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In cooperation with the
U.S. Army Garrison, Aberdeen Proving Ground
Environmental Conservation and Restoration Division
Aberdeen Proving Ground, Maryland

Ground-Water and Surface-Water Quality Data for the West Branch Canal Creek Area, Aberdeen Proving Ground, Maryland, November 1999 - May 2001

Open-File Report 01-420

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

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by Tracey A. Spencer, Daniel J. Phelan, Lisa D. Olsen, and Michelle M. Lorah

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Baltimore, Maryland
2002

U.S. Department of the Interior
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Conversion Factors, Vertical Datum, and Selected Abbreviations

Multiply	By	To obtain
inch (in.)	2.54	centimeter
cubic inch (in^3)	16.39	cubic centimeter
inch (in.)	25,400	micrometer
inch per year (in/yr)	0.02540	meter per year
foot (ft)	0.3048	meter
foot per day (ft/d)	0.3048	meter per day
foot per year (ft/yr)	0.3048	meter per year
foot squared per day (ft^2/d)	0.09290	meter squared per day
mile (mi)	1.609	kilometer

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

Other abbreviated units of measure: Water temperature, chemical concentration, and other chemical and physical properties of constituents are given in metric units. Water temperatures in degrees Celsius ($^{\circ}C$) can be converted to degrees Fahrenheit ($^{\circ}F$) by using the following equation:

$$^{\circ}F = 1.8\ (^{\circ}C\ ) + 32$$

Specific conductance is given in microsiemens per centimeter at 25 degrees Celsius (µS/cm at 25 $^{\circ}C$).

avgRPD	average relative percent difference
bls	below land surface
$^{\circ}F$	degrees Fahrenheit
ELCD	electrolytic conductivity detector
ES	environmental sample
EV	estimated value
ft	feet
gpm	gallons per minute
GC/MSD	gas-chromatography/mass-selective detector
g	grams
g/cm^3	grams per cubic centimeter
L	liter
MS	matrix spike
m^3/s	cubic meters per second
mg/L	milligrams per liter
mL	milliliter
µg/L	micrograms per liter
µm	micrometer
MLS	multi-level monitoring system
nm	nanometers
–	not statistically meaningful to calculate
NR	no replicate
PDBs	passive-diffusion-bag samplers
peeper	porous-membrane sampling device
QA/QC	quality assurance/quality control
redox	reduction-oxidation
VOCs	volatile organic compounds

Ground-Water and Surface-Water Quality Data for the West Branch Canal Creek Area, Aberdeen Proving Ground, Maryland, November 1999–May 2001

By Tracey A. Spencer, Daniel J. Phelan, Lisa D. Olsen, *and* Michelle M. Lorah

Abstract

This report presents ground-water and surface-water quality data from samples collected by the U.S. Geological Survey from November 1999 through May 2001 at West Branch Canal Creek, Aberdeen Proving Ground, Maryland. The report also provides a description of the sampling and analytical methods that were used to collect and analyze the samples, and includes an evaluation of the quality-assurance data.

The ground-water sampling network included two 4-inch wells, two 2-inch wells, sixteen 1-inch piezometers, one hundred thirteen 0.75-inch piezometers, two 0.25-inch flexible-tubing piezometers, twenty-seven 0.25-inch piezometers, and forty-two multi-level monitoring system depths at six sites. Ground-water profiler samples were collected from nine sites at 34 depths. In addition, passive-diffusion-bag samplers were deployed at four sites, and porous-membrane sampling devices were installed in the upper sediment at five sites. Surface-water samples were collected from 20 sites.

Samples were collected from wells and 0.75-inch piezometers for measurement of field parameters and reduction-oxidation constituents, and analysis of inorganic and organic constituents, during three sampling events in March–April and June–August 2000, and May 2001. Surface-water samples were collected from November 1999 through September 2000 during five sampling events for analysis of organic constituents. Ground-water profiler samples were collected in April–May 2000, and analyzed for field measurements, reduction-oxidation constituents, and inorganic constituents and organic constituents. Passive-diffusion-bag samplers were installed in September 2000, and samples were analyzed for organic constituents. Multi-level monitoring system samples were collected and analyzed for field measurements and reduction-oxidation constituents, inorganic constituents, and organic constituents in March–April and June–August 2000. Field measurements and organic constituents were collected from 0.25-inch piezometers during three sampling rounds in March–April and June–August 2000, and May 2001. Porous-membrane sampling devices were installed at depths of up to 3 feet and sampled for organic compounds and reduction-oxidation constituents in March and June 2000, and May 2001. Field measurements, reduction-oxidation constituents, inorganic and organic ground-water samples were collected and analyzed from 1-inch piezometers in May 2001.

Introduction

The U.S. Geological Survey (USGS) collected ground-water and surface-water quality samples from November 1999 through May 2001 at West Branch Canal Creek, Aberdeen Proving Ground, Maryland. The West Branch Canal Creek study area is in northeast Maryland at the U.S. Army's Aberdeen Proving Ground in Edgewood, Maryland (fig. 1). These samples were collected and analyzed in support of an ongoing USGS investigation of ground-water contamination in the Canal Creek aquifer and overlying wetland sediments, including an evaluation of the factors controlling the fate and transport of the contaminants, and an analysis of natural attenuation as a possible remediation method. The primary contaminants in the study area are 1,1,2,2–tetrachloroethane, trichloroethene, carbon tetrachloride, chloroform, and their daughter products. Current investigations are focused on plume delineation and identifying natural attenuation processes in the freshwater tidal

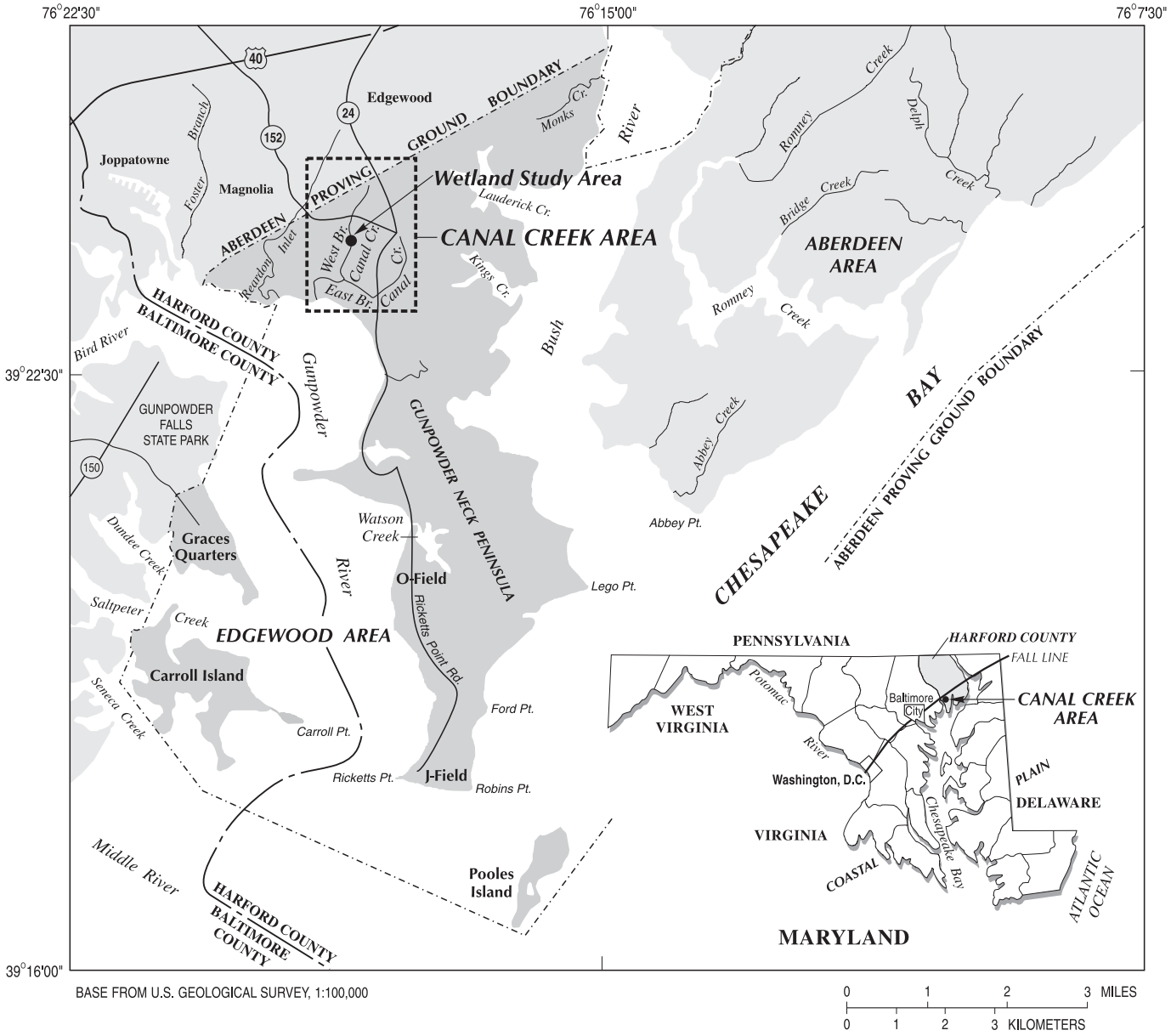

Figure 1. Location of the Canal Creek area and the wetland study area along West Branch Canal Creek, Aberdeen Proving Ground, Maryland.

Subsets of the data presented in this report may also be found in Olsen and Spencer (2000); Phelan, Senus, and Olsen (2001); and Phelan, Olsen and others (2001). All data collected from November 1999 through May 2001 are presented in this report to provide a comprehensive compilation of all water-quality data collected by the USGS at the West Branch Canal Creek study area during this period.

Purpose and Scope

This report presents ground-water and surface-water quality data collected from November 1999 through May 2001 from a tidally influenced wetland under investigation for natural attenuation of VOCs. Surface-water samples were also collected from seven sites from the nontidal part of the West Branch Canal Creek basin. Methods for installation of piezometers, multi-level monitoring

systems (MLSs), porous-membrane sampling devices (peepers), and passive-diffusion-bag samplers (PDB samplers) are presented. This report also provides a description of the sample-collection and analysis methods. In addition, quality-assurance data are presented and evaluated.

Site History

Aberdeen Proving Ground has been the U.S. Army's primary chemical warfare research and development center since 1917. Most of Aberdeen Proving Ground's chemical-manufacturing and munitions-filling plants were concentrated in the area of the West Branch and East Branch Canal Creek. Chlorinated organic solvents, decontaminating agents, and degreasers were common waste products from the manufacturing and filling plants in the Canal Creek area from World War I until the 1970s. In the late 1960s, potentially contaminated construction materials from the demolition of some of these manufacturing plants were pushed out into the Canal Creek wetland, creating landfills where there had been natural wetland sediments (Lorah and Vroblesky, 1989; Lorah and Clark, 1996). The chemical plants thought to be predominantly responsible for the contamination at the site have been inactive for more than 20 years. In 1990, Aberdeen Proving Ground was placed on the National Priorities List under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). This action led to an Interagency Agreement between the U.S. Army and Region III of the U.S. Environmental Protection Agency that required investigation and remediation of the Canal Creek area. The study area was recently expanded to further characterize the extent of the contaminant plumes, including locations that were previously inaccessible due to the wetland environment.

Description of Study Area

The West Branch Canal Creek study area is in a wetland in the Edgewood area of Aberdeen Proving Ground (fig. 2). The Edgewood area includes the Gunpowder Neck Peninsula in Harford County and is located within the Atlantic Coastal Plain Physiographic Province. The West Branch Canal Creek is tidally influenced and drains southward into the Gunpowder River near the head of the Chesapeake Bay (fig. 1). Tides in the area range from 0.5 to 2.0 ft (feet). Climate in Maryland is generally temperate, with average high temperatures of 90 °F (degrees Fahrenheit) in the summer and 40 °F in the winter. The average low temperatures are 65 °F and 25 °F, respectively. The primary vegetation in the study area includes *Phragmites*, a tall plant that is approximately 10 ft high during the summer months, and grasses, sedges, cattails, arrowhead, and pickerelweed (Durda and others, 1991, p. 2–4).

A thick deposit of unconsolidated Coastal Plain sediments underlies the Canal Creek area (Lorah and Clark, 1996). The Canal Creek aquifer sediments consist of medium- to coarse-grained sand and gravel, interfingered with thin layers, or lenses, of clay and silt. The Canal Creek aquifer, which is 30 to 70 ft thick in the study area, underlies the wetland sediments.

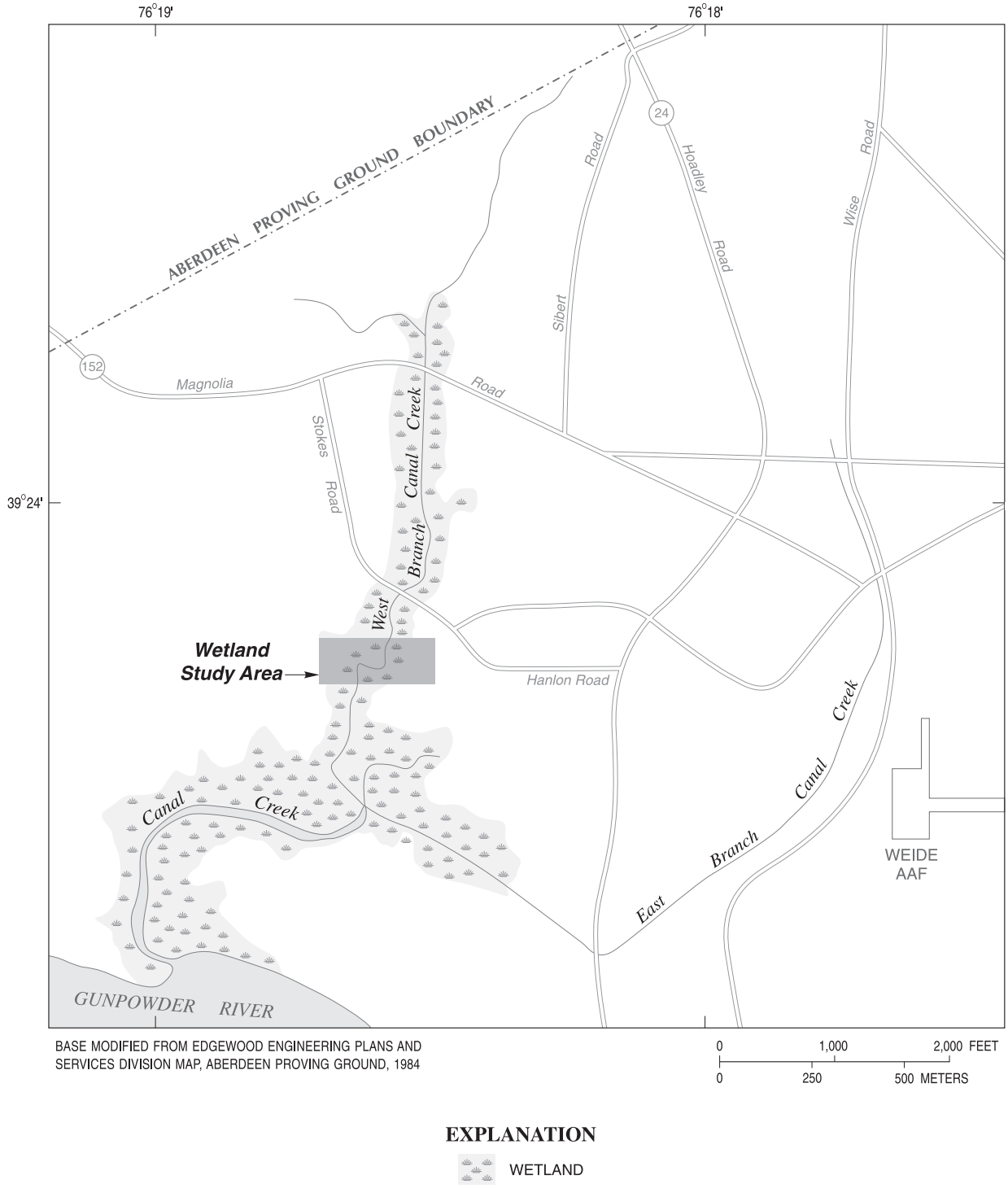

Figure 2. Location of the wetland study area along West Branch Canal Creek, Aberdeen Proving Ground, Maryland (modified from Lorah and Clark, 1996, p. 106).

Site Investigations

The USGS has participated in investigations of the Canal Creek area since 1985. A USGS investigation that began in 1985 described the hydrogeology of the site, and determined that a large ground-water contaminant plume was present in the Canal Creek aquifer along West Branch Canal Creek (Lorah and Vroblesky, 1989), but did not include ground-water sampling within the wetland study area (fig. 1). A follow-up study conducted by the USGS in 1992–96 determined the distribution and fate and transport of chlorinated VOCs in ground water within a relatively small area of the West Branch Canal Creek wetland (Lorah and others, 1997). This study defined the ground-water flow paths and the contaminant concentrations along these flow paths. Major geochemical and microbial processes active in the study area were identified, and an initial evaluation of the natural attenuation of contaminants was provided. Data collected from the West Branch Canal Creek wetland area between 1992–96 were presented in Olsen and others (1997), and the evaluation of natural attenuation of chlorinated VOCs was presented in Lorah and others (1997). Data collected from October 1998 through September 1999 were presented in Spencer and others (2000).

The current investigation is focused on determining the extent of surface-water contamination in the wetland area, and further defining the significant hydrologic, geochemical, and microbial processes affecting the natural attenuation of contaminants within the ground water, surface water, and wetland sediments. The USGS maintains two 4-in. (inch) diameter wells, two 2-in. diameter wells, sixteen 1-in. piezometers, one hundred and thirteen 0.75-in. drive-point piezometers, two 0.25-in. flexible-tubing piezometers, twenty-seven 0.25-in. inverted-screen piezometers, and six sites of MLSs installed at 42 depths. In addition to the network of piezometers and MLSs, the USGS installed 15 peepers and 12 PDB samplers to collect pore-water samples at selected locations, and 8 supplemental piezometers at 4 Hoverprobe sites in August 2000. Ground-water profiling was performed with the Hoverprobe at nine sites in September 2000.

Acknowledgments

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- The Environmental Security Technology Certification Program of the U.S. Army is also thanked for their contributions to this investigation, including installation and sampling of the 0.25-in. inverted-screen piezometers, the MLSs, and the peepers.
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Methods of Investigation

The Canal Creek sampling network includes ground-water and surface-water sampling locations. The ground-water samples were collected from 4-in. wells, 2-in. wells, 1-in. piezometers, 0.75-in. drive-point piezometers, 0.25-in. flexible-tubing piezometers, 0.25-in. inverted-screen piezometers, and MLSs (figs. 3a-b). Ground-water samples were also collected from the ground-water profiler mounted on the Hoverprobe (fig. 4), supplemental piezometers installed at Hoverprobe sites (fig. 4), peepers (fig. 3a), and PDB samplers (fig. 4). Surface-water samples were collected at 20 sites (fig. 5). All sample locations could not be shown on one map because of scale limitations.

Ground-Water and Surface-Water Sampling Networks

Ground-water samples were collected from March 2000 through May 2001 from 4-in. wells, 2-in. wells, 1-in. piezometers, 0.75-in. drive-point piezometers, 0.25-in. flexible-tubing piezometers, 0.25-in. inverted-screen piezometers, MLSs, peepers, and PDB samplers. Additional ground-water samples were collected using a ground-water profiler at 9 of the 13 sites that were accessed with the USGS Hoverprobe in April and May 2000 (fig. 4). Supplemental samples were collected from 1-in. piezometers and PDB samplers at the four most contaminated Hoverprobe sites (HP01, HP02, HP05, and HP13). A list of the locations of wells, piezometers, and multi-level sampling devices, including site number, device type, hydrogeologic unit, well diameter, depth of screened interval, and land-surface

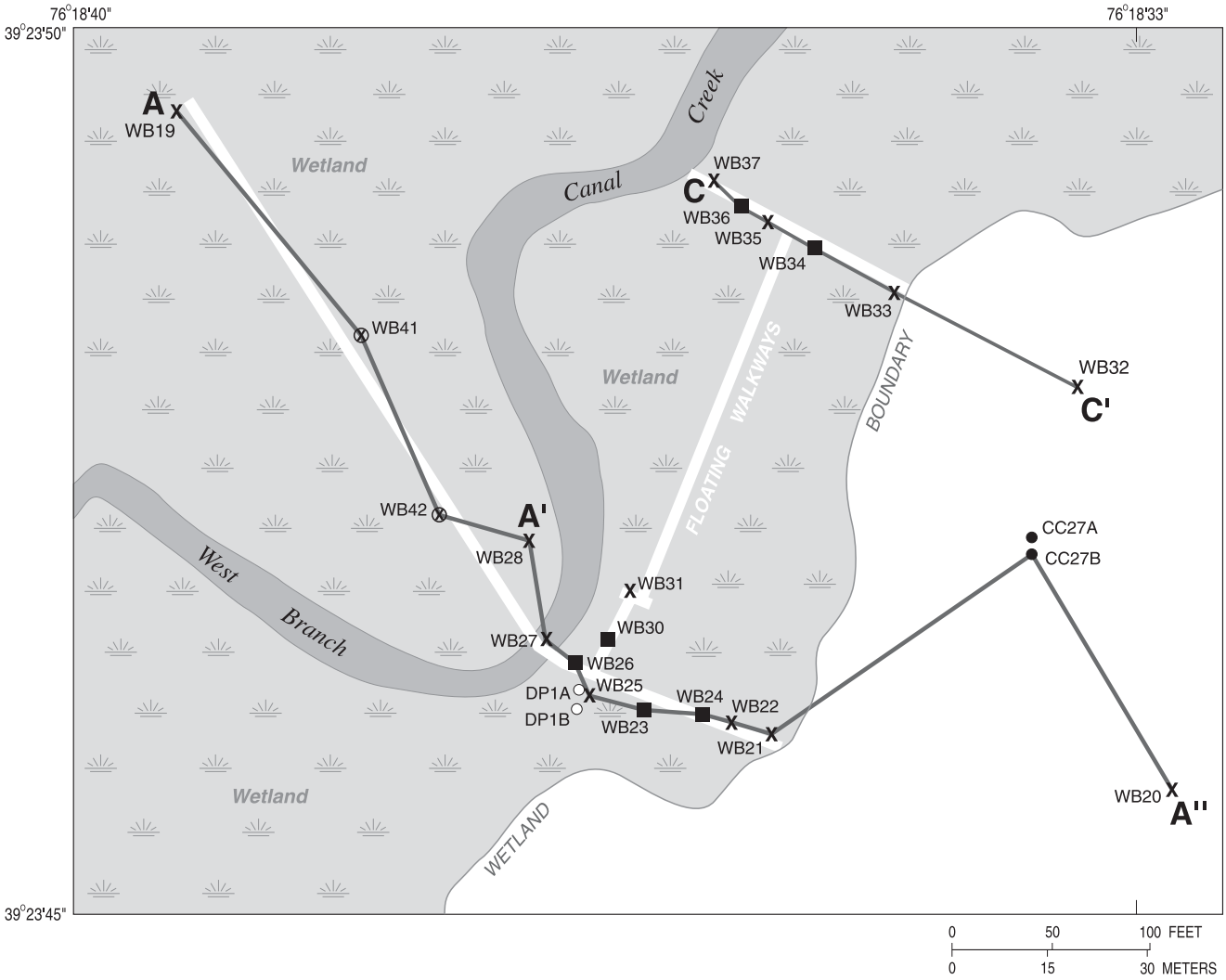
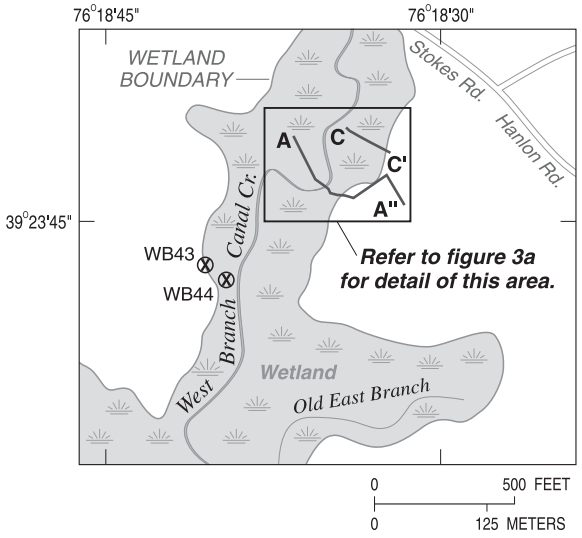


Figure 3a. Location of wells, piezometers, multi-device sampling sites, and transects A-A" and C-C' in the wetland study area along West Branch Canal Creek, Aberdeen Proving Ground, Maryland.



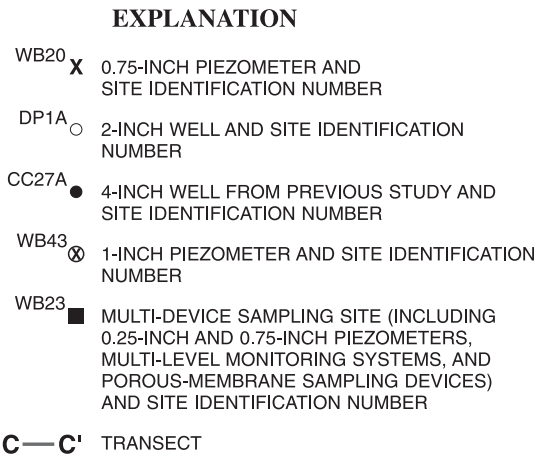


Figure 3b. Location of piezometer nests WB43 and WB44 in the wetland study area along West Branch Canal Creek, Aberdeen Proving Ground, Maryland.

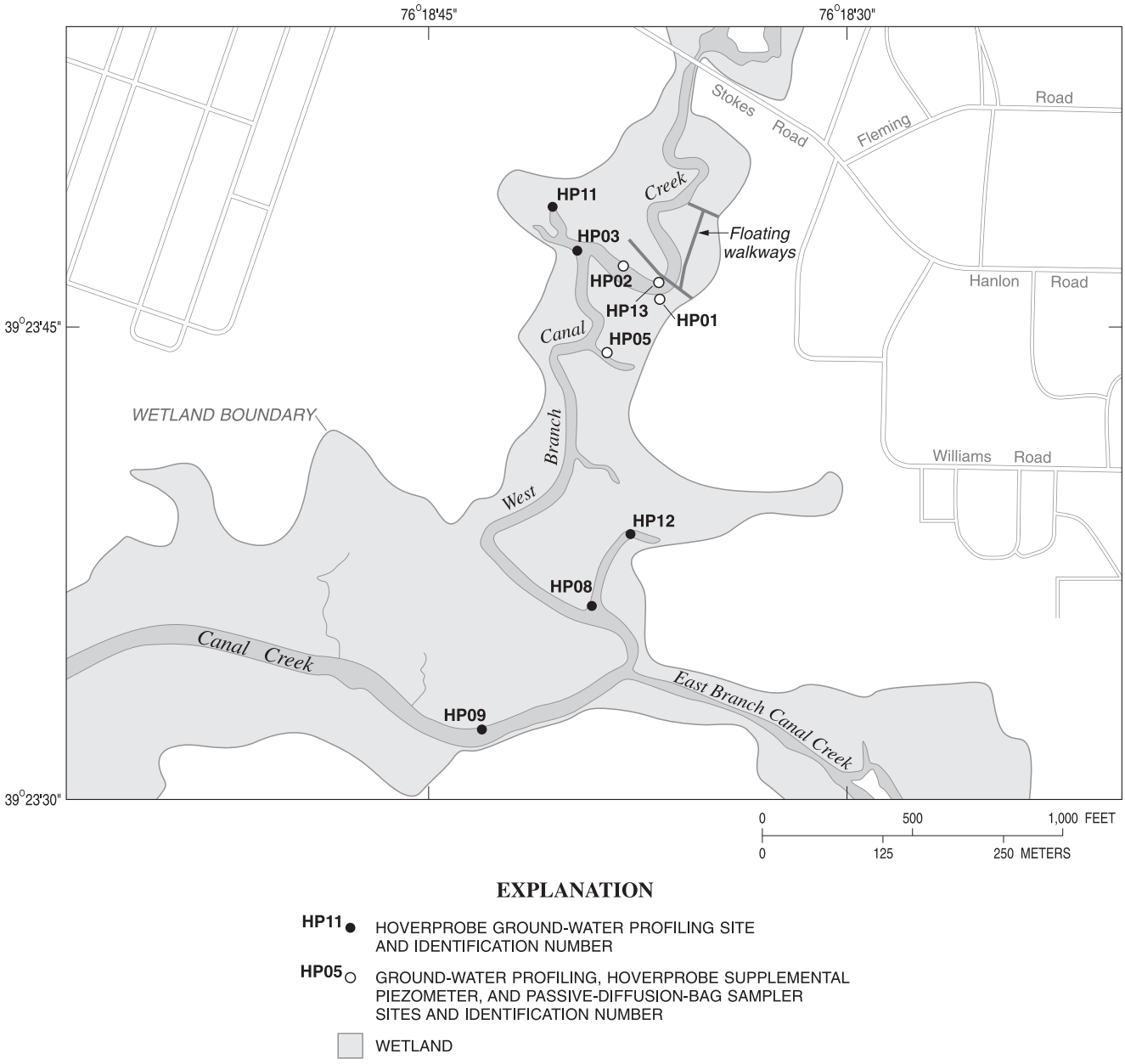


Figure 4. Location of Hoverprobe sampling sites, West Branch Canal Creek, Aberdeen Proving Ground, Maryland (modified fom Phelan and others, 2001, p. 3).

elevation is provided in Appendix 1A at the end of the report. The peepers and PDB samplers were installed in shallow marsh sediments adjacent to existing wells and piezometers, and are therefore associated with the locations listed in Appendix 1A. Surface-water samples were collected from 20 sites during November 1999 and February, March, May, and September 2000 to determine the extent of VOC concentrations in Canal Creek over both the tidal and nontidal reaches of the creek. A list of surface-water sampling locations including site names, the distance upstream of mouth, tidal or nontidal reach, and location descriptions is presented in Appendix 1B.

Ground-Water 1-Inch Piezometers Ground-water samples were collected from 1-in. drive-point piezometers that were installed in November and December 2000. The 1-in. diameter piezometers were constructed of wire-wrapped stainless steel or slotted-screen polyvinyl chloride (PVC) with a 0.010-in. screen opening. They were installed using a U.S. Army Corps of Engineers portable vibracore drill rig. Stainless-steel drive-point piezometers were pushed into the sediment without pre-drilling a hole; therefore, no drill cuttings were produced. The piezometer numbers, their screened intervals, and casing materials are listed in table 1.

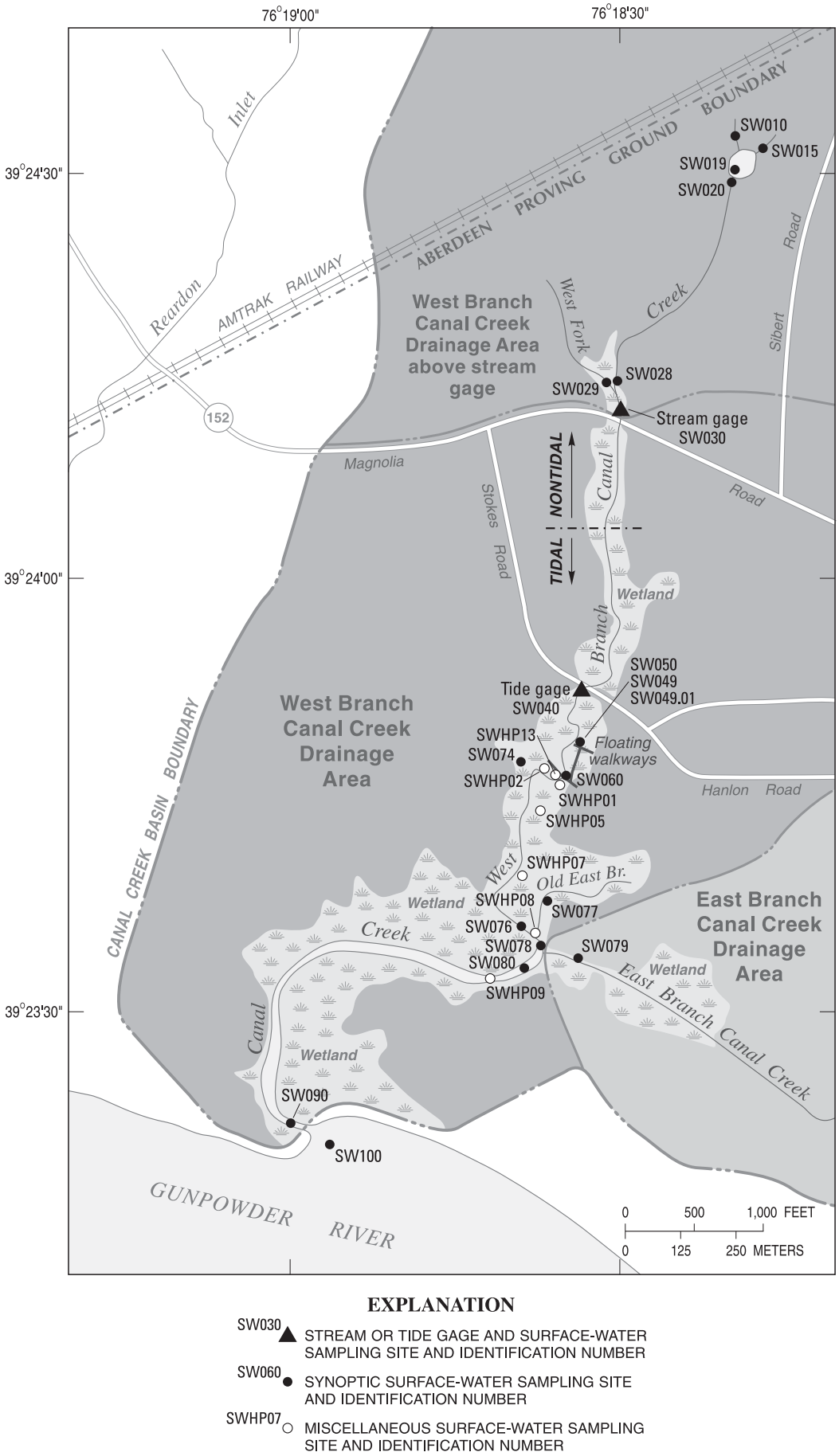


Figure 5. Location of surface-water sampling sites, West Branch Canal Creek, Aberdeen Proving Ground, Maryland.

The piezometer locations are shown in figure 3 and listed in Appendix 1A.

Table 1. *Description of 1-inch piezometers installed in the West Branch Canal Creek study area, Aberdeen Proving Ground, Maryland, November and December 2000*

[SS, stainless steel; PVC, polyvinyl chloride]

Piezometer number	Screened interval (feet below land surface)	Casing material
WB41A	8.25–9.25	PVC
WB41B	9.0–10.0	PVC
WB41C	22.4–23.4	SS
WB41D	29.0–30.0	SS
WB41E	31.3–32.3	SS
WB42A	6.0–7.0	SS
WB42B	13.0–14.0	SS
WB42C	19.0–20.0	SS
WB42D	25.0–26.0	SS
WB42E	31.0–32.0	SS
WB42F	37.0–38.0	SS
WB43A	4.8–5.8	SS
WB43B	7.2–8.2	SS
WB43C	10.1–11.1	SS
WB43D	14.0–15.0	SS
WB44A	3.1–4.1	SS

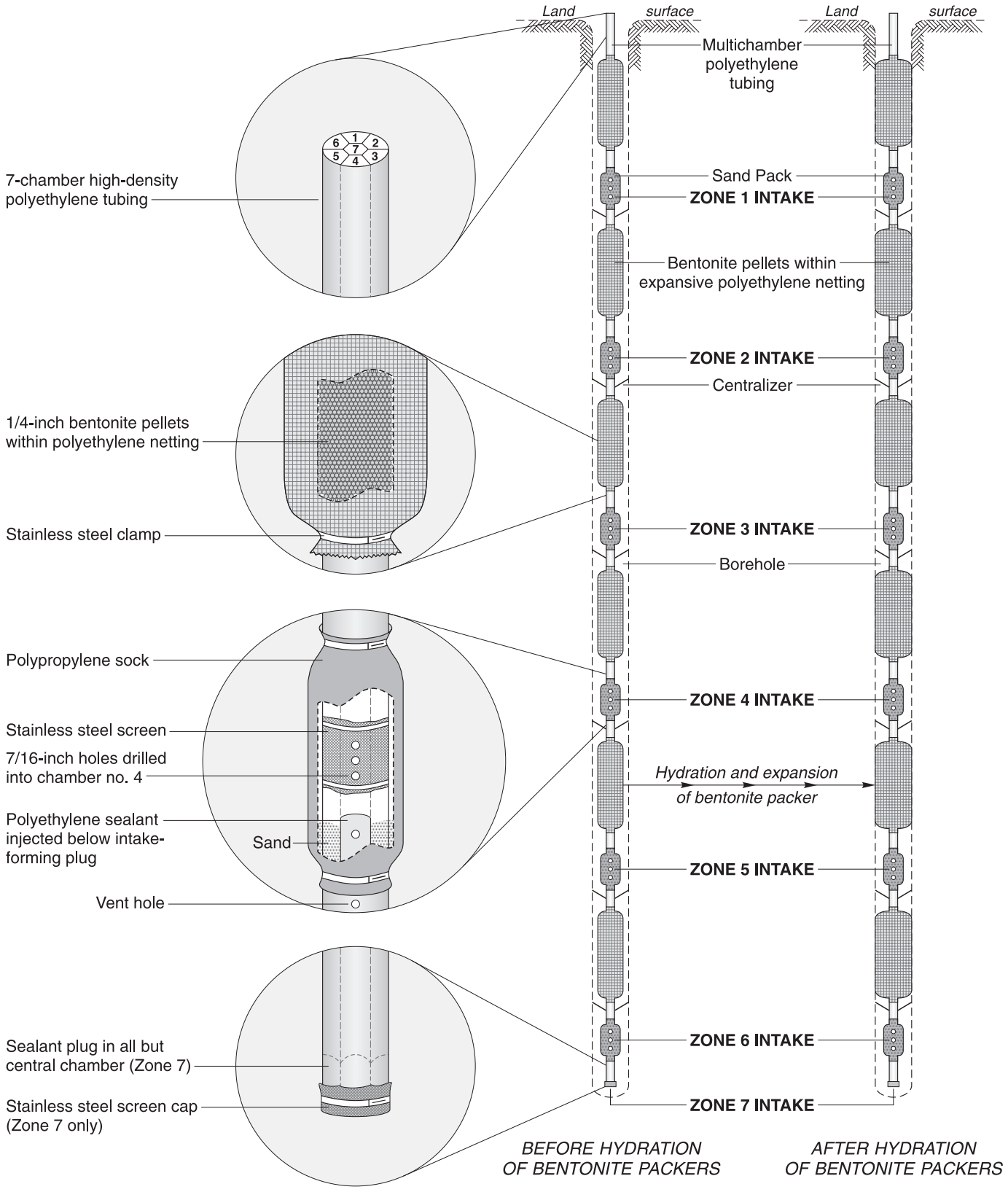


Figure 6. Multi-level monitoring system placed within the borehole (modified from Einarson, 2001, p. 79).

Figure 7b. The Hoverprobe and support hovercraft at site HP08, West Branch Canal Creek wetland, Aberdeen Proving Ground, Maryland.

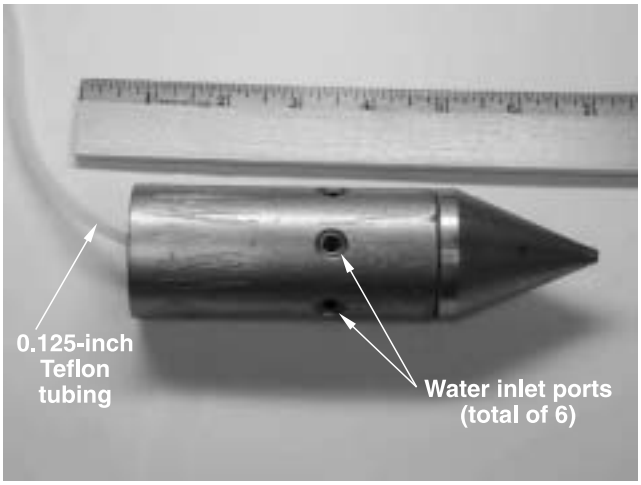


Figure 7a. The ground-water profiler (from Phelan and others, 2001, p. 11).

Ground-Water Profiler Ground-water profiling is a ground-water sampling technique that uses a hovercraft with a mounted drill rig to collect samples. Ground-water quality profiling involves collecting ground-water quality samples at multiple discrete depths to determine the vertical changes in water quality, without first drilling a borehole and installing a well (fig. 7a). The USGS co-developed the Hoverprobe 2000 (referred to hereafter as the Hoverprobe) with Hovertechnics, Inc. of Benton Harbor, Michigan, and MPI Drilling, Inc. of Picton, Ontario (fig. 7b). The Hoverprobe is the first craft that combines the versatility of a hovercraft with the utility of a drill rig. The Hoverprobe has a mounted vibracore drill rig that was used for collecting lithologic and ground-water quality data in remote areas of the tidal wetland. These areas were previously inaccessible because of deep mud and shallow water, so conventional drill rigs could not be used. Ground-water samples were collected with the Hoverprobe profiler at nine sites at a total of 34 depths ranging from 6 to 43 ft bls (below land surface) from April–May 2000. An example of the naming convention used at the profiler sites is HP01-36; HP01 indicates that it was collected at site HP01, at a depth of 36 ft bls. Continuous sediment cores were collected at five Hoverprobe sites, and their lithologic descriptions are presented in a separate report by Phelan, Senus, and Olsen (2001).

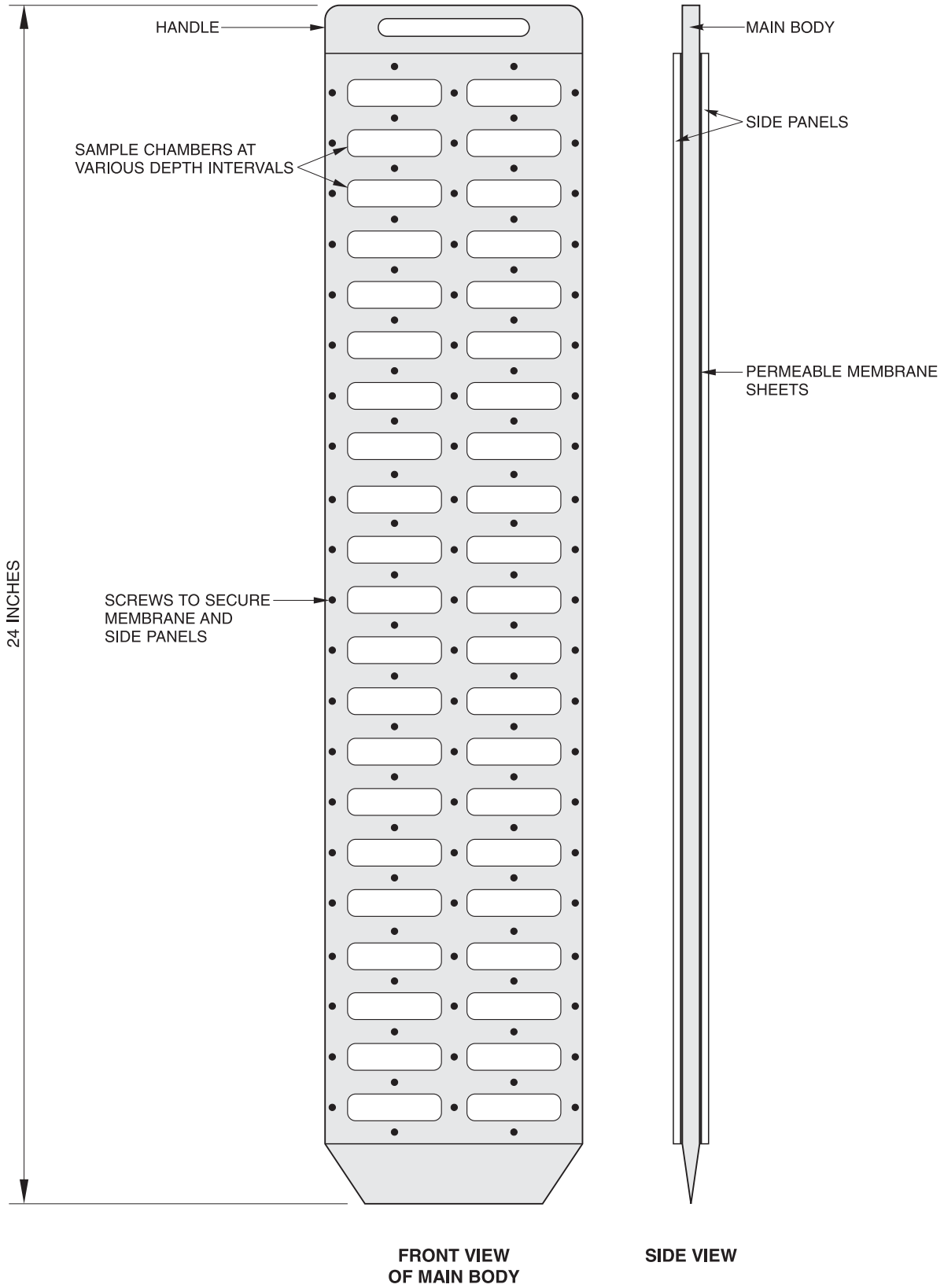


Figure 8. Schematic diagram of a porous-membrane sampling device.

Figure 9. Passive-diffusion-bag sampler. (Photograph by Daniel J. Phelan, USGS, 2001.)

Ground-Water and Surface-Water Sampling Methods

Ground-water samples were collected during three sampling rounds in March–April and June–August 2000, and May 2001. Ground-water samples were collected and analyzed for field parameters, reduction-oxidation (redox) constituents, inorganic constituents, and organic constituents. Surface-water samples were collected during four synoptic sampling rounds in November 1999, and February, May, and September 2000. Surface-water samples were analyzed for organic constituents. Selected surface-water samples were also analyzed for field measurements and inorganic constituents.

Well and Piezometer Sampling Methods

Two types of wells and four types of piezometers were sampled. Well types included 2-in. and 4-in.-diameter wells. Piezometer types included 1-in. piezometers, 0.75-in. drive-point piezometers, 0.25-in. flexible-tubing piezometers, and 0.25-in. inverted-screen piezometers. Methods of sampling varied seasonally, depending on water availability, well depth, and well volume, and included a submersible pump, a peristaltic pump, a glass syringe with Teflon tubing, and a stainless-steel bailer. Between sample collections, the equipment was decontaminated using a soapy water wash, rinsed three times with deionized water, and then pre-rinsed with sample water. Sampling methods for the 1-in., 0.75-in. and 0.25-in. piezometers are similar.

1-Inch Piezometer Sampling Methods Prior to sampling, at least two or three piezometer-casing volumes were purged from the piezometers until the specific conductance, pH, and temperature parameters stabilized. Water samples were collected using a peristaltic pump, or a glass syringe with Teflon tubing assembled with a three-way stop-cock valve between the syringe and tubing. The syringe assembly allowed several milliliters of water to be expelled before sample collection and allowed water samples to be collected into sample vials with minimal aeration of the sample or the water column. Samples were collected and analyzed for field parameters, redox constituents, inorganic constituents, and organic constituents at 16 sites in May 2001.

0.75-Inch Drive-Point Piezometer Sampling Methods Prior to sampling, the 0.75-in. drive-point piezometers were purged until field parameters stabilized or until the well went dry. Piezometers were purged by use of either a glass syringe with Teflon tubing, a stainless-steel bailer, or a peristaltic pump if the piezometer produced sufficient volumes of water. The majority of the shallow piezometers screened in the wetland sediments have low recovery rates and were purged using a stainless-steel bailer or a glass syringe with Teflon tubing. Piezometer recovery after purging typically took between several hours to several days before sampling could begin. After recovery, the water samples were collected using a peristaltic pump or a glass syringe using the same method described for the 1-in. piezometer sample collection. Sampling rounds for the 0.75-in. drive-point piezometers took place in March–April and June–August 2000. Samples were collected and analyzed for field parameters, redox constituents, inorganic constituents, and organic constituents at 18 piezometer sites.

0.25-Inch Flexible Tubing and Inverted-Screen Piezometer Sampling Methods Due to low recovery rates and small water-column volumes, these piezometers were purged and sampled using the glass syringe and Teflon tubing. After purging, samples were collected directly above the piezometer screen. Samples were collected and analyzed primarily for organic constituents. When enough water was present, field parameters, redox constituents, and inorganic constituents were also collected and analyzed. Samples were collected in March–April and June–August 2000.

Multi-Level Monitoring System Sampling Methods

The MLSs were sampled in March–April and June–August 2000. Samples were collected at six sites from 42 depths by first placing Teflon tubing above the well screen, and then using a syringe or peristaltic pump, purging the well until the pH, specific conductance, and temperature stabilized to within 5 percent, or after one well volume of purging if the well went dry. The well recovery rates varied

with depth, but all wells recovered faster than the 1-in., 0.75-in., and 0.25-in. piezometers. Samples were collected and analyzed for field measurements, redox constituents, inorganic constituents, and organic constituents at six sites from 42 depths in March–April and June–August 2000.

Ground-Water Profiler Sampling Methods

The USGS Hoverprobe was used to collect ground-water quality profiling data at nine sites. The USGS Hoverprobe is shown in figure 7a. Ground-water quality profiling samples were collected with a 1.7-in.-diameter stainless-steel drive-point screen with a 0.125-in.-diameter Teflon riser tube connected directly to the profiler screen (fig. 7b). A peristaltic pump was used to continuously pump organic-free deionized water at a very low rate down the tubing to clean the tubing and keep the drive-point screen clear as it was being pushed into the sediments. The pump direction was reversed and ground water was pumped to the surface when the desired sample depth was reached. Specific conductance, pH, dissolved oxygen, and temperature of the ground water were measured. When the readings stabilized, typically after 15–20 minutes of pumping, water samples were collected.

Ground-water samples were collected and analyzed for VOCs at all nine sites, and methane and sulfide samples were collected from four of the nine profiling sites in April–May 2000. If the dissolved oxygen concentrations exceeded approximately 2 mg/L (milligrams per liter), sulfide samples were not collected. After a sample was collected, deionized water was pumped down the tubing with a peristaltic pump while the Hoverprobe vibrated the drive point down to the next desired sampling depth. The pumping direction was again reversed for sampling, and the sampling process was repeated. Pumping deionized water down the tubing and pumping ground water for 15–20 minutes before samples were collected helped to minimize carry-over from the previous sample. When the sampling profile was finished, the pipe and screen were removed, and the hole was filled with bentonite pellets. Additional information regarding the profiler sampling can be found in Phelan, Senus, and Olsen (2001).

Porous-Membrane Sampling Device Sampling Methods

After the peepers were assembled and installed in the wetland sediments, they were left to equilibrate with ambient ground water for 2 to 3 weeks. When the peepers were removed, they were sampled immediately for sulfide, ferrous and ferric iron, methane, and VOCs. Samples were collected from the individual chambers of the peeper by puncturing the porous membrane and immediately withdrawing the sample water using a glass syringe and rigid Teflon tubing. The sample was then expelled into sample vials with a smooth motion to minimize aeration. Each 2-ft peeper chamber yielded 11 mL of sample, while each 4-ft peeper chamber yielded about 20 mL of sample. The peepers were constructed with two chambers at each depth interval so that duplicates of some constituents could be collected at most of the depth intervals. Peepers were installed during sampling rounds in March and June 2000, and May 2001.

Passive-Diffusion-Bag Sampler Methods

The PDB samplers were constructed of a lay-flat polyethylene membrane formed into 4-in.- by 2-in.-diameter tubes. The diffusion samplers were installed in the mud near Hoverprobe sites HP01, HP02, HP05, and HP13, at 0.5 to 1 ft bls for 19 days (fig. 4). After the 19-day period, the samplers were removed and the contents poured into VOC vials and chilled. The samples were refrigerated until they were analyzed at the on-site laboratory within 14 days of sampling. PDB samplers were sampled in September 2000.

Surface-Water Sampling Methods

The surface-water samples were collected from the creek and wetland using a grab method. Sample vials were submerged 3 to 5 in. below the water surface. The vials were capped underwater to prevent sample aeration. Sample-collection times were scheduled according to predicted tides; however, wind speed and direction, precipitation, ice, and other weather events in the Gunpowder River and Chesapeake Bay areas can dramatically affect the water levels in the creek. Therefore, water levels in the tidal part of the creek are not always consistent with predicted tides. Synoptic surface-water sample collection occurred in November 1999 and February, May, and September 2000. Surface-water samples were collected from the Hoverprobe sites in March and September 2000. Additional surface-water sampling information is presented in Phelan and others (2001).

Ground-Water and Surface-Water Analytical Methods

Most ground-water and surface-water samples were collected and analyzed for several field parameters, redox constituents, inorganic constituents, and organic constituents. Ground-water samples were analyzed in the field for specific conductance, pH, temperature, and if sufficient water was available, dissolved oxygen and alkalinity. Redox constituents were analyzed in the field and at the on-site laboratory at West Branch Canal Creek. All inorganic analyses were conducted at the U.S. Geological Survey National Water-Quality Laboratory (NWQL) in Denver, Colorado. Most organic constituents were analyzed at the on-site laboratory at West Branch Canal Creek; however, some of the MLS samples were analyzed at the USGS office in West Trenton, New Jersey.

Field Measurements

Parameters measured in the field included specific conductance, pH, water temperature, dissolved oxygen, and alkalinity. A Multi-Line P3 pH/Conductivity/Temperature meter manufactured by Wissenschaftlich-Technische Werkstätten was used for the field measurements. Specific

conductance was calibrated daily with three conductance standard solutions of approximately 200 µS/cm (microsiemens per centimeter), 500 µS/cm, and 1,000 µS/cm. The pH was calibrated daily with two pH standards, 4.00- and 7.00-pH buffer. Meter calibration was also verified against an additional pH standard, 10.0-pH buffer. The piezometers often did not produce enough water to measure all of the field parameters. If sufficient water was available, dissolved oxygen was measured using a modified Winkler titration method, and alkalinity was measured in the field after the sample had been filtered through a 0.45-µm filter. Alkalinity as bicarbonate was determined using the inflection-point titration method. Field measurements were collected using modified methodology from Wilde and others (1998).

Redox Analyses

Redox-sensitive constituents that were analyzed included sulfide, ferrous and ferric iron, and methane. The iron and methane samples were chilled until processed, and were analyzed at the on-site laboratory at West Branch Canal Creek.

Sulfide was measured in the field using a CHEMetrics A–1051 photometer kit and U.S. Environmental Protection Agency Method 376.2 (1983). The kit includes a portable spectrophotometer set to 670 nm (nanometers) that was calibrated daily, and Vacu-Vials with reagent. For each analysis, three drops of a ferric chloride acid mixture was added to the 25 mL of sample water. Next, the sample was stirred with a Vacu-Vial filled with a reagent mixture of dimethyl-*p*-phenylenediamine. After stirring, the ampule tip was broken while submersed in the sample, allowing the sample water to be drawn up by vacuum into the reagent-filled Vacu-Vial. The vial of sample water and reagent were then allowed to react and equilibrate for 5 minutes before being placed into the spectrophotometer for analysis (CHEMetrics Inc., 2000).

Ferrous and ferric iron samples were filtered through a 0.2-µm filter and preserved with reagents in the field. The iron samples were processed at the on-site laboratory with a Bausch and Lomb Spectronic 21 spectrophotometer at 520 nm, using the colorimetric bipyridine technique described by Brown and others (1970) and Baedecker and Cozzarelli (1992). After establishing an initial calibration curve, the instrument calibration was verified daily by processing several iron standards and plotting them on the calibration curve to verify accuracy. Ferric iron concentrations were calculated by subtracting the ferrous iron concentrations from the total iron concentrations.

Methane samples were collected and injected by syringe into sealed serum vials, which had been preserved with mercuric chloride and purged with nitrogen gas prior to

sample collection. Methane samples were analyzed using a gas chromatograph with a flame-ionization detector at the on-site laboratory. The instrument calibration was verified daily using standard compressed gases before and after sample analyses. Air blanks were analyzed frequently to verify the absence of bias due to contamination from the sample vials or the laboratory equipment. Nearly all methane samples from piezometers were collected in duplicate. The lower reporting limit for methane analyses ranged from less than 13.5 µg/L (micrograms per liter) to less than 148 µg/L, depending on the volume of sample analyzed. The upper reporting limit of 77,000 µg/L was not exceeded by any sample concentration. This method of methane analysis is described in Baedecker and Cozzarelli (1992).

Inorganic Analyses

The USGS NWQL in Denver, Colorado performed the inorganic analyses. Inorganic samples were chilled immediately after collection and during shipment to NWQL. Samples were analyzed for calcium, magnesium, sodium, potassium, sulfate, chloride, fluoride, bromide, silica, nitrogen as nitrite plus nitrate, nitrogen as ammonia, and nitrogen as ammonia plus organic, iron, and manganese. Methods used by NWQL for analysis of inorganic constituents in water samples are explained in detail in Fishman and Friedman (1989), and in Fishman (1993). Table 2 lists the inorganic constituents analyzed, the instrumentation used, and the reporting limit for each constituent.

Table 2. *Methods of analyses for inorganic constituents*

[National Water Quality Laboratory, 2001; mg/L, milligrams per liter; µg/L, micrograms per liter]

Constituent	Instrumentation	Reporting limit
Bromide	Colorimetry	0.01 mg/L
Calcium	Inductively coupled plasma	0.011 mg/L
Chloride	Ion chromatography	0.08 mg/L
Fluoride	Ion chromatography	0.16 mg/L
Iron	Inductively coupled plasma	10 µg/L
Magnesium	Inductively coupled plasma	0.008 mg/L
Manganese	Inductively coupled plasma	0.1 µg/L
Nitrogen, nitrite plus nitrate	Colorimetry	0.037 mg/L
Nitrogen, ammonia	Colorimetry	0.049 mg/L
Nitrogen, ammonia plus organic	Colorimetry	0.10 mg/L
Potassium	Flame atomic absorption	0.09 mg/L
Silica	Ion chromatography	0.09 mg/L
Sodium	Inductively coupled plasma	0.06 mg/L
Sulfate	Ion chromatography	0.11 mg/L

Table 2. *Methods of analyses for inorganic constituents*

[National Water Quality Laboratory, 2001; mg/L, milligrams per liter; µg/L, micrograms per liter]

Organic Analyses

VOC analyses were performed at both the on-site laboratory at West Branch Canal Creek, and the USGS office in West Trenton, New Jersey. The samples processed for VOCs at the on-site laboratory were analyzed using a purge-and-trap capillary gas-chromatograph with a mass-selective detector (GC/MSD). The analytical method used to analyze for VOCs is modified from U.S. Environmental Protection Agency Method 524.2 (U.S. Environmental Protection Agency, 1988), and is presented in Rose and Schroeder (1995). The lower reporting limit for VOC analyses ranged from 0.5 to 25.0 µg/L. This lower limit is dependent on the compound being analyzed, instrument performance, and the need for dilution of the samples if concentrations are high. Compounds that were detected at levels below the lower reporting limit are reported as less than the lower reporting limit due to the reliability of results. The upper reporting limit for the VOC analyses ranged from 100 to 250 µg/L. Reporting limits are equivalent to the instrument calibration limits as discussed in the following sections. Based on long-term observations, the instrument response is fairly linear to concentrations up to twice the calibration limit; therefore, concentrations detected between 250 and 500 µg/L are reported even though they exceed the upper reporting limit of 250 µg/L. Compounds that were detected at concentrations above 500 µg/L did not necessarily correlate well with the calibration curve, and were therefore reported as "> 500 µg/L." A gas chromatograph with a Hall detector (electrolytic conductivity detector, or ELCD) was used to process some organic samples at the West Trenton, New Jersey office. The lower reporting limit was 0.47 µg/L, and the upper reporting limit was 96 µg/L for organic constituents analyzed by ELCD.

Quality-Assurance Methods

Quality assurance was conducted for both the field and analytical procedures. Replicates and field blank samples were collected to test the reliability of field sampling methods. Analytical quality assurance for VOC analyses at the on-site laboratory was tested by evaluating the internal standard and surrogate areas and concentrations, and by analyzing replicate and blind samples. Field blanks (redox constituents, inorganic compounds, and VOCs), ambient blanks (VOCs), trip blanks (VOCs), source-water blanks (inorganic and VOCs), sequential replicate (redox constituents, inorganic, and VOCs), and matrix spike samples (VOCs) were collected and analyzed during the sampling events. A discussion of the quality-assurance results is presented in the following sections of the report.

Field Replicates and Blind Samples

Field replicates were samples that were collected sequentially using the same equipment and sampling procedure. Replicate samples collected from the same location at the same time are referred to as replicate sets. These sets were analyzed to detect variability in the sampling and analytical procedures. In the sample name, the first sample collected is designated by a "1," and the second sample, or replicate, is designated by a "2." If a triplicate sample was collected, it is designated by a "3." The variability was determined by calculating the average relative percent difference (*avgRPD*) of the concentration of each analyte that was detected in replicate samples.

Field replicate sample sets were collected and analyzed, and then classified as one of three types of sample sets—(1) replicate sets in which all samples were below the lower reporting limit; (2) replicate sets in which one sample was above the lower reporting limit and another was below the reporting limit; and (3) replicate sets in which all samples were above the lower reporting limit. The variability between samples in replicate sets with multiple detections above the limit (classification 3) was determined by calculating the *avgRPD* of the concentration of each analyte using the following formulas:

$$RPD_n = \left| \frac{\frac{\Sigma(C_1, C_2 \ldots C_n)}{n} - C_n}{\frac{\Sigma(C_1, C_2 \ldots C_n)}{n}} \right| \text{ x 100 percent}$$

$$avgRPD = \frac{\Sigma(RPD_1, RPD_2 \ldots RPD_n)}{n}$$

where:

n	=	the total number of replicate samples,
Σ	=	the sum of the replicates or *RPDs*,
C_1	=	the concentration in the first sample,
C_2	=	the concentration in the replicate sample,
C_n	=	the concentration of the last replicate sample,
RPD_1	=	the *RPD* of the first replicate set,
RPD_2	=	the *RPD* of the second replicate set, and
RPD_n	=	the *RPD* of the last replicate set.

The *avgRPD* can be used to identify sources of variability among replicate samples, including variability introduced during the sampling process and intrinsic variability in the analytical method. The spatial and temporal differences in the composition of ground water or surface water were minimized by collecting samples simultaneously and sequentially in the same location.

Blind samples were also collected and analyzed. Blind samples are samples that were collected by field personnel from a site in replicate. The field personnel labeled one sample with the correct sample name and labeled the other sample with a "dummy" or "blind" sample location. After the samples were analyzed, the data were compared for variability.

Blanks

In addition to sequential replicates, field blank samples were routinely collected and analyzed for redox-sensitive constituents and inorganic and organic analyses. These blanks were collected after sampling by processing analyte-free water using the same sampling methods and equipment used for the collection of environmental samples. The field blanks were then analyzed, and if no constituents were detected, the decontaminating and sampling procedures were considered to have no effect on sample contamination. If the blanks were analyzed and constituents were detected, then steps were isolated to test the cleaning and sampling procedures, and methods were improved. Therefore, a reduced amount of contaminant carry-over from sample to sample occurred.

Field blanks collected during the ground-water profiler sample collection were used to evaluate the effectiveness of the *in situ* decontamination procedures that were performed on the profiling equipment between sampling depths. *In situ* decontamination involved carefully pumping organic-free deionized water down the 0.125-in.-diameter Teflon

tubing to clear the tubing and the drive point of potentially contaminated ground water while advancing the drive point to the next sampling depth. The volume of water used to decontaminate the tubing was minimized to avoid introducing undesirable amounts of organic-free water at the next sampling depth. Field blanks consisted of the water that was left in the tubing after this rinsing step, but before the aquifer water reached the pump. Field blanks were therefore not expected to be completely free of ground water from the previous sample. The additional rinsing of the drive point and tubing for at least 15–20 minutes during the purging steps would have considerably reduced the potential for contamination from the previous sampling depth to bias the concentrations in the new sample. Field blanks were collected from 13 randomly selected sampling depths during the ground-water profiler sampling event.

No sampling equipment is needed to collect surface-water quality-assurance samples. These samples are collected by pouring organic-free water directly into the sample vials. This type of sample can reveal whether contamination occurred during the sampling and handling procedures. Surface-water field blanks were analyzed for organic constituents only.

Equipment blanks, which consist of organic-free deionized water drawn through the drive-point screen, sample tubing, and peristaltic pump tubing prior to sampling, were collected to determine the potential for contamination bias associated with the sampling equipment. Equipment blanks were analyzed for organic constituents.

Ambient blanks are samples made up of analyte-free water that is collected in the same type of sample bottle as the environmental samples. The ambient blank is collected before sampling in the field and is kept with the other sample vials. The ambient blank is opened at the field site and exposed to the same conditions that the environmental samples are exposed to. Ambient blanks were analyzed for organic constituents.

Trip blanks are sample vials that are filled with organic-free water prior to sampling. These vials are then carried throughout the sampling trip and analyzed to detect bias caused by transportation of the samples during the sampling event. Trip blanks were analyzed for organic constituents.

Source-water blanks were analyzed to assess the analyte-free water. Analyte-free water is poured directly from the container into the sample vial. The source water was analyzed for both inorganic and organic constituents.

Laboratory Quality Assurance

As part of the on-site laboratory's internal quality-assurance and quality-control (QA/QC) procedure, a calibration check was performed daily to verify the standard calibration curve prior to processing samples. A laboratory blank was also processed to ensure that there was no contamination caused by ambient laboratory conditions. In addition, internal standards and surrogate standards were injected into every blank and sample. The injection of internal standards was necessary to determine the relative response of each target compound. Concentrations of the target compounds were calculated on the basis of known internal standard responses and concentrations. Surrogate standards with similar properties to the analytes of interest were used to track possible variations in each analytical sample run. The surrogate concentrations were known values; therefore, the responses of the surrogates could be evaluated to detect variations in instrument performance. If a sample was processed and either the internal standard response was low or the surrogate detection was inconsistent with the known concentration, then the sample was reprocessed and/or the instrument was adjusted and recalibrated before other samples were processed.

Matrix Spikes and Matrix Spike Duplicates

Matrix spike sample analysis was conducted for organic constituents at the on-site laboratory. Matrix spike samples consist of known quantities of five organic compounds added to environmental samples, and are used to measure the accuracy of the analytical procedure in detecting the spiked compounds in the particular sample matrix. These samples were used to determine the changes in analyte concentrations during the sample processing and analyses steps. Matrix spike duplicates were used to determine the reproducibility of these procedures. Analyses of paired spiked and unspiked samples enabled calculation of the spike recovery for each sample, thereby providing a measure of the recovery efficiency for the analytical method. The acceptable spike recovery of 70 to 130 percent is the data-quality objective (Rose and Schroeder, 1995). Spike recovery, in percent, was calculated using the following equation (Phelan and others, 2001):

$$\text{Spike recovery in percent} = \frac{\boldsymbol{M}spiked - \boldsymbol{M}unspiked}{\boldsymbol{E}spiked} \times 100 \text{ percent}$$

where:

***M**spiked*	=	the concentration of the spiked compound **measured** in the spiked sample,
***M**unspiked*	=	the concentration of the unspiked compound **measured** in the unspiked sample, and
***E**spiked*	=	the concentration of the spiked compound **expected** in the spiked sample based on the volume and concentration of spike mixture used.

Ground-Water Data from Wells, Piezometers, and Multi-Level Monitoring Systems

Ground-water samples were collected from two 4-in. wells, two 2-in. wells, 164 piezometers, 42 MLS depths at six sites, 34 ground-water profiler depths at nine sites, 15

peepers, and 14 PDB samplers. Ground-water samples were analyzed for field parameters, redox constituents, inorganic constituents, and organic constituents. Surface-water samples were collected and analyzed for organic constituents at 27 sampling sites (including 7 Hoverprobe sites), and analyzed for inorganic constituents at 2 sites. Well, piezometer, and MLS field measurements and redox data are presented in Appendix 2A, inorganic data are presented in Appendix 2B, and organic data are presented in Appendix 2C. Ground-water profiler and supplemental Hoverprobe piezometer field measurements and redox data, and inorganic data are presented in Appendixes 3A and 3B, respectively. Ground-water profiler, supplemental Hoverprobe piezometers, and PDB organic data are presented in Appendix 3C. Peeper sampling data for redox constituents are presented in Appendix 4A, and organic data are listed in Appendix 4B. Inorganic data from the peepers were not collected due to the low sample volume of the devices. Surface-water field measurements and organic data are listed in Appendix 5A, and inorganic data are listed in Appendix 5B.

Field Measurements and Redox Constituents for Wells, Piezometers, and Multi-Level Monitoring Systems

Samples from 4 wells, 164 piezometers, and 42 MLS depths at six sites were collected and analyzed for field parameters (specific conductance, pH, air temperature, water temperature, dissolved oxygen, and alkalinity) and redox constituents (sulfide, iron, and methane) during sampling events in March–April and June–August 2000, and May 2001 (Appendix 2A). Quality-assurance replicates associated with these data are presented throughout Appendix 2A and are identified with a designation of "2" or higher in the replicate column. Two hundred and seventy-five replicate methane samples were analyzed. The replicate methane samples were classified into the three categories that were discussed previously in the Quality-Assurance Methods Section. Of the 275 replicate samples, 105 replicate samples were in classification 1 (replicate sets in which all samples were below the lower reporting limit); 6 replicate methane samples were in classification 2 (replicate sets in which one sample was above the lower reporting limit and another was below the reporting limit); and 164 replicate methane samples were in classification 3 (replicate sets in which all samples were above the lower reporting limit). Blind samples included four piezometer samples, two MLS samples, and one field blank associated with MLS samples. Total iron values collected from sample WB22D on August 1 and August 3, 2000 were deleted from this sample set because the total iron values were 150 mg/L and 100 mg/L, respectively. These values were much greater than total iron values for the entire sample set. Replicate *avgRPDs* for field measurements and redox constituents are presented in table 3.

Of the replicate field measurements and redox parameters collected and analyzed during March–April and June–August 2000, and May 2001, dissolved oxygen had the lowest median *avgRPD* of 0.98 percent, and alkalinity had the highest median *avgRPD* of 11.4 percent. Since these parameters are influenced by ambient air, the median *RPD* is considered acceptable. Field measurements inherently display more variability than organic or inorganic analyses.

Table 3. *Replicate average relative percent difference values for well, piezometer, and multi-level monitoring system samples collected and analyzed for field measurements and reduction-oxidation constituents, West Branch Canal Creek study area, Aberdeen Proving Ground, Maryland, March 2000–May 2001*

[*avgRPD*, average relative percent difference; %, percent]

Compounds detected in replicate sets	Number of replicate sets with detections	Minimum *avgRPD* (%)	Maximum *avgRPD* (%)	Median *avgRPD* (%)
Dissolved oxygen	19	0.00	50.0	0.98
Alkalinity	4	4.76	33.3	11.4
Sulfide	16	0.00	47.6	3.72
Iron, total	32	0.00	63.3	5.08
Iron, ferrous	35	0.00	97.3	6.44
Methane	164	0.00	53.5	1.68

During the March–April 2000 sampling event, two field blanks were collected and analyzed for redox constituents. All constituents detected were below the lower calibration

limit except total iron. One field blank was collected during the June–August 2000 sampling event and total iron was the only constituent with any detection in the blank. Field blanks were not collected and analyzed for redox parameters during the May 2001 sampling event.

Inorganic Constituents for Wells, Piezometers, and Multi-Level Monitoring Systems

Including replicate samples, 157 piezometer samples and 53 MLS samples were analyzed for inorganic constituents during sampling events in March–April and June–August 2000, and May 2001 (Appendix 2B). Seven field blanks and one source-water blank were collected during piezometer sampling, and two field blanks were collected from MLSs during the three events. Inorganic samples were not collected from 2-in. and 4-in. wells. Forty-five replicate sample sets were collected for inorganic constituents; of these, 20 sets were collected from piezometers and 2 sets were collected from MLSs. All replicate sets contained detections above the lower reporting limit (classification 3). A list of compounds that were detected in 22 replicate piezometer and MLS sample sets and their *avgRPDs* are presented in table 4.

All replicate analyses of inorganic constituents had a median *avgRPD* of equal to or less than 6.55 percent. The compound with the greatest median and maximum *avgRPD* was dissolved iron (6.55 percent and 83.1 percent, respectively).

During the March–April 2000 sampling event, two field blanks were collected after piezometer samples and one field blank was collected after MLS samples and analyzed for inorganic constituents. During the June–August 2000 sampling event, five field blanks were collected after piezometer samples and one field blank was collected after MLS samples and analyzed for inorganic constituents. All three field blanks contained detections of calcium and silica. One of the three field blanks also contained magnesium, sodium, dissolved iron, and manganese.

A source-water blank was collected and analyzed during the May 2001 sampling event. A chloride concentration of 0.2 mg/L was detected in the source water. Since the environmental samples collected from the supplemental piezometers indicated very high chloride concentrations, it is likely that the source-water detection is due to analytical carry-over contamination rather than contamination from the source water.

Organic Constituents for Wells, Piezometers, and Multi-Level Monitoring Systems

Ground-water samples were collected from 4-in. wells, 2-in. wells, and 1-in., 0.75-in., and 0.25-in. piezometers for VOC analyses in the on-site laboratory at West Branch Canal Creek. MLS samples were collected and analyzed for VOCs at the on-site laboratory and at the USGS Office in West Trenton, New Jersey. The 4-in. wells, 2-in. wells, and 0.75-in. piezometers were sampled in March–April and June–August 2000. The 1-in. piezometers were sampled in September 2000 and May 2001. The 0.25-in. piezometers were sampled in March–April and June–August 2000.

Table 4. *Replicate average relative percent difference values for piezometer and multi-level monitoring system samples analyzed for inorganic constituents, West Branch Canal Creek study area, Aberdeen Proving Ground, Maryland, March 2000–May 2001*

[*avgRPD*, average relative percent difference; %, percent; –, not statistically meaningful to calculate]

Compounds detected in replicate sets	Number of replicate sets with detections	Minimum *avgRPD* (%)	Maximum *avgRPD* (%)	Median *avgRPD* (%)
Calcium, dissolved	20	0.00	35.3	0.29
Magnesium, dissolved	20	0.00	34.0	0.36
Sodium, dissolved	20	0.00	38.1	1.00
Potassium, dissolved	19	0.00	33.3	0.00
Sulfate, dissolved	19	0.00	69.5	0.00
Chloride, dissolved	19	0.00	68.4	0.62
Fluoride, dissolved	10	0.00	33.3	0.00
Bromide, dissolved	17	0.00	33.3	5.26
Silica, dissolved	20	0.00	40.2	0.00
Nitrogen, as nitrite plus nitrate, dissolved	3	0.00	0.81	0.00
Nitrogen, as ammonia plus organic, dissolved	2	0.00	7.69	–
Iron, dissolved	18	0.00	83.1	6.55

Table 4. *Replicate average relative percent difference values for piezometer and multi-level monitoring system samples analyzed for inorganic constituents, West Branch Canal Creek study area, Aberdeen Proving Ground, Maryland, March 2000–May 2001*

[*avgRPD*, average relative percent difference; %, percent; –, not statistically meaningful to calculate]

Compounds detected in replicate sets	Number of replicate sets with detections	Minimum *avgRPD* (%)	Maximum *avgRPD* (%)	Median *avgRPD* (%)
Manganese, dissolved	20	0.00	33.4	0.92

The MLSs were sampled in March and June–August 2000. The data for organic analyses are presented in Appendix 2C.

Of the 59 target compounds analyzed, 18 were not detected above the lower reporting limits (0.5 µg/L – 25.0 µg/L) for well and piezometer ground-water analyses, and are listed below:

Bromobenzene	Bromochloro-methane	Bromoform
Chloroethane	Dibromochloro-methane	Dibromoethane
1,2–Dibromo-ethane	Dichlorodifluoro-methane	2,2–Dichloro-propane
cis-1,3–Dichloropropene	*trans*-1,3–Dichloro-propene	1,1–Dichloro-ethane
1,3–Dichloropropane	Isopropylbenzene	Styrene
Trichlorofluoro-methane	1,2,3–Trichloro-propane	*o*-Xylene

A total of 558 ground-water samples were analyzed for organic constituents from wells, piezometers, and MLSs from March 2000 through May 2001. The 558 samples included 57 samples that failed internal QA/QC parameters, 272 replicate sample sets including 214 duplicate samples, 39 triplicate samples, 8 quadruplicate samples, 1 set of 5 replicate samples, 1 set of 6 replicate samples, 30 blind samples (20 of which were blanks), and 1 matrix spike duplicate set.

The replicate sample sets analyzed by the GC/MSD method at the on-site laboratory were classified into three categories. Of the 113 replicate sample sets analyzed by GC/MSD, 8 replicate sample sets were in classification 1 (replicate sets in which all samples were below the lower reporting limit), 5 replicate sample sets were in classification 2 (replicate sets in which one sample was above the lower reporting limit and another was below the reporting limit), and 100 replicate sample sets were in classification 3 (replicate sets in which all samples were above the lower reporting limit). *AvgRPD* differences for the 20 compounds that were detected in well, piezometer, MLS, and field blank replicate sample sets are presented in table 5.

Table 5. *Replicate average relative percent difference values for well, piezometer, and multi-level monitoring system samples analyzed for organic constituents detected by the gas-chromatograph/mass-selective-detector method at the on-site laboratory, West Branch Canal Creek study area, Aberdeen Proving Ground, Maryland, March 2000–May 2001*

[*avgRPD*, average relative percent difference; %, percent; –, not statistically meaningful to calculate; *, number does not represent a median value because only one replicate set was detected, therefore this is an average of one pair]

Compounds detected in replicate sets	Number of replicate sets with detections	Minimum *avgRPD* (%)	Maximum *avgRPD* (%)	Median *avgRPD* (%)
1,1,2,2–Tetrachloroethane	76	0.22	78.3	8.19
1,1,1,2–Tetrachloroethane	1	–	–	9.53 *
1,1,2–Trichloroethane	41	0.73	31.1	7.61
1,2–Dichloroethane	61	0.62	27.1	5.07
Tetrachloroethene	56	0.70	26.8	7.49
Trichloroethene	85	0.11	70.5	5.89
cis–1,2–Dichloroethene	78	0.00	41.2	5.24
trans–1,2–Dichloroethene	41	0.05	44.2	6.25
1,1–Dichloroethene	8	0.00	13.1	6.95
Vinyl chloride	23	0.65	66.7	16.4
Carbon tetrachloride	54	0.00	29.3	4.82
Chloroform	66	0.06	43.7	5.01
Methylene chloride	8	0.65	20.6	9.42
Benzene	7	3.10	17.0	4.06
Bromodichloromethane	6	0.00	7.51	4.48
Bromomethane	1	–	–	58.4*
Chlorobenzene	1	–	–	5.66 *
Ethyl benzene	1	–	–	12.2 *
Hexachlorobutadiene	1	–	–	10.0 *
Toluene	4	4.58	26.3	25.0

In samples analyzed by GC/MSD, bromomethane and toluene both had relatively high median *avgRPDs* (58.4 percent and 25.0 percent, respectively) compared to the other organic compounds. These compounds are not site-related contaminants. The median *avgRPDs* for all other organic compounds were 16.4 percent or less, which is an acceptable variability.

During the March–April 2000 sampling, five field blanks were collected from piezometers and five field blanks were collected from MLSs. All piezometer field blanks indicated adequate decontaminating procedures between sample collections, since no VOC detections were found. All MLS field blank analyses indicate that a small amount of residual contaminant may exist between samples; however, the concentration was reduced 75 percent from the initial concentration to the field blank.

During the June–August 2000 sampling event, 11 field blanks were collected from piezometers. No constituents were detected in six of the field blank samples. The other five field blank samples detected contaminants. The contaminant concentrations indicated a 96-percent reduction in the field blank concentration compared with the original concentration.

Two matrix spike samples were collected during the June–August 2000 sampling event. Replicate ground-water samples were collected and injected with matrix-spike

Table 6. *Average relative percent difference values for matrix spike samples used to evaluate matrix effects and analytical reproducibility for ground-water samples, West Branch Canal Creek study area, Aberdeen Proving Ground, Maryland, August 2000*

[µg/L, micrograms per liter; %, percent; MS, matrix spike; ES, environmental sample; R, replicate; *avgRPD*%, average relative percent difference between spiked and unspiked samples; <, less than]

Site name	Sample type	Sample date	Sample time	Matrix Spike Compounds (spike amount is 25 µg/L)				
				1,1-Dichloroethene	Benzene	Trichloroethene	Toluene	Chlorobenzene
WB36G	ES	08/07/2000	1130	<0.5 µg/L	0.9 µg/L	<0.5 µg/L	<0.8 µg/L	<0.8 µg/L
WB36G	MS	08/07/2000	1130	23.6	26.0	24.4	29. 2	29.4
	Percent recovery			94.4%	104%	97.6%	117%	118%
WB36G	MS, R	08/07/2000	1130	23.6	26.0	23.9	28.9	29.5
	Percent recovery			94.4%	104%	95.6%	116%	118%
	avgRPD %			0%	0%	2.07%	1.03%	0.34%

standards. The percent recovery for the set of matrix spike samples was calculated and compared with the data-quality percent recovery control limits for each spike. The data-quality control limits are 76–127 for benzene, 75–130 for chlorobenzene, 61–145 for 1,1–dichloroethene, 76–120 for toluene, and 71–120 for trichloroethene. The results of the comparison of the spiked and unspiked samples, and percent recovery calculations are shown in table 6.

The percent recovery for the set of matrix spike samples fell within the data-quality objectives—the minimum percent recovery was 94.4 percent, and the maximum was 118 percent (table 6). The *avgRPDs* of the analyses of the replicate spike pair ranged from 0 to 2.07 percent.

During the May 2001 sampling event, six field blanks, two equipment blanks, and one source-water blank were collected and analyzed for organic constituents. Three field blanks contained detections, however, the concentrations were generally reduced by 87 percent; one constituent was only reduced by 66 percent for one sample. The contaminants detected in the field blanks are probably due to the higher environmental sample concentrations. These sites are in a new sampling area, and concentrations of this magnitude have not been previously encountered at this site. Field blanks were analyzed the same day they were collected and adjustments were made in the decontaminating procedures to eliminate potential carry-over between samples. The equipment blanks and source-water blank contained no detections, indicating that the decontaminating water and equipment were free of analytes prior to sampling, thus reducing the risk of contaminant carry-over between samples.

Samples processed by the ELCD method at the USGS laboratory in West Trenton, New Jersey were analyzed for 11 compounds, which are listed in table 7. There were 14 replicate sample sets (28 samples) analyzed by this method. All 28 replicate samples contained constituent detections above the lower reporting limit (classification 3).

Organic constituents analyzed by the ELCD method had median *avgRPDs* that were less than 14.9 percent. The median *avgRPD* of all ELCD analyses (table 7) was 9.60 percent, compared to the median *avgRPD* of all GC/MSD analyses, which was 7.25 percent (table 5). A comparison of median *avgRPDs* of both analytical methods indicates that there are negligible differences in the quality of the results obtained by the two methods.

The overall increased variability of *avgRPDs* of organic analyses compared to the *avgRPD* of inorganic constituents may be due to the volatility of the compounds being analyzed and the low concentrations sometimes detected in replicate samples. A 1 µg/L difference between concentrations of 1 and 2 µg/L results in a 100-percent difference in *avgRPD*, while a 1 µg/L difference between concentrations of 99 and 100 µg/L results in a 1-percent difference in *avgRPD*. Organic data for wells, piezometers, and MLSs are presented in Appendix 2C.

During the June–August 2000 sampling event, one field blank was collected from the MLS and analyzed for organic constituents by ELCD methodology. Chloroform was detected at concentrations at least 88 percent less than the environmental sample. One sample was collected as a split sample and analyzed by both GC/MSD and ELCD. This sample showed negligible differences between the methodologies; the *avgRPD* was generally less than 20 percent,

Table 7. *Replicate average relative percent difference values for well and piezometer samples analyzed for organic constituents detected by the electrolytic conductivity detector method at the West Trenton, New Jersey laboratory, May 2001*

[*avgRPD*, average relative percent difference; %, percent; –, not statistically meaningful to calculate]

Compounds detected in replicate sets	Number of replicate sets with detections	Minimum *avgRPD* (%)	Maximum *avgRPD* (%)	Median *avgRPD* (%)
1,1,2,2–Tetrachloroethane	14	1.43	64.0	10.9
1,1,2–Trichloroethane	7	0.89	38.9	12.9
1,2–Dichloroethane	6	0.48	22.3	1.97
Tetrachloroethene	4	7.82	84.4	14.9
Trichloroethene	12	3.30	24.8	8.29
cis–1,2–Dichloroethene	10	1.14	36.8	4.23
trans–1,2–Dichloroethene	9	4.63	62.6	14.1
Vinyl chloride	6	0.34	8.44	5.37
Carbon tetrachloride	8	0.86	15.9	5.24
Chloroform	8	3.65	80.9	11.3
Bromodichloromethane	2	2.16	4.42	–

indicating consistency between the analyses. Samples were not analyzed with the ELCD method during the March–April and May 2001 sampling events.

Ground-Water Profiler and Supplemental Piezometer Data

Ground-water samples were collected from nine sites using the Hoverprobe ground-water profiler with a vibracore drill rig mounted on a hovercraft. These sampling sites were previously inaccessible due to the wetland environment. Profiler samples were collected for field measurements, redox constituents, inorganic constituents, and organic constituents in April–May 2000. Data from this sampling event are also published in Phelan, Senus, and Olsen (2001). Supplemental piezometers were also used to collect ground-water samples at four sites. The supplemental piezometers were installed at depths of 6 and 12 ft. Samples were collected from the supplemental piezometers and analyzed for field measurements, inorganic constituents, and organic constituents in September 2000.

Field Measurements and Redox Constituents for Profiler and Supplemental Piezometer Samples

Dissolved oxygen, sulfide, and methane concentrations were measured to determine aquifer and overlying wetland sediment conditions. Because of the high oxidation states in highly chlorinated VOCs, they are degraded most easily through reduction reactions under anaerobic conditions by microbes (Lorah and others, 1997). Field measurements and redox constituents at the Hoverprobe sampling sites are presented in Appendix 3A.

Field measurements and redox-sensitive constituent data were collected for 34 ground-water profiler samples at nine sites in April–May 2000. The eight supplemental piezometer samples were measured for pH and dissolved oxygen in September 2000.

Duplicate methane samples were analyzed from 33 of 34 profiler sample depths. Seven replicate sets were analyzed, and all samples had concentrations above the lower reporting limit, while 26 replicate sets had no concentrations above the lower reporting limit. Of these seven replicate pairs, the minimum *avgRPD* was 0.43 percent, the maximum *avgRPD* was 21.8 percent, and the median *avgRPD* was 2.28 percent. Blanks were not collected for redox constituent analyses during profiler or supplemental piezometer sampling events.

Inorganic Constituents for Profiler and Supplemental Piezometer Samples

Ground-water samples were collected by profiler for analyses of major ions from six of the nine sampling sites accessed by the Hoverprobe, and from four supplemental Hoverprobe piezometer sites. Three of the nine ground-water profiler sites did not have enough water available for

inorganic sample analyses. These samples were used to determine the general ground-water geochemistry and locations of potential contaminant sources. The inorganic ground-water quality data and associated field parameters are presented in Appendix 3B. A discussion of these data is presented in Phelan, Senus, and Olsen (2001). Twenty-one samples were collected with the ground-water profiler for inorganic analyses, including 1 duplicate set and 1 source-water sample, in April–May 2000. The *avgRPD* for the replicate pair was 0 percent for 7 of 11 constituents. The *avgRPDs* for the remaining four constituents were 0.79 for calcium, 1.41 for sulfate, 1.69 for chloride, and 0.74 for manganese.

One source-water blank was collected and analyzed during the April–May 2000 sampling event. Analyses of the source-water blank indicated that no inorganic constituents were present. Seven inorganic samples were collected from supplemental Hoverprobe piezometers in September 2000, however, no QA/QC samples were collected.

Organic Constituents for Profiler and Supplemental Piezometer Samples

Ground-water quality profiling was performed at nine sites (fig. 4) at 34 depths in April–May 2000 using the USGS Hoverprobe. Eighty-four ground-water profiling samples were collected in April–May 2000, including 19 samples without replicate samples, 8 duplicate sets, 8 triplicate sets, 1 set of four samples, 14 field blanks, 6 equipment blanks, and 1 source-water blank. Eighteen supplemental piezometer samples were collected and analyzed for organic constituents in September 2000, including three samples without replicates, six duplicate samples, six triplicate samples, and three field blanks. These data are presented in Appendix 3C.

The profiling was conducted on April 6–7, 2000 and continued on April 26, 2000. After the VOC concentrations from the first of the replicate samples were analyzed, it was determined that several constituent concentrations exceeded the upper reporting limit. Replicate samples were analyzed to verify the high concentrations (reported in Appendix 3C as "> 500" if the sample concentration was not diluted prior to analysis). The second analysis verified the results from the first analysis, and since higher concentrations were expected, the replicate samples were often diluted to ensure that the concentrations would fall within the instrument calibration range of the organic analyses method discussed previously in the Ground-Water and Surface-Water Analytical Methods section.

Many field blanks collected during ground-water profiling consisted of the deionized water used to rinse the sample tubing between sample collection. Many had detections of site-specific VOCs such as trichloroethene, tetrachloroethene, carbon tetrachloride, and chloroform, but concentrations were generally reduced, by at least 90 percent, when compared to the concentrations detected in the environmental samples. For example, sample HP13-16 contained a tetrachloroethene concentration of approximately 4,340 µg/L (Appendix 3C). The field blank collected after this sample contained an estimated value of 364 µg/L of tetrachloroethene, which represents a 92-percent decrease in contaminant concentration. Ground water was pumped through the sample tubing for 26 minutes after collection of the field blank, and prior to collection of the next environmental sample at site HP13-21. Quality-assurance data are discussed in more detail in Phelan, Senus, and Olsen (2001).

Of the 44 replicate samples collected during the ground-water profiling sampling event, 16 samples were duplicates, 24 samples were triplicates, and 1 set had four samples. All 44 replicate samples were in classification 3 (replicate sets in which all samples were above the lower reporting limit). Replicate *avgRPDs* are listed in table 8. Additional data from the ground-water profiler sampling are presented in Phelan, Senus, and Olsen (2001).

Of the 12 replicate samples collected during the supplemental piezometer sampling event, 6 samples were duplicates and 6 were triplicates. All 12 replicate samples were in classification 3 (replicate sets in which all samples were above the lower reporting limit).

Overall, the profiler analyses had higher *avgRPDs* for the organic constituents than any other sampling method. Phelan, Senus, and Olsen (2001) reported that only two samples were analyzed using the same dilution factor for both samples of the replicate pair, and *avgRPDs* for these two samples ranged from a minimum of 0 to a maximum of 33.9 percent. The median *avgRPDs* for those two samples were 3.1 and 15.4 percent, respectively. Sample HP01-12, collected on April 6, 2000, contained 1,1,2,2–tetrachloroethane, 1,1,1,2–tetrachloroethane, 1,1,2–trichloroethane, trichloroethene, chloromethane, and bromodichloromethane. All of these compounds in sample HP01-12 had high *avgRPDs* (greater than 37.8 percent), except for chloromethane, which had an *avgRPD* of 9.71. Sample HP01-12 was collected in triplicate; however, one of the analyses was diluted. Therefore, only two of the three values were comparable (the diluted sample concentrations were all below the lower reporting limit), which may help to explain the higher *avgRPDs*.

Twenty-one blanks were collected during the April–May 2000 ground-water profiler sampling event, including 14 field blanks, 6 equipment blanks, and 1 source-water blank (at an average frequency of 33 percent). No organic constituents were detected in 3 of the 14 field blanks. Low concentrations of organic constituents were detected in two field blank samples that were collected prior to environmental sample collection. The environmental sample did not contain any organic constituents; therefore, it was determined that the additional rinses conducted prior to environmental sampling prevented any contaminant carry-over from the field blank concentration. Seven field blanks were collected prior to environmental sample collection and both the field blanks and environmental samples contained organic constituents. Organic constituent detections included tetrachloroethane, trichloroethene, tetrachloroethene, carbon tetrachloride, and chloroform, which are all

Table 8. *Replicate average relative percent difference values for ground-water profiler and supplemental piezometer samples analyzed for organic constituents, West Branch Canal Creek study area, Aberdeen Proving Ground, Maryland, April–May 2000*

[*avgRPD*, average relative percent difference; %, percent; –, not statistically meaningful to calculate; *, number does not represent a median value because only one replicate set was detected, therefore this is an average of one pair]

Compounds detected in replicate sets	Number of replicate sets with detections	Minimum *avgRPD* (%)	Maximum *avgRPD* (%)	Median *avgRPD* (%)
1,1,2,2–Tetrachloroethane	8	1.68	56.1	13.2
1,1,1,2–Tetrachloroethane	1	–	–	46.4*
1,1,2–Trichloroethane	2	17.5	49.5	–
1,2–Dichloroethane	4	31.7	106	67.0
Trichloroethene	14	2.56	78.5	19.0
Tetrachloroethene	13	1.80	42.7	17.4
cis–1,2–Dichloroethene	6	1.40	55.6	31.6
trans–1,2,–Dichloroethene	2	5.04	83.0	–
1,1–Dichloroethene	2	3.67	14.3	–
Vinyl chloride	1	–	–	10.4*
Carbon tetrachloride	6	9.63	74.4	48.6
Chloroform	13	1.67	89.4	20.2
Methylene chloride	4	3.68	81.7	38.8
Chloromethane	4	9.71	71.1	47.2
Benzene	2	0.38	1.75	–
Bromodichloromethane	2	0.00	39.22	–
Toluene	1	–	–	10.8*

site-specific contaminants. It is unlikely that the detections measured in the field blanks affected the concentrations in the environmental samples since the concentrations in the environmental samples were much higher than the concentrations in field blank samples. One field blank collected after the environmental sample had a low concentration of organic constituents, which amounts to a 40-percent reduction when compared to the original concentration. One field blank that was collected prior to an environmental sample contained organic constituents and the environmental sample also contained organic constituents at a lower concentration. It is likely that some amount of carry-over occurred from the field blank to the environmental sample during this sample collection.

Organic constituents were not detected in three equipment blanks, and bromomethane (less than 4.5 µg/L) was detected in three equipment blanks. Chloromethane and equipment blanks and they are not site-specific contaminants. No organic constituents were detected in the source-water blank.

Passive-Diffusion-Bag Sampler Data

Ground-water samples were collected from PDB samplers placed in the surficial sediments at four Hoverprobe sites in September 2000. Sixteen samples were collected and analyzed for organic constituents, including one duplicate set, one field blank, and one source-water blank. There were no organic constituents detected in the field blank and source-water sample. Toluene was the most frequently detected compound of all PDB organic analyses with seven detections, benzene was next with four detections, vinyl chloride was detected at very low concentrations in three samples, and 1,1–dichloroethane and 1,1–dichloro-

Table 9. *Replicate average relative percent difference values for porous-membrane sampling device samples analyzed for reduction-oxidation constituents, West Branch Canal Creek study area, Aberdeen Proving Ground, Maryland, March 2000–May 2001*

[*avgRPD*, average relative percent difference; %, percent; –, not statistically meaningful to calculate; *, number does not represent a median value because only one replicate set was detected, therefore this is an average of one pair]]

Compounds detected in replicate sets	Number of replicate sets with detections	Minimum *avgRPD* (%)	Maximum *avgRPD* (%)	Median *avgRPD* (%)
Iron, total	10	0.00	49.1	20.6
Iron, ferrous	1	–	–	17.6*
Methane	60	0.00	58.4	1.47

propene were detected once each. The replicate *avgRPD* percentage was 0.38 for benzene and 10.8 for toluene. Benzene and toluene are associated with gasoline and other fuels, but are not necessarily associated with known contamination in the Canal Creek aquifer or wetland sediments. Vinyl chloride and 1,1–dichloroethane are known daughter products of the VOCs found in the Canal Creek aquifer. Organic data for the PDB samplers are presented in Appendix 3C.

Ground-Water Porous-Membrane Sampling Device Data

Ground-water samples were collected from peepers during March and June 2000, and May 2001. Peeper samples were analyzed for redox constituents (Appendix 4A) and organic constituents (Appendix 4B). Replicate samples were collected from most peeper devices. Additional QA/QC samples collected as part of these sampling events included one equipment blank and two peeper membrane blanks.

Redox Constituents for Porous-Membrane Sampling Devices

As part of the sampling events conducted in March and June 2000 and May 2001, 371 peeper samples were analyzed for redox constituents. Redox data are presented in Appendix 4A. Sulfide analyses were not collected for replicate samples because of the low volume of water in the peepers. Total iron analyses were conducted for 10 sample sets (20 samples). Results of these analyses indicated that the sample sets were all in classification 3 (replicate sets in which all samples were above the lower reporting limit). Ferrous iron was analyzed for one replicate sample set, which was in classification 3. Methane analyses were conducted on 60 replicate sets consisting of 58 duplicate sets, 1 triplicate set, and 1 set of four samples for a total of 123 samples. The *avgRPDs* for all 60 replicate methane sample sets were in classification 3. Individual redox results are presented in table 9.

Methane had the lowest median *avgRPD* (1.47 percent). No blanks were collected for redox constituents during the March and June 2000 and May 2001 peeper sampling events.

Organic Constituents for Porous-Membrane Sampling Devices

Peeper samples were collected during March and June 2000 and May 2001, and analyzed for 59 organic constituents. Of the 352 total peeper samples analyzed for organic constituents, 71 duplicate sample sets (142 samples), and 3 blank samples were collected. Two hundred and seven of the samples did not have replicate analyses. Organic data from the peepers are shown in Appendix 4B.

Of the 59 VOC compounds analyzed, 42 were not detected above the lower reporting limit (0.5 µg/L–25.0 µg/L) in the analyses. Therefore, these compounds are not shown in Appendix 4B, but are listed at the top of the next page:

Bromobenzene	Bromochloromethane	Bromodichloromethane
Bromoform	*n*–Butylbenzene	*sec*–Butylbenzene
tert–Butylbenzene	2–Chlorotoluene	4–Chlorotoluene
Chlorobenzene	Chloroethane	Dibromochloromethane
1,2–Dibromo–3–chloropropane	1,2–Dibromoethane	Dibromomethane
1,2–Dichlorobenzene	1,3–Dichlorobenzene	1,4–Dichlorobenzene
Dichlorodifluoromethane	1,1–Dichloroethane	1,2–Dichloropropane
1,3–Dichloropropane	2,2–Dichloropropane	1,1–Dichloropropene
cis–1,3–Dichloropropene	*trans*–1,3–Dichloropropene	Ethyl benzene
Hexachlorobutadiene	Isopropylbenzene	*p*–Isopropyltoluene
Methylene chloride	*n*–Propylbenzene	Styrene
1,1,1,2–Tetrachloroethane	1,2,3–Trichlorobenzene	1,2,4–Trichlorobenzene
1,1,1–Trichloroethane	1,2,3–Trichloropropane	1,2,4–Trimethylbenzene
1,3,5–Trimethylbenzene	*m*,*p*–Xylenes	*o*–Xylene

Six sets of duplicate peeper samples that were analyzed for VOCs were in classification 1 (replicate sets in which all samples were below the lower reporting limit); 9 duplicate VOC sample sets were in classification 2 (replicate sets in which one sample was above the lower reporting limit and another was below the reporting limit); and 56 duplicate VOC sample sets were in classification 3 (replicate sets in which all samples were above the lower reporting limit). *AvgRPDs* for replicate analyses of VOCs in peeper samples are presented in table 10.

Vinyl chloride and *trans*-1,2-dichloroethene had significant ranges between the minimum *avgRPD* and the maximum *avgRPD*. The organic data from the peeper samples are more variable than organic data from the wells and piezometers. The higher variability in the peeper data compared to the well, piezometer, and multi-level monitoring data may be due to the lower contaminant concentrations in the environmental samples. When contaminant concentrations are very close to the lower reporting limit, there is higher variability in the analyses.

One equipment blank and two peeper membrane paper blanks were collected during the May 2001 sampling event. The equipment blank contained a detection of 4.7 µg/L of chloroform, but was otherwise free of organic constituents. One peeper membrane paper blank was collected before deployment and one was collected after retrieval to determine if sorption was occurring on the membrane paper. Both peeper membrane paper blanks contained similar VOC detections. Since both peeper membrane paper samples contained VOC detections, a determination of whether sorption is occurring could not be made without further analysis.

Table 10. *Replicate average relative percent difference values for porous-membrane sampling device samples analyzed for organic constituents, West Branch Canal Creek study area, Aberdeen Proving Ground, Maryland, March 2000–May 2001*

[*avgRPD*, average relative percent difference; %, percent; –, not statistically meaningful to calculate]

Compounds detected in replicate sets	Number of replicate sets with detections	Minimum *avgRPD* (%)	Maximum *avgRPD* (%)	Median *avgRPD* (%)
1,1,2,2–Tetrachloroethane	2	7.69	20.0	–
1,1,2–Trichloroethane	6	1.78	34.0	19.1
1,2–Dichloroethane	45	0.00	57.2	8.00
Trichloroethene	17	0.00	65.5	14.3
cis–1,2–Dichloroethene	50	0.00	54.1	10.4
trans–1,2–Dichloroethene	42	.38	91.1	17.1
1,1–Dichloroethene	5	5.78	28.4	10.7
Vinyl chloride	51	.01	73.2	12.0
Chloroform	1	–	–	37.1
Bromomethane	1	–	–	7.59
Toluene	5	1.48	92.1	58.4

Surface-Water Sampling Data

Surface-water samples were collected in November 1999 and February, March, May, and September 2000, from a total of 27 locations. One hundred forty-six samples were collected and analyzed for organic constituents; 5 samples were analyzed for inorganic constituents and organic constituents. Most samples were collected from locations at high, mid, and low tidal cycles to obtain several synoptic data sets. Field measurements and organic data for surface-water samples are presented in Appendix 5A. Inorganic data for surface-water samples are presented in Appendix 5B.

Inorganic Constituents for Surface-Water Samples

Five surface-water samples were analyzed for inorganic constituents collected during the May 2000 sampling event. The inorganic constituents were analyzed to measure differences in major-ion concentrations at different times during a tidal cycle. Samples were collected during the high, mid, and low tidal cycles at site SW050 (fig. 5). Samples were also collected at site SW060 during high and low tide. No replicates or blank samples were collected for inorganic analyses. The results of the inorganic analyses are presented in Appendix 5B.

Field Measurements and Organic Constituents for Surface-Water Samples

Surface-water samples were collected and analyzed for field parameters (specific conductance, pH, and water temperature), and organic constituents during November 1999 and February, May, and September 2000. The 146 total samples analyzed for VOCs include 58 samples without replicates, 35 duplicate sets (70 samples), 3 triplicate samples, 4 trip blanks, 7 ambient blanks, and 4 matrix spike samples. The data for the organic analyses are presented in Appendix 5A.

The 36 replicate organic sample sets were grouped into the three classification categories discussed in the Quality-Assurance Methods Section. Of the 36 replicate sample sets, 13 replicate sample sets were in classification 1 (replicate sets in which all samples were below the lower reporting limit); and 23 replicate sample sets were in classification 3 (replicate sets in which all samples were above the lower reporting limit). These analyses are shown in Appendix 5A. The *avgRPDs* for replicate analyses of VOCs in surface-water samples are presented in table 11.

Of the 59 VOC compounds analyzed, 46 were not detected above the lower reporting limit (0.5 µg/L –25.0 µg/L). Therefore, these compounds are not listed in Appendix 5A, but are listed at the top of the next page.

Benzene	Bromobenzene	Bromochloromethane
Bromoform	Bromomethane	*n*–Butylbenzene
sec–Butylbenzene	*tert*–Butylbenzene	2–Chlorotoluene
4–Chlorotoluene	Chlorobenzene	Chloroethane
Chloromethane	Dibromochloromethane	1,2–Dibromo–3–chloropropane
1,2–Dibromoethane	Dibromomethane	1,2–Dichlorobenzene
1,3–Dichlorobenzene	1,4–Dichlorobenzene	1,1–Dichloroethane
1,1–Dichloroethene	1,2–Dichloropropane	1,3–Dichloropropane
2,2–Dichloropropane	1,1–Dichloropropene	*cis*–1,3–Dichloropropene
t*rans*–1,3–Dichloropropene	Ethyl benzene	Hexachlorobutadiene
Isopropylbenzene	*p*–Isopropyltoluene	Methylene chloride
Naphthalene	*n*–Propylbenzene	Styrene
1,1,1,2–Tetrachloroethane	1,2,3–Trichlorobenzene	1,2,4–Trichlorobenzene
1,1,1–Trichloroethane	Trichlorofluoromethane	1,2,3–Trichloropropane
1,2,4–Trimethylbenzene	1,3,5–Trimethylbenzene	*m*,*p*–Xylene
o–Xylene		

Table 11. *Replicate average relative percent difference values for surface-water samples analyzed for organic constituents, West Branch Canal Creek study area, Aberdeen Proving Ground, Maryland, November 1999–September 2000*

[*avgRPD*, average relative percent difference; %, percent]

Compounds detected in replicate sets	**Number of replicate sets with detections**	**Minimum *avgRPD* (%)**	**Maximum *avgRPD* (%)**	**Median *avgRPD* (%)**
1,1,2,2–Tetrachloroethane	15	0.80	40.5	4.74
Tetrachloroethene	5	2.08	7.33	4.15
Trichloroethene	3	3.08	4.76	4.58
Carbon tetrachloride	17	0.81	39.1	3.92
Chloroform	20	0.16	13.6	2.70

Variability among samples was determined by analyzing field replicate samples. The *avgRPD* minimum, maximum, and median ranges for constituents indicate that the reproducibility of surface-water samples was good. Occasionally, surface-water sample analysis variability is higher due to changing environmental conditions and the volatility of the compounds analyzed (Olsen and Spencer, 2000), however, this sample set indicates low variability.

The replicate sample SW049 collected on September 14, 2000 is not included in table 11. This sample was omitted because it was not representative of the replicate sample (Phelan and others, 2001). Replicate 2 contained high concentrations of vinyl chloride and dichlorodifluoromethane, but these compounds were not detected in replicate 1. The site where sample SW049 was collected is next to the floating walkways within the study area (fig. 5). The walkways are constructed of a wood surface that is floated with a rigid foam product underneath. Replicate 2 contains very different VOC concentrations than replicate 1. Replicate 2 was probably a sample that had been trapped under the docks, while replicate 1 is more representative of the surface water from that location. Dichlorodifluoromethane is a used as a refrigerant and aerosol propellant, likely a manufacturing product of rigid foam under the walkways. Vinyl chloride is a common contaminant in the study area; however, the elevated concentrations indicate that the vinyl chloride became more concentrated when trapped under the docks. Additional information regarding these data is presented in Phelan and others (2001).

Two trip blanks were collected during the February 2000 sampling events (a frequency of 8 percent). During the May 2000 sampling event, two trip blanks, seven ambient blanks, and four matrix spike samples were collected (a frequency of 24 percent). In the February 2000 sampling event, two trip blanks were transported with other samples by van. In the May 2000 sampling event, one of the trip blanks was transported by van, and the other was transported by boat. Seven ambient blanks were collected during the May 2000 sampling event, including two that were collected while sampling from the boat. All trip blanks and ambient blank analyses detected no concentrations of VOCs above the lower reporting limit, indicating that no sample bias was introduced by transporting the sample vials to and from the field or the ambient conditions in which sampling was performed. Trip and ambient blanks were not collected during other sampling events.

Replicate surface-water samples were collected and injected with matrix spike standards. The percent recovery for the two sets of matrix- pike samples were calculated and compared with the data quality percent recovery control limits for each spike. The data-quality control limits are 76–127 for benzene, 75–130 for chlorobenzene, 61–145 for 1,1–dichloroethene, 76–120 for toluene, and 71–120 for trichloroethene. The results of the comparison of the spiked and unspiked samples, and percent recovery calculations are shown in table 12).

The *avgRPDs* of the analyses of two replicate spike pairs ranged from 0 to 12 percent. The *avgRPDs* from 9 of the 10 compounds analyzed ranged from 0 to only 8 percent. The percent recovery for the two sets of matrix spike samples were calculated and compared with the data-quality objectives percent recovery control limits. The data-quality control limits are 76–127 for benzene, 75–130 for chlorobenzene, 61–145 for 1,1–dichloroethene, 76–120 for toluene, and 71–120 for trichloroethene. The minimum percent recovery of the two matrix spike sample sets was 94.5 percent, and the maximum was 128 percent, indicating that analytical values are acceptable. The results of the comparison of the spiked and unspiked samples, and percent recovery calculations are shown in table 12.

Table 12. *Average relative percent difference values for matrix spike samples used to evaluate matrix effects and analytical reproducibility for surface-water samples, West Branch Canal Creek study area, Aberdeen Proving Ground, Maryland, May 2000*

[Modified from Phelan, Olsen and others, 2001, table 6, page 18; µg/L, micrograms per liter; %, percent; MS, matrix spike; ES, environmental sample; R, replicate; L, low tide; *avgRPD* %, average relative percent difference between spiked and unspiked samples; <, less than]

				Matrix Spike Compounds (spike amount is 25 µg/L)				
Site name	**Sample type**	**Sample date**	**Sample time**	**1,1-Dichloro-ethene**	**Benzene**	**Trichloro-ethene**	**Toluene**	**Chloro-benzene**
SW050L	ES	05/17/2000	1535	<0.5 µg/L	<0.5 µg/L	<0.5 µg/L	<0.5 µg/L	<0.5 µg/L
SW050L	MS	05/17/2000	1535	27.4 µg/L	25.4 µg/L	24.8 µg/L	27.7 µg/L	26.1 µg/L
	Percent recovery			110%	102%	99.30%	111%	104%
SW050L	MS, R	05/17/2000	1535	32.0 µg/L	28.3 µg/L	28.0 µg/L	30.5 µg/L	28.1 µg/L
	Percent recovery			128%	113%	112%	122%	113%
	avgRPD %			8%	5%	6%	5%	4%
SW060L	ES	05/17/2000	1514	<0.5 µg/L	<0.5 µg/L	<0.5 µg/L	<0.5 µg/L	<0.5 µg/L
SW060L	MS	05/17/2000	1514	23.6 µg/L	26.3 µg/L	25.3 µg/L	26.9 µg/L	25.6 µg/L
	Percent recovery			94.50%	105%	101%	107%	102%
SW060L	MS, R	05/17/2000	1514	30.2 µg/L	26.1 µg/L	26.4 µg/L	28.5 µg/L	25.6 µg/L
	Percent recovery			121%	104%	105%	114%	103%
	avgRPD %			12%	0%	2%	3%	0%

Summary

This report presents water-quality data collected by the U.S. Geological Survey from November 1999 through May 2001 at West Branch Canal Creek, Aberdeen Proving Ground, Maryland. The water-quality data were collected from ground-water and surface-water sites. The report also includes a description of the sampling and analytical methods, and an evaluation of the quality-assurance data.

Methodology for sample collection varied. Ground-water samples were collected from 2-inch and 4-inch wells, 1-inch piezometers, 0.75-inch drive-point piezometers, and 0.25-inch piezometers during March–April and June–August 2000, and May 2001. Ground-water samples were analyzed for field parameters, reduction-oxidation constituents, inorganic constituents, and organic constituents. Replicate quality-assurance data for inorganic constituents indicate that for well and piezometer sampling techniques, variability was within acceptable levels. Replicate quality-assurance data for organic constituents indicate that there is increased variability when compared to inorganic analyses, which is expected due to the low yield from small diameter piezometers, the slow recovery rates in these piezometers, and the volatility of the compounds being analyzed. Field blanks collected and analyzed for reduction-oxidation constituents, and inorganic constituents during the March–April and June–August 2000, and May 2001 sampling events confirmed a reduction in concentrations by 95 percent or better. Organic constituents collected during the March–April and June–August 2000 sampling events confirmed a reduction in concentrations by 95 percent or better. In May 2001, contaminant reduction was generally better than 87 percent; however, in one instance the reduction was 76 percent. The change in the percent reduction during the May 2001 sampling event is attributed to the increase in initial contaminant concentrations. The May 2001 samples are from a new sampling location and concentrations of this magnitude were not anticipated. Decontamination procedures have since

been modified to decrease the likelihood that contaminant carry-over would occur between samples. Two matrix spike samples were collected and analyzed for organic constituents during the June–August 2000 sampling event, and the recovery rates were within the control limits provided by the analytical method, which indicates an acceptable level of variability between the unspiked and spiked samples.

Ground-water samples were also collected from multi-level monitoring systems. These systems represent a new sampling technique at the Canal Creek study area. The multi-level monitoring systems consist of seven sampling chambers or wells installed within one borehole. The sampling chambers are encased in a polyethylene sampling tube with different screen depths for each sampling chamber. Multi-level monitoring systems were sampled for field measurements, reduction-oxidation constituents, and inorganic and organic constituents in March-April and June–August 2000. Field blanks were collected and analyzed for reduction-oxidation constituents, inorganic constituents, and organic constituents during the March–April and June–August 2000 sampling events.

Ground-water samples were collected at nine new sites in the study area, during April–May 2000, using the ground-water profiler in conjunction with the U.S. Geological Survey Hoverprobe. The Hoverprobe allowed the collection of ground-water samples in previously inaccessible areas of the wetland. Results of organic analyses from the profiler data collection showed higher variability than results from other sampling techniques. Blank samples were collected for organic constituents during the April–May 2000 sampling event at an average frequency of 33 percent. Many of the field blanks contained some volatile organic compound detections, however, concentrations were generally reduced by 90 percent or better. When compared to environmental samples, three of the six equipment blanks contained small amounts of bromomethane. Bromomethane is not a contaminant of interest at the study site. The source-water blank did not contain any organic constituents.

Passive-diffusion-bag samplers were constructed and deployed in near-surface wetland sediments at West Branch Canal Creek in September 2000. Organic analyses were performed on 15 samples, including 1 field blank, 1 source-water blank and 1 replicate pair. The analyses contained toluene and benzene, which are fuel ingredients and are not typically in ground water within the wetland. 1,1–Dichloroethane was also frequently detected in the passive-diffusion-bag samplers and is a known daughter product of volatile organic compounds found in the Canal Creek aquifer and wetland sediments. Compounds typically detected in ground water such as 1,1,2,2–tetrachloroethane, trichloroethene, carbon tetrachloride, and chloroform were not detected in these samples. The field blank and source-water blank did not contain any organic constituents.

Porous-membrane sampling devices (peepers) were installed in March and June 2000 and May 2001. Peepers were sampled for sulfide, total iron and ferrous iron, methane, and organic constituents. Replicate samples analyzed for methane indicate low variability in all methane analyses. Total iron and ferrous iron exhibited much higher variability; however, the sample set was much smaller for these analyses. Replicate samples collected from peepers and analyzed for organic constituents showed higher variability than well and piezometer samples and the increased variability may be attributed to the sampling technique. One equipment blank and two source-water blanks with peeper membrane paper were collected during the May 2001 sampling event. These blank samples were analyzed for organic constituents. The equipment blank contained a small amount of chloroform. The source-water blank samples were collected to determine if sorption of contaminants is occurring on the membrane paper. A source-water blank was collected before deployment and after retrieval of the peepers. Both source-water blanks contained organic detections. Additional sample collection is necessary to determine whether sorption is occurring on the peeper membrane paper.

Surface-water samples were collected from November 1999 through September 2000 during five sampling events, and analyzed for organic and inorganic constituents. The results of field blanks and trip blanks indicate that there was no sample bias in the analytical methods caused by field operations or sample handling. Matrix spike recovery rates were within the target percentages set by the control limits in the analytical method. The matrix spike samples also showed an acceptable level of variability between the unspiked and spiked samples, which was generally between 0 and 8 percent.

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Appendixes 1 through 5 Follow

Appendix 1A. *Sampling locations for wells, piezometers, multi-level monitoring systems, and Hoverprobe sampling sites in the West Branch Canal Creek study area, Aberdeen Proving Ground, Maryland*

[Site identification number represents the latitude, longitude, and piezometer number within the cluster and is used for tracking water-quality samples; --, no data; DP, 0.75-inch drive-point piezometer; DP1, 1-inch supplemental piezometer; HP, ground-water profiler; ML, multi-level monitoring system; SP, supplemental piezometer at Hoverprobe sites; PDB, passive-diffusion-bag sampler; PP, peeper; T, 0.25-inch inverted screen tubing wells; W2, 2-inch well; W4, 4-inch well
*Note: *, site was used for peeper installation only, pressure transducers were installed in wells ending in ".1"]*

Site name	Device used at the site	Site identification no.	Hydrogeologic unit	Sampling device diameter (inches)	Screened interval (feet below land surface)	Land surface elevation (feet above sea level)
CC-27A	W4	392343076183301	Canal Creek aquifer	4.0	18.0-23.0	11.2
CC-27B	W4	392343076183302	Canal Creek aquifer	4.0	35.0-40.0	11.4
DP-1A	W2	392346076183501	Wetland sediments, upper peat unit	2.0	1.9- 2.9	1.20
DP-1B	W2	392346076183502	Wetland sediments, lower clayey unit	2.0	6.5- 7.5	1.23
DP-12*	PP	392348076183401	Wetland sediments	2.0	2.6- 3.6	1.05
HP01	HP, PDB	392346076183701	Canal Creek aquifer	--	--	.6
HP01-06	SP	392346076183701	Wetland sediments, upper peat unit	1.0	4.5 -5.5	.66
HP01-12	SP	392346076183702	Canal Creek aquifer	1.0	10.5-11.5	.74
HP02	HP, PDB	392346076183801	Canal Creek aquifer	--	--	.80
HP02-06	SP	392346076183801	Wetland sediments, upper peat unit	1.0	5.5- 6.5	.90
HP02-12	SP	392346076183802	Canal Creek aquifer	1.0	11.5-12.5	1.13
HP03	HP	392347076183901	Canal Creek aquifer	--	--	1.20
HP05	HP, PDB	392344076183801	Canal Creek aquifer	--	--	- .1
HP05-06	SP	392344076183801	Wetland sediments, upper peat unit	1.0	5.5- 6.5	.31
HP05-12	SP	392344076183802	Canal Creek aquifer	1.0	11.5-12.5	.21
HP08	HP	392335076183901	Canal Creek aquifer	--	--	1.30
HP09	HP	392332076184301	Canal Creek aquifer	--	--	-.20
HP11	HP	392348076184001	Canal Creek aquifer	--	--	.2
HP12	HP	392338076183701	Canal Creek aquifer	--	--	1.0
HP13	HP, PDB	392346076183701	Canal Creek aquifer	--	--	.3
HP13-06	SP	392346076183703	Wetland sediments, upper peat unit	1.0	4.5- 5.5	.82
HP13-12	SP	392346076183704	Canal Creek aquifer	1.0	9.5-10.5	.76
WB19A	DP, PP	392354076183701	Wetland sediments, upper peat unit	.75	1.3- 1.8	1.52
WB19B	DP, PP	392354076183702	Wetland sediments, upper peat unit	.75	4.2- 4.7	1.50
WB19D	DP, PP	392354076183704	Canal Creek aquifer	.75	13.5-14.0	1.51
WB19E	DP, PP	392354076183705	Canal Creek aquifer	.75	28.5-29.0	1.46
WB19F	DP, PP	392354076183706	Canal Creek aquifer	.75	45.0-45.5	1.33
WB20A	DP	392345076183101	Canal Creek aquifer	.75	15.1-16.0	12.18

Appendix 1A. *Sampling locations for wells, piezometers, multi-level monitoring systems, and Hoverprobe sampling sites in the West Branch Canal Creek study area, Aberdeen Proving Ground, Maryland - Continued*

Site name	Device used at the site	Site identification no.	Hydrogeologic unit	Sampling device diameter (inches)	Screened interval (feet below land surface)	Land surface elevation (feet above sea level)
WB20B	DP	392345076183102	Canal Creek aquifer	0.75	21.0-21.5	12.32
WB21A	DP	392346076183301	Wetland sediments, lower clayey unit	.75	1.5- 2.0	3.00
WB21B	DP	392346076183302	Canal Creek aquifer	.75	6.5- 7.0	3.10
WB21C	DP	392346076183303	Canal Creek aquifer	.75	13.5-14.0	2.74
WB21D	DP	392346076183304	Canal Creek aquifer	.75	17.5-18.0	3.14
WB21E	DP	392346076183305	Canal Creek aquifer	.75	29.5-30.0	3.10
WB21F	DP	392346076183306	Canal Creek aquifer	.75	36.0-36.5	3.10
WB21G	DP	392346076183307	Canal Creek aquifer	.75	45.0-45.5	3.25
WB22A	DP	392342076183401	Wetland sediments, upper peat unit	.75	1.5- 2.0	2.52
WB22B	DP	392342076183402	Wetland sediments, upper peat unit	.75	7.0- 7.5	2.62
WB22C	DP	392342076183403	Canal Creek aquifer	.75	13.0-13.5	2.52
WB22D	DP	392342076183404	Canal Creek aquifer	.75	17.0-17.5	2.47
WB22E	DP	392342076183405	Canal Creek aquifer	.75	22.0-22.5	2.53
WB23A	DP	392341076183401	Wetland sediments, upper peat unit	.75	.5- 1.0	1.05
WB23B	DP	392341076183402	Wetland sediments, lower clayey unit	.75	2.2- 2.7	.77
WB23C	DP	392341076183403	Wetland sediments, lower clayey unit	.75	8.5- 9.0	1.06
WB23D	DP	392341076183404	Canal Creek aquifer	.75	12.5-13.0	1.01
WB23E	DP	392341076183405	Canal Creek aquifer	.75	16.0-16.5	.92
WB23F	DP	392341076183406	Canal Creek aquifer	.75	21.0-21.5	1.00
WB23G	DP	--	Canal Creek aquifer	.75	--	--
WBM23A	ML	392341076183407	Wetland sediments, upper peat unit	.50	.6- .9	1.4
WBM23B	ML	392341076183408	Wetland sediments, upper peat unit	.50	1.3- 1.6	1.4
WBM23C	ML	392341076183409	Wetland sediments, lower clayey unit	.50	2.3- 2.6	1.4
WBM23D	ML	392341076183410	Wetland sediments, lower clayey unit	.50	4.8- 5.1	1.4
WBM23E	ML	392341076183411	Wetland sediments, lower clayey unit	.50	8.6- 8.9	1.4
WBM23F	ML	392341076183412	Wetland sediments, lower clayey unit	.50	10.6-10.9	1.4
WBM23G	ML	392341076183413	Canal Creek aquifer	.50	12.6-12.9	1.4
WBT23A	T	--	Wetland sediments, upper peat unit	.25	.75	--
WBT23B	T	--	Wetland sediments, upper peat unit	.25	1.5	--
WBT23C	T	--	Wetland sediments, lower clayey unit	.25	2.5	--
WBT23E	T	--	Wetland sediments, lower clayey unit	.25	8.8	--
WB24A	DP	392343076183401	Wetland sediments, upper peat unit	.75	.9- 1.4	1.85
WB24B	DP	392343076183402	Wetland sediments, upper peat unit	.75	3.0- 3.5	1.77
WB24C	DP	392343076183403	Wetland sediments, upper peat unit	.75	5.5- 6.0	1.75

Appendix 1A. *Sampling locations for wells, piezometers, multi-level monitoring systems, and Hoverprobe sampling sites in the West Branch Canal Creek study area, Aberdeen Proving Ground, Maryland - Continued*

Site name	Device used at the site	Site identification no.	Hydrogeologic unit	Sampling device diameter (inches)	Screened interval (feet below land surface)	Land surface elevation (feet above sea level)
WB24C.1	DP	392343076392343	Wetland sediments, upper peat unit	0.75	5.0- 6.0	1.76
WB24D	DP	392343076183404	Canal Creek aquifer	.75	12.5- 13.0	1.64
WB24E	DP	392343076183405	Canal Creek aquifer	.75	16.5-17.0	1.85
WB24G	DP	392343076183407	Canal Creek aquifer	.75	34.5- 35.0	1.87
WBM24A	ML	392343076183411	Wetland sediments, upper peat unit	.50	1.0- 1.3	--
WBM24B	ML	392343076183412	Wetland sediments, upper peat unit	.50	2.0- 2.3	--
WBM24C	ML	392343076183413	Wetland sediments, upper peat unit	.50	3.1- 3.4	--
WBM24D	ML	392343076183414	Wetland sediments, lower clayey unit	.50	5.8- 6.1	--
WBM24E	ML	392343076183415	Wetland sediments, lower clayey unit	.50	7.8- 8.1	--
WBM24F	ML	392343076183416	Wetland sediments, lower clayey unit	.50	11.8-12.1	--
WBM24G	ML	392343076183417	Canal Creek aquifer	.50	16.6-16.9	--
WBT24A	T	--	Wetland sediments, upper peat unit	.25	1.2	--
WBT24B	T	--	Wetland sediments, upper peat unit	.25	2.2	--
WBT24C	T	--	Wetland sediments, upper peat unit	.25	3.3	--
WBT24D	T	--	Wetland sediments, lower clayey unit	.25	6.0	--
WB25A	DP	392342076183502	Wetland sediments, upper peat unit	.75	.5- 1.0	1.23
WB25B	DP	392342076183503	Canal Creek aquifer	.75	13.5-14.0	1.20
WB25C	DP	392342076183504	Canal Creek aquifer	.75	15.5-16.0	1.12
WB25C.1	DP	392342076183505	Wetland sediments, upper peat unit	2.0	.4- 1.4	1.21
WB25D	DP	--	--	.75	--	--
WB25D.1	DP	392342076183506	Canal Creek aquifer	2.0	12.0-13.0	1.16
WB25E	DP	--	Canal Creek aquifer	.75	--	--
WB26A	DP	392343076183502	Wetland sediments, upper peat unit	.75	1.0-1.5	.38
WB26B	DP	392343076183503	Wetland sediments, upper peat unit	.75	2.5-3.0	.47
WB26B.1	DP	392343076183511	Wetland sediments, upper peat unit	2.0	2.0-3.0	.45
WB26C	DP	392343076183504	Wetland sediments, upper peat unit	.75	4.0-4.5	.20
WB26D	DP	392343076183505	Wetland sediments, lower clayey unit	.75	5.5- 6.0	.33
WB26E	DP	392343076183506	Paleochannel	.75	8.8- 9.3	.28
WB26F	DP	392343076183507	Canal Creek aquifer	.75	15.0-15.5	.33
WB26G	DP	392343076183508	Canal Creek aquifer	.75	19.5-20.0	.40
WB26H	DP	392343076183509	Canal Creek aquifer	.75	27.0-27.5	.50
WBM26A	ML	392343076183512	Wetland sediments, upper peat unit	.50	1.1- 1.4	.90
WBM26B	ML	392343076183513	Wetland sediments, upper peat unit	.50	2.5- 2.8	.90
WBM26C	ML	392343076183514	Wetland sediments, upper peat unit	.50	4.1- 4.4	.90

Appendix 1A. *Sampling locations for wells, piezometers, multi-level monitoring systems, and Hoverprobe sampling sites in the West Branch Canal Creek study area, Aberdeen Proving Ground, Maryland - Continued*

Site name	Device used at the site	Site identification no.	Hydrogeologic unit	Sampling device diameter (inches)	Screened interval (feet below land surface)	Land surface elevation (feet above sea level)
WBM26D	ML	392343076183515	Wetland sediments, lower clayey unit	0.50	5.5- 5.8	0.90
WBM26E	ML	392343076183516	Paleochannel	.50	7.0- 7.3	.90
WBM26F	ML	392343076183517	Wetland sediments, lower clayey unit	.50	8.8- 9.1	.90
WBM26G	ML	392343076183518	Canal Creek aquifer	.50	15.1-15.4	.90
WBT26C	T	--	Wetland sediments, upper peat unit	.25	4.3	--
WBT26D	T	--	Wetland sediments, lower clayey unit	.25	5.7	--
WBT26E	T	--	Paleochannel	.25	7.2	--
WB27A	DP	392343076183521	Wetland sediments, upper peat unit	.75	1.0- 1.5	-.92
WB27A.1	DP	392343076183529	Wetland sediments, upper peat unit	2.0	.7- 1.7	-.94
WB27B	DP	392343076183522	Wetland sediments, upper peat unit	.75	3.2- 3.7	-.97
WB27B.1	DP	392343076183530	Wetland sediments, upper peat unit	2.0	4.5- 5.5	-1.00
WB27C	DP	392343076183523	Wetland sediments, upper peat unit	.75	4.5- 5.0	-.98
WB27C.1	DP	--	--	.75	--	--
WB27C.2	DP	--	--	.75	--	--
WB27D	DP	392343076183524	Paleochannel	.75	8.2- 8.7	-.88
WB27E	DP	392343076183525	Canal Creek aquifer	.75	15.0-15.5	-.96
WB27F	DP	392343076183526	Canal Creek aquifer	.75	18.0-18.5	-.90
WB27G	DP	392343076183527	Canal Creek aquifer	.75	26.0-26.5	-.90
WB28A	DP	392345076183511	Wetland sediments, upper peat unit	.75	1.2- 1.7	.83
WB28B	DP	392345076183512	Wetland sediments, upper peat unit	.75	4.5- 5.0	.84
WB28C	DP	392345076183513	Wetland sediments, upper peat unit	.75	9.0- 9.5	.82
WB28C.1	DP	392345076183517	Wetland sediments, upper peat unit	2.0	9.0-10.0	.75
WB28D	DP	392345076183514	Canal Creek aquifer	.75	14.5-15.0	.89
WB28D.1	DP	392345076183518	Canal Creek aquifer	2.0	14.0-15.0	.81
WB28F	DP	392345076183516	Canal Creek aquifer	.75	34.5-35.0	.73
WB28G	DP	--	--	.75	--	--
WB30A	DP	392344076183401	Wetland sediments, upper peat unit	.75	.9- 1.4	1.45
WB30B	DP	392344076183402	Wetland sediments, lower clayey unit	.75	2.0- 2.5	1.44
WB30C	DP	392344076183403	Wetland sediments, lower clayey unit	.75	4.5- 5.0	1.49
WB30D	DP	392344076183404	Wetland sediments, lower clayey unit	.75	6.5- 7.0	1.41
WB30E	DP	392344076183405	Canal Creek aquifer	.75	12.5-13.0	1.45
WB30F	DP	--	--	.75	--	--
WB30G	DP	--	--	.75	--	--
WBM30A	ML	392344076183406	Wetland sediments, upper peat unit	.50	1.0- 1.3	1.64

Appendix 1A. *Sampling locations for wells, piezometers, multi-level monitoring systems, and Hoverprobe sampling sites in the West Branch Canal Creek study area, Aberdeen Proving Ground, Maryland - Continued*

Site name	Device used at the site	Site identification no.	Hydrogeologic unit	Sampling device diameter (inches)	Screened interval (feet below land surface)	Land surface elevation (feet above sea level)
WBM30B	ML	392344076183407	Wetland sediments, lower clayey unit	0.50	2.1- 2.4	1.64
WBM30C	ML	392344076183408	Wetland sediments, lower clayey unit	.50	3.1- 3.4	1.64
WBM30D	ML	392344076183409	Wetland sediments, lower clayey unit	.50	4.6- 4.9	1.64
WBM30E	ML	392344076183410	Wetland sediments, lower clayey unit	.50	6.6- 6.9	1.64
WBM30F	ML	392344076183411	Wetland sediments, lower clayey unit	.50	9.6- 9.9	1.64
WBM30G	ML	392344076183412	Canal Creek aquifer	.50	12.6-12.9	1.64
WBT30A	T	--	Wetland sediments, upper peat unit	.25	1.1	--
WBT30B	T	--	Wetland sediments, lower clayey unit	.25	2.2	--
WBT30C	T	--	Wetland sediments, lower clayey unit	.25	3.2	--
WBT30D	T	--	Wetland sediments, lower clayey unit	.25	4.7	--
WBT30E	T	--	Wetland sediments, lower clayey unit	.25	6.7	--
WB31A	DP	392345076183401	Wetland sediments, upper peat unit	.75	1.0- 1.5	1.60
WB31B	DP	392345076183402	Wetland sediments, lower clayey unit	.75	3.5- 4.0	1.61
WB31C	DP	392345076183403	Wetland sediments, lower clayey unit	.75	5.5- 6.0	1.61
WB31D	DP	392345076183404	Wetland sediments, lower clayey unit	.75	7.0- 7.5	1.54
WB31E	DP	392345076183405	Canal Creek aquifer	.75	12.8-13.3	1.52
WB32B	DP	392347076183202	Canal Creek aquifer	.75	26.5-27.0	10.77
WB33A	DP	392353076183301	Canal Creek aquifer	.75	8.7- 9.2	2.96
WB33B	DP	392353076183302	Canal Creek aquifer	.75	14.0-14.5	2.95
WB33F	DP	392353076183306	Canal Creek aquifer	.75	42.5-43.0	2.95
WB33Y	DP	--	Wetland sediments, upper peat unit	.25	1.9- 2.0	2.96
WB33Z	DP	--	Wetland sediments, upper peat unit	.25	4.5- 4.6	2.96
WB34A	DP, PP	392348076183410	Wetland sediments, upper peat unit	.75	1.5- 2.0	1.43
WB34B	DP, PP	392348076183411	Canal Creek aquifer	.75	7.3- 7.8	1.37
WB34C	DP, PP	392348076183412	Canal Creek aquifer	.75	15.0-15.5	1.36
WB34D	DP, PP	392348076183413	Canal Creek aquifer	.75	18.3-18.8	1.35
WB34E	DP, PP	392348076183414	Canal Creek aquifer	.75	26.5-27.0	1.35
WB34F	DP, PP	--	Canal Creek aquifer	.75	--	--
WB34G	DP, PP	--	--	.75	--	--
WBM34A	ML	392348076183416	Wetland sediments, upper peat unit	.50	1.6- 1.9	1.82
WBM34B	ML	392348076183417	Wetland sediments, upper peat unit	.50	2.6- 2.9	1.82
WBM34C	ML	392348076183418	Wetland sediments, lower clayey unit	.50	3.6- 3.9	1.82
WBM34D	ML	392348076183419	Wetland sediments, lower clayey unit	.50	4.6- 4.9	1.82
WBM34E	ML	392348076183420	Wetland sediments, lower clayey unit	.50	5.6- 5.9	1.82

Appendix 1A. *Sampling locations for wells, piezometers, multi-level monitoring systems, and Hoverprobe sampling sites in the West Branch Canal Creek study area, Aberdeen Proving Ground, Maryland - Continued*

Site name	Device used at the site	Site identification no.	Hydrogeologic unit	Sampling device diameter (inches)	Screened interval (feet below land surface)	Land surface elevation (feet above sea level)
WBM34F	ML	392348076183421	Wetland sediments, lower clayey unit	0.50	6.4- 6.7	1.82
WBM34G	ML	392348076183422	Canal Creek aquifer	.50	7.3- 7.6	1.82
WBT34A	T	--	Wetland sediments, upper peat unit	.25	1.7	--
WBT34B	T	--	Wetland sediments, upper peat unit	.25	2.7	--
WBT34C	T	--	Wetland sediments, lower clayey unit	.25	3.7	--
WBT34D	T	--	Wetland sediments, lower clayey unit	.25	4.7	--
WBT34E	T	--	Wetland sediments, lower clayey unit	.25	5.7	--
WB35A	DP, PP	392354076183402	Wetland sediments, upper peat unit	.75	1.5- 2.0	1.19
WB35B	DP, PP	392354076183403	Wetland sediments, upper peat unit	.75	2.8- 3.3	1.29
WB35C	DP, PP	392354076183404	Canal Creek aquifer	.75	7.2- 7.7	1.27
WB35C.1	DP, PP	392354076392354	Canal Creek aquifer	.75	6.5- 7.0	1.26
WB35D	DP, PP	392354076183405	Canal Creek aquifer	.75	13.0-13.5	1.27
WB35E	DP, PP	392354076183406	Canal Creek aquifer	.75	18.0-18.5	1.27
WB35F	DP, PP	392354076183407	Canal Creek aquifer	.75	27.5-28.0	1.31
WB36A	DP, PP	392355076183402	Wetland sediments, upper peat unit	.75	1.7- 2.2	1.27
WB36B	DP, PP	392355076183403	Wetland sediments, upper peat unit	.75	2.7- 3.2	.99
WB36C	DP, PP	392355076183404	Canal Creek aquifer	.75	7.1- 7.6	1.04
WB36D	DP, PP	392355076183405	Canal Creek aquifer	.75	13.0-13.5	.98
WB36E	DP, PP	392355076183406	Canal Creek aquifer	.75	18.0-18.5	1.03
WB36F	DP, PP	392355076183407	Canal Creek aquifer	.75	27.5-28.0	1.00
WB36G	DP, PP	392355076183408	Canal Creek aquifer	.75	32.0-32.5	1.09
WB36H	DP, PP	392355076183409	Canal Creek aquifer	.75	--	--
WBM36A	ML, PP	392355076183410	Wetland sediments, upper peat unit	.50	.8- 1.1	--
WBM36B	ML, PP	392355076183411	Wetland sediments, upper peat unit	.50	1.8- 2.1	--
WBM36C	ML, PP	392355076183412	Wetland sediments, upper peat unit	.50	2.8- 3.1	--
WBM36D	ML, PP	392355076183413	Wetland sediments, upper peat unit	.50	3.8- 4.1	--
WBM36E	ML, PP	392355076183414	Wetland sediments, lower clayey unit	.50	4.8- 5.1	--
WBM36F	ML, PP	392355076183415	Wetland sediments, lower clayey unit	.50	5.8- 6.1	--
WBM36G	ML, PP	392355076183416	Canal Creek aquifer	.50	7.2- 7.5	--
WBT36B	T, PP	--	Wetland sediments, upper peat unit	.25	1.0	--
WBT36C	T, PP	--	Wetland sediments, upper peat unit	.25	1.5	--
WBT36D	T, PP	--	Wetland sediments, upper peat unit	.25	2.0	--
WBT36F	T, PP	--	Wetland sediments, upper peat unit	.25	4.0	--
WBT36G	T, PP	--	Wetland sediments, lower clayey unit	.25	5.0	--

Appendix 1A. *Sampling locations for wells, piezometers, multi-level monitoring systems, and Hoverprobe sampling sites in the West Branch Canal Creek study area, Aberdeen Proving Ground, Maryland - Continued*

Site name	Device used at the site	Site identification no.	Hydrogeologic unit	Sampling device diameter (inches)	Screened interval (feet below land surface)	Land surface elevation (feet above sea level)
WBT36H	T, PP	--	Canal Creek aquifer	0.25	6.0	--
WB37B	DP	392356076183403	Wetland sediments, upper peat unit	.75	2.5- 3.0	0.71
WB37B.1	DP	392356076392356	Wetland sediments, upper peat unit	.75	2.0- 3.0	.77
WB37C	DP	392356076183404	Canal Creek aquifer	.75	7.1- 7.6	.72
WB37C.1	DP	392356076392356	Canal Creek aquifer	.75	6.3- 7.3	.55
WB37D	DP	392356076183405	Canal Creek aquifer	.75	13.5-14.0	.75
WB41A	DP1	392345076183601	Wetland sediments, upper peat unit	1.0	8.2- 9.2	1.00
WB41B	DP1	392345076183602	Wetland sediments, upper peat unit	1.0	9.0-10.0	1.00
WB41C	DP1	392345076183603	Canal Creek aquifer	1.0	22.4-23.4	1.00
WB41D	DP1	392345076183604	Canal Creek aquifer	1.0	28.0-30.0	1.00
WB41E	DP1	392345076183605	Canal Creek aquifer	1.0	31.3-32.3	1.00
WB42A	DP1	392343076183601	Wetland sediments, upper peat unit	1.0	6.0- 7.0	1.00
WB42B	DP1	392343076183602	Canal Creek aquifer	1.0	13.0-14.0	1.00
WB42C	DP1	392343076183603	Canal Creek aquifer	1.0	19.0-20.0	1.00
WB42D	DP1	392343076183604	Canal Creek aquifer	1.0	25.0-26.0	1.00
WB42E	DP1	392343076183605	Canal Creek aquifer	1.0	31.0-32.0	1.00
WB42F	DP1	392343076183606	Canal Creek aquifer	1.0	37.0-38.0	1.00
WB43A	DP1	392347076184001	Canal Creek aquifer	1.0	4.8- 5.8	5.29
WB43B	DP1	392347076184002	Canal Creek aquifer	1.0	7.2- 8.2	5.29
WB43C	DP1	392347076184003	Canal Creek aquifer	1.0	10.1-11.1	5.29
WB43D	DP1	392347076184004	Canal Creek aquifer	1.0	14.0-15.0	5.29
WB44A	DP1	392347076184005	Wetland sediments, lower clayey unit	1.0	3.1- 4.1	1.72

Appendix 1B. *Sampling locations for surface-water sites in the West Branch Canal Creek study area, Aberdeen Proving Ground, Maryland*

[mi; miles; ft, feet; -, indicates distance downstream of the mouth; °, degrees; ', minutes; ", seconds; USGS, U.S. Geological Survey; site locations are shown in figure 5]

Sample name	Distance upstream of mouth [1] (mi)	Tidal or nontidal reach	Latitude-longitude		Description of location
SW010	2.09	nontidal	39°24'33"	076°18'21"	West Branch Canal Creek, at north inlet to the stormwater retention pond.
SW015	2.09	nontidal	39°24'32"	076°18'18"	East inlet to the stormwater retention pond.
SW019	2.05	nontidal	39°24'31"	076°18'21"	Stormwater retention pond.
SW020	2.04	nontidal	39°24'29"	076°18'21"	West Branch Canal Creek, 20 ft downstream of the stormwater retention pond.
SW028	1.57	nontidal	39°24'16"	076°18'32"	West Branch Canal Creek, about 50 ft upstream of gage and the confluence with West Fork.
SW029	1.57	nontidal	39°24'16"	076°18'33"	West Fork of the West Branch Canal Creek, about 50 ft upstream of gage.
SW030	1.56	nontidal	39°24'14"	076°18'32"	West Branch Canal Creek, at the USGS stream gage at Magnolia Road.
SW040	1.15	tidal	39°23'53"	076°18'35"	West Branch Canal Creek, at the tide gage at Hanlon Road.
SW049	1.04	tidal	39°23'48"	076°18'35"	Surface water near tracer array, between piezometers WB35 and WB36, north of walkway.
SW049.01	1.04	tidal	39°23'48"	076°18'35"	Seep north of the upstream floating walkways, occurs during low tide.
SW050	1.05	tidal	39°23'48"	076°18'35"	West Branch Canal Creek, at end of the upstream floating walkways.
SW060	0.98	tidal	39°23'47"	076°18'36"	West Branch Canal Creek, at floating walkbridge of the downstream floating walkways, near the staff gage.
SW074	0.97	tidal	39°23'48"	076°18'40"	Unnamed tributary, about 120 ft upstream of the West Branch.
SW076	0.67	tidal	39°23'37"	076°18'41"	West Branch Canal Creek, about 120 ft upstream of confluence of the Old East Branch Channel.
SW077	0.70	tidal	39°23'37"	076°18'38"	Old East Branch channel, about 240 ft upstream of the West Branch.
SW078	0.63	tidal	39°23'34"	076°18'39"	West Branch Canal Creek, about 75 ft upstream of confluence with the East Branch.
SW079	0.67	tidal	39°23'33"	076°18'36"	East Branch Canal Creek, about 60-90 ft upstream of confluence with the West Branch.
SW080	0.62	tidal	39°23'33"	076°18'40"	Canal Creek, about 240 ft downstream of confluence of the East and West Branch.
SW090	0.02	tidal	39°23'22"	076°19'03"	Canal Creek, about 150 ft upstream of the confluence with the Gunpowder River.
SW100	-0.05	tidal	39°23'20"	076°18'59"	Gunpowder River, about 300 ft from the mouth of Canal Creek.

[1] Distance upstream of mouth measured along the creek channel.

Appendix 2A. *Field measurements and redox-sensitive constituents for wells, piezometers, and multi-level monitoring systems in the West Branch Canal Creek study area, Aberdeen Proving Ground, Maryland, March 2000 through May 2001*

[µS/cm, microsiemens per centimeter at 25 degrees Celsius; °C, degrees Celcius; mg/L, milligrams per liter; µg/L, micrograms per liter; '--, no data; <, less than; BL, blind sample; NR, no replicate; pressure transducers were installed in wells ending in ".1"; DP, 0.75-inch drive-point piezometer; DP1, 1-inch drive-point piezometer; ML, multi-level monitoring system; T, 0.25-inch inverted screen piezometer; W2, 2-inch well; W4, 4-inch well]

						Field Measurements		
Site name	**Sample device**	**Replicate**	**Collection date**	**Collection time**	**Sampling method**	**Specific conductance (µS/cm)**	**pH (standard units)**	**Air temperature (°C)**
				March - April 2000 Sampling Event				
WB19B	DP	NR	3/8/2000	1100	syringe	526	5.9	17.8
WB19B	DP	NR	3/10/2000	--	syringe	--	--	--
WB19E	DP	NR	3/8/2000	1000	peristaltic pump	211	4.7	13.9
WB23A	DP	NR	3/12/2000	1000	syringe	--	--	--
WB23A	DP	NR	3/16/2000	--	syringe	--	--	--
WB23B	DP	NR	3/9/2000	930	syringe	801	6.3	--
WB23B	DP	NR	3/14/2000	--	syringe	--	--	--
WB23C	DP	NR	3/22/2000	--	syringe	605	6.9	--
WB23D	DP	NR	3/12/2000	1000	peristaltic pump	504	4.7	8.0
WBM23A	ML	1	3/10/2000	1615	syringe	1,400	6.9	--
WBM23A	ML	2	3/10/2000	1615	syringe	1,400	6.9	--
WBM23B	ML	1	3/11/2000	1000	syringe	1,420	7.3	--
WBM23B	ML	2	3/11/2000	1000	syringe	--	--	--
WBM23C	ML	NR	3/13/2000	1400	syringe	2,180	6.8	--
WBM23C	ML	NR	3/16/2000	--	syringe	--	--	--
WBM23D	ML	NR	3/12/2000	900	syringe	1,080	5.9	12.5
WBM23E	ML	1	3/11/2000	1330	peristaltic pump	636	5.6	--
WBM23E	ML	2	3/11/2000	1330	peristaltic pump	--	--	--
WBM23E	ML	NR	3/14/2000	--	peristaltic pump	--	--	--
WBM23F	ML	NR	3/11/2000	1600	peristaltic pump	584	5.0	--
WBM23F	ML	NR	3/29/2000	1430	peristaltic pump	--	--	--
WBM23G	ML	NR	3/11/2000	1440	peristaltic pump	560	4.8	--
WBT23A	T	NR	3/24/2000	--	syringe	--	6.9	16.2
WBT23A	T	1	3/28/2000	--	syringe	--	--	--
WBT23A	T	2	3/28/2000	--	syringe	--	--	--

Field Measurements			Redox Parameters					
Water temperature (ºC)	Oxygen, dissolved (mg/L)	Alkalinity as bicarbonate (mg/L as HCO_3)	Sulfide (mg/L)	Iron, total (mg/L)	Iron, ferrous (mg/L)	Methane (µg/L)	Duplicate methane (µg/L)	Site name
17.8	--	--	0.03	13.8	11.4	13,500	13,600	WB19B
--	--	150	--	--	--	--	--	WB19B
13.9	5.1	--	<.01	0.1	0.1	<27.7	<25.5	WB19E
--	--	--	--	--	--	130	132	WB23A
--	--	--	--	6.7	5.5	--	--	WB23A
15.2	--	--	.01	13.8	--	1,520	1,430	WB23B
--	--	280	--	--	--	--	--	WB23B
20.3	--	--	--	--	--	--	<52.2	WB23C
10.4	1.0	6	<.01	.1	.1	<39.7	<42.9	WB23D
15.5	0	420	.01	3.6	3.4	--	--	WBM23A
15.5	0	--	.01	--	3.2	1,650	--	WBM23A
10.3	0	430	<.01	5.9	4.8	1,300	1,190	WBM23B
--	--	--	--	4.7	4.0	--	--	WBM23B
18.5	--	890	.11	12.2	10.7	8,000	8,000	WBM23C
--	--	--	--	--	12.9	--	--	WBM23C
12.5	0	87	<.01	75.5	38.1	1,390	1,370	WBM23D
12.0	.1	35	--	5.5	.5	76.0	76.3	WBM23E
--	--	--	--	--	14.3	--	--	WBM23E
--	--	--	--	--	2.3	--	--	WBM23E
11.5	1.2	13	<.01	.1	.1	<48.5	<39.4	WBM23F
--	--	9	--	--	--	--	--	WBM23F
11.8	1.1	6	<.01	.1	.1	<44.0	<40.3	WBM23G
16.2	--	--	--	--	--	909	--	WBT23A
--	--	--	--	.8	--	--	--	WBT23A
--	--	--	--	1.2	--	--	--	WBT23A

Appendix 2A. *Field measurements and redox-sensitive constituents for wells, piezometers, and multi-level monitoring systems in the West Branch Canal Creek study area, Aberdeen Proving Ground, Maryland, March 2000 through May 2001- Continued*

Site name	Sample device	Replicate	Collection date	Collection time	Sampling method	Field Measurements: Specific conductance (µS/cm)	Field Measurements: pH (standard units)	Field Measurements: Air temperature (°C)
March -April 2000 Sampling Event - *Continued*								
WBT23A	T	1	3/31/2000	--	syringe	--	--	--
WBT23A	T	2	3/31/2000	--	syringe	--	--	--
WBT23B	T	NR	3/24/2000	--	syringe	--	6.9	17.0
WBT23C	T	1	3/24/2000	--	syringe	--	6.6	--
WBT23C	T	2	3/24/2000	--	syringe	--	6.6	--
WBT23C	T	1	3/27/2000	--	syringe	--	--	--
WBT23C	T	2	3/27/2000	--	syringe	--	--	--
WBT23C	T	NR	3/31/2000	--	syringe	--	--	--
WBT23D	T	NR	3/24/2000	--	syringe	--	6.5	--
WBT23E	T	NR	3/24/2000	--	syringe	511	5.5	18.5
WB24A	DP	NR	3/9/2000	920	syringe	--	--	--
WB24A	DP	NR	3/13/2000	--	syringe	--	--	--
WB24A	DP	NR	3/20/2000	--	syringe	--	--	--
WB24B	DP	1	3/14/2000	1430	syringe	480	6.0	--
WB24B	DP	2	3/14/2000	1430	syringe	--	--	--
WB24E	DP	NR	3/15/2000	900	syringe	364	5.1	--
WBM24A	ML	NR	3/13/2000	1515	syringe	882	6.9	--
WBM24A	ML	NR	3/14/2000	915	syringe	--	--	--
WBM24B	ML	NR	3/13/2000	1620	syringe	1,160	7.4	--
WBM24C	ML	1	3/14/2000	1315	syringe	1,690	7.0	--
WBM24C	ML	2	3/14/2000	1315	syringe	--	--	--
WBM24D	ML	NR	3/14/2000	1300	syringe	975	6.6	--
WBM24E	ML	NR	3/14/2000	900	peristaltic pump	467	5.9	--
WBM24F	ML	NR	3/14/2000	1030	peristaltic pump	343	5.1	12.5
WBM24G	ML	NR	3/14/2000	1100	peristaltic pump	493	5.0	--
WBT24A	T	NR	3/31/2000	--	syringe	--	--	--
WBT24B	T	NR	3/31/2000	--	syringe	--	--	--
WBT24C	T	1	3/24/2000	--	syringe	866	6.2	--
WBT24C	T	2	3/24/2000	--	syringe	--	--	--

Field Measurements			Redox Parameters					
Water temperature (ºC)	Oxygen, dissolved (mg/L)	Alkalinity as bicarbonate (mg/L as HCO_3)	Sulfide (mg/L)	Iron, total (mg/L)	Iron, ferrous (mg/L)	Methane (µg/L)	Duplicate methane (µg/L)	Site name
--	--	--	--	0.5	--	--	--	WBT23A
--	--	--	--	.9	--	--	--	WBT23A
17.0	--	--	--	.7	--	4,020	--	WBT23B
19.8	--	--	--	--	--	--	--	WBT23C
20.0	--	--	--	--	--	--	--	WBT23C
--	--	--	--	22.2	--	--	--	WBT23C
--	--	--	--	20.7	--	4,940	4,940	WBT23C
--	--	--	--	.5	<0.5	--	--	WBT23C
17.6	--	--	--	--	--	--	--	WBT23D
21.0	--	--	--	3.2	3.0	<52.9	<63.4	WBT23E
--	--	--	--	--	--	1,490	1,440	WB24A
--	--	--	--	1.3	--	--	--	WB24A
--	--	--	--	15.3	15.3	--	--	WB24A
16.7	0.5	117	0.25	4.8	4.7	6,210	6,510	WB24B
--	.4	--	--	4.6	4.6	5,780	6,600	WB24B
13.6	--	9	<.01	.2	.2	<34.3	<30.2	WB24E
10.8	.3	278	.11	--	1.1	1,860	1,860	WBM24A
--	--	293	--	1.5	1.4	--	--	WBM24A
10.7	.8	472	<.01	.7	.6	5,610	5,270	WBM24B
23.0	--	279	<.01	--	--	5,570	5,220	WBM24C
--	--	--	--	--	--	1,650	1,620	WBM24C
14.2	--	--	<.01	48.3	50.7	--	--	WBM24D
11.7	.2	58	--	2.4	--	159	152	WBM24E
12.3	.5	12	<.01	.2	.1	35.6	38.2	WBM24F
13.5	.6	4	<.01	.1	.1	<32.4	<33.1	WBM24G
--	--	--	--	--	--	2,480	2,600	WBT24A
--	--	--	--	20.8	--	6,280	--	WBT24B
18.8	--	--	--	5.8	--	6,000	5,970	WBT24C
--	--	--	--	6.4	.3	--	--	WBT24C

Appendix 2A. *Field measurements and redox-sensitive constituents for wells, piezometers, and multi-level monitoring systems in the West Branch Canal Creek study area, Aberdeen Proving Ground, Maryland, March 2000 through May 2001- Continued*

Site name	Sample device	Replicate	Collection date	Collection time	Sampling method	Field Measurements: Specific conductance (µS/cm)	Field Measurements: pH (standard units)	Field Measurements: Air temperature (ºC)
March -April 2000 Sampling Event - *Continued*								
WBT24C	T	NR	3/28/2000	--	syringe	--	6.8	--
WBT24D	T	NR	3/28/2000	--	syringe	--	--	--
WBT24D	T	NR	3/31/2000	--	syringe	--	--	--
WBT24E	T	NR	3/24/2000	--	syringe	511	5.5	21.0
WB25E	DP	NR	3/22/2000	--	peristaltic pump	--	--	--
WBM25E	ML	NR	3/11/2000	--	--	--	--	--
WB26A	DP	NR	3/8/2000	1300	syringe	204	6.8	28.0
WB26B	DP	NR	3/10/2000	1330	syringe	1,800	6.3	--
WB26B	DP	NR	3/12/2000	--	syringe	--	--	--
WB26B	DP	NR	3/14/2000	--	syringe	--	--	--
WB26B	DP	NR	3/16/2000	1405	syringe	--	--	--
WB26C	DP	NR	3/8/2000	1540	syringe	459	5.9	--
WB26D	DP	NR	3/8/2000	830	syringe	737	5.9	18.5
WB26D	DP	1	3/9/2000	--	syringe	--	--	--
WB26D	DP	2	3/9/2000	--	syringe	--	--	--
WB26E	DP	NR	3/10/2000	1330	syringe	762	5.4	--
WB26F	DP	NR	3/9/2000	1315	peristaltic pump	504	4.7	21.5
WBM26A	ML	NR	3/9/2000	1315	syringe	572	5.9	--
WBM26A	ML	NR	3/22/2000	1400	syringe	561	5.5	--
WBM26B	ML	1	3/10/2000	930	syringe	652	5.9	17.0
WBM26B	ML	2	3/10/2000	930	syringe	--	--	--
WBM26B	ML	NR	3/10/2000	--	syringe	--	--	--
WBM26B	ML	NR	3/24/2000	845	syringe	648	6.0	--
WBM26C	ML	NR	3/10/2000	1030	syringe	557	5.2	18.0
WBM26C	ML	NR	3/24/2000	845	syringe	546	5.3	--
WBM26D	ML	NR	3/10/2000	1110	syringe	694	5.4	19.5
WBM26E	ML	1	3/9/2000	1640	peristaltic pump	710	5.8	--
WBM26E	ML	2	3/9/2000	1640	peristaltic pump	--	--	--
WBM26E	ML	NR	3/10/2000	--	peristaltic pump	--	--	--

Field Measurements			Redox Parameters					
Water temperature (ºC)	Oxygen, dissolved (mg/L)	Alkalinity as bicarbonate (mg/L as HCO_3)	Sulfide (mg/L)	Iron, total (mg/L)	Iron, ferrous (mg/L)	Methane (µg/L)	Duplicate methane (µg/L)	Site name
13.6	--	--	--	--	--	--	--	WBT24C
--	--	--	--	40.6	44.2	--	--	WBT24D
--	--	--	--	--	--	186	186	WBT24D
21.0	--	--	0.10	--	--	--	--	WBT24E
--	--	--	--	--	<0.05	--	--	WB25E
--	--	--	--	7.8	--	--	--	WBM25E
20.1	--	537	<.01	2.5	2.3	2,330	912	WB26A
16.9	--	--	.02	--	--	1,280	1,430	WB26B
--	--	--	--	1.0	1.0	--	--	WB26B
--	--	--	--	0.8	.8	--	--	WB26B
--	--	447	--	--	--	--	--	WB26B
25.0	--	72	--	.7	.7	2,690	2,900	WB26C
15	2.7	--	.02	--	--	405	383	WB26D
--	--	69	--	2.6	1.9	--	--	WB26D
--	--	--	--	2.0	2.5	--	--	WB26D
19.6	--	31	.03	<.05	<.05	<29.9	<37.4	WB26E
14.3	1.2	--	.10	.1	.1	<51.9	<47.7	WB26F
15.5	0.8	43	.08	.8	.8	124	130	WBM26A
12.5	.8	31	<.01	<.05	<.05	141	129	WBM26A
16.9	--	102	--	<.5	<.5	403	401	WBM26B
--	--	--	--	--	<.5	413	398	WBM26B
--	--	--	--	--	--	404	--	WBM26B
15.8	1.6	92	<.01	.5	<.5	367	410	WBM26B
16.0	--	47	--	<.5	1.0	528	505	WBM26C
18.2	2.2	--	<.01	--	--	419	392	WBM26C
18.0	.3	83	--	<.5	--	854	889	WBM26D
13.2	.3	--	--	.6	<.5	360	--	WBM26E
--	--	--	--	--	<.5	--	--	WBM26E
--	--	65	--	--	--	--	--	WBM26E

Appendix 2A. *Field measurements and redox-sensitive constituents for wells, piezometers, and multi-level monitoring systems in the West Branch Canal Creek study area, Aberdeen Proving Ground, Maryland, March 2000 through May 2001- Continued*

Site name	Sample device	Replicate	Collection date	Collection time	Sampling method	Field Measurements: Specific conductance (µS/cm)	Field Measurements: pH (standard units)	Field Measurements: Air temperature (°C)
March -April 2000 Sampling Event - *Continued*								
WBM26F	ML	NR	3/10/2000	1315	syringe	738	6.4	20.5
WBM26G	ML	NR	3/10/2000	1400	peristaltic pump	530	4.7	--
WBT26A	T	NR	3/23/2000	1100	syringe	--	--	14
WBT26B	T	NR	3/23/2000	1115	syringe	--	--	--
WBT26B	T	NR	3/31/2000	--	syringe	--	--	--
WBT26C	T	NR	3/23/2000	1150	syringe	--	6.0	--
WBT26C	T	NR	3/24/2000	--	syringe	--	--	--
WBT26D	T	NR	3/23/2000	1435	syringe	--	5.9	17.0
WBT26D	T	NR	3/28/2000	--	syringe	--	--	--
WBT26E	T	NR	3/23/2000	1500	syringe	688	5.2	--
WB30A	DP	NR	3/9/2000	955	syringe	1,260	6.5	--
WB30A	DP	1	3/12/2000	--	syringe	--	--	--
WB30A	DP	2	3/12/2000	--	syringe	--	--	--
WB30C	DP	NR	3/9/2000	1000	syringe	348	6.1	18.0
WB30C	DP	NR	3/12/2000	--	syringe	--	--	--
WB30D	DP	NR	3/9/2000	1010	syringe	274	5.8	18.0
WB30E	DP	NR	3/13/2000	1300	peristaltic pump	400	5.0	--
WBM30A	ML	NR	3/12/2000	1200	syringe	2	6.7	--
WBM30B	ML	NR	3/13/2000	955	syringe	--	--	--
WBM30B	ML	NR	3/14/2000	--	syringe	2,080	6.8	10.7
WBM30C	ML	NR	3/13/2000	930	syringe	1,260	6.6	--
WBM30D	ML	NR	3/13/2000	1115	syringe	933	6.2	--
WBM30E	ML	NR	3/13/2000	--	syringe	1,160	5.3	13.2
WBM30F	ML	NR	3/12/2000	1500	peristaltic pump	443	5.9	--
WBM30G	ML	1	3/13/2000	1020	peristaltic pump	349	5.0	--
WBM30G	ML	2	3/13/2000	1020	peristaltic pump	--	--	--
WBT30A	T	NR	3/24/2000	--	syringe	488	6.0	--
WBT30B	T	NR	3/24/2000	--	syringe	--	6.5	--
WBT30C	T	1	3/24/2000	--	syringe	--	6.2	--

Field Measurements			Redox Parameters					
Water temperature (ºC)	Oxygen, dissolved (mg/L)	Alkalinity as bicarbonate (mg/L as HCO_3)	Sulfide (mg/L)	Iron, total (mg/L)	Iron, ferrous (mg/L)	Methane (µg/L)	Duplicate methane (µg/L)	Site name
17.8	0.4	93	--	0.7	4.4	4,130	4,150	WBM26F
15.5	1.1	--	<0.01	.2	<0.05	<46.0	<46.2	WBM26G
--	--	--	--	6.6	--	6,530	--	WBT26A
18.9	--	--	--	--	--	5,990	5,540	WBT26B
--	--	--	--	<.5	<.5	--	--	WBT26B
17.9	--	--	<.01	--	--	1,020	1,040	WBT26C
--	--	--	--	<.5	--	--	--	WBT26C
18.8	--	--	.04	--	--	509	515	WBT26D
--	--	--	--	16.1	16.0	--	--	WBT26D
14.8	--	--	--	12.8	13.0	330	351	WBT26E
19.2	--	--	.33	--	--	892	874	WB30A
--	--	178	--	16.8	16.1	--	--	WB30A
--	--	--	--	16.2	15.7	--	--	WB30A
17.3	--	--	<.01	--	--	370	340	WB30C
--	--	32	--	5.8	4.9	329	370	WB30C
15.5	--	34	<.01	.8	.8	<58.6	<52.7	WB30D
13.3	.9	6	<.01	.1	<.05	<21.7	<17.1	WB30E
6.1	.1	1,060	<.01	18.8	18.7	13,400	13,600	WBM30A
10.7	--	924	--	2.8	2.1	--	--	WBM30B
--	--	--	.08	--	2.5	5,550	6,180	WBM30B
15.2	--	477	--	10.4	8.7	5,390	5,250	WBM30C
14.0	--	181	<.01	20.9	20.3	5,770	5,650	WBM30D
13.3	--	33	--	2.6	2.1	1,600	1,560	WBM30E
9.5	.1	40	.03	6.2	5.3	123	133	WBM30F
11.5	.6	6	<.01	.2	--	<35.4	<41.4	WBM30G
--	--	--	--	.2	--	--	--	WBM30G
23.5	--	--	.49	3.2	2.8	1,550	--	WBT30A
20.9	--	--	<.02	3.1	--	4,850	4,740	WBT30B
22.0	--	--	<.02	22.1	21.7	3,280	3,130	WBT30C

Appendix 2A. *Field measurements and redox-sensitive constituents for wells, piezometers, and multi-level monitoring systems in the West Branch Canal Creek study area, Aberdeen Proving Ground, Maryland, March 2000 through May 2001- Continued*

Site name	Sample device	Replicate	Collection date	Collection time	Sampling method	Field Measurements: Specific conductance (µS/cm)	Field Measurements: pH (standard units)	Field Measurements: Air temperature (°C)
March - April 2000 Sampling Event - *Continued*								
WBT30C	T	2	3/24/2000	--	syringe	--	--	--
WBT30D	T	NR	3/24/2000	--	syringe	--	6.0	--
WBT30E	T	NR	3/24/2000	--	syringe	--	5.7	--
WBT30E	T	NR	3/28/2000	--	syringe	--	--	--
WB33A	DP	NR	3/20/2000	1630	syringe	148	5.0	--
WB33A	DP	NR	3/22/2000	--	syringe	--	--	--
WB33B	DP	1	3/20/2000	1645	peristaltic pump	583	4.0	--
WB33B	DP	2	3/20/2000	1645	peristaltic pump	580	4.0	--
WB33B	DP, BL	3	3/20/2000	1645	peristaltic pump	--	--	--
WB33Y	DP	1	3/22/2000	1130	syringe	742	5.1	40.5
WB33Y	DP	2	3/22/2000	1130	syringe	742	5.1	--
WB33Z	DP	1	3/22/2000	1300	syringe	1,060	5.5	--
WB33Z	DP	2	3/22/2000	1300	syringe	--	--	--
WB34A	DP	NR	3/20/2000	1440	syringe	524	5.9	--
WB34A	DP	NR	3/22/2000	--	syringe	--	--	--
WB34B	DP	NR	3/15/2000	1440	syringe	620	4.8	--
WBM34A	ML	NR	3/15/2000	900	syringe	1,440	5.6	--
WBM34B	ML	1	3/15/2000	910	syringe	1,450	6.0	--
WBM34B	ML	2	3/15/2000	910	syringe	--	--	--
WBM34C	ML	NR	3/15/2000	1014	syringe	909	5.9	16.5
WBM34C	ML	1	3/16/2000	--	syringe	--	--	--
WBM34C	ML	2	3/16/2000	--	syringe	--	--	--
WBM34D	ML	NR	3/15/2000	1050	peristaltic pump	933	6.3	--
WBM34E	ML	NR	3/15/2000	1110	syringe	1,230	6.1	--
WBM34F	ML	NR	3/15/2000	1500	syringe	1,100	5.8	--
WBM34G	ML	NR	3/15/2000	1330	syringe	1,070	5.8	--
WBM34G	ML	NR	3/16/2000	1545	syringe	--	--	--
WBT34A	T	NR	3/24/2000	--	syringe	--	--	--
WBT34B	T	1	3/24/2000	--	syringe	1,100	5.7	--

Field Measurements			Redox Parameters					
Water temperature (ºC)	Oxygen, dissolved (mg/L)	Alkalinity as bicarbonate (mg/L as HCO_3)	Sulfide (mg/L)	Iron, total (mg/L)	Iron, ferrous (mg/L)	Methane (µg/L)	Duplicate methane (µg/L)	Site name
--	--	--	--	22.4	17.4	--	--	WBT30C
19.5	--	--	<0.01	32.4	31.1	227	--	WBT30D
20.2	--	--	<.02	2.3	2.6	157	151	WBT30E
--	--	--	--	--	--	--	--	WBT30E
8.5	5.7	--	--	--	--	<38.7	<36.7	WB33A
--	--	3	--	<0.05	<0.05	--	--	WB33A
9.4	1.6	<1	<.01	.1	.1	466	437	WB33B
10.6	1.0	--	<.01	.1	.1	462	427	WB33B
--	--	--	--	<.05	<.05	--	--	WB33B
7.9	--	--	<.01	7.4	7.7	--	<58.1	WB33Y
7.9	--	--	<.01	29.4	30.2	--	--	WB33Y
8.4	--	79	.22	49.2	47.3	65.0	<87.4	WB33Z
--	--	--	.18	--	--	--	--	WB33Z
7.4	--	--	.01	94.4	92.2	917	905	WB34A
--	--	90	--	43.8	46.6	1,630	1,470	WB34A
8.5	1.7	1	<.01	.1	.1	<36.2	<39.2	WB34B
21.5	0.9	401	--	39.9	39.0	6,700	6,800	WBM34A
19.6	--	220	<.01	--	46.2	--	--	WBM34B
--	--	--	--	--	41.5	--	--	WBM34B
13.3	0	120	<.01	34.9	34.9	1,690	1,710	WBM34C
--	--	--	--	35.3	36.2	--	--	WBM34C
--	--	--	--	35.1	35.9	--	--	WBM34C
17.2	0	38	<.01	16.1	21.8	2,060	2,040	WBM34D
18.7	--	83	.14	19.8	19.9	1,490	1,840	WBM34E
18.1	0	43	<.01	16.4	16.4	1,510	1,980	WBM34F
17.5	0	104	.05	14.2	20.9	2,680	1,500	WBM34G
--	--	2	--	--	--	--	--	WBM34G
--	--	--	--	23.6	--	2,110	2,090	WBT34A
14.8	--	--	.23	70.2	69.8	--	2,030	WBT34B

Appendix 2A. *Field measurements and redox-sensitive constituents for wells, piezometers, and multi-level monitoring systems in the West Branch Canal Creek study area, Aberdeen Proving Ground, Maryland, March 2000 through May 2001- Continued*

Site name	Sample device	Replicate	Collection date	Collection time	Sampling method	Field Measurements: Specific conductance (µS/cm)	Field Measurements: pH (standard units)	Field Measurements: Air temperature (°C)
March - April 2000 Sampling Event - *Continued*								
WBT34B	T	2	3/24/2000	--	syringe	--	--	--
WBT34C	T	1	3/24/2000	--	syringe	--	6.4	--
WBT34C	T	2	3/24/2000	--	syringe	--	--	--
WBT34D	T	NR	3/22/2000	1405	syringe	882	5.6	--
WBT34D	T	NR	3/28/2000	--	--	--	--	--
WBT34E	T	NR	3/22/2000	1545	syringe	705	5.1	--
WB35A	DP	NR	3/20/2000	1430	syringe	272	4.6	--
WB35B	DP	1	3/20/2000	1530	syringe	445	3.9	--
WB35B	DP	2	3/20/2000	1530	syringe	--	--	--
WB35C	DP	1	3/20/2000	1500	syringe	366	4.2	--
WB35C	DP	2	3/20/2000	1500	syringe	387	4.1	--
WB35C	DP	1	3/20/2000	1830	syringe	--	--	--
WB35C	DP, BL	2	3/20/2000	1830	syringe	--	--	--
WB35E	DP	1	3/22/2000	1108	peristaltic pump	320	4.2	--
WB35E	DP	2	3/22/2000	1108	peristaltic pump	--	--	--
WB36A	DP	NR	3/16/2000	--	syringe	--	--	--
WB36A	DP	NR	3/20/2000	1045	syringe	287	4.8	--
WB36B	DP	1	3/20/2000	1115	syringe	369	4.7	--
WB36B	DP	2	3/20/2000	1115	syringe	--	--	--
WB36C	DP	NR	3/20/2000	1130	syringe	240	4.9	--
WBM36A	ML	NR	3/16/2000	950	syringe	1,020	6.3	--
WBM36B	ML	NR	3/16/2000	1000	syringe	505	6.2	18.0
WBM36B	ML	NR	3/17/2000	--	syringe	--	--	--
WBM36C	ML	1	3/16/2000	1030	syringe	470	6.3	--
WBM36C	ML	2	3/16/2000	1030	syringe	--	--	--
WBM36D	ML	NR	3/16/2000	1345	syringe	469	6.1	--
WBM36D	ML	NR	3/17/2000	--	syringe	--	--	--
WBM36E	ML	NR	3/16/2000	1350	syringe	534	6.0	--
WBM36F	ML	NR	3/16/2000	1400	syringe	517	6.1	16.0

Field Measurements			Redox Parameters					
Water temperature (ºC)	Oxygen, dissolved (mg/L)	Alkalinity as bicarbonate (mg/L as HCO_3)	Sulfide (mg/L)	Iron, total (mg/L)	Iron, ferrous (mg/L)	Methane (µg/L)	Duplicate methane (µg/L)	Site name
--	--	--	--	70.0	69.4	--	--	WBT34B
21.3	--	--	<0.02	60.2	337.0	--	--	WBT34C
--	--	--	--	58.8	--	--	--	WBT34C
13.1	--	--	<.01	28.7	28.6	199	212	WBT34D
--	--	--	--	--	--	--	--	WBT34D
11.3	--	--	<.01	8.8	0.9	<42.2	<39.5	WBT34E
7.7	1.2	--	<.01	0.7	--	<50.0	<46.7	WB35A
12.2	--	<1	.14	5.5	5.5	--	<38.3	WB35B
--	--	--	--	5.8	5.5	--	--	WB35B
11.4	2.2	<1	<.1	<.05	--	<42.8	<39.9	WB35C
9.7	2.2	--	<.1	<.05	<.05	<35.8	<41.4	WB35C
--	--	--	--	<.05	<.05	<46.6	<41.5	WB35C
--	--	--	--	<.05	--	--	--	WB35C
10.8	1.3	--	<.01	<.05	--	<40.5	<49.2	WB35E
--	1.3	--	--	<.05	<.05	<36.9	<35.7	WB35E
--	--	--	--	<.05	--	--	--	WB36A
9.0	--	2	<.01	3.6	3.6	48.1	45.2	WB36A
9.6	5.3	6	<.01	2.6	2.5	<36.2	<41.3	WB36B
--	4.3	--	--	--	--	--	--	WB36B
10.3	1.7	4	<.01	<.05	<.05	<36.6	<40.5	WB36C
16.7	--	--	<.01	--	1.1	7,520	7,600	WBM36A
18.2	--	--	<.01	2.2	1.4	1,670	1,690	WBM36B
--	--	--	--	3.7	2.2	1,480	1,600	WBM36B
19.5	--	--	--	3.1	3.1	2,070	2,100	WBM36C
--	--	--	--	--	--	2,140	2,210	WBM36C
22.9	0	--	--	--	--	1,430	1,490	WBM36D
--	--	--	--	6.7	6.4	--	--	WBM36D
19.0	0	--	--	6.9	7.0	748	903	WBM36E
16.8	--	--	--	--	--	580	556	WBM36F

Appendix 2A. *Field measurements and redox-sensitive constituents for wells, piezometers, and multi-level monitoring systems in the West Branch Canal Creek study area, Aberdeen Proving Ground, Maryland, March 2000 through May 2001- Continued*

Site name	Sample device	Replicate	Collection date	Collection time	Sampling method	Field Measurements: Specific conductance (µS/cm)	Field Measurements: pH (standard units)	Field Measurements: Air temperature (ºC)
March - April 2000 Sampling Event - *Continued*								
WBM36G	ML	NR	3/13/2000	--	syringe	--	--	--
WBM36G	ML	NR	3/16/2000	1540	syringe	346	4.6	--
WBT36A	T	NR	3/24/2000	--	syringe	--	5.7	--
WBT36B	T	1	3/24/2000	--	syringe	337	4.4	--
WBT36B	T	2	3/24/2000	--	syringe	--	--	--
WBT36B	T	3	3/24/2000	--	syringe	--	--	--
WBT36C	T	NR	3/22/2000	1430	syringe	367	4.1	--
WBT36D	T	NR	3/24/2000	--	syringe	358	4.5	--
WBT36F	T	NR	3/24/2000	--	syringe	--	5.6	--
WBT36G	T	NR	3/24/2000	--	syringe	363	5.1	--
WBT36H	T	NR	3/23/2000	--	syringe	363	5.1	--
March - April 2000 Field Blanks								
After WBM23G	ML	NR	3/11/2000	1540	peristaltic pump	--	--	--
After WBM24B	ML, BL	NR	3/13/2000	1620	syringe	--	--	--
Comprehensive Sampling Event (June - August 2000)								
CC27A	W4	NR	8/10/2000	1100	peristaltic pump	748	5.2	--
CC27B	W4	NR	8/10/2000	1130	peristaltic pump	341	5.2	--
DP-1A	W2	NR	8/11/2000	1100	peristaltic pump	1,190	7.1	--
DP-1A	W2	NR	8/16/2000	1030	peristaltic pump	1,190	7.1	--
DP-1B	W2	NR	8/14/2000	1330	syringe	658	6.2	--
WB19A	DP	NR	7/13/2000	1330	syringe	738	5.9	--
WB19A	DP	NR	7/13/2000	940	syringe	--	--	--
WB19B	DP	1	6/13/2000	900	syringe	446	5.9	--
WB19B	DP	2	6/13/2000	900	syringe	446	5.9	--
WB19D	DP	NR	7/13/2000	1500	syringe	224	5.3	--

Field Measurements			Redox Parameters					
Water temperature (ºC)	Oxygen, dissolved (mg/L)	Alkalinity as bicarbonate (mg/L as HCO_3)	Sulfide (mg/L)	Iron, total (mg/L)	Iron, ferrous (mg/L)	Methane (µg/L)	Duplicate methane (µg/L)	Site name
--	--	--	--	0.7	--	--	--	WBM36G
16.3	1.3	--	<0.01	--	0.6	61.6	--	WBM36G
--	--	--	.05	7.7	7.0	168	149	WBT36A
--	--	--	<.02	1.7	--	62.9	<60.0	WBT36B
--	--	--	--	1.7	--	--	--	WBT36B
--	--	--	--	1.5	1.4	--	--	WBT36B
11.6	--	--	<.01	<.05	<.05	<50.2	<45.5	WBT36C
20.3	--	--	<.03	2.5	--	<55.8	<65.2	WBT36D
21.0	--	--	<.02	11.6	12.0	<53.5	66.2	WBT36F
22.0	--	--	--	11.6	12.4	<79.3	<46.8	WBT36G
22.0	--	--	--	21.3	21.0	<78.0	<70.5	WBT36H
--	--	--	--	.2	0	<42.3	--	After WBM23G
--	--	--	--	.1	<.05	--	--	After WBM24B
15.0	0	32	<.01	.6	.6	245	247	CC27A
15.5	0.3	15	<.01	.4	.5	<36.5	<20.9	CC27B
23.5	--	357	.40	12.7	12.5	2,370	2,310	DP-1A
23.5	--	18	.40	0	0	--	--	DP-1A
23.3	--	--	.10	--	--	93.0	--	DP-1B
25.0	--	--	--	10.7	11.8	2,490	2,490	WB19A
--	--	136	--	--	--	<40.4	<36.9	WB19A
18.0	0	186	<.01	13.9	14.4	14,100	14,200	WB19B
18.0	0	--	<.01	15.1	13.6	--	--	WB19B
20.0	4.2	--	<.01	0	0	<58.1	<50.3	WB19D

Appendix 2A. *Field measurements and redox-sensitive constituents for wells, piezometers, and multi-level monitoring systems in the West Branch Canal Creek study area, Aberdeen Proving Ground, Maryland, March 2000 through May 2001- Continued*

Site name	Sample device	Replicate	Collection date	Collection time	Sampling method	Field Measurements: Specific conductance (µS/cm)	Field Measurements: pH (standard units)	Field Measurements: Air temperature (°C)
Comprehensive Sampling Event (June - August 2000) - *Continued*								
WB19D	DP	NR	7/14/2000	915	--	--	--	--
WB19E	DP	NR	6/13/2000	930	peristaltic pump	209	4.6	--
WB20A	DP	NR	8/11/2000	1100	peristaltic pump	477	10.3	--
WB20B	DP	NR	8/11/2000	1330	peristaltic pump	159	5.9	--
WB21A	DP	NR	7/17/2000	1350	syringe	77	5.9	30.0
WB21A	DP	NR	8/3/2000	--	syringe	--	--	--
WB21A	DP	NR	8/10/2000	--	syringe	--	--	--
WB21B	DP	NR	7/17/2000	1450	syringe	590	5.8	--
WB21B	DP	NR	7/17/2000	1530	syringe	--	--	--
WB21C	DP	NR	7/17/2000	1120	syringe	--	4.9	--
WB21D	DP	NR	8/1/2000	1045	syringe	610	5.3	--
WB21E	DP	NR	8/1/2000	1500	syringe	--	--	--
WB21E	DP	NR	8/1/2000	850	syringe	488	4.8	--
WB21F	DP	1	8/10/2000	1100	syringe	154	5.7	--
WB21F	DP	2	8/10/2000	1100	syringe	154	5.7	--
WB21F	DP	NR	8/11/2000	935	--	--	--	--
WB21G	DP	NR	7/31/2000	1135	syringe	302	4.5	--
WB22A	DP	NR	7/17/2000	1350	--	--	--	--
WB22A	DP	NR	8/10/2000	945	syringe	--	--	--
WB22B	DP	1	7/17/2000	--	--	--	--	--
WB22B	DP	2	7/17/2000	--	--	--	--	--
WB22B	DP	NR	8/1/2000	1130	syringe	--	--	--
WB22C	DP	NR	7/17/2000	--	--	--	--	--
WB22C	DP	NR	8/1/2000	1330	syringe	--	--	--
WB22D	DP	1	8/1/2000	1500	syringe	455	5.0	--
WB22D	DP	2	8/1/2000	1500	syringe	--	--	--
WB22D	DP	3	8/1/2000	1500	syringe	--	--	--
WB22D	DP	1	8/3/2000	1000	--	--	--	--
WB22D	DP	2	8/3/2000	1000	--	--	--	--

Field Measurements			Redox Parameters					
Water temperature (ºC)	Oxygen, dissolved (mg/L)	Alkalinity as bicarbonate (mg/L as HCO_3)	Sulfide (mg/L)	Iron, total (mg/L)	Iron, ferrous (mg/L)	Methane (µg/L)	Duplicate methane (µg/L)	Site name
--	--	23	--	--	--	--	--	WB19D
15.2	6.2	--	--	1.2	<0.02	<35.0	<33.9	WB19E
28.1	0.1	1,010	0.41	1.2	--	115	111	WB20A
21.7	--	12	.02	<0.02	.1	<26.4	<33.5	WB20B
30.6	--	--	--	--	--	--	--	WB21A
--	--	--	--	10.1	10.3	--	--	WB21A
--	--	180	--	--	--	--	--	WB21A
26.3	0	80	.14	--	--	--	--	WB21B
--	--	--	.03	--	--	--	--	WB21B
15.7	1.3	7	.09	--	--	--	--	WB21C
30.5	.4	15	.02	.8	.8	<36.8	<42.2	WB21D
--	--	12	--	.3	0	<40.2	<40.3	WB21E
25.7	2.9	--	--	0	--	--	--	WB21E
17.8	--	--	1.5	1.5	1.4	--	--	WB21F
--	--	--	1.5	6.7	7.8	--	--	WB21F
--	--	110	--	--	--	--	--	WB21F
18.7	.9	--	.17	--	--	<28.3	<28.5	WB21G
--	--	--	--	<.02	<.02	839	697	WB22A
--	--	--	--	--	--	824	853	WB22A
--	--	--	--	46.6	46.1	<35.7	<38.5	WB22B
--	--	--	--	18.5	21.5	<38.9	--	WB22B
--	1.5	12	.02	8.5	9.5	<32.0	<34.2	WB22B
--	--	--	--	.1	.1	<65.7	<69.5	WB22C
--	0	40	--	7.3	7.4	415	421	WB22C
17.8	.1	--	<.01	.1	--	<35.3	<50.9	WB22D
--	--	--	--	0	0	--	--	WB22D
--	--	--	--	0	.1	--	--	WB22D
--	--	10	--	.3	0	--	--	WB22D
--	--	--	--	0	0	--	--	WB22D

Appendix 2A. *Field measurements and redox-sensitive constituents for wells, piezometers, and multi-level monitoring systems in the West Branch Canal Creek study area, Aberdeen Proving Ground, Maryland, March 2000 through May 2001- Continued*

Site name	Sample device	Replicate	Collection date	Collection time	Sampling method	Field Measurements: Specific conductance (µS/cm)	Field Measurements: pH (standard units)	Field Measurements: Air temperature (ºC)
Comprehensive Sampling Event (June - August 2000) - *Continued*								
WB22E	DP	NR	8/3/2000	1115	syringe	497	5.3	18.2
WB22E	DP	NR	8/9/2000	1430	syringe	--	--	--
WB23A	DP	NR	6/23/2000	1000	syringe	778	6.6	26.5
WB23A	DP	NR	7/7/2000	1300	syringe	--	--	--
WB23B	DP	NR	6/15/2000	1330	syringe	942	6.3	28.3
WB23B	DP	NR	6/23/2000	1100	--	--	--	--
WB23C	DP	1	6/23/2000	1020	syringe	630	6.1	23.4
WB23C	DP	2	6/23/2000	1020	syringe	--	6.2	23.4
WB23C	DP	1	7/7/2000	1330	--	--	--	--
WB23C	DP	2	7/7/2000	1330	--	--	--	--
WB23D	DP	1	6/20/2000	1500	peristaltic pump	539	4.8	24.9
WB23D	DP	2	6/20/2000	1500	peristaltic pump	--	--	--
WB23D	DP, BL	3	6/20/2000	1500	peristaltic pump	--	--	--
WB23E	DP	NR	7/18/2000	1130	syringe	462	5.0	32.0
WB23F	DP	1	7/19/2000	1300	syringe	433	5.7	--
WB23F	DP	2	7/19/2000	1300	syringe	433	5.7	--
WBM23A	ML	NR	6/29/2000	1545	syringe	1,410	6.9	25.6
WBM23B	ML	NR	6/29/2000	1330	syringe	1,470	6.7	28.2
WBM23C	ML	NR	7/5/2000	1345	syringe	1,460	6.6	24.1
WBM23C	ML	NR	7/6/2000	1055	syringe	1,460	6.6	24.1
WBM23D	ML	NR	7/6/2000	1140	syringe	833	5.8	26.1
WBM23E	ML	NR	6/30/2000	930	syringe	654	5.5	22.5
WBM23F	ML	1	6/29/2000	1350	peristaltic pump	608	5.3	17.5
WBM23F	ML	2	6/29/2000	1350	peristaltic pump	--	--	--
WBM23F	ML, BL	3	6/29/2000	1350	peristaltic pump	--	--	--
WBM23F	ML, BL	4	6/29/2000	1350	peristaltic pump	--	--	--
WBM23G	ML	NR	6/29/2000	1500	peristaltic pump	626	4.6	20.2
WBT23A	T	NR	6/15/2000	--	syringe	--	--	--
WBT23B	T	NR	6/14/2000	1530	syringe	--	6.2	24.7

Field Measurements			Redox Parameters					
Water temperature (ºC)	Oxygen, dissolved (mg/L)	Alkalinity as bicarbonate (mg/L as HCO_3)	Sulfide (mg/L)	Iron, total (mg/L)	Iron, ferrous (mg/L)	Methane (µg/L)	Duplicate methane (µg/L)	Site name
18.2	1.0	--	0.01	--	--	<44.8	<33.0	WB22E
--	--	9	.01	0.1	0.2	--	--	WB22E
26.5	--	--	--	--	1.0	<43.7	285	WB23A
--	--	220	--	--	--	--	--	WB23A
28.3	--	--	<.01	33.9	33.6	1,330	1,290	WB23B
--	--	320	--	--	--	--	--	WB23B
23.4	--	--	.03	--	--	<24.8	<148.0	WB23C
23.4	--	--	--	--	--	--	--	WB23C
--	--	131	--	--	2.9	<39.4	<40.0	WB23C
--	--	--	--	3.8	4.0	--	--	WB23C
24.9	1.5	4	<.01	0	0	<48.5	<47.7	WB23D
--	--	--	<.01	--	--	--	--	WB23D
--	--	--	--	<.02	<.02	--	--	WB23D
18.4	0.9	9	.07	.1	0	<27.1	<28.8	WB23E
18.4	1.0	--	.07	1.1	1.1	<33.1	<34.2	WB23F
--	1.0	--	.07	1.2	1.2	<32.0	--	WB23F
25.6	0	602	.03	4.6	4.6	2,450	2,490	WBM23A
28.2	0	589	.12	2.4	2.4	1,480	1,490	WBM23B
24.1	--	--	<.01	--	--	4,470	4,230	WBM23C
24.1	--	550	<.01	6.6	6.7	--	--	WBM23C
26.1	0	--	--	21.3	23.1	1,110	1,020	WBM23D
22.5	--	45	--	--	1.0	346	335	WBM23E
17.5	1.3	10	<.01	.1	.1	72.8	77.6	WBM23F
--	1.5	--	--	--	--	--	--	WBM23F
--	--	--	--	.1	.1	--	--	WBM23F
--	--	--	--	.1	.1	--	--	WBM23F
20.2	1.4	4	.10	<.02	<.02	<22.6	<18.9	WBM23G
--	--	--	--	--	--	2,430	2,370	WBT23A
24.7	--	--	--	6.1	6.7	7,120	7,100	WBT23B

Appendix 2A. *Field measurements and redox-sensitive constituents for wells, piezometers, and multi-level monitoring systems in the West Branch Canal Creek study area, Aberdeen Proving Ground, Maryland, March 2000 through May 2001- Continued*

Site name	Sample device	Replicate	Collection date	Collection time	Sampling method	Field Measurements: Specific conductance (µS/cm)	Field Measurements: pH (standard units)	Field Measurements: Air temperature (°C)
Comprehensive Sampling Event (June - August 2000) - *Continued*								
WBT23C	T	NR	6/14/2000	--	syringe	1,190	6.5	21.3
WBT23C	T	NR	6/15/2000	930	syringe	--	--	--
WBT23C	T	NR	6/16/2000	1100	syringe	--	--	--
WBT23E	T	NR	6/15/2000	1130	syringe	526	5.4	22.7
WBT23E	T	NR	6/16/2000	1130	syringe	--	--	--
WB24A	DP	NR	6/20/2000	--	syringe	1,180	5.8	28.5
WB24A	DP	NR	6/27/2000	1600	syringe	--	--	--
WB24B	DP	1	6/15/2000	1500	syringe	494	5.9	21.8
WB24B	DP	2	6/15/2000	1500	syringe	--	--	--
WB24B	DP	1	6/15/2000	--	syringe	--	--	--
WB24B	DP	2	6/15/2000	--	syringe	--	--	--
WB24C.1	DP	NR	7/14/2000	1115	syringe	--	--	--
WB24C.1	DP	NR	7/17/2000	--	syringe	597	6.4	--
WB24D	DP	NR	6/28/2000	1140	--	--	--	--
WB24D	DP	NR	6/28/2000	--	--	--	--	--
WB24E	DP	NR	6/23/2000	1650	peristaltic pump	290	4.8	--
WB24E	DP	NR	6/23/2000	--	syringe	--	--	--
WBM24A	ML	NR	6/28/2000	1200	syringe	1,300	6.6	25.4
WBM24B	ML	1	6/28/2000	1430	syringe	1,390	6.9	24.8
WBM24B	ML	2	6/28/2000	1430	syringe	--	--	--
WBM24C	ML	NR	6/29/2000	1100	syringe	1,560	6.8	22.7
WBM24D	ML	NR	6/29/2000	1130	syringe	932	6.3	20.1
WBM24D	ML	NR	7/7/2000	--	--	--	--	--
WBM24E	ML	NR	6/28/2000	1345	peristaltic pump	412	5.4	--
WBM24F	ML	NR	6/28/2000	1545	peristaltic pump	329	5.0	--
WBM24G	ML	NR	6/29/2000	1030	peristaltic pump	469	4.9	15.7
WBT24A	T	NR	6/15/2000	1145	syringe	--	--	--
WBT24B	T	NR	6/15/2000	1200	syringe	--	--	--
WBT24C	T	NR	6/15/2000	1200	syringe	--	6.3	25.0

Field Measurements			Redox Parameters					
Water temperature (ºC)	Oxygen, dissolved (mg/L)	Alkalinity as bicarbonate (mg/L as HCO_3)	Sulfide (mg/L)	Iron, total (mg/L)	Iron, ferrous (mg/L)	Methane (µg/L)	Duplicate methane (µg/L)	Site name
21.3	--	--	0.01	9.3	9.3	4,240	4,150	WBT23C
--	--	448	--	--	--	--	--	WBT23C
--	--	446	--	--	--	--	--	WBT23C
22.7	--	--	.11	3.5	3.4	<58.7	<52.2	WBT23E
--	--	20	--	--	--	--	--	WBT23E
28.5	--	--	.03	10.6	10.3	1,480	1,530	WB24A
--	--	93	--	--	--	--	--	WB24A
21.8	0.4	107	.25	4.2	4.3	7,110	7,020	WB24B
--	--	--	--	4.8	4.1	6,560	7,060	WB24B
--	--	113	--	4.2	4.4	--	--	WB24B
--	--	--	--	4.0	4.3	--	--	WB24B
--	0	115	--	3.9	3.8	117	110	WB24C.1
18.4	0	--	--	6.8	12.4	--	--	WB24C.1
--	--	242	--	--	--	--	--	WB24D
--	--	--	--	--	--	<30.9	--	WB24D
14.7	1.0	--	.15	--	--	232	137	WB24E
--	--	2	--	<0.02	0	<18.1	<30.0	WB24E
25.4	0	478	.54	4.4	3.2	2,600	2,590	WBM24A
24.8	.3	612	.32	.2	4.1	6,790	6,520	WBM24B
--	--	--	--	--	2.2	--	--	WBM24B
22.7	--	--	--	--	--	3,920	4,090	WBM24C
20.1	--	--	.20	56.9	55.4	1,770	1,800	WBM24D
--	--	--	--	--	--	1,080	--	WBM24D
22.5	0	--	<.01	--	2.0	54.6	113	WBM24E
--	0	10	.02	.1	0	32.0	<25.6	WBM24F
15.7	1.6	16	.13	.1	.1	<46.0	<47.2	WBM24G
--	--	--	--	--	3.4	2,600	2,750	WBT24A
--	--	--	--	--	--	5,450	5,980	WBT24B
25.0	--	--	--	6.0	7.6	5,190	5,110	WBT24C

Appendix 2A. *Field measurements and redox-sensitive constituents for wells, piezometers, and multi-level monitoring systems in the West Branch Canal Creek study area, Aberdeen Proving Ground, Maryland, March 2000 through May 2001- Continued*

Site name	Sample device	Replicate	Collection date	Collection time	Sampling method	Field Measurements: Specific conductance (µS/cm)	Field Measurements: pH (standard units)	Field Measurements: Air temperature (ºC)
Comprehensive Sampling Event (June - August 2000) - *Continued*								
WBT24C	T	NR	6/16/2000	900	syringe	--	--	--
WBT24D	T	NR	6/20/2000	1600	syringe	--	--	--
WB25A	DP	NR	7/18/2000	1050	syringe	1,280	6.8	32.0
WB25A	DP	NR	8/9/2000	--	--	--	--	--
WB25B	DP	1	7/18/2000	1115	syringe	617	5.0	32.0
WB25B	DP	2	7/18/2000	1115	syringe	617	5.0	--
WB25C	DP	NR	7/28/2000	1415	syringe	546	4.7	--
WB25C.1	DP	NR	7/28/2000	1300	syringe	1,342	7.0	--
WB25D.1	DP	NR	7/31/2000	1300	syringe	612	5.3	--
WB26A	DP	NR	6/13/2000	1445	syringe	2,040	6.6	21.4
WB26A	DP	NR	6/27/2000	--	syringe	--	--	--
WB26B	DP	NR	6/13/2000	1515	syringe	1,800	6.3	25.6
WB26B	DP	NR	6/27/2000	--	--	--	--	--
WB26B.1	DP	NR	7/14/2000	1015	syringe	2,510	7.9	--
WB26B.1	DP	NR	7/17/2000	1115	syringe	--	--	--
WB26C	DP	NR	6/13/2000	1525	syringe	413	6.0	20.7
WB26D	DP	NR	6/13/2000	1540	syringe	673	6.1	19.7
WB26D	DP	NR	6/14/2000	955	syringe	--	--	--
WB26E	DP	NR	6/13/2000	1615	syringe	625	5.4	20.4
WB26F	DP	NR	6/14/2000	1100	peristaltic pump	405	4.7	14.8
WB26G	DP	NR	7/14/2000	1033	syringe	508	5.1	--
WB26H	DP	NR	7/14/2000	1130	syringe	328	4.7	--
WBM26A	ML	NR	6/30/2000	1230	syringe	574	4.7	24.8
WBM26B	ML	NR	7/6/2000	1000	syringe	626	5.9	21.7
WBM26C	ML	NR	6/30/2000	--	syringe	--	--	--
WBM26C	ML	NR	7/6/2000	--	syringe	614	5.5	24.1
WBM26D	ML	NR	7/6/2000	--	syringe	--	--	--
WBM26E	ML	NR	7/5/2000	1100	syringe	579	5.2	16.8
WBM26F	ML	NR	7/6/2000	1400	syringe	--	--	--

Field Measurements			Redox Parameters					
Water temperature (ºC)	Oxygen, dissolved (mg/L)	Alkalinity as bicarbonate (mg/L as HCO_3)	Sulfide (mg/L)	Iron, total (mg/L)	Iron, ferrous (mg/L)	Methane (µg/L)	Duplicate methane (µg/L)	Site name
--	--	393	--	--	--	--	--	WBT24C
--	--	--	--	42.6	41.5	63.2	157	WBT24D
29.9	--	--	--	--	--	233	191	WB25A
--	--	--	--	0.3	0.7	--	--	WB25A
19.9	1.6	7	--	0	0	<37.0	<37.5	WB25B
--	1.6	--	--	0	0	<49.1	--	WB25B
18.3	2.1	--	0.06	<.02	<.02	<25.3	<25.9	WB25C
24.1	0	467	.03	0	0	2,400	2,510	WB25C.1
23.4	0.8	20	.01	.4	.4	<35.1	<31.6	WB25D.1
21.4	.3	757	<.01	3.0	3.3	300	300	WB26A
--	--	--	--	--	--	--	--	WB26A
25.6	--	--	.02	1.8	1.7	269	263	WB26B
--	--	473	--	0	0	--	--	WB26B
23.2	0	686	.02	--	--	<43.4	<40.9	WB26B.1
--	--	663	--	0	0	--	--	WB26B.1
20.7	--	116	.71	.8	.9	2,680	2,670	WB26C
19.7	--	--	.27	.9	.8	305	304	WB26D
--	--	137	--	--	--	--	--	WB26D
20.4	3.1	27	<.01	.1	.1	<52.8	<50.1	WB26E
14.8	1.8	--	<.01	.1	.1	<55.3	<31.7	WB26F
23.0	2.0	8	<.01	.2	.2	<47.1	<55.4	WB26G
26.4	3.2	4	<.01	0	0	<43.3	<42.4	WB26H
24.8	1.1	7	.03	.1	0	113	117	WBM26A
21.7	1.0	52	.01	--	1.3	82.1	79.6	WBM26B
--	--	--	--	--	--	<39.5	--	WBM26C
24.1	--	--	--	--	1.0	374	390	WBM26C
--	--	--	--	1.3	.9	331	340	WBM26D
16.8	.6	--	--	--	--	37.9	<43.0	WBM26E
--	--	84	--	5.5	5.6	280	245	WBM26F

Appendix 2A. *Field measurements and redox-sensitive constituents for wells, piezometers, and multi-level monitoring systems in the West Branch Canal Creek study area, Aberdeen Proving Ground, Maryland, March 2000 through May 2001- Continued*

Site name	Sample device	Replicate	Collection date	Collection time	Sampling method	Field Measurements: Specific conductance (µS/cm)	Field Measurements: pH (standard units)	Field Measurements: Air temperature (ºC)
Comprehensive Sampling Event (June - August 2000) - *Continued*								
WBM26G	ML	NR	6/30/2000	1045	peristaltic pump	554	4.6	18.6
WBT26C	T	NR	6/14/2000	1515	syringe	572	6.2	--
WBT26C	T	NR	6/20/2000	--	syringe	--	--	--
WBT26D	T	NR	6/14/2000	1400	syringe	625	5.5	20.5
WBT26E	T	NR	6/20/2000	1435	syringe	--	--	--
WBT26E	T	1	6/27/2000	--	syringe	--	--	--
WBT26E	T	2	6/27/2000	--	syringe	--	--	--
WBT26F	T	NR	6/20/2000	1435	syringe	--	--	--
WB27A	DP	NR	7/20/2000	850	syringe	406	5.0	24.1
WB27A	DP	NR	8/4/2000	--	--	--	--	--
WB27A.1	DP	NR	7/17/2000	1100	--	--	--	--
WB27A.1	DP	NR	7/28/2000	1000	syringe	878	6.0	--
WB27B	DP	1	7/20/2000	1145	syringe	570	5.5	--
WB27B	DP	2	7/20/2000	1145	syringe	--	--	--
WB27B	DP	NR	7/27/2000	1205	--	--	--	--
WB27B.1	DP	NR	7/28/2000	1030	syringe	1,110	9.4	--
WB27B.1	DP	NR	8/9/2000	--	--	--	--	--
WB27C	DP	NR	7/20/2000	1400	syringe	173	6.3	--
WB27C.1	DP	NR	7/20/2000	--	syringe	--	--	--
WB27C.2	DP	NR	7/20/2000	1400	syringe	--	--	--
WB27D	DP	NR	7/27/2000	1315	syringe	596	4.8	--
WB27E	DP	NR	7/27/2000	1430	syringe	393	5.1	--
WB27F	DP	NR	7/27/2000	1430	syringe	403	4.8	--
WB27G	DP	1	7/27/2000	900	syringe	212	4.8	--
WB27G	DP	2	7/27/2000	900	syringe	--	--	--
WB28A	DP	NR	7/19/2000	950	syringe	1,390	6.6	--
WB28A	DP	NR	8/4/2000	920	syringe	1,500	6.3	--
WB28B	DP	NR	7/19/2000	1005	syringe	713	6.7	--
WB28B	DP	NR	7/27/2000	1410	--	--	--	--

Field Measurements			Redox Parameters					
Water temperature (ºC)	Oxygen, dissolved (mg/L)	Alkalinity as bicarbonate (mg/L as HCO_3)	Sulfide (mg/L)	Iron, total (mg/L)	Iron, ferrous (mg/L)	Methane (µg/L)	Duplicate methane (µg/L)	Site name
--	2.1	5	0.28	0.1	0.1	<20.2	<18.4	WBM26G
20.2	--	101	<.02	--	--	837	820	WBT26C
--	--	--	--	1.4	--	--	--	WBT26C
20.5	--	33	.08	15.5	15.4	577	654	WBT26D
--	--	--	.08	--	--	232	137	WBT26E
--	--	--	.08	10.7	10.3	--	--	WBT26E
--	--	--	.08	11.3	10.4	--	--	WBT26E
--	--	--	--	--	--	--	--	WBT26F
24.1	0.1	10	.21	0	1.2	1,280	1,280	WB27A
--	--	--	--	3.7	5.1	--	--	WB27A
--	--	118	--	--	--	--	--	WB27A.1
22.8	--	--	--	19.5	21.1	593	614	WB27A.1
21.0	.2	--	.15	--	--	149	140	WB27B
--	--	--	.14	--	--	153	--	WB27B
--	--	15	--	--	--	--	--	WB27B
--	.1	232	.06	0	<.02	<26.3	<25.7	WB27B.1
--	--	--	--	.8	.6	65.2	64.3	WB27B.1
20.6	--	29	.72	--	<.2	<29.1	<27.2	WB27C
--	--	--	.38	.3	<.2	--	--	WB27C.1
--	--	--	.38	<.2	<.2	<27.2	--	WB27C.2
17.1	.6	7	<.01	--	<.12	32.4	<26.5	WB27D
18.6	2.0	7	.02	--	--	<19.1	<35.6	WB27E
16.8	2.3	--	.56	<.02	<.02	<25.9	<26.7	WB27F
21.1	1.7	6	.05	--	--	<26.3	<28.1	WB27G
--	1.7	3	--	--	--	--	--	WB27G
27.2	--	--	--	--	--	--	--	WB28A
27.5	--	--	--	14.4	13.9	335	332	WB28A
25.2	--	--	.01	47.2	47.4	1,870	1,920	WB28B
--	--	85	--	--	--	--	--	WB28B

Appendix 2A. *Field measurements and redox-sensitive constituents for wells, piezometers, and multi-level monitoring systems in the West Branch Canal Creek study area, Aberdeen Proving Ground, Maryland, March 2000 through May 2001- Continued*

Site name	Sample device	Replicate	Collection date	Collection time	Sampling method	Field Measurements: Specific conductance (µS/cm)	Field Measurements: pH (standard units)	Field Measurements: Air temperature (ºC)
Comprehensive Sampling Event (June - August 2000) - *Continued*								
WB28C	DP	NR	7/27/2000	1200	--	--	--	--
WB28C.1	DP	NR	7/19/2000	1045	syringe	451	4.7	--
WB28C.1	DP	1	7/20/2000	--	syringe	--	--	--
WB28C.1	DP	2	7/20/2000	--	syringe	--	--	--
WB28C.1	DP	NR	7/27/2000	1340	syringe	--	--	--
WB28C.2	DP	NR	7/19/2000	1500	syringe	4,300	5.1	--
WB28D	DP	NR	7/19/2000	1300	syringe	455	5.3	--
WB28D.1	DP	NR	7/20/2000	920	syringe	183	5.7	--
WB28D.1	DP	NR	7/27/2000	1100	syringe	--	--	--
WB28F	DP	NR	7/20/2000	1015	syringe	408	5.2	--
WB28G	DP	1	7/27/2000	--	syringe	--	--	--
WB28G	DP	2	7/27/2000	--	syringe	--	--	--
WB30A	DP	NR	6/27/2000	--	syringe	--	6.1	26.1
WB30A	DP	NR	7/7/2000	--	syringe	--	--	--
WB30B	DP	NR	6/27/2000	1030	syringe	569	6.4	27.5
WB30C	DP	NR	6/27/2000	1100	syringe	356	6.0	26.5
WB30D	DP	1	6/27/2000	1200	syringe	404	5.4	26.7
WB30D	DP	2	6/27/2000	1200	syringe	--	--	--
WB30E	DP	NR	6/23/2000	1445	peristaltic pump	408	4.5	19.3
WB30E	DP	NR	7/7/2000	--	syringe	--	--	--
WBM30A	ML	NR	6/30/2000	1130	syringe	1,900	6.5	25.5
WBM30B	ML	NR	7/6/2000	1410	syringe	1,870	7.1	28.1
WBM30B	ML	NR	7/7/2000	--	syringe	1,870	7.1	--
WBM30C	ML	NR	7/6/2000	1500	syringe	950	6.5	--
WBM30D	ML	NR	7/6/2000	1630	syringe	735	6.2	28.9
WBM30E	ML	1	7/6/2000	1132	syringe	769	5.3	21.8
WBM30E	ML	2	7/6/2000	1132	syringe	--	5.3	--
WBM30F	ML	1	7/7/2000	1200	syringe	376	5.4	23.0
WBM30F	ML	2	7/7/2000	1200	syringe	--	--	--

Field Measurements			Redox Parameters					
Water temperature (ºC)	Oxygen, dissolved (mg/L)	Alkalinity as bicarbonate (mg/L as HCO_3)	Sulfide (mg/L)	Iron, total (mg/L)	Iron, ferrous (mg/L)	Methane (µg/L)	Duplicate methane (µg/L)	Site name
20.5	--	34	--	--	--	--	--	WB28C
20.3	0.1	--	0.02	24.2	25.1	5,190	4,950	WB28C.1
--	--	--	--	--	0.1	5,172	--	WB28C.1
--	--	--	--	0	0	--	--	WB28C.1
--	--	183	--	--	--	--	--	WB28C.1
--	0	--	.01	24.2	25.2	169	157	WB28C.2
24.3	1.1	15	.05	0.4	.3	83.8	86.7	WB28D
19.3	--	--	--	--	--	--	--	WB28D.1
--	--	31	--	--	--	131	140	WB28D.1
24.2	3.0	--	.18	.1	--	<28.6	<27.3	WB28F
--	--	--	--	0	--	--	--	WB28G
--	--	--	--	0	0	--	--	WB28G
26.1	--	--	--	--	--	10,500	10,300	WB30A
--	--	--	--	2.1	1.6	300	302	WB30A
27.5	--	209	--	--	1.2	1,940	2,060	WB30B
26.5	--	86	.01	24.9	23.0	533	521	WB30C
26.7	--	17	<.01	5.2	5.0	61.4	59.0	WB30D
--	--	--	--	--	--	--	--	WB30D
19.3	1.3	5	.01	<.02	0	<23.9	<26.6	WB30E
--	--	--	--	--	--	--	--	WB30E
25.5	--	850	.20	10.9	10.0	10,500	10,300	WBM30A
--	--	--	--	--	--	2,590	2,620	WBM30B
28.1	--	--	--	3.4	3.2	--	--	WBM30B
23.7	--	--	.19	3.7	3.9	2,940	2,990	WBM30C
28.9	0	--	--	11.9	11.9	--	--	WBM30D
21.0	.4	--	--	--	--	1,070	1,090	WBM30E
21.0	--	--	--	--	--	664	695	WBM30E
23.0	1.5	--	.27	2.0	2.1	264	262	WBM30F
--	.7	--	--	--	--	--	--	WBM30F

Appendix 2A. *Field measurements and redox-sensitive constituents for wells, piezometers, and multi-level monitoring systems in the West Branch Canal Creek study area, Aberdeen Proving Ground, Maryland, March 2000 through May 2001- Continued*

Site name	Sample device	Replicate	Collection date	Collection time	Sampling method	Field Measurements: Specific conductance (µS/cm)	Field Measurements: pH (standard units)	Field Measurements: Air temperature (°C)
Comprehensive Sampling Event (June - August 2000) - *Continued*								
WBM30G	ML	NR	7/5/2000	1500	peristaltic pump	348	4.8	15.8
WBM30G	ML	NR	7/5/2000	1530	peristaltic pump	--	--	--
WBT30A	T	NR	6/14/2000	1148	syringe	438	6.1	--
WBT30B	T	NR	6/16/2000	1355	syringe	1,100	6.3	--
WBT30C	T	NR	6/14/2000	1430	syringe	--	--	--
WBT30C	T	1	6/15/2000	--	syringe	--	--	--
WBT30C	T	2	6/15/2000	--	syringe	--	--	--
WBT30C	T	NR	6/16/2000	1400	syringe	669	6.2	--
WBT30C	T	NR	6/19/2000	--	syringe	--	--	--
WBT30C	T	NR	6/20/2000	--	syringe	--	--	--
WBT30D	T	NR	6/14/2000	1535	syringe	--	--	--
WBT30D	T	NR	6/15/2000	--	syringe	--	--	--
WBT30D	T	NR	6/19/2000	--	syringe	--	--	--
WBT30E	T	NR	6/15/2000	1030	syringe	--	--	--
WBT30E	T	NR	6/16/2000	1445	syringe	--	--	--
WBT30E	T	NR	6/19/2000	--	syringe	--	5.2	--
WBT30E	T	NR	6/23/2000	1125	syringe	447	--	--
WB31A	DP	NR	8/9/2000	920	syringe	146	5.8	26.8
WB31A	DP	NR	8/17/2000	--	syringe	--	--	--
WB31B	DP	NR	7/28/2000	1200	syringe	298	6.4	24.5
WB31B	DP	NR	8/9/2000	1000	syringe	--	--	--
WB31C	DP	1	7/28/2000	1050	syringe	867	5.2	--
WB31C	DP	2	7/28/2000	1050	syringe	--	--	--
WB31D	DP	1	7/28/2000	1030	syringe	161	5.7	--
WB31D	DP	2	7/28/2000	1030	syringe	--	--	--
WB31D	DP	1	8/9/2000	1115	syringe	161	5.7	--
WB31D	DP	2	8/9/2000	1115	syringe	--	--	--
WB31E	DP	NR	7/28/2000	850	syringe	955	5.3	--
WB32B	DP	NR	8/17/2000	840	syringe	464	5.9	--

Field Measurements			Redox Parameters					
Water temperature (ºC)	Oxygen, dissolved (mg/L)	Alkalinity as bicarbonate (mg/L as HCO_3)	Sulfide (mg/L)	Iron, total (mg/L)	Iron, ferrous (mg/L)	Methane (µg/L)	Duplicate methane (µg/L)	Site name
15.8	0.8	1	<0.01	0.1	0.1	<36.7	<33.7	WBM30G
--	--	--	--	--	--	--	--	WBM30G
22.8	--	93	--	.3	.3	2,100	2,130	WBT30A
22.7	--	--	--	3.5	4.0	3,330	3,180	WBT30B
--	--	--	.02	--	--	1,330	1,440	WBT30C
--	--	--	.02	24.9	10.6	--	--	WBT30C
--	--	--	.02	10.1	--	--	--	WBT30C
--	--	196	--	--	--	--	--	WBT30C
27.2	--	--	.02	--	24.4	--	--	WBT30C
--	--	--	.02	--	1.6	--	--	WBT30C
--	--	--	--	--	--	291	--	WBT30D
--	--	--	--	28.6	29.7	--	--	WBT30D
--	--	--	--	34.2	34.5	--	--	WBT30D
--	--	--	<.01	3.4	2.9	173	175	WBT30E
27.2	--	7	--	--	--	--	--	WBT30E
--	--	--	<.01	2.8	2.9	--	--	WBT30E
--	--	13	--	--	--	--	--	WBT30E
26.7	--	--	--	--	--	--	--	WB31A
--	--	--	--	.3	.2	--	--	WB31A
--	--	--	.05	.6	.5	<48.5	<46.6	WB31B
--	--	39	--	--	--	--	--	WB31B
22.5	3.3	9	.02	--	--	<37.0	<35.8	WB31C
--	--	--	.01	--	--	<36.0	--	WB31C
--	.7	--	<.01	--	--	<47.3	<59.8	WB31D
--	--	--	<.01	--	--	<42.2	--	WB31D
--	--	22	--	.5	.5	--	--	WB31D
--	--	--	--	.5	.6	--	--	WB31D
22.8	1.7	19	.06	<.02	<.02	<37.8	<33.8	WB31E
25.1	--	--	.05	.3	<.31	<46.5	<46.6	WB32B

Appendix 2A. *Field measurements and redox-sensitive constituents for wells, piezometers, and multi-level monitoring systems in the West Branch Canal Creek study area, Aberdeen Proving Ground, Maryland, March 2000 through May 2001- Continued*

Site name	Sample device	Replicate	Collection date	Collection time	Sampling method	Field Measurements: Specific conductance (µS/cm)	Field Measurements: pH (standard units)	Field Measurements: Air temperature (ºC)
Comprehensive Sampling Event (June - August 2000) - *Continued*								
WB33A	DP	NR	6/20/2000	1000	syringe	--	--	--
WB33A	DP	NR	6/23/2000	1545	syringe	472	5.2	28.8
WB33A	DP	NR	6/23/2000	--	syringe	--	--	--
WB33B	DP	1	6/19/2000	1100	peristaltic pump	657	3.9	23.0
WB33B	DP	2	6/19/2000	1100	peristaltic pump	--	--	--
WB33F	DP	NR	8/14/2000	1100	syringe	233	5.3	--
WB33Z	DP	NR	6/19/2000	1430	syringe	793	5.7	--
WB34A	DP	NR	6/19/2000	1400	syringe	706	6.0	26.4
WB34A	DP	NR	7/7/2000	1430	syringe	--	--	--
WB34A	DP	NR	8/9/2000	--	syringe	--	--	--
WB34B	DP	NR	6/16/2000	955	syringe	613	4.6	--
WB34B	DP	NR	6/21/2000	--	syringe	--	--	--
WB34C	DP	NR	8/4/2000	1055	syringe	385	4.1	--
WB34D	DP	NR	8/7/2000	1030	syringe	321	5.5	--
WB34E	DP	NR	8/7/2000	1330	syringe	91	5.3	--
WBM34A	ML	1	7/7/2000	930	syringe	1,280	6.5	28.4
WBM34A	ML	2	7/7/2000	930	syringe	1,280	6.5	28.4
WBM34B	ML	NR	7/7/2000	945	syringe	1,340	6.4	26.1
WBM34C	ML	NR	7/7/2000	1015	syringe	875	5.9	23.1
WBM34D	ML	NR	7/7/2000	1200	syringe	859	5.8	20.4
WBM34E	ML	NR	7/7/2000	1240	syringe	1,240	5.7	--
WBM34F	ML	NR	7/7/2000	1315	syringe	959	5.6	24.1
WBM34G	ML	1	7/7/2000	1345	syringe	852	5.7	22.6
WBM34G	ML	2	7/7/2000	1345	syringe	852	5.7	22.6
WBT34A	T	NR	6/21/2000	1225	syringe	--	--	--
WBT34B	T	NR	6/21/2000	1235	syringe	13	6.0	30.0
WBT34C	T	NR	6/27/2000	1615	syringe	--	--	32.5
WBT34D	T	NR	6/21/2000	1640	syringe	--	--	--
WBT34D	T	NR	6/23/2000	1205	syringe	890	5.6	26.8

Field Measurements			Redox Parameters					
Water temperature (ºC)	Oxygen, dissolved (mg/L)	Alkalinity as bicarbonate (mg/L as HCO_3)	Sulfide (mg/L)	Iron, total (mg/L)	Iron, ferrous (mg/L)	Methane (µg/L)	Duplicate methane (µg/L)	Site name
--	--	--	<0.01	--	--	127	143	WB33A
28.8	--	26	<.01	2.1	2.0	--	--	WB33A
--	--	--	<.01	2.9	2.4	--	--	WB33A
15.9	0.8	--	<.01	0	0	357	350	WB33B
--	.9	--	--	--	--	363	357	WB33B
24.1	--	--	--	--	--	<53.5	<43.4	WB33F
25.8	0	101	.52	43.8	46.9	97.3	96.4	WB33Z
26.4	--	--	.09	57.6	57.0	293	297	WB34A
--	--	161	--	--	--	--	--	WB34A
--	--	--	--	--	--	86.1	--	WB34A
29.9	1.0	--	.01	0	0.1	<48.3	<40.6	WB34B
--	1.0	--	.01	48.9	--	--	--	WB34B
19.4	.2	--	.15	0	0	<35.7	<36.0	WB34C
19.3	1.6	13	<.01	2.3	2.4	--	<33.8	WB34D
17.6	.1	17	.01	1.4	1.5	<34.9	<35.4	WB34E
28.4	--	312	.15	36.8	33.6	5,430	5,370	WBM34A
28.4	--	--	.15	--	35.8	--	--	WBM34A
26.1	--	235	.34	31.8	31.7	1,760	1,700	WBM34B
23.1	0	105	.15	35.0	--	1,550	1,610	WBM34C
20.4	--	58	.23	18.1	17.4	1,080	--	WBM34D
29.2	--	--	--	--	--	1,240	1,190	WBM34E
24.1	--	53	.08	16.9	16.2	2,050	2,040	WBM34F
22.6	--	89	.26	31.6	30.9	2,350	2,380	WBM34G
22.6	--	--	.26	--	33.8	--	--	WBM34G
--	--	--	--	--	--	1,370	1,390	WBT34A
30.0	--	137	<.01	--	47.8	1,330	--	WBT34B
--	--	--	--	50.2	53.3	270	279	WBT34C
--	--	--	--	--	38.9	205	219	WBT34D
26.8	--	71	--	39.1	--	<45.7	--	WBT34D

Appendix 2A. *Field measurements and redox-sensitive constituents for wells, piezometers, and multi-level monitoring systems in the West Branch Canal Creek study area, Aberdeen Proving Ground, Maryland, March 2000 through May 2001- Continued*

Site name	Sample device	Replicate	Collection date	Collection time	Sampling method	Field Measurements: Specific conductance (µS/cm)	Field Measurements: pH (standard units)	Field Measurements: Air temperature (ºC)
Comprehensive Sampling Event (June - August 2000) - *Continued*								
WBT34E	T	NR	6/22/2000	1450	syringe	743	5.2	31.0
WBT34E	T	NR	6/27/2000	1350	syringe	--	--	--
WB35A	DP	1	6/19/2000	1345	syringe	385	4.7	23.4
WB35A	DP	2	6/19/2000	1345	syringe	--	--	--
WB35A	DP	NR	6/27/2000	--	syringe	--	--	--
WB35B	DP	NR	6/16/2000	1400	syringe	405	4.1	29.0
WB35C	DP	1	6/16/2000	1125	syringe	386	4.1	26.0
WB35C	DP, BL	2	6/16/2000	1125	syringe	--	--	--
WB35C.1	DP	NR	8/8/2000	1030	peristaltic pump	--	--	--
WB35C.1	DP	NR	8/9/2000	--	peristaltic pump	392	4.2	30.0
WB35D	DP	1	8/9/2000	1200	syringe	384	4.2	--
WB35D	DP	2	8/9/2000	1200	syringe	--	--	--
WB35E	DP	NR	6/20/2000	1145	peristaltic pump	304	4.1	19.1
WB35F	DP	NR	8/8/2000	--	syringe	--	--	--
WB35F	DP	1	8/11/2000	915	syringe	92	5.7	--
WB35F	DP	2	8/11/2000	915	syringe	--	--	--
WB36A	DP	NR	6/20/2000	1100	syringe	--	--	--
WB36A	DP	NR	6/28/2000	--	syringe	368	4.9	--
WB36B	DP	NR	6/20/2000	945	syringe	389	5.2	27.1
WB36B	DP	NR	6/27/2000	1000	syringe	--	--	--
WB36C	DP	NR	6/20/2000	1000	syringe	258	4.4	--
WB36D	DP	NR	8/3/2000	1145	syringe	309	4.5	--
WB36D	DP	1	8/8/2000	1200	peristaltic pump	320	4.3	31.0
WB36D	DP	2	8/8/2000	1200	syringe	--	--	--
WB36E	DP	NR	8/3/2000	1500	syringe	363	4.2	--
WB36F	DP	1	8/4/2000	1100	peristaltic pump	131	5.8	--
WB36F	DP	2	8/4/2000	1100	peristaltic pump	--	--	--
WB36F	DP	1	8/8/2000	1000	peristaltic pump	123	5.6	17.7
WB36F	DP	2	8/8/2000	1000	peristaltic pump	--	--	--

Field Measurements			Redox Parameters					
Water temperature (ºC)	Oxygen, dissolved (mg/L)	Alkalinity as bicarbonate (mg/L as HCO_3)	Sulfide (mg/L)	Iron, total (mg/L)	Iron, ferrous (mg/L)	Methane (µg/L)	Duplicate methane (µg/L)	Site name
31.0	--	--	--	5.7	5.4	<42.8	<48.2	WBT34E
--	--	12	--	--	--	--	--	WBT34E
23.4	--	6	0.78	0.3	0.3	139	141	WB35A
--	--	--	.72	--	--	--	--	WB35A
--	--	--	.72	2.8	2.8	--	--	WB35A
29.0	--	--	.42	5.5	6.3	<41.0	<45.2	WB35B
18.9	1.6	--	.03	0	.1	<71.2	<42.6	WB35C
--	--	--	--	0	0	<54.2	<39.8	WB35C
--	0.2	--	.03	--	--	<75.3	<78.8	WB35C.1
18.4	.2	--	.03	1.7	1.9	--	--	WB35C.1
17.8	.5	--	<.01	.1	.1	<75.3	<80.7	WB35D
--	--	--	--	--	--	<70.1	<74.1	WB35D
19.8	1.7	--	<.01	.1	0	<40.4	<36.1	WB35E
--	--	--	--	.4	.4	<75.0	<71.5	WB35F
19.8	--	22	--	.5	.5	<29.1	<24.7	WB35F
--	--	17	--	--	--	--	--	WB35F
--	--	1	.07	1.7	1.4	<46.2	<50.8	WB36A
25.2	--	--	.07	7.8	8.0	--	--	WB36A
27.1	--	36	<.01	9.3	8.6	<49.7	<46.6	WB36B
--	--	--	--	--	--	--	--	WB36B
20.5	1.0	--	<.01	<.02	<.02	<50.5	<47.9	WB36C
23.5	.3	--	.19	--	--	--	--	WB36D
17.3	4.8	--	.21	--	--	<36.1	<37.7	WB36D
--	--	--	.19	.1	.1	--	--	WB36D
20.0	.7	--	.72	.7	.7	<27.4	<26.5	WB36E
16.7	.2	20	.15	1.4	1.4	47.9	47.4	WB36F
--	.2	22	--	--	--	--	--	WB36F
31.0	.1	25	.25	--	--	--	--	WB36F
--	.1	--	--	--	--	--	--	WB36F

Appendix 2A. *Field measurements and redox-sensitive constituents for wells, piezometers, and multi-level monitoring systems in the West Branch Canal Creek study area, Aberdeen Proving Ground, Maryland, March 2000 through May 2001- Continued*

Site name	Sample device	Replicate	Collection date	Collection time	Sampling method	Field Measurements: Specific conductance (µS/cm)	Field Measurements: pH (standard units)	Field Measurements: Air temperature (ºC)
Comprehensive Sampling Event (June - August 2000) - *Continued*								
WB36G	DP	1	8/7/2000	1130	peristaltic pump	180	5.7	17.9
WB36G	DP	2	8/7/2000	1130	peristaltic pump	--	--	--
WBM36A	ML	NR	7/6/2000	1600	syringe	668	6.3	27.2
WBM36B	ML	NR	7/5/2000	1430	syringe	376	5.9	27.8
WBM36C	ML	NR	7/6/2000	1700	syringe	387	6.4	23.5
WBM36D	ML	NR	7/6/2000	1710	syringe	446	5.9	26.4
WBM36E	ML	NR	7/6/2000	1745	syringe	460	6.0	22.5
WBM36F	ML	NR	7/7/2000	--	syringe	536	6.1	23.4
WBM36G	ML	NR	7/5/2000	1600	syringe	346	4.5	17.4
WBT36B	T	NR	6/22/2000	1500	syringe	346	4.2	30.0
WBT36B	T	1	6/27/2000	1430	syringe	--	--	--
WBT36B	T	2	6/27/2000	1430	syringe	--	--	--
WBT36C	T	NR	6/22/2000	1505	syringe	346	4.0	28.5
WBT36C	T	NR	6/29/2000	1400	syringe	--	--	--
WBT36D	T	NR	6/22/2000	1515	syringe	352	4.7	31.1
WBT36D	T	NR	6/26/2000	--	syringe	--	--	--
WBT36D	T	NR	6/27/2000	--	syringe	--	--	--
WBT36E	T	NR	6/22/2000	1520	syringe	--	--	--
WBT36F	T	NR	6/22/2000	1525	syringe	333	5.1	28.4
WBT36F	T	NR	6/28/2000	--	syringe	--	--	--
WBT36F	T	NR	6/29/2000	1500	syringe	--	--	--
WBT36G	T	NR	6/22/2000	1530	syringe	356	5.4	27.2
WBT36G	T	NR	6/28/2000	1040	syringe	--	--	--
WBT36H	T	NR	6/27/2000	1135	syringe	395	4.9	26.4
WB37B	DP	NR	8/3/2000	915	syringe	199	6.3	--
WB37B	DP	NR	8/7/2000	--	syringe	--	--	--
WB37B	DP	NR	8/8/2000	930	syringe	--	--	--
WB37B.1	DP	1	8/3/2000	950	syringe	502	5.9	--
WB37B.1	DP	2	8/3/2000	950	syringe	--	--	--

Field Measurements			Redox Parameters					
Water temperature (ºC)	Oxygen, dissolved (mg/L)	Alkalinity as bicarbonate (mg/L as HCO_3)	Sulfide (mg/L)	Iron, total (mg/L)	Iron, ferrous (mg/L)	Methane (µg/L)	Duplicate methane (µg/L)	Site name
--	0.6	22	0.11	0.5	0.6	<37.5	<43.3	WB36G
--	.6	18	--	--	--	--	--	WB36G
27.2	--	246	.35	2.3	2.6	6,170	5,980	WBM36A
27.8	--	--	--	--	--	2,080	2,100	WBM36B
23.5	--	--	--	--	--	1,780	1,770	WBM36C
26.4	--	--	--	--	2.2	1,040	1,100	WBM36D
22.5	--	--	--	--	--	911	943	WBM36E
23.4	--	--	--	4.7	4.1	808	770	WBM36F
17.4	.9	--	.01	.4	.4	109	108	WBM36G
30.0	--	--	<.01	--	--	<49.5	<47.1	WBT36B
--	--	2	--	.9	.9	--	--	WBT36B
--	--	--	--	1.1	1.0	--	--	WBT36B
28.5	--	--	<.01	--	--	--	--	WBT36C
--	--	1	--	.1	.1	--	--	WBT36C
31.1	--	--	<.01	--	--	--	--	WBT36D
--	--	--	--	3.0	2.7	--	--	WBT36D
--	--	5	--	--	--	--	--	WBT36D
--	--	--	--	--	--	115	--	WBT36E
28.4	--	--	.02	--	--	<61.7	<53.5	WBT36F
--	--	--	--	10.7	10.1	--	--	WBT36F
--	--	19	--	--	--	--	--	WBT36F
27.2	--	--	.03	--	--	<50.9	<55.3	WBT36G
--	--	24	--	12.1	12.0	--	--	WBT36G
26.4	--	17	.01	20.5	20.1	<42.8	<42.3	WBT36H
--	--	--	--	--	--	--	--	WB37B
--	--	--	<.01	2.9	2.6	--	--	WB37B
--	--	81	--	--	--	--	--	WB37B
24.9	0	112	.33	12.4	12.6	2,510	2,870	WB37B.1
--	--	--	.28	--	--	2,620	--	WB37B.1

Appendix 2A. *Field measurements and redox-sensitive constituents for wells, piezometers, and multi-level monitoring systems in the West Branch Canal Creek study area, Aberdeen Proving Ground, Maryland, March 2000 through May 2001- Continued*

Site name	Sample device	Replicate	Collection date	Collection time	Sampling method	Field Measurements: Specific conductance (µS/cm)	Field Measurements: pH (standard units)	Field Measurements: Air temperature (ºC)
Comprehensive Sampling Event (June - August 2000) - *Continued*								
WB37C	DP	NR	8/1/2000	1045	syringe	450	5.0	--
WB37C.1	DP	NR	8/9/2000	1430	syringe	445	5.2	--
WB37D	DP	NR	8/8/2000	945	syringe	910	5.4	--
Comprehensive Sampling Event Field Blank								
After WB19A	DP	NR	7/13/2000	1330	syringe	--	--	--
May 2001 Sampling Event								
WB41A	DP1	NR	5/17/2001	1415	syringe	1,880	6.5	21.1
WB41A	DP1	NR	5/23/2001	--	syringe	--	--	--
WB41B	DP1	NR	5/17/2001	1440	syringe	1,820	6.5	21.1
WB41C	DP1	NR	5/17/2001	1015	peristaltic pump	617	4.9	21.1
WB41D	DP1	NR	5/17/2001	1030	peristaltic pump	905	4.6	21.1
WB41E	DP1	1	5/17/2001	1100	peristaltic pump	1,110	4.7	21.1
WB41E	DP1	2	5/17/2001	1100	peristaltic pump	1,110	4.7	21.1
WB42A	DP1	NR	5/17/2001	1430	syringe	1,600	6.4	21.1
WB42B	DP1	NR	5/17/2001	1445	syringe	620	6.5	21.1
WB42B	DP1	1	5/23/2001	950	syringe	--	--	--
WB42B	DP1	2	5/23/2001	950	syringe	--	--	--
WB42C	DP1	NR	5/16/2001	1310	peristaltic pump	534	5.0	24.9
WB42D	DP1	NR	5/16/2001	1350	peristaltic pump	423	4.7	24.9
WB42E	DP1	1	5/16/2001	1350	peristaltic pump	459	4.7	24.9
WB42F	DP1	2	5/16/2001	1350	peristaltic pump	469	4.5	22.8
WB42F	DP1	3	5/16/2001	1350	peristaltic pump	469	4.5	24.9
WB43A	DP1	NR	5/18/2001	1000	peristaltic pump	284	4.2	15.0
WB43B	DP1	1	5/18/2001	1030	peristaltic pump	828	4.1	15.0
WB43B	DP1	2	5/18/2001	1030	peristaltic pump	828	4.1	15.0

Field Measurements			Redox Parameters					
Water temperature (ºC)	Oxygen, dissolved (mg/L)	Alkalinity as bicarbonate (mg/L as HCO_3)	Sulfide (mg/L)	Iron, total (mg/L)	Iron, ferrous (mg/L)	Methane (µg/L)	Duplicate methane (µg/L)	Site name
23.8	0.3	--	0.07	0.7	0.6	<24.4	<25.3	WB37C
22.1	--	15	.02	2.5	.5	<78.8	<92.4	WB37C.1
20.1	--	9	<.01	11.0	11.3	<59.3	<43.7	WB37D
--	--	--	--	.1	0	<40.4	<36.9	After WB19A
15.6	--	381	.05	--	.1	--	--	WB41A
--	--	--	--	.3	.3	--	--	WB41A
15.3	--	466	--	--	1.9	8,190	8,430	WB41B
13.9	1.5	9	.03	.2	.2	<25.8	<27.2	WB41C
14.3	1.3	--	.04	.1	.1	<26.6	<25.8	WB41D
14.5	1.0	2	.01	.1	.1	<25.7	<27.2	WB41E
14.5	1.1	--	.02	0	0	<27.5	<29.7	WB41E
21.6	--	354	<.01	.4	.3	2,250	2,320	WB42A
18.6	--	278	.02	0	0	1,590	1,600	WB42B
--	--	--	--	0	0	--	--	WB42B
--	--	--	--	--	0	--	--	WB42B
16.1	.7	7	.05	.5	--	47.3	45.0	WB42C
15.6	1.8	15	.05	.1	.1	<25.8	<26.9	WB42D
17.0	1.9	6	.08	.3	.3	<26.0	<26.6	WB42E
16.0	--	--	.03	.2	.2	<30.4	<25.3	WB42F
16.0	2.1	--	.03	.1	.1	<26.6	<23.7	WB42F
12.7	.6	--	.01	0	0	<24.8	<25.3	WB43A
12.5	2.2	--	<.01	--	--	<22.1	<23.2	WB43B
12.5	.7	--	<.01	0	0	<25.7	<20.3	WB43B

Appendix 2A. *Field measurements and redox-sensitive constituents for wells, piezometers, and multi-level monitoring systems in the West Branch Canal Creek study area, Aberdeen Proving Ground, Maryland, March 2000 through May 2001- Continued*

Site name	Sample device	Replicate	Collection date	Collection time	Sampling method	Field Measurements: Specific conductance (µS/cm)	Field Measurements: pH (standard units)	Field Measurements: Air temperature (ºC)
Comprehensive Sampling Event (May 2001) - *Continued*								
WB43C	DP1	NR	5/18/2001	1210	peristaltic pump	823	4.0	15.6
WB43D	DP1	NR	5/18/2001	1230	peristaltic pump	715	4.2	15.6
WB44A	DP1	1	5/18/2001	1400	peristaltic pump	940	4.4	16.1
WB44A	DP1	2	5/18/2001	1400	peristaltic pump	--	--	--

Field Measurements			Redox Parameters					
Water temperature (ºC)	Oxygen, dissolved (mg/L)	Alkalinity as bicarbonate (mg/L as HCO_3)	Sulfide (mg/L)	Iron, total (mg/L)	Iron, ferrous (mg/L)	Methane (µg/L)	Duplicate methane (µg/L)	Site name
12.0	0.8	--	<0.01	0	0	<26.0	<26.8	WB43C
13.5	1.1	--	.11	0	0	<23.8	<25.6	WB43D
14.8	.2	--	.43	0	0	56.6	58.2	WB44A
--	--	--	.30	--	--	--	55.8	WB44A

Appendix 2B. *Inorganic ground-water constituents for wells, piezometers, and multi-level monitoring systems in the West Branch Canal Creek study area, Aberdeen Proving Ground, Maryland, March 2000 through May 2001*

[mg/L, milligrams per liter; µg/L, micrograms per liter; BL, blind sample; EV, estimated value; --, no data; <, less than; DP, 0.75-inch drive-point piezometer; DP1, 1-inch supplemental piezometers; ML, multi-level monitoring system; $NO_2 + NO_3$, nitrite plus nitrate; NR, no replicate; T, 0.25-inch inverted-screen piezometer.
Note: pressure transducers were installed in wells ending in ".1"]

Site name	Sample device	Replicate	Collection date	Collection time	Calcium, dissolved (mg/L as Ca)	Magnesium, dissolved (mg/L as Mg)	Sodium, dissolved (mg/L as Na)	Potassium, dissolved (mg/L as K)	Sulfate, dissolved (mg/L as SO_4)
				March - April 2000 Sampling Event					
WB19B	DP	NR	3/8/2000	1100	3.2	6.9	33	2	3.2
WB19E	DP	NR	3/8/2000	1000	3.1	3.6	8.4	1	25
WB23D	DP	NR	3/12/2000	1000	7.1	3.0	33	2	110
WBM23B	ML	NR	3/11/2000	1015	42	18	90	3	190
WBM23C	ML	NR	3/13/2000	1000	1.6	1.2	3.9	1	15
WBM23D	ML	NR	3/12/2000	900	2.9	6.3	85	1	320
WB24B	DP	NR	3/14/2000	1431	2.2	4.2	40	0.4	2.6
WB24E	DP	NR	3/15/2000	900	5.1	2.6	22	1	84
WB24G	DP	NR	3/10/2000	1615	44	18	87	3	190
WBM24A	ML	NR	3/11/2000	1330	3.7	4.4	52	1	130
WBM24A	ML	NR	3/13/2000	1515	16	11	64	2	52
WBM24A	ML	NR	3/22/2000	930	3.7	6.8	44	2	170
WBM24B	ML	NR	3/11/2000	1600	9.0	4.2	39	2	120
WBM24B	ML	NR	3/13/2000	1530	9.7	17	96	2	42
WBM24C	ML	NR	3/11/2000	1440	8.5	3.5	37	2	120
WBM24D	ML	NR	3/16/2000	1145	5.4	6.1	75	3	220
WBM24E	ML	NR	3/14/2000	900	--	--	--	--	110
WBM24F	ML	NR	3/14/2000	1030	5.8	2.8	20	2	73
WBM24G	ML	NR	3/14/2000	1241	8.2	4.1	33	2	120
WB26A	DP	NR	3/8/2000	1300	15	29	160	2	22
WB26B	DP	NR	3/10/2000	1400	8.0	13	170	3	1.5
WB26C	DP	NR	3/8/2000	1540	2.5	4.6	45	4	5.4
WB26D	DP	NR	3/10/2000	1300	6.2	11	49	5	120
WB26E	DP	NR	3/10/2000	1330	26	14	92	3	150
WB26F	DP	1	3/9/2000	1315	15	6.8	65	2	92

Chloride, dissolved (mg/L as Cl)	Fluoride, dissolved (mg/L as F)	Bromide, dissolved (mg/L as Br)	Silica, dissolved (mg/L as SiO_2)	$NO_2 + NO_3$, dissolved (mg/L as N)	Nitrogen, ammonia (mg/L as N)	Nitrogen, ammonia + organic (mg/L as N)	Iron, dissolved (µg/L as Fe)	Manganese, dissolved (µg/L as Mn)	Site name
76	<0.1	0.07	28	--	--	--	6,700	320	WB19B
38	<.1	.09	4.4	--	--	--	<10	45	WB19E
72	.1	.10	5.3	--	--	--	<10	210	WB23D
150	.1	.21	15	--	--	--	2,000	660	WBM23B
13	<.1	<.01	2.5	--	--	--	50	33	WBM23C
100	<.1	.17	37	--	--	--	17,000	170	WBM23D
98	<.1	.09	12	--	--	--	2,400	130	WB24B
40	<.1	.05	5.6	--	--	--	120	220	WB24E
140	.2	.14	16	--	--	--	1,900	690	WB24G
87	.2	.13	7.9	--	--	--	2,300	130	WBM24A
120	.3	.06	9.6	--	--	--	600	290	WBM24A
68	.2	.04	11	--	--	--	20	170	WBM24A
84	.2	.11	6.0	--	--	--	40	270	WBM24B
140	.3	.10	15	--	--	--	180	250	WBM24B
82	.2	.10	5.0	--	--	--	<10	230	WBM24C
66	<.1	.42	34	--	--	--	21,000	140	WBM24D
50	<.1	.11	--	--	--	--	--	--	WBM24E
44	<.1	.05	5.7	--	--	--	80	250	WBM24F
65	.3	.07	5.9	--	--	--	90	310	WBM24G
440	.1	1.08	14	--	--	--	1,400	590	WB26A
410	.2	.85	23	--	--	--	540	350	WB26B
100	.1	.06	19	--	--	--	300	130	WB26C
120	<.1	.15	7.9	--	--	--	1,400	280	WB26D
120	<.1	.14	14	--	--	--	30	1,600	WB26E
83	<.1	.10	15	--	--	--	70	530	WB26F

Appendix 2B. *Inorganic ground-water constituents for wells, piezometers, and multi-level monitoring systems in the West Branch Canal Creek study area, Aberdeen Proving Ground, Maryland, March 2000 through May 2001- Continued*

Site name	Sample device	Replicate	Collection date	Collection time	Calcium, dissolved (mg/L as Ca)	Magnesium, dissolved (mg/L as Mg)	Sodium, dissolved (mg/L as Na)	Potassium, dissolved (mg/L as K)	Sulfate, dissolved (mg/L as SO_4)
March - April 2000 Sampling Event-*Continued*									
WB26F	DP, BL	2	3/9/2000	1315	7.6	3.6	33	2	94
WBM26A	ML	NR	3/9/2000	1315	14	6.2	36	2	100
WBM26A	ML, BL	NR	3/22/2000	1400	10	4.5	35	2	100
WBM26B	ML	NR	3/10/2000	930	--	--	--	--	110
WBM26C	ML	NR	3/10/2000	1000	5.3	3.1	41	2	95
WBM26D	ML	NR	3/10/2000	1110	--	--	--	--	150
WBM26G	ML	NR	3/10/2000	1400	8.3	3.8	35	2	100
WB30A	DP	NR	3/16/2000	1300	--	--	--	--	12
WB30C	DP	NR	3/31/2000	1255	--	--	--	--	17
WB30D	DP	NR	3/9/2000	1010	1.2	2.4	22	1	35
WB30E	DP	NR	3/13/2000	1300	8.0	15	51	2	160
WBM30A	ML	NR	3/12/2000	1200	29	25	250	11	1.0
WBM30E	ML	NR	3/13/2000	1530	--	--	--	--	280
WBM30F	ML	NR	3/12/2000	1500	4.3	2.1	74	1	86
WBM30G	ML	NR	3/13/2000	1020	5.4	2.8	21	1	74
WB33A	DP	NR	3/22/2000	1000	10	12	170	3	30
WB33B	DP	1	3/20/2000	1645	8.6	5.1	27	3	130
WB33B	DP, BL	2	3/20/2000	1645	8.7	5.1	27	3	130
WB33G	DP	NR	3/22/2000	1200	5.8	8.8	40	1	140
WB34C	DP	NR	3/22/2000	900	--	--	--	--	22
WBM34C	ML	NR	3/15/2000	1014	12	25	110	2	190
WBM34D	ML	NR	3/15/2000	1050	3.6	7.5	69	2	140
WBM34E	ML	NR	3/15/2000	1110	5.8	11	210	2	350
WBT34D	T, BL	NR	3/22/2000	1405	--	--	--	--	1.6
WB35A	DP	NR	3/22/2000	900	5.2	3.2	12	2	63
WB35B	DP	NR	3/20/2000	1530	7.0	3.9	15	2	110
WB35C	DP	1	3/20/2000	1500	6.7	3.4	13	2	100
WB35C	DP	2	3/20/2000	1500	14	6.9	29	2	110
WB35E	DP	1	3/22/2000	1100	5.0	2.6	15	1	80
WB35E	DP	2	3/22/2000	1100	4.5	2.4	15	1	75

Chloride, dissolved (mg/L as Cl)	Fluoride, dissolved (mg/L as F)	Bromide, dissolved (mg/L as Br)	Silica, dissolved (mg/L as SiO_2)	$NO_2 + NO_3$, dissolved (mg/L as N)	Nitrogen, ammonia (mg/L as N)	Nitrogen, ammonia + organic (mg/L as N)	Iron, dissolved (µg/L as Fe)	Manganese, dissolved (µg/L as Mn)	Site name
82	<0.1	0.11	6.4	--	--	--	40	290	WB26F
86	.1	.12	7.4	--	--	--	470	370	WBM26A
87	.1	.10	6.6	--	--	--	170	320	WBM26A
90	.2	.08	--	--	--	--	--	--	WBM26B
93	.1	.10	13	--	--	--	420	210	WBM26C
91	.6	.07	--	--	--	--	--	--	WBM26D
86	.1	.10	6.3	--	--	--	50	300	WBM26G
250	<.1	.90	--	--	--	--	--	--	WB30A
68	<.1	.06	--	--	--	--	--	--	WB30C
56	<.1	.07	5.0	--	--	--	1,200	110	WB30D
190	<.1	.24	9.5	--	--	--	21,000	720	WB30E
580	.3	1.53	18	--	--	--	7,500	1,300	WBM30A
89	<.1	.14	--	--	--	--	--	--	WBM30E
51	.1	.13	12	--	--	--	2,500	210	WBM30F
46	<.1	.06	5.4	--	--	--	70	250	WBM30G
270	.4	.66	33	--	--	--	3,400	370	WB33A
84	<.1	.05	19	--	--	--	20	140	WB33B
83	<.1	.04	19	--	--	--	30	140	WB33B
130	<.1	.58	7.8	--	--	--	14,000	430	WB33G
110	<.1	.21	--	--	--	--	--	--	WB34C
120	<.1	.17	43	--	--	--	33,000	430	WBM34C
160	<.1	.67	21	--	--	--	11,000	180	WBM34D
130	<.1	1.07	98	--	--	--	20,000	520	WBM34E
390	.2	.66	--	--	--	--	--	--	WBT34D
32	.5	.04	9.6	--	--	--	110	340	WB35A
39	.6	.04	14	--	--	--	1,200	400	WB35B
36	.1	.02	14	--	--	--	20	230	WB35C
39	.2	.04	31	--	--	--	60	460	WB35C
41	.1	.04	11	--	--	--	<10	210	WB35E
39	.2	.04	11	--	--	--	<10	190	WB35E

Appendix 2B. *Inorganic ground-water constituents for wells, piezometers, and multi-level monitoring systems in the West Branch Canal Creek study area, Aberdeen Proving Ground, Maryland, March 2000 through May 2001- Continued*

Site name	Sample device	Replicate	Collection date	Collection time	Calcium, dissolved (mg/L as Ca)	Magnesium, dissolved (mg/L as Mg)	Sodium, dissolved (mg/L as Na)	Potassium, dissolved (mg/L as K)	Sulfate, dissolved (mg/L as SO_4)
March - April 2000 Sampling Event-*Continued*									
WB35E	DP, BL	3	3/22/2000	1100	4.5	2.4	15	1	75
WB35E	DP	NR	3/22/2000	1200	7.0	3.3	25	2	84
WB36B	DP	NR	3/20/2000	1115	6.4	4.1	14	2	83
WB36C	DP	NR	3/20/2000	1130	4.2	2.4	34	1	36
WBM36E	ML	NR	3/16/2000	1630	--	--	--	--	110
WBM36F	ML	NR	3/16/2000	1400	--	--	--	--	130
WBM36G	ML	NR	3/16/2000	1545	10	5.5	36	2	82
March - April 2000 Field Blanks									
After WBM24C	ML, BL	NR	3/11/2000	1440	8.46	<0.1	<0.1	<0.2	<0.3
After WB33B	DP, BL	NR	3/20/2000	1800	0.04	.01	.1	<.2	<.3
After WB35C	DP, BL	NR	3/20/2000	1530	.01	<.01	<.1	<.2	<.3
Comprehensive Sampling Event (June - August 2000)									
WB19A	DP	NR	7/14/2000	900	8.9	11	100	.8	.5
WB19B	DP	NR	6/13/2000	900	15	6.6	67	2	3.0
WB19D	DP	NR	7/13/2000	1500	8.1	5.3	21	2	22
WB19E	DP	NR	6/13/2000	930	6.6	6.8	18	2	27
WB20A	DP	NR	8/11/2000	1100	4.5	0.2	1,060	.1	430
WB20B	DP	NR	8/11/2000	1330	7.8	3.3	15	1	41
WB21A	DP	NR	7/17/2000	1350	9.5	6.7	100	.5	5.6
WB21D	DP	NR	8/1/2000	1430	20	9.6	80	2	140
WB21E	DP	NR	8/1/2000	1330	15	7.4	62	2	100
WB21F	DP	NR	8/10/2000	1100	4.9	2.2	17	2	12
WB21G	DP	1	7/31/2000	1135	5.8	2.9	41	1	32
WB21G	DP	2	7/31/2000	1135	5.7	2.8	42	1	32
WB22A	DP, BL	NR	7/17/2000	1410	.0	.0	.2 EV	<.2	<.3
WB22B	DP	NR	7/17/2000	1450	20	9.0	50	2	140
WB22B	DP	NR	8/1/2000	1130	2.0	4.1	36	2	49

Chloride, dissolved (mg/L as Cl)	Fluoride, dissolved (mg/L as F)	Bromide, dissolved (mg/L as Br)	Silica, dissolved (mg/L as SiO_2)	$NO_2 + NO_3$, dissolved (mg/L as N)	Nitrogen, ammonia (mg/L as N)	Nitrogen, ammonia + organic (mg/L as N)	Iron, dissolved (µg/L as Fe)	Manganese, dissolved (µg/L as Mn)	Site name
38	0.2	0.04	11	--	--	--	<10	190	WB35E
56	<.1	.04	5.5	--	--	--	<10	270	WB35E
39	<.1	<.01	15	--	--	--	1,500	350	WB36B
43	<.1	.04	11	--	--	--	30	250	WB36C
47	<.1	.04	--	--	--	--	--	--	WBM36E
48	<.1	.05	--	--	--	--	--	--	WBM36F
47	.2	.04	20	--	--	--	620	460	WBM36G
<0.3	<.1	<.01	0.2	--	--	--	<10	<2	After WBM24C
<.3	<.1	<.01	.1	--	--	--	30	51	After WB33B
<.3	<.1	<.01	1.6	--	--	--	<10	<2	After WB35C
140	.2	.58	32	--	--	--	15,000	550	WB19A
72	--	.13	12	0.03 EV	2.7	3.1	40	540	WB19B
38	<.1	.11	10	--	--	--	30 EV	90	WB19D
37	--	.08	8.0	.51	<0.03	<0.10	<10	92	WB19E
630	3.7	.44	210	--	--	--	480	14	WB20A
8.0	.2	.01	23	--	--	--	10	210	WB20B
110	.1	.16	19	--	--	--	8,700	580	WB21A
74	<.1	.07	11	--	--	--	580	1,400	WB21D
68	.1	.08	10	--	--	--	330	490	WB21E
17	.6	.02	8.7	--	--	--	7400	300	WB21F
61	<.1	.05	10	--	--	--	830	670	WB21G
62	<.1	.05	9.8	--	--	--	820	660	WB21G
<.3	.1	.04	.1 E	--	--	--	100	6.8	WB22A
63	<.1	1.19	11	--	--	--	47,000	1,300	WB22B
43	<.1	.34	7.7	--	--	--	11,000	270	WB22B

Appendix 2B. *Inorganic ground-water constituents for wells, piezometers, and multi-level monitoring systems in the West Branch Canal Creek study area, Aberdeen Proving Ground, Maryland, March 2000 through May 2001- Continued*

Site name	Sample device	Replicate	Collection date	Collection time	Calcium, dissolved (mg/L as Ca)	Magnesium, dissolved (mg/L as Mg)	Sodium, dissolved (mg/L as Na)	Potassium, dissolved (mg/L as K)	Sulfate, dissolved (mg/L as SO_4)
Comprehensive Sampling Event (June - August 2000)-*Continued*									
WB22C	DP	NR	7/17/2000	1430	19	9.0	98	2	180
WB22C	DP	NR	8/1/2000	1330	16	6.9	59	2	95
WB22D	DP	NR	8/1/2000	1500	14	6.2	60	2	91
WB22E	DP	NR	8/3/2000	1115	26	12	61	2	130
WB23D	DP	1	6/20/2000	1500	15	6.4	73	1	110
WB23D	DP, BL	2	6/20/2000	1500	16	6.6	75	2	110
WB23E	DP	NR	7/18/2000	1315	11	6.5	64	2	85
WB23F	DP	1	7/19/2000	1400	11	6.0	57	2	18
WB23F	DP	2	7/19/2000	1400	12	6.7	59	2	100
WBM23A	ML	NR	6/29/2000	1545	94	33	170	3	130
WBM23B	ML	NR	6/29/2000	1330	90	34	170	3	58
WBM23C	ML	NR	7/6/2000	1010	31	24	250	2	34
WBM23C	ML	NR	7/7/2000	1330	11	20	85	2	25
WBM23D	ML	NR	7/6/2000	1140	7.0	8.9	140	1	180
WBM23F	ML	1	6/29/2000	1350	18	8.4	84	<0.2	--
WBM23F	ML, BL	2	6/29/2000	1350	18	8.4	86	2	130
WBM23G	ML	NR	6/29/2000	1500	19	7.6	84	2	130
WB24B	DP	1	6/15/2000	1500	--	--	--	--	--
WB24B	DP, BL	2	6/15/2000	1500	--	--	--	--	--
WB24C.1	DP	NR	7/14/2000	1145	--	--	--	<.2	25
WB24E	DP	NR	6/23/2000	1700	9.5	4.5	37	1	75
WBM24A	ML	NR	6/28/2000	1200	60	36	160	3	21
WBM24D	ML	NR	6/29/2000	1130	11	12	140	2	170
WBM24E	ML	NR	6/28/2000	1345	7.5	6.4	79	1	97
WBM24F	ML	NR	6/28/2000	1545	11	5.3	42	1	80
WB25A	DP, BL	NR	7/18/2000	1050	58.9	42.2	190	3	1.4
WB25B	DP	NR	7/18/2000	1300	19	7.7	81	2	130
WB25C	DP	1	7/28/2000	1415	15	7.0	68	2	110
WB25C	DP	2	7/28/2000	1415	15	6.9	65	2	110
WB25C.1	DP	NR	7/28/2000	1300	31	40	170	2	2.1

Chloride, dissolved (mg/L as Cl)	Fluoride, dissolved (mg/L as F)	Bromide, dissolved (mg/L as Br)	Silica, dissolved (mg/L as SiO_2)	$NO_2 + NO_3$, dissolved (mg/L as N)	Nitrogen, ammonia (mg/L as N)	Nitrogen, ammonia + organic (mg/L as N)	Iron, dissolved (µg/L as Fe)	Manganese, dissolved (µg/L as Mn)	Site name
87	0.2	0.15	12	--	--	--	66	770	WB22C
74	.1	.21	13	--	--	--	6,100	760	WB22C
61	.1	.07	12	--	--	--	40	490	WB22D
71	.1	.09	14	--	--	--	7.3	1,000	WB22E
80	--	.10	10	1.4	0.02 EV	<0.10	10	450	WB23D
79	--	.10	10	1.4	<.03	.06 EV	<10	470	WB23D
68	<.1	.09	10	--	--	--	35	400	WB23E
9.0	<.1	--	12	--	--	--	950	420	WB23F
48	<.1	.07	13	--	--	--	920	460	WB23F
80	.3	.09	37	--	--	--	4,100	1,300	WBM23A
160	.2	.61	41	--	--	--	1,000	1,300	WBM23B
180	.3	.87	55	--	--	--	6,200	820	WBM23C
110	.2	.25	23	--	--	--	3,200	280	WBM23C
97	.1	1.05	58	--	--	--	21,000	280	WBM23D
--	--	--	12	--	--	--	50	560	WBM23F
80	.2	.11	13	--	--	--	60	560	WBM23F
82	0.2	.11	12	--	--	--	<10	500	WBM23G
--	--	--	--	<0.04	<.03	.10 EV	--	--	WB24B
--	--	--	--	<.04	<.03	.10 EV	--	--	WB24B
87	<.1	.20	--	--	--	--	--	--	WB24C.1
32	--	.04	9.6	.66	.03	<.10	<10	400	WB24E
180	.2	.05	29	--	--	--	1,900	1,300	WBM24A
62	.2	2.00	74	--	--	--	48,000	240	WBM24D
41	.1	1.79	68	--	--	--	6,800	250	WBM24E
32	<.1	.04	17	--	--	--	50	470	WBM24F
280	.1	.87	21	--	--	--	--	1,400	WB25A
88	.2	.09	12	--	--	--	21	540	WB25B
83	.1	.10	11	--	--	--	130	520	WB25C
82	.1	.09	11	--	--	--	12	510	WB25C
220	<.1	1.28	30	--	--	--	6,800	1,200	WB25C.1

Appendix 2B. *Inorganic ground-water constituents for wells, piezometers, and multi-level monitoring systems in the West Branch Canal Creek study area, Aberdeen Proving Ground, Maryland, March 2000 through May 2001- Continued*

Site name	Sample device	Replicate	Collection date	Collection time	Calcium, dissolved (mg/L as Ca)	Magnesium, dissolved (mg/L as Mg)	Sodium, dissolved (mg/L as Na)	Potassium, dissolved (mg/L as K)	Sulfate, dissolved (mg/L as SO_4)
Comprehensive Sampling Event (June - August 2000)-*Continued*									
WB25D.1	DP	NR	7/31/2000	1300	18	7.1	74	2	130
WB26A	DP	NR	6/13/2000	1445	20	35	180	2	2.7
WB26B	DP	NR	6/22/2000	1200	17	24	330	3	8.0
WB26C	DP	NR	6/13/2000	1525	5.8	8.7	90	5	9.3
WB26D	DP	NR	6/14/2000	930	12	20	110	5	88
WB26G	DP	NR	7/14/2000	1315	15	5.7	66	2	100
WB26H	DP	NR	7/14/2000	1345	11	4.7	37	<0.2	52
WB26E	DP	NR	6/13/2000	1615	23	12	89	3	140
WB26F	DP	NR	6/14/2000	1100	11	19	120	2	94
WBM26F	ML	NR	7/6/2000	1430	17	7.8	100	2	110
WBM26G	ML	NR	6/30/2000	1045	17	7.6	71	2	110
WB27A	DP	NR	7/20/2000	850	2.6	3.5	67	4	13
WB27A.1	DP	NR	7/28/2000	1000	10	11	120	6	14
WB27B	DP	NR	7/20/2000	1145	1.8	1.7	32	2	16
WB27B .1	DP	NR	7/28/2000	1030	17	13	120	4	92
WB27C	DP	NR	7/20/2000	1400	3.1	3.8	82	2	72
WB27D	DP	NR	7/27/2000	1315	14	8.2	83	2	110
WB27E	DP	NR	7/27/2000	1430	12	4.7	52	2	70
WB27F	DP	NR	7/27/2000	1430	10	4.3	54	2	70
WB27G	DP	NR	7/27/2000	900	5.2	2.5	28	1	21
WB28A	DP	NR	8/4/2000	920	17	19	210	3	14
WB28B	DP	NR	7/19/2000	1005	30	57	240	9	1.5
WB28C	DP	NR	7/19/2000	1045	18	31	110	12	4.2
WB28C.1	DP	NR	7/19/2000	1500	37	56	170	4	17
WB28D	DP	NR	7/19/2000	1430	3.5	2.4	86	2	57
WB28D.1	DP	NR	7/27/2000	920	3.3	1.9	80	2	55
WB28F	DP	1	7/20/2000	1015	7.5	4.4	62	2	54
WB28F	DP	2	7/20/2000	1015	7.4	4.3	62	2	54
WB30C	DP	NR	6/27/2000	1100	2.3	4.2	47	3	12
WB30D	DP	NR	6/27/2000	1200	2.1	6.3	62	1	70

Chloride, dissolved (mg/L as Cl)	Fluoride, dissolved (mg/L as F)	Bromide, dissolved (mg/L as Br)	Silica, dissolved (mg/L as SiO_2)	$NO_2 + NO_3$, dissolved (mg/L as N)	Nitrogen, ammonia (mg/L as N)	Nitrogen, ammonia + organic (mg/L as N)	Iron, dissolved (µg/L as Fe)	Manganese, dissolved (µg/L as Mn)	Site name
85	0.1	0.09	11	--	--	--	370	500	WB25D.1
360	--	.90	160	<0.04	<0.03	0.38	37,000	1,700	WB26A
370	--	.28	48	.02 EV	.03	.48	1,100	620	WB26B
82	--	.02	33	.04	.06	.29	580	270	WB26C
120	--	.11	15	.02 EV	<.03	0.1	920	480	WB26D
71	.2	.12	13	--	--	--	1,600	550	WB26G
53	<.1	.10	11	--	--	--	91	420	WB26H
100	--	.11	13	.14	.03	.05 EV	150	1,300	WB26E
79	--	.10	11	1.5	<.03	<.10	820	350	WB26F
82	.2	.14	20	--	--	--	3,900	840	WBM26F
86	.2	.09	13	--	--	--	70	600	WBM26G
120	<.1	.10	42	--	--	--	91	180	WB27A
230	<.1	.98	53	--	--	--	910	900	WB27A.1
42	<.1	.04	14	--	--	--	21,000	90	WB27B
120	.1	.12	31	--	--	--	600	1,500	WB27B.1
110	.1	.21	25	--	--	--	1,800	160	WB27C
100	<.1	.10	14	--	--	--	310	810	WB27D
61	<.1	.08	12	--	--	--	13	420	WB27E
64	.1	.07	12	--	--	--	7.4	380	WB27F
40	<0.1	.06	9.8	--	--	--	10 EV	260	WB27G
350	.4	.99	8.9	--	--	--	33,000	670	WB28A
610	<.1	1.55	64	--	--	--	48,000	4,100	WB28B
340	<.1	.34	66	--	--	--	21,000	2,500	WB28C
670	<.1	1.15	28	--	--	--	160,000	8,000	WB28C.1
84	.1	.09	13	--	--	--	1,100	180	WB28D
90	<.1	.07	11	--	--	--	9,200	180	WB28D.1
81	<.1	.09	15	--	--	--	14	540	WB28F
80	<.1	.08	15	--	--	--	15	540	WB28F
62	<.1	.75	8.0	.41	.11	.21	13,000	100	WB30C
65	<.1	.09	14	.04	.08	.12	4,200	290	WB30D

Appendix 2B. *Inorganic ground-water constituents for wells, piezometers, and multi-level monitoring systems in the West Branch Canal Creek study area, Aberdeen Proving Ground, Maryland, March 2000 through May 2001- Continued*

Site name	Sample device	Replicate	Collection date	Collection time	Calcium, dissolved (mg/L as Ca)	Magnesium, dissolved (mg/L as Mg)	Sodium, dissolved (mg/L as Na)	Potassium, dissolved (mg/L as K)	Sulfate, dissolved (mg/L as SO_4)
Comprehensive Sampling Event (June - August 2000)-*Continued*									
WB30E	DP	NR	6/23/2000	1445	14	6.2	50	2	90
WBM30A	ML	NR	6/30/2000	1130	43	32	380	11	3.5
WBM30B	ML	NR	7/6/2000	1410	--	--	--	--	1.2
WBM30F	ML	NR	7/7/2000	1200	--	--	--	--	77
WBM30G	ML	1	7/5/2000	1500	11	5.4	44	1	76
WBM30G	ML, BL	2	7/5/2000	1500	11	5.4	43	1	79
WB31B	DP	NR	7/28/2000	1200	8.0	8.9	130	2	140
WB31C	DP	NR	7/28/2000	1050	9.5	9.2	130	2	150
WB31D	DP	NR	7/28/2000	1030	7.0	5.3	49	3	65
WB31E	DP	NR	7/28/2000	850	14	6.1	45	2	94
WB32B	DP	NR	8/17/2000	840	8.3	4.7	76	1	140
WB33A	DP	NR	6/23/2000	1600	--	--	--	--	73
WB33A	DP	NR	6/27/2000	1500	19	13	51	2	--
WB33B	DP	1	6/19/2000	1100	20	11	59	3	140
WB33B	DP, BL	2	6/19/2000	1100	20	12	58	3	140
WB33F	DP	NR	8/14/2000	1100	7.0	4.7	28	2	50
WB34B	DP	NR	6/27/2000	1515	2.4	4.3	95	1	--
WB34C	DP	NR	6/16/2000	1040	--	--	--	--	--
WB34C	DP	NR	8/4/2000	1055	15	6.8	29	2	110
WB34D	DP	NR	8/7/2000	1030	9.6	5.4	34	1	70
WB34E	DP	1	8/7/2000	1330	0.9	0.7	12	1	1.2
WB34E	DP	2	8/7/2000	1330	.9	.8	12	1	1.2
WBM34C	ML	NR	7/7/2000	1015	12	25	100	2	170
WBM34D	ML	NR	7/7/2000	1200	4.3	11	140	2	170
WBM34F	ML	NR	7/7/2000	1315	5.5	12	160	2	200
WBM34G	ML	NR	7/7/2000	1345	7.8	15	130	2	160
WB35A	DP	NR	6/19/2000	1345	13	7.4	29	2	86
WB35B	DP	NR	6/16/2000	1400	--	--	--	--	--
WB35C	DP	1	6/16/2000	1125	--	--	--	--	--
WB35C	DP, BL	2	6/16/2000	1125	--	--	--	--	--

Chloride, dissolved (mg/L as Cl)	Fluoride, dissolved (mg/L as F)	Bromide, dissolved (mg/L as Br)	Silica, dissolved (mg/L as SiO_2)	$NO_2 + NO_3$, dissolved (mg/L as N)	Nitrogen, ammonia (mg/L as N)	Nitrogen, ammonia + organic (mg/L as N)	Iron, dissolved (µg/L as Fe)	Manganese, dissolved (µg/L as Mn)	Site name
53	--	0.06	10	1.2	0.02 EV	<0.10	40	490	WB30E
260	0.4	.77	49	--	--	--	4,700	1,700	WBM30A
160	.4	.18	--	--	--	--	--	--	WBM30B
36	.3	.06	--	--	--	--	--	--	WBM30F
37	<.1	.05	11	--	--	--	50	510	WBM30G
38	<.1	.04	12	--	--	--	50	500	WBM30G
140	.3	.05	13	--	--	1,600	810	--	WB31B
150	<.1	.05	10	--	--	1,900	920	--	WB31C
52	.1	.05	8.8	--	--	400	890	--	WB31D
43	<.1	.05	10	--	--	6.3 EV	680	--	WB31E
29	.2	.05	25	--	--	--	300	310	WB32B
36	--	.02	--	--	--	--	--	--	WB33A
--	--	--	32	0.04	.14	.21	1,400	330	WB33A
97	--	--	36	.16	<.03	.06 EV	20	320	WB33B
100	--	.10	37	.16	<.03	.07 EV	30	330	WB33B
38	.2	.03	21	--	--	--	40	400	WB33F
--	--	--	9.8	.04	.18	.46	71,000	460	WB34B
--	--	--	--	.22	<.03	<.10	--	--	WB34C
36	.5	.03	37	--	--	--	30	580	WB34C
41	.2	.06	22	--	--	--	4,100	470	WB34D
19	.1	.08	11	--	--	--	1,800	65	WB34E
19	.1	.08	11	--	--	--	1,800	67	WB34E
100	.1	.17	39	--	--	--	33,000	410	WBM34C
110	<.1	.09	49	--	--	--	17,000	190	WBM34D
110	.1	1.06	99	--	--	--	18,000	260	WBM34F
98	.1	1.23	120	--	--	--	21,000	330	WBM34G
39	--	.03	29	0.04	0.1	0.17	2,600	800	WB35A
--	--	--	--	<.04	.04	.14	--	--	WB35B
--	--	--	--	.61	<.03	<.10	--	--	WB35C
--	--	--	--	.62	<.03	<.10	--	--	WB35C

Appendix 2B. *Inorganic ground-water constituents for wells, piezometers, and multi-level monitoring systems in the West Branch Canal Creek study area, Aberdeen Proving Ground, Maryland, March 2000 through May 2001- Continued*

Site name	Sample device	Replicate	Collection date	Collection time	Calcium, dissolved (mg/L as Ca)	Magnesium, dissolved (mg/L as Mg)	Sodium, dissolved (mg/L as Na)	Potassium, dissolved (mg/L as K)	Sulfate, dissolved (mg/L as SO_4)
Comprehensive Sampling Event (June - August 2000)-*Continued*									
WB35C.1	DP	NR	8/9/2000	1030	14	6.8	32	2	110
WB35D	DP	NR	8/9/2000	1200	13	6.5	35	2	70
WB35E	DP	NR	6/20/2000	1030	8.4	4.2	29	1	71
WB35F	DP	1	8/11/2000	915	0.1	0.1	18	.3	1.4
WB35F	DP	2	8/11/2000	915	.1	.1	18	.3	1.5
WB36A	DP	NR	6/28/2000	1100	14	6.6	23	1	--
WB36B	DP	NR	6/20/2000	945	12	6.7	28	2	84
WB36C	DP	NR	6/20/2000	1000	4.6	2.4	36	1	35
WB36D	DP	NR	8/4/2000	1150	11	5.6	32	1	67
WB36D	DP	NR	8/8/2000	1200	11	5.5	32	1	96
WB36E	DP	NR	8/6/2000	1500	13	6.3	31	2	89
WB36F	DP	1	8/4/2000	1100	.1	.1	22	0.2	5.0
WB36F	DP	2	8/4/2000	1100	.1	.1	22	.2	5.0
WB36F	DP	1	8/8/2000	1000	.2	.1	24	.2	5.1
WB36F	DP	2	8/8/2000	1000	.1	.1	21	.2	5.1
WB36G	DP	1	8/7/2000	1130	.1	.1	38	.2	13.0
WB36G	DP	2	8/7/2000	1130	.1	.1	39	.2	14.0
WBM36A	ML	NR	7/6/2000	1600	--	--	--	--	3.5
WBM36G	ML	NR	6/15/2000	1600	10	5.2	38	1	82
WB37B	DP	NR	8/3/2000	915	3.6	3.3	57	1.1	2.9
WB37B.1	DP	NR	8/3/2000	950	6.2	6.2	80	.9	.5
WB37C	DP	NR	8/1/2000	1045	7.6	4.2	64	1	42
WB37C.1	DP	NR	8/9/2000	1430	8.6	4.7	64	1	40
WB37D	DP	NR	8/8/2000	945	6.6	9.9	140	2	23
Comprehensive Sampling Event Field Blanks									
After WB23D	DP, BL	NR	6/20/2000	1530	.0	<.0	0.0 EV	<.2	<0.3
After WB24E	DP, BL	NR	6/23/2000	1730	.0	<.0	<.1	<.2	<.3
After WB27G	DP, BL	NR	7/27/2000	1015	.0	.0	.2	<.2	<.3
After WBM30G	ML, BL	NR	7/5/2000	1710	.0	<.0	.0 EV	<.2	<.3

Chloride, dissolved (mg/L as Cl)	Fluoride, dissolved (mg/L as F)	Bromide, dissolved (mg/L as Br)	Silica, dissolved (mg/L as SiO_2)	$NO_2 + NO_3$, dissolved (mg/L as N)	Nitrogen, ammonia (mg/L as N)	Nitrogen, ammonia + organic (mg/L as N)	Iron, dissolved (µg/L as Fe)	Manganese, dissolved (µg/L as Mn)	Site name
43	0.3	0.03	32	--	--	--	1,600	580	WB35C.1
39	.1	.05	29	--	--	--	58	530	WB35D
36	--	.04	19	0.38	0.01 EV	0.06 EV	20	340	WB35E
16	.1	.05	13	--	--	--	410	12	WB35F
16	.1	.05	14	--	--	--	420	12	WB35F
--	--	--	28	.06	.12	.18	5,400	800	WB36A
40	--	.09	23	.13	.57	.76	6,600	550	WB36B
46	--	.05	10	.28	.01 EV	.08 EV	10	250	WB36C
38	.1	.05	17	--	--	--	290	520	WB36D
44	.2	.04	17	--	--	--	53	500	WB36D
42	.1	.05	25	--	--	--	48	460	WB36E
19	.1	.10	10	--	--	--	580	10	WB36F
20	.1	.09	10	--	--	--	580	10	WB36F
21	.1	.07	11	--	--	--	480	9	WB36F
20	.1	.06	11	--	--	--	450	10	WB36F
38.0	.1	.05	12	--	--	--	240	8	WB36G
40.0	.1	.10	12	--	--	--	290	10	WB36G
90	1.2	.05	--	--	--	--	--	--	WBM36A
45	.2	.07	24	--	--	--	320	460	WMB36G
61	.2	.05	46	--	--	--	2,000	170	WB37B
95	.2	.20	58	--	--	--	11,000	580	WB37B.1
100	.2	.06	12	--	--	--	600	460	WB37C
95	.4	.05	13	--	--	--	210	550	WB37C.1
260	.1	.10	9.4	--	--	--	17,000	290	WB37D
<0.3	--	<.01	<0.1	<.04	<.03	<.10	<10	<2	After WB23D
<.3	--	<.01	<.1	.02 EV	.02 EV	<.10	<10	<2	After WB24E
<.3	<.1	<.01	<.1	--	--	--	6.1 EV	<10	After WB27G
<.3	<.1	<.01	.4	--	--	--	<10	2 EV	After WBM30G

Appendix 2B. *Inorganic ground-water constituents for wells, piezometers, and multi-level monitoring systems in the West Branch Canal Creek study area, Aberdeen Proving Ground, Maryland, March 2000 through May 2001- Continued*

Site name	Sample device	Replicate	Collection date	Collection time	Calcium, dissolved (mg/L as Ca)	Magnesium, dissolved (mg/L as Mg)	Sodium, dissolved (mg/L as Na)	Potassium, dissolved (mg/L as K)	Sulfate, dissolved (mg/L as SO_4)
Comprehensive Sampling Event (June - August 2000)-*Continued*									
Comprehensive Sampling Event Field Blanks - *Continued*									
After WB33B	DP, BL	NR	6/19/2000	1200	0.0	<0.0	<0.1	<0.2	<0.3
After WB35C	DP, BL	NR	6/16/2000	1125	--	--	--	--	--
May 2001 Sampling Event									
WB41A	DP1	NR	5/17/2001	1415	21	43	270	18	3.1
WB41B	DP1	NR	5/17/2001	1440	20	41	260	17	0.9
WB41C	DP1	NR	5/17/2001	1015	16	8.2	85	2.1	100
WB41D	DP1	NR	5/17/2001	1030	14	7.1	140	1.8	110
WB41E	DP1	1	5/17/2001	1100	12	5.8	180	1.8	100
WB41E	DP1	2	5/17/2001	1105	11	5.7	180	1.7	100
WB42A	DP1	NR	5/16/2001	1430	18	36	260	11	14
WB42B	DP1	NR	5/16/2001	1445	15	26	200	13	32
WB42C	DP1	NR	5/16/2001	1310	17	8.8	66	2.6	110
WB42D	DP1	NR	5/16/2001	1350	13	6.3	53	2.0	73
WB42E	DP1	NR	5/16/2001	1340	18	11	42	3.1	60
WB42F	DP1	1	5/16/2001	1355	18	11	43	3.1	61
WB42F	DP1	2	5/16/2001	1400	18	11	42	3.0	60
WB43A	DP1	NR	5/18/2001	1000	8.1	6.0	23	1.2	30
WB43B	DP1	1	5/18/2001	1030	11	6.7	110	2.0	93
WB43B	DP1	2	5/18/2001	1045	11	6.7	110	1.9	93
WB43C	DP1	NR	5/18/2001	1210	13	7.4	110	2.3	91
WB43D	DP1	NR	5/18/2001	1230	11	6.3	98	2.0	91
WB44A	DP1	NR	5/18/2001	1400	15	9.3	140	2.3	94
May 2001 Source Blank									
Source water	--	NR	37034	1200	<.01	<.008	<.06	<.09	<.11

Chloride, dissolved (mg/L as Cl)	Fluoride, dissolved (mg/L as F)	Bromide, dissolved (mg/L as Br)	Silica, dissolved (mg/L as SiO_2)	$NO_2 + NO_3$, dissolved (mg/L as N)	Nitrogen, ammonia (mg/L as N)	Nitrogen, ammonia + organic (mg/L as N)	Iron, dissolved (µg/L as Fe)	Manganese, dissolved (µg/L as Mn)	Site name
<0.3	--	<0.01	<0.1	<0.04	<0.03	<0.10	10	<2	After WB33B
--	--	--	--	<.04	<.03	<.10	--	--	After WB35C
360	0.3	1.12	66	--	--	--	51	3,300	WB41A
350	.2	1.09	67	--	--	--	530	3,900	WB41B
100	.1 EV	.10	15	--	--	--	210	1,100	WB41C
180	.1 EV	.11	13	--	--	--	78	730	WB41D
250	.1 EV	.12	13	--	--	--	49	610	WB41E
250	.1 EV	.12	12	--	--	--	59	610	WB41E
360	.2	.87	55	--	--	--	240	1,800	WB42A
300	.2	1.10	48	--	--	--	100	1,400	WB42B
69	.3	.10	14	--	--	--	510	590	WB42C
64	.1 EV	.08	11	--	--	--	120	490	WB42D
84	.5	.12	16	--	--	--	330	1,300	WB42E
86	.4	.11	16	--	--	--	130	1,400	WB42F
86	.4	.11	16	--	--	--	270	1,400	WB42F
27	.1 EV	.04	11	--	--	--	54	760	WB43A
170	<0.2	.09	15	--	--	--	24	580	WB43B
170	<0.2	.10	15	--	--	--	26	570	WB43B
170	<0.2	.10	15	--	--	--	21	570	WB43C
140	<0.2	.14	16	--	--	--	1,200	630	WB43D
220	.1 EV	.12	15	--	--	--	2,400	860	WB44A
0.2	<.2	<.01	<.09	--	--	--	<10	<3	Source water

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Appendix 2C. *Organic constituents for wells, piezometers, and multi-level monitoring systems in the West Branch Canal Creek study area, Aberdeen Proving Ground, Maryland, March 2000 through May 2001-Continued*

Site name	Replicate	Sample device	Analysis code	Collection date	Collection time	Additional Volatile Organic Compounds				
						1,2-Di-chloro-benzene (µg/L)	1,3-Di-chloro-benzene (µg/L)	1,4-Di-chloro-benzene (µg/L)	1,2-Di-chloro-propane (µg/L)	1,1-Di-chloro-propene (µg/L)
March - April 2000 Sampling Event										
WB19B	NR	DP	GC/MSD	3/8/2000	1100	<2.0	<10.0	<10.0	<0.5	<0.5
WB19E	NR	DP	GC/MSD	3/8/2000	1000	<0.5	<10.0	<10.0	<.5	<.5
WB23A	NR	DP	GC/MSD	3/12/2000	1000	<.5	<10.0	<10.0	<.5	<.5
WB23B	NR	DP	GC/MSD	3/9/2000	930	<.5	<10.0	<10.0	<.5	<.5
WB23C	NR	DP	GC/MSD	3/14/2000	--	<1.0	<20.0	<20.0	<1.0	<1.0
WB23C	NR	DP	GC/MSD	3/22/2000	--	<.5	<10.0	<10.0	<.5	<.5
WB23C	NR	DP	GC/MSD	3/28/2000	--	<.5	<10.0	<10.0	<.5	<.5
WB23D	NR	DP	GC/MSD	3/12/2000	1000	<.5	<10.0	<10.0	<.5	<.5
WBM23A	NR	ML	GC/MSD	3/10/2000	1615	<.5	<10.0	<10.0	<.5	<.5
WBM23B	1	ML	GC/MSD	3/11/2000	1000	<.5	<10.0	<10.0	<.5	<.5
WBM23B	2	ML	GC/MSD	3/11/2000	1000	<.5	<10.0	<10.0	<.5	<.5
WBM23C	NR	ML	GC/MSD	3/13/2000	1400	<.5	<10.0	<10.0	<.5	<.5
WBM23C	NR	ML	GC/MSD	3/28/2000	--	<.5	<10.0	<10.0	<.5	<.5
WBM23D	NR	ML	GC/MSD	3/12/2000	900	<.5	<10.0	<10.0	<.5	<.5
WBM23E	1	ML	GC/MSD	3/11/2000	1330	<.5	<10.0	<10.0	<.5	<.5
WBM23E	2	ML	GC/MSD	3/11/2000	1330	<.5	<10.0	<10.0	<.5	<.5
WBM23F	NR	ML	GC/MSD	3/11/2000	1600	<.5	<10.0	<10.0	<.5	<.5
WBM23G	NR	ML	GC/MSD	3/11/2000	1440	<.5	<10.0	<10.0	<.5	<.5
WBT23A	NR	T	GC/MSD	3/27/2000	--	<1.1	<1.1	<1.1	<.6	<.6
WBT23B	NR	T	GC/MSD	4/20/2000	--	<1.0	<1.0	<1.0	<.5	<.5
WBT23C	NR	T	GC/MSD	4/20/2000	--	<1.0	<1.0	<1.0	<.5	<.5
WBT23E	NR	T	GC/MSD	4/20/2000	--	<1.0	<1.0	<1.0	<.5	<.5
WB24A	NR	DP	GC/MSD	3/8/2000	--	<.5	<10.0	<10.0	<.5	<.5
WB24A	NR	DP	GC/MSD	3/20/2000	--	<.5	<10.0	<10.0	<.5	<.5
WB24B	NR	DP	GC/MSD	3/14/2000	--	<10.0	<200	<200	<10.0	<10.0

Additional Volatile Organic Compounds											
Ethyl benzene (µg/L)	Hexa-chloro-butadiene (µg/L)	*p* -Iso-propyl-toluene (µg/L)	*m,p* - Xylenes (µg/L)	Naph-thalene (µg/L)	*n* - Propyl-benzene (µg/L)	Toluene (µg/L)	1,2,3-Tri-chloro-benzene (µg/L)	1,2,4-Tri-chloro-benzene (µg/L)	1,2,4-Tri-methyl-benzene (µg/L)	1,3,5-Tri-methyl-benzene (µg/L)	Site name
<10.0	<10.0	<0.5	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<0.5	WB19B
<10.0	<10.0	<.5	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<.5	WB19E
<10.0	<10.0	<.5	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<.5	WB23A
<10.0	<10.0	<.5	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<.5	WB23B
<20.0	<20.0	<1.0	<20.0	<20.0	<20.0	<20.0	<20.0	<20.0	<20.0	<1.0	WB23C
<0.5	<10.0	<.5	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<.5	WB23C
<.5	<10.0	<.5	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<.5	WB23C
<10.0	<10.0	<.5	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<.5	WB23D
<10.0	<10.0	<.5	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<.5	WBM23A
<10.0	<10.0	<.5	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<.5	WBM23B
<10.0	<10.0	<.5	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<.5	WBM23B
<10.0	<10.0	<.5	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<.5	WBM23C
<.5	<10.0	<.5	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<.5	WBM23C
<10.0	<10.0	<.5	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<.5	WBM23D
<10.0	<10.0	<.5	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<.5	WBM23E
<10.0	<10.0	<.5	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<.5	WBM23E
<10.0	<10.0	<.5	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<.5	WBM23F
<10.0	<10.0	<.5	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<.5	WBM23G
<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	WBT23A
<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	WBT23B
<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	WBT23C
<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	WBT23E
<10.0	<10.0	<.5	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<.5	WB24A
<.5	<10.0	<.5	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<.5	WB24A
<200	<200	<10.0	<200	<200	<200	<200	<200	<200	<200	<10.0	WB24B

Appendix 2C. *Organic constituents for wells, piezometers, and multi-level monitoring systems in the West Branch Canal Creek study area, Aberdeen Proving Ground, Maryland, March 2000 through May 2001-Continued*

Site name	Replicate	Sample device	Analysis code	Collection date	Collection time	Additional Volatile Organic Compounds				
						1,2-Di-chloro-benzene (µg/L)	1,3-Di-chloro-benzene (µg/L)	1,4-Di-chloro-benzene (µg/L)	1,2-Di-chloro-propane (µg/L)	1,1-Di-chloro-propene (µg/L)
March - April 2000 Sampling Event - *Continued*										
WB24E	1	DP	GC/MSD	3/15/2000	900	<0.5	<10.0	<10.0	<0.5	<0.5
WB24E	2	DP	GC/MSD	3/15/2000	900	<10.0	<200	<200	<10.0	<10.0
WBM24A	NR	ML	GC/MSD	3/13/2000	1515	<.5	<10.0	<10.0	<.5	<.5
WBM24B	1	ML	GC/MSD	3/13/2000	1620	<.5	<10.0	<10.0	<.5	<.5
WBM24B	2	ML	GC/MSD	3/13/2000	1620	<.5	<10.0	<10.0	<.5	<.5
WBM24C	NR	ML	GC/MSD	3/16/2000	--	<.5	<10.0	<10.0	<.5	<.5
WBM24F	NR	ML	GC/MSD	3/14/2000	1030	<.5	<10.0	<10.0	<.5	<.5
WBM24G	NR	ML	GC/MSD	3/14/2000	1100	<.5	<10.0	<10.0	<.5	<.5
WBT24A	NR	T	GC/MSD	3/28/2000	--	<.5	<10.0	<10.0	<.5	<.5
WBT24B	NR	T	GC/MSD	3/28/2000	--	<.5	<10.0	<10.0	<.5	<.5
WBT24C	NR	T	GC/MSD	4/20/2000	--	<1.0	<1.0	<1.0	<.5	<.5
WBT24D	NR	T	GC/MSD	4/20/2000	--	<1.0	<1.0	<1.0	<.5	<.5
WB26A	1	DP	GC/MSD	3/8/2000	1300	<.5	<10.0	<10.0	<.5	<.5
WB26A	2	DP	GC/MSD	3/8/2000	1300	<.5	<10.0	<10.0	<.5	<.5
WB26B	NR	DP	GC/MSD	3/9/2000	--	<.5	<10.0	<10.0	<.5	<.5
WB26C	NR	DP	GC/MSD	3/8/2000	1540	<.5	<10.0	<10.0	<.5	<.5
WB26D	1	DP	GC/MSD	3/8/2000	830	<.5	<10.0	<10.0	<.5	<.5
WB26D	2	DP	GC/MSD	3/8/2000	830	<.5	<10.0	<10.0	<.5	<.5
WB26E	NR	DP	GC/MSD	3/8/2000	--	<1.0	<20.0	<20.0	<1.0	<1.0
WB26E	NR	DP	GC/MSD	3/9/2000	--	<.6	<11.0	<11.0	<.6	<.6
WB26F	1	DP	GC/MSD	3/8/2000	--	<.5	<10.0	<10.0	<.5	<.5
WB26F	2	DP, BL	GC/MSD	3/8/2000	--	<.5	<10.0	<10.0	<.5	<.5
WB26F	1	DP	GC/MSD	3/9/2000	1315	<.5	<10.0	<10.0	<.5	<.5
WB26F	2	DP, BL	GC/MSD	3/9/2000	1315	<.5	<10.0	<10.0	<.5	<.5
WBM26A	NR	ML	GC/MSD	3/9/2000	1315	<.5	<10.0	<10.0	<.5	<.5
WBM26A	NR	ML	GC/MSD	3/22/2000	1400	<.5	<10.0	<10.0	<.5	<.5
WBM26B	1	ML	GC/MSD	3/10/2000	930	<1.0	<20.0	<20.0	<1.0	<1.0
WBM26B	2	ML	GC/MSD	3/10/2000	930	<.5	<10.0	<10.0	<.5	<.5
WBM26B	NR	ML	GC/MSD	3/24/2000	845	<1.0	<1.0	<1.0	<1.0	<.5
WBM26B	NR	ML	GC/MSD	4/20/2000	--	<1.0	<1.0	<1.0	<.5	<.5

Additional Volatile Organic Compounds											
Ethyl benzene (µg/L)	Hexa-chloro-butadiene (µg/L)	*p* -Iso-propyl-toluene (µg/L)	*m,p* - Xylenes (µg/L)	Naph-thalene (µg/L)	*n* - Propyl-benzene (µg/L)	Toluene (µg/L)	1,2,3-Tri-chloro-benzene (µg/L)	1,2,4-Tri-chloro-benzene (µg/L)	1,2,4-Tri-methyl-benzene (µg/L)	1,3,5-Tri-methyl-benzene (µg/L)	Site name
<0.5	<10.0	<0.5	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<0.5	WB24E
<200	<200	<10.0	<200	<200	<200	<200	<200	<200	<200	<10.0	WB24E
<10.0	<10.0	<.5	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<.5	WBM24A
<10.0	<10.0	<.5	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<1.0	WBM24B
<10.0	<10.0	<.5	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<.5	WBM24B
<10.0	<10.0	<.5	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<.5	WBM24C
<10.0	<10.0	<.5	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<.5	WBM24F
<10.0	<10.0	<.5	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<.5	WBM24G
<.5	<10.0	<.5	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<.5	WBT24A
<.5	<10.0	<.5	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<.5	WBT24B
<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	WBT24C
<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	WBT24D
<10.0	<10.0	<.5	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<.5	WB26A
<10.0	<10.0	<.5	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<.5	WB26A
<10.0	<10.0	<.5	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<.5	WB26B
<10.0	<10.0	<.5	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<.5	WB26C
<10.0	<10.0	<.5	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<.5	WB26D
<10.0	<10.0	<.5	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<.5	WB26D
<20.0	<20.0	<1.0	<20.0	<20.0	<20.0	<20.0	<20.0	<20.0	<20.0	<1.0	WB26E
<11.0	<11.0	<.6	<11.0	<11.0	<11.0	<11.0	<11.0	<11.0	<11.0	<.6	WB26E
<10.0	<10.0	<.5	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<.5	WB26F
<10.0	<10.0	<.5	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<.5	WB26F
<10.0	<10.0	<.5	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<.5	WB26F
<10.0	<10.0	<.5	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<.5	WB26F
<10.0	<10.0	<.5	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<.5	WBM26A
<.5	<10.0	<.5	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<.5	WBM26A
<20.0	<20.0	<1.0	<20.0	<20.0	<20.0	<20.0	<20.0	<20.0	<20.0	<1.0	WBM26B
<10.0	<10.0	<.5	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<.5	WBM26B
<1.0	<1.0	<.5	<1.0	<5.0	<1.0	<1.0	<5.0	<1.0	<1.0	<1.0	WBM26B
<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	WBM26B

Appendix 2C. *Organic constituents for wells, piezometers, and multi-level monitoring systems in the West Branch Canal Creek study area, Aberdeen Proving Ground, Maryland, March 2000 through May 2001-Continued*

Site name	Replicate	Sample device	Analysis code	Collection date	Collection time	Additional Volatile Organic Compounds				
						1,2-Di-chloro-benzene (µg/L)	1,3-Di-chloro-benzene (µg/L)	1,4-Di-chloro-benzene (µg/L)	1,2-Di-chloro-propane (µg/L)	1,1-Di-chloro-propene (µg/L)
March - April 2000 Sampling Event - *Continued*										
WBM26C	1	ML	GC/MSD	3/10/2000	1030	<0.5	<10.0	<10.0	<0.5	<0.5
WBM26C	2	ML	GC/MSD	3/10/2000	1030	<.5	<10.0	<10.0	<.5	<.5
WBM26C	NR	ML	GC/MSD	3/24/2000	845	<1.0	<1.0	<1.0	<1.0	<.5
WBM26C	1	ML	GC/MSD	4/20/2000	--	<1.0	<1.0	<1.0	<.5	<.5
WBM26D	NR	ML	GC/MSD	3/8/2000	--	<1.0	<20.0	<20.0	<1.0	<1.0
WBM26D	NR	ML	GC/MSD	3/10/2000	1110	<.5	<10.0	<10.0	<.5	<.5
WBM26E	NR	ML	GC/MSD	3/9/2000	1640	<1.0	<20.0	<20.0	<1.0	<1.0
WBM26E	NR	ML	GC/MSD	4/20/2000	--	<1.0	<1.0	<1.0	<.5	<.5
WBM26F	1	ML	GC/MSD	3/10/2000	1315	<.5	<10.0	<10.0	<.5	<.5
WBM26F	2	ML	GC/MSD	3/10/2000	1315	<.5	<10.0	<10.0	<.5	<.5
WBM26G	NR	ML	GC/MSD	3/10/2000	1400	<.5	<10.0	<10.0	<.5	<.5
WBT26C	NR	T	GC/MSD	3/23/2000	1100	<.5	<10.0	<10.0	<.5	<.5
WBT26C	NR	T	GC/MSD	4/20/2000	--	<1.0	<1.0	<1.0	<.5	<.5
WBT26D	NR	T	GC/MSD	3/28/2000	--	<.5	<10.0	<10.0	<.5	<.5
WBT26D	NR	T	GC/MSD	4/20/2000	--	<1.6	<1.6	<1.6	<.8	<.8
WBT26E	NR	T	GC/MSD	3/23/2000	1500	<.5	<10.0	<10.0	<.5	<.5
WB30A	NR	DP	GC/MSD	3/9/2000	955	<.5	<10.0	<10.0	<.5	<.5
WB30C	NR	DP	GC/MSD	3/9/2000	1000	<.5	<10.0	<10.0	<.5	<.5
WB30D	NR	DP	GC/MSD	3/9/2000	1010	<.5	<10.0	<10.0	<.5	<.5
WB30E	NR	DP	GC/MSD	3/28/2000	--	<.5	<10.0	<10.0	<.5	<.5
WBM30A	NR	ML	GC/MSD	3/9/2000	--	<.5	<10.0	<10.0	<.5	<.5
WBM30A	NR	ML	GC/MSD	3/12/2000	1200	<.5	<10.0	<10.0	<.5	<.5
WBM30B	NR	ML	GC/MSD	3/13/2000	--	<.5	<10.0	<10.0	<.5	<.5
WBM30C	NR	ML	GC/MSD	3/13/2000	930	<.5	<10.0	<10.0	<.5	<.5
WBM30D	NR	ML	GC/MSD	3/13/2000	--	<.5	<10.0	<10.0	<.5	<.5
WBM30E	NR	ML	GC/MSD	3/13/2000	--	<.5	<10.0	<10.0	<.5	<.5
WBM30F	NR	ML	GC/MSD	3/12/2000	1500	<.5	<10.0	<10.0	<.5	<.5
WBM30G	1	ML	GC/MSD	3/13/2000	1020	<.5	<10.0	<10.0	<.5	<.5
WBM30G	2	ML	GC/MSD	3/13/2000	1020	<.5	<10.0	<10.0	<.5	<.5
WBT30A	NR	T	GC/MSD	4/20/2000	--	<1.0	<1.0	<1.0	<.5	<.5

Additional Volatile Organic Compounds											
Ethyl benzene (µg/L)	Hexa-chloro-butadiene (µg/L)	*p* -Iso-propyl-toluene (µg/L)	*m,p* - Xylenes (µg/L)	Naph-thalene (µg/L)	*n* - Propyl-benzene (µg/L)	Toluene (µg/L)	1,2,3-Tri-chloro-benzene (µg/L)	1,2,4-Tri-chloro-benzene (µg/L)	1,2,4-Tri-methyl-benzene (µg/L)	1,3,5-Tri-methyl-benzene (µg/L)	Site name
<10.0	<10.0	<0.5	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<0.5	WBM26C
<10.0	<10.0	<.5	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<.5	WBM26C
<1.0	<1.0	<.5	<1.0	<5.0	<1.0	<1.0	<5.0	<1.0	<1.0	<1.0	WBM26C
<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	WBM26C
<20.0	<20.0	<1.0	<20.0	<20.0	<20.0	<20.0	<20.0	<20.0	<20.0	<1.0	WBM26D
<10.0	<10.0	<.5	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<.5	WBM26D
<20.0	<20.0	<1.0	<20.0	<20.0	<20.0	<20.0	<20.0	<20.0	<20.0	<1.0	WBM26E
<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	WBM26E
<10.0	<10.0	<.5	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<.5	WBM26F
<10.0	<10.0	<.5	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<.5	WBM26F
<10.0	<10.0	<.5	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<.5	WBM26G
<0.5	<10.0	<.5	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<.5	WBT26C
<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	WBT26C
<.5	<10.0	<.5	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<.5	WBT26D
<1.6	<1.6	<1.6	<1.6	<1.6	<1.6	<1.6	<1.6	<1.6	<1.6	<1.6	WBT26D
<.5	<10.0	<.5	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<.5	WBT26E
<10.0	<10.0	<.5	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<.5	WB30A
<10.0	<10.0	<.5	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<.5	WB30C
<10.0	<10.0	<.5	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<.5	WB30D
<10.0	<10.0	<.5	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<.5	WB30E
<10.0	<10.0	<.5	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<.5	WBM30A
<10.0	<10.0	<.5	<10.0	<10.0	<10.0	97.8	<10.0	<10.0	<10.0	<.5	WBM30A
<10.0	<10.0	<.5	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<.5	WBM30B
<10.0	<10.0	<.5	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<.5	WBM30C
<10.0	<10.0	<.5	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<.5	WBM30D
<10.0	<10.0	<.5	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<.5	WBM30E
<10.0	<10.0	<.5	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<.5	WBM30F
<10.0	<10.0	<.5	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<.5	WBM30G
<10.0	<10.0	<.5	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<.5	WBM30G
<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	WBT30A

Appendix 2C. *Organic constituents for wells, piezometers, and multi-level monitoring systems in the West Branch Canal Creek study area, Aberdeen Proving Ground, Maryland, March 2000 through May 2001-Continued*

Site name	Replicate	Sample device	Analysis code	Collection date	Collection time	Additional Volatile Organic Compounds: 1,2-Di-chloro-benzene (µg/L)	1,3-Di-chloro-benzene (µg/L)	1,4-Di-chloro-benzene (µg/L)	1,2-Di-chloro-propane (µg/L)	1,1-Di-chloro-propene (µg/L)
March - April 2000 Sampling Event - *Continued*										
WBT30C	NR	T	GC/MSD	4/20/2000	--	<1.0	<1.0	<1.0	<0.5	<0.5
WBT30E	NR	T	GC/MSD	4/20/2000	--	<1.0	<1.0	<1.0	<.5	<.5
WB33A	1	DP	GC/MSD	3/20/2000	1630	<0.5	<10.0	<10.0	<.5	<.5
WB33A	2	DP	GC/MSD	3/20/2000	1630	<2.5	<50.0	<50.0	<2.5	<2.5
WB33A	3	DP	GC/MSD	3/20/2000	1630	<2.5	<50.0	<50.0	<2.5	<2.5
WB33B	1	DP	GC/MSD	3/20/2000	1645	<.5	<10.0	<10.0	<.5	<.5
WB33B	2	DP	GC/MSD	3/20/2000	1645	<2.5	<50.0	<50.0	<2.5	<2.5
WB33B	3	DP	GC/MSD	3/20/2000	1645	<2.5	<50.0	<50.0	<2.5	<2.5
WB33Y	NR	DP	GC/MSD	3/22/2000	1130	<.5	<10.0	<10.0	<.5	<.5
WB33Z	1	DP	GC/MSD	3/22/2000	1300	<.5	<10.0	<10.0	<.5	<.5
WB33Z	2	DP	GC/MSD	3/22/2000	1300	<.5	<10.0	<10.0	<.5	<.5
WB34A	NR	DP	GC/MSD	3/20/2000	1440	<.5	<10.0	<10.0	<.5	<.5
WB34B	1	DP	GC/MSD	3/15/2000	1440	<.5	<10.0	<10.0	<.5	<.5
WB34B	2	DP	GC/MSD	3/15/2000	1440	<.5	<10.0	<10.0	<.5	<.5
WBM34A	NR	ML	GC/MSD	3/15/2000	900	<.5	<10.0	<10.0	<.5	<.5
WBM34B	NR	ML	GC/MSD	3/15/2000	910	<.5	<10.0	<10.0	<.5	<.5
WBM34C	NR	ML	GC/MSD	3/15/2000	1014	<.5	<10.0	<10.0	<.5	<.5
WBM34D	NR	ML	GC/MSD	3/15/2000	1050	<.5	<10.0	<10.0	<.5	<.5
WBM34E	NR	ML	GC/MSD	3/15/2000	1110	<.5	<10.0	<10.0	<.5	<.5
WBM34F	1	ML	GC/MSD	3/15/2000	1500	<.5	<10.0	<10.0	<.5	<.5
WBM34F	2	ML	GC/MSD	3/15/2000	1500	<.5	<10.0	<10.0	<.5	<.5
WBM34G	NR	ML	GC/MSD	3/15/2000	1330	<.5	<10.0	<10.0	<.5	<.5
WBT34B	1	T	GC/MSD	4/20/2000	--	<1.0	<1.0	<1.0	<.5	<.5
WBT34B	2	T	GC/MSD	4/20/2000	--	<1.0	<1.0	<1.0	<.5	<.5
WBT34C	NR	T	GC/MSD	4/20/2000	--	<1.0	<1.0	<1.0	<.5	<.5
WBT34D	1	T	GC/MSD	3/22/2000	1405	<.5	<10.0	<10.0	<.5	<.5
WBT34D	2	T	GC/MSD	3/22/2000	1405	<5.0	<100	<100	<5.0	<5.0
WBT34D	3	T	GC/MSD	3/22/2000	1405	<.5	<10.0	<10.0	<.5	<.5
WBT34D	NR	T	GC/MSD	4/20/2000	--	<1.0	<1.0	<1.0	<.5	<.5
WBT34E	NR	T	GC/MSD	3/22/2000	1545	<.5	<10.0	<10.0	<.5	<.5

Additional Volatile Organic Compounds											
Ethyl benzene (µg/L)	Hexa-chloro-butadiene (µg/L)	*p* -Iso-propyl-toluene (µg/L)	*m,p* - Xylenes (µg/L)	Naph-thalene (µg/L)	*n* - Propyl-benzene (µg/L)	Toluene (µg/L)	1,2,3-Tri-chloro-benzene (µg/L)	1,2,4-Tri-chloro-benzene (µg/L)	1,2,4-Tri-methyl-benzene (µg/L)	1,3,5-Tri-methyl-benzene (µg/L)	Site name
<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	WBT30C
<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	WBT30E
<0.5	<10.0	<0.5	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<0.5	WB33A
<2.5	<50.0	<2.5	<50.0	<50.0	<50.0	<50.0	<50.0	<50.0	<50.0	<2.5	WB33A
<2.5	<50.0	<2.5	<50.0	<50.0	<50.0	<50.0	<50.0	<50.0	<50.0	<2.5	WB33A
<.5	<10.0	<.5	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<.5	WB33B
<2.5	<50.0	<2.5	<50.0	<50.0	<50.0	<50.0	<50.0	<50.0	<50.0	<2.5	WB33B
<2.5	<50.0	<2.5	<50.0	<50.0	<50.0	<50.0	<50.0	<50.0	<50.0	<2.5	WB33B
<.5	<10.0	<.5	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<.5	WB33Y
<.5	<10.0	<.5	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<.5	WB33Z
<.5	<10.0	<.5	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<.5	WB33Z
<.5	<10.0	<.5	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<.5	WB34A
<.5	<10.0	<.5	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<.5	WB34B
<.5	<10.0	<.5	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<.5	WB34B
.5	<10.0	<.5	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<.5	WBM34A
<.5	<10.0	<.5	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<.5	WBM34B
.7	<10.0	<.5	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<.5	WBM34C
.6	<10.0	<.5	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<.5	WBM34D
.7	<10.0	<.5	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<.5	WBM34E
1.1	<10.0	<.5	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	.6	WBM34F
1.4	<10.0	<.5	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<.5	WBM34F
2.0	<10.0	<.5	<10.0	<10.0	<10.0	15.8	<10.0	<10.0	<10.0	1.2	WBM34G
<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	WBT34B
<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	WBT34B
<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	WBT34C
<.5	<10.0	<.5	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<.5	WBT34D
<5.0	<100	<5.0	<100	<100	<100	<100	<100	<100	<100	<5.0	WBT34D
<.5	<10.0	<.5	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<.5	WBT34D
<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	WBT34D
<.5	<10.0	<.5	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<.5	WBT34E

Appendix 2C. *Organic constituents for wells, piezometers, and multi-level monitoring systems in the West Branch Canal Creek study area, Aberdeen Proving Ground, Maryland, March 2000 through May 2001-Continued*

Site name	Replicate	Sample device	Analysis code	Collection date	Collection time	Additional Volatile Organic Compounds				
						1,2-Di-chloro-benzene (µg/L)	1,3-Di-chloro-benzene (µg/L)	1,4-Di-chloro-benzene (µg/L)	1,2-Di-chloro-propane (µg/L)	1,1-Di-chloro-propene (µg/L)
March - April 2000 Sampling Event - *Continued*										
WBT34E	NR	T	GC/MSD	4/20/2000	--	<1.0	<1.0	<1.0	<0.5	<0.5
WB35A	NR	DP	GC/MSD	3/20/2000	1430	<0.5	<10.0	<10.0	<.5	<.5
WB35B	NR	DP	GC/MSD	3/20/2000	1530	<.5	<10.0	<10.0	<.5	<.5
WB35C	1	DP	GC/MSD	3/20/2000	1500	<.5	<10.0	<10.0	<.5	<.5
WB35C	2	DP	GC/MSD	3/20/2000	1500	<.5	<10.0	<10.0	<.5	<.5
WB35E	1	DP	GC/MSD	3/22/2000	1108	<.5	<10.0	<10.0	<.5	<.5
WB35E	2	DP	GC/MSD	3/22/2000	1108	<.5	<10.0	<10.0	<.5	<.5
WB36A	NR	DP	GC/MSD	3/20/2000	1045	<.5	<10.0	<10.0	<.5	<.5
WB36B	NR	DP	GC/MSD	3/20/2000	1115	<.5	<10.0	<10.0	<.5	<.5
WB36C	NR	DP	GC/MSD	3/20/2000	1130	<.5	<10.0	<10.0	<.5	<.5
WBM36A	NR	ML	GC/MSD	3/16/2000	950	<.5	<10.0	<10.0	<.5	<.5
WBM36B	1	ML	GC/MSD	3/16/2000	1000	<.5	<10.0	<10.0	<.5	<.5
WBM36B	2	ML	GC/MSD	3/16/2000	1000	<.5	<10.0	<10.0	<.5	<.5
WBM36B	NR	ML	GC/MSD	3/20/2000	1000	<.5	<10.0	<10.0	<.5	<.5
WBM36C	1	ML	GC/MSD	3/16/2000	1030	<.5	<10.0	<10.0	<.5	<.5
WBM36C	2	ML	GC/MSD	3/16/2000	1030	<.5	<10.0	<10.0	<.5	<.5
WBM36C	NR	ML	GC/MSD	3/20/2000	1030	<.5	<10.0	<10.0	<.5	<.5
WBM36D	NR	ML	GC/MSD	3/16/2000	1345	<.5	<10.0	<10.0	<.5	<.5
WBM36E	NR	ML	GC/MSD	3/16/2000	1350	<.5	<10.0	<10.0	<.5	<.5
WBM36F	NR	ML	GC/MSD	3/16/2000	1400	<.5	<10.0	<10.0	<.5	<.5
WBM36G	NR	ML	GC/MSD	3/16/2000	1540	<.5	<10.0	<10.0	<.5	<.5
WBT36B	NR	T	GC/MSD	4/20/2000	--	<1.0	<1.0	<1.0	<.5	<.5
WBT36C	NR	T	GC/MSD	3/22/2000	1430	<.5	<10.0	<10.0	<.5	<.5
WBT36C	1	T	GC/MSD	4/20/2000	--	<1.0	<1.0	<1.0	<.5	<.5
WBT36C	2	T	GC/MSD	4/20/2000	--	<1.0	<1.0	<1.0	<.5	<.5
WBT36D	NR	T	GC/MSD	4/20/2000	--	<1.0	<1.0	<1.0	<.5	<.5
WBT36F	NR	T	GC/MSD	4/20/2000	--	<1.0	<1.0	<1.0	<.5	<.5
WBT36G	1	T	GC/MSD	4/20/2000	--	<1.0	<1.0	<1.0	<.5	<.5
WBT36G	2	T	GC/MSD	4/20/2000	--	<1.0	<1.0	<1.0	<.5	<.5
WBT36H	NR	T	GC/MSD	4/20/2000	--	<1.0	<1.0	<1.0	<.5	<.5

Additional Volatile Organic Compounds											
Ethyl benzene (µg/L)	Hexa-chloro-butadiene (µg/L)	*p* -Iso-propyl-toluene (µg/L)	*m,p* - Xylenes (µg/L)	Naph-thalene (µg/L)	*n* - Propyl-benzene (µg/L)	Toluene (µg/L)	1,2,3-Tri-chloro-benzene (µg/L)	1,2,4-Tri-chloro-benzene (µg/L)	1,2,4-Tri-methyl-benzene (µg/L)	1,3,5-Tri-methyl-benzene (µg/L)	Site name
<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	WBT34E
<0.5	<10.0	<0.5	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<0.5	WB35A
<.5	<10.0	<.5	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<.5	WB35B
<.5	<10.0	<.5	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<.5	WB35C
<.5	<10.0	<.5	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<.5	WB35C
<.5	<10.0	<.5	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<.5	WB35E
<.5	<10.0	<.5	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<.5	WB35E
<.5	<10.0	<.5	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<.5	WB36A
<.5	<10.0	<.5	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<.5	WB36B
<.5	<10.0	<.5	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<.5	WB36C
<.5	<10.0	<.5	<10.0	<10.0	<10.0	13.0	<10.0	<10.0	<10.0	<.5	WBM36A
<.5	<10.0	<.5	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<.5	WBM36B
<.5	<10.0	<.5	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<.5	WBM36B
<.5	<10.0	<.5	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<.5	WBM36B
<.5	<10.0	<.5	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<.5	WBM36C
<.5	<10.0	<.5	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<.5	WBM36C
<.5	<10.0	<.5	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	.5	WBM36C
<.5	<10.0	<.5	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<.5	WBM36D
<.5	<10.0	<.5	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<.5	WBM36E
<.5	<10.0	<.5	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<.5	WBM36F
<.5	<10.0	<.5	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<.5	WBM36G
<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	WBT36B
<.5	<10.0	<.5	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<.5	WBT36C
<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	WBT36C
<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	WBT36C
<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	WBT36D
<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	WBT36F
<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	WBT36G
<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	WBT36G
<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	WBT36H

Appendix 2C. *Organic constituents for wells, piezometers, and multi-level monitoring systems in the West Branch Canal Creek study area, Aberdeen Proving Ground, Maryland, March 2000 through May 2001-Continued*

Site name	Replicate	Sample device	Analysis code	Collection date	Collection time	Additional Volatile Organic Compounds				
						1,2-Di-chloro-benzene (µg/L)	1,3-Di-chloro-benzene (µg/L)	1,4-Di-chloro-benzene (µg/L)	1,2-Di-chloro-propane (µg/L)	1,1-Di-chloro-propene (µg/L)
March - April 2000 Field Blanks										
After WBM23G	1	ML, BL	GC/MSD	3/11/2000	1440	<0.5	<10.0	<10.0	<0.5	<0.5
After WBM23G	2	ML, BL	GC/MSD	3/11/2000	1440	<.5	<10.0	<10.0	<.5	<.5
After WB24B	NR	DP, BL	GC/MSD	3/14/2000	--	<.5	<10.0	<10.0	<.5	<.5
After WBM24B	NR	ML, BL	GC/MSD	3/13/2000	1630	<.5	<10.0	<10.0	<.5	<.5
After WBM24C	NR	ML	GC/MSD	3/16/2000	--	<.5	<10.0	<10.0	<.5	<.5
After WBM24G	NR	ML, BL	GC/MSD	3/14/2000	1100	<.5	<10.0	<10.0	<.5	<.5
After WBT26C	1	T, BL	GC/MSD	4/20/2000	--	<1.0	<1.0	<1.0	<.5	<.5
After WBT26C	2	T, BL	GC/MSD	4/20/2000	--	<1.0	<1.0	<1.0	<.5	<.5
After WB35C	NR	DP, BL	GC/MSD	3/20/2000	1530	<.5	<10.0	<10.0	<.5	<.5
After WBT36G	NR	T, BL	GC/MSD	4/20/2000	--	<1.0	<1.0	<1.0	<.5	<.5
Comprehensive Sampling Event (June - August 2000)										
CC27A	1	W4	GC/MSD	8/10/2000	1100	<37.5	<37.5	<37.5	<37.5	<25.0
CC27A	2	W4	GC/MSD	8/10/2000	1100	<37.5	<37.5	<37.5	<37.5	<25.0
CC27A	3	W4	GC/MSD	8/10/2000	1100	<15.0	<15.0	<15.0	<15.0	<10.0
CC27A	4	W4	GC/MSD	8/10/2000	1100	<3.8	<3.8	<3.8	<3.8	<2.5
CC27B	1	W4	GC/MSD	8/10/2000	1130	<37.5	<37.5	<37.5	<37.5	<25.0
CC27B	2	W4	GC/MSD	8/10/2000	1130	<15.0	<15.0	<15.0	<15.0	<10.0
CC27B	3	W4	GC/MSD	8/10/2000	1130	<3.8	<3.8	<3.8	<3.8	<2.5
DP-1A	1	W2	GC/MSD	8/11/2000	1100	<.8	<0.8	<0.8	<.8	<.5
DP-1A	2	W2	GC/MSD	8/11/2000	1100	<.8	<.8	<.8	<.8	<.5
DP-1A	NR	W2	GC/MSD	8/14/2000	1415	<.8	<.8	<.8	<.8	<.5
DP-1B	NR	W2	GC/MSD	8/14/2000	1330	<.8	<.8	<.8	<.8	<.5
WB19A	NR	DP	GC/MSD	6/21/2000	1325	<.9	<.9	<.9	<.8	<.6
WB19A	NR	DP	GC/MSD	7/13/2000	1325	<.8	<.8	<.8	<.8	<.5
WB19B	NR	DP	GC/MSD	6/13/2000	900	<.8	<.8	<.8	<.8	<.5
WB19D	NR	DP	GC/MSD	7/13/2000	1500	<.8	<.8	<.8	<.8	<.5
WB19E	NR	DP	GC/MSD	6/13/2000	930	<.8	<.8	<.8	<.8	<.5
WB20A	1	DP	GC/MSD	8/11/2000	1100	<.8	<.8	<.8	<.8	<.5
WB20A	2	DP	GC/MSD	8/11/2000	1100	<.8	<.8	<.8	<.8	<.5

Additional Volatile Organic Compounds											
Ethyl benzene (µg/L)	Hexa-chloro-butadiene (µg/L)	*p* -Iso-propyl-toluene (µg/L)	*m,p* - Xylenes (µg/L)	Naph-thalene (µg/L)	*n* - Propyl-benzene (µg/L)	Toluene (µg/L)	1,2,3-Tri-chloro-benzene (µg/L)	1,2,4-Tri-chloro-benzene (µg/L)	1,2,4-Tri-methyl-benzene (µg/L)	1,3,5-Tri-methyl-benzene (µg/L)	Site name
<10.0	<10.0	<0.5	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<0.5	After WBM23G
<10.0	<10.0	<.5	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<.5	After WBM23G
<10.0	<10.0	<.5	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<.5	After WB24B
<10.0	<10.0	<.5	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<.5	After WBM24B
<10.0	<10.0	<.5	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	.7	After WBM24C
<10.0	<10.0	<.5	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<.5	After WBM24G
<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	After WBT26C
<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	After WBT26C
<0.5	<10.0	<.5	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<.5	After WB35C
<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	After WBT36G
<37.5	<37.5	<25.0	<37.5	<25.0	<37.5	<37.5	<25.0	<25.0	<37.5	<37.5	CC27A
<37.5	<37.5	<25.0	<37.5	<25.0	<37.5	<37.5	<25.0	<25.0	<37.5	<37.5	CC27A
<15.0	<15.0	<10.0	<15.0	<10.0	<15.0	<15.0	<10.0	<10.0	<15.0	<15.0	CC27A
<3.8	<3.8	<2.5	<3.8	<2.5	<3.8	<3.8	<2.5	<2.5	<3.8	<3.8	CC27A
<37.5	<37.5	<25.0	<37.5	<25.0	<37.5	<37.5	<25.0	<25.0	<37.5	<37.5	CC27B
<15.0	<15.0	<10.0	<15.0	<10.0	<15.0	<15.0	<10.0	<10.0	<15.0	<15.0	CC27B
<3.8	<3.8	<2.5	<3.8	<2.5	<3.8	<3.8	<2.5	<2.5	<3.8	<3.8	CC27B
<.8	<0.8	<.5	<.8	<0.5	<0.8	<0.8	<0.5	<0.5	<0.8	<.8	DP-1A
<.8	<.8	<.5	<.8	<.5	<.8	<.8	<.5	<.5	<.8	<.8	DP-1A
<.8	<.8	<.5	<.8	<.5	<.8	<.8	<.5	<.5	<.8	<.8	DP-1A
<.8	<.8	<.5	<.8	<.5	<.8	<.8	<.5	<.5	<.8	<.8	DP-1B
<.9	<.9	<.6	<.9	<.9	<.9	<.9	<.9	<.9	<.9	<.9	WB19A
<.8	<.8	<.5	<.8	<.8	<.8	<.8	<.8	<.8	<.8	<.8	WB19A
<.8	<.8	<.5	<.8	<.8	<.8	<.8	<.8	<.8	<.8	<.8	WB19B
<.8	<.8	<.5	<.8	<.8	<.8	<.8	<.8	<.8	<.8	<.8	WB19D
<.8	<.8	<.5	<.8	<.8	<.8	<.8	<.8	<.8	<.8	<.8	WB19E
<.8	<.8	<.5	<.8	<.5	<.8	.8	<.5	<.5	<.8	<.8	WB20A
<.8	<.8	.7	<.8	10.5	<.8	1.4	<.5	<.5	<.8	<.8	WB20A

Appendix 2C. *Organic constituents for wells, piezometers, and multi-level monitoring systems in the West Branch Canal Creek study area, Aberdeen Proving Ground, Maryland, March 2000 through May 2001-Continued*

Site name	Replicate	Sample device	Analysis code	Collection date	Collection time	Additional Volatile Organic Compounds: 1,2-Di-chloro-benzene (µg/L)	1,3-Di-chloro-benzene (µg/L)	1,4-Di-chloro-benzene (µg/L)	1,2-Di-chloro-propane (µg/L)	1,1-Di-chloro-propene (µg/L)
Comprehensive Sampling Event (June - August 2000) - *Continued*										
WB20B	1	DP	GC/MSD	8/11/2000	1330	<0.8	<0.8	<0.8	<0.8	<0.5
WB20B	2	DP	GC/MSD	8/11/2000	1330	<.8	<.8	<.8	<.8	<.5
WB21B	NR	DP	GC/MSD	8/1/2000	1045	<.8	<.8	<.8	<.8	<.5
WB21D	NR	DP	GC/MSD	8/1/2000	1045	<.8	<.8	<.8	<.8	<.5
WB21E	2	DP	GC/MSD	8/1/2001	1310	<.8	<.8	<.8	<.8	<.5
WB21F	1	DP	GC/MSD	8/10/2000	1100	<.8	<.8	<.8	<.8	<.5
WB21F	2	DP	GC/MSD	8/10/2000	1100	<.8	<.8	<.8	<.8	<.5
WB21G	NR	DP	GC/MSD	7/31/2000	1135	<.8	<.8	<.8	<.8	<.5
WB22B	1	DP	GC/MSD	7/17/2000	1450	<.8	<.8	<.8	<.8	<.5
WB22B	2	DP	GC/MSD	7/17/2000	1450	<.8	<.8	<.8	<.8	<.5
WB22B	1	DP	GC/MSD	8/1/2000	1130	<.8	<.8	<.8	<.8	<.5
WB22B	2	DP	GC/MSD	8/1/2000	1130	<.8	<.8	<.8	<.8	<.5
WB22C	1	DP	GC/MSD	7/17/2000	1120	<.8	<.8	<.8	<.8	<.5
WB22C	2	DP	GC/MSD	7/17/2000	1120	<.8	<.8	<.8	<.8	<.5
WB22C	1	DP	GC/MSD	8/1/2000	1330	<.8	<.8	<.8	<.8	<.5
WB22C	2	DP	GC/MSD	8/1/2000	1330	<.8	<.8	<.8	<.8	<.5
WB22D	1	DP	GC/MSD	8/1/2000	1500	<.8	<.8	<.8	<.8	<.5
WB22D	2	DP	GC/MSD	8/1/2000	1500	<.8	<.8	<.8	<.8	<.5
WB22E	1	DP	GC/MSD	8/3/2000	1115	<.8	<.8	<.8	<.8	<.5
WB22E	2	DP	GC/MSD	8/3/2000	1115	<.8	<.8	<.8	<.8	<.5
WB23A	NR	DP	GC/MSD	6/23/2000	1000	--	--	--	<.8	<.5
WB23B	NR	DP	GC/MSD	6/15/2000	1330	<.8	<.8	<.8	<.8	<.5
WB23C	1	DP	GC/MSD	7/7/2000	1330	<.8	<.8	<.8	<.8	<.5
WB23C	2	DP	GC/MSD	7/7/2000	1330	<.8	<.8	<.8	<.8	<.5
WB23C	3	DP	ELCD	7/7/2000	1330	NA	NA	NA	NA	NA
WB23D	1	DP	GC/MSD	6/20/2000	1500	<.8	<.8	<.8	<.8	<.5
WB23D	2	DP, BL	GC/MSD	6/20/2000	1500	<.8	<.8	<.8	<.8	<.5
WB23D	3	DP, BL	GC/MSD	6/20/2000	1500	<.8	<.8	<.8	<.8	<.5
WB23E	1	DP	GC/MSD	7/18/2000	1115	<.8	<.8	<.8	<.8	<.5
WB23E	2	DP	GC/MSD	7/18/2000	1115	<.8	<.8	<.8	<.8	<.5

Additional Volatile Organic Compounds											
Ethyl benzene (µg/L)	Hexa-chloro-butadiene (µg/L)	*p* -Iso-propyl-toluene (µg/L)	*m,p* - Xylenes (µg/L)	Naph-thalene (µg/L)	*n* - Propyl-benzene (µg/L)	Toluene (µg/L)	1,2,3-Tri-chloro-benzene (µg/L)	1,2,4-Tri-chloro-benzene (µg/L)	1,2,4-Tri-methyl-benzene (µg/L)	1,3,5-Tri-methyl-benzene (µg/L)	Site name
<0.8	<0.8	<0.5	<0.8	<0.5	<0.8	<0.8	<0.5	<0.5	<0.8	<0.8	WB20B
<.8	<.8	<.5	<.8	<.5	<.8	1.0	<.5	<.5	<.8	<.8	WB20B
<.8	<.8	<.5	<.8	<.5	<.8	<.8	<.5	<.5	<.8	<.8	WB21B
<.8	<.8	<.5	<.8	<.5	<.8	<.8	<.5	<.5	<.8	<.8	WB21D
<.8	<.8	<.5	<.8	<.5	<.8	<.8	<.5	<.5	<.8	<.8	WB21E
<.8	<.8	<.5	<.8	<.5	<.8	<.8	<.5	<.5	<.8	<.8	WB21F
<.8	<.8	<.5	<.8	<.5	<.8	<.8	<.5	<.5	<.8	<.8	WB21F
<.8	<.8	<.5	<.8	<.5	<.8	<.8	<.5	<.5	<.8	<.8	WB21G
<.8	<.8	<.5	<.8	<.8	<.8	<.8	<.8	<.8	<.8	<.8	WB22B
<.8	<.8	<.5	<.8	8.5	<.8	<.8	6.3	2.6	<.8	<.8	WB22B
<.8	<.8	<.5	<.8	<.5	<.8	<.8	<.5	<.5	<.8	<.8	WB22B
<.8	<.8	<.5	<.8	<.5	<.8	<.8	<.5	<.5	<.8	<.8	WB22B
<.8	<.8	<.5	<.8	<.8	<.8	<.8	<.8	<.8	<.8	<.8	WB22C
<.8	<.8	<.5	<.8	.5	<.8	<.8	.8	.9	<.8	<.8	WB22C
<.8	<.8	<.5	<.8	<.5	<.8	<.8	<.5	<.5	<.8	<.8	WB22C
<.8	<.8	<.5	<.8	<.5	<.8	<.8	<.5	<.5	<.8	<.8	WB22C
<.8	<.8	<.5	<.8	<.5	<.8	<.8	<.5	<.5	<.8	<.8	WB22D
<.8	<.8	<.5	<.8	<.5	<.8	<.8	<.5	<.5	<.8	<.8	WB22D
<.8	<.8	<.5	<.8	<.5	<.8	<.8	<.5	<.5	<.8	<.8	WB22E
<.8	<.8	<.5	<.8	<.5	<.8	<.8	<.5	<.5	<.8	<.8	WB22E
--	--	--	--	--	--	--	--	--	--	--	WB23A
<.8	<.8	<.5	<.8	<.8	<.8	<.8	<.8	<.8	<.8	<.8	WB23B
<.8	<.8	<.5	<.8	<.8	<.8	<.8	<.8	<.8	<.8	<.8	WB23C
<.8	<.8	<.5	<.8	<.8	<.8	<.8	<.8	<.8	<.8	<.8	WB23C
NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	WB23C
<.8	<.8	<.5	<.8	<.8	<.8	<.8	<.8	<.8	<.8	<.8	WB23D
<.8	<.8	<.5	<.8	<.8	<.8	<.8	<.8	<.8	<.8	<.8	WB23D
<.8	<.8	<.5	<.8	<.8	<.8	<.8	<.8	<.8	<.8	<.8	WB23D
<.8	<.8	<.5	<.8	<.8	<.8	<.8	<.8	<.8	<.8	<.8	WB23E
<.8	<.8	<.5	<.8	<.5	<.8	<.8	<.8	.8	<.8	<.8	WB23E

Appendix 2C. *Organic constituents for wells, piezometers, and multi-level monitoring systems in the West Branch Canal Creek study area, Aberdeen Proving Ground, Maryland, March 2000 through May 2001-Continued*

Site name	Replicate	Sample device	Analysis code	Collection date	Collection time	Additional Volatile Organic Compounds				
						1,2-Di-chloro-benzene (µg/L)	1,3-Di-chloro-benzene (µg/L)	1,4-Di-chloro-benzene (µg/L)	1,2-Di-chloro-propane (µg/L)	1,1-Di-chloro-propene (µg/L)
Comprehensive Sampling Event (June - August 2000) - *Continued*										
WB23F	1	DP	GC/MSD	7/19/2000	1310	<0.8	<0.8	<0.8	<0.8	<0.5
WB23F	2	DP	GC/MSD	7/19/2000	1310	<.8	<.8	<.8	<.8	<.5
WBM23A	NR	ML	ELCD	7/6/2000	--	NA	NA	NA	NA	NA
WBM23B	1	ML	GC/MSD	6/7/2000	--	<1.0	<1.0	<1.0	<1.0	<.5
WBM23B	2	ML	GC/MSD	6/7/2000	--	<1.0	<1.0	<1.0	<1.0	<.5
WBM23B	3	ML	GC/MSD	6/7/2000	--	<1.0	<1.0	<1.0	<1.0	<.5
WBM23B	NR	ML	ELCD	7/6/2000	--	NA	NA	NA	NA	NA
WBM23C	1	ML	ELCD	7/5/2000	--	NA	NA	NA	NA	NA
WBM23C	2	ML	ELCD	7/5/2000	--	NA	NA	NA	NA	NA
WBM23D	NR	ML	ELCD	7/6/2000	--	NA	NA	NA	NA	NA
WBM23E	1	ML	ELCD	7/7/2000	--	NA	NA	NA	NA	NA
WBM23E	2	ML	ELCD	7/7/2000	--	NA	NA	NA	NA	NA
WBM23F	NR	ML	ELCD	7/6/2000	--	NA	NA	NA	NA	NA
WBM23G	NR	ML	ELCD	7/6/2000	--	NA	NA	NA	NA	NA
WBT23A	NR	T	GC/MSD	6/22/2000	1115	<1.2	<1.2	<1.2	<1.2	<.8
WBT23B	NR	T	GC/MSD	6/19/2000	--	<.8	<.8	<.8	<.8	<.5
WBT23C	NR	T	GC/MSD	6/14/2000	--	<.8	<.8	<.8	<.8	<.5
WBT23E	1	T	GC/MSD	6/15/2000	1130	<.8	<.8	<.8	<.8	<.5
WBT23E	2	T	GC/MSD	6/15/2000	1130	<.8	<.8	<.8	<.8	<.5
WB24A	NR	DP	GC/MSD	6/20/2000	--	<.8	<.8	<.8	<.8	<.5
WB24B	1	DP	GC/MSD	6/15/2000	1500	<.8	<.8	<.8	<.8	<.5
WB24B	2	DP	GC/MSD	6/15/2000	1500	<.8	<.8	<.8	<.8	<.5
WB24B	3	DP, BL	GC/MSD	6/15/2000	1500	<.8	<.8	<.8	<.8	<.5
WB24C.1	NR	DP	GC/MSD	7/14/2000	1115	<.8	<.8	<.8	<.8	5.4
WB24E	NR	DP	GC/MSD	6/23/2000	1655	--	--	--	<.8	<.5
WBM24A	NR	ML	ELCD	7/6/2000	--	NA	NA	NA	NA	NA
WBM24B	NR	ML	ELCD	7/6/2000	--	NA	NA	NA	NA	NA
WBM24C	1	ML	ELCD	7/7/2000	--	NA	NA	NA	NA	NA
WBM24C	2	ML	ELCD	7/7/2000	--	NA	NA	NA	NA	NA
WBM24D	1	ML	GC/MSD	6/7/2000	--	<1.0	<1.0	<1.0	<1.0	<.5

Additional Volatile Organic Compounds											
Ethyl benzene (µg/L)	Hexa-chloro-butadiene (µg/L)	*p* -Iso-propyl-toluene (µg/L)	*m,p* - Xylenes (µg/L)	Naph-thalene (µg/L)	*n* - Propyl-benzene (µg/L)	Toluene (µg/L)	1,2,3-Tri-chloro-benzene (µg/L)	1,2,4-Tri-chloro-benzene (µg/L)	1,2,4-Tri-methyl-benzene (µg/L)	1,3,5-Tri-methyl-benzene (µg/L)	Site name
<0.8	<0.8	<0.5	<0.8	<0.8	<0.8	<0.8	0.6	<0.8	<0.8	<0.8	WB23F
<.8	1.0	<.5	<.8	<.5	<.8	<.8	.8	.9	<.8	<.8	WB23F
NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	WBM23A
<1.0	<1.0	<.5	<1.0	<5.0	<1.0	1.7	<5.0	<1.0	<1.0	<1.0	WBM23B
<1.0	<1.0	<.5	<1.0	<5.0	<1.0	1.5	<5.0	<1.0	<1.0	<1.0	WBM23B
<1.0	<1.0	<.5	<1.0	<5.0	<1.0	1.6	<5.0	<1.0	<1.0	<1.0	WBM23B
NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	WBM23B
NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	WBM23C
NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	WBM23C
NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	WBM23D
NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	WBM23E
NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	WBM23E
NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	WBM23F
NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	WBM23G
<1.2	<1.2	<.8	<1.2	<1.2	<1.2	<1.2	<1.2	<1.2	<1.2	<1.2	WBT23A
<.8	<.8	<.5	<.8	<.8	<.8	6.1	<.8	<.8	<.8	<.8	WBT23B
<.8	<.8	<.5	<.8	<.8	<.8	<.8	<.8	<.8	<.8	<.8	WBT23C
<.8	<.8	<.5	<.8	<.8	<.8	<.8	<.8	<.8	<.8	<.8	WBT23E
<.8	<.8	<.5	<.8	<.8	<.8	<.8	<.8	<.8	<.8	<.8	WBT23E
<.8	<.8	<.5	<.8	<.8	<.8	<.8	<.8	<.8	<.8	<.8	WB24A
<.8	<.8	<.5	<.8	<.8	<.8	<.8	<.8	<.8	<.8	<.8	WB24B
<.8	<.8	<.5	<.8	<.8	<.8	<.8	<.8	<.8	<.8	<.8	WB24B
<.8	<.8	<.5	<.8	<.8	<.8	<.8	<.8	<.8	<.8	<.8	WB24B
<.8	<.8	<.5	<.8	<.8	<.8	.8 EV	<.8	<.8	<.8	<.8	WB24C.1
--	--	--	--	--	--	--	--	--	--	--	WB24E
NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	WBM24A
NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	WBM24B
NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	WBM24C
NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	WBM24C
<1.0	<1.0	<.5	<1.0	<5.0	<1.0	<1.0	<5.0	<1.0	<1.0	<1.0	WBM24D

Appendix 2C. *Organic constituents for wells, piezometers, and multi-level monitoring systems in the West Branch Canal Creek study area, Aberdeen Proving Ground, Maryland, March 2000 through May 2001-Continued*

Site name	Replicate	Sample device	Analysis code	Collection date	Collection time	Additional Volatile Organic Compounds: 1,2-Di-chloro-benzene (µg/L)	1,3-Di-chloro-benzene (µg/L)	1,4-Di-chloro-benzene (µg/L)	1,2-Di-chloro-propane (µg/L)	1,1-Di-chloro-propene (µg/L)
Comprehensive Sampling Event (June - August 2000) - *Continued*										
WBM24D	2	ML	GC/MSD	6/7/2000	--	<1.0	<1.0	<1.0	<1.0	<0.5
WBM24D	NR	ML	ELCD	7/7/2000	--	NA	NA	NA	NA	NA
WBM24E	NR	ML	ELCD	7/6/2000	--	NA	NA	NA	NA	NA
WBM24F	NR	ML	ELCD	7/6/2000	--	NA	NA	NA	NA	NA
WBM24G	NR	ML	ELCD	7/6/2000	--	NA	NA	NA	NA	NA
WBT24B	NR	T	GC/MSD	6/15/2000	1205	<0.8	<0.8	<0.8	<0.8	<.5
WBT24C	NR	T	GC/MSD	6/15/2000	1210	<.8	<.8	<.8	<.8	<.5
WB25A	1	DP	GC/MSD	7/18/2000	1050	<.8	<.8	<.8	<.8	<.5
WB25A	2	DP	GC/MSD	7/18/2000	1050	.86	1.1	1.2	<.8	<.5
WB25A	NR	DP	GC/MSD	7/28/2000	1000	<.8	<.8	<.8	<.8	<.5
WB25B	NR	DP	GC/MSD	7/18/2000	1115	1.4	1.8	1.9	<.8	<.5
WB25C	1	DP	GC/MSD	7/28/2000	1415	<.8	<.8	<.8	<.8	<.5
WB25C	2	DP	GC/MSD	7/28/2000	1415	<.8	<.8	<.8	<.8	<.5
WB25C.1	1	DP	GC/MSD	7/28/2000	1300	<.8	<.8	<.8	<.8	<.5
WB25C.1	2	DP	GC/MSD	7/28/2000	1300	<.8	<.8	<.8	<.8	<.5
WB25D	NR	DP	GC/MSD	7/18/2000	1115	<.8	<.8	<.8	<.8	5.1
WB25D.1	1	DP	GC/MSD	7/31/2000	1300	<.8	<.8	<.8	<.8	<.5
WB25D.1	2	DP	GC/MSD	7/31/2000	1300	<.8	<.8	<.8	<.8	<.5
WB26A	1	DP	GC/MSD	6/14/2000	--	<.8	<.8	<.8	<.8	<.5
WB26A	2	DP	GC/MSD	6/14/2000	--	<.8	<.8	<.8	<.8	<.5
WB26B	NR	DP	GC/MSD	6/22/2000	--	--	--	--	<.8	<.5
WB26B.1	1	DP	GC/MSD	7/17/2000	1000	<.8	<.8	<.8	<.8	<.5
WB26B.1	2	DP	GC/MSD	7/17/2000	1000	1.0	1.3	1.4	<.8	<.5
WB26C	NR	DP	GC/MSD	6/13/2000	1525	<.8	<.8	<.8	<.8	<.5
WB26D	NR	DP	GC/MSD	6/13/2000	1540	<.8	<.8	<.8	<.8	<.5
WB26E	1	DP	GC/MSD	6/13/2000	1615	<.8	<.8	<.8	<.8	<.5
WB26E	2	DP	GC/MSD	6/13/2000	1615	<.8	<.8	<.8	<.8	<.5
WB26F	1	DP	GC/MSD	6/14/2000	1100	<.8	<.8	<.8	<.8	<.5
WB26F	2	DP	GC/MSD	6/14/2000	1100	<.8	<.8	<.8	<.8	<.5
WB26G	1	DP	GC/MSD	7/14/2000	1035	<.8	<.8	<.8	<.8	<.5

Additional Volatile Organic Compounds											
Ethyl benzene (µg/L)	Hexa-chloro-butadiene (µg/L)	*p* -Iso-propyl-toluene (µg/L)	*m,p* - Xylenes (µg/L)	Naph-thalene (µg/L)	*n* - Propyl-benzene (µg/L)	Toluene (µg/L)	1,2,3-Tri-chloro-benzene (µg/L)	1,2,4-Tri-chloro-benzene (µg/L)	1,2,4-Tri-methyl-benzene (µg/L)	1,3,5-Tri-methyl-benzene (µg/L)	Site name
<1.0	<1.0	<0.5	<1.0	<5.0	<1.0	<1.0	<5.0	<1.0	<1.0	<1.0	WBM24D
NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	WBM24D
NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	WBM24E
NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	WBM24F
NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	WBM24G
<0.8	<0.8	<.5	<0.8	<0.8	<0.8	25.1	<0.8	<0.8	<0.8	<0.8	WBT24B
<.8	<.8	<.5	<.8	<.8	<.8	<0.8	<.8	<.8	<.8	<.8	WBT24C
<.8	<.8	<.5	<.8	<.8	<.8	<.8	<.8	<.8	<.8	<.8	WB25A
<.8	1.9	1.1	<.8	.9	.89	<.8	1.6	2.0	.9	<.8	WB25A
<.8	<.8	<.5	<.8	<.5	<.8	<.8	<.5	<.5	<.8	<.8	WB25A
<.8	3.0	1.7	.9	1.5	1.3	<.8	2.5	3.1	1.3	1.2	WB25B
<.8	<.8	<.5	<.8	.6	<.8	<.8	<.5	<.5	<.8	<.8	WB25C
<.8	<.8	<.5	<.8	<.5	<.8	<.8	<.5	<.5	<.8	<.8	WB25C
<.8	<.8	<.5	<.8	.7	<.8	<.8	.6	<.5	<.8	<.8	WB25C.1
<.8	<.8	<.5	<.8	<.5	<.8	<.8	<.5	<.5	<.8	<.8	WB25C.1
<.8	<.8	<.5	<.8	<.8	<.8	<.8	<.8	<.8	<.8	<.8	WB25D
<.8	<.8	<.5	<.8	<.5	<.8	<.8	<.5	<.5	<.8	<.8	WB25D.1
<.8	<.8	<.5	<.8	<.5	<.8	<.8	<.5	<.5	<.8	<.8	WB25D.1
<.8	<.8	<.5	<.8	<.8	<.8	<.8	<.8	<.8	<.8	<.8	WB26A
<.8	<.8	<.5	<.8	<.8	<.8	<.8	<.8	<.8	<.8	<.8	WB26A
--	--	--	--	--	--	--	--	--	--	--	WB26B
<.8	<.8	<.5	<.8	<.8	<.8	<.8	<.8	<.8	<.8	<.8	WB26B.1
<.8	2.2	1.2	<.8	.9	1.0	<.8	1.8	2.3	1.0	.8	WB26B.1
<.8	<.8	<.5	<.8	<.8	<.8	<.8	<.8	<.8	<.8	<.8	WB26C
<.8	<.8	<.5	<.8	<.8	<.8	<.8	<.8	<.8	<.8	<.8	WB26D
<.8	<.8	<.5	<.8	<.8	<.8	<.8	<.8	<.8	<.8	<.8	WB26E
<.8	<.8	<.5	<.8	<.8	<.8	<.8	<.8	<.8	<.8	<.8	WB26E
<.8	<.8	<.5	<.8	<.8	<.8	<.8	<.8	<.8	<.8	<.8	WB26F
<.8	<.8	<.5	<.8	<.8	<.8	<.8	<.8	<.8	<.8	<.8	WB26F
<.8	<.8	<.5	<.8	<.8	<.8	<.8	<.8	<.8	<.8	<.8	WB26G

Appendix 2C. *Organic constituents for wells, piezometers, and multi-level monitoring systems in the West Branch Canal Creek study area, Aberdeen Proving Ground, Maryland, March 2000 through May 2001-Continued*

Site name	Replicate	Sample device	Analysis code	Collection date	Collection time	Additional Volatile Organic Compounds: 1,2-Di-chloro-benzene (µg/L)	1,3-Di-chloro-benzene (µg/L)	1,4-Di-chloro-benzene (µg/L)	1,2-Di-chloro-propane (µg/L)	1,1-Di-chloro-propene (µg/L)
Comprehensive Sampling Event (June - August 2000) - *Continued*										
WB26G	2	DP	GC/MSD	7/14/2000	1035	<0.8	<0.8	<0.8	<0.8	<0.5
WB26H	1	DP	GC/MSD	7/14/2000	1130	<.8	<.8	<.8	<.8	<.5
WB26H	2	DP	GC/MSD	7/14/2000	1130	<.8	<.8	<.8	<.8	<.5
WBM26A	1	ML	ELCD	7/5/2000	--	NA	NA	NA	NA	NA
WBM26A	2	ML	ELCD	7/5/2000	--	NA	NA	NA	NA	NA
WBM26B	NR	ML	ELCD	7/6/2000	--	NA	NA	NA	NA	NA
WBM26C	1	ML	GC/MSD	6/7/2000	1010	<1.0	<1.0	<1.0	<1.0	<.5
WBM26C	2	ML	GC/MSD	6/7/2000	1010	<1.0	<1.0	<1.0	<1.0	<.5
WBM26C	3	ML	GC/MSD	6/7/2000	1010	<1.0	<1.0	<1.0	<1.0	<.5
WBM26C	4	ML	GC/MSD	6/7/2000	1010	<1.0	<1.0	<1.0	<1.0	<.5
WBM26C	5	ML	GC/MSD	6/7/2000	1010	<1.0	<1.0	<1.0	<1.0	<.5
WBM26C	6	ML	GC/MSD	6/7/2000	1010	<1.0	<1.0	<1.0	<1.0	<.5
WBM26C	NR	ML	ELCD	7/6/2000	--	NA	NA	NA	NA	NA
WBM26D	1	ML	ELCD	7/6/2000	--	NA	NA	NA	NA	NA
WBM26D	2	ML	ELCD	7/6/2000	--	NA	NA	NA	NA	NA
WBM26E	1	ML	ELCD	7/5/2000	--	NA	NA	NA	NA	NA
WBM26E	2	ML	ELCD	7/5/2000	--	NA	NA	NA	NA	NA
WBM26F	1	ML	ELCD	7/6/2000	--	NA	NA	NA	NA	NA
WBM26F	2	ML	ELCD	7/6/2000	--	NA	NA	NA	NA	NA
WBM26G	1	ML	ELCD	7/5/2000	--	NA	NA	NA	NA	NA
WBM26G	2	ML	ELCD	7/5/2000	--	NA	NA	NA	NA	NA
WBT26C	1	T	GC/MSD	6/16/2000	--	<.8	<.8	<.8	<.8	<.5
WBT26C	2	T	GC/MSD	6/16/2000	--	<.8	<.8	<.8	<.8	<.5
WBT26D	1	T	GC/MSD	6/14/2000	1400	<.8	<.8	<.8	<.8	<.5
WBT26D	2	T	GC/MSD	6/14/2000	1400	<.8	<.8	<.8	<.8	<.5
WB27A	1	DP	GC/MSD	7/20/2000	850	<.8	<.8	<.8	<.8	<.5
WB27A	2	DP	GC/MSD	7/20/2000	850	<.8	<.8	<.8	<.8	<.5
WB27A.1	NR	DP	GC/MSD	7/28/2000	1000	<.8	<.8	<.8	<.8	<.5
WB27B	1	DP	GC/MSD	7/20/2000	1145	<.8	<.8	<.8	<.8	<.5
WB27B	2	DP	GC/MSD	7/20/2000	1145	<.8	<.8	<.8	<.8	<.5

Additional Volatile Organic Compounds											
Ethyl benzene (µg/L)	Hexa-chloro-butadiene (µg/L)	*p* -Iso-propyl-toluene (µg/L)	*m,p* - Xylenes (µg/L)	Naph-thalene (µg/L)	*n* - Propyl-benzene (µg/L)	Toluene (µg/L)	1,2,3-Tri-chloro-benzene (µg/L)	1,2,4-Tri-chloro-benzene (µg/L)	1,2,4-Tri-methyl-benzene (µg/L)	1,3,5-Tri-methyl-benzene (µg/L)	Site name
<0.8	<0.8	<0.5	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	WB26G
<.8	<.8	<.5	<.8	<.8	<.8	<.8	<.8	<.8	<.8	<.8	WB26H
<.8	<.8	<.5	<.8	<.8	<.8	<.8	<.8	<.8	<.8	<.8	WB26H
NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	WBM26A
NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	WBM26A
NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	WBM26B
<1.0	<1.0	<.5	<1.0	<5.0	<1.0	5.2	<5.0	<1.0	<1.0	<1.0	WBM26C
<1.0	<1.0	<.5	<1.0	<5.0	<1.0	4.8	<5.0	<1.0	<1.0	<1.0	WBM26C
<1.0	<1.0	<.5	<1.0	<5.0	<1.0	4.0	<5.0	<1.0	<1.0	<1.0	WBM26C
<1.0	<1.0	<.5	<1.0	<5.0	<1.0	3.5	<5.0	<1.0	<1.0	<1.0	WBM26C
<1.0	<1.0	<.5	<1.0	<5.0	<1.0	3.2	<5.0	<1.0	<1.0	<1.0	WBM26C
<1.0	<1.0	<.5	<1.0	<5.0	<1.0	1.8	<5.0	<1.0	<1.0	<1.0	WBM26C
NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	WBM26C
NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	WBM26D
NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	WBM26D
NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	WBM26E
NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	WBM26E
NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	WBM26F
NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	WBM26F
NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	WBM26G
NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	WBM26G
<.8	<.8	<.5	<.8	<.8	<.8	<.8	<.8	<.8	<.8	<.8	WBT26C
<.8	<.8	<.5	<.8	<.8	<.8	<.8	<.8	<.8	<.8	<.8	WBT26C
<.8	<.8	<.5	<.8	<.8	<.8	<.8	<.8	<.8	<.8	<.8	WBT26D
<.8	<.8	<.5	<.8	<.8	<.8	<.8	<.8	<.8	<.8	<.8	WBT26D
<.8	<.8	<.5	<.8	1.5	<.8	<.8	3.2	1.0	<.8	<.8	WB27A
<.8	<.8	<.5	<.8	<.5	<.8	<.8	<.5	<.5	<.8	<.8	WB27A
<.8	<.8	<.5	<.8	<.5	<.8	<.8	<.5	<.5	<.8	<.8	WB27A.1
<.8	<.8	<.5	<.8	<.5	<.8	<.8	<.5	<.5	<.8	<.8	WB27B
<.8	<.8	<.5	<.8	<.5	<.8	<.8	<.5	<.5	<.8	<.8	WB27B

Appendix 2C. *Organic constituents for wells, piezometers, and multi-level monitoring systems in the West Branch Canal Creek study area, Aberdeen Proving Ground, Maryland, March 2000 through May 2001-Continued*

Site name	Replicate	Sample device	Analysis code	Collection date	Collection time	Additional Volatile Organic Compounds: 1,2-Di-chloro-benzene (µg/L)	1,3-Di-chloro-benzene (µg/L)	1,4-Di-chloro-benzene (µg/L)	1,2-Di-chloro-propane (µg/L)	1,1-Di-chloro-propene (µg/L)
Comprehensive Sampling Event (June - August 2000) - *Continued*										
WB27B.1	1	DP	GC/MSD	7/28/2000	1030	<0.8	<0.8	<0.8	<0.8	<0.5
WB27B.1	2	DP	GC/MSD	7/28/2000	1030	<.8	<.8	<.8	<.8	<.5
WB27B.1	1	DP	GC/MSD	8/9/2000	1100	<.8	<.8	<.8	<.8	<.5
WB27B.1	2	DP	GC/MSD	8/9/2000	1100	<.8	<.8	<.8	<.8	<.5
WB27B.1	3	DP	GC/MSD	8/9/2000	1100	<1.9	<1.9	<1.9	<1.9	<1.2
WB27C	NR	DP	GC/MSD	7/20/2000	1400	<.8	<.8	<.8	<.8	<.5
WB27D	1	DP	GC/MSD	7/27/2000	1430	<.8	<.8	<.8	<.8	<.5
WB27D	2	DP	GC/MSD	7/27/2000	1315	<.8	<.8	<.8	<.8	<.5
WB27D	3	DP	GC/MSD	7/27/2000	1315	<.8	<.8	<.8	<.8	<.5
WB27E	NR	DP	GC/MSD	7/27/2000	1430	<.8	<.8	<.8	<.8	<.5
WB27F	1	DP	GC/MSD	7/27/2000	1430	<.8	<.8	<.8	<.8	<.5
WB27F	2	DP	GC/MSD	7/27/2000	1430	<.8	<.8	<.8	<.8	<.5
WB27G	1	DP	GC/MSD	7/27/2000	900	<.8	<.8	<.8	<.8	<.5
WB27G	2	DP	GC/MSD	7/27/2000	900	<.8	<.8	<.8	<.8	<.5
WB28A	1	DP	GC/MSD	8/4/2000	920	<.8	<.8	<.8	<.8	<.5
WB28A	2	DP	GC/MSD	8/4/2000	920	<.8	<.8	<.8	<.8	<.5
WB28B	1	DP	GC/MSD	7/19/2000	1005	<.8	<.8	<.8	<.8	<.5
WB28B	2	DP	GC/MSD	7/19/2000	1005	<.8	<.8	<.8	<.8	<.5
WB28C	1	DP	GC/MSD	7/19/2000	1045	<.8	<.8	<.8	<.8	<.5
WB28C	2	DP	GC/MSD	7/19/2000	1045	<.8	<.8	<.8	<.8	<.5
WB28C.1	1	DP	GC/MSD	7/19/2000	1500	<.8	<.8	<.8	<.8	<.5
WB28C.1	2	DP	GC/MSD	7/19/2000	1500	<.8	<.8	<.8	<.8	<.5
WB28D	1	DP	GC/MSD	7/19/2000	1300	<.8	<.8	<.8	<.8	5.3
WB28D	2	DP	GC/MSD	7/19/2000	1300	<.8	<.8	<.8	<.8	<.5
WB28F	1	DP	GC/MSD	7/20/2000	1015	<.8	<.8	<.8	<.8	<.5
WB28F	2	DP	GC/MSD	7/20/2000	1015	<.8	<.8	<.8	<.8	<.5
WB28F	3	DP	GC/MSD	7/20/2000	1015	<15.0	<15.0	<15.0	<15.0	<10.0
WB30A	NR	DP	GC/MSD	6/27/2000	--	<.8	<.8	<.8	<.8	<.5
WB30A	NR	DP	GC/MSD	7/7/2000	--	--	--	--	<.8	<.5
WB30B	NR	DP	GC/MSD	6/27/2000	1030	<.8	<.8	<.8	<.8	<.5

Additional Volatile Organic Compounds											
Ethyl benzene (µg/L)	Hexa-chloro-butadiene (µg/L)	*p* -Iso-propyl-toluene (µg/L)	*m,p* - Xylenes (µg/L)	Naph-thalene (µg/L)	*n* - Propyl-benzene (µg/L)	Toluene (µg/L)	1,2,3-Tri-chloro-benzene (µg/L)	1,2,4-Tri-chloro-benzene (µg/L)	1,2,4-Tri-methyl-benzene (µg/L)	1,3,5-Tri-methyl-benzene (µg/L)	Site name
<0.8	<0.8	<0.5	<0.8	<0.5	<0.8	<0.8	<0.5	<0.5	<0.8	<0.8	WB27B.1
<.8	<.8	<.5	<.8	<.5	<.8	<.8	<.5	<.5	<.8	<.8	WB27B.1
<.8	<.8	<.5	<.8	<.5	<.8	<.8	<.5	<.5	<.8	<.8	WB27B.1
<.8	<.8	<.5	<.8	<.5	<.8	<.8	<.5	<.5	<.8	<.8	WB27B.1
<1.9	<1.9	<1.2	<1.9	<1.2	<1.9	<1.9	<1.2	<1.2	<1.9	<1.9	WB27B.1
<.8	<.8	<.5	<.8	<.5	<.8	<.8	<.5	<.5	<.8	<.8	WB27C
<.8	<.8	<.5	<.8	<.5	<.8	<.8	<.5	<.5	<.8	<.8	WB27D
<.8	1.5	<.5	<.8	<.5	<.8	<.8	<.5	<.5	<.8	<.8	WB27D
<.8	1.8	<.5	<.8	<.5	<.8	<.8	<.5	<.5	<.8	<.8	WB27D
<.8	<.8	<.5	<.8	<.5	<.8	<.8	<.5	<.5	<.8	<.8	WB27E
<.8	<.8	<.5	<.8	<.5	<.8	<.8	<.5	<.5	<.8	<.8	WB27F
<.8	<.8	<.5	<.8	<.5	<.8	<.8	<.5	<.5	<.8	<.8	WB27F
<.8	<.8	<.5	<.8	<.5	<.8	<.8	<.5	<.5	<.8	<.8	WB27G
<.8	<.8	<.5	<.8	<.5	<.8	<.8	<.5	<.5	<.8	<.8	WB27G
<.8	<.8	<.5	<.8	<.5	<.8	<.8	<.5	<.5	<.8	<.8	WB28A
<.8	<.8	<.5	<.8	<.5	<.8	<.8	<.5	<.5	<.8	<.8	WB28A
<.8	<.8	<.5	<.8	<.8	<.8	<.8	<.8	<.8	<.8	<.8	WB28B
<.8	<.8	<.5	<.8	<.8	<.8	<.8	<.8	<.8	<.8	<.8	WB28B
<.8	<.8	<.5	<.8	<.8	<.8	<.8	<.8	<.8	<.8	<.8	WB28C
<.8	<.8	<.5	<.8	<.5	<.8	<.8	<.5	<.5	<.8	<.8	WB28C
<.8	<.8	<.5	<.8	<.8	<.8	<.8	<.8	<.8	<.8	<.8	WB28C.1
<.8	<.8	<.5	<.8	<.5	<.8	<.8	<.5	<.5	<.8	<.8	WB28C.1
<.8	<.8	<.5	<.8	<.8	<.8	<.8	<.8	<.8	<.8	<.8	WB28D
<.8	<.8	<.5	<.8	<.5	<.8	<.8	<.5	<.5	<.8	<.8	WB28D
<.8	<.8	<.5	<.8	<.5	<.8	<.8	<.5	<.5	<.8	<.8	WB28F
<.8	<.8	<.5	<.8	<.5	<.8	<.8	<.5	<.5	<.8	<.8	WB28F
<15.0	<15.0	<10.0	<15.0	<10.0	<15.0	<15.0	<10.0	<10.0	<15.0	<15.0	WB28F
<.8	<.8	<.5	<.8	<.8	<.8	<.8	<.8	<.8	<.8	<.8	WB30A
<.8	--	--	<.8	--	--	<.8	--	--	--	--	WB30A
<.8	<.8	<.5	<.8	<.8	<.8	<.8	<.8	<.8	<.8	<.8	WB30B

Appendix 2C. *Organic constituents for wells, piezometers, and multi-level monitoring systems in the West Branch Canal Creek study area, Aberdeen Proving Ground, Maryland, March 2000 through May 2001-Continued*

Site name	Replicate	Sample device	Analysis code	Collection date	Collection time	Additional Volatile Organic Compounds: 1,2-Di-chloro-benzene (µg/L)	1,3-Di-chloro-benzene (µg/L)	1,4-Di-chloro-benzene (µg/L)	1,2-Di-chloro-propane (µg/L)	1,1-Di-chloro-propene (µg/L)
Comprehensive Sampling Event (June - August 2000) - *Continued*										
WB30B	NR	DP	GC/MSD	7/7/2000	--	<0.8	<0.8	<0.8	<0.8	<0.5
WB30C	1	DP	GC/MSD	6/27/2000	1100	<.8	<.8	<.8	<.8	<.5
WB30C	2	DP	GC/MSD	6/27/2000	1100	<.8	<.8	<.8	<.8	<.5
WB30D	1	DP	GC/MSD	6/27/2000	1200	<.8	<.8	<.8	<.8	<.5
WB30D	2	DP	GC/MSD	6/27/2000	1200	<.8	<.8	<.8	<.8	<.5
WBM30A	NR	ML	ELCD	7/6/2000	--	NA	NA	NA	NA	NA
WBM30B	NR	ML	ELCD	7/6/2000	--	NA	NA	NA	NA	NA
WBM30C	NR	ML	ELCD	7/6/2000	--	NA	NA	NA	NA	NA
WBM30D	NR	ML	ELCD	7/6/2000	--	NA	NA	NA	NA	NA
WBM30E	NR	ML	ELCD	7/6/2000	--	NA	NA	NA	NA	NA
WBM30F	NR	ML	ELCD	7/7/2000	--	NA	NA	NA	NA	NA
WBM30G	1	ML	ELCD	7/5/2000	--	NA	NA	NA	NA	NA
WBM30G	2	ML	ELCD	7/5/2000	--	NA	NA	NA	NA	NA
WBM30G	NR	ML, BL	ELCD	7/5/2000	--	NA	NA	NA	NA	NA
WBT30A	NR	T	GC/MSD	6/14/2000	1330	<.8	<.8	<.8	<.8	<.5
WBT30B	NR	T	GC/MSD	6/14/2000	1355	<.8	<.8	<.8	<.8	<.5
WBT30C	NR	T	GC/MSD	6/14/2000	1503	<.8	<.8	<.8	<.8	<.5
WBT30D	NR	T	GC/MSD	6/14/2000	1545	<.8	<.8	<.8	<.8	<.5
WBT30E	NR	T	GC/MSD	6/15/2000	1029	<.8	<.8	<.8	<.8	<.5
WB31A	NR	DP	GC/MSD	8/9/2000	920	<.8	<.8	<.8	<.8	<.5
WB31B	1	DP	GC/MSD	7/28/2000	1200	<.8	<.8	<.8	<.8	<.5
WB31B	2	DP	GC/MSD	7/28/2000	1200	<.8	<.8	<.8	<.8	<.5
WB31C	NR	DP	GC/MSD	7/28/2000	1050	<.8	<.8	<.8	<.8	<.5
WB31C	NR	DP	GC/MSD	7/28/2001	1050	<.8	<.8	<.8	<.8	<.5
WB31D	1	DP	GC/MSD	7/28/2000	1030	<.8	<.8	<.8	<.8	<.5
WB31D	2	DP	GC/MSD	7/28/2000	1030	<.8	<.8	<.8	<.8	<.5
WB31E	1	DP	GC/MSD	7/28/2000	850	<.8	<.8	<.8	<.8	<.5
WB31E	2	DP	GC/MSD	7/28/2000	850	<.8	<.8	<.8	<.8	<.5
WB32B	1	DP	GC/MSD	8/17/2000	840	<25.0	<25.0	<25.0	<.8	<16.6
WB32B	2	DP	GC/MSD	8/17/2000	840	<.8	<.8	<.8	<.8	<.5

Additional Volatile Organic Compounds											
Ethyl benzene (µg/L)	Hexa-chloro-butadiene (µg/L)	*p* -Iso-propyl-toluene (µg/L)	*m,p* - Xylenes (µg/L)	Naph-thalene (µg/L)	*n* - Propyl-benzene (µg/L)	Toluene (µg/L)	1,2,3-Tri-chloro-benzene (µg/L)	1,2,4-Tri-chloro-benzene (µg/L)	1,2,4-Tri-methyl-benzene (µg/L)	1,3,5-Tri-methyl-benzene (µg/L)	Site name
<0.8	<0.8	<0.5	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	WB30B
<.8	<.8	<.5	<.8	<.8	<.8	<.8	<.8	<.8	<.8	<.8	WB30C
<.8	<.8	<.5	<.8	<.8	<.8	<.8	<.8	<.8	<.8	<.8	WB30C
<.8	<.8	<.5	<.8	<.8	<.8	<.8	<.8	<.8	<.8	<.8	WB30D
<.8	<.8	<.5	<.8	<.8	<.8	<.8	<.8	<.8	<.8	<.8	WB30D
NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	WBM30A
NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	WBM30B
NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	WBM30C
NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	WBM30D
NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	WBM30E
NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	WBM30F
NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	WBM30G
NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	WBM30G
NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	WBM30G
<.8	<.8	<.5	<.8	<.8	<.8	8.4	<.8	<.8	<.8	<.8	WBT30A
<.8	<.8	<.5	<.8	<.8	<.8	<.8	<.8	<.8	<.8	<.8	WBT30B
<.8	<.8	<.5	<.8	<.8	<.8	<.8	<.8	<.8	<.8	<.8	WBT30C
<.8	<.8	<.5	<.8	<.8	<.8	<.8	<.8	<.8	<.8	<.8	WBT30D
<.8	<.8	<.5	<.8	<.8	<.8	<.8	<.8	<.8	<.8	<.8	WBT30E
<.8	<.8	<.5	<.8	<.5	<.8	<.8	<.5	<.5	<.8	<.8	WB31A
<.8	<.8	<.5	<.8	<.5	<.8	<.8	<.5	<.5	<.8	<.8	WB31B
<.8	<.8	<.5	<.8	<.5	<.8	<.8	<.5	<.5	<.8	<.8	WB31B
<.8	<.8	<.5	<.8	<.5	<.8	<.8	<.5	<.5	<.8	<.8	WB31C
<.8	<.8	<.5	<.8	<.5	<.8	<.8	<.5	<.5	<.8	<.8	WB31C
<.8	<.8	<.5	<.8	<.5	<.8	<.8	<.5	<.5	<.8	<.8	WB31D
<.8	<.8	<.5	<.8	<.5	<.8	<.8	<.5	<.5	<.8	<.8	WB31D
<.8	<.8	<.5	<.8	<.5	<.8	<.8	<.5	<.5	<.8	<.8	WB31E
<.8	<.8	<.5	<.8	<.5	<.8	<.8	<.5	<.5	<.8	<.8	WB31E
<25.0	<25.0	<16.6	<25.0	<16.6	<25.0	<25.0	<16.6	<16.6	<25.0	<25.0	WB32B
<.8	<.8	<.5	<.8	<.5	<.8	<.8	<.5	<.5	<.8	<.8	WB32B

Appendix 2C. *Organic constituents for wells, piezometers, and multi-level monitoring systems in the West Branch Canal Creek study area, Aberdeen Proving Ground, Maryland, March 2000 through May 2001-Continued*

Site name	Replicate	Sample device	Analysis code	Collection date	Collection time	Additional Volatile Organic Compounds				
						1,2-Di-chloro-benzene (µg/L)	1,3-Di-chloro-benzene (µg/L)	1,4-Di-chloro-benzene (µg/L)	1,2-Di-chloro-propane (µg/L)	1,1-Di-chloro-propene (µg/L)
Comprehensive Sampling Event (June - August 2000) - *Continued*										
WB33A	1	DP	GC/MSD	6/20/2000	1000	<0.8	<0.8	<0.8	<0.8	<0.5
WB33A	2	DP	GC/MSD	6/20/2000	1000	<.8	<.8	<.8	<.8	<.5
WB33A	1	DP	GC/MSD	7/7/2000	--	<.8	<.8	<.8	<.8	<.5
WB33A	2	DP	GC/MSD	7/7/2000	--	<7.5	<7.5	<7.5	<7.5	<5.0
WB33B	1	DP	GC/MSD	6/19/2000	1100	<.8	<.8	<.8	<.8	<.5
WB33B	2	DP	GC/MSD	6/19/2000	1100	<.8	<.8	<.8	<.8	<.5
WB33B	3	DP	GC/MSD	6/19/2000	1100	<.8	<.8	<.8	<.8	<.5
WB33B	4	DP, BL	GC/MSD	6/19/2000	1100	<.8	<.8	<.8	<.8	<.5
WB33B	5	DP, BL	GC/MSD	6/19/2000	1100	<3.8	<3.8	<3.8	<.8	<2.5
WB33B	1	DP	GC/MSD	7/7/2000	--	<.8	<.8	<.8	<.8	<.5
WB33B	2	DP	GC/MSD	7/7/2000	--	<4.0	<4.0	<4.0	<4.0	<2.5
WB33F	NR	DP	GC/MSD	8/16/2000	1030	<.8	<.8	<.8	<.8	<.5
WB33Z	NR	DP	GC/MSD	6/19/2000	1430	<.8	<.8	<.8	<.8	<.5
WB34B	NR	DP	GC/MSD	6/16/2000	955	<.8	<.8	<.8	<.8	<.5
WB34C	1	DP	GC/MSD	8/4/2000	1055	<.8	<.8	<.8	<.8	<.5
WB34C	2	DP	GC/MSD	8/4/2000	1055	<.8	<.8	<.8	<.8	<.5
WB34D	1	DP	GC/MSD	8/7/2000	1030	<.8	<.8	<.8	<.8	<.5
WB34D	2	DP	GC/MSD	8/7/2000	1030	<.8	<.8	<.8	<.8	<.5
WB34E	1	DP	GC/MSD	8/7/2000	1330	<.8	<.8	<.8	<.8	<.5
WB34E	2	DP	GC/MSD	8/7/2000	1330	<1.2	<1.2	<1.2	<.8	<.8
WBM34A	NR	ML	ELCD	7/7/2000	--	NA	NA	NA	NA	NA
WBM34B	1	ML	ELCD	7/7/2000	--	NA	NA	NA	NA	NA
WBM34B	2	ML	ELCD	7/7/2000	--	NA	NA	NA	NA	NA
WBM34C	1	ML	ELCD	7/6/2000	--	NA	NA	NA	NA	NA
WBM34C	2	ML	ELCD	7/6/2000	--	NA	NA	NA	NA	NA
WBM34D	1	ML	ELCD	7/7/2000	--	NA	NA	NA	NA	NA
WBM34D	2	ML	ELCD	7/7/2000	--	NA	NA	NA	NA	NA
WBM34E	NR	ML	ELCD	7/7/2000	--	NA	NA	NA	NA	NA
WBM34F	1	ML	ELCD	7/7/2000	--	NA	NA	NA	NA	NA
WBM34F	2	ML	ELCD	7/7/2000	--	NA	NA	NA	NA	NA

Additional Volatile Organic Compounds											
Ethyl benzene (µg/L)	Hexa-chloro-butadiene (µg/L)	*p* -Iso-propyl-toluene (µg/L)	*m,p* - Xylenes (µg/L)	Naph-thalene (µg/L)	*n* - Propyl-benzene (µg/L)	Toluene (µg/L)	1,2,3-Tri-chloro-benzene (µg/L)	1,2,4-Tri-chloro-benzene (µg/L)	1,2,4-Tri-methyl-benzene (µg/L)	1,3,5-Tri-methyl-benzene (µg/L)	Site name
<0.8	<0.8	<0.5	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	WB33A
<.8	<.8	<.5	<.8	<.8	<.8	<.8	<.8	<.8	<.8	<.8	WB33A
<.8	<.8	<.5	<.8	<.8	<.8	<.8	<.8	<.8	<.8	<.8	WB33A
<7.5	<7.5	<5.0	<7.5	<7.5	<7.5	<7.5	<7.5	<7.5	<7.5	<7.5	WB33A
<.8	<.8	<.5	<.8	<.8	<.8	<.8	<.8	<.8	<.8	<.8	WB33B
<.8	<.8	<.5	<.8	<.8	<.8	<.8	<.8	<.8	<.8	<.8	WB33B
<.8	<.8	<.5	<.8	<.8	<.8	<.8	<.8	<.8	<.8	<.8	WB33B
<.8	<.8	<.5	<.8	<.8	<.8	<.8	<.8	<.8	<.8	<.8	WB33B
<3.8	<3.8	<2.5	<3.8	<3.8	<3.8	<3.8	<3.8	<3.8	<3.8	<3.8	WB33B
<.8	<.8	<.5	<.8	<.8	<.8	<.8	<.8	<.8	<.8	<.8	WB33B
<4.0	<4.0	<2.5	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0	WB33B
<.8	<.8	<.5	<.8	<.5	<.8	<.8	<.5	<.5	<.8	<.8	WB33F
<.8	<.8	<.5	<.8	<.8	<.8	<.8	<.8	<.8	<.8	<.8	WB33Z
<.8	<.8	<.5	<.8	<.8	<.8	<.8	<.8	<.8	<.8	<.8	WB34B
<.8	<.8	<.5	<.8	<.5	<.8	<.8	<.5	<.5	<.8	<.8	WB34C
<.8	<.8	<.5	<.8	<.5	<.8	<.8	<.5	<.5	<.8	<.8	WB34C
<.8	<.8	<.5	<.8	<.5	<.8	<.8	<.5	<.5	<.8	<.8	WB34D
<.8	<.8	<.5	<.8	<.5	<.8	<.8	<.5	<.5	<.8	<.8	WB34D
<.8	<.8	<.5	<.8	<.5	<.8	<.8	<.5	<.5	<.8	<.8	WB34E
<1.2	<1.2	<.8	<1.2	<.8	<1.2	<1.2	<.8	<.8	<1.2	<1.2	WB34E
NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	WBM34A
NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	WBM34B
NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	WBM34B
NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	WBM34C
NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	WBM34C
NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	WBM34D
NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	WBM34D
NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	WBM34E
NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	WBM34F
NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	WBM34F

Appendix 2C. *Organic constituents for wells, piezometers, and multi-level monitoring systems in the West Branch Canal Creek study area, Aberdeen Proving Ground, Maryland, March 2000 through May 2001-Continued*

Site name	Replicate	Sample device	Analysis code	Collection date	Collection time	Additional Volatile Organic Compounds: 1,2-Di-chloro-benzene (µg/L)	1,3-Di-chloro-benzene (µg/L)	1,4-Di-chloro-benzene (µg/L)	1,2-Di-chloro-propane (µg/L)	1,1-Di-chloro-propene (µg/L)
Comprehensive Sampling Event (June - August 2000) - *Continued*										
WBM34G	1	ML	ELCD	7/7/2000	--	NA	NA	NA	NA	NA
WBM34G	2	ML	ELCD	7/7/2000	--	NA	NA	NA	NA	NA
WBT34A	NR	T	GC/MSD	6/21/2000	1225	<2.4	<2.4	<2.4	<2.4	<1.6
WBT34B	NR	T	GC/MSD	6/21/2000	1235	<0.8	<0.8	<0.8	<0.8	<0.5
WBT34C	NR	T	GC/MSD	6/21/2000	1630	<.8	<.8	<.8	<.8	<.5
WBT34D	NR	T	GC/MSD	6/21/2000	1640	<.8	<.8	<.8	<.8	<.5
WBT34E	NR	T	GC/MSD	6/22/2000	1500	--	--	--	--	<.5
WB35A	NR	DP	GC/MSD	6/19/2000	1345	<.8	<.8	<.8	<.8	<.5
WB35B	NR	DP	GC/MSD	6/16/2000	1400	<.8	<.8	<.8	<.8	<.5
WB35C	1	DP	GC/MSD	6/16/2000	1125	<.8	<.8	<.8	<.8	<.5
WB35C	2	DP	GC/MSD	6/16/2000	1125	<.8	<.8	<.8	<.8	<.5
WB35C	3	DP, BL	GC/MSD	6/16/2000	1126	<.8	<.8	<.8	<.8	<.5
WB35C	4	DP, BL	GC/MSD	6/16/2000	1126	<.8	<.8	<.8	<.8	<.5
WB35C.1	1	DP	GC/MSD	8/9/2000	1030	<.8	<.8	<.8	<.8	<.5
WB35C.1	2	DP	GC/MSD	8/9/2000	1030	<.8	<.8	<.8	<.8	<.5
WB35D	2	DP	GC/MSD	8/9/2000	1200	<.8	<.8	<.8	<.8	<.5
WB35E	NR	DP	GC/MSD	6/20/2000	1030	<.8	<.8	<.8	<.8	<.5
WB35F	1	DP	GC/MSD	8/8/2000	1000	<.8	<.8	<.8	<.8	<.5
WB35F	2	DP	GC/MSD	8/8/2000	1000	<.8	<.8	<.8	<.8	<.5
WB35F	1	DP	GC/MSD	8/11/2000	915	<.8	<.8	<.8	<.8	<.5
WB35F	2	DP	GC/MSD	8/11/2000	915	<.8	<.8	<.8	<.8	<.5
WB36A	NR	DP	GC/MSD	6/20/2000	1100	<.8	<.8	<.8	<.8	<.5
WB36B	NR	DP	GC/MSD	6/20/2000	945	<.8	<.8	<.8	<.8	<.5
WB36C	NR	DP	GC/MSD	6/20/2000	1000	<.8	<.8	<.8	<.8	<.5
WB36D	1	DP	GC/MSD	8/3/2000	1145	<.8	<.8	<.8	<.8	<.5
WB36D	2	DP	GC/MSD	8/3/2000	1145	<.8	<.8	<.8	<.8	<.5
WB36E	1	DP	GC/MSD	8/3/2000	1500	<.8	<.8	<.8	<.8	<.5
WB36E	2	DP	GC/MSD	8/3/2000	1500	<.8	<.8	<.8	<.8	<.5
WB36F	1	DP	GC/MSD	8/4/2000	1100	<.8	<.8	<.8	<.8	<.5
WB36F	2	DP	GC/MSD	8/4/2000	1100	<.8	<.8	<.8	<.8	<.5

Additional Volatile Organic Compounds											
Ethyl benzene (µg/L)	Hexa-chloro-butadiene (µg/L)	*p* -Iso-propyl-toluene (µg/L)	*m,p* - Xylenes (µg/L)	Naph-thalene (µg/L)	*n* - Propyl-benzene (µg/L)	Toluene (µg/L)	1,2,3-Tri-chloro-benzene (µg/L)	1,2,4-Tri-chloro-benzene (µg/L)	1,2,4-Tri-methyl-benzene (µg/L)	1,3,5-Tri-methyl-benzene (µg/L)	Site name
NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	WBM34G
NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	WBM34G
<2.4	<2.4	<1.6	<2.4	<2.4	<2.4	<2.4	<2.4	<2.4	<2.4	<2.4	WBT34A
<0.8	<0.8	<0.5	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	WBT34B
<.8	<.8	<.5	<.8	<.8	<.8	<.8	<.8	<.8	<.8	<.8	WBT34C
<.8	<.8	<.5	<.8	<.8	<.8	<.8	<.8	<.8	<.8	<.8	WBT34D
--	--	--	--	--	--	--	--	--	--	--	WBT34E
<.8	<.8	<.5	<.8	<.8	<.8	<.8	<.8	<.8	<.8	<.8	WB35A
<.8	<.8	<.5	<.8	<.8	<.8	<.8	<.8	<.8	<.8	<.8	WB35B
<.8	<.8	<.5	<.8	<.8	<.8	<.8	<.8	<.8	<.8	<.8	WB35C
<.8	<.8	<.5	<.8	<.8	<.8	<.8	<.8	<.8	<.8	<.8	WB35C
<.8	<.8	<.5	<.8	<.8	<.8	<.8	<.8	<.8	<.8	<.8	WB35C
<.8	<.8	<.5	<.8	<.8	<.8	<.8	<.8	<.8	<.8	<.8	WB35C
<.8	<.8	<.5	<.8	<.5	<.8	<.8	<.5	<.5	<.8	<.8	WB35C.1
<.8	<.8	<.5	<.8	<.5	<.8	<.8	<.5	<.5	<.8	<.8	WB35C.1
<.8	<.8	<.5	<.8	<.5	<.8	<.8	<.5	<.5	<.8	<.8	WB35D
<.8	<.8	<.5	<.8	<.8	<.8	<.8	<.8	<.8	<.8	<.8	WB35E
<.8	<.8	<.5	<.8	<.5	<.8	<.8	<.5	<.5	<.8	<.8	WB35F
<.8	<.8	<.5	<.8	<.5	<.8	<.8	<.5	<.5	<.8	<.8	WB35F
<.8	<.8	<.5	<.8	<.5	<.8	<.8	<.5	<.5	<.8	<.8	WB35F
<.8	<.8	<.5	<.8	<.5	<.8	<.8	<.5	<.5	<.8	<.8	WB35F
<.8	<.8	<.5	<.8	<.8	<.8	<.8	<.8	<.8	<.8	<.8	WB36A
<.8	<.8	<.5	<.8	<.8	<.8	<.8	<.8	<.8	<.8	<.8	WB36B
<.8	<.8	<.5	<.8	<.8	<.8	<.8	<.8	<.8	<.8	<.8	WB36C
<.8	<.8	<.5	<.8	<.5	<.8	<.8	<.5	<.5	<.8	<.8	WB36D
<.8	<.8	<.5	<.8	<.5	<.8	<.8	<.5	<.5	<.8	<.8	WB36D
<.8	<.8	<.5	<.8	<.5	<.8	<.8	<.5	<.5	<.8	<.8	WB36E
<.8	<.8	<.5	<.8	<.5	<.8	<.8	<.5	<.5	<.8	<.8	WB36E
<.8	<.8	<.5	<.8	<.5	<.8	<.8	<.5	<.5	<.8	<.8	WB36F
<.8	<.8	<.5	<.8	<.5	<.8	<.8	<.5	<.5	<.8	<.8	WB36F

Appendix 2C. *Organic constituents for wells, piezometers, and multi-level monitoring systems in the West Branch Canal Creek study area, Aberdeen Proving Ground, Maryland, March 2000 through May 2001-Continued*

Site name	Replicate	Sample device	Analysis code	Collection date	Collection time	Additional Volatile Organic Compounds: 1,2-Di-chloro-benzene (µg/L)	1,3-Di-chloro-benzene (µg/L)	1,4-Di-chloro-benzene (µg/L)	1,2-Di-chloro-propane (µg/L)	1,1-Di-chloro-propene (µg/L)
Comprehensive Sampling Event (June - August 2000) -*Continued*										
WB36G	1	DP	GC/MSD	8/7/2000	1130	<0.8	<0.8	<0.8	<0.8	<0.5
WB36G	2	DP	GC/MSD	8/7/2000	1130	<.8	<.8	<.8	<.8	<.5
WB36G	3	DP, MS	GC/MSD	8/7/2000	1130	<.8	<.8	<.8	<.8	<.5
WB36G	4	DP, MS	GC/MSD	8/7/2000	1130	<.8	<.8	<.8	<.8	<.5
WBM36A	NR	ML	ELCD	7/6/2000	--	NA	NA	NA	NA	NA
WBM36B	NR	ML	ELCD	7/5/2000	--	NA	NA	NA	NA	NA
WBM36C	NR	ML	ELCD	7/6/2000	--	NA	NA	NA	NA	NA
WBM36D	NR	ML	ELCD	7/6/2000	--	NA	NA	NA	NA	NA
WBM36E	NR	ML	ELCD	7/6/2000	--	NA	NA	NA	NA	NA
WBM36F	NR	ML	ELCD	7/7/2000	--	NA	NA	NA	NA	NA
WBM36G	NR	ML	ELCD	7/5/2000	--	NA	NA	NA	NA	NA
WBT36B	1	T	GC/MSD	6/27/2000	--	<.8	<.8	<.8	<.8	<.5
WBT36B	2	T	GC/MSD	6/27/2000	--	<.8	<.8	<.8	<.8	<.5
WBT36C	1	T	GC/MSD	6/29/2000	--	<.8	<.8	<.8	<.8	<.5
WBT36C	2	T	GC/MSD	6/29/2000	--	<.8	<.8	<.8	<.8	<.5
WBT36D	1	T	GC/MSD	6/26/2000	1140	<.8	<.8	<.8	<.8	<.5
WBT36D	2	T	GC/MSD	6/26/2000	1140	<.8	<.8	<.8	<.8	<.5
WBT36F	NR	T	GC/MSD	6/26/2000	1150	<.8	<.8	<.8	<.8	<.5
WBT36F	NR	T	GC/MSD	6/26/2000	1150	<.8	<.8	<.8	<.8	5.4
WBT36G	NR	T	GC/MSD	6/26/2000	--	<.8	<.8	<.8	<.8	2.2 EV
WBT36G	NR	T	GC/MSD	6/27/2000	--	<.8	<.8	<.8	<.8	<.5
WBT36H	NR	T	GC/MSD	6/26/2000	--	<.8	<.8	<.8	<.8	<.5
WBT36H	NR	T	GC/MSD	7/14/2000	1655	<.8	<.8	<.8	<.8	<.5
WB37B	NR	DP	GC/MSD	8/3/2000	915	<.8	<.8	<.8	<.8	<.5
WB37B.1	1	DP	GC/MSD	8/3/2000	950	<.8	<.8	<.8	<.8	<.5
WB37B.1	2	DP	GC/MSD	8/3/2000	950	<.8	<.8	<.8	<.8	<.5
WB37B.1	3	DP	GC/MSD	8/3/2000	950	<.8	<.8	<.8	<.8	<.5
WB37C	1	DP	GC/MSD	8/1/2000	1045	<.8	<.8	<.8	<.8	<.5
WB37C	2	DP	GC/MSD	8/1/2000	1045	<.8	<.8	<.8	<.8	<.5
WB37C.1	NR	DP	GC/MSD	8/9/2000	1430	<.8	<.8	<.8	<.8	<.5

Additional Volatile Organic Compounds											
Ethyl benzene (µg/L)	Hexa-chloro-butadiene (µg/L)	*p* -Iso-propyl-toluene (µg/L)	*m,p* - Xylenes (µg/L)	Naph-thalene (µg/L)	*n* - Propyl-benzene (µg/L)	Toluene (µg/L)	1,2,3-Tri-chloro-benzene (µg/L)	1,2,4-Tri-chloro-benzene (µg/L)	1,2,4-Tri-methyl-benzene (µg/L)	1,3,5-Tri-methyl-benzene (µg/L)	Site name
<0.8	<0.8	<0.5	<0.8	<0.5	<0.8	<0.8	<0.5	<0.5	<0.8	<0.8	WB36G
<.8	<.8	<.5	<.8	<.5	<.8	<.8	<.5	<.5	<.8	<.8	WB36G
<.8	<.8	<.5	<.8	<.5	<.8	spike	<.5	<.5	<.8	<.8	WB36G
<.8	<.8	<.5	<.8	<.5	<.8	spike	<.5	<.5	<.8	<.8	WB36G
NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	WBM36A
NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	WBM36B
NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	WBM36C
NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	WBM36D
NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	WBM36E
NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	WBM36F
NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	WBM36G
<.8	<.8	<.5	<.8	<.8	<.8	<.8	<.8	<.8	<.8	<.8	WBT36B
<.8	<.8	<.5	<.8	<.8	<.8	<.8	<.8	<.8	<.8	<.8	WBT36B
<.8	<.8	<.5	<.8	<.8	<.8	<.8	<.8	<.8	<.8	<.8	WBT36C
<.8	<.8	<.5	<.8	<.8	<.8	<.8	<.8	<.8	<.8	<.8	WBT36C
<.8	<.8	<.5	<.8	<.8	<.8	<.8	<.8	<.8	<.8	<.8	WBT36D
<.8	<.8	<.5	<.8	<.8	<.8	<.8	<.8	<.8	<.8	<.8	WBT36D
<.8	<.8	<.5	<.8	<.8	<.8	<.8	<.8	<.8	<.8	<.8	WBT36F
<.8	<.8	<.5	<.8	<.8	<.8	<.8	<.8	<.8	<.8	<.8	WBT36F
<.8	<.8	<.5	<.8	<.8	<.8	<.8	<.8	<.8	<.8	<.8	WBT36G
<.8	<.8	<.5	<.8	<.8	<.8	<.8	<.8	<.8	<.8	<.8	WBT36G
<.8	<.8	<.5	<.8	<.8	<.8	<.8	<.8	<.8	<.8	<.8	WBT36H
<.8	<.8	<.5	<.8	<.8	<.8	<.8	<.8	<.8	<.8	<.8	WBT36H
<.8	<.8	<.5	<.8	<.5	<.8	<.8	<.5	<.5	<.8	<.8	WB37B
<.8	<.8	<.5	<.8	<.5	<.8	<.8	<.5	<.5	<.8	<.8	WB37B.1
<.8	<.8	<.5	<.8	<.5	<.8	152	<.5	<.5	<.8	<.8	WB37B.1
<.8	<.8	<.5	<.8	<.5	<.8	89.8	<.5	<.5	<.8	<.8	WB37B.1
<.8	<.8	<.5	<.8	<.5	<.8	<.8	<.5	<.5	<.8	<.8	WB37C
<.8	<.8	<.5	<.8	<.5	<.8	<.8	<.5	<.5	<.8	<.8	WB37C
<.8	<.8	<.5	<.8	<.5	<.8	<.8	<.5	<.5	<.8	<.8	WB37C.1

Appendix 2C. *Organic constituents for wells, piezometers, and multi-level monitoring systems in the West Branch Canal Creek study area, Aberdeen Proving Ground, Maryland, March 2000 through May 2001-Continued*

Site name	Replicate	Sample device	Analysis code	Collection date	Collection time	Additional Volatile Organic Compounds				
						1,2-Di-chloro-benzene (µg/L)	1,3-Di-chloro-benzene (µg/L)	1,4-Di-chloro-benzene (µg/L)	1,2-Di-chloro-propane (µg/L)	1,1-Di-chloro-propene (µg/L)
Comprehensive Sampling Event (June - August 2000) - *Continued*										
WB37D	1	DP	GC/MSD	8/8/2000	945	<0.8	<0.8	<0.8	<0.8	<0.5
WB37D	2	DP	GC/MSD	8/8/2000	945	<.8	<.8	<.8	<.8	<.5
Comprehensive Sampling Event Field Blanks										
After WB19A	NR	DP	GC/MSD	7/13/2000	1400	<.8	<.8	<.8	<.8	<.5
After WB23D	1	DP, BL	GC/MSD	6/20/2000	1530	<.8	<.8	<.8	<.8	<.5
After WB23D	2	DP, BL	GC/MSD	6/20/2000	1530	<.8	<.8	<.8	<.8	<.5
Before WB24E	NR	DP, BL	GC/MSD	6/23/2000	1730	--	--	--	<.8	<.5
After WBT24C	1	T, BL	GC/MSD	6/15/2000	1220	<.8	<.8	<.8	<.8	<.5
After WBT24C	2	T, BL	GC/MSD	6/15/2000	1220	<.8	<.8	<.8	<.8	<.5
After WB26H	NR	DP, BL	GC/MSD	7/14/2000	1415	<.8	<.8	<.8	<.8	<.5
After WB28F	NR	DP, BL	GC/MSD	7/20/2000	1015	<.8	<.8	<.8	<.8	<.5
After WBM30G	NR	ML, BL	ELCD	7/5/2000	--	NA	NA	NA	NA	NA
After WB33B	2	DP, BL	GC/MSD	6/19/2000	1200	<.8	<.8	<.8	<.8	<.5
After WB33B	1	DP, BL	GC/MSD	6/19/2000	1200	<.8	<.8	<.8	<.8	<.5
After WB35C	NR	DP, BL	GC/MSD	6/16/2000	1345	<.8	<.8	<.8	<.8	<.5
May 2001 Sampling Event										
WB41A	1	DP1	GC/MSD	5/17/2001	1300	<.5	<.5	<.5	<.5	<.5
WB41A	2	DP1	GC/MSD	5/18/2001	1300	<.5	<.5	<.5	<.5	<.5
WB41B	NR	DP1	GC/MSD	5/17/2001	1330	<.5	<.5	<.5	<.5	<.5
WB41C	NR	DP1	GC/MSD	5/17/2001	1015	<.5	<.5	<.5	<.5	<.5
WB41D	1	DP1	GC/MSD	5/17/2001	1030	<.5	<.5	<.5	<.5	<.5
WB41D	2	DP1	GC/MSD	5/18/2001	1030	<1.0	<1.0	<1.0	<1.0	<1.0
WB41E	1	DP1	GC/MSD	5/17/2001	1105	<.5	<.5	<.5	1.5	<.5
WB41E	2	DP1	GC/MSD	5/17/2001	1105	<1.0	<1.0	<1.0	<1.0	<1.0
WB41E	1	DP1	GC/MSD	5/17/2001	1100	<.5	<.5	<.5	<.5	<.5
WB41E	2	DP1	GC/MSD	5/18/2001	1100	<1.0	<1.0	<1.0	<1.0	<1.0

Additional Volatile Organic Compounds											
Ethyl benzene (µg/L)	Hexa-chloro-butadiene (µg/L)	*p* -Iso-propyl-toluene (µg/L)	*m,p* - Xylenes (µg/L)	Naph-thalene (µg/L)	*n* - Propyl-benzene (µg/L)	Toluene (µg/L)	1,2,3-Tri-chloro-benzene (µg/L)	1,2,4-Tri-chloro-benzene (µg/L)	1,2,4-Tri-methyl-benzene (µg/L)	1,3,5-Tri-methyl-benzene (µg/L)	Site name
<0.8	<0.8	<0.5	<0.8	<0.5	<0.8	<0.8	<0.5	<0.5	<0.8	<0.8	WB37D
<.8	<.8	<.5	<.8	<.5	<.8	<.8	<.5	<.5	<.8	<.8	WB37D
<.8	<.8	<.5	<.8	<.8	<.8	<.8	<.8	<.8	<.8	<.8	After WB19A
<.8	<.8	<.5	<.8	<.8	<.8	<.8	<.8	<.8	<.8	<.8	After WB23D
<.8	<.8	<.5	<.8	<.8	<.8	<.8	<.8	<.8	<.8	<.8	After WB23D
--	--	--	--	--	--	--	--	--	--	--	Before WB24E
<.8	<.8	<.5	<.8	<.8	<.8	<.8	<.8	<.8	<.8	<.8	After WBT24C
<.8	<.8	<.5	<.8	<.8	<.8	<.8	<.8	<.8	<.8	<.8	After WBT24C
<.8	<.8	<.5	<.8	<.8	<.8	<.8	<.8	<.8	<.8	<.8	After WB26H
<.8	<.8	<.5	<.8	<.5	<.8	<.8	<.5	<.5	<.8	<.8	After WB28F
NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	After WBM30G
<.8	<.8	<.5	<.8	<.8	<.8	<.8	<.8	<.8	<.8	<.8	After WB33B
<.8	<.8	<.5	<.8	<.8	<.8	<.8	<.8	<.8	<.8	<.8	After WB33B
<.8	<.8	<.5	<.8	<.8	<.8	<.8	<.8	<.8	<.8	<.8	After WB35C
<.5	<.5	<.5	<.5	<.5	<.5	<.5	<5.0	<5.0	<.5	<.5	WB41A
<.5	<25	<.5	<.5	<.7	<.5	<.5	<25	<.5	<.5	<.5	WB41A
<.5	<.5	<.5	<.5	<.5	<.5	1.5	<.5	<5.0	<.5	<.5	WB41B
<.5	<.5	<.5	<.5	<.5	<.5	<.5	<.5	<5.0	<.5	<.5	WB41C
<.5	<.5	<.5	<.5	<.5	<.5	<.5	<.5	<5.0	<.5	<.5	WB41D
<1.0	<50	<1.0	<1.0	<1.4	<1.0	<1.0	<50	<1.0	<1.0	<1.0	WB41D
<.5	<.5	<.5	<.5	<.5	<.5	<.5	<.5	<5.0	<.5	<.5	WB41E
<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<10	<1.0	<1.0	WB41E
<.5	<.5	<.5	<.5	<.5	<.5	<.5	<.5	<5.0	<.5	<.5	WB41E
<1.0	<50	<1.0	<1.0	<1.4	<1.0	<1.0	<50	<1.0	<1.0	<1.0	WB41E

Appendix 2C. *Organic constituents for wells, piezometers, and multi-level monitoring systems in the West Branch Canal Creek study area, Aberdeen Proving Ground, Maryland, March 2000 through May 2001-Continued*

						Additional Volatile Organic Compounds				
Site name	Replicate	Sample device	Analysis code	Collection date	Collection time	1,2-Di-chloro-benzene (µg/L)	1,3-Di-chloro-benzene (µg/L)	1,4-Di-chloro-benzene (µg/L)	1,2-Di-chloro-propane (µg/L)	1,1-Di-chloro-propene (µg/L)
May 2001 Sampling Event - *Continued*										
WB42A	NR	DP1	GC/MSD	5/17/2001	1430	<0.5	<0.5	<0.5	<0.5	<0.5
WB42B	1	DP1	GC/MSD	5/17/2001	1430	<.5	<.5	<.5	<.5	<.5
WB42B	2	DP1	GC/MSD	5/18/2001	1445	<.5	<.5	<.5	<.5	<.5
WB42C	NR	DP1	GC/MSD	5/16/2001	1310	<.5	<.5	<.5	<.5	<.5
WB42D	1	DP1	GC/MSD	5/16/2001	1350	<.5	<.5	<.5	<.5	<.5
WB42D	2	DP1	GC/MSD	5/16/2001	1350	<.5	<.5	<.5	<.5	<.5
WB42E	1	DP1	GC/MSD	5/16/2001	1440	<.5	<.5	<.5	<.5	<.5
WB42E	2	DP1	GC/MSD	5/16/2001	1440	<25.0	<25.0	<25.0	<25.0	<25.0
WB42F-D	1	DP1	GC/MSD	5/16/2001	1355	<.5	<.5	<.5	<.5	<.5
WB42F-D	2	DP1	GC/MSD	5/16/2001	1355	<25.0	<25.0	<25.0	<25.0	<25.0
WB42F	1	DP1	GC/MSD	5/16/2001	1450	<.5	<.5	<.5	<.5	<.5
WB42F	2	DP1	GC/MSD	5/16/2001	1450	<25.0	<25.0	<25.0	<25.0	<25.0
WB43A	1	DP1	GC/MSD	5/18/2001	1000	<.5	<.5	<.5	<.5	<.5
WB43A	2	DP1	GC/MSD	5/18/2001	1000	<1.7	<1.7	<1.7	<1.7	<1.7
WB43B	1	DP1	GC/MSD	5/18/2001	1030	<.5	<.5	<.5	<.5	<.5
WB43B	2	DP1	GC/MSD	5/18/2001	1030	<1.0	<1.0	<1.0	<1.0	<1.0
WB43B-D	1	DP1	GC/MSD	5/18/2001	1045	<.5	<.5	<.5	<.5	<.5
WB43B-D	2	DP1	GC/MSD	5/18/2001	1045	<1.0	<1.0	<1.0	<1.0	<1.0
WB43C	1	DP1	GC/MSD	5/18/2001	1210	<.5	<.5	<.5	<.5	<.5
WB43C	2	DP1	GC/MSD	5/18/2001	1210	<1.0	<1.0	<1.0	<1.0	<1.0
WB43D	1	DP1	GC/MSD	5/18/2001	1230	<.5	<.5	<.5	<.5	<.5
WB43D	2	DP1	GC/MSD	5/18/2001	1230	<1.0	<1.0	<1.0	<1.0	<1.0
WB43D	3	DP1	GC/MSD	5/18/2001	1230	<1.0	<1.0	<1.0	<1.0	<1.0
WB44A	1	DP1	GC/MSD	5/18/2001	1400	<.5	<.5	<.5	<.5	<.5
WB44A	2	DP1	GC/MSD	5/18/2001	1400	<1.0	<1.0	<1.0	<1.0	<1.0

Additional Volatile Organic Compounds											
Ethyl benzene (µg/L)	Hexa-chloro-butadiene (µg/L)	*p* -Iso-propyl-toluene (µg/L)	*m,p* - Xylenes (µg/L)	Naph-thalene (µg/L)	*n* - Propyl-benzene (µg/L)	Toluene (µg/L)	1,2,3-Tri-chloro-benzene (µg/L)	1,2,4-Tri-chloro-benzene (µg/L)	1,2,4-Tri-methyl-benzene (µg/L)	1,3,5-Tri-methyl-benzene (µg/L)	Site name
<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<5.0	<.5	<.5	WB42A
<.5	<.5	<.5	<.5	<.5	<.5	<.5	<.5	<5.0	<.5	<.5	WB42B
<.5	<25	<.5	<.5	<.7	<.5	<.5	<25	<.5	<.5	<.5	WB42B
<.5	<.5	<.5	<.5	<.5	<.5	<.5	<.5	<5.0	<.5	<.5	WB42C
<.5	<.5	<.5	<.5	<.5	<.5	<.5	<.5	<5.0	<.5	<.5	WB42D
<.5	<.5	<.5	<.5	<.5	<.5	<.5	<.5	<5.0	<.5	<.5	WB42D
<.5	<.5	<.5	<.5	<.5	<.5	<.5	<.5	<5.0	<.5	<.5	WB42E
<25.0	<25.0	<25.0	<25.0	<25.0	<25.0	<25.0	<25.0	<250	<25.0	<25.0	WB42E
<.5	<.5	<.5	<.5	<.5	<.5	<.5	<.5	<5.0	<.5	<.5	WB42F-D
<25.0	<25.0	<25.0	<25.0	<25.0	<25.0	<25.0	<25.0	<250	<25.0	<25.0	WB42F-D
<.5	<.5	<.5	<.5	<.5	<.5	<.5	<.5	<5.0	<.5	<.5	WB42F
<25.0	<25.0	<25.0	<25.0	<25.0	<25.0	<25.0	<25.0	<250	<25.0	<25.0	WB42F
<.5	<.5	<.5	<.5	<.5	<.5	<.5	<.5	<5.0	<.5	<.5	WB43A
<1.7	<83.2	<1.7	<1.7	<.5	<1.7	<1.7	<83.2	1.7	<1.7	<1.7	WB43A
<.5	<.5	<.5	<.5	<.5	<.5	<.5	<.5	<5.0	<.5	<.5	WB43B
<1.0	<50.0	<1.0	<1.0	<1.4	<1.0	<1.0	<50.0	<1.0	<1.0	<1.0	WB43B
<.5	<.5	<.5	<.5	<.5	<.5	<.5	<.5	<5.0	<.5	<.5	WB43B-D
<1.0	<50.0	<1.0	<1.0	<1.4	<1.0	<1.0	<50.0	<1.0	<1.0	<1.0	WB43B-D
<.5	<.5	<.5	<.5	<.5	<.5	<.5	<.5	<5.0	<.5	<.5	WB43C
<1.0	<50.0	<1.0	<1.0	<1.4	<1.0	<1.0	<50.0	<1.0	<1.0	<1.0	WB43C
<.5	<.5	<.5	<.5	<.5	<.5	<.5	<.5	<5.0	<.5	<.5	WB43D
<1.0	<50.0	<1.0	<1.0	<1.4	<1.0	<1.0	<50.0	<1.0	<1.0	<1.0	WB43D
<1.0	<50.0	<1.0	<1.0	<1.4	<1.0	<1.0	<50.0	<1.0	<1.0	<1.0	WB43D
<.5	<.5	<.5	<.5	<.5	<.5	<.5	<.5	<5.0	<.5	<.5	WB44A
<1.0	<50.0	<1.0	<1.0	<1.4	<1.0	<1.0	<50.0	<1.0	<1.0	<1.0	WB44A

Appendix 2C. *Organic constituents for wells, piezometers, and multi-level monitoring systems in the West Branch Canal Creek study area, Aberdeen Proving Ground, Maryland, March 2000 through May 2001-Continued*

Site name	Replicate	Sample device	Analysis code	Collection date	Collection time	Additional Volatile Organic Compounds: 1,2-Di-chloro-benzene (µg/L)	1,3-Di-chloro-benzene (µg/L)	1,4-Di-chloro-benzene (µg/L)	1,2-Di-chloro-propane (µg/L)	1,1-Di-chloro-propene (µg/L)
May 2001 Sampling Event - *Continued*										
May 2001 Blanks										
Source Water	NR	--	GC/MSD	5/16/2001	1315	<0.5	<0.5	<0.5	<0.5	<0.5
Equipment	NR	--	GC/MSD	5/16/2001	1230	<.5	<.5	<.5	<.5	<.5
Equipment	NR	--	GC/MSD	5/16/2001	1250	<.5	<.5	<.5	<.5	<.5
Field - After WB41D	NR	DP1	GC/MSD	5/17/2001	1045	<.5	<.5	<.5	<.5	<.5
Field - After WB42F	1	DP1	GC/MSD	5/16/2001	1515	<.5	<.5	<.5	<.5	<.5
Field - After WB42F	2	DP1	GC/MSD	5/16/2001	1520	<.5	<.5	<.5	<.5	<.5
Field - After WB42F	3	DP1	GC/MSD	5/17/2001	944	<.5	<.5	<.5	<.5	<.5
Field - After WB43B	1	DP1	GC/MSD	5/18/2001	1136	<.5	<.5	<.5	<.5	<.5
Field - After WB43B	2	DP1	GC/MSD	5/18/2001	1136	<.5	<.5	<.5	<.5	<.5

Additional Volatile Organic Compounds											
Ethyl benzene (µg/L)	**Hexa-chloro-butadiene (µg/L)**	***p*-Iso-propyl-toluene (µg/L)**	***m,p*-Xylenes (µg/L)**	**Naph-thalene (µg/L)**	***n*-Propyl-benzene (µg/L)**	**Toluene (µg/L)**	**1,2,3-Tri-chloro-benzene (µg/L)**	**1,2,4-Tri-chloro-benzene (µg/L)**	**1,2,4-Tri-methyl-benzene (µg/L)**	**1,3,5-Tri-methyl-benzene (µg/L)**	**Site name**
<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<5.0	<0.5	<0.5	Source Water
<.5	<.5	<.5	<.5	<.5	<.5	<.5	<.5	<5.0	<.5	<.5	Equipment
<.5	<.5	<.5	<.5	<.5	<.5	<.5	<.5	<5.0	<.5	<.5	Equipment
<.5	<.5	<.5	<.5	<.5	<.5	<.5	<.5	<5.0	<.5	<.5	Field - After WB41D
<.5	<.5	<.5	<.5	<.5	<.5	<.5	<.5	<5.0	<.5	<.5	Field - After WB42F
<.5	<25.0	<.5	<.5	<.7	<.5	<.5	<25.0	<.5	<.5	<.5	Field - After WB42F
<.5	<.5	<.5	<.5	<.5	<.5	<.5	<.5	<5.0	<.5	<.5	Field - After WB42F
<.5	<.5	<.5	<.5	<.5	<.5	<.5	<.5	<5.0	<.5	<.5	Field - After WB43B
<.5	<25.0	<.5	<.5	<.7	<.5	<.5	<25.0	<.5	<.5	<.5	Field - After WB43B

Appendix 3A. *Field measurements and redox-sensitive constituents for Hoverprobe ground-water sites (profiler and supplemental piezometers) in the West Branch Canal Creek study area, Aberdeen Proving Ground, Maryland, April through September 2000*

[µS/cm, microsiemens per centimeter at 25° Celsius; °C, degrees Celsius; mg/L, milligrams per liter; µg/L, micrograms per liter; - -, no data; <, less than; HP, ground-water profiler; SP, supplemental piezometer. *Note: the last two digits in the sample name represent the depth in feet below land surface; field measurement and redox-sensitive constituent data were not collected for passive-diffusion-bag samplers]*

			Field Measurements				Redox Parameters		
Site name	Sample device	Date collected	Specific conductance, field (µS/cm)	pH (standard units)	Water temperature (°C)	Oxygen, dissolved (mg/L)	Sulfide (mg/L)	Methane, aqueous phase (µg/L)	Duplicate methane, aqueous phase (µg/L)
April - May 2000 Sampling Event									
HP01-12	HP	4/6/2000	1,240	4.6	--	2.8	0.01	1,170	1,180
HP01-12	HP	4/26/2000	841	5.6	--	--	--	6,090	--
HP01-15	HP	4/26/2000	900	4.0	--	1.3	.08	67.0	55.0
HP01-17	HP	4/7/2000	873	4.0	--	1.7	.01	<45.6	<45.6
HP01-18	HP	4/26/2000	530	4.7	--	3.9	--	<45.2	<52.5
HP01-27	HP	4/7/2000	413	4.6	--	3.9	.01	<45.1	<45.7
HP01-27	HP	4/26/2000	414	4.6	14.9	2.9	--	<45.9	<53.6
HP01-37	HP	4/7/2000	572	3.7	--	3.2	<.01	<46.4	<49.6
HP01-42	HP	4/7/2000	629	3.9	--	3.0	.01	<45.3	<45.7
HP02-24	HP	4/25/2000	756	4.7	10.2	2.8	<.01	<44.2	<48.0
HP02-30	HP	4/25/2000	978	4.7	--	3.4	--	<47.1	<51.4
HP02-33	HP	4/26/2000	989	4.6	8.5	1.9	<.01	<48.8	<49.7
HP02-38	HP	4/26/2000	1,370	4.7	11.6	2.1	--	<47.2	<47.3
HP02-43	HP	4/26/2000	1,890	4.7	12.9	1.7	<.01	<42.8	<51.0
HP03-12	HP	5/10/2000	193	4.9	24.0	4.2	--	<35.9	<38.1
HP03-17	HP	5/10/2000	187	4.7	23.2	4.8	--	<44.6	<46.6
HP03-22	HP	5/10/2000	187	4.8	24.1	4.6	--	<45.2	<51.0
HP03-27	HP	5/10/2000	195	4.7	25.8	4.3	--	<43.6	<52.2
HP03-32	HP	5/10/2000	193	4.7	25.9	4.6	--	<46.3	<47.8
HP03-37	HP	5/10/2000	187	4.7	26.2	5.2	--	<48.7	<50.8
HP05-22	HP	4/12/2000	792	4.0	--	1.6	<.01	224	219
HP05-35	HP	4/12/2000	565	3.8	--	3.4	.01	<44.1	<50.8
HP08-17	HP	4/13/2000	2,190	6.4	--	1.8	<.01	511	524
HP09-20	HP	5/8/2000	4,820	6.1	--	2.4	.08	397	352

Appendix 3A. *Field measurements and redox-sensitive constituents for Hoverprobe ground-water sites (profiler and supplemental piezometers) in the West Branch Canal Creek study area, Aberdeen Proving Ground, Maryland, April through September 2000-Continued*

Site Name	Sample device	Date collected	Field Measurements: Specific conductance, field (µS/cm)	Field Measurements: pH (standard units)	Field Measurements: Water temperature (°C)	Field Measurements: Oxygen, dissolved (mg/L)	Redox Parameters: Sulfide (mg/L)	Redox Parameters: Methane, aqueous phase (µg/L)	Redox Parameters: Duplicate methane, aqueous phase (µg/L)
April - May 2000 Sampling Event - *Continued*									
HP11-15	HP	4/18/2000	207	4.7	8.6	5.6	--	<13.5	<18.4
HP11-20	HP	4/19/2000	204	4.7	--	5.0	--	<48.8	<49.1
HP11-25	HP	4/19/2000	164	4.7	--	--	--	<43.6	<53.0
HP11-30	HP	4/19/2000	207	4.7	12.6	5.3	--	<48.0	<48.7
HP12-27	HP	5/9/2000	1,790	5.7	21.2	1.4	0.01	82.8	101
HP12-31	HP	5/9/2000	1,990	4.2	22.9	1.7	<.01	<41.3	<58.8
HP12-36	HP	5/9/2000	2,880	4.2	25.1	2.1	<.01	<41.3	<55.9
HP13-12	HP	4/27/2000	881	4.7	--	1.4	.03	133	131
HP13-16	HP	4/27/2000	697	4.3	11.7	1.9	<.01	<48.0	<51.3
HP13-21	HP	4/27/2000	104	4.8	10.9	1.9	.01	<36.2	<50.2
September 2000 Sampling Event									
HP01-06	SP	9/13/2000	6,880	8.0	--	--	--	--	--
HP01-12	SP	9/13/2000	2,730	7.0	--	--	--	--	--
HP02-06	SP	9/13/2000	2,000	--	--	6.6	--	--	--
HP02-12	SP	9/13/2000	1,130	6.5	--	--	--	--	--
HP05-06	SP	9/13/2000	1,700	6.8	--	--	--	--	--
HP05-12	SP	9/13/2000	1,650	6.5	--	--	--	--	--
HP13-12	SP	9/13/2000	1,650	8.8	--	--	--	--	--

Appendix 3B. *Inorganic data for Hoverprobe ground-water sites (profiler and supplemental piezometers) in the West Branch Canal Creek study area, Aberdeen Proving Ground, Maryland, April through September 2000*

[µS/cm, microsiemens per centimeter at 25ºC; º C, degrees Celsius; µg/L, micrograms per liter; mg/L, milligrams per liter; NR, no replicate; <, less than; --, no data; HP, ground-water profiler; SP, supplemental piezometer. *Note: inorganic data were not collected for passive-diffusion-bag samplers; Note: the last two digits in the sample name represent the depth in feet below land surface]*

Site name	Sample device	Replicate	Collection date	Collection time	Calcium, dissolved (mg/L as Ca)	Magnesium, dissolved (mg/L as Mg)	Sodium, dissolved (mg/L as Na)	Potassium, dissolved (mg/L as K)
April - May 2000 Sampling Event								
HP01-27	HP	NR	4/26/2000	1600	14	8.1	42	3
HP02-24	HP	NR	4/25/2000	1530	9.7	7.6	110	2
HP02-33	HP	NR	4/26/2000	815	9.6	6.0	160	2
HP02-38	HP	NR	4/26/2000	910	5.1	2.9	240	2
HP02-43	HP	NR	4/26/2000	1040	6.6	3.8	330	2
HP03-12	HP	NR	5/10/2000	1050	6.0	7.0	13	2
HP03-17	HP	NR	5/10/2000	1145	6.1	6.8	13	1
HP03-22	HP	NR	5/10/2000	1225	5.9	6.7	13	1
HP03-27	HP	NR	5/10/2000	1310	6.2	7.1	14	1
HP03-32	HP	NR	5/10/2000	1400	28	38	810	9
HP03-37	HP	NR	5/10/2000	1440	5.8	6.6	13	1
HP11-15	HP	NR	4/18/2000	1130	6.7	8.0	15	1
HP11-30	HP	1	4/19/2000	1100	6.4	7.7	15	1
HP11-30	HP	2	4/19/2000	1100	6.3	7.7	15	1
HP12-27	HP	NR	5/9/2000	905	10	9.1	300	6
HP12-31	HP	NR	5/9/2000	945	10	5.4	380	2
HP12-36	HP	NR	5/9/2000	1050	9.9	5.1	550	2
HP13-16	HP	NR	4/27/2000	940	24	15	100	4
HP13-16	HP	NR	4/27/2000	1035	16	9.2	93	2
HP13-21	HP	NR	4/27/2000	1410	2.9	1.7	11	0.8
Source Blank								
Source Water	HP	NR	5/12/2000	1200	<0.0	<0.0	<0.0	<.2

Sulfate, dissolved (mg/L as SO_4)	Chloride, dissolved (mg/L as Cl)	Fluoride, dissolved (mg/L as F)	Bromide, dissolved (mg/L as Br)	Silica, dissolved (mg/L as SiO_2)	Iron, dissolved (µg/L as Fe)	Mangenese, dissolved (µg/L as Mn)	Site name
61	73	0.2	0.09	10	40	560	HP01-27
91	150	.1	.09	10	40	480	HP02-24
100	200	.2	.10	11	10	590	HP02-33
100	320	<.1	.11	8.8	50	320	HP02-38
44	540	<.1	.09	7.4	170	380	HP02-43
32	27	<.1	.06	7.1	1,400	100	HP03-12
31	28	<.1	.04	6.9	30	170	HP03-17
32	27	<.1	.05	6.6	20	64	HP03-22
33	29	<.1	.05	6.4	100	71	HP03-27
270	1,400	<.1	<.01	6.9	180,000	1,700	HP03-32
32	26	<.1	.05	6.1	<10	59	HP03-37
36	33	<.1	.03	7.3	50	90	HP11-15
35	29	<.1	.03	6.0	20	68	HP11-30
36	30	<.1	.03	6.0	20	67	HP11-30
120	460	<.1	<.01	16	23,000	530	HP12-27
110	560	<.1	<.01	16	50	700	HP12-31
140	820	<.1	.14	21	170	880	HP12-36
170	150	<.1	.11	14	13,000	1,600	HP13-16
120	120	.1	.11	13	70	600	HP13-16
23	8.4	<.1	.02	10	50	200	HP13-21
<0.3	<0.3	<.1	<.01	<0.1	<10	<2	Source Water

Appendix 3B. *Inorganic data for Hoverprobe ground-water sites (profiler and piezometers) in the West Branch Canal Creek study area, Aberdeen Proving Ground, Maryland, April through September 2000-Continued*

Site name	Sample device	Replicate	Collection date	Collection time	Calcium, dissolved (mg/L as Ca)	Magnesium, dissolved (mg/L as Mg)	Sodium, dissolved (mg/L as Na)	Potassium, dissolved (mg/L as K)
				September 2000 Sampling Event				
HP01-06	SP	NR	9/13/2000	1010	83	45	1,900	9
HP01-12	SP	NR	9/13/2000	1030	7.2	11	550	7
HP02-06	SP	NR	9/13/2000	1120	18	37	280	12
HP02-12	SP	NR	9/13/2000	1135	18	18	130	8
HP05-06	SP	NR	9/13/2000	915	7.8	69	370	20
HP05-12	SP	NR	9/13/2000	930	41	50	270	17
HP13-12	SP	NR	9/13/2000	1345	17	13	300	4

Sulfate, dissolved (mg/L as SO_4)	Chloride, dissolved (mg/L as Cl)	Fluoride, dissolved (mg/L as F)	Bromide, dissolved (mg/L as Br)	Silica, dissolved (mg/L as SiO_2)	Iron, dissolved (µg/L as Fe)	Mangenese, dissolved (µg/L as Mn)	Site name
<0.3	400	<0.1	114	86	18,000	2,000	HP01-06
27	450	<.1	0.47	33	7,000	640	HP01-12
1.6	430	<.1	.91	52	1,900	2,100	HP02-06
2.0	140	<.1	.35	39	1,900	2,100	HP02-12
19	590	<.1	.85	56	2,700	4,500	HP05-06
9.7	290	<.1	.53	80	15,000	5,700	HP05-12
120	300	<.1	.46	46	90	110	HP13-12

Appendix 3C. *Organic constituents for Hoverprobe ground-water sites (profiler, supplemental piezometers, and passive-diffusion-bag samplers) in the West Branch Canal Creek study area, Aberdeen Proving Ground, Maryland, April through September 2000-Continued*

					Additional Volatile Organic Compounds		
Site name	**Sample device**	**Replicate**	**Collection date**	**Collection time**	**1,3-Dichloro-benzene (µg/L)**	**1,4-Dichloro-benzene (µg/L)**	**1,1-Dichloro-propene (µg/L)**
			April - May 2000 Sampling Event				
HP01-12	HP	1	4/6/2000	1500	<1.0	<1.0	2.3
HP01-12	HP	2	4/6/2000	1500	<200	<200	<100
HP01-12	HP	3	4/6/2000	1500	<5.0	<5.0	<2.5
HP01-12	HP	1	4/26/2000	1415	<100	<100	<50.0
HP01-12	HP	2	4/26/2000	1415	<200	<200	<100
HP01-12	HP	3	4/26/2000	1415	<50.0	<50.0	<25.0
HP01-12	HP	4	4/26/2000	1415	<20.0	<20.0	<10.0
HP01-15	HP	1	4/26/2000	1445	<200	<200	<100
HP01-15	HP	2	4/26/2000	1445	<66.7	<66.7	<0.5
HP01-17	HP	1	4/7/2000	810	<1.0	<1.0	<.5
HP01-17	HP	2	4/7/2000	810	<200	<200	<100
HP01-17	HP	3	4/7/2000	810	<100	<100	<50.0
HP01-18	HP	1	4/26/2000	1540	<5.0	<5.0	<2.5
HP01-18	HP	2	4/26/2000	1540	<50.0	<50.0	<25.0
HP01-27	HP	1	4/7/2000	845	<1.0	<1.0	<.5
HP01-27	HP	2	4/7/2000	845	<200	<200	<100
HP01-27	HP	3	4/7/2000	845	<2.5	<2.5	<1.3
HP01-27	HP	1	4/26/2000	1600	<100	<100	<50.0
HP01-27	HP	2	4/26/2000	1600	<5.0	<5.0	<2.5
HP01-27	HP	3	4/26/2000	1600	<1.0	<1.0	<.5
HP01-37	HP	1	4/7/2000	945	<1.0	<1.0	<.5
HP01-37	HP	2	4/7/2000	945	<200	<200	<100
HP01-37	HP	3	4/7/2000	945	<20.0	<20.0	<10.0
HP01-42	HP	1	4/7/2000	1115	<1.0	<1.0	<.5

Additional Volatile Organic Compounds								
Ethyl benzene (µg/L)	**Hexachloro-butadiene (µg/L)**	**Naphthalene (µg/L)**	**Styrene (µg/L)**	**Toluene (µg/L)**	**1,2,3-Trichloro-benzene (µg/L)**	**1,2,4-Trichloro-benzene (µg/L)**	***m,p* - Xylenes (µg/L)**	**Site name**
<1.0	21.1	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	HP01-12
<200	<200	<200	<200	<200	<200	<200	<200	HP01-12
<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	HP01-12
<100	<100	<100	<100	<100	<100	<100	<100	HP01-12
<200	<200	<200	<200	<200	<200	<200	<200	HP01-12
<50.0	<50.0	<50.0	<50.0	<50.0	<50.0	<50.0	<50.0	HP01-12
<20.0	<20.0	<100	<20.0	<20.0	<100	<20.0	<20.0	HP01-12
<200	<200	<200	<200	<200	<200	<200	<200	HP01-15
<66.7	<66.7	<66.7	<66.7	<66.7	<66.7	<66.7	<66.7	HP01-15
<1.0	122	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	HP01-17
<200	<200	<200	<200	<200	<200	<200	<200	HP01-17
<100	<100	<500	<100	<100	<500	<100	<100	HP01-17
<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	HP01-18
<50.0	<50.0	<50.0	<50.0	<50.0	<50.0	<50.0	<50.0	HP01-18
<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	HP01-27
<200	<200	<200	<200	<200	<200	<200	<200	HP01-27
<2.5	<2.5	<12.5	<2.5	<2.5	<12.5	<2.5	<2.5	HP01-27
<100	<100	<100	<100	<100	<100	<100	<100	HP01-27
<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	HP01-27
<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	HP01-27
<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	HP01-37
<200	<200	<200	<200	<200	<200	<200	<200	HP01-37
<20.0	<20.0	<100	<20.0	<20.0	<100	<20.0	<20.0	HP01-37
<1.0	3.6	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	HP01-42

Appendix 3C. *Organic constituents for Hoverprobe ground-water sites (profiler, supplemental piezometers, and passive-diffusion-bag samplers) in the West Branch Canal Creek study area, Aberdeen Proving Ground, Maryland, April through September 2000-Continued*

					Additional Volatile Organic Compounds		
Site name	**Sample device**	**Replicate**	**Collection date**	**Collection time**	**1,3-Dichloro-benzene (µg/L)**	**1,4-Dichloro-benzene (µg/L)**	**1,1-Dichloro-propene (µg/L)**
			April - May 2000 Sampling Event - *Continued*				
HP01-42	HP	2	4/7/2000	1115	<200	<200	<100
HP01-42	HP	3	4/7/2000	1115	<100	<100	<50.0
HP02-24	HP	NR	4/25/2000	1530	<1.0	<1.0	<0.5
HP02-30	HP	NR	4/25/2000	1620	<1.0	<1.0	<.5
HP02-33	HP	1	4/26/2000	815	<5.0	<5.0	<2.5
HP02-33	HP	2	4/26/2000	815	<1.0	<1.0	<.5
HP02-33	HP	3	4/26/2000	815	<1.0	<1.0	<.5
HP02-38	HP	NR	4/26/2000	910	<50.0	<50.0	<25.0
HP02-43	HP	1	4/26/2000	1040	<5.0	<5.0	<2.5
HP02-43	HP	2	4/26/2000	1040	<1.0	<1.0	<.5
HP02-43	HP	3	4/26/2000	1040	<1.0	<1.0	<.5
HP03-12	HP	NR	5/10/2000	1050	1.4	2.6	<.5
HP03-17	HP	NR	5/10/2000	1145	<1.0	<1.0	<.5
HP03-22	HP	NR	5/10/2000	1225	<1.0	<1.0	<.5
HP03-27	HP	NR	5/10/2000	1310	<1.0	<1.0	<.5
HP03-32	HP	NR	5/10/2000	1400	<1.0	<1.0	<.5
HP03-37	HP	NR	5/10/2000	1440	<1.0	<1.0	<.5
HP05-22	HP	1	4/12/2000	1000	<1.0	<1.0	<.5
HP05-22	HP	2	4/12/2000	1000	<5.0	<5.0	<2.5
HP05-35	HP	1	4/12/2000	1130	<1.0	<1.0	<.5
HP05-35	HP	2	4/12/2000	1130	<5.0	<5.0	<2.5
HP08-17	HP	NR	4/13/2000	1650	<1.0	<1.0	<.5
HP08-17	HP	NR	5/10/2000	1650	<1.0	<1.0	<.5
HP09-20	HP	1	5/8/2000	1400	<5.0	<5.0	<2.5
HP09-20	HP	2	5/8/2000	1400	<1.0	<1.0	<.5
HP11-15	HP	NR	4/18/2000	1130	<5.0	<5.0	<2.5
HP11-20	HP	NR	4/19/2000	930	<5.0	<5.0	<2.5
HP11-25	HP	NR	4/19/2000	1030	<1.0	<1.0	<.5
HP12-27	HP	NR	5/9/2000	905	<1.0	<1.0	<.5

Additional Volatile Organic Compounds								
Ethyl benzene (µg/L)	**Hexachloro-butadiene (µg/L)**	**Naphthalene (µg/L)**	**Styrene (µg/L)**	**Toluene (µg/L)**	**1,2,3-Trichloro-benzene (µg/L)**	**1,2,4-Trichloro-benzene (µg/L)**	***m,p* - Xylenes (µg/L)**	**Site name**
<200	<200	<200	<200	<200	<200	<200	<200	HP01-42
<100	<100	<500	<100	<100	<500	<100	<100	HP01-42
<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	HP02-24
<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	HP02-30
<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	HP02-33
<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	HP02-33
<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	HP02-33
<50.0	<50.0	<50.0	<50.0	<50.0	<50.0	<50.0	<50.0	HP02-38
<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	HP02-43
<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	HP02-43
<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	HP02-43
<1.0	<1.0	2.1	1.6	<1.0	1.5	1.7	<1.0	HP03-12
<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	HP03-17
<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	HP03-22
<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	HP03-27
<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	HP03-32
<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	HP03-37
<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	HP05-22
<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	HP05-22
<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	HP05-35
<5.0	<5.0	<5.0	<5.0	<5.0	<25.0	<5.0	<5.0	HP05-35
<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	HP08-17
<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	HP08-17
<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	HP09-20
<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	HP09-20
<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	HP11-15
<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	HP11-20
<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	HP11-25
<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	HP12-27

Appendix 3C. *Organic constituents for Hoverprobe ground-water sites (profiler, supplemental piezometers, and passive-diffusion-bag samplers) in the West Branch Canal Creek study area, Aberdeen Proving Ground, Maryland, April through September 2000-Continued*

					Additional Volatile Organic Compounds		
Site name	**Sample device**	**Replicate**	**Collection date**	**Collection time**	**1,3-Dichloro-benzene (µg/L)**	**1,4-Dichloro-benzene (µg/L)**	**1,1-Dichloro-propene (µg/L)**
			April - May 2000 Sampling Event - *Continued*				
HP12-31	HP	NR	5/9/2000	945	<1.0	<1.0	<0.5
HP12-36	HP	NR	5/9/2000	1050	<1.0	<1.0	<.5
HP13-12	HP	NR	4/26/2000	940	<50.0	<50.0	<25.0
HP13-12	HP	1	4/27/2000	940	<50.0	<50.0	<25.0
HP13-12	HP	2	4/27/2000	940	<100	<100	<50.0
HP13-16	HP	1	4/27/2000	1035	<1.0	<1.0	<.5
HP13-16	HP	2	4/27/2000	1035	<50.0	<50.0	<25.0
HP13-21	HP	1	4/27/2000	1410	<2.0	<2.0	<1.0
HP13-21	HP	2	4/27/2000	1410	<1.0	<1.0	<.5
			April - May 2000 Blanks				
Source Water	HP	NR	4/26/2000	1400	<1.0	<1.0	<.5
Equipment-before HP01-12	HP	1	4/26/2000	1400	<1.0	<1.0	<.5
Equipment-before HP01-12	HP	2	4/26/2000	1400	<1.0	<1.0	<.5
Equipment-before HP03-12	HP	NR	5/10/2000	955	<1.0	<1.0	<.5
Equipment-before HP09-20	HP	NR	5/8/2000	1110	<1.0	<1.0	<.5
Equipment-before HP11-15	HP	NR	4/18/2000	1015	<1.0	<1.0	<.5
Equipment-before HP11-25	HP	NR	4/18/2000	950	<1.0	<1.0	<.5
Field-before HP01-12	HP	1	4/6/2000	1500	<1.0	<1.0	<.5
Field-before HP01-12	HP	2	4/6/2000	1500	<1.0	<1.0	<.5
Field-before HP01-17	HP	NR	4/7/2000	800	<1.0	<1.0	<.5
Field-before HP01-18	HP	NR	4/26/2000	1505	<1.0	<1.0	<.5
Field-before HP01-37	HP	NR	4/7/2000	945	<1.0	<1.0	<.5
Field-before HP02-38	HP	NR	4/26/2000	900	<1.0	<1.0	<.5
Field-before HP02-43	HP	NR	4/26/2000	930	<1.0	<1.0	<.5
Field-before HP05-35	HP	NR	4/12/2000	1005	<1.0	<1.0	<.5
Field-after HP05-35	HP	NR	4/12/2000	1130	<1.0	<1.0	<.5
Field-before HP07	HP	NR	5/11/2000	1410	<1.0	<1.0	<.5

Additional Volatile Organic Compounds								
Ethyl benzene (µg/L)	**Hexachloro-butadiene (µg/L)**	**Naphthalene (µg/L)**	**Styrene (µg/L)**	**Toluene (µg/L)**	**1,2,3-Trichloro-benzene (µg/L)**	**1,2,4-Trichloro-benzene (µg/L)**	***m,p* - Xylenes (µg/L)**	**Site name**
<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	HP12-31
<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	HP12-36
<50.0	<50.0	<50.0	<50.0	<50.0	<50.0	<50.0	<50.0	HP13-12
<50.0	<50.0	<50.0	<50.0	<50.0	<50.0	<50.0	<50.0	HP13-12
<100	<100	<100	<100	<100	<100	<100	<100	HP13-12
<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	HP13-16
<50.0	<50.0	<50.0	<50.0	<50.0	<50.0	<50.0	<50.0	HP13-16
<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	HP13-21
<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	HP13-21
<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	Source Water
<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	Equipment-before HP01-12
<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	Equipment-before HP01-12
<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	Equipment-before HP03-12
<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	Equipment-before HP09-20
<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	Equipment-before HP11-15
<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	Equipment-before HP11-25
<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	Field-before HP01-12
<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	Field-before HP01-12
<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	Field-before HP01-17
<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	Field-before HP01-18
<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	Field-before HP01-37
<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	Field-before HP02-38
<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	Field-before HP02-43
<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	Field-before HP05-35
<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	Field-after HP05-35
<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	Field-before HP07

Appendix 3C. *Organic constituents for Hoverprobe ground-water sites (profiler, supplemental piezometers, and passive-diffusion-bag samplers) in the West Branch Canal Creek study area, Aberdeen Proving Ground, Maryland, April through September 2000-Continued*

					Additional Volatile Organic Compounds		
Site name	**Sample device**	**Replicate**	**Collection date**	**Collection time**	**1,3-Dichloro-benzene (µg/L)**	**1,4-Dichloro-benzene (µg/L)**	**1,1-Dichloro-propene (µg/L)**
			April - May 2000 Blanks-*Continued*				
Field-before HP11-25	HP	NR	4/19/2000	950	<1.0	<1.0	<0.5
Field-before HP11-30	HP	NR	4/19/2000	1045	<1.0	<1.0	<.5
Field-before HP13-16	HP	NR	4/27/2000	1035	<1.0	<1.0	<.5
Field-before HP13-21	HP	NR	4/27/2000	1325	<1.0	<1.0	<.5
			September 2000 Sampling Event				
HP01-DS01	PDB	NR	9/11/2000	1250	<0.5	<0.5	<.5
HP01-DS02	PDB	NR	9/11/2000	1250	<.5	<.5	<.5
HP01-DS03	PDB	NR	9/11/2000	1250	<.5	<.5	<.5
HP01-DS06	PDB	NR	9/11/2000	1950	<.5	<.5	.5
HP01-06	SP	1	9/13/2000	1010	<.5	<.5	<.5
HP01-06	SP	2	9/13/2000	1010	<.5	<.5	<.5
HP01-12	SP	1	9/13/2000	1030	<10.0	<10.0	<10.0
HP01-12	SP	2	9/13/2000	1030	<.5	<.5	.50
HP01-12	SP	3	9/13/2000	1030	<25.0	<25.0	<25.0
HP02-DS01	PDB	NR	9/11/2000	1030	<.5	<.5	<.5
HP02-DS03	PDB	NR	9/11/2000	1030	<.5	<.5	<.5
HP02-06	SP	NR	9/13/2000	1120	<.5	<.5	<.5
HP02-12	SP	1	9/13/2000	1135	<10.0	<10.0	<10.0
HP02-12	SP	2	9/13/2000	1135	<.5	<.5	<.5
HP05-DS01	PDB	NR	9/11/2000	1000	<.5	<.5	<.5
HP05-DS02	PDB	NR	9/11/2000	1000	<.5	<.5	<.5
HP05-DS03	PDB	1	9/11/2000	1000	<.5	<.5	<.5
HP05-DS03	PDB	2	9/11/2000	1000	<.5	<.5	<.5
HP05-DS03	PDB	3	9/11/2000	1000	<.5	<.5	<.5
HP05-06	SP	NR	9/13/2000	915	<.5	<.5	<.5

Additional Volatile Organic Compounds								
Ethyl benzene (µg/L)	**Hexachloro-butadiene (µg/L)**	**Naphthalene (µg/L)**	**Styrene (µg/L)**	**Toluene (µg/L)**	**1,2,3-Trichloro-benzene (µg/L)**	**1,2,4-Trichloro-benzene (µg/L)**	***m,p* - Xylenes (µg/L)**	**Site name**
<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	Field-before HP11-25
<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	Field-before HP11-30
<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	Field-before HP13-16
<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	Field-before HP13-21
<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	HP01-DS01
<.5	<.5	<.5	<.5	<.5	<.5	<.5	<.5	HP01-DS02
<.5	<.5	<.5	<.5	<.5	<.5	<.5	<.5	HP01-DS03
<.5	<.5	<.5	<.5	2.2	<.5	<.5	<.5	HP01-DS06
<.5	<.5	<.5	<.5	2.1	<.5	<.5	<.5	HP01-06
<.5	<.5	<.5	<.5	<.5	<.5	<.5	<.5	HP01-06
<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	HP01-12
<.5	<.5	<.5	<.5	<.5	<.5	<.5	<.5	HP01-12
<25.0	<25.0	<25.0	<25.0	<25.0	<25.0	<25.0	<25.0	HP01-12
<.5	<.5	<.5	<.5	19.3	<.5	<.5	<.5	HP02-DS01
<.5	<.5	<.5	<.5	12.7	<.5	<.5	<.5	HP02-DS03
<.5	<.5	<.5	<.5	<.5	<.5	<.5	<.5	HP02-06
<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	HP02-12
<.5	<.5	<.5	<.5	<.5	<.5	<.5	<.5	HP02-12
<.5	<.5	<.5	<.5	1.0	<.5	<.5	<.5	HP05-DS01
<.5	<.5	<.5	<.5	.9	<.5	<.5	<.5	HP05-DS02
<.5	<.5	<.5	<.5	1.0	<.5	<.5	<.5	HP05-DS03
<.5	<.5	<.5	<.5	.8	<.5	<.5	<.5	HP05-DS03
<.5	<.5	<.5	<.5	<.5	<.5	<.5	<.5	HP05-DS03
<.5	<.5	<.5	<.5	<.5	<.5	<.5	<.5	HP05-06

Appendix 3C. *Organic constituents for Hoverprobe ground-water sites (profiler, supplemental piezometers, and passive-diffusion-bag samplers) in the West Branch Canal Creek study area, Aberdeen Proving Ground, Maryland, April through September 2000-Continued*

					Additional Volatile Organic Compounds		
Site name	**Sample device**	**Replicate**	**Collection date**	**Collection time**	**1,3-Dichloro-benzene (µg/L)**	**1,4-Dichloro-benzene (µg/L)**	**1,1-Dichloro-propene (µg/L)**
			September 2000 Sampling Event - *Continued*				
HP05-12	SP	1	9/13/2000	930	<10.0	<10.0	<10.0
HP05-12	SP	2	9/13/2000	930	2.3	<0.5	<0.5
HP13-DS01	PDB	NR	9/11/2000	1440	<0.5	<.5	<.5
HP13-DS02	PDB	NR	9/11/2000	1440	<.5	<.5	<.5
HP13-DS03	PDB	NR	9/11/2000	1440	<.5	<.5	<.5
HP13-06	SP	NR	9/13/2000	1315	<10.0	<10.0	<10.0
HP13-12	SP	1	9/13/2000	1330	<10.0	<10.0	<10.0
HP13-12	SP	2	9/13/2000	1330	<10.0	<10.0	<10.0
HP13-12	SP	3	9/13/2000	1330	<100	<100	<100
			September 2000 Blanks				
Source water	PDB	NR	8/18/2000	--	<.5	<.5	<.5
Field-before HP13	PDB	NR	9/11/2000	1410	<.5	<.5	<.5
Field-after PHP01-12	SP	NR	9/13/2000	1040	<.5	<.5	<.5
Field-after HP05-12	SP	1	9/13/2000	930	<.5	<.5	<.5
Field-after HP05-12	SP	2	9/13/2000	930	<.5	<.5	<.5

Additional Volatile Organic Compounds								
Ethyl benzene (µg/L)	**Hexachloro-butadiene (µg/L)**	**Naphthalene (µg/L)**	**Styrene (µg/L)**	**Toluene (µg/L)**	**1,2,3-Trichloro-benzene (µg/L)**	**1,2,4-Trichloro-benzene (µg/L)**	***m,p* - Xylenes (µg/L)**	**Site name**
<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	HP05-12
<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	HP05-12
<.5	<.5	<.5	<.5	<.5	<.5	<.5	<.5	HP13-DS01
<.5	<.5	<.5	<.5	<.5	<.5	<.5	<.5	HP13-DS02
<.5	<.5	<.5	<.5	<.5	<.5	<.5	<.5	HP13-DS03
<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	HP13-06
<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	HP13-12
<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	HP13-12
<100	<100	<100	<100	<100	<100	<100	<100	HP13-12
<.5	<.5	<.5	<.5	<.5	<.5	<.5	<.5	Source water
<.5	<.5	<.5	<.5	<.5	<.5	<.5	<.5	Field-before HP13
<.5	<.5	<.5	<.5	<.5	<.5	<.5	<.5	Field-after PHP01-12
<.5	<.5	<.5	<.5	<.5	<.5	<.5	<.5	Field-after HP05-12
<.5	<.5	<.5	<.5	<.5	<.5	<.5	<.5	Field-after HP05-12

Appendix 4A. *Redox-sensitive constituents for porous-membrane sampling devices in the West Branch Canal Creek study area, Aberdeen Proving Ground, Maryland, March 2000 through May 2001*

[mg/L, milligrams per liter; µg/L, micrograms per liter; --, no data; <, less than; NR, no replicate;
P35S, peeper installed adjacent to WB35; P36P, peeper installed adjacent to WB36;
P36M, peeper installed adjacent to WBM36; P36T, peeper installed adjhacent to WBT36]

Site name	Installation site	Replicate	Date collected	Iron, total (mg/L)	Iron, ferrous (mg/L)	Methane (µg/L)	Duplicate methane (µg/L)
			March 2000 Sampling Event				
P12-1	DP12	NR	3/27/2000	<0.5	--	<71.0	--
P12-2	DP12	NR	3/27/2000	1.4	--	<59.0	--
P12-3	DP12	NR	3/27/2000	6.6	--	<61.0	--
P12-4	DP12	NR	3/27/2000	8.1	--	<74.0	--
P12-5	DP12	1	3/27/2000	25.5	--	226	--
P12-5	DP12	2	3/27/2000	8.7	--	--	--
P12-6	DP12	NR	3/27/2000	10.4	--	975	--
P12-7	DP12	NR	3/27/2000	13.0	--	2,280	--
P12-8	DP12	NR	3/27/2000	10.0	--	2,130	--
P12-9	DP12	1	3/27/2000	30.3	--	2,140	2,120
P12-9	DP12	2	3/27/2000	19.2	--	--	--
P12-10	DP12	NR	3/27/2000	10.5	--	--	--
P12-11	DP12	NR	3/27/2000	16.0	--	1,100	--
P12-12	DP12	NR	3/27/2000	16.3	--	--	--
P12-13	DP12	NR	3/27/2000	19.9	--	5,870	--
P12-14	DP12	NR	3/27/2000	23.8	--	1,880	--
P12-15	DP12	NR	3/27/2000	--	--	2,400	--
P12-16	DP12	NR	3/27/2000	23.6	--	2,540	--
P12-17	DP12	NR	3/27/2000	25.6	--	2,840	--
P12-18	DP12	NR	3/27/2000	31.0	--	2,690	--
P12-19	DP12	NR	3/27/2000	--	--	3,140	--
P12-20	DP12	NR	3/27/2000	23.9	--	2,350	2,140
P12-21	DP12	NR	3/27/2000	21.0	--	1,770	--
P19-1	WB19	NR	3/27/2000	8.7	--	2,330	--
P19-2	WB19	NR	3/27/2000	6.2	--	2,010	--
P19-3	WB19	NR	3/27/2000	15.1	--	6,090	--
P19-4	WB19	1	3/27/2000	18.5	--	7,100	--
P19-4	WB19	2	3/27/2000	17.1	--	--	--
P19-5	WB19	NR	3/27/2000	20.5	--	7,200	--

Appendix 4A. *Redox-sensitive constituents for porous-membrane sampling devices in the West Branch Canal Creek study area, Aberdeen Proving Ground, Maryland, March 2000 through May 2001-Continued*

Site name	Installation site	Replicate	Date collected	Iron, total (mg/L)	Iron, ferrous (mg/L)	Methane (µg/L)	Duplicate methane (µg/L)
			March 2000 Sampling Event - Continued				
P19-6	WB19	1	3/27/2000	24.5	--	7,630	--
P19-6	WB19	2	3/27/2000	24.5	--	--	--
P19-7	WB19	NR	3/27/2000	20.0	--	9,070	--
P19-8	WB19	NR	3/27/2000	17.1	--	8,700	--
P19-9	WB19	NR	3/27/2000	23.8	--	9,180	--
P19-10	WB19	1	3/27/2000	24.5	--	11,900	12,300
P19-10	WB19	2	3/27/2000	21.0	--	--	--
P19-11	WB19	NR	3/27/2000	20.0	--	9,440	--
P19-12	WB19	NR	3/27/2000	34.2	--	12,300	--
P19-13	WB19	NR	3/27/2000	41.4	--	12,900	--
P19-14	WB19	NR	3/27/2000	46.1	--	12,200	--
P19-15	WB19	NR	3/27/2000	44.2	--	13,500	--
P19-16	WB19	NR	3/27/2000	48.1	--	14,600	--
P19-17	WB19	NR	3/27/2000	46.0	--	12,500	--
P19-18	WB19	NR	3/27/2000	47.9	--	11,500	--
P19-19	WB19	NR	3/27/2000	49.9	--	15,500	--
P19-20	WB19	NR	3/27/2000	49.3	--	15,800	--
P19-21	WB19	NR	3/27/2000	41.6	--	16,900	--
P34-1	WB34	NR	3/23/2000	0.3	--	<69.0	--
P34-2	WB34	NR	3/23/2000	4.7	--	901	--
P34-3	WB34	NR	3/23/2000	27.6	--	2,110	--
P34-4	WB34	NR	3/23/2000	38.3	--	1,900	1,800
P34-5	WB34	NR	3/23/2000	48.8	--	4,660	--
P34-6	WB34	NR	3/23/2000	34.5	--	3,400	--
P34-7	WB34	NR	3/23/2000	37.2	--	4,350	--
P34-8	WB34	NR	3/23/2000	36.3	--	4,750	--
P34-9	WB34	NR	3/23/2000	27.8	--	4,220	--
P34-10	WB34	NR	3/23/2000	45.7	--	3,480	--
P34-11	WB34	NR	3/23/2000	47.9	--	4,940	--
P34-12	WB34	NR	3/23/2000	33.2	--	4,600	--

Appendix 4A. *Redox-sensitive constituents for porous-membrane sampling devices in the West Branch Canal Creek study area, Aberdeen Proving Ground, Maryland, March 2000 through May 2001-Continued*

Site name	Installation site	Replicate	Date collected	Iron, total (mg/L)	Iron, ferrous (mg/L)	Methane (µg/L)	Duplicate methane (µg/L)
			March 2000 Sampling Event - Continued				
P34-13	WB34	NR	3/23/2000	44.8	--	4,970	--
P34-14	WB34	NR	3/23/2000	42.6	--	4,540	--
P34-15	WB34	NR	3/23/2000	41.8	--	4,220	--
P34-16	WB34	NR	3/23/2000	37.2	--	4,110	--
P34-17	WB34	1	3/23/2000	33.1	--	3,410	--
P34-17	WB34	2	3/23/2000	32.8	--	--	--
P34-18	WB34	NR	3/23/2000	40.0	--	3,320	--
P34-19	WB34	NR	3/23/2000	62.3	--	2,830	--
P34-20	WB34	NR	3/23/2000	41.8	--	3,540	--
P34-21	WB34	1	3/23/2000	33.6	--	3,420	3,360
P34-21	WB34	2	3/23/2000	20.0	--	--	--
P35-1	WB35	NR	3/27/2000	2.0	--	258	--
P35-2	WB35	NR	3/27/2000	20.3	--	3,950	--
P35-3	WB35	NR	3/27/2000	15.0	--	5,440	--
P35-4	WB35	NR	3/27/2000	15.3	--	6,290	--
P35-5	WB35	NR	3/27/2000	18.9	--	9,530	--
P35-6	WB35	NR	3/27/2000	13.1	--	7,020	--
P35-7	WB35	NR	3/27/2000	10.6	--	7,410	--
P35-8	WB35	NR	3/27/2000	22.8	--	8,400	--
P35-9	WB35	NR	3/27/2000	10.7	--	5,410	--
P35-10	WB35	NR	3/27/2000	9.6	--	3,450	--
P35-11	WB35	NR	3/27/2000	7.7	--	2,880	--
P35-12	WB35	NR	3/27/2000	5.7	--	2,250	--
P35-13	WB35	NR	3/27/2000	5.9	--	2,020	--
P35-14	WB35	NR	3/27/2000	6.1	--	1,760	--
P35-15	WB35	NR	3/27/2000	9.2	--	1,560	--
P35-16	WB35	NR	3/27/2000	5.7	--	1,360	--
P35-17	WB35	NR	3/27/2000	9.3	--	1,520	--
P35-18	WB35	NR	3/27/2000	11.8	--	1,580	--
P35-19	WB35	NR	3/27/2000	9.5	--	1,240	--

Appendix 4A. *Redox-sensitive constituents for porous-membrane sampling devices in the West Branch Canal Creek study area, Aberdeen Proving Ground, Maryland, March 2000 through May 2001-Continued*

Site name	Installation site	Replicate	Date collected	Iron, total (mg/L)	Iron, ferrous (mg/L)	Methane (µg/L)	Duplicate methane (µg/L)
			March 2000 Sampling Event - Continued				
P35-20	WB35	NR	3/27/2000	10.7	--	1,240	--
P35-21	WB35	NR	3/27/2000	13.2	--	1,140	--
P36-1	WB36	NR	3/23/2000	<0.5	--	<79.0	--
P36-2	WB36	NR	3/23/2000	4.3	--	603	--
P36-3	WB36	NR	3/23/2000	19.0	--	2,360	--
P36-4	WB36	NR	3/23/2000	24.6	--	5,100	--
P36-5	WB36	NR	3/23/2000	--	--	7,070	--
P36-6	WB36	NR	3/23/2000	36.8	--	7,930	--
P36-7	WB36	1	3/23/2000	46.5	--	10,000	--
P36-7	WB36	2	3/23/2000	18.5	--	--	--
P36-8	WB36	NR	3/23/2000	30.6	--	8,250	--
P36-9	WB36	NR	3/23/2000	20.7	--	6,840	--
P36-10	WB36	NR	3/23/2000	19.8	--	6,450	--
P36-11	WB36	NR	3/23/2000	30.4	--	5,220	--
P36-12	WB36	NR	3/23/2000	33.5	--	2,940	--
P36-13	WB36	NR	3/23/2000	23.5	--	2,820	--
P36-14	WB36	NR	3/23/2000	--	--	1,990	--
P36-15	WB36	NR	3/23/2000	17.3	--	1,660	--
P36-16	WB36	NR	3/23/2000	14.6	--	1,650	--
P36-17	WB36	NR	3/23/2000	18.6	--	1,330	1,230
P36-18	WB36	NR	3/23/2000	17.7	--	1,210	--
P36-19	WB36	NR	3/23/2000	15.8	--	957	--
P36-20	WB36	NR	3/23/2000	11.1	--	720	--
P36-21	WB36	NR	3/23/2000	--	--	672	--
PL36-1	WB36	NR	3/23/2000	1.1	1.0	578	594
PL36-2	WB36	NR	3/23/2000	25.9	27.4	6,580	6,610
PL36-3	WB36	NR	3/23/2000	71.6	67.5	4,450	4,190
PL36-4	WB36	NR	3/23/2000	34.9	34.2	4,650	4,480
PL36-5	WB36	1	3/23/2000	24.4	22.0	5,940	5,860
PL36-5	WB36	2	3/23/2000	38.1	--	--	--

Appendix 4A. *Redox-sensitive constituents for porous-membrane sampling devices in the West Branch Canal Creek study area, Aberdeen Proving Ground, Maryland, March 2000 through May 2001-Continued*

Site name	Installation site	Replicate	Date collected	Iron, total (mg/L)	Iron, ferrous (mg/L)	Methane (µg/L)	Duplicate methane (µg/L)
			March 2000 Sampling Event - Continued				
PL36-6	WB36	NR	3/23/2000	25.3	27.0	4,280	4,460
PL36-7	WB36	NR	3/23/2000	--	19.9	4,090	4,120
PL36-8	WB36	NR	3/23/2000	18.2	18.3	1,770	1,800
PL36-9	WB36	NR	3/23/2000	18.5	20.2	1,450	1,460
PL36-10	WB36	NR	3/23/2000	18.1	18.3	1,530	1,580
PL36-11	WB36	NR	3/23/2000	17.1	14.3	1,080	1,080
PL36-12	WB36	NR	3/23/2000	20.7	23.1	914	915
PL36-13	WB36	NR	3/23/2000	19.6	21.2	813	794
PL36-14	WB36	1	3/23/2000	14.3	22.2	795	794
PL36-14	WB36	2	3/23/2000	21.1	--	--	--
PL36-15	WB36	NR	3/23/2000	18.6	20.5	734	728
PL36-16	WB36	NR	3/23/2000	17.2	17.7	778	768
PL36-17	WB36	NR	3/23/2000	16.7	16.7	769	750
PL36-18	WB36	NR	3/23/2000	10.9	14.0	809	806
PL36-19	WB36	NR	3/23/2000	14.2	14.7	809	807
PL36-20	WB36	NR	3/23/2000	14.6	14.3	980	996
PL36-21	WB36	NR	3/23/2000	14.0	14.8	842	817
PL36-22	WB36	NR	3/23/2000	14.5	14.6	710	682
			June 2000 Sampling Event				
P12-1	DP12	NR	6/26/2000	--	14.7	6,760	--
P12-2	DP12	NR	6/26/2000	--	16.8	7,990	--
P12-3	DP12	NR	6/26/2000	--	17.2	7,930	--
P12-4	DP12	NR	6/26/2000	--	14.1	9,300	--
P12-5	DP12	NR	6/26/2000	--	15.2	9,380	--
P12-6	DP12	NR	6/26/2000	--	14.2	9,100	--
P12-7	DP12	NR	6/26/2000	--	11.5	8,940	--
P12-8	DP12	NR	6/26/2000	--	8.8	8,680	--
P12-9	DP12	NR	6/26/2000	--	8.8	9,380	--
P12-10	DP12	NR	6/26/2000	--	8.6	8,100	--

Appendix 4A. *Redox-sensitive constituents for porous-membrane sampling devices in the West Branch Canal Creek study area, Aberdeen Proving Ground, Maryland, March 2000 through May 2001-Continued*

Site name	Installation site	Replicate	Date collected	Iron, total (mg/L)	Iron, ferrous (mg/L)	Methane (µg/L)	Duplicate methane (µg/L)
			June 2000 Sampling Event - Continued				
P12-11	DP12	NR	6/26/2000	--	7.9	8,730	--
P12-12	DP12	NR	6/26/2000	--	6.2	8,270	--
P12-13	DP12	NR	6/26/2000	--	6.1	8,190	--
P12-14	DP12	NR	6/26/2000	--	6.7	8,100	--
P12-15	DP12	NR	6/26/2000	--	5.1	7,920	--
P12-16	DP12	NR	6/26/2000	--	5.2	7,690	--
P12-17	DP12	NR	6/26/2000	--	7.7	6,920	--
P12-18	DP12	NR	6/26/2000	--	8.6	7,180	--
P12-19	DP12	NR	6/26/2000	--	7.2	7,040	--
P12-20	DP12	NR	6/26/2000	--	10.1	6,710	--
P12-21	DP12	NR	6/26/2000	--	10.0	6,720	--
P19-1	WB19	NR	6/26/2000	--	14.6	8,780	--
P19-2	WB19	NR	6/26/2000	--	9.8	8,110	--
P19-3	WB19	NR	6/26/2000	--	10.4	8,170	--
P19-4	WB19	NR	6/26/2000	--	7.7	8,200	--
P19-5	WB19	NR	6/26/2000	--	9.7	8,291	--
P19-6	WB19	NR	6/26/2000	--	8.3	7,020	--
P19-7	WB19	NR	6/26/2000	--	8.1	7,440	--
P19-8	WB19	NR	6/26/2000	--	9.1	--	--
P19-9	WB19	NR	6/26/2000	--	12.9	8,270	--
P19-10	WB19	NR	6/26/2000	--	13.9	9,090	--
P19-11	WB19	NR	6/26/2000	--	17.8	9,840	--
P19-12	WB19	NR	6/26/2000	--	15.9	9,370	--
P19-13	WB19	NR	6/26/2000	--	20.2	8,980	--
P19-14	WB19	NR	6/26/2000	--	19.7	9,360	--
P19-15	WB19	NR	6/26/2000	--	24.8	9,930	--
P19-16	WB19	NR	6/26/2000	--	30.8	9,340	--
P19-17	WB19	NR	6/26/2000	--	33.6	9,530	--
P19-18	WB19	NR	6/26/2000	--	39.2	9,220	--
P19-19	WB19	NR	6/26/2000	--	33.2	10,100	--

Appendix 4A. *Redox-sensitive constituents for porous-membrane sampling devices in the West Branch Canal Creek study area, Aberdeen Proving Ground, Maryland, March 2000 through May 2001-Continued*

Site name	Installation site	Replicate	Date collected	Iron, total (mg/L)	Iron, ferrous (mg/L)	Methane (µg/L)	Duplicate methane (µg/L)
			June 2000 Sampling Event - Continued				
P19-20	WB19	NR	6/26/2000	--	44.0	9,260	--
P19-21	WB19	NR	6/26/2000	--	44.1	11,300	--
P34-2	WB34	NR	6/21/2000	--	20.0	4,590	--
P34-3	WB34	NR	6/21/2000	--	40.8	8,630	--
P34-4	WB34	NR	6/21/2000	--	40.3	7,670	--
P34-5	WB34	NR	6/26/2000	--	--	9,010	--
P34-6	WB34	NR	6/21/2000	--	56.8	6,590	--
P34-7	WB34	NR	6/21/2000	--	36.0	9,080	--
P34-8	WB34	NR	6/21/2000	--	35.8	8,410	--
P34-9	WB34	NR	6/21/2000	--	26.2	7,610	--
P34-10	WB34	NR	6/21/2000	--	24.6	8,010	--
P34-11	WB34	NR	6/21/2000	--	20.0	9,070	--
P34-12	WB34	NR	6/21/2000	--	22.3	9,020	--
P34-13	WB34	NR	6/21/2000	--	23.0	--	--
P34-14	WB34	NR	6/21/2000	--	23.9	7,280	--
P34-15	WB34	NR	6/21/2000	--	23.4	6,300	--
P34-16	WB34	NR	6/21/2000	--	24.1	5,470	--
P34-17	WB34	NR	6/21/2000	--	25.6	4,320	--
P34-18	WB34	NR	6/21/2000	--	26.8	5,101	--
P34-19	WB34	NR	6/21/2000	--	26.4	4,060	--
P34-20	WB34	NR	6/21/2000	--	23.9	4,050	--
P34-21	WB34	NR	6/21/2000	--	27.7	3,560	--
P35-1	WB35	NR	6/26/2000	--	29.0	6,100	--
P35-2	WB35	NR	6/26/2000	--	18.4	7,730	--
P35-3	WB35	NR	6/26/2000	--	16.6	8,510	--
P35-4	WB35	NR	6/26/2000	--	14.3	8,460	--
P35-5	WB35	NR	6/26/2000	--	12.7	--	--
P35-6	WB35	NR	6/26/2000	--	12.5	8,640	--
P35-7	WB35	NR	6/26/2000	--	8.8	8,561	--
P35-8	WB35	NR	6/26/2000	--	7.0	8,050	--

Appendix 4A. *Redox-sensitive constituents for porous-membrane sampling devices in the West Branch Canal Creek study area, Aberdeen Proving Ground, Maryland, March 2000 through May 2001-Continued*

Site name	Installation site	Replicate	Date collected	Iron, total (mg/L)	Iron, ferrous (mg/L)	Methane (µg/L)	Duplicate methane (µg/L)
			June 2000 Sampling Event - Continued				
P35-9	WB35	NR	6/26/2000	--	--	7,790	--
P35-10	WB35	NR	6/26/2000	--	5.8	8,840	--
P35-11	WB35	NR	6/26/2000	--	5.2	8,260	--
P35-12	WB35	NR	6/26/2000	--	4.4	7,440	--
P35-13	WB35	NR	6/26/2000	--	4.0	7,630	--
P35-14	WB35	NR	6/26/2000	--	4.5	8,080	--
P35-15	WB35	NR	6/26/2000	--	5.3	8,010	--
P35-16	WB35	NR	6/26/2000	--	4.5	7,520	--
P35-17	WB35	NR	6/26/2000	--	4.7	7,100	--
P35-18	WB35	NR	6/26/2000	--	5.3	5,510	--
P35-19	WB35	NR	6/26/2000	--	24.3	10,000	--
P35-20	WB35	NR	6/26/2000	--	8.4	8,070	--
P35-21	WB35	NR	6/26/2000	--	52.8	8,870	--
P36-1	WB36	NR	6/21/2000	--	3.8	2,601	--
P36-2	WB36	NR	6/21/2000	--	16.3	6,740	--
P36-3	WB36	NR	6/21/2000	--	20.5	10,000	--
P36-4	WB36	NR	6/21/2000	--	18.1	10,100	--
P36-5	WB36	NR	6/21/2000	--	14.3	9,950	--
P36-6	WB36	NR	6/21/2000	--	10.9	10,700	--
P36-7	WB36	NR	6/21/2000	--	10.0	10,700	--
P36-8	WB36	NR	6/21/2000	--	7.6	11,500	--
P36-9	WB36	NR	6/21/2000	--	8.4	11,601	--
P36-10	WB36	NR	6/21/2000	--	6.9	11,500	--
P36-11	WB36	NR	6/21/2000	--	6.7	11,300	--
P36-12	WB36	NR	6/21/2000	--	6.1	10,900	--
P36-13	WB36	NR	6/21/2000	--	<.2	9,770	--
P36-14	WB36	NR	6/21/2000	--	6.9	9,430	--
P36-15	WB36	NR	6/21/2000	--	7.5	8,970	--
P36-16	WB36	NR	6/21/2000	--	9.4	7,860	--
P36-17	WB36	NR	6/21/2000	--	15.4	7,420	--

Appendix 4A. *Redox-sensitive constituents for porous-membrane sampling devices in the West Branch Canal Creek study area, Aberdeen Proving Ground, Maryland, March 2000 through May 2001-Continued*

Site name	Installation site	Replicate	Date collected	Iron, total (mg/L)	Iron, ferrous (mg/L)	Methane (µg/L)	Duplicate methane (µg/L)
			June 2000 Sampling Event - Continued				
P36-18	WB36	NR	6/21/2000	--	9.6	7,350	--
P36-19	WB36	NR	6/21/2000	--	7.3	5,190	--
P36-20	WB36	NR	6/21/2000	--	7.9	4,890	--
P36-21	WB36	NR	6/21/2000	--	16.8	--	--
PL36-1	WB36	NR	6/21/2000	18.6	15.4	9,430	9,060
PL36-2	WB36	1	6/21/2000	13.7	13.3	8,570	8,210
PL36-2	WB36	2	6/21/2000	--	--	8,970	8,180
PL36-3	WB36	NR	6/21/2000	10.3	8.6	8,080	8,470
PL36-4	WB36	NR	6/21/2000	21.7	20.2	9,500	9,440
PL36-5	WB36	NR	6/21/2000	13.5	12.0	8,840	8,460
PL36-6	WB36	NR	6/21/2000	9.5	9.5	5,860	6,120
PL36-7	WB36	NR	6/21/2000	39.9	39.0	6,150	5,980
PL36-8	WB36	NR	6/21/2000	6.6	6.8	9,140	8,000
PL36-9	WB36	NR	6/21/2000	6.3	7.0	4,070	4,180
PL36-10	WB36	NR	6/21/2000	7.2	--	9,640	9,980
PL36-11	WB36	NR	6/21/2000	7.2	7.5	2,160	2,220
PL36-12	WB36	NR	6/21/2000	7.5	8.1	1,660	1,770
PL36-13	WB36	NR	6/21/2000	7.7	7.8	1,760	1,800
PL36-14	WB36	NR	6/21/2000	7.1	6.6	4,500	4,560
PL36-15	WB36	NR	6/21/2000	7.8	7.7	1,860	1,800
PL36-16	WB36	NR	6/21/2000	7.8	7.0	1,720	1,740
PL36-17	WB36	NR	6/21/2000	8.0	7.2	2,810	2,890
PL36-18	WB36	NR	6/21/2000	7.6	7.8	1,760	1,740
PL36-19	WB36	NR	6/21/2000	8.4	7.2	1,560	1,550
PL36-20	WB36	NR	6/21/2000	7.8	7.8	2,580	2,530
PL36-21	WB36	NR	6/21/2000	9.0	8.7	1,520	1,520
PL36-22	WB36	NR	6/21/2000	9.0	8.2	2,490	2,420

Appendix 4A. *Redox-sensitive constituents for porous-membrane sampling devices in the West Branch Canal Creek study area, Aberdeen Proving Ground, Maryland, March 2000 through May 2001-Continued*

Site name	Installation site	Replicate	Date collected	Iron, total (mg/L)	Iron, ferrous (mg/L)	Methane (µg/L)	Duplicate methane (µg/L)
			May 2001 Sampling Event				
P35-1	WB35	NR	5/23/2001	--	23.6	8,580	--
P35-2	WB35	NR	5/23/2001	--	28.3	6,750	--
P35-3	WB35	NR	5/23/2001	--	33.0	6,980	--
P35-4	WB35	NR	5/23/2001	--	28.6	5,330	--
P35-5	WB35	NR	5/23/2001	--	23.5	3,960	--
P35-6	WB35	NR	5/23/2001	--	29.7	4,540	--
P35-7	WB35	NR	5/23/2001	--	21.2	2,480	2,290
P35-8	WB35	NR	5/23/2001	--	10.7	3,550	--
P35-9	WB35	NR	5/23/2001	--	7.3	2,790	--
P35-10	WB35	NR	5/23/2001	--	10.7	3,670	--
P35-11	WB35	NR	5/23/2001	--	12.5	3,030	--
P35-12	WB35	NR	5/23/2001	--	9.3	2,300	--
P35-13	WB35	NR	5/23/2001	--	10.4	2,380	--
P35-14	WB35	NR	5/23/2001	--	10.4	2,030	--
P35-15	WB35	NR	5/23/2001	--	10.2	2,970	--
P35-16	WB35	NR	5/23/2001	--	12.3	2,720	--
P35-17	WB35	NR	5/23/2001	--	10.3	2,680	--
P35-18	WB35	NR	5/23/2001	--	13.3	2,320	--
P35-19	WB35	NR	5/23/2001	--	11.2	2,140	--
P35-20	WB35	NR	5/23/2001	--	11.8	1,820	--
P35-21	WB35	NR	5/23/2001	--	15.5	2,080	--
P35S-1	WB35	NR	5/23/2001	--	3.8	6,910	--
P35S-2	WB35	NR	5/23/2001	--	3.6	5,980	--
P35S-3	WB35	NR	5/23/2001	--	2.8	3,910	--
P35S-4	WB35	NR	5/23/2001	--	1.2	4,560	--
P35S-5	WB35	NR	5/23/2001	--	1.0	5,190	--
P35S-6	WB35	NR	5/23/2001	--	0.5	4,960	--
P35S-7	WB35	NR	5/23/2001	--	.6	1,820	1,740
P35S-8	WB35	NR	5/23/2001	--	<10	5,900	--
P35S-9	WB35	1	5/23/2001	--	.8	882	--

Appendix 4A. *Redox-sensitive constituents for porous-membrane sampling devices in the West Branch Canal Creek study area, Aberdeen Proving Ground, Maryland, March 2000 through May 2001-Continued*

Site name	Installation site	Replicate	Date collected	Iron, total (mg/L)	Iron, ferrous (mg/L)	Methane (µg/L)	Duplicate methane (µg/L)
			May 2001 Sampling Event - Continued				
P35S-9	WB35	2	5/23/2001	--	0.6	--	--
P35S-10	WB35	NR	5/23/2001	--	1.2	788	--
P35S-11	WB35	NR	5/23/2001	--	1.3	737	--
P35S-12	WB35	NR	5/23/2001	--	1.5	663	--
P35S-13	WB35	NR	5/23/2001	--	2.5	578	--
P35S-14	WB35	NR	5/23/2001	--	2.9	511	--
P35S-15	WB35	NR	5/23/2001	--	2.6	452	--
P35S-16	WB35	NR	5/23/2001	--	2.6	451	--
P35S-17	WB35	NR	5/23/2001	--	3.4	418	--
P35S-18	WB35	NR	5/23/2001	--	3.0	677	--
P35S-19	WB35	NR	5/23/2001	--	1.9	345	--
P35S-20	WB35	NR	5/23/2001	--	3.5	341	--
P35S-21	WB35	NR	5/23/2001	--	2.1	397	--
P36M-1	WBM36	NR	5/18/2001	--	15.2	3,300	--
P36M-2	WBM36	NR	5/18/2001	--	17.5	4,060	--
P36M-3	WBM36	NR	5/18/2001	--	27.2	3,930	--
P36M-4	WBM36	NR	5/18/2001	--	26.0	9,100	--
P36M-5	WBM36	NR	5/18/2001	--	29.0	8,930	--
P36M-6	WBM36	NR	5/18/2001	--	32.0	5,000	--
P36M-7	WBM36	NR	5/18/2001	--	30.1	5,410	--
P36M-8	WBM36	NR	5/18/2001	--	72.7	4,020	--
P36M-9	WBM36	NR	5/18/2001	--	71.4	<55.9	--
P36M-10	WBM36	NR	5/18/2001	--	36.5	3,800	--
P36M-11	WBM36	NR	5/18/2001	--	26.5	3,770	--
P36M-12	WBM36	NR	5/18/2001	--	23.4	4,080	--
P36M-13	WBM36	NR	5/18/2001	--	23.5	3,530	--
P36M-14	WBM36	NR	5/18/2001	--	29.0	3,380	--
P36M-15	WBM36	NR	5/18/2001	--	31.9	4,230	--
P36M-16	WBM36	NR	5/18/2001	--	19.8	4,290	--
P36M-17	WBM36	NR	5/18/2001	--	22.3	3,830	--

Appendix 4A. *Redox-sensitive constituents for porous-membrane sampling devices in the West Branch Canal Creek study area, Aberdeen Proving Ground, Maryland, March 2000 through May 2001-Continued*

Site name	Installation site	Replicate	Date collected	Iron, total (mg/L)	Iron, ferrous (mg/L)	Methane (µg/L)	Duplicate methane (µg/L)
			May 2001 Sampling Event - Continued				
P36M-18	WBM36	NR	5/18/2001	--	19.3	3,950	--
P36M-19	WBM36	NR	5/18/2001	--	17.2	3,360	--
P36M-20	WBM36	NR	5/18/2001	--	21.2	3,240	--
P36M-21	WBM36	NR	5/18/2001	--	22.5	3,580	--
P36P-1	WB36	NR	5/18/2001	--	30.1	4,660	--
P36P-2	WB36	NR	5/18/2001	--	31.5	7,440	--
P36P-3	WB36	NR	5/18/2001	--	27.8	8,560	--
P36P-4	WB36	NR	5/18/2001	--	29.8	9,770	--
P36P-5	WB36	NR	5/18/2001	--	21.7	9,850	--
P36P-6	WB36	NR	5/18/2001	--	17.6	11,400	--
P36P-7	WB36	NR	5/18/2001	--	48.7	11,400	--
P36P-8	WB36	NR	5/18/2001	--	9.6	6,360	--
P36P-9	WB36	NR	5/18/2001	--	20.4	7,550	--
P36P-10	WB36	NR	5/18/2001	--	16.8	5,150	--
P36P-11	WB36	NR	5/18/2001	--	15.1	3,120	--
P36P-12	WB36	NR	5/18/2001	--	15.4	1,670	--
P36P-13	WB36	NR	5/18/2001	--	13.5	1,620	--
P36P-14	WB36	NR	5/18/2001	--	13.8	1,590	--
P36P-15	WB36	NR	5/18/2001	--	18.9	2,570	--
P36P-16	WB36	NR	5/18/2001	--	15.1	1,730	--
P36P-17	WB36	NR	5/18/2001	--	19.4	1,650	--
P36P-18	WB36	NR	5/18/2001	--	16.9	2,310	--
P36P-19	WB36	NR	5/18/2001	--	19.8	1,580	--
P36P-20	WB36	NR	5/18/2001	--	17.2	698	--
P36P-21	WB36	NR	5/18/2001	--	22.5	864	--
P36T-1	WBT36	NR	5/18/2001	--	13.7	7,140	--
P36T-2	WBT36	NR	5/18/2001	--	16.1	9,260	--
P36T-3	WBT36	NR	5/18/2001	--	26.1	7,850	--
P36T-4	WBT36	NR	5/18/2001	--	17.4	9,920	--
P36T-5	WBT36	NR	5/18/2001	--	14.1	10,600	--

Appendix 4A. *Redox-sensitive constituents for porous-membrane sampling devices in the West Branch Canal Creek study area, Aberdeen Proving Ground, Maryland, March 2000 through May 2001-Continued*

Site name	Installation site	Replicate	Date collected	Iron, total (mg/L)	Iron, ferrous (mg/L)	Methane (µg/L)	Duplicate methane (µg/L)
			May 2001 Sampling Event - Continued				
P36T-6	WBT36	NR	5/18/2001	--	15.2	10,300	--
P36T-7	WBT36	NR	5/18/2001	--	13.5	9,280	10,300
P36T-8	WBT36	NR	5/18/2001	--	10.0	8,300	--
P36T-9	WBT36	NR	5/18/2001	--	9.9	7,650	6,140
P36T-10	WBT36	NR	5/18/2001	--	12.5	6,010	--
P36T-11	WBT36	NR	5/18/2001	--	10.3	4,550	--
P36T-12	WBT36	NR	5/18/2001	--	9.7	5,510	--
P36T-13	WBT36	NR	5/18/2001	--	9.7	4,910	--
P36T-14	WBT36	1	5/18/2001	--	12.8	4,860	--
P36T-14	WBT36	2	5/18/2001	--	--	3,610	3,290
P36T-15	WBT36	NR	5/18/2001	--	13.5	4,610	3,770
P36T-16	WBT36	NR	5/18/2001	--	12.6	5,110	--
P36T-17	WBT36	NR	5/18/2001	--	11.0	4,400	--
P36T-18	WBT36	NR	5/18/2001	--	12.3	3,300	3,670
P36T-19	WBT36	NR	5/18/2001	--	7.7	2,840	--
P36T-20	WBT36	NR	5/18/2001	--	16.6	3,270	--
P36T-21	WBT36	NR	5/18/2001	--	30.7	3,220	3,000

APPENDIX 4B FOLLOWS

Appendix 4B. *Organic constituents for porous-membrane sampling devices in the West Branch Canal Creek study area, Aberdeen Proving Ground, Maryland, March 2000 through May 2001*

[µg/L, micrograms per liter; NR, no replicate; <, less than; --, no data; EV, estimated value; MP, peeper membrane paper; P35S, peeper installed adjacent to WB35; P36P, peeper installed adjacent to WB36; P36M, peeper installed adjacent to WBM36; P36T, peeper installed adjacent to WBT36]

			Chlorinated Ethanes			Chlorinated Ethenes					
Site name	Replicate	Collection date	1,1,2,2-Tetra-chloro-ethane (µg/L)	1,1,2-Tri-chloro-ethane (µg/L)	1,2-Di-chloro-ethane (µg/L)	Tetra-chloro-ethene (µg/L)	Tri-chloro-ethene (µg/L)	*cis*-1,2-Di-chloro-ethene (µg/L)	*trans*-1,2-Di-chloro-ethene (µg/L)	1,1-Di-chloro-ethene (µg/L)	Vinyl chloride (µg/L)
March 2000 Sampling Event											
P12-1	NR	3/27/2000	<1.0	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
P12-2	NR	3/27/2000	<1.0	<.5	<.5	<.5	<.5	<.5	<.5	<.5	<.5
P12-3	NR	3/27/2000	<1.0	<.5	<.5	<.5	<.5	<.5	<.5	<.5	<.5
P12-4	NR	3/27/2000	<1.0	<.5	<.5	<.5	<.5	<.5	<.5	<.5	<.5
P12-5	NR	3/27/2000	<1.0	<.5	<.5	<.5	<.5	<.5	<.5	<.5	<.5
P12-6	NR	3/27/2000	<1.0	<.5	<.5	<.5	<.5	<.5	<.5	<.5	<.5
P12-7	NR	3/27/2000	<1.0	<.5	<.5	<.5	<.5	<.5	<.5	<.5	<.5
P12-8	NR	3/27/2000	<1.0	<.5	<.5	<.5	<.5	<.5	<.5	<.5	<.5
P12-9	NR	3/27/2000	<1.0	<.5	<.5	<.5	<.5	<.5	<.5	<.5	<.5
P12-10	NR	3/27/2000	<1.0	<.5	<.5	<.5	<.5	<.5	<.5	<.5	<.5
P12-11	NR	3/27/2000	<1.0	<.5	<.5	<.5	<.5	<.5	<.5	<.5	<.5
P12-12	NR	3/27/2000	<1.0	<.5	<.5	<.5	<.5	<.5	<.5	<.5	<.5
P12-14	NR	3/27/2000	<1.0	<.5	<.5	<.5	<.5	<.5	<.5	<.5	<.5
P12-15	NR	3/27/2000	<1.0	<.5	<.5	<.5	<.5	<.5	<.5	<.5	<.5
P12-17	NR	3/27/2000	<1.0	<.5	<.5	<.5	<.5	<.5	<.5	<.5	<.5
P12-19	NR	3/27/2000	<1.0	<.5	<.5	<.5	<.5	<.5	<.5	<.5	<.5
P12-20	NR	3/27/2000	<1.0	<.5	<.5	<1.0	<.5	<.5	<.5	<.5	<.5
P34-1	NR	3/23/2000	<0.5	<.5	<.5	<.5	<.5	<.5	<.5	<.5	<.5
P34-3	NR	3/23/2000	<.5	<.5	<.5	<.5	<.5	<.5	<.5	<.5	<.5
P34-5	NR	3/23/2000	<.5	<.5	<.5	<.5	<.5	<.5	<.5	<.5	<.5
P34-8	NR	3/23/2000	<1.0	<.5	<.5	<.5	<.5	<.5	<.5	<.5	<.5
P34-15	NR	3/23/2000	<.5	<.5	<.5	<.5	<.5	<.5	<.5	<.5	<.5
P34-17	NR	3/23/2000	<.5	<.5	<.5	<.5	<.5	<.5	<.5	<.5	<.5
P34-18	NR	3/13/2000	<1.0	<.5	<.5	<.5	<.5	<.5	<.5	<.5	<.5
P34-21	NR	3/23/2000	<.5	<.5	<.5	<.5	<.5	<.5	<.5	<.5	<.5

Chlorinated Methanes			Additional Volatile Organic Compounds					
Carbon tetra-chloride (µg/L)	Chloroform (µg/L)	Chloro-methane (µg/L)	Benzene (µg/L)	Bromo-methane (µg/L)	Toluene (µg/L)	Tri-chloro-fluoro-methane (µg/L)	Naph-thalene (µg/L)	Site name
<0.5	<0.5	<1.0	<0.5	<1.0	<1.0	<.5	<10.0	P12-1
<.5	<.5	<1.0	<.5	<1.0	<1.0	<.5	<10.0	P12-2
<.5	<.5	<1.0	<.5	<1.0	<1.0	<.5	<10.0	P12-3
<.5	<.5	<1.0	<.5	<1.0	<1.0	<.5	<10.0	P12-4
<.5	<.5	<1.0	<.5	<1.0	<1.0	<.5	<10.0	P12-5
<.5	<.5	<1.0	<.5	<1.0	<1.0	<.5	<10.0	P12-6
<.5	<.5	<1.0	<.5	<1.0	<1.0	<.5	<10.0	P12-7
<.5	<.5	<1.0	<.5	<1.0	<1.0	<.5	<10.0	P12-8
<.5	<.5	<1.0	<.5	<1.0	<1.0	<.5	<10.0	P12-9
<.5	<.5	<1.0	<.5	<1.0	<1.0	<.5	<10.0	P12-10
<.5	<.5	<1.0	<.5	<1.0	<1.0	<.5	<10.0	P12-11
<.5	<.5	<1.0	<.5	<1.0	<1.0	<.5	<10.0	P12-12
<.5	<.5	<1.0	<.5	<1.0	<1.0	<.5	<10.0	P12-14
<.5	<.5	<1.0	<.5	<1.0	<1.0	<.5	<10.0	P12-15
<.5	<.5	<1.0	<.5	<1.0	<1.0	<.5	<10.0	P12-17
<.5	<.5	<1.0	<.5	<1.0	<1.0	<.5	<10.0	P12-19
<.5	<.5	<1.0	<.5	<1.0	<1.0	<.5	<10.0	P12-20
<.5	<.5	<10.0	<.5	<10.0	<10.0	<.5	<10.0	P34-1
<.5	<.5	<10.0	<.5	<10.0	<10.0	<.5	<10.0	P34-3
<.5	<.5	<10.0	<.5	<10.0	<10.0	<.5	<10.0	P34-5
<.5	<.5	<1.0	<.5	<1.0	<1.0	<.5	<10.0	P34-8
<.5	<.5	<10.0	<.5	<10.0	<10.0	<.5	<10.0	P34-15
<.5	<.5	<10.0	<.5	<10.0	<10.0	<.5	<10.0	P34-17
<.5	<.5	<1.0	<.5	2.3	<1.0	<.5	<10.0	P34-18
<.5	<.5	<10.0	<.5	<10.0	<10.0	<.5	<10.0	P34-21

Appendix 4B. *Organic constituents for porous-membrane sampling devices in the West Branch Canal Creek study area, Aberdeen Proving Ground, Maryland, March 2000 through May 2001-Continued*

Site name	Replicate	Collection date	Chlorinated Ethanes: 1,1,2,2-Tetrachloroethane (µg/L)	1,1,2-Trichloroethane (µg/L)	1,2-Dichloroethane (µg/L)	Chlorinated Ethenes: Tetrachloroethene (µg/L)	Trichloroethene (µg/L)	*cis*-1,2-Dichloroethene (µg/L)	*trans*-1,2-Dichloroethene (µg/L)	1,1-Dichloroethene (µg/L)	Vinyl chloride (µg/L)
March 2000 Sampling Event - *Continued*											
P35-1	NR	3/27/2000	<1.0	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
P35-2	NR	3/27/2000	<1.0	<.5	<.5	<.5	<.5	<.5	<.5	<.5	<.5
P35-3	NR	3/27/2000	<1.0	<.5	<.5	<.5	<.5	<.5	<.5	<.5	<.5
P35-4	NR	3/27/2000	<1.0	<.5	<.5	<.5	<.5	<.5	<.5	<.5	<.5
P35-5	NR	3/27/2000	<1.0	<.5	<.5	<.5	<.5	<.5	<.5	<.5	<.5
P35-6	NR	3/27/2000	<1.0	<.5	<.5	<.5	<.5	<.5	<.5	<.5	<.5
P35-7	NR	3/27/2000	<1.0	<.5	<.5	<.5	<.5	<.5	<.5	<.5	<.5
P35-8	NR	3/27/2000	<1.0	<.5	<.5	<.5	<.5	<.5	<.5	<.5	5.3
P35-11	NR	3/27/2000	<1.0	<.5	<.5	<.5	<.5	1.7	6.5	<.5	8.0
P35-12	NR	3/27/2000	<1.0	<.5	<.5	<.5	<.5	<.5	2.9	<.5	10.6
P35-15	NR	3/27/2000	<1.0	<.5	<.5	<.5	<.5	2.8	10.3	<.5	9.7
P35-16	NR	3/27/2000	<1.0	<.5	<.5	<.5	<.5	1.3	5.5	<.5	4.5
P35-17	NR	3/27/2000	<1.0	<.5	<.5	<.5	<.5	3.3	10.4	<.5	4.4
P35-18	NR	3/27/2000	<1.0	<.5	<.5	<.5	<.5	4.4	11.2	<.5	21.2
P35-19	NR	3/27/2000	<1.0	<.5	<.5	<.5	<.5	5.5	13.8	<.5	10.4
P35-20	NR	3/27/2000	<1.0	<.5	<.5	<.5	<.5	5.0	13.3	<.5	12.1
P36-1	NR	3/23/2000	<0.5	<.5	<.5	<.5	<.5	<.5	<.5	<.5	<.5
P36-3	NR	3/23/2000	<.5	<.5	<.5	<.5	<.5	<.5	<.5	<.5	<.5
P36-4	NR	3/23/2000	<1.0	<.5	<.5	<.5	<.5	<.5	<.5	<.5	<.5
P36-5	NR	3/23/2000	<.5	<.5	<.5	<.5	<.5	<.5	<.5	<.5	<.5
P36-6	NR	3/23/2000	<1.0	<.5	<.5	<.5	<.5	<.5	<.5	<.5	<.5
P36-7	NR	3/23/2000	<.5	<.5	<.5	<.5	<.5	<.5	<.5	<.5	<.5
P36-8	NR	3/23/2000	<1.0	<.5	<.5	<.5	<.5	<.5	<.5	<.5	<.5
P36-9	NR	3/23/2000	<.5	<.5	<.5	<.5	<.5	<.5	<.5	<.5	<.5
P36-10	NR	3/23/2000	<1.0	<.5	<.5	<.5	<.5	<.5	<.5	<.5	<.5
P36-11	NR	3/23/2000	<.5	<.5	<.5	<.5	<.5	<.5	<.5	<.5	2.2
P36-12	NR	3/23/2000	<1.0	<.5	<.5	<.5	<.5	<.5	<.5	<.5	<.5
P36-13	NR	3/23/2000	<.5	<.5	<.5	<.5	<.5	<.5	<.5	<.5	5.6
P36-14	NR	3/23/2000	<1.0	<.5	<.5	<.5	<.5	<.5	<.5	<.5	<.5

Chlorinated Methanes			Additional Volatile Organic Compounds					
Carbon tetra-chloride (µg/L)	Chloroform (µg/L)	Chloro-methane (µg/L)	Benzene (µg/L)	Bromo-methane (µg/L)	Toluene (µg/L)	Tri-chloro-fluoro-methane (µg/L)	Naph-thalene (µg/L)	Site name
<0.5	<0.5	<1.0	<0.5	<1.0	<1.0	<0.5	<10.0	P35-1
<.5	<.5	<1.0	<.5	<1.0	<1.0	<.5	<10.0	P35-2
<.5	<.5	<1.0	<.5	<1.0	<1.0	<.5	<10.0	P35-3
<.5	<.5	<1.0	<.5	<1.0	<1.0	<.5	<10.0	P35-4
<.5	<.5	<1.0	<.5	<1.0	<1.0	<.5	<10.0	P35-5
<.5	<.5	<1.0	<.5	<1.0	<1.0	<.5	<10.0	P35-6
<.5	<.5	<1.0	<.5	<1.0	<1.0	<.5	<10.0	P35-7
<.5	<.5	<1.0	<.5	9.4	7.5	<.5	<10.0	P35-8
<.5	<.5	<1.0	<.5	<1.0	<1.0	<.5	<10.0	P35-11
<.5	<.5	<1.0	<.5	<1.0	<1.0	<.5	<10.0	P35-12
<.5	<.5	<1.0	<.5	<1.0	<1.0	<.5	<10.0	P35-15
<.5	<.5	<1.0	<.5	<1.0	<1.0	<.5	<10.0	P35-16
<.5	<.5	<1.0	<.5	<1.0	<1.0	<.5	<10.0	P35-17
<.5	<.5	<1.0	<.5	6.2	<1.0	<.5	<10.0	P35-18
<.5	<.5	<1.0	<.5	<1.0	<1.0	<.5	<10.0	P35-19
<.5	<.5	<1.0	<.5	<1.0	<1.0	<.5	<10.0	P35-20
<.5	<.5	<10.0	<.5	<10.0	<10.0	<.5	<10.0	P36-1
<.5	<.5	<10.0	<.5	<10.0	<10.0	<.5	<10.0	P36-3
<.5	<.5	<1.0	<.5	<1.0	<1.0	<.5	<10.0	P36-4
<.5	<.5	<10.0	<.5	<10.0	<10.0	<.5	<10.0	P36-5
<.5	<.5	<1.0	<.5	<1.0	<1.0	<.5	<10.0	P36-6
<.5	<.5	11.3	<.5	<10.0	<10.0	<.5	<10.0	P36-7
<.5	<.5	<1.0	<.5	<1.0	1.1	<.5	<10.0	P36-8
<.5	<.5	16.7	<.5	<10.0	<10.0	<.5	<10.0	P36-9
<.5	<.5	<1.0	<.5	<1.0	1.5	<.5	<10.0	P36-10
<.5	<.5	19.7	<.5	<10.0	<10.0	<.5	<10.0	P36-11
<.5	<.5	<1.0	<.5	<1.0	<1.0	<.5	<10.0	P36-12
<.5	<.5	<10.0	<.5	<10.0	<10.0	<.5	<10.0	P36-13
<.5	<.5	<1.0	<.5	<1.0	<1.0	<.5	<10.0	P36-14

Appendix 4B. *Organic constituents for porous-membrane sampling devices in the West Branch Canal Creek study area, Aberdeen Proving Ground, Maryland, March 2000 through May 2001-Continued*

Site name	Replicate	Collection date	Chlorinated Ethanes: 1,1,2,2-Tetrachloroethane (µg/L)	1,1,2-Trichloroethane (µg/L)	1,2-Dichloroethane (µg/L)	Chlorinated Ethenes: Tetrachloroethene (µg/L)	Trichloroethene (µg/L)	*cis*-1,2-Dichloroethene (µg/L)	*trans*-1,2-Dichloroethene (µg/L)	1,1-Dichloroethene (µg/L)	Vinyl chloride (µg/L)
March 2000 Sampling Event - *Continued*											
P36-15	1	3/23/2000	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	6.2
P36-15	2	3/23/2000	<.5	<.5	<.5	<.5	<.5	<.5	<.5	<.5	<0.5
P36-16	NR	3/23/2000	<1.0	<.5	<.5	<.5	<.5	<.5	<.5	<.5	<.5
P36-17	NR	3/23/2000	<2.5	<.5	<2.5	<2.5	<2.5	<2.5	<2.5	<.5	<2.5
P36-18	NR	3/23/2000	<1.0	<.5	<.5	<.5	<.5	<.5	<.5	<.5	<.5
P36-19	NR	3/23/2000	<.5	<.5	<.5	<.5	<.5	<.5	<.5	<.5	<.5
P36-20	NR	3/23/2000	<1.0	<.5	<.5	<.5	<.5	<.5	<.5	<.5	<.5
P36-21	NR	3/23/2000	<.5	<.5	<.5	<.5	<.5	<.5	<.5	<.5	<.5
PL36-1	NR	3/23/2000	<.5	<.5	<.5	<.5	<.5	<.5	<.5	<.5	<.5
PL36-2	NR	3/23/2000	<1.0	<.5	<.5	<.5	<.5	<.5	<.5	<.5	<.5
PL36-3	NR	3/23/2000	<.5	<.5	<.5	<.5	<.5	<.5	<.5	<.5	<.5
PL36-4	NR	3/23/2000	<1.0	<.5	<.5	<.5	<.5	<.5	<.5	<.5	<.5
PL36-5	NR	3/23/2000	<.5	<.5	<.5	<.5	<.5	<.5	<.5	<.5	<.5
PL36-6	NR	3/23/2000	<1.0	<.5	<.5	<.5	<.5	<.5	<.5	<.5	15.0
PL36-8	NR	3/23/2000	<1.0	<.5	<.5	<.5	<.5	<.5	<.5	<.5	23.8
PL36-9	NR	3/23/2000	<.5	<.5	<.5	<.5	<.5	.8	.6	<.5	9.6 EV
PL36-10	NR	3/23/2000	<1.0	<.5	<.5	<.5	<.5	<.5	<.5	<.5	12.8EV
PL36-11	NR	3/23/2000	<.5	<.5	<.5	<.5	<.5	<.5	<.5	<.5	4.3 EV
PL36-12	1	3/23/2000	<1.0	<.5	<.5	<.5	<.5	.9	3.3	<.5	11.9
PL36-12	2	3/23/2000	<1.0	<.5	<.5	<.5	<.5	.9	3.2	<.5	12.4
PL36-14	NR	3/23/2000	<1.0	<.5	<.5	<.5	<.5	<.5	<.5	<.5	<.5
PL36-16	NR	3/23/2000	<1.0	<.5	<.5	<.5	<.5	<.5	<.5	<.5	<.5
PL36-17	NR	3/23/2000	--	<.5	<.5	--	<.5	--	--	<.5	--
PL36-18	NR	3/23/2000	<1.0	<.5	<.5	<.5	<.5	<.5	<.5	<.5	<.5
PL36-19	NR	3/23/2000	<.5	<.5	<.5	<.5	<.5	.8 EV	4.8 EV	<.5	5.4 EV
PL36-20	NR	3/23/2000	<1.0	<.5	<.5	<.5	<.5	<.5	<.5	<.5	<.5
PL36-22	NR	3/23/2000	<1.0	<.5	<.5	<.5	<.5	<.5	2.6	<.5	<.5

Chlorinated Methanes			Additional Volatile Organic Compounds					
Carbon tetra-chloride (µg/L)	Chloroform (µg/L)	Chloro-methane (µg/L)	Benzene (µg/L)	Bromo-methane (µg/L)	Toluene (µg/L)	Tri-chloro-fluoro-methane (µg/L)	Naph-thalene (µg/L)	Site name
<0.5	<0.5	18.8	<0.5	<10.0	<10.0	<0.5	<10.0	P36-15
<.5	<.5	<10.0	<.5	<10.0	<10.0	<.5	<10.0	P36-15
<.5	<.5	<1.0	<.5	<1.0	<1.0	<.5	<10.0	P36-16
<2.5	<2.5	<50.0	<2.5	<50.0	<50.0	<.5	<10.0	P36-17
<.5	<.5	<1.0	<.5	<1.0	<1.0	<.5	<10.0	P36-18
<.5	<.5	15.7	<.5	<10.0	<10.0	<.5	<10.0	P36-19
<.5	<.5	<1.0	<.5	<1.0	<1.0	<.5	<10.0	P36-20
<.5	<.5	<10.0	<.5	<10.0	<10.0	<.5	<10.0	P36-21
<.5	<.5	<10.0	<.5	<10.0	<10.0	<.5	<10.0	PL36-1
<.5	<.5	<1.0	<.5	1.2	<1.0	<.5	<10.0	PL36-2
<.5	<.5	<10.0	<.5	<10.0	<10.0	<.5	<10.0	PL36-3
<.5	<.5	<1.0	<.5	2.0	<1.0	<.5	<10.0	PL36-4
<.5	<.5	<10.0	<.5	<10.0	<10.0	<.5	<10.0	PL36-5
<.5	<.5	<1.0	<.5	<1.0	<1.0	<.5	<10.0	PL36-6
<.5	<.5	<1.0	<.5	<1.0	<1.0	<.5	<10.0	PL36-8
<.5	<.5	<10.0	<.5	<10.0	<10.0	<.5	<10.0	PL36-9
<.5	<.5	<1.0	<.5	<1.0	<1.0	<.5	<10.0	PL36-10
<.5	<.5	<10.0	<.5	<10.0	<10.0	<.5	<10.0	PL36-11
<.5	<.5	<1.0	<.5	4.4	<1.0	<.5	<10.0	PL36-12
<.5	<.5	<1.0	<.5	5.1	<1.0	<.5	<10.0	PL36-12
<.5	<.5	<1.0	<.5	<1.0	<1.0	<.5	<10.0	PL36-14
<.5	<.5	<1.0	<.5	<1.0	<1.0	<.5	<10.0	PL36-16
<.5	--	--	<.5	--	<10.0	<.5	<10.0	PL36-17
<.5	<.5	<1.0	<.5	<1.0	<1.0	<.5	<10.0	PL36-18
<.5	<.5	<10.0	<.5	<10.0	<10.0	<.5	<10.0	PL36-19
<.5	<.5	<1.0	<.5	<1.0	<1.0	<.5	<10.0	PL36-20
<.5	<.5	<1.0	<.5	<1.0	<1.0	<.5	<10.0	PL36-22

Appendix 4B. *Organic constituents for porous-membrane sampling devices in the West Branch Canal Creek study area, Aberdeen Proving Ground, Maryland, March 2000 through May 2001-Continued*

			Chlorinated Ethanes			Chlorinated Ethenes					
Site name	Replicate	Collection date	1,1,2,2-Tetra-chloro-ethane (µg/L)	1,1,2-Tri-chloro-ethane (µg/L)	1,2-Di-chloro-ethane (µg/L)	Tetra-chloro-ethene (µg/L)	Tri-chloro-ethene (µg/L)	*cis*-1,2-Di-chloro-ethene (µg/L)	*trans*-1,2-Di-chloro-ethene (µg/L)	1,1-Di-chloro-ethene (µg/L)	Vinyl chloride (µg/L)
June 2000 Sampling Event											
P12-1	NR	6/26/2000	<0.8	<0.5	<0.5	<0.8	<0.5	<0.5	<0.5	<0.8	<0.5
P12-2	NR	6/26/2000	<.8	<.5	<.5	<.8	<.5	<.5	<.5	<.8	<.5
P12-3	NR	6/26/2000	<.8	<.5	<.5	<.8	<.5	<.5	<.5	<.8	<.5
P12-4	NR	6/26/2000	<.8	<.5	<.5	<.8	<.5	<.5	<.5	<.8	<.5
P12-5	NR	6/26/2000	<.8	<.5	<.5	<.8	<.5	<.5	<.5	<.8	<.5
P12-6	NR	6/26/2000	<.8	<.5	<.5	<.8	<.5	<.5	<.5	<.8	<.5
P12-7	NR	6/26/2000	<.8	<.5	<.5	<.8	<.5	<.5	<.5	<.8	<.5
P12-8	NR	6/26/2000	<.8	<.5	<.5	<.8	<.5	<.5	<.5	<.8	<.5
P12-9	NR	6/26/2000	<.8	<.5	<.5	<.8	<.5	<.5	<.5	<.8	<.5
P12-10	NR	6/26/2000	<.8	<.5	<.5	<.8	<.5	<.5	<.5	<.8	<.5
P12-11	NR	6/26/2000	<.8	<.5	<.5	<.8	<.5	<.5	<.5	<.8	<.5
P12-12	1	6/26/2000	<.8	<.5	<.5	<.8	<.5	<.5	<.5	<.8	<.5
P12-12	2	6/26/2000	<.8	<.5	<.5	<.8	<.5	<.5	<.5	<.8	<.5
P12-13	NR	6/26/2000	<.8	<.5	<.5	<.8	<.5	<.5	<.5	<.8	<.5
P12-14	NR	6/26/2000	<.8	<.5	<.5	<.8	<.5	<.5	<.5	<.8	<.5
P12-15	1	6/26/2000	<.8	<.5	<.5	<.8	<.5	<.5	<.5	<.8	<.5
P12-15	2	6/26/2000	<.8	<.5	<.5	<.8	<.5	<.5	<.5	<.8	<.5
P12-17	NR	6/26/2000	<.8	<.5	<.5	<.8	<.5	<.5	<.5	<.8	<.5
P12-18	NR	6/26/2000	<.8	<.5	<.5	<.8	<.5	<.5	<.5	<.8	<.5
P12-19	1	6/26/2000	--	<.5	<.5	--	<.5	.8	<.5	<.8	<.5
P12-19	2	6/26/2000	<.8	<.5	<.5	<.8	<.5	1.5	<.5	<.8	<.5
P12-20	NR	6/26/2000	<.8	<.5	<.5	<.8	<.5	3.1	<.5	<.8	20.8
P12-21	NR	6/26/2000	<.8	<.5	<.5	<.8	<.5	19.6	<.5	<.8	135
P34-2	1	6/21/2000	<.8	<.5	<.5	<.8	<.5	<.5	<.5	<.8	<.5
P34-2	2	6/21/2000	<.8	<.5	<.5	<.8	<.5	<.5	<.5	<.8	<.5
P34-3	NR	6/21/2000	<.8	<.5	<.5	<.8	<.5	<.5	<.5	<.8	<.5
P34-4	NR	6/21/2000	<.8	<.5	<.5	<.8	<.5	<.5	<.5	<.8	<.5
P34-6	NR	6/21/2000	--	<.5	<.5	16.0	<.5	<.5	<.5	<.8	<.5
P34-7	NR	6/21/2000	<1.6	<.5	<1.0	<1.6	<1.0	<1.0	<1.0	<.8	<1.0

Chlorinated Methanes			Additional Volatile Organic Compounds					
Carbon tetra-chloride (µg/L)	Chloroform (µg/L)	Chloro-methane (µg/L)	Benzene (µg/L)	Bromo-methane (µg/L)	Toluene (µg/L)	Tri-chloro-fluoro-methane (µg/L)	Naph-thalene (µg/L)	Site name
<0.5	<0.5	<0.8	<0.5	<0.8	<0.8	<0.5	<0.8	P12-1
<.5	<.5	<.8	<.5	<.8	<.8	<.5	<.8	P12-2
<.5	<.5	<.8	<.5	<.8	<.8	<.5	<.8	P12-3
<.5	<.5	<.8	<.5	<.8	<.8	<.5	<.8	P12-4
<.5	<.5	<.8	<.5	<.8	3.4	<.5	<.8	P12-5
<.5	<.5	<.8	<.5	<.8	<.8	<.5	<.8	P12-6
<.5	<.5	<.8	<.5	<.8	<.8	<.5	<.8	P12-7
<.5	<.5	<.8	<.5	<.8	<.8	<.5	<.8	P12-8
<.5	<.5	<.8	<.5	<.8	<.8	<.5	<.8	P12-9
<.5	<.5	<.8	<.5	<.8	<.8	<.5	<.8	P12-10
<.5	<.5	<.8	<.5	<.8	<.8	<.5	<.8	P12-11
<.5	<.5	<.8	<.5	<.8	<.8	<.5	<.8	P12-12
<.5	<.5	<.8	<.5	<.8	<.8	<.5	<.8	P12-12
<.5	<.5	<.8	<.5	<.8	<.8	<.5	<.8	P12-13
<.5	<.5	<.8	<.5	<.8	<.8	<.5	<.8	P12-14
<.5	<.5	<.8	<.5	<.8	<.8	<.5	<.8	P12-15
<.5	<.5	<.8	<.5	<.8	<.8	<.5	<.8	P12-15
<.5	<.5	<.8	<.5	<.8	<.8	<.5	<.8	P12-17
<.5	<.5	<.8	<.5	<.8	<.8	<.5	<.8	P12-18
<.5	<.5	<.8	<.5	<.8	--	<.5	<.8	P12-19
<.5	<.5	<.8	<.5	<.8	<.8	<.5	<.8	P12-19
<.5	<.5	<.8	<.5	<.8	<.8	<.5	<.8	P12-20
<.5	<.5	<.8	<.5	<.8	2.4	<.5	<.8	P12-21
<.5	<.5	<.8	<.5	<.8	<.8	<.5	<.8	P34-2
<.5	<.5	<.8	<.5	<.8	1.9	<.5	<.8	P34-2
<.5	<.5	<.8	<.5	<.8	34.1	<.5	<.8	P34-3
<.5	<.5	<.8	<.5	<.8	42.9	<.5	<.8	P34-4
<.5	<.5	<.8	<.5	<.8	78.0	<.5	<.8	P34-6
<1.0	<1.0	<1.6	<1.0	<1.6	67.5	<.5	<.8	P34-7

Appendix 4B. *Organic constituents for porous-membrane sampling devices in the West Branch Canal Creek study area, Aberdeen Proving Ground, Maryland, March 2000 through May 2001-Continued*

			Chlorinated Ethanes			Chlorinated Ethenes					
Site name	Replicate	Collection date	1,1,2,2-Tetra-chloro-ethane (µg/L)	1,1,2-Tri-chloro-ethane (µg/L)	1,2-Di-chloro-ethane (µg/L)	Tetra-chloro-ethene (µg/L)	Tri-chloro-ethene (µg/L)	*cis*-1,2-Di-chloro-ethene (µg/L)	*trans*-1,2-Di-chloro-ethene (µg/L)	1,1-Di-chloro-ethene (µg/L)	Vinyl chloride (µg/L)
June 2000 Sampling Event - *Continued*											
P34-8	1	6/21/2000	<0.8	<0.5	<0.5	<0.8	<0.5	<0.5	<0.5	<0.8	<0.5
P34-8	2	6/21/2000	<.8	<.5	<.5	<.8	<.5	<.5	<.5	<.8	<.5
P34-10	1	6/21/2000	<.8	<.5	<.5	<.8	<.5	<.5	<.5	<.8	<.5
P34-10	2	6/21/2000	<.8	<.5	<.5	<.8	<.5	<.5	<.5	<.8	<.5
P34-11	1	6/21/2000	<.8	<.5	<.5	<.8	<.5	<.5	<.5	<.8	<.5
P34-11	2	6/21/2000	<.8	<.5	<.5	<.8	<.5	<.5	<.5	<.8	<.5
P34-12	NR	6/21/2000	<.8	<.5	<.5	<.8	<.5	<.5	<.5	<.8	<.5
P34-13	NR	6/21/2000	--	<.5	<.5	<.8	<.5	<.5	<.5	<.8	1.9
P34-14	NR	6/21/2000	<.8	<.5	<.5	<.8	<.5	<.5	<.5	<.8	<.5
P34-15	NR	6/21/2000	<.8	<.5	<.5	<.8	<.5	1.7	<.5	<.8	23.7
P34-16	NR	6/21/2000	<.8	<.5	<.5	<.8	<.5	3.5	<.5	<.8	50.5
P34-17	NR	6/21/2000	<.8	<.5	<.5	<.8	<.5	5.8	<.5	<.8	106
P34-18	NR	6/21/2000	<.8	<.5	<.5	<.8	<.5	7.2	1.1	<.8	94.8
P34-19	NR	6/21/2000	<.8	<.5	<.5	<.8	<.5	7.6	1.4	<.8	112
P34-20	NR	6/21/2000	<.8	<.5	<.5	<.8	<.5	6.6	1.4	<.8	129
P34-21	NR	6/21/2000	<.8	<.5	<.5	<.8	<.5	4.7	1.9	<.8	102
P35-1	NR	6/26/2000	<.8	<.5	<.5	<.8	<.5	<.5	<.5	<.8	<.5
P35-2	NR	6/26/2000	<.8	<.5	<.5	<.8	<.5	<.5	<.5	<.8	<.5
P35-3	NR	6/26/2000	<.8	<.5	<.5	<.8	<.5	<.5	<.5	<.8	<.5
P35-4	NR	6/26/2000	<.8	<.5	<.5	<.8	<.5	<.5	<.5	<.8	<.5
P35-5	NR	6/26/2000	<.8	<.5	<.5	<.8	<.5	<.5	<.5	<.8	<.5
P35-6	1	6/26/2000	<.8	<.5	<.5	<.8	<.5	<.5	<.5	<.8	<.5
P35-6	2	6/26/2000	<.8	<.5	<.5	<.8	<.5	<.5	<.5	<.8	<.5
P35-7	1	6/26/2000	<.8	<.5	<.5	<.8	<.5	<.5	<.5	<.8	<.5
P35-7	2	6/26/2000	<.8	<.5	<.5	<.8	<.5	<.5	<.5	<.8	<.5
P35-8	NR	6/26/2000	<.8	<.5	<.5	<.8	<.5	<.5	<.5	<.8	<.5
P35-9	NR	6/26/2000	<.8	<.5	<.5	<.8	<.5	<.5	<.5	<.8	2.0
P35-10	1	6/26/2000	<.8	<.5	<.5	<.8	<.5	<.5	<.5	<.8	8.2
P35-10	2	6/26/2000	<.8	<.5	<.5	<.8	<.5	3.0	<.5	<.8	53.2

Chlorinated Methanes			Additional Volatile Organic Compounds					
Carbon tetra-chloride (µg/L)	Chloroform (µg/L)	Chloro-methane (µg/L)	Benzene (µg/L)	Bromo-methane (µg/L)	Toluene (µg/L)	Tri-chloro-fluoro-methane (µg/L)	Naph-thalene (µg/L)	Site name
<0.5	<0.5	<0.8	<0.5	<0.8	22.7	<0.5	<0.8	P34-8
<.5	<.5	<.8	<.5	<.8	242 EV	<.5	<.8	P34-8
<.5	<.5	<.8	<.5	<.8	20.6	<.5	<.8	P34-10
<.5	<.5	<.8	<.5	<.8	<0.8	<.5	<.8	P34-10
<.5	<.5	<.8	<.5	<.8	3.2	<.5	<.8	P34-11
<.5	<.5	<.8	<.5	<.8	<.8	<.5	<.8	P34-11
<.5	<.5	<.8	<.5	<.8	<.8	<.5	<.8	P34-12
<.5	<.5	<.8	<.5	<.8	<.8	<.5	<.8	P34-13
<.5	<.5	<.8	<.5	<.8	<.8	<.5	<.8	P34-14
<.5	<.5	<.8	<.5	<.8	<.8	<.5	<.8	P34-15
<.5	<.5	<.8	<.5	<.8	<.8	<.5	<.8	P34-16
<.5	<.5	<.8	<.5	<.8	1.2	<.5	<.8	P34-17
<.5	<.5	.8	<.5	<.8	1.4	<.5	<.8	P34-18
<.5	<.5	<.8	<.5	<.8	1.6	<.5	<.8	P34-19
<.5	<.5	<.8	<.5	<.8	1.0	<.5	<.8	P34-20
<.5	<.5	<.8	<.5	<.8	1.2	<.5	<.8	P34-21
<.5	<.5	<.8	<.5	<.8	<.8	<.5	<.8	P35-1
<.5	<.5	<.8	<.5	<.8	1.2	<.5	<.8	P35-2
<.5	<.5	<.8	<.5	<.8	<.8	<.5	<.8	P35-3
<.5	<.5	<.8	<.5	<.8	<.8	<.5	<.8	P35-4
<.5	<.5	<.8	<.5	<.8	<.8	<.5	<.8	P35-5
<.5	<.5	<.8	<.5	<.8	<.8	<.5	<.8	P35-6
<.5	<.5	<.8	<.5	<.8	<.8	<.5	<.8	P35-6
<.5	<.5	<.8	<.5	<.8	<.8	<.5	<.8	P35-7
<.5	<.5	<.8	<.5	<.8	<.8	<.5	<.8	P35-7
<.5	<.5	<.8	<.5	<.8	<.8	<.5	<.8	P35-8
<.5	<.5	<.8	<.5	<.8	<.8	<.5	<.8	P35-9
<.5	<.5	<.8	<.5	<.8	<.8	<.5	<.8	P35-10
<.5	<.5	<.8	<.5	<.8	12.7 EV	<.5	<.8	P35-10

Appendix 4B. *Organic constituents for porous-membrane sampling devices in the West Branch Canal Creek study area, Aberdeen Proving Ground, Maryland, March 2000 through May 2001-Continued*

Site name	Replicate	Collection date	Chlorinated Ethanes: 1,1,2,2-Tetrachloroethane (µg/L)	1,1,2-Trichloroethane (µg/L)	1,2-Dichloroethane (µg/L)	Chlorinated Ethenes: Tetrachloroethene (µg/L)	Trichloroethene (µg/L)	*cis*-1,2-Dichloroethene (µg/L)	*trans*-1,2-Dichloroethene (µg/L)	1,1-Dichloroethene (µg/L)	Vinyl chloride (µg/L)
June 2000 Sampling Event - *Continued*											
P35-11	NR	6/26/2000	<0.8	<0.5	0.6	<0.8	<0.5	4.6	3.2	<0.8	102
P35-12	1	6/26/2000	<.8	<.5	<.5	<.8	<.5	4.0	0.6	<.8	58.8
P35-12	2	6/26/2000	<.8	<.5	<.5	<.8	.6	6.2	6.7	<.8	111
P35-13	NR	6/26/2000	<.8	<.5	<.5	<.8	<.5	3.7	.7	<.8	81.8
P35-15	NR	6/26/2000	<.8	<.5	.5	<.8	<.5	3.8	.7	<.8	66.1
P35-16	NR	6/26/2000	<.8	<.5	.7	<.8	1.3	9.3	13.4	<.8	127
P35-17	NR	6/26/2000	<.8	<.5	.6	<.8	<.5	8.4	1.7	<.8	105
P35-18	NR	6/26/2000	<.8	<.5	.9	<.8	2.1	14.4	19.3	<.8	122
P35-19	NR	6/26/2000	<.8	<.5	.8	<.8	1.8	12.9	16.2	<.8	144
P35-20	NR	6/26/2000	<.8	<.5	.8	<.8	1.4	13.3	13.3	<.8	164
P35-21	NR	6/26/2000	--	<.5	<.5	--	<.5	21.6	16.6	<.8	233
P36-1	1	6/21/2000	<.8	<.5	<.5	<.8	<.5	<0.5	<.5	<.8	<0.5
P36-1	2	6/21/2000	<.8	<.5	.5	<.8	<.5	<.5	<.5	<.8	<.5
P36-2	NR	6/21/2000	<.8	<.5	<.5	<.8	<.5	<.5	<.5	<.8	<.5
P36-4	NR	6/21/2000	<.8	<.5	<.5	<.8	<.5	<.5	<.5	<.8	<.5
P36-5	NR	6/21/2000	<.8	<.5	<.5	<.8	<.5	<.5	<.5	<.8	<.5
P36-6	NR	6/21/2000	<.8	<.5	<.5	<.8	<.5	<.5	<.5	<.8	<.5
P36-7	NR	6/21/2000	<.8	<.5	<.5	<.8	<.5	<.5	<.5	<.8	<.5
P36-8	1	6/21/2000	<.8	<.5	.6	<.8	<.5	<.5	<.5	<.8	<.5
P36-8	2	6/21/2000	<.8	<.5	.7	<.8	<.5	<.5	<.5	<.8	<.5
P36-11	NR	6/21/2000	--	<.5	.7	<.8	<.5	3.2	<.5	<.8	55.1
P36-12	1	6/21/2000	--	<.5	.7	<.8	<.5	3.9	.5	<.8	69.6
P36-12	2	6/21/2000	<.8	<.5	.9	<.8	<.5	2.9	<.5	<.8	43.2
P36-13	NR	6/21/2000	--	<.5	.6	<.8	<.5	3.8	1.0	<.8	80.2
P36-14	NR	6/21/2000	<.8	<.5	1.0	<.8	<.5	5.4	1.7	<.8	93.3
P36-15	NR	6/21/2000	--	<.5	1.5	<.8	<.5	5.2	2.4	<.8	120
P36-17	NR	6/21/2000	--	<.5	2.6	<.8	.7	6.8	5.5	<.8	90.6
P36-18	1	6/21/2000	--	<.5	1.9	--	<.7	5.7	5.3	<.8	120
P36-18	2	6/21/2000	<.8	<.5	1.9	<.8	.7	5.0	4.4	<.8	96.6

Chlorinated Methanes			Additional Volatile Organic Compounds					
Carbon tetra-chloride (µg/L)	Chloroform (µg/L)	Chloro-methane (µg/L)	Benzene (µg/L)	Bromo-methane (µg/L)	Toluene (µg/L)	Tri-chloro-fluoro-methane (µg/L)	Naph-thalene (µg/L)	Site name
<0.5	<0.5	<0.8	<0.5	<0.8	<0.8	<0.5	<0.8	P35-11
<.5	<.5	<.8	<.5	<.8	<.8	<.5	<.8	P35-12
<.5	<.5	<.8	<.5	<.8	.9 EV	<.5	<.8	P35-12
<.5	<.5	<.8	<.5	<.8	<.8	<.5	<.8	P35-13
<.5	<.5	<.8	<.5	<.8	<.8	<.5	<.8	P35-15
<.5	<.5	<.8	<.5	<.8	<.8	<.5	<.8	P35-16
<.5	<.5	<.8	<.5	<.8	<.8	<.5	<.8	P35-17
<.5	<.5	<.8	.5	<.8	7.9 EV	<.5	<.8	P35-18
<.5	<.5	<.8	<.5	<.8	<.8	<.5	<.8	P35-19
<.5	<.5	<.8	<.5	<.8	<.8	<.5	<.8	P35-20
<.5	<.5	<.8	<.5	<.8	--	<.5	<.8	P35-21
<.5	.9	<.8	<.5	<.8	<.8	<.5	<.8	P36-1
<.5	1.4	<.8	<.5	<.8	<.8	<.5	<.8	P36-1
<.5	<.5	<.8	<.5	<.8	<.8	<.5	<.8	P36-2
<.5	<.5	<.8	<.5	<.8	<.8	<.5	<.8	P36-4
<.5	<.5	<.8	<.5	<.8	<.8	<.5	<.8	P36-5
<.5	<.5	<.8	<.5	<.8	<.8	<.5	<.8	P36-6
<.5	<.5	<.8	<.5	<.8	<.8	<.5	<.8	P36-7
<.5	<.5	<.8	<.5	<.8	13.1	<.5	<.8	P36-8
<.5	<.5	<.8	<.5	<.8	<.8	<.5	<.8	P36-8
<.5	<.5	<.8	<.5	<.8	<.8	<.5	<.8	P36-11
<.5	<.5	<.8	<.5	<.8	<.8	<.5	<.8	P36-12
<.5	<.5	<.8	<.5	<.8	10.0 EV	<.5	<.8	P36-12
<.5	<.5	<.8	<.5	<.8	<.8	<.5	<.8	P36-13
<.5	<.5	<.8	<.5	<.8	.8	<.5	<.8	P36-14
<.5	<.5	<.8	<.5	<.8	<.8	<.5	<.8	P36-15
<.5	<.5	<.8	<.5	<.8	3.6	<.5	<.8	P36-17
<.7	<.7	<1.1	<.7	<1.1	--	<.5	<.8	P36-18
<.5	<.5	1.3	<.5	<.8	3.6 EV	<.5	<.8	P36-18

Appendix 4B. *Organic constituents for porous-membrane sampling devices in the West Branch Canal Creek study area, Aberdeen Proving Ground, Maryland, March 2000 through May 2001-Continued*

			Chlorinated Ethanes			Chlorinated Ethenes					
Site name	Replicate	Collection date	1,1,2,2-Tetra-chloro-ethane (µg/L)	1,1,2-Tri-chloro-ethane (µg/L)	1,2-Di-chloro-ethane (µg/L)	Tetra-chloro-ethene (µg/L)	Tri-chloro-ethene (µg/L)	*cis*-1,2-Di-chloro-ethene (µg/L)	*trans*-1,2-Di-chloro-ethene (µg/L)	1,1-Di-chloro-ethene (µg/L)	Vinyl chloride (µg/L)
June 2000 Sampling Event - *Continued*											
P36-19	1	6/21/2000	<0.8	<0.5	2.2	<0.8	0.7	6.2	7.0	<0.8	74.9
P36-19	2	6/21/2000	<.8	<.5	1.9	<.8	.6	4.3	5.0	<.8	90.2
P36-20	1	6/21/2000	--	<.5	2.0	--	<.5	5.1	9.0	<.8	98.4
P36-20	2	6/21/2000	<.8	<.5	2.0	<.8	.8	4.5	5.1	<.8	69.2
P36-21	1	6/21/2000	<.8	<.5	2.2	<.8	.8	5.6	9.9	<.8	54.1
P36-21	2	6/21/2000	<.8	<.5	2.1	<.8	1.2	5.5	7.5	<.8	69.1
PL36-1	NR	6/21/2000	<.8	<.5	<0.5	<.8	<.5	<0.5	<0.5	<.8	<0.5
PL36-2	1	6/21/2000	<.8	<.5	.7	<.8	<.5	<.5	<.5	<.8	<.5
PL36-2	2	6/21/2000	<.8	<.5	<.5	2.3	<.5	<.5	<.5	<.8	<.5
PL36-3	1	6/21/2000	--	<.5	.6	--	<.5	<.5	<.5	<.8	2.9
PL36-3	2	6/21/2000	<.8	<.5	.6	<.8	<.5	<.5	<.5	<.8	2.3
PL36-4	NR	6/21/2000	--	<.5	1.0	--	<.5	<.5	<.5	<.8	12.7
PL36-5	NR	6/21/2000	--	<.5	1.3 EV	--	<.5	3.9 EV	<.5	<.8	66.9 EV
PL36-6	NR	6/21/2000	--	<.5	1.7	--	<.5	4.2	<.5	<.8	99.1
PL36-8	1	6/21/2000	<.8	<.5	1.2	<.8	<.5	4.2	<.5	<.8	70.5
PL36-8	2	6/21/2000	--	<.5	1.3 EV	--	<.5	4.4 EV	<.5	<.8	104 EV
PL36-9	NR	6/21/2000	<.8	<.5	.7	<.8	<.5	1.3	<.5	<.8	14.5
PL36-10	NR	6/21/2000	<.8	<.5	1.9	<.8	.6	4.4	5.2	<.8	98.5
PL36-12	1	6/21/2000	<.8	<.5	1.5	<.8	.8	4.1	9.8	<.8	32.4
PL36-12	2	6/21/2000	<.8	<.5	1.3	<.8	.6	3.4	8.3	<.8	48.7
PL36-13	1	6/21/2000	<.8	<.5	1.4	<.8	.6	4.3	12.4	<.8	46.7
PL36-13	2	6/21/2000	--	<.5	1.3 EV	--	<.5	4.9 EV	15.1 EV	<.8	66.3 EV
PL36-14	1	6/21/2000	--	<.5	5.0 EV	--	<.5	7.5	1.0	<.8	103
PL36-14	2	6/21/2000	<.8	<.5	.9	<.8	.7	3.4	11.6	<.8	34.7
PL36-15	1	6/21/2000	<.8	<.5	1.0	<.8	.6	3.7	12.9	<.8	21.4
PL36-15	2	6/21/2000	<.8	<.5	.9	<.8	.6	3.0	10.9	<.8	25.6
PL36-16	1	6/21/2000	<.8	<.5	1.9	<.8	.6	5.9	3.0	<.8	73.2
PL36-16	2	6/21/2000	<.8	<.5	1.0	9.7	.6	3.2	12.0	<.8	31.0
PL36-17	NR	6/21/2000	--	<.5	3.8 EV	--	.8 EV	9.6 EV	5.7 EV	<.8	162 EV

Chlorinated Methanes			Additional Volatile Organic Compounds					
Carbon tetra-chloride (µg/L)	Chloroform (µg/L)	Chloro-methane (µg/L)	Benzene (µg/L)	Bromo-methane (µg/L)	Toluene (µg/L)	Tri-chloro-fluoro-methane (µg/L)	Naph-thalene (µg/L)	Site name
<0.5	<0.5	<0.8	<0.5	<0.8	1.6	<0.5	<0.8	P36-19
<.5	<.5	<.8	<.5	<.8	6.2 EV	<.5	<.8	P36-19
<.5	<.5	<.8	<.5	<.8	--	<.5	<.8	P36-20
<.5	<.5	<.8	<.5	<.8	9.3 EV	<.5	<.8	P36-20
<.5	<.5	<.8	<.5	<.8	<0.8	<.5	<.8	P36-21
<.5	<.5	<.8	<.5	<.8	19.1 EV	<.5	<.8	P36-21
<.5	<.5	<.8	<.5	<.8	193	<.5	<.8	PL36-1
<.5	<.5	<.8	<.5	<.8	<.8	<.5	<.8	PL36-2
4.0	3.1	<.8	<.5	<.8	<.8	<.5	<.8	PL36-2
<.5	<.5	<.8	<.5	<.8	--	<.5	<.8	PL36-3
<.5	<.5	<.8	<.5	<.8	<.8	<.5	<.8	PL36-3
<.5	<.5	<.8	<.5	<.8	--	<.5	<.8	PL36-4
<.5	<.5	<.8	<.5	<.8	--	<.5	<.8	PL36-5
<.5	<.5	<.8	<.5	1.0	--	<.5	<.8	PL36-6
<.5	<.5	<.8	<.5	<.8	3.9	<.5	<.8	PL36-8
<.5	<.5	<.8	<.5	<.8	--	<.5	<.8	PL36-8
<.5	<.5	<.8	<.5	<.8	22.6	<.5	<.8	PL36-9
<.5	<.5	<.8	<.5	<.8	1.3	<.5	<.8	PL36-10
<.5	<.5	<.8	<.5	<.8	1.0	<.5	<.8	PL36-12
<.5	<.5	<.8	<.5	<.8	1.0	<.5	<.8	PL36-12
<.5	<.5	<.8	<.5	<.8	<.8	<.5	<.8	PL36-13
<.5	<.5	<.8	<.5	<.8	--	<.5	<.8	PL36-13
<.5	<.5	<.8	<.5	<.8	--	<.5	<.8	PL36-14
<.5	<.5	<.8	<.5	<.8	.9	<.5	<.8	PL36-14
<.5	<.5	<.8	<.5	<.8	.8	<.5	<.8	PL36-15
<.5	<.5	<.8	<.5	<.8	<.8	<.5	<.8	PL36-15
<.5	<.5	<.8	<.5	<.8	1.7	<.5	<.8	PL36-16
17.6	5.2	<.8	<.5	<.8	<.8	<.5	<.8	PL36-16
<.5	<.5	<.8	<.5	<.8	--	<.5	<.8	PL36-17

Appendix 4B. *Organic constituents for porous-membrane sampling devices in the West Branch Canal Creek study area, Aberdeen Proving Ground, Maryland, March 2000 through May 2001-Continued*

Site name	Replicate	Collection date	Chlorinated Ethanes: 1,1,2,2-Tetrachloroethane (µg/L)	1,1,2-Trichloroethane (µg/L)	1,2-Dichloroethane (µg/L)	Chlorinated Ethenes: Tetrachloroethene (µg/L)	Trichloroethene (µg/L)	*cis*-1,2-Dichloroethene (µg/L)	*trans*-1,2-Dichloroethene (µg/L)	1,1-Dichloroethene (µg/L)	Vinyl chloride (µg/L)
June 2000 Sampling Event - *Continued*											
PL36-18	NR	6/21/2000	<0.8	<0.5	1.0	<0.8	0.7	3.3	12.4	<0.8	19.3
PL36-19	1	6/21/2000	<.8	<.5	0.9	<.8	.6	3.6	14.2	<.8	32.2
PL36-19	2	6/21/2000	--	<.5	1.0 EV	--	<.5	4.4 EV	17.4 EV	<.8	45.3 EV
PL36-20	NR	6/21/2000	--	<.5	.7	--	<.5	3.8	14.5	<.8	29.3
PL36-21	1	6/21/2000	<.8	<.5	.6	<.8	.6	3.4	14.1	<.8	28.4
PL36-21	2	6/21/2000	--	<.5	.8 EV	--	<.5	4.9 EV	21.0 EV	<.8	46.0 EV
PL36-22	NR	6/21/2000	<.8	<.5	.6	<.8	.8	3.4	14.1	<.8	21.4
May 2001 Sampling Event											
P35-1	1	5/23/2001	<.5	<.5	<.5	<.5	<.5	<0.5	<0.5	<.5	<0.5
P35-1	2	5/23/2001	<.5	<.5	<.5	<.5	<.5	<.5	<.5	<.5	<.5
P35-2	1	5/23/2001	<.5	<.5	<.5	<.5	<.5	<.5	<.5	<.5	<.5
P35-2	2	5/23/2001	<.5	<.5	<.5	<.5	<.5	<.5	<.5	<.5	<.5
P35-3	1	5/23/2001	<.5	<.5	<.5	<.5	<.5	<.5	<.5	<.5	<.5
P35-3	2	5/23/2001	<.5	<.5	<.5	<.5	<.5	<.5	<.5	<.5	<.5
P35-4	1	5/23/2001	<.5	<.5	<.5	<.5	<.5	<.5	<.5	<.5	<.5
P35-4	2	5/23/2001	<.5	<.5	<.5	<.5	<.5	<.5	<.5	<.5	<.5
P35-5	NR	5/23/2001	<.5	<.5	<.5	<.5	<.5	<.5	<.5	<.5	3.2
P35-6	NR	5/23/2001	<.5	<.5	<.5	<.5	<.5	2.0	.6	<.5	10.4
P35-7	NR	5/23/2001	<.5	<.5	.6	<.5	<.5	3.6	5.1	<.5	32.9
P35-8	NR	5/23/2001	<.5	<.5	.6	<.5	1.1	3.6	9.4	<.5	14.1
P35-9	NR	5/23/2001	<.5	<.5	.9	<.5	1.3	4.4	14.2	<.5	14.7
P35-10	1	5/23/2001	<.5	<.5	<.5	<.5	.7	3.1	8.9	<.5	29.1
P35-10	2	5/23/2001	<.5	<.5	.9	<.5	<.5	5.1	15.8	<.5	17.5
P35-11	1	5/23/2001	<.5	<.5	<.5	<.5	.8	3.4	10.5	<.5	11.1
P35-11	2	5/23/2001	<.5	<.5	<.5	<.5	.7	2.9	10.4	<.5	9.0
P35-12	NR	5/23/2001	<.5	<.5	.9	<.5	1.0	3.8	12.9	<.5	19.6
P35-13	NR	5/23/2001	<.5	<.5	1.1 EV	<.5	1.2	4.4	16.4	<.5	20.9

Chlorinated Methanes			Additional Volatile Organic Compounds					
Carbon tetra-chloride (µg/L)	Chloroform (µg/L)	Chloro-methane (µg/L)	Benzene (µg/L)	Bromo-methane (µg/L)	Toluene (µg/L)	Tri-chloro-fluoro-methane (µg/L)	Naph-thalene (µg/L)	Site name
<0.5	<0.5	<0.8	<0.5	<0.8	<0.8	<0.5	<0.8	PL36-18
<.5	<.5	<.8	<.5	<.8	<.8	<.5	<.8	PL36-19
<.5	<.5	<.8	<.5	<.8	--	<.5	<.8	PL36-19
<.5	<.5	<.8	<.5	<.8	--	<.5	<.8	PL36-20
<.5	<.5	<.8	<.5	<.8	<.8	<.5	<.8	PL36-21
<.5	<.5	<.8	<.5	<.8	--	<.5	<.8	PL36-21
<.5	<.5	<.8	<.5	<.8	<.8	<.5	<.8	PL36-22
<.5	<.5	<.5	<.5	<.7	<.5	<.5	<.7	P35-1
<.5	<.5	<.5	<.5	<.7	<.5	<.5	<.7	P35-1
<.5	<.5	<.5	<.5	<.7	<.5	<.5	<.7	P35-2
<.5	<.5	<.5	<.5	<.7	25.9	<.5	<.7	P35-2
<.5	<.5	<.5	<.5	<.7	.7	<.5	<.7	P35-3
<.5	<.5	<.5	<.5	<.7	16.5	<.5	<.7	P35-3
<.5	<.5	<.5	<.5	<.7	<.5	<.5	<.7	P35-4
<.5	<.5	<.5	<.5	<.7	23.5	<.5	<.7	P35-4
<.5	<.5	<.5	<.5	<.7	<.5	<.5	<.7	P35-5
<.5	<.5	<.5	<.5	<.7	1.0	<.5	<.7	P35-6
<.5	<.5	<.5	<.5	<.7	.9	<.5	<.7	P35-7
<.5	<.5	<.5	<.5	<.7	<.5	<.5	<.7	P35-8
<.5	<.5	<.5	<.5	<.7	<.5	<.5	<.7	P35-9
<.5	<.5	<.5	<.5	<.7	<.5	<.5	<.7	P35-10
<.5	<.5	<.5	<.5	<.7	<.5	<.5	<.7	P35-10
<.5	<.5	<.5	<.5	<.7	<.5	<.5	<.7	P35-11
<.5	<.5	<.5	<.5	<.7	<.5	<.5	<.7	P35-11
<.5	<.5	<.5	<.5	<.7	<.5	<.5	<.7	P35-12
<.5	<.5	<.5	<.5	<.7	<.5	<.5	<.7	P35-13

Appendix 4B. *Organic constituents for porous-membrane sampling devices in the West Branch Canal Creek study area, Aberdeen Proving Ground, Maryland, March 2000 through May 2001-Continued*

			Chlorinated Ethanes			Chlorinated Ethenes					
Site name	Replicate	Collection date	1,1,2,2-Tetra-chloro-ethane (µg/L)	1,1,2-Tri-chloro-ethane (µg/L)	1,2-Di-chloro-ethane (µg/L)	Tetra-chloro-ethene (µg/L)	Tri-chloro-ethene (µg/L)	*cis*-1,2-Di-chloro-ethene (µg/L)	*trans*-1,2-Di-chloro-ethene (µg/L)	1,1-Di-chloro-ethene (µg/L)	Vinyl chloride (µg/L)
May 2001 Sampling Event - *Continued*											
P35-14	1	5/23/2001	<0.5	<0.5	<0.5	<0.5	1.1	4.5	15.0	<0.5	18.4
P35-14	2	5/23/2001	<.5	<.5	1.7	<.5	1.5	6.1	26.6	<.5	12.1
P35-15	NR	5/23/2001	<.5	<.5	<.5	<.5	1.1	4.8	16.0	<.5	20.1
P35-16	NR	5/23/2001	<.5	<.5	<.5	<.5	1.2	5.4	16.7	<.5	17.7
P35-17	1	5/23/2001	<.5	<.5	.7	<.5	1.2	5.2	15.7	<.5	21.7
P35-17	2	5/23/2001	<.5	<.5	<.5	<.5	1.1	4.2	15.9	<.5	6.1
P35-18	1	5/23/2001	<.5	<.5	.6	<.5	1.0	4.9	17.1	<.5	18.9
P35-18	2	5/23/2001	<.5	<.5	1.4	<.5	1.8	6.7	24.3	<.5	12.0
P35-19	NR	5/23/2001	<.5	<.5	1.6	<.5	1.4	5.8	21.0	<.5	8.1
P35-20	1	5/23/2001	<.5	<.5	1.3	<.5	1.2	5.5	17.5	<.5	16.8
P35-20	2	5/23/2001	<.5	<.5	2.4	<.5	1.3	7.9	28.3	<.5	11.7
P35-21	1	5/23/2001	<.5	<.5	1.4	<.5	1.1	5.1	16.0	<.5	18.2
P35-21	2	5/23/2001	<.5	<.5	2.8	<.5	1.2	7.2	25.7	<.5	8.2
P35S-1	NR	5/23/2001	<.5	<.5	<.5	<.5	<0.5	0.7	<0.5	<.5	<0.5
P35S-2	NR	5/23/2001	<.5	<.5	<.5	<.5	<.5	<.5	<.5	<.5	<.5
P35S-3	1	5/23/2001	<.5	<.5	<.5	<.5	<.5	<.5	<.5	<.5	<.5
P35S-3	2	5/23/2001	<.5	<.5	<.5	<.5	<.5	<.5	<.5	<.5	<.5
P35S-4	NR	5/23/2001	<.5	<.5	<.5	<.5	<.5	1.1	<.5	<.5	3.9
P35S-5	NR	5/23/2001	<.5	<.5	.7	<.5	<.5	3.0	<.5	<.5	10.5
P35S-6	NR	5/23/2001	<.5	<.5	1.1	<.5	<.5	5.9	<.5	<.5	20.3
P35S-7	NR	5/23/2001	<.5	<.5	1.6	<.5	2.9	9.7	6.6	<.5	32.3
P35S-8	1	5/23/2001	<.5	<.5	1.6	<.5	3.3	9.6	7.5	<.5	29.3
P35S-8	2	5/23/2001	<.5	<.5	.8	<.5	<.5	4.1	<.5	<.5	25.3
P35S-9	NR	5/23/2001	<.5	<.5	1.3	<.5	1.5	8.5	3.6	.9	37.7
P35S-10	1	5/23/2001	<.5	<.5	1.4	<.5	.9	9.4	2.0	<.5	37.7
P35S-10	2	5/23/2001	<.5	<.5	.9	<.5	<.5	5.3	<.5	<.5	35.8
P35S-11	1	5/23/2001	<.5	<.5	1.4	<.5	1.3	10.2	2.4	<.5	43.7
P35S-11	2	5/23/2001	<.5	<.5	1.6	<.5	.5	10.3	<.5	<.5	52.3
P35S-12	NR	5/23/2001	--	<.5	<.5	<.5	1.1	9.9	2.1	<.5	48.2

Chlorinated Methanes			Additional Volatile Organic Compounds					
Carbon tetra-chloride (µg/L)	Chloroform (µg/L)	Chloro-methane (µg/L)	Benzene (µg/L)	Bromo-methane (µg/L)	Toluene (µg/L)	Tri-chloro-fluoro-methane (µg/L)	Naph-thalene (µg/L)	Site name
<0.5	<0.5	<0.5	<0.5	<0.7	<0.5	<0.5	<0.7	P35-14
<.5	<.5	<.5	<.5	<.7	<.5	<.5	<.7	P35-14
<.5	<.5	<.5	<.5	<.7	<.5	<.5	<.7	P35-15
<.5	<.5	<.5	<.5	<.7	<.5	<.5	<.7	P35-16
<.5	<.5	<.5	12.2	<.7	<.5	<.5	<.7	P35-17
<.5	<.5	<.5	<.5	<.7	<.5	<.5	<.7	P35-17
<.5	<.5	<.5	.7	<.7	<.5	<.5	<.7	P35-18
<.5	<.5	<.5	<.5	<.7	<.5	<.5	<.7	P35-18
<.5	<.5	<.5	<.5	<.7	<.5	<.5	<.7	P35-19
<.5	<.5	<.5	1.3	<.7	<.5	<.5	<.7	P35-20
<.5	<.5	<.5	<.5	<.7	<.5	<.5	<.7	P35-20
<.5	<.5	<.5	1.2	<.7	<.5	<.5	<.7	P35-21
<.5	<.5	<.5	<.5	<.7	<.5	<.5	<.7	P35-21
<.5	<.5	<.5	<.5	<.7	<.5	<.5	<.7	P35S-1
<.5	<.5	<.5	<.5	<.7	<.5	<.5	<.7	P35S-2
<.5	<.5	<.5	<.5	<.7	<.5	<.5	<.7	P35S-3
<.5	<.5	<.5	<.5	<.7	<.5	<.5	<.7	P35S-3
<.5	<.5	<.5	<.5	<.7	<.5	<.5	<.7	P35S-4
<.5	<.5	<.5	<.5	<.7	<.5	<.5	<.7	P35S-5
<.5	<.5	<.5	<.5	<.7	<.5	<.5	<.7	P35S-6
<.5	<.5	<.5	<.5	<.7	<.5	<.5	<.7	P35S-7
<.5	<.5	<.5	<.5	<.7	<.5	<.5	<.7	P35S-8
<.5	<.5	<.5	<.5	<.7	<.5	<.5	<.7	P35S-8
<.5	<.5	<.5	<.5	<.7	<.5	<.5	<.7	P35S-9
<.5	<.5	<.5	<.5	<.7	<.5	<.5	<.7	P35S-10
<.5	<.5	<.5	<.5	<.7	1.9	<.5	<.7	P35S-10
<.5	<.5	<.5	<.5	<.7	<.5	<.5	<.7	P35S-11
<.5	<.5	<.5	<.5	<.7	<.5	<.5	<.7	P35S-11
<.5	<.5	<.5	<.5	<.7	<.5	<.5	--	P35S-12

Appendix 4B. *Organic constituents for porous-membrane sampling devices in the West Branch Canal Creek study area, Aberdeen Proving Ground, Maryland, March 2000 through May 2001-Continued*

Site name	Replicate	Collection date	Chlorinated Ethanes: 1,1,2,2-Tetrachloroethane (µg/L)	1,1,2-Trichloroethane (µg/L)	1,2-Dichloroethane (µg/L)	Chlorinated Ethenes: Tetrachloroethene (µg/L)	Trichloroethene (µg/L)	*cis*-1,2-Dichloroethene (µg/L)	*trans*-1,2-Dichloroethene (µg/L)	1,1-Dichloroethene (µg/L)	Vinyl chloride (µg/L)
May 2001 Sampling Event - *Continued*											
P35S-13	NR	5/23/2001	<0.5	<0.5	<0.5	<0.5	1.7	10.7	3.4	1.3	51.2
P35S-14	NR	5/23/2001	<.5	<.5	1.7	<.5	1.7	10.9	3.3	1.2	52.1
P35S-15	1	5/23/2001	<.5	<.5	2.0	<.5	0.6	8.7	0.8	0.8	47.3
P35S-15	2	5/23/2001	<.5	<.5	1.9	<.5	2.2	11.1	5.2	1.0	47.4
P35S-16	NR	5/23/2001	<.5	<.5	2.8	<.5	3.7	14.1	10.7	1.2	47.3
P35S-17	1	5/23/2001	<.5	<.5	3.5	<.5	4.4	15.2	14.6	1.2	43.9
P35S-17	2	5/23/2001	<.5	<.5	3.3	<.5	1.1	11.6	2.2	1.0	44.1
P35S-18	1	5/23/2001	<.5	<.5	3.9	<.5	4.9	18.5	17.8 EV	1.3	49.1
P35S-18	2	5/23/2001	<.5	<.5	3.8	<.5	1.0	11.8	1.9	1.1	49.4
P35S-19	1	5/23/2001	<.5	<.5	4.5	<.5	6.0	18.6	22.5	1.1	40.7
P35S-19	2	5/23/2001	<.5	<.5	4.5	<.5	2.5	12.4	6.1	1.2	40.3
P35S-20	NR	5/23/2001	<.5	<.5	5.6	<.5	5.9	18.5	22.6	1.1	38.7
P35S-21	1	5/23/2001	<.5	<.5	7.0	<.5	5.5	18.7	19.3	1.0	39.5
P35S-21	2	5/23/2001	<.5	<.5	11.1	<.5	5.4	22.8	16.0	1.8	73.5
P36M-1	NR	5/18/2001	<.5	.9	14.2	<.5	<.5	2.7	.6	<.5	9.0
P36M-2	NR	5/18/2001	<.5	2.2	16.3	<.5	.7	4.3	1.0	<.5	19.9
P36M-3	NR	5/18/2001	<.5	2.7	15.3	<.5	.6	4.4	1.2	<.5	12.0
P36M-4	NR	5/18/2001	<.5	1.6	14.9	<.5	<.5	3.7	.9	<.5	13.3
P36M-5	NR	5/18/2001	<.5	<.5	8.0	<.5	<.5	2.2	<.5	<.5	16.0
P36M-6	1	5/18/2001	<.5	2.9	12.2	<.5	<.5	5.9	1.1	<.5	30.2
P36M-6	2	5/18/2001	<.5	<.5	8.1	<.5	<.5	2.4	<.5	<.5	27.0
P36M-7	NR	5/18/2001	1.1	1.9	8.8	<.5	.5	5.0	.9	<.5	34.8
P36M-8	NR	5/18/2001	2.8	7.5	10.3	<.5	1.3	9.2	2.9	<.5	34.1
P36M-9	NR	5/18/2001	5.9	10.1	8.8	<.5	2.2	10.4	4.1	<.5	33.2
P36M-10	NR	5/18/2001	1.4	2.6	11.1	<.5	<.5	6.4	3.1	<.5	36.9
P36M-11	NR	5/18/2001	.8	2.0	10.2	<.5	.6	5.9	3.9	<.5	24.2
P36M-12	1	5/18/2001	<.5	1.9	8.3	<.5	.5	5.1	4.1	<.5	26.5
P36M-12	2	5/18/2001	<.5	.9	9.8	<.5	<.5	4.5	3.5	<.5	33.3
P36M-13	NR	5/18/2001	.9	2.0	11.9	<.5	.8	6.0	4.0	<.5	16.0

Chlorinated Methanes			Additional Volatile Organic Compounds					
Carbon tetra-chloride (µg/L)	Chloroform (µg/L)	Chloro-methane (µg/L)	Benzene (µg/L)	Bromo-methane (µg/L)	Toluene (µg/L)	Tri-chloro-fluoro-methane (µg/L)	Naph-thalene (µg/L)	Site name
<0.5	<0.5	<0.5	<0.5	<0.7	<0.5	<0.5	<0.7	P35S-13
<.5	<.5	<.5	<.5	<.7	<.5	<.5	<.7	P35S-14
<.5	<.5	<.5	<.5	<.7	<.5	<.5	<.7	P35S-15
<.5	<.5	<.5	<.5	<.7	<.5	<.5	<.7	P35S-15
<.5	<.5	<.5	<.5	<.7	<.5	<.5	<.7	P35S-16
<.5	<.5	<.5	<.5	<.7	<.5	<.5	<.7	P35S-17
<.5	<.5	<.5	<.5	<.7	<.5	<.5	<.7	P35S-17
<.5	<.5	<.5	<.5	<.7	<.5	<.5	<.7	P35S-18
<.5	<.5	<.5	<.5	<.7	<.5	<.5	<.7	P35S-18
<.5	<.5	<.5	<.5	<.7	<.5	<.5	<.7	P35S-19
<.5	<.5	<.5	<.5	<.7	<.5	<.5	<.7	P35S-19
<.5	<.5	<.5	<.5	<.7	<.5	<.5	<.7	P35S-20
<.5	<.5	<.5	<.5	<.7	<.5	<.5	<.7	P35S-21
<.5	<.5	<.5	<.5	<.7	<.5	<.5	<.7	P35S-21
<.5	<.5	<.5	<.5	2.0 EV	<.5	<.5	2.2	P36M-1
<.5	<.5	<.5	<.5	<.5	<.5	<.5	<.5	P36M-2
<.5	<.5	<.5	<.5	1.1	<.5	<.5	<.7	P36M-3
<.5	<.5	<.5	<.5	1.0	<.5	<.5	<.7	P36M-4
<.5	<.5	<.5	<.5	<.5	<.5	<.5	<.5	P36M-5
<.5	<.5	<.5	<.5	<.5	<.5	<.5	<.5	P36M-6
<.5	<.5	<.5	<.5	<.7	.8	<.5	<.7	P36M-6
<.5	<.5	<.5	<.5	<.5	<.5	<.5	<.5	P36M-7
<.5	<.5	<.5	<.5	<.5	<.5	<.5	<.5	P36M-8
<.5	<.5	<.5	<.5	<.5	<.5	<.5	<.5	P36M-9
<.5	<.5	<.5	<.5	<.5	<.5	<.5	<.5	P36M-10
<.5	<.5	<.5	<.5	.7	<.5	<.5	<.7	P36M-11
<.5	<.5	<.5	<.5	<.5	<.5	<.5	<.5	P36M-12
<.5	<.5	<.5	<.5	<.7	<.5	<.5	<.7	P36M-12
<.5	<.5	<.5	<.5	1.0	<.5	<.5	<.7	P36M-13

Appendix 4B. *Organic constituents for porous-membrane sampling devices in the West Branch Canal Creek study area, Aberdeen Proving Ground, Maryland, March 2000 through May 2001-Continued*

Site name	Replicate	Collection date	Chlorinated Ethanes: 1,1,2,2-Tetrachloroethane (µg/L)	1,1,2-Trichloroethane (µg/L)	1,2-Dichloroethane (µg/L)	Chlorinated Ethenes: Tetrachloroethene (µg/L)	Trichloroethene (µg/L)	*cis*-1,2-Dichloroethene (µg/L)	*trans*-1,2-Dichloroethene (µg/L)	1,1-Dichloroethene (µg/L)	Vinyl chloride (µg/L)
May 2001 Sampling Event - *Continued*											
P36M-14	NR	5/18/2001	1.6	1.7	6.5	<0.5	<0.5	4.7	3.1	<0.5	17.0
P36M-15	NR	5/18/2001	<0.5	1.6	6.9	<.5	.5	4.7	3.2	<.5	13.4
P36M-16	NR	5/18/2001	<.5	0.9	7.7	<.5	<.5	4.1	2.5	<.5	13.5
P36M-17	1	5/18/2001	<.5	<.5	6.5	<.5	.7	3.7	2.7	<.5	17.6
P36M-17	2	5/18/2001	<.5	<.5	7.5	<.5	<.5	3.6	2.8	<.5	16.4
P36M-18	1	5/18/2001	<.5	<.5	6.2	<.5	<.5	3.5	2.3	<.5	16.5
P36M-18	2	5/18/2001	<.5	<.5	7.0	<.5	<.5	3.6	2.6	<.5	16.3
P36M-19	1	5/18/2001	<.5	<.5	5.6	<.5	<.5	3.5	1.9	<.5	14.4
P36M-19	2	5/18/2001	<.5	<.5	5.7	<.5	<.5	3.4	2.1	<.5	21.1
P36M-20	1	5/18/2001	<.5	<.5	4.8	<.5	<.5	3.5	1.7	<.5	19.4
P36M-20	2	5/18/2001	<.5	<.5	4.8	<.5	<.5	3.0	1.7	<.5	21.9
P36M-21	1	5/18/2001	<.5	<.5	6.9	<.5	<.5	4.8	1.4	<.5	32.3
P36M-21	2	5/18/2001	<.5	<.5	4.2	<.5	<.5	2.8	1.4	<.5	20.9
P36P-1	NR	5/18/2001	<.5	<.5	<0.5	<.5	<.5	<0.5	<0.5	<.5	<0.5
P36P-2	NR	5/18/2001	<.5	<.5	<.5	<.5	<.5	<.5	<.5	<.5	<.5
P36P-3	NR	5/18/2001	<.5	<.5	<.5	<.5	<.5	<.5	<.5	<.5	<.5
P36P-4	NR	5/18/2001	<.5	<.5	<.5	<.5	<.5	<.5	<.5	<.5	<.5
P36P-5	1	5/18/2001	<.5	<.5	<.5	<.5	<.5	<.5	<.5	<.5	<.5
P36P-5	2	5/18/2001	<.5	<.5	<.5	<.5	<.5	<.5	<.5	<.5	<.5
P36P-6	1	5/18/2001	<.5	<.5	<.5	<.5	<.5	<.5	<.5	<.5	<.5
P36P-6	2	5/18/2001	<.5	<.5	<.5	<.5	<.5	<.5	<.5	<.5	<.5
P36P-7	NR	5/18/2001	<.5	<.5	<.5	<.5	<.5	<.5	<.5	<.5	<.5
P36P-8	NR	5/18/2001	<.5	<.5	<.5	<.5	<.5	.9	<.5	<.5	12.4
P36P-9	NR	5/18/2001	<.5	<.5	<.5	<.5	<.5	1.4	.8	<.5	10.6
P36P-10	NR	5/18/2001	<.5	<.5	<.5	<.5	<.5	1.5	1.3	<.5	13.1
P36P-11	1	5/18/2001	<.5	<.5	1.6	<.5	<.5	1.6	2.2	<.5	13.8
P36P-11	2	5/18/2001	<.5	<.5	1.7	<.5	<.5	2.5	5.4	<.5	13.7
P36P-12	1	5/18/2001	<.5	<.5	1.4	<.5	<.5	1.8	3.1	<.5	11.6
P36P-12	2	5/18/2001	<.5	<.5	1.8	<.5	<.5	2.6	6.1	<.5	11.3

Chlorinated Methanes			Additional Volatile Organic Compounds					
Carbon tetra-chloride (µg/L)	Chloroform (µg/L)	Chloro-methane (µg/L)	Benzene (µg/L)	Bromo-methane (µg/L)	Toluene (µg/L)	Tri-chloro-fluoro-methane (µg/L)	Naph-thalene (µg/L)	Site name
<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	P36M-14
<.5	<.5	<.5	<.5	<.7	<.5	<.5	<.7	P36M-15
<.5	<.5	<.5	<.5	<.7	<.5	<.5	<.7	P36M-16
<.5	<.5	<.5	<.5	<.5	<.5	<.5	<.5	P36M-17
<.5	<.5	<.5	<.5	<.7	<.5	<.5	<.7	P36M-17
1.4	<.5	<.5	<.5	<.5	<.5	<.5	<.5	P36M-18
<.5	<.5	<.5	<.5	<.7	<.5	<.5	<.7	P36M-18
<.5	<.5	<.5	<.5	<.7	<.5	<.5	<.7	P36M-19
<.5	<.5	<.5	<.5	<.7	<.5	<.5	<.7	P36M-19
<.5	<.5	<.5	<.5	<.5	<.5	<.5	<.5	P36M-20
<.5	<.5	<.5	<.5	<.7	<.5	<.5	<.7	P36M-20
<.5	<.5	<.5	<.5	<.5	<.5	<.5	<.5	P36M-21
<.5	<.5	<.5	<.5	<.7	<.5	<.5	<.7	P36M-21
<.5	<.5	<.5	<.5	<.5	<.5	<.5	<.5	P36P-1
<.5	<.5	<.5	<.5	<.5	2.2	<.5	<.5	P36P-2
<.5	<.5	<.5	<.5	<.5	.7	<.5	<.5	P36P-3
<.5	<.5	<.5	<.5	<.5	1.3	<.5	<.5	P36P-4
<.5	<.5	<.5	<.5	<.5	.7	<.5	<.5	P36P-5
<.5	<.5	<.5	<.5	<.7	<.5	<.5	<.7	P36P-5
<.5	<.5	<.5	<.5	<.5	2.2	<.5	<.5	P36P-6
<.5	<.5	<.5	<.5	<.7	<.5	<.5	<.7	P36P-6
<.5	<.5	<.5	<.5	<.5	5.4	<.5	<.5	P36P-7
<.5	<.5	<.5	<.5	<.5	<.5	<.5	<.5	P36P-8
<.5	<.5	<.5	<.5	<.5	<.5	<.5	<.5	P36P-9
<.5	<.5	<.5	<.5	<.5	<.5	<.5	<.5	P36P-10
<.5	<.5	<.5	<.5	<.5	<.5	<.5	<.5	P36P-11
<.5	<.5	<.5	<.5	<.7	<.5	<.5	<.7	P36P-11
<.5	<.5	<.5	<.5	<.5	<.5	<.5	<.5	P36P-12
<.5	<.5	<.5	<.5	<.7	<.5	<.5	<.7	P36P-12

Appendix 4B. *Organic constituents for porous-membrane sampling devices in the West Branch Canal Creek study area, Aberdeen Proving Ground, Maryland, March 2000 through May 2001-Continued*

Site name	Replicate	Collection date	Chlorinated Ethanes: 1,1,2,2-Tetrachloroethane (µg/L)	1,1,2-Trichloroethane (µg/L)	1,2-Dichloroethane (µg/L)	Chlorinated Ethenes: Tetrachloroethene (µg/L)	Trichloroethene (µg/L)	*cis*-1,2-Dichloroethene (µg/L)	*trans*-1,2-Dichloroethene (µg/L)	1,1-Dichloroethene (µg/L)	Vinyl chloride (µg/L)
May 2001 Sampling Event - *Continued*											
P36P-14	NR	5/18/2001	<0.5	<0.5	<0.5	<0.5	<0.5	2.6	4.3	<0.5	12.6
P36P-15	NR	5/18/2001	<.5	<.5	1.0	<.5	<.5	2.3	4.1	<.5	13.9
P36P-16	NR	5/18/2001	<.5	<.5	.7	<.5	<.5	2.1	4.2	<.5	10.8
P36P-17	1	5/18/2001	<.5	<.5	.6	<.5	<.5	1.9	5.1	<.5	8.4
P36P-17	2	5/18/2001	<.5	<.5	.9	<.5	<.5	2.2	7.9	<.5	7.6
P36P-18	NR	5/18/2001	<.5	<.5	.6	<.5	<.5	1.9	6.0	<.5	7.3
P36P-19	NR	5/18/2001	<.5	<.5	.6	<.5	<.5	2.2	5.6	<.5	6.5
P36P-20	1	5/18/2001	<.5	<.5	.7	<.5	<.5	2.0	6.6	<.5	4.9
P36P-20	2	5/18/2001	<.5	<.5	.7	<.5	<.5	2.4	6.6	<.5	5.1
P36P-21	1	5/18/2001	<.5	<.5	.6	<.5	<.5	2.5	7.7	<.5	3.2
P36P-21	2	5/18/2001	<.5	<.5	.8	<.5	<.5	2.3	7.3	<.5	4.2
P36T-1	NR	5/18/2001	<.5	<.5	4.4	<.5	<.5	1.1	<0.5	<.5	8.2
P36T-2	NR	5/18/2001	<.5	<.5	3.0	<.5	<.5	1.3	<.5	<.5	13.2
P36T-3	NR	5/18/2001	<.5	<.5	1.8	<.5	<.5	1.2	<.5	<.5	11.0
P36T-4	NR	5/18/2001	<.5	<.5	2.1	<.5	<.5	0.9	<.5	<.5	8.7
P36T-5	1	5/18/2001	<.5	<.5	2.2	<.5	<.5	.8	<.5	<.5	6.7
P36T-5	2	5/18/2001	<.5	<.5	7.9	<.5	.5	2.7	.9	<.5	12.5
P36T-6	NR	5/18/2001	<.5	<.5	2.8	<.5	<.5	1.1	<.5	<.5	8.5
P36T-7	NR	5/18/2001	<.5	<.5	4.7	<.5	<.5	2.3	.8	<.5	13.0
P36T-8	NR	5/18/2001	<.5	.8	7.4	<.5	<.5	3.6	1.3	<.5	25.7
P36T-9	1	5/18/2001	<.5	.6	5.8	<.5	<.5	3.5	1.2	<.5	21.3
P36T-9	2	5/18/2001	<.5	.8	7.4	<.5	<.5	3.9	1.8	<.5	31.2
P36T-10	1	5/18/2001	<.5	.8	6.3	<.5	<.5	4.1	1.4	<.5	23.8
P36T-10	2	5/18/2001	.6	1.2	8.1	<.5	<.5	4.4	2.4	<.5	25.4
P36T-11	NR	5/18/2001	<.5	1.0	7.3	<.5	<.5	4.4	1.7	<.5	26.6
P36T-12	NR	5/18/2001	<.5	.7	6.6	<.5	<.5	4.2	1.3	<.5	25.1
P36T-13	NR	5/18/2001	<.5	.8	6.4	<.5	<.5	3.9	1.1	<.5	23.3
P36T-14	NR	5/18/2001	<.5	.6	6.7	<.5	<.5	4.4	1.1	<.5	22.4
P36T-15	1	5/18/2001	<.5	.5	6.5	<.5	<.5	4.2	1.1	<.5	18.5

Chlorinated Methanes			Additional Volatile Organic Compounds					
Carbon tetra-chloride (µg/L)	Chloroform (µg/L)	Chloro-methane (µg/L)	Benzene (µg/L)	Bromo-methane (µg/L)	Toluene (µg/L)	Tri-chloro-fluoro-methane (µg/L)	Naph-thalene (µg/L)	Site name
<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	P36P-14
<.5	<.5	<.5	<.5	<.5	<.5	<.5	<.5	P36P-15
<.5	<.5	<.5	<.5	<.5	<.5	<.5	<.5	P36P-16
<.5	<.5	<.5	<.5	<.5	<.5	<.5	<.5	P36P-17
<.5	<.5	<.5	<.5	<.7	<.5	<.5	<.7	P36P-17
<.5	<.5	<.5	<.5	<.5	<.5	<.5	<.5	P36P-18
<.5	<.5	<.5	<.5	<.5	<.5	<.5	<.5	P36P-19
<.5	<.5	<.5	<.5	<.5	<.5	<.5	<.5	P36P-20
<.5	<.5	<.5	<.5	<.7	<.5	<.5	<.7	P36P-20
<.5	<.5	<.5	<.5	<.5	<.5	<.5	<.5	P36P-21
<.5	<.5	<.5	<.5	<.7	<.5	<.5	<.7	P36P-21
<.5	<.5	<.5	<.5	<.7	<.5	<.5	<.7	P36T-1
<.5	<.5	<.5	<.5	<.7	<.5	<.5	<.7	P36T-2
<.5	<.5	<.5	<.5	<.7	6.1	<.5	<.7	P36T-3
<.5	<.5	<.5	<.5	<.7	1.8	<.5	<.7	P36T-4
<.5	<.5	<.5	<.5	<.7	1.3	<.5	<.7	P36T-5
<.5	<.5	<.5	<.5	<.7	.8	<.5	<.7	P36T-5
<.5	<.5	<.5	<.5	<.7	2.0	<.5	<.7	P36T-6
<.5	<.5	<.5	<.5	<.7	1.2	<.5	<.7	P36T-7
<.5	<.5	<.5	<.5	<.7	<.5	<.5	<.7	P36T-8
<.5	<.5	<.5	<.5	<.7	<.5	<.5	<.7	P36T-9
<.5	<.5	<.5	<.5	<.7	<.5	<.5	<.7	P36T-9
<.5	<.5	<.5	<.5	<.7	<.5	<.5	<.7	P36T-10
<.5	<.5	<.5	<.5	<.7	<.5	<.5	<.7	P36T-10
<.5	<.5	<.5	<.5	<.7	<.5	<.5	<.7	P36T-11
<.5	<.5	<.5	<.5	<.7	<.5	<.5	<.7	P36T-12
<.5	<.5	<.5	<.5	<.7	<.5	<.5	<.7	P36T-13
<.5	<.5	<.5	<.5	<.7	<.5	<.5	<.7	P36T-14
<.5	<.5	<.5	<.5	<.7	<.5	<.5	<.7	P36T-15

Appendix 4B. *Organic constituents for porous-membrane sampling devices in the West Branch Canal Creek study area, Aberdeen Proving Ground, Maryland, March 2000 through May 2001-Continued*

Site name	Replicate	Collection date	Chlorinated Ethanes: 1,1,2,2-Tetrachloroethane (µg/L)	1,1,2-Trichloroethane (µg/L)	1,2-Dichloroethane (µg/L)	Chlorinated Ethenes: Tetrachloroethene (µg/L)	Trichloroethene (µg/L)	*cis*-1,2-Dichloroethene (µg/L)	*trans*-1,2-Dichloroethene (µg/L)	1,1-Dichloroethene (µg/L)	Vinyl chloride (µg/L)
May 2001 Sampling Event - *Continued*											
P36T-15	2	5/18/2001	0.6	1.0	6.1	<0.5	<0.5	4.6	1.7	<0.5	16.3
P36T-16	NR	5/18/2001	<.5	<0.5	5.6	<.5	<.5	3.7	0.9	<.5	16.5
P36T-17	1	5/18/2001	<.5	<.5	5.4	<.5	<.5	3.9	1.0	<.5	17.0
P36T-17	2	5/18/2001	<.5	.9	8.7	<.5	<.5	4.7	1.7	<.5	16.6
P36T-18	NR	5/18/2001	<.5	.5	6.0	<.5	<.5	4.1	1.3	<.5	16.4
P36T-19	NR	5/18/2001	.8 EV	1.0	6.0	<.5	<.5	4.6	1.7	<.5	16.0
P36T-20	1	5/18/2001	.6 EV	.9	7.8	<.5	<.5	4.9	1.3	<.5	16.2
P36T-20	2	5/18/2001	.9 EV	.8	8.1	<.5	<.5	4.4	1.4	<.5	11.5
P36T-21	1	5/18/2001	.6 EV	1.0	6.9	<.5	<.5	4.2	1.1	<.5	13.3
P36T-21	2	5/18/2001	.7 EV	.9	9.1	<.5	<.5	4.3	1.1	<.5	13.4
May 2001 Blank Samples											
Equipment	NR	5/18/2001	<.5	<.5	<0.5	<.5	<.5	<0.5	<.5	<.5	<0.5
MP before	NR	5/23/2001	<.5	<.5	<.5	<.5	.7	1.5	3.3	<.5	<.5
MP after	NR	5/23/2001	.9	<.5	<.5	<.5	1.0	1.1	2.4	<.5	<.5

Chlorinated Methanes			Additional Volatile Organic Compounds					
Carbon tetra-chloride (µg/L)	Chloroform (µg/L)	Chloro-methane (µg/L)	Benzene (µg/L)	Bromo-methane (µg/L)	Toluene (µg/L)	Tri-chloro-fluoro-methane (µg/L)	Naph-thalene (µg/L)	Site name
<0.5	<0.5	<0.5	<0.5	<0.7	<0.5	<0.5	<0.7	P36T-15
<.5	<.5	<.5	<.5	<.7	<.5	<.5	<.7	P36T-16
<.5	<.5	<.5	<.5	<.7	<.5	<.5	<.7	P36T-17
<.5	<.5	<.5	<.5	<.7	<.5	<.5	<.7	P36T-17
<.5	<.5	<.5	<.5	<.7	<.5	<.5	<.7	P36T-18
<.5	<.5	<.5	<.5	<.7	<.5	<.5	<.7	P36T-19
<.5	<.5	<.5	<.5	<.7	<.5	<.5	<.7	P36T-20
<.5	<.5	<.5	<.5	<.7	<.5	<.5	<.7	P36T-20
<.5	<.5	<.5	<.5	<.7	<.5	<.5	<.7	P36T-21
<.5	<.5	<.5	<.5	<.7	<.5	<.5	<.7	P36T-21
<.5	4.7	<.5	<.5	<.7	<.5	<.5	<.7	Equipment
<.5	<.5	<.5	<.5	<.7	<.5	<.5	<.7	MP before
<.5	<.5	<.5	<.5	<.7	<.5	1.6	<.7	MP after

Appendix 5A. *Field measurements and organic constituents for surface-water sites in the West Branch Canal Creek study area, Aberdeen Proving Ground, Maryland, November 1999 through September 2000*

[µS/cm, microsiemens per centimeter at 25 °C; °C, degrees Celsius; µg/L, micrograms per liter; <, less than; - -, no data; EV, estimated value; NR, no replicate; MS, matrix spike; *, water trapped under floating walkways]

					Field Measurements			Chlorinated Ethanes		
Site name	Tide	Date collected	Time collected	Replicate number	Specific conductance (µS/cm)	pH (standard units)	Water temperature (°C)	1,1,2,2-Tetrachloroethane (µg/L)	1,1,2-Trichloroethane (µg/L)	1,2-Dichloroethane (µg/L)
November 1999 Sampling Event										
SW020L	Low	11/5/1999	1254	1	--	--	--	8.3	<1.0	<1.0
SW020L	Low	11/5/1999	1254	2	--	--	--	8.4	<1.0	<1.0
SW020H	High	11/5/1999	1630	1	--	--	--	<1.0	<1.0	<1.0
SW020H	High	11/5/1999	1630	2	--	--	--	<1.0	<1.0	<1.0
SW030L	Low	11/5/1999	1245	NR	--	--	--	<1.0	<1.0	<1.0
SW030H	High	11/5/1999	1640	NR	--	--	--	6.2	<1.0	<1.0
SW040L	Low	11/5/1999	1315	1	--	--	--	<1.0	<1.0	<1.0
SW040L	Low	11/5/1999	1315	2	--	--	--	<1.0	<1.0	<1.0
SW040H	High	11/5/1999	1650	1	--	--	--	8.0	<1.0	<1.0
SW040H	High	11/5/1999	1650	2	--	--	--	3.4	2.3	<1.0
SW049L	Low	11/5/1999	1246	NR	--	--	--	4.9	<1.0	<1.0
SW060L	Low	11/5/1999	1305	NR	--	--	--	<1.0	<1.0	<1.0
SW060H	High	11/5/1999	1700	NR	--	--	--	<1.0	<1.0	<1.0
SW090L	Low	11/5/1999	1300	NR	--	--	--	<1.0	<1.0	<1.0
SW090H	High	11/5/1999	1710	1	--	--	--	<1.0	<1.0	<1.0
SW090H	High	11/5/1999	1710	2	--	--	--	<1.0	<1.0	<1.0
February 2000 Sampling Event										
SW010L	Low	2/8/2000	1615	1	231	--	5.1	<1.0	<1.0	<1.0
SW010L	Low	2/8/2000	1615	2	--	--	--	<1.0	<1.0	<1.0
SW015L	Low	2/8/2000	1625	NR	--	--	3.4	<1.0	<1.0	<1.0
SW020H	High	2/8/2000	1050	NR	773	--	1.3	<1.0	<1.0	<1.0
SW020L	Low	2/8/2000	1405	1	666	--	2.9	<1.0	<1.0	<1.0
SW020L	Low	2/8/2000	1405	2	--	--	--	<1.0	<1.0	<1.0

Chlorinated Ethenes					Chlorinated Methanes		Additional Volatile Organic Compounds		
Tetra-chloro-ethene (µg/L)	Tri-chloro-ethene (µg/L)	*cis* -1,2-Dichloro-ethene (µg/L)	*trans* -1,2-Dichloro-ethene (µg/L)	Vinyl chloride (µg/L)	Carbon tetra-chloride (µg/L)	Chloro-form (µg/L)	Dichloro-difluoro-methane (µg/L)	Bromo-dichloro-methane (µg/L)	Toluene (µg/L)
<1.0	2.2	<1.0	<1.0	<1.0	4.8	5.1	<5.0	<1.0	<1.0
<1.0	2.4	<1.0	<1.0	<1.0	5.7	5.0	<5.0	<1.0	<1.0
<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<5.0	<1.0	<1.0
<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<5.0	<1.0	<1.0
<1.0	<1.0	<1.0	<1.0	<1.0	2.4	3.6	<5.0	<1.0	<1.0
8.7	4.0	<1.0	<1.0	<1.0	31.8	50.2	<5.0	<1.0	<1.0
<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	3.2	<5.0	<1.0	<1.0
<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	4.2	<5.0	<1.0	<1.0
<1.0	2.3	<1.0	<1.0	<1.0	2.3	<1.0	<5.0	<1.0	<1.0
<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<5.0	<1.0	<1.0
3.6	2.3	<1.0	<1.0	<1.0	15.5	20.8	<5.0	<1.0	<1.0
<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<5.0	<1.0	<1.0
<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<5.0	<1.0	<1.0
<1.0	2.1	<1.0	<1.0	<1.0	2.9	<1.0	<5.0	<1.0	<1.0
<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	3.2	<5.0	<1.0	<1.0
<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	3.7	<5.0	<1.0	<1.0
<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	<5.0	<1.0	<1.0
<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	<5.0	<1.0	<1.0
<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	2.3	<5.0	<1.0	<1.0
<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	<5.0	<1.0	<1.0
<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	<5.0	<1.0	<1.0
<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	<5.0	<1.0	<1.0

Site name
SW020L
SW020L
SW020H
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SW030L
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SW040L
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SW010L
SW010L
SW015L
SW020H
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SW020L

Appendix 5A. *Field measurements and organic constituents for surface-water sites in the West Branch Canal Creek study area, Aberdeen Proving Ground, Maryland, November 1999 through September 2000-Continued*

					Field Measurements			Chlorinated Ethanes		
Site name	Tide	Date collected	Time collected	Replicate number	Specific conduct-ance (µS/cm)	pH (standard units)	Water temp-erature (ºC)	1,1,2,2-Tetra-chloro-ethane (µg/L)	1,1,2-Trichloro-ethane (µg/L)	1,2-Dichloro-ethane (µg/L)
February 2000 Sampling Event - *Continued*										
SW028L	Low	2/8/2000	1555	NR	624	--	3.0	--	--	--
SW029L	Low	2/8/2000	1550	NR	151	--	2.9	--	--	--
SW030H	High	2/8/2000	1035	NR	540	--	1.0	<1.0	<1.0	<1.0
SW030L	Low	2/8/2000	1545	1	474	--	5.4	<1.0	<1.0	<1.0
SW030L	Low	2/8/2000	1545	2	--	--	--	<1.0	<1.0	<1.0
SW040H	High	2/8/2000	1020	1	785	--	2.7	7.5	<1.0	<1.0
SW040H	High	2/8/2000	1020	2	--	--	--	7.6	<1.0	<1.0
SW040L	Low	2/8/2000	1530	NR	756	--	--	4.3	<1.0	<1.0
SW050H	High	2/8/2000	1000	1	793	--	2.0	6.2	<1.0	<1.0
SW050H	High	2/8/2000	1000	2	--	--	--	6.8	<1.0	<1.0
SW050L	Low	2/8/2000	1440	1	540	--	6.9	5.7	<1.0	<1.0
SW050L	Low	2/8/2000	1440	2	--	--	--	7.4	<1.0	<1.0
SW060H	High	2/8/2000	945	NR	--	--	1.4	6.2	<1.0	<1.0
SW060L	Low	2/8/2000	1425	1	788	--	7.3	6.3	<1.0	<1.0
SW060L	Low	2/8/2000	1425	2	--	--	--	7.1	<1.0	<1.0
SW090H	High	2/8/2000	920	NR	1,620	--	0.5	<1.0	<1.0	<1.0
SW090L	Low	2/8/2000	1345	NR	1,400	--	.9	5.6	<1.0	<1.0
February 2000 Trip Blanks										
Trip Blank	--	2/8/2000	850	1	--	--	--	<1.0	<1.0	<1.0
Trip Blank	--	2/8/2000	850	2	--	--	--	<1.0	<1.0	<1.0
March 2000 Hoverprobe Site Samples										
SWHP07	--	3/13/2000	--	NR	--	--	--	3.6	<0.5	<0.5
SWHP08	--	3/13/2000	--	NR	--	--	--	1.4	<.5	<.5
SWHP09	--	3/14/2000	--	NR	--	--	--	3.6	<.5	<.5

Chlorinated Ethenes					Chlorinated Methanes		Additional Volatile Organic Compounds		
Tetra-chloro-ethene (µg/L)	**Tri-chloro-ethene (µg/L)**	***cis*-1,2-Dichloro-ethene (µg/L)**	***trans*-1,2-Dichloro-ethene (µg/L)**	**Vinyl chloride (µg/L)**	**Carbon tetra-chloride (µg/L)**	**Chloro-form (µg/L)**	**Dichloro-difluoro-methane (µg/L)**	**Bromo-dichloro-methane (µg/L)**	**Toluene (µg/L)**
--	--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--	--
<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	<5.0	<1.0	<1.0
<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	<5.0	<1.0	<1.0
<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	<5.0	<1.0	<1.0
<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	<5.0	<1.0	<1.0
<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	<5.0	<1.0	<1.0
<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	<5.0	<1.0	<1.0
<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	<5.0	<1.0	<1.0
<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	<5.0	<1.0	<1.0
<1.0	<1.0	<1.0	<2.0	<1.0	2.3	<1.0	<5.0	<1.0	<1.0
<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	<5.0	<1.0	<1.0
<1.0	<1.0	<1.0	<2.0	<1.0	5.4	6.2	<5.0	<1.0	<1.0
<1.0	<1.0	<1.0	<2.0	<1.0	2.8	2.7	<5.0	<1.0	<1.0
<1.0	<1.0	<1.0	<2.0	<1.0	3.5	2.9	<5.0	<1.0	<1.0
3.1	4.2	<1.0	<2.0	<1.0	9.2	18.0	<5.0	<1.0	<1.0
3.0	3.0	<1.0	<2.0	<1.0	7.7	15.9	<5.0	<1.0	<1.0
<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	<5.0	<1.0	<1.0
<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	<5.0	<1.0	<1.0
1.4	1.4	<0.5	<0.5	<0.5	7.5	9.3	<0.5	<0.5	<10.0
<0.5	<0.5	<.5	<.5	<.5	2.5	4.0	<.5	<.5	<10.0
2.9	1.8	.8	<.5	<.5	16.0	15.9	<.5	<.5	<10.0

Site name
SW028L
SW029L
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SW060L
SW060L
SW090H
SW090L
Trip Blank
Trip Blank
SWHP07
SWHP08
SWHP09

Appendix 5A. *Field measurements and organic constituents for surface-water sites in the West Branch Canal Creek study area, Aberdeen Proving Ground, Maryland, November 1999 through September 2000-Continued*

					Field Measurements			Chlorinated Ethanes		
Site name	Tide	Date collected	Time collected	Replicate number	Specific conduct-ance (µS/cm)	pH (standard units)	Water temp-erature (ºC)	1,1,2,2-Tetra-chloro-ethane (µg/L)	1,1,2-Trichloro-ethane (µg/L)	1,2-Dichloro-ethane (µg/L)
May 2000 Sampling Event										
SW010H	High	5/17/2000	1010	NR	--	--	--	<1.0	<1.0	<0.5
SW015H	High	5/17/2000	957	NR	--	--	--	<1.0	<1.0	<.5
SW019H	High	5/17/2000	945	NR	--	--	--	<1.0	<1.0	<.5
SW020H	High	5/17/2000	930	NR	--	--	--	<1.0	<1.0	<.5
SW028H	High	5/17/2000	859	NR	--	--	--	<1.0	<1.0	.9
SW028M	Mid	5/17/2000	1155	NR	--	--	--	<1.0	<1.0	<.5
SW029H	High	5/17/2000	908	NR	--	--	--	<1.0	<1.0	<.5
SW029M	Mid	5/17/2000	1200	NR	--	--	--	<1.0	<1.0	<.5
SW030H	High	5/17/2000	846	1	--	--	--	<1.0	<1.0	<.5
SW030H	High	5/17/2000	846	2	--	--	--	<1.0	<1.0	<.5
SW040H	High	5/17/2000	826	NR	--	--	--	<1.0	<1.0	<.5
SW040M	Mid	5/17/2000	1145	NR	--	--	--	1.9	1.1	<.5
SW040L	Low	5/17/2000	1550	NR	--	--	--	3.3	<1.0	<.5
SW049L	Low	5/17/2000	1545	1	--	--	--	<1.0	<1.0	<.5
SW049L	Low	5/17/2000	1545	2	--	--	--	<1.0	<1.0	<.5
SW049.01L	Low	5/17/2000	1552	NR	598	6.6	24.4	<1.0	<1.0	<.5
SW050H	High	5/17/2000	827	1	695	--	20.6	<1.0	<1.0	<.5
SW050H	High	5/17/2000	827	2	--	--	--	<1.0	<1.0	<.5
SW050M	Mid	5/17/2000	1135	NR	651	7.1	20.9	1.2	<1.0	<.5
SW050L	Low	5/17/2000	1535	NR	502	7.2	24.7	2.4	<1.0	<.5
SW050L-MS	Low	5/17/2000	1535	1	--	--	--	2.5	<1.0	<.5
SW050L-MS	Low	5/17/2000	1535	2	--	--	--	2.5	<1.0	<.5
SW060H	High	5/17/2000	825	1	702	--	--	<1.0	<1.0	<.5
SW060H	High	5/17/2000	825	2	--	--	--	<1.0	<1.0	<.5
SW060M	Mid	5/17/2000	1140	NR	641	--	21.3	1.1	<1.0	<.5
SW060L	Low	5/17/2000	1514	NR	509	7.3	25.0	2.8	<1.0	<.5
SW060L-MS	Low	5/17/2000	1514	1	--	--	--	2.0	<1.0	<.5

Chlorinated Ethenes					Chlorinated Methanes		Additional Volatile Organic Compounds		
Tetra-chloro-ethene (µg/L)	Tri-chloro-ethene (µg/L)	*cis* -1,2-Dichloro-ethene (µg/L)	*trans* -1,2-Dichloro-ethene (µg/L)	Vinyl chloride (µg/L)	Carbon tetra-chloride (µg/L)	Chloro-form (µg/L)	Dichloro-difluoro-methane (µg/L)	Bromo-dichloro-methane (µg/L)	Toluene (µg/L)
<1.0	<1.0	<0.5	<0.5	<0.5	<0.5	<0.5	<1.0	<0.5	<1.0
<1.0	<1.0	<.5	<.5	<.5	<.5	1.1	<1.0	<.5	<1.0
<1.0	<1.0	<.5	<.5	<.5	<.5	1.6	<1.0	<.5	<1.0
<1.0	<1.0	<.5	<.5	<.5	<.5	9.2	<1.0	2.3 EV	<1.0
<1.0	<1.0	<.5	<.5	<.5	<.5	<.5	<1.0	<.5	<1.0
<1.0	<1.0	<.5	<.5	<.5	<.5	<.5	<1.0	<.5	<1.0
<1.0	<1.0	<.5	<.5	<.5	<.5	<.5	<1.0	<.5	<1.0
<1.0	<1.0	<.5	<.5	<.5	<.5	<.5	<1.0	<.5	<1.0
<1.0	<1.0	<.5	<.5	<.5	<.5	<.5	<1.0	<.5	<1.0
<1.0	<1.0	<.5	<.5	<.5	2.4	2.5	<1.0	<.5	<1.0
<1.0	<1.0	<.5	<.5	<.5	6.0	5.9	<1.0	<.5	<1.0
<1.0	<1.0	<.5	<.5	<.5	4.4	3.7	<1.0	<.5	<1.0
<1.0	<1.0	<.5	<.5	<.5	<.5	<.5	<1.0	<.5	<1.0
<1.0	<1.0	<.5	<.5	<.5	<.5	<.5	<1.0	<.5	<1.0
<1.0	<1.0	<.5	<.5	<.5	<.5	1.3	<1.0	<.5	<1.0
<1.0	<1.0	<.5	<.5	<.5	1.0	1.3	<1.0	<.5	<1.0
<1.0	<1.0	<.5	<.5	<.5	1.1	1.2	<1.0	<.5	<1.0
<1.0	<1.0	<.5	<.5	<.5	5.1	4.9	<1.0	<.5	<1.0
<1.0	<1.0	<.5	<.5	<.5	5.2	4.7	<1.0	<.5	<1.0
<1.0	MS	<.5	<.5	<.5	4.7	4.9	<1.0	<.5	MS
<1.0	MS	<.5	<.5	<.5	5.0	5.1	<1.0	<.5	MS
<1.0	<1.0	<.5	<.5	<.5	1.8	1.7	<1.0	<.5	<1.0
<1.0	<1.0	<.5	<.5	<.5	1.4	1.5	<1.0	<.5	<1.0
<1.0	<1.0	<.5	<.5	<.5	4.7	4.6	<1.0	<.5	<1.0
<1.0	<1.0	<.5	<.5	<.5	4.1	4.2	<1.0	<.5	<1.0
<1.0	MS	<.5	<.5	<.5	1.8	3.6	<1.0	<.5	MS

Site name

SW010H
SW015H
SW019H
SW020H
SW028H

SW028M
SW029H
SW029M
SW030H
SW030H

SW040H
SW040M
SW040L
SW049L
SW049L

SW049.01L
SW050H
SW050H
SW050M
SW050L

SW050L-MS
SW050L-MS
SW060H
SW060H
SW060M

SW060L
SW060L-MS

SW060L-MS	Low	5/17/2000	1514	2	--	--	--	2.4	<1.0	<.5

Appendix 5A. *Field measurements and organic constituents for surface-water sites in the West Branch Canal Creek study area, Aberdeen Proving Ground, Maryland, November 1999 through September 2000-Continued*

					Field Measurements			Chlorinated Ethanes		
Site name	Tide	Date collected	Time collected	Replicate number	Specific conductance (µS/cm)	pH (standard units)	Water temperature (ºC)	1,1,2,2-Tetrachloroethane (µg/L)	1,1,2-Trichloroethane (µg/L)	1,2-Dichloroethane (µg/L)
May 2000 Sampling Event - *Continued*										
SW074H	High	5/17/2000	911	NR	716	7.6	20.6	<1.0	<1.0	<.5
SW074M	Mid	5/17/2000	1158	NR	645	7.5	20.8	<1.0	<1.0	<0.5
SW074L	Low	5/17/2000	1530	NR	533	7.5	25.8	<1.0	<1.0	<.5
SW076H	High	5/17/2000	904	NR	719	7.7	20.5	<1.0	<1.0	<.5
SW076M	Mid	5/17/2000	1151	NR	700	7.5	21.5	<1.0	<1.0	<.5
SW076L	Low	5/17/2000	1525	NR	627	7.6	24.5	1.4	<1.0	<.5
SW077H	High	5/17/2000	858	NR	720	7.7	20.4	<1.0	<1.0	<.5
SW077M	Mid	5/17/2000	1145	NR	732	7.6	21.2	<1.0	<1.0	<.5
SW077L	Low	5/17/2000	1516	1	963	7.4	28.7	<1.0	<1.0	<.5
SW077L	Low	5/17/2000	1516	2	--	--	--	<1.0	<1.0	<.5
SW078H	High	5/17/2000	853	NR	720	8.0	20.6	<1.0	<1.0	<.5
SW078L	Low	5/17/2000	1512	1	632	7.7	24.2	<1.0	<1.0	<.5
SW078L	Low	5/17/2000	1512	2	--	--	--	<1.0	<1.0	<.5
SW078M	Mid	5/17/2000	1143	1	708	7.6	21.3	<1.0	<1.0	<.5
SW078M	Mid	5/17/2000	1143	2	--	--	--	<1.0	<1.0	<.5
SW079H	High	5/17/2000	850	NR	716	7.9	20.4	<1.0	<1.0	<.5
SW079M	Mid	5/17/2000	1141	NR	700	7.6	21.4	<1.0	<1.0	<.5
SW079L	Low	5/17/2000	1508	1	579	7.6	24.4	1.8	<1.0	<.5
SW079L	Low	5/17/2000	1508	2	--	--	--	2.0	<1.0	<.5
SW080H	High	5/17/2000	847	NR	718	7.8	20.6	<1.0	<1.0	<.5
SW080M	Mid	5/17/2000	1134	NR	710	7.8	21.3	<1.0	<1.0	<.5
SW080L	Low	5/17/2000	1503	NR	638	7.7	24.0	1.6	<1.0	<.5
SW090H	High	5/17/2000	844	NR	719	7.9	20.8	<1.0	<1.0	<.5
SW090M	Mid	5/17/2000	1131	NR	722	7.9	21.0	--	--	--
SW090L	Low	5/17/2000	1500	1	712	8.0	22.8	<1.0	<1.0	<.5
SW090L	Low	5/17/2000	1500	2	--	--	--	<1.0	<1.0	<.5

<1.0	MS	<.5	<.5	<.5	4.0	4.0	<1.0	<.5	MS

Chlorinated Ethenes					Chlorinated Methanes		Additional Volatile Organic Compounds		
Tetra-chloro-ethene (µg/L)	**Tri-chloro-ethene (µg/L)**	***cis*-1,2-Dichloro-ethene (µg/L)**	***trans*-1,2-Dichloro-ethene (µg/L)**	**Vinyl chloride (µg/L)**	**Carbon tetra-chloride (µg/L)**	**Chloro-form (µg/L)**	**Dichloro-difluoro-methane (µg/L)**	**Bromo-dichloro-methane (µg/L)**	**Toluene (µg/L)**
<1.0	<1.0	<.5	<.5	<.5	2.2	2.2	<1.0	<.5	<1.0
<1.0	<1.0	<0.5	<0.5	<0.5	4.7	5.2	<1.0	<0.5	<1.0
<1.0	<1.0	<.5	<.5	<.5	2.0	2.7	<1.0	<.5	<1.0
<1.0	<1.0	<.5	<.5	<.5	<0.5	<0.5	<1.0	<.5	<1.0
<1.0	<1.0	<.5	<.5	<.5	3.3	3.2	<1.0	<.5	<1.0
1.1	<1.0	<.5	<.5	<.5	6.6	7.5	<1.0	<.5	<1.0
<1.0	<1.0	<.5	<.5	<.5	<.5	<.5	<1.0	<.5	<1.0
<1.0	<1.0	<.5	<.5	<.5	<.5	.9	<1.0	<.5	<1.0
<1.0	<1.0	<.5	<.5	<.5	<.5	<.5	<1.0	<.5	<1.0
<1.0	<1.0	<.5	<.5	<.5	<.5	<.5	<1.0	<.5	<1.0
<1.0	<1.0	<.5	<.5	<.5	5.3	6.4	<1.0	<.5	<1.0
<1.0	<1.0	<.5	<.5	<.5	4.7	5.7	<1.0	<.5	<1.0
<1.0	<1.0	<.5	<.5	<.5	2.6	2.6	<1.0	<.5	<1.0
<1.0	<1.0	<.5	<.5	<.5	2.2	2.3	<1.0	<.5	<1.0
<1.0	<1.0	<.5	<.5	<.5	<.5	<.5	<1.0	<.5	<1.0
<1.0	<1.0	<.5	<.5	<.5	1.1	1.5	<1.0	<.5	<1.0
<1.0	<1.0	<.5	<.5	<.5	<.5	1.6	<1.0	<.5	<1.0
<1.0	1.0	.9	<.5	<.5	1.4	1.9	<1.0	<.5	<1.0
<1.0	<1.0	<.5	<.5	<.5	<.5	<.5	<1.0	<.5	<1.0
<1.0	<1.0	<.5	<.5	<.5	<.5	1.0	<1.0	<.5	<1.0
<1.0	<1.0	.8	<.5	<.5	2.6	3.2	<1.0	<.5	<1.0
<1.0	<1.0	<.5	<.5	<.5	<.5	<.5	<1.0	<.5	<1.0
--	--	--	--	--	--	--	--	--	--
<1.0	<1.0	<.5	<.5	<.5	1.6	2.1	<1.0	<.5	<1.0
<1.0	<1.0	<.5	<.5	<.5	2.1	2.2	<1.0	<.5	<1.0

SW060L-MS

Site name

SW074H
SW074M
SW074L
SW076H
SW076M

SW076L
SW077H
SW077M
SW077L
SW077L

SW078H
SW078L
SW078L
SW078M
SW078M

SW079H
SW079M
SW079L
SW079L
SW080H

SW080M
SW080L
SW090H
SW090M
SW090L

SW090L

SW100H	High	5/17/2000	840	1	718	7.5	--	<1.0	<1.0	<.5
SW100H	High	5/17/2000	841	2	--	--	--	<1.0	<1.0	<.5

Appendix 5A. *Field measurements and organic constituents for surface-water sites in the West Branch Canal Creek study area, Aberdeen Proving Ground, Maryland, November 1999 through September 2000-Continued*

					Field Measurements			Chlorinated Ethanes		
Site name	**Tide**	**Date collected**	**Time collected**	**Replicate number**	**Specific conduct-ance (µS/cm)**	**pH (standard units)**	**Water temp-erature (ºC)**	**1,1,2,2-Tetra-chloro-ethane (µg/L)**	**1,1,2-Trichloro-ethane (µg/L)**	**1,2-Dichloro-ethane (µg/L)**
May 2000 Sampling Event - *Continued*										
SW100M	Mid	5/17/2000	1126	NR	719	8.6	22.0	<1.0	<1.0	<.5
SW100L	Low	5/17/2000	1455	NR	714	8.5	22.7	<1.0	<1.0	<.5
May 2000 Ambient Blanks										
After SW020H	--	5/17/2000	946	NR	--	--	--	<1.0	<1.0	<0.5
After SW029H	--	5/17/2000	915	NR	--	--	--	<1.0	<1.0	<.5
After SW029M	--	5/17/2000	1205	NR	--	--	--	<1.0	<1.0	<.5
After SW060H	--	5/17/2000	834	NR	--	--	--	<1.0	<1.0	<.5
Before SW060L	--	5/17/2000	1449	NR	--	--	--	<1.0	<1.0	<.5
Boat	--	5/17/2000	920	NR	--	--	--	<1.0	<1.0	<.5
Boat	--	5/17/2000	--	NR	--	--	--	<1.0	<1.0	<.5
May 2000 Trip Blanks										
Van/foot	--	5/17/2000	826	NR	--	--	--	<1.0	<1.0	<.5
Boat	--	5/17/2000	--	NR	--	--	--	<1.0	<1.0	<.5
September 2000 Sampling Event										
SW020H	High	9/14/2000	1022	NR	188	9.6	22.8	<0.5	<1.0	<.5
SW020L	Low	9/14/2000	1645	NR	325	10.1	27.0	<.5	<1.0	<.5
SW030H	High	9/14/2000	1007	1	214	7.1	19.2	<.5	<1.0	<.5
SW030H	High	9/14/2000	1007	2	--	--	--	<.5	<1.0	<.5
SW030L	Low	9/14/2000	1635	NR	220	7.4	22.3	<.5	<1.0	<.5
SW049H	High	9/14/2000	1015	1	1,600	5.6	--	3.1	<1.0	<.5
SW049H	High	9/14/2000	1015	2	--	--	--	3.4	<1.0	<.5
SW049M	Mid	9/14/2000	1322	1	1,550	7	--	1.8	<1.0	<.5

<1.0	<1.0	<.5	<.5	<.5	<.5	<.5	<1.0	<.5	<1.0
<1.0	<1.0	<.5	<.5	<.5	<.5	<.5	<1.0	<.5	<1.0

Chlorinated Ethenes					**Chlorinated Methanes**		**Additional Volatile Organic Compounds**		
Tetra-chloro-ethene (µg/L)	**Tri-chloro-ethene (µg/L)**	***cis*-1,2-Dichloro-ethene (µg/L)**	***trans*-1,2-Dichloro-ethene (µg/L)**	**Vinyl chloride (µg/L)**	**Carbon tetra-chloride (µg/L)**	**Chloro-form (µg/L)**	**Dichloro-difluoro-methane (µg/L)**	**Bromo-dichloro-methane (µg/L)**	**Toluene (µg/L)**
<1.0	<1.0	<.5	<.5	<.5	<.5	<.5	<1.0	<.5	<1.0
<1.0	<1.0	<.5	<.5	<.5	<.5	<.5	<1.0	<.5	<1.0
<1.0	<1.0	<0.5	<0.5	<0.5	<0.5	<0.5	<1.0	<0.5	<1.0
<1.0	<1.0	<.5	<.5	<.5	<.5	<.5	<1.0	<.5	<1.0
<1.0	<1.0	<.5	<.5	<.5	<.5	<.5	<1.0	<.5	<1.0
<1.0	<1.0	<.5	<.5	<.5	<.5	<.5	<1.0	<.5	<1.0
<1.0	<1.0	<.5	<.5	<.5	<.5	<.5	<1.0	<.5	<1.0
<1.0	<1.0	<.5	<.5	<.5	<.5	<.5	<1.0	<.5	<1.0
<1.0	<1.0	<.5	<.5	<.5	<.5	<.5	<1.0	<.5	<1.0
<1.0	<1.0	<.5	<.5	<.5	<.5	<.5	<1.0	<.5	<1.0
<1.0	<1.0	<.5	<.5	<.5	<.5	<.5	<1.0	<.5	<1.0
<0.5	<.5	<.5	<.5	<.5	<.5	1.7	<5.0	<.5	<0.5
<.5	<.5	<.5	<.5	<.5	<.5	1.2	<5.0	<.5	<.5
<.5	<.5	<.5	<.5	<.5	<.5	<.5	<5.0	<.5	<.5
<.5	<.5	<.5	<.5	<.5	<.5	<.5	<5.0	<.5	<.5
<.5	<.5	<.5	<.5	<.5	<.5	<.5	<5.0	<.5	<.5
1.5	.8	<.5	<.5	<.5	9.0	11.2	<5.0	<.5	<.5
1.4	.9	<.5	<.5	<.5	8.4	11.3	<5.0	<.5	<.5
1.0	<.5	<.5	<.5	<.5	4.5	6.0	<5.0	<.5	<.5

SW100H
SW100H

Site name

SW100M
SW100L

After SW020H
After SW029H
After SW029M
After SW060H
Before SW060L
Boat
Boat

Van/foot
Boat

SW020H
SW020L
SW030H
SW030H
SW030L

SW049H
SW049H
SW049M

SW049M	Mid	9/14/2000	1322	2	--	--	--	2.1	<1.0	<.5
SW049L	Low	9/14/2000	1630	1	--	--	--	1.8	<1.0	<.5

Appendix 5A. *Field measurements and organic constituents for surface-water sites in the West Branch Canal Creek study area, Aberdeen Proving Ground, Maryland, November 1999 through September 2000-Continued*

					Field Measurements			Chlorinated Ethanes		
Site name	Tide	Date collected	Time collected	Replicate number	Specific conductance (µS/cm)	pH (standard units)	Water temperature (ºC)	1,1,2,2-Tetrachloroethane (µg/L)	1,1,2-Trichloroethane (µg/L)	1,2-Dichloroethane (µg/L)
September 2000 Sampling Event - *Continued*										
SW049L*	Low	9/14/2000	1630	2	640	6.6	--	1.5	<1.0	<.5
SW049.01H	High	9/14/2000	1025	1	1,370	6.6	--	3.0	<1.0	<.5
SW049.01H	High	9/14/2000	1025	2	--	--	--	3.4	<1.0	<.5
SW049.01M	Mid	9/14/2000	1330	1	1,440	6.9	--	1.5	<1.0	<0.5
SW049.01M	Mid	9/14/2000	1330	2	--	--	--	1.4	<1.0	<.5
SW049.01L	Low	9/14/2000	1635	1	1,650	6.3	--	<0.5	<1.0	<.5
SW049.01L	Low	9/14/2000	1635	2	--	--	--	<.6	<1.1	<.6
SW049.01L	Low	9/13/2000	1635	3	--	--	--	<.5	<1.0	<.5
SW060H	High	9/14/2000	1010	NR	3,420	6.5	--	.8	<1.0	<.5
SW060M	Mid	9/14/2000	1315	NR	2,030	7	--	1.9	<1.0	<.5
SW060L	Low	9/14/2000	1620	NR	1,100	6.9	--	6.6	<1.0	<.5
SW090H	High	9/14/2000	950	1	6,360	7.2	23.7	<.5	<1.0	<.5
SW090H	High	9/14/2000	950	2	--	--	--	<.5	<1.0	<.5
SW090M	Mid	9/14/2000	1320	1	6,030	7.6	25.8	<.5	<1.0	<.5
SW090M	Mid	9/14/2000	1320	2	--	--	--	<.5	<1.0	<.5
SW090L	Low	9/14/2000	1620	1	6,260	8.7	28.2	<.5	<1.0	<.5
SW090L	Low	9/14/2000	1620	2	--	--	--	<.5	<1.0	<.5
September 2000 Hoverprobe Site Samples										
SWHP01	--	9/11/2000	1250	1	--	--	--	1.3	<1.0	<.5
SWHP01	--	9/11/2000	1250	2	--	--	--	1.4	<1.0	<.5
SWHP02	--	9/11/2000	1030	1	--	--	--	<.5	<1.0	<.5
SWHP02	--	9/11/2000	1030	2	--	--	--	<.5	<1.0	<.5
SWHP05	--	9/11/2000	1000	1	--	--	--	<.5	<1.0	<.5

.9	<.5	<.5	<.5	<.5	4.4	5.9	<5.0	<.5	<.5
<.5	1.1	3.7	1.2	<.5	<.5	.8	<5.0	<.5	<.5

Chlorinated Ethenes					Chlorinated Methanes		Additional Volatile Organic Compounds		
Tetra-chloro-ethene (µg/L)	**Tri-chloro-ethene (µg/L)**	***cis*-1,2-Dichloro-ethene (µg/L)**	***trans*-1,2-Dichloro-ethene (µg/L)**	**Vinyl chloride (µg/L)**	**Carbon tetra-chloride (µg/L)**	**Chloro-form (µg/L)**	**Dichloro-difluoro-methane (µg/L)**	**Bromo-dichloro-methane (µg/L)**	**Toluene (µg/L)**
<.5	1.8	5.3	7.1	33.3	<.5	<.5	9.8	<.5	.7
1.6	.6	<.5	<.5	<.5	9.0	11.1	<5.0	<.5	<.5
1.4	.7	<.5	<.5	<.5	7.7	9.7	<5.0	<.5	<.5
<0.5	<0.5	<0.5	<0.5	<0.5	1.8	3.9	<5.0	<0.5	<0.5
<.5	<.5	<.5	<.5	<.5	1.9	3.9	<5.0	<.5	<.5
<.5	<.5	<.5	<.5	<.5	<0.5	<0.5	<5.0	<.5	<.5
<.6	<.6	<.6	<.6	<.6	<.6	<.6	<5.0	<.6	<.6
<.5	<.5	<.5	<.5	<.5	<.5	<.5	<5.0	<.5	<.5
1.0	<.5	<.5	<.5	<.5	4.8	6.0	<5.0	<.5	<.5
1.4	.5	<.5	<.5	<.5	7.3	8.7	<5.0	<.5	<.5
.8	.8	<.5	<.5	<.5	6.3	5.1	<5.0	<.5	<.5
<.5	<.5	<.5	<.5	<.5	<.5	<.5	<5.0	<.5	<.5
<.5	<.5	<.5	<.5	<.5	<.5	<.5	<5.0	<.5	<.5
<.5	<.5	<.5	<.5	<.5	<.5	<.5	<5.0	<.5	<.5
<.5	<.5	<.5	<.5	<.5	<.5	<.5	<5.0	<.5	<.5
<.5	<.5	<.5	<.5	<.5	<.5	<.5	<5.0	<.5	<.5
<.5	<.5	<.5	<.5	<.5	<.5	<.5	<5.0	<.5	<.5
1.1	<.5	<.5	<.5	<.5	4.8	6.2	<0.5	<.5	<.5
1.0	<.5	<.5	<.5	<.5	4.9	6.3	<.5	<.5	<.5
<.5	<.5	<.5	<.5	<.5	1.3	1.6	<.5	<.5	<.5
<.5	<.5	<.5	<.5	<.5	1.2	1.7	<.5	<.5	<.5
.7	<.5	<.5	<.5	<.5	2.3	3.5	<.5	<.5	<.5

SW049M
SW049L

Site name

SW049L*
SW049.01H
SW049.01H
SW049.01M
SW049.01M

SW049.01L
SW049.01L
SW049.01L
SW060H
SW060M

SW060L
SW090H
SW090H
SW090M
SW090M

SW090L
SW090L

SWHP01
SWHP01
SWHP02
SWHP02
SWHP05

SWHP05	--	9/11/2000	1000	2	--	--	--	<.5	<1.0	<.5
SWHP13	--	9/11/2000	1440	1	--	--	--	2.4	<1.0	<.5
SWHP13	--	9/11/2000	1440	2	--	--	--	2.5	<1.0	<.5

<.5	<.5	<.5	<.5	<.5	2.4	3.5	<.5	<.5	<.5
1.4	<.5	<.5	<.5	<.5	6.1	7.6	<.5	<.5	<.5
1.3	<.5	<.5	<.5	<.5	6.2	7.8	<.5	<.5	<.5

SWHP05
SWHP13
SWHP13