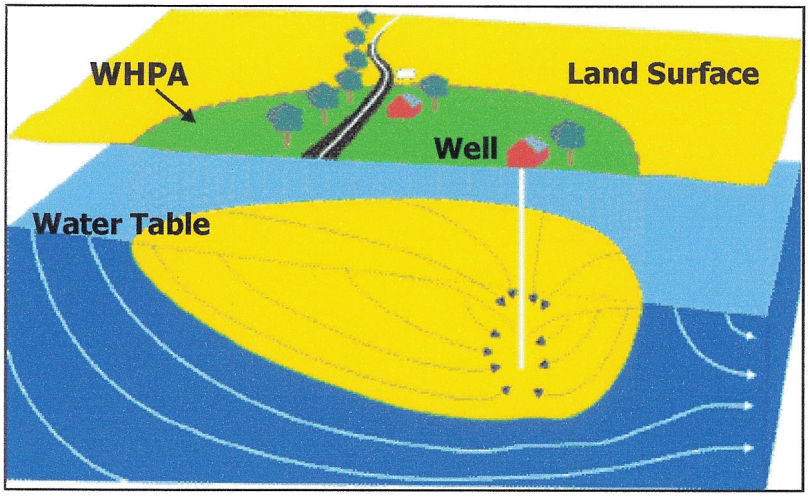
SOURCE WATER ASSESSMENT

FOR SMALL WATER SYSTEMS

IN HARFORD COUNTY



Prepared By
Maryland Department of the Environment
Water Management Administration
Water Supply Program
October 2001

MDE

TABLE OF CONTENTS

TABLE OF CONTENTS
(CONT.)

SUMMARY

The Maryland Department of the Environment's Water Supply Program (WSP) has conducted a Source Water Assessment for forty-one small systems in Harford County. The required components of this report as described in Maryland's Source Water Assessment Program (SWAP) are 1) delineation of an area that contributes water to each source, 2) identification of potential sources of contamination within the areas, and 3) determination of the susceptibility of each water supply to contamination. Recommendations for protecting the drinking water supplies conclude this report.

The sources of water supply wells in Harford County are unconfined fractured-rock and Coastal Plain aquifers. The forty-one small water systems included in this report are currently using seventy wells that draw from various bedrock formations and a Coastal Plain aquifer. The individual rock formations and unconsolidated Coastal Plain sediments have unique hydrologic characteristics that allow them to be grouped into two separate hydro-geologic regions. The Source Water Assessment areas were delineated by the WSP using U.S. EPA approved methods specifically designed for each source.

Potential point sources of contamination within the assessment areas were identified from field inspections and contaminant inventory databases. The more common potential sources of contamination identified are underground storage tanks and controlled hazardous substance generators commonly associated with commercial areas. The Maryland Office of Planning's 1997 land use map for Harford County was used to identify non-point sources of contamination. The most common type of land use that presents a potential for contamination is agricultural cropland. Private septic systems are another common non-point contaminant source. Most of the small systems in this report utilize on-site septic systems for the disposal of domestic wastewater. Figures showing land use, potential contaminant sources within Source Water Assessment areas, and aerial photographs of well locations are enclosed at the end of the report.

The susceptibility analysis is based on a review of the existing water quality data for each water system, the presence of potential sources of contamination in the individual assessment areas, well integrity, and the inherent vulnerability of the aquifer. It was determined that some small water systems are susceptible to contamination by nitrate, radon, volatile organic compounds, synthetic organic compounds, and microbiological contaminants. Some small systems may be susceptible to one contaminant, while others are susceptible to one or more groups of contaminants.

EXECUTIVE SUMMARY
HART HERITAGE

The Maryland Department of the Environment's Water Supply Program (WSP) has conducted a Source Water Assessment for forty-one small systems in Harford County, including the Hart Heritage community supply. The required components of this report as described in Maryland's Source Water Assessment Program (SWAP) are 1) delineation of an area that contributes water to the source, 2) identification of potential sources of contamination, and 3) determination of the susceptibility of the water supply to contamination. Recommendations for protecting the drinking water supply conclude this report.

The sources of water supply wells in Harford County are unconfined fractured-rock and unconsolidated Coastal Plain aquifers. The Hart Heritage water system, located in the Piedmont Region of northwest Harford County, is currently using one well that draws from the Metagraywacke Wissahickon Formation. The Wellhead Protection area was delineated by the WSP using U.S. EPA's approved methods specifically designed for this source.

Point sources of contamination were identified within and near the assessment area from field inspections and contaminant inventory databases. The Maryland Office of Planning's 1997 land use map for Harford County was used to identify non-point sources of contamination. Figure 2e is an aerial photograph showing potential sources of contamination within and near the Wellhead Protection Area.

The susceptibility analysis is based on a review of the existing water quality data for the water system, the presence of potential sources of contamination in the individual assessment areas, well integrity, and the inherent vulnerability of the aquifer. It was determined that the Hart Heritage water supply is susceptible to contamination by nitrate, radon, volatile organic compounds, and synthetic organic compounds. This water supply is not susceptible to microbiological contaminants, or other inorganic and radiological compounds.

EXECUTIVE SUMMARY
CLEAR VIEW MOBILE HOME PARK

The Maryland Department of the Environment's Water Supply Program (WSP) has conducted a Source Water Assessment for forty-one small systems in Harford County, including the Clear View Mobile Home Park community supply. The required components of this report as described in Maryland's Source Water Assessment Program (SWAP) are 1) delineation of an area that contributes water to the source, 2) identification of potential sources of contamination, and 3) determination of the susceptibility of the water supply to contamination. Recommendations for protecting the drinking water supply conclude this report.

The sources of water supply wells in Harford County are unconfined fractured-rock and unconsolidated Coastal Plain aquifers. The Clear View Mobile Home Park water system, located in the Piedmont Region of northeastern Harford County, is currently using three wells that draw water from the Baltimore Gabbro Complex. The Wellhead Protection Area was delineated by the WSP using U.S. EPA's approved methods specifically designed for each source.

Point sources of contamination were identified within and near the assessment area from field inspections and contaminant inventory databases. The Maryland Office of Planning's 1997 land use map for Harford County was used to identify non-point sources of contamination. Figure 2j is an aerial photograph showing potential sources of contamination within and near the Wellhead Protection Area.

The susceptibility analysis is based on a review of the existing water quality data for the water system, the presence of potential sources of contamination in the individual assessment areas, well integrity, and the inherent vulnerability of the aquifer. It was determined that the Clear View Mobile Home Park water supply is susceptible to contamination by nitrate and may be susceptible to radon. This water supply is not susceptible to volatile organic compounds, synthetic organic compounds, or other inorganic and radiological compounds. The susceptibility to microbiological contaminants could not be determined at the present time due to inconsistencies with the current data.

EXECUTIVE SUMMARY
WILLIAMS MOBILE HOME PARK

The Maryland Department of the Environment's Water Supply Program (WSP) has conducted a Source Water Assessment for forty-one small systems in Harford County, including the Williams Mobile Home Park community water supply. The required components of this report as described in Maryland's Source Water Assessment Program (SWAP) are 1) delineation of an area that contributes water to the source, 2) identification of potential sources of contamination, and 3) determination of the susceptibility of the water supply to contamination. Recommendations for protecting the drinking water supply conclude this report.

The sources of water supply wells in Harford County are unconfined fractured-rock and unconsolidated Coastal Plain aquifers. The Williams Mobile Home Park water system, located in the Coastal Plain Region of southwestern Harford County, is currently using one well that draws water from the underlying Port Deposit Gneiss Formation. The Wellhead Protection area was delineated by the WSP using U.S. EPA's approved methods specifically designed for each source.

Point sources of contamination were identified within the assessment area from field inspections and contaminant inventory databases. The Maryland Office of Planning's 1997 land use map for Harford County was used to identify non-point sources of contamination. Figure 2bb is an aerial photograph showing potential sources of contamination within and near the Wellhead Protection Area.

The susceptibility analysis is based on a review of the existing water quality data for the water system, the presence of potential sources of contamination in the individual assessment areas, well integrity, and the inherent vulnerability of the aquifer. It was determined that the Williams Mobile Home Park water supply may be susceptible to contamination by radon, and is susceptible to volatile organic compounds, and synthetic organic compounds. The system is not susceptible to contamination by nitrates, or other inorganic and radiological compounds. The susceptibility of the water supply to microbiological contaminants could not be determined at the present time due to inconsistencies with the current data.

EXECUTIVE SUMMARY
FOUNTAIN GREEN MOBILE HOME PARK

The Maryland Department of the Environment's Water Supply Program (WSP) has conducted a Source Water Assessment for forty-one small systems in Harford County, including the Fountain Green Mobile Home Park community water supply. The required components of this report as described in Maryland's Source Water Assessment Program (SWAP) are 1) delineation of an area that contributes water to the source, 2) identification of potential sources of contamination, and 3) determination of the susceptibility of the water supply to contamination. Recommendations for protecting the drinking water supply conclude this report.

The sources of water supply wells in Harford County are unconfined fractured-rock, and unconsolidated Coastal Plain aquifers. The Fountain Green Mobile Home Park water system, located in the Piedmont Region of central Harford County, is currently using two wells that draw water from the James Run Gneiss Formation. The Wellhead Protection area was delineated by the WSP using U.S. EPA's approved methods specifically designed for each source.

No specific point sources of contamination were identified within the assessment area from field inspections and contaminant inventory databases. The Maryland Office of Planning's 1997 land use map for Harford County was used to identify non-point sources of contamination. Figure 2cc is an aerial photograph showing potential sources of contamination within and near the Wellhead Protection Area.

The susceptibility analysis is based on a review of the existing water quality data for the water system, the presence of potential sources of contamination in the individual assessment areas, well integrity, and the inherent vulnerability of the aquifer. It was determined that the Fountain Green Mobile Home Park water supply may be susceptible to contamination by radon. This water supply is not susceptible to contamination by other radiological or inorganic compounds including nitrate, volatile organic compounds, synthetic organic compounds, or microbiological contaminants.

EXECUTIVE SUMMARY
ATKINS RETREAT

The Maryland Department of the Environment's Water Supply Program (WSP) has conducted a Source Water Assessment for forty-one small systems in Harford County, including the Atkins Retreat community water supply. The required components of this report as described in Maryland's Source Water Assessment Program (SWAP) are 1) delineation of an area that contributes water to the source, 2) identification of potential sources of contamination, and 3) determination of the susceptibility of the water supply to contamination. Recommendations for protecting the drinking water supply conclude this report.

The sources of water supply wells in Harford County are unconfined fractured-rock and unconsolidated Coastal Plain aquifers. The Atkins Retreat water system, located in the Piedmont Region of northeast Harford County, is currently using one production well and two standby wells that draw water from the Baltimore Gabbro Complex. The system is in the process of constructing a new on-site septic system. The standby wells are then to be abandoned and sealed, and a new backup well is to be drilled. The Wellhead Protection area was delineated by the WSP using U.S. EPA's approved methods specifically designed for this source.

Point sources of contamination were identified within and near the assessment area from field inspections and contaminant inventory databases. The Maryland Office of Planning's 1997 land use map for Harford County was used to identify non-point sources of contamination. Figure 2h is an aerial photograph showing potential sources of contamination within and near the Wellhead Protection Area.

The susceptibility analysis is based on a review of the existing water quality data for the water system, the presence of potential sources of contamination in the individual assessment areas, well integrity, and the inherent vulnerability of the aquifer. It was determined that the Atkins Retreat water supply is susceptible to contamination by nitrate, volatile organic compounds, and synthetic organic compounds, and may be susceptible to radon. The system is not susceptible to other inorganic or radiological compounds. The susceptibility of the water supply to microbiological contaminants cannot be determined at this time due to insufficient data.

EXECUTIVE SUMMARY
QUEENS CASTLE MOBILE HOME PARK

The Maryland Department of the Environment's Water Supply Program (WSP) has conducted a Source Water Assessment for forty-one small systems in Harford County, including the Queens Castle Mobile Home Park community water supply. The required components of this report as described in Maryland's Source Water Assessment Program (SWAP) are 1) delineation of an area that contributes water to the source, 2) identification of potential sources of contamination, and 3) determination of the susceptibility of the water supply to contamination. Recommendations for protecting the drinking water supply conclude this report.

The sources of water supply wells in Harford County are unconfined fractured-rock and unconsolidated Coastal Plain aquifers. The Queens Castle Mobile Home Park water system, located in the Piedmont Region of northeast Harford County, is currently using two production wells that draw water from the Baltimore Gabbro Complex. The Wellhead Protection area was delineated by the WSP using U.S. EPA's approved methods specifically designed for this source.

Point sources of contamination were identified within and near the assessment area from field inspections and contaminant inventory databases. The Maryland Office of Planning's 1997 land use map for Harford County was used to identify non-point sources of contamination. Figure 2i is an aerial photograph showing potential sources of contamination within and near the Wellhead Protection Area.

The susceptibility analysis is based on a review of the existing water quality data for the water system, the presence of potential sources of contamination in the individual assessment areas, well integrity, and the inherent vulnerability of the aquifer. It was determined that the Queens Castle Mobile Home Park water supply is susceptible to contamination by nitrate, and volatile organic compounds. The system is not susceptible to radiological compounds, microbiological contaminants, or other inorganic compounds.

INTRODUCTION

The Water Supply Program has conducted a Source Water Assessment for 41 small water systems in Harford County. Harford County is in the northeastern part of the State, and is bounded by the Susquehanna River to the east, the Chesapeake Bay to the southeast, and Baltimore County to the west. Based on July 1998 data, the total population of Harford County is 215,900 persons (Md. Assoc. of Counties, 1999). As defined in Maryland's Source Water Assessment Plan (SWAP), "small systems" are community and non-transient non-community water systems that have a ground water appropriation permit of less than 10,000 gallons average daily use (Appendix F). All but one of the small systems in Harford County obtain their water supply from unconfined fractured rock aquifers. The wells used by the remaining system are completed in unconsolidated Coastal Plain sediments. The County lies within two physiographic provinces bounded by the Fall Line (Figure 1). Two SWAP regions were identified for this assessment based on the two physiographic provinces and their respective geologic formations. An inventory of potential contaminant sources and a susceptibility analysis was completed for each of the SWAP regions.

WELL INFORMATION

Well information for each system was obtained from the Water Supply Program's database, site visits, well completion reports, and sanitary survey inspection reports. A total of 71 wells are used by the 41 systems assessed in this report. Forty-seven of the wells were drilled after 1973 and should comply with Maryland's well construction regulations. Seventeen of the wells were drilled prior to 1973, when current regulations went into effect, and may not meet the current construction standards. Well completion report data was not available for six of the wells and Well 2 at Mountain Christian School is a dug well. Table 1 contains a summary of well information for each of the small systems.

Field surveys verified unused wells at Harford Christian School (Figure 2f) and North Bend Elementary School respectively. Unused wells that have not been properly abandoned and sealed may provide a direct route for ground water contamination to an aquifer. Systems whose wells are cased below ground surface are more likely to be subject to flooding during heavy rains. This may allow contaminated surface water to enter through the casing and ultimately reach the aquifer. Field inspections verified wells below ground surface in well vaults at the Hickory Annex Complex (Figure 2o), the J.F.K. Maintenance Facility (Figure 2ee), and the Harford Jewish Center (Figure 2t). Wells located near Storm Water Management ponds (e.g. Figure 2l) and down gradient and near parking lots are subject to storm water runoff and physical damage from vehicles. Some of the systems visited have installed posts near these wells to aid in protecting them from vehicular damage.

HYDROGEOLOGY

About 77% of the Harford County land area lies within the Piedmont physiographic province and the remaining 23% to the southeast of the Fall Line is in the Atlantic Coastal Plain province (Figure 1). The Piedmont is characterized by gently rolling hills and valleys. The Coastal Plain sediments consist of unconsolidated beds of clay, silt, sand, and gravel.

For the purposes of this report the County was separated into two SWAP regions (Figure 1). These regions represent areas where ground water flow is distinct based on the geologic formations that comprise the aquifers, and the physiographic provinces that characterize the land at the surface. With one exception, the small systems covered in this report obtain water from unconfined, fractured-rock aquifers. The wells at Father Martin Ashley draw water from the Talbot Formation, which is part of the Coastal Plain sediments of Harford County (Figure 2gg). Williams Mobile Home Park is located over Potomac Group Coastal Plain sediments (Figure 1). However, the well was completed in an underlying fractured rock aquifer known as the Port Deposit Gneiss.

Piedmont Region

The Piedmont region is composed of the crystalline bedrock formations of Precambrian to early Paleozoic age. The formations consist of a complex sequence of metasedimentary and metavolcanic rocks (e.g. schist, gneiss, phyllite, gabbro, metagabbro, amphibolite, and metagraywacke, with smaller quantities of quartzite, granite, serpentine, and slate). Ground water flow in this geologic setting is primarily from precipitation that enters the permeable weathered overburden soils and saprolite (weathered rock), and then flows through joints, bedding plane contacts, and fractures in the rock (Dingman & Ferguson, 1956). In general, the depth to the water table is shallower in stream valleys than on hilltops, and therefore, the largest producing wells are found in the lowland areas of this region.

Coastal Plain Region

The Coastal Plain Region consists of unconsolidated beds of clay, silt, sand, and gravel that dips and thickens to the southeast from the Fall Line to the Ocean (Otton & Mandle, 1984). The deposits form a wedge-shaped body of sediments of Crertaceous, Tertiary, and Quaternary age that overlie crystalline basement rock (Edwards & Hansen, 1979). The Units that comprise the Coastal Plain Sediments in Harford County are the Talbot Formation, the Potomac Group, and the Upland Gravels (Drummond & Blomquist, 1993). Water travels through the pore spaces of the sand, gravel, and clay, with the largest water supplies obtained from the permeable beds of sand and gravel. Localized clay layers may act as confining or semi-confining units in this region.

SOURCE WATER ASSESSMENT AREA DELINEATION

For ground water systems, a Wellhead Protection Area (WHPA) is considered to be the source water assessment area for the system. As defined in Maryland's SWAP,

the wellhead protection areas for "small" public water systems using an average of less than 10,000 gallons per day (gpd), in unconfined fractured-rock aquifers is a fixed radius of 1,000 feet around the well. This radius is based on calculating the land area needed to provide a yield of 10,000 gpd assuming a 400 gpd per acre recharge rate (drought year recharge conditons) and a safety factor.

For "small" public water systems whose wells are completed in unconfined Coastal Plain aquifers, a simplified variable-shape based on annual recharge was used to delineate the WHPA. This method was used for one small system in this report (Father Martin Ashley). A major flow direction of 320^0 from true north was used for each well based on the regional ground water flow. To account for uncertainties in the flow direction, the boundaries were extended 30^o to each side of the major flow lines to obtain the maximum outer limits of each WHPA. A 100-foot radius to the southeast of each well was added for additional protection. Since the wells are within about 265 feet of each other, the resulting recharge areas were combined together to form one larger wedge-shaped WHPA (Figure 2gg).

POTENTIAL SOURCES OF CONTAMINATION

Potential sources of contamination are classified as either point or non-point sources. Examples of point sources of contamination are leaking underground storage tanks, landfills, discharge permits, large-scale feeding operations, and known ground water contamination sites. These sites are generally associated with commercial or industrial facilities that use chemical substances that may, if inappropriately handled, contaminate ground water via a discrete point location. Non-point sources of contamination are associated with certain types of land use practices such as the use of pesticides, application of fertilizers or animal wastes, or septic systems that may lead to ground water contamination over a larger area.

Point Sources

Potential point sources of contamination were identified and mapped within and near the Wellhead Protection Areas of the 41 small systems. Table 2 lists the potential contaminant sites identified with their associated contaminants and Figures 2a-2gg show the locations and WHPAs. The point sources listed are identified from MDE contaminant databases and field inspections conducted by MDE employees. Potential contamination sources that were investigated include: underground storage tanks (USTs), leaking underground storage tanks (LUSTs), ground water discharge Permit sites (GWDP), Controlled Hazardous Substance Generators (CHS), pesticide dealers (PD), solid waste landfills (SWLF), and ground water contamination sites. Miscellaneous (MISC) potential contaminant sites include commercial buildings with chemical storage and vehicle maintenance facilities. The contaminants associated with the types of facilities are based on generalized categories and often the potential contaminant depends on the specific chemicals and processes being used at the individual facility. The potential contaminants for an activity may not be limited to those listed in Table 2. Potential contaminants are grouped as Volatile

Organic Compounds (VOC), Synthetic Organic Compounds (SOC), Heavy Metals (HM), Nitrate/Nitrite (NN), and Microbiological Pathogens (MP).

A summary of open cases within or near the various WHPAs from the MDE Oil Control Program can be found in Appendix A. The Oil Control Program also reported that all Harford County Public Schools have heating oil underground storage tanks that are in compliance with current State regulations. The approximate locations of the tanks are mapped and are also listed on Table 2.

Field inspections were conducted within and near the WHPAs to determine the potential of any unpermitted ground water discharges (e.g. open floor drains) to the various aquifers in Harford County. Facilities located within and near the WHPAs were inspected. The facilities that received notice of violations (NOVs) are shown in Appendix B. The current compliance status for each facility is also summarized. Reports of additional sites that were inspected are available from MDE.

Ground water discharge permits were issued to five facilities within or near the various WHPAs covered in this report. The facilities are as follows: Harford Community College, Harford Technical High School, Jarrettsville Elementary School, Fallston Volunteer Fire & Ambulance Company, and the Oak Avenue Rubble Landfill (see Table 2). Summary reports and fact sheets discussing the general permit details and requirements are found in Appendix C.

The Oak Avenue Rubble Landfill and the Union Road Dump are located within or near the WHPAs of Williams Mobile Home Park (Figure 2bb) and Beechtree Golf Club (Figure 2ff) respectively. Appendix D provides general site information and fact sheets for the two facilities. The reader may contact the specific programs within the MDE Waste Management Administration for additional information on any of the potential contaminant sites described in this report.

Non-Point Sources

The Maryland Office of Planning's 1997 Land Use / Land Cover map for Harford County was used to determine the predominant types of land use in each SWAP region (Figure 3). The land use of Harford County is approximately 39% agricultural, 34% forested, 15% residential, and 7% commercial with the remaining land uses making up the remaining 5% (Figure 3). Tables 8a and 8b break down the land uses by the two SWAP regions. Pesticides and herbicides used in agriculture are potential non-point sources of SOCs. The application of fertilizers on agricultural fields is a potential non-point source of nitrate. The use of private septic systems and lawn maintenance and landscaping activities in residential areas are potential non-point sources of nitrate and SOCs to ground water.

A review of the Maryland Office of Planning 1994 Harford County Sewerage Coverage map indicates that 7% of the County is in the existing sewer service area or areas under construction, 8% is planned for sewer service within 5 to 10 years,

and 85% of the County has no plans for sewer service (Figure 4 & Table 9). Note that these percentages include the Aberdeen Proving Ground federal facility property. Figure 3 shows that the areas with no planned service are predominantly agricultural or forested lands. Low-density residential areas are generally outside the existing sewer service area and may be a source of nitrate loading to ground water through private septic systems. Most of the small systems in this report rely on on-site disposal of domestic wastewater. Commercial or industrial land use areas outside the existing sewer service present a potential source of all types of contaminants if byproducts and wastes are not disposed of properly.

Other sources that may potentially contaminate the ground water supplies include unregulated heating oil USTs, stormwater drainage ditches, stormwater management ponds, and roads and parking lots within or near WHPAs. Roads are a concern in the event of chemical or petroleum spills, and from the over-application of salts and other chemicals used for snow removal.

WATER QUALITY DATA

Water Quality data was reviewed from the Water Supply Program's database for Safe Drinking Water Act (SDWA) contaminants. All data reported is from the finished (treated) water unless otherwise noted. Four systems (Churchville Day Care, Highland Community Association, Harford Early Learning Center, and Bethel Day Care & School) are currently providing only bottled water for human consumption and therefore are not subject to SDWA monitoring requirements except for bacteria and nitrate. Nineteen systems currently do not use water treatment. The treatment methods currently in use for the remaining 22 systems included in this report are summarized on Table 3.

In accordance with Maryland's SWAP, data from the treatment plant was compared with the Maximum Contaminant Levels (MCLs). If the monitoring data is greater than 50% of a MCL, the written assessment will describe the sources of such a contaminant and, if possible, locate the specific sources that are the cause of the elevated contaminant level. A review of the monitoring data since 1993 indicates that the water supplies for the 41 systems in this report meet the drinking water standards with a few exceptions (Table 4). Tables 5a-5d provide a list of all detections above 50% of the MCL. Results that exceeded an MCL are shown in bold. Among the inorganic compounds tested, nitrate was the predominant contaminant detected. Radon-222 was the only radiological contaminant present potentially at a level of concern. However, there is no standard that has been established for radon at this time. Volatile organic compounds have been detected in the water supplies of 15 systems. However, only two systems (Prospect Mill Elementary School, and Hickory Annex) had detects above 50% of their respective MCLs. Synthetic Organic Compounds were detected in 24 of the 41 systems from this report. However, the only SOC compound detected above 50% of its respective MCL is often found in laboratory blanks, and therefore should not represent actual water quality of the affected systems.

Inorganic Compounds (IOCs)

Nitrate was detected above the threshold level of 5 parts per million (ppm) in 22 of the 41 water systems in this report (Table 5a). Furthermore, nitrate was detected repeatedly above 5 ppm in 18 of the 22 systems. Table 5a shows the nitrate results in bold that exceeded the MCL of 10 ppm.

Other IOCs that were detected above 50% of their respective MCLs were lead, selenium, copper, and nitrite. With the exception of lead, none of these contaminants were detected in more than one system, and all were detected above the 50% MCL threshold only once for each affected system (Table 5a).

Radionuclides

There is currently no MCL for Radon-222, however EPA has proposed an MCL of 300 picocuries per Liter (pCi/L) or an alternate of 4000 pCi/L for community water systems if the State has a program to address the more significant risk from radon in indoor air. Non-transient non-community systems are not currently regulated for radionuclides, and may not be for radon, although data is available for some of these systems. Radon-222 has been detected at levels above 50% of the more conservative, proposed MCL of 300 pCi/L in 23 of the 29 systems that have tested for this contaminant (Table 5b). Eight of these systems had radon detects above 2000 pCi/L. Twelve non-transient non-community systems have no data available for this contaminant. Gross alpha and gross beta were not detected at levels of concern for any of the small systems tested for this contaminant.

Volatile Organic Compounds (VOCs)

VOCs have been detected above the 50% MCL threshold in two of the 41 systems (Table 5c). At Prospect Mill Elementary School, methylene chloride was detected once at 3 parts per billion (ppb) on 2/11/91 (Table 5c). The MCL for methylene chloride is 5 ppb. Trichloroethylene and toluene have also been detected in 6 samples collected since 1996 at levels well below their respective MCLs. The contaminant 1-1 dichloroethylene was detected above the 50% MCL threshold in 4 samples collected since 1991 at the Hickory Annex (Table 5c). Other VOCs that were detected at levels below their respective MCLs at the Hickory Annex since 1991 are: 1,1,1-trichloroethane, tetrachloroethylene, trichloroethylene, and cis-1,2-dichloroethylene. No VOCs were detected from available sampling results of 25 of the 41 systems. The VOC detects from the remaining 14 systems were well below their respective MCLs. Nine of these systems had a VOC detect in only one sample. In addition, disinfection by-products were not detected at levels of concern for any of the 41 small systems.

Methyl-tert-butyl-ether (MTBE) is an oxygenate additive that makes gasoline burn cleaner. Due to MTBE's high solubility and mobility, it can enter an aquifer and may contaminate a ground water supply. MTBE is currently an unregulated VOC that has no MCL. EPA's advisory to avoid unpleasant taste and odors is currently at 20-40 ppb. Four of the Harford County small systems have had detects of this contaminant since 1997. Forest Hill Elementary had 2 detects in 1997 of 0.8 and 1

ppb, but has been free of MTBE since that time. Hickory Annex had 4 MTBE detects of 320 ppb (3/96), 512.2 ppb (2/97), 556 ppb (1/98), and 12.3 ppb (2/01) respectively. Note that the levels have dropped considerably in the most recent sampling results. North Bend Elementary had 4 MTBE detections of 7.7 ppb (3/97), 11 ppb (5/97), 5.8 ppb (1/98), and 2.8 ppb (4/01) respectively. Crossroads Station also had 4 detections of 12.9 ppb (3/00), 11 ppb (4/00), 8.5 ppb (6/00), and 6.5 ppb (10/00). MDE currently investigates areas for potential sources when MTBE levels exceed 10 ppb.

Synthetic Organic Compounds (SOCs)

The only SOC detected above the 50% threshold was Di(2-Ethylhexyl)Phthalate (Table 5d). This contaminant is commonly found in laboratory blank samples. The SOC was detected once in five out of the six systems and has been found at 0.7 ppb in one repeat sample collected at North Harford Elementary School.

Di (2-ethylhexyl) adipate was detected once for four systems at levels well below the MCL of 400 ppb. In 1995, the contaminant was detected at Harford Center, Fair Meadows (formerly Eastern Christian College), and the J.F.K. Maintenance Facility. The SOC was detected in 1998 at North Harford Elementary School.

The three treatment plants at Harford Christian School each had one detect of decachlorobiphenyl (PCB) on 10/12/94 at 0.1 ppb. The MCL for this contaminant is 0.5 ppb.

Dalapon was detected once in September 1995 at Mountain Christian School, Prospect Mill Elementary, and Harford Technical High School at levels well below the MCL of 200 ppb.

As part of a pesticide survey conducted by MDE in March 1994, raw water samples were collected at North Bend Elementary School Wells 1, 2, and 3. The results showed atrazine levels of 0.92 ppb, 0.25 ppb, and 0.3 ppb respectively. Repeat sampling in October 1994 and June 1998 showed atrazine levels of 0.86 ppb and 0.59 ppb respectively. The average of all the positive samples is 0.58 ppb. Atrazine has an MCL of 3 ppb.

Pentachlorophenol and 2,4-D were detected once in October 2000 at the Father Martin Ashley Facility. The results were well below their respective MCLs of 1 and 70 ppb.

Microbiological Contaminants

Ground water under the direct influence of surface water (GWUDI) testing was conducted for 4 of the 6 small community systems and one small non-transient non-community system in Harford County. All results were negative for the presence of total and fecal coliform bacteria (Table 5e). The remaining 36 systems have not yet been evaluated for surface water influence, and therefore do not have GWUDI raw water bacteriological data.

All of the systems do, however, have either monthly or quarterly routine bacteriological samples that were collected as required by the Safe Drinking Water Act (Table 6). These samples are generally collected from finished (treated) water, which may not be indicative of the source water conditions. Thirty-five of the systems have had no positive routine bacteriological samples in all samples collected since 1996. Six systems had positive coliform bacteria results and three of these systems have had positive bacteria results in more than one routine sample. Four of the six systems that have had positive bacteria results do not use disinfection treatment and therefore the results may be representative of raw water. The remaining two systems that use chlorine for disinfection have had only one positive occurrence of bacteria.

Fieldwork for a cooperative study between the USGS and MDE was completed in the year 2000 regarding viral contamination of ground water in fractured bedrock aquifers in Baltimore and Harford Counties. As part of the study, raw water testing for viral contamination was conducted for 20 of the 41 systems from this report (Table 7). Preliminary test results show no total culturable viruses detected for any of the systems tested from this report (Table 7). However, the results for Dublin Elementary School show positive detects of E-coli (fecal contamination), F+coliphage, and B fragills phages (Table 7). Positive results for Enterococci were found at the Clear View and Williams Mobile Home Parks respectively. Eight of the systems tested including Dublin Elementary and Clear View Mobile Home Park had positive total coliform results (Table 7).

SUSCEPTIBILITY ANALYSIS

All of the wells serving the small water systems included in this report draw water from unconfined aquifers. In general, wells in unconfined aquifers are susceptible to contamination from activities on the land surface that occur within the wellhead protection areas. However, this vulnerability will vary based on the two hydrogeologic regions defined in this report. For example, the wells that are located in the Coastal Plain region may be less vulnerable to activity on the land surface due to presence of localized confining clay layers overlying the aquifer that may inhibit the infiltration of contaminants from entering the water supply. The susceptibility analysis is conducted in two distinct parts. First, the susceptibility for each of the SWAP regions is discussed. Secondly, the susceptibility of the individual water supplies to each group of contaminants has been completed based on the following criteria: 1) the presence of potential contaminant sources within the WHPA, 2) water quality data, 3) well integrity 4) the aquifer conditions and their SWAP region. Table's 10a-e summarizes the susceptibility of each of the 41 systems covered in this report to each of the groups of contaminants.

Piedmont Region

Ground water in this geologic setting comes from precipitation that passes through porous and permeable weathered overburden soil and saprolite and then flows in different directions through joints and fractures in the rock. Saprolite and overlying weathered soils serve as a natural filter and protective barrier for properly constructed wells whose casing is extended to competent rock and properly encased in grout. Properly constructed wells with no potential sources of contamination in their WHPAs should be well protected from contamination. According to the Harford County 1997 Land Use Map, 34% of the County is forested. Systems whose recharge areas are within forested lands should be better protected from contamination. However, localized land use will play a role in a developed area. The most common threats of contamination in both regions of Harford County are from the over-application of fertilizers on agricultural fields, and effluent from on-site septic systems. Both contribute to nitrate loading in ground water. Another common threat in the Piedmont Region is stormwater runoff. Wells in fractured-rock aquifers, and especially in the Piedmont Region, are commonly sited in low-lying areas where ground water is likely to be available. This may lead to flooding during heavy rains.

Coastal Plain Region

The Coastal Plain Region consists of unconsolidated layers of clay, silt, sand, and gravel, which thicken from the Fall Line to the Ocean (Figure 4). Precipitation flows through the permeable sand and gravel layers originating from outcrop areas and from overlying porous soils. Clay layers within the unconsolidated sediments may act as confining or semi-confining units that may inhibit the infiltration of contaminants to an aquifer. Properly constructed wells whose casing is adequately encased with grout, and with no potential sources of contamination in their WHPAs should be well protected from contamination in this region. Father Martin Ashley is the only system in this report that utilizes a Coastal Plain aquifer. The wells for this system are completed in the Talbot Formation, which is unconfined in this area. Other systems that border or are near the Fall Line had their wells drilled through the Coastal Plain sediments into fractured rock aquifers. Well logs indicate that clay layers are present in the overlying Coastal Plain sediments for each of these bordering systems.

Inorganic Compounds

Nitrate is present in the wells of 22 systems at 5 ppm or greater (Table 5a). The MCL for nitrate is 10 ppm. Some of the systems, including a number of the Harford County Schools, have regularly exceeded the established MCL (Table 5a in bold). Sources of nitrate can generally be traced back to land use. Fertilizer applied to agricultural fields and residential lawns, animal waste in pasturelands, and effluent from residential and commercial septic systems are all non-point sources of nitrate loading in ground water. According to 1997 land use, thirty-five of the forty-one systems in this report have cropland within their respective WHPAs (Figure 3). In addition, 36 of the systems are in areas with no planned public sewerage service based on the 1994 Harford County Sewerage Coverage Map (Figure 4). A new on-

site septic system is currently in the process of being installed at Atkins Retreat Mobile Home Park since the current system has failed.

Thirty of the systems in this report **are** susceptible to nitrate due to the levels and persistence of this contaminant found, the vulnerability of the unconfined aquifers to land activity, and the presence of nitrate sources in their wellhead protection areas. Based on available sampling data reported since 1993, ten of the systems were determined **not** susceptible to nitrate contamination. James Run Christian Academy did not have sufficient nitrate data available to make a susceptibility determination at this time. A nitrate susceptibility logic chart is outlined for each system in Table 10a.

Iron is a naturally occurring element that is present in aquifer material at Fountain Green Mobile Home Park, Fair Meadows, Mountain Christian School, and Beechtree Golf Club. Excessive iron levels can cause taste, color, and odor problems in drinking water as well as iron bacteria build-up around well screens. The secondary MCL for iron is 0.3 ppm. The above four systems have installed treatment for iron removal. Mountain Christian School also treats for high levels of manganese in their wells.

Based on available water quality data, all of the systems in this report were determined **not** susceptible to other regulated inorganic compounds other than nitrate.

Radionuclides

An MCL for radon-222 has not been adopted yet for Maryland. However, the U.S. EPA is proposing an MCL of 300 pCi/L or an alternative of 4000 pCi/L for drinking water if the State has a program to reduce the more significant risk from radon in indoor air, which is the primary health concern. Radon is present in 29 of the 30 water systems that have tested for this contaminant. Eleven systems do not have radiological results available. Twenty-three water systems have radon levels above 50% of the more conservative proposed MCL of 300 pCi/L. The source of radon in ground water can be traced back to the natural occurrence of uranium in rocks. Radon is prevalent in ground water throughout the Piedmont Region of Harford County due to radioactive decay of uranium bearing minerals in the bedrock (Bolton, 1996). The health effects and risks of radon in drinking water are reviewed in the Committee on Health Risks of Exposure to Radon BEIRVI (1999) report. The EPA also has information on proposed regulations for radon in indoor air and drinking water on their web site (http://www.epa.gov/safewater/radon.html). The systems that may be susceptible to radon-222 based on the more conservative MCL of 300 pCi/L are shown on Table 10b.

If the higher MCL of 4000 pCi/L is adopted, the following systems from Table 10b will be susceptible to radon: Hart Heritage, Forest Hill Elementary School. Harford Christian School, Jarrettsville Elementary School, North Harford Elementary

School, North Harford Middle School, Harford Technical High School, and Harford Early Learning Center.

The systems that have radon results that are less than 50% of the more conservative MCL and therefore are **not** susceptible to this contaminant are: Queens Castle Mobile Home Park, Dublin Elementary School, Fallston Pre-Kindergarten, and the J.F.K. Maintenance Facility. Churchville and Dublin Elementary Schools, and Fallston Middle School have radon results close to the150 pCi/L limit. Therefore, the data for these water supplies is insufficient to determine their susceptibility to radon at this time (Table 10b). Eleven systems outlined in Table 10b do not have radon results available and their susceptibility to this contaminant also cannot be determined at this time.

Other radiological contaminants were not detected at levels of concern in any of the water supply systems covered in this report. Therefore, the 41 systems are **not** susceptible to radiological contaminants other than radon-222.

Volatile Organic Compounds

Incidents of ground water contamination by VOCs are known to exist within or near the wellhead protection areas for some of the systems included in this report. The open cases that are still being investigated by the MDE Oil Control Program are summarized in Appendix A. Sites that have undertaken the proper corrective actions (e.g. removal of USTs and surrounding contaminated soils, repair of leaky connection fittings etc.) and where monitoring well sampling results show no VOC detects are no longer considered a potential ground water threat. Such cases have since been closed as determined by the MDE Oil Control Program.

Hickory Annex is a facility that stores, maintains, and refuels buses used to transport Harford County public school students. The system is served by one well located in a pit that is near a number of potential VOC threats (Figure 2o). This facility and neighboring gas stations have been investigated for LUSTs. The MDE Oil Control Program has ordered this facility to stop using their well and to connect to another water system because of a LUST (Figure 2o). The system is currently using bottled water due to VOC contamination in the well. A field inspection of this well also revealed that the casing extension was not secure, and that the plumbing in the pit was under water. MTBE was also detected at high levels from 1996 to present (see Water Quality section & Appendix A).

VOCs were detected in 7 samples collected since 1991 at Prospect Mill Elementary School (see Water Quality section). No known VOC contaminant sources are located within this WHPA based on field surveys and database reviews (Figure 2q). Possible VOC sources may be unregulated leaking residential heating oil USTS or a former UST serving the school.

Dichloropropane and dichlorobenzene were detected in 3 rounds of sampling data since 1991 at the Harford Christian School. According to the Oil Control Program,

USTS were removed at this facility with no reported ground water or soil contamination concerns. Located upgradient of the supply wells is a maintenance bus garage that serves the school. An automotive garage located within the WHPA is another other possible source of VOC contamination (Figure 2f).

Tetrachloroethylene and 1,2-dichloroethane were detected in 4 rounds of sampling data since 1991 at Forest Hill Elementary School. These compounds in ground water are typically associated with improper disposal of dry cleaning solvent. MTBE was also detected at low levels in 1997. The Oil Control Program reported that ground water contamination occurred from a LUST of a former gas station from the 1920's (now a Sunoco Station). The LUST was removed and recent monitoring well results have shown no further ground water concerns (see Appendix A).

Toluene and MTBE were detected from four rounds of sampling since 1995 at North Bend Elementary School. According to the Oil Control Program, an UST was removed with no reported problems. A new UST was installed that complies with current State regulations. There are no other known sources of VOC contamination located within the WHPA as shown in Figure 2l.

A known source of MTBE contamination exists at the 7-Eleven/Citgo Gas station near the WHPA of the James Run Christian Academy (Figure 2v). Old tanks were removed and the MDE Oil Control Program is currently monitoring the site. Results from two rounds of sampling completed in February and April 2001 at the James Run Christian Academy have shown no VOC detects.

MTBE was also recently detected in the wells at Crossroads Station (see Water Quality section). A possible source is from the Exxon Gas Station located across the street (Figure 2u). The Exxon was ordered to sample all businesses and residences' wells located near the intersection for VOC contaminants. Additional information for this open case can be found in Appendix A.

The predominant sources of VOCs are point sources of contamination outlined in Table 2. Some of the systems that have potential VOC sources within or near their respective wellhead protection areas have not had any VOC detections in monitoring samples. However, due to the vulnerable nature of unconfined aquifers coupled with a potential source, twenty-five of the systems in this report **are** considered susceptible to VOCs as outlined in Table 10c. Fifteen systems do not have potential sources within their respective WHPAs and therefore are **not** susceptible to VOCs (Table 10c). Helping Hands Ministries and Day Care do not have VOC results available and therefore its susceptibility to this contaminant cannot be determined at this time.

Synthetic Organic Compounds

The sources of SOCs to ground water include point and non-point sources such as pesticide application. Potential point sources of SOCs have been identified within or near the wellhead protection areas and are shown on Figures 2h, 2m, 2o, 2p, 2r, 2v,

2bb, and 2ff. Non-point sources include pesticides applied to agricultural fields, golf courses, and residential lawns. Thirty-five of the forty-one systems in this report have cropland making up some portion of the land use within their respective WHPAs. Figures 2e, 2ff, and 2gg show the golf courses that are within the wellhead protection areas of 3 systems included in this report. The SOC potential contaminant sources are also listed on Table 2. Pesticides and chemicals used on residential and commercial lawns and gardens are also a potential threat. However, typical lawn maintenance herbicides are very biodegradable and should not pose a significant SOC risk if applied properly.

The only contaminant in this group detected above 50% of the MCL was di(2-ethylhexyl) phthalate, which can be attributed to its presence in the laboratory environment (Table 5d). Other SOCs that were detected at levels well below their respective MCLs are described in the Water Quality section. Di(2-ethylhexyl) adipate is used in synthetic rubber, food packaging, and cosmetics. PCBs are found in coolant oils from electrical transformers, runoff from landfills, and are used in plasticizers. Dalapon is a herbicide used on cropland, lawns and road/railway lines. Pentachlorophenol is used as a wood preservative, and is found in cooling tower waste. Atrazine and 2,4-D are herbicides used on row crops, and lawns.

Based on the potential contaminant sources within or near the respective WHPAs, available water quality data, and the vulnerability of unconfined aquifers to contamination, thirteen of the systems in this report **are** considered susceptible to SOCs as outlined in Table 10d. Twenty-four systems were determined **not** susceptible to SOC contamination (Table 10d). This indicates that pesticides are not being over applied to cropland in these areas. Bethel Day Care & School, Harford Jewish Center, Helping Hands Ministries and Day Care, and Beechtree Golf Club do not have SOC results available and therefore their susceptibility to this contaminant cannot be determined at this time.

Microbiological Contaminants

Sources of microbiological pathogens in surface water are improperly treated wastewater (discharge to surface water or failing septic systems), waste material from mammals, and urban runoff in developed areas. Ground water is generally thought to be not susceptible to contamination by pathogenic microorganisms due to the natural filtration ability of soil and aquifer material. The exceptions to this are 1) wells that are classified as "Ground water under the direct influence of surface water" (GWUDI) and 2) wells that may be sensitive to viruses due to a short travel time of water from the source of viral contamination to the well.

Three community water systems and one non-transient-non-community water system have tested all of their supply wells for sensitivity to surface water. Clear View Mobile Home Park Wells 1 and 2 have also been tested for GWUDI. However, Well 3 for this system has not been completed to date. The systems that were tested for surface water influence are shown on Table 5e.

Six of the forty-one systems from this report have had positive results in at least one sample from routine bacteriological testing conducted since 1996. Four of the six systems do not use disinfection for treatment and therefore the results may be indicative of raw water (Table 6). This does not imply however that the wells of these four systems are susceptible to protozoa or bacteriological contaminants from surface water. Storage tanks and distribution systems may also become contaminated with total coliform bacteria despite raw water being free of bacteria. Therefore, the remaining 36 systems from this report must be tested for surface water influence in order to properly determine their susceptibility to microbial contamination.

The well at Helping Hands Ministries and Day Care is located down gradient and at the back edge of a parking lot at the lowest elevation of the property (Figure 2s). The ground around the well is depressed, and the casing was flush with the ground surface. Surficial storm water could easily travel down gradient over the parking lot and enter the well. This scenario is the likely cause of the positive bacteriological results at this well (Table 6). The casing of the well has since been extended to approximately 18 inches above ground surface. The latest sampling results show no bacteriological detects.

Based on preliminary results from a viral contamination study completed by the USGS, total coliform and Enterococci were detected in raw water results from Clear View Mobile Home Park. Positive total coliform results were also detected at seven other systems included in this report (Table 7). Total coliform may be an indicator of viral contaminants, as these are much smaller, can survive longer, and may not be as effectively filtered by aquifer material as protozoans or bacteria. Based on the study, no cultural viruses were detected in any of the twenty systems tested. However, the preliminary results indicate that the wells at Dublin Elementary School **may be** susceptible to viruses due to the presence of viral indicators and positive gene probe results (Table 7). Well 1 at Dublin Elementary was drilled in 1958; long before the current well construction regulations went into effect. It is unlikely that the annular space around the well casing was properly grouted as per current standards. Therefore, the integrity of the wells may have contributed to the positive viral test results. In addition, the well was only drilled to a depth of 65 feet (Table 1b). The school may want to consider properly abandoning and sealing the old wells and exploring for new water sources or deepening and upgrading the existing wells to current well construction standards. Based on the results of the virus study, Dublin Elementary School is considered "high risk" when evaluated for GWUDI and will therefore be required to complete more extensive raw water sampling to determine its susceptibility.

The virus results also indicate that additional GWUDI testing may be required at Clear View and Williams Mobile Home Parks before a final decision on susceptibility to microbiological pathogens can be made. Preliminary results from the mobile home parks show positive Enterococci results, which is an indicator of

fecal strep (Table 7). Additional information regarding the USGS virus study can be found in Appendix E.

Thirty-six systems from this report have not completed GWUDI testing for their supply wells to date. Based on available sampling data, the susceptibility analysis for microbiological pathogens is summarized in Table 10e. The susceptibility determinations listed in Table 10e will need to be revised after GWUDI data for the remaining systems becomes available.

MANAGEMENT OF THE SOURCE WATER ASSESSMENT AREA

With the information contained in this report, the individual water system owners as well as the Harford County government have a basis for better understanding the risks to drinking water supplies for smaller community and non-transient-non-community ground water systems. Being aware of the areas delineated for wellhead protection, knowing potential contaminant sources, evaluating future development, working with agricultural producers and soil conservation agencies, and effective outreach and education are examples of management practices that will help protect each water supply. Specific management recommendations for consideration are listed below. The following recommendations are intended for 1) a countywide wellhead protection effort, and 2) for individual water systems.

RECOMMENDATIONS FOR COUNTY AGENCIES:

Form a Local Planning Team

- The report showed a significant number of County-owned schools, and several private schools with elevated nitrate levels. It would seem logical for the School System to take a leadership role in developing a plan to promote the protection of these important water supplies. County Health and Planning Departments along with agricultural interests would be logical partners in this effort. In addition, local businesses, developers, and residents located within and near wellhead protection areas should also take an active role in addressing the protection of the water supply.
- A management strategy adopted by the county should be consistent with the level of resources available for implementation. Harford County has drafted a Wellhead Protection Overlay district to manage land use and development activities at the Perryman Well Field. Perryman may act as a model for implementation of wellhead protection on a countywide basis. MDE is currently reviewing the ordinance. Funding is also available through MDE for wellhead protection programs.

Public Awareness and Outreach

- Conduct education outreach to the facilities listed in Table 2. Important topics include: (a) minimizing the risk of contamination from all in-ground tanks and lines (b) inspection of all waste streams that may go into dry wells, septic tanks or other ground water discharge points, (c) reporting chemical and petroleum spills, and (d) proper material and chemical storage practices.

- Informing property owners and businesses located within WHPAs that their activities could have serious impacts on the respective water supplies.
- Road signs at the boundaries of wellhead protection areas are an effective way of making the public aware of protecting their source of water supply, and to help in the event of spill notification and response.

Planning/ New Development

- Plans for new commercial development should consider placement of water supply wells a priority for such facilities as gas stations, and other users of hazardous materials. Additionally, ensuring the adequacy of the well to supply water for the facilities in the long term will ensure that additional wells in less desirable locations are not necessary.
- A Countywide strategy for addressing water quality protection issues for small systems deserves consideration. A cooperative effort is needed to minimize future risks to contamination beyond minimum setback requirements.

Land Acquisition/Easements

- The availability of loans for purchasing land or easements for the purpose of protecting designated wellhead protection areas is available from MDE for community water systems and for non-transient non-community water systems owned by non-profit organizations. Loans are offered at zero percent interest and zero points.

Contingency Plan

- Develop a spill response plan in concert with the Fire Departments and other emergency response personnel.

RECOMMENDATIONS FOR INDIVIDUAL SYSTEMS:

Public Awareness and Outreach

- The Consumer Confidence Report should list that this report is available to the general public by contacting MDE.

Planning/New Development

- MDE recommends that water supply system owners within Harford County should encourage the County to evaluate applying a wellhead protection ordinance to smaller systems.

Cooperative Efforts with Other Agencies

- Systems that have cropland making up part of their wellhead protection areas can request the assistance of the University of Maryland Agricultural Extension Service and the Soil Conservation Service to work with farmers to adopt Best Management Practices (BMP's) for cropland located in their WHPA. The school systems may want to take the lead in working with these agencies.
- The systems may also encourage farmers to participate in the New Conservation Reserve Program (CREP) applicable to the cropland located within wellhead

protection areas. Government funding is available to qualified farmers equal to the cost and financial benefit of farming the area. The Natural Resources Conservation Service is responsible for determining the environmental benefits of each acre offered for participation.

Monitoring

- Systems should continue to monitor for contaminants that have been previously detected to ensure public health protection.
- Systems whose wellhead protection areas are within or near open LUST cases should stay in contact with the MDE Oil Control Program for the latest status and updates of these cases.
- Systems should continue to monitor for all Safe Drinking Water Act contaminants as required by MDE.
- Annual raw water sampling for microbiological contaminants is a good check on well integrity.

Contingency Plan

- All water system owners should have a Contingency Plan for their water system. COMAR 26.04.01.22 requires all community water systems to prepare and submit for approval a plan for providing a safe and adequate drinking water supply under emergency conditions.

Contaminant Source Inventory Updates/ Inspections

- Water system owners should conduct its own survey of their wellhead protection area to ensure that there are no additional potential sources of contamination. Updated records of new development within the WHPA should be maintained.
- Periodic inspections and a regular maintenance program for the supply wells will ensure their integrity and protect the aquifer from contamination.
- Some of the systems in this report have unused wells that are no longer connected to the distribution. Such wells should be abandoned and sealed as per current State regulations to prevent contamination to the aquifer.
- Systems that have wells that are below ground surface should consider extending the casing to prevent surface waters from entering the well. In addition, depressions around wells should be properly filled and graded to prevent surface water ponding and to allow for proper drainage away from the wells.

Changes in Use

- Water system owners are required to notify the MDE Water Supply Program if new wells are to be added or if they wish to increase their water useage. Drilling a new well outside the current wellhead protection area would modify the area; therefore the Water Supply Program should be contacted if a new well is being proposed.

REFERENCES

Bolton, D.W., 1996, Network Description and Initial Water-Quality Data from a Statewide Ground-Water-Quality Network in Maryland: Maryland Geological Survey Report of Investigations No. 60, 167 pp.

Committee on Health Risks of Exposure to Radon, 1999, Health Effects of Exposure to Radon: BEIR VI, (http://www.epa.gov/iaq/radon/beirvi1.html).

Dingman, R.J., Ferguson, H.F., and Martin, R.O.R., 1956, The Water Resources of Baltimore and Harford Counties: Maryland Department of Geology, Mines and Water Resources Bulletin 17, 233 p.

Drummond, D.D., and Blomquist, J.D., 1993, Hydrogeology, Water Supply Potential, and Water Quality of the Coastal Plain Aquifers of Harford County, Maryland: Maryland Geological Survey Report of Investigations No. 58, 160 p.

Edwards, J.E., Jr., and Hansen, H.J., 1979, New Data Bearing on the Structural Significance of the Upper Chesapeake Bay Magnetic Anamoly: Maryland Geological Survey Report of Investigations 30, 36 p.

Maryland Association of Counties, 1999/2000 Directory of County Officials, 412 pp

Maryland Department of the Environment, Water Supply Program, 1999, Maryland's Source Water Assessment Plan, 36 p.

Nutter L.J., 1977, Ground-Water Resources of Harford County Maryland: Maryland Geological Survey Bulletin No. 32, 44 p.

Nutter, L.J., and Otton, E.G., 1969, Ground-Water Occurrence in the Maryland Piedmont: Maryland Geological Survey Report of Investigations 10, 56 p.

Otton, E.G., and Mandle, R.J., 1984, Hydrogeology of the Upper Chesapeake Bay Area, Maryland, with Emphasis on Aquifers in the Potomac Group: Maryland Geological Survey Report of Investigations No. 39, 62 p.

U.S. Environmental Protection Agency, 1991, Delineation of Wellhead Protection Areas in Fractured Rocks: Office of Ground Water and Drinking Water, EPA/570/9-91-009, 144 pp.

USGS and MDE, 2000, Cooperative Study Regarding the Viral Contamination of Ground Water in Fractured Bedrock Aquifers in Baltimore & Harford Counties.

OTHER SOURCES OF DATA

Water Appropriation and Use Permits
Public Water Supply Sanitary Survey Inspection Reports
MDE Water Supply Program Oracle® Database
MDE Waste Management Sites Database
Department of Natural Resources Digital Orthophoto Quarter Quadrangles
USGS Topographic 7.5-Minute Quadrangles
Maryland Office of Planning 1997 Harford County Land Use Map
Maryland Office of Planning 1994 Harford County Sewer Map

TABLES

PWSID [1]	PWS NAME	PLANT ID [2]	SRC. ID [3]	USE CODE [4]	SOURCE NAME	WAPID [5]	AVE. AMT. (gpd)	WELL PERMIT NO.	WELL DEPTH (ft)	CASING DEPTH (ft)	YEAR DRILLED	AQUIFER
0120021	HART HERITAGE	01	01	P	HART HERITAGE 1	HA1995G060	4000	HA940971	225	100	1996	METAGRAYWACKE WISSAHICKON
0120204	CLEAR VIEW M.H.P.	01	01	P	CLEARVIEW 1	HA1973G002	4700	HA812350	250	50	1985	BALTO. GABBRO COMPLEX
0120204	CLEAR VIEW M.H.P.	01	02	P	CLEARVIEW2	HA1973G002	4700	HA812404	350	n/a	1985	BALTO. GABBRO COMPLEX
0120204	CLEAR VIEW M.H.P.	01	03	P	CLEARVIEW 3	HA1973G002	4700	n/a	n/a	n/a	n/a	BALTO. GABBRO COMPLEX
0120207	WILLIAMS M.H.P.	01	01	P	WILLIAMS TP	HA1985G040	5000	HA812276	300	144	1986	PORT DEPOSIT GNEISS
0120208	FOUNTAIN GREEN M.H.P.	01	02	P	FOUNTAIN GREEN 1	HA1969G012	4400	HA812346	400	40	1985	JAMES RUN GNEISS
0120208	FOUNTAIN GREEN M.H.P.	01	03	P	FOUNTAIN GREEN 2	HA1969G012	4400	HA920888	200	45	1994	JAMES RUN GNEISS
0120210	ATKINS RETREAT	01	01	P	ATKINS 1	HA1973G002	4700	n/a	n/a	n/a	n/a	BALTO. GABBRO COMPLEX
0120210	ATKINS RETREAT	02	02	S	ATKINS 2	HA1973G002	4700	HA730356	250	46	1972	BALTO. GABBRO COMPLEX
0120210	ATKINS RETREAT	02	03	S	ATKINS 3	HA1973G002	4700	HA940717	325	34	1995	BALTO. GABBRO COMPLEX
0120213	QUEENS CASTLE M.H.P.	01	01	P	QUEENS CASTLE 1	HA1971G013	5600	HA660404	76	48	1965	BALTO. GABBRO COMPLEX
0120213	QUEENS CASTLE M.H.P.	01	02	P	QUEENS CASTLE 2	HA1971G013	5600	HA710219	97	69	1971	BALTO. GABBRO COMPLEX

Table 1a. Well Information for Community Water Supply Wells

[1] PWSID = Public Water System Identification

[2] PLANT ID = Plant Identification. The water point of entry to a system from each well

[3] SRC. ID = Source Identification. Each well is considered a unique water source

[4] P = Production, S = Standby, U = Unused

[5] WAPID = Water Appropriation Permit Identification

PWSID [1]	PWS NAME	PLANT ID [2]	SRC. ID [3]	USE CODE [4]	SOURCE NAME	WAPID [5]	AVE. AMT. (gpd)	WELL PERMIT NO.	WELL DEPTH (ft)	CASING DEPTH (ft)	YEAR DRILLED	AQUIFER
1120004	CHURCHVILLE DAY CARE CENTER	01	01	P	CHURCHVILLE DAY CARE CTRE.	n/a	1250	n/a	150	50	n/a	PORT DEPOSIT GNEISS
1120005	CHURCHVILLE ELEMENTARY	01	01	P	CHURCHVILLE ELEM. SCHOOL	HA1999G005	5000	HA012989	39	24	1953	JAMES RUN GNEISS
1120005	CHURCHVILLE ELEMENTARY	01	02	P	WELL 2	HA1999G005	5000	n/a	n/a	n/a	n/a	JAMES RUN GNEISS
1120006	DARLINGTON ELEMENTARY	01	01	P	DARLINGTON ELEM. SCHOOL	HA1999G003	3000	HA942744	420	30	1999	QTZ GABBR0 / QTZ DIORITE GNEISS
1120006	DARLINGTON ELEMENTARY	01	02	S	BACKUP WELL	HA1999G003	3000	n/a	n/a	n/a	n/a	QTZ GABBR0 / QTZ DIORITE GNEISS
1120007	DUBLIN ELEMENTARY	01	01	P	DUBLIN ELEM. SCHOOL	HA1999G002	4500	HA031213	65	55	1958	BALTO. GABBRO COMPLEX
1120007	DUBLIN ELEMENTARY	01	02	P	WELL 2	HA1999G002	4500	n/a	n/a	n/a	n/a	BALTO. GABBRO COMPLEX
1120008	FAIR MEADOWS	01	02	S	EASTERN CHRISTIAN COLL.	HA1965G011	6000	HA730408	225	21	1972	JAMES RUN GNEISS
1120008	FAIR MEADOWS	01	04	P	NEW WELL	HA1965G011	6000	HA920432	390	60	1992	JAMES RUN GNEISS
1120010	FALLSTON CHILD CARE CENTER	01	01	P	FALLSTON CHILD CARE CENTER	HA1965G016	1500	HA650746	162	75	1965	LWR PELITIC SCHIST WISSAHICKON
1120010	FALLSTON CHILD CARE CENTER	01	02	P	WELL 2	HA1965G016	1500	HA943837	500	113	2000	LWR PELITIC SCHIST WISSAHICKON
1120011	FALLSTON PRE-KINDERGARTEN	01	01	P	FALLSTON PRE-KINDERGARTEN	HA1986G020	300	HA812814	205	22	1986	BALTO. GABBRO COMPLEX
1120014	FOREST HILL ELEMENTARY	01	01	P	FOREST HILL ES 1	HA1989G071	6000	HA880602	400	72	1989	LWR PELITIC SCHIST WISSAHICKON
1120014	FOREST HILL ELEMENTARY	01	02	P	FOREST HILL ES 2	HA1989G071	6000	HA943593	425	80	2000	LWR PELITIC SCHIST WISSAHICKON
1120016	HARFORD CENTER INC.	01	01	P	HARFORD CENTER INC.	HA1971G004	800	HA710055	52	34	1970	METAGABBRO AND AMPHIBOLITE
1120017	HARFORD CHRISTIAN SCHOOL	01	01	U	HARFORD CHRISTIAN WELL 1	HA1979G025	5000	HA814027	300	55	1987	BOULDER GNEISS WISSAHICKON FRM
1120017	HARFORD CHRISTIAN SCHOOL	03	02	U	HARFORD CHRISTIAN WELL3B	HA1979G025	5000	HA736739	314	22	1981	BOULDER GNEISS WISSAHICKON FRM
1120017	HARFORD CHRISTIAN SCHOOL	02	03	P	HARFORD CHRISTIAN WELL 2	HA1979G025	5000	HA735872	199	42	1979	BOULDER GNEISS WISSAHICKON FRM

Table 1b (continued). Well Information for Non-Transient Water Supply Wells

PWSID [1]	PWS NAME	PLANT ID [2]	SRC. ID [3]	USE CODE [4]	SOURCE NAME	WAPID [5]	AVE. AMT. (gpd)	WELL PERMIT NO.	WELL DEPTH (ft)	CASING DEPTH (ft)	YEAR DRILLED	AQUIFER
1120017	HARFORD CHRISTIAN SCHOOL	01	05	U	WELL 5	HA1979G025	5000	n/a	n/a	n/a	n/a	BOULDER GNEISS WISSAHICKON FRM
1120023	JARRETTSVILLE ELEMENTARY	01	02	P	REPLACEMENT WELL (1997)	HA1999G004	8500	HA941818	250	39	1997	LWR PELITIC SCHIST WISSAHICKON
1120023	JARRETTSVILLE ELEMENTARY	01	03	S	WELL 1	HA1999G004	8500	HA880406	200	62	1989	LWR PELITIC SCHIST WISSAHICKON
1120024	JOHN ARCHER SCHOOL	01	01	P	JOHN ARCHER SCHOOL 1	HA1971G011	2900	HA710167	200	77	1970	PORT DEPOSIT GNEISS
1120024	JOHN ARCHER SCHOOL	01	02	P	JOHN ARCHER SCHOOL 2	HA1971G011	2900	HA813955	200	80	1987	PORT DEPOSIT GNEISS
1120026	MOUNTAIN CHRISTIAN SCHOOL	01	01	P	MTN CHRISTIAN DRILLED WELL	HA1976G033	3400	HA733342	450	116	1976	PORT DEPOSIT GNEISS
1120026	MOUNTAIN CHRISTIAN SCHOOL	02	02	P	MTN CHRISTIAN SCH DUG WELL	HA1976G033	3400		16			PORT DEPOSIT GNEISS
1120026	MOUNTAIN CHRISTIAN SCHOOL	02	03	S	WELL 3	HA1976G033	3400	HA943620	475	50	2000	PORT DEPOSIT GNEISS
1120026	MOUNTAIN CHRISTIAN SCHOOL	02	04	S	WELL 4	HA1976G033	3400	HA944033	600	49	2000	PORT DEPOSIT GNEISS
1120027	NORRISVILLE ELEMENTARY	01	02	P	WELL 2 (NEW)	HA1966G021	2300	HA943349	250	80	1999	UP. PELITIC SCHIST WISSAHICKON
1120027	NORRISVILLE ELEMENTARY	01	03	S	WELL 1	HA1966G021	2300	n/a	97	86	1966	UP. PELITIC SCHIST WISSAHICKON
1120028	NORTH HARFORD ELEMENTARY	01	01	P	NORTH HARFORD ELEM. SCHOOL	HA1999G001	6000	HA736786	250	21	1981	METAGRAYWACKE WISSAHICKON FO
1120030	NORTH HARFORD MIDDLE SCHOOL	01	03	P	WELL 3	HA1974G055	10000	HA736663	100	62	1981	METAGRAYWACKE WISSAHICKON FO
1120031	HIGHLAND COMMUNITY ASSOC.	01	01	P	HIGHLAND COMM. ASSOC.	HA1975G010	200	HA009807	192	84	1952	METAGRAYWACKE WISSAHICKON FO
1120032	PROSPECT MILL ELEMENTARY	01	01	P	PROSPECT MILL ELEM. SCHOOL	HA1972G013	8700	HA720910	250	41	1972	PORT DEPOSIT GNEISS
1120033	SALEM LUTHERAN CHILD CARE CENTER	01	01	P	CHURCH WELL	HA1968G013	1000	HA680618	251	60	1968	LWR PELITIC SCHIST WISSAHICKON
1120033	SALEM LUTHERAN CHILD CARE CENTER	01	02	S	PARSONAGE WELL	HA1968G013	1000	n/a	150	n/a	1968	LWR PELITIC SCHIST WISSAHICKON

Table 1b (continued). Well Information for Non-Transient Water Supply Wells

PWSID [1]	PWS NAME	PLANT ID [2]	SRC. ID [3]	USE CODE [4]	SOURCE NAME	WAPID [5]	AVE. AMT. (gpd)	WELL PERMIT NO.	WELL DEPTH (ft)	CASING DEPTH (ft)	YEAR DRILLED	AQUIFER
1120034	STONEWALL DAY CARE CENTER #2	01	01	P	STONEWALL DAY CARE WELL 1	HA1989G084	3200	HA810477	150	60	1983	BALTO. GABBRO COMPLEX
1120034	STONEWALL DAY CARE CENTER #2	01	02	P	STONEWALL DAY CARE WELL 2	HA1989G084	3200	HA880809	125	53	1990	BALTO. GABBRO COMPLEX
1120035	HARFORD TECHNICAL HIGH	01	01	P	VO-TECH CENTER	HA1976G021	6000	HA733345	300	42	1976	PORT DEPOSIT GNEISS
1120035	HARFORD TECHNICAL HIGH	01	02	P	VO-TECH CENTER	HA1976G021	6000	HA733344	300	37	1976	PORT DEPOSIT GNEISS
1120041	LOVING HEART ADULT DAY CARE	01	01	P	LOVING HEART WELL	HA1974G090	2000	HA731941	150	49	1974	BALTO. GABBRO COMPLEX
1120044	HICKORY ANNEX	01	01	P	HICKORY ANNEX	HA1962G005	600	HA046539	59	25	1962	BALTO. GABBRO COMPLEX
1120046	J.F.K. MAINTENANCE FACILITY # 1	01	01	P	MD TRANSP. AUTHORITY	HA1963G002	1000	HA051497	400	64	1963	METAGABBRO & AMPHIBOLITE
1120048	NORTH BEND ELEMENTARY	01	01	P	NORTH BEND ELEM. SCHOOL	HA1989G075	5000	HA880894	300	42	1990	METAGRAYWACKE WISSAHICKON FO
1120048	NORTH BEND ELEMENTARY	01	02	P	NORTH BEND ELEM. SCHOOL	HA1989G075	5000	HA881033	850	50	1990	METAGRAYWACKE WISSAHICKON FO
1120048	NORTH BEND ELEMENTARY	01	03	P	NORTH BEND ELEM. SCHOOL	HA1989G075	5000	HA881034	350	42	1990	METAGRAYWACKE WISSAHICKON FO
1120051	FALLSTON MIDDLE SCHOOL	01	01	P	FALLSTON MIDDLE SCHOOL	HA1991G059	7500	HA882176	250	115	1992	BALTO. GABBRO COMPLEX
1120051	FALLSTON MIDDLE SCHOOL	01	02	P	FALLSTON MIDDLE SCHOOL	HA1991G059	7500	HA882175	300	111	1992	BALTO. GABBRO COMPLEX
1120052	HARFORD EARLY LEARNING CENTER	01	01	P	WELL	HA1980G015	1000	HA736047	250	68	1980	METAGRAYWACKE WISSAHICKON FO
1120054	ADVENT CHILD DEVELOP. CENTER	01	01	P	WELL 1	HA1995G056	1400	HA940695	500	63	1995	METAGRAYWACKE WISSAHICKON FO
1120054	ADVENT CHILD DEVELOP. CENTER	01	02	P	WELL 2	HA1995G056	1400	HA942066	500	100	1998	METAGRAYWACKE WISSAHICKON FO
1120055	BETHEL DAY CARE AND SCHOOL	01	01	P	WELL	HA1981G015	1000	HA736591	100	44	1981	METAGABBRO AND AMPHIBOLITE
1120056	HARFORD JEWISH CENTER	01	01	P	WELL	HA1968G010	1000	HA680421	110	65	1968	PORT DEPOSIT GNEISS
1120057	JAMES RUN CHRISTIAN ACADEMY	01	01	P	WELL 1	HA1984G005	300	HA811229	500	60	1984	LWR PELITIC SCHIST WISSAHICKON
1120058	HELPING HANDS MINISTRIES AND D.C.	01	01	P	WELL 1	HA1997G023	800	HA880425	400	36	1989	JAMES RUN GNEISS

Table 1b (continued). Well Information for Non-Transient Water Supply Wells

PWSID [1]	PWS NAME	PLANT ID [2]	SRC. ID [3]	USE CODE [4]	SOURCE NAME	WAPID [5]	AVE. AMT. (gpd)	WELL PERMIT NO.	WELL DEPTH (ft)	CASING DEPTH (ft)	YEAR DRILLED	AQUIFER
1121005	FATHER MARTIN'S ASHLEY	01	01	P	WELL	HA1981G029	8000	HA881467	122	112	1991	TALBOT FORMATION
1121005	FATHER MARTIN'S ASHLEY	02	02	P	NOBLE HALL WELL 2	HA1981G029	8000	HA810090	100	n/a	1982	TALBOT FORMATION
1121005	FATHER MARTIN'S ASHLEY	02	03	P	NOBLE HALL WELL 3	HA1981G029	8000	HA810091	100	n/a	1982	TALBOT FORMATION
1121126	CROSSROADS STATION	01	01	P	WELL 2	HA1987G018	2500	HA814145	350	80	1987	LWR PELITIC SCHIST WISSAHICKON
1121126	CROSSROADS STATION	01	02	P	WELL 1	HA1987G018	2500	HA813960	500	60	1987	LWR PELITIC SCHIST WISSAHICKON
1121214	BEECHTREE GOLF CLUB	01	01	P	WELL 1	HA1997G002	2000	HA941619	400	72	1997	METAGABBRO AND AMPHIBOLITE
1121214	BEECHTREE GOLF CLUB	01	02	P	WELL 2	HA1997G002	2000	HA941618	300	75	1997	METAGABBRO AND AMPHIBOLITE

Table 1b (continued). Well Information for Non-Transient Water Supply Wells

[1] PWSID = Public Water System Identification

[2] PLANT ID = Plant Identification. The water point of entry to a system from each well

[3] SRC. ID = Source Identification. Each well is considered a unique water source

[4] P = Production, S = Standby, U = Unused

[5] WAPID = Water Appropriation Permit Identification

Type[1]	Site Name	Address	Potential Contaminant[1]	Reference Location	Status
UST	Royal Farm/Enroy Gas	3606 Conowingo Rd.	VOC	Figures 2h & 2i	In compliance
UST, MISC	Crouse Construction	3634 Conowingo Rd.	VOC	Figure 2h	Unknown
UST	WAWA Food/Gas	3535 Conowingo Rd.	VOC	Figure 2i	In compliance
UST, MISC	Beechtree Golf Club	811 S. Stepney Rd.	VOC, SOC, NN, HM	Figure 2ff	Unknown
UST	Churchville Elementary	2935 Level Rd.	VOC	Figure 2r	In compliance
LUST, UST	Royal Farm/Enroy Gas	2906 Churchville Rd.	VOC	Figure 2r	Under Investigation
LUST,UST CHS	Crown Gas	2901 Churchville Rd.	VOC, HM	Figure 2r	Under Investigation
UST	Citgo Gas	3940 Conowingo Rd.	VOC	Figure 2j	Unknown
UST	Darlington Elementary	2119 Shuresville Rd.	VOC	Figure 2k	In compliance
UST	Dublin Elementary	1527 Whiteford Rd.	VOC	Figure 2g	In compliance
UST	Fair Meadows	2410 Creswell Rd.	VOC	Figure 2dd	Unknown
UST, AST	Fallston Middle	2303 Carrs Mill Road	VOC	Figure 2x	In compliance
UST, MISC	Golf & Country Club	1 Country Club Rd.	VOC, SOC, NN, HM	Figure 2gg	Unknown
UST	Father Martin Ashley	800 Tydings Lane	VOC	Figure 2gg	Unknown
UST	Dieter's Mini Market/Sunoco	2403 Rocks Rd.	VOC	Figure 2n	Unknown
UST	Benfield Electric Co.	17 E. Jarrettsville Rd.	VOC	Figure 2n	Unknown
UST	Harford Christian School	1736 Whiteford Rd.	VOC	Figure 2f	Unknown
UST, MISC	Hart Heritage	3708 Grier Nursery Rd.	VOC, SOC, NN	Figure 2e	Unknown
UST	Squire's Pantry	2203 Conowingo Rd.	VOC	Figure 2o	Unknown
UST	Mobil/Hickory Garage	2210 Conowingo Rd.	VOC, HM	Figure 2o	Unknown
UST	Citgo	2201 Conowingo Rd.	VOC	Figure 2o	Unknown
UST,CHS	Hickory I Complex	2220 Ady Rd.	VOC,SOC,HM	Figure 2o	Unknown
UST	Highland Community Assoc.	708 Highland Rd.	VOC	Figure 2d	Unknown
UST,CHS	J.F.K. Maintenance Facility # 1	2919 Belcamp Dr.	VOC, HM	Figure 2ee	Unknown
UST	7-Eleven/ Citgo Gas	2400 Pleasantville Rd.	VOC	Figure 2v	On-going monitoring
UST, GWDP	Jarrettsville Elementary	3818 Norrisville Rd.	VOC	Figure 2m	In compliance
UST	Loving Heart Adult Day Care	501 Granary Rd.	VOC	Figure 2p	Unknown
UST	Citgo	Granary Rd. & Rt. 1	VOC	Figure 2p	Unknown
UST	Norrisville Elementary	5302 Norrisville Rd.	VOC	Figure 2a	In compliance
UST	North Bend Elementary	1445 North Bend Rd.	VOC	Figure 2l	In compliance
UST	North Harford High School	211 Pylesville Rd.	VOC	Figure 2c	In compliance
UST	North Harford Middle	112 Pylesville Rd.	VOC	Figure 2c	In compliance
UST	North Harford Elementary	120 Pylesville Rd.	VOC	Figure 2c	In compliance
UST	High's/Citgo Gas	4802 Rocks Rd.	VOC	Figure 2c	Unknown
UST, GWDP	Harford Technical High School	200 Thomas Run Rd.	VOC,HM, NN, MP	Figure 2q	In compliance
UST, CHS	Amoco	2201 Churchville Rd.	VOC, HM	Figure 2q	Unknown
UST	Unnamed Service Station (closed)	3325 Conowingo Rd.	VOC	Figure 2i	Unknown
UST	Fallston High School	2301 Carrs Mill Rd.	VOC	Figure 2x	In compliance

Table 2. Potential Contaminant Point Sources within or near Wellhead Protection Areas (see figures referenced for location)

Type[1]	Site Name	Address	Potential Contaminant[1]	Reference Location	Status
UST	Forest Hill Elementary	2407 Rocks Rd.	VOC	Figure 2n	In compliance
LUST, PD	Tharpe & Green Mill	101 Calvary Rd.	VOC, SOC	Figure 2r	On-going monitoring
LUST	State Highway Administration	4218 Conowingo Rd.	VOC, HM	Figure 2j	Monitoring-ok
LUST,CHS	Crossroads Exxon	2800 Fallston Rd.	VOC, HM	Figure 2u	On-going monitoring
LUST	Central Garage/Lloyd Scarborough	1118 Main St.	VOC, HM	Figure 2k	On-going monitoring
LUST	Cleary's Service Center	3530 Conowingo Rd.	VOC	Figure 2i	On-going monitoring
LUST	State Highway Administration	3268 Dublin Rd.	VOC, HM	Figure 2g	On-going monitoring
LUST	Fallston Service Center Gas & Go	602 Fallston Rd.	VOC	Figure 2y	Monitoring-ok
LUST	Lee Snyder	4 E. Jarrettsville Rd.	VOC	Figure 2n	
LUST	Hickory Annex	2209 Conowingo Rd.	VOC	Figure 2o	Under Investigation
LUST	Hickory II Complex	1807 N. Fountain Gr. Rd.	VOC,SOC,HM	Figure 2o	
SWLF	Union Road Dump	1515 Union Rd.	VOC,HM,SOC, NN,MP	Figure 2ff	Inactive
PD	Kroh's Nursery & Market	3023 Churchville Rd.	SOC	Figure 2r	Active
PD	Aberdeen Sales Co., Inc.	3021 Churchville Rd.	SOC	Figure 2r	Active
CHS	Conestoga Wood Specialists, Inc.	3502 Hughes Rd.	SOC,HM,VOC	Figure 2j	Active
CHS	Upper Crossroads Medical Grp.	2412 Baldwin Mill Rd.	VOC,HM	Figure 2u	
GWDP	Fallston Volunteer Fire & Ambulance	2201 Carrs Mill Rd.	VOC, HM	Figure 2x	
CHS	Benfield Electric Company	14 E. Jarrettsville Rd.	VOC, HM	Figure 2n	
CHS	Forest Hill Cleaners	15 E. Jarrettsville Rd.	VOC	Figure 2n	
CHS	Forest Hill Cleaners	4 Newport Dr. # 1D	VOC	Figure 2n	
CHS	Consolidated Engrg. & Mfg.	110 Industry Lane	VOC, HM	Figure 2n	
CHS	Electronic & System Consultant	108 Industry Lane	VOC, HM	Figure 2n	
CHS	Diversified Signs Inc.	2001 Conowingo Rd.	VOC, HM	Figure 2o	
CHS	Northfield Press, Inc.	2227 Conowingo Rd.	VOC, HM	Figure 2o	
CHS	Jimmy's Dry Cleaners	2102 Fallston Rd.	VOC	Figure 2v	
CHS	Garland's Dry Cleaners	2404 Pleasantville Rd.	VOC	Figure 2v	
PD	Feed Stop, Inc.	2414 Pleasantville Rd.	SOC	Figure 2v	Active
CHS	Keene Dodge Co., Inc.	3707 Norrisville Rd.	VOC, HM	Figure 2m	
CHS, GWDP	Harford Community College	401 Thomas Run Rd.	VOV,HM, NN, MP	Figure 2q	
CHS	Dublin Cleaners & Laundromat	3522 Conowingo Rd.	VOC	Figure 2i	
CHS	Harford Tire Service	1205 Priestford Rd.	VOC, HM	Figure 2i	
SWLF, GWDP	Oak Avenue Rubble Fill	1020 Oak Ave.	VOC, HM, SOC, NN, MP	Figure 2bb	Active
CHS	Ellers Machine Shop	801 Barry's Lane	VOC, HM, SOC	Figure 2bb	
MISC	Harford Auto Parts	3610 Conowingo Rd.	VOC, HM	Figures 2h, 2i	
MISC	Crouse Construction	3634 Conowingo Rd.	VOC,HM,SOC	Figure 2h	Active

Table 2 (continued). Potential Contaminant Point Sources within or near Wellhead Protection Areas (see figures referenced for location)

Type[1]	Site Name	Address	Potential Contaminant[1]	Reference Location	Status
MISC	Moxley Welding & Machine Serv.	3601 Conowingo Rd.	VOC, HM	Figures 2h,2i	
MISC	Harford Tire Service	MD Rt. 1 & MD Rt. 136	VOC, HM	Figures 2h,2i	
MISC	Structural Concrete, Inc.	1558 Arena Rd.	VOC, HM	Figure 2h	
MISC	Darlington Equipment	1558 Arena Rd.	VOC, HM	Figure 2h	
MISC	Amrein Auto Repair Shop	Churchville Rd.	VOC, HM	Figure 2r	
MISC	Churchville Kennels	2832 Churchville Rd.	HM,NN,MP	Figure 2r	
MISC	Safelite Auto Glass	2832 Churchville Rd.	VOC, HM	Figure 2r	
MISC	Churchville Auto Diagnostic Ctre.	2839 Churchville Rd.	VOC, HM	Figure 2r	
MISC	Walter G. Coale, Inc.	2849 Churchville Rd.	VOC, HM	Figure 2r	
MISC	Churchville Garage	11 Calvary Rd.	VOC, HM	Figure 2r	
MISC	Blevin's Heating & Cooling, Inc.	2910 Churchville Rd.	VOC, HM	Figure 2r	
MISC	Bate's Garage	4216 Conowingo Rd.	VOC, HM	Figure 2j	
MISC	KRP Trucking, Inc.	3317 Dublin School Rd.	VOC, HM	Figure 2g	
MISC	Clark Sales & Service, Inc.	1607 Whiteford Rd.	VOC, HM	Figure 2g	
MISC	Forest Hill Veterinary Clinic/Kennel	6 W. Jarrettsville Rd.	HM,NN,MP	Figure 2n	
MISC	Harford Builder Supply	4 Newport Dr. # A	VOC, HM	Figure 2n	
MISC	Courtland Hearth & Hardware	2745 Fallston Rd.	VOC	Figure 2u	
MISC	Don's Garage	1744 Whiteford Rd.	VOC, HM	Figure 2f	
MISC	Dublin Heating & Air Conditioning	1701 Whiteford Rd.	VOC, HM	Figure 2f	
MISC	Deer Creek Equipment	720 Wheeler School Rd.	VOC, HM	Figure 2b	
MISC	J&R Sheds & Equipment, Inc.	3639 Grier Nursery Rd.	VOC, HM	Figure 2e	
MISC	Hickory Hardware & Supply	2214 Conowingo Rd.	VOC, HM	Figure 2o	
MISC	Gibsons Auto Service	2202 Conowingo Rd.	VOC, HM	Figure 2o	
MISC	BTG Automotive	2203 Conowingo Rd.	VOC, HM	Figure 2o	
MISC	Eugene Coulter Used Autos	2215 Conowingo Rd.	VOC, HM	Figure 2o	
MISC	Charlie's Auto & Truck	2133 N. Fountain Gr. Rd.	VOC, HM	Figure 2o	
MISC	Frank Thomas Saw Mill	Fallston Rd.	VOC, HM	Figure 2v	Active
MISC	FABCO-Spencer Construction	3805 Norrisville Rd.	VOC,HM,SOC	Figure 2m	
MISC	Smith Hardware	3803 Norrisville Rd.	VOC, HM	Figure 2m	
MISC	Rodney's Automotive Machine	3803 Norrisville Rd.	VOC, HM	Figure 2m	
MISC	Ma Jar Motors	3803 Norrisville Rd.	VOC, HM	Figure 2m	
MISC	Keene Dodge Body Shop	3707 Norrisville Rd.	VOC, HM	Figure 2m	
MISC	Lumber Yard	505 Granary Rd.	VOC,HM,SOC	Figure 2p	
MISC	Greater Harford Industrial Center	Bynum Rd./Industry Ct.	VOC,HM,SOC	Figure 2p	Active
MISC	Husky Oil North	1702 Conowingo Rd.	VOC	Figure 2p	
MISC	Action Mechanical, Inc.	2101 E. Churchville Rd.	VOC, HM	Figure 2q	
MISC	E&B Auto & Paint	3328 Conowingo Rd.	VOC, HM	Figure 2i	
MISC	A.P. Mufflers & Pipes	Conowingo Rd.	VOC, HM	Figure 2i	
MISC	Keep on Trucking (Street Auto Repair)	717 Highland Rd.	VOC, HM	Figure 2d	

Table 2 (continued). Potential Contaminant Point Sources within or near Wellhead Protection Areas

[1] UST = underground storage tanks, LUST = leaking underground storage tanks, AST = above ground storage tanks
CHS = controlled hazardous substance generators, GWDP = ground water discharge permit sites, PD = pesticide dealers
SWLF = sanitary waste landfills, MISC = miscellaneous sites, HM = heavy metals, NN = nitrate/nitrite
VOC = volatile organic compunds, SOC = synthetic organic compounds, MP = microbiological pathogens

PWSID	PWS NAME	PLANT ID	TREATMENT METHOD	REASON FOR TREATMENT
120021	HART HERITAGE	1	NO TREATMENT	
120204	CLEAR VIEW MOBILE HOME PARK	1	HYPOCHLORINATION, POST	DISINFECTION
120207	WILLIAMS MOBILE HOME PARK	1	HYPOCHLORINATION, POST	DISINFECTION
120208	FOUNTAIN GREEN M.H.P.	1	pH ADJUSTMENT	CORROSION CONTROL
120208	FOUNTAIN GREEN M.H.P.	1	HYPOCHLORINATION, PRE	DISINFECTION
120208	FOUNTAIN GREEN M.H.P.	1	ION EXCHANGE	INORGANICS REMOVAL
120208	FOUNTAIN GREEN M.H.P.	1	FILTRATION, CARTRIDGE	PARTICULATE REMOVAL
120210	ATKINS RETREAT	1	HYPOCHLORINATION, POST	DISINFECTION
120210	ATKINS RETREAT	2	NO TREATMENT	
120213	QUEENS CASTLE MOBILE HOME PARK	1	HYPOCHLORINATION, POST	DISINFECTION
1120004	CHURCHVILLE DAY CARE CENTER	1	NO TREATMENT	
1120005	CHURCHVILLE ELEMENTARY SCHOOL	1	pH ADJUSTMENT	CORROSION CONTROL
1120006	DARLINGTON ELEMENTARY SCHOOL	1	pH ADJUSTMENT	CORROSION CONTROL
1120006	DARLINGTON ELEMENTARY SCHOOL	1	HYPOCHLORINATION, PRE	DISINFECTION
1120007	DUBLIN ELEMENTARY SCHOOL	1	pH ADJUSTMENT	CORROSION CONTROL
1120007	DUBLIN ELEMENTARY SCHOOL	1	HYPOCHLORINATION, POST	DISINFECTION
1120008	FAIR MEADOWS	1	HYPOCHLORINATION, PRE	DISINFECTION
1120008	FAIR MEADOWS	1	FILTRATION, PRESSURE SAND	IRON REMOVAL
1120010	FALLSTON UNITED METHODIST CHURCH	1	NO TREATMENT	
1120010	FALLSTON UNITED METHODIST CHURCH	2	NO TREATMENT	
1120011	FALLSTON PRE-KINDERGARTEN	1	NO TREATMENT	
1120014	FOREST HILL ELEMENTARY SCHOOL	1	pH ADJUSTMENT	CORROSION CONTROL
1120014	FOREST HILL ELEMENTARY SCHOOL	1	HYPOCHLORINATION, PRE	DISINFECTION
1120016	HARFORD CENTER INC.	1	NO TREATMENT	
1120017	HARFORD CHRISTIAN SCHOOL	1	ION EXCHANGE	SOFTENING
1120017	HARFORD CHRISTIAN SCHOOL	1	pH ADJUSTMENT, POST	CORROSION CONTROL
1120017	HARFORD CHRISTIAN SCHOOL	1	ION EXCHANGE	INORGANICS REMOVAL

Table 3. Treatment Methods for Harford County Small Systems

PWSID	PWS NAME	PLANT ID	TREATMENT METHOD	REASON FOR TREATMENT
1120017	HARFORD CHRISTIAN SCHOOL	2	NO TREATMENT	
1120017	HARFORD CHRISTIAN SCHOOL	3	NO TREATMENT	
1120023	JARRETTSVILLE ELEMENTARY	1	pH ADJUSTMENT	CORROSION CONTROL
1120024	JOHN ARCHER SCHOOL	1	pH ADJUSTMENT	CORROSION CONTROL
1120026	MOUNTAIN CHRISTIAN SCHOOL	1	ION EXCHANGE	INORGANICS REMOVAL
1120026	MOUNTAIN CHRISTIAN SCHOOL	1	pH ADJUSTMENT	CORROSION CONTROL
1120026	MOUNTAIN CHRISTIAN SCHOOL	2	pH ADJUSTMENT	CORROSION CONTROL
1120026	MOUNTAIN CHRISTIAN SCHOOL	2	ION EXCHANGE	INORGANICS REMOVAL
1120026	MOUNTAIN CHRISTIAN SCHOOL	2	FILTRATION, CARTRIDGE	PARTICULATE REMOVAL
1120027	NORRISVILLE ELEMENTARY SCHOOL	1	INHIB., POLYPHOSPHATE	CORROSION CONTROL
1120027	NORRISVILLE ELEMENTARY SCHOOL	1	pH ADJUSTMENT	CORROSION CONTROL
1120028	NORTH HARFORD ELEMENTARY	1	INHIB., POLYPHOSPHATE	CORROSION CONTROL
1120028	NORTH HARFORD ELEMENTARY	1	pH ADJUSTMENT	CORROSION CONTROL
1120030	NORTH HARFORD MIDDLE SCHOOL	1	INHIB., ORTHOPHOSPHATE	CORROSION CONTROL
1120030	NORTH HARFORD MIDDLE SCHOOL	1	pH ADJUSTMENT	CORROSION CONTROL
1120030	NORTH HARFORD MIDDLE SCHOOL	1	HYPOCHLORINATION, PRE	DISINFECTION
1120031	HIGHLAND COMMUNITY ASSOC.	1	NO TREATMENT	
1120032	PROSPECT MILL ELEMENTARY	1	pH ADJUSTMENT	CORROSION CONTROL
1120033	SALEM LUTHERAN CHILD CARE CENTER	1	pH ADJUSTMENT	CORROSION CONTROL
1120034	STONEWALL DAY CARE CENTER #2	1	pH ADJUSTMENT	CORROSION CONTROL
1120035	HARFORD TECHNICAL HIGH	1	pH ADJUSTMENT	CORROSION CONTROL
1120035	HARFORD TECHNICAL HIGH	1	HYPOCHLORINATION, PRE	DISINFECTION
1120041	LOVING HEART ADULT DAY CARE	1	NO TREATMENT	
1120044	HICKORY ANNEX	1	NO TREATMENT	
1120046	J.F.K. MAINTENANCE FACILITY #1	1	SOFTENING (HARDNESS REMOVAL)	SOFTENING
1120048	NORTH BEND ELEMENTARY SCHOOL	1	pH ADJUSTMENT	CORROSION CONTROL

Table 3 (continued). Treatment Methods for Harford County Small Systems

PWSID	PWS NAME	PLANT ID	TREATMENT METHOD	REASON FOR TREATMENT
1120048	NORTH BEND ELEMENTARY SCHOOL	1	HYPOCHLORINATION, PRE	DISINFECTION
1120051	FALLSTON MIDDLE SCHOOL	1	pH ADJUSTMENT	CORROSION CONTROL
1120051	FALLSTON MIDDLE SCHOOL	1	HYPOCHLORINATION, POST	DISINFECTION
1120052	HARFORD EARLY LEARNING CENTER	1	NO TREATMENT	
1120054	ADVENT CHILD DEVELOPMENT CENTER	1	NO TREATMENT	
1120055	BETHEL DAY CARE & SCHOOL	1	NO TREATMENT	
1120056	HARFORD JEWISH CENTER	1	NO TREATMENT	
1120057	JAMES RUN CHRISTIAN ACADEMY	1	NO TREATMENT	
1120058	HELPING HANDS MINISTRIES AND DAY CARE	1	NO TREATMENT	
1121005	FATHER MARTIN'S ASHLEY	1	HYPOCHLORINATION, PRE	DISINFECTION
1121005	FATHER MARTIN'S ASHLEY	2	HYPOCHLORINATION, PRE	DISINFECTION
1121005	FATHER MARTIN'S ASHLEY	2	pH ADJUSTMENT	CORROSION CONTROL
1121126	CROSSROADS STATION	1	NO TREATMENT	
1121214	BEECHTREE GOLF CLUB	1	pH ADJUSTMENT	CORROSION CONTROL
1121214	BEECHTREE GOLF CLUB	1	HYPOCHLORINATION, POST	DISINFECTION
1121214	BEECHTREE GOLF CLUB	1	OZONATION, PRE	IRON REMOVAL
1121214	BEECHTREE GOLF CLUB	1	OZONATION, PRE	TASTE & ODOR

Table 3 (continued). Treatment Methods for Harford County Small Systems

PWSID	PWS NAME	PLANT ID	Nitrate		SOCs		VOCs		IOCs (except nitrate)	
			No. of Samples	No. of samples > 50% MCL	No. of Samples	No. of samples > 50% MCL	No. of Samples	No. of samples > 50% MCL	No. of Samples	No. of samples > 50% MCL
120021	HART HERITAGE	1	6	0	1	0	4	0	4	0
120204	CLEAR VIEW M.H.P	1	8	0	2	0	8	0	8	0
120207	WILLIAMS M.H.P.	1	10	0	3	0	6	0	9	0
120208	FOUNTAIN GREEN M.H.P.	1	9	0	3	0	5	0	10	0
120210	ATKINS RETREAT	1	8	0	3	0	8	0	8	0
120213	QUEENS CASTLE M.H.P.	1	10	0	3	0	8	0	9	0
1120004	CHURCHVILLE DAY CARE CENTER	1	12	1	1	0	5	0	1	0
1120005	CHURCHVILLE ELEM. SCHOOL	1	31	30	2	0	6	0	4	0
1120006	DARLINGTON ELEM. SCHOOL	1	24	15	3	0	6	0	7	0
1120007	DUBLIN ELEM. SCHOOL	1	10	0	2	0	10	0	6	0
1120008	FAIR MEADOWS	1	11	0	2	1	7	0	6	0
1120010	FALLSTON CHILD CARE CENTER	1	13	0	3	0	8	0	5	0
1120011	FALLSTON PRE-KINDERGARTEN	1	12	0	2	0	5	0	4	0
1120014	FOREST HILL ELEM. SCHOOL	1	34	34	1	0	10	0	3	1
1120016	HARFORD CENTER, INC.	1	17	0	2	1	8	0	6	0
1120017	HARFORD CHRISTIAN SCHOOL	1	34	18	2	0	9	0	5	0

Table 4. Total Water Quality Samples Collected for all Harford County Small Systems

PWSID	PWS NAME	PLANT ID	Nitrate		SOCs		VOCs		IOCs (except nitrate)	
			No. of Samples	No. of samples > 50% MCL	No. of Samples	No. of samples > 50% MCL	No. of Samples	No. of samples > 50% MCL	No. of Samples	No. of samples > 50% MCL
1120017	HARFORD CHRISTIAN SCHOOL	2	34	22	3	0	9	0	9	0
1120017	HARFORD CHRISTIAN SCHOOL	3	30	20	3	0	9	0	8	0
1120023	JARRETTSVILLE ELEMENTARY	1	10	0	2	0	5	0	3	0
1120024	JOHN ARCHER SCHOOL	1	19	16	3	0	10	0	4	0
1120026	MOUNTAIN CHRISTIAN SCHOOL	1	14	0	3	0	9	0	4	0
1120026	MOUNTAIN CHRISTIAN SCHOOL	2	3	0	2	0	6	0	2	0
1120027	NORRISVILLE ELEM. SCHOOL	1	21	14	2	1	6	0	7	2
1120028	NORTH HARFORD ELEMENTARY	1	36	36	2	1	6	0	5	1
1120030	NORTH HARFORD MIDDLE SCHOOL	1	41	41	2	1	5	0	7	1
1120031	HIGHLAND COMM. ASSOC.	1	18	15	1	0	4	0	3	0
1120032	PROSPECT MILL ELEMENTARY	1	15	11	2	0	15	1	4	0
1120033	SALEM LUTHERAN CHILD CARE CENTER	1	13	0	2	0	8	0	4	0
1120034	STONEWALL DAY CARE CENTER #2	1	12	0	2	0	5	0	3	0

Table 4 (continued). Total Water Quality Samples Collected for all Harford County Small Systems

PWSID	PWS NAME	PLANT ID	Nitrate		SOCs		VOCs		IOCs (except nitrate)	
			No. of Samples	No. of samples > 50% MCL	No. of Samples	No. of samples > 50% MCL	No. of Samples	No. of samples > 50% MCL	No. of Samples	No. of samples > 50% MCL
1120035	HARFORD TECHNICAL HIGH	1	14	8	2	0	5	0	4	0
1120041	LOVING HEART ADULT DAY CARE	1	30	26	2	0	7	0	3	0
1120044	HICKORY ANNEX	1	9	0	2	0	20	4	5	1
1120046	J.F.K. MAINTENANCE FACILITY #1	1	13	0	2	1	8	0	5	0
1120048	NORTH BEND ELEM. SCHOOL	1	37	36	15	0	12	0	5	0
1120051	FALLSTON MIDDLE SCHOOL	1	22	12	3	0	11	0	5	0
1120052	HARFORD EARLY LEARNING CENTER	1	20	16	2	0	5	0	5	0
1120054	ADVENT CHILD DEV. CENTER	1	7	7	1	0	2	0	2	0
1120055	BETHEL DAY CARE AND SCHOOL	1	2	1	0	0	1	0	1	0
1120056	HARFORD JEWISH CENTER	1	2	2	0	0	1	0	0	0
1120057	JAMES RUN CHRISTIAN ACADEMY	1	1	0	1	0	2	0	0	0
1120058	HELPING HANDS MIN. AND DAY CARE	1	1	1	0	0		0	1	0
1121005	FATHER MARTIN'S ASHLEY	1	6	1	1	0	5	0	2	1
1121005	FATHER MARTIN'S ASHLEY	2	1	0	1	0		0	0	0
1121126	CROSSROADS STATION	1	2	2	1	0	4	0	2	0

Table 4 (continued). Total Water Quality Samples Collected for all Harford County Small Systems

PWSID	PWS NAME	PLANT ID	Nitrate		SOCs		VOCs		IOCs (except nitrate)	
			No. of Samples	No. of samples > 50% MCL	No. of Samples	No. of samples > 50% MCL	No. of Samples	No. of samples > 50% MCL	No. of Samples	No. of samples > 50% MCL
1121214	BEECHTREE GOLF CLUB	1	3	0	0	0	1	0	2	0

Table 4 (continued). Total Water Quality Samples Collected for all Harford County Small Systems

PWSID	PWS NAME	PLANT ID	CONTAMINANT NAME	MCL (ppm)	SAMPLE DATE	RESULT (ppm)
1120004	CHURCHVILLE DAY CARE	1	NITRATE	10	17-Jan-95	5.71
1120005	CHURCHVILLE ELEMENTARY SCHOOL	1	NITRATE	10	9-Feb-93	8.8
1120005	CHURCHVILLE ELEMENTARY SCHOOL	1	NITRATE	10	12-May-93	6.6
1120005	CHURCHVILLE ELEMENTARY SCHOOL	1	NITRATE	10	8-Sep-93	8.18
1120005	CHURCHVILLE ELEMENTARY SCHOOL	1	NITRATE	10	26-Oct-93	9.44
1120005	CHURCHVILLE ELEMENTARY SCHOOL	1	NITRATE	10	2-Feb-94	9.28
1120005	CHURCHVILLE ELEMENTARY SCHOOL	1	NITRATE	10	5-May-94	9.36
1120005	CHURCHVILLE ELEMENTARY SCHOOL	1	NITRATE	10	7-Sep-94	9.43
1120005	**CHURCHVILLE ELEMENTARY SCHOOL**	**1**	**NITRATE**	**10**	**15-Nov-94**	**10.5**
1120005	**CHURCHVILLE ELEMENTARY SCHOOL**	**1**	**NITRATE**	**10**	**17-Nov-94**	**11**
1120005	**CHURCHVILLE ELEMENTARY SCHOOL**	**1**	**NITRATE**	**10**	**10-Jan-95**	**11.1**
1120005	**CHURCHVILLE ELEMENTARY SCHOOL**	**1**	**NITRATE**	**10**	**13-Jan-95**	**10.6**
1120005	CHURCHVILLE ELEMENTARY SCHOOL	1	NITRATE	10	4-May-95	8.84
1120005	CHURCHVILLE ELEMENTARY SCHOOL	1	NITRATE	10	20-Sep-95	8.99
1120005	CHURCHVILLE ELEMENTARY SCHOOL	1	NITRATE	10	21-Sep-95	7.9
1120005	CHURCHVILLE ELEMENTARY SCHOOL	1	NITRATE	10	8-Nov-95	9.15
1120005	CHURCHVILLE ELEMENTARY SCHOOL	1	NITRATE	10	6-Feb-96	7.98
1120005	CHURCHVILLE ELEMENTARY SCHOOL	1	NITRATE	10	23-May-96	10
1120005	**CHURCHVILLE ELEMENTARY SCHOOL**	**1**	**NITRATE**	**10**	**5-Sep-96**	**11.7**
1120005	**CHURCHVILLE ELEMENTARY SCHOOL**	**1**	**NITRATE**	**10**	**19-Sep-96**	**11.2**
1120005	**CHURCHVILLE ELEMENTARY SCHOOL**	**1**	**NITRATE**	**10**	**26-Nov-96**	**11.5**
1120005	CHURCHVILLE ELEMENTARY SCHOOL	1	NITRATE	10	17-Apr-97	9.91
1120005	CHURCHVILLE ELEMENTARY SCHOOL	1	NITRATE	10	9-Oct-97	9.2
1120005	CHURCHVILLE ELEMENTARY SCHOOL	1	NITRATE	10	16-Oct-97	8.7

Table 5a. Regulated Inorganic Compound (IOC) Results Above 50% of the MCL

PWSID	PWS NAME	PLANT ID	CONTAMINANT NAME	MCL (ppm)	SAMPLE DATE	RESULT (ppm)
1120005	CHURCHVILLE ELEMENTARY SCHOOL	1	NITRATE	10	20-Oct-97	6.71
1120005	CHURCHVILLE ELEMENTARY SCHOOL	1	NITRATE	10	1-Sep-98	6.5
1120005	CHURCHVILLE ELEMENTARY SCHOOL	1	NITRATE	10	28-Jan-99	9.3
1120005	CHURCHVILLE ELEMENTARY SCHOOL	1	NITRATE	10	17-Nov-99	6.5
1120005	CHURCHVILLE ELEMENTARY SCHOOL	1	NITRATE	10	10-Aug-00	7.9
1120005	CHURCHVILLE ELEMENTARY SCHOOL	1	NITRATE	10	5-Oct-00	8.6
1120005	CHURCHVILLE ELEMENTARY SCHOOL	1	NITRATE	10	20-Nov-00	8.6
1120006	DARLINGTON ELEMENTARY SCHOOL	1	NITRATE	10	9-Feb-93	5.2
1120006	DARLINGTON ELEMENTARY SCHOOL	1	NITRATE	10	8-Sep-93	5.3
1120006	DARLINGTON ELEMENTARY SCHOOL	1	NITRATE	10	26-Jan-94	5.56
1120006	DARLINGTON ELEMENTARY SCHOOL	1	NITRATE	10	2-May-94	5.73
1120006	DARLINGTON ELEMENTARY SCHOOL	1	NITRATE	10	1-Nov-95	5.05
1120006	DARLINGTON ELEMENTARY SCHOOL	1	NITRATE	10	15-Feb-96	5.39
1120006	DARLINGTON ELEMENTARY SCHOOL	1	NITRATE	10	23-May-96	5
1120006	DARLINGTON ELEMENTARY SCHOOL	1	NITRATE	10	14-Nov-96	5.84
1120006	DARLINGTON ELEMENTARY SCHOOL	1	NITRATE	10	7-Jan-97	5
1120006	DARLINGTON ELEMENTARY SCHOOL	1	NITRATE	10	28-May-98	5.43
1120006	DARLINGTON ELEMENTARY SCHOOL	1	NITRATE	10	8-Sep-99	5.4
1120006	DARLINGTON ELEMENTARY SCHOOL	1	NITRATE	10	14-Apr-00	5.2
1120006	DARLINGTON ELEMENTARY SCHOOL	1	NITRATE	10	9-Aug-00	6.5
1120006	DARLINGTON ELEMENTARY SCHOOL	1	NITRATE	10	20-Sep-00	7.1
1120006	DARLINGTON ELEMENTARY SCHOOL	1	NITRATE	10	2-Nov-00	6.5
1120014	FOREST HILL ELEMENTARY SCHOOL	1	NITRATE	10	9-Feb-93	9.5
1120014	FOREST HILL ELEMENTARY SCHOOL	1	NITRATE	10	12-May-93	9.5

Table 5a (continued). Regulated Inorganic Compound (IOC) Results Above 50% of the MCL

PWSID	PWS NAME	PLANT ID	CONTAMINANT NAME	MCL (ppm)	SAMPLE DATE	RESULT (ppm)
1120014	FOREST HILL ELEMENTARY SCHOOL	1	NITRATE	10	8-Sep-93	9.36
1120014	FOREST HILL ELEMENTARY SCHOOL	1	NITRATE	10	19-Oct-93	5.96
1120014	**FOREST HILL ELEMENTARY SCHOOL**	**1**	**NITRATE**	**10**	**26-Jan-94**	**10.3**
1120014	**FOREST HILL ELEMENTARY SCHOOL**	**1**	**NITRATE**	**10**	**31-Jan-94**	**10.1**
1120014	**FOREST HILL ELEMENTARY SCHOOL**	**1**	**NITRATE**	**10**	**18-Apr-94**	**12.6**
1120014	FOREST HILL ELEMENTARY SCHOOL	1	NITRATE	10	20-Apr-94	9.11
1120014	**FOREST HILL ELEMENTARY SCHOOL**	**1**	**NITRATE**	**10**	**14-Sep-94**	**10.8**
1120014	**FOREST HILL ELEMENTARY SCHOOL**	**1**	**NITRATE**	**10**	**16-Sep-94**	**10.1**
1120014	**FOREST HILL ELEMENTARY SCHOOL**	**1**	**NITRATE**	**10**	**15-Nov-94**	**13.4**
1120014	**FOREST HILL ELEMENTARY SCHOOL**	**1**	**NITRATE**	**10**	**17-Nov-94**	**13.3**
1120014	**FOREST HILL ELEMENTARY SCHOOL**	**1**	**NITRATE**	**10**	**12-Jan-95**	**11.6**
1120014	**FOREST HILL ELEMENTARY SCHOOL**	**1**	**NITRATE**	**10**	**17-Jan-95**	**12.2**
1120014	**FOREST HILL ELEMENTARY SCHOOL**	**1**	**NITRATE**	**10**	**10-May-95**	**11.2**
1120014	**FOREST HILL ELEMENTARY SCHOOL**	**1**	**NITRATE**	**10**	**12-May-95**	**10.2**
1120014	**FOREST HILL ELEMENTARY SCHOOL**	**1**	**NITRATE**	**10**	**20-Sep-95**	**10.6**
1120014	**FOREST HILL ELEMENTARY SCHOOL**	**1**	**NITRATE**	**10**	**25-Sep-95**	**11.1**
1120014	FOREST HILL ELEMENTARY SCHOOL	1	NITRATE	10	6-Nov-95	10
1120014	**FOREST HILL ELEMENTARY SCHOOL**	**1**	**NITRATE**	**10**	**9-Nov-95**	**11.3**
1120014	**FOREST HILL ELEMENTARY SCHOOL**	**1**	**NITRATE**	**10**	**1-Feb-96**	**10.2**
1120014	FOREST HILL ELEMENTARY SCHOOL	1	NITRATE	10	29-May-96	9.88
1120014	FOREST HILL ELEMENTARY SCHOOL	1	NITRATE	10	11-Sep-96	9.6
1120014	**FOREST HILL ELEMENTARY SCHOOL**	**1**	**NITRATE**	**10**	**14-Nov-96**	**13.8**
1120014	**FOREST HILL ELEMENTARY SCHOOL**	**1**	**NITRATE**	**10**	**24-Jan-97**	**12.5**
1120014	**FOREST HILL ELEMENTARY SCHOOL**	**1**	**NITRATE**	**10**	**5-May-97**	**12.2**

Table 5a (continued). Regulated Inorganic Compound (IOC) Results Above 50% of the MCL

PWSID	PWS NAME	PLANT ID	CONTAMINANT NAME	MCL (ppm)	SAMPLE DATE	RESULT (ppm)
1120014	FOREST HILL ELEMENTARY SCHOOL	1	NITRATE	10	10-Sep-97	9.9
1120014	FOREST HILL ELEMENTARY SCHOOL	1	NITRATE	10	9-Oct-97	9.2
1120014	FOREST HILL ELEMENTARY SCHOOL	1	NITRATE	10	16-Oct-97	8.7
1120014	FOREST HILL ELEMENTARY SCHOOL	1	NITRATE	10	20-Oct-97	6.71
1120014	**FOREST HILL ELEMENTARY SCHOOL**	**1**	**NITRATE**	**10**	**28-May-98**	**10.5**
1120014	**FOREST HILL ELEMENTARY SCHOOL**	**1**	**NITRATE**	**10**	**4-Jun-98**	**10.9**
1120014	FOREST HILL ELEMENTARY SCHOOL	1	NITRATE	10	2-Aug-00	9.2
1120014	FOREST HILL ELEMENTARY SCHOOL	1	NICKEL		17-Nov-00	0.12
1120014	FOREST HILL ELEMENTARY SCHOOL	1	NITRATE	10	17-Nov-00	8.3
1120017	HARFORD CHRISTIAN SCHOOL	1	NITRATE	10	26-Jul-95	5.35
1120017	**HARFORD CHRISTIAN SCHOOL**	**1**	**NITRATE**	**10**	**28-Sep-95**	**48**
1120017	**HARFORD CHRISTIAN SCHOOL**	**1**	**NITRATE**	**10**	**2-Oct-95**	**45**
1120017	HARFORD CHRISTIAN SCHOOL	1	NITRATE	10	16-Oct-95	5.42
1120017	**HARFORD CHRISTIAN SCHOOL**	**1**	**NITRATE**	**10**	**20-Oct-95**	**28.2**
1120017	HARFORD CHRISTIAN SCHOOL	1	NITRATE	10	21-Dec-95	7.1
1120017	**HARFORD CHRISTIAN SCHOOL**	**1**	**NITRATE**	**10**	**31-Jan-96**	**12.2**
1120017	**HARFORD CHRISTIAN SCHOOL**	**1**	**NITRATE**	**10**	**14-Feb-96**	**14.3**
1120017	**HARFORD CHRISTIAN SCHOOL**	**1**	**NITRATE**	**10**	**4-Mar-96**	**13.6**
1120017	HARFORD CHRISTIAN SCHOOL	1	NITRATE	10	23-Apr-96	9.8
1120017	**HARFORD CHRISTIAN SCHOOL**	**1**	**NITRATE**	**10**	**24-Jul-96**	**13.5**
1120017	HARFORD CHRISTIAN SCHOOL	1	NITRATE	10	28-Jan-98	5.26
1120017	HARFORD CHRISTIAN SCHOOL	1	NITRATE	10	28-Jan-98	5.47
1120017	HARFORD CHRISTIAN SCHOOL	1	NITRATE	10	22-Apr-98	7.51
1120017	HARFORD CHRISTIAN SCHOOL	1	NITRATE	10	28-Oct-98	5.29

Table 5a (continued). Regulated Inorganic Compound (IOC) Results Above 50% of the MCL

PWSID	PWS NAME	PLANT ID	CONTAMINANT NAME	MCL (ppm)	SAMPLE DATE	RESULT (ppm)
1120017	HARFORD CHRISTIAN SCHOOL	1	NITRATE	10	28-Oct-98	5.8
1120017	HARFORD CHRISTIAN SCHOOL	1	NITRATE	10	27-Jan-99	5.4
1120017	HARFORD CHRISTIAN SCHOOL	1	NITRATE	10	22-Oct-99	5.3
1120017	HARFORD CHRISTIAN SCHOOL	2	NITRATE	10	23-Feb-93	6.7
1120017	HARFORD CHRISTIAN SCHOOL	2	NITRATE	10	9-Sep-93	5.33
1120017	HARFORD CHRISTIAN SCHOOL	2	NITRATE	10	2-Dec-93	5.84
1120017	HARFORD CHRISTIAN SCHOOL	2	NITRATE	10	12-Oct-94	5.03
1120017	HARFORD CHRISTIAN SCHOOL	2	NITRATE	10	13-Feb-95	6.88
1120017	HARFORD CHRISTIAN SCHOOL	2	NITRATE	10	19-Apr-95	5.74
1120017	HARFORD CHRISTIAN SCHOOL	2	NITRATE	10	13-Jun-95	5.1
1120017	HARFORD CHRISTIAN SCHOOL	2	NITRATE	10	28-Sep-95	5.5
1120017	HARFORD CHRISTIAN SCHOOL	2	NITRATE	10	2-Oct-95	5.5
1120017	HARFORD CHRISTIAN SCHOOL	2	NITRATE	10	21-Dec-95	7
1120017	HARFORD CHRISTIAN SCHOOL	2	NITRATE	10	16-Oct-96	6.6
1120017	HARFORD CHRISTIAN SCHOOL	2	NITRATE	10	23-Jun-97	5.2
1120017	HARFORD CHRISTIAN SCHOOL	2	NITRATE	10	23-Jun-97	5.2
1120017	HARFORD CHRISTIAN SCHOOL	2	NITRATE	10	12-Aug-97	7.6
1120017	HARFORD CHRISTIAN SCHOOL	2	NITRATE	10	12-Aug-97	7.74
1120017	HARFORD CHRISTIAN SCHOOL	2	NITRATE	10	12-Aug-97	7.6
1120017	HARFORD CHRISTIAN SCHOOL	2	NITRATE	10	23-Oct-97	5.5
1120017	HARFORD CHRISTIAN SCHOOL	2	NITRATE	10	13-Nov-97	5.3
1120017	HARFORD CHRISTIAN SCHOOL	2	NITRATE	10	28-Jan-98	5.3
1120017	HARFORD CHRISTIAN SCHOOL	2	NITRATE	10	22-Apr-98	7.07
1120017	HARFORD CHRISTIAN SCHOOL	2	NITRATE	10	4-Dec-98	5.3

Table 5a (continued). Regulated Inorganic Compound (IOC) Results Above 50% of the MCL

PWSID	PWS NAME	PLANT ID	CONTAMINANT NAME	MCL (ppm)	SAMPLE DATE	RESULT (ppm)
1120017	HARFORD CHRISTIAN SCHOOL	2	NITRATE	10	27-Jan-99	5.4
1120017	HARFORD CHRISTIAN SCHOOL	3	NITRATE	10	23-Feb-93	8.5
1120017	HARFORD CHRISTIAN SCHOOL	3	NITRATE	10	9-Sep-93	6.02
1120017	HARFORD CHRISTIAN SCHOOL	3	NITRATE	10	6-Oct-93	5.1
1120017	HARFORD CHRISTIAN SCHOOL	3	NITRATE	10	2-Dec-93	6.24
1120017	HARFORD CHRISTIAN SCHOOL	3	NITRATE	10	16-Feb-94	5.84
1120017	HARFORD CHRISTIAN SCHOOL	3	NITRATE	10	12-Oct-94	5.64
1120017	HARFORD CHRISTIAN SCHOOL	3	NITRATE	10	20-Feb-95	6.8
1120017	HARFORD CHRISTIAN SCHOOL	3	NITRATE	10	19-Apr-95	5.58
1120017	HARFORD CHRISTIAN SCHOOL	3	NITRATE	10	13-Jun-95	5.6
1120017	HARFORD CHRISTIAN SCHOOL	3	NITRATE	10	2-Oct-95	5.3
1120017	HARFORD CHRISTIAN SCHOOL	3	NITRATE	10	16-Oct-95	5.86
1120017	HARFORD CHRISTIAN SCHOOL	3	NITRATE	10	21-Dec-95	7.47
1120017	HARFORD CHRISTIAN SCHOOL	3	NITRATE	10	24-Jul-96	5.7
1120017	HARFORD CHRISTIAN SCHOOL	3	NITRATE	10	16-Oct-96	6.83
1120017	HARFORD CHRISTIAN SCHOOL	3	NITRATE	10	12-Aug-97	9.3
1120017	HARFORD CHRISTIAN SCHOOL	3	NITRATE	10	22-Apr-98	6.35
1120017	HARFORD CHRISTIAN SCHOOL	3	NITRATE	10	28-Oct-98	5.01
1120017	HARFORD CHRISTIAN SCHOOL	3	NITRATE	10	27-Jan-99	6.9
1120017	HARFORD CHRISTIAN SCHOOL	3	NITRATE	10	28-Apr-99	5.5
1120017	HARFORD CHRISTIAN SCHOOL	3	NITRATE	10	27-Aug-99	5.1
1120024	JOHN ARCHER SCHOOL	1	NITRATE	10	11-May-95	5
1120024	JOHN ARCHER SCHOOL	1	NITRATE	10	6-Sep-95	5
1120024	JOHN ARCHER SCHOOL	1	NITRATE	10	20-Sep-95	5.32
1120024	JOHN ARCHER SCHOOL	1	NITRATE	10	8-Nov-95	6.03
1120024	JOHN ARCHER SCHOOL	1	NITRATE	10	21-Jan-97	6
1120024	JOHN ARCHER SCHOOL	1	NITRATE	10	21-Apr-97	5.55
1120024	JOHN ARCHER SCHOOL	1	NITRATE	10	4-Sep-97	5.22

Table 5a (continued). Regulated Inorganic Compound (IOC) Results Above 50% of the MCL

PWSID	PWS NAME	PLANT ID	CONTAMINANT NAME	MCL (ppm)	SAMPLE DATE	RESULT (ppm)
1120024	JOHN ARCHER SCHOOL	1	NITRATE	10	21-Jan-98	5.33
1120024	JOHN ARCHER SCHOOL	1	NITRATE	10	3-Jun-98	5.89
1120024	JOHN ARCHER SCHOOL	1	NITRATE	10	16-Sep-98	7.61
1120024	JOHN ARCHER SCHOOL	1	NITRATE	10	16-Nov-98	5.7
1120024	JOHN ARCHER SCHOOL	1	NITRATE	10	8-Dec-98	5.9
1120024	JOHN ARCHER SCHOOL	1	NITRATE	10	13-Jan-99	5.6
1120024	JOHN ARCHER SCHOOL	1	NITRATE	10	10-Aug-00	7
1120024	JOHN ARCHER SCHOOL	1	NITRATE	10	26-Oct-00	6.2
1120024	JOHN ARCHER SCHOOL	1	NITRATE	10	20-Nov-00	6.8
1120027	NORRISVILLE ELEMENTARY SCHOOL	1	NITRATE	10	12-Jan-95	5.11
1120027	NORRISVILLE ELEMENTARY SCHOOL	1	NITRATE	10	6-Apr-95	5.12
1120027	NORRISVILLE ELEMENTARY SCHOOL	1	NITRATE	10	13-Sep-95	5.66
1120027	NORRISVILLE ELEMENTARY SCHOOL	1	NITRATE	10	6-Nov-95	6.7
1120027	NORRISVILLE ELEMENTARY SCHOOL	1	NITRATE	10	16-Jan-96	5.88
1120027	NORRISVILLE ELEMENTARY SCHOOL	1	NITRATE	10	28-May-96	5.18
1120027	NORRISVILLE ELEMENTARY SCHOOL	1	NITRATE	10	16-Sep-96	5.03
1120027	NORRISVILLE ELEMENTARY SCHOOL	1	NITRATE	10	16-Oct-96	5.55
1120027	NORRISVILLE ELEMENTARY SCHOOL	1	NITRATE	10	8-Jan-97	6.71
1120027	NORRISVILLE ELEMENTARY SCHOOL	1	NITRATE	10	24-Apr-97	6.83
1120027	NORRISVILLE ELEMENTARY SCHOOL	1	NITRATE	10	4-Dec-98	5.05
1120027	NORRISVILLE ELEMENTARY SCHOOL	1	NITRATE	10	20-Oct-99	8.8
1120027	**NORRISVILLE ELEMENTARY SCHOOL**	**1**	**LEAD**	**0.015**	**20-Oct-99**	**0.05**
1120027	NORRISVILLE ELEMENTARY SCHOOL	1	NITRATE	10	20-Oct-99	8.8
1120027	NORRISVILLE ELEMENTARY SCHOOL	1	TURBIDITY	5	20-Oct-99	4.6
1120027	NORRISVILLE ELEMENTARY SCHOOL	1	NITRATE	10	6-Jan-00	7
1120028	NORTH HARFORD ELEMENTARY SCHOOL	1	NITRATE	10	9-Feb-93	9.5
1120028	NORTH HARFORD ELEMENTARY SCHOOL	1	NITRATE	10	6-Apr-93	7
1120028	NORTH HARFORD ELEMENTARY SCHOOL	1	NITRATE	10	8-Sep-93	10
1120028	**NORTH HARFORD ELEMENTARY SCHOOL**	**1**	**NITRATE**	**10**	**2-Feb-94**	**10.5**

Table 5a (continued). Regulated Inorganic Compound (IOC) Results Above 50% of the MCL

PWSID	PWS NAME	PLANT ID	CONTAMINANT NAME	MCL (ppm)	SAMPLE DATE	RESULT (ppm)
1120028	**NORTH HARFORD ELEMENTARY SCHOOL**	**1**	**NITRATE**	**10**	**4-Feb-94**	**11**
1120028	NORTH HARFORD ELEMENTARY SCHOOL	1	NITRATE	10	20-Apr-94	9.72
1120028	NORTH HARFORD ELEMENTARY SCHOOL	1	NITRATE	10	15-Sep-94	7.61
1120028	NORTH HARFORD ELEMENTARY SCHOOL	1	NITRATE	10	3-Nov-94	9.92
1120028	NORTH HARFORD ELEMENTARY SCHOOL	1	NITRATE	10	12-Jan-95	6.49
1120028	NORTH HARFORD ELEMENTARY SCHOOL	1	NITRATE	10	11-Apr-95	8.29
1120028	NORTH HARFORD ELEMENTARY SCHOOL	1	NITRATE	10	13-Sep-95	8.83
1120028	NORTH HARFORD ELEMENTARY SCHOOL	1	NITRATE	10	17-Oct-95	8.18
1120028	NORTH HARFORD ELEMENTARY SCHOOL	1	NITRATE	10	26-Oct-95	7.3
1120028	NORTH HARFORD ELEMENTARY SCHOOL	1	SELENIUM	0.05	26-Oct-95	0.025
1120028	NORTH HARFORD ELEMENTARY SCHOOL	1	NITRATE	10	16-Jan-96	9.5
1120028	NORTH HARFORD ELEMENTARY SCHOOL	1	NITRATE	10	3-Jun-96	8
1120028	NORTH HARFORD ELEMENTARY SCHOOL	1	NITRATE	10	16-Sep-96	9.1
1120028	**NORTH HARFORD ELEMENTARY SCHOOL**	**1**	**NITRATE**	**10**	**16-Oct-96**	**12.5**
1120028	NORTH HARFORD ELEMENTARY SCHOOL	1	NITRATE	10	7-Jan-97	9.28
1120028	NORTH HARFORD ELEMENTARY SCHOOL	1	NITRATE	10	5-May-97	9.72
1120028	NORTH HARFORD ELEMENTARY SCHOOL	1	NITRATE	10	4-Sep-97	6.56
1120028	NORTH HARFORD ELEMENTARY SCHOOL	1	NITRATE	10	7-Jan-98	6.38
1120028	NORTH HARFORD ELEMENTARY SCHOOL	1	NITRATE	10	15-Apr-98	7
1120028	NORTH HARFORD ELEMENTARY SCHOOL	1	NITRATE	10	8-Sep-98	7.62
1120028	NORTH HARFORD ELEMENTARY SCHOOL	1	NITRATE	10	30-Nov-98	7.4
1120028	NORTH HARFORD ELEMENTARY SCHOOL	1	NITRATE	10	6-Jan-99	7.28
1120028	NORTH HARFORD ELEMENTARY SCHOOL	1	NITRATE	10	16-Jan-99	7.28
1120028	NORTH HARFORD ELEMENTARY SCHOOL	1	NITRATE	10	7-Apr-99	7.5

Table 5a (continued). Regulated Inorganic Compound (IOC) Results Above 50% of the MCL

PWSID	PWS NAME	PLANT ID	CONTAMINANT NAME	MCL (ppm)	SAMPLE DATE	RESULT (ppm)
1120028	NORTH HARFORD ELEMENTARY SCHOOL	1	NITRATE	10	7-Apr-99	7.5
1120028	NORTH HARFORD ELEMENTARY SCHOOL	1	NITRATE	10	7-Sep-99	6.9
1120028	NORTH HARFORD ELEMENTARY SCHOOL	1	NITRATE	10	7-Sep-99	6.9
1120028	NORTH HARFORD ELEMENTARY SCHOOL	1	NITRATE	10	3-Nov-99	6.7
1120028	NORTH HARFORD ELEMENTARY SCHOOL	1	NITRATE	10	4-Jan-00	6.6
1120028	NORTH HARFORD ELEMENTARY SCHOOL	1	NITRATE	10	10-Apr-00	7.2
1120028	NORTH HARFORD ELEMENTARY SCHOOL	1	NITRATE	10	14-Jun-00	8.3
1120028	NORTH HARFORD ELEMENTARY SCHOOL	1	NITRATE	10	9-Aug-00	8.1
1120028	NORTH HARFORD ELEMENTARY SCHOOL	1	NITRATE	10	4-Oct-00	9.2
1120030	NORTH HARFORD MIDDLE SCHOOL	1	NITRATE	10	9-Feb-93	8.2
1120030	NORTH HARFORD MIDDLE SCHOOL	1	NITRATE	10	6-Apr-93	8.2
1120030	NORTH HARFORD MIDDLE SCHOOL	1	NITRATE	10	9-Sep-93	8
1120030	**NORTH HARFORD MIDDLE SCHOOL**	**1**	**NITRATE**	**10**	**31-Jan-94**	**10.8**
1120030	**NORTH HARFORD MIDDLE SCHOOL**	**1**	**NITRATE**	**10**	**2-Feb-94**	**11**
1120030	**NORTH HARFORD MIDDLE SCHOOL**	**1**	**NITRATE**	**10**	**20-Apr-94**	**10.9**
1120030	**NORTH HARFORD MIDDLE SCHOOL**	**1**	**NITRATE**	**10**	**25-Apr-94**	**11**
1120030	NORTH HARFORD MIDDLE SCHOOL	1	NITRATE	10	15-Sep-94	7.96
1120030	NORTH HARFORD MIDDLE SCHOOL	1	NITRATE	10	3-Nov-94	9.7
1120030	NORTH HARFORD MIDDLE SCHOOL	1	NITRATE	10	12-Jan-95	9.84
1120030	NORTH HARFORD MIDDLE SCHOOL	1	NITRATE	10	11-Apr-95	9.55
1120030	NORTH HARFORD MIDDLE SCHOOL	1	NITRATE	10	13-Sep-95	10
1120030	NORTH HARFORD MIDDLE SCHOOL	1	NITRATE	10	17-Oct-95	9.54
1120030	NORTH HARFORD MIDDLE SCHOOL	1	NITRATE	10	26-Oct-95	8.6
1120030	**NORTH HARFORD MIDDLE SCHOOL**	**1**	**NITRATE**	**10**	**16-Jan-96**	**11.2**

Table 5a (continued). Regulated Inorganic Compound (IOC) Results Above 50% of the MCL

PWSID	PWS NAME	PLANT ID	CONTAMINANT NAME	MCL (ppm)	SAMPLE DATE	RESULT (ppm)
1120030	NORTH HARFORD MIDDLE SCHOOL	1	NITRATE	10	15-Apr-96	7
1120030	**NORTH HARFORD MIDDLE SCHOOL**	**1**	**NITRATE**	**10**	**16-Sep-96**	**11**
1120030	**NORTH HARFORD MIDDLE SCHOOL**	**1**	**NITRATE**	**10**	**19-Sep-96**	**11.3**
1120030	**NORTH HARFORD MIDDLE SCHOOL**	**1**	**NITRATE**	**10**	**16-Oct-96**	**13.1**
1120030	NORTH HARFORD MIDDLE SCHOOL	1	NITRATE	10	7-Jan-97	9.95
1120030	NORTH HARFORD MIDDLE SCHOOL	1	NITRATE	10	4-Apr-97	9.38
1120030	NORTH HARFORD MIDDLE SCHOOL	1	NITRATE	10	3-Sep-97	7.23
1120030	NORTH HARFORD MIDDLE SCHOOL	1	NITRATE	10	9-Oct-97	9.2
1120030	NORTH HARFORD MIDDLE SCHOOL	1	NITRATE	10	3-Feb-98	7.3
1120030	**NORTH HARFORD MIDDLE SCHOOL**	**1**	**NITRATE**	**10**	**15-Apr-98**	**11.2**
1120030	NORTH HARFORD MIDDLE SCHOOL	1	NITRATE	10	8-Sep-98	8.17
1120030	NORTH HARFORD MIDDLE SCHOOL	1	NITRATE	10	30-Nov-98	7.8
1120030	NORTH HARFORD MIDDLE SCHOOL	1	NITRATE	10	6-Jan-99	8.05
1120030	NORTH HARFORD MIDDLE SCHOOL	1	NITRATE	10	6-Jan-99	8.05
1120030	NORTH HARFORD MIDDLE SCHOOL	1	NITRATE	10	7-Apr-99	8.6
1120030	NORTH HARFORD MIDDLE SCHOOL	1	NITRATE	10	7-Apr-99	8.6
1120030	NORTH HARFORD MIDDLE SCHOOL	1	NITRATE	10	7-Sep-99	8.5
1120030	NORTH HARFORD MIDDLE SCHOOL	1	NITRATE	10	7-Sep-99	8.5
1120030	NORTH HARFORD MIDDLE SCHOOL	1	NITRATE	10	13-Oct-99	8.9
1120030	NORTH HARFORD MIDDLE SCHOOL	1	NITRATE	10	4-Jan-00	9.3
1120030	**NORTH HARFORD MIDDLE SCHOOL**	**1**	**NITRATE**	**10**	**10-Apr-00**	**10.3**
1120030	**NORTH HARFORD MIDDLE SCHOOL**	**1**	**NITRATE**	**10**	**14-Jun-00**	**12.4**
1120030	**NORTH HARFORD MIDDLE SCHOOL**	**1**	**NITRATE**	**10**	**14-Jun-00**	**12.4**
1120030	NORTH HARFORD MIDDLE SCHOOL	1	COPPER	1.3	14-Jun-00	1.27

Table 5a (continued). Regulated Inorganic Compound (IOC) Results Above 50% of the MCL

PWSID	PWS NAME	PLANT ID	CONTAMINANT NAME	MCL (ppm)	SAMPLE DATE	RESULT (ppm)
1120030	**NORTH HARFORD MIDDLE SCHOOL**	**1**	**NITRATE**	**10**	**6-Jul-00**	**12**
1120030	**NORTH HARFORD MIDDLE SCHOOL**	**1**	**NITRATE**	**10**	**10-Jul-00**	**12**
1120030	**NORTH HARFORD MIDDLE SCHOOL**	**1**	**NITRATE**	**10**	**4-Oct-00**	**13**
1120031	HIGHLAND COMMUNITY ASSOC.	1	NITRATE	10	9-Dec-93	6.4
1120031	HIGHLAND COMMUNITY ASSOC.	1	NITRATE	10	22-Feb-94	6.2
1120031	HIGHLAND COMMUNITY ASSOC.	1	NITRATE	10	16-Mar-94	5
1120031	HIGHLAND COMMUNITY ASSOC.	1	NITRATE	10	21-Jul-94	5
1120031	HIGHLAND COMMUNITY ASSOC.	1	NITRATE	10	31-Oct-94	6
1120031	HIGHLAND COMMUNITY ASSOC.	1	NITRATE	10	20-Mar-95	5.9
1120031	HIGHLAND COMMUNITY ASSOC.	1	NITRATE	10	5-Oct-95	5.8
1120031	HIGHLAND COMMUNITY ASSOC.	1	NITRATE	10	31-Jan-96	5.5
1120031	HIGHLAND COMMUNITY ASSOC.	1	NITRATE	10	4-Feb-97	5.8
1120031	HIGHLAND COMMUNITY ASSOC.	1	NITRATE	10	9-Oct-97	5.8
1120031	HIGHLAND COMMUNITY ASSOC.	1	NITRATE	10	11-Jun-98	5.3
1120031	HIGHLAND COMMUNITY ASSOC.	1	NITRATE	10	11-Nov-99	6.2
1120031	HIGHLAND COMMUNITY ASSOC.	1	NITRATE	10	12-Jun-00	5.4
1120031	HIGHLAND COMMUNITY ASSOC.	1	NITRATE	10	11-Sep-00	5.8
1120031	HIGHLAND COMMUNITY ASSOC.	1	NITRATE	10	11-Sep-00	5.5
1120032	PROSPECT MILL ELEM. SCHOOL	1	NITRATE	10	9-Feb-93	5.2
1120032	PROSPECT MILL ELEM. SCHOOL	1	NITRATE	10	16-Jun-93	5
1120032	PROSPECT MILL ELEM. SCHOOL	1	NITRATE	10	8-Sep-93	5.31
1120032	PROSPECT MILL ELEM. SCHOOL	1	NITRATE	10	26-Oct-93	5.9
1120032	PROSPECT MILL ELEM. SCHOOL	1	NITRATE	10	21-Sep-95	5.2
1120032	PROSPECT MILL ELEM. SCHOOL	1	NITRATE	10	8-Nov-95	5.11

Table 5a (continued). Regulated Inorganic Compound (IOC) Results Above 50% of the MCL

PWSID	PWS NAME	PLANT ID	CONTAMINANT NAME	MCL (ppm)	SAMPLE DATE	RESULT (ppm)
1120032	PROSPECT MILL ELEM. SCHOOL	1	NITRATE	10	24-Jan-97	5.85
1120032	PROSPECT MILL ELEM. SCHOOL	1	NITRATE	10	24-Apr-97	5.9
1120032	PROSPECT MILL ELEM. SCHOOL	1	NITRATE	10	4-Sep-97	6.29
1120032	PROSPECT MILL ELEM. SCHOOL	1	NITRATE	10	1-Oct-98	5.3
1120032	PROSPECT MILL ELEM. SCHOOL	1	NITRATE	10	19-Nov-98	5.94
1120035	HARFORD TECHNICAL HIGH SCHOOL	1	NITRATE	10	17-Jan-95	5.81
1120035	HARFORD TECHNICAL HIGH SCHOOL	1	NITRATE	10	20-Sep-95	5.34
1120035	HARFORD TECHNICAL HIGH SCHOOL	1	NITRATE	10	8-Nov-95	5.57
1120035	HARFORD TECHNICAL HIGH SCHOOL	1	NITRATE	10	21-Jan-98	5.13
1120035	HARFORD TECHNICAL HIGH SCHOOL	1	NITRATE	10	1-Oct-98	5.9
1120035	HARFORD TECHNICAL HIGH SCHOOL	1	NITRATE	10	13-Jan-99	6
1120035	HARFORD TECHNICAL HIGH SCHOOL	1	NITRATE	10	10-Aug-00	6.4
1120035	HARFORD TECHNICAL HIGH SCHOOL	1	NITRATE	10	26-Oct-00	5.9
1120041	LOVING HEART ADULT DAY CARE	1	NITRATE	10	3-Feb-93	6.5
1120041	LOVING HEART ADULT DAY CARE	1	NITRATE	10	17-Jun-93	7.8
1120041	LOVING HEART ADULT DAY CARE	1	NITRATE	10	8-Sep-93	6.97
1120041	LOVING HEART ADULT DAY CARE	1	NITRATE	10	14-Oct-93	5.2
1120041	LOVING HEART ADULT DAY CARE	1	NITRATE	10	24-Jan-94	6.38
1120041	LOVING HEART ADULT DAY CARE	1	NITRATE	10	26-May-94	6.77
1120041	LOVING HEART ADULT DAY CARE	1	NITRATE	10	26-Jan-95	9.24
1120041	LOVING HEART ADULT DAY CARE	1	NITRATE	10	4-Apr-95	5.5
1120041	LOVING HEART ADULT DAY CARE	1	NITRATE	10	14-Aug-95	6.1
1120041	LOVING HEART ADULT DAY CARE	1	NITRATE	10	6-Sep-95	5.9
1120041	LOVING HEART ADULT DAY CARE	1	NITRATE	10	4-Dec-95	6.42

Table 5a (continued). Regulated Inorganic Compound (IOC) Results Above 50% of the MCL

PWSID	PWS NAME	PLANT ID	CONTAMINANT NAME	MCL (ppm)	SAMPLE DATE	RESULT (ppm)
1120041	LOVING HEART ADULT DAY CARE	1	NITRATE	10	22-Feb-96	5.58
1120041	LOVING HEART ADULT DAY CARE	1	NITRATE	10	31-Jul-96	6.28
1120041	LOVING HEART ADULT DAY CARE	1	NITRATE	10	26-Nov-96	7.35
1120041	LOVING HEART ADULT DAY CARE	1	NITRATE	10	24-Jan-97	6.8
1120041	LOVING HEART ADULT DAY CARE	1	NITRATE	10	16-May-97	6.4
1120041	LOVING HEART ADULT DAY CARE	1	NITRATE	10	10-Sep-97	5.97
1120041	LOVING HEART ADULT DAY CARE	1	NITRATE	10	9-Oct-97	6.4
1120041	LOVING HEART ADULT DAY CARE	1	NITRATE	10	5-Feb-98	5.37
1120041	LOVING HEART ADULT DAY CARE	1	NITRATE	10	28-May-98	5.66
1120041	LOVING HEART ADULT DAY CARE	1	NITRATE	10	23-Jul-98	5.73
1120041	LOVING HEART ADULT DAY CARE	1	NITRATE	10	11-Aug-98	5.3
1120041	LOVING HEART ADULT DAY CARE	1	NITRATE	10	8-Dec-98	5.5
1120041	LOVING HEART ADULT DAY CARE	1	NITRATE	10	5-Feb-99	5.5
1120041	LOVING HEART ADULT DAY CARE	1	NITRATE	10	16-Aug-99	5.4
1120044	**HICKORY ANNEX**	**1**	**NITRITE**	**1**	**18-Feb-99**	**1.7**
1120048	NORTH BEND ELEMENTARY SCHOOL	1	NITRATE	10	9-Feb-93	7.7
1120048	NORTH BEND ELEMENTARY SCHOOL	1	NITRATE	10	5-May-93	9.7
1120048	NORTH BEND ELEMENTARY SCHOOL	1	NITRATE	10	8-Sep-93	7
1120048	NORTH BEND ELEMENTARY SCHOOL	1	NITRATE	10	8-Nov-93	9
1120048	**NORTH BEND ELEMENTARY SCHOOL**	**1**	**NITRATE**	**10**	**2-Feb-94**	**10.6**
1120048	**NORTH BEND ELEMENTARY SCHOOL**	**1**	**NITRATE**	**10**	**4-Feb-94**	**10.7**
1120048	**NORTH BEND ELEMENTARY SCHOOL**	**1**	**NITRATE**	**10**	**18-Apr-94**	**12**
1120048	**NORTH BEND ELEMENTARY SCHOOL**	**1**	**NITRATE**	**10**	**20-Apr-94**	**12.3**
1120048	NORTH BEND ELEMENTARY SCHOOL	1	NITRATE	10	14-Sep-94	8.28
1120048	NORTH BEND ELEMENTARY SCHOOL	1	NITRATE	10	15-Nov-94	9.8

Table 5a (continued). Regulated Inorganic Compound (IOC) Results Above 50% of the MCL

PWSID	PWS NAME	PLANT ID	CONTAMINANT NAME	MCL (ppm)	SAMPLE DATE	RESULT (ppm)
1120048	**NORTH BEND ELEMENTARY SCHOOL**	**1**	**NITRATE**	**10**	**12-Jan-95**	**10.3**
1120048	NORTH BEND ELEMENTARY SCHOOL	1	NITRATE	10	17-Jan-95	9.75
1120048	NORTH BEND ELEMENTARY SCHOOL	1	NITRATE	10	10-May-95	9.02
1120048	NORTH BEND ELEMENTARY SCHOOL	1	NITRATE	10	14-Sep-95	8.55
1120048	NORTH BEND ELEMENTARY SCHOOL	1	NITRATE	10	5-Oct-95	7.6
1120048	NORTH BEND ELEMENTARY SCHOOL	1	NITRATE	10	6-Nov-95	9.9
1120048	NORTH BEND ELEMENTARY SCHOOL	1	NITRATE	10	16-Jan-96	9.25
1120048	NORTH BEND ELEMENTARY SCHOOL	1	NITRATE	10	3-Jun-96	8.7
1120048	**NORTH BEND ELEMENTARY SCHOOL**	**1**	**NITRATE**	**10**	**11-Sep-96**	**11**
1120048	NORTH BEND ELEMENTARY SCHOOL	1	NITRATE	10	19-Sep-96	10
1120048	NORTH BEND ELEMENTARY SCHOOL	1	NITRATE	10	12-Nov-96	9.2
1120048	NORTH BEND ELEMENTARY SCHOOL	1	NITRATE	10	30-Jan-97	9.19
1120048	NORTH BEND ELEMENTARY SCHOOL	1	NITRATE	10	9-May-97	8.83
1120048	NORTH BEND ELEMENTARY SCHOOL	1	NITRATE	10	3-Sep-97	6.87
1120048	NORTH BEND ELEMENTARY SCHOOL	1	NITRATE	10	12-Nov-97	8.45
1120048	NORTH BEND ELEMENTARY SCHOOL	1	NITRATE	10	7-Jan-98	7
1120048	NORTH BEND ELEMENTARY SCHOOL	1	NITRATE	10	13-Jan-98	7
1120048	NORTH BEND ELEMENTARY SCHOOL	1	NITRATE	10	28-May-98	9.39
1120048	NORTH BEND ELEMENTARY SCHOOL	1	NITRATE	10	16-Sep-98	7.9
1120048	NORTH BEND ELEMENTARY SCHOOL	1	NITRATE	10	23-Oct-98	8.31
1120048	NORTH BEND ELEMENTARY SCHOOL	1	NITRATE	10	4-Mar-99	6.6
1120048	NORTH BEND ELEMENTARY SCHOOL	1	NITRATE	10	2-Sep-99	7.5
1120048	NORTH BEND ELEMENTARY SCHOOL	1	NITRATE	10	2-Sep-99	7.5
1120048	NORTH BEND ELEMENTARY SCHOOL	1	NITRATE	10	20-Oct-99	6.9

Table 5a (continued). Regulated Inorganic Compound (IOC) Results Above 50% of the MCL

PWSID	PWS NAME	PLANT ID	CONTAMINANT NAME	MCL (ppm)	SAMPLE DATE	RESULT (ppm)
1120048	NORTH BEND ELEMENTARY SCHOOL	1	NITRATE	10	9-Aug-00	8.4
1120048	NORTH BEND ELEMENTARY SCHOOL	1	NITRATE	10	13-Oct-00	7.5
1120051	FALLSTON MIDDLE SCHOOL	1	NITRATE	10	14-Dec-93	5.12
1120051	FALLSTON MIDDLE SCHOOL	1	NITRATE	10	2-Feb-94	5.64
1120051	FALLSTON MIDDLE SCHOOL	1	NITRATE	10	25-Apr-94	6.02
1120051	FALLSTON MIDDLE SCHOOL	1	NITRATE	10	15-Nov-94	6.37
1120051	FALLSTON MIDDLE SCHOOL	1	NITRATE	10	23-Jan-95	7.23
1120051	FALLSTON MIDDLE SCHOOL	1	NITRATE	10	13-Sep-95	5.49
1120051	FALLSTON MIDDLE SCHOOL	1	NITRATE	10	7-Feb-96	5.06
1120051	FALLSTON MIDDLE SCHOOL	1	NITRATE	10	3-Jun-96	9.36
1120051	FALLSTON MIDDLE SCHOOL	1	NITRATE	10	12-Sep-96	5.85
1120051	FALLSTON MIDDLE SCHOOL	1	NITRATE	10	18-Nov-96	6.68
1120051	FALLSTON MIDDLE SCHOOL	1	NITRATE	10	8-Jan-97	6.06
1120051	FALLSTON MIDDLE SCHOOL	1	NITRATE	10	3-Apr-97	5.76
1120052	HARFORD EARLY LEARNING CENTER	1	NITRATE	10	28-May-96	10
1120052	**HARFORD EARLY LEARNING CENTER**	**1**	**NITRATE**	**10**	**2-Jul-96**	**11**
1120052	**HARFORD EARLY LEARNING CENTER**	**1**	**NITRATE**	**10**	**17-Dec-96**	**11.9**
1120052	**HARFORD EARLY LEARNING CENTER**	**1**	**NITRATE**	**10**	**20-Dec-96**	**11.8**
1120052	HARFORD EARLY LEARNING CENTER	1	NITRATE	10	21-Oct-97	9
1120052	HARFORD EARLY LEARNING CENTER	1	NITRATE	10	16-Jul-98	8.66
1120052	HARFORD EARLY LEARNING CENTER	1	NITRATE	10	5-Oct-98	8.69
1120052	HARFORD EARLY LEARNING CENTER	1	NITRATE	10	6-Jan-99	8.12
1120052	HARFORD EARLY LEARNING CENTER	1	NITRATE	10	6-Jan-99	8.12
1120052	HARFORD EARLY LEARNING CENTER	1	NITRATE	10	7-Apr-99	9.4

Table 5a (continued). Regulated Inorganic Compound (IOC) Results Above 50% of the MCL

PWSID	PWS NAME	PLANT ID	CONTAMINANT NAME	MCL (ppm)	SAMPLE DATE	RESULT (ppm)
1120052	HARFORD EARLY LEARNING CENTER	1	NITRATE	10	7-Apr-99	9.4
1120052	HARFORD EARLY LEARNING CENTER	1	NITRATE	10	10-Aug-99	8.6
1120052	HARFORD EARLY LEARNING CENTER	1	NITRATE	10	20-Oct-99	8.8
1120052	HARFORD EARLY LEARNING CENTER	1	NITRATE	10	17-May-00	7.6
1120052	HARFORD EARLY LEARNING CENTER	1	NITRATE	10	20-Jul-00	8.3
1120052	HARFORD EARLY LEARNING CENTER	1	NITRATE	10	6-Oct-00	8.1
1120054	ADVENT CHILD DEVELOPMENT CTRE.	1	NITRATE	10	20-May-99	7.7
1120054	ADVENT CHILD DEVELOPMENT CTRE.	1	NITRATE	10	23-Jul-99	8.1
1120054	ADVENT CHILD DEVELOPMENT CTRE.	1	NITRATE	10	4-Nov-99	8.2
1120054	ADVENT CHILD DEVELOPMENT CTRE.	1	NITRATE	10	14-Feb-00	6.7
1120054	ADVENT CHILD DEVELOPMENT CTRE.	1	NITRATE	10	25-Sep-00	8.9
1120054	ADVENT CHILD DEVELOPMENT CTRE.	1	NITRATE	10	28-Nov-00	8
1120055	BETHEL DAY CARE & SCHOOL	1	NITRATE	10	24-Mar-99	6.4
1120056	HARFORD JEWISH CENTER	1	NITRATE	10	28-Apr-00	8.7
1120056	HARFORD JEWISH CENTER	1	NITRATE	10	28-Apr-00	8.7
1120058	HELPING HANDS MINISTRIES & D.C.	1	NITRATE	10	12-Dec-00	6.3
1121005	**FATHER MARTIN ASHLEY**	**1**	**LEAD**	**0.015**	**18-Aug-99**	**3.3**
1121005	**FATHER MARTIN ASHLEY**	**1**	**NITRATE**	**10**	**18-Aug-99**	**15.61**
1121126	CROSSROADS STATION	1	NITRATE	10	14-Oct-99	6.2
1121126	CROSSROADS STATION	1	NITRATE	10	7-Dec-00	5.8

Table 5a (continued). Regulated Inorganic Compound (IOC) Results Above 50% of the MCL

PWSID	PWS NAME	PLANT ID	SAMPLE DATE	RESULT (pCi/L)
120021	HART HERITAGE	1	12-May-99	5240
120204	CLEAR VIEW MOBILE HOME PARK	1	4-Jun-97	260
120207	WILLIAMS MOBILE HOME PARK	1	6-May-97	865
120208	FOUNTAIN GREEEN MOBILE HOME PARK	1	4-Mar-97	885
120210	ATKINS RETREAT	1	12-Mar-97	340
1120008	FAIR MEADOWS	1	1-May-97	180
1120014	FOREST HILL ELEMENTARY SCHOOL	1	26-Mar-96	3420
1120016	HARFORD CENTER, INC.	1	6-May-97	245
1120017	HARFORD CHRISTIAN SCHOOL	1	1-May-97	3880
1120017	HARFORD CHRISTIAN SCHOOL	2	1-May-97	2080
1120023	JARRETTSVILLE ELEMENTARY SCHOOL	1	10-Jun-96	2135
1120024	JOHN ARCHER SCHOOL	1	4-Mar-97	1740
1120026	MOUNTAIN CHRISTIAN SCHOOL	1	8-May-97	985
1120027	NORRISVILLE ELEMENTARY SCHOOL	1	10-Jun-96	1470
1120028	NORTH HARFORD ELEMENTARY SCHOOL	1	25-Mar-97	2915
1120030	NORTH HARFORD MIDDLE SCHOOL	1	25-Mar-97	5040
1120032	PROSPECT MILL ELEMENTARY SCHOOL	1	25-Feb-97	1660
1120033	SALEM LUTHERAN CHILD CARE CENTER	1	10-Jun-96	1235
1120034	STONEWALL DAY CARE CENTER # 2	1	8-May-97	1310
1120035	HARFORD TECHNICAL HIGH SCHOOL	1	25-Feb-97	2820
1120041	LOVING HEART ADULT DAY CARE	1	20-Feb-97	1025
1120044	HICKORY ANNEX	1	20-Feb-97	1585
1120048	NORTH BEND ELEMENTARY SCHOOL	1	23-Apr-96	1070
1120052	HARFORD EARLY LEARNING CENTER	1	20-Feb-97	5730

Table 5b. Radon-222 Results Above 50% of the More Conservative Proposed MCL of 300 pCi/L

PWSID	PWS NAME	PLANT ID	CONTAMINANT NAME	MCL (ppb)	SAMPLE DATE	RESULT (ppb)
1120032	PROSPECT MILL ELEMENTARY SCHOOL	1	METHYLENE CHLORIDE	5	11-Feb-91	3
1120044	HICKORY ANNEX	1	1,1-DICHLOROETHYL-ENE	7	7-Feb-91	7
1120044	HICKORY ANNEX	1	1,1-DICHLOROETHYL-ENE	7	9-Sep-92	4
1120044	HICKORY ANNEX	1	1,1-DICHLOROETHYL-ENE	7	21-Feb-94	4
1120044	HICKORY ANNEX	1	1,1-DICHLOROETHYL-ENE	7	20-Feb-97	4.7

Table 5c. Regulated Volatile Organic Compound (VOC) Results Above 50% of the MCL

PWSID	PWS NAME	PLANT ID	CONTAMINANT NAME	MCL (ppb)	SAMPLE DATE	RESULT (ppb)
1120008	FAIR MEADOWS	1	DI(2-ETHYLHEXYL) PHTHALATE	6	12-Oct-95	9.69
1120016	HARFORD CENTER, INC.	1	DI(2-ETHYLHEXYL) PHTHALATE	6	12-Oct-95	11.45
1120027	NORRISVILLE ELEMENTARY SCHOOL	1	DI(2-ETHYLHEXYL) PHTHALATE	6	26-Oct-95	3.37
1120028	NORTH HARFORD ELEMENTARY SCHOOL	1	DI(2-ETHYLHEXYL) PHTHALATE	6	26-Oct-95	3.37
1120030	NORTH HARFORD MIDDLE SCHOOL	1	DI(2-ETHYLHEXYL) PHTHALATE	6	26-Oct-95	16.84
1120046	J.F.K. MAINTENANCE FACILITY	1	DI(2-ETHYLHEXYL) PHTHALATE	6	12-Oct-95	11.16

Table 5d. Regulated Synthetic Organic Compound (SOC) Results Above 50% of the MCL

PWSID	PWS NAME	No. of Samples	No. of Positive Samples	Disinfection Treatment?
120021	HART HERITAGE	30	0	N
120204	CLEAR VIEW MOBILE HOME PARK	50	0	Y
120207	WILLIAMS MOBILE HOME PARK	51	0	Y
120208	FOUNTAIN GREEN M.H.P.	53	0	Y
120210	ATKINS RETREAT	51	0	Y
120213	QUEENS CASTLE MOBILE HOME PARK	52	1	Y
1120004	CHURCHVILLE DAY CARE CENTER	20	0	N
1120005	CHURCHVILLE ELEMENTARY SCHOOL	14	0	N
1120006	DARLINGTON ELEMENTARY SCHOOL	19	0	Y
1120007	DUBLIN ELEMENTARY SCHOOL	18	0	Y
1120008	FAIR MEADOWS	19	0	Y
1120010	FALLSTON CHILD CARE CENTER	20	0	N
1120011	FALLSTON PRE-KINDERGARTEN	20	0	N
1120014	FOREST HILL ELEMENTARY SCHOOL	12	0	Y
1120016	HARFORD CENTER INC.	21	0	N
1120017	HARFORD CHRISTIAN SCHOOL	22	4	N
1120023	JARRETTSVILLE ELEMENTARY	18	0	N
1120024	JOHN ARCHER SCHOOL	18	0	N
1120026	MOUNTAIN CHRISTIAN SCHOOL	21	0	N
1120027	NORRISVILLE ELEMENTARY SCHOOL	19	0	N
1120028	NORTH HARFORD ELEMENTARY SCHOOL	18	0	N
1120030	NORTH HARFORD MIDDLE SCHOOL	45	0	Y
1120031	HIGHLAND COMMUNITY ASSOC.	18	0	N
1120032	PROSPECT MILL ELEMENTARY	18	0	N
1120033	SALEM LUTHERAN CHILD CARE CENTER	20	0	N
1120034	STONEWALL DAY CARE CENTER #2	21	1	N
1120035	HARFORD TECHNICAL HIGH	22	0	Y
1120041	LOVING HEART ADULT DAY CARE	18	0	N
1120044	HICKORY ANNEX	17	0	N
1120046	J.F.K. MAINTENANCE FACILITY #1	17	3	N
1120048	NORTH BEND ELEMENTARY SCHOOL	19	0	Y
1120051	FALLSTON MIDDLE SCHOOL	32	0	Y
1120052	HARFORD EARLY LEARNING CENTER	19	0	N
1120054	ADVENT CHILD DEVELOPMENT CENTER	8	0	N
1120055	BETHEL DAY CARE & SCHOOL	6	0	N
1120056	HARFORD JEWISH CENTER	5	0	N
1120057	JAMES RUN CHRISTIAN ACADEMY	4	0	N
1120058	HELPING HANDS MINISTRIES AND DAY CARE	4	2	N
1121005	FATHER MARTIN ASHLEY	6	0	Y
1121126	CROSSROADS STATION	5	0	N
1121214	BEECHTREE GOLF CLUB	8	1	Y

Table 6. Routine Bacteriological Samples from Distribution for each Small System since 1996

Table 7. Preliminary Results From USGS Viral Contamination Study In Harford County

			INDICATOR MICROORGANISM ASSAY RESULTS							VIRAL ASSAY RESULTS										
PWSID	Location	Address	Collection Date	Sample Temp (oC)	Sample Volume	Sample pH	Total coliforms [CFU/100 mL]	E. coli [CFU/100 mL]	Enterococci [CFU/100 mL]	F+coliphage [PFU/500 mL]	F-coliphage [PFU/500 mL]	C. perfringens [CFU/200 mL]	B. fragilis phages [CFU/500 mL]	Sample volume passed through 1MDS virus filter (gallons)	Volume of concentrate (mL)	Total culturable viruses [PFU/100 liters]	HAV +/-	RV +/-	EV +/-	CV-1 +/-	CV-2 +/-
	Williams Mobile Home Park	578 Trimble Rd.	2-May-00	14.0	400 gal	7.90	<1	<1	2.0	<1	<1	<1	<1	400	13.5	negative	negative	negative	negative	negative	negative
	J.K. Maintenance Facility #1	2919 Belcamp Rd	31-May-00	?	400 gal	7.64	<1	<1	<1	<1	<1	<1	<1	400	11.0	negative	negative	negative	negative	negative	negative
1120046	J.K. Maintenance Facility #1	2919 Belcamp Rd.	31-May-00	?	400 gal	7.66	<1	<1	<1	<1	<1	<1	<1	400	11.5	negative	negative	negative	negative	negative	negative
1120008	Eastern Christian College	2410 Creswell Rd.	20-Jun-00	?	425 gal	7.20	<1	<1	<1	<1	<1	<1	<1	425	15.0	negative	negative	negative	negative	negative	negative
1120034	Stonewall Day Care Center #2	601 Fallston Rd.	26-Jun-00	?	400 gal	6.24	3.1	<1	<1	<1	<1	<1	<1	400		negative	negative	negative	negative	negative	negative
1120034	Stonewall Day Care Center #2	601 Fallston Rd	26-Jun-00	13.5	400 gal	6.18	2	<1	<1	<1	<1	<1	<1	400		negative	negative	negative	negative	negative	negative
1120028	North Harford Elementary School	120 Pylesville Rd	10-Jul-00	14.5	200 gal	5.47	1	<1	<1	<1	?	<1	<1	200		negative	negative	negative	negative	negative	negative
1120051	Fallston Middle School	2303 Carrs Mill Rd.	11-Jul-00	13.5	395 gal	6.59	<1	<1	<1	<1	<1	<1	<1	395		negative	negative	negative	negative	negative	negative
1120051	Fallston Middle School	2303 Carrs Mill Rd.	11-Jul-00	13.5	290 gal	6.59	<1	<1	<1	<1	<1	<1	<1	290		negative	negative	negative	negative	negative	negative
1120010	Fallston Child Care Center	1503 Fallston Rd.	12-Jul-00	14.5	271 gal	7.35	<1	<1	<1	<1	<1	<1	<1	271		negative	negative	negative	negative	negative	negative
1120024	John Archer School	100 Thomas Run Rd	17-Jul-00	15.0	200 gal	5.94	<1	<1	<1	<1	<1	<1	<1	200		negative	negative	negative	negative	negative	negative
1121214	Beechtree Golf Club	811 South Stepney Rd	18-Jul-00	16.0	400 gal	7.30	<1	<1	<1	<1	<1	<1	<1	400	10.5	negative	negative	negative	negative	negative	negative
1121005	Father Martin Ashley	800 Tydings Lane	20-Jul-00	14.0	270 gal	6.64	<1	<1	<1	<1	<1	<1	<1	270		negative	negative	negative	negative	negative	negative
1120044	Hickory Annex Aberdeen	2209 Conowingo Rd.	24-Jul-00	16.5	200 gal	7.51	<1	<1	<1	<1	<1	<1	<1	200		negative	negative	negative	negative	negative	negative
1120007	Dublin Elementary School	1527 Whiteford Rd	31-Jul-00	15.0	370 gal	7.00	49.5	3.1	<1	positive	<1	<1	positive	370		negative	negative	positive	negative	negative	negative
1120048	North Bend Elementary School	1445 North Bend Rd.	31-Jul-00	15.0	280 gal	5.95	<1	<1	<1	<1	<1	<1	<1	280		negative	negative	negative	negative	negative	negative
1120011	Fallston Pre-kindergarten	600 Fallston Rd.	22-Aug-00	14.5	200 gal	?	275.5	<1	<1	<1	<1	2.0	<1	200		negative	negative	negative	negative	negative	negative
1120005	Churchville Elementary School	2935 Level Rd.	23-Aug-00	15.5	200 gal	5.61	1046.2	<1	<1	<1	<1	<1	<1	200		negative	negative	negative	negative	negative	negative
1120023	Jarrettsville Elementary School	3818 Norrisville Rd	28-Aug-00	16.5	200 gal	6.65	<1	<1	<1	<1	<1	<1	<1	200		negative	negative	negative	negative	negative	negative
1120056	Harford Jewish Center	8 North Earlton Ave.	28-Aug-00	16.0	200 gal	5.80	<1	<1	<1	<1	<1	<1	<1	200		negative	negative	negative	negative	negative	negative
1120052	Harford Early Learning Center	719 Wheeler School Rd.	11-Sep-00	13.0	200 gal	5.80	4.1	<1	<1	<1	<1	<1	<1	200		negative	negative	negative	negative	negative	negative
1120017	Harford Christian School	1736 Whiteford Rd	11-Oct-00	?	249 gal	6.34	<1	<1	<1	<1	<1	<1	<1	249		negative	negative	negative	negative	negative	negative
120204	Clear View Mobile Home Park	4104 Conowingo Rd.	24-Oct-00	14.0	200 gal	7.11	161.6	<1	4.1	<1	<1	<1	<1	200		negative	negative	negative	negative	negative	negative

Land Use	Acres	% of Total Area
Low Density Residential	26445	12
Medium Density Residential	6573	3
High Density Residential	1215	1
Commercial	4113	2
Industrial	218	0.1
Extractive	497	0.2
Open Urban Land	745	0.3
Cropland	89140	42
Pasture	12756	6
Orchards	919	0.4
Forest	68931	32
Water	455	0.2
Wetlands	28	0
Barren Land	312	0.1
Feeding Operations	1564	0.7
Total Area	213911	100

Table 8a. Harford County Piedmont Region Land Use Summary (See Figure 3)

Land Use	Acres	% of Total Area
Low Density Residential	2522	4
Medium Density Residential	3389	5
High Density Residential	1696	3
Commercial	15882	25
Industrial	1101	2
Extractive	163	0.2
Open Urban Land	722	1
Cropland	5274	9
Pasture	382	0.6
Orchards	104	0.1
Forest	25832	41
Water	1098	2
Wetlands	4369	7
Barren Land	139	0.2
Feeding Operations	45	0
Total Area	62718	100

Table 8b. Harford County Coastal Plain Region Land Use Summary (See Figure 3)

Category	Acres	% of Total Area
Existing Service Area or System Under Construction	20637	7
Area Programmed for Service within 5 Years	9510	3
Area Programmed for Service within 6 to 10 Years	12750	5
No Planned Service	236837	85
Total Area	279734	100

Table 9.Sewer Service Area Summary of Harford County (see Figure 4)

PWSID	PWS Name	Are Contaminant Sources Present in WHPA?	Are Contaminants Detected in WQ Samples at Levels of Concern?	Is Well Integrity a Factor?	Is the Aquifer Vulnerable?	Is the System Susceptible to VOCs?
0120021	HART HERITAGE	YES	NO	NO	YES	YES
0120204	CLEAR VIEW MOBILE HOME PARK	NO	NO	NO	YES	NO
0120207	WILLIAMS MOBILE HOME PARK	YES	NO	NO	YES	YES
0120208	FOUNTAIN GREEN MOBILE HOME PARK	NO	NO	NO	YES	NO
0120210	ATKINS RETREAT	YES	NO	YES	YES	YES
0120213	QUEENS CASTLE MOBILE HOME PARK	YES	NO	YES	YES	YES
1120004	CHURCHVILLE DAY CARE CENTER	YES	NO	YES	YES	YES
1120005	CHURCHVILLE ELEMENTARY	NO	NO	YES-well inside school	YES	NO
1120006	DARLINGTON ELEMENTARY	LUST case & colonial pipe near WHPA	NO	YES-backup well in pit	YES	YES
1120007	DUBLIN ELEMENTARY	YES	NO	YES	YES	YES
1120008	FAIR MEADOWS	NO	NO	NO	YES	NO
1120010	FALLSTON CHILD CARE CENTER	NO	NO	YES-old well	YES	NO
1120011	FALLSTON PRE-KINDERGARTEN	YES	NO	NO	YES	YES
1120014	FOREST HILL ELEMENTARY	YES	YES	NO	YES	YES
1120016	HARFORD CENTER INC.	NO	NO	NO	YES	NO
1120017	HARFORD CHRISTIAN SCHOOL	YES	YES	NO	YES	YES
1120023	JARRETTSVILLE ELEMENTARY	YES	NO	NO	YES	YES
1120024	JOHN ARCHER SCHOOL	YES	NO	NO	YES	YES
1120026	MOUNTAIN CHRISTIAN SCHOOL	NO	NO	YES-dug well	YES	NO
1120027	NORRISVILLE ELEMENTARY	NO	NO	YES-standby well	YES	NO
1120028	NORTH HARFORD ELEMENTARY	NO	NO	NO	YES	NO
1120030	NORTH HARFORD MIDDLE SCHOOL	NO	NO	NO	YES	NO

Table 10c. Susceptibility Logic Chart for Volatile Organic Compounds

PWSID	PWS NAME	Are Contaminant Sources Present in WHPA?	Are Contaminants Detected in WQ Samples at Levels of Concern?	Is Well Integrity a Factor?	Is the Aquifer Vulnerable?	Is the System Susceptible to VOCs?
1120031	HIGHLAND COMMUNITY ASSOC.	YES	NO	YES	YES	YES
1120032	PROSPECT MILL ELEMENTARY	NO	YES	NO	YES	YES
1120033	SALEM LUTHERAN CHILD CARE CENTER	YES	NO	YES	YES	YES
1120034	STONEWALL DAY CARE CENTER #2	NO	NO	NO	YES	NO
1120035	HARFORD TECHNICAL HIGH	YES	NO	NO	YES	YES
1120041	LOVING HEART ADULT DAY CARE	YES	NO	NO	YES	YES
1120044	HICKORY ANNEX	YES	YES	YES	YES	YES
1120046	J.F.K. MAINTENANCE FACILITY # 1	YES	NO	YES	YES	YES
1120048	NORTH BEND ELEMENTARY	NO	YES	NO	YES	YES
1120051	FALLSTON MIDDLE SCHOOL	YES	NO	NO	YES	YES
1120052	HARFORD EARLY LEARNING CENTER	YES	NO	NO	YES	YES
1120054	ADVENT CHILD DEVELOP. CENTER	YES	NO	NO	YES	YES
1120055	BETHEL DAY CARE AND SCHOOL	NO	NO	NO	YES	NO
1120056	HARFORD JEWISH CENTER	NO	NO	YES	YES	NO
1120057	JAMES RUN CHRISTIAN ACADEMY	near WHPA	NO	NO	YES	YES
1120058	HELPING HANDS MINISTRIES AND D.C.	NO	no data available	YES	YES	?
1121005	FATHER MARTIN'S ASHLEY	NO	NO	NO	YES	NO
1121126	CROSSROADS STATION	YES	YES	NO	YES	YES
1121214	BEECHTREE GOLF CLUB	NO	NO	NO	YES	NO

Table 10c (continued). Susceptibility Logic Chart for Volatile Organic Compounds

PWSID	PWS NAME	Are Contaminant Sources Present in WHPA?	Are Contaminants Detected in WQ Samples at Levels of Concern?	Is Well Integrity a Factor?	Is the Aquifer Vulnerable?	Is the System Susceptible to Radiological Compounds?
1120032	PROSPECT MILL ELEMENTARY	YES-naturally occurring	YES	NO	YES	may be
1120033	SALEM LUTHERAN CHILD CARE CENTER	YES-naturally occurring	YES	NO	YES	may be
1120034	STONEWALL DAY CARE CENTER #2	YES-naturally occurring	YES	NO	YES	may be
1120035	HARFORD TECHNICAL HIGH	YES-naturally occurring	YES	NO	YES	YES
1120041	LOVING HEART ADULT DAY CARE	YES-naturally occurring	YES	NO	YES	may be
1120044	HICKORY ANNEX	YES-naturally occurring	YES	NO	YES	may be
1120046	J.F.K. MAINTENANCE FACILITY # 1	NO	NO	NO	YES	NO
1120048	NORTH BEND ELEMENTARY	YES-naturally occurring	YES	NO	YES	may be
1120051	FALLSTON MIDDLE SCHOOL	YES-naturally occurring	insufficient data	NO	YES	?
1120052	HARFORD EARLY LEARNING CENTER	YES-naturally occurring	YES	NO	YES	YES
1120054	ADVENT CHILD DEVELOP. CENTER	?	no data available	NO	YES	?
1120055	BETHEL DAY CARE AND SCHOOL	?	no data available	NO	YES	?
1120056	HARFORD JEWISH CENTER	?	no data available	NO	YES	?
1120057	JAMES RUN CHRISTIAN ACADEMY	?	no data available	NO	YES	?
1120058	HELPING HANDS MINISTRIES AND D.C.	?	no data available	NO	YES	?
1121005	FATHER MARTIN'S ASHLEY	?	no data available	NO	YES	?
1121126	CROSSROADS STATION	?	no data available	NO	YES	?
1121214	BEECHTREE GOLF CLUB	?	no data available	NO	YES	?

Table 10b (continued). Susceptibility Logic Chart for Radiological Compounds

PWSID	PWS Name	Are Contaminant Sources Present in WHPA?	Are Contaminants Detected in WQ Samples at Levels of Concern?	Is Well Integrity a Factor?	Is the Aquifer Vulnerable?	Is the System Susceptible to Radiological Compounds?
0120021	HART HERITAGE	YES-naturally occurring	YES	NO	YES	YES
0120204	CLEAR VIEW MOBILE HOME PARK	YES-naturally occurring	YES	NO	YES	may be
0120207	WILLIAMS MOBILE HOME PARK	YES-naturally occurring	YES	NO	YES	may be
0120208	FOUNTAIN GREEN MOBILE HOME PARK	YES-naturally occurring	YES	NO	YES	may be
0120210	ATKINS RETREAT	YES-naturally occurring	YES	NO	YES	may be
0120213	QUEENS CASTLE MOBILE HOME PARK	YES-naturally occurring	NO	NO	YES	NO
1120004	CHURCHVILLE DAY CARE CENTER	?	no data available	NO	YES	?
1120005	CHURCHVILLE ELEMENTARY	YES-naturally occurring	insufficient data	NO	YES	?
1120006	DARLINGTON ELEMENTARY	YES-naturally occurring	insufficient data	NO	YES	?
1120007	DUBLIN ELEMENTARY	YES-naturally occurring	NO	NO	YES	NO
1120008	FAIR MEADOWS	YES-naturally occurring	YES	NO	YES	may be
1120010	FALLSTON CHILD CARE CENTER	?	no data available	NO	YES	?
1120011	FALLSTON PRE-KINDERGARTEN	YES-naturally occurring	NO	NO	YES	NO
1120014	FOREST HILL ELEMENTARY	YES-naturally occurring	YES	NO	YES	YES
1120016	HARFORD CENTER INC.	YES-naturally occurring	YES	NO	YES	may be
1120017	HARFORD CHRISTIAN SCHOOL	YES-naturally occurring	YES	NO	YES	YES
1120023	JARRETTSVILLE ELEMENTARY	YES-naturally occurring	YES	NO	YES	YES
1120024	JOHN ARCHER SCHOOL	YES-naturally occurring	YES	NO	YES	may be
1120026	MOUNTAIN CHRISTIAN SCHOOL	YES-naturally occurring	YES	NO	YES	may be
1120027	NORRISVILLE ELEMENTARY	YES-naturally occurring	YES	NO	YES	may be
1120028	NORTH HARFORD ELEMENTARY	YES-naturally occurring	YES	NO	YES	YES
1120030	NORTH HARFORD MIDDLE SCHOOL	YES-naturally occurring	YES	NO	YES	YES
1120031	HIGHLAND COMMUNITY ASSOC.	?	no data available	NO	YES	?

Table 10b. Susceptibility Logic Chart for Radiological Compounds

PWSID	PWS NAME	Are Contaminant Sources Present in WHPA?	Are Contaminants Detected in WQ Samples at Levels of Concern?	Is Well Integrity a Factor?	Is the Aquifer Vulnerable?	Is the System Susceptible to Nitrate?
1120034	STONEWALL DAY CARE CENTER #2	YES	YES	NO	YES	YES
1120035	HARFORD TECHNICAL HIGH	YES	YES	NO	YES	YES
1120041	LOVING HEART ADULT DAY CARE	YES	YES	NO	YES	YES
1120044	HICKORY ANNEX	YES	YES	YES	YES	YES
1120046	J.F.K. MAINTENANCE FACILITY # 1	YES	NO	YES	YES	NO
1120048	NORTH BEND ELEMENTARY	YES	YES	NO	YES	YES
1120051	FALLSTON MIDDLE SCHOOL	YES	YES	NO	YES	YES
1120052	HARFORD EARLY LEARNING CENTER	YES	YES	NO	YES	YES
1120054	ADVENT CHILD DEVELOP. CENTER	YES	YES	NO	YES	YES
1120055	BETHEL DAY CARE AND SCHOOL	YES	YES	NO	YES	YES
1120056	HARFORD JEWISH CENTER	YES	YES	YES	YES	YES
1120057	JAMES RUN CHRISTIAN ACADEMY	YES	Insufficient Data	NO	YES	?
1120058	HELPING HANDS MINISTRIES AND D.C.	YES	YES	YES	YES	YES
1121005	FATHER MARTIN'S ASHLEY	YES	YES	NO	YES	YES
1121126	CROSSROADS STATION	YES	YES	NO	YES	YES
1121214	BEECHTREE GOLF CLUB	YES	NO	NO	YES	NO

Table 10a (continued). Susceptibility Logic Chart for Nitrate

PWSID	PWS Name	Are Contaminant Sources Present in WHPA?	Are Contaminants Detected in WQ Samples at Levels of Concern?	Is Well Integrity a Factor?	Is the Aquifer Vulnerable?	Is the System Susceptible to Nitrate?
0120021	HART HERITAGE	YES	YES	NO	YES	YES
0120204	CLEAR VIEW MOBILE HOME PARK	YES	YES	NO	YES	YES
0120207	WILLIAMS MOBILE HOME PARK	YES	NO	NO	YES	NO
0120208	FOUNTAIN GREEN MOBILE HOME PARK	YES	NO	NO	YES	NO
0120210	ATKINS RETREAT	YES	NO	YES	YES	YES
0120213	QUEENS CASTLE MOBILE HOME PARK	YES	YES	YES	YES	YES
1120004	CHURCHVILLE DAY CARE CENTER	YES	YES	YES	YES	YES
1120005	CHURCHVILLE ELEMENTARY	YES	YES	YES-well inside school	YES	YES
1120006	DARLINGTON ELEMENTARY	YES	YES	YES- backup well in pit	YES	YES
1120007	DUBLIN ELEMENTARY	YES	YES	YES	YES	YES
1120008	FAIR MEADOWS	YES	NO	NO	YES	NO
1120010	FALLSTON CHILD CARE CENTER	YES	NO	YES-old well	YES	NO
1120011	FALLSTON PRE-KINDERGARTEN	YES	NO	NO	YES	NO
1120014	FOREST HILL ELEMENTARY	YES	YES	NO	YES	YES
1120016	HARFORD CENTER INC.	YES	YES	NO	YES	YES
1120017	HARFORD CHRISTIAN SCHOOL	YES	YES	NO	YES	YES
1120023	JARRETTSVILLE ELEMENTARY	YES	NO	NO	YES	NO
1120024	JOHN ARCHER SCHOOL	YES	YES	NO	YES	YES
1120026	MOUNTAIN CHRISTIAN SCHOOL	YES	NO	YES-dug well	YES	NO
1120027	NORRISVILLE ELEMENTARY	YES	YES	YES-standby well	YES	YES
1120028	NORTH HARFORD ELEMENTARY	YES	YES	NO	YES	YES
1120030	NORTH HARFORD MIDDLE SCHOOL	YES	YES	NO	YES	YES
1120031	HIGHLAND COMMUNITY ASSOC.	YES	YES	YES	YES	YES
1120032	PROSPECT MILL ELEMENTARY	YES	YES	NO	YES	YES
1120033	SALEM LUTHERAN CHILD CARE CENTER	YES	NO	YES	YES	NO

Table 10a. Susceptibility Logic Chart for Nitrate

PWSID	PWS Name	Are Contaminant Sources Present in WHPA?	Are Contaminants Detected in WQ Samples at Levels of Concern?	Is Well Integrity a Factor?	Is the Aquifer Vulnerable?	Is the System Susceptible to SOCs?
0120021	HART HERITAGE	YES	NO	NO	YES	YES
0120204	CLEAR VIEW MOBILE HOME PARK	NO	NO	NO	YES	NO
0120207	WILLIAMS MOBILE HOME PARK	YES	NO	NO	YES	YES
0120208	FOUNTAIN GREEN MOBILE HOME PARK	YES	NO	NO	YES	NO
0120210	ATKINS RETREAT	YES	NO	YES	YES	YES
0120213	QUEENS CASTLE MOBILE HOME PARK	YES	NO	YES	YES	NO
1120004	CHURCHVILLE DAY CARE CENTER	YES	NO	YES	YES	YES
1120005	CHURCHVILLE ELEMENTARY	YES	NO	YES-well inside school	YES	YES
1120006	DARLINGTON ELEMENTARY	YES	NO	YES-backup well in pit	YES	YES
1120007	DUBLIN ELEMENTARY	YES	NO	YES	YES	NO
1120008	FAIR MEADOWS	YES	NO	NO	YES	NO
1120010	FALLSTON CHILD CARE CENTER	YES	NO	YES-old well	YES	NO
1120011	FALLSTON PRE-KINDERGARTEN	YES	NO	NO	YES	NO
1120014	FOREST HILL ELEMENTARY	YES	NO	NO	YES	NO
1120016	HARFORD CENTER INC.	YES	NO	NO	YES	NO
1120017	HARFORD CHRISTIAN SCHOOL	YES	YES	NO	YES	YES
1120023	JARRETTSVILLE ELEMENTARY	YES	NO	NO	YES	YES
1120024	JOHN ARCHER SCHOOL	YES	NO	NO	YES	NO
1120026	MOUNTAIN CHRISTIAN SCHOOL	YES	NO	YES-dug well	YES	NO
1120027	NORRISVILLE ELEMENTARY	YES	NO	YES-standby well	YES	NO
1120028	NORTH HARFORD ELEMENTARY	YES	NO	NO	YES	NO
1120030	NORTH HARFORD MIDDLE SCHOOL	YES	NO	NO	YES	NO

Table 10d. Susceptibility Logic Chart for Synthetic Organic Compounds

PWSID	PWS NAME	Are Contaminant Sources Present in WHPA?	Are Contaminants Detected in WQ Samples at Levels of Concern?	Is Well Integrity a Factor?	Is the Aquifer Vulnerable?	Is the System Susceptible to SOCs?
1120031	HIGHLAND COMMUNITY ASSOC.	YES	NO	YES	YES	NO
1120032	PROSPECT MILL ELEMENTARY	YES	NO	NO	YES	NO
1120033	SALEM LUTHERAN CHILD CARE CENTER	YES	NO	YES	YES	YES
1120034	STONEWALL DAY CARE CENTER #2	YES	NO	NO	YES	NO
1120035	HARFORD TECHNICAL HIGH	YES	NO	NO	YES	NO
1120041	LOVING HEART ADULT DAY CARE	YES	NO	NO	YES	YES
1120044	HICKORY ANNEX	YES	NO	YES	YES	NO
1120046	J.F.K. MAINTENANCE FACILITY # 1	NO	NO	YES	YES	NO
1120048	NORTH BEND ELEMENTARY	YES	YES	NO	YES	YES
1120051	FALLSTON MIDDLE SCHOOL	YES	NO	NO	YES	NO
1120052	HARFORD EARLY LEARNING CENTER	YES	NO	NO	YES	NO
1120054	ADVENT CHILD DEVELOP. CENTER	YES	NO	NO	YES	NO
1120055	BETHEL DAY CARE AND SCHOOL	YES	?	NO	YES	?
1120056	HARFORD JEWISH CENTER	YES	?	YES	YES	?
1120057	JAMES RUN CHRISTIAN ACADEMY	YES	NO	NO	YES	YES
1120058	HELPING HANDS MINISTRIES AND D.C.	YES	?	YES	YES	?
1121005	FATHER MARTIN'S ASHLEY	YES	NO	NO	YES	YES
1121126	CROSSROADS STATION	YES	NO	NO	YES	NO
1121214	BEECHTREE GOLF CLUB	YES	?	NO	YES	?

Table 10d (continued). Susceptibility Logic Chart for Synthetic Organic Compounds

PWSID	PWS Name	Are Contaminant Sources Present in WHPA?	Are Contaminants Detected in WQ Samples?	Is Well Integrity a Factor?	Is the Aquifer Vulnerable?	Is the System Susceptible to Microbiological Pathogens?
0120021	HART HERITAGE	YES	NO	NO	NO	NO-based on routine sampling
0120204	CLEAR VIEW MOBILE HOME PARK	YES	YES-from virus study	NO	NO	?-repeat sampling is needed
0120207	WILLIAMS MOBILE HOME PARK	YES	YES-from virus study	NO	NO	?-repeat sampling is needed
0120208	FOUNTAIN GREEN MOBILE HOME PARK	YES	NO	NO	NO	NO
0120210	ATKINS RETREAT	YES	NO	YES	NO	?
0120213	QUEENS CASTLE MOBILE HOME PARK	YES	YES-one routine sample	YES	NO	NO
1120004	CHURCHVILLE DAY CARE CENTER	YES	NO	YES	NO	NO-based on routine sampling
1120005	CHURCHVILLE ELEMENTARY	YES	YES-from virus study	YES-well inside school	NO	YES
1120006	DARLINGTON ELEMENTARY	YES	NO	YES-backup well in pit	NO	NO
1120007	DUBLIN ELEMENTARY	YES	YES-from virus study	YES	NO	? - "high risk" sampling planned
1120008	FAIR MEADOWS	YES	NO	NO	NO	NO-based on virus study
1120010	FALLSTON CHILD CARE CENTER	YES	NO	YES-old well	NO	NO-based on virus study & routine sampling
1120011	FALLSTON PRE-KINDERGARTEN	YES	YES-from virus study	NO	NO	?
1120014	FOREST HILL ELEMENTARY	YES	NO	NO	NO	?
1120016	HARFORD CENTER INC.	YES	NO	NO	NO	NO-based on routine sampling
1120017	HARFORD CHRISTIAN SCHOOL	YES	YES	NO	NO	?
1120023	JARRETTSVILLE ELEMENTARY	YES	NO	NO	NO	NO-based on virus study & routine sampling
1120024	JOHN ARCHER SCHOOL	YES	NO	NO	NO	NO-based on virus study & routine sampling
1120026	MOUNTAIN CHRISTIAN SCHOOL	YES	NO	YES-dug well	NO	YES

Table 10e. Susceptibility Logic Chart for Microbiological Pathogens

PWSID	PWS NAME	Are Contaminant Sources Present in WHPA?	Are Contaminants Detected in WQ Samples?	Is Well Integrity a Factor?	Is the Aquifer Vulnerable?	Is the System Susceptible to Microbiological Pathogens?
1120027	NORRISVILLE ELEMENTARY	YES	NO	YES-standby well	NO	NO-based on routine sampling
1120028	NORTH HARFORD ELEMENTARY	YES	NO	NO	NO	NO-based on virus study & routine sampling
1120030	NORTH HARFORD MIDDLE SCHOOL	YES	NO	NO	NO	?
1120031	HIGHLAND COMMUNITY ASSOC.	YES	NO	YES	NO	NO-based on routine sampling
1120032	PROSPECT MILL ELEMENTARY	YES	NO	NO	NO	NO-based on routine sampling
1120033	SALEM LUTHERAN CHILD CARE CENTER	YES	NO	YES	NO	NO-based on routine sampling
1120034	STONEWALL DAY CARE CENTER #2	NO	YES-from bldg. taps	NO	NO	NO-based on virus study & routine sampling
1120035	HARFORD TECHNICAL HIGH	YES	NO	NO	NO	?
1120041	LOVING HEART ADULT DAY CARE	NO	NO	NO	NO	NO-based on routine sampling
1120044	HICKORY ANNEX	NO	NO	YES	NO	NO-based on virus study & routine sampling
1120046	J.F.K. MAINTENANCE FACILITY # 1	YES	YES	YES	NO	?
1120048	NORTH BEND ELEMENTARY	YES	NO	NO	NO	NO-based on virus study
1120051	FALLSTON MIDDLE SCHOOL	YES	NO	NO	NO	NO-based on virus study
1120052	HARFORD EARLY LEARNING CENTER	YES	NO	NO	NO	NO-based on routine sampling
1120054	ADVENT CHILD DEVELOP. CENTER	YES	NO	NO	NO	NO-based on routine sampling
1120055	BETHEL DAY CARE AND SCHOOL	YES	NO	NO	NO	NO-based on routine sampling
1120056	HARFORD JEWISH CENTER	YES	NO	YES	NO	NO-based on virus study & routine sampling
1120057	JAMES RUN CHRISTIAN ACADEMY	YES	NO	NO	NO	NO-based on routine sampling
1120058	HELPING HANDS MINISTRIES AND D.C.	YES	YES	YES	NO	YES

Table 10e (continued). Susceptibility Logic Chart for Microbiological Pathogens

PWSID	PWS NAME	Are Contaminant Sources Present in WHPA?	Are Contaminants Detected in WQ Samples?	Is Well Integrity a Factor?	Is the Aquifer Vulnerable?	Is the System Susceptible to Microbiological Pathogens?
1121005	FATHER MARTIN ASHLEY	YES	NO	NO	NO	NO-based on virus study
1121126	CROSSROADS STATION	YES	NO	NO	NO	NO-based on routine sampling
1121214	BEECHTREE GOLF CLUB	NO	YES	NO	NO	NO-based on virus study

Table 10e (continued). Susceptibility Logic Chart for Microbiological Pathogens

Figure 1. Harford County SWAP Regions for Small Ground Water Systems

LEGEND

- Community Wells
- Non-Transient Wells

SWAP Regions

- Coastal Plain Region
- Piedmont Region

N

4.5 0 4.5 Miles

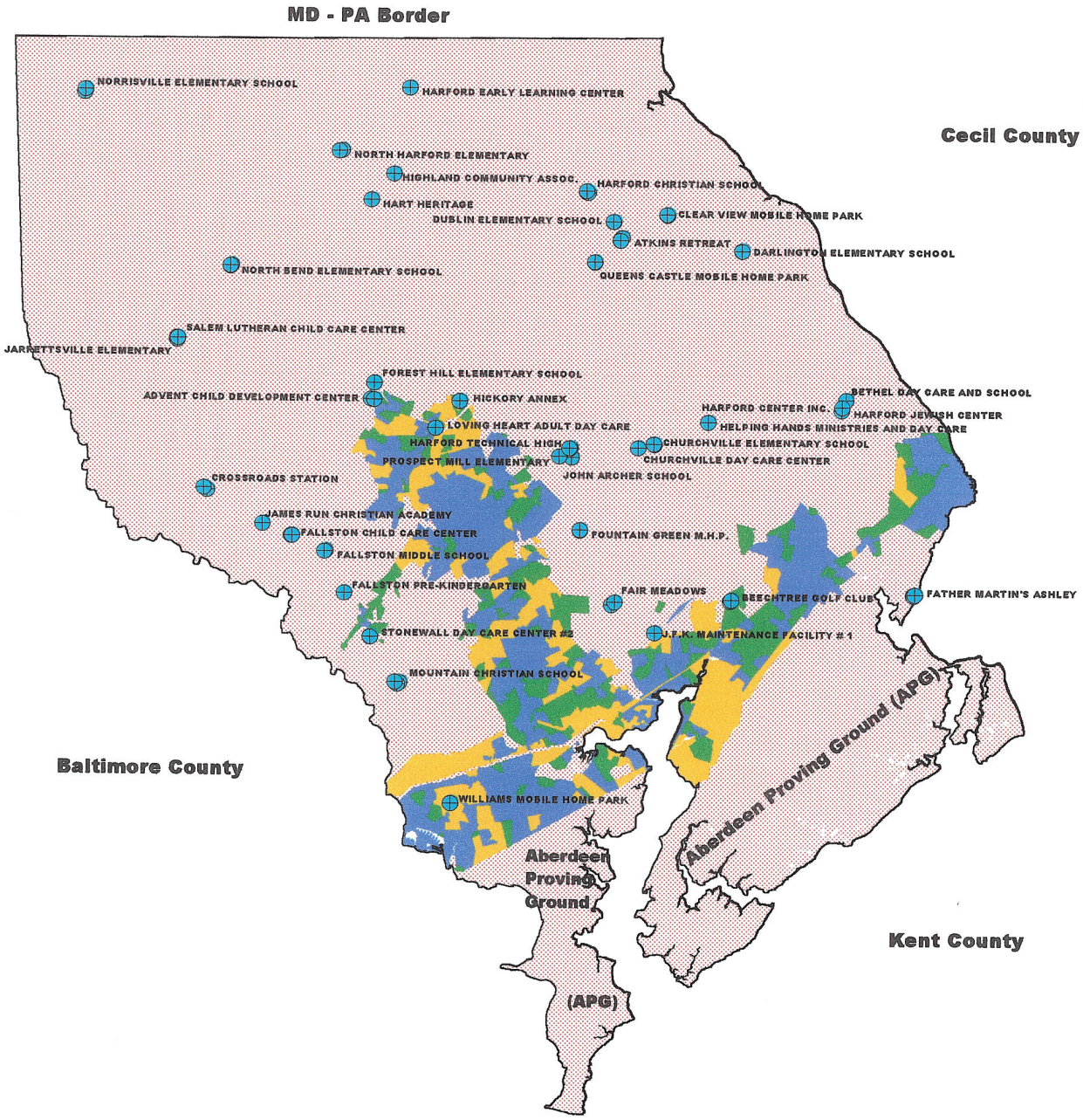


Figure 4. Sewer Service Area Map of Harford County

LEGEND

Sewer Service Category

- No Planned Service
- Existing Service Area or System under Construction
- Area Programmed for Service within 5 Years
- Area Programmed for Service within 6 to 10 Years
- Supply Wells

N

4.5 0 4.5 Miles

Source: MD Office of Planning 1994 Harford County Sewerage Coverage Map

APPENDICES

APPENDIX A

Report of open cases within or near WHPAs from MDE Oil Control Program.

Harford County Case Summaries

June 8, 2001

Case # 9-0354HA Cleary's Service Station
3530 Conowingo Rd
Street

All problem LUSTs have been removed and three groundwater monitoring wells have been installed. Wawa has installed three new USTs on site, has drilled a new domestic well, and has installed a carbon filtration system as a precaution. Harford Co. Health Department has been greatly involved in the process of property upgrading and has (I believe) placed this site in the non-transient water program requiring periodic VOC testing.

Case # 9-0816HA Fallston Service Center
602 ~~2800~~ Fallston Rd
Fallston

Historic LUSTs have created petroleum problems for the station and the abandoned house just west of the station. All LUSTs have been removed and replaced with fully compliant USTs. Contamination appears to be localized to the area west of the station around the tank field. This Administration has in the past required VOC analyticals to be conducted on the church domestic well (just east of the station). However, those reports have always been non-detect.

Case # 91-2228HA Lee Snyder
4 E. Jarrettsville Rd
Forest Hill

Case originally opened as a result of a complaint of petroleum in the domestic well. Active and properly maintained carbon system is installed. Moderate pre-carbon contamination. Source believed to be an ancient UST, now properly abandoned.

Case # 92-2348HA Crown Petroleum
2901 Churchville Rd
Churchville

Case originally opened due to a line leak. An estimated 1055 gallons of product were lost. Local domestic wells (including the station's) have carbon systems and are monitored on a monthly basis. There are 7 monitoring wells on the station property that are sampled on a semi-annual basis.

Case # 93-0197HA Royal Farms
2906 Churchville Rd
Churchville

Case was opened as a result of ground water quality concerns expressed by HA CO Health Dept. Further investigation revealed petroleum contamination in the station's domestic well and other local residential domestic wells. The LUSTs at the site have been removed and replaced with new USTs. There are five monitoring wells on site and the station has a carbon filtration system for its domestic wells. The responsible party has been ordered to monitor local domestic well impacts. The HA CO Health Dept. has placed the site in the non-transient water program.

Case 93-1634HA Moody's Store, SHA is the RP
3268 Dublin Rd
Dublin

Three groundwater monitoring wells were installed at the directive of MDE-OCP. Recent sampling shows elevated levels of VOCs in 2 wells and free phase product in the third. SHA has begun Vacuum extraction in the well exhibiting product. SHA directed to sample all domestic wells in the immediate area.

Case # 94-0444HA Hickory Annex
2209 Conowingo Rd
Belair 21015

Case was opened as a result of ground water quality concerns expressed by HA CO Health Dept. Further investigation revealed petroleum contamination in the site's domestic well and other local residential domestic wells. The LUSTs at the site have been removed and replaced with new USTs. There are five monitoring wells on site and the county has potable water brought on site. The responsible party has been ordered to tap into available public water.

Case # 94-1179HA SHA
4218 Conowingo Rd
Darlington

The case was opened for the removal of site USTs. During the removal it was determined that the tanks were LUSTs. One groundwater monitoring well was installed and sampled. Results non-detect for VOC's. SHA has been ordered to sample the site domestic well and the domestic wells for each adjacent property prior to closure being granted. Awaiting samples. This Administration does not anticipate problems.

Case # 94-1251HA Crossroads Exxon
2800 Fallston Rd
Fallston

The case was originally opened when the "new" station was installed then the case was closed. The case was re-opened as a result of ground water quality concerns expressed by HA CO Health Dept. Further investigation revealed petroleum contamination in the station's domestic well and other local domestic wells. The station has a carbon filtration system for its domestic wells and Exxon has been ordered to monitor local domestic well impacts. The HA CO Health Dept. has placed this site and the WAWA across the street in the non-transient water program.

Case # 01-0888HA Hickory II Complex
1807 Fountain Green Rd
Belair 21015

This case was opened to bring a non-compliant UST into compliance. Awaiting soil samples.

APPENDIX C

Ground water discharge permits summaries within or near WHPAs

Department of The Environment
Groundwater Discharge Permit
Summary Report and Fact Sheet

Project Type: Absorption Trench System

State Application No.: 98-DP-3274

Facility Name: Harford community College
Address: 401 Thomas Run Road
Bel Air MD 21015

County: Harford

Contact (name,title): Stephen Gary, Associate Director

Phone: (410) 836-4156

Applicant is engaged in: Operation of a Community College

Legal Name of Applicant: Harford Community College

Address: 401 Thomas Run Road, Bel Air MD 21015

Basin Code: ??.??.??.??

Receiving Water Name(class): Groundwater Type I Aquifer??

MD Coordinates: **East:** 1,001,800 **North:** 630,000

Public Notice Issue Date: June 17 and 18, 1998

Application Received: *June 4, 1998* **Assigned:** *???*

Project Manager: *Ching-Tzone Tien/ Jay Prager*

Phone: (410) 631-3779

Date Completed: **Reviewed By:**

Date Reviewed on:

Wastewater Characteristics

Average Flow: 5,500gpd Peak Flow:11,000 gpd

Proposed Discharge Period: Year round

Flow Diagram

septic tank --> pump chamber --> siphon chamber --> pressure manifold --> gravity absorption trenches

Groundwater System

Aquifer Name:

Port Deposit Gneiss/Gabbro/Peter's Creek Quartzite

Other Properties:

Transmissivity ranges from 650 to 6100 gpd/ft based on tests performed at two near-by community wells.

Projected Impact:

The nitrogen balance analysis indicates the nitrogen level in the percolate will be diluted to less than 10 mg/l before exiting the property.

Present Use:

Both the present and proposed use is for a Community College. This permit is for a small expansion of the existing use.

Fact Sheet

The applicant has applied for a permit to discharge septic tank effluent to the land and subsequently to groundwaters of the State. Significant information involving the application,

additional data and determinations made by the State may be summarized as follow:

Description of the Facility:

The Harford Community College system is planned to receive sewage effluent from a community college. The system described herein receives only that portion of effluent produced from Edgewood Hall, the new library, Maryland Hall, the Book Store, Aberdeen Hall, Havre de Grace Hall, The Barn, and Bel Air Hall. Sewage effluent is collected by gravity sewer and transported to a 16,000 gallon septic tank. The septic tank discharges by gravity to a pump chamber that is interconnected to a storage/overflow tank. The pump chamber will discharge effluent to a dosing siphon chamber. The siphon chamber discharges to three 50% drainfields; two alternating one resting. A pressure manifold is to be used so that all tenches receive an equal flow. The subsurface disposal system consists of three treatment cells which each contains 900 linear feet of disposal trench. The disposal trenches are three feet wide, 6.5 feet deep, and spaced 12.5 feet apart center to center.

PUBLIC NOTICE

Harford County

State Discharge Permit 98-DP-3274 Harford Community College, 401 Thomas Run Road, Bel Air, Maryland 21015-1698 submitted an application for a permit to discharge a maximum of 8,320 gallons per day of septic tank effluent from the college campus located at the same address to groundwater via a subsurface soil absorption system.

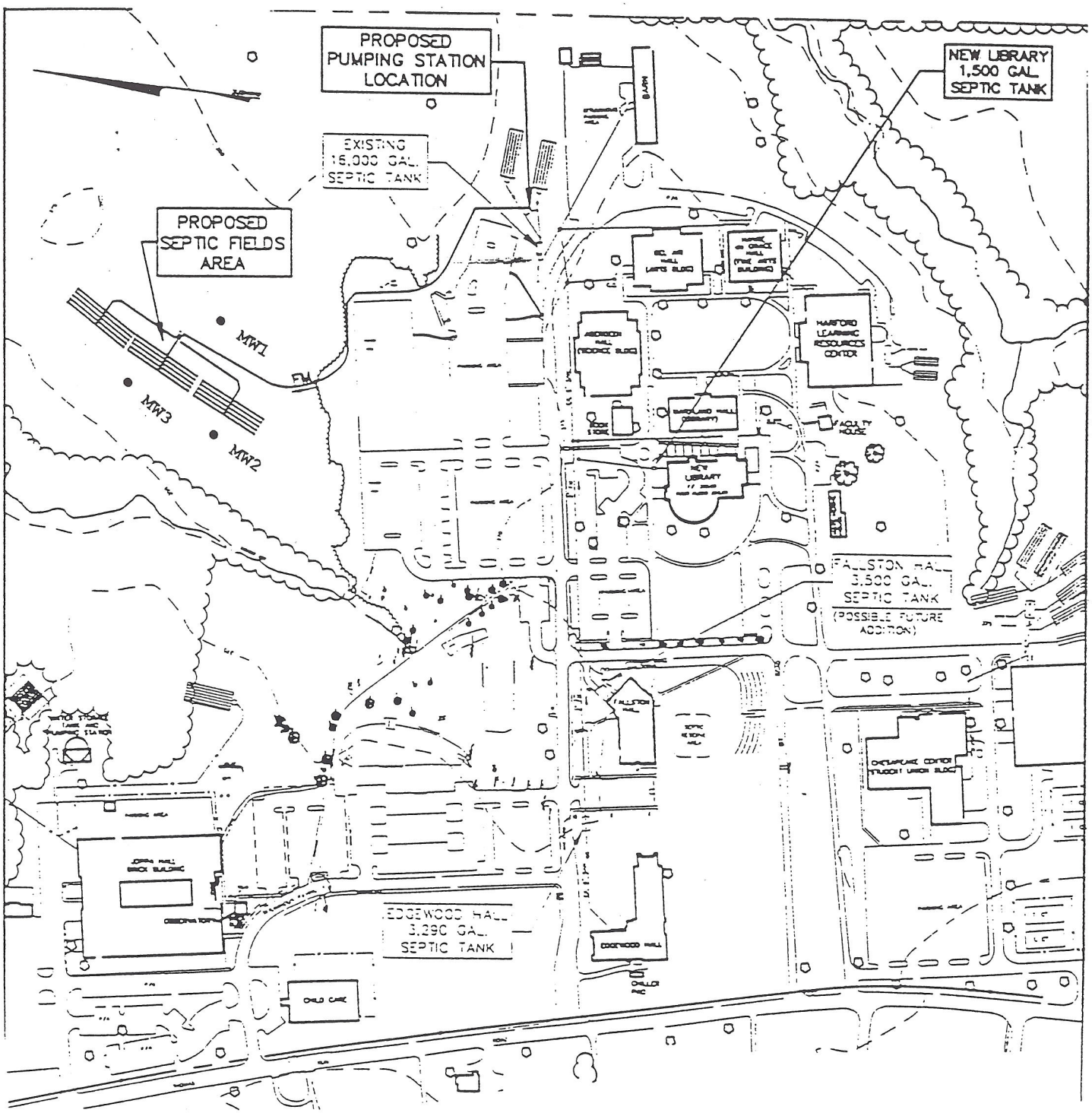
Tentative Determination:

Issue Permit with the following limitations and conditions:(1) flow: 11,000 gal/day (daily maximum);(2) The Permittee shall install three monitoring wells and monitor groundwater quality and (3) The Permittee shall monitor the performance of the subsurface soil absorption system.

Contact Person:

Stephen P. Garey, Associate Director
Harford Community College
401 Thomas Run Road
Bel Air, Maryland 21015-1698

Tel. (410) 836-4156
Fax. (410) 836-4392



Map B. Locations of Monitoring Wells (•) and Subsurface Systems

Scale 1"= 300'

Department of The Environment
Groundwater Discharge Permit
Summary Report and Fact Sheet

Project Type: Absorption Trench System

State Application No.: 99-DP-3285

Facility Name: Harford Technical High School
Address: 200 Thomas Run Road
Bel Air MD 21015

County: Harford

Contact (name,title): Christopher Morton, Assitant Supervisor

Phone: (410) 638-3165

Applicant is engaged in: Operation of a public school

Legal Name of Applicant: Board of Education of Harford County

Address: 45 East Gorden Street, Bel Air MD 21014

Basin Code: ??.??.??.??

Receiving Water Name(class): Groundwater Type I Aquifer??

MD Coordinates: **East:** 1,000,500 **North:** 629,000

Public Notice Issue Date: November 11 and 18, 1998

Application Received: *October 14,1998* **Assigned:** *October 21, 1998*

Project Manager: *Ching-Tzone Tien/ Jay Prager*

Phone: (410) 631-3779

Date Completed: **Reviewed By:**

Date Reviewed on:

Description of the Facility:

The Harford Technical High School system is planned to receive sewage effluent from a high school. The septic tank discharges by gravity to a series of five cells of drainfields. As existing, there are three cells with 600 feet of trench per cell. As proposed, two additional cells will be added with 600 feet of trench each. The cells can be managed so that one or more cells is always at rest.

Wastewater Characteristics

Average Flow: 11,022gpd Peak Flow:22,044 gpd

Proposed Discharge Period: Year round

Flow Diagram

septic tank --> gravity absorption trenches

Groundwater System

Aquifer Name:

Port Deposit Gneiss/Gabbro/Peter's Creek Quartzite

Other Properties:

Transmissivity ranges from 650 to 6100 gpd/ft based on tests performed at two near-by community wells.

Projected Impact:

The nitrogen balance analysis indicates the nitrogen level in the percolate will be diluted to less than 10 mg/l before exiting the property.

Present Use:

Both the present and proposed use is for a High School. This permit is for a small expansion of the existing use.

Fact Sheet

The applicant has applied for a permit to discharge septic tank effluent to the land and subsequently to groundwaters of the State. Significant information involving the application, additional data and determinations made by the State may be summarized as follow:

PUBLIC NOTICE

Harford County

State Discharge Permit 99-DP-3285 Board of Education of Harford County, 45 East Gordon Street, Bel Air, Maryland 21014 submitted an application for a permit to discharge an average of 11,022 gallons per day of septic tank effluent from the Harford Technical High School located at 200 Thomas Run Road, Bel Air, Maryland to groundwater via a subsurface soil absorption system.

Tentative Determination:

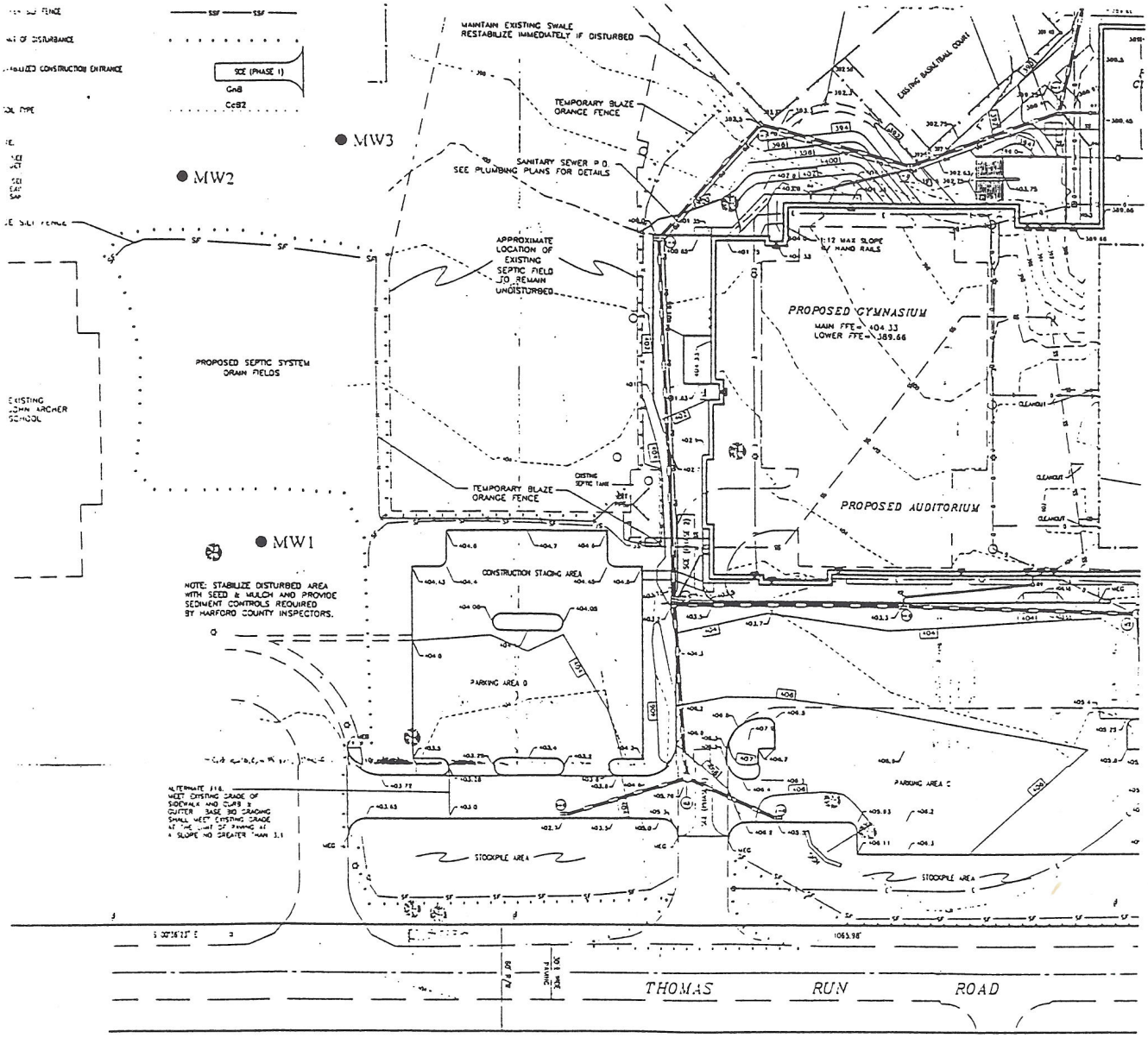
Issue permit with the following conditions:

Daily average flow limited to 11,000 gpd; the absorption trench system shall be periodically monitored and evaluated for treatment and hydraulic capacities; and the permittee shall monitoring ground water quality via three wells.

Contact Person:

Mr. Christopher L. Morton, Assistant Supervisor
Board of Education of Harford County-Planning & Construction
45 East Gordon Street
Bel Air, Maryland 21014

Tel. (410) 638-4303
Fax. (410) 638-3165



Map B. Locations of Momitoring Wells (●) and Subsurface Systems
(not to scale)

MARYLAND DEPARTMENT OF THE ENVIRONMENT
WATER MANAGEMENT ADMINISTRATION

NOTICE OF APPLICATION RECEIVED

Harford County

State Discharge Permit 01-DP-1318:

Harford County Public Schools, 45 East Gordon Street, Bel Air, MD, 21014, submitted an application for renewal of a permit to discharge cooling tower condensate and boiler blowdown from Jarrettsville Elementary School, located at 3818 Norrisville Road, Jarrettsville, MD , 21084-1499, to ground water via an infiltration pond.

An informational meeting will be held to discuss the application and the permitting process if a written request is received by **November 1, 2000.** The request should be forwarded to the **Maryland Department of the Environment, Water Management Administration, 2500 Broening Highway, Baltimore, Maryland 21224, Attn: Dr. Ching-Tzone Tien.** Hearing-impaired persons may request an interpreter at the informational meeting by contacting Dr. Tien, at (410) 631-3662 or at the above address, at lease ten working days prior to the scheduled meeting.

Any person wishing to review the application should contact Dr. Tien at the above telephone number to schedule an appointment. Copies may be obtained at a cost of $0.30 per page.

Publication Dates: Please publish on **October 18 and 25, 2000**

I. SPECIAL CONDITIONS

A. DISCHARGE AUTHORIZATION

1. The permittee is authorized to discharge cooling tower condensate overflow and boiler blowdown to ground water via an onsite stormwater retention pond.

2. The permittee is prohibited from discharging the cooling tower condensate and boiler blowdown to surface waters of the State.

3. The permittee is prohibited from using any boiler water treatment chemicals without first obtaining written permission from the Department. The permittee is authorized to use the following water treatment chemicals: Sodium Hydroxide Solution, WSCP, Formula 1100, Sodium Nitrate and Dimet.

4. The permittee is prohibited from discharging or causing to be discharged any waste oil, grease, ethylene glycol, solvents or any other waste material or toxic pollutant to waters of the State.

5. The permittee shall ensure that the stormwater retention pond provides adequate infiltration capacity for stormwater and wastewater discharges.

B. REMOVED SUBSTANCES

1. Within 90 days after the effective date of the permit, unless already submitted with the application, the permittee shall submit to the Department on a form provided, the following information:

   a. Locate, on a suitable map, all areas used for the disposal of any removed substances as defined by General Condition B.7;

   b. The physical, chemical, and biological characteristics (as appropriate), quantities of any removed substances handled, and the method of disposal;

   c. If disposal is handled by other than the permittee, identify the contractor or subcontractor, their mailing address, and the information specified in a and b above.

2. Prior to the use of new or additional disposal areas, contractors, or subcontractors, the permittee shall notify the Department in writing.

II. GENERAL CONDITIONS

A. MONITORING AND REPORTING

1. REPRESENTATIVE SAMPLING

Samples and measurements if required herein shall be taken at such times as to be representative of the quantity and quality of the discharges during the specified monitoring periods.

MEMORANDUM

TO: Dr. Ching-Tzone Tien, Mike Eisner

FROM: Robert Daniel, EPSC

RE: Permit Application Received

DATE: September 15, 2000

The attached permit application has been received and logged into the EPSC database on the dates indicated below. If there is anything we can do to assist in the processing of this application or if you expect the application to raise sensitive issues which will require additional attention, please contact the EPSC at extension 3772.

In addition to Best Management Practices, we encourage you to promote pollution prevention measures with all permit applications.

Date EPSC Received:	09/15/2000	Initial: RBD
Date EPSC Entered:	09/15/2000	Initial: RBD
Date EPSC Forwarded:	09/15/2000	Initial: RBD

DISCHARGE PERMIT TYPE

_ WMA1G- Industrial Groundwater with Surface Stormwater (NPDES) -

X WMA3- Industrial Groundwater - RENEWAL

FACILITY/OWNER INFORMATION

Applicant and permit holder is: Harford County Public Schools, 45 East Gordon Street, Bel Air, MD 21014

Facility Name and location: Jarrettsville Elementary School, 3818 Norrisville Road, Jarrettsville, Harford County, 21084

Application Number: 01DP1318 EPSC Number: 5176

For discharge of 300 GPD of boiler blowdown to stormwater retention pond.

B. WASTEWATER DESCRIPTION: General:

Point of Discharge or Outfall	Process(es) Generating Wastewater	Wastewater Treatment Prior to Discharge (See Table 1 in Attachment One)	Method of Discharge (See Table 2 in Attachment 1)
001	cooling tower condensate overflow and boiler blowdown	None	discharge to groundwater via stormwater retention pond on site.
002			
003			

Use additional sheets if necessary.

MARYLAND DEPARTMENT OF THE ENVIRONMENT
2500 Broening Highway • Baltimore, Maryland 21224
MDE (410) 631-3000

William Donald Schaefer
Governor

David A. C. Carroll
Secretary

October 14, 1993

CERTIFIED MAIL

Joseph Livingston, Jr.
Fallston Volunteer Fire
& Ambulance Co., Inc.
2201 Carrs Mill Road
Fallston MD 21027

Dear Mr. Livingston:

Enclosed is your validated State Discharge Permit 92-DP-3011 which will be in force on its effective date. The permittee is responsible for complying with all permit conditions. Please note that this permit only authorizes a discharge to groundwaters of the State. Discharges to surface waters are prohibited. Accordingly, you are advised to carefully read this permit and become thoroughly familiar with its requirements.

After the effective date of the permit, please refer all future correspondence to the following:

Maryland Department of the Environment
Water Management Administration
Inspection and Compliance Program
2500 Broening Highway
Baltimore, Maryland 21224

If you have any questions, please do not hesitate to call Roger E. Simon at (410) 631-3323.

Sincerely,

J. L. Hearn

J.L. Hearn, Director
Water Management Administration

JLH:srt

Enclosure

MDE MARYLAND DEPARTMENT OF THE ENVIRONMENT
2500 Broening Highway • Baltimore, Maryland 21224
(410) 631-3000

William Donald Schaefer
Governor

David A. C. Carroll
Secretary

STATE DISCHARGE PERMIT NUMBER	92-DP-3011
EFFECTIVE DATE	October 14, 1993
EXPIRATION DATE	October 13, 1998

Pursuant to the provisions of Title 9 of the Environment Article, Annotated Code of Maryland and regulations promulgated thereunder, the Department of the Environment, hereinafter referred to as the "Department," hereby authorizes

Fallston Volunteer Fire & Ambulance Co., Inc.
2201 Carrs Mill Road
Fallston, Maryland 21047

TO DISCHARGE FROM

a volunteer fire & ambulance company

LOCATED AT

2201 Carrs Mill Road, Harford County, Maryland.

VIA OUTFALL

001 (stormwater management pond) as identified and described herein

TO

groundwaters of the State in accordance with the following special and general conditions and map made a part hereof.

I. SPECIAL CONDITIONS

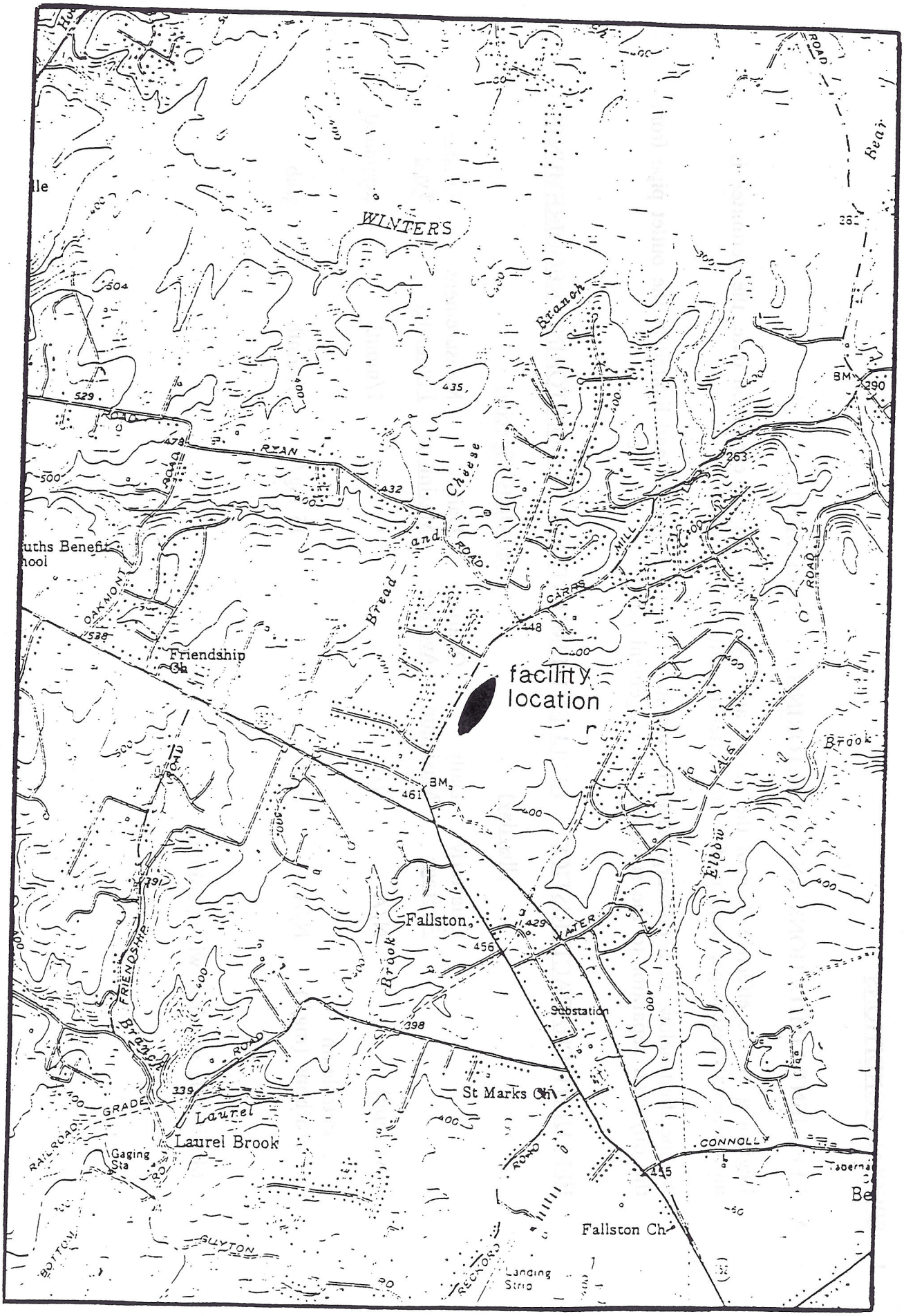
A. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

Beginning on the effective date of the permit and lasting through the expiration date, the permittee is authorized to discharge, from outfall 001, exterior vehicle wash water.

As specified below, such discharge shall be monitored by the permittee and limited at the outlet pipe from the oil/water separator to the stormwater management pond:

EFFLUENT CHARACTERISTICS	EFFLUENT LIMITATIONS (lbs/day)		EFFLUENT LIMITATIONS Other Units (Specify)		MONITORING REQUIREMENTS	
	Quarterly Average	Daily Maximum	Quarterly Average	Daily Maximum	Measurement Frequency	Sample Type
Flow (gpd)	N/A	N/A	*	*	1/month	estimated
Total Petroleum Hydrocarbons (mg/l)	N/A	N/A	*	15 mg/l	1/month	grab

* Monitoring required without limits.



Taken from the Jarrettsville USGS Quad.
Scale: 1:24000

LPJ INC. CONSULTING ENGINEERS

16 WEST TWENTY-FIFTH ST. BALTIMORE, MD 21218 TELE: 301-366-7800 FAX: 301-366-3835

June 16, 1992

Mr. Roger Simon
State of Maryland
Department of the Environment
Hazardous Solid Waste Management Administration
Industrial Discharge Program
2500 Broening Highway
Baltimore, Maryland 21224

Re: Fallston Volunteer Fire
and Ambulance Co., Inc.
Groundwater Discharge
Permit Application
LPJ #1-91126.1

Dear Mr. Simon:

On behalf of the Fallston Volunteer Fire and Ambulance Co., Inc. We wish to submit this Groundwater Discharge Permit Application.

The Fallston Volunteer Fire Department is an existing facility located at 2201 Carrs Mill Road in Fallston, Harford County. A 20,000 square foot building addition/apparatus area and related parking is proposed. As part of normal operations proposed for the facility, Fire Department vehicles will be washed in the apparatus area. This water will discharge via a storm drain system to a proposed infiltration stormwater management facility. Treatment for this water will be provided by a sand trap oil interceptor. The water will be channeled through the interceptor prior to discharge.

We understand that a groundwater discharge permit is required for the proposed system. The enclosed permit package includes the following information.

(1) Permit Application

(2) Site Plan

(3) Oil/Grit Separator Detail

MARYLAND DEPARTMENT OF THE ENVIRONMENT
P.O. Box 2057 • Baltimore, Maryland 21203-2057
(410) 631-3000 • 1-800-633-6101 • http:// www. mde. state. md. us

Parris N. Glendening
Governor

Jane T. Nishida
Secretary

January 18, 2001

CERTIFIED MAIL
Return Receipt Requested

Mr. Richard Warfel
Pappy, Inc., (d/b/a Waste Management, Inc.)
1020 Oak Avenue
Joppa MD 21085

Dear Mr. Warfel:

Enclosed herewith is the State of Maryland Discharge Permit No. 99-DP-2445, which is being renewed pursuant to the provisions of Title 9 of the Environment Article, Annotated Code of Maryland, and regulations promulgated thereunder for the Oak Avenue Rubble Landfill. The rubble landfill is located 1020 Oak Avenue, Joppa, Harford County, Maryland.

Please note that this permit is subject to the enclosed terms and conditions. If we do not receive a response from you regarding this permit ten days following receipt of this letter, that constitutes acceptance of the terms and conditions contained therein. This permit may be appealed by filing a written request for a hearing within ten days of receipt of this permit. The request should be addressed to Mr. Richard W. Collins, Director, Waste Management Administration, at the above address. All permit hearings will be conducted in accordance with the Administrative Procedure Act.

If you have any questions regarding this matter, please contact me at (410) 631-3318 or Mr. Edward M. Dexter, Chief, Field Operations and Projects Division, at (410) 631-3424.

Sincerely,

Barry J. Schmidt, Administrator
Solid Waste Program

BJS:KK:lak
Enclosure
cc: Mr. Richard W. Collins
Mr. John Rist
Ms. Hilary Miller

MDE

MARYLAND DEPARTMENT OF THE ENVIRONMENT

2500 Broening Highway • Baltimore Maryland 21224
(410) 631- 3000 • 1- 800 -633-6101 • http:// www. mde. state. md. us

Parris N. Glendening
Governor

Jane T. Nishida
Secretary

DISCHARGE PERMIT NUMBER	99-DP-2445
EFFECTIVE DATE	January 12, 2001
EXPIRATION DATE	January 11, 2006

Pursuant to the provisions of Title 9 of the Environment Article, Annotated Code of Maryland and regulations promulgated thereunder, the Maryland Department of the Environment, hereinafter referred to as "the Department", hereby authorizes

Pappy, Inc., (d/b/a Waste Management, Inc.)
1020 Oak Avenue
Joppa MD 21085

To discharge from:

The Oak Avenue Rubble Landfill

Located:

1020 Oak Avenue
Joppa, Harford County, Maryland 21085

Via:

Infiltration/percolation through the rubble landfill cell floor as identified and described herein,

Into:

Underground waters of the State in accordance with the following special and general conditions and map made a part hereof.

PART I. SPECIAL CONDITIONS:

A. Groundwater Discharge Authorization:

1. The permittee is authorized to discharge wastewater (leachate) generated by rainwater percolating through the rubble landfill cell floor into the groundwater in accordance with Code of Maryland Regulations (COMAR), specifically 26.08.02.09C(1).

2. The characteristics or constituents of the groundwater in the aquifer or aquifers, which receive discharges from the rubble landfill cell floor shall not be caused to exceed primary or secondary drinking water standards outside the mixing zone or property boundary of the facility as provided in COMAR 26.04.01, "Quality of Drinking Water in Maryland", as a result of the discharge.

3. The permittee is prohibited from using the facility's stormwater management system for the collection, storage, or treatment of leachate generated by the landfill.

4. The permittee is prohibited from discharging any pollutants to waters of the State except under the following conditions:

   a. Landfill leachate to groundwater as expressly authorized by this permit;

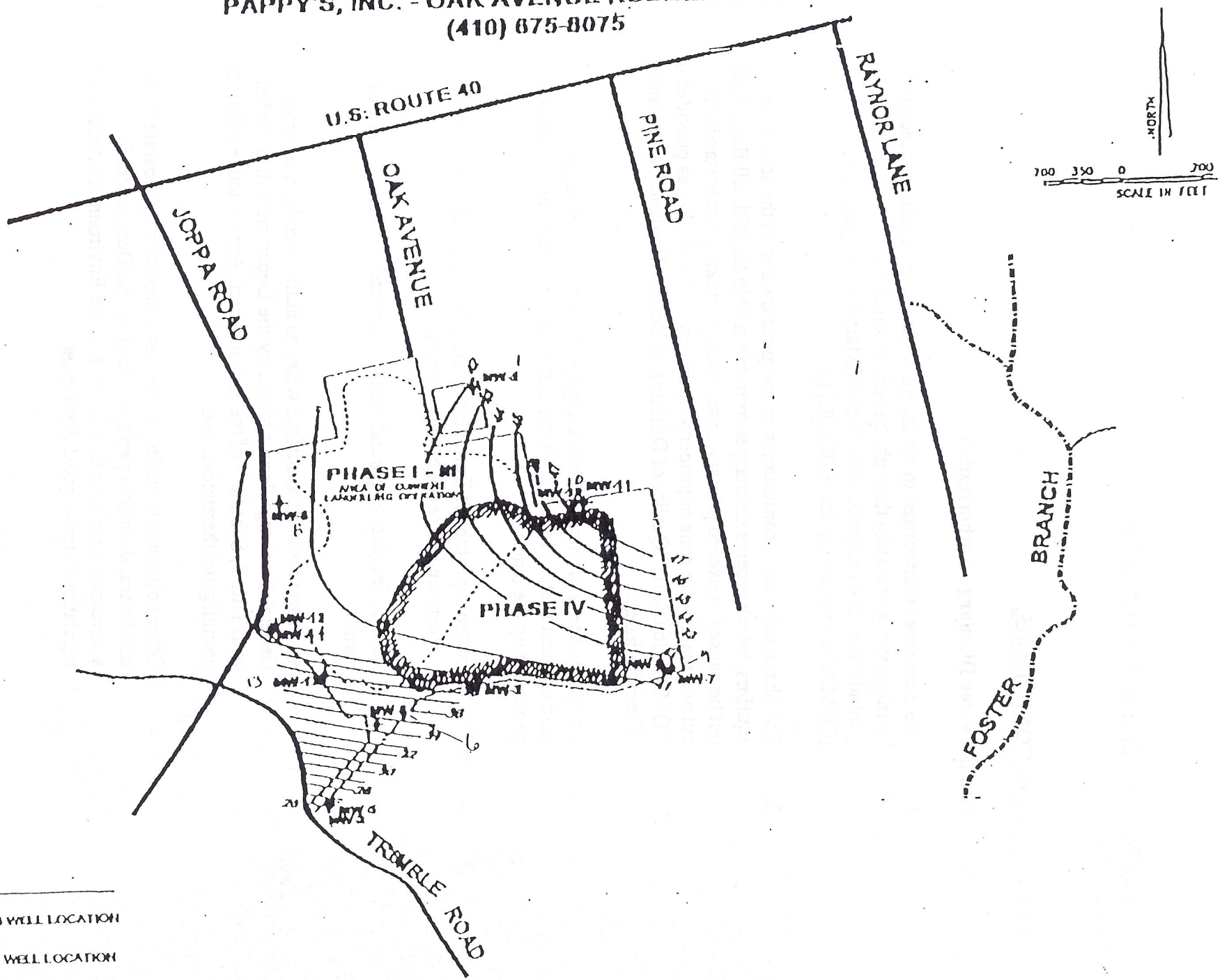
   b. Stormwater runoff to surface water as authorized by a separate General Discharge Permit issued by the Department in accordance with Title 9, Subtitle 3 of the Environment Article and regulations promulgated thereunder; and

   c. Other pollutants to surface waters as authorized by separate State and federal discharge permits issued by the Department in accordance with Title 9, Subtitle 3 of the Environment Article and regulations promulgated thereunder.

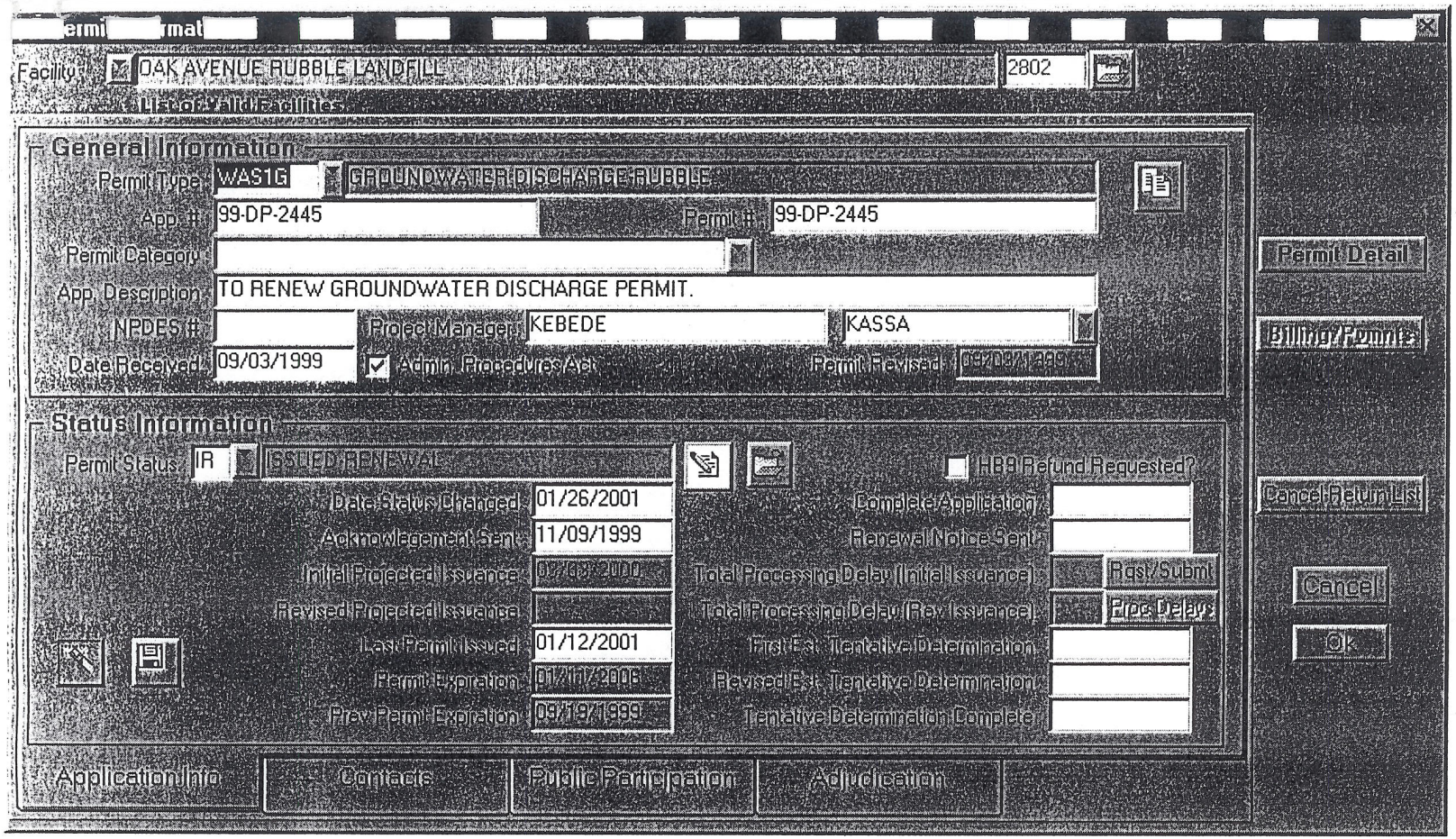
LOCATION MAP AND GROUNDWATER MONITORING NETWORK

PAPPY'S, INC. - OAK AVENUE RUBBLE LANDFILL

(410) 875-8075



DRAFT


Facility:
OAK AVENUE RUBBLE LANDFILL
2802
List of Valid Facilities
General Information
Permit Type:
WAS1G
GROUNDWATER DISCHARGE-RUBBLE
App. #:
99-DP-2445
Permit #:
99-DP-2445
Permit Category:
App. Description:
TO RENEW GROUNDWATER DISCHARGE PERMIT.
NPDES #:
Project Manager:
KEBEDE
KASSA
Date Received:
09/03/1999
Admin. Procedures Act
Permit Revised:
Permit Detail
Billing/Permits
Status Information
Permit Status:
IR
ISSUED-RENEWAL
HBB Refund Requested?
Date Status Changed:
01/26/2001
Complete Application:
Acknowlegement Sent:
11/09/1999
Renewal Notice Sent:
Initial Projected Issuance:
Total Processing Delay (Intial Issuance)
Rqst/Submt
Revised Projected Issuance:
Total Processing Delay (Rev. Issuance)
Proc Delay
Last Permit Issued:
01/12/2001
1st Est. Tentative Determination:
Permit Expiration:
01/11/2006
Revised Est. Tentative Determination:
Prev Permit Expiration:
09/19/1999
Tentative Determination Complete:
Cancel/Return List
Cancel
Ok
Application Info
Contacts
Public Participation
Adjudication

APPENDIX D

General site information of sanitary landfills within or near WHPAs

Oak Avenue Rubble Landfill
1020 Oak Avenue
Joppatowne, MD 21085

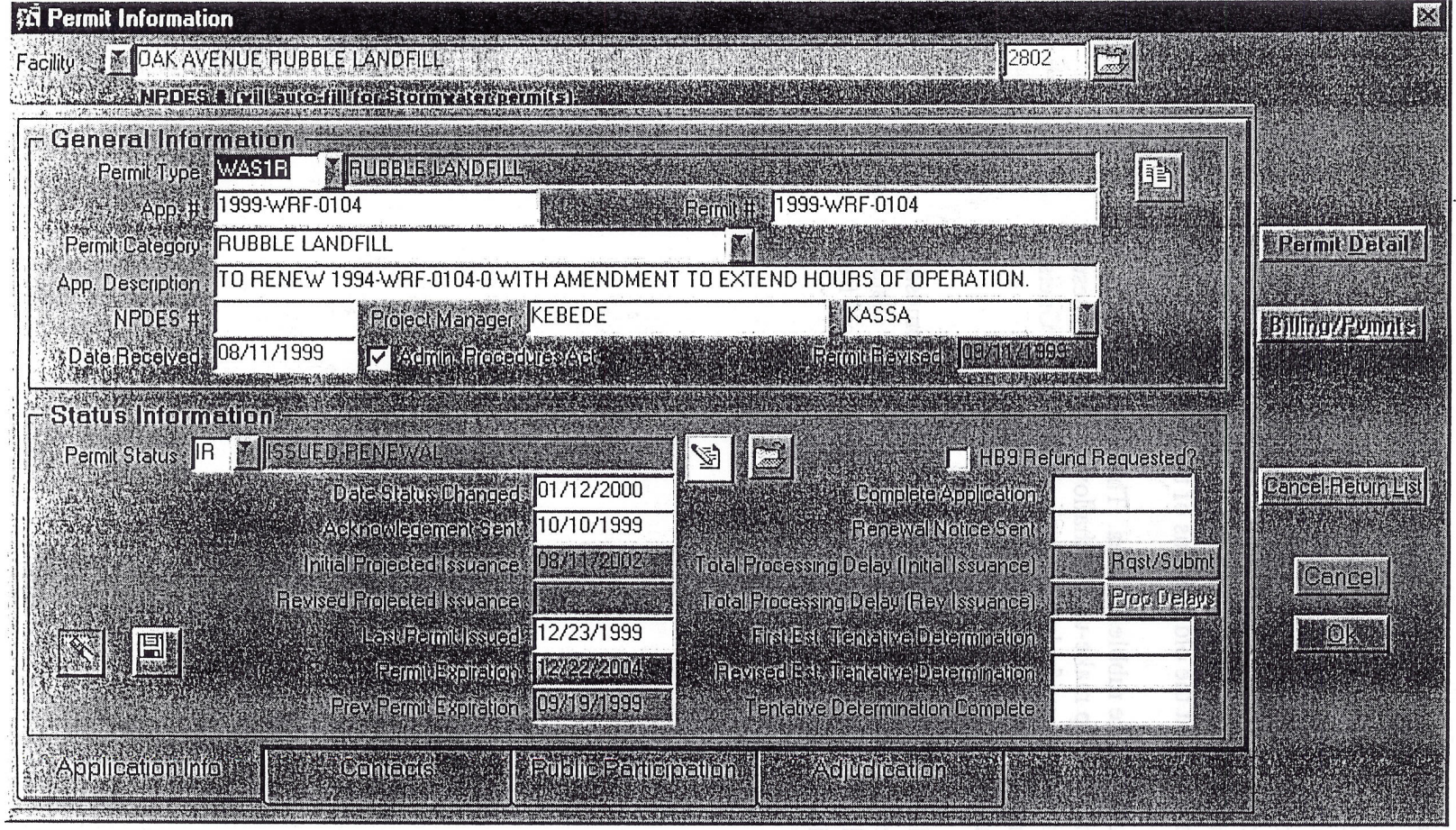
Permit No.: 1999-WRF-0104

Information from the MDE Solid Waste Program and Water Supply Program

The Oak Avenue Rubble landfill is located within the northwest portion of the Williams Mobile Home Park WHPA (Figure 2bb). All types of construction debree (e.g. wood, bricks, concrete, metals, etc.) are disposed at this facility. A liner was installed in the new section of the landfill to protect the underlying ground water aquifers. The old sections are unlined and therefore have no protective barrier between the landfill and the aquifers. A leachate collection system is used at the old sections of the rubble fill.

Two hydraulically different aquifers underlie the rubble fill area. The Coastal Plain unconsolidated sediments of the Potomac Group make-up the shallower aquifer. These sediments overlie the fractured rock Piedmont aquifer known as the Port Deposit Gneiss. Based on monitoring wells near the landfill, the ground water flow direction was determined to be toward the south-southwest.

High levels of lead were found at the landfill Monitoring Well 4 and in nearby domestic wells. The cause of the high lead levels was determined to be from the plumbing systems and not from the landfill. No elevated levels of contaminants were observed to date from sampling results at the Mobile Home Park.


Permit Information
Facility :
OAK AVENUE RUBBLE LANDFILL
2802
NPDES # (will auto-fill for Stormwater permits)
General Information
Permit Type :
WAS1R
RUBBLE LANDFILL
App. # :
1999-WRF-0104
Permit # :
1999-WRF-0104
Permit Category :
RUBBLE LANDFILL
App. Description :
TO RENEW 1994-WRF-0104-0 WITH AMENDMENT TO EXTEND HOURS OF OPERATION.
NPDES # :
Project Manager :
KEBEDE
KASSA
Date Received :
08/11/1999
Admin. Procedures Act
Permit Revised :
09/11/1999
Permit Detail
Billing/Pymnt
Status Information
Permit Status :
IR
ISSUED-RENEWAL
HB9 Refund Requested?
Date Status Changed :
01/12/2000
Acknowledgement Sent :
10/10/1999
Initial Projected Issuance :
08/11/2002
Revised Projected Issuance :
Last Permit Issued :
12/23/1999
Permit Expiration :
12/22/2004
Prev Permit Expiration :
09/19/1999
Complete Application :
Renewal Notice Sent :
Total Processing Delay (Initial Issuance) :
Rast/Submt
Total Processing Delay (Rev Issuance) :
Proc Delays
First Est. Tentative Determination :
Revised Est. Tentative Determination :
Tentative Determination Complete :
Cancel Return List
Cancel
Ok
Application Info
Contacts
Public Participation
Adjudication

2.0 Site Description

The Union Road Dump site is located on a 20-acre tract of land located at 1515 Union Road, Aberdeen, Harford County, Maryland 21001. The site is located in the Aberdeen, MD quadrangle 7.5 minute topographic map. The Maryland Grid coordinates for the site are 608,667 feet north by 1,021,000 feet east.[1,2,3,4] The inactive municipal waste burning dump covers approximately four acres of the total property owned by Herman Lieske, Jr. The dump area is centrally located on the Lieske property. The western boundary of the dump area is defined by the Gray's Run flood plain. The northern, eastern, and southern boundaries of the dump have not been precisely defined. The dump is completely accessible to trespassers. The estimated site area and its boundaries are shown in Figure 3.

The site may be reached from the Baltimore area by taking Interstate I-95 north for approximately 32 miles to exit 80 south (Route 543). Proceed south on Route 543 for about 700 feet to Route 7 (Old Philadelphia Road) east. Turn left onto Route 7 and continue approximately 2.5 miles to Stepney Road. Turn left onto Stepney Road and proceed about ¾ of a mile to Union Road. Turn left onto Union Road and continue about ¼ of a mile to the dead end. The Union Road Dump is located to the left of the dead end (Figures 1 and 2).

The property has an average slope of level to 8%, with the slope of the western face of the dump area in excess of 30%. The elevation of this portion of the dump is approximately 20 to 25 feet higher than the surrounding property. Surface water runoff from the site flows through ditches that drain west of the dump area into Gray's Run.

There is one on-site domestic well that serves approximately four persons with potable water.[5] This well is approximately 44 feet deep and is located about 600 feet east of the dump area.[6] There are two houses, one mobile home, and two sheds located within 800 feet of the dump area. One house is located about 200 feet north of the dump and is

occupied by Mr. Lieske and his wife. The other house and mobile home are located approximately 500 and 600 feet east of the dump area and are occupied by Mr. Lieske's relatives.

2.1 Site Use

Herman Lieske, Jr. inherited 20 acres of property from his father, Herman Lieske, Sr., on October 4, 1973 (Tax Map 58, parcel 18, liber 939, folio 889).[7] Currently, the Union Road Dump site property is used as an active salvage yard for all types of abandoned motor vehicles, above and underground storage tanks, abandoned tanker trailers, numerous 55-gallon metal and plastic drums in deteriorating condition, and other types of scrap metal. Mr. Lieske also uses the property to store tank trucks, a backhoe, and equipment used by Lieske Septic Tank/Sewage Removal Company.

Approximately four acres (174,240 ft^2) of the total amount of property owned by Mr. Lieske is occupied by burn fill material. This fill area is located on the western portion of the site property and extends into the flood plain for Gray's Run. Mr. Lieske, Sr. purchased this property on February 4, 1941 (liber 265, folio 21).[7] Between 1942 and 1965, Mr. Lieske, Sr. used this property to dispose of refuse collected from several housing developments in Aberdeen, Aberdeen Proving Grounds, and Edgewood Arsenal. In the fall of 1952, Mr. Lieske, Sr. was contracted by the Harford County Commissioners to use his property as a dump for the county refuse. Mr. Lieske Sr. would collect the trash, sort out the salvageable materials, burn the remaining waste, push it over the face of the dump, and periodically cover it with fill dirt from his property and the Harford County Department of Public Works, Road Maintenance.[5,10]

Prior to 1941, the above mentioned property was referred to as "The Union." It is documented that the 20-acre parcel of the Lieske's property was part of a larger tract of land that was farmed. The deed history and parcel use is listed below:

DATE	DEED INFO.	PURCHASER	SELLER	ACRES	REMARKS
10/04/73	Liber 393 Folio 889	Herman Lieske, Jr.	Herman Lieske, Sr.	20	Inherited
02/04/41	Liber 265 Folio 021	Herman Lieske, Sr.	James Shinault	20	Sale
04/29/29	Liber 211 Folio 209	Louise Scheuerman	James Schinault	20	Lease
04/30/27	Liber DGW203 Folio 209	James Schinault	Rumsey Knellinger	81	Sale
08/28/24	Liber DGW189 Folio 405	Rumsey Knellinger	Otto U. Von Schrader	81	Sale

2.2 Permits and Regulatory Actions

According to the MDE/Hazardous Waste Enforcement Division, no regulatory actions have been taken at this site. Because the dump and burn landfill operated before the Resource Conservation and Recovery Act (RCRA) was implemented, no permit was issued to generate, store or transport hazardous waste to Mr. Lieske or to any of his businesses.[8] There is no known documentation of hazardous waste being dumped at this site.[8]

In response to a site visit on October 22, 1992 by the MDE/Site Assessment/Pre-Remedial Division, an inspector from the MDE/Hazardous Waste Enforcement Division conducted a complaint investigation on November 9, 1992.[8] This investigation consisted of a walk-through of the site, photographs and collection of field samples for analysis. These samples were analyzed for volatile organic compounds, Toxicity Characteristic Leaching Procedure (TCLP) metals, and priority pollutant compounds including PCBs. Based on the analysis of these samples, no material meeting the characteristic of a hazardous waste was identified.[8]

Occasional unannounced inspections have been conducted by the MDE/Solid Waste Field Operations and Compliance Division. The MDE/Solid Waste Field Operations and Compliance Division has inspected the Union Road Dump periodically since the mid 1980s. These inspections are performed to observe operating procedures and maintenance of the salvage and dump areas. According to Division files, this site never had a permit to dispose solid waste.[10] There have been no known regulatory actions filed against Mr. Lieske by the MDE/Solid Waste Field Operations and Compliance Division.

Mr. Herman Lieske, III, operator of the Lieske Septic Tank/Sewage Removal Company, is currently permitted by the Harford County Department of Public Works, Division of Water and Sewage, to dispose of sewage at the Sod Run Sewage Plant, Harford County, Maryland.[11] The current permit number is FL-131. Permit requirements consist of a completed application and annual truck inspections. Mr. Lieske also has an agreement with the towns of Aberdeen and Havre de Grace to haul and dispose of non-hazardous industrial waste to the Aberdeen Sewage Treatment Plant.[11]

In the early 1950s, the site was inspected by DHMH.[10] The site files indicate that the inspection violations which occurred during this time were because of rodent infestation and odors caused by the dump, not the actual dumping of refuse at the site.

2.3 Remedial Actions

As of this date, there has been no known CERCLA remedial action or emergency removal action taken at the Union Road Dump site.[9]

APPENDIX E

General information on USGS Virus Study

Maryland Coastal Plain Virus Study

Why Should I be Concerned about Microorganisms in My Drinking Water?

The presence of bacteria, viruses, or indicator organisms suggests the possibility that the source of your drinking water has been contaminated by septic, sewage or other fecal waste. In ideal circumstances, well water is protected from contamination through appropriate placement and proper well construction. If your water tests positive for the presence of microorganisms, it may mean that these protective barriers are not working. Bacteria and viruses that are associated with fecal waste can cause a variety of diseases, with gastrointestinal disorders being the most common complaint. If your water tested positive for bacteria, viruses, or any indicator organisms, there is a possibility that the water was contaminated by fecal waste and could make someone sick. You may wish to find an alternate source of drinking water until the results of the study have been confirmed and any possible source of contamination has been identified and eliminated.

How do Water Tests Reveal the Presence of Fecal Contamination in Water?

Traditionally, regulation of public drinking water supplies has focused on coliform bacteria as indicators of fecal contamination in water. The methods for detecting the presence of coliform bacteria are rapid, simple, and inexpensive. The presence of coliform in water can occur, however, under a variety of conditions when pathogenic organisms are absent. More specific indicators of fecal contamination, such as *E.coli*, a heat-tolerant bacteria that grows at temperatures consistent with the mammalian gastrointestinal system, are also used, but even the heat-tolerant bacteria may not effectively identify the presence of viruses in the environment. The EPA is seeking ways to better identify water supplies that may be contaminated with viruses, through identifying either environmental factors that may affect the vulnerability of a water supply, and/or identifying an organism whose presence in water is an effective indicator of the presence of harmful viruses.

What Are Enteric Viruses?

Viruses are among the smallest of the disease-causing microorganisms that can be found in water. *Enteric* viruses are those which follow a fecal-oral route of transmission, meaning that they are generally ingested in the form of contaminated food or contaminated water, they establish a progressive infection in susceptible individuals and ultimately are excreted in relatively large numbers in feces. The *enteric* viruses may cause a wide variety of symptoms in humans ranging from mild gastroenteritis to myocarditis, encephalitis and irreversible paralysis. Many are extremely stable in water and may survive for months. Since they may cause disease when even just a few virus particles are ingested, even low levels of environmental contamination may impact water consumers or recreational bathers.

What Tests Were Conducted On My Water?

The samples collected for the virus study were analyzed for both viral and microbial organisms. The microbial indicators included the total coliform group of bacteria as well as *E. coli*, enterococci and *C. perfringens*, bacteria typically associated with fecal contamination. In addition, the water was analyzed for the presence of bacteriophages, viruses that infect bacteria, which may also indicate the presence of fecal contamination. These include the F+ and F- coliphages, as well as the *B. fragilis* phages, which are specific to certain anaerobic bacteria and hence may be more specific indicators of mammalian feces since the gastrointestinal tract is essentially anaerobic.

Viruses are not capable of replication outside of a suitable host or host cell. In the absence of an animal host, cells derived from mammalian organs can be used to provide a surface for growing viruses in the laboratory. This cell culture-based detection method enables the identification of virus cells by amplifying the numbers of infectious virus particles from low levels to readily detectable levels. This methodology, however, has many limitations and is expensive. The particular method used for this study identifies only that culturable *enteric* viruses are either present or absent from the water sample. The presence of culturable *enteric* viruses means that the water contains viruses that may be capable of infecting humans who ingest the water.

The samples collected for this study were also analyzed by a method that uses gene probes to detect some of the viral agents that may have resisted cell culture-based detection. This detection method is sensitive, is capable of identifying specific virus groups that may be present, and may detect viruses that could not be cultured. The method, however, detects both infectious and noninfectious viral DNA particles and therefore a positive signal using this technique does not necessarily mean that infectious viruses are present.

Why Was My Drinking Water Sampled?

In the Fall of 1998, the Maryland Department of the Environment and the U.S. Geological Survey initiated a study to evaluate the extent and nature of viral contamination of ground waters in the coastal plain region of Wicomico and Worcester Counties. The study had the following goals:

1. Estimate the extent of any viral contamination in small public water supplies in Coastal Plain surficial aquifers,
2. Define any environmental or geologic factors that contribute to viral susceptibility of a well, and
3. Evaluate the use of several organisms as "indicators" for the presence of viruses in water.

APPENDIX F

Definitions of Public Water System types

A standard designation for Public Water Systems outlined in Code of Maryland Regulations (COMAR 26.04.01.01) was the basis for categorizing each system type. The system type affects the types of contaminants for which they will be assessed. These are described below:

+ Community water system = a public water system which services at least 15 service connections used by year-round residents, or regularly at least 25 residents throughout the year

+ Nontransient noncommunity water system = a public water system that is not a community and regularly serves at least 25 of the same individuals over 6 months per year

+ Transient noncommunity water system = a noncommunity water system that does not regularly serve at least 25 of the same individuals over 6 months per year

For delineation purposes, the ground water based public water systems are divided into systems that use an average of 10,000 or more gallons per day (gpd) and those that use less than 10,000 gpd. MDE's Water Rights Division requires a detailed hydrogeologic evaluation for ground water appropriation permits using greater than 10,000 gpd, prior to issuance of a permit. As a result, good site specific hydrogeologic information is available for delineation of the areas, which can be used to justify a site specific approach.

Systems using less than 10,000 gpd do not significantly influence regional ambient ground water flow directions or flow systems. Hence, detailed hydrogeologic evaluation is not required for these permitees. The lack of site specific data makes a site specific model inappropriate. Methods being selected for systems in this size category include fixed radial distances and regional interpretation of ground water recharge areas.