 year for the same constituents as in phase 2; (4) sample 15 of the 20 wells from phase 3 twice (early spring and late summer), and 45 wells once (late summer) for common cations and anions, trace metals, and pesticides; and (5) present the results of the study in reports and public meetings.

Purpose and Scope

The purpose of this report is to present data on the concentrations of the forms of nitrogen and concentrations of indicator bacteria in ground water. Surface-water data were collected in an attempt to determine the effect of ground-water discharge on the water quality of drains and streams. The data are presented on maps, graphs, and tables. The data are from analyses of samples collected during the summer and fall of 1989, primarily from the eastern two-thirds of the basin.

Description of the Study Area

The Toppenish Creek Basin covers about 630 mi^2 in south-central Washington and lies entirely within the Yakima Indian Reservation (fig. 1). The basin is bounded on the north and south by Ahtanum and Toppenish Ridges,

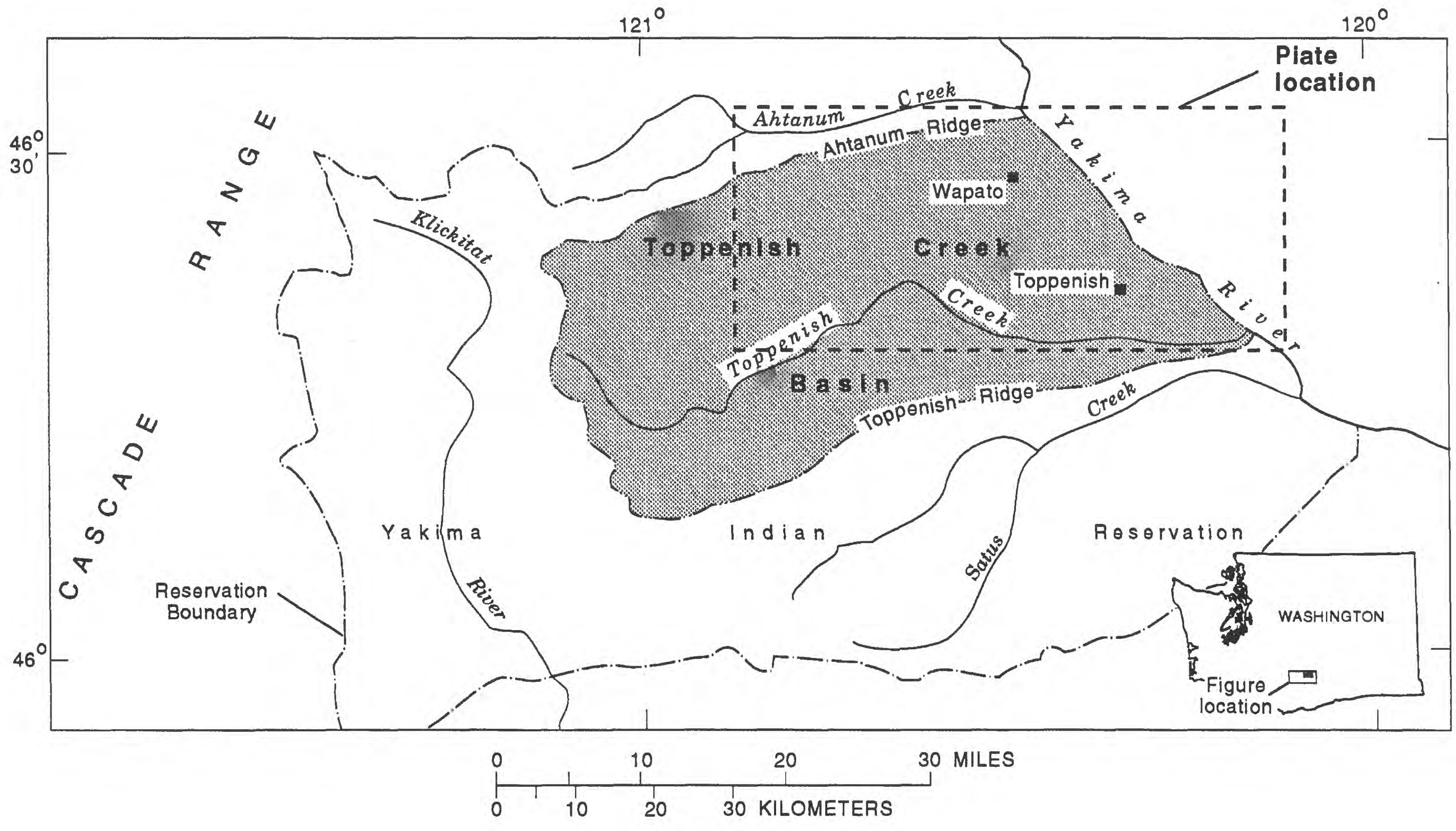

Figure 1.--Location of Toppenish Creek Basin.

respectively; on the west by the topographic divide with the Klickitat River Basin, in the foothills of the Cascade Range; and on the east by the Yakima River. Land-surface altitudes in the basin range from about 6,000 feet in the western foothills to about 700 feet at the mouth of Toppenish Creek. The western part of the basin is mostly forest or arid range land. The eastern part of the basin is mostly irrigated agricultural land. Major crops grown in the basin include apples, pears, hops, grapes, potatoes, corn, asparagus, mint, and alfalfa. Water for irrigation comes through a system of canals from the Yakima River, to which Toppenish Creek is a tributary, and from ground water.

The Toppenish Creek Basin is the most densely populated of the four major stream basins on the Yakima Indian Reservation and is the most agriculturally developed (Fretwell, 1979). A separate report describes the population distribution and land and water uses in the basin (Yakima Indian Nation, 1991).

The long-term (1971-1990) average annual precipitation at Wapato, Wash., near the Yakima River in the basin, is about 6 in. (U.S. Department of Commerce, 1990). Precipitation in the western highlands is about 50 in/yr (Pacific Northwest River Basins Committee, 1969, p. A-29). The eastern part of the Toppenish Creek Basin exhibits a continental climate, characterized by hot, dry summers and cold, dry winters. During the summer, daytime temperatures may range from 70°F to more than 100°F. Daytime temperatures during the winter may range from below freezing to 40°-50°F (Donaldson, 1979). Long-term mean annual temperature (1951-1980) at Wapato was 53°F (U.S. Department of Commerce, 1990).

Previous Investigations

Bentley and others (1980) described the stratigraphy and geologic structure of the Yakima Indian Reservation, emphasizing the Columbia River Basalt Group. Investigations of sediments and sedimentary geology in the Yakima River Basin were conducted by Rigby and Othberg (1979), Campbell (1983), and Smith (1988).

The USGS published a technical report on the water resources of the Toppenish Creek Basin (U.S. Geological Survey, 1975), along with a more general, non-technical version (Gregg and Laird, 1975). Drost and Whiteman (1986) described the geologic framework for ground-water flow in the Columbia Plateau. Bolke and Skrivan (1981) and Skrivan (1987) developed and calibrated ground-water flow models to simulate the effects of ground-water withdrawals from unconfined and confined aquifers in the Toppenish Creek Basin.

The quantity and quality of irrigation-return flow to the Yakima River were studied by Sylvester and Seabloom (1962). Van Denburgh and Santos (1965) included data from a few wells in the Toppenish Creek Basin in their summary of ground-water quality in Washington State. Data from surface and ground waters in the Toppenish Creek Basin were included by Fretwell (1979) in his evaluation of the quality of the surface and ground waters of the Yakima Indian Reservation.

Also, the Water Resources Planning Program (WRPP) of the Yakima Indian Nation studied ground-water quality in the basin (Wittman and Armstrong, 1989).

Acknowledgments

The authors express their appreciation to the municipal, industrial, and private well owners and tenants who cooperated in the study by allowing access to their wells for data collection. A significant part of the field work was done by personnel from the Water Resources Planning Program of the Yakima Indian Nation who also provided laboratory space for the processing of water samples.

METHODS

Standard USGS sampling (Wood, 1976; Rantz and others, 1982) and analytical procedures (Feltz and Anthony, 1984; Fishman and Friedman, 1985) were used for collecting samples at all surface-water and ground-water sites selected for the study. Bacterial concentrations were determined using membrane filtration techniques with appropriate growth media and test solutions (Britton and Greeson, 1988, and Dufour and others, 1981). Samples requiring laboratory analysis were treated, preserved, and sent to the USGS National Water Quality Laboratory (NWQL) in Arvada, Colo.

Ground Water

Four hundred and eighty-seven wells were sampled for this study. Field personnel visited the well sites prior to sampling to obtain or confirm well location, well ownership, well construction information, and permission to sample.

Well-Numbering System

The well-numbering system for the State of Washington is based on a rectangular subdivision system that identifies wells within a township, range, section, and 40-acre tract within the section (fig. 2). A local well number such as 11N/18E-24C01 indicates that the well is in Township 11 North, and Range 18 East, with reference to the Willamette base line and meridian. The first number following the hyphen (24) indicates the section, and the letter (C) gives the 40-acre tract within the section. The two-digit number (01) following the letter is the sequence number of the well in that 40-acre tract. Local well numbers with a "D" and a number following the sequence number indicate a deepened well. Well numbers may be shortened to the part after the hyphen (for instance, 24C01) for convenience on some illustrations.

Site Selection

Water Resources Planning Program and USGS personnel selected wells to be sampled based on well depth, lithology, and well construction information obtained from drillers' logs. The drillers' logs are filed with the State of Washington or with the Indian Health Service of the Yakima Indian Nation. Most of the drinking water in the Toppenish Creek Basin is derived from unconsolidated sediments; therefore, most of the wells selected for sampling withdraw water from this material. A few wells that withdraw water from basalt also were selected for sampling.

Sampling Techniques

A flow-through chamber was connected by nylon hose to a faucet located as close to the wellhead as possible. Instrument probes for measuring water temperature, pH, and dissolved-oxygen concentration were inserted into the chamber. Specific-conductance measurements were made on water obtained through a separate line. Samples requiring laboratory analysis were collected after the water had run for 15 to 45 minutes, and values for the above four measurements showed consistent readings for 5 minutes. If the dissolved-oxygen concentration of the water was less than 2.0 mg/L (milligrams per liter), a sample also was collected to determine total ammonia and total organic nitrogen concentrations.

Surface Water

Fifty surface-water sites were selected for this study. Twelve of the 50 sites had been sampled previously either during a study of surface- and ground-water quality in the basin (Fretwell, 1979) or during the Yakima Basin National Water Quality Assessment (NAWQA) study (Stuart MacKenzie, personal commun., 1989). The remainder of the sites were new sites established for this study.

Surface-Water Site Numbering System

Surface-water sites were numbered using two systems. Sites established previously were numbered according to the USGS numbering system used to identify discharge measurement sites and surface-water-quality sampling sites. This system is comprised of an 8-digit number sequence given to each river system. Sites established during this study were assigned a 15-digit identification number consisting of latitude, longitude, and a sequence number. Each surface-water site was also assigned an arbitrary map site number from 1 to 50 to show the location of the site on plate 1. Table 1 cross-references the map site number and site name.

Site Selection

Surface-water sites in the basin were located on streams, canals, and drains that are used for irrigation. Most of the sampling sites are drains located downgradient of agricultural areas or streams located downgradient of outlets of subsurface drains. A few sites were located on streams upgradient of the agricultural areas.

Sampling Techniques

Representative surface-water samples were obtained using a depth-integrated sampling method (U.S. Geological Survey, 1982). Samples were collected in a portable sampling device equipped with a collection bottle and nozzle that allowed water to enter at a rate proportional to the velocity of flow. Several equally spaced points across the width of the stream were selected prior to sampling, and appropriate volumes of water were collected at each point. Samples were then combined into a composite sample for subsequent chemical analysis. In

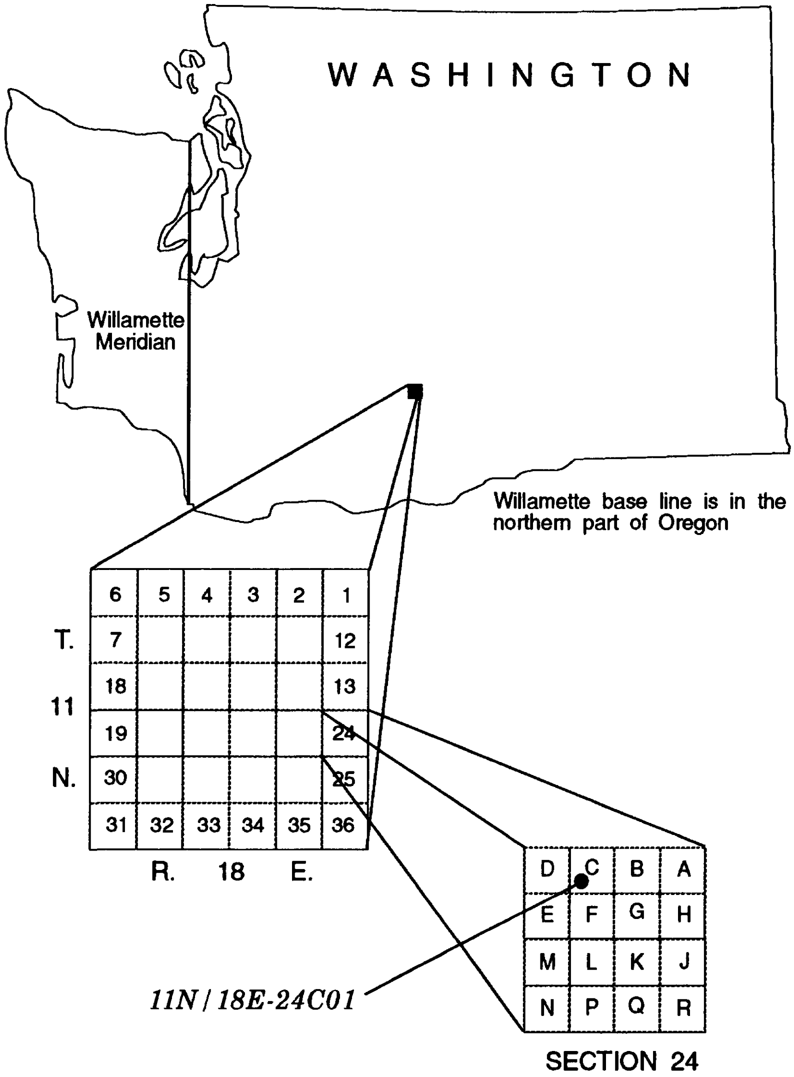

Figure 2.--Well numbering system used in Washington.

addition, discharge was measured at each site before samples were collected to correlate flow volumes with water-quality values.

Quality Assurance

Temperature, specific conductance, pH, and dissolved-oxygen concentration were measured in the field using appropriate instruments calibrated at least once a day. The accuracy of water analyses was assessed by collecting and analyzing a duplicate sample from about 10 percent of the ground-water and surface-water samples. The duplicate sample was collected immediately after the regular sample and was intended to represent an identical sample. Deionized water samples were collected at the same frequency as the duplicate samples. Duplicate field determinations of bacterial concentrations were performed about once every 13 sites (36 of 487 wells and 4 of 50 surface-water sites). Buffered dilution water and saline solution (used during the filtration of bacterial samples) were filtered and incubated as a check on the sterility of the solutions and as assurance that aseptic procedures were used.

DATA SUMMARY

The results of analyses of ground-water and surface-water samples are presented in tables 2 and 3, respectively. A "<" preceding the value indicates that the concentration of that constituent was less than the number following the "<". A brief description of the constituent and a summary of the results for each constituent are presented in the following sections.

Discharge

Discharge (as measured at surface-water sites) is a measure of flow in a stream and is defined as the volume of water passing a given point in a given period of time, expressed as cubic feet per second (ft^3/s). The highest discharge, 343 ft^3/s, was measured in Marion Drain at Indian Church Road at Granger (site 23 on plate 1). The lowest discharge, 0.13 ft^3/s, was measured in a small tributary to Mill Creek at Tecumseh Road near White Swan (site 41 on plate 1).

Temperature

Temperature affects specific conductance, pH, dissolved-oxygen concentration, chemical reactions, and biological processes in water.

Ground-water temperatures in wells sampled in the Toppenish Creek Basin ranged from 11.5°C to 29.0°C (table 2 and fig. 3). Generally, shallow ground water has a nearly constant temperature that is close to the mean annual air temperature. Deeper ground water is usually warmer because of geothermal heat. Water temperatures were recorded at the faucet after samples were taken, when the water had run for 15 to 45 minutes. Surface-water temperatures varied from 3.3°C in Wanity Slough at East First Street at Wapato to 15.7°C at unnamed drain at Fort Road near Harrah (sites 49 and 44, respectively, on plate 1).

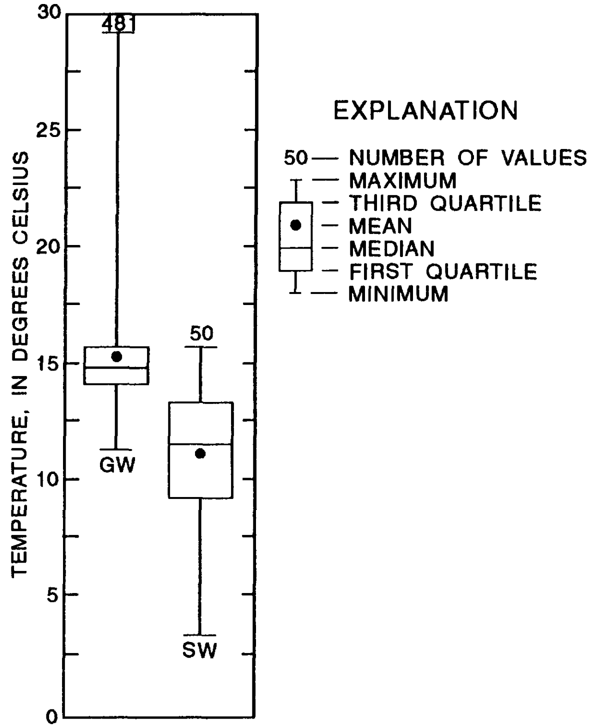

Figure 3.--Temperature values for ground-water and surface-water samples.

Specific Conductance

Electrical conductance, or conductivity, is the ability of a substance to conduct an electrical current; specific conductance is the conductance of a substance at a specific temperature. The specific conductance value, expressed in microsiemens per centimeter (μS/cm) at 25 degrees Celsius (°C), gives an indication of the concentration of dissolved minerals in the water. Dissolved minerals increase the current-carrying capacity of the water; therefore, the smaller the amount of dissolved minerals, the lower the specific conductance value; the larger the amount of dissolved minerals, the higher the specific conductance value.

Ground-water samples collected from the 487 wells show specific conductance values ranging from 104 μS/cm to 1,120 μS/cm (table 2 and fig. 4). For surface-water samples, values for specific conductance ranged from 130 μS/cm to 1,560 μS/cm (table 3 and fig. 4).

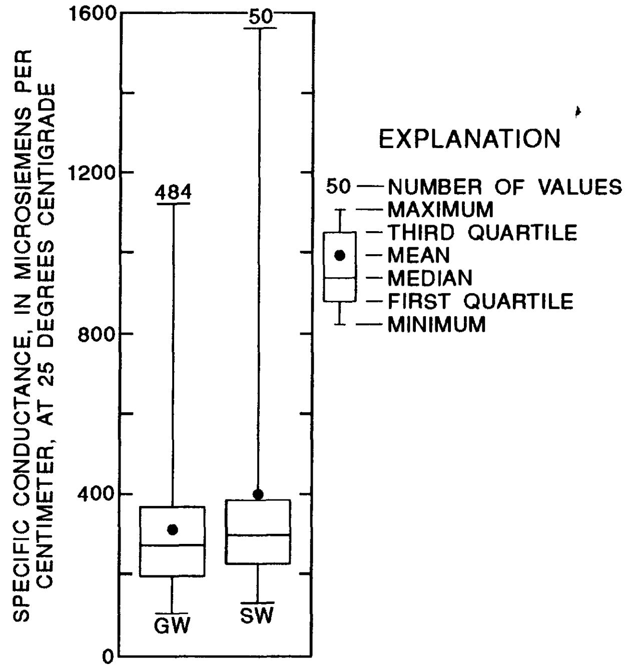

Figure 4.--Specific-conductance values for ground-water and surface-water samples.

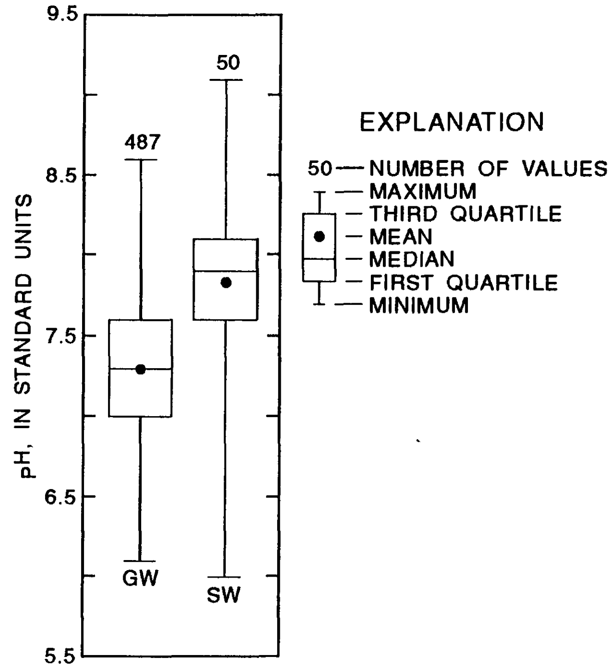

Figure 5.-- pH values for ground-water and surface-water samples.

pH

The pH of water is a measure of the concentration and activity of hydrogen ions in solution, expressed in standard units. The pH value represents the negative base-10 logarithm of the hydrogen-ion activity in moles per liter. The pH value is used as an indicator of the status of the interrelated chemical reactions that consume hydrogen ions. Water with a large concentration of hydrogen ions (low pH) is considered acidic, and water with a small concentration (high pH) is considered alkaline. Water with a pH of 7 is considered to be neutral. The pH of ground water usually ranges from 6.0 to 8.5. Surface water generally ranges between 6.5 and 8.5. Temperature is an important factor in measuring the hydrogen-ion activity and must be taken into account when measuring pH.

Ground water in the study area had pH values ranging from 6.1 to 8.6 (table 2 and fig. 5). These values were near the range of expected pH values for ground water. Surface-water sites had a range of pH from 6.0 to 9.1 (table 3 and fig. 5). These values show a slightly greater range than those of the ground-water sites.

Dissolved Oxygen

The amount of dissolved oxygen in water, expressed in milligrams per liter (mg/L), is dependent on chemical reactions and biological processes. The solubility of oxygen in water is dependent on several factors, including the partial pressure of oxygen in the air, the temperature of the water, and the mineral content of the water. Dissolved-oxygen concentrations may be decreased by processes that consume organic matter and may increase as oxygen is given off during photosynthesis by aquatic plants.

Concentrations of oxygen in ground water are typically close to surface-water concentrations unless organic material below the land surface has oxidized. Dissolved-oxygen concentrations for ground-water sites in the study area ranged from 0.0 mg/L at 22 sites to 15.3 mg/L (table 2 and fig. 6). Surface-water concentrations of dissolved oxygen ranged from 3.8 mg/L to 16.2 mg/L (table 3 and fig. 6).

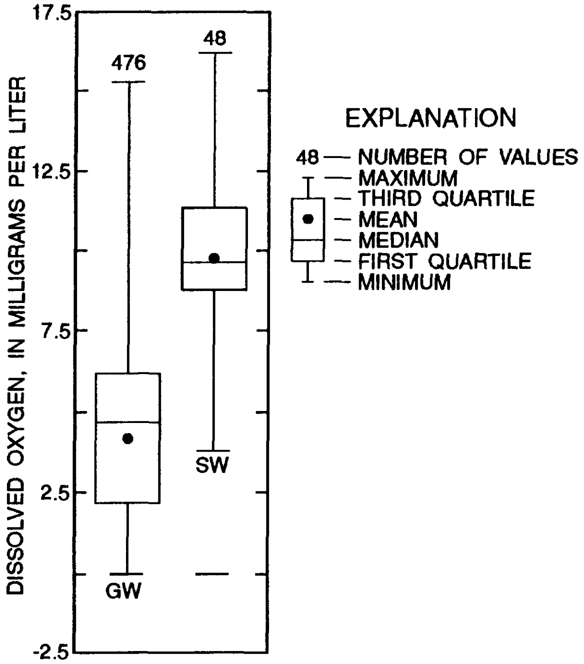

Figure 6.--Dissolved oxygen values for ground-water and surface-water samples.

Nitrogen

Nitrogen, in the form of nitrate (NO_3), is required for growth by plants, and therefore, is a major component of fertilizers. Nitrates also are found in human and animal wastes, septic tank effluent, landfill leachate, and barnyard runoff. Nitrate from natural sources is attributed to the oxidation of nitrogen from the air by bacteria and the decomposition of organic material in the soil. In drinking water, nitrate at concentrations greater than 10 mg/L may cause methemoglobinemia in children, a condition that reduces the oxygen-carrying capacity of the blood. The water samples in this study were analyzed for nitrite-plus-nitrate ($NO_2 + NO_3$). In most waters, nitrite concentrations are negligible and the combined value represents primarily nitrate. Some samples also were analyzed for two other forms of nitrogen, ammonia and ammonia-plus-organic nitrogen.

$NO_2 + NO_3$ concentrations in samples from two ground-water sites exceeded 10 mg/L. $NO_2 + NO_3$ concentrations in the remaining samples ranged from <0.1 mg/L to 9.3 mg/L. The range of values for ammonia-plus-organic nitrogen in ground water was <0.2 mg/L to 4.3 mg/L. Most of the samples were at or near the limit of detection (0.2 mg/L). At the surface-water sites sampled, $NO_2 + NO_3$ concentrations ranged from <0.1 mg/L to 6.0 mg/L. Concentrations of ammonia-plus-organic nitrogen ranged from <0.2 mg/L to 0.6 mg/L.

Bacteria

Samples for bacterial analyses were collected at all ground-water and surface-water sites. Three types of fecal-indicator bacteria were enumerated: fecal-coliform, fecal-streptococcal, and *Escherichia coli* bacteria. None of the three types is normally pathogenic, but their presence may indicate the presence of pathogenic bacteria. Indicator bacteria are used instead of the pathogens themselves because pathogens usually are found in low concentrations, if at all. Also, field tests for many pathogens have not been developed yet, and drinking water standards use indicator bacteria to determine potability. Some of the bacterial counts presented in tables 2 and 3 may be preceded by the letter "K." This indicates that the number of colonies counted on the plate was outside the ideal range of the number of colonies established for that organism. The lower limit of this range is arbitrarily set at 20 colonies per plate for the three types of bacteria included in this study. Counts below this number may not be statistically valid (Britton and Greeson, 1988). The upper limits of this range are set at 60 colonies for fecal-coliform bacteria, 100 colonies for fecal-streptococcal bacteria, and 80 colonies for *E. coli*. If the number of colonies exceeds these limits, interferences from crowding and inhibition of growth and reproduction due to the build-up of waste products may occur resulting in questionable results. Each bacteria type is described in the next three sections.

Fecal Coliform

The occurrence of fecal-coliform bacteria in water is regarded as an important indicator of the presence of pathogenic organisms. Human pathogens, as found in the intestinal tract of warm-blooded animals, have as their source, sewage containing human feces.

Analysis for fecal-coliform bacteria was done for all surface- and ground-water samples. Fecal-coliform bacteria were present in samples from eight ground-water sites (table 2) and in samples from all surface-water sites.

Fecal Streptococci

Fecal-streptococcal bacteria are used to indicate the sanitary quality of the water and to verify the presence of fecal-coliform bacteria. Because fecal-streptococcal bacteria are found in the intestines of non-human warm-blooded animals, they are useful in detecting contamination by cattle, feedlots, or farmland. Fecal-streptococcal bacteria were found at 64 ground-water sites and at all surface-water sites.

Escherichia coli

The analysis for *E. coli*, a species of bacteria in the fecal-coliform group, was included in the sampling program because it has been shown that for surface waters used for recreation, it is more specific for fecal contamination and may provide a better indicator-to-pathogen ratio than fecal coliform concentrations (Freier and Hartman, 1987). This study provided an opportunity to investigate the occurrence and distribution of *E. coli* in ground water in the basin. *E. coli* were found at seven ground-water sites and at all surface-water sites.

Duplicate and Blank Samples

Sites where duplicate samples were collected and the results of the analyses of those samples are presented in table 4. In general, the percent differences (the difference in concentration between the initial and the duplicate samples, divided by the average of the two) for nitrite-plus-nitrate nitrogen, ammonia, and ammonia-plus-organic nitrogen concentrations in ground and surface water were less than 10 percent. For those cases where the difference was greater than 10 percent, the concentrations were near the detection level of the respective analytical technique, and small differences in concentration led to large percent differences. Nitrite-plus-nitrate nitrogen concentrations in duplicate samples from well 11N/18E-22D01 were 7.8 mg/L and 1.8 mg/L, leading to uncertainty of the actual concentration in this well. Duplicate samples in two wells showed large differences in concentrations of ammonia- plus-organic nitrogen. A sample from well 10N/18E-02Q01 had a concentration of 4.3 mg/L, and the duplicate sample had a concentration of <0.2 mg/L. At well 10N/18E-04C02, the concentrations were 0.3 mg/L and 1.9 mg/L. These differences may be due to sampling or analytical errors because there was no difference between samples for nitrite-plus-nitrate nitrogen concentrations for these same two wells.

There was almost no difference in bacterial concentrations between the initial and duplicate samples of ground water. Duplicate surface-water samples exhibited larger concentrations and larger differences than did ground-water samples. Because of the greater exposure of surface waters to possible sources of bacteria and the greater velocity of surface water relative to ground water, larger concentrations and greater variability were expected.

Blanks were prepared from deionized water obtained from the USGS Field Services Unit in Tacoma. Results of the analyses of the blank samples are presented in table 5. Nitrite-plus-nitrate nitrogen was detected in 1 out of 48 blanks and ammonia-plus-organic nitrogen was detected in 3 out of 10 blanks. The concentrations were near the detection limit of the respective analyses, indicating that the sampling procedures and the analytical methods did not significantly affect the results. All blanks analyzed for bacteria showed no growth.

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Table 1.--List of surface-water site names and site numbers

Site number	Identification number	Site name
1	462258120450801	Agency Creek at Highway 220
2	462640120311801	Drain 2 at Lateral C
3	462602120233501	Drain 2 above Wanity Slough
4	462351120220601	Drain 3 at Highway 97 near Toppenish
5	462206120265301	Drain 4 near Ashue Road
6	462207120321701	Drain 4 near Harrah Road
7	462205120195401	Drain 4 near Wanity Slough
8	461931120261701	Drain at Campbell Road into Marion Drain
9	12506900	Drain at Evans Road near Mountain View School near White Swan
10	461927120190801	Drain at Highway 97 into Marion Drain
11	462206120265401	Drain into Drain 4 near Ashue Road
12	462207120235001	Drain into Drain 4 near McKinley Road
13	462206120220001	Drain into Drain 4 near Olden Way
14	462803120333001	Drain near Decker Road and Deering Road
15	462629120304201	Drain to Drain 2 near Lateral C
16	462206120280301	Drain to Drain 4 near Lateral A
17	12505350	East Toppenish Drain at Wilson Road near Toppenish
18	462230120335001	Harrah Drain at Fort Road
19	12505466	Harrah Drain at Harrah Drain Road at Harrah
20	462112120335001	Harrah Drain near Marion Drain at Harrah Drain Road
21	462238120323401	Marion Drain at Harrah Road near Harrah
22	461927120191001	Marion Drain at Highway 97
23	12505510	Marion Drain at Indian Church Road at Granger
24	462203120363401	Mud Lake Drain at Piute Lateral
25	12506300	North Fork Simcoe Creek near Fort Simcoe
26	462312120371701	Olney Flat Drain at Simcoe Creek
27	12506330	South Fork Simcoe Creek near Fort Simcoe
28	462327120385401	Simcoe Creek at Barkes Road
29	462341120433801	Simcoe Creek at White Swan
30	462342120483501	Simcoe Creek above Spring Creek
31	462517120254201	Small Drain into Drain 2 near Highway 97
32	462351120222301	Small Drain into Drain 3 at Olden Way near Toppenish
33	12505410	Sub 35 Drain at Parton Road near Granger
34	461830120200701	Toppenish Creek - 1/4 mile above Highway 97
35	462232120382401	Toppenish Creek at Fort Road
36	461924120311601	Toppenish Creek at Lateral C
37	12507508	Toppenish Creek at Indian Church Road near Granger
38	12507200	Toppenish Creek at Island Road near Harrah
39	462110120411501	Toppenish Creek near Shaker Road
40	12506000	Toppenish Creek near Fort Simcoe
41	12507150	Tributary to Mill Creek at Tecumseh Road near White Swan
42	462235120385101	Tributary to Toppenish Creek near Fort Road
43	12505469	Unnamed Drain at Becker and Yost Roads near Toppenish
44	12505468	Unnamed Drain at Fort Road near Harrah
45	12503640	Unnamed Drain at Lateral 1 and Riggs Roads near Wapato
46	12507050	Unnamed Drain at Progressive Road near Harrah
47	12505475	Unnamed Drain at Yethonat at Branch Road near Wapato
48	12505467	Unnamed Drain to Marion Drain near Harrah
49	12505470	Wanity Slough at East First Street at Wapato
50	12505482	Wanity Slough at Meyers Road

Table 2.--Ground-water-quality data, July-September, 1989

[Deg C, degrees Celsius; µS/cm, microsiemens per centimeter at 25° Celsius; mg/L, milligrams per liter; cols./100 ml, colonies per 100 milliliters; <, less than; --, constituents not analyzed for; E, estimated number based on count of only part of the plate; K, number based on count outside of ideal range]

Local well number	Date	Temperature water (Deg C)	Specific conductance (µS/cm)	pH (standard units)	Oxygen, Dissolved (mg/L)	Nitrogen, ammonia total (mg/L as N)	Nitrogen, ammonia+ organic total (mg/L as N)	Nitrogen, NO_2 $+NO_3$ total (mg/L as N)	Coliform, fecal, (cols./ 100 ml)	Streptococci, fecal, (cols./ 100 ml)	*Escherichia coli* (cols./ 100 ml)
10N/16E-01C01	08-17-89	14.5	440	7.2	6.3	<0.010	0.30	1.90	<1	<1	<1
10N/16E-01D01	08-18-89	12.0	270	7.6	7.1	--	--	.80	<1	<1	<1
10N/16E-01D02	08-17-89	14.5	430	7.3	6.8	--	--	1.30	<1	<1	<1
10N/16E-02D02	08-17-89	13.5	160	7.0	5.0	--	--	<.10	<1	<1	<1
10N/16E-03N02	08-30-89	19.5	410	7.5	.4	<.010	<.20	<.10	<1	<1	<1
10N/16E-09J01	08-30-89	15.0	171	7.6	5.8	--	--	.60	<1	<1	<1
10N/16E-10J01	08-22-89	16.0	310	7.9	1.8	--	--	<.10	<1	<1	<1
10N/16E-11B01	09-26-89	13.5	224	7.7	2.2	--	--	.40	<1	<1	<1
10N/16E-11C02	08-24-89	14.0	208	7.6	2.0	<.010	<.20	.40	<1	<1	<1
10N/16E-11J03	08-21-89	12.5	148	7.6	5.2	--	--	.10	<1	<1	<1
10N/16E-11K02	08-22-89	13.5	148	7.4	5.1	--	--	.10	<1	E71	<1
10N/16E-11K03	08-22-89	13.5	145	7.7	5.9	--	--	.10	<1	<1	<1
10N/16E-12B01	08-24-89	13.0	170	6.9	5.6	<.010	<.20	.10	<1	8	<1
10N/16E-12M01	08-28-89	13.5	175	8.0	.3	<.010	<.20	<.10	<1	<1	<1
10N/16E-12N02	08-18-89	15.0	131	7.7	2.8	--	--	<.10	<1	K2	<1
10N/16E-12P01	08-24-89	15.5	129	8.0	2.1	<.010	<.20	<.10	<1	<1	<1
10N/16E-13D01	08-17-89	14.0	144	7.5	6.6	--	--	.10	<1	<1	<1
	08-30-89	13.5	149	7.5	8.7	--	--	.20	<1	<1	<1
10N/16E-13J01	08-25-89	13.0	168	6.9	7.9	--	--	1.60	<1	K1	<1
	08-30-89	12.5	163	6.6	5.9	--	--	1.50	<1	<1	<1
10N/16E-15M02	08-17-89	15.5	248	7.4	4.2	--	--	.50	<1	11	<1
10N/16E-15N02	08-24-89	15.0	229	7.5	8.7	--	--	.30	<1	<1	<1
10N/16E-20E01D1	08-24-89	16.0	270	7.7	5.9	--	--	.20	<1	<1	<1
10N/16E-20F01	09-14-89	14.5	252	7.3	--	--	--	.60	<1	<1	<1
10N/16E-21D01	08-23-89	14.0	840	7.3	6.9	--	--	.40	<1	<1	<1
10N/16E-24F01	08-18-89	18.0	169	7.7	4.7	--	--	<.10	<1	<1	<1
10N/16E-35F02	08-18-89	15.0	252	7.3	3.0	--	--	<.10	<1	<1	<1
10N/17E-02E01	08-10-89	15.0	455	7.6	.1	.040	<.20	<.10	<1	<1	<1
10N/17E-02M02	08-09-89	14.5	648	6.8	2.4	--	--	2.00	<1	<1	<1
10N/17E-04F01	08-09-89	13.0	182	7.2	4.9	--	--	.20	<1	<1	<1
10N/17E-04Q02	08-09-89	13.5	203	7.2	6.5	--	--	.30	<1	<1	<1
10N/17E-05D01	08-29-89	--	190	7.8	.3	--	--	<.10	<1	K155	<1
10N/17E-05D02	08-30-89	14.5	170	7.9	.7	<.010	<.20	<.10	<1	<1	<1
10N/17E-05D03	08-29-89	13.0	188	7.6	3.6	--	--	.20	<1	K36	<1
10N/17E-05E03	08-23-89	15.0	160	7.8	.0	<.010	.30	.20	<1	<1	<1
10N/17E-05E04	08-23-89	14.0	148	7.8	1.2	<.010	.40	.10	<1	<1	<1
10N/17E-05L01	08-29-89	15.5	179	7.7	3.5	--	--	.20	<1	K2	<1
10N/17E-05L02	08-17-89	12.5	178	6.7	8.2	--	--	.70	<1	<1	<1
10N/17E-05L05	08-29-89	12.0	201	7.0	6.9	<.010	<.20	.70	<1	<1	<1
10N/17E-05Q02	09-13-89	20.0	152	7.3	.4	.020	.40	<.10	<1	<1	<1
10N/17E-06H02	09-25-89	16.5	199	6.7	1.4	<.010	<.20	<.10	<1	<1	<1
10N/17E-07A02	08-17-89	13.0	134	6.8	7.6	--	--	.30	<1	<1	<1
10N/17E-07A03	08-17-89	13.0	134	6.8	8.2	--	--	.30	<1	<1	<1
10N/17E-07H01	08-11-89	13.5	144	8.1	2.4	--	--	.10	<1	<1	<1
10N/17E-07J02	08-30-89	--	180	6.8	8.3	--	--	.70	<1	<1	<1

Local well number	Date	Temperature water (Deg C)	Specific conductance (µS/cm)	pH (standard units)	Oxygen, Dissolved (mg/L)	Nitrogen, ammonia total (mg/L as N)	Nitrogen, ammonia+ organic total (mg/L as N)	Nitrogen, NO_2 $+NO_3$ total (mg/L as N)	Coliform, fecal, (cols./ 100 ml)	Streptococci, fecal, (cols./ 100 ml)	*Escherichia coli* (cols./ 100 ml)
10N/17E-07J03	08-30-89	12.5	164	6.8	6.0	--	--	0.70	<1	<1	<1
10N/17E-07J04	08-30-89	12.5	166	7.0	9.5	--	--	.90	<1	K12	<1
10N/17E-07R01	08-18-89	13.0	155	7.1	6.9	--	--	.40	<1	<1	<1
10N/17E-07R02	08-30-89	13.5	142	6.9	7.4	--	--	.50	<1	<1	<1
10N/17E-08E01	08-11-89	13.5	165	6.8	7.2	--	--	.70	<1	<1	<1
10N/17E-08L02	08-18-89	14.0	135	8.0	5.2	--	--	<.10	<1	<1	<1
10N/17E-08N01	08-29-89	14.5	138	7.8	.1	<0.010	<0.20	<.10	<1	<1	<1
10N/17E-08N02	08-29-89	14.5	165	7.0	4.3	--	--	.70	<1	<1	<1
10N/17E-08N03	08-29-89	20.0	134	7.8	1.5	<.010	<.20	.10	<1	<1	<1
10N/17E-08N04	09-15-89	17.0	133	8.0	.2	<.010	<.20	<.10	<1	<1	<1
10N/17E-10D02	08-17-89	14.0	351	7.2	2.5	--	--	1.00	<1	<1	<1
10N/17E-10D03	08-25-89	14.0	260	7.2	3.8	--	--	.30	<1	<1	<1
10N/17E-10J01	08-28-89	13.5	--	7.1	2.0	--	--	<.10	<1	<1	<1
10N/17E-10R01	08-28-89	15.5	--	7.3	.0	.040	2.5	<.10	<1	<1	<1
10N/17E-11B03	09-01-89	14.0	599	6.9	1.6	<.010	<.20	1.40	<1	K3	<1
10N/17E-11B04	09-11-89	13.0	360	7.0	.9	<.010	<.20	.80	<1	<1	<1
10N/17E-11B05	09-12-89	13.5	372	7.3	.7	<.010	.40	.30	<1	<1	<1
10N/17E-11C01	09-15-89	14.5	328	7.4	.0	.020	<.20	<.10	<1	<1	<1
10N/17E-11N01	08-30-89	16.0	271	7.3	.0	.020	<.20	<.10	<1	<1	<1
10N/17E-15M03	08-16-89	13.0	162	7.0	4.2	--	--	.20	<1	<1	<1
10N/17E-15M04	09-11-89	15.0	180	7.6	--	--	--	<.10	<1	K1	<1
10N/17E-17L01	08-11-89	16.0	152	7.1	5.3	--	--	.40	<1	K4	<1
10N/17E-17N01	08-10-89	12.0	127	7.0	6.5	--	--	.40	<1	<1	<1
10N/17E-18M01	09-01-89	12.5	134	7.1	6.8	<.010	<.20	.30	<1	<1	<1
10N/17E-18M02	09-11-89	13.0	142	7.1	4.4	--	--	.40	<1	<1	<1
10N/17E-18N01	09-27-89	12.5	136	6.9	6.6	--	--	.50	<1	<1	<1
10N/17E-18N02	09-26-89	12.0	110	7.0	8.5	--	--	.30	<1	<1	<1
10N/17E-18P01	08-11-89	12.5	126	6.9	7.2	--	--	.40	<1	<1	<1
10N/17E-18R01	09-01-89	12.5	128	6.8	7.1	--	--	.40	<1	<1	<1
10N/17E-19M01	09-13-89	15.0	168	7.4	5.6	<.010	<.20	1.20	<1	<1	<1
10N/17E-20A02	08-11-89	13.0	157	7.4	2.3	--	--	<.10	<1	<1	<1
10N/17E-20A03	08-25-89	14.0	130	7.6	2.0	<.010	<.20	<.10	<1	<1	<1
10N/17E-20A04	09-13-89	12.5	148	7.3	1.2	.080	.50	<.10	<1	<1	<1
10N/17E-20A05	08-10-89	11.5	128	7.0	6.4	--	--	.30	<1	<1	<1
10N/17E-20B01	09-12-89	11.5	112	6.8	7.1	--	--	.20	<1	<1	<1
10N/17E-20E01	08-11-89	14.5	180	8.1	.3	<.010	<.20	<.10	<1	K2	<1
10N/17E-20R02	09-12-89	--	555	7.2	5.4	--	--	2.30	<1	<1	<1
10N/17E-21A01	08-25-89	15.5	156	7.7	.1	.020	<.20	<.10	<1	<1	<1
10N/17E-25C01	08-25-89	13.0	1,020	7.2	.6	.010	.40	3.50	<1	<1	<1
10N/17E-26B01	09-15-89	19.5	381	7.2	.0	.030	<.20	<.10	<1	<1	<1
10N/17E-26J01	09-15-89	24.5	380	7.5	.0	.040	<.20	<.10	<1	<1	<1
10N/17E-27Q01	09-26-89	29.0	428	7.3	1.0	.030	<.20	<.10	<1	<1	<1
10N/17E-28B01	09-15-89	24.5	390	7.8	--	--	--	<.10	<1	<1	<1
10N/17E-29A01	08-31-89	16.0	335	7.3	4.3	--	--	3.90	<1	K4	<1
10N/17E-29A02	09-12-89	16.5	360	7.4	8.0	--	--	4.00	<1	K1	<1
10N/17E-29C01	09-12-89	20.0	320	7.4	.2	.020	<.20	.30	K30	K38	K34
10N/17E-35B02	09-14-89	24.5	415	7.6	--	--	--	<.10	<1	<1	<1
10N/17E-36R01	08-23-89	23.5	350	7.8	.1	.040	<.20	<.10	<1	<1	<1
10N/18E-01A02	07-19-89	15.0	289	7.2	1.4	.110	2.0	1.50	<1	<1	<1
10N/18E-02N01	09-13-89	14.5	372	7.4	5.3	--	--	5.30	<1	K1	<1

Table 2.--Ground-water-quality data, July-September, 1989--Continued

Local well number	Date	Temperature water (Deg C)	Specific conductance (µS/cm)	pH (standard units)	Oxygen, Dissolved (mg/L)	Nitrogen, ammonia total (mg/L as N)	Nitrogen, ammonia+ organic total (mg/L as N)	Nitrogen, NO_2 $+NO_3$ total (mg/L as N)	Coliform, fecal, (cols./ 100 ml)	Streptococci, fecal, (cols./ 100 ml)	*Escherichia coli* (cols./ 100 ml)
10N/18E-02Q01	07-20-89	14.0	340	7.3	6.2	<0.010	4.3	5.10	<1	<1	<1
10N/18E-02P01	08-31-89	16.0	370	7.3	2.5	<.010	<.20	5.10	<1	<1	<1
10N/18E-02R01	08-31-89	14.5	340	7.4	6.7	--	--	4.30	<1	<1	<1
10N/18E-04C01	07-20-89	14.0	425	7.4	3.6	--	--	4.10	<1	<1	<1
10N/18E-04C02	08-25-89	13.0	501	7.1	2.3	<.010	.30	1.50	K2	K8	K2
10N/18E-04C03	08-25-89	13.5	502	7.1	2.3	--	--	1.30	K1	<1	<1
10N/18E-04G01	09-01-89	14.5	370	7.4	3.8	--	--	2.60	<1	<1	<1
10N/18E-04Q01	08-25-89	14.5	586	7.3	4.3	--	--	4.30	<1	<1	<1
10N/18E-06H02	07-27-89	16.0	650	7.1	.0	.140	.30	<.10	<1	<1	<1
10N/18E-06H03	08-31-89	15.5	478	7.4	3.0	--	--	1.50	<1	<1	<1
10N/18E-06N01D1	08-31-89	14.5	482	7.5	.2	.090	<.20	<.10	<1	<1	<1
10N/18E-06P03	08-25-89	15.5	400	7.6	.0	.050	.50	<.10	<1	<1	<1
10N/18E-06R04	07-20-89	13.5	835	7.0	2.3	--	--	5.00	<1	<1	<1
10N/18E-08C01	07-27-89	14.0	720	7.3	.2	<.010	<.20	.20	<1	<1	<1
10N/18E-08D02	07-27-89	16.0	492	7.6	.0	.030	<.20	<.10	<1	<1	<1
10N/18E-09M01	07-28-89	15.0	642	7.6	.0	.060	1.4	<.10	<1	<1	<1
10N/18E-09N01	08-28-89	15.5	532	7.4	.3	.050	<.20	<.10	<1	<1	<1
10N/18E-12A02	09-27-89	14.5	283	7.1	6.5	--	--	2.60	<1	<1	<1
10N/18E-12C01	07-28-89	15.5	282	7.1	5.9	--	--	3.00	<1	<1	<1
10N/18E-15A01	07-21-89	15.5	410	7.3	7.9	--	--	5.60	<1	<1	<1
10N/18E-15H01	07-21-89	14.0	425	7.3	4.0	--	--	6.00	<1	<1	<1
10N/18E-15L01	09-01-89	15.0	860	7.5	.0	<.010	<.20	<.10	<1	K8	<1
10N/18E-15P01	09-01-89	15.5	469	7.5	.0	.050	<.20	<.10	<1	<1	<1
10N/18E-16E01	09-13-89	15.5	743	7.4	.4	.010	.30	<.10	<1	<1	<1
10N/18E-16M01	08-16-89	15.5	299	7.8	.3	.140	.30	<.10	<1	<1	<1
10N/18E-16N01	09-13-89	14.5	548	7.7	.5	.200	.40	<.10	<1	<1	<1
10N/18E-18H01	08-16-89	14.5	725	7.3	.3	.030	<.20	<.10	<1	<1	<1
10N/18E-24A01	08-09-89	14.5	330	7.3	4.6	--	--	3.40	<1	<1	<1
10N/18E-30E01	07-28-89	15.5	215	7.5	.3	<.010	<.20	<.10	<1	<1	<1
10N/18E-30E02	09-25-89	14.5	650	7.3	5.7	--	--	3.00	<1	<1	<1
10N/18E-31N01	09-26-89	22.5	363	7.8	--	.020	<.20	<.10	<1	K48	<1
10N/18E-34C01	07-28-89	14.5	502	7.3	4.7	<.010	<.20	.80	<1	<1	<1
10N/18E-34C02	07-28-89	15.5	410	7.3	5.2	--	--	.70	<1	<1	<1
10N/18E-36A01	08-09-89	16.0	1,120	7.4	6.5	--	--	8.20	<1	<1	<1
10N/19E-01J01	07-17-89	15.0	287	7.0	6.3	--	--	4.50	<1	K800	<1
10N/19E-01J02	07-18-89	15.0	272	7.1	5.9	--	--	4.30	<1	<1	<1
10N/19E-03A01	07-18-89	14.5	290	7.1	6.3	--	--	4.30	<1	<1	<1
10N/19E-05L01	07-18-89	16.0	264	7.2	4.3	--	--	3.80	<1	K350	<1
10N/19E-06P01	07-26-89	15.0	295	7.1	4.4	--	--	1.80	<1	<1	<1
10N/19E-06P02	07-26-89	15.5	308	7.1	3.3	--	--	1.80	<1	<1	<1
10N/19E-06P03	08-08-89	15.5	262	7.0	5.4	--	--	1.70	<1	13	<1
10N/19E-07B01	09-13-89	15.5	262	7.1	4.8	--	--	1.90	<1	<1	<1
10N/19E-07B03	07-18-89	15.5	281	7.1	4.1	<.010	.20	2.20	<1	<1	<1
10N/19E-07C02	09-11-89	17.0	384	7.1	3.7	--	--	1.80	<1	50	<1
10N/19E-07L01	09-13-89	14.5	318	7.2	3.4	--	--	1.70	<1	<1	<1
10N/19E-07R01	09-13-89	14.5	305	7.7	4.2	--	--	3.20	<1	<1	<1
10N/19E-08A01	08-08-89	15.0	262	7.1	7.0	--	--	3.10	<1	<1	<1
10N/19E-08D01	07-19-89	14.5	278	7.2	7.7	.010	<.20	4.70	<1	<1	<1
10N/19E-08N02	09-13-89	15.5	299	7.7	4.4	--	--	2.70	<1	<1	<1

Table 2.--Ground-water-quality data, July-September, 1989--Continued

Local well number	Date	Temperature water (Deg C)	Specific conductance (µS/cm)	pH (standard units)	Oxygen, Dissolved (mg/L)	Nitrogen, ammonia total (mg/L as N)	Nitrogen, ammonia+ organic total (mg/L as N)	Nitrogen, NO_2 $+NO_3$ total (mg/L as N)	Coliform, fecal, (cols./ 100 ml)	Streptococci, fecal, (cols./ 100 ml)	*Escherichia coli* (cols./ 100 ml)
10N/19E-11A02	07-18-89	15.0	273	7.1	5.6	--	--	3.00	<1	<1	<1
10N/19E-11B05	08-30-89	15.5	310	7.1	--	--	--	5.40	<1	K4	<1
10N/19E-11P01	09-13-89	15.0	308	7.8	4.6	--	--	3.60	<1	<1	<1
10N/19E-11R01	07-19-89	15.0	292	7.3	5.4	--	--	3.40	<1	<1	<1
10N/19E-12M01	09-14-89	15.0	280	7.6	5.3	--	--	2.80	<1	<1	<1
10N/19E-12Q02	07-26-89	15.0	319	7.0	5.4	--	--	4.00	<1	<1	<1
10N/19E-15C01	07-19-89	14.5	338	7.8	5.1	--	--	4.50	<1	<1	<1
10N/19E-16D01	07-19-89	17.0	299	7.6	3.8	--	--	2.70	<1	<1	<1
10N/19E-18A01	07-19-89	15.5	280	7.0	5.5	--	--	2.90	<1	<1	<1
10N/19E-18B01	09-13-89	15.0	260	7.1	4.2	--	--	2.10	<1	<1	<1
10N/19E-18Q01	07-19-89	14.5	290	7.3	3.1	--	--	1.80	<1	<1	<1
10N/19E-21B01	08-08-89	14.5	325	7.6	5.4	--	--	4.00	<1	<1	<1
10N/19E-21D01	07-27-89	14.0	260	7.2	4.7	<0.010	<0.20	3.00	<1	<1	<1
10N/19E-21D02	08-14-89	15.5	272	7.1	5.2	--	--	3.30	<1	<1	<1
10N/19E-21H03	08-08-89	14.5	323	7.5	4.9	--	--	3.90	<1	<1	<1
10N/19E-21K01	09-14-89	14.0	310	7.3	5.0	--	--	4.10	<1	<1	<1
10N/19E-21M01	08-07-89	15.0	315	7.4	3.5	--	--	3.00	<1	<1	<1
10N/19E-25A01	07-19-89	17.0	368	7.4	4.7	--	--	5.30	<1	<1	<1
10N/19E-25B02	07-19-89	14.5	380	7.4	3.3	--	--	5.50	<1	<1	<1
10N/19E-25H01	08-07-89	14.0	375	7.4	2.6	--	--	5.10	<1	<1	<1
10N/19E-25H02	08-07-89	14.0	370	7.4	2.6	--	--	5.00	<1	<1	<1
10N/19E-25H03	08-08-89	14.5	409	7.3	2.2	<.010	.20	5.10	<1	<1	<1
10N/19E-26M01	07-20-89	17.0	306	8.1	2.3	<.010	.60	<.10	<1	<1	<1
10N/19E-30R01	07-19-89	23.0	370	7.8	7.0	--	--	.10	<1	<1	<1
10N/19E-34K01	07-19-89	17.5	430	7.5	--	.010	2.90	.10	<1	<1	<1
10N/20E-01P01	07-24-89	14.5	280	7.0	2.4	.010	.40	3.30	<1	8	<1
10N/20E-01P03	09-12-89	15.0	214	7.0	2.1	--	--	1.30	<1	<1	<1
10N/20E-01Q02	09-12-89	16.5	212	8.0	3.4	--	--	.10	<1	<1	<1
10N/20E-01Q03	09-12-89	15.5	112	6.9	1.9	--	--	1.00	<1	<1	<1
10N/20E-03P01	07-25-89	14.0	221	7.0	4.1	--	--	2.60	<1	<1	<1
10N/20E-04J01	07-25-89	14.0	182	7.3	5.2	--	--	1.90	<1	<1	<1
10N/20E-04K01	07-24-89	15.0	203	6.9	5.3	--	--	1.40	--	--	--
10N/20E-04L01	07-25-89	23.5	219	8.0	.1	.030	.20	<.10	<1	<1	<1
10N/20E-04Q01	07-24-89	14.5	189	6.9	4.9	--	--	1.10	<1	<1	<1
10N/20E-05A02	09-13-89	16.0	180	7.0	5.7	--	--	2.50	<1	<1	<1
10N/20E-05H01	07-21-89	15.0	182	7.0	5.8	--	--	1.40	<1	<1	<1
10N/20E-05M02	09-14-89	15.5	230	6.9	4.7	--	--	3.60	<1	<1	<1
10N/20E-06C01	08-22-89	15.0	252	7.5	9.5	--	--	2.20	<1	<1	<1
10N/20E-06N02	08-03-89	21.5	272	6.9	6.3	--	--	4.00	<1	<1	<1
10N/20E-07P01	07-20-89	14.5	279	7.0	6.0	<.010	1.2	4.00	<1	<1	<1
10N/20E-08C02	07-21-89	18.5	236	7.1	5.9	--	--	3.10	<1	<1	<1
10N/20E-09D01	08-04-89	15.5	104	8.3	5.0	--	--	.20	<1	<1	<1
10N/20E-09D02	08-04-89	14.5	189	7.3	--	--	--	.70	<1	K2	<1
10N/20E-09P01	07-20-89	14.0	249	6.9	5.1	--	--	3.90	<1	<1	<1
10N/20E-10J01	07-20-89	19.5	292	7.1	5.9	--	--	3.30	<1	<1	<1
10N/20E-11P01	07-20-89	13.5	332	6.8	1.2	<.010	.50	4.00	<1	<1	<1
10N/20E-12A01	08-04-89	15.5	278	7.0	.8	<.010	<.20	.70	<1	<1	<1
10N/20E-12C01	07-21-89	13.0	266	7.0	2.2	--	--	1.90	<1	<1	<1
10N/20E-13A01	07-21-89	13.5	340	6.9	1.3	<.010	.70	3.10	<1	<1	<1
10N/20E-13E02	07-25-89	15.0	344	7.2	1.0	.010	.40	2.20	<1	<1	<1

Table 2.--Ground-water-quality data, July-September, 1989--Continued

Local well number	Date	Temperature water (Deg C)	Specific conductance (µS/cm)	pH (standard units)	Oxygen, Dissolved (mg/L)	Nitrogen, ammonia total (mg/L as N)	Nitrogen, ammonia+ organic total (mg/L as N)	Nitrogen, NO_2 $+NO_3$ total (mg/L as N)	Coliform, fecal, (cols./ 100 ml)	Streptococci, fecal, (cols./ 100 ml)	*Escherichia coli* (cols./ 100 ml)
10N/20E-13E03	08-09-89	14.0	389	6.9	1.3	<0.010	<0.20	3.20	<1	<1	<1
10N/20E-14E01	07-25-89	14.5	295	7.3	2.6	.020	.50	3.00	<1	<1	<1
10N/20E-14L01	09-13-89	15.0	280	7.1	4.0	--	--	<.10	<1	<1	<1
10N/20E-14L03	08-04-89	15.0	292	7.0	2.6	--	--	2.60	<1	<1	<1
10N/20E-15B02	07-20-89	15.5	230	7.0	5.8	--	--	2.90	<1	<1	<1
10N/20E-16A01	08-08-89	18.5	198	6.8	4.0	--	--	1.60	<1	<1	<1
10N/20E-16G01	09-26-89	15.0	255	7.1	4.2	--	--	3.30	<1	<1	<1
10N/20E-16P01	07-21-89	14.0	310	7.3	4.0	--	--	4.50	<1	<1	<1
10N/20E-17F01	07-26-89	15.5	300	7.2	6.8	--	--	4.30	<1	K2	K5
10N/20E-17H01	08-03-89	14.0	315	7.0	4.7	--	--	4.30	<1	K2	<1
10N/20E-17J01	08-04-89	14.0	329	7.1	4.6	--	--	4.30	<1	<1	<1
10N/20E-17P01	08-08-89	14.5	320	7.0	5.1	<.010	<.20	4.50	<1	<1	<1
10N/20E-18D01	07-20-89	14.0	300	7.4	5.1	--	--	3.20	<1	<1	<1
10N/20E-18L01	07-25-89	15.5	340	7.6	4.2	--	--	4.50	<1	<1	<1
10N/20E-18N01	07-25-89	14.0	325	7.2	5.4	--	--	4.10	<1	<1	<1
10N/20E-19J01	07-26-89	15.5	377	7.5	4.3	--	--	4.30	<1	<1	<1
10N/20E-20K01	07-24-89	14.5	369	7.3	3.8	.010	.40	3.80	<1	<1	<1
10N/20E-20M01	07-24-89	17.0	365	7.4	3.4	--	--	4.00	<1	<1	<1
10N/20E-20P01	07-24-89	15.0	320	7.9	3.2	--	--	4.60	<1	<1	<1
10N/20E-21B01	09-14-89	15.0	308	7.1	3.2	--	--	3.50	<1	<1	<1
10N/20E-21G01	07-27-89	14.5	330	7.2	3.4	--	--	4.70	<1	<1	<1
10N/20E-21G02	07-27-89	14.0	355	7.1	3.2	--	--	5.80	<1	<1	<1
10N/20E-21J01	07-25-89	16.0	390	7.3	3.3	--	--	5.30	<1	<1	<1
10N/20E-25H01	07-27-89	15.0	395	7.2	1.1	<.010	.20	1.70	<1	>33	<1
10N/20E-27A01	09-13-89	15.0	242	7.5	2.1	--	--	.30	<1	<1	<1
10N/20E-28H02	08-08-89	14.5	362	7.1	3.1	--	--	5.50	<1	<1	<1
10N/20E-29E01	08-22-89	18.0	371	7.2	2.3	--	--	5.40	<1	K9	<1
10N/20E-29H01	08-22-89	16.0	252	7.3	2.3	--	--	2.70	<1	<1	<1
10N/21E-05C01	07-26-89	15.5	397	7.9	5.3	--	--	1.10	<1	<1	<1
10N/21E-06A01	07-26-89	15.5	481	7.6	5.4	--	--	2.30	<1	<1	<1
10N/21E-07L01	07-26-89	15.0	247	7.0	2.9	--	--	1.40	<1	<1	<1
10N/21E-18D01	07-26-89	14.0	382	6.9	2.0	<.010	.30	4.60	<1	<1	<1
10N/21E-28F01	07-26-89	14.5	365	7.1	3.2	--	--	1.90	<1	<1	<1
10N/21E-28P01	07-27-89	15.0	372	7.2	2.6	<.010	.30	2.20	<1	<1	<1
10N/21E-29A01	08-23-89	15.5	320	7.6	.1	.030	<.20	<.10	<1	<1	<1
10N/21E-29G01	07-27-89	16.0	319	7.1	.1	<.010	.70	.30	<1	<1	<1
10N/21E-30C01	08-23-89	16.0	259	7.9	.1	.030	<.20	<.10	<1	<1	<1
10N/21E-30H01	07-28-89	15.0	268	7.8	.1	.030	<.20	<.10	<1	<1	<1
10N/21E-30J01	08-22-89	15.0	277	7.8	.1	.040	<.20	<.10	<1	K1	<1
10N/21E-32K02	08-23-89	17.0	277	8.2	.0	.040	<.20	<.10	<1	<1	<1
10N/21E-33B02	07-27-89	15.5	402	7.1	.2	<.010	.90	4.60	<1	1	<1
10N/21E-33C01	09-14-89	13.5	372	7.1	4.0	--	--	<.10	<1	<1	<1
10N/21E-33C03	08-23-89	16.0	288	8.0	.2	.050	<.20	<.10	<1	<1	<1
10N/21E-33K01	07-28-89	15.5	267	7.1	.3	.010	<.20	.40	<1	<1	<1
10N/21E-34L01	08-23-89	15.0	310	7.1	.1	<.010	<.20	1.10	<1	<1	<1
10N/21E-35J01	08-24-89	15.5	388	7.1	3.0	<.010	1.0	3.40	<1	<1	<1
11N/16E-09P03	08-14-89	15.5	220	7.4	4.8	--	--	1.10	<1	<1	<1
11N/16E-09P01	09-14-89	16.0	210	7.4	4.8	--	--	1.00	<1	<1	<1
11N/16E-09P02	09-14-89	18.5	225	7.0	--	--	--	1.00	<1	K52	<1
11N/16E-11P02	08-15-89	14.0	171	7.2	8.1	--	--	.90	<1	<1	<1

Local well number	Date	Temperature water (Deg C)	Specific conductance (µS/cm)	pH (standard units)	Oxygen, Dissolved (mg/L)	Nitrogen, ammonia total (mg/L as N)	Nitrogen, ammonia+ organic total (mg/L as N)	Nitrogen, NO_2 $+NO_3$ total (mg/L as N)	Coliform, fecal, (cols./ 100 ml)	Streptococci, fecal, (cols./ 100 ml)	*Escherichia coli* (cols./ 100 ml)
11N/16E-16P02	08-16-89	14.5	204	7.6	5.8	--	--	0.90	<1	K1	<1
11N/16E-21J01	08-16-89	18.5	178	7.0	3.8	<0.010	0.30	.50	<1	<1	<1
11N/16E-22M02	08-18-89	14.5	195	7.3	7.6	--	--	.40	<1	<1	<1
11N/16E-23B02	08-15-89	13.0	368	7.1	3.1	--	--	.60	<1	<1	<1
11N/16E-25G01	09-12-89	18.0	207	7.5	3.7	--	--	<.10	<1	<1	--
11N/16E-25H01	08-15-89	17.5	167	7.6	2.3	--	--	.50	<1	<1	<1
11N/16E-25H02	09-12-89	16.5	219	7.3	5.3	--	--	.30	<1	K2	<1
11N/16E-25J01	08-21-89	20.0	196	7.3	2.8	--	--	.60	<1	<1	<1
11N/16E-25J02	08-21-89	17.0	189	7.3	5.6	<.010	<.20	.70	<1	<1	<1
11N/16E-25J03	09-12-89	16.0	180	7.4	3.5	--	--	.70	<1	<1	<1
11N/16E-25N01	09-12-89	14.5	615	7.5	5.3	--	--	3.50	<1	<1	<1
11N/16E-27C02	08-15-89	14.5	314	7.1	6.9	--	--	1.10	<1	<1	<1
11N/16E-28F02	08-16-89	13.0	174	7.4	7.2	--	--	.40	<1	K3	<1
11N/16E-28L01	08-16-89	14.5	181	7.6	4.8	--	--	.30	<1	<1	<1
11N/16E-34K03	08-22-89	22.5	409	6.5	.0	.030	<.20	<.10	<1	<1	<1
11N/16E-35J01	09-12-89	15.5	405	7.5	4.8	--	--	3.20	<1	<1	--
11N/16E-35Q01	08-15-89	14.0	326	7.0	6.7	--	--	.50	<1	<1	<1
11N/17E-01A01	08-31-89	19.5	270	8.0	--	--	--	<.10	<1	<1	<1
11N/17E-02P01	08-31-89	25.5	280	8.0	.6	.020	<.20	<.10	<1	<1	<1
11N/17E-03L02	09-14-89	25.5	270	7.9	.0	.020	.20	<.10	<1	<1	<1
11N/17E-11Q01	08-09-89	13.0	1,100	7.6	5.4	--	--	1.90	<1	<1	<1
11N/17E-11Q02	08-22-89	13.0	1,040	7.6	4.1	--	--	1.90	<1	<1	<1
11N/17E-12J02	08-08-89	16.5	270	7.6	1.4	--	--	.50	<1	10	<1
11N/17E-12J03	08-23-89	16.5	255	7.6	2.3	--	--	.60	<1	<1	<1
11N/17E-12R01	08-08-89	16.5	272	7.8	2.5	.010	<.20	<.10	<1	<1	<1
11N/17E-16F01	09-14-89	18.0	338	7.6	1.9	.010	<.20	.70	<1	<1	<1
11N/17E-16H01	08-09-89	20.5	259	7.9	.3	.030	<.20	<.10	<1	<1	<1
11N/17E-16R01	08-22-89	16.5	280	7.3	2.2	--	--	3.00	<1	K190	<1
11N/17E-16R02	08-22-89	14.0	358	7.8	7.2	--	--	--	<1	<1	<1
11N/17E-16R03	09-01-89	13.5	700	7.6	6.4	<.010	<.20	2.60	<1	<1	<1
11N/17E-17P01	09-14-89	19.0	443	7.5	2.3	.030	<.20	<.10	<1	<1	<1
11N/17E-19C01	09-15-89	21.5	590	6.8	.0	.040	<.20	<.10	<1	<1	<1
11N/17E-19E01	08-31-89	19.5	205	7.1	.4	.020	<.20	<.10	<1	<1	<1
11N/17E-20B01	08-08-89	17.5	244	7.4	4.7	--	--	.20	<1	<1	<1
11N/17E-20F01	09-15-89	18.5	448	7.4	1.0	.030	<.20	<.10	<1	<1	<1
11N/17E-21J01	09-12-89	14.5	250	7.1	7.9	--	--	.30	<1	10	<1
11N/17E-21P01	08-09-89	15.5	218	7.1	8.3	<.010	<.20	.20	<1	<1	<1
11N/17E-22G01	08-23-89	14.0	756	7.3	6.1	--	--	3.30	<1	K73	<1
11N/17E-23D02	08-24-89	14.0	373	7.2	5.8	--	--	.90	<1	<1	<1
11N/17E-23M01	08-09-89	15.0	330	7.4	6.6	--	--	.50	<1	<1	<1
11N/17E-24N01	08-10-89	14.0	640	7.6	.4	.010	.50	.60	<1	<1	<1
11N/17E-24R01	08-10-89	15.5	575	7.4	.3	<.010	1.3	2.90	<1	<1	<1
11N/17E-24R02	09-15-89	14.5	740	7.5	.1	.010	<.20	3.50	<1	<1	<1
11N/17E-27Q01	08-10-89	13.0	405	7.2	5.4	--	--	1.20	<1	<1	<1
11N/17E-28D02	08-10-89	14.0	350	7.0	4.6	--	--	1.10	<1	<1	<1
11N/17E-30Q01	09-15-89	19.5	430	7.4	.8	.040	<.20	<.10	<1	K2	<1
11N/17E-31L02	08-28-89	13.5	760	8.0	.5	<.010	.30	.60	<1	<1	<1
11N/17E-32L02	09-01-89	13.5	230	7.6	5.4	--	--	.70	<1	<1	<1
11N/17E-32N01	08-24-89	14.5	175	7.6	.1	<.010	.40	<.10	<1	<1	<1
	08-28-89	14.0	182	8.2	.1	--	--	--	<1	<1	<1

Table 2.--Ground-water-quality data, July-September, 1989--Continued

Local well number	Date	Temperature water (Deg C)	Specific conductance (µS/cm)	pH (standard units)	Oxygen, Dissolved (mg/L)	Nitrogen, ammonia total (mg/L as N)	Nitrogen, ammonia+ organic total (mg/L as N)	Nitrogen, NO_2 $+NO_3$ total (mg/L as N)	Coliform, fecal, (cols./ 100 ml)	Streptococci, fecal, (cols./ 100 ml)	*Escherichia coli* (cols./ 100 ml)
11N/17E-33K01	08-11-89	14.5	292	7.3	2.4	--	--	0.20	<1	<1	<1
11N/17E-34M01	08-11-89	15.0	164	7.7	.8	<0.010	<0.20	.10	<1	K1	<1
11N/18E-01B02	06-20-89	14.0	220	7.3	7.4	--	--	.90	<1	<1	<1
11N/18E-01M02	06-21-89	13.0	300	7.2	7.6	--	--	3.10	<1	<1	<1
11N/18E-02P01	06-29-89	16.0	360	7.8	15.3	--	--	1.30	<1	<1	<1
11N/18E-03D01	07-18-89	16.5	200	7.7	.4	.020	<.20	<.10	<1	<1	<1
11N/18E-03N01	07-18-89	15.0	342	7.8	6.7	--	--	2.70	<1	<1	<1
11N/18E-04H01	06-30-89	14.5	756	7.6	12.3	--	--	4.40	<1	<1	<1
11N/18E-05N01	06-30-89	15.0	452	7.4	9.1	--	--	1.20	<1	K11	<1
11N/18E-06J01	06-27-89	14.0	330	7.4	4.2	--	--	.70	<1	<1	<1
11N/18E-06K01	06-27-89	15.0	305	7.9	6.5	--	--	.70	<1	K2	<1
11N/18E-06N01	06-27-89	16.0	290	8.0	.5	--	--	<.10	<1	<1	<1
11N/18E-07N01	06-27-89	13.0	590	7.6	2.4	.010	<.20	.90	<1	<1	<1
11N/18E-07P01	06-27-89	13.5	730	7.4	2.3	--	--	.90	<1	<1	<1
11N/18E-10C01	08-17-89	15.5	510	7.6	8.5	--	--	23.00	<1	<1	<1
11N/18E-10D01	09-27-89	15.0	306	7.6	8.2	--	--	2.40	<1	<1	<1
11N/18E-10J01	06-27-89	15.0	560	7.7	6.0	--	--	4.50	<1	<1	<1
11N/18E-11C01	06-20-89	16.5	445	7.8	7.7	--	--	3.10	<1	<1	<1
11N/18E-11D01	06-21-89	16.0	510	7.7	5.0	--	--	1.90	<1	<1	<1
11N/18E-11R01	06-21-89	12.5	420	7.3	6.6	--	--	3.60	<1	K1	<1
11N/18E-12H01	06-20-89	14.5	230	7.1	5.6	--	--	1.80	<1	<1	<1
11N/18E-12J01	06-20-89	15.5	260	7.2	5.2	--	--	2.50	<1	<1	<1
11N/18E-12P01	06-20-89	14.0	300	7.4	4.8	--	--	1.90	<1	<1	<1
11N/18E-13A01	06-21-89	13.5	280	7.2	5.7	--	--	2.70	<1	<1	<1
11N/18E-13B02	06-22-89	14.0	370	8.0	--	--	--	3.10	<1	<1	<1
11N/18E-13R01	06-21-89	14.0	240	7.2	6.6	--	--	1.80	<1	<1	<1
11N/18E-13R02	06-21-89	14.0	265	7.3	6.0	<.010	.40	2.10	<1	<1	<1
11N/18E-14E01	08-07-89	15.5	695	7.7	8.1	--	--	2.60	<1	<1	<1
11N/18E-17B01	06-23-89	19.5	245	7.8	.4	--	--	<.10	<1	<1	<1
11N/18E-17C01	06-23-89	14.0	530	7.8	.9	--	--	3.00	<1	<1	<1
11N/18E-17D03	08-28-89	14.0	510	7.8	1.9	<.010	<.20	.80	<1	<1	<1
11N/18E-18D01	06-26-89	14.5	560	7.6	4.5	--	--	1.30	<1	<1	<1
11N/18E-18M01	06-26-89	13.5	570	7.5	.0	--	--	<.10	<1	<1	<1
11N/18E-18Q01	08-03-89	14.0	756	7.6	1.5	<.010	<.20	1.10	<1	<1	<1
11N/18E-20H01	06-28-89	14.0	378	7.7	2.4	--	--	1.10	<1	<1	<1
11N/18E-21E01	06-22-89	14.0	480	7.7	4.0	--	--	2.40	<1	K6	<1
11N/18E-21R01	06-22-89	15.0	490	7.7	6.4	--	--	1.70	<1	>33	<1
11N/18E-22D01	08-07-89	14.0	725	7.5	3.8	--	--	7.80	<1	<1	<1
11N/18E-22R01	06-22-89	15.0	340	7.3	5.4	--	--	4.50	<1	<1	<1
11N/18E-22R02	06-28-89	13.5	290	7.2	5.9	--	--	5.20	<1	<1	<1
11N/18E-24C01	06-22-89	14.5	300	7.3	6.9	--	--	2.70	<1	<1	<1
11N/18E-25M01	06-22-89	14.0	340	7.3	11.4	--	--	4.00	<1	<1	<1
11N/18E-25M02	06-23-89	14.0	340	7.3	6.7	--	--	3.70	<1	<1	<1
11N/18E-26M03	06-29-89	--	402	7.6	.3	.020	<.20	<.10	<1	<1	<1
11N/18E-26N04	08-03-89	14.5	381	7.3	5.9	--	--	2.90	<1	<1	<1
11N/18E-26P01	06-29-89	13.5	363	7.3	9.4	--	--	5.70	<1	<1	<1
11N/18E-27N01	06-26-89	14.5	490	7.4	4.8	--	--	9.30	<1	<1	<1
11N/18E-27R01	06-26-89	13.5	440	7.1	6.2	--	--	11.00	<1	<1	<1
11N/18E-27R02	08-29-89	14.5	320	7.3	5.7	--	--	4.90	<1	<1	<1
11N/18E-28H01	06-23-89	14.0	330	7.8	2.8	<.010	<.20	1.20	<1	<1	<1

Table 2.--Ground-water-quality data, July-September, 1989--Continued

Local well number	Date	Temperature water (Deg C)	Specific conductance (µS/cm)	pH (standard units)	Oxygen, Dissolved (mg/L)	Nitrogen, ammonia total (mg/L as N)	Nitrogen, ammonia+ organic total (mg/L as N)	Nitrogen, NO_2 +NO_3 total (mg/L as N)	Coliform, fecal, (cols./ 100 ml)	Streptococci, fecal, (cols./ 100 ml)	*Escherichia coli* (cols./ 100 ml)
11N/18E-29N01	06-26-89	16.0	540	7.4	1.5	--	--	4.70	<2	<2	<2
11N/18E-29R01	06-23-89	15.5	510	7.6	1.5	--	--	.80	<1	<1	<1
11N/18E-31A01	08-03-89	15.5	696	7.3	.1	0.010	<0.20	3.30	<1	<1	<1
11N/18E-31J01	06-28-89	13.0	620	7.3	.0	--	--	.40	<1	<1	<1
11N/18E-31J02	06-28-89	14.0	690	7.3	.1	--	--	1.00	<1	<1	<1
11N/18E-31R03	06-28-89	14.0	595	7.7	.7	--	--	<.10	<1	<1	<1
11N/18E-33D02	06-23-89	14.0	520	7.7	1.3	--	--	.60	<1	<1	<1
11N/18E-34C01	08-03-89	16.0	358	7.4	--	--	--	5.30	<1	<1	<1
11N/18E-36R01	06-29-89	15.0	259	7.0	6.4	--	--	1.90	<1	<1	<1
11N/19E-02M01	07-05-89	12.5	162	6.9	2.3	--	--	.40	<1	<1	<1
11N/19E-02M02	07-05-89	13.0	138	6.7	1.9	--	--	.20	<1	<1	<1
11N/19E-03M01	07-05-89	14.5	157	6.9	5.2	--	--	.80	<1	<1	<1
11N/19E-03N01	07-06-89	14.5	177	6.6	6.0	--	--	1.40	<1	<1	<1
11N/19E-03R01	07-06-89	14.0	180	6.9	7.5	--	--	1.30	<1	<1	<1
11N/19E-03R02	08-22-89	14.0	184	7.4	3.5	--	--	.70	<1	<1	<1
11N/19E-04D01	09-27-89	15.0	231	6.8	6.2	--	--	2.00	<1	<1	<1
11N/19E-04E01	07-06-89	14.5	200	6.7	6.6	--	--	1.60	<1	<1	<1
11N/19E-04H02	08-22-89	14.5	182	6.9	6.8	--	--	1.30	<1	<1	<1
11N/19E-04P01	07-07-89	13.5	162	6.8	6.6	--	--	.80	<1	<1	<1
11N/19E-04P02D1	07-14-89	13.5	165	7.0	8.4	--	--	.50	<1	K7	<1
11N/19E-04P03	07-14-89	14.5	165	6.9	7.4	--	--	.60	<1	<1	<1
11N/19E-06M01	08-07-89	15.5	328	7.4	5.8	<.010	<.20	2.40	<1	<1	<1
11N/19E-06N01	07-13-89	15.5	225	7.0	4.5	--	--	.90	<1	<1	<1
11N/19E-06R02	07-14-89	14.0	242	7.1	7.3	--	--	3.80	<1	<1	<1
11N/19E-07D01	07-18-89	14.5	203	6.9	5.7	--	--	1.30	K1	K2	<1
11N/19E-07N02	07-12-89	13.5	247	7.1	5.1	--	--	2.10	<1	<1	<1
11N/19E-08J01	07-07-89	14.5	235	7.2	6.1	.010	.40	1.60	<1	<1	<1
11N/19E-08J02	07-13-89	14.5	255	7.5	5.9	--	--	1.70	<1	<1	<1
11N/19E-08N02	09-27-89	15.5	743	7.2	6.6	--	--	2.10	<1	<1	<1
11N/19E-09C01	08-24-89	14.0	157	7.1	8.8	--	--	.60	<1	<1	<1
11N/19E-09G02	07-17-89	14.0	189	6.9	7.2	--	--	1.00	<1	<1	<1
11N/19E-09G01	08-14-89	14.0	185	6.9	5.2	--	--	.80	<1	<1	<1
11N/19E-09H02	08-07-89	15.0	161	7.0	6.6	--	--	.50	<1	<1	<1
11N/19E-10B01	07-18-89	19.0	149	8.2	--	--	--	<.10	<1	<1	<1
11N/19E-10D01	07-07-89	15.0	206	7.7	5.2	--	--	1.20	<1	K17	<1
11N/19E-10E03	07-07-89	14.5	154	7.1	6.9	--	--	.60	<1	<1	<1
11N/19E-10G01	07-10-89	14.5	164	6.9	7.8	--	--	1.10	<1	<1	<1
11N/19E-10G02	07-10-89	14.0	165	6.9	7.6	--	--	1.20	<1	<1	<1
11N/19E-10M01	07-11-89	15.0	119	6.7	6.7	--	--	1.00	<1	<1	<1
11N/19E-10P01	07-17-89	15.5	165	7.1	7.8	--	--	1.20	K1	<1	<1
11N/19E-11M01	07-11-89	13.5	175	6.8	2.9	--	--	.80	<1	K1	<1
11N/19E-12R01	07-11-89	14.0	155	7.0	1.6	<.010	.20	.30	<1	<1	<1
11N/19E-13A01	08-11-89	13.5	156	6.8	3.6	--	--	.60	<1	<1	<1
11N/19E-13A02	08-11-89	13.5	163	6.8	3.0	--	--	.90	<1	<1	<1
11N/19E-13H01	07-11-89	13.5	157	6.9	2.9	--	--	.60	<1	<1	<1
11N/19E-13K01	07-11-89	14.0	165	6.8	4.4	--	--	1.20	<1	<1	<1
11N/19E-14E01	08-25-89	16.0	216	7.0	7.6	--	--	1.90	<1	<1	<1
11N/19E-14D02	08-25-89	23.0	131	8.6	2.6	--	--	<.10	<1	<1	<1
11N/19E-14N01	07-12-89	17.5	169	6.7	6.8	--	--	1.60	<1	<1	<1
11N/19E-14N02	07-12-89	16.5	194	7.1	6.0	--	--	1.30	<1	<1	<1

Table 2.--Ground-water-quality data, July-September, 1989--Continued

Local well number	Date	Temperature water (Deg C)	Specific conductance (µS/cm)	pH (standard units)	Oxygen, Dissolved (mg/L)	Nitrogen, ammonia total (mg/L as N)	Nitrogen, ammonia+ organic total (mg/L as N)	Nitrogen, NO_2 +NO_3 total (mg/L as N)	Coliform, fecal, (cols./ 100 ml)	Streptococci, fecal, (cols./ 100 ml)	*Escherichia coli* (cols./ 100 ml)
11N/19E-14N03	08-15-89	17.0	195	6.8	6.3	--	--	1.30	<1	<1	<1
11N/19E-15E02	07-12-89	18.0	225	6.8	6.6	--	--	1.80	<1	<1	<1
11N/19E-15F01	07-12-89	16.5	218	6.8	6.0	0.020	0.20	1.80	<1	<1	<1
11N/19E-15F02	07-12-89	17.0	225	7.6	4.5	--	--	1.40	<1	<1	<1
11N/19E-15F03	08-25-89	14.5	235	6.9	7.7	--	--	1.10	<1	<1	<1
11N/19E-16A01	09-27-89	15.5	202	6.6	6.0	--	--	.90	<1	<1	<1
11N/19E-16J02	09-27-89	15.5	235	6.9	5.8	--	--	1.40	<1	<1	<1
11N/19E-16D01	07-13-89	17.0	255	7.5	4.9	--	--	1.90	<1	<1	<1
11N/19E-17J01	07-14-89	15.0	301	7.1	6.3	--	--	2.90	<1	<1	<1
11N/19E-17N01	07-13-89	15.0	263	6.8	6.9	--	--	4.00	<1	<1	<1
11N/19E-17P01	08-24-89	15.5	227	7.1	6.5	--	--	2.10	<1	<1	<1
11N/19E-18D01	07-13-89	18.0	316	7.1	4.5	--	--	2.10	<1	<1	<1
11N/19E-18N01	08-14-89	14.5	311	7.0	4.8	<.010	.30	2.60	<1	<1	<1
11N/19E-18N02	08-14-89	15.0	300	7.0	5.4	--	--	2.30	<1	<1	<1
11N/19E-19E02	09-15-89	16.0	283	7.4	--	--	--	2.50	K3	K1	K1
11N/19E-20H01	07-14-89	13.5	277	7.3	6.6	--	--	2.20	<1	<1	<1
11N/19E-20H02	07-14-89	14.0	244	7.3	6.6	--	--	1.90	<1	<1	<1
11N/19E-21Q02	07-11-89	14.5	289	7.3	6.2	--	--	2.80	<1	<1	<1
11N/19E-21R01	07-11-89	15.5	267	7.0	6.6	--	--	2.40	<1	<1	<1
11N/19E-22A01	07-13-89	15.5	155	6.9	6.2	--	--	1.70	<1	<1	<1
11N/19E-22A02	08-24-89	14.0	208	6.9	6.7	--	--	1.40	<1	<1	<1
11N/19E-22A05	07-11-89	15.0	195	6.7	5.6	--	--	1.40	<1	<1	<1
11N/19E-22M01	07-19-89	15.0	199	7.1	6.4	--	--	2.00	<1	<1	<1
11N/19E-23A01	07-12-89	16.0	225	7.6	.7	.020	<.20	.60	<1	<1	<1
11N/19E-23E01	08-24-89	17.0	204	6.8	6.7	--	--	1.30	<1	<1	<1
11N/19E-23Q03	07-17-89	16.0	187	6.8	3.4	--	--	3.50	<1	<1	<1
11N/19E-24H01	07-12-89	16.0	155	6.1	5.8	--	--	.60	<1	<1	<1
11N/19E-24R01	08-15-89	14.0	164	6.8	4.4	--	--	.50	<1	<1	<1
11N/19E-25B01	07-12-89	15.5	179	6.8	6.9	--	--	1.20	<1	<1	<1
11N/19E-25B02	08-15-89	17.0	205	7.0	--	--	--	1.80	12	K33	11
11N/19E-25C01	08-24-89	15.0	201	6.8	6.3	--	--	1.90	<1	<1	<1
11N/19E-26A02	09-15-89	15.5	180	6.9	3.0	--	--	2.40	<1	<1	<1
11N/19E-26C01	08-24-89	15.0	260	6.9	7.7	--	--	3.40	<1	<1	<1
11N/19E-26C02	07-12-89	16.0	196	6.9	7.4	--	--	2.40	<1	<1	<1
11N/19E-27D03	07-11-89	14.5	272	7.1	6.5	--	--	2.50	<1	<1	<1
11N/19E-27R01	07-13-89	15.5	248	7.1	4.9	--	--	2.80	<1	<1	<1
11N/19E-28A01	09-27-89	16.0	260	6.6	7.3	<.010	<.20	4.00	<1	<1	<1
11N/19E-28C01	07-11-89	15.5	289	7.2	6.6	--	--	3.10	<1	<1	<1
11N/19E-28E01	07-11-89	14.0	258	6.8	7.3	--	--	2.40	<1	<1	<1
11N/19E-28P01	07-14-89	14.0	290	7.1	7.6	--	--	2.80	<1	<1	<1
11N/19E-29N01	07-20-89	13.5	308	7.0	6.2	--	--	7.00	<1	<1	<1
11N/19E-29N02	07-20-89	14.5	278	7.4	7.8	--	--	2.80	<1	<1	<1
11N/19E-30D02	07-14-89	13.5	261	7.0	6.4	--	--	1.60	<1	<1	<1
11N/19E-30D03	08-25-89	14.0	259	6.8	5.7	--	--	2.30	<1	<1	<1
11N/19E-31F01D1	07-14-89	--	261	7.6	6.4	--	--	1.90	<1	<1	<1
11N/19E-33E01	07-21-89	14.5	228	7.1	6.0	--	--	2.60	<1	<1	<1
11N/19E-34C01	07-13-89	16.5	271	7.3	5.2	--	--	2.80	<1	<1	<1
11N/19E-34E01	07-13-89	17.5	260	7.1	6.8	--	--	3.20	<1	<1	<1
11N/19E-34M02	07-26-89	16.0	299	7.3	6.1	<.010	<.20	3.40	<1	<1	<1
11N/19E-35A02	07-27-89	15.0	276	7.1	6.1	--	--	4.60	<1	<1	<1

Table 2.--Ground-water-quality data, July-September, 1989--Continued

Local well number	Date	Temperature water (Deg C)	Specific conductance (µS/cm)	pH (standard units)	Oxygen, Dissolved (mg/L)	Nitrogen, ammonia total (mg/L as N)	Nitrogen, ammonia+organic total (mg/L as N)	Nitrogen, NO_2 $+NO_3$ total (mg/L as N)	Coliform, fecal, (cols./ 100 ml)	Streptococci, fecal, (cols./ 100 ml)	*Escherichia coli* (cols./ 100 ml)
11N/19E-35G01	07-13-89	14.0	278	7.4	5.4	--	--	2.90	<1	<1	<1
11N/19E-35G02	07-13-89	14.0	235	7.1	6.0	--	--	2.90	<1	K6	<1
11N/19E-36B01	07-13-89	15.0	189	6.7	5.2	<0.010	0.30	2.40	<1	<1	<1
11N/19E-36P01	07-21-89	15.5	262	6.8	6.0	--	--	4.90	<1	<1	<1
11N/20E-19M01	07-28-89	15.5	172	6.9	4.2	--	--	.40	<1	<1	<1
11N/20E-20M01	09-14-89	16.0	160	6.6	1.3	--	--	.30	<1	<1	<1
11N/20E-28M01	08-08-89	--	196	6.9	3.3	--	--	1.70	<1	<1	<1
11N/20E-28N01	07-27-89	14.0	181	6.7	4.3	--	--	1.20	<1	<1	<1
11N/20E-29Q01	07-27-89	14.0	188	6.8	6.2	--	--	2.40	<1	<1	<1
11N/20E-30L01	07-26-89	16.0	180	7.0	6.4	--	--	1.00	<1	K1	<1
11N/20E-30M01	08-08-89	15.0	180	6.9	5.8	--	--	1.10	<1	<1	<1
11N/20E-30R01	08-07-89	15.0	168	7.0	5.2	--	--	.40	<1	<1	<1
11N/20E-31D02	08-14-89	15.5	210	6.9	5.6	--	--	1.90	<1	<1	<1
11N/20E-31E02	08-14-89	16.0	180	6.7	4.6	--	--	1.10	<1	<1	<1
11N/20E-31E03	08-08-89	15.5	200	6.9	5.8	--	--	1.60	<1	K2	<1
11N/20E-32N01	08-14-89	18.0	180	6.7	5.2	--	--	1.10	<1	<1	<1
11N/20E-33N03	08-07-89	15.0	--	6.8	5.3	<.010	.30	3.00	<1	<1	<1
11N/20E-33N04	08-07-89	14.0	234	6.9	5.7	--	--	4.70	<1	<1	<1
11N/20E-34R01	09-26-89	14.0	110	7.4	2.9	--	--	.20	<1	K1	<1
12N/18E-23N02	08-17-89	26.0	310	8.6	.2	.020	<.20	<.10	<1	<1	<1
12N/18E-26C01	08-29-89	24.5	300	7.9	.0	.020	<.20	<.10	<1	<1	<1
12N/18E-27N02D1	08-30-89	23.5	265	7.9	.0	.030	<.20	<.10	<1	<1	<1
12N/18E-35H01	08-30-89	16.0	565	7.5	3.7	--	--	3.20	<1	<1	<1
12N/18E-35Q01	08-16-89	14.5	1,120	7.3	2.7	--	--	3.80	<1	<1	<1
	08-30-89	14.5	1,020	7.2	2.8	--	--	4.30	<1	<1	<1
12N/18E-36J01	08-16-89	15.5	370	7.6	--	--	--	2.70	<1	K5	<1
	08-25-89	13.0	352	7.0	9.2	--	--	2.50	<1	<1	<1
12N/19E-19N01	08-15-89	17.5	430	8.0	.3	.050	<.20	<.10	<1	<1	<1
12N/19E-20E01	08-23-89	14.5	158	8.4	1.1	.010	<.20	<.10	<1	<1	<1
12N/19E-20F01	08-23-89	15.0	149	8.6	.2	<.010	<.20	<.10	<1	<1	<1
12N/19E-20M01	08-24-89	14.0	167	8.4	.6	<.010	<.20	<.10	<1	<1	<1
12N/19E-20P02	08-23-89	15.0	228	6.8	2.1	<.010	.40	.40	<1	<1	<1
12N/19E-28N01	08-24-89	15.5	315	7.6	.2	.010	1.0	<.10	<1	<1	<1
12N/19E-29B03	08-23-89	15.5	375	7.7	.7	<.010	<.20	<.10	<1	<1	<1
12N/19E-29B04	08-30-89	14.5	648	7.6	.0	.010	.20	<.10	<1	<1	<1
12N/19E-29G01	08-10-89	14.0	887	7.5	4.1	--	--	5.70	K4	K5	K1
12N/19E-29G02	08-10-89	15.5	430	7.3	5.6	--	--	.70	<1	7	K1
12N/19E-29G03	08-24-89	13.5	680	8.0	.3	.010	.30	<.10	<1	K5	<1
12N/19E-30G01	08-24-89	15.5	298	8.0	3.1	--	--	<.10	<1	<1	<1
12N/19E-30L01	08-16-89	14.0	320	7.5	4.2	--	--	1.10	<1	<1	<1
12N/19E-30L02	09-13-89	15.5	419	7.9	.0	.030	<.20	<.10	<1	K1	<1
12N/19E-32G01	09-11-89	15.5	297	7.9	3.7	--	--	<.10	<1	<1	<1
12N/19E-32H01	09-11-89	14.5	271	7.4	4.9	--	--	1.50	<1	<1	<1
12N/19E-32H02	09-11-89	15.0	261	7.4	4.9	<.010	<.20	1.40	<1	<1	<1
12N/19E-32K01	08-25-89	15.0	227	6.7	5.6	--	--	2.20	<1	<1	<1
12N/19E-32N01	09-11-89	15.0	214	7.1	6.4	--	--	1.60	<1	<1	<1
12N/19E-32R01	08-25-89	17.0	270	6.6	6.8	--	--	3.70	<1	K5	<1
12N/19E-33D01	08-10-89	15.0	265	7.3	4.1	<.010	.70	1.30	<1	<1	<1

Table 3.--Surface-water quality data, October-November 1989

[Deg C, degrees Celsius; µS/cm, microsiemens per centimeter at 25°Celsius; mg/L, milligrams per liter; cols./100 ml, colonies per 100 milliliters; <, less than; --, constituents not analyzed for; E, estimated number based on count of only part of the plate; K, number based on count outside of ideal range]

Site number	Date	Time	Discharge inst. (cubic feet per second)	Temperature water (Deg C)	Specific conductance (µs/cm)	pH (standard units)	Oxygen, dissolved (mg/L)	Nitrogen, NO_2 +NO_3 dissolved (mg/L as N)	Nitrogen, ammonia+ organic dissolved (mg/L as N)	Nitrogen, ammonia dissolved (mg/L as N)	Coliform, fecal, 0.7 um-mf (cols./ 100 ml)	Streptococci, fecal, kf agar (cols./ 100 ml)	*Escherichia-coli* (cols./ 100 ml)
1	11-01-89	1630	1.17	9.0	210	7.6	10.7	0.35	--	--	32	140	K7
2	10-25-89	1145	4.90	12.7	321	7.8	10.8	1.50	--	--	36	190	48
3	10-25-89	1700	6.51	13.6	281	8.1	11.8	3.20	--	--	K14	82	K8
4	10-27-89	1330	6.58	14.0	218	7.5	8.7	1.80	0.60	0.01	41	220	34
5	10-31-89	1655	13.2	14.0	282	7.5	11.2	2.90	--	--	28	180	K7
6	10-27-89	1050	.22	8.7	342	7.7	8.6	4.90	--	--	K14	170	K6
7	10-31-89	1445	14.4	12.7	288	7.8	11.6	3.90	--	--	K13	190	K21
8	10-24-89	1530	10.6	14.6	302	8.0	10.0	4.60	--	--	67	150	49
9	10-24-89	1210	.31	10.3	1,360	8.1	8.8	.28	--	--	210	5,000	280
10	10-24-89	1430	11.1	13.7	293	8.4	12.7	4.10	--	--	120	160	K73
11	10-30-89	1505	.47	12.3	241	9.1	14.2	3.00	--	--	48	E4,700	K13
12	10-31-89	1100	2.12	13.3	270	8.1	12.8	2.90	--	--	21	120	K11
13	10-31-89	1230	.36	11.3	236	9.1	16.2	3.00	--	--	K5	150	K9
14	10-24-89	0920	.16	7.2	1,560	8.1	8.6	.29	--	--	130	4,900	150
15	10-25-89	1610	.64	11.3	220	7.7	9.2	1.30	--	--	23	260	24
16	10-27-89	1220	.30	11.3	220	7.6	9.4	1.70	--	--	K5	520	K6
17	10-30-89	1615	19.2	14.7	305	7.3	5.7	4.40	--	--	K2,500	520	K1,000
18	10-25-89	1210	12.3	13.5	385	7.9	11.3	6.00	--	--	57	30	20
19	10-26-89	1110	2.96	12.8	332	7.9	9.7	5.50	--	--	61	120	70
20	10-25-89	0945	28.9	11.5	406	7.9	8.8	5.80	--	--	K62	78	29
21	10-25-89	1110	3.65	13.5	366	6.9	6.2	6.00	--	--	22	570	K8
22	10-24-89	1100	222	12.5	348	7.9	9.0	4.20	--	--	120	240	56
23	10-23-89	1600	343	13.8	315	8.0	8.8	3.60	--	--	320	920	K60
24	10-25-89	1500	17.9	13.3	592	8.3	12.3	3.20	.60	.02	100	240	71
25	10-26-89	1050	4.09	7.2	161	8.0	10.8	<.10	--	--	K15	54	K15
26	11-01-89	1315	13.7	11.0	457	8.5	13.8	1.20	--	--	67	K65	K3
27	10-26-89	1255	3.64	7.1	130	7.8	--	<.10	--	--	97	330	68
28	11-01-89	1550	8.60	9.1	348	8.0	--	.57	--	--	K21	130	K12
29	11-02-89	1500	4.83	7.1	289	8.0	10.4	.25	--	--	150	590	80
30	11-01-89	1240	1.19	5.4	219	7.9	11.4	<.10	--	--	180	93	77
31	10-27-89	1000	.63	12.6	222	7.1	5.6	1.80	--	--	22	200	K19
32	10-27-89	1150	3.55	15.0	192	7.6	7.2	1.60	--	--	67	200	46
33	10-31-89	1500	26.8	13.6	242	7.9	10.2	2.50	--	--	200	230	110
34	10-24-89	1215	31.6	9.5	497	8.1	8.8	.12	--	--	100	96	38
35	10-26-89	1200	1.23	9.2	226	8.0	9.5	<.10	--	--	80	K1,700	53
36	11-02-89	1300	35.6	7.2	515	8.1	9.8	.77	--	--	K20	85	K14
37	10-24-89	1000	56.3	9.8	426	8.1	9.3	1.30	--	--	320	460	250
38	10-26-89	1445	51.8	11.2	508	8.2	10.0	1.70	--	--	210	160	120
39	11-02-89	1540	.49	4.8	165	7.7	11.4	<.10	<.20	<.01	K12	39	K14
40	11-01-89	1440	17.4	6.4	142	7.9	12.0	<.10	--	--	K3	K6	K4
41	10-26-89	1545	.13	10.9	1,510	6.0	11.4	3.20	--	--	K5	67	K4
42	10-24-89	1630	3.22	10.6	367	7.8	9.5	.12	--	--	120	290	74
43	10-31-89	1100	9.33	12.3	310	7.6	9.9	4.40	--	--	54	240	33
44	10-26-89	0950	2.06	15.7	342	6.6	3.8	.41	--	--	110	210	83
45	10-23-89	1510	.50	11.7	1,440	7.9	6.4	.58	--	--	3,300	29,000	2,000
46	10-26-89	1600	3.22	11.5	665	8.2	9.4	1.10	.60	.04	77	250	130
47	10-27-89	1010	.67	10.6	230	7.5	7.1	2.10	--	--	54	250	43
48	10-26-89	1355	1.56	13.3	285	7.4	5.5	3.20	--	--	K14	51	K10
49	10-31-89	0925	.25	3.3	179	7.7	9.6	.37	--	--	28	56	K15
50	10-31-89	1300	72.4	13.2	245	7.5	9.2	2.40	--	--	150	130	110

Table 4.--Concentrations of nitrogen species and bacteria in duplicate samples

[mg/L, milligrams per liter; cols./100 ml, colonies per 100 milliliters; <, less than; --, constituent not analyzed for; K, number based on count outside of ideal range]

Local well number	Date	Nitrogen, ammonia total (mg/L as N)	Nitrogen, ammonia +organic total (mg/L as N)	Nitrogen, NO_2 $+NO_3$ total (mg/L as N)	Coliform, fecal (cols./ 100 ml)	Streptococci, fecal (cols./ 100 ml)	*Escherichia-coli* (cols./ 100 ml)
10N/16E-01C01	08-17-89	<0.01	0.30	1.9	<1	<1	<1
		--	--	1.5	<1	<1	<1
10N/16E-12B01	08-24-89	<.01	<.20	.10	<1	8	<1
		--	--	.10	<1	10	<1
10N/17E-05L05	08-29-89	<.01	<.20	.70	<1	<1	<1
		<.01	<.20	.70	--	--	--
10N/17E-07R02	08-30-89	--	--	.50	<1	<1	<1
		--	--	.50	<1	<1	<1
10N/17E-08N01	08-29-89	<.01	<.20	<.10	<1	<1	<1
		<.01	<.20	--	--	--	--
10N/17E-11C01	09-15-89	.02	<.20	<.10	<1	<1	<1
		--	--	<.10	<1	1	<1
10N/17E-18M01	09-01-89	<.01	<.20	.30	<1	<1	<1
		--	--	.30	<1	<1	<1
10N/17E-19M01	09-13-89	<.01	<.20	1.20	<1	<1	<1
		--	--	1.20	<1	<1	<1
10N/17E-26B01	09-15-89	.03	<.20	<.10	<1	<1	<1
		--	--	<.10	<1	<1	<1
10N/18E-02Q01	07-20-89	<.01	4.3	5.10	<1	<1	<1
		.02	<.20	5.10	<1	<1	<1
10N/18E-02P01	08-31-89	<.01	<.20	5.10	<1	<1	<1
		--	--	5.10	<1	<1	<1
10N/18E-04C02	08-25-89	<.01	.30	1.50	K2	K8	K2
		<.01	1.9	1.50	--	--	--
10N/18E-16N01	09-13-89	.20	.40	<.10	<1	<1	<1
		--	.50	--	--	--	--
10N/18E-34C01	07-28-89	<.01	<.20	.80	<1	<1	<1
		--	--	.80	<1	<1	<1
10N/19E-07B03	07-18-89	<.01	.20	2.20	<1	<1	<1
		--	--	2.20	<1	<1	<1
10N/19E-08N02	09-13-89	.01	<.20	2.70	<1	<1	<1
		--	--	2.70	<1	<1	<1
10N/19E-21D02	08-14-89	<.01	<.20	3.30	<1	<1	<1
		--	--	3.40	<1	<1	<1
10N/20E-01P01	07-24-89	.01	.40	3.30	<1	8	<1
		--	--	3.30	K1	K6	<1
10N/20E-07P01	07-20-89	<.01	1.2	4.00	<1	<1	<1
		--	--	4.00	<1	<1	<1
10N/20E-17P01	08-08-89	<.01	<.20	4.50	<1	<1	<1
		--	--	4.50	<1	<1	<1
10N/20E-20K01	07-24-89	.01	.40	3.80	<1	<1	<1
		--	--	3.80	<1	<1	<1
10N/21E-18D01	07-26-89	<.01	.30	4.60	<1	<1	<1
		--	--	4.60	<1	<1	<1

Table 4.--Concentrations of nitrogen species and bacteria in duplicate samples--Continued

Local well number	Date	Nitrogen, ammonia total (mg/L as N)	Nitrogen, ammonia +organic total (mg/L as N)	Nitrogen, NO_2 $+NO_3$ total (mg/L as N)	Coli-form, fecal (cols./ 100 ml)	Strepto-cocci, fecal (cols./ 100 ml)	*Escher-ichia-coli* (cols./ 100 ml)
10N/21E-35J01	08-24-89	<0.01	1.0	3.40	<1	<1	<1
		--	--	3.50	<1	<1	<1
11N/16E-25J02	08-21-89	<.01	<.20	.70	<1	<1	<1
		--	--	.70	<1	<1	<1
11N/17E-03L02	09-14-89	.02	.20	<.10	<1	<1	<1
		--	--	--	<1	<1	<1
11N/17E-12R01	08-08-89	.01	<.20	<.10	<1	<1	<1
		.02	<.20	--	--	--	--
11N/17E-16H01	08-09-89	.03	<.20	<.10	<1	<1	<1
		--	--	<.10	<1	<1	<1
11N/17E-16R03	09-01-89	<.01	<.20	2.60	<1	<1	<1
		--	--	2.50	<1	<1	<1
11N/18E-07P01	06-27-89	--	--	.90	<1	<1	<1
		--	--	.90	--	--	--
11N/18E-10C01	08-17-89	--	--	23.0	<1	<1	<1
		--	--	20.0	<1	<1	<1
11N/18E-10D01	09-27-89	--	--	2.40	<1	<1	<1
		--	--	2.40	<1	<1	<1
11N/18E-13R01	06-21-89	--	--	1.80	<1	<1	<1
		--	--	1.80	--	--	--
11N/18E-22D01	08-07-89	--	--	7.80	<1	<1	<1
		--	--	1.80	<1	<1	<1
11N/18E-25M02	06-23-89	--	--	3.70	<1	<1	<1
		--	--	3.70	--	--	--
11N/18E-26M03	06-29-89	.02	<.20	<.10	<1	<1	<1
		.02	<.20	<.10	--	--	--
11N/18E-31A01	08-03-89	.01	<.20	3.30	<1	<1	<1
		--	--	3.30	<1	<1	<1
11N/19E-08J01	07-07-89	.01	.40	1.60	<1	<1	<1
		--	--	1.60	--	--	--
11N/19E-10P01	07-17-89	--	--	1.20	K1	<1	<1
		--	--	1.30	<1	K1	<1
11N/19E-15F01	07-12-89	.02	.20	1.80	<1	<1	<1
		--	--	1.80	<1	<1	<1
11N/19E-18N01	08-14-89	<.01	.30	2.60	<1	<1	<1
		<.01	<.20	2.50	<1	<1	<1
11N/19E-23A01	07-12-89	.02	<.20	.60	<1	<1	<1
		--	--	.60	--	--	--
11N/19E-28A01	09-27-89	<.01	<.20	4.00	<1	<1	<1
		--	--	4.10	<1	<1	<1
11N/19E-34M02	07-26-89	<.01	<.20	3.40	<1	<1	<1
		--	--	3.40	<1	<1	<1
11N/19E-36B01	07-13-89	<.01	.30	2.40	<1	<1	<1
		--	--	2.10	,1	<1	<1
11N/20E-33N03	08-07-89	<.01	.30	3.00	<1	<1	<1
		--	--	2.40	<1	<1	<1
12N/19E-20F01	08-23-89	<.01	<.20	<.10	<1	<1	<1
		<.01	<.20	<.10	<1	<1	<1

Table 4.--Concentrations of nitrogen species and bacteria in duplicate samples--Continued

Local well number	Date	Nitrogen, ammonia total (mg/L as N)	Nitrogen, ammonia +organic total (mg/L as N)	Nitrogen, NO_2 $+NO_3$ total (mg/L as N)	Coli-form, fecal (cols./ 100 ml)	Strepto-cocci, fecal (cols./ 100 ml)	*Escher-ichia-coli* (cols./ 100 ml)
12N/19E-32H02	09-11-89	<0.01	<0.20	1.40	<1	<1	<1
		--	--	1.40	<1	<1	<1
12N/19E-33D01	08-10-89	<.01	.70	1.30	<1	<1	<1
		--	--	1.30	--	--	--
Surface-water site number							
4	10-27-89	.01	.60	1.80	41	220	34
		--	--	1.90	38	190	22
24	10-25-89	.02	.60	3.20	100	240	71
		--	--	3.20	110	290	66
39	11-02-89	<.01	<.20	<.10	K12	39	K14
		<.01	.40	<.10	K6	24	K12
46	10-26-89	.04	.60	1.10	77	250	130
		--	--	1.10	83	300	83

Table 5.--Concentrations of nitrogen species in blank samples
[mg/L, milligrams per liter; --, constituent not analyzed for; <, less than]

Date	Nitrogen ammonia total (mg/L as N)	Nitrogen, ammonia+ organic total (mg/L as N)	Nitrogen, NO_2+NO_3 total (mg/L as N)
06-21-89	--	--	<0.10
06-23-89	--	--	<.10
06-27-89	--	--	<.10
06-29-89	<0.01	<0.20	<.10
07-07-89	--	--	<.10
07-12-89	--	--	<.10
07-12-89	--	--	.20
07-13-89	--	--	<.10
07-17-89	--	--	<.10
07-18-89	--	--	<.10
07-20-89	<.01	<.20	<.10
07-20-89	--	--	<.10
07-24-89	--	--	<.10
07-26-89	--	--	<.10
07-26-89	--	--	<.10
07-28-89	--	--	<.10
08-07-89	--	--	<.10
08-07-89	--	--	<.10
08-08-89	<.01	.20	--
08-08-89	--	--	<.10
08-09-89	--	--	<.10
08-10-89	--	--	<.10
08-14-89	--	--	<.10
08-14-89	<.01	<.20	<.10
08-16-89	--	--	<.10
08-17-89	--	--	<.10
08-17-89	--	--	<.10
08-21-89	--	--	<.10
08-23-89	<.01	<.20	<.10
08-24-89	--	--	<.10
08-24-89	--	--	<.10
08-25-89	<.01	.30	<.10
08-29-89	<.01	.20	--
08-29-89	<.01	<.20	<.10
08-30-89	--	--	<.10
08-31-89	--	--	<.10
09-01-89	--	--	<.10
09-01-89	--	--	<.10
09-11-89	--	--	<.10
09-13-89	--	--	<.10
09-13-89	--	--	<.10
09-13-89	--	<.20	--
09-14-89	--	--	<.10
09-15-89	--	--	<.10
09-15-89	--	--	<.10
09-27-89	--	--	<.10
09-27-89	--	--	<.10
10-25-89	--	--	<.10
10-26-89	--	--	<.10
10-27-89	--	--	<.10
11-02-89	<.01	<.20	<.10

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