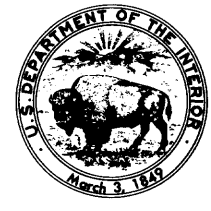
HYDROGEOLOGIC AND CHEMICAL DATA FOR THE O-FIELD AREA, ABERDEEN PROVING GROUND, MARYLAND

By Peggy R. Nemoff and Don A. Vroblesky

U.S. GEOLOGICAL SURVEY

Open-File Report 89-238

Prepared in cooperation with
OFFICE OF ENVIRONMENTAL MANAGEMENT,
ABERDEEN PROVING GROUND, MARYLAND



Towson, Maryland

1989

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Page 3, Figure 2:

The symbol for site OF14 was not included on map and should be placed directly northeast of site OF13, leaving a one millimeter increment between the two points.

Page 3, Figure 2, EXPLANATION:

Change topographical contour interval from 6 feet to 5 feet.

Page 5, HYDROGEOLOGIC SETTING, paragraph 3, line 6:

Change southeastward to southwestward.

Page 39, table 7:

Headings for wells OF21, OF22, OF23, and OF24 are in error. Change from:

Well OF21	to	Well OF13Cr
Well OF22	to	Well OF17Br
Well OF23	to	Well OF14Dr
Well OF24	to	Well OF14Br

These are replicate samples for the indicated wells.

November 1990

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ILLUSTRATIONS

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CONVERSION FACTORS AND ABBREVIATIONS

For the convenience of readers who may prefer to use metric (International System) units rather than the inch-pound units used in this report, values may be converted by using the following factors:

Multiply inch-pound unit	by	To obtain metric unit	
inch (in.)	25.4	millimeter	(mm)
	25,400	micron	(μ)
foot (ft)	0.3048	meter	(m)
mile (mi)	1.609	kilometer	(km)
foot per day (ft/d)	0.3048	meter per day	(m/d)
gallon (gal)	3.785	liter	(L)
	0.003785	cubic meter	(m^3)

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

Chemical concentration in water is expressed in milligrams per liter (mg/L) or micrograms per liter (μg/L). Chemical concentration in sediment is expressed in micrograms per gram (μg/g). Cation exchange capacity is expressed as milliequivalent per 100 grams (meq/100g).

Dry density is expressed by grams per milliliter (g/ml). Hydraulic conductivity is expressed in feet per day (ft/d). Radiation emission from ground-water samples is expressed as picoCuries per liter (pC/L) plus or minus two standard deviations.

Detection limits and analytical results for surface-water organics are expressed in micrograms per liter (μg/L). Detection limits and analytical results for bottom-sediment organics are expressed in micrograms per kilogram (μg/kg).

Liquid limit, plastic limit and plasticity index are expressed as percents and were established through American Society for Testing and Materials (ASTM) method D 43-18.

Specific electrical conductance of water is expressed in microsiemens per centimeter at 25 °Celsius (μS/cm). This unit is identical to micromhos per centimeter at 25 °Celsius, formerly used by the U.S. Geological Survey.

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ABSTRACT

O-Field, located at the Edgewood area of Aberdeen Proving Ground, Maryland, was periodically used for disposal of munitions, waste chemicals, and chemical-warfare agents from World War II through the 1950's. This report includes various physical, geologic, chemical, and hydrologic data obtained from well-core, ground-water, surface-water, and bottom-sediment sampling sites at and near the O-Field disposal area.

BACKGROUND

O-Field (fig. 1), in the Edgewood area of Aberdeen Proving Ground (APG), Aberdeen, Maryland, was periodically used for disposal of waste material from U.S. Army operations from World War II through the 1950's. The waste material consists of munitions and chemical-warfare agents. The study area consists of three-fourths of a square mile on the central western edge of the Gunpowder peninsula of APG. It includes O-Field, Watson Creek, parts of H-Field, and the Gunpowder River near O-Field.

O-Field contains three sites which have been used for waste disposal--Old O-Field, New O-Field, and a small site west of Old O-Field (figs. 2-3). Analyses of ground-water samples by the U.S. Department of Defense in 1977 and 1978 showed the presence of arsenic and chlorinated-organic solvents (Nemeth and others, 1983). Analyses of surface-water and soil samples indicated that arsenic from disposed materials at O-Field was being transported from the site by ground water and discharging into Watson Creek (Vroblesky, D.A., Lorah, M.M., and Oliveros, J.P., written commun., 1989). Watson Creek is a tributary of the Gunpowder River, which discharges into the Chesapeake Bay; therefore, further investigation was needed to determine if contamination was migrating offsite by way of ground and (or) surface water. Moreover, there was a need to characterize fully the site hydrogeology and to assess potential remedial actions.

In March 1984, the U.S. Army Environmental Management Office of APG and the U.S. Geological Survey began a hydrogeologic assessment of O-Field. On September 30, 1986, while the study was ongoing, the U.S. Environmental Protection Agency (USEPA) issued a Resource Conservation and Recovery Act (RCRA) corrective action permit to APG to address Solid Waste Management Units with potential to release hazardous wastes into the environment.

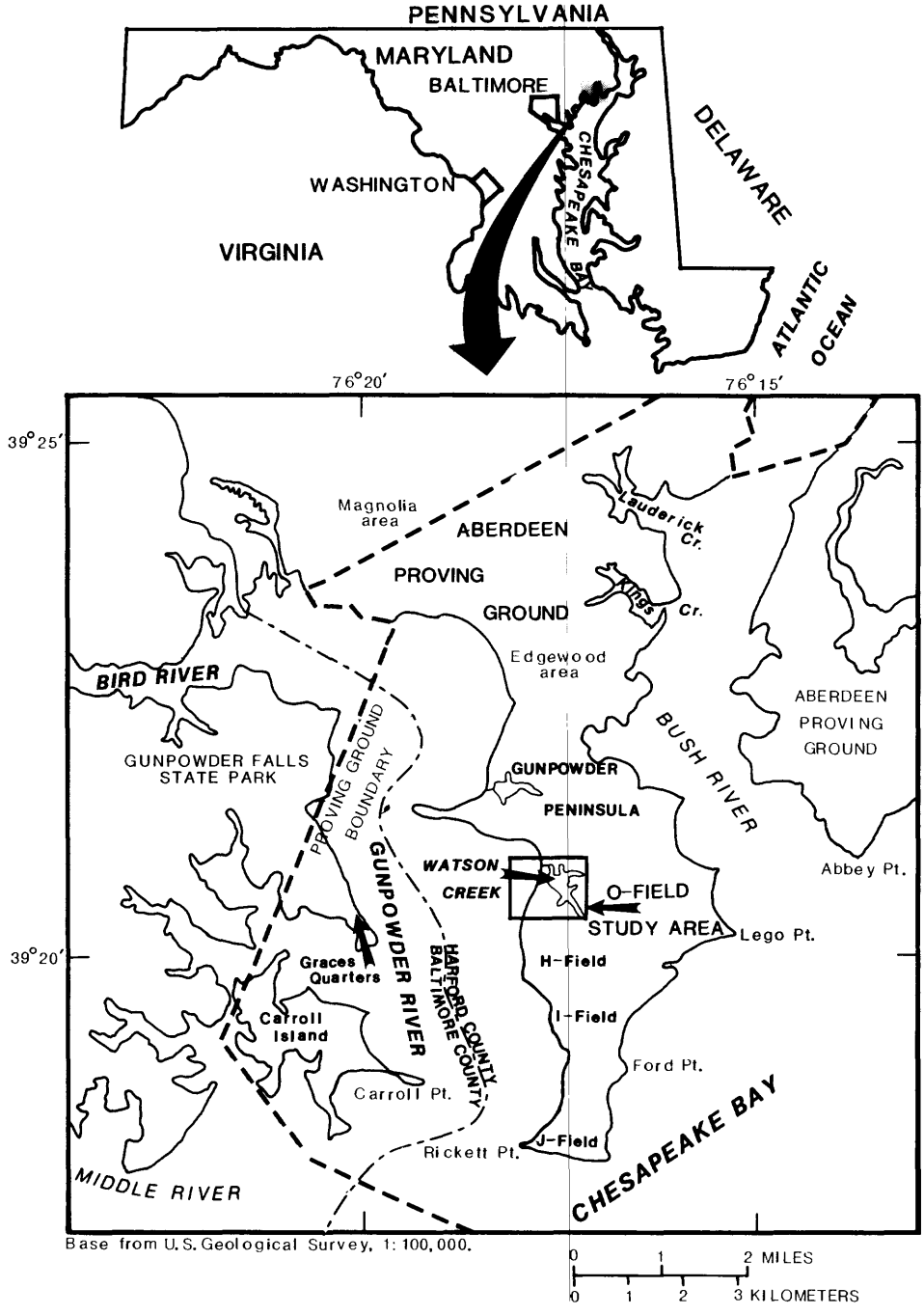

Figure 1.--Location of O-Field study area.

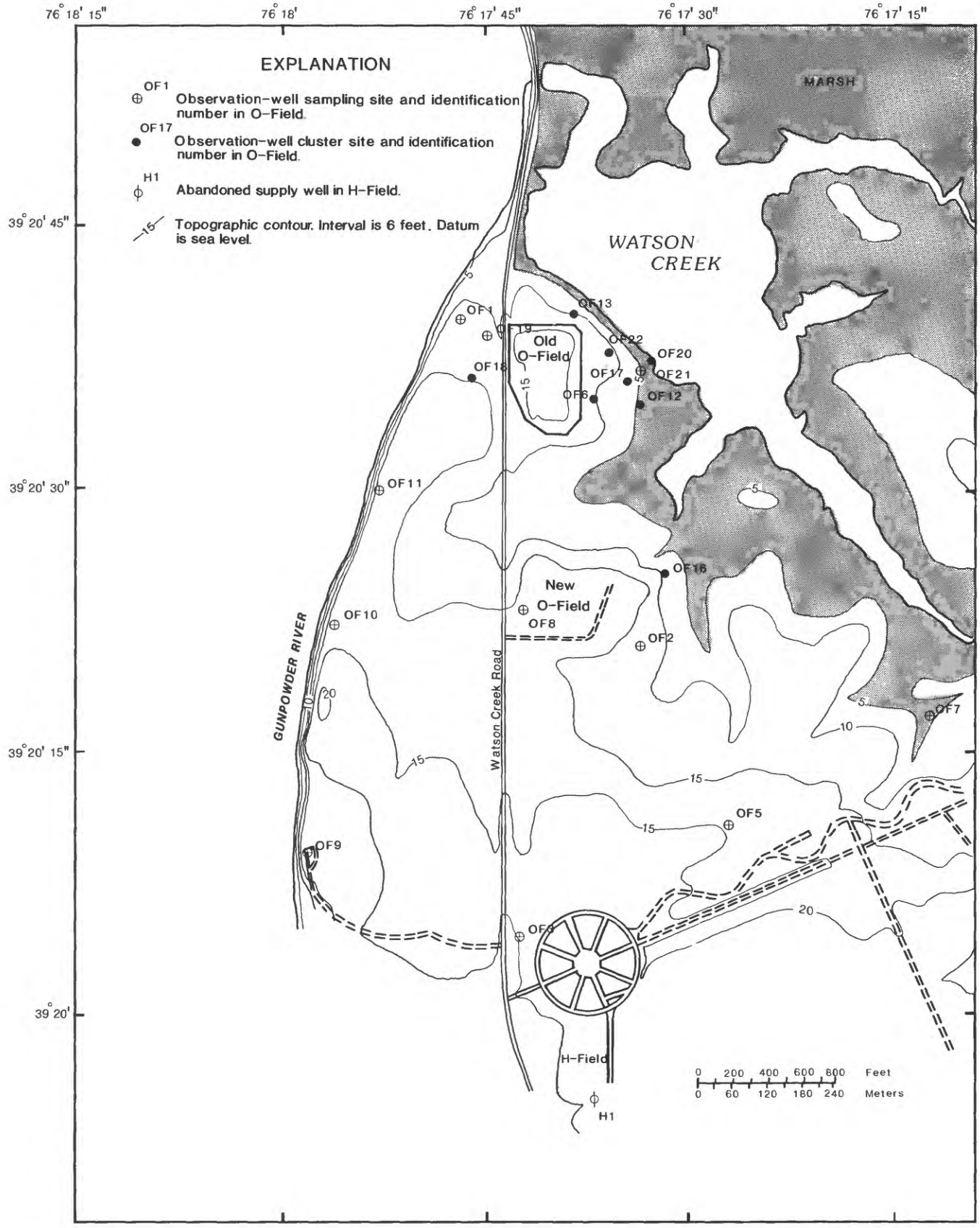

Figure 2.--Location of ground-water sampling sites.

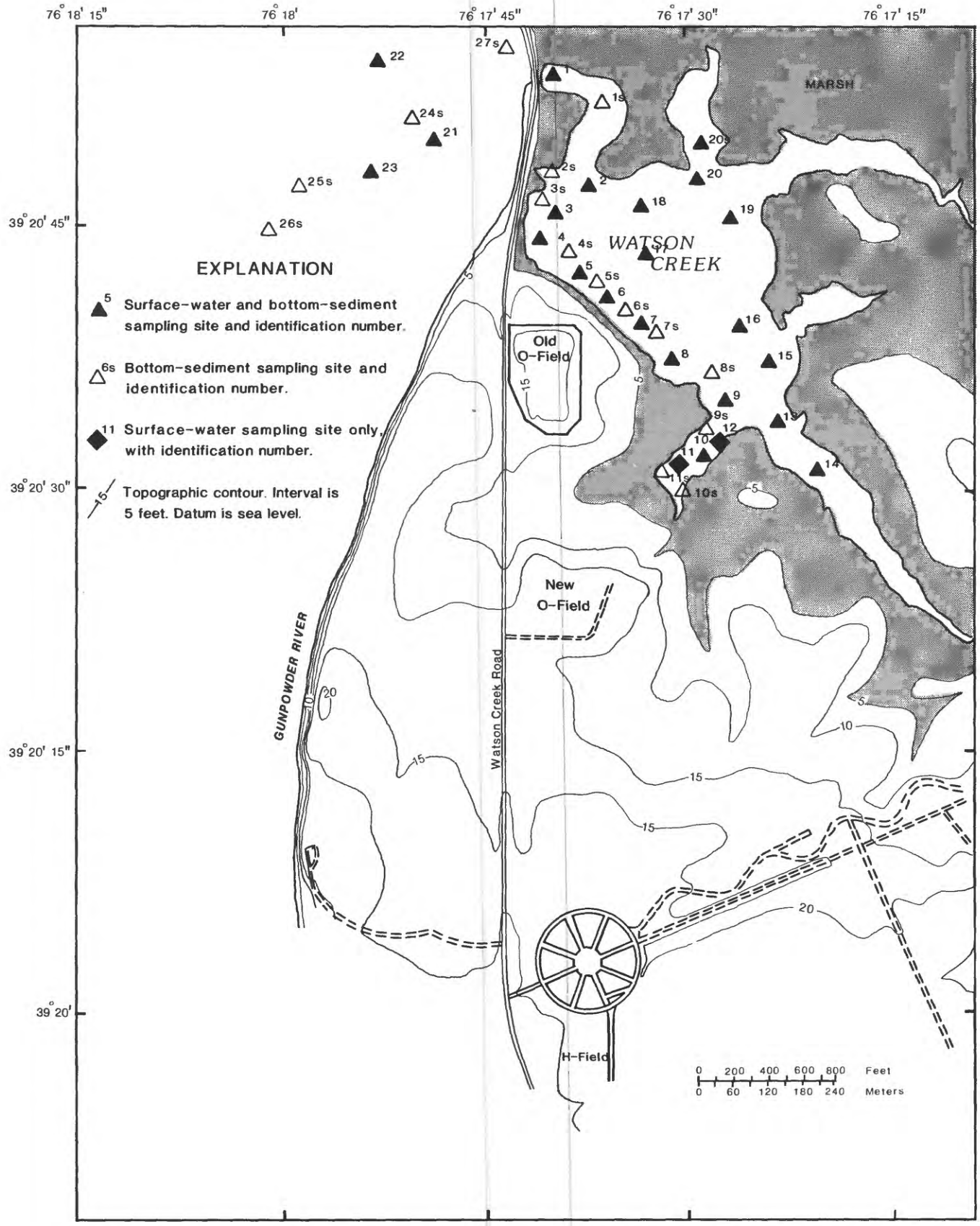

Figure 3.--Location of surface-water and bottom sediment sampling sites.

The permit required the hydrogeologic assessment to (1) provide a framework for characterization of contaminant releases and contaminant plumes at O-Field; and (2) develop a predictive system, such as a ground-water-flow model, capable of generating design information for selection of remedial measures. The framework would include establishment of observation-well networks capable of determining rate and direction of ground-water movement, and concentrations and spatial distribution of various pollutants and their usefullness as indicators of contamination. The flow model would be used to help determine proper remedial action. This report includes the necessary data for hydrogeologic assessment of these factors.

PURPOSE AND SCOPE

The purpose of this report is to document the data needed for site evaluation and interpretation with regards to possible ground-water, surface-water, and bottom-sediment contamination; and to plan remedial action with regards to containment, cleanup, and (or) removal of contaminants.

HYDROGEOLOGIC SETTING

O-Field is located on unconsolidated sand, clay, and silt of the Atlantic Coastal Plain. Three aquifers are present at O-Field terminating at a depth of about 120 ft (foot). In this report, the aquifers are designated, from shallowest to deepest, the "water-table aquifer," the "upper confined aquifer," and the "lower confined aquifer." Other deeper aquifers are present but were not investigated during this study.

The water-table aquifer consists of fine- to coarse-grained sand, interbedded with discontinuous clay lenses, and is underlain by a confining unit composed of black to greenish-gray clay. The thickness of the confining unit ranges from about one-half ft at Old O-Field to 5 ft at New O-Field.

The upper confined aquifer at O-Field consists of dark-gray to brown, medium- to coarse-grained sand interbedded with gravel and discontinuous clay lenses. The aquifer is underlaid with a dense, black to dark-gray clay layer approximately 50 ft thick. The clay is continuous beneath O-Field, but does not extend far to the north or south; however, it does extend southeastward at least as far as Carroll Island. A clay of differing lithology is present south of O-Field at H-Field at about the same depth as the dark clay at O-Field, suggesting that the clay acts as a continuous confining unit.

No samples were collected from the confining unit underlying the lower confined aquifer. However, geophysical logs of boreholes penetrating the confining unit indicate that it is about 48 ft thick and overlies an aquifer about 10 ft thick. This aquifer is underlain by about 47 ft of clayey material, which overlies a sand unit.

HYDROGEOLOGIC DATA

The hydrogeologic data for ground water presented in this report were collected at 37 wells. Eleven wells existed before the study began, 21 wells were drilled at O-Field in 1985, and five supplemental wells were installed in 1987 (fig. 2). Additionally, in 1985, 23 surface-water and 37 bottom-sediment sampling sites at Watson Creek and the Gunpowder River near O-Field were established for this study (fig. 3). These data include results of core studies, ground-water analyses, surface-water analyses, and bottom-sediment analyses.

The core-study data include lithology (table 1), grain-size distribution (table 2), various chemical characteristics (table 3), and confining-unit characteristics (table 4).

The ground-water data include ground-water chemistry (table 5), method blanks[1] for volatile organic carbon (table 6), available data on volatile and base/neutral organics (table 7), analytical results of method blanks (table 8), chemical-warfare agents (table 9), explosive-related products (table 10), radionuclides (table 11), herbicides (table 12), and ground-water levels (table 13).

Surface-water data include field characteristics (table 14); concentrations of various inorganic constituents (table 15); arsenic (table 16); organic chemistry (with method blanks, table 17); detection limits for organics (table 18); and available data on corresponding acids, volatile, and semivolatile organics (table 19).

Bottom-sediment data include inorganic constituents (table 20); organic chemistry (table 21); detection limits for organic chemicals (table 22); available data on acids, volatile, and semivolatile organics (table 23); and analytical results of method blanks corresponding to acids, volatile, and semivolatile organics (table 24).

A series of hydrographs (figs. 4-18) for wells fitted with analog-to-digital-recorders also is included in this report. In most instances, measuring points for wells are at the top of the polyvinyl chloride casing. In addition to the sites mentioned in this study, lithologic data are available for five wells that were drilled by the U.S. Army Toxic and Hazardous Materials Agency (Nemeth and others, 1983).

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[1] A method blank is a sample of deionized water run by the laboratory along with study-site samples to provide a background check for analytical errors and laboratory contamination.

SAMPLING-POINT NUMBERING SYSTEM

The well numbers of ground-water sampling points at O-Field are designated by the prefix "OF" to differentiate them from wells used in several other ongoing ground-water investigations at APG. At sites containing more than one well, the well numbers contain letter suffixes. Suffixes were assigned to wells in alphabetical order from shallowest to deepest. Thus, well OF14A is the shallowest well and well OF14C is the deepest well at cluster 14. An exception is well OF6. Although well OF6 is part of well-cluster 6, it existed prior to this study and was monitored by the U.S. Army for several years. In order to maintain consistency with historical monitoring records, no suffix was assigned to well OF6.

Thirty-seven bottom-sediment sites and 23 surface-water sites within Watson Creek and the Gunpowder River also were established. Sites where surface-water and bottom-sediment samples were collected are designated by a site number with no suffix. Thus, the surface-water samples are numbered consecutively from 1 to 23, and the bottom-sediment samples from those sites have the same number designation. However, sediment samples also were collected between several surface-water sampling sites. Sites where only a bottom-sediment sample was collected are designated by a site number with the suffix "s". Additionally, an "r" designation following any site number indicates collection of a replicate sample.

ACKNOWLEDGMENTS

Many people outside the U.S. Geological Survey made important contributions to this investigation. Cynthia Couch and David Parks, Environmental Management Office of Aberdeen Proving Ground, coordinated the interaction of several different organizations during drilling. Gary Nemeth, U.S. Army Environmental Hygiene Agency, provided valuable information regarding site history and chemistry of specific chemical-warfare agents. Special thanks are given to the personnel of the Technical Escort Unit at Aberdeen Proving Ground for monitoring safety and by Charles Brown, Edward Woods, and Jerome Jenkins, U.S. Army Corps of Engineers, for performing an outstanding job remotely drilling the observation wells.

REFERENCES

American Society for Testing and Materials (ASTM), 1988, Soil and rock, building stones, geotextiles, in 1988 Annual Book of ASTM Standards: American Society for Testing and Materials (ASTM), method D 4318-84 for liquid limit, plastic limit, and plasticity index, section 4, Construction, v. 04.08, p. 573-583.

Nemeth, Gary, Murphy, J. M., Jr., and Zarzycki, J. H., 1983, Environmental survey of the Edgewood area of Aberdeen Proving Ground, Maryland: U.S. Army Toxic and Hazardous Materials Agency, Aberdeen Proving Ground, Maryland, Report no. DRXTH-AS-FR-82185, 276 p.

U.S. Environmental Protection Agency, 1988, U.S. Code of Federal Regulations, Title 40, Protection of Environment, Parts 100-149: Part 141, National Primary Drinking Water Regulations; Part 142, National Primary Drinking Water Regulations Implementation; Part 143, National Secondary Drinking Water Regulations, p. 526-610.

Table 1.--Lithologic logs and construction data for observation wells

[ft = feet; in. = inches; THAMA = Toxic and Hazardous Materials Agency; Depth measurement is read at base of lithologic descriptor unit]

Sand size nomenclature:

vcus = very coarse upper* sand	1,410 - 2,000 microns	mls = middle lower sand	250 - 350 microns
vcls = very coarse lower* sand	1,000 - 1,410 microns	fus = fine upper sand	177 - 250 microns
cus = coarse upper sand size	710 - 1,000 microns	fls = fine lower sand	125 - 177 microns
cls = coarse lower sand size	500 - 710 microns	vfus = very fine upper sand	88 - 125 microns
mus = middle upper sand size	350 - 500 microns	vfls = very fine lower sand	62 - 88 microns

*Lower and upper refer to the finest and coarsest grain sizes within each category of the 62 to 2,000 micron spectrum

Site OF6
Average altitude of land surface at cluster: 8.89 ft

	Depth (ft)	Thickness (ft)
Silt, dark-brown, clayey to mls	5.0	5.0
Sand, light-brown, mus, no clay	10.0	5.0
Sand, light-brown, mus to cus, with streaks of iron staining	11.5	1.5
Clay	12.5	1.0
Sand, mus	14.3	1.8
Clay, brown	15.0	0.7
Sand, brown, cls	16.1	1.1
Silt, darker reddish-brown zone with thin maroon streak	16.2	0.1
Clay, gray	16.3	0.1
Clay, black	16.4	0.1
Clay, gray	20.0	3.6
Sand, light-gray, cls, subrounded	21.0	1.0
Clay, gray, plastic	22.0	1.0
Gravel, gray, cobbles, rounded	27.5	5.5
Clay, dark-gray, plastic; with thin (0.008 in.) layers of sand and muscovite, abundant carbonized leaves and clam shells; disseminated particles of vivianite are present in clay matrix and as replacement of stems in carbonized leaves and on clam shells	50.0	22.5
No sample	83.0	33.0
No sample	88.0	5.0

	Screen depths (ft)	Altitude of measuring point (ft above sea level)
Well OF6 [THAMA]	--	11.665
Well OF6A	9.5-11.5	11.580
Well OF6B	20.1-24.5	11.655
Well OF6C	83.8-85.8	12.650

Site OF12
Average altitude of land surface at cluster: 4.09 ft

	Depth (ft)	Thickness (ft)
Soil, dark-brown with roots	1.0	1.0
Clay, brown with patches of gray color, moderately friable	2.0	1.0
Sand, gray, clayey with patches of brown color, cus, moderately friable	5.0	3.0
Sand, vfls, quartz	5.8	0.8
Sand, mus, quartz	7.1	1.3
Sand, brown with gray mottling, vfls	10.0	2.9
Clay, gray	12.5	2.5
Sand, gray, fls	14.5	2.0
Sand, gray, fls; gravel within the sand matrix, gravel diameter approximately 1 in.	15.0	0.5
Sand, fls	15.5	0.5
Sand, cus	15.8	0.3
Sand, gray, vcls; and poorly sorted gravel, with 2.4 in. diameter cobbles	25.5	9.7
Clay, dark-gray, plastic, develops vertical cracks upon drying out	30.0	4.5
Clay, dark-gray, with disseminated particles of vivianite, clay develops horizontal fissility upon drying out	45.0	15.0

	Screen depths (ft)	Altitude of measuring point (ft above sea level)
Well OF12A	1.6- 8.9	-- (Destroyed, sealed)
Well OF12B	15.0-17.0	7.09
Well OF12C	22.9-24.9	7.32

Table 1.--Lithologic logs and construction data for observation wells--Continued

[ft = feet; in. = inches; THAMA = Toxic and Hazardous Materials Agency; Depth measurement is read at base of lithologic descriptor unit]

Sand size nomenclature:

vcus = very coarse upper* sand	1,410 - 2,000 microns	mls = middle lower sand	250 - 350 microns
vcls = very coarse lower sand	1,000 - 1,410 microns	fus = fine upper sand	177 - 250 microns
cus = coarse upper sand size	710 - 1,000 microns	fls = fine lower sand	125 - 177 microns
cls = coarse lower sand size	500 - 710 microns	vfus = very fine upper sand	88 - 125 microns
mus = middle upper sand size	350 - 500 microns	vfls = very fine lower sand	62 - 88 microns

*Lower and upper refer to the finest and coarsest grain sizes within each category of the 62 to 2,000 micron spectrum

Site OF13
Average altitude of land surface at cluster: 8.43 ft

	Depth (ft)	Thickness (ft)
Soil and root zone	0.5	0.5
Sand, dark-brown, vfus to vfls, tightly packed	1.5	1.0
Sand, brown, fine, vfus to vfls	2.5	1.0
Sand, tan, vfls	7.7	5.2
Clay, light-gray with a large 5-in.-diameter cobble	8.0	0.3
Sand, light-gray to tan with gold mottling, fls to vfls	13.0	5.0
Sand, light-brown or tan, fus-mls, loose, water logged	14.4	1.4
Sand, brownish-gray, vfls-fls	15.5	1.1
Sand, light-brown to gold, vfus-fls	16.0	0.5
Clay, gray	17.5	1.5
Sand, brown, coarse, mus-cls	18.7	1.2
Sand, gray-brown, coarse , mus mostly with some larger, cls and cus	20.0	1.3
Clay, light brownish-gray, appears to fracture horizontally. Upper portion of clay is dry and brittle but gradually becomes more plastic toward bottom	23.0	3.0
Sand, grayish-brown, mls, grading to vcus near bottom	24.5	1.5
Gravel, rounded, 1.6-2.0-in.-diameter	28.3	3.8
Sand, gray, cls; small amount of clay at bottom of column	28.5	0.2
Sand and gravel	28.7	0.2
Clay, grayish-brown	43.5	14.8

	Screen depths (ft)	Altitude of measuring point (ft above sea level)
Well OF13A	5.4-12.4	12.090
Well OF13B	18.0-20.0	11.370
Well OF13C	26.0-28.0	11.005

Site OF14
Average altitude of land surface at cluster: 3.24 ft

	Depth (ft)	Thickness (ft)
Loam, black organic-rich soil zone	0.9	0.9
Sand, clayey, gray to brown, mottled, vfls	4.0	3.1
Clay, gray plastic with brown mottled areas	5.5	1.5
Clay, gray, sandy, sand particle size vfls to vfus	7.0	1.5
Sand, tan, fls to vfus, becoming coarser and grayer at the bottom	8.5	1.5
Clay, tan with gray mottling, non-plastic	10.0	1.5
Sand, gray, vfls	12.8	2.8
Sand, gray, mls, sharp upper and lower contacts	13.2	0.4
Clay, gray, friable	15.0	0.8
Clay, slate-gray, plastic	16.9	1.9
Sand, greenish-brown; vfus, with 0.5-in.-thick layers of gray clay	18.1	1.2
Gravel and sand, cls	20.0	1.9
Sand, brown, cls	20.7	0.7
Sand, gray predominantly, vcus; and 0.5-in.-diameter gravel	24.2	3.5
Silt, gray	24.7	0.3
Gravel and sand, cls	25.5	0.8
Clay, dark gray to grayish-brown, friable	30.0	4.5
Clay, dark gray, friable; with lignite and white particles of vivianite	50.0	20.0
No sample	80.0	30.0
Sand	85.0	5.0

	Screen depths (ft)	Altitude of measuring point (ft above sea level)	
Well OF14A	1.0- 8.0	--	(Destroyed, sealed)
Well OF14B	11.0-13.0	6.930	
Well OF14C	19.0-21.0	6.640	
Well OF14D	81.1-83.0	6.340	

Table 1.--Lithologic logs and construction data for observation wells--Continued

[ft = feet; in. = inches; THAMA = Toxic and Hazardous Materials Agency; Depth measurement is read at base of lithologic descriptor unit]

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cus = coarse upper sand size	710 - 1,000 microns	fls = fine lower sand	125 - 177 microns
cls = coarse lower sand size	500 - 710 microns	vfus = very fine upper sand	88 - 125 microns
mus = middle upper sand size	350 - 500 microns	vfls = very fine lower sand	62 - 88 microns

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Site OF16
Average altitude of land surface at cluster: 6.45 ft

	Depth (ft)	Thickness (ft)
No samples	3.0	3.0
Sand, clayey, gray; with patches of clayey brown sand	5.0	2.0
Sand, brownish-gray, fus to cls, with up to 2-in.-diamater cobbles	11.0	6.0
Sand, gray, mls and mus	13.0	2.0
Sand, brownish, fls, very wet and fluid	17.5	4.5
Clay, gray and gold variegated	17.7	0.2
Clay, dark-gray, friable	18.0	0.3
Sand, gray, well-sorted, mls	30.5	12.5
Clay, dark-gray, plastic, with horizontal bedding	36.0	5.5
Clay, dark-gray, plastic, with particles of vivianite	37.0	1.0
Clay, dark-gray, horizontal bedding, gradually becomming more friable with depth	43.0	6.0
Clay, dark-gray, horizontal bedding, plastic	44.0	1.0
Clay, dark-gray, horizontal bedding, with more friable tan clay above	45.0	1.0

	Screen depths (ft)	Altitude of measuring point (ft above sea level)
Well OF16A	9.0-11.0	9.650
Well OF16B	19.0-21.0	9.690

Site OF17
Average altitude of land surface at cluster: 8.14 ft

	Depth (ft)	Thickness (ft)
Silt, dark-brown, roots	0.6	0.6
Clay, brown, sandy	2.9	2.3
Sand, brown, mus	4.0	1.1
Sand, brown, mus at top and moderately sorted, cls-cus at base	9.0	5.0
Sand, grayish-brown, cus, with some streaks of black (dark color coating sand grains) at botom of column	14.0	5.0
Sand, grayish-brown, vcls to vcus, some streaks of black; 0.12-in.-diameter gravel at 15.4 ft. No apparent vertical variation in grain size. Gradational lower contact	16.7	2.7
Sand, tan, vcls and cls, with streaks of black (grain coating); small amount of tan clay as matrix. Gradational lower contact	17.2	0.5
Gravel and cobbles with small amount of tan clay matrix, poorly sorted	17.6	0.4
Sand, tan, vfls, sharp upper contact	18.2	0.6
Sand, tan, mus, gradational upper contact	19.0	0.8
Sand, tan, some streaks of gray, mus, clayey matrix but not enough for plasticity, sharp lower contact	19.3	0.3
Clay, gray, crumbly, has streaks of brown clay and patches (dispersed throughout section), sharp lower contact	21.6	2.3
Gravel, gray, rounded, 0.02-0.08-in.-diameter, in sand (mus-cls) matrix, gradational lower contact	23.6	2.0
Cobbles, subrounded up to 0.35-in.-diameter	24.0	0.4
Sand, gray, mls	24.6	0.6
Gravel, gray, 0.03-in.-diameter; 0.24-in.-diameter cobbles; and cls sand	26.2	1.6
Clay, gray, sharp upper contact	26.5	0.3
Sand, gray, mls, gradational upper contact	27.0	0.5
Sand, gray, and gravel; cls sand near top, poorly sorted, mostly quartz with some flecks of black mineral. Gravel near bottom averages 0.04-in.-diameter	34.0	7.0
Sand, gray, cls, becoming coarser downward, gradational lower contact	34.6	0.6
Sand, gray, vcus; with 0.08-in.-diameter gravel, and 0.20-in.-diameter cobbles near base, sharp lower contact	35.5	0.9
Clay, dark-gray, with mica and dissemenated vivianite	39.0	3.5
Clay, gray, friable, contains carbonized leaf fossils	49.0	10.0

	Screen depths (ft)	Altitude of measuring point (ft above sea level)
Well OF17A	9.0-11.0	11.490
Well OF17B	24.0-26.0	11.365

Table 1.--Lithologic logs and construction data for observation wells--Continued

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mus = middle upper sand size	350 - 500 microns	vfls = very fine lower sand	62 - 88 microns

*Lower and upper refer to the finest and coarsest grain sizes within each category of the 62 to 2,000 micron spectrum

Site OF18 Average altitude of land surface at cluster: 15.69 ft	Depth (ft)	Thickness (ft)
Sand, brown, vfls, very tight	7.5	7.5
Sand, brown, mls	10.0	2.5
Sand, brown, fls	11.5	1.5
Sand, brown, fls grading into mls; with gravel up to 0.4-in.-diameter	12.0	0.5
Sand, fus, becoming increasingly clayey	13.5	1.5
Sand, brown, fus-fls	18.0	4.5
Sand, brown, fus; with horizontal bands of 1-in.-thick, light-gray silty clay	19.0	1.0
Clay, blue-gray, plastic	20.0	1.0
Sand, brown fus	20.7	0.7
Sand, gray, fls near top, mls at bottom, sharp upper contact	23.7	3.0
Silt, gray, with dark mottling	25.0	1.3
Clay, gray; except for bottom 2-in. which has poorly sorted mls-cus sand; and gravel	30.0	5.0
Sand, greenish-gray, mus-vcus; and gravel	30.5	0.5
Clay, greenish-gray	36.5	6.0
Clay, gray	49.0	12.5
Gravel	50.0	1.0
No sample	85.0	35.0
No sample	95.0	10.0

	Screen depths (ft)	Altitude of measuring point (ft above sea level)
Well OF18A	12.5-19.4	18.800
Well OF18B	17.0-19.0	19.050
Well OF18C	88.0-90.0	19.220

Site OF19 Average altitude of land surface at cluster: 9.27 ft	Depth (ft)	Thickness (ft)
Sand, brown, tight, medium size, moderately consolidated	2.0	2.0
Sand, brown, medium, unconsolidated	2.5	0.5
Clay, reddish-brown, friable with patches of dark brown to black material (looks organic)	3.0	0.5
Clay, gray	3.3	0.3
Sand, brown, with streaks of reddish-brown color, mls	8.0	4.7
Sand, clayey, brown	8.5	0.5
Clay, gray	9.2	0.7
Sand, gray, fine-grained	9.7	0.5
Clay, gray, plastic	10.4	0.7
Sand, clayey, gray	10.9	0.5
Clay, gray, plastic	11.5	0.6
Sand, gray, medium	13.0	1.5
Sand, gray	15.0	2.0
Sand, gray, very fine, tight	17.0	2.0
Sand, dark-gray, medium	18.0	1.0
Clay, gray, moderately friable; with lignite; no vivianite	23.0	5.0

	Screen depth (ft)	Altitude of measuring point (ft above sea level)
Well OF19	12.0-14.0	12.495

Site OF20 Average altitude of land surface at cluster: 6.07 ft	Depth (ft)	Thickness (ft)
Silt, clayey, black	0.5	0.5
No sample	4.0	3.5
Sand, clayey, gray/tan, becoming less clayey with depth	5.5	1.5
Sand, tan/orange, coarse, turning gray at bottom, very wet	9.0	3.5
Sand and gravel, orange/gray, coarse, very wet	13.7	4.7
Clay, light gray/green, plastic	18.0	4.3
Sand and gravel, dark-gray, sharp upper contact	24.0	6.0

	Screen depth (ft)	Altitude of measuring point (ft above sea level)
Well OF20A	11.0-14.0	9.280
Well OF20B	19.0-24.0	8.550

Table 1.--Lithologic logs and construction data for observation wells--Continued

[ft = feet; in. = inches; THAMA = Toxic and Hazardous Materials Agency; Depth measurement is read at base of lithologic descriptor unit]

Sand size nomenclature:

vcus = very coarse upper* sand	1,410 - 2,000 microns	mls = middle lower sand	250 - 350 microns
vcls = very coarse lower* sand	1,000 - 1,410 microns	fus = fine upper sand	177 - 250 microns
cus = coarse upper sand size	710 - 1,000 microns	fls = fine lower sand	125 - 177 microns
cls = coarse lower sand size	500 - 710 microns	vfus = very fine upper sand	88 - 125 microns
mus = middle upper sand size	350 - 500 microns	vfls = very fine lower sand	62 - 88 microns

*Lower and upper refer to the finest and coarsest grain sizes within each category of the 62 to 2,000 micron spectrum

Site OF21
Average altitude of land surface at cluster: 8.33 ft

	Depth (ft)	Thickness (ft)
Soil, clayey	0.5	0.5
Sand, silty, orange	2.3	1.8
Sand, orange, and small gravel	4.0	1.7
Sand and gravel, orange, wet. Bottom slightly grayer with more gravel, dark-gray coating on gravel	9.0	5.0
Sand, orange/tan, coarse, wet with some small pebbles	10.0	1.0
Sand, dark-gray, coarse, wet with some small pebbles	14.0	4.0

	Screen depth (ft)	Altitude of measuring point (ft above sea level)
Well OF21	9.0-14.0	11.125

Site OF22
Average altitude of land surface at cluster: 9.05 ft

	Depth (ft)	Thickness (ft)
Sand, silty, brown, tight	4.0	4.0
Sand, brown, medium, poorly sorted	7.0	3.0
Sand, brown, medium, well sorted, wet	9.0	2.0
Sand, light-tan, medium, well sorted	14.0	5.0
Sand, grayish-brown, (darker than layer above), medium, poorly sorted	19.0	5.0
Sand, clayey, brown; and silt, greenish-gray	21.0	2.0
Sand, brown, fine grained, well-sorted	24.0	3.0

	Screen depth (ft)	Altitude of measuring point (ft above sea level)
Well Of22A	11.0-13.0	11.62
Well OF22B	22.0-24.0	12.67

Table 2.--Grain-size distribution from core-sample analyses

[Grain size is measured in micrometers. Units are expressed as the percentage of material that is finer than the indicated grain size]

Well site OF6 at 14-foot depth		Well site OF6C at 13-foot depth		Well site OF6C at 23-foot depth		Well site OF12A at 7.1-7.6-foot depth	
Grain size analyzed	Percentage finer than	Grain size analyzed	Percentage finer than	Grain size analyzed	Percentage finer than	Grain size analyzed	Percentage finer than
5,000	99.3	2,000	100	9,525	82.5	2,000	100
2,000	97.3	800	99.8	5,000	57	800	99.9
800	92.2	430	89	2,000	34.3	430	96
430	73	250	26.6	800	27.1	250	78.8
250	62.3	150	9.7	430	17.8	150	40.9
150	49.9	75	7.5	250	9.4	75	24.6
75	32.1	23	5.5	150	6.7	22	12.8
22	17.1	9	4.5	75	4.2	9	11.2
9	15.3	5	4.5	24	1.5	5	10.2
5	13.6	2	4.5	10	1	2	8.7
2	12.2	.5	4	5	1	.5	6.6
.5	10.6	.2	3.5	2	1	.2	5.6
.2	9.4	.1	3	.5	.9	.1	4.6
.1	8.3	.03	3	.2	.4	.03	3.5
.03	7			.1	0		
				.03	0		

Well site OF12B at 16-17.5-foot depth		Well site OF12B at 22.5-24-foot depth		Well site OF14C at 11-13-foot depth		Well site OF14C at 20-25-foot depth	
Grain size analyzed	Percentage finer than	Grain size analyzed	Percentage finer than	Grain size analyzed	Percentage finer than	Grain size analyzed	Percentage finer than
5,000	99.1	9,525	94.3	2,000	100	5,000	98.4
2,000	78.2	5,000	83.5	800	99.9	2,000	84.2
800	66.2	2,000	78.1	430	99.5	800	73.4
430	41.1	800	73.3	250	98.6	430	56
250	14.2	430	54	150	93.2	250	34.5
150	7.9	250	21	150	54.1	150	26
75	4.7	150	11.5	75	14.7	75	18.7
24	3.6	75	7.7	22	12.1	22	14.1
9	2.8	23	6	9	10.6	9	11.6
5	2.8	9	5.7	5	8.6	5	9.7
2	2.4	5	5.3	2	7.1	2	7.8
.5	2	2	4.2	.5	6.1	.5	6.3
.2	1.6	.5	3.4	.2	5.6	.2	5.3
.1	1.4	.2	2.7	.1	3.6	.1	4.8
.03	.8	.1	2.1	.03		.03	3.4
		.03	1.5				

Well site OF14D at 80-85-foot depth		Well site OF16A at 9-11-foot depth		Well site OF16A at 18.5-23.5-foot depth		Well site OF17B at 32-33-foot depth	
Grain size analyzed	Percentage finer than	Grain size analyzed	Percentage finer than	Grain size analyzed	Percentage finer than	Grain size analyzed	Percentage finer than
5,000	95	5,000	98.4	9,525	95.5	2,000	99.6
2,000	91.5	2,000	96.6	5,000	76.4	800	91.5
800	90.8	800	93.6	2,000	60.4	430	51.2
430	86.4	430	84.3	800	56	250	19
250	59.8	250	53.3	430	47.8	150	11
150	42.5	150	30.4	250	34	75	5.5
75	36.7	75	21.5	150	12.7	24	3.6
21	28.2	22	16.1	75	4.7	9	3
8	25.8	9	13.9	23	3.5	5	1.2
4	22.9	5	11.7	9	3.2	2	1.2
1	18.8	3	9.5	5	2.8	.5	1
.5	15.3	.5	7.8	2	2.5	.2	.6
.2	12.9	.2	6.1	.5	2.1	.1	0
.1	11.7	.1	5.6	.2	1.8	.03	0
.03	8.8	.03	4.2	.1	1.4		
		.03	1.1				

Table 3.--Chemical analyses of selected core samples

[All units are in micrograms per gram except for cation-exchange capacity, which is expressed as milliequivalents per 100 grams; < = less than; % = percent]

NOTE: Core may be sampled at a point above or below screened intervals

Well site OF6 at 14-foot depth	
Constituent	Concentration
Total organic carbon in soil	1,476
Total organic carbon in <125 micrometer fraction (32.2% of soil core)	393
Cation exchange capacity	3
Arsenic	22.4
Iron	7,310
Manganese	35.2
Antimony	< .32

Well site OF6C at 13-foot depth	
Constituent	Concentration
Total organic carbon in soil	2,983
Total organic carbon in <125 micrometer fraction (2.0% of soil core)	149
Cation exchange capacity	1.2
Arsenic	4.06
Iron	1,700
Manganese	10
Antimony	< .32

Well site OF6C at 23-foot depth	
Constituent	Concentration
Total organic carbon in soil	2,310
Total organic carbon in <125 micrometer fraction (5.1% of soil core)	271
Cation exchange capacity	1
Arsenic	.84
Iron	5,030
Manganese	22.2
Antimony	< .32

Well site OF12B at 16-17.5-foot depth	
Constituent	Concentration
Total organic carbon in soil	2,290
Total organic carbon in <125 micrometer fraction (3.7% of soil core)	170
Cation exchange capacity	.6
Arsenic	1.05
Iron	2,290
Manganese	14.3
Antimony	< .32

Well site OF12B at 22.5-24-foot depth	
Constituent	Concentration
Total organic carbon in soil	39,904
Total organic carbon in <125 micrometer fraction (6.1% of soil core)	1,758
Cation exchange capacity	1.6
Arsenic	.38
Iron	2,300
Manganese	14.3
Antimony	< .32

Well site OF14C at 11-13-foot depth	
Constituent	Concentration
Total organic carbon in soil	546
Total organic carbon in <125 micrometer fraction (85.7% of soil core)	2,008
Cation exchange capacity	2.7
Arsenic	2.33
Iron	9,150
Manganese	69.9
Antimony	< .32

Well site OF16A at 9-11-foot depth	
Constituent	Concentration
Total organic carbon in soil	27,497
Total organic carbon in <125 micrometer fraction (17.1% of soil core)	274
Cation exchange capacity	1.9
Arsenic	2.65
Iron	4,680
Manganese	33.5
Antimony	< .32

Well site OF16A at 18.5-23.5-foot depth	
Constituent	Concentration
Total organic carbon in soil	2,795
Total organic carbon in <125 micrometer fraction (5.1% of soil core)	332
Cation exchange capacity	1
Arsenic	.77
Iron	4,180
Manganese	61.1
Antimony	< .32

Well site OF12A at 7.1-7.6-foot depth	
Constituent	Concentration
Total organic carbon in soil	737
Total organic carbon in <125 micrometer fraction (27.9% of soil core)	374
Cation exchange capacity	2.7
Arsenic	1.46
Iron	11,600
Manganese	45.4
Antimony	< .32

Well site OF14C at 20-25-foot depth	
Constituent	Concentration
Total organic carbon in soil	25,142
Total organic carbon in <125 micrometer fraction (14.1% of soil core)	1,119
Cation exchange capacity	1.9
Arsenic	1.81
Iron	4,700
Manganese	29
Antimony	< .32

Well site OF14D at 80-85-foot depth	
Constituent	Concentration
Total organic carbon in soil	95,680
Total organic carbon in <125 micrometer fraction (22.4% of soil core)	4,940
Cation exchange capacity	4.4
Arsenic	2.49
Iron	10,300
Manganese	113
Antimony	< .32

Well site OF17B at 32-33-foot depth	
Constituent	Concentration
Total organic carbon in soil	1,543
Total organic carbon in <125 micrometer fraction (11.3% of soil core)	266
Cation exchange capacity	.7
Arsenic	1.11
Iron	2,550
Manganese	18.9
Antimony	< .32

Table 4.--Laboratory analyses of undisturbed samples from the confining unit for wells OF18B and OF13B

[Dry density is expressed in grams per milliliter, cation-exchange capacity is expressed as milliequivalent per 100 grams, and hydraulic conductivity is expressed in feet per day. Liquid limit and plastic limit are expressed as percents. Plasticity index is the difference between these two limits[1]]

Parameter	Depth of sample, in feet				
	Well OF18B			Well OF13B	
	25-26	30-31	39-40	35-36	40-41
Dry density	1.704	1.798	1.405	1.481	1.236
Soil pH	5.9	5.75	5.38	4.64	5.06
Cation-exchange capacity	3.842	8.906	10.478	8.557	21.829
Percent moisture	12.9	16.8	27.9	35.9	52.3
Hydraulic conductivity	6.8×10^{-6}	4.7×10^{-6}	1.6×10^{-5}	1.6×10^{-4}	4.7×10^{-4}
Liquid limit	57	37	27	69	172
Plastic limit	37	21	18	43	108
Plasticity index	20	16	9	26	64

[1] John Barker, Geotechnology, St. Louis, Missouri, oral commun., 1988.

Table 5.--Chemical analyses of ground water, December 1985 to September 1987

[Inorganics, organics, and dissolved oxygen are expressed in milligrams per liter (mg/L). Fixed end point (4.5) alkalinity is expressed by milligrams per liter bicarbonate, and specific conductance is expressed as microsiemens per centimeter at 25 degrees Celsius. Dashes indicate parameter was not analyzed. < = less than]

NOTE: Some inorganic constituents were analyzed only once because they were not detectable or were present at concentrations less than those allowed by the National Primary Drinking Water Regulations established by the U.S. Environmental Protection Agency (1987). These nondetectable inorganic constituents and their detection limits (shown in parentheses) included beryllium (0.001 mg/L), lead (0.005 mg/L), mercury (0.0002 mg/L), selenium (0.003 mg/L), and cyanide (0.005 mg/L).

Copper concentrations were at less than detectable limits (0.004 mg/L) in most wells and were present below the allowable National Secondary Drinking Water Regulations (U.S. Environmental Protection Agency, 1987) for drinking water (1.0 mg/L) in well OF6 (0.156 mg/L), in well OF14A (0.022 mg/L), and in well OF17A (0.088 mg/L). Chromium concentrations were at less than detection levels (0.004 mg/L) in most wells and were present at concentrations less than maximum National Primary Drinking Water Regulations allowable (U.S. Environmental Protection Agency, 1987) for drinking water (0.05 mg/L) in well OF13B (0.01 mg/L) and well OF14B (0.01 mg/L). Therefore, copper and chromium were deleted from subsequent sampling analyses.

Nickel concentrations varied across the site. The maximum measured concentrations in December 1985 were 0.09 mg/L in well OF14A, 0.031 mg/L in well OF12A, and 0.21 mg/L in well OF6. The remaining concentrations varied from less than detectable levels (0.004 mg/L) to 0.016 mg/L. Nickel was detected in background wells at concentrations up to 0.013 mg/L. Allowable National Primary Drinking Water Regulations or Secondary Drinking Water Regulations or have not been formulated for nickel.

Cond	= Specific conductance	Chlorob.	= Chlorobenzene	PCE	= Tetrachloroethylene
D.O.	= Dissolved oxygen	Chlorofm.	= Chloroform	12DCE	= 1,2-Dichloroethylene
AmmOrN	= Ammonia + organic nitrogen	12DCA	= 1,2-Dichloroethane	TCA	= 1,1,2-Trichloroethane
Phosph.	= Phosphorous	11DCE	= 1,1-Dichloroethylene	TCE	= Trichloroethylene
TDS	= Total dissolved solids	Ethylben.	= Ethylbenzene	VC	= Vinyl chloride
DOC	= Dissolved organic carbon	Meth. Cl.	= Methylene chloride	MB	= Identification letter for method blank in table 6
Carb.Tet.	= Carbon tetrachloride	PCA	= 1,1,2,2-Tetrachloroethane		

Property or Constituent	Concentrations at wells for each sampling date (month/day)											
	Well OF1					Well OF2	Well OF3			Well OF5		
	12/06 1985	3/10 1986	7/09 1986	9/09 1986	12/02 1986	12/09 1985	12/12 1985	3/11 1986	7/09 1986	12/12 1985	3/11 1986	7/09 1986
pH	5.61	--	5.85	6.04	5.79	5.43	4.86	4.98	4.94	4.83	4.97	5.25
Cond.	124	--	117	114	109	96	79	85	94	--	135	129
D.O.	4.2	--	--	5.1	4.6	--	2.3	2.5	--	2.7	6.7	3.2
Alkalinity	19.15	--	--	--	17.07	11.95	1.83	--	2.32	2.44	--	4.88
Antimony	.0019	--	--	--	<.0027	.0017	.0023	--	--	.003	--	--
Arsenic	<.001	--	--	--	<.0035	<.001	<.001	--	--	<.001	--	--
Boron	.356	--	--	--	<.04	.101	<.04	--	--	<.04	--	--
Calcium	8.52	--	--	--	9.86	7.89	2.9	--	--	2.47	--	--
Iron	1.37	--	--	--	.494	.009	.154	--	--	13.5	--	--
Magnesium	3.29	--	--	--	2.8	2.95	3.85	--	--	5.8	--	--
Manganese	.156	--	--	--	.149	.024	.224	--	--	.21	--	--
Potassium	1	--	--	--	.78	.167	.949	--	--	1.32	--	--
Sodium	6.36	--	--	--	5.62	2.96	3.06	--	--	8.98	--	--
Silica	8.98	--	--	--	--	9.5	5.03	--	--	7.8	--	--
Zinc	.017	--	--	--	.042	.016	.05	--	--	.029	--	--
Chloride	15.3	--	--	--	4.5	2.2	4.1	--	--	23.1	--	--
Fluoride	<.1	--	--	--	<.1	<.1	<.1	--	--	<.1	--	--
Bromide	<.5	--	--	--	<.5	<.5	<.5	--	--	<.5	--	--
Sulfate	33.9	--	--	--	27.5	22	20.7	--	--	25	--	--
Sulfide	--	--	--	--	--	--	--	--	--	--	--	--
Nitrate	.1	--	--	--	.143	1.08	.42	--	--	.63	--	--
Nitrite	6.1	--	--	--	<.05	<.01	<.01	--	--	<.01	--	--
AmmOrN	1.12	--	--	--	--	<.28	.027	--	--	.027	--	--
Phosph.	2.11	--	--	--	.011	.012	.068	--	--	<.01	--	--
Ammonia	.281	--	--	--	--	<.01	.56	--	--	.28	--	--
TDS	92	--	--	--	84	--	60	--	--	100	--	--
DOC	1.92	--	--	--	--	--	1.75	--	--	1.64	--	--
Benzene	<.005	<.005	.001	<.0005	--	<.005	<.005	<.005	.001	<.005	<.005	.001
Carb. Tet.	<.005	<.005	<.0015	<.0015	--	<.005	<.005	<.005	<.0015	<.005	<.005	<.0015
Chlorob.	<.005	<.005	<.0006	<.0006	--	<.005	<.005	<.005	<.0006	<.005	<.005	<.0006
Chlorofm.	<.005	<.005	<.0008	<.0008	--	<.005	.006	<.005	<.0008	<.005	<.005	<.0008
12DCA	<.001	<.001	<.0015	<.0015	--	<.001	<.001	<.001	<.0015	<.001	<.01	<.0015
Meth. Cl.	.515	<.005	.003	<.0011	--	.014	.026	<.005	.003	.106	<.005	.004
PCA	<.01	<.01	.013	<.0014	--	<.01	<.01	<.01	<.0014	<.01	<.01	<.0014
PCE	<.005	<.005	<.0015	<.0015	--	<.005	<.005	<.005	<.0015	<.005	<.005	<.0015
Toluene	<.005	<.005	<.001	<.0004	--	<.005	<.005	<.005	.001	<.005	<.005	<.001
12DCE	<.005	<.005	<.0015	<.0015	--	<.005	<.005	<.005	<.0015	<.005	<.005	<.0015
TCA	<.005	<.005	<.0016	<.0016	--	<.005	<.005	<.005	<.0016	<.005	<.005	<.0016
TCE	<.005	<.005	<.0013	.0014	--	<.005	<.005	<.005	<.0013	<.005	<.005	<.0013
VC	<.01	<.01	<.0012	<.0012	--	<.01	<.01	<.01	<.0012	<.01	<.01	<.0012
MB	A	K	R	S	--	B	D	J	R	D	J	R

Table 5.--Chemical analyses of ground water, December 1985 to September 1987--Continued

[Inorganics, organics, and dissolved oxygen are expressed in milligrams per liter (mg/L). Fixed end point (4.5) alkalinity is expressed by milligrams per liter bicarbonate, and specific conductance is expressed as microsiemens per centimeter at 25 degrees Celsius. Dashes indicate parameter was not analyzed. < = less than]

Cond	= Specific conductance	Chlorob.	= Chlorobenzene	PCE	= Tetrachloroethylene
D.O.	= Dissolved oxygen	Chlorofm.	= Chloroform	12DCE	= 1,2-Dichloroethylene
AmmOrN	= Ammonia + organic nitrogen	12DCA	= 1,2-Dichloroethane	TCA	= 1,1,2-Trichloroethane
Phosph.	= Phosphorous	11DCE	= 1,1-Dichloroethylene	TCE	= Trichloroethylene
TDS	= Total dissolved solids	Ethylben.	= Ethylbenzene	VC	= Vinyl chloride
DOC	= Dissolved organic carbon	Meth. Cl.	= Methylene chloride	MB	= Identification letter for method blank in table 6
Carb.Tet.	= Carbon tetrachloride	PCA	= 1,1,2,2-Tetrachloroethane		

Property or Constituent	Concentrations at wells for esch sampling date (month/day) Well OF6												
	12/11 1985	3/10 1986	7/08 1986	7/22 1986	7/29 1986	8/05 1986	8/12 1986	8/19 1986	8/25 1986	9/03 1986	9/12 1986	9/23 1986	10/02 1986
pH	4.37	4.76	4.65	4.45	4.4	4.35	4.33	4.33	4.41	4.29	4.32	4.44	4.31
Cond.	628	679	995	922	893	954	935	907	915	860	807	734	755
D.O.	.5	--	.2	--	--	--	--	--	--	--	.5	--	--
Alkalinity	0	4.63	0	--	--	--	--	--	--	--	0	--	--
Antimony	.0132	.013	.015	--	--	--	--	--	--	--	<.0032	--	--
Arsenic	.472	2.243	--	1.73	.68	1.26	1.23	1.33	1.47	1.49	1.51	1.6	1.53
Boron	.805	.59	1.96	--	--	--	--	--	--	--	.724	--	--
Calcium	18	10.7	22.7	21.7	18.1	19.7	18.6	17.6	16.9	1.89	15.4	11.7	16.8
Iron	27.9	26.3	52.2	46.7	42.2	47.9	47.3	46.0	43.3	48.7	45.2	37.8	36.4
Magnesium	30.2	52.2	81.4	--	--	--	--	--	--	--	45.1	--	--
Manganese	.878	.657	1.72	--	--	--	--	--	--	--	1.32	--	--
Potassium	5.76	5.06	9.8	--	--	--	--	--	--	--	10.6	--	--
Sodium	11.3	6.27	14.6	10.8	11	13.5	13.3	12.8	13.1	12.4	32	11.4	12.6
Silica	11.2	8.61	--	--	--	--	--	--	--	--	--	--	--
Zinc	1.43	.885	2.18	--	--	--	--	--	--	--	2.09	--	--
Chloride	97	157	270	277	252	318	246	249	249	246	212.6	172.	431
Fluoride	.27	.2	.71	--	--	--	--	.1	.14	.15	.14	.13	.13
Bromide	<.5	<.5	.69	--	--	--	--	1.24	<.5	1.24	<.5	<.5	1.19
Sulfate	51.2	65	116	84.5	85.4	187	146	157	249	148	176.5	145	346
Sulfide	--	<1	--	--	--	--	--	--	--	--	--	--	--
Nitrate	.52	.29	.3	--	--	--	--	--	--	--	.81	--	--
Nitrite	.52	<.05	<.05	--	--	--	--	--	--	--	<.05	--	--
AmmOrN	2.24	1.96	--	--	--	--	--	--	--	--	--	--	--
Phosph.	.143	.329	.67	--	--	--	--	--	--	--	.194	--	--
Ammonia	.842	.98	1.76	--	--	--	--	--	--	--	1.41	--	--
TDS	302	294	896	--	--	--		542	610	478	514	466	438
DOC	43.9	74	56.9	--	--	--	--	--	--	--	--	--	--
Benzene	.641	1.032	2.588	--	--	--	--	--	--	--	1.155	--	--
Carb. Tet.	.247	.678	.343	--	--	--	--	--	--	--	.203	--	--
Chlorob.	.185	.096	.214	--	--	--	--	--	--	--	.101	--	--
Chlorofm.	2.34	2.684	5.68	--	--	--	--	--	--	--	2.85	--	--
12DCA	.525	1.156	1.653	--	--	--	--	--	--	--	.888	--	--
Meth. Cl.	.027	.268	.214	--	--	--	--	--	--	--	.0759	--	
PCA	3.815	4.356	8.142	--	--	--	--	--	--	--	6.05	--	
PCE	.665	1.182	.82	--	--	--	--	--	--	--	.9625	--	--
Toluene	.074	.246	.122	--	--	--	--	--	--	--	.0691	--	--
12DCE	.599	2.586	.976	--	--	--	--	--	--	--	.795	--	--
TCA	.013	.048	.06	--	--	--	--	--	--	--	.0224	--	--
TCE	.599	1.326	1.397	--	--	--	--	--	--	--	.785	--	--
VC	<.01	<.01	.047	--	--	--	--	--	--	--	.0102	--	--
MB	B	K	P	--	--	--	--	--	--	--	V	--	--

Table 5.--Chemical analyses of ground water, December 1985 to September 1987--Continued

[Inorganics, organics, and dissolved oxygen are expressed in milligrams per liter (mg/L). Fixed end point (4.5) alkalinity is expressed by milligrams per liter bicarbonate, and specific conductance is expressed as microsiemens per centimeter at 25 degrees Celsius. Dashes indicate parameter was not analyzed. < = less than]

Cond	= Specific conductance	Chlorob.	= Chlorobenzene	PCE	= Tetrachloroethylene
D.O.	= Dissolved oxygen	Chlorofm.	= Chloroform	12DCE	= 1,2-Dichloroethylene
AmmOrN	= Ammonia + organic nitrogen	12DCA	= 1,2-Dichloroethane	TCA	= 1,1,2-Trichloroethane
Phosph.	= Phosphorous	11DCE	= 1,1-Dichloroethylene	TCE	= Trichloroethylene
TDS	= Total dissolved solids	Ethylben.	= Ethylbenzene	VC	= Vinyl chloride
DOC	= Dissolved organic carbon	Meth. Cl.	= Methylene chloride	MB	= Identification letter for method blank in table 6
Carb.Tet.	= Carbon tetrachloride	PCA	= 1,1,2,2-Tetrachloroethane		

Property or Constituent	Concentrations at wells for each sampling date (month/day)												
	Well OF6 (cont.)								Well OF6A				
	10/15 1986	10/30 1986	11/14 1986	12/08 1986	12/30 1986	1/16 1987	2/05 1987	9/21 1987	12/11 1985	3/10 1986	7/08 1986	7/22 1986	7/29 1986
pH	4.25	4.25	4.30	4.37	4.55	4.73	4.82	4.54	6.21	5.67	5.93	5.94	6.24
Cond.	866	769	776	614	638	440	384	722	1,369	746	1,066	1,214	1,491
D.O.	--	--	--	1.6	--	--	--	.5	0	0	0	--	--
Alkalinity	--	--	--	0	--	--	--	0	181.71	62.81	138.42	--	--
Antimony	--	--	--	<.0027	--	--	--	<.024	.0219	.019	.023	--	--
Arsenic	1.07	1.06	1.17	1.137	.72	.91	1.14	1.15	.167	.113	--	.28	.32
Boron	--	--	--	.35	--	--	--	.24	.682	2.51	1.23	--	--
Calcium	19.6	19	16.6	16	37.4	12.9	10.2	18	39.3	26.2	23.4	22.8	25.7
Iron	38.2	44	35.4	35.9	26.1	23.5	21.1	37.9	87.3	58.8	49.8	46.3	44.4
Magnesium	--	--	--	31	--	--	--	42.9	33.9	41.3	39.9	--	--
Manganese	--	--	--	1.01	--	--	--	1.14	4.57	2.83	2.5	--	--
Potassium	--	--	--	6.36	--	--	--	8.86	10.1	8.61	8.26	--	--
Sodium	19.6	14	14.7	11.2	16.7	7.7	6	12.3	102	59.1	86.4	60.3	111
Silica	--	--	--	--	--	--	--	14.5	10	13.7	--	--	--
Zinc	--	--	--	1.92	--	--	--	2.05	.162	1.29	1.6	--	--
Chloride	172	230	227	120	134	77	52	206	260	200	220	250	291
Fluoride	.12	.57	.23	.12	<.1	<.1	.10	.23	.33	.2	.2	--	--
Bromide	<.5	<.5	<.5	<.5	<.5	<.5	<.5	--	1.1	<.5	.68	--	--
Sulfate	111	183	223	122.5	78	79	128	71	170	72	94.8	123	106
Sulfide	--	--	--	--	--	--	--	14	--	<1	--	--	--
Nitrate	--	--	--	.53	--	--	--	.68*	.05	.1	<.05	--	--
Nitrite	--	--	--	<.05	--	--	--	.09	.94	.08	<.05	--	--
AmmOrN	--	--	--	--	--	--	--	3.61	1.96	3.08	--	--	--
Phosph.	--	--	--	.037	--	--	--	.02	.148	.176	.292	--	--
Ammonia	--	--	--	.941	--	--	--	1.8	1.64	1.65	2.11	--	--
TDS	484	392	580	230	362	224	229	461	126	560	616	--	--
DOC	--	--	--	--	--	--	--	--	87.4	74	81.4	--	--
Benzene	2.295	1.84	.9	.565	.525	<.025	<.025	3.08	2.324	1.638	1.73	--	--
Carb. Tet.	.39	.637	.115	.12	.125	.135	<.075	.75	.105	.143	.159	--	--
Chlorob.	.269	.203	.145	.115	.09	.053	<.03	.255	.164	.16	.222	--	--
Chlorofm.	6.82	4.545	3.49	1.855	1.635	.235	.695	9.25	6.117	3.715	3.91	--	--
12DCA	2.42	1.302	1.12	.81	.565	.39	.15	<.001	1.059	1.063	.855	--	--
11DCE	.005	.009	<.095	--	<.095	<.095	<.095	--	--	--	--	--	--
Ethylben.	.295	.01	<.02	--	<.02	<.02	.05	--	--	--	--	--	--
Meth. Cl.	.074	.132	<.055	.415	<.055	<.055	<.055	.34	.157	.255	.12	--	--
PCA	6.265	2.620	4.375	2.305	3.08	1.552	8.085	3.665	8.346	4.149	8.64	--	--
PCE	1.59	.936	.68	.475	.535	.353	.285	1.765	1.223	1.027	.901	--	--
Toluene	.19	.124	.085	.065	.06	<.02	.1	.19	.164	.114	.149	--	--
12DCE	1.575	1.789	.67	.505	.58	.365	.46	2.215	.91	.905	.422	--	--
TCA	.019	<.0016	<.08	<.08	<.08	<.08	<.08	<.001	.04	<.05	.036	--	--
TCE	1.59	1.246	.545	.485	.63	.505	3.28	--	1.287	1.068	1.027	--	--
VC	.018	.074	<.065	<.065	<.065	<.065	<.001	--	<.023	<.1	.014	--	--
MB	KK	LL	MM	Z	NN	OO	PP	FF	B	K	P	--	--

* Nitrate quantity calculated by subtracting nitrite concentration from total nitrate-nitrite-nitrogen concentration.

Table 5.--Chemical analyses of ground water, December 1985 to September 1987--Continued

[Inorganics, organics, and dissolved oxygen are expressed in milligrams per liter (mg/L). Fixed end point (4.5) alkalinity is expressed by milligrams per liter bicarbonate, and specific conductance is expressed as microsiemens per centimeter at 25 degrees Celsius. Dashes indicate parameter was not analyzed. < = less than]

Cond	= Specific conductance	Chlorob.	= Chlorobenzene	PCE	= Tetrachloroethylene
D.O.	= Dissolved oxygen	Chlorofm.	= Chloroform	12DCE	= 1,2-Dichloroethylene
AmmOrN	= Ammonia + organic nitrogen	12DCA	= 1,2-Dichloroethane	TCA	= 1,1,2-Trichloroethane
Phosph.	= Phosphorous	11DCE	= 1,1-Dichloroethylene	TCE	= Trichloroethylene
TDS	= Total dissolved solids	Ethylben.	= Ethylbenzene	VC	= Vinyl chloride
DOC	= Dissolved organic carbon	Meth. Cl.	= Methylene chloride	MB	= Identification letter for method blank in table 6
Carb.Tet.	= Carbon tetrachloride	PCA	= 1,1,2,2-Tetrachloroethane		

Property or Constituent	Concentrations at wells for each sampling date (month/day)												
	Well OF6A (cont.)												
	8/05 1986	8/12 1986	8/19 1986	8/25 1986	9/03 1986	9/12 1986	9/23 1986	10/02 1986	10/15 1986	10/30 1986	11/14 1986	12/08 1986	12/30 1986
pH	5.67	6.16	5.73	6.19	5.64	5.93	4.42	5.89	5.96	6.14	5.81	5.81	5.55
Cond.	1,136	1,430	1,227	1,433	1,162	1,550	1,250	1,326	1,449	1,590	1,289	1,215	704
D.O.	--	--	--	--	--	0	--	--	--	--	--	.2	--
Alkalinity	--	--	--	--	--	--	--	--	--	--	--	70.12	--
Antimony	--	--	--	--	--	<.0032	--	--	--	--	--	<.0027	--
Arsenic	.31	.31	.24	--	--	.34	.34	.28	.16	.22	.26	.323	.29
Boron	--	--	--	--	--	.828	--	--	--	--	--	.483	
Calcium	29.5	16.9	32.8	32.2	34.4	33.4	38	35.3	40.2	38.6	36.9	33	28.7
Iron	45.2	45.7	44.6	40.6	52.4	49.7	44.9	45.4	52.1	3.98	47.9	48.7	41.3
Magnesium	--	--	--	--	--	48.1	--	--	--	--	--	53.5	--
Manganese	--	--	--	--	--	3.58	--	--	--	--	--	3.25	--
Potassium	--	--	--	--	--	10.3	--	--	--	--	--	10.04	--
Sodium	112	101	112	149	102	93.5	120	110	146	91.8	91.4	68.4	51.6
Silica	--	--	--	--	--	--	--	--	--	--	--	--	--
Zinc	--	--	--	--	--	1.93	--	--	--	--	--	2.27	--
Chloride	327	332	339	361	375	319.6	215	273	321	304	399	298	224
Fluoride	--	--	.16	.15	.15	.2	.18	.23	.18	.19	.19	.26	.28
Bromide	--	--	<.5	1.83	<.5	1.88	<.5	.77	<.5	<.5	<.5	<.5	<.5
Sulfate	159	166	182	108	86	136.8	181	76	91	94	120	112.5	71
Sulfide	--	--	--	--	--	--	--	--	--	--	--	--	--
Nitrate	--	--	--	--	--	.38	--	--	--	--	--	.14	--
Nitrite	--	--	--	--	--	<.05	--	--	--	--	--	<.05	--
AmmOrN	--	--	--	--	--	--	--	--	--	--	--	--	--
Phosph.	--	--	--	--	--	.147	--	--	--	--	--	.037	--
Ammonia	--	--	--	--	--	2.08	--	--	--	--	--	2.22	--
TDS	--	--	--	--	--	814	--	786	842	684	768	614	604
DOC	--	--	--	--	--	--	--	--	--	--	--	--	--
Benzene	--	--	--	--	--	2.89	--	--	3.73	6.04	2.54	2.975	3.08
Carb. Tet.	--	--	--	--	--	.223	--	--	.42	<.15	<.15	.19	.19
Chlorob.	--	--	--	--	--	.188	--	--	.17	.28	.17	.19	.19
Chlorofm.	--	--	--	--	--	9.465	--	--	10.74	14.9	9.57	10.555	10.32
12DCA	--	--	--	--	--	1.185	--	--	.93	1.85	.97	1.195	1.16
11DCE	--	--	--	--	--	--	--	--	.014	<.19	<.19	<.095	<.19
Ethylben.	--	--	--	--	--	--	--	--	.022	<.04	<.04	<.020	<.04
Meth. Cl.	--	--	--	--	--	.323	--	--	.96	1.64	<.11	.27	<.11
PCA	--	--	--	--	--	7.465	--	--	5.85	9.73	9.79	9.255	11.73
PCE	--	--	--	--	--	2.397	--	--	1.35	2.5	1.28	1.5	1.42
Toluene	--	--	--	--	--	.16	--	--	.31	.36	.18	.21	.22
12DCE	--	--	--	--	--	.843	--	--	1.16	2.29	.88	1.125	1.06
TCA	--	--	--	--	--	.055	--	--	<.0016	<.16	<.16	.08	<.16
TCE	--	--	--	--	--	1.17	--	--	1.78	2.9	1.25	1.28	1.9
VC	--	--	--	--	--	<.03	--	--	.034	<.12	<.13	<.065	<.13
MB	--	--	--	--	--	V	--	--	KK	LL	MM	Z	NN

* Nitrate quantity calculated by subtracting nitrite concentration from total nitrate-nitrite-nitrogen concentration.

Table 5.--Chemical analyses of ground water, December 1985 to September 1987--Continued

[Inorganics, organics, and dissolved oxygen are expressed in milligrams per liter (mg/L). Fixed end point (4.5) alkalinity is expressed by milligrams per liter bicarbonate, and specific conductance is expressed as microsiemens per centimeter at 25 degrees Celsius. Dashes indicate parameter was not analyzed. < = less than]

Cond	= Specific conductance	Chlorob.	= Chlorobenzene	PCE	= Tetrachloroethylene
D.O.	= Dissolved oxygen	Chlorofm.	= Chloroform	12DCE	= 1,2-Dichloroethylene
AmmOrN	= Ammonia + organic nitrogen	12DCA	= 1,2-Dichloroethane	TCA	= 1,1,2-Trichloroethane
Phosph.	= Phosphorous	11DCE	= 1,1-Dichloroethylene	TCE	= Trichloroethylene
TDS	= Total dissolved solids	Ethylben.	= Ethylbenzene	VC	= Vinyl chloride
DOC	= Dissolved organic carbon	Meth. Cl.	= Methylene chloride	MB	= Identification letter for method blank in table 6
Carb.Tet.	= Carbon tetrachloride	PCA	= 1,1,2,2-Tetrachloroethane		

Property or Constituent	Concentrations at wells for each sampling date (month/day)												
	Well OF6A (cont.)			Well OF6B						Well OF6C			
	1/16 1987	2/05 1987	9/21 1987	12/11 1985	3/10 1986	7/08 1986	9/12 1986	12/08 1986	9/21 1987	12/11 1985	3/13 1986	7/01 1986	
pH	5.73	5.30	5.76	6.44	6.31	6.16	6.33	6.27	6.22	6.75	6.59	6.58	
Cond.	1,037	930	1,040	527	513	652	537	505	561	592	300	274	
D.O.	--	--	.9	0	0	0	0	0	0	0	0	--	
Alkalinity	--	--	--	91.46	99.02	118.29	101.83	87.8	87.8	130.49	158.41	166.46	
Antimony	--	--	<.024	.0017	.005	.004	<.0032	<.0027	<.024	.0119	.005	<.003	
Arsenic	.30	.32	.296	.0084	.017	--	.0278	.016	.014	.0016	<.001	<.003	
Boron	--	--	.17	1.345	1.78	2.76	1.02	.544	<.05	.345	.77	.853	
Calcium	25.6	21.2	21.9	23.1	31.1	29.3	22.5	24.7	24.8	26.2	16.8	19.5	
Iron	39.3	35.2	37.4	59.9	67.1	69.6	60.8	58.9	55.7	10.7	16.3	19	
Magnesium	--	--	39.1	10.6	13.5	13.9	10.9	11.2	12.1	6.34	3.89	4.01	
Manganese	--	--	1.87	1.27	1.54	1.69	1.26	1.18	1.13	.866	.508	.449	
Potassium	--	--	9.26	1.98	2.1	2.07	2.37	1.91	1.92	5.13	2.61	2	
Sodium	53.3	35.4	97.5	12.6	7.71	35.2	19.2	16.5	23.5	42.3	9.08	17	
Silica	--	--	15.3	12.8	13.7	--	--	--	17.8	10.7	13.1	--	
Zinc	--	--	1.39	<.002	.015	.018	.02	.02	.03	.04	.004	.008	
Chloride	219	229	253	100	209.2	141	121.9	120	112	11.9	5.5	3.12	
Fluoride	.18	.21	.25	.1	.32	<.1	<.1	.1	.17	.4	.21	.13	
Bromide	<.5	<.5	--	<.5	<.5	<.05	<.5	<.5	--	<.5	<.5	<.05	
Sulfate	60	108	62	1.4	4.2	<.1	<2	10	20	90	22.4	6.82	
Sulfide	--	--	<1	--	<1	--	--	--	8.8	--	2.7	--	
Nitrate	--	--	<.02*	.04	.06	.52	<.05	.07	<.02*	.03	.1	<.05	
Nitrite	--	--	.01	.94	.12	<.05	.05	<.05	<.01	.025	<.05	<.05	
AmmOrN	--	--	3.74	.148	.104	.217	.106	.037	.14	.038	.271	.17	
Phosph.	--	--	.14	.932	.635	.832	.912	.817	.8	1.96	1.68	2.16	
Ammonia	--	--	.6	1.4	<.28	--	--	--	1.34	1.96	1.68	--	
TDS	546	574	627	312	350	560	358	280	368	76	148	118	
DOC	--	--	--	12.9	13	11	--	--	--	34.6	2	2	
Benzene	2.515	<.05	4.72	.18	--	.344	.3733	.151	.95	<.005	<.005	.038	
Carb. Tet.	.255	<.15	.46	<.005	--	<.0015	<.0015	<.0015	<.0015	<.005	<.005	<.0015	
Chlorob.	.215	.140	.43	<.005	--	.006	.0062	.0018	.0213	<.005	<.005	<.0006	
Chlorofm.	2	5.03	15	<.005	--	.15	.0054	<.0008	.0134	<.005	<.005	.0008	
12DCA	1.05	.95	<.0015	.005	--	.008	.0066	.0031	<.0015	<.001	<.001	<.0015	
11DCE	<.095	<.19	--	--	--	--	--	<.0019	--	--	--	--	
Ethylben.	<.02	<.04	--	--	--	--	--	<.0004	--	--	--	--	
Meth. Cl.	<.055	<.11	1.14	.011	--	.014	.003	.0025	.0158	.012	<.005	.0139	
PCA	9.84	6.05	18.6	<.01	--	.102	.0281	.0073	.0349	<.01	<.01	<.0014	
PCE	1.41	4.57	1.7	<.005	--	<.0015	.0042	<.0015	.0027	<.005	<.005	<.0015	
Toluene	.21	.17	.26	<.005	--	.005	.0042	.0015	.0135	<.005	<.005	.0017	
12DCE	1.195	.85	2.28	.052	--	.13	.187	.0703	.37	<.005	<.005	<.0015	
TCA	<.08	<.16	<.0016	<.005	--	<.0016	<.0016	<.0016	<.0016	<.005	<.005	<.0016	
TCE	2.205	.41	3.86	<.005	--	.016	.053	.0029	.0061	<.005	<.005	<.0013	
VC	<.065	>.13	<.003	<.01	--	.005	.0076	.0023	.2725	<.01	<.01	<.0012	
MB	OO	PP	FF	B		Q	V	Z	FF	B	K	Q	

* Nitrate quantity calculated by subtracting nitrite concentration from total nitrate-nitrite-nitrogen concentration.

Table 5.--Chemical analyses of ground water, December 1985 to September 1987--Continued

[Inorganics, organics, and dissolved oxygen are expressed in milligrams per liter (mg/L). Fixed end point (4.5) alkalinity is expressed by milligrams per liter bicarbonate, and specific conductance is expressed as microsiemens per centimeter at 25 degrees Celsius. Dashes indicate parameter was not analyzed. < = less than]

Cond	= Specific conductance	Chlorob.	= Chlorobenzene	PCE	= Tetrachloroethylene
D.O.	= Dissolved oxygen	Chlorofm.	= Chloroform	12DCE	= 1,2-Dichloroethylene
AmmOrN	= Ammonia + organic nitrogen	12DCA	= 1,2-Dichloroethane	TCA	= 1,1,2-Trichloroethane
Phosph.	= Phosphorous	11DCE	= 1,1-Dichloroethylene	TCE	= Trichloroethylene
TDS	= Total dissolved solids	Ethylben.	= Ethylbenzene	VC	= Vinyl chloride
DOC	= Dissolved organic carbon	Meth. Cl.	= Methylene chloride	MB	= Identification letter for method blank in table 6
Carb.Tet.	= Carbon tetrachloride	PCA	= 1,1,2,2-Tetrachloroethane		

Property or Constituent	Concentrations at wells for each sampling date (month/day)										
	Well OF6C (cont.)		Well OF7		Well OF8						Well OF9
	9/10 1986	12/04 1986	12/12 1985	7/09 1986	12/06 1985	3/03 1986	7/01 1986	9/10 1986	12/02 1986	9/15 1987	12/16 1985
pH	6.65	6.82	7.06	6.76	4.92	5.68	4.88	4.95	5.16	5.57	5.28
Cond.	250	221	225	256	118	94	104	102	107	118	82
D.O.	--	0	0	0	3.3	2.1	2	3.3	2.8	--	3.1
Alkalinity	168.29	122.56	178.05	150	4.51	16.1	0	3.96	11.58	23.48	8.29
Antimony	<.0032	<.0027	.0014	--	.0021	.004	<.003	<.0032	<.0027	<.024	.0035
Arsenic	<.0015	<.0035	.0221	--	<.001	<.001	<.003	<.0015	<.0035	<.005	<.001
Boron	<.04	.105	.448	--	<.04	<.04	.024	.437	<.04	<.1	<.04
Calcium	18	19.6	39.1	--	3.66	6.88	2.74	2.69	5.23	7.4	3.1
Iron	21.1	2.33	13.5	--	.038	.068	.062	.054	.017	.13	.044
Magnesium	3.79	3.87	3.55	--	3.65	3.25	3.99	3.38	3.59	3.88	5.48
Manganese	.442	.354	.348	--	.05	.049	.056	.05	.047	.08	.088
Potassium	17.5	1.53	.962	--	1.19	2.99	.732	12.4	1.76	5.95	1.39
Sodium	12.7	13.9	.77	--	8.15	8.98	7.46	6.3	7.12	6.58	6.26
Silica	--	--	21.5	--	7.85	7.93	--	--	--	7.5	10.7
Zinc	.253	.025	.006	--	.008	.02	.037	.024	.06	.042	.023
Chloride	2.8	2.4	10.4	--	7.7	8.4	4.74	7.41	5.3	5	3.2
Fluoride	.11	.48	.2	--	<.1	.11	.06	<.1	<.1	.19	<.1
Bromide	<.5	<.5	<.5	--	<.5	<.5	<.05	<.5	<.5	--	<.5
Sulfate	1.97	8	<1	--	32.8	31.8	28.6	25.6	40	19.8	31.6
Sulfide	--	--	--	--	--	<1	--	--	--	--	--
Nitrate	<.05	.115	.02	--	.2	.22	.28	<.05	.222	.3*	.6
Nitrite	<.05	<.05	<.01	--	<.01	<.05	<.05	<.05	<.05	<.01	<.01
AmmOrN	.06	.021	1.68	--	.28	<.28	--	--	--	.33	.048
Phosph.	1.98	--	.059	--	.111	.016	.021	.055	.032	.02	<.01
Ammonia	--	--	1	--	<.01	.002	.005	.028	--	.3	<.28
TDS	138	194	22	--	94	92	42	90	120	109	108
DOC	--	--	11.4	--	1.24	2	2	--	--	--	2.4
Benzene	<.0005	<.0005	<.005	<.0005	--	<.005	<.0005	<.0005	--	<.0005	<.005
Carb. Tet.	<.0015	<.0015	<.005	<.0015	--	<.005	<.0015	<.0015	--	<.0015	<.005
Chlorob.	<.0006	<.0006	<.005	<.0006	--	<.005	<.0006	<.0006	--	<.0006	<.005
Chlorofm.	<.0008	<.0008	.25	<.0008	--	<.005	<.0008	<.0008	--	<.0008	.008
12DCA	<.0015	<.0015	<.001	<.0015	--	<.001	<.0015	<.0015	--	<.0015	<.001
Meth. Cl.	.0027	.0057	.125	.002	--	<.005	.0038	.0036	--	.0077	.018
PCA	<.0014	<.0014	<.01	<.0014	--	<.01	<.0014	<.0014	--	<.0014	<.01
PCE	<.0015	<.0015	<.005	<.0015	--	<.005	<.0015	<.0015	--	<.0015	<.005
Toluene	<.0004	.002	<.005	<.001	--	<.005	.002	<.0004	--	<.0004	<.005
12DCE	<.0015	<.0016	<.005	<.0015	--	<.005	<.0015	<.0015	--	<.0016	<.005
TCA	<.0016	<.0016	<.005	<.0016	--	<.005	<.0016	<.0016	--	<.0016	<.005
TCE	.0013	<.0013	<.005	<.0013	--	<.005	<.0013	.0014	--	<.0013	<.005
VC	<.0012	<.0013	<.01	<.0012	--	<.01	<.0012	<.0012	--	<.0013	<.01
MB	V	Z	D	R		K	M	T		CC	D

* Nitrate quantity calculated by subtracting nitrite concentration from total nitrate-nitrite-nitrogen concentration.

Table 5.--Chemical analyses of ground water, December 1985 to September 1987--Continued

[Inorganics, organics, and dissolved oxygen are expressed in milligrams per liter (mg/L). Fixed end point (4.5) alkalinity is expressed by milligrams per liter bicarbonate, and specific conductance is expressed as microsiemens per centimeter at 25 degrees Celsius. Dashes indicate parameter was not analyzed. < = less than]

Cond	= Specific conductance	Chlorob.	= Chlorobenzene	PCE	= Tetrachloroethylene
D.O.	= Dissolved oxygen	Chlorofm.	= Chloroform	12DCE	= 1,2-Dichloroethylene
AmmOrN	= Ammonia + organic nitrogen	12DCA	= 1,2-Dichloroethane	TCA	= 1,1,2-Trichloroethane
Phosph.	= Phosphorous	11DCE	= 1,1-Dichloroethylene	TCE	= Trichloroethylene
TDS	= Total dissolved solids	Ethylben.	= Ethylbenzene	VC	= Vinyl chloride
DOC	= Dissolved organic carbon	Meth. Cl.	= Methylene chloride	MB	= Identification letter for method blank in table 6
Carb.Tet.	= Carbon tetrachloride	PCA	= 1,1,2,2-Tetrachloroethane		

Property or Constituent	Concentrations at wells for each sampling date (month/day)									
	Well OF10	Well OF11	Well OF12A		Well OF12B					
	12/16 1985	12/16 1985	12/10 1985	3/06 1986	12/10 1985	3/06 1986	7/01 1986	9/10 1986	12/08 1986	9/18 1987
pH	6.0	6.22	5.76	4.66	7.0	6.53	6.74	6.63	6.66	6.52
Cond.	86	154	1,202	842	245	158	163	169	159	169
D.O.	4.8	2.1	.9	.6	0	1.6	0	0	.6	.7
Alkalinity	28.29	28.54	45.24	0	57.32	90.24	98.54	96.95	91.46	90.24
Antimony	.0048	.0038	.0136	.1	<.001	.047	<.003	<.0032	<.0027	<.024
Arsenic	.0014	.0013	<.001	<.001	<.001	<.001	<.003	<.0015	<.0035	<.005
Boron	.173	<.04	.081	.06	.224	.21	<.04	.8	.054	<.05
Calcium	4.88	8.71	33.3	28.8	13.6	11.7	10.6	9.9	11.3	10.8
Iron	6.21	2.34	2.33	1.47	9	2.93	10.6	12.6	13.4	11.7
Magnesium	2.08	5.65	20.5	16.8	5.7	5.18	5.12	4.47	4.35	4.52
Manganese	.157	.234	.998	.798	.489	.149	.471	.392	.341	.333
Potassium	1.2	1.24	13.2	8.76	1.33	1.13	1.07	1.07	.99	1.17
Sodium	5.9	12.5	126	88.4	10.6	8.99	9.7	8.16	8.16	9.41
Silica	8.98	9.19	7.34	7.23	13.8	13.7	--	--	--	18
Zinc	.027	.06	.201	.202	.012	.1	.039	.018	.015	.08
Chloride	6.5	17.9	163.8	151.2	30	10.2	7.7	11.1	9.3	10
Fluoride	<.1	<.1	.29	.25	.61	.15	.14	.13	.14	.19
Bromide	<.5	<.5	<.5	<.5	<.5	<.5	<.05	<.5	<.5	--
Sulfate	15.4	39.1	147.6	133.4	12.2	2	<.1	<2	3	50
Sulfide	--	--	--	<1	--	<1	--	--	--	--
Nitrate	.03	.05	.22	.06	.01	.05	<.05	<.05	<.05	.1*
Nitrite	.03	<.01	<.01	<.05	.02	<.05	<.05	<.05	<.05	<.01
Phosph.	<.01	.56	--	<.28	.075	.013	.042	.039	.037	.08
Ammonia	.436	.043	--	.018	.41	.238	.658	.659	.556	.4
AmmOrN	.56	.153	--	.032	.84	<.28	--	--	--	.73
TDS	100	136	750	454	98	78	82	138	114	305
DOC	--	15.7	9.97	7	1.51	1	1.3	--	--	--
Benzene	--	<.005	.04	.064	.057	<.005	<.0005	<.0005	.0012	<.0005
Carb. Tet.	--	<.005	<.005	<.005	<.005	<.005	<.0015	<.0015	<.0015	<.0015
Chlorob.	--	<.005	<.005	<.005	<.005	<.005	<.0006	<.0006	<.0006	<.0006
Chlorofm.	--	<.005	.267	.266	.007	<.005	.0017	<.0008	<.0008	<.0008
12DCA	--	<.001	<.001	<.001	<.001	<.001	<.0015	<.0015	<.0015	<.0015
Meth. Cl.	--	<.009	.006	.009	.068	.005	.0188	.0027	.0039	.0088
PCA	--	<.01	.192	.203	.017	.012	<.0014	<.0014	<.0014	<.0014
PCE	--	<.005	<.005	<.005	<.005	<.005	<.0015	<.0015	<.0015	<.0015
Toluene	--	<.005	.055	<.005	.024	<.005	.0007	<.0004	<.0004	<.0004
12DCE	--	<.005	<.005	.066	<.005	<.005	.0033	.0025	.0026	<.0016
TCA	--	<.005	.047	<.005	<.005	<.005	<.0016	<.0016	<.0016	<.0016
TCE	--	<.005	<.005	.025	<.005	<.005	<.0013	.0018	<.0013	<.0013
VC	--	<.01	<.01	<.01	<.01	<.01	<.0012	<.0012	<.0013	<.0013
MB	--	F	D	I	B	I	L	T	Z	JJ

* Nitrate quantity calculated by subtracting nitrite concentration from total nitrate-nitrite-nitrogen concentration.

Table 5.--Chemical analyses of ground water, December 1985 to September 1987--Continued

[Inorganics, organics, and dissolved oxygen are expressed in milligrams per liter (mg/L). Fixed end point (4.5) alkalinity is expressed by milligrams per liter bicarbonate, and specific conductance is expressed as microsiemens per centimeter at 25 degrees Celsius. Dashes indicate parameter was not analyzed. < = less than]

Cond	= Specific conductance	Chlorob.	= Chlorobenzene	PCE	= Tetrachloroethylene
D.O.	= Dissolved oxygen	Chlorofm.	= Chloroform	12DCE	= 1,2-Dichloroethylene
AmmOrN	= Ammonia + organic nitrogen	12DCA	= 1,2-Dichloroethane	TCA	= 1,1,2-Trichloroethane
Phosph.	= Phosphorous	11DCE	= 1,1-Dichloroethylene	TCE	= Trichloroethylene
TDS	= Total dissolved solids	Ethylben.	= Ethylbenzene	VC	= Vinyl chloride
DOC	= Dissolved organic carbon	Meth. Cl.	= Methylene chloride	MB	= Identification letter for method blank in table 6
Carb.Tet.	= Carbon tetrachloride	PCA	= 1,1,2,2-Tetrachloroethane		

Property or Constituent	Concentrations at wells for each sampling date (month/day)											
	Well OF12C						Well OF13A					
	12/10 1985	3/06 1986	7/01 1986	9/10 1986	12/08 1986	9/18 1987	12/17 1985	3/11 1986	7/03 1986	9/11 1986	12/25 1986	9/16 1987
pH	6.57	6.11	6.26	6.34	6.48	6.36	5.29	5.37	4.95	5.08	5.14	5.01
Cond.	173	157	160	159	163	160	188	91	156	130	140	170
D.O.	0	0	0	0	.2	0	3.4	5.8	2.5	0	4.8	3.6
alkalinity	87.81	72.56	90.24	90.85	91.46	85.98	7.81	11.22	4.88	5.79	6.1	6.1
Antimony	.001	<.002	<.003	<.0032	<.0027	<.024	.0055	<.002	<.003	<.0032	<.0027	<.024
Arsenic	<.001	<.001	<.003	<.0015	<.0035	<.005	<.001	<.001	.004	<.0015	<.0035	<.005
Boron	.427	.46	.683	.7	.217	<.05	<.04	.56	<.04	<.04	<.04	<.1
Calcium	7.68	9.67	8.84	9.92	10	9.57	12.2	10.1	11.3	9.14	12.7	14.7
Iron	12.8	16.1	15.4	14.8	16.2	15.2	.067	.171	.126	.066	.046	.18
Magnesium	2.46	2.99	3.22	3.06	3.09	3.44	4.85	4.34	5.29	4.85	4.7	6.85
Manganese	.279	.311	.301	.291	.282	.284	.118	.076	.129	.059	.045	.29
Potassium	1.05	1.01	.847	.99	.84	.89	.741	.44	.592	.6	.44	.72
Sodium	8.47	7.67	8.44	7.7	8.02	8.64	20	5.82	3.79	4.11	4.9	5.34
Silica	15.8	16.4	--	--	--	19.2	5.9	5.25	--	--	--	8.3
Zinc	.004	.006	.025	.03	.02	.03	.393	.183	.303	.196	.194	.379
Chloride	9.3	6.5	5.97	8.97	8.1	8	3.9	2.8	9.33	7.15	7.25	9
Fluoride	.1	<.1	.08	<.1	.15	.13	<.1	<.1	<.1	<.1	.15	.16
Bromide	<.5	<.5	<.05	<.5	<.5	--	<.5	<.5	<.05	<.5	<.5	--
Sulfate	4.2	2.3	3.07	<2	6	40	72.7	32.1	42	36.4	47.5	33.9
Sulfide	--	<1	--	--	--	--	--	<1	--	--	--	--
Nitrate	<.05	<.05	<.05	<.05	.1	.06*	5.46	3.19	1.24	1.53	2.61	1.76*
Nitrite	<.01	<.05	<.05	<.05	<.05	<.01	<.01	<.05	<.05	<.05	<.05	.04
Phosph.	.322	.385	<.01	.132	.052	.13	.28	< .28	--	--	--	<.2
Ammonia	.895	.935	1.12	.793	1.18	1.2	.027	<.01	.052	.039	.021	.02
AmmOrN	1.4	1.4	--	--	--	1.46	<.01	.013	.002	<.01	<.01	<.2
TDS	122	16	72	112	64	107	176	70	106	102	76	119
DOC	1.64	1	2.7	--	--	--	2.04	1	1.4	--	--	--
Benzene	<.005	<.005	.0023	<.0005	<.0005	<.0005	--	<.005	<.0005	<.0005	<.0005	<.0005
Carb. Tet.	<.005	<.005	<.0015	<.0015	<.0015	<.0015	--	<.005	<.0015	<.0015	<.0015	<.0015
Chlorob.	<.005	<.005	<.0006	<.0006	<.0006	<.0006	--	<.005	<.0006	<.0006	<.0006	<.0006
Chlorofm.	<.005	<.005	<.0008	<.0008	<.0008	<.0008	--	<.005	.0012	<.0008	<.0008	<.0008
12DCA	.008	<.001	<.0015	<.0015	<.0015	<.0015	--	<.001	<.0015	<.0015	<.0015	<.0015
Meth. Cl.	.031	<.005	.0163	.0027	.0038	.0028	--	.005	.0155	.0024	.0034	.0061
PCA	<.01	<.01	<.0014	<.0014	<.0014	<.0014	--	<.01	<.0014	.0037	<.0014	<.0014
PCE	<.005	<.005	<.0015	<.0015	<.0015	<.0015	--	<.005	<.0015	.0024	<.0015	<.0015
Toluene	.082	<.005	.0021	<.0004	<.0004	<.0004	--	<.005	<.001	<.0004	<.0004	<.0004
12DCE	<.005	<.005	<.0015	<.0015	<.0016	<.0016	--	<.005	<.0015	<.0015	<.0016	<.0016
TCA	<.005	<.005	<.0016	<.0016	<.0016	<.0016	--	<.005	<.0016	<.0016	<.0016	<.0016
TCE	<.005	<.005	<.0013	.0018	<.0013	<.0013	--	<.005	<.0013	.0032	.0015	<.0013
VC	<.01	<.01	<.0012	<.0012	<.0013	<.0013	--	<.01	<.0012	<.0012	<.0013	<.0013
MB	B	I	L	T	Z	JJ	--	K	L	T	W	DD

* Nitrate quantity calculated by subtracting nitrite concentration from total nitrate-nitrite-nitrogen concentration.

Table 5.--Chemical analyses of ground water, December 1985 to September 1987--Continued

[Inorganics, organics, and dissolved oxygen are expressed in milligrams per liter (mg/L). Fixed end point (4.5) alkalinity is expressed by milligrams per liter bicarbonate, and specific conductance is expressed as microsiemens per centimeter at 25 degrees Celsius. Dashes indicate parameter was not analyzed. < = less than]

Cond	= Specific conductance	Chlorob.	= Chlorobenzene	PCE	= Tetrachloroethylene
D.O.	= Dissolved oxygen	Chlorofm.	= Chloroform	12DCE	= 1,2-Dichloroethylene
AmmOrN	= Ammonia + organic nitrogen	12DCA	= 1,2-Dichloroethane	TCA	= 1,1,2-Trichloroethane
Phosph.	= Phosphorous	11DCE	= 1,1-Dichloroethylene	TCE	= Trichloroethylene
TDS	= Total dissolved solids	Ethylben.	= Ethylbenzene	VC	= Vinyl chloride
DOC	= Dissolved organic carbon	Meth. Cl.	= Methylene chloride	MB	= Identification letter for method blank in table 6
Carb.Tet.	= Carbon tetrachloride	PCA	= 1,1,2,2-Tetrachloroethane		

Property or Constituent	Concentrations at wells for each sampling date (month/day)											
	Well OF13B						Well OF13C					
	12/17 1985	3/11 1986	7/03 1986	9/11 1986	12/05 1986	9/16 1987	12/17 1985	3/11 1986	7/03 1986	9/11 1986	12/05 1986	9/16 1987
pH	6.14	5.96	6.12	6.13	6.11	5.77	5.98	5.68	6.02	5.84	5.88	5.67
Cond.	904	1,069	2,580	1,571	1,386	2,050	1,020	1,061	1,550	1,552	1,629	1,627
D.O.	1.4	0	0	0	0	0	0	0	0	0	0	0
Alkalinity	38.42	47.56	151.22	77.44	60.98	86.59	46.59	24.02	52.44	35.37	48.78	49.39
Antimony	.0143	.023	.021	<.0032	<.0027	.044	.0214	.021	.011	<.0032	<.0027	.05
Arsenic	<.001	.003	.038	.0022	<.0035	.006	.0124	.001	.014	<.0015	<.0035	<.005
Boron	3.82	6.99	11	2.91	3.6	.14	4.074	9.62	5.45	6.57	2.38	.15
Calcium	48.8	57.1	134	70.7	57.2	90.3	62.2	68.6	67	67.7	71	72.1
Iron	1.56	149	242	193	85	239	208	203	229	226	219	242
Magnesium	24.7	32.7	97.6	39.1	32.1	66.1	26.4	28.8	30.8	30.4	31.6	35.3
Manganese	3.15	4.76	17.4	5.8	4.33	9.61	4.18	4.16	4.37	4.71	4.5	4.49
Potassium	2.61	4.65	4.64	3.77	2.95	4.48	2.97	11.7	7.18	3.49	2.82	3.23
Sodium	21.2	54.4	59	36.3	30.1	45.1	20.5	8.13	22.2	21.5	20	23.7
Silica	12.8	12.8	--	--	--	15	15.3	15.8	--	--	--	18.4
Zinc	.02	.022	.053	.051	.026	.072	.014	.016	.021	.019	.016	.063
Chloride	380	313.5	604	623	420	604	460	384.6	410	491.2	516	533
Fluoride	<.1	.17	<.1	<.1	.38	.14	<.1	.28	<.1	<.1	.2	.12
Bromide	.84	<.5	.46	1.05	.95	--	.53	<.5	.32	.77	.95	--
Sulfate	5.6	26.3	14.3	9	47.5	32.7	<1	<2	1.3	<2	47.5	28
Sulfide	--	<1	--	--	--	--	--	<1	--	--	--	--
Nitrate	.16	<.05	<.05	.1	<.05	.6*	.13	<.05	<.05	.14	.08	<.024*
Nitrite	.15	<.05	<.05	.09	.08	.08	.156	.14	<.05	.08	<.05	.003
AmmOrN	1.12	<.28	--	--	--	.68	.222	.109	.072	.045	.323	.23
Phosph.	.048	.023	.098	.05	.083	<.01	.164	1.5	1.87	1.72	1.81	2.5
Ammonia	.516	.361	.397	.547	.545	.7	2.52	1.96	--	--	--	2.5
TDS	640	818	2,012	1,106	768	1,140	799	320	1,182	1,008	916	953
DOC	5.84	5	27	--	--	--	9.62	3	7.9	--	--	--
Benzene	.008	.009	.018	.0111	.0092	.0104	<.005	.008	.004	.0152	.0178	.0089
Carb. Tet.	<.005	<.005	<.0015	<.0015	<.0015	<.0015	<.005	<.005	<.0015	<.0015	<.0015	<.0015
Chlorob.	<.005	<.005	.007	.0017	<.0006	.0023	<.005	<.005	<.0006	<.0006	<.0006	.003
Chlorofm.	<.005	<.005	.005	<.0008	<.0008	<.0008	<.005	<.005	<.0008	<.0008	<.0008	<.0008
12DCA	.009	.022	.123	.0446	<.0015	.208	.001	.01	.014	.0143	.0132	<.0015
Meth. Cl.	.006	.007	.005	.0024	.0023	.0043	.031	.01	.005	.004	.0049	.009
PCA	<.01	.01	.068	<.0014	<.0014	<.0014	<.01	<.01	.005	<.0014	.0024	.0035
PCE	<.005	<.005	<.0015	<.0015	<.0015	<.0015	<.005	<.005	<.0015	<.0015	<.0015	<.0015
Toluene	.152	<.005	<.001	<.0004	.0011	<.0004	<.005	<.005	<.001	<.0004	.001	<.0004
12DCE	<.005	.191	.306	.186	.1129	.0412	<.005	.129	.101	.182	.243	.488
TCA	.009	.006	.048	<.0016	<.0016	<.0016	<.005	<.005	.007	.0048	.0058	.0018
TCE	<.005	.015	.052	.0089	.0024	<.0013	<.005	.01	.021	.0134	.0047	.0089
VC	<.01	<.01	.028	.102	.058	.0994	<.01	<.01	.007	.0118	.015	.1097
MB	F	J	O	T	W	DD	F	J	O	T	W	EE

* Nitrate quantity calculated by subtracting nitrite concentration from total nitrate-nitrite-nitrogen concentration.

Table 5.--Chemical analyses of ground water, December 1985 to September 1987--Continued

[Inorganics, organics, and dissolved oxygen are expressed in milligrams per liter (mg/L). Fixed end point (4.5) alkalinity is expressed by milligrams per liter bicarbonate, and specific conductance is expressed as microsiemens per centimeter at 25 degrees Celsius. Dashes indicate parameter was not analyzed. < = less than]

Cond	= Specific conductance	Chlorob.	= Chlorobenzene	PCE	= Tetrachloroethylene
D.O.	= Dissolved oxygen	Chlorofm.	= Chloroform	12DCE	= 1,2-Dichloroethylene
AmmOrN	= Ammonia + organic nitrogen	12DCA	= 1,2-Dichloroethane	TCA	= 1,1,2-Trichloroethane
Phosph.	= Phosphorous	11DCE	= 1,1-Dichloroethylene	TCE	= Trichloroethylene
TDS	= Total dissolved solids	Ethylben.	= Ethylbenzene	VC	= Vinyl chloride
DOC	= Dissolved organic carbon	Meth. Cl.	= Methylene chloride	MB	= Identification letter for method blank in table 6
Carb.Tet.	= Carbon tetrachloride	PCA	= 1,1,2,2-Tetrachloroethane		

Property or Constituent	Concentrations at wells for each sampling date (month/day)											
	Well OF14A		Well OF14B						Well OF14C			
	12/17 1985	3/12 1986	12/17 1985	3/12 1986	7/03 1986	9/11 1986	12/05 1986	9/16 1987	12/17 1985	3/12 1986	7/03 1986	9/11 1986
pH	4.45	4.6	6.22	6.23	5.73	5.59	5.98	5.54	6.2	6.38	5.76	6.08
Cond.	5,140	1,964	1,890	1,314	1,733	1,770	1,821	1,800	809	564	722	743
D.O.	3.6	2.6	1.9	0	0	0	0	0	0.3	3.3	0	0
alkalinity	.73	4.02	110.85	123.66	73.05	55.49	75	50.61	71.22	69.39	65.12	69.51
Antimony	.0355	.022	.0246	.015	.011	<.0032	<.0027	.028	.008	.005	<.003	<.0032
Arsenic	.0073	.001	.0131	.01	.026	.0082	.01	<.005	<.001	<.001	.004	<.0015
Boron	.193	.25	4.227	7.85	7.07	4.69	3.02	.1	2.576	4.32	1.75	1.35
Calcium	101	48.3	87.4	86.3	93.3	99.7	101	99.4	33.9	31.2	28.7	30.2
Iron	1.27	.477	163	146	176	155	160	156	95.5	88.8	99.6	98.4
Magnesium	108	61.4	57.1	58.2	68.6	67.6	68.6	73.3	12.4	11.7	11.8	12.2
Manganese	5.49	2.29	5.2	5.56	6.41	6.55	6.09	6.34	1.64	1.93	1.88	2.01
Potassium	30.7	16.4	2.46	1.88	1.79	2.57	1.91	2.5	2.99	9.18	4.75	3.2
Sodium	426	54.4	39.4	63.9	23.6	28.1	29.3	27.5	23.8	6.7	20.8	18.7
Silica	9.09	9.22	8.68	9.3	--	--	--	12.5	13.8	13.8	--	--
Zinc	7.89	4.31	.019	.036	.043	.045	.042	.082	.011	.007	.017	.032
Chloride	1,720	834.2	560	557.5	415	669.8	564	533	232	193.1	134	121.6
Fluoride	.13	<.1	<.1	1.33	.1	<.1	.12	.11	<.1	<.1	.1	.11
Bromide	4.9	.9	3.4	1	.98	3.2	5.85	--	<.5	<.5	.17	<.5
Sulfate	388	261	3.5	11.7	.66	<2	30	18.6	18.1	8.2	12.8	3.25
Sulfide	--	<1	--	<1	--	--	--	--	--	<1	--	--
Nitrate	2	1.25	.2	<.05	<.05	<.05	.09	.39*	.13	.291	<.05	<.05
Nitrite	.01	<.05	.14	.15	<.05	.07	<.05	.01	.132	.16	<.05	.07
Phosph.	.048	.062	<.28	<.28	--	--	--	.56	1.96	.28	--	--
Ammonia	.452	.079	.248	.051	.139	.106	.282	<.01	.106	.077	.227	.266
AmmOrN	1.96	1.12	.324	.204	.362	.393	.327	.5	1.27	1.28	1.58	1.25
TDS	2,862	1,708	948	1,064	1,444	1,118	943	1,070	450	404	494	466
DOC	8.74	13	7.08	11	19.8	--	--	--	4	3	2.3	--
Benzene	<.005	<.005	.145	.132	.1375	.1941	.157	.0441	<.005	<.005	<.0005	<.0005
Carb. Tet.	<.005	<.005	<.005	<.005	<.0015	<.0015	<.0015	<.0015	<.005	<.005	<.0015	<.0015
Chlorob.	<.005	<.005	.057	.046	.0563	.091	.0871	.1041	<.005	<.005	<.0006	<.0006
Chlorofm.	<.005	<.005	<.005	<.005	.0027	.0019	.0008	<.0008	<.005	<.005	<.0008	<.0008
12DCA	<.001	.003	.096	.116	.1341	.1916	.079	.2125	<.001	<.001	<.0015	<.0015
Meth. Cl.	.009	<.005	.009	.061	.0186	.0027	.0033	.0093	.013	.011	.009	<.0011
PCA	<.01	<.01	<.01	<.01	<.0014	<.0014	<.0014	<.0014	<.01	<.01	<.0014	<.0014
PCE	<.005	<.005	<.005	<.005	<.0015	<.0015	<.0015	<.0015	<.005	<.005	<.0015	<.0015
Toluene	.021	<.005	<.005	<.005	.0035	.0014	.0039	.0019	<.005	<.005	<.001	<.0004
12DCE	<.005	.014	1.321	1.736	1.489	1.5625	.565	2.277	<.005	<.005	<.0015	.0028
TCA	<.005	<.005	<.005	<.005	<.0016	<.0016	<.0016	<.0016	<.005	<.005	<.0016	<.0016
TCE	<.005	<.005	<.005	<.005	<.0013	.0015	<.0013	<.0013	<.005	<.005	<.0013	<.0013
VC	<.01	<.01	1.113	.665	1.558	1.8627	2.2	1.19	<.01	<.01	.002	<.0012
MB	F	K	F	K	L	U	W	HH	F	K	P	T

* Nitrate quantity calculated by subtracting nitrite concentration from total nitrate-nitrite-nitrogen concentration.

Table 5.--Chemical analyses of ground water, December 1985 to September 1987--Continued

[Inorganics, organics, and dissolved oxygen are expressed in milligrams per liter (mg/L). Fixed end point (4.5) alkalinity is expressed by milligrams per liter bicarbonate, and specific conductance is expressed as microsiemens per centimeter at 25 degrees Celsius. Dashes indicate parameter was not analyzed. < = less than]

Cond	= Specific conductance	Chlorob.	= Chlorobenzene	PCE	= Tetrachloroethylene
D.O.	= Dissolved oxygen	Chlorofm.	= Chloroform	12DCE	= 1,2-Dichloroethylene
AmmOrN	= Ammonia + organic nitrogen	12DCA	= 1,2-Dichloroethane	TCA	= 1,1,2-Trichloroethane
Phosph.	= Phosphorous	11DCE	= 1,1-Dichloroethylene	TCE	= Trichloroethylene
TDS	= Total dissolved solids	Ethylben.	= Ethylbenzene	VC	= Vinyl chloride
DOC	= Dissolved organic carbon	Meth. Cl.	= Methylene chloride	MB	= Identification letter for method blank in table 6
Carb.Tet.	= Carbon tetrachloride	PCA	= 1,1,2,2-Tetrachloroethane		

Property or Constituent	Concentrations at wells for each sampling date (month/day)											
	Well OF14C (cont.)		Well OF14D					Well OF16A				
	12/05 1986	9/16 1987	12/17 1985	3/13 1986	7/03 1987	9/11 1986	12/05 1986	12/09 1985	3/06 1986	7/03 1986	9/15 1986	
pH	6.34	5.69	6.78	6.37	6.39	6.54	6.65	6.68	6.47	6.55	6.6	
Cond.	759	669	918	318	290	258	256	1,369	1,440	--	1,367	
D.O.	0	.2	0	0	0	0	0	0	0	0	.1	
alkalinity	69.51	59.15	148.17	141.46	145.12	145.73	137.8	658.17	677.44	718.29	758.54	
Antimony	<.0027	<.024	.0029	.003	<.003	<.0032	<.0027	.0065	.008	.011	<.0032	
Arsenic	<.0035	<.005	.0018	.006	.004	.0044	.004	.0017	<.001	.011	.0109	
Boron	1	<.1	.591	.79	.651	.876	.222	1.577	3.8	2.49	4.06	
Calcium	29.4	31.7	16.1	11.3	11.5	18.2	13.2	60.3	68.9	65.5	58.8	
Iron	102	106	21.1	16.2	15.2	30.1	21	21.6	30.7	25.6	20.1	
Magnesium	11.6	13.4	8.52	6.2	6.32	10.4	5.51	92.7	108	110	101	
Manganese	1.81	2.03	.35	.301	.329	.784	.298	1.38	1.36	1.31	1.41	
Potassium	2.83	2.48	3.4	2.1	1.92	2.09	1.6	25	21.1	16.1	21.7	
Sodium	17.7	19.7	50.6	2.47	24.5	19.2	15.8	55.2	69.4	76	81.8	
Silica	--	18.1	10.2	11.3	--	--	--	7.7	7.13	--	--	
Zinc	.016	.05	.028	.005	.005	.195	.01	.007	.017	.008	.02	
Chloride	208	216	344	330.2	14.8	44.4	12.6	116	123.6	141	79.7	
Fluoride	.15	.12	.14	.17	.1	.14	.2	.18	<.1	.32	.4	
Bromide	<.5	--	1.3	<.5	<.05	<.5	<.5	.5	<.5	.25	<.5	
Sulfate	27.5	28.2	45.8	3.3	2.23	<2	3	108	122.5	102.7	80.98	
Sulfide	--	--	--	<1	--	--	--	--	<1	--	--	
Nitrate	<.05	.09*	.02	.07	<.05	<.05	<.05	.03	<.05	<.05	<.05	
Nitrite	.09	.03	.05	<.05	<.05	<.05	<.05	<.01	<.05	<.05	<.05	
AmmOrN	--	1.6	.274	.361	.582	.183	.236	1.11	2.46	2.2	.286	
Phosph.	.497	.19	1.53	1.29	1.58	.944	--	2.71	3.13	3.67	2.85	
Ammonia	.144	1.5	2.52	.84	--	--	--	7	3.4	--	--	
TDS	418	437	268	160	168	200	196	787	764	918	854	
DOC	--	--	2.96	1	--	--	--	135	15	18.6	--	
Benzene	<.0005	.0011	<.005	<.005	<.0005	<.0005	--	.012	.017	.0265	.0291	
Carb. Tet.	<.0015	<.0015	<.005	<.005	<.0015	<.0015	--	<.005	<.005	<.0015	<.0015	
Chlorob.	<.0006	<.0006	<.005	<.005	<.0006	<.0006	--	<.005	<.005	.0015	.0025	
Chlorofm.	.0019	<.0008	<.005	<.005	<.0008	<.0008	--	<.005	<.005	<.0008	<.0008	
12DCA	<.0015	<.0015	<.001	<.001	<.0015	<.0015	--	<.001	<1	<.0015	.0016	
Meth. Cl.	.0021	.004	<.005	<.005	.002	.0018	--	.054	<.005	.0096	.002	
PCA	<.0014	<.0014	<.01	<.01	<.0014	<.0014	--	<.01	<.01	<.0014	.0018	
PCE	<.0015	<.0015	<.005	<.005	<.0015	<.0015	--	.017	.028	.0035	.0017	
Toluene	<.0004	<.0004	<.005	<.005	.001	<.0004	--	.007	.013	.0286	.0214	
12DCE	<.0016	.0012	<.005	<.005	<.0015	<.0015	--	.884	2.12	4.062	1.57	
TCA	<.0016	<.0016	<.005	<.005	<.0016	<.0016	--	<.005	<.005	<.0016	<.0016	
TCE	<.0013	<.0013	<.005	<.005	<.0013	.0013	--	.008	.006	<.0013	.0023	
VC	<.0013	<.0013	<.01	<.01	<.0012	<.0012	--	1.52	2.44	3.11	7.244	
MB	X	EE	F	K	P	T	--	A	I	M	V	

* Nitrate quantity calculated by subtracting nitrite concentration from total nitrate-nitrite-nitrogen concentration.

Table 5.--Chemical analyses of ground water, December 1985 to September 1987--Continued

[Inorganics, organics, and dissolved oxygen are expressed in milligrams per liter (mg/L). Fixed end point (4.5) alkalinity is expressed by milligrams per liter bicarbonate, and specific conductance is expressed as microsiemens per centimeter at 25 degrees Celsius. Dashes indicate parameter was not analyzed. < = less than]

Cond	= Specific conductance	Chlorob.	= Chlorobenzene	PCE	= Tetrachloroethylene
D.O.	= Dissolved oxygen	Chlorofm.	= Chloroform	12DCE	= 1,2-Dichloroethylene
AmmOrN	= Ammonia + organic nitrogen	12DCA	= 1,2-Dichloroethane	TCA	= 1,1,2-Trichloroethane
Phosph.	= Phosphorous	11DCE	= 1,1-Dichloroethylene	TCE	= Trichloroethylene
TDS	= Total dissolved solids	Ethylben.	= Ethylbenzene	VC	= Vinyl chloride
DOC	= Dissolved organic carbon	Meth. Cl.	= Methylene chloride	MB	= Identification letter for method blank in table 6
Carb.Tet.	= Carbon tetrachloride	PCA	= 1,1,2,2-Tetrachloroethane		

Property or Constituent	Concentrations at wells for each sampling date (month/day)											
	Well OF16A (cont.)		Well OF16B						Well OF17A			
	12/10 1986	9/15 1987	12/09 1985	3/06 1986	7/07 1986	9/15 1986	12/10 1986	9/15 1987	12/10 1985	3/07 1986	7/08 1986	7/22 1986
pH	6.72	6.78	6.35	6.27	6.35	6.15	6.39	6.30	4.66	4.49	4.67	4.45
Cond.	1,199	1,340	540	317	477	568	477	643	525	476	529	553
D.O..	0	.05	.4	0	0	0	.4	.05	0	.3	0	--
alkalinity	707.32	760.67	143.66	122.44	137.93	171.34	140.24	197.56	1.95	0	.98	--
Antimony	<.0027	<.024	.0033	.005	.006	<.0032	<.0027	<.024	.0042	.006	.007	--
Arsenic	.01	.006	<.001	<.001	.005	<.0015	.004	<.005	.76	.375	--	.5
Boron	.591	3.39	.631	.96	1.09	.873	.336	.6	.795	1.35	1.49	--
Calcium	59.2	54.5	36.6	23.2	21.6	26.2	24.7	30.2	22.7	22.7	21.8	19.8
Iron	17.9	14	63.7	17.8	31	36.8	24.1	36.2	30.3	29.2	38.5	34.5
Magnesium	104	107	19.1	11.2	11.3	14	13.3	16	22.6	18.3	25.9	--
Manganese	1.31	1.32	.649	.684	.659	.848	.7	.862	.532	.626	.642	--
Potassium	19.9	21.9	2.64	2.14	1.89	3.42	3.54	5.28	4.59	3.61	3.45	--
Sodium	77.6	96.2	31.8	46.4	27.6	50.3	42.1	62	9.98	7.22	11.1	8.84
Silica	--	8.87	12.2	13.1	--	--	--	15.2	10.3	9.88	--	--
Zinc	.015	.036	.042	.024	.018	.021	.014	.044	1.41	1.52	1.63	--
Chloride	75	112	70	61.2	66.4	66.5	42	112	104	85.7	100	93.7
Fluoride	.54	.14	.2	<.1	<.1	<.1	.16	.13	.18	.21	.18	--
Bromide	<.5	--	<.5	<.5	.18	<.5	<.5	--	<.5	<.5	<.05	--
Sulfate	125.5	111	46	43.4	41.4	43.86	57.5	98.8	86.5	123.2	115	163
Sulfide	--	--	--	<1	--	--	--	--	--	<1	--	--
Nitrate	321	.03*	.08	<.05	<.05	<.05	410	.04*	.04	.12	.23	--
Nitrite	1.72	.03	<.01	<.05	<.05	<.05	2.19	.04	.47	<.05	<.05	--
Phosph.	.057	1.3	.28	<.28	--	--	--	2.2	.84	1.1	--	--
Ammonia	2.95	4.3	.994	.778	1.09	12.78	.052	1.47	.127	.145	.045	--
AmmOrN	--	4.7	.921	.694	.96	.841	1.18	1.9	3.88	.388	.524	--
TDS	743	802	306	258	370	388	246	410	302	230	204	--
DOC	--	--	3.9	3	5	--	--	--	34.7	19	29.5	--
Benzene	.028	.0327	.036	.04	.0368	.038	.048	.0012	.295	.27	.215	--
Carb. Tet.	<.015	<.0015	<.005	<.005	<.0015	<.015	<.03	<.0015	<.25	<.005	.242	--
Chlorob.	<.006	.002	.01	<.005	.0167	.015	<.012	<.0006	<.25	.1	.081	--
Chlorofm.	<.008	<.0008	<.005	.016	<.0008	<.008	<.016	<.0008	.775	.65	.45	--
12DCA	<.015	<.0015	.009	<.001	.0078	<.015	<.03	<.0015	.75	.43	.599	--
Meth. Cl.	.065	.0095	.011	.462	.0063	.031	.11	.0073	.615	1.55	.015	--
PCA	<.014	<.0014	.016	.068	<.0014	<.014	<.028	<.0014	5.12	4.62	1.844	--
PCE	<.015	<.0015	.58	.17	.299	.39	.546	.0043	.485	.79	.129	--
Toluene	.02	.0187	<.005	.012	.049	<.004	<.008	<.0004	<.25	.21	.07	--
12DCE	1.586	10.35	.488	.504	.262	.492	.472	.0226	.315	.78	.396	--
TCA	<.016	<.0016	.006	<.005	.004	<.016	<.032	<.0016	<.25	<.005	.011	--
TCE	<.013	<.0013	.287	.208	.1738	.19	.218	.0014	.795	.62	.352	--
VC	3.304	3.25	.188	.324	.173	.988	.248	.0019	<.5	<.1	.011	--
MB	AA	GG	G	K	M	V	BB	GG	C	K	Q	--

* Nitrate quantity calculated by subtracting nitrite concentration from total nitrate-nitrite-nitrogen concentration.

Table 5.--Chemical analyses of ground water, December 1985 to September 1987--Continued

[Inorganics, organics, and dissolved oxygen are expressed in milligrams per liter (mg/L). Fixed end point (4.5) alkalinity is expressed by milligrams per liter bicarbonate, and specific conductance is expressed as microsiemens per centimeter at 25 degrees Celsius. Dashes indicate parameter was not analyzed. < = less than]

Cond	= Specific conductance	Chlorob.	= Chlorobenzene	PCE	= Tetrachloroethylene
D.O.	= Dissolved oxygen	Chlorofm.	= Chloroform	12DCE	= 1,2-Dichloroethylene
AmmOrN	= Ammonia + organic nitrogen	12DCA	= 1,2-Dichloroethane	TCA	= 1,1,2-Trichloroethane
Phosph.	= Phosphorous	11DCE	= 1,1-Dichloroethylene	TCE	= Trichloroethylene
TDS	= Total dissolved solids	Ethylben.	= Ethylbenzene	VC	= Vinyl chloride
DOC	= Dissolved organic carbon	Meth. Cl.	= Methylene chloride	MB	= Identification letter for method blank in table 6
Carb.Tet.	= Carbon tetrachloride	PCA	= 1,1,2,2-Tetrachloroethane		

Property or Constituent	Concentrations at wells for each sampling date (month/day) — Well OF17A (cont.)												
	7/29 1986	8/05 1986	8/12 1986	8/19 1986	8/25 1986	9/03 1986	9/12 1986	9/23 1986	10/02 1986	10/15 1986	10/30 1986	11/14 1986	12/08 1986
pH	4.43	4.53	4.5	4.51	4.53	4.47	4.47	4.63	4.53	4.52	4.50	4.46	4.53
Cond.	530	518	512	499	511	483	477	464	473	455	434	458	464
D.O.	--	--	--	--	--	--	0	--	--	--	--	--	0
alkalinity	--	--	--	--	--	--	0	--	--	--	--	--	0
Antimony	--	--	--	--	--	--	<.0032	--	--	--	--	--	<.0027
Arsenic	.52	.58	.55	.40	.59	.7	--	.56	.46	.52	.4	.52	.635
Boron	--	--	--	--	--	--	.529	--	--	--	--	--	.427
Calcium	20.2	11.5	19.1	19.0	18.4	20.6	17.8	13.7	17.1	16.8	17.2	15.6	18.2
Iron	35.3	32.6	31.3	31.1	30.8	29.8	33.5	30.1	29.4	29.8	30.8	26.4	30.6
Magnesium	--	--	--	--	--	--	21.9	--	--	--	--	--	23.7
Manganese	--	--	--	--	--	--	.482	--	--	--	--	--	.45
Potassium	--	--	--	--	--	--	3.54	--	--	--	--	--	3.25
Sodium	8.62	10.4	10.1	9.92	10	9.02	9.38	8.4	8.36	8.8	10.1	8.3	9.92
Silica	--	--	--	--	--	--	--	--	--	--	--	--	--
Zinc	--	--	--	--	--	--	1.5	--	--	--	--	--	1.41
Chloride	89.8	92.8	86	86	92	84	75.6	131	65	64	82	124	77
Fluoride	--	--	--	<.10	.25	.17	.18	.17	.18	.17	.17	.16	.15
Bromide	--	--	--	<.5	<.5	<.5	<.5	<.5	<.5	<.5	.5	<.5	<.5
Sulfate	125	166	204	204	180	131	182.4	254	205	167	178	239	132.5
Sulfide	--	--	--	--	--	--	--	--	--	--	--	--	--
Nitrate	--	--	--	--	--	--	.8	--	--	--	--	--	.24
Nitrite	--	--	--	--	--	--	<.05	--	--	--	--	--	<.05
AmmOrN	--	--	--	--	--	--	--	--	--	--	--	--	--
Phosph.	--	--	--	--	--	--	.039	--	--	--	--	--	.042
Ammonia	--	--	--	--	--	--	.419	--	--	--	--	--	.311
TDS	--	--	--	308	308	328	320	306	310	319	265	296	296
DOC	--	--	--	--	--	--	--	--	--	.			--
Benzene	--	--	--	--	--	--	.118	--	--	.31	.285	.89	.074
Carb. Tet.	--	--	--	--	--	--	.148	--	--	.35	<.225	.111	.084
Chlorob.	--	--	--	--	--	--	.103	--	--	.24	.15	.099	.104
Chlorofm.	--	--	--	--	--	--	.425	--	--	1.05	.705	.504	.432
12DCA	--	--	--	--	--	--	.533	--	--	.86	<.225	.368	.494
11DCE	--	--	--	--	--	--	--	--	--	<.0019	<.285	<.019	<.038
Ethylben.	--	--	--	--	--	--	--	--	--	<.0004	<.06	<.004	<.008
Meth. Cl.	--	--	--	--	--	--	.1	--	--	.38	2.43	.012	.07
PCA	--	--	--	--	--	--	1.46	--	--	1.58	1.17	.788	1.198
PCE	--	--	--	--	--	--	<.0375	--	--	.495	.27	.164	.198
Toluene	--	--	--	--	--	--	<.01	--	--	.07	<.15	.018	.022
12DCE	--	--	--	--	--	--	.348	--	--	.605	<.225	.194	.24
TCA	--	--	--	--	--	--	<.04	--	--	.003	<.24	<.016	<.032
TCE	--	--	--	--	--	--	.298	--	--	.640	.645	.164	.172
VC	--	--	--	--	--	--	<.03	--	--	<.0012	<.180	<.013	<.026
MB	--	--	--	--	--	--	V	--	--	KK	LL	MM	Z

Table 5.--Chemical analyses of ground water, December 1985 to September 1987--Continued

[Inorganics, organics, and dissolved oxygen are expressed in milligrams per liter (mg/L). Fixed end point (4.5) alkalinity is expressed by milligrams per liter bicarbonate, and specific conductance is expressed as microsiemens per centimeter at 25 degrees Celsius. Dashes indicate parameter was not analyzed. < = less than]

Cond	= Specific conductance	Chlorob.	= Chlorobenzene	PCE	= Tetrachloroethylene
D.O.	= Dissolved oxygen	Chlorofm.	= Chloroform	12DCE	= 1,2-Dichloroethylene
AmmOrN	= Ammonia + organic nitrogen	12DCA	= 1,2-Dichloroethane	TCA	= 1,1,2-Trichloroethane
Phosph.	= Phosphorous	11DCE	= 1,1-Dichloroethylene	TCE	= Trichloroethylene
TDS	= Total dissolved solids	Ethylben.	= Ethylbenzene	VC	= Vinyl chloride
DOC	= Dissolved organic carbon	Meth. Cl.	= Methylene chloride	MB	= Identification letter for method blank in table 6
Carb.Tet.	= Carbon tetrachloride	PCA	= 1,1,2,2-Tetrachloroethane		

Property or Constituent	Concentrations at wells for each sampling dste (month/day)											
	Well OF17A				Well OF17B						Well OF18A	
	12/30 1986	1/16 1987	2/05 1987	9/18 1987	12/10 1985	3/07 1986	7/08 1986	9/12 1986	12/08 1986	9/18 1987	12/05 1985	3/07 1986
pH	4.67	4.44	4.7	4.48	6.28	6.29	6.13	6.34	6.38	6.55	5.50	5.4
Cond.	491	418	443	480	286	257	284	289	298	283	192	185
D.O.	--	--	--	0	0	0	0	0	0	0	1.7	2.3
alkalinity	--	--	--	0	94.39	81.71	93.9	99.39	126.83	99.39	15.24	8.9
Antimony	--	--	--	<.024	<.001	<.002	<.003	<.0032	<.0027	<.024	.0031	.003
Arsenic	.43	.45	.37	.678	.0359	.038	--	.0458	.092	.037	<.001	<.001
Boron	--	--	--	.28	.672	.98	1.01	.999	.36	<.1	.162	.18
Calcium	21	16.2	17.5	20.3	16.6	12.8	15.9	13.6	16.2	16.1	9.6	10.2
Iron	30.1	27.2	28.4	38.8	26.9	25.6	34.1	34.5	36.9	38.5	5.27	1.48
Magnesium	--	--	--	23.3	5.43	4.83	5.6	5.24	5.98	6.09	8.2	8.52
Manganese	--	--	--	.633	.879	.686	.8	.692	.706	.651	1.82	1.74
Potassium	--	--	--	3.69	1.48	1.22	1.16	1.35	1.19	1.35	2.73	2.62
Sodium	9.7	8.4	7.4	8.5	9.77	8.13	10.6	8.7	9.46	10.9	6.32	6.25
Silica	--	--	--	12.5	13	13.7	--	--	--	17.5	9.4	8.96
Zinc	--	--	--	1.97	.015	.016	.01	.021	.013	.026	.04	.064
Chloride	71	68	73	111	37.2	44.6	46.2	43.1	49	54	6.9	5.7
Fluoride	.22	<.1	.16	.2	.11	.37	.1	<.1	.13	.12	<.1	<.1
Bromide	<.5	<.5	<.5	--	<.5	<.5	<.05	<.5	<.5	--	<.5	<.5
Sulfate	69	84	145.	76.2	3.7	2.2	1.98	<2	6	39.5	61.3	52.5
Sulfide	--	--	--	6	--	<1	--	--	--	<1	--	--
Nitrate	--	--	--	.35*	.024	<.05	<.05	<.05	<.05	.1*	1.06	1.57
Nitrite	--	--	--	<.01	.46	.09	<.05	<.05	<.05	.04	.03	<.05
AmmOrN	--	--	--	1.2	.532	.482	.433	.543	.155	.48	.096	.053
Phosph.	--	--	--	.21	1.11	.946	1.12	.841	1.13	1.2	.89	.002
Ammonia	--	--	--	.6	<.28	1.4	--	--	--	1.5	6.72	<.28
TDS	316	260	284.	936	194	106	334	206	156	292	140	192
DOC	--	--	--	--	4.16	5	2.38	--	--	--	1.54	1
Benzene	.170	--	<.005	.28	.015	--	.009	.012	.0102	<.0005	<.005	<.005
Carb. Tet.	.178	--	<.015	<.0015	<.005	--	<.0015	<.0015	<.0015	<.0015	<.005	<.005
Chlorob.	.104	--	.052	.1	<.005	--	.001	.002	.0018	<.0006	<.005	<.005
Chlorofm.	.662	--	.278	1.41	.013	--	<.0008	<.0008	<.0008	.002	<.005	<.005
12DCA	.592	--	.162	.77	.016	--	.005	.0057	.0086	.007	<.001	<.001
11DCE	<.038	--	<.019	--	--	--	--	--	<.0019	--	--	--
Ethylben.	<.008	--	<.004	--	--	--	--	--	<.0004	--	--	--
Meth. Cl.	<.022	--	<.011	.84	.032	--	.005	.0016	.007	.009	<.005	<.005
PCA	2.638	--	1.991	14.09	.029	--	.008	.005	.0035	.006	<.01	<.01
PCE	.314	--	.185	6.407	.005	--	.003	.0032	.0031	.003	<.005	<.005
Toluene	.050	--	.058	.1	<.005	--	.002	<.0004	.0013	<.0004	<.005	<.005
12DCE	.386	--	.790	1.61	.048	--	.014	.0238	.038	.062	.008	<.005
TCA	<.032	--	<.016	<.0016	<.005	--	<.0016	<.0016	<.0016	<.0016	<.005	<.005
TCE	.402	--	.13	2.2	.013	--	.005	.0053	.0048	<.0013	<.005	<.005
VC	<.026	--	<.013	<.0013	<.01	--	<.0012	<.0012	<.0013	<.0013	<.01	<.01
MB	NN	OO	PP	HH	D	I	R	V	Z	HH	F	I

* Nitrate quantity calculated by subtracting nitrite concentration from total nitrate-nitrite-nitrogen concentration.

Table 5.--Chemical analyses of ground water, December 1985 to September 1987--Continued

[Inorganics, organics, and dissolved oxygen are expressed in milligrams per liter (mg/L). Fixed end point (4.5) alkalinity is expressed by milligrams per liter bicarbonate, and specific conductance is expressed as microsiemens per centimeter at 25 degrees Celsius. Dashes indicate parameter was not analyzed. < = less than]

Cond	= Specific conductance	Chlorob.	= Chlorobenzene	PCE	= Tetrachloroethylene
D.O.	= Dissolved oxygen	Chlorofm.	= Chloroform	12DCE	= 1,2-Dichloroethylene
AmmOrN	= Ammonia + organic nitrogen	12DCA	= 1,2-Dichloroethane	TCA	= 1,1,2-Trichloroethane
Phosph.	= Phosphorous	11DCE	= 1,1-Dichloroethylene	TCE	= Trichloroethylene
TDS	= Total dissolved solids	Ethylben.	= Ethylbenzene	VC	= Vinyl chloride
DOC	= Dissolved organic carbon	Meth. Cl.	= Methylene chloride	MB	= Identification letter for method blank in table 6
Carb.Tet.	= Carbon tetrachloride	PCA	= 1,1,2,2-Tetrachloroethane		

Property or Constituent	Concentrations at wells for each sampling date (month/day)											
	Well OF18A (cont.)				Well OF18B						Well OF18C	
	7/08 1986	9/12 1986	12/03 1986	9/15 1987	12/05 1985	3/03 1986	6/30 1986	9/09 1986	12/03 1986	9/15 1987	12/05 1985	3/05 1986
pH	5.06	5.1	5.14	5.05	6.14	6.25	6.13	6.36	6.38	6.17	6.66	6.66
Cond.	209	194	180	202	280	278	221	239	247	222	160	244
D.O.	1.7	5.9	--	3.9	0	.5	.7	.1	0	.2	0	0
alkalinity	6.71	7.93	6.71	7.32	98.05	111.22	85.98	101.22	118.29	78.66	140.85	175
Antimony	<.003	<.0032	<.0027	<.024	.0031	.003	.003	<.0032	<.0027	<.024	.0011	<.002
Arsenic	<.003	<.0015	.0044	<.005	.0013	.003	.005	.0041	<.0035	<.005	<.001	<.001
Boron	.024	.627	<.04	<.1	.662	.99	.726	.551	.182	<.1	.18	.83
Calcium	11.4	10.9	10.3	11.9	19.3	16.8	12.2	13.5	14.3	14.3	22.8	23.5
Iron	.044	.13	.072	.007	26.5	24.5	18.9	21.2	21.3	16.9	6.81	25.5
Magnesium	11.1	10.1	9.66	11.1	7.9	6.9	5.72	6.16	5.87	6.85	5.08	4.89
Manganese	.21	.554	.606	.132	1.29	1.26	1.06	1.21	1.06	1.39	.563	.671
Potassium	3.14	3.63	3.19	3.6	3.23	2.85	2.35	3.13	2.48	3.53	4.17	9.86
Sodium	7.03	5.94	6.06	6.23	28	8.27	13	9.88	11.3	9.69	8.85	8.18
Silica	--	--	--	6.95	10.7	11.3	--	--	--	12.1	12.8	13.7
Zinc	.059	.055	.068	.099	.026	.012	.025	.02	.026	.08	.007	.017
Chloride	6.84	8.6	7.7	12	50.5	23	9.45	7.89	8.9	6	6.2	3.9
Fluoride	.06	<.1	<.1	<.1	.1	<.1	.11	<.1	<.1	.16	.1	.1
Bromide	<.05	<.5	<.5	--	<.5	<.5	<.05	<.5	<.5	--	<.5	<.5
Sulfate	45.2	54.8	85	36	41.5	35.3	35	36.7	35	43.5	2.8	<2
Sulfide	--	--	--	--	--	--	--	--	--	--	--	--
Nitrate	6.02	<.05	1.094	4.64*	.82	.82	.65	.47	.362	.5*	.03	<.05
Nitrite	<.05	<.05	<.05	<.01	.09	<.05	<.05	<.05	<.05	.02	.03	<.05
Phosph.	.021	.05	.042	.01	5.04	<.28	--	--	--	.59	3.92	2.5
Ammonia	.008	.007	--	.2	.153	.176	.268	.091	.216	<.01	.064	.013
AmmOrN	--	--	--	<.2	.895	.485	.495	.547	--	.3	1.16	2.59
TDS	132	148	178	140	272	258	144	158	198	162	152	186
DOC	1.1	--	--	--	6.39	4	1.3	--	--	--	5.82	4
Benzene	<.0005	<.0005	--	<.0005	<.005	<.005	<.0005	<.0005	--	<.005	--	<.005
Carb. Tet.	<.0015	<.0015	--	<.0015	<.005	<.005	<.0015	<.0015	--	<.0015	--	<.005
Chlorob.	<.0006	<.0006	--	<.0006	<.005	<.005	<.0006	<.0006	--	<.0006	--	<.005
Chlorofm.	<.0008	<.0008	--	<.0008	<.005	<.005	.001	<.0008	--	<.0008	--	<.005
12DCA	<.0015	<.0015	--	<.0015	<.001	<.001	<.0015	<.0015	--	<.0015	--	<.001
Meth. Cl.	.0038	.0027	--	.0035	.007	.007	.0053	.0026	--	.0227	--	<.005
PCA	<.0014	<.0014	--	<.0014	<.01	<.01	<.0014	<.0014	--	<.0014	--	<.01
PCE	<.0015	<.0015	--	<.0015	<.005	<.005	<.0015	<.0015	--	<.0015	--	<.005
Toluene	.003	<.0004	--	<.0004	<.005	<.005	.0018	<.0004	--	.0011	--	<.005
12DCE	<.0015	<.0015	--	<.0016	<.005	<.005	<.0015	<.0015	--	.0019	--	<.005
TCA	<.0016	<.0016	--	<.0016	<.005	<.005	<.0016	<.0016	--	<.0016	--	<.005
TCE	<.0013	<.0013	--	<.0013	<.005	<.005	<.0013	.0014	--	<.0013	--	<.005
VC	<.0012	<.0012	--	<.0013	<.01	<.01	<.0012	<.0012	--	.0014	--	<.01
MB	L	S	--	DD	F	I	L	S	--	DD	--	I

* Nitrate quantity calculated by subtracting nitrite concentration from total nitrate-nitrite-nitrogen concentration.

Table 5.--Chemical analyses of ground water, December 1985 to September 1987--Continued

[Inorganics, organics, and dissolved oxygen are expressed in milligrams per liter (mg/L). Fixed end point (4.5) alkalinity is expressed by milligrams per liter bicarbonate, and specific conductance is expressed as microsiemens per centimeter at 25 degrees Celsius. Dashes indicate parameter was not analyzed. < = less than]

Cond	= Specific conductance	Chlorob.	= Chlorobenzene	PCE	= Tetrachloroethylene
D.O.	= Dissolved oxygen	Chlorofm.	= Chloroform	12DCE	= 1,2-Dichloroethylene
AmmOrN	= Ammonia + organic nitrogen	12DCA	= 1,2-Dichloroethane	TCA	= 1,1,2-Trichloroethane
Phosph.	= Phosphorous	11DCE	= 1,1-Dichloroethylene	TCE	= Trichloroethylene
TDS	= Total dissolved solids	Ethylben.	= Ethylbenzene	VC	= Vinyl chloride
DOC	= Dissolved organic carbon	Meth. Cl.	= Methylene chloride	MB	= Identification letter for method blank in table 6
Carb.Tet.	= Carbon tetrachloride	PCA	= 1,1,2,2-Tetrachloroethane		

Property or Constituent	Concentrations at wells for each sampling date (month/day)											
	Well OF18C			Well OF19						Well OF20A	Well OF20B	
	6/30 1986	9/10 1986	12/04 1986	12/06 1985	3/10 1986	7/03 1986	9/09 1986	12/03 1986	9/15 1987	9/18 1987	9/17 1987	
pH	6.88	6.71	6.6	6.13	6.47	6.4	6.35	6.51	6.23	6.43	6.69	
Cond.	238	198	281	240	197	--	225	176	152	6,190	181	
D.O..	0	0	0	0	.2	--	0	4.2	0	0	0	
alkalinity	149.39	163.42	185.98	54.51	65.61	65.85	70.12	78.05	53.66	112.8	85.37	
Antimony	<.003	<.0032	<.0027	.0028	.009	.007	<.0032	<.0027	<.024	.042	<.024	
Arsenic	.003	<.0015	<.0035	<.001	<.001	.005	<.0015	<.0035	<.005	.424	<.005	
Boron	.194	.708	.299	.55	.89	.46	.611	.044	<.1	.37	<.1	
Calcium	25	29.8	24.2	7.5	6.63	6.18	5.54	5.64	6.21	53.6	12	
Iron	3.12	13.8	29.8	13.2	16.3	12.8	13.3	13.6	3.8	245	17.5	
Magnesium	5.54	5.58	5.48	5.08	5.59	5.14	4.74	4.15	4.73	105	4.53	
Manganese	.686	.822	.687	.773	.417	.47	.714	.648	.71	7	.323	
Potassium	3.14	3.89	2.88	1.82	1.44	1.53	1.74	1.34	1.59	27.5	1.22	
Sodium	9.22	7.34	8.67	9.72	43.7	25.4	21.7	15.3	14.3	859	9.4	
Silica	--	--	--	8.57	7.86	--	--	--	9.6	4.58	17.8	
Zinc	.008	.022	.01	.02	.02	.029	.028	.028	.248	.394	.128	
Chloride	3.4	2.88	2.6	6	10.1	5.72	9.06	5.1	6	2150	28	
Fluoride	.19	.13	.42	.1	<.1	<.1	<.1	<.1	.15	<.1	.11	
Bromide	<.05	<.5	<.5	<.5	<.5	<.05	<.5	<.5	--	--	--	
Sulfate	.7	2.58	10	41.7	69.8	68.7	45.6	35	21.2	245	26.5	
Sulfide	--	--	--	--	<1	--	--	--	--	<1	<1	
Nitrate	<.05	<.05	.091	.04	<.05	.16	<.05	<.05	.17*	--	<.01*	
Nitrite	<.05	<.05	<.05	.02	.15	<.05	<.05	<.05	.01	.16	.02	
AmmOrN	--	--	--	.09	.013	.026	.039	.016	<.01	<.01	<.01	
Phosph.	.016	.039	.216	.313	.12	.234	.249	--	.6	4.1	.8	
Ammonia	2.75	2.71	--	.98	<.28	--	--	--	.77	5.5	1	
TDS	138	136	198	167	168	144	130	142	125	3,230	139	
DOC	2.7	--	--	2.31	1	1.7	--	--	--	--	--	
Benzene	<.0005	<.0005	--	--	<.005	.0006	<.0005	--	<.0005	.361	<.0005	
Carb. Tet.	<.0015	<.0015	--	--	<.005	<.0015	<.0015	--	<.0015	<.0015	<.0015	
Chlorob.	<.0006	<.0006	--	--	<.005	<.0006	<.0006	--	<.0006	.156	<.0006	
Chlorofm.	.0016	<.0008	--	--	<.005	<.0008	<.0008	--	<.0008	.349	<.0008	
12DCA	<.0015	<.0015	--	--	<.001	<.0015	<.0015	--	<.0015	.2	<.0015	
Meth. Cl.	.0082	.0028	--	--	<.005	.0109	.0062	--	.0047	.107	.009	
PCA	<.0014	<.0014	--	--	<.01	<.0014	<.0014	--	<.0014	.199	.0018	
PCE	<.0015	<.0015	--	--	<.005	<.0015	<.0015	--	<.0015	.033	<.0015	
Toluene	.0011	<.0004	--	--	<.005	.0038	<.0004	--	<.0004	.035	<.0004	
12DCE	<.0015	<.0015	--	--	<.005	<.0015	<.0015	--	<.0016	.77	.0018	
TCA	<.0016	<.0016	--	--	<.005	<.0016	<.0016	--	<.0016	<.0016	<.0016	
TCE	<.0013	.0014	--	--	<.005	<.0013	<.0013	--	<.0013	.091	<.0013	
VC	<.0012	<.0012	--	--	<.01	<.0012	<.0012	--	<.0013	.193	<.0013	
MB	L	T	--	--	K	N	S	--	CC	II	II	

* Nitrate quantity calculated by subtracting nitrite concentration from total nitrate-nitrite-nitrogen concentration.

Table 5.--Chemical analyses of ground water, December 1985 to September 1987--Continued

[Inorganics, organics, and dissolved oxygen are expressed in milligrams per liter (mg/L). Fixed end point (4.5) alkalinity is expressed by milligrams per liter bicarbonate, and specific conductance is expressed as microsiemens per centimeter at 25 degrees Celsius. Dashes indicate parameter was not analyzed. < = less than]

Cond	= Specific conductance	Chlorob.	= Chlorobenzene	PCE	= Tetrachloroethylene
D.O.	= Dissolved oxygen	Chlorofm.	= Chloroform	12DCE	= 1,2-Dichloroethylene
AmmOrN	= Ammonia + organic nitrogen	12DCA	= 1,2-Dichloroethane	TCA	= 1,1,2-Trichloroethane
Phosph.	= Phosphorous	11DCE	= 1,1-Dichloroethylene	TCE	= Trichloroethylene
TDS	= Total dissolved solids	Ethylben.	= Ethylbenzene	VC	= Vinyl chloride
DOC	= Dissolved organic carbon	Meth. Cl.	= Methylene chloride	MB	= Identification letter for method blank in table 6
Carb.Tet.	= Carbon tetrachloride	PCA	= 1,1,2,2-Tetrachloroethane		

	Concentrations at wells for each sampling date (month/day)				
Property or Constituent	Well OF21 9/18 1987	Well OF22A 9/18 1987	Well OF22B 9/18 1987	Well H-1 12/16 1985	Well H-1 7/09 1986
pH	5.75	6.33	6.2	--	--
Cond.	721	766	276	--	--
D.O.	.3	.6	0	--	--
alkalinity	39.63	128.05	66.46	--	--
Antimony	<.024	<.024	<.024	00012	<0.003
Arsenic	.625	.406	<.005	<.001	<.003
Boron	.22	.21	<.05	.366	.332
Calcium	36.7	39.9	13.1	2.22	2.36
Iron	21.4	1.14	27.5	13.3	5.26
Magnesium	34.6	74.8	6.87	.859	.927
Manganese	1.86	.822	.36	.117	.298
Potassium	5.68	2.37	1.41	.955	2.6
Sodium	13.5	6.76	11.3	4.12	4.99
Silica	10.9	10.2	17.1	6.93	--
Zinc	1.11	1.76	.05	2.09	1.64
Chloride	145	97	62	2.6	--
Fluoride	<.1	.11	.11	<.1	--
Bromide	--	--	--	<.5	--
Sulfate	61.2	160	38	<1	--
Sulfide	5.6	8.4	<1	--	--
Nitrate	.01*	1.27*	.06*	<.05	--
Nitrite	.02	.02	<.01	.03	--
AmmOrN	.14	1.38	.91	.56	--
Phosph.	1	.45	.04	.043	--
Ammonia	2	.9	.6	.052	--
TDS	411	496	192	76	--
DOC	--	--	--	1.67	--
Benzene	1.113	<.0005	.0066	<.005	.001
Carb. Tet.	.378	<.0015	<.0015	<.005	<.0015
Chlorob.	.099	<.0006	<.0006	<.005	<.0006
Chlorofm.	1.815	.202	<.0008	.007	<.0008
12DCA	1.095	.075	.0011	<.001	<.0015
Meth. Cl.	.228	.061	.0079	.011	.003
PCA	3.201	2.108	.0139	<.01	<.0014
PCE	.321	.392	<.0015	<.005	<.0015
Toluene	.057	<.0004	<.0004	<.005	.001
12DCE	2.262	.202	.0737	<.005	<.0015
TCA	.219	<.0016	<.0016	<.005	<.0016
TCE	3.429	.716	.0318	<.005	<.0013
VC	<.0013	<.0013	<.0013	<.01	<.0012
MB	II	II	II	D	R

* Nitrate quantity calculated by subtracting nitrite concentration from total nitrate-nitrite-nitrogen concentration.

Table 6.--Chemical analyses of volatile organic carbon in laboratory method blanks for December 1985 to September 1987

[All units are in milligrams per liter]

Carb. Tet.	= Carbon Tetrachloride	Ethylben.	= Ethylbenzene	TCA	= 1,1,2-Trichloroethane
Chlorob.	= Chlorobenzene	Meth. Cl.	= Methylene Chloride	TCE	= Trichloroethylene
Chlorofm.	= Chloroform	PCA	= 1,1,2,2-Tetrachloroethane	VC	= Vinyl chloride
12DCA	= 1,2-Dichloroethane	PCE	= Tetrachloroethylene	MB	= Identification letter for method blank in table 5
11DCE	= 1,1-Dichloroethylene	12DCE	= 1,2-Dicholorethylene		

Constituent	Volatile organic carbon method blanks										
MB	A	B	C	D	E	F	G	H	I	J	K
Benzene	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Carb. Tet.	< .005	< .005	< .005	< .005	< .005	< .005	< .005	< .005	< .005	< .005	< .005
Chlorob.	< .005	< .005	< .005	< .005	< .005	< .005	< .005	< .005	< .005	< .005	< .005
Chlorofm.	< .005	< .005	< .005	.006	< .005	< .005	< .005	< .005	< .005	< .005	< .005
12DCA	< .001	< .001	< .001	< .001	< .001	< .001	< .001	< .001	< .001	< .001	< .001
Meth. Cl.	.038	.007	< .005	< .005	.016	.007	< .005	.011	.017	< .005	.006
PCA	< .01	< .01	< .01	< .01	< .01	< .01	< .01	< .01	< .01	< .01	< .01
PCE	< .005	< .005	< .005	< .005	< .005	< .005	< .005	< .005	< .005	< .005	< .005
Toluene	< .005	< .005	< .005	< .005	< .005	< .005	< .005	< .005	< .005	< .005	< .005
12DCE	< .005	< .005	< .005	< .005	< .005	< .005	< .005	< .005	< .005	< .005	< .005
TCA	< .005	< .005	< .005	< .005	< .005	< .005	< .005	< .005	< .005	< .005	< .005
TCE	< .005	< .005	< .005	< .005	< .005	< .005	< .005	< .005	< .005	< .005	< .005
VC	< .01	< .01	< .01	< .01	< .01	< .01	< .01	< .01	< .01	< .01	< .01
Test Date	12/13/85	21/27/85	21/29/85	21/30/85	21/31/85	1/01/86	1/10/86	3/12/86	3/19/86	3/25/86	3/26/86

MB	L	M	N	O	P	Q	R	S	T	U	V
Benzene	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.002	0.001	<0.0005	<0.0005	<0.0005	<0.0005
Carb. Tet.	< .0015	< .0015	< .0015	< .0015	< .0015	< .0015	< .0015	< .0015	< .0015	< .0015	< .0015
Chlorob.	< .0006	< .0006	< .0006	< .0006	< .0006	< .0006	< .0006	< .0006	< .0006	< .0006	< .0006
Chlorofm.	.0017	.0011	< .0008	< .0008	.003	.003	< .0008	< .0008	< .0008	< .0008	< .0008
12DCA	< .0015	< .0015	< .0015	< .0015	< .0015	< .0015	< .0015	< .0015	< .0015	< .0015	< .0015
Meth. Cl.	.0054	.0109	.0095	.007	.005	.006	.006	.0034	.0041	.0059	.0025
PCA	< .0014	< .0014	< .0014	< .0014	< .0014	< .0014	< .0014	< .0014	< .0014	< .0014	< .0014
PCE	< .0015	< .0015	< .0015	< .0015	< .0015	< .0015	< .0015	< .0015	< .0015	< .0015	< .0015
Toluene	.001	.0011	.0023	.002	< .001	.002	< .001	< .0004	< .0004	< .0004	< .0004
12DCE	< .0015	< .0015	< .0015	< .0015	< .0015	< .0015	.002	< .0015	< .0015	< .0015	.0023
TCA	< .0016	< .0016	< .0016	< .0016	< .0016	< .0016	< .0016	< .0016	< .0016	< .0016	< .0016
TCE	< .0013	< .0013	< .0013	< .0013	< .0013	< .0013	< .0013	.0014	.0015	.0016	.0016
VC	< .0012	< .0012	< .0012	< .0012	< .0012	< .0012	< .0012	< .0012	< .0012	< .0012	< .0012
Test date	7/13/86	7/13/86	7/14/86	7/18/86	7/19/86	7/20/86	7/21/86	9/23/86	9/24/86	9/25/86	9/26/86

MB	W	X	Y	Z	AA	BB	CC	DD	EE	FF	GG
Benzene	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.0025	0.0017
Carb. Tet.	< .0015	< .0015	< .0015	< .0015	< .0015	< .0015	< .0015	< .0015	< .0015	< .0015	< .0015
Chlorob.	< .0006	< .0006	< .0006	< .0006	< .0006	< .0006	< .0006	< .0006	< .0006	< .0006	< .0006
Chlorofm.	< .0008	.0015	< .0008	< .0008	< .0008	< .0008	< .0008	< .0008	< .0008	< .0008	< .0008
12DCA	< .0015	< .0015	< .0015	< .0015	< .0015	< .0015	< .0015	< .0015	< .0015	< .0015	< .0015
Meth. Cl.	.0091	.0107	.0091	.0045	.0032	.0047	.0042	.0061	.0046	< .0011	.0156
PCA	< .0014	< .0014	< .0014	< .0014	< .0014	< .0014	< .0014	< .0014	< .0014	< .0014	< .0014
PCE	< .0015	< .0015	< .0015	< .0015	< .0015	< .0015	< .0015	< .0015	< .0015	< .0015	< .0015
Toluene	< .0004	< .0004	< .0004	< .0004	< .0004	< .0004	< .0004	< .0004	< .0004	< .0004	< .0004
12DCE	< .0016	< .0004	< .0004	< .0004	< .0004	< .0004	< .0016	< .0016	.0028	.0013	
TCA	< .0016	< .0016	< .0016	< .0016	< .0016	< .0016	< .0016	< .0016	< .0016	< .0016	< .0016
TCE	< .0013	< .0013	< .0013	< .0013	< .0013	< .0013	< .0013	< .0013	< .0013	< .0013	< .0013
VC	< .0013	< .0013	< .0013	< .0013	< .0013	< .0013	< .0013	< .0013	< .0013	< .0013	< .0013
Test Date	12/14/86	12/15/86	12/14/86	12/15/86	12/16/86	12/17/86	9/30/87	10/04/87	10/01/87	10/06/87	10/09/87

MB	HH	II	JJ	KK	LL	MM	NN	OO	PP
Benzene	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Carb. Tet.	< .0015	< .0015	< .0015	< .0015	< .0015	< .0015	< .0015	< .0015	< .0015
Chlorob.	< .0006	< .0006	< .0006	< .0006	< .0006	< .0006	< .0006	< .0006	< .0006
Chlorofm.	< .0008	< .0008	< .0008	< .0008	< .0008	< .0008	< .0008	< .0008	< .0008
12DCA	< .0015	< .0015	.0015	< .0015	< .0015	< .0015	< .0015	< .0015	< .0015
11DCA	--	--	--	< .0019	< .0019	< .0019	< .0019	< .0019	< .0019
Ethylben.	--	--	--	< .0004	< .0004	< .0004	< .0004	< .0004	< .0004
Meth. Cl.	.0038	.0086	.0059	.004	.022	.007	.0042	.0092	.0050
PCA	< .0014	< .0014	< .0014	< .0014	< .0014	< .0014	< .0014	< .0014	< .0014
PCE	< .0015	< .0015	< .0015	< .0015	< .0015	< .0015	< .0015	< .0015	< .0015
Toluene	< .0004	< .0004	< .0004	.001	< .001	< .0004	< .0004	< .0004	< .0004
12DCE	< .0016	< .0016	< .0016	.004	< .0015	< .0016	< .0016	< .0016	< .0016
TCA	< .0016	< .0016	< .0016	< .0016	< .0016	< .0016	< .0016	< .0016	< .0016
TCE	< .0013	< .0013	< .0013	.002	< .0013	< .0013	< .0013	< .0013	< .0013
VC	< .0013	< .0013	< .0013	< .0012	< .0012	< .0013	< .0013	< .0013	< .0013
Test Date	10/10/87	10/12/87	01/13/87	10/29/86	11/15/86	21/13/86	1/07/87	2/02/87	2/18/87

Table 7.--Summary of available data on volatile organics and base/neutral organics as determined by U.S. Environmental Protection Agency methods 624 and 625, respectively, for ground-water samples collected in December 1985

['MB' followed by a letter indicates the corresponding method blank analyses for table 8. All units are in micrograms per liter; < = less than]

Well OF1	
Compound identification of best match	Concentration
Volatile organics for 12/13/1985 MB **A**	
2-Butanone	2.0
n-Hexane	.9
Base/neutral organics for 2/19/1985 MB **H**	
1,1'-Bicyclohexyl	2.0

Well OF2	
Compound identification of best match	Concentration
Volatile organics for 12/27/1985 MB **B**	
1,4-Dithiane	4.1
Base/neutral organics for 12/19/1985 MB **I**	
1,1'-Bicyclohexyl	3.0
Unknown phthalate	1.0
Hexanedioic acid, dioctyl ester	411
Unknown phthalate	5
Unknown phthalate	10
Unknown phthalate	3

Well OF3	
Compound identification of best match	Concentration
Volatile organics for 12/30/1985 MB **D**	
Acetone	2.0
Tetrahydrofurane	1
3-Methyl-2-butanone	2
n-Hexane	4
Butanoic acid, 2-methyl, methyl ester	2
2-Butanone	14
Base/neutral organics for 1/01/1986 MB **M**	
Unknown	2
1,1'-Bicyclohexyl	2

Well OF5	
Compound identification of best match	Concentration
Volatile organics for 12/30/1985 MB **D**	
Acetone	3.0
Tetrahydrofurane	2
3-Methyl-2-butanone	1
Unknown	1
1,4-Dichlorobenzene	23
2-Butanone	8
Base/neutral organics for 1/01/1986 MB **M**	
Unknown	1
1,1'-Bicyclohexyl	3

Well OF6	
Compound identification of best match	Concentration
Volatile organics for 12/26/1985 MB **B**	
1,2,3-Propanetriol	4.0
Carbon disulfide	15
Thiophene	9
3-Methyl-2-butanone	2
Methylcyclohexane	6
1,1,1,2-Tetrachloroethane	2
Base/neutral organics for 12/31/1985 MB **J**	
1,4-Dithiane	4,634
Unknown (contains sulfur)	43
Unknown (contains sulfur)	113
2-Hydroxybenzoic acid, methy ester	47
2-Methylquinoline	49
Isomer of methylquinoline	53
Unkonwn (sulfur compound)	194
Unknown (sulfur compound)	204
Ethanol,2,2'-{1,2-ethanediyl-bis(thio)}bis	50
Unknown	86

Well OF6a	
Compound identification of best match	Concentration
Volatile organics for 12/26/1985 MB **B**	
Thiirane	5.0
2-Fluoro-2-methylpropane	7
Carbon disulfide	17
Thiophene	12
3-Methyl-2-butanone	2
Methylcyclohexane	7
1,1,1,2-Tetrachloroethane	4
4-Carene	10
Unknown	2
Base/neutral organics for 12/31/1985 MB **J**	
1,4-Dithiane	5,154
C3 Alkyl benzene	1,854
1,3-Dithiolane-2-thione	52
Unknown	80
3,5-Dimethyl-1,2,4-trithiolane	115
Unknown	127
Ethanol,2,2'-{1,2-ethanediyl-bis(thio)}bis-	127
Unknown	60
Unknown {related to oxathione-(1,2-thioxane)}	307
Hexanedioc acid, dioctyl ester	116

Well OF6b	
Compound identification of best match	Concentration
Volatile organics for 12/26/1985 MB **B**	
2-Butanone	6.0
3-Methyl-2-butanone	<1
2-Methyl-3-pentanone	1
4-Methyl-2-pentanone	4
1,4-Dithiane	10
Base/neutral organics for 12/31/1985 MB **J**	
1,4-Dithiane	130
Unknown (aromatic)	5
Unknown	4
Unknown	10
6-Methyl-1,3-oxathiane	21
1,1'-Bicyclohexyl	4
Unknown	4
1 (3H)-Isobenzofuranone	15
Unknown	10
Hexanedioic acid, dioctyl ester	373

Well OF6c	
Compound identification of best match	Concentration
Volatile organics for 12/26/1985 MB **B**	
Acetone	14.0
1-Pentene	5
2-Butanone	7
1,4-Dioxane	53
Base/neutral organics for 12/31/1985 MB **J**	
Cyclohexanol	1
Unknown 1,4-dithiane	3
Methyl naphthalene	1
Bicyclohexyl	3
Unknown	1
Unknown	1
Unknown	1
Unknown	3
Unknown	2
Sulfur (S8)	3

Table 7.--Summary of available data on volatile organics and base/neutral organics as determined by U.S. Environmental Protection Agency methods 624 and 625, respectively, for ground-water samples collected in December 1985--Continued

['MB' followed by a letter indicates the corresponding method blank analyses for table 8. All units are in micrograms per liter; < = less than]

Well OF7	
Compound identification of best match	Concentration
Volatile organics for 12/30/1985 MB D	
Acetone	80.0
Tetrahydrofurane	1,520
3-Methyl-2-butanone	45
n-Hexane	81
Unknown	48
2-Butanone	305
Base/neutral organics for 1/01/1986 MB M	
Unknown	1
Unknown	2
1,1'-Bicyclohexyl	3
Unknown	1
Unknown	2

Well OF8	
Compound identification of best match	Concentration
Sample not tested for volatile organics	
Base/neutral organics for 12/19/1985 MB H	
1,1'-Bicyclohexyl	2.0
Hexanedioic acid, dioctyl ester	5

Well OF9	
Compound identification of best match	Concentration
Volatile organics for 12/30/1985 MB D	
Acetone	2.0
Tetrahydrofurane	1
3-Methyl-2-butanone	2
n-Hexane	4
Unknown	1
Butanoic acid, 2-methyl, methyl ester	2
2-Butanone	15
Base/neutral organics for 1/01/1986 MB M	
Unknown	1
1,1'-Bicyclohexyl	2
Unknown	1
Unknown	2

Well OF11	
Compound identification of best match	Concentration
Volatile organics for 1/01/1986 MB F	
Acetone	2.0
3-Methyl-2-butanone	2
n-Hexane	4
2-Butanone	13
Base/neutral organics for 1/01/1986 MB L	
Unknown	1
2-Methylnaphthalene	1
1,1'-Bicyclohexyl	2
Unknown	2
Unknown	4

Well OF12a	
Compound identification of best match	Concentration
Volatile organics for 12/30/1985 MB D	
Acetone	3.0
1,4-Dioxane	3
Unknown	2
Heptane	4
2-butanone	4
Base/neutral organics for 12/30/1985 MB J	
Cyclohexanol	2
Cyclohexane	1
Unknown	1
Unknown	1
Unknown	1
C3 Alykl benzene	10
Unknown	1
Bicyclohexyl	2
Unknown	4

Well OF12b	
Compound identification of best match	Concentration
Volatile organics for 12/26/1985 MB B	
Acetone	1.0
2-Butanone	10
1,4-Dioxane	2
3-Methyl-2-butanone	2
Base/neutral organics 12/31/1985 MB J	
1,4-Dithiane	3
Unknown aromatic hydrocarbon	1
1,1'-Bicyclohexyl	2
Unknown	2
Unknown	4
5-Methyl-5-phenyl-2-hexanone	1

Well OF12c	
Compound identification of best match	Concentration
Volatile organics for 12/26/1985 MB B	
Acetone	2.0
2-Butanone	16
3-Methyl-2-butanone	2
Unknown	4
Dichlorobenzene	10
Base/neutral organics for 1/01/1986 MB M	
Unknown	2
1,1'-Bicyclohexyl	2
Unknown	1
Hexanedioic acid, dioctyl ester	18

Well OF13a	
Compound identification of best match	Concentration
Sample not tested for volatile organics	
Base/neutral organics for 12/31/1985 MB L	
Pentafluorophenone derivative	3.0
Methyl naphthalene	1
1,1'-Bicyclohexyl	4
Unknown	1
Dioctyl adipate	177

Table 7.--Summary of available data on volatile organics and base/neutral organics as determined by U.S. Environmental Protection Agency methods 624 and 625, respectively, for ground-water samples collected in December 1985--Continued

['MB' followed by a letter indicates the corresponding method blank analyses for table 8. All units are in micrograms per liter; < = less than]

Well OF13b	
Compound identification of best match	Concentration
Volatile organics for 1/01/1986 MB F	
Acetone	2.0
3-Methyl-2-butanone	1
1,4-Dithiane	8
2-Butanone	10
Base/neutral organics for 12/31/1985 MB L	
Unknown	8
Unknown	1
1,4-Dithiane	58
Unknown	7
1,1'-Bicyclohexyl	3
Unknown	2
Unknown	2
Dioctyl adipate	180
Unknown phthalate	2
Unknown phthalate	47

Well OF13c	
Compound identification of best match	Concentration
Volatile organics for 1/01/1986 MB F	
1,4-Dithiane	9.0
2-Butanone	6
Base/neutral organics for 12/31/1985 MB L	
Chlorocarbon	4
Dithione	110
Unknown	8
Substituted dithione	3
Unknown	25
Unknown	1
Unknown	2
1,1'-Bicyclohexyl	2
Unknown	3
Unknown	2

Well OF14a	
Compound identification of best match	Concentration
Volatile organics for 1/01/1986 MB F	
Acetone	1.0
1,4-Dithiane	8
2-Butanone	8
Base/neutral organics for 1/01/1986 MB not available	
Unknown	3
1,4-Dithiane	40
2-Methylnaphthalene	2
1,1'-Bicyclohexyl	4
Unknown	2
Unknown	3

Well OF14b	
Compound identification of best match	Concentration
Volatile organics for 1/01/1986 MB F	
Acetone	5.0
3-Methyl-2-butanone	2
1,4-Dithiane	58
2-Butanone	14
Base/neutral organics for 12/31/1985 MB L	
Unknown	17
1,4-Dithiane	1132
Unknown	20
Unknown	5
Unknown	7
Unknown	3
Unknown	6
Unknown	3
Unknown	12
Unknown	4

Well OF14c	
Compound identification of best match	Concentration
Volatile organics for 1/01/1986 MB F	
Acetone	2.0
3-Methyl-2-butanone	1
n-Hexane	4
2-Butanone	14
Base/neutral organics for 12/31/1985 MB L	
Unknown	1
1,4-Dithiane	8
Unknown	5
Pentafluorophenol derivative	5
Methyl naphthalene	1
1,1'-Bicyclohexyl	2
Unknown	2
Unknown	2
Dioctyl adipate	52

Well OF14d	
Compound identification of best match	Concentration
Volatile organics for 1/01/1986 MB F	
Acetone	1.0
n-Hexane	2
2-Butanone	6
Base/neutral organics for 1/02/1986 MB L	
Unknown	3
1,1'-Bicyclohexyl	3

Table 7.--Summary of available data on volatile organics and base/neutral organics as determined by U.S. Environmental Protection Agency methods 624 and 625, respectively, for ground-water samples collected in December 1985--Continued

['MB' followed by a letter indicates the corresponding method blank analyses for table 8. All units are in micrograms per liter; < = less than]

Well OF16a		Well OF16b	
Compound identification of best match	Concentration	Compound identification of best match	Concentration
Volatile organics for 12/13/1985 MB **A**		Volatile organics for 1/10/1986 MB **G**	
2-Butanone	8.0	Cyclohexane	7.0
Cyclohexane	7	Methylcyclopentane	5
Methylcyclopentane	7	3-Methyl-2-butanone	2
Methylcyclohexane	4		
2,2-Dimethyl-3-hexene	8		
1-Methylethyl-benzene	60		
Xylene	21		
Base/neutral organics for 12/19/1985 MB **I**		Base/neutral organics for 12/19/1985 MB **I**	
Ethyl-2-methylbenzene	21	Unknown	2
1-Ethenyl-2-methylbenzene	9	Xylene	2
Phosphonic acid, methyl-bis (1-methylethyl)ester	32	Aniline	26
Unknown aromatic	10	Trimethylbenzene isomer	2
Unknown	10	Phosphonic acid, methyl-bis (1-methylethyl)ester	24
Chloroaniline	16	Unknown	2
Unknown	16	1,1'-Bicyclohexyl	2
3,5-Dichloroaniline	20	Dimethylbenzoic acid	6
Trichloroaniline	19	Diphenyl methanone	7
Dichlorophenol (not 2,4)	23	Trichloroaniline	2

Well OF17a		Well OF17b	
Compound identification of best match	Concentration	Compound identification of best match	Concentration
Volatile organics for 12/29/1985 MB **C**		Volatile organics for 12/30/1985 MB **D**	
Acetone	125.0	Acetone	2.0
3-Methyl-2-butanone	73	Tetrahydrofurane	4
		3-Methyl-2-butanone	1
		Butanoic acid, 2-methyl, methyl ester	16
		2-Butanone	9
Base/neutral organics for 12/20/1985 MB **K**		Base/neutral organics for 12/31/1985 MB **J**	
Chlorobenzene	37	Cyclohexane	2
1,1,2,2-Tetrachloroethane	197	Unknown	4
1,4-Dithiane	927	1,4-Dithiane	150
Unknown (sulfur containing)	33	C3-Benzene	6
Unknown	33	1,1'-Bicyclohexyl	3
2-Hydroxybenzoic acid methyl ester	28	Unknown	5
Methyl quinoline	21		
Unknown	90		
Unknown (sulfur containing)	92		
Unknown	33		

Well OF18a		Well OF18b	
Compound identification of best match	Concentration	Compound identification of best match	Concentration
Volatile organics for 1/01/1986 MB **F**		Volatile organics for 1/01/1986 MB **F**	
Acetone	1.0	Acetone	1.0
1,4-Dithiane	32	3-Methyl-2-butanone	1
2-Butanone	6	n-Hexane	3
		2-Butanone	-
Base/neutral organics for 12/31/1985 MB **L**		Base/neutral organics for 12/31/1985 MB **C**	
Unknown	4	Unknown	1
Unknown	2	Unknown	2
1,1'-Bicyclohexyl	3	Methyl naphthalene	1
Unknown	1	1,1'-Bicyclohexyl	3
Dioctyl adipate	2	Unknown	<1
		Unknown	1
		Unknown	<1
		Unknown	<1
		Unknown	<1

Table 7.--Summary of available data on volatile organics and base/neutral organics as determined by U.S. Environmental Protection Agency methods 624 and 625, respectively, for ground-water samples collected in December 1985--Continued

['MB' followed by a letter indicates the corresponding method blank analyses for table 8. All units are in micrograms per liter; < = less than]

Well OF18c	
Compound identification of best match	Concentration
Sample not tested for volatile organics	
Base/neutral organics for 12/31/1985 MB **L**	
Unknown	<1.0
Unknown	1
Methyl naphthalene	1
1,1'-Bicyclohexyl	3
Unknown	1

Well OF19a	
Compound identification of best match	Concentration
Volatile organics for 12/29/1985 MB **C**	
Acetone	10.0
3-Methyl-2-butanone	2
n-Hexane	4
Unknown	3
1,4-Dithiane	9
Base/neutral organics for 12/19/1985 MB **H**	
Unknown	2
1,1'-Bicyclohexyl	2

Well OF21	
Compound identification of best match	Concentration
Volatile organics for 12/29/1985 MB **C**	
Unknown	2.0
Acetone	2
3-Methyl-2-butanone	2
Unknown	1
1,4-Dithiane	9
Base/neutral organics for 12/31/1985 MB **J**	
Unknown	3
Cyclohexanone	2
1,4-Dithiane	196
C3 Alkyl benzene	5
Benzoic acid	1
1,1'-Bicyclohexyl	3
Unknown	6
Dioctyl adipate	6

Well OF22	
Compound identification of best match	Concentration
Volatile organics for 1/01/1986 MB **F**	
Acetone	3.0
3-Methyl-2-butanone	2
1,4-Dithiane	7
2-Butanone	14
Sample not tested for base/neutral organics	

Well OF23	
Compound identification of best match	Concentration
Volatile organics for 12/31/1985 MB **E**	
Acetone	1.0
n-Hexane	1
Unknown	1
2-Butanone	5
Base/neutral organics for 1/02/1986 MB **L**	
2-Methylnaphthalene	1
1,1'-Bicyclohexyl	2

Well OF24	
Compound identification of best match	Concentration
Volatile organics for 12/31/1985 MB **E**	
Acetone	38.0
1,4-Dioxane	67
3-Methyl-2-butanone	25
Unknown	26
2-Butanone	5,000
Base/neutral organics for 12/31/1985 MB **L**	
1,4-Dithiane	700
Unknown	5
Unknown	3
Unknown	3
Unknown	2
Unknown	3
Unknown	3
Unknown	4
Sulfur	6
Dioctyl adipate	15

Well H1	
Compound identification of best match	Concentration
Volatile organics for 12/30/1985 MB **D**	
Acetone	2.0
Tetrahydrofurane	1
3-Methyl-2-butanone	1
n-Hexane	3
Butanoic acid, 2-methyl, methyl ester	1
1,4-Dithiane	9
2-Butanone	11

Well H1	
Compound identification of best match	Concentration
Base/neutral organics for 1/01/1986 MB **M**	
Unknown	1.0
Unknown	1
Unknown	1
1,1'-Bicyclohexyl	3
Unknown	2
Unknown hydrocarbon	2
Unknown hydrocarbon	1
Unknown hydrocarbon	4
Unknown hydrocarbon	3
Sulfur (S8)	21

Table 8.--Chemical analyses for volatile organics and base/neutral organics in laboratory method blanks for ground-water samples collected in December 1985

[Letter following method blank denotes corresponding sample analyses from table 7. All units are in micrograms per gram]

Method blank A for 12/13/1985	
Compound identification of best match	Concentration
Volatile organics	
Unknown	1.0
n-Hexane	2
2-Butanone	5

Method blank B for 12/27/1985	
Compound identification of best match	Concentration
Volatile organics	
Acetone	1.0
Propanoic acid, methyl ester	.8
Trimethoxymethane	.6
3-Methyl-2-butanone	1.1
n-Hexane	2.7
Unknown	.9
Unknown	1.4
2-Butanone	9.5

Method blank C for 12/29/1985	
Compound identification of best match	Concentration
Volatile organics	
Acetone	2.0
3-Methyl-2-butanone	1

Method blank D for 12/30/1985	
Compound identification of best match	Concentration
Volatile organics	
Acetone	2.0
1,4-Dioxane	8
3-Methyl-2-butanone	1
n-Hexane	1

Method blank E for 12/31/1985	
Compound identification of best match	Concentration
Volatile organics	
Acetone	2.0
n-Hexane	3
2-Butanone	12

Method blank F for 1/01/1986	
Compound identification of best match	Concentration
Volatile organics	
Acetone	2.0
1,4-Dioxane	9
3-Methyl-2-butanone	1
n-Hexane	3
2-Butanone	11

Method blank G for 1/10/1985	
Compound identification of best match	Concentration
Volatile organics	
Acetone	2.0
Propanoic acid, methyl ester	1
Unknown	1
3-Methyl-2-butanone	1
n-Hexane	2
Unknown	2
Unknown	2

Method blank H for 12/19/1985	
Compound identification of best match	Concentration
Base/neutral organics	
1,1'-Bicyclohexyl	3.0

Method blank I for 12/20/1985	
Compound identification of best match	Concentration
Base/neutral organics	
1,1'-Bicyclohexyl	2.0
Hexanedioic acid, dioctyl ester	5

Method blank J for 12/31/1985	
Compound identification of best match	Concentration
Base/neutral organics	
Unknown	2.0
Unknown	1
1,1'-Bicyclohexyl	3

Method blank K for 12/20/1985	
Compound identification of best match	Concentration
Base/neutral organics	
Unknown hydrocarbon	307.0
Unknown hydrocarbon	344
Unknown acid ester	11
Hexanedioic acid, dioctyl ester	3,052
Unknown acid ester	4
Unknown acid ester	18
Unknown phthalate	6
Unknown phthalate	4
Unknown phthalate	164
Unknown phthalate	64

Method blank L for 1/01/1986	
Compound identification of best match	Concentration
Base/neutral organics	
1,1'-Bicyclohexyl	6.0
Unknown	4
Unknown	6
Unknown	8
Unknown	8
Hexanedioic acid, dioctyl ester	1,972
Unknown diacid ester	6
Unknown phthalate	14
Unknown phthalate	54
Unknown phthalate	18

Method blank M for 1/01/1986	
Compound identification of best match	Concentration
Base/neutral organics	
Unknown	1.0
1,1'-Bicyclohexyl	2

Table 9.--Analysis of chemical-warfare agents and degradation products in ground-water samples from selected wells, September 1987

[All units are in milligrams per liter; > = greater than;
< = less than;
dashes indicate data not available;
EMPA = Ethyl methylphosphonic acid;
IMPA = Isopropyl methylphosphonic acid;
PMPA = Pinacolyl methyl phosphonic acid;
MPA = Methyl phosphonic acid;
TDG = Thiodiglycol;
CVAA = Chlorovinyl arsonic acid]

NOTE: Based on the minimum detectable limit of 0.003 micrograms per milliliter, neither mustard agent nor nerve agent (types GB and GD) samples were found in wells OF6, OF6A, OF16A, OF17A, OF20A, OF21, OF22A or OF22B. Based on the minimum detectable limit of 0.002 micrograms per milliliter, samples of nerve agent (type VX) also were not found.

Well No.	EMPA	IMPA	PMPA	MPA	TDG	CVAA
OF6	<0.4	<0.4	<0.4	<0.4	1,000	<0.04
OF6A	< .4	< .4	< .4	< .4	1,000	< .04
OF13B	< .4	< .4	< .4	< .4	10	< .04
OF14B	< .4	< .4	< .4	< .4	5	< .04
OF14C	< .4	< .4	< .4	< .4	< .4	< .04
OF16A	< .4	< .4	< .4	>10	< .4	< .04
OF16B	< .4	< .4	< .4	< .4	< .4	< .04
OF17A	< .4	< .4	< .4	< .4	100	< .04
OF17B	< .4	< .4	< .4	< .4	2	< .04
OF20A[1]	--	--	--	>10	10	< .04
OF20B	< .4	< .4	< .4	< .4	1	< .04
OF21	< .4	< .4	< .4	< .4	200	< .04
OF22A	< .4	< .4	< .4	< .4	< .4	< .04
OF22B	< .4	< .4	< .4	< .4	2	< .04

[1] 2,000-3,000 milligrams per liter brine present. Could not analyze for EMPA, IMPA and PMPA.

Table 10.--Explosive-related-product analyses for ground-water samples from selected wells, December 1986 and September 1987

[All units are in micrograms per liter; < = less than;
dashes indicate data not available;
TNT = 2,4,6-Trinitrotoluene;
2,4-DNT = 2,4-Dinitrotoluene;
2,6-DNT = 2,6-Dinitrotoluene;
HMX = 1,3,5,7-Tetranitro-1,3,5,7-tetrazacyclo-octane;
RDX = 1,3,5-Trinitro-1,3,4-triazacyclohexane;
1,3,5-TNB = 1,3,5-Trinitrobenzene;
1,3-DNB = 1,3-Dinitrobenzene;
TETRYL = 2,4,5-Trinitrophenylmethylnitramine;
NITRO-BENZ = Nitrobenzene]

Well No.	TNT	2,4-DNT	2,6-DNT	HMX	RDX	1,3,5-TNB	1,3-DNB	TETRYL	NITRO-BENZ
December 1986									
OF6	22.1	<0.283	<0.433	--	--	--	--	--	--
OF6A	<1.83	< .283	< .433	--	--	--	--	--	--
OF13A	< .183	< .283	< .433	--	--	--	--	--	--
OF13B	< .183	< .283	< .433	--	--	--	--	--	--
OF16A	< .183	< .283	< .433	--	--	--	--	--	--
OF16B	< .183	< .283	< .433	--	--	--	--	--	--
September 1987									
OF20A	<0.89	<1.8	<1.8	<0.38	<0.69	<0.38	4.6	<1.3	<2.1
OF20B	< .89	<1.8	<1.8	< .38	< .69	< .38	< .66	<1.3	<2.1
OF21	< .89	<1.8	<1.8	< .38	< .69	< .38	23.3	<1.3	<2.1
OF22A	< .89	<1.8	<1.8	< .38	< .69	< .38	71.8	<1.3	<2.1
OF22B	< .89	<1.8	<1.8	< .38	< .69	< .38	< .66	<1.3	<2.1

Table 11.--Radiation analyses of ground-water samples for gross beta, gross alpha, tritium, and cesium-137

[All data are in picoCuries per liter plus or minus two standard deviations; < = less than]

Well no.	Gross beta	Gross alpha	Tritium	Cesium-137
OF6	8.5 ± 2.0	<2.4	<490	<1.4
OF6A	6.2 ± 2.6	<3.8	<490	<6.2
OF6B	2.6 ± 1.0	<1.3	<490	<1.3
OF17A	2.3 ± 0.9	<1.4	<490	<4.4

Table 12.--Herbicide analyses of ground water for selected wells

[All units are in micrograms per liter;
dashes indicate analysis was not performed; < = less than;
2, 4-D = (2,4-dichlorophenoxy)-acetic acid;
Silvex = 2-(2, 4, 5-tri-chlorophenoxy)-propanoic acid;
2, 4, 5-T = (2, 4, 5-trichlorophenoxy)-acetic acid.]

Herbicide compounds	Detection limits	Well number						
		OF6	OF6A	OF16A	OF17A	OF20A	OF22A	OF22B
2, 4-D	<0.9	<0.3	<0.3	<0.3	<0.3	<0.9	<0.9	<0.9
Silvex	< .3	< .4	< .4	< .4	< .4	< .3	< .3	< .3
2, 4, 5-T	< .4	--	--	--	--	< .4	< .4	< .4

Table 13.--Water level measurements at selected wells

[Water-level is expressed in feet above sea level. Dashes indicate information is not available]

Well No.	Date measured	Time measured	Water-level elevation
OF1	01/27/86	0830	2.43
OF2	01/27/86	0815	6.38
OF3	01/27/86	--	--
OF5	01/27/86	--	--
OF6	01/27/86	1000	2.31
OF6A	01/27/86	1000	2.23
OF6B	01/27/86	1000	2.26
OF6C	01/27/86	1000	2.27
OF7	01/27/86	0715	7.45
OF8	01/27/86	0815	6.46
OF9	01/27/86	0745	8.74
OF10	01/27/86	0800	4.04
0F11	01/27/86	1100	1.97
OF12A	01/27/86	1015	2.91
0F12B	01/27/86	1015	2.25
0F12C	01/27/86	1015	2.47
OF13A	01/27/86	1000	2.14
OF13B	01/27/86	1000	2.13
OF13C	01/27/86	1000	2.22
OF14A	01/27/86	1015	2.48
OF14B	01/27/86	1015	2.09
OF14C	01/27/86	1030	2.23
OF14D	01/27/86	1015	--
OF16A	01/27/86	0900	4.71
0F16B	01/27/86	0915	4.12
OF17A	01/27/86	1045	1.93
OF17B	01/27/86	1045	2.08
OF18A	01/27/86	0900	2.49
OF18B	01/27/86	0900	2.47
OF18C	01/27/86	0915	2.51
OF19	01/27/86	0930	3.15
OH1	01/27/86	0730	--

Well No.	Date measured	Time measured	Water-level elevation
OF1	02/26/86	--	--
OF2	02/26/86	--	--
OF3	02/26/86	--	--
OF5	02/26/86	--	--
OF6	02/26/86	--	--
OF6A	02/26/86	1340	3.19
OF6B	02/26/86	1340	2.55
OF6C	02/26/86	--	--
OF7	02/26/86	--	--
OF8	02/26/86	--	--
OF9	02/26/86	--	--
OF10	02/26/86	--	--
OF11	02/26/86	--	--
OF12A	02/26/86	1400	3.51
OF12B	02/26/86	1400	2.56
OF12C	02/26/86	1400	2.52
0F13A	02/26/86	1445	2.79
OF13B	02/26/86	1445	2.94
OF13C	02/26/86	--	--
OF14A	02/26/86	1515	2.60
OF14B	02/26/86	1515	2.29
0F14C	02/26/86	--	--
OF14D	02/26/86	--	--
OF16A	02/26/86	--	--
OF16B	02/26/86	--	--
OF17A	02/26/86	--	--
OF17B	02/26/86	--	--
OF18A	02/26/86	--	--
OF18B	02/26/86	--	--
OF18C	02/26/86	--	--
OF19	02/26/86	--	--
OH1	02/26/86	--	--

Well No.	Date measured	Time measured	Water-level elevation
OF1	03/05/86	1215	3.30
OF2	03/05/86	1015	7.58
OF3	03/05/86	--	--
OF5	03/05/86	--	--
OF6	03/05/86	1100	3.24
OF6A	03/05/86	1015	3.15
OF6B	03/05/86	1030	2.47
0F6C	03/05/86	1030	2.49
OF7	03/05/86	--	--
OF8	03/05/86	1045	7.73
OF9	03/05/86	1130	7.04
OF10	03/05/86	1130	4.50
OF11	03/05/86	1130	1.82
OF12A	03/05/86	1100	3.23
OF12B	03/05/86	1100	2.48
OF12C	03/05/86	1115	2.47
OF13A	03/05/86	1330	2.96
OF13B	03/05/86	1330	2.60
OF13C	03/05/86	1345	2.48
0F14A	03/05/86	1337	2.39
OF14B	03/05/86	1345	2.18
OF14C	03/05/86	1345	2.44
OF14D	03/05/86	1345	--
OF16A	03/05/86	1115	4.95
OF16B	03/05/86	1130	4.42
OF17A	03/05/86	1215	2.36
OF17B	03/05/86	1215	2.39
OF18A	03/05/86	1200	3.32
OF18B	03/05/86	1200	3.38
0F18C	03/05/86	--	--
OF19	03/05/86	1215	4.87
OH1	03/05/86	--	--

Well No.	Date measured	Time measured	Water-level elevation
OF1	04/22/86	1200	4.20
OF2	04/22/86	1215	7.90
OF3	04/22/86	1230	12.91
OF5	04/22/86	1230	12.72
OF6	04/22/86	1115	3.33
0F6A	04/22/86	1100	3.31
OF6B	04/22/86	1100	3.15
OF6C	04/22/86	1130	4.59
OF7	04/22/86	1230	8.07
OF8	04/22/86	1215	8.40
OF9	04/22/86	1200	7.73
OF10	04/22/86	1215	5.51
OF11	04/22/86	1215	3.03
OF12A	04/22/86	--	--
OF12B	04/22/86	1100	3.20
OF12C	04/22/86	1100	2.48
0F13A	04/22/86	1145	3.07
OF13B	04/22/86	1145	3.05
OF13C	04/22/86	1200	3.08
OF14A	04/22/86	--	--
OF14B	04/22/86	1130	2.78
OF14C	04/22/86	1145	3.11
OF14D	04/22/86	1145	--
OF16A	04/22/86	1215	5.21
OF16B	04/22/86	1215	4.81
OF17A	04/22/86	1100	2.80
OF17B	04/22/86	1115	3.08
OF18A	04/22/86	1145	4.57
OF18B	04/22/86	1145	4.76
OF18C	04/22/86	1145	3.08
OF19	04/22/86	1200	5.54
OH1	04/22/86	1230	--

Table 13.--Water level measurements at selected wells--Continued

[Water level is expressed in feet above sea level. Dashes indicate information is not available]

Well No.	Date measured	Time measured	Water-level elevation
OF1	07/31/86	1039	1.52
OF2	07/31/86	0930	--
OF3	07/31/86	1045	11.51
OF5	07/31/86	1020	10.03
OF6	07/31/86	--	--
OF6A	07/31/86	1115	1.41
OF6B	07/31/86	1115	1.48
OF6C	07/31/86	1115	1.78
OF7	07/31/86	1020	3.92
OF8	07/31/86	0945	5.61
OF9	07/31/86	1105	4.35
OF10	07/31/86	1054	4.72
OF11	07/31/86	1045	2.07
OF12A	07/31/86	--	--
OF12B	07/31/86	1115	1.51
OF12C	07/31/86	1115	1.50
OF13A	07/31/86	1115	1.44
OF13B	07/31/86	1115	1.42
OF13C	07/31/86	1116	1.48
OF14A	07/31/86	--	--
OF14B	07/31/86	1115	.71
OF14C	07/31/86	1115	1.47
OF14D	07/31/86	1115	1.66
OF16A	07/31/86	1108	3.04
OF16B	07/31/86	1110	2.38
OF17A	07/31/86	1115	1.64
OF17B	07/31/86	1115	1.53
OF18A	07/31/86	1115	2.78
OF18B	07/31/86	1115	2.67
OF18C	07/31/86	1240	1.77
OF19	07/31/86	1115	1.63
OH1	07/31/86	1010	--

Well No.	Date measured	Time measured	Water-level elevation
OF1	12/01/86	1044	1.61
OF2	12/01/86	0952	--
OF3	12/01/86	0916	11.40
OF5	12/01/86	0910	10.36
OF6	12/01/86	1116	1.75
OF6A	12/01/86	1107	1.72
OF6B	12/01/86	1111	1.67
OF6C	12/01/86	1125	1.72
OF7	12/01/86	0903	7.53
OF8	12/01/86	0935	5.74
OF9	12/01/86	1015	6.57
OF10	12/01/86	1015	3.67
OF11	12/01/86	1025	1.58
OF12A	12/01/86	--	--
OF12B	12/01/86	1127	1.72
OF12C	12/01/86	1130	1.70
OF13A	12/01/86	--	--
OF13B	12/01/86	1110	1.68
OF13C	12/01/86	1112	1.72
OF14A	12/01/86	--	--
OF14B	12/01/86	1120	1.49
OF14C	12/01/86	1122	1.67
OF14D	12/01/86	1123	1.63
OF16A	12/01/86	0945	4.30
OF16B	12/01/86	0949	3.47
OF17A	12/01/86	1135	1.61
OF17B	12/01/86	1136	1.76
OF18A	12/01/86	1040	1.83
OF18B	12/01/86	1155	1.82
OF18C	12/01/86	1045	1.77
OF19	12/01/86	1132	2.15
OH1	12/01/86	0926	--

Well No.	Date measured	Time measured	Water-level elevation
OF1	09/14/87	--	1.47
OF2	09/14/87	--	--
OF3	09/14/87	1035	12.13
OF5	09/14/87	--	10.03
OF6	09/14/87	--	1.51
OF6A	09/14/87	--	1.50
OF6B	09/14/87	--	1.90
OF6C	09/14/87	--	2.00
OF7	09/14/87	--	5.68
OF8	09/14/87	--	5.78
OF9	09/14/87	--	4.89
OF10	09/14/87	--	4.70
OF11	09/14/87	--	3.22
OF12A	09/14/87	--	--
OF12B	09/14/87	--	1.95
OF12C	09/14/87	--	1.92
OF13A	09/14/87	--	1.45
OF13B	09/14/87	--	1.65
OF13C	09/14/87	--	1.89
OF14A	09/14/87	--	--
OF14B	09/14/87	--	1.42
OF14C	09/14/87	--	1.92
OF14D	09/14/87	--	2.05
OF16A	09/14/87	--	4.06
OF16B	09/14/87	--	3.21
OF17A	09/14/87	--	1.58
OF17B	09/14/87	--	1.85
OF18A	09/14/87	--	2.25
OF18B	09/14/87	--	2.26
OF18C	09/14/87	--	3.16
OF19	09/14/87	--	1.72
OH1	09/14/87	--	--

Table 14.--Field parameters of surface-water samples from Watson Creek, August 22, 1985

[Specific conductance is expressed in microsiemens per centimeter at 25 degrees Celsius. Temperature is expressed in degrees Celsius]

Site No.	pH	Specific conductance	Temperature
1	6.50	9,000	25.0
2	6.10	9,000	24.0
3	6.80	10,200	--
4	6.96	10,330	25.3
6	6.83	10,560	25.6
7	7.08	9,690	26.9
8	7.15	9,700	26.0
9	7.19	9,220	26.9
11	8.57	9,570	30.7
12	8.58	9,360	29.0
13	7.38	9,420	27.9
14	7.63	9,350	28.0
15	7.40	9,000	28.0
16	7.40	9,750	27.0
17	7.40	9,750	26.0
18	7.20	9,000	26.0
19	7.40	9,500	26.0
20	7.30	9,000	27.0
21	7.30	9,500	27.0
22	6.85	8,500	26.6
23	7.10	9,500	26.0

Table 15.--Inorganic chemical analyses of surface-water samples from Watson Creek and the Gunpowder River

[All units are milligrams per liter except for mercury which is micrograms per liter.
Dashes indicate analysis was not performed. < = less than]

Sb	=	Antimony	Ca	=	Calcium	Hg	=	Mercury	Cl	=	Chloride	NH3 = Ammonia
As	=	Arsenic	Cr	=	Chromium	Ni	=	Nickel	F	=	Fluoride	NH4 = Ammonium
As III	=	Arsenic III	Cu	=	Copper	K	=	Potassium	Br	=	Bromide	N = Nitrogen
As V	=	Arsenic V	Fe	=	Iron	Se	=	Selenium	SiO2	=	Silicate	(NH4 + org)
Be	=	Beryllium	Pb	=	Lead	Na	=	Sodium	TDS	=	Total Dissolved	P = Total
B	=	Boron	Mg	=	Magnesium	Ti	=	Titanium			Solids	Phosphorus
Cd	=	Cadmium	Mn	=	Manganese	Zn	=	Zinc	Alk	=	Alkalinity	NO3 = Nitrate
									SO4	=	Sulfate	NO2 = Nitrite

Site No.	Parameters and concentrations: Sb	As	As III	As V	Be	B	Cd	Ca	Cr	Cu	Fe
November 1984											
6	--	--	0.08	--	--	0.6	--	--	--	--	--
9	--	--	.02	--	--	.5	--	--	--	--	--
August 1985											
1	0.123	0.083	0.083	--	<0.001	0.88	<0.002	68.8	<0.004	<0.0025	0.037
2	.149	.073	.065	.008	< .001	.472	< .002	63.2	< .004	< .0025	.794
3	.108	.077	.065	.012	< .001	.454	.018	64.3	< .004	< .0025	.075
4	.106	.107	.079	.028	< .001	.458	.004	67.8	< .004	< .0025	.062
5	.106	.067	.063	.004	< .001	.454	< .002	84.1	< .004	< .0025	.068
6	.102	.075	.053	.022	< .001	.499	< .002	66	< .004	< .0025	.062
7	.118	.088	.072	.016	< .001	.469	< .002	67.4	< .004	< .0025	.060
8	.102	.067	.066	.001	< .001	.472	< .002	61.7	< .004	< .0025	.073
9	.123	.069	.069	.000	< .001	.490	< .002	43.2	< .004	.0025	.062
10	.111	.072	.059	.013	< .001	.481	< .002	61.2	< .004	< .0025	.060
11	.098	.074	.073	.001	< .001	.469	< .002	68.3	< .004	< .0025	.057
12	--	--	--	--	--	--	--	--	--	--	--
13	.096	.050	.035	.015	< .001	.454	< .002	56.5	< .004	< .0025	.068
14	.106	.013	.095	--	< .001	.454	< .002	64.5	< .004	< .0025	.082
15	.124	.126	.060	.066	< .001	.517	< .002	68.3	< .004	< .0025	.617
17	.083	.093	.063	.030	< .001	.476	< .002	63.2	< .004	< .0025	.050
18	.081	.101	.079	.022	< .001	.531	< .002	66.4	< .004	< .0025	.516
19	.086	.091	.061	.030	< .001	.495	< .002	66.4	< .004	< .0025	.061
20	.082	.107	.058	.049	< .001	.508	< .002	62.6	< .004	< .0025	.689
21	.119	.065	.065	--	< .001	1.02	< .002	77	< .004	< .0025	.034
22	.115	.070	.065	.005	< .001	.930	< .002	56.7	< .004	< .0025	.052
23	.126	.090	.075	.015	< .001	.950	< .002	74.6	< .004	< .0025	.054
September 1987											
1	<0.024	--	<0.005	--	<0.001	0.69	<0.002	58.6	<0.006	0.004	1.04
6	< .024	--	< .005	--	< .001	.66	< .002	70.1	< .006	< .004	.11
October 1987											
8	<0.024	--	<0.005	--	<0.001	0.52	<0.002	53.5	<0.006	0.004	1.06

Site No.	Parameters and concentrations: Pb	Mg	Mn	Hg	Ni	K	Se	Na	Ti	Zn	Cl	F
November 1984												
6	--	--	--	--	--	--	<0.005	--	--	--	--	--
9	--	--	--	--	--	--	< .005	--	--	--	--	--
August 1985												
1	<0.01	214	0.661	0.33	<0.004	78.6	0.060	1,724	0.076	0.011	3,164	<0.1
2	< .01	184	.784	.22	< .004	65.1	.063	1,333	.124	.015	3,000	< .1
3	< .01	202	.655	< .2	.006	67.8	.056	1,768	.100	.024	--	--
4	< .01	205	.694	.32	< .004	67.2	.071	1,712	.133	.019	--	--
5	< .01	274	.636	.35	< .004	71.6	.067	2,180	.106	.016	--	--
6	< .01	197	.654	< .2	< .004	70.6	.078	1,660	.107	.017	3,156	< .1
7	< .01	209	.688	.25	< .004	68.6	.094	1,799	.129	.016	--	--
8	< .01	189	.772	< .2	< .004	65.6	.055	1,644	.110	.004	--	--
9	< .01	133	.804	< .2	< .004	64.1	.084	1,131	.099	.006	--	--
10	< .01	185	.616	.22	< .004	65.2	.040	1,644	.097	.002	--	--
11	< .01	199	.479	.28	< .004	61.8	.063	1,736	.096	< .005	--	--
12	--	--	--	--	--	--	--	--	--	--	2,720	< .1
13	< .01	172	.696	.25	< .004	63.5	.034	1,490	.098	.014	--	--
14	< .01	199	.789	< .2	.011	67.4	.047	1,661	.107	.024	--	--
15	< .01	207	.874	< .2	< .004	64.1	.065	1,742	.111	.008	2,776	< .1
17	< .01	202	.782	.38	< .004	61.6	.072	1,524	.112	.003	--	--
18	< .01	198	.777	< .2	< .004	64	.083	1,606	.131	.009	--	--
19	< .01	209	.872	.22	< .004	64.2	.061	1,776	.102	.002	--	--
20	< .01	192	.782	.28	< .004	62.9	.042	1,591	.124	.012	3,180	< .1
21	< .01	216	.396	.21	< .004	73.5	.045	1,756	.076	< .002	--	--
22	< .01	168	.562	< .2	< .004	68.4	.050	1,475	.065	.010	3,064	< .1
23	< .01	211	.396	.21	.005	73.7	.053	1,881	.074	.008	3,148	< .1
September 1987												
1	<0.05	194	0.325	<0.001	<0.008	66.7	<0.005	1,650	--	0.12	2,950	0.34
6	<0.05	194	.389	< .001	< .008	67.1	< .005	1,630	--	.28	3,000	.34
October 1987												
8	<0.05	147	0.163	<0.001	<0.008	53.7	<0.005	1,090	--	0.332	2,300	0.35

Table 15.--Inorganic chemical analyses of surface-water samples from Watson Creek and the Gunpowder River--Continued

[All units are milligrams per liter except for mercury which is micrograms per liter. Dashes indicate analysis was not performed. < = less than]

Sb	=	Antimony	Ca	=	Calcium	Hg	=	Mercury	Cl	=	Chloride	NH3 = Ammonia
As	=	Arsenic	Cr	=	Chromium	Ni	=	Nickel	F	=	Fluoride	NH4 = Ammonium
As III	=	Arsenic III	Cu	=	Copper	K	=	Potassium	Br	=	Bromide	N = Nitrogen
As V	=	Arsenic V	Fe	=	Iron	Se	=	Selenium	SiO2	=	Silicate	(NH4 + org)
Be	=	Beryllium	Pb	=	Lead	Na	=	Sodium	TDS	=	Total Dissolved	P = Total
B	=	Boron	Mg	=	Magnesium	Ti	=	Titanium			Solids	Phosphorus
Cd	=	Cadmium	Mn	=	Manganese	Zn	=	Zinc	Alk	=	Alkalinity	NO3 = Nitrate
									SO4	=	Sulfate	NO2 = Nitrite

Site No.	Parameters and concentrations											
	Br	SiO2	TDS	TSS	Alk	SO4	NH3	NH4	N	P	NO3	NO2
						November 1984						
6	10	--	7,200	--	--	--	--	0.04	--	0.8	<2	0.08
9	8	--	6,000	--	--	--	--	.05	--	.2	<1	.02
						August 1985						
1	10.5	1.39	6,274	20	21	450.2	--	--	--	--	--	--
2	10.4	1.39	6,078	14	13.5	500	--	--	--	--	--	--
3	--	--	--	--	--	--	--	--	--	--	--	--
4	--	--	--	--	--	--	--	--	--	--	--	--
5	--	--	--	--	--	--	--	--	--	--	--	--
6	10.4	1.50	6,352	18	12.7	449.8	--	--	--	--	--	--
7	--	--	--	--	--	--	--	--	--	--	--	--
8	--	--	--	--	--	--	--	--	--	--	--	--
9	--	--	--	--	--	--	--	--	--	--	--	--
10	--	--	--	--	--	--	--	--	--	--	--	--
11	--	--	--	--	--	--	--	--	--	--	--	--
12	10	.116	6,080	20	22.3	568	--	--	--	--	--	--
13	--	--	--	--	--	--	--	--	--	--	--	--
14	--	--	--	--	--	--	--	--	--	--	--	--
15	9.5	.754	5,950	14	14.5	960	--	--	--	--	--	--
17	--	--	--	--	--	--	--	--	--	--	--	--
18	--	--	--	--	--	--	--	--	--	--	--	--
19	--	--	--	--	--	--	--	--	--	--	--	--
20	10.5	1.02	5,914	44	12.2	425	--	--	--	--	--	--
21	--	--	--	--	--	--	--	--	--	--	--	--
22	11.5	1.39	6,184	41	92	414.4	--	--	--	--	--	--
23	12.2	1.98	6,574	22	80.5	473.2	--	--	--	--	--	--
						September 1987						
1	--	2.82	5,520	--	--	370	<0.2	--	0.72	0.03	--	0.15
6	--	2	5,100	--	--	320	< .2	--	.71	.07	--	.14
						October 1987						
8	--	3.70	4,380	--	--	378	<0	--	1	0.08	--	<0.01

Table 16.--Analyses for arsenic in surface-water samples from Watson Creek and the Gunpowder River

[All units are in milligrams per liter; < = less than]

Site	Parameter	Test date	Concentration
1	Total arsenic	03/11/1986	0.0037
21	Total arsenic	03/11/1986	.004
1	Total arsenic	03/11/1986	.008
21	Total arsenic	03/11/1986	.0069
1	Total arsenic	04/18/1986	.004
21	Total arsenic	04/18/1986	.006
21	Total arsenic	04/18/1986	.004
1	Total arsenic	08/25/1986	.0033
21	Total arsenic	08/25/1986	.0034
1	Total arsenic	02/23/1987	<.0035
21	Total arsenic	02/23/1987	<.0035

Table 17.--Organic chemical analyses of surface-water samples from Watson Creek and the Gunpowder River, and analytical results of corresponding method blanks

[The only constituents listed are those detectable in at least one sample. Sites at which the constituient was not detected are indicated by the symbol "nd". Sites at which the constituent was detected but not quantified are indicated by the symbol "dnq". Molecular weight is abbreviated as "mw." All units are in micrograms per liter. Dashes indicate analysis was not performed. < = less than]

Constituent	Concentrations from surface-water sampling sites and corresponding method blank (MB) for November 1984		
	Site 6	Site 9	MB
Methylene chloride	1.1	0.6	0.3
1,1,1-Trichloroethane	.1	.2	.5
Trichloroethylene	nd	.1	nd
Benzene	.3	nd	nd
Toluene	.4	.4	.3
Chlorobenzene	.8	.8	.9
Methyl-t-butyl ether	dnq	dnq	dnq
Hexane	dnq	dnq	dnq
Napthalene	.1	nd	nd
Dimethyl phthalate	nd	nd	.9
Diethyl phthalate	7.5	9.9	6.8
Phenanthrene	.5	.5	nd
Di-n-butyl phthalate	17	12	3.4
Butylbenzyl phthalate	24	21	29
Bis-2-ethylhexyl phthalate	8	2.6	nd
Possible oxabicycloheptane	dnq	dnq	nd
Possible cyclohexene-ol	dnq	nd	nd
A cyclohexene-one	dnq	dnq	dnq
Unknown	dnq	nd	nd
Unknown	dnq	nd	nd
Unknown	dnq	dnq	nd
Possible ester of propanoic acid	dnq	dnq	nd
Possible tetra sub (C4,C4,C1,C1)-biocyclo-hexanone	nd	nd	dnq
Unknown	dnq	nd	nd
Possible tri sub(C4,C4,C1) phenol	nd	nd	dnq
Phosphorthioic acid, o,o-diethyl O-[6-methyl-2-(1-methylethyl) 4-pyrimidinyl] ester	dnq	nd	nd
Unknown	dnq	nd	nd
Long chain acid	dnq	dnq	nd
Hexanedioic acid, dioctyl ester	dnq	dnq	nd
Hexadecatrien-ol, tetramethyl	dnq	dnq	dnq

Constituent	Concentrations from surface-water sampling sites and corresponding method blank (MB) for September 1985							
	Site 2	Site 3	Site 7	Site 9	MB	Site 21	Site 21r	MB
Bis (2-ethylhexyl) phthalate	154	43	123	230	82	24	13	nd
Di-n-octyl phthalate	nd	nd	nd	11	nd	nd	nd	nd

Constituent	Concentrations from surface-water sampling sites and corresponding method blank (MB) for September 1985							
	Site 8	Site 13	MB	Site 1	Site 16	Site 19	Site 19r	MB
Methylene chloride	119	134	20	--	--	--	--	--
Unknown hydrocarbon (mw. 86)	--	--	--	2	1	3	2	nd
n-Hexane	--	--	--	--	1	--	--	nd

Constituent	Concentrations from surface-water sampling sites and corresponding method blank (MB) for September 1987				
	Site 6	Site 9	MB	Site 8	MB
Benzene	2.9	<0.5	2.5	<0.5	--
Ethylbenzene	5.8	1.8	3.3	1.9	--
Metylene chloride	15.8	4.4	<1.1	6.6	--

Constituent	Concentrations from surface-water sampling sites and corresponding method blank (MB) for January 1988		
	Site 1	Site 8	MB
Vinyl chloride	--	47.0	<10.0
Methylene chloride	3	4	10
1,1-Dichloroethene	--	260	< 5
Trans-1,2-dichloroethene	2	130	< 5
Chloroform	4	96	< 5
1,2-Dichloroethane	--	120	< 5
Carbon tetrachloride	--	4	< 5
Trichloroethene	2	34	< 5
Benzene	--	4	< 5
1,1,2,2-Tetrachloroethane	20	90	<10

Table 18.--Detection limits of organic chemical analyses performed on surface-water samples from Watson Creek and the Gunpowder River

[All units are in micrograms per liter]

Constituent	Detection limit	Constituent	Detection limit	Constituent	Detection limit
2-Chlorophenol	10	Bis (2-ethylhexyl) phthalate	10	Hexachloroethane	10
2,4-Dichlorophenol	10	4-Bromophenyl phenyl ether	10	Indeno (1,2,3-cd) pyrene	20
2,4-Dimethylphenol	10	Butyl benzyl phthalate	10	Isophorone	10
4,6-Dinitro-o-cresol	20	2-Chloro napthalene	10	Naphthalene	10
2,4-Dinitrophenol	50	4-Chlorophenyl phenyl ether	10	Nitrobenzene	10
2-Nitrophenol	20	Crysene	20	n-Nitrosodimethyl amine	10
4-Nitrophenol	50	Dibenzo (A,H) anthracene	20	n-Nitrosodi-n-propylamine	10
p-Chloro-m-cresol	10	1,2-Dichlorobenzene	10	Phenanthrene	10
Pentachlorophenol	10	1,3-Dichlorobenzene	10	Pyrene	10
Phenol	10	1,4-Dichlorobenzene	10	1,2,4-Trichloro benzene	10
2,4,6-Trichlorophenol	10	3,3'-Dichlorobenzidine	20	2'-Hydroxyacetophenone	1
Acenaphthene	10	Diethyl phthalate	10	3'-Hydroxyacetophenone	1
Acenaphthylene	10	Dimethyl phthalate	10	4'-Hydroxyacetophenone	1
Anthracene	10	Di-n-butyl phthalate	10	1,4-Thioxane	1
Benzidine	40	2,4-Dinitrotoluene	20	Diethyl methyl phosphonate	1
Benzo (A) anthracene	10	2,6-Dinitrotoluene	20	3-Quinuclidinol	1
Benzo (A) pyrene	20	Di-n-octyl phthalate	10	Cyclohexanone	1
3,4-Benzofluor anthene	20	1,2-Diphenyl hydrazine	20	Cyclohexanol	1
Benzo (Ghi) perylene	20	Fluoranthene	10	1,3-Dicyclohexyl carbodimide	1
Benzo (K) fluoranthene	20	Fluorene	10	1-Bromodecane	1
Bis (2-chloroethoxy) methane	20	Hexachlorobenzene	10	1,3-Dicyclohexyl urea	1
Bis (2-chloroethyl) ether	10	Hexachloro butadiene	10		
Bis (2-chloroisopropyl) ether	20	Phenylarsonic acid	1		
		Hexachlorocyclo pentadiene	10		

Table 19.--Summary of available data on base/neutral acids, volatiles, and semivolatiles with U.S. Environmental Protection Agency method 625[1] for surface-water samples collected from Watson Creek and the Gunpowder River, September 1985

[An asterisk (*) indicates the compound was present in the corresponding method blank at approximately the same concentration. Molecular weight is abbreviated by "mw." All units are in micrograms per liter. < = less than]

SITE 1	
Compound identification of best match	Concentration
Unknown hydrocarbon (mw. 86)*	2
No library search done on base/neutral-acids	

SITE 2	
Compound identification of best match	Concentration
Polymerized acetone	25
Unknown	<1
Unknown	<1
Unknown	<1
Methyl ethyl benzene*	2
Unknown	<1
Bicyclohexyl*	2
Dioctyl adipate*	71
Unknown phthalate	<1
No other peaks	

SITE 3	
Compound identification of best match	Concentration
Dioctyl adipate*	<1
Unknown	<1
Unknown	<1
Unknown	<1
No other peaks	

SITE 4	
Compound identification of best match	Concentration
Xylene*	<1
Unknown	<1
Unknown	<1
Unknown hydrocarbon	<1
Pentafluoromethoxy benzene*	<1
Unknown hydrocarbon*	<1
Bicyclohexyl*	2
Unknown	<1
No other peaks	

SITE 5	
Compound identification of best match	Concentration
No peaks for volatiles	
No library search done on base/neutl-acids	

SITE 6	
Compound identification of best match	Concentration
Unknown	<1
Pentafluoromethoxy benzene*	<1
Unknown hydrocarbon*	<1
Bicyclohexyl*	2
5-Methyl-5-phenyl-2-hexanone	6
2-(Methylthio)-benzothiazole	<1
No other peaks	

SITE 7	
Compound identification of best match	Concentration
Polymerized Acetone	30
Unknown	<1
Xylene*	<1
Unknown	<1
Unknown	<1
Methyl ethyl benzene*	2
Bicyclohexyl*	2
5-Methyl-5-phenyl-2-hexanone	20
Dioctyl adipate*	24
No other peaks	

SITE 8	
Compound identification of best match	Concentration
Polymerized Acetone	12
Xylene*	<1
Unknown	<1
Unknown	<1
Methyl ethyl benzene*	<1
Bicyclohexyl*	2
5-Methyl-5-phenyl-2-hexanone	1
Unknown	<1
No other peaks	

SITE 9	
Compound identification of best match	Concentration
Polymerized Acetone	18
Unknown	<1
Unknown	<1
Methyl ethyl benzene*	1
Unknown	<1
Bicyclohexyl*	3
Unknown	1
Dioctyl adipate*	52
No other peaks	

SITE 9r	
Compound identification of best match	Concentration
Polymerized acetone	25
Xylene*	<1
Unknown	<1
Unknown	<1
Methyl ethylbenzene*	2
Bicyclohexyl*	3
Unknown hydrocarbon	<1
5-Methyl-5-phenyl hexanone	2
No library search for volatiles	

SITE 10	
Compound identification of best match	Concentration
Xylene*	<1
Unknown*	<1
Unknown	2
Unknown hydrocarbon*	<1
Unknown hydrocarbon	<1
Bicyclohexyl*	3
Unknown	<1
5-Methyl-5-phenyl-2-hexanone	3
No other peaks	

SITE 13	
Compound identification of best match	Concentration
No peaks for volatiles	
No library search done on base/neutl acids	

Table 19.--Summary of available data on base/neutral acids, volatiles, and semivolatiles with U.S. Environmental Protection Agency method 625[1] for surface-water samples collected from Watson Creek and the Gunpowder River, September 1985--Continued

[An asterisk (*) indicates the compound was present in the corresponding method blank at approximately the same concentration. Molecular weight is abbreviated by "mw." All units are in micrograms per liter. < = less than]

SITE 14	
Compound identification of best match	Concentration
Xylene*	<1
Unknown	<1
Unknown	<1
Pentafluoro methoxy benzene*	<1
Unknown	2
Unknown	<1
Bicyclohexyl*	2
Unknown hydrocarbon	<1
5-Methyl-5-phenyl-2-hexanone	<1
Unknown	<1
No other peaks	

SITE 15	
Compound identification of best match	Concentration
No peaks for volatiles	
No library search on base/neutral acids	

SITE 16	
Compound identification of best match	Concentration
Unknown hydrocarbon (mw. 86)*	1
n-Hexane	1
No other peaks	<1
No library search on base/neutral-acids	

SITE 17	
Compound identification of best match	Concentration
Ethylbenzene*	<1
Xylene*	<1
Cyclopentanol	<1
Unknown hydrocarbon*	<1
Unknown hydrocarbon*	<1
Bicyclohexyl*	3
No other peaks	

SITE 18	
Compound identification of best match	Concentration
Polymerized acetone	20
Unknown	<1
Unknown	<1
Unknown	<1
Unknown	1
Methyl ethylbenzene*	2
Unknown	<1
Bicyclohexyl*	3
No other peaks	

SITE 19	
Compound identification of best match	Concentration
Toluene	<1
Ethylbenzene	<1
Unknown	<1
Unknown	1
Unknown hydrocarbon	<1
Unknown hydrocarbon	<1
Bicyclohexyl	2
Sulfur	<1
No other peaks	

SITE 19r	
Compound identification of best match	Concentration
Unknown	<1
Bicyclohexyl*	1
Dioctyl adipate*	<1
Unknown hydrocarbon (mw. 86)*	2
No other peaks	

SITE 20	
Compound identification of best match	Concentration
Unknown hydrocarbon (mw. 86)*	1
Polymerized acetone	32
Unknown	<1
Xylene*	<1
Unknown	<1
Unknown	<1
Unknown	<1
Methyl ethylbenzene*	3
Bicyclohexyl*	3
No other peaks	

SITE 21	
Compound identification of best match	Concentration
Xylene	<1
Unknown	<1
Unknown hydrocarbon	<1
Bicyclohexyl	2
Dioctyl adipate	18
No other peaks	

SITE 21r	
Compound identification of best match	Concentration
Bicyclohexyl	<1
Sulfur (S8)*	<1
Unknown	<1
Dioctyl adipate	3
n-Hexane	8

SITE 22	
Compound identification of best match	Concentration
Unknown	1
Unknown hydrocarbon	<1
Unknown hydrocarbon	1
Bicyclohexyl	1
Sulfur (S8)*	<1
Unknown phthalates	6
No peaks for volatiles	

[1] John J. Coniglio, Envirodyne Engineers, St. Louis, Missouri, written commun., 1985.

Table 20.--Inorganic chemical analyses of bottom sediment from Watson Creek and the Gunpowder River, August 23, 1985

[All units are in micrograms per gram. Dashes indicate parameter was not analyzed. < = less than]

NH3 = Ammonia; As V = Arsenic V; Ca = Calcium; Fe = Iron; Hg = Mercury; K = Potassium
Sb = Antimony; Be = Beryllium; Cr = Cromium; Pb = Lead; Ni = Nickel; Se = Selenium
As = Total Arsenic; B = Boron; Cu = Copper; Mg = Magnesium; NO2 = Nitrite; Tl = Thallium
As III = Arsenic III; Cd = Cadmium; CN = Cyanide; Mn = Manganese; P = Phosphorus; Zn = Zinc
C13/C12 = Carbon 13/Carbon 12; TKN = Total Kjeldahl Nitrogen

Site No.	Parameters and concentrations													
	NH3	Sb	As	As III	As V	Be	B	Cd	Ca	C13/12	Cr	Cu	CN	Fe
1	28	<2	1/ 8.7	1/ 11.4	0	1	7.97	<20	447	--	15	7.3	<0.5	11,430
1s	252	4	17	7.1	9.9	<1	5	<2	1,581	-25.8	24.3	45.4	< .25	20,390
2	<28	<2	1.9	1.9	0	<1	.73	<20	393	-25.2	5.4	8.8	< .5	6,090
2s	<2.8	4	17.5	6.1	11.4	<1	3.58	<2	1,442	-25.6	23.3	14.1	< .25	26,010
3	84	3	18	9.4	8.6	<1	6.54	<20	1,954	-27.2	27.7	21.9	< .25	32,190
3s	84	5	29.2	13.2	16	1.3	4.76	<2	1,736	-27.1	32.7	32.5	< .25	35,880
4	168	3	24.5	12.7	11.8	1.1	4.53	<20	1,610	-26.2	30.5	31.3	--	29,570
4s	133	6	41.5	--	--	1.6	5.71	2.2	1,860	-28.4	39.4	34.2	--	40,370
5	84	2	21	--	--	1	3.93	<20	1,849	-26.3	27	48.1	< .5	28,150
5s	168	2	9.7	6.6	3.1	<1	3.51	<20	1,393	-27.2	24.8	17.8	< .5	25,760
6	84	2	8.6	4.3	4.3	<1	4	<20	1.223	-26.4	16.4	9.1	< .5	15.860
6s	56	4	10	4.7	5.3	<1	2.03	<2	813	-25.6	10.2	6.5	< .5	14,110
7	86.8	5	22.2	11	11.2	1.1	2.27	<2	1,591	-25.8	26.6	54.9	< .25	26,890
7r	112	3	16.7	10.6	6.1	1	3.03	<20	1,665	-25	27.1	46.5	< .5	26,590
7s	84	5	25	7.8	17.2	<1	2.87	<2	1,380	-25.6	24	66.7	< .25	20,650
8	84	2	7.1	3.1	4	<1	3.58	<2	840	-25.3	10	8.9	< .5	11,920
8s	112	3	14.9	8	6.9	<1	14.5	<20	2.859	-26.2	24	17.1	< .5	21,510
8sr	--	4	9.3	--	--	<1	8.33	<2	2,558	-25.8	18.4	11.5	< .5	17,830
9	280	6	30.6	6.4	24.2	1	9.99	<2	2,484	-26.8	29.2	15.7	< .25	20,370
9s	252	3	22.5	8.7	13.8	<1	19.72	<2	2,631	-25.9	22.3	18.8	< .5	17,540
10	224	2	15.4	--	--	1.1	11.06	<20	2,841	-26.4	28.8	33.6	--	23,940
10s	252	5	18.2	4.3	13.9	1.1	16.16	<2	3,133	-27.6	24.1	21.7	< .25	24,940
11s	196	2	18	8.8	9.2	<1	4.29	<20	2,520	-27.4	23.4	33.9	< .5	21,880
13	196	2	9.8	7.9	1.9	1	5	<20	2,265	-26.2	22.4	46	< .5	27,520
14	84	4	23	10	13	1.2	6.47	<2	2,234	-25.8	30.6	30.3	< .5	30,330
15	233	2	13.9	--	--	<1	13.9	<20	2,866	-25.1	22.3	15.1	--	23,640
16	112	<2	11.6	7.7	3.9	<1	3.58	<20	1,623	-26	20.5	16.7	< .5	21,730
17	84	3	10.6	8.5	2.1	<1	6.54	<20	1,509	-24.2	23.7	12.5	< .5	26,240
18	84	2	12.6	12	.6	<1	4.29	<20	1,655	-24.4	22.8	23.5	< .5	29,000
19	84	2	15.2	8.2	7	<1	5.71	<20	1,846	-25.4	27.1	34	< .5	24,030
19r	84	4	9.7	8	1.7	<1	4.76	<2	1,575	-23.9	19.3	12.1	< .5	25,240
20	112	2	1/ 7.4	1/ 8.1	--	<1	8.56	<20	2,521	-23.3	22.3	21.6	< .5	27,080
20s	140	2	15.5	7.4	8.1	1.1	8.21	<20	2,440	-24	28.7	33.2	< .5	26,700
24s	<2.8	<2	1.6	<1	1.6	<1	.02	<2	41	-25.7	<4	<4	< .5	1,750
25s	56	2	1.6	<1	1.6	<1	.02	<2	70	-25.4	<4	<4	< .5	1,490
26s	5.6	<2	1.9	<1	1.9	<1	.49	<2	70	-25.2	<4	<4	< .5	1,640
27s	36	<2	1.8	<1	1.8	<1	3.22	<2	530	-26.2	<4	<4	< .5	2,770

1/ Within quantitation limits of the methods used in analysis, these total arsenic and arsenic III values represent approximately the same level within the sample.

Table 20.--Inorganic chemical analyses of bottom sediment from Watson Creek and the Gunpowder River, August 23, 1985--Continued

[All units are in micrograms per gram. Dashes indicate parameter was not analyzed. < = less than]

NH3	= Ammonia	As V	= Arsenic V	Ca	= Calcium	Fe	= Iron	Hg	= Mercury	K	= Potassium	
Sb	= Antimony	Be	= Beryllium	Cr	= Cromium	Pb	= Lead	Ni	= Nickel	Se	= Selenium	
As	= Total Arsenic	B	= Boron	Cu	= Copper	Mg	= Magnesium	NO2	= Nitrite	Tl	= Thallium	
As III	= Arsenic III	Cd	= Cadmium	CN	= Cyanide	Mn	= Manganese	P	= Phosphorus	Zn	= Zinc	
C13/C12 = Carbon 13/Carbon 12								TKN = Total Kjeldahl Nitrogen				

Site No.	Parameters and concentrations												
	Pb	Mg	Mn	Hg	Ni	NO2	P	K	Se	Na	Tl	TKN	Zn
1	10.8	2,273	92.7	0.21	11.5	1.90	152	795	<.25	756	<1	640	45.3
1s	47.9	3,251	216	2.55	22.4	1.80	340	1,330	.43	4,530	<1	5,100	381
2	<10	943	63.3	.22	6	1	61	362	<.25	918	1	840	50.5
2s	12.8	3,655	186	.84	17.6	1.25	<5	1,630	<.25	2,392	<1	4,000	63.9
3	17.8	4,734	236	.22	23.2	--	<5	1,740	<.25	3,862	1.7	1,200	89
3s	21.8	5,053	302	.25	31.5	14.15	<5	2,320	.38	4,222	5.3	110	97.6
4	18.2	4,462	249	.24	24.3	2.55	122	1,610	.27	2,500	2.2	2,920	98
4s	35.2	5,646	331	<.20	37.5	--	--	2,800	.35	3,552	2.4	4,800	131
5	25.5	4,148	244	.41	26	--	142	1,420	<.25	2,924	1.6	2,500	222
5s	<10	3,899	227	<.20	17.2	.90	<5	1,400	<.25	1,989	2.4	3,500	66.9
6	<10	2,599	143	.45	12.5	.90	41	963	<.25	1,340	1.8	3,000	53
6s	<10	1,634	92.5	.26	9.1	<2.5	13	850	<.25	677	<1	2,200	40.2
7	30.7	3,572	236	.39	26	.85	5	1,440	.42	1,692	2	3,800	236
7r	22.5	3,657	233	.92	22.7	1.25	112	1,300	<.25	1,766	1.6	3,800	186
7s	29.2	2,972	200	.37	23.5	1	5	1,320	<.25	1,751	1.2	3,400	240
8	10.3	1,632	134	.30	9.4	.95	78	828	.25	1,033	<1	1,900	48.7
8s	12.8	4,909	251	.25	21.1	1.55	31	1,600	.27	3,889	1.9	5,900	74
8sr	11.5	4,080	212	<.20	19.5	--	26	1,590	.34	3,007	<1	4,700	66.6
9	19.5	4,991	250	<.2	25	1.25	24	2,370	.28	3,673	2.8	5,800	94.4
9s	14.6	4,119	237	<.20	18	1.05	7	1,780	<.25	2,849	3	3,400	70.2
10	23.7	4,687	267	.22	24.6	2.80	--	1,580	.27	3,558	2.4	1,000	164
10s	28.1	4,031	269	.35	23.7	1.40	--	1,560	.48	2,031	2.9	590	126
11s	27.3	3,632	208	.27	18.7	3.04	203	1,220	<.25	2,000	1.3	5,450	394
13	24.2	3,903	317	.38	22.1	1.05	258	1,200	<.25	3,236	1.9	4,500	248
14	26.8	4,318	304	.27	30.2	--	235	1,860	.38	2,712	1.2	84	121
15	15.7	5,267	300	.21	16.5	--	218	1,790	<.25	4,469	2.4	170	74.5
16	12.1	3,874	295	.24	17.9	1.5	167	1,480	<.25	2,453	1.3	3,200	106
17	12.4	4,255	379	.29	17.8	1.25	162	1,590	<.25	2,088	2	3,600	71.1
18	23.8	3,839	288	.99	18.3	2.90	127	1,480	<.25	2,758	1.5	3,300	125
19	16.3	3,991	316	.35	20.1	--	--	1,410	<.25	2,941	1.3	4,700	166
19r	14.9	3,538	283	<.20	16.6	.95	36	1,530	<.25	2,146	<1	3,700	70.4
20	13.3	4,541	364	.23	19.8	1.20	5	1,510	<.25	2,927	2	2,000	96.7
20s	26.7	4,822	270	.57	25.9	1.05	<5	1,700	<.25	4,408	2.4	110	202
24s	<10	77	110	<.2	<4	1.35	24	78	<.25	209	<1	28	12.7
25s	<10	242	35.5	<.2	<4	<2.5	24	178	<.25	346	<1	56	23
26s	<10	290	31.4	<.2	<4	1.40	24	227	<.25	437	<1	168	20.6
27s	<10	550	191	<.2	<4	1.15	23	175	<.25	1,385	<1	840	23.1

Table 21.--Organic chemical analyses of bottom sediment from Watson Creek and the Gunpowder River, and analytical results of corresponding method blanks

[The only parameters listed are those detectable in at least one sample. The only sites listed are those having detectable concentrations of base/neutral-acids. Sites at which the parameter was not detected are indicated by the symbol "nd". Sites at which the parameter was detected but not quantified are indicated by the symbol "dnq". The parameters analyzed during September 1985 were not detected in corresponding laboratory method blanks. All results are in micrograms per kilogram]

Parameter	Concentrations from bottom-sediment sampling sites and corresponding method blank (MB) for November 1984		
	Site 6	Site 9	MB
Methylene chloride	19	11	5.8
Carbon disulfide	16	nd	nd
Trichlorofluoromethane	98	53	nd
Cis/trans 1,2-dichloroethene	nd	.2	nd
Chloroform	nd	.1	nd
1,1,1-Trichloroethane	6.1	4.5	2.7
Benzene	nd	.8	nd
Toluene	2.3	1.5	1.3
Chlorobenzene	1.7	2	2.3
Ethylbenzene	.8	.7	.9
Xylenes	.2	nd	nd
Acetone	dnq	dnq	dnq
Hexane	dnq	dnq	dnq
Naphthalene	35.8	34.3	nd
Diethyl phthalate	339	275	172
Phenanthrene	65.1	53.3	nd
Di-n-butyl phthalate	116	149	105
Pyrene	nd	20.6	nd
Butyl benzyl phthalate	417	604	530
Dioctyladipate	384	540	299
Bis(2-ethylhexyl) phthalate	295	215	486
Di-n-octyl phthalate	6.82	nd	nd
Fluoranthene	30	27.2	nd
Fluoridone	nd	nd	62.1

Parameter	Concentrations from bottom-sediment sampling sites for September 1985											
	Site 1	Site 2	Site 6s	Site 7	Site 7r	Site 8	Site 9s	Site 10	Site 16	Site 17	Site 19	Site 20
Anthracene	nd	210	nd	nd	nd	170	nd	nd	140	nd	nd	nd
Benzo(A) anthracene	nd	200	nd	550	nd	nd	nd	nd	nd	nd	nd	nd
Benzo(A) pyrene	nd	1,150	nd	6,140	nd	2,420	nd	nd	nd	nd	nd	nd
3,4-Benzofluor anthene	nd	nd	nd	670	nd	nd	nd	nd	nd	nd	nd	nd
Bis(2-ethylhexyl) phthalate	880	2,060	nd	2,120	nd	1,960	nd	520	2,460	nd	nd	nd
Butyl benzyl phthalate	nd	nd	nd	nd	nd	160	nd	nd	260	nd	nd	nd
Chrysene	nd	nd	nd	910	nd	nd	nd	nd	nd	nd	nd	nd
Diethyl phthalate	1,250	850	170	nd	nd	2,360	nd	nd	1,410	154	230	240
Dimethyl phthalate	510	230	nd	nd	nd	270	nd	nd	860	nd	nd	nd
Di-n-butyl phthalate	940	1,070	nd	nd	nd	890	nd	nd	1,550	nd	nd	550
Fluoranthene	nd	690	nd	2,010	nd	570	nd	nd	440	nd	nd	nd
Fluorene	nd	nd	nd	1,050	nd	310	nd	nd	nd	nd	nd	nd
Isophorone	nd	nd	nd	nd	nd	nd	nd	nd	nd	180	nd	nd
Naphthalene	nd	360	nd	nd	nd	350	nd	nd	260	nd	nd	nd
Phenanthrene	150	800	nd	2,180	121	740	nd	nd	770	nd	nd	nd
Pyrene	nd	530	nd	1,560	nd	400	nd	nd	440	nd	nd	nd
4'-Hydroxyacetophenone	nd	nd	nd	nd	nd	nd	60	nd	nd	nd	nd	nd
Cyclohexanol	nd	nd	nd	nd	nd	nd	nd	nd	nd	80	nd	nd

Table 22.--Detection limits of organic chemical analyses performed on bottom sediment from Watson Creek and the Gunpowder River, September 1985

[All units are in micrograms per kilogram]

Parameter	Detection limit	Parameter	Detection limit	Parameter	Detection limit
2-Chlorophenol	200	Bis(2-chloroisopropyl)ether	150	Hexachloroethane	500
2,4-Dichlorophenol	300	Bis(2-ethylhexyl)phthalate	150	Indeno(1,2,3-cd) pyrene	300
2,4-Dimethylphenol	400	4-Bromophenyl phenyl ether	350	Isophorone	100
4,6-Dinitro-o-cresol	700	Butyl benzyl phthalate	150	Naphthalene	100
2,4-Dinitrophenol	400	2-Chloro naphthalene	200	Nitrobenzene	200
2-Nitropheno	400	4-Chlorophenyl phenyl ether	150	n-Nitrosodimethyl amine	150
4-Nitrophenol	350	Chrysene	100	n-Nitrosodi-n-propylamine	200
p-Chloro-m-cresol	400	Dibenzo(A,H) anthracene	350	n-Nitrosodiphenylamine	350
Pentachlorophenol	350	1,2-Dichlorobenzene	200	Phenanthrene	100
Phenol	150	1,3-Dichlorobenzene	200	Pyrene	100
2,4,6-Trichlorophenol	800	1,4-Dichlorobenzene	200	1,2,4-Trichlorobenzene	300
Acenaphthene	150	3,3'-Dichlorobenzidine	700	2'-Hydroxyacetophenone	50
Acenaphthylene	100	Diethyl phthalate	150	3'-Hydroxyacetophenone	50
Anthracene	100	Dimethyl phthalate	200	4'-Hydroxyacetophenone	50
Benzidine	700	Di-n-butyl phthalate	100	1,4-Thioxane	50
Benzo(A)anthracene	100	2,4-Dinitrotoluene	350	Diethyl methyl phosphonate	50
Benzo(A)pyrene	600	2,6-Dinitrotoluene	800	3-Quinuclidinol	50
3,4-Benzofluoranthene	200	Di-n-octyl phthalate	100	Cyclohexanone	50
Benzo(Ghi)perylene	300	1,2-Diphenyl hydrazine	150	Cyclohexanol	50
Benzo(K)fluoranthene	200	Fluoranthene	100	1,3-Dicyclohexyl carbodimide	50
Bis(2-chloroethoxy)methane	200	Hexachlorobenzene	350	1-Bromodecane	50
Bis(2-chloroethyl)ether	150	Hexachlorobutadiene	800	1,3-Dicyclohexyl urea	50
Hexachlorocyclopentadiene	800	Phenylarsonic acid	50		

Table 23.--Summary of available data on base/neutral acids, volatiles, and semivolatiles with U.S. Environmental Protection Agency method 625[1] for bottom-sediment samples collected from Watson Creek and the Gunpowder River, September 1985

[All units are in micrograms per gram]

SITE 1 -test date 10/16/1985-	
Compound identification of best match	Concentration
Bicyclohexyl	0.06
Unknown	.13
Propanoic acid, 2-methyl-3-hydroxy-2, 4, 4-trimethyl pentyl ester	.1
Unsaturated hydrocarbon	.05
Sulfur	2.8
Unknown	.05
Hydrocarbon	.07
Unknown	.07
Hydrocarbon	.11
No other peaks	

SITE 2 -test date 10/15/1985-	
Compound identification of best match	Concentration
Unknown	0.015
Sulfur	7
Aldehyde	.19
Hydrocarbon	.26
Aldehyde	.40
Hydrocarbon	.58
Aldehyde	.21
Hydrocarbon	.41
Unsaturated hydrocarbon	.44
Hydrocarbon	.55

SITE 3s -test date 10/10/1985-	
Compound identification of best match	Concentration
4-Hydroxy-3-methoxy benzaldehyde	0.25
Aldehyde	.42
Aldehyde	3.9
Unsaturated hydrocarbon	2.1
Aldehyde	4
Unsaturated hydrocarbon	2.4
Aldehyde	.44
Hydrocarbon	.32
Alcohol and alkene	.28
Hydrocarbon	.41

SITE 4 -test date 10/10/1985-	
Compound identification of best match	Concentration
4-Hydroxy-3-methoxy benzaldehyde	0.17
Hydrocarbon	.17
Hydrocarbon	.23
Unsaturated hydrocarbon	.17
Unknown	.22
Hydrocarbon	.21
Hydrocarbon	.49
Hydrocarbon	.70
Hydrocarbon	.45
Hydrocarbon	.50

SITE 4s -test date 10/21/1985-	
Compound identification of best match	Concentration
Alcohol or alkene	0.65
Unsaturated hydrocarbon	.56
Hexadecanoic acid	1.50
Long-chained aldehyde	6
Long-chained olefin	5.5
Long-chained aldehyde	2.5
Long-chained olefin	9.0
Long-chained olefin	3.4
Long-chained hydrocarbon	2.0
Long-chain hydrocarbon	1.5

SITE 5s -test date 10/09/1985-	
Compound identification of best match	Concentration
Hydrocarbon	1.19
Aldehyde	2.4
Alcohol or alkene	1.5
Hydrocarbon	.80
Aldehyde	2.07
Alcohol or alkene	3.88
Alcohol or alkene	3.96
Hydrocarbon	.90
Hydrocarbon	.69
Aldehyde	.50

SITE 6 -test date 10/10/1985-	
Compound identification of best match	Concentration
Hydrocarbon	2.5
Aldehyde	1.4
Hydrocarbon	1.1
Aldehyde	1.3
Hydrocarbon	1.6
Hydrocarbon	.28
Aldehyde	.31
Hydrocarbon	.81
Hydrocarbon	1.1
Hydrocarbon	.54

SITE 6s -test date 10/10/1985-	
Compound identification of best match	Concentration
Hexathiepene	0.28
Aldehyde	1.78
Alcohol or alkene	.42
Aldehyde	1.56
Alcohol or alkene	1.84
Aldehyde	.45
Hydrocarbon	1.83
Alcohol or alkene	.59
Hydrocarbon	.81
No other peaks	

SITE 7 -test date 10/21/1985-	
Compound identification of best match	Concentration
Alcohol or alkene	0.58
Aldehyde	.99
Alcohol or alkene	.48
Saturated hydrocarbon	1.14
Aldehyde	1.59
Alcohol or alkene	2.64
Saturated hydrocarbon	.90
Saturated hydrocarbon	4.89
Hydrocarbon	.82
Saturated hydrocarbon	1.5

SITE 7r -test date 10/09/1985-	
Compound identification of best match	Concentration
Hydrocarbon	0.44
Sulfur	31
Long-chained organic acid	.47
Hydrocarbon	.78
Organic acid	.64
Aldehyde	.41
Hydrocarbon	1.21
Hydrocarbon	.67
Hydrocarbon	1.10
Hydrocarbon	.48

Table 23.--Summary of available data on base/neutral acids, volatiles, and semivolatiles with U.S. Environmental Protection Agency method 625[1] for bottom-sediment samples collected from Watson Creek and the Gunpowder River, September 1985--Continued

[All units are in micrograms per gram]

SITE 7s -test date 10/09/1985-	
Compound identification of best match	Concentration
Saturated hydrocarbon	0.43
Aldehyde	.97
Alcohol or alkene	.94
Hydrocarbon	.39
Aldehyde	.55
Saturated hydrocarbon	1.91
Hydrocarbon	.34
Aldehyde	.29
Saturated hydrocarbon	1.11
Saturated hydrocarbon	.79

SITE 8 -test date 10/15/1985-	
Compound identification of best match	Concentration
Hexadecanal	0.61
Hydrocarbon	1.26
Aldehyde	.47
Hydrocarbon	.64
Hydrocarbon	1.32
Unknown	1.3
Hydrocarbon	1.37
Unsaturated hydrocarbon or alcohol	.50
Hydrocarbon	.91
Hydrocarbon	.61

SITE 9s -test date 10/10/1985-	
Compound identification of best match	Concentration
Aldehyde	1.81
Hydrocarbon	1.04
Aldehyde	2.29
Hydrocarbon	1.79
Hydrocarbon	.78
Aldehyde	.56
Hydrocarbon	.72
Alcohol or alkene	.47
Hydrocarbon	.44
Hydrocarbon	.86

SITE 10 -test date 10/15/1985-	
Compound identification of best match	Concentration
Long-chain cyclic hydrocarbon or olefin	0.536
Long-chain hydrocarbon	.491
Long-chain hydrocarbon	1.065
Alcohol or alkene	1.866
Hydrocarbon	.54
Hydrocarbon	.899
Alcohol or alkene	.504
Hydrocarbon	1.082
Alcohol or alkene	.521
Hydrocarbon	.655

SITE 14 -test date 10/10/1985-	
Compound identification of best match	Concentration
Unsaturated hydrocarbon	0.66
Aldehyde	.35
Hydrocarbon	.66
Aldehyde	.71
Hydrocarbon	.19
Hydrocarbon	.37
Aldehyde	.35
Hydrocarbon	.67
Hydrocarbon	.79
Hydrocarbon	.47

SITE 16 -test date 10/16/1985-	
Compound identification of best match	Concentration
Hydrocarbon	0.185
Hydrocarbon	.589
Hydrocarbon	.370
Aldehyde	.349
Hydrocarbon	.915
Hydrocarbon	.312
Hydrocarbon	.802
Hydrocarbon	.268
Hydrocarbon	1.029
Hydrocarbon	.580

SITE 17 -test date 10/09/1985-	
Compound identification of best match	Concentration
Propanoic acid, 2-methyl-1-(1, 1-dimethylethyl)-2-methyl-1-,3-propyl ester	0.41
Hydrocarbon	.64
Aldehyde	.76
Alcohol or alkene	1.29
Unknown	.36
Hydrocarbon	.57
Aldehyde	.59
Hydrocarbon	3.35
Hydrocarbon	1.90
Hydrocarbon	1.30

SITE 19 -test date 10/10/1985-	
Compound identification of best match	Concentration
Sulfur	27
Hydrocarbon	.50
Aldehyde	.42
Hydrocarbon	.89
Hydrocarbon	.23
Hydrocarbon	.60
Hydrocarbon	.31
Hydrocarbon	.64
Hydrocarbon	.26
Hydrocarbon	.40

SITE 19r -test date 10/10/1985-	
Compound identification of best match	Concentration
Hydrocarbon	0.20
Sulfur	.26
Hydrocarbon	.39
Aldehyde	.38
Hydrocarbon	.66
Hydrocarbon	.21
Aldehyde	.16
Hydrocarbon	.41
Hydrocarbon	.50
Hydrocarbon	.31

SITE 20 -test date 10/10/1985-	
Compound identification of best match	Concentration
Unsaturated hydrocarbon	0.44
Hydrocarbon	.48
Aldehyde	.31
Hydrocarbon	1.07
Hydrocarbon	.26
Hydrocarbon	.62
Unsaturated hydrocarbon	.46
Hydrocarbon	.32
Hydrocarbon	.86
Hydrocarbon	.54

Table 23.--Summary of available data on base/neutral acids, volatiles, and semivolatiles with U.S. Environmental Protection Agency method 625[1] for bottom-sediment samples collected from Watson Creek and the Gunpowder River, September 1985--Continued

[All units are in micrograms per gram]

SITE 24s -test date 10/09/1985-	
Compound identification of best match	Concentration
Unknown	0.017
Unknown	.039
Bicyclohexyl	.023
Propanoic acid, 2,2-dimethyl-1, (2-hydroxy-1-methylethyl) propyl ester	.029
No other peaks	

SITE 25s -test date 10/09/1985-	
Compound identification of best match	Concentration
Bicyclohexyl	0.015
Propanoic acid, 2,2-methyl-2, 2-dimethyl-1-(2-hydroxy-1-methylethyl) propyl ester	.017
No other peaks	

SITE 26s -test date 10/09/1985-	
Compound identification of best match	Concentration
Bicyclohexyl	0.015
Propanoic acid, 2-methyl-2, 2-dimethyl-1-(2-hydroxy-1-methylethyl) propyl ester	.026
1, 1-biphenyl-2-o1	.015
Hydrocarbon	.009
No other peaks	

SITE 27s -test date 10/09/1985-	
Compound identification of best match	Concentration
Bicyclo [7, 2C] undec-4-ene-9, 11, 11-trimethyl-8-methylene	0.325
1,2,3, 4-Tetrahydro-a, 6-dimethyl-4-(1-methylethyl) naphthalene (1S-Cis)	.210
1,2,3,4,4a,7,8,8a-Octahydro-1, 6-dimethyl-4-(1-methylethyl)-[1R-(1, Alpha., 4. Beta, 4a Beta, 8a Beta)] -1-naphthalenol	.211
Tetradecanoic acid	.255
Unknown	.234
Sulfur	32
Octadecanoic acid	.232
Unknown	.288
Hydrocarbon	.416
Long-chain hydrocarbon	.438

[1] John J. Coniglio, Envirodyne Engineers, St. Louis, Missouri, written commun., 1985.

Table 24.--Chemical analyses for base/neutral acids, volatiles, and semivolatiles in laboratory method blanks for bottom-sediment samples collected from Watson Creek and the Gunpowder River, September 1985

[Method blanks are not available for samples run 10/15/1985 or 10/16/1985. All units are in micrograms per gram]

METHOD BLANK for 10/09/1985	
Compound identification of best match	Concentration
Unknown	0.035
Unknown	.019
Unknown	.040
Bicyclohexyl	.023
Propanoic acid, 2-methyl-2,2-dimethyl-1-(2-hydroxy-1-methylethyl) propyl ester	.025
Hexadenanoic acid	.016
Unknown	.023
Unknown	.025

METHOD BLANK for 10/10/1985	
Compound identification of best match	Concentration
Bicyclohexyl	0.06
Hexyl butanoate	.03
Unknown	.02
Unknown	.05
Unknown	.02
No other peaks	

METHOD BLANK for 10/21/1985	
Compound identification of best match	Concentration
Unknown	0.012
Bicyclohexyl	.015
Unknown	.014
Unknown	.011
Unknown	.043
Unknown	.355
Long-chain hydrocarbon	.130
Long-chain hydrocarbon	.034
Unknown	.527
Long-chain hydrocarbon	.046

 (p. 63 follows)

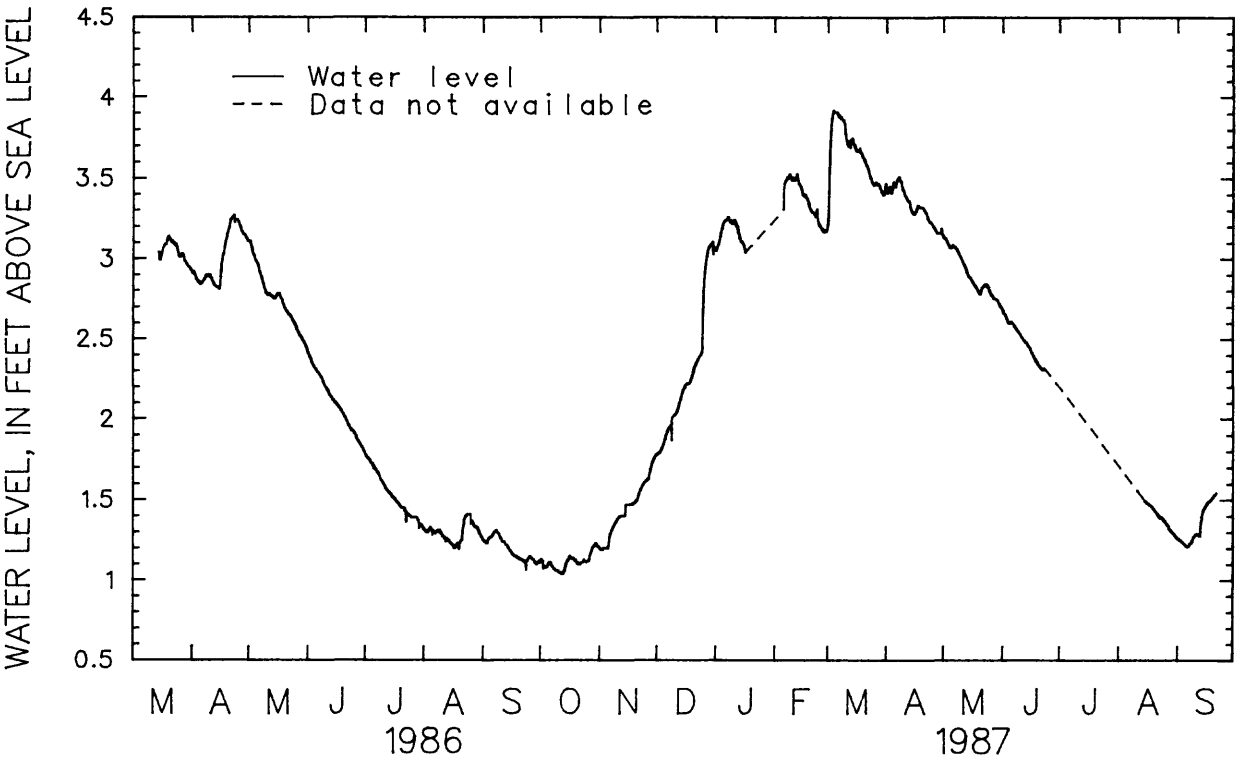

Figure 4.--Water level in the water-table aquifer at well OF6A, March 1986 to September 1987.

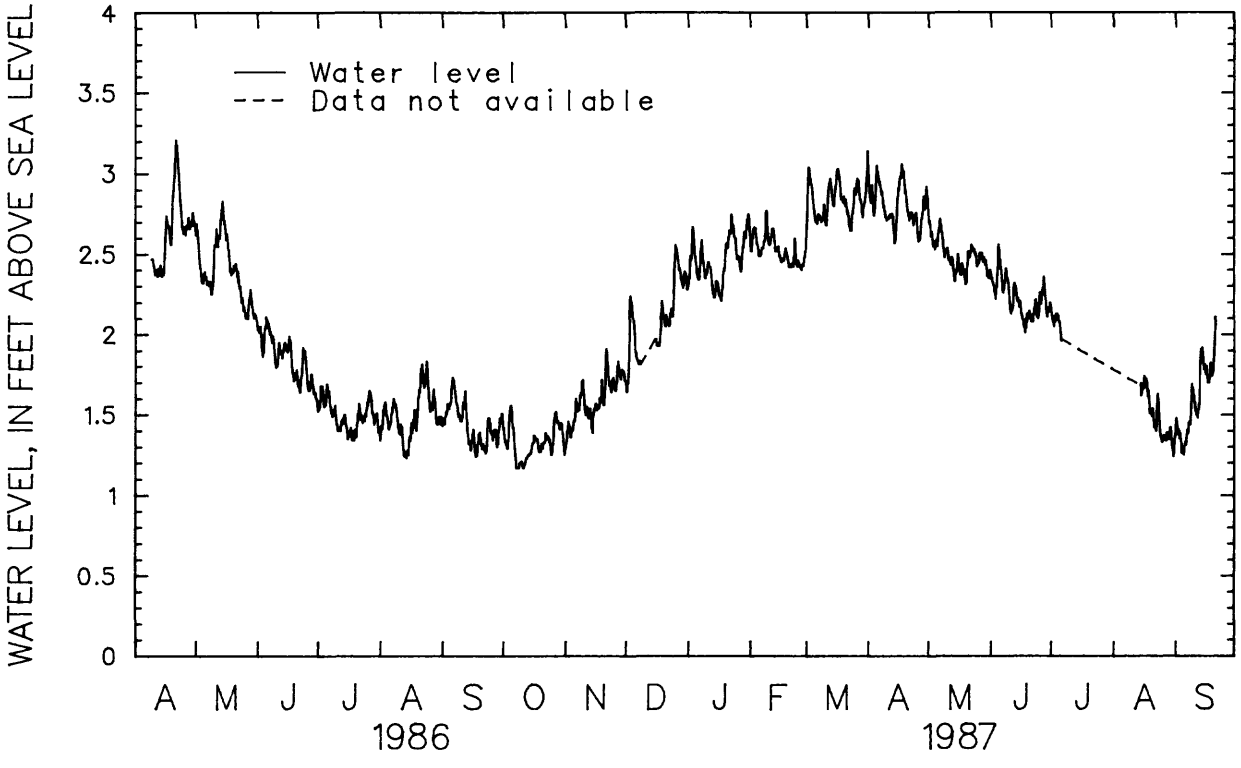

Figure 5.--Water level in the upper confined aquifer at well OF6B, April 1986 to September 1987.

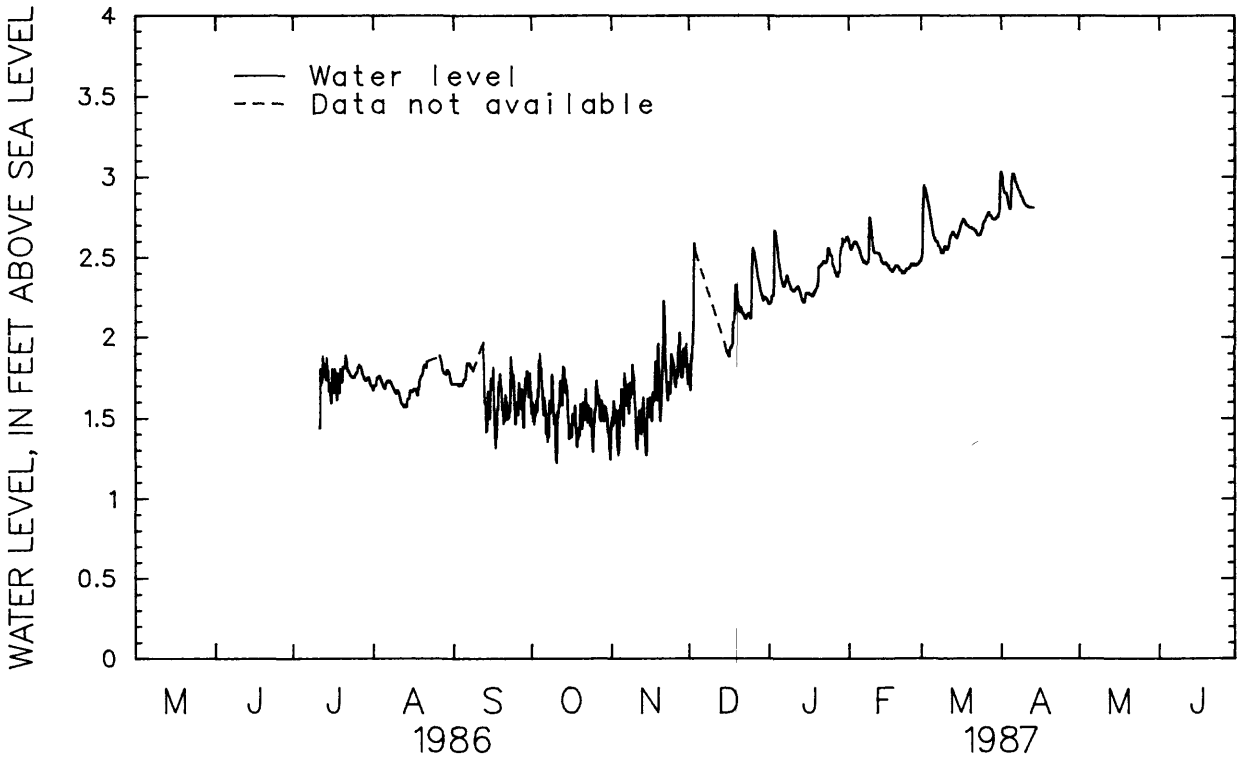

Figure 6.--Water level in the lower confined aquifer at well OF6C, July 1986 to April 1987.

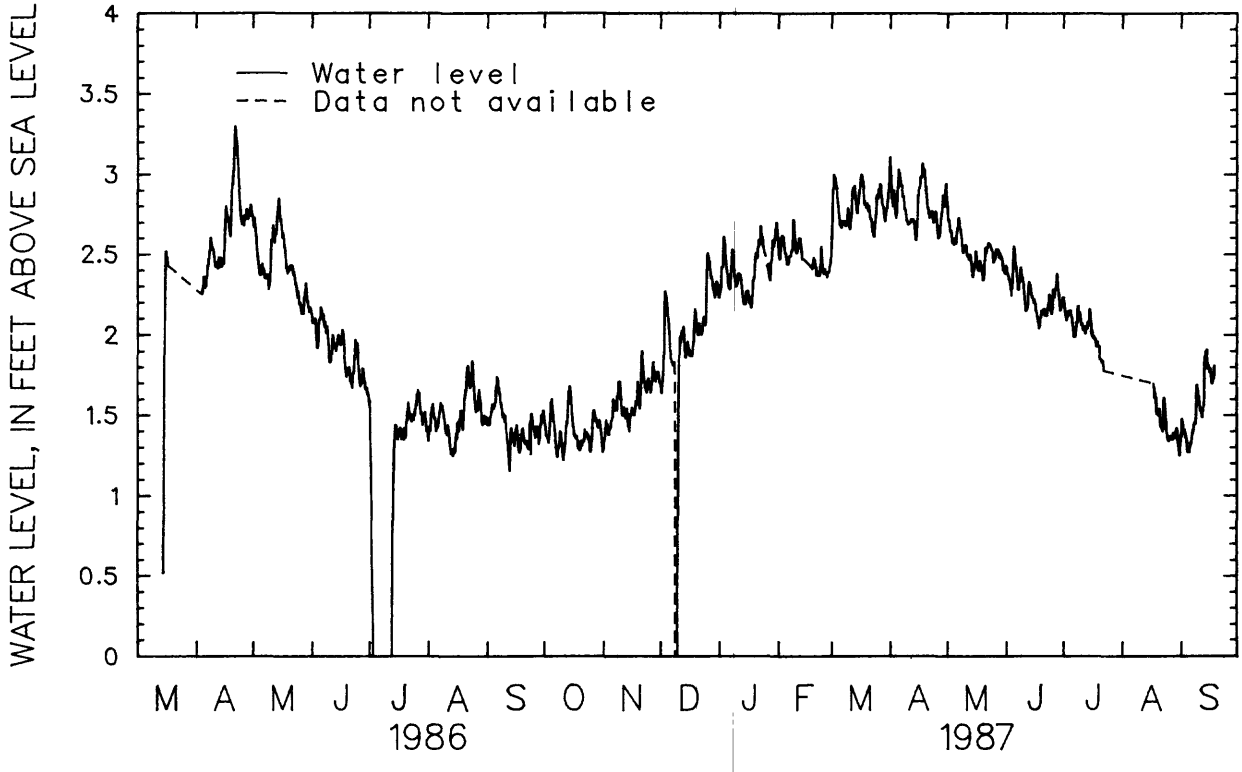

Figure 7.--Water level in the upper confined aquifer at well OF12B, March 1986 to September 1987.

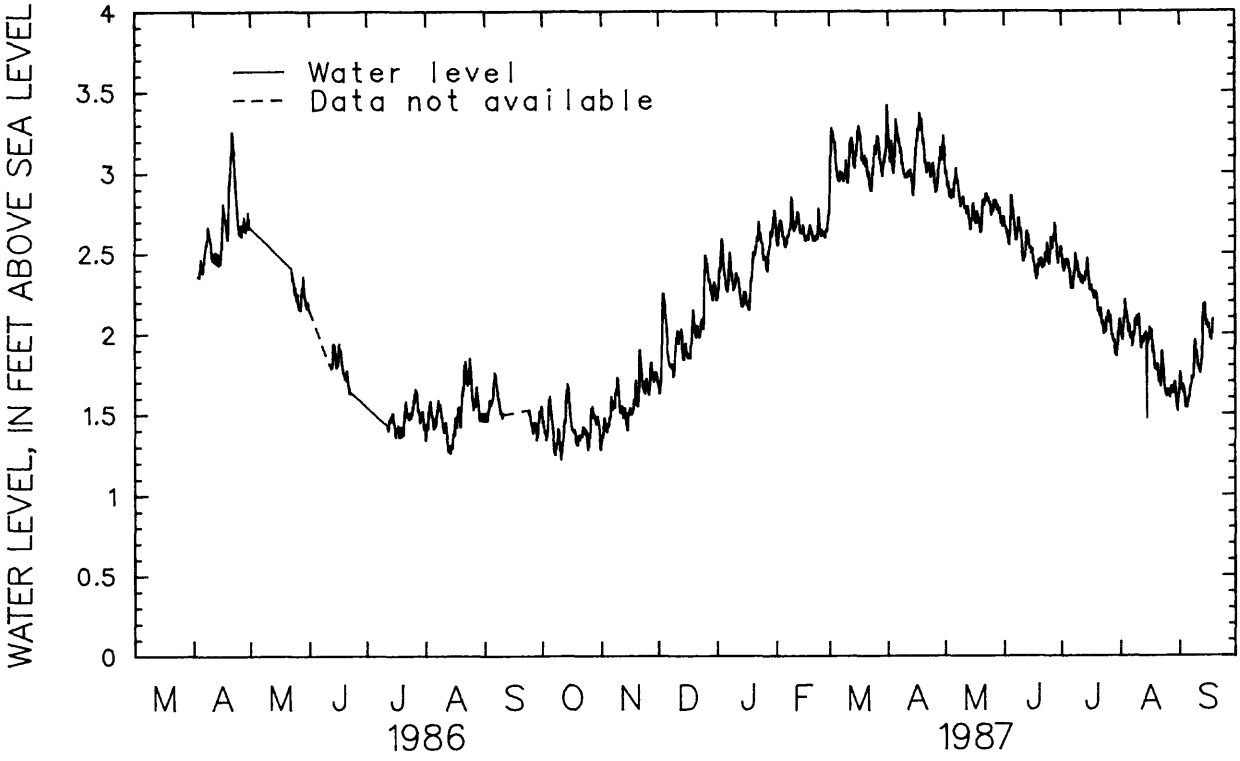

Figure 8.--Water level in the upper confined aquifer at well OF12C, April 1986 to September 1987.

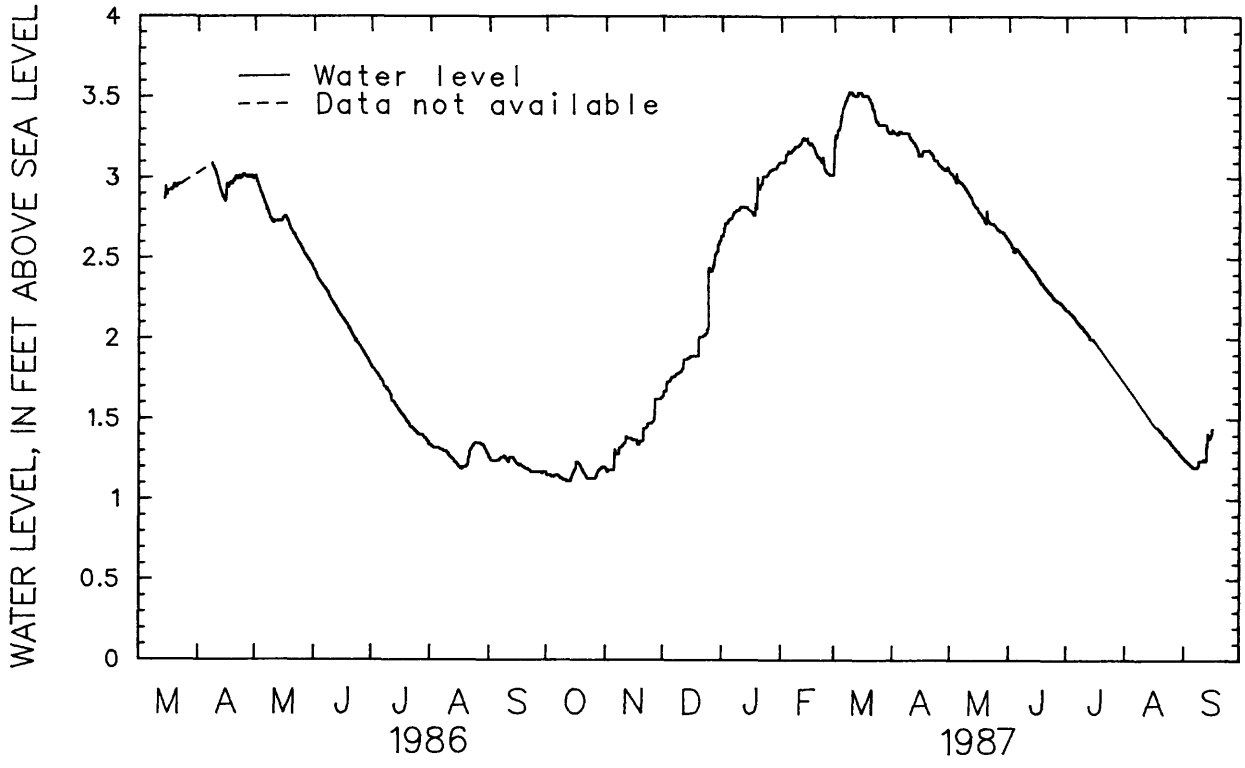

Figure 9.--Water level in the lower confined aquifer at well OF13A, March 1986 to September 1987.

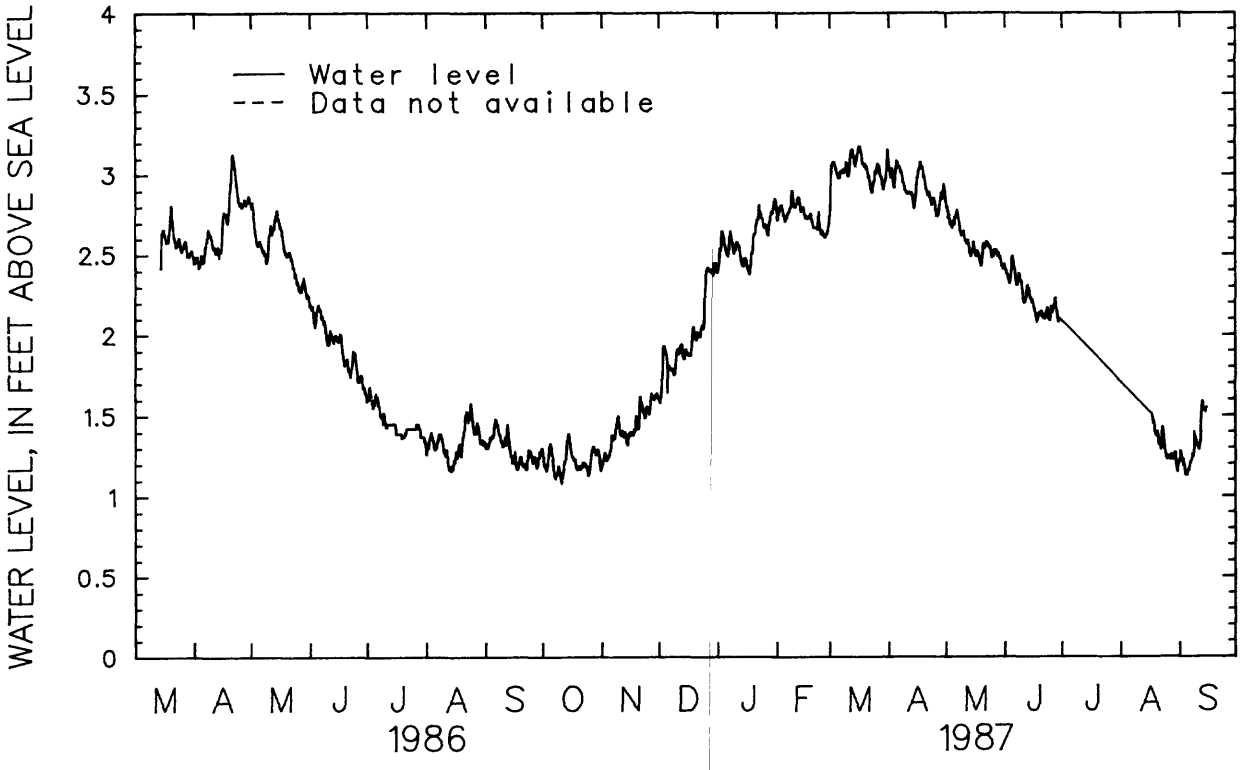

Figure 10.--Water level in the lower confined aquifer at well OF13B, March 1986 to September 1987.

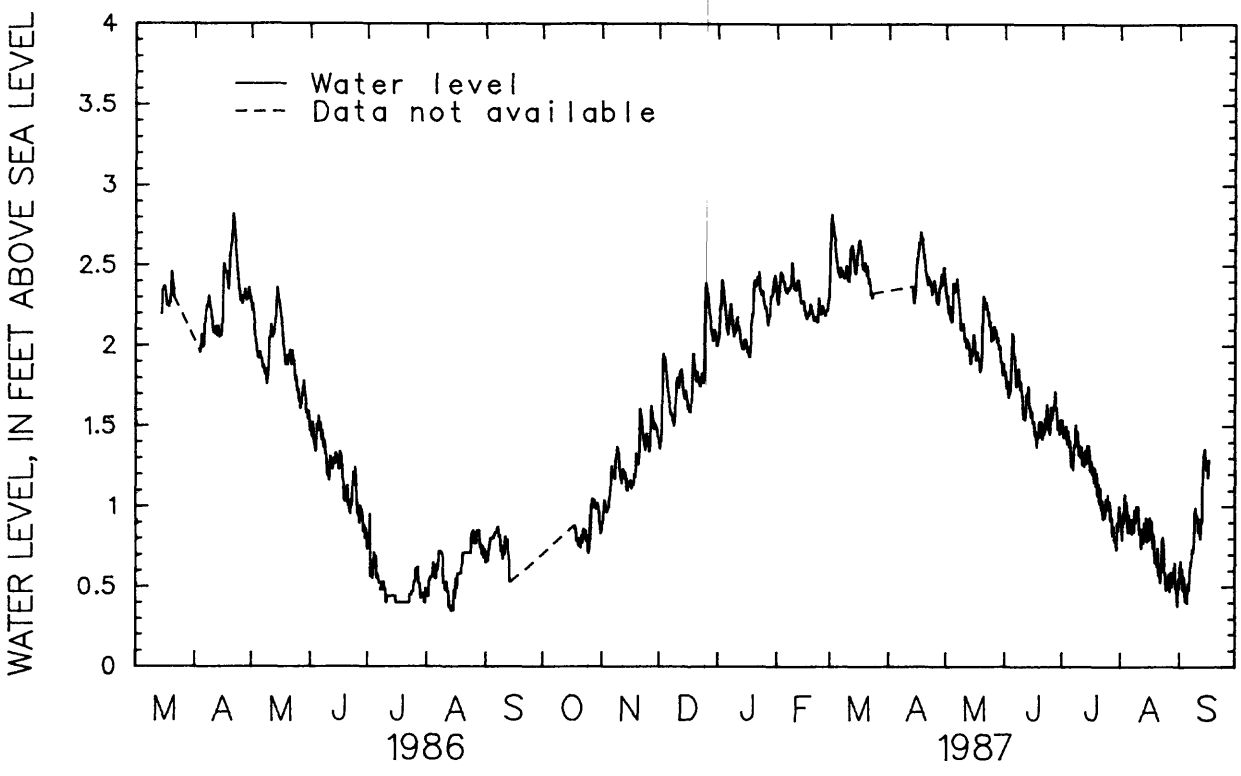

Figure 11.--Water level in the water-table aquifer at well OF14B, March 1986 to September 1987.

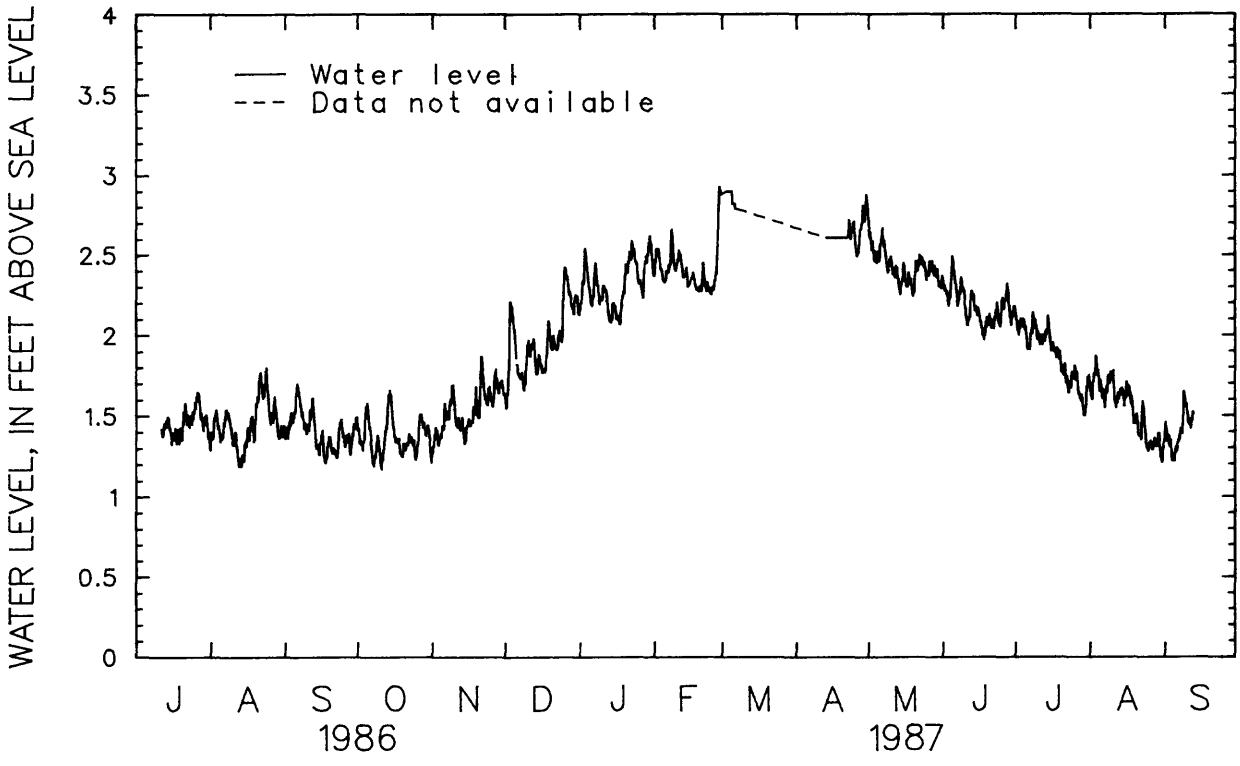

Figure 12.--Water level in the upper confined aquifer at well OF14C, July 1986 to September 1987.

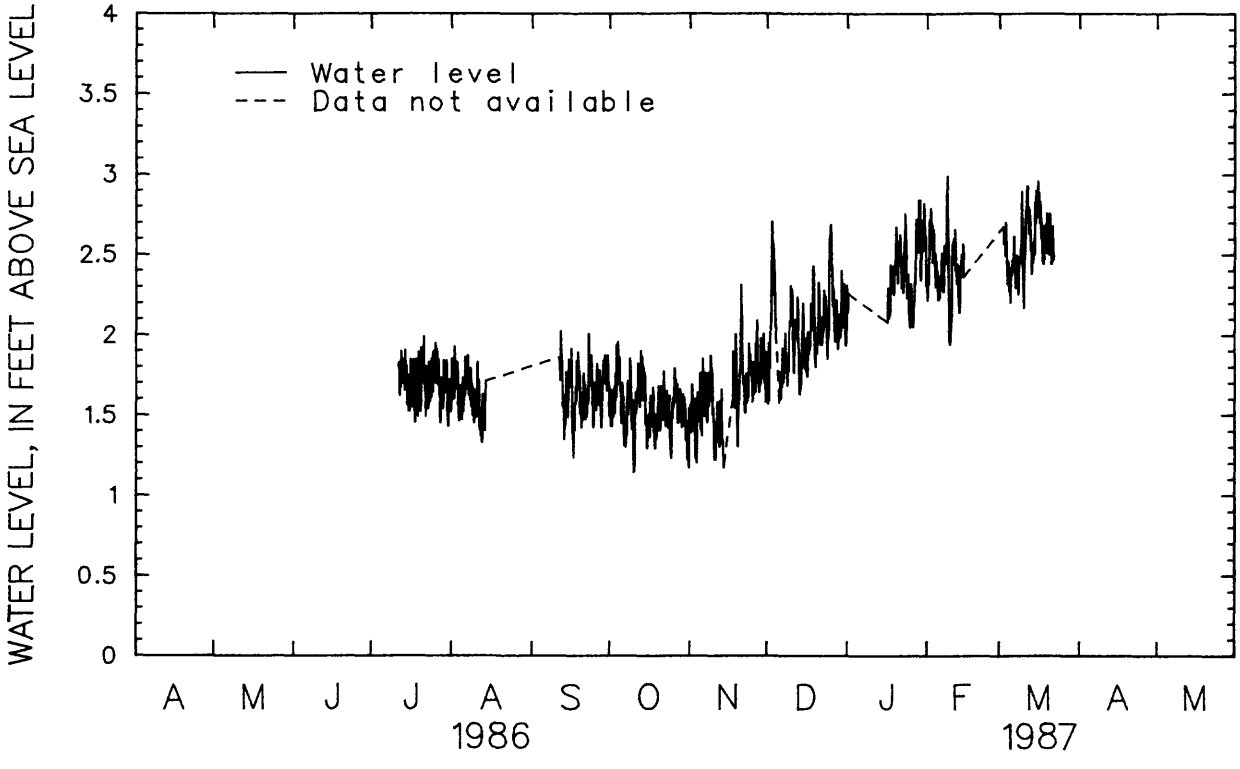

Figure 13.--Water level in the lower confined aquifer at well OF14D, July 1986 to March 1987.

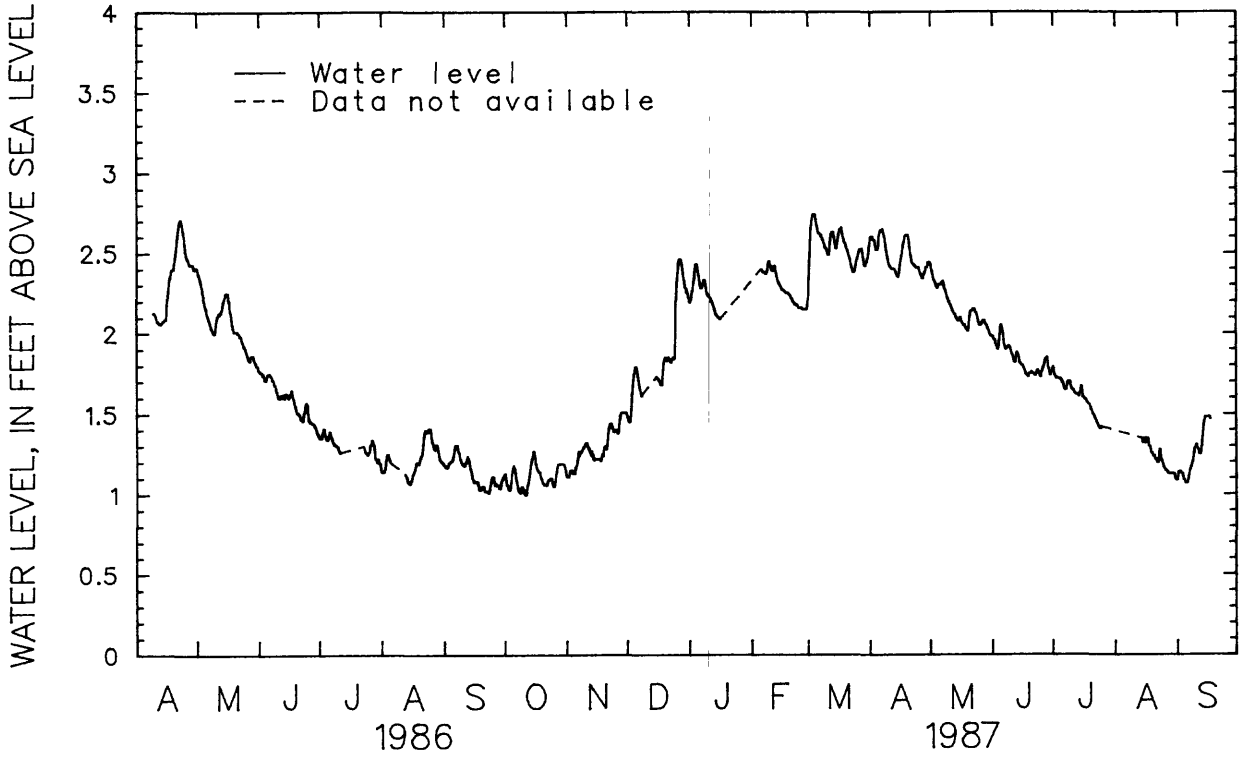

Figure 14.--Water level in the water-table aquifer at well OF17A, April 1986 to September 1987.

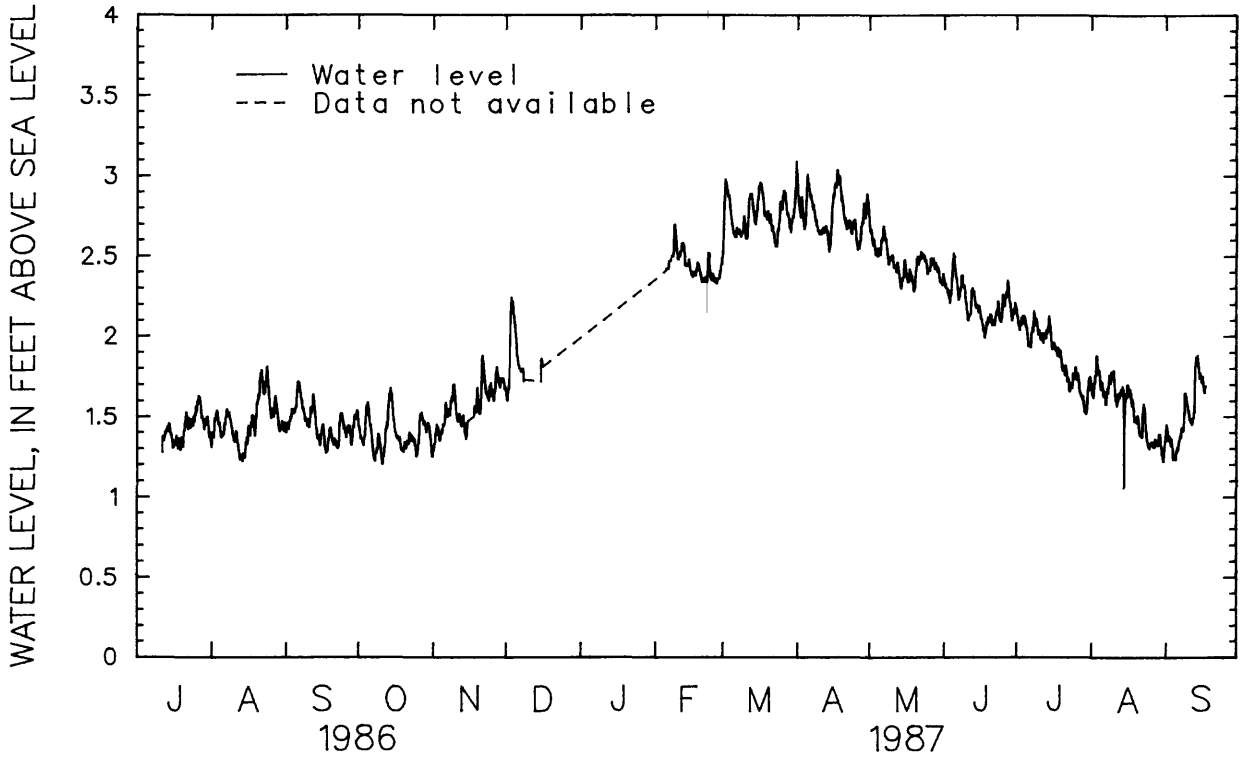

Figure 15.--Water level in the lower confined aquifer at well OF17B, July 1986 to September 1987.

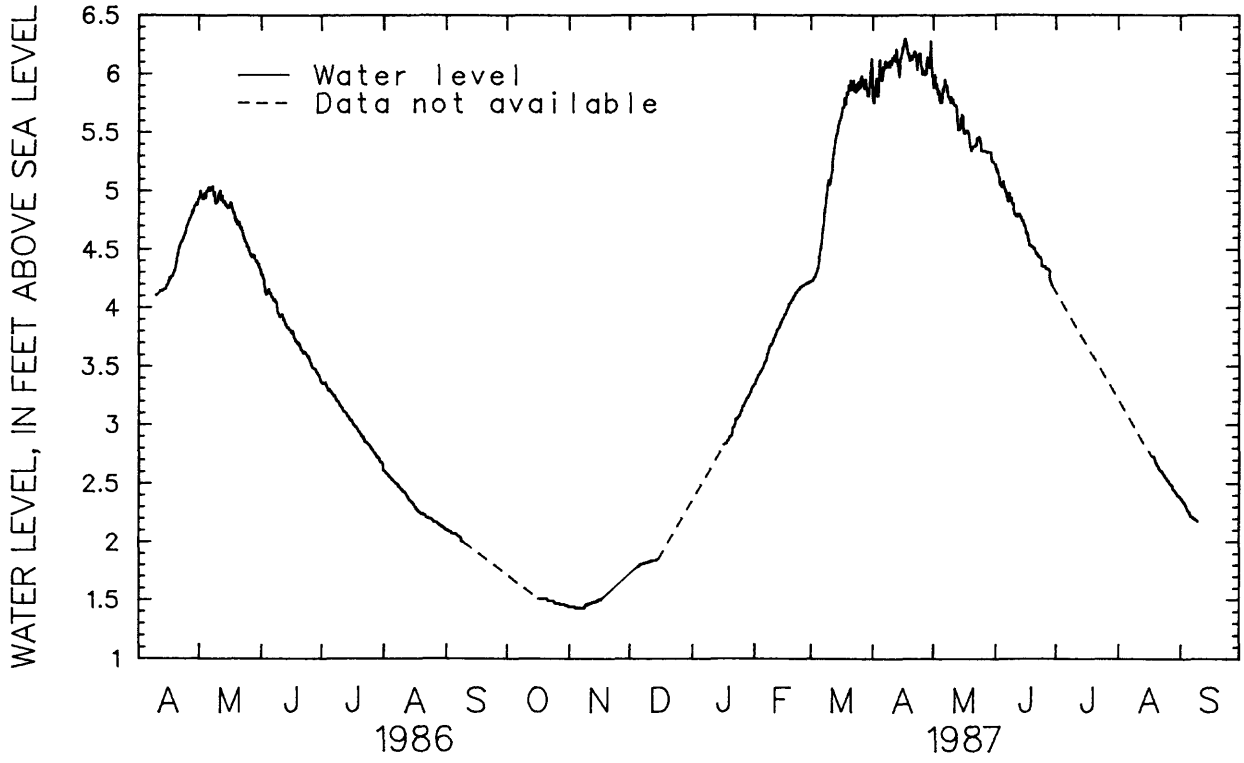

Figure 16.--Water level in the water-table aquifer at well OF18A, April 1986 to September 1987.

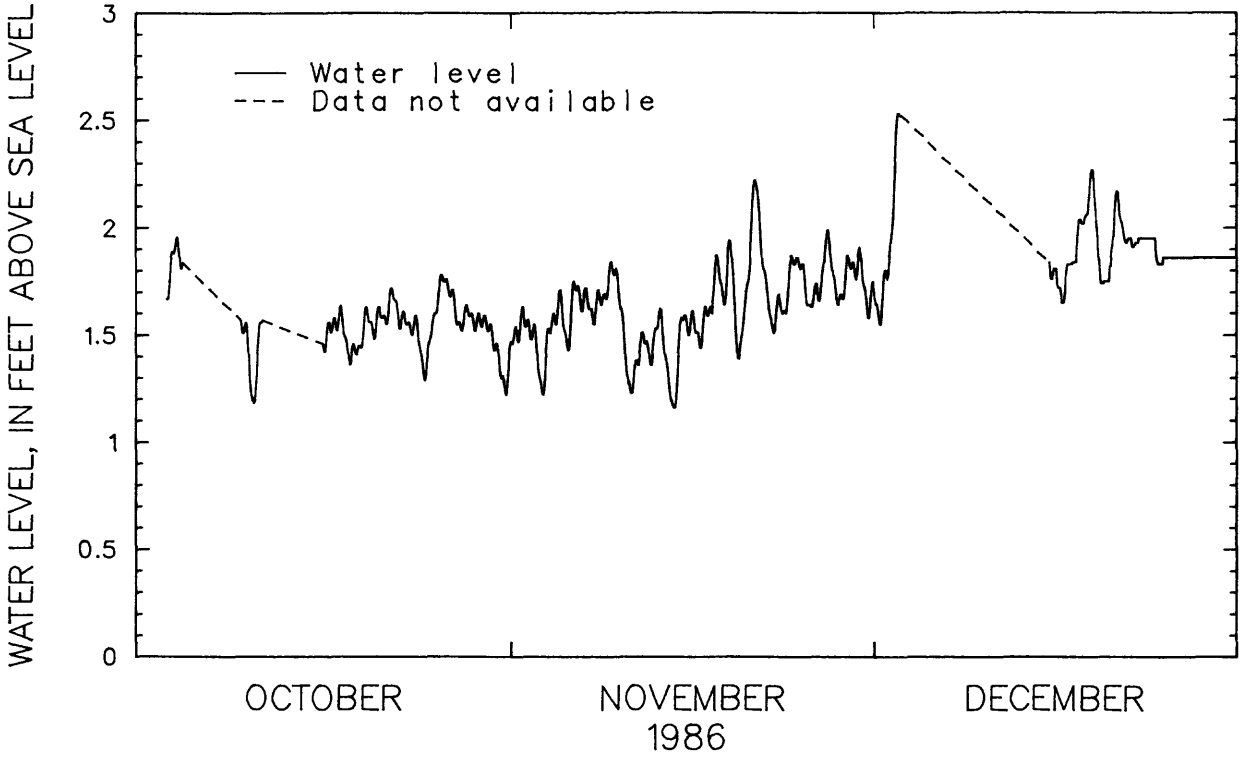

Figure 17.--Water level in the lower confined aquifer at well OF18C, October 1986 to December 1986.

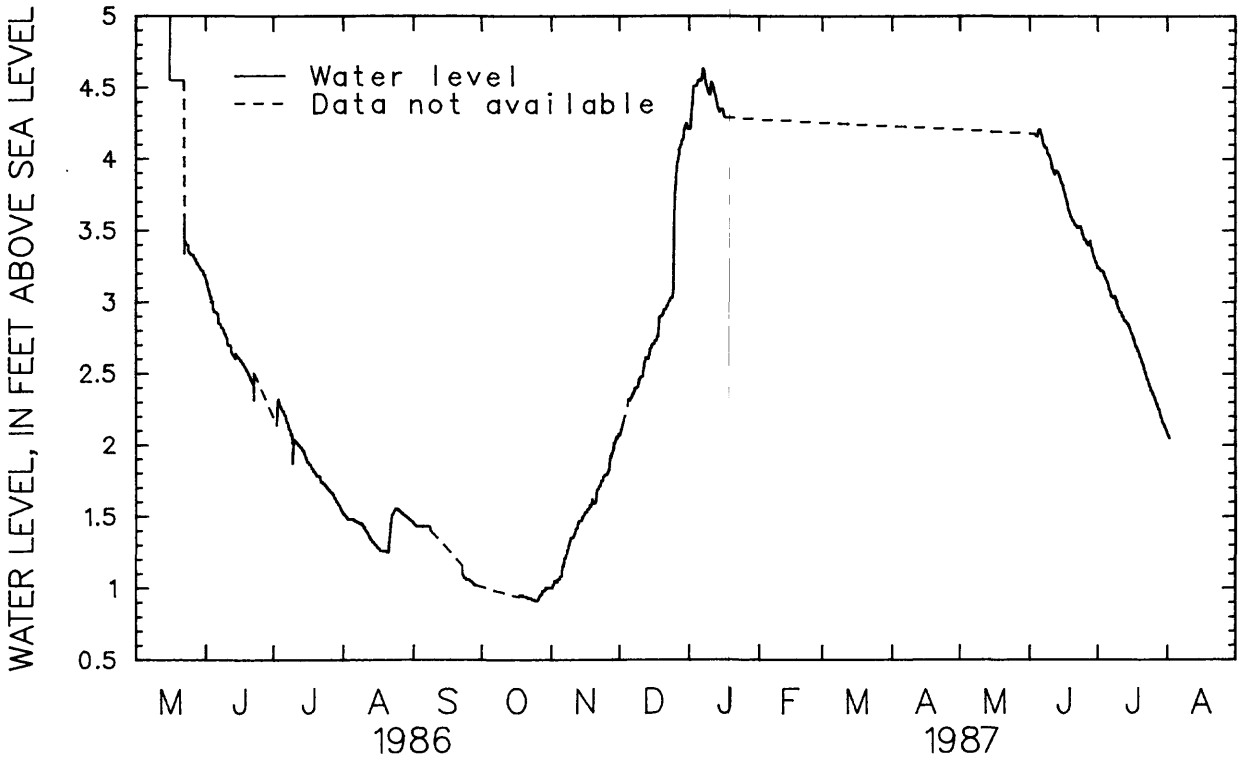

Figure 18.--Water level in the water-table aquifer at well OF19, May 1986 to August 1987.

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ERRATA
for:

HYDROGEOLOGIC AND CHEMICAL DATA FOR THE O-FIELD AREA,

ABERDEEN PROVING GROUND, MARYLAND

By Peggy R. Nemoff and Don A. Vroblesky

U.S. GEOLOGICAL SURVEY

Open-File Report 89-238

Prepared in cooperation with

OFFICE OF ENVIRONMENTAL MANAGEMENT,

ABERDEEN PROVING GROUND, MARYLAND

All of the changes accompanying this errata concern Table 5. Constituent concentrations to be changed are for Ammonia + organic nitrogen (AmmOrN), Phosphorus (Phosph), and Ammonia.

Ammended, October 1993

Various constituent concentrations for AmmOrN, Phosph., and Ammonia were transposed up in the original table. The order of placement in the table for these three constituents was also not uniform. The following inserts indicate proper concentration levels and order of placement for these three constituents. Please note that some of the sampling dates have been changed as well. Dates that have been changed are indicated by an asterisk (*).

Page 17, Table 5:

Property or Constituent	Concentrations at wells for each sampling date (month/day)											
	Well OF1					Well OF2	Well OF3			Well OF5		
	12/06 1985	3/10 1986	7/09 1986	9/09 1986	12/02 1986	12/09 1985	12/12 1985	3/11 1986	7/09 1986	12/12 1985	3/11 1986	7/09 1986
AmmOrN	1.12	--	--	--	--	<.28	.56	--	--	.28	--	--
Phosph.	2.11	--	--	--	.011	.012	.027	--	--	.027	--	--
Ammonia	.281	--	--	--	--	<.01	.068	--	--	<.01	--	--
MB	A	K	R	S	--	B	D	J	R	D	J	R

Page 21, Table 5:

Property or Constituent	Concentrations at wells for each sampling date (month/day)											
	Well OF6A (cont.)			Well OF6B						Well OF6C		
	1/16 1987	2/05 1987	9/21 1987	12/11 1985	3/10 1986	7/08 1986	9/12 1986	12/08 1986	9/21 1987	12/11 1985	3/13 1986	7/01 1986
AmmOrN	--	--	3.74	1.4	<2.8	--	--	--	1.34	1.96	1.68	--
Phosph.	--	--	.14	.148	.104	.217	.106	.037	.14	.038	.217	.170
Ammonia	--	--	.6	.932	.635	.823	.912	.817	.8	1.96	1.68	2.16
MB	OO	PP	FF	B		Q	V	Z	FF	B	K	Q

Page 22, Table 5:

Property or Constituent	Concentrations at wells for each sampling date (month/day)										
	Well OF6C (cont.)		Well OF7		Well OF8						Well OF9
	9/10 1986	12/04 1986	12/12 1985	7/09 1986	12/06 1985	*3/13 1986	7/01 1986	9/10 1986	12/02 1986	9/15 1987	12/16 1985
AmmOrN	--	--	1.68	--	.28	<.28	--	--	--	.33	<.28
Phosph.	.06	.021	.059	--	.111	.016	.021	.055	.032	.02	.048
Ammonia	1.98	--	1	--	<.01	.002	.005	.028	--	.3	<.01
MB	V	Z	D	R		K	M	T		CC	D

Page 23, Table 5:

Property or Constituent	Concentrations at wells for each sampling date (month/day)									
	Well OF10	Well OF11	Well OF12A		Well OF12B					
	12/16 1985	12/16 1985	12/10 1985	3/06 1986	12/10 1985	3/06 1986	7/01 1986	9/10 1986	12/08 1986	9/18 1987
AmmOrN	.56	.56	--	<.28	.84	<.28	--	--	--	.73
Phosph.	<.01	.043	--	.018	.075	.013	.042	.039	.037	.08
Ammonia	.436	.153	--	.032	.41	.238	.658	.659	.556	.4
MB	--	F	D	I	B	I	L	T	Z	JJ

Page 24, Table 5:

Property or Constituent	Concentrations at wells for each sampling date (month/day)											
	Well OF12C						Well OF13A					
	12/10 1985	3/06 1986	7/01 1986	9/10 1986	12/08 1986	9/18 1987	12/17 1985	3/11 1986	7/03 1986	9/11 1986	*12/05 1986	9/16 1987
AmmOrN	1.4	1.4	--	--	--	1.46	.28	< .28	--	--	--	<.2
Phosph.	.322	.385	<.01	.132	.052	.13	.027	<.01	.052	.039	.021	.02
Ammonia	.895	.935	1.12	.793	1.18	1.2	<.01	.013	.002	<.01	<.01	<.02
MB	B	I	L	T	Z	JJ	--	K	L	T	W	DD

Page 25, Table 5:

Property or Constituent	Concentrations at wells for each sampling date (month/day)											
	Well OF13B						Well OF13C					
	12/17 1985	3/11 1986	7/03 1986	9/11 1986	12/05 1986	9/16 1987	12/17 1985	3/11 1986	7/03 1986	9/11 1986	12/05 1986	9/16 1987
AmmOrN	1.12	<.28	--	--	--	.68	2.52	1.96	--	--	--	2.5
Phosph.	.048	.023	.098	.05	.083	<.01	.222	.109	.072	.045	.323	.23
Ammonia	.516	.361	.397	.547	.545	.7	.164	1.5	1.87	1.72	1.81	2.5
MB	F	J	O	T	W	DD	F	J	O	T	W	EE

Page 26, Table 5:

Property or Constituent	Concentrations at wells for each sampling date (month/day)											
	Well OF14A		Well OF14B						Well OF14C			
	12/17 1985	3/12 1986	12/17 1985	3/12 1986	7/03 1986	9/11 1986	12/05 1986	9/16 1987	12/17 1985	3/12 1986	7/03 1986	9/11 1986
AmmOrN	1.96	1.12	<.28	<.28	--	--	--	.56	1.96	.28	--	--
Phosph.	.048	.062	.248	.051	.139	.106	.282	<.01	.106	.077	.227	.266
Ammonia	.452	.079	.324	.204	.362	.393	.327	.5	1.27	1.28	1.58	1.25
MB	F	K	F	K	L	U	W	HH	F	K	P	T

Page 27, Table 5:

Property or Constituent	Concentrations at wells for each sampling date (month/day)											
	Well OF14C (cont.)		Well OF14D					Well OF16A				
	12/05 1986	9/16 1987	12/17 1985	3/13 1986	7/03 1987	9/11 1986	12/05 1986	12/09 1985	3/06 1986	7/03 1986	9/15 1986
AmmOrN	--	1.6	2.52	.84	--	--	--	7.0	3.4	--	--
Phosph.	.497	.19	.274	.361	.582	.183	.236	1.11	2.46	2.2	.286
Ammonia	.144	1.5	1.53	1.29	1.58	.944	--	2.71	3.13	3.67	2.85
MB	X	EE	F	K	P	T	--	A	I	M	V

Page 28, Table 5:

Property or Constituent	Concentrations at wells for each sampling date (month/day)											
	Well OF16A (cont.)		Well OF16B						Well OF17A			
	12/10 1986	9/15 1987	12/09 1985	3/06 1986	7/07 1986	9/15 1986	12/10 1986	9/15 1987	12/10 1985	3/07 1986	7/08 1986	7/22 1986
AmmOrN	--	4.7	.28	<.28	--	--	--	2.2	.84	1.1	--	--
Phosph.	.057	1.3	.994	.778	1.09	12.78	.052	1.47	.127	.145	.045	--
Ammonia	2.95	4.3	.921	.694	.96	.841	1.18	1.9	3.88	.388	.524	--
MB	AA	GG	G	K	M	V	BB	GG	C	K	Q	--

Page 30, Table 5:

Property or Constituent	Concentrations at wells for each sampling date (month/day)											
	Well OF17A				Well OF17B						Well OF18A	
	12/30 1986	1/16 1987	2/05 1987	9/18 1987	12/10 1985	3/07 1986	7/08 1986	9/12 1986	12/08 1986	9/18 1987	12/05 1985	3/07 1986
AmmOrN	--	--	--	1.2	<.28	1.4	--	--	--	1.5	6.72	<.28
Phosph.	--	--	--	.21	.532	.482	.433	.543	.155	.48	.096	.053
Ammonia	--	--	--	.6	1.11	.946	1.12	.841	1.13	1.2	.89	.002
MB	NN	OO	PP	HH	D	I	R	V	Z	HH	F	I

Page 31, Table 5:

Property or Constituent	Concentrations at wells for each sampling date (month/day)											
	Well OF18A (cont.)				Well OF18B						Well OF18C	
	*6/30 1986	*9/09 1986	12/03 1986	9/15 1987	12/05 1985	*3/05 1986	6/30 1986	9/09 1986	12/03 1986	9/15 1987	12/05 1985	3/05 1986
AmmOrN	--	--	--	<.2	5.04	<.28	--	--	--	.59	3.92	2.5
Phosph.	.021	.05	.042	.01	.153	.176	.268	.091	.216	<.01	.064	.013
Ammonia	.008	.007	--	.2	.895	.485	.495	.547	--	.3	1.16	2.59
MB	L	S	--	DD	F	I	L	S	--	DD	--	I

Page 32, Table 5:

Property or Constituent	Concentrations at wells for each sampling date (month/day)										
	Well OF18C			Well OF19						Well OF20A	Well OF20B
	6/30 1986	9/10 1986	12/04 1986	12/06 1985	3/10 1986	7/03 1986	9/09 1986	12/03 1986	9/15 1987	9/18 1987	9/17 1987
AmmOrN	--	--	--	.98	<.28	--	--	--	.77	5.5	1
Phosph.	.016	.039	.216	.09	.013	.026	.039	.016	<.01	<.01	<.01
Ammonia	2.75	2.71	--	.313	.12	.234	.249	--	.6	4.1	.8
MB	L	T	--	--	K	N	S	--	CC	II	II

Page 33, Table 5:

Property or Constituent	Concentrations at wells for each sampling date (month/day)				
	Well OF21	Well OF22A	Well OF22B	Well H-1	
	9/18 1987	9/18 1987	9/18 1987	12/16 1985	7/09 1986
AmmOrN	2.0	1.38	.91	.56	--
Phosph.	.14	.45	.04	.043	--
Ammonia	1.0	.9	.6	.052	--
MB	II	II	II	D	R