

AGENDA ITEM #26  
June 22, 2010

**Public Hearing**

**M E M O R A N D U M**

June 18, 2010

TO: County Council  
FROM:  Keith Levchenko, Senior Legislative Analyst  
SUBJECT: **Public Hearing:** Water Resources Functional Plan

On June 22, the Council will hold a public hearing on the Planning Board's draft Water Resources Functional Plan. This draft plan was transmitted to the Council and Executive on May 5, 2010. The transmittal letter and draft plan (without appendices) are attached on ©A-56.<sup>1</sup>

In 2006, the State General Assembly adopted House Bill 1141 that requires a Water Resources Element to be incorporated into local governments' comprehensive plans addressing the effect of planned growth to 2030 on:

- drinking water supply adequacy,
- wastewater treatment capacity, and
- maintaining water quality standards.

The policies and recommendations of the Water Resources Functional Plan will guide revisions and amendments to future master, sector, and functional plans. The Functional Plan will also provide guidance for the Ten-Year Comprehensive Water Supply and Sewerage Systems Plan and county water quality-related programs and plans.

A Transportation, Infrastructure, Energy & Environment Committee worksession is scheduled for June 24 at 9:00 AM.

attachments

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<sup>1</sup> Copies of the draft plan and appendices are available to the public at the Maryland-National Park and Planning Commission's Montgomery Regional Office Building at 8787 Georgia Avenue, Silver Spring, Maryland. Reference copies are also available at local public libraries. The plan is also available for viewing and download at: <http://www.montgomeryplanning.org/environment/>



**MONTGOMERY COUNTY PLANNING BOARD**  
THE MARYLAND-NATIONAL CAPITAL PARK AND PLANNING COMMISSION

**OFFICE OF THE CHAIRMAN**

November 16, 2009

The Honorable Phil Andrews  
President  
Montgomery County Council  
100 Maryland Avenue  
Rockville, Maryland 20850

Dear Mr. Andrews:

I am pleased to send you copies of the Public Hearing Draft Water Resources Functional Plan. This Plan examines County land use, growth, and stormwater management in the context of adequate drinking water supplies, wastewater treatment capacity, water quality regulations, and inter-jurisdictional commitments.

In 2006, the State General Assembly adopted House Bill 1141 that requires a Water Resources Element to be incorporated into local governments' comprehensive plans addressing the effect of planned growth to 2030 on:

- drinking water supply adequacy,
- wastewater treatment capacity, and
- maintaining water quality standards.

The purpose of the State law is to ensure that water supply, wastewater treatment, and water quality are sufficient to serve planned growth and to help us meet the goals of the Clean Water Act and the Chesapeake Bay agreements to protect and improve water quality. The Plan will amend the General Plan as well as all approved and adopted master, sector, and functional plans. Moreover, the policies and recommendations of the Water Resources Functional Plan will guide revisions and amendments to future master plans and provide guidance for the Ten-Year Comprehensive Water Supply and Sewerage Systems Plan and County water quality-related programs and plans.

Although this Plan satisfies the immediate HB1141 requirements, realizing the long-term goals of the State law and this Plan will require ongoing interagency cooperation, collaboration, and creativity as the water quality needs and regulatory requirements continue to increase. The need for interagency coordination is particularly important not only in view of the complexities of the issues, but also because of the wide distribution of water resource-related programs and responsibilities in many agencies. There is an urgent need to carry the work of the County's earlier Clean Water Task Force to address this needed collaboration to address the long-range issues and goals. This will affect our work program for many years.

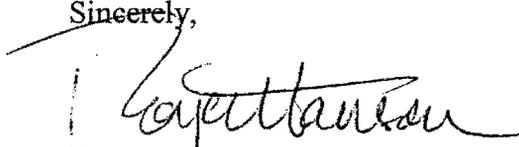


Honorable Phil Andrews  
November 16, 2009  
Page 2

The Planning Board's public hearing will be held Thursday evening, December 17, 2009, at 7:30 p.m., in the first floor auditorium at 8787 Georgia Avenue in Silver Spring. A copy of the public hearing draft plan is enclosed. Copies of the Plan can also be viewed on line at: <http://www.montgomeryplanning.org/environment>

The Planning Board and its staff look forward to working with you and your staff as the Plan proceeds.

Sincerely,



Royce Hanson  
Chairman

RH:ms:tc

Enclosure

PLANNING BOARD DRAFT

MAY 2010

# water resources

FUNCTIONAL PLAN



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

[MontgomeryPlanning.org](http://MontgomeryPlanning.org)

## **water resources**

### Functional Plan

#### **abstract**

This report contains the text of the Planning Board Draft of the *Water Resources Functional Plan (WRFP)*. It amends all County master and sector plans, and *The General Plan (On Wedges and Corridors) for the Physical Development of the Maryland-Washington Regional District in Montgomery and Prince George's Counties*, as amended.

The Plan provides information on County water and sewer service capacity in light of planned growth to 2030, summarizes an estimate of nutrient loadings on watersheds for existing and future conditions, and identifies the policies and recommendations to amend the General Plan that are needed to maintain adequate drinking water supply and wastewater treatment capacity to 2030, and meet water quality regulatory requirements as the County continues to grow. It is meant to satisfy the requirements of House Bill 1141.

#### **source of copies**

The Maryland-National Capital Park and Planning Commission  
8787 Georgia Avenue  
Silver Spring, MD 20910-3760

This report plus an appendix of supporting documents online at [MontgomeryPlanning.org/environment](http://MontgomeryPlanning.org/environment)

#### **The Maryland-National Capital Park and Planning Commission**

The Maryland-National Capital Park and Planning Commission is a bi-county agency created by the General Assembly of Maryland in 1927. The Commission's geographic authority extends to the great majority of Montgomery and Prince George's Counties; the Maryland-Washington Regional District (M-NCPPC planning jurisdiction) comprises 1,001 square miles, while the Metropolitan District (parks) comprises 919 square miles, in the two counties.

The Commission is charged with preparing, adopting, and amending or extending *The General Plan (On Wedges and Corridors) for the Physical Development of the Maryland-Washington Regional District in Montgomery and Prince George's Counties*.

The Commission operates in each county through Planning Boards appointed by the county government. The Boards are responsible for all local plans, zoning amendments, subdivision regulations, and administration of parks.

The Maryland-National Capital Park and Planning Commission encourages the involvement and participation of individuals with disabilities, and its facilities are accessible. For assistance with special needs (e.g., large print materials, listening devices, sign language interpretation, etc.), please contact the Community Outreach and Media Relations Division, 301-495-4600 or TDD 301-495-1331.

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Many agencies contributed to this Plan. The Washington Suburban Sanitary Commission (WSSC), and the County's Departments of Environmental Protection (DEP), Permitting Services (DPS), Transportation (DOT), Economic Development (DED), and General Services (DGS) all provided information and guidance in developing the Plan's policies and recommendations. Their assistance is gratefully acknowledged.

Photos on the cover (lower left) and on pages 7, 10, and 29 are courtesy of National Oceanic and Atmospheric Administration/Department of Commerce.

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## introduction

Montgomery County residents enjoy a plentiful, clean water supply fed by well-managed reservoirs, filtration plants, and groundwater. Water quality is afforded a significant level of protection by a large amount of undeveloped land—almost half of the County’s land is preserved in parks and the Agricultural Reserve—and high-quality wastewater treatment.

Yet, in the past few decades, low density suburban development and increasing impervious surfaces such as large surface parking lots have affected our water resources. Monitoring shows that water quality is degrading, especially in older, developed areas with little or no stormwater management. Moreover, Montgomery County continues to attract new residents, and growth poses additional challenges for water quality. As well, the County’s water and sewer distribution and collection infrastructure is aging, and will continue to need maintenance and replacement to minimize the impacts that pipe failures have on our water resources.

In response, we need to reconsider how the County grows. Planners and environmental regulators are defining new “greener” ways to develop and manage stormwater centering on encouraging infill and redevelopment, designing all new developments with new environmental standards, and stormwater retrofitting of older developments.

The challenge is to ensure that smarter growth helps us maintain and restore our streams and reservoirs as the County continues to grow.

This Water Resources Plan examines County land use, growth, and stormwater management in the context of adequate drinking water supplies, wastewater treatment capacity, water quality regulatory requirements, and inter-jurisdictional commitments.

In 2006, the State General Assembly adopted House Bill 1141 that requires a Water Resources Element to be incorporated into local governments’ comprehensive plans to address:

- drinking water supply adequacy
- wastewater treatment capacity
- meeting water quality standards to 2030.

This Water Resources Functional Master Plan fulfills the law’s requirements and will be updated every six years to incorporate advances in meeting its goal—to ensure adequate water supply, wastewater treatment capacity, and water quality that meets regulatory standards as the County continues to develop.

### Water in Montgomery County

Water resources are a vital part of the County’s environmental and economic health and sustainability. Our streams and reservoirs provide the water we drink and a recreational resource. They are also the life blood of our natural areas, providing crucial habitats, accommodating runoff from a range of land uses, and supporting the great diversity of plants and animals found in the County. Our waters also feed a larger network of water resources that culminate in the Chesapeake Bay—the importance and value of which, as both a regional and national environmental resource—are well known.

The State of Maryland and Montgomery County have long considered protection of the Chesapeake Bay and its tributaries, including our local streams, to be a high priority. Protection of land and water resources and stewardship of the Chesapeake Bay are put forth in the Planning Visions Act of 2009 that guides local comprehensive planning throughout the State.



But past efforts have not been enough. Today we stand at a critical time in the history of our County and the state of our water resources. The continued degradation of the Bay and many of our local streams will require increased funding and efforts to grow smarter and enhance and protect our natural resources, in order to meet water quality standards.

Continued threats to the County's water resources involve both effects from past practices as well as the consequences of existing and anticipated future trends. These include:

- the stormwater impacts from older development
- impacts from development of remaining open land
- increasing air pollution
- competing priorities for limited funds
- our aging water and sewer pipe infrastructure
- the loss and degradation of forest, wetland, and other natural areas.

These issues, especially as they relate to impaired water bodies identified by the State for specific pollutant limitations such as bacteria, trash, nutrients, and sediment, will be the highest priority issues to address as we move forward.

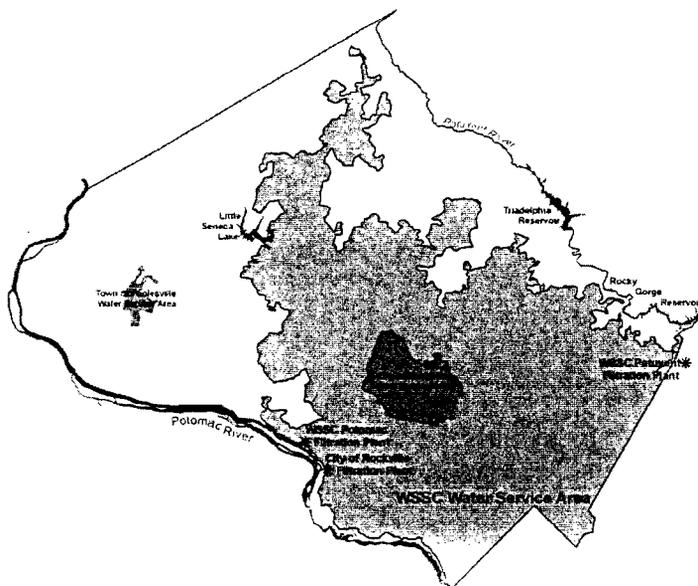
By addressing all aspects of water resources management, this Plan provides a basis for prioritizing and coordinating the shared responsibilities and efforts of County agencies, municipalities, and citizens to produce optimal environmental benefits. Comprehensive sustainability planning is important to address the interconnectedness of all that we do to and on the land.

The policies, programs, and plans that address water quality include:

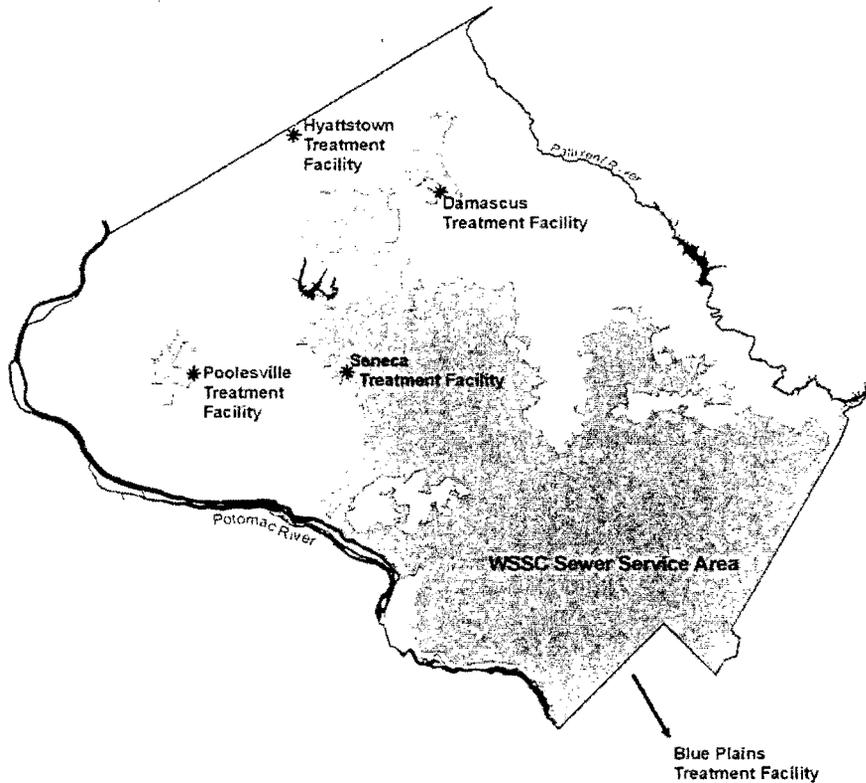
- the County's stormwater discharge (MS-4) permit and implementation plans
- future Total Maximum Daily Load (TMDL) implementation plans for non-point source pollution
- functional, master, and sector plans
- County Growth Policy
- the County's *Ten-Year Comprehensive Water Supply and Sewerage Systems Plan*
- regulatory/code review and changes
- integrating stormwater management and sediment control/erosion into development review
- natural resources management.

Many of these are currently being prepared or revised. This Plan is just one component of an interagency approach to dealing with water resources and water quality issues.

#### map 1 water service areas and facilities



## map 2 sewer service areas and facilities



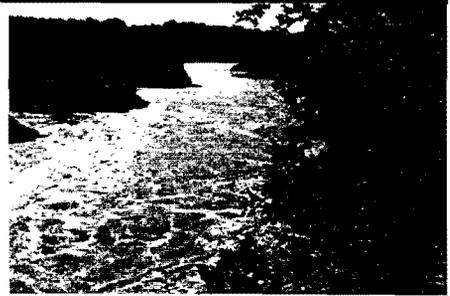
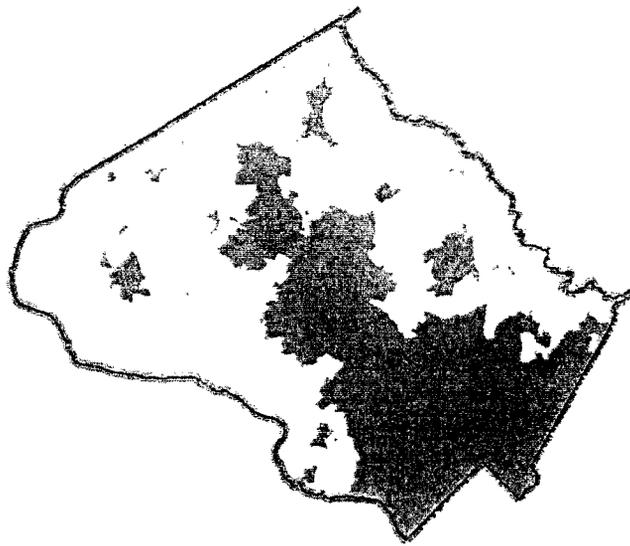
*Treatment facilities and service areas in Montgomery County*

In Montgomery County, water supply is plentiful and generally well-managed. Public water and sewer is provided to most of the County's population within the Priority Funding Areas (Map 3). Drinking water comes from three sources: the Patuxent reservoirs, the Potomac River, and well water (Map 1). These resources are afforded significant protection by the large amount of low-density zoned land in the Agricultural Reserve, as well as the natural areas throughout the County. Wastewater is collected and treated primarily at the Blue Plains treatment plant in the District of Columbia and at four smaller treatment facilities in Germantown, Damascus, Hyattstown, and Poolesville (Map 2). These facilities operate at very high standards, applying advanced treatment before discharging to streams and rivers.

Stormwater management is a much more difficult issue, especially in the built-up areas of the County. Many down-County communities developed before stormwater management policies were in place and stream conditions are generally fair or poor. Even the streams in areas with newer, higher density development in the Priority Funding Area often show impairments, although new stormwater regulations promise better results. Providing treatment sufficient to prevent degradation of stream conditions in areas of high imperviousness remains a challenge.

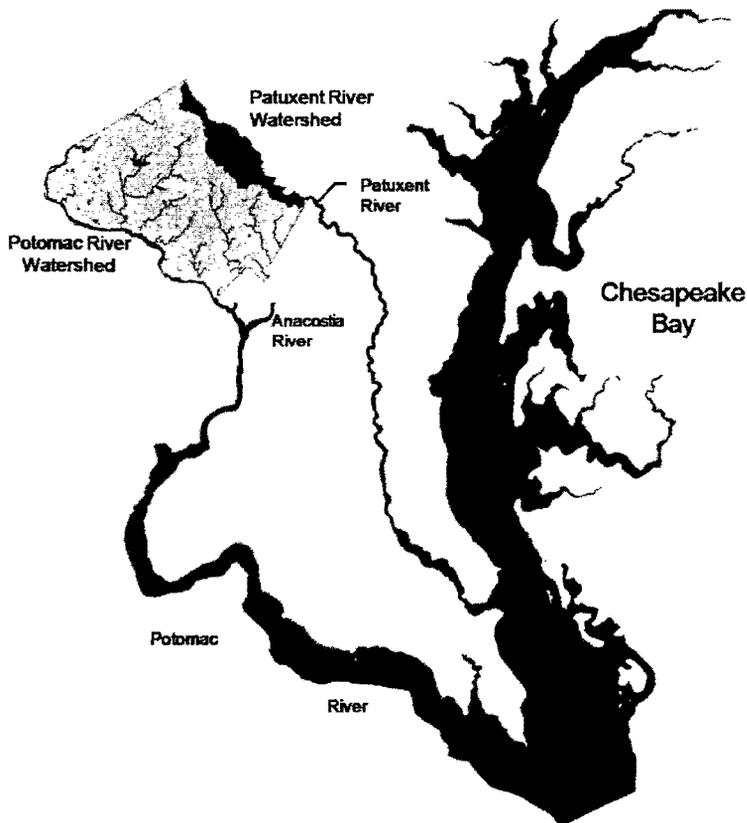
The County's principal watersheds, the Potomac and Patuxent Rivers, make it part of the regional drainage system that ultimately drains to the Chesapeake Bay. How we live on the land affects the health of local streams, as well as downstream water resources (Map 4).

map 3 priority funding areas



----- County Boundary  
▨ Priority Funding Areas

map 4 county watersheds and the chesapeake bay



This Plan explains the planning process for maintaining the capacity to provide drinking water, wastewater treatment, and absorption of stormwater to accommodate growth to 2030 and the challenges we face in achieving the goals of federal, State, and local governments.

The Water Resources Functional Plan was developed in coordination with the local government agencies that share responsibility for water resources. Their staffs' expertise was instrumental in providing technical information and support in drafting the Plan's policies and recommendations. The Plan's purpose and scope was presented to stakeholder groups, which were also provided updates on the Plan's progress and proposed policies and recommendations (Appendix 9).

#### **Agencies**

DED	Department of Economic Development
DEP	Department of Environmental Protection
DGS	Department of General Services
DOT	Department of Transportation
DPS	Department of Permitting Services
EPA	Environmental Protection Agency
ICPRB	Interstate Commission on the Potomac River Basin
MDE	Maryland Department of the Environment
MDP	Maryland Department of Planning
MGS	Maryland Geological Survey
MWCOG	Metropolitan Washington Council of Governments
WSSC	Washington Suburban Sanitary Commission

#### **Regulatory**

APFO	Adequate Public Facilities Ordinance
BLT	Building Lot Termination
BMP	Best Management Practice
BNR	Biological Nutrient Removal
ENR	Enhanced Nutrient Removal
ESD	Environmental Site Design
GIS	Geographic Information System
MEP	Maximum Extent Practicable
MS-4	Municipal Separate Storm Sewer System
NPDES	National Pollutant Discharge Elimination System
SPA	Special Protection Area
SSA	Sole Source Aquifer
TAZ	Transportation Analysis Zone
TMDL	Total Maximum Daily Load
WWTP	Wastewater Treatment Plant



## a strategic framework

This Plan's goals, policies, and recommendations are intended to guide the efforts of multiple agencies, plans, programs, and work programs. Evolving water quality regulations will require updating existing plans and programs, and new ones as we move forward.

The strategic framework for implementing this Plan includes the land use plans, permit implementation processes, growth policy decisions, and site design and development practices described below.

Water resources-related planning occurs in many government agencies. For example, the bi-county Washington Suburban Sanitary Commission (WSSC) provides water and sewer service to Montgomery and Prince Georges Counties. It works with the two Counties to ensure adequate water supply and wastewater capacity for planned development and redevelopment, and to ensure that development is not approved unless water and sewer adequacy is clearly demonstrated.

The Interstate Commission on the Potomac River Basin (ICPRB) is a regional agency whose studies of the health and flow regime of the Potomac River and its tributaries are used by WSSC for their long-range capacity projections. ICPRB also coordinates Potomac source water protection activities.

The Metropolitan Washington Council of Governments (MWCOG) is a regional agency that coordinates drought preparedness and management plans used by local jurisdictions. MWCOG also tracks monitoring data and works with local agencies on watershed and stormwater issues.

Montgomery and Prince George's Counties have Ten-Year Water and Sewer Plans covering water, sewer, groundwater, and septic systems planning. Montgomery County's Department of Environmental Protection (DEP) is responsible for the County's *Ten-Year Comprehensive Water Supply and Sewerage Systems Plan*.

Many other agencies are responsible for programmatic and planning functions that address water resources issues (Chart 1). (See Appendix 1, and Chapter 1 of the *Ten-Year Comprehensive Water Supply and Sewerage Systems Plan*)

### Plans

The Planning Department is developing a multi-faceted environmental policy and planning framework for Montgomery County. This Plan will be part of that framework. The component plans within the environmental framework will be coordinated to inform and realize multiple goals and maximize environmental benefits for the County. This Plan will provide important policy guidance for other functional plans. Knowing where water quality needs are greatest will be important in prioritizing natural resource preservation, enhancement, and restoration efforts. Master plan coordination will increase both the success in achieving the goals and objectives of each plan, as well as the success of the various plans working together in meeting water resources requirements and goals.

A number of plans address water resources in Montgomery County:

#### M-NCPPC

- The General Plan and the master, sector, and functional plans that amend it
- *Land Preservation, Parks and Recreation Plan*
- *Countywide Green Infrastructure Functional Master Plan*
- *Legacy Open Space Functional Master Plan*

#### Montgomery County DEP

- *Montgomery County Ten-Year Comprehensive Water Supply and Sewerage Systems Plan*
- MS-4 Permit Implementation Plans

chart 1 government agency water resources–related responsibilities

**state agencies**

**Maryland Department of Environment (MDE)**

- Water and Sewer Plan approval
- Comprehensive Plan Guidance and Review
- Impaired Water Listing
- TMDL Program
- Tier II Waters Anti-degradation Program
- Stormwater Manual
- NPDES Program

**Maryland Department of Planning (MDP)**

- Planning and Zoning Oversight
- Comprehensive Plan Guidance and Review
- Smart Growth Program
- Land Use Forecasts

**Montgomery Soil Conservation District (MSCD)**

- Agricultural Management and Conservation Support
  - Soil Conservation
  - Water Quality
  - Nutrient Management
  - Agricultural BMPs

**Maryland Department of Natural Resource (DNR)**

- State Forestry Program
- Bay Program Support
- Park and Natural Resource Management

**regional agencies**

**D.C. Water and Sewer Authority (DCWASA)**

- Blue Plains Wastewater Treatment Plan
  - Bi-County Agreement
  - Inter-Municipal Agreement

**Interstate Commission on the Potomac River Basin (ICPRB)**

- Pollution Control and Prevention
- Source Water Protection Partnership
- Water Quality Technical Studies and Modeling
- Drought Management Support
- Water Supply Planning Analyses

**Metropolitan Washington Council of Governments (MwCOG)**

- Forum for Coordination of Regional Actions
  - Water Supply
  - Watershed Protection
  - Anacostia Restoration
  - Water Conservation
  - Drought Management Plans
  - Water Emergency Response Plan
  - Regional Water-Related Databases
  - Urban Forestry
  - Regional Air Quality

## bi-county agencies

### Maryland-National Capital Park and Planning Commission (M-NCPPC)

- General Plan
- Master, Sector, and Functional Plans
- Growth policy
- Park Planning and Development
  - Natural Resource Management
  - Recreation
  - Stream Monitoring in Parks
- Zoning Code
- SPA Imperviousness Requirements
- Forest Conservation Program
  - Law, Regulations, Enforcement
- Development Review
  - Environmental Guidelines
  - Environmental Inventory Approval
  - Special Exceptions and Mandatory Referrals
  - Forest Conservation Plans
  - Water Quality Plans in SPAs

### Washington Suburban Sanitary Commission (WSSC)

- Water Supply and Sewerage Systems
  - Planning
  - CIP Program
  - Design
  - Construction
  - Operation
  - Maintenance

## county agencies

### Department of Permitting Services (DPS)

- Floodplain Review
- Sediment and Erosion (S&E) Control
- Site Plan Inspection and Enforcement
- Stormwater Code
- Stormwater Review, Inspection, Enforcement
- Building Code
- SPA, S&E Control, and SWM design goals
- Well and Septic Regulations and Permitting

### Department of Transportation (DOT)

- Road Code
- Road Planning, Design, and Construction
- Bridge and Road Stream Crossings
- Road Development Plan Review
- Road SWM and S&E Control
- ROW Maintenance

### Department of Environmental Protection (DEP)

- Environmental Policy and Compliance
- Comprehensive Water and Sewer Plan
- Countywide Stream Protection Strategy
- Stream Monitoring
- SPA Monitoring and Reporting
- Watershed Management Planning
- Forest Protection Strategy
- CIP Program
- NPDES/MS4 Program
- Stormwater Management Facility Maintenance
- Water Quality Protection Change
- Air Quality
- Hazardous Waste
- Solid Waste

### Department of General Services (DGS)

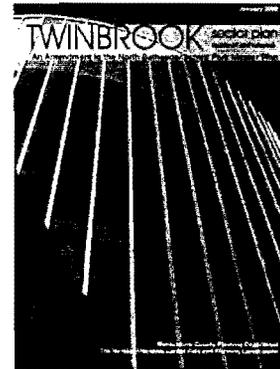
- Pollution prevention at County facilities
- Abatement of existing pollution problems at County facilities
- Inspection and maintenance of existing pollution devices at County facilities, including stormwater ponds
- Building new retention and control devices at new existing County facilities including ponds and containment buildings
- Permits where applicable to a specific County site
- County underground storage tanks (maintenance, permits, installation, and removal)

The General Plan contains the comprehensive land use vision and development plan for Montgomery County. Goals and strategies are defined to guide land use, transportation, housing, environmental protection, and community design.

The 1993 General Plan Refinement already contains goals, objectives, and strategies for water resources. This Plan does not replace that document, but supplies detailed policies and recommendations to reach the same objectives based on the requirements of HB1141. It also provides general guidance for detailed implementation that will occur in a number of plans and permit documents specified by law.

#### Master Plans

Master plans, sector plans, and functional plans will be guided by this Plan. This guidance will continue the coordination of the General Plan's land use element with water and wastewater planning, and ensure long-term water and sewer adequacy as the County grows. Other plans that deal with the County's natural resource issues, such as the Green Infrastructure Plan, will be coordinated with this Plan to help optimize water quality benefits associated with natural resource stewardship. Likewise, master and sector plans will also be revised periodically and implemented to maximize the water quality improvement and protection benefits in their particular geography. Specific decisions about the pattern, density, and zoning of development are established in master and sector plans and are updated periodically.



#### The Montgomery County Ten-Year Comprehensive Water Supply and Sewerage Systems Plan

The *Ten-Year Comprehensive Water Supply and Sewerage Systems Plan* (Water and Sewer Plan) prepared by DEP documents the policies, needs, issues, and planned infrastructure related to public water and sewer systems, private systems (groundwater and septic systems), and related public health, environmental protection, and land use issues in Montgomery County. It gives both background information and a planning basis for the evaluation of water supply and sewerage system needs in the County, and coordination of these capacities and related infrastructure with planned development. The continued close coordination of the Water and Sewer Plan with the County's General Plan and master plans is vital in ensuring ongoing adequacy of water supplies and wastewater treatment capacity as the County continues to grow.

The Water and Sewer Plan also details the inter-agency coordination of planning and implementing the County's water and sewer service. It is closely coordinated with WSSC, reviewed by various local and State agencies, and approved by the County Council.

The current Water and Sewer Plan covers 2003-2012 and is being revised, with approval expected in 2010. The current plan is online at: [montgomerycountymd.gov/waterworks](http://montgomerycountymd.gov/waterworks)

#### Water and Sewer Plan Goals and Objectives

The overall goal of the Water and Sewer Plan is to ensure that the existing and future water supply and sewerage system needs of Montgomery County are satisfied in a manner consistent with:

- emphasizing service to urban areas
- adopted land use recommendations
- provision of other services
- Smart Growth initiatives
- protection of surface and groundwater resources
- identifying water and sewer and public health needs and solutions.

Supporting information from the Water and Sewer Plan is provided in Appendices 1 through 4 of this Plan. Appendix 1 has information on objectives, policies, and inter-agency responsibilities. Appendix 2 contains general information on characteristics of the natural environment, as well as the cultural background that

includes demographics, land use, and development. Appendices 3 and 4 pertain to water supply and wastewater systems, respectively.

Technical information on WSSC's water supply and wastewater flow projections is provided in Appendices 5 and 6. The complete Water and Sewer Plan provides full details on all these aspects of water and sewer planning in Montgomery County.

#### **Coordination with Land Use Element of the General Plan**

The Water and Sewer Plan is closely coordinated with the land use element of the General Plan. The County's growth projections based on master plan recommendations and zoning capacity are provided to MWCOG for their regional forecasts. The forecasts are based on master and sector plan land use, and the forecasts must be within the capacities allowed by existing or proposed zoning. This information is used in conjunction with County wide trends. The projected growth is placed geographically in relation to Traffic Analysis Zones (TAZs). Through this process, County forecasts are developed for households, jobs, and population. (Municipalities with independent planning and zoning authority do their own forecasts, which are incorporated into the County totals.) These projections are used by DEP and WSSC in planning for existing and future adequacy of water supply and sewerage systems in the County. (See Appendix 1, and Chapter 1 of the *Ten-Year Comprehensive Water Supply and Sewerage Systems Plan*)

As master and sector plans are developed, DEP and WSSC are consulted regarding the adequacy of systems and the feasibility of any needed extensions. Once the County Council approves a new master plan and any related zoning changes, the Water and Sewer Plan is amended to implement the master plan's recommendations. These amendments are either comprehensive service area changes for large areas proposed by DEP, or individual service area change requests filed by property owners. These proposed changes are judged for consistency with the Water and Sewer Plan's service policies and with the master plan's land use and service recommendations. If the County Council approves, these areas are added as amendments to the Water and Sewer Plan.

#### **Policies**

Along with a coordinated framework of plans, the County has established development policies and zoning standards that contribute to preserving water quality.

#### **Growth Policy**

Reviewed biennially, this policy guides future development in Montgomery County, reinforcing smart growth principles and ensuring that development is coordinated with the provision of infrastructure. The current Growth Policy supports smart growth within the Priority Funding Area that focuses new development on areas already served by water and sewer infrastructure and minimizes expansion of development into greenfield areas. Consequently, future growth to be served by public water and sewer will help achieve the statewide goals of increasing the current percentage of growth in Priority Funding Areas (PFAs), and decreasing the current percentage of growth outside of PFAs.

The County Council adopts the Growth Policy every two years based on Planning Board recommendations. The Policy sets the rules the Planning Board will use to consider subdivisions over the following two year period, in the context of the Adequate Public Facilities Ordinance (APFO). The APFO ensures that there is enough school and road capacity to accommodate development. Adequacy of water and sewer service is determined through the Water and Sewer Plan process.

By 2030, an additional 200,000 residents are expected in the County. Only four percent of the County, about 14,000 acres, remains undeveloped. And there is even less developable land when steep slopes, floodplains, and other regulated sensitive areas are considered. Because of this, new strategies and policies are needed to guide the County's growth in the future, and to be more consistent with Smart Growth practices.

Montgomery County's growth management tools, including master plans, zoning, and subdivision regulations, are being used to direct growth toward redevelopment in transit-served areas to reduce the vehicle miles traveled relative to the population and job growth. It will also limit adverse effects of growth on water quality by accommodating that growth with a significantly smaller increase in imperviousness. Redevelopment and infill, along with enhancing and revitalizing activity centers will become increasingly important strategies in growing smarter and will create opportunities for creative use of Environmental Site Design to increase water quality in urban areas. Finding ways to decrease our carbon footprint and become more sustainable will increasingly come to the fore as the County continues to grow. The Growth Policy is available online at [montgomeryplanning.org](http://montgomeryplanning.org)

### **The InterCounty Connector (ICC)**

From a master planning perspective, the ICC has been master planned along its current alignment since 1972 (with only minor changes in 1981 and 2009) so the project supports the land use plans already in place. No master planned land use changes are associated with the ICC.

From a development staging perspective, the additional accessibility provided by the ICC is expected to affect the timing of planned development to some extent. This effect was reflected in the adjustment of our cooperative growth forecasts approved by the Metropolitan Washington Council of Governments as Round 6.4A when the ICC was added to the region's Constrained Long Range Plan in 2004. This reflected effect has been carried through in subsequent forecast rounds that have been used in recent planning. As a result, any potential impact of the ICC on water and sewer demand has already been factored into WSSC water and sewer demand projections.

### **Urban Design Guidelines**

Recent master and sector plans for urban areas have been accompanied by Urban Design Guidelines intended to implement the plan vision by providing design guidance for applicants seeking approval of private development or capital improvement projects. The guidelines are approved by the Planning Board for use in developing and evaluating building projects and other applications. They will be revised to reflect new technologies or field conditions and updated at least once every six years.

With the exception of street standards and other specific recommendations, the urban design guidelines are not regulations that mandate specific forms and locations of buildings and open space. They illustrate how plan recommendations and principles might be met, and they encourage applicants and public agencies to propose designs that create an attractive and successful public realm. They include guidance on a wide range of environmental issues including tree canopy, green open spaces, and stormwater management.

To date, draft urban design guidelines have been developed for the Twinbrook Sector Plan, the White Flint Sector Plan, and the Germantown Master Plan. They are available at [montgomeryplanning.org](http://montgomeryplanning.org).

### **The Agricultural Reserve**

The General Plan position that the desired land use in the Agricultural Reserve is agriculture is supported by the *Functional Master Plan for the Preservation of Agriculture and Rural Open Space*. It established two zones, Rural Density Transfer (RDT) and Rural Cluster (RC), in conjunction with a Transfer of Development Rights (TDR) system. The RDT Zone requires a minimum of 25 acres per dwelling unit and the RC Zone allows one dwelling unit per five acres. These densities enable the County to limit development and preserve large amounts of land for agriculture.

The Agriculture and Open Space Plan also prohibits extending sewer and water to areas zoned RDT, unless needed to address public health problems. This has helped preserve agricultural uses and limited sprawl, thereby protecting water quality and supply. Continuing these policies will help guarantee these benefits in the future. (See Appendix 1, and Chapter 1 of *Ten-Year Comprehensive Water Supply and Sewerage Systems Plan*)

Agriculture is also supported by Department of Economic Development's (DED) Agricultural Land Preservation Easements program. This program protects and preserves agricultural land from development with the goal of

70,000 protected acres by 2012. Montgomery County has protected a higher proportion of agricultural land than any other county in the nation. As of 2009, the County has exceeded its goal, protecting 71,000 acres, 20,000 of which are permanently preserved through perpetual easements. The remaining 51,000 acres are protected under TDR easements, but retain development rights of one unit per 25 acres (Appendix 7).

The County has recently passed a Building Lot Termination (BLT) program designed to extinguish remaining residential development rights through purchase. As with TDRs, the purchased density is transferred to development in mixed-use zones close to services and transit.

## **Regulatory Framework**

### **Montgomery County Municipal Separate Storm Sewer System (MS-4) Permit**

The County's MS-4 Permit is the principal implementation tool in meeting stormwater point source water quality regulatory requirements. DEP is the lead agency for implementing this permit, but most County agencies participate. Watershed analyses will identify pollutant sources so that reduction and control options that meet stormwater point source load reduction requirements can be developed. Information on the County's MS-4 Permit is available online at [www.montgomerycountymd.gov/DEP](http://www.montgomerycountymd.gov/DEP)

### **Site Design and Development Practices**

Environmental Site Design (ESD), which is required by State stormwater management regulations to be implemented to the Maximum Extent Practicable (MEP), is vital to realizing this Plan's goals. These standards apply to any remaining greenfield development in the County, as well as to infill and redevelopment projects. Redevelopment projects offer challenging constraints, but ESD approaches are especially important when using redevelopment to improve water quality in urban areas.



## water supply

Both the Water and Sewer Plan and other planning and program efforts address water supply by addressing water sources, its treatment and protection, and developing estimates for demand and future protection efforts.

### Findings

The County has a strong water and sewer policy and program structure. The comprehensive interagency water and sewer planning process discussed in this Plan and detailed in the Water and Sewer Plan is designed to ensure that water supply is adequate for existing and future growth. WSSC periodically assesses water supply and demand projections based on planned growth to ensure this adequacy.

Appendices 3 and 5 contain technical summaries from the Water and Sewer Plan and WSSC projections, respectively, comparing projected water demand with water supply capacity. The projections indicate that water supply is adequate for existing needs and will be adequate to at least 2030. (See Chapter 3 of the *Ten-Year Comprehensive Water Supply and Sewerage Systems Plan*)

Although comprehensive planning by DEP and WSSC has ensured the adequacy of water supplies to accommodate projected growth to 2030, there are still issues and challenges.

With only four percent of the County left for new development, and much of that in environmentally sensitive areas, accommodating future growth through redevelopment of existing built areas presents excellent opportunities for improving and funding water supply infrastructure, without extending water and sewer service or expanding the water and sewer service envelope. This approach also provides opportunities to grow even smarter and greener, in accordance with the State's Planning Visions Act of 2009. Recent master plan revisions have focused on redevelopment and M-NCPPC is coordinating closely with DEP and WSSC to ensure that the plans' proposed zoning and densities can be accommodated by water supply infrastructure. Close coordination among the various agencies will continue to be a critical component of future planning.

The County will continue to evaluate and pursue policies and programs to ensure that source waters are protected and infrastructure is maintained, particularly:

- protecting the Agricultural Reserve and other areas planned for low-density development
- coordinating water planning with the County's land use plan and Growth Policy
- educating the public on water resources, conservation, and reuse
- reducing the impacts of infrastructure failure on streams and water quality.

### Sources

#### Surface Water

The County's water supply comes from the Potomac and Patuxent Rivers. The Potomac is the larger source. WSSC withdraws water from the Potomac at Watkins Island near the mouth of the Watts Branch. WSSC is also working on a new Potomac Water Filtration Plant Submerged Channel Intake. This intake is still in the planning and design stage, and is intended to provide higher quality Potomac source water, not increased water withdrawals. WSSC operates two reservoirs along the Patuxent River, the Triadelphia and Rocky Gorge Reservoirs, created by the Brighton and T. Howard Duckett Dams, respectively (Map 1).

At low flow periods, the Potomac River flow can be supplemented by the Jennings Randolph Reservoir on the River's North Branch, 200 miles upstream from the Watkins Island intake, and by Little Seneca Lake in western Montgomery County. WSSC operates this dam and release facility.

Long-range water resource development options are considered on a regional basis. As potential opportunities arise, they are examined. A number of alternatives have been suggested, some of which are being investigated



in a preliminary way because the need is not currently pressing. These include a number of potential quarry options in Maryland and Virginia for water storage and settling, as well as the rehabilitation of an estuarine pumping station and possible treatment of estuarine water.

### **Distribution and Storage**

WSSC delivers drinking water from treatment plants to consumers throughout the community water service area in Montgomery County through a series of pumping facilities, transmission mains, and storage facilities. The County's water distribution system is aging, and maintenance and replacement of this infrastructure is vital for continued adequate public water service. It is also important in preventing stream erosion and adverse water quality impacts that result from water line breaks. WSSC is completing a Utility-Wide Master Plan to ensure that its entire infrastructure is adequate to meet the service area's present and future needs (Appendix 1).

### **Groundwater**

In less densely-populated parts of Montgomery County, water is supplied primarily by groundwater wells. Approximately 80,000 residents rely on groundwater as their only source of water, with approximately 50,000 individual wells in use. Although most wells are located in areas not served by the community water supply systems, older wells are found throughout the County. Only Poolesville's municipal wells are part of a community water supply system.



According to the Maryland Geological Survey (MGS) and the Department of Permitting Services (DPS), the County's groundwater is generally of good quality with fairly reliable flow rates. The levels of nitrates and natural pollutants are generally low. Local problems, especially low flow, occur during significant drought. But the overall picture is good because of the County's relatively thick soils, the low density development in the Agricultural Reserve, and the high level of care in installing septic systems over the years.

DPS's Well and Septic Section is responsible for administering and enforcing County and State laws governing on-site individual water supply systems. The Water and Sewer Plan identifies problem areas based on well information from DPS, and that Plan will continue to be the County's tool for identifying and addressing groundwater and well issues. (See Appendix 3, and Chapter 3 of the *Ten-Year Comprehensive Water Supply and Sewerage Systems Plan*)

## **Treatment and Protection**

### **Treatment Facilities**

The County's drinking water is treated at two WSSC two filtration plants: the Potomac Water Filtration Plant, on River Road west of Potomac Village, and the Patuxent Water Filtration Plant, on Sandy Spring Road just east of the County limits in Laurel. These plants draw untreated water from the Potomac and Patuxent Rivers and process it into drinking water.

### **The Agricultural Reserve and Water Resources**

Although some uses in Montgomery County's Agricultural Reserve are sources of non-point pollutants associated with farming, the Reserve has served to help protect water quality and supply in many ways. By keeping density and imperviousness low, the Reserve has limited sprawl and promoted smart growth. The Reserve has also served to protect drinking source waters in the Potomac River and Patuxent River Reservoirs. Low density and low imperviousness within the Reserve have also helped protect water quality and keep stream erosion low by attenuating water quantity and quality impacts from more dense upstream areas in the central portion of the County.

In addition to surface water benefits, the Agricultural Reserve and associated policies have provided excellent protection of groundwater resources in the portion of the County outside of the water and sewer service envelope, where groundwater is the only source of drinking water. According to MGS hydro-geologists, low

densities and imperviousness levels in the Agricultural Reserve have been instrumental in protecting the County's groundwater quantity and quality. The County's commitment to continue these policies will help safeguard groundwater as a reliable resource.

#### **Potomac River Basin Drinking Water Source Protection Partnership**

The ICPRB coordinates a voluntary association of 19 water suppliers and government agencies that focuses on protecting drinking water sources in the Potomac River basin. This coalition of water utilities and management and regulatory agencies enables a comprehensive approach to protection. The Partnership's 2005 plan for source water protection establishes priorities and projects for the coming years. Through work groups, the Partnership is identifying a strategy for source water protection as recommended by assessments throughout the Potomac River basin. Further information is available online at [www.potomacdwsp.org](http://www.potomacdwsp.org).

#### **Source Water Assessments**

MDE has studied the Potomac and Patuxent source waters. The 2002 *Potomac River Source Water Assessment* guides the work of the Partnership. The 2004 *Patuxent River Source Water Assessment* guides the development of the Patuxent Reservoirs' Total Maximum Daily Loads (TMDLs) and the work of the Patuxent Reservoirs Watershed Protection Group (which includes the Patuxent Reservoirs Policy Board that sets key policies for the reservoirs, and the Patuxent Reservoirs Technical Advisory Committee that advises the Policy Board). WSSC is directly involved in the Partnership for both the Potomac River and the Patuxent Reservoirs Technical Advisory Committee (Appendix 3).



Recommendations of the 2002 and 2004 MDE source water assessments and agency responses are in Appendix 3.

#### **Maryland Piedmont and Poolesville Sole Source Aquifers**

According to the Environmental Protection Agency, a sole source aquifer supplies at least 50 percent of the drinking water consumed in an aquifer's area. The Sole Source Aquifer (SSA) Program provides federal overview of federally-funded projects within designated areas. Projects that could potentially contaminate areas designated as sole source aquifers cannot receive federal funds. There are two designated sole source aquifers in the County: the Maryland Piedmont SSA and the Poolesville SSA (Appendix 3). Most of the County land that is outside the water and sewer service envelope is in the Maryland Piedmont SSA. The Poolesville SSA covers the town and surrounding area.

#### **Water Conservation and Reuse**

WSSC provides water conservation practices as inserts to its customer's monthly bills, as detailed on their web site: [wsscwater.com/info/tips.cfm](http://wsscwater.com/info/tips.cfm).

WSSC is also a core member of MWCOG's Wise Water Use (Conservation) Campaign, which provides water saving tips to all users within the metropolitan region. More information can be found at [mwkog.org/environment/water/watersupply/core\\_campaign\\_partners.asp](http://mwkog.org/environment/water/watersupply/core_campaign_partners.asp)

WSSC participates in the Chesapeake Water Environment Association Water Reuse Committee, developing new water reuse regulations and WSSC is working with MDE on this effort, taking a phased approach to implementation. Phase 1 slightly modified the existing land treatment guidelines to create a new Class III effluent (high quality WWTP effluent) for unrestricted public access reuse (to water highway strips, public golf courses, school fields, etc., in addition to farmlands).

Phase 2 focuses on commercial and industrial uses, watering residential lawns, toilet flushing, and more to prevent cross-contamination. New regulations are expected to prohibit water connections in private homes (so homeowners can't inadvertently tie the potable water lines to the non-potable pipe lines.) WSSC is using

Virginia's new water reuse regulations as a baseline, and has begun reviewing and modifying them. A review draft is expected in early 2010. WSSC's chief plumbing inspector is also participating on the committee to ensure that cross-connection prevention and other offset requirements are met.

The County's relative abundance of surface water and low densities in the areas using well water has, so far, limited the need for water reuse. As climate change continues, this may change. Water reuse considered viable elsewhere, such as agricultural application or power plant cooling, is problematic in Montgomery County due to distribution problems (potential reuse areas are at higher elevations). In homes, current plumbing codes do not allow the use of graywater (water that has been used previously for washing) for flushing toilets or irrigation due to health concerns. The Water and Sewer Plan is the proper context for more detailed consideration of these issues.

The County has received requests for information on home use of roof runoff, which does not involve the same health concerns as graywater. Further consideration of this option could be a potential first step in addressing the issue of water reuse in homes.

## **Regional Forecasts**

### **WSSC Water Production Projections**

As population projections are updated for the region, WSSC refines and updates its water production projections (Appendix 5).

### **ICPRB Water Supply Reliability Forecast**

Every five years the ICPRB updates a twenty-year Water Supply Reliability Forecast for the Washington metropolitan area, which is used by WSSC to plan water and sewer infrastructure capacity. The 2005 forecast determined that the water supply system is highly reliable and will be adequate to meet growing demand through the next 20 years. The forecast will be updated in 2010 to extend to 2030.

### **Climate Change**

The Reliability Forecast addresses water resources in the Potomac River basin under climate uncertainty using climate change and flow trend data. It recognizes the high degree of uncertainty associated with climate change research, noting the need for more focused study that includes an assessment of extreme conditions. The Forecast notes that additional study can clarify the potential impact of climate change on extreme hydrologic events such as drought. Under most scenarios, existing resources are sufficient for projected population growth to 2030, but studies recommend planning for mitigating potential climate impacts.

The Water Supply Reliability Forecast is available online at [potomacriver.org](http://potomacriver.org)

For detailed information on water supply systems, see Appendix 3, and Chapter 3 of the *Ten-Year Comprehensive Water Supply and Sewerage Systems Plan*.



## wastewater

Both the Water and Sewer Plan and WSSC planning and program efforts address wastewater conveyance and treatment needs by estimating existing and future demand, and by providing the wastewater capacity, maintenance, and replacements needed to meet those demands.

### Findings

The comprehensive interagency water and sewer planning process discussed in this Plan and detailed in the Water and Sewer Plan is designed to ensure that wastewater treatment capacity is adequate for existing and future growth. WSSC periodically assesses water supply and demand projections based on planned growth to ensure this adequacy.

Appendices 4 and 6 of this Plan contain graphics and tables from the Water and Sewer Plan and WSSC projections, respectively, comparing projected sewerage system needs with sewage treatment capacity. Projections indicate that capacity is adequate for existing needs and at least to the planning horizon of 2030, including a six million gallon per day expansion of the Seneca Wastewater Treatment Plant (WWTP) that is currently underway. (See Chapter 4 of the *Ten-Year Comprehensive Water Supply and Sewerage Systems Plan*.)

Although comprehensive planning by DEP and WSSC has ensured the adequacy of wastewater treatment capacity to accommodate projected growth to 2030, there are still issues and challenges.

With only four percent of the County left for new development, accommodating future growth through redevelopment of existing built areas presents excellent opportunities for improving and funding wastewater infrastructure, without extending water and sewer service or expanding the water and sewer service envelope. This approach also provides opportunities to grow even smarter and greener, in accordance with the State's Planning Visions Act of 2009. Recent master plans have focused on redevelopment, and M-NCPPC is coordinating with DEP and WSSC to ensure that the plans' proposed zoning and densities can be accommodated by sewer infrastructure. Close coordination among the various agencies will continue to be a critical component of future planning, especially beyond 2030, to continue to ensure wastewater adequacy.

The County will continue to evaluate and pursue policies and programs to ensure wastewater infrastructure is maintained and nutrient inputs from septic systems and wastewater infrastructure are reduced, particularly:

- protecting the Agricultural Reserve to limit sprawl and the expansion of wastewater infrastructure and sewage loads to WWTPs
- coordinating sewer planning with the County land use plans and Growth Policy
- educating the public on wastewater and sewage system issues
- reducing nutrient loadings from wastewater treatment plants
- reducing water pollution from wastewater infrastructure
- reducing nitrogen from septic systems
- addressing sand mounds and other septic system technologies in the Agricultural Reserve.

### Collection and Conveyance

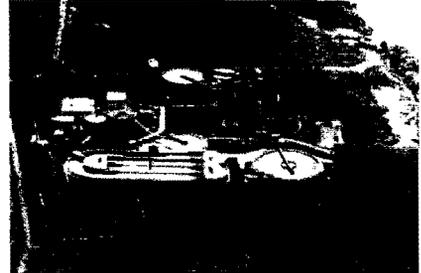
Wastewater either flows by gravity or is pumped through sewer lines to the nearest wastewater treatment plant. The County's wastewater collection and conveyance system is aging, and maintenance and replacement of this infrastructure is vital for continued adequate public sewer service. It is also important for water resources protection because of negative water quality impacts that result from sewer line leaks and breaks. WSSC is completing a Utility-Wide Master Plan to ensure that its entire infrastructure is adequate to meet present and future needs of the service area. WSSC is also complying with a Consent Decree to minimize and eliminate where possible sanitary sewer overflows and pipe breaks (Appendix 1). Further information on the WSSC Consent Decree is also available on WSSC's website, [wsscwater.com](http://wsscwater.com) Minimizing water quality impacts from

wastewater collection and conveyance infrastructure will continue to be important in meeting water quality standards.

## Treatment

### Wastewater Treatment Plants (WWTPs)

WSSC operates three wastewater treatment plants (WWTPs) in Montgomery County: the Seneca, Damascus, and Hyattstown WWTPs (Map 2). The Mill Bottom WWTP, located in and operated by Frederick County, treats sewage from the Rattlewood Golf Course in Montgomery County. But most of the County's sewage is treated at the Blue Plains WWTP, operated by the District of Columbia Water and Sewer Authority. The Town of Poolesville operates its own WWTP. In addition, there are a number of small privately operated WWTPs in Montgomery County.



### National Pollutant Discharge Elimination System (NPDES) Permits

All wastewater treatment plants are required to have State-issued NPDES permits that regulate what can be discharged to streams. The permits specify discharge limitations for each pollutant and specify reporting requirements.

### Biological Nutrient Reduction (BNR) and Enhanced Nutrient Reduction (ENR)

WSSC uses BNR—a standard treatment using bacteria to reduce nutrients discharged from sewage treatment plants—and is planning and installing plant upgrades to ENR status, which will lower nutrients to near the limits of current technology.

ENR upgrades are in various stages of design, construction, and application. Estimated completion dates are:

- Seneca WWTP operational 2013
- Damascus WWTP operational 2010
- Hyattstown WWTP below the ENR flow threshold
- Blue Plains WWTP operational 2015
- Poolesville WWTP operational 2010.

Each WWTP has been assigned a cap on the amount of nutrients that can be discharged in its treated effluent. These caps are or will be specified in the plants' NPDES discharge permits. Even with the implementation of enhanced nutrient reduction at all the major WWTPs, these caps may eventually limit the amount of sewage that can be treated. It should be noted, however, that the WWTP flow projections and nutrient caps were calculated based on the same maximum permitted flow, so they correspond exactly. As a result, the nutrient caps will expire at the same rate as the flow capacity expires. Because of this, the caps will only be limiting when the flow reaches the permitted maximum. The WSSC flow projections in Appendix 6 indicate that this will not occur within the 2030 horizon of the Plan.

### Onsite Wastewater Treatment Systems

The more rural, less-densely populated parts of the County depend primarily on septic systems that discharge effluent to the ground. Although properly maintained septic systems contribute some nitrogen to groundwater, failing systems can contribute much more. Septic system areas generally coincide with the County's well service areas. Although most septic systems are located in areas not served by community sewer systems, as with wells, older septic systems are found throughout the County. Some larger individual treatment systems are referred to as "multi-use systems."

DPS's Well and Septic Section administers and enforces County and State laws governing on-site, individual sewerage systems to prevent failing or improperly maintained septic systems that can contribute excessive nitrogen to ground and surface waters. Based on information collected by DPS, problem areas are reported in the Water and Sewer Plan. The Water and Sewer Plan will continue to be the County's planning mechanism for

identifying and addressing septic issues. (See Appendix 4 and Chapter 4 of the *Ten-Year Comprehensive Water Supply and Sewerage Systems Plan*)

#### **Sand Mound and Alternative Technology Septic Systems**

County regulations allow two types of septic systems for new construction: conventional in-ground trench systems, with trenches installed in existing soil, and sand mound systems, with trenches installed within a constructed mound above the original ground level. Enhanced nutrient reduction technologies to improve effluent quality are encouraged in both of these systems. Septic systems using alternative technologies (such as low-pressure drip systems) are allowed only as replacements for existing septic systems.

Although sand mounds and alternative septic systems can provide a higher quality of effluent than trench septic systems, they can allow development on land where in-ground trench systems are not permitted due to high water tables or unacceptable percolation rates. Sand mounds have been permitted in the Agricultural Reserve since 1994 pursuant to Executive Regulation No. 28-93 AM. This policy is inconsistent with the recommendations of the *Functional Master for Preservation of Agriculture and Rural Open Space* that development in the Agricultural Reserve should be limited to that which can be supported by the natural capacity of the soils and that alternative technologies should be strictly limited.

Sand mounds have increased pressure for residential subdivisions on sites that are not suitable for in-ground trench systems and that might have otherwise remained agricultural land. The continued use of sand mounds for ordinary subdivision development contributes to fragmentation of the critical mass of farmland in the Reserve, marginally increases impervious surfaces, and exacerbates any associated negative water quality impacts.

In cases where conventional systems fail and owners can no longer rely on standard in-ground trench systems, sand mounds and alternative technology septic systems should be permitted since they can reduce pressure to provide public sewer systems to relieve failing septic systems in low-density areas outside the planned public sewer service envelope.

But these systems can have unforeseen development and water quality impacts in the Agricultural Reserve. The Water and Sewer Plan should restrict the use of such systems to replacement of failing trench systems and to support residential and other uses that are clearly associated with protection, use, and encouragement of agricultural activities.

#### **Chesapeake Bay Restoration Fund for Septic Upgrades**

Part of the State's Bay Restoration Fund comes from fees assessed to homes served by an on-site wastewater system, and a portion of those fees is used for septic system upgrades. DPS works with septic system owners to use these funds to upgrade their systems. DPS has applied to the State to assume responsibility for administering the Bay Restoration Fund monies for qualifying on site systems in Montgomery County.

#### **Emerging Contaminants**

Emerging contaminants are chemicals or materials that have a real or perceived threat to human health or the environment. They include endocrine (hormonal) disrupters, pharmaceutical drugs, and personal care products. In 2008, WSSC and its regional and national partners tested the Potomac and Patuxent source waters and its drinking water for emerging contaminants. The findings indicated that WSSC drinking water is safe to consume due to the extremely low levels of contaminants. Likewise, the findings for both source waters showed extremely small amounts of emerging contaminants. WSSC will continue to work with its partners to understand and treat emerging contaminants. Further information is available on WSSC's website, [wsscwater.com](http://wsscwater.com)

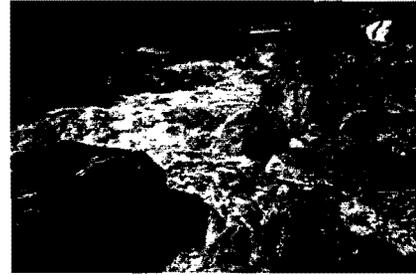
There are still many unanswered questions and additional data needed regarding emerging contaminants. Research is underway in many agencies to address this issue, which is likely to become increasingly important as the concentrations and the effects of these contaminants also increase. A recent report on emerging

contaminants in the Potomac River is available online at [www.potomac.org](http://www.potomac.org). Further information on this issue is available at the Potomac Drinking Water Source Partnership at [www.potomacdwspp.org](http://www.potomacdwspp.org).

For detailed information on wastewater systems, see Appendix 4, and Chapter 4 of the *Ten-Year Comprehensive Water Supply and Sewerage Systems Plan*.

## stormwater and water quality

Stormwater runoff generates additional flow and carries pollutants to receiving water bodies. Because of the close connection between stormwater and water quality, stormwater management is a vital component of protecting and improving water quality. Stormwater management is a constantly evolving field that has in recent years seen significant advancements in Best Management Practices (BMPs), both structural and non-structural, including Environmental Site Design (ESD) practices.



Both the Water and Sewer Plan and other planning and program efforts address stormwater and its effect on water quality by addressing sources and treatment techniques, and by estimating demand and developing future efforts. The County's extensive set of programs and policies minimize stormwater impacts and the State's legal requirements for nutrient loadings and receiving waters are addressed below.

### Findings

State and County monitoring data show that water quality is continuing to degrade in many portions of Montgomery County and regionally as growth continues, especially in older developed areas and areas with increasing impervious cover. In response, water quality regulatory requirements are also increasing. As a result, where and how the County grows and how it manages stormwater will be increasingly important in meeting water quality regulations.

New State regulations requiring ESD to the maximum extent practicable will help decrease the water quality impacts of growth, and County codes and regulations are being revised to remove impediments.

Because the County is currently near build-out, opportunities to realize significant changes in water quality through land use and alternative development patterns will not be available. For Montgomery County, addressing water quality issues will center on retrofitting older development, pollution prevention, implementing ESD, and accommodating growth through redevelopment and infill. Designing redevelopment and infill projects to reduce impervious cover such as parking lots, and improving stormwater management will help to improve water quality.

This approach is consistent with the EPA report, *Protecting Water Resources with Higher Density Development*, available online at [epa.gov/smartgrowth](http://epa.gov/smartgrowth).

Enhancing stewardship of natural areas including resource protection, conservation, enhancement, and restoration, especially in riparian and headwater areas, will also be important in achieving and maintaining water quality standards. These efforts will be prioritized to focus on areas most in need of water quality protection and improvement by coordinating existing programs and plan implementation with water resource needs.

Results of County analyses, MS-4 implementation plans, and TMDL plans for non-point source water quality will help guide the implementation and updating of master plans, natural area protection, enhancement and restoration efforts, stormwater management, and the development review process.

Other findings include:

- regulatory requirements for water quality will require more effective stormwater management and environmental site design for new development, redevelopment, infill, and roads, as well as retrofitting older development
- increased inter-agency cooperation and collaboration will be essential to meet water quality standards and regulatory requirements

- a watershed-based approach should be used to identify and prioritize opportunities for improving and protecting water quality
- coordinating water quality improvement efforts with local and regional jurisdictions will be important in addressing TMDLs and meeting water quality standards
- maintaining adequate resources to meet evolving water quality regulatory requirements will continue to be important.

## **Sources**

### **Point Sources**

The County's storm drain system collects and discharges stormwater runoff in most developed areas. This system is considered a pollutant point source under the Clean Water Act and the State TMDL Program. The County has been issued a NPDES permit to operate its storm drain system. This permit is also known as a Municipal Separate Storm Sewer System (MS-4) Permit.

### **Non-Point Sources**

Areas without storm drains are considered non-point sources of pollution, contributing to the total pollutant load governed under the TMDL program. In Montgomery County, these areas are mostly in the Agricultural Reserve. Where non-point pollutants contribute to an impaired water body, they are included as part of the TMDL allocations, but are not covered by the County's MS-4 permit. Agricultural operations are required to implement nutrient management plans and BMPs, and County farmers have a high compliance rate with these requirements. Although these practices help to significantly reduce non-point pollution, they are not tied to any particular TMDL. As a result, there is currently no enforcement to ensure any needed load reductions from non-point sources can be achieved. If a water body remains impaired and there is no enforcement plan to achieve the entire TMDL including non-point sources, then theoretically, no further discharges could be allowed to that water body, including those resulting from land conversion. This scenario highlights the need for an implementation strategy with a clear regulatory framework and designated responsibilities. Ensuring that loads are reduced equitably across all contributing sources will require additional guidance from the State.

## **Treatment**

### **Sediment/Erosion Control and Stormwater Management**

During construction, sediment and erosion control standards protect water quality. DPS is the lead County agency for both sediment/erosion control and stormwater management, charged with enforcing State standards and regulations, which are currently under revision.

In 2000, the County adopted the State Stormwater Management Manual as a minimum to guide its stormwater management program. In some instances, however, Montgomery County sets more stringent standards than the State. The County's stormwater management manual details a variety of structural and non-structural practices that control stormwater quantity and quality according to specified standards.

The management of stormwater is regulated through the County's Stormwater Ordinance, which implements the State Manual with additional County requirements. In 2009, the State Stormwater Manual was revised to include requirements for enhanced stormwater management through the use of Environmental Site Design (ESD) to the Maximum Extent Practicable (MEP). All jurisdictions are required to revise their stormwater ordinances to reflect the new requirements.

As the County moves forward in implementing ESD, it will be important to continue to build our information base on ESD practices in different settings. This can include ongoing research on innovative ESD practices elsewhere in the country, as well as opportunities for monitoring specific applications of ESD in the County. This will provide a foundation for refining the use of ESD in the County, as well as helping to further clarify the meaning of MEP in different development contexts.

### Natural Resources Management

The County's natural resources, including forests, wetlands, and meadows, provide vital natural water quality protection and treatment functions. In addition, urban trees and canopy provide water quality and other environmental benefits. The County has many programs and plans that are designed to protect and manage these resources. Because of the close link between healthy natural areas and water quality, it will be important to seek ways to enhance ongoing urban tree programs and natural resource management, conservation, enhancement, and protection efforts to accomplish multiple objectives including maximizing benefits to water resources.

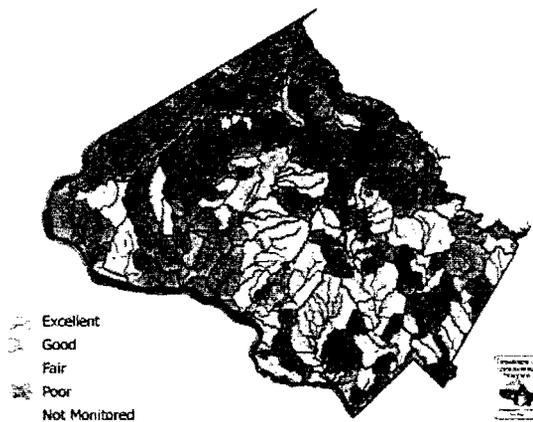
### Water Quality Monitoring

#### County Monitoring

The County DEP and the M-NCPPC Department of Parks monitor streams for benthic macro-invertebrates, fish, and habitat. DEP is the lead agency for County stream monitoring and maintains the countywide monitoring database. DEP has maintained the program since 1994, and monitors stations throughout the County both on parkland and in the remainder of the County. DEP coordinates the yearly countywide monitoring with the Department of Parks so that duplication of effort is avoided and collected information can be shared to the benefit of the County, the Department of Parks, and the Planning Department. DEP develops the monitoring methods and maintains the data's quality. The entire County is covered during a five-year cycle of watershed monitoring.

County monitoring shows that urban and suburban streams are generally in fair to poor condition while less densely developed watersheds often are in good and in some cases excellent condition (Map 5). This pattern supports the correlation between higher levels of imperviousness and lower water quality, a trend that supports accommodating future growth in existing urban areas near transit as opposed to developing in greenfields, which would increase impervious cover. More information on the County's stream monitoring program is available online at [www.montgomerycountymd.gov/DEP](http://www.montgomerycountymd.gov/DEP)

map 5 stream conditions 2000-2008



Source: Montgomery County DEP



#### State Monitoring

The Maryland Department of the Environment maintains stream monitoring stations in Montgomery County as part of a statewide network. Monitoring parameters include chemical, sediment, bacteria, trash, and stream biology, and the data is used to document water quality impairments statewide.

The State also maintains and updates the *Integrated Report of Surface Water Quality*, a list of impaired waters (Tables 1-6). As required by federal law, the Report describes categories of water quality, and identifies waters with pollutant loads or conditions that require a TMDL limitation to reach State standards. Waters that do not

meet standards may require a State TMDL study to determine the maximum amount of an impairing substance or pollutant that a particular water body can assimilate and still meet water quality criteria. The Report also helps prioritize watersheds that should be restored and those in need of protection.

The State is developing a GIS-based system for mapping and reporting the information in the Report, projected to be available in 2010. Access to the State's detailed water quality data in GIS format will greatly improve its usefulness in County water quality analyses and planning.

#### **The Agricultural Reserve and Nutrients**

The County's Agricultural Reserve provides many water supply and quality benefits. Agriculture contributes fewer pollutants than many other land uses, including urban land. This reinforces the need to continue to maintain the Reserve and accommodate growth through redevelopment and infill in existing urban areas. It should be noted, however, that agriculture has been identified by the EPA Chesapeake Bay Program as the leading contributor of nutrients to the Bay due to the large amount of agricultural land in the Bay's watershed. While nutrients are significant pollutants in the Bay, they do not affect local streams as much and so the Agricultural Reserve's streams have relatively high overall water quality conditions.

Although the benefits provided by the Agricultural Reserve generally outweigh its pollutant contributions (which have already been significantly reduced through the farmers' high compliance rates with regulations and conservation practices), the role of nutrients in the Bay and the pending Bay nutrient TMDLs may require additional measures to further reduce nutrients in all sectors of the County, including the Agricultural Reserve.

#### **Regulatory Framework**

Many government agencies at the State, Regional, bi-County, and County levels are responsible for water quality and stormwater management. Each agency has its own focus and jurisdiction under various laws and charters. This distribution of responsibilities creates a challenge in dealing with increasingly complex water resource issues and regulations. But with continued and enhanced efforts to coordinate and collaborate more effectively, progress can continue to be made in identifying and implementing solutions (Chart 1).

#### **State Water Quality Policies and Regulations**

The State, through water quality standards and regulations, stormwater management regulations, and the National Pollution Discharge Elimination System (NPDES) Permits for point sources sets the regulatory requirements and standards that Montgomery County must meet to comply with State requirements.

#### **Water Quality Standards**

State and federal laws set annual or seasonal standards with quantifiable criteria to protect a water body, depending on its designated use. MDE uses these standards to ensure that water is useable for drinking water, swimming, fishing, industry, and agriculture. The standards are also used by permitting agencies to regulate discharges into water bodies.

The Clean Water Act requires local water quality standards to have three components:

- goals for each water body based on designated uses
- criteria to protect the designated uses
- an anti-degradation policy that maintains high quality waters.

These standards are the key criteria in determining whether a given water body is impaired.

#### **Total Maximum Daily Loads (TMDLs)**

A TMDL establishes the amount of pollutant, plus a margin of safety, that a water body can assimilate and still meet water quality standards for that pollutant. All waters identified in Maryland's Integrated 303(d) List as needing a TMDL are studied by the State before a load limit is imposed. If a TMDL limit is imposed, responsible parties determine where pollutant reductions will be made.

When water quality monitoring data suggest that a listed impaired water body meets water quality standards, it can be removed from the list. Maryland is also pursuing alternative approaches to TMDLs that result in more rapid implementation measures to address impairments.

Through this process, it will be determined if County water bodies have sufficient capacity to assimilate the pollutants discharged to them (Tables 1-6).

**table 1 nutrient impairments and tmdls**

cycle first listed	basin code	basin name	water body name	water type	listing category	cause
1998	02131107	Rocky Gorge Dam	DUCKETT RESERVOIR	IMPOUNDMENT	4a – Impaired, TMDL Completed	Phosphorus (Total)
1998	02131108	Brighton Dam	TRIADELPHIA RESERVOIR	IMPOUNDMENT	4a – Impaired, TMDL Completed	Phosphorus (Total)
1996	02140202	Potomac River Montgomery County		RIVER	5 – Impaired, TMDL Required	Phosphorus (Total)
1996	02140205	Anacostia River		RIVER	4a – Impaired, TMDL Completed	Phosphorus (Total)
1996	02140206	Rock Creek		RIVER	5 – Impaired, TMDL Required	Phosphorus (Total)
1996	02140207	Cabin John Creek		RIVER	5 – Impaired, TMDL Required	Phosphorus (Total)
1996	02140208	Seneca Creek		RIVER	5 – Impaired, TMDL Required	Phosphorus (Total)
1998	02140208	Seneca Creek	CLOPPER LAKE	IMPOUNDMENT	4a – Impaired, TMDL Completed	Phosphorus (Total)
1996	02140302	Lower Monocacy River		RIVER	5 – Impaired, TMDL Required	Phosphorus (Total)
1996	02140102, 02140201, 02140202, 02140204	POTTF - Upper Potomac River Tidal Fresh		ESTUARY	5 – Impaired, TMDL Required	Nitrogen (Total)
1996	02140102, 02140201, 02140202, 02140204	POTTF - Upper Potomac River Tidal Fresh		ESTUARY	5 – Impaired, TMDL Required	Phosphorus (Total)

*(Information current as of 9/14/09.)*

table 2 sediment impairments and tmdls

cycle first listed	basin code	basin name	water body name	water type	listing category	cause
1998	02131108	Brighton Dam	TRIADELPHIA RESERVOIR	IMPOUNDMENT	4a – Impaired, TMDL Completed	Sedimentation /siltation
1996	02140202	Potomac River Montgomery County		RIVER	5 – Impaired, TMDL Required	Total Suspended Solids (TSS)
1996	02140205	Anacostia River		RIVER	4a – Impaired, TMDL Completed	Total Suspended Solids (TSS)
1996	02140206	Rock Creek		RIVER	5 – Impaired, TMDL Required	Total Suspended Solids (TSS)
1996	02140207	Cabin John Creek		RIVER	5 – Impaired, TMDL Required	Total Suspended Solids (TSS)
1998	02140208	Seneca Creek	CLOPPER LAKE	IMPOUNDMENT	4a – Impaired, TMDL Completed	Sedimentation /siltation
1996	02140208	Seneca Creek		RIVER	5 – Impaired, TMDL Required	Total Suspended Solids (TSS)
1996	02140302	Lower Monocacy River		RIVER	4a – Impaired, TMDL Completed	Total Suspended Solids (TSS)
1996	02140102, 02140201, 02140202, 02140204	POTTF - Upper Potomac River Tidal Fresh		ESTUARY	5 – Impaired, TMDL Required	Total Suspended Solids (TSS)

(Information current as of 9/14/09.)

table 3 bacteria impairments and tmdls

cycle first listed	basin code	basin name	water body name	water type	listing category	cause
2002	02140205	Anacostia River		RIVER	4a – Impaired, TMDL Completed	Fecal Coliform
2002	02140206	Rock Creek		RIVER	4a – Impaired, TMDL Completed	Fecal Coliform
2002	02140207	Cabin John Creek		RIVER	4a – Impaired, TMDL Completed	Fecal Coliform
2002	02140302	Lower Monocacy River		RIVER	5 – Impaired, TMDL Required*	Fecal Coliform

(Information current as of 9/14/09.)

\*Note: Although not yet approved by EPA, a TMDL for bacteria has been submitted for this watershed.

table 4 biological impairments and tmdls

cycle first listed	basin code	basin name	water body name	water type	listing category	cause
2004	02131107	Rocky Gorge Dam		RIVER	5 – Impaired, TMDL Required	Combination Benthic/Fishes Bioassessments
2006	02140202	Potomac River Montgomery County		RIVER	5 – Impaired, TMDL Required	Combination Benthic/Fishes Bioassessments
2002	02140205	Anacostia River		RIVER	5 – Impaired, TMDL Required	Combination Benthic/Fishes Bioassessments
2002	02140206	Rock Creek		RIVER	5 – Impaired, TMDL Required.	Combination Benthic/Fishes Bioassessments
2006	02140207	Cabin John Creek		RIVER	5 – Impaired, TMDL Required	Combination Benthic/Fishes Bioassessments
2006	02140208	Seneca Creek		RIVER	5 – Impaired, TMDL Required	Combination Benthic/Fishes Bioassessments
2002	02140302	Lower Monocacy River		RIVER	5 – Impaired, TMDL Required	Combination Benthic/Fishes Bioassessments

(Information current as of 9/14/09.)

**table 5 toxics impairments and tmdls**

cycle first listed	basin code	basin name	water body name	water type	listing category	cause
2008	02140202	Potomac River Montgomery County		RIVER	5 – Impaired, TMDL Required	PCB in Fish Tissue
2002	02140205	Anacostia River		RIVER	5 – Impaired, TMDL Required	PCBs - water
2002	02140205	Anacostia River		RIVER	5 – Impaired, TMDL Required	Heptachlor Epoxide

*(Information current as of 9/14/09.)*

**table 6 trash impairments and tmdls**

cycle first listed	basin code	basin name	water body name	water type	listing category	cause
2006	02140205	Anacostia River		RIVER	5 – Impaired, TMDL Required	Debris/Floatables/Trash

*(Information current as of 9/14/09.)*

**Anti-degradation Policy and Tier II Water Listings**

Under the State’s anti-degradation policy, waters are classified in three tiers based on designated uses and criteria. Tier I waters are those required, at a minimum, to meet their designated use criteria.

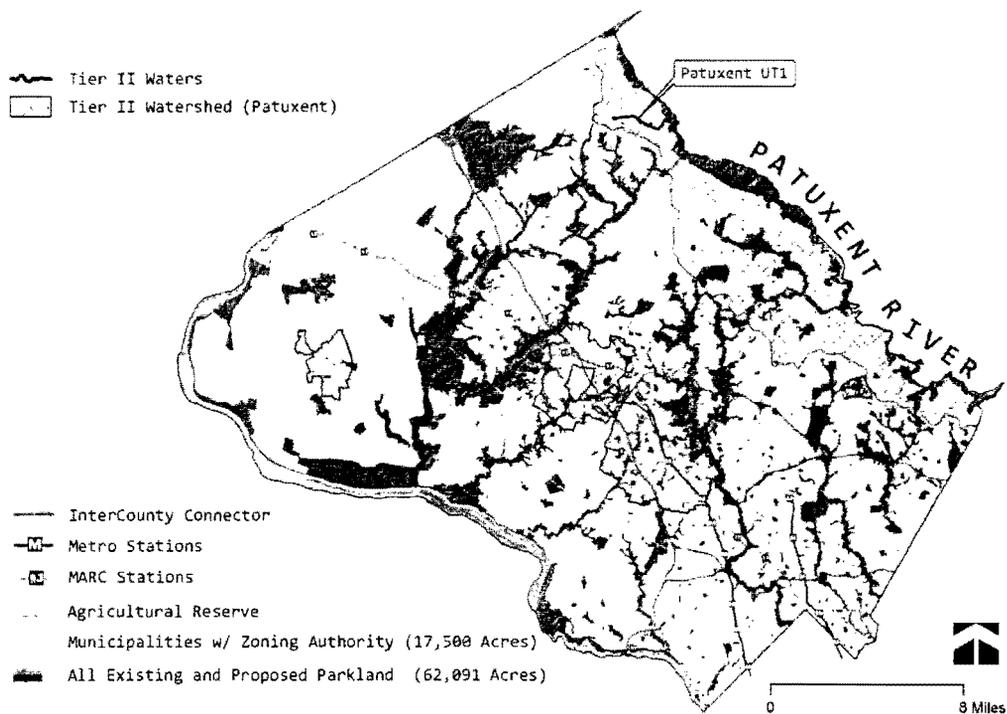
Tier II waters are those at risk of degradation. Any future growth or development in watersheds with Tier II waters will need to be planned and managed to prevent degrading the water resource. For example, when preparing a master plan amendment for Damascus, the land area draining to a headwater stream of the Patuxent (designated as Tier II waters) was rezoned to provide greater protection. Map 6 shows the County’s current Tier II waters.

Water bodies of the highest quality are designated as Tier III (Outstanding National Resource Waters). To date, no Tier III waters have been designated in Montgomery County.

**Smart, Green, and Growing--Local Government Planning**

In 2009, the State Legislature revised the 1992 Economic Growth, Resource Protection, and Planning Act. The new State Planning Visions Act details twelve visions that cover local government planning goals for sustainability, accommodating growth in or adjacent to existing population and business centers, community design, transportation, infrastructure, housing, economic development, environmental protection, resource conservation, stewardship, and implementation. Implementation includes local government planning for adequate funding to achieve the visions. As water quality regulatory requirements continue to evolve, it will be vital to maintain adequate resources to meet them.

**map 6 high quality (tier II) waters in montgomery county**



**Stormwater Management Act of 2007**

This State law requires local jurisdictions to implement Environmental Site Design (ESD) to the Maximum Extent Practicable (MEP). In support of this law the State has revised its Stormwater Management Manual. To comply with the law, jurisdictions are required to amend their stormwater ordinances to reflect the new State regulations, and to show how ESD will be implemented. The law also requires reviewing and modifying local ordinances to remove impediments and facilitate ESD implementation. The County is committed to full compliance with the Stormwater Management Act.

**County Water Quality Policies and Regulations**

County water quality policies and sediment/erosion control and stormwater regulations are directed by State and federal requirements, and are undertaken cooperatively by DPS, DEP, and M-NCPPC.

**Comprehensive Code Review for Environmental Site Design to the Maximum Extent Practicable**

The DEP is conducting a consultant study to review all County codes, regulations, ordinances, policies, and planning process for opportunities and gaps in implementing environmental site design to the maximum extent practicable. This review was recommended by the Clean Water Task Force in 2007 and will be a requirement in the next round of the County's MS4 permit. The County's Chapter 19, which covers floodplain, erosion and sediment control, and stormwater management is under a separate review process to meet State regulatory changes. The DEP study will include recommendations for changes where gaps are identified. The study is to be completed in late summer 2010.



## **Code Revisions**

### **Stormwater Ordinance Revisions**

As the lead Montgomery County agency for stormwater management, the Department of Permitting Services is coordinating the revisions to the County Stormwater Ordinance to address new State regulations. The new County regulations are due by May 2010.

### **Zoning Code Rewrite**

The comprehensive revision of the County's Zoning Code will reorganize, revise, and simplify the Code. This work is being coordinated with the revisions to the County's Stormwater Ordinance, and will remove impediments to implementing ESD. Information on the Zoning Code Rewrite is available online at [montgomeryplanning.org](http://montgomeryplanning.org)

### **Road Code Revisions**

In 2008, the County Road Code underwent an extensive review and was revised to address a number of issues to better fit roads into the natural and community environment. As part of this review and revision process, the Road Code stakeholder group came to consensus about "practicable goals" for using vegetated treatment systems. The revisions include goals for stormwater management and infiltration in road rights-of-way using vegetated treatment systems, the first jurisdiction in the nation to mandate this.

### **MS4 Permit**

In 1990, the EPA established the Municipal Separate Storm Sewer System (MS4) Permit program to control urban stormwater. These permits are part of the National Pollutant Discharge Elimination System (NPDES) established under the 1972 federal Clean Water Act.

The Maryland Department of the Environment (MDE) is responsible for issuing NPDES permits with the goal of eliminating non-stormwater pollutant discharges and reducing pollutants from the storm drain system to the "maximum extent practicable." Montgomery County's first permit was issued in April 1996 and requires compliance in seven areas: legal authority, source identification, discharge characterization, management programs, program funding, assessment of controls, and annual reporting on compliance status.

On February 16, 2010, MDE issued the third round of the Montgomery County's MS4 Permit. The new permit is more stringent, including the requirement to develop implementation plans to achieve the assigned MS4 Permit waste load (i.e. point source) allocations for all EPA-approved TMDLs.

The permit will also require the County to manage runoff from an additional twenty percent of the County's impervious surface area not currently treated to the maximum extent practicable. Management techniques must include ESD practices as well as more conventional stormwater retrofits and stream restoration.

Meeting these requirements will be a technical and fiscal challenge and will be the focus of County watershed management and restoration. DEP will continue to be the lead agency for those affected by the permit including DPS, the Department of General Services (DGS), DOT, and Montgomery County Public Schools (MCPS). DEP will also be the lead agency for coordinating with other local agencies and municipalities with water resource responsibilities. More information on the County's MS4 Permit is available online at [www.montgomerycountymd.gov/DEP](http://www.montgomerycountymd.gov/DEP)

### **Environmental Guidelines**

State law requires all local governments to protect sensitive areas during the development process. The Planning Board's Environmental Guidelines cover the protection of streams and their buffers, wetlands, steep slopes, floodplains, and rare, threatened and endangered species. The Environmental Guidelines are available online at [montgomeryplanning.org](http://montgomeryplanning.org)

The Guidelines are coordinated with State and County programs and laws to protect and conserve sensitive environmental resources, including forest conservation legislation. They also implement strategies for non-point

source pollution reduction, relying on appropriate land use design, stream buffer protection, and Best Management Practices.

### The Clean Water Task Force

In 2006, the County Executive and County Council established the Clean Water Task Force to evaluate existing agency coordination of water resources protection programs, and to examine in detail agency responsibilities for stormwater management and water resources protection.



Task Force members included the directors and high-level administrators from the Department of Environmental Protection, Department of Permitting Services, Department of Transportation, Montgomery County Public Schools, Maryland-National Capital Park and Planning Commission, and the Washington Suburban Sanitary Commission.

In 2007, Task Force members identified a number of high priority recommendations, including creating a Water Resources Protection Policy Committee to improve stormwater management approaches, encourage innovation, and integrate natural drainage and volume reduction design approaches into existing processes. The Task Force's final report is available online at: [www.resolv.org/montgomery/index.html](http://www.resolv.org/montgomery/index.html)

Some of the Task Force's recommendations are being implemented. Since 2007, significant regulatory changes have occurred in stormwater management and water quality.

In early 2010, the Clean Water Task Force reconvened to begin considering the implications and needs of the County's new MS4 Permit, the new State regulations requiring the use of Environmental Site Design (ESD), code revisions to address ESD, and the need to establish an ongoing Water Resources Policy Coordinating Committee, as recommended in the 2007 Task Force Report.

### Special Protection Areas

The County has identified Special Protection Areas (SPAs) where existing water resources or other high quality and unusually sensitive environmental features would be threatened by proposed land uses. The County's four SPAs are Upper Rock Creek, Upper Paint Branch, Piney Branch, and Clarksburg.



In SPAs, land use controls and management techniques help ensure that impacts from master planned development activities are mitigated as much as possible. These controls include limiting imperviousness, planting forest buffers before construction, and extra measures to protect natural features. Special engineered water quality protection measures include enhanced sediment and erosion control and redundant stormwater management structures that go beyond minimum standards.

Performance goals guide design and monitoring for each development project. DEP also performs watershed-wide biological and water quality monitoring to study the overall effects of development on the watershed. The monitoring data is used to evaluate the design and function of SPA Best Management Practices, link their performance to changing stream conditions, and guide future planning decisions.

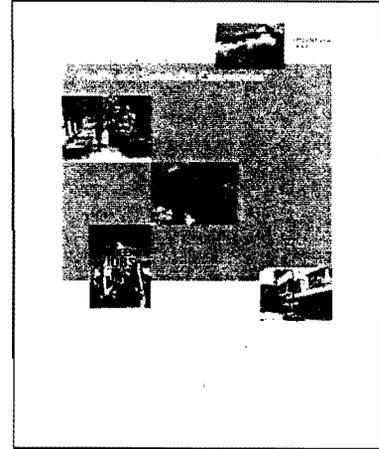
### Patuxent Primary Management Area

The 1984 *Patuxent River Policy Plan*, adopted by the Maryland General Assembly and the seven Patuxent watershed counties, was prepared by the Maryland Office of State Planning to direct local and State agencies in carrying out programs and regulatory decisions in the Patuxent River Watershed. It recommends that local governments enact a Primary Management Area, establishing a wide buffer around reservoirs and streams.

Montgomery County's *Functional Master Plan for the Patuxent River Watershed* focuses on protecting stream systems and the two drinking water reservoirs, and reducing water quality impacts on downstream counties and the Chesapeake Bay. The Plan established the Patuxent River Watershed Primary Management Area where stream buffers are protected, development densities are limited, and extra Best Management Practices are used to control runoff from developing land and agriculture. These requirements are also incorporated in the Environmental Guidelines.

#### **County Climate Protection Plan**

In January 2009, the Montgomery County Sustainability Working Group presented the County's first Climate Protection Plan to the County Executive and the County Council. The Plan starts the County along the path of reducing greenhouse gas emissions by 80 percent by 2050. Its 58 recommendations cover seven areas: renewable energy; residential building energy efficiency; commercial, multifamily, and public building energy efficiency; transportation; forestry and agriculture; long-term planning; and education and outreach. The recommendations that overlap with water resources issues should be identified for priority implementation to achieve multiple environmental benefits. The Climate Protection Plan is available at [montgomerycountymd.gov](http://montgomerycountymd.gov)



#### **Healthy and Sustainable Communities Project**

Following the County Council's direction in the 2007 Growth Policy, Planning staff delivered an initial set of potential Healthy and Sustainable Communities policy goals and indicators, or ways to measure progress. These goals and indicators will help policymakers and community members judge how their policies, programs, and actions contribute to achieving goals such as clean air and water.

The Framework for Action report, drafted with the County Department of Environmental Protection, evolved from public input gathered at a Healthy and Sustainable Communities workshop in 2007. The report's six goals and its indicators will help measure the County's collective efforts toward reaching those goals. This project is viewed as a starting point and will continue coordinated work with the County Executive to create more indicators to measure our mutual goals for housing, transportation, public safety, education, environment, and others. The Framework for Action Report is available online at [montgomeryplanning.org](http://montgomeryplanning.org)

#### **Nutrient Loading Analysis**

Under HB1141, the State requires a nutrient loading analysis for existing and 2030 land cover to estimate the amount of nutrients contributed by land uses in the County's Potomac and Patuxent watersheds. As part of the analysis, the State requested at least two 2030 land cover scenarios.

##### **Land Cover Scenarios**

The State's land cover data for the analysis was updated in 2007, and augmented with major roads and highways, wetland areas, and mixed land use areas. Because the State's model does not include loading factors for mixed uses, they were aggregated with other land cover types with comparable density already in the spreadsheet.

To develop the nutrient loading analysis, the County coordinated with MDE and the seven municipalities with planning and zoning authority—Rockville, Gaithersburg, Poolesville, Laytonsville, Washington Grove, Brookeville, and Barnesville. Each municipality reviewed and modified the State's 2007 land cover data, and provided 2030 land cover projections for two 2030 scenarios.

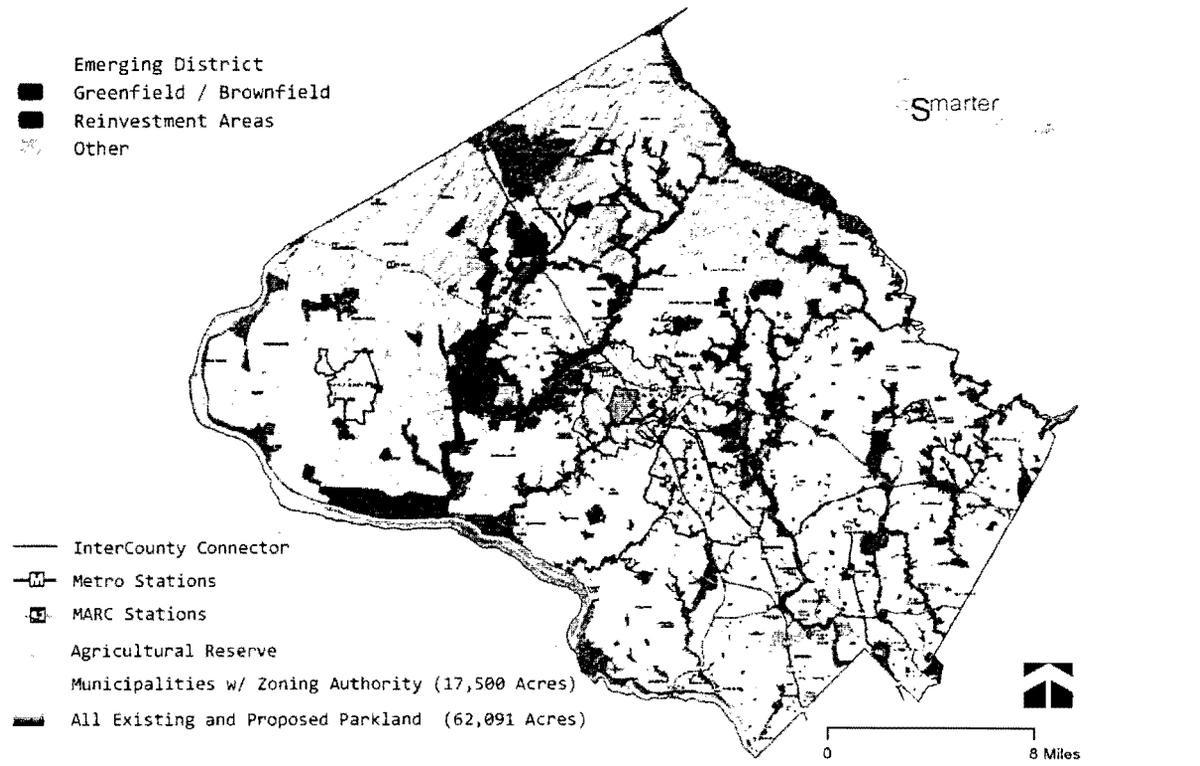
Scenario 1 was based on information contained in County master and sector plans, municipality projections, and the development pipeline in conjunction with demographic and employment projections for 2030.

Scenario 2 is similar to Scenario 1, but with some potential additional areas of development that might occur regardless of horizon year. These additional areas were taken from a strategic growth map (Map 7), developed during the 2009 revision to the Growth Policy.

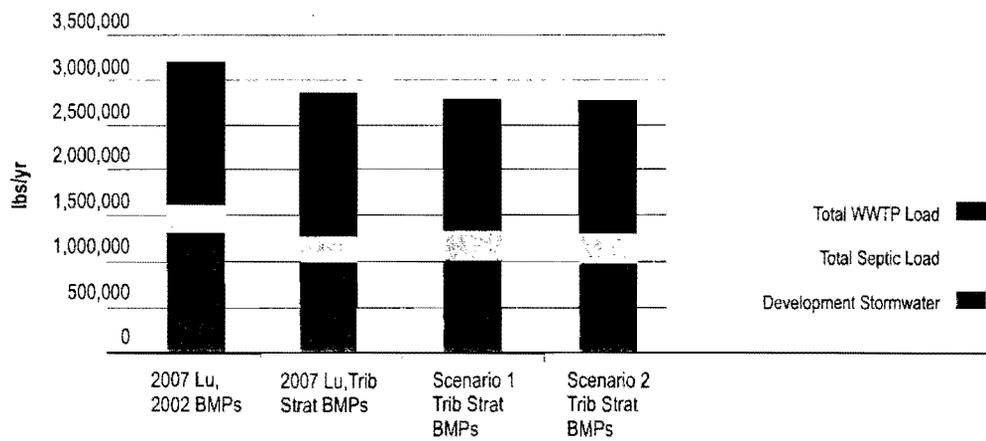
**Nutrient Loading Results**

The estimated nutrient loads include loadings from surface runoff, WWTPs, and septic systems. The results indicate only minor changes in nutrient loading between existing land cover and both 2030 scenarios, and even less difference between the two future scenarios (Charts 2-6). These results are not unexpected because there is little vacant land left in the County, and therefore no significant land conversion scenario options remain (Appendix 8).

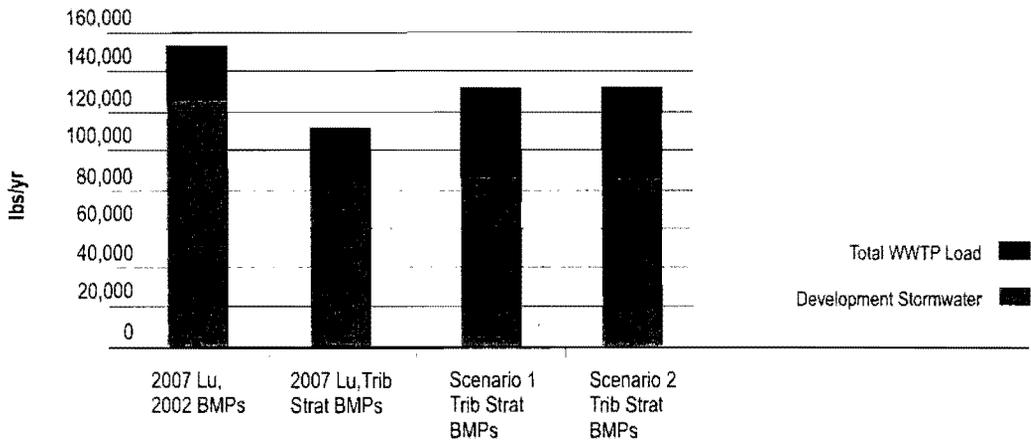
**map 7 strategic growth map**



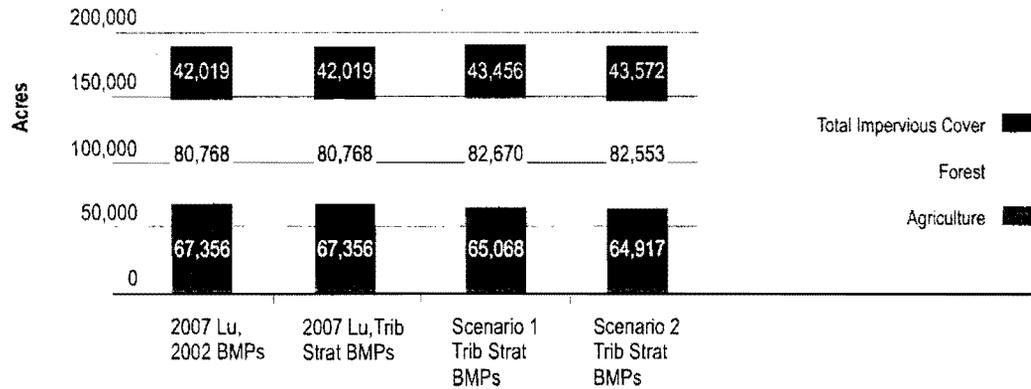
**chart 2 nitrogen loading from development**



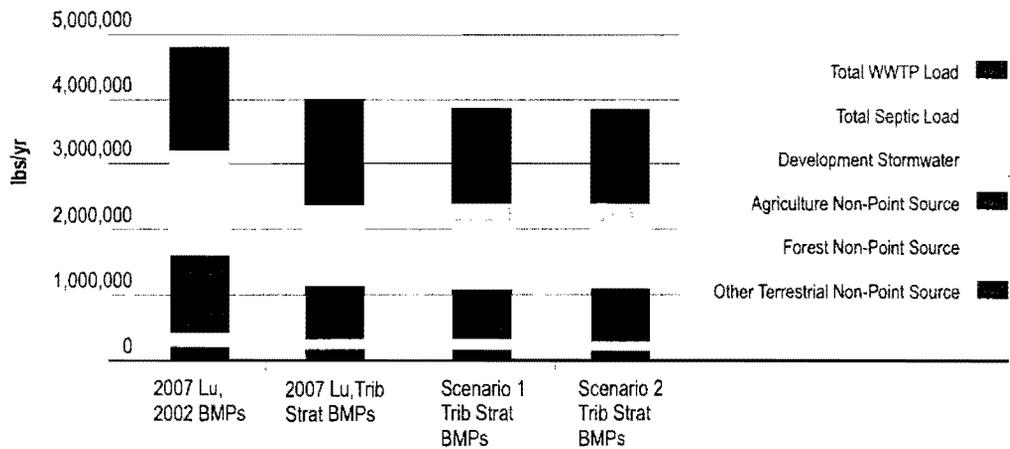
**chart 3 phosphorus loading from development**



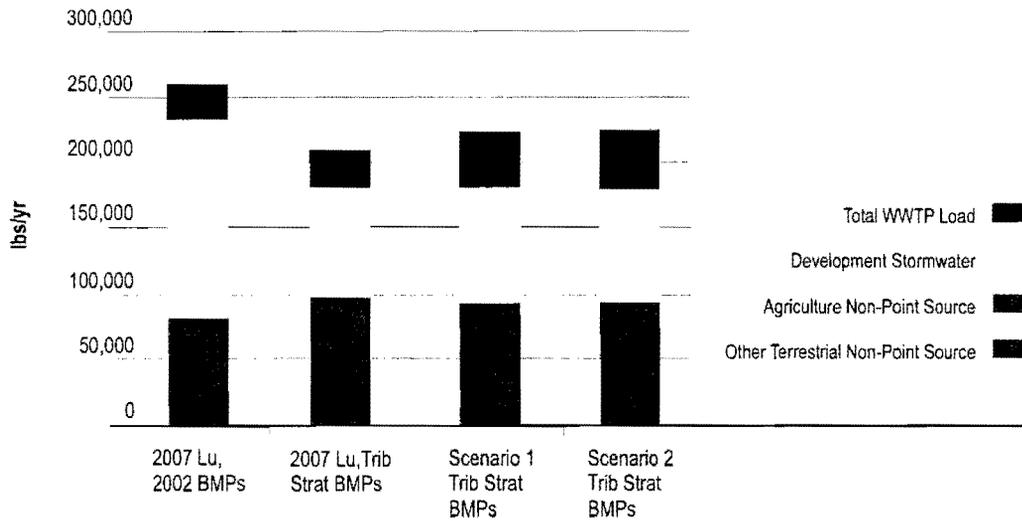
**chart 4 open space and impervious cover**



**chart 5 total nitrogen load**



**chart 6 total phosphorus load**



Accordingly, future land use and development patterns will not significantly influence water quality trends. Strategies such as Environmental Site Design on redeveloped and infill properties, retrofitting older development, and stream restoration will be necessary to protect and improve water quality. Measuring the benefits of these strategies will require analysis on a finer subwatershed scale, which can also account for the effects of various management practices. This type of more detailed analysis will also be useful in implementing the new MS4 Permit and non-point TMDL strategies.

#### Receiving Waters

Water bodies are suitable to receive discharges if they can assimilate pollutant loads and still meet State standards. This concept underlies the Total Maximum Daily Load (TMDL) program, which establishes the amount of pollutants that can be delivered to a water body from all sources without violating water quality standards. In establishing TMDLs, the Maryland Department of the Environment allocates specific pollutant loads to each permitted point source (wastewater treatment plant, industry, etc.). The remaining allowable load is allocated as non-point sources to that water body, plus a margin of safety.

The State's TMDL program is supported by watershed-based water quality modeling that provides management targets. However, given the inherent uncertainty in watershed modeling, an adaptive management strategy and subsequent monitoring will be required to determine if a TMDL will be sufficient to meet water quality standards. Under an adaptive management strategy, management techniques are put in place, the results monitored, and the techniques are changed based on the monitoring results. For example, if monitoring shows that standards are not met, then more stringent stormwater management might be required. As a result, the ultimate suitability of receiving waters for discharges cannot be determined with any certainty in advance of implementing management strategies, but will be addressed as part of the overall TMDL implementation process. This issue will require additional coordination with the State as the County moves forward with MS4 Permit implementation.

Through the MS4 Permit, the County will be required to develop an implementation plan to achieve the stormwater portion of point-source load allocations in those water bodies which have EPA-approved TMDLs. These implementation plans must address runoff from existing developed land must be developed within one year after the new permit is issued, or within one year after subsequent TMDLs are approved by EPA.

These watershed-based plans will include:

- specific and general BMP retrofit implementation
- non-structural BMPs (operational)
- acreage treated with BMPs
- estimated pollutant reductions
- estimated costs for installation and maintenance
- timeline for meeting the MS4 permit stormwater allocations.

There are currently no regulatory requirements for TMDL implementation plans in the County other than through the MS4 Permit. The County's MS4 Permit does not cover the cities of Gaithersburg, Rockville, and Takoma Park. It also does not cover federal and State agencies, including the M-NCPPC and WSSC. These jurisdictions and agencies already have or will be issued separate permits.

Although alternative development patterns and stormwater management are usually considered in assessing the suitability of receiving waters, they will not be a significant factor in Montgomery County because there is so little vacant land left for development. Instead, questions will center on how Environmental Site Design, stormwater retrofits, pollution prevention, and redevelopment can be used to improve water quality and meet standards. For example, accommodating growth through concentrated redevelopment and infill will provide the opportunity to improve water quality, especially in areas built before stormwater management requirements. Because of this, the County's planned growth in its new Growth Policy can actually help protect and even improve water quality and the suitability of receiving waters to assimilate stormwater discharge.

Environmental Site Design is a comprehensive site design method that reduces and treats stormwater runoff using techniques including:

- building placement
- parking areas with minimal impervious cover
- roads with vegetative buffers
- vegetated rooftops
- rain gardens
- minimizing grading
- maximizing vegetative cover and infiltration.

Montgomery County already has in place two important programs for protecting sensitive watersheds, namely the Special Protection Area (SPA) program and the Patuxent Primary Management Area. These programs prescribe standards and measures to resources that merit additional levels of protection. Although these measures predate TMDLs and are therefore not indexed to water quality standards, they are examples of the County's ongoing efforts to implement measures that provide extra protection to sensitive watersheds.

The County's commitment to protecting sensitive and high quality watersheds, MS4 implementation, ESD implementation, maintaining the Agricultural Reserve, protecting and enhancing natural resources, and accommodating future growth through redevelopment and infill will be instrumental in establishing and maintaining the suitability of receiving waters to receive discharges.

#### **Inter-Jurisdictional Coordination**

Meeting water quality standards in watersheds that extend beyond the borders of a given jurisdiction will require the coordination of plans, programs, and efforts among the involved jurisdictions. This will especially be important in TMDL implementation. Guidance from the State will be needed to facilitate this process, especially as the Chesapeake Bay TMDLs are developed and allocated on a smaller scale.

## looking ahead

Clearly, Montgomery County is blessed with many valuable water resources. It is equally clear, however, that although much has been done, much more needs to be done to improve and safeguard those resources, and to meet State standards and TMDLs. The value of our water resources for the County's environmental and economic health and sustainability is simply too great to do otherwise. Continually evolving water quality regulations will necessitate careful planning and cost-effective actions.

As the County runs out of open land to develop, accommodating future growth through redevelopment and infill will become increasingly important. Redevelopment will afford new opportunities to green our urban areas for multiple environmental benefits, including stormwater quantity and quality management. Implementing Environmental Site Design will play a large role in both remaining greenfield development and in future redevelopment. Finding ways to retrofit older development with no or inadequate stormwater controls will also be needed, considering the past and ongoing water quality and habitat degradation in the County's urban streams. Increasing the area, quality, and connectivity of our natural resources, especially in riparian areas, will continue to be vital in protecting the integrity of our water resources. Limiting non-point pollutants while protecting agriculture will also be a challenge.

Funding to implement the County's MS4 Permit, meet TMDLs and water quality standards, and replace and maintain our water and sewer infrastructure, will be a continuing challenge, especially in the face of competing needs and scarce resources. To meet the challenges ahead, implement the County's regulatory programs, and achieve our water resources goals, inter-agency and inter-jurisdictional coordination and cooperation will be even more vital.

## policies and recommendations

The following policies and recommendations address the main water resource issues addressed above including stormwater and water quality, and water supply and wastewater capacity. A separate section is devoted to land use and growth policy because these are key components in all water resources issues.

### Land Use and Growth Policy

**Policy 1.** Plan water supply and wastewater treatment capacity to meet the demands of future growth.

#### Recommendations

- 1.1 .Continue to coordinate future development and redevelopment with WSSC and the *Ten-Year Water and Sewerage Systems Plan*.
- 1.2 Ensure that the *Patuxent River Functional Master Plan* responds to and is coordinated with the updated *Patuxent River Policy Plan*.

**Policy 2.** Ensure that future growth is consistent with smart growth principles.

#### Recommendations

- 2.1 Accommodate future growth through redevelopment and infill in existing urban areas within the Priority Funding Areas.
- 2.2 Support agriculture as the preferred land use in the Agricultural Reserve by limiting the use of alternatives to in-ground septic systems for non-agricultural subdivisions.
- 2.3 Provide funding and regulatory support for the Building Lot Termination (BLT) Easement Program in the Agricultural Reserve to reduce residential uses that are not farm-related.

**Policy 3.** Plan future growth to minimize impacts to water resources.

#### Recommendations

- 3.1 The County's regulatory framework for redevelopment and infill should facilitate levels of stormwater management that exceed State requirements.
- 3.2 Enhance incentives for constructing green buildings and green retrofitting and redevelopment to maximize resource benefits.
- 3.3 Continue to integrate land use, zoning, redevelopment, and urban design planning and strategies into water resources protection and regulatory programs and plans.
- 3.4 Use results from approved water quality implementation plans, watershed studies, Special Protection Areas, and State and County water resource monitoring to guide the master plan update process.

Policy 4. Focus natural area protection, conservation, mitigation, enhancement, restoration, and management to maximize water resources protection and quality.

#### Recommendations

- 4.1 Increase forest, wetland, meadow, stream buffer, and urban tree canopy County wide, especially in watersheds with regulatory limits, water quality impairments, or Tier II designations.
- 4.2 Provide both regulations and incentives to protect and expand urban tree canopy.
- 4.3 Revise the Forest Conservation Law and regulations and the *Trees Technical Manual* as needed to increase the speed and success of reforestation efforts.
- 4.4 Continue to support natural land preservation and easement programs, especially in watersheds with known water quality impairments.
- 4.5 Coordinate park planning and development with Countywide efforts to address water quality regulations.
- 4.6 Develop and implement natural resource management plans for lands owned by local governments.
- 4.7 Maximize water quality protection and improvement through protecting, restoring, and enhancing natural areas.

### **Stormwater and Water Quality**

Policy 5. Manage stormwater and non-point source pollution to maximize water quality and quantity benefits, and meet regulatory requirements and inter-jurisdictional commitments.

#### Recommendations

- 5.1 Develop and implement a collaborative interagency and external stakeholder process to effectively address water resource regulatory issues.
- 5.2 Establish a Water Resources Policy Coordination Committee as recommended by the Clean Water Task Force, and implement an institutional framework to ensure broad-based interagency coordination and collaboration.
- 5.3 Coordinate activities in inter-jurisdictional watersheds with municipalities, adjacent counties, and federal and state property owners to meet water quality protection, compliance, and improvement needs.

- 5.4 Identify improvements needed to maximize water quality improvements and protection associated with new development, redevelopment, infill, roads, retrofitting of older development, and adopt guidelines, regulations, and best practices, including rainwater harvesting and reuse, to achieve those improvements.
  - 5.5 Coordinate efforts with the Maryland Department of the Environment and other State and County agencies and municipalities to meet their separate MS4 Permit requirements and develop TMDL implementation plans for pollutant sources not covered by the County's Permit.
  - 5.6 Use results from approved water quality implementation plans, watershed studies, Special Protection Areas, and State and County water resource monitoring to inform any needed changes to development review requirements.
  - 5.7 Identify and pursue priority implementation for those recommendations of the County's Climate Protection Plan and any subsequent efforts of the Sustainability Working Group that have direct benefits on water quality and quantity.
  - 5.8 Maintain adequate resources and expertise in agencies with water resources responsibilities to meet evolving water quality regulations.
- Policy 6. Maintain effective public outreach and educational programs to convey the vital role of water resources and water quality in the County's overall health and sustainability.

Recommendations

- 6.1 Evaluate existing efforts and implement more effective programs to increase awareness of stormwater as a valuable and usable resource.
- 6.2 Enhance stewardship, education, and outreach programs to increase the voluntary implementation of pollution prevention and runoff management practices.
- 6.3 Continue the development, refinement, and promotion of online tools to raise awareness and encourage stewardship of water resources issues.

**Water Supply and Wastewater**

- Policy 7. Continue to ensure adequate and safe water supply and wastewater conveyance throughout areas served by community systems.
- Policy 8. Continue to ensure that the *Ten-Year Comprehensive Water Supply and Sewerage Systems Plan* supports and is consistent with the General Plan and master and sector plans.
- Policy 9. Continue to use the *Ten-Year Comprehensive Water Supply and Sewerage Systems Plan* to ensure that water supply and wastewater treatment capacities are sufficient for existing and planned development and redevelopment.
- Policy 10. Continue public outreach and education to increase awareness of drinking water as a resource to be valued and conserved.
- Policy 11. Continue programs and actions to minimize pollutant contributions to surface water and groundwater from water and wastewater infrastructure, and meet applicable water quality regulations.

Recommendations

- 11.1 Continue to incorporate progressive technology at wastewater treatment facilities to meet point source pollution limits, while allowing for planned growth.
- 11.2 Continue studies and programs to reduce inflow and infiltration into wastewater collection systems.
- 11.3 Continue programs to reduce sanitary sewer overflows and pipe failures, in accordance with WSSC's Consent Decree agreement with EPA.

Policy 12. Continue programs and actions to protect and recharge source water resources.

#### Recommendations

- 12.1 Continue to promote and implement local and regional source water planning and recommended actions to protect the Potomac and Patuxent Rivers as drinking water sources.
- 12.2 Reduce nitrogen contributions to surface and groundwater from septic systems.
- 12.3 Continue to address well and septic system issues according to the policies and procedures included in the *Ten-Year Comprehensive Water Supply and Sewerage Systems Plan*.
- 12.4 Resolve the issue of sand mounds and alternative technology septic systems and their effects on land use and development density in the Agricultural Reserve in the *Ten-Year Comprehensive Water Supply and Sewerage Systems Plan*.

## implementation

Dealing with water resources issues comprehensively is beyond the scope of any one agency or plan. Consequently, this Plan establishes policies and recommendations to guide the more specific plans and implementation actions of a number of different entities.

Implementing and updating this Plan (as required by State law) will involve more detailed analyses, programs, and action strategies by a variety of stakeholder agencies that have responsibilities related to water resources. A coordinated and collaborative interagency approach consistent over many years will be needed to make progress in meeting this Plan's goals, including meeting water quality requirements that will continue to evolve.

Continuing the work begun by the County's Clean Water Task Force will also be instrumental in achieving these goals. A key Task Force recommendation was to create a Water Resources Policy Coordination Committee, to carry forth the work begun by the Task Force. This Water Resources Plan is one component of a coordinated interagency approach to dealing with water resources and water quality issues and needs.

Table 7 outlines the Plan's policies and recommendations by type and lead agency. It identifies the lead responsibility even though all would have a role in achieving these recommendations.

It classifies the policies and recommendations by type. The umbrella category is for long-term policies or recommendations. The implementation category applies to short- and mid-term actions. Policies and recommendations in the further study category will need additional research to set more specific actions.

**table 7 recommendation type and interagency implementation/coordination**

	type			lead agency
	umbrella	implementation	further study	
<b>land use planning and growth policy</b>				
<b>Policy 1.</b> Plan water supply and wastewater treatment capacity to meet the demands of future growth.	✓			M-NCPPC
<b>recommendations</b>				
1.1 Continue to coordinate future development and redevelopment with WSSC and the <i>Ten-Year Water and Sewerage Systems Plan</i> .	✓			M-NCPPC
1.2 Ensure that the <i>Patuxent River Functional Master Plan</i> responds to and is coordinated with the updated <i>Patuxent River Policy Plan</i> .		✓	✓	M-NCPPC
<b>Policy 2.</b> Ensure that future growth is consistent with smart growth principles.	✓			M-NCPPC

	type			lead agency
	umbrella	implementation	further study	
<b>recommendations</b>				
2.1 Accommodate future growth as much as possible through redevelopment and infill in existing urban areas within the Priority Funding Areas.	✓			M-NCPPC
2.2 Support agriculture as the preferred land use in the Agricultural Reserve by limiting the use of alternatives to in-ground septic systems for non-agricultural subdivisions.	✓			M-NCPPC
2.3 Provide funding and regulatory support for the Building Lot Termination (BLT) Easement Program in the Agricultural Reserve to reduce residential uses that are not farm-related.		✓		M-NCPPC
<b>Policy 3.</b> Plan future growth to minimize impacts to water resources.	✓		✓	M-NCPPC
<b>recommendations</b>				
3.1 The County's regulatory framework for redevelopment and infill should facilitate levels of stormwater management that exceed State requirements.		✓	✓	M-NCPPC/ DPS/DEP
3.2 Enhance incentives for constructing green buildings and green retrofitting and redevelopment to maximize resource benefits.			✓	M-NCPPC/ DPS
3.3 Integrate land use, zoning, redevelopment, and urban design planning and strategies into water resources protection and regulatory programs and plans.		✓	✓	M-NCPPC/ DEP
3.4 Use results from approved water quality implementation plans, watershed studies, Special Protection Areas, and State and County water resource monitoring to guide the master plan update process.		✓	✓	DEP/ M-NCPPC
<b>Policy 4.</b> Focus natural area protection,				

	type			lead agency
	umbrella	implementation	further study	
conservation, mitigation, enhancement, restoration and management to maximize water resources protection and quality.	✓		✓	M-NCPPC
<b>recommendations</b>				
4.1 Increase forest, wetland, meadow, stream buffer, and urban tree canopy area countywide, especially in watersheds with regulatory limits, water quality impairments, or Tier II designations.		✓	✓	M-NCPPC/ DEP
4.2 Provide both regulations and incentives to protect and expand urban tree canopy.			✓	DEP
4.3 Revise the Forest Conservation Laws and Regulations and <i>Trees Technical Manual</i> as needed to increase the speed and success of reforestation efforts.		✓		M-NCPPC
4.4 Continue to support natural land preservation and easement programs and activities, especially in watersheds with known water quality impairments.	✓			M-NCPPC/ DEP
4.5 Coordinate park planning and development with countywide efforts to address water quality regulations.			✓	M-NCPPC
4.6 Develop and implement natural resource management plans for lands owned by local governments.			✓	DEP/ M-NCPPC
4.7 Maximize water quality protection and improvement through protecting, restoring, and enhancing natural areas.			✓	DEP/ M-NCPPC
<b>stormwater and water quality</b>				
<b>Policy 5.</b> Manage stormwater and non point source pollution to maximize water quality and quantity benefits, and meet regulatory requirements inter-jurisdictional commitments.	✓			DPS/ DEP

	type			lead agency
	umbrella	implementation	further study	
	✓			
<b>recommendations</b>				
5.1 Develop and implement a collaborative interagency and external stakeholder process to effectively address water resource regulatory issues.		✓		DEP
5.2 Establish an overarching Water Resources Policy Coordination Committee as recommended by the Clean Water Task Force, and implement an institutional framework to ensure broad-based interagency coordination and collaboration.		✓	✓	DEP
5.3 Coordinate activities in inter jurisdictional watershed with municipalities, adjacent counties, and federal and state property-owners to meet water quality protection, compliance, and improvement needs.		✓		DEP/ M-NCPPC/ WSSC
5.4 Identify improvements needed to maximize water quality improvements and protection associated with new development, redevelopment, infill, roads, retrofitting of older development, and adopt guidelines, regulations, and best practices, including rainwater harvesting and reuse, to achieve those improvements.		✓		DEP/ DPS/ DOT
5.5 Coordinate efforts with MDE and other State and County agencies and municipalities to meet their separate MS-4 Permit requirements, and develop TMDL implementation plans for pollutant sources not covered by the County's Permit.		✓		DEP
5.6 Use results from approved water quality implementation plans, watershed studies, Special Protection Areas, and State and County water resource monitoring to inform any needed changes to		✓	✓	DEP/ M-NCPPC

	type			lead agency
	umbrella	implementation	further study	
development review requirements.				
5.7 Identify and pursue priority implementation for those recommendations of the County's Climate Protection Plan and any subsequent efforts of the Sustainability Working Group that have direct benefits on water quality and quantity.			✓	M-NCPPC/ DEP
5.8 Maintain adequate resources and expertise in agencies with water resources responsibilities to meet evolving water quality regulations.	✓		✓	ALL
<b>Policy 6.</b> Maintain effective public outreach and educational programs to convey the vital role of water resources and water quality to the County's overall health and sustainability.	✓			DEP
<b>recommendations</b>				
6.1 Evaluate existing efforts and implement more effective programs to increase awareness of stormwater as a valuable and usable resource.			✓	DEP
6.2 Enhance stewardship, education, and outreach programs to increase the voluntary implementation of pollution prevention and runoff management practices.			✓	DEP
6.3 Continue the development, refinement, and promotion of on-line tools to raise awareness and encourage stewardship of water resources issues.			✓	DEP
<b>water supply and wastewater</b>				
<b>Policy 7.</b> Continue to ensure adequate and safe water supply and wastewater conveyance throughout areas served by community systems.	✓			DEP
<b>Policy 8.</b> Continue to ensure that the <i>Ten-Year Comprehensive Water Supply and Sewerage Systems Plan</i> supports and is consistent	✓			DEP

		type			lead agency
		umbrella	implementation	further study	
	with the General Plan and master and sector plans.				
<b>Policy 9.</b>	Continue to use the <i>Ten-Year Comprehensive Water and Sewerage Systems Plan</i> to ensure that water supply and wastewater treatment capacities are sufficient for existing and planned development and redevelopment.	✓			DEP/ WSSC
<b>Policy 10.</b>	Continue public outreach and education to increase awareness of viewing drinking water as a resource to be valued and conserved.		✓	✓	DEP/ WSSC
<b>Policy 11.</b>	Continue programs and actions to minimize pollutant contributions to surface water and groundwater from water and wastewater infrastructure, and meet applicable water quality regulations.	✓			WSSC
<b>recommendations</b>					
11.1	Continue to incorporate progressive technology at wastewater treatment facilities to meet point source pollution limits, while allowing for planned growth.	✓			WSSC
11.2	Continue studies and programs to reduce inflow and infiltration into wastewater collections systems.	✓			WSSC
11.3	Continue programs to reduce sanitary overflows and pipe failures, in accordance with WSSC's Consent Decree agreement with EPA.	✓			WSSC
<b>Policy 12.</b>	Continue programs and actions to protect and recharge source water resources.	✓			DEP/ DPS
<b>recommendations</b>					
12.1	Continue to promote and implement local and regional	✓			DEP

	type			lead agency
	umbrella	implementation	further study	
source water planning and recommended actions to protect the Potomac and Patuxent Rivers as drinking water sources.				
12.2 Reduce nitrogen contributions to surface and groundwater from septic systems.		✓		DPS/DEP
12.3 Continue to address well and septic system issues according to the policies and procedures included in the <i>Ten-Year Comprehensive Water Supply and Sewerage Systems Plan</i> .	✓			DEP
12.4 Resolve the issue of sand mounds and alternative technology septic systems and their effects on land use and development density in the Agricultural Reserve in the <i>Ten-Year Comprehensive Water Supply and Sewerage Systems Plan</i> .	✓		✓	DEP

## elected and appointed officials

### County Council

Phil Andrews, President  
Roger Berliner, Vice-President  
Marc Elrich  
Valerie Ervin  
Nancy Floreen  
Michael Knapp  
George L. Leventhal  
Nancy Navarro  
Duchy Trachtenberg

### County Executive

Isiah Leggett

### The Maryland-National Capital Park and Planning Commission

Samuel J. Parker, Jr., Chairman  
Royce Hanson, Chairman

### Commissioners

#### Montgomery County Planning Board

Royce Hanson, Chairman  
Joe Alfandre  
Amy Presley  
Marye Wells-Harley  
Norman Dreyfus

#### Prince George's County Planning Board

Samuel J. Parker, Jr., Chairman  
Sylvester J. Vaughns, Vice Chair  
Sarah A. Cavitt  
Jesse Clark  
Colonel John H. Squire

PLANNING BOARD DRAFT

# water resources

Functional Master Plan

COUNTY DEPARTMENT OF PLANNING AND DEVELOPMENT  
THE MONTGOMERY COUNTY DEPARTMENT OF PLANNING AND DEVELOPMENT

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