



# **Laboratory analytical results for ground-water sampling at Southern Polytechnic State University, Marietta, Georgia, 1997**

**Open-File Report 00-277**

**Prepared in cooperation with the  
U.S. Department of Defense  
U.S. Air Force  
Aeronautical Systems Center**

**U.S. Department of the Interior  
U.S. Geological Survey**

# LABORATORY ANALYTICAL RESULTS FOR GROUND-WATER SAMPLING AT SOUTHERN POLYTECHNIC STATE UNIVERSITY, MARIETTA, GEORGIA, 1997

By Lisa M. Stewart

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U.S. GEOLOGICAL SURVEY

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AERONAUTICAL SYSTEMS CENTER



Atlanta, Georgia  
2000

**U.S. DEPARTMENT OF THE INTERIOR**

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**U.S. GEOLOGICAL SURVEY**

**Charles G. Groat, Director**

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For additional information write to:

State Representative  
U.S. Geological Survey  
3039 Amwiler Road  
Peachtree Business Center, Suite 130  
Atlanta, GA 30360-2824  
<http://ga.water.usgs.gov>

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## VERTICAL DATUM

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 the United States and Canada, formerly called Sea Level Datum of 1929.

# **LABORATORY ANALYTICAL RESULTS FOR GROUND-WATER SAMPLING AT SOUTHERN POLYTECHNIC STATE UNIVERSITY, MARIETTA, GEORGIA, 1997**

**by Lisa M. Stewart**

## **ABSTRACT**

Ground-water samples were collected during the Summer of 1997 from four deep and three shallow monitoring wells to delineate the vertical and areal extent of ground water containing a trichloroethylene and metals contamination plume. Contaminated ground water occurs on the property of Southern Polytechnic State University, adjacent to U.S. Air Force Plant 6, Marietta, Georgia.

Ground-water samples were analyzed for selected compounds from Appendix IX to U.S. Code of Federal Regulations, Title 40, Part 264 (40 CFR 264) that include volatile and semi-volatile organic compounds, metals, cyanide, and sulfide. One deep monitoring well was resampled for chemical analysis of gasoline-range and diesel-range hydrocarbons and an expanded Appendix IX list of compounds (including dioxins and furans; and pesticides and herbicides).

Because each deep monitoring well intercepts multiple water-bearing fracture zones in the crystalline rocks underlying the site, mixing of water from different fracture zones is probable. Such borehole mixing results in ground-water samples that poorly represent a specific water-bearing zone. A sampling device specifically designed to isolate short vertical open sections of a monitoring well was used to ensure that the ground-water samples collected were representative of specific water-bearing zones.

Analytical results from the ground-water samples show that trichloroethylene and metals are present in ground water in the saprolite and fractured rock underlying the site. Diesel-range organic compounds also were detected in ground water from one deep monitoring well.

## INTRODUCTION

Southern Polytechnic State University (SPSU) is located in Marietta, Cobb County, Ga., adjacent to U.S. Air Force Plant 6 (AFP6) (figs. 1 and 2). AFP6 is located on 720 acres of a 3,336-acre military complex that includes Dobbins Air Force Base, the Atlanta Naval Air Station, the United States Army Reserve, and the Georgia Air National Guard (Parsons Engineering Science, Inc., 1995, section 2, p. 1) (fig. 1). The plant was constructed in 1942 to support production of B-29 aircraft during World War II. Lockheed Martin Aeronautical Systems Corp. (LMASC) has operated AFP6 for the U.S. Air Force (USAF) as an aircraft production and modification facility since 1951 (B&V Waste Science and Technology Corporation, 1994, section 1, p. 3).

As part of the operations at AFP6, large quantities of petroleum fuels, oils, lubricants, chlorinated solvents, and protective coatings are used (Parsons Engineering Science, Inc., 1995, section 2, p.1). Past manufacturing practices have resulted in the release of volatile organic compounds (VOCs), primarily trichloroethylene (TCE), tetrachloroethylene (PCE), and benzene, along with semivolatile organic compounds (SVOCs) and metals into the soil and ground water at the plant site (B&V Waste Science and Technology Corporation, 1994, section 1, p.13). In 1995, dissolved TCE was detected in ground water collected from a new, but unused, irrigation well on the SPSU campus, indicating that VOCs may have migrated from known areas of contamination on AFP6.

In 1995, the U.S. Geological Survey (USGS), in cooperation with the USAF Aeronautical Systems Center (ASC), began an investigation at SPSU to describe the vertical and areal distribution of VOCs, SVOCs, and metals in ground water. Three pairs of monitoring wells (one well approximately 600-feet (ft) deep paired with a well approximately 50- to 100-ft deep) were installed at SPSU; in 1997 ground-water samples were collected from selected fracture intervals in each well, including an existing unused irrigation well (600-ft deep).

## Purpose and Scope

This report presents selected ground-water-quality data collected from USGS installed monitoring wells and the irrigation well at SPSU. The scope of this report includes the water-quality data collected from multiple depth intervals in each deep monitoring well; from the shallow monitoring wells paired with each deep monitoring well; and analytical results for quality-assurance samples

collected concurrently with the ground-water samples. Water-quality data described in this report include a list of selected compounds from Appendix IX to U.S. Code of Federal Regulations, Title 40, Part 264 (40 CFR 264) (U.S. Environmental Protection Agency, 1997b) cyanide and sulfide. An additional sample was collected from one deep monitoring well and analyzed for the complete list of Appendix IX to 40 CFR 264 (U.S. Environmental Protection Agency, 1997b) compounds, cyanide and sulfide, gasoline-range organics, and extractable petroleum hydrocarbons.

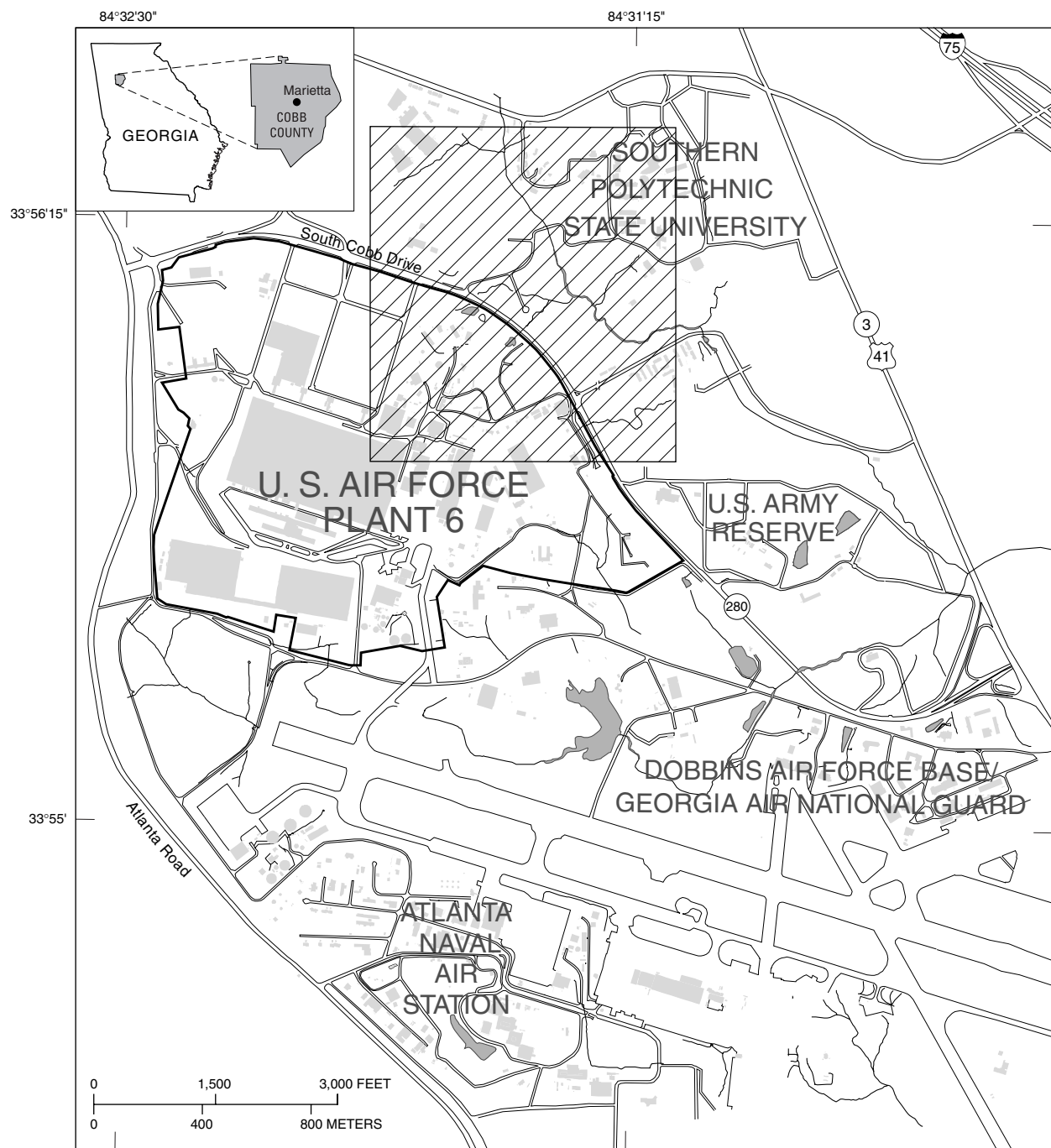
## Geology

The geology of the study area consists of late Precambrian to early Paleozoic igneous and metamorphic crystalline rocks (McConnell and Abrams, 1984), overlain by a mantle of regolith. The crystalline rock was subjected to multiple deformation and metamorphic events that produced oriented structural features, such as foliation, joints, and faults (Cressler and others, 1983); these structures probably have significant hydrologic importance (Thomas J. Crawford, U.S. Geological Survey, written commun., 1996). Weathering of the crystalline rock typically results in a widening of the structural features, creating potential pathways for ground-water movement (Cressler and others, 1983). A transitional weathering zone typically is present above the crystalline rock. This transition zone consists of partially weathered crystalline rock, contains particle sizes ranging from clay to boulders, and generally ranges from 20 to 30 ft in thickness. Lateral ground-water movement may occur in such a transition zone if the zone is sufficiently permeable (Daniel, 1990). Overlying regolith can be divided into a saprolite zone and a soil zone. The saprolite zone in the study area is a clay-rich weathered rock residuum that retains textural characteristics of the parent rock (Joiner, 1967). The saprolite zone in the study area ranges in thickness from 5 ft at the top of ridges and in stream channels to nearly 80 ft on ridge slopes and flood plains. The soil zone is thin, ranging from 1 to 3 ft thick. Clay-rich alluvium also comprises part of the regolith in stream valleys in the study area.

## Acknowledgments

Many USGS employees assisted in the collection and compilation of data for this report. The author extends special thanks to the administrators and staff of Southern Polytechnic State University for their support.





Base modified from U.S. Geological Survey  
Marietta 1:24,000, 1992

#### EXPLANATION

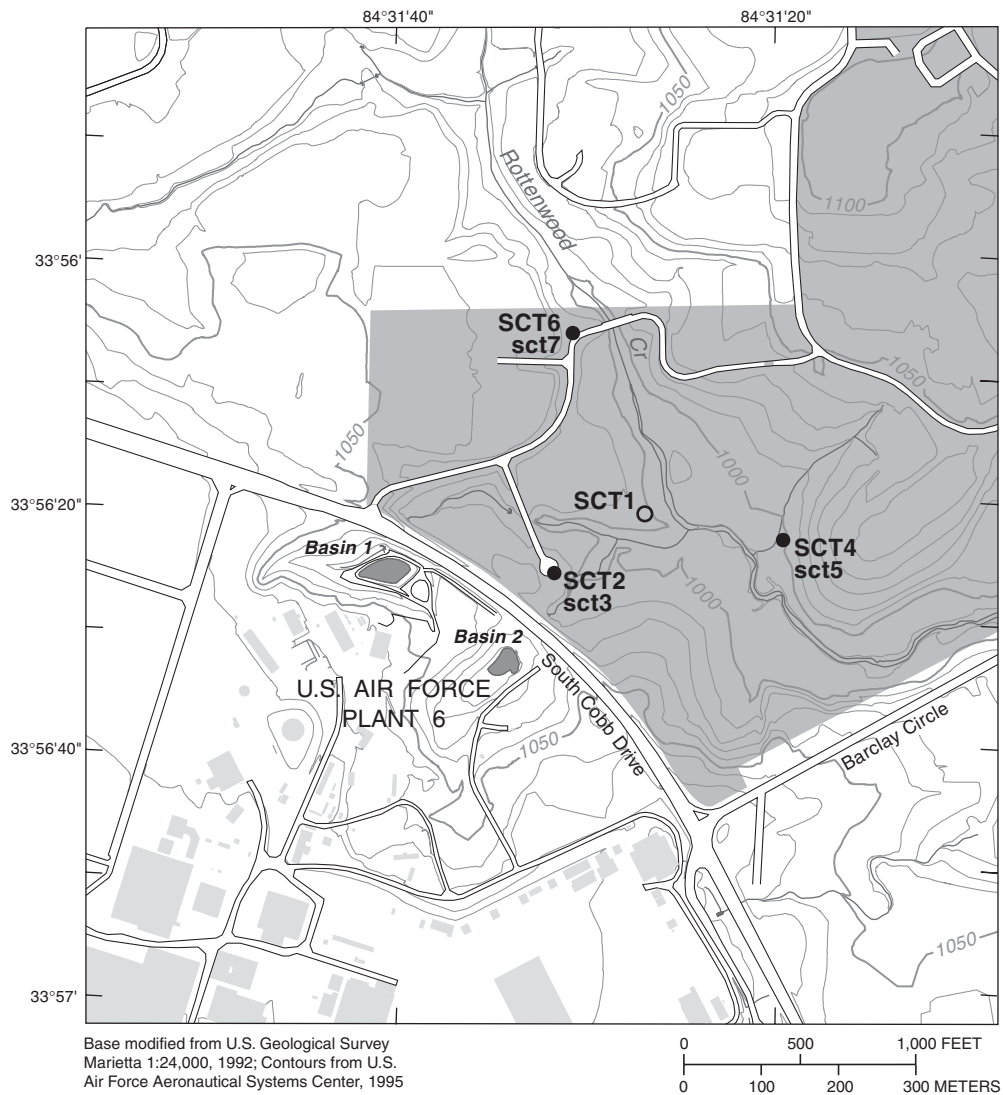


AREA OF MAP IN FIGURE 2



BOUNDARY OF U.S. AIR FORCE PLANT 6

**Figure 1.** U.S. Air Force Plant 6 and adjacent areas, Marietta, Georgia.



#### EXPLANATION

- SOUTHERN POLYTECHNIC STATE UNIVERSITY (SPSU)
- SCT6** ● DEEP MONITORING WELL, UPPERCASE;  
**sct7** ● shallow monitoring well, lowercase
- SCT1** ○ DEEP MONITORING WELL AND SPSU UNUSED IRRIGATION WELL

**Figure 2.** Location of monitoring wells, Southern Polytechnic State University, and U.S. Air Force Plant 6, Marietta, Georgia.

## METHODS OF STUDY

Field activities conducted during this investigation included installation of monitoring wells and water-quality sampling.

### Monitoring-Well Installation

Three deep monitoring wells ranging in depth from 575 to 604 ft were installed by the USGS on the SPSU campus (fig. 1, table 1). Core samples were selectively collected as the borehole for each monitoring well was drilled. The cores were analyzed to identify potential water-bearing zones penetrated by the monitoring well in the transition zone and underlying crystalline rock.

Each borehole was drilled through the transition zone and 5 to 10 feet into crystalline rock. The boreholes were then reamed and 6-inch-diameter steel casing was installed from the crystalline rock to 2 ft above land surface, isolating the regolith and transition zone within each borehole. Cement grout was tremmied into the annular space between the rock and the casing. Subsequently, each borehole was drilled to final depth. The boreholes were then reamed from the bottom of the casing to the borehole total depth to a diameter between 5.8 and 6.0 inches. Each bore-hole was left open from the bottom of the steel casing to the bottom of the borehole. Well construction details are given in table 1 and are shown diagrammatically in figure 3.

A shallow monitoring well was installed next to each deep monitoring well. Each shallow monitoring well penetrates to the top of unweathered crystalline rock. The

shallow wells are constructed with a 4-inch-diameter, 0.010-inch-slot size, polyvinylchloride (PVC) screen with a 4-inch- diameter riser from the top of the screen to 4 ft above land surface. A sand pack was tremmied into the annular space around the well screen and 4 ft above the well screen for each monitoring well. A bentonite grout seal was tremmied into place above the sand pack. Grout was tremmied from the top of the bentonite seal to land surface. The screened interval in each shallow monitoring well is in the transition zone between the saprolite and unweathered crystalline rock.

### Ground-Water Sampling

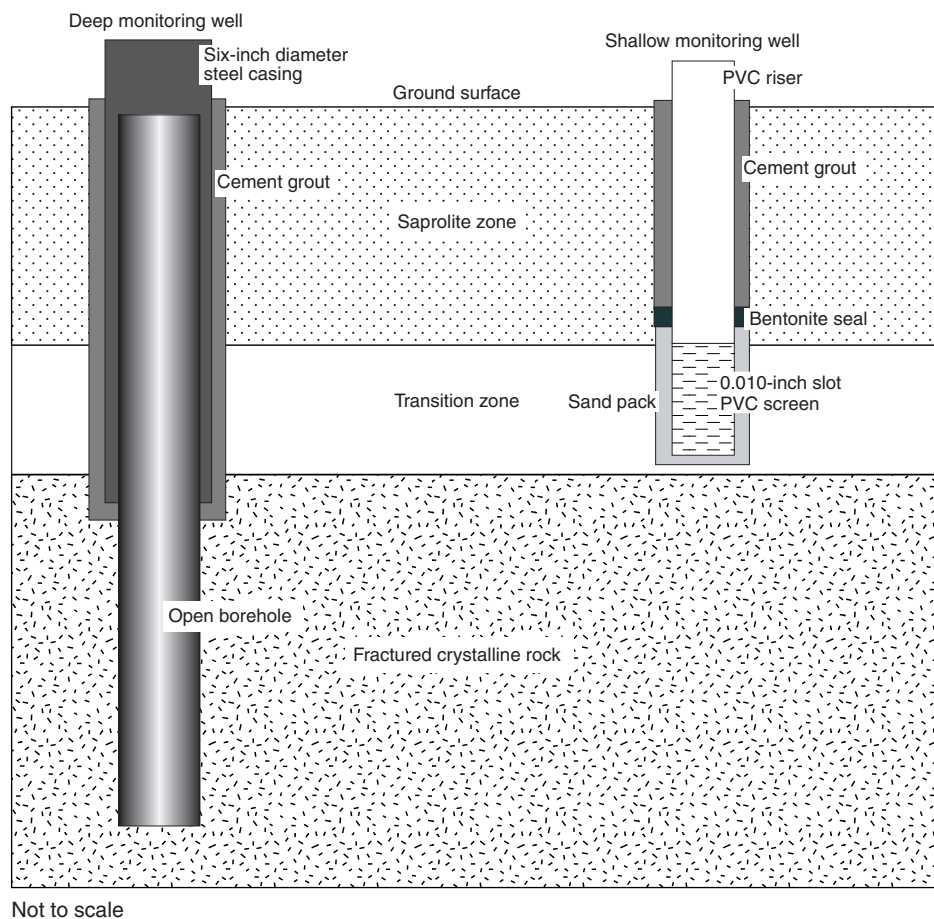
Ground-water samples were collected from the shallow monitoring wells during June 1997, and from the deep monitoring wells during July to September 1997. Ground-water samples collected at SPSU were analyzed for selected compounds from Appendix IX to 40 CFR 264 (U.S. Environmental Protection Agency, 1997b). Appendix IX compounds, USEPA established maximum contaminant levels (MCLs), and USEPA suggested laboratory analytical methods are included in table 2 (in back of report). A petroleum odor was noted in ground water discharged from well SCT6 while collecting the initial sample in August 1997. Consequently, a second ground-water sample was collected from well SCT6 in October 1997 and analyzed for additional Appendix IX compounds, and gasoline-range and extractable petroleum hydrocarbons (table 3, in back of report).

**Table 1.** Monitoring-well construction data, Southern Polytechnic State University, Marietta, Georgia, 1997  
[pvc, polyvinylchloride; na, not applicable]

Well number	NWIS <sup>1/</sup> site identification number	Date of completion	Well depth (in feet below sea level)	Altitude of land surface (in feet above sea level)	Type of casing	Altitude of bottom of casing (in feet above sea level)	Altitude of bottom of screen (in feet above sea level)	Screen material
<sup>2/</sup> SCT1	335605084312801	07/29/93	605	1,005	pvc	919	na	na
SCT2	335602084313101	08/16/96	604	1,026	steel	930	na	na
SCT3	335602084313102	08/19/96	95	1,026	pvc	961	931	pvc
SCT4	335605084312101	09/01/96	600	1,009	steel	926	na	na
SCT5	335605084312102	09/03/96	77	1,009	pvc	952	932	pvc
SCT6	335612084312901	12/10/96	575	1,025	steel	968	na	na
SCT7	335612084312902	12/11/96	55	1,025	pvc	990	970	pvc

<sup>1/</sup>U.S. Geological Survey, National Water Information System.

<sup>2/</sup>Existing well (unused irrigation well) at Southern Polytechnic State University sampled as a part of this project.



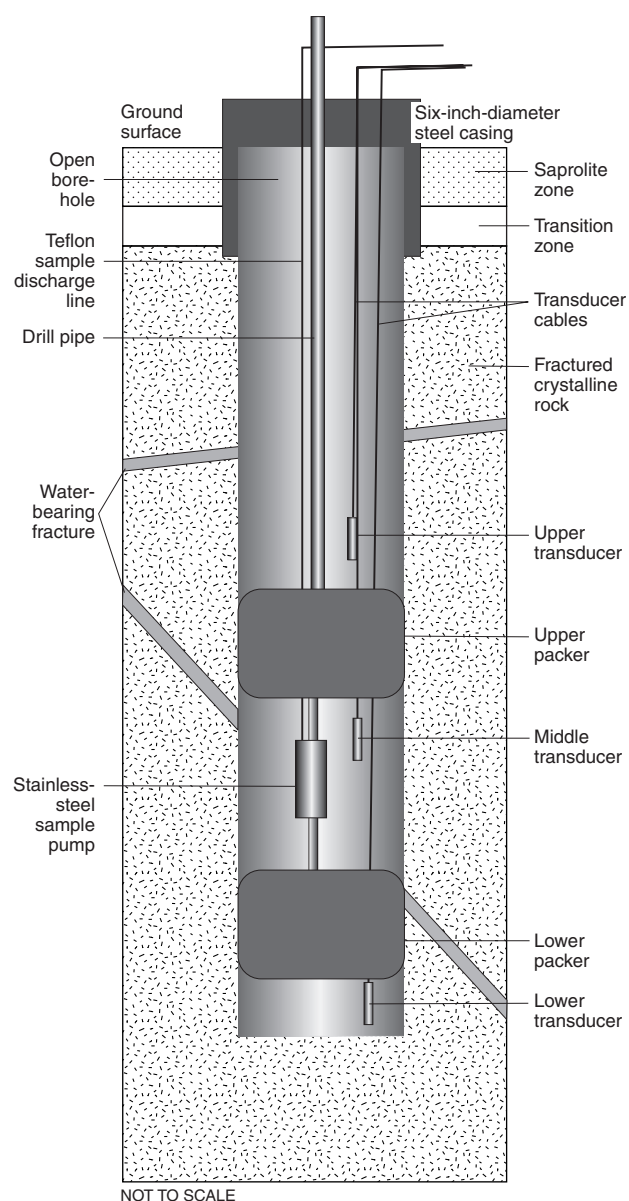
**Figure 3.** Schematic diagram showing monitoring-well construction and generalized geology.

## Sample Collection

Ground-water samples were collected from shallow monitoring wells using a stainless-steel submersible pump equipped with a Teflon sample delivery line. The submersible pump was lowered to the mid-point of the well screen. The procedure for collecting water samples consisted of (1) purging three well volumes of water from each well; (2) monitoring the field parameters of pH, dissolved oxygen, specific conductance, and temperature; and (3) sampling after the field parameters stabilized. During purging, field parameters were measured in a flowthrough chamber connected to the delivery line of the sampling pump.

Because each deep monitoring well consists of approximately 500 ft of continuous open hole, mixing of water from different water-bearing zones in the well could result in misleading analytical sample results. Therefore, a sampling device designed to isolate short vertical sections in a well was used. Generally, the sampling device consists

of two inflatable packers, positioned one above the other, with 9 ft of separation between the upper and lower packer (fig. 4). A stainless-steel, low-volume submersible sampling pump was installed between the packers. A Teflon sample discharge line connected to the discharge port of the pump passed through the upper packer to the land surface; samples were collected directly from the end of the Teflon discharge line. To collect a sample, the packer system was lowered to a specified depth and the packers were inflated to isolate the sample zone from the rest of the well. Pressure transducers installed above, below, and between the packers were monitored to ensure that the packers created a seal and that complete isolation occurred. After the packers were sealed, the pump was activated to evacuate water from the isolated water-bearing zone. Field parameters, pH, dissolved oxygen, specific conductance, and temperature were monitored as water from the isolated zone was evacuated. Samples were collected after three sample-interval volumes were purged and/or the field parameters stabilized.



**Figure 4.** Schematic diagram showing a two-packer sampling device installed in a monitoring well.

Sample-collection procedures included filtering and sample preservation. Samples to be analyzed for volatile and semivolatile organic compounds, and total metals were unfiltered. Samples collected for volatile organic compounds were preserved with 1 milliliter (mL) of hydrochloric acid. Samples collected for semivolatile organic compounds were chilled. Samples collected for total metals were preserved with 1 mL nitric acid. Samples

to be analyzed for cyanide and sulfide were filtered through a 0.45-micron pore-size membrane filter placed in the sample discharge line. Samples collected for cyanide were preserved with 1 mL sodium hydroxide, and samples collected for sulfide were preserved with 1 mL sodium hydroxide and zinc acetate. The samples were shipped to Quanterra Environmental Services, Arvada, Colo., for laboratory analyses.

Four types of quality-assurance samples were collected during to (1) monitor equipment contamination from previously collected samples that may be introduced into a subsequent sample (rinsate samples), (2) evaluate the analytical consistency of the laboratory (replicate samples), (3) monitor possible sample contamination from airborne volatile organic compounds present when each well was sampled (ambient sample), and (4) evaluate if cases used for shipping samples to the laboratory were contaminated with volatile organic compounds while enroute to the laboratory (trip blank samples).

Rinsate samples were collected immediately after the pump, packers, and sample lines were decontaminated after being retrieved from each sampled well. These samples were collected using organic- and inorganic-free water that was pumped by the sample pump through the sample lines. At a minimum, rinsate samples were analyzed for volatile and semivolatile organic constituents. Samples for metals, cyanide, sulfide, and inorganic constituents for general chemical analysis also were collected for selected rinsate samples.

Replicate samples were collected at one shallow monitoring well and at three deep monitoring wells. A replicate sample consisted of three samples collected at the same time and at the same depth in a well. The samples were submitted with different times and depths designated so that the laboratory was unaware that the samples were identical replicates. The replicate samples were analyzed for the compounds selected from Appendix IX for analysis in this study.

Ambient environment samples were collected by placing an open 40 mL vial filled with organic-free water next to the outfall from the sample line during sampling of the monitoring well. The ambient samples were analyzed for volatile organic compounds. Trip blanks consisting of closed 40 mL vials filled with organic-free water were placed in the shipping containers with the ground-water samples to detect if the samples were contaminated with volatile organic constituents while enroute to the laboratory.

## ANALYTICAL RESULTS

Analytical results of selected compounds (tables 2 and 3, in back of report) for ground-water samples collected from three deep monitoring wells installed by USGS, one deep irrigation well installed by SPSU, and three shallow monitoring wells installed by USGS are listed by well in tables 4-9 (in back of report). Analytical results for quality-assurance samples collected concurrently with the ground-water samples are listed by sample number in tables 10-13 (in back of report). Association of ground-water samples with the corresponding quality-assurance samples for each monitoring well is listed by well in tables 14-18 (in back of report). U.S. Environmental Protection Agency Primary Drinking Water maximum contaminant levels (MCLs) for selected analytes are included in tables 4-9 (in back of report). Laboratory reporting limits (LRLs) for each analyte are listed in tables 4-13 (in back of report).

Analytical results include definitively identified compounds and tentatively identified compounds (TICs) and the compound concentrations detected in the ground water. Definitively identified compounds are compounds included in Appendix IX to 40 CFR 264 (U.S. Environmental Protection Agency, 1997b) (tables 2 and 3, in back of report) and were specifically analyzed for by the laboratory. TICs are compounds that were not specifically analyzed for, but were detected. Tentative identification of these compounds was determined by comparing the analytical signature of the compound to a library of over 3,000 reference compounds and a "best match" was reported. TICs may or may not be included in the list of compounds included in Appendix IX to 40 CFR 264 (U.S. Environmental Protection Agency, 1997b). Tables 4 through 13 (in back of report) present analytical results for compounds listed in tables 2 and 3 that were detected above LRLs. Compounds listed in tables 2 and 3 (in back of report) not detected above LRLs are not included in tables 4-13 (in back of report).

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- \_\_\_\_\_, 1997b, Standards for Owners and Operators of Hazardous Waste Treatment, Storage and Disposal Facilities: Washington, D.C., U.S. Code of Federal Regulations, Title 40, Part 264, p. 152.

## **TABULAR DATA**

**TABLES 2 THROUGH 18**

**Table 2.** List of selected analytes from Appendix IX to 40 CFR 264; suggested laboratory analytical methods<sup>1/</sup>; established National Primary Drinking Water maximum contaminant levels<sup>2/</sup>; and Ground-Water Protection maximum contaminant levels<sup>1/</sup>  
[µg/L, micrograms per liter; MCL, maximum contaminant level; do., ditto]

Compound name	U.S. Environmental Protection Agency		
	Suggested laboratory analytical method <sup>1/</sup>	Primary Drinking Water, MCL <sup>2/</sup> (µg/L)	Ground-Water Protection, MCL <sup>3/</sup> (µg/L)
<i>Volatile Organic Compounds</i>			
Acetone	8260A	4/	5/
Acetonitrile	do.	4/	5/
Acrolein	do.	4/	5/
Acrylonitrile	do.	4/	5/
Allyl chloride	do.	4/	5/
Benzene	do.	5.0	5/
Bromodichloromethane	do.	4/	5/
Bromoform	do.	4/	5/
Bromomethane	do.	4/	5/
2-Butanone (MEK)	do.	4/	5/
Carbon disulfide	do.	4/	5/
Carbon tetrachloride	do.	5.0	5/
Chlorobenzene	do.	4/	5/
Chloroethane	do.	4/	5/
Chloroform	do.	4/	5/
Chloromethane	do.	4/	5/
Chloroprene	do.	4/	5
Dibromochloromethane	do.	4/	5/
1,2-Dibromo-3-chloro-propane (DBCP)	do.	4/	5/
1,2-Dibromoethane (EDB)	do.	4/	5/
Dibromoethane	do.	4/	5/
trans-1,4-Dichloro-2-butene	do.	4/	5/
Dichlorodifluoromethane	do.	4/	5/
1,1-Dichloroethane	do.	4/	5/
1,2-Dichloroethane	do.	5.0	5/
1,1-Dichloroethylene	do.	7.0	5/
1,1-Dichloroethylene	do.	4/	5/
cis-1,2-Dichloroethylene	do.	70	5/
trans-1,2-Dichloroethylene	do.	100	5/
1,2-Dichloroethene (total)	do.	4/	5/
1,2-Dichloropropane	do.	5.0	5/
cis-1,3-Dichloropropene	do.	4/	5/
trans-1,3-Dichloropropene	do.	4/	5/
1,4-Dioxane	do.	4/	5/
Ethylbenzene	do.	700	5/
Ethyl methacrylate	do.	4/	5/
2-Hexanone	do.	4/	5/
Iodomethane	do.	4/	5/
Isobutyl alcohol	do.	4/	5/
Methacrylonitrile	do.	4/	5/
Methylene chloride	do.	5.0	5/



**Table 2.** List of selected analytes from Appendix IX to 40 CFR 264; suggested laboratory analytical methods<sup>1/</sup>; established National Primary Drinking Water maximum contaminant levels<sup>2/</sup>; and Ground-Water Protection maximum contaminant levels<sup>1/</sup>—Continued  
[µg/L, micrograms per liter; MCL, maximum contaminant level; do., ditto]

Compound name	U.S. Environmental Protection Agency		
	Suggested laboratory analytical method <sup>1/</sup>	Primary Drinking Water, MCL <sup>2/</sup> (µg/L)	Ground-Water Protection, MCL <sup>3/</sup> (µg/L)
Methyl methacrylate	8260A	4/	5/
4-Methyl-2-pentanone (MIBK)	do.	4/	5/
Propionitrile	do.	4/	5/
Styrene	do.	100	5/
1,1,1,2-Tetrachloroethane	do.	4/	5/
1,1,2,2-Tetrachloroethane	do.	4/	5/
Tetrachloroethylene	do.	5.0	5/
Toluene	do.	1,000	5/
1,1,1-Trichloroethane	do.	200	5/
1,1,2-Trichloroethane	do.	5.0	5/
Trichloroethylene	do.	5.0	5/
Trichlorofluoromethane	do.	4/	5/
1,2,3-Trichloropropane	do.	4/	5/
Vinyl acetate	do.	4/	5/
Vinyl chloride	do.	2.0	5/
m & p-Xylenes	do.	4/	5/
o-Xylene	do.	4/	5/
Xylenes (total)	do.	10,000	5/
<i>Semivolatile Organic Compounds</i>			
Acenaphthene	8270B	4/	5/
Acenaphthylene	do.	4/	5/
Acetophenone	do.	4/	5/
2-Acetylaminofluorene	do.	4/	5/
4-Aminobiphenyl	do.	4/	5/
Aniline	do.	4/	5/
Anthracene	do.	4/	5/
Aramite	do.	4/	5/
Benzo(a)anthracene	do.	4/	5/
Benzo(b)fluoranthene	do.	4/	5/
Benzo(k)fluoranthene	do.	4/	5/
Benzo(g,h,i)perylene	do.	4/	5/
Benzo(a)pyrene	do.	4/	5/
Benzyl alcohol	do.	4/	5/
4-Bromophenyl phenyl ether	do.	4/	5/
Butyl benzyl phthalate	do.	4/	5/
2-sec-Butyl-4,6-dinitro-phenol	do.	4/	5/
4-Chloroaniline	do.	4/	5/
bis(2-Chloroethoxy)methane	do.	4/	5/
bis(2-Chloroethyl) ether	do.	4/	5/
2,2'-oxybis(1-chloropropane)	do.	4/	5/
4-Chloro-3-methylphenol	do.	4/	5/
2-Chloronaphthalene	do.	4/	5/
2-Chlorophenol	do.	4/	5/
4-Chlorophenyl phenyl ether	do.	4/	5/

**Table 2.** List of selected analytes from Appendix IX to 40 CFR 264; suggested laboratory analytical methods<sup>1/</sup>; established National Primary Drinking Water maximum contaminant levels<sup>2/</sup>; and Ground-Water Protection maximum contaminant levels<sup>1/</sup>—Continued  
[µg/L, micrograms per liter; MCL, maximum contaminant level; do., ditto]

Compound name	U.S. Environmental Protection Agency		
	Suggested laboratory analytical method <sup>1/</sup>	Primary Drinking Water, MCL <sup>2/</sup> (µg/L)	Ground-Water Protection, MCL <sup>3/</sup> (µg/L)
Chrysene	8270B.	4/	5/
Dibenz(a,h)anthracene	do.	4/	5/
Dibenzofuran	do.	4/	5/
Di-n-butyl phthalate	do.	4/	5/
1,2-Dichlorobenzene	do.	600	5/
1,3-Dichlorobenzene	do.	4/	5/
1,4-Dichlorobenzene	do.	75	5/
3,3'-Dichlorobenzidine	do.	4/	5/
2,4-Dichlorophenol	do.	4/	5/
2,6-Dichlorophenol	do.	4/	5/
Diethyl phthalate	do.	4/	5/
Dimethoate	do.	4/	5/
p-Dimethylaminoazobenzene	do.	4/	5/
7,12-Dimethylbenz(a)-anthracene	do.	4/	5/
3,3'-Dimethylbenzidine	do.	4/	5/
a,a-Dimethylphenethyl-amine	do.	4/	5/
2,4-Dimethylphenol	do.	4/	5/
Dimethyl phthalate	do.	4/	5/
1,3-Dinitrobenzene	do.	4/	5/
4,6-Dinitro-2-methylphenol	do.	4/	5/
2,4-Dinitrophenol	do.	4/	5/
2,4-Dinitrotoluene	do.	4/	5/
2,6-Dinitrotoluene	do.	4/	5/
Di-n-octyl phthalate	do.	4/	5/
Diphenylamine	do.	4/	5/
Disulfoton	do.	4/	5/
bis(2-Ethylhexyl)phthalate	do.	4/	5/
Ethyl methanesulfonate	do.	4/	5/
Famphur	do.	4/	5/
Fluoranthene	do.	4/	5/
Fluorene	do.	4/	5/
Hexachlorobenzene	do.	4/	5/
Hexachlorobutadiene	do.	4/	5/
Hexachlorocyclopentadiene	do.	4/	5/
Hexachloroethane	do.	4/	5/
Hexachlorophene	do.	4/	5/
Hexachloropropene	do.	4/	5/
Indeno(1,2,3-cd)pyrene	do.	4/	5/
Isophorone	do.	4/	5/
Isosafrole	do.	4/	5/
Methapyrilene	do.	4/	5/

**Table 2.** List of selected analytes from Appendix IX to 40 CFR 264; suggested laboratory analytical methods<sup>1/</sup>; established National Primary Drinking Water maximum contaminant levels<sup>2/</sup>; and Ground-Water Protection maximum contaminant levels<sup>1/</sup>—Continued  
[µg/L, micrograms per liter; MCL, maximum contaminant level; do., ditto]

Compound name	U.S. Environmental Protection Agency		
	Suggested laboratory analytical method <sup>1/</sup>	Primary Drinking Water, MCL <sup>2/</sup> (µg/L)	Ground-Water Protection, MCL <sup>3/</sup> (µg/L)
3-Methylcholanthrene	8270B.	4/	5/
Methyl methanesulfonate	do.	4/	5/
2-Methylnaphthalene	do.	4/	5/
Methyl parathion	do.	4/	5/
2-Methylphenol	do.	4/	5/
3/4-Methylphenol	do.	4/	5/
Naphthalene	do.	4/	5/
1,4-Naphthoquinone	do.	4/	5/
1-Naphthylamine	do.	4/	5/
2-Naphthylamine	do.	4/	5/
2-Nitroaniline	do.	4/	5/
3-Nitroaniline	do.	4/	5/
4-Nitroaniline	do.	4/	5/
Nitrobenzene	do.	4/	5/
2-Nitrophenol	do.	4/	5/
4-Nitrophenol	do.	4/	5/
4-Nitroquinoline-1-oxide	do.	4/	5/
N-Nitroso-di-n-butylamine	do.	4/	5/
N-Nitrosodiethylamine	do.	4/	5/
N-Nitrosodimethylamine	do.	4/	5/
N-Nitrosodiphenylamine	do.	4/	5/
N-Nitroso-di-n-propylamine	do.	4/	5/
N-Nitrosomethylethylamine	do.	4/	5/
N-Nitrosomorpholine	do.	4/	5/
N-Nitrosopiperidine	do.	4/	5/
N-Nitrosopyrrolidine	do.	4/	5/
5-Nitro-o-toluidine	do.	4/	5/
Parathion	do.	4/	5/
Pentachlorobenzene	do.	4/	5/
Pentachloroethane	do.	4/	5/
Pentachloronitrobenzene	do.	4/	5/
Pentachlorophenol	do.	4/	5/
Phenacetin	do.	4/	5/
Phenanthrene	do.	4/	5/
Phenol	do.	4/	5/
p-Phenylenediamine	do.	4/	5/
Phorate	do.	4/	5/
2-Picoline	do.	4/	5/
Pronamide	do.	4/	5/
Pyrene	do.	4/	5/
Pyridine	do.	4/	5/
Safrole	do.	4/	5/
Sulfotepp	do.	4/	5/
1,2,4,5-Tetrachloro-benzene	do.	4/	5/

**Table 2.** List of selected analytes from Appendix IX to 40 CFR 264; suggested laboratory analytical methods<sup>1/</sup>; established National Primary Drinking Water maximum contaminant levels<sup>2/</sup>; and Ground-Water Protection maximum contaminant levels<sup>1/</sup>—Continued  
[µg/L, micrograms per liter; MCL, maximum contaminant level; do., ditto]

Compound name	U.S. Environmental Protection Agency		
	Suggested laboratory analytical method <sup>1/</sup>	Primary Drinking Water, MCL <sup>2/</sup> (µg/L)	Ground-Water Protection, MCL <sup>3/</sup> (µg/L)
2,3,4,6-Tetrachlorophenol	8270B	4/	5/
Thionazin	do.	4/	5/
o-Toluidine	do.	4/	5/
1,2,4-Trichlorobenzene	do.	70	5/
2,4,5-Trichlorophenol	do.	4/	5/
2,4,6-Trichlorophenol	do.	4/	5/
0,0,0-Triethylphosphoro-thioate	do.	4/	5/
1,3,5-Trinitrobenzene	do.	4/	5/
<i>Metals</i>			
Antimony	6010	6.0	5/
Arsenic	7060	50	50
Barium	6010	2,000	1,000
Beryllium	do.	4.0	5/
Cadmium	do.	5.0	10
Chromium	do.	100	50
Cobalt	do.	4/	5/
Copper	do.	4/	5/
Lead	do.	<sup>6/</sup> 0	50
Mercury	7470	2.0	2.0
Nickel	6010	4/	5/
Selenium	do.	50	10
Silver	do.	4/	50
Thallium	7841	2.0	5/
Tin	6010	4/	5/
Vanadium	do.	4/	5/
Zinc	do.	4/	5/
<i>Inorganic Compounds</i>			
Cyanide	9012	200	5/
Sulfide	376.2	4/	5/

<sup>1/</sup>U.S. Environmental Protection Agency, (1997b)—40 CFR 264—suggested laboratory analytical methods.

<sup>2/</sup>U.S. Environmental Protection Agency (1997a)—40 CFR 141.61 and 40 CFR 141.62—Primary Drinking Water maximum contaminant level.

<sup>3/</sup>U.S. Environmental Protection Agency (1997b)—40 CFR 264—Ground-Water Protection maximum contaminant level.

<sup>4/</sup>U.S. Environmental Protection Agency (1997a)—40 CFR 141.61 and 40 CFR 141.62—Primary Drinking Water maximum contaminant level not established for this compound.

<sup>5/</sup>U.S. Environmental Protection Agency, (1997b)—40 CFR 264—Ground-Water Protection maximum contaminant level not established for this compound.

<sup>6/</sup>U.S. Environmental Protection Agency (1997a)—40 CFR 141.51—Primary Drinking Water maximum contaminant level goal.

**Table 3.** List of selected analytes from Appendix IX to 40 CF 264; suggested laboratory analytical methods<sup>1/</sup>; established National Primary Drinking Water maximum contaminant levels<sup>2/</sup>; and Ground-Water Protection maximum contaminant levels<sup>1/</sup>  
[µg/L, micrograms per liter; MCL, maximum contaminant level; do, ditto]

Compound name	U.S. Environmental Protection Agency		
	Suggested laboratory analytical method <sup>1/</sup>	Primary Drinking Water, MCL <sup>3/</sup> (µg/L)	Ground-Water Protection MCL <sup>3/</sup> (µg/L)
<b><i>Volatile Organic Compounds</i></b>			
See table 2 for complete list.	see table 2	see table 2	see table 2
<b><i>Semivolatile Organic Compounds</i></b>			
See table 2	see table 2	see table 2	see table 2
<b><i>Polychlorinated Dioxins/Furans</i></b>			
TCDs (total)	8280	4/	5/
2,3,7,8-TCDF	do.	4/	5/
PeCDFs (total)	do.	4/	5/
1,2,3,7,8-PeCDF	do.	4/	5/
2,3,4,7,8-peCDF	do.	4/	5/
HxCDFs (total)	do.	4/	5/
1,2,3,4,7,8-HxCDF	do.	4/	5/
1,2,3,6,7,8-HxCDF	do.	4/	5/
2,3,4,6,7,8-HxCDF	do.	4/	5/
1,2,3,7,8,9-HxCDF	do.	4/	5/
HpCDFs (total)	do.	4/	5/
1,2,3,4,6,7,8-HpCDF	do.	4/	5/
1,2,3,4,7,8,9-HpCDF	do.	4/	5/
OCDF	do.	4/	5/
TCDDs (total)	do.	3 x 10 <sup>-5</sup>	5/
2,3,7,8-TCDD	do.	3 x 10 <sup>-5</sup>	5/
HxCDDs (total)	do.	4/	5/
1,2,3,4,7,8-HxCDD	do.	4/	5/
1,2,3,6,7,8-HxCDD	do.	4/	5/
1,2,3,7,8,9-HxCDD	do.	4/	5/
HpCDDs (total)	do.	4/	5/
1,2,3,6,7,8,-HpCDD	do.	4/	5/
OCDD	do.	4/	5/
<b><i>Chlorinated Pesticides and Herbicides</i></b>			
Aldrin	8080A	4/	5/
Aroclar 1016	do.	4/	5/
Aroclar 1221	do.	4/	5/
Aroclar 1232	do.	4/	5/
Aroclar 1242	do.	4/	5/
Aroclar 1248	do.	4/	5/
Aroclar 1254	do.	4/	5/
Aroclar 1260	do.	4/	5/
alpha-BHC	do.	0.2	4.0
beta-BHC	do.	0.2	4.0
delta-BHC	do.	0.2	4.0
gamma-BHC	do.	0.2	4.0
alpha-Chlordane	do.	2.0	5/

**Table 3.** List of selected analytes from Appendix IX to 40 CF 264; suggested laboratory analytical methods<sup>1/</sup>; established National Primary Drinking Water maximum contaminant levels<sup>2/</sup>; and Ground-Water Protection maximum contaminant levels<sup>1/</sup>—Continued  
[µg/L, micrograms per liter; MCL, maximum contaminant level; do, ditto]

Compound name	U.S. Environmental Protection Agency		
	Suggested laboratory analytical method <sup>1/</sup>	Primary Drinking Water, MCL <sup>3/</sup> (µg/L)	Ground-Water Protection MCL <sup>3/</sup> (µg/L)
gamma-Chlordane	8080A	2.0	5/
Chlorobenzilate	do.	4/	5/
4,4-DDD	do.	4/	5/
4,4-DDE	do.	4/	5/
4,4-DDT	do.	4/	5/
Diallate	do.	4/	5/
Dieldrin	do.	4/	5/
Endosulfan I	do.	4/	5/
Endosulfan II	do.	4/	5/
Endosulfan sulfate	do.	4/	5/
Endrin	do.	2.0	0.2
Endrin aldehyde	do.	4/	5/
Heptachlor	do.	0.4	5/
Heptachlor epoxide	do.	0.2	5/
Isodrin	do.	4/	5/
Kepone	do.	4/	5/
Methoxychlor	do.	40	100
Toxaphene	do.	3.0	5.0
<b>Metals</b>			
see table 2	see table 2	see table 2	see table 2
<b>Inorganic Compounds</b>			
see table 2	see table 2	see table 2	see table 2

<sup>1/</sup>U.S. Environmental Protection Agency (1997b)—40 CFR 264—suggested laboratory analytical methods.

<sup>2/</sup>U.S. Environmental Protection Agency (1997a)—40 CFR 141.61 and 40 CFR 141.62—Primary Drinking Water maximum contaminant level.

<sup>3/</sup>U.S. Environmental Protection Agency (1997b)—40 CFR 264—Ground-Water Protection maximum contaminant level.

<sup>4/</sup>U.S. Environmental Protection Agency (1997a)—40 CFR 141.61 and 40 CFR 141.62—Primary Drinking Water maximum contaminant level not established for this compound.

<sup>5/</sup>U.S. Environmental Protection Agency (1997b)—40 CFR 264—Ground-Water Protection maximum contaminant level not established for this compound.

**Table 4.** List of selected analytes from Appendix IX to 40 CFR 264 and analyte concentrations detected in ground-water samples collected from monitoring well SCT1, Southern Polytechnic State University, Marietta, Georgia, 1997

[ $\mu\text{g/L}$ , micrograms per liter; MCL, maximum contaminant level; LRL, laboratory reporting limit; USEPA, U.S. Environmental Protection Agency; nd, not detected at minimum reporting level]

Analyte name	USEPA Primary Drinking Water MCL <sup>1/</sup> (µg/L)	Sample number; sample depth, in feet; date and time of sample collection; analyte concentration; and laboratory reporting limit, by analyte											
		SCT1-85, 85-94, 08/13/97, 1000		SCT1-96, 96-105, 08/13/97, 1200		SCT1-184, 184-193, 08/13/97, 1500		SCT1-393, 393-402, 15/97, 08/ 0900		SCT1-492, 492-501, 08/14/97, 1500		SCT1-555, 555-564, 08/14/97, 1800	
		Concen- tration (µg/L)	LRL (µg/L)	Concen- tration (µg/L)	LRL (µg/L)	Concen- tration (µg/L)	LRL (µg/L)	Concen- tration (µg/L)	LRL (µg/L)	Concen- tration (µg/L)	LRL (µg/L)	Concen- tration (µg/L)	LRL (µg/L)
Volatile organic compounds													
Trichloroethylene	5.0	94	<sup>2/</sup> 4.2	130	<sup>2/</sup> 6.2	83	<sup>2/</sup> 3.6	6.1	<sup>2/</sup> 1.0	11	<sup>2/</sup> 1.0	78	<sup>2/</sup> 3.6
Propane, 2-methyl	<sup>3/</sup>	8.5	<sup>4/</sup>	nd	<sup>4/</sup>	nd	<sup>4/</sup>	nd	<sup>4/</sup>	nd	<sup>4/</sup>	nd	<sup>4/</sup>
Siloxane	<sup>3/</sup>	nd	<sup>4/</sup>	nd	<sup>4/</sup>	nd	<sup>4/</sup>	1.5	<sup>4/</sup>	1.3	<sup>4/</sup>	nd	<sup>4/</sup>
Semivolatile organic compounds													
1,1,2,2-Tetrachloroethane	200	12	<sup>4/</sup>	nd	<sup>4/</sup>	nd	<sup>4/</sup>	nd	<sup>4/</sup>	nd	<sup>4/</sup>	nd	<sup>4/</sup>
Total Metals													
Barium	2,000	37	10	31	10	18	10	49	10	18	10	34	10
Zinc	<sup>3/</sup>	26	20	24	20	nd	20	nd	20	nd	20	23	20
Lead	<sup>5/0</sup>	3.4	3.0	nd	3.0	nd	3.0	3.0	3.0	3.5	3.0	nd	3.0
Selenium	50	5.1	5.0	nd	5.0	nd	5.0	nd	5.0	nd	5.0	nd	5.0

<sup>1/</sup>U.S. Environmental Protection Agency (1997a)—40 CFR 141.61 and 40 CFR 141.62—Primary Drinking Water maximum contaminant level.

<sup>2/</sup>Laboratory reporting limits are adjusted for dilutions performed on samples during laboratory analysis.

<sup>3/</sup>U.S. Environmental Protection Agency (1997a)—40 CFR 141.61 and 40 CFR 141.62—Primary Drinking Water maximum contaminant level not established for this compound.

<sup>4/</sup>Tentatively identified compound—laboratory reporting limit not determined.

<sup>5/</sup>U.S. Environmental Protection Agency (1997a)—40 CFR 141.51—Primary Drinking Water maximum contaminant level goal.

**Table 5.** List of selected analytes from Appendix IX to 40 CFR 264 and analyte concentrations detected in ground-water samples collected from monitoring well SCT2, Southern Polytechnic State University, Marietta, Georgia, 1997

[µg/L, micrograms per liter; MCL, maximum contaminant level; LRL, laboratory reporting limit; USPEA, U.S. Environmental Protection Agency; nd, not detected at minimum reporting level]

Analyte name	USEPA Primary Drinking Water MCL <sup>1/</sup> (µg/L)	Sample number; sample depth, in feet; date and time of sample collection; analyte concentration; and laboratory reporting limit, by analyte																	
		SCT2-120, 120-129, 07/11/97, 1530		SCT2-132, 132-141, 07/14/97, 1200		SCT2-136 <sup>2/</sup> , 132-141, 07/14/97, 1230		SCT2-140 <sup>2/</sup> , 132-141, 07/14/97, 1300		SCT2-395, 395-404, 07/14/97, 1300		SCT2-445, 445-454, 07/16/97, 1000		SCT2-480, 480-489, 07/16/97, 1800		SCT2-512, 512-521, 07/17/97, 1030		SCT2-536, 536-545, 07/17/97, 1400	
		Concen- tration (µg/L)	LRL (µg/L)	Concen- tration (µg/L)	LRL (µg/L)	Concen- tration (µg/L)	LRL (µg/L)	Concen- tration (µg/L)	LRL (µg/L)	Concen- tration (µg/L)	LRL (µg/L)	Concen- tration (µg/L)	LRL (µg/L)	Concen- tration (µg/L)	LRL (µg/L)	Concen- tration (µg/L)	LRL (µg/L)	Concen- tration (µg/L)	LRL (µg/L)
Volatile organic compounds																			
Trichloro-ethylene	5.0	230	<sup>3/</sup> 6.2	320	<sup>3/</sup> 8.3	300	<sup>3/</sup> 10	330	<sup>3/</sup> 10	290	<sup>3/</sup> 10	320	<sup>3/</sup> 6.2	290	<sup>3/</sup> 7.1	280	<sup>3/</sup> 8.3	320	<sup>3/</sup> 8.3
1,2-Dichloro-ethylene (total)	70	10	<sup>3/</sup> 6.2	9.6	<sup>3/</sup> 8.3	nd	<sup>3/</sup> 10	10	<sup>3/</sup> 10	nd	<sup>3/</sup> 10	9.1	<sup>3/</sup> 6.2	9.1	<sup>3/</sup> 7.1	8.3	<sup>3/</sup> 8.3	8.9	<sup>3/</sup> 8.3
Propane, 2-methyl	<sup>4/</sup>	nd	<sup>5/</sup>	nd	<sup>5/</sup>	nd	<sup>5/</sup>	nd	<sup>5/</sup>	18	<sup>5/</sup>	nd	<sup>5/</sup>	120	<sup>5/</sup>	54	<sup>5/</sup>	nd	<sup>5/</sup>
Semivolatile organic compounds																			
Cyclohexanol	<sup>4/</sup>	4.0	<sup>5/</sup>	nd	<sup>5/</sup>	nd	<sup>5/</sup>	nd	<sup>5/</sup>	nd	<sup>5/</sup>	nd	<sup>5/</sup>	nd	<sup>5/</sup>	nd	<sup>5/</sup>	nd	<sup>5/</sup>
Benzothiaz-ole	<sup>4/</sup>	12	<sup>5/</sup>	nd	<sup>5/</sup>	nd	<sup>5/</sup>	nd	<sup>5/</sup>	6.5	<sup>5/</sup>	nd	<sup>5/</sup>	7.8	<sup>5/</sup>	11	<sup>5/</sup>	nd	<sup>5/</sup>
1-Penten-3-ol, 2-methyl	<sup>4/</sup>	nd	<sup>5/</sup>	nd	<sup>5/</sup>	nd	<sup>5/</sup>	nd	<sup>5/</sup>	nd	<sup>5/</sup>	nd	<sup>5/</sup>	nd	<sup>5/</sup>	9.2	<sup>5/</sup>	nd	<sup>5/</sup>
Pyrazole	<sup>4/</sup>	4.1	<sup>5/</sup>	nd	<sup>5/</sup>	nd	<sup>5/</sup>	nd	<sup>5/</sup>	nd	25	nd	<sup>5/</sup>	nd	<sup>5/</sup>	nd	<sup>5/</sup>	nd	<sup>5/</sup>
Benzene-sulfona- mide, N-butyl	<sup>4/</sup>	180	<sup>5/</sup>	nd	<sup>5/</sup>	nd	<sup>5/</sup>	nd	<sup>5/</sup>	66	<sup>5/</sup>	31	<sup>5/</sup>	65	<sup>5/</sup>	130	<sup>5/</sup>	24	<sup>5/</sup>
Sulfur	<sup>4/</sup>	5.9	<sup>5/</sup>	nd	<sup>5/</sup>	nd	<sup>5/</sup>	nd	<sup>5/</sup>	nd	<sup>5/</sup>	nd	<sup>5/</sup>	15	<sup>5/</sup>	nd	<sup>5/</sup>	nd	<sup>5/</sup>
Caprolactum	<sup>4/</sup>	nd	<sup>5/</sup>	4.3	<sup>5/</sup>	4.2	<sup>5/</sup>	nd	<sup>5/</sup>	nd	<sup>5/</sup>	14	<sup>5/</sup>	31	<sup>5/</sup>	62	<sup>5/</sup>	10	<sup>5/</sup>
Siloxane	<sup>4/</sup>	nd	<sup>5/</sup>	nd	<sup>5/</sup>	nd	<sup>5/</sup>	nd	<sup>5/</sup>	4.6	<sup>5/</sup>	nd	<sup>5/</sup>	nd	<sup>5/</sup>	nd	<sup>5/</sup>	nd	<sup>5/</sup>
Oxygenated hydrocar- bon	<sup>4/</sup>	nd	<sup>5/</sup>	nd	<sup>5/</sup>	nd	<sup>5/</sup>	nd	<sup>5/</sup>	4.9	<sup>5/</sup>	nd	<sup>5/</sup>	nd	<sup>5/</sup>	nd	<sup>5/</sup>	nd	<sup>5/</sup>



**Table 5.** List of selected analytes from Appendix IX to 40 CFR 264 and analyte concentrations detected in ground-water samples collected from monitoring well SCT2, Southern Polytechnic State University, Marietta, Georgia, 1997—Continued

[µg/L, micrograms per liter; MCL, maximum contaminant level; LRL, laboratory reporting limit; USPEA, U.S. Environmental Protection Agency; nd, not detected at minimum reporting level]

Analyte name	USEPA Primary Drinking Water MCL <sup>1/</sup> (µg/L)	Sample number; sample depth, in feet; date and time of sample collection; analyte concentration; and laboratory reporting limit, by analyte																	
		SCT2-120, 120-129, 07/11/97, 1530		SCT2-132, 132-141, 07/14/97, 1200		SCT2-136 <sup>2/</sup> , 132-141, 07/14/97, 1230		SCT2-140 <sup>2/</sup> , 132-141, 07/14/97, 1300		SCT2-395, 395-404, 07/14/97, 1300		SCT2-445, 445-454, 07/16/97, 1000		SCT2-480, 480-489, 07/16/97, 1800		SCT2-512, 512-521, 07/17/97, 1030		SCT2-536, 536-545, 07/17/97, 1400	
		Concen- tration (µg/L)	LRL (µg/L)	Concen- tration (µg/L)	LRL (µg/L)	Concen- tration (µg/L)	LRL (µg/L)	Concen- tration (µg/L)	LRL (µg/L)	Concen- tration (µg/L)	LRL (µg/L)	Concen- tration (µg/L)	LRL (µg/L)	Concen- tration (µg/L)	LRL (µg/L)	Concen- tration (µg/L)	LRL (µg/L)	Concen- tration (µg/L)	LRL (µg/L)
Total Metals																			
Barium	2,000	64	10	73	10	78	10	74	10	79	10	73	10	100	10	98	10	80	10
Chromium	100	nd	10	nd	10	nd	10	nd	10	nd	10	nd	10	13	10	15	10	12	10
Cobalt	<sup>4/</sup>	nd	10	nd	10	nd	10	nd	10	11	10	nd	10	11	10	15	10	15	10
Copper	<sup>4/</sup>	nd	20	nd	20	nd	20	nd	20	nd	20	nd	20	26	20	29	20	20	20
Nickel	<sup>4/</sup>	50	40	43	40	41	40	44	40	59	40	nd	40	64	40	66	40	42	40
Zinc	<sup>4/</sup>	77	20	nd	20	nd	20	nd	20	600	20	780	20	770	20	74	20	560	20
Lead	<sup>5/</sup>	nd	3.0	nd	3.0	nd	3.0	nd	3.0	4.5	3.0	nd	3.0	5.1	3.0	3.0	3.0	nd	3.0
Selenium	50	nd	5.0	nd	5.0	8.1	5.0	nd	5.0	nd	5.0	nd	5.0	nd	5.0	nd	5.0	nd	5.0
Inorganics																			
Cyanide	200	nd	10	19	10	13	10	14	10	13	10	13	10	12	10	nd	10	nd	10

<sup>1/</sup>U.S. Environmental Protection Agency (1997a)—40 CFR 141.61 and 40 CFR 141.62—Primary Drinking Water maximum contaminant level.

<sup>2/</sup>Replicate sample of SCT2-132.

<sup>3/</sup>Laboratory reporting limits are adjusted for dilutions performed on samples during laboratory analysis.

<sup>4/</sup>U.S. Environmental Protection Agency (1997a)—40 CFR 141.61 and 40 CFR 141.62—Primary Drinking Water maximum contaminant level not established for this compound.

<sup>5/</sup>U.S. Environmental Protection Agency (1997a)—40 CFR 141.51—Primary Drinking Water maximum contaminant level goal.

**Table 6.** List of selected analytes from Appendix IX to 40 CFR 264 and analyte concentrations detected in ground-water samples collected from monitoring well SCT4, Southern Polytechnic State University, Marietta, Georgia, 1997

[µg/L, micrograms per liter; MCL, maximum contaminant level; LRL, laboratory reporting limit; USEPA, U.S. Environmental Protection Agency; nd, not detected at minimum reporting level; na, not analyzed]

Analyte name	USEPA Primary Drinking Water MCL <sup>1/</sup> (µg/L)	Sample number; sample depth, in feet; date and time of sample collection; analyte concentration; and laboratory reporting limit, by analyte									
		SCT4-207, 207-216, 09/02/97, 1800		SCT4-294, 294-303, 09/03/97, 1200		SCT4-30 <sup>2/</sup> , 294-303 09/03/97, 1400		SCT4-310 <sup>2/</sup> , 294-303, 09/03/97, 1500		SCT4-420, 420-429, 09/03/97, 1600	
		Concen- tration (µg/L)	LRL (µg/L)	Concen- tration (µg/L)	LRL (µg/L)	Concen- tration (µg/L)	LRL (µg/L)	Concen- tration (µg/L)	LRL (µg/L)	Concen- tration (µg/L)	LRL (µg/L)
Volatile Organic compounds											
Trichloroethylene	5.0	13	1.0	35	1.0	34	1.0	35	1.0	13	1.0
1,2-Dichloroethylene	70	nd	1.0	2.8	1.0	2.6	1.0	2.7	1.0	nd	1.0
Semivolatile Organic compounds											
Toluene	1,000	3.9	3/	nd	3/	nd	3/	nd	3/	na	3/
Benzenesulfonamide, N-butyl-	4/	4.8	3/	nd	3/	nd	3/	nd	3/	na	3/
Trichloroetheylne	5.0	nd	3/	4.1	3/	nd	3/	nd	3/	na	3/
Total Metals											
Lead	<sup>5/</sup> 0	nd	3.0	nd	3.0	3.1	3.0	nd	3.0	nd	3.0

<sup>1/</sup>U.S. Environmental Protection Agency (1997a)—40 CFR 141.61 and 40 CFR 141.62—Primary Drinking Water maximum contaminant level.

<sup>2/</sup>Replicate sample of SCT4-294.

<sup>3/</sup>Tentatively identified compound—laboratory reporting limit not determined.

<sup>4/</sup>U.S. Environmental Protection Agency (1997a)—40 CFR 141.61 and 40 CFR 141.62—Primary Drinking Water maximum contaminant level not established for this compound.

<sup>5/</sup>U.S. Environmental Protection Agency (1997a)—40 CFR 141.51—Primary Drinking Water maximum contaminant level goal.

**Table 7.** List of selected analytes from Appendix IX to 40 CFR 264 and analyte concentrations detected in ground-water samples collected from monitoring well SCT6, Southern Polytechnic State University, Marietta, Georgia, 1997

[µg/L, micrograms per liter; MCL, maximum contaminant level; LRL, laboratory reporting limit; USEPA, U.S. Environmental Protection Agency; nd, not detected at minimum reporting level]

Analyte name	USEPA Primary Drinking Water MCL <sup>1/</sup> (µg/L)	Sample number; sample depth, in feet; date and time of sample collection; analyte concentration; and laboratory reporting limit, by analyte									
		SCT6-254, 254-263, 08/22/97, 1430		SCT6-482, 482-491, 08/25/97, 1930		SCT6-490 <sup>2/</sup> , 482-491, 08/25/97, 2000		SCT6-510 <sup>2/</sup> , 482-491, 08/25/97, 2100		SCT6-400, 400-409, 08/25/97, 1430	
		Concen- tration (µg/L)	LRL (µg/L)	Concen- tration (µg/L)	LRL (µg/L)	Concen- tration (µg/L)	LRL (µg/L)	Concen- tration (µg/L)	LRL (µg/L)	Concen- tration (µg/L)	LRL (µg/L)
Volatile Organic compounds											
Siloxane	3/	1.5	4/	3.6	4/	2.1	4/	1.4	4/	2.4	4/
Semivolatile Organic compounds											
bis(2-Ethylhexyl) phthalate	3/	nd	11	nd	11	nd	11	11	11	nd	11
Total Metals											
Barium	2,000	120	10	46	10	47	10	43	10	80	10
Lead	<sup>5/</sup> 0	3.2	3.0	nd	3.0	nd	3.0	nd	30	16	3.0
Selenium	5.0	nd	5.0	nd	5.0	nd	5.0	nd	50	12	5.0
Zinc	20	140	20	nd	20	nd	20	nd	20	36	20

<sup>1/</sup> U.S. Environmental Protection Agency (1997a)—40 CFR 141.61 and 40 CFR 141.62—Primary Drinking Water maximum contaminant level.

<sup>2/</sup> Replicate sample of SCT6-482.

<sup>3/</sup> U.S. Environmental Protection Agency (1997a)—40 CFR 141.61 and 40 CFR 141.62—Primary Drinking Water contaminant level not established for this compound.

<sup>4/</sup> Tentatively identified compound—laboratory reporting limit not determined.

<sup>5/</sup> U.S. Environmental Protection Agency (1997a)—40 CFR 141.51—Primary Drinking Water maximum contaminant level goal.

**Table 8.** List of selected analytes from Appendix IX to 40 CFR 264 and analyte concentrations; and gasoline-range organic and extractable petroleum hydrocarbon compounds and compound concentrations detected in ground-water samples collected from monitoring well SCT6, Southern Polytechnic State University, Marietta, Georgia, 1997 [ $\mu\text{g/L}$ , micrograms per liter; MCL, maximum contaminant level; LRL, laboratory reporting limit]

Analyte name	USEPA Primary Drinking Water MCL <sup>1/</sup> (µg/L)	Sample number; sample depth, in feet; date of sample collection; analyte concentration; and laboratory reporting limit, by analyte	
		SCT6-254, 254-263, 10/15/97 1600	
		Concentration (µg/L)	LRL (µg/L)
<i>Volatile Organic Compounds</i>			
Toluene	1,000	0.40	1.0
Pentane	2/	.34	3/
Siloxane	3/	1.6	2/
Hexane, 3-ethyl	3/	.16	2/
Octane	3/	.26	2/
Nonanal	3/	.21	2/
Dodecane	3/	.16	2/
<i>Semivolatile Organic Compounds</i>			
di-N-butyl phthalate	3/	2.6	9.6
N-nitrosodiphenylamine	3/	1.0	9.6
1,2-dimethyl Benzene	3/	1.7	2/
Benzothiazole	3/	4.2	2/
Caprolactum	3/	17	2/
4,4-difluoro-1-1-Biphenyl	3/	1.4	2/
Sulfur	3/	1.5	2/
N-butyl Benzenesulfonamide	3/	90	2/
1,2-Benzenedicarboxylic acid	3/	1.4	2/
Oxygenated hydrocarbon	3/	2.2	2/
Oxygenated hydrocarbon	3/	19	2/
Oxygenated hydrocarbon	3/	16	2/
Oxygenated hydrocarbon	3/	6.9	2/
<i>Gasoline-Range Organics and Selected Components</i>			
Toluene	1,000	.26	0.50
Gasoline-range organics	3/	7.0	10
<i>Extractable Petroluem Hydrocarbons</i>			
Diesel-range organics	3/	370	95
<i>Total Metals</i>			
Barium	2,000	170	60
Chromium	100	14	10
Cobalt	3/	5.0	10
Copper	3/	13	20
Lead	4/0	0.3	5.0
Nickel	3/	13	40
Vanadium	3/	6.3	10
Zinc	3/	140	20
<i>Inorganics</i>			
Sulfide	3/	120	50

<sup>1/</sup>U.S. Environmental Protection Agency (1997a)—40 CFR 141.61 and 40 CFR 141.62—Primary Drinking Water maximum contaminant level.

<sup>2/</sup>U.S. Environmental Protection Agency (1997a)—40 CFR 141.61 and 40 CFR 141.62—Primary Drinking Water maximum contaminant level not established for this compound.

<sup>3/</sup>Tentatively identified compound—laboratory reporting limit not determined

<sup>4/</sup>U.S. Environmental Protection Agency (1997a)—40 CFR 141.51—Primary Drinking Water maximum contaminant level goal.

**Table 9.** List of selected analytes from Appendix IX to 40 CFR 264 and analyte concentrations detected in ground-water samples collected from shallow monitoring wells SCT3, SCT5, and SCT7, Southern Polytechnic State University, Marietta, Georgia, 1997  
[µg/L, micrograms per liter; MCL, maximum contaminant level; LRL, laboratory reporting limit; nd, not detected at minimum reporting level]

Analyte name	USEPA Primary Drinking Water MCL <sup>1/</sup> (µg/L)	LRL (µg/L)	Monitoring well number, date, and time of sample collection				
			SCT3, 06/05/97, 1700	SCT5, 06/06/97, 1600	SCT7, 06/05/97, 1930	<sup>2/</sup> SCT8, 06/06/97, 1800	<sup>2/</sup> SCT9, 06/06/97, 1200
Volatile Organic Compounds							
Trichloroethylene	5.0	8.3	330	nd	nd	nd	nd
1,2-Dichloroethylene	70	8.3	9.3	nd	nd	nd	nd
Chloroform	<sup>3/</sup>	1.0	nd	nd	10	nd	nd
Semivolatile Organic Compounds							
Ethanol, 2-(2-methoxyethoxy)	<sup>3/</sup>	<sup>4/</sup>	7.3	nd	11	20	5.3
Ethanol, 2-(2-ethoxyethoxy)	<sup>3/</sup>	<sup>4/</sup>	nd	nd	4.2	nd	nd
2-Propanol, 1-(1-methylethoxy)	<sup>3/</sup>	<sup>4/</sup>	5.5	nd	nd	nd	nd
Aminocaproic acid	<sup>3/</sup>	<sup>4/</sup>	57	nd	nd	nd	nd
Caprolactum	<sup>3/</sup>	<sup>4/</sup>	nd	nd	16	nd	nd
Butanoic acid	<sup>3/</sup>	<sup>4/</sup>	nd	nd	6.0	nd	4.6
Siloxane	<sup>3/</sup>	<sup>4/</sup>	nd	13	nd	nd	nd
Propanoic acid	<sup>3/</sup>	<sup>4/</sup>	nd	4.0	nd	nd	nd
Cyclopentanone, 2,2-dimethyl-	<sup>3/</sup>	<sup>4/</sup>	nd	8.0	nd	nd	nd
Octadecanoic acid, butyl ester	<sup>3/</sup>	<sup>4/</sup>	nd	4.2	nd	nd	nd
Ethane, 1,1-oxybis[2-ethoxy]	<sup>3/</sup>	<sup>4/</sup>	nd	nd	nd	5.4	nd
Butyric acid	<sup>3/</sup>	<sup>4/</sup>	nd	nd	nd	7.4	nd
Total Metals							
Barium	2,000	10	71	45	52	43	44
Zinc	<sup>3/</sup>	20	nd	nd	nd	nd	38
Inorganics							
Sulfide	<sup>3/</sup>	50	nd	nd	56	nd	nd

<sup>1/</sup>U.S. Environmental Protection Agency (1997a)—40 CFR 141.61 and 40 CFR 141.62—Primary Drinking Water maximum contaminant level.

<sup>2/</sup>Replicate sample of SCT5.

<sup>3/</sup>U.S. Environmental Protection Agency (1997a)—40 CFR 141.61 and 40 CFR 141.62—Primary Drinking Water maximum contaminant level not established for this compound.

<sup>4/</sup>Tentatively identified compound—laboratory reporting limit not determined.

**Table 10.** List of selected analytes from Appendix IX to 40 CFR 264 and analyte concentrations detected in rinsate samples collected from shallow monitoring wells SCT3, SCT5, and SCT7; and deep monitoring wells SCT1, SCT2, SCT4, and SCT6, Southern Polytechnic State University, Marietta, Georgia, 1997

[ $\mu\text{g/L}$ , micrograms per liter; LRL, laboratory reporting limit; nd, not detected at minimum reporting level; na, not analyzed]

Analyte name	LRL (µg/L)	Rinsate blank-sample number; date and time of collection; and analyte concentration, in micrograms per liter						
		SCT1, 08/11/97, 1100	SCT2, 07/07/97, 1500	SCT3, 06/05/97, 1400	SCT4, 08/26/97, 2000	SCT5, 06/06/97, 1400	SCT6, 08/13/97, 1000	SCT7, 06/05/97, 1800
Volatile organic compounds								
Isopropanol	1/	85	21	nd	19	240	nd	20
2-Butanone (MEK)	5.0	nd	nd	nd	nd	nd	5.2	nd
Decane, 2,6,8-trimethyl	1/	nd	nd	nd	1.1	nd	nd	nd
Semivolatile organic compounds								
Ethanol, 2-(2-methoxyethoxy)	1/	nd	nd	nd	nd	nd	nd	7.3
Ethanol, 2-(2-ethoxyethoxy)	1/	nd	nd	nd	nd	nd	nd	4.1
Propanoic acid	1/	nd	nd	5.9	nd	nd	nd	4.0
Total Metals								
Barium	10	15	nd	nd	nd	nd	nd	nd
Lead	3.0	3.0	nd	nd	nd	nd	nd	nd
Selenium	5.0	nd	nd	nd	6.6	nd	nd	nd
Inorganics								
Cyanide	10	nd	na	nd	nd	na	nd	nd
Sulfide	50	nd	na	nd	nd	na	nd	56

<sup>1/</sup>Tentatively identified compound—analytical reporting limit not determined.

**Table 11.** List of selected analytes from Appendix IX to 40 CFR 264 and analyte concentrations detected in ambient samples collected from shallow monitoring wells SCT3, SCT5, and SCT7; and deep monitoring wells SCT1, SCT2, SCT4, and SCT6; Southern Polytechnic State University, Marietta, Georgia, 1997 [ $\mu\text{g/L}$ , micrograms per liter; LRL, laboratory reporting limit; nd, not detected at minimum reporting level]

Analyte name	LRL (µg/L)	Ambient blank-sample number; date and time of collection; and analyte concentration, in micrograms per liter					
		SCT1, 08/15/97, 0900	SCT2, 07/11/97, 1530	SCT3, 06/05/97, 1700	SCT4, 09/03/97, 1600	SCT5, 06/06/97, 1600	SCT6, 08/25/97, 1430
Volatile organic compounds							
Acetone	10	nd	nd	nd	nd	nd	50
2-Butanone (MEK)	5.0	nd	nd	nd	5.1	nd	18
1-Propene, 2-methyl	1/	2.8	nd	nd	nd	nd	4.5
Propanol, 2,2,-dimethyl	1/	nd	nd	nd	nd	nd	2.7
Cyclohexane	1/	1.8	nd	nd	nd	nd	6.6

<sup>1/</sup>Tentatively identified compound—analytical reporting limit not determined.

**Table 12.** List of selected analytes from Appendix IX to 40 CFR 264 and analyte concentrations detected in trip-blank samples collected for monitoring wells SCT1 and SCT2, Southern Polytechnic State University, Marietta, Georgia, 1997  
[ $\mu\text{g/L}$ , micrograms per liter; LRL, laboratory reporting limit; nd, not detected at minimum reporting level]

Analyte name	Trip-blank sample number, date, and time of collection															
	SCT1A, 08/13/97, 1200		SCT1B, 09/15/9, 12007		SCT1B(2), 08/13/97, 1900		SCT2A, 07/07/97, 1500		SCT2B, 07/11/97, 1530		SCT2C, 07/14/97, 1300		SCT2D, 07/16/97 1000		SCT2E, 07/17/97, 1030	
	Concen- tration ( $\mu\text{g/L}$ )	LRL ( $\mu\text{g/L}$ )	Concen- tration ( $\mu\text{g/L}$ )	LRL ( $\mu\text{g/L}$ )	Concen- tration ( $\mu\text{g/L}$ )	LRL ( $\mu\text{g/L}$ )	Concen- tration ( $\mu\text{g/L}$ )	LRL ( $\mu\text{g/L}$ )	Concen- tration ( $\mu\text{g/L}$ )	LRL ( $\mu\text{g/L}$ )	Concen- tration ( $\mu\text{g/L}$ )	LRL ( $\mu\text{g/L}$ )	Concen- tration ( $\mu\text{g/L}$ )	LRL ( $\mu\text{g/L}$ )	Concen- tration ( $\mu\text{g/L}$ )	LRL ( $\mu\text{g/L}$ )
<i>Volatile Organic Compounds</i>																
1-Propene, 2-methyl	1.5	1/	nd	1/	3.2	1/	nd	1/	nd	1/	nd	1/	nd	1/	nd	1/
Cyclohexane	nd	1/	nd	1/	23	1/	nd	1/	nd	1/	nd	1/	nd	1/	nd	1/
Siloxane	nd	1/	nd	1/	nd	1/	nd	1/	nd	1/	2.2	1/	nd	1/	nd	1/

<sup>1/</sup>Tentatively identified compound—laboratory reporting limit not determined.



**Table 13.** List of selected analytes from Appendix IX to 40 CFR 264 and analyte concentrations detected in trip-blank samples collected from shallow monitoring wells SCT3 and SCT5; and deep monitoring wells SCT4 and SCT6, Southern Polytechnic State University, Marietta, Georgia, 1997  
[ $\mu\text{g/L}$ , micrograms per liter; LRL, laboratory reporting limit; nd, not detected at minimum reporting level]

Analyte name	LRL, (µg/L)	Trip-blank sample number; and date and time of collection				
		Shallow monitoring wells		Deep monitoring wells		
		SCT3,	SCT5,	SCT4A,	SCT6A,	SCT6,
		06/05/97, 1700	06/06/97, 1400	09/03/97, 1600	08/18/97, 1000	08/25/97, 1430
Volatile Organic Compound						
Acetone	10	nd	nd	11	nd	49
Isopropanol	1/	nd	nd	nd	16	nd
2-Butanone (MEK)	5.0	nd	nd	5.8	nd	18
Cyclohexane	1/	nd	nd	nd	nd	7.0
1-Butene	1/	nd	nd	nd	nd	5.8
3-Heptanone, 5-ethyl-4-methyl	1/	nd	nd	nd	nd	2.8

<sup>1/</sup>Tentatively identified compound—laboratory reporting limit not determined.

**Table 14.** Ground-water and corresponding quality-assurance samples collected from monitoring well SCT1, Southern Polytechnic State University, Marietta, Georgia, 1997  
[—, only one ambient sample collected per monitoring well; do., ditto]

Ground-water sample	Ambient sample	Trip-blank sample
SCT1-85	—	trip blank—SCT1A
SCT1-96	—	do.
SCT1-184	—	trip blank—SCT1B
SCT1-393	ambient\ blank—SCT1	—
SCT1-492	—	trip blank—SCT1B(2)
SCT1-555	—	do.
Rinsate-blank SCT1	—	—

**Table 15.** Ground-water and corresponding quality-assurance samples collected from monitoring well SCT2, Southern Polytechnic State University, Marietta, Georgia, 1997  
[—, only one ambient sample collected per monitoring well; do., ditto]

Ground-water sample	Ambient sample	Trip-blank sample
SCT2-120	ambient blank—SCT2	trip blank—SCT2B
SCT2-132	—	trip blank—SCT2C
<sup>1/</sup> SCT2-136	—	do.
<sup>1/</sup> SCT2-140	—	do.
SCT2-395	—	trip blank—SCT2D
SCT2-445	—	do.
SCT2-480	—	do.
SCT2-512	—	trip blank—SCT2E
SCT2-536	—	do.
Rinsate-blank SCT2	—	trip blank—SCT2A

<sup>1/</sup>Replicate sample of SCT2-132.

**Table 16.** Ground-water and corresponding quality-assurance samples collected from monitoring well SCT4, Southern Polytechnic State University, Marietta, Georgia, 1997

[—, only one ambient sample collected per monitoring well; do., ditto]

Ground-water sample	Ambient sample	Trip-blank sample
SCT4-207	—	—
SCT4-294	—	trip blank—SCT4A
<sup>1/</sup> SCT4-300	—	do.
<sup>1/</sup> SCT4-310	—	do.
SCT4-420	ambient blank—SCT4	do.

<sup>1/</sup>Replicate sample of SCT4-294.

**Table 17.** Ground-water and corresponding quality-assurance samples collected from monitoring well SCT6, Southern Polytechnic State University, Marietta, Georgia, 1997

[—, only one ambient sample collected per monitoring well; do., ditto]

Ground-water sample	Ambient sample	Trip-blank sample
SCT6-254	—	—
SCT6-482	—	trip blank—SCT6
<sup>1/</sup> SCT6-490	—	do.
<sup>1/</sup> SCT6-510	—	do.
SCT6-400	—	do.

<sup>1/</sup>Replicate sample of SCT6-482.

**Table 18.** Ground-water and corresponding quality-assurance samples collected from shallow monitoring wells SCT3, SCT5, and SCT7, Southern Polytechnic State University, Marietta, Georgia, 1997

Ground-water sample	Ambient sample	Trip-blank sample
SCT3	ambient blank—SCT3	trip blank—SCT3
SCT5	ambient blank—SCT5	trip blank—SCT5
SCT7	not analyzed	trip blank—SCT3
<sup>1/</sup> SCT8	ambient blank—SCT5	trip blank—SCT5
<sup>1/</sup> SCT9	ambient blank—SCT5	trip blank—SCT5

<sup>1/</sup>Replicate sample of SCT5.