

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

Hydrogeologic and Water-Quality Data for the East Management Unit of Dover Air Force Base, Kent County, Delaware, 1995–96

*By Joseph E. Beman, Daniel J. Phelan, Joel E. Dysart, Martha L. Cashel and
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Open-File Report 99-253

In cooperation with the

THE UNITED STATES AIR FORCE

**Baltimore, Maryland
October 1999**

U.S. Department of the Interior
BRUCE BABBITT, SECRETARY

U.S. Geological Survey
Charles G. Groat, Director

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United States Government Printing Office: 1999

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CONVERSION FACTORS, ABBREVIATIONS, AND VERTICAL DATUM

Multiply	By	To obtain
inch (in.)	25.4	millimeter (mm)
foot (ft)	0.3048	meter (m)
mile (mi)	1.609	kilometer (km)
acre	4,047	square meter
gallon	3.785	liter
gallon per minute (gal/min)	0.06308	liter per second

Temperature is reported in degrees Celsius ($^{\circ}\text{C}$), which can be converted to degrees Fahrenheit ($^{\circ}\text{F}$) by using the following equation: $^{\circ}\text{F}=1.8(^{\circ}\text{C})+32$.

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

Chemical concentration, specific conductance, and water temperature are reported in metric units. Aqueous chemical concentration is given in milligrams per liter (mg/L) or in micrograms per liter ($\mu\text{g}/\text{L}$). Milligrams per liter is a unit expressing the concentration of chemical constituents in solution as well as weight (milligrams) of solute per unit volume (liter) of water.

One thousand micrograms per liter is equivalent to one milligram per liter. For concentrations less than 7,000 mg/L, the numerical value is the same as for concentrations in parts per million. Hydrogen concentrations in samples are expressed in nanomoles per liter (nmol/L).

Specific conductance of water is expressed in microsiemens per centimeter at 25 degrees Celsius ($\mu\text{S}/\text{cm}$), which is identical to micromhos per centimeter at 25 degrees Celsius, formerly used by the U.S. Geological Survey.

**HYDROGEOLOGIC AND WATER-QUALITY DATA FOR THE
EAST MANAGEMENT UNIT OF DOVER AIR FORCE BASE,
KENT COUNTY, DELAWARE, 1995-96**

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Martha L. Cashel, and Vanessa C. Smith

ABSTRACT

This report presents data collected by the U.S. Geological Survey from April 1995 through September 1996 as part of a project to assess ground- and surface-water contamination, and to determine if natural attenuation of organic contaminants is a feasible alternative to remediation at four sites in the East Management Unit of Dover Air Force Base, in Kent County, Delaware. Ground- and surface-water-level data, borehole and surface geophysical data, and ground- and surface-water quality data, and the techniques used to collect the data are presented. The water-level and water-quality sampling network for this project consisted of 11 drainage-ditch piezometers and 8 cone penetrometer wells installed during the study, and 86 previously drilled wells. An evaluation of quality-assurance data showed that water-quality data were of good quality, there was no evidence of cross-contamination in any samples, and the data were reproducible and unbiased.

INTRODUCTION

Dover Air Force Base (DAFB) is located in Kent County, Delaware, approximately 3.5 mi southeast of the center of the City of Dover, Delaware (fig. 1). DAFB began operation in 1941 at the site of the partially constructed Dover Municipal Airfield. The base was used for various purposes during and after World War II and was deactivated in 1946, only to be reactivated as Dover Air Force Base in 1950. Since then, DAFB has been supporting activities of the U.S. Air Force (USAF) Air Mobility Command.

In March 1989, DAFB was listed on the National Priorities List (NPL), which placed it under regulations described in the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) that governs activities at hazardous waste sites. The U.S. Geological Survey (USGS) conducted an investigation in cooperation with the Environmental Flight of the USAF to evaluate whether or not natural attenuation is a feasible alternative to remediation at disposal sites located in the East Management Unit of DAFB. This investigation was conducted in response to previous investigations that had determined sources of contamination, and the presence of contaminants in the ground- and surface-water systems in the East Management Unit. This report presents the results of the data-collection effort for that project.

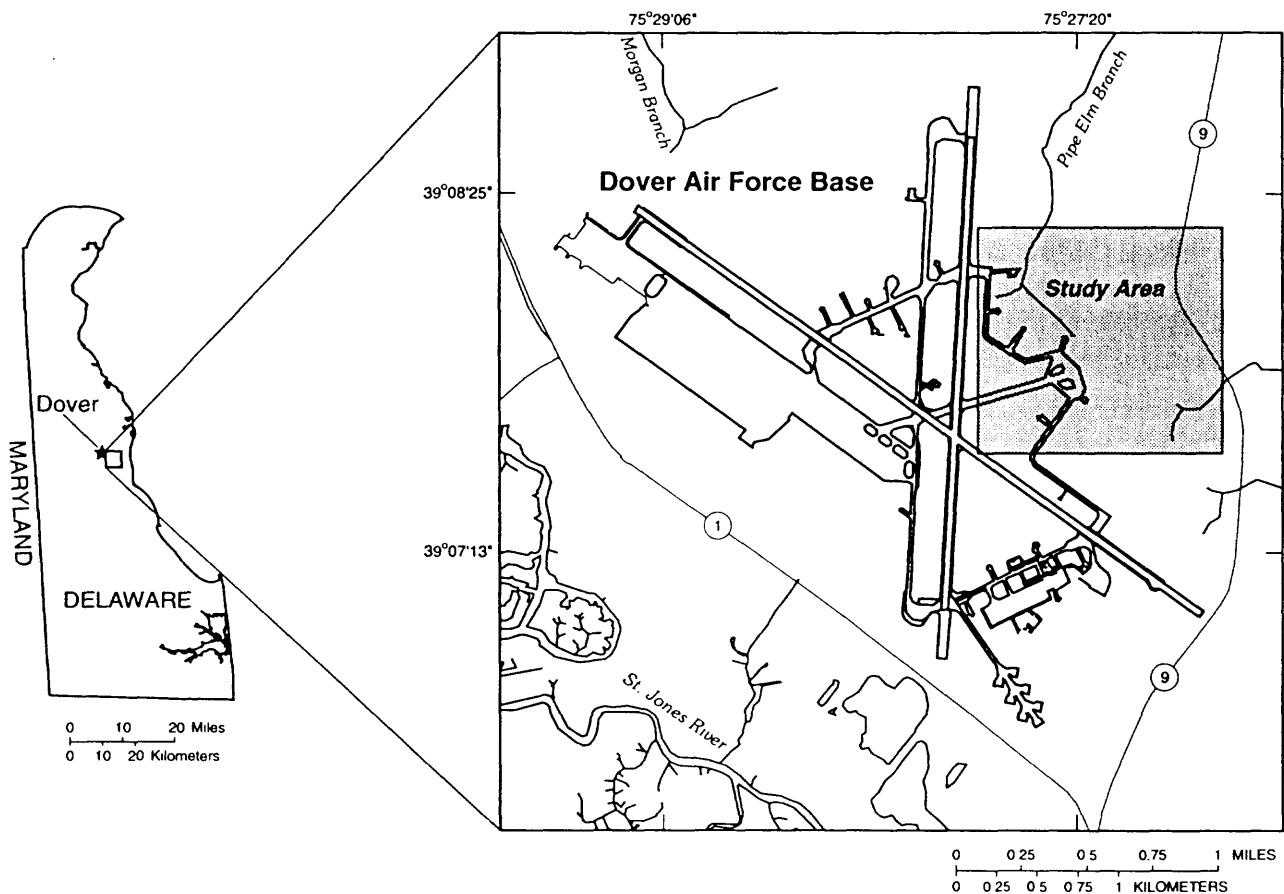


Figure 1. Location of the natural-attenuation study area at Dover Air Force Base, Kent County, Delaware.

Purpose and Scope

The purpose of this report is to present data collected by the USGS from April 1995 through September 1996 as part of the natural-attenuation (NA) project to determine if natural attenuation of contaminants is a feasible alternative to remediation at four sites in the Eastern Management Unit of DAFB. An interpretive administrative report is being prepared concurrent with this report by the USGS. Ground- and surface-water-level data, borehole and surface geophysical data, and ground- and surface-water quality data, and the techniques used to collect the data are presented.

Description of Study Area

The topography of DAFB is flat with little spatial variation. Naturally-occurring land-surface elevations range from sea level along the St. Jones River, to about 37 ft above sea level on the northwestern boundary of the base (fig. 1). The northwest-southeast runway has an elevation of about 28 ft above sea level, which is higher than most of the surrounding area. Land-surface elevations in the study area of the East Management Unit range from a high of about 45 ft atop landfill LF13, to about 3.5 ft where Pipe Elm Branch flows across the base boundary at Postles Corner Road (fig. 2). With the exception of the landfill LF13, and the small valley along Pipe Elm Branch, land-surface elevations in the study area range from 20 to 25 ft above sea level.

Three major hydrologic units have been identified beneath the base. The units are, in descending order, (1) the unconfined aquifer--chiefly sand units of the Columbia Group, (2) the Frederica and Cheswold confined aquifers of the Chesapeake Group, and (3) the sand units of the confined Piney Point and Magothy Formations (Leahy, 1982).

Data for the NA project were collected from four sites in the northeastern portion of DAFB. The sites are: Fire Training area 3 (FT03), Landfill 15 (LF15), Waste Pit 14 (WP14), and Landfill 13 (LF13). The locations of these sites are shown in figure 2.

Site FT03 covers approximately 1.3 acres (fig. 2). The site was used for fire training from 1970 to 1989. Fuels were ignited and extinguished as part of fire training exercises. Site FT03 was remediated in 1992, currently has a clay cap, and is covered with grass and minor gravel (Dames and Moore, written commun., 1996).

Site LF15 is two former landfills located near the receiver station (fig. 2). The site was initially reported to be an area of less than 0.5 acre; however, personnel familiar with the site described it as much larger. During the 1960's, LF15 was reportedly used for disposal of general refuse and small quantities of industrial shop wastes. Reportedly, the disposal area was filled to a depth of approximately 8 ft. When disposal activities ceased at an unknown date, the site was covered with several feet of local soil and seeded with grass. Site LF15 is currently an open, grass-covered field (Dames and Moore, written commun., 1996).

Site WP14 was used as a liquid waste-disposal trench. The site is located near the access road leading to the receiver station, and 200 ft to the west of LF15. An individual involved in the trench's construction stated that it was 15 ft wide by 100 ft long by 6 ft deep. The trench was used during the 1950's for the disposal of waste solvents, hydraulic fluids, waste oils, and other liquid wastes generated in shop operations. After disposal activities ceased at WP14, the trench was filled with 3 to 4 ft of local soil and seeded with grass (Dames and Moore, written commun., 1996).

Site LF13 is an active landfill located about 1,000 ft to the southeast of LF15. The site, which covers approximately 4 acres, is sparsely covered with small trees and underbrush, with a gravel road down the center. The landfill slopes upward to the east, with the eastern edge of the site ending abruptly at a 20-ft-

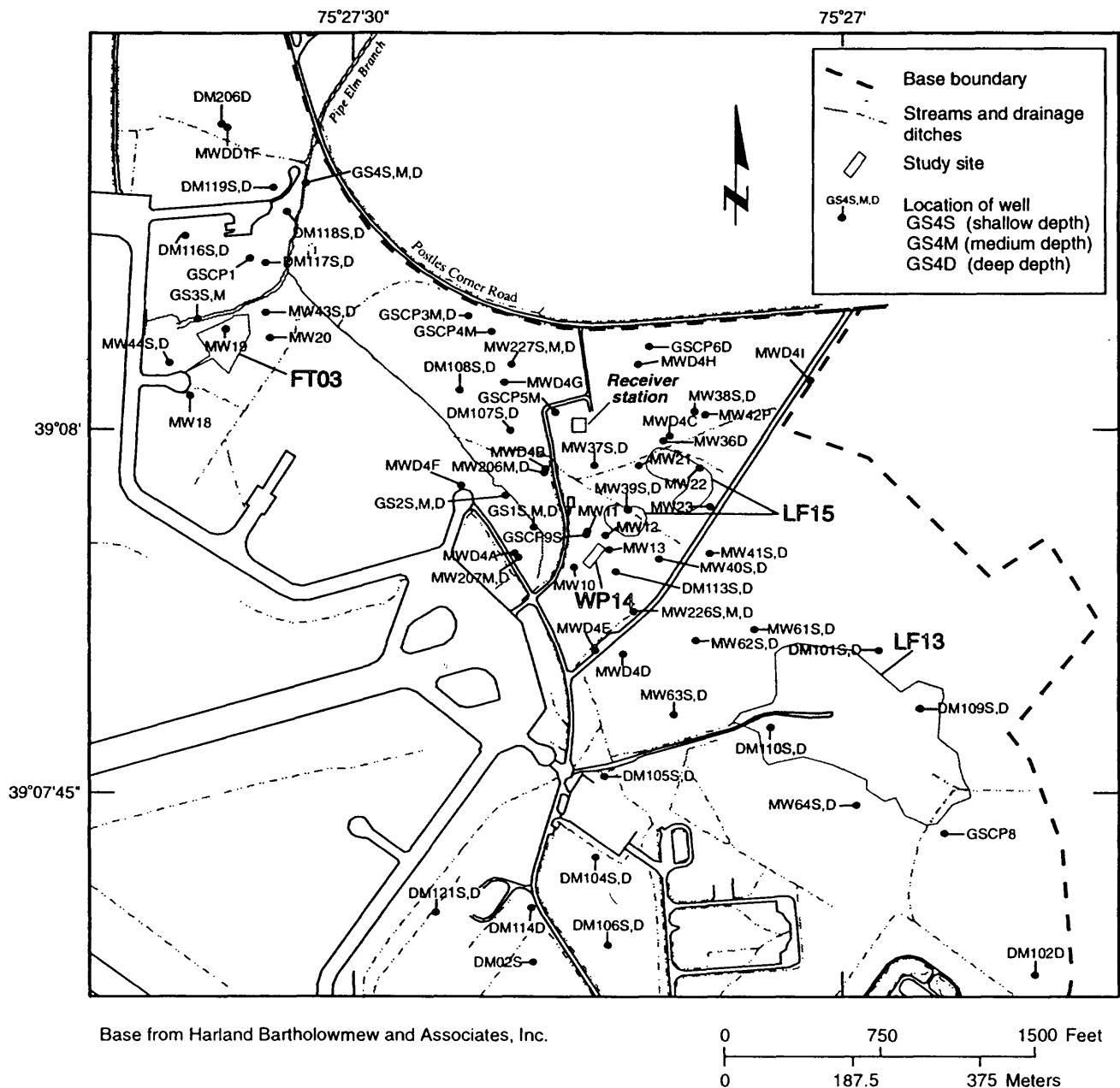


Figure 2. Location of study sites, previously-drilled wells, drainage-ditch piezometers, and cone penetrometer wells at the natural-attenuation study area, Dover Air Force Base, Kent County, Delaware. [Well numbers for previously-drilled wells begin with DM or MW. Site numbers for drainage-ditch piezometers begin with GS, and well numbers of cone penetrometer wells begin with GSCP.]

high ledge of debris and concrete. Site LF13 was used from the early to late 1960's for disposal of small quantities of general refuse and large quantities of construction rubble. At present, the site is partially covered with construction rubble such as concrete, metal scraps and cans (Dames and Moore, written commun., 1996).

Previous Investigations

All four study sites have undergone previous or concurrent investigations, including the North and East Management Units Remedial Investigation (RI) of 1993 (Dames and Moore, written commun., 1996). Other studies which were conducted at some or all of the four study sites are: Science Applications International Corporation (SAIC) (1986 and 1989), and Hazardous Waste Remedial Actions Program (HAZWRAP) (1990). The following paragraphs describe investigations which have taken place at each study site.

Two previous investigations were conducted at site FT03 by SAIC (1986 and 1989). The SAIC studies led to a focused feasibility study (FFS), and subsequent remedial oversight activities. Based on the FFS, a Record of Decision (ROD) was signed in September 1990. During the 1986 investigation, ground-water and surface-water samples were collected on and around the site upon discovering evidence of oil contamination along a bank adjacent to a drainage ditch north of the site. During the 1989 investigation, a soil gas survey was conducted to delineate concentrations of petroleum and hydrocarbons and to finalize the locations of new monitoring wells and auger borings. Soil and ground-water samples were collected to characterize ground water and to identify extent of contamination. During the 1993 study, existing monitoring wells were resampled and soil samples were collected. Ground-water samples were analyzed for volatile organic compounds (VOCs), semivolatile organic compounds (SVOCs), pesticides/polychlorinated biphenyl (PCBs), hardness, and total dissolved solids (TDS). Soil samples were analyzed for VOCs, SVOCs, metals, total petroleum hydrocarbons (TPH) and pesticides/PCBs (Dames and Moore, written commun., 1996).

Three previous investigations were conducted at site LF15 prior to the NA project: SAIC (1986 and 1989), HAZWRAP, (1990). During the 1986 investigation, three monitoring wells were installed, and ground-water samples were collected from those wells. All ground water samples were analyzed for oil and grease, cyanide and phenols, total organic carbon (TOC) and total organic halogens (TOX). During the 1989 investigation, geophysical and soil gas surveys were conducted and ground water, surface water, and sediment were sampled (SAIC, 1989). The third investigation (HAZWRAP, 1990) focused primarily on WP14, however, a soil gas survey and ground-water sampling conducted for this investigation are relevant to LF15. The soil gas survey overlapped with the western portion of LF15. During a concurrent investigation, two test pits were excavated and sampled, soil samples were collected, and all existing monitoring wells were resampled to delineate the extent of contamination at the sites (Dames and Moore, written commun., 1996).

Two previous investigations were conducted at site WP14: SAIC (1986), HAZWRAP (1990). During the 1986 investigation, four monitoring wells were installed, and ground water samples were collected from those wells. All ground-water samples were analyzed for oil and grease, cyanide, TOX, and TOC. The first ground water samples analyzed during the study were also analyzed for metals, and the second set of samples were also analyzed for VOCs. During the 1990 investigation, a soil gas survey was conducted to identify source areas, and soil samples were collected to determine soil quality. During a concurrent investigation, surface geophysical surveys were conducted to assess the possible presence of buried metal objects within suspected trench areas and to identify potential source areas. Soil samples were collected to test for contaminants in the soil. One monitoring well pair was installed downgradient of a trench and sampled to determine if the trench was a source of contaminants, and to delineate contaminants originating from other sources (Dames and Moore, written commun., 1996).

Two previous investigations were conducted at site LF13 by SAIC (1986 and 1989). During the 1986 investigation, soil samples were collected from the edge of the landfill and analyzed for metals, oil and grease, TOX, total organic chloride, and TOC. During the 1989 study, surface electro-magnetic conductivity and ground-penetrating radar surveys were performed, and two well pairs were installed upgradient and two well pairs downgradient. Ground-water samples were collected from the new wells to determine if contaminants were introduced from LF13. During a concurrent investigation, 12 subsurface samples were collected from six soil borings drilled to evaluate soil conditions. Three additional monitoring well pairs were installed and sampled along with the existing wells. Surface-water and bottom-sediment samples were collected from areas north and east of LF13 to determine if activities at LF13 affected nearby surface water (Dames and Moore, written commun., 1996).

Description of Monitoring-Well Network

The water-level and water-quality sampling network for this project consisted of 11 drainage-ditch piezometers and 8 cone penetrometer (CPT) wells installed by USGS personnel, and 86 previously drilled wells. The locations of all wells and piezometers in the monitoring-well network are shown in figure 2. Construction data for all wells and piezometers in the monitoring-well network are shown in table 1, located at the end of the report. Methods used for installing drainage-ditch piezometers and cone-penetrometer wells, and the numbering systems are described in the following sections.

Previously Drilled Wells

Fifty-four monitoring wells were installed during three previous studies--20 during HAZWRAP, (1990), and 34 by SAIC, (1986 and 1989). Thirty-two additional wells were installed during one concurrent investigation by Dames and Moore. All 86 of these wells were screened in the Columbia aquifer. The 20 wells drilled during the 1990 study by HAZWRAP were drilled using hollow-stem auger methods, and used 2-in.-diameter polyvinyl chloride (PVC) well casings and screens (HAZWRAP, 1990). Of the 34 wells drilled during the 1986 and 1989 studies by SAIC, 33 of the 34 wells were drilled using hollow-stem auger methods and used 2-in.-diameter PVC casings and screens, and the other well (MW42P) was drilled using the hydraulic mud rotary method, with a bentonite and water mixture for the drilling mud, and was cased and screened with 4-in.-diameter PVC. The lower two-thirds of the saturated interval in well MW42P was screened to allow for an aquifer test (SAIC, 1989).

The 32 wells drilled during the concurrent study by Dames and Moore have well numbers with the prefix 'DM', and were installed in compliance with the basewide remedial investigation/feasibility study (RI/FS) work plan (WP). Shallow and deep well nests were installed in the Columbia Formation with hollow stem augering techniques. Well numbers for the shallower wells end in "S", and well numbers for the deeper wells end in "D" (e.g. DM117S and DM117D). All drilling equipment was steam cleaned prior to use and between each well boring. 2-in.-diameter PVC casing and screen (0.010 or 0.020 slot size) were installed through the augers. In deep wells, the lower 10 ft of the aquifer were screened. Shallow wells were installed such that 10-ft-long screens were positioned with 2 ft of screen above the water table (Dames and Moore, written commun., 1996).

Drainage-Ditch Piezometers

Eleven drainage-ditch piezometers were installed during the summer of 1995 at four sites in the NA study area. Three sites (GS1, GS2, and GS4) have shallow, medium and deep piezometers in a nest, and one site (GS3) has shallow and medium-depth piezometers (fig. 2). Piezometers GS1S, GS1M, and GS1D represent the shallow, medium, and deepest depth screened in the nest, respectively. Each piezometer is a 2-in.-diameter stainless-steel drive point and is screened at the bottom with 0.010-in.- slot size

screen. Screen lengths range from 0.5 to 3 ft (table 1). Piezometers were driven using a tripod-mounted slide hammer which was raised and lowered by a manually controlled cat-head.

Cone-Penetrometer Wells

During May 1996, eight wells were installed in the study area by USGS and Applied Research Associates, Inc. (ARA) personnel using a trailer-mounted cone penetrometer (CPT) rig owned by the USAF. Two of the eight CPT wells failed and were replaced by the USGS in July 1996 using the same CPT rig. The CPT rig was manufactured by Vertek¹, weighs 12,000 pounds, and can push with a force of 30 tons when anchored. The CPT wells were installed by (1) anchoring the rig to the ground by means of four augers [ground anchors] and turnbuckles, (2) hydraulically pushing a 2.5-in.-diameter steel drive point to the desired [or maximum] depth and removing it, and (3) pushing the 2-in. PVC well screen and casing with steel rods from behind the screen's drive point to the planned depth. The PVC screens and casings, and the steel drive points and rods were steam cleaned after work at each site. The well numbers for the CPT wells begin with the letters 'GSCP' (for Geological Survey Cone Penetrometer), followed by a site number, and the letters 'D', 'M', or 'S' indicating deep, medium, or shallow depth wells, respectively.

At two sites, GSCP-1 and -5, an experimental oxidation-reduction probe operated by ARA personnel was pushed to 40 and 42 ft, respectively, prior to pushing the 2.5-in.-diameter point. A probe that measures and records resistivity, pore pressure, sleeve stress, and tip stress was also operated by ARA personnel and was also pushed at sites GSCP -1, -4, -5, -6, -8, and -9. Techniques used to measure the data during the pushes are still experimental, therefore the data are not included in this report, but are on file at the Delaware USGS office.

Acknowledgments

The authors thank the following people whose contributions made this report possible. Charles Mikula, Robert Wickso, Gregory Jackson, and Joanne Deramo of the 436th support group, Civil Engineering Squadron, Environmental Flight of the USAF at DAFB provided logistical support and background information essential to all data-collection efforts. Michael Apgar of the Delaware Department of Natural Resources and Environmental Control (DNREC) oversaw all USGS well-installation activities. Mark Winner, Daniel Rooney, Travis Ingraham and Sean Ricker of Applied Research Associates, Inc. (ARA) operated cone penetrometer (CPT) equipment and installed CPT wells. The authors also thank Mark Knoll, site supervisor for ARA at DAFB, for logistical support during the CPT well installations.

The following USGS personnel assisted in essential aspects of the study. Francis Chapelle, Paul Bradley, and James Landmeyer of the South Carolina District collected oxidation-reduction data presented in this report. George Zynjuk coordinated installation of piezometers and access piers. Robert Rosman and William Daniels assisted in piezometer installations and down-hole camera logging. Lisa Olsen analyzed methane samples collected during the July-August 1995 and the May-July 1996 sampling efforts. Anthony Tallman and Elizabeth Marchand aided in the field data collection and logistical coordination between the Maryland and Delaware USGS offices, and Judy Tegeler assisted in map presentation work necessary to the completion of this report. The authors also thank Peggy R. Nemoff and Donald A. Storck for thorough colleague reviews of the report.

¹. Use of brand names in this report is for identification purposes only and does not constitute endorsement by the U.S. Geological Survey.

HYDROGEOLOGIC DATA

Hydrologic and geophysical data collected during the USGS investigations in the study area from May 1995 through September 1996 are presented in this section.

Hydrologic Data

Continuous ground-water-level data were collected using analog to digital recorders (ADR's) that were installed on wells DM110S and DM110D at the LF13 site, and in piezometers GS4S and GS4D that were installed in the Pipe Elm Branch streambed near where the stream crosses the base boundary (fig. 2). A hydrograph showing daily mean ground-water elevations for wells DM110S and DM110D is shown in figure 3a.

An additional ADR was installed in October 1995 adjacent to piezometers GS4S, GS4M, and GS4D (fig. 2) to record the stream stage of Pipe Elm Branch. The stage data were used to determine the relation between stream stage and ground-water elevations. Discharge was not calculated from the stage data because the stream is affected by tides. A hydrograph showing ground-water elevations in piezometers GS4S and GS4D, and the elevation of the stream stage is shown in figure 3b. Daily mean water-level elevations for the four ground-water and one surface-water sites measured with the ADR's are shown in table 2 at the end of the report.

Synoptic ground-water-level measurements were made during July and December 1995, and during March, April, June, August, and September 1996. Additional water-level measurements were made during the July-August 1995 and May-July 1996 water-quality sampling periods. Periodic surface-water elevations were measured at streambed piezometers GS1, GS3, and GS4. Measured ground- and surface-water elevations are shown in table 3.

Geophysical Data

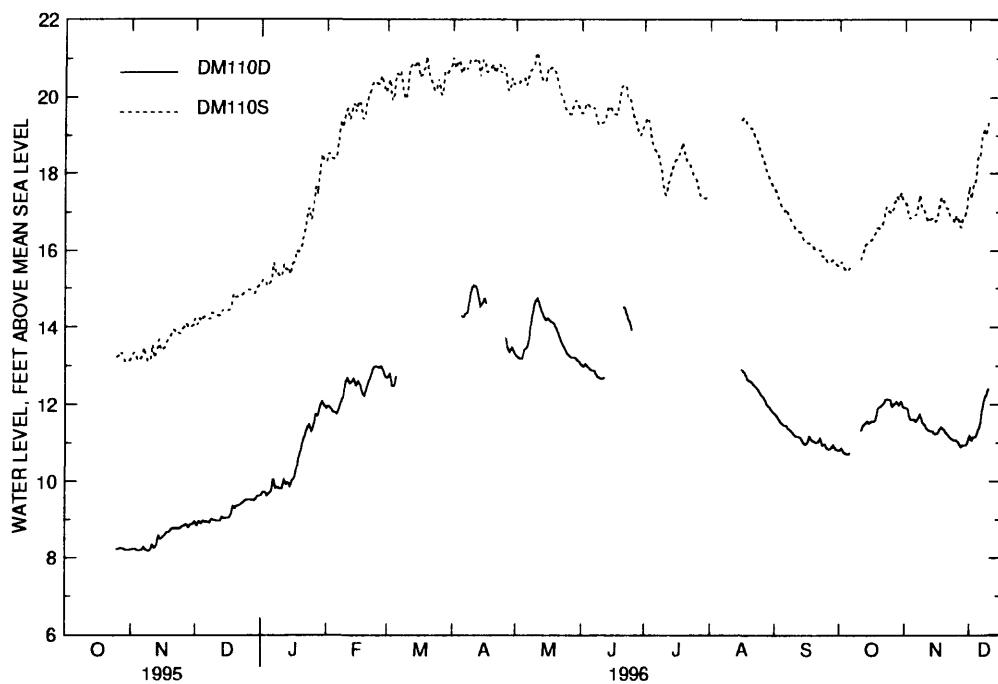
Surface and borehole geophysical measurements were used during this study to help determine lithologic and water-quality changes in the unconfined Columbia aquifer in the study area. The following sections describe the methods and presentation of the data from those investigations.

Areal Electro-Magnetic Conductivity Survey

Areal electro-magnetic conductivity surveys were performed during March, 1996 at 126 sampling points throughout the study area. The Geonics EM-34 terrain conductivity meter was used to measure conductivity in the 20- and 10-meter vertical and horizontal dipole orientations. The instrument measures apparent conductivity in millimhos per meter. The sampling point locations and the point numbers are shown in figure 4. The conductivity values for each data point are shown in table 4. Instrument checks were performed each day before data collection began. The conductivity was measured for each coil orientation at site number 1 to verify that the instrument was working properly, and no problems with the calibration checks were found.

The depth of the investigation is dependent on the inter-coil spacing, the operating frequency, and the orientation of the coils. In general, when the coils are in the horizontal-dipole mode (coil oriented vertically), the instrument responds to earth materials from the surface to a depth of 0.75 times the coil spacing, and is most sensitive to the shallow subsurface layers. In the vertical-dipole mode, (coils oriented horizontally) the instrument responds to earth materials to a depth of 1.5 times the coil spacing and is most

(a)



(b)

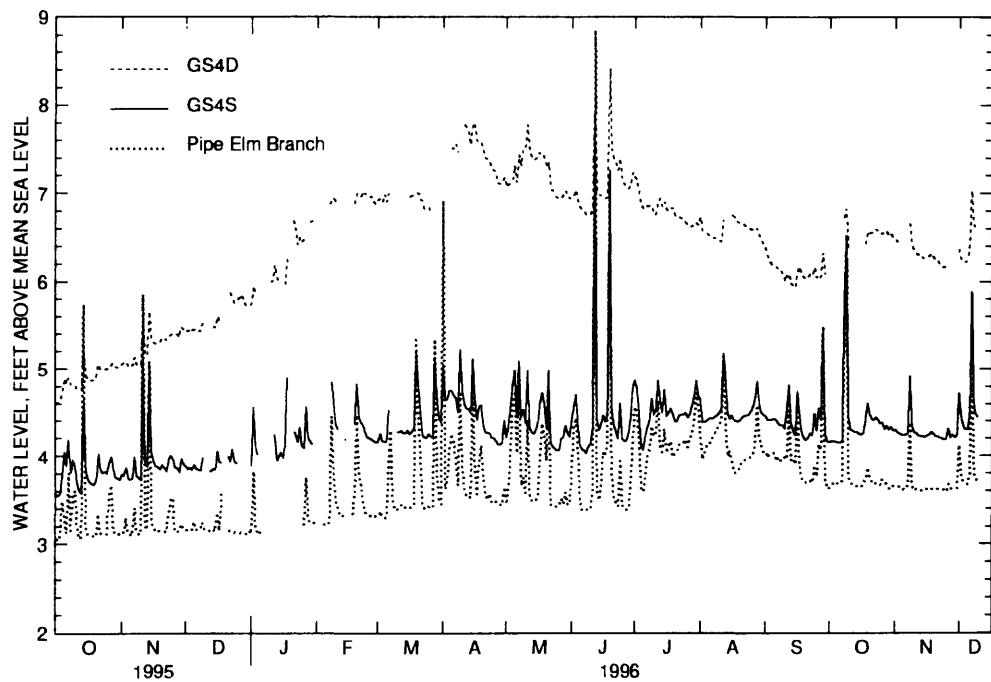


Figure 3. Hydrograph showing daily mean water-level elevations at the natural attenuation study area, Dover Air Force Base, Kent County, Delaware, from October 1995 through December 1996 in:

- (a) wells DM110S and DM110D.
- (b) piezometers GS4S and GS4D, and Pipe Elm Branch

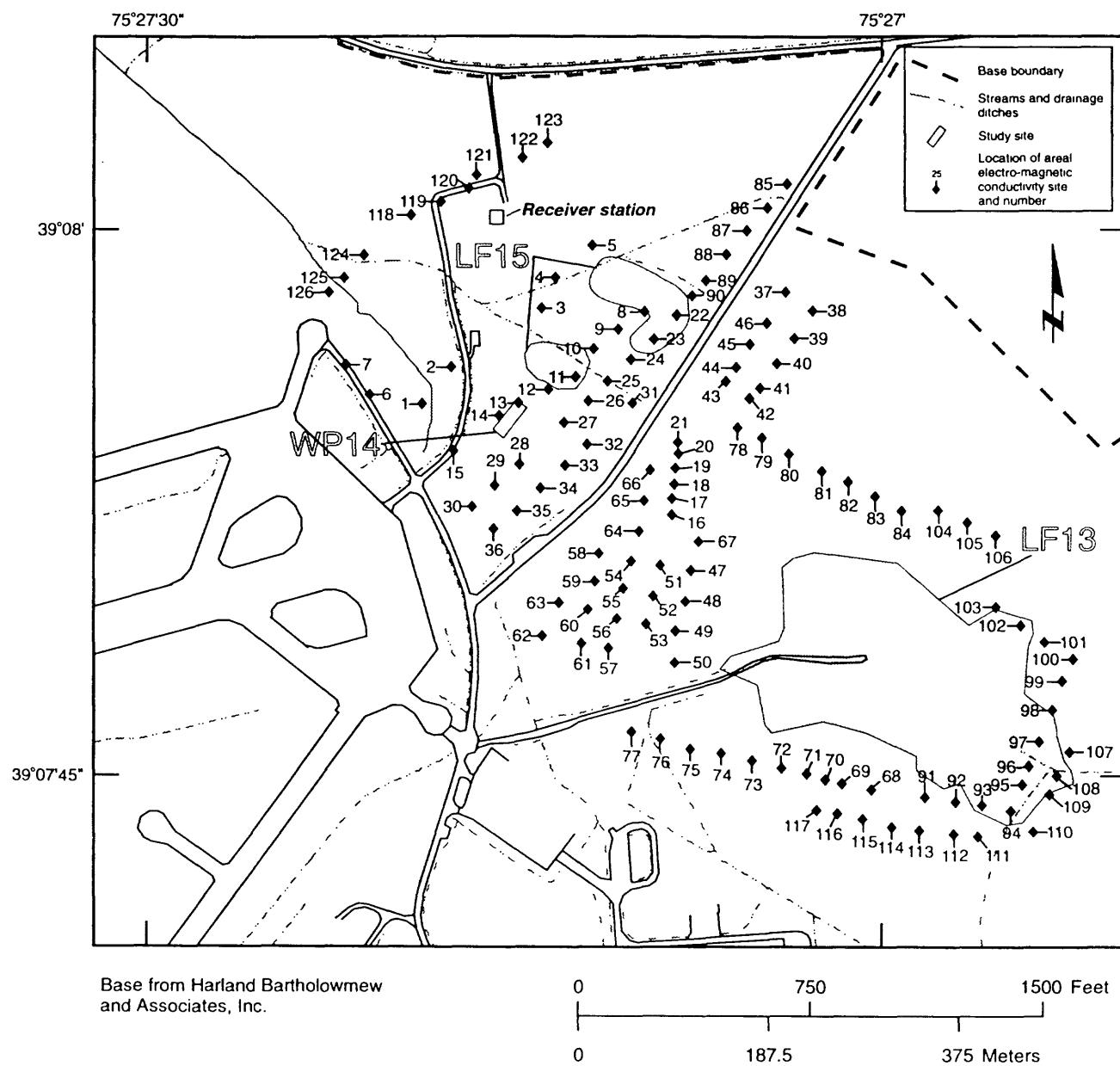


Figure 4. Location and site numbers of the areal electro-magnetic conductivity survey at the natural-attenuation study area, Dover Air Force Base, Kent County, Delaware, March 1996.

sensitive to layers at 0.4 times that spacing. Near-surface layers have little effect on the instrument in this mode (Haeni, 1986).

Borehole Geophysics

Natural-gamma (gamma) and borehole electro-magnetic conductivity (EM) geophysical logs were obtained for 22 wells during March 1996 with a Mount Sopris portable MGX logging system. Gamma logs alone were run on an additional 5 wells during the same period. The type of logs run for each well are shown in table 1. The geophysical logs are shown in the Appendix at the end of the report.

Natural-gamma logs

Gamma logs measure the amount of naturally-occurring gamma radiation in boreholes or wells. Gamma logs are used to indicate lithologic changes. Sands and gravels are indicated when the counts per second (cps) are low (curve deflects to the left). Clays are indicated by higher cps (curve deflects to the right). Obtaining gamma logs in cased holes results in a slightly reduced amount of radiation that is measured at the probe, but has no effect on the interpretation of the logs unless multiple casing techniques are used to install the well, resulting in decreased readings as the tool enters each additional casing. No wells logged during this study have multiple casings

Electro-magnetic conductivity logs

Borehole EM logs measure the apparent conductivity (in millisiemens per meter [mS/m,]) or inversely, resistivity, (in ohm-meters) of formations in open holes or in wells with PVC casing, but cannot work in steel-cased wells. The EM logs in this report are displayed in units of conductivity. The EM log works in air or fluid-filled holes, and can be interpreted similarly to electrical resistivity logs that can only be run in open (uncased) boreholes. The EM logs in the Appendix are graphed with increasing values to the right, and the curve generally follows the same trend as the gamma log. Ground water with conductive contaminant plumes can be indicated when there is a significant increase in conductivity without a corresponding increase in cps on the gamma log.

Conductive metals near the well casing will cause the measurements to be anomalously high. Metal surface casings that protect each well from damage cause interference by increasing the measured conductivity as the EM tool approaches land surface. Other metal in the borehole or well will also cause anomalously high readings. Casing centralizers, made from metal, or rubber with metal clamps, will cause interference in the log. This type of interference was found on the following logs:

DM110D MW10 MW11 MW12 MW19 MW20.

Interference with metal was also found at the bottom of 11 wells. Measured EM conductivity increased on the logs in the bottom of these wells with no corresponding increase in specific conductance in water samples taken from the deeper screened interval, compared to the measured specific conductance in the corresponding shallower well. There were also no corresponding changes in lithology when the EM logs were compared to the gamma logs. The interference was most likely caused by the use of a "knock-out" plug in the bottom of the auger bit that kept drill cuttings from entering the auger flights during drilling. When the wells were installed inside the auger flights, the well casing pushed out the knock-out plug, leaving the plug in the hole and allowing the well to stay in position as the auger flights were removed. No records have been found to document what type of plugs--if any--were used. Logs from the following wells had an increase in conductivity values at the bottom of the well that did not correspond to any lithologic or water-quality changes:

DM110D	DM117D	DM118D	MW10	MW11
MW20D	MW43D	MW44D	MW206D	MW226D
MW227D.				

The gamma tool typically measures about 1.5 ft deeper than the EM tool because the measuring point of the gamma tool is about 0.5 ft above the bottom of the tool, whereas the measuring point of the EM tool is about 2 ft above the bottom of the tool.

Down-hole camera logs

In May 1996, 55 wells in the study area were inspected with a Laval down-hole camera system as part of a larger basewide long-term monitoring project by the USGS. Twenty-nine wells outside this study area, but on base property, also were inspected with the downhole camera. Two different cameras were used: (1) a camera that would fit down a minimum 2-in.-diameter well casing, and (2) a larger camera that could fit down a minimum 4-in.-diameter casing. The aperture and focus of the larger camera could be changed downhole during logging, while the aperture and focus of the smaller camera was fixed while in the well. The intensity of the light source was adjustable for both cameras during logging. Wells in the study area that were logged with the down-hole camera are noted on table 1. The videotapes of the well logging are on file at the Dover, Delaware office of the USGS.

Of the 55 wells inspected, the only well that exhibited any sign of damage was DM110D, which had a crack at a casing joint at a depth of 4 ft below the top of the steel protective casing, and just below land surface. There was no indication of any leakage into the well at the crack, and the crack is likely sealed by the concrete pad surrounding the well.

WATER-QUALITY DATA

Between July 1995 and August 1996, ground- and surface-water samples were collected in the study area to help determine if natural attenuation of contaminants is occurring. The following sections describe the field methods used to collect the samples, and the field methods used to determine concentrations of specific parameters. Ground- and surface-water quality samples collected during the July-August, 1995 and May-July, 1996 samplings were sent to a laboratory certified by the U.S. Environmental Protection Agency contract laboratory program (CLP). Field parameters, samples collected for methane, ethane, and ethylene, and samples collected during August, 1996 were analyzed by USGS personnel. The data are summarized in tables 5-9 at the end of the report.

Ground-Water Samples

Ground-water samples were collected from 35 wells during July-August 1995, and from 37 wells in May and July 1996. Additionally, samples from 21 wells were collected in August 1996. The location of the wells and piezometers that were sampled are shown in figure 5. All samples were analyzed for inorganic constituents (major ions and metals) and organic contaminants. Selected wells were also sampled for dissolved inorganic carbon, methane, and hydrogen. Inorganic ground-water quality data are shown in table 5, and organic ground-water quality data are shown in table 6.

Sampling Methods

Ground-water samples obtained during July-August 1995 and May-July 1996 were collected using a submersible, stainless steel and Teflon, positive displacement pump with a Teflon discharge tube. Drain-

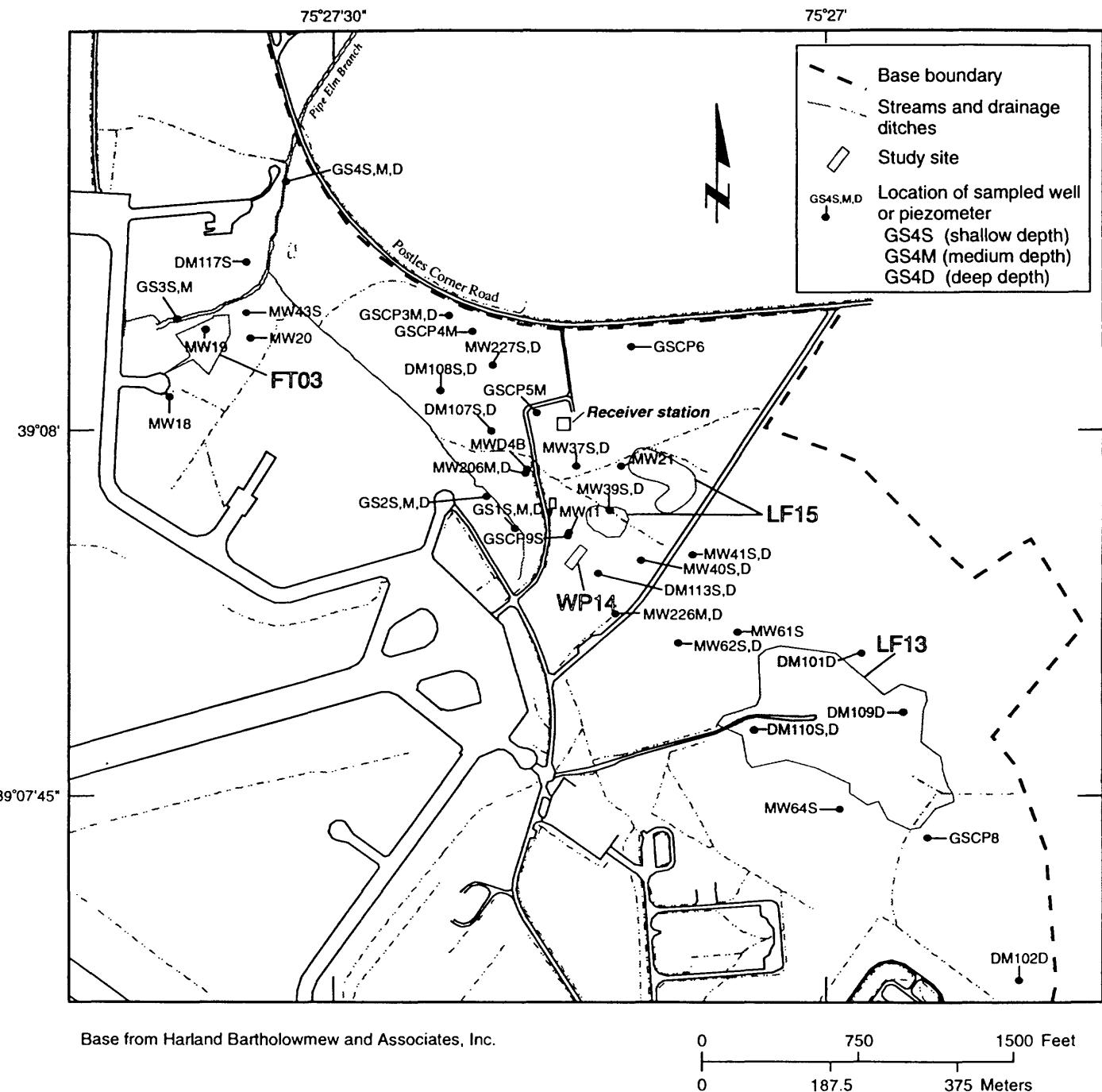


Figure 5. Locations of wells and piezometers sampled during July-August 1995, May-July 1996, and August 1996 at the natural-attenuation study area, Dover Air Force Base, Kent County, Delaware.

age-ditch piezometers and DM110S were sampled using a peristaltic pump with clear PVC laboratory grade tubing. The submersible pump was used for both purging and sampling each well. The pump was lowered to the top of the screened interval and the water was purged at a flow rate of 0.2 to 0.25 gal/min to prevent drawdown of the water column. Field parameters (specific conductance, dissolved oxygen, pH, and temperature) were monitored in a flow-through chamber during purging. The wells were sampled after field parameters had stabilized, and at least one well volume had been purged.

Ground-water samples that were sent to the laboratory for inorganic analyses were filtered through a high capacity, 0.45-micron in-line filter. Samples sent to the laboratory for volatile organic analyses were not filtered.

Alkalinity, dissolved iron ($\text{Fe}^{+2} + \text{Fe}^{+3}$), and dissolved ferrous iron (Fe^{+2}) concentrations were determined in the field from filtered sample water. The alkalinity (as CaCO_3) was determined using an incremental titration. The ($\text{Fe}^{+2} + \text{Fe}^{+3}$) and Fe^{+2} concentrations were determined by the colorimetric bipyridine method (Brown and others, 1970, p. 103) using a portable Hach spectrophotometer.

Hydrogen sulfide was also determined in the field using the colorimetric bipyridine method, and concentrations were usually determined from unfiltered samples. In the 1995 sampling, when some water samples were too turbid to determine using the spectrophotometer, the samples were then filtered. In the 1996 sampling, no hydrogen sulfide samples were filtered. If the water was too turbid, then the hydrogen sulfide concentrations were not determined.

Ground-water samples collected during August 1996 were analyzed using different methods to determine hydrogen, methane, sulfide and dissolved inorganic carbon (DIC) concentrations, and field parameters. Methods for collecting those samples are described below.

Hydrogen (as H_2) samples were collected by the bubble-strip method of Chapelle and McMahon (1991). A stream of water was pumped from the well through a gas-sampling bulb at a rate of about 600 milliliters per minute. An injected bubble of nitrogen in the bulb asymptotically collected hydrogen and other slightly soluble gases until equilibrium was achieved. Once equilibrium was achieved, (less than 5 percent change in 5 minutes, which occurred within 15 minutes), gas was extracted from the bulb with a syringe. Concentrations of H_2 were measured with a gas chromatograph equipped with a Reduction Gas Detector (Trace Analytical, Menlo Park, California). H_2 was separated from carbon monoxide and methane on a 0.5-m column Carbosieve II (Supelco, Inc.) column using nitrogen as the carrier gas. The detection limit for H_2 in a gas phase using this method is approximately 0.01 microliters per liter.

All samples from August 1996 were collected using standard water-quality techniques (Skougstad and others, 1978; Wood, 1976). All August 1996 samples were collected with a Bennett compressed-gas powered piston-driven submersible pump. Unstable parameters such as pH, DIC, dissolved oxygen, sulfide, and dissolved H_2 were measured in the field at the time of sample collection. Dissolved oxygen and sulfide were determined using colorimetric procedures. Dissolved oxygen was determined by Winkler titration. Samples for the determination of Fe^{+2} were filtered through a 0.1-micron pore-size filter, and determined using the Ferrozine method with a Hach Colorimeter (Stookey, 1970). Nitrate and sulfate were separated in the laboratory by anion-exchange chromatography and quantified by conductivity detection. Methane and DIC samples were collected by using a syringe with an attached 0.2 micron pore-size filter to inject 5 milliliters of water into separate, sealed, septated vials. Samples were refrigerated to minimize microbial activity. Methane and DIC concentrations were quantified by thermal conductivity detection gas chromatography. Dissolved methane concentrations were calculated by using Henry's Law coefficients (Stumm and Morgan, 1981).

Decontamination Methods

The pump and discharge line were decontaminated between the sampling of each well to prevent cross contamination. The outside of the pump head and line were scrubbed with a scrub-brush in a solution of deionized (DI) water and non-phosphate detergent and rinsed with DI water. The inside of the pump head and line were decontaminated by cycling a solution of DI water and detergent through the entire system. The pump head was placed in a 5-liter glass graduated cylinder full of the detergent solution and operated while discharging into the same cylinder for approximately 3 minutes. A DI water rinse followed by operating the pump in a separate rinse cylinder until the remaining detergent was no longer evident in the discharge. A 3-liter volume of isopropyl alcohol was passed through the system by operating the pump in a glass cylinder containing the alcohol (the same cylinder which earlier contained detergent solution). A final rinse of approximately three gallons of organic free DI water was flushed through the system. With organic free blank DI water still in the line, the pump head was covered in ultra clean aluminum foil and the entire system (pump, line, reel, and discharge tube) was enclosed in a fresh plastic bag for transport to the next sample site.

Surface-Water Samples

Surface-water samples were collected from four sites where the drainage-ditch piezometers are located, and the site locations are shown in figure 6. All surface-water samples were analyzed for the same constituents as ground-water samples. Samples were taken during July-August 1995, and May-July 1996.

Samples for laboratory analysis and field analysis were collected with a peristaltic pump and dedicated clear PVC laboratory-grade tubing. One end of the tubing was placed near the middle of the stream or ditch at a depth of about half that of the stream, and the other end of the tubing discharged sample directly into the sample container. Streams or drainage ditches were generally less than 10 ft wide, less than 1 ft deep, and nearly stagnant or very slow moving. Field parameters were determined by placing meter probes directly into the stream or ditch. Decontamination procedures for the tubing used for surface-water samples were the same as the procedures described in the ground-water section. Inorganic surface-water quality data are shown along with the inorganic ground-water quality data in table 5. Organic surface-water quality data are shown along with the organic ground-water quality data in table 6.

EVALUATION OF QUALITY-ASSURANCE DATA

Assessment of the quality of the water-quality data is an important step in data interpretation. In this report, data quality is evaluated in relation to data measurement error shown by reproducibility and bias. The quality of data is acceptable when analyte concentrations are reasonably reproducible and unbiased.

Reproducibility of data measurements can be determined using duplicate and field-spiked ampules. Duplicate samples were used to estimate the relative percent difference (RPD) between two theoretically similar measurements, and were calculated as follows:

$$\frac{|(C_1 - C_2)|}{(C_1 + C_2)/2} \times 100 = \text{relative percent difference},$$

where C₁ is the concentration in the first sample, and C₂ is the concentration in the duplicate sample. In this study, RPD values greater than 40 percent indicate data measurements of poor quality.

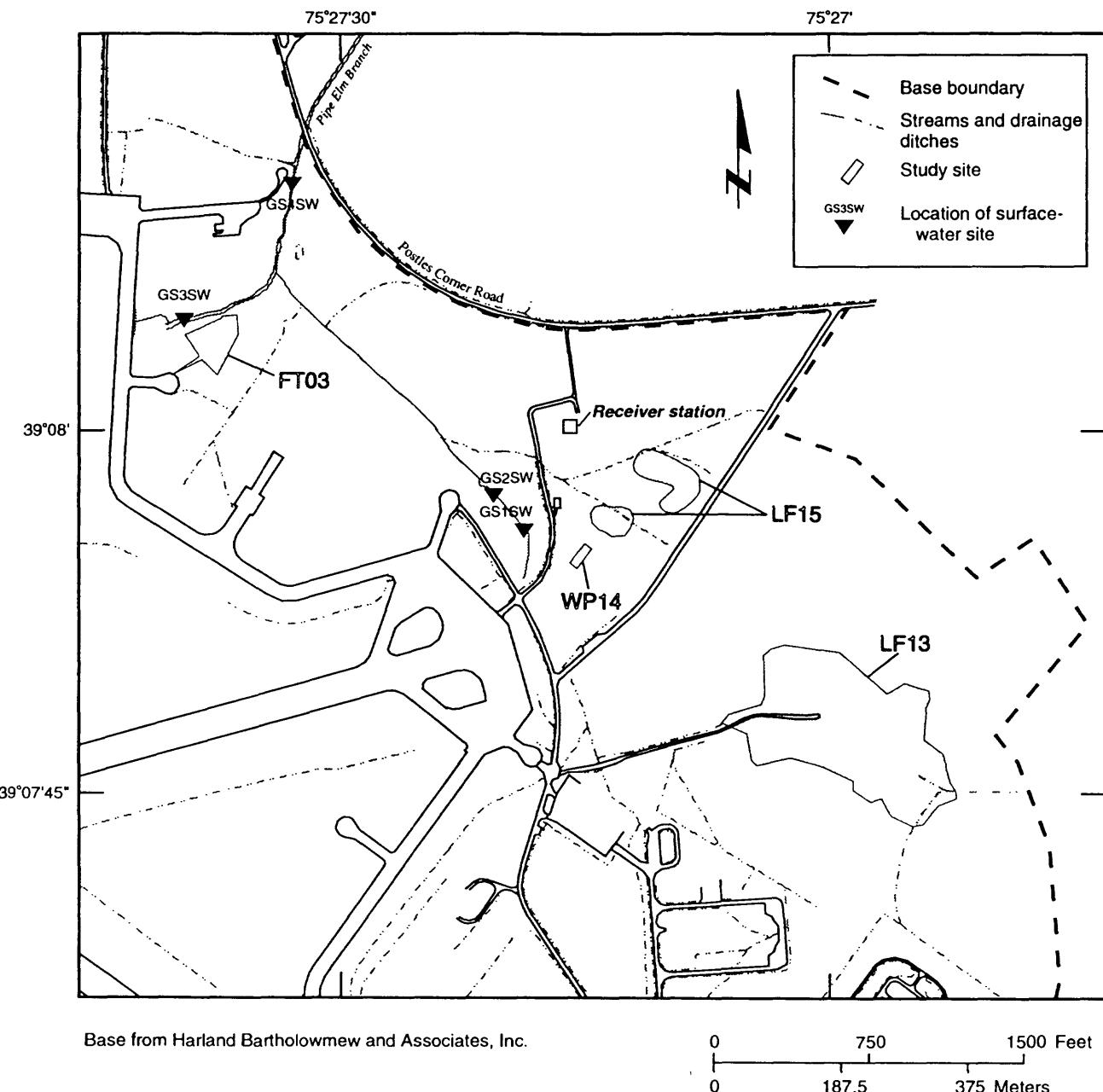


Figure 6. Locations of surface-water sites sampled during 1995 and 1996 at the natural-attenuation study area, Dover Air Force Base, Kent County, Delaware.

Bias in data measurements can occur because of contamination from a variety of sources. Contamination may be introduced into water samples during the well installation, during the collection of samples, in transit from the field to the laboratory, and during analysis in the laboratory. A positive bias can be introduced in the measurement of one or more analytes as a result of contamination. Contamination bias can be assessed by the incorporation of blank samples into the sampling program. Sample water for the blanks in this study was organic-free de-ionized water that was commercially supplied.

Equipment blanks were used to assess equipment or sampling conditions that may result in sample contamination. Equipment blanks consisted of organic-free de-ionized water passed through sampling equipment which had been decontaminated in the field. Analysis of both inorganic and organic analytes were completed for these blanks.

Trip and ambient blanks were used to assess contamination of VOCs during the field collection and shipping process. Trip blanks were prepared by filling VOCs vials with organic-free de-ionized water, sealing the vials, and exposing the closed vials to field conditions, and then shipping the blanks to the laboratory for analysis of VOCs. Ambient blanks were prepared by exposing organic-free de-ionized water to ambient conditions at selected field sites, pouring the blank water into VOCs vials, and shipping to the laboratory for analysis of VOCs.

Contamination bias also can be determined by comparing the concentration of selected analytes to those in previous samples. Cross-contamination of samples is likely if samples with high concentrations of one or more analytes are chronologically followed by a series of samples that indicate a progressive decline in concentrations for those same analytes. In this study, checks on chronological analyses (date and time of collection) were used to determine if cross-contamination had occurred.

The quality-control samples shown in the following table were collected from ground- and surface-water sites during 1995-96. Data results for all constituents are listed in tables 5 and 6 of this report.

Site type	Analyte group	Duplicate pairs	Blanks		
			Equipment	VOCs	Ambient
				Trip	--
Ground water	Organics				
	VOCs	7	15	8	2
	Methane	17	--	--	--
	Inorganics				
	Major ions and metals	7	15	--	--
	Hydrogen	15	--	--	--
Surface water	Organics				
	VOCs	2	2	--	--
	Methane	2	--	--	--
	Inorganics				
	Major ions and metals	2	2	--	--
	Hydrogen	--	--	--	--

Organic Analytes

Volatile Organic Compounds

Analyte measurements were generally reproducible for the VOCs. Estimates of measurement reproducibility for these analytes were limited because the duplicate sample pairs seldom contained measurable concentrations. Ground water from four wells and surface water from one site had measurements above the reporting limit. The RPD of a VOC measurement varies as little as 0 percent and up to 11 percent. The four VOC compounds detected in these samples are shown in Table 7.

The sites at which duplicate samples were measured reflect the reproducibility of data measurements only for those sites with low concentrations of VOCs; duplicate samples were not representative of those environmental sites with higher concentrations of VOCs. For example, 60 of 82 environmental samples analyzed for trichloroethene had concentrations less than 1.0 µg/L (table 6); but data for the other 22 environmental samples ranged from 1.0 µg/L to 190 µg/L. The median concentration for the 22 environmental samples was 30 µg/L.

VOC concentrations in blanks rarely exceeded the reporting limits. Concentrations measured in blanks collected with the submersible pump were less than 2.0 µg/L for vinyl chloride and less than 1.0 µg/L for other VOCs. However, concentrations above the reporting limits were measured in a blank collected with the peristaltic pump, equipment blank no. 16. The tubing used to collect this blank was discarded. The sequential data for samples collected for well DM110S, equipment blank no. 16, and equipment blank no. 17 are shown in the following table.

Sample	Date	Pump type	<i>cis</i> - 1,2-Dichloroethene, (µg/L)	Chlorobenzene, (µg/L)	Vinyl chloride, (µg/L)
DM110S	6/13/96	Peristaltic	1,400	61	800
Equipment Blank No. 16	6/13/96	Peristaltic	24	2.4	4.7
Equipment Blank No. 17	6/14/96	Submersible	<1.0	<1.0	<2.0

Blank data indicate that there is no cross-contamination of VOCs during sampling. Evidence shows that the VOCs detected in equipment blank no. 16 was not transferred to subsequent environmental samples.

Methane

Analyte measurements were reproducible for a wide range of concentrations of methane. Estimates of measurement reproducibility for methane included data from 17 duplicate samples (table 8). The median relative percent difference (RPD) for the duplicate samples was about 5 percent and ranged from 1 percent to 17 percent. Concentrations ranged from about 30 µg/L to about 11,000 µg/L; and the RPD for those samples was 7 percent and 5 percent, respectively.

Inorganic Analytes

Major Ions and Metals

The major ions of dissolved calcium, magnesium, sodium, potassium, chloride, sulfate, nitrogen and phosphorus are in this analyte group. The metals include dissolved aluminum, antimony, arsenic, barium, cadmium, chromium, cobalt, iron (total and Fe²⁺), lead, manganese, mercury, molybdenum, nickel, selenium, silver, thallium, vanadium, and zinc.

Analyte measurements were generally reproducible for the major ions and metals. Estimates of measurement reproducibility for these analytes were limited because the duplicate sample pairs often contained concentrations below the reporting limit for the constituent. A summary of measurement reproducibility for the 10 analytes in this group that had at least one duplicate pair with measurements above the reporting limit is shown in the following table.

Analyte	Number of duplicate pairs, all	Number of duplicate pairs less than reporting limit	Relative percent difference	
			Maximum	Minimum
Calcium	9	1	1	1
Magnesium	9	2	2	1
Sodium	9	9	7	1
Potassium	9	1	0	0
Chloride	9	9	2	0
Sulfate	9	9	2	1
Nitrogen, ammonia, as N	9	1	0	0
Nitrate, as N	9	2	1	0
Iron (total)	9	5	12	0
Manganese	9	6	11	0
Zinc	9	7	35	3

The RPDs ranged from 0 percent for zinc to 35 percent for several analytes. The RPD was greater than 10 percent for some samples with low concentrations. Zinc measured in duplicate samples ranged only from less than the reporting limit of 0.010 mg/L to 0.036 mg/L. The RPD for zinc ranged from 3 percent to 35 percent. Concentrations for iron at one surface-water site, GS4SW, were 0.24 mg/L and 0.27 mg/L and the RPD was 12 percent. In other duplicate samples, the concentration of iron ranged from 0.19 mg/L to 19 mg/L and the RPD for these samples ranged from 2 percent to 8 percent.

Concentrations of the major ions and metals in blanks only exceeded the reporting limits for a single analyte in 2 of 17 blanks. Chloride concentrations from equipment blanks nos. 5 and 16 were 0.62 and 0.53 mg/L, respectively. All other measurements were less than the reporting limit of 0.50 mg/L.

Hydrogen

Analyte measurements were generally reproducible for a wide range of hydrogen concentrations. Concentrations ranged from about less than 1.0 nanomoles/L to 21 nanomoles/L (table 9). Estimates of measurement reproducibility for hydrogen included data from 17 duplicate samples. The median RPD for the duplicate samples was about 9 percent and ranged from 2 percent to 37 percent.

Field Measurements

Equipment blanks were not collected for measurement of specific conductance, pH, alkalinity, water temperature, dissolved oxygen, dissolved iron, and hydrogen sulfide. Replicate measurements of sample water were usually completed for two species of dissolved iron (total and Fe^{2+}) and hydrogen sulfide; differences in the replicates was always less than 50 percent (data not shown). Dissolved-oxygen concentrations were determined by meter, but concentrations less than 0.5 mg/L were also determined by Winkler titration.

Summary of Quality-Assurance Data Evaluation

The following conclusion is based on an examination of the quality of ground- and surface-water data collected for this study: Data for volatile organic carbon compounds, methane, major ions, metals, and hydrogen are of good quality. All RPD values were less than 40 percent. The RPD ranged from 0 percent to 11 percent for VOC compounds, 1 percent to 17 percent for methane, 0 percent to 35 percent for major ions and metals, and from 2 percent to 37 percent for hydrogen.

There was no evidence of cross-contamination in any samples and the data were reproducible and unbiased.

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Tables 1 through 9 follow

Table 1. Well-construction data and types of geophysical logs available for monitoring wells at the natural-attenuation study area, Dover Air Force Base, Kent County, Delaware

[Coordinates are in North American datum of 1927 - Delaware state plane; elevation is in feet above and below (-) sea level; ft, feet; in., inch; wells are cased in either PVC, Polyvinyl chloride; GS, galvanized steel; or SS, Stainless steel. Available geophysical logs include Cam, downhole camera log; EM, electro-magnetic conductivity log or G, natural gamma log. --, no data available]

Well number	Date installed	Easting coordinate (ft)	Northing coordinate (ft)	Elevation		Screen length (ft)	Type	Diameter (in.)	Well Casing		Geophysical logs available
				Top of casing	Ground surface				Total depth, below land surface (ft)	Type	
PREVIOUSLY INSTALLED WELLS											
DM02S	05-02-91	489069	410065	26.24	24.14	14.44	10.0	19.70	PVC	2	--
DM101D	06-17-93	490735	411581	25.84	22.89	-20.11	10.0	53.00	PVC	2	EM,G
DM101S	06-17-93	490740	411577	25.70	23.11	16.92	10.0	16.19	PVC	2	--
DM102D	06-15-93	491503	410001	21.44	19.12	-30.12	10.0	59.24	PVC	2	G
DM104D	07-02-93	489371	410579	24.68	22.49	-47.43	10.0	79.92	PVC	2	G,Cam
DM104S	06-30-93	489377	410576	24.71	22.45	15.13	10.0	17.32	PVC	2	Cam
DM105D	07-07-93	489418	410971	21.65	18.55	-50.51	10.0	79.06	PVC	2	G
DM105S	07-07-93	489425	410969	21.44	18.77	11.85	10.0	16.92	PVC	2	--
DM106D	06-29-93	489430	410154	26.07	23.51	-48.85	10.0	82.36	PVC	2	--
DM106S	06-30-93	489428	410141	26.05	23.31	15.93	10.0	17.38	PVC	2	--
DM107D	06-06-93	488957	412656	15.96	13.60	-15.15	10.0	38.75	PVC	2	Cam,EM,G
DM107S	06-06-93	488962	412658	16.38	13.85	7.47	10.0	26.38	PVC	2	Cam
DM108D	06-08-93	488709	412848	13.80	11.46	-11.33	10.0	32.79	PVC	2	Cam
DM108S	06-08-93	488715	412847	13.99	11.66	4.75	10.0	16.91	PVC	2	Cam
DM109D	06-23-93	490939	411295	23.87	21.39	-12.54	10.0	43.93	PVC	2	EM,G
DM109S	06-23-93	490941	411303	24.18	21.59	14.88	10.0	16.71	PVC	2	--
DM110D	06-23-93	490219	411211	29.43	25.37	-38.00	10.0	73.37	PVC	2	Cam,EM,G
DM110S	06-25-93	490224	411212	29.36	25.66	15.33	10.0	20.33	PVC	2	Cam,
DM113D	06-11-93	489466	411967	23.34	20.92	-32.68	10.0	63.60	PVC	2	Cam,EM,G
DM113S	06-16-93	489466	411975	23.20	20.87	12.06	10.0	18.81	PVC	2	Cam

Table 1. Well-construction data and types of geophysical logs available for monitoring wells at the natural-attenuation study area, Dover Air Force Base, Kent County, Delaware--Continued

Well number	Date installed	Easting coordinate (ft)	Northing coordinate (ft)	Elevation		Screen length (ft)	Total depth below land surface (ft)	Well Casing		Geophysical logs available
				Top of casing	Ground surface			Type	Diameter (in.)	
PREVIOUSLY INSTALLED WELLS--CONTINUED										
DM114D	08-24-93	489067	410324	26.51	24.45	-44.66	10.0	79.11	PVC	2
DM116D	08-18-93	487395	413598	19.70	17.89	-18.97	10.0	46.86	PVC	2
DM116S	08-18-93	487394	413603	20.02	17.62	12.33	10.0	15.29	PVC	2
DM117D	08-18-93	487785	413472	16.95	14.77	-18.61	10.0	43.38	PVC	2
DM117S	08-23-93	487786	413477	16.52	14.59	8.33	10.0	15.76	PVC	2
DM118D	08-19-93	487783	413720	16.42	13.31	-18.34	10.0	41.65	PVC	2
DM118S	08-19-93	487780	413720	16.55	13.68	6.50	10.0	17.18	PVC	2
DM119D	08-20-93	487822	413838	17.27	15.54	-14.07	10.0	39.61	PVC	2
DM119S	08-20-93	487822	413833	15.72	14.66	5.41	10.0	19.25	PVC	2
DM121D	08-25-93	488598	410304	25.05	22.25	-36.55	10.0	68.80	PVC	2
DM121S	08-25-93	488459	410300	24.86	22.25	17.29	10.0	14.96	PVC	2
DM206D	08-20-93	487384	414135	19.68	16.59	-17.33	10.0	43.92	PVC	2
MW10	10-25-84	489275	411990	22.38	19.40	9.36	46.0	56.04	PVC	2
MW11	10-26-84	489330	412156	21.76	19.75	8.74	44.0	55.01	PVC	2
MW12	10-29-84	489424	412151	21.81	19.74	8.73	44.0	55.01	PVC	2
MW13	10-26-84	489441	412076	22.97	20.36	8.10	50.00	62.26	PVC	2
MW18	10-24-84	487418	412819	19.73	18.13	7.52	38.0	48.61	PVC	2
MW19	10-24-84	487600	413144	16.27	14.42	5.26	35.0	44.16	PVC	2
MW20	10-25-84	487800	413104	12.34	10.39	3.23	33.0	40.16	PVC	2
MW21	10-29-84	489591	412488	18.03	16.06	6.00	50.0	60.06	PVC	2
MW22	10-30-84	489880	412474	20.19	18.23	8.16	50.0	60.07	PVC	2
MW23	10-30-84	489935	412284	21.39	19.44	9.30	47.0	57.14	PVC	2

Table 1. Well-construction data and types of geophysical logs available for monitoring wells at the natural-attenuation study area, Dover Air Force Base, Kent County, Delaware--Continued

Well number	Date installed	Easting coordinate (ft)	Northing coordinate (ft)	Elevation		Screen length (ft)	Type	Diameter (in.)	Well Casing		Geophysical logs available
				Top of casing	Ground surface				Total depth, below land surface (ft)	Cam	
PREVIOUSLY INSTALLED WELLS--CONTINUED											
MW36D	03-24-88	489701	412604	17.53	15.90	-34.11	5.0	55.01	PVC	2	Cam
MW37D	03-21-88	489365	412481	16.28	14.39	-28.61	5.0	48.00	PVC	2	Cam,EM,G
MW37S	03-21-88	489363	412490	16.29	14.01	3.69	10.0	20.32	PVC	2	Cam
MW38D	03-25-88	489861	412143	19.64	17.20	-34.96	5.0	57.16	PVC	2	Cam
MW38S	03-25-88	489865	412133	19.05	17.22	-2.71	10.0	29.93	PVC	2	Cam
MW39D	03-23-88	489535	412288	19.55	18.28	-34.70	5.0	57.98	PVC	2	Cam,EM,G
MW39S	03-23-88	489537	412279	19.57	17.01	7.41	10.0	19.60	PVC	2	Cam
MW40D	03-22-88	489586	412027	20.51	18.76	-23.27	5.0	47.03	PVC	2	Cam,EM,G
MW40S	03-23-88	489681	412031	20.68	18.66	6.57	10.0	22.09	PVC	2	Cam
MW41D	03-21-88	489931	412065	23.45	21.60	-36.55	5.0	63.15	PVC	2	--
MW41S	03-21-88	489925	412055	23.61	21.60	8.60	10.0	23.00	PVC	2	Cam
MW42P	05-17-88	489911	412733	19.41	16.84	-7.58	33.0	57.42	PVC	4	Cam,G
MW43D	03-30-88	487775	413230	14.06	11.70	-3.31	5.0	20.01	PVC	2	Cam
MW43S	05-28-88	487787	413230	14.15	11.62	-20.49	10.0	42.11	PVC	2	Cam,EM,G
MW44D	03-28-88	487310	412982	20.99	18.06	-26.93	5.0	49.99	PVC	2	Cam,EM,G
MW44S	03-29-88	487322	412990	20.61	17.78	5.85	10.0	21.93	PVC	2	Cam
MW61D	03-29-88	490150	411683	26.51	25.21	-37.74	5.0	67.95	PVC	2	--
MW61S	03-29-88	490140	411682	26.77	24.74	7.21	10.0	27.53	PVC	2	EM,G
MW62D	05-03-88	489860	411628	22.14	19.77	-42.94	5.0	67.71	PVC	2	Cam,EM,G
MW62S	05-04-88	489862	411635	22.27	19.48	4.49	10.0	24.99	PVC	2	Cam
MW63D	05-02-88	489751	411274	22.20	20.15	-47.86	5.0	73.01	PVC	2	--
MW63S	04-29-88	489761	411277	22.12	19.63	9.61	10.0	20.02	PVC	2	--

Table I. Well-construction data and types of geophysical logs available for monitoring wells at the natural-attenuation study area, Dover Air Force Base, Kent County, Delaware—Continued

Well number	Date installed	Easting coordinate (ft)	Northing coordinate (ft)	Elevation			Well Casing			Geophysical logs available
				Top of casing	Ground surface	Top of screen	Screen length (ft)	Type	Diameter (in.)	
PREVIOUSLY INSTALLED WELLS—CONTINUED										
MW64D	03-25-88	490634	410825	23.92	21.68	-37.48	5.0	PVC	2	--
MW64S	03-25-88	490626	410827	24.14	21.69	-3.09	10.0	PVC	2	--
MW206D	03-15-88	489137	412452	16.85	14.27	-20.05	10.0	44.32	PVC	2
MW206M	04-23-88	489097	412435	16.22	14.10	-4.22	10.0	28.32	PVC	2
MW207D	04-22-88	488992	412045	20.75	18.00	-19.48	10.0	47.48	PVC	2
MW207M	04-22-88	488986	412057	20.82	18.07	-6.64	10.0	34.71	PVC	2
MW226D	03-24-89	489552	411777	24.31	22.31	-44.99	10.0	77.30	PVC	2
MW226M	04-04-89	489558	411769	24.71	22.38	-14.51	10.0	46.89	PVC	2
MW226S	04-04-89	489554	411774	24.81	22.31	12.53	10.0	19.78	PVC	2
MW227D	03-23-89	488960	412970	22.86	19.36	-16.85	10.0	46.21	PVC	2
MW227M	04-03-89	488965	412973	21.45	19.35	-3.98	10.0	33.33	PVC	2
MW227S	04-04-89	488969	412977	21.39	19.35	6.41	10.0	22.94	PVC	2
MWD4A	03-10-88	488996	412055	20.93	17.97	13.72	10.0	14.25	PVC	2
MWD4B	03-08-88	489126	412459	17.29	14.17	11.25	10.0	12.92	PVC	2
MWD4C	03-09-88	489727	412614	18.81	16.31	12.00	10.0	14.31	PVC	2
MWD4D	03-10-88	489208	411561	23.34	20.42	16.35	10.0	14.07	PVC	2
MWD4E	03-01-89	489374	411580	24.01	21.43	6.88	3.0	17.55	PVC	2
MWD4F	02-28-89	488714	412283	20.38	17.63	6.25	3.0	14.38	GS	2
MWD4G	02-28-89	488931	412891	21.68	19.43	6.32	3.0	16.11	PVC	2
MWD4H	03-01-89	489587	412977	21.21	19.01	12.47	3.0	9.54	PVC	2
MWD4I	03-01-89	490408	412896	21.87	18.58	-0.45	3.0	22.03	PVC	2
MWDD1F	03-11-88	487595	414128	19.09	16.19	10.39	10.0	15.80	PVC	2

Table 1. Well-construction data and types of geophysical logs available for monitoring wells at the natural-attenuation study area, Dover Air Force Base, Kent County, Delaware—Continued

Well number	Date installed	Easting coordinate (ft)	Northing coordinate (ft)	Elevation			Screen length (ft)	Type	Diameter (in.)	Well Casing	
				Top of casing	Ground surface	Top of screen				Total depth below land surface (ft)	Geophysical logs available
WELLS INSTALLED BY THE U.S. GEOLOGICAL SURVEY											
GSI1S	07-12-95	489080	412185	14.26	9.06	6.16	0.5	3.70	SS	2	--
GSI1M	07-02-95	489080	412185	15.82	9.21	-2.59	1.0	13.10	SS	2	--
GSI1D	07-12-95	489080	412185	13.59	9.09	-12.21	3.0	23.30	SS	2	--
GSI2S	07-19-95	488938	412341	14.86	7.28	2.28	0.5	5.80	SS	2	--
GSI2M	07-18-95	488938	412341	10.36	7.06	-4.44	1.0	12.30	SS	2	--
GSI2D	07-19-95	488938	412341	10.79	7.39	-12.71	3.0	23.30	SS	2	--
GSI3S	07-20-95	487458	412203	7.56	4.76	-1.34	3.0	11.30	SS	2	--
GSI3M	07-21-95	487458	412203	8.27	4.37	-7.33	3.0	18.80	SS	2	--
GSI4S	07-31-95	487978	413863	10.47	3.27	-1.73	0.5	5.80	SS	2	--
GSI4M	08-02-95	487978	413863	10.33	3.76	-5.24	0.5	9.80	SS	2	--
GSI4D	07-31-95	487978	413863	9.60	4.50	-13.80	3.0	21.30	SS	2	--
GSCP1	07-02-96	487694	413506	15.44	15.60	-5.40	3.0	24.00	PVC	2	--
GSCP3D	05-15-96	488754	413226	16.26	16.60	-26.40	3.0	46.00	PVC	2	--
GSCP3M	05-15-96	488752	413224	16.30	16.80	-2.20	3.0	22.00	PVC	2	--
GSCP4M	05-17-96	488863	413131	18.33	18.60	-2.40	3.0	24.00	PVC	2	--
GSCP5M	05-06-96	489178	412731	17.92	18.20	-8.80	3.0	30.00	PVC	2	--
GSCP6D	05-23-96	489645	413073	18.44	18.80	-18.70	3.0	40.50	PVC	2	--
GSCP8	07-02-96	491065	410697	22.30	22.50	-7.50	3.0	33.00	PVC	2	--
GSCP9S	05-10-96	489325	412149	19.59	19.90	-4.10	3.0	26.00	PVC	2	--

Table 2. Daily mean water-level elevations in wells DM110D and DM110S, piezometers GS4D and GS4S, and Pipe Elm Branch, Dover Air Force Base, Kent County, Delaware, October 1995 through December 1996

[--,data not available]

WELL DM110D STATION NUMBER 390744075270402 LATITUDE 39°07'44" LONGITUDE 075°27'04"
WELL DEPTH 74.0 FEET BELOW LAND SURFACE, GEOLOGIC UNIT: COLUMBIA AQUIFER

GROUND-WATER LEVEL ELEVATIONS, IN FEET ABOVE SEA LEVEL, DAILY MEAN VALUES														
1995						1996								
DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG			
1	---	8.21	8.95	9.62	11.92	12.69	---	13.29	13.05	---	11.78	10.81	11.92	11.08
2	---	8.23	8.87	9.66	11.95	12.77	---	13.25	13.00	---	11.70	10.84	11.91	11.16
3	---	8.25	8.91	9.77	11.96	12.67	---	13.19	13.01	---	11.61	10.84	11.75	11.10
4	---	8.21	8.93	9.65	11.87	12.45	---	13.19	13.02	---	11.55	10.73	11.62	11.17
5	---	8.19	8.92	9.66	11.80	12.65	---	13.26	12.96	---	11.49	10.71	11.61	11.19
6	---	8.19	8.95	9.69	11.78	---	14.26	13.49	12.89	---	11.47	10.73	11.59	11.48
7	---	8.25	8.95	9.91	11.81	---	14.30	13.49	12.88	---	11.44	---	11.60	11.59
8	---	8.25	8.93	9.95	11.97	---	14.35	13.84	12.85	---	11.36	---	11.71	12.03
9	---	8.19	9.00	9.84	12.14	---	14.51	14.23	12.75	---	11.29	---	11.66	12.24
10	---	8.18	8.99	9.84	12.35	---	14.92	14.54	12.70	---	11.23	---	11.52	12.32
11	---	8.25	8.99	9.80	12.69	---	15.05	14.69	12.68	---	11.19	---	11.46	---
12	---	8.28	8.97	9.97	12.62	---	15.07	14.69	12.68	---	11.18	11.39	11.36	---
13	---	8.28	8.97	9.98	12.55	---	14.86	14.48	12.68	---	11.17	11.49	11.32	---
14	---	8.44	9.03	9.94	12.74	---	14.70	14.33	12.85	---	11.08	11.57	11.33	---
15	---	8.54	9.04	9.93	12.59	---	14.49	14.22	12.70	---	11.00	11.54	11.26	---
16	---	8.52	9.04	9.93	12.55	---	14.72	14.21	12.68	---	10.96	11.56	11.24	---
17	---	8.57	9.04	10.07	12.54	---	14.66	14.22	12.85	---	12.89	11.15	11.58	11.29
18	---	8.64	9.08	10.14	12.43	---	14.14	14.14	12.81	---	11.13	11.58	11.39	---
19	---	8.68	9.23	10.60	12.24	---	14.11	14.11	12.70	---	11.07	11.79	11.40	---
20	---	8.70	9.32	10.69	12.30	---	14.03	14.03	12.62	---	11.02	11.92	11.32	---
21	---	8.78	9.33	10.96	12.52	---	13.91	13.73	14.49	---	12.60	11.01	11.96	11.25
22	---	8.77	9.36	11.13	12.67	---	13.60	14.32	12.47	---	12.54	11.09	12.02	11.19
23	---	8.77	9.39	11.31	12.83	---	13.51	14.15	12.41	---	12.47	11.05	12.13	11.11
24	---	8.77	9.44	11.52	13.04	---	13.37	14.07	12.32	---	10.96	12.15	11.07	---
25	---	8.80	9.48	11.34	12.98	---	13.30	13.30	12.24	---	12.24	10.85	12.09	11.15
26	8.23	8.83	9.52	11.34	12.97	---	13.58	13.26	12.16	10.84	11.99	10.95	---	
27	8.24	8.86	9.53	11.68	12.94	---	13.38	13.21	12.06	10.91	12.11	10.92	---	
28	8.27	8.85	9.52	11.69	13.05	---	13.41	13.21	12.76	10.92	12.00	10.94	---	
29	8.23	8.84	9.50	11.83	12.76	---	13.46	13.21	12.01	10.84	12.07	10.95	---	
30	8.20	8.87	9.54	12.01	12.07	---	13.12	13.12	12.07	10.84	11.96	11.32	---	
31	8.20	---	9.61	12.07	12.07	---	13.75	13.75	12.43	10.50	11.18	11.36	---	
MEAN	---	8.51	9.17	10.50	12.43	---	14.69	13.05	12.07	9.61	11.78	11.92	---	
MAX	---	8.87	9.61	12.07	12.07	---	13.12	13.12	12.07	9.62	10.84	10.92	---	
MIN	---	8.18	8.87	9.62	11.78	---	13.12	13.12	12.07	9.62	10.84	10.92	---	

Table 2. Daily mean water-level elevations in wells DMI10D and DMI10S, piezometers GS4D and GS4S, and Pipe Elm Branch, Dover Air Force Base, Kent County, Delaware, October 1995 through December 1996—Continued

WELL DMI10S STATION NUMBER 390744075270401 LATITUDE 39°07'44" LONGITUDE 75°27'04"
WELL DEPTH 19.0 FEET BELOW T.A.:D SURFACE, GEOLOGIC UNIT: COLUMBIA AQUIFER

GROUND-WATER LEVEL ELEVATIONS, IN FEET ABOVE SEA LEVEL, DAILY MEAN VALUES

DAY	1995					1996									
	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1	...	13.16	14.17	15.08	18.24	20.17	20.92	20.31	19.64	19.24	17.38	17.63	15.61	17.28	17.37
2	...	13.30	14.11	15.14	18.39	20.42	20.85	20.34	19.58	19.39	...	17.50	15.66	17.27	17.50
3	...	13.36	14.14	15.26	18.53	20.24	20.82	20.39	19.72	19.50	...	17.32	15.66	16.96	17.53
4	...	13.22	14.21	15.11	18.42	19.93	20.89	20.47	19.86	19.22	...	17.21	15.52	16.81	17.80
5	...	13.13	14.16	15.07	18.37	20.42	20.77	20.38	19.80	18.82	...	17.07	15.49	16.89	17.98
6	...	13.19	14.25	15.13	18.45	20.68	20.67	20.49	19.71	18.66	...	17.07	15.51	16.91	18.53
7	...	13.38	14.26	15.44	18.71	20.65	20.83	20.36	19.73	18.56	...	17.03	15.34	17.04	18.71
8	...	13.36	14.19	15.54	19.18	20.56	20.73	20.68	19.63	18.49	...	16.87	15.75	17.34	19.05
9	...	13.15	14.33	15.38	19.34	20.10	20.89	20.75	19.37	18.26	...	16.75	15.55	17.25	19.14
10	...	13.11	14.32	15.38	19.27	19.93	20.97	20.90	19.29	17.79	...	16.64	15.44	17.06	19.17
11	...	13.33	14.31	15.28	19.74	20.32	20.92	21.15	19.31	17.48	...	16.56	15.36	16.97	...
12	...	13.31	14.29	15.57	19.58	20.78	20.97	20.95	19.37	17.51	...	16.52	15.83	16.80	...
13	...	13.23	14.28	15.56	19.45	20.82	20.87	20.59	19.37	18.05	...	16.50	16.02	16.78	...
14	...	13.51	14.39	15.49	19.92	20.82	20.77	20.43	19.73	18.04	...	16.38	16.19	16.89	...
15	...	13.58	14.43	15.45	19.74	20.99	20.64	20.40	19.78	18.23	...	16.26	16.17	16.77	...
16	...	13.40	14.43	15.46	19.78	20.67	21.06	20.64	19.65	18.32	...	16.18	16.26	16.81	...
17	...	13.46	14.40	15.68	19.83	20.56	20.76	20.76	19.59	18.41	19.45	16.23	16.32	17.02	...
18	...	13.60	14.48	15.80	19.68	20.59	20.64	20.74	19.57	18.48	19.46	16.17	16.38	17.30	...
19	...	13.69	14.71	16.15	19.38	20.85	20.77	20.77	19.70	18.81	19.33	16.12	16.60	17.37	...
20	...	13.74	14.82	15.94	19.61	20.89	20.83	20.68	20.14	18.66	19.22	16.04	16.59	17.23	...
21	...	13.90	14.77	16.19	19.94	20.68	20.71	20.50	20.32	18.42	19.20	16.00	16.62	17.11	...
22	...	13.89	14.78	16.39	20.12	20.48	20.68	20.20	20.31	18.27	19.11	16.04	16.73	17.00	...
23	...	13.85	14.79	16.71	20.27	20.31	20.88	20.03	20.14	18.24	18.95	15.95	17.01	16.83	...
24	...	13.84	14.85	17.15	20.51	20.12	20.67	19.90	19.96	18.06	18.84	15.85	17.09	16.76	...
25	...	13.88	14.90	16.87	20.36	20.35	20.69	19.67	19.93	17.92	18.63	15.77	17.02	16.78	...
26	13.23	13.97	14.95	16.93	20.36	20.30	20.83	19.60	19.59	17.86	18.48	15.69	16.95	17.02	...
27	13.30	14.05	14.96	17.65	20.38	20.05	20.42	19.59	19.40	17.56	18.32	15.69	17.11	16.66	...
28	13.37	14.04	14.93	17.49	20.65	20.29	20.14	19.67	19.25	17.39	18.13	15.76	17.43	16.74	...
29	13.19	...	14.88	17.77	20.20	20.69	20.37	19.88	19.02	17.37	17.98	15.72	17.34	16.89	...
30	13.09	14.00	14.92	18.25	...	20.61	20.51	19.92	19.07	17.36	17.84	15.64	17.57	17.03	...
31	13.11	...	15.04	18.47	...	20.74	...	19.77	19.77	17.38	17.68	15.35	17.35	17.35	...
MEAN	14.53	16.09	19.53	20.48	20.75	20.35	18.25	17.63	16.41	16.99	16.99	16.99	...
MAX	...	14.05	15.04	18.47	20.65	20.99	21.06	21.15	20.32	19.50	17.63	17.37	17.37	17.37	...
MIN	...	13.11	14.11	15.07	18.24	19.93	20.14	19.59	19.02	17.36	15.64	16.66	16.66	16.66	...

Table 2. Daily mean water-level elevations in wells DM110D and DM110S, piezometers GS4D and GS4S, and Pipe Elm Branch, Dover Air Force Base, Kent County, Delaware, October 1995 through December 1996—Continued

WELL GS4D STATION NUMBER 390742075300102 LATITUDE 39°07'42" LONGITUDE 075°30'01"
WELL DEPTH 25.0 FEET BELOW LAND SURFACE, GEOLOGIC UNIT: COLUMBIA AQUIFER

GROUND-WATER LEVEL ELEVATIONS, IN FEET ABOVE SEA LEVEL, DAILY MEAN VALUES											
1995						1996					
DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG
1	...	5.02	5.47	5.75	...	6.90	...	7.10	6.89	7.06	6.41
2	4.62	5.07	5.44	5.81	...	6.95	...	7.05	6.87	7.04	6.36
3	4.63	5.06	5.45	5.94	...	...	...	7.04	6.98	7.02	6.42
4	4.65	5.05	5.45	5.94	...	...	...	7.03	6.92	6.93	6.23
5	4.94	5.02	5.45	...	...	...	...	7.36	6.91	6.86	6.22
6	4.83	5.03	5.47	...	...	...	...	7.45	7.22	6.84	6.56
7	4.83	5.08	5.46	...	...	...	...	7.61	7.14	6.83	6.66
8	4.80	5.09	5.44	...	...	...	...	7.51	7.48	6.79	6.72
9	4.80	5.04	5.52	...	...	...	...	...	7.62	6.76	6.49
10	4.79	5.04	...	...	...	...	...	7.52	6.77	6.81	6.62
11	4.79	5.10	...	6.00	...	...	...	7.57	6.85	6.52	6.38
12	4.77	5.28	...	...	...	...	...	7.76	7.57	6.89	6.46
13	4.76	5.15	...	...	...	...	...	7.71	7.45	7.36	6.04
14	4.83	5.52	...	...	...	...	...	7.63	7.40	6.99	6.02
15	5.04	5.42	5.48	...	...	...	...	7.58	7.37	6.95	5.95
16	4.90	5.31	5.61	...	...	...	...	7.44	6.90	6.86	5.95
17	4.88	5.29	5.56	...	...	6.98	7.62	7.39	6.89	6.81	6.27
18	4.87	5.30	5.53	6.05	...	6.97	7.55	7.37	6.95	6.75	6.28
19	4.87	5.33	...	...	...	...	7.55	7.35	7.35	6.89	6.74
20	4.90	5.35	...	...	...	6.88	...	7.50	7.30	...	6.27
21	5.11	5.38	...	...	...	...	...	7.43	...	6.75	6.27
22	5.01	5.35	...	6.95	...	6.92	7.39	7.15	7.39	6.73	6.31
23	4.99	5.37	...	6.52	...	6.86	7.38	7.05	7.31	6.65	6.32
24	5.00	5.40	...	6.53	...	6.82	7.29	7.01	7.28	6.71	6.17
25	4.99	5.40	5.78	...	...	6.83	7.27	6.96	7.25	6.68	6.18
26	5.00	5.41	5.80	...	...	6.82	7.25	6.94	7.13	6.67	6.04
27	5.03	5.42	5.82	...	6.96	...	7.16	6.96	7.09	6.59	6.26
28	5.13	5.38	5.83	...	...	...	...	7.02	7.07	6.62	6.56
29	5.03	5.51	5.78	...	6.89	...	...	7.05	7.02	6.61	6.07
30	5.01	5.46	5.73	6.68	...	...	7.20	6.98	7.13	6.62	6.55
31	5.01	...	5.73	...	...	...	...	6.92	...	6.62	6.46
MEAN	...	5.25	...	...	...	...	...	...	...	6.81	6.41
MAX	5.13	5.52	...	...	...	...	7.62	7.79	7.18	...	5.95
MIN	4.62	5.02	...	...	...	...	6.92	6.76	6.61	...	...

Table 2. Daily mean water-level elevations in wells DM110D and DM110S, piezometers GS4D and GS4S, and Pipe Elm Branch, Dover Air Force Base, Kent County, Delaware, October 1995 through December 1996—Continued

WELL GS4S STATION NUMBER 390742075300101 LATITUDE 39°07'42" LONGITUDE 075°30'01"
WELL DEPTH 5.0 FEET BELOW LAND SURFACE, GEOLOGIC UNIT: COLUMBIA AQUIFER

GROUND-WATER LEVEL ELEVATIONS, IN FEET ABOVE SEA LEVEL, DAILY MEAN VALUES

1995												1996											
DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC								
1	...	3.76	3.93	...	4.15	...	4.26	4.14	4.34	4.93	4.47	4.16	4.31	4.51									
2	3.62	3.85	3.86	4.14	4.29	...	4.19	4.13	4.30	4.49	4.49	4.17	4.28	4.72									
3	3.63	3.82	3.86	4.40	4.20	4.59	4.22	4.44	4.30	4.41	4.41	4.17	4.26	4.38									
4	3.66	3.80	3.87	4.04	4.16	4.52	4.20	4.26	4.23	4.40	4.41	4.17	4.24	4.32									
5	...	3.74	3.88	...	4.16	4.49	...	4.31	4.14	4.42	4.42	4.15	4.24	4.30									
6	3.92	3.75	3.89	...	4.37	4.49	4.56	4.14	4.23	4.43	4.45	4.14	4.24	5.10									
7	3.94	3.89	3.85	...	4.83	...	4.11	4.25	4.43	4.39	4.15	4.24	5.28										
8	3.83	3.88	3.84	...	4.59	...	4.07	4.38	4.44	4.37	5.26	4.41	4.83										
9	3.78	3.75	4.03	...	...	...	4.08	4.44	4.46	4.33	4.83	4.53	4.53										
10	3.75	3.76	...	4.42	...	4.45	4.15	4.52	4.48	4.32	4.94	4.31	4.50										
11	3.72	...	...	4.34	4.26	4.67	...	4.43	4.50	4.51	4.55	4.35	4.29	...									
12	3.65	...	...	4.29	4.57	4.50	...	4.66	4.50	4.44	4.30	4.24	4.24	...									
13	3.62	3.90	3.82	...	4.31	4.58	4.29	...	5.34	...	4.39	4.28	4.24	...									
14	...	...	3.84	...	4.29	4.53	4.26	4.31	4.53	4.52	4.28	4.28	4.24	...									
15	...	4.31	3.84	3.99	4.34	4.47	4.24	4.22	4.56	4.38	4.27	4.28	4.26	...									
16	3.79	3.98	4.26	4.01	4.29	4.42	4.31	4.16	4.57	4.40	4.31	4.25	4.29	...									
17	3.72	3.90	3.97	4.06	4.30	4.42	4.31	4.45	4.43	5.00	4.25	4.24	4.24	...									
18	3.69	3.89	3.92	4.36	4.30	4.35	4.33	4.39	4.51	4.41	4.36	4.41	4.32	...									
19	3.68	3.90	...	...	4.35	4.29	...	4.63	4.40	4.25	5.40	4.37	4.37	...									
20	3.76	3.95	...	4.41	...	4.33	...	5.10	4.43	4.40	4.22	4.63	4.28	...									
21	...	3.99	...	4.68	4.40	4.29	4.23	4.46	4.40	4.43	4.20	4.48	4.25	...									
22	3.92	3.90	3.96	4.29	4.33	4.29	4.27	4.33	4.35	4.43	4.48	4.39	4.43	4.21	...								
23	3.84	3.96	4.03	4.18	4.51	4.23	4.26	4.16	4.25	4.48	4.46	4.26	4.45	4.24	...								
24	3.84	4.02	3.99	4.39	4.32	4.20	4.23	4.10	4.29	4.47	4.46	4.34	4.40	4.21	...								
25	3.80	3.98	3.95	4.17	4.23	4.23	4.20	4.09	4.29	4.47	4.48	4.26	4.38	4.23	...								
26	3.85	3.96	...	4.10	4.21	4.23	4.18	4.06	4.18	4.54	4.50	4.25	4.36	4.47	...								
27	...	3.94	...	4.20	4.21	4.15	4.22	4.17	4.45	4.53	4.26	4.35	4.25	...									
28	4.09	3.84	4.28	4.21	...	4.13	4.38	4.22	4.49	4.53	4.32	4.39	4.26	...									
29	3.80	4.14	4.16	...	4.14	4.14	4.45	4.24	4.55	4.53	4.53	4.34	4.22	...									
30	3.75	3.95	4.14	...	4.52	4.44	4.27	4.54	4.61	4.51	4.22	4.40	4.23	...									
31	3.74	...	...	...	4.41	...	4.18	...	4.56	4.50	...	4.31	...	...							
MEAN	...	...	...	...	...	...	...	...	...	...	...	...	...	...
MAX	...	...	...	...	...	...	...	...	...	...	...	...	...	...
MIN	...	...	...	...	...	...	...	...	...	...	...	...	...	...

Table 2. Daily mean water-level elevations in wells DMI10D and DMI10S, piezometers GS4D and GS4S, and Pipe Elm Branch Dover Air Force Base, Kent County, Delaware, October 1995 through December 1996—Continued

PIPE ELM BRANCH NEAR DOVER, DELAWARE STATION NUMBER 01483625 LATITUDE 39°07'42" LONGITUDE 075°30'01"

GAGE HEIGHT ELEVATIONS, IN FEET ABOVE SEA LEVEL, DAILY MEAN VALUES

1995												1996													
DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC										
1	...	3.15	3.23	3.20	...	3.31	5.08	3.55	3.49	3.58	4.60	4.06	3.64	3.68	4.01										
2	3.20	3.26	3.15	3.75	...	3.51	4.22	3.52	3.48	3.57	4.03	4.09	3.66	3.64	4.11										
3	3.23	3.24	3.17	3.60	...	3.35	3.65	3.58	3.87	3.59	4.01	4.02	3.68	3.64	3.72										
4	3.26	3.19	3.20	3.16	...	3.30	3.59	3.54	3.57	3.53	4.04	4.04	3.70	3.62	3.68										
5	4.32	3.11	3.22	3.18	3.22	3.30	3.57	4.60	3.67	3.49	4.12	4.04	3.68	3.61	3.68										
6	3.38	3.15	3.22	3.11	3.21	3.66	3.58	3.91	3.47	3.74	4.15	4.06	3.68	3.62	4.56										
7	3.48	3.34	3.18	3.18	...	3.24	4.39	4.07	3.76	3.46	3.83	4.17	3.99	3.70	3.65										
8	3.30	3.27	3.18	3.18	...	3.47	...	3.67	4.42	3.43	4.02	4.23	4.01	5.03	3.83	4.12									
9	3.29	3.12	3.41	3.41	...	4.41	3.42	4.64	4.51	3.45	4.12	4.27	3.96	4.25	3.84	3.80									
10	3.25	3.16	3.19	3.19	...	3.55	3.37	4.31	3.67	3.51	4.17	4.32	3.96	4.33	3.63	3.80									
11	3.20	3.32	3.16	3.16	...	3.46	3.39	3.67	3.80	3.83	4.24	4.37	4.16	3.70	3.64	...									
12	3.11	3.89	3.15	3.15	...	3.36	3.43	3.58	3.73	3.98	4.38	4.32	3.99	3.68	3.61	...									
13	3.10	3.18	3.14	3.14	...	3.31	...	3.66	3.51	4.83	5.00	6.59	3.92	3.67	3.62	...									
14	3.49	4.77	3.15	3.15	...	3.33	3.45	3.62	3.51	3.56	4.02	3.97	3.84	3.67	3.63	...									
15	3.81	...	3.14	3.14	...	3.46	3.54	3.75	3.51	3.51	4.13	3.87	3.85	3.68	3.67	...									
16	3.14	3.21	3.43	3.19	...	3.48	4.35	4.35	3.73	3.49	4.08	3.82	3.92	3.66	3.66	...									
17	3.10	3.17	3.19	3.19	...	3.52	3.61	3.57	3.47	4.01	3.80	4.56	3.66	3.69	3.69	...									
18	3.09	3.17	3.22	3.22	...	3.52	3.58	3.58	3.74	4.12	3.80	3.80	3.86	3.72	3.72	...									
19	3.10	3.21	...	...	...	3.44	3.94	3.58	3.55	6.30	4.19	3.82	3.74	4.92	2.78	...								
20	3.23	3.33	...	...	...	3.71	3.90	3.56	3.54	4.37	3.98	3.88	3.74	3.98	3.67	...								
21	4.03	3.36	3.24	3.15	...	4.02	3.62	3.52	3.60	3.63	4.02	3.93	3.73	3.80	3.65	...									
22	3.25	3.24	3.34	3.34	...	3.48	3.47	3.52	3.64	3.55	4.09	3.98	3.91	3.75	3.62	...									
23	3.19	3.40	3.28	3.28	...	3.74	3.41	3.51	3.47	3.48	4.12	3.96	3.77	3.78	3.66	...									
24	3.22	3.34	3.23	3.23	...	3.44	3.40	3.49	3.44	3.59	4.13	3.98	3.88	3.73	3.63	...									
25	3.19	3.34	3.11	3.11	...	3.34	3.42	3.42	3.44	3.51	4.16	4.01	3.77	3.72	3.65	...									
26	3.28	3.33	3.12	3.12	...	3.33	3.41	3.47	3.42	3.43	4.20	4.03	3.82	3.72	3.90	...									
27	3.36	3.30	3.12	4.07	3.33	3.41	3.45	3.61	3.44	4.13	4.06	3.81	3.71	3.63	3.63	...									
28	3.57	3.14	3.13	3.38	3.34	3.77	3.44	3.77	3.54	4.22	4.08	3.88	3.75	3.67	3.67	...									
29	3.14	3.54	3.12	3.26	3.31	5.13	3.46	3.86	3.56	4.26	4.03	4.00	3.68	3.63	3.63	3.63	...								
30	3.11	3.24	3.11	3.25	...	3.60	3.85	3.60	3.90	4.29	4.04	3.68	3.76	3.66	3.66	3.66	...								
31	3.13	...	3.11	3.27	...	3.48	...	3.50	...	4.19	4.06	3.66	3.66	3.66	3.66	3.66	...								
MEAN	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
MAX	4.32	4.77	5.13	5.08	4.60	6.30	5.00	6.59	4.56	5.03	3.90	3.90
MIN	3.09	3.11	3.30	3.44	3.42	3.43	3.80	3.68	3.64	3.64	3.61	3.61

Table 3. Measured ground- and surface-water level elevations at the natural-attenuation study area, Dover Air Force Base, Kent County, Delaware, July 1995 through September 1996

[Locations of wells shown in figure 2; surface-water sites shown in figure 7; --, data not collected]

Well identification number	WATER-LEVEL ELEVATIONS IN FEET ABOVE SEA LEVEL						
	1995		1996				
	July 24	December 6	March 6	April 26	June 4	August 16	September 19
GROUND-WATER LEVELS							
DM101D	8.99	8.86	12.70	13.72	12.84	12.79	10.92
DM101S	14.96	13.25	21.13	21.05	20.26	18.04	15.91
DM107D	--	--	--	--	10.21	9.87	8.78
DM107S	--	--	--	--	10.43	10.04	8.90
DM108D	--	--	--	--	9.21	8.98	7.95
DM108S	--	--	--	--	9.37	9.09	8.04
DM109D	9.30	8.99	13.22	14.32	13.35	13.5	11.22
DM109S	13.83	11.68	20.67	20.68	19.8	17.73	14.98
DM110D	9.12	8.88	12.75	13.83	12.95	12.9	11.01
DM110S	15.04	14.16	20.73	20.91	19.86	19.24	15.81
DM113D	8.76	8.72	12.11	12.97	12.23	12.4	10.58
DM113S	8.95	8.85	12.55	13.51	12.55	12.75	10.86
DM116D	--	6.12	7.72	7.04	7.60	7.51	6.80
DM116S	--	10.02	11.59	12.29	11.27	11.66	9.68
DM117D	--	6.00	7.50	7.77	7.41	7.22	6.64
DM117S	--	4.61	5.62	5.67	5.46	5.43	5.01
DM118D	--	5.67	7.18	7.37	7.04	6.92	6.23
DM118S	--	5.30	6.38	6.37	6.15	6.14	4.68
DM119D	--	5.59	7.12	7.27	--	6.84	6.17
DM119S	--	3.75	5.01	5.02	--	4.72	4.21
DM206D	--	--	--	--	6.59	6.61	5.76
MW10	8.87	8.83	11.98	12.75	12.05	12.00	10.58
MW12	8.70	8.71	12.05	12.86	12.15	12.1	10.54
MW11	8.66	8.67	11.94	12.74	12.04	11.96	10.46
MW18	7.04	--	9.29	11.16	9.35	9.12	8.32

Table 3. Measured ground- and surface-water level elevations at the natural-attenuation study area, Dover Air Force Base, Kent County, Delaware, July 1995 through September 1996—Continued

Well identification number	WATER-LEVEL ELEVATIONS IN FEET ABOVE SEA LEVEL						
	1995		1996				
	July 24	December 6	March 6	April 26	June 4	August 16	September 19
GROUND-WATER LEVELS--CONTINUED							
MW19	6.07	6.53	8.02	8.45	8.02	7.91	7.21
MW20	5.84	6.34	7.72	8.05	7.71	7.59	6.94
MW21	8.58	8.63	11.98	12.83	12.11	12.06	10.22
MW22	8.61	8.65	12.10	12.95	12.22	12.05	10.48
MW23	8.82	8.76	12.28	13.12	12.35	12.28	10.62
MW36D	8.35	8.43	11.81	12.65	11.93	11.82	10.24
MW37D	8.42	8.50	11.75	12.58	12.28	11.73	10.28
MW37S	8.06	8.14	11.31	12.07	11.38	11.25	9.75
MW38D	8.52	8.56	12.04	12.84	12.12	--	10.41
MW38S	8.52	8.60	12.03	12.87	12.15	--	10.39
MW39D	8.53	8.55	11.92	13.73	12.01	11.83	14.34
MW39S	8.55	8.55	11.91	12.76	12.06	11.99	10.36
MW40D	8.79	8.74	12.22	13.08	12.33	12.33	--
MW40S	8.61	8.58	12.03	12.87	12.13	12.04	--
MW41D	8.8	8.74	12.30	13.2	12.38	12.31	10.65
MW41S	8.78	8.75	12.29	13.19	12.4	12.36	10.69
MW42P	8.54	8.66	12.09	12.91	12.18	12.08	10.50
MW43D	6.05	6.55	7.94	8.29	7.94	5.82	7.17
MW43S	5.88	6.44	7.76	8.09	7.75	5.67	7.03
MW44D	7.07	7.44	9.19	9.69	9.21	9.08	--
MW44S	7.14	7.51	9.28	9.87	9.40	9.09	--
MW61D	9.04	--	22.96	--	--	--	--
MW61S	9.02	8.87	12.57	13.49	12.67	12.57	10.89
MW62D	8.94	8.84	12.47	13.43	12.59	12.56	10.80
MW62S	8.94	8.82	12.48	13.43	12.57	12.48	10.81
MW63D	9.03	8.88	12.62	13.61	12.73	--	--

Table 3. Measured ground- and surface-water level elevations at the natural-attenuation study area, Dover Air Force Base, Kent County, Delaware, July 1995 through September 1996—Continued

Well identification number	WATER-LEVEL ELEVATIONS IN FEET ABOVE SEA LEVEL						
	1995			1996			
	July 24	December 6	March 6	April 26	June 4	August 16	September 19
GROUND-WATER LEVELS--CONTINUED							
MW63S	9.06	8.88	12.64	13.8	12.87	--	--
MW64D	9.28	8.98	13.14	14.27	13.29	13.47	11.26
MW64S	9.33	9.00	13.24	14.39	13.39	13.58	11.32
MW206D	8.37	8.47	11.57	12.38	11.70	11.64	10.20
MW206M	8.28	8.43	11.42	12.14	11.54	11.46	10.12
MW207D	--	8.62	11.64	12.40	11.75	11.74	10.29
MW207M	--	8.62	11.62	12.43	11.72	11.69	10.32
MW226D	8.86	8.78	12.28	13.18	12.39	12.31	10.70
MW226M	8.91	8.81	12.31	13.22	12.45	12.36	10.76
MW226S	9.03	8.91	12.56	13.00	12.66	12.56	10.94
MW227D	6.33	--	--	--	9.56	9.11	8.04
MW227M	6.36	--	--	--	9.61	9.20	8.07
MW227S	6.93	--	--	--	9.60	9.83	9.14
MWD4A	--	--	13.55	15.29	13.52	11.69	11.61
MWD4B	8.32	8.59	11.44	11.94	11.55	12.00	10.34
MWD4C	8.70	9.81	13.71	13.58	13.39	12.95	11.07
MWD4D	11.48	12.04	16.66	16.44	15.75	15.39	12.98
MWD4E	8.93	8.78	12.28	13.2	12.41	12.23	10.77
MWD4F	7.99	8.22	10.48	11.15	10.70	10.91	9.63
MWD4H	11.18	12.36	17.02	16.49	16.20	14.83	12.8
MWD4I	9.61	7.97	9.36	10.52	11.06	11.33	11.05
GS1D	--	8.59	11.61	12.40	11.73	11.73	10.29
GS1M	--	8.6	10.88	11.42	10.83	11.16	10.09
GS1S	--	8.72	9.28	9.59	9.41	9.77	9.51
GS2D	--	7.79	10.30	--	--	10.23	9.10
GS2M	--	8.16	10.26	--	--	10.36	9.33

Table 3. Measured ground- and surface-water level elevations at the natural-attenuation study area, Dover Air Force Base, Kent County, Delaware, July 1995 through September 1996—Continued

Well identification number	WATER-LEVEL ELEVATIONS IN FEET ABOVE SEA LEVEL						
	1995		1996				
	July 24	December 6	March 6	April 26	June 4	August 16	September 19
GROUND-WATER LEVELS--CONTINUED							
GS2S	--	8.04	9.78	--	9.73	9.90	9.08
GS3M	--	6.17	6.88	8.27	8.11	8.07	7.30
GS3S	--	5.86	6.56	6.76	6.51	6.75	6.33
GS4D	--	4.08	6.95	7.25	7.00	6.73	3.56
GS4M	--	5.20	6.38	6.53	6.21	6.23	5.68
GS4S	--	6.57	4.26	4.26	4.26	4.4	6.22
GSCP1	--	--	--	--	--	7.47	6.74
GSCP3D	--	--	--	--	8.90	8.48	7.13
GSCP3M	--	--	--	--	7.70	7.90	7.13
GSCP4M	--	--	--	--	9.10	8.75	7.54
GSCP5M	--	--	--	--	10.90	9.35	9.22
GSCP6D	--	--	--	--	11.40	11.40	9.69
GSCP8	--	--	--	--	--	13.98	11.51
GSCP9S	--	--	--	--	--	11.90	10.44
MWDD1F	--	--	--	6.20	5.44	5.08	4.89
SURFACE-WATER STAGE							
GS1 staff	--	--	--	--	2.10	1.88	1.95
GS3 staff	--	--	--	--	--	--	1.88
GS4 staff	--	--	--	1.98	2.04	1.69	1.60

Table 4. Areal electro-magnetic conductivity survey data at the natural-attenuation study area, Dover Air Force Base, Kent County, Delaware, March 1996

[Values are millimhos per meter; --, no data; locations of sites shown in figure 4]

Site	20-meter spacing		10-meter spacing	
	Horizontal dipole	Vertical dipole	Horizontal dipole	Vertical dipole
1	11.0	17.0	6.6	11.0
2	10.0	16.0	5.0	7.8
3	9.6	11.0	6.4	7.5
4	9.9	14.0	5.0	7.2
5	9.4	12.0	6.8	6.0
6	17.0	15.0	11.0	12.0
7	13.0	19.0	10.0	13.0
8	9.0	11.0	7.2	7.6
9	9.0	11.5	7.2	8.0
10	10.0	12.0	8.6	8.4
11	11.5	12.0	9.6	9.4
12	14.0	5.0	11.0	13.0
13	10.5	13.0	5.4	5.2
14	10.0	13.5	5.2	5.6
15	13.5	17.0	12.0	27.0
16	10.0	11.0	9.0	9.6
17	10.5	10.0	9.6	8.6
18	10.0	11.0	7.8	8.0
19	10.0	12.0	9.9	10.0
20	9.0	9.5	10.0	10.0
21	10.0	11.0	9.4	8.2
22	9.2	13.0	7.2	8.4
23	8.0	14.0	3.6	8.6
24	10.0	12.0	8.8	9.2
25	10.5	12.5	8.4	9.6
26	9.8	12.5	10.0	4.4
27	6.6	13.0	5.0	7.8
28	9.6	12.0	6.8	8.2
29	11.0	14.0	8.4	9.8
30	10.5	17.0	7.8	9.8
31	9.0	16.0	8.0	11.0
32	9.5	12.0	7.2	9.0

Table 4. Areal electro-magnetic conductivity survey data at the natural-attenuation study area, Dover Air Force Base, Kent County, Delaware, March 1996 –Continued

Site	20-meter spacing		10-meter spacing	
	Horizontal dipole	Vertical dipole	Horizontal dipole	Vertical dipole
33	7.2	10.0	5.2	6.8
34	8.8	11.5	6.0	7.2
35	9.6	13.0	6.0	7.8
36	13.0	14.0	10.0	9.3
37	10.0	12.0	10.0	8.4
38	9.4	13.5	11.0	13.0
39	11.0	14.0	11.0	13.0
40	11.0	14.0	13.0	17.0
41	11.0	13.0	17.0	16.0
42	11.0	13.0	16.0	19.0
43	11.0	14.5	15.0	20.0
44	10.0	14.0	14.0	17.0
45	9.6	13.0	10.0	12.0
46	10.0	14.0	10.0	12.0
47	13.0	17.0	12.0	9.4
48	13.0	11.0	11.0	11.0
49	12.0	13.0	11.0	13.0
50	15.0	13.0	13.0	13.0
51	10.0	11.0	8.2	9.6
52	11.0	9.6	8.0	8.1
53	9.0	12.0	6.4	9.0
54	9.8	10.0	7.2	9.0
55	9.4	11.0	6.4	7.6
56	9.4	11.0	7.1	8.2
57	9.8	9.6	6.2	5.6
58	9.4	10.5	7.0	7.6
59	9.4	11.0	6.7	8.1
60	9.0	10.5	7.2	4.4
61	9.6	10.0	7.2	5.4
62	9.8	12.0	6.3	7.9
63	9.5	11.0	7.4	9.4
64	9.6	11.0	8.1	7.5
65	8.6	9.6	7.3	7.3

Table 4. Areal electro-magnetic conductivity survey data at the natural-attenuation study area, Dover Air Force Base, Kent County, Delaware, March 1996—Continued

Site	20-meter spacing		10-meter spacing	
	Horizontal dipole	Vertical dipole	Horizontal dipole	Vertical dipole
66	3.3	4.3	8.3	8.2
67	13.4	13.2	11.8	13.8
68	20.5	15.0	20.5	20.0
69	17.5	17.0	18.0	18.0
70	19.5	11.0	19.0	15.0
71	18.0	12.5	19.5	13.0
72	15.0	12.0	14.0	13.0
73	12.0	13.0	9.8	12.0
74	11.0	11.5	10.0	10.0
75	13.0	10.0	11.0	14.0
76	14.0	10.5	15.0	8.6
77	12.5	9.4	11.0	11.5
78	11.0	12.0	11.0	12.0
79	12.0	13.0	11.0	10.0
80	15.0	10.0	17.0	14.5
81	16.0	15.0	13.0	16.0
82	14.0	14.0	14.0	15.0
83	14.5	15.0	12.0	16.0
84	15.0	17.0	12.0	13.0
85	15.0	26.0	10.0	17.0
86	14.0	23.0	11.0	14.0
87	14.0	18.0	7.8	9.4
88	9.4	16.0	6.6	8.8
89	9.6	13.0	7.4	9.2
90	9.4	14.0	6.2	8.8
91	19.0	13.0	17.0	16.0
92	--	--	--	--
93	13.5	17.0	11.0	16.3
94	16.5	17.0	16.0	15.0
95	18.0	18.5	16.0	18.0
96	18.0	17.0	17.0	18.0
97	17.5	16.0	13.0	17.0
98	15.0	19.0	10.0	14.0

Table 4. Areal electro-magnetic conductivity survey data at the natural-attenuation study area, Dover Air Force Base, Kent County, Delaware, March 1996 –Continued

Site	20-meter spacing		10-meter spacing	
	Horizontal dipole	Vertical dipole	Horizontal dipole	Vertical dipole
99	15.0	18.0	12.0	13.0
100	14.0	14.0	12.0	12.0
101	14.0	15.0	11.0	13.0
102	14.0	13.0	11.0	9.8
103	12.0	16.0	9.6	13.0
104	14.0	16.0	12.0	12.0
105	14.0	15.0	10.0	12.5
106	12.0	15.0	9.6	12.0
107	--	18.0	--	22.0
108	--	20.0	--	19.5
109	--	20.0	--	18.0
110	--	17.0	--	17.0
111	--	16.0	--	21.0
112	--	13.0	--	17.0
113	--	18.0	--	20.0
114	--	13.0	--	10.0
115	--	8.6	--	13.0
116	--	15.0	--	16.0
117	--	13.0	--	16.0
118	12.0	19.0	6.2	9.5
119	11.0	6.0	8.6	10.0
120	11.0	23.0	6.2	11.0
121	10.0	19.0	8.4	5.6
122	11.0	17.0	6.2	8.8
123	12.0	18.0	7.2	9.8
124	15.0	20.0	9.2	11.0
125	13.0	19.0	8.0	13.0
126	13.0	19.0	8.4	10.5

Table 5. Ground- and surface-water quality data at the natural-attenuation study area, Dover Air Force Base, Kent County, Delaware, July - August 1995, May - July 1996, and August 1996, for inorganic constituents

[Locations of sample sites shown on figures 5 and 6; $\mu\text{S}/\text{cm}$, microsiemens per centimeter; $^{\circ}\text{C}$, degrees Celsius; mg/L , milligrams per liter; --, no data; nmol/L , nanomoles per liter; $\mu\text{g}/\text{L}$, micrograms per liter, quality assurance samples are at end of table; (d), quality control duplicate samples; Eq. Blank, equipment blank; August, 1996 samples and all field parameters were analyzed by USGS personnel; all others were analyzed by a contract laboratory]

Sample identification number	Sample date	Time	FIELD PARAMETERS				MAJOR IONS			
			Specific conductance ($\mu\text{S}/\text{cm}$)	pH, (standard units)	Temperature ($^{\circ}\text{C}$)	Oxygen, dissolved (mg/L)	Hydrogen, mean value, (nmol/L as H_2)	Calcium (mg/L as Ca)	Magnesium (mg/L as Mg)	Sodium, (mg/L) as Na
GROUND-WATER SAMPLES										
DM101D	08-03-96	--	--	8.80	18.9	0.42	8.5	26.02	3.76	10.89
DM102D	06-06-96	01:00 PM	153	5.54	18.5	3.32		10.2	<5.0	10.1
DM102D	08-02-96	--	--	5.05	19.4	2.22	0.95	13.76	5.31	9.60
DM107D	05-02-96	10:00 AM	86	3.56	15.0	1.34		<5.0	<5.0	11.7
DM107D	08-02-96	--	--	5.08	16.2	0.11	1.5	6.28	2.52	10.61
DM107S	05-01-96	03:30 PM	69	5.27	10.9	7.0	--	<5.0	<5.0	6.90
DM108D	05-13-96	--	80	5.42	12.6	0.47	--	<5.0	<5.0	10.50
DM108D	08-02-96	--	--	5.43	15.4	0.18	1.35	3.99	2.13	10.86
DM108S	05-10-96	12:00 PM	94	4.58	11.5	1.15	--	<5.0	<5.0	8.60
DM109D	08-03-96	--	--	8.29	18.1	0.00	21.2	8.05	2.73	10.94
DM110D	06-13-96	10:00 AM	185	4.58	15.8	5.69	--	12.3	5.9	14.4
DM110D	08-03-96	--	--	4.94	16.9	2.30	4.1	23.65	11.45	15.06
DM110S	08-21-95	12:15 PM	1751	5.94	20.5	0.00	--	51.1	91.2	118.0
DM110S	06-13-96	12:00 PM	1467	5.73	13.3	0.00	--	42.9	74.5	83.0
DM110S	08-03-96	--	--	5.84	19.6	0.00	0.7	46.21	69.17	56.27
DM113D	06-04-96	03:00 PM	101	5.42	16.9	5.00	--	<5.0	<5.0	11.0
DM113D	08-02-96	--	--	6.06	19.0	3.73	7.8	10.87	3.28	12.2
DM113S	08-08-95	02:30 PM	87	5.00	17.00	3.35	--	<5.0	<5.0	6.80
DM117D	05-21-96	03:00 PM	96	5.61	16.1	0.00	--	<5.0	<5.0	8.20
GS1D	08-11-95	10:00 AM	107	5.83	17.6	0.58	--	<5.0	<5.0	9.90
GS1D	05-23-96	01:00 PM	124	6.00	15.6	0.00	--	<5.0	<5.0	10.4
GS1M	08-10-95	01:00 PM	226	5.51	20.1	0.5	--	8.1	<5.0	12.9
GS1M	05-23-96	11:00 AM	74	5.21	15.0	0.10	--	<5.0	<5.0	11.3
GS1S	08-10-95	11:00 AM	146	5.31	26.2	1.30	--	<5.0	<5.0	14.0
GS1S	05-23-96	08:00 AM	80	5.54	15.1	0.00	--	<5.0	<5.0	10.40
GS2D	08-09-95	11:30 AM	97	5.85	19.5	0.75	--	<5.0	<5.0	10.0
GS2D	06-05-96	08:00 AM	68	5.64	13.8	0.00	--	<5.0	<5.0	9.50
GS2M	08-09-95	10:00 AM	98	5.49	22.6	0.50	--	<5.0	<5.0	10.40
GS2M	06-05-96	11:00 AM	75	5.77	13.0	0.00	--	<5.0	<5.0	9.50
GS2S	08-09-95	08:30 AM	97	5.43	20.6	0.00	--	<5.0	<5.0	9.90
GS2S	06-05-96	04:00 PM	89	5.68	14.5	0.00	-	<5.0	<5.0	9.70
GS3M	08-28-95	09:30 AM	93	5.58	17.3	6.15	--	<5.0	<5.0	10.5

MAJOR IONS												
Potassium (mg/ L as K)	Alka- linity, field (mg/ L as Ca CO ₃)	Hydro- gen sul- fide, field (mg/L as H ₂ S)	Sulfate (mg/L as SO ₄)	Chlo- ride (mg/L as Cl)	Fluo- ride (mg/L as F)	Bro- mide, (mg/ L as Br)	Nitro- gen, am- monia (mg/L as NH ₄)	Nitro- gen, kjel- dahl (mg/L as N)	Nit- rate (mg/ L as N)	Ni- trate, plus ni- trite, (mg/ L as N)	Phos- phate, ortho (mg/ L as PO ₄)	Sample identification number
GROUND-WATER SAMPLES--CONTINUED												
2.87	--	0.000	6.68	10.00	--	--	0.35	--	2.13	--	<0.02	DM101D
<5.0	7.50	0.008	25.3	11.80	<0.10	--	<0.10	<0.50	3.4	<0.5	<0.5	DM102D
1.86	--	0.000	21.33	9.57	--	--	<0.02	--	19.48	--	<.02	DM102D
<5.0	--	0.003	4.4	10.80	<.10	--	<.10	<.50	0.57	0.57	<.5	DM107D
1.54	--	0.000	3.70	9.95	--	0.07	<.02	--	2.59	--	<.02	DM107D
<5.0	--	0.050	11.8	5.10	<.10	--	<.10	<.50	<0.5	0.36	<.5	DM107S
<5.0	7.50	0.000	5.1	12.00	<.10	--	<.10	<.50	<.5	0.48	<.5	DM108D
1.53	--	0.000	4.00	10.10	--	0.16	<.02	--	1.13	--	<.02	DM108D
<5.0	--	0.004	15.4	9.60	<.10	--	<.10	<.50	0.56	0.57	<.5	DM108S
1.03	--	0.000	11.04	7.65	--	--	0.69	--	0.18	--	<.02	DM109D
<5.0	--	0.014	74.2	6.10	<.10	--	<.10	<.50	0.69	0.79	<.5	DM110D
1.63	--	0.000	81.43	4.11	--	--	<.02	--	1.77	--	<.02	DM110D
<5.0	390.0	0.021	37.3	304.00	<.10	--	<.10	1.8	1.2	<.5	<.5	DM110S
<5.0	268.0	0.022	69.2	250.00	<.10	--	0.15	1.2	1.2	<.5	<.5	DM110S
0.37	--	0.002	45.38	372.71	--	4.54	<.02	--	<.02	--	<.02	DM110S
<5.0	14.5	0.002	0.76	13.40	<.10	--	<.10	<.50	2.2	2.5	<.5	DM113D
4.2	--	0.008	0.52	11.39	--	--	<.02	--	11.81	--	<.02	DM113D
5.4	7.5	0.000	17.9	3.30	<.10	--	<.10	<.50	0.66	0.7	<.5	DM113S
<5.0	17.0	0.042	16.2	4.70	<.10	--	<.10	<.50	<.5	<.5	<.5	DM117D
<5.0	42.5	0.011	1.5	11.30	<.10	--	<.10	<.50	<.5	<.5	<.5	GS1D
<5.0	45.0	0.007	<0.50	11.00	<.10	--	<.10	<.50	<.5	<.5	<.5	GS1D
<5.0	8.05	0.006	3.3	15.40	<.10	--	3.3	3.8	<.5	<.5	<.5	GS1M
<5.0	4.50	0.010	4.3	<0.50	<.10	--	<.10	<.50	<.5	0.18	<.5	GS1M
<5.0	4.85	0.000	3.7	12.90	<.10	--	<.10	<.50	<.5	<.5	<.5	GS1S
<5.0	13.0	0.000	5.8	10.20	<.10	--	<.10	<.50	<.5	<.5	<.5	GS1S
<5.0	20.5	0.025	4.0	9.90	<.10	--	<.10	<.50	<.5	<.5	<.5	GS2D
<5.0	17.3	0.008	3.8	10.60	<.10	--	<.10	<.50	<.5	<.5	<.5	GS2D
<5.0	20.5	0.025	4.9	10.30	<.10	--	<.10	<.50	<.5	<.5	<.5	GS2M
<5.0	21.5	0.014	4.4	10.80	<.10	--	<.10	<.50	<.5	<.5	<.5	GS2M
<5.0	23.0	0.006	4.9	9.20	<.10	--	0.21	<.50	<.5	<.5	<.5	GS2S
<5.0	18.5	0.002	5.9	9.50	<.10	--	0.1	<.50	<.5	<.5	<.5	GS2S
<5.0	10.0	0.025	18.9	4.70	<.10	--	<.10	<.50	<.5	0.24	<.5	GS3M

Table 5. Ground- and surface-water quality data at the natural-attenuation study area, Dover Air Force Base, Kent County, Delaware, July - August 1995, May - July 1996, and August 1996, for inorganic constituents—Continued

Sample identification number	Sample date	Time	FIELD PARAMETERS				MAJOR IONS			
			Specific conductance ($\mu\text{S}/\text{cm}$)	pH, (standard units)	Temperature ($^{\circ}\text{C}$)	Oxygen, dissolved (mg/L)	Hydrogen, mean value, (nmol/L as H_2)	Calcium (mg/L as Ca)	Magnesium (mg/L as Mg)	Sodium, (mg/L) as Na
GROUND-WATER SAMPLES--CONTINUED										
GS3M(d)	05-22-96	--	--	--	--	--	--	<5.0	<5.0	9.6
GS3M	05-22-96	02:00 PM	87	5.66	14.2	7.1	--	<5.0	<5.0	9.4
GS3S	08-17-95	02:00 PM	338	6.12	18.9	0.00	--	15.3	12.1	13.1
GS3S	05-22-96	08:00 AM	278	6.26	13.3	0.00	--	16.1	11.5	10.0
GS4D	08-17-95	10:00 AM	110	5.94	17.3	0.00	--	5.8	<5.0	9.0
GS4D	05-20-96	09:00 AM	108	5.99	13.5	0.00	--	6.1	<5.0	7.1
GS4M	08-16-95	12:30 PM	90	5.45	18.4	0.00	--	<5.0	<5.0	6.6
GS4M	05-20-96	12:00 PM	91	5.56	16.2	0.00	--	<5.0	<5.0	6.9
GS4S	08-16-95	09:30 AM	92	5.62	19.5	0.00	--	<5.0	<5.0	6.3
GS4S	05-20-96	01:00 PM	108	5.58	13.5	0.00	--	<5.0	<5.0	7.3
GSCP3D	06-11-96	09:30 AM	82	5.2	16.6	2.21	--	<5.0	<5.0	10.7
GSCP3D	08-02-96	--	--	5.38	17.9	0.00	1.95	6.73	3.49	12.47
GSCP3M	06-11-96	11:00 AM	130	5.67	15.8	0.00	--	<5.0	<5.0	12.0
GSCP3M	08-02-96	--	--	5.32	17.4	2.10	1.75	4.73	2.21	10.21
GSCP4M	06-11-96	01:30 PM	120	5.53	14.9	0.00	--	<5.0	<5.0	12
GSCP4M	08-02-96	--	--	5.81	15.7	0.00	0.79	6.85	3.64	11.73
GSCP5M	06-07-96	09:30 AM	122	5.69	15.9	0.00	--	<5.0	<5.0	12.7
GSCP5M(d)	06-07-96	--	--	--	--	--	--	<5.0	<5.0	13.1
GSCP5M	08-02-96	--	--	5.33	17.5	0.00	1.01	4.57	2.23	12.65
GSCP6D	06-10-96	01:30 PM	135	5.38	17.6	0.00	--	<5.0	<5.0	<5.0
GSCP6D	08-02-96	--	--	5.82	17.0	0.00	5.5	4.75	1.94	8.35
GSCP8	07-11-96	10:00 AM	121	4.94	15.8	0.82	--	10.2	<5.0	14.8
GSCP9S	06-12-96	04:00 PM	98	5.4	27	0.00	--	<5.0	<5.0	10.4
GSCP9S	08-03-96	--	--	5.08	16.1	0.00	2.8	8.78	4.23	9.63
MW11	08-22-95	01:00 PM	103	5.2	16.4	0.70	--	<5.0	<5.0	11
MW18	08-03-95	02:30 PM	86	5.06	19.4	6.6	--	<5.0	<5.0	8
MW19	08-08-95	08:30 AM	106	5.13	16.6	3.1	--	<5.0	<5.0	10.4
MW19	05-17-96	12:00 PM	125	5.55	14.8	3.7	--	5.7	<5.0	10.8
MW19	08-03-96	--	--	5.25	17.5	4.48	3.4	11.00	4.60	10.55
MW20	07-28-95	09:00 AM	74	4.96	18.8	3.85	--	<5.0	<5.0	6.7
MW21	07-27-95	01:00 PM	87	5.23	19.8	0.15	--	<5.0	<5.0	10.2
MW37D	07-27-95	09:30 AM	103	4.78	17.6	0.20	--	<5.0	<5.0	12.3

MAJOR IONS												
Potassium (mg/L as K)	Alkalinity, field (mg/L as Ca CO ₃)	Hydrogen sulfide, field (mg/L as H ₂ S)	Sulfate (mg/L as SO ₄)	Chloride (mg/L as Cl)	Fluoride (mg/L as F)	Bromide, (mg/L as Br)	Nitrogen, ammonia (mg/L as NH ₄)	Nitrogen, kjeldahl (mg/L as N)	Nitrate (mg/L as N)	Nitrate, plus nitrite, (mg/L as N)	Phosphate, ortho (mg/L as PO ₄)	Sample identification number
GROUND-WATER SAMPLES--CONTINUED												
<5.0	--	--	17.1	4.40	<.10	--	<.10	<.50	<.5	0.29	<.5	GS3M(d)
<5.0	9.50	0.003	17.2	4.50	<.10	--	<.10	<.50	<.5	0.29	<.5	GS3M
<5.0	120.0	0.016	11.6	32.40	<.10	--	<.10	<.50	<.5	84.1	<.5	GS3S
<5.0	65.0	0.007	15.6	21.50	<.10	--	<.10	<.50	<.5	<.5	<.5	GS3S
<5.0	--	-0.058	12.8	6.60	<.10	--	0.17	<.50	<.5	<.5	<.5	GS4D
<5.0	22.5	0.000	15.8	5.10	<.10	--	0.13	<.50	<.5	<.5	<.5	GS4D
<5.0	8.0	0.680	21.3	3.80	<.10	--	<.10	<.50	0.52	<.5	<.5	GS4M
<5.0	10.5	0.030	23.3	3.80	<.10	--	<.10	<.50	<.5	<.5	<.5	GS4M
<5.0	18.5	0.171	21.1	3.80	<.10	--	0.1	<.50	<.5	<.5	<.5	GS4S
<5.0	10.0	0.000	23.8	5.40	<.10	--	0.13	<.50	<.5	<.5	<.5	GS4S
<5.0	7.5	0.009	9.4	8.60	<.10	--	<.10	<.50	<.5	0.42	<.5	GSCP3D
0.84	--	0.000	1.03	12.62	--	0.04	1.34	--	<.02	--	<.02	GSCP3D
<5.0	35.50	0.035	1.4	13.60	<.10	--	0.16	<.50	<.5	<.5	<.5	GSCP3M
1.03	--	0.000	6.358	6.39	--	--	<.02	--	1.07	--	<.02	GSCP3M
<5.0	18.50	0.033	12.3	12.30	<.10	--	0.13	<.50	<.5	<.5	<.5	GSCP4M
0.81	--	0.034	7.73	12.04	--	0.04	0.89	--	<.02	--	<.02	GSCP4M
<5.0	22.00	0.000	6.2	16.0	<.10	--	<.10	<.50	<.5	<.5	<.5	GSCP5M
<5.0	--	--	6.2	15.90	<.10	--	<.10	<.50	<.5	<.5	<.5	GSCP5M(d)
1.10	--	0.000	4.71	10.17	--	0.06	0.94	--	0.123	--	<.02	GSCP5M
<5.0	13.00	0.000	<.50	<.50	<.10	--	<.10	--	--	--	--	GSCP6D
0.81	--	0.000	6.426	6.65	--	--	0.56	--	0.213	--	<.02	GSCP6D
<5.0	12.50	0.000	22.6	8.60	<.10	--	0.11	<.50	<.5	<.5	<.5	GSCP8
<5.0	19.00	0.026	15.4	4.40	<.10	--	<.10	<.50	<.5	<.5	<.5	GSCP9S
1.13	--	0.000	10.89	3.36	--	--	<.02	--	0.041	--	<.02	GSCP9S
<5.0	22.00	0.004	10.6	7.60	<.10	--	<.10	<.50	<.5	<.5	<.5	MW11
<5.0	8.00	0.001	20.4	3.0	<.10	--	<.10	<.50	<.5	0.27	<.5	MW18
11	17.50	0.003	6.4	<.50	0.13	--	<.10	<.50	0.72	0.62	<.5	MW19
<5.0	22.00	0.003	10.7	7.40	<.10	--	0.48	0.51	0.6	1.1	<.5	MW19
1.03	--	0.000	9.74	6.33	--	0.21	3.26	--	2.55	--	<.02	MW19
<5.0	4.50	0.000	15.6	3.40	<.10	--	<.10	<.50	<.5	0.44	<.5	MW20
<5.0	4.00	0.000	12.1	10.10	<.10	--	<.10	<.50	<.5	<.5	<.5	MW21
<5.0	8.50	0.000	14.0	11.60	<.10	--	<.10	<.50	0.51	0.4	<.5	MW37D

Table 5. Ground- and surface-water quality data at the natural-attenuation study area, Dover Air Force Base, Kent County, Delaware, July - August 1995, May - July 1996, and August 1996, for inorganic constituents—Continued

Sample identification number	Sample date	Time	FIELD PARAMETERS				MAJOR IONS			
			Specific conductance ($\mu\text{S}/\text{cm}$)	pH, (standard units)	Temperature ($^{\circ}\text{C}$)	Oxygen, dissolved (mg/L)	Hydrogen, mean value, (nmol/L as H_2)	Calcium (mg/L as Ca)	Magnesium (mg/L as Mg)	Sodium, (mg/L) as Na
GROUND-WATER SAMPLES--CONTINUED										
MW37S	08-07-95	11:30 AM	103	5.12	16.1	1.59	--	<5.0	<5.0	17.3
MW37S(d)	08-07-95	--	--	--	--	--	--	<5.0	<5.0	17.6
MW37S	05-28-96	02:00 PM	118	5.16	12.6	1.83	--	<5.0	<5.0	15.7
MW37S	08-02-96	--	--	5.31	17.6	0.85	1.35	6.26	3.43	15.88
MW39D	08-01-95	11:00 AM	98	5.09	17.7	1.5	--	<5.0	<5.0	11.1
MW39D(d)	08-01-95	--	--	--	--	--	--	<5.0	<5.0	10.7
MW39S	07-26-95	03:00 PM	171	4.89	17.7	0.20	--	<5.0	<5.0	22.2
MW39S	06-12-96	01:00 PM	171	5.18	14.5	0.00	--	5.1	<5.0	20.8
MW39S	08-03-95	--	--	5.04	18.1	2.72	2.40	8.61	5.56	21.65
MW40D	08-03-95	11:25 AM	71	5.28	17.9	4.05	--	<5.0	<5.0	8.1
MW40S	08-03-95	10:00 AM	93	4.91	19.1	3.6	--	<5.0	<5.0	13
MW41D	07-31-95	01:00 PM	72	5.21	16.7	4.8	--	<5.0	<5.0	8.2
MW41S	08-01-95	08:00 AM	180	5.36	13.7	0.2	--	<5.0	<5.0	24.7
MW43S	07-26-95	10:00 AM	72	5.14	17.0	1.5	--	<5.0	<5.0	7.3
MW43S(d)	07-26-95	--	--	--	--	--	--	<5.0	<5.0	7.8
MW61S	08-04-95	09:00 AM	1547	5.85	15.9	0.66	--	55.9	43.1	155
MW61S	08-15-95	09:00 AM	--	--	--	--	--	--	--	--
MW61S	06-21-96	12:00 PM	1612	5.89	22.0	0.00	--	60.1	45.6	185
MW61S	08-03-96	--	--	5.70	18.0	0.00	2.75	65.97	48.56	138.22
MW62D	06-19-96	11:30 AM	59	5.25	14.7	7.6	--	<5.0	<5.0	8.8
MW62S	06-18-96	01:00 PM	117	5.36	16.4	0.00	--	<5.0	<5.0	18.1
MW62S	08-03-96	--	--	5.42	16.8	0.00	9.80	7.32	3.84	15.39
MW64S	06-14-96	10:00 AM	557	5.08	18.5	0.00	--	33.7	23.9	40.1
MW64S(d)	06-14-96	--	--	--	--	--	--	33.8	24.2	41.4
MW206D	08-01-95	08:00 AM	81	5.07	16.8	1.8	--	<5.0	<5.0	10.2
MW206D	05-31-96	09:30 AM	85	5.03	15.6	1.51	--	<5.0	<5.0	10.8
MW206D(d)	05-31-96	--	--	--	--	--	--	<5.0	<5.0	10.5
MW206M	08-07-95	03:00 PM	85	5.14	17.6	1.82	--	<5.0	<5.0	9.7
MW206M	05-30-96	09:00 AM	90	5.28	13.8	1.22	--	<5.0	<5.0	9.2
MW206M	08-03-96	--	--	5.05	17.9	0.78	3.80	8.01	4.06	10.74
MW226D	08-02-95	08:30 AM	75	5	16.5	5.0	--	<5.0	<5.0	8.4
MW226M	08-02-95	09:00 AM	86	5.21	19	1.67	--	<5.0	<5.0	10.8

MAJOR IONS												
Potassium (mg/ L as K)	Alka- linity, field (mg/ L as Ca CO ₃)	Hydro- gen sul- fide, field (mg/L as H ₂ S)	Sulfate (mg/L as SO ₄)	Chlo- ride (mg/L as Cl)	Fluo- ride (mg/L as F)	Bromo- ide, (mg/ L as Br)	Nitro- gen, am- monia (mg/L as NH ₄)	Nitro- gen, kjel- dahl (mg/L as N)	Nit- rate (mg/ L as N)	Ni- trate, plus ni- trite, (mg/ L as N)	Phos- phate, ortho (mg/ L as PO ₄)	Sample identification number
GROUND-WATER SAMPLES--CONTINUED												
<5.0	12.60	0.004	23.3	6.50	<.10	--	<.10	<.50	0.6	0.52	<.5	MW37S
<5.0	--	--	23.6	6.50	<.10	--	<.10	<.50	0.61	0.54	<.5	MW37S(d)
<5.0	14.50	0.009	23.4	6.40	<.10	--	<.10	0.81	<.5	1.2	<.5	MW37S
0.77	--	0.000	18.81	5.11	--	0.04	<.02	--	1.94	--	<.02	MW37S
<5.0	14.00	0.000	9	10.30	<.10	--	<.10	<.50	0.8	0.82	<.5	MW39D
<5.0	--	--	9.1	10.50	<.10	--	<.10	<.50	0.79	0.88	<.5	MW39D(d)
<5.0	19.50	0.004	23.4	17.80	<.10	--	<.10	<.50	<.5	<.5	<.5	MW39S
<5.0	8.00	0.000	44.8	9.40	<.10	--	<.10	<.50	<.5	0.48	<.5	MW39S
0.47	--	0.000	34.65	9.04	--	0.04	<.02	--	2.149	--	<.02	MW39S
<5.0	9.50	0.000	3.9	7.50	<.10	--	<.10	<.50	1.1	1.2	<.5	MW40D
<5.0	11.5	0.002	8.5	7.40	<.10	--	<.10	<.50	1.4	1.6	<.5	MW40S
<5.0	11.0	0.000	2.2	7.60	<.10	--	<.10	<.50	1.7	2	<.5	MW41D
<5.0	23.5	0.057	24.90	16.20	<.10	--	<.10	<.50	<.5	<.5	<.5	MW41S
<5.0	10.00	0.007	12.20	3.30	<.10	--	0.1	<.50	<.5	0.18	<.5	MW43S
<5.0	--	--	12.40	3.30	<.10	--	<.10	<.50	<.5	0.18	<.5	MW43S(d)
<5.0	462	--	10.20	202.00	<.10	--	<.10	1.4	0.82	<.5	<.5	MW61S
<5.0	--	0.082	--	--	--	--	--	--	--	--	--	MW61S
<5.0	440	0.000	12.10	208.00	<.10	--	0.11	1.5	0.75	<.5	<.5	MW61S
2.24	--	0.000	8.56	150.63	--	2.80	<.02	--	<.02	--	<.02	MW61S
<5.0	8.00	0.002	0.53	7.80	<.10	--	<.10	<.50	2.4	2.6	<.5	MW62D
<5.0	31.50	0.000	4.50	15.90	<.10	--	<.10	<.50	<.5	<.5	<.5	MW62S
1.17	--	0.000	--	11.84	--	0.15	1.67	--	0.04	--	<.02	MW62S
<5.0	11.80	0.000	234.0	39.70	<.10	--	0.26	<.50	<.5	<.5	<.5	MW64S
<5.0	--	--	231.0	38.80	<.10	--	0.26	<.50	<.5	<.5	<.5	MW64S(d)
<5.0	8.00	0.004	2.50	11.90	<.10	--	<.10	<.50	0.87	0.97	<.5	MW206D
<5.0	10.60	0.000	1.60	13.60	<.10	--	<.10	<.50	0.69	0.76	<.5	MW206D
<5.0	--	--	1.60	13.60	<.10	--	<.10	<.50	0.69	0.77	<.5	MW206D(d)
<5.0	13.0	0.005	9.70	6.90	<.10	--	<.10	<.50	<.5	0.14	<.5	MW206M
<5.0	14.50	0.006	9.20	9.00	<.10	--	<.10	<.50	<.5	0.1	<.5	MW206M
0.87	--	0.000	7.75	8.61	--	0.15	<.02	--	0.87	--	<.02	MW206M
<5.0	6.60	0.000	1.20	8.70	<.10	--	<.10	<.50	2.4	2.7	<.5	MW226D
<5.0	8.60	0.023	5.10	11.30	<.10	--	<.10	<.50	0.84	0.91	<.5	MW226M

Table 5. Ground- and surface-water quality data at the natural-attenuation study area, Dover Air Force Base, Kent County, Delaware, July - August 1995, May - July 1996, and August 1996, for inorganic constituents—Continued

Sample identification number	Sample date	Time	FIELD PARAMETERS				MAJOR IONS			
			Specific conductance ($\mu\text{S}/\text{cm}$)	pH, (standard units)	Temperature ($^{\circ}\text{C}$)	Oxygen, dissolved (mg/L)	Hydrogen, mean value, (nmol/L as H_2)	Calcium (mg/L as Ca)	Magnesium (mg/L as Mg)	Sodium, (mg/L as Na)
GROUND-WATER SAMPLES--CONTINUED										
MW226M	06-06-96	09:00 AM	88	5.01	15.8	1.46	--	<5.0	<5.0	11.3
MW226M	08-03-96	--	--	5.39	15.9	0.32	0.35	5.70	2.54	11.34
MW227D	08-22-95	09:30 AM	86	5.03	15.7	1.35	--	<5.0	<5.0	10.9
MW227D	05-02-96	01:30 PM	81	4.54	15.2	2.21	--	<5.0	<5.0	11.3
MW227D	08-03-96	--	--	5.08	16.5	3.03	0.90	4.91	2.14	9.68
MW227S	05-06-96	12:30 PM	199	5.00	11.3	3.9	--	12.5	11.2	20.9
MWD4B	05-31-96	03:00 PM	148	5.75	15.1	5.1	--	11.8	7.1	6.2
SURFACE-WATER SAMPLES										
GS1SW	08-10-95	10:15 AM	72	5.56	25.9	3.2	--	6.4	<5.0	<5.0
GS1SW	05-23-96	02:00 PM	136	5.82	16.3	6.5	--	10.2	<5.0	10.7
GS2SW	08-10-95	10:45 AM	241	4.22	26.3	1.65	--	19.9	5.4	5.2
GS2SW	06-05-95	03:30 PM	127	6.16	19.5	7.0	--	11.2	<5.0	8.2
GS2SW(d)	06-05-95	--	--	--	--	--	--	11.2	<5.0	8.5
GS3SW	08-17-95	11:30 PM	157	6.56	27.9	5.5	--	11.5	5.3	12
GS3SW	05-22-96	10:30 AM	127	6.28	20.9	5.9	--	11	<5.0	5.5
GS4SW	08-16-95	01:00 PM	828	6.56	27.6	5.0	--	15.9	20	145
GS4SW(d)	08-16-95	--	--	--	--	--	--	16.0	20.3	144
GS4SW	05-20-96	02:00 PM	145	6.56	24.5	--	--	5.7	<5.0	9
QUALITY-ASSURANCE SAMPLES										
Eq. Blank (1)	07-27-95	--	--	--	--	--	--	<5.0	<5.0	<5.0
Eq. Blank (2)	08-02-95	--	--	--	--	--	--	<5.0	<5.0	<5.0
Eq. Blank (3)	08-03-95	--	--	--	--	--	--	<5.0	<5.0	<5.0
Eq. Blank (4)	08-09-95	--	--	--	--	--	--	<5.0	<5.0	<5.0
Eq. Blank (5)	08-11-95	--	--	--	--	--	--	<5.0	<5.0	<5.0
Eq. Blank (6)	08-16-95	--	--	--	--	--	--	<5.0	<5.0	<5.0
Eq. Blank (7)	08-16-95	--	--	--	--	--	--	<5.0	<5.0	<5.0
Eq. Blank (8)	08-18-95	--	--	--	--	--	--	<5.0	<5.0	<5.0
Eq. Blank (9)	08-22-95	--	--	--	--	--	--	<5.0	<5.0	<5.0
Eq. Blank (10)	05-01-96	--	--	--	--	--	--	<5.0	<5.0	<5.0
Eq. Blank (11)	05-21-96	--	--	--	--	--	--	<5.0	<5.0	<5.0
Eq. Blank (12)	05-22-96	--	--	--	--	--	--	<5.0	<5.0	<5.0
Eq. Blank (13)	05-30-96	--	--	--	--	--	--	<5.0	<5.0	<5.0
Eq. Blank (14)	06-05-96	--	--	--	--	--	--	<5.0	<5.0	<5.0
Eq. Blank (15)	06-12-96	--	--	--	--	--	--	<5.0	<5.0	<5.0

MAJOR IONS												
Potassium (mg/ L as K)	Alka- linity, field (mg/ L as Ca CO ₃)	Hydro- gen sul- fide, field (mg/L as H ₂ S)	Sulfate (mg/L as SO ₄)	Chlo- ride (mg/L as Cl)	Fluo- ride (mg/L as F)	Bromo- ide, (mg/ L as Br)	Nitro- gen, am- monia (mg/L as NH ₄)	Nitro- gen, kjel- dahl (mg/L as N)	Nit- rate (mg/ L as N)	Ni- trate, plus ni- trite, (mg/ L as N)	Phos- phate, ortho (mg/ L as PO ₄)	Sample identification number
GROUND-WATER SAMPLES--CONTINUED												
<5.0	9.00	0.015	5.70	12.00	<.10	--	<.10	<.50	<.5	0.44	<.5	MW226M
1.28	--	0.000	6.43	10.20	--	--	<.02	--	1.82	--	<.02	MW226M
<5.0	19.40	0.011	8.00	10.70	<.10	--	<.10	<.50	<.5	0.46	<.5	MW227D
<5.0	4.00	0.002	9.30	8.70	<.10	--	<.10	<.50	<.5	0.4	<.5	MW227D
0.81	--	0.004	6.39	4.97	--	--	<.02	--	1.42	--	<.02	MW227D
<5.0	14.00	0.028	56.60	34.80	<.10	--	<.10	<.50	<.5	<.5	<.5	MW227S
<5.0	32.00	0.000	17.70	6.20	<.10	--	<.10	<.50	1.2	1.4	<.5	MWD4B
SURFACE-WATER SAMPLES												
<5.0	19.00	0.0076	6.10	2.00	<.10	--	<.10	0.81	<.5	<.5	<.5	GS1SW
<5.0	26.50	0.003	16.10	8.30	<.10	--	1.1	<.50	--	--	--	GS1SW
<5.0	--	0.007	115.0	4.00	<.10	--	0.32	0.96	<.5	<.5	<.5	GS2SW
<5.0	28.50	0.003	12.60	6.3	<.10	--	<.10	<.50	0.85	0.95	<.5	GS2SW
<5.0	--	--	12.60	6.0	<.10	--	<.10	<.50	0.86	0.95	<.5	GS2SW(d)
<5.0	31.50	0.002	23.10	6	<.10	--	<.10	<.50	<.5	0.37	<.5	GS3SW
<5.0	26.00	0.004	12.70	2.9	<.10	--	0.18	<.50	2.4	2.8	<.5	GS3SW
6.9	36.00	0.000	44.3	238	<.10	--	0.12	<.50	<.5	0.29	<.5	GS4SW
6.9	--	--	43.9	236	<.10	--	0.11	<.50	<.5	0.26	<.5	GS4SW(d)
<5.0	29.50	0.007	19.8	6.6	<.10	--	<.10	0.51	0.98	1.1	<.5	GS4SW
QUALITY-ASSURANCE SAMPLES												
<5.0	--	--	<5.0	<.50	<.10	--	<.10	<.50	<.5	<.5	<.5	Eq. Blank (1)
<5.0	--	--	<5.0	<.50	<.10	--	<.10	<.50	<.5	<.5	<.5	Eq. Blank (2)
<5.0	--	--	<5.0	<.50	<.10	--	<.10	<.50	<.5	<.5	<.5	Eq. Blank (3)
<5.0	--	--	<5.0	<.50	<.10	--	<.10	<.50	<.5	<.5	<.5	Eq. Blank (4)
<5.0	--	--	<5.0	0.62	<.10	--	<.10	<.50	<.5	<.5	<.5	Eq. Blank (5)
<5.0	--	--	<5.0	<.50	<.10	--	<.10	<.50	<.5	<.5	<.5	Eq. Blank (6)
<5.0	--	--	0.82	<.50	<.10	--	<.10	<.50	<.5	<.5	<.5	Eq. Blank (7)
<5.0	--	--	<5.0	<.50	<.10	--	<.10	<.50	<.5	<.5	<.5	Eq. Blank (8)
<5.0	--	--	<5.0	<.50	<.10	--	<.10	<.50	<.5	0.50	<.5	Eq. Blank (9)
<5.0	--	--	<5.0	<.50	<.10	--	<.10	<.50	<.5	<.5	<.5	Eq. Blank (10)
<5.0	--	--	<5.0	<.50	<.10	--	<.10	<.50	<.5	<.5	<.5	Eq. Blank (11)
<5.0	--	--	<5.0	<.50	<.10	--	<.10	<.50	<.5	<.5	<.5	Eq. Blank (12)
<5.0	--	--	<5.0	<.50	<.10	--	<.10	<.50	<.5	<.5	<.5	Eq. Blank (13)
<5.0	--	--	<5.0	<.50	<.10	--	<.10	<.50	<.5	<.5	<.5	Eq. Blank (14)
<5.0	--	--	<5.0	<.50	<.10	--	<.10	<.50	<.5	<.5	<.5	Eq. Blank (15)

Table 5. Ground- and surface-water quality data at the natural-attenuation study area, Dover Air Force Base, Kent County, Delaware, July - August 1995, May - July 1996, and August 1996, for inorganic constituents—Continued

Sample identification number	Sample date	Time	FIELD PARAMETERS				MAJOR IONS			
			Specific conductance ($\mu\text{S}/\text{cm}$)	pH, (standard units)	Temperature ($^{\circ}\text{C}$)	Oxygen, dissolved (mg/L)	Hydrogen, mean value, (nmol/L as H_2)	Calcium (mg/L as Ca)	Magnesium (mg/L as Mg)	Sodium, (mg/L) as Na)
QUALITY-ASSURANCE SAMPLES --CONTINUED										
Eq. Blank (16)	06-13-96	--	--	--	--	--	--	<5.0	<5.0	<5.0
Eq. Blank (17)	06-14-96	--	--	--	--	--	--	<5.0	<5.0	<5.0

MAJOR IONS													Sample identification number
Potas-	Alka-	Hydro-	Sulfate	Chlo-	Fluo-	Bro-	Nitro-	Nitro-	Nit-	Ni-	Phos-		
sium	linity,	gen	(mg/L	ride	ride	mide,	gen,	gen,	rate	trate,	phate,		
(mg/	field	sulfide,	as	(mg/L	(mg/L	(mg/	am-	kjel-	(mg/	plus	ortho		
L as	L as	field	SO ₄)	as Cl)	as F)	L as	monia	dahl	L as	nitrite,	(mg/		
K)	Ca	(mg/L				Br)	as	(mg/L	N)	(mg/	L as		
	CO ₃)	as	H ₂ S)				NH ₄)	as N)	N)	L as	PO ₄)		
QUALITY-ASSURANCE SAMPLES --CONTINUED													
<5.0	--	--	<5.0	0.53	<.10	--	<.10	<.50	<.5	<.5	<.5		Eq. Blank (16)
<5.0	--	--	<5.0	<.50	<.10	--	<.10	<.50	<.5	<.5	<.5		Eq. Blank (17)

Table 5. Ground- and surface-water quality data at the natural-attenuation study area, Dover Air Force Base, Kent County, Delaware, July - August 1995, May - July 1996, and August 1996, for inorganic constituents

[Locations of sample sites shown on figures 5 and 6; mg/L, milligrams per liter; µg/L, micrograms per liter; --, no data; quality-assurance samples are at end of table; (d), quality control duplicate samples; Eq. Blank, equipment blank; constituents analyzed in field ($\text{Fe}^{+2} + \text{Fe}^{+3}$ and Fe^{+2}) were analyzed by USGS personnel; all others were analyzed by a contract laboratory]

METALS										
Sample identification number	Sample date	Alum- inum, (µg/L as Al)	Anti- mony, (µg/L as Sb)	Arsenic, (µg/L as As)	Barium, (µg/L as Ba)	Cad- mium, (µg/L as Cd)	Chro- mium, (µg/L as Cr)	Cobalt, (µg/L as Co)	Copper, (µg/L as Cu)	Iron, field, (mg/L as $\text{Fe}^{+2} +$ Fe^{+3})
GROUND-WATER SAMPLES										
DM102D	06-06-96	<0.20	<0.20	<0.30	<0.10	<0.005	<0.030	<0.040	<0.030	--
DM107D	05-02-96	<.20	<.20	<.30	<.10	<.005	<.030	<.040	<.030	0.48
DM107S	05-01-96	<.20	<.20	<.30	<.10	<.005	<.030	<.040	<.030	0.01
DM108D	05-13-96	<.20	<.20	<.30	<.10	<.005	<.030	<.040	<.030	0.06
DM108S	05-01-96	<.20	<.20	<.30	<.10	<.005	<.030	<.040	<.030	0.25
DM110D	06-13-96	<.20	<.20	<.30	<.10	<.005	<.030	<.040	<.030	0.35
DM110S	08-21-95	<.20	<.20	<.30	<.10	<.005	<.030	0.090	<.030	36.48
DM110S	06-13-96	<.20	<.20	<.30	<.10	<.005	<.030	0.10	<.030	20.08
DM113D	06-04-96	<.20	<.20	<.30	<.10	<.005	<.030	<.040	<.030	0.00
DM113S	08-08-95	<.20	<.20	<.30	<.10	<.005	<.030	<.040	<.030	0.01
DM117D	05-21-96	<.20	<.20	<.30	<.10	<.005	<.030	<.040	<.030	17.00
GS1D	08-11-95	<.20	<.20	<.30	<.10	<.005	<.030	<.040	<.030	12.37
GS1D	05-23-96	<.20	<.20	<.30	<.10	<.005	<.030	<.040	<.030	17.81
GS1M	08-10-95	<.20	<.20	<.30	0.11	<.005	<.030	<.040	<.030	15.84
GS1M	05-23-96	<.20	<.20	<.30	<.10	<.005	<.030	<.040	<.030	1.07
GS1S	08-10-95	<.20	<.20	<.30	<.10	<.005	<.030	<.040	<.030	12.60
GS1S	05-23-96	<.20	<.20	<.30	<.10	<.005	<.030	<.040	<.030	3.76
GS2D	08-09-95	0.20	<.20	<.30	0.11	<.005	<.030	<.040	<.030	6.12
GS2D	06-05-96	<.20	<.20	<.30	<.10	<.005	<.030	<.040	<.030	5.81
GS2M	08-09-95	0.30	<.20	<.30	<.10	<.005	<.030	<.040	<.030	6.72
GS2M	06-05-96	<.20	<.20	<.30	<.10	<.005	<.030	<.040	<.030	7.96
GS2S	08-09-95	<.20	<.20	<.30	<.10	<.005	<.030	<.040	<.030	8.02
GS2S	06-05-96	<.20	<.20	<.30	<.10	<.005	<.030	<.040	<.030	6.99
GS2S(d)	06-05-96	<.20	<.20	--	<.10	<.005	<.030	<.040	<.030	--
GS3M	08-18-95	<.20	<.20	<.30	<.10	<.005	<.030	<.040	<.030	0.00
GS3M	05-22-96	<.20	<.20	<.30	<.10	<.005	<.030	<.040	<.030	0.00
GS3M(d)	05-22-96	<.20	<.20	--	<.10	<.005	<.030	<.040	<.030	--
GS3S	08-17-95	<.20	<.20	<.30	0.12	<.005	<.030	<.040	<.030	39.00
GS3S	05-22-96	<.20	<.20	<.30	<.10	<.005	<.030	<.040	<.030	16.16
GS4D	08-17-95	<.20	<.20	<.30	<.10	<.005	<.030	<.040	<.030	3.35
GS4D	05-21-96	<.20	<.20	<.30	<.10	<.005	<.030	<.040	<.030	4.75
GS4M	08-16-95	<.20	<.20	<.30	<.10	<.005	<.030	<.040	<.030	5.92
GS4M	05-21-96	<.20	<.20	<.30	<.10	<.005	<.030	<.040	<.030	8.96

METALS											Sample identification number
Iron, field, (mg/L as Fe ⁺²)	Lead, (µg/L as Pb)	Manganese, (µg/L as Mn)	Mercury, (µg/L as Hg)	Molybdenum(µg/L as Mo)	Nickel, (µg/L as Ni)	Selenium, (µg/L as Se)	Silver, (µg/L as Ag)	Thallium, (µg/L as Tl)	Vanadium, (µg/L as V)	Zinc, (µg/L as Z)	
GROUND-WATER SAMPLES--CONTINUED											
1.36	<0.20	0.17	<.002	<.040	<.040	<.40	<.040	<5.0	<.040	0.019	DM102D
0.52	<.20	0.017	<.002	<.040	<.040	<.40	<.040	<5.0	<.040	0.015	DM107D
0.05	<.20	<.010	<.002	<.040	<.040	<.40	<.040	<5.0	<.040	<.010	DM107S
0.05	<.20	0.013	<.002	<.040	<.040	<.40	<.040	<5.0	<.040	0.013	DM108D
0.24	<.20	0.036	<.002	<.040	<.040	<.40	<.040	<5.0	<.040	0.033	DM108S
0.34	<.20	0.026	<.002	<.040	<.040	<.40	<.040	<5.0	<.040	0.025	DM110D
12.9	<.20	1.4	<.002	<.040	0.041	<.40	<.040	<5.0	<.040	<.010	DM110S
19.68	<.20	1.4	<.002	<.040	0.055	<.40	<.040	<5.0	<.040	<.010	DM110S
0.02	<.20	<.010	<.002	<.040	<.040	<.40	<.040	<5.0	<.040	0.011	DM113D
0.02	<.20	0.050	<.002	<.040	<.040	<.40	<.040	<5.0	<.040	<.010	DM113S
15.80	<.20	0.065	<.002	<.040	<.040	<.40	<.040	<5.0	<.040	<.010	DM117D
8.09	<.20	0.74	<.002	<.040	0.064	<.40	<.040	<5.0	<.040	<.010	GS1D
8.41	<.20	0.88	<.002	<.040	<.040	<.40	<.040	<5.0	<.040	<.010	GS1D
10.03	<.20	0.22	<.002	<.040	<.040	<.40	<.040	<5.0	<.040	<.010	GS1M
1.09	<.20	0.022	<.002	<.040	<.040	<.40	<.040	<5.0	<.040	<.010	GS1M
9.11	<.20	0.10	<.002	<.040	<.040	<.40	<.040	<5.0	<.040	0.014	GS1S
3.12	<.20	0.029	<.002	<.040	<.040	<.40	<.040	<5.0	<.040	<.010	GS1S
2.62	<.20	0.064	<.002	<.040	0.043	<.40	<.040	<5.0	<.040	0.025	GS2D
4.32	<.20	0.048	<.002	<.040	<.040	<.40	<.040	<5.0	<.040	0.023	GS2D
4.25	<.20	0.052	<.002	<.040	0.040	<.40	<.040	<5.0	<.040	0.035	GS2M
7.76	<.20	0.052	<.002	<.040	<.040	<.40	<.040	<5.0	<.040	0.027	GS2M
5.00	<.20	0.063	<.002	<.040	<.040	<.40	<.040	<5.0	<.040	<.010	GS2S
6.68	<.20	0.059	<.002	<.040	<.040	<.40	<.040	<5.0	<.040	<.010	GS2S
--	<.20	0.035	<.002	<.040	<.040	<.40	<.040	<5.0	<.040	<.010	GS2S(d)
0.00	<.20	<.010	<.002	<.040	<.040	<.40	<.040	<5.0	<.040	0.024	GS3M
0.00	<.20	<.010	<.002	<.040	<.040	<.40	<.040	<5.0	<.040	0.033	GS3M
--	<.20	<.010	<.002	<.040	<.040	<.40	<.040	<5.0	<.040	0.024	GS3M(d)
33.90	<.20	0.47	<.002	<.040	<.040	<.40	<.040	<5.0	<.040	<.010	GS3S
12.56	<.20	0.26	<.002	<.040	<.040	<.40	<.040	<5.0	<.040	<.010	GS3S
3.34	<.20	0.092	<.002	<.040	<.040	<.40	<.040	<5.0	<.040	<.010	GS4D
1.70	<.20	0.081	<.002	<.040	<.040	<.40	<.040	<5.0	<.040	<.010	GS4D
5.31	<.20	0.050	<.002	<.040	<.040	<.40	<.040	<5.0	<.040	<.010	GS4M
1.77	<.20	0.053	<.002	<.040	<.040	<.40	<.040	<5.0	<.040	<.010	GS4M

Table 5. Ground- and surface-water quality data at the natural-attenuation study area, Dover Air Force Base, Kent County, Delaware, July - August 1995, May - July 1996, and August 1996, for inorganic constituents--Continued

Sample identification number	Sample date	METALS								Iron, field, (mg/L as Fe ⁺² + Fe ⁺³)
		Aluminum, (µg/L as Al)	Antimony, (µg/L as Sb)	Arsenic, (µg/L as As)	Barium, (µg/L as Ba)	Cadmium, (µg/L as Cd)	Chromium, (µg/L as Cr)	Cobalt, (µg/L as Co)	Copper, (µg/L as Cu)	
GROUND-WATER SAMPLES--CONTINUED										
GS4S	08-16-95	<.20	<.20	<.30	<.10	<.005	<.030	<.040	<.030	6.47
GS4S	05-20-95	<.20	<.20	<.30	<.10	<.005	<.030	<.040	<.030	7.29
GSCP3D	06-11-96	<.20	<.20	<.30	<.10	<.005	<.030	<.040	<.030	0.04
GSCP3M	06-11-96	<.20	<.20	<.30	<.10	<.005	<.030	<.040	<.030	10.12
GSCP4M	06-11-96	<.20	<.20	<.30	<.10	<.005	<.030	<.040	<.030	4.54
GSCP5M	06-07-96	<.20	<.20	<.30	<.10	<.005	<.030	<.040	<.030	4.72
GSCP5M(d)	06-07-96	<.20	<.20	--	<.10	<.005	<.030	<.040	<.030	--
GSCP6D	06-10-96	<.20	<.20	<.30	<.10	<.005	<.030	<.040	<.030	6.64
GSCP8	07-11-96	<.20	<.20	<.30	<.10	<.005	<.030	<.040	<.030	2.09
GSCP9S	06-12-96	<.20	<.20	<.30	<.10	0.0053	<.030	<.040	<.030	0.31
MW11	08-22-95	<.20	<.20	<.30	<.10	<.005	<.030	<.040	<.030	1.20
MW18	08-03-95	<.20	<.20	<.30	<.10	<.005	<.030	<.040	<.030	0.00
MW 9	08-08-95	<.20	<.20	<.30	<.10	<.005	<.030	<.040	<.030	2.05
MW19	08-08-95	<.20	<.20	<.30	<.10	<.005	<.030	<.040	<.030	0.28
MW19	05-17-96	<.20	<.20	<.30	<.10	<.005	<.030	<.040	<.030	1.45
MW20	07-28-95	<.20	<.20	<.30	<.10	<.005	<.030	<.040	<.030	3.30
MW206D	08-01-95	<.20	<.20	<.30	0.10	<.005	<.030	<.040	<.030	0.01
MW206D	05-31-96	<.20	<.20	<.30	<.10	<.005	<.030	<.040	<.030	0.01
MW206D(d)	05-31-96	<.20	<.20	--	<.10	<.005	<.030	<.040	<.030	--
MW206M	07-08-95	<.20	<.20	<.30	<.10	<.005	<.030	<.040	<.030	0.33
MW206M	05-30-96	<.20	<.20	<.30	<.10	<.005	<.030	<.040	<.030	1.04
MW21	07-25-95	<.20	<.20	<.30	<.10	<.005	<.030	<.040	<.030	2.35
MW226D	08-02-95	<.20	<.20	<.30	<.10	<.005	<.030	<.040	<.030	0.00
MW226M	08-02-95	<.20	<.20	<.30	<.10	<.005	<.030	<.040	<.030	0.29
MW226M	06-06-96	<.20	<.20	<.30	<.10	<.005	<.030	<.040	<.030	0.24
MW227D	08-22-95	<.20	<.20	<.30	<.10	<.005	<.030	<.040	<.030	0.00
MW227D	05-02-96	<.20	<.20	<.30	<.10	<.005	<.030	<.040	<.030	0.03
MW227S	05-06-96	<.20	<.20	<.30	<.10	<.005	<.030	<.040	<.030	2.12
MW37D	07-27-95	<.20	<.20	<.30	<.10	<.005	<.030	<.040	<.030	0.00
MW37S	08-07-95	<.20	<.20	<.30	<.10	<.005	<.030	<.040	<.030	0.49
MW37S(d)	08-04-95	<.20	<.20	--	<.10	<.005	<.030	<.040	<.030	--
MW37S	05-28-96	<.20	<.20	<.30	<.10	<.005	<.030	<.040	<.030	0.61
MW39D	08-01-95	<.20	<.20	<.30	<.10	<.005	<.030	<.040	<.030	0.01

METALS

Iron, field, (mg/L as Fe ⁺²)	Lead, ($\mu\text{g}/\text{L}$ as Pb)	Mang- anese, ($\mu\text{g}/\text{L}$ as Mn)	Merc- ury, ($\mu\text{g}/\text{L}$ as Hg)	Moly- bden- um($\mu\text{g}/\text{L}$ as Mo)	Nickel, ($\mu\text{g}/\text{L}$ as Ni)	Selen- ium, ($\mu\text{g}/\text{L}$ as Se)	Silver, ($\mu\text{g}/\text{L}$ as Ag)	Thal- lium, ($\mu\text{g}/\text{L}$ as Tl)	Vana- dium, ($\mu\text{g}/\text{L}$ as V)	Zinc, ($\mu\text{g}/\text{L}$ as Z)	Sample ident- ification number
GROUND-WATER SAMPLES--CONTINUED											
5.99	<.20	0.056	<.002	<.040	<.040	<.40	<.040	<5.0	<.040	<.010	GS4S
1.72	<.20	0.057	<.002	<.040	<.040	<.40	<.040	<5.0	<.040	<.010	GS4S
0.03	<.20	0.028	<.002	<.040	<.040	<.40	<.040	<5.0	<.040	0.020	GSCP3D
9.72	<.20	0.048	<.002	<.040	<.040	<.40	<.040	<5.0	<.040	<.010	GSCP3M
4.30	<.20	0.050	<.002	<.040	<.040	<.40	<.040	<5.0	<.040	<.010	GSCP4M
5.07	<.20	0.060	<.002	<.040	<.040	<.40	<.040	<5.0	<.040	0.035	GSCP5M
--	<.20	0.060	<.002	<.040	<.040	<.40	<.040	<5.0	<.040	0.036	GSCP5M(d)
6.51	<.20	0.062	<.002	<.040	0.050	<.40	<.040	<5.0	<.040	0.032	GSCP6D
2.00	<.20	0.066	<.002	<.040	<.040	<.40	<.040	<5.0	<.040	0.029	GSCP8
0.00	<.20	0.053	<.002	<.040	<.040	<.40	<.040	<5.0	<.040	0.011	GSCP9S
1.17	<.20	0.076	<.002	<.040	<.040	<.40	<.040	<5.0	<.040	<.010	MW11
0.01	<.20	<.010	<.002	<.040	<.040	<.40	<.040	<5.0	<.040	<.010	MW18
1.85	<.20	0.032	<.002	<.040	<.040	<.40	<.040	<5.0	<.040	<.010	MW19
0.27	<.20	<.010	<.002	<.040	<.040	<.40	<.040	<5.0	<.040	<.010	MW19
1.23	<.20	0.025	<.002	<.040	<.040	<.40	<.040	<5.0	<.040	<.010	MW19
0.12	<.20	0.046	<.002	<.040	<.040	<.40	<.040	<5.0	<.040	0.017	MW20
0.00	<.20	<.010	<.002	<.040	<.040	<.40	<.040	<5.0	<.040	0.012	MW206D
0.01	<.20	<.010	<.002	<.040	<.040	<.40	<.040	<5.0	<.040	0.016	MW206D
--	<.20	<.010	<.002	<.040	<.040	<.40	<.040	<5.0	<.040	0.013	MW206D(d)
0.29	<.20	0.036	<.002	<.040	<.040	<.40	<.040	<5.0	<.040	0.017	MW206M
0.76	<.20	0.034	<.002	<.040	<.040	<.40	<.040	<5.0	<.040	<.010	MW206M
1.16	<.20	<.010	<.002	<.040	<.040	<.40	<.040	<5.0	<.040	<.010	MW21
0.00	<.20	<.010	<.002	<.040	<.040	<.40	<.040	<5.0	<.040	<.010	MW226D
0.23	<.20	0.019	<.002	<.040	<.040	<.40	<.040	<5.0	<.040	<.010	MW226M
0.23	<.20	0.017	<.002	<.040	<.040	<.40	<.040	<5.0	<.040	0.013	MW226M
0.00	<.20	<.010	<.002	<.040	<.040	<.40	<.040	<5.0	<.040	0.024	MW227D
0.00	<.20	<.010	<.002	<.040	<.040	<.40	<.040	<5.0	<.040	0.017	MW227D
2.05	<.20	0.099	<.002	<.040	<.040	<.40	<.040	<5.0	<.040	<.010	MW227S
0.00	<.20	<.010	<.002	<.040	<.040	<.40	<.040	<5.0	<.040	0.057	MW37D
0.41	<.20	0.17	<.002	<.040	<.040	<.40	<.040	<5.0	<.040	0.011	MW37S
--	<.20	0.19	<.002	<.040	<.040	<.40	<.040	<5.0	<.040	0.013	MW37S(d)
0.06	<.20	0.16	<.002	<.040	<.040	<.40	<.040	<5.0	<.040	<.010	MW37S
--	<.20	<.010	<.002	<.040	<.040	<.40	<.040	<5.0	<.040	0.024	MW39D

Table 5. Ground- and surface-water quality data at the natural-attenuation study area, Dover Air Force Base, Kent County, Delaware, July - August 1995, May - July 1996, and August 1996, for inorganic constituents—Continued

METALS										
Sample identification number	Sample date	Alum- inum, ($\mu\text{g/Las}$ Al)	Anti- mony, ($\mu\text{g/Las}$ Sb)	Arsenic, ($\mu\text{g/Las}$ As)	Barium, ($\mu\text{g/Las}$ Ba)	Cad- mium, ($\mu\text{g/Las}$ Cd)	Chro- mium, ($\mu\text{g/Las}$ Cr)	Cobalt, ($\mu\text{g/Las}$ Co)	Copper, ($\mu\text{g/Las}$ Cu)	Iron, field, (mg/Las Fe^{+2} Fe^{+3})
GROUND-WATER SAMPLES--CONTINUED										
MW39D(d)	08-01-95	<.20	<.20	<.30	<.10	<.005	<.030	<.040	<.030	--
MW39S	07-26-95	<.20	<.20	<.30	<.10	<.005	<.030	<.040	<.030	0.07
MW39S	06-12-96	<.20	<.20	<.30	<.10	<.005	<.030	<.040	<.030	0.00
MW40D	08-03-95	<.20	<.20	<.30	<.10	<.005	<.030	<.040	<.030	0.00
MW40S	08-03-95	<.20	<.20	<.30	<.10	<.005	<.030	<.040	<.030	0.00
MW41D	07-31-95	<.20	<.20	<.30	<.10	<.005	<.030	<.040	<.030	0.01
MW41S	08-01-95	<.20	<.20	<.30	<.10	<.005	<.030	<.040	<.030	1.73
MW43S	07-26-95	<.20	<.20	<.30	<.10	<.005	<.030	<.040	<.030	3.62
MW43S(d)	07-26-95	<.20	<.20	--	<.10	<.005	<.030	<.040	<.030	--
MW61S	08-04-95	<.20	<.20	<.30	0.32	<.005	<.030	<.040	<.030	17.52
MW61S	06-21-96	<.20	<.20	<.30	0.36	<.005	<.030	<.040	<.030	18.2
MW62D	06-21-96	<.20	<.20	<.30	<.10	<.005	<.030	<.040	<.030	0.00
MW62S	06-18-96	<.20	<.20	<.30	<.10	<.005	<.030	<.040	<.030	5.96
MW64D	07-11-96	<.20	<.20	<.30	<.10	<.005	<.030	<.040	<.030	--
MW64S	06-14-96	<.20	<.20	<.30	<.10	<.005	<.030	<.040	<.030	9.24
MW64S(d)	06-14-96	<.20	<.20	<.30	<.10	<.005	<.030	<.040	<.030	--
MWD4B	05-31-96	<.20	<.20	<.30	<.10	<.005	<.030	<.040	<.030	0.00
SURFACE-WATER SAMPLES										
GS1SW	08-10-95	<.20	<.20	<.30	<.10	<.005	<.030	<.040	<.030	2.64
GS1SW	05-23-96	<.20	<.20	<.30	<.10	<.005	<.030	<.040	<.030	0.18
GS2SW	08-10-95	<.20	<.20	<.30	0.15	<.005	<.030	0.069	<.030	6.23
GS2SW	06-05-96	<.20	<.20	<.30	<.10	<.005	<.030	<.040	<.030	0.18
GS3SW	08-17-95	<.20	<.20	<.30	<.10	<.005	<.030	<.040	<.030	0.56
GS3SW	05-22-96	<.20	<.20	<.30	<.10	<.005	<.030	<.040	<.030	0.39
GS4SW	08-16-95	<.20	<.20	<.30	<.10	<.005	<.030	<.040	<.030	0.32
GS4SW(d)	06-14-96	<.20	<.20	<.30	<.10	<.005	<.030	<.040	<.030	0.32
GS4SW	05-20-96	<.20	<.20	<.30	<.10	<.005	<.030	<.040	<.030	0.32
QUALITY-ASSURANCE SAMPLES										
Eq. Blank (1)	07-27-95	<.20	<.20	<.30	<.10	<.005	<.030	<.040	<.030	--
Eq. Blank (2)	08-02-95	<.20	<.20	<.30	<.10	<.005	<.030	<.040	<.030	--
Eq. Blank (3)	08-03-95	<.20	<.20	<.30	<.10	<.005	<.030	<.040	<.030	--
Eq. Blank (4)	08-09-95	<.20	<.20	<.30	<.10	<.005	<.030	<.040	<.030	--
Eq. Blank (5)	08-11-95	<.20	<.20	<.30	<.10	<.005	<.030	<.040	<.030	--
Eq. Blank (6)	08-16-95	<.20	<.20	<.30	<.10	<.005	<.030	<.040	<.030	--

METALS											Sample identification number
Iron, field, (mg/L as Fe ⁺²)	Lead, (μg/L as Pb)	Manganese, (μg/L as Mn)	Mercury, (μg/L as Hg)	Molybdenum(μg/L as Mo)	Nickel, (μg/L as Ni)	Selenium, (μg/L as Se)	Silver, (μg/L as Ag)	Thallium, (μg/L as Tl)	Vanadium, (μg/L as V)	Zinc, (μg/L as Z)	
GROUND-WATER SAMPLES--CONTINUED											
--	<.20	<.010	<.002	<.040	<.040	<.40	<.040	<5.0	<.040	0.025	MW39D(d)
0.08	<.20	0.016	<.002	<.040	<.040	<.40	<.040	<5.0	<.040	0.018	MW39S
0.00	<.20	<.010	<.002	<.040	<.040	<.40	<.040	<5.0	<.040	<.010	MW39S
--	<.20	<.010	<.002	<.040	<.040	<.40	<.040	<5.0	<.040	0.012	MW40D
0.00	<.20	<.010	<.002	<.040	<.040	<.40	<.040	<5.0	<.040	<.010	MW40S
0.01	<.20	<.010	<.002	<.040	<.040	<.40	<.040	<5.0	<.040	<.010	MW41D
1.61	<.20	0.029	<.002	<.040	<.040	<.40	<.040	<5.0	<.040	<.010	MW41S
2.80	<.20	0.052	<.002	<.040	<.040	<.40	<.040	<5.0	<.040	0.034	MW43S
--	<.20	0.053	<.002	<.040	<.040	<.40	<.040	<5.0	<.040	0.035	MW43S(d)
10.85	<.20	0.37	<.002	<.040	<.040	<.40	<.040	<5.0	<.040	<.010	MW61S
16.84	<.20	0.40	<.002	<.040	<.040	<.40	<.040	<5.0	<.040	<.010	MW61S
0.00	<.20	<.010	<.002	<.040	<.040	<.40	<.040	<5.0	<.040	0.016	MW62D
5.68	<.20	0.055	<.002	<.040	<.040	<.40	<.040	<5.0	<.040	0.016	MW62S
--	<.20	0.057	<.002	<.040	<.040	<.40	<.040	<5.0	<.040	0.018	MW64D
8.84	<.20	0.44	<.002	<.040	<.040	<.40	<.040	<5.0	<.040	0.020	MW64S
--	<.20	0.44	<.002	<.040	<.040	<.40	<.040	<5.0	<.040	0.014	MW64S(d)
0.00	<.20	0.015	<.002	<.040	<.040	<.40	<.040	<5.0	<.040	<.010	MWD4B
SURFACE-WATER SAMPLES											
0.13	<.20	0.16	<.002	<.040	<.040	<.40	<.040	<5.0	<.040	<.010	GS1SW
0.11	<.20	0.078	<.002	<.040	<.040	<.40	<.040	<5.0	<.040	<.010	GS1SW
3.25	<.20	1.2	<.002	<.040	<.040	<.40	<.040	<5.0	<.040	0.18	GS2SW
0.12	<.20	0.035	<.002	<.040	<.040	<.40	<.040	<5.0	<.040	<.010	GS2SW
0.03	<.20	0.078	<.002	<.040	<.040	<.40	<.040	<5.0	<.040	0.013	GS3SW
0.04	<.20	0.14	<.002	<.040	<.040	<.40	<.040	<5.0	<.040	0.029	GS3SW
0.02	<.20	0.23	<.002	<.040	<.040	<.40	<.040	<5.0	<.040	<.010	GS4SW
--	<.20	0.23	<.002	<.040	<.040	<.40	<.040	<5.0	<.040	<.010	GS4SW(d)
0.13	<.20	0.097	<.002	<.040	<.040	<.40	<.040	<5.0	<.040	<.010	GS4SW
QUALITY-ASSURANCE SAMPLES											
--	<.20	<.010	<.002	<.040	<.040	<.40	<.040	<5.0	<.040	<.010	Eq. Blank (1)
--	<.20	<.010	<.002	<.040	<.040	<.40	<.040	<5.0	<.040	<.010	Eq. Blank (2)
--	<.20	<.010	<.002	<.040	<.040	<.40	<.040	<5.0	<.040	<.010	Eq. Blank (3)
--	<.20	<.010	<.002	<.040	<.040	<.40	<.040	<5.0	<.040	<.010	Eq. Blank (4)
--	<.20	<.010	<.002	<.040	<.040	<.40	<.040	<5.0	<.040	<.010	Eq. Blank (5)
--	<.20	<.010	<.002	<.040	<.040	<.40	<.040	<5.0	<.040	<.010	Eq. Blank (6)

Table 5. Ground- and surface-water quality data at the natural-attenuation study area, Dover Air Force Base, Kent County, Delaware, July - August 1995, May - July 1996, and August 1996, for inorganic constituents--Continued

Sample identification number	Sample date	METALS								Iron, field, (mg/L as Fe ⁺² + Fe ⁺³)
		Alum- inum, ($\mu\text{g/L}$ as Al)	Anti- mony, ($\mu\text{g/L}$ as Sb)	Arsenic, ($\mu\text{g/L}$ as As)	Barium, ($\mu\text{g/L}$ as Ba)	Cad- mium, ($\mu\text{g/L}$ as Cd)	Chro- mium, ($\mu\text{g/L}$ as Cr)	Cobalt, ($\mu\text{g/L}$ as Co)	Copper, ($\mu\text{g/L}$ as Cu)	
QUALITY-ASSURANCE SAMPLES--CONTINUED										
Eq. Blank (7)	08-16-95	<.20	<.20	<.30	<.10	<.005	<.030	<.040	<.030	--
Eq. Blank (8)	08-18-95	<.20	<.20	<.30	<.10	<.005	<.030	<.040	<.030	--
Eq. Blank (9)	08-22-95	<.20	<.20	<.30	<.10	<.005	<.030	<.040	<.030	--
Eq. Blank (10)	05-01-96	<.20	<.20	<.30	<.10	<.005	<.030	<.040	<.030	--
Eq. Blank (11)	05-21-96	<.20	<.20	<.30	<.10	<.005	<.030	<.040	<.030	--
Eq. Blank (12)	05-22-96	<.20	<.20	<.30	<.10	<.005	<.030	<.040	<.030	--
Eq. Blank (13)	05-30-96	<.20	<.20	<.30	<.10	<.005	<.030	<.040	<.030	--
Eq. Blank (14)	06-05-96	<.20	<.20	<.30	<.10	<.005	<.030	<.040	<.030	--
Eq. Blank (15)	06-12-96	<.20	<.20	<.30	<.10	<.005	<.030	<.040	<.030	--
Eq. Blank (16)	06-13-96	<.20	<.20	<.30	<.10	<.005	<.030	<.040	<.030	--
Eq. Blank (17)	06-14-96	<.20	<.20	<.30	<.10	<.005	<.030	<.040	<.030	--

METALS

Iron, field, (mg/L as Fe ⁺²)	Lead, (μg/L as Pb)	Mang- anese, (μg/L as Mn)	Merc- ury, (μg/L as Hg)	Moly- bden- um(μg/ L as Mo)	Nickel, (μg/L as Ni)	Selen- ium, (μg/L as Se)	Silver, (μg/L as Ag)	Thal- lium, (μg/L as Tl)	Vana- dium, (μg/L as V)	Zinc, (μg/L as Z)	Sample iden- tification number
QUALITY-ASSURANCE SAMPLES--CONTINUED											
--	<.20	<.010	<.002	<.040	<.040	<.40	<.040	<5.0	<.040	0.016	Eq. Blank (7)
--	<.20	<.010	<.002	<.040	<.040	<.40	<.040	<5.0	<.040	<.010	Eq. Blank (8)
--	<.20	<.010	<.002	<.040	<.040	<.40	<.040	<5.0	<.040	<.010	Eq. Blank (9)
--	<.20	<.010	<.002	<.040	<.040	<.40	<.040	<5.0	<.040	<.010	Eq. Blank (10)
--	<.20	<.010	<.002	<.040	<.040	<.40	<.040	<5.0	<.040	<.010	Eq. Blank (11)
--	<.20	<.010	<.002	<.040	<.040	<.40	<.040	<5.0	<.040	<.010	Eq. Blank (12)
--	<.20	<.010	<.002	<.040	<.040	<.40	<.040	<5.0	<.040	<.010	Eq. Blank (13)
--	<.20	<.010	<.002	<.040	<.040	<.40	<.040	<5.0	<.040	<.010	Eq. Blank (14)
--	<.20	<.010	<.002	<.040	<.040	<.40	<.040	<5.0	<.040	<.010	Eq. Blank (15)
--	<.20	<.010	<.002	<.040	<.040	<.40	<.040	<5.0	<.040	<.010	Eq. Blank (16)
--	<.20	<.010	<.002	<.040	<.040	<.40	<.040	<5.0	<.040	<.010	Eq. Blank (17)

Table 6. Ground- and surface-water quality data at the natural-attenuation study area, Dover Air Force Base, Kent County, Delaware, May - July 1996, and August 1996, for organic constituents and total dissolved carbon

[Locations of sample sites shown in figures 5-6; mg/L, milligrams per liter; µg/L, micrograms per liter; --, no data; (d), quality-control duplicate sample; quality-assurance samples are at end of table; Eq. blank, equipment blank; Am. blank, ambient blank; August, 1996 samples were analyzed by USGS personnel; all others were analyzed by a contract laboratory]

Sample identification number	Sample date	Sample time	Carbon, total, dissolved (mg/L)	Benzene (µg/L)	Bromo-methane (µg/L)	4-Bromo-fluoro-benzene (µg/L)	Bromo-form (µg/L)	Bromo-benzene (µg/L)	Chloro-ethane (µg/L)	Chloro-form (µg/L)	Chloro-methane (µg/L)	Dibromo-chloromethane (µg/L)
GROUND-WATER SAMPLES												
DM101D	08-03-96	--	38.3	--	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	--
DM102D	06-06-96	11:00	--	<1.0	--	--	--	--	--	--	<1.0	<1.0
DM102D	08-02-96	--	43.2	--	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	--
DM107D	05-02-96	10:00	--	<1.0	--	--	--	--	--	<1.0	<1.0	<1.0
DM107D	08-02-96	--	94.9	--	--	--	--	--	--	--	--	--
DM107S	05-01-96	15:30	--	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
DM108D	05-13-96	11:30	--	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
DM108D	08-02-96	--	97.6	--	--	--	--	--	--	--	--	--
DM108S	05-10-96	12:00	--	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
DM109D	08-03-96	--	76.6	--	--	--	--	--	--	--	--	--
DM110D	06-13-96	10:00	--	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
DM111D	08-03-96	--	97.2	--	--	--	--	--	--	--	--	--
DM110S	08-21-95	12:00	--	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
DM110S	06-13-96	12:00	--	<1.0	<1.0	<1.0	<1.0	<1.0	61	<1.0	<1.0	<1.0
DM110S	08-03-96	--	1,187.6	--	--	--	--	--	--	--	--	--
DM113D	06-04-96	15:00	--	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
DM113D	08-02-96	--	72.6	--	--	--	--	--	--	--	--	--
DM113S	08-08-95	14:30	--	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
DM117D	05-21-96	15:00	--	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
GSID	08-11-95	10:00	--	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
GSID	05-23-96	13:00	--	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
GSIM	08-10-95	13:00	--	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0

**Table 6. Ground- and surface-water quality data at the natural-attenuation study area, Dover Air Force Base, Kent County, Delaware, July - August 1995,
May - July 1996, and August 1996, sampling for organic constituents and total dissolved carbon—Continued**

Sample identification number	Sample date	Sample time	Carbon, total, dissolved (mg/L)	Benzene (µg/L)	Bromo-methane (µg/L)	Bromo-dichloro-methane (µg/L)	4-Bromo-fluoro-benzene (µg/L)	Bromo-form (µg/L)	Chloro-benzene (µg/L)	Chloro-ethane (µg/L)	Chloro-form (µg/L)	Chloro-methane (µg/L)	Di-bromo-chloro-methane (µg/L)
GROUND-WATER SAMPLES—CONTINUED													
GS1M	05-23-96	11:00	--	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
GS1S	08-10-95	11:00	--	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
GS1S	05-23-96	08:00	--	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
GS2D	08-09-95	11:30	--	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
GS2D	05-06-96	08:00	--	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
GS2M	08-09-95	10:00	--	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
GS2M	06-05-96	11:00	--	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
GS2S	08-09-95	08:30	--	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
GS2S	06-05-96	16:00	--	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
GS3M	08-18-95	09:30	--	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
GS3M	05-22-96	14:00	--	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
GS3M(d)	05-22-96	15:00	--	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
GS3S	08-17-95	14:00	--	2.6	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
GS3S	05-22-96	08:00	--	2.5	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
GS4D	08-17-95	10:00	--	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
GS4D	05-21-96	09:00	--	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
GS4M	08-16-95	12:30	--	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
GS4M	05-21-96	12:00	--	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
GS4S	08-16-95	09:30	--	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
GS4S	05-20-96	13:00	--	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
GSCP3D	06-11-96	09:30	--	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
GSCP3D	08-02-96	--	16.2	--	--	--	--	--	--	--	--	--	--
GSCP3M	06-11-96	11:00	--	3.2	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
GSCP3M	08-02-96	--	97.7	--	--	--	--	--	--	--	--	--	--

Table 6. Ground- and surface-water quality data at the natural-attenuation study area, Dover Air Force Base, Kent County, Delaware, July - August 1995, May - July 1996, and August 1996, sampling for organic constituents and total dissolved carbon—Continued

Sample identification number	Sample date	Sample time	Carbon, total, dissolved (mg/L)	Benzene (µg/L)	Bromo-methane (µg/L)	Bromo-dichloro-methane (µg/L)	4-Bromo-fluoro-benzene (µg/L)	Bromo-form (µg/L)	Chloro-benzene (µg/L)	Chloro-ethane (µg/L)	Chloro-form (µg/L)	Chloro-methane (µg/L)	Di-bromo-chloro-methane (µg/L)
GROUND-WATER SAMPLES--CONTINUED													
GSCP4M	06-11-96	13:30	--	9.3	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
GSCP4M	08-02-96	--	116.0	--	--	--	--	--	--	--	--	--	--
GSCP5M	06-07-96	09:00	--	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
GSCP5M(d)	06-07-96	09:30	--	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
GSCP5M	08-02-96	--	113.3	--	--	--	--	--	--	--	--	--	--
GSCP6D	06-10-96	13:30	--	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
GSCP6D	06-07-96	--	88.3	--	--	--	--	--	--	--	--	--	--
GSCP8	07-11-96	10:00	--	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
GSCP9S	06-12-96	16:00	--	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
GSCP9S	08-03-96	--	154.0	--	--	--	--	--	--	--	--	--	--
MW11	08-22-95	13:00	--	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
MW18	08-03-95	14:30	--	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
MW19	08-08-95	08:30	--	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
MW19	08-08-95	09:30	--	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
MW19	05-17-96	12:00	--	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
MW19	08-01-96	--	104.6	--	--	--	--	--	--	--	--	--	--
MW20	07-28-95	09:00	--	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
MW206D	08-01-95	--	--	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
MW206D	05-31-96	09:30	--	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
MW206D(d)	05-31-96	09:45	--	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
MW206M	08-07-95	15:00	--	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
MW206M	05-30-96	09:00	--	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
MW206M	08-03-96	--	114.4	--	--	--	--	--	--	--	--	--	--
MW21	07-27-95	13:00	--	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0

**Table 6. Ground- and surface-water quality data at the natural-attenuation study area, Dover Air Force Base, Kent County, Delaware, July - August 1995,
May - July 1996, and August 1996, sampling for organic constituents and total dissolved carbon--Continued**

Sample identification number	Sample date	Sample time	Carbon, total, dissolved (mg/L)	Benzene (µg/L)	Bromo-methane (µg/L)	Bromo-dichloro-methane (µg/L)	4-Bromo-fluoro-benzene (µg/L)	Bromo-form (µg/L)	Chloro-benzene (µg/L)	Chloro-ethane (µg/L)	Chloro-form (µg/L)	Chloro-methane (µg/L)	Di-bromo-chloro-methane (µg/L)
GROUND-WATER SAMPLES--CONTINUED													
MW226D	08-02-95	08:30	--	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
MW226M	08-02-95	09:00	--	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
MW226M	06-06-96	09:00	--	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
MW226M	08-02-96	--	89.1	--	--	--	--	--	--	--	--	--	--
MW227D	05-02-96	13:30	--	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
MW227D	08-22-95	09:30	--	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
MW227D	08-02-96	--	84.0	--	--	--	--	--	--	--	--	--	--
MW227S	05-06-96	12:30	--	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
MW37D	07-27-95	09:30	--	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
MW37S	08-07-95	11:30	--	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
MW37S(d)	08-07-95	11:00	--	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
MW37S	05-28-96	14:00	--	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
MW37S	08-02-96	--	91.0	--	--	--	--	--	--	--	--	--	--
MW39D	08-01-95	11:00	--	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
MW39D(d)	08-01-95	--	--	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
MW39S	07-26-95	15:00	--	37	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
MW39S	06-12-96	14:00	--	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
MW39S	08-02-96	--	122.7	--	--	--	--	--	--	--	--	--	--
MW40D	08-03-95	08:30	--	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
MW40S	08-03-95	10:00	--	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
MW41D	07-31-95	13:00	--	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
MW41S	08-01-95	08:00	--	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
MW43S	07-26-95	10:00	--	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
MW43S(d)	07-26-95	10:00	--	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0

Table 6. Ground- and surface-water quality data at the natural-attenuation study area, Dover Air Force Base, Kent County, Delaware, July - August 1995, May - July 1996, and August 1996, sampling for organic constituents and total dissolved carbon—Continued

Sample identification number	Sample date	Sample time	Carbon, total, dissolved (mg/L)	Benzene (µg/L)	Bromo-methane (µg/L)	Bromo-dichloro-methane (µg/L)	4-Bromo-fluoro-benzene (µg/L)	Bromo-form (µg/L)	Chloro-benzene (µg/L)	Chloro-ethane (µg/L)	Chloro-form (µg/L)	Chloro-methane (µg/L)	Di-bromo-chloro-methane (µg/L)
GROUND-WATER SAMPLES—CONTINUED													
MW61S	08-04-95	09:00	--	6.5	<1.0	<1.0	<1.0	<1.0	87	<1.0	<1.0	<1.0	<1.0
MW61S	06-21-96	12:00	--	7.8	<1.0	<1.0	<1.0	<1.0	82	<1.0	<1.0	<1.0	<1.0
MW61S	08-03-96	--	1,421.2	--	--	--	--	--	--	--	--	--	--
MW62D	06-18-96	11:30	--	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
MW62S	06-18-96	13:30	--	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
MW62S	08-03-96	--	163.5	--	--	--	--	--	--	--	--	--	--
MW64D	07-11-96	14:00	--	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
MW64S	06-14-96	10:30	--	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
MW64S(d)	06-14-96	10:45	--	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
MWD4B	05-31-96	15:00	--	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
SURFACE-WATER SAMPLES													
GS1SW	08-10-95	10:15	--	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
GS1SW	05-22-96	14:00	--	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
GS2SW	08-10-95	10:45	--	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
GS2SW	06-05-96	15:30	--	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
GS2SW(d)	05-06-96	15:45	--	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
GS3SW	08-17-95	15:00	--	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
GS3SW	05-22-96	10:00	--	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
GS4SW	08-16-95	13:00	--	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
GS4SW(d)	08-16-95	13:30	--	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
GS4SW	05-20-96	14:00	--	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
QUALITY-ASSURANCE SAMPLES													
Eq. blank (1)	07-27-95	13:30	--	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Eq. blank (2)	08-02-95	09:30	--	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Eq. blank (3)	08-03-95	09:30	--	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Eq. blank (4)	08-09-95	15:00	--	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0

Table 6. Ground- and surface-water quality data at the natural-attenuation study area, Dover Air Force Base, Kent County, Delaware, July - August 1995, May - July 1996, and August 1996, sampling for organic constituents and total dissolved carbon—Continued

Sample identification number	Sample date	Sample time	Carbon, total, dissolved (mg/L)	Benzene (µg/L)	Bromo-methane (µg/L)	Bromo-dichloro-methane (µg/L)	4-Bromo-fluoro-benzene (µg/L)	Bromo-form (µg/L)	Chloro-ethane (µg/L)	Chloro-form (µg/L)	Chloro-methane (µg/L)	Dibromo-chloromethane (µg/L)
QUALITY ASSURANCE SAMPLES—CONTINUED												
Eq. blank (5)	08-11-95	12:00	—	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Eq. blank (6)	08-16-95	10:00	—	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Eq. blank (7)	08-16-95	14:00	—	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Eq. blank (8)	08-18-95	10:00	—	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Eq. blank (9)	08-22-95	10:00	—	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Eq. blank (10)	05-02-96	14:00	—	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Eq. blank (11)	05-21-96	10:00	—	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Eq. blank (12)	05-22-96	09:00	—	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Eq. blank (13)	05-30-96	13:00	—	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Eq. blank (14)	06-05-96	16:30	—	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Eq. blank (15)	06-12-96	14:30	—	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Eq. blank (16)	06-13-96	15:30	—	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	2.4	<1.0	<1.0
Eq. blank (17)	06-14-96	11:00	—	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Trip blank (1)	07-26-95	10:00	—	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Trip blank (2)	07-27-95	13:00	—	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Trip blank (3)	08-04-95	08:45	—	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Trip blank (4)	08-09-95	10:30	—	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Trip blank (5)	08-11-95	08:30	—	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Trip blank (6)	08-17-95	09:30	—	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Trip blank (7)	08-18-95	08:30	—	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Trip blank (8)	08-21-95	11:30	—	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Am. blank (1)	08-07-95	11:45	—	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Am. blank (2)	05-31-96	09:00	—	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0

**Table 6. Ground- and surface-water quality data at the natural-attenuation study area, Dover Air Force Base, Kent County, Delaware, July - August 1995,
May - July 1996, and August 1996, for organic constituents and total dissolved carbon**

[Locations of sample sites shown in figures 5-6; µg/L, micrograms per liter; --, no data; (d), quality control duplicate sample; quality-assurance samples are at end of table; Eq. Blank, equipment blank;
Amb. blank, ambient blank; August, 1996 samples, ethane, ethylene, and methane samples were analyzed by USGS personnel, all others were analyzed by a contract laboratory]

Sample identification number	Sample date	GROUND-WATER SAMPLES										trans-DI-CHLOROPROPENE				
		1,1-Dichloroethane (µg/L)	1,2-Dichloroethane (µg/L)	1,1-Dichloroethene, total (µg/L)	1,2-Dichloroethene, total (µg/L)	cis-1,2-Dichloroethene (µg/L)	trans-1,2-Dichloroethene (µg/L)	1,2-Dichloropropane (µg/L)	1,2-Dichloropropane (µg/L)	cis-1,3-Dichloropropane (µg/L)	trans-1,3-Dichloropropane (µg/L)	Ethane (µg/L)	Ethylbenzene (µg/L)	Ethyl-ene, (µg/L)	2-Hexanone (µg/L)	Methane (µg/L)
DM101D	08-03-96	--	--	<0.97	--	<0.97	<0.97	--	--	--	--	--	--	--	--	300
DM102D	06-06-96	<1.0	<1.0	<1.0	--	<1.0	<1.0	<1.0	<1.0	ND	<1.0	ND	<1.0	<1.0	<25	
DM102D	08-02-96	--	--	<0.97	--	<0.97	<0.97	--	--	--	--	--	--	--	ND	
DM107D	05-02-96	<1.0	6.3	<1.0	--	4.5	<1.0	<1.0	<1.0	--	<1.0	--	<1.0	<1.0	--	
DM107D	08-02-96	--	--	<0.97	--	11.63	<1.0	--	--	--	--	--	--	--	100	
DM107S	05-01-96	<1.0	2.5	<1.0	--	2.1	<1.0	<1.0	<1.0	<1.0	<1.0	--	<1.0	--	<1.0	
DM108D	05-13-96	<1.0	<1.0	<1.0	--	15.0	<1.0	<1.0	<1.0	--	<1.0	--	<1.0	--	<1.0	
DM108D	08-02-96	--	--	<0.97	--	29.082	<0.97	--	--	--	--	--	--	--	0	
DM108S	05-10-96	<1.0	<1.0	<1.0	--	17.0	<1.0	<1.0	<1.0	--	<1.0	--	<1.0	--	--	
DM109D	08-03-96	--	--	<0.97	--	<0.97	<0.97	--	--	--	--	--	--	--	N.D.	
DM110D	06-13-96	<1.0	<1.0	<1.0	--	<1.0	<1.0	<1.0	<1.0	ND	<1.0	ND	<1.0	<1.0	<34	
DM110D	08-03-96	--	--	<0.97	--	<0.97	--	--	--	--	--	--	--	--	ND	
DM110S	08-21-95	<1.0	<1.0	<1.0	2,000	--	--	<1.0	<1.0	0.55	<1.0	<0.87	<1.0	<1.0	8501	
DM110S	06-13-96	<1.0	<1.0	<1.0	--	1400	<1.0	<1.0	<1.0	0.36	<1.0	0.84	<1.0	<1.0	9228	
DM110S	08-03-96	--	--	<0.97	--	155.60	35.09	--	--	--	--	--	--	--	6700	
DM113D	06-04-96	<1.0	<1.0	<1.0	--	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<0.34	<1.0	<1.0	<25	
DM113D	08-02-96	--	--	<0.97	--	<0.97	<0.97	--	--	--	--	--	--	--	ND	
DM113S	08-08-95	<1.0	<1.0	<1.0	--	<1.0	--	<1.0	<1.0	ND	<1.0	<1.0	<1.0	<1.0	<27	
DM117D	05-21-96	<1.0	<1.0	<1.0	--	--	--	<1.0	<1.0	ND	<1.0	ND	<1.0	<1.0	<29	
GS1D	08-11-95	<1.0	<1.0	<1.0	<1.0	<1.0	--	<1.0	<1.0	ND	<1.0	ND	<1.0	<1.0	--	
GS1D	05-23-96	<1.0	<1.0	<1.0	--	<1.0	<1.0	<1.0	<1.0	ND	<1.0	<0.79	<1.0	<1.0	--	
GS1M	08-10-95	<1.0	<1.0	<1.0	<1.0	<1.0	--	<1.0	<1.0	ND	<1.0	ND	<1.0	<1.0	2720	

Table 6. Ground- and surface-water quality data at the natural-attenuation study area, Dover Air Force Base, Kent County, Delaware, July - August 1995, May - July 1996, and August 1996, for organic constituents and total dissolved carbon—Continued

Sample identification number	Sample date	1,1-Di-chloro-ethane ($\mu\text{g/L}$)	1,2-Di-chloro-ethane ($\mu\text{g/L}$)	1,1-Di-chloro-ethene ($\mu\text{g/L}$)	1,2-Di-chloro-ethene, total ($\mu\text{g/L}$)	cis-1,2-Di-chloro-ethene ($\mu\text{g/L}$)	trans-1,2-Di-chloro-ethene ($\mu\text{g/L}$)	cis-1,3-Di-chloro-propane ($\mu\text{g/L}$)	trans-1,2-Di-chloro-propane ($\mu\text{g/L}$)	Ethane ($\mu\text{g/L}$)	Ethyl-benzene ($\mu\text{g/L}$)	Ethyl-ene ($\mu\text{g/L}$)	Ethyl-hexane, none ($\mu\text{g/L}$)	Methane ($\mu\text{g/L}$)	
GROUND-WATER SAMPLES—CONTINUED															
GS1M	05-23-96	<1.0	<1.0	<1.0	<1.0	--	--	<1.0	<1.0	<1.0	ND	<1.0	ND	<1.0	<27
GS1S	08-10-95	<1.0	<1.0	<1.0	<1.0	110	--	<1.0	<1.0	<1.0	ND	<1.0	ND	<1.0	3947
GS1S	05-23-96	<1.0	<1.0	<1.0	<1.0	--	29.0	<1.0	<1.0	<1.0	ND	<1.0	ND	<1.0	53
GS2D	08-09-95	<1.0	63	<1.0	17	--	--	<1.0	<1.0	<1.0	ND	<1.0	--	<1.0	105
GS2D	05-06-96	<1.0	68	<1.0	--	13.0	<1.0	<1.0	<1.0	<1.0	ND	<1.0	<0.84	<1.0	157
GS2M	08-09-95	<1.0	<1.0	<1.0	<1.0	--	--	<1.0	<1.0	<1.0	ND	<1.0	ND	<1.0	<28
GS2M	06-05-96	<1.0	<1.0	<1.0	<1.0	--	<1.0	<1.0	<1.0	<1.0	ND	<1.0	<0.91	<1.0	<29
GS2S	08-09-95	<1.0	<1.0	<1.0	<1.0	5.7	--	--	<1.0	<1.0	ND	<1.0	<0.90	<1.0	38
GS2S	06-05-96	<1.0	<1.0	<1.0	<1.0	--	33.0	<1.0	<1.0	<1.0	ND	<1.0	<1.0	<1.0	--
GS3M	08-18-95	<1.0	<1.0	<1.0	<1.0	3.3	--	--	<1.0	<1.0	ND	<1.0	ND	<1.0	<27
GS3M	05-22-96	<1.0	<1.0	<1.0	<1.0	--	1.6	<1.0	<1.0	<1.0	ND	<1.0	ND	<1.0	ND
GS3M(d)	05-22-96	<1.0	<1.0	<1.0	<1.0	--	1.7	<1.0	<1.0	<1.0	ND	<1.0	--	<1.0	--
GS3S	08-17-95	<1.0	<1.0	<1.0	<1.0	11	--	--	<1.0	<1.0	ND	<1.0	ND	<1.0	3128
GS3S	05-22-96	<1.0	<1.0	<1.0	<1.0	<1.0	8.8	<1.0	<1.0	<1.0	ND	<1.0	<0.37	<1.0	1969
GS4D	08-17-95	<1.0	<1.0	<1.0	<1.0	1.3	--	--	<1.0	<1.0	ND	<1.0	ND	<1.0	<26
GS4D	05-21-96	<1.0	<1.0	<1.0	<1.0	--	<1.0	<1.0	<1.0	<1.0	ND	<1.0	<1.0	<1.0	<32
GS4M	08-16-95	<1.0	<1.0	<1.0	<1.0	--	--	<1.0	<1.0	<1.0	ND	<1.0	<0.85	<1.0	<27
GS4M	05-21-96	<1.0	<1.0	<1.0	<1.0	--	<1.0	<1.0	<1.0	<1.0	ND	<1.0	<1.0	<1.0	<26
GS4M	08-16-95	<1.0	<1.0	<1.0	<1.0	--	<1.0	<1.0	<1.0	<1.0	ND	<1.0	<1.0	<1.0	<26
GS4S	05-20-96	<1.0	<1.0	<1.0	<1.0	--	<1.0	<1.0	<1.0	<1.0	ND	<1.0	<1.0	<1.0	<32
GSCP3D	06-11-96	<1.0	<1.0	<1.0	<1.0	--	2.6	<1.0	<1.0	<1.0	ND	<1.0	<0.81	<1.0	<27
GSCP3D	08-02-96	--	--	<0.97	--	<0.97	--	--	--	--	ND	<1.0	--	--	ND
GSCP3M	06-11-96	<1.0	<1.0	<1.0	<1.0	--	<1.0	<1.0	<1.0	<1.0	ND	<1.0	<0.83	<1.0	274
GSCP3M	08-02-96	--	--	<0.97	--	<0.97	--	--	--	--	ND	<1.0	--	--	300

Table 6. Ground- and surface-water quality data at the natural-attenuation study area, Dover Air Force Base, Kent County, Delaware, July - August 1995, May - July 1996, and August 1996, for organic constituents and total dissolved carbon—Continued

Sample identification number	Sample date	1,1-Dichloroethane ($\mu\text{g/L}$)	1,2-Dichloroethane ($\mu\text{g/L}$)	1,1-Dichloroethene, total ($\mu\text{g/L}$)	1,2-Dichloroethene, total ($\mu\text{g/L}$)	cis-1,2-Dichloroethene ($\mu\text{g/L}$)	trans-1,2-Dichloroethene ($\mu\text{g/L}$)	cis-1,3-Dichloropropane ($\mu\text{g/L}$)	trans-1,3-Dichloropropane ($\mu\text{g/L}$)	Ethane ($\mu\text{g/L}$)	Ethylbenzene ($\mu\text{g/L}$)	Ethylene, none ($\mu\text{g/L}$)	Methane ($\mu\text{g/L}$)
GROUND-WATER SAMPLES--CONTINUED													
GSCP4M	06-11-96	<1.0	<1.0	<1.0	--	<1.0	<1.0	<1.0	<1.0	ND	<1.0	<0.80	<1.0
GSCP4M	08-02-96	--	--	6.69	--	<0.97	5.72	--	--	--	--	--	--
GSCP5M	06-07-96	<1.0	<1.0	<1.0	--	5.3	<1.0	<1.0	<1.0	ND	<1.0	<0.80	<1.0
GSCP5M(d)	06-07-96	<1.0	<1.0	<1.0	--	--	--	<1.0	<1.0	--	<1.0	--	<26
GSCP5M	08-02-96	--	--	<0.97	--	12.99	<0.97	--	--	--	--	--	--
GSCP6D	06-10-96	<1.0	<1.0	<1.0	--	<1.0	<1.0	<1.0	<1.0	ND	<1.0	<0.84	<1.0
GSCP6D	06-07-96	--	--	<0.97	--	<0.97	<0.97	--	--	--	--	--	--
GSCP8	07-11-96	<1.0	<1.0	<1.0	--	<1.0	<1.0	<1.0	<1.0	ND	<1.0	ND	<1.0
GSCP9S	06-12-96	<1.0	<1.0	<1.0	--	2.5	<1.0	<1.0	<1.0	ND	<1.0	<0.82	<1.0
GSCP9S	08-03-96	--	--	<0.97	--	25.98	--	--	--	--	--	--	--
MW11	08-22-95	<1.0	<1.0	46	--	--	<1.0	<1.0	<1.0	ND	<1.0	ND	<1.0
MW18	08-03-95	<1.0	<1.0	<1.0	--	--	<1.0	<1.0	<1.0	<1.0	<1.0	--	<1.0
MW19	08-08-95	<1.0	<1.0	4.8	--	--	<1.0	<1.0	<1.0	<1.0	<1.0	<0.90	<1.0
MW19	08-08-95	<1.0	<1.0	1.1	--	--	<1.0	<1.0	<1.0	--	<1.0	--	<1.0
MW19	05-17-96	<1.0	<1.0	<1.0	--	<1.0	<1.0	<1.0	<1.0	ND	<1.0	<0.91	<1.0
MW19	08-03-96	--	--	<0.97	--	8.72	<0.97	--	--	--	--	--	--
MW20	07-28-95	<1.0	<1.0	<1.0	<1.0	<1.0	--	<1.0	<1.0	--	<1.0	--	<1.0
MW206D	08-01-95	<1.0	<1.0	1.3	--	--	--	<1.0	<1.0	--	<1.0	--	<1.0
MW206D	05-31-96	<1.0	<1.0	<1.0	--	5.1	<1.0	<1.0	<1.0	ND	<1.0	ND	<1.0
MW206D(d)	05-31-96	<1.0	<1.0	<1.0	--	5.0	--	<1.0	<1.0	--	<1.0	--	<1.0
MW206M	08-07-95	<1.0	15	<1.0	13	--	<1.0	<1.0	<1.0	ND	<1.0	<0.82	<1.0
MW206M	05-30-96	<1.0	19	<1.0	--	17.0	<1.0	<1.0	<1.0	ND	<1.0	ND	<1.0
MW206M	08-03-96	--	--	<0.97	--	36.934	<0.97	--	--	--	--	--	--
MW21	07-27-95	<1.0	<1.0	<1.0	<1.0	--	<1.0	<1.0	<1.0	--	<1.0	--	<1.0

Table 6. Ground- and surface-water quality data at the natural-attenuation study area, Dover Air Force Base, Kent County, Delaware, July - August 1995, May - July 1996, and August 1996, for organic constituents and total dissolved carbon—Continued

Sample identification number	Sample date	1,1-Di-chloro-ethane ($\mu\text{g/L}$)	1,2-Di-chloro-ethane ($\mu\text{g/L}$)	1,1-Di-chloro-ethene, total ($\mu\text{g/L}$)	1,2-Di-chloro-ethene ($\mu\text{g/L}$)	cis-1,2-Di-chloro-ethene, total ($\mu\text{g/L}$)	trans-1,2-Di-chloro-ethene ($\mu\text{g/L}$)	cis-1,3-Di-chloro-propane ($\mu\text{g/L}$)	trans-1,2-Di-chloro-propane ($\mu\text{g/L}$)	Ethane ($\mu\text{g/L}$)	Ethyleneglycol ($\mu\text{g/L}$)	Ethylenecarbonate ($\mu\text{g/L}$)	2-Hexanone ($\mu\text{g/L}$)	Methane ($\mu\text{g/L}$)
GROUND-WATER SAMPLES—CONTINUED														
MW226D	08-02-95	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	—
MW226M	08-02-95	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	—
MW226M	06-06-96	<1.0	<1.0	<1.0	—	<1.0	<1.0	<1.0	<1.0	<1.0	ND	<1.0	<85	<1.0
MW226M	08-03-96	—	—	<0.97	—	<0.97	—	—	—	—	—	—	—	ND
MW227D	08-22-95	<1.0	<1.0	<1.0	11	—	<1.0	<1.0	<1.0	<1.0	ND	<1.0	<1.0	<28
MW227D	05-02-96	<1.0	<1.0	<1.0	—	7.4	<1.0	<1.0	<1.0	<1.0	—	<1.0	<1.0	—
MW227D	08-02-96	—	—	<0.97	—	<0.97	<0.97	—	—	—	—	—	—	ND
MW227S	05-06-96	<1.0	<1.0	<1.0	—	<1.0	<1.0	<1.0	<1.0	<1.0	—	<1.0	<1.0	—
MW37D	07-27-95	<1.0	<1.0	<1.0	—	<1.0	—	—	<1.0	<1.0	—	<1.0	<1.0	—
MW37S	08-07-95	<1.0	<1.0	<1.0	1.5	—	—	<1.0	<1.0	<1.0	ND	<1.0	<1.0	<28
MW37S(d)	08-07-95	<1.0	<1.0	<1.0	1.4	—	—	<1.0	<1.0	<1.0	—	<1.0	<1.0	—
MW37S	05-28-96	<1.0	<1.0	<1.0	—	<1.0	<1.0	<1.0	<1.0	<1.0	—	<1.0	<1.0	—
MW37S	08-02-96	—	—	<0.97	—	<0.97	<0.97	—	—	—	—	—	—	ND
MW39D	08-01-95	<1.0	<1.0	<1.0	—	<1.0	—	—	<1.0	<1.0	—	<1.0	<1.0	—
MW39D(d)	08-01-95	<1.0	<1.0	<1.0	—	<1.0	—	—	<1.0	<1.0	—	<1.0	<1.0	—
MW39S	07-26-95	<1.0	45	6.4	130	—	—	<1.0	<1.0	<1.0	—	<1.0	<1.0	—
MW39S	06-12-96	<1.0	<1.0	<1.0	—	<1.0	<1.0	<1.0	<1.0	<1.0	ND	<1.0	<84	<1.0
MW39S	08-02-96	—	—	<0.97	—	<0.97	<0.97	—	—	—	—	—	—	ND
MW40D	08-03-95	<1.0	<1.0	<1.0	—	<1.0	—	—	<1.0	<1.0	—	<1.0	<1.0	—
MW40S	08-03-95	<1.0	<1.0	<1.0	—	<1.0	—	—	<1.0	<1.0	—	<1.0	<1.0	—
MW41D	07-31-95	<1.0	<1.0	<1.0	—	<1.0	—	—	<1.0	<1.0	—	<1.0	<1.0	—
MW41S	08-01-95	1.3	<1.0	<1.0	—	<1.0	—	—	<1.0	<1.0	—	<1.0	<1.0	69
MW43S	07-26-95	<1.0	<1.0	<1.0	—	<1.0	—	—	<1.0	<1.0	ND	<1.0	<1.0	<28
MW43S(d)	07-26-95	<1.0	<1.0	<1.0	—	<1.0	—	—	<1.0	<1.0	—	<1.0	<1.0	—

Table 6. Ground- and surface-water quality data at the natural-attenuation study area, Dover Air Force Base, Kent County, Delaware, July - August 1995, May - July 1996, and August 1996, for organic constituents and total dissolved carbon—Continued

Sample identification number	Sample date	1,1-Di-chloro-ethane ($\mu\text{g/L}$)	1,2-Di-chloro-ethane ($\mu\text{g/L}$)	1,1-Di-chloro-ethene, total ($\mu\text{g/L}$)	1,2-Di-chloro-ethene ($\mu\text{g/L}$)	cis-1,2-Di-chloro-ethene ($\mu\text{g/L}$)	trans-1,2-Di-chloro-ethene ($\mu\text{g/L}$)	cis-1,3-Di-chloro-propane ($\mu\text{g/L}$)	trans-1,3-Di-chloro-propane ($\mu\text{g/L}$)	Ethyl-benzene ($\mu\text{g/L}$)	Ethyl-ene, none ($\mu\text{g/L}$)	Ethyl-hexane ($\mu\text{g/L}$)	Methane ($\mu\text{g/L}$)	
GROUND-WATER SAMPLES—CONTINUED														
MW61S	08-04-95	<1.0	<1.0	<1.0	<1.0	--	--	<1.0	<1.0	--	<1.0	--	<1.0	9147
MW61S	06-21-96	<1.0	<1.0	<1.0	<1.0	--	--	<1.0	<1.0	ND	<1.0	ND	ND	10654
MW61S	08-03-96	--	--	<0.97	--	<0.97	5.23	--	--	--	--	--	--	10400
MW62D	06-18-96	<1.0	<1.0	<1.0	<1.0	--	<1.0	<1.0	<1.0	ND	<1.0	ND	<1.0	<40
MW62S	06-18-96	<1.0	<1.0	<1.0	<1.0	--	<1.0	<1.0	<1.0	ND	<1.0	ND	<1.0	133
MW62S	08-03-96	--	--	<0.97	--	<0.97	<0.97	--	--	--	--	--	--	100
MW64D	07-11-96	<1.0	<1.0	<1.0	<1.0	--	<1.0	<1.0	<1.0	--	<1.0	--	<1.0	-
MW64S	06-14-96	<1.0	<1.0	<1.0	<1.0	--	<1.0	<1.0	<1.0	--	<1.0	<89	<1.0	31
MW64S(d)	06-14-96	<1.0	<1.0	<1.0	<1.0	--	--	<1.0	<1.0	--	<1.0	--	<1.0	--
MWD4B	05-31-96	<1.0	<1.0	<1.0	<1.0	--	<1.0	<1.0	<1.0	ND	<1.0	ND	<1.0	<28
SURFACE-WATER SAMPLES														
GSI SW	05-31-96	<1.0	<1.0	<1.0	<1.0	--	--	<1.0	<1.0	<1.0	<37	<1.0	ND	<1.0
GSI SW	05-23-96	<1.0	<1.0	<1.0	<1.0	--	2.3	<1.0	<1.0	<1.0	ND	<1.0	ND	<1.0
GSI SW	08-10-95	<1.0	<1.0	<1.0	<1.0	--	--	<1.0	<1.0	<1.0	ND	<1.0	ND	<1.0
GSI SW	06-05-96	<1.0	<1.0	<1.0	<1.0	--	1.4	<1.0	<1.0	<1.0	ND	<1.0	<0.82	<1.0
GSI SW(d)	06-05-96	<1.0	<1.0	<1.0	<1.0	--	--	<1.0	<1.0	<1.0	--	<1.0	--	<1.0
GSI SW	08-17-95	<1.0	<1.0	<1.0	<1.0	--	--	<1.0	<1.0	<1.0	<1.0	<1.0	ND	218
GSI SW	05-22-96	<1.0	<1.0	<1.0	<1.0	--	1.0	<1.0	<1.0	<1.0	ND	<1.0	ND	<26
GSA SW	08-16-95	<1.0	<1.0	<1.0	<1.0	--	--	<1.0	<1.0	<1.0	ND	<1.0	ND	68
GSA SW(d)	08-16-95	<1.0	<1.0	<1.0	<1.0	--	1.0	<1.0	<1.0	<1.0	ND	<1.0	ND	<26
GSA SW	05-20-96	<1.0	<1.0	<1.0	<1.0	--	<1.0	<1.0	<1.0	<1.0	ND	<1.0	ND	<27
QUALITY-ASSURANCE SAMPLES														
Eq. blank (1)	07-27-95	<1.0	<1.0	<1.0	<1.0	--	--	<1.0	<1.0	<1.0	<1.0	<1.0	--	<1.0
Eq. blank (2)	08-02-95	<1.0	<1.0	<1.0	<1.0	--	--	<1.0	<1.0	<1.0	<1.0	<1.0	--	<1.0
Eq. blank (3)	08-03-95	<1.0	<1.0	<1.0	<1.0	--	--	<1.0	<1.0	<1.0	<1.0	<1.0	--	<1.0
Eq. blank (4)	08-09-95	<1.0	<1.0	<1.0	<1.0	--	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	--	<1.0

Table 6. Ground- and surface-water quality data at the natural-attenuation study area, Dover Air Force Base, Kent County, Delaware, July - August 1995, May - July 1996, and August 1996, for organic constituents and total dissolved carbon—Continued

Sample identification number	Sample date	1,1-Di-chloro-ethane ($\mu\text{g/L}$)	1,2-Di-chloro-ethane ($\mu\text{g/L}$)	1,1-Di-chloro-ethene, total ($\mu\text{g/L}$)	1,2-Di-chloro-ethene ($\mu\text{g/L}$)	cis-1,2-Di-chloro-ethene ($\mu\text{g/L}$)	trans-1,2-Di-chloro-ethene ($\mu\text{g/L}$)	cis-1,3-Di-chloropropane ($\mu\text{g/L}$)	trans-1,3-Di-chloropropane ($\mu\text{g/L}$)	Ethylbenzene ($\mu\text{g/L}$)	Ethyl-ene, none ($\mu\text{g/L}$)	Ethylhexane, none ($\mu\text{g/L}$)	Methane ($\mu\text{g/L}$)	
QUALITY-ASSURANCE SAMPLES—CONTINUED														
Eq. blank (5)	08-11-95	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Eq. blank (6)	08-16-95	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Eq. blank (7)	08-16-95	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Eq. blank (8)	08-18-95	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Eq. blank (9)	08-22-95	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Eq. blank (10)	05-02-96	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Eq. blank (11)	05-21-96	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Eq. blank (12)	05-22-96	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Eq. blank (13)	05-30-96	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Eq. blank (14)	06-05-96	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Eq. blank (15)	06-12-96	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Eq. blank (16)	06-13-96	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Eq. blank (17)	06-14-96	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Trip blank (1)	07-26-95	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Trip blank (2)	07-27-95	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Trip blank (3)	08-04-95	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Trip blank (4)	08-09-95	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Trip blank (5)	08-11-95	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Trip blank (6)	08-17-95	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Trip blank (7)	08-18-95	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Trip blank (8)	08-21-95	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Amb. blank (1)	08-07-95	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Amb. blank (2)	05-31-96	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0

Table 6. Ground- and surface-water quality data at the natural-attenuation study area, Dover Air Force Base, Kent County, Delaware, July - August 1995, May - July 1996, and August 1996, for organic constituents and total dissolved carbon

[Locations of sample sites shown in figures 5-6; mg/L, milligrams per liter; µg/L, micrograms per liter; --, no data; (d), quality control duplicate sample; quality-assurance samples are at end of table; Eq., blank, equipment blank; Amb., blank, ambient blank, August, 1996 samples were analyzed by USGS personnel; all others were analyzed by a contract laboratory]

Sample identification number	Sample date	1,1,2,2-tetra-chloro-ethane (µg/L)						1,1,1-Tri-chloro-ethane (µg/L)						1,1,2-Tri-chloro-ethene (µg/L)						Vinyl-acetate (µg/L)						Vinyl-chloride (µg/L)					
		Methyl-ethyl-ketone (µg/L)	Meth-ylen-chloride (µg/L)	Syrene (µg/L)	Tetra-chloro-ethene (µg/L)	Toluene (µg/L)	1,1,1-Tri-chloro-ethane (µg/L)	1,1,2-Tri-chloro-ethene (µg/L)	Toluene (µg/L)	Vinyl-acetate (µg/L)	Vinyl-chloride (µg/L)	Xylenes (µg/L)																			
GROUND-WATER SAMPLES																															
DM101D	08-03-96	--	<1.0	<1.0	--	<1.0	<1.0	<1.0	<1.0	--	--	<1.31	--	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0		
DM102D	06-06-96	<1.0	<1.0	<1.0	--	--	--	<1.65	--	--	--	<1.31	--	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0		
DM102D	08-02-96	--	--	--	--	<1.0	--	11	<1.0	<1.0	<1.0	<1.0	--	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0		
DM107D	05-02-96	<1.0	<1.0	--	--	--	--	40.63	--	--	--	--	--	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0		
DM107D	08-02-96	--	--	--	--	--	--	--	--	--	--	--	--	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	
DM107S	05-01-96	<1.0	<1.0	--	--	--	<1.0	6.30	<1.0	<1.0	<1.0	<1.0	--	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0		
DM108D	05-13-96	<1.0	<1.0	--	--	--	9.3	12.0	<1.0	<1.0	<1.0	<1.0	--	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0		
DM108D	08-02-96	--	--	--	--	--	--	--	19.9	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--		
DM108S	05-10-96	<1.0	<1.0	--	--	--	12	14.0	<1.0	<1.0	<1.0	<1.0	--	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0		
DM109D	08-03-96	--	--	--	--	--	--	<1.65	--	--	--	--	--	<1.65	--	--	--	--	--	<1.31	--	<1.31	--	<1.31	--	<1.31	--	<1.31	--		
DM111D	06-13-96	<1.0	<1.0	--	--	--	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	--	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0		
DM111D	08-03-96	--	--	--	--	--	--	--	<1.65	--	--	--	--	<1.65	--	--	--	--	--	<1.31	--	<1.31	--	<1.31	--	<1.31	--	<1.31	--		
DM110S	08-21-95	<1.0	<1.0	--	--	--	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	--	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0		
DM110S	06-13-96	<1.0	36	--	--	--	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	--	<1.65	--	--	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0		
DM110S	08-03-96	--	--	--	--	--	--	--	--	--	--	--	--	<1.65	--	--	--	--	--	<1.31	--	<1.31	--	<1.31	--	<1.31	--	<1.31	--		
DM111D	06-04-96	<1.0	<1.0	--	--	--	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	--	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0		
DM111D	08-02-96	--	--	--	--	--	--	--	<1.65	--	--	--	--	<1.65	--	--	--	--	--	<1.31	--	<1.31	--	<1.31	--	<1.31	--	<1.31	--		
DM111S	08-08-95	<1.0	<1.0	--	--	--	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	--	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0		
DM111D	05-21-96	<1.0	<1.0	--	--	--	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	--	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0		
GSD	08-11-95	<1.0	<1.0	--	--	--	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	--	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0		
GSD	05-23-96	<1.0	<1.0	--	--	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	--	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0			
GSM	08-10-95	<1.0	<1.0	--	--	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	--	470	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0		

Table 6. Ground- and surface-water quality data at the natural-attenuation study area, Dover Air Force Base, Kent County, Delaware, July - August 1995, May - July 1996, and August 1996, for organic constituents and total dissolved carbon—Continued

Sample identification number	Sample date	Methyl-ethyl-ketone ($\mu\text{g/L}$)	Methylen-chloride ($\mu\text{g/L}$)	Styrene ($\mu\text{g/L}$)	Tetra-chloro-ethane ($\mu\text{g/L}$)	Toluene ($\mu\text{g/L}$)	Tri-chloro-ethane ($\mu\text{g/L}$)	1,1,1,2-tetra-chloro-ethane ($\mu\text{g/L}$)	1,1,1, Tri-chloro-ethane ($\mu\text{g/L}$)	Vinyl-acetate ($\mu\text{g/L}$)	Vinyl-chloride ($\mu\text{g/L}$)	Xylenes ($\mu\text{g/L}$)
GROUND-WATER SAMPLES--CONTINUED												
GS1M	05-23-96	<1.0	<1.0	--	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0
GS1S	08-10-95	<1.0	<1.0	--	<1.0	7.0	54	<1.0	<1.0	32	<1.0	<1.0
GS1S	05-23-96	<1.0	<1.0	--	<1.0	35	<1.0	<1.0	<1.0	61	<1.0	<1.0
GS2D	08-09-95	<1.0	2.5	--	15	11	<1.0	<1.0	<1.0	46	<1.0	<1.0
GS2D	05-06-96	<1.0	2.5	--	12	11	<1.0	<1.0	<1.0	44	<1.0	<1.0
GS2M	08-09-95	<1.0	<1.0	--	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0
GS2M	06-05-96	<1.0	<1.0	--	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0
GS2S	08-09-95	<1.0	<1.0	--	<1.0	4.2	<1.0	<1.0	<1.0	22	<1.0	<1.0
GS2S	06-03-96	<1.0	<1.0	--	<1.0	36	<1.0	<1.0	<1.0	94	<1.0	<1.0
GS3M	08-18-95	<1.0	<1.0	--	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0
GS3M(d)	05-22-96	<1.0	<1.0	--	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0
GS3M	05-22-96	<1.0	<1.0	--	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0
GS3S	08-17-95	<1.0	<1.0	--	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	7.9	<1.0
GS3S	05-22-96	<1.0	<1.0	--	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	7.7	<1.0
GS4D	08-17-95	<1.0	<1.0	--	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0
GS4D	05-21-96	<1.0	<1.0	--	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0
GS4M	08-16-95	<1.0	<1.0	--	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0
GS4M	05-21-96	<1.0	<1.0	--	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0
GS4S	08-16-95	<1.0	<1.0	--	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0
GS4S	05-20-96	<1.0	<1.0	--	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0
GSCP3D	06-11-96	<1.0	<1.0	--	2.6	<1.0	<1.0	<1.0	<1.0	3.8	<1.0	<2.0
GSCP3D	08-02-96	--	--	--	--	<1.65	--	--	--	<1.31	--	6.19
GSCP3M	06-11-96	<1.0	<1.0	--	<1.0	<1.0	4.5	<1.0	<1.0	<1.0	<2.0	<1.0
GSCP3M	08-02-96	--	--	--	--	<1.65	--	--	--	6.18	--	<0.63

Table 6. Ground- and surface-water quality data at the natural-attenuation study area, Dover Air Force Base, Kent County, Delaware, July - August 1995, May - July 1996, and August 1996, for organic constituents and total dissolved carbon—Continued

Sample identification number	Sample date	Methyl-ethyl-ketone ($\mu\text{g/L}$)	Meth-ylen-chloride ($\mu\text{g/L}$)	Styrene ($\mu\text{g/L}$)	1,1,2,2-tetra-chloro-ethane ($\mu\text{g/L}$)	Tetra-chloro-ethylene ($\mu\text{g/L}$)	Toluene ($\mu\text{g/L}$)	1,1,1-Tri-chloro-ethane ($\mu\text{g/L}$)	1,1,2-Tri-chloro-ethane ($\mu\text{g/L}$)	Vinyl-acetate ($\mu\text{g/L}$)	Vinyl-chloride ($\mu\text{g/L}$)	Xylenes ($\mu\text{g/L}$)
GROUND-WATER SAMPLES--CONTINUED												
GSCP4M	06-11-96	<1.0	<1.0	<1.0	<1.0	3.7	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0
GSCP4M	08-02-96	--	--	--	--	7.13	--	--	<1.31	--	11.44	--
GSCP5M	06-07-96	<1.0	<1.0	--	5.9	<1.0	2.0	<1.0	7.6	<1.0	<2.0	<1.0
GSCP5M(d)	06-07-96	<1.0	<1.0	<1.0	5.3	<1.0	1.7	<1.0	7.6	<1.0	<2.0	<1.0
GSCP5M	08-02-96	--	--	--	--	<1.65	--	--	20.10	--	<0.63	--
GSCP6D	06-10-96	<1.0	<1.0	--	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0
GSCP6D	06-07-96	--	--	--	--	<1.65	--	--	<1.31	--	<0.63	--
GSCP8	07-11-96	<1.0	<1.0	--	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0
GSCP9S	06-12-96	<1.0	<1.0	--	<1.0	<1.0	4.6	<1.0	<1.0	<1.0	<2.0	<1.0
GSCP9S	08-03-96	--	--	--	--	4.48	--	--	26.63	--	<0.63	--
MW11	08-22-95	<1.0	<1.0	--	<1.0	40	<1.0	<1.0	50	<1.0	<2.0	<1.0
MW18	08-03-95	<1.0	<1.0	--	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0
MW19	08-08-95	<1.0	<1.0	--	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	15	<1.0
MW19	08-08-95	<1.0	<1.0	--	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	2.5	<1.0
MW19	05-17-96	<1.0	<1.0	--	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	12	<1.0
MW19	08-03-96	--	--	--	--	<1.65	--	--	<1.31	--	<0.63	--
MW20	07-28-95	<1.0	<1.0	--	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0
MW206D	08-01-95	<1.0	<1.0	--	<1.0	1.6	<1.0	<1.0	1.0	<1.0	<2.0	<1.0
MW206D	05-31-96	<1.0	<1.0	--	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0
MW206D(d)	05-31-96	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0
MW206M	08-07-95	<1.0	<1.0	--	<1.0	25	<1.0	<1.0	47	<1.0	<2.0	<1.0
MW206M	05-30-96	<1.0	<1.0	--	<1.0	22	<1.0	<1.0	44	<1.0	<2.0	<1.0
MW206M	08-03-96	--	--	--	35.99	--	--	--	56.89	--	<0.63	--
MW21	07-27-95	<1.0	<1.0	--	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0

Table 6. Ground- and surface-water quality data at the natural-attenuation study area, Dover Air Force Base, Kent County, Delaware, July - August 1995, May - July 1996, and August 1996, for organic constituents and total dissolved carbon—Continued

Sample identification number	Sample date	Methyl-ethyl-ketone ($\mu\text{g/L}$)	Meth-ylen-chloride ($\mu\text{g/L}$)	Styrene ($\mu\text{g/L}$)	Tetra-chloro-ethane ($\mu\text{g/L}$)	Toluene ($\mu\text{g/L}$)	Tri-chloro-ethane ($\mu\text{g/L}$)	Vinyl-chloride ($\mu\text{g/L}$)	Vinyl-acetate ($\mu\text{g/L}$)	Xylenes ($\mu\text{g/L}$)
GROUND-WATER SAMPLES—CONTINUED										
MW226D	08-02-95	<1.0	<1.0	--	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
MW226M	08-02-95	<1.0	<1.0	--	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
MW226M	06-06-96	<1.0	<1.0	--	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
MW226M	08-02-96	--	--	--	--	<1.65	--	--	<1.31	--
MW227D	08-22-95	<1.0	<1.0	--	7.4	<1.0	<1.0	<1.0	12	<1.0
MW227D	05-02-96	<1.0	<1.0	--	5.3	<1.0	<1.0	<1.0	10	<1.0
MW227D	08-02-96	--	--	--	--	17.74	--	--	12.35	--
MW227S	05-06-96	<1.0	<1.0	--	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
MW37D	07-27-95	<1.0	<1.0	--	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
MW37S	08-07-95	<1.0	<1.0	--	<1.0	<1.0	<1.0	<1.0	2.0	<1.0
MW37S(d)	08-07-95	<1.0	<1.0	<1.0	1.6	<1.0	<1.0	<1.0	1.9	<1.0
MW37S	05-28-96	<1.0	<1.0	--	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
MW37S	08-02-96	--	--	--	--	<1.65	--	--	<1.31	--
MW39D	08-01-95	<1.0	<1.0	--	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
MW39D(d)	08-01-95	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
MW39S	07-26-95	<1.0	<1.0	--	<1.0	29	<1.0	<1.0	190	<1.0
MW39S	06-12-96	<1.0	<1.0	--	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
MW39S	08-02-96	--	--	--	--	<1.65	--	--	<1.31	--
MW40D	08-03-95	<1.0	<1.0	--	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
MW40S	08-03-95	<1.0	<1.0	--	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
MW41D	07-31-95	<1.0	<1.0	--	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
MW41S	08-01-95	<1.0	<1.0	--	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
MW43S	07-26-95	<1.0	<1.0	--	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
MW43S(d)	07-26-95	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0

Table 6. Ground- and surface-water quality data at the natural-attenuation study area, Dover Air Force Base, Kent County, Delaware, July - August 1995, May - July 1996, and August 1996, for organic constituents and total dissolved carbon—Continued

Sample identification number	Sample date	Methyl-ethyl-ketone ($\mu\text{g/L}$)	Methylen-chloride ($\mu\text{g/L}$)	Styrene ($\mu\text{g/L}$)	Tetra-chloro-ethane ($\mu\text{g/L}$)	Toluene ($\mu\text{g/L}$)	1,1,1-Tri-chloro-ethane ($\mu\text{g/L}$)	1,1,2-Tri-chloro-ethane ($\mu\text{g/L}$)	Vinyl-acetate ($\mu\text{g/L}$)	Vinyl-chloride ($\mu\text{g/L}$)	Xylenes ($\mu\text{g/L}$)
GROUND-WATER SAMPLES—CONTINUED											
MW61S	08-04-95	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0
MW61S	06-21-96	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0
MW61S	08-03-96	--	--	--	--	<1.65	--	--	<1.31	--	<0.63
MW62D	06-18-96	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0
MW62S	06-18-96	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0
MW62S	08-14-96	--	--	--	--	<1.65	--	--	<1.31	--	<0.63
MW64D	07-11-96	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0
MW64S	06-14-96	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0
MW64S(d)	06-14-96	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0
MWD4B	05-31-96	<1.0	--	--	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0
SURFACE-WATER SAMPLES											
GS1SW	08-10-95	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0
GS1SW	05-23-96	<1.0	<1.0	<1.0	<1.0	4.3	<1.0	<1.0	7.1	<2.0	<1.0
GS2SW	08-10-95	<1.0	<1.0	<1.0	<1.0	0.86	<1.0	<1.0	<1.0	<2.0	<1.0
GS2SW	06-05-96	<1.0	<1.0	<1.0	<1.0	2.1	<1.0	<1.0	3.1	<2.0	<1.0
GS2SW(d)	05-06-96	<1.0	<1.0	<1.0	<1.0	2.1	<1.0	<1.0	3.3	<2.0	<1.0
GS3SW	08-17-95	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0
GS3SW	05-22-96	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	7.1	<2.0	<1.0
GS4SW	08-16-95	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0
GS4SW(d)	08-16-95	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	3.1	<2.0	<1.0
GS4SW	05-20-96	<1.0	--	<1.0	<1.0	<1.0	<1.0	<1.0	3.3	<2.0	<1.0
QUALITY-ASSURANCE SAMPLES											
Eq. blank (1)	07-27-95	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0
Eq. blank (2)	08-02-95	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0
Eq. blank (3)	08-03-95	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0
Eq. blank (4)	08-09-95	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0

Table 6. Ground- and surface-water quality data at the natural-attenuation study area, Dover Air Force Base, Kent County, Delaware, July - August 1995, May - July 1996, and August 1996, for organic constituents and total dissolved carbon—Continued

Sample identification number	Sample date	Methyl-ethyl-ketone ($\mu\text{g/L}$)	Methylen-chloride ($\mu\text{g/L}$)	Styrene ($\mu\text{g/L}$)	Tetra-chloro-ethane ($\mu\text{g/L}$)	Toluene ($\mu\text{g/L}$)	Tri-chloro-ethane ($\mu\text{g/L}$)	Vinyl-chloride ($\mu\text{g/L}$)	Vinyl-acetate ($\mu\text{g/L}$)	Xylenes ($\mu\text{g/L}$)
QUALITY-ASSURANCE SAMPLES--CONTINUED										
Eq. blank (5)	08-11-95	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Eq. blank (6)	08-16-95	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Eq. blank (7)	08-16-95	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Eq. blank (8)	08-18-95	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Eq. blank (9)	08-22-95	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Eq. blank (10)	05-02-96	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Eq. blank (11)	05-21-96	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Eq. blank (12)	05-22-96	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Eq. blank (13)	05-30-96	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Eq. blank (14)	06-05-96	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Eq. blank (15)	06-12-96	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Eq. blank (16)	06-13-96	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	4.7
Eq. blank (17)	06-14-96	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Trip blank (1)	07-26-95	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Trip blank (2)	07-27-95	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Trip blank (3)	08-04-95	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Trip blank (4)	08-09-95	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Trip blank (5)	08-11-95	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Trip blank (6)	08-17-95	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Trip blank (7)	08-18-95	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Trip blank (8)	08-21-95	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Am. blank (1)	08-07-95	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Am. blank (2)	05-31-96	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0

Table 7. Sample and duplicate concentrations, and relative percent differences for four volatile organic compounds at sites where concentrations exceeded the reporting limit, July 1995 through July 1996, Dover Air Force Base, Kent County, Delaware

[$\mu\text{g/L}$, micrograms per liter]

Site	Date	Analyte	Sample concentration ($\mu\text{g/L}$)	Duplicate concentration ($\mu\text{g/L}$)	Relative percent difference
MW37S	08/07/95	1,2-Dichloroethene, total	1.5	1.4	6.9
MW37S	08/07/95	Trichloroethene	2	1.9	5.1
GS3M	05/22/96	cis-1,2-Dichloroethene	1.6	1.7	6.1
MW206D	05/31/96	cis-1,2-Dichloroethene	5	5.1	2
GS2SW	06/05/96	cis-1,2-Dichloroethene	1.4	1.4	0
GS2SW	06/05/96	Trichloroethene	3.1	3.3	6.2
GSCP5M	06/07/96	1,1,2,2-Tetrachloroethane	5.3	5.9	10.7
GSCP5M	06/07/96	cis-1,2-Dichloroethene	5.3	5.3	0
GSCP5M	06/07/96	Trichloroethene	7.6	7.6	0

Table 8. Sample and duplicate concentrations, relative percent differences, and summary statistics for methane samples collected from July, 1995 through July, 1996, Dover Air Force Base, Kent County, Delaware

[$\mu\text{g/L}$, micrograms per liter]

Site	Date	Sample concentration ($\mu\text{g/L}$)	Duplicate concentration ($\mu\text{g/L}$)	Relative percent difference
MW39S	07/26/95	2,812	2,668	5.3
MW37D	07/27/95	240	235	2.1
MW21	07/27/95	39	34	13.7
MW206D	08/01/95	38	36	5.4
MW41S	08/01/95	69	65	6
MW61S	08/04/95	9,821	9,147	7.1
MW19	05/17/96	1,514	1,493	1.4
GS3S	05/22/96	1,969	1,877	4.8
MW206M	05/30/96	96	94	2.1
MW206D	05/31/96	541	481	11.7
GS2D	06/05/96	157	144	8.6
GSCP4M	06/11/96	66	63	4.7
GSCP3D	06/11/96	274	263	4.1
GSCP9S	06/12/96	230	223	3.1
DM110S	06/13/96	9,228	9,951	7.5
MW64S	06/14/96	31	29	6.7
MW61S	06/21/96	10,654	10,106	5.3
Number		17	17	--
Median		240	235	5.3
Maximum		10,654	10,106	13.7
Minimum		31	29	1.4

Table 9. Sample and duplicate concentrations, relative percent differences, and summary statistics for hydrogen samples collected in August, 1996, Dover Air Force Base, Kent County, Delaware

[nmol/L, nanomoles per liter]

Site	Sample concentration (nmol/L)	Duplicate concentration (nmol/L)	Relative percent difference
GSCP5	1.1	0.92	17.8
GSCP6D	5.6	5.4	3.6
GSCP9S	3	2.6	14.3
MW19	3.5	3.4	2.9
MW37S	1.3	1.4	7.4
MW39S	2.2	2.6	16.7
MW61S	2.7	2.8	3.6
MW206M	3.7	3.9	5.3
MW226M	.36	.3	18.2
MW227D	.79	1	23.5
DM102D	1.1	.76	36.6
DM108D	1.3	1.4	7.4
DM109D	21.4	21	1.9
DM110S	.73	.69	5.6
DM113D	7.1	8.5	17.9
Number	15	15	--
Median	2.2	2.6	7.4
Maximum	21.4	21	36.6
Minimum	.36	.3	1.9

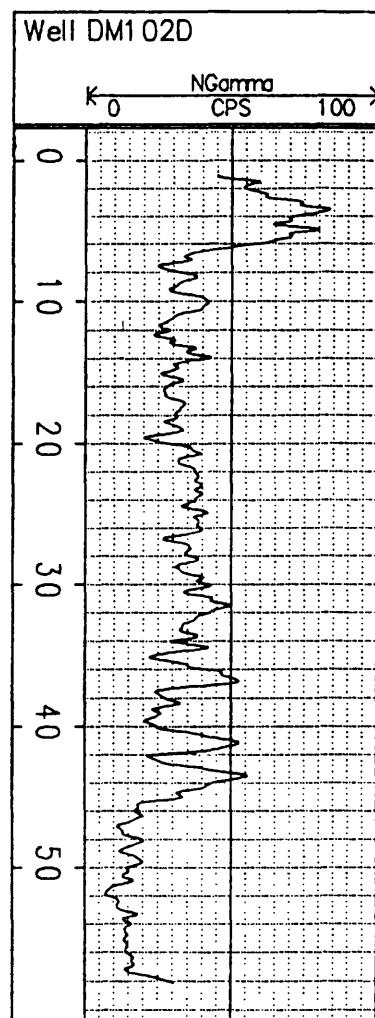
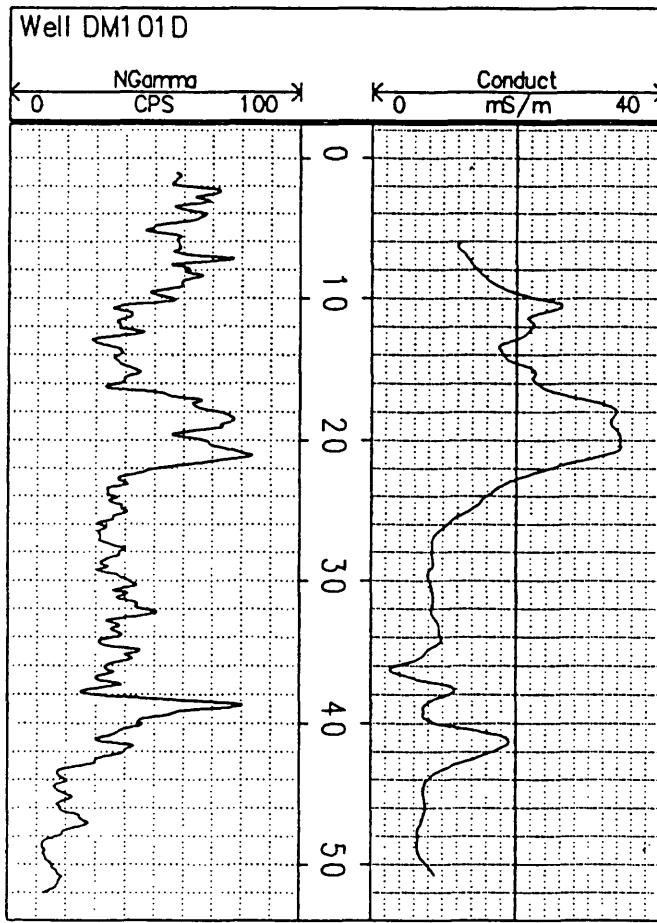
APPENDIX

Geophysical logs at the natural-attenuation study area,
Dover Air Force Base, Kent County, Delaware, for wells:

	Page
DM101D and DM102D	82
DM104D and DM105D	83
DM107D and DM109D	84
DM110D and DM113D	85
DM117D and DM118D	86
MW10 and MW11	87
MW12 and MW19	88
MW20 and MW37D	89
MW39D and MW40D	90
MW42P and MW43D	91
MW44D and MW61S	92
MW62D and MW206D	93
MW207D and MW226D	94
MW227D	95

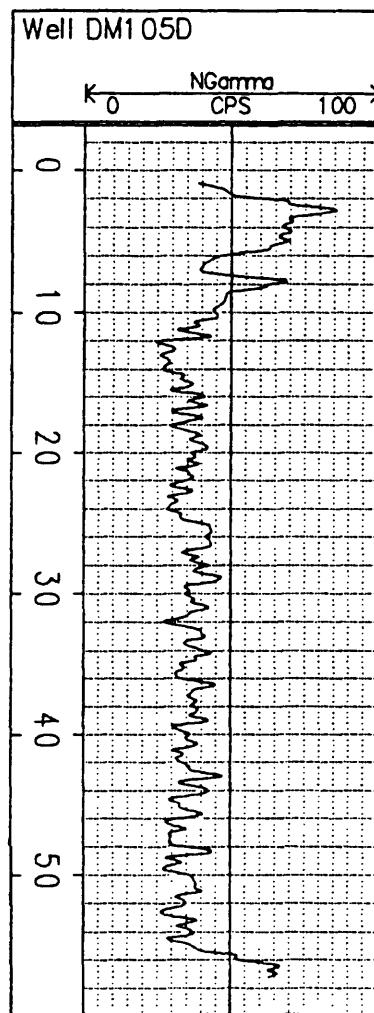
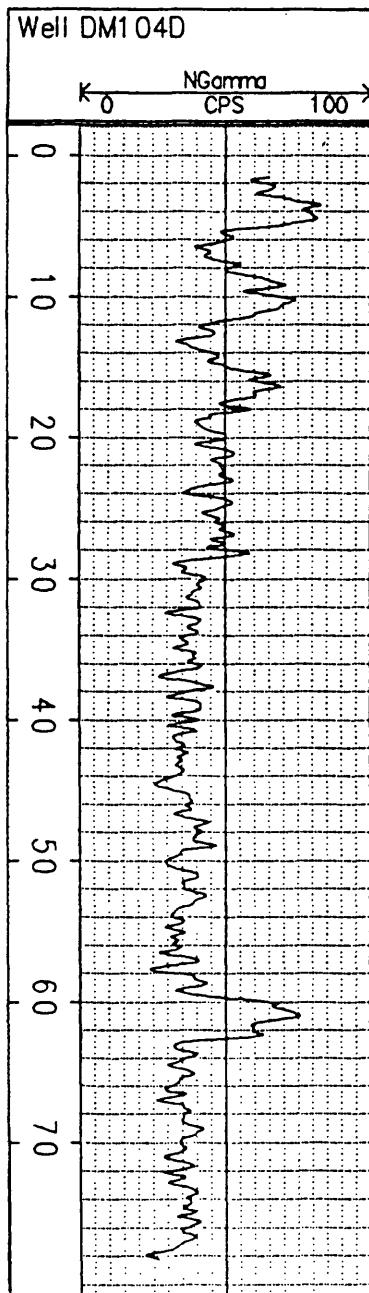
(NGamma = Natural gamma log; Conduct = Electro-magnetic conductivity log;
CPS = counts per second; mS/m = millisiemens per meter; \ominus = curve of Conduct
log in that area is affected by metal near the well casing, not lithologic or water-quality
changes)

DEPTH, IN FEET BELOW LAND SURFACE



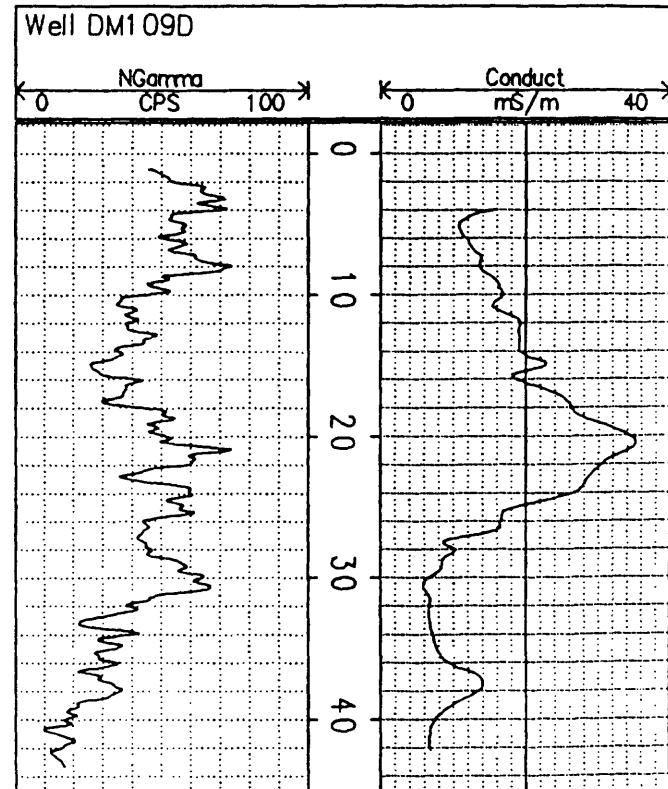
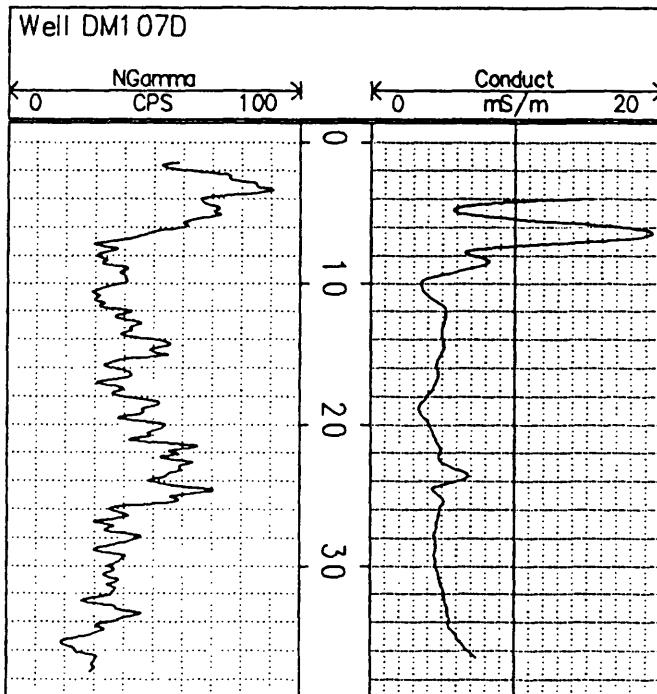
Geophysical logs at the natural-attenuation study area, Dover Air Force Base, Kent County, Delaware, for wells DM101D and DM102D.

DEPTH, IN FEET BELOW LAND SURFACE



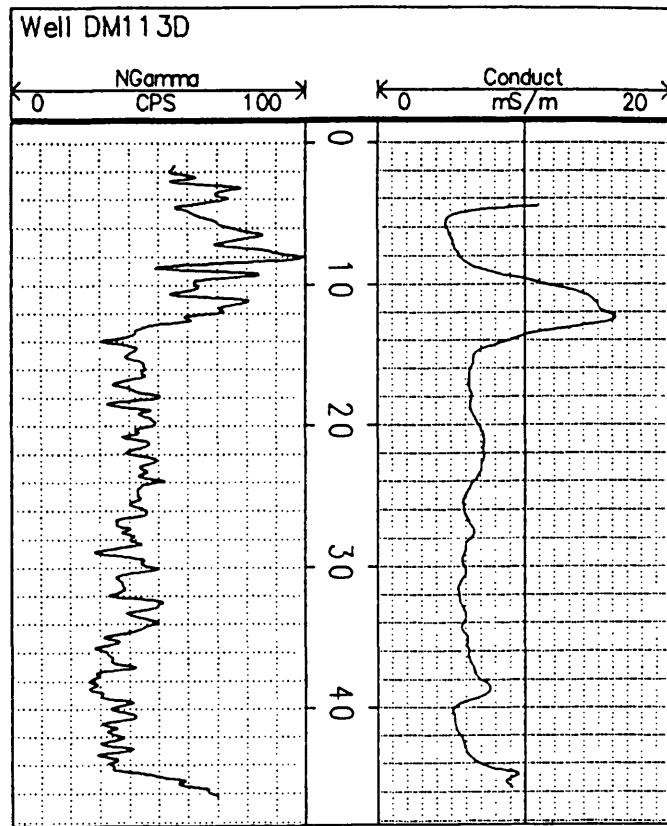
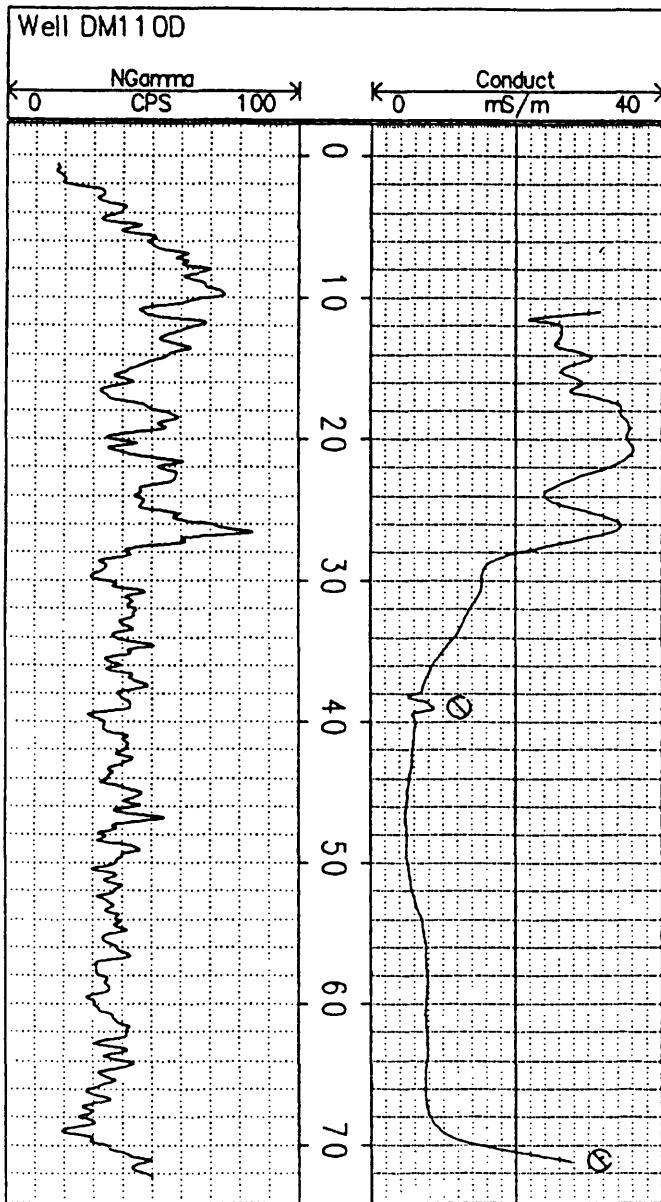
Geophysical logs at the natural-attenuation study area, Dover Air Force Base, Kent County, Delaware, for wells DM104D and DM105D.

DEPTH, IN FEET BELOW LAND SURFACE



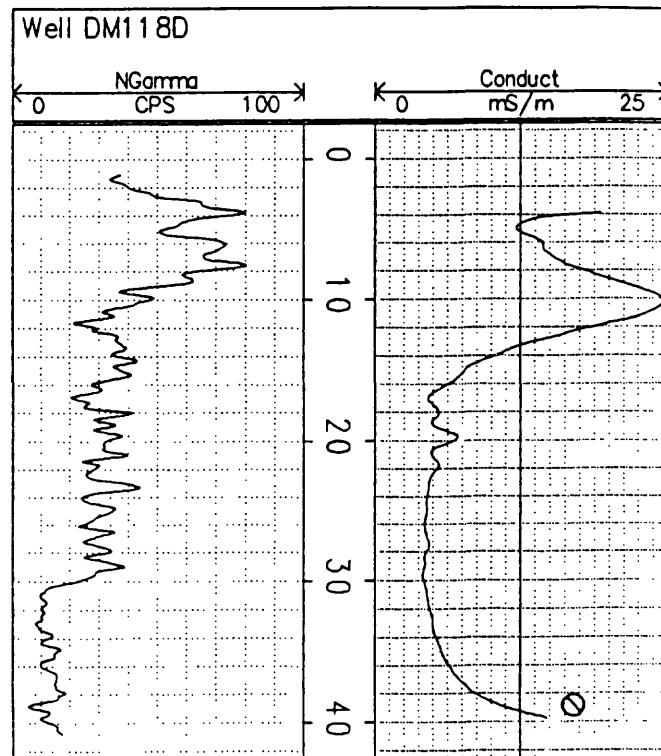
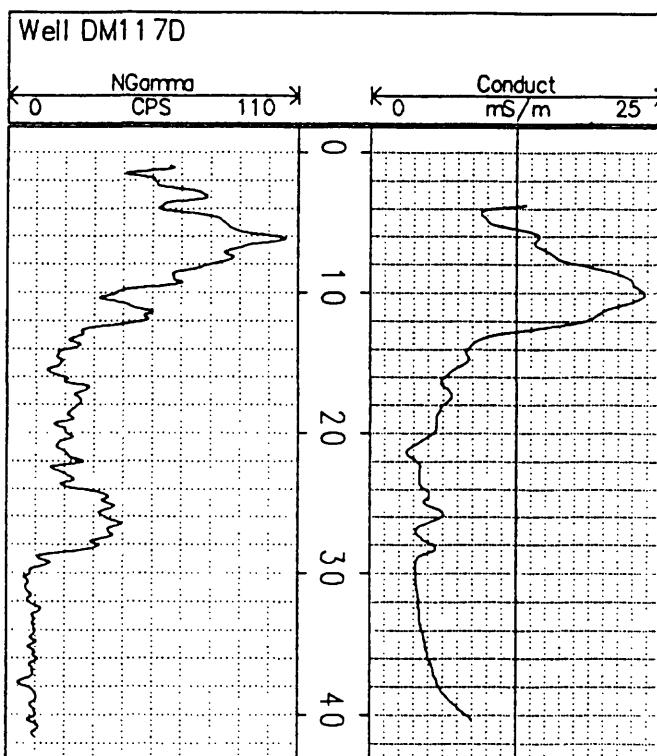
Geophysical logs at the natural-attenuation study area, Dover Air Force Base, Kent County, Delaware, for wells DM107D and DM109D.

DEPTH, IN FEET BELOW LAND SURFACE



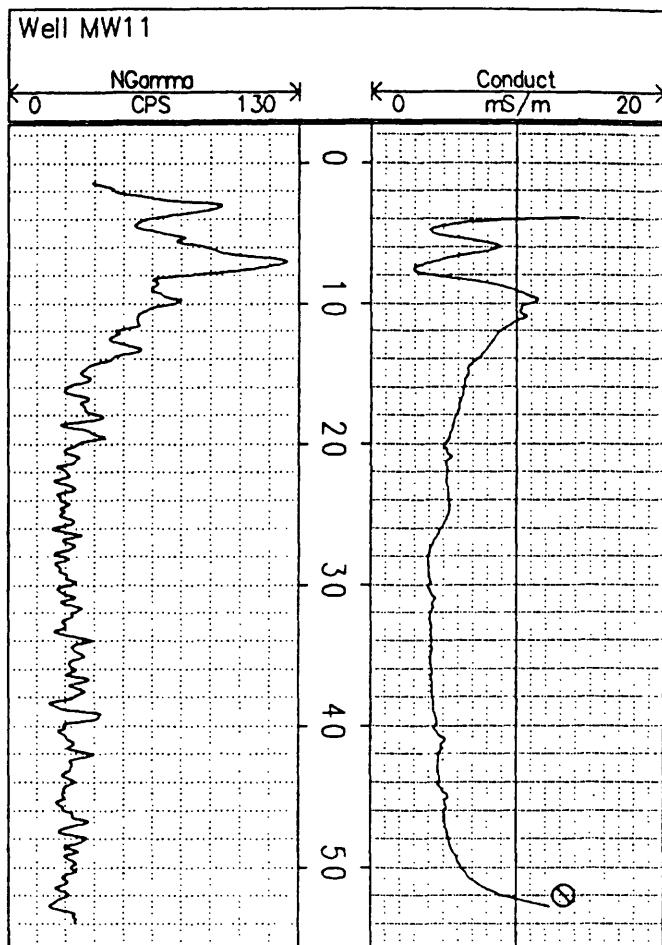
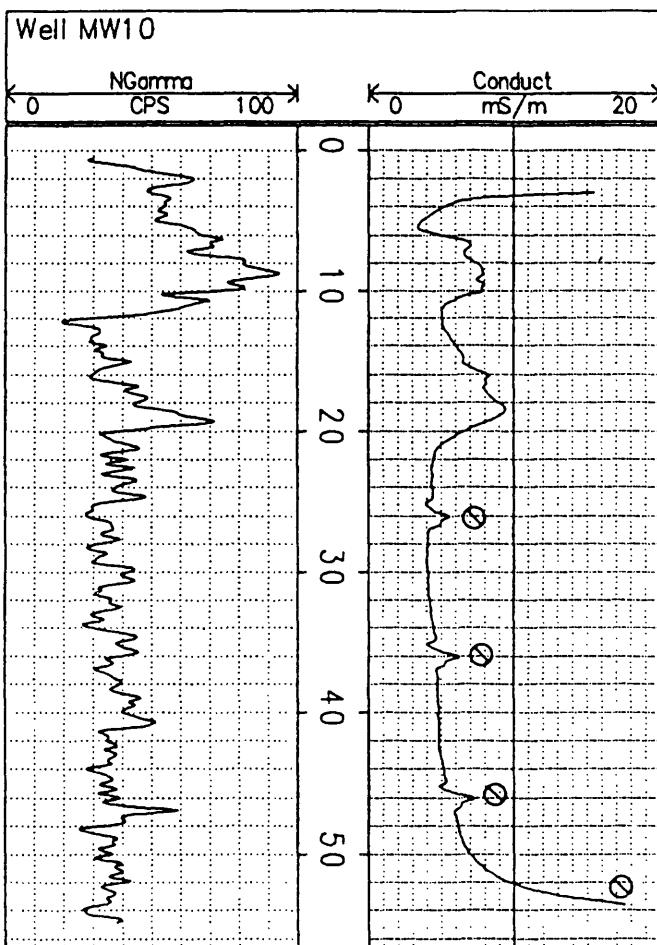
Geophysical logs at the natural-attenuation study area, Dover Air Force Base, Kent County, Delaware, for wells DM110D and DM113D.

DEPTH, IN FEET BELOW LAND SURFACE



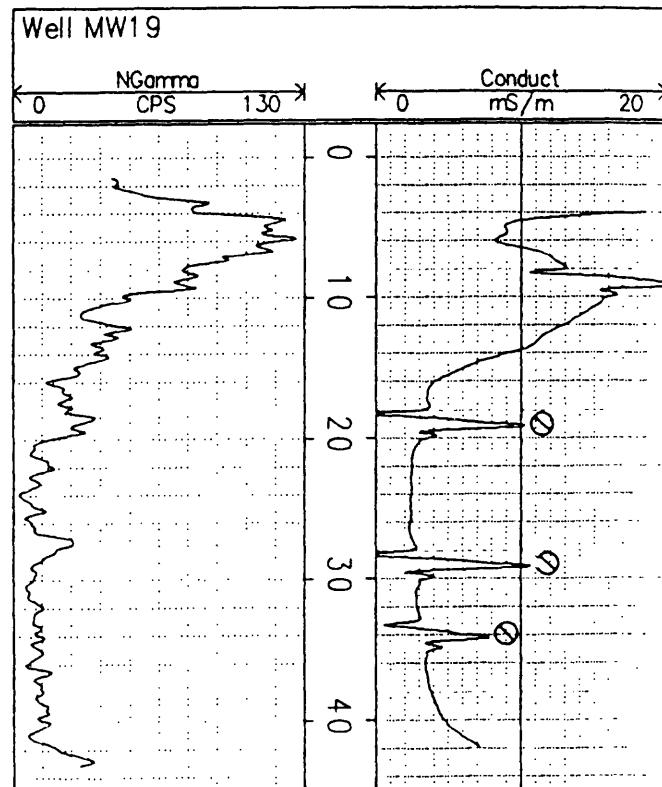
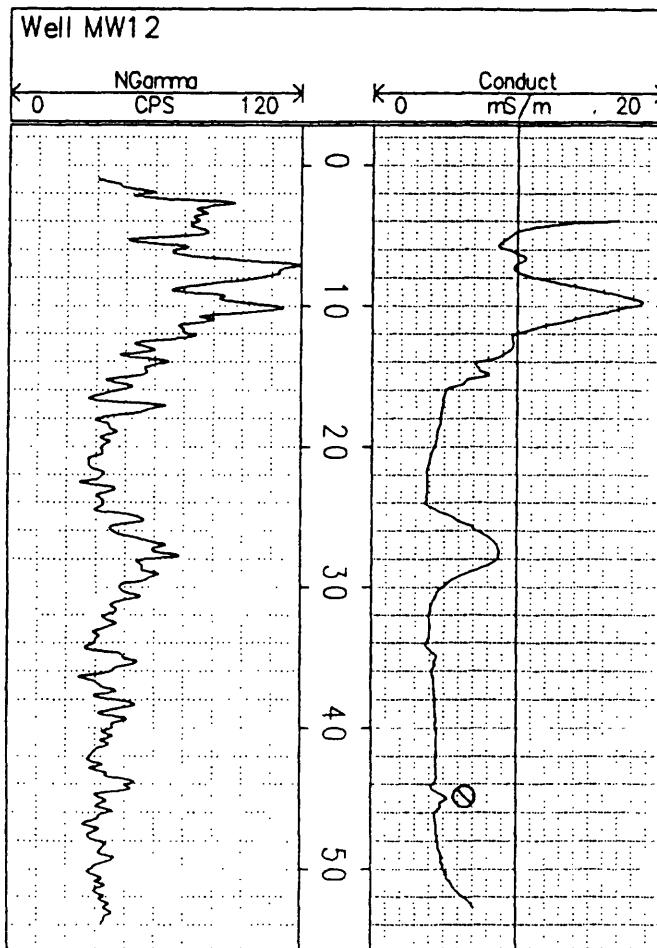
Geophysical logs at the natural-attenuation study area, Dover Air Force Base, Kent County, Delaware, for wells DM117D and DM118D.

DEPTH, IN FEET BELOW LAND SURFACE



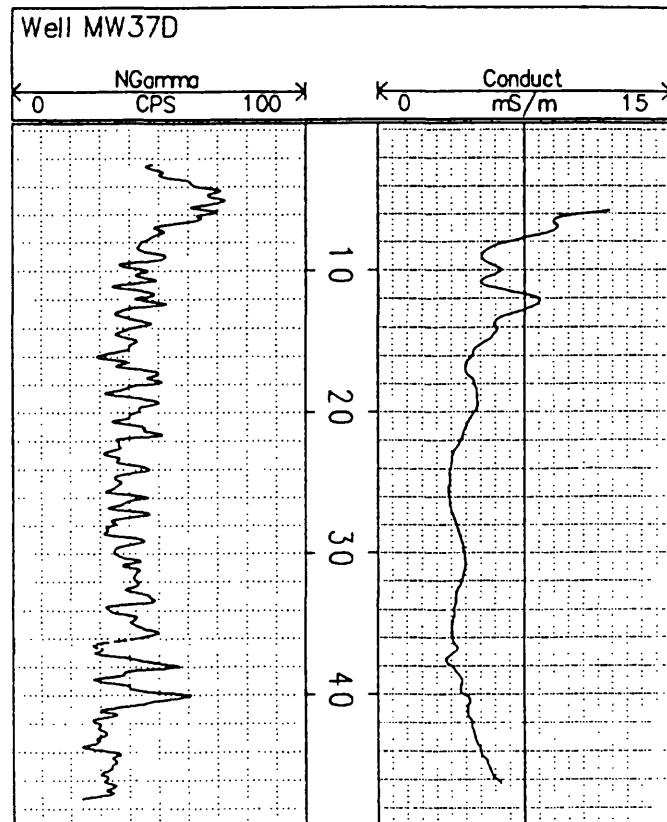
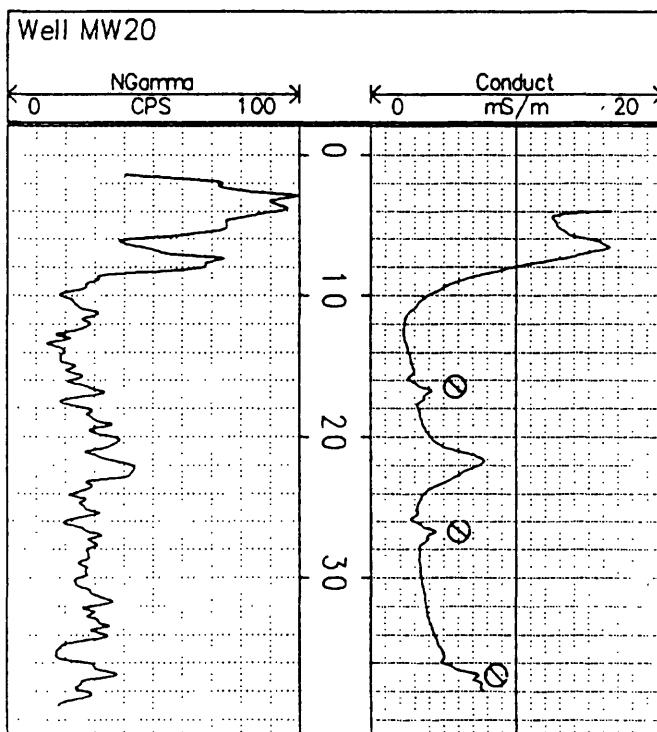
Geophysical logs at the natural-attenuation study area, Dover Air Force Base, Kent County, Delaware, for wells MW10 and MW11.

DEPTH, IN FEET BELOW LAND SURFACE



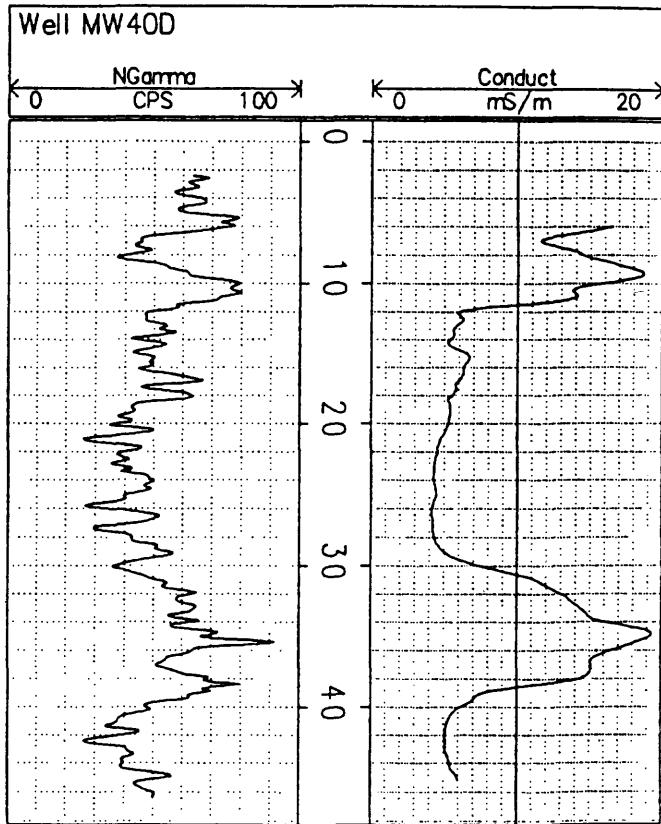
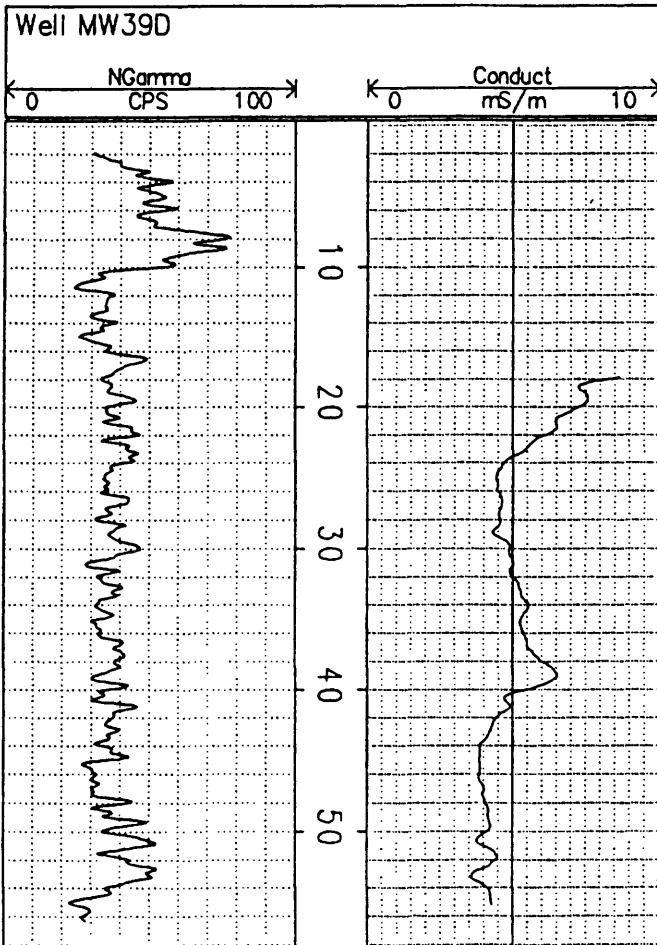
Geophysical logs at the natural-attenuation study area, Dover Air Force Base, Kent County, Delaware, for wells MW12 and MW19.

DEPTH, IN FEET BELOW LAND SURFACE



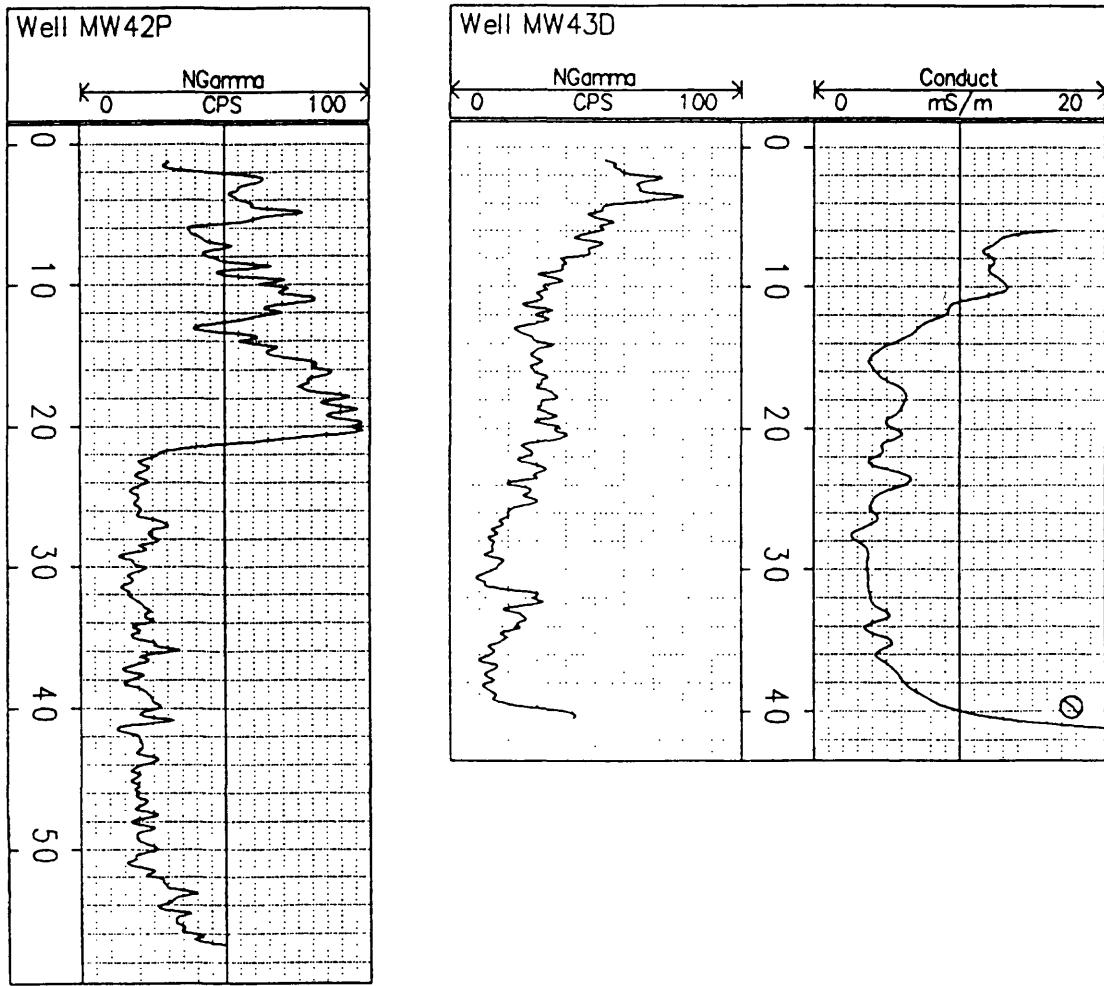
Geophysical logs at the natural-attenuation study area, Dover Air Force Base, Kent County, Delaware, for wells MW20 and MW37D.

DEPTH, IN FEET BELOW LAND SURFACE



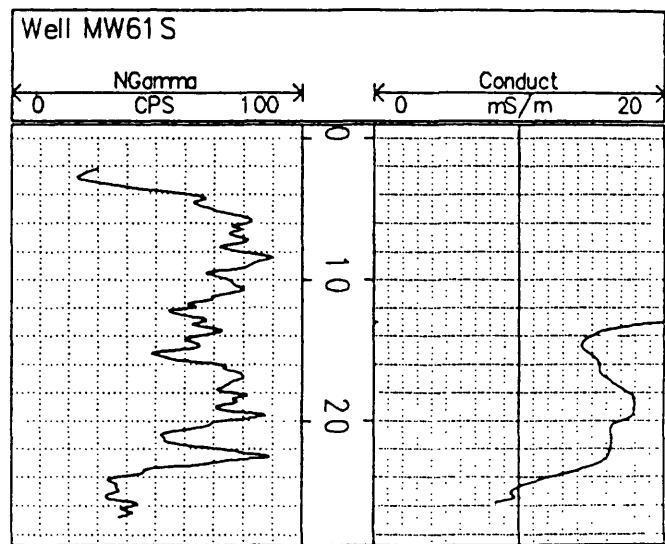
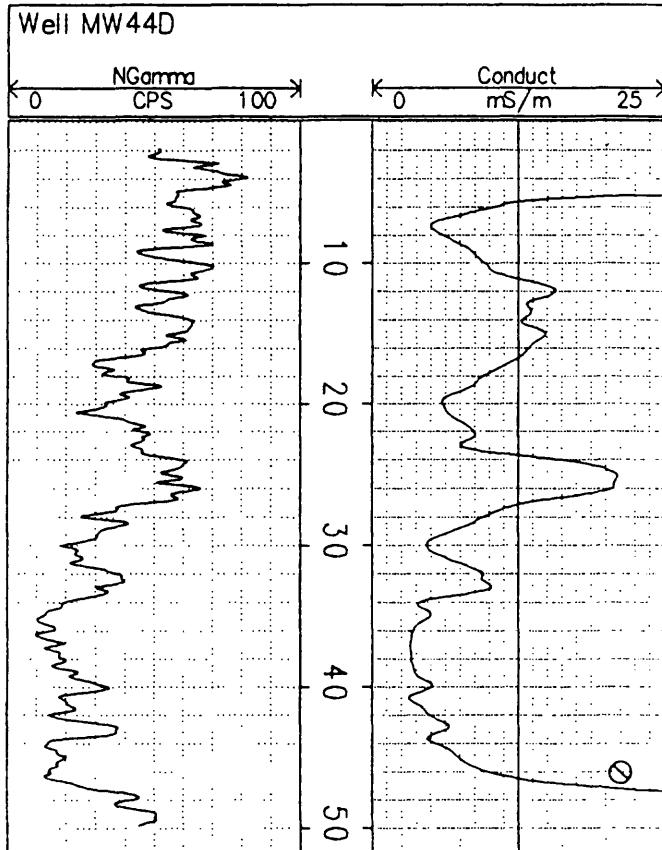
Geophysical logs at the natural-attenuation study area, Dover Air Force Base, Kent County, Delaware, for wells MW39D and MW40D.

DEPTH, IN FEET BELOW LAND SURFACE



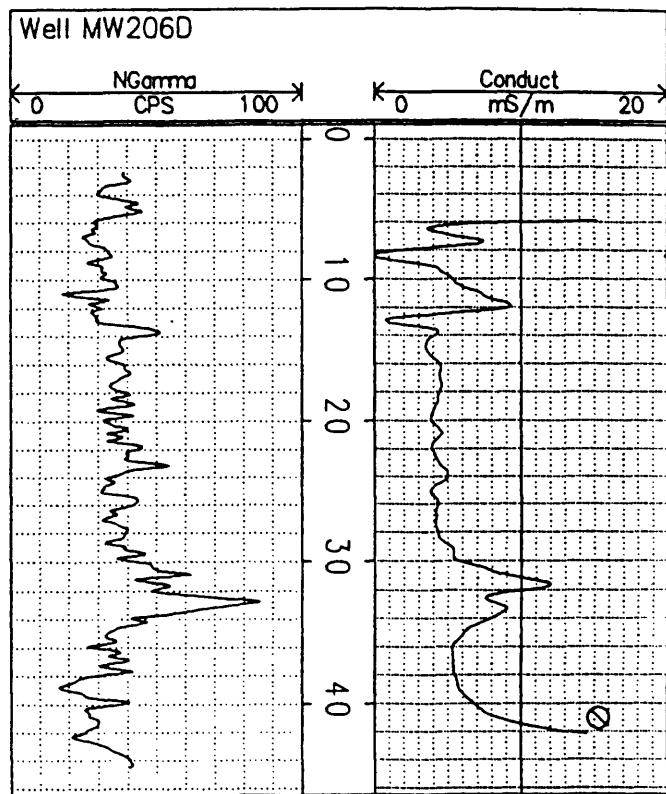
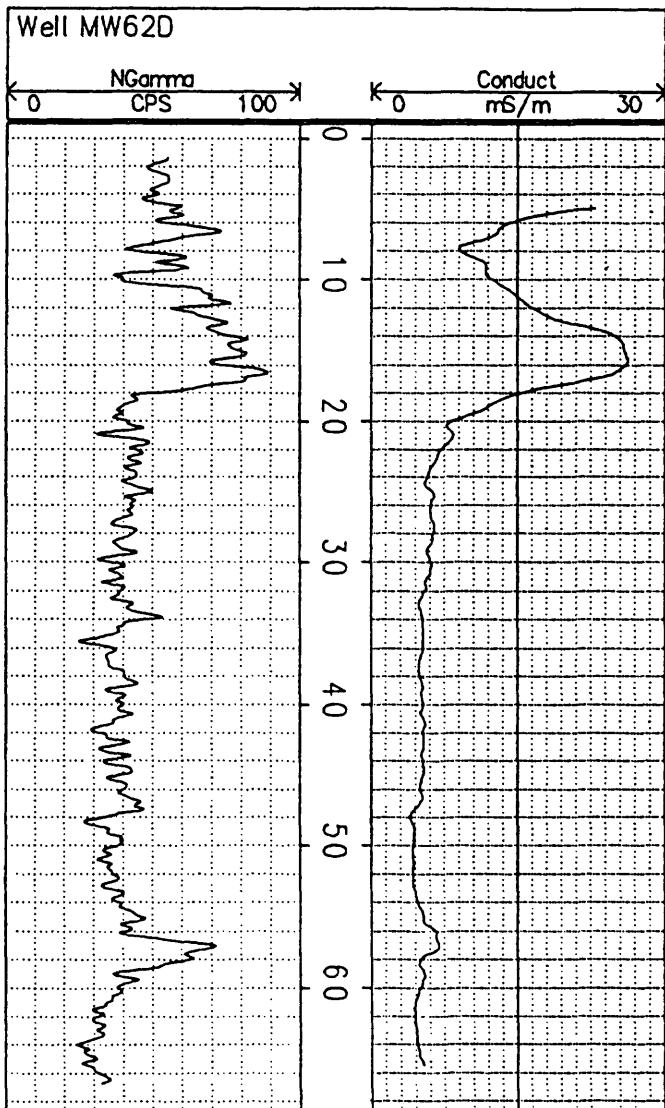
Geophysical logs at the natural-attenuation study area, Dover Air Force Base, Kent County, Delaware, for wells MW42P and MW43D.

DEPTH, IN FEET BELOW LAND SURFACE



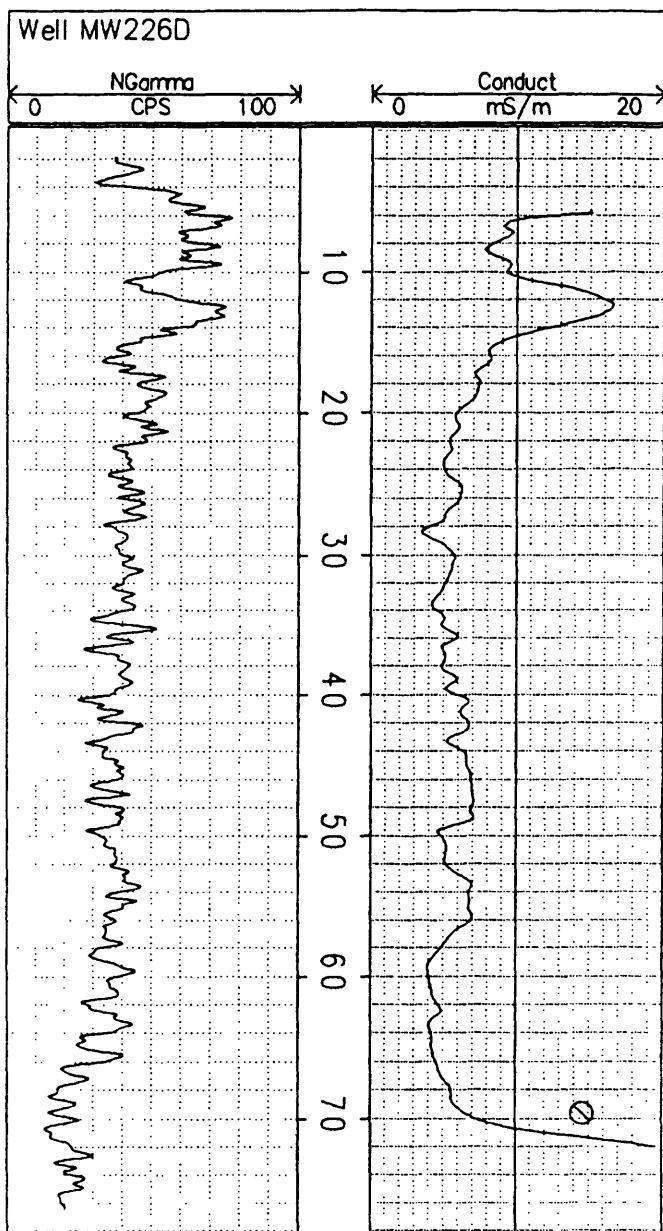
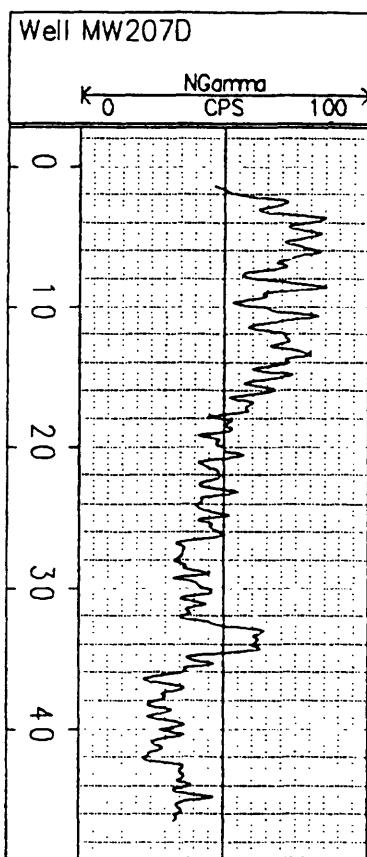
Geophysical logs at the natural-attenuation study area, Dover Air Force Base,
Kent County, Delaware, for wells MW44D and MW61S.

DEPTH, IN FEET BELOW LAND SURFACE

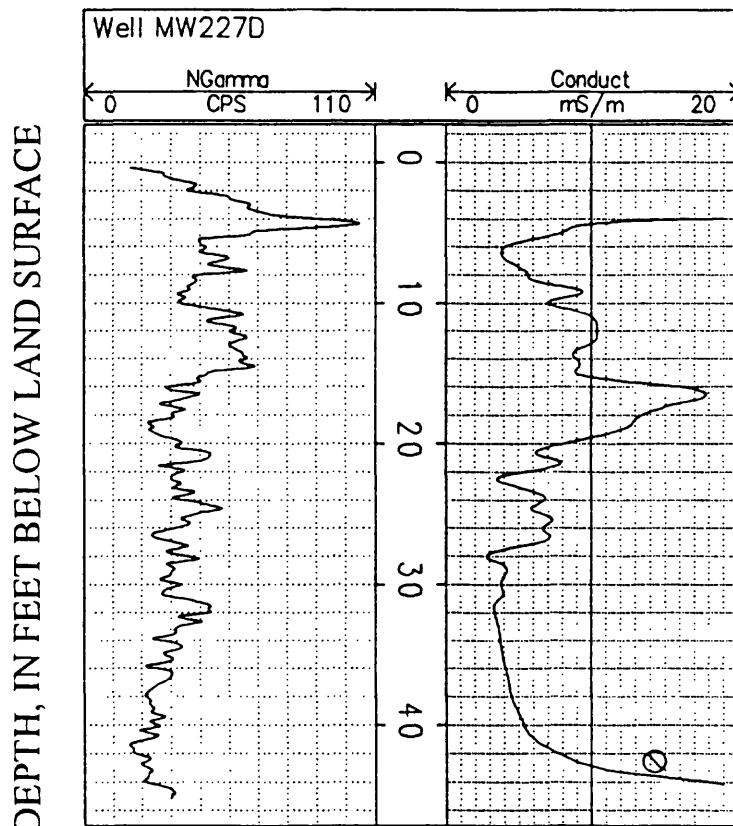


Geophysical logs at the natural-attenuation study area, Dover Air Force Base, Kent County, Delaware, for wells MW62D and MW206D.

DEPTH, IN FEET BELOW LAND SURFACE



Geophysical logs at the natural-attenuation study area, Dover Air Force Base, Kent County, Delaware, for wells MW207D and MW226D.



Geophysical logs at the natural-attenuation study area, Dover Air Force Base, Kent County, Delaware, for well MW227D.