WATER-QUALITY DATA FOR TWO SURFACE COAL MINES RECLAIMED WITH ALKALINE WASTE OR URBAN SEWAGE SLUDGE, CLARION COUNTY, PENNSYLVANIA, MAY 1983 THROUGH NOVEMBER 1989

by Diana L. Dugas, Charles A. Cravotta III, and David A. Saad

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CONVERSION FACTORS, VERTICAL DATUM, AND ABBREVIATED WATER-QUALITY UNITS

Multiply	By	To obtain
	Length	
inch (in.)	25,400	micrometer
inch (in.)	2.54	centimeter
foot (ft)	0.3048	meter
mile (mi)	1.609	kilometer
	Area	
acre	0.4047	hectare
	Volume	
gallon, U.S. liquid (gal)	3.785	liter
gallon, U.S. liquid (gal)	3,785	milliliter
	Mass	
ton per acre (ton/acre)	2.2417	megagram per hectare
	Temperature	
degree Fahrenheit (°F)	°C=5/9 (°F-32)	degree Celsius

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

Abbreviated water-quality units used in report:

milligrams per liter (mg/L)
micrograms per liter (µg/L)
microsiemens per centimeter at 25 degrees Celsius (µS/cm)
micrometer (µm)

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ABSTRACT

Water-quality and other hydrologic data for two surface coal mines in Clarion County, Pa., were collected during 1983-89 as part of studies conducted by the U.S. Geological Survey in cooperation with the Pennsylvania Department of Environmental Resources. Water samples were collected from streams, seeps, monitor wells, and lysimeters on a monthly basis to evaluate changes in water quality resulting from the addition of alkaline waste or urban sewage sludge to the reclaimed mine-spoil surface. The mines are about 3.5 miles apart and were mined for bituminous coal of the upper and lower Clarion seams of the Allegheny Group of Pennsylvanian age. The coal had high sulfur (greater than 2 weight percent) concentrations. Acidic mine drainage is present at both mines.

At one mine, about 8 years after mining was completed, large quantities (greater than 400 tons per acre) of alkaline waste consisting of limestone and lime-kiln flue dust were applied on two 2.5-acre plots within the 65-acre mine area. Water-quality data for the alkaline-addition plots and surrounding area were collected for 1 year before and 3 years after application of the alkaline additives (May 1983-July 1987). Data collected for the alkaline-addition study include ground-water level, surface-water discharge rate, temperature, specific conductance, pH, and concentrations of alkalinity, acidity, sulfate, iron (total and ferrous), manganese, aluminum, calcium, and magnesium. At the other mine, about 3.5 years after mining was completed, urban sewage sludge was applied over 60 acres within the 150-acre mine area. Water-quality data for the sludge-addition study were collected for 3.5 years after the application of the sludge (June 1986-December 1989). Data collected for the sludge-addition study include the above constituents plus dissolved oxygen, redox potential (Eh), and concentrations of dissolved solids, phosphorus, nitrogen species, sulfide, chloride, silica, sodium, potassium, cyanide, arsenic, barium, boron, cadmium, chromium, copper, lead, mercury, molybdenum, nickel, selenium, strontium, and zinc. Climatic data, including monthly average temperature and cumulative precipitation, from a nearby weather station for the period January 1983 through December 1989 also are reported.

INTRODUCTION

Many surface coal mines in the northern Appalachian coal fields, although reclaimed, produce acidic mine drainage (AMD), in which total mineral acidity exceeds alkalinity. AMD has degraded the aquatic habitat and the quality of water supplies over extensive areas of western Pennsylvania (Hornberger and others, 1990). AMD typically contains large concentrations of sulfate, iron, and other solutes that are dissolved from reactive minerals in the mined coal and overburden, and results mainly from the accelerated oxidation of pyrite (Stumm and Morgan, 1981, p. 469-471; Kleinmann and others, 1981; Cathles, 1982). By implementing improved mining and reclamation techniques, however, pyrite oxidation potentially can be slowed or inhibited and AMD can be abated (Kleinmann and others, 1981; Erickson and others, 1982). Several innovative techniques involve the use of industrial or municipal waste materials as additives to mine spoil after reclamation. The addition of alkaline waste (Waddell, 1978; Waddell and others, 1980; Geidel, 1982; Lusardi and Erickson, 1985; Taylor and Schumam, 1988; Brady and others, 1990) or municipal sewage sludge (Sopper, 1985; Blickwedel and Linn 1987; Daniels and Haering, 1990) can create less acidic or less toxic conditions, respectively, that can inhibit pyrite oxidation in the underlying mine spoil and should improve mine-soil conditions for revegetation. Studies were conducted by the U.S. Geological Survey (USGS), in cooperation with the Pennsylvania Department of Environmental Resources (PaDER),

at two reclaimed surface coal mines in western Pennsylvania (fig. 1) to determine the effects of surficial applications of alkaline materials or sewage sludge on pyritic mine spoil. The mines are about 3.5 mi apart and involved mining of the same high-sulfur (greater than 2 weight percent), bituminous coal seams. At one mine, calcareous materials (limestone-quarry waste and lime-kiln flue dust) were applied, and at the other, composted sewage sludge was applied several years after mining and reclamation were completed.

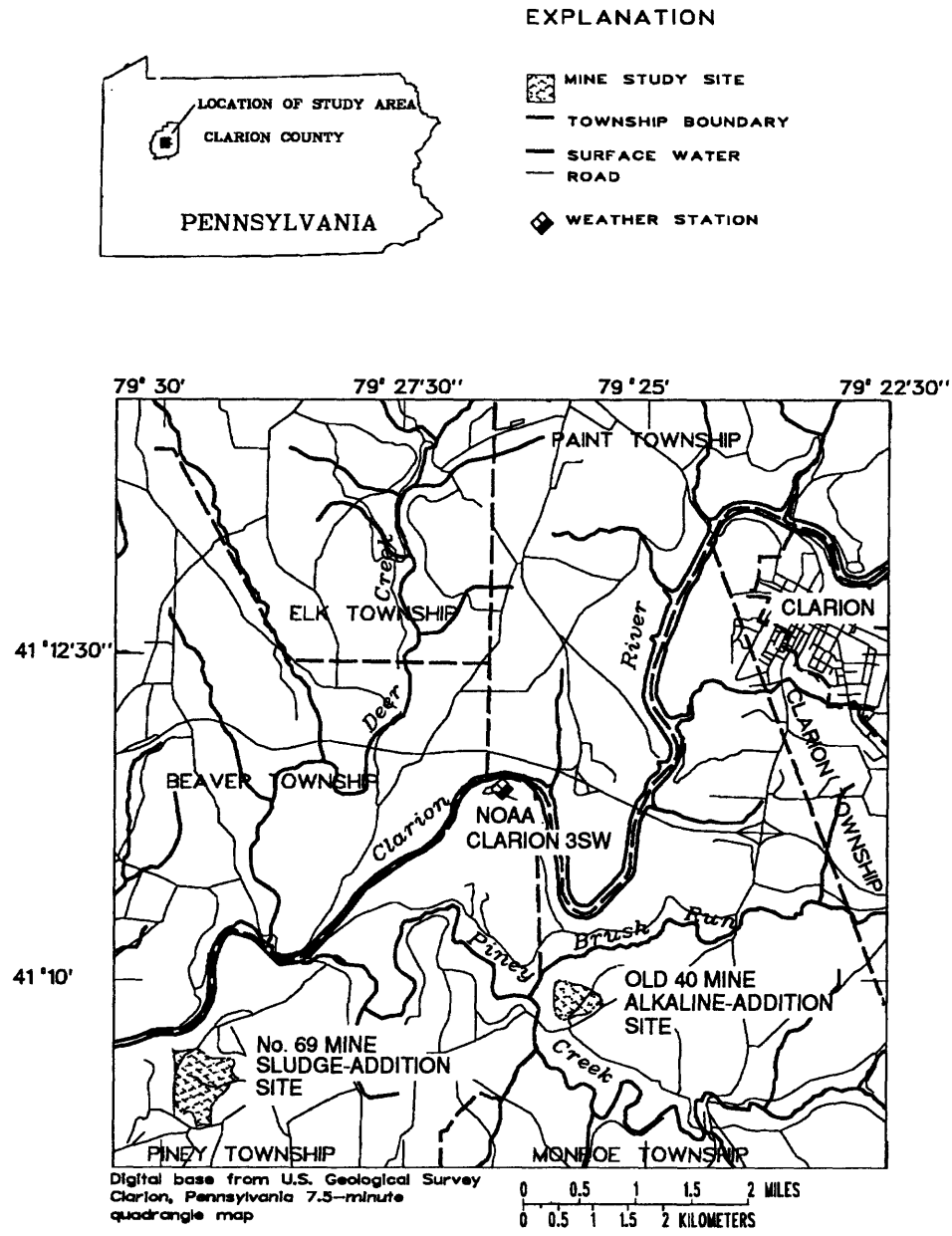

Figure 1.--Locations of two surface coal mine study sites, Old 40 mine and C&K No. 69 mine, and National Oceanic and Atmospheric Administration weather monitoring station, Clarion 3SW, in Clarion County, Pennsylvania.

Purpose and Scope

This report presents water-quality and other hydrologic data for surface and ground-water samples from two reclaimed surface coal mines in Clarion County, Pa. Data for constituents indicated in table 1 were collected by the USGS on a monthly basis for at least 3 years during 1983-89. Descriptions of the mines and methods of data collection are presented in the following sections.

Acknowledgments

The authors gratefully acknowledge cooperation from C&K Coal Company of Clarion, Pa., for providing construction support at the mines and for providing information on the mining and reclamation activities. We thank the land owners, Mr. W.W. Baltzer for allowing access to the Old 40 mine, and C&K Coal Company for allowing access to the No. 69 mine. Dr. Richard Parizek of the Pennsylvania State University played a critical role in the study design and construction of the monitoring network for the alkaline-addition study. Nevin Strock, Joseph Tarentino, and Laurie Odenthall of the PaDER provided mine-permit information. Thanks are due to PaDER Laboratory personnel, especially Vince White (retired), Linda Cohen, Lynn Schaffer, and Dennis Neuin, for providing analytical services.

Table 1.--Water-quality analytical techniques and reporting levels

[mg/L, milligram per liter; µg/L, microgram per liter; °C, degree Celsius; µS/cm, microsiemens per centimeter at 25 degrees Celsius; ft, foot; ft^3/s, cubic feet per second; mV, millivolt; <, less than; >, greater than; NA, not applicable

Constituent	Units[a]	Parameter code[a]	Lab schedule[b]	Analytical techniques	Reporting levels[c]
Acidity, methyl orange, as $CaCO_3$[d]	(mg/L)	00436	437, 435, 635	Titrimetric	<2
Acidity, total, heated, as $CaCO_3$[d]	(mg/L)	70508	437, 435, 635	Titrimetric	>2,000
Alkalinity, water, lab, as $CaCO_3$[d]	(mg/L)	00410	437, 435, 635	Titrimetric	<2
Aluminum, dissolved	(mg/L)	01106	437, 435, 635	ICP emission	<0.035; <0.1; <0.13; <0.14
Altitude of water table, above sea level[d]	(ft)	72020	NA	Electrometric	
Arsenic	(µg/L)	01000	437	ICP emission	<4; <5; <10; <20; <40; <80; <100; <1,000
Barium	(µg/L)	01005	437	ICP emission	<10; <20; <50; <100; <500
Boron	(µg/L)	01022	437	Colorimetric	<200; <250
Cadmium	(µg/L)	01025	437	ICP emission	<0.2; <0.24; <0.5; <1; <6.6; <10
Calcium, dissolved[d]	(mg/L)	00915	437, 435, 635	ICP emission	
Chloride, total	(mg/L)	00940	437	Ferricyanide	<0.1; <1
Chromium	(µg/L)	01030	437	ICP emission	<10; <25; <50; <500
Copper	(µg/L)	01040	437	ICP emission	<10; <19; <25; <50
Cyanide, total, as CN	(mg/L)	00720	437	Colorimetric	<0.001; <0.005
Iron, dissolved[d]	(mg/L)	01046	437, 435, 635	ICP emission	<0.01; <0.1; >1,000; >1,400
Iron, ferrous, dissolved[d]	(mg/L)	01047	437, 435	Colorimetric	<0.1
Lead	(µg/L)	01049	437	Atomic absorption	<4; <5; <10; <20; <40; <50; <80
Magnesium, dissolved[d]	(mg/L)	00925	437, 435, 635	ICP emission	>60
Manganese, dissolved[d]	(mg/L)	01056	437, 435, 635	ICP emission	<0.01; <0.1; <40;>50
Mercury	(µg/L)	71890	437	ICP emission	<1

Table 1.--Water-quality analytical techniques and reporting levels--Continued

[mg/L, milligram per liter; µg/L, microgram per liter; °C, degree Celsius; µS/cm, microsiemens per centimeter at 25 degrees Celsius; ft, foot; ft^3/s, cubic feet per second; mV, millivolt; <, less than; >, greater than; NA, not applicable

Constituent	Units[a]	Parameter code[a]	Lab schedule[b]	Analytical techniques	Reporting levels[c]
Molybdenum	(µg/L)	01060	437	ICP emission	<70; <74; <300; <700
Nickel	(mg/L)	01065	437	ICP emission	<0.025
Nitrogen, ammonia, total, as N	(mg/L)	00610	437	Colorimetric	<0.01; <0.60; <1; <1.4
Nitrogen, ammonia plus organic, total, as N	(mg/L)	00625	437	Colorimetric	<1; <2
Nitrogen, nitrate, total, as N	(mg/L)	00620	437	Colorimetric	<0.002; <0.004; <0.02; <0.04
Nitrogen, nitrite, total, as N	(mg/L)	00615	437	Colorimetric	<0.002; <0.004; <0.018
Oxidation reduction potential, Eh	(mV)	00090	NA	Electrometric	
Oxygen, dissolved	(mg/L)	00300	NA	Electrometric	
pH, field[d]	(units)	00400	NA	Electrometric	
pH, lab[d]	(units)	00403	437, 435, 635	Electrometric	
Phosphorus, total, as P	(mg/L)	00665	437	Colorimetric	<0.02
Potassium, dissolved	(mg/L)	00935	437	ICP emission	<0.13; <0.14
Selenium	(µg/L)	01145	437	ICP emission	<6; <7.5; <15; <30; <60; <150; <300; <1,000
Silica, as SiO_2	(mg/L)	00955	437	ICP emission	<4.3
Sodium, dissolved	(mg/L)	00930	437	ICP emission	<0.2; <2
Solids, residue at 105 °C, dissolved	(mg/L)	00515	437	Gravimetric	
Specific conductance[d]	(µS/cm)	00095	437, 435, 635	Electrometric	>8,000
Streamflow/discharge, instantaneous[d]	(ft^3/s)	00061	NA	Volumetric	
Strontium	(µg/L)	01080	437	ICP emission	<100
Sulfate, total, as SO_4[d]	(mg/L)	00945	437, 435, 635	Methylthymol blue	<10; <40; >1,900
Sulfide, as S[e]	(mg/L)	00745	NA	Titrimetric	<0.2
Temperature, water[d]	(°C)	00010	NA	Thermometric	
Zinc, dissolved	(mg/L)	01090	437	ICP emission	<0.01

[a] Each constituent has a unique parameter code with particular units of measure by definition. However, the following constituents are reported with units of milligrams per liter instead of micrograms per liter because of the magnitude of concentrations: aluminum, iron, ferrous iron, manganese, nickel, and zinc.

[b] Laboratory analysis conducted by PaDER following methods of Skougstad and others (1979). Laboratory analysis schedules: 635 used May 1983 through December 1983; 435 used January 1984 through May 1986; 437 used June 1986 through November 1989; and NA for field measurements conducted by USGS following methods of Wood (1976) and Buchanan and Somers (1969).

[c] Reporting levels as reported by PaDER Laboratory. Multiple reporting levels result from variable dilution steps.

[d] Water-quality data collected at the alkaline-addition study site during the period of May 1983 - July 1987.

[e] Sulfide measured by USGS following methods of Skougstad and others (1979).

DESCRIPTION OF STUDY AREA

The study area consists of two surface coal mines southwest of the city of Clarion in Clarion County, Pa. (fig. 1). Surface water from the two mines flows northward and westward to tributaries of the Clarion River, which drains into the Allegheny River. Details of the hydrogeologic characteristics of the study area were reported by Buckwalter and others (1981), Henke (1985), Williams and others (in press), Cravotta (1991), and Saad and Cravotta (1991), and are summarized below.

Physiography and Geology

The study area lies within the nonglaciated region of the Appalachian Plateau physiographic province, which is characterized by narrow, steep-sided valleys, rounded hills, and broad, flat-topped uplands. Relatively flat-lying, repetitious strata of sandstone, siltstone, shale, and coal, which were deposited in brackish and marine environments during the Pennsylvanian Period (Williams, 1960), underlie the study area. These strata compose (from oldest to youngest) the Connoquenessing, Mercer, and Homewood Formations of the Pottsville Group; and the Clarion and Kittanning Formations of the Allegheny Group (Berg and others, 1980; 1983; Buckwalter and others, 1981). Locally mined coal resources include the lower and upper Clarion coal and lower and middle Kittanning coal of the respective formations in the Allegheny Group (Glover, 1987). Fine-grained, white-to-gray sandstone and siltstone are the predominant overburden lithologies, and gray, interbedded shale and siltstone lie above and below the coals.

Climate

The local climate is characterized as humid continental, with seasonal and diurnal variations in air temperature and with precipitation each month of the year. Air temperature and precipitation data for the study area are available for a National Oceanic and Atmospheric Administration (NOAA) weather station, Clarion 3SW, within 3 mi of the mines (fig. 1, table 2). In addition, Henke (1985) collected precipitation, temperature, infiltration, and runoff data to determine a hydrologic budget for the Old 40 mine (alkaline-addition site) for the period November 1, 1983, to November 1, 1984.

The mean annual[1] air temperature is 8.7°C. Mean monthly temperatures range from below 0°C in December, January, and February, to nearly 25°C in July and August (table 2). Although freezing temperatures are common during the winter months, periodic warming trends tend to minimize the development of a persistent snowpack throughout the area.

The mean annual[1] precipitation for the area is 44.7 in. During the study period 1983-89, annual precipitation averaged 48.3 in. and ranged from 39.6 in. in 1988-89 to 52.3 in. in 1984-85 (table 2). Monthly precipitation ranged from 0.38 in. in February 1987 to 12.0 in. in November 1985 and June 1989.

RECLAIMED COAL MINES

Alkaline-Waste Site

The alkaline-addition study area includes a reclaimed 65-acre surface coal mine and surrounding 275-acre drainage area about 4 mi southwest of the city of Clarion in Clarion County, Pa. (figs. 1 and 2). The drainage area of the site is bounded by Brush Run on the north and an intermittent tributary on the south, which flow westward to Piney Creek on the west boundary. Piney Creek flows approximately 2 mi northwestward from the mine drainage area to the Clarion River. Elevations within the drainage area range from greater than 1,400 ft to less than 1,140 ft above sea level.

The upper and (or) lower Clarion coals were mined intermittently from 1961 through 1975 mostly by use of a dragline (Henke, 1985; Williams and others, in press). About half the area was mined for the lower Clarion coal leaving an approximately 40-ft highwall separating an upper and lower bench. At the

[1] For this report, the annual calculations are based on the period June through May.

Table 2.--Monthly average air temperature and cumulative precipitation data measured at National Oceanic and Atmospheric Administration weather station Clarion 3SW (411200079260001), 1983-89

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
Monthly average air temperature (degrees Celsius)												
1983	-3.1	-1.4	3.1	6.9	11.9	18.6	20.6	21.4	16.4	10.3	4.2	-5.3
1984	-6.7	0.	-1.9	8.1	11.4	18.6	19.2	20.0	15.0	13.1	2.8	1.7
1985	-6.1	-3.6	3.3	11.1	15.3	16.7	20.3	19.7	17.2	11.1	6.1	-4.7
1986	-4.7	-3.1	3.3	9.7	15.8	19.2	21.7	18.9	16.4	10.8	3.3	-1.1
1987	-4.2	-2.8	3.1	9.7	15.8	20.6	22.5	20.0	16.4	7.8	5.6	.8
1988	-4.7	-3.0	2.8	8.4	15.6	18.4	23.0	22.4	16.8	7.4	5.6	-2.8
1989	-.6	-3.3	3.4	7.3	13.6	19.6	22.3	20.9	17.2	10.9	3.4	-7.7
Average	-4.3	-2.5	2.4	8.7	12.8	17.4	21.4	20.5	16.5	10.2	4.4	-2.7
Monthly cumulative precipitation (inches)												
1983	1.4	1.1	2.2	4.1	6.8	6.9	3.4	6.5	3.6	3.9	4.9	5.1
1984	1.7	3.5	2.8	3.4	6.6	5.6	5.5	7.0	2.4	3.3	5.1	3.8
1985	2.3	1.9	6.5	2.1	4.3	5.5	5.4	6.0	3.8	2.4	12.0	3.0
1986	2.0	4.3	1.8	3.4	2.5	7.3	6.2	4.0	3.9	4.8	4.8	4.1
1987	2.1	.38	3.9	5.0	2.6	7.4	4.0	5.8	8.7	2.5	2.2	2.7
1988	1.4	2.8	1.9	3.1	4.4	1.5	2.9	4.0	2.8	3.3	4.8	2.0
1989	2.2	2.5	4.0	1.7	7.9	12.0	2.1	1.7	5.1	2.4	2.9	1.9
Average	1.9	2.4	2.9	3.3	5.0	6.6	4.2	5.0	4.3	3.2	5.2	3.2

completion of mining, the mine was backfilled with overburden and coal waste, including tipple refuse from other mines, and was regraded to the original hillside configuration. AMD broke out at seeps along several locations in the study area. Detailed descriptions of the history of mining and the hydrogeologic characteristics at the mine were reported by Henke (1985), Diodato and Parizek (1988), and Williams and others (in press).

In May and June 1984, more than 8 years after the mine had been closed, limestone-quarry waste fragments (nearly pure $CaCO_3$) and aged lime-kiln flue dust [mostly $Ca(OH)_2$] were applied on the mine-spoil surface within two 2.5-acre treatment plots, A and B, and a small amount of lime sufficient to promote revegetation was applied to the surrounding area including the 2.5-acre control plot, C (fig. 2). These alkaline waste materials were trucked to the coal mine from a limestone quarry and associated lime plant in Centre County, Pa. (Henke, 1985). Plot A received 40 tons/acre limestone plus 400 tons/acre lime. Plot B received 400 tons/acre limestone plus 120 tons/acre lime. Plot C received only 2.4 tons/acre lime (to promote revegetation). After the application of alkaline materials, the plots were chisel plowed and furrowed perpendicular to the hillslope, seeded, fertilized, and hay mulched.

Surface-water sampling locations at the alkaline-addition site include a ground-water drain, two seeps, and a stream (fig. 2, table 3). The drain and seep locations are downgradient from the mined area. The stream sampling location is upgradient from the drain and the contributing area to the stream is largely unmined. The drain is the outflow of interconnected, perforated pipes that were installed below the land surface by the mine operator to intercept and route upwelling ground water to a treatment pond (fig. 2). The pipe outlet (drain) into the pond was equipped with a continuous, liquid sodium hydroxide dispenser that was disconnected during water-quality sampling and discharge measurements. The seeps are located approximately 500 ft downhill from the mine along a haulroad leading away from the site (fig. 2, HH and HC).

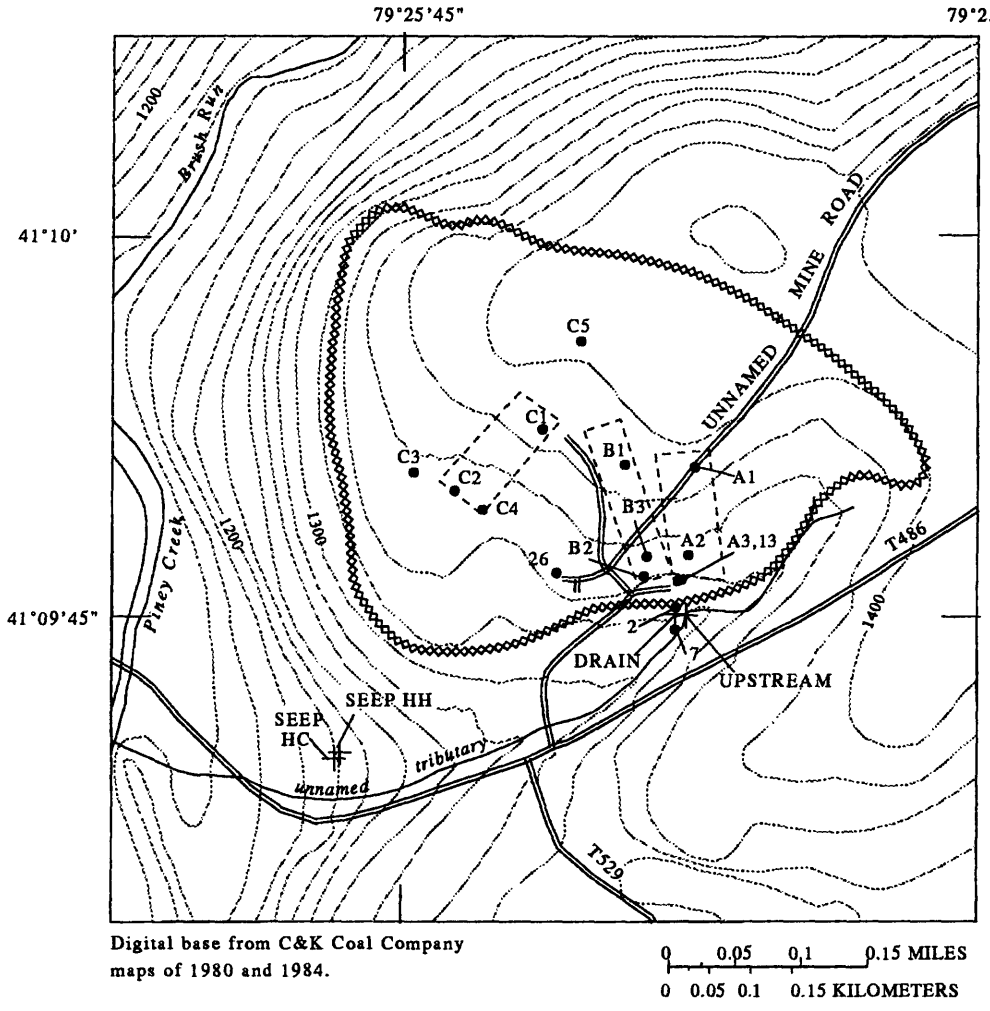

Figure 2.--Topography and water-quality sampling locations at the alkaline-waste site--Old 40 mine.

Table 3.--Description of sampling locations at the alkaline-waste site-- Old 40 mine, Clarion County, Pennsylvania

[NA, not applicable]

Site identification number	Site name[a]	Latitude north	Longitude west	Elevation of land surface (feet)[b]	Depth of borehole (feet)[b]	Depth to screened interval (feet)[b]	Lithology[c]	Surficial treatment[d]
410945079253101	Drain (ground-water y-drain)	41°09'45"	79°25'31"	1,320.0	NA	NA	NA	A+B
410940079254801	Seep HH (HH; haulroad hillside)	41°09'40"	79°25'48"	1,204.0	NA	NA	NA	N?
410939079254901	Seep HC (HC; haulroad channel)	41°09'39"	79°25'49"	1,198.0	NA	NA	NA	N?
410945079253001	Upstream (US; upstream at weir)	41°09'45"	79°25'30"	1,320.0	NA	NA	NA	N
410951079253011	Well A1 (4)	41°09'51"	79°25'30"	1,390.8	86	72-82	BRLC	A
410947079253011	Well A2 (11)	41°09'47"	79°25'30"	1,350.3	46	30-40	SP	A
410946079253011	Well A3 (3 or 3K)	41°09'46"	79°25'30"	1,335.5	48	0-27	SP	A
410951079253311	Well B1 (19)	41°09'51"	79°25'33"	1,388.5	75	55-63	BRCS	B
410947079253311	Well B2 (14)	41°09'47"	79°25'33"	1,343.3	35	25-35	SP	B
410948079253211	Well B3 (24)	41°09'48"	79°25'32"	1,350.0	50	35-45	SP	B
410953079253911	Well C1 (20)	41°09'53"	79°25'39"	1,384.7	67	56-62	BRCS	C
410950079254211	Well C2 (23)	41°09'50"	79°25'42"	1,352.7	41	29-39	SP	C
410951079254511	Well C3 (22)	41°09'51"	79°25'45"	1,354.5	44	32-42	SP	C
410949079254111	Well C4 (21)	41°09'49"	79°25'41"	1,346.2	40	28-38	SP	C
410956079253611	Well C5 (27)	41°09'56"	79°25'36"	1,405.0	80	70-80	BRCS	C
410945079253111	Well 2 (2K)	41°09'45"	79°25'31"	1,328.0	75	60-75	BRHW	A+B?
410944079253111	Well 7 (7K)	41°09'44"	79°25'31"	1,316.1	61	46-61	BRHW	A+B?
410946079253111	Well 13 (13 or 14K)	41°09'46"	79°25'31"	1,335.3	15	8-13	SP	A?
410947079253711	Well 26 (26)	41°09'47"	79°25'37"	1,346.3	40	30-40	SP	C?

[a] Abbreviation or numeral in parentheses refers to surface-drainage name or well-identification number used by Williams and others (in press).

[b] Elevation in feet above sea level; depth of borehole and screened interval in feet below land surface datum. Surface-water site elevations interpolated from topographic map and well location elevations determined by survey from the nearest benchmark.

[c] Lithology: BRLC: bedrock, lower Clarion coal; BRCS: bedrock, shale and sandstone above lower Clarion coal; BRHW: bedrock, Homewood Formation sandstone and shale; SP: spoil, mixed lithologies of Clarion Formation.

[d] Treatment by addition of alkaline materials in May-June, 1984: A, 40 tons/acre crushed limestone + 400 tons/acre lime-kiln flue dust; B, 400 tons/acre crushed limestone + 120 tons/acre lime-kiln flue dust; C, 2.4 tons/acre lime-kiln flue dust; A+B, Probably affected by treatments A and B; N, not treated; and query (?) where treatments uncertain.

Ground-water sampling locations at the alkaline-addition site include 15 monitor wells (fig. 2, table 3), which were installed at various times, 12 by the mine operator or representative prior to 1983, and three by the USGS in 1984. Wells A1, B1, C1, C5, 2, and 7 are screened in bedrock underlying mine spoil, and wells A2, A3, B2, B3, C2, C3, C4, 13, and 26 are screened in mine spoil. Well numbers having the prefix A, B, or C are located within plots A, B, or C, respectively, and those without a letter prefix are outside the plots and are identified by numbers used by Williams and others (in press). The sample-site numbering scheme used by Williams and others (in press) also is indicated in table 3. Each well was constructed of 4-in. diameter polyvinyl-chloride (PVC) pipe and screen installed in separate drill holes. The annulus above the screen was filled with well cuttings and grout and that below the screen with carbonate-free silica sand. Geologic logs for the wells were reported by Williams and others (in press).

Sample Collection and Processing

In May 1983, sample collection and hydrologic monitoring started at the 4 surface-water (stream and seeps) and 12 ground-water (wells) sampling locations (fig. 2, table 3). In April 1984, monitoring started at three additional wells, B1, C1, and C2. Water-quality and other hydrologic data for most locations were collected at monthly intervals from May 1983 through July 1987 as part of a USGS-PaDER study of the effectiveness of alkaline additives in abating AMD (Williams and others, in press; Brady and others, 1990). Seven of these sites also were monitored as control stations for another USGS-PaDER study of the effects of sewage sludge on water quality during June 1986 through September 1989.

Surface-water samples were grab samples; ground-water samples were collected after purging approximately three well volumes of stagnant water from the wells by use of submersible pumps or bailers. Samples from each location were collected in two 1-gal polyethylene jugs for temporary storage until field measurements and sample processing could be completed. Field water-quality measurements, described below, were conducted within 15 minutes after collection.

Water-quality samples were split into three subsamples, processed in the field, and then stored in clean polyethylene bottles on ice until laboratory analysis. A whole-water subsample for laboratory analysis of pH, acidity, alkalinity, specific conductance, and sulfate was capped leaving no head space (air). A second whole-water subsample for analysis of ferrous iron was preserved with sulfuric acid. The third subsample for analysis of major cations (aluminum, calcium, iron, magnesium, and manganese) was filtered though 0.45-µm pore-size nitrocellulose filters, transferred to acid-rinsed bottles, and preserved with nitric acid.

Water-Quality and Hydrologic Data

Water-quality and other hydrologic data for the pre- and post-treatment study periods are contained in the USGS computer data base and are reported in Appendix 1. Field measurements were conducted by USGS personnel following methods of Buchanan and Somers (1969) and Wood (1976) and included instantaneous discharge rate at surface-water sampling locations and ground-water drain or depth to water in wells, pH, specific conductance, and water temperature. Specific conductances measured in the field were not temperature-corrected and were used only for quality-assurance purposes; they are not reported in Appendix 1. Discharge from the ground-water drain was measured volumetrically. Discharge in the stream and seeps was measured by use of v-notch weirs and continuous water-level recorders.

Laboratory analyses were conducted at the PaDER Bureau of Laboratories facility in Harrisburg, Pa., following methods of Skougstad and others (1979) and included measurements of specific conductance, pH, and concentrations of alkalinity, acidity, sulfate, iron (total and ferrous), manganese, aluminum, calcium, and magnesium. The laboratory analytical techniques that were used are reported in table 1.

Urban Sewage Sludge Site

The sludge-addition study area includes a reclaimed 150-acre surface coal mine about 7 mi southwest of the city of Clarion (figs. 1 and 3). The area includes a broad hilltop, surrounded by steep hillsides, and bounded by several small tributaries that flow northward and westward to the Clarion River. Seepage from the mine-spoil banks and outcropping, underlying bedrock flows into these tributaries. Elevations in the study area range from greater than 1,400 ft to less than 1,200 ft above sea level. The ground-water hydrology, rock chemistry, and mineralogy as they effect water quality at the sludge-addition site were reported by Cravotta (1991).

Prior to 1982, the lower Kittanning coal and the upper and lower Clarion coals were mined. Because roughly half of the area was mined only for the lower Kittanning coal (hilltop) and the other half only for the upper and lower Clarion coals (hillside), a highwall was created separating upper and lower benches. During mining, the mine was backfilled with overburden and coal waste material, and in 1982 at the completion of mining, the mine spoil was regraded into terraces corresponding to the upper and lower benches. The average thickness of the mine spoil is about 50 ft on the upper bench and 70 ft on the lower bench.

In the spring of 1986, about 3.5 years after mining was completed, a mixture of composted wood chips and sewage sludge from Philadelphia wastewater treatment plants was spread at a rate of about 60 dry tons per acre over about 60 acres of the mine-spoil surface on the lower bench (fig. 3). The sludge-covered spoil composes about 40 percent of the reclaimed area. The composted sludge mixture was not applied on the hilltop, which was planted with pine trees, or on the steep "toe-of-spoil" banks below the berms, which remained barren, erodible, and permeable. In contrast, the sludge-treated areas support lush vegetative growth that was established within months after seeding with perennial grasses and legumes.

Surface-water sampling locations at the sludge-addition site include four drains and six seeps, all of which are downhill from the sludge-covered area (fig. 3, table 4). The four drains represent the outflow of interconnected, perforated pipes that were installed by the mine operator to intercept and route most of the seepage water to four corresponding treatment ponds. The pipe outlets (drains) into these ponds were equipped with continuous, liquid sodium hydroxide dispensers that could be disconnected during water-quality sampling and discharge measurements. The six seeps are located about midway up the spoil slope at roughly the elevation of the mine floor (lower bench).

Ground-water sampling locations at the sludge-addition site include four lysimeters and 15 monitor wells (fig. 3, table 4). In June 1986, the four lysimeters were installed by the USGS to a maximum depth of 15 ft in the sludge-covered mine spoil. In December 1982, the mine operator installed five monitor-well nests and a single well to depths greater than 200 ft below the land surface. Each well was constructed of 2-in. diameter PVC pipe installed in separate drill holes. The annulus above the screen was filled with grout and that below the screen with rock cuttings. Each well nest was identified by an arbitrarily assigned number. Individual wells within a nest were further identified by the number and a letter indicating the screened interval. Well nest 14 is in the untreated zone of the pine-covered hilltop and consists of four wells (14, 14A, 14B, 14C). Well nests 15 and 16 are located in the sludge-covered zone on the hillslope and consist of three wells each (15, 15A, 15B, 16, 16A, 16B). Well nests 17 and 18 are downhill from the sludge-covered area, below the toe of spoil and consist of two wells each (17, 17A, 18, 18A). Wells 14, 15, 16, 17, and 18 were screened in the Connoquenessing Formation sandstone. Wells 14A, 15A, 16A, 17A were screened in the Homewood and Mercer Formation sandstone and shale. Well 18A was screened in the overlying Mercer Formation coal and shale. Wells 14B, 15B, and 16B were completed in the lower Clarion coal horizon; well 14B was screened through bedrock and wells 15B and 16B were screened through sludge-covered mine spoil. Well 14C was screened through the untreated mine spoil at the Kittanning coal horizon on the upper bench. Well 1 is located across the local drainage boundary relative to the nested wells (outside area shown in fig. 3), and its screened interval is unknown. Cravotta (1991) reported detailed information on the geology and monitoring design.

Sample Collection and Processing

From June 1986 through November 1989, surface-water-quality and discharge data were collected at the 10 surface-water locations at the sludge-addition site (table 4) and the ground-water drain at the alkaline addition site (table 3, drain); ground-water-quality and water-level data were collected from the 15 monitor wells and four lysimeters at the sludge-addition site (table 4) and six "control" wells at the alkaline-addition site (table 3, wells A1, A2, B1, B2, C1, and C2).

Surface-water samples were grab samples; ground-water samples were collected after purging at least 5 gal of stagnant water from the wells by use of PVC bailers. Water samples from each location were collected in two 1-gal polyethylene jugs for temporary storage until field measurements and sample processing could be completed. Wellhead field water-quality measurements, described below, were conducted within 15 minutes after collection.

Water-quality samples were split into five subsamples, processed in the field, and then stored in clean polyethylene bottles on ice until laboratory analysis. A whole-water subsample for laboratory analysis of specific conductance, pH, acidity, alkalinity, sulfate, chloride, and nutrients was capped leaving no head space. A second whole-water subsample for analysis of ferrous iron was preserved with sulfuric acid. A third whole-water subsample for analysis of cyanide was preserved with sodium hydroxide. A fourth whole-water subsample for analysis of sulfide was preserved with sodium hydroxide and zinc acetate. A fifth subsample for analysis of cations and silica was filtered though 0.45-µm pore-size nitrocellulose filters, transferred to acid-rinsed bottles, and preserved with nitric acid.

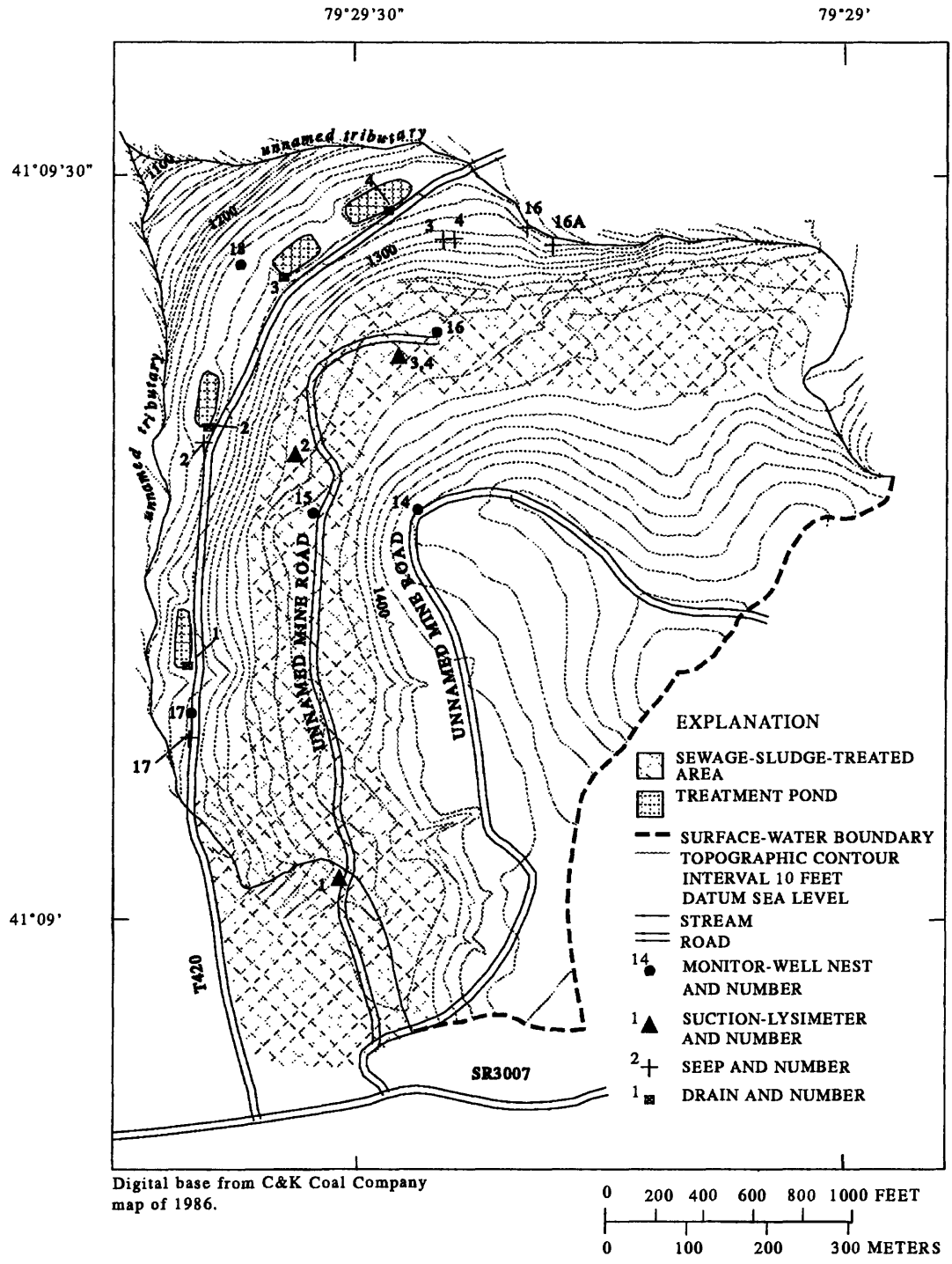

Figure 3.--Topography and water-quality sampling locations at the urban sewage sludge site--C&K No. 69 mine.

Table 4.--Descriptions of sampling locations at the urban sewage sludge site-- C&K No. 69 mine, Clarion County, Pennsylvania

[NA, not applicable]

Site identification number	Site name	Latitude north	Longitude west	Elevation of land surface (feet)[a]	Depth of borehole (feet)[a]	Depth to screened interval (feet)[a]	Lithology[b]	Surficial treatment[c]
410909079294201	Drain 1	41°09'09"	79°29'42"	1,278.0	NA	NA	SP	DS
410918079294101	Drain 2	41°09'18"	79°29'41"	1,256.0	NA	NA	SP	DS
410924079293701	Drain 3	41°09'24"	79°29'37"	1,267.0	NA	NA	SP	DS
410927079293101	Drain 4	41°09'27"	79°29'31"	1,265.0	NA	NA	SP	DS
410918079294102	Seep 2	41°09'18"	79°29'41"	1,258.0	NA	NA	SP	DS
410925079292801	Seep 3	41°09'25"	79°29'28"	1,296.0	NA	NA	SP	DS
410925079292701	Seep 4	41°09'25"	79°29'27"	1,295.0	NA	NA	SP	DS
410926079292401	Seep 16	41°09'26"	79°29'24"	1,270.0	NA	NA	SP	DS
410925079292301	Seep 16A	41°09'25"	79°29'23"	1,276.0	NA	NA	SP	DS
410903079294301	Seep 17	41°09'03"	79°29'43"	1,293.0	NA	NA	SP	DS
410901079293401	Lysimeter 1	41°09'01"	79°29'34"	1,354.0	3	3	SP	SL
410918079293601	Lysimeter 2	41°09'18"	79°29'36"	1,346.0	3	3	SP	SL
410921079293101	Lysimeter 3	41°09'21"	79°29'31"	1,353.0	9	9	SP	SL
410921079293102	Lysimeter 4	41°09'21"	79°29'31"	1,353.0	6	6	SP	SL
410848079295701	Well 1	41°08'48"	79°29'57"	1,468.0	133	?-133	BR?	?
410916079292901	Well 14	41°09'16"	79°29'29"	1,426.0	215	195-215	BRCQ	NS
410916079292902	Well 14A	41°09'16"	79°29'29"	1,426.0	195	131-195	BRHM	NS
410916079292903	Well 14B	41°09'16"	79°29'29"	1,426.0	126	50-126	BRLC	NS
410916079292904	Well 14C	41°09'16"	79°29'29"	1,426.0	48	5-48	SP	NS
410915079293501	Well 15	41°09'15"	79°29'35"	1,363.0	155	135-155	BRCQ	SL
410915079293502	Well 15A	41°09'15"	79°29'35"	1,363.0	118	70-118	BRHM	SL
410915079293503	Well 15B	41°09'15"	79°29'35"	1,363.0	70	5-70	SP	SL
410921079292901	Well 16	41°09'21"	79°29'29"	1,351.0	138	117-135	BRCQ	SL
410921079292902	Well 16A	41°09'21"	79°29'29"	1,351.0	117	60-117	BRHM	SL
410921079292903	Well 16B	41°09'21"	79°29'29"	1,351.0	60	5-60	SP	SL
410907079294201	Well 17	41°09'07"	79°29'42"	1,293.0	85	68-85	BRCQ	DS
410907079294202	Well 17A	41°09'07"	79°29'42"	1,293.0	65	5-65	BRHM	DS
410925079293901	Well 18	41°09'25"	79°29'39"	1,254.0	45	25-45	BRCQ	DS
410925079293902	Well 18A	41°09'25"	79°29'39"	1,254.0	25	5-25	BRMR	DS

[a] Elevation in feet above sea level interpolated from topographic map and reported on driller's logs; depth of borehole and screened interval in feet below land surface datum; query (?) where data uncertain.

[b] Lithology: BRLC: bedrock, lower Clarion coal; BRCQ: bedrock, Connoquenessing Formation; BRHM: bedrock, Homewood and Mercer Formation sandstone and shale; BRMR: bedrock, Mercer Formation; BR?: bedrock, formation uncertain; SP: spoil, mixed lithologies of Clarion Formation.

[c] Treatment: SL, sludge applied; NS, no sludge applied; DS, downflow from sludge-treated areas; query (?) where treatment uncertain.

Water-Quality and Hydrologic Data

Water-quality and other hydrologic data for the sludge-addition study are contained in the USGS computer data base and are reported in Appendix 2. Field measurements were conducted by USGS personnel following methods of Buchanan and Somers (1969) and Wood (1976) and included instantaneous discharge rate at surface-water sampling locations or depth to water in wells, plus downhole and wellhead measurements. Water levels were measured before purging. After sampling, downhole dissolved oxygen (DO) and water temperature, wellhead redox potential (Eh), pH, and specific conductance were measured. DO and water temperature were measured by suspending a combination DO and temperature electrode to a depth of about 5 ft below the water level in the well. Eh, pH, and specific conductance were measured by collecting water into a 10-ft long PVC bailer, inserting a nylon tube at the bottom of the bailer, and draining water through the tube into a water-filled glass bottle (flow cell) containing appropriate electrodes. Specific conductances measured in the field were not temperature corrected and were used only for quality-assurance purposes; they are not reported in Appendix 2. With the exception of seep 16, discharge from the seeps and drains was measured volumetrically. Because discharge from seep 16 was large and diffuse, flow was computed by use of the difference between upstream and downstream discharge measurements on the adjacent receiving stream.

Laboratory analyses were conducted at the PaDER Bureau of Laboratories facility in Harrisburg, Pa., following methods of Skougstad and others (1979) and included measurements of specific conductance, pH, and concentrations of alkalinity, acidity, sulfate, chloride, silica, dissolved solids, phosphorus, nitrogen species (nitrate, nitrite, ammonia, organic nitrogen plus ammonia, cyanide), aluminum, arsenic, barium, boron, cadmium, calcium, chromium, copper, iron (total and ferrous), lead, magnesium, manganese, mercury, molybdenum, nickel, potassium, selenium, sodium, strontium, and zinc. Sulfide was measured at the USGS office in Harrisburg, Pa., following methods of Skougstad and others (1979). The laboratory analytical techniques that were used are reported in table 1.

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(p. 17 follows)

APPENDIXES

Appendix 1.--Water-quality data for alkaline-waste site, May 1983 through September 1989

[ft^3/s, cubic foot per second; µS/cm, microsiemen per centimeter at 25 degrees Celsius; °C, degree Celsius; mg/L, milligram per liter; µg/L, microgram per liter; <, less than; >, greater than; --, no data]

Date	Time	Water table altitude (feet above sea level)	Streamflow/ discharge, instan-taneous (ft^3/s)	Specific conduc-tance (µS/cm)	pH, field (units)	pH, lab (units)	Water temper-ature (°C)	Acidity total heated (mg/L as $CaCO_3$)	Acidity mineral (methyl orange) (mg/L as $CaCO_3$)	Calcium, dissolved (mg/L)	Magnesium, dissolved (mg/L)
410945079253101 Drain (LAT 41°09'45" N. LONG 079°25'31" W.)											
MAY 03, 1983	1540	--	0.06	>8,000	2.4	2.4	13.0	4,800	2,000	140	190
JUNE 07, 1983	1425	--	.05	6,000	2.3	2.4	14.0	5,000	1,500	160	210
JULY 13, 1983	0845	--	.04	6,300	2.3	2.5	15.0	3,100	1,100	150	93
AUG 09, 1983	1145	--	--	6,800	2.2	2.5	15.5	3,600	1,500	--	110
SEPT 13, 1983	1030	--	.01	7,400	2.3	2.5	14.5	4,600	1,000	190	220
OCT 11, 1983	1600	--	.00	6,600	2.1	2.6	14.0	4,100	960	190	250
NOV 15, 1983	1340	--	.01	6,600	2.0	2.6	9.0	4,000	840	170	220
DEC 12, 1983	1600	--	.10	6,500	1.9	2.6	10.0	3,800	1,400	150	170
JAN 16, 1984	1400	--	.11	5,500	2.0	2.6	--	3,500	960	160	210
FEB 14, 1984	1100	--	.13	5,000	2.5	2.6	10.5	1,300	1,200	--	--
MAR 22, 1984	0830	--	.11	4,000	2.2	2.4	10.0	4,800	1,100	110	160
APR 25, 1984	1215	--	.08	5,200	2.1	2.5	11.0	3,400	930	98	150
MAY 23, 1984	1205	--	.06	5,000	2.4	2.5	14.5	2,500	940	100	170
JUNE 18, 1984	1245	--	.07	4,700	2.5	2.7	13.0	350	810	130	180
JULY 18, 1984	0935	--	.06	4,800	2.4	2.5	13.5	2,600	--	110	160
AUG 21, 1984	1040	--	.06	5,070	2.1	2.5	13.0	3,000	1,400	110	120
SEPT 17, 1984	1025	--	.02	4,850	2.4	2.6	13.0	3,700	1,500	140	220
OCT 30, 1984	1145	--	.00	4,700	3.2	3.0	14.0	2,700	360	140	200
NOV 20, 1984	0925	--	.02	5,810	2.3	2.5	12.0	3,400	940	120	51
DEC 11, 1984	0950	--	.02	4,350	2.3	2.7	10.0	2,800	720	140	>60
JAN 21, 1985	1115	--	.02	4,730	2.2	2.6	12.0	2,600	840	160	180
FEB 11, 1985	1545	--	.02	4,770	2.5	2.7	12.0	>2,000	700	94	51
FEB 19, 1985	1410	--	.02	5,190	--	2.6	--	3,000	860	65	40
MAR 12, 1985	1150	--	.08	4,300	2.6	2.6	10.0	2,400	670	110	49
APR 01, 1985	1325	--	.08	3,920	2.2	2.5	10.5	2,000	710	130	160
MAY 14, 1985	1600	--	.03	4,930	2.2	2.6	12.0	2,600	680	65	39
JUNE 12, 1985	0835	--	.03	4,780	2.2	2.6	12.5	2,800	680	130	160
JULY 09, 1985	1130	--	.02	4,800	2.4	2.6	14.0	560	610	140	160
AUG 07, 1985	1135	--	.00	5,350	2.2	2.6	16.5	3,000	770	130	59
SEPT 11, 1985	0915	--	.00	3,900	2.9	2.8	15.0	2,200	580	130	150
NOV 13, 1985	1010	--	.03	6,300	2.6	2.5	14.0	3,900	1,200	150	180
DEC 11, 1985	1015	--	.06	4,700	2.3	2.5	12.0	2,800	800	150	180
JAN 07, 1986	1000	--	.04	5,000	2.2	2.5	12.0	2,800	870	160	220
FEB 04, 1986	1020	--	.05	4,800	2.1	2.5	11.0	2,600	860	140	140
MAR 10, 1986	1430	--	.07	4,500	2.5	2.5	12.0	2,300	830	130	120
APR 01, 1986	1500	--	.04	4,840	2.4	2.5	12.0	2,500	890	120	130
MAY 06, 1986	1030	--	.03	5,060	2.5	2.4	12.5	2,700	870	150	140
JUNE 04, 1986	0920	--	.01	4,680	2.5	2.5	12.5	3,100	850	140	140
JULY 08, 1986	0845	--	.02	5,150	2.5	2.4	14.0	3,100	900	--	--
AUG 05, 1986	1055	--	.02	5,220	2.5	2.5	13.5	3,200	990	140	140
SEPT 03, 1986	1340	--	.01	5,350	2.6	2.5	15.0	1,100	870	150	180
OCT 07, 1986	1340	--	.03	6,300	2.6	2.3	14.0	3,800	1,300	150	170
NOV 19, 1986	0840	--	.02	6,000	2.4	2.5	12.0	3,000	870	120	160
DEC 09, 1986	1100	--	.10	4,650	2.4	2.4	12.0	2,700	910	100	120
JAN 06, 1987	1340	--	.05	5,100	2.4	2.4	12.5	2,700	900	120	150
FEB 02, 1987	1520	--	.04	5,600	2.3	2.4	11.5	3,100	1,100	140	180
MAR 16, 1987	1210	--	.01	5,500	2.4	2.4	10.0	3,300	1,100	160	190
MAR 17, 1987	1210	--	.01	5,700	2.3	2.3	10.0	3,300	1,100	140	160
MAR 17, 1987	1330	--	--	5,700	2.4	2.3	11.5	3,300	1,100	140	160
APR 06, 1987	1115	--	.06	5,500	2.3	2.4	11.5	3,000	1,000	120	140
MAY 06, 1987	1200	--	.14	4,800	2.3	2.4	12.0	2,700	870	110	130

Appendix 1.–Water-quality data for alkaline-addition study site, May 1983 through September 1989–Continued

Date	Sodium, dissolved (mg/L)	Potassium, dissolved (mg/L)	Alkalinity water lab (mg/L as $CaCO_3$)	Sulfate, dissolved (mg/L as SO_4)	Chloride, dissolved (mg/L)	Silica, dissolved (mg/L as SiO_2)	Solids, residue at 105 °C, dissolved (mg/L)	Nitrogen, nitrate total (mg/L as N)	Nitrogen, nitrite total (mg/L as N)	Nitrogen, ammonia total (mg/L as N)
410945079253101 Drain (LAT 41°09'45" N. LONG 079°25'31" W.)										
MAY 03, 1983	--	--	0	3,400	--	--	--	--	--	--
JUNE 07, 1983	--	--	0	3,300	--	--	--	--	--	--
JULY 13, 1983	--	--	0	3,500	--	--	--	--	--	--
AUG 09, 1983	--	--	0	2,500	--	--	--	--	--	--
SEPT 13, 1983	--	--	0	4,800	--	--	--	--	--	--
OCT 11, 1983	--	--	0	4,600	--	--	--	--	--	--
NOV 15, 1983	--	--	0	3,700	--	--	--	--	--	--
DEC 12, 1983	--	--	0	2,600	--	--	--	--	--	--
JAN 16, 1984	--	--	0	2,400	--	--	--	--	--	--
FEB 14, 1984	--	--	0	3,600	--	--	--	--	--	--
MAR 22, 1984	--	--	0	3,700	--	--	--	--	--	--
APR 25, 1984	--	--	0	2,900	--	--	--	--	--	--
MAY 23, 1984	--	--	0	3,400	--	--	--	--	--	--
JUNE 18, 1984	--	--	0	2,200	--	--	--	--	--	--
JULY 18, 1984	--	--	0	3,300	--	--	--	--	--	--
AUG 21, 1984	--	--	0	3,800	--	--	--	--	--	--
SEPT 17, 1984	--	--	0	1,800	--	--	--	--	--	--
OCT 30, 1984	--	--	0	2,900	--	--	--	--	--	--
NOV 20, 1984	--	--	0	3,800	--	--	--	--	--	--
DEC 11, 1984	--	--	0	2,800	--	--	--	--	--	--
JAN 21, 1985	--	--	0	2,500	--	--	--	--	--	--
FEB 11, 1985	--	--	0	3,000	--	--	--	--	--	--
FEB 19, 1985	--	--	0	3,100	--	--	--	--	--	--
MAR 12, 1985	--	--	0	3,000	--	--	--	--	--	--
APR 01, 1985	--	--	0	2,800	--	--	--	--	--	--
MAY 14, 1985	--	--	0	3,100	--	--	--	--	--	--
JUNE 12, 1985	--	--	0	3,900	--	--	--	--	--	--
JULY 09, 1985	--	--	0	--	--	--	--	--	--	--
AUG 07, 1985	--	--	0	4,000	--	--	--	--	--	--
SEPT 11, 1985	--	--	0	3,300	--	--	--	--	--	--
NOV 13, 1985	--	--	0	4,900	--	--	--	--	--	--
DEC 11, 1985	--	--	0	3,100	--	--	--	--	--	--
JAN 07, 1986	--	--	0	3,200	--	--	--	--	--	--
FEB 04, 1986	--	--	0	2,800	--	--	--	--	--	--
MAR 10, 1986	--	--	0	3,200	--	--	--	--	--	--
APR 01, 1986	--	--	0	3,200	--	--	--	--	--	--
MAY 06, 1986	--	--	0	3,200	--	--	--	--	--	--
JUNE 04, 1986	--	--	0	3,200	--	--	--	--	--	--
JULY 08, 1986	27	<0.14	0	3,400	1	--	6,210	<0.02	<0.002	1.5
AUG 05, 1986	33	<.14	0	3,300	3	--	6,760	<.04	<.004	1.6
SEPT 03, 1986	20	<.14	0	3,700	5	--	6,130	<.02	<.002	1.3
OCT 07, 1986	59	1.4	0	4,000	2	--	7,520	<.02	.004	1.7
NOV 19, 1986	30	.92	0	3,600	2	--	6,170	<.02	<.004	.42
DEC 09, 1986	13	<.13	0	2,300	1.4	--	5,040	.04	<.004	.94
JAN 06, 1987	9.1	2.1	0	2,900	1	--	5,300	.04	<.004	1
FEB 02, 1987	71	<.14	0	2,000	2	--	6,070	<.02	<.004	1.2
MAR 16, 1987	--	--	--	3,100	--	--	--	--	--	--
MAR 17, 1987	14	.91	--	2,900	2	--	6,570	<.04	<.004	1.4
MAR 17, 1987	14	.91	0	2,900	2	--	6,570	<.04	<.004	1.4
APR 06, 1987	14	1.3	0	2,700	2	--	5,930	<.04	<.004	1.3
MAY 06, 1987	7.5	1.3	0	2,500	1	91	4,940	<.04	<.004	.96

Appendix 1.–Water-quality data for alkaline-addition study site, May 1983 through September 1989–Continued

Date	Nitrogen, ammonia + organic total (mg/L as N)	Phosphorus total (mg/L as P)	Aluminum, dissolved (mg/L)	Arsenic, dissolved (µg/L)	Barium, dissolved (µg/L)	Boron, dissolved (µg/L)	Cadmium, dissolved (µg/L)	Chromium, dissolved (µg/L)	Copper, dissolved (µg/L)	Iron, dissolved (mg/L)
410945079253101 Drain (LAT 41°09'45" N. LONG 079°25'31" W.)										
MAY 03, 1983	–	–	190	–	–	–	–	–	–	700
JUNE 07, 1983	–	–	180	–	–	–	–	–	–	650
JULY 13, 1983	–	–	270	–	–	–	–	–	–	570
AUG 09, 1983	–	–	200	–	–	–	–	–	–	480
SEPT 13, 1983	–	–	190	–	–	–	–	–	–	370
OCT 11, 1983	–	–	270	–	–	–	–	–	–	–
NOV 15, 1983	–	–	180	–	–	–	–	–	–	800
DEC 12, 1983	–	–	150	–	–	–	–	–	–	610
JAN 16, 1984	–	–	170	–	–	–	–	–	–	620
FEB 14, 1984	–	–	140	–	–	–	–	–	–	620
MAR 22, 1984	–	–	130	–	–	–	–	–	–	500
APR 25, 1984	–	–	120	–	–	–	–	–	–	460
MAY 23, 1984	–	–	150	–	–	–	–	–	–	490
JUNE 18, 1984	–	–	140	–	–	–	–	–	–	74
JULY 18, 1984	–	–	130	–	–	–	–	–	–	400
AUG 21, 1984	–	–	94	–	–	–	–	–	–	470
SEPT 17, 1984	–	–	100	–	–	–	–	–	–	450
OCT 30, 1984	–	–	190	–	–	–	–	–	–	680
NOV 20, 1984	–	–	220	–	–	–	–	–	–	810
DEC 11, 1984	–	–	120	–	–	–	–	–	–	570
JAN 21, 1985	–	–	150	–	–	–	–	–	–	540
FEB 11, 1985	–	–	130	–	–	–	–	–	–	540
FEB 19, 1985	–	–	52	–	–	–	–	–	–	260
MAR 12, 1985	–	–	110	–	–	–	–	–	–	410
APR 01, 1985	–	–	130	–	–	–	–	–	–	330
MAY 14, 1985	–	–	140	–	–	–	–	–	–	400
JUNE 12, 1985	–	–	150	–	–	–	–	–	–	470
JULY 09, 1985	–	–	160	–	–	–	–	–	–	550
AUG 07, 1985	–	–	180	–	–	–	–	–	–	660
SEPT 11, 1985	–	–	120	–	–	–	–	–	–	560
NOV 13, 1985	–	–	240	–	–	–	–	–	–	950
DEC 11, 1985	–	–	190	–	–	–	–	–	–	410
JAN 07, 1986	–	–	210	–	–	–	–	–	–	560
FEB 04, 1986	–	–	180	–	–	–	–	–	–	590
MAR 10, 1986	–	–	160	–	–	–	–	–	–	400
APR 01, 1986	–	–	150	–	–	–	–	–	–	670
MAY 06, 1986	–	–	190	–	–	–	–	–	–	610
JUNE 04, 1986	–	–	180	–	–	–	–	–	–	630
JULY 08, 1986	2.3	–	200	<1,000	–	–	<10	<50	220	–
AUG 05, 1986	2.2	–	200	100	–	<250	11	<50	200	740
SEPT 03, 1986	2	–	210	32	–	<250	12	<50	180	820
OCT 07, 1986	2.2	–	220	300	<10	<250	14	240	390	110
NOV 19, 1986	2.3	–	180	120	<10	<250	14	170	250	750
DEC 09, 1986	1.8	–	140	110	<10	<250	9	160	270	490
JAN 06, 1987	1.9	–	200	210	–	<250	1.4	<50	270	610
FEB 02, 1987	2	–	220	220	–	<250	15	<50	250	740
MAR 16, 1987	–	–	24	–	–	–	–	–	–	840
MAR 17, 1987	1.8	–	210	180	–	–	14	<50	200	730
MAR 17, 1987	1.8	–	210	180	<10	–	14	<50	200	730
APR 06, 1987	1.9	–	170	110	<10	<250	13	<50	<10	660
MAY 06, 1987	1.9	0.16	150	210	<10	<250	11	710	<10	500

Appendix 1.–Water-quality data for alkaline-addition study site, May 1983 through September 1989–Continued

Date	Iron, ferrous dissolved (mg/L)	Lead, dissolved (µg/L)	Manganese, dissolved (mg/L)	Mercury, dissolved (µg/L)	Molybdenum, dissolved (µg/L)	Nickel, dissolved (mg/L)	Selenium, dissolved (mg/L)	Strontium, dissolved (µg/L)	Zinc, dissolved (mg/L)	Cyanide total (mg/L)
410945079253101 Drain (LAT 41°09'45" N. LONG 079°25'31" W.)										
MAY 03, 1983	–	–	90	–	–	–	–	–	–	–
JUNE 07, 1983	–	–	97	–	–	–	–	–	–	–
JULY 13, 1983	–	–	91	–	–	–	–	–	–	–
AUG 09, 1983	–	–	100	–	–	–	–	–	–	–
SEPT 13, 1983	–	–	96	–	–	–	–	–	–	–
OCT 11, 1983	–	–	120	–	–	–	–	–	–	–
NOV 15, 1983	–	–	99	–	–	–	–	–	–	–
DEC 12, 1983	–	–	91	–	–	–	–	–	–	–
JAN 16, 1984	8.4	–	100	–	–	–	–	–	–	–
FEB 14, 1984	–	–	67	–	–	–	–	–	–	–
MAR 22, 1984	500	–	65	–	–	–	–	–	–	–
APR 25, 1984	12	–	73	–	–	–	–	–	–	–
MAY 23, 1984	490	–	68	–	–	–	–	–	–	–
JUNE 18, 1984	69	–	74	–	–	–	–	–	–	–
JULY 18, 1984	310	–	68	–	–	–	–	–	–	–
AUG 21, 1984	–	–	74	–	–	–	–	–	–	–
SEPT 17, 1984	–	–	70	–	–	–	–	–	–	–
OCT 30, 1984	680	–	97	–	–	–	–	–	–	–
NOV 20, 1984	810	–	92	–	–	–	–	–	–	–
DEC 11, 1984	–	–	74	–	–	–	–	–	–	–
JAN 21, 1985	–	–	94	–	–	–	–	–	–	–
FEB 11, 1985	500	–	78	–	–	–	–	–	–	–
FEB 19, 1985	260	–	34	–	–	–	–	–	–	–
MAR 12, 1985	180	–	53	–	–	–	–	–	–	–
APR 01, 1985	–	–	62	–	–	–	–	–	–	–
MAY 14, 1985	400	–	51	–	–	–	–	–	–	–
JUNE 12, 1985	120	–	73	–	–	–	–	–	–	–
JULY 09, 1985	360	–	77	–	–	–	–	–	–	–
AUG 07, 1985	170	–	98	–	–	–	–	–	–	–
SEPT 11, 1985	360	–	85	–	–	–	–	–	–	–
NOV 13, 1985	500	–	89	–	–	–	–	–	–	–
DEC 11, 1985	210	–	60	–	–	–	–	–	–	–
JAN 07, 1986	370	–	78	–	–	–	–	–	–	–
FEB 04, 1986	290	–	75	–	–	–	–	–	–	–
MAR 10, 1986	310	–	57	–	–	–	–	–	–	–
APR 01, 1986	370	–	85	–	–	–	–	–	–	–
MAY 06, 1986	410	–	79	–	–	–	–	–	–	–
JUNE 04, 1986	400	–	86	–	–	–	–	–	–	–
JULY 08, 1986	480	<50	–	<1	<700	2.9	<1,000	310	5.9	<0.001
AUG 05, 1986	530	<50	68	<1	<700	2.8	<1,000	370	5.9	<.001
SEPT 03, 1986	460	<50	90	<1	<70	3	<30	350	6.4	<.001
OCT 07, 1986	790	930	92	<1	<70	5.4	<150	370	7.1	<.001
NOV 19, 1986	600	<4	79	<1	<70	3.4	<30	270	5.2	<.001
DEC 09, 1986	320	<4	59	<1	<70	2.2	<30	300	4.8	<.001
JAN 06, 1987	480	<50	75	<1	<70	2.1	<60	350	6.1	<.001
FEB 02, 1987	540	<4	84	<1	<70	2.2	<30	240	6.4	<.001
MAR 16, 1987	570	–	88	–	–	–	–	–	–	–
MAR 17, 1987	–	<50	76	<1	<70	3.2	<60	350	5.6	<.001
MAR 17, 1987	–	5.2	76	<1	<70	3.2	<60	350	5.6	<.001
APR 06, 1987	500	11	64	<1	<70	2.7	<300	430	5.6	<.001
MAY 06, 1987	340	4.3	59	<1	<70	2.4	<150	310	5	<.001

Appendix 1.–Water-quality data for alkaline-addition study site, May 1983 through September 1989–Continued

Date	Time	Water table altitude (feet above sea level)	Streamflow/ discharge, instan-taneous (ft^3/s)	Specific conduc-tance (µS/cm)	pH, field (units)	pH, lab (units)	Water temper-ature (°C)	Acidity total heated (mg/L as $CaCO_3$)	Acidity mineral (methyl orange) (mg/L as $CaCO_3$)	Calcium, dissolved (mg/L)	Magnesium, dissolved (mg/L)
410945079253101 Drain (LAT 41°09'45" N. LONG 079°25'31" W.)–Continued											
JUNE 08, 1987	1500	–	0.02	5,300	2.5	2.5	14.0	2,800	890	140	170
JULY 07, 1987	1900	–	.04	5,160	2.5	2.4	14.0	2,900	860	110	130
AUG 11, 1987	0005	–	.01	4,700	2.3	2.9	14.5	2,500	300	–	–
AUG 12, 1987	0005	–	–	–	–	–	–	–	–	120	140
AUG 12, 1987	1400	–	.01	5,110	2.3	2.5	14.5	2,700	820	120	150
SEPT 15, 1987	1100	–	.02	5,800	2.3	2.3	13.0	3,400	1,000	120	140
OCT 06, 1987	0900	–	.02	5,000	2.5	2.4	12.5	2,700	900	120	140
NOV 17, 1987	0815	–	.01	4,900	2.5	2.5	13.0	3,000	940	130	160
DEC 14, 1987	1210	–	–	5,800	2.3	2.4	11.0	3,400	1,200	120	160
JAN 11, 1988	1350	–	.01	5,600	2.0	4.4	9.5	3,700	–	140	120
FEB 08, 1988	1125	–	.03	4,870	2.4	2.3	7.0	3,100	1,200	120	130
MAR 14, 1988	1300	–	–	4,750	2.3	2.3	7.0	3,400	1,000	110	140
JUNE 07, 1988	1600	–	.02	4,530	2.4	2.4	15.0	3,000	960	110	120
MAR 13, 1989	1220	–	.01	5,000	2.4	2.2	10.0	4,400	1,600	140	150
JUNE 13, 1989	1440	–	.08	3,860	2.4	2.3	11.0	2,400	890	120	140
SEPT 11, 1989	1135	–	.01	3,900	2.6	2.5	14.0	3,100	850	140	160
410940079254801 Seep HH (LAT 41°09'40" N. LONG 079°25'48" W.)											
JUNE 07, 1983	0825	–	.02	2,300	3.0	3.1	–	530	–	–	–
JULY 12, 1983	0947	–	.02	3,000	3.3	3.4	–	610	–	110	82
AUG 09, 1983	0940	–	.05	4,600	6.4	5.6	–	92	–	72	48
SEPT 13, 1983	1400	–	.01	3,200	–	3.1	–	880	–	95	86
OCT 12, 1983	0800	–	.01	3,200	–	3.1	–	1,100	160	130	120
NOV 15, 1983	1136	–	.03	2,350	4.6	5.3	3.5	280	–	72	59
DEC 12, 1983	1347	–	.31	3,000	6.6	5.4	7.0	62	–	42	35
JAN 16, 1984	1145	–	–	5,000	5.6	5.7	.0	140	–	76	46
FEB 14, 1984	0850	–	–	1,040	5.0	5.0	5.5	280	–	–	–
MAR 21, 1984	1310	–	–	3,200	5.9	6.3	4.0	12	–	24	13
APR 25, 1984	0900	–	–	1,750	3.4	3.6	7.5	380	22	55	51
MAY 21, 1984	1415	–	.10	–	7.3	7.1	–	0	–	27	16
JUNE 18, 1984	0940	–	.06	–	6.1	5.7	18.5	150	–	41	36
JULY 17, 1984	1410	–	.06	4,560	6.3	6.5	24.0	0	–	38	27
AUG 21, 1984	1420	–	.03	2,910	6.1	5.4	26.5	230	–	69	66
OCT 30, 1984	0900	–	.02	2,600	4.3	4.2	10.5	530	–	100	100
NOV 20, 1984	1105	–	.02	2,360	4.5	4.4	3.5	610	–	45	23
DEC 11, 1984	1415	–	.06	1,860	6.3	6.0	6.0	150	–	44	37
JAN 21, 1985	1010	–	.01	2,550	3.2	3.4	.5	650	68	120	53
FEB 12, 1985	0945	–	.02	3,600	3.2	6.2	.5	140	–	67	51
MAR 12, 1985	1035	–	.11	1,030	6.8	6.3	1.5	56	–	17	13
APR 09, 1985	1400	–	.10	2,360	5.4	4.9	7.5	96	–	49	39
MAY 15, 1985	0810	–	.01	2,600	2.9	3.0	15.0	660	150	65	39
JUNE 12, 1985	0805	–	.10	990	4.8	4.8	13.0	110	–	25	22
JULY 09, 1985	0810	–	.04	1,450	3.2	3.3	17.5	360	50	52	48
AUG 06, 1985	0935	–	.01	3,550	3.6	3.8	19.5	850	14	130	59
SEPT 11, 1985	0825	–	.01	2,850	6.5	6.0	17.0	160	–	91	77
OCT 08, 1985	0826	–	.01	3,400	6.0	5.4	8.0	620	–	140	130
NOV 14, 1985	1005	–	.15	1,360	7.6	7.1	13.5	0	–	17	2.1
DEC 11, 1985	0910	–	.00	615	6.4	6.0	8.0	4	–	15	11
JAN 07, 1986	0855	–	.01	2,700	6.7	6.0	.0	94	–	78	73
FEB 05, 1986	0835	–	.13	610	6.6	6.0	6.5	0	–	11	9
MAR 11, 1986	0935	–	.06	1,090	7.4	6.0	4.0	6	–	27	23
APR 02, 1986	0715	–	.02	2,160	3.0	3.3	6.0	540	82	92	82
MAY 06, 1986	1005	–	.02	2,300	3.3	3.2	15.0	570	80	110	90
JUNE 04, 1986	0900	–	.01	2,690	3.4	3.2	14.0	700	72	130	100
JULY 08, 1986	0000	–	.01	2,440	3.6	3.4	19.0	710	32	110	–

Appendix 1.–Water-quality data for alkaline-addition study site, May 1983 through September 1989–Continued

Date	Sodium, dissolved (mg/L)	Potassium, dissolved (mg/L)	Alkalinity water lab (mg/L as $CaCO_3$)	Sulfate, dissolved (mg/L as SO_4)	Chloride, dissolved (mg/L)	Silica, dissolved (mg/L as SiO_2)	Solids, residue at 105 °C, dissolved (mg/L)	Nitrogen, nitrate total (mg/L as N)	Nitrogen, nitrite total (mg/L as N)	Nitrogen, ammonia total (mg/L as N)
410945079253101 Drain (LAT 41°09'45" N. LONG 079°25'31" W.)–Continued										
JUNE 08, 1987	24	1.2	0	3,600	3	110	6,350	<0.04	<0.004	1.2
JULY 07, 1987	11	1.2	0	3,100	1	100	7,040	.04	<.004	1.2
AUG 11, 1987	–	–	0	3,300	8	–	5,790	–	–	1.3
AUG 12, 1987	15	1.3	–	–	–	110	–	–	–	–
AUG 12, 1987	15	.94	0	3,100	3	120	5,120	<.04	<.004	1.4
SEPT 15, 1987	14	1.4	–	4,100	2	130	7,670	<.04	<.004	1.8
OCT 06, 1987	22	1.2	–	2,900	2	110	5,550	<.04	<.004	.99
NOV 17, 1987	9.5	.60	–	3,200	3	120	6,300	–	<.004	.94
DEC 14, 1987	17	.82	–	4,900	2	120	7,120	<.04	<.004	1.6
JAN 11, 1988	9	1	12	3,100	2	130	6,670	<.04	<.004	1.6
FEB 08, 1988	2	1.3	–	2,700	1	110	7,010	<.04	<.004	1
MAR 14, 1988	15	1.1	–	3,200	2	100	3,280	<.04	<.004	1.2
JUNE 07, 1988	28	1.2	–	3,200	3	120	6,700	.06	.004	1.4
MAR 13, 1989	22	.86	–	4,000	2	120	6,800	<.04	<.004	1.6
JUNE 13, 1989	7.4	1.2	–	2,300	3	85	7,350	.04	<.004	.79
SEPT 11, 1989	16	.39	–	3,300	2	110	7,120	<.04	<.004	1.3
410940079254801 Seep HH (LAT 41°09'40" N. LONG 079°25'48" W.)										
JUNE 07, 1983	–	–	0	800	–	–	–	–	–	–
JULY 12, 1983	–	–	0	2,000	–	–	–	–	–	–
AUG 09, 1983	–	–	22	2,600	–	–	–	–	–	–
SEPT 13, 1983	–	–	0	1,700	–	–	–	–	–	–
OCT 12, 1983	–	–	0	2,100	–	–	–	–	–	–
NOV 15, 1983	–	–	17	1,300	–	–	–	–	–	–
DEC 12, 1983	–	–	14	1,900	–	–	–	–	–	–
JAN 16, 1984	–	–	64	4,000	–	–	–	–	–	–
FEB 14, 1984	–	–	3	480	–	–	–	–	–	–
MAR 21, 1984	–	–	70	2,100	–	–	–	–	–	–
APR 25, 1984	–	–	0	970	–	–	–	–	–	–
MAY 21, 1984	–	–	140	2,700	–	–	–	–	–	–
JUNE 18, 1984	–	–	14	970	–	–	–	–	–	–
JULY 17, 1984	–	–	64	3,400	–	–	–	–	–	–
AUG 21, 1984	–	–	16	1,700	–	–	–	–	–	–
OCT 30, 1984	–	–	5	1,500	–	–	–	–	–	–
NOV 20, 1984	–	–	10	1,400	–	–	–	–	–	–
DEC 11, 1984	–	–	36	970	–	–	–	–	–	–
JAN 21, 1985	–	–	0	1,600	–	–	–	–	–	–
FEB 12, 1985	–	–	62	2,100	–	–	–	–	–	–
MAR 12, 1985	–	–	22	480	–	–	–	–	–	–
APR 09, 1985	–	–	12	1,300	–	–	–	–	–	–
MAY 15, 1985	–	–	0	1,500	–	–	–	–	–	–
JUNE 12, 1985	–	–	10	590	–	–	–	–	–	–
JULY 09, 1985	–	–	0	–	–	–	–	–	–	–
AUG 06, 1985	–	–	–	–	–	–	–	–	–	–
SEPT 11, 1985	–	–	58	1,500	–	–	–	–	–	–
OCT 08, 1985	–	–	16	2,200	–	–	–	–	–	–
NOV 14, 1985	–	–	310	680	–	–	–	–	–	–
DEC 11, 1985	–	–	38	440	–	–	–	–	–	–
JAN 07, 1986	–	–	110	1,500	–	–	–	–	–	–
FEB 05, 1986	–	–	58	220	–	–	–	–	–	–
MAR 11, 1986	–	–	46	500	–	–	–	–	–	–
APR 02, 1986	–	–	0	1,300	–	–	–	–	–	–
MAY 06, 1986	–	–	0	1,300	–	–	–	–	–	–
JUNE 04, 1986	–	–	0	2,100	–	–	–	–	–	–
JULY 08, 1986	130	5.6	0	1,400	6	–	2,400	.24	<.002	.66

Appendix 1.--Water-quality data for alkaline-addition study site, May 1983 through September 1989--Continued

Date	Nitrogen, ammonia + organic total (mg/L as N)	Phosphorus total (mg/L as P)	Aluminum, dissolved (mg/L)	Arsenic, dissolved (µg/L)	Barium, dissolved (µg/L)	Boron, dissolved (µg/L)	Cadmium, dissolved (µg/L)	Chromium, dissolved (µg/L)	Copper, dissolved (µg/L)	Iron, dissolved (mg/L)
410945079253101 Drain (LAT 41°09'45" N. LONG 079°25'31" W.)--Continued										
JUNE 08, 1987	2	0.15	130	160	<10	<250	14	120	<10	670
JULY 07, 1987	2.8	.13	160	220	<10	<250	11	630	<10	530
AUG 11, 1987	2	.12	--	--	--	--	--	--	--	--
AUG 12, 1987	--	--	--	180	<10	--	13	610	170	500
AUG 12, 1987	2.1	.11	170	130	<10	<250	14	170	220	580
SEPT 15, 1987	2.2	.24	200	150	<10	<250	15	690	280	790
OCT 06, 1987	2	.17	190	190	120	<250	11	73	290	720
NOV 17, 1987	1.6	.13	130	150	<100	<250	11	<50	120	560
DEC 14, 1987	1.9	.26	230	120	36	<250	12	<50	310	910
JAN 11, 1988	1.8	.23	210	190	<10	<250	9.8	82	240	940
FEB 08, 1988	1.2	.22	180	180	<10	<250	13	110	240	720
MAR 14, 1988	1.7	.20	170	180	16	<250	9.9	<50	310	670
JUNE 07, 1988	2	.17	150	81	15	<250	14	70	270	670
MAR 13, 1989	1.5	.39	250	140	<10	<250	14	<50	490	1,200
JUNE 13, 1989	1	.16	170	40	<10	<250	12	50	240	520
SEPT 11, 1989	1.4	.10	200	30	<10	<250	13	58	310	660
410940079254801 Seep HH (LAT 41°09'40" N. LONG 079°25'48" W.)										
JUNE 07, 1983	--	--	31	--	--	--	--	--	--	130
JULY 12, 1983	--	--	28	--	--	--	--	--	--	130
AUG 09, 1983	--	--	.30	--	--	--	--	--	--	58
SEPT 13, 1983	--	--	17	--	--	--	--	--	--	200
OCT 12, 1983	--	--	26	--	--	--	--	--	--	260
NOV 15, 1983	--	--	.44	--	--	--	--	--	--	27
DEC 12, 1983	--	--	.79	--	--	--	--	--	--	24
JAN 16, 1984	--	--	1.4	--	--	--	--	--	--	55
FEB 14, 1984	--	--	1.7	--	--	--	--	--	--	12
MAR 21, 1984	--	--	.37	--	--	--	--	--	--	8.1
APR 25, 1984	--	--	41	--	--	--	--	--	--	76
MAY 21, 1984	--	--	.30	--	--	--	--	--	--	400
JUNE 18, 1984	--	--	.10	--	--	--	--	--	--	13
JULY 17, 1984	--	--	.30	--	--	--	--	--	--	10
AUG 21, 1984	--	--	.20	--	--	--	--	--	--	86
OCT 30, 1984	--	--	20	--	--	--	--	--	--	180
NOV 20, 1984	--	--	20	--	--	--	--	--	--	210
DEC 11, 1984	--	--	.35	--	--	--	--	--	--	73
JAN 21, 1985	--	--	17	--	--	--	--	--	--	220
FEB 12, 1985	--	--	.11	--	--	--	--	--	--	84
MAR 12, 1985	--	--	.06	--	--	--	--	--	--	23
APR 09, 1985	--	--	1.7	--	--	--	--	--	--	39
MAY 15, 1985	--	--	15	--	--	--	--	--	--	230
JUNE 12, 1985	--	--	1.9	--	--	--	--	--	--	31
JULY 09, 1985	--	--	8.6	--	--	--	--	--	--	85
AUG 06, 1985	--	--	14	--	--	--	--	--	--	280
SEPT 11, 1985	--	--	<.04	--	--	--	--	--	--	94
OCT 08, 1985	--	--	.26	--	--	--	--	--	--	290
NOV 14, 1985	--	--	<.04	--	--	--	--	--	--	--
DEC 11, 1985	--	--	.78	--	--	--	--	--	--	11
JAN 07, 1986	--	--	<.13	--	--	--	--	--	--	92
FEB 05, 1986	--	--	<.13	--	--	--	--	--	--	5.1
MAR 11, 1986	--	--	<.13	--	--	--	--	--	--	31
APR 02, 1986	--	--	25	--	--	--	--	--	--	150
MAY 06, 1986	--	--	28	--	--	--	--	--	--	180
JUNE 04, 1986	--	--	22	--	--	--	--	--	--	250
JULY 08, 1986	1.3	--	19	<1,000	--	--	<10	<50	<10	220

Appendix 1.–Water-quality data for alkaline-addition study site, May 1983 through September 1989–Continued

Date	Iron, ferrous dissolved (mg/L)	Lead, dissolved (µg/L)	Manganese, dissolved (mg/L)	Mercury, dissolved (µg/L)	Molybdenum, dissolved (µg/L)	Nickel, dissolved (mg/L)	Selenium, dissolved (mg/L)	Strontium, dissolved (µg/L)	Zinc, dissolved (mg/L)	Cyanide total (mg/L)
410945079253101 Drain (LAT 41°09'45" N. LONG 079°25'31" W.)–Continued										
JUNE 08, 1987	550	6.3	55	<1	<70	2.2	<150	340	3.3	<0.001
JULY 07, 1987	420	5.3	58	<1	<70	2.1	<30	330	4.9	<.001
AUG 11, 1987	510	–	–	–	–	–	–	–	–	–
AUG 12, 1987	–	<10	68	<1	<70	1.8	<30	370	4.8	<.001
AUG 12, 1987	500	<10	69	<1	<70	2.3	<30	360	5	<.001
SEPT 15, 1987	610	<20	62	<1	<70	3.1	<30	320	5.5	<.001
OCT 06, 1987	430	<10	65	<1	<70	2.2	<30	310	5.3	<.001
NOV 17, 1987	470	<4	76	<1	<70	2.3	<30	330	5.8	<.001
DEC 14, 1987	660	<10	79	<1	<70	2.4	<30	360	5.4	<.001
JAN 11, 1988	650	<10	82	<1	<70	.78	<30	310	4.3	<.001
FEB 08, 1988	520	<10	66	<1	<70	2.5	<30	320	5.9	<.001
MAR 14, 1988	560	<20	63	<1	<70	2.1	<30	–	5.1	<.001
JUNE 07, 1988	500	<10	55	<1	<70	2.3	<30	300	5.4	<.001
MAR 13, 1989	840	<40	75	<1	<70	2.9	<30	340	6.1	<.001
JUNE 13, 1989	1,200	<4	59	<1	<70	2.1	<30	240	5.4	<.001
SEPT 11, 1989	480	<40	73	<1	<70	3.3	<30	360	6.5	<.001
410940079254801 Seep HH (LAT 41°09'40" N. LONG 079°25'48" W.)										
JUNE 07, 1983	–	–	36	–	–	–	–	–	–	–
JULY 12, 1983	–	–	40	–	–	–	–	–	–	–
AUG 09, 1983	–	–	21	–	–	–	–	–	–	–
SEPT 13, 1983	–	–	44	–	–	–	–	–	–	–
OCT 12, 1983	–	–	55	–	–	–	–	–	–	–
NOV 15, 1983	–	–	31	–	–	–	–	–	–	–
DEC 12, 1983	–	–	16	–	–	–	–	–	–	–
JAN 16, 1984	.80	–	18	–	–	–	–	–	–	–
FEB 14, 1984	–	–	5.2	–	–	–	–	–	–	–
MAR 21, 1984	8.1	–	5.9	–	–	–	–	–	–	–
APR 25, 1984	76	–	23	–	–	–	–	–	–	–
MAY 21, 1984	360	–	5.3	–	–	–	–	–	–	–
JUNE 18, 1984	2.9	–	13	–	–	–	–	–	–	–
JULY 17, 1984	10	–	8.9	–	–	–	–	–	–	–
AUG 21, 1984	–	–	23	–	–	–	–	–	–	–
OCT 30, 1984	180	–	39	–	–	–	–	–	–	–
NOV 20, 1984	210	–	43	–	–	–	–	–	–	–
DEC 11, 1984	–	–	18	–	–	–	–	–	–	–
JAN 21, 1985	–	–	46	–	–	–	–	–	–	–
FEB 12, 1985	84	–	26	–	–	–	–	–	–	–
MAR 12, 1985	23	–	6.1	–	–	–	–	–	–	–
APR 09, 1985	–	–	12	–	–	–	–	–	–	–
MAY 15, 1985	200	–	51	–	–	–	–	–	–	–
JUNE 12, 1985	32	–	9.8	–	–	–	–	–	–	–
JULY 09, 1985	99	–	22	–	–	–	–	–	–	–
AUG 06, 1985	–	–	52	–	–	–	–	–	–	–
SEPT 11, 1985	100	–	41	–	–	–	–	–	–	–
OCT 08, 1985	310	–	61	–	–	–	–	–	–	–
NOV 14, 1985	1.8	–	–	–	–	–	–	–	–	–
DEC 11, 1985	11	–	4.8	–	–	–	–	–	–	–
JAN 07, 1986	93	–	37	–	–	–	–	–	–	–
FEB 05, 1986	2.8	–	4.1	–	–	–	–	–	–	–
MAR 11, 1986	33	–	11	–	–	–	–	–	–	–
APR 02, 1986	140	–	44	–	–	–	–	–	–	–
MAY 06, 1986	170	–	49	–	–	–	–	–	–	–
JUNE 04, 1986	250	–	62	–	–	–	–	–	–	–
JULY 08, 1986	210	<50	–	<1	<700	1	<1,000	320	1.8	<.001

Appendix 1.–Water-quality data for alkaline-addition study site, May 1983 through September 1989–Continued

Date	Time	Water table altitude (feet above sea level)	Streamflow/ discharge, instan-taneous (ft^3/s)	Specific conduc-tance (µS/cm)	pH, field (units)	pH, lab (units)	Water temper-ature (°C)	Acidity total heated (mg/L as $CaCO_3$)	Acidity mineral (methyl orange) (mg/L as $CaCO_3$)	Calcium, dissolved (mg/L)	Magnesium, dissolved (mg/L)
410940079254801 Seep HH (LAT 41°09'40" N. LONG 079°25'48" W.)–Continued											
AUG 04, 1986	1045	–	0.02	1,990	5.4	5.1	22.5	410	–	84	68
SEPT 03, 1986	0835	–	.01	3,000	5.1	5.2	16.0	610	–	130	120
OCT 08, 1986	0835	–	.03	2,020	6.4	5.9	9.0	110	–	59	54
NOV 18, 1986	1010	–	.02	2,600	4.9	4.9	3.5	680	–	89	87
DEC 09, 1986	1035	–	.04	1,590	6.4	6.0	6.5	80	–	40	39
JAN 06, 1987	0953	–	.01	1,800	4.6	4.5	.0	430	–	68	84
FEB 03, 1987	0840	–	.02	1,920	5.0	4.8	1.0	360	–	69	68
MAR 16, 1987	1130	–	.02	1,920	4.5	4.4	6.0	410	8	86	84
APR 08, 1987	0945	–	.04	1,320	5.1	5.2	7.5	210	–	44	41
MAY 06, 1987	1000	–	.01	1,620	4.1	4.0	20.0	430	–	30	33
JUNE 09, 1987	1730	–	.00	1,880	3.9	3.9	17.0	510	6	81	79
JULY 07, 1987	2000	–	.00	1,440	5.9	5.3	22.0	170	–	44	44
410939079254901 Seep HC (LAT 41°09'39" N. LONG 079°25'49" W.)											
MAY 03, 1983	1550	–	.03	1,430	3.0	3.0	–	420	–	42	52
JUNE 07, 1983	0810	–	.02	2,100	2.8	2.9	–	510	–	–	–
JULY 12, 1983	1007	–	.01	2,600	2.8	2.9	–	680	–	88	90
AUG 09, 1983	0957	–	–	3,150	2.8	2.8	–	200	–	87	89
SEPT 13, 1983	1420	–	.01	2,850	2.7	2.8	–	780	–	85	87
OCT 12, 1983	0830	–	.01	3,000	2.5	2.8	15.5	880	370	98	110
NOV 15, 1983	1111	–	.02	2,100	2.6	3.1	2.5	460	210	63	63
DEC 12, 1983	1305	–	.11	580	3.4	3.4	6.0	68	34	12	11
JAN 16, 1984	1130	–	–	1,950	2.8	2.9	.5	680	290	90	95
FEB 14, 1984	0855	–	–	630	3.3	3.5	5.0	120	–	–	–
MAR 21, 1984	1305	–	–	1,500	2.9	3.0	4.5	440	180	47	55
APR 25, 1984	0905	–	.01	1,950	2.6	2.9	6.5	590	200	58	69
MAY 21, 1984	1415	–	.01	2,200	2.8	2.9	–	740	280	66	78
JUNE 18, 1984	0925	–	.02	–	2.8	2.9	18.0	450	260	51	55
JULY 17, 1984	1415	–	.01	2,270	2.8	2.8	21.0	600	–	75	86
AUG 21, 1984	1355	–	.01	2,300	2.8	2.9	20.5	700	400	82	110
SEPT 17, 1984	1005	–	.01	2,630	2.8	3.0	10.0	880	450	110	110
OCT 30, 1984	0830	–	.01	2,760	2.8	2.9	8.0	910	300	100	120
NOV 20, 1984	1050	–	.01	2,190	2.6	3.1	1.5	730	210	92	51
DEC 11, 1984	1410	–	.02	2,100	2.7	3.0	5.0	640	250	73	>60
JAN 21, 1985	1000	–	.00	2,350	2.3	2.9	.5	800	350	100	53
FEB 12, 1985	0930	–	.00	2,400	2.9	2.9	1.0	750	350	100	52
MAR 12, 1985	1000	–	.09	900	3.2	3.2	5.0	220	70	25	23
APR 09, 1985	1405	–	.02	1,680	3.0	3.1	7.5	340	120	60	75
MAY 15, 1985	0755	–	.01	2,370	2.6	2.9	15.0	680	270	65	39
JUNE 12, 1985	0735	–	.05	1,440	2.8	3.0	14.0	390	150	48	50
JULY 09, 1985	0750	–	.03	1,530	3.0	2.9	18.5	500	130	52	56
AUG 06, 1985	0915	–	–	3,850	2.8	2.8	17.5	990	400	120	59
SEPT 11, 1985	0800	–	.01	3,050	2.8	2.9	17.0	550	220	88	92
OCT 08, 1985	0800	–	.01	3,450	2.6	2.8	7.0	1,000	510	140	170
NOV 14, 1985	1020	–	.02	1,600	3.1	3.1	14.0	260	80	37	40
DEC 11, 1985	0905	–	.00	230	4.8	4.7	6.5	30	–	11	5.5
FEB 05, 1986	0845	–	.09	635	3.3	3.4	5.5	110	12	18	17
MAR 11, 1986	0940	–	.01	1,780	3.0	2.9	3.0	520	170	73	73
APR 02, 1986	0710	–	.00	2,700	2.6	2.8	6.0	840	340	100	110
MAY 06, 1986	0955	–	.00	2,850	2.7	2.7	14.0	820	450	120	120
JUNE 04, 1986	0820	–	.00	3,140	2.8	2.6	11.0	1,200	480	120	130
JULY 08, 1986	0815	–	.00	3,080	2.6	2.5	19.5	1,100	410	–	–
AUG 04, 1986	1015	–	.01	3,160	2.7	2.6	18.0	940	370	100	100
SEPT 03, 1986	0810	–	.00	3,500	2.7	2.6	15.0	390	530	130	150
OCT 08, 1986	0825	–	.01	2,370	3.0	2.9	6.5	460	210	67	77

Appendix 1.–Water-quality data for alkaline-addition study site, May 1983 through September 1989–Continued

Date	Sodium, dissolved (mg/L)	Potassium, dissolved (mg/L)	Alkalinity water lab (mg/L as $CaCO_3$)	Sulfate, dissolved (mg/L as SO_4)	Chloride, dissolved (mg/L)	Silica, dissolved (mg/L as SiO_2)	Solids, residue at 105 °C, dissolved (mg/L)	Nitrogen, nitrate total (mg/L as N)	Nitrogen, nitrite total (mg/L as N)	Nitrogen, ammonia total (mg/L as N)
410940079254801 Seep HH (LAT 41°09'40" N. LONG 079°25'48" W.)–Continued										
AUG 04, 1986	200	4.8	12	1,300	6	–	2,000	0.20	<0.004	0.51
SEPT 03, 1986	300	7.2	14	2,000	7	–	2,850	.18	.024	.54
OCT 08, 1986	–	–	50	1,200	–	–	–	–	–	–
NOV 18, 1986	–	–	12	1,400	–	–	–	–	–	–
DEC 09, 1986	–	–	58	640	–	–	–	–	–	–
JAN 06, 1987	–	–	10	1,200	–	–	–	–	–	–
FEB 03, 1987	–	–	12	960	–	–	–	–	–	–
MAR 16, 1987	–	–	0	1,200	–	–	–	–	–	–
APR 08, 1987	–	–	10	500	–	–	–	–	–	–
MAY 06, 1987	–	–	4	970	–	20	–	–	–	–
JUNE 09, 1987	–	–	–	1,100	–	–	–	–	–	–
JULY 07, 1987	–	–	16	680	–	–	–	–	–	–
410939079254901 Seep HC (LAT 41°09'39" N. LONG 079°25'49" W.)										
MAY 03, 1983	–	–	0	450	–	–	–	–	–	–
JUNE 07, 1983	–	–	0	680	–	–	–	–	–	–
JULY 12, 1983	–	–	0	1,400	–	–	–	–	–	–
AUG 09, 1983	–	–	0	1,600	–	–	–	–	–	–
SEPT 13, 1983	–	–	0	1,300	–	–	–	–	–	–
OCT 12, 1983	–	–	0	1,800	–	–	–	–	–	–
NOV 15, 1983	–	–	0	900	–	–	–	–	–	–
DEC 12, 1983	–	–	0	200	–	–	–	–	–	–
JAN 16, 1984	–	–	0	1,200	–	–	–	–	–	–
FEB 14, 1984	–	–	0	260	–	–	–	–	–	–
MAR 21, 1984	–	–	0	480	–	–	–	–	–	–
APR 25, 1984	–	–	0	810	–	–	–	–	–	–
MAY 21, 1984	–	–	0	1,000	–	–	–	–	–	–
JUNE 18, 1984	–	–	0	590	–	–	–	–	–	–
JULY 17, 1984	–	–	0	1,400	–	–	–	–	–	–
AUG 21, 1984	–	–	0	1,400	–	–	–	–	–	–
SEPT 17, 1984	–	–	0	1,400	–	–	–	–	–	–
OCT 30, 1984	–	–	0	1,400	–	–	–	–	–	–
NOV 20, 1984	–	–	0	1,100	–	–	–	–	–	–
DEC 11, 1984	–	–	0	520	–	–	–	–	–	–
JAN 21, 1985	–	–	0	1,300	–	–	–	–	–	–
FEB 12, 1985	–	–	0	1,300	–	–	–	–	–	–
MAR 12, 1985	–	–	0	320	–	–	–	–	–	–
APR 09, 1985	–	–	0	1,200	–	–	–	–	–	–
MAY 15, 1985	–	–	0	1,100	–	–	–	–	–	–
JUNE 12, 1985	–	–	0	780	–	–	–	–	–	–
JULY 09, 1985	–	–	0	–	–	–	–	–	–	–
AUG 06, 1985	–	–	–	–	–	–	–	–	–	–
SEPT 11, 1985	–	–	0	1,600	–	–	–	–	–	–
OCT 08, 1985	–	–	0	2,200	–	–	–	–	–	–
NOV 14, 1985	–	–	0	980	–	–	–	–	–	–
DEC 11, 1985	–	–	8	99	–	–	–	–	–	–
FEB 05, 1986	–	–	0	240	–	–	–	–	–	–
MAR 11, 1986	–	–	0	940	–	–	–	–	–	–
APR 02, 1986	–	–	0	1,400	–	–	–	–	–	–
MAY 06, 1986	–	–	0	1,300	–	–	–	–	–	–
JUNE 04, 1986	–	–	0	1,900	–	–	–	–	–	–
JULY 08, 1986	39	4.6	0	1,200	4	–	2,470	.10	<.002	.72
AUG 04, 1986	37	4.8	0	1,700	3	–	2,570	<.04	<.004	.57
SEPT 03, 1986	81	7.6	0	2,000	8	–	2,900	<.02	<.002	.57
OCT 08, 1986	–	–	0	580	–	–	–	–	–	–

Appendix 1.–Water-quality data for alkaline-addition study site, May 1983 through September 1989–Continued

Date	Nitrogen, ammonia + organic total (mg/L as N)	Phosphorus total (mg/L as P)	Aluminum, dissolved (mg/L)	Arsenic, dissolved (µg/L)	Barium, dissolved (µg/L)	Boron, dissolved (µg/L)	Cadmium, dissolved (µg/L)	Chromium, dissolved (µg/L)	Copper, dissolved (µg/L)	Iron, dissolved (mg/L)
410940079254801 Seep HH (LAT 41°09'40" N. LONG 079°25'48" W.)–Continued										
AUG 04, 1986	0.95	–	0.41	<10	–	<250	2.4	<50	<10	160
SEPT 03, 1986	1.2	–	1.4	<40	–	<250	2.3	<50	<10	270
OCT 08, 1986	–	–	.16	–	–	–	–	–	–	100
NOV 18, 1986	–	–	3	–	–	–	–	–	–	150
DEC 09, 1986	–	–	.24	–	–	–	–	–	–	55
JAN 06, 1987	–	–	14	–	–	–	–	–	–	180
FEB 03, 1987	–	–	5.1	–	–	–	–	–	–	120
MAR 16, 1987	–	–	19	–	–	–	–	–	–	120
APR 08, 1987	–	–	2.1	–	–	–	–	–	–	64
MAY 06, 1987	–	0.03	14	–	–	–	–	–	–	40
JUNE 09, 1987	–	–	16	–	–	–	–	–	–	160
JULY 07, 1987	–	–	<.14	–	–	–	–	–	–	70
410939079254901 Seep HC (LAT 41°09'39" N. LONG 079°25'49" W.)										
MAY 03, 1983	–	–	22	–	–	–	–	–	–	2.2
JUNE 07, 1983	–	–	36	–	–	–	–	–	–	53
JULY 12, 1983	–	–	52	–	–	–	–	–	–	71
AUG 09, 1983	–	–	37	–	–	–	–	–	–	77
SEPT 13, 1983	–	–	29	–	–	–	–	–	–	67
OCT 12, 1983	–	–	45	–	–	–	–	–	–	100
NOV 15, 1983	–	–	23	–	–	–	–	–	–	75
DEC 12, 1983	–	–	3.9	–	–	–	–	–	–	9.9
JAN 16, 1984	–	–	50	–	–	–	–	–	–	52
FEB 14, 1984	–	–	4.6	–	–	–	–	–	–	14
MAR 21, 1984	–	–	20	–	–	–	–	–	–	39
APR 25, 1984	–	–	24	–	–	–	–	–	–	54
MAY 21, 1984	–	–	36	–	–	–	–	–	–	31
JUNE 18, 1984	–	–	20	–	–	–	–	–	–	26
JULY 17, 1984	–	–	38	–	–	–	–	–	–	40
AUG 21, 1984	–	–	30	–	–	–	–	–	–	54
SEPT 17, 1984	–	–	47	–	–	–	–	–	–	82
OCT 30, 1984	–	–	58	–	–	–	–	–	–	110
NOV 20, 1984	–	–	47	–	–	–	–	–	–	12
DEC 11, 1984	–	–	29	–	–	–	–	–	–	89
JAN 21, 1985	–	–	45	–	–	–	–	–	–	96
FEB 12, 1985	–	–	42	–	–	–	–	–	–	100
MAR 12, 1985	–	–	11	–	–	–	–	–	–	23
APR 09, 1985	–	–	28	–	–	–	–	–	–	47
MAY 15, 1985	–	–	43	–	–	–	–	–	–	75
JUNE 12, 1985	–	–	27	–	–	–	–	–	–	32
JULY 09, 1985	–	–	27	–	–	–	–	–	–	38
AUG 06, 1985	–	–	40	–	–	–	–	–	–	160
SEPT 11, 1985	–	–	23	–	–	–	–	–	–	110
OCT 08, 1985	–	–	41	–	–	–	–	–	–	270
NOV 14, 1985	–	–	12	–	–	–	–	–	–	43
DEC 11, 1985	–	–	1	–	–	–	–	–	–	1.6
FEB 05, 1986	–	–	6.3	–	–	–	–	–	–	12
MAR 11, 1986	–	–	32	–	–	–	–	–	–	61
APR 02, 1986	–	–	45	–	–	–	–	–	–	97
MAY 06, 1986	–	–	54	–	–	–	–	–	–	120
JUNE 04, 1986	–	–	58	–	–	–	–	–	–	140
JULY 08, 1986	1.4	–	–	<1,000	–	–	<10	<50	<10	100
AUG 04, 1986	1.4	–	49	33	–	<250	5	<50	<10	120
SEPT 03, 1986	1.2	–	57	<20	–	<250	5.8	<50	<10	190
OCT 08, 1986	–	–	32	–	–	–	–	–	–	91

Appendix 1.–Water-quality data for alkaline-addition study site, May 1983 through September 1989–Continued

Date	Iron, ferrous dissolved (mg/L)	Lead, dissolved (µg/L)	Manganese, dissolved (mg/L)	Mercury, dissolved (µg/L)	Molybdenum, dissolved (µg/L)	Nickel, dissolved (mg/L)	Selenium, dissolved (mg/L)	Strontium, dissolved (µg/L)	Zinc, dissolved (mg/L)	Cyanide total (mg/L)
410940079254801 Seep HH (LAT 41°09'40" N. LONG 079°25'48" W.)–Continued										
AUG 04, 1986	160	<50	31	<1	<700	0.70	<1,000	280	1.1	<0.001
SEPT 03, 1986	240	<50	57	<1	<70	1.2	<60	360	1.8	<.001
OCT 08, 1986	110	–	28	–	–	–	–	–	–	–
NOV 18, 1986	140	–	43	–	–	–	–	–	–	–
DEC 09, 1986	53	–	18	–	–	–	–	–	–	–
JAN 06, 1987	180	–	39	–	–	–	–	–	–	–
FEB 03, 1987	120	–	33	–	–	–	–	–	–	–
MAR 16, 1987	130	–	41	–	–	–	–	–	–	–
APR 08, 1987	69	–	19	–	–	–	–	–	–	–
MAY 06, 1987	120	–	.21	–	–	–	–	–	–	–
JUNE 09, 1987	190	–	37	–	–	–	–	–	–	–
JULY 07, 1987	84	–	19	–	–	–	–	–	–	–
410939079254901 Seep HC (LAT 41°09'39" N. LONG 079°25'49" W.)										
MAY 03, 1983	–	–	25	–	–	–	–	–	–	–
JUNE 07, 1983	–	–	39	–	–	–	–	–	–	–
JULY 12, 1983	–	–	43	–	–	–	–	–	–	–
AUG 09, 1983	–	–	48	–	–	–	–	–	–	–
SEPT 13, 1983	–	–	44	–	–	–	–	–	–	–
OCT 12, 1983	–	–	59	–	–	–	–	–	–	–
NOV 15, 1983	–	–	30	–	–	–	–	–	–	–
DEC 12, 1983	–	–	5.4	–	–	–	–	–	–	–
JAN 16, 1984	1.6	–	47	–	–	–	–	–	–	–
FEB 14, 1984	–	–	6.8	–	–	–	–	–	–	–
MAR 21, 1984	1.6	–	26	–	–	–	–	–	–	–
APR 25, 1984	12	–	43	–	–	–	–	–	–	–
MAY 21, 1984	–	–	29	–	–	–	–	–	–	–
JUNE 18, 1984	20	–	26	–	–	–	–	–	–	–
JULY 17, 1984	5.7	–	50	–	–	–	–	–	–	–
AUG 21, 1984	–	–	55	–	–	–	–	–	–	–
SEPT 17, 1984	–	–	66	–	–	–	–	–	–	–
OCT 30, 1984	37	–	78	–	–	–	–	–	–	–
NOV 20, 1984	12	–	55	–	–	–	–	–	–	–
DEC 11, 1984	–	–	45	–	–	–	–	–	–	–
JAN 21, 1985	–	–	59	–	–	–	–	–	–	–
FEB 12, 1985	18	–	60	–	–	–	–	–	–	–
MAR 12, 1985	9.7	–	13	–	–	–	–	–	–	–
APR 09, 1985	–	–	31	–	–	–	–	–	–	–
MAY 15, 1985	7.1	–	51	–	–	–	–	–	–	–
JUNE 12, 1985	9.5	–	29	–	–	–	–	–	–	–
JULY 09, 1985	10	–	31	–	–	–	–	–	–	–
AUG 06, 1985	–	–	73	–	–	–	–	–	–	–
SEPT 11, 1985	62	–	59	–	–	–	–	–	–	–
OCT 08, 1985	65	–	86	–	–	–	–	–	–	–
NOV 14, 1985	28	–	21	–	–	–	–	–	–	–
DEC 11, 1985	2.2	–	2	–	–	–	–	–	–	–
FEB 05, 1986	6.9	–	8.5	–	–	–	–	–	–	–
MAR 11, 1986	15	–	44	–	–	–	–	–	–	–
APR 02, 1986	4.3	–	>50	–	–	–	–	–	–	–
MAY 06, 1986	13	–	72	–	–	–	–	–	–	–
JUNE 04, 1986	6.3	–	84	–	–	–	–	–	–	–
JULY 08, 1986	3.4	<50	–	<1	<700	1.7	<1,000	300	3.4	<.001
AUG 04, 1986	7.7	<50	58	<1	<700	1.6	<1,000	300	3.2	<.001
SEPT 03, 1986	12	<50	85	<1	<70	2.2	<30	380	4.3	<.001
OCT 08, 1986	42	–	47	–	–	–	–	–	–	–

Appendix 1.–Water-quality data for alkaline-addition study site, May 1983 through September 1989–Continued

Date	Time	Water table altitude (feet above sea level)	Streamflow/ discharge, instan-taneous (ft^3/s)	Specific conduc-tance (µS/cm)	pH, field (units)	pH, lab (units)	Water temper-ature (°C)	Acidity total heated (mg/L as $CaCO_3$)	Acidity mineral (methyl orange) (mg/L as $CaCO_3$)	Calcium, dissolved (mg/L)	Magnesium, dissolved (mg/L)
410939079254901 Seep HC (LAT 41°09'39" N. LONG 079°25'49" W.)–Continued											
NOV 18, 1986	1000	--	0.01	3,000	2.6	2.8	3.0	1,200	330	92	110
DEC 08, 1986	1015	--	.03	1,700	3.1	3.0	4.0	520	140	45	64
JAN 06, 1987	0922	--	.01	2,000	3.1	3.0	.5	570	220	84	100
FEB 03, 1987	0810	--	--	1,970	2.9	3.0	.0	610	220	83	99
MAR 16, 1987	1055	--	.00	2,170	2.8	2.8	1.0	660	250	84	110
APR 08, 1987	0915	--	.01	1,570	2.8	3.0	4.0	420	180	50	58
MAY 06, 1987	1000	--	.00	2,050	2.8	2.8	19.5	720	230	130	140
JUNE 09, 1987	1730	--	.00	2,450	2.7	2.7	17.0	840	300	84	100
JULY 07, 1987	1930	--	.00	2,250	2.6	2.7	25.0	630	250	56	64
410945079253001 Upstream (LAT 41°09'45" N. LONG 079°25'30" W.)											
MAY 03, 1983	1400	--	--	105	6.6	6.9	11.0	0	--	11	2.3
JUNE 07, 1983	1630	--	--	110	6.9	6.4	15.5	150	--	9.8	2.4
SEPT 13, 1983	0925	--	.00	220	6.6	8.0	17.5	0	--	33	3.6
OCT 12, 1983	1000	--	.01	230	6.9	7.1	14.5	0	--	32	3.5
NOV 15, 1983	1350	--	.03	150	7.5	7.3	3.0	0	--	14	2.7
DEC 12, 1983	1550	--	1.10	90	7.6	6.1	6.0	6	--	8.5	1.8
JAN 16, 1984	1204	--	--	110	6.6	6.0	.0	4	--	15	2.8
FEB 14, 1984	1020	--	--	70	6.0	6.4	3.0	32	--	16	4.9
MAR 21, 1984	1600	--	--	105	5.7	6.1	4.5	84	--	10	2.1
APR 25, 1984	1200	--	--	90	6.9	6.5	10.5	0	--	11	2.8
MAY 23, 1984	1200	--	.24	--	--	6.7	--	0	--	14	2.2
JUNE 18, 1984	0955	--	.17	--	7.8	6.4	15.0	38	--	13	2.4
JULY 17, 1984	1435	--	.01	105	6.4	7.0	17.0	0	--	12	2.5
AUG 21, 1984	1050	--	.01	125	7.1	7.1	13.0	0	--	17	3
OCT 30, 1984	0925	--	.02	135	8.1	6.9	9.5	0	--	22	3.7
NOV 19, 1984	1540	--	.03	95	8.0	6.9	5.0	0	--	--	--
DEC 11, 1984	0945	--	.05	105	7.7	6.6	4.0	0	--	12	2.4
JAN 21, 1985	1110	--	.01	110	6.4	6.7	.5	0	--	14	2.5
FEB 11, 1985	1555	--	.01	105	6.9	6.6	.0	0	--	12	2.3
MAR 12, 1985	1115	--	.78	85	--	6.8	5.0	0	--	7.5	1.6
APR 08, 1985	1425	--	.15	110	6.5	6.3	8.0	0	--	14	2.8
MAY 14, 1985	1605	--	.01	110	7.7	6.3	20.0	0	--	12	2.7
JUNE 12, 1985	1430	--	.43	99	6.5	6.2	13.5	8	--	11	1.9
JULY 09, 1985	0830	--	.11	140	7.2	7.3	17.0	0	--	20	2.4
SEPT 11, 1985	0925	--	.01	140	7.3	6.6	16.0	0	--	22	2.8
NOV 13, 1985	0830	--	.31	125	8.6	7.7	12.0	0	--	12	10
DEC 11, 1985	1030	--	.00	80	6.5	6.2	6.5	0	--	11	1.9
JAN 07, 1986	1130	--	.01	105	7.0	5.9	.0	18	--	14	2.6
FEB 04, 1986	1100	--	.44	150	9.8	9.5	1.5	0	--	22	1.9
MAR 10, 1986	1440	--	.09	115	8.5	6.6	4.5	0	--	16	2.4
APR 02, 1986	0755	--	.01	94	7.8	5.8	5.5	0	--	11	2.5
MAY 06, 1986	1035	--	.01	99	7.7	6.4	14.0	0	--	12	2.8
JUNE 04, 1986	0930	--	.00	161	7.2	7.2	11.5	0	--	22	3.6
OCT 07, 1986	1325	--	.04	116	7.0	6.4	12.0	0	--	16	2.5
NOV 19, 1986	0845	--	.30	100	6.9	6.0	4.5	14	--	11	2.2
DEC 09, 1986	0850	--	.30	107	6.3	6.2	6.0	30	--	14	2.5
JAN 07, 1987	1320	--	.03	95	7.4	5.9	.5	0	--	11	2.6
FEB 03, 1987	1000	--	.02	100	6.7	6.4	.0	0	--	12	2.6
MAR 16, 1987	1220	--	.03	90	6.6	5.9	.5	44	--	13	3
APR 06, 1987	1400	--	.30	80	6.4	6.4	7.0	48	--	9.2	2.2
MAY 06, 1987	1000	--	.04	85	7.6	5.7	9.0	2	--	8.9	2.3
JUNE 08, 1987	1445	--	.02	105	7.3	6.0	22.0	12	--	13	2.7
JULY 07, 1987	1830	--	.04	112	6.3	6.1	20.5	8	--	14	2.5

Appendix 1.–Water-quality data for alkaline-addition study site, May 1983 through September 1989–Continued

Date	Sodium, dissolved (mg/L)	Potassium, dissolved (mg/L)	Alkalinity water lab (mg/L as $CaCO_3$)	Sulfate, dissolved (mg/L as SO_4)	Chloride, dissolved (mg/L)	Silica, dissolved (mg/L as SiO_2)	Solids, residue at 105 °C, dissolved (mg/L)	Nitrogen, nitrate total (mg/L as N)	Nitrogen, nitrite total (mg/L as N)	Nitrogen, ammonia total (mg/L as N)
410939079254901 Seep HC (LAT 41°09'39" N. LONG 079°25'49" W.)–Continued										
NOV 18, 1986	--	--	--	1,200	--	--	--	--	--	--
DEC 08, 1986	--	--	--	820	--	--	--	--	--	--
JAN 06, 1987	--	--	--	910	--	--	--	--	--	--
FEB 03, 1987	--	--	--	690	--	--	--	--	--	--
MAR 16, 1987	--	--	--	1,100	--	--	--	--	--	--
APR 08, 1987	--	--	--	520	--	--	--	--	--	--
MAY 06, 1987	--	--	--	880	--	29	--	--	--	--
JUNE 09, 1987	--	--	--	1,000	--	--	--	--	--	--
JULY 07, 1987	--	--	--	660	--	--	--	--	--	--
410945079253001 Upstream (LAT 41°09'45" N. LONG 079°25'30" W.)										
MAY 03, 1983	--	--	19	15	--	--	--	--	--	--
JUNE 07, 1983	--	--	20	58	--	--	--	--	--	--
SEPT 13, 1983	--	--	84	85	--	--	--	--	--	--
OCT 12, 1983	--	--	84	130	--	--	--	--	--	--
NOV 15, 1983	--	--	48	55	--	--	--	--	--	--
DEC 12, 1983	--	--	16	42	--	--	--	--	--	--
JAN 16, 1984	--	--	32	55	--	--	--	--	--	--
FEB 14, 1984	--	--	10	8	--	--	--	--	--	--
MAR 21, 1984	--	--	22	61	--	--	--	--	--	--
APR 25, 1984	--	--	22	62	--	--	--	--	--	--
MAY 23, 1984	--	--	34	98	--	--	--	--	--	--
JUNE 18, 1984	--	--	26	37	--	--	--	--	--	--
JULY 17, 1984	--	--	30	55	--	--	--	--	--	--
AUG 21, 1984	--	--	40	64	--	--	--	--	--	--
OCT 30, 1984	--	--	42	52	--	--	--	--	--	--
NOV 19, 1984	--	--	30	<40	--	--	--	--	--	--
DEC 11, 1984	--	--	24	<40	--	--	--	--	--	--
JAN 21, 1985	--	--	30	<40	--	--	--	--	--	--
FEB 11, 1985	--	--	26	<40	--	--	--	--	--	--
MAR 12, 1985	--	--	16	49	--	--	--	--	--	--
APR 08, 1985	--	--	32	34	--	--	--	--	--	--
MAY 14, 1985	--	--	30	37	--	--	--	--	--	--
JUNE 12, 1985	--	--	24	34	--	--	--	--	--	--
JULY 09, 1985	--	--	44	40	--	--	--	--	--	--
SEPT 11, 1985	--	--	54	25	--	--	--	--	--	--
NOV 13, 1985	--	--	42	32	--	--	--	--	--	--
DEC 11, 1985	--	--	22	21	--	--	--	--	--	--
JAN 07, 1986	--	--	30	36	--	--	--	--	--	--
FEB 04, 1986	--	--	50	26	--	--	--	--	--	--
MAR 10, 1986	--	--	38	23	--	--	--	--	--	--
APR 02, 1986	--	--	26	22	--	--	--	--	--	--
MAY 06, 1986	--	--	26	18	--	--	--	--	--	--
JUNE 04, 1986	--	--	56	47	--	--	--	--	--	--
OCT 07, 1986	--	--	36	<10	--	--	--	--	--	--
NOV 19, 1986	--	--	24	110	--	--	--	--	--	--
DEC 09, 1986	--	--	30	28	--	--	--	--	--	--
JAN 07, 1987	--	--	32	33	--	--	--	--	--	--
FEB 03, 1987	--	--	28	30	--	--	--	--	--	--
MAR 16, 1987	--	--	24	34	--	--	--	--	--	--
APR 06, 1987	--	--	18	38	--	--	--	--	--	--
MAY 06, 1987	--	--	22	<10	--	5.2	--	--	--	--
JUNE 08, 1987	--	--	36	47	--	--	--	--	--	--
JULY 07, 1987	--	--	38	26	--	--	--	--	--	--

Appendix 1.–Water-quality data for alkaline-addition study site, May 1983 through September 1989–Continued

Date	Nitrogen, ammonia + organic total (mg/L as N)	Phosphorus total (mg/L as P)	Aluminum, dissolved (mg/L)	Arsenic, dissolved (µg/L)	Barium, dissolved (µg/L)	Boron, dissolved (µg/L)	Cadmium, dissolved (µg/L)	Chromium, dissolved (µg/L)	Copper, dissolved (µg/L)	Iron, dissolved (mg/L)
410939079254901 Seep HC (LAT 41°09'39" N. LONG 079°25'49" W.)–Continued										
NOV 18, 1986	–	–	44	–	–	–	–	–	–	140
DEC 08, 1986	–	–	23	–	–	–	–	–	–	78
JAN 06, 1987	–	–	44	–	–	–	–	–	–	110
FEB 03, 1987	–	–	46	–	–	–	–	–	–	92
MAR 16, 1987	–	–	45	–	–	–	–	–	–	110
APR 08, 1987	–	–	26	–	–	–	–	–	–	53
MAY 06, 1987	–	0.03	48	–	–	–	–	–	–	160
JUNE 09, 1987	–	–	48	–	–	–	–	–	–	68
JULY 07, 1987	–	–	27	–	–	–	–	–	–	42
410945079253001 Upstream (LAT 41°09'45" N. LONG 079°25'30" W.)										
MAY 03, 1983	–	–	.08	–	–	–	–	–	–	.05
JUNE 07, 1983	–	–	.18	–	–	–	–	–	–	.01
SEPT 13, 1983	–	–	.11	–	–	–	–	–	–	.06
OCT 12, 1983	–	–	.35	–	–	–	–	–	–	.69
NOV 15, 1983	–	–	1.3	–	–	–	–	–	–	2.2
DEC 12, 1983	–	–	.06	–	–	–	–	–	–	.09
JAN 16, 1984	–	–	.04	–	–	–	–	–	–	.21
FEB 14, 1984	–	–	.22	–	–	–	–	–	–	.30
MAR 21, 1984	–	–	.31	–	–	–	–	–	–	.48
APR 25, 1984	–	–	.97	–	–	–	–	–	–	9.80
MAY 23, 1984	–	–	.60	–	–	–	–	–	–	.70
JUNE 18, 1984	–	–	.10	–	–	–	–	–	–	<.10
JULY 17, 1984	–	–	<.10	–	–	–	–	–	–	<.10
AUG 21, 1984	–	–	.30	–	–	–	–	–	–	2.4
OCT 30, 1984	–	–	6	–	–	–	–	–	–	3.4
NOV 19, 1984	–	–	<.10	–	–	–	–	–	–	.10
DEC 11, 1984	–	–	.12	–	–	–	–	–	–	.54
JAN 21, 1985	–	–	.11	–	–	–	–	–	–	.07
FEB 11, 1985	–	–	.23	–	–	–	–	–	–	1.1
MAR 12, 1985	–	–	.23	–	–	–	–	–	–	.61
APR 08, 1985	–	–	.26	–	–	–	–	–	–	.80
MAY 14, 1985	–	–	.38	–	–	–	–	–	–	.36
JUNE 12, 1985	–	–	<.04	–	–	–	–	–	–	.04
JULY 09, 1985	–	–	.15	–	–	–	–	–	–	.30
SEPT 11, 1985	–	–	<.04	–	–	–	–	–	–	.16
NOV 13, 1985	–	–	1.7	–	–	–	–	–	–	2.8
DEC 11, 1985	–	–	.43	–	–	–	–	–	–	.66
JAN 07, 1986	–	–	<.13	–	–	–	–	–	–	.96
FEB 04, 1986	–	–	.27	–	–	–	–	–	–	.72
MAR 10, 1986	–	–	.58	–	–	–	–	–	–	.96
APR 02, 1986	–	–	<.13	–	–	–	–	–	–	.17
MAY 06, 1986	–	–	.26	–	–	–	–	–	–	.86
JUNE 04, 1986	–	–	<.14	–	–	–	–	–	–	.43
OCT 07, 1986	–	–	<.14	–	–	–	–	–	–	.24
NOV 19, 1986	–	–	.16	–	–	–	–	–	–	.61
DEC 09, 1986	–	–	.44	–	–	–	–	–	–	1.3
JAN 07, 1987	–	–	<.14	–	–	–	–	–	–	.19
FEB 03, 1987	–	–	<.14	–	–	–	–	–	–	.16
MAR 16, 1987	–	–	<.14	–	–	–	–	–	–	.20
APR 06, 1987	–	–	<.14	–	–	–	–	–	–	.66
MAY 06, 1987	–	.02	<.14	–	–	–	–	–	–	.08
JUNE 08, 1987	–	–	1.2	–	–	–	–	–	–	.90
JULY 07, 1987	–	–	.20	–	–	–	–	–	–	.26

Appendix 1.–Water-quality data for alkaline-addition study site, May 1983 through September 1989–Continued

Date	Iron, ferrous dissolved (mg/L)	Lead, dissolved (µg/L)	Manganese, dissolved (mg/L)	Mercury, dissolved (µg/L)	Molybdenum, dissolved (µg/L)	Nickel, dissolved (mg/L)	Selenium, dissolved (mg/L)	Strontium, dissolved (µg/L)	Zinc, dissolved (mg/L)	Cyanide total (mg/L)
410939079254901 Seep HC (LAT 41°09'39" N. LONG 079°25'49" W.)–Continued										
NOV 18, 1986	36	–	58	–	–	–	–	–	–	–
DEC 08, 1986	41	–	35	–	–	–	–	–	–	–
JAN 06, 1987	51	–	53	–	–	–	–	–	–	–
FEB 03, 1987	18	–	54	–	–	–	–	–	–	–
MAR 16, 1987	24	–	51	–	–	–	–	–	–	–
APR 08, 1987	22	–	30	–	–	–	–	–	–	–
MAY 06, 1987	5.1	–	67	–	–	–	–	–	–	–
JUNE 09, 1987	2.9	–	59	–	–	–	–	–	–	–
JULY 07, 1987	6.5	–	38	–	–	–	–	–	–	–
410945079253001 Upstream (LAT 41°09'45" N. LONG 079°25'30" W.)										
MAY 03, 1983	–	–	.03	–	–	–	–	–	–	–
JUNE 07, 1983	–	–	–	–	–	–	–	–	–	–
SEPT 13, 1983	–	–	.02	–	–	–	–	–	–	–
OCT 12, 1983	–	–	.20	–	–	–	–	–	–	–
NOV 15, 1983	–	–	.27	–	–	–	–	–	–	–
DEC 12, 1983	–	–	.04	–	–	–	–	–	–	–
JAN 16, 1984	.01	–	.05	–	–	–	–	–	–	–
FEB 14, 1984	–	–	.18	–	–	–	–	–	–	–
MAR 21, 1984	–	–	.26	–	–	–	–	–	–	–
APR 25, 1984	.08	–	.63	–	–	–	–	–	–	–
MAY 23, 1984	.40	–	.10	–	–	–	–	–	–	–
JUNE 18, 1984	.02	–	<.10	–	–	–	–	–	–	–
JULY 17, 1984	–	–	<.10	–	–	–	–	–	–	–
AUG 21, 1984	–	–	.40	–	–	–	–	–	–	–
OCT 30, 1984	<.10	–	.70	–	–	–	–	–	–	–
NOV 19, 1984	<.10	–	<.10	–	–	–	–	–	–	–
DEC 11, 1984	–	–	.11	–	–	–	–	–	–	–
JAN 21, 1985	–	–	.066	–	–	–	–	–	–	–
FEB 11, 1985	<.10	–	.16	–	–	–	–	–	–	–
MAR 12, 1985	.13	–	.089	–	–	–	–	–	–	–
APR 08, 1985	–	–	.096	–	–	–	–	–	–	–
MAY 14, 1985	.10	–	.11	–	–	–	–	–	–	–
JUNE 12, 1985	.10	–	<.010	–	–	–	–	–	–	–
JULY 09, 1985	–	–	.016	–	–	–	–	–	–	–
SEPT 11, 1985	.09	–	.039	–	–	–	–	–	–	–
NOV 13, 1985	.05	–	3.5	–	–	–	–	–	–	–
DEC 11, 1985	.16	–	.15	–	–	–	–	–	–	–
JAN 07, 1986	.02	–	.06	–	–	–	–	–	–	–
FEB 04, 1986	.21	–	.086	–	–	–	–	–	–	–
MAR 10, 1986	.17	–	.15	–	–	–	–	–	–	–
APR 02, 1986	.03	–	.072	–	–	–	–	–	–	–
MAY 06, 1986	.03	–	.15	–	–	–	–	–	–	–
JUNE 04, 1986	.04	–	.22	–	–	–	–	–	–	–
OCT 07, 1986	.12	–	<.010	–	–	–	–	–	–	–
NOV 19, 1986	.09	–	.079	–	–	–	–	–	–	–
DEC 09, 1986	.10	–	.18	–	–	–	–	–	–	–
JAN 07, 1987	.07	–	.070	–	–	–	–	–	–	–
FEB 03, 1987	.90	–	<.010	–	–	–	–	–	–	–
MAR 16, 1987	.04	–	.10	–	–	–	–	–	–	–
APR 06, 1987	.06	–	.14	–	–	–	–	–	–	–
MAY 06, 1987	.06	–	.086	–	–	–	–	–	–	–
JUNE 08, 1987	.11	–	.061	–	–	–	–	–	–	–
JULY 07, 1987	.07	–	.044	–	–	–	–	–	–	–

Appendix 1.–Water-quality data for alkaline-addition study site, May 1983 through September 1989–Continued

Date	Time	Water table altitude (feet above sea level)	Streamflow/ discharge, instan-taneous (ft^3/s)	Specific conduc-tance (µS/cm)	pH, field (units)	pH, lab (units)	Water temper-ature (°C)	Acidity total heated (mg/L as $CaCO_3$)	Acidity mineral (methyl orange) (mg/L as $CaCO_3$)	Calcium, dissolved (mg/L)	Magnesium, dissolved (mg/L)
410951079253011 Well A1 (LAT 41°09'51" N. LONG 079°25'30" W.)											
MAY 04, 1983	1014	1,362	--	4,000	2.6	2.9	12.0	1,400	720	--	--
JUNE 07, 1983	1324	1,363	--	8,000	2.3	2.4	13.0	680	3,000	160	260
JULY 12, 1983	1200	--	--	6,350	2.6	2.5	12.5	450	1,700	150	200
AUG 10, 1983	1100	--	--	3,150	2.9	2.9	12.0	2,000	650	97	110
SEPT 12, 1983	1348	--	--	3,000	2.5	2.9	14.5	1,400	200	110	130
OCT 11, 1983	1030	1,358	--	3,000	2.8	3.0	12.5	1,200	190	110	130
NOV 15, 1983	1620	1,359	--	3,600	2.5	3.0	12.5	1,500	240	130	150
DEC 13, 1983	1430	1,361	--	3,000	2.3	3.0	13.0	1,200	470	100	150
JAN 17, 1984	0912	1,359	--	5,100	2.3	2.7	12.5	1,900	1,000	130	180
FEB 13, 1984	1020	1,360	--	2,600	2.8	3.0	13.0	1,500	500	--	--
MAR 29, 1984	1425	1,362	--	2,800	2.4	2.8	13.0	1,000	260	84	110
APR 24, 1984	--	1,362	--	2,700	2.6	2.8	12.0	1,000	200	76	97
MAY 22, 1984	1325	1,361	--	3,000	2.7	2.8	13.0	1,600	460	83	120
JUNE 18, 1984	1600	1,361	--	--	2.6	2.9	12.0	1,200	430	79	100
JULY 16, 1984	1510	1,361	--	2,320	2.6	2.9	12.0	1,000	--	78	92
AUG 20, 1984	1605	1,361	--	2,430	2.8	2.9	12.0	980	560	73	99
SEPT 18, 1984	1300	--	--	3,080	2.6	2.8	13.0	1,900	920	86	120
OCT 30, 1984	1410	1,358	--	2,240	2.9	3.0	13.5	980	160	80	100
NOV 19, 1984	1240	1,359	--	2,910	2.8	3.0	12.5	1,400	240	110	110
DEC 10, 1984	1200	1,360	--	2,670	3.1	3.0	12.5	1,300	440	100	>60
FEB 11, 1985	1440	1,359	--	2,450	2.6	2.9	12.0	980	200	78	52
MAR 12, 1985	1250	1,361	--	2,800	3.0	2.8	11.5	1,300	250	90	49
APR 09, 1985	1145	1,362	--	2,730	2.6	2.8	12.0	1,200	270	120	130
MAY 14, 1985	1425	1,360	--	4,200	2.4	2.7	12.0	2,400	770	65	39
JUNE 11, 1985	1235	1,359	--	2,330	2.8	3.0	11.5	1,000	160	72	76
JULY 08, 1985	1235	1,360	--	2,400	2.8	2.9	12.5	>2,000	180	79	92
AUG 06, 1985	1205	1,358	--	2,500	2.9	2.9	12.0	910	170	89	59
SEPT 09, 1985	1420	1,358	--	2,350	2.7	2.9	13.5	920	260	100	98
DEC 09, 1985	1345	1,361	--	2,700	2.6	2.8	12.0	1,000	240	100	110
JAN 06, 1986	1240	1,361	--	4,300	2.5	2.6	12.5	2,700	820	110	140
FEB 03, 1986	1300	1,360	--	3,500	2.5	2.7	12.5	2,200	630	100	120
MAR 10, 1986	1210	1,361	--	2,500	2.8	2.8	13.0	960	220	78	71
APR 01, 1986	1215	1,361	--	3,710	2.5	2.6	12.5	1,900	610	81	92
MAY 07, 1986	1200	1,360	--	2,960	2.8	2.7	13.0	1,300	440	78	81
JUNE 02, 1986	1220	1,359	--	2,040	3.0	2.9	12.0	790	130	62	62
JULY 07, 1986	1215	1,360	--	2,470	3.0	2.9	12.5	1,400	180	73	--
AUG 05, 1986	1420	1,360	--	2,420	2.9	2.9	13.0	1,000	240	79	78
SEPT 03, 1986	0930	1,359	--	2,300	2.9	3.0	13.0	800	130	88	83
NOV 18, 1986	1430	1,359	--	2,800	3.0	3.0	11.5	1,300	140	71	87
DEC 08, 1986	1355	1,361	--	3,170	2.8	2.8	13.0	1,300	300	100	120
JAN 07, 1987	1030	1,361	--	2,450	2.8	2.8	13.0	920	170	83	96
FEB 02, 1987	1225	1,360	--	4,800	2.4	2.5	12.0	2,900	1,200	92	120
MAR 17, 1987	1130	1,360	--	2,200	2.9	2.9	12.5	850	140	67	74
APR 07, 1987	1125	1,362	--	2,700	2.8	2.9	12.5	1,200	240	82	88
MAY 06, 1987	1230	1,362	--	2,400	2.7	2.8	12.5	1,000	170	71	76
JUNE 09, 1987	0005	1,360	--	2,450	2.8	2.9	13.0	1,100	160	48	54
JUNE 09, 1987	1500	1,360	--	2,300	2.8	2.9	13.0	1,000	150	63	70
JULY 07, 1987	1230	1,361	--	2,500	3.1	2.9	14.5	900	160	80	88
AUG 10, 1987	1515	1,360	--	2,300	3.0	--	14.0	940	160	66	72
SEPT 16, 1987	0800	1,361	--	6,650	2.4	2.3	13.0	4,200	2,300	180	260
OCT 06, 1987	0945	1,361	--	2,400	2.8	2.9	13.0	1,000	150	79	84
NOV 17, 1987	0900	1,359	--	1,950	3.1	3.0	14.0	900	100	62	76
DEC 14, 1987	1330	1,359	--	2,100	3.0	3.0	13.0	940	150	47	50
JAN 12, 1988	0750	1,360	--	3,100	2.4	2.7	11.0	1,800	520	94	120

Appendix 1.–Water-quality data for alkaline-addition study site, May 1983 through September 1989–Continued

Date	Sodium, dissolved (mg/L)	Potassium, dissolved (mg/L)	Alkalinity water lab (mg/L as $CaCO_3$)	Sulfate, dissolved (mg/L as SO_4)	Chloride, dissolved (mg/L)	Silica, dissolved (mg/L as SiO_2)	Solids, residue at 105 °C, dissolved (mg/L)	Nitrogen, nitrate total (mg/L as N)	Nitrogen, nitrite total (mg/L as N)	Nitrogen, ammonia total (mg/L as N)
410951079253011 Well A1 (LAT 41°09'51" N. LONG 079°25'30" W.)										
MAY 04, 1983	–	–	0	1,600	–	–	–	–	–	–
JUNE 07, 1983	–	–	0	4,800	–	–	–	–	–	–
JULY 12, 1983	–	–	0	3,400	–	–	–	–	–	–
AUG 10, 1983	–	–	0	2,100	–	–	–	–	–	–
SEPT 12, 1983	–	–	0	1,900	–	–	–	–	–	–
OCT 11, 1983	–	–	0	1,300	–	–	–	–	–	–
NOV 15, 1983	–	–	0	1,900	–	–	–	–	–	–
DEC 13, 1983	–	–	0	2,100	–	–	–	–	–	–
JAN 17, 1984	–	–	0	3,700	–	–	–	–	–	–
FEB 13, 1984	–	–	0	2,100	–	–	–	–	–	–
MAR 29, 1984	–	–	0	1,800	–	–	–	–	–	–
APR 24, 1984	–	–	0	1,200	–	–	–	–	–	–
MAY 22, 1984	–	–	0	1,800	–	–	–	–	–	–
JUNE 18, 1984	–	–	0	1,300	–	–	–	–	–	–
JULY 16, 1984	–	–	0	2,400	–	–	–	–	–	–
AUG 20, 1984	–	–	0	1,600	–	–	–	–	–	–
SEPT 18, 1984	–	–	0	2,000	–	–	–	–	–	–
OCT 30, 1984	–	–	0	1,400	–	–	–	–	–	–
NOV 19, 1984	–	–	0	1,900	–	–	–	–	–	–
DEC 10, 1984	–	–	0	1,600	–	–	–	–	–	–
FEB 11, 1985	–	–	0	1,500	–	–	–	–	–	–
MAR 12, 1985	–	–	0	1,900	–	–	–	–	–	–
APR 09, 1985	–	–	0	2,100	–	–	–	–	–	–
MAY 14, 1985	–	–	0	3,100	–	–	–	–	–	–
JUNE 11, 1985	–	–	0	1,900	–	–	–	–	–	–
JULY 08, 1985	–	–	0	–	–	–	–	–	–	–
AUG 06, 1985	–	–	0	–	–	–	–	–	–	–
SEPT 09, 1985	–	–	0	1,400	–	–	–	–	–	–
DEC 09, 1985	–	–	0	1,700	–	–	–	–	–	–
JAN 06, 1986	–	–	0	3,100	–	–	–	–	–	–
FEB 03, 1986	–	–	0	2,500	–	–	–	–	–	–
MAR 10, 1986	–	–	0	1,300	–	–	–	–	–	–
APR 01, 1986	–	–	0	2,500	–	–	–	–	–	–
MAY 07, 1986	–	–	0	1,800	–	–	–	–	–	–
JUNE 02, 1986	–	–	0	1,200	–	–	–	–	–	–
JULY 07, 1986	0.52	1.9	0	1,500	3	–	2,530	<0.02	<0.002	0.50
AUG 05, 1986	.75	2.2	0	1,500	2	–	2,540	<.04	<.004	.45
SEPT 03, 1986	1.2	3.3	0	1,300	3	–	2,210	<.02	<.002	.34
NOV 18, 1986	.96	2.9	0	1,500	<1	–	2,200	<.02	<.004	.24
DEC 08, 1986	1.1	3.4	0	1,600	.8	–	3,270	<.04	<.004	.32
JAN 07, 1987	1	3.8	0	1,400	<1	–	2,140	<.04	<.004	.27
FEB 02, 1987	.38	2.5	0	2,400	1	–	5,530	<.02	<.004	.35
MAR 17, 1987	.83	2.5	0	1,400	<1	–	2,080	<.04	<.004	.30
APR 07, 1987	2.6	3.7	0	1,400	1	–	2,490	<.04	<.004	.38
MAY 06, 1987	.99	3	0	1,300	2	59	1,980	<.04	<.004	.24
JUNE 09, 1987	1.2	2.5	0	1,100	2	66	2,380	<.04	<.004	.38
JUNE 09, 1987	.79	2.5	0	1,100	2	67	2,390	<.04	<.004	.40
JULY 07, 1987	1.6	3.2	0	1,100	<1	68	3,230	<.04	<.004	.30
AUG 10, 1987	.51	2.4	0	950	2	64	2,100	<.04	<.004	.66
SEPT 16, 1987	2	4.8	–	5,800	3	130	11,000	<.04	<.004	1.6
OCT 06, 1987	2.1	3.4	–	1,200	2	64	2,340	<.04	<.004	.31
NOV 17, 1987	1.2	2.6	–	1,000	2	59	2,100	<.04	<.004	.30
DEC 14, 1987	1.3	2.3	–	1,200	2	67	2,150	<.04	<.004	.60
JAN 12, 1988	1.9	2.1	–	2,300	2	85	3,660	<.04	<.004	1.3

Appendix 1.--Water-quality data for alkaline-addition study site, May 1983 through September 1989--Continued

Date	Nitrogen, ammonia + organic total (mg/L as N)	Phosphorus total (mg/L as P)	Aluminum, dissolved (mg/L)	Arsenic, dissolved (µg/L)	Barium, dissolved (µg/L)	Boron, dissolved (µg/L)	Cadmium, dissolved (µg/L)	Chromium, dissolved (µg/L)	Copper, dissolved (µg/L)	Iron, dissolved (mg/L)
410951079253011 Well A1 (LAT 41°09'51" N. LONG 079°25'30" W.)										
MAY 04, 1983	--	--	99	--	--	--	--	--	--	270
JUNE 07, 1983	--	--	280	--	--	--	--	--	--	1,200
JULY 12, 1983	--	--	260	--	--	--	--	--	--	890
AUG 10, 1983	--	--	83	--	--	--	--	--	--	260
SEPT 12, 1983	--	--	65	--	--	--	--	--	--	290
OCT 11, 1983	--	--	92	--	--	--	--	--	--	190
NOV 15, 1983	--	--	85	--	--	--	--	--	--	270
DEC 13, 1983	--	--	79	--	--	--	--	--	--	220
JAN 17, 1984	--	--	170	--	--	--	--	--	--	700
FEB 13, 1984	--	--	57	--	--	--	--	--	--	330
MAR 29, 1984	--	--	56	--	--	--	--	--	--	170
APR 24, 1984	--	--	60	--	--	--	--	--	--	180
MAY 22, 1984	--	--	60	--	--	--	--	--	--	290
JUNE 18, 1984	--	--	53	--	--	--	--	--	--	34
JULY 16, 1984	--	--	56	--	--	--	--	--	--	150
AUG 20, 1984	--	--	36	--	--	--	--	--	--	170
SEPT 18, 1984	--	--	60	--	--	--	--	--	--	210
OCT 30, 1984	--	--	61	--	--	--	--	--	--	150
NOV 19, 1984	--	--	96	--	--	--	--	--	--	300
DEC 10, 1984	--	--	60	--	--	--	--	--	--	360
FEB 11, 1985	--	--	42	--	--	--	--	--	--	260
MAR 12, 1985	--	--	56	--	--	--	--	--	--	230
APR 09, 1985	--	--	74	--	--	--	--	--	--	180
MAY 14, 1985	--	--	100	--	--	--	--	--	--	400
JUNE 11, 1985	--	--	44	--	--	--	--	--	--	200
JULY 08, 1985	--	--	52	--	--	--	--	--	--	230
AUG 06, 1985	--	--	52	--	--	--	--	--	--	170
SEPT 09, 1985	--	--	58	--	--	--	--	--	--	140
DEC 09, 1985	--	--	77	--	--	--	--	--	--	200
JAN 06, 1986	--	--	140	--	--	--	--	--	--	500
FEB 03, 1986	--	--	110	--	--	--	--	--	--	490
MAR 10, 1986	--	--	55	--	--	--	--	--	--	190
APR 01, 1986	--	--	98	--	--	--	--	--	--	500
MAY 07, 1986	--	--	78	--	--	--	--	--	--	400
JUNE 02, 1986	--	--	39	--	--	--	--	--	--	200
JULY 07, 1986	2.3	--	57	<1,000	--	--	<10	<50	39	260
AUG 05, 1986	.73	--	61	<20	--	<250	4.5	<50	56	240
SEPT 03, 1986	1	--	60	25	--	<200	5.2	<50	44	240
NOV 18, 1986	1.2	--	62	28	<10	<250	6.6	78	88	300
DEC 08, 1986	.91	--	99	34	<10	<250	7.5	130	250	260
JAN 07, 1987	1	--	71	46	--	<250	5.9	<50	76	210
FEB 02, 1987	.65	--	150	180	--	<250	11	<50	480	590
MAR 17, 1987	.81	--	51	23	<10	--	4.4	<50	28	270
APR 07, 1987	.76	--	69	53	<10	<250	6.8	68	<10	210
MAY 06, 1987	.58	0.08	48	47	<10	<250	6.5	760	<10	180
JUNE 09, 1987	.64	.07	41	<40	<10	<250	4.9	<50	80	180
JUNE 09, 1987	.68	.06	54	<40	<10	<250	5.4	<50	100	230
JULY 07, 1987	1	.06	69	56	<10	<250	5.6	<50	200	220
AUG 10, 1987	1.1	.05	48	39	<10	<250	4.4	86	160	190
SEPT 16, 1987	1.9	1.7	280	210	<100	<250	17	<50	1,100	1,400
OCT 06, 1987	1.1	.08	66	36	<10	<250	5.7	53	36	250
NOV 17, 1987	<1	.06	40	26	<10	<250	4.2	<50	100	240
DEC 14, 1987	1.6	.07	34	29	<10	<250	4.2	<50	99	170
JAN 12, 1988	2.2	.36	110	68	<10	<250	6.4	57	100	440

Date	Iron, ferrous dissolved (mg/L)	Lead, dissolved (µg/L)	Manganese, dissolved (mg/L)	Mercury, dissolved (µg/L)	Molybdenum, dissolved (µg/L)	Nickel, dissolved (mg/L)	Selenium, dissolved (mg/L)	Strontium, dissolved (µg/L)	Zinc, dissolved (mg/L)	Cyanide total (mg/L)
410951079253011 Well A1 (LAT 41°09'51" N. LONG 079°25'30" W.)										
MAY 04, 1983	--	--	63	--	--	--	--	--	--	--
JUNE 07, 1983	--	--	110	--	--	--	--	--	--	--
JULY 12, 1983	--	--	89	--	--	--	--	--	--	--
AUG 10, 1983	--	--	46	--	--	--	--	--	--	--
SEPT 12, 1983	--	--	52	--	--	--	--	--	--	--
OCT 11, 1983	--	--	51	--	--	--	--	--	--	--
NOV 15, 1983	--	--	61	--	--	--	--	--	--	--
DEC 13, 1983	--	--	64	--	--	--	--	--	--	--
JAN 17, 1984	7.8	--	79	--	--	--	--	--	--	--
FEB 13, 1984	--	--	45	--	--	--	--	--	--	--
MAR 29, 1984	5.5	--	39	--	--	--	--	--	--	--
APR 24, 1984	18	--	44	--	--	--	--	--	--	--
MAY 22, 1984	290	--	29	--	--	--	--	--	--	--
JUNE 18, 1984	34	--	34	--	--	--	--	--	--	--
JULY 16, 1984	30	--	38	--	--	--	--	--	--	--
AUG 20, 1984	--	--	39	--	--	--	--	--	--	--
SEPT 18, 1984	--	--	29	--	--	--	--	--	--	--
OCT 30, 1984	150	--	45	--	--	--	--	--	--	--
NOV 19, 1984	300	--	54	--	--	--	--	--	--	--
DEC 10, 1984	--	--	47	--	--	--	--	--	--	--
FEB 11, 1985	250	--	33	--	--	--	--	--	--	--
MAR 12, 1985	62	--	36	--	--	--	--	--	--	--
APR 09, 1985	--	--	41	--	--	--	--	--	--	--
MAY 14, 1985	370	--	51	--	--	--	--	--	--	--
JUNE 11, 1985	5	--	32	--	--	--	--	--	--	--
JULY 08, 1985	310	--	37	--	--	--	--	--	--	--
AUG 06, 1985	--	--	38	--	--	--	--	--	--	--
SEPT 09, 1985	90	--	43	--	--	--	--	--	--	--
DEC 09, 1985	85	--	43	--	--	--	--	--	--	--
JAN 06, 1986	350	--	48	--	--	--	--	--	--	--
FEB 03, 1986	220	--	45	--	--	--	--	--	--	--
MAR 10, 1986	190	--	30	--	--	--	--	--	--	--
APR 01, 1986	310	--	39	--	--	--	--	--	--	--
MAY 07, 1986	260	--	36	--	--	--	--	--	--	--
JUNE 02, 1986	200	--	18	--	--	--	--	--	--	--
JULY 07, 1986	240	<50	33	<1	<700	1.2	<1,000	160	2.2	<0.001
AUG 05, 1986	2.8	<50	37	<1	<700	1.2	<1,000	200	2.4	<.001
SEPT 03, 1986	120	<50	38	<1	<70	38	<30	190	2.5	<.001
NOV 18, 1986	310	<4	36	<1	<70	1.6	<30	160	2.5	<.001
DEC 08, 1986	220	4.8	45	<1	<70	2.1	<30	210	4.2	<.001
JAN 07, 1987	200	<4	36	<1	<70	1.2	<30	200	2.8	<.001
FEB 02, 1987	410	<4	46	<1	<70	3.1	<60	110	4.6	<.001
MAR 17, 1987	260	<4	32	<1	<70	.55	<30	160	2.2	<.001
APR 07, 1987	220	4.8	32	<1	<70	1.7	<300	210	2.8	<.001
MAY 06, 1987	180	<4	27	<1	<70	1.1	<150	170	2.2	<.001
JUNE 09, 1987	260	<4	22	<1	<70	.68	<60	150	1.8	<.001
JUNE 09, 1987	270	<4	28	<1	<70	.87	<150	140	2.1	<.001
JULY 07, 1987	210	10	35	<1	<70	1	<60	200	2.6	<.001
AUG 10, 1987	210	8.5	27	<1	<70	1.1	<30	160	2	<.001
SEPT 16, 1987	540	<20	94	<1	<70	7.4	<30	240	9.8	<.001
OCT 06, 1987	230	<10	31	<1	<70	1.2	<30	170	2.4	<.001
NOV 17, 1987	230	<4	23	<1	<70	.90	<30	180	1.8	<.001
DEC 14, 1987	240	<4	20	<1	<70	1	<30	160	2.2	<.001
JAN 12, 1988	280	<10	39	<1	<70	.61	<30	190	3.1	<.001

Appendix 1.–Water-quality data for alkaline-addition study site, May 1983 through September 1989–Continued

Date	Time	Water table altitude (feet above sea level)	Streamflow/ discharge, instan-taneous (ft^3/s)	Specific conduc-tance (µS/cm)	pH, field (units)	pH, lab (units)	Water temper-ature (°C)	Acidity total heated (mg/L as $CaCO_3$)	Acidity mineral (methyl orange) (mg/L as $CaCO_3$)	Calcium, dissolved (mg/L)	Magnesium, dissolved (mg/L)
410951079253011 Well A1 (LAT 41°09'51" N. LONG 079°25'30" W.)–Continued											
FEB 08, 1988	1220	1,360	–	2,030	2.6	2.9	9.0	830	140	98	110
MAR 14, 1988	1400	1,361	–	2,380	2.8	2.8	10.0	1,200	250	86	97
JUNE 07, 1988	1645	1,361	–	2,050	2.9	2.9	15.0	980	140	79	77
DEC 20, 1988	1130	1,357	–	2,870	2.6	2.6	12.5	2,200	710	130	140
MAR 13, 1989	1315	1,359	–	5,800	2.4	2.3	12.5	6,400	2,700	180	260
JUNE 13, 1989	1645	–	–	1,910	2.7	2.7	14.0	800	190	72	72
SEPT 11, 1989	1355	1,359	–	1,780	3.1	2.9	13.0	890	130	73	68
410947079253011 Well A2 (LAT 41°09'47" N. LONG 079°25'30" W.)											
MAY 04, 1983	1410	1,320	–	7,000	2.3	2.6	–	2,000	1,600	160	210
JUNE 08, 1983	1110	1,319	–	5,300	2.4	2.6	13.5	2,000	1,000	170	220
JULY 12, 1983	1620	1,319	–	5,250	2.5	2.6	–	2,700	900	170	110
AUG 10, 1983	1425	–	–	6,300	2.6	2.6	–	1,700	1,100	190	230
SEPT 12, 1983	1625	1,319	–	4,700	2.4	2.7	–	4,000	390	190	240
OCT 11, 1983	1400	1,318	–	5,700	2.3	2.8	13.5	3,700	240	190	240
NOV 16, 1983	1115	1,318	–	4,900	2.8	3.0	–	2,300	190	180	200
DEC 13, 1983	1200	1,318	–	5,000	2.5	2.8	–	1,900	840	140	200
JAN 17, 1984	1330	1,319	–	5,000	2.0	2.7	–	3,100	550	170	220
FEB 13, 1984	1400	–	–	4,900	2.8	3.8	–	2,200	590	–	–
MAR 29, 1984	0915	–	–	4,500	2.3	2.6	–	3,500	680	110	180
APR 24, 1984	0000	1,320	–	–	2.2	2.6	11.0	3,300	470	100	160
MAY 22, 1984	0850	–	–	4,500	2.7	2.7	–	2,700	440	110	180
JUNE 19, 1984	1545	1,320	–	–	2.5	2.7	13.0	2,200	560	130	190
JULY 17, 1984	0936	1,319	–	4,040	2.4	2.6	13.0	1,900	–	110	160
AUG 21, 1984	0840	1,319	–	4,350	2.4	2.6	12.5	2,500	1,000	120	200
SEPT 17, 1984	1430	1,319	–	4,300	2.6	2.7	13.0	2,600	1,000	150	200
OCT 29, 1984	1415	1,318	–	4,420	3.0	2.8	14.0	2,500	250	140	220
NOV 19, 1984	1240	1,318	–	4,250	2.6	2.8	13.0	2,400	310	140	160
DEC 10, 1984	1605	1,318	–	4,000	2.8	3.0	13.0	2,400	490	140	>60
FEB 12, 1985	1100	1,318	–	4,300	2.6	2.7	12.0	2,200	320	160	51
MAR 13, 1985	0830	1,319	–	4,000	2.8	2.6	12.0	2,500	480	120	49
APR 10, 1985	0850	1,320	–	3,550	2.4	2.7	12.5	1,700	470	150	180
JUNE 11, 1985	1330	1,319	–	4,190	2.4	2.7	13.0	270	280	120	150
JULY 09, 1985	1425	1,318	–	3,800	2.4	2.8	14.5	640	160	150	170
AUG 07, 1985	1050	1,318	–	4,400	2.1	2.8	14.0	2,200	200	130	59
SEPT 10, 1985	0950	1,318	–	4,300	2.6	2.9	15.0	2,500	160	150	190
NOV 12, 1985	1430	1,319	–	4,700	2.7	2.7	13.0	2,700	410	150	180
DEC 10, 1985	1115	1,319	–	4,100	2.4	2.7	12.5	2,400	510	160	230
JAN 06, 1986	1330	1,319	–	4,600	2.4	2.6	12.0	2,700	570	160	220
FEB 06, 1986	1335	1,319	–	4,250	2.6	2.6	12.5	2,500	450	150	140
MAR 10, 1986	1240	1,319	–	4,300	2.6	2.5	13.0	2,100	500	130	120
APR 01, 1986	1250	1,319	–	4,360	2.4	2.6	13.0	2,100	470	120	130
MAY 07, 1986	1315	1,319	–	3,770	2.7	2.6	13.5	1,700	300	130	120
JUNE 02, 1986	1255	1,319	–	3,940	2.8	2.7	13.0	2,200	280	140	140
JULY 07, 1986	1300	1,319	–	3,760	2.8	2.7	12.0	1,900	250	120	120
AUG 05, 1986	0945	1,319	–	3,890	2.8	2.7	13.5	2,400	370	130	130
SEPT 03, 1986	1015	1,319	–	4,230	2.8	2.8	14.0	3,200	230	140	170
NOV 19, 1986	1340	1,319	–	4,400	2.8	2.8	12.0	2,600	210	140	170
NOV 19, 1986	1420	1,319	–	4,600	–	2.8	12.0	2,200	230	130	170
DEC 09, 1986	0920	1,319	–	3,920	2.7	2.7	–	1,700	370	150	140
JAN 06, 1987	1220	1,319	–	4,600	2.6	2.6	13.0	2,200	510	150	190
FEB 02, 1987	1440	1,316	–	4,250	2.6	2.6	12.0	2,000	430	150	180
MAR 17, 1987	1300	1,319	–	4,100	2.7	2.7	13.0	2,100	250	140	180
APR 07, 1987	1210	1,320	–	3,800	2.5	2.7	13.0	2,000	390	110	120
MAY 06, 1987	1000	1,319	–	3,550	2.5	2.6	11.5	1,800	450	100	120

Appendix 1.–Water-quality data for alkaline-addition study site, May 1983 through September 1989–Continued

Date	Sodium, dissolved (mg/L)	Potassium, dissolved (mg/L)	Alkalinity water lab (mg/L as $CaCO_3$)	Sulfate, dissolved (mg/L as SO_4)	Chloride, dissolved (mg/L)	Silica, dissolved (mg/L as SiO_2)	Solids, residue at 105 °C, dissolved (mg/L)	Nitrogen, nitrate total (mg/L as N)	Nitrogen, nitrite total (mg/L as N)	Nitrogen, ammonia total (mg/L as N)
410951079253011 Well A1 (LAT 41°09'51" N. LONG 079°25'30" W.)–Continued										
FEB 08, 1988	<0.20	5.1	–	1,200	<1	72	2,340	<0.04	<0.004	0.33
MAR 14, 1988	1.2	3	–	1,300	2	72	1,380	<.04	<.004	.38
JUNE 07, 1988	1.1	3.1	–	1,400	2	59	2,640	<.04	<.004	.42
DEC 20, 1988	1.4	.53	–	2,500	2	120	4,230	<.04	<.004	.78
MAR 13, 1989	1.3	.96	–	5,700	2	120	12,200	<.04	<.004	1.1
JUNE 13, 1989	.87	2.7	–	1,100	2	50	288	<.04	<.004	.34
SEPT 11, 1989	1.2	2.4	–	1,200	2	63	2,540	<.04	<.004	.49
410947079253011 Well A2 (LAT 41°09'47" N. LONG 079°25'30" W.)										
MAY 04, 1983	–	–	0	2,000	–	–	–	–	–	–
JUNE 08, 1983	–	–	0	4,000	–	–	–	–	–	–
JULY 12, 1983	–	–	0	2,800	–	–	–	–	–	–
AUG 10, 1983	–	–	0	3,900	–	–	–	–	–	–
SEPT 12, 1983	–	–	0	2,900	–	–	–	–	–	–
OCT 11, 1983	–	–	0	3,700	–	–	–	–	–	–
NOV 16, 1983	–	–	0	3,500	–	–	–	–	–	–
DEC 13, 1983	–	–	0	3,700	–	–	–	–	–	–
JAN 17, 1984	–	–	0	5,300	–	–	–	–	–	–
FEB 13, 1984	–	–	0	4,200	–	–	–	–	–	–
MAR 29, 1984	–	–	0	3,000	–	–	–	–	–	–
APR 24, 1984	–	–	0	2,800	–	–	–	–	–	–
MAY 22, 1984	–	–	0	3,000	–	–	–	–	–	–
JUNE 19, 1984	–	–	0	2,600	–	–	–	–	–	–
JULY 17, 1984	–	–	0	2,800	–	–	–	–	–	–
AUG 21, 1984	–	–	0	2,700	–	–	–	–	–	–
SEPT 17, 1984	–	–	0	2,600	–	–	–	–	–	–
OCT 29, 1984	–	–	0	3,700	–	–	–	–	–	–
NOV 19, 1984	–	–	0	2,900	–	–	–	–	–	–
DEC 10, 1984	–	–	–	3,100	–	–	–	–	–	–
FEB 12, 1985	–	–	0	3,700	–	–	–	–	–	–
MAR 13, 1985	–	–	0	2,900	–	–	–	–	–	–
APR 10, 1985	–	–	0	2,500	–	–	–	–	–	–
JUNE 11, 1985	–	–	0	3,300	–	–	–	–	–	–
JULY 09, 1985	–	–	0	–	–	–	–	–	–	–
AUG 07, 1985	–	–	–	2,900	–	–	–	–	–	–
SEPT 10, 1985	–	–	0	3,200	–	–	–	–	–	–
NOV 12, 1985	–	–	0	4,200	–	–	–	–	–	–
DEC 10, 1985	–	–	0	3,000	–	–	–	–	–	–
JAN 06, 1986	–	–	0	3,200	–	–	–	–	–	–
FEB 06, 1986	–	–	0	3,000	–	–	–	–	–	–
MAR 10, 1986	–	–	0	3,100	–	–	–	–	–	–
APR 01, 1986	–	–	0	3,000	–	–	–	–	–	–
MAY 07, 1986	–	–	0	2,400	–	–	–	–	–	–
JUNE 02, 1986	–	–	0	2,800	–	–	–	–	–	–
JULY 07, 1986	1.5	1.5	0	2,500	3	–	4,690	.04	<.002	1.1
AUG 05, 1986	1.5	1.4	0	2,600	3	–	4,960	.04	<.004	1.1
SEPT 03, 1986	2	2.8	0	3,100	5	–	1,980	<.02	<.002	1.2
NOV 19, 1986	–	–	–	2,600	–	–	–	–	–	–
NOV 19, 1986	2.2	2.8	0	2,900	<1	–	4,940	<.02	<.004	.42
DEC 09, 1986	2.1	2.5	0	1,800	1.4	–	4,590	<.04	<.004	1.1
JAN 06, 1987	1.6	1.8	0	3,000	1	–	4,980	<.04	<.004	1.1
FEB 02, 1987	1.4	2.4	0	2,400	1	–	4,650	<.02	<.004	1
MAR 17, 1987	1.7	2.1	0	2,400	1	–	4,650	<.04	<.004	1.1
APR 07, 1987	2.9	2.8	0	2,300	1	–	4,090	.12	<.004	1.2
MAY 06, 1987	–	–	–	1,900	–	88	–	–	–	–

Appendix 1.–Water-quality data for alkaline-addition study site, May 1983 through September 1989–Continued

Date	Nitrogen, ammonia + organic total (mg/L as N)	Phosphorus total (mg/L as P)	Aluminum, dissolved (mg/L)	Arsenic, dissolved (µg/L)	Barium, dissolved (µg/L)	Boron, dissolved (µg/L)	Cadmium, dissolved (µg/L)	Chromium, dissolved (µg/L)	Copper, dissolved (µg/L)	Iron, dissolved (mg/L)
410951079253011 Well A1 (LAT 41°09'51" N. LONG 079°25'30" W.)–Continued										
FEB 08, 1988	0.68	0.08	75	38	<10	<250	6.3	<50	100	200
MAR 14, 1988	.75	.16	81	48	<10	<250	4.2	<50	140	250
JUNE 07, 1988	.83	.10	58	<20	<10	<250	4.9	<50	72	270
DEC 20, 1988	.96	.27	180	8.2	<10	<250	26	230	2,100	280
MAR 13, 1989	1.2	2.5	460	150	<10	<250	24	160	1,600	1,500
JUNE 13, 1989	.37	.11	40	<4	<10	<250	5.2	<50	220	180
SEPT 11, 1989	.39	.07	43	<4	<10	<250	4.2	<50	87	250
410947079253011 Well A2 (LAT 41°09'47" N. LONG 079°25'30" W.)										
MAY 04, 1983	–	–	230	–	–	–	–	–	–	570
JUNE 08, 1983	–	–	190	–	–	–	–	–	–	530
JULY 12, 1983	–	–	310	–	–	–	–	–	–	29
AUG 10, 1983	–	–	230	–	–	–	–	–	–	640
SEPT 12, 1983	–	–	160	–	–	–	–	–	–	480
OCT 11, 1983	–	–	190	–	–	–	–	–	–	600
NOV 16, 1983	–	–	160	–	–	–	–	–	–	360
DEC 13, 1983	–	–	160	–	–	–	–	–	–	380
JAN 17, 1984	–	–	170	–	–	–	–	–	–	39
FEB 13, 1984	–	–	46	–	–	–	–	–	–	1,100
MAR 29, 1984	–	–	110	–	–	–	–	–	–	350
APR 24, 1984	–	–	170	–	–	–	–	–	–	320
MAY 22, 1984	–	–	110	–	–	–	–	–	–	370
JUNE 19, 1984	–	–	120	–	–	–	–	–	–	82
JULY 17, 1984	–	–	120	–	–	–	–	–	–	330
AUG 21, 1984	–	–	90	–	–	–	–	–	–	370
SEPT 17, 1984	–	–	89	–	–	–	–	–	–	330
OCT 29, 1984	–	–	180	–	–	–	–	–	–	550
NOV 19, 1984	–	–	150	–	–	–	–	–	–	450
DEC 10, 1984	–	–	110	–	–	–	–	–	–	450
FEB 12, 1985	–	–	120	–	–	–	–	–	–	410
MAR 13, 1985	–	–	120	–	–	–	–	–	–	340
APR 10, 1985	–	–	130	–	–	–	–	–	–	260
JUNE 11, 1985	–	–	130	–	–	–	–	–	–	350
JULY 09, 1985	–	–	140	–	–	–	–	–	–	410
AUG 07, 1985	–	–	140	–	–	–	–	–	–	470
SEPT 10, 1985	–	–	120	–	–	–	–	–	–	560
NOV 12, 1985	–	–	190	–	–	–	–	–	–	580
DEC 10, 1985	–	–	180	–	–	–	–	–	–	330
JAN 06, 1986	–	–	190	–	–	–	–	–	–	390
FEB 06, 1986	–	–	170	–	–	–	–	–	–	400
MAR 10, 1986	–	–	150	–	–	–	–	–	–	360
APR 01, 1986	–	–	140	–	–	–	–	–	–	360
MAY 07, 1986	–	–	140	–	–	–	–	–	–	290
JUNE 02, 1986	–	–	150	–	–	–	–	–	–	390
JULY 07, 1986	1.4	–	130	<1,000	–	–	<10	<50	120	–
AUG 05, 1986	1.7	–	140	63	–	<250	9.4	<50	140	400
SEPT 03, 1986	2	–	150	<20	–	<250	10	<50	93	520
NOV 19, 1986	–	–	150	–	–	–	–	–	–	470
NOV 19, 1986	1.7	–	140	61	<10	<250	13	170	200	460
DEC 09, 1986	1.1	–	140	58	<10	<250	9.9	240	280	300
JAN 06, 1987	1.9	–	210	160	–	<250	15	<50	270	470
FEB 02, 1987	1.1	–	190	120	–	<250	14	<50	150	380
MAR 17, 1987	1.2	–	180	84	<10	–	12	<50	120	480
APR 07, 1987	1.5	–	120	100	<10	<250	11	<50	<10	320
MAY 06, 1987	–	.05	130	–	–	–	–	–	–	260

Date	Iron, ferrous dissolved (mg/L)	Lead, dissolved (µg/L)	Manganese, dissolved (mg/L)	Mercury, dissolved (µg/L)	Molybdenum, dissolved (µg/L)	Nickel, dissolved (mg/L)	Selenium, dissolved (mg/L)	Strontium, dissolved (µg/L)	Zinc, dissolved (mg/L)	Cyanide total (mg/L)
410951079253011 Well A1 (LAT 41°09'51" N. LONG 079°25'30" W.)–Continued										
FEB 08, 1988	190	<10	37	<1	<70	1.4	<30	210	2.2	<0.001
MAR 14, 1988	230	<4	36	<1	<70	1.3	<30	160	2.4	<.001
JUNE 07, 1988	280	<4	28	<1	<70	1	<30	140	2.2	<.001
DEC 20, 1988	50	9.4	50	<1	<70	2.7	<30	260	7.1	<.001
MAR 13, 1989	600	<20	96	<1	<70	4.1	<30	270	9	<.001
JUNE 13, 1989	160	6.1	26	<1	<70	.98	<30	160	2.3	<.001
SEPT 11, 1989	260	<10	27	<1	<70	.88	<30	180	2.3	<.001
410947079253011 Well A2 (LAT 41°09'47" N. LONG 079°25'30" W.)										
MAY 04, 1983	–	–	97	–	–	–	–	–	–	–
JUNE 08, 1983	–	–	99	–	–	–	–	–	–	–
JULY 12, 1983	–	–	100	–	–	–	–	–	–	–
AUG 10, 1983	–	–	110	–	–	–	–	–	–	–
SEPT 12, 1983	–	–	100	–	–	–	–	–	–	–
OCT 11, 1983	–	–	120	–	–	–	–	–	–	–
NOV 16, 1983	–	–	110	–	–	–	–	–	–	–
DEC 13, 1983	–	–	96	–	–	–	–	–	–	–
JAN 17, 1984	5.2	–	94	–	–	–	–	–	–	–
FEB 13, 1984	–	–	84	–	–	–	–	–	–	–
MAR 29, 1984	350	–	83	–	–	–	–	–	–	–
APR 24, 1984	32	–	80	–	–	–	–	–	–	–
MAY 22, 1984	370	–	79	–	–	–	–	–	–	–
JUNE 19, 1984	31	–	82	–	–	–	–	–	–	–
JULY 17, 1984	260	–	69	–	–	–	–	–	–	–
AUG 21, 1984	–	–	84	–	–	–	–	–	–	–
SEPT 17, 1984	–	–	34	–	–	–	–	–	–	–
OCT 29, 1984	550	–	98	–	–	–	–	–	–	–
NOV 19, 1984	450	–	77	–	–	–	–	–	–	–
DEC 10, 1984	–	–	83	–	–	–	–	–	–	–
FEB 12, 1985	410	–	79	–	–	–	–	–	–	–
MAR 13, 1985	88	–	67	–	–	–	–	–	–	–
APR 10, 1985	–	–	70	–	–	–	–	–	–	–
JUNE 11, 1985	4.2	–	73	–	–	–	–	–	–	–
JULY 09, 1985	540	–	76	–	–	–	–	–	–	–
AUG 07, 1985	95	–	84	–	–	–	–	–	–	–
SEPT 10, 1985	220	–	96	–	–	–	–	–	–	–
NOV 12, 1985	560	–	87	–	–	–	–	–	–	–
DEC 10, 1985	110	–	68	–	–	–	–	–	–	–
JAN 06, 1986	340	–	76	–	–	–	–	–	–	–
FEB 06, 1986	260	–	74	–	–	–	–	–	–	–
MAR 10, 1986	300	–	62	–	–	–	–	–	–	–
APR 01, 1986	310	–	75	–	–	–	–	–	–	–
MAY 07, 1986	170	–	65	–	–	–	–	–	–	–
JUNE 02, 1986	360	–	80	–	–	–	–	–	–	–
JULY 07, 1986	340	<50	60	<1	<700	2.2	<1,000	290	4.8	<.001
AUG 05, 1986	400	<50	59	<1	<700	2.3	<1,000	320	5.1	<.001
SEPT 03, 1986	450	<50	82	<1	<70	2.8	<30	330	6	<.001
NOV 19, 1986	460	–	81	–	–	–	–	–	–	–
NOV 19, 1986	–	14	70	<1	<70	2.5	<60	280	5.4	<.001
DEC 09, 1986	220	17	68	<1	<70	2.5	<30	310	5.4	<.001
JAN 06, 1987	360	22	85	<1	<70	2.4	<30	340	6.8	<.001
FEB 02, 1987	380	16	79	<1	<70	1.7	<30	160	5.8	<.001
MAR 17, 1987	440	17	85	<1	<70	2.2	<30	350	6.4	<.001
APR 07, 1987	320	24	55	<1	<70	2.4	<300	290	5	<.001
MAY 06, 1987	200	–	59	–	–	–	–	–	–	–

Appendix 1.–Water-quality data for alkaline-addition study site, May 1983 through September 1989–Continued

Date	Time	Water table altitude (feet above sea level)	Streamflow/ discharge, instan-taneous (ft^3/s)	Specific conduc-tance (µS/cm)	pH, field (units)	pH, lab (units)	Water temper-ature (°C)	Acidity total heated (mg/L as $CaCO_3$)	Acidity mineral (methyl orange) (mg/L as $CaCO_3$)	Calcium, dissolved (mg/L)	Magnesium, dissolved (mg/L)
410947079253011 Well A2 (LAT 41°09'47" N. LONG 079°25'30" W.)–Continued											
MAY 06, 1987	1200	1,319	--	3,400	2.3	2.7	12.5	1,600	430	100	120
JUNE 08, 1987	1830	1,319	--	4,350	2.6	2.6	13.5	2,100	340	120	150
JULY 07, 1987	1730	1,320	--	3,650	2.8	2.7	15.0	1,800	340	110	120
AUG 10, 1987	1415	1,316	--	3,350	2.9	2.8	14.5	1,500	200	100	120
SEPT 15, 1987	1000	1,319	--	4,200	2.6	2.6	13.0	2,400	390	130	150
OCT 06, 1987	0830	1,320	--	3,800	2.7	2.6	13.0	1,800	360	110	140
NOV 17, 1987	0830	1,320	--	4,100	2.8	2.7	13.0	2,100	300	130	160
DEC 14, 1987	1220	1,320	--	3,000	2.8	2.9	12.5	1,600	140	110	99
DEC 16, 1987	0830	1,320	--	4,450	2.8	2.7	12.5	2,600	300	140	170
JUNE 07, 1988	1545	1,320	--	2,800	2.8	2.8	13.5	1,500	300	110	110
MAR 13, 1989	1215	1,318	--	2,900	2.7	2.6	11.0	2,300	350	130	140
JUNE 13, 1989	1600	--	--	3,230	2.4	2.5	13.0	2,000	620	110	100
SEPT 11, 1989	1120	1,318	--	3,400	2.9	2.6	12.5	2,400	360	140	150
410946079253011 Well A3 (LAT 41°09'46" N. LONG 079°25'30" W.)											
SEPT 17, 1984	1615	1,318	--	3,950	3.2	3.2	14.5	2,300	280	300	160
JUNE 08, 1987	1530	--	--	4,000	2.7	2.7	14.5	2,200	500	120	120
JULY 07, 1987	1500	--	--	5,000	2.6	2.5	14.0	3,100	630	130	140
410951079253311 Well B1 (LAT 41°09'51" N. LONG 079°25'33" W.)											
APR 25, 1984	0000	--	--	6,000	3.8	4.1	14.0	1,400	--	210	320
JUNE 01, 1984	0001	--	--	--	--	3.3	--	1,200	170	170	170
JULY 16, 1984	1436	1,352	--	3,690	3.7	3.7	13.5	1,400	--	200	260
AUG 20, 1984	1520	1,355	--	3,590	3.5	3.8	13.5	1,700	52	210	240
SEPT 18, 1984	0915	--	--	4,950	3.2	3.7	13.0	2,600	84	340	390
OCT 29, 1984	1135	1,346	--	6,130	3.7	3.4	13.5	2,800	94	360	560
NOV 19, 1984	1150	1,348	--	1,400	3.3	3.4	13.0	300	64	130	36
DEC 10, 1984	1240	1,348	--	3,200	3.7	3.6	12.5	1,100	260	140	>60
JAN 22, 1985	1410	1,355	--	4,550	4.0	3.2	12.0	1,800	160	340	350
FEB 11, 1985	1350	1,348	--	5,200	3.6	3.4	12.5	1,900	130	180	52
MAR 13, 1985	1505	1,355	--	3,900	3.1	3.1	12.5	1,700	260	120	49
APR 09, 1985	1025	1,356	--	4,780	3.0	3.3	12.0	3,300	150	270	290
MAY 14, 1985	1145	1,355	--	4,850	2.3	3.7	14.0	1,500	36	65	39
JUNE 11, 1985	1120	1,351	--	4,390	3.8	3.6	14.0	2,100	58	290	290
JULY 08, 1985	1145	1,354	--	1,840	3.3	3.3	14.0	760	150	120	74
AUG 07, 1985	0842	1,346	--	4,000	3.2	3.3	14.0	1,400	92	130	59
SEPT 09, 1985	1355	1,345	--	1,620	3.0	3.2	14.0	380	100	130	68
OCT 07, 1985	1210	1,336	--	1,100	3.3	3.4	14.0	180	22	100	37
NOV 12, 1985	1240	1,355	--	1,620	3.4	3.4	13.0	500	38	110	64
DEC 09, 1985	1305	1,356	--	4,000	3.5	3.8	13.0	2,300	26	250	190
JAN 06, 1986	1150	1,356	--	4,350	4.0	3.8	11.5	2,200	26	270	250
FEB 03, 1986	1245	1,355	--	3,550	3.9	3.7	12.5	850	6	300	180
MAR 10, 1986	1135	1,356	--	3,700	4.0	3.8	14.0	1,300	16	260	150
APR 01, 1986	1130	1,355	--	3,600	4.0	3.9	13.0	1,200	--	360	180
MAY 07, 1986	1125	1,355	--	3,920	4.0	3.9	14.0	970	28	360	210
JUNE 02, 1986	1135	1,347	--	3,840	4.0	3.5	14.0	3,100	70	360	220
JULY 08, 1986	1140	1,352	--	2,840	3.6	3.3	14.5	1,300	110	--	--
AUG 04, 1986	1335	1,347	--	1,620	3.1	3.2	14.5	470	64	150	86
SEPT 02, 1986	1205	1,342	--	2,950	2.9	2.9	15.0	680	200	200	190
NOV 18, 1986	1345	1,362	--	2,300	--	3.4	12.0	550	64	180	89
NOV 19, 1986	1345	1,362	--	2,200	3.4	3.3	12.0	900	66	200	83
DEC 08, 1986	1315	1,354	--	1,630	4.0	4.0	11.0	440	10	140	66
JAN 07, 1987	0950	1,356	--	3,500	3.4	3.8	13.0	1,000	26	260	250
FEB 02, 1987	1150	1,355	--	3,700	3.8	3.8	13.0	1,100	50	340	260
MAR 16, 1987	1055	1,350	--	3,600	4.0	3.7	14.0	1,300	94	320	240

Date	Sodium, dissolved (mg/L)	Potassium, dissolved (mg/L)	Alkalinity water lab (mg/L as $CaCO_3$)	Sulfate, dissolved (mg/L as SO_4)	Chloride, dissolved (mg/L)	Silica, dissolved (mg/L as SiO_2)	Solids, residue at 105 °C, dissolved (mg/L)	Nitrogen, nitrate total (mg/L as N)	Nitrogen, nitrite total (mg/L as N)	Nitrogen, ammonia total (mg/L as N)
410947079253011 Well A2 (LAT 41°09'47" N. LONG 079°25'30" W.)–Continued										
MAY 06, 1987	1.8	2.9	0	1,900	2	88	3,410	0.10	<0.004	0.66
JUNE 08, 1987	2	2	0	2,600	2	120	5,310	<.04	<.004	1
JULY 07, 1987	2.6	2.6	0	970	<1	93	4,790	.10	<.004	.84
AUG 10, 1987	2.4	3.1	0	1,800	2	100	3,730	.11	.008	.99
SEPT 15, 1987	2.6	2.4	–	2,900	<1	110	6,000	<.04	<.004	1.1
OCT 06, 1987	.56	2.5	–	2,200	2	100	4,050	.08	<.004	.88
NOV 17, 1987	2.4	1.9	–	2,400	2	120	4,730	<.04	<.004	.82
DEC 14, 1987	2	2.6	–	2,200	3	87	3,530	.05	.006	.90
DEC 16, 1987	2.7	1.7	–	3,000	1	130	5,390	<.04	<.004	1.3
JUNE 07, 1988	2.2	3.6	–	1,600	2	100	3,920	.04	<.004	.99
MAR 13, 1989	2.4	2.7	0	2,500	2	110	5,260	<.04	<.004	1.3
JUNE 13, 1989	1.9	2	–	2,200	2	83	5,740	<.04	<.004	.73
SEPT 11, 1989	2.3	1.6	–	2,800	3	110	6,470	<.04	<.004	1.1
410946079253011 Well A3 (LAT 41°09'46" N. LONG 079°25'30" W.)										
SEPT 17, 1984	–	–	0	3,300	–	–	–	–	–	–
JUNE 08, 1987	–	–	0	2,500	–	–	–	–	–	–
JULY 07, 1987	–	–	–	3,200	–	–	–	–	–	–
410951079253311 Well B1 (LAT 41°09'51" N. LONG 079°25'33" W.)										
APR 25, 1984	–	–	10	3,800	–	–	–	–	–	–
JUNE 01, 1984	–	–	0	1,900	–	–	–	–	–	–
JULY 16, 1984	–	–	0	3,300	–	–	–	–	–	–
AUG 20, 1984	–	–	0	3,000	–	–	–	–	–	–
SEPT 18, 1984	–	–	0	3,600	–	–	–	–	–	–
OCT 29, 1984	–	–	0	5,300	–	–	–	–	–	–
NOV 19, 1984	–	–	0	730	–	–	–	–	–	–
DEC 10, 1984	–	–	0	2,600	–	–	–	–	–	–
JAN 22, 1985	–	–	0	4,300	–	–	–	–	–	–
FEB 11, 1985	–	–	0	6,400	–	–	–	–	–	–
MAR 13, 1985	–	–	0	3,300	–	–	–	–	–	–
APR 09, 1985	–	–	0	4,900	–	–	–	–	–	–
MAY 14, 1985	–	–	0	4,900	–	–	–	–	–	–
JUNE 11, 1985	–	–	0	4,600	–	–	–	–	–	–
JULY 08, 1985	–	–	0	–	–	–	–	–	–	–
AUG 07, 1985	–	–	0	2,800	–	–	–	–	–	–
SEPT 09, 1985	–	–	–	900	–	–	–	–	–	–
OCT 07, 1985	–	–	–	490	–	–	–	–	–	–
NOV 12, 1985	–	–	0	1,000	–	–	–	–	–	–
DEC 09, 1985	–	–	0	3,400	–	–	–	–	–	–
JAN 06, 1986	–	–	0	3,500	–	–	–	–	–	–
FEB 03, 1986	–	–	0	3,000	–	–	–	–	–	–
MAR 10, 1986	–	–	0	3,300	–	–	–	–	–	–
APR 01, 1986	–	–	0	3,100	–	–	–	–	–	–
MAY 07, 1986	–	–	0	3,300	–	–	–	–	–	–
JUNE 02, 1986	–	–	0	3,500	–	–	–	–	–	–
JULY 08, 1986	1.4	8.4	0	2,200	4	–	3,500	<.02	<.002	1.4
AUG 04, 1986	1.8	6.4	0	990	3	–	1,740	<.04	<.004	1
SEPT 02, 1986	2	8.3	0	1,800	4	–	2,840	.02	<.002	1.1
NOV 18, 1986	1.5	6.9	0	1,300	2	–	1,860	<.02	.004	.82
NOV 19, 1986	–	–	–	1,300	–	–	–	–	–	–
DEC 08, 1986	.88	3.5	2	1,100	2.5	–	1,590	.04	<.004	.42
JAN 07, 1987	1.2	10	0	2,500	2	–	4,660	<.04	<.004	1.9
FEB 02, 1987	.64	13	0	1,800	3	–	4,510	<.02	<.004	1.9
MAR 16, 1987	.71	13	–	3,100	3	–	4,600	<.04	<.004	2.1

Appendix 1.–Water-quality data for alkaline-addition study site, May 1983 through September 1989–Continued

Date	Nitrogen, ammonia + organic total (mg/L as N)	Phosphorus total (mg/L as P)	Aluminum, dissolved (mg/L)	Arsenic, dissolved (µg/L)	Barium, dissolved (µg/L)	Boron, dissolved (µg/L)	Cadmium, dissolved (µg/L)	Chromium, dissolved (µg/L)	Copper, dissolved (µg/L)	Iron, dissolved (mg/L)
410947079253011 Well A2 (LAT 41°09'47" N. LONG 079°25'30" W.)–Continued										
MAY 06, 1987	1.3	0.07	100	130	<10	<250	8.7	720	<10	220
JUNE 08, 1987	1.9	.05	160	96	<10	<250	13	630	190	370
JULY 07, 1987	1.8	.05	120	80	<10	<250	9.1	650	49	300
AUG 10, 1987	1.5	.05	120	43	<10	<250	11	280	190	260
SEPT 15, 1987	2	.11	170	72	170	<250	13	<50	320	670
OCT 06, 1987	1.9	.06	130	100	<10	<250	13	720	420	350
NOV 17, 1987	1.6	.05	160	92	<10	<250	4.2	93	370	420
DEC 14, 1987	1.3	.06	130	80	41	<250	7.7	530	310	340
DEC 16, 1987	1.8	.06	200	110	<10	<250	13	180	260	570
JUNE 07, 1988	1.4	.06	110	29	<10	<250	8.5	50	190	260
MAR 13, 1989	1.3	.07	170	11	<10	<250	13	60	340	500
JUNE 13, 1989	.77	.10	130	<10	<10	<250	12	62	450	320
SEPT 11, 1989	1.2	.08	180	<10	<10	<250	15	95	360	450
410946079253011 Well A3 (LAT 41°09'46" N. LONG 079°25'30" W.)										
SEPT 17, 1984	–	–	110	–	–	–	–	–	–	290
JUNE 08, 1987	–	–	170	–	–	–	–	–	–	500
JULY 07, 1987	–	–	89	–	–	–	–	–	–	570
410951079253311 Well B1 (LAT 41°09'51" N. LONG 079°25'33" W.)										
APR 25, 1984	–	–	91	–	–	–	–	–	–	250
JUNE 01, 1984	–	–	55	–	–	–	–	–	–	120
JULY 16, 1984	–	–	70	–	–	–	–	–	–	330
AUG 20, 1984	–	–	63	–	–	–	–	–	–	270
SEPT 18, 1984	–	–	100	–	–	–	–	–	–	360
OCT 29, 1984	–	–	110	–	–	–	–	–	–	640
NOV 19, 1984	–	–	19	–	–	–	–	–	–	30
DEC 10, 1984	–	–	48	–	–	–	–	–	–	280
JAN 22, 1985	–	–	160	–	–	–	–	–	–	150
FEB 11, 1985	–	–	180	–	–	–	–	–	–	170
MAR 13, 1985	–	–	130	–	–	–	–	–	–	180
APR 09, 1985	–	–	220	–	–	–	–	–	–	940
MAY 14, 1985	–	–	130	–	–	–	–	–	–	320
JUNE 11, 1985	–	–	160	–	–	–	–	–	–	260
JULY 08, 1985	–	–	68	–	–	–	–	–	–	43
AUG 07, 1985	–	–	85	–	–	–	–	–	–	260
SEPT 09, 1985	–	–	18	–	–	–	–	–	–	38
OCT 07, 1985	–	–	11	–	–	–	–	–	–	6.7
NOV 12, 1985	–	–	60	–	–	–	–	–	–	47
DEC 09, 1985	–	–	160	–	–	–	–	–	–	480
JAN 06, 1986	–	–	110	–	–	–	–	–	–	280
FEB 03, 1986	–	–	110	–	–	–	–	–	–	140
MAR 10, 1986	–	–	120	–	–	–	–	–	–	240
APR 01, 1986	–	–	120	–	–	–	–	–	–	150
MAY 07, 1986	–	–	150	–	–	–	–	–	–	120
JUNE 02, 1986	–	–	150	–	–	–	–	–	–	83
JULY 08, 1986	2.9	–	110	<1,000	–	–	<10	<50	78	110
AUG 04, 1986	2.1	–	57	30	–	<250	3.2	<50	240	20
SEPT 02, 1986	2.5	–	69	28	–	<200	3.1	380	740	70
NOV 18, 1986	1.9	–	62	32	11	<250	4	150	350	31
NOV 19, 1986	–	–	58	–	–	–	–	–	–	30
DEC 08, 1986	.82	–	29	21	12	<250	1.4	52	39	92
JAN 07, 1987	4	–	110	97	–	<250	4	<50	<10	180
FEB 02, 1987	4.2	–	140	87	–	<250	3.8	<50	<10	110
MAR 16, 1987	4.4	–	140	86	–	–	7.7	<50	24	68

Appendix 1.--Water-quality data for alkaline-addition study site, May 1983 through September 1989--Continued

Date	Iron, ferrous dissolved (mg/L)	Lead, dissolved (µg/L)	Manganese, dissolved (mg/L)	Mercury, dissolved (µg/L)	Molybdenum, dissolved (µg/L)	Nickel, dissolved (mg/L)	Selenium, dissolved (mg/L)	Strontium, dissolved (µg/L)	Zinc, dissolved (mg/L)	Cyanide total (mg/L)
410947079253011 Well A2 (LAT 41°09'47" N. LONG 079°25'30" W.)--Continued										
MAY 06, 1987	170	13	49	<1	<70	1.8	<60	300	4	<0.001
JUNE 08, 1987	400	16	72	<1	<70	1.7	<150	290	5.2	<.001
JULY 07, 1987	300	14	56	<1	<70	2	<60	320	4.5	<.001
AUG 10, 1987	300	34	54	<1	<70	1.5	<30	340	4.4	<.001
SEPT 15, 1987	460	24	67	<1	<70	2.6	<30	290	5.9	<.001
OCT 06, 1987	300	26	60	<1	<70	2	<30	280	4.8	<.001
NOV 17, 1987	390	15	74	<1	<70	2.3	<30	300	5.8	<.001
DEC 14, 1987	340	38	60	<1	<70	2.1	<30	--	4.9	<.001
DEC 16, 1987	650	13	76	<1	<70	2.5	<30	320	5.9	<.001
JUNE 07, 1988	250	<20	50	<1	<70	1.8	<30	300	4.2	<.001
MAR 13, 1989	470	14	70	<1	<70	2.4	<30	330	5.8	<.001
JUNE 13, 1989	210	<10	45	<1	<70	2.1	<30	240	5.4	<.001
SEPT 11, 1989	480	<10	70	<1	<70	3.8	<30	350	6.3	<.001
410946079253011 Well A3 (LAT 41°09'46" N. LONG 079°25'30" W.)										
SEPT 17, 1984	--	--	29	--	--	--	--	--	--	--
JUNE 08, 1987	430	--	62	--	--	--	--	--	--	--
JULY 07, 1987	470	--	69	--	--	--	--	--	--	--
410951079253311 Well B1 (LAT 41°09'51" N. LONG 079°25'33" W.)										
APR 25, 1984	250	--	210	--	--	--	--	--	--	--
JUNE 01, 1984	18	--	120	--	--	--	--	--	--	--
JULY 16, 1984	90	--	160	--	--	--	--	--	--	--
AUG 20, 1984	--	--	130	--	--	--	--	--	--	--
SEPT 18, 1984	--	--	160	--	--	--	--	--	--	--
OCT 29, 1984	640	--	320	--	--	--	--	--	--	--
NOV 19, 1984	30	--	16	--	--	--	--	--	--	--
DEC 10, 1984	--	--	99	--	--	--	--	--	--	--
JAN 22, 1985	--	--	260	--	--	--	--	--	--	--
FEB 11, 1985	170	--	81	--	--	--	--	--	--	--
MAR 13, 1985	11	--	76	--	--	--	--	--	--	--
APR 09, 1985	--	--	160	--	--	--	--	--	--	--
MAY 14, 1985	310	--	51	--	--	--	--	--	--	--
JUNE 11, 1985	120	--	200	--	--	--	--	--	--	--
JULY 08, 1985	37	--	44	--	--	--	--	--	--	--
AUG 07, 1985	920	--	190	--	--	--	--	--	--	--
SEPT 09, 1985	22	--	46	--	--	--	--	--	--	--
OCT 07, 1985	1.9	--	18	--	--	--	--	--	--	--
NOV 12, 1985	1.7	--	51	--	--	--	--	--	--	--
DEC 09, 1985	440	--	96	--	--	--	--	--	--	--
JAN 06, 1986	280	--	180	--	--	--	--	--	--	--
FEB 03, 1986	140	--	210	--	--	--	--	--	--	--
MAR 10, 1986	280	--	100	--	--	--	--	--	--	--
APR 01, 1986	180	--	170	--	--	--	--	--	--	--
MAY 07, 1986	150	--	180	--	--	--	--	--	--	--
JUNE 02, 1986	92	--	180	--	--	--	--	--	--	--
JULY 08, 1986	110	71	--	<1	<700	3.3	<1,000	330	7.1	<.001
AUG 04, 1986	4.1	51	58	<1	<700	1.7	<1,000	280	3.5	<.001
SEPT 02, 1986	2.3	150	130	<1	<70	2.3	<30	350	3.8	<.001
NOV 18, 1986	--	77	54	<1	<70	2.6	<60	300	4.6	<.001
NOV 19, 1986	30	--	51	--	--	--	--	--	--	--
DEC 08, 1986	92	16	32	<1	<70	1.1	<30	240	2	<.001
JAN 07, 1987	200	77	160	<1	<70	3.5	<30	510	4.8	<.001
FEB 02, 1987	130	220	150	<1	<70	3.4	<30	360	4.4	<.001
MAR 16, 1987	84	130	150	<1	<70	4.1	<30	550	5.1	<.001

Appendix 1.–Water-quality data for alkaline-addition study site, May 1983 through September 1989–Continued

Date	Time	Water table altitude (feet above sea level)	Streamflow/ discharge, instan-taneous (ft^3/s)	Specific conduc-tance (µS/cm)	pH, field (units)	pH, lab (units)	Water temper-ature (°C)	Acidity total heated (mg/L as $CaCO_3$)	Acidity mineral (methyl orange) (mg/L as $CaCO_3$)	Calcium, dissolved (mg/L)	Magnesium, dissolved (mg/L)
410951079253311 Well B1 (LAT 41°09'51" N. LONG 079°25'33" W.)–Continued											
MAR 17, 1987	1055	--	--	3,600	4.0	3.7	14.0	1,300	94	320	240
APR 07, 1987	1045	1,356	--	1,950	4.0	3.7	13.0	690	16	190	86
MAY 06, 1987	1415	1,356	--	3,000	4.0	3.9	15.0	980	16	300	170
JUNE 09, 1987	1330	1,352	--	3,300	4.0	3.9	13.5	1,000	16	280	190
JUNE 09, 1987	1400	1,352	--	3,200	4.0	3.7	13.5	940	22	290	180
JULY 07, 1987	1130	1,355	--	2,850	4.2	3.6	15.0	570	32	280	240
AUG 11, 1987	0730	1,351	--	1,800	3.6	2.3	13.5	620	670	130	82
SEPT 16, 1987	0830	1,355	--	1,800	3.6	3.4	14.0	580	34	160	81
OCT 06, 1987	1030	1,355	--	2,200	3.5	3.6	13.5	650	30	180	110
NOV 17, 1987	0930	1,355	--	2,400	3.8	3.8	14.0	900	18	250	160
NOV 19, 1987	1100	1,355	--	3,520	3.6	3.6	11.5	790	28	280	220
DEC 16, 1987	0930	1,354	--	580	4.0	4.1	11.0	48	--	67	16
JAN 12, 1988	0930	1,355	--	3,100	3.8	3.8	11.0	710	14	310	240
FEB 08, 1988	1425	1,356	--	2,000	3.7	3.8	11.0	570	14	190	130
MAR 14, 1988	1330	1,355	--	2,270	3.9	3.8	11.0	700	10	220	170
JUNE 07, 1988	1750	1,354	--	1,900	3.8	3.8	17.0	510	12	240	100
SEPT 20, 1988	1310	1,338	--	--	3.3	--	16.0	--	--	300	100
DEC 20, 1988	1145	1,355	--	793	3.7	3.7	13.0	120	6	130	22
MAR 13, 1989	1325	1,356	--	2,150	3.1	3.2	12.5	1,100	110	260	150
JUNE 13, 1989	1800	--	--	3,580	3.1	3.1	14.0	2,700	84	190	140
SEPT 11, 1989	1315	1,355	--	3,100	3.5	3.3	14.0	2,600	88	200	170
410947079253311 Well B2 (LAT 41°09'47" N. LONG 079°25'33" W.)											
MAY 04, 1983	1300	--	--	1,500	3.0	3.2	--	640	100	--	--
JUNE 08, 1983	0850	1,320	--	2,000	3.0	3.2	12.0	690	120	73	66
JULY 12, 1983	1445	1,320	--	2,100	3.0	3.2	--	870	72	76	77
SEPT 13, 1983	1000	1,319	--	2,450	3.1	4.0	--	730	--	170	110
OCT 11, 1983	1300	1,319	--	2,200	3.6	4.2	14.0	1,000	--	180	110
NOV 16, 1983	1010	1,319	--	1,800	3.9	4.1	--	420	--	130	67
DEC 13, 1983	1125	1,322	--	1,750	3.0	3.3	14.0	520	52	63	61
JAN 17, 1984	1200	1,319	--	2,400	2.6	3.2	--	1,500	110	92	91
FEB 13, 1984	1245	--	--	2,400	2.9	3.1	--	1,600	27	--	--
MAR 28, 1984	1150	--	--	1,650	3.0	3.2	--	520	100	67	65
APR 24, 1984	0000	1,322	--	--	2.8	3.0	11.0	790	150	57	67
MAY 22, 1984	1500	--	--	1,650	3.0	3.1	--	600	150	58	62
JUNE 18, 1984	1200	1,322	--	--	3.1	3.2	11.0	550	130	65	60
JULY 17, 1984	1030	1,322	--	1,600	2.8	3.0	11.0	1,000	--	58	58
AUG 21, 1984	0910	1,321	--	1,830	2.9	3.0	12.0	860	260	65	76
SEPT 17, 1984	1315	--	--	2,100	2.8	3.0	13.0	990	320	74	85
NOV 19, 1984	1525	1,319	--	1,660	3.0	3.1	11.5	630	110	69	51
DEC 10, 1984	1640	--	--	1,760	3.0	3.2	13.0	660	84	79	60
JAN 22, 1985	1250	1,319	--	1,550	2.8	3.3	11.0	580	58	84	53
FEB 12, 1985	1130	1,318	--	1,910	3.3	3.3	12.0	750	98	84	52
FEB 19, 1985	1315	1,318	--	2,350	--	3.0	--	1,000	160	56	38
MAR 13, 1985	0930	1,321	--	1,950	3.0	3.0	11.0	880	110	76	49
APR 10, 1985	0945	1,320	--	3,310	2.3	2.6	12.0	1,900	600	100	120
MAY 15, 1985	1030	1,320	--	2,310	2.4	3.0	11.5	860	160	65	39
JUNE 11, 1985	1410	1,319	--	3,060	2.7	2.2	11.5	750	630	70	65
JULY 09, 1985	1400	1,319	--	1,780	2.6	2.9	12.0	520	120	63	55
NOV 12, 1985	1500	1,320	--	985	3.4	3.5	13.0	240	16	66	32
DEC 10, 1985	1135	1,321	--	1,730	2.8	3.0	12.0	640	94	71	58
JAN 06, 1986	1350	1,319	--	1,800	2.8	3.0	13.0	720	110	70	60
FEB 03, 1986	1400	1,320	--	1,560	3.0	3.1	12.5	490	68	72	60
MAR 10, 1986	1300	1,321	--	1,800	3.0	2.9	12.5	720	110	60	49
APR 01, 1986	1315	1,320	--	1,670	2.8	3.0	12.0	630	90	56	47

Appendix 1.–Water-quality data for alkaline-addition study site, May 1983 through September 1989–Continued

Date	Sodium, dissolved (mg/L)	Potassium, dissolved (mg/L)	Alkalinity water lab (mg/L as $CaCO_3$)	Sulfate, dissolved (mg/L as SO_4)	Chloride, dissolved (mg/L)	Silica, dissolved (mg/L as SiO_2)	Solids, residue at 105 °C, dissolved (mg/L)	Nitrogen, nitrate total (mg/L as N)	Nitrogen, nitrite total (mg/L as N)	Nitrogen, ammonia total (mg/L as N)
410951079253311 Well B1 (LAT 41°09'51" N. LONG 079°25'33" W.)–Continued										
MAR 17, 1987	0.71	13	0	3,100	3	–	4,600	<0.04	<0.004	2.1
APR 07, 1987	.41	8.1	0	1,100	2	–	2,210	<.04	<.004	.46
MAY 06, 1987	150	6.9	0	2,200	3	65	3,770	<.04	<.004	.90
JUNE 09, 1987	1.4	9.2	0	2,200	3	57	4,460	<.04	<.004	1.2
JUNE 09, 1987	–	–	–	2,000	–	–	–	–	–	–
JULY 07, 1987	2.1	13	0	2,300	2	27	4,590	<.04	<.004	1.3
AUG 11, 1987	<.20	7.2	0	890	2	28	2,180	<.04	<.004	.66
SEPT 16, 1987	1.4	7.1	–	1,100	2	27	2,020	<.04	.042	.49
OCT 06, 1987	2.8	7.6	–	1,500	2	37	2,480	<.04	.004	.55
NOV 17, 1987	2	8.1	–	1,700	3	38	3,220	<.04	<.004	.66
NOV 19, 1987	1.5	11	–	2,300	3	29	4,160	<.04	<.004	1.3
DEC 16, 1987	.52	2.7	2	260	2	9.3	442	.16	.004	.15
JAN 12, 1988	3.4	12	–	2,400	2	33	4,090	<.04	<.004	1.2
FEB 08, 1988	1	10	–	1,600	2	24	2,880	.08	.004	.55
MAR 14, 1988	1.2	11	–	1,600	3	20	1,610	<.04	<.004	.88
JUNE 07, 1988	.81	6.3	–	1,100	2	37	2,770	.06	.004	.38
SEPT 20, 1988	1.5	6.2	–	–	–	38	–	.16	<.004	.36
DEC 20, 1988	.75	2.7	–	550	2	8.7	876	.08	<.004	.14
MAR 13, 1989	1.3	6.6	–	2,400	2	54	3,090	<.04	<.004	.75
JUNE 13, 1989	1	18	–	3,600	2	89	6,340	<.04	<.004	2.2
SEPT 11, 1989	1.4	6.8	–	2,600	2	92	6,560	<.04	<.004	1.9
410947079253311 Well B2 (LAT 41°09'47" N. LONG 079°25'33" W.)										
MAY 04, 1983	–	–	0	660	–	–	–	–	–	–
JUNE 08, 1983	–	–	0	–	–	–	–	–	–	–
JULY 12, 1983	–	–	0	1,200	–	–	–	–	–	–
SEPT 13, 1983	–	–	3	1,300	–	–	–	–	–	–
OCT 11, 1983	–	–	9	1,200	–	–	–	–	–	–
NOV 16, 1983	–	–	5	1,000	–	–	–	–	–	–
DEC 13, 1983	–	–	0	1,200	–	–	–	–	–	–
JAN 17, 1984	–	–	0	2,300	–	–	–	–	–	–
FEB 13, 1984	–	–	0	1,600	–	–	–	–	–	–
MAR 28, 1984	–	–	0	1,000	–	–	–	–	–	–
APR 24, 1984	–	–	0	930	–	–	–	–	–	–
MAY 22, 1984	–	–	0	1,000	–	–	–	–	–	–
JUNE 18, 1984	–	–	0	1,200	–	–	–	–	–	–
JULY 17, 1984	–	–	0	1,100	–	–	–	–	–	–
AUG 21, 1984	–	–	0	1,700	–	–	–	–	–	–
SEPT 17, 1984	–	–	0	1,300	–	–	–	–	–	–
NOV 19, 1984	–	–	0	850	–	–	–	–	–	–
DEC 10, 1984	–	–	0	1,100	–	–	–	–	–	–
JAN 22, 1985	–	–	0	1,000	–	–	–	–	–	–
FEB 12, 1985	–	–	0	1,300	–	–	–	–	–	–
FEB 19, 1985	–	–	0	1,700	–	–	–	–	–	–
MAR 13, 1985	–	–	0	1,300	–	–	–	–	–	–
APR 10, 1985	–	–	0	2,800	–	–	–	–	–	–
MAY 15, 1985	–	–	0	1,400	–	–	–	–	–	–
JUNE 11, 1985	–	–	0	1,300	–	–	–	–	–	–
JULY 09, 1985	–	–	0	–	–	–	–	–	–	–
NOV 12, 1985	–	–	0	510	–	–	–	–	–	–
DEC 10, 1985	–	–	0	1,100	–	–	–	–	–	–
JAN 06, 1986	–	–	0	1,100	–	–	–	–	–	–
FEB 03, 1986	–	–	0	830	–	–	–	–	–	–
MAR 10, 1986	–	–	0	1,000	–	–	–	–	–	–
APR 01, 1986	–	–	0	830	–	–	–	–	–	–

Appendix 1.–Water-quality data for alkaline-addition study site, May 1983 through September 1989–Continued

Date	Nitrogen, ammonia + organic total (mg/L as N)	Phosphorus total (mg/L as P)	Aluminum, dissolved (mg/L)	Arsenic, dissolved (µg/L)	Barium, dissolved (µg/L)	Boron, dissolved (µg/L)	Cadmium, dissolved (µg/L)	Chromium, dissolved (µg/L)	Copper, dissolved (µg/L)	Iron, dissolved (mg/L)
410951079253311 Well B1 (LAT 41°09'51" N. LONG 079°25'33" W.)–Continued										
MAR 17, 1987	4.4	–	140	86	<10	–	7.7	<50	24	68
APR 07, 1987	1.20	–	78	53	<10	<250	14	<50	80	6.5
MAY 06, 1987	2.20	0.05	130	120	<10	<250	5.6	<50	<10	76
JUNE 09, 1987	3	.13	120	63	<10	<250	5.4	68	<10	55
JUNE 09, 1987	–	–	120	–	–	–	–	–	–	53
JULY 07, 1987	3.4	.02	110	110	<10	<250	2.7	140	<10	37
AUG 11, 1987	.96	.04	59	62	13	<250	6.8	480	920	6.6
SEPT 16, 1987	1.5	.05	60	26	<10	<250	4.2	<500	<10	6.9
OCT 06, 1987	1.5	.03	85	54	<10	<250	7.1	420	950	29
NOV 17, 1987	1.9	.05	100	44	<10	<250	4.7	<50	<10	51
NOV 19, 1987	3	.06	150	69	<10	<250	6	<50	360	6.4
DEC 16, 1987	.34	.02	5.80	<4	<10	<250	2.3	<50	60	2.7
JAN 12, 1988	2.2	.05	120	69	<10	<250	11	<50	<10	22
FEB 08, 1988	1.2	.04	70	47	<10	<250	11	<50	170	12
MAR 14, 1988	1.7	.07	90	50	12	<250	7.9	<50	62	22
JUNE 07, 1988	1.2	.05	64	<20	<10	–	8.1	<50	100	3.8
SEPT 20, 1988	1.8	.03	72	<4	<10	–	<.20	42	620	5.7
DEC 20, 1988	.28	.04	12	<4	<10	<250	2.3	<50	51	13
MAR 13, 1989	1.2	.03	140	9.8	<10	<250	<.20	61	280	88
JUNE 13, 1989	2	.36	180	16	<10	<250	6.9	<50	54	710
SEPT 11, 1989	2	.08	190	5.1	<10	<250	6.4	120	130	730
410947079253311 Well B2 (LAT 41°09'47" N. LONG 079°25'33" W.)										
MAY 04, 1983	–	–	70	–	–	–	–	–	–	3.6
JUNE 08, 1983	–	–	79	–	–	–	–	–	–	3.7
JULY 12, 1983	–	–	120	–	–	–	–	–	–	4.3
SEPT 13, 1983	–	–	78	–	–	–	–	–	–	36
OCT 11, 1983	–	–	51	–	–	–	–	–	–	9.4
NOV 16, 1983	–	–	37	–	–	–	–	–	–	15
DEC 13, 1983	–	–	64	–	–	–	–	–	–	3.1
JAN 17, 1984	–	–	120	–	–	–	–	–	–	45
FEB 13, 1984	–	–	120	–	–	–	–	–	–	43
MAR 28, 1984	–	–	62	–	–	–	–	–	–	4.7
APR 24, 1984	–	–	83	–	–	–	–	–	–	13
MAY 22, 1984	–	–	52	–	–	–	–	–	–	6.5
JUNE 18, 1984	–	–	43	–	–	–	–	–	–	33
JULY 17, 1984	–	–	57	–	–	–	–	–	–	6.9
AUG 21, 1984	–	–	43	–	–	–	–	–	–	8.2
SEPT 17, 1984	–	–	52	–	–	–	–	–	–	34
NOV 19, 1984	–	–	64	–	–	–	–	–	–	8.9
DEC 10, 1984	–	–	51	–	–	–	–	–	–	10
JAN 22, 1985	–	–	48	–	–	–	–	–	–	4.4
FEB 12, 1985	–	–	58	–	–	–	–	–	–	25
FEB 19, 1985	–	–	55	–	–	–	–	–	–	39
MAR 13, 1985	–	–	83	–	–	–	–	–	–	15
APR 10, 1985	–	–	150	–	–	–	–	–	–	28
MAY 15, 1985	–	–	70	–	–	–	–	–	–	43
JUNE 11, 1985	–	–	81	–	–	–	–	–	–	32
JULY 09, 1985	–	–	57	–	–	–	–	–	–	18
NOV 12, 1985	–	–	32	–	–	–	–	–	–	2.3
DEC 10, 1985	–	–	81	–	–	–	–	–	–	20
JAN 06, 1986	–	–	82	–	–	–	–	–	–	29
FEB 03, 1986	–	–	62	–	–	–	–	–	–	11
MAR 10, 1986	–	–	73	–	–	–	–	–	–	17
APR 01, 1986	–	–	61	–	–	–	–	–	–	11

Date	Iron, ferrous dissolved (mg/L)	Lead, dissolved (µg/L)	Manganese, dissolved (mg/L)	Mercury, dissolved (µg/L)	Molybdenum, dissolved (µg/L)	Nickel, dissolved (mg/L)	Selenium, dissolved (mg/L)	Strontium, dissolved (µg/L)	Zinc, dissolved (mg/L)	Cyanide total (mg/L)
410951079253311 Well B1 (LAT 41°09'51" N. LONG 079°25'33" W.)–Continued										
MAR 17, 1987	–	130	150	<1	<70	4.1	<30	550	5.1	<0.001
APR 07, 1987	6.7	53	41	<1	<70	1.5	<7.5	290	5.2	<.001
MAY 06, 1987	100	23	86	<1	<70	3.5	<150	460	6.6	<.001
JUNE 09, 1987	66	18	100	<1	<70	3	<60	480	5	<.001
JUNE 09, 1987	68	–	100	–	–	–	–	–	–	–
JULY 07, 1987	29	25	160	<1	<70	4.1	<30	470	3.3	<.001
AUG 11, 1987	10	60	51	<1	<70	1.4	<30	260	2.6	<.001
SEPT 16, 1987	5.5	54	50	<1	<70	1.6	<30	320	2.7	<.001
OCT 06, 1987	30	50	64	<1	<70	2.2	<30	280	4.3	<.001
NOV 17, 1987	45	19	100	<1	<70	3.4	<30	420	4.3	<.001
NOV 19, 1987	3.9	140	150	<1	<70	3.2	<30	540	2.9	<.001
DEC 16, 1987	.15	16	5.9	<1	<70	.25	<30	130	.45	<.001
JAN 12, 1988	26	80	160	<1	<70	2.4	<30	490	5.4	<.001
FEB 08, 1988	4.5	240	87	<1	<70	3	<30	350	4.7	<.001
MAR 14, 1988	17	180	130	<1	<70	2.6	<30	390	3.1	<.001
JUNE 07, 1988	3	230	57	<1	<70	2.1	<30	310	4	<.001
SEPT 20, 1988	5.3	420	43	<1	<70	2.4	<30	420	5	–
DEC 20, 1988	13	40	5.6	<1	<70	.49	<30	220	.87	<.001
MAR 13, 1989	78	120	74	<1	<70	3.8	<30	400	8.8	<.001
JUNE 13, 1989	820	32	68	<1	<70	2	<30	370	4.4	<.001
SEPT 11, 1989	700	37	82	<1	<70	2	<30	410	4.7	<.001
410947079253311 Well B2 (LAT 41°09'47" N. LONG 079°25'33" W.)										
MAY 04, 1983	–	–	41	–	–	–	–	–	–	–
JUNE 08, 1983	–	–	50	–	–	–	–	–	–	–
JULY 12, 1983	–	–	60	–	–	–	–	–	–	–
SEPT 13, 1983	–	–	87	–	–	–	–	–	–	–
OCT 11, 1983	–	–	100	–	–	–	–	–	–	–
NOV 16, 1983	–	–	57	–	–	–	–	–	–	–
DEC 13, 1983	–	–	47	–	–	–	–	–	–	–
JAN 17, 1984	.88	–	66	–	–	–	–	–	–	–
FEB 13, 1984	–	–	73	–	–	–	–	–	–	–
MAR 28, 1984	4	–	46	–	–	–	–	–	–	–
APR 24, 1984	4.6	–	47	–	–	–	–	–	–	–
MAY 22, 1984	3.4	–	26	–	–	–	–	–	–	–
JUNE 18, 1984	1.9	–	33	–	–	–	–	–	–	–
JULY 17, 1984	1.8	–	28	–	–	–	–	–	–	–
AUG 21, 1984	–	–	35	–	–	–	–	–	–	–
SEPT 17, 1984	–	–	33	–	–	–	–	–	–	–
NOV 19, 1984	7.8	–	40	–	–	–	–	–	–	–
DEC 10, 1984	–	–	59	–	–	–	–	–	–	–
JAN 22, 1985	2.5	–	51	–	–	–	–	–	–	–
FEB 12, 1985	23	–	65	–	–	–	–	–	–	–
FEB 19, 1985	28	–	36	–	–	–	–	–	–	–
MAR 13, 1985	5.6	–	45	–	–	–	–	–	–	–
APR 10, 1985	–	–	49	–	–	–	–	–	–	–
MAY 15, 1985	27	–	51	–	–	–	–	–	–	–
JUNE 11, 1985	20	–	50	–	–	–	–	–	–	–
JULY 09, 1985	13	–	44	–	–	–	–	–	–	–
NOV 12, 1985	.59	–	22	–	–	–	–	–	–	–
DEC 10, 1985	12	–	41	–	–	–	–	–	–	–
JAN 06, 1986	22	–	50	–	–	–	–	–	–	–
FEB 03, 1986	5.9	–	39	–	–	–	–	–	–	–
MAR 10, 1986	12	–	35	–	–	–	–	–	–	–
APR 01, 1986	6.6	–	33	–	–	–	–	–	–	–

Appendix 1.--Water-quality data for alkaline-addition study site, May 1983 through September 1989--Continued

Date	Time	Water table altitude (feet above sea level)	Streamflow/ discharge, instantaneous (ft^3/s)	Specific conductance ($\mu S/cm$)	pH, field (units)	pH, lab (units)	Water temperature (°C)	Acidity total heated (mg/L as $CaCO_3$)	Acidity mineral (methyl orange) (mg/L as $CaCO_3$)	Calcium, dissolved (mg/L)	Magnesium, dissolved (mg/L)
410947079253311 Well B2 (LAT 41°09'47" N. LONG 079°25'33" W.)--Continued											
MAY 06, 1986	1255	1,320	--	1,700	3.1	3.0	13.0	570	140	67	53
JUNE 02, 1986	1320	1,319	--	1,620	3.4	3.1	12.0	630	62	68	57
JULY 07, 1986	1320	1,320	--	1,460	3.2	3.2	11.5	480	56	69	54
AUG 05, 1986	1010	1,320	--	1,400	3.2	3.1	13.5	490	120	64	46
SEPT 03, 1986	1035	1,319	--	1,490	3.1	3.1	14.0	490	60	66	55
NOV 19, 1986	1445	1,320	--	1,400	3.4	3.4	14.0	400	28	60	43
DEC 09, 1986	0940	1,321	--	1,440	3.1	3.1	--	580	62	58	47
JAN 06, 1987	1140	1,321	--	1,700	3.0	3.0	13.5	630	92	56	52
FEB 02, 1987	1500	1,320	--	1,500	3.0	3.2	12.0	580	66	61	51
MAR 17, 1987	1320	1,319	--	1,350	3.2	3.2	12.0	400	54	58	48
APR 07, 1987	1230	1,322	--	1,470	3.0	3.1	12.0	610	88	54	46
MAY 06, 1987	1000	1,322	--	2,550	2.2	2.7	12.0	1,400	290	70	69
JUNE 08, 1987	1930	1,321	--	1,760	2.9	3.0	11.0	800	94	59	24
JULY 07, 1987	1630	1,322	--	1,440	3.0	3.1	15.0	500	110	53	47
AUG 10, 1987	1445	1,321	--	1,340	3.3	3.2	15.0	410	40	54	46
SEPT 15, 1987	0930	1,321	--	1,260	3.3	3.1	13.0	370	58	48	37
OCT 06, 1987	0745	1,322	--	1,240	3.1	3.1	13.0	410	56	50	40
NOV 17, 1987	0745	1,320	--	1,250	3.4	3.3	14.5	430	34	55	45
DEC 14, 1987	1230	1,320	--	1,080	3.6	3.8	13.0	400	6	61	40
DEC 16, 1987	0730	1,320	--	1,260	3.6	3.2	13.0	390	48	52	39
JAN 12, 1988	0830	1,320	--	1,270	2.8	4.9	11.0	410	--	53	35
FEB 08, 1988	1130	1,321	--	1,200	2.9	3.0	9.5	430	74	42	36
MAR 14, 1988	1200	1,321	--	1,080	3.3	3.2	10.0	460	44	50	39
JUNE 07, 1988	1610	1,321	--	1,230	3.2	3.1	14.5	520	74	50	44
MAR 13, 1989	1200	1,319	--	900	3.4	3.2	10.0	420	68	68	39
JUNE 13, 1989	1615	--	--	3,380	2.4	2.4	13.0	2,400	700	98	98
410948079253211 Well B3 (LAT 41°09'48" N. LONG 079°25'32" W.)											
MAY 04, 1983	1330	1,320	--	1,900	2.8	2.9	12.0	660	190	40	52
JUNE 08, 1983	0950	1,319	--	4,200	2.4	2.6	12.0	4,400	920	97	120
JULY 12, 1983	1520	1,319	--	4,200	2.5	2.6	12.0	>2,000	610	100	120
AUG 12, 1983	1315	--	--	4,200	2.6	2.5	12.0	1,400	630	89	110
SEPT 13, 1983	1100	1,318	--	2,950	--	2.6	13.0	1,300	380	65	84
OCT 11, 1983	1400	1,318	--	3,000	2.3	2.6	12.0	1,200	330	66	82
NOV 16, 1983	0950	1,318	--	2,100	2.8	2.9	10.5	600	140	57	59
DEC 13, 1983	1100	1,321	--	1,600	2.6	3.0	13.5	450	120	36	40
JAN 17, 1984	1050	1,317	--	5,100	2.2	2.6	11.5	4,400	980	130	160
FEB 13, 1984	1200	1,319	--	3,700	2.4	2.6	12.5	2,200	420	21	2
MAR 01, 1984	0001	1,322	--	4,500	2.3	2.4	12.0	3,800	1,200	91	150
APR 24, 1984	0000	--	--	6,500	2.0	2.4	11.0	2,400	1,600	120	200
SEPT 18, 1984	1515	--	--	6,150	2.4	2.5	13.0	4,400	1,900	130	240
OCT 29, 1984	1530	1,318	--	5,590	2.4	2.5	12.5	3,800	1,100	120	200
NOV 20, 1984	0840	1,319	--	2,640	2.4	2.8	11.5	1,200	310	70	51
DEC 11, 1984	1125	1,319	--	3,950	2.3	2.6	11.5	2,400	780	98	60
JAN 23, 1985	1120	1,319	--	5,550	2	2.4	11.0	3,800	1,400	130	140
FEB 12, 1985	1330	1,319	--	5,880	2.2	2.4	11.5	4,200	1,600	110	51
MAR 13, 1985	0955	1,321	--	3,300	2.5	2.4	11.0	1,800	660	72	49
APR 08, 1985	1345	1,321	--	3,430	2.5	2.6	11.0	2,000	770	97	100
MAY 15, 1985	1200	1,320	--	5,260	2.2	2.6	12.0	3,400	1,200	65	39
JUNE 12, 1985	1150	1,321	--	1,460	2.6	3.0	11.5	550	140	49	38
JULY 09, 1985	1240	1,319	--	4,600	2.3	2.4	13.5	2,900	800	110	130
AUG 08, 1985	0910	1,318	--	5,000	2.3	2.5	12.5	2,700	740	120	59
SEPT 10, 1985	1415	1,318	--	4,550	2.3	2.5	13.0	2,700	590	110	120
OCT 08, 1985	0935	1,317	--	3,000	2.6	2.7	12.0	1,100	270	73	80
NOV 13, 1985	1215	1,320	--	1,060	3.4	3.1	13.0	260	60	40	23

Appendix 1.–Water-quality data for alkaline-addition study site, May 1983 through September 1989–Continued

Date	Sodium, dissolved (mg/L)	Potassium, dissolved (mg/L)	Alkalinity water lab (mg/L as $CaCO_3$)	Sulfate, dissolved (mg/L as SO_4)	Chloride, dissolved (mg/L)	Silica, dissolved (mg/L as SiO_2)	Solids, residue at 105 °C, dissolved (mg/L)	Nitrogen, nitrate total (mg/L as N)	Nitrogen, nitrite total (mg/L as N)	Nitrogen, ammonia total (mg/L as N)
410947079253311 Well B2 (LAT 41°09'47" N. LONG 079°25'33" W.)–Continued										
MAY 06, 1986	--	--	0	1,000	--	--	--	--	--	--
JUNE 02, 1986	--	--	0	920	--	--	--	--	--	--
JULY 07, 1986	2.2	6.8	0	670	5	--	1,410	1.2	0.020	0.48
AUG 05, 1986	2.3	6.2	0	890	4	--	1,460	1.3	.034	.54
SEPT 03, 1986	2.7	9.1	0	860	3	--	1,370	2.1	.044	.78
NOV 19, 1986	2.6	6.8	0	590	2	--	962	2	.064	.39
DEC 09, 1986	3	6.8	0	680	2.5	--	1,160	1.1	.014	.34
JAN 06, 1987	1.6	5.9	0	810	3	--	1,530	1.2	.038	.44
FEB 02, 1987	1.8	6.3	0	510	2	--	1,480	.79	.050	.32
MAR 17, 1987	2.3	6.5	0	700	3	--	1,370	1.6	.036	.50
APR 07, 1987	1.3	11	0	760	2	--	1,330	1.1	.012	.42
MAY 06, 1987	2	5.8	0	1,200	2	75	2,690	.58	.020	.75
JUNE 08, 1987	1.8	5.7	0	770	3	70	1,820	1.1	.060	.41
JULY 07, 1987	1.4	6	0	660	2	53	1,700	1.2	.014	.30
AUG 10, 1987	2.3	7.5	0	630	2	57	1,430	.66	.018	.27
SEPT 15, 1987	1.9	7	--	600	2	51	1,450	1.4	.016	.17
OCT 06, 1987	<.20	6.7	--	570	3	57	1,010	.08	.018	.20
NOV 17, 1987	1.7	7.1	--	720	3	60	1,240	.58	.016	.28
DEC 14, 1987	2.2	6.9	--	660	3	55	4,000	.42	.020	.37
DEC 16, 1987	2.1	6	--	640	2	62	1,050	.48	.038	.29
JAN 12, 1988	2.9	6.2	14	580	2	67	1,180	.79	.014	.20
FEB 08, 1988	2	7.2	--	400	2	64	1,210	1.1	.004	.19
MAR 14, 1988	1.2	6.5	--	620	3	60	546	1	.012	.10
JUNE 07, 1988	1.4	6.3	--	700	3	56	1,540	1.2	.010	.10
MAR 13, 1989	1.4	6.6	0	610	2	50	1,430	1.1	<.004	.21
JUNE 13, 1989	1.5	5	--	2,200	2	91	6,070	.12	.014	.87
410948079253211 Well B3 (LAT 41°09'48" N. LONG 079°25'32" W.)										
MAY 04, 1983	--	--	--	500	--	--	--	--	--	--
JUNE 08, 1983	--	--	--	2,600	--	--	--	--	--	--
JULY 12, 1983	--	--	--	2,500	--	--	--	--	--	--
AUG 12, 1983	--	--	--	2,700	--	--	--	--	--	--
SEPT 13, 1983	--	--	--	1,600	--	--	--	--	--	--
OCT 11, 1983	--	--	--	930	--	--	--	--	--	--
NOV 16, 1983	--	--	0	900	--	--	--	--	--	--
DEC 13, 1983	--	--	0	780	--	--	--	--	--	--
JAN 17, 1984	--	--	0	4,000	--	--	--	--	--	--
FEB 13, 1984	--	--	0	>1,900	--	--	--	--	--	--
MAR 01, 1984	--	--	0	2,900	--	--	--	--	--	--
APR 24, 1984	--	--	0	4,500	--	--	--	--	--	--
SEPT 18, 1984	--	--	0	1,900	--	--	--	--	--	--
OCT 29, 1984	--	--	0	4,300	--	--	--	--	--	--
NOV 20, 1984	--	--	0	1,700	--	--	--	--	--	--
DEC 11, 1984	--	--	0	2,700	--	--	--	--	--	--
JAN 23, 1985	--	--	0	4,100	--	--	--	--	--	--
FEB 12, 1985	--	--	0	4,600	--	--	--	--	--	--
MAR 13, 1985	--	--	0	2,000	--	--	--	--	--	--
APR 08, 1985	--	--	0	2,600	--	--	--	--	--	--
MAY 15, 1985	--	--	0	3,600	--	--	--	--	--	--
JUNE 12, 1985	--	--	0	820	--	--	--	--	--	--
JULY 09, 1985	--	--	0	--	--	--	--	--	--	--
AUG 08, 1985	--	--	0	--	--	--	--	--	--	--
SEPT 10, 1985	--	--	0	3,200	--	--	--	--	--	--
OCT 08, 1985	--	--	0	1,700	--	--	--	--	--	--
NOV 13, 1985	--	--	0	400	--	--	--	--	--	--

Appendix 1.--Water-quality data for alkaline-addition study site, May 1983 through September 1989--Continued

Date	Nitrogen, ammonia + organic total (mg/L as N)	Phosphorus total (mg/L as P)	Aluminum, dissolved (mg/L)	Arsenic, dissolved (µg/L)	Barium, dissolved (µg/L)	Boron, dissolved (µg/L)	Cadmium, dissolved (µg/L)	Chromium, dissolved (µg/L)	Copper, dissolved (µg/L)	Iron, dissolved (mg/L)
410947079253311 Well B2 (LAT 41°09'47" N. LONG 079°25'33" W.)--Continued										
MAY 06, 1986	--	--	69	--	--	--	--	--	--	14
JUNE 02, 1986	--	--	64	--	--	--	--	--	--	15
JULY 07, 1986	1.5	--	57	<1,000	--	--	<10	<50	54	5.6
AUG 05, 1986	1	--	49	22	--	<250	7.5	<50	45	7.3
SEPT 03, 1986	1.6	--	58	<20	--	<250	7.9	<50	41	9.7
NOV 19, 1986	1.1	--	34	22	16	<250	7.1	<50	54	3.6
DEC 09, 1986	.83	--	65	25	15	<250	8.5	<50	82	4
JAN 06, 1987	1	--	83	72	--	<250	9.3	<50	130	19
FEB 02, 1987	.90	--	61	52	--	<250	11	<50	36	9.2
MAR 17, 1987	1.2	--	46	26	<10	--	8.7	<50	32	8.4
APR 07, 1987	.90	--	71	52	10	<250	9.8	<50	42	4.6
MAY 06, 1987	1.7	0.03	140	160	<10	<250	14	67	<10	150
JUNE 08, 1987	.91	.02	76	54	16	<250	11	760	670	40
JULY 07, 1987	.62	.03	63	32	<10	<250	8	<50	130	14
AUG 10, 1987	.71	.03	50	45	16	<250	8	730	71	12
SEPT 15, 1987	.64	.12	54	32	<10	<250	8.8	<50	110	3.8
OCT 06, 1987	.78	<.02	43	25	15	<250	9	760	890	6.2
NOV 17, 1987	<1	.03	47	35	<10	<250	7.1	<50	23	20
DEC 14, 1987	.86	.05	38	23	26	<250	4.8	<50	68	20
DEC 16, 1987	.96	.02	56	32	<10	<250	6.7	<50	73	10
JAN 12, 1988	.68	.02	52	33	<10	<250	5.6	<50	74	8.4
FEB 08, 1988	.62	.02	55	31	<10	<250	6.8	<50	77	5
MAR 14, 1988	.65	.03	47	25	<10	<250	7.1	<50	99	3.1
JUNE 07, 1988	.61	.02	54	<20	<10	<250	8.6	<50	82	3.1
MAR 13, 1989	<.20	.03	51	<4	10	<250	<.20	<50	74	1.6
JUNE 13, 1989	1.2	.07	200	<10	<10	<250	16	79	760	430
410948079253211 Well B3 (LAT 41°09'48" N. LONG 079°25'32" W.)										
MAY 04, 1983	--	--	61	--	--	--	--	--	--	20
JUNE 08, 1983	--	--	200	--	--	--	--	--	--	330
JULY 12, 1983	--	--	200	--	--	--	--	--	--	280
AUG 12, 1983	--	--	150	--	--	--	--	--	--	220
SEPT 13, 1983	--	--	90	--	--	--	--	--	--	100
OCT 11, 1983	--	--	97	--	--	--	--	--	--	110
NOV 16, 1983	--	--	55	--	--	--	--	--	--	38
DEC 13, 1983	--	--	42	--	--	--	--	--	--	140
JAN 17, 1984	--	--	220	--	--	--	--	--	--	470
FEB 13, 1984	--	--	120	--	--	--	--	--	--	270
MAR 01, 1984	--	--	160	--	--	--	--	--	--	480
APR 24, 1984	--	--	190	--	--	--	--	--	--	760
SEPT 18, 1984	--	--	190	--	--	--	--	--	--	620
OCT 29, 1984	--	--	250	--	--	--	--	--	--	880
NOV 20, 1984	--	--	85	--	--	--	--	--	--	170
DEC 11, 1984	--	--	120	--	--	--	--	--	--	410
JAN 23, 1985	--	--	210	--	--	--	--	--	--	780
FEB 12, 1985	--	--	200	--	--	--	--	--	--	650
MAR 13, 1985	--	--	100	--	--	--	--	--	--	310
APR 08, 1985	--	--	120	--	--	--	--	--	--	380
MAY 15, 1985	--	--	150	--	--	--	--	--	--	400
JUNE 12, 1985	--	--	37	--	--	--	--	--	--	58
JULY 09, 1985	--	--	170	--	--	--	--	--	--	520
AUG 08, 1985	--	--	170	--	--	--	--	--	--	540
SEPT 10, 1985	--	--	140	--	--	--	--	--	--	440
OCT 08, 1985	--	--	85	--	--	--	--	--	--	170
NOV 13, 1985	--	--	31	--	--	--	--	--	--	8.7

Date	Iron, ferrous dissolved (mg/L)	Lead, dissolved (µg/L)	Manganese, dissolved (mg/L)	Mercury, dissolved (µg/L)	Molybdenum, dissolved (µg/L)	Nickel, dissolved (mg/L)	Selenium, dissolved (mg/L)	Strontium, dissolved (µg/L)	Zinc, dissolved (mg/L)	Cyanide total (mg/L)
410947079253311 Well B2 (LAT 41°09'47" N. LONG 079°25'33" W.)–Continued										
MAY 06, 1986	18	–	40	–	–	–	–	–	–	–
JUNE 02, 1986	13	–	50	–	–	–	–	–	–	–
JULY 07, 1986	3.8	–	40	<1	<700	1.3	<1,000	260	4.2	0.002
AUG 05, 1986	4.1	<50	31	<1	<700	1.2	<1,000	330	3.7	.001
SEPT 03, 1986	7.3	<50	44	<1	<70	1.4	<6	300	4.2	.001
NOV 19, 1986	3.7	22	34	<1	<70	.92	<60	240	2.8	<.001
DEC 09, 1986	1.4	31	33	<1	<70	1.2	<30	270	4.6	<.001
JAN 06, 1987	16	37	35	<1	<70	1.4	<30	330	5.3	<.001
FEB 02, 1987	8.1	34	33	<1	<70	.89	<30	200	3.6	<.001
MAR 17, 1987	10	24	36	<1	<70	.90	<6	310	3.2	.001
APR 07, 1987	1.6	29	30	<1	<70	.67	<300	280	4.1	<.001
MAY 06, 1987	94	57	38	<1	<70	1.7	<150	330	6.2	<.001
JUNE 08, 1987	14	36	34	<1	<70	1.3	<60	300	6.7	.002
JULY 07, 1987	2	40	32	<1	<70	.98	<150	270	4.6	<.001
AUG 10, 1987	10	28	32	<1	<70	.90	<30	300	3.4	.001
SEPT 15, 1987	1.9	29	24	<1	<70	.90	<30	240	3.4	<.001
OCT 06, 1987	1.7	45	25	<1	<70	.73	<30	260	3.6	<.001
NOV 17, 1987	22	25	32	<1	<70	1.1	<30	280	3.5	.001
DEC 14, 1987	23	29	33	<1	<70	.93	<30	350	2.9	<.001
DEC 16, 1987	11	34	28	<1	<70	1.1	<30	260	3.8	.001
JAN 12, 1988	6.2	22	31	<1	<70	.73	<30	230	4.1	<.001
FEB 08, 1988	1.6	30	22	<1	<70	1.1	<30	240	4.3	<.001
MAR 14, 1988	1.9	30	25	<1	<70	.97	<30	280	3.4	<.001
JUNE 07, 1988	1.5	26	27	<1	<70	1.1	<30	240	4.5	<.001
MAR 13, 1989	1.5	27	26	<1	<70	.92	<30	290	3.4	<.001
JUNE 13, 1989	260	43	49	<1	<70	2.3	<30	250	7	<.001
410948079253211 Well B3 (LAT 41°09'48" N. LONG 079°25'32" W.)										
MAY 04, 1983	–	–	21	–	–	–	–	–	–	–
JUNE 08, 1983	–	–	80	–	–	–	–	–	–	–
JULY 12, 1983	–	–	82	–	–	–	–	–	–	–
AUG 12, 1983	–	–	64	–	–	–	–	–	–	–
SEPT 13, 1983	–	–	44	–	–	–	–	–	–	–
OCT 11, 1983	–	–	48	–	–	–	–	–	–	–
NOV 16, 1983	–	–	35	–	–	–	–	–	–	–
DEC 13, 1983	–	–	25	–	–	–	–	–	–	–
JAN 17, 1984	8.6	–	100	–	–	–	–	–	–	–
FEB 13, 1984	–	–	63	–	–	–	–	–	–	–
MAR 01, 1984	12	–	73	–	–	–	–	–	–	–
APR 24, 1984	530	–	98	–	–	–	–	–	–	–
SEPT 18, 1984	–	–	75	–	–	–	–	–	–	–
OCT 29, 1984	700	–	93	–	–	–	–	–	–	–
NOV 20, 1984	170	–	38	–	–	–	–	–	–	–
DEC 11, 1984	–	–	62	–	–	–	–	–	–	–
JAN 23, 1985	–	–	77	–	–	–	–	–	–	–
FEB 12, 1985	430	–	76	–	–	–	–	–	–	–
MAR 13, 1985	95	–	36	–	–	–	–	–	–	–
APR 08, 1985	–	–	38	–	–	–	–	–	–	–
MAY 15, 1985	390	–	51	–	–	–	–	–	–	–
JUNE 12, 1985	31	–	17	–	–	–	–	–	–	–
JULY 09, 1985	490	–	67	–	–	–	–	–	–	–
AUG 08, 1985	–	–	69	–	–	–	–	–	–	–
SEPT 10, 1985	350	–	85	–	–	–	–	–	–	–
OCT 08, 1985	140	–	51	–	–	–	–	–	–	–
NOV 13, 1985	2.7	–	11	–	–	–	–	–	–	–

Appendix 1.--Water-quality data for alkaline-addition study site, May 1983 through September 1989--Continued

Date	Time	Water table altitude (feet above sea level)	Streamflow/ discharge, instan-taneous (ft^3/s)	Specific conduc-tance (µS/cm)	pH, field (units)	pH, lab (units)	Water temper-ature (°C)	Acidity total heated (mg/L as $CaCO_3$)	Acidity mineral (methyl orange) (mg/L as $CaCO_3$)	Calcium, dissolved (mg/L)	Magnesium, dissolved (mg/L)
410948079253211 Well B3 (LAT 41°09'48" N. LONG 079°25'32" W.)--Continued											
DEC 10, 1985	1320	1,321	--	4,850	2.3	2.5	11.0	3,200	1,200	130	140
JAN 07, 1986	1135	1,320	--	4,600	2.3	2.5	11.5	2,900	1,000	120	140
FEB 04, 1986	1130	1,320	--	4,300	2.2	2.5	11.0	2,900	790	120	120
MAR 11, 1986	1130	1,321	--	4,900	2.3	2.4	11.5	3,100	1,200	110	95
APR 02, 1986	0940	1,320	--	5,360	2.2	2.4	12.0	3,300	1,300	110	110
MAY 06, 1986	1200	1,320	--	5,170	2.5	2.4	13.0	2,900	970	120	120
JUNE 04, 1986	1305	1,319	--	5,340	2.5	2.4	13.0	3,400	960	130	130
JULY 08, 1986	1145	1,319	--	2,220	2.8	2.8	12.5	960	200	53	--
AUG 05, 1986	1240	1,319	--	2,520	2.6	2.6	12.5	860	280	52	54
SEPT 04, 1986	1100	1,319	--	2,470	--	2.7	13.0	890	210	59	63
OCT 08, 1986	1240	1,320	--	1,230	3.0	3.0	13.0	450	92	41	31
NOV 19, 1986	1340	1,319	--	2,250	2.9	2.8	11.5	1,200	140	48	51
DEC 09, 1986	1120	1,321	--	1,590	3.0	2.9	12.0	640	160	40	33
JAN 08, 1987	1020	1,322	--	6,040	2.3	2.2	11.5	4,100	1,700	140	160
FEB 03, 1987	1015	1,320	--	6,800	2.4	2.4	11.0	2,700	1,000	100	120
MAR 16, 1987	1320	1,319	--	4,200	2.5	2.4	11.0	--	700	98	110
APR 06, 1987	1245	1,321	--	2,000	2.7	2.7	12.0	780	230	52	49
MAY 06, 1987	1000	1,321	--	3,700	2.5	2.5	13.0	2,200	740	80	87
JUNE 08, 1987	1600	1,320	--	2,600	2.6	2.7	12.5	1,300	310	60	68
JULY 07, 1987	1700	1,321	--	2,300	2.9	2.8	13.0	910	290	52	52
410953079253911 Well C1 (LAT 41°09'53" N. LONG 079°25'39" W.)											
APR 25, 1984	0000	1,353	--	--	--	2.5	--	3,900	430	140	200
JUNE 19, 1984	0900	1,357	--	--	2.3	2.5	--	360	700	150	210
JULY 16, 1984	1310	1,359	--	5,920	2.0	2.4	14.0	--	--	130	200
AUG 20, 1984	1320	1,359	--	6,980	2.2	2.3	13.5	4,000	1,800	130	250
SEPT 18, 1984	1000	--	--	6,950	2.0	2.4	13.5	4,100	2,000	150	240
OCT 29, 1984	1050	1,347	--	6,850	2.6	2.5	13.5	4,000	640	160	300
NOV 19, 1984	1115	1,359	--	11,200	2.2	2.3	12.5	7,700	1,300	260	390
DEC 10, 1984	1145	1,350	--	11,000	2.3	2.1	12.5	7,800	1,700	140	260
JAN 22, 1985	1500	1,359	--	7,350	1.8	2.3	11.0	4,300	1,000	200	240
FEB 11, 1985	1315	1,351	--	7,880	2.0	2.3	13.0	4,200	810	220	51
MAR 13, 1985	1430	1,359	--	8,060	2.2	2.2	13.5	5,100	1,200	200	49
APR 09, 1985	0850	1,360	--	5,740	2.0	2.4	13.0	2,800	520	220	250
MAY 14, 1985	1050	1,358	--	5,150	2.4	2.7	14.0	2,500	480	65	39
JUNE 11, 1985	1035	1,351	--	8,260	2.1	2.3	14.0	5,200	810	200	270
JULY 08, 1985	1115	1,349	--	9,000	2.2	2.2	14.5	3,500	950	210	310
AUG 07, 1985	0806	1,343	--	9,350	2.2	2.4	15.0	5,900	960	130	59
NOV 12, 1985	1150	1,349	--	15,000	2.2	2.2	14.0	10,000	2,000	280	480
DEC 09, 1985	1210	1,359	--	6,400	2.1	2.4	14.5	3,800	690	180	180
JAN 06, 1986	1055	1,359	--	5,400	2.2	2.5	12.0	2,500	510	150	200
FEB 03, 1986	1145	1,359	--	7,100	2.2	2.3	14.0	4,300	770	200	160
MAR 10, 1986	1035	1,359	--	5,400	2.5	2.3	15.0	2,400	490	140	130
APR 01, 1986	1040	1,359	--	5,440	2.4	2.4	14.0	2,400	480	120	130
MAY 07, 1986	1050	1,359	--	6,740	2.4	2.3	14.5	3,200	620	160	150
JUNE 02, 1986	1100	1,354	--	7,620	2.6	2.3	14.5	4,900	720	190	190
JULY 08, 1986	1050	1,358	--	9,080	2.3	2.2	14.5	780	980	--	--
AUG 04, 1986	1225	1,358	--	10,700	2.0	2.0	15.5	6,100	1,300	180	170
SEPT 02, 1986	1040	1,353	--	11,500	2.2	2.1	13.0	6,400	1,400	220	290
NOV 18, 1986	1140	1,353	--	13,700	2.2	2.0	14.0	8,000	1,300	230	330
DEC 08, 1986	1200	1,360	--	11,600	2.2	2.0	14.5	7,300	1,600	180	270
JAN 07, 1987	0905	1,359	--	5,800	2.5	2.3	15.0	2,600	640	150	180
FEB 02, 1987	1040	1,358	--	6,500	2.2	2.3	13.0	3,400	710	170	200
MAR 16, 1987	0915	1,355	--	11,500	2.1	2.0	14.0	7,000	1,400	210	310
MAR 17, 1987	0915	--	--	11,500	2.1	2.0	14.0	7,000	1,400	210	310

Appendix 1.–Water-quality data for alkaline-addition study site, May 1983 through September 1989–Continued

Date	Sodium, dissolved (mg/L)	Potassium, dissolved (mg/L)	Alkalinity water lab (mg/L as $CaCO_3$)	Sulfate, dissolved (mg/L as SO_4)	Chloride, dissolved (mg/L)	Silica, dissolved (mg/L as SiO_2)	Solids, residue at 105 °C, dissolved (mg/L)	Nitrogen, nitrate total (mg/L as N)	Nitrogen, nitrite total (mg/L as N)	Nitrogen, ammonia total (mg/L as N)
410948079253211 Well B3 (LAT 41°09'48" N. LONG 079°25'32" W.)–Continued										
DEC 10, 1985	–	–	0	3,500	–	–	–	–	–	–
JAN 07, 1986	–	–	0	3,200	–	–	–	–	–	–
FEB 04, 1986	–	–	0	3,100	–	–	–	–	–	–
MAR 11, 1986	–	–	0	3,200	–	–	–	–	–	–
APR 02, 1986	–	–	0	3,800	–	–	–	–	–	–
MAY 06, 1986	–	–	0	3,300	–	–	–	–	–	–
JUNE 04, 1986	–	–	0	4,100	–	–	–	–	–	–
JULY 08, 1986	1.1	2.9	0	930	4	–	2,220	0.54	0.010	1.3
AUG 05, 1986	.93	2.9	0	980	3	–	2,160	.56	.020	1.3
SEPT 04, 1986	1	3.5	0	1,200	4	–	1,820	.47	.012	1.4
OCT 08, 1986	–	–	0	680	–	–	–	–	–	–
NOV 19, 1986	–	–	–	780	–	–	–	–	–	–
DEC 09, 1986	–	–	0	730	–	–	–	–	–	–
JAN 08, 1987	–	–	–	3,400	–	–	–	–	–	–
FEB 03, 1987	–	–	–	2,200	–	–	–	–	–	–
MAR 16, 1987	–	–	–	2,000	–	–	–	–	–	–
APR 06, 1987	–	–	–	640	–	–	–	–	–	–
MAY 06, 1987	–	–	–	2,200	–	78	–	–	–	–
JUNE 08, 1987	–	–	–	1,200	–	–	–	–	–	–
JULY 07, 1987	–	–	–	1,100	–	–	–	–	–	–
410953079253911 Well C1 (LAT 41°09'53" N. LONG 079°25'39" W.)										
APR 25, 1984	–	–	0	3,100	–	–	–	–	–	–
JUNE 19, 1984	–	–	0	2,800	–	–	–	–	–	–
JULY 16, 1984	–	–	0	3,300	–	–	–	–	–	–
AUG 20, 1984	–	–	0	4,300	–	–	–	–	–	–
SEPT 18, 1984	–	–	0	4,500	–	–	–	–	–	–
OCT 29, 1984	–	–	0	5,200	–	–	–	–	–	–
NOV 19, 1984	–	–	0	8,600	–	–	–	–	–	–
DEC 10, 1984	–	–	0	8,700	–	–	–	–	–	–
JAN 22, 1985	–	–	0	5,300	–	–	–	–	–	–
FEB 11, 1985	–	–	0	6,100	–	–	–	–	–	–
MAR 13, 1985	–	–	0	6,300	–	–	–	–	–	–
APR 09, 1985	–	–	0	3,900	–	–	–	–	–	–
MAY 14, 1985	–	–	0	3,600	–	–	–	–	–	–
JUNE 11, 1985	–	–	0	6,200	–	–	–	–	–	–
JULY 08, 1985	–	–	0	–	–	–	–	–	–	–
AUG 07, 1985	–	–	0	7,100	–	–	–	–	–	–
NOV 12, 1985	–	–	0	14,000	–	–	–	–	–	–
DEC 09, 1985	–	–	0	4,200	–	–	–	–	–	–
JAN 06, 1986	–	–	0	3,500	–	–	–	–	–	–
FEB 03, 1986	–	–	0	4,500	–	–	–	–	–	–
MAR 10, 1986	–	–	0	3,100	–	–	–	–	–	–
APR 01, 1986	–	–	0	3,300	–	–	–	–	–	–
MAY 07, 1986	–	–	0	3,300	–	–	–	–	–	–
JUNE 02, 1986	–	–	0	5,600	–	–	–	–	–	–
JULY 08, 1986	1.2	5.4	0	4,600	2	–	11,200	<.02	<.002	1.9
AUG 04, 1986	1.4	6	0	5,600	2	–	12,500	<.04	<.004	2.5
SEPT 02, 1986	2	8.2	0	5,700	2	–	14,300	<.02	<.002	1.5
NOV 18, 1986	1.8	8.2	0	8,900	<1	–	14,100	<.02	.006	1.3
DEC 08, 1986	2.1	9.1	0	6,800	<.1	–	12,600	<.04	<.004	1.5
JAN 07, 1987	1.1	7.2	0	3,200	<1	–	5,490	<.04	<.004	.88
FEB 02, 1987	.86	5.6	0	2,800	<1	–	6,800	<.02	.010	.75
MAR 16, 1987	.87	7.1	–	6,700	<1	–	13,400	<.04	.004	1.8
MAR 17, 1987	.87	7.1	0	6,700	<1	–	13,400	<.04	.004	1.8

Appendix 1.–Water-quality data for alkaline-addition study site, May 1983 through September 1989–Continued

Date	Nitrogen, ammonia + organic total (mg/L as N)	Phosphorus total (mg/L as P)	Aluminum, dissolved (mg/L)	Arsenic, dissolved (µg/L)	Barium, dissolved (µg/L)	Boron, dissolved (µg/L)	Cadmium, dissolved (µg/L)	Chromium, dissolved (µg/L)	Copper, dissolved (µg/L)	Iron, dissolved (mg/L)
410948079253211 Well B3 (LAT 41°09'48" N. LONG 079°25'32" W.)–Continued										
DEC 10, 1985	–	–	230	–	–	–	–	–	–	640
JAN 07, 1986	–	–	190	–	–	–	–	–	–	510
FEB 04, 1986	–	–	190	–	–	–	–	–	–	540
MAR 11, 1986	–	–	170	–	–	–	–	–	–	490
APR 02, 1986	–	–	180	–	–	–	–	–	–	600
MAY 06, 1986	–	–	220	–	–	–	–	–	–	540
JUNE 04, 1986	–	–	230	–	–	–	–	–	–	650
JULY 08, 1986	1.6	–	73	<1,000	–	–	<10	<50	110	110
AUG 05, 1986	1.9	–	74	24	–	<250	8.3	<50	110	87
SEPT 04, 1986	2.1	–	95	32	–	<200	14	<50	110	110
OCT 08, 1986	–	–	43	–	–	–	–	–	–	22
NOV 19, 1986	–	–	68	–	–	–	–	–	–	69
DEC 09, 1986	–	–	54	–	–	–	–	–	–	110
JAN 08, 1987	–	–	310	–	–	–	–	–	–	930
FEB 03, 1987	–	–	240	–	–	–	–	–	–	550
MAR 16, 1987	–	–	210	–	–	–	–	–	–	410
APR 06, 1987	–	–	71	–	–	–	–	–	–	94
MAY 06, 1987	–	0.07	160	–	–	–	–	–	–	420
JUNE 08, 1987	–	–	110	–	–	–	–	–	–	170
JULY 07, 1987	–	–	80	–	–	–	–	–	–	150
410953079253911 Well C1 (LAT 41°09'53" N. LONG 079°25'39" W.)										
APR 25, 1984	–	–	110	–	–	–	–	–	–	610
JUNE 19, 1984	–	–	92	–	–	–	–	–	–	78
JULY 16, 1984	–	–	150	–	–	–	–	–	–	750
AUG 20, 1984	–	–	130	–	–	–	–	–	–	730
SEPT 18, 1984	–	–	130	–	–	–	–	–	–	820
OCT 29, 1984	–	–	230	–	–	–	–	–	–	890
NOV 19, 1984	–	–	450	–	–	–	–	–	–	2,000
DEC 10, 1984	–	–	310	–	–	–	–	–	–	860
JAN 22, 1985	–	–	170	–	–	–	–	–	–	1,400
FEB 11, 1985	–	–	170	–	–	–	–	–	–	>1,400
MAR 13, 1985	–	–	170	–	–	–	–	–	–	1,400
APR 09, 1985	–	–	130	–	–	–	–	–	–	620
MAY 14, 1985	–	–	110	–	–	–	–	–	–	400
JUNE 11, 1985	–	–	270	–	–	–	–	–	–	120
JULY 08, 1985	–	–	310	–	–	–	–	–	–	1,400
AUG 07, 1985	–	–	330	–	–	–	–	–	–	1,300
NOV 12, 1985	–	–	550	–	–	–	–	–	–	3,200
DEC 09, 1985	–	–	170	–	–	–	–	–	–	780
JAN 06, 1986	–	–	130	–	–	–	–	–	–	550
FEB 03, 1986	–	–	220	–	–	–	–	–	–	1,100
MAR 10, 1986	–	–	120	–	–	–	–	–	–	520
APR 01, 1986	–	–	110	–	–	–	–	–	–	690
MAY 07, 1986	–	–	180	–	–	–	–	–	–	880
JUNE 02, 1986	–	–	270	–	–	–	–	–	–	1,300
JULY 08, 1986	2.8	–	320	<1,000	–	–	130	240	460	–
AUG 04, 1986	2.5	–	340	440	–	<250	18	340	740	1,900
SEPT 02, 1986	2.6	–	430	570	–	<200	23	960	1,300	2,300
NOV 18, 1986	3.8	–	490	490	<10	<250	26	5,800	790	12
DEC 08, 1986	2.9	–	300	290	<10	<250	18	920	1,200	820
JAN 07, 1987	1.8	–	170	280	–	<250	1.4	190	280	770
FEB 02, 1987	1.6	–	250	480	–	<250	15	880	910	960
MAR 16, 1987	3.1	–	470	1,000	–	–	23	2,700	2,200	360
MAR 17, 1987	3.1	–	470	1,000	<10	–	23	2,700	2,200	360

Appendix 1.–Water-quality data for alkaline-addition study site, May 1983 through September 1989–Continued

Date	Iron, ferrous dissolved (mg/L)	Lead, dissolved (µg/L)	Manganese, dissolved (mg/L)	Mercury, dissolved (µg/L)	Molybdenum, dissolved (µg/L)	Nickel, dissolved (mg/L)	Selenium, dissolved (mg/L)	Strontium, dissolved (µg/L)	Zinc, dissolved (mg/L)	Cyanide total (mg/L)
410948079253211 Well B3 (LAT 41°09'48" N. LONG 079°25'32" W.)–Continued										
DEC 10, 1985	350	–	50	–	–	–	–	–	–	–
JAN 07, 1986	260	–	54	–	–	–	–	–	–	–
FEB 04, 1986	300	–	60	–	–	–	–	–	–	–
MAR 11, 1986	230	–	53	–	–	–	–	–	–	–
APR 02, 1986	250	–	67	–	–	–	–	–	–	–
MAY 06, 1986	260	–	70	–	–	–	–	–	–	–
JUNE 04, 1986	420	–	800	–	–	–	–	–	–	–
JULY 08, 1986	83	–	–	<1	<700	1.3	<1,000	240	4.5	0.001
AUG 05, 1986	74	<50	32	<1	<700	1.4	<1,000	260	4.8	.001
SEPT 04, 1986	92	<50	37	<1	<70	1.6	<30	300	5.6	.001
OCT 08, 1986	14	–	16	–	–	–	–	–	–	–
NOV 19, 1986	60	–	28	–	–	–	–	–	–	–
DEC 09, 1986	80	–	17	–	–	–	–	–	–	–
JAN 08, 1987	390	–	74	–	–	–	–	–	–	–
FEB 03, 1987	320	–	59	–	–	–	–	–	–	–
MAR 16, 1987	210	–	59	–	–	–	–	–	–	–
APR 06, 1987	63	–	25	–	–	–	–	–	–	–
MAY 06, 1987	200	–	44	–	–	–	–	–	–	–
JUNE 08, 1987	130	–	33	–	–	–	–	–	–	–
JULY 07, 1987	89	–	25	–	–	–	–	–	–	–
410953079253911 Well C1 (LAT 41°09'53" N. LONG 079°25'39" W.)										
APR 25, 1984	610	–	88	–	–	–	–	–	–	–
JUNE 19, 1984	75	–	78	–	–	–	–	–	–	–
JULY 16, 1984	790	–	85	–	–	–	–	–	–	–
AUG 20, 1984	–	–	88	–	–	–	–	–	–	–
SEPT 18, 1984	–	–	75	–	–	–	–	–	–	–
OCT 29, 1984	890	–	120	–	–	–	–	–	–	–
NOV 19, 1984	980	–	200	–	–	–	–	–	–	–
DEC 10, 1984	–	–	97	–	–	–	–	–	–	–
JAN 22, 1985	–	–	110	–	–	–	–	–	–	–
FEB 11, 1985	1,200	–	80	–	–	–	–	–	–	–
MAR 13, 1985	770	–	74	–	–	–	–	–	–	–
APR 09, 1985	–	–	95	–	–	–	–	–	–	–
MAY 14, 1985	520	–	51	–	–	–	–	–	–	–
JUNE 11, 1985	990	–	120	–	–	–	–	–	–	–
JULY 08, 1985	980	–	140	–	–	–	–	–	–	–
AUG 07, 1985	540	–	250	–	–	–	–	–	–	–
NOV 12, 1985	500	–	260	–	–	–	–	–	–	–
DEC 09, 1985	680	–	76	–	–	–	–	–	–	–
JAN 06, 1986	580	–	67	–	–	–	–	–	–	–
FEB 03, 1986	830	–	89	–	–	–	–	–	–	–
MAR 10, 1986	600	–	58	–	–	–	–	–	–	–
APR 01, 1986	610	–	72	–	–	–	–	–	–	–
MAY 07, 1986	830	–	76	–	–	–	–	–	–	–
JUNE 02, 1986	180	–	100	–	–	–	–	–	–	–
JULY 08, 1986	420	620	–	<1	<700	4.2	<1,000	330	–	<.001
AUG 04, 1986	930	710	84	<1	<700	4.3	<1,000	330	9.7	<.001
SEPT 02, 1986	1,900	940	130	<1	<70	5.1	<150	370	13	<.001
NOV 18, 1986	2,500	200	140	<1	<70	5.7	<300	310	13	<.001
DEC 08, 1986	1,700	140	130	<1	<70	5.2	<60	350	11	<.001
JAN 07, 1987	750	96	74	<1	<70	2.4	<60	280	6.1	<.001
FEB 02, 1987	890	370	86	<1	<70	4.2	<60	180	5.9	<.001
MAR 16, 1987	2,000	590	140	<1	<70	7.9	<60	390	10	<.001
MAR 17, 1987	–	590	140	<1	<70	7.9	<60	390	10	<.001

Appendix 1.–Water-quality data for alkaline-addition study site, May 1983 through September 1989–Continued

Date	Time	Water table altitude (feet above sea level)	Streamflow/ discharge, instan-taneous (ft^3/s)	Specific conduc-tance (µS/cm)	pH, field (units)	pH, lab (units)	Water temper-ature (°C)	Acidity total heated (mg/L as $CaCO_3$)	Acidity mineral (methyl orange) (mg/L as $CaCO_3$)	Calcium, dissolved (mg/L)	Magnesium, dissolved (mg/L)
410953079253911 Well C1 (LAT 41°09'53" N. LONG 079°25'39" W.)–Continued											
APR 07, 1987	1000	1,360	–	17,000	1.9	1.9	14.0	9,200	3,200	170	260
MAY 06, 1987	1300	1,359	–	5,750	2.2	2.3	15.0	2,800	680	130	150
JUNE 09, 1987	1630	1,359	–	6,500	2.3	2.3	14.0	3,500	620	140	180
JULY 07, 1987	0830	1,359	–	11,000	2.2	2.0	15.0	5,500	1,400	160	200
AUG 11, 1987	0005	1,360	–	7,800	2.2	2.3	14.0	4,500	710	–	–
AUG 11, 1987	0815	1,360	–	7,800	2.2	3.6	14.0	4,500	16	140	170
SEPT 15, 1987	0005	1,359	–	14,200	1.8	1.8	14.5	8,800	2,400	200	170
SEPT 15, 1987	1330	1,359	–	14,000	1.8	1.8	14.5	8,600	2,400	200	270
OCT 06, 1987	1100	1,359	–	8,800	2.0	2.1	14.5	4,300	1,100	150	190
NOV 17, 1987	1015	1,354	–	8,200	2.3	2.2	15.5	4,900	800	150	170
NOV 19, 1987	1200	1,354	–	8,840	2.2	2.2	14.5	5,400	830	170	220
DEC 16, 1987	1000	1,354	–	10,000	2.0	2.1	13.5	7,000	1,100	190	250
JAN 12, 1988	1000	1,358	–	12,700	2.0	1.9	12.0	7,500	1,900	180	260
JUNE 07, 1988	1735	1,359	–	6,400	2.0	2.2	15.5	3,800	910	150	170
DEC 20, 1988	1200	1,347	–	5,820	2.8	2.7	14.0	5,400	970	310	540
MAR 13, 1989	1340	1,359	–	9,600	2.2	1.9	13.0	7,500	1,600	200	230
410950079254211 Well C2 (LAT 41°09'50" N. LONG 079°25'42" W.)											
APR 25, 1984	0000	1,330	–	–	4.9	4.9	12.5	3,900	86	220	320
JUNE 19, 1984	1230	–	–	–	4.7	4.8	12.0	4,400	–	340	330
JULY 17, 1984	0840	1,334	–	5,670	4.8	4.8	13.0	5,800	–	230	300
AUG 20, 1984	1235	1,332	–	5,550	4.6	4.7	12.0	4,000	–	220	320
SEPT 18, 1984	1150	–	–	5,800	4.7	4.7	13.5	4,000	–	250	290
OCT 31, 1984	1100	1,329	–	5,590	4.7	4.7	12.5	3,500	–	240	310
NOV 19, 1984	1022	1,331	–	5,750	5.0	4.7	12.0	3,800	–	270	270
DEC 10, 1984	1050	1,330	–	5,650	4.2	4.5	12.0	4,000	–	140	>60
FEB 11, 1985	1230	1,331	–	5,460	4.7	4.7	12.5	3,400	–	150	52
MAR 13, 1985	1430	1,333	–	5,450	5.0	4.6	12.5	3,900	–	120	49
APR 09, 1985	0945	1,324	–	5,300	4.9	3.3	12.5	3,300	68	330	370
MAY 14, 1985	1030	1,337	–	5,530	4.6	4.6	12.0	3,200	–	65	39
JUNE 11, 1985	1010	1,331	–	5,460	4.7	4.7	12.0	4,100	–	220	250
JULY 08, 1985	1030	1,330	–	5,500	4.5	4.6	14.0	1,000	–	240	260
AUG 06, 1985	1055	1,329	–	5,500	4.8	4.7	13.0	3,500	–	130	59
SEPT 09, 1985	1035	1,329	–	5,500	4.5	4.6	12.5	3,500	–	220	260
OCT 07, 1985	1040	1,328	–	5,850	4.4	4.7	12.5	4,000	–	260	300
NOV 12, 1985	1100	1,328	–	5,800	4.4	4.7	13.5	3,700	–	250	270
DEC 09, 1985	1115	1,333	–	5,500	4.5	4.6	12.5	3,700	–	240	240
JAN 06, 1986	1020	1,332	–	5,600	4.8	4.7	12.0	3,400	–	200	210
FEB 03, 1986	1120	1,332	–	5,600	4.6	4.7	12.0	3,900	–	270	180
MAR 10, 1986	1010	1,333	–	5,500	4.8	4.7	13.0	3,800	–	260	190
APR 01, 1986	1020	1,332	–	5,340	4.8	4.7	12.0	3,500	–	220	200
MAY 07, 1986	1025	1,331	–	5,480	4.6	4.7	13.0	3,400	–	240	190
JUNE 02, 1986	1010	1,330	–	5,280	4.8	4.6	11.5	3,500	–	230	190
JULY 08, 1986	1025	1,331	–	5,300	4.4	4.5	13.5	3,700	–	–	–
AUG 04, 1986	1155	1,331	–	5,220	4.4	4.4	13.0	3,700	–	200	160
SEPT 02, 1986	1020	1,330	–	5,310	4.3	4.4	12.5	2,200	–	230	220
OCT 07, 1986	1005	1,330	–	5,080	4.6	4.6	12.5	3,300	–	220	210
NOV 18, 1986	1045	1,330	–	6,000	4.5	4.5	11.5	4,300	–	190	220
DEC 08, 1986	1130	1,330	–	5,640	4.6	4.6	12.0	3,500	–	93	230
JAN 07, 1987	0840	1,323	–	5,580	4.5	4.5	13	3,300	–	360	290
FEB 02, 1987	1010	1,332	–	5,750	4.6	4.6	12.0	3,300	–	240	280
MAR 16, 1987	0845	1,330	–	5,400	4.7	4.6	12.0	3,400	–	250	270
MAR 17, 1987	0845	–	–	5,300	4.7	4.6	12.0	3,400	–	240	270
APR 07, 1987	0930	1,331	–	5,700	4.5	4.7	12.5	3,700	–	210	230
MAY 06, 1987	1340	1,333	–	5,300	4.5	4.6	12.0	3,500	–	230	260

Appendix 1.–Water-quality data for alkaline-addition study site, May 1983 through September 1989–Continued

Date	Sodium, dissolved (mg/L)	Potassium, dissolved (mg/L)	Alkalinity water lab (mg/L as $CaCO_3$)	Sulfate, dissolved (mg/L as SO_4)	Chloride, dissolved (mg/L)	Silica, dissolved (mg/L as SiO_2)	Solids, residue at 105 °C, dissolved (mg/L)	Nitrogen, nitrate total (mg/L as N)	Nitrogen, nitrite total (mg/L as N)	Nitrogen, ammonia total (mg/L as N)
410953079253911 Well C1 (LAT 41°09'53" N. LONG 079°25'39" W.)–Continued										
APR 07, 1987	280	26	0	6,800	<1	–	15,800	<0.04	<0.004	2.3
MAY 06, 1987	1.6	5.2	0	2,500	1	100	5,730	<.04	<.004	.84
JUNE 09, 1987	1.6	4.8	0	4,300	1	130	7,930	<.04	<.004	1.1
JULY 07, 1987	1.7	7.1	0	4,900	<1	150	13,400	<.04	<.004	6.4
AUG 11, 1987	–	–	–	5,300	1	–	10,100	<.04	.010	1.9
AUG 11, 1987	2	6.1	0	5,300	2	140	8,740	<.04	.004	2.8
SEPT 15, 1987	2.2	9.2	–	8,200	<1	180	16,100	<.04	.010	8.4
SEPT 15, 1987	2.3	9.2	–	8,300	<1	190	14,800	<.04	.006	7.8
OCT 06, 1987	2.3	6.4	–	5,000	<1	150	9,030	<.04	<.004	1
NOV 17, 1987	2.2	6.4	–	3,400	<1	150	9,810	<.04	.008	.94
NOV 19, 1987	1.4	6.6	–	6,200	<1	130	10,600	<.04	.006	1.1
DEC 16, 1987	2.6	6.9	–	8,000	<1	200	13,100	<.04	.008	3.4
JAN 12, 1988	<2	8.6	–	8,100	<1	190	13,400	<.04	.018	2
JUNE 07, 1988	1.5	6.7	–	4,000	2	120	8,240	<.04	.026	1
DEC 20, 1988	3	1.9	–	6,200	2	130	12,300	<.04	.004	4.3
MAR 13, 1989	2.5	11	–	7,200	2	130	13,900	<.04	.006	2.3
410950079254211 Well C2 (LAT 41°09'50" N. LONG 079°25'42" W.)										
APR 25, 1984	–	–	34	7,200	–	–	–	–	–	–
JUNE 19, 1984	–	–	26	7,100	–	–	–	–	–	–
JULY 17, 1984	–	–	30	6,000	–	–	–	–	–	–
AUG 20, 1984	–	–	20	5,600	–	–	–	–	–	–
SEPT 18, 1984	–	–	24	5,800	–	–	–	–	–	–
OCT 31, 1984	–	–	28	6,300	–	–	–	–	–	–
NOV 19, 1984	–	–	20	5,500	–	–	–	–	–	–
DEC 10, 1984	–	–	22	5,900	–	–	–	–	–	–
FEB 11, 1985	–	–	22	5,600	–	–	–	–	–	–
MAR 13, 1985	–	–	26	5,800	–	–	–	–	–	–
APR 09, 1985	–	–	0	6,000	–	–	–	–	–	–
MAY 14, 1985	–	–	24	5,800	–	–	–	–	–	–
JUNE 11, 1985	–	–	22	5,900	–	–	–	–	–	–
JULY 08, 1985	–	–	24	–	–	–	–	–	–	–
AUG 06, 1985	–	–	28	5,500	–	–	–	–	–	–
SEPT 09, 1985	–	–	24	5,500	–	–	–	–	–	–
OCT 07, 1985	–	–	24	5,700	–	–	–	–	–	–
NOV 12, 1985	–	–	26	5,500	–	–	–	–	–	–
DEC 09, 1985	–	–	28	5,100	–	–	–	–	–	–
JAN 06, 1986	–	–	26	5,600	–	–	–	–	–	–
FEB 03, 1986	–	–	26	5,600	–	–	–	–	–	–
MAR 10, 1986	–	–	28	5,400	–	–	–	–	–	–
APR 01, 1986	–	–	30	5,100	–	–	–	–	–	–
MAY 07, 1986	–	–	24	4,900	–	–	–	–	–	–
JUNE 02, 1986	–	–	24	4,900	–	–	–	–	–	–
JULY 08, 1986	2.7	17	26	4,700	2	–	8,680	<.02	<.002	2.8
AUG 04, 1986	2.7	18	24	3,800	2	–	8,280	<.04	<.004	3.6
SEPT 02, 1986	2.9	22	20	5,000	2	–	8,040	<.02	.008	3
OCT 07, 1986	3.4	20	28	5,100	1	–	8,120	<.02	<.004	3
NOV 18, 1986	2.8	1.9	28	4,800	<1	–	–	<.02	<.004	2.4
DEC 08, 1986	3.1	19	28	5,100	.7	–	7,920	<.04	<.004	2.9
JAN 07, 1987	3.2	16	32	4,400	<1	–	8,270	<.04	<.004	2.1
FEB 02, 1987	3.3	17	30	4,400	<1	–	7,800	<.02	<.004	1.3
MAR 16, 1987	–	–	26	5,600	–	–	–	–	–	–
MAR 17, 1987	2.6	15	28	5,400	<1	–	7,810	<.04	<.004	2.9
APR 07, 1987	4.2	26	32	4,800	<1	–	7,780	<.04	<.004	2.9
MAY 06, 1987	3.4	16	28	4,400	1	19	8,270	<.04	<.004	1.7

Appendix 1.–Water-quality data for alkaline-addition study site, May 1983 through September 1989–Continued

Date	Nitrogen, ammonia + organic total (mg/L as N)	Phosphorus total (mg/L as P)	Aluminum, dissolved (mg/L)	Arsenic, dissolved (µg/L)	Barium, dissolved (µg/L)	Boron, dissolved (µg/L)	Cadmium, dissolved (µg/L)	Chromium, dissolved (µg/L)	Copper, dissolved (µg/L)	Iron, dissolved (mg/L)
410953079253911 Well C1 (LAT 41°09'53" N. LONG 079°25'39" W.)–Continued										
APR 07, 1987	2.9	–	370	760	<10	<250	23	920	4,500	2,200
MAY 06, 1987	1.8	0.68	130	220	<10	<250	8.9	720	<10	710
JUNE 09, 1987	1.8	1.5	180	300	<10	<250	14	1,400	<10	930
JULY 07, 1987	7.9	3.4	290	510	<10	<250	5.6	6,300	1,200	1,600
AUG 11, 1987	2.2	2.4	–	–	–	<250	–	–	–	–
AUG 11, 1987	3	1.8	220	240	<10	<250	12	9,000	47	1,100
SEPT 15, 1987	9.6	4.2	430	720	18	<250	23	5,600	5,000	–
SEPT 15, 1987	8.4	3.9	440	710	54	<250	26	5,800	4,600	2,400
OCT 06, 1987	2	1.2	200	340	<100	<250	9	1,600	170	1,600
NOV 17, 1987	1.7	1.7	390	250	<10	<250	12	7,200	230	1,300
NOV 19, 1987	2	1.6	200	320	<10	<250	18	7,600	380	1,000
DEC 16, 1987	4.2	2.3	420	460	54	<250	15	13,000	300	2,000
JAN 12, 1988	3	3.4	450	890	<10	<250	24	1,600	2,200	2,100
JUNE 07, 1988	5.5	1.8	170	340	<10	–	14	840	660	1,000
DEC 20, 1988	4.8	.68	410	67	<10	<250	38	3,500	3,200	1,200
MAR 13, 1989	3.4	1.9	370	430	<10	<250	25	500	1,000	2,100
410950079254211 Well C2 (LAT 41°09'50" N. LONG 079°25'42" W.)										
APR 25, 1984	–	–	14	–	–	–	–	–	–	160
JUNE 19, 1984	–	–	11	–	–	–	–	–	–	130
JULY 17, 1984	–	–	9.4	–	–	–	–	–	–	1,400
AUG 20, 1984	–	–	11	–	–	–	–	–	–	>1,000
SEPT 18, 1984	–	–	13	–	–	–	–	–	–	1,500
OCT 31, 1984	–	–	23	–	–	–	–	–	–	1,400
NOV 19, 1984	–	–	16	–	–	–	–	–	–	1,600
DEC 10, 1984	–	–	27	–	–	–	–	–	–	860
FEB 11, 1985	–	–	12	–	–	–	–	–	–	940
MAR 13, 1985	–	–	23	–	–	–	–	–	–	780
APR 09, 1985	–	–	15	–	–	–	–	–	–	–
MAY 14, 1985	–	–	13	–	–	–	–	–	–	400
JUNE 11, 1985	–	–	16	–	–	–	–	–	–	410
JULY 08, 1985	–	–	28	–	–	–	–	–	–	1,600
AUG 06, 1985	–	–	17	–	–	–	–	–	–	1,600
SEPT 09, 1985	–	–	17	–	–	–	–	–	–	1,700
OCT 07, 1985	–	–	16	–	–	–	–	–	–	1,900
NOV 12, 1985	–	–	17	–	–	–	–	–	–	1,800
DEC 09, 1985	–	–	31	–	–	–	–	–	–	1,600
JAN 06, 1986	–	–	17	–	–	–	–	–	–	1,400
FEB 03, 1986	–	–	22	–	–	–	–	–	–	2,000
MAR 10, 1986	–	–	15	–	–	–	–	–	–	1,600
APR 01, 1986	–	–	18	–	–	–	–	–	–	1,800
MAY 07, 1986	–	–	24	–	–	–	–	–	–	1,700
JUNE 02, 1986	–	–	25	–	–	–	–	–	–	330
JULY 08, 1986	4.5	–	45	<1,000	–	–	150	<50	<10	1,700
AUG 04, 1986	4.6	–	58	30	–	<250	9	<50	<10	1,600
SEPT 02, 1986	4.5	–	47	16	–	<200	8.4	<50	<10	1,800
OCT 07, 1986	3.6	–	31	21	<10	<250	7.7	180	57	770
NOV 18, 1986	5.2	–	42	<10	<10	<250	9.6	180	38	780
DEC 08, 1986	3.9	–	27	9.6	<10	<250	6.4	200	64	800
JAN 07, 1987	3.5	–	53	33	–	<250	5.8	<50	<10	630
FEB 02, 1987	1.3	–	35	22	–	<250	6.5	<500	140	810
MAR 16, 1987	–	–	28	–	–	–	–	–	–	800
MAR 17, 1987	3.7	–	28	<10	<10	–0	5.6	<50	<10	940
APR 07, 1987	3.2	–	25	15	<10	<250	5.8	<50	<10	530
MAY 06, 1987	3	.05	31	20	<10	<250	4.4	<50	<10	150

Appendix 1.–Water-quality data for alkaline-addition study site, May 1983 through September 1989–Continued

Date	Iron, ferrous dissolved (mg/L)	Lead, dissolved (µg/L)	Manganese, dissolved (mg/L)	Mercury, dissolved (µg/L)	Molybdenum, dissolved (µg/L)	Nickel, dissolved (mg/L)	Selenium, dissolved (mg/L)	Strontium, dissolved (µg/L)	Zinc, dissolved (mg/L)	Cyanide total (mg/L)
410953079253911 Well C1 (LAT 41°09'53" N. LONG 079°25'39" W.)–Continued										
APR 07, 1987	2,400	170	120	<1	<70	3.9	<300	400	9	<0.001
MAY 06, 1987	580	69	62	<1	<70	3.3	<150	280	4.8	<.001
JUNE 09, 1987	970	88	67	<1	<70	3.6	<150	300	5.3	<.001
JULY 07, 1987	1,700	84	84	<1	<70	5.5	<300	370	7.1	<.001
AUG 11, 1987	1.3	–	–	–	–	–	–	–	–	–
AUG 11, 1987	1,400	38	69	<1	<70	5	<30	340	5.6	<.001
SEPT 15, 1987	2,200	140	110	<1	<70	6.9	<30	380	8.8	<.001
SEPT 15, 1987	2,100	130	120	<1	<70	6.8	<30	390	8.8	<.001
OCT 06, 1987	1,200	120	75	<1	<70	3.6	<30	270	5.9	<.001
NOV 17, 1987	1,400	46	75	<1	<70	8	<30	310	7	<.001
NOV 19, 1987	1,500	56	75	<1	<70	8.5	<30	300	6.5	<.001
DEC 16, 1987	2,200	49	110	<1	<70	13	<30	390	8.4	<.001
JAN 12, 1988	2,100	310	87	<1	230	75	<30	290	.83	<.001
JUNE 07, 1988	600	140	74	<1	<70	2.7	<30	260	5.1	<.001
DEC 20, 1988	870	130	290	<1	<70	40	<30	450	17	<.001
MAR 13, 1989	2,400	70	100	<1	<70	7.4	<30	360	8.2	<.001
410950079254211 Well C2 (LAT 41°09'50" N. LONG 079°25'42" W.)										
APR 25, 1984	160	–	170	–	–	–	–	–	–	–
JUNE 19, 1984	130	–	130	–	–	–	–	–	–	–
JULY 17, 1984	1,300	–	120	–	–	–	–	–	–	–
AUG 20, 1984	–	–	140	–	–	–	–	–	–	–
SEPT 18, 1984	–	–	94	–	–	–	–	–	–	–
OCT 31, 1984	370	–	120	–	–	–	–	–	–	–
NOV 19, 1984	570	–	110	–	–	–	–	–	–	–
DEC 10, 1984	–	–	97	–	–	–	–	–	–	–
FEB 11, 1985	940	–	80	–	–	–	–	–	–	–
MAR 13, 1985	2,100	–	74	–	–	–	–	–	–	–
APR 09, 1985	–	–	150	–	–	–	–	–	–	–
MAY 14, 1985	700	–	51	–	–	–	–	–	–	–
JUNE 11, 1985	320	–	110	–	–	–	–	–	–	–
JULY 08, 1985	310	–	110	–	–	–	–	–	–	–
AUG 06, 1985	88	–	120	–	–	–	–	–	–	–
SEPT 09, 1985	380	–	120	–	–	–	–	–	–	–
OCT 07, 1985	1,600	–	130	–	–	–	–	–	–	–
NOV 12, 1985	780	–	120	–	–	–	–	–	–	–
DEC 09, 1985	650	–	99	–	–	–	–	–	–	–
JAN 06, 1986	1,400	–	90	–	–	–	–	–	–	–
FEB 03, 1986	280	–	120	–	–	–	–	–	–	–
MAR 10, 1986	800	–	98	–	–	–	–	–	–	–
APR 01, 1986	680	–	120	–	–	–	–	–	–	–
MAY 07, 1986	850	–	110	–	–	–	–	–	–	–
JUNE 02, 1986	2,100	–	100	–	–	–	–	–	–	–
JULY 08, 1986	680	470	–	<1	<700	3.9	<1,000	620	–	<.001
AUG 04, 1986	700	420	76	<1	<700	4	<1,000	610	14	<.001
SEPT 02, 1986	720	240	100	<1	<70	4	<150	620	14	<.001
OCT 07, 1986	1,800	1,800	100	<1	<70	7.7	<150	640	13	<.001
NOV 18, 1986	1,900	<4	97	<1	<70	7.2	<60	580	15	<.001
DEC 08, 1986	1,800	<4	100	<1	<70	3.5	<150	620	13	<.001
JAN 07, 1987	1,700	<4	120	<1	<70	2.5	<60	620	11	<.001
FEB 02, 1987	420	<4	120	<1	<70	2.4	<60	480	11	<.001
MAR 16, 1987	1,800	–	120	–	–	–	–	–	–	–
MAR 17, 1987	–	<4	120	<1	<70	2.4	<30	660	12	<.001
APR 07, 1987	1,900	<4	99	<1	<70	3.2	<300	590	9.6	<.001
MAY 06, 1987	1,800	5.2	110	<1	<70	5	<150	570	9	<.001

Appendix 1.–Water-quality data for alkaline-addition study site, May 1983 through September 1989–Continued

Date	Time	Water table altitude (feet above sea level)	Streamflow/ discharge, instan-taneous (ft^3/s)	Specific conduc-tance (µS/cm)	pH, field (units)	pH, lab (units)	Water temper-ature (°C)	Acidity total heated (mg/L as $CaCO_3$)	Acidity mineral (methyl orange) (mg/L as $CaCO_3$)	Calcium, dissolved (mg/L)	Magnesium, dissolved (mg/L)
410950079254211 Well C2 (LAT 41°09'50" N. LONG 079°25'42" W.)–Continued											
JUNE 09, 1987	1100	1,332	--	5,200	4.6	4.6	12.5	3,200	--	250	280
JULY 07, 1987	1030	1,332	--	5,620	4.7	4.7	15.0	3,500	--	220	260
AUG 11, 1987	0830	1,332	--	5,400	4.6	4.7	12.5	3,400	--	200	230
SEPT 15, 1987	1200	1,331	--	5,400	4.6	4.8	11.0	3,200	--	210	240
OCT 06, 1987	1130	1,332	--	5,200	4.6	4.8	13.0	3,100	--	230	260
NOV 17, 1987	1045	1,331	--	5,200	4.6	4.8	13.5	3,400	--	220	250
DEC 16, 1987	1030	1,330	--	5,300	4.6	4.8	12.0	3,300	--	170	200
JAN 12, 1988	1045	1,330	--	4,800	4.7	4.8	12.0	3,100	--	180	210
FEB 08, 1988	1335	1,331	--	4,380	4.4	4.5	10.5	3,600	--	190	200
MAR 14, 1988	1415	1,329	--	4,750	4.6	4.5	10.0	3,700	--	220	260
JUNE 07, 1988	1715	1,331	--	4,580	4.5	4.5	14.0	3,100	--	250	270
SEPT 20, 1988	1350	1,328	--	4,590	4.4	4.6	12.5	3,400	--	230	240
DEC 20, 1988	1230	1,327	--	4,060	4.6	4.5	12.5	3,300	--	230	240
MAR 13, 1989	1400	1,330	--	3,550	4.5	4.5	14.0	3,200	--	200	200
JUNE 13, 1989	1730	--	--	4,900	4.4	4.4	13.0	3,900	--	230	240
SEPT 11, 1989	1340	1,329	--	4,450	4.9	4.5	13.0	3,800	--	240	240
410951079254511 Well C3 (LAT 41°09'51" N. LONG 079°25'45" W.)											
JUNE 13, 1985	0850	1,331	--	2,620	2.8	3.0	11.0	1,300	280	53	95
SEPT 09, 1985	1125	1,328	--	3,500	2.7	2.8	13.0	2,000	480	92	110
OCT 08, 1985	1415	1,328	--	3,950	3.0	3.1	13.0	2,300	180	100	140
DEC 09, 1985	1120	1,333	--	3,000	2.9	3.5	12.5	1,400	46	93	170
MAR 04, 1986	1125	1,335	--	2,900	3.4	3.4	12.0	1,400	42	74	110
JUNE 03, 1986	0730	1,330	--	3,400	3.6	3.5	12.0	2,200	32	99	140
SEPT 02, 1986	1105	1,330	--	3,640	3.4	3.5	13.5	1,800	46	110	160
DEC 10, 1986	0955	1,332	--	3,450	3.6	3.5	12.5	2,200	36	120	160
APR 08, 1987	1125	1,331	--	3,850	3.4	3.7	13.0	1,800	24	110	180
JUNE 09, 1987	1000	1,331	--	3,450	3.4	3.5	13.0	2,000	72	97	170
410949079254111 Well C4 (LAT 41°09'49" N. LONG 079°25'41" W.)											
SEPT 18, 1984	1130	1,324	--	4,900	4.7	4.7	13.0	3,200	--	260	250
APR 09, 1985	0940	1,333	--	4,250	4.0	3.9	10.0	2,200	4	280	300
JUNE 13, 1985	0845	1,331	--	4,570	3.0	3.2	10.5	2,600	160	210	220
SEPT 09, 1985	1115	1,328	--	4,400	3.9	4.0	12.5	2,600	--	190	220
OCT 08, 1985	1425	1,328	--	4,700	4.2	4.3	12.0	2,500	--	230	250
DEC 09, 1985	1130	1,333	--	4,500	4.1	4.3	12.5	2,400	--	220	210
DEC 09, 1985	1135	1,333	--	4,350	4.1	4.3	12.5	2,500	--	220	210
MAR 04, 1986	1115	1,332	--	4,500	3.3	3.4	11.5	2,500	86	210	160
JUNE 03, 1986	0740	1,330	--	4,480	3.2	3.1	10.5	2,600	280	220	190
SEPT 02, 1986	1110	1,330	--	4,270	4.2	4.5	13.0	7,500	--	210	210
OCT 08, 1986	1320	1,330	--	4,040	3.8	3.9	13.5	2,100	8	200	220
DEC 10, 1986	1000	1,332	--	4,190	4.3	4.5	12.5	1,900	--	70	200
APR 08, 1987	1115	1,331	--	4,300	3.4	3.5	12.0	1,800	34	190	200
JUNE 08, 1987	0930	--	--	4,300	3.3	3.4	12.0	2,100	120	170	190
410956079253611 Well C5 (LAT 41°09'56" N. LONG 079°25'36" W.)											
SEPT 18, 1984	1100	1,326	--	6,300	2.5	2.9	13.5	5,400	1,200	220	380
JAN 23, 1985	1220	1,326	--	5,500	2.2	2.7	11.0	3,400	620	260	250
APR 10, 1985	1055	1,330	--	8,430	2.0	2.3	11.5	6,000	1,100	330	370
JUNE 13, 1985	0930	1,326	--	6,610	2.6	2.8	12.0	5,300	500	230	280
SEPT 09, 1985	1300	1,324	--	5,300	2.8	3.0	14.0	3,300	340	220	300
DEC 09, 1985	1250	1,328	--	10,700	2.0	2.2	11.5	8,000	2,500	260	290
MAR 04, 1986	1105	1,328	--	12,800	2.0	2.0	12.0	9,400	2,400	260	210
JUNE 03, 1986	0825	1,325	--	7,990	2.7	2.6	12.5	6,900	920	300	260
SEPT 02, 1986	1255	1,325	--	7,410	2.7	2.7	13.5	2,300	1,400	300	360

Appendix 1.–Water-quality data for alkaline-addition study site, May 1983 through September 1989–Continued

Date	Sodium, dissolved (mg/L)	Potassium, dissolved (mg/L)	Alkalinity water lab (mg/L as $CaCO_3$)	Sulfate, dissolved (mg/L as SO_4)	Chloride, dissolved (mg/L)	Silica, dissolved (mg/L as SiO_2)	Solids, residue at 105 °C, dissolved (mg/L)	Nitrogen, nitrate total (mg/L as N)	Nitrogen, nitrite total (mg/L as N)	Nitrogen, ammonia total (mg/L as N)
410950079254211 Well C2 (LAT 41°09'50" N. LONG 079°25'42" W.)–Continued										
JUNE 09, 1987	3	17	30	5,200	2	20	8,870	<0.04	<0.004	2.4
JULY 07, 1987	2.9	15	32	4,400	<1	16	9,300	<.04	<.004	4.3
AUG 11, 1987	4	24	28	4,900	1	15	8,210	<.04	.008	3.8
SEPT 15, 1987	4.1	15	32	4,900	<1	14	8,290	<.04	.004	6
OCT 06, 1987	4.9	16	34	4,900	<1	12	8,140	<.04	<.004	2.1
NOV 17, 1987	3.6	15	32	4,400	2	14	8,270	<.04	<.004	1.9
DEC 16, 1987	5	15	34	4,800	2	18	7,780	<.04	.012	3.6
JAN 12, 1988	3.8	15	32	4,200	1	19	7,520	<.04	<.004	3.2
FEB 08, 1988	3	15	22	4,500	<1	18	7,900	<.04	.010	2.2
MAR 14, 1988	3.7	16	26	4,300	2	22	3,860	<.04	.006	2.4
JUNE 07, 1988	3.8	15	26	5,000	2	18	8,640	<.04	.004	1.6
SEPT 20, 1988	4	14	28	5,000	2	13	8,260	<.04	<.004	2.5
DEC 10, 1988	3.6	15	26	4,600	2	16	7,930	<.04	<.004	3.1
MAR 13, 1989	3	15	–	3,900	2	22	6,900	<.04	.006	2.6
JUNE 13, 1989	4.1	16	24	5,500	2	20	9,360	<.04	<.004	2.7
SEPT 11, 1989	4.2	13	34	5,000	1	18	9,610	<.04	<.004	2.3
410951079254511 Well C3 (LAT 41°09'51" N. LONG 079°25'45" W.)										
JUNE 13, 1985	–	–	0	2,100	–	–	–	–	–	–
SEPT 09, 1985	–	–	–	2,900	–	–	–	–	–	–
OCT 08, 1985	–	–	–	3,100	–	–	–	–	–	–
DEC 09, 1985	–	–	0	2,400	–	–	–	–	–	–
MAR 04, 1986	–	–	0	2,300	–	–	–	–	–	–
JUNE 03, 1986	–	–	0	3,200	–	–	–	–	–	–
SEPT 02, 1986	4.1	16	0	2,300	4	–	4,560	<.02	<.002	1.6
DEC 10, 1986	–	–	–	2,200	–	–	–	–	–	–
APR 08, 1987	–	–	–	2,700	–	–	–	–	–	–
JUNE 09, 1987	–	–	–	2,200	–	–	–	–	–	–
410949079254111 Well C4 (LAT 41°09'49" N. LONG 079°25'41" W.)										
SEPT 18, 1984	–	–	20	4,500	–	–	–	–	–	–
APR 09, 1985	–	–	0	4,100	–	–	–	–	–	–
JUNE 13, 1985	–	–	0	4,800	–	–	–	–	–	–
SEPT 09, 1985	–	–	2	4,700	–	–	–	–	–	–
OCT 08, 1985	–	–	10	4,200	–	–	–	–	–	–
DEC 09, 1985	–	–	10	4,100	–	–	–	–	–	–
DEC 09, 1985	–	–	10	3,600	–	–	–	–	–	–
MAR 04, 1986	–	–	0	4,100	–	–	–	–	–	–
JUNE 03, 1986	–	–	0	4,000	–	–	–	–	–	–
SEPT 02, 1986	9	12	–	2,900	4	–	5,560	<.02	<.002	1.5
OCT 08, 1986	–	–	8	3,900	–	–	–	–	–	–
DEC 10, 1986	–	–	16	2,600	–	–	–	–	–	–
APR 08, 1987	–	–	–	3,200	–	–	–	–	–	–
JUNE 08, 1987	–	–	0	2,600	–	–	–	–	–	–
410956079253611 Well C5 (LAT 41°09'56" N. LONG 079°25'36" W.)										
SEPT 18, 1984	–	–	0	5,500	–	–	–	–	–	–
JAN 23, 1985	–	–	0	4,700	–	–	–	–	–	–
APR 10, 1985	–	–	0	6,900	–	–	–	–	–	–
JUNE 13, 1985	–	–	–	5,500	–	–	–	–	–	–
SEPT 09, 1985	–	–	–	4,900	–	–	–	–	–	–
DEC 09, 1985	–	–	0	8,300	–	–	–	–	–	–
MAR 04, 1986	–	–	0	10,000	–	–	–	–	–	–
JUNE 03, 1986	–	–	0	7,700	–	–	–	–	–	–
SEPT 02, 1986	1.6	<.14	0	7,500	5	–	13,200	<.02	.010	1.7

Appendix 1.–Water-quality data for alkaline-addition study site, May 1983 through September 1989–Continued

Date	Nitrogen, ammonia + organic total (mg/L as N)	Phosphorus total (mg/L as P)	Aluminum, dissolved (mg/L)	Arsenic, dissolved (µg/L)	Barium, dissolved (µg/L)	Boron, dissolved (µg/L)	Cadmium, dissolved (µg/L)	Chromium, dissolved (µg/L)	Copper, dissolved (µg/L)	Iron, dissolved (mg/L)
410950079254211 Well C2 (LAT 41°09'50" N. LONG 079°25'42" W.)–Continued										
JUNE 09, 1987	3.1	0.03	33	<40	<10	<250	4.8	110	<10	1,800
JULY 07, 1987	5.8	.01	32	33	<10	<250	5.3	90	<10	1,700
AUG 11, 1987	6	.42	22	<10	<10	<250	4.9	<50	<10	1,700
SEPT 15, 1987	8.4	.04	24	11	<10	<250	4.3	<50	<10	1,600
OCT 06, 1987	3.8	.03	22	9.6	<10	<250	2.9	<50	<10	1,600
NOV 17, 1987	3.1	.03	22	11	<10	<250	3.3	<50	<10	820
DEC 16, 1987	5	.05	26	15	60	<250	4	<50	<10	1,700
JAN 12, 1988	5	.03	24	11	<10	<250	4	<50	<10	170
FEB 08, 1988	2.4	.04	18	18	<10	<250	7	<50	<10	1,400
MAR 14, 1988	2.9	.06	39	18	120	<250	4.4	<50	<10	1,600
JUNE 07, 1988	2.7	.05	36	<80	<10	<250	4.8	<50	24	–
SEPT 20, 1988	3.8	.06	33	<4	<10	<250	3.8	<50	72	–
DEC 20, 1988	2.7	.05	44	<4	<10	<250	6	<50	61	1,800
MAR 13, 1989	2.4	.04	43	<4	<10	<250	6.7	<50	68	1,700
JUNE 13, 1989	2.1	.03	52	<4	<10	<250	9.2	<50	68	1,800
SEPT 11, 1989	2.3	.04	36	<4	<10	<250	5	<50	50	1,900
410951079254511 Well C3 (LAT 41°09'51" N. LONG 079°25'45" W.)										
JUNE 13, 1985	–	–	41	–	–	–	–	–	–	350
SEPT 09, 1985	–	–	54	–	–	–	–	–	–	610
OCT 08, 1985	–	–	68	–	–	–	–	–	–	860
DEC 09, 1985	–	–	53	–	–	–	–	–	–	550
MAR 04, 1986	–	–	39	–	–	–	–	–	–	570
JUNE 03, 1986	–	–	48	–	–	–	–	–	–	800
SEPT 02, 1986	2.5	–	58	19	–	<200	7.8	<50	<10	910
DEC 10, 1986	–	–	40	–	–	–	–	–	–	880
APR 08, 1987	–	–	39	–	–	–	–	–	–	970
JUNE 09, 1987	–	–	43	–	–	–	–	–	–	790
410949079254111 Well C4 (LAT 41°09'49" N. LONG 079°25'41" W.)										
SEPT 18, 1984	–	–	3.8	–	–	–	–	–	–	1,100
APR 09, 1985	–	–	13	–	–	–	–	–	–	–
JUNE 13, 1985	–	–	12	–	–	–	–	–	–	920
SEPT 09, 1985	–	–	11	–	–	–	–	–	–	1,000
OCT 08, 1985	–	–	13	–	–	–	–	–	–	1,200
DEC 09, 1985	–	–	15	–	–	–	–	–	–	1,000
DEC 09, 1985	–	–	17	–	–	–	–	–	–	1,000
MAR 04, 1986	–	–	12	–	–	–	–	–	–	1,000
JUNE 03, 1986	–	–	18	–	–	–	–	–	–	980
SEPT 02, 1986	2.4	–	20	5.9	–	<200	3.8	<50	<10	1,100
OCT 08, 1986	–	–	18	–	–	–	–	–	–	53
DEC 10, 1986	–	–	16	–	–	–	–	–	–	110
APR 08, 1987	–	–	19	–	–	–	–	–	–	35
JUNE 08, 1987	–	–	24	–	–	–	–	–	–	940
410956079253611 Well C5 (LAT 41°09'56" N. LONG 079°25'36" W.)										
SEPT 18, 1984	–	–	190	–	–	–	–	–	–	750
JAN 23, 1985	–	–	270	–	–	–	–	–	–	640
APR 10, 1985	–	–	–	–	–	–	–	–	–	–
JUNE 13, 1985	–	–	270	–	–	–	–	–	–	890
SEPT 09, 1985	–	–	150	–	–	–	–	–	–	620
DEC 09, 1986	–	–	460	–	–	–	–	–	–	1,900
MAR 04, 1986	–	–	480	–	–	–	–	–	–	2,400
JUNE 03, 1986	–	–	510	–	–	–	–	–	–	1,800
SEPT 02, 1986	2.8	–	590	210	–	<200	33	<50	540	1,800

Appendix 1.–Water-quality data for alkaline-addition study site, May 1983 through September 1989–Continued

Date	Iron, ferrous dissolved (mg/L)	Lead, dissolved (µg/L)	Manganese, dissolved (mg/L)	Mercury, dissolved (µg/L)	Molybdenum, dissolved (µg/L)	Nickel, dissolved (mg/L)	Selenium, dissolved (mg/L)	Strontium, dissolved (µg/L)	Zinc, dissolved (mg/L)	Cyanide total (mg/L)
410950079254211 Well C2 (LAT 41°09'50" N. LONG 079°25'42" W.)–Continued										
JUNE 09, 1987	1,800	<4	120	<1	<70	2.9	<150	600	10	<0.001
JULY 07, 1987	1,700	4.3	120	<1	<70	2.8	<60	580	9.5	<.001
AUG 11, 1987	1,600	<10	100	<1	<70	2.3	<30	620	8.1	<.001
SEPT 15, 1987	1,700	<20	110	<1	<70	3.1	<30	560	8.9	<.001
OCT 06, 1987	1,700	<10	110	<1	<70	2.8	<30	530	8.4	<.001
NOV 17, 1987	1,700	<40	110	<1	<70	2.8	<30	570	8.5	<.001
DEC 16, 1987	1,700	<10	110	<1	<70	6.1	<30	550	8.7	<.001
JAN 12, 1988	1,700	<10	110	<1	<70	2.4	<30	590	10	<.001
FEB 08, 1988	1,600	<10	94	<1	<70	3	<30	660	8.4	<.001
MAR 14, 1988	1,600	<20	110	<1	<70	2.6	<30	590	8.2	<.001
JUNE 07, 1988	1,800	<20	110	<1	<70	6.1	<30	520	8.8	<.001
SEPT 20, 1988	1,700	<40	110	<1	<70	3.3	<30	540	7.8	<.001
DEC 20, 1988	1,700	<40	100	<1	<70	2	<30	530	8.8	<.001
MAR 13, 1989	1,800	<20	88	<1	<70	5	<30	530	9	<.001
JUNE 13, 1989	2,100	<50	100	<1	<70	6.1	<30	600	8.8	<.001
SEPT 11, 1989	2,200	<10	110	<1	<70	3.3	<30	620	10	<.001
410951079254511 Well C3 (LAT 41°09'51" N. LONG 079°25'45" W.)										
JUNE 13, 1985	280	–	23	–	–	–	–	–	–	–
SEPT 09, 1985	550	–	42	–	–	–	–	–	–	–
OCT 08, 1985	840	–	45	–	–	–	–	–	–	–
DEC 09, 1985	620	–	49	–	–	–	–	–	–	–
MAR 04, 1986	200	–	36	–	–	–	–	–	–	–
JUNE 03, 1986	480	–	56	–	–	–	–	–	–	–
SEPT 02, 1986	820	<50	61	<1	<70	2	<30	410	5.3	<.001
DEC 10, 1986	900	–	66	–	–	–	–	–	–	–
APR 08, 1987	950	–	73	–	–	–	–	–	–	–
JUNE 09, 1987	850	–	62	–	–	–	–	–	–	–
410949079254111 Well C4 (LAT 41°09'49" N. LONG 079°25'41" W.)										
SEPT 18, 1984	–	–	84	–	–	–	–	–	–	–
APR 09, 1985	–	–	120	–	–	–	–	–	–	–
JUNE 13, 1985	910	–	97	–	–	–	–	–	–	–
SEPT 09, 1985	200	–	100	–	–	–	–	–	–	–
OCT 08, 1985	–	–	110	–	–	–	–	–	–	–
DEC 09, 1985	87	–	92	–	–	–	–	–	–	–
DEC 09, 1985	530	–	94	–	–	–	–	–	–	–
MAR 04, 1986	340	–	95	–	–	–	–	–	–	–
JUNE 03, 1986	1,100	–	110	–	–	–	–	–	–	–
SEPT 02, 1986	1,000	<50	100	<1	<70	3.2	<60	490	6.8	<.001
OCT 08, 1986	1,100	–	100	–	–	–	–	–	–	–
DEC 10, 1986	1,100	–	100	–	–	–	–	–	–	–
APR 08, 1987	1,100	–	97	–	–	–	–	–	–	–
JUNE 08, 1987	980	–	87	–	–	–	–	–	–	–
410956079253611 Well C5 (LAT 41°09'56" N. LONG 079°25'36" W.)										
SEPT 18, 1984	–	–	62	–	–	–	–	–	–	–
JAN 23, 1985	510	–	65	–	–	–	–	–	–	–
APR 10, 1985	–	–	–	–	–	–	–	–	–	–
JUNE 13, 1985	680	–	93	–	–	–	–	–	–	–
SEPT 09, 1985	620	–	110	–	–	–	–	–	–	–
DEC 09, 1985	200	–	69	–	–	–	–	–	–	–
MAR 04, 1986	14	–	62	–	–	–	–	–	–	–
JUNE 03, 1986	–	–	100	–	–	–	–	–	–	–
SEPT 02, 1986	900	1,000	120	<1	<70	7.1	<30	560	14	<.001

Appendix 1.–Water-quality data for alkaline-addition study site, May 1983 through September 1989–Continued

Date	Time	Water table altitude (feet above sea level)	Streamflow/ discharge, instan-taneous (ft^3/s)	Specific conduc-tance (µS/cm)	pH, field (units)	pH, lab (units)	Water temper-ature (°C)	Acidity total heated (mg/L as $CaCO_3$)	Acidity mineral (methyl orange) (mg/L as $CaCO_3$)	Calcium, dissolved (mg/L)	Magnesium, dissolved (mg/L)
410956079253611 Well C5 (LAT 41°09'56" N. LONG 079°25'36" W.)–Continued											
DEC 10, 1986	0945	--	--	13,100	2.2	2.0	11.0	10,000	4,000	300	380
APR 08, 1987	1140	1,327	--	9,200	2.2	2.4	13.0	6,600	1,200	230	280
JUNE 09, 1987	1400	1,326	--	7,550	2.5	2.5	13.5	5,800	910	250	310
410945079253111 Well 2 (LAT 41°09'45" N. LONG 079°25'31" W.)											
JUNE 08, 1983	1225	1,294	--	5,500	2.6	2.7	13.0	2,200	650	170	160
JULY 13, 1983	0915	1,294	--	5,500	2.9	3.0	12.0	2,000	390	260	110
SEPT 17, 1984	1630	--	--	1,030	4.5	4.6	13.0	460	--	48	26
JAN 22, 1985	0945	1,294	--	290	6.4	6.5	--	--	--	310	42
APR 08, 1985	1300	1,295	--	280	6.6	6.8	10.5	0	--	46	3.5
JUNE 12, 1985	1420	1,294	--	310	6.4	6.6	11.0	0	--	42	2.9
SEPT 10, 1985	1045	1,292	--	4,400	3.7	2.8	13.0	2,700	220	140	140
OCT 08, 1985	1300	1,290	--	2,450	3.0	3.2	13.0	1,000	68	100	74
DEC 10, 1985	1325	1,295	--	250	9.8	9.0	11.5	0	--	45	2.8
MAR 04, 1986	1300	1,295	--	1,900	3.3	3.4	11.0	880	62	77	48
JUNE 03, 1986	1310	1,293	--	2,570	3.2	3.2	11.0	1,300	66	110	78
SEPT 03, 1986	1350	1,293	--	3,510	2.9	2.9	12.5	1,600	180	130	110
DEC 10, 1986	1035	1,295	--	3,920	2.6	2.7	12.0	2,100	240	48	120
JAN 06, 1987	1340	--	--	5,100	2.4	2.4	12.5	2,700	900	120	150
APR 06, 1987	1230	1,295	--	3,850	2.5	2.7	11.0	1,800	250	82	79
JUNE 08, 1987	1330	1,294	--	2,950	2.8	2.8	13.0	1,600	180	94	89
410944079253111 Well 7 (LAT 41°09'44" N. LONG 079°25'31" W.)											
JUNE 08, 1983	1425	1,293	--	5,300	4.3	3.8	14.0	2,500	70	310	180
JULY 13, 1983	1040	1,291	--	5,000	4.0	3.7	14.0	3,600	22	270	80
DEC 13, 1983	1330	1,294	--	5,500	2.7	3.4	11.5	3,100	80	200	150
FEB 13, 1984	1510	--	--	4,000	2.4	2.7	13.0	3,800	1,100	--	--
JAN 22, 1985	1000	1,293	--	2,950	3.8	3.6	--	1,500	38	200	120
APR 08, 1985	1245	1,293	--	3,000	3.6	2.9	10.0	1,300	260	180	120
JUNE 12, 1985	1210	1,291	--	2,670	3.4	3.7	10.5	1,400	16	110	73
SEPT 10, 1985	1100	1,291	--	2,700	3.6	3.7	11.5	1,400	8	130	81
DEC 10, 1985	1330	1,294	--	2,800	3.7	3.8	10.0	1,200	14	180	110
MAR 04, 1986	1305	1,295	--	2,700	4.2	4.1	10.5	1,300	--	130	74
JUNE 03, 1986	1315	1,293	--	2,280	4.2	4.0	10.5	1,100	--	120	74
SEPT 03, 1986	1410	1,292	--	2,340	4.0	3.9	11.5	1,000	--	120	81
DEC 10, 1986	1025	1,295	--	2,350	4.0	3.9	10.5	1,000	8	35	81
APR 06, 1987	1220	1,295	--	2,300	3.7	3.9	10.5	980	6	110	75
MAY 06, 1987	1000	1,295	--	2,100	4.0	3.6	11.0	1,000	18	99	72
JUNE 08, 1987	1330	1,294	--	1,820	4.1	3.9	11.5	950	8	100	74
410946079253111 Well 13 (LAT 41°09'46" N. LONG 079°25'31" W.)											
JUNE 07, 1983	1650	1,327	--	750	3.4	3.6	--	250	100	48	16
JULY 12, 1983	1520	1,325	--	1,950	3.5	3.6	--	470	50	230	26
AUG 10, 1983	1435	--	--	1,750	3.5	3.5	--	>2,000	160	190	25
SEPT 12, 1983	1645	1,324	--	850	3.6	3.6	--	220	16	100	11
OCT 11, 1983	1200	1,322	--	540	4.0	3.9	--	300	--	65	7.3
DEC 13, 1983	0945	1,329	--	930	3.0	3.5	--	290	--	30	21
JAN 18, 1984	0840	1,323	--	1,850	3.6	4.0	--	490	--	260	44
FEB 13, 1984	1430	--	--	--	--	--	--	--	--	--	--
MAR 29, 1984	1000	--	--	1,100	3.0	3.3	--	400	78	32	24
APR 24, 1984	1200	--	--	--	2.8	3.1	8.5	670	110	44	37
MAY 23, 1984	1000	--	--	1,100	3.7	3.7	--	460	110	62	22
JUNE 19, 1984	0820	1,328	--	--	6.3	6.5	16.0	0	--	66	3.5
AUG 21, 1984	1215	1,326	--	795	2.6	3.5	16.0	260	98	28	18
SEPT 17, 1984	1600	1,324	--	2,150	3.4	3.6	15.0	630	64	350	36

Appendix 1.--Water-quality data for alkaline-addition study site, May 1983 through September 1989--Continued

Date	Sodium, dissolved (mg/L)	Potassium, dissolved (mg/L)	Alkalinity water lab (mg/L as $CaCO_3$)	Sulfate, dissolved (mg/L as SO_4)	Chloride, dissolved (mg/L)	Silica, dissolved (mg/L as SiO_2)	Solids, residue at 105 °C, dissolved (mg/L)	Nitrogen, nitrate total (mg/L as N)	Nitrogen, nitrite total (mg/L as N)	Nitrogen, ammonia total (mg/L as N)
410956079253611 Well C5 (LAT 41°09'56" N. LONG 079°25'36" W.)--Continued										
DEC 10, 1986	--	--	--	10,000	--	--	--	--	--	--
APR 08, 1987	--	--	--	7,400	--	--	--	--	--	--
JUNE 09, 1987	--	--	--	6,600	--	--	--	--	--	--
410945079253111 Well 2 (LAT 41°09'45" N. LONG 079°25'31" W.)										
JUNE 08, 1983	--	--	0	3,600	--	--	--	--	--	--
JULY 13, 1983	--	--	0	3,800	--	--	--	--	--	--
SEPT 17, 1984	--	--	16	560	--	--	--	--	--	--
JAN 22, 1985	--	--	46	140	--	--	--	--	--	--
APR 08, 1985	--	--	70	360	--	--	--	--	--	--
JUNE 12, 1985	--	--	64	420	--	--	--	--	--	--
SEPT 10, 1985	--	--	0	3,300	--	--	--	--	--	--
OCT 08, 1985	--	--	--	1,700	--	--	--	--	--	--
DEC 10, 1985	--	--	60	83	--	--	--	--	--	--
MAR 04, 1986	--	--	0	1,300	--	--	--	--	--	--
JUNE 03, 1986	--	--	0	2,000	--	--	--	--	--	--
SEPT 03, 1986	26	3.2	0	2,600	3	--	3,910	0.04	0.002	1.3
DEC 10, 1986	--	--	--	2,300	--	--	--	--	--	--
JAN 06, 1987	9.1	2.1	0	2,900	1	--	5,300	.04	<.004	1
APR 06, 1987	--	--	--	2,100	--	--	--	--	--	--
JUNE 08, 1987	--	--	--	1,700	--	--	--	--	--	--
410944079253111 Well 7 (LAT 41°09'44" N. LONG 079°25'31" W.)										
JUNE 08, 1983	--	--	0	4,200	--	--	--	--	--	--
JULY 13, 1983	--	--	0	3,400	--	--	--	--	--	--
DEC 13, 1983	--	--	0	4,000	--	--	--	--	--	--
FEB 13, 1984	--	--	0	4,100	--	--	--	--	--	--
JAN 22, 1985	--	--	0	2,500	--	--	--	--	--	--
APR 08, 1985	--	--	0	2,100	--	--	--	--	--	--
JUNE 12, 1985	--	--	0	1,800	--	--	--	--	--	--
SEPT 10, 1985	--	--	0	2,100	--	--	--	--	--	--
DEC 10, 1985	--	--	0	2,200	--	--	--	--	--	--
MAR 04, 1986	--	--	6	2,100	--	--	--	--	--	--
JUNE 03, 1986	--	--	2	1,800	--	--	--	--	--	--
SEPT 03, 1986	11	7.1	0	1,800	3	--	2,650	<.02	<.002	1.1
DEC 10, 1986	--	--	--	1,400	--	--	--	--	--	--
APR 06, 1987	--	--	--	1,300	--	--	--	--	--	--
MAY 06, 1987	--	--	--	1,600	--	60	--	--	--	--
JUNE 08, 1987	--	--	0	1,100	--	--	--	--	--	--
410946079253111 Well 13 (LAT 41°09'46" N. LONG 079°25'31" W.)										
JUNE 07, 1983	--	--	0	350	--	--	--	--	--	--
JULY 12, 1983	--	--	0	630	--	--	--	--	--	--
AUG 10, 1983	--	--	0	1,300	--	--	--	--	--	--
SEPT 12, 1983	--	--	0	310	--	--	--	--	--	--
OCT 11, 1983	--	--	0	220	--	--	--	--	--	--
DEC 13, 1983	--	--	0	460	--	--	--	--	--	--
JAN 18, 1984	--	--	1	1,800	--	--	--	--	--	--
FEB 13, 1984	--	--	--	--	--	--	--	--	--	--
MAR 29, 1984	--	--	0	830	--	--	--	--	--	--
APR 24, 1984	--	--	0	760	--	--	--	--	--	--
MAY 23, 1984	--	--	0	490	--	--	--	--	--	--
JUNE 19, 1984	--	--	52	310	--	--	--	--	--	--
AUG 21, 1984	--	--	0	360	--	--	--	--	--	--
SEPT 17, 1984	--	--	0	1,500	--	--	--	--	--	--

Appendix 1.–Water-quality data for alkaline-addition study site, May 1983 through September 1989–Continued

Date	Nitrogen, ammonia + organic total (mg/L as N)	Phosphorus total (mg/L as P)	Aluminum, dissolved (mg/L)	Arsenic, dissolved (µg/L)	Barium, dissolved (µg/L)	Boron, dissolved (µg/L)	Cadmium, dissolved (µg/L)	Chromium, dissolved (µg/L)	Copper, dissolved (µg/L)	Iron, dissolved (mg/L)
410956079253611 Well C5 (LAT 41°09'56" N. LONG 079°25'36" W.)–Continued										
DEC 10, 1986	–	–	380	–	–	–	–	–	–	44
APR 08, 1987	–	–	540	–	–	–	–	–	–	600
JUNE 09, 1987	–	–	480	–	–	–	–	–	–	1,400
410945079253111 Well 2 (LAT 41°09'45" N. LONG 079°25'31" W.)										
JUNE 08, 1983	–	–	120	–	–	–	–	–	–	650
JULY 13, 1983	–	–	170	–	–	–	–	–	–	780
SEPT 17, 1984	–	–	20	–	–	–	–	–	–	73
JAN 22, 1985	–	–	.36	–	–	–	–	–	–	8.9
APR 08, 1985	–	–	.09	–	–	–	–	–	–	.18
JUNE 12, 1985	–	–	.26	–	–	–	–	–	–	.26
SEPT 10, 1985	–	–	110	–	–	–	–	–	–	630
OCT 08, 1985	–	–	62	–	–	–	–	–	–	290
DEC 10, 1985	–	–	2.4	–	–	–	–	–	–	2
MAR 04, 1986	–	–	52	–	–	–	–	–	–	230
JUNE 03, 1986	–	–	81	–	–	–	–	–	–	320
SEPT 03, 1986	2.1	–	120	43	–	<200	22	<50	53	440
DEC 10, 1986	–	–	120	–	–	–	–	–	–	490
JAN 06, 1987	1.9	–	200	210	–	<250	1.4	<50	270	610
APR 06, 1987	–	–	95	–	–	–	–	–	–	370
JUNE 08, 1987	–	–	100	–	–	–	–	–	–	360
410944079253111 Well 7 (LAT 41°09'44" N. LONG 079°25'31" W.)										
JUNE 08, 1983	–	–	67	–	–	–	–	–	–	1,100
JULY 13, 1983	–	–	100	–	–	–	–	–	–	710
DEC 13, 1983	–	–	69	–	–	–	–	–	–	930
FEB 13, 1984	–	–	180	–	–	–	–	–	–	560
JAN 22, 1985	–	–	34	–	–	–	–	–	–	590
APR 08, 1985	–	–	30	–	–	–	–	–	–	520
JUNE 12, 1985	–	–	25	–	–	–	–	–	–	430
SEPT 10, 1985	–	–	25	–	–	–	–	–	–	590
DEC 10, 1985	–	–	37	–	–	–	–	–	–	510
MAR 04, 1986	–	–	27	–	–	–	–	–	–	540
JUNE 03, 1986	–	–	24	–	–	–	–	–	–	470
SEPT 03, 1986	1.8	–	28	9.4	–	<200	2.1	<50	<10	470
DEC 10, 1986	–	–	26	–	–	–	–	–	–	400
APR 06, 1987	–	–	29	–	–	–	–	–	–	400
MAY 06, 1987	–	0.02	28	–	–	–	–	–	–	400
JUNE 08, 1987	–	–	31	–	–	–	–	–	–	350
410946079253111 Well 13 (LAT 41°09'46" N. LONG 079°25'31" W.)										
JUNE 07, 1983	–	–	21	–	–	–	–	–	–	13
JULY 12, 1983	–	–	58	–	–	–	–	–	–	51
AUG 10, 1983	–	–	26	–	–	–	–	–	–	77
SEPT 12, 1983	–	–	7.8	–	–	–	–	–	–	2
OCT 11, 1983	–	–	4.1	–	–	–	–	–	–	2.4
DEC 13, 1983	–	–	35	–	–	–	–	–	–	3.8
JAN 18, 1984	–	–	68	–	–	–	–	–	–	4.2
FEB 13, 1984	–	–	53	–	–	–	–	–	–	1.9
MAR 29, 1984	–	–	42	–	–	–	–	–	–	6.8
APR 24, 1984	–	–	47	–	–	–	–	–	–	29
MAY 23, 1984	–	–	38	–	–	–	–	–	–	12
JUNE 19, 1984	–	–	.50	–	–	–	–	–	–	1.5
AUG 21, 1984	–	–	12	–	–	–	–	–	–	47
SEPT 17, 1984	–	–	39	–	–	–	–	–	–	51

Date	Iron, ferrous dissolved (mg/L)	Lead, dissolved (µg/L)	Manganese, dissolved (mg/L)	Mercury, dissolved (µg/L)	Molybdenum, dissolved (µg/L)	Nickel, dissolved (mg/L)	Selenium, dissolved (mg/L)	Strontium, dissolved (µg/L)	Zinc, dissolved (mg/L)	Cyanide total (mg/L)
410956079253611 Well C5 (LAT 41°09'56" N. LONG 079°25'36" W.)–Continued										
DEC 10, 1986	2.4	–	92	–	–	–	–	–	–	–
APR 08, 1987	1.4	–	64	–	–	–	–	–	–	–
JUNE 09, 1987	1,500	–	79	–	–	–	–	–	–	–
410945079253111 Well 2 (LAT 41°09'45" N. LONG 079°25'31" W.)										
JUNE 08, 1983	–	–	86	–	–	–	–	–	–	–
JULY 13, 1983	–	–	92	–	–	–	–	–	–	–
SEPT 17, 1984	–	–	7.1	–	–	–	–	–	–	–
JAN 22, 1985	–	–	1.2	–	–	–	–	–	–	–
APR 08, 1985	–	–	.34	–	–	–	–	–	–	–
JUNE 12, 1985	.88	–	.39	–	–	–	–	–	–	–
SEPT 10, 1985	660	–	91	–	–	–	–	–	–	–
OCT 08, 1985	290	–	42	–	–	–	–	–	–	–
DEC 10, 1985	.03	–	.15	–	–	–	–	–	–	–
MAR 04, 1986	1.7	–	28	–	–	–	–	–	–	–
JUNE 03, 1986	310	–	>40	–	–	–	–	–	–	–
SEPT 03, 1986	350	<50	67	<1	<70	2	<60	290	4.4	<0.001
DEC 10, 1986	460	–	76	–	–	–	–	–	–	–
JAN 06, 1987	–	<4	75	<1	<70	2.1	<60	350	6.1	<.001
APR 06, 1987	460	–	48	–	–	–	–	–	–	–
JUNE 08, 1987	380	–	50	–	–	–	–	–	–	–
410944079253111 Well 7 (LAT 41°09'44" N. LONG 079°25'31" W.)										
JUNE 08, 1983	–	–	91	–	–	–	–	–	–	–
JULY 13, 1983	–	–	72	–	–	–	–	–	–	–
DEC 13, 1983	–	–	87	–	–	–	–	–	–	–
FEB 13, 1984	–	–	120	–	–	–	–	–	–	–
JAN 22, 1985	–	–	52	–	–	–	–	–	–	–
APR 08, 1985	–	–	48	–	–	–	–	–	–	–
JUNE 12, 1985	500	–	40	–	–	–	–	–	–	–
SEPT 10, 1985	480	–	53	–	–	–	–	–	–	–
DEC 10, 1985	580	–	43	–	–	–	–	–	–	–
MAR 04, 1986	380	–	42	–	–	–	–	–	–	–
JUNE 03, 1986	250	–	460	–	–	–	–	–	–	–
SEPT 03, 1986	500	<50	44	<1	<70	1.7	<30	270	3.4	<.001
DEC 10, 1986	460	–	46	–	–	–	–	–	–	–
APR 06, 1987	460	–	39	–	–	–	–	–	–	–
MAY 06, 1987	320	–	40	–	–	–	–	–	–	–
JUNE 08, 1987	400	–	37	–	–	–	–	–	–	–
410946079253111 Well 13 (LAT 41°09'46" N. LONG 079°25'31" W.)										
JUNE 07, 1983	–	–	–	–	–	–	–	–	–	–
JULY 12, 1983	–	–	17	–	–	–	–	–	–	–
AUG 10, 1983	–	–	13	–	–	–	–	–	–	–
SEPT 12, 1983	–	–	4.8	–	–	–	–	–	–	–
OCT 11, 1983	–	–	2.8	–	–	–	–	–	–	–
DEC 13, 1983	–	–	10	–	–	–	–	–	–	–
JAN 18, 1984	.41	–	17	–	–	–	–	–	–	–
FEB 13, 1984	–	–	23	–	–	–	–	–	–	–
MAR 29, 1984	6.5	–	11	–	–	–	–	–	–	–
APR 24, 1984	21	–	18	–	–	–	–	–	–	–
MAY 23, 1984	5.5	–	7.7	–	–	–	–	–	–	–
JUNE 19, 1984	.36	–	1.5	–	–	–	–	–	–	–
AUG 21, 1984	–	–	8.9	–	–	–	–	–	–	–
SEPT 17, 1984	–	–	8	–	–	–	–	–	–	–

Appendix 1.–Water-quality data for alkaline-addition study site, May 1983 through September 1989–Continued

Date	Time	Water table altitude (feet above sea level)	Streamflow/ discharge, instan-taneous (ft^3/s)	Specific conduc-tance (µS/cm)	pH, field (units)	pH, lab (units)	Water temper-ature (°C)	Acidity total heated (mg/L as $CaCO_3$)	Acidity mineral (methyl orange) (mg/L as $CaCO_3$)	Calcium, dissolved (mg/L)	Magnesium, dissolved (mg/L)
410946079253111 Well 13 (LAT 41°09'46" N. LONG 079°25'31" W.)–Continued											
OCT 29, 1984	1500	1,322	--	2,300	3.6	3.6	15.5	510	28	440	40
NOV 20, 1984	0815	1,326	--	780	3.0	3.3	14.0	250	54	31	19
DEC 11, 1984	1040	1,325	--	2,000	2.9	3.2	12.5	480	110	130	>60
JAN 23, 1985	1050	1,325	--	1,720	2.9	3.2	10.0	400	130	250	30
FEB 12, 1985	1315	1,325	--	2,360	3.2	3.2	10.0	470	100	420	28
MAR 12, 1985	1500	1,327	--	780	3.8	3.6	8.0	160	12	80	13
APR 08, 1985	1320	1,328	--	580	3.4	4.0	8.0	120	--	47	17
MAY 15, 1985	1200	1,325	--	1,830	3.1	3.6	13.0	360	30	65	27
JUNE 12, 1985	1225	1,325	--	2,370	2.9	3.4	12.0	570	76	300	32
JULY 10, 1985	0845	1,324	--	2,500	2.8	3.2	13.5	530	86	59	37
AUG 08, 1985	0840	1,323	--	2,850	2.9	3.2	14.5	460	62	130	46
SEPT 10, 1985	1020	1,322	--	2,300	3.0	3.2	16.5	360	46	360	41
NOV 13, 1985	1130	1,329	--	3,800	3.6	1.9	14.0	6,500	6,300	86	19
DEC 10, 1985	1340	1,327	--	760	3.2	3.4	12.0	160	22	42	24
JAN 07, 1986	1145	1,325	--	900	3.3	3.4	10.0	200	26	72	23
FEB 04, 1986	1035	1,326	--	595	3.6	4.3	10.0	56	--	100	5
MAR 11, 1986	1040	1,327	--	1,100	11.0	11.0	7.0	--	--	160	.09
APR 02, 1986	0840	1,325	--	931	11.0	10.0	10.0	--	--	170	.05
MAY 07, 1986	1310	1,325	--	1,720	9.7	8.5	12.5	--	--	420	.69
JUNE 04, 1986	1210	1,323	--	2,420	8.4	8.1	13.0	--	--	660	10
JULY 08, 1986	1015	1,325	--	1,300	7.2	6.2	15.0	30	--	--	11
AUG 05, 1986	1255	1,325	--	1,890	6.4	5.9	15.0	0	--	360	28
OCT 08, 1986	1350	1,328	--	507	7.8	6.6	17.5	--	--	90	3.90
NOV 19, 1986	1340	1,327	--	660	6.5	6.4	12.0	--	--	100	6.20
DEC 09, 1986	1045	1,328	--	693	6.9	6.3	13.0	190	--	120	9.20
JAN 08, 1987	1010	1,326	--	615	6.5	6.0	11.0	--	--	110	7.10
FEB 02, 1987	1030	1,326	--	750	7.5	6.5	9.0	--	--	140	7.20
MAR 16, 1987	1240	1,326	--	625	11.0	11.0	8.5	--	--	100	.07
APR 06, 1987	1205	1,329	--	5,300	12.0	12.0	7.0	--	--	510	.13
MAY 06, 1987	1500	1,327	--	3,050	12.0	12.0	11.0	--	--	240	.03
JUNE 08, 1987	1800	1,325	--	1,400	12.0	12.0	14.5	--	--	160	1
JULY 07, 1987	1430	1,329	--	2,700	11.0	12.0	16.0	--	--	220	.02
410947079253711 Well 26 (LAT 41°09'47" N. LONG079°25'37" W.)											
MAY 15, 1985	1530	--	--	1,020	6.1	6.4	15.0	--	--	65	37
SEPT 10, 1985	1340	1,309	--	835	5.8	6.2	14.0	--	--	120	32
DEC 11, 1985	1220	--	--	615	5.8	6.2	10.5	--	--	78	25
MAR 04, 1986	1220	1,310	--	670	6.0	6.2	12.0	--	--	93	24
JUNE 03, 1986	0845	1,309	--	532	6.3	6.3	12.0	8	--	67	21
DEC 10, 1986	0850	1,309	--	601	6.5	5.9	11.0	98	--	72	24
APR 08, 1987	1000	1,311	--	540	5.5	5.8	12.5	8	--	63	22

Appendix 1.–Water-quality data for alkaline-addition study site, May 1983 through September 1989–Continued

Date	Sodium, dissolved (mg/L)	Potassium, dissolved (mg/L)	Alkalinity water lab (mg/L as $CaCO_3$)	Sulfate, dissolved (mg/L as SO_4)	Chloride, dissolved (mg/L)	Silica, dissolved (mg/L as SiO_2)	Solids, residue at 105 °C, dissolved (mg/L)	Nitrogen, nitrate total (mg/L as N)	Nitrogen, nitrite total (mg/L as N)	Nitrogen, ammonia total (mg/L as N)
410946079253111 Well 13 (LAT 41°09'46" N. LONG 079°25'31" W.)–Continued										
OCT 29, 1984	--	--	0	1,700	--	--	--	--	--	--
NOV 20, 1984	--	--	0	500	--	--	--	--	--	--
DEC 11, 1984	--	--	0	1,300	--	--	--	--	--	--
JAN 23, 1985	--	--	0	1,000	--	--	--	--	--	--
FEB 12, 1985	--	--	0	1,500	--	--	--	--	--	--
MAR 12, 1985	--	--	0	330	--	--	--	--	--	--
APR 08, 1985	--	--	2	250	--	--	--	--	--	--
MAY 15, 1985	--	--	0	1,200	--	--	--	--	--	--
JUNE 12, 1985	--	--	0	1,900	--	--	--	--	--	--
JULY 10, 1985	--	--	0	--	--	--	--	--	--	--
AUG 08, 1985	--	--	0	--	--	--	--	--	--	--
SEPT 10, 1985	--	--	0	1,400	--	--	--	--	--	--
NOV 13, 1985	--	--	0	6,600	--	--	--	--	--	--
DEC 10, 1985	--	--	0	260	--	--	--	--	--	--
JAN 07, 1986	--	--	0	560	--	--	--	--	--	--
FEB 04, 1986	--	--	6	280	--	--	--	--	--	--
MAR 11, 1986	--	--	180	220	--	--	--	--	--	--
APR 02, 1986	--	--	86	470	--	--	--	--	--	--
MAY 07, 1986	--	--	60	1,200	--	--	--	--	--	--
JUNE 04, 1986	--	--	26	1,800	--	--	--	--	--	--
JULY 08, 1986	5.2	11	34	1,000	9	--	1,400	<0.02	<0.002	0.60
AUG 05, 1986	4.6	12	82	1,200	9	--	1,720	<.04	<.004	.81
OCT 08, 1986	--	--	92	180	--	--	--	--	--	--
NOV 19, 1986	--	--	92	260	--	--	--	--	--	--
DEC 09, 1986	--	--	90	330	--	--	--	--	--	--
JAN 08, 1987	--	--	80	270	--	--	--	--	--	--
FEB 02, 1987	--	--	50	350	--	--	--	--	--	--
MAR 16, 1987	--	--	110	190	--	--	--	--	--	--
APR 06, 1987	--	--	1,100	560	--	--	--	--	--	--
MAY 06, 1987	--	--	750	45	--	3.4	--	--	--	--
JUNE 08, 1987	--	--	380	140	--	--	--	--	--	--
JULY 07, 1987	--	--	680	96	--	--	--	--	--	--
410947079253711 Well 26 (LAT 41°09'47" N. LONG 079°25'37" W.)										
MAY 15, 1985	--	--	220	440	--	--	--	--	--	--
SEPT 10, 1985	--	--	74	510	--	--	--	--	--	--
DEC 11, 1985	--	--	94	630	--	--	--	--	--	--
MAR 04, 1986	--	--	110	600	--	--	--	--	--	--
JUNE 03, 1986	--	--	54	230	--	--	--	--	--	--
DEC 10, 1986	--	--	72	580	--	--	--	--	--	--
APR 08, 1987	--	--	68	220	--	--	--	--	--	--

Appendix 1.–Water-quality data for alkaline-addition study site, May 1983 through September 1989–Continued

Date	Nitrogen, ammonia + organic total (mg/L as N)	Phosphorus total (mg/L as P)	Aluminum, dissolved (mg/L)	Arsenic, dissolved (µg/L)	Barium, dissolved (µg/L)	Boron, dissolved (µg/L)	Cadmium, dissolved (µg/L)	Chromium, dissolved (µg/L)	Copper, dissolved (µg/L)	Iron, dissolved (mg/L)
410946079253111 Well 13 (LAT 41°09'46" N. LONG 079°25'31" W.)–Continued										
OCT 29, 1984	–	–	61	–	–	–	–	–	–	8
NOV 20, 1984	–	–	26	–	–	–	–	–	–	3.7
DEC 11, 1984	–	–	30	–	–	–	–	–	–	26
JAN 23, 1985	–	–	35	–	–	–	–	–	–	18
FEB 12, 1985	–	–	30	–	–	–	–	–	–	58
MAR 12, 1985	–	–	9	–	–	–	–	–	–	.60
APR 08, 1985	–	–	12	–	–	–	–	–	–	.45
MAY 15, 1985	–	–	19	–	–	–	–	–	–	63
JUNE 12, 1985	–	–	23	–	–	–	–	–	–	110
JULY 10, 1985	–	–	27	–	–	–	–	–	–	97
AUG 08, 1985	–	–	41	–	–	–	–	–	–	20
SEPT 10, 1985	–	–	29	–	–	–	–	–	–	7
NOV 13, 1985	–	–	14	–	–	–	–	–	–	2.6
DEC 10, 1985	–	–	23	–	–	–	–	–	–	1.3
JAN 07, 1986	–	–	18	–	–	–	–	–	–	1.4
FEB 04, 1986	–	–	5.30	–	–	–	–	–	–	1.2
MAR 11, 1986	–	–	1.10	–	–	–	–	–	–	.09
APR 02, 1986	–	–	.26	–	–	–	–	–	–	<.01
MAY 07, 1986	–	–	.40	–	–	–	–	–	–	.26
JUNE 04, 1986	–	–	<.14	–	–	–	–	–	–	<.01
JULY 08, 1986	2.4	–	<.14	<1,000	–	–	<10	<50	<10	1.2
AUG 05, 1986	1.6	–	<.14	<10	–	<250	.35	<50	25	9.8
OCT 08, 1986	–	–	.32	–	–	–	–	–	–	3.8
NOV 19, 1986	–	–	<.14	–	–	–	–	–	–	.07
DEC 09, 1986	–	–	<.14	–	–	–	–	–	–	.15
JAN 08, 1987	–	–	<.14	–	–	–	–	–	–	.07
FEB 02, 1987	–	–	.57	–	–	–	–	–	–	.98
MAR 16, 1987	–	–	1.1	–	–	–	–	–	–	<.01
APR 06, 1987	–	–	.99	–	–	–	–	–	–	.56
MAY 06, 1987	–	0.07	1.1	–	–	–	–	–	–	.14
JUNE 08, 1987	–	–	8.6	–	–	–	–	–	–	.22
JULY 07, 1987	–	–	.66	–	–	–	–	–	–	.08
410947079253711 Well 26 (LAT 41°09'47" N. LONG 079°25'37" W.)										
MAY 15, 1985	–	–	<.04	–	–	–	–	–	–	1.2
SEPT 10, 1985	–	–	<.04	–	–	–	–	–	–	6.4
DEC 11, 1985	–	–	2.4	–	–	–	–	–	–	9.8
MAR 04, 1986	–	–	.62	–	–	–	–	–	–	6.8
JUNE 03, 1986	–	–	.17	–	–	–	–	–	–	6.2
DEC 10, 1986	–	–	<.14	–	–	–	–	–	–	7.3
APR 08, 1987	–	–	2.8	–	–	–	–	–	–	8.7

Date	Iron, ferrous dissolved (mg/L)	Lead, dissolved (µg/L)	Manganese, dissolved (mg/L)	Mercury, dissolved (µg/L)	Molybdenum, dissolved (µg/L)	Nickel, dissolved (mg/L)	Selenium, dissolved (mg/L)	Strontium, dissolved (µg/L)	Zinc, dissolved (mg/L)	Cyanide total (mg/L)
410946079253111 Well 13 (LAT 41°09'46" N. LONG 079°25'31" W.)--Continued										
OCT 29, 1984	8	–	18	–	–	–	–	–	–	–
NOV 20, 1984	.44	–	7.7	–	–	–	–	–	–	–
DEC 11, 1984	–	–	13	–	–	–	–	–	–	–
JAN 23, 1985	3.8	–	14	–	–	–	–	–	–	–
FEB 12, 1985	53	–	16	–	–	–	–	–	–	–
MAR 12, 1985	.15	–	5.2	–	–	–	–	–	–	–
APR 08, 1985	–	–	6.1	–	–	–	–	–	–	–
MAY 15, 1985	75	–	13	–	–	–	–	–	–	–
JUNE 12, 1985	2.5	–	17	–	–	–	–	–	–	–
JULY 10, 1985	12	–	21	–	–	–	–	–	–	–
AUG 08, 1985	–	–	23	–	–	–	–	–	–	–
SEPT 10, 1985	3.7	–	21	–	–	–	–	–	–	–
NOV 13, 1985	.12	–	7.3	–	–	–	–	–	–	–
DEC 10, 1985	.42	–	8.5	–	–	–	–	–	–	–
JAN 07, 1986	.75	–	9.1	–	–	–	–	–	–	–
FEB 04, 1986	.14	–	2	–	–	–	–	–	–	–
MAR 11, 1986	.02	–	.044	–	–	–	–	–	–	–
APR 02, 1986	.04	–	<.010	–	–	–	–	–	–	–
MAY 07, 1986	2	–	.082	–	–	–	–	–	–	–
JUNE 04, 1986	.08	–	.13	–	–	–	–	–	–	–
JULY 08, 1986	2.9	–	1.7	<1	<700	0.070	<1,000	420	0.016	0.001
AUG 05, 1986	3.5	<50	7.2	<1	<700	.039	<1,000	770	<.010	.001
OCT 08, 1986	.09	–	.59	–	–	–	–	–	–	–
NOV 19, 1986	.05	–	1.3	–	–	–	–	–	–	–
DEC 09, 1986	.03	–	.13	–	–	–	–	–	–	–
JAN 08, 1987	.04	–	.031	–	–	–	–	–	–	–
FEB 02, 1987	.06	–	.30	–	–	–	–	–	–	–
MAR 16, 1987	.05	–	<.010	–	–	–	–	–	–	–
APR 06, 1987	.03	–	.074	–	–	–	–	–	–	–
MAY 06, 1987	.49	–	.060	–	–	–	–	–	–	–
JUNE 08, 1987	.44	–	.35	–	–	–	–	–	–	–
JULY 07, 1987	.20	–	.010	–	–	–	–	–	–	–
410947079253711 Well 26 (LAT 41°09'47" N. LONG 079°25'37" W.)										
MAY 15, 1985	–	–	15	–	–	–	–	–	–	–
SEPT 10, 1985	.12	–	6.5	–	–	–	–	–	–	–
DEC 11, 1985	2.3	–	7	–	–	–	–	–	–	–
MAR 04, 1986	.49	–	4.3	–	–	–	–	–	–	–
JUNE 03, 1986	6	–	3.7	–	–	–	–	–	–	–
DEC 10, 1986	8.1	–	2.2	–	–	–	–	–	–	–
APR 08, 1987	8.4	–	3.1	–	–	–	–	–	–	–

Appendix 2.--Water-quality data for urban sewage sludge site, June 1986 through November 1989

[ft^3/s, cubic foot per second; µS/cm, microdiemen per centimeter at 25 degrees Celsius; mV, millivolt; °C, degree Celsius; mg/L, milligram per liter; µg/L, microgram per liter; <, less than; >, greater than; --, no data]

Date	Time	Water table altitude (ft above sea level)	Streamflow/ discharge, instan-taneous (ft^3/s)	Specific conduc-tance (µS/cm)	pH, field (units)	pH, lab (units)	Oxidation reduction potential (mV)	Water temper-ature (°C)	Oxygen, dissolved (mg/L)	Acidity total heated (mg/L as $CaCO_3$)	Acidity mineral (methyl orange) (mg/L as $CaCO_3$)	Calcium, dissolved (mg/L)
410909079294201 Drain 1 (LAT 41°09'09" N. LONG 079°29'42" W.)												
JUNE 12, 1986	0730	--	--	1,390	--	3.4	--	--	--	260	32	98
JUNE 18, 1986	1200	--	0.10	2,500	3.1	3.2	--	17.5	--	510	140	150
JULY 08, 1986	1500	--	.04	3,070	3.1	3.1	--	17.0	--	1,100	220	--
AUG 05, 1986	1400	--	.04	3,020	3.2	3.1	--	17.0	--	870	160	210
SEPT 08, 1986	1430	--	.03	3,100	3.1	3.1	--	15.5	--	900	170	190
OCT 09, 1986	1000	--	--	2,590	3.0	3.2	--	14.5	--	600	110	190
NOV 05, 1986	0005	--	.03	2,700	3.3	3.1	--	11.5	--	760	160	200
NOV 05, 1986	1030	--	.03	2,750	3.3	3.1	--	11.5	--	760	170	200
DEC 09, 1986	0005	--	--	2,610	3.2	3.1	--	10.0	--	470	120	220
DEC 09, 1986	1000	--	.09	2,270	3.5	3.2	--	8.5	--	550	92	140
JAN 07, 1987	1200	--	--	2,850	3.8	3.2	--	6.0	--	830	160	180
FEB 10, 1987	1630	--	.04	3,600	2.5	3.1	--	4.5	--	940	180	230
MAR 10, 1987	1015	--	.03	3,000	3.6	3.1	--	4.5	--	850	210	240
APR 14, 1987	1100	--	--	3,020	3.3	3.3	--	8.5	--	940	120	210
MAY 04, 1987	0005	--	.05	2,660	3.2	3.2	--	13.5	--	630	150	160
MAY 04, 1987	1445	--	.05	2,670	3.2	3.1	--	13.5	--	650	150	180
JUNE 03, 1987	1000	--	.04	2,450	3.2	3.2	--	16.0	--	570	140	150
JULY 09, 1987	1030	--	.04	2,400	3.2	3.1	--	18.0	--	500	150	150
AUG 12, 1987	0925	--	.02	2,800	3.0	3.0	--	17.0	--	670	210	190
SEPT 16, 1987	1100	--	.03	1,980	3.2	3.1	--	16.5	--	530	140	150
OCT 06, 1987	1330	--	.02	2,600	3.2	3.1	--	14.5	--	630	180	200
NOV 18, 1987	0005	--	.01	3,150	3.2	3.0	--	11.0	--	940	200	240
NOV 18, 1987	1015	--	.02	3,100	3.2	3.1	--	14.5	--	920	200	230
DEC 15, 1987	0800	--	.04	1,910	3.5	3.2	--	5.5	--	390	64	140
JAN 12, 1988	1330	--	.03	2,650	3.1	5.6	--	5.0	--	710	--	220
FEB 09, 1988	1015	--	--	--	--	--	--	--	--	--	--	--
MAR 15, 1988	1115	--	.03	2,350	3.4	3.2	--	7.0	--	740	140	170
APR 12, 1988	1200	--	.04	2,300	3.4	3.1	--	12.0	--	690	150	220
MAY 09, 1988	0005	--	.03	2,300	3.2	3.1	--	13.0	--	600	170	190
MAY 09, 1988	1505	--	.03	2,350	3.2	3.1	--	13.0	--	590	170	230
JUNE 07, 1988	1430	--	.02	2,470	3.2	3.0	--	17.0	--	720	180	230
JULY 12, 1988	1630	--	.01	2,810	3.1	3.0	--	21.0	--	810	290	280
AUG 08, 1988	1530	--	.00	2,860	3.0	3.0	--	20.0	--	750	270	--
SEPT 21, 1988	0005	--	.00	2,520	3.0	3.1	--	15.5	--	570	180	260
SEPT 21, 1988	0840	--	.00	2,480	3.0	3.1	--	15.5	--	540	180	260
OCT 18, 1988	0845	--	.01	1,440	3.5	3.4	--	12.0	--	220	42	200
NOV 16, 1988	1255	--	.01	2,150	3.2	3.3	--	10.5	--	490	100	280
DEC 20, 1988	1445	--	.01	2,030	3.5	3.2	--	5.0	--	540	88	250
JAN 09, 1989	0005	--	.01	2,310	3.5	3.6	--	3.0	--	620	100	240
JAN 09, 1989	1645	--	.01	2,240	3.5	3.3	--	3.0	--	630	110	250
FEB 14, 1989	1545	--	.02	2,150	3.4	3.2	--	3.0	--	620	110	220
MAR 13, 1989	1600	--	.03	2,300	3.3	3.1	--	8.0	--	860	210	270
APR 10, 1989	1500	--	.07	2,200	3.1	3.1	--	6.5	--	890	160	230
MAY 09, 1989	1625	--	.07	2,800	3.1	3.1	--	10.0	--	1,100	220	240
JUNE 15, 1989	0005	--	.10	1,930	3.2	3.1	--	14.0	--	600	130	160
JUNE 15, 1989	0815	--	.10	2,080	3.2	3.1	--	14.0	--	630	140	180
JULY 10, 1989	1545	--	.07	2,840	3.8	3.2	--	18.0	--	940	190	260
AUG 08, 1989	1545	--	.03	2,920	3.1	3.1	--	15.5	--	1,100	270	210
SEPT 11, 1989	1725	--	.01	2,800	2.9	3.0	--	17.0	--	1,200	320	280
OCT 16, 1989	0005	--	.01	2,930	3.1	3.1	--	15.0	--	1,000	310	270
OCT 16, 1989	1435	--	.01	2,840	3.1	3.1	--	15.0	--	1,000	300	280
NOV 07, 1989	1350	--	.01	2,770	3.2	3.1	--	12.0	--	1,100	300	350

Appendix 2.--Water-quality data for urban sewage sludge site, June 1986 through November 1989--Continued

Date	Magnesium, dissolved (mg/L)	Sodium, dissolved (mg/L)	Potassium, dissolved (mg/L)	Alkalinity water lab (mg/L as $CaCO_3$)	Sulfide total (mg/L as S)	Sulfate, dissolved (mg/L as SO_4)	Chloride, dissolved (mg/L)	Silica, dissolved (mg/L as SiO_2)	Solids, residue at 105 °C, dissolved (mg/L)	Nitrogen, nitrate total (mg/L as N)	Nitrogen, nitrite total (mg/L as N)
410909079294201 Drain 1 (LAT 41°09'09" N. LONG 079°29'42" W.)											
JUNE 12, 1986	71	15	3.4	--	--	770	5	--	1,400	<0.04	<0.004
JUNE 18, 1986	130	51	5.2	--	--	1,600	3	--	2,680	.16	<.004
JULY 08, 1986	220	41	5.8	0	--	2,200	4	--	3,550	<.02	<.002
AUG 05, 1986	160	31	6.2	0	--	2,100	5	--	3,460	.19	.006
SEPT 08, 1986	180	31	6.8	0	--	740	4	--	3,510	.13	.030
OCT 09, 1986	170	22	4.3	0	--	1,000	2	--	2,700	.39	.006
NOV 05, 1986	190	17	5.9	0	--	1,400	4	--	3,070	.06	.006
NOV 05, 1986	210	20	5.6	0	--	1,600	3	--	3,160	.06	.006
DEC 09, 1986	130	7.3	4.2	0	--	1,200	1.3	--	2,470	<.04	<.004
DEC 09, 1986	130	14	4.2	0	--	920	2	--	2,550	.18	.008
JAN 07, 1987	240	12	4.9	0	--	1,900	2	--	3,340	<.04	<.004
FEB 10, 1987	230	13	4.5	0	--	1,800	2	--	3,530	<.02	<.004
MAR 10, 1987	230	14	4.9	0	--	1,900	2	--	3,630	<.04	<.002
APR 14, 1987	200	10	5.8	0	--	1,900	2	65	138	.10	.030
MAY 04, 1987	180	6.2	5.9	0	--	1,400	3	51	2,790	.04	.010
MAY 04, 1987	180	5.9	5.7	0	--	1,300	2	52	2,710	.04	.010
JUNE 03, 1987	140	6.3	5.3	0	--	1,100	3	52	2,550	.04	.004
JULY 09, 1987	130	6.7	4.9	0	--	1,300	2	51	3,210	<.04	.010
AUG 12, 1987	170	10	5.6	0	--	1,400	4	57	3,010	<.04	<.004
SEPT 16, 1987	120	6.2	5.2	--	--	1,100	3	46	2,150	.08	<.004
OCT 06, 1987	160	9.3	5	--	--	1,800	3	54	2,990	<.04	<.004
NOV 18, 1987	210	26	5.8	--	--	2,100	4	62	3,560	<.04	<.004
NOV 18, 1987	200	25	5.9	--	--	2,100	4	62	3,670	<.04	<.004
DEC 15, 1987	110	4.9	3.6	--	--	1,100	3	33	2,020	.08	<.004
JAN 12, 1988	150	8.5	4.9	68	--	2,100	3	58	2,910	<.04	<.004
FEB 09, 1988	--	--	--	--	--	--	--	--	--	--	--
MAR 15, 1988	190	8.6	5.4	--	--	2,000	3	52	3,160	<.04	<.004
APR 12, 1988	170	6.6	5.4	--	--	1,600	3	59	3,340	<.04	<.004
MAY 09, 1988	160	6.7	5.4	--	--	1,600	2	50	3,310	<.04	<.004
MAY 09, 1988	190	5.2	5.2	--	--	1,700	2	54	3,310	<.04	<.004
JUNE 07, 1988	200	9.5	8.7	--	--	1,800	4	59	3,780	<.04	<.004
JULY 12, 1988	240	8.2	6.8	--	--	1,800	2	59	4,760	<.04	<.004
AUG 08, 1988	--	--	--	--	--	2,300	3	--	3,500	<.04	<.004
SEPT 21, 1988	190	14	7.5	--	--	1,900	3	45	3,490	.04	<.004
SEPT 21, 1988	200	14	7.5	--	--	2,000	2	43	3,260	.04	<.004
OCT 18, 1988	100	4.8	4.7	--	<0.20	1,100	2	19	1,900	.30	.004
NOV 16, 1988	190	14	5.3	--	.29	1,800	3	42	3,160	<.04	<.004
DEC 20, 1988	160	8	4.9	--	<.20	1,400	3	32	232	.14	<.004
JAN 09, 1989	180	7	5.1	--	<.20	2,100	2	44	3,120	<.04	<.004
JAN 09, 1989	180	7.2	5.2	--	<.20	2,000	2	43	3,990	<.04	<.004
FEB 14, 1989	170	5	4.7	--	<.20	1,800	3	40	2,920	.10	<.004
MAR 13, 1989	220	5	4.4	0	.72	2,400	2	55	3,760	<.04	<.004
APR 10, 1989	190	3.9	4.7	--	<.20	2,200	3	59	--	<.04	<.004
MAY 09, 1989	230	4.9	4.4	--	<.20	2,900	2	67	5,580	<.04	<.004
JUNE 15, 1989	140	4	4.9	--	<.20	1,700	3	50	3,290	<.04	.004
JUNE 15, 1989	150	3.9	5.1	--	<.20	1,500	2	45	3,630	<.04	.004
JULY 10, 1989	250	6.4	5.1	--	<.20	2,400	3	54	3,950	<.04	<.004
AUG 08, 1989	200	5.6	5	--	<.20	2,800	4	67	6,060	<.04	<.004
SEPT 11, 1989	270	8.2	5	--	<.20	2,800	3	70	5,870	<.04	<.004
OCT 16, 1989	220	4.7	5.2	0	<.20	2,800	3	60	4,390	<.04	<.004
OCT 16, 1989	240	4.7	5	0	<.20	2,700	4	61	4,410	<.04	<.004
NOV 07, 1989	300	5.5	5.2	0	<.20	2,700	3	59	4,060	<.04	<.004

Appendix 2.–Water-quality data for urban sewage sludge site, June 1986 through November 1989–Continued

Date	Nitrogen, ammonia total (mg/L as N)	Nitrogen, ammonia + organic total (mg/L as N)	Phosphorus total (mg/L as P)	Aluminum, dissolved (mg/L)	Arsenic, dissolved (µg/L)	Barium, dissolved (µg/L)	Boron, dissolved (µg/L)	Cadmium, dissolved (µg/L)	Chromium, dissolved (µg/L)	Copper, dissolved (µg/L)	Iron, dissolved (mg/L)
410909079294201 Drain 1 (LAT 41°09'09" N. LONG 079°29'42" W.)											
JUNE 12, 1986	0.24	0.82	–	19	11	<500	–	4.6	<50	23	37
JUNE 18, 1986	.42	1.1	–	32	27	<500	–	3.8	<50	<10	58
JULY 08, 1986	1.1	1.3	–	69	<1,000	<500	–	<10	–	37	110
AUG 05, 1986	2	2.8	–	66	25	<500	<250	6.6	<50	50	140
SEPT 08, 1986	1.5	2.8	–	72	37	–	<250	7.8	<50	67	170
OCT 09, 1986	1.5	2.1	–	53	21	–	<250	7.4	69	51	99
NOV 05, 1986	.82	2.1	–	62	40	–	<250	8	100	88	140
NOV 05, 1986	.82	2.1	–	73	28	<10	<250	8.5	<50	<10	140
DEC 09, 1986	.50	1	–	.80	<4	<10	<250	<.20	150	35	170
DEC 09, 1986	.49	1.3	–	45	23	19	<250	8.3	140	58	80
JAN 07, 1987	.66	1.8	–	68	74	–	<250	9.5	<50	16	120
FEB 10, 1987	.88	1.8	–	87	46	<10	<250	7.5	<50	12	170
MAR 10, 1987	.69	1.9	–	79	<40	<10	<250	6	<50	<10	190
APR 14, 1987	.60	1.2	0.03	89	70	<10	<250	9.3	61	<10	130
MAY 04, 1987	.46	1.3	<.02	57	52	<10	<250	7.4	300	460	83
MAY 04, 1987	.46	1.3	<.02	68	50	<10	<250	6.4	<50	<10	92
JUNE 03, 1987	.60	1.4	.05	45	<4	<10	<250	8.7	<50	<10	87
JULY 09, 1987	.46	1.5	.04	41	46	14	<250	6.3	470	470	82
AUG 12, 1987	.85	1.5	.03	48	40	15	<250	4.9	81	<10	110
SEPT 16, 1987	.44	1.1	.03	33	28	<10	<250	4.2	<500	<10	54
OCT 06, 1987	.66	1.6	.02	61	24	<10	<250	6.2	<50	<10	98
NOV 18, 1987	.77	1.6	.02	71	26	<10	<250	6	<50	31	200
NOV 18, 1987	.66	1.5	.03	69	29	<10	<250	4.7	<50	31	190
DEC 15, 1987	.36	.96	.04	29	28	<10	<250	4	<50	15	76
JAN 12, 1988	2	2.4	.02	57	29	<10	<250	7.5	<50	<10	130
FEB 09, 1988	–	–	–	–	–	–	–	–	–	–	–
MAR 15, 1988	.66	1.1	.02	50	44	520	<250	5	<50	<10	98
APR 12, 1988	.48	.91	.02	66	45	25	<250	12	<50	53	110
MAY 09, 1988	.66	1.3	.02	64	23	<10	<250	5.6	<50	18	90
MAY 09, 1988	.66	.92	.02	69	23	<10	<250	5.2	<50	–	120
JUNE 07, 1988	.75	1.6	.02	75	<20	13	<250	6.2	<50	33	94
JULY 12, 1988	1.30	1.7	.02	73	<20	<10	<250	5.4	110	<10	160
AUG 08, 1988	.91	1.1	.03	–	–	–	–	–	–	–	–
SEPT 21, 1988	.96	1.9	.04	49	<4	<10	<250	10	<50	43	86
SEPT 21, 1988	1	2	.04	52	<4	<10	<250	4.5	<50	<10	92
OCT 18, 1988	.44	1.2	.04	27	<4	<10	<250	4.2	<50	34	28
NOV 16, 1988	.72	.76	.03	68	<4	<10	<250	7	23	73	56
DEC 20, 1988	.72	.75	.04	55	<4	<10	<250	6.1	<50	35	72
JAN 09, 1989	.81	.79	.02	74	<4	<10	<250	5.9	<50	62	99
JAN 09, 1989	.81	.81	.02	78	<4	<10	<250	7	<50	69	100
FEB 14, 1989	.84	.89	.03	77	<4	<10	<250	5	<50	38	130
MAR 13, 1989	.66	.88	.02	88	5.9	<10	<250	.27	<50	57	150
APR 10, 1989	.55	.71	<.02	100	<4	<10	<250	8.2	<50	77	98
MAY 09, 1989	.59	.87	.05	120	<4	<10	<250	10	<50	85	140
JUNE 15, 1989	.51	.89	.05	110	<4	<10	<250	7	<50	63	66
JUNE 15, 1989	.51	.92	.05	71	<4	<10	<250	7.3	<50	58	66
JULY 10, 1989	.65	.91	.03	120	<4	<10	<250	13	<50	120	93
AUG 08, 1989	.70	1.1	.05	110	<4	<10	<250	5.6	<50	100	150
SEPT 11, 1989	1	1.3	.03	120	<4	<10	<250	10	<50	97	200
OCT 16, 1989	.80	<1	.04	100	<4	<10	<250	8.9	<50	140	190
OCT 16, 1989	.83	<1	.04	100	<4	<10	<250	11	<50	130	190
NOV 07, 1989	.79	1.1	.03	120	<4	<10	<250	8.1	<25	72	270

Appendix 2.--Water-quality data for urban sewage sludge site, June 1986 through November 1989--Continued

Date	Iron, ferrous dissolved (mg/L)	Lead, dissolved (µg/L)	Manganese, dissolved (mg/L)	Mercury, dissolved µg/l)	Molybdenum, dissolved (µg/L)	Nickel, dissolved (mg/L)	Selenium, dissolved (µg/L)	Strontium, dissolved (µL)	Zinc, dissolved (mg/L)	Cyanide total (mg/L)
410909079294201 Drain 1 (LAT 41°09'09" N. LONG 079°29'42" W.)										
JUNE 12, 1986	--	<50	24	<1	<700	0.76	<1,000	320	1.1	--
JUNE 18, 1986	--	<50	44	<1	<700	1.2	<1,000	540	2	--
JULY 08, 1986	--	--	68	<1	<700	1.9	<1,000	730	--	--
AUG 05, 1986	--	<50	56	<1	<700	1.9	<1,000	760	3.5	0.001
SEPT 08, 1986	160	<50	57	<1	<70	2.1	<30	740	3.6	<.001
OCT 09, 1986	75	140	54	<1	<70	1.7	<150	610	3.1	<.001
NOV 05, 1986	93	7.9	62	<1	<70	1.8	<15	600	3.3	<.001
NOV 05, 1986	96	8.9	62	<1	<70	1.1	<30	620	3.1	<.001
DEC 09, 1986	160	<4	37	<1	<70	<.02	<60	570	.3	<.001
DEC 09, 1986	63	<4	40	<1	<70	1.3	<30	450	2.3	<.001
JAN 07, 1987	99	14	56	<1	<70	1.3	<30	730	3	<.001
FEB 10, 1987	130	6.5	72	<1	<70	1.2	<30	800	3.7	<.001
MAR 10, 1987	130	8	72	<1	<70	1.3	<60	820	3.5	<.001
APR 14, 1987	110	9	47	<1	<70	1.6	<60	630	2.8	<.001
MAY 04, 1987	48	14	49	<1	<70	1.1	<60	660	2.7	<.001
MAY 04, 1987	47	9	57	<1	<70	.87	<60	680	3.3	<.001
JUNE 03, 1987	51	8.6	46	<1	<70	1.1	<6	530	2.4	<.001
JULY 09, 1987	46	8.1	43	<1	<70	1	<60	650	2.2	<.001
AUG 12, 1987	55	11	52	<1	<70	1.3	<30	820	2.4	<.001
SEPT 16, 1987	18	<20	35	<1	<70	1.2	<30	490	1.9	<.001
OCT 06, 1987	42	10	52	<1	<70	1.2	<30	670	3	<.001
NOV 18, 1987	140	8.8	59	<1	<70	1.7	<30	820	3.1	<.001
NOV 18, 1987	130	12	59	<1	<70	2.1	<30	820	3	<.001
DEC 15, 1987	64	<10	36	<1	<70	.90	<30	530	1.6	<.001
JAN 12, 1988	100	9	49	<1	<300	.24	<30	780	2.6	<.001
FEB 09, 1988	--	--	--	--	--	--	--	--	--	--
MAR 15, 1988	83	<10	63	<1	<70	1.7	<30	890	2.3	<.001
APR 12, 1988	67	9.9	54	<1	<70	1.6	<30	850	2.8	<.001
MAY 09, 1988	32	<10	66	<1	<70	1.5	<30	800	2.8	<.001
MAY 09, 1988	28	<10	65	<1	<70	1.4	<30	770	2.6	<.001
JUNE 07, 1988	37	<20	62	<1	<70	1.9	<30	700	3.3	<.001
JULY 12, 1988	34	<20	77	<1	<300	1.8	<30	960	3.5	<.001
AUG 08, 1988	3.5	--	--	--	--	--	--	--	--	--
SEPT 21, 1988	27	<40	57	<1	<70	1.4	<30	670	2.5	<.001
SEPT 21, 1988	30	9.7	61	<1	<70	1.5	<30	680	2.6	<.001
OCT 18, 1988	14	<40	28	<1	<70	.58	<30	460	1.2	<.001
NOV 16, 1988	14	<20	56	<1	<70	2	<30	760	3.5	<.001
DEC 20, 1988	34	7.6	49	<1	<70	1.1	<30	670	2.3	<.001
JAN 09, 1989	69	6.2	54	<1	<70	1.5	<30	690	2.9	<.001
JAN 09, 1989	70	7.2	52	<1	<70	1.5	<30	690	3	<.001
FEB 14, 1989	110	<40	54	<1	<70	1.4	<30	740	2.4	<.001
MAR 13, 1989	100	<4	56	<1	<70	1.5	<30	830	3.2	<.001
APR 10, 1989	58	5.2	61	<1	<70	2.4	<30	720	4.8	<.001
MAY 09, 1989	95	<10	70	<1	<70	2	<30	830	4	<.001
JUNE 15, 1989	26	6.5	46	<1	<70	1.4	<30	530	2.8	<.001
JUNE 15, 1989	23	4.9	48	<1	<70	1.4	<30	530	2.9	<.001
JULY 10, 1989	49	<20	84	<1	<70	2.5	<30	750	4.9	<.001
AUG 08, 1989	69	<10	83	<1	<70	2.5	<30	840	5.7	<.001
SEPT 11, 1989	97	<10	84	<1	<70	2.5	<30	970	4.6	<.001
OCT 16, 1989	94	<10	73	<1	<70	2.5	<30	780	4.6	<.001
OCT 16, 1989	93	10	76	<1	<70	2.2	<30	780	4.4	<.001
NOV 07, 1989	120	7.3	94	<1	<70	2	<30	870	4	<.001

Date	Time	Water table altitude (ft above sea level)	Streamflow/ discharge, instantaneous (ft^3/s)	Specific conductance ($\mu S/cm$)	pH, field (units)	pH, lab (units)	Oxidation reduction potential (mV)	Water temperature (°C)	Oxygen, dissolved (mg/L)	Acidity total heated (mg/L as $CaCO_3$)	Acidity mineral (methyl orange) (mg/L as $CaCO_3$)	Calcium, dissolved (mg/L)
410918079294101 Drain 2 (LAT 41°09'18" N. LONG 079°29'41" W.)												
JUNE 12, 1986	0820	–	–	2,370	–	3.4	–	–	–	360	48	200
JUNE 18, 1986	1600	–	0.04	3,250	3.3	3.4	–	14.0	–	850	82	270
JULY 08, 1986	1630	–	.03	3,450	3.3	3.4	–	15.5	–	830	110	160
AUG 05, 1986	1500	–	.04	3,490	3.2	3.2	–	16.0	–	800	110	300
SEPT 08, 1986	1600	–	.03	3,250	3.5	3.3	–	15.0	–	680	110	320
OCT 09, 1986	0900	–	.07	2,840	3.2	3.4	–	14.0	–	580	68	270
NOV 04, 1986	1200	–	.04	3,100	2.8	3.3	–	11.0	–	640	92	310
DEC 09, 1986	1200	–	.19	2,990	3.5	3.3	–	9.5	–	560	130	220
JAN 07, 1987	1130	–	.07	3,000	3.7	3.3	–	7.5	–	510	100	250
FEB 12, 1987	0945	–	.04	3,400	3.6	3.3	–	7.0	–	610	80	310
MAR 10, 1987	1500	–	.03	3,100	3.5	3.4	–	5.0	–	620	82	310
APR 14, 1987	0005	–	.04	2,970	3.4	3.3	–	11.0	–	430	76	220
APR 14, 1987	1200	–	.04	2,920	3.4	3.4	–	11.0	–	440	60	260
MAY 04, 1987	1600	–	.04	2,910	3.4	3.4	–	10.5	–	400	62	260
JUNE 03, 1987	1100	–	.03	3,130	3.4	3.4	–	15.0	–	490	72	270
JULY 09, 1987	1200	–	.05	3,270	3.3	3.3	–	16.5	–	600	88	270
AUG 12, 1987	0945	–	.02	3,250	3.3	3.2	–	16.5	–	630	96	280
SEPT 16, 1987	1200	–	.03	3,000	3.4	3.3	–	15.5	–	510	88	270
OCT 06, 1987	1400	–	.04	2,950	3.4	3.3	–	12.5	–	540	82	280
NOV 18, 1987	1100	–	.02	2,900	3.4	3.3	–	10.5	–	390	68	300
DEC 15, 1987	1035	–	.03	2,550	3.6	3.4	–	7.5	–	300	30	240
JAN 12, 1988	1410	–	.02	3,000	3.2	3.4	–	7.0	–	480	64	270
FEB 09, 1988	1100	–	.04	2,150	–	3.4	–	4.5	–	440	52	260
MAR 15, 1988	1230	–	.03	2,650	3.1	3.2	–	6.0	–	510	84	220
APR 11, 1988	1420	–	.04	2,200	3.6	3.3	–	10.5	–	490	72	230
MAY 09, 1988	0005	–	.03	2,650	3.4	3.3	–	13.0	–	470	66	360
MAY 09, 1988	1525	–	.03	2,700	3.4	3.3	–	13.0	–	470	74	350
JUNE 08, 1988	0750	–	.02	2,270	3.6	3.6	–	14.0	–	260	16	310
JULY 12, 1988	0845	–	.02	2,950	3.4	3.2	–	16.5	–	730	120	360
AUG 08, 1988	1630	–	.01	3,010	3.2	3.2	–	18.0	–	650	120	370
SEPT 21, 1988	1730	–	.01	2,760	3.2	3.3	–	15.0	–	550	120	360
OCT 18, 1988	0940	–	.01	2,480	3.4	3.2	–	12.0	–	400	76	330
NOV 17, 1988	0005	–	.01	2,550	3.3	3.3	–	10.5	–	470	92	320
NOV 17, 1988	1500	–	.01	2,580	3.4	3.3	–	7.0	–	470	88	320
DEC 20, 1988	1545	–	.01	2,540	3.4	3.2	–	7.0	–	610	92	320
JAN 10, 1989	1420	–	.01	2,210	3.7	3.4	–	5.0	–	390	62	310
FEB 15, 1989	1345	–	.02	1,930	3.7	3.8	–	5.0	–	220	14	290
MAR 14, 1989	1330	–	.02	2,100	3.6	3.4	–	8.0	–	440	66	300
APR 12, 1989	1615	–	.10	2,350	3.3	3.2	–	8.0	–	650	90	320
MAY 10, 1989	1420	–	.07	1,660	3.3	3.6	–	10.0	–	320	16	180
JUNE 15, 1989	1000	–	.13	2,380	3.1	3.2	–	14.0	–	520	140	330
JULY 11, 1989	0005	–	.04	3,210	3.2	3.0	–	15.5	–	740	210	310
JULY 11, 1989	1400	–	.04	3,200	3.2	3.0	–	15.5	–	750	210	320
AUG 09, 1989	1310	–	.02	3,020	3.0	3.1	–	15.0	–	730	160	380
SEPT 13, 1989	0815	–	.02	3,300	3.2	3.1	–	15.0	–	820	170	390
OCT 16, 1989	1615	–	.01	3,090	3.2	3.2	–	13.5	–	750	150	360
NOV 07, 1989	1430	–	.01	2,910	3.4	3.2	–	11.0	–	710	170	450
410924079293701 Drain 3 (LAT 41°09'24" N. LONG 079°29'37" W.)												
JUNE 12, 1986	0900	–	–	2,600	–	6.2	–	–	–	24	–	2,700
JUNE 18, 1986	1000	–	.05	3,160	6.1	6.2	–	13.5	–	4	–	360
JULY 08, 1986	1700	–	.04	3,220	6.1	6.3	–	14.5	–	22	–	410
AUG 05, 1986	0005	–	.05	3,170	6.3	6.1	–	15.0	–	0	–	380
AUG 05, 1986	1800	–	.05	3,510	6.3	6.2	–	15.0	–	14	–	380
SEPT 09, 1986	1720	–	.04	2,900	6.5	6.4	–	12.5	–	0	–	380

Date	Magnesium, dissolved (mg/L)	Sodium, dissolved (mg/L)	Potassium, dissolved (mg/L)	Alkalinity water lab (mg/L as $CaCO_3$)	Sulfide total (mg/L as S)	Sulfate, dissolved (mg/L as SO_4)	Chloride, dissolved (mg/L)	Silica, dissolved (mg/L as SiO_2)	Solids, residue at 105 °C, dissolved (mg/L)	Nitrogen, nitrate total (mg/L as N)	Nitrogen, nitrite total (mg/L as N)
410918079294101 Drain 2 (LAT 41°09'18" N. LONG 079°29'41" W.)											
JUNE 12, 1986	160	8	3.8	--	--	1,400	2	--	2,530	0.10	<0.004
JUNE 18, 1986	210	14	5.3	--	--	2,400	3	--	3,860	.06	<.004
JULY 08, 1986	--	17	6.9	0	--	2,700	4	--	3,980	<.02	<.002
AUG 05, 1986	210	13	4.8	0	--	2,600	4	--	4,440	<.04	.004
SEPT 08, 1986	280	15	7	0	--	2,300	4	--	3,870	<.02	<.004
OCT 09, 1986	240	6.8	5.5	0	--	1,900	3	--	3,390	.30	.024
NOV 04, 1986	290	9.2	5.8	0	--	1,900	5	--	3,740	<.02	<.004
DEC 09, 1986	200	5.2	4.4	0	--	1,600	2.2	--	3,750	.50	.008
JAN 07, 1987	230	5	5.7	0	--	2,000	3	--	3,370	.16	<.004
FEB 12, 1987	290	6.3	6.2	0	--	2,100	3	--	3,450	<.02	<.004
MAR 10, 1987	290	6.2	5.9	0	--	1,800	2	--	3,520	.06	<.002
APR 14, 1987	100	13	8	0	--	1,600	2	38	3,380	.32	.004
APR 14, 1987	240	6.1	8.1	0	--	1,600	2	38	274	.31	.006
MAY 04, 1987	240	3.9	7.1	0	--	1,500	2	35	3,040	.16	<.004
JUNE 03, 1987	240	6.9	5.8	0	--	1,900	3	40	3,560	.08	<.004
JULY 09, 1987	250	6	5.7	0	--	2,200	3	45	4,700	<.04	<.004
AUG 12, 1987	250	5.8	6.2	0	--	2,200	4	41	4,050	<.04	<.004
SEPT 16, 1987	240	6.6	5.7	--	--	2,100	4	42	3,620	<.04	<.004
OCT 06, 1987	240	7.6	5.8	--	--	2,000	3	38	3,350	<.04	<.004
NOV 18, 1987	250	7.2	6.4	--	--	1,500	3	34	3,460	.10	<.004
DEC 15, 1987	190	6.4	5	--	--	1,100	3	29	2,750	<.04	<.004
JAN 12, 1988	210	8	5.4	--	--	2,200	4	44	3,200	<.04	<.004
FEB 09, 1988	210	6	5.4	--	--	1,800	2	40	3,240	.08	<.004
MAR 15, 1988	230	7.8	5.4	--	--	2,100	4	47	3,240	.04	<.004
APR 11, 1988	190	4.8	5.7	--	--	1,700	2	49	3,380	.12	<.004
MAY 09, 1988	270	5	5.9	--	--	1,800	2	43	3,490	.04	<.004
MAY 09, 1988	270	4.8	5.7	--	--	2,000	2	42	4,330	<.04	<.004
JUNE 08, 1988	240	6.1	6.9	--	--	2,000	4	30	3,670	.06	<.004
JULY 12, 1988	290	5.3	5.8	--	--	2,000	2	45	5,280	<.04	<.004
AUG 08, 1988	300	6.2	6.2	--	--	2,600	4	39	4,940	<.04	<.004
SEPT 21, 1988	300	6	6	--	<0.20	2,600	2	32	3,930	<.04	<.004
OCT 18, 1988	240	5	5.4	--	<.20	2,100	2	26	2,880	.06	<.004
NOV 17, 1988	250	6.6	5.3	--	.53	2,100	3	34	3,500	<.04	<.004
NOV 17, 1988	250	5.9	5.4	--	.56	1,900	3	34	3,500	<.04	<.004
DEC 20, 1988	250	6.5	5.7	--	.56	2,100	3	31	3,660	.08	<.004
JAN 10, 1989	240	5.8	5.7	--	.24	2,100	2	33	3,060	<.04	<.004
FEB 15, 1989	180	5	4.8	--	.48	1,500	3	27	2,310	.10	<.004
MAR 14, 1989	240	5.1	5.4	--	.24	2,200	3	37	2,900	.04	<.004
APR 12, 1989	280	4.6	5.3	--	<.20	2,300	3	46	--	.40	<.004
MAY 10, 1989	140	3.2	4.6	--	<.20	1,600	2	34	5,160	.11	<.004
JUNE 15, 1989	230	5.2	5.1	--	<.20	1,900	4	37	4,550	.04	<.004
JULY 11, 1989	260	6.4	5.4	--	<.20	2,600	3	42	4,400	.04	<.004
JULY 11, 1989	270	6.8	5.4	--	<.20	2,600	3	42	4,420	.04	<.004
AUG 09, 1989	300	9.1	5.2	--	<.20	2,700	4	40	5,870	<.04	<.004
SEPT 13, 1989	320	7.1	4.8	--	<.20	2,900	3	47	14,600	<.04	<.004
OCT 16, 1989	290	7.1	8.9	0	.32	2,800	3	45	4,140	.10	.006
NOV 07, 1989	370	7.6	5.6	0	.24	2,800	4	41	3,990	<.04	<.004
410924079293701 Drain 3 (LAT 41°09'24" N. LONG 079°29'37" W.)											
JUNE 12, 1986	210	7.6	5.6	84	--	1,000	2	--	2,850	.08	<.004
JUNE 18, 1986	250	10	7.8	140	--	2,300	3	--	3,560	<.04	<.004
JULY 08, 1986	340	12	8.8	150	--	2,500	4	--	3,600	<.02	<.002
AUG 05, 1986	240	9.5	7.6	150	--	2,400	4	--	3,910	<.02	.004
AUG 05, 1986	250	10	8.1	150	--	2,100	4	--	3,830	<.04	.004
SEPT 09, 1986	320	11	8.9	160	--	900	4	--	3,520	.054	.006

Appendix 2.--Water-quality data for urban sewage sludge site, June 1986 through November 1989--Continued

Date	Nitrogen, ammonia total (mg/L as N)	Nitrogen, ammonia + organic total (mg/L as N)	Phosphorus total (mg/L as P)	Aluminum, dissolved (mg/L)	Arsenic, dissolved (µg/L)	Barium, dissolved (µg/L)	Boron, dissolved (µg/L)	Cadmium, dissolved (µg/L)	Chromium, dissolved (µg/L)	Copper, dissolved (µg/L)	Iron, dissolved (mg/L)
410918079294101 Drain 2 (LAT 41°09'18" N. LONG 079°29'41" W.)											
JUNE 12, 1986	0.22	0.88	–	300	24	<500	–	3.7	<50	48	43
JUNE 18, 1986	.39	1	–	46	35	<500	–	4.2	<50	42	81
JULY 08, 1986	.51	1.9	–	55	<1,000	<500	–	<10	<50	39	97
AUG 05, 1986	.78	1.5	–	49	37	<500	<250	5.4	<10	52	100
SEPT 08, 1986	.78	1.5	–	56	22	–	<200	5.2	<50	65	130
OCT 09, 1986	.50	1.3	–	49	64	–	<250	6	95	70	66
NOV 04, 1986	.63	1.5	–	51	43	–	<250	5.8	130	86	130
DEC 09, 1986	.39	1	–	49	32	21	<250	<6.6	170	110	26
JAN 07, 1987	.44	1.2	–	63	44	–	<250	5.6	<50	24	43
FEB 12, 1987	.60	1.4	–	58	37	<10	<250	5.6	<50	14	78
MAR 10, 1987	.54	1.5	–	58	28	<10	<250	5	<50	<10	92
APR 14, 1987	.35	.40	<0.02	41	32	20	<250	5.1	4,100	880	23
APR 14, 1987	.34	.60	.04	39	28	13	<250	5	<50	<10	27
MAY 04, 1987	.38	1.2	<.02	44	41	<10	<250	4.6	<50	<10	41
JUNE 03, 1987	.48	1.2	.05	43	<4	<10	<250	7.4	<50	<10	63
JULY 09, 1987	.69	1.5	.03	54	25	<10	<250	4.8	<50	440	100
AUG 12, 1987	.63	1.2	.02	46	28	<10	<250	4.3	<50	620	110
SEPT 16, 1987	.53	1.1	.03	47	38	<10	<250	4.2	<50	<10	110
OCT 06, 1987	.51	1.1	<.02	45	32	<10	<250	4.4	<50	<10	100
NOV 18, 1987	.36	1.2	<.02	34	20	<10	<250	2.8	<50	49	77
DEC 15, 1987	.40	.84	.02	22	17	12	<250	2.6	<50	<10	44
JAN 12, 1988	.66	1.1	.02	28	20	<20	<250	3.8	<50	16	78
FEB 09, 1988	.49	.98	<.02	42	35	<10	<250	3.8	<50	17	52
MAR 15, 1988	.51	.96	.03	37	28	<10	<250	4.1	<50	34	80
APR 11, 1988	.39	.99	.02	43	33	26	<250	5.1	<50	55	59
MAY 09, 1988	.60	1	.02	47	14	<10	<250	3.6	<50	48	75
MAY 09, 1988	.66	1.1	.02	51	14	<10	<250	4.1	<50	<10	80
JUNE 08, 1988	.38	1	.02	35	<20	<10	<250	3.5	<50	48	17
JULY 12, 1988	.93	1.3	.02	70	<20	<10	<250	<.20	110	<10	180
AUG 08, 1988	.99	1.6	.03	61	<20	16	<250	4.3	<50	87	160
SEPT 21, 1988	.84	1.4	.03	56	<4	<10	<250	3.7	<50	10	130
OCT 18, 1988	.66	1.2	.02	29	<4	<10	<250	3.2	<50	54	68
NOV 17, 1988	.66	.66	.02	41	<4	<10	<250	3.8	<50	62	78
NOV 17, 1988	.66	.69	.02	40	<4	<10	<250	3.9	<50	55	76
DEC 20, 1988	.72	.78	.04	36	<4	<10	<250	3.5	<50	49	94
JAN 10, 1989	.75	.63	<.02	46	<5	<10	<250	3.6	<50	66	68
FEB 15, 1989	.42	.71	.02	24	<4	<10	<250	3.5	<50	51	23
MAR 14, 1989	.51	.53	.04	48	4.4	<10	<250	.26	<50	57	21
APR 12, 1989	.34	.63	.02	96	<4	<10	<250	10	<50	150	26
MAY 10, 1989	.25	.36	.10	31	<4	<10	<250	4.60	<50	55	7.6
JUNE 15, 1989	.38	.52	.03	59	<4	<10	<250	5.2	<50	99	60
JULY 11, 1989	.55	.69	.04	73	<4	<10	<250	6.6	<50	100	76
JULY 11, 1989	.56	.74	.04	78	<4	<10	<250	6.5	<50	120	79
AUG 09, 1989	.56	.94	.05	66	<5	<10	<250	6	<50	100	100
SEPT 13, 1989	.82	.95	.03	82	<4	<10	<250	5.2	<50	72	59
OCT 16, 1989	.74	1.4	.08	68	<4	<10	<250	6.2	<50	120	140
NOV 07, 1989	.68	<1	.03	72	<4	<10	<250	4	<50	89	170
410924079293701 Drain 3 (LAT 41°09'24" N. LONG 079°29'37" W.)											
JUNE 12, 1986	.28	.82	–	1	<4	<500	–	.55	<50	29	12
JUNE 18, 1986	.36	1	–	.46	<4	<500	–	.28	<50	25	16
JULY 08, 1986	.24	2	–	.39	<1,000	<500	–	<10	<50	44	17
AUG 05, 1986	.63	1.2	–	.36	<4	<500	<250	.56	<50	37	17
AUG 05, 1986	.63	1.3	–	<.14	<4	<500	<250	.68	<50	40	18
SEPT 09, 1986	.69	1.5	–	.37	<4	15	<200	.83	<50	34	22

Appendix 2.–Water-quality data for urban sewage sludge site, June 1986 through November 1989–Continued

Date	Iron, ferrous dissolved (mg/L)	Lead, dissolved (µg/L)	Manganese, dissolved (mg/L)	Mercury, dissolved µg/l)	Molybdenum, dissolved (µg/L)	Nickel, dissolved (mg/L)	Selenium, dissolved (µg/L)	Strontium, dissolved (µL)	Zinc, dissolved (mg/L)	Cyanide total (mg/L)
410918079294101 Drain 2 (LAT 41°09'18" N. LONG 079°29'41" W.)										
JUNE 12, 1986	–	<50	31	<1	<700	0.90	<1,000	500	0.83	–
JUNE 18, 1986	–	<50	42	<1	<700	1.9	<1,000	650	1.7	–
JULY 08, 1986	–	–	–	<1	<700	1.4	<1,000	730	–	–
AUG 05, 1986	–	<50	41	<1	<700	1.3	<1,000	790	1.9	<0.001
SEPT 08, 1986	85	<50	51	<1	<70	1.7	<30	770	2.1	<.001
OCT 09, 1986	46	190	48	<1	<70	1.5	<60	690	2.2	<.001
NOV 04, 1986	97	7.4	50	2.4	<70	1.4	<30	710	2.3	<.001
DEC 09, 1986	8.4	<4	42	<1	<70	1.5	<30	610	2.5	<.001
JAN 07, 1987	18	8.5	49	<1	<70	.90	<30	730	2.1	<.001
FEB 12, 1987	64	5.7	51	<1	<70	.43	<30	790	1.8	<.001
MAR 10, 1987	75	8.2	50	<1	<70	.75	<60	770	1.8	<.001
APR 14, 1987	10	5.3	35	<1	<70	2.2	<60	610	2.3	<.001
APR 14, 1987	10	5.7	38	<1	<70	1.1	<60	700	1.6	<.001
MAY 04, 1987	26	6.2	40	<1	<70	.86	<60	2,200	1.8	<.001
JUNE 03, 1987	46	10	40	<1	<70	1.1	<30	760	1.7	<.001
JULY 09, 1987	84	8.7	47	<1	<70	.27	<30	780	1.6	<.001
AUG 12, 1987	100	9	41	<1	<70	.23	<30	800	1.1	<.001
SEPT 16, 1987	82	<20	42	<1	<70	1	<30	720	1.6	<.001
OCT 06, 1987	74	11	40	<1	<70	.92	<30	730	1.6	<.001
NOV 18, 1987	51	10	40	<1	<70	1.2	<30	830	1.2	<.001
DEC 15, 1987	42	<10	27	<1	<70	.71	<30	650	.97	<.001
JAN 12, 1988	65	<10	36	<1	<70	.98	<30	710	1.8	<.001
FEB 09, 1988	34	<10	37	<1	<70	1	<30	640	1.8	<.001
MAR 15, 1988	49	<4	42	<1	<70	1.1	<30	660	1.8	<.001
APR 11, 1988	35	5.9	38	<1	<70	1.1	<30	720	1.8	<.001
MAY 09, 1988	53	<4	48	2.9	<300	1.1	<30	860	2	<.001
MAY 09, 1988	52	<10	48	<1	<300	1.1	<30	900	1.9	<.001
JUNE 08, 1988	.66	5.4	39	<1	<70	.84	<30	740	1.5	<.001
JULY 12, 1988	100	<20	54	<1	<300	1.2	<30	830	2	<.001
AUG 08, 1988	98	7.4	53	<1	<300	1.2	<30	880	2	<.001
SEPT 21, 1988	84	5.8	50	<1	<70	1	<30	860	1.7	<.001
OCT 18, 1988	48	<40	35	<1	<70	.79	<30	770	1.3	<.001
NOV 17, 1988	42	20	41	1.3	<70	.95	<30	840	1.7	<.001
NOV 17, 1988	42	4.9	41	1.2	<70	.88	<30	840	1.6	<.001
DEC 20, 1988	62	<4	40	<1	<70	.89	<30	780	1.5	<.001
JAN 10, 1989	40	<4	41	<1	<70	.99	<30	740	1.7	<.001
FEB 15, 1989	12	<40	29	<1	<70	.71	<30	590	1.3	<.001
MAR 14, 1989	9.5	<20	37	<1	<70	.92	<30	740	1.7	<.001
APR 12, 1989	2.8	<4	56	<1	<70	2.2	<30	680	3.8	<.001
MAY 10, 1989	3.4	5.2	24	<1	<70	.74	<30	510	1.3	<.001
JUNE 15, 1989	10	<4	42	<1	<70	1	<30	670	1.7	<.001
JULY 11, 1989	14	4.8	47	<1	<70	1.4	<30	820	2.3	<.001
JULY 11, 1989	14	<4	49	<1	<70	1.4	<30	850	2.4	<.001
AUG 09, 1989	46	<10	54	<1	<70	1.3	<30	860	2.5	<.001
SEPT 13, 1989	87	<10	58	<1	<70	1.3	<30	950	2.2	<.001
OCT 16, 1989	100	<10	46	<1	<70	1.2	<30	720	2	<.001
NOV 07, 1989	73	7.1	61	<1	<70	1.1	<30	800	1.9	<.001
410924079293701 Drain 3 (LAT 41°09'24" N. LONG 079°29'37" W.)										
JUNE 12, 1986	–	<50	17	<1	<700	.41	<1,000	710	.25	–
JUNE 18, 1986	–	<50	21	<1	<700	.46	<1,000	900	.40	–
JULY 08, 1986	–	80	25	<1	<700	.51	<1,000	810	.43	–
AUG 05, 1986	–	<50	23	<1	<700	.51	<1,000	940	.42	<.001
AUG 05, 1986	–	<50	25	<1	<700	.52	<1,000	900	.44	<.001
SEPT 09, 1986	–	70	25	<1	<70	.55	<30	850	.46	<.001

Appendix 2.--Water-quality data for urban sewage sludge site, June 1986 through November 1989--Continued

Date	Time	Water table altitude (ft above sea level)	Streamflow/ discharge, instan-taneous (ft^3/s)	Specific conduc-tance (µS/cm)	pH, field (units)	pH, lab (units)	Oxidation reduction potential (mV)	Water temper-ature (°C)	Oxygen, dissolved (mg/L)	Acidity total heated (mg/L as $CaCO_3$)	Acidity mineral (methyl orange) (mg/L as $CaCO_3$)	Calcium, dissolved (mg/L)
410924079293701 Drain 3 (LAT 41°09'24" N. LONG 079°29'37" W.)--Continued												
OCT 08, 1986	1700	--	0.06	2,850	6.4	6.2	--	12.5	--	0	--	360
NOV 04, 1986	1530	--	.04	3,000	5.9	6.4	--	11.5	--	0	--	380
DEC 09, 1986	1430	--	.08	3,090	6.2	5.9	--	11.5	--	38	--	310
JAN 07, 1987	1015	--	.06	3,200	6.2	5.9	--	9.0	--	14	--	320
FEB 12, 1987	0005	--	.04	3,300	6.0	6.2	--	9.0	--	0	--	380
FEB 12, 1987	0830	--	.04	3,350	6.0	6.2	--	9.0	--	10	--	380
MAR 10, 1987	1700	--	.04	3,100	6.2	6.3	--	9.0	--	10	--	390
APR 14, 1987	1300	--	.05	3,200	6.1	6.5	--	12.5	--	0	--	440
MAY 04, 1987	1730	--	.06	3,160	6.0	6.3	--	12.0	--	0	--	370
JUNE 03, 1987	1330	--	.04	3,300	6.2	6.1	--	15.0	--	0	--	380
JULY 09, 1987	1230	--	.04	3,260	6.2	6.4	--	15.5	--	0	--	360
AUG 12, 1987	1010	--	.02	3,350	6.2	7.2	--	15.5	--	--	--	330
SEPT 16, 1987	1230	--	.02	3,200	6.4	6.7	--	14.5	--	0	--	350
OCT 06, 1987	0000	--	.02	3,000	6.5	6.7	--	12.5	--	0	--	350
OCT 06, 1987	0005	--	.02	3,000	6.5	6.7	--	12.5	--	0	--	340
OCT 06, 1987	1500	--	.02	3,000	6.5	6.7	--	12.5	--	0	--	340
NOV 18, 1987	1230	--	.02	3,000	6.3	6.7	--	11.0	--	0	--	360
DEC 15, 1987	1200	--	.01	2,750	6.2	6.8	--	8.5	--	0	--	300
JAN 12, 1988	1420	--	.01	2,250	4.7	4.9	--	5.0	--	80	--	220
FEB 09, 1988	1110	--	.04	2,250	6.4	6.4	--	6.5	--	0	--	270
MAR 15, 1988	1400	--	.04	2,600	6.4	6.3	--	6.5	--	0	--	260
APR 11, 1988	0005	--	--	2,400	6.5	6.4	--	12.0	--	0	--	360
APR 11, 1988	1445	--	.05	2,340	6.5	6.4	--	12.0	--	0	--	360
MAY 09, 1988	1700	--	.03	2,750	6.3	6.8	--	15.0	--	0	--	350
JUNE 08, 1988	0900	--	.03	2,640	6.3	6.5	--	13.5	--	0	--	420
JULY 12, 1988	1010	--	.01	2,700	7.1	7.1	--	16.5	--	0	--	400
AUG 08, 1988	0005	--	.01	2,900	6.5	7.6	--	18.0	--	0	--	440
AUG 08, 1988	1640	--	.01	2,800	6.5	7.4	--	18.0	--	0	--	460
SEPT 20, 1988	1700	--	.00	2,600	7.3	7.1	--	16.0	--	0	--	390
OCT 18, 1988	1040	--	.00	689	6.4	6.4	--	12.5	--	8	--	94
NOV 17, 1988	0845	--	.00	883	5.5	5.3	--	6.0	--	46	--	84
MAR 14, 1989	1430	--	.03	2,050	6.6	6.8	--	11.0	--	0	--	320
APR 11, 1989	1640	--	.07	2,300	5.5	5.8	--	10.0	--	78	--	340
MAY 10, 1989	0005	--	.05	2,150	4.8	5.0	--	11.0	--	130	--	280
MAY 10, 1989	1435	--	.05	2,100	4.8	5.0	--	11.0	--	92	--	300
JUNE 15, 1989	1030	--	.04	1,710	3.9	4.1	--	13.5	--	170	--	240
JULY 11, 1989	1410	--	.10	3,020	4.8	4.6	--	15.5	--	190	--	400
AUG 09, 1989	1350	--	.07	2,780	5.1	5.8	--	14.0	--	74	--	450
SEPT 13, 1989	0005	--	.07	3,050	6.0	6.7	--	13.5	--	0	--	400
SEPT 13, 1989	0900	--	.07	3,050	6.0	6.7	--	13.5	--	0	--	380
OCT 16, 1989	1630	--	.04	2,820	6.4	6.9	--	13.5	--	0	--	430
NOV 07, 1989	0005	--	.03	2,570	6.3	6.9	--	12.0	--	0	--	550
NOV 07, 1989	1530	--	.03	2,600	6.3	6.9	--	12.0	--	0	--	560
410927079293101 Drain 4 (LAT 41°09'27" N. LONG 079°29'31" W.)												
JUNE 12, 1986	1200	--	--	1,590	--	3.9	--	--	--	280	--	140
JUNE 18, 1986	1730	--	.00	2,480	3.8	3.8	--	13.0	--	420	6	210
JULY 08, 1986	1800	--	--	2,920	3.8	3.8	--	14.0	--	710	14	280
AUG 05, 1986	1600	--	.00	3,170	4.2	4.1	--	15.5	--	520	--	280
SEPT 09, 1986	1730	--	.00	2,800	4.4	4.2	--	18.0	--	410	--	290
OCT 08, 1986	1600	--	.00	2,300	4.3	4.4	--	13.5	--	310	--	210
NOV 04, 1986	1500	--	.00	2,600	4.5	4.3	--	12.0	--	430	--	270
DEC 19, 1986	1500	--	--	1,730	4.4	4.2	--	9.0	--	350	--	140
JAN 07, 1987	0005	--	.01	2,590	4.2	3.9	--	7.0	--	540	270	200
JAN 07, 1987	0930	--	.00	2,600	4.0	3.9	--	7.0	--	520	8	210

Appendix 2.--Water-quality data for urban sewage sludge site, June 1986 through November 1989--Continued

Date	Magnesium, dissolved (mg/L)	Sodium, dissolved (mg/L)	Potassium, dissolved (mg/L)	Alkalinity water lab (mg/L as $CaCO_3$)	Sulfide total (mg/L as S)	Sulfate, dissolved (mg/L as SO_4)	Chloride, dissolved (mg/L)	Silica, dissolved (mg/L as SiO_2)	Solids, residue at 105 °C, dissolved (mg/L)	Nitrogen, nitrate total (mg/L as N)	Nitrogen, nitrite total (mg/L as N)
410924079293701 Drain 3 (LAT 41°09'24" N. LONG 079°29'37" W.)--Continued											
OCT 08, 1986	310	11	9.6	150	–	1,800	3	–	3,490	0.10	0.006
NOV 04, 1986	340	8.6	8.2	140	–	2,000	3	–	3,340	.06	<.004
DEC 09, 1986	320	8.9	6.5	110	–	2,000	2	–	3,450	.04	<.004
JAN 07, 1987	310	6.9	7.8	98	–	2,200	5	–	3,600	<.04	<.004
FEB 12, 1987	350	8.6	7	130	–	2,200	6	–	3,560	<.02	<.004
FEB 12, 1987	350	8.6	8.8	140	–	2,400	3	–	3,470	<.02	<.004
MAR 10, 1987	350	9.2	8.8	170	–	1,700	2	–	3,400	<.04	<.002
APR 14, 1987	320	6.6	9.2	160	–	2,000	3	15	200	<.04	<.004
MAY 04, 1987	330	7.5	9.4	160	–	2,100	2	11	3,170	<.04	.004
JUNE 03, 1987	340	9.2	7.6	180	–	2,200	3	13	3,800	<.04	<.004
JULY 09, 1987	320	8.4	8.6	190	–	2,100	4	11	4,400	<.04	.006
AUG 12, 1987	290	94	9.4	370	–	2,500	5	8.8	3,560	<.04	.004
SEPT 16, 1987	320	8	8.1	200	–	2,200	4	12	3,500	.04	<.004
OCT 06, 1987	310	11	8.1	190	–	2,100	3	14	3,220	.11	.012
OCT 06, 1987	300	15	8.2	190	–	2,100	3	12	3,260	.13	.010
OCT 06, 1987	300	15	8.2	190	–	2,100	3	12	3,260	.13	.010
NOV 18, 1987	310	11	8.6	210	–	2,000	3	10	3,500	<.04	<.004
DEC 15, 1987	290	20	7.1	160	–	1,500	3	16	2,860	.12	.004
JAN 12, 1988	170	4.9	6	6	–	1,600	3	44	2,550	.68	.016
FEB 09, 1988	230	9	8.2	140	–	2,200	2	17	3,120	.18	.004
MAR 15, 1988	250	8.4	8.1	140	–	2,100	3	14	6,690	.08	<.004
APR 11, 1988	320	8.4	9.1	160	–	2,100	3	14	3,200	.04	<.004
APR 11, 1988	280	12	9	160	–	2,100	3	14	3,500	.04	<.004
MAY 09, 1988	310	9	9.1	170	–	2,400	3	11	3,620	<.04	<.004
JUNE 08, 1988	340	9.9	8.6	200	–	1,900	4	12	4,140	<.04	<.004
JULY 12, 1988	320	13	8.2	190	–	1,900	3	11	3,930	<.04	<.004
AUG 08, 1988	360	11	8.5	210	–	2,400	4	8.6	3,980	<.04	<.004
AUG 08, 1988	370	11	8.8	220	–	2,500	4	8.2	4,140	<.04	<.004
SEPT 20, 1988	290	9.5	8.4	200	<0.20	2,300	2	8.4	3,600	<.04	<.004
OCT 18, 1988	54	2.8	4.1	34	<.20	410	2	<4.3	936	.14	<.004
NOV 17, 1988	53	46	5	16	<.20	560	3	18	816	.10	<.004
MAR 14, 1989	280	6.9	7.6	–	.72	2,000	3	16	2,860	.14	<.004
APR 11, 1989	290	6.4	8	34	<.20	2,400	3	20	–	.09	<.004
MAY 10, 1989	250	6.7	6.5	14	<.20	2,100	2	21	3,860	.15	<.004
MAY 10, 1989	240	7.2	6.7	–	<.20	1,800	2	21	3,840	.13	<.004
JUNE 15, 1989	180	4	4.9	4	<.20	1,300	3	27	2,460	.04	<.004
JULY 11, 1989	350	7.6	7.2	16	.31	2,500	3	18	3,950	.04	<.004
AUG 09, 1989	410	8.9	7.3	30	<.20	2,700	4	12	4,300	<.04	<.004
SEPT 13, 1989	360	10	7.6	110	<.20	2,600	4	11	3,680	<.04	.004
SEPT 13, 1989	340	10	7.8	100	<.20	2,500	4	11	3,570	<.04	.004
OCT 16, 1989	350	10	7.8	140	<.20	2,500	3	13	3,740	<.04	<.004
NOV 07, 1989	450	9.6	8.7	160	.32	2,100	3	9.5	3,440	<.04	<.004
NOV 07, 1989	460	11	8.5	160	.32	2,300	3	9.9	3,320	<.04	<.004
410927079293101 Drain 4 (LAT 41°09'27" N. LONG 079°29'31" W.)											
JUNE 12, 1986	100	3.4	3	0	–	1,200	2	–	1,610	.12	<.004
JUNE 18, 1986	170	5.4	4.4	–	–	1,800	3	–	2,900	<.04	<.004
JULY 08, 1986	260	7.4	6.6	0	–	2,200	4	–	3,490	<.02	<.002
AUG 05, 1986	200	6.5	5.5	6	–	2,100	3	–	3,480	<.04	.012
SEPT 09, 1986	260	9.8	6.6	8	–	760	3	–	3,440	<.04	<.004
OCT 08, 1986	200	5.5	5.8	12	–	1,500	2	–	2,700	.13	.048
NOV 04, 1986	270	5.6	5.9	12	–	1,700	4	–	2,950	.06	.020
DEC 19, 1986	140	2.7	2.1	6	–	860	1.3	–	1,820	.10	.022
JAN 07, 1987	200	3.7	4.8	0	–	1,700	2	–	2,850	<.04	.016
JAN 07, 1987	210	4.3	4.4	0	–	1,600	3	–	3,060	<.04	<.018

Appendix 2.--Water-quality data for urban sewage sludge site, June 1986 through November 1989--Continued

Date	Nitrogen, ammonia total (mg/L as N)	Nitrogen, ammonia + organic total (mg/L as N)	Phos-phorus total (mg/L as P)	Aluminum, dissolved (mg/L)	Arsenic, dissolved (µg/L)	Barium, dissolved (µg/L)	Boron, dissolved (µg/L)	Cadmium, dissolved (µg/L)	Chromium, dissolved (µg/L)	Copper, dissolved (µg/L)	Iron, dissolved (mg/L)
410924079293701 Drain 3 (LAT 41°09'24" N. LONG 079°29'37" W.)--Continued											
OCT 08, 1986	0.55	1.2	–	0.40	<4	–	<250	0.95	110	27	21
NOV 04, 1986	.50	1.5	–	.79	<40	–	<250	.82	130	45	22
DEC 09, 1986	.34	1	–	1.4	<10	15	<250	<.20	120	36	21
JAN 07, 1987	.35	1.2	–	1	<4	–	<250	.70	<50	<10	24
FEB 12, 1987	.38	.50	–	.86	<4	<10	<250	.50	<50	<10	20
FEB 12, 1987	.34	1.3	–	.92	<4	<10	<250	.57	<50	<10	20
MAR 10, 1987	.28	1.1	–	.40	<4	<10	<250	.59	<50	<10	20
APR 14, 1987	.27	.96	0.04	<.14	<4	<10	<250	.44	<50	<10	15
MAY 04, 1987	.26	1.2	<.02	1.3	<4	<10	<250	.58	<50	<10	19
JUNE 03, 1987	.30	.73	.05	.42	<4	11	<250	.37	<50	600	16
JULY 09, 1987	.35	1.1	.04	.39	<4	<10	<250	.44	<50	<10	18
AUG 12, 1987	.39	.88	.02	.14	<10	<10	<250	.42	<50	620	.46
SEPT 16, 1987	.38	.83	.03	.38	<4	24	<250	<1	<50	<10	–
OCT 06, 1987	.28	.82	<.02	.14	<4	<10	<250	<.50	<50	800	16
OCT 06, 1987	.30	.82	<.02	1.8	<4	21	<250	<.20	<50	<10	16
OCT 06, 1987	.30	.82	<.02	1.8	<4	21	<250	<.20	<50	<10	16
NOV 18, 1987	.27	.80	.02	2.4	<4	<10	<250	<.50	<50	<10	21
DEC 15, 1987	.35	.86	.02	<.14	<4	<10	<250	1.1	<50	<10	12
JAN 12, 1988	.40	.72	.02	4	<4	19	<250	2.8	<50	33	3.9
FEB 09, 1988	.32	.58	<.02	.17	<4	17	<250	.70	<50	<10	14
MAR 15, 1988	.38	.44	<.02	1.7	<4	<10	<250	.85	<50	<10	20
APR 11, 1988	.26	.65	.02	.50	<4	<10	<250	2.4	<50	<10	20
APR 11, 1988	.26	.70	.02	.78	<4	<10	<250	2.5	<50	34	20
MAY 09, 1988	.36	.67	.02	.33	<20	<10	<250	.75	<50	<10	27
JUNE 08, 1988	.35	1.1	.02	.68	<4	<10	<250	.43	<50	<10	27
JULY 12, 1988	.44	1	.02	.56	<20	<10	<250	.42	110	<10	8.7
AUG 08, 1988	.37	1.2	.04	.35	<20	<10	<250	.46	<50	<10	13
AUG 08, 1988	.31	1.2	.03	.36	<20	<10	<250	.45	<50	18	16
SEPT 20, 1988	.99	1.2	.04	.24	<4	<10	<250	.35	<50	<10	12
OCT 18, 1988	.02	.52	.04	<.14	<4	<10	<250	<.20	<50	13	.14
NOV 17, 1988	.11	.56	.03	2.2	<4	29	<250	5.3	<50	19	1.3
MAR 14, 1989	.34	.45	.02	.17	<4	<10	<250	1.7	<50	35	18
APR 11, 1989	.32	.74	<.02	5.5	<4	10	<250	1.8	<50	55	19
MAY 10, 1989	.32	.69	.04	6.7	<4	<10	<250	2	<50	46	13
MAY 10, 1989	.32	.64	.04	6.3	<4	<10	<250	2	<50	68	14
JUNE 15, 1989	.25	.30	.02	20	<4	<10	<250	2.2	<50	66	2.8
JULY 11, 1989	.45	.69	.03	22	<4	<10	<250	2.7	<50	48	10
AUG 09, 1989	.33	.94	.04	2.2	<4	12	<250	1.2	<50	35	13
SEPT 13, 1989	.35	.54	.03	.74	<4	<10	<250	.71	<50	34	13
SEPT 13, 1989	.43	.59	.04	.68	<4	<10	<250	.78	<50	32	13
OCT 16, 1989	.28	<1	.03	.45	<4	<10	<250	.44	<50	40	13
NOV 07, 1989	.29	<1	.03	.34	<4	<10	<250	.38	<50	34	21
NOV 07, 1989	.29	<1	.03	.38	<4	<10	<250	.35	<50	33	21
410927079293101 Drain 4 (LAT 41°09'27" N. LONG 079°29'31" W.)											
JUNE 12, 1986	.52	.92	–	18	12	<500	–	2.7	<50	24	29
JUNE 18, 1986	1.3	1.9	–	35	19	<500	–	3.1	<50	<10	54
JULY 08, 1986	1.4	1.6	–	38	<1,000	<500	–	<10	<50	43	69
AUG 05, 1986	1.3	2.2	–	35	24	<500	<250	3.2	<50	25	64
SEPT 09, 1986	1.4	2.8	–	34	21	–	<250	3.6	<50	30	76
OCT 08, 1986	1	6.1	–	37	<20	–	<250	4.6	76	42	54
NOV 04, 1986	1.2	2.6	–	36	28	–	<250	3.6	120	52	75
DEC 19, 1986	.45	.90	–	36	13	17	<250	3.5	55	42	30
JAN 07, 1987	.82	1.9	–	44	42	–	<250	5.9	<50	<10	47
JAN 07, 1987	.82	1.9	–	45	52	–	<250	5.4	<50	<10	53

Date	Iron, ferrous dissolved (mg/L)	Lead, dissolved (µg/L)	Manganese, dissolved (mg/L)	Mercury, dissolved µg/l)	Molybdenum, dissolved (µg/L)	Nickel, dissolved (mg/L)	Selenium, dissolved (µg/L)	Strontium, dissolved (µL)	Zinc, dissolved (mg/L)	Cyanide total (mg/L)
410924079293701 Drain 3 (LAT 41°09'24" N. LONG 079°29'37" W.)--Continued										
OCT 08, 1986	21	260	26	<1	<70	0.50	<15	890	0.58	<0.001
NOV 04, 1986	24	<4	26	<1	<70	.62	<15	860	.59	<.001
DEC 09, 1986	20	<4	30	<1	<70	.62	30	830	.67	<.001
JAN 07, 1987	19	<4	32	<1	<70	.17	<30	930	.50	<.001
FEB 12, 1987	22	<4	27	<1	<70	.05	<15	960	.13	<.001
FEB 12, 1987	22	<4	27	<1	<70	.03	<15	910	.14	<.001
MAR 10, 1987	18	<4	24	<1	<70	<.02	<60	940	.23	<.001
APR 14, 1987	18	<4	20	<1	<70	<.02	<60	880	.24	<.001
MAY 04, 1987	19	<4	26	<1	<70	.08	<60	930	.21	<.001
JUNE 03, 1987	17	<4	21	<1	<70	2.7	<30	1,000	1.9	<.001
JULY 09, 1987	18	<4	21	<1	<70	.39	<30	980	.15	<.001
AUG 12, 1987	1.2	<4	16	<1	<70	.26	<30	1,000	.079	.001
SEPT 16, 1987	17	<20	15	<1	<70	.32	<30	920	.30	<.001
OCT 06, 1987	13	<10	16	<1	<70	.11	<30	920	.28	<.001
OCT 06, 1987	14	<10	18	<1	<70	.28	<30	890	.30	<.001
OCT 06, 1987	14	<10	18	<1	<70	.28	<30	890	.30	<.001
NOV 18, 1987	22	<10	20	<1	<70	.74	<30	970	.31	<.001
DEC 15, 1987	13	<10	17	<1	–	.09	<30	820	.42	<.001
JAN 12, 1988	4.2	<10	21	<1	<70	.66	<30	590	1	<.001
FEB 09, 1988	18	<10	19	<1	<70	.34	<30	850	.41	<.001
MAR 15, 1988	22	<10	23	<1	<70	.39	<30	870	.48	<.001
APR 11, 1988	22	<4	23	<1	<70	.41	<30	1,100	.45	<.001
APR 11, 1988	22	<4	22	<1	<70	.36	<30	990	.41	<.001
MAY 09, 1988	22	<10	22	<1	<70	.44	<30	1,100	.43	<.001
JUNE 08, 1988	22	<4	20	<1	<70	.30	<30	920	.31	<.001
JULY 12, 1988	18	<20	21	<1	<300	.40	<30	990	.33	<.001
AUG 08, 1988	12	<20	21	<1	<70	.41	<30	1,000	.14	<.001
AUG 08, 1988	12	<4	24	<1	<300	.39	<30	1,000	.13	<.001
SEPT 20, 1988	12	<4	20	<1	<70	.32	<30	1,000	.23	<.001
OCT 18, 1988	1.1	<40	1.7	<1	<70	.05	<30	240	.037	<.001
NOV 17, 1988	.34	<4	9.1	<1	<70	.44	<30	280	1.4	<.001
MAR 14, 1989	23	<4	24	<1	<70	.51	<30	870	.61	<.001
APR 11, 1989	22	<4	30	<1	<70	.98	<30	870	.97	<.001
MAY 10, 1989	16	<10	27	<1	<70	.58	<30	780	.83	<.001
MAY 10, 1989	16	<4	28	<1	<70	.58	<30	780	.90	<.001
JUNE 15, 1989	2.7	<4	25	<1	<70	.60	<30	490	.98	<.001
JULY 11, 1989	14	<4	31	<1	<70	.86	<30	870	1.1	<.001
AUG 09, 1989	16	<10	40	<1	<70	.60	<30	990	.84	<.001
SEPT 13, 1989	15	<10	26	<1	<70	.37	<30	1,000	.50	<.001
SEPT 13, 1989	16	<10	25	<1	<70	.36	<30	960	.51	<.001
OCT 16, 1989	17	<10	20	<1	<70	.30	<30	800	.40	<.001
NOV 07, 1989	17	<4	28	<1	<70	.34	<30	910	.41	<.001
NOV 07, 1989	17	<4	29	<1	<70	.33	<30	900	.40	<.001
410927079293101 Drain 4 (LAT 41°09'27" N. LONG 079°29'31" W.)										
JUNE 12, 1986	–	<50	20	<1	<700	.46	<1,000	350	.40	–
JUNE 18, 1986	–	<50	34	<1	<700	.68	<1,000	470	.91	–
JULY 08, 1986	–	89	45	<1	<700	.89	<1,000	610	.08	–
AUG 05, 1986	–	<50	39	<1	<700	.82	<1,000	690	.97	<.001
SEPT 09, 1986	–	<50	46	<1	<70	.80	<30	670	.85	<.001
OCT 08, 1986	47	160	40	<1	<70	.87	<15	530	1.4	<.001
NOV 04, 1986	79	5.5	46	<1	<70	.88	<15	590	1.1	<.001
DEC 19, 1986	28	<4	26	<1	<70	.69	<30	370	1.2	<.001
JAN 07, 1987	36	<4	34	<1	<70	.47	<30	560	.97	<.001
JAN 07, 1987	44	<4	38	<1	<70	.43	<30	570	.95	<.001

Appendix 2.–Water-quality data for urban sewage sludge site, June 1986 through November 1989–Continued

Date	Time	Water table altitude (ft above sea level)	Streamflow/ discharge, instantaneous (ft^3/s)	Specific conductance (µS/cm)	pH, field (units)	pH, lab (units)	Oxidation reduction potential (mV)	Water temperature (°C)	Oxygen, dissolved (mg/L)	Acidity total heated (mg/L as $CaCO_3$)	Acidity mineral (methyl orange) (mg/L as $CaCO_3$)	Calcium, dissolved (mg/L)
410927079293101 Drain 4 (LAT 41°09'27" N. LONG 079°29'31" W.)–Continued												
FEB 11, 1987	1430	–	0.00	2,800	4.0	4.0	–	7.0	–	530	–	260
MAR 09, 1987	1730	–	.01	2,650	4.6	4.2	–	5.0	–	350	–	240
APR 14, 1987	1400	–	.01	2,530	4.4	4.3	–	8.0	–	400	–	210
MAY 04, 1987	1700	–	.01	2,550	4.1	4.0	–	8.5	–	350	–	230
JUNE 03, 1987	1445	–	.00	2,710	4.2	4.2	–	13.0	–	370	–	210
JULY 09, 1987	1530	–	.00	2,640	4.4	4.4	–	16.0	–	330	–	230
AUG 12, 1987	1115	–	.00	2,700	4.7	4.6	–	15.0	–	230	–	250
SEPT 16, 1987	0005	–	.00	2,550	4.7	4.7	–	15.0	–	300	–	230
SEPT 16, 1987	1300	–	.00	2,600	4.7	4.7	–	15.0	–	250	–	250
OCT 06, 1987	1445	–	.00	2,500	4.7	4.6	–	13.5	–	290	–	240
NOV 18, 1987	1330	–	.00	2,600	5.0	4.6	–	9.5	–	340	–	260
DEC 15, 1987	1230	–	.01	1,750	4.6	4.5	–	8.0	–	200	–	140
JAN 12, 1988	1450	–	.00	2,400	4.4	4.4	–	6.0	–	310	–	230
FEB 09, 1988	0005	–	.00	1,780	7.3	4.5	–	5.0	–	240	–	280
FEB 09, 1988	1210	–	.00	1,880	7.3	4.6	–	5.0	–	290	–	220
MAR 15, 1988	1410	–	.00	1,900	4.1	4.2	–	2.5	–	290	–	130
APR 12, 1988	0930	–	.00	1,900	3.8	3.8	–	8.5	–	360	4	200
MAY 09, 1988	1710	–	.00	2,200	3.6	3.8	–	14.5	–	310	8	260
JUNE 08, 1988	0005	–	.00	2,150	3.6	3.5	–	16.0	–	330	24	260
JUNE 08, 1988	0945	–	.00	2,150	3.6	3.5	–	16.0	–	320	24	240
JULY 12, 1988	1025	–	.00	2,230	4.0	3.8	–	18.0	–	320	4	290
AUG 09, 1988	0910	–	–	2,310	3.7	3.2	–	17.0	–	300	12	580
410918079294102 Seep 2 (LAT 41°09'18" N. LONG 079°29'41" W.)												
SEPT 09, 1986	1530	–	.00	3,300	3.4	3.4	–	17.5	–	580	56	320
DEC 09, 1986	0001	–	.02	2,730	3.6	3.4	–	8.5	–	460	38	230
MAR 11, 1987	1430	–	.01	3,000	3.6	3.4	–	1.5	–	470	42	270
JUNE 03, 1987	0005	–	.01	3,640	3.0	3.1	–	16.0	–	760	210	300
JUNE 03, 1987	1100	–	.01	3,610	3.0	3.1	–	16.0	–	840	210	280
SEPT 16, 1987	1130	–	.00	2,700	3.4	3.4	–	17.5	–	250	36	250
DEC 15, 1987	1040	–	.00	1,970	3.5	3.6	–	5.0	–	180	18	170
APR 12, 1988	0915	–	–	2,400	3.2	3.3	–	7.5	–	330	46	230
MAY 09, 1988	1220	–	.01	2,700	3.3	3.3	–	12.5	–	580	62	290
JUNE 08, 1988	0005	–	.01	3,150	3.1	3.0	–	13.0	–	1,100	250	360
JUNE 08, 1988	0800	–	.01	3,260	3.1	3.0	–	13.0	–	1,100	240	360
JULY 12, 1988	0915	–	.00	2,790	3.1	3.1	–	20.0	–	410	140	330
410925079292801 Seep 3 (LAT 41°09'25" N. LONG 079°29'28" W.)												
OCT 08, 1986	1530	–	–	1,690	3.3	3.5	–	–	–	270	22	160
DEC 11, 1986	0830	–	–	2,610	3.4	3.5	–	10.0	–	280	34	320
MAR 11, 1987	1430	–	–	2,700	3.8	3.8	–	–	–	230	10	270
JUNE 03, 1987	1400	–	–	3,000	3.7	3.8	–	14.5	–	210	10	280
SEPT 16, 1987	1400	–	.00	2,250	3.7	3.7	–	14.5	–	140	8	240
DEC 15, 1987	0005	–	.00	2,100	3.6	3.7	–	9.0	–	150	8	200
DEC 15, 1987	1430	–	–	2,100	3.6	3.7	–	9.0	–	160	8	200
MAR 16, 1988	0915	–	–	2,050	3.3	3.8	–	8.5	–	250	6	260
APR 12, 1988	1245	–	.00	2,100	3.7	3.7	–	12.5	–	260	8	250
MAY 10, 1988	0005	–	.01	2,350	3.6	3.7	–	14.5	–	240	14	250
MAY 10, 1988	1410	–	.01	2,400	3.6	3.7	–	14.5	–	260	14	270
JUNE 07, 1988	1145	–	–	2,350	3.8	3.8	–	14.0	–	240	8	310
JULY 12, 1988	1400	–	–	2,450	3.8	3.8	–	15.5	–	240	6	340
AUG 09, 1988	1120	–	–	2,480	3.5	3.5	–	21.5	–	210	20	290
FEB 15, 1989	0820	–	–	1,830	3.4	3.4	–	7.5	–	310	20	190
MAR 14, 1989	0820	–	.00	1,850	3.2	3.4	–	9.0	–	290	22	240
APR 12, 1989	0825	–	–	2,100	3.1	3.4	–	9.5	–	–	26	250

Appendix 2.--Water-quality data for urban sewage sludge site, June 1986 through November 1989--Continued

Date	Magnesium, dissolved (mg/L)	Sodium, dissolved (mg/L)	Potassium, dissolved (mg/L)	Alkalinity water lab (mg/L as $CaCO_3$)	Sulfide total (mg/L as S)	Sulfate, dissolved (mg/L as SO_4)	Chloride, dissolved (mg/L)	Silica, dissolved (mg/L as SiO_2)	Solids, residue at 105 °C, dissolved (mg/L)	Nitrogen, nitrate total (mg/L as N)	Nitrogen, nitrite total (mg/L as N)
410927079293101 Drain 4 (LAT 41°09'27" N. LONG 079°29'31" W.)--Continued											
FEB 11, 1987	260	5.7	5.1	2	--	1,800	3	--	3,100	<0.02	<0.004
MAR 09, 1987	240	5.4	4.8	8	--	1,100	2	--	2,690	<.04	.006
APR 14, 1987	200	5.4	5.4	10	--	1,600	2	21	480	.08	.030
MAY 04, 1987	230	4.1	5.5	2	--	1,400	1	17	2,760	.04	.024
JUNE 03, 1987	200	4.9	4.6	6	--	1,500	3	19	3,260	<.04	<.004
JULY 09, 1987	210	14	5.9	10	--	1,700	3	21	3,740	<.04	.026
AUG 12, 1987	220	5.4	5.9	12	--	1,900	4	16	3,070	<.04	<.004
SEPT 16, 1987	190	10	5.7	16	--	1,800	4	22	2,980	.06	.042
SEPT 16, 1987	220	5.7	5.8	16	--	1,900	4	22	3,150	.04	.006
OCT 06, 1987	210	4.4	5.5	18	--	1,600	3	21	2,750	<.04	.034
NOV 18, 1987	230	9.6	6	16	--	1,800	3	17	3,120	<.04	<.004
DEC 15, 1987	120	4.4	4.3	14	--	1,100	2	21	1,910	.08	.038
JAN 12, 1988	170	5.7	4.7	--	--	1,600	2	21	2,550	<.04	.004
FEB 09, 1988	190	4.8	5.1	18	--	1,600	2	21	2,680	.12	.036
FEB 09, 1988	190	6.2	5	18	--	1,500	2	21	2,530	.12	.040
MAR 15, 1988	120	4.8	3.9	8	--	1,400	2	19	2,140	.06	.012
APR 12, 1988	200	3.9	5.2	--	--	1,500	3	22	2,680	.12	.020
MAY 09, 1988	210	6.1	5	--	--	1,600	2	17	24	<.04	<.004
JUNE 08, 1988	240	5.6	5.1	--	--	1,400	3	18	3,480	<.04	<.004
JUNE 08, 1988	230	5.7	5.2	--	--	1,300	3	19	3,430	<.04	<.004
JULY 12, 1988	240	8.1	6.7	--	--	1,800	3	15	3,150	<.04	<.004
AUG 09, 1988	530	5.9	5.6	--	--	1,900	3	15	3,040	<.04	<.004
410918079294102 Seep 2 (LAT 41°09'18" N. LONG 079°29'41" W.)											
SEPT 09, 1986	260	8.7	8.5	0	--	860	4	--	3,920	<.04	<.004
DEC 09, 1986	220	4.9	4.8	0	--	1,300	2	--	3,030	.38	<.004
MAR 11, 1987	250	5.7	5.1	0	--	1,500	2	--	3,230	.22	<.002
JUNE 03, 1987	240	5.4	4.1	0	--	2,400	3	55	4,130	.04	<.004
JUNE 03, 1987	240	5	6.2	0	--	2,100	2	61	4,230	.04	<.004
SEPT 16, 1987	230	5.6	6.8	--	--	1,700	3	31	3,140	<.04	<.004
DEC 15, 1987	140	4.1	4.1	--	--	1,100	2	27	2,030	.08	<.004
APR 12, 1988	200	4.4	6.6	--	--	1,900	4	41	3,000	.10	<.004
MAY 09, 1988	210	4	4.8	--	--	1,800	2	55	4,190	.04	<.004
JUNE 08, 1988	280	5.7	4.1	--	--	2,900	3	69	5,800	<.04	<.004
JUNE 08, 1988	280	5.9	4	--	--	2,700	3	68	5,940	<.04	.004
JULY 12, 1988	290	5.5	7.9	--	--	2,000	2	37	4,420	<.04	<.004
410925079292801 Seep 3 (LAT 41°09'25" N. LONG 079°29'28" W.)											
OCT 08, 1986	110	5.1	7.4	0	--	980	4	--	1,700	1.2	.030
DEC 11, 1986	220	5.1	5.7	0	--	1,500	2.5	--	2,750	.40	<.004
MAR 11, 1987	250	6.6	5.8	0	--	1,700	2	--	2,900	.16	<.002
JUNE 03, 1987	270	6.3	5.9	0	--	1,800	3	27	3,280	<.04	<.004
SEPT 16, 1987	200	5.7	5.8	--	--	1,300	4	39	2,440	.64	.11
DEC 15, 1987	170	3.6	5.2	--	--	1,200	3	42	2,220	.68	.020
DEC 15, 1987	170	4.6	5.3	--	--	1,100	4	42	2,160	.70	.020
MAR 16, 1988	210	5.1	6.3	--	--	1,700	3	31	2,420	.14	<.004
APR 12, 1988	220	5.4	6.8	--	--	1,800	4	40	2,790	.10	<.004
MAY 10, 1988	260	6.9	6.2	--	--	1,500	2	32	2,990	.10	<.004
MAY 10, 1988	250	6.6	6.3	--	--	1,700	2	33	3,050	.10	<.004
JUNE 07, 1988	260	5.4	8.8	--	--	1,200	3	32	2,590	.06	.004
JULY 12, 1988	290	6	6.6	--	--	1,800	2	28	3,330	<.04	<.004
AUG 09, 1988	240	6.4	6.6	--	--	2,000	3	32	3,730	<.04	<.004
FEB 15, 1989	160	4.8	4.6	--	<0.20	1,500	3	54	2,420	.60	<.004
MAR 14, 1989	200	4.1	4.8	--	<.20	1,500	3	45	2,660	.46	<.004
APR 12, 1989	210	5.4	5.8	--	<.20	1,700	3	38	--	.29	<.004

Appendix 2.--Water-quality data for urban sewage sludge site, June 1986 through November 1989--Continued

Date	Nitrogen, ammonia total (mg/L as N)	Nitrogen, ammonia + organic total (mg/L as N)	Phosphorus total (mg/L as P)	Aluminum, dissolved (mg/L)	Arsenic, dissolved (µg/L)	Barium, dissolved (µg/L)	Boron, dissolved (µg/L)	Cadmium, dissolved (µg/L)	Chromium, dissolved (µg/L)	Copper, dissolved (µg/L)	Iron, dissolved (mg/L)
410927079293101 Drain 4 (LAT 41°09'27" N. LONG 079°29'31" W.)--Continued											
FEB 11, 1987	1.2	2.1	--	44	26	<10	<250	3.5	<50	<10	59
MAR 09, 1987	.87	1.7	--	36	15	<10	<250	3.1	<50	<10	63
APR 14, 1987	.72	1.6	0.04	32	23	24	<250	3.3	250	510	58
MAY 04, 1987	.78	2	<.02	40	35	<10	<250	3.1	<50	<10	58
JUNE 03, 1987	.99	1.3	.07	27	38	16	<250	15	240	530	53
JULY 09, 1987	.85	2	.03	51	30	<10	<250	3.2	<50	<10	50
AUG 12, 1987	.95	1.7	.02	20	<10	14	<250	2	<50	500	52
SEPT 16, 1987	.91	1.3	.02	17	10	<10	<250	2.4	<50	28	54
SEPT 16, 1987	.88	1.7	.03	19	10	<10	<250	2.2	<50	<10	50
OCT 06, 1987	.88	1.8	<.02	20	16	<10	<250	2.5	93	720	55
NOV 18, 1987	.77	1.5	.02	23	14	<10	<250	2.2	<50	<10	54
DEC 15, 1987	.50	1.1	.02	22	18	<10	<250	2.6	<50	<10	26
JAN 12, 1988	.88	1.5	.02	19	10	23	<250	2.4	<50	<10	55
FEB 09, 1988	.78	1.1	<.02	21	20	<10	<250	2.8	<50	12	60
FEB 09, 1988	.84	.86	<.02	27	19	<10	<250	3	<50	<10	38
MAR 15, 1988	.60	1.2	<.02	39	22	<10	<250	2.9	<50	<10	44
APR 12, 1988	.87	1.3	.02	32	28	20	<250	3.4	<50	36	44
MAY 09, 1988	1.1	1.3	.02	31	5.2	<10	<250	2.8	<50	<10	48
JUNE 08, 1988	1.1	1.4	.05	42	<20	<10	<250	3	<50	<10	48
JUNE 08, 1988	1.1	1.7	.03	31	<20	11	<250	3.3	<50	<10	56
JULY 12, 1988	1.2	1.6	.02	33	<20	<10	<250	2.7	93	<10	69
AUG 09, 1988	1.3	1.4	.14	25	<20	<10	<250	2.4	<50	<10	62
410918079294102 Seep 2 (LAT 41°09'18" N. LONG 079°29'41" W.)											
SEPT 09, 1986	.54	1.4	--	44	26	--	<250	5	<50	48	38
DEC 09, 1986	.25	.78	--	44	34	14	<250	8.6	94	80	5.3
MAR 11, 1987	.36	1.2	--	40	24	<10	<250	3.8	<50	<10	20
JUNE 03, 1987	.55	1.5	.07	80	48	<10	<250	7.6	<50	<10	120
JUNE 03, 1987	.60	1.6	.06	77	<4	<10	<250	6.3	67	<10	110
SEPT 16, 1987	.30	.94	.02	19	20	<10	<250	2.7	<50	220	12
DEC 15, 1987	.20	.86	.02	20	13	<10	<250	3.6	<50	<10	13
APR 12, 1988	.38	.92	.02	29	31	21	<250	4	<50	<10	8.3
MAY 09, 1988	.34	.92	.02	84	32	<10	<250	6.4	<50	50	15
JUNE 08, 1988	.90	1.2	.04	110	<20	<10	<250	7.3	<50	86	160
JUNE 08, 1988	.90	1.3	.04	110	<20	<10	<250	8.4	<50	87	230
JULY 12, 1988	.75	1.5	.02	32	<20	<10	<250	2.8	88	<10	36
410925079292801 Seep 3 (LAT 41°09'25" N. LONG 079°29'28" W.)											
OCT 08, 1986	2.6	3.8	--	22	17	--	<250	3.4	<50	73	2.4
DEC 11, 1986	1.1	1.8	--	33	22	13	<250	8.4	89	91	1.9
MAR 11, 1987	.63	1.4	--	14	7.4	<10	<250	1.9	<50	<50	6
JUNE 03, 1987	.55	1.2	.05	17	16	<10	<250	2.4	<50	30	8.7
SEPT 16, 1987	.44	.54	.03	13	7.8	<10	<250	2.2	<50	32	5.2
DEC 15, 1987	.47	1.3	.02	16	11	<10	<250	3.8	92	44	1.1
DEC 15, 1987	.58	.96	.02	19	11	<10	<250	3.2	<50	<10	1.3
MAR 16, 1988	.33	.71	<.02	14	17	<10	<250	2.8	<50	27	1.5
APR 12, 1988	.30	.76	.02	30	22	11	<250	3.2	<50	37	2.3
MAY 10, 1988	.38	.74	.02	35	8	<10	<250	3.5	<50	53	4.8
MAY 10, 1988	.38	.82	.02	33	7.6	<10	<250	3.7	<50	62	4.2
JUNE 07, 1988	.33	1.1	.02	42	<20	<10	<250	2.9	<50	37	5.4
JULY 12, 1988	.44	1.3	.02	38	<20	<10	<250	2.4	84	45	8.5
AUG 09, 1988	.42	1.2	.03	22	<20	<10	<250	2.6	<50	53	6.7
FEB 15, 1989	.36	.76	.03	69	<4	<10	<250	3.8	<50	68	.49
MAR 14, 1989	.28	.40	.03	50	4.7	<10	<250	4.6	<50	86	.77
APR 12, 1989	.30	.40	<.02	44	<4	<10	<250	4.3	<50	100	1.1

Date	Iron, ferrous dissolved (mg/L)	Lead, dissolved (µg/L)	Manganese, dissolved (mg/L)	Mercury, dissolved µg/l)	Molybdenum, dissolved (µg/L)	Nickel, dissolved (mg/L)	Selenium, dissolved (µg/L)	Strontium, dissolved (µL)	Zinc, dissolved (mg/L)	Cyanide total (mg/L)
410927079293101 Drain 4 (LAT 41°09'27" N. LONG 079°29'31" W.)--Continued										
FEB 11, 1987	70	<4	42	<1	<70	0.27	<30	650	0.90	<0.001
MAR 09, 1987	66	4.9	37	<1	<70	.24	<60	580	.78	<.001
APR 14, 1987	63	7.2	33	<1	<70	.66	<60	550	.97	<.001
MAY 04, 1987	60	5.1	37	<1	<70	.34	<60	550	.88	<.001
JUNE 03, 1987	63	6.6	32	<1	<70	.29	<30	630	.57	<.001
JULY 09, 1987	57	4.9	34	<1	<70	.60	<60	600	.84	<.001
AUG 12, 1987	59	<4	32	<1	<70	.50	<30	690	.18	<.001
SEPT 16, 1987	58	<20	36	<1	<70	.53	<30	620	.88	<.001
SEPT 16, 1987	56	<20	32	<1	<70	.63	<30	630	.85	<.001
OCT 06, 1987	51	<10	35	<1	<70	.41	<30	650	.86	<.001
NOV 18, 1987	59	7.8	34	<1	94	.92	<30	640	.67	<.001
DEC 15, 1987	30	<10	22	<1	<70	.53	<30	400	.92	<.001
JAN 12, 1988	54	<10	36	<1	<70	.54	<30	590	.95	<.001
FEB 09, 1988	1.7	<10	34	<1	<70	.81	<30	550	1.4	<.001
FEB 09, 1988	38	<10	31	<1	<70	.64	<30	540	1	<.001
MAR 15, 1988	40	<4	35	<1	<70	.60	<30	490	1.1	<.001
APR 12, 1988	42	4.6	33	<1	<70	.66	<30	540	1.2	<.001
MAY 09, 1988	47	<10	35	<1	<70	.63	<30	630	1	<.001
JUNE 08, 1988	44	6.3	38	<1	<70	.67	<30	520	1.1	<.001
JUNE 08, 1988	45	6.1	35	<1	<70	.62	<30	530	1.1	<.001
JULY 12, 1988	61	<20	36	<1	<300	.50	<30	620	.69	<.001
AUG 09, 1988	61	<20	34	<1	<70	.61	<30	610	.72	<.001
410918079294102 Seep 2 (LAT 41°09'18" N. LONG 079°29'41" W.)										
SEPT 09, 1986	29	<50	58	<1	<70	1.8	<30	840	2.4	<.001
DEC 09, 1986	3.3	<4	41	<1	<70	1.4	<60	600	2.5	<.001
MAR 11, 1987	13	5	45	<1	<70	.61	<30	760	1.5	<.001
JUNE 03, 1987	55	9.6	56	<1	<70	.72	<30	1,100	2.2	<.001
JUNE 03, 1987	60	11	54	<1	<70	.87	<60	860	2.1	<.001
SEPT 16, 1987	6.7	<20	27	<1	<70	.99	<30	700	1.3	<.001
DEC 15, 1987	8.7	<10	27	<1	<70	.76	<30	500	.99	<.001
APR 12, 1988	1.9	8	40	<1	<70	1.2	<30	780	1.8	<.001
MAY 09, 1988	2.5	16	52	<1	<70	1.4	<30	860	.54	<.001
JUNE 08, 1988	120	10	65	<1	<70	1.7	<30	720	3	<.001
JUNE 08, 1988	120	12	65	<1	<70	1.7	<30	720	3.1	<.001
JULY 12, 1988	11	<20	62	<1	<300	1.4	<30	830	2.1	<.001
410925079292801 Seep 3 (LAT 41°09'25" N. LONG 079°29'28" W.)										
OCT 08, 1986	1.3	<50	18	<1	<70	.65	<7.5	340	1.3	<.001
DEC 11, 1986	.80	<4	29	<1	<70	1.1	<60	580	1.8	<.001
MAR 11, 1987	4.8	<4	25	<1	<70	.22	<30	640	.69	<.001
JUNE 03, 1987	8.8	<4	28	<1	<70	.73	<30	750	.58	<.001
SEPT 16, 1987	4.5	<20	22	<1	<70	.59	<30	520	.94	<.001
DEC 15, 1987	1.1	<10	17	<1	<300	.63	<30	530	.92	<.001
DEC 15, 1987	.88	<10	21	<1	–	.45	<30	530	.99	<.001
MAR 16, 1988	1.2	<4	24	<1	<70	.75	<30	560	1.2	<.001
APR 12, 1988	2	<10	27	<1	<70	.96	<30	730	1.5	<.001
MAY 10, 1988	3.3	<10	27	<1	<70	1	<30	790	1.7	<.001
MAY 10, 1988	3.3	<10	27	<1	<70	1	<30	840	1.7	<.001
JUNE 07, 1988	5.6	<10	28	<1	<70	.86	<30	640	1.4	<.001
JULY 12, 1988	7.5	<20	30	<1	20	.71	<30	700	1.3	<.001
AUG 09, 1988	7.1	<20	27	<1	<70	.80	<30	700	1.3	<.001
FEB 15, 1989	.28	<40	22	<1	<70	1.2	<30	540	1	<.001
MAR 14, 1989	.52	<20	27	<1	<70	.90	<30	520	1.7	<.001
APR 12, 1989	.64	<4	29	<1	<70	1	<30	540	2	<.001

Appendix 2.--Water-quality data for urban sewage sludge site, June 1986 through November 1989--Continued

Date	Time	Water table altitude (ft above sea level)	Streamflow/ discharge, instan-taneous (ft^3/s)	Specific conduc-tance ($\mu S/cm$)	pH, field (units)	pH, lab (units)	Oxidation reduction potential (mV)	Water temper-ature (°C)	Oxygen, dissolved (mg/L)	Acidity total heated (mg/L as $CaCO_3$)	Acidity mineral (methyl orange) (mg/L as $CaCO_3$)	Calcium, dissolved (mg/L)
410925079292801 Seep 3 (LAT 41°09'25" N. LONG 079°29'28" W.)--Continued												
MAY 10, 1989	0005	--	--	2,250	3.4	3.6	--	9.0	--	240	16	390
MAY 10, 1989	0815	--	--	2,500	3.4	3.6	--	9.0	--	240	18	320
JUNE 14, 1989	1715	--	--	2,370	3.4	3.5	--	13.0	--	270	18	220
JULY 11, 1989	0810	--	--	2,770	--	3.8	--	16.0	--	240	12	280
AUG 09, 1989	0805	--	--	2,710	3.6	3.7	--	13.0	--	190	12	400
SEPT 12, 1989	0830	--	--	2,850	3.8	3.7	--	14.0	--	160	8	380
OCT 17, 1989	0005	--	--	2,690	3.6	3.8	--	11.5	--	140	8	340
OCT 17, 1989	0845	--	--	2,590	3.6	3.8	--	14.0	--	140	8	350
410925079292701 Seep 4 (LAT 41°09'25" N. LONG 079°29'27" W.)												
MAR 11, 1987	1430	--	--	3,200	6.4	6.3	--	10.0	--	0	--	350
JUNE 03, 1987	1030	--	--	3,360	6.3	6.3	--	14.5	--	0	--	370
SEPT 16, 1987	1415	--	0.01	3,200	6.0	6.4	--	13.0	--	0	--	380
DEC 15, 1987	1500	--	.01	3,200	5.9	6.5	--	11.0	--	0	--	370
MAR 16, 1988	0930	--	--	2,700	6.2	6.4	--	9.5	--	0	--	410
APR 12, 1988	0005	--	.01	2,650	6.0	6.5	--	13.5	--	0	--	410
APR 12, 1988	1250	--	.01	2,600	6.0	6.4	--	13.5	--	0	--	420
MAY 10, 1988	1415	--	--	2,900	6.0	6.5	--	14.5	--	0	--	390
JUNE 07, 1988	1145	--	--	2,910	6.2	6.5	--	16.0	--	0	--	410
JULY 11, 1988	1355	--	--	2,880	6.2	6.7	--	15.5	--	0	--	430
AUG 09, 1988	1110	--	--	2,960	6.0	6.7	--	19.5	--	0	--	470
SEPT 21, 1988	1205	--	--	2,840	6.1	6.5	--	13.5	--	0	--	410
DEC 20, 1988	1115	--	.00	2,390	6.2	6.5	--	10.0	--	0	--	500
JAN 10, 1989	0005	--	--	2,660	5.9	6.6	--	10.5	--	0	--	450
JAN 10, 1989	0855	--	--	2,680	5.9	6.6	--	10.5	--	0	--	440
FEB 15, 1989	0810	--	--	2,550	5.9	6.5	--	9.0	--	0	--	390
MAR 14, 1989	0815	--	.02	2,550	5.8	6.6	--	10.0	--	0	--	430
APR 12, 1989	0815	--	--	2,700	5.8	6.4	--	10.5	--	--	--	410
MAY 10, 1989	0820	--	--	2,600	5.8	6.0	--	11.0	--	20	--	350
JUNE 14, 1989	1715	--	--	2,660	5.6	6.3	--	13.5	--	30	--	300
JULY 11, 1989	0005	--	--	2,850	4.7	5.1	--	14.5	--	140	--	380
JULY 11, 1989	0820	--	--	2,850	4.7	5.1	--	14.5	--	150	--	400
AUG 09, 1989	0800	--	--	2,730	5.4	6.1	--	12.0	--	22	--	410
SEPT 12, 1989	0005	--	--	2,650	5.8	6.4	--	13.0	--	0	--	420
SEPT 12, 1989	0835	--	--	2,800	5.8	6.3	--	13.0	--	0	--	410
OCT 17, 1989	0850	--	--	2,730	5.7	6.5	--	13.0	--	0	--	420
NOV 07, 1989	0800	--	--	2,730	5.9	6.4	--	11.5	--	0	--	500
410926079292401 Seep 16 (LAT 41°09'26" N. LONG 079°29'24" W.)												
SEPT 11, 1986	0005	--	.08	3,300	5.2	5.2	--	15.0	--	330	--	360
SEPT 11, 1986	0930	--	.08	3,250	5.2	5.2	--	15.0	--	260	--	380
OCT 09, 1986	1500	--	.04	3,440	4.8	5.2	--	12.5	--	310	--	350
NOV 04, 1986	1330	--	.12	3,400	4.9	5.1	--	12.0	--	280	--	380
DEC 10, 1986	1000	--	.07	3,620	5.3	4.9	--	11.0	--	320	--	460
JAN 07, 1987	0845	--	.10	3,550	4.8	4.8	--	12.0	--	280	--	--
FEB 12, 1987	1345	--	.08	3,450	4.8	5.0	--	12.0	--	200	--	360
MAR 11, 1987	1115	--	.11	3,300	5.1	5.0	--	10.5	--	200	--	290
APR 14, 1987	1200	--	--	3,400	4.8	5.2	--	13.5	--	230	--	280
MAY 05, 1987	0005	--	--	3,450	4.9	5.2	--	13.0	--	180	--	340
MAY 05, 1987	1530	--	--	3,430	5.0	5.1	--	13.0	--	220	--	310
JUNE 02, 1987	1630	--	--	3,460	5.0	5.1	--	13.0	--	130	--	320
JULY 09, 1987	1000	--	.16	3,400	5.0	5.2	--	14.0	--	170	--	320
AUG 12, 1987	1215	--	--	3,250	5.1	5.6	--	14.0	--	160	--	310
SEPT 16, 1987	1400	--	.08	3,300	5.2	5.5	--	14.0	--	140	--	340
OCT 07, 1987	0830	--	.11	3,300	5.3	5.6	--	11.0	--	120	--	320

Appendix 2.--Water-quality data for urban sewage sludge site, June 1986 through November 1989--Continued

Date	Magnesium, dissolved (mg/L)	Sodium, dissolved (mg/L)	Potassium, dissolved (mg/L)	Alkalinity water lab (mg/L as $CaCO_3$)	Sulfide total (mg/L as S)	Sulfate, dissolved (mg/L as SO_4)	Chloride, dissolved (mg/L)	Silica, dissolved (mg/L as SiO_2)	Solids, residue at 105 °C, dissolved (mg/L)	Nitrogen, nitrate total (mg/L as N)	Nitrogen, nitrite total (mg/L as N)
410925079292801 Seep 3 (LAT 41°09'25" N. LONG 079°29'28" W.)--Continued											
MAY 10, 1989	260	7.1	6.4	--	<0.20	2,400	2	26	4,550	0.04	<0.004
MAY 10, 1989	270	6.7	6.4	--	<.20	2,100	2	27	4,610	.04	<.004
JUNE 14, 1989	200	7.6	6.5	--	<.20	2,000	3	31	4,300	.07	<.004
JULY 11, 1989	250	7.4	6.9	--	<.20	2,400	3	19	4,080	.04	<.004
AUG 09, 1989	320	8.2	7	--	<.20	2,600	4	19	4,080	<.04	<.004
SEPT 12, 1989	340	9.8	6.9	--	<.20	2,400	3	22	4,200	<.04	<.004
OCT 17, 1989	290	11	6.6	0	.32	2,200	3	22	3,460	<.04	<.004
OCT 17, 1989	300	8.1	6.9	0	.32	2,300	3	28	3,480	<.04	<.004
410925079292701 Seep 4 (LAT 41°09'25" N. LONG 079°29'27" W.)											
MAR 11, 1987	310	8.2	7	230	--	2,300	2	--	3,480	<.04	<.002
JUNE 03, 1987	330	8.7	8.4	230	--	2,000	3	9.8	3,350	<.04	<.004
SEPT 16, 1987	330	10	8.4	260	--	2,100	4	11	3,740	<.04	<.004
DEC 15, 1987	310	8	8.3	260	--	2,400	3	8.4	3,480	<.04	<.004
MAR 16, 1988	340	9.8	9.3	240	--	2,400	2	8.8	3,210	<.04	<.004
APR 12, 1988	350	8.9	9.3	230	--	2,500	4	11	3,800	<.04	<.004
APR 12, 1988	340	6.7	9.2	240	--	2,300	4	11	3,620	<.04	<.004
MAY 10, 1988	350	9.8	9.3	230	--	2,200	2	9.6	40	<.04	<.004
JUNE 07, 1988	340	8	8.8	250	--	1,700	4	11	3,920	<.04	.004
JULY 11, 1988	370	8.3	9.4	240	--	1,900	3	9	4,700	.04	<.004
AUG 09, 1988	350	8.2	8.3	240	<.20	2,500	4	8	3,590	<.04	<.004
SEPT 21, 1988	330	9.1	8.5	270	<.20	2,400	4	8.2	3,780	<.04	<.004
DEC 20, 1988	340	10	8.5	240	.48	2,300	4	8	3,420	<.04	.004
JAN 10, 1989	350	10	9.1	240	<.20	2,200	3	6.8	3,440	.06	<.004
JAN 10, 1989	360	10	9.3	--	<.20	2,300	3	7.1	3,470	<.04	.004
FEB 15, 1989	320	10	8.9	240	<.20	2,200	3	8.1	3,890	<.04	<.004
MAR 14, 1989	330	9.5	9.1	220	.64	2,600	4	8.5	4,180	<.04	<.004
APR 12, 1989	360	9.9	9.4	180	<.20	2,500	3	10	--	<.04	<.004
MAY 10, 1989	290	8.8	8.4	--	<.20	2,600	3	12	5,020	<.04	<.004
JUNE 14, 1989	260	11	9	130	<.20	2,300	3	15	4,060	<.04	<.004
JULY 11, 1989	340	8.2	8.6	24	<.20	2,500	3	17	4,360	.04	<.004
JULY 11, 1989	360	7.5	8	26	<.20	2,500	3	17	4,270	<.04	<.004
AUG 09, 1989	340	10	7.8	94	<.20	2,500	4	11	4,710	<.04	<.004
SEPT 12, 1989	360	12	8.1	160	<.20	2,700	3	13	4,100	<.04	<.004
SEPT 12, 1989	350	11	7.9	150	<.20	2,500	3	14	4,130	<.04	<.004
OCT 17, 1989	330	10	7.6	190	<.20	2,500	3	8.7	3,850	<.04	<.004
NOV 07, 1989	400	11	8.6	190	.24	2,500	3	8.9	3,410	<.04	<.004
410926079292401 Seep 16 (LAT 41°09'26" N. LONG 079°29'24" W.)											
SEPT 11, 1986	370	3.3	8	28	--	2,600	3	--	4,300	<.02	<.004
SEPT 11, 1986	250	3.5	5.9	20	--	2,000	4	--	4,160	<.02	<.004
OCT 09, 1986	380	8.5	8.5	30	--	2,800	2	--	4,010	<.02	<.004
NOV 04, 1986	440	7	7.7	32	--	2,400	--	--	6,380	<.02	<.004
DEC 10, 1986	410	6.8	6.7	30	--	2,300	1.9	--	4,230	<.04	<.004
JAN 07, 1987	--	--	7.6	28	--	2,600	1	--	4,110	<.04	<.004
FEB 12, 1987	390	6.8	7.4	26	--	2,400	5	--	3,960	<.02	<.004
MAR 11, 1987	310	7.9	14	30	--	2,200	2	--	3,850	<.04	<.002
APR 14, 1987	100	6	8.7	32	--	2,500	2	13	1,600	<.04	<.004
MAY 05, 1987	360	8.7	8.8	30	--	2,400	1	12	3,740	<.04	<.004
MAY 05, 1987	340	6.5	8.6	32	--	2,500	1	12	3,870	<.04	<.004
JUNE 02, 1987	340	6.5	6.5	32	--	2,300	3	12	3,920	<.04	<.004
JULY 09, 1987	340	7.9	7.1	36	--	2,500	2	10	4,900	<.04	<.004
AUG 12, 1987	310	6.2	7.9	42	--	2,600	5	11	3,780	<.04	<.004
SEPT 16, 1987	360	9.1	7.3	52	--	2,400	4	12	4,130	<.04	<.004
OCT 07, 1987	350	8.3	8.1	56	--	2,500	3	11	4,120	<.04	<.004

Appendix 2.--Water-quality data for urban sewage sludge site, June 1986 through November 1989--Continued

Date	Nitrogen, ammonia total (mg/L as N)	Nitrogen, ammonia + organic total (mg/L as N)	Phos-phorus total (mg/L as P)	Aluminum, dissolved (mg/L)	Arsenic, dissolved (µg/L)	Barium, dissolved (µg/L)	Boron, dissolved (µg/L)	Cadmium, dissolved (µg/L)	Chromium, dissolved (µg/L)	Copper, dissolved (µg/L)	Iron, dissolved (mg/L)
410925079292801 Seep 3 (LAT 41°09'25" N. LONG 079°29'28" W.)--Continued											
MAY 10, 1989	0.42	0.72	0.04	31	<4	<10	<250	2.9	<50	65	7
MAY 10, 1989	.43	.72	.04	30	4.4	<10	<250	2.7	<50	69	7.4
JUNE 14, 1989	.44	.87	.02	35	<4	<10	<250	3.2	<50	75	3.6
JULY 11, 1989	.49	.78	.02	19	<4	<10	<250	2.7	<50	59	4.9
AUG 09, 1989	.41	.83	.04	15	<4	11	<250	1.8	<50	50	9.8
SEPT 12, 1989	.45	.90	.02	14	<4	<10	<250	1.4	<50	39	14
OCT 17, 1989	.42	<1	.03	12	<4	<10	<250	1.8	<50	70	16
OCT 17, 1989	.43	<1	.03	12	<4	<10	<250	1.8	<50	55	14
410925079292701 Seep 4 (LAT 41°09'25" N. LONG 079°29'27" W.)											
MAR 11, 1987	.26	1.2	--	<.14	<4	<10	<250	.26	<50	<10	20
JUNE 03, 1987	.27	1	.06	.35	<4	<10	<250	<.20	<50	<10	20
SEPT 16, 1987	.29	.98	.03	.45	<4	18	<250	<1	<50	<10	22
DEC 15, 1987	.30	1.1	.02	.29	<4	<10	<250	.95	<50	<10	23
MAR 16, 1988	.31	.80	.04	.39	<4	<10	<250	3.3	<50	<10	28
APR 12, 1988	.28	.75	.03	.23	<4	<10	<250	<.20	<50	<10	27
APR 12, 1988	.28	.73	<.02	.18	<4	<10	<250	<.20	<50	<10	24
MAY 10, 1988	.34	.55	.02	.33	<20	<10	<250	<.50	<50	<10	30
JUNE 07, 1988	.31	1	.02	.15	<4	14	<250	<.20	<50	<10	40
JULY 11, 1988	.36	1.2	.02	.40	<20	<10	<250	.20	<50	<10	26
AUG 09, 1988	.36	1.3	.03	.35	<20	<10	<250	.32	<50	<10	27
SEPT 21, 1988	.38	1.4	.06	.30	<4	<10	<250	.20	<50	<10	30
DEC 20, 1988	.47	.58	.06	.35	<4	<10	<250	.42	<50	27	51
JAN 10, 1989	.44	.51	.04	.27	<4	<10	<250	2.1	<50	21	39
JAN 10, 1989	.44	.48	.04	.36	4.1	<10	<250	2.4	<50	22	40
FEB 15, 1989	.40	.89	.03	.23	<4	<10	<250	<.20	<50	20	40
MAR 14, 1989	.26	.59	.02	.28	<4	<10	<250	.25	<50	22	38
APR 12, 1989	.35	.56	<.02	.61	<4	<10	<250	.40	<50	18	31
MAY 10, 1989	.30	.69	.04	.84	<4	<10	<250	.42	<50	24	26
JUNE 14, 1989	.44	.65	.02	1.3	<4	11	<250	.45	<50	36	22
JULY 11, 1989	.46	.75	.03	10	<4	<10	<250	2.2	<50	35	22
JULY 11, 1989	.46	.66	.03	10	<4	<10	<250	2.2	<50	65	22
AUG 09, 1989	.34	1.2	.04	2.5	<4	<10	<250	.98	<50	27	17
SEPT 12, 1989	.34	1	.02	1.5	<4	<10	<250	.59	<50	23	18
SEPT 12, 1989	.28	.69	<.02	1.5	<4	<10	<250	.45	<50	27	16
OCT 17, 1989	.28	<1	.03	1.5	<4	<10	<250	.46	<50	83	20
NOV 07, 1989	.28	<1	.03	.82	<4	<10	<250	.53	<50	24	15
410926079292401 Seep 16 (LAT 41°09'26" N. LONG 079°29'24" W.)											
SEPT 11, 1986	.72	1.4	--	3.7	<4	<10	<250	.45	<50	<10	64
SEPT 11, 1986	.78	1.2	--	2.5	<4	<10	<250	.33	<50	<10	51
OCT 09, 1986	.45	1.3	--	4.9	<4	--	<250	.79	130	34	64
NOV 04, 1986	.50	1.6	--	6.3	<4	--	<250	.45	150	51	74
DEC 10, 1986	.44	1.2	--	7.3	4	15	<250	<.20	150	32	57
JAN 07, 1987	.44	1.8	--	--	7.3	--	<250	.68	--	--	--
FEB 12, 1987	.42	1.1	--	7.2	4.6	<10	<250	.91	<50	<10	60
MAR 11, 1987	.44	1.5	--	5.7	<4	<10	<250	.46	<50	<10	51
APR 14, 1987	.38	.48	<.02	3.7	<5	18	<250	.97	<50	<10	40
MAY 05, 1987	.37	1.2	.02	5.4	<4	<10	<250	.68	<50	<10	47
MAY 05, 1987	.36	1.4	<.02	4.2	<4	<10	<250	.30	<50	520	41
JUNE 02, 1987	.44	1.4	.05	3.2	<4	<10	<250	.32	<50	<10	46
JULY 09, 1987	.40	1.5	.03	3.2	4.1	11	<250	1.7	110	<10	48
AUG 12, 1987	.40	1	.02	2.1	<10	<10	<250	<.20	<50	<10	44
SEPT 16, 1987	.43	1.3	.02	1.8	<4	<10	<250	<1	<50	<10	51
OCT 07, 1987	.41	1.5	<.02	2	<4	<10	<250	<.50	<50	<10	53

Appendix 2.--Water-quality data for urban sewage sludge site, June 1986 through November 1989--Continued

Date	Iron, ferrous dissolved (mg/L)	Lead, dissolved (µg/L)	Manganese, dissolved (mg/L)	Mercury, dissolved µg/l)	Molybdenum, dissolved (µg/L)	Nickel, dissolved (mg/L)	Selenium, dissolved (µg/L)	Strontium, dissolved (µL)	Zinc, dissolved (mg/L)	Cyanide total (mg/L)
410925079292801 Seep 3 (LAT 41°09'25" N. LONG 079°29'28" W.)--Continued										
MAY 10, 1989	7	<10	36	<1	<70	0.81	<30	840	1.1	<0.001
MAY 10, 1989	7.5	<4	35	<1	<70	1.2	<30	850	1.2	<.001
JUNE 14, 1989	2.8	<4	26	<1	<70	.94	<30	770	1.4	<.001
JULY 11, 1989	5.8	<4	31	<1	<70	.66	<30	850	.94	<.001
AUG 09, 1989	10	<4	40	<1	<70	.72	<30	910	.90	<.001
SEPT 12, 1989	14	<4	37	<1	<70	.66	<30	860	.93	<.001
OCT 17, 1989	13	<10	33	<1	<70	.60	<30	690	.87	<.001
OCT 17, 1989	14	<10	33	<1	<70	.58	<30	690	.79	<.001
410925079292701 Seep 4 (LAT 41°09'25" N. LONG 079°29'27" W.)										
MAR 11, 1987	22	<4	19	<1	<70	<.02	<30	930	.28	<.001
JUNE 03, 1987	20	<4	22	<1	<70	.39	<30	1,100	.31	<.001
SEPT 16, 1987	24	<20	17	<1	<70	.42	<30	1,000	.32	<.001
DEC 15, 1987	29	<10	16	<1	<300	.31	<30	1,000	.26	<.001
MAR 16, 1988	30	<4	22	<1	<70	.05	<30	1,000	<.01	<.001
APR 12, 1988	29	<10	22	<1	<300	.28	<30	1,000	.26	<.001
APR 12, 1988	33	<10	18	<1	<70	.27	<30	1,000	.18	<.001
MAY 10, 1988	29	<10	22	<1	<70	.35	<30	1,100	.29	<.001
JUNE 07, 1988	32	<10	21	<1	<70	.33	<30	930	.22	<.001
JULY 11, 1988	30	<20	20	<1	<300	.25	<30	970	.25	<.001
AUG 09, 1988	30	<20	20	<1	<70	.36	<30	1,000	.32	<.001
SEPT 21, 1988	32	<40	20	<1	<70	.30	<30	990	.30	<.001
DEC 20, 1988	39	<4	28	<1	<70	.24	<30	1,000	.34	<.001
JAN 10, 1989	39	<40	24	<1	<70	.24	<30	1,000	.32	<.001
JAN 10, 1989	46	<40	28	<1	<70	.24	<30	1,000	.32	<.001
FEB 15, 1989	40	<40	24	<1	<70	.26	<30	1,000	.24	<.001
MAR 14, 1989	40	<20	27	<1	<70	.29	<30	1,000	.34	<.001
APR 12, 1989	36	<4	32	<1	<70	.36	<30	1,000	.38	<.001
MAY 10, 1989	32	<10	28	<1	<70	.36	<30	970	.39	<.001
JUNE 14, 1989	32	<4	28	<1	<70	.66	<30	900	.54	<.001
JULY 11, 1989	23	<4	45	<1	<70	.76	<30	880	.94	<.001
JULY 11, 1989	24	<4	44	<1	<70	.80	<30	880	1	<.001
AUG 09, 1989	20	<10	30	<1	<70	.46	<30	950	.53	<.001
SEPT 12, 1989	19	<20	25	<1	<70	.35	<30	970	.46	<.001
SEPT 12, 1989	18	<20	24	<1	<70	.33	<30	970	.43	<.001
OCT 17, 1989	18	<10	21	<1	<70	.27	<30	790	.39	<.001
NOV 07, 1989	19	<4	18	<1	<70	.24	<30	840	.33	<.001
410926079292401 Seep 16 (LAT 41°09'26" N. LONG 079°29'24" W.)										
SEPT 11, 1986	--	<50	54	<1	<70	<.02	<30	770	.52	<.001
SEPT 11, 1986	--	<50	52	<1	<70	<.02	<30	790	.40	<.001
OCT 09, 1986	65	370	60	<1	<70	1.1	<15	870	1.2	<.001
NOV 04, 1986	76	<4	63	<1	<70	1.2	<15	760	1.4	<.001
DEC 10, 1986	59	<4	64	<1	<70	1.2	<30	840	1.2	<.001
JAN 07, 1987	65	<4	--	<1	<70	--	<7.5	830	--	<.001
FEB 12, 1987	73	<4	59	<1	<70	.49	<30	820	.84	<.001
MAR 11, 1987	63	<4	43	<1	<70	.56	<30	770	1.1	<.001
APR 14, 1987	56	7.2	40	<1	<70	.36	<60	740	.69	<.001
MAY 05, 1987	50	<4	47	<1	<70	.92	<60	870	.97	<.001
MAY 05, 1987	50	<4	44	<1	<70	.89	<60	810	.54	<.001
JUNE 02, 1987	48	<4	46	<1	<70	.86	<30	1,100	.43	<.001
JULY 09, 1987	51	<4	44	<1	<70	.59	<60	800	.76	<.001
AUG 12, 1987	56	<4	38	<1	<70	.67	<30	800	.11	<.001
SEPT 16, 1987	48	<20	43	<1	<70	.56	<30	760	.80	<.001
OCT 07, 1987	51	<10	40	<1	<70	.82	<30	830	.73	<.001

Appendix 2.--Water-quality data for urban sewage sludge site, June 1986 through November 1989--Continued

Date	Time	Water table altitude (ft above sea level)	Streamflow/ discharge, instan-taneous (ft^3/s)	Specific conduc-tance (µS/cm)	pH, field (units)	pH, lab (units)	Oxidation reduction potential (mV)	Water temper-ature (°C)	Oxygen, dissolved (mg/L)	Acidity total heated (mg/L as $CaCO_3$)	Acidity mineral (methyl orange) (mg/L as $CaCO_3$)	Calcium, dissolved (mg/L)
410926079292401 Seep 16 (LAT 41°09'26" N. LONG 079°29'24" W.)--Continued												
NOV 18, 1987	1345	--	0.16	3,200	5.3	5.6	--	12.0	--	170	--	340
DEC 15, 1987	1200	--	.07	3,300	5.2	5.7	--	11.5	--	140	--	330
JAN 12, 1988	1500	--	.07	3,100	5.1	6.0	--	10.5	--	120	--	350
FEB 09, 1988	1145	--	.02	2,550	--	5.8	--	10.5	--	98	--	340
MAR 15, 1988	1415	--	.10	2,800	5.2	5.7	--	10.0	--	110	--	230
APR 12, 1988	1110	--	.17	2,850	5.3	5.9	--	12.0	--	110	--	360
MAY 10, 1988	0005	--	.31	3,000	5.4	5.9	--	14.0	--	86	--	340
MAY 10, 1988	1200	--	.31	3,000	5.4	5.8	--	14.0	--	86	--	340
JUNE 08, 1988	1600	--	.06	2,880	5.3	5.7	--	20.0	--	96	--	390
JULY 11, 1988	1100	--	.10	2,980	5.4	6.0	--	16.0	--	110	--	370
AUG 09, 1988	0005	--	.05	2,910	5.4	5.9	--	13.5	--	100	--	430
AUG 09, 1988	0945	--	.05	2,880	5.4	6.1	--	13.5	--	80	--	450
SEPT 21, 1988	1020	--	.03	2,960	5.4	5.9	--	13.0	--	90	--	360
OCT 18, 1988	1310	--	.04	2,780	5.4	5.9	370	12.0	0.30	130	--	330
NOV 17, 1988	1045	--	.04	2,920	5.6	5.9	--	11.5	--	50	--	320
DEC 20, 1988	1600	--	.03	2,440	2.9	5.9	--	12.0	--	74	--	400
JAN 10, 1989	1425	--	.02	2,560	5.6	6.1	--	10.0	--	30	--	390
FEB 14, 1989	0005	--	.17	2,820	5.6	6.0	--	10.0	--	48	--	410
FEB 14, 1989	1700	--	.17	2,730	5.6	6.0	--	10.0	--	54	--	330
MAR 13, 1989	1620	--	.07	2,300	5.5	6.0	--	12.0	--	88	--	360
APR 12, 1989	1400	--	.01	2,400	5.2	5.7	--	11.5	--	74	--	380
MAY 09, 1989	1720	--	.03	2,550	5.2	6.5	--	11.5	--	0	--	380
JUNE 15, 1989	0005	--	--	2,450	5.5	6.2	--	13.0	--	80	--	300
JUNE 15, 1989	1615	--	--	2,320	5.5	6.2	--	13.0	--	78	--	360
JULY 10, 1989	1620	--	.03	2,870	4.7	5.3	--	19.0	--	150	--	380
AUG 08, 1989	1640	--	.05	2,810	5.1	5.4	--	13.0	--	130	--	410
SEPT 11, 1989	1720	--	.02	2,600	4.7	5.3	--	15.0	--	160	--	380
OCT 17, 1989	1440	--	.04	2,870	5.1	5.5	--	13.0	--	170	--	380
NOV 07, 1989	1300	--	.14	2,660	4.9	5.6	--	11.5	--	140	--	530
410925079292301 Seep 16A (LAT 41°09'25" N. LONG 079°29'23" W.)												
SEPT 11, 1986	1100	--	--	3,500	3.5	3.6	--	14.0	--	400	28	370
DEC 10, 1986	1030	--	--	4,050	3.6	3.5	--	11.5	--	510	48	290
MAR 11, 1987	1130	--	--	3,300	3.5	3.5	--	8.5	--	450	40	280
JUNE 02, 1987	1630	--	--	3,640	3.6	3.6	--	17.0	--	250	30	300
SEPT 16, 1987	0005	--	.00	3,400	3.5	3.5	--	15.5	--	340	42	320
SEPT 16, 1987	1345	--	.00	3,450	3.5	3.5	--	15.5	--	300	68	320
DEC 15, 1987	1200	--	.01	3,250	3.4	3.5	--	10.0	--	230	32	230
MAR 15, 1988	0005	--	--	3,180	3.2	3.4	--	8.0	--	360	50	230
MAR 15, 1988	1445	--	.01	3,200	3.2	3.4	--	8.0	--	370	52	230
APR 12, 1988	1100	--	.01	3,050	3.4	3.4	--	12.0	--	380	42	300
MAY 10, 1988	1205	--	.01	3,300	3.4	3.5	--	15.0	--	340	42	330
JUNE 08, 1988	1600	--	.01	3,120	3.5	3.5	--	18.0	--	340	40	380
JULY 11, 1988	0005	--	.01	3,250	3.6	3.5	--	15.5	--	310	40	410
JULY 11, 1988	1110	--	.01	3,260	3.6	3.5	--	15.5	--	310	52	370
AUG 09, 1988	0940	--	--	3,240	3.4	3.4	--	16.5	--	250	40	410
SEPT 21, 1988	1015	--	.00	3,170	3.4	3.5	--	14.0	--	220	42	340
JAN 10, 1989	1420	--	--	2,900	3.5	3.4	--	7.5	--	290	40	340
FEB 14, 1989	1705	--	--	3,110	3.4	3.4	--	8.5	--	290	66	340
MAR 13, 1989	1630	--	.01	2,700	3.5	3.4	--	10.5	--	350	68	340
APR 12, 1989	0005	--	--	2,900	3.4	3.4	--	11.5	--	380	46	390
APR 12, 1989	1405	--	--	2,900	3.4	3.4	--	11.5	--	370	30	400
MAY 09, 1989	1725	--	--	3,000	3.4	3.5	--	11.0	--	320	44	370
JUNE 15, 1989	1630	--	--	2,930	3.4	3.5	--	12.0	--	360	38	390
JULY 10, 1989	1625	--	--	3,130	3.7	3.5	--	20.0	--	390	44	380

Date	Magnesium, dissolved (mg/L)	Sodium, dissolved (mg/L)	Potassium, dissolved (mg/L)	Alkalinity water lab (mg/L as $CaCO_3$)	Sulfide total (mg/L as S)	Sulfate, dissolved (mg/L as SO_4)	Chloride, dissolved (mg/L)	Silica, dissolved (mg/L as SiO_2)	Solids, residue at 105 °C, dissolved (mg/L)	Nitrogen, nitrate total (mg/L as N)	Nitrogen, nitrite total (mg/L as N)
410926079292401 Seep 16 (LAT 41°09'26" N. LONG 079°29'24" W.)--Continued											
NOV 18, 1987	340	8.5	8.1	62	–	1,900	3	9.6	3,480	<0.04	<0.004
DEC 15, 1987	330	9.6	6.9	70	–	1,600	3	9.1	3,620	<.04	<.004
JAN 12, 1988	300	9.7	7	92	–	2,200	2	12	3,920	<.04	<.004
FEB 09, 1988	330	7.8	8.1	74	–	2,500	2	11	3,790	<.04	<.004
MAR 15, 1988	330	9.2	8	76	–	2,600	2	9.7	4,090	<.04	<.004
APR 12, 1988	360	8.6	7.9	74	–	2,500	3	12	4,080	.06	<.004
MAY 10, 1988	360	6.7	8.1	74	–	2,200	2	11	3,770	<.04	<.004
MAY 10, 1988	360	8	8.2	74	–	2,500	2	10	4,370	<.04	<.004
JUNE 08, 1988	340	7.4	7.6	80	–	2,000	3	11	4,810	<.04	<.004
JULY 11, 1988	350	6.8	7.7	74	–	2,100	2	9.2	4,770	<.04	<.004
AUG 09, 1988	370	7.4	7.6	82	0.24	2,700	3	8.4	3,780	<.04	<.004
AUG 09, 1988	390	7	7.3	78	.24	2,700	3	8.5	4,240	<.04	<.004
SEPT 21, 1988	330	7.9	7.6	88	.60	2,400	3	8.3	4,600	<.04	<.004
OCT 18, 1988	370	8.1	7.4	90	<.20	2,400	2	7.8	4,080	<.04	<.004
NOV 17, 1988	310	8.3	7.3	94	.37	2,600	2	4.8	3,770	<.04	<.004
DEC 20, 1988	360	8.8	7.7	100	.24	2,400	3	7.6	3,470	.12	<.004
JAN 10, 1989	360	8.8	7.9	–	<.20	2,600	2	6.6	3,920	<.04	<.004
FEB 14, 1989	390	9.8	7.9	110	<.20	2,700	4	7.3	3,920	<.04	<.004
FEB 14, 1989	330	7.4	8	100	<.20	2,300	4	7.6	3,690	<.04	<.004
MAR 13, 1989	340	8.1	8	–	.48	2,300	3	8.7	3,300	.04	<.004
APR 12, 1989	350	8.1	8	78	<.20	2,700	3	12	–	<.04	<.004
MAY 09, 1989	350	8.8	8	72	<.20	2,400	2	13	6,270	<.04	<.004
JUNE 15, 1989	280	6.8	7.5	32	.20	2,100	2	15	3,480	<.04	<.004
JUNE 15, 1989	300	5.7	7.7	–	<.20	2,200	3	11	3,380	<.04	<.004
JULY 10, 1989	340	7.8	8.5	28	<.20	2,600	3	15	4,370	.04	<.004
AUG 08, 1989	400	9	7.7	40	<.20	2,300	3	13	4,770	<.04	<.004
SEPT 11, 1989	370	10	7.4	44	<.20	2,400	3	15	4,670	<.04	<.004
OCT 17, 1989	350	8.9	7.4	42	.32	2,600	3	18	4,120	<.04	<.004
NOV 07, 1989	490	9.6	7.7	42	<.20	2,500	3	11	3,720	<.04	<.004
410925079292301 Seep 16A (LAT 41°09'25" N. LONG 079°29'23" W.)											
SEPT 11, 1986	400	2.2	6.1	0	–	3,000	3	–	4,440	<.02	<.004
DEC 10, 1986	440	5.5	6.3	0	–	2,400	2	–	5,500	.04	.004
MAR 11, 1987	320	4.1	5.8	0	–	2,500	2	–	3,870	<.04	<.002
JUNE 02, 1987	350	4.9	7.1	0	–	2,300	3	18	4,240	<.04	<.004
SEPT 16, 1987	360	6.6	6.6	–	–	2,300	3	23	4,430	<.04	<.004
SEPT 16, 1987	270	6.9	6.7	–	–	2,400	3	24	3,880	<.04	<.004
DEC 15, 1987	240	5.3	6.3	–	–	2,000	2	23	3,460	<.04	<.004
MAR 15, 1988	280	6.3	7.4	–	–	3,000	2	23	4,690	<.04	<.004
MAR 15, 1988	280	6.8	7.4	–	–	2,800	2	22	4,240	<.04	<.004
APR 12, 1988	310	6.1	7.2	–	–	2,800	3	26	4,300	<.04	<.004
MAY 10, 1988	380	6.6	7.5	–	–	2,300	2	21	4,540	<.04	<.004
JUNE 08, 1988	390	7.2	7	–	–	2,800	3	22	5,460	<.04	<.004
JULY 11, 1988	440	6.7	7.1	–	–	2,000	2	18	5,580	<.04	<.004
JULY 11, 1988	400	5.7	6.9	–	–	2,400	2	17	4,840	<.04	<.004
AUG 09, 1988	380	7	6.5	–	<.20	2,800	3	13	4,500	<.04	<.004
SEPT 21, 1988	340	7.2	6.8	–	<.20	2,600	3	16	4,610	<.04	<.004
JAN 10, 1989	330	6.9	6.5	–	.24	2,500	2	24	4,120	.06	<.004
FEB 14, 1989	360	6.4	6.6	–	<.20	2,700	3	21	3,890	.04	<.004
MAR 13, 1989	400	6.9	7.2	–	.40	2,800	2	18	4,880	<.04	<.004
APR 12, 1989	410	6.9	7.8	–	<.20	3,300	3	18	–	<.04	<.004
APR 12, 1989	430	7.6	7.6	–	<.20	3,200	3	20	–	<.04	<.004
MAY 09, 1989	430	7.4	7.3	–	.24	3,200	2	21	6,370	<.04	<.004
JUNE 15, 1989	360	5.7	6.8	–	<.20	2,700	3	29	5,240	<.04	<.004
JULY 10, 1989	380	6.7	7.2	–	<.20	3,000	3	23	4,780	.04	<.004

Appendix 2.–Water-quality data for urban sewage sludge site, June 1986 through November 1989–Continued

Date	Nitrogen, ammonia total (mg/L as N)	Nitrogen, ammonia + organic total (mg/L as N)	Phos-phorus total (mg/L as P)	Aluminum, dissolved (mg/L)	Arsenic, dissolved (µg/L)	Barium, dissolved (µg/L)	Boron, dissolved (µg/L)	Cadmium, dissolved (µg/L)	Chromium, dissolved (µg/L)	Copper, dissolved (µg/L)	Iron, dissolved (mg/L)
410926079292401 Seep 16 (LAT 41°09'26" N. LONG 079°29'24" W.)–Continued											
NOV 18, 1987	0.38	0.91	0.02	1.5	<4	<10	<250	<0.50	<50	<10	52
DEC 15, 1987	.40	1.1	.02	1.2	<4	31	<250	<.20	<50	<10	45
JAN 12, 1988	.48	.85	.02	<.14	<4	<10	<250	<.50	<50	<10	53
FEB 09, 1988	.42	.72	.02	1.2	<4	<10	<250	<.50	<50	<10	56
MAR 15, 1988	.46	.96	<.02	1.2	<4	15	<250	.21	<50	<10	47
APR 12, 1988	.37	.90	.04	1.1	<4	35	<250	.21	<50	12	46
MAY 10, 1988	.69	.84	.02	1	<10	<10	<250	.55	<50	<10	45
MAY 10, 1988	.63	.79	.02	1.1	<4	<10	<250	<.50	<50	<10	46
JUNE 08, 1988	.44	1.1	.02	1.1	<4	<10	<250	.24	<50	<10	41
JULY 11, 1988	.54	1.3	.02	1.2	<20	<10	<250	<.50	120	<10	44
AUG 09, 1988	.48	1.2	.03	1.1	<20	<10	<250	.42	<50	<10	56
AUG 09, 1988	.49	1.3	.03	1	<20	<10	<250	.28	<50	<10	53
SEPT 21, 1988	.50	1.1	.04	1.1	<4	20	<250	<.20	<50	34	48
OCT 18, 1988	.48	1.2	.02	1.2	<4	<10	<250	.36	<50	38	56
NOV 17, 1988	.54	.92	<.02	1.1	<4	<10	<250	.25	<50	27	48
DEC 20, 1988	.51	.55	.05	1.2	<4	<10	<250	.76	<50	30	56
JAN 10, 1989	.66	.63	.02	1.1	<4	<10	<250	<.20	<50	39	52
FEB 14, 1989	.46	.79	.02	.89	4.1	<10	<250	<.20	<50	31	50
FEB 14, 1989	.50	.99	.03	.90	<4	<10	<250	<.20	<50	37	49
MAR 13, 1989	.46	.65	.03	.80	<4	<10	<250	<.20	<50	27	39
APR 12, 1989	.39	.63	.02	1.8	<4	10	<250	1.8	<50	35	35
MAY 09, 1989	.38	.74	.04	1.5	<4	<10	<250	.40	<50	22	41
JUNE 15, 1989	.35	.52	.02	.88	<4	11	<250	.80	<50	22	12
JUNE 15, 1989	.35	.55	.02	1.2	<4	<10	<250	.66	<50	26	18
JULY 10, 1989	.48	.73	.02	6.8	<4	<10	<250	.96	<50	33	28
AUG 08, 1989	.39	.83	.05	4.2	<4	<10	<250	.39	<50	25	35
SEPT 11, 1989	.47	.90	.02	4.7	<4	<10	<250	.51	<50	13	40
OCT 17, 1989	.49	<1	.04	3.8	<4	<10	<250	.41	<50	27	39
NOV 07, 1989	.47	<1	.03	4.2	<4	<10	<250	<.20	<50	35	72
410925079292301 Seep 16A (LAT 41°09'25" N. LONG 079°29'23" W.)											
SEPT 11, 1986	.72	1.6	--	21	18	<10	<250	2.9	<50	<10	42
DEC 10, 1986	.63	.98	--	46	34	13	<250	8.6	150	58	35
MAR 11, 1987	.50	1.6	--	16	10	<10	<250	2.6	<50	<10	40
JUNE 02, 1987	.45	1.4	.05	19	<4	<10	<250	2.6	<50	<10	43
SEPT 16, 1987	.46	.96	.03	26	17	16	<250	2.4	<50	<10	46
SEPT 16, 1987	.46	1.3	.03	26	17	<10	<250	2.4	<50	<10	36
DEC 15, 1987	.43	.96	.02	16	17	<10	<250	1.6	<50	<10	9.6
MAR 15, 1988	.57	.98	<.02	34	22	24	<250	2.7	<50	<10	48
MAR 15, 1988	.51	1.2	.02	39	22	<10	<250	2.6	<50	18	50
APR 12, 1988	.50	.97	.02	43	20	11	<250	2.9	<50	<10	42
MAY 10, 1988	.81	1	.02	29	<5	<10	<250	2.4	<50	<10	46
JUNE 08, 1988	.66	1.4	.02	24	<20	<10	<250	3.1	<50	<10	58
JULY 11, 1988	.63	1.2	.02	32	<20	<10	<250	2.3	<50	<10	61
JULY 11, 1988	.63	1.2	.02	18	<20	<10	<250	.41	130	<10	45
AUG 09, 1988	.78	1.5	.04	22	<20	<10	<250	2.1	<50	<10	34
SEPT 21, 1988	.49	1.2	.04	16	<4	<10	<250	2.6	<50	<10	17
JAN 10, 1989	.63	.63	.02	41	<4	<10	<250	4.8	<50	73	2.3
FEB 14, 1989	.54	.84	.05	28	<4	<10	<250	3.2	<50	52	27
MAR 13, 1989	.57	.75	.02	21	<4	<10	<250	<.20	<50	39	37
APR 12, 1989	.56	.81	.02	35	<4	<10	<250	4.2	<50	51	46
APR 12, 1989	.56	.92	.02	35	<4	<10	--	5.1	<50	44	46
MAY 09, 1989	.52	.92	.04	30	<4	<10	<250	4	<50	35	48
JUNE 15, 1989	.56	.77	.02	36	<4	12	<250	3.3	<50	47	48
JULY 10, 1989	.69	1.1	.02	37	<4	<10	<250	4.6	<50	45	32

Date	Iron, ferrous dissolved (mg/L)	Lead, dissolved (µg/L)	Manganese, dissolved (mg/L)	Mercury, dissolved µg/l)	Molybdenum, dissolved (µg/L)	Nickel, dissolved (mg/L)	Selenium, dissolved (µg/L)	Strontium, dissolved (µL)	Zinc, dissolved (mg/L)	Cyanide total (mg/L)
410926079292401 Seep 16 (LAT 41°09'26" N. LONG 079°29'24" W.)--Continued										
NOV 18, 1987	55	<10	41	<1	<70	0.90	<30	810	0.58	<0.001
DEC 15, 1987	58	<10	34	<1	<300	.49	<30	800	.54	<.001
JAN 12, 1988	52	<10	42	<1	<70	.53	<30	780	.49	<.001
FEB 09, 1988	48	<10	41	<1	<70	.62	<30	810	.52	<.001
MAR 15, 1988	59	<10	25	<1	<70	.58	<30	850	.64	<.001
APR 12, 1988	44	<10	41	<1	<70	.49	<30	880	.45	<.001
MAY 10, 1988	48	<10	41	<1	<70	.64	<30	960	.61	<.001
MAY 10, 1988	47	<10	40	<1	<70	.58	<30	950	.48	<.001
JUNE 08, 1988	43	<4	39	<1	<70	.58	<30	760	.52	<.001
JULY 11, 1988	50	<4	40	<1	<300	.52	<30	870	.51	<.001
AUG 09, 1988	48	<20	39	<1	<70	.59	<30	850	.58	<.001
AUG 09, 1988	50	<20	45	<1	<70	.56	<30	860	.56	<.001
SEPT 21, 1988	53	<40	38	<1	<70	.41	<30	810	.48	<.001
OCT 18, 1988	56	<40	36	<1	<70	.40	<30	840	.57	<.001
NOV 17, 1988	60	<20	37	<1	<70	.32	<30	880	.46	<.001
DEC 20, 1988	60	<4	42	<1	<70	.38	<30	820	.53	<.001
JAN 10, 1989	53	<40	42	<1	<70	.44	<30	820	.50	<.001
FEB 14, 1989	50	<40	42	<1	<70	.36	<30	830	.47	<.001
FEB 14, 1989	50	<40	39	<1	<70	.35	<30	810	.42	<.001
MAR 13, 1989	46	<4	36	<1	<70	.32	<30	880	.36	<.001
APR 12, 1989	36	<4	41	<1	<70	.56	<30	830	.52	<.001
MAY 09, 1989	47	<10	48	<1	<70	.52	<30	920	.51	<.001
JUNE 15, 1989	21	<20	36	<1	<70	.62	<30	740	.55	<.001
JUNE 15, 1989	22	<4	35	<1	<70	.57	<30	730	.57	<.001
JULY 10, 1989	28	<4	48	<1	<70	1.5	<30	910	1.6	<.001
AUG 08, 1989	40	<10	55	<1	<70	.67	<30	900	.67	<.001
SEPT 11, 1989	45	<4	46	<1	<70	.67	<30	900	.66	<.001
OCT 17, 1989	52	<10	43	<1	<70	.60	<30	700	.56	<.001
NOV 07, 1989	50	<4	63	<1	<70	.61	<30	770	.65	<.001
410925079292301 Seep 16A (LAT 41°09'25" N. LONG 079°29'23" W.)										
SEPT 11, 1986	38	<50	68	<1	<70	.46	<30	770	1.6	<.001
DEC 10, 1986	21	<4	87	<1	<70	2.1	<30	800	3.3	<.001
MAR 11, 1987	38	<4	54	<1	<70	1	<30	710	1.9	<.001
JUNE 02, 1987	29	4.1	63	<1	<70	1.3	<30	910	1.5	<.001
SEPT 16, 1987	28	<20	69	<1	<70	1.2	<30	690	1.9	<.001
SEPT 16, 1987	28	<20	73	<1	<70	1.3	<30	730	2	<.001
DEC 15, 1987	8	<10	37	<1	<70	.45	<30	690	1	<.001
MAR 15, 1988	37	<10	74	<1	<70	1.3	<30	820	1.8	<.001
MAR 15, 1988	36	<10	76	<1	390	1.3	<30	790	1.2	<.001
APR 12, 1988	40	<10	53	<1	<70	1.3	<30	840	2	<.001
MAY 10, 1988	43	<10	63	<1	<70	1.4	<30	870	2.2	<.001
JUNE 08, 1988	46	<4	67	<1	<70	1.3	<30	750	2.1	<.001
JULY 11, 1988	36	<20	72	<1	<70	1.1	<30	800	1.9	<.001
JULY 11, 1988	38	<20	61	<1	<300	1	<30	820	1.7	<.001
AUG 09, 1988	24	<20	59	<1	<70	1.1	<30	820	1.8	<.001
SEPT 21, 1988	8	<40	51	<1	<70	.85	<30	780	1.5	<.001
JAN 10, 1989	.60	<4	52	<1	<70	1.1	<30	750	2.8	<.001
FEB 14, 1989	8.1	<40	60	<1	<70	.92	<30	800	2	<.001
MAR 13, 1989	28	<4	58	<1	<70	.90	<30	850	1.7	<.001
APR 12, 1989	34	<4	72	<1	<70	1.6	<30	850	2.8	<.001
APR 12, 1989	34	<4	75	<1	<70	1.7	<30	830	2.5	<.001
MAY 09, 1989	41	<10	73	<1	<70	1.3	<30	880	1.8	<.001
JUNE 15, 1989	32	<4	67	<1	<70	1.3	<30	710	2.3	<.001
JULY 10, 1989	21	<4	74	<1	<70	1.5	<30	790	2.6	<.001

Appendix 2.--Water-quality data for urban sewage sludge site, June 1986 through November 1989--Continued

Date	Time	Water table altitude (ft above sea level)	Streamflow/ discharge, instan-taneous (ft^3/s)	Specific conduc-tance (µS/cm)	pH, field (units)	pH, lab (units)	Oxidation reduction potential (mV)	Water temper-ature (°C)	Oxygen, dissolved (mg/L)	Acidity total heated (mg/L as $CaCO_3$)	Acidity mineral (methyl orange) (mg/L as $CaCO_3$)	Calcium, dissolved (mg/L)
410925079292301 Seep 16A (LAT 41°09'25" N. LONG 079°29'23" W.)--Continued												
AUG 08, 1989	0005	--	--	3,060	3.5	3.6	--	13.0	--	310	36	390
AUG 08, 1989	1645	--	--	3,020	3.5	3.6	--	13.0	--	310	34	400
SEPT 11, 1989	1725	--	--	2,850	3.2	3.5	--	14.5	--	290	32	350
OCT 17, 1989	1435	--	--	3,200	3.4	3.5	--	13.0	--	240	36	350
NOV 07, 1989	1305	--	--	2,720	3.4	3.5	--	12.0	--	240	36	440
410903079294301 Seep 17.0 (LAT 41°09'03" N. LONG 079°29'43" W.)												
SEPT 08, 1986	1400	--	--	2,500	3.6	3.3	--	12.5	--	550	120	170
DEC 09, 1986	1045	--	0.08	559	5.9	5.1	--	6.0	--	28	--	63
MAR 10, 1987	1005	--	.01	2,600	3.6	3.5	--	6.5	--	530	34	190
JUNE 03, 1987	0005	--	--	2,040	3.4	3.5	--	14.0	--	340	30	140
JUNE 03, 1987	0830	--	--	2,030	3.4	3.6	--	14.0	--	410	38	130
SEPT 16, 1987	1015	--	.01	2,050	3.3	3.4	--	14.0	--	590	44	140
DEC 15, 1987	0845	--	.03	515	4.3	4.7	--	2.5	--	38	--	51
MAR 15, 1988	0005	--	.01	1,770	3.5	3.5	--	6.0	--	440	22	100
MAR 15, 1988	1100	--	.01	1,770	3.5	3.5	--	6.0	--	450	22	96
APR 12, 1988	0830	--	.01	1,800	3.4	3.5	--	8.0	--	500	26	170
MAY 09, 1988	1500	--	.01	2,150	3.4	3.5	--	11.0	--	550	34	160
JUNE 07, 1988	1415	--	.01	2,030	3.4	3.4	--	12.0	--	560	32	200
JULY 11, 1988	0005	--	.00	2,440	3.5	3.4	--	14.0	--	700	68	240
JULY 12, 1988	1530	--	.00	2,350	3.5	3.4	--	14.0	--	700	44	230
AUG 08, 1988	1540	--	--	2,660	3.3	3.4	--	16.5	--	730	38	300
SEPT 21, 1988	0855	--	--	2,590	3.2	3.4	--	14.0	--	740	36	290
OCT 18, 1988	0830	--	.00	2,460	3.3	3.4	--	12.5	--	850	50	250
NOV 16, 1988	1245	--	--	2,240	3.3	3.5	--	12.0	--	690	68	240
DEC 20, 1988	0005	--	--	2,170	3.5	3.5	--	10.5	--	880	44	240
DEC 20, 1988	1430	--	--	2,090	3.5	3.5	--	10.5	--	900	40	250
JAN 09, 1989	1640	--	--	2,220	3.7	2.3	--	9.5	--	610	26	240
FEB 14, 1989	1540	--	--	2,160	3.4	3.5	--	7.5	--	640	36	250
MAR 13, 1989	1530	--	--	1,860	3.6	3.5	--	8.0	--	580	52	220
APR 10, 1989	0005	--	--	1,650	3.5	3.4	--	7.0	--	470	30	190
APR 10, 1989	1415	--	--	1,610	3.5	3.4	--	7.0	--	470	30	160
MAY 09, 1989	1605	--	--	1,950	3.5	3.4	--	8.0	--	610	34	200
JUNE 15, 1989	0845	--	.09	335	3.4	4.5	--	16.5	--	18	--	53
JULY 10, 1989	1515	--	--	2,110	3.1	3.4	--	14.0	--	510	40	190
AUG 08, 1989	0005	--	--	2,360	3.3	3.4	--	13.5	--	700	46	220
AUG 08, 1989	1510	--	--	2,410	3.3	3.4	--	13.5	--	700	44	230
SEPT 11, 1989	1705	--	--	2,300	3.2	3.3	--	14.5	--	810	44	240
OCT 16, 1989	1415	--	--	2,450	3.2	3.4	--	14.0	--	720	38	240
NOV 07, 1989	0005	--	--	2,390	3.4	3.4	--	12.5	--	740	40	290
NOV 07, 1989	1325	--	--	2,230	3.4	3.4	--	12.5	--	740	38	300
410901079293401 Lysimeter 1 (LAT 41°09'01" N. LONG 079°29'34" W.)												
OCT 09, 1986	1120	--	--	--	--	--	--	--	--	--	--	170
NOV 05, 1986	1800	--	--	--	4.9	--	--	10.0	--	--	--	88
DEC 11, 1986	1000	--	--	654	--	5.5	--	--	--	18	--	97
JAN 06, 1987	1645	--	--	335	--	6.0	--	--	--	20.0	--	46
FEB 13, 1987	1200	--	--	280	--	--	--	--	--	--	--	42
MAR 11, 1987	1700	--	--	310	--	6.4	--	4.5	--	0	--	50
APR 14, 1987	0810	--	--	368	6.1	6.5	--	8.0	--	0	--	37
MAY 05, 1987	0800	--	--	315	6.1	6.3	--	10.0	--	120	--	45
JUNE 02, 1987	0800	--	--	--	6.0	--	--	19.0	--	0	--	33
JULY 06, 1987	1500	--	--	--	--	--	--	--	--	--	--	38
AUG 11, 1987	1425	--	--	--	--	--	--	--	--	--	--	41
SEPT 14, 1987	1200	--	--	470	5.0	6.0	--	21.0	--	24	--	65

Appendix 2.--Water-quality data for urban sewage sludge site, June 1986 through November 1989--Continued

Date	Magnesium, dissolved (mg/L)	Sodium, dissolved (mg/L)	Potassium, dissolved (mg/L)	Alkalinity water lab (mg/L as $CaCO_3$)	Sulfide total (mg/L as S)	Sulfate, dissolved (mg/L as SO_4)	Chloride, dissolved (mg/L)	Silica, dissolved (mg/L as SiO_2)	Solids, residue at 105 °C, dissolved (mg/L)	Nitrogen, nitrate total (mg/L as N)	Nitrogen, nitrite total (mg/L as N)
410925079292301 Seep 16A (LAT 41°09'25" N. LONG 079°29'23" W.)--Continued											
AUG 08, 1989	380	8.1	7.2	--	<0.20	2,400	4	19	5,620	<0.04	<0.004
AUG 08, 1989	430	8.4	6.8	--	<.20	2,300	3	20	5,960	<.04	<.004
SEPT 11, 1989	350	9	6.7	--	<.20	2,600	3	20	4,580	<.04	<.004
OCT 17, 1989	310	6.8	6.7	0	.24	2,700	3	22	4,440	<.04	<.004
NOV 07, 1989	430	9.7	7.2	0	<.20	2,700	3	17	3,780	<.04	<.004
410903079294301 Seep 17 (LAT 41°09'03" N. LONG 079°29'43" W.)											
SEPT 08, 1986	150	46	8.7	0	--	1,600	6	--	2,660	<.02	<.004
DEC 09, 1986	21	1.3	2.1	10	--	280	.7	--	578	.22	<.004
MAR 10, 1987	180	11	4	0	--	1,500	2	--	2,750	<.04	<.002
JUNE 03, 1987	130	4.6	5.1	--	--	1,100	3	40	2,040	.12	<.004
JUNE 03, 1987	120	4.9	4.7	0	--	990	2	41	2,050	.16	<.004
SEPT 16, 1987	140	6.4	5.8	--	--	1,300	3	51	2,350	<.04	<.004
DEC 15, 1987	17	.84	5.2	8	--	230	6	5.5	470	.16	.004
MAR 15, 1988	90	3.2	4.7	--	--	1,400	4	45	2,410	<.04	<.004
MAR 15, 1988	89	3.2	4.7	--	--	1,400	4	43	2,740	<.04	<.004
APR 12, 1988	140	3.4	5.4	--	--	1,300	4	52	2,490	<.04	<.004
MAY 09, 1988	180	3.7	5.4	--	--	1,700	2	54	2,790	<.04	<.004
JUNE 07, 1988	170	2.8	6.2	--	--	1,400	3	52	2,570	<.04	.010
JULY 11, 1988	210	3.2	5.9	--	--	1,700	2	57	4,500	<.04	<.004
JULY 12, 1988	200	3.4	6.1	--	--	1,800	2	55	3,790	<.04	<.004
AUG 08, 1988	230	3.4	5.9	--	<.20	2,300	3	54	4,430	<.04	<.004
SEPT 21, 1988	230	3.8	6.2	--	1.5	2,300	2	52	3,950	<.04	<.004
OCT 18, 1988	230	3.9	5.9	--	<.20	2,100	2	52	4,100	<.04	<.004
NOV 16, 1988	200	3.9	5.3	--	.21	2,200	3	45	3,440	<.04	<.004
DEC 20, 1988	200	3.9	5.8	--	.64	1,900	3	48	3,080	<.04	<.004
DEC 20, 1988	200	3.9	6	--	.64	2,100	3	50	3,350	<.04	<.004
JAN 09, 1989	190	3.5	5.9	--	<.20	2,000	2	46	2,930	<.04	<.004
FEB 14, 1989	210	3.8	5.2	--	.24	1,800	3	51	3,310	<.04	<.004
MAR 13, 1989	180	3	5	--	.56	1,800	3	46	3,080	<.04	<.004
APR 10, 1989	140	3.5	5.1	--	.22	1,400	3	43	--	<.04	<.004
APR 10, 1989	140	3.2	5	--	.22	1,500	3	42	--	<.04	<.004
MAY 09, 1989	180	3.3	5.1	--	<.20	2,100	2	52	4,260	<.04	<.004
JUNE 15, 1989	18	.56	2.6	--	<.20	190	2	13	396	<.04	<.004
JULY 10, 1989	160	2.8	5.7	--	<.20	1,500	2	49	2,920	.04	<.004
AUG 08, 1989	190	3.1	6	--	.24	1,700	3	59	4,430	<.04	<.004
AUG 08, 1989	200	3.1	5.8	--	.24	2,100	3	60	4,240	<.04	<.004
SEPT 11, 1989	230	3.9	5.8	--	<.20	2,100	2	61	3,940	<.04	<.004
OCT 16, 1989	200	3.3	6.2	0	.24	2,200	2	61	3,180	<.04	<.004
NOV 07, 1989	250	3.3	6.4	0	.32	2,000	3	55	3,100	<.04	<.004
NOV 07, 1989	260	3.3	6.1	0	.32	2,000	3	53	3,030	<.04	<.004
410901079293401 Lysimeter 1 (LAT 41°09'01" N. LONG 079°29'34" W.)											
OCT 09, 1986	40	7.3	38	--	--	--	--	--	--	.89	.010
NOV 05, 1986	17	2.7	20	--	--	--	--	--	--	.86	.012
DEC 11, 1986	16	1.2	7.7	26	--	310	.2	--	580	.30	<.004
JAN 06, 1987	7.2	.55	2.4	46	--	180	<1	--	332	.06	<.004
FEB 13, 1987	5.8	.50	1.9	--	--	140	2	--	250	.08	<.004
MAR 11, 1987	6.6	.68	1.6	70	--	91	<1	--	382	.12	.004
APR 14, 1987	4.8	1	3.2	60	--	130	3	15	2,590	.22	<.004
MAY 05, 1987	5.9	1.2	3.2	56	--	120	3	14	238	.68	<.004
JUNE 02, 1987	4.5	.83	2.8	--	--	92	2	24	--	.62	.004
JULY 06, 1987	5.6	.80	3.3	--	--	--	--	25	--	.57	.006
AUG 11, 1987	5.4	1.1	3.4	--	--	--	--	34	--	.46	<.004
SEPT 14, 1987	8.8	1	4.7	14	--	220	<1	48	530	.18	.004

Appendix 2.--Water-quality data for urban sewage sludge site, June 1986 through November 1989--Continued

Date	Nitrogen, ammonia total (mg/L as N)	Nitrogen, ammonia + organic total (mg/L as N)	Phosphorus total (mg/L as P)	Aluminum, dissolved (mg/L)	Arsenic, dissolved (µg/L)	Barium, dissolved (µg/L)	Boron, dissolved (µg/L)	Cadmium, dissolved (µg/L)	Chromium, dissolved (µg/L)	Copper, dissolved (µg/L)	Iron, dissolved (mg/L)
410925079292301 Seep 16A (LAT 41°09'25" N. LONG 079°29'23" W.)--Continued											
AUG 08, 1989	0.51	1	0.05	22	<4	<10	<250	3.1	<50	32	32
AUG 08, 1989	.50	.89	.05	23	<4	<10	<250	3.1	<50	35	35
SEPT 11, 1989	.52	.90	.02	19	<4	<10	<250	2.4	<50	12	32
OCT 17, 1989	.51	<1	.04	18	<4	<10	<250	1.8	<50	110	26
NOV 07, 1989	.47	<1	.03	17	<4	<10	<250	2.4	<50	35	31
410903079294301 Seep 17 (LAT 41°09'03" N. LONG 079°29'43" W.)											
SEPT 08, 1986	.99	1.9	--	57	28	--	<250	8.2	<50	31	54
DEC 09, 1986	.18	.54	--	.41	<4	16	<250	2.2	<50	29	.27
MAR 10, 1987	1.1	2	--	65	20	<10	<250	8.2	<50	<10	66
JUNE 03, 1987	1	1.5	.03	43	28	<10	<250	6.3	520	<10	44
JUNE 03, 1987	.77	1.6	.05	41	<4	<10	<250	<1	<50	<10	38
SEPT 16, 1987	.80	1.6	.03	46	29	<10	<250	6.8	<500	<10	45
DEC 15, 1987	.35	.84	.05	3.2	<4	<10	<250	1.4	<50	20	.30
MAR 15, 1988	.60	1.1	.02	44	37	<10	<250	5.4	<50	<10	35
MAR 15, 1988	.55	1	.02	45	35	<10	<250	5.3	<50	<10	43
APR 12, 1988	.66	1.2	.03	52	30	<10	<250	9.5	<50	<10	53
MAY 09, 1988	1	1.2	.05	61	22	<10	<250	<.20	<50	<10	68
JUNE 07, 1988	.90	1.8	.08	67	<20	<10	<250	6	<50	17	74
JULY 11, 1988	.99	1.4	.02	83	<20	13	<250	6.9	<50	<10	100
JULY 12, 1988	1.1	1.6	.02	78	<20	12	<250	13	<50	<10	110
AUG 08, 1988	1.3	1.8	.03	85	<20	<10	<250	8.8	<50	<10	140
SEPT 21, 1988	1	1.8	.04	92	<4	<10	<250	8	<50	24	140
OCT 18, 1988	1.1	1.6	.04	79	<4	<10	<250	8.4	<50	62	140
NOV 16, 1988	1.1	1	.03	69	<4	<10	<250	7.8	<50	52	110
DEC 20, 1988	1	1.2	.04	72	<4	<10	<250	9.5	<50	44	120
DEC 20, 1988	1.1	1.1	.05	79	4.6	<10	<250	7.9	<50	42	110
JAN 09, 1989	1.1	1.3	.02	78	<4	<10	<250	6.7	<50	51	100
FEB 14, 1989	1	1.1	.03	78	<4	<10	<250	9	<50	28	110
MAR 13, 1989	.69	.80	.02	76	<4	<10	<250	<.20	<50	34	71
APR 10, 1989	.59	.61	.03	49	<4	15	--	5.7	<50	32	54
APR 10, 1989	.59	.63	.02	51	<4	<10	--	5.8	<50	39	47
MAY 09, 1989	.66	.91	.04	75	<4	<10	<250	8.7	<50	34	56
JUNE 15, 1989	.04	.44	.04	1.8	<4	21	<250	2	15	14	1
JULY 10, 1989	.71	.71	.04	64	<4	<10	<250	7	<50	31	35
AUG 08, 1989	.69	.99	.05	85	<4	<10	<250	1.3	<50	38	53
AUG 08, 1989	.67	.89	.06	88	<4	<10	<250	1.4	<50	44	56
SEPT 11, 1989	.81	1	.03	95	<4	<10	<250	8.7	<50	23	79
OCT 16, 1989	.76	1	.04	84	<4	<10	<250	12	<50	78	82
NOV 07, 1989	.76	<1	.03	110	<4	<10	<250	9.9	<50	51	120
NOV 07, 1989	.76	<1	.03	110	<4	<10	<250	8.3	<50	51	120
410901079293401 Lysimeter 1 (LAT 41°09'01" N. LONG 079°29'34" W.)											
OCT 09, 1986	1.4	3.9	--	1.6	<4	--	--	13	<50	48	.12
NOV 05, 1986	.72	2.5	--	.36	<4	--	--	4.2	<50	28	.13
DEC 11, 1986	.16	1.2	--	<.14	<4	<10	<250	3	<50	12	.18
JAN 06, 1987	.075	.74	--	<.14	<4	--	--	1.2	<50	12	.04
FEB 13, 1987	.06	.98	--	<.14	<4	14	--	.71	<50	<10	<.01
MAR 11, 1987	.12	.72	--	<.14	<4	--	<250	.72	<50	<10	1.8
APR 14, 1987	.22	.38	.05	<.14	<4	--	<250	2.5	<50	18	.06
MAY 05, 1987	.20	1.4	.04	.22	<4	35	<250	.98	<50	15	.85
JUNE 02, 1987	.20	1	.13	.42	<4	24	--	1.5	<50	18	1.7
JULY 06, 1987	.14	1.3	.08	<.14	<4	27	--	1.1	<50	73	14
AUG 11, 1987	.04	1.4	.07	<.14	<10	31	--	1.2	<50	22	.55
SEPT 14, 1987	.07	1.1	.03	<.14	<4	36	<250	3.4	<50	17	.14

Date	Iron, ferrous dissolved (mg/L)	Lead, dissolved (µg/L)	Manganese, dissolved (mg/L)	Mercury, dissolved µg/l)	Molybdenum, dissolved (µg/L)	Nickel, dissolved (mg/L)	Selenium, dissolved (µg/L)	Strontium, dissolved (µL)	Zinc, dissolved (mg/L)	Cyanide total (mg/L)
410925079292301 Seep 16A (LAT 41°09'25" N. LONG 079°29'23" W.)–Continued										
AUG 08, 1989	29	<10	66	<1	<70	1.2	<30	850	2	<0.001
AUG 08, 1989	29	<10	68	<1	<70	1.2	<30	840	2.2	<.001
SEPT 11, 1989	26	<4	56	<1	<70	1.1	<30	800	1.8	<.001
OCT 17, 1989	26	<10	44	<1	<70	.81	<30	550	1.6	<.001
NOV 07, 1989	19	<4	63	<1	<70	.97	<30	750	1.8	<.001
410903079294301 Seep 17 (LAT 41°09'03" N. LONG 079°29'43" W.)										
SEPT 08, 1986	–	<50	52	<1	<70	1.8	<30	530	3	<.001
DEC 09, 1986	.70	<4	4.1	<1	<70	.17	<6	140	.60	.001
MAR 10, 1987	70	21	56	<1	<70	1.3	<30	600	3.1	<.001
JUNE 03, 1987	36	17	41	<1	<70	.60	<30	530	2	<.001
JUNE 03, 1987	41	17	36	<1	<70	.98	<6	480	2.2	<.001
SEPT 16, 1987	60	21	43	<1	<70	1.8	<30	460	3.1	<.001
DEC 15, 1987	.30	<10	4.2	<1	<70	.15	<30	120	.33	<.001
MAR 15, 1988	45	16	31	<1	<70	1.2	<30	510	1.9	<.001
MAR 15, 1988	49	17	30	<1	<70	1.4	<30	520	2.5	<.001
APR 12, 1988	57	16	44	<1	<70	1.4	<30	600	2.8	<.001
MAY 09, 1988	68	18	51	<1	<70	1.7	<30	730	4	<.001
JUNE 07, 1988	72	20	55	<1	<70	1.6	<30	600	3.1	<.001
JULY 11, 1988	94	23	65	<1	<300	1.7	<30	730	3.6	<.001
JULY 12, 1988	96	26	63	<1	<70	1.9	<30	710	4	<.001
AUG 08, 1988	120	26	73	<1	<70	2	<30	800	4	<.001
SEPT 21, 1988	130	27	72	<1	<70	2.2	<30	840	4.4	<.001
OCT 18, 1988	140	<40	69	<1	<70	2.1	<30	740	4.4	<.001
NOV 16, 1988	130	20	59	<1	<70	1.9	<30	840	3.7	<.001
DEC 20, 1988	120	20	61	<1	<70	1.8	<30	720	3.8	<.001
DEC 20, 1988	120	15	62	<1	<70	1.8	<30	730	3.7	<.001
JAN 09, 1989	110	18	62	<1	<70	1.8	<30	750	3.6	<.001
FEB 14, 1989	100	<40	61	<1	<70	1.7	<30	740	4.2	<.001
MAR 13, 1989	72	26	55	<1	<70	1.4	<30	700	3	<.001
APR 10, 1989	49	14	50	<1	<70	1.5	<30	510	3.1	<.001
APR 10, 1989	50	14	43	<1	<70	1.6	<30	480	3.3	<.001
MAY 09, 1989	67	28	54	<1	<70	1.6	<30	690	3.5	<.001
JUNE 15, 1989	.32	<5	5.9	<1	<70	.18	<30	110	.35	<.001
JULY 10, 1989	35	30	49	<1	<70	1.4	<30	610	3	<.001
AUG 08, 1989	61	22	59	<1	<70	1.6	<30	700	3.8	<.001
AUG 08, 1989	65	24	61	<1	<70	2.4	<30	740	4	<.001
SEPT 11, 1989	86	23	72	<1	<70	2.1	<30	770	4.4	<.001
OCT 16, 1989	93	26	61	<1	<70	2	<30	620	4.2	<.001
NOV 07, 1989	110	30	80	<1	<70	2	<30	650	4.2	<.001
NOV 07, 1989	100	30	83	<1	<70	2.1	<30	670	4.2	<.001
410901079293401 Lysimeter 1 (LAT 41°09'01" N. LONG 079°29'34" W.)										
OCT 09, 1986	–	54	20	<1	<70	.33	<6	510	.77	–
NOV 05, 1986	–	<4	6.1	<1	<70	.15	<30	190	.25	–
DEC 11, 1986	–	<4	4	<1	<70	<.02	<6	180	.17	–
JAN 06, 1987	–	<4	1.4	<1	<70	.03	<6	<100	.079	–
FEB 13, 1987	–	<4	.79	<1	<70	<.02	<6	<100	.048	–
MAR 11, 1987	.05	<4	.89	<1	<70	<.02	<6	<100	.11	–
APR 14, 1987	–	<4	.66	<1	<70	.06	<6	110	.072	–
MAY 05, 1987	.06	5.6	.64	<1	<70	<.02	<6	<100	.11	–
JUNE 02, 1987	.09	4.9	.43	<1	<70	.47	<6	100	.13	–
JULY 06, 1987	–	9.9	.82	<1	<70	.03	<6	<100	.32	–
AUG 11, 1987	–	8.3	.60	–	<70	.29	<30	100	.33	–
SEPT 14, 1987	.10	4.9	1.8	<1	<70	.10	<30	150	.13	–

Appendix 2.--Water-quality data for urban sewage sludge site, June 1986 through November 1989--Continued

Date	Time	Water table altitude (ft above sea level)	Streamflow/ discharge, instan-taneous (ft^3/s)	Specific conduc-tance (µS/cm)	pH, field (units)	pH, lab (units)	Oxidation reduction potential (mV)	Water temper-ature (°C)	Oxygen, dissolved (mg/L)	Acidity total heated (mg/L as $CaCO_3$)	Acidity mineral (methyl orange) (mg/L as $CaCO_3$)	Calcium, dissolved (mg/L)
410901079293401 Lysimeter 1 (LAT 41°09'01" N. LONG 079°29'34" W.)--Continued												
OCT 05, 1987	1330	--	--	450	5.6	6.0	--	15.5	--	2	--	69
NOV 16, 1987	1345	--	--	420	5.8	6.2	--	10.5	--	0	--	--
DEC 17, 1987	0900	--	--	495	6.2	6.1	--	6.0	--	4	--	75
APR 13, 1988	1030	--	--	255	6.0	6.5	--	11.0	--	0	--	55
MAY 10, 1988	1430	--	--	240	5.8	6.3	--	15.0	--	0	--	42
JUNE 07, 1988	1300	--	--	189	5.7	6.3	--	22.0	--	0	--	35
AUG 09, 1988	1330	--	--	--	6.1	--	--	28.5	--	--	--	--
OCT 18, 1988	1615	--	--	1,290	4.6	4.3	--	13.0	--	66	--	290
NOV 16, 1988	1145	--	--	1,250	4.7	5.0	--	--	--	48	--	370
DEC 21, 1988	1400	--	--	603	5.2	5.4	--	5.5	--	54	--	120
FEB 15, 1989	1115	--	--	376	5.5	6.0	--	3.0	--	--	--	69
MAR 14, 1989	1120	--	--	185	6.1	6.5	--	6.0	--	0	--	37
APR 12, 1989	1050	--	--	200	6.1	6.4	--	8.5	--	--	--	36
MAY 10, 1989	1125	--	--	185	5.0	6.4	--	11.0	--	0	--	32
JUNE 14, 1989	1630	--	--	160	6.2	7.0	--	--	--	0	--	26
JULY 11, 1989	1050	--	--	175	5.7	6.4	--	20.0	--	--	--	27
AUG 09, 1989	1025	--	--	200	5.6	6.1	--	19.0	--	6	--	30
OCT 17, 1989	1135	--	--	288	5.2	5.8	--	14.5	--	--	--	45
NOV 07, 1989	1015	--	--	328	5.6	6.1	--	10.0	--	46	--	80
410918079293601 Lysimeter 2 (LAT 41°09'18" N. LONG 079°29'36" W.)												
OCT 09, 1986	1410	--	--	--	4.2	--	--	--	--	--	--	280
NOV 05, 1986	1730	--	--	--	3.9	--	--	10.5	--	--	--	200
JAN 06, 1987	1630	--	--	1,200	--	4.3	--	--	--	150	--	190
FEB 13, 1987	1200	--	--	640	--	4.6	--	--	--	76	--	85
MAR 11, 1987	1700	--	--	650	4.7	4.6	--	6.0	--	0	--	92
APR 14, 1987	1730	--	--	718	4.6	4.6	--	8.5	--	76	--	76
MAY 05, 1987	1645	--	--	644	4.5	4.5	--	12.0	--	56	--	92
JUNE 02, 1987	1030	--	--	549	4.4	4.5	--	19.0	--	0	--	52
JULY 06, 1987	1830	--	--	490	4.0	4.3	--	20.5	--	180	--	51
AUG 11, 1987	1415	--	--	--	--	4.2	--	--	--	--	--	66
SEPT 14, 1987	0000	--	--	730	3.8	4.0	--	15.0	--	76	--	81
OCT 05, 1987	1345	--	--	675	3.8	4.0	--	15.0	--	68	--	78
NOV 18, 1987	0845	--	--	660	3.8	4.0	--	9.0	--	130	--	--
DEC 17, 1987	0001	--	--	711	4.1	4.0	--	5.5	--	72	--	84
APR 13, 1988	1000	--	--	425	4.0	3.8	--	9.0	--	--	--	62
MAY 10, 1988	1430	--	--	490	4.0	4.1	--	14.0	--	54	--	71
JUNE 07, 1988	1305	--	--	363	4.2	4.1	--	20.0	--	52	--	52
NOV 15, 1988	1600	--	--	415	4.1	3.9	--	5.0	--	--	4	74
DEC 21, 1988	1340	--	--	406	4.1	3.9	--	5.0	--	82	2	53
FEB 15, 1989	1055	--	--	363	4.0	4.0	--	2.5	--	56	--	59
MAR 14, 1989	1100	--	--	185	4.1	4.2	--	5.0	--	56	--	26
APR 12, 1989	1030	--	--	185	4.4	4.4	--	7.0	--	--	--	26
MAY 09, 1989	1200	--	--	195	4.0	4.2	--	11.0	--	26	--	36
JUNE 14, 1989	1645	--	--	175	4.3	4.6	--	--	--	38	--	20
JULY 11, 1989	1040	--	--	170	4.3	4.5	--	20.0	--	--	--	18
AUG 09, 1989	1010	--	--	190	3.9	4.2	--	18.0	--	28	--	24
SEPT 12, 1989	1040	--	--	265	3.9	4.0	--	19.5	--	46	--	31
OCT 17, 1989	1110	--	--	274	3.8	4.0	--	14.0	--	52	--	30
NOV 07, 1989	0950	--	--	284	3.9	4.1	--	10.0	--	86	--	41
410921079293101 Lysimeter 3 (LAT 41°09'21" N. LONG 079°29'31" W.)												
OCT 09, 1986	1420	--	--	--	4.7	--	--	--	--	--	--	150
NOV 05, 1986	1630	--	--	--	3.3	--	--	--	--	--	--	180
DEC 11, 1986	0915	--	--	2,130	--	3.5	--	--	--	200	22	170

Appendix 2.–Water-quality data for urban sewage sludge site, June 1986 through November 1989–Continued

Date	Magnesium, dissolved (mg/L)	Sodium, dissolved (mg/L)	Potassium, dissolved (mg/L)	Alkalinity water lab (mg/L as $CaCO_3$)	Sulfide total (mg/L as S)	Sulfate, dissolved (mg/L as SO_4)	Chloride, dissolved (mg/L)	Silica, dissolved (mg/L as SiO_2)	Solids, residue at 105 °C, dissolved (mg/L)	Nitrogen, nitrate total (mg/L as N)	Nitrogen, nitrite total (mg/L as N)
410901079293401 Lysimeter 1 (LAT 41°09'01" N. LONG 079°29'34" W.)--Continued											
OCT 05, 1987	9.7	0.94	3.6	18	–	230	<1	45	404	<0.04	<0.004
NOV 16, 1987	–	.31	–	28	–	200	<1	29	488	<.04	<.004
DEC 17, 1987	9.9	.67	2.4	28	–	230	<1	32	–	<.04	<.004
APR 13, 1988	5.4	.60	2.1	50	–	140	2	17	324	<.04	<.004
MAY 10, 1988	4.5	.60	3.5	46	–	88	<1	15	184	<.04	<.004
JUNE 07, 1988	3.2	.63	3	48	–	69	<1	11	580	<.04	.004
AUG 09, 1988	–	–	–	–	–	–	–	–	–	.06	.004
OCT 18, 1988	38	.81	3	6	–	890	<1	55	–	.04	<.004
NOV 16, 1988	43	1.4	2.2	12	–	810	<1	43	1,400	.04	<.004
DEC 21, 1988	13	.81	1.6	14	–	420	<1	24	768	.12	<.004
FEB 15, 1989	7.3	1.5	1.1	20	–	200	<1	14	648	<.04	<.004
MAR 14, 1989	3.9	.56	1.8	42	–	100	<1	6.9	876	<.04	<.004
APR 12, 1989	3.7	.71	3.1	44	–	67	3	9.1	–	<.04	<.004
MAY 10, 1989	3.5	.64	3.6	–	–	79	<1	11	188	.22	<.004
JUNE 14, 1989	2.6	.44	3.4	48	–	32	<1	7.1	–	.53	<.004
JULY 11, 1989	2.5	.40	3.2	42	–	62	2	11	384	.22	<.004
AUG 09, 1989	2.7	.59	4	20	–	58	13	20	288	2	<.004
OCT 17, 1989	5.1	.78	6.4	12	–	140	4	28	–	2.8	<.004
NOV 07, 1989	8.4	.68	7.3	17	–	190	3	23	322	2.6	<.004
410918079293601 Lysimeter 2 (LAT 41°09'18" N. LONG 079°29'36" W.)											
OCT 09, 1986	48	15	67	–	–	–	–	–	–	1.8	.004
NOV 05, 1986	30	9	53	–	–	–	–	–	–	.52	<.004
JAN 06, 1987	27	5.7	23	10	–	750	1	–	1,230	<.04	<.004
FEB 13, 1987	12	2.5	10	8	–	300	<1	–	544	<.02	<.004
MAR 11, 1987	13	2.9	10	8	–	300	9	–	666	.06	<.002
APR 14, 1987	11	2.3	11	8	–	330	12	32	272	.04	<.004
MAY 05, 1987	17	2.4	12	8	–	290	5	34	494	2.6	.012
JUNE 02, 1987	7.9	2.3	17	8	–	240	2	43	592	.04	<.004
JULY 06, 1987	7.6	2.6	8.3	6	–	190	–	36	542	<.04	<.004
AUG 11, 1987	9.9	2.8	13	–	–	–	–	61	–	.36	<.004
SEPT 14, 1987	14	3	16	2	–	340	5	86	728	2.2	<.004
OCT 05, 1987	12	2.5	12	–	–	290	3	88	600	2.4	<.004
NOV 18, 1987	–	–	–	2	–	320	2	65	806	2	<.004
DEC 17, 1987	13	2	8.8	2	–	340	1	74	–	1.9	<.004
APR 13, 1988	9	1.5	6.6	–	–	200	6	53	–	1	<.004
MAY 10, 1988	10	1.7	–	4	–	220	2	42	568	.04	<.004
JUNE 07, 1988	6.5	1.4	4.5	2	–	170	4	33	452	.92	.004
NOV 15, 1988	11	2.2	6.8	–	–	210	5	58	1,010	3.6	<.004
DEC 21, 1988	7.2	1.3	6.2	0	–	200	4	51	632	2	<.004
FEB 15, 1989	6.6	1	4.7	2	–	190	3	38	532	1.2	<.004
MAR 14, 1989	3.6	1.1	3.3	4	–	81	2	16	484	.44	<.004
APR 12, 1989	3.2	1.2	3.5	4	–	55	2	15	–	.46	<.004
MAY 09, 1989	3.1	.68	3.1	–	–	100	<1	23	212	.97	<.004
JUNE 14, 1989	2.5	.66	3.1	6	–	65	<1	16	376	.42	<.004
JULY 11, 1989	2	.62	3.4	6	–	60	3	20	196	.42	<.004
AUG 09, 1989	2.7	.67	4.1	4	–	62	5	41	300	1.1	<.004
SEPT 12, 1989	4.1	.84	8.4	<2	–	120	6	64	294	2.1	.004
OCT 17, 1989	3.7	.73	6.6	1	–	110	5	49	–	2.2	<.004
NOV 07, 1989	4.9	.75	5.9	3	–	150	3	43	310	1.7	<.004
410921079293101 Lysimeter 3 (LAT 41°09'21" N. LONG 079°29'31" W.)											
OCT 09, 1986	50	9.1	18	–	–	–	–	–	–	<.02	<.004
NOV 05, 1986	120	9.3	22	–	–	–	–	–	–	.04	.004
DEC 11, 1986	160	9.6	18	0	–	900	8.4	–	2,240	<.02	<.004

Appendix 2.--Water-quality data for urban sewage sludge site, June 1986 through November 1989--Continued

Date	Nitrogen, ammonia total (mg/L as N)	Nitrogen, ammonia + organic total (mg/L as N)	Phos-phorus total (mg/L as P)	Aluminum, dissolved (mg/L)	Arsenic, dissolved (µg/L)	Barium, dissolved (µg/L)	Boron, dissolved (µg/L)	Cadmium, dissolved (µg/L)	Chromium, dissolved (µg/L)	Copper, dissolved (µg/L)	Iron, dissolved (mg/L)
410901079293401 Lysimeter 1 (LAT 41°09'01" N. LONG 079°29'34" W.)--Continued											
OCT 05, 1987	0.04	1	0.04	0.14	<4	27	–	3.5	<50	20	0.46
NOV 16, 1987	.05	1.1	.03	.15	<4	24	<250	2.2	<50	25	.13
DEC 17, 1987	.06	.66	.03	.17	<4	23	<250	4.6	<50	18	.06
APR 13, 1988	.03	1.8	.03	<.14	<4	20	<250	1.5	<50	<10	.08
MAY 10, 1988	<.01	.94	.05	<.14	<4	<10	<250	1	<50	18	.57
JUNE 07, 1988	.01	3.5	.11	.18	<4	<10	–	.60	<50	19	.27
AUG 09, 1988	.11	2.8	.20	–	–	–	–	–	–	–	–
OCT 18, 1988	.12	2.2	.06	3.6	<4	31	<250	33	<50	88	.12
NOV 16, 1988	.06	2.1	.04	4.3	<4	29	<250	20	<50	100	3.1
DEC 21, 1988	.07	.83	.05	1.2	<4	19	<250	9.2	<50	58	.06
FEB 15, 1989	.02	.31	.02	.49	<4	14	<250	2.2	<50	37	.04
MAR 14, 1989	.01	.27	<.02	.17	<4	12	<250	1.2	<50	23	.13
APR 12, 1989	.03	.51	.13	.18	<4	12	<250	.73	<50	21	.17
MAY 10, 1989	.08	.62	.05	.27	<4	26	<250	.67	<50	39	.18
JUNE 14, 1989	.14	.77	.04	<.14	<4	20	<250	.60	<50	31	.33
JULY 11, 1989	.08	.89	.08	<.14	<4	25	–	.90	<50	24	2.7
AUG 09, 1989	.04	.62	.08	<.14	<4	46	<250	.87	<50	15	.61
OCT 17, 1989	.03	<1	.04	<.14	<4	68	<250	2.7	<50	16	.05
NOV 07, 1989	.02	<1	.03	<.14	<4	69	<250	2.6	<50	34	.05
410918079293601 Lysimeter 2 (LAT 41°09'18" N. LONG 079°29'36" W.)											
OCT 09, 1986	3.1	6.1	–	18	9.1	–	–	14	<50	130	.42
NOV 05, 1986	1.4	3.8	–	10	7.6	–	–	6.2	<50	85	.25
JAN 06, 1987	.18	2.1	–	9.6	8.6	–	–	4.2	<50	78	.18
FEB 13, 1987	.04	1.4	–	2.7	<4	<10	<250	1.2	<50	19	<.01
MAR 11, 1987	.14	1.5	–	3.6	<4	–	<250	1.2	<50	21	.16
APR 14, 1987	.15	.50	.07	2.2	<4	<10	<250	1.4	<50	23	.12
MAY 05, 1987	.10	1.7	.03	4.4	<4	22	<250	1.4	<50	25	1.6
JUNE 02, 1987	.18	1.7	.06	2	<4	14	<250	2	<50	36	.19
JULY 06, 1987	.05	1.3	.06	4	<10	20	–	.98	<50	140	3.6
AUG 11, 1987	.72	3.4	.06	4.4	<10	27	–	1.5	680	77	.31
SEPT 14, 1987	1	1.8	.04	8.2	5.6	<10	<250	2.9	<50	47	.43
OCT 05, 1987	.77	2.1	.05	9	<4	22	–	2.3	650	860	2.3
NOV 18, 1987	.36	2	.07	–	<4	–	–	1.9	–	–	–
DEC 17, 1987	.44	1.6	.05	8.8	5	16	<250	2.1	<50	20	.20
APR 13, 1988	.32	.91	.04	7.2	–	17	<250	–	<50	66	.32
MAY 10, 1988	.34	2.2	.04	5.9	<4	<10	<250	1.4	<50	52	.22
JUNE 07, 1988	.28	3.2	.06	3.2	<4	10	–	.71	<50	34	.19
NOV 15, 1988	.18	2.4	.15	9.6	<4	24	<250	3.7	<50	86	.42
DEC 21, 1988	.12	.83	.05	8.2	<4	19	<250	1.6	<50	67	.19
FEB 15, 1989	.09	.91	.03	5.9	<4	13	<250	.68	<50	53	.35
MAR 14, 1989	.06	.45	.02	2.5	<4	12	<250	.51	<50	28	.39
APR 12, 1989	.09	.41	.05	1.6	<4	<10	<250	.65	<50	22	.21
MAY 09, 1989	.23	1.5	.06	1.7	<4	18	<250	.47	<50	21	.09
JUNE 14, 1989	.12	1.3	.04	1.4	<4	17	<250	.30	<50	30	.13
JULY 11, 1989	.11	1.4	.05	.90	<4	28	–	.34	<50	34	.17
AUG 09, 1989	.10	1.2	.09	1.6	<4	42	<250	.61	<50	38	.16
SEPT 12, 1989	.10	1.3	.11	3.9	<4	38	<250	.86	<50	33	.14
OCT 17, 1989	.05	1	.08	3.4	<4	34	<250	.76	<50	41	.24
NOV 07, 1989	.03	<1	.06	4.2	<4	29	<250	.82	<50	44	.16
410921079293101 Lysimeter 3 (LAT 41°09'21" N. LONG 079°29'31" W.)											
OCT 09, 1986	2.5	54	–	2.6	<4	–	–	3.4	66	30	50
NOV 05, 1986	2.6	5.6	–	2.6	<4	–	–	1.2	67	16	55
DEC 11, 1986	4.7	5.2	–	6.7	<4	31	<250	1	69	26	3.5

Appendix 2.--Water-quality data for urban sewage sludge site, June 1986 through November 1989--Continued

Date	Iron, ferrous dissolved (mg/L)	Lead, dissolved (µg/L)	Manganese, dissolved (mg/L)	Mercury, dissolved µg/l)	Molybdenum, dissolved (µg/L)	Nickel, dissolved (mg/L)	Selenium, dissolved (µg/L)	Strontium, dissolved (µL)	Zinc, dissolved (mg/L)	Cyanide total (mg/L)
410901079293401 Lysimeter 1 (LAT 41°09'01" N. LONG 079°29'34" W.)--Continued										
OCT 05, 1987	0.14	<4	1.8	<1	<70	0.09	<30	120	0.23	<0.001
NOV 16, 1987	.09	<4	1	<1	–	.14	<30	120	.062	–
DEC 17, 1987	.12	<4	1.5	<1	<70	.11	<30	140	.17	–
APR 13, 1988	.04	<4	.26	<1	<70	.06	<30	<100	.091	–
MAY 10, 1988	.05	<4	.18	<1	<300	<.02	<30	<100	.10	–
JUNE 07, 1988	.12	<4	.06	<1	<70	.06	<30	<100	.032	–
AUG 09, 1988	–	–	–	–	–	–	–	–	–	–
OCT 18, 1988	.18	<40	7.4	<1	–	1.1	<30	440	2.1	–
NOV 16, 1988	.13	4.2	6.1	<1	<70	.78	<30	490	1.9	<.001
DEC 21, 1988	–	<4	1.8	<1	<70	.27	<30	210	.63	–
FEB 15, 1989	–	<40	.54	<1	<70	.09	<30	100	.27	–
MAR 14, 1989	.06	<4	.12	<1	<70	.05	<30	<100	.12	–
APR 12, 1989	.09	<4	.06	<1	–	<.02	<30	70	.14	–
MAY 10, 1989	.05	4	.11	<1	<70	<.02	<30	<100	.12	–
JUNE 14, 1989	.06	<4	.07	<1	<70	<.02	<30	<100	.060	–
JULY 11, 1989	–	4.2	.68	<1	<70	.04	<30	<100	.094	–
AUG 09, 1989	.08	<4	.35	<1	<70	.07	<30	<100	.077	–
OCT 17, 1989	.08	<4	.32	<1	<70	.08	<30	93	.15	–
NOV 07, 1989	.08	<4	.32	<1	<70	.04	<30	120	.14	–
410918079293601 Lysimeter 2 (LAT 41°09'18" N. LONG 079°29'36" W.)										
OCT 09, 1986	–	<50	23	<1	<70	.63	<15	650	1.4	–
NOV 05, 1986	–	<4	12	<1	<70	.49	<30	410	1.1	–
JAN 06, 1987	–	<4	6.6	<1	<70	.32	<6	330	.54	–
FEB 13, 1987	–	<4	2.6	<1	<70	.03	<6	150	.14	–
MAR 11, 1987	.08	<4	2.4	<1	<70	.02	<6	160	.18	–
APR 14, 1987	–	<4	2	<1	<70	.08	<6	170	.16	–
MAY 05, 1987	.08	<4	2.9	<1	<70	.05	<6	140	.20	–
JUNE 02, 1987	.10	4.9	1.6	<1	<70	.28	<6	170	.39	–
JULY 06, 1987	–	<4	1.5	<1	<70	.06	<30	120	.32	–
AUG 11, 1987	–	<4	2.4	<1	<70	.37	<30	140	.49	–
SEPT 14, 1987	.13	<4	4.2	<1	<70	.24	<30	190	.56	–
OCT 05, 1987	.11	<4	3.3	<1	<70	.26	<30	150	.64	–
NOV 18, 1987	.13	<10	–	<1	–	–	<30	150	–	–
DEC 17, 1987	.09	<4	3	<1	<70	.13	<30	<100	.36	–
APR 13, 1988	.09	–	1.3	–	<70	.14	–	<100	.85	–
MAY 10, 1988	.04	<10	1.1	<1	<300	.08	<30	130	.52	–
JUNE 07, 1988	.08	<4	.58	<1	<70	.05	<30	<100	.52	–
NOV 15, 1988	.12	4.7	1.6	<1	<70	.16	<30	130	.82	–
DEC 21, 1988	–	4.7	.95	<1	<70	.15	<30	130	.41	–
FEB 15, 1989	–	<40	.66	<1	<70	.06	<30	<100	.31	–
MAR 14, 1989	.06	<4	.28	<1	<70	.08	<30	<100	.13	–
APR 12, 1989	.11	<4	.21	<1	<70	<.02	<30	40	1.3	–
MAY 09, 1989	.04	<4	.17	<1	<70	<.02	<30	<100	.23	–
JUNE 14, 1989	.07	<4	.17	<1	<70	<.02	<30	<100	.18	–
JULY 11, 1989	–	<4	.12	<1	<70	.03	<30	<100	.22	–
AUG 09, 1989	.10	<4	.20	<1	<70	.11	<30	<100	.45	–
SEPT 12, 1989	.06	<4	.51	<1	<70	.04	<30	<100	.36	–
OCT 17, 1989	.15	<4	.38	<1	<70	.05	<30	61	.29	–
NOV 07, 1989	.13	<4	.38	<1	<70	.07	<30	77	.24	–
410921079293101 Lysimeter 3 (LAT 41°09'21" N. LONG 079°29'31" W.)										
OCT 09, 1986	–	170	56	<1	<70	.90	<60	540	1.7	–
NOV 05, 1986	–	<4	56	<1	<70	.73	<30	510	1.3	–
DEC 11, 1986	–	<4	61	<1	<70	.64	<60	520	1	–

Appendix 2.--Water-quality data for urban sewage sludge site, June 1986 through November 1989--Continued

Date	Time	Water table altitude (ft above sea level)	Streamflow/ discharge, instan-taneous (ft^3/s)	Specific conduc-tance (µS/cm)	pH, field (units)	pH, lab (units)	Oxidation reduction potential (mV)	Water temper-ature (°C)	Oxygen, dissolved (mg/L)	Acidity total heated (mg/L as $CaCO_3$)	Acidity mineral (methyl orange) (mg/L as $CaCO_3$)	Calcium, dissolved (mg/L)
410921079293101 Lysimeter 3 (LAT 41°09'21" N. LONG 079°29'31" W.)--Continued												
JAN 06, 1987	0120	--	--	2,050	--	3.3	--	--	--	170	50	140
FEB 10, 1987	1545	--	--	1,900	--	3.3	--	--	--	0	60	160
MAR 11, 1987	1330	--	--	1,700	3.5	3.2	--	6.0	--	250	68	160
APR 13, 1987	1630	--	--	1,450	3.2	3.2	--	13.0	--	180	60	73
MAY 05, 1987	1200	--	--	--	3.6	--	--	16.0	--	--	--	--
JUNE 02, 1987	1330	--	--	--	3.5	--	--	--	--	--	--	--
JULY 06, 1987	1745	--	--	--	--	--	--	--	--	--	--	160
AUG 11, 1987	1440	--	--	--	3.4	--	--	9.5	--	--	--	--
AUG 20, 1987	0000	--	--	--	3.4	6.1	--	9.5	--	30	--	--
SEPT 15, 1987	1030	--	--	--	3.9	--	--	17.0	--	--	--	--
OCT 05, 1987	1400	--	--	915	4.4	5.0	--	16.5	--	16	--	120
NOV 16, 1987	1430	--	--	930	4.8	4.9	--	11.5	--	24	--	130
DEC 17, 1987	1200	--	--	--	5.2	--	--	5.0	--	--	--	--
MAY 10, 1988	1340	--	--	--	5.8	--	--	16.0	--	--	--	--
JUNE 07, 1988	1105	--	--	--	6.1	--	--	23.0	--	--	--	--
JULY 13, 1988	0935	--	--	--	5.8	--	--	22.0	--	--	--	--
DEC 21, 1988	1245	--	--	--	5.3	--	--	8.0	--	--	--	--
JUNE 14, 1989	1510	--	--	445	5.6	--	--	18.0	--	--	--	--
SEPT 12, 1989	1015	--	--	--	5.8	--	--	16.0	--	--	--	--
410921079293102 Lysimeter 4 (LAT 41°09'21" N. LONG 079°29'31" W.)												
OCT 09, 1986	1430	--	--	--	--	--	--	--	--	--	--	420
NOV 05, 1986	1700	--	--	--	4.6	--	--	--	--	--	--	350
DEC 11, 1986	0930	--	--	2,650	--	4.7	--	--	--	150	--	470
JAN 06, 1987	1500	--	--	1,830	--	4.3	--	--	--	120	--	280
FEB 10, 1987	1600	--	--	1,710	--	4.4	--	--	--	130	--	210
MAR 11, 1987	1330	--	--	930	5.2	5.3	--	5.5	--	38	--	140
APR 13, 1987	1630	--	--	1,150	5.5	5.9	--	13.0	--	76	--	140
MAY 05, 1987	1200	--	--	1,250	5.5	5.8	--	13.5	--	80	--	180
JUNE 01, 1987	0001	--	--	--	4.9	--	--	16.0	--	--	--	--
JULY 06, 1987	1745	--	--	--	3.5	2.8	--	16.0	--	--	--	--
AUG 11, 1987	1445	--	--	--	3.6	--	--	10.0	--	--	--	150
SEPT 15, 1987	1045	--	--	1,080	4.6	4.7	--	17.5	--	100	--	140
DEC 17, 1987	0001	--	--	899	4.6	4.9	--	4.5	--	30	--	110
APR 12, 1988	1415	--	--	770	4.8	4.9	--	9.5	--	58	--	130
MAY 10, 1988	1345	--	--	765	4.6	5.1	--	13.0	--	14	--	120
JUNE 07, 1988	1100	--	--	786	4.6	4.3	--	19.0	--	44	--	110
JULY 13, 1988	0930	--	--	850	4.3	4.2	--	22.0	--	--	--	130
AUG 09, 1988	1140	--	--	--	5.2	--	--	30.0	--	--	--	--
OCT 18, 1988	1515	--	--	--	5.5	--	--	13.0	--	--	--	--
NOV 15, 1988	1445	--	--	692	4.7	5.4	--	18.5	--	48	--	94
DEC 21, 1988	1245	--	--	796	5.1	5.2	--	6.5	--	20	--	140
FEB 15, 1989	0930	--	--	815	4.9	5.3	--	3.5	--	26	--	170
MAR 14, 1989	0905	--	--	675	5.0	5.1	--	5.5	--	14	--	120
APR 12, 1989	1015	--	--	630	4.8	5.1	--	8.0	--	--	--	110
MAY 10, 1989	1040	--	--	695	5.7	4.4	--	15.0	--	24	--	120
JUNE 14, 1989	1500	--	--	750	4.4	4.3	--	18.0	--	40	--	120
JULY 11, 1989	0910	--	--	765	4.1	4.2	--	20.0	--	--	--	100
AUG 09, 1989	0910	--	--	640	4.1	4.2	--	18.0	--	--	--	100
SEPT 12, 1989	1010	--	--	610	4.7	5.1	--	18.0	--	26	--	97
OCT 17, 1989	1055	--	--	588	4.7	5.3	--	15.0	--	--	--	93
NOV 07, 1989	0915	--	--	514	4.9	5.6	--	11.0	--	58	--	110
410848079295701 Well 1 (LAT 41°08'48" N. LONG 079°29'57" W.)												
SEPT 10, 1986	0900	1,356	--	3,450	5.9	6.4	--	11.5	--	0	--	520

Appendix 2.--Water-quality data for urban sewage sludge site, June 1986 through November 1989--Continued

Date	Magnesium, dissolved (mg/L)	Sodium, dissolved (mg/L)	Potassium, dissolved (mg/L)	Alkalinity water lab (mg/L as $CaCO_3$)	Sulfide total (mg/L as S)	Sulfate, dissolved (mg/L as SO_4)	Chloride, dissolved (mg/L)	Silica, dissolved (mg/L as SiO_2)	Solids, residue at 105 °C, dissolved (mg/L)	Nitrogen, nitrate total (mg/L as N)	Nitrogen, nitrite total (mg/L as N)
410921079293101 Lysimeter 3 (LAT 41°09'21" N. LONG 079°29'31" W.)--Continued											
JAN 06, 1987	120	8.4	15	0	--	1,300	6	--	1,900	<0.04	<0.004
FEB 10, 1987	140	7.9	12	0	--	860	4	--	1,720	<.04	<.004
MAR 11, 1987	110	6.6	11	0	--	780	3	--	1,500	<.04	<.002
APR 13, 1987	69	4	11	0	--	640	6	21	2,740	<.04	<.004
MAY 05, 1987	--	--	--	--	--	600	8	--	--	<.04	<.004
JUNE 02, 1987	--	--	--	--	--	600	9	--	--	<.04	<.004
JULY 06, 1987	48	4.4	11	--	--	--	--	16	--	<.04	<.004
AUG 11, 1987	--	--	--	--	--	--	--	--	--	<.04	<.004
AUG 20, 1987	--	--	--	22	--	130	--	--	--	--	--
SEPT 15, 1987	--	--	--	--	--	--	--	--	--	.20	.028
OCT 05, 1987	39	3.1	12	10	--	510	<1	24	692	<.04	<.004
NOV 16, 1987	42	3.6	10	8	--	420	2	20	9,120	<.04	<.004
DEC 17, 1987	--	--	--	--	--	--	--	--	--	<.04	<.004
MAY 10, 1988	--	--	--	--	--	--	--	--	--	.38	<.004
JUNE 07, 1988	--	--	--	--	--	--	--	--	--	.24	.004
JULY 13, 1988	--	--	--	--	--	--	--	--	--	.78	<.004
DEC 21, 1988	--	--	--	--	--	--	--	--	--	.04	<.004
JUNE 14, 1989	--	--	--	--	--	260	1	--	--	--	--
SEPT 12, 1989	--	--	--	--	--	--	--	--	--	2.2	<.004
410921079293102 Lysimeter 4 (LAT 41°09'21" N. LONG 079°29'31" W.)											
OCT 09, 1986	220	14	21	--	--	--	--	--	--	.38	.008
NOV 05, 1986	140	11	23	--	--	--	--	--	--	.08	<.004
DEC 11, 1986	160	9.2	18	14	--	1,500	8.4	--	2,800	.12	<.004
JAN 06, 1987	110	5.8	8.6	6	--	1,300	4	--	1,800	.12	<.004
FEB 10, 1987	75	4.8	8.5	8	--	990	2	--	1,590	<.04	<.004
MAR 11, 1987	41	2.9	6.8	12	--	540	2	--	844	.12	<.002
APR 13, 1987	40	2.8	8.8	36	--	580	7	15	114	<.04	<.004
MAY 05, 1987	52	3.60	9.7	26	--	670	7	12	1,120	<.04	<.004
JUNE 01, 1987	--	--	--	--	--	850	6	19	--	<.04	<.004
JULY 06, 1987	--	--	--	--	--	--	--	--	--	<.04	<.004
AUG 11, 1987	46	4.5	14	--	--	--	--	23	--	.18	.004
SEPT 15, 1987	46	4.3	13	8	--	620	2	23	988	.08	.016
DEC 17, 1987	37	2.7	9.3	130	--	520	2	20	--	<.04	<.004
APR 12, 1988	41	2.6	8.1	10	--	560	2	18	1,040	<.04	<.004
MAY 10, 1988	33	2.6	7.3	10	--	430	2	13	3,570	<.04	<.004
JUNE 07, 1988	28	3.2	7.1	4	--	440	3	14	944	<.04	<.004
JULY 13, 1988	35	3	6.9	--	--	440	18	17	--	.04	<.004
AUG 09, 1988	--	--	--	--	--	--	--	--	--	.19	.008
OCT 18, 1988	--	--	--	--	--	--	--	--	--	<.04	<.004
NOV 15, 1988	27	3.1	9.9	12	--	470	<1	15	896	<.04	<.004
DEC 21, 1988	38	2.9	6.6	10	--	510	2	14	432	<.04	<.004
FEB 15, 1989	38	2.7	5.6	10	--	540	3	13	1,220	<.04	<.004
MAR 14, 1989	34	2.8	8.6	8	--	410	3	9.7	680	<.04	<.004
APR 12, 1989	25	2.5	4.6	8	--	370	3	8.9	--	<.04	<.004
MAY 10, 1989	27	2.5	4.8	--	--	410	1	12	756	<.04	<.004
JUNE 14, 1989	28	2.8	5.1	4	--	410	1	11	852	.04	<.004
JULY 11, 1989	26	2.8	7.1	4	--	390	2	13	972	.07	<.004
AUG 09, 1989	25	2.9	6.1	4	--	330	4	16	780	<.04	<.004
SEPT 12, 1989	25	2.7	7.2	18	--	360	3	19	664	.04	<.004
OCT 17, 1989	24	2.4	6.7	10	--	340	3	--	--	<.04	<.004
NOV 07, 1989	30	2.3	6.8	11	--	350	4	15	516	<.04	<.004
410848079295701 Well 1 (LAT 41°08'48" N. LONG 079°29'57" W.)											
SEPT 10, 1986	300	14	9	420	--	2,700	9	--	4,130	<.02	<.004

Appendix 2.--Water-quality data for urban sewage sludge site, June 1986 through November 1989--Continued

Date	Nitrogen, ammonia total (mg/L as N)	Nitrogen, ammonia + organic total (mg/L as N)	Phos-phorus total (mg/L as P)	Aluminum, dissolved (mg/L)	Arsenic, dissolved (µg/L)	Barium, dissolved (µg/L)	Boron, dissolved (µg/L)	Cadmium, dissolved (µg/L)	Chromium, dissolved (µg/L)	Copper, dissolved (µg/L)	Iron, dissolved (mg/L)
410921079293101 Lysimeter 3 (LAT 41°09'21" N. LONG 079°29'31" W.)--Continued											
JAN 06, 1987	2.2	4.7	--	2.4	<4	--	<250	0.42	<50	<10	8
FEB 10, 1987	2.8	3.9	--	1.8	<4	<10	<250	.37	<50	<10	13
MAR 11, 1987	1.8	2	--	1.9	<4	--	<250	1.4	<50	<10	19
APR 13, 1987	<1.4	1.5	0.04	.81	<4	<10	<250	.37	<50	<10	11
MAY 05, 1987	1.4	1.9	.03	--	--	--	--	--	--	--	--
JUNE 02, 1987	1.6	3.1	.11	--	--	--	--	--	--	--	--
JULY 06, 1987	1.3	1.9	.05	3.3	<4	--	--	.41	<50	120	4.40
AUG 11, 1987	2.3	4.3	.14	--	--	--	--	--	--	--	--
AUG 20, 1987	--	--	--	--	--	--	--	--	--	--	--
SEPT 15, 1987	1.4	3.1	.15	--	--	--	--	--	--	--	--
OCT 05, 1987	.33	.98	.03	.24	<4	17	<250	1.2	550	800	2.8
NOV 16, 1987	.26	.88	.02	.69	<4	15	<250	1.2	--	15	.80
DEC 17, 1987	.27	--	.08	--	--	--	--	--	--	--	--
MAY 10, 1988	.29	.87	--	--	--	--	--	--	--	--	--
JUNE 07, 1988	.22	1.6	.28	--	--	--	--	--	--	--	--
JULY 13, 1988	.19	1.7	--	--	--	--	--	--	--	--	--
DEC 21, 1988	.39	1.2	.08	--	--	--	--	--	--	--	--
JUNE 14, 1989	--	.46	.02	--	--	--	--	--	--	--	--
SEPT 12, 1989	.16	.79	.13	--	--	--	--	--	--	--	--
410921079293102 Lysimeter 4 (LAT 41°09'21" N. LONG 079°29'31" W.)											
OCT 09, 1986	2.2	3.9	--	8.1	6.5	--	--	14	110	110	.07
NOV 05, 1986	1.4	3.8	--	7.6	5.4	--	--	6.1	94	56	.40
DEC 11, 1986	1.6	2	--	6.5	<4	17	<250	3.5	84	33	.31
JAN 06, 1987	.81	1.9	--	4	<4	--	<250	1.7	58	41	1.3
FEB 10, 1987	1.2	2.1	--	2.9	<4	<10	<250	1.2	<50	<10	.12
MAR 11, 1987	.60	1.8	--	.70	<4	--	<250	.54	<50	<10	2.4
APR 13, 1987	<.60	.51	.09	<.14	<4	11	<250	.27	<50	<10	6.9
MAY 05, 1987	.55	2	.02	4.5	<4	26	<250	<.20	<50	11	25
JUNE 01, 1987	1	1.9	.03	--	<4	--	--	--	--	--	--
JULY 06, 1987	2.7	3.5	.04	--	--	--	--	--	--	--	--
AUG 11, 1987	1.3	2.5	.06	.94	<10	21	--	1	390	870	.85
SEPT 15, 1987	.64	1.3	.14	.59	<4	12	--	2.3	<50	11	.28
DEC 17, 1987	.26	.66	.03	.67	<4	17	<250	1.2	<50	12	1.1
APR 12, 1988	.22	.93	.02	.70	<4	21	<250	.58	<50	<10	.61
MAY 10, 1988	.15	.55	.02	.50	<4	<10	<250	<.50	<50	24	.11
JUNE 07, 1988	.20	.99	.09	.36	<4	<10	--	.24	<50	11	13
JULY 13, 1988	.24	1	.04	.41	<4	12	--	.41	<50	<10	3.50
AUG 09, 1988	.24	1.4	.20	--	--	--	--	--	--	--	--
OCT 18, 1988	.12	.39	.04	--	--	--	--	--	--	--	--
NOV 15, 1988	.14	.66	<.02	.48	<4	21	<250	3.4	47	48	.28
DEC 21, 1988	.14	.29	.04	.59	<4	15	<250	1.6	<50	28	.09
FEB 15, 1989	.11	.21	.48	.61	<4	10	<250	1.3	<50	15	.03
MAR 14, 1989	.05	<.20	<.02	.54	4.6	<10	<250	.94	<50	<10	.02
APR 12, 1989	.04	.21	.04	.54	<4	<10	<250	.72	<50	<10	.30
MAY 10, 1989	.08	.39	.04	.62	<4	<10	<250	.82	<50	10	1.1
JUNE 14, 1989	.07	.27	.02	.40	<4	<10	<250	.25	<50	18	.69
JULY 11, 1989	.08	.26	.03	.25	<4	10	--	.55	<50	<10	.76
AUG 09, 1989	.06	.35	.08	.33	<4	15	<250	.33	<50	<10	.66
SEPT 12, 1989	.06	.32	.06	.18	<4	15	<250	3.2	<50	<10	.34
OCT 17, 1989	.05	<1	.05	.22	<4	15	<250	2.3	<50	23	.75
NOV 07, 1989	.05	<1	.02	.21	<4	12	<250	2.7	<50	<10	.44
410848079295701 Well 1 (LAT 41°08'48" N. LONG 079°29'57" W.)											
SEPT 10, 1986	.66	1.2	--	<.14	4.9	<10	<250	4.4	<50	<10	45

Appendix 2.--Water-quality data for urban sewage sludge site, June 1986 through November 1989--Continued

Date	Iron, ferrous dissolved (mg/L)	Lead, dissolved (µg/L)	Manganese, dissolved (mg/L)	Mercury, dissolved µg/l)	Molybdenum, dissolved (µg/L)	Nickel, dissolved (mg/L)	Selenium, dissolved (µg/L)	Strontium, dissolved (µL)	Zinc, dissolved (mg/L)	Cyanide total (mg/L)
410921079293101 Lysimeter 3 (LAT 41°09'21" N. LONG 079°29'31" W.)--Continued										
JAN 06, 1987	--	4.7	41	<1	<70	0.17	<7.5	480	0.39	--
FEB 10, 1987	--	--	49	<1	<70	.11	<7.5	450	.19	--
MAR 11, 1987	0.75	<4	46	<1	<70	.21	<30	340	.29	--
APR 13, 1987	--	<4	23	<1	<70	.11	.	280	.17	--
MAY 05, 1987	--	--	--	--	--	--	--	--	--	--
JUNE 02, 1987	9.6	--	--	--	--	--	--	--	--	--
JULY 06, 1987	--	7.8	15	<1	<70	.17	<30	300	.22	--
AUG 11, 1987	--	--	--	--	--	--	--	--	--	--
AUG 20, 1987	--	--	--	--	--	--	--	--	--	--
SEPT 15, 1987	--	--	--	--	--	--	--	--	--	--
OCT 05, 1987	.10	<20	13	<1	<70	<.02	<30	210	.26	--
NOV 16, 1987	.14	5.2	13	<1	<70	.23	<30	230	.20	--
DEC 17, 1987	--	--	--	--	--	--	--	--	--	--
MAY 10, 1988	--	--	--	--	--	--	--	--	--	--
JUNE 07, 1988	--	--	--	--	--	--	--	--	--	--
JULY 13, 1988	--	--	--	--	--	--	--	--	--	--
DEC 21, 1988	--	--	--	--	--	--	--	--	--	--
JUNE 14, 1989	.03	--	--	--	--	--	--	--	--	--
SEPT 12, 1989	--	--	--	--	--	--	--	--	--	--
410921079293102 Lysimeter 4 (LAT 41°09'21" N. LONG 079°29'31" W.)										
OCT 09, 1986	--	230	96	<1	<70	1.4	<30	1,400	1.8	--
NOV 05, 1986	--	<4	59	<1	<70	.84	<30	810	1.6	--
DEC 11, 1986	--	<4	52	<1	<70	.62	<60	670	1.1	--
JAN 06, 1987	--	<4	33	<1	<70	.38	<30	460	.55	--
FEB 10, 1987	--	4.5	21	<1	<70	<.02	<6	390	.24	--
MAR 11, 1987	.13	6	11	<1	<70	<.02	<60	220	.16	--
APR 13, 1987	--	<4	10	<1	<70	<.02	--	240	.09	--
MAY 05, 1987	21	11	14	<1	<70	.12	<6	290	.37	--
JUNE 01, 1987	4.4	--	--	<1	<70	--	<6	320	--	<0.001
JULY 06, 1987	--	--	--	--	--	--	--	--	--	--
AUG 11, 1987	--	5.3	15	<1	<70	.27	<30	310	.31	--
SEPT 15, 1987	.07	<20	15	<1	<70	.18	<30	260	.44	--
DEC 17, 1987	.12	<10	13	<1	<70	.13	<30	120	.21	--
APR 12, 1988	.11	<4	13	<1	<70	.11	<30	190	.22	--
MAY 10, 1988	.03	<4	9.4	<1	<300	.11	<30	220	.25	--
JUNE 07, 1988	.29	<4	8.1	<1	<70	9.3	<30	180	.20	--
JULY 13, 1988	.15	<4	10	<1	<300	.16	--	210	.36	--
AUG 09, 1988	--	--	--	--	--	--	--	--	--	--
OCT 18, 1988	--	--	--	--	--	--	--	--	--	--
NOV 15, 1988	.13	4.3	8	<1	<70	.22	<30	210	.55	--
DEC 21, 1988	--	4.2	9.8	<1	<70	.28	<30	240	.49	--
FEB 15, 1989	--	<40	9.4	<1	<70	.17	<30	220	.40	--
MAR 14, 1989	.05	<4	8	<1	<70	.17	<30	210	.26	--
APR 12, 1989	.10	<4	5.9	<1	<70	.10	<30	160	.28	--
MAY 10, 1989	.20	--	6.3	<1	--	.11	<30	180	.31	--
JUNE 14, 1989	.15	<4	6.3	<1	<70	.14	<30	180	.22	--
JULY 11, 1989	--	10	5.9	<1	<70	.28	<30	190	.20	--
AUG 09, 1989	.11	<4	6	<1	<70	.15	<30	180	.21	--
SEPT 12, 1989	.13	<4	6.2	<1	<70	.18	<30	190	.38	--
OCT 17, 1989	.16	<4	6	<1	<70	.15	<30	160	.32	--
NOV 07, 1989	.11	<4	6	<1	<70	.12	<30	160	.28	--
410848079295701 Well 1 (LAT 41°08'48" N. LONG 079°29'57" W.)										
SEPT 10, 1986	--	<50	16	<1	<70	<.02	<30	2,000	<.01	<.001

Appendix 2.--Water-quality data for urban sewage sludge site, June 1986 through November 1989--Continued

Date	Time	Water table altitude (ft above sea level)	Streamflow/ discharge, instan-taneous (ft^3/s)	Specific conduc-tance (µS/cm)	pH, field (units)	pH, lab (units)	Oxidation reduction potential (mV)	Water temper-ature (°C)	Oxygen, dissolved (mg/L)	Acidity total heated (mg/L as $CaCO_3$)	Acidity mineral (methyl orange) (mg/L as $CaCO_3$)	Calcium, dissolved (mg/L)
410848079295701 Well 1 (LAT 41°08'48" N. LONG 079°29'57" W.)--Continued												
DEC 08, 1986	1600	1,346	--	3,790	6.2	6.3	--	12.5	--	0	--	520
MAR 09, 1987	1800	1,347	--	3,600	6.1	6.4	--	11.0	--	0	--	560
MAR 11, 1987	0005	1,347	--	3,600	6.1	6.3	--	11.0	--	0	--	450
JUNE 01, 1987	1745	1,349	--	3,770	6.2	6.2	--	14.0	--	0	--	520
SEPT 16, 1987	0830	1,346	--	3,600	6.2	6.6	--	13.5	--	0	--	360
DEC 15, 1987	1445	1,346	--	3,500	6.1	6.5	--	13.5	--	0	--	530
MAR 16, 1988	0005	1,347	--	2,900	5.7	6.5	--	12.0	--	0	--	510
MAR 16, 1988	1200	1,347	--	2,850	5.7	6.4	--	12.0	--	0	--	540
JUNE 08, 1988	1020	1,348	--	3,040	6.1	6.4	--	14.5	--	0	--	570
SEPT 21, 1988	1400	1,345	--	2,810	6.7	6.6	--	14.5	--	0	--	490
DEC 21, 1988	1545	1,345	--	2,800	6.2	6.7	285	12.0	0.14	0	--	570
MAR 15, 1989	1120	1,347	--	3,000	6.1	6.9	--	13.0	.42	0	--	710
JUNE 15, 1989	1300	1,351	--	3,130	6.1	7.0	--	13.5	.45	0	--	660
SEPT 12, 1989	1335	1,348	--	3,050	6.1	6.8	--	14.5	.36	0	--	550
410916079292901 Well 14.0 (LAT 41°09'16" N. LONG 079°29'29" W.)												
SEPT 09, 1986	0005	1,317	--	2,700	5.9	6.0	--	11.5	--	200	--	300
SEPT 09, 1986	1100	1,317	--	2,700	5.9	6.0	--	11.5	--	190	--	300
DEC 08, 1986	1330	1,319	--	2,880	6.2	5.8	--	10.5	--	210	--	280
MAR 09, 1987	1700	1,318	--	3,000	5.8	6.0	--	9.0	--	200	--	370
JUNE 01, 1987	1420	1,319	--	3,080	6.0	5.8	--	13.0	--	190	--	350
SEPT 14, 1987	1330	1,317	--	3,000	5.8	6.3	--	12.0	--	170	--	340
DEC 16, 1987	0005	1,316	--	3,000	5.5	6.3	--	9.5	--	150	--	310
DEC 16, 1987	0945	1,315	--	3,000	5.9	6.3	--	9.0	--	130	--	340
MAR 15, 1988	1200	1,318	--	2,600	5.6	6.1	--	7.0	--	130	--	350
APR 11, 1988	1200	1,319	--	2,350	5.8	6.1	--	11.0	--	190	--	330
MAY 09, 1988	0005	1,316	--	2,600	5.7	6.1	--	12.0	--	240	--	340
MAY 09, 1988	1310	1,316	--	2,650	5.7	6.0	--	12.0	--	240	--	300
JUNE 07, 1988	0835	1,316	--	2,640	5.5	5.9	--	15.0	--	310	--	390
JULY 12, 1988	1330	1,317	--	2,530	5.5	6.0	--	15.0	--	290	--	390
AUG 08, 1988	1245	1,316	--	2,730	6.0	6.2	--	15.0	--	210	--	380
SEPT 20, 1988	1515	1,315	--	2,460	5.7	6.0	--	12.5	--	160	--	310
OCT 17, 1988	0005	1,314	--	2,650	6.0	6.1	330	12.0	.20	160	--	330
OCT 17, 1988	1455	1,314	--	2,620	6.0	6.1	330	12.0	.20	200	--	370
NOV 16, 1988	0930	1,315	--	2,580	5.8	6.3	335	11.5	.22	220	--	400
DEC 21, 1988	0845	1,315	--	2,430	6.1	6.2	340	10.5	.22	190	--	370
JAN 09, 1989	1450	1,314	--	2,580	6.1	6.4	328	9.0	.21	200	--	370
FEB 14, 1989	1322	1,317	--	2,390	6.0	6.4	353	10.0	.09	150	--	380
MAR 15, 1989	0915	1,317	--	2,600	5.9	6.3	383	11.5	.22	170	--	330
APR 10, 1989	1210	1,320	--	2,250	5.8	6.2	341	11.0	.17	160	--	340
MAY 09, 1989	0005	1,319	--	2,200	6.0	6.3	308	11.0	.10	120	--	330
MAY 09, 1989	1440	1,319	--	2,150	6.0	6.4	308	11.0	.10	120	--	330
JUNE 14, 1989	0900	1,320	--	2,580	5.8	6.4	345	12.0	.74	210	--	370
JULY 10, 1989	1320	1,320	--	2,540	5.9	6.1	470	13.5	.27	210	--	360
AUG 08, 1989	1255	1,319	--	2,500	5.7	5.7	380	12.0	.31	300	--	420
SEPT 11, 1989	1530	1,318	--	2,450	5.1	5.8	413	12.5	.42	270	--	420
OCT 16, 1989	0005	1,317	--	2,620	5.8	6.2	420	13.5	--	190	--	370
OCT 16, 1989	1210	1,317	--	2,750	5.8	6.2	420	13.5	--	200	--	360
NOV 07, 1989	1130	1,317	--	2,540	6.0	6.4	390	12.0	--	160	--	470
410916079292902 Well 14A (LAT 41°09'16" N. LONG 079°29'29" W.)												
SEPT 09, 1986	1130	1,314	--	2,900	6.7	6.1	--	12.0	--	190	--	370
DEC 08, 1986	1400	1,318	--	3,080	6.1	5.9	--	11.0	--	180	--	350
MAR 09, 1987	1530	1,317	--	3,000	6.0	6.1	--	10.0	--	170	--	350
JUNE 01, 1987	1430	1,318	--	3,060	6.0	5.9	--	13.0	--	160	--	340

Appendix 2.--Water-quality data for urban sewage sludge site, June 1986 through November 1989--Continued

Date	Magnesium, dissolved (mg/L)	Sodium, dissolved (mg/L)	Potassium, dissolved (mg/L)	Alkalinity water lab (mg/L as $CaCO_3$)	Sulfide total (mg/L as S)	Sulfate, dissolved (mg/L as SO_4)	Chloride, dissolved (mg/L)	Silica, dissolved (mg/L as SiO_2)	Solids, residue at 105 °C, dissolved (mg/L)	Nitrogen, nitrate total (mg/L as N)	Nitrogen, nitrite total (mg/L as N)
410848079295701 Well 1 (LAT 41°08'48" N. LONG 079°29'57" W.)--Continued											
DEC 08, 1986	330	15	10	370	–	2,000	5.8	–	3,980	0.10	<0.004
MAR 09, 1987	360	17	12	380	–	2,500	6	–	3,900	<.04	.004
MAR 11, 1987	290	14	12	400	–	2,400	6	–	3,680	.04	.004
JUNE 01, 1987	340	23	11	420	–	2,200	7	11	4,190	<.04	.004
SEPT 16, 1987	230	30	13	460	–	2,400	8	12	4,140	.06	<.004
DEC 15, 1987	300	19	11	470	–	2,300	8	8.9	3,710	.06	.004
MAR 16, 1988	320	18	11	430	–	2,400	7	61	3,840	<.04	.008
MAR 16, 1988	320	17	11	440	–	2,400	10	43	4,030	<.04	.008
JUNE 08, 1988	340	16	9.8	410	–	2,500	7	10	4,600	<.04	<.004
SEPT 21, 1988	250	16	9.6	500	0.40	2,200	8	9.6	3,500	<.04	<.004
DEC 21, 1988	300	21	10	520	<.20	2,400	10	8.6	3,520	.11	.004
MAR 15, 1989	320	21	11	–	.48	2,100	9	9.3	4,260	.04	.004
JUNE 15, 1989	300	17	11	–	.20	2,300	7	9.3	4,040	<.04	.004
SEPT 12, 1989	320	19	11	510	<.20	1,900	7	16	4,120	<.04	<.004
410916079292901 Well 14 (LAT 41°09'16" N. LONG 079°29'29" W.)											
SEPT 09, 1986	290	12	11	52	–	740	4	–	3,150	<.002	<.004
SEPT 09, 1986	290	12	10	52	–	630	4	–	3,170	<.004	<.004
DEC 08, 1986	290	9.5	10	60	–	1,700	3.2	–	3,140	<.04	<.004
MAR 09, 1987	290	5.7	8.9	92	–	2,200	3	–	3,370	<.04	.002
JUNE 01, 1987	370	8.2	10	100	–	1,500	3	16	3,930	<.04	<.004
SEPT 14, 1987	270	7.1	10	92	–	2,100	4	15	3,430	<.04	<.004
DEC 16, 1987	250	5.5	18	110	–	2,100	5	16	3,330	.22	.004
DEC 16, 1987	280	8.2	18	110	–	2,100	5	16	3,410	.23	.006
MAR 15, 1988	270	8.3	8.4	110	–	2,200	2	15	3,260	<.04	<.004
APR 11, 1988	240	6.1	9.2	100	–	2,100	2	18	3,300	<.04	.004
MAY 09, 1988	260	6	9.1	72	–	2,000	2	17	3,330	<.04	<.004
MAY 09, 1988	250	7.2	8.6	72	–	2,200	2	18	3,540	<.04	<.004
JUNE 07, 1988	270	5.5	8.3	66	–	1,900	2	18	3,490	<.04	<.004
JULY 12, 1988	260	6.3	9.2	58	–	2,200	2	19	4,050	<.04	.016
AUG 08, 1988	280	5.9	8.2	80	–	2,400	3	14	3,980	.04	<.004
SEPT 20, 1988	230	5	8.1	100	7	2,300	2	14	3,730	.10	<.004
OCT 17, 1988	280	5.2	7.5	100	.30	1,700	2	13	3,830	<.04	<.004
OCT 17, 1988	290	5.7	7.5	110	.30	1,800	2	13	3,640	<.04	<.004
NOV 16, 1988	330	8.1	7.6	120	<.20	1,900	2	9.9	4,140	<.04	<.004
DEC 21, 1988	300	7.1	8	120	.40	2,200	3	9.2	3,500	<.04	.008
JAN 09, 1989	270	7.3	8.9	120	.24	2,200	3	9.8	3,520	<.04	.014
FEB 14, 1989	290	5.8	8.3	120	<.20	2,100	3	12	4,930	<.04	<.004
MAR 15, 1989	260	6.8	8.2	110	.72	1,800	2	12	3,290	<.04	<.004
APR 10, 1989	250	7	8.5	120	<.20	2,300	3	13	–	<.04	<.004
MAY 09, 1989	260	6.7	8.2	98	<.20	2,300	2	15	4,240	<.04	<.004
MAY 09, 1989	250	7	7.8	100	<.20	2,300	2	14	4,310	<.04	<.004
JUNE 14, 1989	260	6.8	18	80	.32	2,100	3	17	3,520	<.04	.008
JULY 10, 1989	260	7.1	8.5	72	<.20	2,100	2	14	3,260	<.04	.004
AUG 08, 1989	270	6.4	8.3	40	.48	2,400	4	18	3,980	<.04	<.004
SEPT 11, 1989	290	7	7.7	42	<.20	2,400	3	21	3,880	<.04	<.004
OCT 16, 1989	250	6.8	8.2	68	<.20	2,300	3	20	3,450	<.04	<.004
OCT 16, 1989	240	6.8	8.5	70	<.20	2,300	3	19	3,450	<.04	<.004
NOV 07, 1989	340	8.1	8.5	96	<.20	2,300	3	14	3,290	<.04	<.004
410916079292902 Well 14A (LAT 41°09'16" N. LONG 079°29'29" W.)											
SEPT 09, 1986	94	<.20	6.5	120	–	2,600	3	–	3,410	<.02	<.004
DEC 08, 1986	280	5.2	7.5	110	–	2,100	1.6	–	3,330	.10	<.004
MAR 09, 1987	280	5.3	8.2	120	–	1,400	2	–	3,280	<.04	.020
JUNE 01, 1987	270	5.5	8.3	110	–	1,900	3	15	3,640	<.04	<.004

Appendix 2.--Water-quality data for urban sewage sludge site, June 1986 through November 1989--Continued

Date	Nitrogen, ammonia total (mg/L as N)	Nitrogen, ammonia + organic total (mg/L as N)	Phosphorus total (mg/L as P)	Aluminum, dissolved (mg/L)	Arsenic, dissolved (µg/L)	Barium, dissolved (µg/L)	Boron, dissolved (µg/L)	Cadmium, dissolved (µg/L)	Chromium, dissolved (µg/L)	Copper, dissolved (µg/L)	Iron, dissolved (mg/L)
410848079295701 Well 1 (LAT 41°08'48" N. LONG 079°29'57" W.)--Continued											
DEC 08, 1986	0.46	1.3	--	<0.14	<4	<10	<250	2.7	200	45	71
MAR 09, 1987	.43	1.7	--	<.14	<4	<10	<250	.69	<50	<10	63
MAR 11, 1987	.46	1.8	--	<.14	<4	<10	<250	.45	<50	<10	52
JUNE 01, 1987	.48	1.3	0.06	<.14	4.9	13	<250	<.20	<50	520	60
SEPT 16, 1987	.50	1.6	.06	.14	4.6	<10	<250	<1	<50	<10	40
DEC 15, 1987	.56	.96	.03	.19	4.6	<10	<250	<.50	<50	<10	37
MAR 16, 1988	.50	1	.06	5.4	8.1	32	<250	5.8	<50	<10	58
MAR 16, 1988	.50	.84	.06	4.9	14	45	<250	4.1	<50	12	97
JUNE 08, 1988	.57	1.6	.04	.29	<4	<10	<250	.92	<50	<10	83
SEPT 21, 1988	.57	.88	.22	1.2	5	<10	<250	.48	<50	<10	28
DEC 21, 1988	.55	1.3	.06	.26	5.2	11	<250	.31	<10	22	30
MAR 15, 1989	.28	1.5	.28	.19	5.4	14	<250	1.5	<50	24	29
JUNE 15, 1989	.54	1	.06	.40	4.7	19	<250	.47	<50	35	39
SEPT 12, 1989	.54	1.3	.06	.37	<4	13	<250	.32	<50	25	34
410916079292901 Well 14 (LAT 41°09'16" N. LONG 079°29'29" W.)											
SEPT 09, 1986	.60	1.5	--	.14	<4	--	<250	.21	<50	16	60
SEPT 09, 1986	.57	1.4	--	.15	<10	31	<250	<.20	<50	18	64
DEC 08, 1986	.60	1.5	--	<.14	<5	<10	<250	<.20	130	33	67
MAR 09, 1987	.54	1.6	--	<.14	<4	<10	<250	1.5	<50	<10	120
JUNE 01, 1987	.55	1.8	.07	.20	<4	<10	<250	1.3	<50	<10	94
SEPT 14, 1987	.88	2.2	.05	.34	<4	<10	<250	<.20	<50	<10	99
DEC 16, 1987	.59	2.4	.29	.54	4.7	12	<250	.68	<50	<10	95
DEC 16, 1987	.65	2.6	.02	.30	<4	<10	<250	.72	<50	<10	98
MAR 15, 1988	.78	.88	.04	.39	<4	<10	<250	<.20	<50	13	99
APR 11, 1988	.57	1	.03	.26	<4	<10	<250	.51	<50	18	110
MAY 09, 1988	.96	1.2	.05	.60	<20	<10	<250	.52	<50	14	130
MAY 09, 1988	.94	1	.07	.64	<4	<10	<250	<.50	<50	19	120
JUNE 07, 1988	.78	1.3	.03	.67	4.6	<10	<250	<.20	<50	10	160
JULY 12, 1988	1	1.9	.06	.92	<20	<10	<250	1.8	120	<10	180
AUG 08, 1988	.93	1.7	.06	.48	<4	<10	<250	.81	<50	26	130
SEPT 20, 1988	.81	3.8	.05	.43	4	<10	<250	.84	<50	<10	100
OCT 17, 1988	.90	1.6	.04	.41	<4	<10	<250	.21	<50	34	110
OCT 17, 1988	.87	1.5	.05	.42	<4	<10	<250	<.20	<50	34	110
NOV 16, 1988	1	.99	.04	.59	<4	<10	<250	<.20	<50	13	160
DEC 21, 1988	.90	.98	.07	.34	<4	<10	<250	<.20	<50	32	120
JAN 09, 1989	1.1	1.2	.04	.33	<4	<10	<250	<.20	<50	19	120
FEB 14, 1989	.90	1.4	.03	.30	<4	<10	<250	<.20	<50	28	130
MAR 15, 1989	.36	1.2	.06	.40	<4	<10	<250	.32	<50	24	110
APR 10, 1989	.59	1	.03	.28	<4	<10	<250	.29	<50	18	94
MAY 09, 1989	.59	.95	.05	.19	<4	<10	<250	<.20	<50	20	94
MAY 09, 1989	.59	.93	.05	.23	<4	<10	<250	<.20	<50	20	92
JUNE 14, 1989	.82	1.4	.09	.56	<4	<10	<250	.81	<50	26	110
JULY 10, 1989	.76	1.2	.06	.40	<4	<10	<250	1	<50	13	110
AUG 08, 1989	1	2	.14	1.60	<4	18	<250	.81	<50	25	140
SEPT 11, 1989	.82	1.2	.13	.86	<4	10	<250	.43	<50	<19	99
OCT 16, 1989	.68	1.2	.07	.49	4	10	<250	.65	<50	32	110
OCT 16, 1989	.68	1.5	.08	.42	4.1	10	<250	.73	<50	25	97
NOV 07, 1989	.70	1.2	.05	.25	<4	<10	<250	.36	<50	23	120
410916079292902 Well 14A (LAT 41°09'16" N. LONG 079°29'29" W.)											
SEPT 09, 1986	.52	1.7	--	<.14	<4	<10	<250	2.2	<50	<10	90
DEC 08, 1986	.50	1.4	--	<.14	<4	<10	<250	<.20	180	42	99
MAR 09, 1987	.48	1.7	--	<.14	<4	<10	<250	.44	<50	<10	99
JUNE 01, 1987	.48	1.2	.06	.24	<4	<10	<250	<.20	<50	<10	100

Date	Iron, ferrous dissolved (mg/L)	Lead, dissolved (µg/L)	Manganese, dissolved (mg/L)	Mercury, dissolved µg/l)	Molybdenum, dissolved (µg/L)	Nickel, dissolved (mg/L)	Selenium, dissolved (µg/L)	Strontium, dissolved (µL)	Zinc, dissolved (mg/L)	Cyanide total (mg/L)
410848079295701 Well 1 (LAT 41°08'48" N. LONG 079°29'57" W.)--Continued										
DEC 08, 1986	80	<4	17	<1	<70	<0.02	<30	1,800	0.26	<0.001
MAR 09, 1987	67	<4	16	<1	<70	<.02	<60	1,700	<.01	<.001
MAR 11, 1987	66	<4	15	<1	<70	<.02	<30	1,700	.011	<.001
JUNE 01, 1987	61	<4	21	<1	<70	3.3	<30	1,800	1.3	<.001
SEPT 16, 1987	44	<20	13	<1	<70	.09	<30	1,800	.12	<.001
DEC 15, 1987	41	<10	13	<1	210	.04	<30	2,200	.10	<.001
MAR 16, 1988	59	6.5	13	5.6	<70	.07	<30	2,000	.17	<.001
MAR 16, 1988	62	<4	14	5.8	<70	.07	<30	2,700	.19	<.001
JUNE 08, 1988	78	<4	17	<1	<70	.14	<30	1,600	.17	<.001
SEPT 21, 1988	39	7.8	9.5	<1	<70	.11	<30	2,400	.21	<.001
DEC 21, 1988	31	4.1	10	<1	<70	<.02	<30	2,200	.12	<.001
MAR 15, 1989	93	<20	10	<1	<70	.04	<30	2,600	.12	<.001
JUNE 15, 1989	30	<20	12	<1	<70	.03	<30	2,100	.16	<.001
SEPT 12, 1989	38	<20	14	<1	<70	<.02	<30	2,000	.12	<.001
410916079292901 Well 14 (LAT 41°09'16" N. LONG 079°29'29" W.)										
SEPT 09, 1986	--	<50	43	<1	<70	.22	<30	1,100	.17	<.001
SEPT 09, 1986	--	<50	44	<1	<70	.21	<30	1,100	.027	<.001
DEC 08, 1986	78	<4	42	<1	<70	<.02	<30	1,200	.12	<.001
MAR 09, 1987	110	<4	44	<1	<70	.26	<60	1,600	.26	<.001
JUNE 01, 1987	92	<4	41	<1	<70	.57	<30	1,500	.25	<.001
SEPT 14, 1987	110	<4	37	<1	<70	.45	<30	1,800	.10	<.001
DEC 16, 1987	98	<10	36	<1	<70	.60	<30	1,600	.11	<.001
DEC 16, 1987	100	<10	42	<1	<70	.52	<30	1,600	.12	<.001
MAR 15, 1988	100	<10	44	<1	<70	.50	<30	1,600	.14	<.001
APR 11, 1988	110	<4	41	<1	<70	.54	<30	1,800	.16	<.001
MAY 09, 1988	140	<10	36	<1	<70	.66	<30	1,900	.35	<.001
MAY 09, 1988	140	<10	36	<1	<70	.72	<30	1,800	.39	<.001
JUNE 07, 1988	150	<20	40	<1	<70	.68	<30	1,600	.41	<.001
JULY 12, 1988	170	<20	37	<1	<300	.70	<30	1,800	.50	<.001
AUG 08, 1988	130	<4	41	<1	<300	.66	<30	1,600	.39	<.001
SEPT 20, 1988	130	<4	36	<1	<70	.54	<30	1,600	.26	<.001
OCT 17, 1988	120	<40	45	<1	<70	.49	<30	1,400	.41	<.001
OCT 17, 1988	130	<40	49	<1	<70	.50	<30	1,400	.43	<.001
NOV 16, 1988	130	25	57	<1	<70	.64	<30	1,500	.64	<.001
DEC 21, 1988	130	<4	52	<1	<70	.50	<30	1,400	.58	<.001
JAN 09, 1989	120	<40	49	<1	<70	.48	<30	1,400	.59	<.001
FEB 14, 1989	120	<40	48	<1	<70	.40	<30	1,500	.58	<.001
MAR 15, 1989	110	<20	48	<1	<70	.46	<30	1,600	.47	<.001
APR 10, 1989	110	<4	40	<1	<70	.41	<30	1,400	.45	<.001
MAY 09, 1989	100	<10	38	<1	<70	.48	<30	1,600	.36	<.001
MAY 09, 1989	110	<10	37	<1	<70	.39	<30	1,600	.36	<.001
JUNE 14, 1989	110	<10	38	<1	<70	.44	<30	1,600	.43	<.001
JULY 10, 1989	120	<20	36	<1	<70	.32	<30	1,700	.29	<.001
AUG 08, 1989	150	<10	35	<1	<70	.52	<30	1,900	.58	<.001
SEPT 11, 1989	140	<4	31	<1	<70	.42	<30	1,800	.44	<.001
OCT 16, 1989	120	<10	34	<1	<70	.40	<30	1,400	.32	<.001
OCT 16, 1989	120	<10	33	<1	<70	.40	<30	1,400	.32	<.001
NOV 07, 1989	110	<4	48	<1	<70	.40	<30	1,500	.30	<.001
410916079292902 Well 14A (LAT 41°09'16" N. LONG 079°29'29" W.)										
SEPT 09, 1986	--	<50	44	<1	<70	<.02	<30	1,600	<.01	<.001
DEC 08, 1986	110	<4	46	<1	<70	.06	<30	1,600	.50	<.001
MAR 09, 1987	97	<4	46	<1	<70	.08	<30	1,600	.12	<.001
JUNE 01, 1987	87	<4	41	<1	<70	.42	<30	1,400	.12	<.001

Appendix 2.–Water-quality data for urban sewage sludge site, June 1986 through November 1989–Continued

Date	Time	Water table altitude (ft above sea level)	Streamflow/ discharge, instan-taneous (ft^3/s)	Specific conduc-tance (µS/cm)	pH, field (units)	pH, lab (units)	Oxidation reduction potential (mV)	Water temper-ature (°C)	Oxygen, dissolved (mg/L)	Acidity total heated (mg/L as $CaCO_3$)	Acidity mineral (methyl orange) (mg/L as $CaCO_3$)	Calcium, dissolved (mg/L)
410916079292902 Well 14A (LAT 41°09'16" N. LONG 079°29'29" W.)–Continued												
SEPT 14, 1987	1330	1,317	–	3,000	5.9	6.3	–	14.0	–	130	–	330
DEC 16, 1987	0005	1,315	–	2,950	5.9	6.3	–	9.0	–	140	–	310
DEC 16, 1987	1100	1,316	–	2,850	5.5	6.3	–	9.5	–	120	–	310
MAR 15, 1988	1000	1,318	–	2,500	5.9	6.0	–	9.0	–	160	–	310
APR 11, 1988	1245	1,318	–	2,380	6.2	6.1	–	12.0	–	150	–	290
MAY 09, 1988	1310	1,316	–	2,550	5.9	6.2	–	12.0	–	150	–	310
JUNE 07, 1988	0915	1,316	–	2,530	6.0	6.1	–	14.0	–	140	–	360
JULY 11, 1988	0005	1,317	–	2,690	6.0	6.2	–	14.5	–	150	–	340
JULY 11, 1988	1400	1,316	–	2,490	6.0	6.2	–	14.5	–	150	–	380
AUG 08, 1988	1315	1,316	–	2,740	6.0	6.3	–	13.0	–	140	–	430
SEPT 20, 1988	1600	1,315	–	2,480	5.8	6.1	–	13.5	–	120	–	310
OCT 17, 1988	1425	1,313	–	2,560	5.9	6.1	320	13.0	0.14	200	–	330
NOV 16, 1988	0945	1,314	–	2,450	5.9	6.2	320	11.5	.16	230	–	440
DEC 21, 1988	0005	1,315	–	2,530	6.1	6.2	330	10.5	.46	150	–	370
DEC 21, 1988	0855	1,315	–	2,430	6.1	6.2	330	10.5	.46	160	–	370
JAN 09, 1989	1520	1,313	–	2,490	6.1	6.5	308	9.0	.21	0	–	340
FEB 14, 1989	1405	1,316	–	2,490	6.0	6.4	353	9.0	.13	150	–	330
MAR 15, 1989	0910	1,317	–	2,550	5.8	6.3	353	12.0	.22	170	–	360
APR 10, 1989	1250	1,319	–	2,300	5.8	6.2	356	10.5	.08	–	–	330
MAY 10, 1989	1420	1,319	–	2,400	5.9	6.3	318	11.5	.09	200	–	350
JUNE 14, 1989	0005	1,320	–	2,620	5.5	6.1	275	11.5	.32	270	–	360
JUNE 14, 1989	0900	1,320	–	2,640	5.5	6.2	275	11.5	.32	310	–	390
JULY 10, 1989	1400	1,320	–	3,250	3.8	3.2	515	15.5	.33	850	94	390
AUG 08, 1989	1315	1,319	–	2,470	5.7	6.0	340	12.0	.27	240	–	370
SEPT 11, 1989	1605	1,318	–	2,300	5.6	6.4	323	13.0	.41	160	–	370
OCT 16, 1989	1255	1,317	–	2,650	5.9	6.4	435	13.5	–	110	–	390
NOV 07, 1989	1135	1,316	–	2,630	6.1	6.4	410	12.0	–	120	–	460
410916079292903 Well 14B (LAT 41°09'16" N. LONG 079°29'29" W.)												
JULY 09, 1986	0900	1,317	–	2,740	6.6	6.6	–	14.0	–	0	–	420
AUG 06, 1986	0900	1,317	–	3,390	6.8	6.3	–	12.0	–	20.0	–	410
SEPT 09, 1986	1500	1,317	–	2,900	6.5	6.2	–	12.5	–	210	–	390
OCT 09, 1986	1800	1,318	–	3,050	6.0	6.2	–	11.5	–	86	–	380
NOV 06, 1986	1300	1,315	–	2,900	–	6.3	–	12.0	–	160	–	180
DEC 08, 1986	1445	1,319	–	3,120	5.8	5.9	–	11.0	–	160	–	330
JAN 05, 1987	1330	1,319	–	2,950	5.9	5.9	–	10.5	–	170	–	340
FEB 10, 1987	0005	1,318	–	3,100	5.9	6.2	–	11.0	–	52	–	360
FEB 10, 1987	1300	1,318	–	3,100	5.9	6.2	–	11.0	–	150	–	360
MAR 10, 1987	0900	1,318	–	2,950	6.1	6.1	–	9.5	–	98	–	360
APR 13, 1987	1330	1,319	–	3,070	6.1	6.3	–	11.5	–	180	–	320
MAY 04, 1987	1315	1,319	–	3,010	5.8	6.3	–	11.5	–	130	–	330
JUNE 01, 1987	1600	1,319	–	3,100	6.2	5.8	–	12.5	–	90	–	320
JULY 06, 1987	1230	1,318	–	3,020	6.2	6.0	–	13.0	–	74	–	310
AUG 11, 1987	1100	1,317	–	3,000	5.8	6.2	–	13.0	–	40	–	310
SEPT 14, 1987	1500	1,317	–	3,000	6.5	6.3	–	12.5	–	94	–	330
OCT 05, 1987	1245	1,317	–	3,050	5.9	6.2	–	12.0	–	68	–	330
NOV 16, 1987	1230	1,317	–	3,040	5.9	6.3	–	12.0	–	120	–	360
DEC 16, 1987	0915	1,317	–	2,900	5.9	6.3	–	10.0	–	120	–	310
JAN 12, 1988	1200	1,315	–	3,000	5.8	6.4	–	9.5	–	20.0	–	390
FEB 09, 1988	0920	1,318	–	2,500	5.9	6.4	–	7.0	–	0	–	380
MAR 15, 1988	0935	1,318	–	2,400	6.0	6.2	–	8.0	–	94	–	240
APR 11, 1988	0005	1,319	–	2,260	5.9	6.1	–	13.5	–	110	–	310
APR 11, 1988	1215	1,319	–	2,330	5.8	6.1	–	13.5	–	100	–	330
MAY 09, 1988	1345	1,317	–	2,650	5.8	6.2	–	12.0	–	100	–	340
JUNE 07, 1988	1200	1,316	–	2,550	6.0	6.1	–	14.0	–	170	–	380

Appendix 2.--Water-quality data for urban sewage sludge site, June 1986 through November 1989--Continued

Date	Magnesium, dissolved (mg/L)	Sodium, dissolved (mg/L)	Potassium, dissolved (mg/L)	Alkalinity water lab (mg/L as $CaCO_3$)	Sulfide total (mg/L as S)	Sulfate, dissolved (mg/L as SO_4)	Chloride, dissolved (mg/L)	Silica, dissolved (mg/L as SiO_2)	Solids, residue at 105 °C, dissolved (mg/L)	Nitrogen, nitrate total (mg/L as N)	Nitrogen, nitrite total (mg/L as N)
410916079292902 Well 14A (LAT 41°09'16" N. LONG 079°29'29" W.)--Continued											
SEPT 14, 1987	270	6.3	9.3	120	–	2,000	3	13	3,560	<0.04	<0.004
DEC 16, 1987	250	4.7	7.9	100	–	2,000	4	16	3,350	.06	.008
DEC 16, 1987	240	8	8.2	100	–	2,100	4	18	3,040	.09	.010
MAR 15, 1988	250	5.8	7.8	110	–	2,200	3	14	3,140	<.04	.010
APR 11, 1988	220	5.6	10	110	–	2,100	2	17	3,240	<.04	.006
MAY 09, 1988	280	6.3	9.6	96	–	2,100	3	17	3,560	<.04	<.004
JUNE 07, 1988	260	5.4	7.8	110	–	1,500	3	15	3,390	<.04	<.004
JULY 11, 1988	270	5.6	8.1	82	–	2,100	2	15	4,140	<.04	.010
JULY 11, 1988	300	5.8	8.5	100	–	2,100	2	16	4,020	<.04	.012
AUG 08, 1988	320	5.5	7.3	110	–	2,300	3	13	3,710	<.04	<.004
SEPT 20, 1988	240	5.5	7.6	110	3.1	2,200	2	13	4,190	.06	<.004
OCT 17, 1988	300	5.3	7.1	110	.30	1,600	2	12	3,420	<.04	<.004
NOV 16, 1988	360	8.1	7.1	110	.20	2,200	3	9.9	3,710	<.04	.008
DEC 21, 1988	300	6.8	7.6	130	.56	2,100	3	9.3	3,520	<.04	.004
DEC 21, 1988	290	6.6	7.6	120	.56	2,200	3	9	3,310	<.04	.004
JAN 09, 1989	260	6.7	7.8	130	.24	2,000	3	10	3,400	<.04	.014
FEB 14, 1989	250	6.3	7.5	–	<.20	2,100	3	12	3,810	<.04	<.004
MAR 15, 1989	280	6.7	7.4	110	.56	2,000	3	12	4,010	<.04	.004
APR 10, 1989	240	7.1	8.5	96	.29	2,300	3	19	–	<.04	.006
MAY 10, 1989	250	6.5	7.2	90	<.20	1,900	2	15	4,160	<.04	.006
JUNE 14, 1989	240	6.6	14	56	4.9	2,300	3	20	3,460	<.04	<.004
JUNE 14, 1989	270	6.2	15	58	4.9	2,100	3	20	3,570	<.04	.004
JULY 10, 1989	260	5.8	9.4	–	<.20	2,800	5	36	4,670	<.04	.022
AUG 08, 1989	270	6.7	7.3	64	.32	2,300	4	16	3,790	<.04	<.004
SEPT 11, 1989	290	7.7	7.1	120	<.20	1,900	3	15	3,660	<.04	<.004
OCT 16, 1989	270	6.7	7.5	110	.32	2,300	3	18	3,520	<.04	<.004
NOV 07, 1989	350	7.7	7.8	120	.48	2,300	3	12	3,270	<.04	<.004
410916079292903 Well 14B (LAT 41°09'16" N. LONG 079°29'29" W.)											
JULY 09, 1986	150	38	20	280	–	2,000	4	–	2,890	.092	.004
AUG 06, 1986	190	18	13	120	–	2,400	4	–	3,350	<.04	.030
SEPT 09, 1986	280	3.6	8.2	160	–	2,300	4	–	3,370	<.02	<.004
OCT 09, 1986	270	9.5	12	160	–	1,600	3	–	3,240	.04	.004
NOV 06, 1986	140	6.5	9.6	140	–	1,900	2	–	3,150	.02	.006
DEC 08, 1986	240	7.7	8.7	130	–	1,900	1.5	–	3,300	<.04	<.004
JAN 05, 1987	250	6.6	8.3	130	–	1,900	2	–	3,270	<.04	<.004
FEB 10, 1987	280	6.9	9.6	130	–	2,100	5	–	3,340	<.02	<.004
FEB 10, 1987	280	6.6	8	130	–	2,100	3	–	3,270	<.02	<.004
MAR 10, 1987	290	5.8	<.14	120	–	1,700	2	–	3,150	<.04	.002
APR 13, 1987	260	6.6	11	120	–	2,200	2	14	790	.04	.004
MAY 04, 1987	260	5	9.4	130	–	2,000	2	12	3,210	<.04	<.004
JUNE 01, 1987	260	7.9	11	150	–	1,800	3	15	3,500	.03	.010
JULY 06, 1987	240	6.2	8.2	100	–	2,100	3	14	3,860	<.04	.004
AUG 11, 1987	250	5.2	8.4	130	–	2,100	3	14	3,040	<.04	.006
SEPT 14, 1987	260	7.7	8.6	140	–	2,100	3	15	3,260	<.04	.004
OCT 05, 1987	280	6.7	9.5	120	–	2,200	2	15	3,170	<.04	.016
NOV 16, 1987	300	6.8	8.8	130	–	2,000	4	14	3,580	<.04	.016
DEC 16, 1987	260	8.1	10	140	–	2,000	3	17	3,150	<.04	.006
JAN 12, 1988	240	6.2	8.1	160	–	2,000	2	27	3,140	.04	.016
FEB 09, 1988	250	9.4	9.7	220	–	2,100	3	20	3,410	<.04	<.004
MAR 15, 1988	180	7.6	8.6	160	–	2,100	2	15	3,100	<.04	.010
APR 11, 1988	220	7.6	9.4	110	–	2,000	2	36	2,980	<.04	.012
APR 11, 1988	240	7.8	9	120	–	1,700	3	38	2,930	<.04	.012
MAY 09, 1988	270	6	9.8	100	–	1,600	4	23	3,400	<.04	<.004
JUNE 07, 1988	280	7	9.5	110	–	1,700	3	31	3,600	<.04	.006

Appendix 2.--Water-quality data for urban sewage sludge site, June 1986 through November 1989--Continued

Date	Nitrogen, ammonia total (mg/L as N)	Nitrogen, ammonia + organic total (mg/L as N)	Phosphorus total (mg/L as P)	Aluminum, dissolved (mg/L)	Arsenic, dissolved (µg/L)	Barium, dissolved (µg/L)	Boron, dissolved (µg/L)	Cadmium, dissolved (µg/L)	Chromium, dissolved (µg/L)	Copper, dissolved (µg/L)	Iron, dissolved (mg/L)
410916079292902 Well 14A (LAT 41°09'16" N. LONG 079°29'29" W.)--Continued											
SEPT 14, 1987	0.54	1.6	0.06	0.20	<4	<10	<250	0.31	<50	<10	88
DEC 16, 1987	.50	1.9	.15	.49	<4	<10	<250	8.4	<50	<10	76
DEC 16, 1987	.52	2.1	.20	.43	<4	<10	<250	8.7	<50	<10	74
MAR 15, 1988	.69	.74	.10	.25	<4	340	<250	<.20	<50	<10	110
APR 11, 1988	.48	1.1	.15	.69	<4	<10	<250	1.3	<50	<10	92
MAY 09, 1988	.96	1.3	.06	1.4	<10	<10	<250	.72	<50	<10	100
JUNE 07, 1988	.81	1.5	.04	.44	<4	<10	<250	<.20	<50	25	85
JULY 11, 1988	.93	1	.09	.64	<20	11	<250	.24	<50	<10	100
JULY 11, 1988	1.2	1.9	.08	.73	<20	<10	<250	.28	89	<10	120
AUG 08, 1988	.81	1.5	.06	.38	<20	23	<250	.60	<50	36	140
SEPT 20, 1988	.72	1	.09	.21	<4	<10	<250	.61	<50	<10	98
OCT 17, 1988	.75	1.3	.07	.32	<4	<10	<250	<.20	<50	34	120
NOV 16, 1988	.72	1.2	.17	.41	<4	<10	<250	.22	<50	12	180
DEC 21, 1988	.77	1	.09	.32	<4	<10	<250	.29	<50	28	140
DEC 21, 1988	.78	.78	.05	.31	<4	<10	<250	<.20	<50	28	120
JAN 09, 1989	.87	.84	.04	.30	<4	<10	<250	<.20	<50	24	110
FEB 14, 1989	.69	1.5	.07	.24	<4	<10	<250	.29	<50	31	97
MAR 15, 1989	.27	1.1	.11	.40	<4	<10	<250	.34	<50	24	110
APR 10, 1989	.59	1.3	.08	1.4	4.1	11	<250	.68	<50	24	110
MAY 10, 1989	.68	1.4	.21	.63	<4	<10	<250	.46	<50	22	100
JUNE 14, 1989	.60	.89	.09	1.2	6.4	<10	<250	.46	<50	24	140
JUNE 14, 1989	.63	.99	.11	1	5.7	<10	<250	.49	<50	30	150
JULY 10, 1989	.89	1.4	.99	19	16	14	<250	2.1	<50	50	390
AUG 08, 1989	.55	1.2	.41	.87	5.7	15	<250	.51	<50	25	120
SEPT 11, 1989	.54	1	.18	<.14	5.8	<10	<250	.25	<50	<10	92
OCT 16, 1989	.59	1.2	.26	.82	4.4	<10	<250	.39	<50	79	94
NOV 07, 1989	.57	1.9	.07	.30	4.2	<10	<250	.30	<50	19	110
410916079292903 Well 14B (LAT 41°09'16" N. LONG 079°29'29" W.)											
JULY 09, 1986	.47	1.4	--	.57	<1,000	<500	--	<10	<50	44	26
AUG 06, 1986	.54	1.3	--	<.14	<4	<500	<250	<.20	<50	31	38
SEPT 09, 1986	.81	1.1	--	<.14	<4	<10	<250	1.1	<50	<10	86
OCT 09, 1986	.36	1.2	--	.50	<100	21	<250	1.8	110	31	82
NOV 06, 1986	.40	.98	--	.33	<4	18	<250	.88	110	39	73
DEC 08, 1986	.39	.97	--	<.14	<4	<10	<250	<.20	170	36	81
JAN 05, 1987	.35	1.2	--	<.14	<4	--	<250	.98	<50	<10	76
FEB 10, 1987	.42	.42	--	<.14	<4	<10	<250	<.20	<50	<10	80
FEB 10, 1987	.48	1.7	--	<.14	<4	<10	<250	<.20	<50	<10	80
MAR 10, 1987	.40	1.5	--	<.14	<4	<10	<250	.64	<50	<10	100
APR 13, 1987	.38	.41	.09	<.14	<4	<10	<250	.28	<50	<10	80
MAY 04, 1987	.38	1.6	.05	<.14	<4	<10	<250	<.20	<50	<10	82
JUNE 01, 1987	.48	1.4	.08	1.4	<4	<10	<250	.22	<50	<10	93
JULY 06, 1987	.29	1.4	.12	.21	4.5	<10	<250	.47	<50	<10	78
AUG 11, 1987	.38	.70	.10	.51	<10	13	<250	<.20	95	<10	80
SEPT 14, 1987	.41	1.2	.12	.23	<4	<10	<250	.30	<50	<10	82
OCT 05, 1987	.46	1.1	.09	.31	<4	<10	<250	<.50	<50	<10	90
NOV 16, 1987	.72	2	.18	.36	<4	<10	<250	.42	<50	<10	110
DEC 16, 1987	.44	1.7	.04	.28	<4	<10	<250	1.2	<50	<10	96
JAN 12, 1988	1.9	3.2	1.2	<.14	<4	<10	<250	<.50	<50	<10	79
FEB 09, 1988	.46	1.3	.07	<.14	<4	<10	<250	<.50	<50	13	74
MAR 15, 1988	1.1	1.6	1.6	.17	<4	<10	<250	<.20	<50	<10	72
APR 11, 1988	.72	.96	.22	1.2	<4	<10	<250	.90	<50	<10	82
APR 11, 1988	.49	.84	.38	1.6	<4	<10	<250	2.8	<50	14	84
MAY 09, 1988	1	1.6	.21	14	<4	14	<250	<.50	<50	<10	93
JUNE 07, 1988	.84	1.5	.15	3.1	<4	31	<250	<.20	<50	<10	87

Date	Iron, ferrous dissolved (mg/L)	Lead, dissolved (µg/L)	Manganese, dissolved (mg/L)	Mercury, dissolved µg/l)	Molybdenum, dissolved (µg/L)	Nickel, dissolved (mg/L)	Selenium, dissolved (µg/L)	Strontium, dissolved (µL)	Zinc, dissolved (mg/L)	Cyanide total (mg/L)
410916079292902 Well 14A (LAT 41°09'16" N. LONG 079°29'29" W.)--Continued										
SEPT 14, 1987	110	<4	40	<1	<70	0.47	<30	1,800	0.38	<0.001
DEC 16, 1987	100	<10	34	<1	<70	.60	<30	1,500	.40	<.001
DEC 16, 1987	110	<10	36	<1	<70	.60	<30	1,500	.50	<.001
MAR 15, 1988	100	<4	36	<1	<70	.55	<30	1,500	.52	<.001
APR 11, 1988	100	<4	38	<1	<70	.47	<30	1,600	.42	<.001
MAY 09, 1988	99	<10	42	<1	<70	.54	<30	1,700	.69	<.001
JUNE 07, 1988	110	<20	40	<1	<70	.48	<30	1,400	.44	<.001
JULY 11, 1988	99	<20	42	<1	<300	.44	<30	1,500	.44	<.001
JULY 11, 1988	100	<20	47	<1	<300	.50	<30	1,500	.47	<.001
AUG 08, 1988	100	<4	45	<1	<300	.63	<30	1,400	.56	<.001
SEPT 20, 1988	120	<4	43	<1	<70	1.1	<30	1,400	.63	<.001
OCT 17, 1988	130	<40	48	<1	<70	.52	<30	1,300	.67	<.001
NOV 16, 1988	130	29	64	2	<70	.45	<30	1,400	.56	<.001
DEC 21, 1988	120	<4	50	<1	<70	.53	<30	1,300	.68	<.001
DEC 21, 1988	120	<4	48	<1	<70	.51	<30	1,300	.64	<.001
JAN 09, 1989	120	<40	44	<1	<70	.47	<30	1,300	.61	<.001
FEB 14, 1989	120	<40	40	<1	<70	.42	<30	1,300	.66	<.001
MAR 15, 1989	110	<20	44	<1	<70	.49	<30	1,400	.57	<.001
APR 10, 1989	120	<4	42	<1	<70	.36	<30	1,400	.52	<.001
MAY 10, 1989	130	<4	36	<1	<70	.52	<30	1,500	.54	<.001
JUNE 14, 1989	170	<10	33	<1	<70	.51	<30	1,600	.53	<.001
JUNE 14, 1989	160	<10	37	<1	<70	.50	<30	1,600	.52	<.001
JULY 10, 1989	400	21	28	<1	<70	.87	<30	1,900	1.1	<.001
AUG 08, 1989	110	<10	37	<1	<70	.41	<30	1,600	.45	<.001
SEPT 11, 1989	100	<4	40	<1	<70	.37	<30	1,500	.36	<.001
OCT 16, 1989	110	<4	40	<1	<70	.40	<30	1,200	.44	<.001
NOV 07, 1989	110	<4	51	<1	<70	.40	<30	1,300	.42	<.001
410916079292903 Well 14B (LAT 41°09'16" N. LONG 079°29'29" W.)										
JULY 09, 1986	–	83	24	<1	<700	.36	<1,000	2,200	.14	–
AUG 06, 1986	–	<50	35	<1	<700	.41	<1,000	2,000	.11	<.001
SEPT 09, 1986	–	<50	44	<1	<70	<.02	<30	1,500	<.01	<.001
OCT 09, 1986	–	–	44	<1	<70	.60	<15	1,800	.46	<.001
NOV 06, 1986	96	<4	38	<1	<70	.59	<30	1,400	.45	<.001
DEC 08, 1986	96	<4	40	<1	<70	.07	<30	1,600	.52	<.001
JAN 05, 1987	86	<4	37	<1	<70	<.02	<30	1,600	.11	<.001
FEB 10, 1987	90	<4	43	<1	<70	.07	<30	1,500	.13	<.001
FEB 10, 1987	98	<4	43	<1	<70	.03	<30	1,400	.27	<.001
MAR 10, 1987	96	<4	47	<1	<70	.11	<30	1,400	.21	<.001
APR 13, 1987	100	<4	40	<1	<70	.19	<60	1,400	.30	<.001
MAY 04, 1987	94	<4	40	<1	<70	.18	<60	1,500	.30	<.001
JUNE 01, 1987	91	<4	39	<1	<70	.41	<60	1,400	.23	<.001
JULY 06, 1987	88	–	38	<1	<70	.46	<60	1,700	.11	<.001
AUG 11, 1987	110	<10	39	<1	<70	.58	<30	1,400	.072	<.005
SEPT 14, 1987	120	<4	39	<1	<70	.56	<30	1,600	.40	<.001
OCT 05, 1987	96	<4	42	<1	<70	.39	<30	1,300	.46	<.001
NOV 16, 1987	110	<4	42	<1	<70	.60	<30	1,400	.45	<.001
DEC 16, 1987	210	<10	44	<1	<300	.64	<30	1,300	.53	<.001
JAN 12, 1988	150	<10	36	<1	<70	<.02	<30	1,400	.25	<.001
FEB 09, 1988	84	<10	37	<1	<70	.57	<30	1,600	.20	<.001
MAR 15, 1988	140	<10	29	<1	<70	.55	<30	1,500	.27	<.001
APR 11, 1988	150	<4	38	<1	<70	.64	<30	1,600	.51	<.001
APR 11, 1988	120	<10	38	<1	<70	.51	<30	1,800	.46	<.001
MAY 09, 1988	100	<10	41	<1	<70	.55	<30	1,500	.54	<.001
JUNE 07, 1988	85	<4	40	<1	<70	.52	<30	1,400	.46	<.001

Appendix 2.--Water-quality data for urban sewage sludge site, June 1986 through November 1989--Continued

Date	Time	Water table altitude (ft above sea level)	Streamflow/ discharge, instan-taneous (ft^3/s)	Specific conduc-tance (µS/cm)	pH, field (units)	pH, lab (units)	Oxidation reduction potential (mV)	Water temper-ature (°C)	Oxygen, dissolved (mg/L)	Acidity total heated (mg/L as $CaCO_3$)	Acidity mineral (methyl orange) (mg/L as $CaCO_3$)	Calcium, dissolved (mg/L)
410916079292903 Well 14B (LAT 41°09'16" N. LONG 079°29'29" W.)--Continued												
JULY 11, 1988	1430	1,315	--	2,580	6.0	6.2	--	17.0	--	88	--	360
AUG 08, 1988	1305	1,316	--	2,740	6.0	6.3	--	15.5	--	70	--	410
SEPT 20, 1988	0005	1,315	--	2,620	5.9	6.4	--	13.0	--	4	--	370
SEPT 20, 1988	1530	1,315	--	2,470	5.9	6.4	--	13.0	--	0	--	320
OCT 17, 1988	1350	1,314	--	2,640	5.9	6.1	300	13.0	0.20	180	--	370
NOV 16, 1988	1000	1,315	--	2,670	5.9	6.3	315	11.5	.13	200	--	310
DEC 21, 1988	0920	1,315	--	2,390	6.1	6.2	305	10.0	.15	140	--	370
JAN 09, 1989	1530	1,314	--	2,530	6.2	6.4	293	9.0	.07	180	--	380
FEB 14, 1989	0005	1,317	--	2,340	6.0	6.4	348	9.0	.23	140	--	370
FEB 14, 1989	1400	1,317	--	2,330	6.0	6.4	348	9.0	.23	130	--	380
MAR 15, 1989	0940	1,317	--	2,600	5.9	6.3	338	12.0	.27	130	--	370
APR 10, 1989	1305	1,319	--	2,250	6.0	6.2	376	10.5	.06	--	--	380
MAY 09, 1989	1400	1,319	--	2,400	6.0	6.3	328	11.0	.17	120	--	340
JUNE 14, 1989	1045	1,320	--	2,480	5.7	6.4	313	12.0	.62	160	--	420
JULY 10, 1989	1350	1,320	--	2,550	5.9	6.1	455	14.0	.30	130	--	270
AUG 08, 1989	0005	1,319	--	2,530	6.0	6.2	290	12.0	.29	120	--	380
AUG 08, 1989	1350	1,319	--	2,290	6.0	6.2	290	12.0	.29	88	--	380
SEPT 11, 1989	1555	1,318	--	2,350	5.6	6.5	293	13.0	.26	0	--	350
OCT 16, 1989	1250	1,317	--	2,640	6.0	6.5	430	13.0	--	0	--	360
NOV 07, 1989	1200	1,317	--	2,520	6.1	6.5	440	12.0	--	0	--	460
410916079292904 Well 14C (LAT 41°09'16" N. LONG 079°29'29" W.)												
JULY 09, 1986	0900	1,388	--	1,970	3.3	3.7	--	13.0	--	640	18	150
AUG 06, 1986	0845	1,388	--	1,840	3.3	3.4	--	13.0	--	510	32	85
SEPT 09, 1986	1000	1,388	--	1,520	4.2	4.1	--	12.5	--	420	--	110
OCT 09, 1986	1830	1,388	--	1,540	3.2	3.5	--	11.0	--	360	26	82
NOV 06, 1986	0005	1,388	--	1,560	--	3.5	--	12.0	--	390	24	130
NOV 06, 1986	1600	1,388	--	1,560	--	3.5	--	12.0	--	420	24	83
DEC 08, 1986	1500	1,389	--	1,900	3.2	3.3	--	11.0	--	470	72	81
JAN 05, 1987	1300	1,389	--	1,560	3.4	3.5	--	11.5	--	410	22	76
FEB 10, 1987	1230	1,388	--	1,350	3.0	3.6	--	11.0	--	260	16	75
MAR 09, 1987	1800	1,388	--	1,350	3.6	3.6	--	9.0	--	310	16	78
APR 13, 1987	1300	1,389	--	1,670	3.5	3.5	--	11.0	--	610	24	78
MAY 04, 1987	1300	1,389	--	1,450	3.5	3.6	--	12.0	--	410	16	70
JUNE 01, 1987	1600	1,388	--	1,400	3.5	3.7	--	12.0	--	300	12	68
JULY 06, 1987	1330	1,388	--	1,400	3.7	3.7	--	13.5	--	270	10	72
AUG 12, 1987	0005	1,388	--	1,340	3.5	3.8	--	12.0	--	290	10	66
AUG 12, 1987	0800	1,388	--	1,360	3.5	3.6	--	12.0	--	300	10	69
SEPT 14, 1987	1300	1,388	--	1,400	3.8	3.7	--	14.0	--	300	10	76
OCT 05, 1987	1200	1,388	--	1,450	3.5	3.6	--	12.5	--	280	14	80
NOV 16, 1987	1245	1,388	--	1,470	3.7	3.7	--	12.5	--	210	8	83
DEC 16, 1987	1045	1,388	--	1,450	3.3	3.7	--	10.5	--	320	10	76
JAN 12, 1988	0005	1,386	--	1,480	3.2	3.6	--	10.0	--	320	14	82
JAN 12, 1988	1215	1,386	--	1,480	3.2	3.6	--	10.0	--	320	14	82
FEB 09, 1988	0900	1,388	--	1,290	--	3.5	--	8.0	--	330	16	82
MAR 15, 1988	0845	1,388	--	1,220	3.4	3.6	--	8.0	--	340	12	60
APR 11, 1988	1250	1,388	--	1,180	3.6	3.5	--	12.5	--	310	16	81
MAY 09, 1988	1340	1,388	--	1,360	3.6	3.5	--	12.5	--	310	32	74
JUNE 07, 1988	0005	1,386	--	1,300	3.6	3.5	--	14.5	--	320	18	87
JUNE 07, 1988	0830	1,386	--	1,320	3.6	3.5	--	14.5	--	340	28	88
JULY 11, 1988	1330	1,386	--	1,290	3.6	3.5	--	16.0	--	320	34	86
AUG 08, 1988	1320	1,387	--	1,320	3.7	3.6	--	15.5	--	290	12	130
410915079293501 Well 15.0 (LAT 41°09'15" N. LONG 079°29'35" W.)												
JULY 09, 1986	1100	1,261	--	4,600	2.8	3.0	--	17.5	--	2,400	200	370

Appendix 2.--Water-quality data for urban sewage siudge site, June 1986 through November 1989--Continued

Date	Magnesium, dissolved (mg/L)	Sodium, dissolved (mg/L)	Potassium, dissolved (mg/L)	Alkalinity water lab (mg/L as $CaCO_3$)	Sulfide total (mg/L as S)	Sulfate, dissolved (mg/L as SO_4)	Chloride, dissolved (mg/L)	Silica, dissolved (mg/L as SiO_2)	Solids, residue at 105 °C, dissolved (mg/L)	Nitrogen, nitrate total (mg/L as N)	Nitrogen, nitrite total (mg/L as N)
410916079292903 Well 14B (LAT 41°09'16" N. LONG 079°29'29" W.)--Continued											
JULY 11, 1988	270	6.6	9.4	100	--	2,100	2	14	3,630	<0.04	0.012
AUG 08, 1988	310	6.3	8.3	120	--	2,500	6	12	3,780	<.04	<.004
SEPT 20, 1988	280	7.5	7.7	140	2.6	2,200	4	14	3,950	<.04	.004
SEPT 20, 1988	240	7.2	7.7	150	2.6	2,200	4	13	4,090	<.04	<.004
OCT 17, 1988	300	8	8.1	110	.20	2,100	2	14	3,460	<.04	<.004
NOV 16, 1988	320	8.7	7.5	120	<.20	2,300	5	12	4,100	<.04	.006
DEC 21, 1988	290	8.2	7.9	--	.32	2,100	4	10	3,130	<.04	.004
JAN 09, 1989	290	7.6	10	120	<.20	1,500	15	42	3,460	<.04	.012
FEB 14, 1989	290	8.5	7.7	110	<.20	2,300	4	17	3,260	<.04	.006
FEB 14, 1989	300	9.1	7.7	120	<.20	2,400	4	16	4,700	<.04	.006
MAR 15, 1989	280	8.1	8.1	130	.72	2,000	3	13	3,480	<.04	.008
APR 10, 1989	250	7.5	8.6	110	<.20	2,100	3	17	--	<.04	<.004
MAY 09, 1989	250	7.4	7.7	--	<.20	1,900	2	16	3,460	<.04	.006
JUNE 14, 1989	260	7.4	12	--	.24	2,100	3	16	3,740	<.04	.006
JULY 10, 1989	180	7.2	7.6	72	<.20	2,100	3	15	3,340	<.004	.012
AUG 08, 1989	250	7.3	7.4	90	<.20	2,300	4	14	3,590	<.04	<.004
AUG 08, 1989	250	7.5	7.4	90	<.20	2,200	4	14	3,390	<.04	<.004
SEPT 11, 1989	250	7.6	7.3	120	<.20	2,000	3	16	3,610	<.04	<.004
OCT 16, 1989	240	7.1	7.7	110	<.20	2,200	3	21	3,490	<.04	<.004
NOV 07, 1989	330	8.4	8.4	130	.40	2,200	3	15	3,180	<.04	.004
410916079292904 Well 14C (LAT 41°09'16" N. LONG 079°29'29" W.)											
JULY 09, 1986	120	3.3	7.3	0	--	1,400	5	--	2,520	<.02	.018
AUG 06, 1986	88	2.5	5.2	0	--	1,100	4	--	1,900	<.04	.010
SEPT 09, 1986	98	3.4	9.1	4	--	1,100	4	--	1,600	<.02	.018
OCT 09, 1986	95	2.6	5.4	0	--	570	3	--	1,490	<.02	.006
NOV 06, 1986	110	2.5	6.8	0	--	860	2	--	1,740	<.02	.010
NOV 06, 1986	120	2.8	6.5	0	--	870	2	--	1,690	<.02	.014
DEC 08, 1986	100	3	5.7	0	--	1,000	1.9	--	1,820	<.04	<.004
JAN 05, 1987	93	2.2	6.4	0	--	1,100	2	--	1,670	<.04	.008
FEB 10, 1987	90	2.2	4.9	0	--	800	6	--	1,410	<.02	<.004
MAR 09, 1987	92	2.2	<.14	0	--	890	2	--	1,440	<.04	.030
APR 13, 1987	99	2.7	7.4	0	--	780	2	65	2,040	<.04	<.004
MAY 04, 1987	86	2.8	7.2	0	--	770	2	52	1,350	<.04	<.004
JUNE 01, 1987	81	2.2	5.7	0	--	720	3	54	1,460	<.04	.018
JULY 06, 1987	87	3.1	6.5	--	--	680	4	53	1,810	<.04	.012
AUG 12, 1987	78	2.3	9.2	0	--	920	4	56	1,470	<.04	.008
AUG 12, 1987	81	2.5	7.7	0	--	900	4	55	1,310	<.04	.006
SEPT 14, 1987	89	2.7	7	--	--	830	3	61	1,530	<.04	<.004
OCT 05, 1987	95	2.9	8.4	--	--	820	2	58	1,360	<.04	.016
NOV 16, 1987	97	2.1	7.7	--	--	600	3	52	2,950	<.04	.020
DEC 16, 1987	--	3.3	7	0	--	860	4	67	1,820	.04	.006
JAN 12, 1988	85	<.20	6.6	--	--	890	2	81	1,740	<.04	.034
JAN 12, 1988	85	2.1	6.6	--	--	890	2	81	1,740	<.04	.034
FEB 09, 1988	92	3.4	7.1	--	--	940	4	59	1,630	<.04	<.004
MAR 15, 1988	90	4.1	7	--	--	850	3	59	1,400	<.04	.010
APR 11, 1988	92	2.3	6.8	--	--	800	2	64	1,530	<.04	.044
MAY 09, 1988	99	3.2	7.1	--	--	810	2	66	1,510	<.04	.004
JUNE 07, 1988	92	2.4	8	--	--	920	4	66	1,330	<.04	.034
JUNE 07, 1988	95	2.7	8.2	--	--	850	4	63	1,750	<.04	.010
JULY 11, 1988	95	2.5	6.7	--	--	870	2	65	1,620	<.04	.008
AUG 08, 1988	98	2.2	6.9	--	--	860	3	51	1,760	<.04	<.004
410915079293501 Well 15 (LAT 41°09'15" N. LONG 079°29'35" W.)											
JULY 09, 1986	310	6.9	6	0	--	3,400	4	--	6,010	<.04	<.002

Appendix 2.--Water-quality data for urban sewage sludge site, June 1986 through November 1989--Continued

Date	Nitrogen, ammonia total (mg/L as N)	Nitrogen, ammonia + organic total (mg/L as N)	Phos-phorus total (mg/L as P)	Aluminum, dissolved (mg/L)	Arsenic, dissolved (µg/L)	Barium, dissolved (µg/L)	Boron, dissolved (µg/L)	Cadmium, dissolved (µg/L)	Chromium, dissolved (µg/L)	Copper, dissolved (µg/L)	Iron, dissolved (mg/L)
410916079292903 Well 14B (LAT 41°09'16" N. LONG 079°29'29" W.)--Continued											
JULY 11, 1988	0.72	2.1	0.33	0.65	<20	<10	<250	0.65	91	<10	87
AUG 08, 1988	.81	2.5	.34	.85	<20	<10	<250	.84	<50	15	100
SEPT 20, 1988	.72	2.6	.14	.39	<4	<10	<250	.22	<50	34	110
SEPT 20, 1988	.75	1.9	.18	.37	<4	<10	<250	<.20	<50	<10	91
OCT 17, 1988	.72	4.2	.76	.99	<4	10	<250	1.1	<50	55	120
NOV 16, 1988	.69	1.3	.32	.96	<4	15	<250	<.20	<50	47	140
DEC 21, 1988	.72	1.1	.33	.51	<4	<10	<250	<.20	<50	77	120
JAN 09, 1989	1	2	.46	6.8	<4	<10	<250	.38	<50	24	110
FEB 14, 1989	.66	1.1	.08	.87	<4	12	<250	<.20	<50	31	120
FEB 14, 1989	.66	1.1	.04	.73	<4	11	<250	<.20	<50	<10	120
MAR 15, 1989	.26	1.6	.28	.27	<4	<10	<250	3.2	<50	25	96
APR 10, 1989	.47	.68	.02	.71	<4	<10	<250	<.20	<50	13	99
MAY 09, 1989	.53	1.1	.04	.16	<4	<10	<250	.40	<50	20	82
JUNE 14, 1989	.53	.79	.07	.19	<4	<10	<250	.23	<50	20	72
JULY 10, 1989	.59	.92	.09	.22	<4	<10	<250	.58	<50	17	51
AUG 08, 1989	.49	1.1	.15	.27	<4	<10	<250	.50	<50	24	68
AUG 08, 1989	.51	1.3	.21	.26	<4	<10	<250	.45	<50	35	69
SEPT 11, 1989	.65	1.3	.11	<.14	<4	<10	<250	.54	<50	17	72
OCT 16, 1989	.56	1.1	.08	.43	<4	<10	<250	.39	<50	87	73
NOV 07, 1989	.54	1.6	.04	.33	<4	<10	<250	.38	<50	18	100
410916079292904 Well 14C (LAT 41°09'16" N. LONG 079°29'29" W.)											
JULY 09, 1986	1.1	1.6	--	26	<1,000	<500	--	<10	<50	43	160
AUG 06, 1986	.60	.60	--	22	12	<500	<250	3.9	<50	<10	100
SEPT 09, 1986	.78	1.3	--	13	9.1	28	<250	3.5	<50	<10	140
OCT 09, 1986	.42	.76	--	18	18	13	<250	3.2	50	26	100
NOV 06, 1986	.48	.51	--	21	13	11	<250	3.3	51	18	120
NOV 06, 1986	.48	.81	--	21	12	15	<250	3.3	63	32	91
DEC 08, 1986	.51	.74	--	24	28	18	<250	2.5	130	43	93
JAN 05, 1987	.39	.82	--	20	16	--	<250	2.9	<50	<10	120
FEB 10, 1987	.38	.96	--	16	9.7	<10	<250	2.6	<50	<10	90
MAR 09, 1987	.44	1.2	--	15	6.4	<10	<250	4.4	<50	<10	110
APR 13, 1987	.42	.45	.07	19	12	<10	<250	2.4	<50	<10	110
MAY 04, 1987	.38	1	.04	17	11	11	<250	2.4	<50	<10	110
JUNE 01, 1987	.43	1.1	.10	12	13	<10	<250	2.1	<50	<10	110
JULY 06, 1987	.36	.91	.14	14	9.3	<10	<250	2.5	<50	63	100
AUG 12, 1987	.39	1	.07	12	<10	<10	<250	2.8	67	<10	110
AUG 12, 1987	.40	1	.07	11	<10	18	<250	2.4	66	<10	80
SEPT 14, 1987	.42	1	.08	14	9.5	<10	<250	18	52	120	85
OCT 05, 1987	.48	.74	.17	16	<4	<10	<250	3	<50	<10	85
NOV 16, 1987	.45	.99	.11	14	<4	<10	<250	2.5	<50	<10	96
DEC 16, 1987	.45	1.2	.02	18	6.6	<10	<250	3	<50	<10	100
JAN 12, 1988	.55	1.2	.20	160	12	<10	<250	2.8	52	<10	100
JAN 12, 1988	.55	1.2	.20	16	12	<10	<250	2.8	52	<10	100
FEB 09, 1988	.47	1.3	.09	16	9.3	<10	<250	2.8	<50	<10	74
MAR 15, 1988	.46	1.3	.72	12	9.3	760	<250	2.4	<50	<10	98
APR 11, 1988	.60	1.3	.18	17	8.9	22	<250	2.7	<50	15	81
MAY 09, 1988	.66	1.3	.21	16	5.1	<10	<250	2.3	<50	<10	91
JUNE 07, 1988	.81	1.9	.19	18	<4	22	<250	2.4	<50	30	93
JUNE 07, 1988	.76	2.5	.14	13	<20	15	<250	2.4	<50	27	97
JULY 11, 1988	.72	3.1	.07	14	<4	14	<250	2.3	47	<10	95
AUG 08, 1988	.45	1.7	.19	13	<20	<10	<250	2.1	<50	33	99
410915079293501 Well 15 (LAT 41°09'15" N. LONG 079°29'35" W.)											
JULY 09, 1986	.82	2.2	--	84	<1,000	<500	--	<10	<50	160	260

Date	Iron, ferrous dissolved (mg/L)	Lead, dissolved (µg/L)	Manganese, dissolved (mg/L)	Mercury, dissolved µg/l)	Molybdenum, dissolved (µg/L)	Nickel, dissolved (mg/L)	Selenium, dissolved (µg/L)	Strontium, dissolved (µL)	Zinc, dissolved (mg/L)	Cyanide total (mg/L)
410916079292903 Well 14B (LAT 41°09'16" N. LONG 079°29'29" W.)–Continued										
JULY 11, 1988	110	<20	41	<1	<300	0.54	<30	1,400	0.44	<0.001
AUG 08, 1988	98	<4	50	<1	<300	.62	<30	1,300	.57	<.001
SEPT 20, 1988	190	<40	48	<1	<70	.58	<30	1,300	.53	<.001
SEPT 20, 1988	200	<4	41	<1	<70	.57	<30	1,400	.53	<.001
OCT 17, 1988	200	<40	50	<1	<70	.53	<30	1,300	.75	<.001
NOV 16, 1988	130	<20	56	1.8	<70	.62	<30	1,300	.72	<.001
DEC 21, 1988	130	<20	49	<1	<70	.52	<30	1,200	.68	<.001
JAN 09, 1989	120	<40	48	<1	<70	.47	<30	1,300	.64	<.001
FEB 14, 1989	110	<40	46	<1	<70	.61	<30	1,300	.60	<.001
FEB 14, 1989	110	<40	48	<1	<70	.64	<30	1,300	.72	<.001
MAR 15, 1989	100	<20	42	<1	<70	.59	<30	1,400	.57	<.001
APR 10, 1989	100	<4	38	<1	<70	.47	<30	1,400	.51	<.001
MAY 09, 1989	97	<4	36	<1	<70	.39	<30	1,400	.46	<.001
JUNE 14, 1989	88	<4	38	<1	<70	.36	<30	1,600	.38	<.001
JULY 10, 1989	74	<20	23	<1	<70	.35	<30	1,600	.34	<.001
AUG 08, 1989	82	<4	33	<1	<70	.36	<30	1,700	.35	<.001
AUG 08, 1989	85	<10	33	<1	<70	.35	<30	1,700	.51	<.001
SEPT 11, 1989	86	<4	34	<1	<70	.33	<30	1,600	.36	<.001
OCT 16, 1989	94	<4	35	<1	<70	.36	<30	1,200	.38	<.001
NOV 07, 1989	98	<4	48	<1	<70	.38	<30	1,400	.39	<.001
410916079292904 Well 14C (LAT 41°09'16" N. LONG 079°29'29" W.)										
JULY 09, 1986	–	<50	24	<1	<700	.81	<1,000	470	1.1	–
AUG 06, 1986	–	<50	18	<1	<700	.66	<1,000	360	.92	<.001
SEPT 09, 1986	–	<50	20	<1	<70	.66	<30	830	.87	<.001
OCT 09, 1986	110	170	19	<1	<70	.66	<6	330	.96	<.001
NOV 06, 1986	120	<4	22	<1	70	.67	<30	270	.94	<.001
NOV 06, 1986	130	<4	17	<1	70	.69	<30	270	.91	<.001
DEC 08, 1986	96	<4	20	<1	<70	.81	<30	330	1.1	<.001
JAN 05, 1987	140	<4	18	<1	<70	.36	<30	280	.76	<.001
FEB 10, 1987	100	<4	17	<1	<70	.27	<15	260	.72	<.001
MAR 09, 1987	1.8	<4	18	<1	<70	.28	<60	260	.75	<.001
APR 13, 1987	130	<4	17	<1	<70	.36	<60	280	.81	<.001
MAY 04, 1987	120	<4	16	<1	<70	.56	<60	240	.84	<.001
JUNE 01, 1987	94	4.9	15	<1	<70	.34	<6	440	.64	<.001
JULY 06, 1987	96	4.4	18	<1	<70	.46	<30	270	.84	<.001
AUG 12, 1987	100	4	20	<1	<70	.30	<30	300	.49	.001
AUG 12, 1987	93	<4	15	<1	<70	.59	<30	280	.56	.001
SEPT 14, 1987	100	500	16	<1	<70	.53	<30	290	.96	<.001
OCT 05, 1987	88	<4	18	<1	<70	.56	<30	280	.80	<.001
NOV 16, 1987	99	<4	17	<1	<70	.62	<30	320	.73	<.001
DEC 16, 1987	96	<10	20	<1	<300	.71	<30	310	.88	<.001
JAN 12, 1988	100	<10	17	<1	<70	73	<30	260	.89	<.001
JAN 12, 1988	100	<10	17	<1	<70	.73	<30	260	.89	<.001
FEB 09, 1988	90	<10	16	<1	<70	.66	<30	290	.84	<.001
MAR 15, 1988	91	4.7	13	<1	<70	.63	<30	270	1	<.001
APR 11, 1988	91	4	17	<1	<70	.54	<30	300	.81	<.001
MAY 09, 1988	95	<10	16	<1	<70	.83	<30	310	.84	<.001
JUNE 07, 1988	100	5.2	18	<1	<70	.48	<30	250	.80	<.001
JUNE 07, 1988	160	5.6	18	<1	<70	.54	<30	250	.81	<.001
JULY 11, 1988	97	<4	18	<1	<300	.54	<30	300	.78	<.001
AUG 08, 1988	88	<4	19	<1	<300	.55	<30	270	.77	<.001
410915079293501 Well 15 (LAT 41°09'15" N. LONG 079°29'35" W.)										
JULY 09, 1986	–	<50	55	<1	<700	1.6	<1,000	1,200	4.5	–

Appendix 2.--Water-quality data for urban sewage sludge site, June 1986 through November 1989--Continued

Date	Time	Water table altitude (ft above sea level)	Streamflow/ discharge, instan-taneous (ft^3/s)	Specific conduc-tance (µS/cm)	pH, field (units)	pH, lab (units)	Oxidation reduction potential (mV)	Water temper-ature (°C)	Oxygen, dissolved (mg/L)	Acidity total heated (mg/L as $CaCO_3$)	Acidity mineral (methyl orange) (mg/L as $CaCO_3$)	Calcium, dissolved (mg/L)
410915079293501 Well 15 (LAT 41°09'15" N. LONG 079°29'35" W.)--Continued												
SEPT 10, 1986	0005	1,260	--	4,250	3.2	3.2	--	14.0	--	1,400	100	320
SEPT 10, 1986	1300	1,260	--	4,200	3.2	3.2	--	14.0	--	1,400	98	460
OCT 09, 1986	1330	1,261	--	4,220	2.9	3.3	--	12.0	--	1,200	84	420
NOV 06, 1986	1000	1,260	--	4,400	3.6	3.1	--	11.0	--	1,700	140	430
DEC 10, 1986	1300	1,263	--	4,880	3.2	3.1	--	10.5	--	2,400	180	380
JAN 06, 1987	1030	1,267	--	4,220	3.4	3.1	--	11.0	--	1,300	110	340
FEB 11, 1987	0930	1,262	--	4,600	3.6	2.9	--	9.0	--	1,500	180	360
MAR 12, 1987	1030	1,263	--	4,650	3.2	2.9	--	11.0	--	1,800	180	370
APR 13, 1987	1930	1,265	--	5,030	2.8	2.9	--	11.5	--	1,900	250	360
MAY 04, 1987	0930	1,266	--	4,930	2.8	2.9	--	11.0	--	1,900	220	330
JUNE 02, 1987	0920	1,269	--	4,600	3.1	3.1	--	13.0	--	1,400	140	390
JULY 06, 1987	1600	1,269	--	4,640	3.0	3.0	--	13.0	--	1,500	150	360
AUG 11, 1987	0005	1,268	--	5,000	2.9	2.8	--	13.5	--	2,200	240	310
AUG 11, 1987	1300	1,268	--	5,100	2.9	2.8	--	13.5	--	2,100	240	310
SEPT 15, 1987	1300	1,267	--	4,850	3.2	2.9	--	12.0	--	2,300	180	320
OCT 07, 1987	1045	1,265	--	5,200	3.0	2.9	--	11.0	--	2,100	200	340
NOV 17, 1987	1310	1,266	--	4,900	3.0	2.9	--	12.5	--	2,000	160	350
NOV 19, 1987	0900	1,266	--	4,950	3.0	3.0	--	12.5	--	2,400	140	360
DEC 16, 1987	1245	1,266	--	4,500	3.0	3.0	--	10.5	--	1,600	130	280
JAN 13, 1988	1040	1,266	--	5,500	2.8	2.8	--	8.5	--	2,500	270	310
FEB 09, 1988	0005	1,265	--	4,450	2.3	2.8	--	10.0	--	3,700	390	300
FEB 09, 1988	1410	1,265	--	4,450	2.3	2.8	--	10.0	--	2,500	370	300
MAR 16, 1988	1030	1,259	--	3,950	2.6	3.0	--	10.0	--	1,700	190	350
APR 13, 1988	0915	1,249	--	3,600	3.3	3.4	--	11.0	--	1,400	64	510
MAY 11, 1988	1155	1,245	--	3,650	3.3	3.3	--	12.0	--	1,400	60	450
JUNE 07, 1988	1320	1,244	--	4,150	3.5	3.5	--	14.0	--	1,500	56	520
JULY 13, 1988	0955	1,253	--	3,840	3.6	3.5	--	14.0	--	1,400	56	500
AUG 08, 1988	1345	1,264	--	3,410	4.2	3.8	--	14.5	--	1,100	10	540
SEPT 20, 1988	0945	1,264	--	5,320	2.5	2.8	--	12.5	--	3,400	370	370
SEPT 22, 1988	0005	1,264	--	5,540	2.5	2.8	--	12.5	--	3,400	360	390
OCT 17, 1988	1850	1,260	--	3,750	3.4	3.4	573	12.5	0.35	1,400	74	108
NOV 15, 1988	1630	1,249	--	3,510	3.3	3.4	585	11.0	.23	1,400	82	460
DEC 21, 1988	1420	1,246	--	3,990	3.2	3.0	585	10.0	.15	3,000	260	520
JAN 10, 1989	1140	1,243	--	4,910	2.9	3.0	590	10.0	.20	3,200	350	530
MAR 14, 1989	1040	1,243	--	5,000	3.2	2.9	598	12.0	.29	3,600	510	520
APR 12, 1989	1110	1,243	--	5,050	3.1	3.2	560	10.5	.13	--	210	540
MAY 10, 1989	1155	1,243	--	4,550	3.0	3.1	570	11.5	.38	2,700	150	500
JUNE 14, 1989	1245	1,245	--	3,440	3.1	3.1	565	11.0	.36	1,100	130	380
JULY 11, 1989	1110	1,244	--	3,020	3.6	4.4	525	13.0	.26	800	--	440
AUG 09, 1989	1045	1,244	--	3,610	2.9	3.1	579	12.5	.13	1,300	120	380
SEPT 12, 1989	0005	1,243	--	3,600	3.1	3.0	552	13.5	.38	1,400	140	400
SEPT 12, 1989	1110	1,243	--	3,600	3.1	3.0	552	13.5	.38	1,400	140	390
OCT 17, 1989	1145	1,243	--	3,820	2.9	3.1	433	12.0	--	1,700	120	410
NOV 07, 1989	1110	1,243	--	4,450	2.9	2.9	571	11.0	--	2,700	200	590
410915079293502 Well 15A (LAT 41°09'15" N. LONG 079°29'35" W.)												
JULY 08, 1986	1100	1,310	--	4,130	3.1	3.3	--	19.5	--	1,800	72	360
SEPT 10, 1986	1200	1,307	--	5,100	3.0	3.0	--	14.0	--	2,900	170	410
OCT 09, 1986	1300	1,309	--	5,410	2.6	2.9	--	12.0	--	3,400	290	390
NOV 06, 1986	1100	1,306	--	6,400	--	2.7	--	11.5	--	4,000	530	350
DEC 10, 1986	1230	1,308	--	5,950	2.9	2.8	--	11.0	--	3,600	390	360
JAN 06, 1987	1115	1,304	--	5,250	3.3	2.9	--	11.0	--	2,500	4	320
FEB 11, 1987	1030	1,296	--	5,600	3.2	2.9	--	10.0	--	2,600	240	340
MAR 12, 1987	1130	1,292	--	5,200	3.4	3.2	--	11.0	--	2,500	120	420
APR 14, 1987	0005	1,287	--	5,460	3.0	2.9	--	11.5	--	2,600	550	360

Date	Magnesium, dissolved (mg/L)	Sodium, dissolved (mg/L)	Potassium, dissolved (mg/L)	Alkalinity water lab (mg/L as $CaCO_3$)	Sulfide total (mg/L as S)	Sulfate, dissolved (mg/L as SO_4)	Chloride, dissolved (mg/L)	Silica, dissolved (mg/L as SiO_2)	Solids, residue at 105 °C, dissolved (mg/L)	Nitrogen, nitrate total (mg/L as N)	Nitrogen, nitrite total (mg/L as N)
410915079293501 Well 15 (LAT 41°09'15" N. LONG 079°29'35" W.)--Continued											
SEPT 10, 1986	220	0.20	11	0	--	3,300	2	--	5,810	<0.02	<0.004
SEPT 10, 1986	300	<.20	6.3	0	--	3,100	2	--	5,620	<.02	<.004
OCT 09, 1986	280	6.4	8.8	0	--	3,600	2	--	5,200	.04	<.004
NOV 06, 1986	320	6.9	10	0	--	2,400	2	--	5,790	.02	<.004
DEC 10, 1986	280	4.8	8.5	0	--	3,100	1.8	--	5,790	.16	<.004
JAN 06, 1987	280	4.1	8.1	0	--	2,800	1	--	4,780	<.04	.034
FEB 11, 1987	310	4.5	8.6	0	--	2,500	3	--	5,560	<.02	<.004
MAR 12, 1987	300	4.5	6.9	0	--	3,300	1	--	5,570	<.04	.002
APR 13, 1987	290	5.8	7.1	0	--	3,500	2	62	732	.06	<.004
MAY 04, 1987	270	4.2	8.1	0	--	3,500	1	59	6,440	<.04	<.004
JUNE 02, 1987	280	8.5	6.5	0	--	3,000	2	55	5,570	<.04	<.004
JULY 06, 1987	280	5.8	6.9	0	--	3,100	2	53	7,070	<.04	.004
AUG 11, 1987	250	4	6	0	--	3,500	2	58	6,850	<.04	<.004
AUG 11, 1987	250	3.9	6	0	--	3,600	2	61	6,280	<.04	<.004
SEPT 15, 1987	260	3.2	5	--	--	4,000	1	70	7,090	<.04	<.004
OCT 07, 1987	280	5.3	5.5	--	--	3,900	2	69	7,000	<.04	<.004
NOV 17, 1987	310	4.3	6.1	--	--	3,800	2	63	6,100	--	<.004
NOV 19, 1987	270	4.4	8	--	--	3,000	3	63	6,150	<.04	<.004
DEC 16, 1987	260	7.3	5.4	--	--	3,400	2	57	5,600	<.04	.004
JAN 13, 1988	290	4.7	4.4	--	--	4,500	2	71	6,920	<.04	<.004
FEB 09, 1988	290	5.6	4.2	--	--	4,400	2	63	8,020	.19	.006
FEB 09, 1988	290	6	4.4	--	--	4,100	2	70	7,170	.19	.006
MAR 16, 1988	250	6.2	7.5	--	--	3,700	2	52	5,840	.05	.006
APR 13, 1988	340	6.4	10	--	--	2,800	2	45	5,640	<.04	<.004
MAY 11, 1988	300	6.4	8.9	--	--	4,000	2	44	6,240	<.04	.008
JUNE 07, 1988	320	5.4	9.6	--	--	3,300	2	46	6,500	<.04	.006
JULY 13, 1988	300	5.7	8.6	--	--	3,500	2	43	5,430	<.04	.004
AUG 08, 1988	310	6.2	8.4	--	--	3,100	3	33	5,600	<.04	<.004
SEPT 20, 1988	280	3.5	5.1	--	0.76	5,300	2	65	8,780	<.04	.006
SEPT 22, 1988	230	4.3	4.9	--	.76	5,800	2	63	11,000	<.04	.004
OCT 17, 1988	120	6.4	8.1	--	.50	3,500	1	27	5,780	<.04	<.004
NOV 15, 1988	250	7.5	8.5	--	.37	3,500	2	28	9,470	<.04	<.004
DEC 21, 1988	320	7.7	8.6	--	.56	4,400	2	38	6,810	<.04	.004
JAN 10, 1989	310	7	8.7	--	.24	5,200	2	45	7,990	<.04	.006
MAR 14, 1989	340	6.4	8	--	.56	5,100	2	62	10,400	<.04	.004
APR 12, 1989	370	6.5	9.7	--	<.20	6,000	2	61	--	<.04	<.004
MAY 10, 1989	350	6.4	8.6	--	.48	4,800	2	68	10,700	<.04	.004
JUNE 14, 1989	280	7	12	--	1.1	2,800	4	36	4,960	<.04	.018
JULY 11, 1989	300	11	8.6	16	<.20	3,000	4	26	4,960	.12	.006
AUG 09, 1989	300	7.8	7	--	.32	3,300	4	42	6,740	<.04	<.004
SEPT 12, 1989	330	7.4	5.6	--	<.20	3,200	3	51	6,600	<.04	.004
SEPT 12, 1989	320	7.6	5.8	--	<.20	3,500	3	52	6,240	<.04	.004
OCT 17, 1989	290	6.9	6.8	0	.72	3,800	2	49	6,200	<.04	<.004
NOV 07, 1989	410	7	6.5	0	.48	4,600	3	55	6,570	<.04	<.004
410915079293502 Well 15A (LAT 41°09'15" N. LONG 079°29'35" W.)											
JULY 08, 1986	210	6.1	6.7	0	--	3,300	4	--	5,520	.18	.020
SEPT 10, 1986	220	<.20	3.1	0	--	1,800	2	--	7,150	<.02	.008
OCT 09, 1986	340	5.4	5.3	0	--	4,900	3	--	7,520	<.02	.034
NOV 06, 1986	340	3.9	4.3	0	--	3,700	2	--	8,040	.02	.018
DEC 10, 1986	340	4	5	0	--	4,200	3.1	--	7,730	<.04	.016
JAN 06, 1987	300	3.5	8.8	0	--	4,100	1	--	6,620	<.04	.016
FEB 11, 1987	310	3	4.9	0	--	4,200	4	--	7,610	<.02	<.004
MAR 12, 1987	360	4	4.9	0	--	4,100	2	--	6,850	<.04	.054
APR 14, 1987	320	5.8	6.7	--	--	4,200	2	73	84	<.04	.018

Appendix 2.--Water-quality data for urban sewage sludge site, June 1986 through November 1989--Continued

Date	Nitrogen, ammonia total (mg/L as N)	Nitrogen, ammonia + organic total (mg/L as N)	Phos-phorus total (mg/L as P)	Aluminum, dissolved (mg/L)	Arsenic, dissolved (µg/L)	Barium, dissolved (µg/L)	Boron, dissolved (µg/L)	Cadmium, dissolved (µg/L)	Chromium, dissolved (µg/L)	Copper, dissolved (µg/L)	Iron, dissolved (mg/L)
410915079293501 Well 15 (LAT 41°09'15" N. LONG 079°29'35" W.)--Continued											
SEPT 10, 1986	1.2	2.2	--	64	28	<10	<250	6.4	<50	<10	290
SEPT 10, 1986	1.1	1.9	--	55	46	<10	<200	6.3	<50	<10	410
OCT 09, 1986	1.4	2.5	--	60	<20	<10	<250	.58	160	130	390
NOV 06, 1986	.99	2.3	--	89	64	<10	<250	9.4	200	170	430
DEC 10, 1986	1	1.8	--	64	38	13	<250	7.1	200	150	420
JAN 06, 1987	.63	1.8	--	68	64	--	<250	6	<50	56	360
FEB 11, 1987	.82	1.9	--	100	56	<10	<250	8.2	<50	110	440
MAR 12, 1987	.75	1.8	--	100	52	<10	<250	7.9	<50	120	550
APR 13, 1987	.46	1.3	0.73	110	90	<10	<250	8	<50	<10	520
MAY 04, 1987	.82	1.9	.53	93	78	<10	<250	6.5	<50	85	440
JUNE 02, 1987	1.3	1.7	.24	85	58	<10	<250	5.8	100	<10	480
JULY 06, 1987	.72	2	.34	100	54	<10	<250	9.7	650	210	480
AUG 11, 1987	.96	1.3	.45	89	92	<10	<250	6.5	<50	81	460
AUG 11, 1987	.96	1.5	.44	89	80	<10	<250	6.4	<50	79	460
SEPT 15, 1987	1.1	2	3	120	40	<10	<250	6.5	<50	120	620
OCT 07, 1987	.88	2	.54	98	96	<10	<250	6.6	69	150	640
NOV 17, 1987	.88	1.9	.44	120	66	<10	<250	4	130	240	690
NOV 19, 1987	.77	2.2	.44	94	67	<10	<250	7	<50	<10	480
DEC 16, 1987	1.1	2.4	.33	92	56	<10	<250	6.2	85	32	420
JAN 13, 1988	1.3	1.9	.80	150	98	23	<250	8	160	220	730
FEB 09, 1988	.72	1.7	3.4	140	160	<10	<250	12	520	240	540
FEB 09, 1988	.72	1.3	2.8	150	140	<10	<250	12	530	260	560
MAR 16, 1988	.75	1.6	1.4	100	79	23	<250	5.8	<50	140	430
APR 13, 1988	1	2.5	.69	59	51	14	<250	3.8	<50	53	630
MAY 11, 1988	1.5	1.7	.48	84	31	<10	<250	3.2	<50	23	490
JUNE 07, 1988	1.4	1.7	.66	82	<20	<10	<250	2.8	62	56	560
JULY 13, 1988	1.4	1.7	.47	66	<10	<10	<250	2.3	160	36	550
AUG 08, 1988	1.5	1.9	.25	68	<20	<10	<250	1.5	<50	43	530
SEPT 20, 1988	1.3	1.7	1.5	200	61	<10	<250	13	140	480	910
SEPT 22, 1988	1.2	2.4	1.7	200	59	15	<250	11	150	460	750
OCT 17, 1988	1.4	2.2	.38	65	7.6	<10	<250	3.6	<50	140	490
NOV 15, 1988	1.4	1.4	.88	96	18	<10	<250	3.8	120	240	590
DEC 21, 1988	1.6	1.7	2.9	160	61	<10	<250	9.5	170	480	570
JAN 10, 1989	1.6	1.6	3.5	200	110	<10	<250	11	240	600	1,100
MAR 14, 1989	1.5	1.8	1.7	190	81	<10	<250	12	260	400	--
APR 12, 1989	1.2	1.6	1.4	180	26	<10	<250	13	240	210	1,000
MAY 10, 1989	1.1	1.8	.46	150	18	<10	<250	8.5	<50	180	800
JUNE 14, 1989	.87	1.5	.62	46	7.2	<10	<250	3	<50	90	360
JULY 11, 1989	.97	1.4	.38	40	4	<10	<250	2	<50	56	340
AUG 09, 1989	.92	1.7	.76	78	11	<10	<250	3.6	77	180	380
SEPT 12, 1989	.99	1	.48	95	18	<10	<250	5.3	<50	190	380
SEPT 12, 1989	1	1.1	.44	93	17	<10	<250	6	<50	190	440
OCT 17, 1989	.90	1.3	.62	93	19	<10	<250	5	100	190	470
NOV 07, 1989	.97	1.7	.65	180	28	<10	<250	7.5	180	280	920
410915079293502 Well 15A (LAT 41°09'15" N. LONG 079°29'35" W.)											
JULY 08, 1986	1.4	1.6	--	65	<1,000	<500	--	<10	--	770	310
SEPT 10, 1986	1	1.8	--	120	100	<10	<200	11	<50	120	770
OCT 09, 1986	1.5	6.4	--	170	73	14	<250	14	280	450	840
NOV 06, 1986	.99	2.2	--	200	190	13	<250	14	300	500	1,100
DEC 10, 1986	1	1.8	--	130	83	23	<250	9.1	320	340	870
JAN 06, 1987	.94	2.6	--	130	130	--	<250	9.3	<50	120	710
FEB 11, 1987	1.1	2.3	--	170	130	<10	<250	12	<50	220	880
MAR 12, 1987	1	1.8	--	170	65	<10	<250	11	<50	230	780
APR 14, 1987	.60	.76	.97	.47	110	12	<250	10	<50	<10	220

Appendix 2.--Water-quality data for urban sewage sludge site, June 1986 through November 1989--Continued

Date	Iron, ferrous dissolved (mg/L)	Lead, dissolved (µg/L)	Manganese, dissolved (mg/L)	Mercury, dissolved µg/l)	Molybdenum, dissolved (µg/L)	Nickel, dissolved (mg/L)	Selenium, dissolved (µg/L)	Strontium, dissolved (µL)	Zinc, dissolved (mg/L)	Cyanide total (mg/L)
410915079293501 Well 15 (LAT 41°09'15" N. LONG 079°29'35" W.)--Continued										
SEPT 10, 1986	400	<50	41	<1	<70	0.30	<30	2,900	1.6	<0.001
SEPT 10, 1986	380	<50	57	1.3	<70	.25	<30	2,600	1.6	<.001
OCT 09, 1986	--	350	59	<1	<70	1.5	<30	3,000	2.4	<.001
NOV 06, 1986	480	<4	58	<1	<70	1.6	<30	2,200	2.7	<.001
DEC 10, 1986	470	<4	61	<1	<70	1.7	<30	2,500	2.7	<.001
JAN 06, 1987	360	<4	55	<1	<70	.43	<30	1,700	2.1	<.001
FEB 11, 1987	490	<4	59	<1	<70	.76	<30	1,400	2.6	<.001
MAR 12, 1987	480	<4	60	<1	<70	.48	<30	1,700	2.5	<.001
APR 13, 1987	510	<4	57	<1	<70	1.7	<60	1,700	2.9	<.001
MAY 04, 1987	480	<4	53	<1	<70	.87	<60	1,800	2.4	<.001
JUNE 02, 1987	450	<4	59	<1	<70	3.9	<60	2,500	4.4	<.001
JULY 06, 1987	460	4.6	55	<1	<70	.98	<60	2,200	2.4	<.001
AUG 11, 1987	550	5.2	49	<1	<70	.95	<30	1,700	2	<.001
AUG 11, 1987	500	<10	49	<1	<70	.90	<30	1,700	2.1	<.001
SEPT 15, 1987	660	<20	49	<1	<70	1.6	<30	1,500	2.8	<.001
OCT 07, 1987	590	<10	47	<1	<70	2.8	<30	1,600	3.2	<.001
NOV 17, 1987	630	16	57	<1	<70	1.1	<30	1,800	2.9	<.001
NOV 19, 1987	590	<10	49	<1	<70	1.5	<30	1,900	2.6	<.001
DEC 16, 1987	570	<10	48	<1	<70	1.2	<30	2,200	2.2	<.001
JAN 13, 1988	700	<10	68	<1	<70	1.5	<30	1,400	4.6	<.001
FEB 09, 1988	560	<10	71	<1	<70	2.2	<30	1,100	5.4	<.001
FEB 09, 1988	540	<4	73	<1	<70	2.6	<30	1,100	5.3	<.001
MAR 16, 1988	520	<4	49	<1	<70	2	<30	2,500	3.5	<.001
APR 13, 1988	490	<40	51	<1	<70	1.7	<30	3,300	2.1	<.001
MAY 11, 1988	510	<10	57	<1	<70	1.5	<30	3,400	2.7	<.001
JUNE 07, 1988	600	<20	65	<1	<70	1.3	<30	3,100	2.6	<.001
JULY 13, 1988	500	<10	62	<1	<300	1.4	<30	3,100	2.5	<.001
AUG 08, 1988	440	<4	62	<1	<300	1.2	<30	3,400	2.2	<.001
SEPT 20, 1988	990	<10	66	<1	<70	2.4	<30	1,800	4.5	<.001
SEPT 22, 1988	1,000	<40	69	<1	<70	2.9	<30	1,900	6.5	<.001
OCT 17, 1988	520	<40	44	<1	<70	1.1	<30	3,100	2.1	<.001
NOV 15, 1988	480	24	49	<1	<70	.74	<30	3,800	2.2	<.001
DEC 21, 1988	710	<40	60	<1	<70	1.5	<30	3,100	3.8	<.001
JAN 10, 1989	990	<40	64	<1	<70	2.4	<30	3,700	4.4	<.001
MAR 14, 1989	1,200	<40	70	<1	<70	1.7	<30	3,000	5.3	<.001
APR 12, 1989	1,200	<40	80	<1	<70	3.6	<30	3,100	5.6	<.001
MAY 10, 1989	900	<20	74	<1	<70	1.7	<30	3,200	4.7	<.001
JUNE 14, 1989	370	<20	45	<1	<70	.88	<30	1,600	2	<.001
JULY 11, 1989	340	<40	45	<1	<70	.69	<30	1,900	1.6	<.001
AUG 09, 1989	430	<10	46	<1	<70	.80	<30	1,500	2.1	<.001
SEPT 12, 1989	340	<20	54	<1	<70	1.1	<30	1,500	2.2	<.001
SEPT 12, 1989	340	<20	54	<1	<70	1.1	<30	1,400	2.5	<.001
OCT 17, 1989	470	<10	50	<1	<70	1	<30	1,800	2.3	<.001
NOV 07, 1989	730	<10	78	<1	<70	2	<30	2,000	3.2	<.001
410915079293502 Well 15A (LAT 41°09'15" N. LONG 079°29'35" W.)										
JULY 08, 1986	--	<50	45	<1	<700	1.1	<1,000	1,300	2.3	--
SEPT 10, 1986	--	<50	58	<1	<70	.48	<60	1,600	2.5	<.001
OCT 09, 1986	780	860	76	<1	<70	2.4	<60	1,400	4.4	<.001
NOV 06, 1986	950	22	73	<1	<70	2.5	<60	910	5.2	<.001
DEC 10, 1986	800	<4	73	<1	<70	2.2	<60	1,300	3.4	<.001
JAN 06, 1987	760	12	62	<1	<70	.52	<60	1,000	2.8	<.001
FEB 11, 1987	990	<4	63	<1	<70	.88	<30	1,100	3.3	<.001
MAR 12, 1987	740	17	53	<1	<70	2	<30	1,400	3.2	<.001
APR 14, 1987	620	18	41	<1	<70	.46	<60	1,100	.26	<.001

Appendix 2.--Water-quality data for urban sewage sludge site, June 1986 through November 1989--Continued

Date	Time	Water table altitude (ft above sea level)	Streamflow/ discharge, instantaneous (ft^3/s)	Specific conductance ($\mu S/cm$)	pH, field (units)	pH, lab (units)	Oxidation reduction potential (mV)	Water temperature (°C)	Oxygen, dissolved (mg/L)	Acidity total heated (mg/L as $CaCO_3$)	Acidity mineral (methyl orange) (mg/L as $CaCO_3$)	Calcium, dissolved (mg/L)
410915079293502 Well 15A (LAT 41°09'15" N. LONG 079°29'35" W.)--Continued												
APR 14, 1987	0900	1,287	--	5,450	3.0	2.9	--	11.5	--	3,000	540	360
MAY 04, 1987	0005	1,287	--	5,250	2.9	3.1	--	12.0	--	2,500	230	360
MAY 04, 1987	1020	1,287	--	5,450	2.9	3.0	--	12.0	--	2,700	260	330
JUNE 02, 1987	1030	1,289	--	5,610	2.8	2.9	--	13.0	--	3,000	370	290
JULY 06, 1987	1600	1,288	--	5,070	3.0	3.1	--	13.5	--	1,900	180	350
AUG 11, 1987	1300	1,289	--	5,100	3.0	3.4	--	13.0	--	2,200	150	350
SEPT 15, 1987	1230	1,289	--	4,500	3.1	3.2	--	12.5	--	2,100	90	370
OCT 07, 1987	1100	1,289	--	4,900	3.1	3.2	--	11.5	--	2,100	110	360
NOV 17, 1987	1315	1,289	--	4,700	3.5	3.2	--	12.0	--	2,200	130	380
DEC 16, 1987	1245	1,288	--	4,500	3.0	3.2	--	10.5	--	1,700	120	400
JAN 13, 1988	1200	1,288	--	5,150	3.0	3.1	--	9.0	--	2,300	150	350
FEB 09, 1988	1400	1,287	--	4,150	2.7	3.1	--	10.5	--	2,700	190	340
MAR 16, 1988	1015	1,291	--	5,100	2.4	2.7	--	10.5	--	3,000	510	290
APR 13, 1988	0005	1,292	--	5,150	2.5	2.6	--	11.5	--	3,300	570	390
APR 13, 1988	0950	1,292	--	5,300	2.5	2.6	--	11.5	--	3,400	570	320
MAY 11, 1988	1140	1,300	--	5,150	2.6	2.6	--	13.5	--	3,100	580	390
JUNE 07, 1988	1345	1,292	--	5,530	2.6	2.7	--	13.5	--	3,600	570	370
JULY 13, 1988	0920	1,292	--	4,660	3.0	3.0	--	14.0	--	2,500	190	440
AUG 08, 1988	1400	1,289	--	4,910	3.1	3.0	--	14.0	--	2,700	200	480
SEPT 22, 1988	1005	1,287	--	6,080	2.4	2.9	--	13.0	--	4,200	410	430
OCT 17, 1988	0005	1,285	--	5,380	2.9	2.9	627	13.0	0.68	3,900	370	390
OCT 17, 1988	1755	1,285	--	5,260	2.9	2.9	627	13.0	.68	3,900	380	420
NOV 15, 1988	1655	1,286	--	6,640	2.5	2.7	638	12.0	.14	5,500	840	460
DEC 21, 1988	1440	1,287	--	7,310	2.7	2.6	590	10.0	.14	7,600	1,000	440
JAN 10, 1989	1150	1,287	--	7,980	2.4	2.6	590	10.0	.20	7,600	1,000	490
FEB 15, 1989	1155	1,289	--	7,380	2.4	2.6	620	10.0	.17	7,400	1,100	430
MAR 14, 1989	1110	1,289	--	6,500	2.7	2.5	598	12.5	.30	6,000	890	380
APR 12, 1989	1120	1,290	--	5,500	2.6	2.6	585	11.0	.10	--	680	420
MAY 10, 1989	1210	1,293	--	5,750	2.5	2.6	610	11.5	.28	3,800	650	370
JUNE 14, 1989	1230	1,292	--	2,840	3.2	3.3	595	11.5	.20	300	54	350
JULY 11, 1989	1135	1,289	--	2,930	3.6	3.6	555	13.5	.28	230	28	370
AUG 09, 1989	1115	1,289	--	4,470	2.6	2.8	606	13.5	.14	2,200	320	360
SEPT 12, 1989	1130	1,288	--	5,000	2.7	2.7	527	13.0	.96	3,000	400	330
OCT 17, 1989	1210	1,286	--	5,300	2.6	2.8	573	12.5	--	3,200	350	380
NOV 07, 1989	1050	1,287	--	4,780	2.8	2.9	566	11.0	--	3,400	250	550
410915079293503 Well 15B (LAT 41°09'15" N. LONG 079°29'35" W.)												
JULY 09, 1986	1000	1,308	--	5,420	2.8	2.8	--	14.5	--	3,300	270	--
AUG 05, 1986	1840	1,309	--	5,430	2.9	2.8	--	13.0	--	2,400	210	380
SEPT 10, 1986	1130	1,309	--	4,600	3.1	2.9	--	14.0	--	2,000	190	360
OCT 09, 1986	1215	1,310	--	4,050	2.9	3.2	--	12.5	--	740	120	390
NOV 05, 1986	0005	1,309	--	4,250	--	3.0	--	12.0	--	1,300	140	330
NOV 05, 1986	1200	1,309	--	4,200	--	3.0	--	12.0	--	1,300	140	340
DEC 10, 1986	1140	1,311	--	3,630	3.4	3.3	--	11.0	--	760	50	300
JAN 06, 1987	1215	1,314	--	3,000	3.5	3.3	--	12.0	--	430	42	280
FEB 11, 1987	1000	1,310	--	3,500	3.3	3.2	--	11.0	--	440	74	310
MAR 12, 1987	1030	1,309	--	4,100	3.2	3.0	--	11.0	--	1,200	160	340
APR 13, 1987	1930	1,311	--	3,700	3.1	3.2	--	12.0	--	880	76	310
MAY 04, 1987	1200	1,311	--	3,470	3.2	3.1	--	12.0	--	780	110	230
JUNE 02, 1987	0900	1,310	--	3,240	3.0	3.1	--	13.0	--	610	88	230
JULY 06, 1987	1730	1,306	--	3,830	2.9	2.9	--	13.0	--	910	130	250
AUG 11, 1987	0005	1,307	--	5,000	2.6	2.8	--	13.5	--	2,000	270	270
AUG 11, 1987	1355	1,307	--	5,000	2.6	2.8	--	13.5	--	2,000	260	280
SEPT 15, 1987	1330	1,307	--	5,400	2.7	2.7	--	13.0	--	2,600	300	320
OCT 07, 1987	0001	1,308	--	5,300	2.7	2.7	--	11.5	--	2,000	280	320

Date	Magnesium, dissolved (mg/L)	Sodium, dissolved (mg/L)	Potassium, dissolved (mg/L)	Alkalinity water lab (mg/L as $CaCO_3$)	Sulfide total (mg/L as S)	Sulfate, dissolved (mg/L as SO_4)	Chloride, dissolved (mg/L)	Silica, dissolved (mg/L as SiO_2)	Solids, residue at 105 °C, dissolved (mg/L)	Nitrogen, nitrate total (mg/L as N)	Nitrogen, nitrite total (mg/L as N)
410915079293502 Well 15A (LAT 41°09'15" N. LONG 079°29'35" W.)--Continued											
APR 14, 1987	320	5.3	6.9	0	--	3,300	2	74	2,470	<0.04	0.010
MAY 04, 1987	310	4.6	6.7	0	--	4,200	4	77	7,200	<.04	.004
MAY 04, 1987	300	2.8	6.3	0	--	3,200	3	73	7,100	<.04	<.004
JUNE 02, 1987	270	2.7	4.8	0	--	3,800	2	92	7,470	<.04	.022
JULY 06, 1987	270	3.9	6.6	0	--	3,800	3	58	8,040	<.04	.010
AUG 11, 1987	260	3.4	7	0	--	4,100	2	60	6,790	<.04	.004
SEPT 15, 1987	260	5	7.1	--	--	3,600	1	63	6,330	<.04	.014
OCT 07, 1987	270	5.1	7.1	--	--	4,400	2	64	7,590	<.04	.046
NOV 17, 1987	280	4.1	6.8	--	--	3,200	3	56	6,870	<.04	.032
DEC 16, 1987	370	4	6	--	--	4,000	2	57	5,940	<.04	.008
JAN 13, 1988	280	4.9	7.4	--	--	4,200	3	60	6,430	<.04	.010
FEB 09, 1988	250	3.8	6.8	--	--	4,300	4	56	7,100	<.04	.006
MAR 16, 1988	280	4.4	5.1	--	--	4,800	2	110	7,470	<.04	.034
APR 13, 1988	350	4.4	4.8	--	--	5,700	3	130	16,400	<.04	.020
APR 13, 1988	320	2.9	5	--	--	5,600	3	120	8,590	<.04	.016
MAY 11, 1988	350	4.1	3.1	--	--	5,000	2	96	8,820	<.04	.008
JUNE 07, 1988	340	3.9	3.3	--	--	5,200	2	95	9,300	<.04	.006
JULY 13, 1988	320	4.6	6.5	--	--	4,200	2	61	6,990	<.04	.014
AUG 08, 1988	340	4.5	6.6	--	0.64	4,700	3	61	9,670	<.04	<.004
SEPT 22, 1988	310	4	6.8	--	2.4	6,100	4	72	11,600	<.04	<.004
OCT 17, 1988	380	3.7	5.8	--	1	5,700	1	72	9,960	<.04	.020
OCT 17, 1988	490	4.5	6.2	--	1	5,600	<1	68	9,100	<.04	.004
NOV 15, 1988	420	3.4	5.6	--	.04	8,500	2	80	13,800	<.04	.006
DEC 21, 1988	440	5.2	7.6	--	3.2	10,000	<1	93	14,600	<.04	.006
JAN 10, 1989	420	4.6	7.3	--	1.1	9,800	2	86	15,600	<.04	.030
FEB 15, 1989	340	4.8	7.7	--	.40	9,000	2	91	16,100	<.04	<.004
MAR 14, 1989	330	4.4	7.1	--	1.7	7,000	2	87	13,900	<.04	.004
APR 12, 1989	420	3.9	2.9	--	<.20	5,800	2	72	--	<.04	.006
MAY 10, 1989	350	4.1	3	--	<.20	5,700	2	88	13,800	<.04	.006
JUNE 14, 1989	330	9	14	--	.24	2,200	4	24	4,250	<.04	.014
JULY 11, 1989	330	8.9	6.9	--	.20	2,400	2	13	3,510	.04	<.004
AUG 09, 1989	320	5.9	5.2	--	.20	3,000	4	64	5,780	<.04	.004
SEPT 12, 1989	320	6.3	4.5	--	<.20	3,900	3	87	7,930	<.04	.004
OCT 17, 1989	270	4.2	4.8	0	.72	5,500	2	84	8,850	<.04	<.004
NOV 07, 1989	390	5.6	6.7	0	.56	5,200	3	70	7,820	<.04	<.004
410915079293503 Well 15B (LAT 41°09'15" N. LONG 079°29'35" W.)											
JULY 09, 1986	--	5.2	4.9	0	--	4,000	4	--	6,160	.034	.006
AUG 05, 1986	270	6.2	4.7	0	--	3,900	4	--	6,030	.49	.006
SEPT 10, 1986	330	<.20	10	0	--	1,300	4	--	5,830	.48	.006
OCT 09, 1986	380	5.4	9.2	0	--	3,100	3	--	4,790	.92	<.004
NOV 05, 1986	380	5	8.3	0	--	2,700	3	--	4,950	.76	.032
NOV 05, 1986	350	4.2	7.4	0	--	2,800	2	--	4,910	.50	.032
DEC 10, 1986	310	5.3	6.9	0	--	1,900	1.4	--	4,160	1.2	.052
JAN 06, 1987	270	4.3	8.8	0	--	1,900	<1	--	3,190	<.04	.018
FEB 11, 1987	290	4.5	5.5	0	--	2,100	4	--	3,480	<.02	<.004
MAR 12, 1987	320	4.2	5.3	0	--	2,700	2	--	4,430	.14	.008
APR 13, 1987	300	5.9	9.5	0	--	2,300	2	51	4,540	.42	.018
MAY 04, 1987	230	3.8	8.6	0	--	2,000	1	42	3,810	.32	.050
JUNE 02, 1987	230	3.1	7	0	--	1,800	2	48	3,360	.15	.066
JULY 06, 1987	250	3.8	7.2	0	--	2,700	2	52	5,520	.14	.018
AUG 11, 1987	250	2.2	4.7	0	--	3,800	2	81	6,180	.07	.010
AUG 11, 1987	260	2.9	4.4	0	--	3,700	2	78	6,050	<.04	.012
SEPT 15, 1987	300	4.2	4.1	--	--	4,200	2	75	7,710	<.04	.010
OCT 07, 1987	280	5	--	--	--	3,900	2	76	7,140	.06	.004

Appendix 2.--Water-quality data for urban sewage sludge site, June 1986 through November 1989--Continued

Date	Nitrogen, ammonia total (mg/L as N)	Nitrogen, ammonia + organic total (mg/L as N)	Phos-phorus total (mg/L as P)	Aluminum, dissolved (mg/L)	Arsenic, dissolved (µg/L)	Barium, dissolved (µg/L)	Boron, dissolved (µg/L)	Cadmium, dissolved (µg/L)	Chromium, dissolved (µg/L)	Copper, dissolved (µg/L)	Iron, dissolved (mg/L)
410915079293502 Well 15A (LAT 41°09'15" N. LONG 079°29'35" W.)--Continued											
APR 14, 1987	0.63	1.2	0.53	140	120	<10	<250	9.5	<50	<10	820
MAY 04, 1987	.77	1.7	.22	130	120	<10	<250	10	<50	240	810
MAY 04, 1987	.99	2.5	.58	140	110	<10	<250	8.7	<50	170	820
JUNE 02, 1987	2.4	2.8	.99	170	89	<10	<250	9.4	230	240	900
JULY 06, 1987	1.7	3.2	.35	110	100	<10	<250	6.7	66	190	740
AUG 11, 1987	.96	1.5	.32	92	80	<10	<250	6.1	140	120	640
SEPT 15, 1987	1.1	1.5	.19	91	39	<10	<250	5	<50	15	590
OCT 07, 1987	.99	3.1	.27	110	61	250	<250	5.4	<50	150	730
NOV 17, 1987	.72	2.3	.30	110	44	<10	<250	4.9	130	160	780
DEC 16, 1987	.84	1.6	.22	110	48	<10	<250	4.6	81	120	660
JAN 13, 1988	1.2	1.8	.81	120	57	<10	<250	2.1	110	210	760
FEB 09, 1988	.78	3.1	.22	140	86	<10	<250	6.2	66	270	760
MAR 16, 1988	.87	2.3	1.7	200	180	70	<250	6	<50	330	710
APR 13, 1988	.93	1.8	1.9	230	160	18	<250	15	160	460	1,100
APR 13, 1988	.90	1.4	1.9	220	190	18	<250	14	140	400	--
MAY 11, 1988	1.4	1.4	1.5	200	130	<10	<250	12	130	400	740
JUNE 07, 1988	1.2	1.6	1.9	210	62	11	<250	10	160	470	830
JULY 13, 1988	1.5	1.8	.40	140	<40	<10	<250	8.3	260	310	960
AUG 08, 1988	1.4	2.3	.47	160	<40	<10	<250	8.3	120	300	1,000
SEPT 22, 1988	1.3	3.4	1.4	230	28	<10	<250	12	200	640	--
OCT 17, 1988	1.3	2.2	1.4	230	35	<10	<250	16	110	660	1,500
OCT 17, 1988	1	2	.91	240	20	<10	<250	17	120	740	1,900
NOV 15, 1988	1.3	1.7	4.3	400	140	<10	<250	17	230	1,300	2,300
DEC 21, 1988	1.4	2.1	6.5	540	50	<10	<250	43	280	4,200	2,500
JAN 10, 1989	1.4	1.5	8.4	540	300	<10	<250	36	270	2,900	2,500
FEB 15, 1989	1.8	2	6.2	430	290	<10	<250	40	220	2,700	2,100
MAR 14, 1989	1.1	2.3	3.7	350	180	<10	<250	31	170	2,200	1,800
APR 12, 1989	1.2	1.8	1.9	190	82	<10	<250	15	61	510	1,000
MAY 10, 1989	1	2	1.2	230	62	<10	<250	82	93	560	500
JUNE 14, 1989	.56	.97	.21	37	<4	<10	<250	5.2	<50	43	44
JULY 11, 1989	.59	.93	.13	12	<4	<10	<250	2.2	<50	34	45
AUG 09, 1989	1	1.5	.56	130	14	<10	<250	8	58	270	620
SEPT 12, 1989	1.1	.95	.68	180	26	<10	<250	8.5	81	370	770
OCT 17, 1989	1	2	.91	250	17	<10	<250	11	60	530	940
NOV 07, 1989	1	1.8	.44	250	15	<10	<250	10	84	480	1,300
410915079293503 Well 15B (LAT 41°09'15" N. LONG 079°29'35" W.)											
JULY 09, 1986	.94	2.2	--	110	<1,000	<500	--	<10	<50	200	440
AUG 05, 1986	.63	2	--	90	44	<500	<250	10	<50	190	340
SEPT 10, 1986	.78	1.9	--	71	42	<10	<250	27	<50	140	230
OCT 09, 1986	.82	1.8	--	80	46	13	<250	14	150	110	120
NOV 05, 1986	.50	1.3	--	70	68	14	<250	9.4	180	140	220
NOV 05, 1986	.49	1.8	--	70	72	14	<250	9.9	160	150	160
DEC 10, 1986	.33	1.1	--	32	<20	19	<250	8.3	180	83	50
JAN 06, 1987	.26	.93	--	22	18	--	<250	5.3	<50	35	55
FEB 11, 1987	.35	1.2	--	36	35	<10	<250	7.6	<50	25	99
MAR 12, 1987	.40	1.2	--	72	42	<10	<250	7.5	<50	78	260
APR 13, 1987	.30	.38	.14	51	34	<10	<250	8	<50	22	60
MAY 04, 1987	.32	1.4	.21	31	34	<10	<250	6.4	220	<10	66
JUNE 02, 1987	.34	1.2	.18	41	<40	<10	<250	5.7	<50	<10	140
JULY 06, 1987	.36	1.4	.32	62	66	<10	<250	7.8	130	63	210
AUG 11, 1987	.66	1	.56	120	120	<10	<250	7.7	<50	87	570
AUG 11, 1987	.60	1.3	.55	120	140	<10	<250	10	<50	110	590
SEPT 15, 1987	1.1	1.3	.58	150	67	<10	<250	7.2	<50	<10	740
OCT 07, 1987	.77	1.4	.78	150	150	<10	<250	9.7	85	260	710

Appendix 2.--Water-quality data for urban sewage sludge site, June 1986 through November 1989--Continued

Date	Iron, ferrous dissolved (mg/L)	Lead, dissolved (µg/L)	Manganese, dissolved (mg/L)	Mercury, dissolved µg/l)	Molybdenum, dissolved (µg/L)	Nickel, dissolved (mg/L)	Selenium, dissolved (µg/L)	Strontium, dissolved (µL)	Zinc, dissolved (mg/L)	Cyanide total (mg/L)
410915079293502 Well 15A (LAT 41°09'15" N. LONG 079°29'35" W.)--Continued										
APR 14, 1987	620	7.8	63	<1	<70	2.8	<60	1,200	3.4	<0.001
MAY 04, 1987	770	8.2	61	6.3	<70	1.6	<60	1,300	3.3	<.001
MAY 04, 1987	890	6.8	61	<1	<70	1	<60	1,300	2.4	<.001
JUNE 02, 1987	870	5.6	60	<1	<70	1.2	<150	1,000	3.3	<.001
JULY 06, 1987	710	5	52	<1	<70	.71	<60	1,700	2.7	<.001
AUG 11, 1987	750	<10	46	<1	<70	.88	<30	2,000	2.2	<.001
SEPT 15, 1987	590	<20	48	<1	<70	1	<30	1,700	2.5	<.001
OCT 07, 1987	730	<10	48	<1	<70	2.9	<30	1,900	2.8	<.001
NOV 17, 1987	700	<4	51	<1	<70	.82	<30	1,900	2.7	<.001
DEC 16, 1987	660	<40	52	<1	<70	.68	<30	1,800	2	<.001
JAN 13, 1988	800	<4	51	<1	<70	1.3	<30	1,700	2.8	<.001
FEB 09, 1988	820	<10	52	<1	<70	1.3	<30	1,800	3.4	<.001
MAR 16, 1988	850	7.8	63	<1	<70	2.4	<30	940	5	<.001
APR 13, 1988	920	<20	84	<1	<70	2.9	<30	1,000	5.3	<.001
APR 13, 1988	940	<20	66	<1	<70	2.8	<30	1,000	3.3	<.001
MAY 11, 1988	740	<10	75	<1	<70	1.4	<30	920	4.1	<.001
JUNE 07, 1988	1,100	<20	79	<1	<70	4.1	<30	880	4.7	<.001
JULY 13, 1988	940	<20	59	<1	<300	2.6	<30	1,800	3.4	<.001
AUG 08, 1988	940	<20	66	<1	<70	2.9	<30	1,900	4.4	<.001
SEPT 22, 1988	1,400	<40	67	<1	<70	2.6	<30	1,900	5.2	<.001
OCT 17, 1988	1,400	<40	60	<1	<70	3.6	<30	1,600	5.2	<.001
OCT 17, 1988	1,200	<40	99	<1	<70	1.9	<30	1,600	5.9	<.001
NOV 15, 1988	1,800	<20	75	<1	<70	2.1	<30	1,700	7.2	<.001
DEC 21, 1988	2,100	<40	85	<1	<70	2.8	<30	1,600	13	<.001
JAN 10, 1989	2,200	<40	82	<1	<70	6.7	<30	1,800	11	<.001
FEB 15, 1989	2,200	<80	66	<1	<70	2.4	<30	1,800	10	<.001
MAR 14, 1989	1,900	<4	63	<1	<70	5.3	<30	1,500	9	<.001
APR 12, 1989	820	<40	89	<1	<70	2.4	<30	1,000	4.8	<.001
MAY 10, 1989	720	<20	81	<1	<70	2	<30	940	4.4	<.001
JUNE 14, 1989	43	<20	41	<1	<70	.82	<30	890	1.2	<.001
JULY 11, 1989	44	<4	38	<1	<70	.62	<30	950	.67	<.001
AUG 09, 1989	670	<10	55	<1	<70	1.3	<30	950	3.1	<.001
SEPT 12, 1989	660	<20	61	<1	<70	.91	<30	970	3.8	<.001
OCT 17, 1989	1,100	<10	52	<1	<70	2.3	<30	980	4.5	<.001
NOV 07, 1989	1,100	<10	74	<1	<70	2.8	<30	1,600	4.6	<.001
410915079293503 Well 15B (LAT 41°09'15" N. LONG 079°29'35" W.)										
JULY 09, 1986	--	<50	62	<1	<700	1.7	<1,000	1,100	4.4	--
AUG 05, 1986	--	<50	59	<1	<700	3.7	<1,000	940	3.4	<.001
SEPT 10, 1986	360	<50	61	<1	<70	.77	<30	950	2.4	<.001
OCT 09, 1986	110	540	79	<1	<70	2.3	<30	930	3.9	<.001
NOV 05, 1986	200	14	79	<1	<70	2.1	<30	790	3.2	<.001
NOV 05, 1986	200	13	66	<1	<70	2.1	<30	810	3.3	<.001
DEC 10, 1986	58	25	64	1	<70	1.7	<30	800	2.3	<.001
JAN 06, 1987	29	18	48	<1	<70	.61	<30	790	1.3	<.001
FEB 11, 1987	110	9.7	51	<1	<70	.66	<30	840	1.6	<.001
MAR 12, 1987	280	14	58	<1	<70	.73	<30	900	2.2	<.001
APR 13, 1987	63	21	57	2.3	<70	1.1	<60	870	2.2	<.001
MAY 04, 1987	160	21	43	<1	<70	.56	<60	710	1.5	<.001
JUNE 02, 1987	140	<4	45	<1	<70	.52	<60	790	1.6	<.001
JULY 06, 1987	210	15	53	<1	<70	.58	<60	750	1.9	<.001
AUG 11, 1987	650	8.8	49	<1	<70	.93	<30	1,100	2.5	.001
AUG 11, 1987	700	7.5	51	<1	<70	.83	<30	1,100	2.4	<.001
SEPT 15, 1987	700	<20	59	<1	<70	1.8	<30	1,200	3	<.001
OCT 07, 1987	580	<10	58	<1	<70	2.2	<30	1,200	3.4	<.001

Appendix 2.--Water-quality data for urban sewage sludge site, June 1986 through November 1989--Continued

Date	Time	Water table altitude (ft above sea level)	Streamflow/ discharge, instan-taneous (ft^3/s)	Specific conduc-tance (µS/cm)	pH, field (units)	pH, lab (units)	Oxidation reduction potential (mV)	Water temper-ature (°C)	Oxygen, dissolved (mg/L)	Acidity total heated (mg/L as $CaCO_3$)	Acidity mineral (methyl orange) (mg/L as $CaCO_3$)	Calcium, dissolved (mg/L)
410915079293503 Well 15B (LAT 41°09'15" N. LONG 079°29'35" W.)--Continued												
NOV 17, 1987	0000	1,304	--	5,200	2.8	2.8	--	12.5	--	2,400	280	350
NOV 19, 1987	1000	1,304	--	5,750	2.7	2.7	--	12.0	--	2,700	310	340
DEC 16, 1987	1345	1,303	--	4,750	2.8	2.9	--	10.5	--	2,300	190	340
JAN 13, 1988	1030	1,306	--	4,900	2.8	3.0	--	10.0	--	1,900	180	390
FEB 09, 1988	0005	1,309	--	4,650	2.2	2.7	--	11.0	--	4,700	450	300
FEB 09, 1988	1515	1,309	--	4,600	2.2	2.7	--	11.0	--	3,600	430	300
MAR 16, 1988	1100	1,309	--	3,650	2.7	2.9	--	10.5	--	1,200	180	340
APR 13, 1988	0900	1,310	--	4,300	2.6	2.7	--	11.5	--	2,000	350	320
MAY 11, 1988	1130	1,309	--	4,150	2.8	2.7	--	13.5	--	1,800	280	340
JUNE 07, 1988	0005	1,310	--	4,220	2.8	2.8	--	15.5	--	1,600	260	370
JUNE 07, 1988	1315	1,310	--	4,060	2.8	2.8	--	15.5	--	1,800	250	370
JULY 13, 1988	0940	1,308	--	5,290	2.6	2.6	--	16.0	--	2,800	390	420
AUG 08, 1988	1410	1,307	--	5,750	2.8	2.6	--	16.0	--	3,500	430	390
SEPT 22, 1988	0925	1,305	--	5,770	2.6	2.8	--	12.5	--	3,600	380	390
OCT 17, 1988	1725	1,305	--	4,660	3.0	3.0	550	12.5	0.40	2,600	190	430
NOV 15, 1988	0005	1,305	--	5,520	2.6	2.8	573	11.5	.11	3,400	540	460
NOV 15, 1988	1710	1,305	--	5,480	2.6	2.8	573	11.5	.11	3,400	560	440
DEC 21, 1988	1445	1,305	--	6,750	2.6	2.5	595	10.5	.16	6,500	910	460
JAN 10, 1989	1210	1,306	--	7,300	2.5	2.5	605	10.5	.10	6,000	1,100	470
FEB 15, 1989	1200	1,306	--	7,870	2.3	2.4	615	10.5	.13	7,700	1,600	400
MAR 14, 1989	1035	1,307	--	7,200	2.5	2.3	623	13.0	.41	6,400	1,500	360
APR 12, 1989	0005	1,311	--	3,150	3.0	3.0	605	11.5	.11	830	150	350
APR 12, 1989	1145	1,311	--	3,200	3.0	3.1	605	11.5	.11	830	160	330
MAY 10, 1989	1235	1,310	--	4,900	2.4	2.6	620	12.0	.23	3,300	630	390
JUNE 14, 1989	1315	1,311	--	3,670	2.7	2.8	605	12.0	.40	1,200	220	300
JULY 11, 1989	1130	1,312	--	2,850	3.5	3.6	600	14.0	.23	270	26	420
AUG 09, 1989	1100	1,310	--	3,460	2.8	3.0	601	13.0	.13	950	120	400
SEPT 12, 1989	1135	1,309	--	3,700	3.0	2.9	547	12.5	1.10	1,200	150	350
OCT 17, 1989	1215	1,308	--	5,140	2.4	2.6	573	12.0	--	3,100	460	360
NOV 07, 1989	1025	1,306	--	4,990	2.6	2.6	586	11.0	--	3,500	410	500
410921079292901 Well 16.0 (LAT 41°09'21" N. LONG 079°29'29" W.)												
SEPT 10, 1986	1500	1,312	--	2,500	5.7	5.8	--	15.5	--	330	--	300
DEC 10, 1986	0005	1,315	--	3,250	6.2	6.0	--	10.0	--	92	--	350
DEC 10, 1986	1530	1,315	--	3,230	6.2	6.0	--	10.0	--	78	--	340
MAR 11, 1987	1300	1,313	--	3,100	5.8	6.0	--	10.5	--	0	--	380
JUNE 02, 1987	1400	1,313	--	2,920	5.6	5.9	--	13.5	--	44	--	310
SEPT 15, 1987	1000	1,312	--	2,900	6.0	6.3	--	12.0	--	32	--	360
DEC 16, 1987	0005	1,312	--	2,950	5.7	6.2	--	10.5	--	0	--	310
DEC 16, 1987	1415	1,312	--	2,950	5.7	6.4	--	10.5	--	0	--	310
MAR 16, 1988	0845	1,314	--	2,350	5.9	6.2	--	9.5	--	4	--	310
APR 12, 1988	1350	1,313	--	2,450	6.0	6.2	--	12.5	--	10	--	360
MAY 10, 1988	1400	1,313	--	2,650	5.8	6.3	--	14.0	--	12	--	350
JUNE 07, 1988	1045	1,313	--	2,700	6.0	6.2	--	14.0	--	0	--	360
JULY 11, 1988	0005	1,312	--	2,710	5.8	6.4	--	15.5	--	0	--	410
JULY 11, 1988	1250	1,312	--	2,690	5.8	6.3	--	15.5	--	0	--	390
AUG 09, 1988	1100	1,312	--	2,660	5.7	6.5	--	13.5	--	0	--	410
SEPT 21, 1988	1130	1,311	--	2,720	5.9	6.3	--	13.0	--	0	--	350
OCT 18, 1988	1415	1,310	--	2,590	5.8	6.3	--	13.0	--	0	--	370
NOV 15, 1988	1355	1,311	--	2,290	5.8	6.4	--	12.0	.17	0	--	380
DEC 21, 1988	1145	1,311	--	2,240	6.0	6.3	--	11.0	.16	28	--	360
JAN 10, 1989	0940	1,311	--	2,340	5.5	6.4	--	11.0	.20	18	--	340
FEB 15, 1989	0855	1,312	--	2,280	5.8	6.3	440	9.0	.10	0	--	420
MAR 14, 1989	0830	1,313	--	2,450	5.7	6.4	--	10.5	.19	14	--	390
APR 12, 1989	0845	1,314	--	2,500	5.7	6.2	--	10.0	.11	--	--	370

Appendix 2.--Water-quality data for urban sewage sludge site, June 1986 through November 1989--Continued

Date	Magnesium, dissolved (mg/L)	Sodium, dissolved (mg/L)	Potassium, dissolved (mg/L)	Alkalinity water lab (mg/L as $CaCO_3$)	Sulfide total (mg/L as S)	Sulfate, dissolved (mg/L as SO_4)	Chloride, dissolved (mg/L)	Silica, dissolved (mg/L as SiO_2)	Solids, residue at 105 °C, dissolved (mg/L)	Nitrogen, nitrate total (mg/L as N)	Nitrogen, nitrite total (mg/L as N)
410915079293503 Well 15B (LAT 41°09'15" N. LONG 079°29'35" W.)--Continued											
NOV 17, 1987	320	3.8	4.1	–	–	4,200	2	74	6,880	<0.04	0.024
NOV 19, 1987	210	4.7	4.1	–	–	4,300	2	75	7,210	<.04	.024
DEC 16, 1987	270	4.7	5.7	–	–	4,000	2	60	5,950	<.04	.012
JAN 13, 1988	320	9.5	9	–	–	3,900	3	77	5,820	<.04	.008
FEB 09, 1988	290	6.4	5	–	–	4,100	4	60	7,190	.41	.006
FEB 09, 1988	280	4.5	5.7	–	–	4,300	4	69	7,560	.43	.010
MAR 16, 1988	340	4.6	6.9	–	–	3,300	2	59	4,900	.91	.008
APR 13, 1988	280	3.5	6.8	–	–	3,100	3	92	16,900	.47	.008
MAY 11, 1988	350	3	5.8	–	–	4,000	3	76	7,180	.42	.008
JUNE 07, 1988	350	8.8	6.4	–	–	2,900	2	67	6,710	.60	.004
JUNE 07, 1988	350	3.9	6.4	–	–	3,000	3	63	6,060	.48	.004
JULY 13, 1988	380	3.6	3.9	–	–	4,600	2	79	8,420	.11	.006
AUG 08, 1988	360	3.6	4.2	–	–	5,100	5	84	10,800	<.04	.004
SEPT 22, 1988	300	4.4	5.6	–	1.8	5,600	4	70	10,000	<.04	<.004
OCT 17, 1988	320	4.2	7.3	–	.50	4,600	2	56	8,370	<.04	<.004
NOV 15, 1988	350	5.1	7.1	–	.50	5,900	2	55	9,690	<.04	<.004
NOV 15, 1988	350	5.4	6.9	–	.50	6,400	3	55	8,970	<.04	.006
DEC 21, 1988	380	4.3	5.6	–	.72	8,000	2	81	12,400	<.04	.008
JAN 10, 1989	360	4.4	5.4	–	.48	8,100	5	81	13,200	<.04	.022
FEB 15, 1989	380	3.7	3.5	–	<.20	9,300	3	100	19,500	<.04	.004
MAR 14, 1989	360	3.2	3.6	–	.72	6,300	3	91	14,000	.65	.006
APR 12, 1989	320	5.6	7.7	–	<.20	3,100	3	42	–	.73	<.004
APR 12, 1989	300	4.6	7.8	–	<.20	2,900	3	43	–	.68	<.004
MAY 10, 1989	350	4.8	5.4	–	<.20	5,100	4	76	12,500	.13	.018
JUNE 14, 1989	260	7	6.7	–	.24	2,900	3	31	6,750	.13	<.004
JULY 11, 1989	340	9	7.6	–	<.20	2,500	4	13	4,110	.15	<.004
AUG 09, 1989	270	8.5	6.4	–	<.20	2,400	4	31	7,420	.04	.004
SEPT 12, 1989	330	8.4	5.3	–	<.20	2,800	3	46	5,440	<.04	.004
OCT 17, 1989	310	5.7	4.1	0	.64	5,200	2	71	8,000	<.04	.004
NOV 07, 1989	400	5.3	4.8	0	.32	5,400	4	77	7,900	<.04	.004
410921079292901 Well 16 (LAT 41°09'21" N. LONG 079°29'29" W.)											
SEPT 10, 1986	230	4.4	6.8	56	–	1,700	3	–	3,170	.12	<.004
DEC 10, 1986	320	7.6	8.1	160	–	1,800	1.7	–	3,410	<.04	<.004
DEC 10, 1986	300	8.1	7.7	160	–	1,600	1.6	–	3,330	<.04	<.004
MAR 11, 1987	340	34	9.1	130	–	2,100	2	–	3,620	<.04	.008
JUNE 02, 1987	280	7.5	8.3	88	–	1,700	4	13	3,470	.06	<.004
SEPT 15, 1987	300	9.1	9.3	190	–	2,200	3	11	3,270	.08	<.004
DEC 16, 1987	250	7.7	8	190	–	2,100	3	14	3,210	<.04	.004
DEC 16, 1987	260	5.8	7.7	180	–	2,100	3	14	3,220	<.04	.004
MAR 16, 1988	260	7.7	8	120	–	1,900	3	12	2,600	<.04	.004
APR 12, 1988	300	8.4	11	150	–	2,300	3	11	2,980	<.04	<.004
MAY 10, 1988	290	8	12	150	–	2,200	2	9.7	3,470	<.04	<.004
JUNE 07, 1988	290	7.5	12	170	–	1,800	3	11	3,800	<.04	<.004
JULY 11, 1988	340	7.4	9.1	150	–	2,100	3	8.5	4,270	<.04	.004
JULY 11, 1988	320	7.8	8.9	160	–	2,100	2	8.7	4,130	<.04	<.004
AUG 09, 1988	340	7.9	9.2	180	–	2,400	4	8	3,680	<.04	.004
SEPT 21, 1988	280	6.7	8.7	200	<.20	2,300	3	8.4	3,450	<.04	<.004
OCT 18, 1988	330	8.7	8.5	190	<.20	2,200	2	8.2	3,380	<.04	<.004
NOV 15, 1988	300	11	7.6	160	.30	2,000	3	7.6	3,060	.04	.004
DEC 21, 1988	290	8.4	8.4	140	.32	2,000	3	10	3,210	<.04	.004
JAN 10, 1989	250	7.2	8.4	120	.24	1,900	3	11	2,870	<.04	.008
FEB 15, 1989	270	8.6	7.6	120	<.20	1,900	3	12	3,150	<.04	.004
MAR 14, 1989	320	7.3	8.7	140	.56	2,300	3	9.9	3,790	<.04	<.004
APR 12, 1989	290	8.5	9.1	120	<.20	2,400	3	11	–	<.04	<.004

Appendix 2.--Water-quality data for urban sewage sludge site, June 1986 through November 1989--Continued

Date	Nitrogen, ammonia total (mg/L as N)	Nitrogen, ammonia + organic total (mg/L as N)	Phos-phorus total (mg/L as P)	Aluminum, dissolved (mg/L)	Arsenic, dissolved (µg/L)	Barium, dissolved (µg/L)	Boron, dissolved (µg/L)	Cadmium, dissolved (µg/L)	Chromium, dissolved (µg/L)	Copper, dissolved (µg/L)	Iron, dissolved (mg/L)
410915079293503 Well 15B (LAT 41°09'15" N. LONG 079°29'35" W.)--Continued											
NOV 17, 1987	0.72	1.7	0.77	150	110	<10	<250	5.3	140	220	870
NOV 19, 1987	.66	1.8	.79	110	120	<10	<250	9	130	460	550
DEC 16, 1987	.93	2.1	.44	96	68	<10	<250	4.8	<50	180	550
JAN 13, 1988	1	1.8	6.5	89	68	<10	<250	4.3	81	160	600
FEB 09, 1988	.66	9.6	.95	140	180	<10	<250	12	110	290	640
FEB 09, 1988	.69	2.3	4.5	200	180	<10	<250	7.2	69	270	740
MAR 16, 1988	.40	.88	.54	90	74	<10	<250	10	<50	110	240
APR 13, 1988	.51	1.3	1.1	130	130	<10	<250	13	<50	220	420
MAY 11, 1988	.69	1	.64	150	76	<10	<250	13	<50	170	440
JUNE 07, 1988	.78	1.6	.53	120	45	<10	<250	12	<50	200	330
JUNE 07, 1988	.75	1.6	.53	130	54	<10	<250	11	<50	170	330
JULY 13, 1988	1.2	1.7	.94	200	47	11	<250	15	280	290	760
AUG 08, 1988	1.4	2.1	1.4	430	–	31	<250	12	140	360	1,100
SEPT 22, 1988	1.3	2.5	1.5	190	55	<10	<250	9.9	140	430	–
OCT 17, 1988	1.3	2.2	.91	130	27	<10	<250	11	55	340	1,000
NOV 15, 1988	.96	2.1	3.3	220	180	<10	<250	8.2	79	820	1,200
NOV 15, 1988	.84	1.5	3.3	200	180	<10	<250	13	84	850	1,200
DEC 21, 1988	1.5	1.9	6.9	330	54	<10	<250	20	190	1,600	1,700
JAN 10, 1989	1.6	2.1	9.8	350	410	<10	<250	16	200	1,800	2,100
FEB 15, 1989	1.6	1.8	8.1	470	530	<10	<250	25	210	1,400	2,200
MAR 14, 1989	.54	1.6	5.9	420	400	<10	<250	<.20	170	1,000	1,900
APR 12, 1989	.42	.63	.26	76	15	<10	<250	10	<50	120	120
APR 12, 1989	.43	.61	.26	72	15	<10	<250	9.4	<50	140	110
MAY 10, 1989	.73	1.6	2.4	230	140	<10	<250	16	120	510	950
JUNE 14, 1989	.63	.72	.55	93	20	<10	<250	5.5	62	160	230
JULY 11, 1989	.58	.93	.07	11	<4	<10	<250	2.4	<50	45	58
AUG 09, 1989	.62	.99	.33	49	11	<10	<250	4.6	<50	150	260
SEPT 12, 1989	.77	.81	.26	66	12	<10	<250	5.1	<50	150	350
OCT 17, 1989	.85	1.3	1.4	200	46	<10	<250	9.6	67	440	880
NOV 07, 1989	.98	2.1	.89	250	60	<10	<250	9.5	84	420	1,900
410921079292901 Well 16 (LAT 41°09'21" N. LONG 079°29'29" W.)											
SEPT 10, 1986	.75	1.4	–	<.14	<4	<10	<200	5.7	<50	<10	12
DEC 10, 1986	.44	1	–	.41	<4	15	<250	<.20	130	96	40
DEC 10, 1986	.44	1.1	–	<.14	<4	<10	<250	<.20	170	98	40
MAR 11, 1987	.36	1.5	–	.94	<4	<10	<250	.77	<50	160	23
JUNE 02, 1987	.48	1.6	.09	1	<4	<10	<250	1.4	<50	530	20
SEPT 15, 1987	.27	1.3	.17	2.9	<4	<10	<250	<1	<50	<10	23
DEC 16, 1987	.31	.96	.02	.58	<4	11	<250	.58	<50	20	19
DEC 16, 1987	.26	1.1	.02	.38	<4	<10	<250	.60	<50	<10	16
MAR 16, 1988	.36	.90	.04	.59	<4	18	<250	1.1	<50	<10	19
APR 12, 1988	.38	.96	.03	.55	<5	<10	<250	.73	<50	<10	28
MAY 10, 1988	.43	1.1	.03	.35	<20	<10	<250	.82	<50	<10	32
JUNE 07, 1988	.40	1.1	.03	.53	<4	<10	<250	.65	<50	24	32
JULY 11, 1988	.51	.99	.02	.66	<20	<10	<250	.63	<50	<10	40
JULY 11, 1988	.49	1	.02	.42	<20	<10	<250	.83	98	<10	36
AUG 09, 1988	.48	1.2	.04	.51	<20	<10	<250	.76	<50	<10	35
SEPT 21, 1988	.46	.99	.05	.28	<4	<10	<250	.45	<50	<10	33
OCT 18, 1988	.44	1.2	.02	.40	<4	<10	<250	.39	<50	42	40
NOV 15, 1988	.51	.87	.04	.52	<4	<10	<250	.73	<50	37	42
DEC 21, 1988	.52	.78	.05	.51	<4	<10	<250	.78	<50	28	29
JAN 10, 1989	.56	.68	.03	.43	<4	<10	<250	.80	<50	15	25
FEB 15, 1989	.40	.86	.03	.35	<4	11	<250	1.1	<50	15	29
MAR 14, 1989	.57	1.1	.05	.46	<4	<10	<250	1.2	<50	28	33
APR 12, 1989	.47	.74	<.02	.72	<4	<10	<250	.86	<50	15	33

Date	Iron, ferrous dissolved (mg/L)	Lead, dissolved (µg/L)	Manganese, dissolved (mg/L)	Mercury, dissolved µg/l)	Molybdenum, dissolved (µg/L)	Nickel, dissolved (mg/L)	Selenium, dissolved (µg/L)	Strontium, dissolved (µL)	Zinc, dissolved (mg/L)	Cyanide total (mg/L)
410915079293503 Well 15B (LAT 41°09'15" N. LONG 079°29'35" W.)--Continued										
NOV 17, 1987	710	<20	60	<1	<70	1.2	<30	1,500	3.2	<0.001
NOV 19, 1987	750	11	59	<1	<70	1.3	<30	1,200	3.2	<.001
DEC 16, 1987	610	<10	50	<1	<70	1	<30	1,700	2.3	<.001
JAN 13, 1988	610	14	51	<1	<70	1.2	<30	1,900	2.6	<.001
FEB 09, 1988	1,200	20	70	<1	<70	2.4	<30	980	4.2	<.001
FEB 09, 1988	570	19	64	<1	<70	2.8	<30	940	3.6	<.001
MAR 16, 1988	240	17	69	<1	<70	2.3	<30	780	2.9	<.001
APR 13, 1988	840	16	67	<1	<70	2	<30	960	2.9	<.001
MAY 11, 1988	370	<10	75	<1	<70	2.4	<30	900	4.2	<.001
JUNE 07, 1988	280	19	80	<1	<70	2.2	<30	690	4.4	<.001
JUNE 07, 1988	290	18	80	<1	<70	2.3	<30	710	4.2	<.001
JULY 13, 1988	720	<10	83	<1	<300	3	<30	1,000	4.5	<.001
AUG 08, 1988	960	<20	76	<1	<70	3.7	–	1,200	4.8	<.001
SEPT 22, 1988	1,100	<40	67	<1	<70	2.5	<30	1,700	4.2	<.001
OCT 17, 1988	900	<40	65	<1	<70	1.5	<30	1,800	3.7	<.001
NOV 15, 1988	1,200	<20	72	<1	<70	2.7	<30	1,900	4.3	<.001
NOV 15, 1988	1,100	<20	67	1.6	<70	3	<30	1,900	4.4	<.001
DEC 21, 1988	1,500	<40	80	<1	<70	3.4	<30	1,400	6.4	<.001
JAN 10, 1989	1,500	<40	85	<1	<70	3.9	<30	1,400	8.1	<.001
FEB 15, 1989	2,000	<80	84	<1	<70	3.3	<30	1,200	7.1	<.001
MAR 14, 1989	1,600	<20	80	<1	<70	5.6	<30	930	7.2	<.001
APR 12, 1989	110	20	71	<1	<70	1.7	<30	800	2.8	<.001
APR 12, 1989	110	20	61	<1	<70	2.5	<30	840	3.8	<.001
MAY 10, 1989	94	<10	72	<1	<70	2.9	<30	920	4.4	<.001
JUNE 14, 1989	350	<4	34	<1	<70	.69	<30	900	1.4	<.001
JULY 11, 1989	53	<20	38	<1	<70	.60	<30	940	.68	<.001
AUG 09, 1989	250	<10	43	<1	<70	.78	<30	990	1.5	<.001
SEPT 12, 1989	320	<20	48	<1	<70	1	<30	1,000	1.8	<.001
OCT 17, 1989	950	<10	51	<1	<70	2	<30	950	3.1	<.001
NOV 07, 1989	1,000	<10	75	<1	<70	2.5	<30	1,300	3.7	<.001
410921079292901 Well 16 (LAT 41°09'21" N. LONG 079°29'29" W.)										
SEPT 10, 1986	–	<50	25	<1	<70	<.02	<30	1,200	.38	<.001
DEC 10, 1986	37	<4	32	<1	<70	.49	<30	1,000	.55	<.001
DEC 10, 1986	37	<4	31	<1	<70	.55	<30	1,100	.55	<.001
MAR 11, 1987	22	<4	24	<1	<70	.17	<30	1,000	.20	<.001
JUNE 02, 1987	18	<4	25	<1	<70	.46	<6	850	.48	<.001
SEPT 15, 1987	24	<20	22	<1	<70	.28	<30	1,000	.39	<.001
DEC 16, 1987	30	<40	19	<1	<70	.46	<30	910	.29	<.001
DEC 16, 1987	30	<10	20	<1	77	.45	<30	900	.32	<.001
MAR 16, 1988	19	<4	22	<1	<70	.42	<30	930	.55	<.001
APR 12, 1988	31	<10	27	<1	<70	.37	<30	1,100	.47	<.001
MAY 10, 1988	28	<10	26	<1	<300	.43	<30	1,100	.42	<.001
JUNE 07, 1988	30	<10	26	<1	<70	.40	<30	970	.41	<.001
JULY 11, 1988	30	<20	33	<1	<300	.44	<30	1,000	.49	<.001
JULY 11, 1988	31	<20	31	<1	<300	.48	<30	1,000	.52	<.001
AUG 09, 1988	33	<20	31	<1	<70	.47	<30	1,200	.51	<.001
SEPT 21, 1988	36	<40	28	<1	<70	.39	<30	1,100	.40	<.001
OCT 18, 1988	8.2	<40	29	<1	<70	.32	<30	1,100	.49	<.001
NOV 15, 1988	32	30	28	<1	<70	.36	<30	1,000	.56	<.001
DEC 21, 1988	31	<4	25	<1	<70	.32	<30	930	.45	<.001
JAN 10, 1989	24	<40	24	<1	<70	.29	<30	910	.49	<.001
FEB 15, 1989	28	<80	26	<1	<70	.36	<30	1,000	.62	<.001
MAR 14, 1989	45	<20	29	<1	<70	.37	<30	1,100	.47	<.001
APR 12, 1989	38	<4	33	<1	<70	.45	<30	1,100	.62	<.001

Appendix 2.--Water-quality data for urban sewage sludge site, June 1986 through November 1989--Continued

Date	Time	Water table altitude (ft above sea level)	Streamflow/ discharge, instan-taneous (ft^3/s)	Specific conduc-tance (µS/cm)	pH, field (units)	pH, lab (units)	Oxidation reduction potential (mV)	Water temper-ature (°C)	Oxygen, dissolved (mg/L)	Acidity total heated (mg/L as $CaCO_3$)	Acidity mineral (methyl orange) (mg/L as $CaCO_3$)	Calcium, dissolved (mg/L)
410921079292901 Well 16 (LAT 41°09'21" N. LONG 079°29'29" W.)--Continued												
MAY 10, 1989	0833	1,314	--	2,400	5.7	6.3	--	10.5	0.15	28	--	360
JUNE 14, 1989	1500	1,315	--	2,590	5.1	5.9	--	12.0	.30	42	--	460
JULY 11, 1989	0915	1,315	--	2,740	5.0	5.5	--	14.5	.30	110	--	430
AUG 09, 1989	0855	1,314	--	2,730	5.0	5.5	--	12.0	.27	68	--	410
SEPT 12, 1989	0840	1,313	--	2,750	5.3	5.6	--	12.5	.41	50	--	400
OCT 17, 1989	0005	1,312	--	2,680	5.6	6.3	--	13.0	--	0	--	420
OCT 17, 1989	0900	1,312	--	2,760	5.6	6.3	--	13.0	--	0	--	420
NOV 07, 1989	0850	1,312	--	2,680	5.7	6.3	--	11.0	--	0	--	490
410921079292902 Well 16A (LAT 41°09'21" N. LONG 079°29'29" W.)												
JULY 09, 1986	1130	1,275	--	3,230	5.5	5.8	--	15.5	--	290	--	420
AUG 06, 1986	1030	1,275	--	3,680	5.7	5.8	--	13.5	--	270	--	450
SEPT 10, 1986	1600	1,275	--	3,200	5.8	6.0	--	14.0	--	270	--	440
OCT 09, 1986	1530	1,275	--	3,350	5.8	6.0	--	12.0	--	220	--	420
NOV 05, 1986	1600	1,275	--	3,200	5.7	6.1	--	11.5	--	280	--	380
DEC 10, 1986	1500	1,276	--	3,380	5.9	5.8	--	10.5	--	240	--	390
JAN 06, 1987	1345	1,279	--	3,250	6.0	5.9	--	11.0	--	210	--	410
FEB 10, 1987	1500	1,275	--	3,450	5.3	5.9	--	10.0	--	150	--	460
MAR 11, 1987	1100	1,275	--	3,300	5.9	6.0	--	10.0	--	190	--	480
APR 13, 1987	1600	1,276	--	3,270	5.8	6.0	--	12.5	--	350	--	420
MAY 05, 1987	1200	1,276	--	3,250	5.7	6.1	--	12.5	--	190	--	500
JUNE 02, 1987	0005	1,276	--	3,360	5.6	5.9	--	12.0	--	140	--	430
JUNE 02, 1987	1230	1,276	--	3,350	5.8	6.0	--	12.0	--	290	--	310
JULY 06, 1987	2000	1,275	--	3,240	6.0	6.0	--	13.0	--	160	--	360
AUG 11, 1987	1515	1,275	--	3,200	5.6	6.1	--	14.0	--	200	--	390
SEPT 15, 1987	0930	1,275	--	3,200	5.9	6.1	--	12.0	--	250	--	390
OCT 07, 1987	0845	1,275	--	3,150	5.9	6.0	--	11.5	--	180	--	380
NOV 18, 1987	0845	1,274	--	3,000	5.8	6.2	--	11.5	--	170	--	420
DEC 16, 1987	1445	1,275	--	3,280	5.6	6.3	--	9.0	--	170	--	360
JAN 13, 1988	0005	1,275	--	3,000	5.6	6.1	--	9.0	--	190	--	320
JAN 13, 1988	0830	1,275	--	3,000	5.6	6.1	--	9.0	--	200	--	340
FEB 09, 1988	1530	1,275	--	2,650	5.4	6.1	--	9.5	--	180	--	350
MAR 16, 1988	0830	1,275	--	2,750	5.6	6.0	--	10.5	--	210	--	400
APR 12, 1988	1330	1,275	--	2,750	5.8	6.0	--	13.0	--	220	--	410
MAY 10, 1988	1400	1,275	--	2,750	5.8	6.2	--	14.0	--	180	--	430
JUNE 07, 1988	1030	1,275	--	2,840	5.8	6.1	--	15.5	--	240	--	490
JULY 11, 1988	1300	1,275	--	2,770	5.8	6.2	--	16.0	--	200	--	470
AUG 09, 1988	0005	1,273	--	2,770	5.7	6.2	--	12.5	--	200	--	530
AUG 09, 1988	1120	1,274	--	2,740	5.7	6.2	--	15.0	--	200	--	530
SEPT 21, 1988	1145	1,273	--	2,790	5.7	6.1	--	12.5	--	210	--	420
OCT 18, 1988	1430	1,273	--	2,730	5.8	6.1	--	12.0	--	210	--	450
NOV 15, 1988	1350	1,271	--	2,720	5.7	6.2	355	13.0	.20	240	--	480
DEC 21, 1988	1145	1,273	--	2,640	6.0	6.2	320	10.0	.62	270	--	460
JAN 10, 1989	0920	1,274	--	2,790	5.6	6.3	330	10.0	.20	260	--	480
FEB 15, 1989	0005	1,274	--	2,650	5.7	6.2	410	10.5	.20	200	--	420
FEB 15, 1989	0900	1,274	--	2,760	5.7	6.3	410	10.5	.20	200	--	440
MAR 14, 1989	0920	1,275	--	2,400	5.7	6.2	380	11.5	.21	260	--	470
APR 12, 1989	0915	1,275	--	2,650	5.7	6.1	430	10.0	.09	240	--	430
MAY 10, 1989	0915	1,275	--	2,450	5.7	6.2	440	10.5	.10	220	--	410
JUNE 14, 1989	1515	1,276	--	2,690	5.6	6.2	332	11.5	.32	170	--	510
JULY 11, 1989	0935	1,276	--	2,760	5.5	6.2	333	14.0	.26	250	--	190
AUG 09, 1989	0850	1,276	--	2,650	5.6	6.1	340	12.5	.22	210	--	500
SEPT 12, 1989	0005	1,275	--	2,600	5.6	6.3	317	13.0	.31	200	--	300
SEPT 12, 1989	0900	1,275	--	2,550	5.6	6.2	317	13.0	.31	200	--	460
OCT 17, 1989	0905	1,274	--	2,940	5.7	6.3	448	13.0	--	230	--	460
NOV 07, 1989	0845	1,272	--	2,750	5.7	6.2	456	11.0	--	230	--	580

Appendix 2.--Water-quality data for urban sewage sludge site, June 1986 through November 1989--Continued

Date	Magnesium, dissolved (mg/L)	Sodium, dissolved (mg/L)	Potassium, dissolved (mg/L)	Alkalinity water lab (mg/L as $CaCO_3$)	Sulfide total (mg/L as S)	Sulfate, dissolved (mg/L as SO_4)	Chloride, dissolved (mg/L)	Silica, dissolved (mg/L as SiO_2)	Solids, residue at 105 °C, dissolved (mg/L)	Nitrogen, nitrate total (mg/L as N)	Nitrogen, nitrite total (mg/L as N)
410921079292901 Well 16 (LAT 41°09'21" N. LONG 079°29'29" W.)--Continued											
MAY 10, 1989	300	7.7	8.2	--	<0.20	2,100	2	12	4,730	<0.04	<0.004
JUNE 14, 1989	420	7.6	9.4	50	.24	2,600	3	13	3,910	.07	<.004
JULY 11, 1989	380	9.7	9.1	42	<.20	2,600	3	9.8	3,990	.11	.004
AUG 09, 1989	350	8.6	8.2	36	.20	2,300	4	11	4,540	<.04	<.004
SEPT 12, 1989	380	10	8.1	54	<.20	2,500	3	11	4,290	<.04	<.004
OCT 17, 1989	330	9.7	7.8	120	.32	2,400	3	7.6	3,880	<.04	<.004
OCT 17, 1989	340	9.9	8.1	130	.32	2,400	3	8.3	3,870	<.04	<.004
NOV 07, 1989	400	10	9.1	150	.32	2,400	4	7.8	3,460	<.04	<.004
410921079292902 Well 16A (LAT 41°09'21" N. LONG 079°29'29" W.)											
JULY 09, 1986	270	7.7	12	80	--	2,700	5	--	3,920	.054	.006
AUG 06, 1986	220	7.6	12	90	--	2,500	15	--	4,310	.056	.004
SEPT 10, 1986	260	<.20	9	100	--	2,500	3	--	4,020	<.02	<.004
OCT 09, 1986	260	5.8	11	110	--	1,800	2	--	3,660	<.02	<.004
NOV 05, 1986	230	6.4	12	110	--	1,900	2	--	3,640	.04	<.004
DEC 10, 1986	240	6.6	11	110	--	1,900	1.7	--	3,410	<.04	<.004
JAN 06, 1987	250	5.5	11	110	--	2,100	3	--	3,840	<.04	<.004
FEB 10, 1987	280	7.4	6.2	110	--	1,900	4	--	3,720	<.02	<.004
MAR 11, 1987	290	6.7	14	110	--	2,200	2	--	3,720	.04	.002
APR 13, 1987	260	5.8	23	110	--	2,400	2	11	7,920	<.04	<.004
MAY 05, 1987	250	8	14	120	--	1,700	2	9.4	3,590	<.04	<.004
JUNE 02, 1987	270	6.4	10	120	--	2,400	3	12	3,560	<.04	.004
JUNE 02, 1987	200	7.4	11	120	--	2,000	3	14	3,720	<.04	.004
JULY 06, 1987	250	9.1	14	110	--	2,100	4	8.1	4,100	.16	.018
AUG 11, 1987	240	6.3	12	130	--	1,800	4	9.8	3,890	<.04	<.004
SEPT 15, 1987	240	7	11	120	--	2,300	2	12	3,750	<.04	<.004
OCT 07, 1987	240	6.3	13	130	--	2,000	2	11	3,800	<.04	.004
NOV 18, 1987	260	8	13	130	--	2,300	3	11	3,490	<.04	<.004
DEC 16, 1987	220	9.5	12	120	--	2,000	2	15	3,400	.04	<.004
JAN 13, 1988	260	7.1	11	120	--	2,200	3	15	3,810	<.04	.014
JAN 13, 1988	260	7.3	11	120	--	2,200	3	12	3,610	<.04	.012
FEB 09, 1988	210	7.9	11	110	--	2,500	2	13	3,820	<.04	.014
MAR 16, 1988	240	7.4	11	110	--	2,200	2	11	3,100	<.04	.004
APR 12, 1988	250	6.5	11	110	--	2,400	3	14	3,750	<.04	<.004
MAY 10, 1988	270	7.7	12	110	--	2,400	2	12	3,960	<.04	<.004
JUNE 07, 1988	280	7.2	11	110	--	1,900	3	12	3,800	<.04	.004
JULY 11, 1988	310	6.5	10	100	--	2,200	2	11	4,080	<.04	.012
AUG 09, 1988	290	6.6	10	110	4.9	2,600	4	8.8	3,950	<.04	.004
AUG 09, 1988	290	6.4	10	110	--	2,500	4	9.9	4,160	<.04	.004
SEPT 21, 1988	250	6.7	9.8	120	4.9	2,400	3	11	4,330	.04	<.004
OCT 18, 1988	280	6	9.5	110	<.20	2,000	2	10	3,810	<.04	<.004
NOV 15, 1988	290	7.9	9.6	110	.50	2,500	2	9.3	8,020	<.04	<.004
DEC 21, 1988	280	7	10	110	.40	2,500	3	10	4,000	<.04	.004
JAN 10, 1989	280	7.8	11	110	.24	2,400	3	8.9	3,830	<.04	.006
FEB 15, 1989	260	7.7	9.9	110	.32	2,200	3	9.9	4,080	<.04	<.004
FEB 15, 1989	270	7.5	11	110	.32	2,300	3	10	3,800	<.04	<.004
MAR 14, 1989	280	7.7	11	100	.88	2,700	3	11	4,130	<.04	<.004
APR 12, 1989	250	6.8	11	98	<.20	2,600	3	12	--	<.04	<.004
MAY 10, 1989	250	7.2	9.7	--	.40	2,400	2	12	4,600	<.04	.004
JUNE 14, 1989	310	10	11	94	.48	2,600	3	12	3,660	.24	<.004
JULY 11, 1989	110	13	10	94	<.20	2,600	3	10	4,180	.04	.004
AUG 09, 1989	280	7.2	10	88	<.20	2,800	4	11	4,370	<.04	<.004
SEPT 12, 1989	180	8.4	9.5	100	<.20	2,500	3	12	4,240	<.04	<.004
SEPT 12, 1989	290	8.2	9.4	110	<.20	2,400	3	14	4,150	<.04	.004
OCT 17, 1989	270	7.8	9.7	96	.48	2,600	3	10	3,960	<.04	<.004
NOV 07, 1989	340	8.4	11	98	.32	2,400	3	11	4,070	<.04	<.004

Appendix 2.--Water-quality data for urban sewage sludge site, June 1986 through November 1989--Continued

Date	Nitrogen, ammonia total (mg/L as N)	Nitrogen, ammonia + organic total (mg/L as N)	Phosphorus total (mg/L as P)	Aluminum, dissolved (mg/L)	Arsenic, dissolved (µg/L)	Barium, dissolved (µg/L)	Boron, dissolved (µg/L)	Cadmium, dissolved (µg/L)	Chromium, dissolved (µg/L)	Copper, dissolved (µg/L)	Iron, dissolved (mg/L)
410921079292901 Well 16 (LAT 41°09'21" N. LONG 079°29'29" W.)--Continued											
MAY 10, 1989	0.43	0.89	0.05	0.70	<4	<10	<250	1.3	<50	27	30
JUNE 14, 1989	.50	1	.02	3	<4	12	<250	2.2	<50	37	30
JULY 11, 1989	.56	.93	.03	4.9	<4	<10	<250	2.5	<50	34	23
AUG 09, 1989	.42	1.1	.10	4.6	<4	<10	<250	2.9	<50	33	19
SEPT 12, 1989	.44	.84	.04	3.2	<4	<10	<250	1.5	<50	28	17
OCT 17, 1989	.38	<1	.04	.58	<4	<10	<250	1.1	<50	81	22
OCT 17, 1989	.38	<1	.04	.60	<4	<10	<250	1.3	<50	63	20
NOV 07, 1989	.38	<1	.03	.41	<4	<10	<250	.81	<50	23	17
410921079292902 Well 16A (LAT 41°09'21" N. LONG 079°29'29" W.)											
JULY 09, 1986	.88	1.2	--	.22	<1,000	<500	--	<10	<50	43	73
AUG 06, 1986	1.1	2.9	--	<.14	<4	<500	<250	.73	<50	33	110
SEPT 10, 1986	1.1	2.4	--	<.14	<4	<10	<250	2.4	<50	<10	120
OCT 09, 1986	1.2	2.2	--	.29	<100	--	<250	.77	110	29	130
NOV 05, 1986	1	2.2	--	.24	<4	--	<250	1.2	110	30	110
DEC 10, 1986	.44	1	--	--	<4	<10	<250	<.20	170	34	110
JAN 06, 1987	.94	1.6	--	<.14	<4	--	<250	.35	<50	<10	120
FEB 10, 1987	1.1	2.2	--	<.14	<4	<10	<250	<.20	<50	<10	120
MAR 11, 1987	1.1	2	--	<.14	<4	<10	<250	.20	<50	<10	130
APR 13, 1987	.82	1.6	.06	--	<4	<10	<250	1.2	<50	<10	110
MAY 05, 1987	1	2.2	.04	.20	<4	<10	<250	<.20	<50	<10	180
JUNE 02, 1987	1.4	1.9	.04	.21	<4	<10	<250	<.20	<50	<10	150
JUNE 02, 1987	2.5	2.7	.08	.34	<4	<10	<250	<.20	<50	<10	120
JULY 06, 1987	.81	1.6	.10	26	<4	<10	<250	<.20	<50	380	79
AUG 11, 1987	.96	1.6	.07	.30	<10	<10	<250	<.20	<50	650	110
SEPT 15, 1987	1.2	2	.15	19	<4	<10	<250	<1	<50	<10	120
OCT 07, 1987	1	2.1	.04	27	<5	<10	<250	<.50	<50	<10	110
NOV 18, 1987	.99	2.4	.11	<.14	<4	<10	<250	<.50	<50	<10	120
DEC 16, 1987	1	1.9	.12	.28	<4	38	<250	.45	<50	<10	100
JAN 13, 1988	1.2	1.9	.16	.38	<5	<20	<250	.20	<50	<10	120
JAN 13, 1988	1.1	1.7	.15	.53	<4	39	<250	<.20	<50	<10	140
FEB 09, 1988	1.1	1.3	.06	.33	<4	<10	<250	<.50	<50	<10	130
MAR 16, 1988	.96	1.6	.10	.18	<4	24	<250	<.20	<50	<10	110
APR 12, 1988	1.2	1.6	.07	.36	<4	<10	<250	<.20	<50	<10	120
MAY 10, 1988	1.5	1.9	.07	.27	<40	<10	<250	<.50	<50	<10	130
JUNE 07, 1988	1.4	2.2	.06	.35	<4	<10	<250	<.20	<50	25	120
JULY 11, 1988	1.5	2.2	.05	.39	<20	<10	<250	.26	90	<10	140
AUG 09, 1988	1.6	2.4	.07	.36	<20	<10	<250	.51	<50	<10	160
AUG 09, 1988	1.6	2.2	.07	.42	<20	<10	<250	.57	<50	29	140
SEPT 21, 1988	1.3	2.4	.08	.39	<4	<10	<250	1.5	<50	<10	130
OCT 18, 1988	1.4	2.2	.10	.29	<4	<10	<250	.59	<50	33	150
NOV 15, 1988	1.4	1.5	.05	.47	<4	10	<250	<.20	<50	47	180
DEC 21, 1988	1.4	1.6	.08	.21	<4	<10	<250	<.20	<50	22	150
JAN 10, 1989	1.7	1.5	.05	.18	<4	<10	<250	2.4	<50	12	160
FEB 15, 1989	1.4	1.4	.05	.52	<4	<10	<250	<.20	<50	18	140
FEB 15, 1989	1.4	1.5	.05	.15	<4	<10	<250	<.20	<50	13	140
MAR 14, 1989	1.4	1.8	.15	.49	5.4	<10	<250	.36	<50	37	150
APR 12, 1989	1.2	1.5	.02	.50	<4	10	<250	.34	<50	38	130
MAY 10, 1989	1.1	1.8	.05	.38	<4	<10	<250	<.20	<50	36	120
JUNE 14, 1989	1.4	1.5	.07	.39	<4	11	<250	.32	<50	23	150
JULY 11, 1989	1.4	1.8	.04	.38	<4	10	<250	.45	<50	18	140
AUG 09, 1989	1.3	2.2	.18	.40	<4	<10	<250	.42	<50	28	130
SEPT 12, 1989	1.1	1.6	.07	.22	<4	<10	<250	.41	<50	14	120
SEPT 12, 1989	1.1	1.5	.06	.29	<4	<10	<250	.35	<50	14	130
OCT 17, 1989	1.3	1.6	.05	.30	<4	<10	<250	.54	<50	43	130
NOV 07, 1989	1.1	1.9	.04	.25	<4	<10	<250	.22	<50	21	170

Appendix 2.–Water-quality data for urban sewage sludge site, June 1986 through November 1989–Continued

Date	Iron, ferrous dissolved (mg/L)	Lead, dissolved (µg/L)	Manganese, dissolved (mg/L)	Mercury, dissolved µg/l)	Molybdenum, dissolved (µg/L)	Nickel, dissolved (mg/L)	Selenium, dissolved (µg/L)	Strontium, dissolved (µL)	Zinc, dissolved (mg/L)	Cyanide total (mg/L)
410921079292901 Well 16 (LAT 41°09'21" N. LONG 079°29'29" W.)–Continued										
MAY 10, 1989	34	<10	36	<1	<70	0.59	<30	1,100	0.56	<0.001
JUNE 14, 1989	26	<4	54	<1	<70	.84	<30	1,000	.75	<.001
JULY 11, 1989	23	<4	49	<1	<70	.83	<30	1,100	.86	<.001
AUG 09, 1989	22	<10	43	<1	<70	.76	<30	1,000	.76	<.001
SEPT 12, 1989	18	<4	37	<1	<70	.50	<30	1,000	.75	<.001
OCT 17, 1989	18	<10	26	<1	<70	.39	<30	850	.55	<.001
OCT 17, 1989	18	<10	27	<1	<70	.39	<30	860	.53	<.001
NOV 07, 1989	22	<4	23	<1	<70	.31	<30	920	.42	<.001
410921079292902 Well 16A (LAT 41°09'21" N. LONG 079°29'29" W.)										
JULY 09, 1986	–	91	32	<1	<700	.52	<1,000	2,500	.31	–
AUG 06, 1986	–	<50	33	<1	<700	.53	<1,000	3,300	.24	.001
SEPT 10, 1986	–	<50	39	<1	<70	<.02	<30	3,300	<.01	<.001
OCT 09, 1986	–	290	43	<1	<70	.53	<15	3,700	.41	<.001
NOV 05, 1986	150	<4	37	<1	<70	.49	<30	3,200	.32	<.001
DEC 10, 1986	120	<4	39	<1	<70	<.02	<30	3,400	.33	<.001
JAN 06, 1987	140	<4	40	<1	<70	.02	<30	3,100	.11	<.001
FEB 10, 1987	150	<4	41	<1	<70	<.02	<30	3,500	.086	<.001
MAR 11, 1987	120	<4	42	<1	<70	<.02	<30	3,500	.10	<.001
APR 13, 1987	120	<4	38	<1	<70	.30	<60	3,000	.23	<.001
MAY 05, 1987	130	5	38	<1	<70	.44	<60	3,000	.11	<.001
JUNE 02, 1987	120	<4	39	<1	<70	.42	<30	4,200	.26	<.001
JUNE 02, 1987	130	<5	35	<1	<70	.45	<30	4,200	.26	<.001
JULY 06, 1987	90	<4	28	<1	<70	.37	<60	2,400	.25	<.001
AUG 11, 1987	130	<10	34	<1	<70	.20	<30	3,200	.19	<.001
SEPT 15, 1987	130	<20	36	<1	<70	.51	<30	3,100	.24	<.001
OCT 07, 1987	120	<10	35	<1	<70	.41	<30	3,000	.33	<.001
NOV 18, 1987	130	<10	37	<1	<70	.78	<30	3,100	.28	<.001
DEC 16, 1987	110	<10	40	<1	<70	.34	<30	2,100	.23	<.001
JAN 13, 1988	140	<4	37	<1	<70	.32	<30	3,000	.088	<.001
JAN 13, 1988	130	<4	40	<1	<70	.56	<30	3,100	.081	<.001
FEB 09, 1988	130	<10	35	<1	<70	.41	<30	3,000	.26	<.001
MAR 16, 1988	270	<4	35	<1	<70	.44	<30	3,000	.33	<.001
APR 12, 1988	130	<10	37	<1	<70	.40	<30	3,100	.26	<.001
MAY 10, 1988	140	<10	40	<1	<70	.44	<30	3,200	.29	<.001
JUNE 07, 1988	130	<10	39	<1	<70	.42	<30	2,800	.30	.001
JULY 11, 1988	140	<20	40	<1	<300	.43	<30	3,000	.28	<.001
AUG 09, 1988	140	<20	41	<1	<70	.44	<30	3,000	.32	<.001
AUG 09, 1988	140	<20	40	<1	<70	.46	<30	3,100	.32	<.001
SEPT 21, 1988	150	<40	43	<1	<70	.47	<30	2,800	3.1	<.001
OCT 18, 1988	150	<40	45	<1	<70	.34	<30	2,800	.36	<.001
NOV 15, 1988	150	<20	47	<1	<70	.48	<30	2,900	.38	<.001
DEC 21, 1988	150	<4	44	<1	<70	.38	<30	2,800	.37	<.001
JAN 10, 1989	160	<40	45	<1	<70	.35	<30	2,900	.40	<.001
FEB 15, 1989	160	<40	40	<1	<70	.37	<30	2,800	.33	<.001
FEB 15, 1989	150	<40	42	<1	<70	.34	<30	2,900	.24	<.001
MAR 14, 1989	150	<20	45	<1	<70	.34	<30	2,900	.51	<.001
APR 12, 1989	150	<4	40	<1	<70	.36	<30	3,000	.41	<.001
MAY 10, 1989	150	<4	38	<1	<70	.30	<30	3,000	.34	<.001
JUNE 14, 1989	150	<4	44	<1	<70	.38	<30	2,700	.44	<.001
JULY 11, 1989	150	<20	32	<1	<70	<.02	<30	390	.11	<.001
AUG 09, 1989	150	<10	41	<1	<70	.30	<30	3,200	.31	<.001
SEPT 12, 1989	140	<4	37	<1	<70	.34	<30	3,000	.31	<.001
SEPT 12, 1989	140	<4	40	<1	<70	.32	<30	3,000	.31	<.001
OCT 17, 1989	150	<10	39	<1	<70	.36	<30	2,700	.33	<.001
NOV 07, 1989	150	<4	53	<1	<70	.36	<30	2,800	.31	<.001

Appendix 2.--Water-quality data for urban sewage sludge site, June 1986 through November 1989--Continued

Date	Time	Water table altitude (ft above sea level)	Streamflow/ discharge, instan-taneous (ft^3/s)	Specific conduc-tance (µS/cm)	pH, field (units)	pH, lab (units)	Oxidation reduction potential (mV)	Water temper-ature (°C)	Oxygen, dissolved (mg/L)	Acidity total heated (mg/L as $CaCO_3$)	Acidity mineral (methyl orange) (mg/L as $CaCO_3$)	Calcium, dissolved (mg/L)
410921079292903 Well 16B (LAT 41°09'21" N. LONG 079°29'29" W.)												
JUNE 19, 1986	1200	1,313	--	3,250	5.9	6.1	--	13.0	--	0	--	380
JULY 09, 1986	1200	1,312	--	3,160	5.7	6.2	--	17.0	--	26	--	380
AUG 06, 1986	1015	1,312	--	2,760	5.1	5.4	--	16.0	--	140	--	310
SEPT 10, 1986	1530	1,312	--	2,700	5.5	5.7	--	13.5	--	50	--	330
OCT 09, 1986	1600	1,313	--	2,830	4.8	5.0	--	12.0	--	90	--	310
NOV 05, 1986	1500	1,312	--	2,900	5.4	5.8	--	11.0	--	74	--	350
DEC 10, 1986	1415	1,314	--	3,100	5.0	4.5	--	10.0	--	490	--	290
JAN 06, 1987	1400	1,317	--	3,200	5.5	5.7	--	11.0	--	22	--	370
FEB 10, 1987	1500	1,313	--	3,200	5.2	5.9	--	10.5	--	10	--	380
MAR 11, 1987	1000	1,313	--	2,300	5.3	5.3	--	10.5	--	48	--	240
APR 13, 1987	1615	1,314	--	2,970	5.4	5.7	--	12.0	--	160	--	370
MAY 05, 1987	1200	1,314	--	3,100	5.5	5.9	--	12.5	--	56	--	310
JUNE 02, 1987	0005	1,313	--	3,220	5.6	5.9	--	12.5	--	0	--	340
JUNE 02, 1987	1200	1,313	--	3,200	5.6	5.9	--	12.5	--	34	--	190
JULY 08, 1987	0900	1,314	--	2,580	5.6	5.8	--	13.0	--	10	--	260
AUG 11, 1987	1505	1,312	--	2,900	5.3	5.9	--	14.5	--	38	--	280
SEPT 15, 1987	0900	1,312	--	1,080	5.0	4.9	--	12.0	--	80	--	99
OCT 07, 1987	0815	1,312	--	1,500	5.0	4.9	--	11.0	--	72	--	150
NOV 18, 1987	0830	1,304	--	2,500	5.2	5.4	--	12.0	--	24	--	310
DEC 16, 1987	0005	1,312	--	1,080	4.9	4.8	--	9.0	--	94	--	100
DEC 16, 1987	1445	1,312	--	1,110	4.9	4.8	--	9.0	--	80	--	100
JAN 13, 1988	0815	1,312	--	2,000	4.6	4.9	--	10.0	--	76	--	210
FEB 09, 1988	1500	1,312	--	1,300	4.3	4.4	--	8.0	--	210	--	120
MAR 16, 1988	0900	1,314	--	1,600	5.1	5.0	--	10.5	--	90	--	180
APR 12, 1988	1315	1,313	--	1,870	4.5	4.5	--	12.5	--	180	--	200
MAY 10, 1988	1230	1,313	--	1,690	4.6	4.8	--	14.0	--	82	--	200
JUNE 07, 1988	0005	1,311	--	2,240	4.7	4.7	--	13.5	--	120	--	290
JUNE 07, 1988	1025	1,311	--	2,290	4.7	4.7	--	13.5	--	130	--	380
JULY 11, 1988	1305	1,312	--	2,580	5.3	5.7	--	16.0	--	66	--	390
AUG 09, 1988	1130	1,311	--	2,540	5.4	5.8	--	18.0	--	50	--	740
SEPT 21, 1988	1200	1,310	--	2,590	4.9	5.0	--	13.0	--	96	--	360
OCT 18, 1988	1410	1,310	--	2,680	5.2	5.4	--	12.0	--	72	--	350
NOV 15, 1988	0005	1,308	--	1,010	4.8	4.8	525	12.0	3.30	100	--	200
NOV 15, 1988	1315	1,308	--	1,010	4.8	4.8	525	12.0	3.30	82	--	210
DEC 21, 1988	1125	1,311	--	1,880	5.1	4.9	360	10.0	.16	120	--	280
JAN 10, 1989	0905	1,311	--	1,160	4.5	4.7	560	9.0	5.40	100	--	160
FEB 15, 1989	0830	1,312	--	1,940	4.7	4.8	515	10.0	1.20	88	--	280
MAR 14, 1989	0840	1,312	--	2,400	4.8	4.8	550	10.5	.28	78	--	360
APR 12, 1989	0005	1,314	--	2,750	4.4	4.2	590	10.0	.14	--	--	350
APR 12, 1989	0850	1,314	--	2,800	4.4	4.2	590	10.0	.14	490	--	340
MAY 10, 1989	0935	1,314	--	2,000	5.0	5.1	530	10.5	.11	94	--	280
JUNE 14, 1989	1600	1,314	--	2,640	4.4	4.8	507	12.5	.28	100	--	440
JULY 11, 1989	0850	1,315	--	2,660	5.2	5.7	423	15.5	.35	82	--	410
AUG 09, 1989	0825	1,314	--	2,670	5.2	5.7	435	12.0	.22	64	--	400
SEPT 12, 1989	0905	1,312	--	2,650	5.5	5.9	352	12.5	.35	40	--	390
OCT 17, 1989	0855	1,311	--	2,780	5.6	6.2	463	13.0	--	0	--	430
NOV 07, 1989	0005	1,309	--	2,490	5.6	6.2	486	11.0	--	0	--	490
NOV 07, 1989	0825	1,309	--	2,460	5.6	6.2	486	11.0	--	0	--	490
410907079294201 Well 17.0 (LAT 41°09'07" N. LONG 079°29'42" W.)												
SEPT 08, 1986	1330	1,244	--	2,450	3.5	3.1	--	12.5	--	490	100	240
DEC 09, 1986	1030	1,245	--	2,650	3.2	3.1	--	10.0	--	530	110	220
MAR 11, 1987	1345	1,245	--	2,300	3.3	3.3	--	9.0	--	410	60	250
JUNE 03, 1987	0915	1,245	--	2,260	3.6	3.6	--	11.5	--	440	22	210
SEPT 16, 1987	1045	1,245	--	2,300	3.3	3.4	--	10.5	--	440	42	170

Appendix 2.--Water-quality data for urban sewage sludge site, June 1986 through November 1989--Continued

Date	Magnesium, dissolved (mg/L)	Sodium, dissolved (mg/L)	Potassium, dissolved (mg/L)	Alkalinity water lab (mg/L as $CaCO_3$)	Sulfide total (mg/L as S)	Sulfate, dissolved (mg/L as SO_4)	Chloride, dissolved (mg/L)	Silica, dissolved (mg/L as SiO_2)	Solids, residue at 105 °C, dissolved (mg/L)	Nitrogen, nitrate total (mg/L as N)	Nitrogen, nitrite total (mg/L as N)
410921079292903 Well 16B (LAT 41°09'21" N. LONG 079°29'29" W.)											
JUNE 19, 1986	260	10	9.1	160	--	2,400	4	--	3,690	0.02	<0.004
JULY 09, 1986	310	12	12	160	--	2,400	10	--	3,250	.28	.056
AUG 06, 1986	200	12	13	42	--	2,000	4	--	3,160	1.6	.030
SEPT 10, 1986	200	5.8	12	70	--	840	12	--	3,250	1.6	.030
OCT 09, 1986	280	8.1	10	28	--	1,300	5	--	3,050	.56	<.004
NOV 05, 1986	320	8.4	11	60	--	2,100	4	--	3,180	.04	<.004
DEC 10, 1986	320	4.5	7.4	22	--	1,700	1.6	--	3,420	.10	<.004
JAN 06, 1987	350	7.6	7.3	94	--	1,900	3	--	3,710	<.04	<.004
FEB 10, 1987	350	8.6	9.2	100	--	2,000	4	--	3,510	<.02	<.004
MAR 11, 1987	210	5.5	10	36	--	1,600	4	--	2,550	.48	.004
APR 13, 1987	100	5.8	10	60	--	2,200	2	14	490	.06	<.004
MAY 05, 1987	300	7.4	10	110	--	1,700	2	9.3	3,360	<.04	<.004
JUNE 02, 1987	320	8.1	8.5	110	--	1,800	3	10	3,310	.04	<.004
JUNE 02, 1987	120	8.5	8.9	100	--	2,000	3	12	3,540	.04	<.004
JULY 08, 1987	230	7.2	7.6	68	--	2,000	2	8.9	3,250	1.2	<.004
AUG 11, 1987	260	6.3	9.3	86	--	1,800	4	9.8	3,520	<.04	<.004
SEPT 15, 1987	67	4	6.2	14	--	700	3	32	1,240	2.4	<.004
OCT 07, 1987	110	4.6	6.6	18	--	1,000	3	37	1,780	2.2	<.004
NOV 18, 1987	270	7.9	8.5	40	--	1,900	6	15	2,890	.30	<.004
DEC 16, 1987	70	3.7	5.2	14	--	620	2	40	1,020	1.4	<.004
DEC 16, 1987	69	3.6	5	14	--	620	2	39	--	1.5	<.004
JAN 13, 1988	190	6.5	6.9	18	--	1,200	3	29	1,940	.70	.004
FEB 09, 1988	100	5.4	6	14	--	1,000	3	32	1,860	.88	<.004
MAR 16, 1988	140	4.9	6.4	18	--	1,200	2	19	1,690	.60	<.004
APR 12, 1988	170	3.8	7	14	--	1,500	4	34	2,210	.46	.004
MAY 10, 1988	160	5.3	6.6	16	--	1,200	2	20	2,110	.56	<.004
JUNE 07, 1988	250	5.9	7.2	18	--	1,500	3	24	2,900	.24	<.004
JUNE 07, 1988	300	6.1	6.8	18	--	1,300	3	24	3,020	.24	.004
JULY 11, 1988	330	7.9	7.9	44	--	2,100	2	12	3,800	.14	<.004
AUG 09, 1988	340	7.7	7.3	40	--	2,300	4	11	3,560	<.04	.004
SEPT 21, 1988	320	7.6	7.7	26	<0.20	2,300	4	9.9	3,920	.04	.004
OCT 18, 1988	340	7.3	7.4	32	<.20	1,800	2	8.1	4,150	<.04	.006
NOV 15, 1988	120	6.3	5.4	14	<.20	780	2	28	1,270	.80	<.004
NOV 15, 1988	120	5.9	5.2	16	<.20	780	3	29	1,640	.80	<.004
DEC 21, 1988	220	6.4	6.9	18	.24	1,600	3	22	2,610	.20	.004
JAN 10, 1989	95	3.7	5.7	14	<.20	790	2	30	2,100	.08	.008
FEB 15, 1989	220	6.6	6.6	16	<.20	1,600	3	29	3,340	.08	<.004
MAR 14, 1989	310	7.7	8.1	20	.56	2,500	3	16	3,340	<.04	<.004
APR 12, 1989	400	7	8.6	20	.22	3,100	3	22	--	.31	<.004
APR 12, 1989	390	7.1	8.4	20	.22	3,000	3	21	--	.31	<.004
MAY 10, 1989	240	6.7	7.7	--	.24	1,900	3	19	2,720	.10	.006
JUNE 14, 1989	420	13	8.7	18	.20	2,400	3	16	3,940	<.04	<.004
JULY 11, 1989	350	9.7	8.6	46	.23	2,500	3	11	4,130	.07	.004
AUG 09, 1989	360	11	8.2	48	<.20	2,600	4	11	4,500	<.04	<.004
SEPT 12, 1989	340	11	7.3	86	<.20	2,200	3	12	4,180	<.04	<.004
OCT 17, 1989	340	10	7.7	110	<.20	2,400	3	13	5,840	<.04	<.004
NOV 07, 1989	400	10	8.1	100	.32	2,200	3	8.4	3,260	<.04	<.004
NOV 07, 1989	400	11	8	100	.32	2,100	3	8.6	3,310	<.04	<.004
410907079294201 Well 17 (LAT 41°09'07" N. LONG 079°29'42" W.)											
SEPT 08, 1986	120	9.1	4.9	0	--	2,800	3	--	2,340	<.02	.006
DEC 09, 1986	130	7.4	5	0	--	1,100	1.2	--	2,430	<.04	<.004
MAR 11, 1987	150	8.8	3.9	0	--	1,400	2	--	2,360	.06	.006
JUNE 03, 1987	130	9.5	4.9	0	--	1,200	3	18	2,360	<.04	<.004
SEPT 16, 1987	120	9.5	17	--	--	1,400	4	18	2,520	<.04	<.004

Appendix 2.–Water-quality data for urban sewage sludge site, June 1986 through November 1989–Continued

Date	Nitrogen, ammonia total (mg/L as N)	Nitrogen, ammonia + organic total (mg/L as N)	Phosphorus total (mg/L as P)	Aluminum, dissolved (mg/L)	Arsenic, dissolved (µg/L)	Barium, dissolved (µg/L)	Boron, dissolved (µg/L)	Cadmium, dissolved (µg/L)	Chromium, dissolved (µg/L)	Copper, dissolved (µg/L)	Iron, dissolved (mg/L)
410921079292903 Well 16B (LAT 41°09'21" N. LONG 079°29'29" W.)											
JUNE 19, 1986	0.54	1.6	–	<0.14	<4	<500	–	3.4	<50	200	19
JULY 09, 1986	5.5	7	–	.43	<1,000	<500	–	<10	<50	72	16
AUG 06, 1986	10	13	–	3	<4	<500	<250	4	<50	610	6.7
SEPT 10, 1986	5.2	7.8	–	.91	<4	<10	<250	3.9	<50	<10	8.4
OCT 09, 1986	2.9	4	–	7.5	6.2	<10	<250	2.5	99	130	14
NOV 05, 1986	1.9	3.9	–	1.8	<4	–	<250	3.3	110	240	14
DEC 10, 1986	.83	2	–	27	26	14	<250	7	120	140	5.4
JAN 06, 1987	.39	1.9	–	.61	<4	–	<250	1.6	<50	<10	20
FEB 10, 1987	.50	1.6	–	<.14	<4	<10	<250	1.5	<50	<10	14
MAR 11, 1987	.78	2	–	2.2	<4	<10	<250	2.7	<50	<10	1.7
APR 13, 1987	.38	1.1	0.03	1.7	<4	<10	<250	2.1	<50	<10	15
MAY 05, 1987	.32	2	.02	11	<4	<10	<250	1.3	<50	<10	16
JUNE 02, 1987	.43	1.6	.06	1.8	<4	<10	<250	1.5	<50	<10	10
JUNE 02, 1987	.42	1.5	.06	.69	<4	<10	<250	1.5	<50	<10	200
JULY 08, 1987	.39	1.6	.04	.64	<4	<10	<250	1.6	<50	15	12
AUG 11, 1987	.47	.90	.04	.67	<10	<10	<250	1.6	63	<10	5.4
SEPT 15, 1987	.27	1.2	<.02	6.3	<4	<10	<250	2.4	<50	140	.29
OCT 07, 1987	.22	1.2	.03	7	<4	<10	<250	2.4	<50	3,400	.38
NOV 18, 1987	.31	.71	.03	2.3	<4	<10	<250	2.8	<50	26	.95
DEC 16, 1987	.08	.42	.02	8.8	5	<10	<250	2.6	<50	52	.38
DEC 16, 1987	.09	.38	.02	8.6	4	24	<250	2	<50	52	.42
JAN 13, 1988	.22	.75	.06	8.5	<4	<10	<250	1.2	<50	27	2.4
FEB 09, 1988	.16	.46	.04	25	23	<10	<250	3.8	<50	28	.85
MAR 16, 1988	.14	.56	.03	6.4	<4	26	<250	2.9	<50	12	.77
APR 12, 1988	.14	1.1	.07	18	18	20	<250	3.2	<50	21	2.9
MAY 10, 1988	.69	.52	.04	8.8	<4	<10	<250	2.7	<50	35	.38
JUNE 07, 1988	.16	.96	.03	13	<10	<10	<250	3.4	<50	21	.88
JUNE 07, 1988	.15	.99	.03	41	<10	<10	<250	3.2	<50	71	.99
JULY 11, 1988	.44	1.2	.02	4.6	<20	<10	<250	2	100	<10	15
AUG 09, 1988	.36	1.6	.06	2.8	<20	<10	<250	2	<50	23	9.4
SEPT 21, 1988	.44	1.4	.06	5.2	<4	<10	<250	2.2	17	22	9.7
OCT 18, 1988	.49	1.6	.06	4	<4	<10	<250	2.8	<50	42	14
NOV 15, 1988	.14	1.8	.08	11	<4	<10	<250	3.2	<50	19	.80
NOV 15, 1988	.18	.92	.07	9.2	<4	13	<250	3.3	<50	53	.73
DEC 21, 1988	.28	.68	.05	7.6	<4	<10	<250	3.3	<50	46	.38
JAN 10, 1989	.13	.46	.04	10	<4	<10	<250	3.7	<50	26	.04
FEB 15, 1989	.27	.69	.03	17	<4	<10	<250	3.2	<50	44	3.9
MAR 14, 1989	.38	.87	.03	11	<4	<10	<250	2.9	<50	48	18
APR 12, 1989	.33	.79	.02	–	<4	<10	<250	15	<50	140	4.3
APR 12, 1989	.32	.79	.02	82	<4	<10	<250	14	<50	140	1.8
MAY 10, 1989	.31	1.2	.07	6.3	<4	<10	<250	3.6	<50	27	7.1
JUNE 14, 1989	.40	.82	.03	12	<4	<10	<250	4.4	56	49	9.6
JULY 11, 1989	.48	.83	.03	2	<4	<10	<250	2	<50	37	18
AUG 09, 1989	.32	.94	.05	2.8	<4	<10	<250	2	<50	30	12
SEPT 12, 1989	.35	.84	.03	1.2	<4	<50	<250	1.2	<50	20	12
OCT 17, 1989	.31	<1	.04	.53	<4	<10	<250	.97	<50	52	8.9
NOV 07, 1989	.29	1.2	.03	.38	<4	<10	<250	1.1	<50	21	7.7
NOV 07, 1989	.31	1.2	.04	.37	<4	<10	<250	1.1	<50	22	8
410907079294201 Well 17 (LAT 41°09'07" N. LONG 079°29'42" W.)											
SEPT 08, 1986	.69	1.2	–	1.6	<4	–	<250	.89	<50	<10	180
DEC 09, 1986	.47	1.2	–	.86	<4	32	<250	<.20	97	24	180
MAR 11, 1987	.54	1.2	–	.47	<10	<10	<250	1.5	<50	<10	190
JUNE 03, 1987	.55	1.3	.06	.46	<4	14	<250	.30	<50	<10	220
SEPT 16, 1987	.55	.94	.02	.75	<4	14	<250	1.6	<500	210	280

Appendix 2.--Water-quality data for urban sewage sludge site, June 1986 through November 1989--Continued

Date	Iron, ferrous dissolved (mg/L)	Lead, dissolved (µg/L)	Manganese, dissolved (mg/L)	Mercury, dissolved µg/l)	Molybdenum, dissolved (µg/L)	Nickel, dissolved (mg/L)	Selenium, dissolved (µg/L)	Strontium, dissolved (µL)	Zinc, dissolved (mg/L)	Cyanide total (mg/L)
410921079292903 Well 16B (LAT 41°09'21" N. LONG 079°29'29" W.)										
JUNE 19, 1986	--	<50	24	<1	<700	0.50	<1,000	900	0.50	--
JULY 09, 1986	--	140	24	<1	<700	.53	<1,000	870	.43	0.008
AUG 06, 1986	--	<50	25	<1	<700	.74	<1,000	810	1	.003
SEPT 10, 1986	--	<50	25	<1	<70	<.02	<30	810	.26	.001
OCT 09, 1986	16	270	30	<1	<70	.68	<6	870	1.3	<.001
NOV 05, 1986	12	<4	28	<1	<70	.63	<30	840	.92	<.001
DEC 10, 1986	2.5	4.4	66	<1	<70	1.8	<30	820	2.2	<.001
JAN 06, 1987	22	<4	35	<1	<70	.24	<30	990	.49	<.001
FEB 10, 1987	16	<4	31	<1	<70	.14	<15	960	.25	<.001
MAR 11, 1987	1.8	<4	27	<1	<70	.50	<30	700	.71	<.001
APR 13, 1987	18	<4	24	<1	<70	.15	<60	880	.51	<.001
MAY 05, 1987	18	<4	26	<1	<70	.54	<60	900	.33	<.001
JUNE 02, 1987	11	<4	28	<1	<70	.56	<30	1,100	.16	<.001
JUNE 02, 1987	11	<4	32	<1	<70	.50	<6	900	.14	<.001
JULY 08, 1987	1.7	<4	22	<1	<70	.47	<30	750	.23	<.001
AUG 11, 1987	7.1	<4	23	<1	<70	.42	<30	910	.14	<.001
SEPT 15, 1987	.18	<20	8.4	2.1	<70	.58	<30	300	.77	<.001
OCT 07, 1987	.24	<10	10	<1	<70	.53	<30	430	.98	<.001
NOV 18, 1987	1.5	<10	22	<1	<70	.50	<30	820	.70	<.001
DEC 16, 1987	.46	<10	9.5	<1	<70	.39	<30	160	.92	<.001
DEC 16, 1987	.45	<10	8.6	<1	<70	.41	<30	150	.91	<.001
JAN 13, 1988	.64	<4	22	<1	<70	.54	<30	630	.89	<.001
FEB 09, 1988	.97	<10	16	<1	<70	.98	<30	380	1.5	<.001
MAR 16, 1988	.70	<4	16	<1	<70	.67	<30	520	1.2	<.001
APR 12, 1988	1.5	<4	21	<1	<70	.69	<30	610	1.4	<.001
MAY 10, 1988	.70	<10	18	<1	<70	.59	<30	600	1.1	<.001
JUNE 07, 1988	1.2	<10	26	<1	<70	.66	<30	670	1.4	<.001
JUNE 07, 1988	1.1	<10	33	<1	<70	.82	<30	670	1.4	<.001
JULY 11, 1988	14	<4	33	<1	<300	.63	<30	950	1	<.001
AUG 09, 1988	9.2	<20	66	<1	<70	.63	<30	970	1	<.001
SEPT 21, 1988	10	<40	41	<1	<70	.65	<30	910	1.2	<.001
OCT 18, 1988	15	<40	40	<1	<70	.56	<30	900	1.1	<.001
NOV 15, 1988	1.2	<4	13	<1	<70	.57	<30	400	.84	<.001
NOV 15, 1988	1.2	<4	11	<1	<70	.55	<30	360	1.1	<.001
DEC 21, 1988	.90	<4	25	<1	<70	.71	<30	650	1.2	<.001
JAN 10, 1989	5.8	<4	12	<1	<70	.46	<30	360	1.1	<.001
FEB 15, 1989	6	<40	26	<1	<70	.71	<30	700	1.5	<.001
MAR 14, 1989	18	<20	39	<1	<70	.75	<30	960	1.5	<.001
APR 12, 1989	2	4	83	--	<70	2.5	--	920	4.5	<.001
APR 12, 1989	2	<4	84	<1	<70	2.2	<30	940	4.3	<.001
MAY 10, 1989	9.7	<4	30	<1	<70	.65	<30	770	1	<.001
JUNE 14, 1989	8.5	<4	49	<1	<70	1.1	<30	940	1	<.001
JULY 11, 1989	17	<4	39	<1	<70	.60	<30	930	.68	<.001
AUG 09, 1989	14	<10	35	<1	<70	.57	<30	950	.74	<.001
SEPT 12, 1989	14	<4	27	<1	<70	.46	<30	980	.59	<.001
OCT 17, 1989	11	<10	24	<1	<70	.34	<30	800	.50	<.001
NOV 07, 1989	10	<4	22	<1	<70	.30	<30	800	.42	<.001
NOV 07, 1989	10	<4	30	<1	<70	.31	<30	840	.44	<.001
410907079294201 Well 17 (LAT 41°09'07" N. LONG 079°29'42" W.)										
SEPT 08, 1986	--	<50	36	<1	<70	.34	<30	550	.38	<.001
DEC 09, 1986	160	4.9	38	<1	<70	.32	<30	580	.29	<.001
MAR 11, 1987	180	<4	39	<1	<70	<.02	<15	550	.027	<.001
JUNE 03, 1987	200	<4	36	<1	<70	.21	<30	610	.11	<.001
SEPT 16, 1987	160	<20	31	<1	<74	.42	<30	460	.15	<.001

Appendix 2.--Water-quality data for urban sewage sludge site, June 1986 through November 1989--Continued

Date	Time	Water table altitude (ft above sea level)	Streamflow/ discharge, instan-taneous (ft^3/s)	Specific conduc-tance (µS/cm)	pH, field (units)	pH, lab (units)	Oxidation reduction potential (mV)	Water temper-ature (°C)	Oxygen, dissolved (mg/L)	Acidity total heated (mg/L as $CaCO_3$)	Acidity mineral (methyl orange) (mg/L as $CaCO_3$)	Calcium, dissolved (mg/L)
410907079294201 Well 17 (LAT 41°09'07" N. LONG 079°29'42" W.)--Continued												
DEC 15, 1987	0005	1,245	--	2,200	3.3	3.3	--	9.0	--	390	52	180
DEC 15, 1987	0800	1,245	--	2,050	3.3	3.3	--	9.0	--	390	50	170
MAR 15, 1988	1130	1,246	--	1,870	3.7	3.8	--	7.0	--	410	6	120
APR 12, 1988	0815	1,245	--	1,850	3.2	3.2	--	10.0	--	380	82	190
MAY 10, 1988	0820	1,246	--	1,930	3.2	3.2	--	11.0	--	380	70	170
JUNE 07, 1988	1425	1,247	--	1,880	3.4	3.3	--	13.0	--	440	62	220
JULY 11, 1988	1600	1,246	--	1,840	3.4	3.2	--	15.5	--	400	68	240
AUG 08, 1988	0005	1,245	--	1,850	3.4	3.2	--	13.0	--	360	62	230
AUG 08, 1988	1510	1,245	--	1,920	3.4	3.2	--	13.0	--	360	60	200
SEPT 21, 1988	0845	1,244	--	1,860	3.2	3.3	--	12.0	--	370	60	200
OCT 18, 1988	0810	1,245	--	1,780	3.2	3.2	--	10.5	--	360	82	200
NOV 17, 1988	1345	1,244	--	1,750	3.2	3.3	590	11.5	0.20	380	56	200
DEC 20, 1988	1530	1,243	--	1,760	3.3	3.3	--	10.0	.42	430	52	210
JAN 10, 1989	0005	1,244	--	1,780	3.5	3.3	--	8.5	4.0	370	56	210
JAN 10, 1989	1410	1,244	--	1,770	3.5	3.3	--	8.5	4.0	350	58	210
FEB 14, 1989	1625	1,247	--	1,680	3.6	3.4	--	8.5	.22	370	30	180
MAR 13, 1989	1645	1,247	--	1,500	3.8	3.5	--	10.5	.35	430	62	230
APR 12, 1989	1450	1,247	--	1,520	3.6	3.4	--	10.0	.49	--	34	190
MAY 09, 1989	1635	1,248	--	1,630	3.7	3.6	--	10.0	.33	390	18	180
JUNE 15, 1989	0815	1,249	--	1,560	4.0	3.9	--	11.0	.26	380	4	200
JULY 10, 1989	0005	1,251	--	1,750	4.2	3.7	--	15.5	.32	440	14	180
JULY 10, 1989	1605	1,251	--	1,780	4.2	3.8	--	15.5	.32	430	14	170
AUG 08, 1989	1545	1,249	--	1,740	4.0	3.8	--	11.0	.44	430	10	200
SEPT 12, 1989	1440	1,248	--	1,730	4.0	3.5	--	12.0	.74	440	20	180
OCT 16, 1989	1450	1,247	--	1,770	3.6	3.6	--	11.5	--	380	26	180
NOV 07, 1989	1350	1,248	--	1,700	3.6	3.6	--	11.0	--	420	22	240
410907079294202 Well 17A (LAT 41°09'07" N. LONG 079°29'42" W.)												
JUNE 18, 1986	1500	1,279	--	3,020	4.3	4.2	--	12.0	--	570	--	270
JULY 08, 1986	1500	1,276	--	3,500	4.8	4.8	--	12.5	--	850	--	--
AUG 05, 1986	1300	1,276	--	2,540	5.8	5.2	--	12.0	--	640	--	190
SEPT 08, 1986	1200	1,276	--	2,200	5.7	5.1	--	11.0	--	590	--	160
OCT 09, 1986	0005	1,277	--	2,440	4.9	5.0	--	12.0	--	580	--	220
OCT 09, 1986	1030	1,277	--	2,390	4.9	5.0	--	12.0	--	670	--	210
NOV 05, 1986	1200	1,276	--	2,250	5.8	5.5	--	11.0	--	550	--	190
DEC 09, 1986	0900	1,278	--	2,330	5.0	4.5	--	11.5	--	520	--	180
JAN 07, 1987	1230	1,278	--	2,180	4.6	4.6	--	--	--	480	--	180
FEB 11, 1987	1200	1,278	--	2,200	5.0	4.5	--	11.0	--	420	--	180
MAR 11, 1987	1630	1,278	--	2,200	5.0	4.6	--	10.0	--	380	--	200
APR 14, 1987	1030	1,279	--	2,230	4.6	4.4	--	10.0	--	440	--	200
MAY 05, 1987	1200	1,279	--	2,170	4.6	4.4	--	10.0	--	350	--	140
JUNE 03, 1987	0930	1,280	--	2,190	4.1	4.0	--	10.5	--	320	--	140
JULY 08, 1987	1000	1,279	--	2,230	4.1	4.0	--	11.0	--	270	--	140
JULY 09, 1987	0005	1,279	--	2,220	4.1	3.9	--	11.0	--	300	4	140
AUG 12, 1987	0900	1,278	--	2,150	4.6	4.7	--	11.0	--	350	--	160
SEPT 17, 1987	1115	1,279	--	2,350	4.5	4.2	--	11.0	--	400	--	180
OCT 05, 1987	1500	1,278	--	2,150	4.9	4.7	--	11.5	--	360	--	170
NOV 18, 1987	0945	1,276	--	2,100	5.3	5.1	--	11.0	--	430	--	180
DEC 15, 1987	0005	1,277	--	2,300	4.2	4.3	--	11.0	--	420	0	160
DEC 15, 1987	0915	1,277	--	2,300	4.2	4.3	--	9.5	--	410	--	180
JAN 12, 1988	1400	1,278	--	2,100	4.5	4.6	--	12.0	--	400	--	180
FEB 09, 1988	1040	1,280	--	1,780	6.1	3.9	--	8.8	--	270	4	170
MAR 15, 1988	1120	--	--	1,870	3.9	3.9	--	7.0	--	290	<2	130
APR 12, 1988	0800	1,278	--	1,680	3.8	3.8	--	9.0	--	310	8	160
MAY 10, 1988	0800	1,281	--	1,850	4.0	3.8	--	11.0	--	250	6	150

Date	Magnesium, dissolved (mg/L)	Sodium, dissolved (mg/L)	Potassium, dissolved (mg/L)	Alkalinity water lab (mg/L as $CaCO_3$)	Sulfide total (mg/L as S)	Sulfate, dissolved (mg/L as SO_4)	Chloride, dissolved (mg/L)	Silica, dissolved (mg/L as SiO_2)	Solids, residue at 105 °C, dissolved (mg/L)	Nitrogen, nitrate total (mg/L as N)	Nitrogen, nitrite total (mg/L as N)
410907079294201 Well 17 (LAT 41°09'07" N. LONG 079°29'42" W.)–Continued											
DEC 15, 1987	110	10	4.3	–	–	1,100	3	15	2,220	<0.04	<0.004
DEC 15, 1987	100	10	4.1	–	–	1,100	3	16	3,640	<.04	<.004
MAR 15, 1988	79	12	4.6	–	–	1,400	2	17	2,460	<.04	.014
APR 12, 1988	110	12	5.2	–	–	1,400	3	21	2,130	<.04	.004
MAY 10, 1988	110	13	4.6	–	–	960	2	15	2,160	<.04	<.004
JUNE 07, 1988	120	14	4.4	–	–	1,300	3	16	2,200	<.04	.004
JULY 11, 1988	120	11	4.2	–	–	1,400	2	16	2,200	<.04	.004
AUG 08, 1988	130	10	4.4	–	–	1,400	3	15	1,840	<.04	<.004
AUG 08, 1988	110	13	4.4	–	–	1,400	3	16	1,940	<.04	<.004
SEPT 21, 1988	110	12	4.4	–	7.4	1,200	2	18	2,420	.04	<.004
OCT 18, 1988	120	11	4	–	.20	1,100	2	16	2,290	<.04	<.004
NOV 17, 1988	110	12	4	–	.20	1,200	3	18	2,250	<.04	<.004
DEC 20, 1988	130	12	4.5	–	.24	1,300	4	16	2,910	.06	.004
JAN 10, 1989	120	12	4.3	–	.32	1,300	2	14	2,380	<.04	<.004
JAN 10, 1989	120	12	4.3	–	.32	1,400	2	14	2,000	<.04	<.004
FEB 14, 1989	100	15	4.3	–	<.20	1,300	3	16	1,900	<.04	<.004
MAR 13, 1989	130	14	4.5	–	.72	1,200	3	16	1,910	<.04	<.004
APR 12, 1989	120	12	4.2	–	<.20	1,500	3	15	–	<.04	<.004
MAY 09, 1989	110	13	3.8	–	.48	1,500	3	16	2,620	<.04	<.004
JUNE 15, 1989	120	12	3.8	–	.80	1,300	3	15	1,980	<.04	<.004
JULY 10, 1989	100	12	3.7	–	<.20	1,200	4	12	2,400	<.04	.010
JULY 10, 1989	100	12	3.7	–	<.20	1,300	4	12	2,190	<.04	.010
AUG 08, 1989	110	12	3.8	–	<.20	1,500	4	14	2,600	<.04	<.004
SEPT 12, 1989	110	13	3.9	–	<.20	1,300	3	18	2,220	<.04	<.004
OCT 16, 1989	110	13	4	0	.56	1,400	3	21	2,240	<.04	<.004
NOV 07, 1989	140	15	4.4	0	<.20	1,300	3	15	2,130	<.04	<.004
410907079294202 Well 17A (LAT 41°09'07" N. LONG 079°29'42" W.)											
JUNE 18, 1986	180	29	7.9	8	–	2,300	2	–	3,700	.10	<.004
JULY 08, 1986	–	13	7.4	22	–	2,900	4	–	4,820	<.02	<.002
AUG 05, 1986	110	10	3.6	30	–	1,800	3	–	3,030	<.04	<.004
SEPT 08, 1986	110	34	2	20	–	1,700	5	–	2,520	<.02	<.004
OCT 09, 1986	150	21	4.7	22	–	1,400	3	–	2,580	<.02	<.004
OCT 09, 1986	150	21	4.7	22	–	1,700	3	–	2,570	<.02	<.004
NOV 05, 1986	140	12	4.5	34	–	1,700	2	–	2,480	<.02	<.004
DEC 09, 1986	150	44	6.5	16	–	1,200	3	–	2,550	.20	<.004
JAN 07, 1987	150	40	7.2	16	–	1,500	3	–	2,520	.14	.004
FEB 11, 1987	150	34	4.4	10	–	1,400	5	–	2,690	<.02	<.004
MAR 11, 1987	160	40	7.2	14	–	1,500	4	–	2,400	.10	.010
APR 14, 1987	150	36	10	12	–	1,400	3	30	17,300	.22	<.004
MAY 05, 1987	150	39	7.2	12	–	1,100	3	30	2,430	.20	<.004
JUNE 03, 1987	140	36	6.2	0	–	1,100	4	39	2,250	.20	<.004
JULY 08, 1987	140	32	7.3	2	–	1,400	3	37	2,980	.10	<.004
JULY 09, 1987	150	33	7	–	–	1,400	4	37	2,970	.12	<.004
AUG 12, 1987	130	25	6.6	12	–	1,600	5	28	2,340	.06	<.004
SEPT 17, 1987	150	57	7.7	6	–	1,500	10	40	2,410	.38	<.004
OCT 05, 1987	140	28	6.5	14	–	1,500	2	31	2,260	.08	.004
NOV 18, 1987	140	19	5.1	16	–	1,400	3	21	2,610	.04	<.004
DEC 15, 1987	130	25	6.2	8	–	1,300	5	28	2,690	.10	<.004
DEC 15, 1987	140	16	6.2	8	–	1,200	5	30	2,420	.16	<.004
JAN 12, 1988	120	16	4.9	8	–	1,500	4	31	2,300	.08	.004
FEB 09, 1988	150	34	7.4	–	–	1,500	5	34	2,380	.40	<.004
MAR 15, 1988	130	31	7.7	0	–	1,400	7	36	2,420	.88	.008
APR 12, 1988	140	30	6.8	–	–	1,300	6	34	2,000	.30	<.004
MAY 10, 1988	150	44	7.2	–	–	1,200	7	35	2,540	.60	<.004

Appendix 2.--Water-quality data for urban sewage sludge site, June 1986 through November 1989--Continued

Date	Nitrogen, ammonia total (mg/L as N)	Nitrogen, ammonia + organic total (mg/L as N)	Phos-phorus total (mg/L as P)	Aluminum, dissolved (mg/L)	Arsenic, dissolved (µg/L)	Barium, dissolved (µg/L)	Boron, dissolved (µg/L)	Cadmium, dissolved (µg/L)	Chromium, dissolved (µg/L)	Copper, dissolved (µg/L)	Iron, dissolved (mg/L)
410907079294201 Well 17 (LAT 41°09'07" N. LONG 079°29'42" W.)--Continued											
DEC 15, 1987	0.60	1.1	0.05	0.20	<4	<10	<250	0.65	<50	<10	150
DEC 15, 1987	.77	1.4	.07	.18	<4	<10	<250	.70	<50	<10	140
MAR 15, 1988	.63	.64	.17	.77	<4	<10	<250	.30	<10	<10	140
APR 12, 1988	.50	.96	.04	1	<4	14	<250	.23	<50	16	140
MAY 10, 1988	.81	1	.07	.60	<20	<10	<250	.90	<50	<10	140
JUNE 07, 1988	.69	1.3	.06	.80	<4	<10	<250	.25	170	10	130
JULY 11, 1988	1	1.6	.02	.88	<20	<10	<250	.55	65	<10	170
AUG 08, 1988	.69	1.4	.06	15	<20	<10	<250	.60	<50	22	180
AUG 08, 1988	.69	1.6	.07	.69	<20	11	<250	.54	<50	<25	150
SEPT 21, 1988	.66	1.1	.07	1	<4	<10	<250	.45	<50	<10	140
OCT 18, 1988	.75	1.1	.07	1.1	<4	10	<250	.25	<50	20	150
NOV 17, 1988	.69	.69	.04	1.6	<4	13	<250	<.20	<50	19	140
DEC 20, 1988	.72	.77	.14	.99	<4	13	<250	<.20	<10	17	170
JAN 10, 1989	.81	.56	.03	1.1	<4	10	<250	<.20	<50	32	160
JAN 10, 1989	.78	.61	.03	1.1	<4	<10	<250	<.20	<50	34	160
FEB 14, 1989	.69	.69	.04	.85	<4	10	<250	<.20	<50	12	160
MAR 13, 1989	.81	1.2	.04	1	<4	12	<250	.20	<50	17	180
APR 12, 1989	.54	.61	.03	.89	<4	15	<250	.26	<50	31	190
MAY 09, 1989	.52	.62	.06	.36	<4	13	<250	.37	<50	<10	180
JUNE 15, 1989	.62	1.1	.05	.36	<4	18	<250	1.1	<50	<10	200
JULY 10, 1989	.67	.83	.08	.22	<4	<10	<250	.86	<50	12	180
JULY 10, 1989	.67	.91	.08	.20	<4	10	<250	.93	<50	14	180
AUG 08, 1989	.57	.81	.12	.55	<4	11	<250	<.20	<50	16	190
SEPT 12, 1989	.62	.90	.06	.66	<4	12	<250	.27	<50	<10	190
OCT 16, 1989	.61	<1	.05	.46	<4	12	<250	.47	<50	17	180
NOV 07, 1989	.63	<1	.06	.42	<4	10	<250	.40	<50	10	220
410907079294202 Well 17A (LAT 41°09'07" N. LONG 079°29'42" W.)											
JUNE 18, 1986	.93	1.3	--	28	22	<500	--	4.1	<50	74	200
JULY 08, 1986	.82	2.1	--	15	<1,000	<500	--	<10	<50	15	250
AUG 05, 1986	.66	1.2	--	.68	<4	<500	<250	1.9	<50	<10	250
SEPT 08, 1986	.90	1.1	--	.44	<4	<10	<250	1.4	<50	200	280
OCT 09, 1986	.77	1.4	--	4.9	<20	--	<250	1.8	74	75	270
OCT 09, 1986	.88	1.5	--	4.5	4	--	<250	1.8	69	70	260
NOV 05, 1986	.60	1.5	--	2	<4	--	<250	1.1	73	51	290
DEC 09, 1986	.47	1.3	--	19	8.4	21	<250	5.4	80	110	160
JAN 07, 1987	.54	1.4	--	14	12	--	<250	5.5	<50	<10	160
FEB 11, 1987	.54	1.4	--	11	8	<10	<250	4	<50	<10	160
MAR 11, 1987	.66	1.5	--	15	8.4	<10	<250	3.8	<50	<10	170
APR 14, 1987	.43	.49	<.02	25	18	110	<250	6	<50	<10	92
MAY 05, 1987	.44	1.5	.02	25	26	11	<250	7.5	330	440	71
JUNE 03, 1987	.48	1.3	.05	32	22	<10	<250	8.2	<50	<10	34
JULY 08, 1987	.39	1.4	.04	30	36	<10	<250	7.8	<50	940	36
JULY 09, 1987	.38	1.4	.05	36	<20	<10	<250	6.4	<50	<10	47
AUG 12, 1987	1	1	.06	10	<10	<10	<250	5.7	--	--	120
SEPT 17, 1987	.55	1.6	.02	23	20	11	<250	6.3	<50	180	73
OCT 05, 1987	.84	1.3	.04	11	<4	<10	<250	5.2	<50	<10	150
NOV 18, 1987	.33	.97	.02	1.6	<4	<10	<250	2.2	<50	<10	220
DEC 15, 1987	.91	1.3	.17	15	12	<10	<250	4.4	<50	<10	100
DEC 15, 1987	.96	1.4	.10	18	12	<10	<250	3.6	<50	<10	130
JAN 12, 1988	.55	1	.04	6.7	15	<10	<250	2.8	<50	<10	160
FEB 09, 1988	.44	1.1	<.02	21	20	<10	<250	6.6	<50	12	28
MAR 15, 1988	.36	.62	.08	39	28	<10	<250	7.6	<50	<10	5.6
APR 12, 1988	.40	1.1	.06	29	26	<10	<250	6.4	<50	<10	23
MAY 10, 1988	.40	.92	.03	37	11	<10	<250	7	<50	<10	10

Appendix 2.--Water-quality data for urban sewage sludge site, June 1986 through November 1989--Continued

Date	Iron, ferrous dissolved (mg/L)	Lead, dissolved (µg/L)	Manganese, dissolved (mg/L)	Mercury, dissolved µg/l)	Molybdenum, dissolved (µg/L)	Nickel, dissolved (mg/L)	Selenium, dissolved (µg/L)	Strontium, dissolved (µL)	Zinc, dissolved (mg/L)	Cyanide total (mg/L)
410907079294201 Well 17 (LAT 41°09'07" N. LONG 079°29'42" W.)--Continued										
DEC 15, 1987	160	<10	30	<1	<70	0.15	<30	470	0.11	<0.001
DEC 15, 1987	170	<10	30	<1	<70	.15	<30	500	.12	<.001
MAR 15, 1988	200	<4	24	<1	<70	.23	<30	520	.18	<.001
APR 12, 1988	130	<4	32	<1	<70	.14	<30	510	.13	<.001
MAY 10, 1988	140	<10	29	<1	<70	.12	<30	520	.11	<.001
JUNE 07, 1988	150	<4	32	<1	<70	.14	<30	460	.13	<.001
JULY 11, 1988	150	<4	35	<1	<300	.16	<30	520	.11	<.001
AUG 08, 1988	150	<4	43	<1	<300	.15	<30	520	.12	<.001
AUG 08, 1988	150	<4	30	<1	<300	.12	<30	510	.15	<.001
SEPT 21, 1988	160	<40	30	<1	<70	.14	<30	540	.039	<.001
OCT 18, 1988	140	<40	31	<1	<70	.09	<30	480	.20	<.001
NOV 17, 1988	160	<20	31	<1	<70	.11	<30	550	.16	<.001
DEC 20, 1988	160	<4	31	<1	<70	.08	<30	440	.14	<.001
JAN 10, 1989	3.7	<4	33	<1	<70	.22	<30	460	.17	<.001
JAN 10, 1989	4.1	<4	33	<1	<70	.16	<30	470	.16	<.001
FEB 14, 1989	180	<40	29	<1	<70	.09	<30	470	.082	<.001
MAR 13, 1989	200	<4	33	<1	<70	.07	<30	490	.23	<.001
APR 12, 1989	190	<4	34	<1	<70	.09	<30	420	.14	<.001
MAY 09, 1989	200	<4	31	<1	<70	.09	<30	420	.12	<.001
JUNE 15, 1989	220	<4	34	<1	<70	.08	<30	390	.13	<.001
JULY 10, 1989	220	<4	30	<1	<70	<.02	<30	420	.11	<.001
JULY 10, 1989	220	<4	29	<1	<70	<.02	<30	430	.099	<.001
AUG 08, 1989	200	<4	32	<1	<70	.08	<30	450	.12	<.001
SEPT 12, 1989	180	<4	30	<1	<70	<.02	<30	440	.095	<.001
OCT 16, 1989	200	<10	32	<1	<70	.09	<30	380	.16	<.001
NOV 07, 1989	210	<4	42	<1	<70	.08	<30	400	.12	<.001
410907079294202 Well 17A (LAT 41°09'07" N. LONG 079°29'42" W.)										
JUNE 18, 1986	–	<50	58	<1	<700	1.2	<1,000	1,300	1.8	–
JULY 08, 1986	–	<50	–	<1	<700	1.1	<1,000	1,800	1.4	–
AUG 05, 1986	–	<50	41	<1	<700	.36	<1,000	430	.36	<.001
SEPT 08, 1986	260	<50	37	<1	<70	<.02	<30	480	<.01	<.001
OCT 09, 1986	210	200	56	<1	<70	.60	<60	700	.80	<.001
OCT 09, 1986	290	180	55	<1	<70	.59	<60	680	.77	<.001
NOV 05, 1986	300	<4	52	<1	<70	.35	<30	470	.41	<.001
DEC 09, 1986	150	9.4	61	<1	<70	.86	<30	450	1.3	<.001
JAN 07, 1987	190	14	50	<1	<70	.30	<30	420	1.1	<.001
FEB 11, 1987	–	5.2	55	<1	<70	.19	<30	450	.72	<.001
MAR 11, 1987	170	<4	59	<1	<70	.26	<15	440	.89	<.001
APR 14, 1987	100	5.8	56	<1	<70	.37	<15	440	1.1	<.001
MAY 05, 1987	88	6.7	48	<1	<70	.40	<60	450	1.2	<.001
JUNE 03, 1987	35	8	52	<1	<70	.40	<30	730	1.4	<.001
JULY 08, 1987	40	10	53	<1	<70	.81	<60	480	1.5	<.001
JULY 09, 1987	40	9.9	56	<1	<70	.55	<30	470	1.6	<.001
AUG 12, 1987	140	<4	47	<1	<70	.53	<30	460	.62	<.001
SEPT 17, 1987	84	<20	59	<1	<70	.90	<30	560	1.6	<.001
OCT 05, 1987	160	<4	49	<1	<70	.39	<30	360	.83	<.001
NOV 18, 1987	200	<10	47	<1	<70	.35	<30	410	.54	<.001
DEC 15, 1987	140	<10	45	<1	<70	.76	<30	630	1.2	<.001
DEC 15, 1987	140	<10	60	<1	<70	.76	<30	680	1	<.001
JAN 12, 1988	170	<10	43	<1	<70	.50	<30	390	.61	<.001
FEB 09, 1988	27	<10	56	<1	<70	1.1	<30	490	1.8	<.001
MAR 15, 1988	3.3	5.2	58	<1	<70	1.1	<30	560	1.5	<.001
APR 12, 1988	24	5.9	64	<1	<70	.94	<30	510	1.7	<.001
MAY 10, 1988	9.5	8.5	54	<1	<70	1	<30	550	1.8	<.001

Appendix 2.--Water-quality data for urban sewage sludge site, June 1986 through November 1989--Continued

Date	Time	Water table altitude (ft above sea level)	Streamflow/ discharge, instantaneous (ft^3/s)	Specific conductance (µS/cm)	pH, field (units)	pH, lab (units)	Oxidation reduction potential (mV)	Water temperature (°C)	Oxygen, dissolved (mg/L)	Acidity total heated (mg/L as $CaCO_3$)	Acidity mineral (methyl orange) (mg/L as $CaCO_3$)	Calcium, dissolved (mg/L)
410907079294202 Well 17A (LAT 41°09'07" N. LONG 079°29'42" W.)--Continued												
JUNE 07, 1988	1420	1,280	--	1,730	4.2	4.0	--	13.0	--	260	--	160
JULY 11, 1988	0005	1,278	--	1,790	4.3	3.8	--	15.0	--	300	8	190
JULY 11, 1988	1550	1,278	--	1,790	4.3	3.8	--	15.0	--	290	8	220
AUG 08, 1988	1450	1,278	--	1,850	4.4	3.6	--	13.0	--	340	18	230
SEPT 21, 1988	0825	1,277	--	1,850	5.0	3.8	--	11.5	--	390	22	170
OCT 18, 1988	0815	1,274	--	1,750	5.3	5.6	--	12.5	--	460	--	190
NOV 17, 1988	1400	1,275	--	1,700	5.3	5.6	--	12.5	0.11	420	--	180
DEC 20, 1988	0005	1,271	--	1,590	5.2	5.6	--	10.5	.40	530	--	200
DEC 20, 1988	1510	1,271	--	1,610	5.2	5.6	--	10.5	.30	430	--	200
JAN 10, 1989	1405	1,273	--	1,750	5.4	5.1	--	10.0	.20	440	--	190
FEB 14, 1989	1630	1,277	--	1,710	4.6	3.8	--	9.0	.49	350	4	180
MAR 13, 1989	1605	1,277	--	1,550	4.0	4.0	--	10.5	.22	370	--	170
APR 10, 1989	1440	1,280	--	1,600	3.8	3.7	--	9.0	.14	320	8	190
MAY 09, 1989	1650	1,277	--	1,600	3.8	3.7	--	9.0	.03	280	18	170
JUNE 15, 1989	0005	1,280	--	1,610	3.8	3.8	--	9.5	.25	240	4	200
JUNE 15, 1989	0830	1,280	--	1,590	3.8	3.8	--	9.5	.25	250	4	210
JULY 10, 1989	1520	1,281	--	1,630	3.8	3.7	--	12.5	.33	270	14	150
AUG 08, 1989	1545	1,279	--	1,710	4.0	4.0	--	11.0	.25	250	--	190
SEPT 12, 1989	1420	1,278	--	1,860	4.6	4.1	--	12.0	.38	360	--	210
OCT 16, 1989	1440	1,278	--	1,830	4.5	4.6	--	12.0	--	350	--	210
NOV 07, 1989	1355	1,278	--	1,720	4.7	4.8	--	11.0	--	340	--	260
410925079293901 Well 18.0 (LAT 41°09'25" N. LONG 079°29'39" W.)												
JULY 08, 1986	1700	1,241	--	3,440	5.8	5.7	--	11.0	--	460	--	--
AUG 05, 1986	1500	1,243	--	3,810	5.6	5.6	--	11.0	--	540	--	430
SEPT 08, 1986	1700	1,242	--	3,300	5.8	5.5	--	18.0	--	510	--	420
OCT 08, 1986	1800	1,243	--	3,330	5.7	5.8	--	12.0	--	450	--	430
DEC 09, 1986	1315	1,243	--	3,530	6.1	5.6	--	11.5	--	500	--	490
MAR 11, 1987	1630	1,242	--	3,300	5.8	5.8	--	9.0	--	450	--	460
JUNE 03, 1987	1245	1,243	--	3,450	5.7	5.9	--	12.0	--	410	--	400
SEPT 16, 1987	0005	1,243	--	3,200	5.6	6.0	--	13.0	--	500	--	390
SEPT 16, 1987	1245	1,243	--	3,200	5.6	6.0	--	13.0	--	380	--	360
DEC 15, 1987	1030	1,243	--	3,200	5.5	6.1	--	10.0	--	390	--	370
MAR 15, 1988	1330	1,246	--	2,950	5.6	5.9	--	7.5	--	420	--	410
APR 12, 1988	0005	1,242	--	2,800	5.6	5.9	--	10.0	--	390	--	440
APR 12, 1988	1000	1,242	--	2,750	5.6	5.9	--	10.0	--	390	--	390
MAY 09, 1988	1600	1,240	--	2,900	5.6	6.0	--	14.0	--	380	--	420
JUNE 08, 1988	1030	1,242	--	2,740	5.7	5.9	--	11.0	--	390	--	440
JULY 11, 1988	0900	1,242	--	2,840	5.7	6.0	--	13.5	--	390	--	440
AUG 09, 1988	0805	1,242	--	2,760	6.0	6.2	--	12.0	--	380	--	500
SEPT 21, 1988	0005	1,241	--	2,870	5.6	6.0	--	13.0	--	410	--	360
SEPT 21, 1988	0955	1,241	--	2,800	5.6	6.0	--	13.0	--	390	--	390
OCT 18, 1988	1000	1,241	--	2,710	5.5	5.9	--	12.0	--	420	--	380
NOV 17, 1988	0920	1,241	--	2,810	5.7	6.1	--	12.5	.20	380	--	410
DEC 21, 1988	0900	1,241	--	2,650	5.9	6.0	--	10.0	.24	370	--	570
JAN 11, 1989	0900	1,241	--	2,720	5.8	6.2	--	9.5	.20	410	--	420
FEB 15, 1989	0005	1,242	--	2,700	5.6	6.1	--	8.5	.25	380	--	400
FEB 15, 1989	1405	1,242	--	2,750	5.6	6.1	--	8.5	.25	380	--	360
MAR 14, 1989	1330	1,242	--	2,400	5.8	6.1	--	11.0	.34	420	--	380
APR 10, 1989	1600	1,242	--	2,450	5.6	6.0	--	9.0	.15	410	--	410
MAY 10, 1989	1500	1,242	--	2,650	5.8	6.4	--	9.5	.22	380	--	370
JUNE 15, 1989	1045	1,281	--	2,730	5.5	6.3	--	10.0	.17	390	--	490
JULY 11, 1989	1420	1,243	--	2,780	5.8	6.2	--	14.0	.22	400	--	410
AUG 09, 1989	0005	1,242	--	2,670	5.4	6.2	--	13.0	.16	410	--	410
AUG 09, 1989	1330	1,242	--	2,790	5.4	6.2	--	13.0	.16	400	--	340

Appendix 2.--Water-quality data for urban sewage sludge site, June 1986 through November 1989--Continued

Date	Magnesium, dissolved (mg/L)	Sodium, dissolved (mg/L)	Potassium, dissolved (mg/L)	Alkalinity water lab (mg/L as $CaCO_3$)	Sulfide total (mg/L as S)	Sulfate, dissolved (mg/L as SO_4)	Chloride, dissolved (mg/L)	Silica, dissolved (mg/L as SiO_2)	Solids, residue at 105 °C, dissolved (mg/L)	Nitrogen, nitrate total (mg/L as N)	Nitrogen, nitrite total (mg/L as N)
410907079294202 Well 17A (LAT 41°09'07" N. LONG 079°29'42" W.)--Continued											
JUNE 07, 1988	150	49	7.8	2	--	1,300	7	30	2,270	0.48	0.004
JULY 11, 1988	160	40	6	--	--	1,300	4	27	2,550	<.04	.008
JULY 11, 1988	160	32	6.2	--	--	1,400	4	28	2,830	.04	.004
AUG 08, 1988	160	21	5.5	--	--	1,500	5	20	2,250	<.04	.004
SEPT 21, 1988	120	16	4.6	--	7.4	1,400	7	17	2,640	<.04	.004
OCT 18, 1988	130	16	4.2	28	.90	1,300	2	15	2,580	<.04	<.004
NOV 17, 1988	130	20	4.1	26	.40	1,500	4	14	2,350	.06	.004
DEC 20, 1988	140	18	4.7	24	.40	1,500	4	16	2,170	<.04	.016
DEC 20, 1988	130	18	4.8	22	.40	1,400	6	14	2,360	<.04	.016
JAN 10, 1989	130	25	4.8	--	.32	1,500	5	15	2,550	<.04	.010
FEB 14, 1989	130	28	5.1	--	.32	1,400	6	20	2,400	.04	<.004
MAR 13, 1989	140	24	5.6	--	.56	1,600	4	24	2,520	.12	.004
APR 10, 1989	170	31	6.6	--	<.20	1,500	6	33	--	.41	<.004
MAY 09, 1989	140	28	5.6	--	.32	1,400	5	32	2,620	.33	.004
JUNE 15, 1989	170	36	6.6	--	<.20	1,300	5	36	2,320	.26	<.004
JUNE 15, 1989	140	31	6.4	--	<.20	1,300	5	36	2,250	.26	<.004
JULY 10, 1989	140	30	7	--	<.20	1,300	5	27	1,940	.30	.014
AUG 08, 1989	140	23	6.2	2	<.20	1,200	4	31	2,410	<.04	<.004
SEPT 12, 1989	150	17	4.8	12	<.20	1,400	3	23	2,610	<.04	.008
OCT 16, 1989	140	16	5	9	.40	1,600	3	25	2,300	<.04	.006
NOV 07, 1989	180	16	5.3	12	.48	1,500	3	21	2,180	<.04	<.004
410925079293901 Well 18 (LAT 41°09'25" N. LONG 079°29'39" W.)											
JULY 08, 1986	--	7.4	11	62	--	2,800	4	--	4,680	<.02	.004
AUG 05, 1986	190	6.1	9.6	56	--	2,700	3	--	4,400	<.04	.004
SEPT 08, 1986	240	7.4	11	44	--	2,000	3	--	4,010	<.02	.006
OCT 08, 1986	260	5.4	10	76	--	2,000	3	--	4,410	<.02	<.004
DEC 09, 1986	260	5.6	11	64	--	2,100	1.8	--	3,960	<.04	<.004
MAR 11, 1987	290	5.5	12	92	--	2,200	3	--	3,800	<.04	.002
JUNE 03, 1987	260	6.4	10	84	--	2,200	3	18	4,080	<.04	<.004
SEPT 16, 1987	250	9.6	11	88	--	2,300	4	18	4,090	<.04	.006
SEPT 16, 1987	220	9.8	10	90	--	2,400	3	19	4,030	<.04	<.004
DEC 15, 1987	230	7.4	10	86	--	1,900	2	17	3,970	<.04	<.004
MAR 15, 1988	240	7.6	10	78	--	2,500	3	18	3,160	<.04	.004
APR 12, 1988	270	5.4	10	78	--	2,500	2	18	3,390	<.04	.004
APR 12, 1988	240	5.9	11	76	--	2,600	3	18	3,810	<.04	<.004
MAY 09, 1988	290	5	10	80	--	2,400	2	16	4,130	<.04	<.004
JUNE 08, 1988	260	5.3	9.7	90	--	2,200	3	18	4,610	<.04	<.004
JULY 11, 1988	260	5.8	10	70	--	2,300	2	15	4,190	<.04	<.004
AUG 09, 1988	270	5.7	9.8	80	2	2,600	3	15	3,910	<.04	<.004
SEPT 21, 1988	200	5.1	10	84	8.3	2,400	3	16	4,500	.06	<.004
SEPT 21, 1988	220	5.8	10	88	8.3	2,400	3	16	4,140	.04	<.004
OCT 18, 1988	220	4.6	10	86	.30	2,400	2	15	3,620	.10	<.004
NOV 17, 1988	250	6.5	12	88	.40	2,600	2	13	3,900	<.04	<.004
DEC 21, 1988	290	6.2	10	90	3.4	2,700	3	14	3,400	<.04	.004
JAN 11, 1989	240	7.1	12	92	.48	2,500	3	13	4,780	<.04	<.004
FEB 15, 1989	250	5.4	10	90	.24	2,300	3	15	3,760	<.04	<.004
FEB 15, 1989	250	5.5	10	90	.24	2,300	3	16	3,670	<.04	<.004
MAR 14, 1989	230	5.4	9.9	--	.48	2,300	2	14	3,290	<.04	<.004
APR 10, 1989	240	5.5	10	78	<.20	2,600	3	14	--	<.04	<.004
MAY 10, 1989	230	6	9.3	--	.32	2,800	2	17	2,850	<.04	.004
JUNE 15, 1989	240	5.4	10	--	.48	2,500	3	14	3,860	<.04	<.004
JULY 11, 1989	250	6.6	9.8	92	.47	2,600	2	13	10,400	<.04	<.004
AUG 09, 1989	240	6.1	9.2	96	.32	2,400	3	15	4,970	<.04	.004
AUG 09, 1989	210	6.6	9.2	94	.32	2,700	4	15	4,330	.04	<.004

Appendix 2.--Water-quality data for urban sewage sludge site, June 1986 through November 1989--Continued

Date	Nitrogen, ammonia total (mg/L as N)	Nitrogen, ammonia + organic total (mg/L as N)	Phosphorus total (mg/L as P)	Aluminum, dissolved (mg/L)	Arsenic, dissolved (µg/L)	Barium, dissolved (µg/L)	Boron, dissolved (µg/L)	Cadmium, dissolved (µg/L)	Chromium, dissolved (µg/L)	Copper, dissolved (µg/L)	Iron, dissolved (mg/L)
410907079294202 Well 17A (LAT 41°09'07" N. LONG 079°29'42" W.)--Continued											
JUNE 07, 1988	0.37	1.3	0.03	22	<20	<10	<250	8.6	<50	<10	20
JULY 11, 1988	.69	1.3	.05	14	<4	<10	<250	4.1	<50	<10	90
JULY 11, 1988	.81	1.4	.03	18	<4	<10	<250	5.2	70	<10	110
AUG 08, 1988	.72	1.4	.05	5.3	<20	<10	<250	3.3	<50	46	170
SEPT 21, 1988	.72	1	.05	1	<4	<10	<250	2.4	26	20	140
OCT 18, 1988	.93	1.3	.03	.41	<4	<10	<250	.76	<50	25	250
NOV 17, 1988	.93	.97	.19	.59	<4	<10	<250	1	<50	16	210
DEC 20, 1988	.87	1.3	.20	.74	<4	<10	<250	.95	<50	19	210
DEC 20, 1988	.84	1.1	.27	.70	<4	10	<250	.80	<50	19	220
JAN 10, 1989	.99	.71	.03	4.1	7.6	<10	<250	2.2	<50	<10	170
FEB 14, 1989	.69	.89	.03	13	<4	<10	<250	4.1	<50	15	130
MAR 13, 1989	.69	.88	.02	18	<4	<10	<250	<.20	<50	25	87
APR 10, 1989	.38	.55	.02	40	<4	<10	–	8	<50	34	18
MAY 09, 1989	.45	.62	.05	28	<4	<10	<250	7.2	<50	23	34
JUNE 15, 1989	.49	.87	.05	35	<4	<10	<250	7.5	<50	30	24
JUNE 15, 1989	.49	.59	.03	36	<4	<10	<250	7.1	<50	25	20
JULY 10, 1989	.51	.86	.17	24	<4	<10	<250	7.3	<50	29	21
AUG 08, 1989	.47	.70	.08	21	<4	<10	<250	6.2	<50	22	50
SEPT 12, 1989	.62	.79	.05	3.8	<4	<10	<250	2.4	<50	10	150
OCT 16, 1989	.57	<1	.04	2.7	4.5	<10	<250	2.4	<50	29	160
NOV 07, 1989	.55	<1	.05	3.8	5.1	<10	<250	2.4	<50	14	160
410925079293901 Well 18 (LAT 41°09'25" N. LONG 079°29'39" W.)											
JULY 08, 1986	.72	1.2	–	.20	<1,000	<500	–	<10	<50	23	230
AUG 05, 1986	1.1	1.7	–	<.14	<4	<500	<250	.80	<50	88	200
SEPT 08, 1986	1.3	1.8	–	<.14	<4	–	<250	<.24	<50	310	230
OCT 08, 1986	.88	1.7	–	<.14	<4	–	<250	<.20	110	55	250
DEC 09, 1986	.77	1.7	–	.21	<5	22	<250	<.20	130	120	250
MAR 11, 1987	.69	2	–	<.14	<4	<10	<250	<.20	<50	<10	240
JUNE 03, 1987	1	1.9	.03	.15	<4	<10	<250	<.20	<50	<10	230
SEPT 16, 1987	.88	1.7	.03	.17	<4	<10	<250	<1	<50	19	220
SEPT 16, 1987	.88	1.8	.04	.22	<4	<10	<250	<1	<50	<10	200
DEC 15, 1987	1.1	1.5	.04	<.14	<4	32	<250	<.20	<50	<10	200
MAR 15, 1988	.72	1.5	.04	.37	<4	27	<250	<.20	<50	<10	230
APR 12, 1988	.99	1.4	.06	<.14	<4	<10	<250	<.20	<50	<10	240
APR 12, 1988	.93	1.2	.05	.16	<4	<10	<250	<.20	<50	<10	220
MAY 09, 1988	1.3	1.5	.05	.18	<20	<10	<250	<.50	<50	<10	250
JUNE 08, 1988	1.1	1.4	.04	.31	<4	<10	<250	<.20	<50	<10	180
JULY 11, 1988	1.3	1.7	.03	.32	<20	<10	<250	<.50	91	<10	250
AUG 09, 1988	1.4	1.9	.03	.28	<20	<10	<250	.35	<50	<10	260
SEPT 21, 1988	1.1	2.2	.22	.30	<4	<10	<250	<.20	<50	25	190
SEPT 21, 1988	1.1	1.7	.02	.29	<4	<10	<250	<.20	<50	31	200
OCT 18, 1988	1.3	2	.03	.23	<4	<10	<250	.32	<50	29	190
NOV 17, 1988	.87	1.5	.05	.30	<4	13	<250	<.20	<50	24	240
DEC 21, 1988	1.1	1.6	.02	.16	<4	<10	<250	<.20	<50	25	220
JAN 11, 1989	1.2	1.3	.07	.18	<4	<10	<250	<.20	<50	21	240
FEB 15, 1989	1.1	1.1	.03	.27	<4	10	<250	<.20	<50	35	220
FEB 15, 1989	1.1	1.2	.03	.31	<4	11	<250	<.20	<50	27	240
MAR 14, 1989	1.1	1.1	.03	.20	<4	<10	<250	.48	<50	30	200
APR 10, 1989	.82	1.2	<.02	.50	<4	15	<250	<.20	<50	40	210
MAY 10, 1989	.79	1.3	.07	.37	<4	10	<250	.44	<50	10	200
JUNE 15, 1989	.99	1.3	.05	.21	<4	<10	<250	<.20	<50	24	230
JULY 11, 1989	1.3	1.5	.03	.36	<4	11	<250	.43	<50	13	220
AUG 09, 1989	.98	1.3	.06	.28	<4	19	<250	.95	<50	24	220
AUG 09, 1989	.96	1.3	.06	.30	<4	<10	<250	.72	<50	23	180

Date	Iron, ferrous dissolved (mg/L)	Lead, dissolved (µg/L)	Manganese, dissolved (mg/L)	Mercury, dissolved µg/l)	Molybdenum, dissolved (µg/L)	Nickel, dissolved (mg/L)	Selenium, dissolved (µg/L)	Strontium, dissolved (µL)	Zinc, dissolved (mg/L)	Cyanide total (mg/L)
410907079294202 Well 17A (LAT 41°09'07" N. LONG 079°29'42" W.)--Continued										
JUNE 07, 1988	20	4.2	58	<1	<70	1	<30	460	1.7	<0.001
JULY 11, 1988	83	7.7	55	<1	<300	.72	<30	470	1.2	<.001
JULY 11, 1988	86	7.3	58	<1	<300	.72	<30	460	1.2	<.001
AUG 08, 1988	140	4.6	57	<1	<300	.53	<30	460	.70	<.001
SEPT 21, 1988	180	<40	41	<1	<70	.36	<30	400	.37	<.001
OCT 18, 1988	230	<40	45	<1	<70	.16	<30	320	.30	<.001
NOV 17, 1988	210	<4	45	<1	<70	.24	<30	430	.38	<.001
DEC 20, 1988	210	<4	47	<1	<70	.22	<30	420	.38	<.001
DEC 20, 1988	220	<4	46	<1	<70	.24	<30	400	.36	<.001
JAN 10, 1989	180	<40	48	<1	<70	.33	<30	410	.51	<.001
FEB 14, 1989	140	<40	46	<1	<70	.51	<30	430	.72	<.001
MAR 13, 1989	110	<4	51	<1	<70	.68	<30	490	1.3	<.001
APR 10, 1989	17	<10	61	<1	<70	1.4	<30	500	2.7	<.001
MAY 09, 1989	41	<10	50	<1	<70	1	<30	500	1.9	<.001
JUNE 15, 1989	23	4.9	60	<1	<70	1.4	<30	500	2.6	<.001
JUNE 15, 1989	23	5.1	48	<1	<70	1.1	<30	480	2.1	<.001
JULY 10, 1989	24	4.5	49	<1	<70	.97	<30	100	1.7	<.001
AUG 08, 1989	59	6.4	49	<1	<70	.88	<30	530	1.5	<.001
SEPT 12, 1989	170	<4	48	<1	<70	.39	<30	510	.62	<.001
OCT 16, 1989	160	<10	46	<1	<70	.44	<30	440	.60	<.001
NOV 07, 1989	160	<4	59	<1	<70	.43	<30	450	.61	<.001
410925079293901 Well 18 (LAT 41°09'25" N. LONG 079°29'39" W.)										
JULY 08, 1986	--	<50	50	<1	<700	.55	<1,000	2,500	.27	--
AUG 05, 1986	--	<50	41	<1	<700	.55	<1,000	2,500	.26	<.001
SEPT 08, 1986	260	<50	47	<1	<70	.74	<30	2,500	.40	<.001
OCT 08, 1986	240	290	54	<1	<70	.58	<60	2,600	.36	<.001
DEC 09, 1986	240	<4	52	<1	<70	.65	<30	2,400	.35	<.001
MAR 11, 1987	250	<4	52	<1	<70	<.02	<30	2,500	.091	<.001
JUNE 03, 1987	230	<4	51	<1	<70	.49	<30	2,900	.12	<.001
SEPT 16, 1987	230	<20	42	<1	<70	.45	<30	2,400	.24	<.001
SEPT 16, 1987	220	<20	32	<1	<70	.45	<30	2,300	.30	<.001
DEC 15, 1987	250	<10	43	<1	<70	.39	<30	2,400	.16	<.001
MAR 15, 1988	220	<10	35	<1	<70	.46	<30	2,400	.18	<.001
APR 12, 1988	220	<10	51	<1	<70	.40	<30	2,800	.27	<.001
APR 12, 1988	220	<10	46	<1	<70	.44	<30	2,600	.27	<.001
MAY 09, 1988	210	<10	49	<1	<300	.45	<30	2,400	.30	<.001
JUNE 08, 1988	230	<4	50	<1	<70	.47	<30	2,300	.27	<.001
JULY 11, 1988	220	<20	50	<1	<300	.46	<30	2,400	.28	<.001
AUG 09, 1988	230	<20	52	<1	<70	.53	<30	2,700	.32	<.001
SEPT 21, 1988	240	<40	40	<1	<70	.49	<30	2,400	.31	<.001
SEPT 21, 1988	220	<40	44	<1	<70	.46	<30	2,500	.22	<.001
OCT 18, 1988	240	<40	43	<1	<70	.51	<30	2,400	.29	<.001
NOV 17, 1988	230	<20	48	<1	<70	.31	<30	2,400	.28	<.001
DEC 21, 1988	250	<4	49	<1	<70	.38	<30	2,200	.31	<.001
JAN 11, 1989	220	<40	50	<1	<70	.41	<30	2,400	.30	<.001
FEB 15, 1989	270	<40	48	<1	<70	.36	<30	2,300	.31	<.001
FEB 15, 1989	230	<40	47	<1	<70	.36	<30	2,400	.33	<.001
MAR 14, 1989	240	<20	43	<1	<70	.31	<30	2,400	.28	<.001
APR 10, 1989	220	<4	46	<1	<70	.38	<30	2,200	.38	<.001
MAY 10, 1989	250	<20	44	<1	<70	.33	<30	2,500	.26	<.001
JUNE 15, 1989	250	<20	48	<1	<70	.33	<30	2,300	.34	<.001
JULY 11, 1989	250	<20	47	<1	<70	.32	<30	2,500	.29	<.001
AUG 09, 1989	250	<10	46	<1	<70	.36	<30	2,800	.34	<.001
AUG 09, 1989	250	<10	48	<1	<70	.32	<30	2,600	.32	<.001

Appendix 2.–Water-quality data for urban sewage sludge site, June 1986 through November 1989–Continued

Date	Time	Water table altitude (ft above sea level)	Streamflow/ discharge, instan-taneous (ft^3/s)	Specific conduc-tance (µS/cm)	pH, field (units)	pH, lab (units)	Oxidation reduction potential (mV)	Water temper-ature (°C)	Oxygen, dissolved (mg/L)	Acidity total heated (mg/L as $CaCO_3$)	Acidity mineral (methyl orange) (mg/L as $CaCO_3$)	Calcium, dissolved (mg/L)
410925079293901 Well 18 (LAT 41°09'25" N. LONG 079°29'39" W.)–Continued												
SEPT 13, 1989	0840	1,241	–	3,000	5.6	6.2	–	12.5	0.42	400	–	410
OCT 16, 1989	1550	1,242	–	2,760	5.7	6.2	–	13.5	–	400	–	420
NOV 07, 1989	1510	1,242	–	2,730	5.8	6.2	–	12.0	–	390	–	570
410925079293902 Well 18A (LAT 41°09'25" N. LONG 079°29'39" W.)												
JUNE 18, 1986	1700	–	–	3,320	5.7	5.5	–	12.0	–	450	–	400
JULY 08, 1986	1645	1,244	–	3,360	–	5.7	–	12.0	–	470	–	320
AUG 05, 1986	1400	1,244	–	3,690	5.7	5.4	–	14.0	–	520	–	460
SEPT 08, 1986	1710	1,244	–	3,300	5.8	5.5	–	18.0	–	410	–	480
OCT 08, 1986	1845	1,244	–	3,340	5.8	5.6	–	12.5	–	470	–	430
NOV 04, 1986	1700	1,244	–	3,200	5.3	5.7	–	12.0	–	430	–	440
DEC 09, 1986	1400	1,244	–	3,420	6.0	5.6	–	11.5	–	450	–	420
JAN 07, 1987	1045	1,244	–	3,300	6.4	5.7	–	9.0	–	400	–	210
FEB 12, 1987	0900	1,244	–	3,400	5.9	5.9	–	9.0	–	380	–	430
MAR 11, 1987	1600	1,244	–	2,400	5.5	5.1	–	7.5	–	340	–	320
APR 14, 1987	1325	1,244	–	3,380	5.6	6.0	–	10.0	–	440	–	380
MAY 05, 1987	1700	1,244	–	3,400	5.8	6.0	–	9.0	–	420	–	390
JUNE 03, 1987	1230	1,244	–	3,370	5.6	5.8	–	11.0	–	350	–	370
JULY 09, 1987	0005	1,244	–	3,490	5.7	6.2	–	14.0	–	440	–	380
JULY 09, 1987	1330	1,244	–	3,440	5.7	5.8	–	14.0	–	380	–	380
AUG 12, 1987	1045	1,244	–	3,050	5.8	6.0	–	13.0	–	350	–	350
SEPT 16, 1987	1230	1,244	–	2,900	5.4	6.0	–	14.0	–	440	–	330
OCT 07, 1987	0000	1,244	–	3,100	5.8	6.0	–	12.5	–	340	–	340
NOV 18, 1987	1200	1,244	–	3,260	5.6	6.1	–	12.0	–	350	–	310
DEC 15, 1987	1035	1,244	–	2,900	5.6	6.0	–	11.0	–	340	–	340
JAN 12, 1988	0005	1,244	–	3,050	5.5	6.0	–	9.5	–	380	–	410
JAN 12, 1988	1440	1,244	–	3,250	5.6	6.0	–	11.0	–	390	–	440
FEB 09, 1988	0001	1,244	–	2,300	–	5.9	–	7.5	–	320	–	340
MAR 15, 1988	1300	1,248	–	2,650	5.6	5.8	–	7.5	–	380	–	540
APR 12, 1988	1015	1,244	–	2,500	5.6	5.8	–	9.5	–	360	–	360
MAY 09, 1988	1615	1,244	–	2,400	5.6	5.8	–	14.0	–	310	–	330
JUNE 08, 1988	0830	1,244	–	2,610	5.7	5.9	–	11.0	–	370	–	400
JULY 11, 1988	0910	1,244	–	2,840	5.8	5.9	–	15.0	–	380	–	440
AUG 09, 1988	0005	1,243	–	2,560	6.2	6.0	–	12.0	–	350	–	460
AUG09, 1988	0800	1,243	–	2,590	6.2	6.1	–	12.0	–	340	–	480
SEPT 21, 1988	0950	1,243	–	2,670	5.7	5.7	–	13.0	–	350	–	370
OCT 18, 1988	1010	1,243	–	2,240	5.6	5.9	–	11.5	–	340	–	360
NOV 17, 1988	0935	1,243	–	2,630	5.7	5.9	–	11.5	.12	330	–	440
DEC 21, 1988	0920	1,242	–	2,420	5.9	6.0	–	9.5	.18	310	–	390
JAN 11, 1989	0005	1,243	–	2,590	5.8	6.0	–	9.0	.20	370	–	420
JAN 11, 1989	0905	1,243	–	2,530	5.8	6.0	–	9.0	.20	380	–	450
MAR 14, 1989	1345	1,243	–	2,150	5.7	5.8	–	10.5	.38	390	–	400
APR 12, 1989	1550	1,244	–	2,100	5.6	5.7	–	9.0	.08	350	–	380
MAY 10, 1989	1515	1,244	–	1,280	5.8	6.1	–	9.0	.29	120	–	150
JUNE 15, 1989	1100	1,283	–	2,050	5.2	6.1	–	9.5	.25	280	–	370
JULY 11, 1989	0005	1,244	–	2,640	5.6	5.9	–	13.5	.22	350	–	370
JULY 11, 1989	1445	1,244	–	2,630	5.6	5.9	–	13.5	.22	350	–	370
AUG 09, 1989	1335	1,244	–	2,690	5.4	6.2	–	13.0	.14	410	–	370
SEPT 13, 1989	0830	1,242	–	2,850	5.6	6.2	–	13.0	.42	370	–	410
OCT 16, 1989	1550	1,244	–	2,470	5.6	6.2	–	14.0	–	340	–	410
NOV 07, 1989	1505	1,244	–	2,120	–	5.9	–	12.5	–	290	–	420

Appendix 2.--Water-quality data for urban sewage sludge site, June 1986 through November 1989--Continued

Date	Magnesium, dissolved (mg/L)	Sodium, dissolved (mg/L)	Potassium, dissolved (mg/L)	Alkalinity water lab (mg/L as $CaCO_3$)	Sulfide total (mg/L as S)	Sulfate, dissolved (mg/L as SO_4)	Chloride, dissolved (mg/L)	Silica, dissolved (mg/L as SiO_2)	Solids, residue at 105 °C, dissolved (mg/L)	Nitrogen, nitrate total (mg/L as N)	Nitrogen, nitrite total (mg/L as N)
410925079293901 Well 18 (LAT 41°09'25" N. LONG 079°29'39" W.)--Continued											
SEPT 13, 1989	260	6.2	9.7	94	<0.20	2,600	3	16	4,320	<0.04	0.004
OCT 16, 1989	250	6.3	10	80	.40	2,600	3	21	4,210	<.04	<.004
NOV 07, 1989	330	6.8	11	90	.32	2,600	3	16	3,620	<.04	<.004
410925079293902 Well 18A (LAT 41°09'25" N. LONG 079°29'39" W.)											
JUNE 18, 1986	200	5.6	9.9	36	--	2,600	3	--	4,090	<.04	<.004
JULY 08, 1986	260	6	11	54	--	2,700	4	--	4,240	<.02	.004
AUG 05, 1986	200	5.4	9.8	42	--	2,700	4	--	4,380	<.04	.004
SEPT 08, 1986	250	<.20	9.5	36	--	2,600	3	--	3,910	<.02	.008
OCT 08, 1986	250	4.9	11	46	--	1,800	3	--	4,520	<.02	<.004
NOV 04, 1986	260	5	11	54	--	2,500	3	--	4,840	<.02	.006
DEC 09, 1986	240	4	11	64	--	1,800	1.7	--	4,150	<.04	<.004
JAN 07, 1987	270	5.1	13	90	--	2,400	2	--	3,850	<.04	<.004
FEB 12, 1987	250	4.3	4.3	88	--	2,300	5	--	3,890	<.02	<.004
MAR 11, 1987	180	3.2	10	16	--	1,600	2	--	2,540	.12	.004
APR 14, 1987	230	5.8	13	82	--	2,300	2	17	158	<.04	<.004
MAY 05, 1987	240	4.5	12	86	--	2,100	3	13	3,970	<.04	<.004
JUNE 03, 1987	230	5.4	9.6	80	--	2,200	3	18	3,960	<.04	.004
JULY 09, 1987	240	4.8	11	72	--	2,500	2	16	4,530	<.04	.004
JULY 09, 1987	250	5.5	11	98	--	2,400	2	16	4,480	<.04	<.004
AUG 12, 1987	200	4.6	10	76	--	2,000	4	18	3,690	<.04	.004
SEPT 16, 1987	180	5.2	10	66	--	2,100	3	18	3,940	<.04	<.004
OCT 07, 1987	190	4.6	11	86	--	2,100	2	19	3,820	<.04	.016
NOV 18, 1987	170	150	9.7	78	--	1,900	3	18	3,270	<.04	.010
DEC 15, 1987	190	4.5	9.3	78	--	1,500	3	17	3,340	<.04	<.004
JAN 12, 1988	200	6.4	8.1	82	--	2,200	3	22	3,710	<.04	.006
JAN 12, 1988	230	5	9.9	90	--	2,300	3	24	3,760	<.04	.008
FEB 09, 1988	190	6.1	10	62	--	2,100	2	17	3,330	<.04	.010
MAR 15, 1988	320	4.7	8.8	68	--	2,200	2	17	3,690	<.04	<.004
APR 12, 1988	210	5	10	46	--	2,300	3	19	3,320	<.04	<.004
MAY 09, 1988	200	4.8	9.4	42	--	1,800	2	14	3,450	<.04	<.004
JUNE 08, 1988	220	4.5	9.3	72	--	2,300	3	16	4,420	<.04	<.004
JULY 11, 1988	240	4.7	10	58	--	2,300	2	16	4,040	<.04	.004
AUG 09, 1988	250	4.6	9.4	70	2.6	2,400	3	16	3,960	<.04	.004
AUG 09, 1988	240	4.6	9.2	62	2.6	2,400	3	16	3,660	<.04	<.004
SEPT 21, 1988	200	4.1	9.6	54	7.4	2,300	4	17	3,040	<.04	.004
OCT 18, 1988	200	5.8	8.8	62	1.4	2,000	2	14	3,010	.06	<.004
NOV 17, 1988	240	5.2	21	56	.50	2,100	11	14	3,570	<.04	.006
DEC 21, 1988	210	5.6	9.6	64	.64	2,300	3	15	3,400	.04	<.004
JAN 11, 1989	230	6	11	--	.32	2,200	3	13	3,380	<.04	.006
JAN 11, 1989	240	6	11	60	.32	2,200	2	13	3,460	<.04	.006
MAR 14, 1989	210	4.6	9.3	44	.32	2,400	3	14	3,650	<.04	.004
APR 12, 1989	220	4.4	8.8	38	<.20	2,200	3	13	--	<.04	<.004
MAY 10, 1989	86	2.4	5.2	24	.32	1,200	2	10	2,140	<.04	.006
JUNE 15, 1989	190	4.2	8	--	.40	1,900	3	15	3,070	.04	<.004
JULY 11, 1989	210	5.2	8.6	46	<.20	2,100	3	13	3,700	<.04	.014
JULY 11, 1989	210	5.7	8.8	46	<.20	2,300	3	14	3,660	<.04	.014
AUG 09, 1989	210	5.3	9.3	86	.48	2,400	4	14	4,370	<.04	.004
SEPT 13, 1989	220	5.1	9.4	82	<.20	2,400	3	16	13,300	<.04	<.004
OCT 16, 1989	200	5	9.1	74	.32	2,200	3	17	3,420	.04	<.004
NOV 07, 1989	210	4.6	8.4	42	.32	1,900	3	15	2,560	<.04	<.004

Appendix 2.--Water-quality data for urban sewage sludge site, June 1986 through November 1989--Continued

Date	Nitrogen, ammonia total (mg/L as N)	Nitrogen, ammonia + organic total (mg/L as N)	Phos-phorus total (mg/L as P)	Aluminum, dissolved (mg/L)	Arsenic, dissolved (µg/L)	Barium, dissolved (µg/L)	Boron, dissolved (µg/L)	Cadmium, dissolved (µg/L)	Chromium, dissolved (µg/L)	Copper, dissolved (µg/L)	Iron, dissolved (mg/L)
410925079293901 Well 18 (LAT 41°09'25" N. LONG 079°29'39" W.)--Continued											
SEPT 13, 1989	0.90	1.3	0.06	0.24	<4	11	<250	<0.20	<50	<10	190
OCT 16, 1989	.92	1.5	.04	.51	<4	10	<250	<.20	<50	28	220
NOV 07, 1989	.87	1.4	.05	.27	<4	<10	<250	<.20	<50	27	290
410925079293902 Well 18A (LAT 41°09'25" N. LONG 079°29'39" W.)											
JUNE 18, 1986	.88	1.6	--	<.14	<4	<500	--	1	<50	95	200
JULY 08, 1986	1	1	--	<.14	<1,000	<500	--	<10	<50	47	220
AUG 05, 1986	1.1	1.5	--	--	<4	<500	<250	<.20	<50	83	250
SEPT 08, 1986	1.3	1.6	--	<.14	<4	<10	<200	3.2	<50	310	230
OCT 08, 1986	1	1.7	--	<.14	<4	--	<250	.95	110	120	250
NOV 04, 1986	.82	2.1	--	.23	<5	--	<250	.36	130	120	250
DEC 09, 1986	.77	2	--	.17	<4	27	<250	<.20	130	57	240
JAN 07, 1987	.72	1.7	--	<.14	<4	--	<250	1	<50	<10	140
FEB 12, 1987	.90	1.4	--	<.14	<4	<10	<250	<.20	<50	<10	220
MAR 11, 1987	.63	1.6	--	<.14	<4	<10	<250	1.2	<50	<10	140
APR 14, 1987	.63	.7	.05	.16	<5	11	<250	.60	<50	<10	220
MAY 05, 1987	.77	1.9	.02	<.14	<4	<10	<250	.26	<50	<10	200
JUNE 03, 1987	1	2	.03	<.14	<4	<10	<250	<.20	<50	180	190
JULY 09, 1987	.90	2	.04	.26	<4	<10	<250	<.20	<50	<10	220
JULY 09, 1987	.78	1.8	.02	2.9	<4	15	<250	<.20	290	160	220
AUG 12, 1987	1.1	1.4	.05	<.14	<10	<10	<250	.26	<50	490	180
SEPT 16, 1987	1	1.6	.03	.23	<4	<10	<250	<1	<50	<10	180
OCT 07, 1987	.77	1.7	.03	28	<4	<10	<250	<.50	<50	<10	190
NOV 18, 1987	.60	1.2	.05	25	<4	230	<250	<.50	<50	33	200
DEC 15, 1987	.99	1.6	.03	.22	<4	19	<250	<.20	<50	<10	180
JAN 12, 1988	1.3	1.9	.06	.51	<4	12	<250	<.50	<50	<10	220
JAN 12, 1988	.99	1.5	.06	<.14	<4	<10	<250	<.50	<50	<10	240
FEB 09, 1988	.69	.74	.03	<.14	<4	<10	<250	<.50	<50	<10	180
MAR 15, 1988	.78	.92	.06	.33	<4	<10	<250	<.20	<50	<10	290
APR 12, 1988	.78	1.3	.12	.41	<4	35	<250	<.20	<50	30	190
MAY 09, 1988	.96	1.1	.05	.18	<20	13	<250	<.50	<50	30	35
JUNE 08, 1988	1	1.2	.05	.28	<4	<10	<250	.20	<50	<10	210
JULY 11, 1988	1.5	1.8	.07	.62	<20	<10	<250	<.50	85	<10	250
AUG 09, 1988	1.3	1.6	.07	.31	<20	<10	<250	.32	<50	<10	260
AUG 09, 1988	1.2	1.5	.07	.36	<20	<10	<250	.32	<50	<10	220
SEPT 21, 1988	1.1	4.4	.25	.34	<4	<10	<250	<.20	<50	27	190
OCT 18, 1988	.96	1.4	.08	.38	<4	<10	<250	.25	<50	29	180
NOV 17, 1988	.87	1.5	.16	.22	<4	16	<250	<.20	<50	24	250
DEC 21, 1988	.72	1.2	.06	.18	<4	14	<250	<.20	<50	23	200
JAN 11, 1989	.96	1.1	.12	<.14	<4	10	<250	<.50	<50	18	210
JAN 11, 1989	.96	1.1	.12	.30	<4	11	<250	<.20	<50	20	220
MAR 14, 1989	.87	1.1	.07	.29	<4	12	<250	.26	<50	24	190
APR 12, 1989	.72	.97	.03	.63	<4	15	<250	<.20	<50	39	190
MAY 10, 1989	.39	.69	.14	.18	<4	<10	<250	<.20	<50	<10	72
JUNE 15, 1989	.74	1.1	.07	.38	<4	12	<250	.33	<50	35	170
JULY 11, 1989	.94	2.5	.13	.17	<4	10	<250	<.20	<50	24	180
JULY 11, 1989	.96	1.4	.13	.20	<4	12	<250	<.20	<50	21	180
AUG 09, 1989	.96	1.6	.09	.16	<4	18	<250	.56	<50	24	190
SEPT 13, 1989	<1	1.2	.09	.14	<4	15	<250	.75	<50	16	190
OCT 16, 1989	.82	1.4	.09	.38	<4	17	<250	.68	<50	66	200
NOV 07, 1989	.64	2.8	.04	.34	<4	20	<250	.83	<50	14	180

Appendix 2.--Water-quality data for urban sewage sludge site, June 1986 through November 1989--Continued

Date	Iron, ferrous dissolved (mg/L)	Lead, dissolved (µg/L)	Manganese, dissolved (mg/L)	Mercury, dissolved µg/l)	Molybdenum, dissolved (µg/L)	Nickel, dissolved (mg/L)	Selenium, dissolved (µg/L)	Strontium, dissolved (µL)	Zinc, dissolved (mg/L)	Cyanide total (mg/L)
410925079293901 Well 18 (LAT 41°09'25" N. LONG 079°29'39" W.)--Continued										
SEPT 13, 1989	260	<10	46	<1	<70	0.32	<30	2,500	0.28	<0.001
OCT 16, 1989	240	<10	47	<1	<70	.38	<30	2,200	.30	<.001
NOV 07, 1989	250	<4	62	<1	<70	.47	<30	2,400	.33	<.001
410925079293902 Well 18A (LAT 41°09'25" N. LONG 079°29'39" W.)										
JUNE 18, 1986	--	<50	42	<1	<700	.49	<1,000	2,300	.23	--
JULY 08, 1986	--	<50	46	<1	<700	.52	<1,000	2,500	.24	--
AUG 05, 1986	--	<50	40	<1	<700	.50	<1,000	2,500	.24	<.001
SEPT 08, 1986	260	<50	40	<1	<70	<.02	<30	2,400	<.01	<.001
OCT 08, 1986	280	280	52	<1	<70	.68	<60	2,800	.38	<.001
NOV 04, 1986	240	<4	45	<1	<70	.58	<15	2,400	.34	<.001
DEC 09, 1986	250	<4	40	<1	<70	.44	<30	2,500	.27	<.001
JAN 07, 1987	260	<4	42	<1	<70	<.02	<30	2,700	.031	<.001
FEB 12, 1987	250	<4	40	<1	<70	<.02	<30	2,400	.048	<.001
MAR 11, 1987	130	<4	30	<1	<70	<.02	<30	1,700	.06	<.001
APR 14, 1987	240	<4	40	<1	<70	.42	<60	2,200	.24	<.001
MAY 05, 1987	240	<4	43	<1	<70	<.02	<60	2,500	<.01	<.001
JUNE 03, 1987	230	<4	39	<1	<70	.29	<30	3,400	.18	<.001
JULY 09, 1987	240	<4	49	<1	<70	.52	<30	2,700	.30	<.001
JULY 09, 1987	200	4.2	49	<1	<70	.49	<60	2,400	.097	<.001
AUG 12, 1987	220	<4	35	<1	<70	.17	<30	2,300	.14	<.001
SEPT 16, 1987	200	<20	29	<1	<70	.29	<30	2,000	.19	<.001
OCT 07, 1987	220	<10	32	<1	<70	.55	<30	2,400	.25	<.001
NOV 18, 1987	230	<10	32	<1	<70	.40	<30	2,300	.19	<.001
DEC 15, 1987	220	<10	36	<1	<70	.24	<30	2,200	.13	<.001
JAN 12, 1988	250	<10	40	<1	<70	.35	<30	2,300	.25	<.001
JAN 12, 1988	220	<10	40	<1	<70	.35	<30	2,500	.12	<.001
FEB 09, 1988	200	<10	33	<1	<70	.38	<30	2,100	.24	<.001
MAR 15, 1988	210	<10	37	<1	<70	.29	<30	2,200	.21	<.001
APR 12, 1988	200	<10	37	<1	<70	.34	<30	2,200	.23	<.001
MAY 09, 1988	160	<10	33	<1	<70	.31	<30	2,200	.21	<.001
JUNE 08, 1988	220	<4	40	<1	<70	.42	<30	2,100	.23	<.001
JULY 11, 1988	220	74	44	<1	<300	.36	<30	2,400	.20	<.001
AUG 09, 1988	200	<20	45	<1	<70	.36	<30	2,300	.25	<.001
AUG 09, 1988	200	<20	40	<1	<70	.39	<30	2,300	.27	<.001
SEPT 21, 1988	240	<40	32	<1	<70	.33	<30	2,300	.14	<.001
OCT 18, 1988	180	<40	34	<1	<70	.24	<30	2,000	.24	<.001
NOV 17, 1988	220	<20	41	<1	<70	.19	<30	2,300	.21	<.001
DEC 21, 1988	200	<4	36	<1	<70	.28	<30	2,000	.20	<.001
JAN 11, 1989	210	<40	37	<1	<70	.29	<30	2,200	.22	<.001
JAN 11, 1989	230	<40	40	<1	<70	.28	<30	2,200	.23	<.001
MAR 14, 1989	220	<20	34	<1	<70	.17	<30	2,200	.18	<.001
APR 12, 1989	200	<4	37	<1	<70	.29	<30	2,000	.30	<.001
MAY 10, 1989	88	4.1	15	<1	<70	.10	<30	1,000	.14	<.001
JUNE 15, 1989	170	<4	36	<1	<70	.26	<30	1,700	.24	<.001
JULY 11, 1989	200	<20	39	<1	<70	.28	<30	2,300	.26	<.001
JULY 11, 1989	200	<40	39	<1	<70	.32	<30	2,400	.28	<.001
AUG 09, 1989	260	<10	37	<1	<70	.30	<30	2,600	.28	<.001
SEPT 13, 1989	240	<10	32	<1	<70	.21	<30	2,400	.19	<.001
OCT 16, 1989	220	<4	33	<1	<70	.22	<30	1,900	.21	<.001
NOV 07, 1989	170	<4	31	<1	<70	.16	<30	1,800	.18	<.001

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