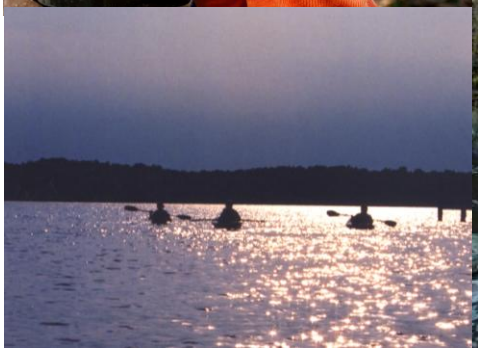
APPENDIX

water resources

FUNCTIONAL PLAN

MAY 2010



Appendix 4

Information on Sewerage Systems Issues, and Excerpts, Selected Maps, and Tables from Chapter 4 of the Water and Sewer Plan

MONTGOMERY COUNTY PLANNING DEPARTMENT
THE MARYLAND–NATIONAL CAPITAL PARK AND PLANNING COMMISSION

MontgomeryPlanning.org

Water and Sewer Plan, Chapter 4: Sewerage Systems

Chapter 4 describes the planning basis for the sewerage systems in the County. It addresses the County's three major community sewerage systems—WSSC, Rockville, and Poolesville.

It defines the County's sewerage systems according to the treatment plant service areas: Blue Plains, Seneca, Damascus, Hyattstown (operated by WSSC), and Mill Bottom (operated by Frederick County). The WSSC system provides most of the County's community sewer service, excepting the Rockville Sanitary District and the Town of Poolesville. Accordingly, the Plan outlines the regional agreements and policies pertaining to the WSSC system, and how they relate to planning and providing sewer service and capital projects to meet anticipated needs, including the Inter-Municipal Agreement (IMA), the Bi-County Agreement, the Strategic Sewerage Plan, and the District of Columbia legislation that created the District of Columbia Water and Sewer Authority (WASA). The Plan includes the details of issues, terms, and conditions of these agreements and their implications for the future.

Over ninety percent of the County's wastewater is conveyed to the Blue Plains Wastewater Treatment Plant in Washington D.C. Accordingly, the IMA provisions that govern the shared use of this facility with the District of Columbia, Fairfax County, and other regional entities is described in detail. Issues important to the County include peak and average flow, allocated treatment capacities, and planned capital improvement projects. Related issues involve the use of the Potomac Interceptor and managing sewage treatment by-product—sewage sludge, also known as biosolids.

The Water and Sewer Plan reviews needs for the sewerage system on a sewershed basis, highlighting parts of their sewerage systems requiring relief, either now or in the future. In addition, the discussion of rural sanitation issues includes a table which summarizes known septic system problem areas throughout the County. This information provides a basis for further investigations and actions to address these rural sanitation problems. In addition, the plan presents policy recommendations and directions related to sewerage systems for future guidance.

Excerpts from Chapter 4

4.1.A Sewer Service Area Categories As discussed in Chapter 1, this Plan classifies all areas of the county into one of five category designations for sewer service areas. The categories range from areas served by community systems (S-1) to areas where improvements to or construction of new community systems will be planned in the future (S-3, S-4, and S-5) to areas where there is no planned community service (S-6). (In practice, Montgomery County does not use category S-2, which designates areas where community sewerage system projects are in the final planning stages.) Figure 4-F1 shows a generalized distribution of sewer service area categories throughout the county. For additional detailed information on sewer service area categories, please refer to Chapter 1.

4.1.B Sanitary Districts A sewer service area can be defined by a sewage system operating authority, and/or by a geographic or structural separation of a group of related treatment and transmission facilities. The county is divided into three publically-operated and largely separate sanitary service areas or districts: the Washington Suburban Sanitary District (WSSD), the largest system, serving most of the county; and two smaller municipal districts operated by the City of Rockville and the Town of Poolesville. (See Figure 3-F2.) Each district is served by its own sewage collection and transmission systems. Sewage from the WSSD is treated at several local plants operated by WSSC and at one regional facility, the Blue Plains Wastewater Treatment Plant (WWTP), located in the District of Columbia. Flows from Rockville eventually enter the WSSD system for transmission to and treatment at the Blue Plains WWTP. Poolesville's treatment plant, for

the most part, serves only the town itself. Information for the districts serving Rockville and Poolesville has been provided primarily by those municipalities and is incorporated into this Plan consistent with State law.

Some properties within each sanitary district are served by individual, on-site systems, rather than community systems. The vast majority of these individual systems are within the WSSD. Information on individual, on-site systems follows at the end of the chapter.

4.1.C Wastewater Treatment Service Areas Based on function, there are two components to a wastewater disposal system: collection/conveyance facilities and treatment facilities. A wastewater treatment service area is a geographic region comprised of a section of one or several sewer basins, where both collection/conveyance and treatment are provided. Presently six community wastewater treatment service areas provide service within Montgomery County: Blue Plains, Seneca, Damascus, Hyattstown, and Mill Bottom within the WSSD, and Poolesville, largely separate from the WSSD, as shown in Table 4-T1. The Rockville Sanitary District (RSD) is located within the Blue Plains service area. Figure 4-F3 shows the areas served by each of these six wastewater treatment plants.

4.1.D Watersheds and Sewersheds: The County is bounded by two rivers: the Potomac to the southwest and the Patuxent to the northeast. Most of the county's streams flow into the Potomac River, either through local tributaries, such as Watts Branch, Rock Creek, Cabin John Creek, and Great Seneca Creek, or through watersheds that drain to two major tributaries outside the county: the Anacostia and Monocacy Rivers. The southeastern part of the county, south of Olney and east of Georgia Avenue, slopes toward the Anacostia River, and includes the Sligo Creek, Northwest Branch, Paint Branch, and Little Paint Branch watersheds. Portions of the northwest part of the county slope toward the Monocacy River, and include the Little Monocacy River, Bennett Creek, and Little Bennett Creek watersheds. The northeastern part of the county, along the border with Howard County, slopes toward the Patuxent River.

To take advantage of gravity to the greatest extent possible, sewage collection and conveyance systems generally follow streams and waterways within various drainage basins. Because of this, the sewer basins (or sewersheds) in this chapter are often referred to by the name of their related watershed (*e.g.*, Watts Branch, Seneca Creek, etc.). Through major trunk lines and pumping facilities the sewage flows from individual sewersheds are collected, combined, and conveyed for their eventual treatment at a wastewater treatment plant. The major drainage basins in the county are shown in Figure 4-F4.

The county is also divided into 27 land use planning areas, each area forming a fairly cohesive district bounded by a major highway or natural border such as a stream valley. These planning areas have been established by legislative action of the County Council. An overlay of the drainage basins and planning areas is shown in Figure 4-F5. All of the county's community sewerage systems, wastewater treatment service areas, sewersheds, and planning areas contained in each community sewerage systems, are listed in Table 4-T1.

4.II WASHINGTON SUBURBAN SANITARY DISTRICT

The Washington Suburban Sanitary District (WSSD), established by State law, includes most of Montgomery and Prince George's Counties, encompassing a total area of approximately 1000 square miles. Within Montgomery County, areas excluded from the WSSD include most of the City of Rockville and some surrounding areas, and the Town of Poolesville. Sewer service areas managed by the Washington Suburban

Sanitary Commission (WSSC) within Montgomery County include the Blue Plains, Seneca, Damascus, and Hyattstown service areas. WSSC also manages a small portion of the WSSD served by the Poolesville WWTP. The City of Rockville, also part of the Blue Plains service area, manages its own collection and conveyance systems, but relies on Blue Plains for treatment. The Town of Poolesville manages its own sewerage system, including collection, conveyance and treatment systems.

Guided by policies specified in this Plan, the provision of community sewer service within Montgomery County generally follows the patterns established by the County's General Plan for development, "On Wedges and Corridors." Community service is established and planned for the central and southern part of the county, following three major transportation corridors of higher density development north from the District of Columbia:

- the U.S. Route 29 (Columbia Pike) corridor to Burtonsville
- the Georgia Avenue (State Route 97) corridor to Olney
- the U.S. Interstate 270/State Route 27 (Ridge Road) corridor to Clarksburg and Damascus.

Elsewhere, primarily in the western and northeastern areas of the county, wastewater disposal service generally depends on individual, on-site systems, which discharge their effluent to the ground.

4.II.A Government Responsibilities The responsibilities for planning for and providing water service within the WSSD are multi-jurisdictional and depend on the cooperative efforts of municipal, County, State, federal, and regional authorities. This is especially true with regard to the Blue Plains WWTP, a wastewater treatment facility shared by several jurisdictions.

These agencies include:

- Montgomery County Government
  - Department of Environmental Protection (DEP)
  - Department of Permitting Services (DPS)
- Washington Suburban Sanitary Commission (WSSC)
- Maryland - National Capital Park and Planning Commission (M-NCPPC)
- District of Columbia Water and Sewer Authority (WASA)
- Metropolitan Washington Council of Governments (COG)
- State of Maryland
  - Department of the Environment (MDE)
  - Department of Planning (MDP).

These agencies, and their primary responsibilities and programs, are described in detail in Chapter 1, Section I.D. of the Comprehensive Water and Sewerage Systems Plan.

4.II.3 Wastewater Flow Analysis Flow projections are based on the County's adopted land use plans and approved service areas for future growth, and are in accordance with the County's latest master plans for development. The projected future flows are estimated in proportion to population projections with an allowance for planned commercial and industrial growth and factors such as infiltration (extraneous groundwater) and inflow (water discharged into sewer systems from roof leaders, area drains, etc.). WSSC is responsible for conducting wastewater

flow measurements and flow analysis for all areas within the WSSD. Various aspects of WSSC's flow management system are discussed in the following sections.

a. Flow Monitoring WSSC's program for field monitoring of sewage flows provides continuous data on the status of peak and average wastewater flows throughout the WSSC system. The current monitoring system consists of permanent stations which telemeter flow data to a central computer, reducing labor-intensive field collection of data and analysis of charts, and providing greater reliability through immediate reporting of any malfunctions. Fifty permanent sewer flow monitors and seven permanent rain gauges have been installed throughout the various sewer basins in Montgomery County. In addition, WSSC uses temporary flow meters which it can install at various locations for special studies.

The WSSC Planning Section is responsible for the maintenance and operation of part of the Consolidated Engineering System (CES), a computerized record keeping system which tracks the status of unconnected sewer commitments by geographic area (basin), type of future connection (residential, commercial, etc.), estimated average daily flow contribution, and expected connection date. WSSC uses data from CES to calculate remaining available treatment capacity in a particular service area, and to assist in projecting future sewage flows at various points in the transmission system, once appropriate peaking factors and existing peak flows have been established.

Currently, CES tracks future additional flow on the basis of authorizations granted by the WSSC, plumbing permits and actual hookups. A review of the CES system with Montgomery and Prince George's counties staff is recommended (see subsection b, below). The CES system is frequently the process by which needs and priorities for sewer infrastructure are identified and linked with population projections.

b. Flow Reporting WSSC generates the following reports on a regular basis:

- Quarterly Available Capacity Report – This report consolidates and replaces three separate WSSC reports: Sewage Flow to Blue Plains; Quarterly Addendum for WSSC Operated Plants, Mattawoman, Poolesville, and Hyattstown; and Uncommitted Capacity Summary, which summarized WSSC's available sewage transmission capacity for which connection permits have not yet been issued.

- Report to MDE on Sewage Flows and Record Plat Commitments – This quarterly report for the State tabulates existing flows, flows committed through record plat, and remaining uncommitted flows at each of the wastewater treatment plants receiving flows from the WSSC sewerage system.

- Flow Forecast for Montgomery County Sewer Service Areas – This report is issued on an as-needed basis. Forecasts are by major basin and mini-basins or some other small geographical unit, as determined by WSSC staff. Predicted sanitary flow is based on current M-NCPPC growth forecasts and the latest unit flow factors projected for 5-, 10-, and 20-year periods.

- Unit Flow Factor Report for Montgomery County Sewer Service Areas – This report is produced periodically and presents current unit flow factors to be used in the sewage flow report. It includes evaluation of the prior winter's water consumption for various user categories to detect any trends in projected sanitary flow. This report includes a reasonable allowance for unit infiltration/inflow based on rainfall and groundwater level probability analyses.

c. Flow Modeling WSSC conducts wastewater flow modeling primarily in conjunction with facility planning studies. WSSC maintains a sewer model which consists of sewer pipe inventory data throughout the sanitary system, as well as data from the comprehensive flow monitoring system described above. This information is used to determine existing and baseline flow conditions. Then land use and demographic data obtained from the M-NCPPC are superimposed on the existing flows to project future flow conditions for a particular study area.

In addition, WSSC applies various levels of more finite sewage flow modeling. For selected sewer basins, available capacity reports are produced periodically. These reports track plumbing permits, hook-ups, and outstanding authorizations for development, by study point, and link this information to the physical capacity of trunk sewer segments within a particular sewer basin. Other analyses include investigation of trunk sewers that are operating at or near capacity. The results provide information regarding the relative risk of surcharge and overflow in the selected sewer segments.

4.II.4 Transmission System Capacity Requirements and Moratorium Policies For planning purposes, the WSSC conducts comprehensive analyses on a regular basis to determine the wastewater transmission needs within the WSSD. In conjunction with these analyses, Montgomery County has developed and adopted policies to prioritize the County's transmission capacity needs. WSSC must follow these criteria and policies for each basin classification, by designating part or all of each sewered drainage basin in the county as either an **Adequate Capacity Basin, Potential Overflow Basin,** or **Existing Overflow Basin**, depending upon the transmission system's ability to handle sewerage flows. For existing and potential overflow basins these designations will be limited to the area above and tributary to the problem that causes the designation. References to the "Director" refer to the Director of the Montgomery County Department of Environmental Protection.

4.II.5 Sanitary Sewer Overflows -- Sanitary sewers serve a vital function in the transport of wastewater from the customer to the treatment plant. Wastewater either flows by gravity or is pumped to the nearest wastewater treatment plant. WSSC's wastewater collection system is comprised of over 5,000 miles of sewer line and forty-four wastewater pumping stations. When sewers become blocked by things like grease or tree roots, wastewater can back up in the line and eventually overflow from a manhole. This is known as a sanitary sewer overflow (SSO). There are a number of other possible causes of SSOs including pipe deterioration, undersized sewer lines, excess infiltration or inflow of stormwater and power outages at sewage pumping stations.

Most of WSSC's overflows are due to blockages caused by grease, tree roots, or other foreign objects and a small percentage are caused by power outages. Less than one percent are caused by "wet weather," i.e. the inflow of storm water. This attests to WSSC's commitment to

maintaining and upgrading its system to keep up with the infrastructure needs of its expanding customer base.

Over the past several years the Environmental Protection Agency (USEPA) has developed specific Federal regulations to address SSOs. In 1999, EPA released "strawman" regulations for comment. These proposed regulations would require utilities to develop and implement a “Capacity, Management, Operation, and Maintenance (CMOM)” program. The CMOM will outline specific ways a utility such as WSSC will prevent and respond to SSOs. WSSC already has a number of procedures in place to minimize the occurrence of SSOs and to mitigate their impacts when they do occur. WSSC has started the process of adapting its procedures to EPA’s proposed CMOM requirements.

The USEPA and the U.S. Department of Justice have initiated the development of an enforcement strategy for all major sewer systems with reported SSOs. In Maryland, this federal policy has included WSSC. Presently the WSSC is negotiating a consent agreement (order) with the U.S. Department of Justice to address past overflows and to adopt a monitoring and management system to prevent the occurrence of SSOs in the future.

The State of Maryland has placed new emphasis on its requirement to report all SSOs to the Department of the Environment (MDE) within twenty-four hours of their occurrence, as well as the need to notify the public whenever an SSO has any significant potential to affect public health or the environment. MDE has provided guidance suggesting that wastewater utilities need to work closely with local environmental and health departments to identify any such potential impacts and to notify the public when warranted. WSSC, in conjunction with Montgomery and Prince George's Counties, has developed procedures for this coordination and public notification.

Montgomery County DEP and WSSC are fundamentally committed to excellence in the safeguarding of public health and the protection of the environment and are committed to aggressive sanitary sewer overflow programs.

4.II.8 Infiltration and Inflow (I/I) Control Program -- Infiltration of groundwater into aging, defective or damaged sewers and the inflow of water from sources such as direct connections of roof leaders, area drains, drains from springs and swampy areas, and manhole covers may contribute to sewage collection system overloading or may stress the capacities of wastewater conveyance and treatment facilities.

WSSC has reviewed its collection system data and is aware of excess I/I in several of the sewer basins in the WSSD. In the past few years, WSSC focused a significant effort on evaluating the county's Rock Creek basin, which led to the development of a Sewer System Evaluation Survey (SSES) for that basin. The SSES recommendations included corrective actions for specific problems identified in manholes and sewer pipelines. The total estimated cost to rehabilitate the system defects identifies in the study area was approximately $10.6 million.

WSSC has identified other sewer basins in the WSSD as priority basins requiring SSES work. However, limited financial resources have limited WSSC’s ability to address these issues in a timely fashion. In the FY 2003 WSSC budget both Montgomery and Prince George’s Counties identified funding policies to begin addressing these I/I problems through the Sewer

Reconstruction Program. Accordingly, WSSC has begun an SSES in the Cabin John basin and has agreed to provide the Counties with a list of problem basins and their priority for future SSESs. Analysis of the Cabin John basin flows revealed not only a problem with I/I, but also a potential sewage exfiltration problem.

The I/I control program also directly supports renewed federal initiatives for controlling Sanitary Sewer Overflows (SSOs) which include facility and manhole overflows as well as basement back-ups. Using I/I assessment techniques, WSSC explores the causes for each SSO event, and seeks resolutions to preclude future occurrences. Survey tools deployed during I/I or related work (physical inspection of manholes, TV inspection of sewers) yield rehabilitation recommendations which are implemented in the Sewer Reconstruction Program. In this manner, WSSC routinely detects and corrects leaking as well as non-leaking structural defects.

4.II.9 Industrial Pretreatment Program -- WSSC implements a federally-required pretreatment program, the Industrial Discharge Control Program (IDCP). The IDCP has four primary goals:

- To monitor and control the discharge of industrial waste into the sanitary sewer system.
- To prevent the discharge of pollutants which will interfere with the operation of wastewater treatment plants, including interference with sludge use and disposal.
- To prevent the discharge of pollutants which will pass through the treatment works or otherwise be incompatible with such works.
- To improve opportunities to recycle and reclaim municipal and industrial wastewater and sludge.

The program also helps protect WSSC personnel and WSSC sewerage systems by regulating the discharge of toxic, corrosive, and other prohibited substances into the sanitary sewer.

IDCP requirements apply to all industrial users within the WSSD, and include those industrial users whose wastewater is treated at the District of Columbia's Blue Plains WWTP. WSSC regulates industrial users in the WSSD through a variety of activities including field investigations and sampling, permitting, compliance reviews, and enforcement measures. In order to comply with WSSC discharge limitations, some industrial users are required to install pretreatment equipment to treat their wastewater prior to discharging it to WSSC's sanitary sewers. In some cases, the equipment may be relatively minor (e.g., silver recovery units or grease traps); in other cases, the required level of pretreatment can be extensive.

4.II.10 Wastewater Treatment System Requirements: General Provisions In addition to discharge and construction permit requirements on existing and new treatment plants administered by the State of Maryland, Montgomery County shall review and approve all new facilities and all significant modifications to existing facilities within the county. All new community and multi-use treatment systems and points of discharge shall be specifically delineated in this Plan prior to the issuance of final construction and discharge permits by the State of Maryland. In addition, the County government may require stricter levels of treatment where warranted by projected receiving water quality impacts resulting from the discharge. These requirements also apply to all individual systems exceeding 1,500 gallons per day average daily flow and all individual systems of any size requiring a groundwater or surface water discharge permit, except heat pump discharges. Permit applicants have the burden of

adequately demonstrating to the County that the proposed facilities will not have a significant, detrimental impact on the surrounding community or receiving waters.

Proposed modifications to existing treatment facilities, including both system upgrading and expansion, are also subject to the County's approval. This includes any proposed community multi-use or individual system treatment facility or discharge point modification which requires a State construction and/or discharge permit. Any modifications requiring MDE's review and approval shall also require prior incorporation of the proposed modification in this Plan, as either a text amendment or as an adopted capital improvement program (CIP) project. Specific proposals for new or modified facilities shall be submitted to the Director of DEP with supporting documentation as required by the Director.

The State of Maryland, as part of its efforts to improve the ecological health of the Chesapeake Bay, is investigating the impact of lowering the wastewater treatment plant nitrogen discharge standard from 8 milligrams per liter (mgl) to 3 mgl. This new standard would affect all of the wastewater treatment plants serving Montgomery County, and would have significant financial implications for WSSC and WASA with regard to the facility upgrades and treatment process improvements needed to comply with the lowered standard.

4.II.11 Financing Sewerage Systems WSSC uses several methods to fund the construction and operation of the sewerage system. Detailed information concerning WSSC's funding methods is included in Chapter 1, Section IV.A.

4.II.11.C Existing and Planned Sewerage Systems and Projected Needs The sewage collection and conveyance system within the WSSD consists of over 4,000 miles of gravity and force mains ranging from 6 to 102 inches in diameter and 52 wastewater pumping stations, including 26 stations in Montgomery County. This section presents an overview of the County's long-term sewerage system needs and anticipated constraints within each service area and individual sewershed. The anticipated sewerage system needs and constraints discussed in this section focus on the major components of WSSC's transmission and treatment facilities. The information presented here is based on the results of various studies as referenced at the end of this chapter.

The planned projects programmed in the WSSC CIP are intended to address the county's current and/or short-term wastewater conveyance or treatment needs. The CIP projects include funding and schedules for planning, design, land acquisition, and construction of facilities. These facilities often support new development in accordance with the County's approved plans and policies for orderly growth and development. Other projects are for system improvements and/or for compliance with environmental regulations and policies.

Flow projections within the WSSD are based on the County's adopted plans and approved service areas for future growth, and are in accordance with the County's latest master plans for development. M-NCPPC provided the population and growth estimates used in WSSC's studies. WSSC has developed flow projections to determine the approximate time a planning decision for each facility should be made. Wastewater flow forecasts are developed from detailed analyses of existing flow records and projected additional future flow based on projected demographics, wastewater flow per household and per employment, and other factors such as infiltration (extraneous groundwater) and inflow. Population forecasting and flow projection are

based on the best available data at the time the planning is conducted. WSSC re-evaluates actual conditions, project needs, etc. before implementing proposed projects.

Projected flows for all sewered basins in Montgomery County are summarized in a table included for sewershed. WSSC based these findings on an 80th percentile of historical flows and on Round 6 Cooperative demographic forecasts. The data also includes updated information regarding I/I control. WSSC' evaluation of the County's long-range sewerage system needs is based on these projections.

A comprehensive long-range strategic plan is under development at WSSC in coordination with Montgomery and Prince George's counties to evaluate the validity of adopted planning concepts, many of which were developed over twenty years ago and have not undergone a comprehensive review since their original adoption. These issues include sewage flow factors, capacity of regional facilities, updated environmental regulations, etc. This long range plan will also incorporate the results of the Potomac Interceptor Study. Relevant to this evaluation are the recent changes in water consumption patterns. The study will provide the WSSC and Montgomery and Prince George's Counties with a valuable tool for planning long-term sewage treatment needs, addressing concerns such as transmission capacity to and treatment capacity at the Blue Plains WWTP, and the timing and need for major capital investments. This comprehensive plan will be coordinated with the Blue Plains regional long-term Wastewater Management Plan which COG initiated in 2002.

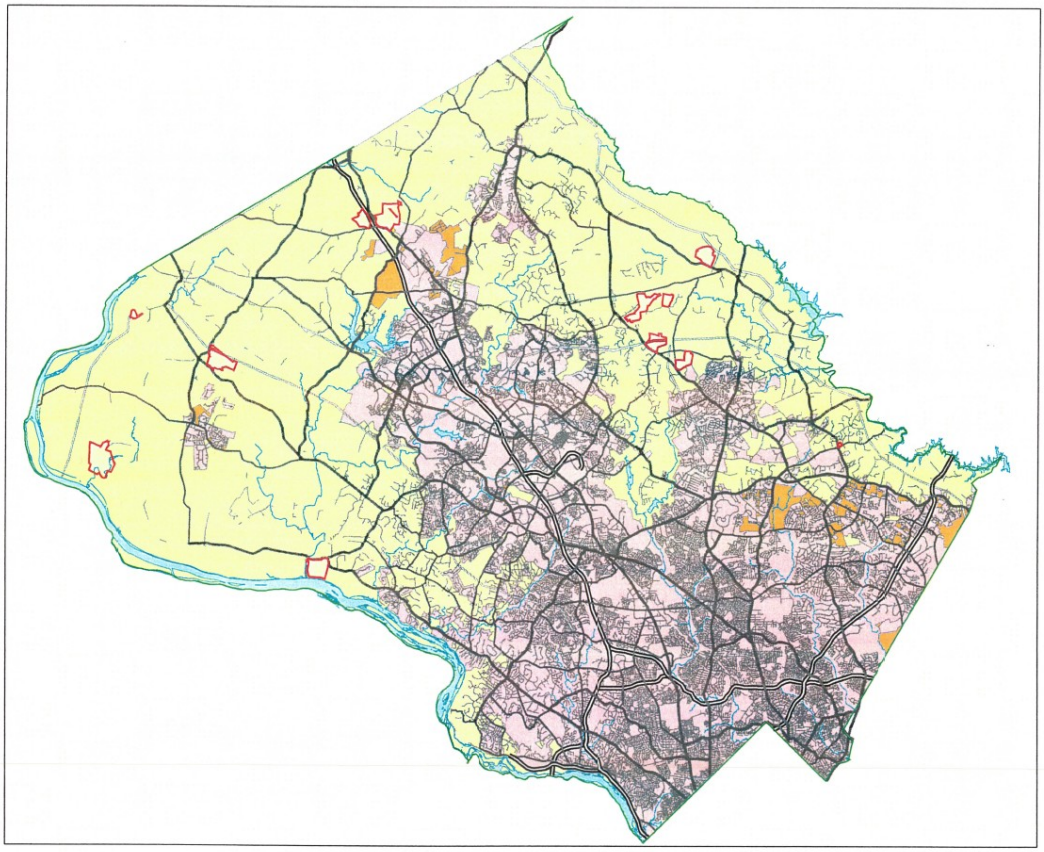
4.V.A Septic Systems Permitting -- The County's Department of Permitting Services (DPS), Well and Septic Section, is responsible for the administration and enforcement of County and State laws and regulations governing on-site, individual sewerage systems. DPS authority is delegated from MDE. Relevant regulations are included in COMAR 26.03.01, 26.03.05, and 26.04.02 -.04, and in County Executive Regulation 28-93AM,"On-Site Water Systems and On-Site Sewage Disposal Systems in Montgomery County."

DPS fulfills these responsibilities by reviewing preliminary plans and record plats for properties served by on-site systems, issuing permits for, and inspecting, the construction of new and replacement systems, and by responding to complaints concerning on-site systems. Testing a property for a new septic system involves two tests: 1) the water table test to determine the probable highest level of water-saturated soil, and 2) the percolation test to determine the speed at which fluids percolate through the soil. The percolation test may be done at almost any time of the year. The water table test can only be done the late winter through early spring when the water table is at its highest level. The duration of the water table testing period depends on overall precipitation conditions for the preceding year or years. Dry conditions, particularly prolonged droughts, can require DPS to shorten the duration of the water table testing period.

4.V.C Multi-Use Sewerage Supply Systems -- Multi-use sewerage supply systems are individual, on-site wastewater disposal systems with a capacity of 1,500 or more gallons per day. Because of their greater potential for environmental impacts, these systems require approval in the Water and Sewer Plan. These facilities are generally large-capacity septic systems, although some facilities use more advanced treatment systems. DEP coordinates the Plan approvals for these systems with DPS. Appendix B of the Water and Sewer Plan includes a listing of the multi-use sewerage facilities in Montgomery County that are approved in this Plan.

Selected Maps and Tables from the Water and Sewer Plan, Chapter 4: Sewerage Systems

Figure 4-F1: Montgomery County Sewer Service Areas



5 0 5 10 15 20 Miles

MAP LEGEND
Major Roads
County Roads
State Roads and Highways
US & Interstate Highways
Major Streams - Rivers - Lakes - Reservoirs
General Sewer Service Areas
Approved Community Sewer Service Areas (S-1 & S-3)
Proposed Community Sewer Service Areas (S-4 & S-5)
Private, On-Site Sewer Service Areas (S-6)
Approved for Multi-Use Sewerage Systems (S-6)

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Montgomery County, Maryland
2003 - 2012
Comprehensive Water Supply
and Sewerage Systems Plan

Department of Environmental Protection
Montgomery County Maryland

Watershed Management Division
6/23/03 -- GIS Project File: o:\wwteam\cwsp\2002update\chapt4\4-f1=gnrlsewercats.apr

Figure 4-F2: Community Sewerage Systems

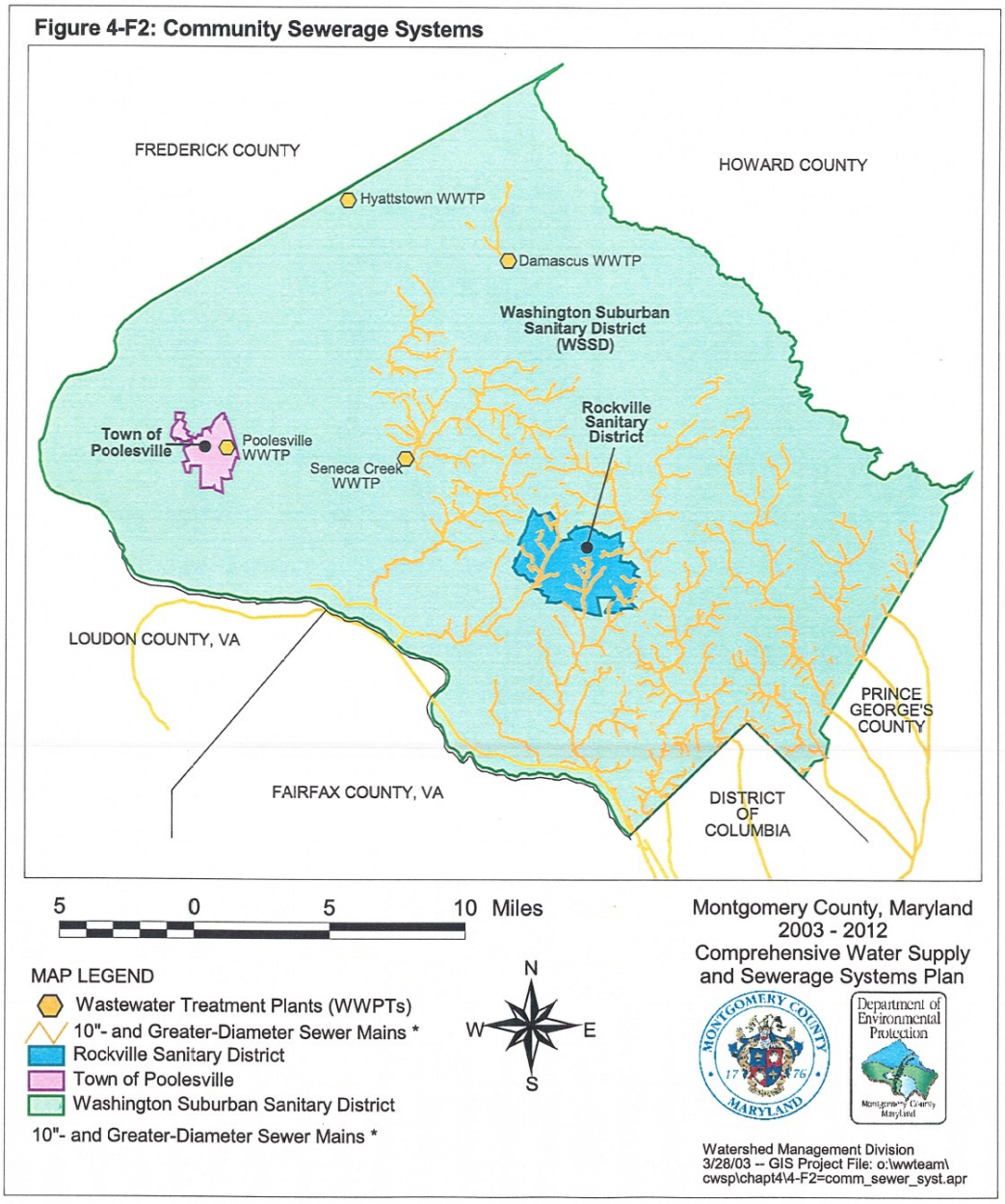


Figure 4-F3: Community Wastewater Treatment Service Areas

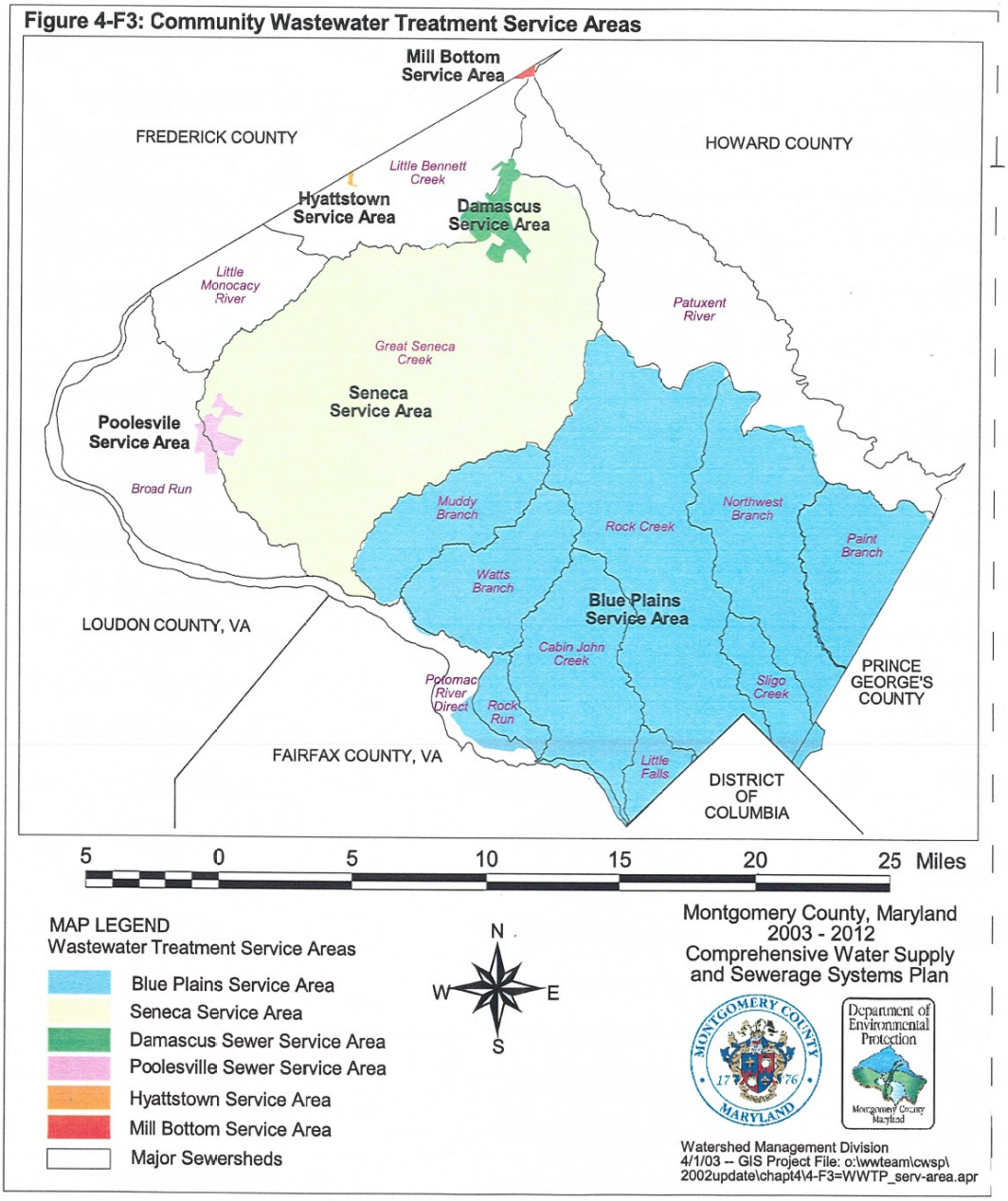


Table 4-T1: Montgomery County Sewer Service Areas

Community Sewerage Systems	Treatment Plant Service Area	Sewer Basins	Planning Areas
WASHINGTON SUBURBAN SANITARY DISTRICT	BLUE PLAINS	Muddy Branch Rock Creek Watts Branch Cabin John Creek Rock Run Little Falls Branch Sligo Creek Paint Branch Northwest Branch *Note: See Figure 4-F5 for detailed information on the relationships between sewer basins and planning areas in the Blue Plains and other treatment plant service areas.*	Aspen Hill (PA 27) Bethesda-Chevy Chase (PA 35) Cloverly - Norwood (PA 28) Colesville - White Oak (PA 33) Fairland - Beltsville (PA 34) Gaithersburg Vicinity (PA 20) Gaithersburg & Washington Grove (PA 21) Germantown (PA 19) Kemp Hill Four Corners (PA 32) Kensington - Wheaton (PA 31) North Bethesda - Garrett Park (PA 30) Olney (PA 23) Patuxent Watershed Conservation (PA 15) Potomac -Cabin John (PA 29) Rockville (PA 26) Silver Spring (PA 36) Takoma Park (PA 37) Travilah (PA 25) Upper Rock Creek Watershed (PA 22)
	SENECA	Seneca Creek*	Darnestown (PA 24) Clarksburg (PA 13) Gaithersburg Vicinity (PA 20) Gaithersburg & Washington Grove (PA 21) Germantown (PA 19)
	DAMASCUS	Portions of Seneca Creek, Patuxent, and Monocacy River	Damascus (PA 11)
	HYATTSTOWN	Monocacy River	Bennett & Little Bennett (PA 10)
	POOLESVILLE**	Portions of Seneca Creek	Poolesville (PA 17)
	MILL BOTTOM	Portions of Patuxent River and Bennett Creek	Damascus (PA 11)
ROCKVILLE SANITARY DISTRICT	BLUE PLAINS	Portions of Cabin John, Watts and Rock Creek	Rockville (PA 26)
TOWN OF POOLESVILLE	POOLESVILLE	Portions of both Seneca Creek and Potomac River	Poolesville (PA 17)

*** The Seneca Creek WWTP currently offloads and treats flows from the Blue Plains Service Area, but will be separate and independent from the Blue Plains system in 2003.**
**** The Poolesville WWTP serves the communities of Jonesville and Jerusalem in the WSSD.**

Figure 4-F4: Major Sewerage Basins (Sewersheds)

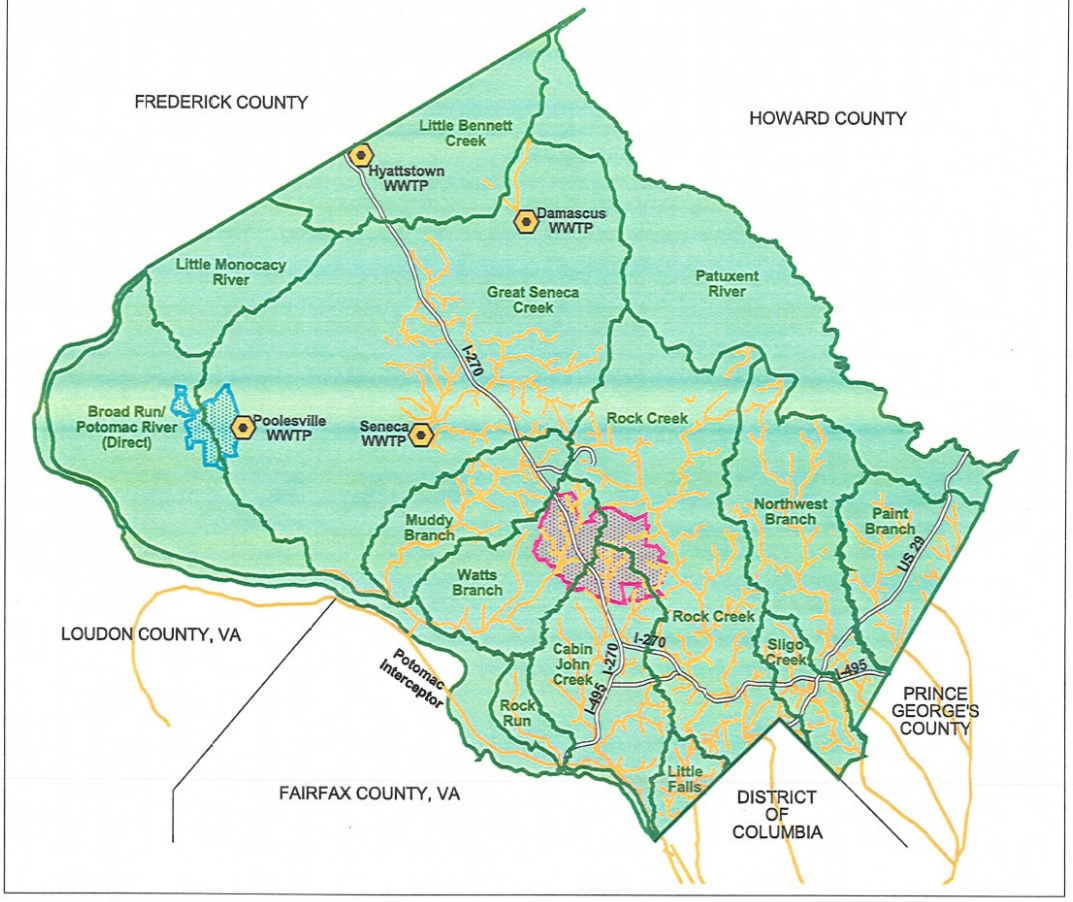
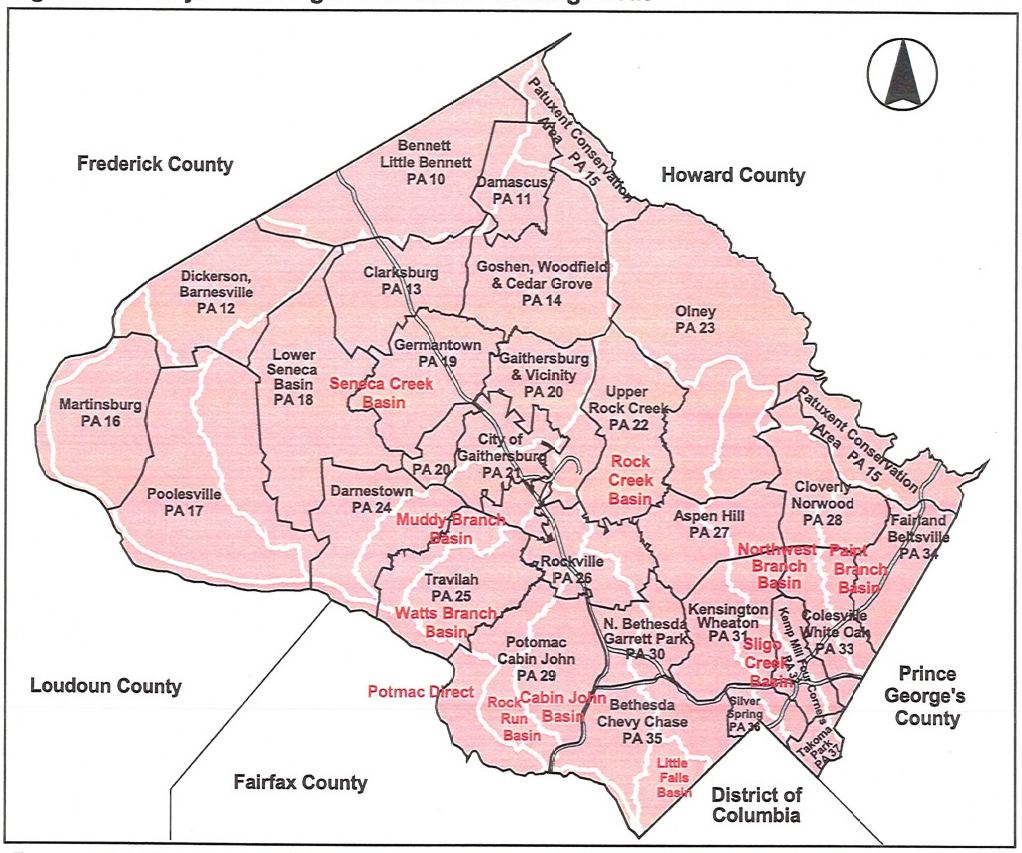


Figure 4F-5: Major Sewerage Basins and Planning Areas



MAP LEGEND

Major Sewerage Basins (Sewersheds)

M-NCPPC Planning Areas

Montgomery County, Maryland
2003 - 2012
Comprehensive Water Supply and Sewerage Systems Plan

Department of Environmental Protection
Montgomery County Maryland

MONTGOMERY COUNTY 1776 MARYLAND

Table 4-T2: Blue Plains IMA Capacity Allocations		
IMA Participants	**Blue Plains WWTP Capacity Allocations at:**	
	309 mgd	**370 mgd**
WSSC	153.3 mgd	169.6 mgd
District of Columbia	135.0 mgd	148.0 mgd
Fairfax County	16.0 mgd	31.0 mgd
Other Potomac Interceptor Users	4.7 mgd	11.4 mgd
Reserved for Potomac Interceptor Users	--	10.0 mgd*
* Approximately 5.0 mgd reserved for Loudoun County, Virginia.		

Table 4-T3: WSSC Blue Plains Capacity Allocations by Jurisdiction	
Jurisdiction	**Allocation (mgd)**
Montgomery County	77.6
Prince George's County	66.4
City of Rockville	9.3
WSSC Total	153.3

Table 4-T5: WSSC Sewerage Basin Designations and Policies		
Designation	**Description**	**Policy**
Adequate Capacity Basin	Part or all of any basin in which regular overflows and user backups have not been experienced and the observed or calculated peak sewage flow, allowing for an appropriate wet weather reserve, does not exceed the sewer operating capacity.	WSSC may permit additional sewer hookups and commitments subject to the availability of adequate treatment capacity.
Potential Overflow Basin	Part or all of any basin which has not experienced regular overflows or user backups, but for which the calculated or observed peak sewage flow, allowing for an appropriate wet weather reserve, exceeds the peak sewer operating capacity	WSSC, after consultation with the Director, should declare by resolution that it will **not** permit additional sewer hookups or commitments which would significantly increase the probability of sewer overflows or user backups until a facility plan is initiated or relief measures are under construction. The WSSC may continue to permit additional sewer hookups or commitments which would result in peak sewer operating capacity being exceeded if the calculated peak sewage flow will not result in an increased significant probability of overflows or user backups prior to completion of a relief project. The identical exemptions defined for immediate public health hazards, public service buildings, and individually-owned abutting lots in the policy for Existing Overflow Basins below also apply to this policy for Potential Overflow Basins.
Existing Overflow Basin	Part or all of any basin which is experiencing regular sewage overflows or user backups such that an immediate public health problem exists. "Regular" is defined as having already occurred and projected to occur more than once in ten years, other than maintenance-related occurrences.	WSSC, after consultation with the Director, should declare by resolution that it will **not** permit additional sewer hookups or commitments which would increase the frequency of overflows or user backups until relief measures are underway with a projected completion date of a year or less. Exemptions: public service buildings approved by the Director, and existing unconnected buildings creating immediate public health hazards as determined by the WSSC or the Director are exempt from any sewer hookup or commitment prohibition. Lots serving existing or proposed individually-owned single-family dwelling units abutting an existing sewer line and which the applicant owned or contracted for prior to the date of the moratorium resolution are exempt from any sewer hookup or commitment prohibition.

Figure 4-F6: Blue Plains Regional Boundaries

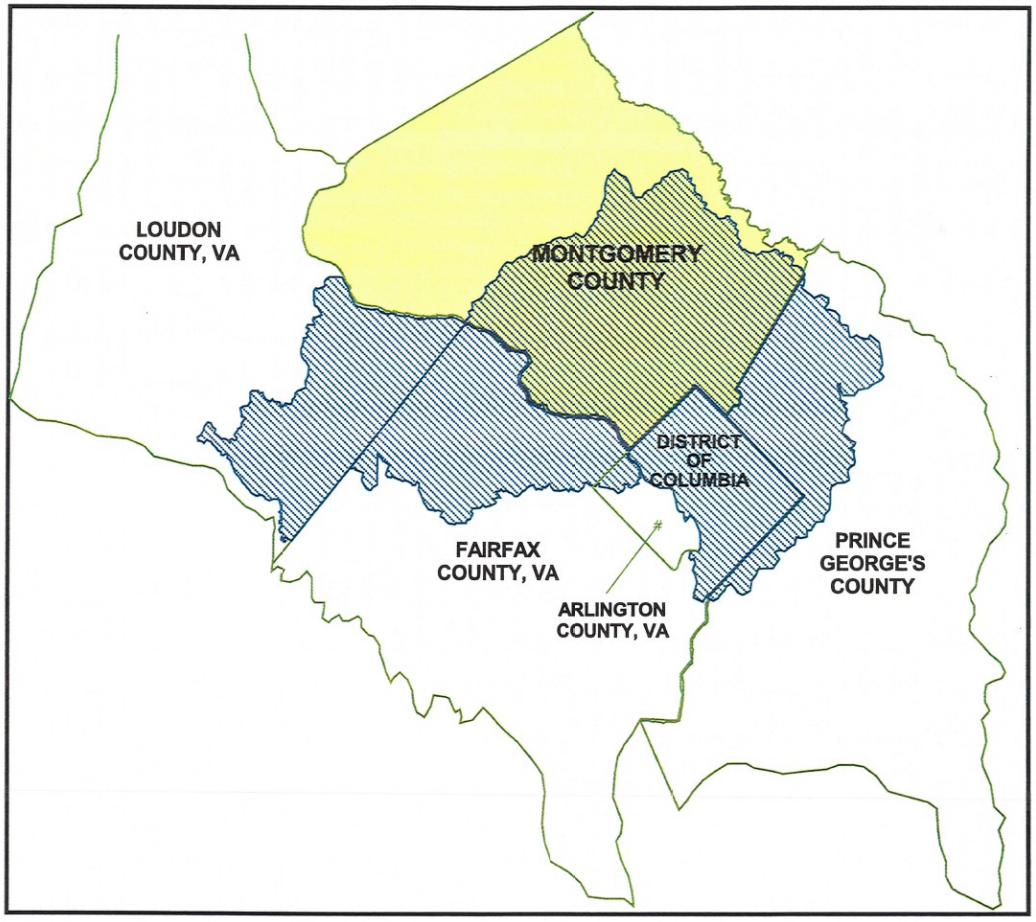


Figure 4-F7: Blue Plains Service Area in Montgomery County

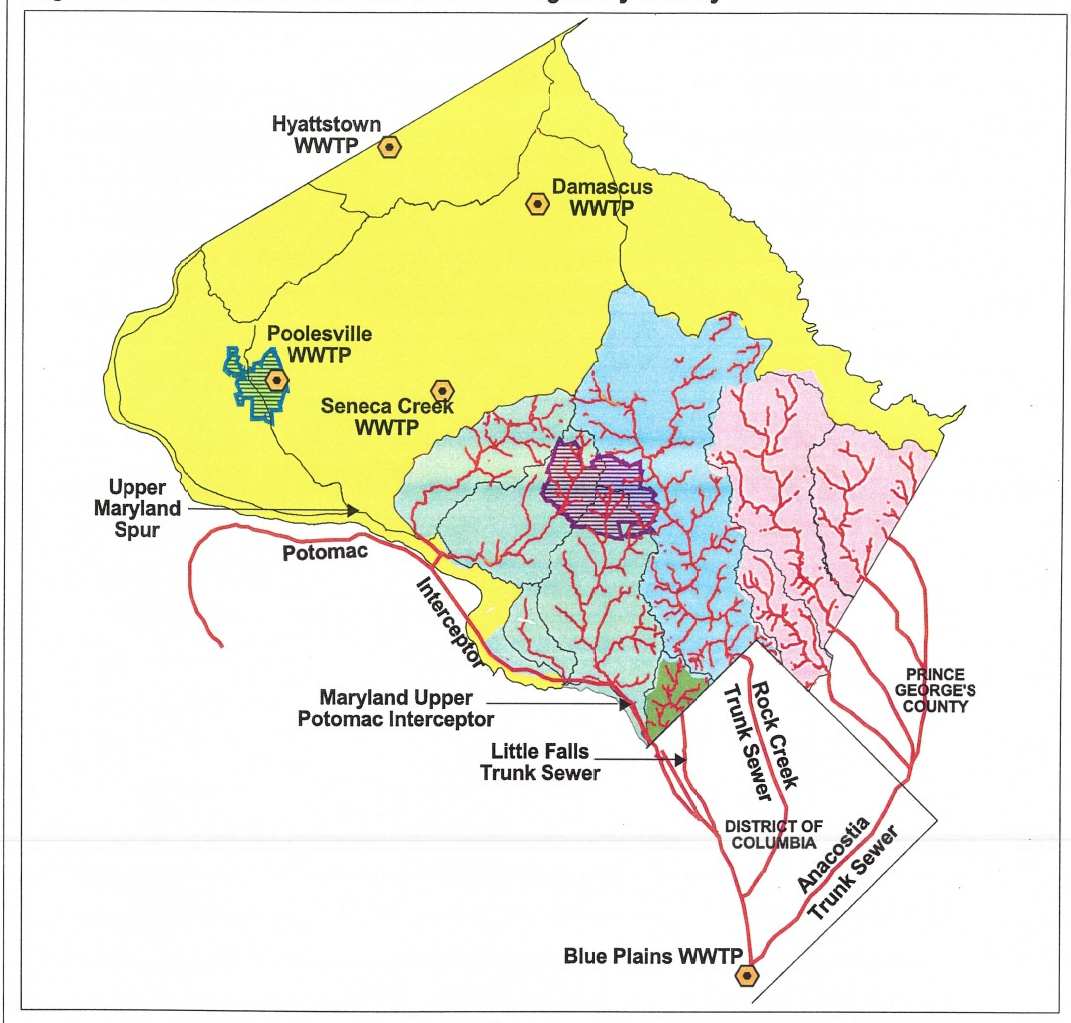


Table 4-T6: Average Basin Flows and IMA Limitations for the Montgomery County Portion of the Blue Plains Service Area

Sewer Basin	Receiving Interceptor	IMA Limit (mgd)	
		Annual Average	Peak
Muddy Branch*	PI	15.5	40.3
Cabin John	MUPI & PI	11.0	48.3
Rock Run	PI	0.9	3.7
Watts Branch	PI	4.5	14.2
Little Falls	UPI	7.6	20.8
Rock Creek	RCTS	33.5	56.6
Other Basins**	Anacostia & PI	NA	NA
Total to Blue Plains WWTP		NA	**NA**

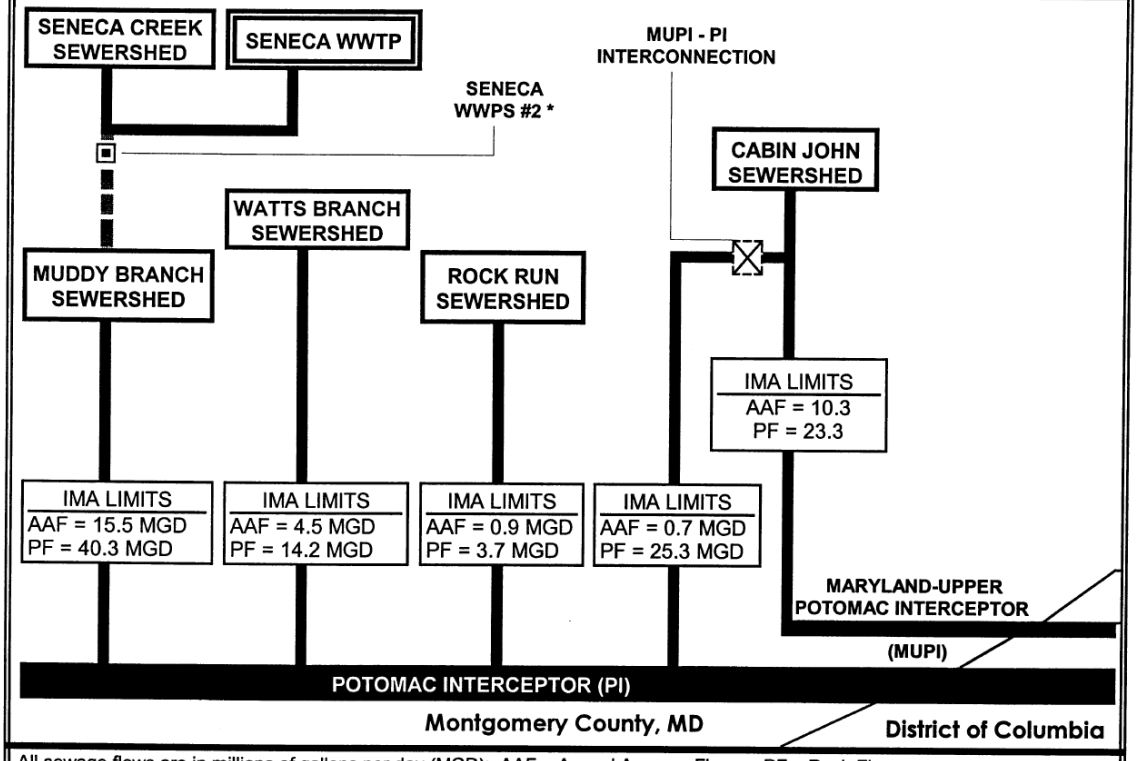
* Current flows to Blue Plains from Muddy Branch includes flows from the Seneca Basin. This will discontinue in mid-2003 after the Seneca WWTP expansion is completed.

** Other Basins include flows from Anacostia and direct connections to the Potomac Interceptor.

- All data include flows from the City of Rockville.
- Anacostia is a Bi-County Basin and capacity is available to both Counties on first come-first served basis. Flows from Montgomery County to the Anacostia Trunk Sewer are from the Northwest Branch, the Paint Branch, and the Sligo Creek sewer basins.

PI = Potomac Interceptor MUPI = Maryland Upper Potomac Interceptor
RCTS = Rock Creek Trunk Sewers NA = Not Analyzed or Not Applicable

Figure 4-F8: Montgomery County Sewage Flow to the Potomac Interceptor



All sewage flows are in millions of gallons per day (MGD): AAF = Annual Average Flow PF = Peak Flow
* The majority of pumpover of flows from the Seneca sewershed into PI via the Muddy Branch sewershed will cease in mid-2003 on the completion of the Seneca WWTP expansion. Pumped flows from the Lower Seneca Basin will continue until a new trunk sewer connecting that basin with the Seneca WWTP is completed in Spring 2006.

Table 4-T14: Community Wastewater Treatment Facilities in Montgomery County

• Facility Name & Owner/Operating Agency • Facility Location • Facility Coordinates	Type of Treatment	• Point of Discharge • Permit No.	Design Capacity (mgd)	Comments/Status
SENECA SERVICE AREA FACILITIES				
Seneca WWTP -- WSSC Great Seneca Highway - Germantown N475,200/E721,900	Activated Sludge	Great Seneca Creek 91-DP-0156	5.0	Expansion to 20 MGD by Summer 2003; until then, the plant treats flows offloaded from the Blue Plains WWTP service area. Ultimate design capacity is 26.0 MGD.
DAMASCUS, HYATTSTOWN, AND POOLESVILLE SERVICE AREA FACILITIES				
Damascus WWTP -- WSSC Log House Road - Damascus N514,500/E741,500	Activated Sludge	Magruder Branch 93-DP-0162	1.5	
Hyattstown WWTP -- WSSC Routes 355 & 109 - Hyattstown N527,000/E710,500	Physical/Bio-logical	Little Bennett Creek 96-DP-3200	0.015	
Poolesville WWTP -- Town of Poolesville Fisher Avenue - Poolesville N476,250/E688,100	Sequencing Batch reactor	Dry Seneca Creek 95-DP-0781	0.625	MDE issued draft permit for process upgrade and expansion to 0.75 MGD.

Figure 4-F18: 2001 Daily Average Wastewater Treated in Montgomery County

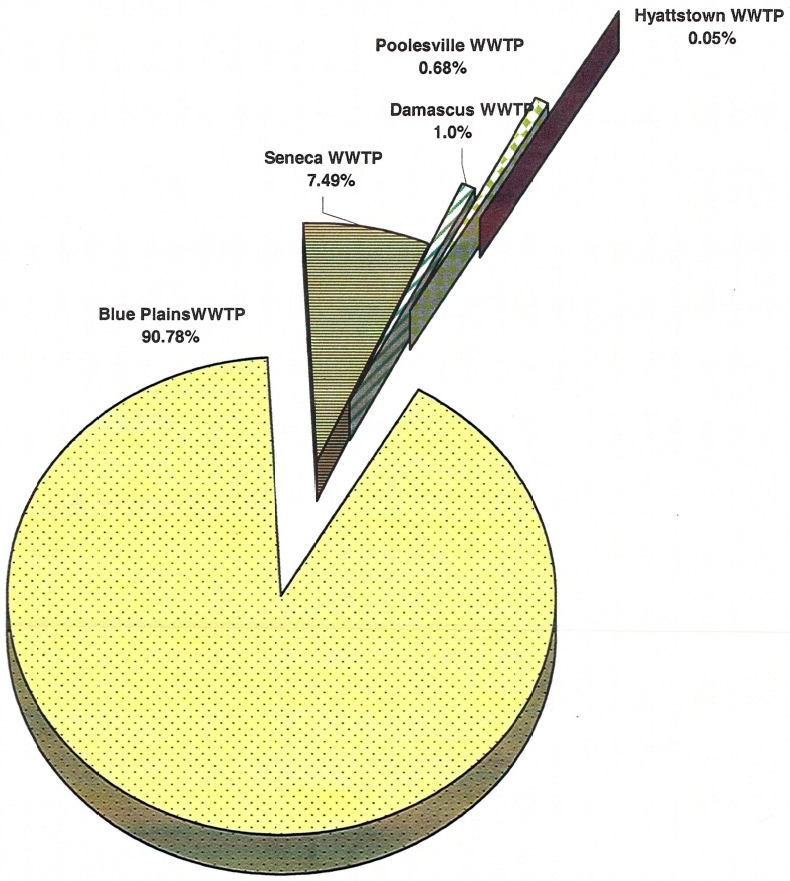
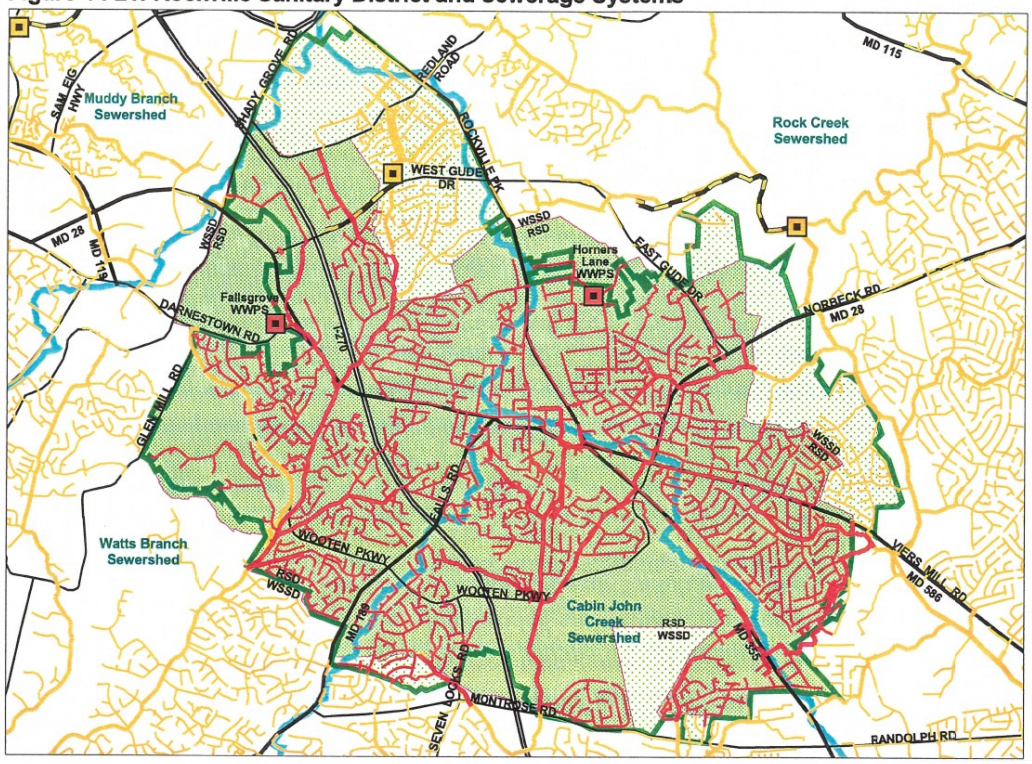


Table 4-T17: Projected Flows and Available Treatment Capacity in the Blue Plains Service Area[1]			
Sewer Basin	Projected Flows (mgd)		
	2005	2010	2015
Anacostia [6]	60.39	62.02	63.73
Cabin John [2]	11.92	12.24	12.6
Little Falls	4.27	4.48	4.56
Muddy Branch	5.69	6.37	6.92
Rock Creek [2]	30.4	31.39	32.06
Rock Run	0.97	1.0	1.03
Watts Branch [2]	4.87	5.53	5.76
Other Montgomery County Flows [5]	0.44	0.44	0.45
Flows from Prince George's County [4]	8.06	8.26	8.47
TOTAL	**127.01 [3]**	**131.73 [3]**	**135.58 [3]**
Blue Plains WWTP	**Treatment Capacity (mgd)**		
	169.6	169.6	169.6
	Available Capacity (mgd)		
	42.59	**37.87**	**34.02**

1 Data are based on latest (2002) WSSC projections.
2 Projected flows in Rock Creek, Cabin John and Watts Branch include flows from Rockville.
3 The allocated capacity to WSSC includes 9.3 mgd for the City of Rockville.
4 Other flows from Prince George's County include flows from Oxon Run, Piney Branch and Watts Branch.
5 For flows from smaller basins directly connected to the Potomac Interceptor.
6 Anacostia flows include flows from the Prince George's County.

Figure 4-F21: Rockville Sanitary District and Sewerage Systems



1 0 1 2 3 4 Miles

MAP LEGEND

Rockville Sewer Mains
- 8-Inch or Smaller Diameter
- 10-Inch or Greater Diameter
- Wastewater Pumping Stations

WSSC Sewer Mains
- 8-Inch or Smaller Diameter
- 10-Inch or Greater Diameter
- Wastewater Pumping Stations
- Sewer Force Mains
- Sewersheds

Major Roads
- County Roads
- State Roads and Highways
- US & Interstate Highways

- City of Rockville Corporate Limits
- Rockville Sanitary District (RSD)

N W E S

Montgomery County, Maryland
2003 - 2012
Comprehensive Water Supply and Sewerage Systems Plan

Department of Environmental Protection
Montgomery County Maryland

Watershed Management Division
4/11/03 -- GIS Project File: o:\wwteam\cwsp\2002update\ch4\4-f21=rockville_sewers.apr

Table 4-T19: Projected Wastewater Flows from the City of Rockville and WSSC-Rockville Flow Limitations.

YEAR		Cabin John Basin		Rock Creek Basin		Watts Branch Basin	
		Average (MGD)	Peak (MGD)	Average (MGD)	Peak (MGD)	Average (MGD)	Peak (MGD)
2005	Projected Flow	2.21	6.21	2.3	6.84	2.32	6.62
	WSSC-Rockville Flow Limitation	n/a	6.8*	n/a	9.84	n/a	8.0
	Balance	n/a	0.59	n/a	3.00	n/a	1.38
2010	Projected Flow	2.25	6.28	2.16	7.09	2.42	7.2
	WSSC-Rockville Flow Limitation	n/a	6.8*	n/a	9.84	n/a	8.0
	Balance	n/a	0.52	n/a	2.75	n/a	0.8
2015	Projected Flow	2.28	6.37	2.35	7.12	2.64	7.23
	WSSC-Rockville Flow Limitation	n/a	6.8*	n/a	9.84	n/a	8.0
	Balance	n/a	0.43	n/a	2.72	n/a	0.77

n/a: The agreements between the City and WSSC only specify peak sewage flow limitations for each sewer basin; the average flows limitation is for the City as a whole, not for each basin.
* The City's allowed peak flow downstream of Booze Creek is 8.0 MGD.

Figure 4-F22: Poolesville Community Sewerage Systems

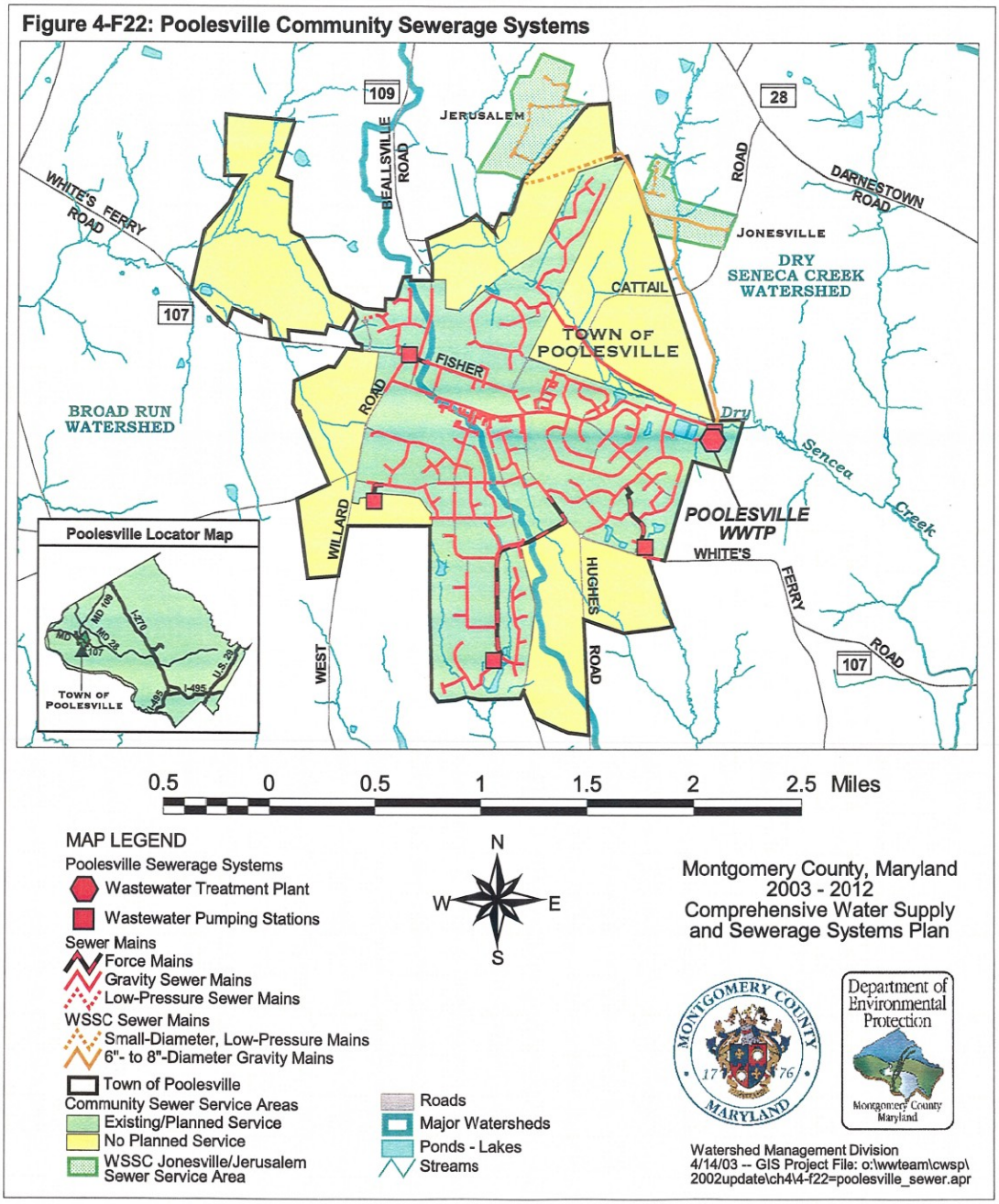
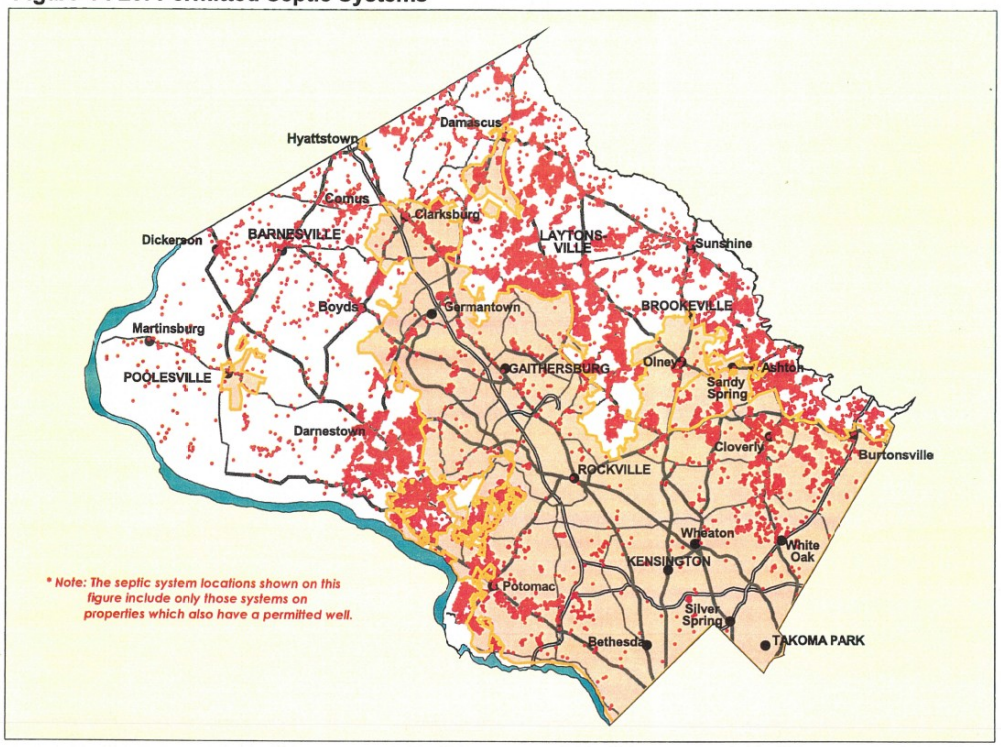


Figure 4-F23: Permitted Septic Systems



5 0 5 10 15 20 Miles

MAP LEGEND

- Septic System Locations *
- Communities

Major Roads

- County Roads
- State Roads and Highways
- US & Interstate Highways
- General Community Sewer Envelope

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Montgomery County, Maryland
2003 - 2012
Comprehensive Water Supply and Sewerage Systems Plan

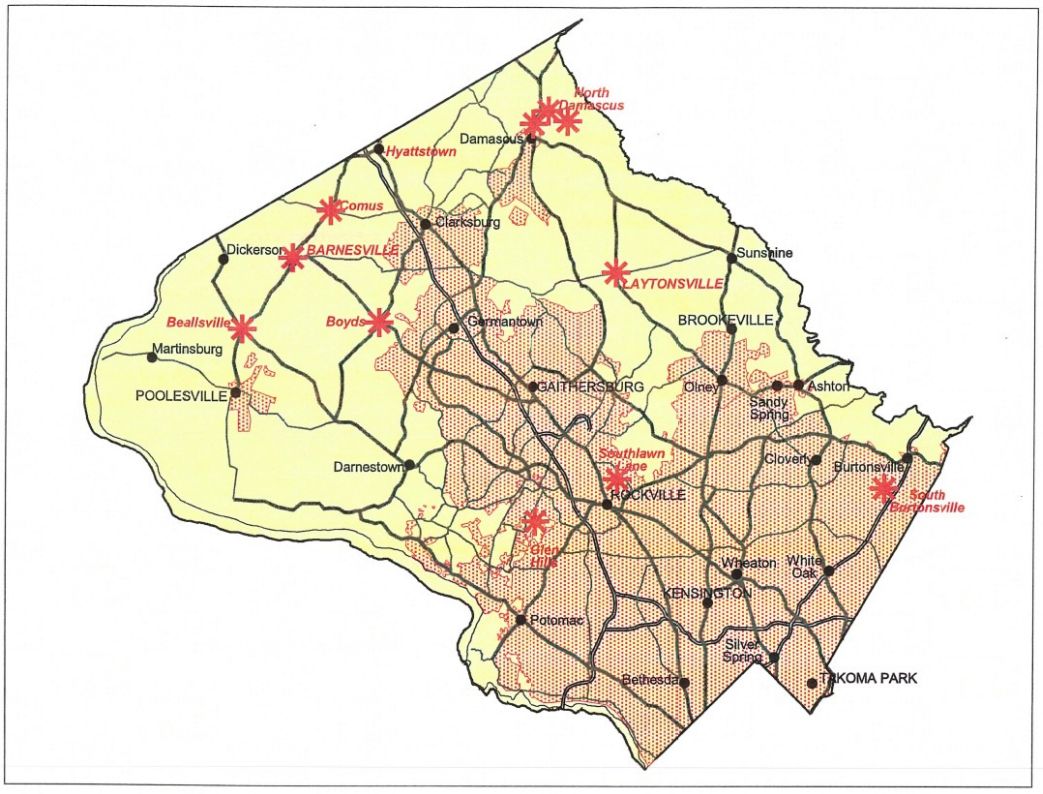
Department of Environmental Protection
Montgomery County Maryland

Watershed Management Division
5/28/04 -- GIS Project File: o:\wwteam\cwsp\2002update\chapt4\4-f23=septicsystems-final.apr

Table 4-T20: Septic Problem Areas			
Location	**Problem**	**Potential Solutions**	**Recommendations/Actions Taken**
Town of Boyds	▪ failing septic systems, some on relatively small lots	DPS recommends: ▪ community sewer service	This will require further investigation by DEP and DPS. Sewer extension issues to this part of the county could have dramatic effects on development demand.
Hyattstown	▪ failing septic systems, most on relatively small lots	▪ community sewer service ▪ innovative/alternative (I/A) systems for properties outside the sewer envelope	Provided sewer service to replace failing septic systems.
Town of Laytonsville	polluted aquifer (hydrocarbons and nitrates)	▪ community water service ▪ individual GAC filters ▪ handle old wells properly	The County and WSSC are investigating the extension of community water service to the town and nearby properties. (See Section II.F.2.b.iii.)
South Burtonsville: Miles Rd., Duvall Rd., Tolson Pl., and Maple Hill Rd.	failing septic systems	▪ community sewer service	DEP continues to approve sewer category change requests within this area. The pending development of a new residential subdivision along Miles Rd. will bring additional sewer mains into the area, expanding the availability of service.
Damascus: Gue rd., Howard Chapel Dr., Ridge Rd. and adjacent areas	failing septic systems - unable to repair	DPS recommends: ▪ community sewer service	Because of the implications of providing sewer service to these areas, they should be studied as part of the upcoming Damascus Master Plan revision.

Table 4-T20: Septic Problem Areas			
Location	**Problem**	**Potential Solutions**	**Recommendations/Actions Taken**
Glen Hills - southwest side of Rockville	failing septic systems, poor soils	▪ community sewer service ▪ innovative/alternative on-site systems	The 2002 Potomac Subregion Master Plan calls for a comprehensive sanitary study of Glen Hills prior to the further extension of sewer mains into the area. The earliest DEP and DPS could undertake such a study is summer 2003.
Southlawn La. - Northeast side of Rockville	failing septic systems, poor soils	DPW and County DPS recommend community sewer service	Rockville is initiating a water and sewer feasibility study. The study will identify alternative locations for community water and sewer extension and recommend a specific project. Rockville will pursue main extensions via the special assessment process in 2004.
Rural communities - Barnesville, Comus (Slidell Rd.), and Beallsville	failing septic systems - unable to repair	DPS recommends: ▪ community sewer service ▪ innovative/alternative on-site systems	These communities are beyond the reach of the County's existing and proposed community sewerage systems. Solutions for these problems may require a Hyattstown-type approach or different concepts such as community-based septic systems.

Figure 4-F24: Septic System Problem Areas



5 0 5 10 15 20 Miles

MAP LEGEND

- ***Septic System Problem Areas****
- INCORPORATED COMMUNITIES
- Unincorporated Communities

Major Roads

- County Roads
- State Roads and Highways
- US & Interstate Highways
- General Community Sewer Service Envelope

* For additional information, refer to Table 4-T20.
Source: DPS Well and Septic Section

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Montgomery County, Maryland
2003 - 2012
Comprehensive Water Supply and Sewerage Systems Plan

Department of Environmental Protection
Montgomery County Maryland

Watershed Management Division
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For more detailed information on wastewater treatment systems, see Chapter 4 of the Water and Sewer Plan.