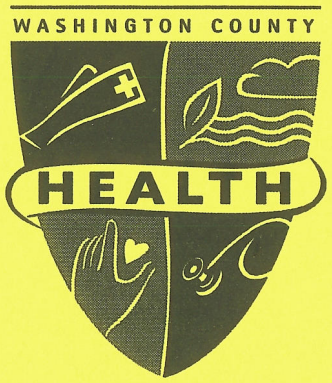
SOURCE WATER ASSESSMENT REPORT



WASHINGTON COUNTY
MARYLAND

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April 2006

Source Water Assessment
for Transient Non-Community Water Supplies
in Washington County

FORWARD

THIS REPORT WAS PREPARED BY THE WASHINGTON COUNTY HEALTH DEPARTMENT, ENVIRONMENTAL HEALTH DIVISION AS A RESULT OF A STATE GRANT AWARDED BY THE MARYLAND DEPARTMENT OF THE ENVIRONMENT.

THE PURPOSE AND OBJECTIVE OF THE GRANT WAS TO EVALUATE PUBLIC DRINKING WATER SUPPLIES WITHIN THE COUNTY IN ACCORDANCE WITH THE STANDARDS SET FOURTH IN THE FEDERAL SAFE DRINKING WATER ACT, (FSDWA), AS AMENDED IN 1996.

THE FINDINGS OF THIS REPORT WILL SERVE AS A RESOURCE GUIDE AND FRAMEWORK OF INFORMATION FOR GOVERNMENT, BUSINESS, AND HOMEOWNERS IN THE PLANNING FOR FUTURE GROWTH DEVELOPMENT AND PROTECTING OUR EXISTING GROUND WATER RESOURCES.

THEODORE J. GORDON

DIRECTOR OF ENVIRONMENTAL HEALTH

SPECIAL ACKNOWLEDGEMENT

THE FOLLOWING WASHINGTON COUNTY HEALTH DEPARTMENT EMPLOYEES OF THE ENVIRONMENTAL HEALTH DIVISION ARE RECOGNIZED FOR THEIR UNTIRING EFFORTS AND HARDWORK IN THE DEVELOPMENT OF THIS REPORT:

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SUMMARY

The Washington County Health Department (WCHD) along with the Maryland Department of Environment's Water Supply Program (WSP) has conducted a Source Water Assessment for approximately one hundred transient non-community water systems in Washington 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 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 scope of work undertaken by the WCHD and the WSP included (1) a survey of active and temporarily inactive transient non-community water supplies, to determine the condition and construction of wells, pumps, storage tanks, and treatment systems; (2) a study of well head protection areas surrounding each well to inventory point and non-point sources of pollution, and identify possible sources of contamination; (3) consultation with each water supply owner/operator to improve protection from contaminants identified and develop management plans for the eventuality of infiltration of contaminants in the future; (4) production of database information, including GIS map overlays and digital image files, on the systems and wellhead protection areas, this information can be used by Environmental Health and other agencies for planning, engineering, development and emergency management strategies; (5) follow through with corrections and any deficiencies in treatment and/or well construction; (6) identify systems that would meet the criteria of ground water under the influence of surface water and follow through with additional treatment requirements and monitoring.

Karst areas are common in Washington County, particularly in the Hagerstown Valley. Karst terrain results from the dissolution of carbonate bedrock. Water creates solution channels in the rock through the solution process. Sinkholes, rock outcrops, sinking streams, and many fissures often occur in the underlying rock. Nearly half of the sources of water supply wells in Washington County are in subsurface karst areas. The density of perennial streams can be significantly less than in non-karst areas. The aquifers of Washington County are quite heterogeneous, and successful wells can be rare. Blocks of sparsely fractured rock may occupy some of the areas between ground-water-carrying conduits. Due to the large amount of subsurface karst, a vast majority of wells are susceptible to surface water runoff and various land uses.

Overall, there are three major risks to the water supply systems. The systems with the highest risk are those classified as Ground Water Under the Direct Influence of Surface Water (GWUDI). Those which pose the next highest risk are the systems located in karst areas. The remaining water systems, which are classified as a moderate risk, are those in non-carbonate fractured rock terrain. The majority of the systems studied revealed that the water supply is very susceptible to outside influences, and nearly all the wells showed contamination of raw water with total coliform bacteria and E. coli. This will become more evident and discussed at length within the report as the water quality data is examined further.

INTRODUCTION

Currently there are approximately one hundred transient non-community water supply systems in Washington County, Maryland, with new facilities being added and existing facilities being closed on a monthly basis. Figure 1 shows a map of the current transient non-community water supply systems. A transient non-community water supply system is defined as a public water system that on average serves twenty-five (25) different individuals each day for at least six (6) months per year. Good examples of transient non-community water supplies are facilities such as campgrounds, parks, food service establishments, clubs, and swimming pools.

Transient water supplies are monitored for total coliform and E. coli, as well as nitrogen and turbidity. Water quality for the transient non-community water supply systems are currently monitored quarterly for total coliform and E. coli bacteria. Nitrogen in the form of nitrate-nitrite and turbidity are monitored annually. Additionally, nitrite levels are only taken initially unless levels are greater then 50% of the Maximum Contaminant Level (MCL). If 50% of the MCL is exceeded for nitrites, quarterly followed by annual monitoring may be required. However, systems classified as GWUDI are sampled monthly for total coliform and E. coli.

The majority of Washington County, Maryland is located in the Ridge and Valley physiographic province. Nearly half of the transient non-community water supply systems are located in karst areas of the county and are using carbonate rock aquifers, such as limestone, as a source for drinking water (see Table 1). The remaining systems are located in non-carbonate aquifers, such as sandstone and shale. All aquifers in the county are unconfined, and the wells are therefore all susceptible to varying degrees of land use, some more than others.

WELL INFORMATION

Well information for each system was obtained from the Water Supply Program's database, site visits, well completion reports, sanitary survey inspection reports, and published reports. A total of ninety four wells are used by the eighty nine systems assessed in this report. The well tag number, which provides vital well information, was found for the majority of the wells (see Table 2).

The locational information found in the sanitary surveys was a good start for this project. However, it was decided that more accurate well location information would have to be obtained. Locations of all the wells by the transient water systems were taken with a GPS and differentially corrected to increase the precision of each location (Figure 1). Along with the GPS point, any wellhead deficiencies and any possible sources of contamination were also noted during the site visit.

HYDROGEOLOGY

To understand the water quality in Washington County, one needs to understand the geology and hydrology of this area. The majority of this area is located over unconfined carbonate aquifers. According to Duigon (2001), about 89% of the Hagerstown Valley is underlain by carbonate rock (see Figure 4). The hydrology of carbonate rock is unique because the dissolution of bedrock has resulted in karst terrain. In karst terrain, water creates solution channels in the rock through the solution process. This process results in unusual surface and subsurface features. For example, sinkholes, rock outcrops, sinking streams, caverns, and many fissures often occur in the underlying rock. It has been well documented by the United States Geological Survey (USGS), the Maryland Geological Survey (MGS) and MDE that sinkholes and sinking streams are direct pathways to the groundwater and springs (Duigon 2001).

Wells in karst areas often intercept enlarged openings, which are directly connected to sinkholes rock outcrops, and/or sinking streams. These direct pathways do not provide a treatment zone to remove pathogens present in the surface water before the water reaches a well. Therefore, anything on the surface, such as fertilizers, pesticides, surface water or any other contaminants can wash into these features, which are direct channels to the groundwater. When this occurs, there is not enough of a treatment zone to remove potentially harmful pathogens that could cause human illness, such as infectious Hepatitis, Giardia, Cryptosporidium, Legionella, etc. The water carrying the contaminants and/or pathogens can travel long distances very quickly, intersecting a drilled well. Across the Hagerstown Valley, you can visibly see in several areas the many sink holes, rock outcroppings, and sinking streams.

The ground water in karst areas often flows at very high volumes and velocities as well. One dye test study conducted by MDE in July of 1997 was noted in Duigon (2001). Results provided ground water velocities based on time the dye was injected into a sinkhole until it was detected at a spring more than two miles to the northeast. The dye test indicated that the water traveled at a rate of approximately fifty feet per hour.

As stated above, nearly 89% of the Hagerstown Valley area is predominately underlain by carbonate rock or karst terrain. The remaining areas within the Hagerstown Valley are underlain by predominately non-carbonate rocks such as sandstone and shale. This area of non-carbonate rock runs mainly along the Conococheague Creek. Outside of the Hagerstown Valley, in the Ridge Areas, the underlying rock tends to be non-carbonate rocks such as shale, siltstone, and sandstone formations.

SOURCE WATER ASSESSMENT AREA DELINEATION

For ground water systems, a Wellhead Protections Area (WHPA) is considered the Source Water Assessment Area (SWAA) for the system. The SWAA for transient non-community water systems pumping less than 10,000 gallons per day from a fractured rock aquifer is a fixed radius of one thousand feet (MD SWAP 1999). The area should be adjusted to account for geological boundaries and ground water dividers if appropriate.

POTENTIAL SOURCES OF CONTAMINATION

Potential sources of contamination are classified as either point sources or non-point sources. Examples of point sources of contamination are leaking underground storage tanks (USTs), landfills, discharge permits, large scale feeding operations, and CERCLA sites. The sites are generally associated with commercial or industrial facilities that use chemical substances that may, if inappropriately handled, contaminate groundwater via a discrete point location. In karst areas, sinking streams and sinkholes underlain by limestone may be considered natural point sources of contamination. These sinkholes maybe receiving contaminated run off and delivering the contamination directly into the aquifer. For this study, specific septic systems at facilities were identified and therefore included as point sources. Non-point sources of contamination are associated with certain types of land use practices such as pesticides, application of fertilizers or animal wastes, or areas with septic systems may lead to groundwater contamination over a large area.

Point Sources

Potential point sources of contamination have been identified within the SWAA of nearly all of the systems. The point sources were identified using a combination of both the sanitary surveys completed by field staff and orthophotography overlays with a one thousand foot buffer around each well head or SWAA. See Appendix A for their locations. Several systems have fuel pumps, USTs, propane tanks, or other hazardous materials storage located within the one thousand foot SWAA. Nearly every system has an onsite absorption field or septic tank, which is a potential point source due to the karst geology. Additionally, there is a Waste Water Treatment Plant and an underground storage pit for manure located within two of the systems SWAA.

Non-Point Sources

The Washington County Land Use Map (Figure 3) was used to determine predominate types of land use across the county and within the SWAAs. The land use of Washington County is approximately 47.7% agricultural, 35.9% forested, and 10.5% residential with a variety of commercial, industrial, open space, and water ways comprising the remaining 6%. However, within the SWAA, the land use patterns change. The land use is as follows: 54% deciduous forests, 38% crop and pasture lands, 3% low density residential, 3% water, with the remaining 2% comprising commercial, industrial, and open space.

Agricultural land use is commonly associated with nitrate loading of ground water. Other potential non-point sources that are not specifically identified, but are commonly found in source water assessment areas include storm water drainage ditches and storm water management ponds.

Sewer

The Comprehensive Plan for the County (2002) states that approximately sixty percent of all dwelling units in the county currently have public sewer service. The remaining forty percent of residents that do not have public sewer service depend on on-site septic systems. The Washington County Health Department has identified many of these areas as having unusually high number of repairs. Unfortunately, due to the nature of the geology of the area, the failure of these systems is likely to result in environmental degradation and present a threat to public health. Figure 2 shows the existing and planned sewer service for Washington County.

WATER QUALITY DATA

Water quality data was reviewed from the WCHD Water Supply Program's database for Safe Drinking Water Act contaminants. The treatment methods currently in use for the nearly one hundred systems included in this report range from disinfection, corrosion control, removal of iron, particulates, and organics, to no treatment (see Table 2).

A review of the monitoring data indicates that the water supplies for the nearly one hundred systems are frequently in violation for exceeding the MCL for microbiological contaminants. Additionally, many of the systems have exceeded the 50% threshold of the MCL for nitrate. The nitrate MCL is also occasionally exceeded by some systems.

Inorganic Compounds

Nitrate was detected above the threshold level of 5 parts per million (ppm) in forty one of the ninety water systems tested (see Table 4). Therefore, nitrate was detected above the threshold level in 43.6% of the facilities. Nine of the water supplies or 10 % have exceeded the MCL of 10 ppm. However, nitrite levels never exceeded the 50% threshold of the MCL in any of the systems.

Microbiological Contaminants

All of the systems have either monthly or quarterly routine bacteriological samples that are collected as required by the Safe Drinking Water Act. These samples are collected from the finished (treated) water. Only eight of the systems have never had positive routine samples in all samples collected since 1993. Eighty six systems had positive coliform bacteria results (see Table 3). This means that total coliform bacteria was detected in 91.5% of the finished water supplies. Thirty systems have sampled positive for E. coli bacteria. Fecal coliform or E. coli was detected in 31.9% of the finished water supplies.

Ground Water Under the Direct Influence (GWUDI) Facilities

Continuous testing in wet and dry weather has also enabled the WCHD to isolate nine facilities which were determined to be GWUDI. The GWUDI facilities are sampled monthly as opposed to quarterly. The nine facilities can be found highlighted in yellow on Tables 1 – 4. All nine or 100% of the GWUDI facilities showed positive for total coliform. Six of the nine GWUDI facilities or 66% were positive for E. coli. Eight or 88.8% of the facilities showed nitrate levels that exceeded the threshold of the MCL. Moreover, three of the facilities or 33% had nitrate levels which exceeded the MCL of 10 ppm.

SUSCEPTABILITY ANALYSIS

The wells serving the water systems included in this report all draw water from unconfined fractured rock aquifers. Wells in unconfined aquifers are generally vulnerable to any activity on the land surface that occurs within the SWAA. However, this vulnerability will vary based on the hydro-geologic regions. Wells which draw water from limestone formations are generally considered more vulnerable to the activity on the land surface due to thin soil cover and development of karst features. Dissolution of minerals generally leaves a very small over burden to filter and store water as it travels from the surface to the water table. Therefore, contamination at the surface can reach a well in this region in a matter of hours or days. This makes it important to ensure wells are properly sited and constructed to avoid potential sources of contamination that may be in the immediate vicinity of the well.

Forty four of the wells studied were found to be in limestone formations. Therefore, continued monitoring of the contaminants is essential to maintaining a safe drinking water supply. The susceptibility of the source to contamination is determined for each group of contaminants based on the following criteria: 1) the presence of potential contaminant sources within the SWAA, 2) water quality data, 3) source integrity, and 4) aquifer conditions.

The remaining fifty wells are also in unconfined fractured rock aquifers. However, these wells are generally situated in non-carbonate rock formations such as shale and sandstone. While not in limestone formations, again the nature of the fractured rock geology is such that the aquifers are susceptible to surface water contamination. However, non-carbonate fractured rock tends to be more susceptible to inorganic compounds such as nitrogen, whereas carbonate rock formations tend to be more susceptible to microbiological and water soluble contaminants.

Inorganic Compounds

Nitrate was detected above the threshold level of 5 ppm in 43.6% of the facilities. The MCL for nitrate is 10 ppm and 10% of the facilities exceeded the MCL for nitrate. Sources of nitrate can generally be traced back to land use. Fertilization of agricultural fields and residential lawns, and septic systems are all common sources of nitrate loading

in the ground water. Additionally, agricultural land comprises nearly 48% of the land use in the county and 38% of the land use in the SWAAs. Specifically, the 38% is in pasture and crop lands.

Due to the levels of nitrate found, the vulnerability of the aquifers to land activities, and the presence of nitrate sources in the SWAAs, the water supplies are determined to be susceptible to this contaminant. It is likely that the water supplies are potentially susceptible to nitrite contamination since they are highly susceptible to nitrate contamination. However, testing has revealed no occurrence to date.

Turbidity

While turbidity is not required under state or federal regulations, WCHD does monitor turbidity. The turbidity results were not included in this report. They are however, collected annually to further ensure proper functioning of disinfectant systems such as an ultraviolet light. If turbidity is found to be high, the efficiency of the UV light may be significantly decreased and therefore is not functioning effectively.

Microbiological contaminants

Total coliform bacteria was detected in 91.5% of the finished water supplies. Fecal coliform or E. coli was detected in 31.9% of the finished water supplies. Sources of these pathogens are generally improperly treated wastewater, failing septic systems, poor well construction, and surface water contamination in the karst geology areas. Based on the water quality data, the water systems are susceptible to microbiological contaminants.

Older working on-site septic systems for example, may especially pose a problem in karst areas as well, because most do not have an adequate treatment zone to treat the wastewater before it reaches the groundwater, therefore contaminating the groundwater. This factor alone poses serious health threats such as infectious hepatitis, which was the reason for initially installing a public water line at Martin's Crossroads in Washington County.

In 1981, an outbreak of infectious hepatitis was linked to contaminated well water at Martin's Crossroads. Hepatitis A was able to be directly cultured from the groundwater in this karst area. This outbreak was linked with the failure of on-site sewage disposal systems to effectively remove pathogens before reaching the groundwater, resulting in the installation of the public water line.

In 1966, there was an infectious hepatitis outbreak that was linked to a spring in the town of Sharpsburg, Maryland. Again, a public water line was installed as a direct result of this outbreak. Both of these outbreaks occurred in the karst limestone areas.

In light of previous viral outbreaks, coliphage testing was also conducted on forty nine wells between 2003 and 2004. The wells tested were a random sampling

representing the transient wells in the county. Samples were collected from each of the forty nine wells and tested to determine the presence or absence of both male specific coliphage and somatic coliphage. Out of the ninety eight total tests, five samples showed positive results. Overall, there was found to be no statistical significance in these results.

Coliphage testing was used because the presence of coliphage in water is more likely to be associated with the presence of fecal pollution originating from the gastrointestinal tract of warm-blooded animals. Therefore, the coliphage viruses are thought to serve as a better or more effective indicator of fecal pollution compared to the coliform bacteria. Total coliform bacteria may multiply in the environment, resulting in an overestimate of the level of pollution that has occurred.

Due to the prevalence of bacteria and viruses in fractured rock geology and unconfined aquifers, current well construction regulations require at least a 100-foot separation between on-site septic systems and wells, many older existing sites may not achieve this requirement. Regardless, of whether the systems meet the requirement, in karst areas the underlying geology may play more of a factor. Wells are more likely to be contaminated from surface water coming from infiltration through geologic features such as sinkholes or sinking streams than from poor construction.

Initially, some wells were found to be inadequately protected by today's construction standards. They may have had old conduit caps, or the well casing or conduit may have been cracked or missing. While poor well construction may have been a factor early on for some of the test results, any well deficiencies that were found since the testing commenced have since been corrected. All of the transient non-community water supplies have all had two-piece caps properly installed and all facilities were inspected by the WCHD for proper well head integrity.

Ground Water Under the Direct Influence (GWUDI) Facilities

Wet weather and dry weather testing has enabled the WCHD to isolate nine transient facilities which were determined to be GWUDI. The facilities were sampled for four consecutive days following a rain event greater than a half an inch. Then the facilities were sampled when there had been no occurrence of rain, hence dry weather samples. After the bacteriological and turbidity results were examined, there were nine facilities that were found to be under the direct influence of surface water. These facilities are highly susceptible to what occurs on the surface of the ground regardless if it is weather related, land use related or a combination thereof. As a result, the GWUDI facilities are sampled monthly as opposed to quarterly. Additionally, the facilities must have treatment in the form of both chlorination and an ultraviolet light. Additionally, they must have a certified operator to maintain and monitor their system.

All 100% of the GWUDI facilities showed positive for total coliform and 66% were positive for E. coli. Additionally, 88.8% of the facilities showed nitrate levels that exceeded the threshold of the MCL, while 33% had nitrate levels which exceeded the MCL of 10 ppm. These significantly higher percentages, especially when examining E.

coli and nitrate, show the difference in the GWUDI facilities compared to the other transient facilities; thus displaying the need for addition treatment and a certified operator to monitor the system.

SUMMARY AND RECOMMENDATIONS FOR PROTECTING WATER SUPPLIES

Key Findings

This report identified transient water systems in Washington County as being likely to be contaminated by microbiological contaminants, such as coliform bacteria and E. coli, and nitrates as a result of geology. Facilities were found to have three general risk levels. If a water supply system was determined to be a GWUDI system, it was considered to have the highest risk of being contaminated. This risk level was followed by water supply systems located in karst areas. Lastly, water supply systems with wells located in non-carbonate fractured rock aquifers were classified as being a moderate risk level. Additionally, microbiological contaminants were more common in GWUDI and karst area water supply systems. Nitrogen and water soluble contaminants were more commonly found in non-carbonate fractured rock water supply systems. With the information contained in this report, the individual water systems and the Washington County government have a basis for protecting the drinking water supplies for ground water users. Evaluating future development and land use practices, and tracking potential contaminant sources will help protect the water supply for these systems. Specific management recommendations are listed below.

Recommendations for Individual Water System Owners

- *The sanitary integrity of the water supply system must be maintained. Sanitary defects noted in MDE's sanitary surveys should be corrected. All work on the water systems should be performed in a sanitary manner and followed with disinfection any time work is completed.*
- *Coliform testing results are a good indication that the sanitary integrity of the system has been affected. All positive results should be investigated to determine the cause of positive tests. Corrective action should be taken to eliminate the source of the problem. Any sources with confirmed fecal contamination must be rehabilitated or abandoned.*
- *A good way to reduce contamination from insects is to install a new two-piece well cap. Additionally, caulking the electrical conduit is needed to ensure a sanitary seal.*
- *Any wells in areas subject to flooding or those just above grade should be sampled following significant rain events to demonstrate if they are sensitive to flooding impacts. If needed a water-tight model well cap should be installed.*
- *Water systems for seasonal facilities, such as camps, should be disinfected and flushed prior to the opening of a new season.*

- *Systems should continue to monitor for contaminants that have been previously detected to ensure public health protection.*
- *Wells identified to be at risk of contamination from underground storage tanks (USTs) should be sampled for Volatile Organic Compounds (VOCs). While not a regulatory requirement, it would assist in protecting the health of consumers as well as provide a means of notification in the event a tank starts to leak.*
- *Wells should be protected from damage by vehicles or other machinery. If a well is at risk it should be surrounded by bollards. If a well is or was damaged, it should be repaired. All work on wells should be followed by disinfection to avoid contamination of the water supply.*
- *Owners should keep track of potential changes in land use that might impact their water supply. Letting neighboring property owners and local officials know their concerns can prevent problems from occurring. The individual maps of Figure 3 should be a useful starting point as these identify the specific areas that have the greatest potential to impact the water quality of each water supply.*
- *Water system owners should conduct their own field survey of the source water assessment area to ensure that there are no additional potential sources of contamination.*
- *Periodic inspections and a regular maintenance program for the supply wells will ensure their integrity and protect the aquifer from contamination.*

<u>Recommendations for County and Enforcement Officials</u>

- *Continue regular inspection, oversight and testing of transient non-community water systems. Ensure that systems correct the cause of positive bacteriological test results.*
- *Ensure that new wells and on-site septic areas are properly sited and constructed.*
- *Continue to plan for future growth by seeking areas that can be converted from private well and/or septic to public water and sewer. Conducting sanitary surveys and water sampling communities, which are thought to be under the influence of surface water or are highly susceptible to karst terrain may assist in future growth and development of the public water and sewer system.*
- *Planning for new commercial development should consider placement of water supply wells a priority when planning for such facilities as gas stations, and dry cleaners.*
- *Manage storm water runoff and review new development including storage of chemicals to keep away from areas prone to sinkholes, sinking streams, etc.*
- *Test results show that some systems have a high percentage of positive results. Priority should be placed on those systems that have not corrected the root causes of past positive results.*

REFERENCE

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Maryland Department of Natural Resources (DNR), 1987, The Quality and Natural Quality of Ground Water in Maryland: DNR Water Resources Administration.

Sanders, Laura L., 1998, A Manual of Field Hydrogeology Simon & Schuster, Upper Saddle River, NJ

Washington County Planning Commission, 2002, Comprehensive Plan for the County 2002.

OTHER SOURCES OF DATA

Water Appropriation and Use Permits

Washington County Sanitary Survey Inspection Reports

MDE Water Supply Program (PDWIS) Database

Washington County Department of Planning Digital Orthophoto Quarter Quadrangles and Topographic Quadrangles

Maryland Office of Planning 2002 Washington County Land Use Map

Maryland Office of Planning 1996 Washington County Sewer Map

PWSID	PWS_Name	Group #	Ground Water Appropriation	Geologic Formation
1211186	A C & T	3	NOT KNOWN	Dh; not limestone
1211104	ANTIETAM RECREATION	4	WA1974G020	Occ; limestone
1211002	APPELTREE INN	3	NOT KNOWN	Dh; not limestone
1211005	BEAVER CREEK COUNTRY CLUB	4	WA1958G005	Ce; limestone
1211007	BIG POOL COMMUNITY CENTER	3	WA1981G001	Dh; not limestone
1211078	BLACK STEER FAMILY STEAK HOUSE	4	NOT KNOWN	Occ; limestone
1211008	BOONSBORO PRODUCE	4	NOT KNOWN	Ct; limestone
1211011	CAMP HARDING	4	WA1975G006	Stl; limestone
1211179	CAMP LOUISE	3	WA1976G035	wf; not limestone
1211013	CAMP MANIDOKAN	3	WA1962G003	hf; not limestone
1211014	CAMP MARY MAC	4	WA1968G011	Occ; limestone
1211015	CANAL CAMPGROUND	3	WA1973G001	hf; not limestone
1211016	CHEWSVILLE COMMUNITY CENTER	4	WA1976G004	Ce; limestone
1211018	CINDY DEE RESTAURANT	3	NOT KNOWN	pCg; not limestone
1211188	CLOPPERS ORCHARD & ICE CREAM	4	NOT KNOWN	Ct; limestone
1211106	COCHRANS AUCTION COMPLEX	4	WA1990G020	Ct; limestone
1211041	COLUMBUS CLUB OF HAGERSTOWN	4	WA1967G010	Ct; limestone
1211020	CONOCOCHEAGUE GROCERY	4	NOT KNOWN	Orr; limestone
1211180	COUNTRY CROSSROADS GENERAL STORE	4	NOT KNOWN	Dh; not limestone
1211023	COUNTRY DELI	3	WA1976G012	Sw; not limestone
1211194	DEBBIES SOFT SERVE	2	NOT KNOWN	hf; not limestone
1211026	DEER PARK LODGE	3	NOT KNOWN	hf; not limestone
1211090	DOWNSVILLE GENERAL STORE	1	N/A	Orr; limestone
1211030	ERNST MARKET	4	NOT KNOWN	Occ; limestone
1211110	FAIRPLAY FIRE COMPANY	4	WA1981G012	Occ; limestone
1211111	FAMILY RECREATION INC	4	WA1948G002	Ct; limestone
1211191	FORT FREDERICK STATE PARK - MAINT AREA	3	NOT KNOWN	Dh; not limestone
1211010	FORTY WEST LOUNGE	3	NOT KNOWN	Om; not limestone
1211112	FRATERNAL ORDER OF POLICE	3	WA1960G002	Om; not limestone
1211033	GATEWAY SEAFOOD	3	NOT KNOWN	Om; not limestone
1211091	GOOD SAMARITAN LODGE	3	WA1976G011	Om; not limestone
1211089	GREENBRIER INN/ DOG PATCH	2	WA1970G008	hf; not limestone
1211034	GREENBRIER STATE PARK	3	WA1976S009	Qc; not limestone
1211019	HAGERSTOWN CINEMA 10	4	WA1961G007	Os; limestone
1211192	HAGERSTOWN HONDA	4	HA1991G001	Occ; limestone
1211172	HAGERSTOWN KIA	4	WA1991G001	Occ; limestone

Table 1

PWSID	PWS_Name	Group #	Ground Water Appropriation	Geologic Formation
1211070	HAGERSTOWN SNUG HARBOR KOA	4	NOT KNOWN	Orr; limestone
1211036	HAGERSTOWN SPEEDWAY	3	WA1958G003	Om; not limestone
1211114	HAPPY HILLS CAMPGROUND	3	WA1991G045	Mp; not limestone
1211092	HILLSIDE LIQUORS	3	NOT KNOWN	pCg; not limestone
1211181	HILLSIDE MOTEL, LEFT	3	WA1970G003	pCg; not limestone
1211115	HILLSIDE MOTEL, RIGHT	3	NOT KNOWN	pCg; not limestone
1211067	HOFFMANS QUALITY MEATS	4	N/A	Orr; limestone
1211042	INDIAN SPRINGS CAMPGROUND	3	WA1971G010	Do; not limestone
1211118	IZAAK WALTON LEAGUE OF WASHINGTON CO	3	WA1957G003	Om; not limestone
1211043	LEITERSBURG GRANGE #361	1	N/A	Occ; limestone
1211044	LEITERSBURG HOTEL INC	1	N/A	Occ; limestone
1211119	LEITERSBURG VFD	4	WA1988G003	Occ; limestone
1211046	LOG CABIN INN	3	NOT KNOWN	Dh; not limestone
1211047	MAPLETREE CAMPGROUND	3	NOT KNOWN	hf; not limestone
1211187	MARYS SOFT ICE CREAM	3	NOT KNOWN	Ca; not limestone
1211048	MASON DIXON DRAGWAY	4	WA1991G002	Ct; limestone
1211120	MCCLELLAN GUN CLUB	2	WA1954G004	Ca; not limestone
1211050	MCMAHONS MILL RESTAURANT	4	NOT KNOWN	Os; limestone
1211051	MCNAMEES TAVERN	4	NOT KNOWN	Occ; limestone
1211173	MT LENA RECREATION CLUB	1	N/A	Ct; limestone
1211195	MULLENDORE'S AUCTION FACILITY	3	NOT KNOWN	Qc; not limestone
1211056	NORTH AMERICAN ROD & GUN CLUB	4	WA1977G027	Occ; limestone
1211123	OLD SOUTH MOUNTAIN INN	3	WA1962G005	pCc; not limestone
1211058	PEN MAR PARK	3	WA1976G001	wf; not limestone
1211174	PINECREST MOBILE HOME PARK	3	NOT KNOWN	Om; not limestone
1211133	PINESBURG SOFTBALL COMPLEX	3	NOT KNOWN	Om; not limestone
1211126	PIZZA BARN	3	NOT KNOWN	Om; not limestone
1211175	PLEASANT VALLEY COMMUNITY PARK	3	WA1993G014	pCg; not limestone
1211182	POTOMAC FISH & GAME CLUB CAMPGROUND	4	NOT KNOWN	Om; not limestone
1211061	POTOMAC FISH & GAME CLUB KITCHEN	3	WA1996G013	Om; not limestone
1211062	POTOMAC VALLEY FIRE COMPANY	3	WA1969G014	hf; not limestone
1211076	SHAMROCK INN	3	WA1980G012	Om; not limestone
1211176	SHEETZ INC #209	4	WA1994G031	Ce; limestone
1211[illegible]	[illegible]HERDS SPRING CABINS	4	WA1991G016	Occ; limestone
1211180	SHEP[illegible] SPRING LODGE	4	WA1991G016	Occ; limestone
1211185	SIDELING HILL [illegible] PARK EXHIBIT RT 68E	3	NOT KNOWN	Mp; not limestone

Table 1

PWSID	PWS_Name	Group #	Ground Water Appropriation	Geologic Formation
1211128	SIDELING HILL STATE PARK EXHIBIT RT 68W	3	NOT KNOWN	Mp; not limestone
1211069	SLIGO ADVENTIST CAMP	4	NOT KNOWN	Ce; limestone
1211129	SOUTH COUNTY PARK	3	WA1985G008	hf; not limestone
1211130	SOUTH MOUNTAIN LITTLE LEAGUE	4	WA1989G032	Ct; limestone
1211077	SOUTH MOUNTAIN ROD & GUN	4	WA1986G004	Occ; limestone
1211184	STATE LINE MOTEL	4	NOT KNOWN	Orr; limestone
1211117	STINGERS (OLD PIKE INN)	4	NOT KNOWN	Ct; limestone
1211102	SUNRISE HANDIMART	4	NOT KNOWN	Occ; limestone
1211183	SWEETIES	1	N/A	Ops; not limestone
1211125	THE RANCH, INC.	3	NOT KNOWN	Sw; not limestone
1211079	VALLEY MARKET	4	NOT KNOWN	Orr; limestone
1211177	WASHINGTON CO AGRIC CENTER	4	WA1995G006	Occ; limestone
1211193	WASHINGTON CO. AG CENTER - EXTENSION	4	WA1995G006	Occ; limestone
1211190	WASHINGTON MONUMENT STATE PARK	3	WA1964G002	pCc; not limestone
1211072	WASHINGTON MONUMENT STATE PARK RANGER	3	WA1964G002	pCc; not limestone
1211082	WESTERN MD SPORTSMENS CLUB	4	WA1970G007	Occ; limestone
1211083	WILSON RURITAN	3	NOT KNOWN	Om; not limestone
1211085	WINDY HILL RESTAURANT	4	WA1974G011	Occ; limestone
1211086	WOODLAWN FARMS BUTCHER SHOP	3	WA1976G009	hf; not limestone
1211134	WOODMONT ROD & GUN CLUB	3	NOT KNOWN	Dr; not limestone
1211088	YELLOW HOUSE	4	NOT KNOWN	Ct; limestone
1211068	YOGI BEARS JELLYSTONE PARK	4	WA1974G002	Orr; limestone

Facilities in yellow represent GWUDI facilities.

Table 1

PWSID	PWS_Name	Well Tag #	Casing Depth	Well Depth	Known Treatment Methods
1211186	A C & T	unknown	unknown	unknown	Uv Light, Softner
1211104	ANTIETAM RECREATION	WA 73-0186	22	285	UV Light, Filter, Softner
1211002	APPELTREE INN	unknown	unknown	unknown	UV Light
1211005	BEAVER CREEK COUNTRY CLUB	unknown	unknown	unknown	Chlorinator
1211007	BIG POOL COMMUNITY CENTER	WA 73-3442	29	150	Chlorinator, Softner
1211078	BLACK STEER FAMILY STEAK HOUSE	WA94-1130	123	155	UV Light, Filter, Softner
1211008	BOONSBORO PRODUCE	unknown	unknown	unknown	Chlorinator
1211011	CAMP HARDING	WA 88-1033	21	265	Chlorinator
1211179	CAMP LOUISE	WA 94-0447	28	200	Chlorinator Filter, Soda Ash
1211013	CAMP MANIDOKAN	WA 67-0274	28	205	Iron Removal, Softening, Filter
1211014	CAMP MARY MAC	WA 73-0622	15	305	Chlorinator
1211015	CANAL CAMPGROUND	WA 67-0274	28	205	None
1211016	CHEWSVILLE COMMUNITY CENTER	WA 73-3216	95	175	Chlorinator, Softner
1211018	CINDY DEE RESTAURANT	unknown	unknown	unknown	Softner, Chlorinator
1211188	CLOPPERS ORCHARD & ICE CREAM	unknown	unknown	unknown	UV Light, Filter
1211106	COCHRANS AUCTION COMPLEX	WA 88-0556	55	450	None
1211041	COLUMBUS CLUB OF HAGERSTOWN	WA 67-0206	30	185	Filter, Softner, UV Light
1211020	CONOCOCHEAGUE GROCERY	unknown	unknown	unknown	Chlorinator, Softner
1211180	COUNTRY CROSSROADS GENERAL STORE	WA088-0492	100	420	Filter, Softner, UV Light
1211023	COUNTRY DELI	unknown	unknown	unknown	UV Light
1211194	DEBBIES SOFT SERVE	WA 94-0584	156	540	None
1211026	DEER PARK LODGE	unknown	unknown	unknown	None
1211090	DOWNSVILLE GENERAL STORE	N/A	N/A	N/A	Iodinator
1211030	ERNST MARKET	WA 66-0293	54	75	Softner, UV Light
1211110	FAIRPLAY FIRE COMPANY	WA 73-3328	22	255	UV Light, Softner
1211111	FAMILY RECREATION INC	WA 00-2607	20	98	Softner, UV Light
1211191	FORT FREDERICK STATE PARK - MAINT AREA	unknown	unknown	unknown	Softner, UV Light, Soda Ash
1211010	FORTY WEST LOUNGE	WA 94-2595	99	380	Chlorinator, Filter
1211112	FRATERNAL ORDER OF POLICE	WA 81-1500	25	185	Softner, UV Light
1211033	GATEWAY SEAFOOD	unknown	unknown	unknown	Chlorinator, Softner, UV Light
1211091	GOOD SAMARITAN LODGE	WA 73-1525	25	125	Fillter, Chlorinator
1211089	GREENBRIER INN/ DOG PATCH	WA 94-2364	105	600	Filter, UV Light
1211034	GREENBRIER STATE PARK	N/A	N/A	N/A	Chlorinator, Filter, Soda Ash
1211019	HAGERSTOWN CINEMA 10	WA 94-2720	105	400	Chlorinator, Softner, UV Light
1211192	HAGERSTOWN HONDA	WA 94-1992	115	300	Chlorinator, Filter
1211172	HAGERSTOWN KIA	WA 94-1993	115	300	Chlorinator, Filter

WA 88-0903

Table 2

PWSID	PWS_Name	Well Tag #	Casing Depth	Well Depth	Known Treatment Methods
1211070	HAGERSTOWN SNUG HARBOR KOA	unknown	unknown	unknown	Chlorinator, Phosphate
1211036	HAGERSTOWN SPEEDWAY	WA 94-2279	24	120	Chlorinator
1211114	HAPPY HILLS CAMPGROUND	WA 94-0549	300	350	Chlorinator
1211092	HILLSIDE LIQUORS	unknown	unknown	unknown	Chlorinator
1211181	HILLSIDE MOTEL, LEFT	unknown	unknown	unknown	None
1211115	HILLSIDE MOTEL, RIGHT	WA 72-0296	41	400	UV Light
1211067	HOFFMANS QUALITY MEATS	N/A	N/A	N/A	Chlorinator, Filter, Softner, R/O
1211042	INDIAN SPRINGS CAMPGROUND	WA 71-0214	185	295	Iodinator
1211118	IZAAK WALTON LEAGUE OF WASHINGTON CO	WA 02-7339	40	89	UV Light, Softner
1211043	LEITERSBURG GRANGE #361	N/A	N/A	N/A	UV Light
1211044	LEITERSBURG HOTEL INC	N/A	N/A	N/A	UV Light, Filter
1211119	LEITERSBURG VFD	WA 81-2305	110	225	UV Light, Softner
1211046	LOG CABIN INN	unknown	unknown	unknown	Softner, UV Light
1211047	MAPLETREE CAMPGROUND	WA 73-0622	unknown	unknown	UV Light
1211187	MARYS SOFT ICE CREAM	WA 73-3078	425	445	Filter, Softner
1211048	MASON DIXON DRAGWAY	WA 88-0910	168	210	Filter, UV Light
1211120	MCCLELLAN GUN CLUB	WA 81-2615	63	500	UV Light
1211050	MCMAHONS MILL RESTAURANT	WA 73-1784	20	200	Iodinator
1211051	MCNAMEES TAVERN	unknown	unknown	unknown	Filter, Softner, UV Light
1211173	MT LENA RECREATION CLUB	N/A	N/A	N/A	UV Light
1211195	MULLENDORE'S AUCTION FACILITY	N/A	N/A	N/A	Softner, UV Light
1211056	NORTH AMERICAN ROD & GUN CLUB	WA 73-2111	85	105	UV Light, Softner
1211123	OLD SOUTH MOUNTAIN INN	WA 04-9572	33	285	Softner, Chlorinator
1211058	PEN MAR PARK	WA 73-0284	75	175	Chlorinator
1211174	PINECREST MOBILE HOME PARK	unknown	unknown	unknown	Chlorinator, Softner
1211133	PINESBURG SOFTBALL COMPLEX	unknown	unknown	unknown	Filter, UV Light
1211126	PIZZA BARN	WA 88-0801	50	175	Filter, UV Light
1211175	PLEASANT VALLEY COMMUNITY PARK	WA 92-0279	84	275	Chlorinator
1211182	POTOMAC FISH & GAME CLUB CAMPGROUND	WA 94-3690	42	425	Chlorinator
1211061	POTOMAC FISH & GAME CLUB KITCHEN	unknown	unknown	unknown	Softner, UV Light
1211062	POTOMAC VALLEY FIRE COMPANY	unknown	21	165	Chlorinator
1211076	SHAMROCK INN	WA 73-3228	79	125	UV Light, Filter, Softner
1211176	SHEETZ INC #209	WA 94-0004	90	150	Softner, UV Light
1211103	SHEPHERDS SPRING CABINS	WA 88-0971	105	523	Chlorinator
1211180	SHEPHERDS SPRING LODGE	WA 88-1330	101	198	Chlorinator
1211185	SIDELING HILL STATE PARK EXHIBIT RT 68E	WA 81-1786	120	272	Chlorinator, Potassium, Filter

Table 2

PWSID	PWS_Name	Well Tag #	Casing Depth	Well Depth	Known Treatment Methods
1211128	SIDELING HILL STATE PARK EXHIBIT RT 68W	WA 81-1787	100	297	Chlorinator, Potassium, Filter
1211069	SLIGO ADVENTIST CAMP	WA 73-3291	63	200	Chlorinator
1211129	SOUTH COUNTY PARK	WA 81-1056	23	500	Chlorinator
1211130	SOUTH MOUNTAIN LITTLE LEAGUE	WA 88-0339	140	330	UV Light
1211077	SOUTH MOUNTAIN ROD & GUN	WA 81-1353	31.5	300	UV Light
1211184	STATE LINE MOTEL	WA 81-1162	28	120	Softner, Chlorinator
1211117	STINGERS (OLD PIKE INN)	unknown	unknown	unknown	Chlorinator
1211102	SUNRISE HANDIMART	WA 05-4042	unknown	unknown	Softner, Chlorinator, Filter
1211183	SWEETIES	N/A	N/A	N/A	UV Light
1211125	THE RANCH, INC.	WA 73-2157	260	345	UV Light, Softner, Filter
1211079	VALLEY MARKET	unknown	unknown	unknown	Iodinator, Softner
1211177	WASHINGTON CO AGRIC CENTER	WA 94-0112	21	375	UV Light, Filter
1211193	WASHINGTON CO. AG CENTER - EXTENSION	WA 94-0221	45	135	UV Light, Filter
1211190	WASHINGTON MONUMENT STATE PARK	WA 94-0351	54	600	Chlorinator, Soda Ash
1211072	WASHINGTON MONUMENT STATE PARK RANGER	unknown	unknown	unknown	Chlorinator, Soda Ash
1211082	WESTERN MD SPORTSMENS CLUB	WA 70-0095	90	105	Chlorinator, Softner
1211083	WILSON RURITAN	unknown	unknown	unknown	Chlorinator, Filter, Softner
1211085	WINDY HILL RESTAURANT	WA 73-0416	45	500	Chlorinator, Softner
1211086	WOODLAWN FARMS BUTCHER SHOP	WA 73-1666	unknown	unknown	Chlorinator, Softner
1211134	WOODMONT ROD & GUN CLUB	unknown	unknown	unknown	Softner, UV Light
1211088	YELLOW HOUSE	unknown	unknown	unknown	Iodinator, Softner, Nitrate
1211068	YOGI BEARS JELLYSTONE PARK	WA 73-0341	unknown	unknown	Chlorinator

Facilities in yellow represent GWUDI facilities.

Table 2

PWSID	PWS Name	Total Number of Bacti. Samples Taken	Number of Postive Bacti. Samples	Percentage of Total Positive Samples	Number of Postive Fecal Samples
1211186	A C & T	25	3	12%	0
1211104	ANTIETAM RECREATION	27	5	19%	0
1211002	APPELTREE INN	44	11	25%	0
1211005	BEAVER CREEK COUNTRY CLUB	77	15	19%	4
1211007	BIG POOL COMMUNITY CENTER	70	19	27%	1
1211078	BLACK STEER FAMILY STEAK HOUSE	64	5	8%	0
1211008	BOONSBORO PRODUCE	75	19	25%	0
1211011	CAMP HARDING	53	22	42%	1
1211179	CAMP LOUISE	27	1	4%	0
1211013	CAMP MANIDOKAN	68	11	16%	0
1211014	CAMP MARY MAC	15	1	7%	0
1211015	CANAL CAMPGROUND	14	4	29%	0
1211016	CHEWSVILLE COMMUNITY CENTER	38	4	11%	1
1211018	CINDY DEE RESTAURANT	72	12	17%	0
1211188	CLOPPERS ORCHARD & ICE CREAM	26	5	19%	0
1211106	COCHRANS AUCTION COMPLEX	51	12	24%	0
1211041	COLUMBUS CLUB OF HAGERSTOWN	32	0	0%	0
1211020	CONOCOCHEAGUE GROCERY	104	21	20%	11
1211180	COUNTRY CROSSROADS GENERAL STORE	78	30	38%	8
1211023	COUNTRY DELI	33	3	9%	0
1211194	DEBBIES SOFT SERVE	10	1	10%	0
1211026	DEER PARK LODGE	50	16	32%	0
1211090	DOWNSVILLE GENERAL STORE	32	3	9%	0
1211030	ERNST MARKET	37	2	5%	0
1211110	FAIRPLAY FIRE COMPANY	47	9	19%	0
1211111	FAMILY RECREATION INC	32	10	31%	0
1211191	FORT FREDERICK STATE PARK - MAINT AREA	18	2	11%	0
1211010	FORTY WEST LOUNGE	72	22	31%	4
1211112	FRATERNAL ORDER OF POLICE	39	11	28%	7
1211033	GATEWAY SEAFOOD	85	52	61%	2
1211091	GOOD SAMARITAN LODGE	78	13	17%	0
1211089	GREENBRIER INN/ DOG PATCH	60	9	15%	0
1211034	GREENBRIER STATE PARK	55	2	4%	0
1211019	HAGERSTOWN CINEMA 10	54	3	6%	0
1211192	HAGERSTOWN HONDA	110	50	45%	28

Table 3

PWSID	PWS Name	Total Number of Bacti. Samples Taken	Number of Postive Bacti. Samples	Percentage of Total Positive Samples	Number of Postive Fecal Samples
1211172	HAGERSTOWN KIA	51	17	33%	2
1211070	HAGERSTOWN SNUG HARBOR KOA	48	3	6%	0
1211036	HAGERSTOWN SPEEDWAY	35	2	6%	0
1211114	HAPPY HILLS CAMPGROUND	87	30	34%	8
1211092	HILLSIDE LIQUORS	58	31	53%	2
1211181	HILLSIDE MOTEL, LEFT	80	40	50%	2
1211115	HILLSIDE MOTEL, RIGHT	48	18	38%	0
1211067	HOFFMANS QUALITY MEATS	67	6	9%	1
1211042	INDIAN SPRINGS CAMPGROUND	27	2	7%	0
1211118	IZAAK WALTON LEAGUE OF WASHINGTON CO	48	4	8%	0
1211043	LEITERSBURG GRANGE #361	38	5	13%	0
1211044	LEITERSBURG HOTEL INC	59	18	31%	2
1211119	LEITERSBURG VFD	59	6	10%	0
1211046	LOG CABIN INN	88	33	38%	4
1211047	MAPLETREE CAMPGROUND	40	4	10%	0
1211187	MARYS SOFT ICE CREAM	10	1	10%	0
1211048	MASON DIXON DRAGWAY	22	3	14%	0
1211120	MCCLELLAN GUN CLUB	75	15	20%	2
1211050	MCMAHONS MILL RESTAURANT	59	19	32%	0
1211051	MCNAMEES TAVERN	44	6	14%	0
1211173	MT LENA RECREATION CLUB	11	0	0%	0
1211195	MULLENDORE'S AUCTION FACILITY	11	1	9%	0
1211056	NORTH AMERICAN ROD & GUN CLUB	47	5	11%	0
1211123	OLD SOUTH MOUNTAIN INN	35	2	6%	0
1211058	PEN MAR PARK	19	0	0%	0
1211174	PINECREST MOBILE HOME PARK	67	19	28%	4
1211133	PINESBURG SOFTBALL COMPLEX	13	3	23%	0
1211126	PIZZA BARN	84	34	40%	0
1211175	PLEASANT VALLEY COMMUNITY PARK	24	4	17%	0
1211182	POTOMAC FISH & GAME CLUB CAMPGROUND	24	17	71%	1
1211061	POTOMAC FISH & GAME CLUB KITCHEN	55	9	16%	1
1211062	POTOMAC VALLEY FIRE COMPANY	34	2	6%	1
1211076	SHAMROCK INN	64	4	6%	0
1211176	SHEETZ INC #209	50	0	0%	0
1211103	SHEPHERDS SPRING CABINS	30	6	20%	0

Table 3

PWSID	PWS Name	Total Number of Bacti. Samples Taken	Number of Postive Bacti. Samples	Percentage of Total Positive Samples	Number of Postive Fecal Samples
1211180	SHEPHERDS SPRING LODGE	28	4	14%	0
1211185	SIDELING HILL STATE PARK EXHIBIT RT 68E	20	2	10%	0
1211128	SIDELING HILL STATE PARK EXHIBIT RT 68W	52	3	6%	0
1211069	SLIGO ADVENTIST CAMP	10	1	10%	0
1211129	SOUTH COUNTY PARK	43	10	23%	0
1211130	SOUTH MOUNTAIN LITTLE LEAGUE	14	2	14%	0
1211077	SOUTH MOUNTAIN ROD & GUN	59	16	27%	0
1211184	STATE LINE MOTEL	73	35	48%	0
1211117	STINGERS (OLD PIKE INN)	125	75	60%	9
1211102	SUNRISE HANDIMART	104	23	22%	7
1211183	SWEETIES	15	0	0%	0
1211125	THE RANCH, INC.	32	2	6%	0
1211079	VALLEY MARKET	44	6	14%	0
1211177	WASHINGTON CO AGRIC CENTER	46	5	11%	2
1211193	WASHINGTON CO. AG CENTER - EXTENSION	18	1	6%	0
1211190	WASHINGTON MONUMENT STATE PARK	26	0	0%	0
1211072	WASHINGTON MONUMENT STATE PARK RANGER	14	0	0%	0
1211082	WESTERN MD SPORTSMENS CLUB	39	3	8%	0
1211083	WILSON RURITAN	72	11	15%	1
1211085	WINDY HILL RESTAURANT	85	22	26%	1
1211086	WOODLAWN FARMS BUTCHER SHOP	36	0	0%	0
1211134	WOODMONT ROD & GUN CLUB	48	7	15%	1
1211088	YELLOW HOUSE	103	57	55%	6
1211068	YOGI BEARS JELLYSTONE PARK	58	9	16%	2

Facilities in yellow represent GWUDI facilities.

PWSID	PWS Name	Total # of Nitrate Samples	>1 ppm	>50%MCL	Total # of Nitrite Samples	Number of Nitrite Samples > 50% MCL
1211186	A C & T	10	0	0	3	0
1211104	ANTIETAM RECREATION	11	11	4	1	0
1211002	APPELTREE INN	10	4	0	1	0
1211005	BEAVER CREEK COUNTRY CLUB	38	3	1	1	0
1211007	BIG POOL COMMUNITY CENTER	28	0	0	2	0
1211078	BLACK STEER FAMILY STEAK HOUSE	25	25	8	1	0
1211008	BOONSBORO PRODUCE	26	26	0	1	0
1211011	CAMP HARDING	19	0	0	1	0
1211179	CAMP LOUISE	13	8	1	1	0
1211013	CAMP MANIDOKAN	27	3	0	2	0
1211014	CAMP MARY MAC	8	1	0	1	0
1211015	CANAL CAMPGROUND	9	5	2	1	0
1211016	CHEWSVILLE COMMUNITY CENTER	27	27	27	2	0
1211018	CINDY DEE RESTAURANT	36	1	0	1	0
1211188	CLOPPERS ORCHARD & ICE CREAM	10	2	0	2	0
1211106	COCHRANS AUCTION COMPLEX	24	20	2	1	0
1211041	COLUMBUS CLUB OF HAGERSTOWN	26	24	23	1	0
1211020	CONOCOCHEAGUE GROCERY	38	26	6	4	0
1211180	COUNTRY CROSSROADS GENERAL STORE	31	1	0	0	0
1211023	COUNTRY DELI	20	18	0	1	0
1211194	DEBBIES SOFT SERVE	3	3	0	1	0
1211026	DEER PARK LODGE	16	0	0	0	0
1211090	DOWNSVILLE GENERAL STORE	16	4	0	1	0
1211030	ERNST MARKET	23	21	21	1	0
1211110	FAIRPLAY FIRE COMPANY	22	21	16	2	0
1211111	FAMILY RECREATION INC	14	13	1	2	0
1211191	FORT FREDERICK STATE PARK - MAINT AREA	7	0	0	3	0
1211010	FORTY WEST LOUNGE	29	3	1	1	0
1211112	FRATERNAL ORDER OF POLICE	22	1	0	1	0
1211033	GATEWAY SEAFOOD	18	10	0	1	0
1211091	GOOD SAMARITAN LODGE	37	1	0	1	0
1211089	GREENBRIER INN/ DOG PATCH	35	0	0	1	0
1211034	GREENBRIER STATE PARK	45	2	0	2	0
1211019	HAGERSTOWN CINEMA 10	30	27	14	2	0
1211192	HAGERSTOWN HONDA	25	24	14	2	0

PWSID	PWS Name	Total # of Nitrate Samples	>1 ppm	>50%MCL	Total # of Nitrite Samples	Number of Nitrite Samples > 50% MCL
1211172	HAGERSTOWN KIA	20	20	15	1	0
1211070	HAGERSTOWN SNUG HARBOR KOA	33	0	0	1	0
1211036	HAGERSTOWN SPEEDWAY	26	0	0	1	0
1211114	HAPPY HILLS CAMPGROUND	32	0	0	1	0
1211092	HILLSIDE LIQUORS	20	19	0	1	0
1211181	HILLSIDE MOTEL, LEFT	27	26	0	1	0
1211115	HILLSIDE MOTEL, RIGHT	14	14	0	1	0
1211067	HOFFMANS QUALITY MEATS	30	29	0	1	0
1211042	INDIAN SPRINGS CAMPGROUND	19	4	1	1	0
1211118	IZAAK WALTON LEAGUE OF WASHINGTON CO	28	0	0	1	0
1211043	LEITERSBURG GRANGE #361	17	2	2	1	0
1211044	LEITERSBURG HOTEL INC	28	8	2	2	0
1211119	LEITERSBURG VFD	33	31	31	3	0
1211046	LOG CABIN INN	29	0	0	1	0
1211047	MAPLETREE CAMPGROUND	20	4	0	2	0
1211187	MARYS SOFT ICE CREAM	3	3	1	1	0
1211048	MASON DIXON DRAGWAY	13	13	1	2	0
1211120	MCCLELLAN GUN CLUB	32	0	0	1	0
1211050	MCMAHONS MILL RESTAURANT	23	23	0	1	0
1211051	MCNAMEES TAVERN	22	22	0	1	0
1211173	MT LENA RECREATION CLUB	8	1	0	1	0
1211195	MULLENDORE'S AUCTION FACILITY	6	5	5	1	0
1211056	NORTH AMERICAN ROD & GUN CLUB	25	23	23	1	0
1211123	OLD SOUTH MOUNTAIN INN	21	20	7	2	0
1211058	PEN MAR PARK	16	15	0	2	0
1211174	PINECREST MOBILE HOME PARK	29	0	0	1	0
1211133	PINESBURG SOFTBALL COMPLEX	9	0	0	0	0
1211126	PIZZA BARN	30	0	0	3	0
1211175	PLEASANT VALLEY COMMUNITY PARK	11	11	4	1	0
1211182	POTOMAC FISH & GAME CLUB CAMPGROUND	8	2	0	1	0
1211061	POTOMAC FISH & GAME CLUB KITCHEN	30	1	0	1	0
1211062	POTOMAC VALLEY FIRE COMPANY	18	18	18	1	0
1211076	SHAMROCK INN	37	0	0	2	0
1211176	SHEETZ INC #209	34	1	1	2	0
1211103	SHEPHERDS SPRING CABINS	18	15	5	2	0

Table 4

PWSID	PWS Name	Total # of Nitrate Samples	>1 ppm	>50%MCL	Total # of Nitrite Samples	Number of Nitrite Samples > 50% MCL
1211180	SHEPHERDS SPRING LODGE	15	15	15	1	0
1211185	SIDELING HILL STATE PARK EXHIBIT RT 68E	9	0	0	1	0
1211128	SIDELING HILL STATE PARK EXHIBIT RT 68W	34	0	0	0	0
1211069	SLIGO ADVENTIST CAMP	5	2	0	1	0
1211129	SOUTH COUNTY PARK	22	0	0	1	0
1211130	SOUTH MOUNTAIN LITTLE LEAGUE	7	7	0	1	0
1211077	SOUTH MOUNTAIN ROD & GUN	28	17	0	1	0
1211184	STATE LINE MOTEL	17	17	7	2	0
1211117	STINGERS (OLD PIKE INN)	22	22	22	1	0
1211102	SUNRISE HANDIMART	39	33	14	2	0
1211183	SWEETIES	8	8	7	1	0
1211125	THE RANCH, INC.	13	2	0	1	0
1211079	VALLEY MARKET	24	23	23	1	0
1211177	WASHINGTON CO AGRIC CENTER	26	25	24	2	0
1211193	WASHINGTON CO. AG CENTER - EXTENSION	7	7	5	1	0
1211190	WASHINGTON MONUMENT STATE PARK	22	17	0	2	0
1211072	WASHINGTON MONUMENT STATE PARK RANGER	6	2	0	2	0
1211082	WESTERN MD SPORTSMENS CLUB	23	22	0	1	0
1211083	WILSON RURITAN	29	1	0	2	0
1211085	WINDY HILL RESTAURANT	36	36	33	2	0
1211086	WOODLAWN FARMS BUTCHER SHOP	24	24	23	1	0
1211134	WOODMONT ROD & GUN CLUB	24	0	0	1	0
1211088	YELLOW HOUSE	29	28	27	1	0
1211068	YOGI BEARS JELLYSTONE PARK	25	25	6	1	0

Facilities in yellow represent GWUDI facilities.

Transient Non-Community Facilities in Washington County

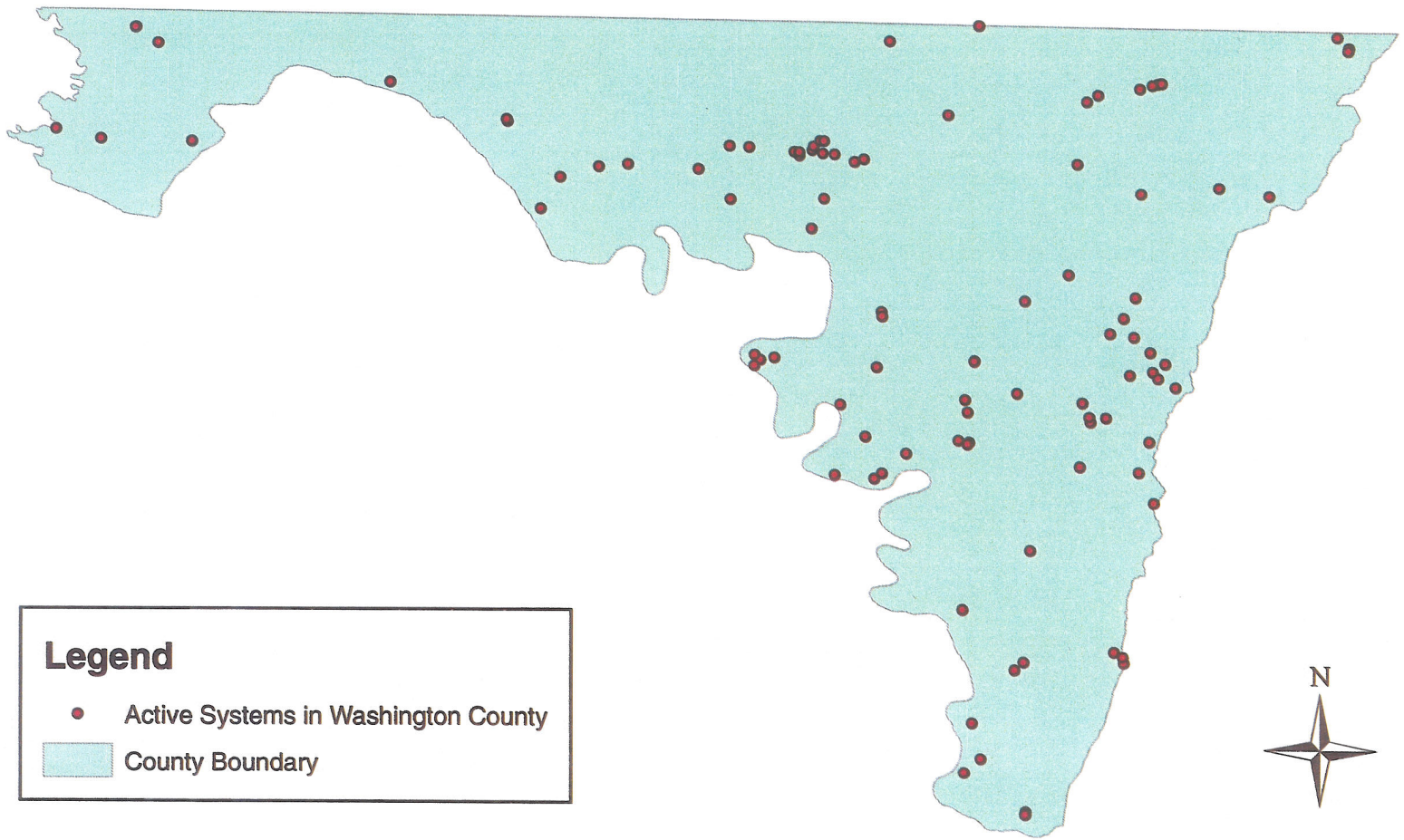
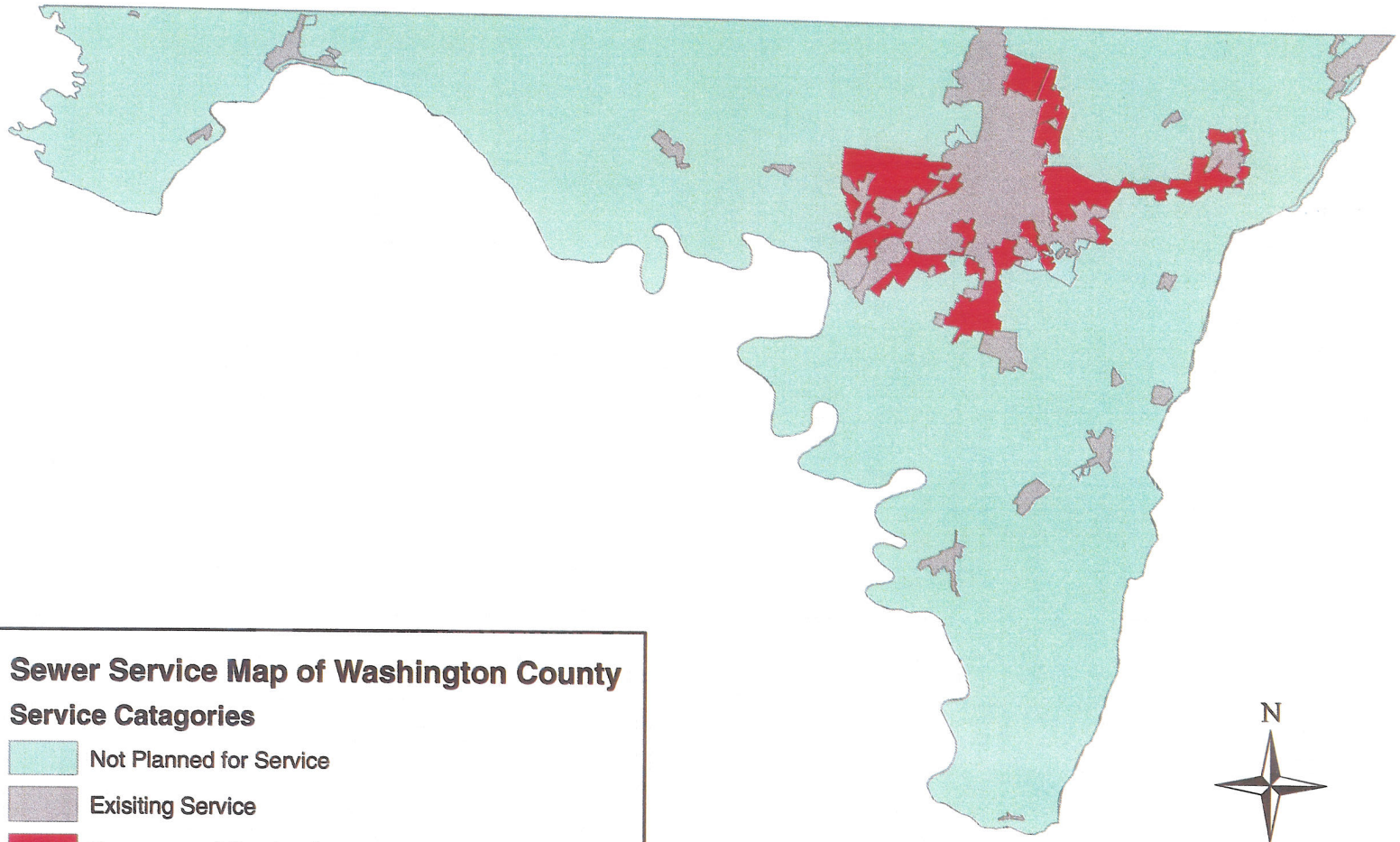


Figure 1

Washington County Sewer Service



Sewer Service Map of Washington County

Service Catagories

- Not Planned for Service
- Exisiting Service
- Programmed Service Area

0 2.5 5 10 15 20 Miles

N

Figure 2

MOP 2002 Washington County Land Use

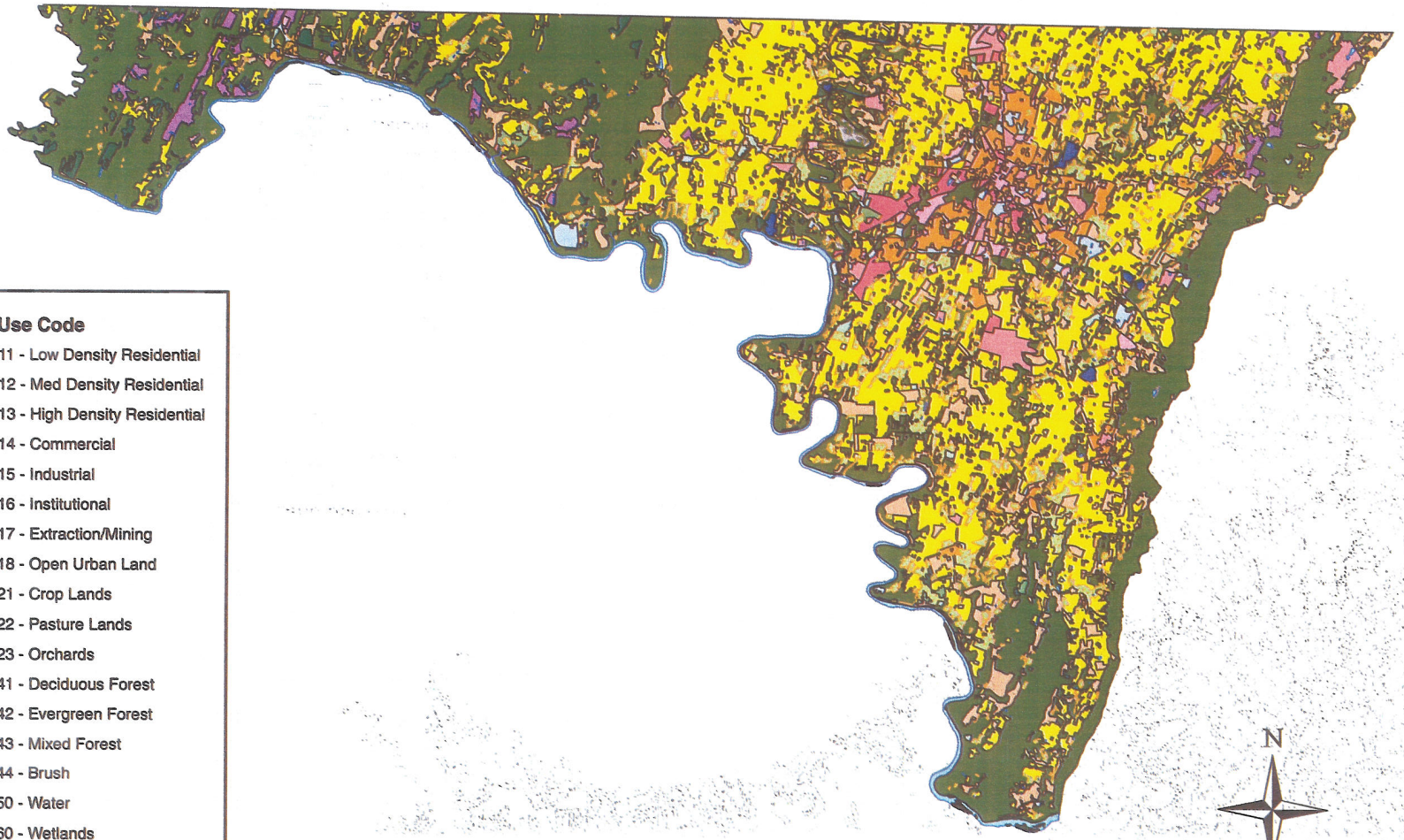
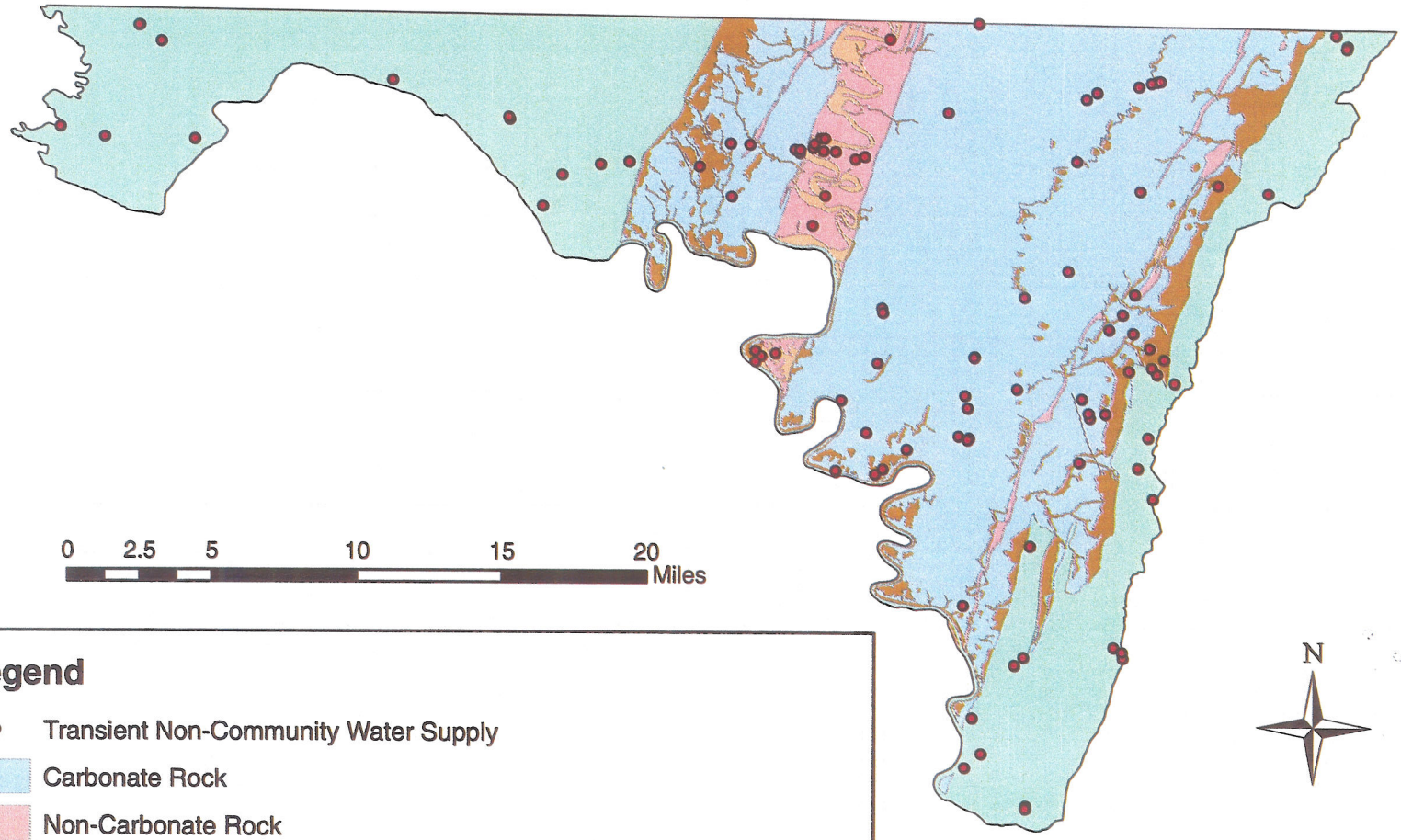


Figure 3

Karst Areas of the Hagerstown Valley



Legend

- Transient Non-Community Water Supply
- Carbonate Rock
- Non-Carbonate Rock
- Carbonate Rock covered by unconsolidated Quaternary Sediments
- Non-Carbonate Rock covered by unconsolidated Quaternary sediments
- Washington County Boundary

Figure 4