

Carroll County Water & Sewer Master Plan



Maryland Department of the Environment Approved Plan
July 2, 2014

Copies of the Carroll County Water & Sewer Master Plan are available...

In hardcopy or on CD at:

Carroll County Bureau of Planning
225 North Center Street, Suite 204
Westminster, Maryland 21157

Online (text and maps) at:

<http://ccgovernment.carr.org/ccg/plan/w-splan/default.asp>

For additional information, contact the Carroll County Planning Bureau:

By phone: 410-386-2145

By e-mail: ccplanning@ccg.carr.org

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RESOLUTION NO. 907-2013

(2013 Water and Sewer Master Plan)

WHEREAS, the County Commissioners of Carroll County are required by Title 9, Subtitle 5 of the Environment Article of the Annotated Code of Maryland to review and revise the Carroll County, Maryland, Water and Sewer Master Plan; and

WHEREAS, on November 6, 2013 the Carroll County Planning and Zoning Commission certified that the proposed 2013 Water and Sewer Master Plan is consistent with the appropriate comprehensive and master plans; and

WHEREAS, the County Commissioners of Carroll County conducted a public hearing, as duly advertised, on the 2013 Water and Sewer Master Plan on December 5, 2013; and

NOW, THEREFORE, BE IT RESOLVED, that the County Commissioners adopt the Master Plan for Water and Sewerage dated December 2013, as revised, this 17th day of December 2013, and direct the Department of Land Use, Planning and Development to incorporate any and all changes on the maps and in the text which may be required.

BE IT FURTHER RESOLVED that this Resolution shall not be effective until the 2013 Water and Sewer Master Plan is approved by the Maryland Department of the Environment in accordance with the Annotated Code of Maryland, Environment Article, Section 9-507.

RESOLVED this 19th day of December 2013.

THE COUNTY COMMISSIONERS OF CARROLL COUNTY, MARYLAND,
a body corporate and politic of the
State of Maryland

ATTEST:

 Shawn D. Reese, County Clerk
 David H. Roush, President (SEAL)

 Richard S. Rothschild, Vice President (SEAL)

 Robin Bartlett Frazier, Secretary (SEAL)

Resolution No. 707-2013
2013 Water and Sewer Master Plan
Page Two
December 19, 2013


J. Douglas Howard (SEAL)


Haven N. Shoemaker, Jr. (SEAL)

Approved for legal sufficiency:


Timothy C. Burke, County Attorney

Alec Yeo, Chairman
Charles M. Chadwick, Vice Chair
Richard J. Soisson
Eugene A. Canale
Matthew S. Helmink
Jeffery A. Wothers
Cynthia L. Cheatwood, Alternate
Richard S. Rothschild, Ex-officio
Philip R. Hager, Secretary



Planning & Zoning Commission
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225 North Center Street
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410-386-2145
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2013 Carroll County Water and Sewer Master Plan

November 6, 2013

The Carroll County Planning and Zoning Commissioner hereby Certifies that the 2013 triennial update to the *Carroll County Water and Sewer Master Plan* as it pertains to the County is consistent with the *2000 Carroll County Master Plan*.

A handwritten signature in black ink, appearing to be "Alec Yeo", written over a horizontal line.

Alec Yeo, Chairman
Carroll County Planning and Zoning Commission

A handwritten signature in black ink, appearing to be "Philip R. Hager", written over a horizontal line.

Philip R. Hager, Secretary
Carroll County Planning and Zoning Commission

CARROLL COUNTY PLANNING & ZONING COMMISSION
Planning a better future for Carroll County

Council Members:
Tim Babylon
Jason Cavey
Marlene Duff
Joseph Renahan
Wayne H. Thuman

Christopher M. Nevin
Mayor



Town of Hampstead

Bradley A. Plante
Town Manager

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2013 CARROLL COUNTY WATER AND SEWER MASTER PLAN

October 23, 2013

The Hampstead Planning and Zoning Commission hereby Certifies that the 2013 triennial update to the *Carroll County Water and Sewer Master Plan* is consistent with the current Town of Hampstead Water Service Area Conditions and Strategy.



Sharon Callahan, Chair
Hampstead Planning & Zoning Commission

10/23/2013

Date



TOWN OF MANCHESTER

(410) 239-3200

FAX (410) 239-6430

RYAN M. WARNER, MAYOR

2013 CARROLL COUNTY WATER AND SEWER MASTER PLAN

October 15, 2013

The Town of Manchester Planning and Zoning Commission hereby Certifies that the 2013 triennial update to the *Carroll County Water and Sewer Master Plan* is consistent with the 2008 Manchester Comprehensive Plan and Environs.

Alexander F. Perricone, Chairperson
Planning & Zoning Commission

3208 YORK STREET P.O. BOX 830 MANCHESTER, MARYLAND 21102-0830

PATRICK T. ROCKINBERG
Mayor

PETER R. HELT
Council President



Council Members
CHRISTOPHER P. EVERICH
Secretary

DAVID M. BLAIS
ROBERT H. KING, JR
SCOTT D. STRONG

October 28, 2013

Lynda D. Eisenberg
Chief, Bureau of Comprehensive Planning
Carroll County Department of Land Use, Planning & Development
225 N. Center Street
Westminster, MD 21157

RE: Mount Airy Water and Sewer Chapter – Carroll County Master Plan

Dear Ms. Eisenberg:

The Town of Mount Airy is currently within the 60-day review period for the Town's Comprehensive Master Plan. Although this process is still on-going, the Mount Airy Planning & Zoning Commission is able to certify that the 2013 triennial update to the Carroll County Master Plan is consistent with the current draft 2013 Mount Airy Master Plan. Based on public comment and process with the update to the draft 2013 Mount Airy Master Plan, substantial changes to the document might be necessary or required. If there are substantial changes to the Mount Airy Master Plan, changes to this update might be required.

If you should have any further questions regarding our response, please contact me directly by email at billbutts@hotmail.com.

Respectfully,

Bill Butts, Chairman
Mount Airy Planning Commission

P.O. Box 50, Mount Airy, MD 21771
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TOWN OF NEW WINDSOR
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NEAL C. ROOP, MAYOR
NRoop@NewWindsorMD.org
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Fax: 410-635-2995

2013 CARROLL COUNTY WATER AND SEWER MASTER PLAN

October 28, 2013

The Town of New Windsor Planning and Zoning Commission hereby certifies that the 2013 triennial update to the Carroll County Water and Sewer Master Plan is consistent with the 2007 New Windsor Community Comprehensive Plan.

David B. Hoffman
Chairperson
New Windsor Planning Commission





Town of Sykesville

7547 Main Street, Sykesville, MD 21784
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sykesville.net

Town House

Ian Shaw, Mayor
Dawn M. Ashbacher, Town Manager
Linda S. Quinn, Town Treasurer
Janice M. Perrault, Town Clerk

2013 CARROLL COUNTY WATER AND SEWER MASTER PLAN
November 4, 2013

The Town of Sykesville Planning and Zoning Commission hereby Certifies that the 2013 triennial update to the *Carroll County Water and Sewer Master Plan* is consistent with the Town of Sykesville Master Plan dated January 24, 2011.

Steve Enslow
Planning Commission Chairman
Town of Sykesville

Taneytown Planning Commission

James Parker
Chairman
Henry Adams
Tom Alvinger
Lance Wisgracht
George Adamczyk

Commission Members
George Taylor
Carl Blough
James LaPorte
Oliver Glass
Ingrid Artois

2013 CARROLL COUNTY WATER AND SEWER MASTER PLAN

October 28, 2013

The Taneytown Planning Commission hereby Certifies that the 2013 triennial update to the *Carroll County Water and Sewer Master Plan* as pertains to the City of Taneytown is consistent with the 2010 Taneytown Community Comprehensive Plan.



James Parker
Chairman Taneytown Planning Commission

Carroll County Water & Sewer Department
1000 North Main Street
Taneytown, MD 21788
www.carrollcountymd.gov



THE TOWN OF UNION BRIDGE

PERRY L. JONES, JR., MAYOR

MEMBERS OF COUNCIL:
DONALD E. WILSON, PRESIDENT
LAURA CONAWAY
LON ELLER CUTSALL
AMY KALIN
EDGAR WENTZ

2013 CARROLL COUNTY WATER AND SEWER MASTER PLAN

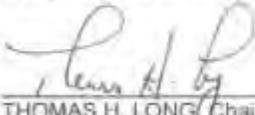
CERTIFICATION

WHEREAS, The Town of Union Bridge Planning & Zoning Commission has studied, reviewed and analyzed those portions of the proposed 2013 Carroll County Water and Sewer Master Plan relating to The Town of Union Bridge and has further examined the operation and effect of this plan as it relates to the Union Bridge Community Comprehensive Plan, adopted July 2008, as amended through April 2010, and

WHEREAS, the foregoing has been discussed and deliberated upon at several meetings of the Planning & Zoning Commission, and the most recent amendments were circulated in advance and discussed at its meeting on October 17, 2013,

NOW THEREFORE, The Town of Union Bridge Planning & Zoning Commission hereby certifies, pursuant to its resolution of October 17, 2013, that the 2013 triennial update to the Carroll County Water and Sewer Master Plan as it relates to The Town of Union Bridge is consistent with Union Bridge Community Comprehensive Plan dated July 2008, as amended through April 2010.

10/17/13
Date



THOMAS H. LONG, Chairperson
Union Bridge Planning & Zoning Commission

The TOWN OF UNION BRIDGE, 114 West Locust Street, Union Bridge, MD 21781
PHONE: 410-775-2711 FAX: 410-775-1095 E-MAIL: UNIONBRIDGE@CARO.GOV

CITY OF WESTMINSTER
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October 10, 2013

**City of Westminster
Planning & Zoning Commission**

2013 CARROLL COUNTY WATER AND SEWER MASTER PLAN

The City of Westminster Planning and Zoning Commission, during its regular meeting on October 10, 2013, certified the 2013 triennial update of the *Carroll County Water and Sewer Master Plan* as consistent with the City of Westminster 2009 Comprehensive Plan.



Peggy Bair, Chair
Planning & Zoning Commission

cc: Steve Horn, City of Westminster
Steve Sager, City of Westminster

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INTRODUCTION

Title 9, Subtitle 5, Health-Environmental Article of the Annotated Code of Maryland, requires Carroll County to review and adopt a Water & Sewer Master Plan every three years. The Maryland Department of the Environment (MDE) Regulation 26.03.01 establishes procedures for implementing the law. This Water & Sewer Master Plan has been developed in accordance with those regulations. This plan is adopted by resolution of the Carroll County Commissioners and does not become effective until approved by MDE.

Carroll County has no central regulating authority that provides water and sewer service. Instead, it has a number of municipal systems and several County-owned community water and/or sewer systems. This Water & Sewer Master Plan encompasses all of Carroll County, including the County's eight incorporated towns and cities. The Carroll County 10-Year Solid Waste Management Plan and triennial updates; and the 2000 Master Plan Update, including the 2009 amendment of the Water Resource Element (WRE) are adopted by the Carroll County Commissioners as separate documents and are incorporated by reference herein.

Carroll County's Water & Sewer Master Plan is broken into four chapters. The first chapter (Countywide Planning Context) addresses the general population and geographic characteristics of Carroll County. This chapter also provides an overview of planning policies, regulations and procedures within the county.

The second chapter (Water and Sewer Planning in General) specifically addresses the purpose and goals of water and sewer planning in Carroll County including: water and sewer related policies, severability, and water and sewer amendment procedures. In addition, the organization and management of the public community water and sewer systems is described, detailing the responsibilities of the municipalities and various County departments involved in oversight and operation of the systems.

The third chapter (Water Supply Facilities) describes groundwater and surface water conditions and existing and proposed water facilities by service area. For each water facility, there is a description of the current conditions, an analysis of needs, and recommendations for future system improvements. A section on regional water facilities addresses current and potential reservoir sites designed to meet water needs outside of municipalities.

The fourth chapter (Sewer Facilities) describes sewage disposal conditions and restrictions in the county. It also describes the existing and proposed public sewer facilities by service area. For each sewer facility, there is a description of the current conditions, an analysis of needs, and recommendations for future system improvements.

Definitions for terms commonly found throughout this document can be found in Appendix 1.

This Water & Sewer Master Plan is administered, implemented, and developed in accordance with:

1. The Code of Public Local Laws and Ordinances of Carroll County;
2. Carroll County Subdivision Regulations - Chapter 103;
3. Carroll County Zoning Ordinance - Chapter 223;
4. The applicable zoning ordinance and subdivision regulations of the county's eight incorporated towns;
5. Construction Codes – Chapter 97; and,
6. The Carroll County Master Plan, small area comprehensive plans, and all associated plan elements.

The MDE has regulatory authority over the systems described in this plan.

The Water & Sewer Master Plan is an implementing measure of the Carroll County Master Plan. It takes into account the policies and visions of the county and municipalities when deciding the areas that will be served with water and sewer. This document does not guarantee that the County or any municipality will provide the facilities needed to achieve the plan. Moreover, this document does not guarantee that facilities or service will be provided by the County or any municipality within the general timeframes (i.e., service area or service area categories) represented in this Plan.

If a property is not within the water and sewer service area, an amendment request can be submitted to change the category of the property if there is a particular need. Any revisions to the service areas must be made by the Planning Commission, Board of Commissioners, and MDE.

The requirements of the Water and Sewer Plan are severable, and if any of its requirements are held unconstitutional by any court of competent jurisdiction, the decision of such court shall not affect or impair any of the remaining sections.

CHAPTER ONE: Countywide Planning Context

• Section I: General Characteristics

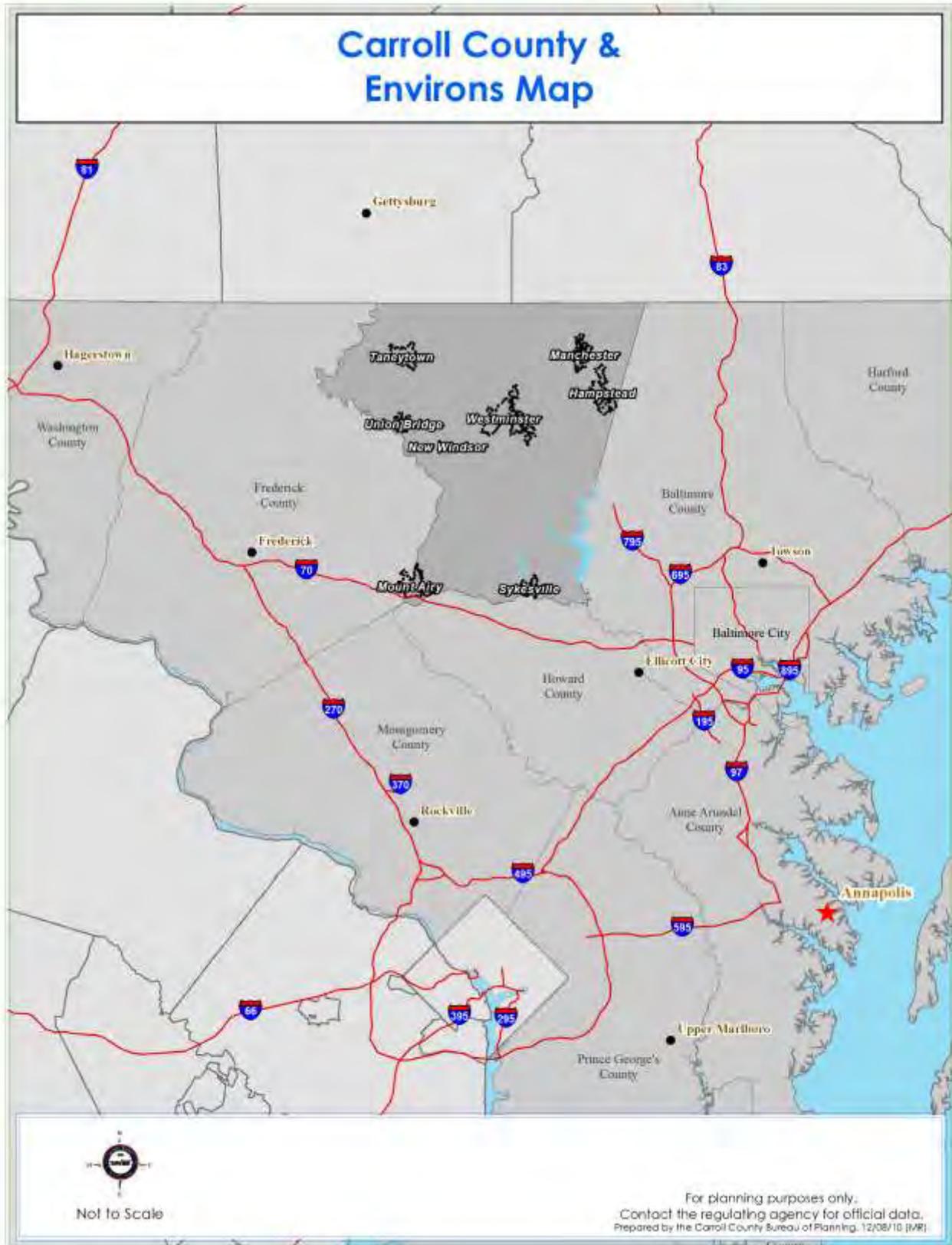
Carroll County is centrally located in Maryland, approximately nine miles west and northwest of Baltimore City. The county is 456 square miles in area and is bounded on the north by the State of Pennsylvania, on the south by Howard County (with the South Branch of the Patapsco River as the common border), on the east by Baltimore County, and on the west by Frederick County.

Topographically, the county has a ridgeline, called Parrs Ridge, running in a northeast-southwest direction, which divides the county into two parts. The area southeast of this ridge drains to the Gunpowder and Patapsco Rivers, while the area to the northwest drains toward the Monocacy River. Eventually, all of these rivers empty into the Chesapeake Bay.

Eight municipalities are located in the county, including the Towns of Hampstead, Manchester, Mount Airy, New Windsor, Sykesville, and Union Bridge and the Cities of Taneytown and Westminster (County Seat). About 28 percent of the county's population lives within the incorporated towns on about five percent of the land area.

Carroll County is a mix of urban small towns, suburban communities, and rural land. It is one of the most productive farming areas in Maryland and is among the leaders in agricultural land preservation nationwide. See Map 1: Carroll County and Environs Map.

Map 1



• Section II: Physical Features

Carroll County's physical features are defined by its soils, geology, aquifers, and streams and reservoirs and the areas that drain into them. In addition, the county's natural features include steep slopes, wetlands, and land cover, including forest land, cropland, and developed land.

Streams and Reservoirs

Many miles of streams traverse the county landscape. The utilization of these waterways is varied, ranging from agricultural uses such as irrigation and livestock watering to recreational uses such as fishing and boating. Carroll County contains all or part of nine 8-digit watersheds, which lie within four different 6-digit watersheds (Middle Potomac River, Conewago Creek, Gunpowder River, and Patapsco River). The 8-digit watershed boundaries are defined by some of the more notable geographic features in the county, including Parr's Ridge. Three of these watersheds drain to public drinking water reservoirs (See Map 2 MDE 8-Digit Watershed Boundaries).

Gunpowder Falls, Morgan Run, Beaver Run, Snowden's Run, Stillwater Creek, East Branch Patapsco River, Carroll Highlands Run, Autumn Run, Piney Run, Gillis Falls, Aspen Run, and South Branch Patapsco River are all Use III waters favorable to natural trout propagation because of their high water quality. Of these, all but Gillis Falls, Aspen Run, and South Branch Patapsco River, are further classified as Use III-P waters, which flow into a public water supply. The remaining streams in the county are either Use IV or Use I waters offering recreational fishing opportunities as well.

Many of the waterways in Carroll County are within the watershed of drinking water reservoirs. A small section of northeastern Carroll County drains into Prettyboy Reservoir and Loch Raven Reservoir in Baltimore County. About 130 square miles, or 28 percent of the county, drains into Liberty Reservoir in the southeast. Together, the three reservoirs are a major drinking water source for Baltimore City, Baltimore County, Harford County, Howard County, and parts of Carroll County and Anne Arundel County. Part of the drainage basin in the South Branch Patapsco River also drains into Piney Run Reservoir in southeastern Carroll County. This reservoir is designed to serve future populations, and is not currently in use as a drinking water source.

Due to the importance placed on protecting the quality of water entering these reservoirs, much of the land immediately surrounding the lakes are well forested and free from development. These reservoir sites provide opportunities for recreational activities.

Map 2



Stream Buffers and Wetlands

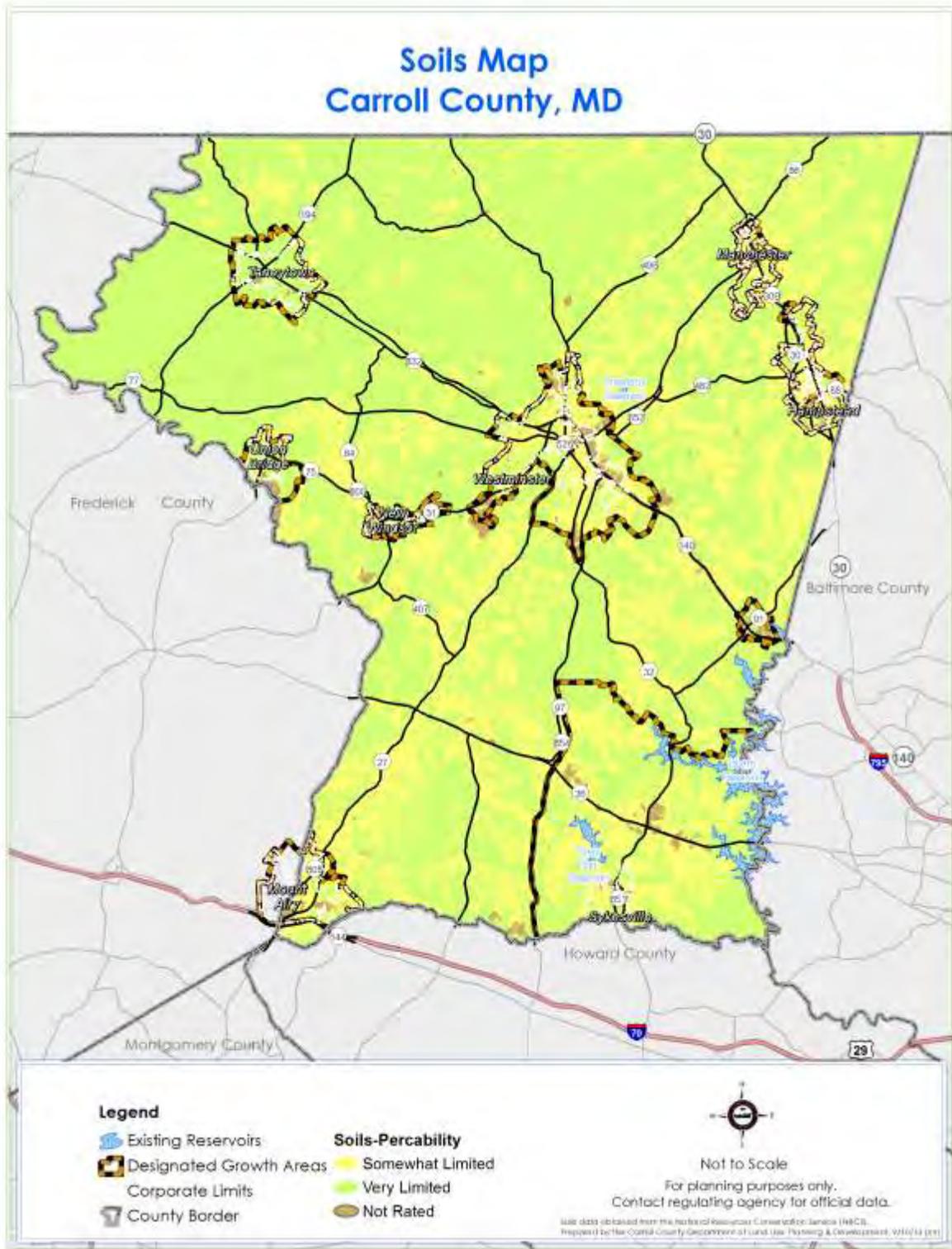
Water quality is of great importance for those areas draining into the reservoirs, but it is also important throughout the county. Carroll County requires a variable width buffer associated with streams through the subdivision process. It also prohibits building in the floodplains, which often include stream buffer areas.

Carroll County does not have any tidal wetlands due to its inland location, but it does have numerous non-tidal wetland areas associated with streams and floodplains. As a result, wetlands play a significant role for the county's streams, ensuring a more consistent delivery of water to the streams, both during drought and flood periods; and serving as natural filtration systems of nutrients.

County Soils

Much of the county's outstanding agricultural production levels depend upon the quality of its soils. The northwestern part of the county, is one of the most productive areas, and is suitable for most general types of farming. There are areas throughout the county that have soil that makes it difficult to farm due to the inability to hold moisture. This makes recharge and drainage also difficult. Residential development on these soils can be problematic as well, particularly in terms of foundation excavation and sighting of septic fields, but they are otherwise suitable for building upon. (See Map 3: Soils Map of Carroll County, MD.)

Map 3



Section III: Population

An important factor affecting the size and scope of water and sewer facilities is population. The distribution of population, population density, and the location of other users such as commercial and industrial facilities is determined to a great extent by the land use plan and zoning regulations of a jurisdiction.

Population Projections

Annual population projections produced by the Carroll County Planning Bureau are primarily derived from the total number of households. The number of use and occupancy (U&O) certificates issued each year is used to determine household growth. Over the last decade, the county has experienced periods of both rapid growth and decline in development activity. Because of the inconsistency, the growth rate used for the County's Round 7C population projections, submitted to the Baltimore Metropolitan Council in August 2010, was 0.986 percent, which was determined by examining the last eight years in total instead of the typical last 5-year period.

Based on current land use designations in the county and an average household size of 2.79 persons, the county is projected to grow to a total population of nearly 258,200 when all of the land is fully developed (i.e. buildout). Using the average number of U&Os issued over the last 8 years, it was determined that the county would add approximately 13,700 additional households, or roughly 685 units per year, between 2010 and 2030. See Map 4: Potential Residential Development.

Future Population

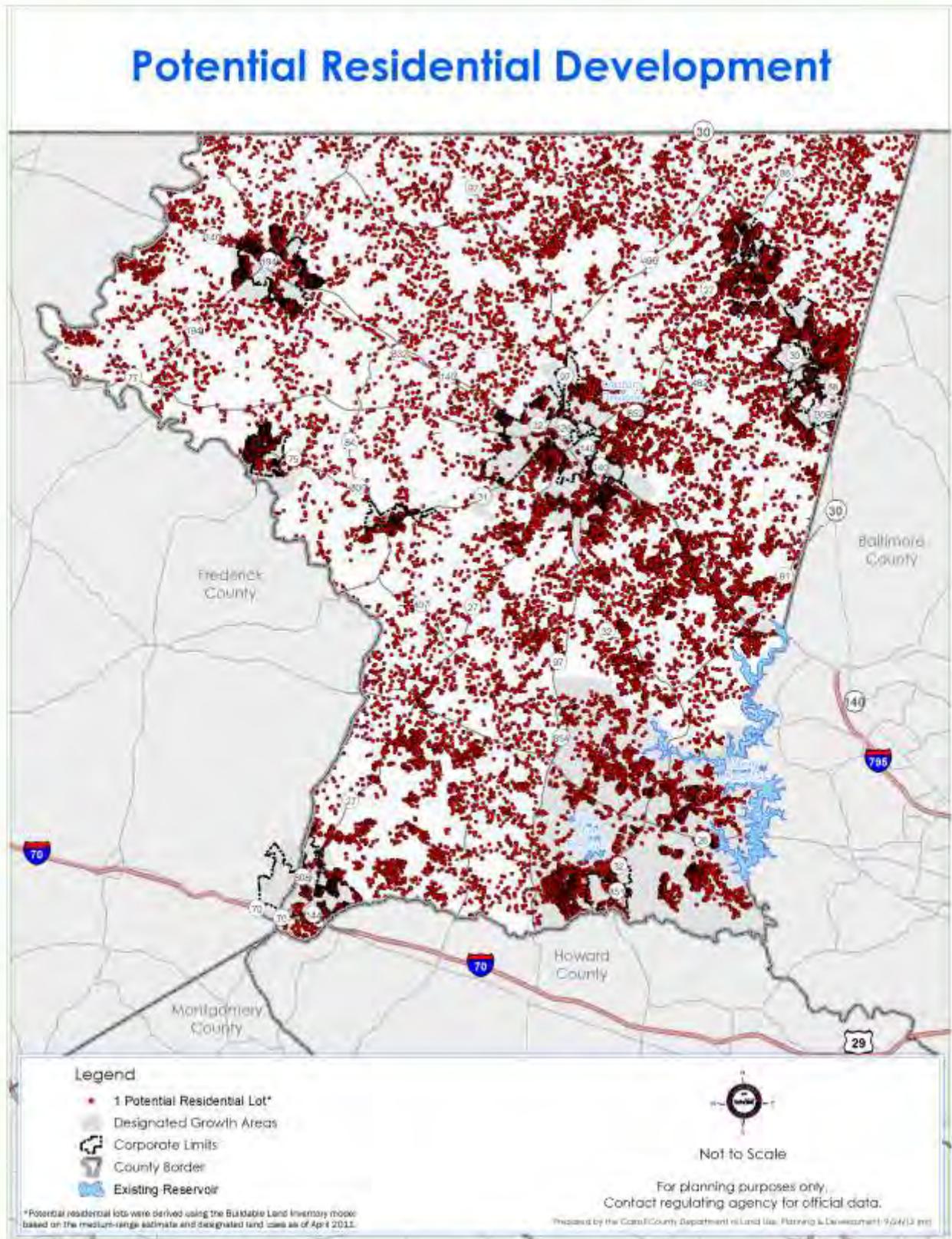
The table below shows the projected population in 2030 and the projected year the county would reach buildout under current land use designations. At this rate of growth, the county would reach a population of 209,550 around 204-. The County believes buildout could be reached by 2060 with a population of 258,187. (See Table 1: Carroll County Population Projections).

Table 1: Carroll County Population Projections

Population	2010	2015	2020	2025	2030	2035	2040
State	5,773,552	5,962,000	6,216,150	6,428,250	6,611,900	6,753,000	6,861,900
County	167,134	171,000	183,600	192,300	199,600	205,500	209,550

Source: Carroll County Bureau of Planning (Round 7C submittal to BMC), August 2010 and the 2010 Census

Map 4



• Section IV: Land Use

General Land Use Patterns

Historically, the majority of development in Carroll County has been directed to the county's eight Designated Growth Areas (DGAs), where public water and sewer facilities are available. Small area comprehensive plans are prepared for DGAs. Most of DGAs have a municipality at their center where residential, commercial and industrial development is concentrated. Directing growth to DGAs preserves farmland, maintains the rural character surrounding the towns, and allows for more effective and efficient delivery of services. As a result, Carroll County has retained its rural, scenic and cultural character.

Table 2: Existing use of Land by Incorporated Status shows the existing use of land, which represents the type of development on the ground.

Table 2: Existing Use of Land by Incorporated Status

Category	Unincorporated Area		Incorporated Area		Countywide	
	Acres	% of Area	Acres	% of Area	Acres	% of Area
Agriculture/Resource	181,865	65.9%	2,826	20.9%	184,691	63.8%
Commercial Uses	1,280	0.5%	761	5.6%	2,041	0.7%
Industrial/Manufacturing	2,209	0.8%	500	3.7%	2,709	0.9%
Mixed Office and Commercial	222	0.1%	132	1.0%	354	0.1%
Mixed Office and Residential	8	0.0%	9	0.1%	17	0.0%
Mixed Office, Res., and Comm.	6	0.0%	6	0.0%	12	0.0%
Mixed Res. and Commercial	336	0.1%	58	0.4%	394	0.1%
Multi-Family Residences	167	0.1%	221	1.6%	389	0.1%
Office	201	0.1%	96	0.7%	296	0.1%
One- and Two-Family Res.	60,764	22.0%	3,887	28.7%	64,650	22.3%
Open Space and Recreation	5,366	1.9%	1,447	10.7%	6,813	2.4%
Public Facilities and Institutions	4,407	1.6%	1,304	9.6%	5,711	2.0%
Reservoirs	6,754	2.4%	0	0.0%	6,754	2.3%
Transportation	9,700	3.5%	1,544	11.4%	11,244	3.9%
Transportation Support	15	0.0%	3	0.0%	17	0.0%
Utility	1,198	0.4%	285	2.1%	1,484	0.5%
Vacant Land	1,150	0.4%	417	3.1%	1,567	0.5%
Warehouse/Flex	164	0.1%	13	0.1%	177	0.1%
Other	336	0.1%	23	0.2%	359	0.1%
TOTAL	276,147	100.0%	13,532	100.0%	289,679	100.0%

Source: Existing Use of Land GIS data layer, Carroll County Bureau of Planning, 2010

- **Section V: County Planning, Policies, Regulations, and Procedures**

Comprehensive Planning

Master Plan and Comprehensive Plans

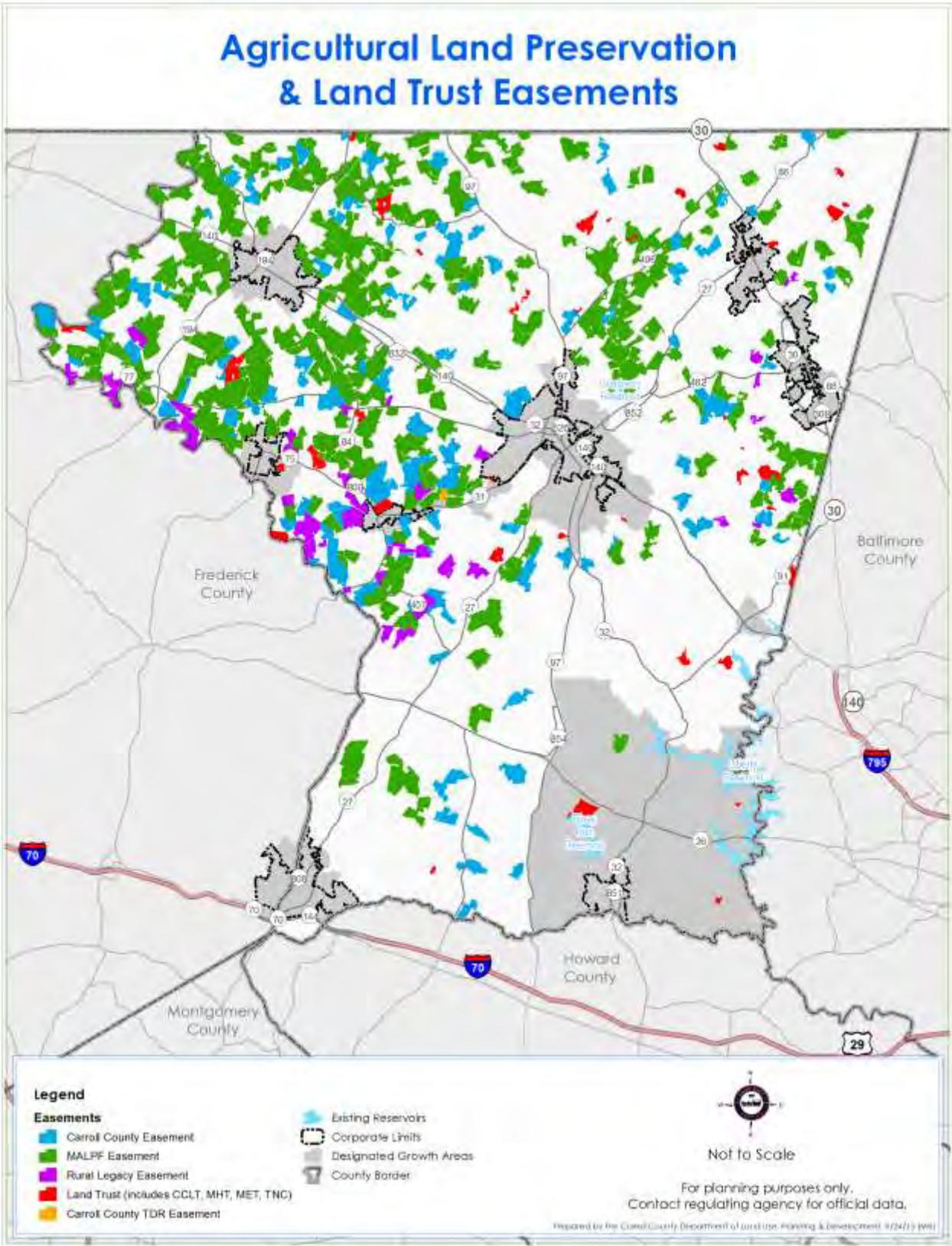
The Carroll County Commissioners adopted *Carroll County Challenges & Choices: A Master Plan for the Future* on December 20, 2000. This 2000 update represented the first revision of the original 1964 Carroll County Master Plan. The plan presents the vision for the County's future in terms of growth, land use, provision of public services, management of water resources and natural resources, economic development, transportation, and other planning related topics.

Agriculture continues to be a major industry in the county. This fact is recognized by the County Master Plan's goal of permanently preserving 100,000 acres of farmland by 2020. See Map 5: Agriculture Land Preservation Easements. The County's locally successful and nationally recognized Agricultural Land Preservation Program will be maintained, continuing to preserve Carroll County's rural characteristics.

The County Master Plan includes a land use map that identifies the locations of general planned land use within the county, excluding DGAs. Small area comprehensive plans, each of which has its own land use map are prepared and adopted on a rotating basis for each of the eight incorporated municipalities and their surrounding DGAs, as well as the unincorporated communities of Eldersburg and Finksburg (see Map 6: County Land use Designations). Carroll's eight incorporated municipalities and their surrounding DGAs, and the unincorporated community of Eldersburg, will continue to accommodate the majority of growth in the county. Water and sewer serve or are planned to serve municipalities and their DGAs with the exception of Finksburg. At one time water and sewer provisions were planned for Finksburg. At present, public water or sewer facilities do not serve Finksburg, nor is service planned for Finksburg..

See Tables 3A & 3B: Land use Designations - Countywide.

Map 5



Map 6

Carroll County Land Use Designations

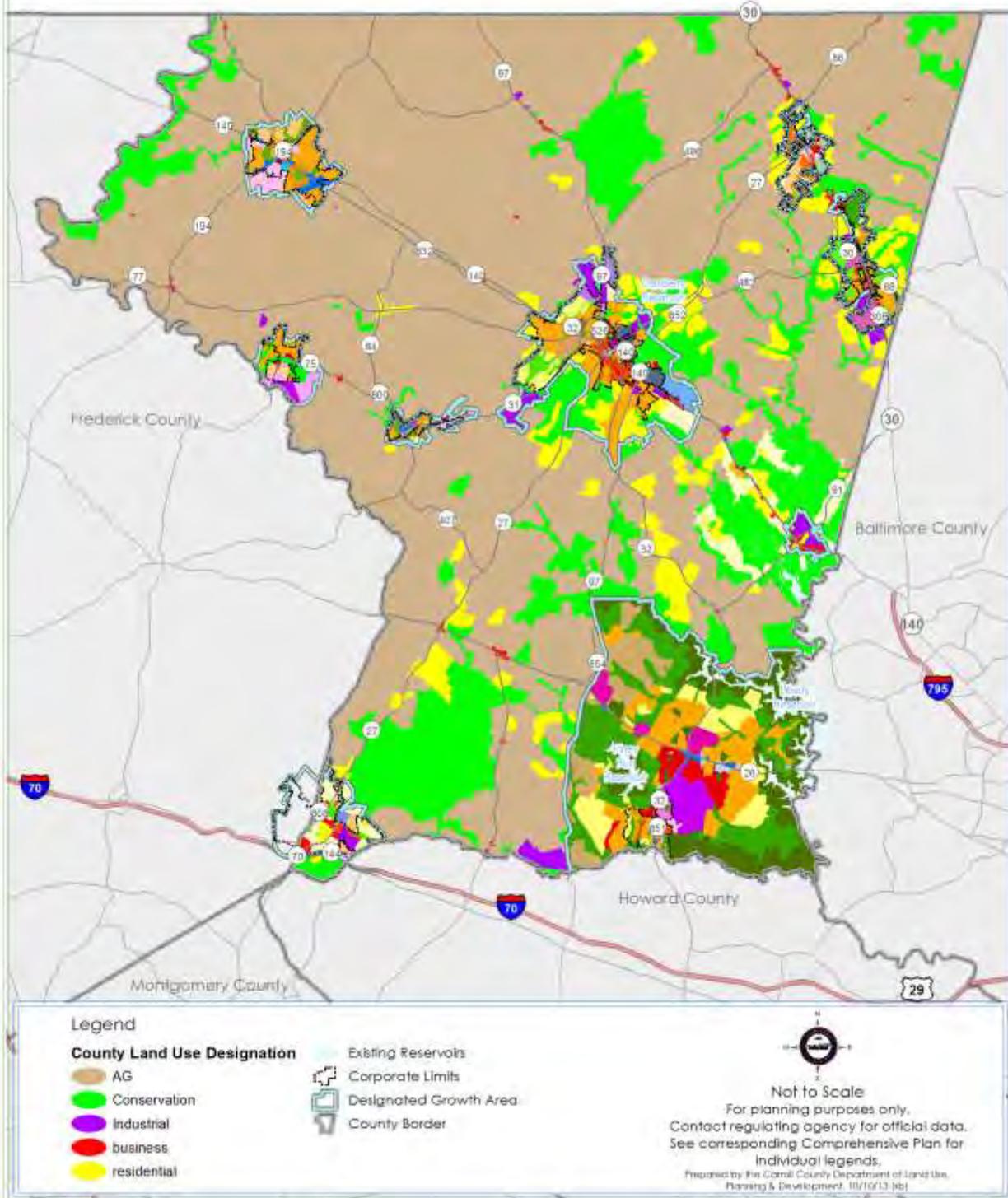


Table 3A: Land Use Designations - Countywide

Land Use	Unincorporated County Outside GABs (Acres)	% of Unincorporated Outside GABs	Incorporated Towns (Acres)	% of Incorporated	Within GABs Outside Corporate Limits (Acres)	Within GABs Outside Corporate Limits	Total Acres*	% of Total
Agriculture	179,628	78.8%	0.0	0.0%	2,682	6.0%	182,310	64.0%
Conservation	35,305	15.5%	2,104	17.5%	22,424	50.1%	59,833	21.0%
Business	702	0.3%	792	6.6%	2,110	4.7%	3,604	1.3%
Industrial	938	0.4%	2,184	18.2%	3,264	7.3%	6,387	2.2%
Residential	11,368	5.0%	6,944	57.7%	14,242	31.8%	32,554	11.4%
Totals	227,941	100.0%	12,024	100.0%	44,723	100.0%	284,688	100.0%

Source: Carroll County Bureau of Planning, 2010

Table 3B: Land Use Designations By Jurisdiction

Land Use	Freedom / Sykesville		Hampstead		Manchester		Mount Airy		New Windsor		Taneytown		Union Bridge		Westminster	
	In Town	Out of Town / In GAB	In Town	Out of Town / In GAB	In Town	Out of Town / In GAB	In Town	Out of Town / In GAB	In Town	Out of Town / In GAB	In Town	Out of Town / In GAB	In Town	Out of Town / In GAB	In Town	Out of Town / In GAB
Agriculture	0	2,581	0	0	0	0	0	0	0	0	0	0	0	0	0	44
Conservation	273	13,852	756	170	353	37	192	30	90	68	160	218	102	270	178	1,771
Business	148	1,300	138	66	95	0	3	66	59	74	282	80	36		579	631
Industrial	0	705	443	55	0	0	361	27	76	72	200	444	88	462	468	939
Residential	434	6,902	560	213	901	61	956	386	216	257	1,099	650	388	176	2,391	2,840
Totals	855	25,340	1,897	504	1,349	98	1,512	509	441	471	1,741	1,392	614	908	3,616	6,225

Source: Carroll County Bureau of Planning, 2010

Zoning

Zoning is one way to implement the County Master Plan. Zoning generally is guided by the land use designations. However, the two do not always match. It is expected that over time, as annexations occur and/or land uses change, zoning and land use designation will come to match.

The Agricultural zone is the largest zoning district in the County, consisting of 179,638 acres. The purpose of the Agriculture zone is to allow for agriculturally oriented uses and limit other uses.

The Conservation Zoning District is the second largest zone in the county, consisting of 59,833 acres; 1,938 of which are located in the towns, and 56,354 of which are located in the county. The purpose of the Conservation zone is to protect sensitive environmental features such as steep slopes, stream valleys, woodlands, and water sources. Permitted uses are limited to those that are fairly low impact, and design guidelines encourage clustering development away from environmental features to land that is more suitable for building upon.

The residential districts are located primarily in the county. Seventy-seven percent of all residential zoning is within the county, and 23 percent lies within the town boundaries.

Business zoning naturally occurs in the areas of heaviest populated area, which are the towns or DGAs. Sixty percent of all business zoning is located in one of the major DGAs. The remaining business zoning is typically located at major crossroads, vestiges of small communities that sprung up around the commerce attracted to these areas. Similarly, industrial zoning is heavily concentrated in the DGAs, with 71 percent of all industrial zoning occurring in these growth areas.

A summary of the land area of the county by zoning classification follows in Table 4: Carroll County Zoning Classification - Acres.

Table 4: Carroll County Zoning Classification – Acres

Zoning	Unincorporated County (Acres)	% of Unincorporated	Incorporated Towns (Acres)	% of Incorporated	Total Zoned Acres*	% of Total
Agriculture	181,907	67.9%	0	0.0%	181,907	65.0%
Conservation	56,354	21.0%	1,938	15.9%	58,292	20.8%
Business	1,105	0.4%	1,602	13.2%	2,707	1.0%
Industrial	3,661	1.4%	1,443	11.8%	5,105	1.8%
Residential	24,630	9.2%	7,195	59.1%	31,825	11.4%
Historic	146	0.1%	1	0.0%	147	0.1%
Totals	267,804	100.0%	12,179	100.0%	279,983	100.0%

*Most roadways do not have a zoning classification and are not included in this table (11.857 acres)

Water Resources Element

The Water Resources Element (WRE) is an element of the 2000 Carroll County Master Plan Update. It is a requirement of 2006 House Bill 1141, passed during the 2006 session. The WRE requires counties and municipalities to account for the opportunities and limitations presented by water resources when planning for growth, including water supply; resource protection; and adequate receiving waters for the purpose of meeting water quality standards, localized total maximum daily loads (TMDLs) and the Bay TMDL.

The WRE was written as a joint effort between Carroll County and its municipalities. The plan provides recommendations for the county's water resources at the MDE 8-digit watershed level, and a countywide assessment of nonpoint pollution source issues. The County hired a consultant, Malcolm Pirnie, to help with the technical analysis required in the plan.

The WRE was adopted by the County on April 1, 2010, and subsequently by each municipality. This Water & Sewer Master Plan reflect many of the concepts and recommendations contained in the WRE acts as one of the WRE's implementation tools.

Water Resources Coordination Council

The Water Resources Coordination Council (WRCC) was formed in March 2007 to serve as the lead intergovernmental agency for water resource planning, development, and protection in Carroll County. The Council consists of representatives from each of the municipalities, the County, and the Carroll County Health Department. Additional coordination has been orchestrated between the County and MDE, Maryland Department of Planning (MDP) and Department of Natural Resources (DNR).

During development of the WRE, the council met once a month, providing a forum for questions and concerns. Each month the council would review changes that were made to the document as a whole, as well as each individual municipal section. WRC also used Capacity Management Plans (CMPs) to gather data for WRE preparation.

Water Conservation and Demand Management Efforts

Carroll County has been aggressively pursuing an understanding and development of its water resources for more than three decades. In the late 1970s, the County Commissioners made a commitment to evaluate the county's groundwater resources. This initial commitment led to the development of a comprehensive countywide water resource management program. Elements of that program have been implemented since that time, including a concerted effort to evaluate impacts and to manage and protect public water supplies. The program is currently located in the Bureau of Resource Management under the Carroll County Department of Land Use, Planning, and Development.

Water Resource Management Program

In 1988, House Bill 710 was enacted, authorizing Carroll County to develop, administer, and enforce a program to protect ground and surface waters through land use controls or other regulations. This Water Resource Management Program has numerous objectives that are directly intended to support the maintenance of public water supplies. These activities include the following:

1. Maintain and improve existing water supply sources
2. Develop new water supply sources
3. Design and implement special targeted water quality monitoring programs, i.e., Piney Run Reservoir
4. Delineate water resource protection areas
5. Develop and maintain water resource related databases
6. Promote a public education and information program
7. Evaluate potential funding mechanisms
8. Work directly with and support the incorporated towns on water resource and supply issues

The Program is also charged with the review of land development proposals with regard to the potential impact on community water supply resources. In that context, numerous databases of potential sources of water resource contamination are used in the review and source development process.

In April 2004, the County Commissioners adopted Ordinance No. 04-08, which created Chapter 218, Water Resource Management of the County Code. This new chapter formalized and strengthened the ability to manage and protect water resources within the county. The chapter provides for the delineation of management areas, and the ability to perform a water resource impact review on all proposed development projects within the county. In addition, water resource protection easements are required adjacent to streams, wells, and well sites when land is developed. Also adopted by resolution was the Water Resource Management Manual, which provides for management standards and design criteria relating to land use activities and management areas. Several municipalities, including the Towns of New Windsor, Manchester, Mount Airy, and Sykesville, also have adopted Chapter 218.

Designation of Water Resource Management Areas

The identification of public water supply sources is a key component in managing existing and future water supply needs. The aquifers and streams that feed the existing and future supplies must be protected to ensure that good quality is maintained and dependable yields are not reduced. Chapter 218 of the County Code designates the following Water Resource Management Areas associated with existing and future water supplies. See Map 7 for Water Resource Management Areas.

Carbonate Rock Area. The Carbonate Rock Area encompasses all areas that are currently known or suspected to be underlain by carbonate rocks. This includes the Wakefield Marble and Silver Run Limestone geologic units, as well as unnamed calcareous zones within schist and phyllite areas.

Wellhead Protection Area. The Wellhead Protection Area represents those regions that contribute groundwater to the indicated sources. These areas are based on “capture areas” as estimated from available field testing data, hydrologic flow equations, and groundwater availability estimates, in combination with the hydrogeological characteristics of the subject aquifers.

Aquifer Protection Area. The Aquifer Protection Area encompasses regions within 2,000 feet of each Designated Growth Area (DGA) boundary, as well as any watershed-draining tributary to the Aquifer Protection Area (APA). The groundwater recharge available is assumed to be that which could be captured by gravity drainage into each of these areas. These areas, therefore, constitute the potential groundwater resource available to serve DGAs into the future.

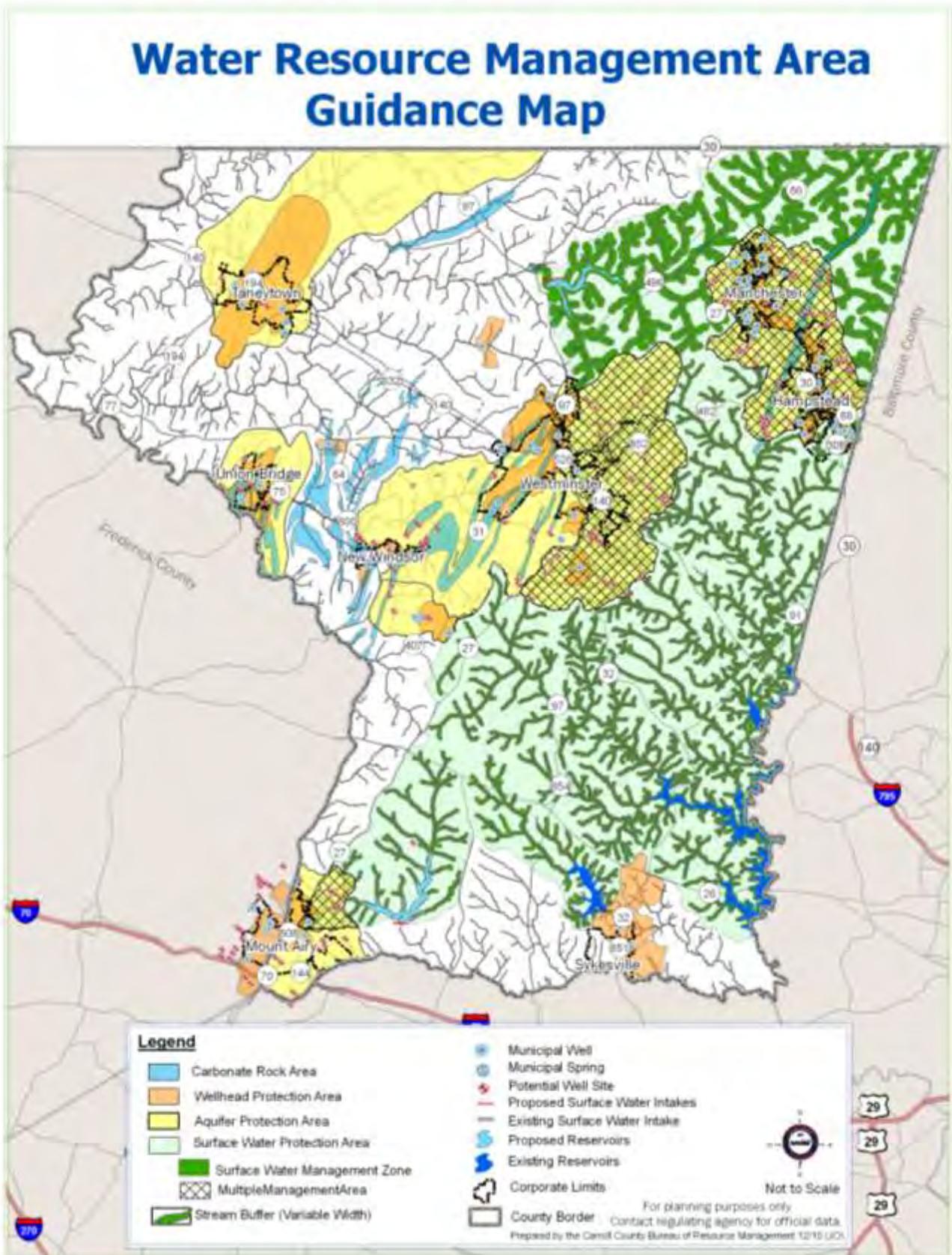
Surface Watershed Area. The Surface Watershed Area encompasses the drainage basins of all existing and proposed surface water reservoirs in Carroll County. The delineation of these areas is based on topography and gravity drainage to the reservoirs.

Countywide Water Conservation Program

The conservation of water is a fundamental aspect of resource protection and management. This component of Carroll County’s Water Resource Management Program consists of three elements: educate the public, update the plumbing code for new construction, and retrofit plumbing in existing construction.

Brochures, videos, and public speaking engagements are components of the educational effort. Information on water conservation is also made available through the County’s website through the Bureau of Utilities and Drought Information pages. The County mandates water conservation devices for new construction and requires that certain plumbing fixtures that are newly installed meet specified flow rates. See Map 7 for the Water Resource Management Area Guidance Map.

Map 7



CHAPTER TWO: Water and Sewer Planning in General

• Section I: Purpose and Goals

Purpose

The purpose of the Water & Sewer Master Plan is to further public health and welfare in Carroll County through the orderly development and provisions of adequate water and sewer service. The Water & Sewer Master Plan implements and is consistent with the 2000 County Master Plan Update, 2010 WRE amendment and small area comprehensive plans. Through a coordinated effort with the municipalities, the Water & Sewer Master Plan sets priorities for water and sewer projects based on an evaluation of facilities usage, the need for upgrade and/or expansion, public health considerations, and planned growth patterns. (See Map 8: Planned Water Service Areas & Map 9: Planned Sewer Service Areas for service area boundaries).

Goals

The Water & Sewer Master Plan is based upon the goals and priorities established in the most recent County Master Plan, *Carroll County: Challenges and Choices – A Master Plan for the Future*, which was adopted on December 20, 2000. Additionally, this Water & Sewer Master Plan incorporates goals and actions recommended in the small area comprehensive plans for the county's nine DGAs include:

- ♦ Finksburg and Environs Comprehensive Plan (adopted January 1981)
- ♦ Freedom Community Comprehensive Plan (adopted August 2001)
 - Town of Sykesville Master Plan (adopted January 2011)
- ♦ Hampstead Community Comprehensive Plan (adopted by Town July 2010)
- ♦ Manchester & Environs Community Comprehensive Plan (adopted by Town January 2009)
- ♦ Mount Airy Environs Community Comprehensive Plan (adopted February 28, 2006)
 - Town of Mount Airy Master Plan (adopted 2003)
- ♦ New Windsor Community Comprehensive Plan – amended (adopted by Town December 2010)
- ♦ Taneytown Community Comprehensive Plan (adopted by Town March 2010)
- ♦ Union Bridge Community Comprehensive Plan- amended (adopted April 2010)
- ♦ Westminster Environs Community Comprehensive Plan (adopted November 2007)
 - City of Westminster Comprehensive Plan (adopted September 2009)

The Water & Sewer Master Plan implements the County Master Plan and community comprehensive plans and plan elements. To accomplish this, the Water & Sewer Master Plan has the following goals:

Goal 1: Establish cost-effective public water and wastewater facilities that are consistent with the type and timing of planned development;

Goal 2: Identify and plan for specific water and wastewater facilities that will accomplish Water Resource Element goals and strategies;

Goal 3: Provide information about private water and wastewater users to inform planning-related analysis and decision-making.

Maps

Maps 8 and 9 depict the various stages and timing of water and sewer planning that supports the fulfillment of the above stated goals. The service area categories are defined as follows:

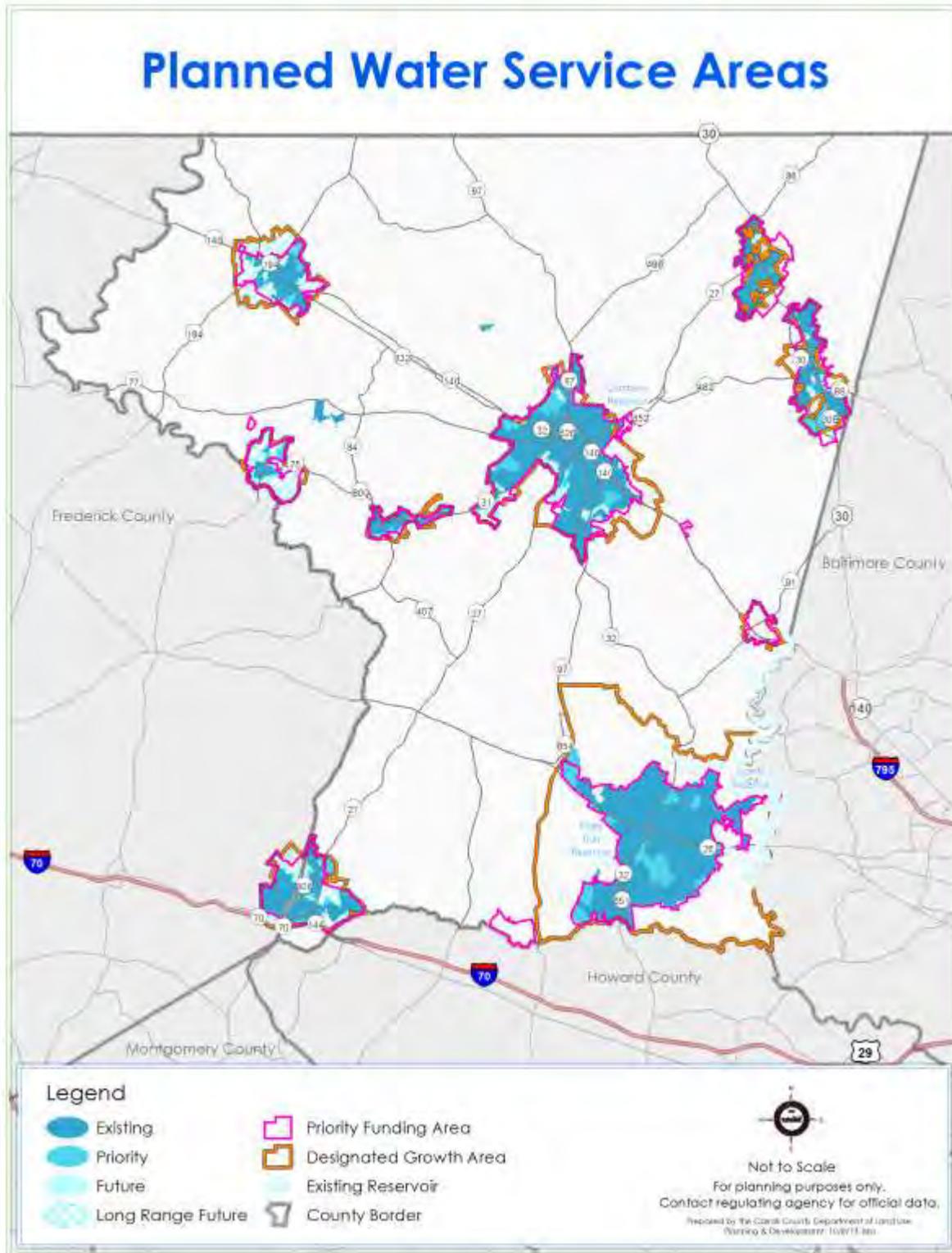
- Existing/Final Planning Service Area (W-1, S-1) - Areas served by community water supply or sewer systems which are either existing, under construction, or have final plans which have been completed. Public water or sewer service is assumed to be existing or under construction if it is in operation or under construction (where actual work is progressing or a notice to proceed has been issued with a contract for such work). Final planning means a work or works of a community water supply or sewer system for which contract plans and specifications have been completed. In areas where service is not yet available, public water or sewer service will be placed in operation immediately after construction is completed. This corresponds to the Existing (W-1, S-1) and Final (W-2, S-2) categories defined in COMAR.
- Priority Service Area (W-3, S-3) - Areas that will likely be served by community water supply or sewer systems for which the beginning of construction is anticipated to start within two years, or capital facilities are scheduled for implementation within the next six years and are possible within the framework of the six-year capital program, or areas that are planned to be served by a community system and are located adjacent to existing facilities of the system. Properties within the Priority Service Area are required, as a prerequisite to development, to connect to the community systems at the time of development. This category corresponds to 1-3 years (W-3, S-3) and 3-6 year (W-4, S-4) categories defined in COMAR.
- Future Service Area (W-5, S-5) - Areas where improvements to, expansion of, or construction of community water supply or sewer systems are planned for but are not anticipated to occur sooner than six years. The beyond six-year time frame is used to indicate that economic and other conditions and growth patterns may warrant extension of public services within the foreseeable future and should not be

construed to mean that, immediately after six years, public facilities will be extended by the County or municipality. The W-5 and S-5 category is intended to be a planned future growth area rather than a programmed growth area. This category corresponds to the 7-10 year (W-5,-S-5) categories defined in COMAR.

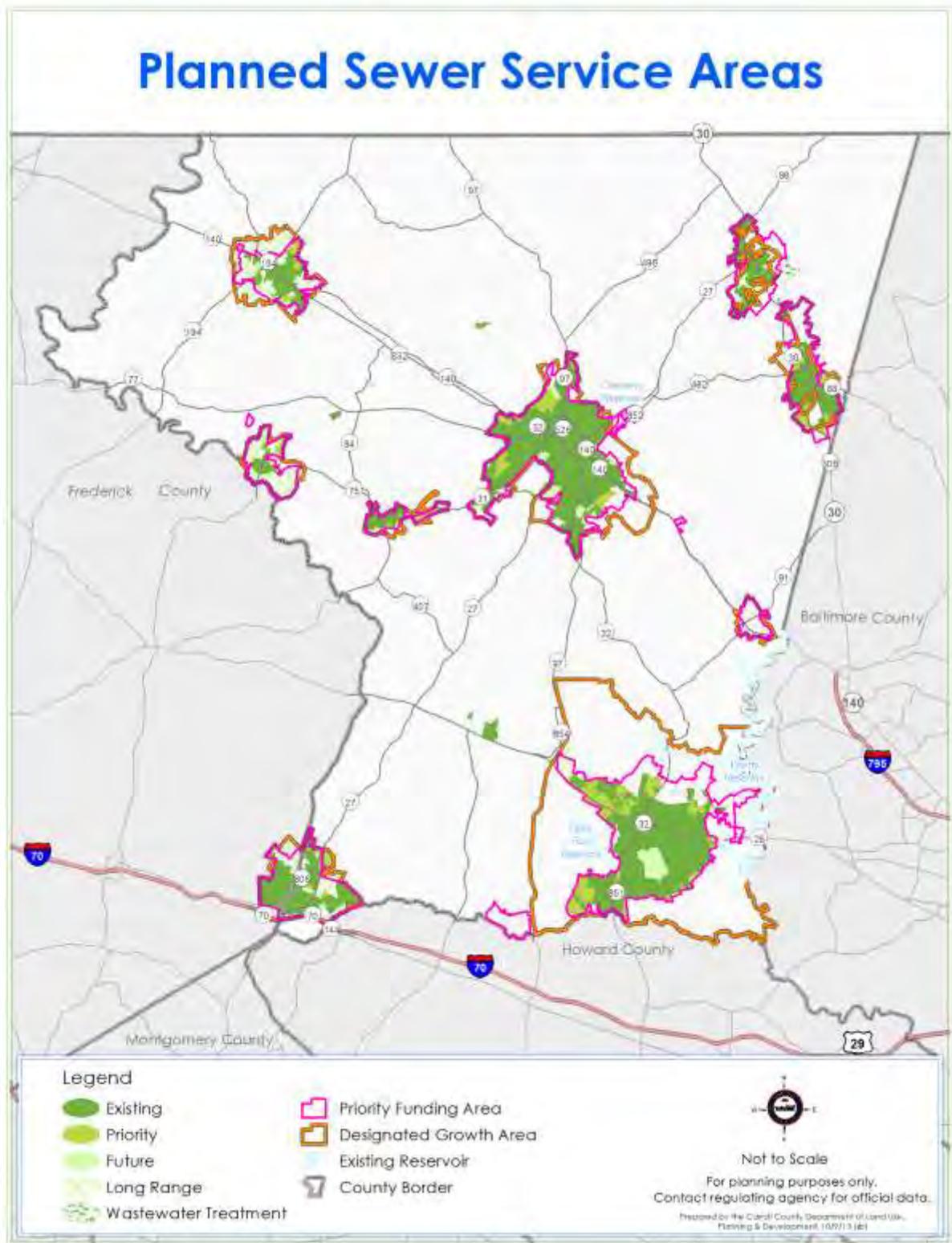
- Long Range Service Area (W-6, S-6) - Areas that are intended to be served by a public water and/or sewer system but not within the planning horizon of this plan.
- No Planned Service Area (W-7, S-7) - Areas not intended to be served by a public water and/or sewer system. These areas rely on individual water supply and sewer systems indefinitely.

See Map 8 for Planner Water Service Areas and Map 9 for Planned Sewer Service Area.

Map 8



Map 9



Section II: Organization and Management of Community Facilities

Pursuant to Title 9, Subtitle 5, Environment Article, Annotated Code of Maryland, the County Commissioners have overall responsibility to facilitate coordination of water and sewer planning throughout the County. The County Bureau of Planning facilitates the review and update of this document and any amendments in cooperation with and on behalf of the County and the eight municipalities, most of which own and operate their own public community water and/or sewer systems. All but Westminster provide service only to residents and businesses within the incorporated area.

Table 5 indicates the jurisdictional responsibility for developing and operating the particular utility system within each service area.

**Table 5: Jurisdictional Chart Relating To
Development of Water and Sewer Facilities**

Authority	Jurisdiction	Planning	Operation
Carroll County	Hampstead (S)	DP	DPW
Department of Public Works	Sykesville-Freedom (W & S)	DP	DPW, MES
	Bark Hill (W)	DP	DPW
	Pleasant Valley (W & S)	DP	DPW
	Mayor and Councils	Hampstead (W)	TOWN
Mayor and Councils	Manchester (W & S)	TOWN	TOWN
	Mount Airy (W & S)	TOWN	TOWN
	New Windsor (W & S)	MES	MES
	Taneytown (W & S)	CITY	CITY
	Union Bridge (W & S)	TOWN	TOWN
	Westminster (W & S)	CITY DP	CITY
	Maryland Environmental Service	Freedom WWTP	MES, DPW

Code:

DPW = Carroll County Department of Public Works

MES = Maryland Environmental Service

W = Water

S = Sewer

Code:

DP = Carroll County Department of Land Use, Planning, & Development

CITY DP = Westminster Department of Planning

Responsibilities specifically related to the Water & Sewer Master Plan and its implementation can be summarized as follows:

Department of Land Use, Planning, & Development

1. Provide overall management of the Water & Sewer Master Plan, including monitoring of implementation milestones.
2. In collaboration with the municipalities, update the Water & Sewer Master Plan on a three-year schedule and prepare biannual amendments as needed. Monitor the long-term fiscal feasibility of implementing the plan.
3. Work with Public Works to identify capital improvement program (CIP) projects and their timing.
4. Coordinate with municipalities for possible extension of water and sewer service into areas with water and sewer problems in the county.
5. Conduct initial public information meetings for preliminary evaluation and participate in subsequent meetings.
6. Assist applicable departments in the preparation of applications for State and Federal permits.
7. Provide technical planning assistance to other County departments and municipalities, when requested, on water and sewer matters.
8. Assist applicable departments in developing budgets that will appropriately reflect needed improvements and/or expansions of water, sewer, and septage facilities.
9. Coordinate and perform studies related to water resource management, including well location and resource viability studies; sharing reports/data with all parties of interest.
10. Provide technical assistance to other County departments and the municipalities, on water resource management-related matters.
11. Coordinate special projects and studies related to contaminated site assessment and remediation.
12. Prepare and implement tracking of the WRE to the County's 2000 Master Plan Update and small area comprehensive plan updates..
13. Manage and implement the County and municipal responsibilities related to the National Pollution Discharge Elimination System (NPDES) permits.

14. Track and implement efforts related to TMDL responsibilities.
15. Provide County representation on the Reservoir Technical Group of the Baltimore Metropolitan Council.
16. Review, inspect, and enforce County Code requirements related to water resource management and protection.

Department of Public Works & Facilities

1. Develop budgets that will appropriately reflect needed improvements and/or expansions of water, sewer, and septage facilities.
2. Monitor water and sewer flows to determine timing of Capital Improvement Program (CIP) projects for new or expanded facilities.
3. Prepare reports on actual and committed flows, allocations, and potential flows from approved preliminary plans and site plans and provide to departments as requested.
4. Plan, design, and construct water and wastewater systems within the designated water and sewer service areas.
5. Operate and maintain County-owned water and wastewater treatment plants and systems.
6. Coordinate with municipal governments, as applicable, during the design, construction, and implementation phases of a project for the extension of community water and/or sewer service.
7. Manage grants for water and sewer projects.
8. Prepare and coordinate environmental permits for system expansions and maintain compliance with operating permits.

Department of the Comptroller

1. Develop funding mechanisms that will appropriately reflect needed improvements and/or expansions of water, sewer, and septage facilities.
2. Develop and monitor the formulation of rates for County water and sewer facilities.
3. Bill for and collect water and sewer payments and payments by septage haulers.
4. Assist in the review of the long-term fiscal feasibility of implementing the Water & Sewer Master Plan.

Department of Management and Budget

1. Recommend, with identified funding sources, budgets for improvements to water and sewer projects.
2. Provide grant identification and application assistance.
3. Provide assistance in financial analysis of proposed projects.
4. Monitor compliance with grant requirements, timelines, and budgets.
5. Review the long-term fiscal feasibility of implementing the Water & Sewer Master Plan.

Carroll County Health Department - Bureau of Environmental Health

1. Identify areas with onsite wastewater disposal and water supply problems and work with the Department of Land Use, Planning, & Development to identify and update these areas in the Water & Sewer Master Plan.
2. Participate in public meetings to provide information on sanitary surveys and concerns about public health risks.
3. Participate in revisions and updates to the Water & Sewer Master Plan.

Municipalities

1. Develop budgets that will appropriately reflect needed improvements and/or expansions of water, sewer, and septage facilities.
2. Monitor water and sewer flows to determine timing of CIP for new or expanded facilities.
3. Prepare report on actual and committed flows, allocations, and potential flows from approved preliminary plans and site plans and provide as requested.
4. Plan, design, and construct water and wastewater systems within the designated water and sewer service areas served by the town.
5. Operate and maintain municipal water and wastewater treatment plants and systems.
6. Coordinate with the County, as applicable, during the design, construction, and implementation phases of a project for the extension of community water and/or sewer service.

7. Manage grants for water and sewer projects.
8. Prepare and coordinate environmental permits for system expansions and maintain compliance with operating permits.

- **Section III: Water- and Sewer–Related Policies**

Connections to Water Supply and Wastewater Systems

In Carroll County, properties within the Existing/Final Planning (W-1 and S-1) and Priority (W-3 and S-3) Service Areas will be connected to the community water supply system at the time of development. It is the responsibility of the developer to arrange for the required engineering and infrastructure to make the connections. The procedure for obtaining water and sewer extensions is outlined in Appendix 4.

Interim individual systems may not be permitted where the utility of record or municipality has an official connection policy and/or code requirement that precludes interim individual systems. Where the utility of record or municipality does not have a connection policy and/or code requirement which precludes new interim individual systems, such interim systems may be considered by the utility of record or municipality where it has been adequately demonstrated that extraordinary or unusual circumstances exist and that authorizing an interim system will not compromise the integrity of the Water & Sewer Master Plan or the County or municipal comprehensive plan.

The Water & Sewer Master Plan's intent is to ensure that: (1) water and water and sewer service occurs as development occurs inside Priority Service Areas; and (2) water and sewer service services can be accommodated by wells and septic systems within Future Service Areas (W-5 and S-5) unless otherwise required by the utility of record or municipality. If the latter is the case, the service area category must be changed to the Priority Service Area (W-3 and S-3) for MDE to issue construction permits. Under the Annotated Code of Maryland, Environment Article, the Carroll County Board of Health has authority to grant exceptions to the County Water & Sewer Master Plan to remediate documented health hazards.

Reservoir Watershed Agreement

As part of the Baltimore region, Carroll County participated in the preparation of a Water Quality Management Plan for the Baltimore Metropolitan Region under Section 208 of P. L. 92-500 (Clean Water Act). A primary goal of that plan is to improve water quality within the three major reservoirs serving the Baltimore metropolitan area, which were all undergoing various stages of eutrophication (nutrient enrichment). As an outgrowth from that plan, the City of Baltimore and Baltimore and Carroll Counties entered into a Reservoir Watershed Management Agreement in 1979. Recognizing that the 1979 Agreement needed to be updated and strengthened, a new agreement was entered into by the City of Baltimore, Baltimore and Carroll counties, the Carroll and Baltimore County Soil Conservation District (SCD), and the Maryland Department of Agriculture (MDA) and MDE. This agreement established a Reservoir Watershed Management Program. The 1984 Agreement included an "Action Strategy for the Reservoir Watersheds" that applied a comprehensive, balanced set of new or enhanced point and non-point source pollution controls, and established a monitoring and reporting system to measure the extent to which goals were being achieved. In 1990, the agreement was reaffirmed by all participating

jurisdictions and agencies and the “Action Strategy” was updated to include new initiatives. The agreement was reaffirmed in 2003. In 2005, the agreement was revisited to update the action strategy. Over a two-year period, the signatories reviewed the Agreement’s commitments and developed topical issue reports to address concerns set forth in federal and local regulatory changes over time.. As a result, the signatories have jointly developed a new agreement and an action strategy that effectively updates the Agreement to address regulatory mandates today. Carroll County remains an active signatory and participant in that effort. The Baltimore Metropolitan Watershed Management Agreement is a model agreement involving a partnership among multi-jurisdictions toward a common goal.

Chapter III (Recommendations) of the document includes an implementation schedule entitled “Pollution Control Action Plan”, which detailed the range of actions to be taken.

No Guarantee of Service

The Water & Sewer Master Plan is an implementing measure of the Carroll County Master Plan. It takes into account the policies and visions of the county and municipalities when deciding the areas that will be served with water and sewer. This document does not guarantee that the County or any municipality will provide the facilities needed to achieve the plan. Moreover, this document does not guarantee that facilities or service will be provided by the County or any municipality within the general timeframes (i.e., service area or service area categories) represented in this Plan.

If a property is not within the water and sewer service area, an amendment request can be submitted to change the category of the property if there is a particular need. Any revisions to the service areas must be made by the Planning Commission, Board of Commissioners, and MDE.

Severability

The requirements of the Water and Sewer Plan are severable, and if any of its requirements are held unconstitutional by any court of competent jurisdiction, the decision of such court shall not affect or impair any of the remaining sections.

Water & Sewer Master Plan Review and Amendment Procedures

Title 9, Subtitle 5 of the Environment Article of the Annotated Code of Maryland requires the governing body of the county, after reasonable opportunity for public hearing, to review the County Water & Sewer Master Plan every three years. Proposed facilities need to be included in the Plan to ensure eligibility for Federal and State grants and loans. State Water and Sewer Construction Permits will not be issued for certain projects unless they are incorporated in the County Water & Sewer Master Plan.

In addition, the governing body of the county may amend the Carroll County Water & Sewer Master Plan when necessary or when MDE requires it. The County's procedure for filing amendments can be found in Appendix 5. The following situations commonly trigger an amendment to the Carroll County Water and Sewer Plan:

- ◆ A project includes proposed water and sewer facilities and the site is designated No Planned Service or Future (7-to-10 Year) Service Area.
- ◆ A project involves the establishment of a multi-use system or the expansion of an existing use that would increase flows to over 5,000 gallons per day.
- ◆ A project involves the establishment or geographic and facility capacity expansion of a community water or sewer system.
- ◆ A project requires the construction of, or capacity changes or other major modifications to, pumping stations, wells or springs, water storage facilities, reservoirs, or treatment plants.
- ◆ There is a change in service area category.

Carroll County also has developed a process to evaluate potential water and sewer projects in the unincorporated areas of the county that currently are not in the Water & Sewer Master Plan. The Bureau of Planning is responsible for the first phase, the preliminary evaluation of a water and/or sewer project outside a planned service area. The Board of Commissioners then decides whether or not to proceed and to amend the Water & Sewer Master Plan to incorporate the project. If the decision is to proceed, the Department of Public Works is then responsible for the second phase: the facility planning and preliminary community investment plan estimate. If the Board of Commissioners decides to continue to advance the project, the third phase is also the Department of Public Works' responsibility. Phase three is the refinement of the capital improvement program estimate, design, and construction of the project.

CHAPTER THREE: Water Supply Facilities

• Section I: Groundwater

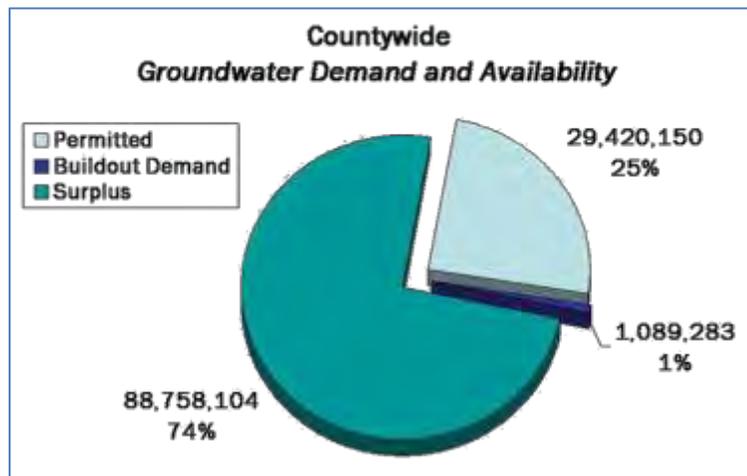
Groundwater is the principal source of both public and private potable water supplies in Carroll County.

Quantity

The majority of water demand in the county is met by groundwater wells with the exception of Westminster and Freedom WSAs. According to the 2010 Carroll County Water Resources Element total water demand in the county was estimated at 20.2 million gallons per day (mgd). This represents water service to an estimated 42,600 equivalent dwelling units (EDUs). Groundwater supplied 15.6 mgd (78 percent) of that demand. Private residential wells demanded 8.0 mgd. Public water systems or private community water systems account for the remaining groundwater demand.

The County's WRE estimates a countywide potential water supply of 101.4 mgd at build out. In 2009, appropriations for groundwater were 18.3 mgd, almost 3.0 mgd more than the demand at that time.

Estimated groundwater demand at buildout is 22.5 mgd. Although this is higher than the current appropriation, groundwater resources in the county theoretically are more than adequate to meet future demands as long as a higher appropriation is made by MDE. However, groundwater resources are not evenly distributed throughout the county and may not meet the local demands entirely in any given area. The WRE provides more detailed information that breaks down data by individual watersheds.



Quality

The quality of groundwater in Carroll County is generally excellent and, except for occasional instances, is acceptable for all uses. Most of the water is soft to moderately hard. Groundwater from the metamorphic rocks often has a low pH and consequently is corrosive (aggressive).

The quality of groundwater is influenced by both natural and human impacts. Rainfall can be contaminated with pollutants before infiltrating into the subsurface aquifers. Purification and mineralization of the water occurs as it percolates through the soil column. The degree to which the groundwater quality is altered is a function of the groundwater travel time through the aquifer. Wells that are properly constructed and isolated from potential pollution sources should not have problems with pollution.

Groundwater pollution problems have been identified in several small communities in rural Carroll County. An inventory of water problem areas appears in each system's individual section. In many of these cases, individual wells have been contaminated by septic systems in close proximity. Small lot sizes prevent replacement of the individual septic systems. Approximately 20 communities have been identified by the local Department of Environmental Health as having groundwater contamination problems. Additionally, isolated instances of contaminated groundwater have been traced to leaking gasoline and mismanagement of oil storage tanks, leaks from industrial facilities, and landfills.

Groundwater Resource Development

The WRE is focused around diversifying the county's water supply sources in order to move away from a dependency on groundwater. However, it is important to remember that most systems throughout the county still rely heavily on groundwater.

Water Recharge Easements and Credits

The County is incorporating more protections for natural and cultural resources into easement documents, including provisions for groundwater protection.

After ensuring adequate water supply for the farming operation, the remaining groundwater on a preserved farm is restricted through a conservation easement. The easement language specifies the percentage of groundwater retained on site versus that which is reserved by the County for future transfer. The County then can transfer unused water credits to municipalities located in the same watershed as the preserved farm. This transfer is in accordance with MDE policies and regulations.

A Memorandum of Understanding (MOU) between the County and each municipality needing water recharge credits states that credits will only be transferred if growth is channeled to DGAs where infrastructure exists and residential densities are 3.5 dwelling units per acre or denser. Additionally, a second agreement between MDE, the County, and the municipality states the number of water recharge credits needed to serve the municipality, which is also reflected in MDE's Water Appropriation and Use Permit.

Several water recharge easements have been recorded to date, and MOUs between the County and two municipalities have been drafted. One easement has a fully executed MOU and Memorandum of Agreement (MOA) by the County, municipality, and MDE.

• Section II: Surface Water

Surface water is utilized in Carroll County community water systems in the Westminster and Sykesville/Freedom service areas.

Surface Water Quantity

In 2009, countywide surface water demand was 4.5 mgd (22 percent). The City of Westminster uses the Cranberry Reservoir and Hull Creek for surface water sources, and the Sykesville/Freedom area is served through a direct withdrawal from Liberty Reservoir. Additionally, in the event of an emergency, withdrawals are permitted from Dickenson Run and Medford quarry for the Town of New Windsor and the City of Westminster, respectively. An allocation (Is this appropriation or allocation?) also exists for Piney Run Reservoir, though this source currently is not used as a public water supply.

It is estimated that countywide approximately 118.8 mgd of surface water flows through the county's streams. However, the State permits (appropriates) only a certain amount of surface water withdrawals for the county. This includes withdrawals used for the public water systems described above, as well withdrawals for agricultural irrigation, golf course irrigation, and some industrial operations. According to the 2010 Carroll County Water Resources Element, the total appropriation for surface water was 11.0 mgd, almost 6.5 mgd more than the demand at that time. Projected demand for surface water at buildout is estimated to be 8.0 mgd.

Surface Water Quality

To protect surface water quality, the State has adopted surface water quality standards, which include designated uses of the waters of the State (i.e., stream classifications), and water quality criteria to protect the designated uses. The standards, which are detailed in COMAR 26.08 of the Code of Maryland Regulations, were established to provide water quality for the designated uses of: water contact recreation; fishing; propagation of fish, other aquatic life, and wildlife; and agricultural and industrial water supply. The specific use classifications are:

State Water Quality Standards	
Use I	Water Contact Recreation and Protection of Aquatic Life
Use I-P	Water Contact Recreation, Protection of Aquatic Life, and Public Water Supply
Use II	Shellfish Harvesting Waters
Use III	Natural Trout Waters
Use III-P	Natural Trout Waters and Public Water Supply
Use IV	Recreational Trout Waters
Use IV-P	Recreational Trout Waters and Public Water Supply

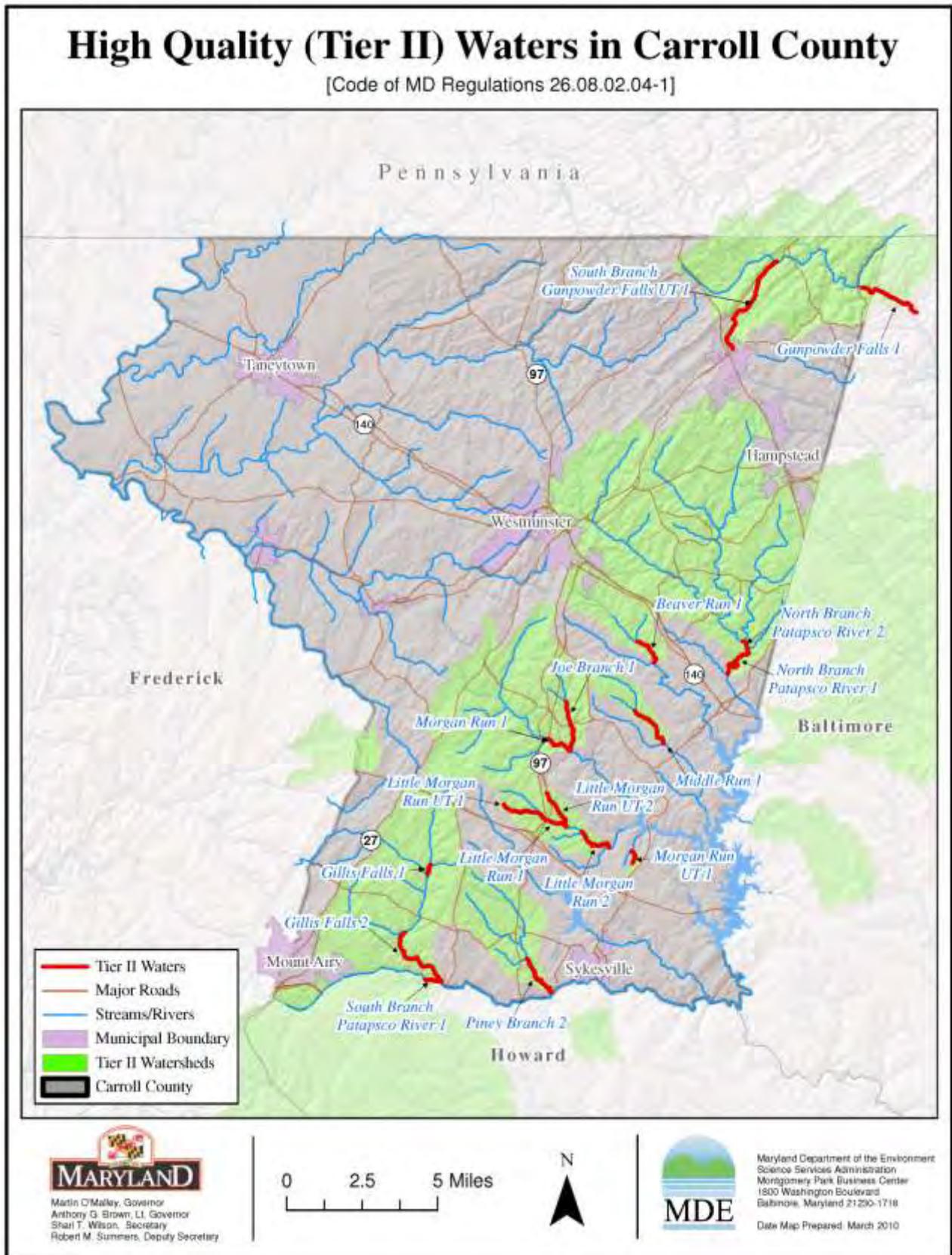
A Tier II water designation refers to Maryland's Antidegradation Policy. The Tier II designation protects streams of high quality, streams that exceed minimum water quality standards, from activities that would decrease the water quality. As a result, within the watersheds of Tier II streams, discharge permits or appropriation permits for new water supply wells – both of which could affect water quality – requires eliminating or reducing discharges or impacts. Monitoring is required. As of 2009, seventeen streams in Carroll County, primarily in the eastern and southern portions of the county, were designated Tier II waters. See Map 10: High Quality (Tier II) Waters in Carroll County.

Total Maximum Daily Loads (TMDLs)

TMDLs are a requirement of the Federal Clean Water Act of 1972. Under this law, the State is required to identify “impaired” water bodies, or those water bodies that are too polluted to meet water quality standards. Impairments can come from nutrients such as nitrogen and phosphorus or from sediment, pathogens, mercury and other metals. Once a water body is deemed “impaired,” a TMDL or the maximum amount of a pollutant that the water body can assimilate and meet water quality standards is developed by MDE. State and local water quality management plans must be developed to address the cause of the impairment and meet TMDLs.

All of the watersheds in Carroll County (except Conewago Creek) have been identified as having impairing substances that do not meet water quality standards. A TMDL either has been set or is pending for all of these watersheds.

Map 10



- Existing and Proposed Water Facilities by Service Area

Regional Facilities

Current Conditions

Carroll County is committed to the development of a multi-resource public water supply system, utilizing both its ground and surface waters.

Sites on Piney Run, Gillis Falls, and Big Pipe Creek were identified as future reservoir sites in the 1960s. The Piney Run Reservoir in the southeastern portion of the County was completed in January 1975. The multi-purpose reservoir was designed to provide a safe yield of 3.5 mgd. Land is committed to protect the areas around the Union Mills Reservoir on Big Pipe Creek and the Gillis Falls Reservoir on Gillis Falls to provide for long-range water supplies. These will be regional water supply facilities, providing drinking water to areas of the County where there is an insufficient ground water supply. As of December 2010, the county owns 65 percent of the property for the Union Mills Reservoir and 83 percent of the Gillis Falls Reservoir.

Carroll County Government adopted a policy of pursuing a diversified and balanced approach to supplying the County's water needs that has been in place since the 1970 County Master Plan for Water and Sewer. This approach has followed through time and continues with the adoption of this Plan. The WRE discusses in greater detail each of the potential future regional facilities and long range water options. These options will be evaluated in greater detail as the need arises. However, none of these options are anticipated to be pursued within the next ten years.

- Existing and Proposed Water Facilities by Service Area

- Bark Hill Water Service Area

Current Conditions

The Bark Hill Water Service Area (WSA), serving 65 EDUs and to non-residential users and comprising of approximately 140 acres, is located on the west side (and partially on the east side) of Raywell Avenue, between Bark Hill and Middleburg Roads. See Map 11: Bark Hill WSA. Permitted average daily use is 33,000 gpd. August 2012 average daily use was 21,287 gpd.

The water supply system serves an unincorporated Rural Village, Keyview Estates. It was constructed in 1993 to address groundwater contamination problems related to failing septic systems. The Carroll County Department of Public Works, Bureau of Utilities operates and maintains the system. Keyview Estates containing 36 lots (and 35 homes), is located on the south side of Middleburg Road. Lots sizes range from 20,000 to 35,000 square feet.

Water is supplied by two wells. The primary well, located southeast of the Bark Hill Road/Raywell Avenue intersection has a rated capacity of 60 gallons per minute. Water treatment includes liquid chlorination, in addition to nitrate removal using reverse osmosis. The secondary well, serving Francis Scott Key High School, is located northeast of the primary well. The secondary well provides a backup to the primary well. The water supply system includes a 100,000-gallon elevated water tank, fire protection, and stable water pressure for approximately 65 homes. Byproducts from the water treatment process are pumped to the Union Bridge wastewater treatment plant. See Table 6A for Bark Hill WSA for appropriations; Table 6B for Bark Hill WSA average daily use; and Table 6C for the storage tank/distribution system.

Table 6A: Bark Hill WSA Appropriations

6-Digit Watershed	Water Source	Permit Number	Permitted Daily Average Use (gpd)	Permitted Average Daily Demand Maximum Usage (gpd)
Middle Potomac	Bark Hill wells (2)	CL1969G009 (06)	20,000	33,000

Table 6B: Bark Hill WSA Average Daily Use

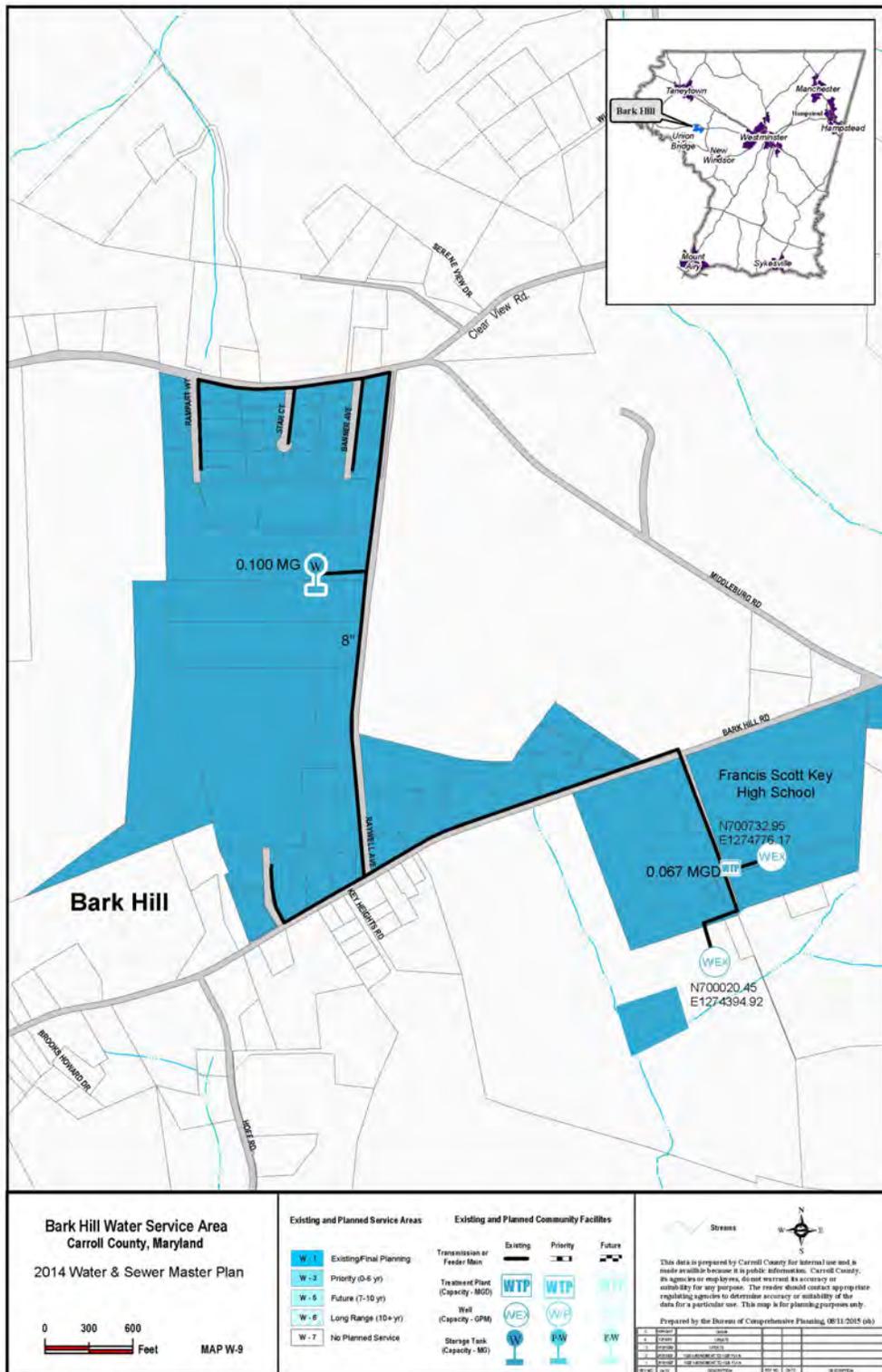
Water Source	Storage Capacity (mgd)	Max. Safe Yield (mgd)	Avg. Daily Use (mgd)	Max. Peak Flow (mgd)	WTP Capacity (mgd)
Well #1 (County) Alternates with Well #2 (FSK*)	0.015 (combined wells 1& 2)	0.020 (combined wells 1& 2)	0.013 (combined wells 1& 2)	0.033 (combined wells 1& 2)	0.072 (combined wells 1& 2)

*Franklin Scott Key High School

Table 6C: Bark Hill WSA Water Storage Tank

Water Storage Tank Capacity	0.100 mg
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Map 11



Allocation Procedure

Connection to the system is available to those properties located within the service area. There is no Allocation Procedure due to the limited number of properties in the area that have small lot sizes and failing septic systems.

Needs Analysis

No need exists for the Bark Hill expansion for the near term or immediate future. Maintenance is scheduled into the long term, 10+ years out.

Planned Projects and Recommendations

No capital projects are recommended for the Bark Hill system at this time. See Table 6C for Bark Hill WSA priority projects.

Table 6C: Bark Hill WSA Priorities Projects

Project Name	Planning Category	Description	Location	Capacity Added
Water Treatment Plant Improvements	Future (W-5) 10-Years	Replace water lines between well & well house; replace electrical lines for the plant	Water Treatment Plant	0 MGD

Freedom Water Service Area

Current Conditions

The Freedom WSA, located in the southeast portion of the county, serves 8,479 EDUs in the Freedom area, including the Town of Sykesville. Carroll County owns and operates the community water supply system. See Map 12: Freedom WSA. Permitted average daily use is 2.848 mgd. 2010 average daily use was 2.33 gpd.

Under agreement with the City of Baltimore, Carroll County purchases water for Freedom from the Liberty Reservoir. The agreement expires July 1, 2018. The County receives the water by way of a floating surface water intake on Liberty Reservoir. Carroll County is authorized to withdraw a monthly average of 4.2 mgd; and a 6.0 mgd maximum monthly withdrawal. Raw water is treated at the County's WTP located at the end of Oakland Road. The WTP has a total design capacity of 7.0 mgd, which includes the existing 3.0 mgd (utilizing diatomaceous earth filtration) and the recently completed expansion to 4.0 mgd (utilizing immersed membrane filtration). Both filtration technologies pre-treat the water by dissolved air flotation (DAF) clarification. Sodium hypochlorite is added for disinfection, sodium hydroxide is added for pH stabilization and fluoride is added for the prevention of dental decay. In addition, a parallel transmission main was installed from the treatment plant along Oakland Road and Mineral Hill Road to Oklahoma Road. Treated water from this line is fed into the existing distribution system at several points. Water storage is conducted through a 400,000 gallon tank that holds on-site finished water.

In addition to the water treatment plant on Liberty Reservoir, appropriations of 0.227 mgd from Fairhaven Well 22B; and 0.211 mgd from Raincliffe Well RC1 are available for consumption. See Table A7 for the Freedom WSA appropriations; Table 7B for the Freedom WSA average daily use; Table 7D for the Freedom WTP; and Table 7D for the Springfield Complex Water Tank System.

Table 7A: Freedom WSA Appropriations

6-Digit Watershed	Water Source	Permit Number	Permitted Average Daily Use (mgd)	Max. Average Daily Permitted Use(mgd)
Patapsco	Liberty Reservoir	CL1970S030 (01)	2.400	6.000
Patapsco	Fairhaven Well 22B	CL98G002 (01)	0.227	0.340
Patapsco	Raincliffe RC-1	CL1998G102 (01)	0.211	0.381
Total			2.848	6.722

Table 7B: Freedom WSA Average Daily Use

Water Source	Permitted Max. Safe Yield (mgd)	Ave. Daily Use (mgd)	Max. Peak Flow (mgd)
Liberty Reservoir	2.400*	2.207	2.973
Well 22B- Fairhaven	0.340	0.076	0.340
Raincliffe RC-1 (not in use)	0.381	0.050	0.381
Total	3.121	2.333	4.694

*Actual Max. Safe Yield is 96 mgd.

Map 12

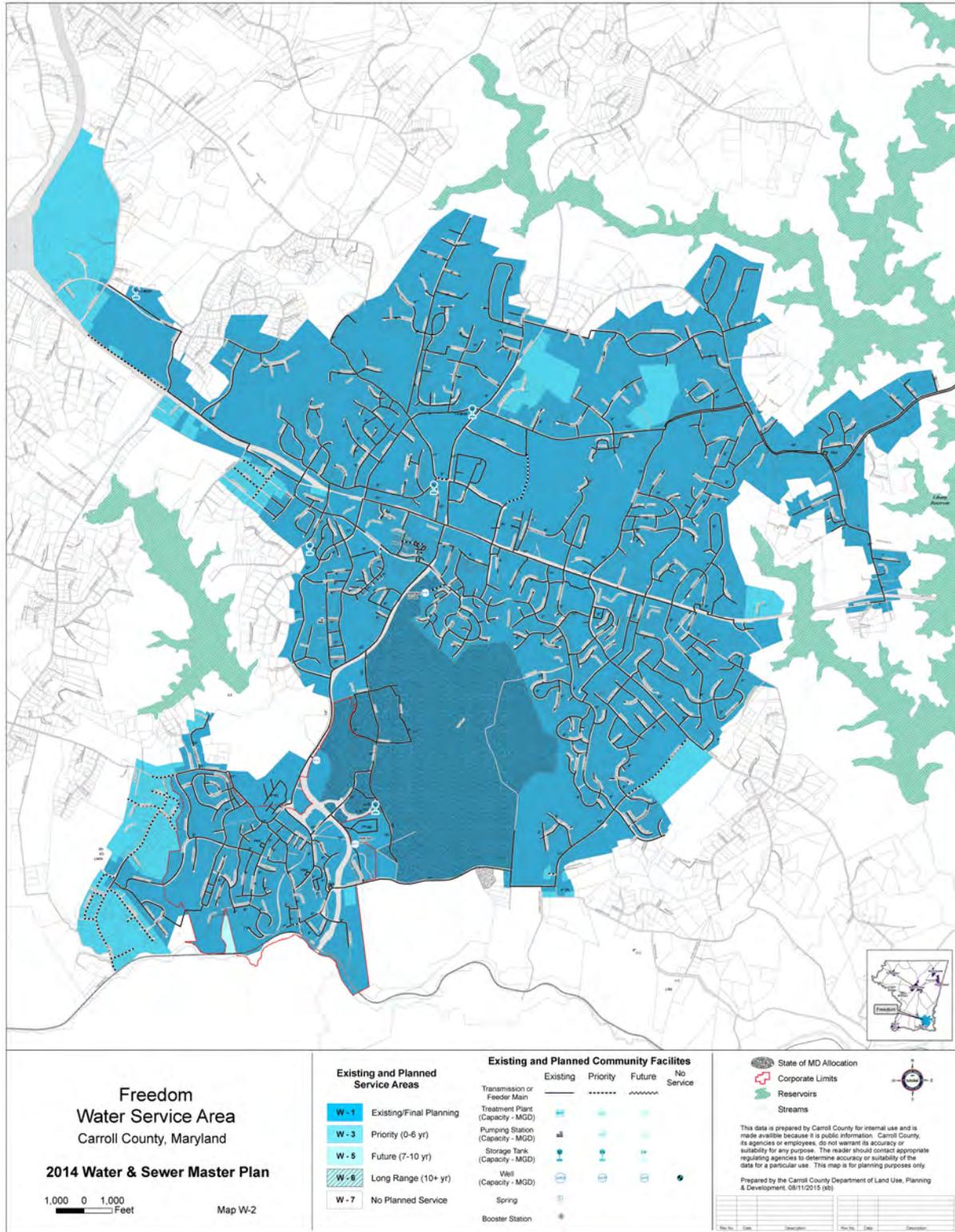


Table 7C: Freedom WTP

Distribution and Treatment System	Permitted Max. Safe Yield (mgd)	Ave. Daily Use (mgd)	Max. Peak Flow (mgd)
Freedom Water Treatment Plant	6.000	4.694	7.000

Under an agreement between Carroll County and the State of Maryland, five water tanks with a total storage capacity of 3.95 mg provide water to the Springfield Complex. The Springfield Complex currently includes a hospital operated by the State Department of Health and Mental Hygiene, a safety training center and minimum security laundry camp operated by the State Department of Public Safety and Corrections, and the Warfield Complex, which was annexed by the Town of Sykesville and is being redeveloped for mixed uses. The agreement requires Carroll County to supply up to 400,000 gpd to the Springfield Complex. Maryland Environmental Service (MES) maintains the infrastructure on the Springfield Complex property, and Carroll County Bureau of Utilities maintains the meters.

Table 7D: Springfield Complex Water Tank System

Springfield Complex Water Tanks	Storage Capacity
Linton Springs Water Tank	0.500
Bartholow Road Water Tank	1.000
Springfield Water Tank	0.450
Liberty Road Water Tank	1.000
Martz Road Water Tank	1.000
Total Tank Storage	3.950

Allocation Procedure

Carroll County, owner and operator of the Freedom community water supply system, currently allocates water flows on a “first come, first served” basis. The code stipulates that allocations shall only be granted upon the execution and acceptance of a standard public works agreement or other agreement as required by County policy, the recordation of an approved subdivision plat, and payment of all applicable charges. To determine availability, the County allocates and records capacity or flows for single EDUs at the time building permits are approved, or at the time area connection charges and any other applicable charges are paid in full.

Needs Analysis

The County will need to renew its agreement with the City of Baltimore for Liberty Reservoir appropriations in 2018 to ensure continued rights to Liberty reservoir as a water source. In addition, iron cast pipes in various locations throughout the distribution system are old and in need of replacement. For the long terms, the County will continue to evaluate the Freedom WSA infrastructure needs using its Freedom District Water Model Update.

A number of houses on Gaither Road are situated on lots less than half an acre in size and experience septic failures. The potential for contamination due to failing septic systems is due to the geography of the area and small lots sizes prohibiting replacement septic fields or restoration of existing fields. There are no replacement wells in this area.

Planned Projects and Recommendations

Below are the recommendations for the Freedom WSA, including its WTP and distribution system. See Table 7E for Freedom WSA priority projects.

Table 7E: Freedom WSA Priority Projects

Project Name	Planning Category	Description	Location	Capacity Added
Sykesville Iron Pipe Replacement	Priority (W-3) 6 years	Replace 28,000-30,000 feet of cast iron pipe throughout town in phases	Phase I - Main Street, Springfield Ave., MD 851; future phases – various locations in Sykesville	0 mgd
Gaither Road Area	Priority (W-3) 6 years	8" water lines to serve existing communities	Gaither Road from Obrecht Road to County line	0 mgd

Long-Term Recommendations (10+ years)

- ◆ Resolve allocation issues related to Piney Run Reservoir/Gaither Road Area septic system failures
- ◆ Renegotiate Liberty Reservoir water withdrawal agreement with Baltimore City before contract expiration in 2018
- ◆ Replace cast pipes in identified areas where need has been identified
- ◆ Based on the update of the Freedom District Water Model Update, identify projects for maintenance and operation purposes of the Freedom water distribution system

Hampstead Water Service Area

Current Conditions

The Town of Hampstead owns and operates the community water supply system which limits service to inside the corporate boundary. Approximately 96 dwelling units in the County receive public water service because they were connected to the system before the policy to serve within town limits only was adopted in 1962. The existing and planned WSA is situated in the northeast section of the County along MD 30, serving 2,230 EDUs and covering approximately 2,566 acres. See Map 13: Hampstead WSA. Permitted average daily use is 0.630 mgd. Average daily use is 0.445 mgd.

The system, which was built by the Town in 1936, is currently supplied by 17 wells, including Wells 20 and 21, which were donated by the Industrial Development Authority (IDA) in 2008. Of the 17 wells in the Town's inventory, 15 are operational. All sources pump directly into the Hampstead system following chlorination and pH adjustment using soda. The operation and production of the pumps in the wells are controlled and monitored by a mechanical system and time clocks. The Town has installed a computerized control (SCADA) system in four pump houses and in the Panther Drive and North Hampstead water storage tanks.

A 100,000-gallon storage tank was constructed on the central-eastern side of the Town on Hillcrest Street as part of the original water system built in the 1930s. The Hillcrest Street tank remains in service today. In 1975, the Town built a 500,000-gallon storage tank near North Carroll High School. In 2001, the Town built a 400,000-gallon storage tank near the North Carroll Shopping Center. These three tanks provide water storage of about one million gallons. The Town currently holds three groundwater appropriation permits for a total average daily withdrawal of 630,000 gpd. See Table 8A for the Hampstead WSA Appropriations; Table 8B for the Hampstead WSA Average Daily Use; and Table 8C for Springfield Complex Hampstead Storage Tanks.

Table 8A: Hampstead WSA Appropriations

6-Digit Watershed	Water Source/Well	Permit Number	Permitted Av. Daily Use (gpd)	Av. Daily Demand Month of Max .Use (gpd)
Patapsco	11, 12, 19, 20 ,21 28, 29, 31, 32	CL1974G062 (07)	283,000	362,000
Gunpowder	19, 24, 25, PWC-1, TW-C	CL1974G162 (03)	161,000	250,000
Gunpowder	13, 15, 22, 23, 26, 27	CL1974G362 (02)	136,000	200,000
Gunpowder	33, 34	CL2008G005 (01)	50,000	72,000
Total			630,000	884,000

Map 13

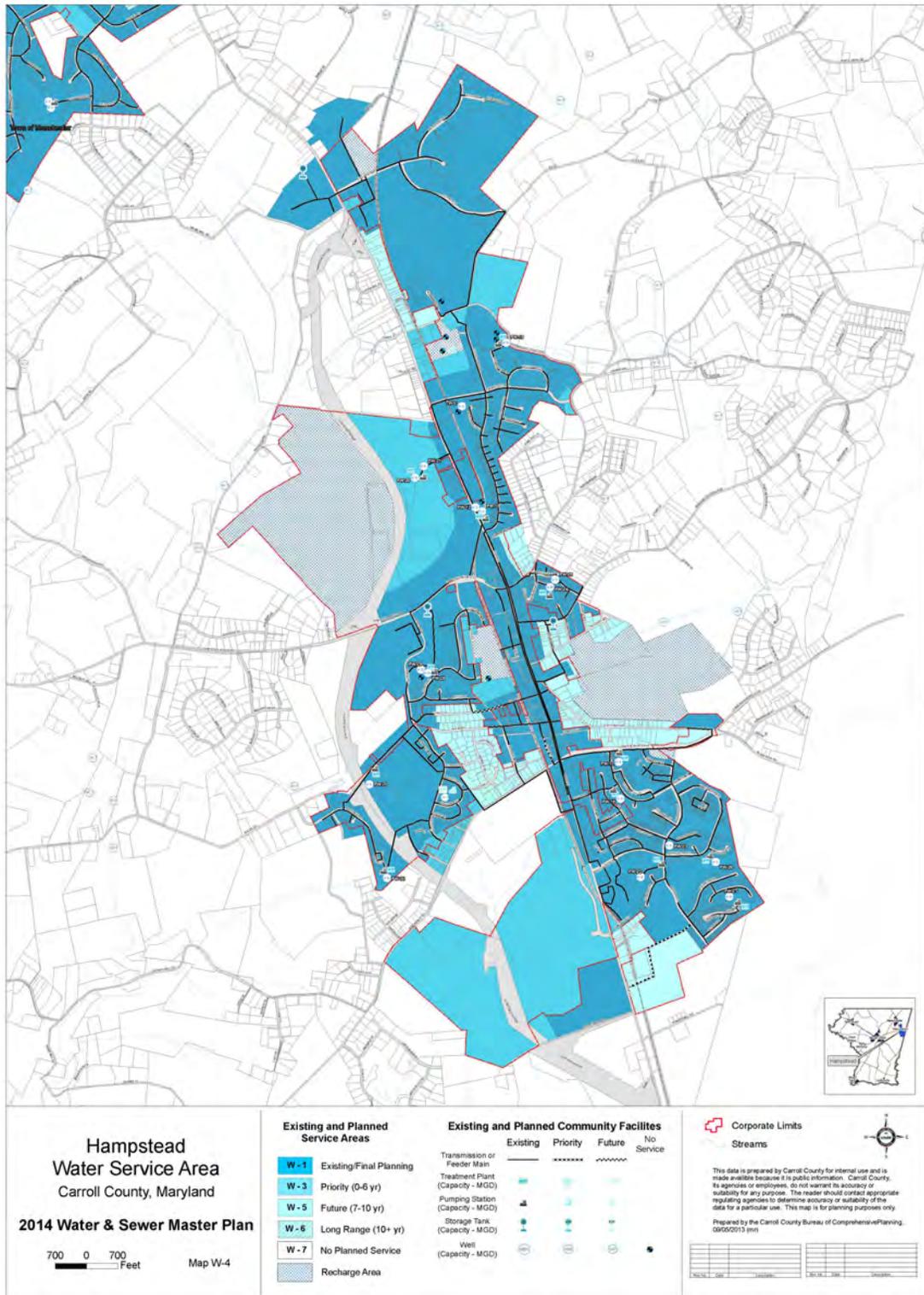


Table 8B:Hampstead WSA Average Daily Use

Water Source	Max. Safe Yield (mgd)	Avg. Daily Use (mgd)	Max. Peak Flow (mgd)
Well 11 (Main Street)	0.065	0.024	0.051
Well 12 (Main Street)	0.079	0.030	0.063
Well 13 (MD 88)	0.091	0.036	0.057
Well 15 (Ralph Avenue)	0.094	0.030	0.056
Well 19 (Greenmount Church Road)	0.058	0.035	0.055
Well 20 (Old Dairy Farm) not in service	0.058	0.031	0.045
Well 21 (Old Dairy Farm) not in service	0.072	0.035	0.043
Well 22 (Boxwood Drive)	0.030	0.017	0.030
Well 23 (Boxwood Drive)	0.030	0.016	0.030
Well 24 (Small Crossings)	0.020	0.018	0.025
Well 25 (Fairmount Rd/Small Crossings)	0.072	0.010	0.025
Well 26 (Caddis Drive)	0.072	0.030	0.045
Well 27 (Retriever Dr)	0.035	0.028	0.035
Well 28 (Shiloh Run)	0.033	0.028	0.040
Well 29 (Shiloh Run)	0.020	0.023	0.030
Well 31 (Westwood Park)	0.041	0.046	0.055
Well 32	0.059	0.074	0.080
Well 33 (not in service)	-	-	-
Well 34 (not in service)	-	-	-
Triple Green Well (not in service)	-	0.008	-
Stansbury Well (not in service)	-	0.004	-
Total Water Sources (2.223 mg)	0.929	0.529	0.765
Total Water Sources in Use (1.921 mg)	0.799	0.445	0.677

Table 8C: Hampstead WSA Storage Tanks

Storage Tank	Capacity
Hillcrest Water Tank	100,000
MD 482/Panther Drive Water Tank	500,000
North Carroll Plaza Water Tank	400,000
Total	1,000,000

Allocation Procedure

Allocations are on a “first come, first served” basis. Allocations are made within the permitted capacity. Prior to approving a development of more than two units, the Town requires that the developer provide a water supply that will deliver 375 gpd for each EDU or commercial unit. Wherever possible, the required water supply is located within the proposed development and the developer is responsible for drilling and testing the well under the supervision of the Town or its agent. In cases where a well meeting these requirements cannot be located within the proposed site, the developer may be assessed a water replacement fee for each EDU or commercial unit if the Town has sufficient water. The fee must be paid prior building permit issuance. As of 2010, the water replacement fee was \$2,250 per EDU or commercial unit.

Needs Analysis

High nitrate water levels are found in Wells 20 and 21, located near a working farm. Farming practices – cover crops and minimum use of fertilizer is practiced to, in part, address nitrates levels. The Town is currently working with local farmers to implement better management practices regarding fertilizer use near Wells 20 and 21. The wells are being tested regularly and the Town is hopeful that positive results will be realized in the near future. In addition to high nitrate levels, MTBE contamination has been found on Hillcrest Street (located outside of city limits) and petroleum contamination has been identified at MD 482 and North Carroll Street. The County and MDE are working to address contamination issues.

The Town is currently planning on replacing approximately 1.8 miles of the water main on Main Street which dates from 1936. The main is in very poor condition and is subject to frequent leaks and loss of service. The estimated cost of the project is \$3 million plus and is expected to take place within 2-3 years.

See Table 8D for Hampstead WSA water problem areas.

Table 8D: Hampstead WSA Water Problem Areas

Location	Population	Nature of Problem	Status
Town of Hampstead	6,200	Elevated nitrates Wells 20 and 21	Out of service
Hillcrest Street neighborhood (outside Town limits)	100	MTBE contamination	MDE investigation, carbon filtration, connection to public water
MD 482 and North Carroll Street	30	Petroleum contamination	Monitoring wells and mechanical recovery

The Town plans on building an oversized pumphouse in the future at North Carroll Farms that would connect Wells 33 and 34. Eventually the Stansbury Well and Triple Green Well will also be brought online at this pumphouse. The Town is hopeful that this, along with the addition of the Oakmont Green Well will address any water shortages that may occur 5+ years out.

Planned Projects and Recommendations

See Table 8E for Hampstead WSA priority projects.

Table 8E: Hampstead WSA Priority Projects

Project Name	Planning Category	Description	Location	Capacity Added
Wells 33 & 34	Priority (W-3) Immediate	Bring well online (N. Carroll Farms, Sec. 5)	East of MD 30/south of Farm Woods Lane	.266 MGD (Currently Permitted)
Stansbury Well & Triple Green Well	Priority (W-3) Immediate	Bring well online (N. Carroll Farms, Sec. 5)	East of MD 30/south of Farm Woods Lane	.200 MGD (Currently Permitted)
Oakmont Green	Priority (W-3) Immediate	Develop and bring well online	Adjacent to Hole #13 on the Oakmont Green Golf Course	.144 MGD
Main Street Water Main Replacement	Priority (W-3) Immediate	Replace water mains	1.8 mile on Main Street	0 MGD

Long-Term Recommendations (10+ years)

- ♦ Drill and develop additional groundwater wells (based on the average MDE appropriation of existing Hampstead wells) to meet projected additional demand within the service area

Manchester Water Service Area

Current Conditions

The Town of Manchester owns and operates the public water system which limits service to its corporate boundary. The existing and planned WSA serves 1,672 EDUs, covers approximately 1,494 acres and is located in the northeast portion of the County along MD 30. See Map 14: Manchester WSA. 2013 average daily use was 0.524 mgd. Average daily appropriations are 0.581 mgd.

The system is currently supplied by 14 wells, Hillside Spring, and 11 pumping stations. Hillside Spring is a spring within the larger Walnut Street Area Spring system. Water is treated at each well pumping station. Treatment consists of chlorination at all 11 pumping stations. Soda ash is also added at all 11 pumping stations for pH control.

Water storage for the Town of Manchester is comprised of three elevated water storage tanks. A 500,000-gallon storage tank is located on York Street on the northeast side of Town; a 100,000-gallon storage tank located on Park Avenue in the western part of Town; and 250,000 gallons at the Manchester Baptist Church. The current storage system is a “floating” system which means three tanks are connected and act as overflow for the distribution system. When demand is low, additional water in the system goes to the tank. When demand is high, water is relieved from the tanks by gravity. See Table 9A for Manchester WSA appropriations; Table 9B: Manchester WSA for average daily use; and Table 9C for Manchester WSA storage tanks.

Map 14

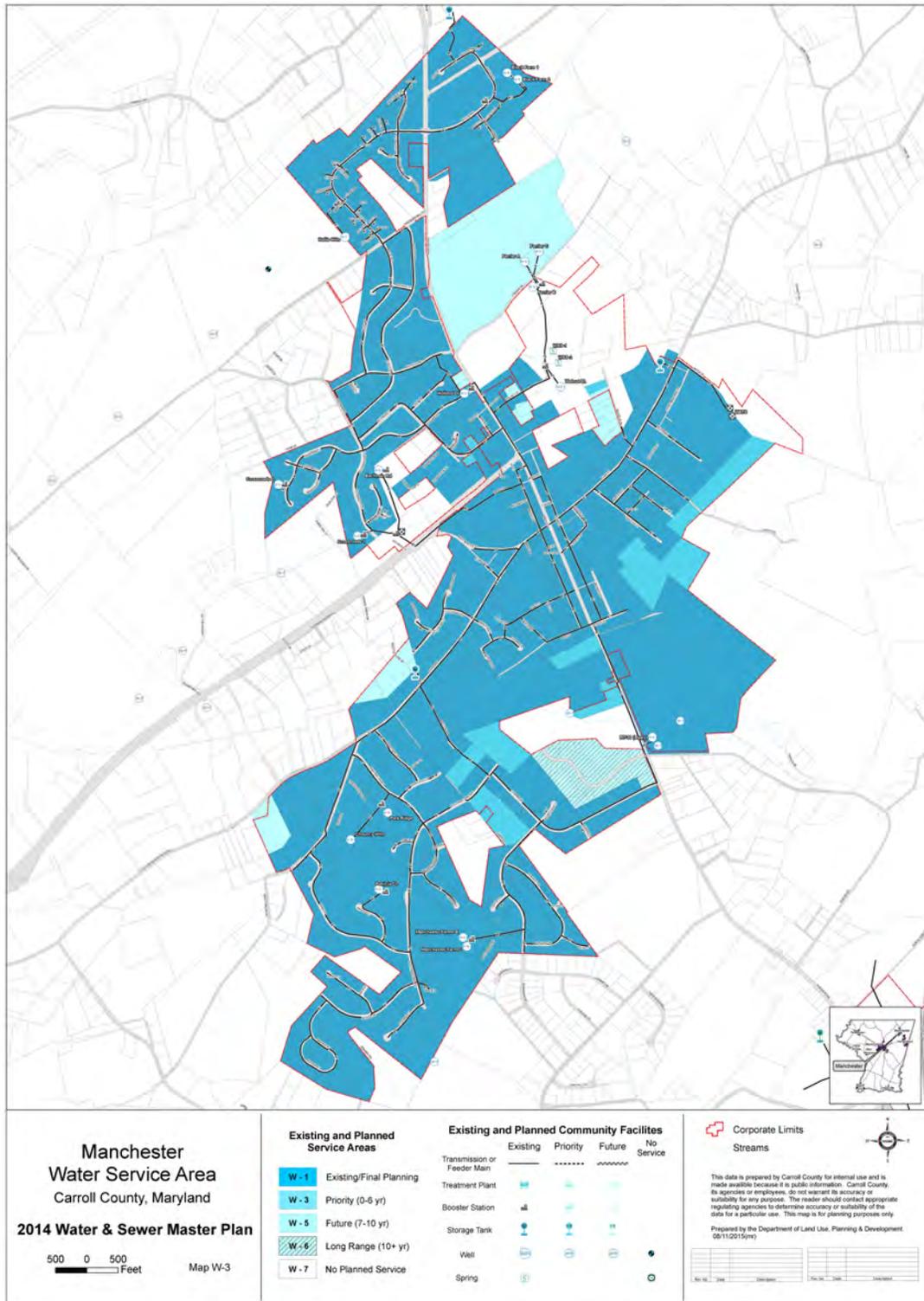


Table 9A: Manchester WSA Appropriations

6-Digit Watershed	Permit No.	Allocation		Wells/Springs Included in the Permit
		Average Daily Demand on Yearly Basis (gpd)	Daily Demand for Month of Maximum Use (gpd)	
Middle Potomac	CL1966G112(03)	134,000	199,000	<ul style="list-style-type: none"> ▪ Bachman Road Well (Well #4) ▪ Crossroads Well #1 (Well #8) ▪ Crossroads Well #2 (Well #9) ▪ Hallie Hill Well (Well #11)
Patapsco	CL1966G212(03)	38,000	63,000	<ul style="list-style-type: none"> ▪ Patricia Court Well (Well #7) ▪ Manchester Falls Well D
	CL1995G046(01)	69,700	116,400	<ul style="list-style-type: none"> ▪ Manchester Farms Well B (Well #10)
	CL2002G005(01)	6,000	10,000	<ul style="list-style-type: none"> ▪ Park Ridge Well (Well #13a)
	CL2004G021(01)	9,300	11,800	<ul style="list-style-type: none"> ▪ Park Ridge B Well (Well #13b)
Gunpowder	CL1966G012(11)	324,000	486,000	<ul style="list-style-type: none"> ▪ Walnut Street Spring Area ▪ MV1 Well #6 Route 30 Lippy ▪ MV2 Manchester V RW ▪ MV3 Manchester V TW4Alt ▪ Holland Drive Well (Well #2) ▪ Black Farm Well #1 (Hallie Hill L Well #14a) ▪ Black Farm Well #2 (Hallie Hill N Well #14b) ▪ Ferrier Road Wells (A, B, C) (Well #12) ▪ Walnut Street Well (Well #1)
Totals		581,000	886,200	

Since 2000, 9 new wells have been brought online. Most recently (2009), the Chauncy Hill Well, also known as Park Ridge B Well #13b, was connected. Hallie Hill Wells “L” and “N”, also known as Black Farms Well #1 and #2, were connected in 2007.

A hydraulic model of the Town’s entire water system was originally developed along with a 15-year projection for water storage needs. The hydraulic model is an ongoing process, as new water supplies or additional developments are brought onto the system the model is updated. If the update is not a Town project, the cost of the update is paid by the developer.

Table 9B: Manchester WSA Average Daily Use

Water Sources	Max. Safe Yield (mgd)	Avg. Daily Use (mgd)	Max. Peak Flow (mgd)
Bachman Road (Dell) Well	0.069	0.059	0.137
Park Ridge Well 13B	0.020	0.010	0.044
Crossroads #1 Well	0.038	0.034	0.076
Crossroads #2 Well	0.044	0.011	0.087
Holland Drive Well	0.041	0.014	0.083
Manchester Farms Well	0.056	0.043	0.113
MD Route 30 (Lippy) Well	0.014	0.020	0.029
Patricia Court Well	0.014	0.009	0.029
Hallie Hill Well	0.037	0.023	0.074
Hallie Hill "L" Well 14	0.024	0.016	0.057
Hallie Hill "N" Well 14	0.039	0.022	0.068
Ferrier Road Well A	0.020	0.018	0.052
Ferrier Road Well B	0.020	0.015	0.029
Ferrier Road Well C	0.019	0.014	0.038
Park Ridge Well 13A	0.029	0.006	0.055
Walnut Street Well	0.012	0.011	0.020
Walnut Street Spring*	0.028	0.021	0.060
Total	0.524	0.406	1.051

Walnut Street Spring storage capacity is 47,965 gpd.

Table 9C: Manchester WSA Storage Tanks

Storage Tank	Capacity (gpd)
Manchester Baptist Church Water Tank	250,000
Park Avenue Water Tank	100,000
York Street Water Tank	500,000
Total	850,000

Allocation Procedure

Prior to approving a development, the proposed use shall be considered in light of the Town's current water supply capacity, as limited by the Town's water appropriations, pumping capability, peaking and drought factors. If the Town determines that adequate water capacity for the proposed use, a fee of \$14,500 per EDU will be accessed, payable with the application of each building permit.

In addition, Chapter 241, the water section of the Town Code requires that public facilities, including water, be adequate for Planning Commission approval at each stage of the approval process.

Needs Analysis

The Huppman Spring, which is part of the larger Walnut Street Area Spring system, has been out-of-service for approximately four years due to surface water influence. Manchester has identified potential municipal groundwater sources and completed rehabilitation of the Walnut Street Area Spring system to address susceptibility to surface water influence and restore water quality. The Town is studying the extent of the contamination problems. Once studies are complete, the Town will develop a strategy to remediate water quality, if needed.

The Lippy Well, also known as the Route 30 Well, has been out-of-service since 2003 due to high nitrates. The Town is working in conjunction with the Carroll County Board of Education to construct a new pump house and two new wells on the Manchester Valley High School property. These two wells in addition to the original Lippy Well are also scheduled for connection to the pump station, where nitrates will be treated. This project is scheduled for completion in 2013.

The Town has had a long-standing goal of developing an accurate and complete map of its distribution system. Such a comprehensive inventory is needed to make the most efficient decisions in emergency situations such as a water main break or if an individual home's water valve will not shut off.

Given that policy changes related to groundwater or changes in projected demand may occur in the future, additional water sources may need to be planned. See Table 9D: Manchester WSA Inventory of Manchester WSA water problem areas.

Table 9D: Manchester WSA Water Problem Areas

Location	Population	Nature of Problem	Status
Manchester	5,089	Impact of Surface Water Treatment Rule under the Safe Drinking Water Act on Town's springs	Under study
Sheetz Store		Petroleum and MTBE	Under Study

Planned Projects and Recommendations

See Table 9E for Manchester WSA priority projects.

Table 9E: Manchester WSA Priority Projects

Project Name	Planning Category	Description	Location	Added Capacity
New Wells and Pump House	Priority (W-3) Immediate	Construct a new pump house and bring 2 wells at Manchester Valley High School into service. Pump house will have nitrate removal system.	Route 30 & Maple Grove/ Manchester Valley H.S.	.056 MGD
Lippy Well	Priority (W-3) Immediate	Connect Lippy Well to new pump house to remove nitrates. Bring into service.	Route 30 & Maple Grove/ Manchester Valley H.S.	.030 MGD

Table 9E: Manchester WSA Priority Projects

Project Name	Planning Category	Description	Location	Added Capacity
Computer Mapping	Priority (W-3) Immediate	Develop mapping of complete water distribution system	Entire Town	0 MGD
Refurbish Walnut Street Springs	Priority (W-3) 5 years	Refurbish springs to meet Surface Water Treatment Rule	North side of Town	.025 MGD

Long-Term Recommendations (10+ years)

- ◆ Address high nitrate concentrations in the Libby Well/MD Route 30 Well through the construction of a pump house; installation of nitrate filtration measures and connecting Libby Well/MD Route 30 Well to the pump station.
- ◆ Map the water distribution system for tracking purposes and make decisions in instances of drought in inadequate water supply.
- ◆ Maintain long term water source options at the Union Mills Reservoir and York PA Water System
- ◆ Maintain long-term options for non-groundwater water supply, including Union Mills Reservoir and connection to the York PA Water Company system

Mount Airy Water Service Area

Current Conditions

The Mount Airy WSA serves 3,160 EDUs and covers 3,280 acres in both Frederick and Carroll counties. The Town of Mount Airy owns and operates the community water supply system that provides water to Town residents only. Unincorporated areas planned for service must first be annexed into Town prior to appropriations. Appropriated average daily demand month of maximum use is 1,386,500 gpd; permitted average daily use is 927,000 gpd. See Map 15: Mount Airy WSA.

The Town of Mount Airy is unique among all municipalities in that it is not only divided between two counties it is also divided among five watersheds. The unconfined fractured rock aquifer within the Ijamsville Formation and Marburg Schist is the Town's water source. The system uses 10 wells to obtain its drinking water. The Mount Airy water supply is susceptible to nitrate contamination, VOCs (except well 8), SOCs, and radionuclides, but not susceptible to protozoans. Further, Wells #2 and #7 are susceptible to bacteria and viruses.

On September 28, 2005, the Town entered into a Consent Agreement with MDE, and subsequently, on June 22, 2007 the Town entered into a Consent Order with MDE due to drinking permit approvals exceeding appropriations. In September 2009, the Town's daily average water appropriation was increased from 865,000 gpd to 910,000 gpd.

To address the need for additional water sources/supply, the Town identified a new well at South Main Street, referred to as Well #11. Well #11 is currently on-line. In conjunction with re-appropriations of Well #6, appropriations from Well #11 satisfy the Consent Order. Permitted average daily use and actual average daily use is 927,000 mgd. See Table 10A for Mount Airy WSA appropriations. See Table 10B for Mount Airy WSA Average Daily Use; and Table 10C for Mount Airy WSA Storage Tanks.

Table 10A: Mount Airy WSA Appropriations
(as of August 2011)

6-Digit Watershed	Water Source	Permit Number	Permitted Daily Average Use (gpd)	Average Daily Demand Month of Maximum Use (gpd)
Middle Potomac	Wells #1-4	FR1976G007(06)	255,000	347,000
Patapsco	Well #5	CL1987G076 (06)	43,000	80,000
Patapsco	Well #6	CL1987G176 (06)	149,000	180,000
Middle Potomac	Well #7	FR1976G107(02)	99,000	139,000
Patapsco	Well #8	FR1995G020(03)	150,000	210,000
Middle Potomac	Well #9	FR2001G022(02)	79,000	204,000
Patapsco	Well #10 (Flickinger)	CL2000G022 (03)	77,000	144,000
Patapsco	Well #11	CL2009G001(02)	75,000	82,500
Totals			927,000	1,386,500

Map 15

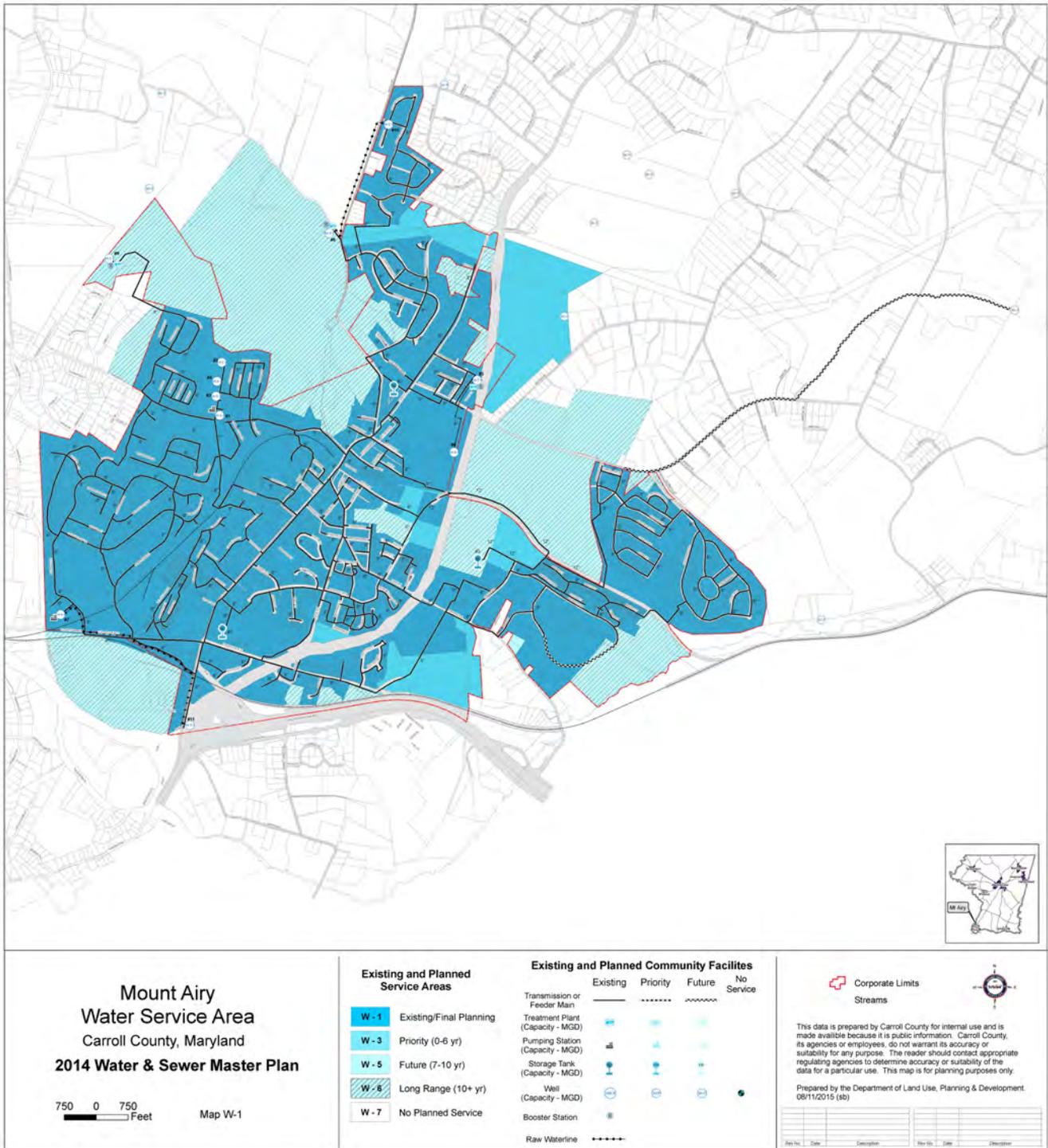


Table 10B: Mount Airy WSA Average Daily Use

Water Source	Max. Safe Yield (mgd)	Avg. Daily Use (mgd)	Max. Peak Flow (mgd)
Main Well Field (1- 4)	0.347	0.255	0.720
Well Fields 5 & 6	0.260	0.192	0.290
Well Fields 7 & 11	0.221	0.174	0.259
Well Fields 8 & 10	0.354	0.227	0.354
Well Field 9	0.204	0.079	0.288
Total	1.386	0.927	1.911*

*The Town only runs 2 of the 4 wells at any one time

Table 10C: Mount Airy WSA Storage Tanks

Storage Tank	Capacity (mgd)
Elevated Tank 1	0.200
Elevated Tank 2	0.500
Elevated Tank 3	1.005
Total	1.705

Allocation Procedure

The Town's Adequate Public Facilities Ordinance (APFO) requires the Planning Commission to review the adequacy of public facilities, including water upon submission of the first development plan by a developer. If water supply for any particular development is not adequate, the project may not proceed until such water supply becomes available. However, review of adequacy of facilities is not required for site plans for any lot contained within a commercial or industrial subdivision that received preliminary plan approval prior to April 5, 2005, unless the proposed development project is designated a "large water user". (A "large water user" refers to any proposed use which, according to water and use projections adopted by the Carroll County Health Department, will generate an average daily water consumption rate of greater than 2,500 gallons per day.)

Needs Analysis

Total future water demand assumes full build out within the growth area boundary, producing a water demand of 1,189,000 gpd. With current appropriations, the Town will need to identify an additional 262,000 gpd to meet future water demand needs. To address these needs, the Town will seek new water sources, preferably groundwater sources.

Currently, the Town is seeking MDE approval for appropriations to four wells on the Harrison/Leishear Properties (Wells #1, #3, #12, and #18). The Town is working on an agreement with the County, which owns the property, to utilize these wells. Based on the Town's testing, in accordance with MDE procedures, the wells have an anticipated (combined) appropriation amount of 152,000 gpd. The wells are situated in the Middle Run Stream subwatershed and are adjacent to the Town's Water Station #2, which is in the design phase and is 75% complete.

With the proximity of the wells and the need for treatment upgrade, it would be most feasible, and in the Town’s best interest, to acquire water rights and easements on the Harrison/Leishear property, and be granted the equivalent water recharge area of the Middle Run Stream subwatershed that will achieve adequate water supply at buildout. An estimated 300 gpd per acre is equivalent to 176,700 gpd of recharge area. The County has identified up to 589 acres that the Town may use for a recharge area. The Dorseytown is an area located outside of the incorporated limits of Mount Airy. The area experiences low well yields, requiring that the area be tied into Mount Airy’s WSA. The Town must annex Dorseytown before service would be allowed/provided. See Table 10C for Mount Airy WSA water problem area.

Table 10C: Mount Airy WSA Water Problem Area

Location	Population	Nature of Problem	Status
Dorseytown	40	Low well yields	W-3 category

Planned Projects and Recommendations

See Table 10D for Mount Airy WSA priority projects.

Table 10D: Mount Airy WSA Priority Projects

Project Name	Planning Category	Description	Location	Capacity Added
New well connection and waterline	Priority (W-3) Immediate	Develop Wells#1, 3, 12, & 18 on Harrison/Leishear Property and pipe to Water Station #2 for Treatment and Distribution.	East of MD27 & North of Watersville Road	.152 MGD
Upgrade Water Plant #2	Priority (W-3) Immediate	Full Plant Upgrade	West of MD27 & North of Watersville Road	.152 MGD (Not additional capacity, treatment for new wells)
SCADA for Water System	Priority (W-3) Immediate	Develop and install. Will be complete 2013	Entire system	0 MGD
Upgrade Water Mains	Priority (W-3) 5 years	Hydraulics Upgrades	Entire System	0 MGD

Long-Term Recommendations (10+ years)

Note: These are options that will be considered for long-term supply. However, inclusion here does not imply that there is a definite plan to move forward with an option. Exploring additional sources, even for those systems that currently project enough capacity to meet demand, is included in order to be prepared for policy changes or other changes that would result in the need for additional available water capacity.

- ◆ Middle Run Branch (Gillis Falls) Well: Anticipated yield 0.050 mgd
- ◆ Surface Water Intake in Gillis Falls Area: Safe yield 0.85 mgd; develop new surface water intake on Carroll County-owned property near planned Gillis Falls Reservoir; 100-120 mg off-stream storage impoundment

- ♦ Interconnection with Freedom: Interconnect with the Freedom water system and purchase agreement to supply approximately 0.85 mgd; 9.7 miles
 - Piney Run Reservoir (as built): Safe yield 3.65 mgd with normal pool elevation of 524 ft.; existing reservoir; to serve as regional source of supply for Mount Airy and THE Freedom WSA
 - Piney Run Reservoir (expanded): Safe yield 4.11 mgd; increase capacity of existing reservoir by raising the spillway riser and emergency spillway; to serve as regional source of supply for Mount Airy and Freedom WSA
- ♦ Interconnection with Frederick County: Interconnection with Frederick County water system and purchase agreement to supply approximately 0.85 mgd (with a maximum agreement of 1.2 mgd)
- ♦ Gillis Falls Reservoir: Safe yield 3.85 mgd with normal pool elevation of 610 ft.; planned reservoir; to serve as regional source of supply for Mount Airy and Sykesville/Freedom Service Areas

The long-term water supply options, beyond further groundwater exploration, may not be financially feasible and may be severely limited due to capacity.

- ♦ Harrison/Leishear Wells #18, #12, #3 and #1 (Middle Run Branch): Anticipated yield 0.152 mgd on existing wells with water rights from Carroll County on adequate recharge land in the Middle Run subwatershed.
- ♦ Groundwater Wells (South Branch of Patapsco): Drill and develop additional groundwater wells in the South Branch of the Patapsco watershed to meet projected additional demand up to 0.273 mgd. Includes areas north and south of I-70. The Town already has adequate recharge land to meet this additional capacity.
- ♦ Groundwater Wells (Upper Bush Creek): Drill and develop additional groundwater well(s) in the Upper Bush Creek watershed. This includes the annexation area south of West Ridgeville Blvd and West of South Main Street. Yields in this area will be limited due to available recharge land.
- ♦ Groundwater Well (Ben's Branch): Drill and develop a groundwater well in the Ben's Branch subwatershed of Lower Linganore. Anticipated yield 0.030 mgd with current quantity of recharge land.

New Windsor Water Service Area

Current Conditions

The community water supply system in New Windsor is owned by the Town and is operated by the Maryland Environmental Service (MES). The system serves 573 EDUs within the corporate limits of the municipality. The existing and planned service area is located in the west-central portion of the County and encompasses approximately 848 acres. See Map 16: New Windsor WSA. Permitted average daily use is 196,100 gpd and average daily demand of maximum use 184,000 gpd.

The New Windsor Municipal Water System is supplied by a network of connected springs and wells. Dennings Spring/Main Roops Spring Meadow Spring; Hillside Wells; and Dickerson Run. Water travels from Dennings Well through a 4 inch-diameter gravity waterline to Main Spring; from Main Spring through a 5 mile pipeline to the town limits; and then to the treatment facility. The two Hillside wells located at the south side of Hillside Drive pump water directly into the Town's water distribution system. Roops Meadow Spring and Dennings Spring, additional longstanding water sources for the system, are currently not utilized due to MDE's findings that the springs are under the influence of surface water. Treatment is required if they were to resume as water sources.

The water from the Main Spring at Bowersox and the Dennings Well flows by gravity through a pipeline to a 50,000 gallon chlorine contact tank for treatment. From there the water flows through a booster pump station and pumped into the distribution system and ultimately into two water storage tanks.

The Hillside wells are also pumped into the distribution system. Storage consists of a 250,000 gallon finished water standpipe and a 375,000-gallon elevated water storage tank located on Town property next to the first tank.

Even though Roops Meadow Spring is currently not in use, a contingency plan remains in effect with the Lehigh Portland Cement Company providing water in the event that quarry operations were to adversely affect Roops Meadow Spring. The Town of New Windsor currently has an Appropriation and Use Permit for an emergency use only municipal water supply. The permit allows an average daily withdrawal of 100 gallons on a yearly basis and maximum daily withdrawal of 250,000 gallons from Dickenson Run. Excluding this emergency water source, the Town is presently permitted for an average daily total demand of 196,000 gpd from the system's multiple sources. Actual average daily use was 154,000 gpd. See Table 11A for New Windsor WSA appropriations; see Table 11B New Windsor average daily use; and see Table 11C for New Windsor WSA Storage Tanks.

Table 11A: New Winsor WSA Appropriations

6-Digit Watershed	Water Source	Permit Number	Permitted Daily Average Use (gpd)	Average Day Demand Month of Maximum Use (gpd)
Middle Potomac	Dennings Well/Main Spring Roops Meadow Spring	CL1978G022 (05)	143,000	202,000
Middle Potomac	Hillside Wells (No. 1 & 2)	CL1992G049 (02)	53,000	80,000
Middle Potomac	Dickerson Run (Emergency source)	CL1977S054 (03)	100	250,000
Total			196,100	452,080

Table 11B: New Windsor WSA Average Daily Use

Water Source	Max. Safe Yield (mgd)	Avg. Daily Use (mgd)	Max. Peak Flow (mgd)
Well/Spring Network (Dennings Well, Main Spring, Roops Meadow Spring)	.202	0.127	0.148
Hillside Wells (Nos. 1 & 2)	0.080	0.027	0.036
Total	0.282	0.154	0.184

Table 11C: New Windsor WSA Storage Tank

Storage Tank	Capacity (mgd)
Chlorine Contact Tank	0.500
Standpipe	0.250
Standpipe	0.375
Total	1.125

Allocation Procedure

New Windsor follows a “first come, first served” policy for the allocation of available water service. Subdivision or development activity is a developer or new-user expense. Currently there are no “set-aside” policies for business or industrial users. “Adequacy” of the water supply system is a prerequisite to executing public works agreements or making new connections for water service to new customers (*New Windsor Code §92-46*).

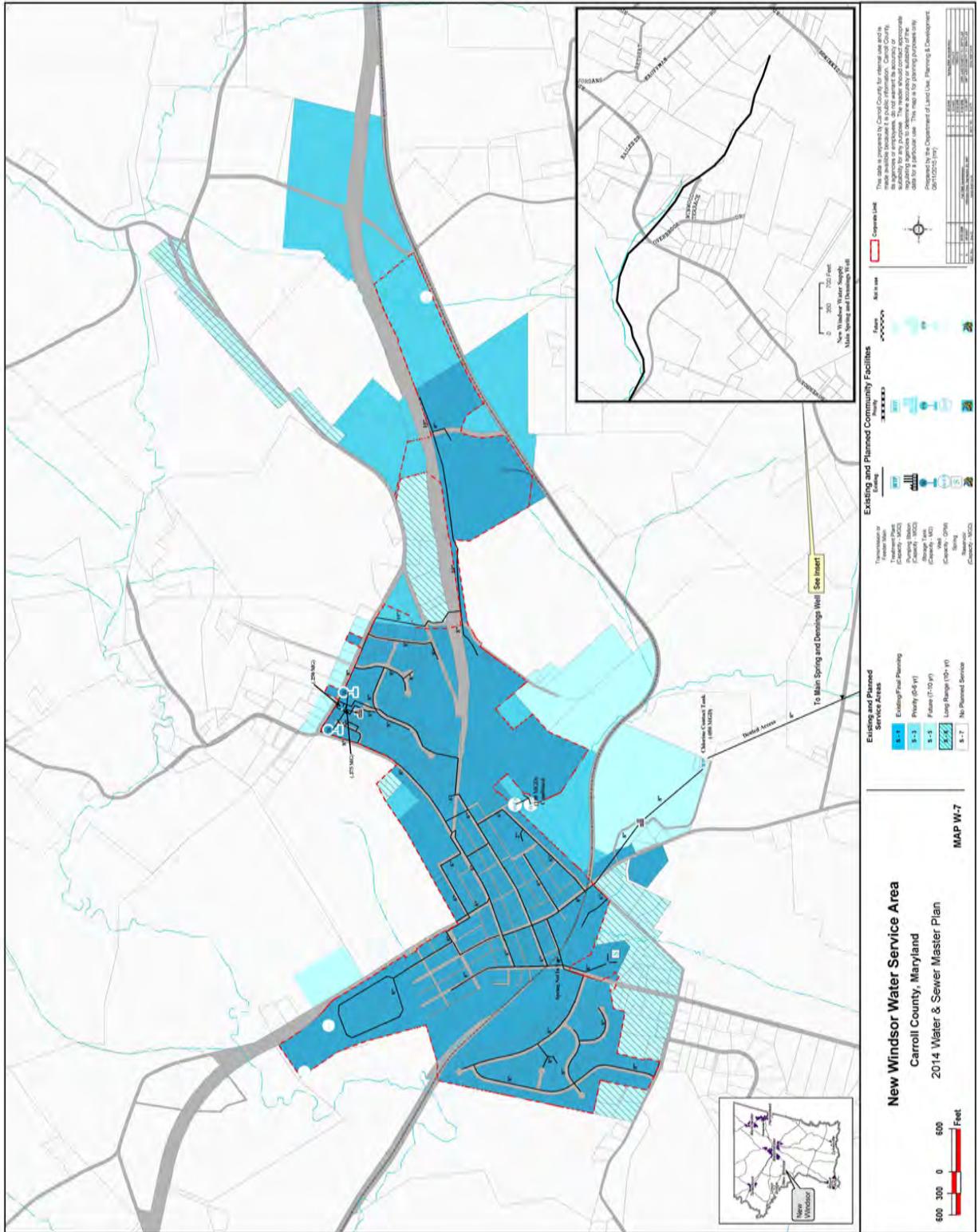
Needs Analysis

As mentioned above, Roops Meadow Spring is under the influence of surface water, requiring the Town to abandon its use until this influence is addressed. In addition, the treat of potential contamination from Lehigh New Windsor Quarry is a possibility. See Table 11D for New Windsor WSA water problem areas.

Table 11D: New Windsor WSA Water Problem Areas

Location	Population	Nature of Problem	Status
Roops Meadow Spring	n/a	Surface water influence	Currently offline
Roops Meadow Spring	n/a	Potential impact from Lehigh New Windsor Quarry	Lehigh contingency plan in effect

Map 16



Planned Projects and Recommendations

See Table 11E for New Windsor WSA priority projects.

Table 11E: New Windsor WSA Priority Projects

Project Name	Planning Category	Description	Location	Added Capacity
Rehabilitate Existing Tank (No. 1)	Priority (W-3) Immediate	Inspect, rehabilitate, paint	Rowe Road	0 MGD
Main Spring Farm Well (MSF-5)	Priority (W-3) 5 years	Well MSF-5; connect to system	Main Spring Farm	0 MGD
Main Spring Infrastructure	Priority (W-3) 5 years	Water control	Main Spring Farm	0 MGD
Main Spring Farm Pump	Priority (W-3) 5 years	Add second pump	Main Spring Farm	0 MGD
Test Well (MSF-6)	Priority (W-3) 5 years	Well MSF-6; resume pump testing	Main Spring Farm	0 MGD
Control Flow Meters	Priority (W-3) 5 years	Central control	System-wide facilities	0 MGD
1,800 Feet of 6-Inch Main	Future (W-5) 10 years	Improve distribution	Lambert/Hillside/Church	0 MGD
Water Audit	Priority (W-3) 5 years	Account for water loss	Wherever necessary	0 MGD
Main St. Project	Priority (W-3) 10 years	Water main replacement to improve distribution	Main/High Streets	0 MGD
Roops Meadow Well	Priority (W-3) 5 years	Explore options to bring the well back online		0 MGD
Hillside Well (No. 1)	Priority (W-3) Immediate	Return to operability	Hillside Drive	0 MGD
Additional Water Sources	Future (W-5) 10 years	Explore, identify, acquire, develop	Various locations (include. Atlee Ridge & Snader property)	.25 MGD

Long-Term Recommendations (10+ years)

- ◆ Replace existing Water Tank #3.
- ◆ Develop an agreement with Lehigh Portland Cement Company to use water pumped from the Lehigh New Windsor Quarry as a potential future water source.
- ◆ Hillside Well 1 (2nd well @Hillside) Bring back online; anticipated yield 0.050 mgd
- ◆ Groundwater Wells: Drill and develop three groundwater wells (based on the average MDE appropriated of existing New Windsor wells) to meet projected additional demand requirements of approximately 198,000 gpd.
- ◆ Maintain long-term options for non-groundwater water supply, including Lehigh New Windsor Quarry, regional connections to Union Bridge water supply, and regional connection to Westminster Water Supply.

Pleasant Valley Water Service Area

Current Conditions

The Pleasant Valley WSA, comprising approximately 37 acres, is located on both sides of Pleasant Valley Road between Richardson Road and Hughes Shop Road. In 2010, an estimated 50 residential EDUs and the Pleasant Valley Fire Department used an average of 6,200 gpd. Permitted daily average use is 10.100 gpd. The original system dated back to around 1929. Pleasant Valley is an unincorporated Rural Village. See Map 17: Pleasant Valley WSA.

The community water supply system was privately owned until 1991 until the County acquired ownership of it in 1993. Construction of a new system was completed in 1994. The County installed meters, vaults, hydrants (for fire protection), a standpipe (0.050 gallon storage), and approximately 3,470 feet of 8-inch diameter ductile iron pipe (DIP) as part of the distribution system. The upgraded system provides 40 pounds of pressure per square inch (psi) at each house and 60 psi in the main line. By providing adequate and constant water pressure, the water system is safeguarded from the danger of contaminants being siphoned back into the system from the user end of the water pipe (e.g., a faucet or garden hose). Since completion of the system upgrade, the Carroll County Department of Public Works, Bureau of Utilities, has operated and maintained the new water supply system. See Table 12A for Pleasant Valley WSA appropriations and see Table 12B for Pleasant Valley WSA average daily use.

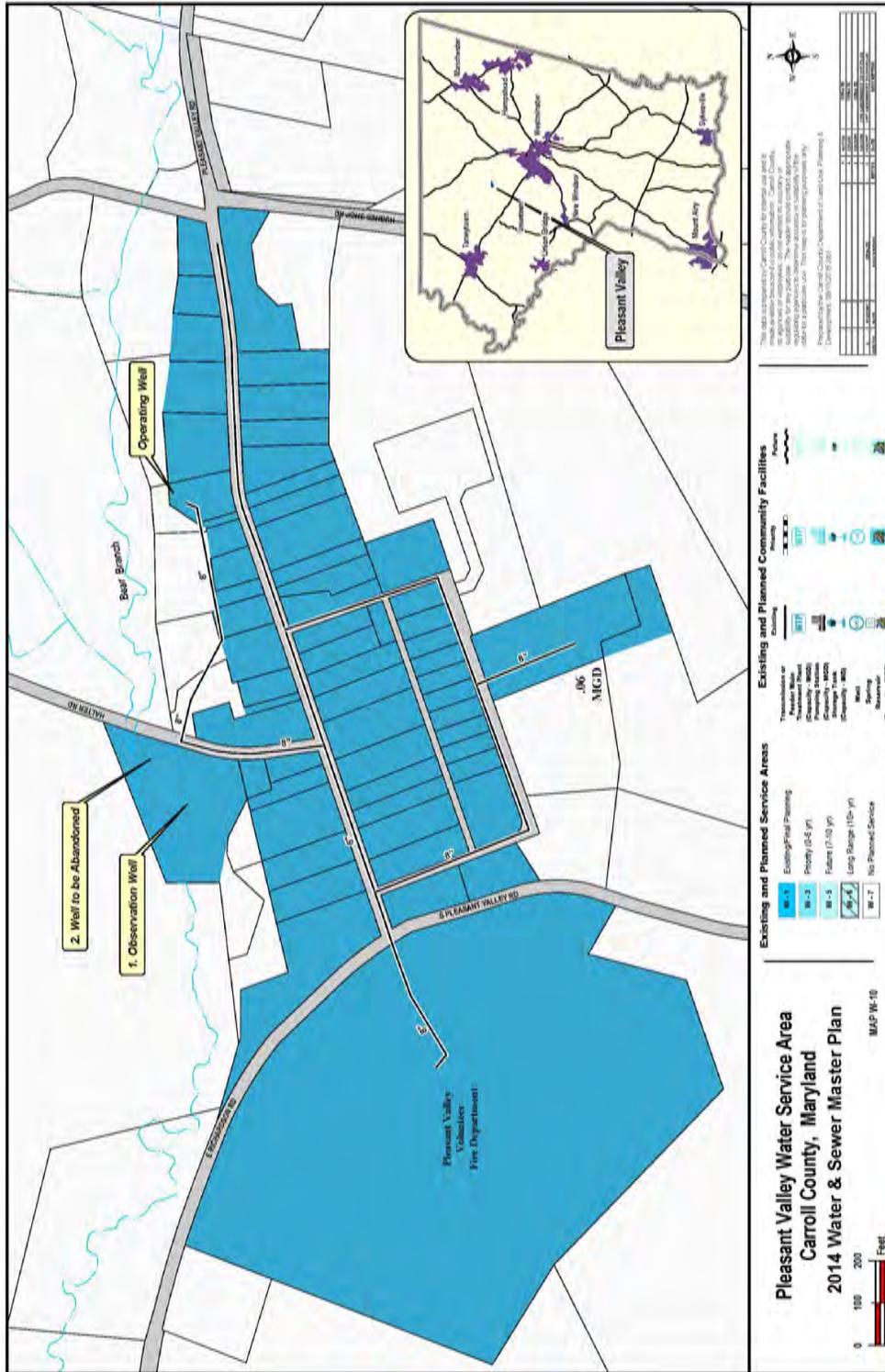
Table 12A: Pleasant Valley WSA Appropriations

6-Digit Watershed	Water Source	Permit Number	Permitted Daily Average Use (gpd)	Average Day Demand Month of Maximum Use (gpd)
Middle Potomac	PW-A1	CL1995G053 (02)	10,100	17,000

Table 12B: Pleasant Valley WSA Average Daily Demand

Water Source	Storage Capacity	Max. Safe Yield (mgd)	Avg. Daily Use (mgd)	Max. Peak Flow (mgd)	WTP Capacity
Water Standpipe	0.050	0.014	0.006	0.005	0.050
Water Treatment Facility	0	0.008	0.005	0.023	0.000
Well PW-A1/Observation Well	0.003	0.022	0.006	0.027	0.003
Total	0.053	0.044	0.167	0.055	0.053

Map 17



Allocation Procedure

Connection to the system is available to those properties located within the service area. There is no allocation procedure due to the limited number of properties in the service area and system capacity.

Needs Analysis

The Town is working with the fire department to upgrade the Fire Department Well to serve as a back-up to the primary well to provide redundancy and ensure enough water pressure for fire hoses.

Planned Projects and Recommendations

See Table 12C for Pleasant Valley WSA priority projects.

Table 12C: Pleasant Valley WSA Priority Projects

Project Name	Planning Category	Description	Location	Added Capacity
Pleasant Valley Well Upgrade	Priority (W-3) Immediate	Upgrade to the Fire Department Well which will serve as a backup to the primary well to provide redundancy.		0 MGD
Upgrade / Replacement of existing water tank	Future (W-5) 10 years	Upgrade or replace existing tank due to problems and deterioration	South of High Street	0 MGD

Taneytown Water Service Area

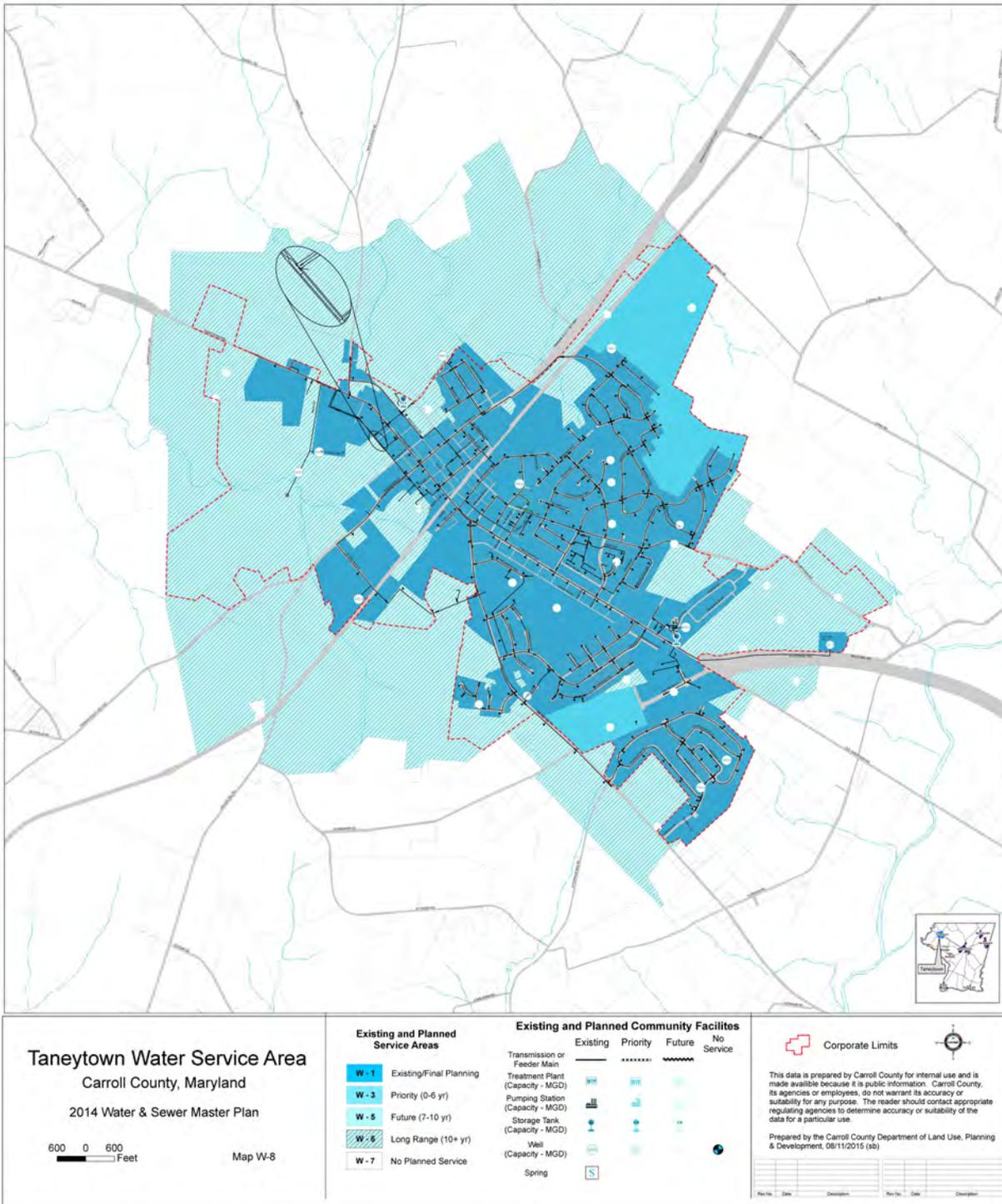
Current Conditions

The City of Taneytown owns and operates the community water supply system and generally limits service to the area located within the City's corporate boundary. Taneytown WSA serves 2815 EDUs. The overall planned WSA covers approximately 3,134 acres within and bordering the municipality, and is situated in the northwest portion of the County along MD 140 and MD 194. See Map 18: Taneytown WSA. The City estimates that 80 percent of total consumption is generated by the residential population. Permitted daily use is 0.552 mgd. Average daily use is 0.372 mgd.

Taneytown's water supply system relies on groundwater which is supplied by eight municipal wells. Wells 8 and 9 have a permitted average day capacity of 190,000 gallons. Wells 11 and 12 have a permitted average day capacity of 118,000 gallons. Well 14 provides an additional 90,000 gallons average day capacity. Wells 15 and 16 are permitted for 135,000 gallons average day capacity. In recent years, the production of Well 11 dropped off considerably. In order to address low water levels, the City lowered the level of pumping and continues to use the well every other week, alternating with Well 12.

When signaled by a level controller at the City's 150,000-gallon (0.150 mg) elevated storage tank, all wells currently on line (typically six) are activated. Chlorination by chlorine gas, the only treatment used, occurs at each pumphouse, with the exception of Well 9 & 12. Well 9 treatments include granular activated carbon treatment for volatile organic compounds. Water from Well 12 also is treated at the Well 11 pumphouse. Well 13 is currently out of service but could be used in case of an emergency. After chlorination, water is piped directly into distribution mains and the City's two aboveground storage tanks, a 0.150-mg elevated tank and a 0.460-mg standpipe. The combined usable storage of 0.610 mg provides a one-day to one-quarter day supply of water based on actual consumption. In addition to maintaining constant pressure throughout the system, the storage tanks also provide an adequate supply for firefighting.

Map 18



The City was under Consent Agreement with MDE to increase the City's production capabilities to meet the drought year month of maximum use demand. To address this issue, the City, brought Wells 15 & 16 online as well as completing capacity improvement projects throughout the entire system. In addition, new wells were drilled on Fringer Road; and the City constructed granular activated carbon to absorb perchloroethylene (PCE) which is a chemical used in manufacturing, because levels had reached the Maximum Containment Levels (MCL) for Well 9. As part of the project, the well was videoed, and the well pump and piping we replaced, yielding a 20 gallon per minute increase in production.

Unaccounted-for water is the difference between pump water and accounted-for water, which includes metered and other authorized unmetered water. From 2007 through 2009 unaccounted-for water was consistent, averaging 25% of the water withdrawals over this period. Unaccounted-for-water reduced to 23% in 2010, 10% in 2011, and 7% in 2012. Recent reduction is attributed to the city's leak identification and repair program and replacement of the water main in Baltimore Street. It is believed that the majority of the remaining water loss is from leaks within the water system.

In 2010, as part of the SHA MD 140 Streetscape project, the City realigned and replaced portions of the existing water line in Baltimore Street from the traffic circle at Antrim Boulevard to Harney Road. The pipes are now 12-inch diameter between Harney Road and the roundabout. The City also replaced the lateral connections to houses.

In 2012 the City constructed a new 8-inch water main in Sells Mill Road from East Baltimore Street to Well 17 to connect the new well to the existing distribution system. In 2013 the City completed replacement of the water main in York Street and Frederick Street.

See Table 13A for Taneytown WSA appropriations; Table 13B for Taneytown WSA Average Daily Use; and Table 13C for Taneytown WSA Storage Tanks.

Table 13A: Taneytown WSA Appropriations

6-Digit Watershed	Water Source	Permit Number	Permitted Daily Average Use (gpd)	Average Day Demand Month of Maximum Use (gpd)
Middle Potomac	Wells 8 & 9	CL1978G079 (09)	190,000	209,000
Middle Potomac	11 & 12	CL1978G279 (01)	118,000	130,000
Middle Potomac	Well 14	CL2007G003 (01)	90,000	225,000
Middle Potomac	Wells 15 & 16	CL2004G018 (02)	135,000	182,000
Middle Potomac	Well 17	CL2007G0003 (01)	204,500*	297,000
Total			737,500	1,043,000

* The existing permitted capacity of Well 17 is 19,100 gpd, however the reliable yield of the Well is approximately 270,000. Additional recharge area will be obtained by the city through developers to meet future capacity needs, resulting in permitted capacity increases.

Table 13B: Taneytown WSA Average Daily Use

Water Source	Max. Safe Yield (mgd)	Avg. Daily Use (mgd)	Max. Peak Flow (mgd)	WTP Capacity
Well 8	0.079	0.039	0.069	53 gpm

Table 13B: Taneytown WSA Average Daily Use

Water Source	Max. Safe Yield (mgd)	Avg. Daily Use (mgd)	Max. Peak Flow (mgd)	WTP Capacity
Well 9	0.187	0.096	0.192	145 gpm
Well 11	0.166	0.019	0.166	52 gpm
Well 12	0.202	0.037	0.170	120 gpm
Well 13 (not online)	0.684	0.000	0.308	290 gpm
Well 14	0.180	0.069	0.123	107 gpm
Well 15	0.125	0.043	-	66 gpm
Well 16	0.149	0.069	-	105 gpm
Well 17	0.270	-	-	-
Total	1.498	0.372	1.028	938 gpm

13C: Taneytown WSA Storage

Storage Tank	Capacity (mgd)
Pump House Rd. Standpipe	0.750 mg
E. Baltimore St. Water Tower	0.150 mg
Total	0.900 mg

Allocation Procedure

City of Taneytown typically provides community water service on a “first come, first served” basis. Generally, the water capacity cannot be purchased in advance and is not held in reserve. However, the City has the ability to enter into Development Rights and Responsibility Agreements (DRRA) for specific circumstances. Building permits are issued for new development only after all fees are paid, including are water connection and benefit-assessment charges, unless specified otherwise in a DRRA. Developers are also required to provide recharge area to offset proposed demand.

Needs Analysis

To plan for securing needed public drinking water to meet the demand generated by the approved Taneytown Master Plan, the City is working with the County to secure water recharge credits on properties covered by land preservation easements. MDE approved deed restriction language to achieve the goal of recharge preservation. Additional sources must be developed to accommodate the growth planned for the Priority and Future Planning Categories. Well #17 (Baptist Church) has been designed and construction will be completed in 2013. See Table 13E for Taneytown WSA water problem areas.

Table 13E: Taneytown WSA Water Problem Areas

Location	Population	Nature of Problem	Status
City of Taneytown	7,757	Insufficient water appropriations for existing and future growth	Under study

Planned Projects and Recommendations

See Table 13F for Taney town WSA priority projects and Table 13G for long term recommendations (10+ years).

Table 13F: Taneytown WSA Priority Projects

Project Name	Planning Category	Description	Location	Added Capacity
Well 17 Wellhouse	Priority (W-3) immediate	Design and construct wellhouse	Sells Mill Road	.019 MGD*
Antrim Blvd. Water Main	Priority (W-3) 5 years	Loop water main in Antrim Blvd to Trevanion Road	Antrim Blvd.	0 MGD
Water Storage Tanks Rehabilitation	Priority (W-3) Immediate	Cleaning, repair, and painting of both storage tanks	Breakiron Street and Pump House Road	0 MGD
Water System Telemetry Improvements	Priority (W-3) Immediate	Hardware, software, and programming to automate water system	Whole System	0 MGD

* The existing permitted capacity of Well 17 is 19,100 gpd, however the reliable yield of the Well is approximately 204,500. Additional recharge area will be obtained by the city through developers to meet future capacity needs, resulting in permitted capacity increases.

Long-Term Recommendations (10+ years)

- ◆ Construct 0.5 mg water storage tank in the Southeast section of Town.
- ◆ Identify and develop new water supplies adequate to support planned future growth.
- ◆ Continue to monitor and address sources of water loss.
- ◆ Maintain long-term options for non-groundwater water supply, including Big Pipe Creek.

Union Bridge Water Service Area

Current Conditions

The Town of Union Bridge owns and operates the community water supply system, which serves approximately 1,049 people residing within the Town's corporate limits. The existing and planned service area is situated in the west-central portion of the County and encompasses approximately 1,352 acres. See Map 19: Union Bridge WSA. Permitted average daily use is 0.208 mgd. Average daily use is 0.166 mgd.

The Town is supplied by two wells used for drinking water. The Town's primary well (Well #1), located on West Locust Street, drilled in 1913 and purchased from the Union Bridge Water Company in 1963, is estimated to have a safe yield of 0.576 mgd. A second well (Well #2), which became operational in 2003, is located near Whyte Street on property owned by the Union Bridge Fire Company. The Town has secured an easement from the fire company for the well and a buffer area surrounding the wellhead. This well has an estimated safe yield of 0.101 mgd.

Both wells are tied into a 0.3 mgd WTP constructed in 2004. Due to concerns that these wells are "under the influence" of surface water, and also due to rising nitrate levels, the Town installed a filtration system, nitrate removal equipment, and telemetry as part of the WTP project.

A third well (Phillips Property – Well #3) has been drilled north of MD 75 on property annexed by the Town in 1992. This property is proposed for residential and commercial development. Well #3 is housed in a wellhouse and is equipped with filtration and nitrate removal technologies. It has an estimated yield of 144,000 gpd. The well is connected by an 8-inch water main extension into the Town's system. This well is currently not in service.

The Town's water has a high hardness rating with a pH value of 7.6. To address this issue, a chlorine generation system was installed as part of the WTP project in 2004.

The water supply system uses one glass-lined steel tank for storage. This elevated tank has storage capacity of 0.3 million gallon, and reserves a two- to three-day supply for residents in the event of a well failure. This elevated tank was constructed in 2003 and replaced a 0.29 million gallon ground level tank. The elevated tank significantly improves water pressure for residential use and fire protection. See Table 14A for Union Bridge WSA appropriations; Table 14B for Union Bridge WSA average daily use; Table 14C for Union Bridge storage tank; and Table 14D for WTP capacity.

Map 19

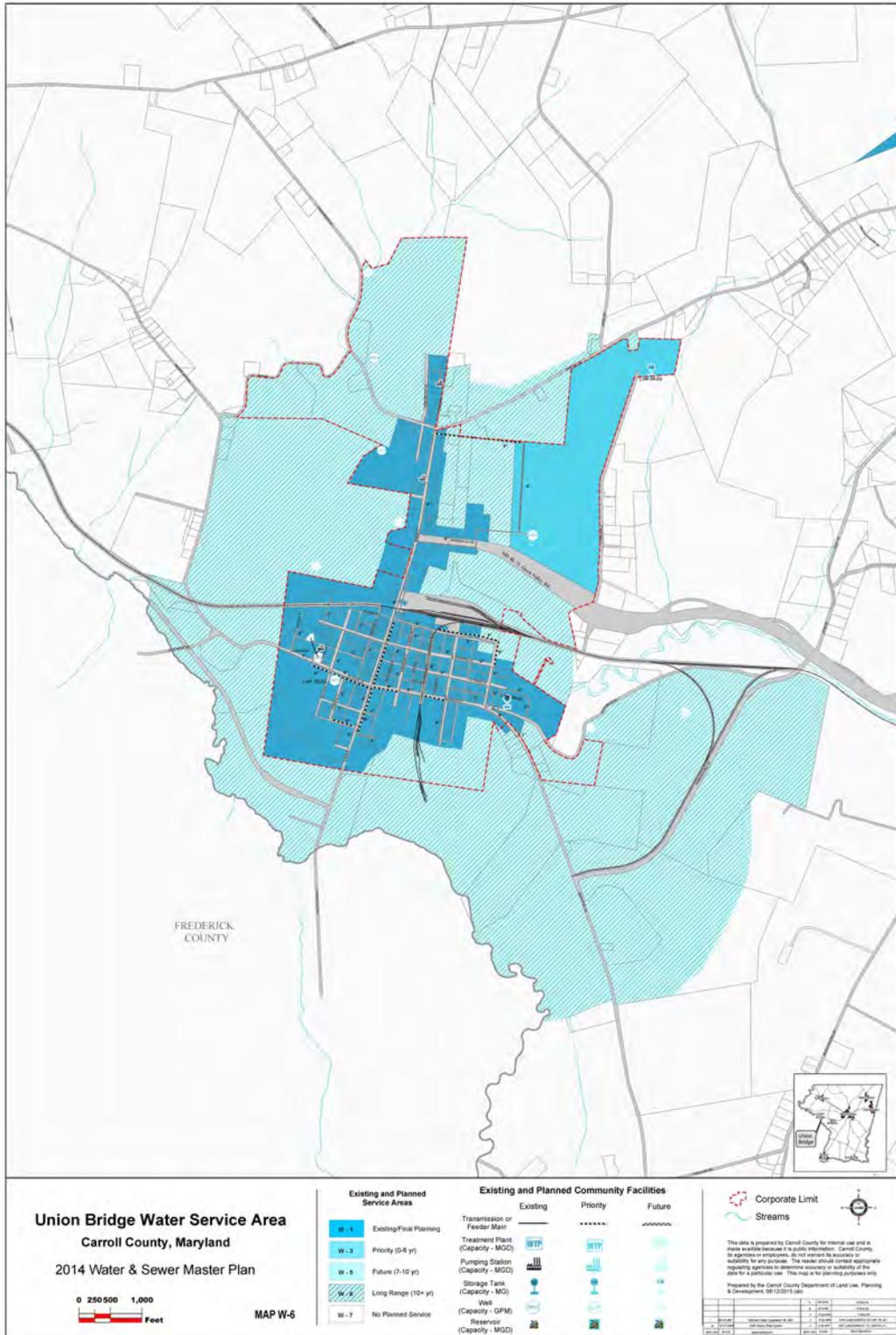


Table 14A: Union Bridge WSA Appropriations

6-Digit Watershed	Water Source	Permit Number	Permitted Daily Average Use (gpd)	Average Day Demand Month of Maximum Use (gpd)
Middle Potomac	Locust St. and Whyte St. Wells (Wells #1 and #2)	CL1979G048 (05)	166,000	200,000
Middle Potomac	Phillips Well (Well #3) (not in use)	CL1979G148 (03)	42,300	82,000
Total			208,300	282,000

Table 14B: Union Bridge WSA Average Daily Use

Water Source	Max. Safe Yield (mgd)	Avg. Daily Use (mgd)	Max. Peak Flow (mgd)
Well (Locust Street) #1	0.576	0.133	unknown
Well (Whyte Street) #2	0.101	0.033	unknown
Well (Phillips Lane) #3	0.144	Pending	unknown
Total	0.821	0.166	unknown

Table 14C: Union Bridge WSA Storage Tank

Water Source	Storage Capacity
Elevated Storage Tank	0.300 mgd

Table 14D: Union Bridge Water Treatment Plant

Water Treatment Plant (W. Locust Street)	0.300 mgd
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Allocation Procedure

A lack of new subdivision activity in Union Bridge has resulted in a first come, first served allocation procedure for Town water services, subject to specific provisions in annexation agreements. Any new development activity that necessitates an expansion of the existing water system will be required to provide the additional water at the sole financial responsibility of the developer; no burden for the expansion will be borne by the existing residents of Union Bridge. No reservations or set aside policies are provided for business or industrial users. However, the Town reserves the right to adopt a policy to reserve a portion of its water and sewerage capacity for commercial and industrial uses. A water benefit assessment fee is charged for all new residential and commercial users.

Needs Analysis

To plan for and secure needed public drinking water to meet the demand generated by the approved Union Bridge Community Comprehensive Plan, the Town may consider working with the County to secure water recharge credits on properties covered by land preservation easements. MDE would need to approve deed restriction language to achieve the goal of allocability transference.

Once the Jackson Ridge (Phillips property) subdivision begins construction, the Phillips Well (Well #3) will need to be brought online to serve the development.

The West Locust Street Well #1 (the Town's primary well) is under the influence of surface water and needs to be rehabilitated. However, work on this well cannot proceed until additional wells are in service that could provide the necessary capacity while the Town's primary well is down. See Table 14E for Union Bridge WSA water problem areas.

Table 14E: Union Bridge WSA Water Problem Areas

Location	Population	Nature of Problem	Status
Locust Street Well (Well#1)	1,049	influence of surface water	cannot proceed until add'l wells found

Planned Projects and Recommendations

See Table 14F for Union Bridge priority projects.

Table 14F: Union Bridge WSA Priority Projects

Project Name	Planning Category	Description	Location	Added Capacity
West Broadway Street Reconstruction	Priority (W-3) Immediate	Replace existing water lines and water connections	West Broadway Street	TBD
Phillips Well (Well #3)	Priority (W-3) 5 years	Developer driven project to bring the well on line	Phillips Lane	.042 MDG*

* Capacity adding project is driven by the demand generated from the Jackson Ridge Development

Long-Term Recommendations (10+ years)

- ♦ Investigate the potential to withdraw water from the existing Lehigh pond to treat and use as potable water.
- ♦ Drill and develop additional groundwater wells (based on the average MDE appropriation of existing Union Bridge wells) to meet projected additional demand within the service area.
- ♦ Build 300,000 water storage stank on the Northeast quadrant of the Phillips property.
- ♦ Re-inline and rehabilitate Well #1 to address surface water influence.

Westminster Water Service Area

Current Conditions

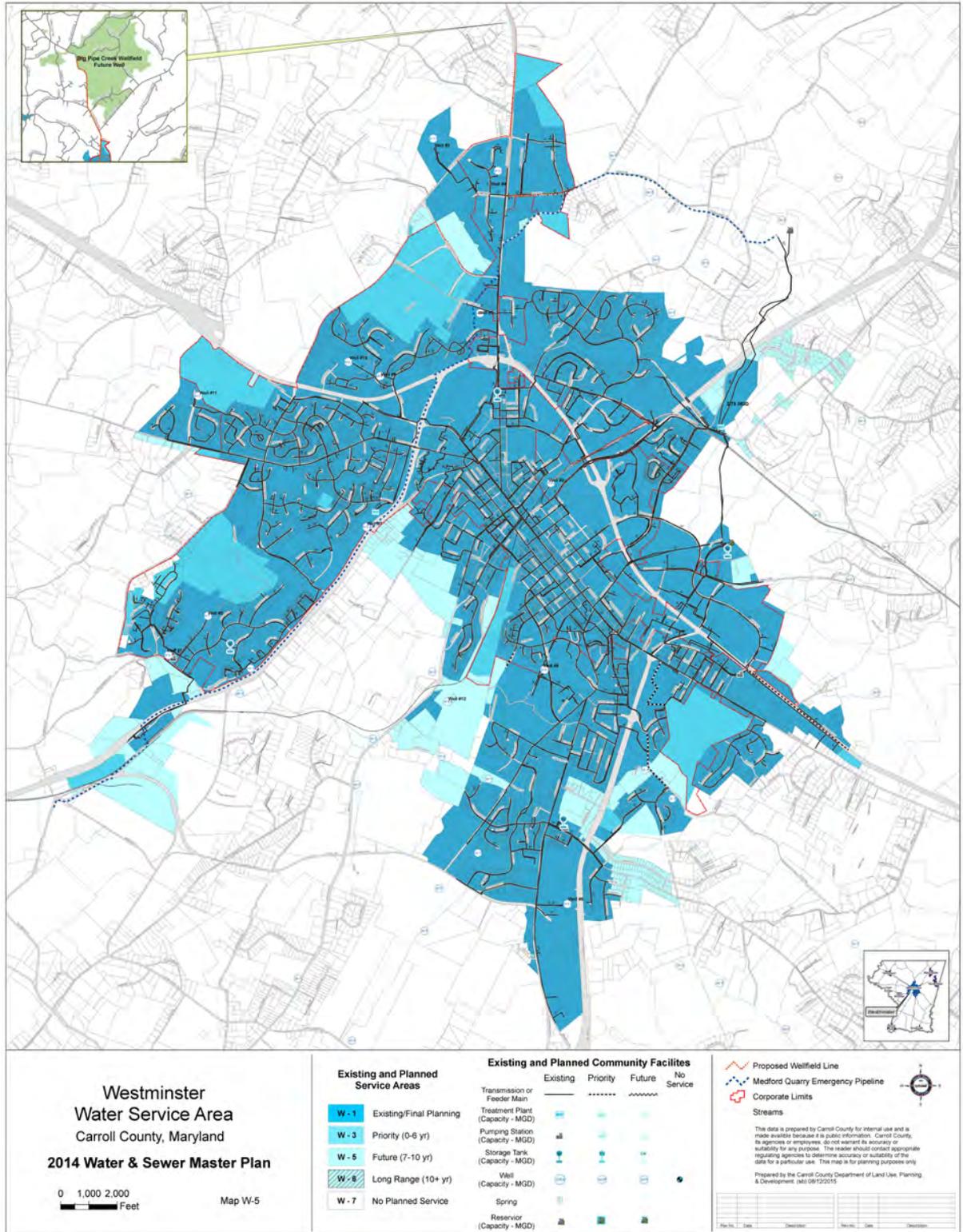
The City of Westminster owns and operates the community water supply system serving the City and areas beyond the corporate limits. The existing and planned WSA serves 10,347 EDUs and is located in central Carroll County and covers approximately 7,704 acres. The existing and planned service area covers approximately 1,494 acres. See Map 20: Westminster WSA. Permitted average daily use is 3.597 mpd. Average daily use is 2.59 mgd. Unincorporated areas planned for service must first be annexed into City prior to appropriations.

The water system, which dates back to 1898, was purchased by the City of Westminster in 1964 from the Maryland Water Works Company. The City relies on both ground and surface water for its potable supply. A major source of surface water is Cranberry Branch, a tributary of the West Branch of the Patapsco River. Cranberry Reservoir is located north of Lucabaugh Mill Road. From that point, a 30-inch transmission line runs for approximately 7,500 feet along the Cranberry Branch to the water treatment plant at Cranberry. In the same vicinity, the City also extracts surface water from the West Branch of the Patapsco River, also known as Hull Creek. A small impoundment and an infiltration gallery are located in Bennett Cerf Park and a 14-16 inch transmission line allows for gravity flow to the water treatment plant at Cranberry. The City has an appropriations permit to withdraw 1.838 mgd from these two sources combined.

An important addition to the City's water system was the construction of an emergency water supply pipeline, utilizing water from the nearby Medford Quarry to supplement the Cranberry system, which consists of the entire system with exception to Wakefield Valley, during drought conditions. The pipeline became operational in 2009 and Medford Quarry is permitted during the month of maximum use at 655,000 gpd monthly maximum use; 162,000 gpd permitted daily use for emergency supply only. The approximately seven mile pipeline varies in size from 12-16 inches and directly connects Medford Quarry with the City's Cranberry Reservoir. Medford Quarry Pipeline was constructed with a larger diameter pipe in the vicinity of Magna Way, so it can handle increased flows from the Big Pipe Creek pipeline when that pipeline interconnects with it at some time in the future.

Since the streams that supply the City's surface water system eventually supply Liberty Reservoir, low stream flow below 0.85 cubic feet per second (cfs), or 0.56 mgd at the gauging station, which is located on Old Manchester Road, requires augmentation. This is accomplished by pumping water from the Koontz Creamery well into a third tributary until the gauge exceeds 1.62 cfs (1.05 mgd). The City purchased the Koontz Creamery well in 1974 in order to meet increasing demands on the City's water supply sources. However, the Koontz Creamery well is not connected directly into the City's potable water system due to the presence of hydrocarbons. Since the City was approaching maximum withdrawals possible from Cranberry Branch and Hull Creek, and in order to maintain a stipulated minimum stream flow, the State agreed to the supplementation procedures noted above. This pumping has been permitted under a State-approved discharge permit. The mixing,

Map 20



dilution and aeration of the Koontz Creamery well water enables dissipation of the pollutants.

The City continually works to develop groundwater supplies. To date, there are 11 wells developed and are operational. The City also has two wells (Wells #1 and #2) located within Wakefield Valley, an area within the corporate limits of Westminster along MD Route 31. The entire Wakefield Valley area, plus the portion extending beyond the City limits, is underlain with Wakefield Marble, which is the most prolific aquifer in the County. While the Wakefield Valley water system was once a satellite system to the City's main Cranberry water system, they are now tied together. With the systems connected, the Wakefield Valley water system can be served by the Cranberry water system in the event of any problems with Wells 1 and 2 or the Wakefield Valley Water Storage Tank.

In 2009, the City completed construction and brought into service a new Cranberry WTP, located adjacent to the City's original water treatment plant on Old Manchester Road. The new treatment plant utilizes submerged membrane technology that enhances the City's ability to provide quality drinking water and to comply with regulations known as the Long Term 2 Enhanced Surface Treatment Rule (LT2 Rule). The major objective of the rule is to increase protection against microbial pathogens in drinking water, including *Cryptosporidium*.

The new Cranberry WTP has a design capacity of 2.75 mgd, with the possibility for efficient expansion of up to 3.5 mgd. The plant's capacity could be further increased to 5.0 mgd by adding membrane racks into existing tanks. The new treatment plant treats water from the same two surface sources as the old plant.

Fluoridation is provided at all of the City's wells. Some of the wells also include filtration facilities and other treatment processes at the wellhead, as required. See Table 15A for Westminster WSA appropriations; and see Table 15B for Westminster WSA average daily use.

The Cranberry Reservoir, with a capacity of 115.0 mg, is located along Cranberry Branch north of Lucabaugh Mill Road. Water in the impoundment is pumped from either a raw water intake on Cranberry Branch or from Medford Quarry thru an emergency pipeline. The intent of the City is to maintain the Reservoir in a full and ready state, regardless of drought or reduced stream flow. The 30-inch transmission line from the water intake to the Cranberry Water Treatment Plant also connects the Raw Reservoir to the treatment plant. The water in the Reservoir is used either when conditions prevent direct withdraw from the stream or to supplement low stream flow. Treated water is pumped to, and stored in, five locations:

1. Clear Water reservoir off of Gorsuch Road, with a capacity of 1.0 mgd
2. 1.5-mg water tank off Hook Road
3. 0.5-mg elevated water tank on the McDaniel College campus
4. 2.0-mg high zone water tank located off Gorsuch Road
5. 2.0-mg storage tank off of Sawgrass Court in Wakefield Valley

See Table 15A for Westminster WSA appropriations and Table 15B for average daily use.

Table 15A: Westminster WSA Appropriations

6-Digit Watershed	Water Source	Permit Number	Permitted Daily Average Use (gpd)	Average Day Demand Month of Maximum Use (gpd)
Middle Potomac	Cranberry Water Treatment Plant	CL1957S002 (07)	1,838,000	3,000,000
Middle Potomac	Koontz Well John Street (for stream augmentation only)	CL1977G036 (06)	500,000	750,000
Patapsco	Air Business Center (Well # 4)	CL1977G136 (04)	85,000	111,000
Middle Potomac	County Maintenance Facility (Well # 3)	CL1977G236 (04)	85,000	111,000
Middle Potomac	South Center Street (Well #6)	CL1977G336 (03)	85,000	111,000
Patapsco	Krider's Church Road (Well # 5)	CL1977G436 (03)	215,000	280,000
Middle Potomac	Wakefield Valley (Wells 1 & 2)	CL1977G536 (03)	207,000	269,000
Middle Potomac	Carfaro (Well 7)	CL1977G636 (04)	233,000	303,000
Patapsco	Vo-Tech (Well 8)	CL1977G736 (03)	119,000	155,000
Middle Potomac	Koontz Property (Wells 9 & 10)	CL1977G836 (02)	95,000	124,000
Middle Potomac	Roop's Mill (Well 11)	CL2000G025 (02)	135,000	176,000
Middle Potomac	Gesell (Well 12) (not in use)	Permit Pending	Permit Pending	Permit Pending
Total			3,597,000	5,390,000
Note: Medford Quarry (Emergency Source)		CL2002G042 (03)	162,000	655,000

Table 15B: Westminster WSA Average Daily Use

Water Source	Storage Capacity	Max. Safe Yield (mgd)	Avg. Daily Use (mgd)	Max. Peak Flow (mgd)	WTP Capacity
Cranberry Water Treatment Plant	-	3.000	1.800	2.670	2.750
Wells 1 and 2 - Wakefield	-	(1 & 2) 0.250	(1 & 2) 0.183	(1 & 2) 0.348	0.197
Well 3 - County Maintenance	-	0.120	0.085	0.098	0.100
Well 4 - Air Business Center	-	0.180	0.072	0.185	0.170
Well 5 - Krider's Church Road	-	0.300	0.158	0.447	0.230
Well 6 - South Center Street	-	0.115	0.105	0.102	0.100
Koontz Creamery Well (John Street)	stream flow augmentation only	0.750	0.255	0.439	0.500
Well 7 - Carfaro	-	0.350	0.130	0.189	0.300
Well 8 - Vo-Tech	-	0.288	0.082	-	0.119
Wells 9 and 10 - Koontz Property	-	0.150	0.080	0.150	0.125
Well 11 - Roop's Mill	-	0.135	Not In Use	0.187	n/a
Raw Reservoir at Cranberry (Lucabaugh Mill Road)	125 mg	-	-	-	-
Wakefield Valley Water Storage Tank	2 mg	-	-	-	-
Clear Reservoir	1 mg	-	-	-	-
McDaniel College Water Tank	0.500 mg	-	-	-	-
Hook Road Water Tank	1.500 mg	-	-	-	-
Gorsuch Road High Zone Water Tank	2. mg	-	-	-	-
Hook Road Booster Station	-	-	-	-	-
High Zone Booster Station	-	-	-	-	-
Total	132 mg	5.638 MGD	2.95 MGD		

The Bramble Hills community water system, which serves approximately 12 lots and consists of 5.4 acres containing a well, well house, and wellhead protection area, is being incorporated into the Westminster WSA with this update of the Water & Sewer Master Plan. Once the Gesell well is in service, the community and its well will be connected to the system. This area previously had been in the Future Water Service Area for Westminster.

Allocation Procedure

Adequate public facilities certification is required for water system capacity at the preliminary and final development plan approval stages and unincorporated areas planned for service must first be annexed into Town prior to appropriations. In order to comply with the current MDE consent order, the City regulates water for new projects through a water allocation policy. Each new project must obtain a water allocation to move forward. It is anticipated that the water allocation policy will continue in the City after the consent order is lifted. It is anticipated that future development projects will be required to implement sustainable techniques such as water conservation efforts and minimal usage standards be followed to ensure the most effective and efficient use of the City's precious water supplies. Upon approval of the consent order, MDE authorized the City to allocate 60,000 gpd of the 139,000 gpd of available water in accordance with an interim Allocation Policy. In 2010, MDE authorized the release of the remaining 79,000 gpd.

The City compared water availability limitations for the Westminster's service area to current demands and development projections. Due to current limits on water supply, limited growth has been projected. In order to satisfy the MDE consent order, development in the City regulated the allocation policy, creates a prioritized "waiting list" for available water supplies. At present, there is a long list of projects waiting for water. This process gives the City control over new connections on a project-by-project basis. Due to the use of the allocation policy, the City is considering only very limited changes to the land use plan, Growth Area Boundary, and water/sewer service areas. The City is continuing to evaluate options for more efficient use of existing resources, as well as development of new water resources to accommodate projected growth.

Westminster's WSA presently extends outside its corporate limits. In August 2002, the Mayor and Common Council adopted Good Cause Waiver legislation for the extension of public water and sewer outside the corporate limits. That legislation requires new or redevelopment projects to be in compliance with the Town-County Agreement, which stipulates that for property contiguous to the corporate limits, the owner must initiate annexation of the property into the City in order for the property to be served. If the property does not meet the test for annexation, the owner must file a Good Cause Waiver application with the City. In order for the Mayor and Common Council to approve a Good Cause Waiver, the property must be identified as W-1 or W-3 in the Carroll County Master Plan for Water and Sewerage. If approved, the applicant must also execute an "Intent to Annex" agreement. Thereafter, the applicant must also obtain a water allocation from the City. These procedures provide control over the extension of City utilities outside the City limits.

Needs Analysis

To address water supply issues, the City is trying to decrease their amount of unaccounted water through its Water Conservation Plan. The City received Federal Stimulus money to upgrade its water meters to a fully automated system. It is participating in programs for leak detection and analysis. However, the City is still working to get their water loss between 10-15%.

As of December 2010, the drought of record deficit is 122,000 gpd. In order for the City's drought of record deficit to be completely eliminated, the Gesell Well will need to become fully operational or other alternatives implemented.

The average day permitted use of all sources currently in use is 3,597,000 mgd. Recent consumption history indicates the City is not able to sustain these yields under drought conditions. In 2006, to address supply limitations during drought conditions and meet Consent Order requirements, the City prepared a Water Supply Capacity Management Plan and constructed the Medford Quarry emergency pipeline. In 2007, a consent order was approved between the City of Westminster and MDE which required the City to:

1. Complete the Medford Quarry pipeline and the Roop's Mill well projects, including:
 - ♦ Roop's Mill well – this project is complete and operational, providing 20,000 gpd of "new" water and reducing the drought of record deficit by a like amount.
 - ♦ Roop's Mill well recharge – The City has approved two agreements that are pending with Carroll County for the Woodward and Hull properties that could allow for the Roop's Mill well permit to be increased by approximately 82,000 gpd.
2. Implement a water loss reduction plan and a water conservation plan, and plan for water hauling.
3. Eliminate the 0.797 mgd "drought of record" deficit by completion of the Medford Quarry pipeline Roop's Mill well projects in 2009.

The Medford Quarry pipeline and the Roop's Mill well projects were both completed in 2009. When the Medford Quarry pipeline and the Roop's Mill well became operational, the 0.797 mgd drought of record deficit was reduced by 0.675 mgd. The City's Water Conservation Program was implemented to comply with the Consent Order.

The water allocation to residential, industrial, and commercial users is controlled by the City's Planning Department through the Interim Water Allocation Plan. The City has had discussion with property owners regarding the Interim Water Allocation Plan and the associated priorities. Additional growth beyond the allocated water will be dependent upon new water sources. The City has received requests under its water allocation program exceeding 282,000 gpd as of April 1, 2011. Additionally, it is estimated that could increase by approximately 50,000 gpd each year until buildout. Additional sources are needed to allow the City to support projects related to economic development and related areas.

The City has not lost sight of its future beyond the water supply solutions outlined in its May 2008 Water Supply Capacity Management Plan and those solutions referenced above. The City is considering the following solution to long term water supply needs: Phase 1: Big Pipe Creek well field; Phase 2: intake on Big Pipe Creek with an inline reservoir; Phase 3: construct the Union Mills reservoir impoundment. Cooperation amongst Carroll County and regional planning agencies exists for Phase 1, but not for Phases 2 and 3 of the Big Pipe Creek project. Big Pipe Creek well field development – the City is working with Carroll County to develop and permit 500,000 gpd in new groundwater resources and construct the connection pipeline to Westminster by 2015

In addition, the City began design work with an anticipated permit amount of approximately 330,000 gpd from Gesell well, to be completed in conjunction with the companion Little Pipe Creek intake project. See Table 15C for Westminster WSA water problem areas.

Table 15C: Westminster WSA Water Problem Areas

Location	Population	Nature of Problem	Status
Old Manchester Road, Cranberry	54	Number of wells are located in the basement, and others too close to the house	Connection to Westminster community water system (W-5 category)
Well #8 (VoTech well)	n/a	High nitrates and radon	Nitrates have been removed and there are efforts in place to remove the radon

Planned Projects and Recommendations

See Table 15D: Westminster WSA priority projects.

Table 15D: Westminster WSA Priority Projects

Project Name	Planning Category	Description	Location	Added Capacity
Well 12 (Gesell)	Priority (W-3) Immediate	Complete testing and put into service	Route 27 near the Carroll County Agricultural Center	.330 MGD
Radon and Nitrate Removal	Priority (W-3) Immediate	Removal of contaminants to comply with drinking water regulations	Vo-Tech well	0 MGD
Main Street Water Main	Priority (W-3) 5 years	Upgrade existing line to 12" water main	Main St. from Longwell Ave. to Penn Ave.	0 MGD
New Water Storage Tank	Priority (W-3) 10 years	Construct additional water storage tank to boost supply and pressures	Downtown Westminster area	0 MGD
Water Treatment Plant Supply Main	Priority (W-3) 10 years	Renovate 30" water transmission line	Supply line from raw reservoir to Water Treatment Plant at Cranberry	0 MGD
Park Avenue Water Main	Priority (W-3) 5 years	Replace two 4" waterlines with 6" water main	Park Avenue from W. Green St. to W. George St.	0 MGD
Winters Street Water Main	Priority (W-3) 5 years	Replace existing lines with 6" water main	Winters St. from Railroad Ave. to John St.	0 MGD

Table 15D: Westminster WSA Priority Projects

Project Name	Planning Category	Description	Location	Added Capacity
Hollow Rock Rd. and City View Rd. Water Main	Priority (W-3) 5 years	Replace 2" waterline with 6" water main in both streets and create a loop in the system	Hollow Rock Rd. from Liberty St. to end and City View Ave. from Hollow Rock Rd. to Goodwin Quarry Rd.	0 MGD
Interzone Main	Priority (W-3) 5 years	Design and construct a water main connecting various water zones in the service area	MD 140 area	0 MGD
Ridge Road Water Main	Priority (W-3) 5 years	Design and construct an 8" and 6" water main as a replacement for an old 2" and 4" main	Old New Windsor Rd. to Westmoreland St. to the dead end of the line on Ridge Road	0 MGD
Sophia Ave. Water Main	Priority (W-3) 5 years	Design and construct an 8" ductile iron water main, replaces existing asbestos concrete pipe	Fairfield Ave. to Gist and Washington Roads	0 MGD
John St. Water Main Replacement	Priority (W-3)	Design and construct 6" water main replacement	John St. between W. Main St. and Winters Alley	0 MGD
James St. Water Main Replacement	Priority (W-3) 5 years	Design and construct 6" water main replacement	James St. from Kemper Ave. to the alley	0 MGD
MD 27 Water Main	Priority (W-3) 5 years	Replace existing main with a new 16 inch DIP main to reduce breaks	MD 27 corridor	0 MGD
Big Pipe Creek Pipeline/ Well Field	Priority (W-3) 5 years	Design and construct a pipeline from Union Mills to the City of Westminster and develop well field to augment existing sources	Union Mills to Westminster along MD Route 97	.5 MGD
MD 140 Parallel Water Main	Future (W-5) 10 years	Construction of parallel main to equalize pressure and improve system operations	MD 140 corridor	0 MGD
Increased Reservoir Surface Elevation	Future (W-5) 10 years	Increase capacity of reservoir by increasing the water surface elevation	Cranberry Reservoir	0 MGD
Interzone Main	Future (W-5) 10 years	Connect zones with a new 12 inch main to enhance operations	Poole Road vicinity	0 MGD
New Water Supply	Priority (W-3) 5 years	Study and develop a new water source	Westminster area	TBD
Little Pipe Creek Intake	Priority (W-3) immediate	Design and construct intake near City's WWTP to supplement Gesell Well, Bramble Hills	MD Route 31 and Old New Windsor Road	.5 MGD

Long-Term Recommendations (10+ years)

- ♦ Implement a system to track water demand for all known and potential development projects by modifying the allocation plan to give priority allocation status to projects that demonstrate significantly reduced water demand through the use of water conservation measures.
- ♦ Drill and develop additional groundwater wells (based on the average MDE appropriation of existing Westminster wells) to meet projected additional demand within the service area.
- ♦ Maintain long-term options for using regional water supply sources including Baltimore City.
- ♦ Design and construct Phase 2 of Big Pipe Creep project to add intake and inline
- ♦ Design and construct Phase 3 of Big Pipe Creek project to impoundment Union Mills and MD Route 97

Projected Water Supply Demands and Projected Capacity

The following table summarizes projected water demand over the next ten years. It incorporates planned capacity improvements that respond to the demand projections.

Service Area	Present Year							Priority Planning (0-6 Year)					Future Planning (7-10 Year)					
	Res. Pop. Ser.	G P C D	Capacity Million Gal. Daily (MGD)				Res. Pop. Ser.	G P C D	Capacity Million Gal. Daily (MGD)				Res. Pop. Ser.	G P C D	Capacity Million Gal. Daily (MGD)			
			Res. Dem.	Oth. Dem.	Tot. Dem.	Ex. Cap.			Res. Dem.	Oth. Dem.	Tot. Dem.	Pl. Cap.			Res. Dem.	Oth. Dem.	Tot. Dem.	Pl. Cap.
Freedom/Sykesville	23,911	87	2.070	.109	2.180	4.427	32,258	87	2.810	.751	3.561	4.427	32,258	87	2.810	.751	3.561	4.427
Hampstead	6,266	56	.349	.110	.460	0.630	7,306	60	.442	.285	.727	0.781	8,295	64	.530	.319	.849	0.781
Manchester	4,698	52	.236	.068	.304	0.581	6,347	60	.383	.084	.467	0.722	6,502	61	.397	.084	.481	0.722
Mount Airy ²	9,482	63	.598	.166	.857	0.927	9,914	63	.634	.398	1.032	1.079	9,914	63	.634	.398	1.032	1.079
New Windsor ³	1,449	76	.110	.019	.130	0.196	2,122	70	.149	.046	.195	0.196	2,583	75	.193	.142	.335	0.446
Taneytown ⁴	6,751	54	.362	.092	.454	0.620	8,068	58	.465	.112	.577	0.639	8,068	58	.465	.112	.577	0.639
Union Bridge	1,000	119	.119	.001	.120	0.208	1,810	109	.199	.001	.200	0.250	1,810	109	.199	.001	.200	0.250
Westminster	24,005	104	2.490	.405	2.895	3.597	24,173	104	2.507	.690	3.197	4.927	28,030	100	2.805	.842	3.647	4.927

¹ See Appendix 3 Method for Projecting Water Supply and Sewer Demands. Note: Table 20 corresponds with MDE's required Table 20 and is therefore out of sequence with preceding and succeeding table numbers.

² Mount Airy's Total Demand includes 91,800gpd to account for drought conditions (which is 12% of total demand). The Priority calculations are based on the Town's "pipeline" allocations and were provided to us by the Town of Mount Airy.

³ New Windsor's Priority and Future calculations are based on 165 gal per unit for residential demand.

⁴ Mount Airy, Taneytown and Union Bridge do not have any properties in the Future Planning Category.

- **Unincorporated Water Supply**

Approximately 257,324 acres or 89 percent of the total land in Carroll County lie outside of existing or planned public water supply service areas. Properties located outside of a public water supply service area derive water from private wells. These wells are not required to have appropriation permits from MDE, primarily because they withdraw less than 10,000 gallons per day of water. However, there are some uses, such as schools, industries, mobile home parks and recreational facilities that are not in a public water supply service area and withdraw low to moderate amounts of water using a private well. These uses withdraw enough water that MDE has determined that an appropriations permit is necessary. This section of the plan covers such uses.

Current Conditions

Most of the private wells that have relatively moderate demand numbers are not intended to accommodate growth. They serve a specific purpose or population that is not expected to change significantly over time. The demand numbers and inventory of appropriations provided in the tables below reflect this. See Table 16A for the County's unincorporated water supply on the following page.

Table 16B: County Unincorporated Water Supply

SERVICE AREA	PRESENT YEAR						PRIORITY PLANNING (0-6 Year)						FUTURE PLANNING (7-10 Year)					
	POPULATION			GCPD	CAPACITY MILLION GAL. DAILY (MGD)		POPULATION			GCPD	CAPACITY MILLION GAL. DAILY (MGD)		POPULATION			GCPD	CAPACITY MILLION GAL. DAILY (MGD)	
	TOT.	SER.	UNS.		DEMAND	EXISTING CAPACITY	TOT.	SER.	UNS.		DEMAND	PLANNED CAPACITY	TOT.	SER.	UNS.		DEMAND	PLANNED CAPACITY
PUBLIC SCHOOLS¹																		
Charles Carroll Elem.		379	0	6.6	0.0025	0.0064		393	0	10.0	0.0039	0.0064		413	0	10.0	0.0041	0.0064
Mechanicsville Elementary		652	0	2.6	0.0017	0.0140		745	0	10.0	0.0075	0.0075		770	0	10.0	0.0077	0.0075
Sandymount Elementary		635	0	3.8	0.0024	0.0050		638	0	10.0	0.0064	0.0050		655	0	10.0	0.0066	0.0050
South Carroll High School		1,356	0	1.0	0.0136	0.0100		1,346	0	12.5	0.0169	0.0100		1,205	0	12.5	0.0151	0.0100
Winfield Elementary		831	0	4.0	0.0033	0.0027		889	0	10.0	0.0089	0.0027		912	0	10.0	0.0091	0.0027
Runnymede Elementary		690	0	3.4	0.0016	0.0250		788	0	10.0	0.0079	0.0250		809	0	10.0	0.0081	0.0168
PRIVATE COMMUNITY, MULTI-USE, OR PRIVATE SCHOOL																		
Ashley MHP	153	153	0	75	0.0115	0.0070	153	153	0	75	0.0115	0.0070	153	153	0	75	0.0115	0.0070
Bowling Brook Prep. School	149	149	0	58	0.0086	0.0330	523	523	0	73	0.0383	0.0330	523	523	0	73	0.0383	0.0330
Gaither Manor Apartments	400	400	0	75	0.0300	0.0250	400	400	0	75	0.0300	0.0250	400	400	0	75	0.0300	0.0250
Gerstell Academy	205	205	0	2.5	0.0005	0.0240	400	400	0	12.5	0.0050	0.0240	690	690	0	12.5	0.0086	0.0240
Golden Age Guest Home	50	50	0	100	0.0050	0.0056	50	50	0	100	0.0050	0.0060	50	50	0	100	0.0050	0.0060
Hillandale MHP	438	438	0	60	0.0263	0.0140	438	438	0	60	0.0263	0.0140	438	438	0	60	0.0263	0.0140
Lakeview MHP	99	99	0	75	0.0074	0.0800	99	99	0	75	0.0074	0.0800	99	99	0	75	0.0074	0.0800
Pheasant Ridge Estates MHP	303	303	0	75	0.0227	0.0200	303	303	0	75	0.0227	0.0200	303	303	0	75	0.0227	0.0200
Pleasant View Nursing Home	100	100	0	100	0.0100	0.0090	100	100	0	100	0.0100	0.0090	100	100	0	100	0.0100	0.0090
Ramblin' Pines Campground	468	468	0	57	0.0267	0.0461	468	468	0	57	0.0267	0.0461	468	468	0	57	0.0267	0.0461
Reservoir MHP	84	84	0	75	0.0063	0.0066	84	84	0	75	0.0063	0.0066	84	84	0	75	0.0063	0.0066
River Valley Ranch	477	477	0	50	0.0239	0.0239	477	477	0	50	0.0239	0.0239	477	477	0	50	0.0239	0.0239
Rock Brook MHP	123	123	0	75	0.0092	0.0130	123	123	0	75	0.0092	0.0075	123	123	0	75	0.0092	0.0075
Shields Todd Village MHP	234	234	0	75	0.0176	0.0200	234	234	0	75	0.0176	0.0200	234	234	0	75	0.0176	0.0200
Sullivan's MHP	123	123	0	75	0.0092	0.0088	123	123	0	75	0.0092	0.0088	123	123	0	75	0.0092	0.0088
Taylorville MHP	60	60	0	75	0.0045	0.0045	60	60	0	75	0.0045	0.0045	60	60	0	75	0.0045	0.0045
Westminster First Church of the Nazarene							2,230	2,230	0	2.5	0.0055	0.0055	2,230	2,230	0	2.5	0.0055	0.0055
PARKS																		
Camp Hashawha	128	128	0	75	0.0096	0.0096	128	128	0	75	0.0096	0.0096	128	128	0	75	0.0096	0.0096
Gillis Falls							500	500	0	10	0.0050	0.0050	500	500	0	10	0.0050	0.0050
Patapsco State	1,000	1,000	0	10	0.0100	0.0100	1,000	1,000	0	10	0.0100	0.0100	1,000	1,000	0	10	0.0100	0.0100
Piney Run	500	500	0	10	0.0050	0.0050	500	500	0	10	0.0050	0.0050	500	500	0	10	0.0050	0.0050
INDUSTRIAL - COMMERCIAL																		
Congoleum Industries	230	230	0	20	0.0046		230	230	0	20	0.0046		230	230	0	20	0.0046	
Development Company of America (Bethel Rd.)	530	530	0	20	0.0106		530	530	0	20	0.0106		530	530	0	20	0.0106	
Finksburg Plaza	500	500	0	20	0.0100	0.0100	500	500	0	20	0.0100	0.0100	500	500	0	20	0.0100	0.0100
Hampstead Industrial Center (former Black & Decker Manufacturing)	472	472	0	20	0.0094		600	600	0	20	0.0120		1,000	1,000	0	20	0.0200	
Joseph A. Bank Clothing	250	250	0	25	0.0063		250	250	0	25	0.0063		250	250	0	25	0.0063	
South Carroll Swim Club	1,234	1,234	0	3	0.0037	0.0077	1,234	1,234	0	10	0.0123	0.0077	1,234	1,234	0	10	0.0123	0.0077
PUBLIC COMMUNITY																		
Greater Carroll Indus. Park	116	116	0	5	0.0005	0.0100	116	116	0	5	0.0005	0.0100	116	116	0	5	0.0005	0.0100
Totals																		

¹ Includes staff at school

See Table 16B for unincorporated county water appropriations.

**Table 16C: Unincorporated County Water Appropriations
(non-municipal and non-agricultural)**

Permit No.	GW* or Surface	Owner	Average Daily Demand (gpd)	Max Day Demand (gpd)	Aquifer Name
Quarries					
CL1970G005	GW	Genstar Stone Products Company	1,360,000	2,969,000	Wakefield Marble
CL1987G083	GW	Lehigh Cement Company	1,000,000	2,000,000	Wakefield Marble
CL1997G026	GW	Arundel Corporation, The	1,000,000	2,000,000	Wakefield Marble
Industrial					
CL1993S019	S	Congoleum Corporation	500,000	850,000	North Branch
CL1966G029	GW	Black & Decker (Us) Inc.	300,000	360,000	Up. Pelitic Schist Wissahickon
CL2004G019	GW	The ESAB Group, Inc.	144,000	150,000	New Oxford Formation
CL1991S032	S	Colonial Pipeline Company	62,100	720,000	South Branch
CL1987G107	GW	Walden Real Estate, Inc.	33,000	53,000	New Oxford Formation
CL1951G002	GW	Thomas, Bennett And Hunter, Inc.	30,000	50,000	Wakefield Marble
CL1965G006	GW	Todd Village, LLC	20,000	35,000	Wissahickon Formation
CL1981G026	GW	S & G Concrete Co.	10,000	12,000	Wissahickon Formation
CL1965G013	GW	Carroll County Board Of Education	10,000	15,000	Up. Pelitic Schist Wissahickon
CL1957G005	GW	Development Company Of America, LLC	10,000	15,000	Up. Pelitic Schist Wissahickon
CL1967G008	GW	AT&T Corp.	9,800	12,700	Up. Pelitic Schist Wissahickon
CL1977G054	GW	Pleasant View Nursing Home	9,000	10,000	Ijamsville Form.-Marburg Schist
CL1981S016	S	CDJ Distillery, LLC	4,900	15,000	Unnamed Tributary
CL2006G024	GW	Mudgett Family, LLC	1,000	1,800	Wissahickon Formation
CL2006G023	GW	Mudgett Family, LLC	500	800	Wissahickon Formation
Private					
CL1963G001	GW	William Schneider Co. Inc., The	20,000	25,000	Wissahickon Formation
CL1960G009	GW	Pheasant Ridge Estates, Inc.	20,000	30,000	Ijamsville Form.-Marburg Schist
CL1970G001	GW	Hillandale, Inc.	14,000	16,000	Up. Pelitic Schist Wissahickon
CL1963G004	GW	Ashley, Michael, Todd	7,000	10,000	Up. Pelitic Schist Wissahickon
MDG490479	GW	Maryland Materials	684,000	1,026,000	
Totals			5,249,300	10,376,300	

*GW = groundwater

Source: Maryland Department of the Environment, July 2009

A number of small communities experience water contamination issues attributed to petroleum and other contaminants. Identifying these areas allows for the possibility that remediation may occur at some point in the future. See Table 16C for unincorporated county water problem areas.

Table 16D: Unincorporated County Water Problem Areas

Area	Location	Population	Nature of Problem	Status
Black & Decker	MD 30		Chemical contamination	Remediation is underway
Finksburg: Pow-r-matic	MD 140 near MD 91	-	Industrial solvent contamination - 2 wells	Remediation is complete; contamination is still present
Finksburg: MD 140 Corridor	MD 140 south of MD 91	20	Petroleum contamination - 10 wells	Remediation is complete; contamination is still present
Finksburg: MD 140 Corridor	East of Brown Rd. to Baltimore Co. line	327	a. Mobile Home Park - high nitrates b. Health issues related to solvent and petroleum contaminations c. Health issues related to salt contamination	None planned
Catalyst Research	Poole Road	-	Contamination including industrial solvents - 2 wells, 1 surface supply	Remediation is complete; contamination is still present
Taylorsville	North of MD 26/MD 27 intersection	-	Petroleum contamination	Remediation is complete; contamination is still present
Taylorsville	Half-mile radius of MD 26/MD 27 intersection	-	Health issues related to salt, petroleum, and nitrate contamination; low well yields	None planned
Woodbine	Woodbine Rd. (MD 94), north of Carroll-Howard County line	-	Petroleum contamination	Under study
Colonial Pipeline	East of Morgan Rd., north side of Carroll-Howard County line	-	Petroleum contamination	Remediation is underway
Smallwood	MD 32 and Deer Park Rd.	-	Petroleum contamination	Under study
Lineboro	Lineboro Rd. (MD 86) south of Pennsylvania State line	152	Contaminated wells	None planned
Gamber	MD 32 and MD 91	-	Petroleum contamination	Under study
Winfield	MD 26 and MD 94	-	Petroleum contamination	Under study
Alesia	Hoffmanville and Grave Run Road area	30	Volatile organic (fuel) contamination	Under study
Finksburg	Sullivan Mobile Home Park	123	MTBE contamination	Under study

Needs Analysis

At this time, the majority of the systems and problem areas noted in this section are not planned to be connected to a public water supply system. If service areas change or regional water supplies are developed that make connection to a public system more feasible, some of these areas could be connected to a public water supply in the future. Remediation of individual problem areas will be the responsibility of private property owners.

Planned Projects and Recommendations

No planned water projects exist in the unincorporated part of the county at this time.

CHAPTER FOUR: Sewer Facilities

• Section I: General Sewage Disposal

General Overview

At present, the vast majority of county residents are not connected to a community sewer system. It is estimated that in 2010 approximately 32,148 residential septic systems existed in the county, of which 9,178 were located within a designated growth area and may have the potential to be connected to a municipal sewer system at some time in the future. With an estimated 61,594 households existing in the county in 2010, the number of residential septic systems currently in use represents 52 percent of households.

This section contains a general overview of countywide sewage disposal now and in the future as it relates to treatment plant points of discharge, the quality of the streams, and soil conditions for individual disposal systems.

Watersheds

The watershed into which municipal sewage effluent is discharged is significant, particularly because it may result in limitations being placed on the discharge. The county falls within nine major watersheds, three of which have their upper reaches in the State of Pennsylvania. The acreage within each watershed that lies in Carroll County is tabulated below (see Table 17).

Table 17: 8-Digit Watersheds

Watershed	Acres
Lower North Branch Patapsco	565
Liberty Reservoir	87,251
South Branch Patapsco	38,736
Upper Monocacy	27,124
Lower Monocacy	5,463
Double Pipe Creek	105,456
Conewago Creek	3,468
Prettyboy Reservoir	21,024
Loch Raven Reservoir	592
Total	289,679

Source: Carroll County Bureau of Comprehensive Planning, 2013

A brief description of each watershed can be found in the Water Resources Element of the Carroll County Master Plan. Watershed information relates to water and sewer planning most directly in terms of the watershed into which each wastewater system discharges. This information is described for each wastewater system in Section III.

Restriction on New Municipal Discharges

Within the Liberty, Prettyboy, and Loch Raven Reservoir drainage areas, new municipal discharges exceeding 1,000 gpd are prohibited except where failing septic systems must be addressed. This is a direct response to the Reservoir Watershed Management Agreement, a more detailed description of which can be found in Section III of Chapter 2 of this plan.

Soil Disposal System

The ability of the soil to absorb septic tank effluent on a long-range basis is important in the extensive use of individual disposal facilities. Factors influencing the suitability of soils for soil-absorption systems are drainability of the effluent, groundwater level, ability to filter the effluent, and ground slope.

Problem Areas

As mentioned in Chapter Three, Water Supply Facilities, some of the County's older communities are experiencing groundwater contamination due to inadequate septic systems. Existing and potential sewerage problem areas in the County are listed in Section II of this chapter under the Unincorporated Sewer Service Areas section on the table entitled Table 27B "Unincorporated Sewage Area Problem Areas." In order to enhance the water quality in these problem areas, alternative or updated methods of sewage disposal must be implemented. These areas are regulated by the Carroll County Health Department.

• Section II: Existing and Proposed Sewer Facilities by Service Area

The following sections describe the County's nine existing publicly owned community sewer systems and the plan for serving the corresponding sewer service areas (SSAs).

Connection to Community Sewer System

In Carroll County, properties within the Existing/Final Planning (S-1) and Priority (S-3) Service Areas will be connected to the community sewer system at the time of development.

It is the responsibility of the developer to arrange for the required engineering and needed lines and facilities to make the connections. Interim individual systems may not be permitted where the utility of record or municipality has an official connection policy and/or code requirement that precludes interim individual systems. Where the utility of record or municipality does not have a connection policy and/or code requirement which precludes new interim individual systems, such interim systems may be considered by the utility of record or municipality where it has been adequately demonstrated that extraordinary or unusual circumstances exist and that authorizing same will not compromise the integrity of the Water & Sewer Master Plan or the County or Municipal Comprehensive Master Plan. It is the intention of the Water & Sewer Master Plan that:

- ♦ Development in the Priority Service Area will not occur without connection to the community system.
- ♦ Development within the Future Service Area (S-5) will be permitted to develop on individual sewer systems, unless
 - Connection to the community system is required by the utility of record or municipality, or
 - Is requested, in which case the service area category must be changed to the Priority Service Area (S-3) in order for the Maryland Department of the Environment to issue construction permits.
 - Under the Annotated Code of Maryland Article 26- Environment, Section 9-513 the Carroll County Board of Health has authority to grant exceptions to the County Water and Sewer Plan.

Freedom Sewer Service Area

Current Conditions

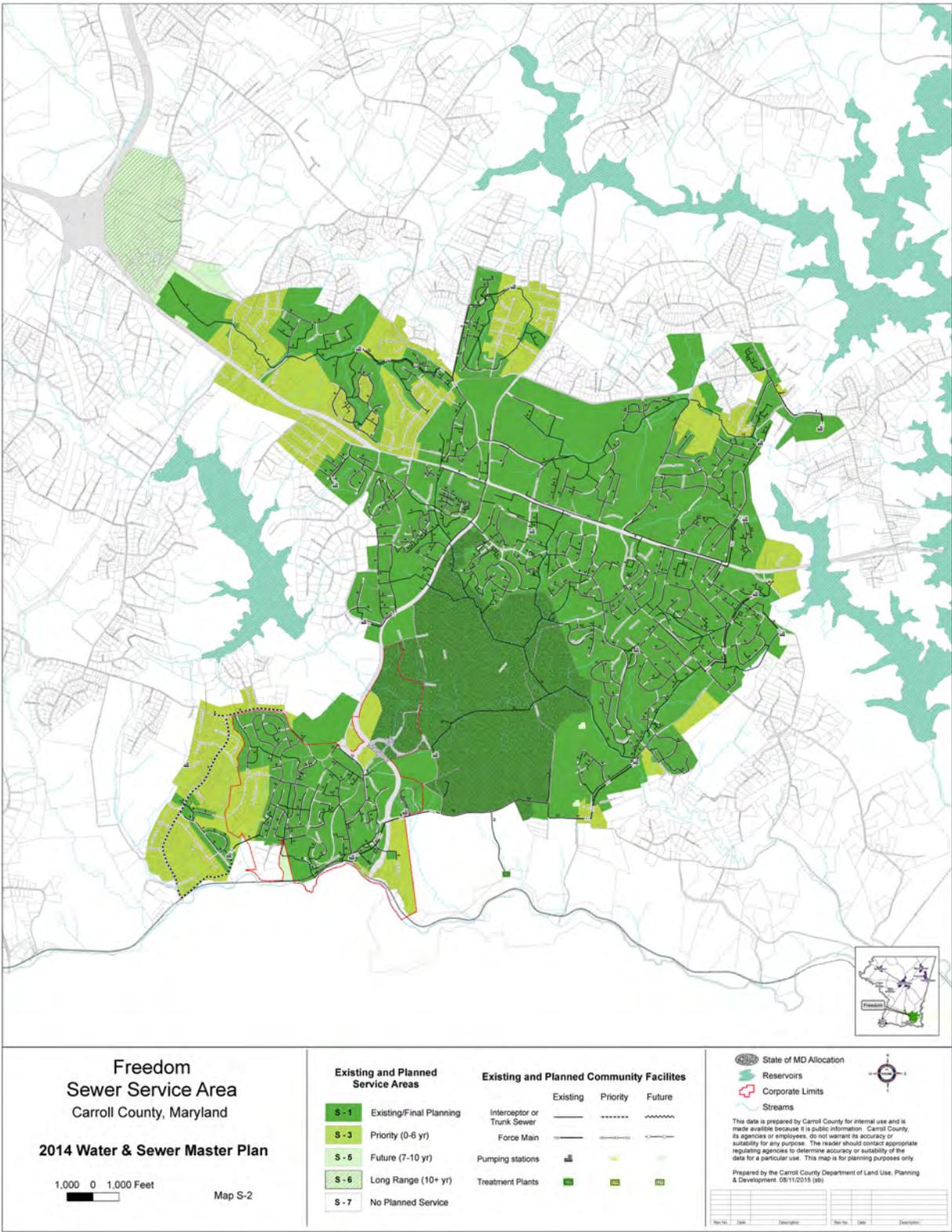
The Freedom SSA is located in southeastern Carroll County and covers approximately 6,755 acres and serves 8,479 EDUs in the Freedom area, including the Town of Sykesville. The Freedom Wastewater Treatment Plant (WWTP) is located near and discharges to the South Branch of the Patapsco River off Raincliffe Road, approximately 2,000 feet east of the Town of Sykesville. See Map 21: Freedom SSA.

The WWTP is owned by the State of Maryland. Operation and maintenance of the plant is the responsibility of Maryland Environmental Service (MES). The County owns and operates the sewage collection and conveyance system, including gravity sewers, force mains, and 11 pumping stations. Maintenance and operation of the sewer lines within the Springfield Complex is the responsibility of MES.

The Freedom WWTP has a design capacity of 3.5 mgd, with a three-year average flow from 2008-2010 of approximately 1.25 mgd. MES is allocated 0.9 mgd for use by State institutions (Springfield complex), and the County is allocated the remaining 2.6 mgd, excluding estimated inflow and infiltration of stormwater (I&I).

The Freedom WWTP process consists of: screening and grit removal; primary sedimentation; an activated sludge process for biological reduction of Biochemical Oxygen Demand (BOD), suspended solids and nitrogen; phosphorus reduction by chemicals; filtration; ultraviolet disinfection; and, effluent aeration by a cascade. Combined primary and waste-activated sludge is thickened by gravity thickeners. The sludge is dewatered by a belt-filter press and stabilized by the addition of quicklime. Each belt-filter is capable of processing 10,130 pounds of solids in a seven-hour shift having a minimum dry solid of 20 percent and a solids capture of 95 percent.

Map 21



Inventory of Existing Wastewater Treatment Plants, Interceptors, Sewage Pumping Stations, and Force Mains

See Tables 18A-18D for Freedom SSA infrastructure.

Table 18A: Freedom SSA Treatment Plant

WWTP Treatment	Points of Discharge	WWTP Design Capacity (mgd)	Average Flows (mgd)	Method of Sludge Disposal
Activated sludge	South Branch Patapsco River	3.500	1.789	Land application and evaporation

Discharge Permit Number: 10DPO670 NPDES Number: MD0021512

Table 18B: Freedom SSA Interceptors

Interceptor	Diameter (inches)	Average Day Flow (mgd)	Design Flow (mgd)
Piney Run - West	24	0.300	4.100
Piney Run - East	18	0.370	2.350
Piney Run - North	18	0.321	2.350
Piney Run - South	30	0.991	6.500
Total		1.982	15.30

Table 18C: Freedom SSA Pumping Stations

Pumping Station	Coordinate Location*	# of Pumps	Capacity of Each Pump (mgd)	Normal Pumping Capacity (mgd)	Average Day Pumping (mgd)
Piney Run #1	N 1331954.74 E 622066.11	3	7.350	10.972	1.512
Sykesville #2	N 1321049.53 E 618402.43	2	0.954	1.340	0.338
Carroll Highlands #3	N 1336546.93 E 628512.68	3	1.261	5.394	n/a
Lake Forest #4	N 1336160.08 E 631389.92	3	0.860	4.806	n/a
Snowdens Run #5	N 1336740.54 E 634314.80	2	0.757	3.888	n/a
Pine Hill #6	N 1337589.35 E 626974.86	2	0.154	0.295	n/a
Water's Edge #20	N 1321514.27 E 627441.73	2	0.201	n/a	n/a
Fairhaven (private)	N 1320315.91 E 623457.36	2	0.288	0.144	n/a
Edgewood #15	N 1321313.83 E 637927.83	2	0.720	n/a	n/a
Patapsco Valley #16	N 1316330.09 E 618479.50	2	0.360	n/a	n/a
Stone Manor #17	N 1327247.96 E 640303.97	2	0.468	n/a	n/a
Woodsyde Estates #18	N 1320426.06 W 632663.82	2	0.187	n/a	n/a
South Carroll Senior Center	N1339305.83 E634903.56	2	n/a	n/a	n/a
Raincliffe	N1323106.83 E620133.35	2	n/a	n/a	n/a
Total		31	13.560	26.839	1.850

*Coordinate locations are Maryland State Plane 1983 Datum.

Table 18D: Freedom SSA Force Mains

Force Main	Maximum Day Pumpage (mgd)	Diameter (inches)	Design Flow (mgd)
Sykesville (Sta #2)	0.315	10	Force Main capacity designed for station
Water's Edge (Sta #20)	n/a	4	n/a
Snowdens Run (Sta #5)	0.156	14	n/a
Lake Forest (Sta #4)	0.407	16	n/a
Carroll Highlands (Sta #3)	0.439	18	n/a
Pine Hill (Sta #6)	0.099	6	n/a
Piney Run (Sta #1)	1.204	20	Force Main capacity designed for station
Edgewood (Sta #15)	n/a	10	n/a
Stone Manor (Sta #17)	n/a	6	n/a
Woodsyde	n/a	6	n/a
Raincliffe	n/a	4	Force Main capacity designed for station
South Carroll Senior Center	n/a	3	n/a
Patapsco Valley Overlook (PVO) (Sta #16)	n/a	6	n/a
Total	2.620		

*Provided Design Average Daily Flow for Design Flow.

Sludge Management

Solids removed by the primary clarifier, aeration basins, and the secondary clarifiers are pumped from the gravity thickeners to either of two sludge storage tanks. The sludge storage tanks are converted aerobic digesters each with a volume of approximately 164,000 gallons. Each storage tank is equipped with an air diffusion system and vertical mechanical aerator, both useful in minimizing odor problems, preventing solids from settling, and improving the dewatering characteristics of the sludge.

The discharge piping of the three sludge transfer pumps is manifolded together to pump sludge to either a belt-filter press, a tank truck loading connection, or to the sludge drying beds. The plan uses the lime stabilization process for production of stabilized sludge. Sludge discharged from the drying bed is undigested, and requires stabilization prior to final disposal. See Table 18E for Freedom SSA Sludge Management.

Table 18E: Freedom SSA Sludge Management

Quantity	Quality	Method of Disposal/Use	Permit #s	Future Disposal Method	Problems
705 dry tons /year; 3,323 wet tons /year	Lime stabilization	Agricultural land application in Virginia and County landfill	S-99-06-3619-L	Agricultural land application, landfill	None

Allocation Procedure

Carroll County, with 85 percent (+/-) of flows through the Freedom WWTP, administers sewer flow allocations for new development. Allocation is made on a "first come, first served" basis. Each development can request a maximum allocation of 25

sewer hook-ups per quarter. This only applies to residential projects. Allocations are granted based on the Code of Public Local Laws and Ordinances of Carroll County, Chapter 179 – Sewer and Water (formerly County Ordinance No. 46). The code stipulates that allocations shall only be granted upon the execution and acceptance of a standard public works agreement or other agreement as required by County policy, the recordation of an approved subdivision plat and payment of all applicable charges. To determine availability, the County allocates and records capacity or flows for single equivalent dwelling units (EDUs) at the time building permits are approved or at the time area connection charges and any other applicable charges are paid.

For the Freedom SSA, allocations represent capacity set aside to accommodate development for which area connection charges have been paid. These are typically sites for which building permits have already been issued, a site plan has been approved or a minor subdivision has been approved. The capacity is “set aside” for two years after the area connections charges are paid. After two years, it is assumed that the development is connected to the system.

The Carroll County Board of Commissioners may reserve up to 15 percent of treatment plant capacity for industrial use. This number comes from the 2.6 million gallons allocated to Carroll County that are set aside for industrial uses. Also, MES, operators of the WWTP, reserves a flow of 20,000 gallons for its use. This is part of the 0.9 mgd that is reserved for the State of Maryland (Springfield Complex).

Needs Analysis

MES is currently planning to upgrade the treatment process at the WWTP from Biological Nutrient Removal (BNR) to Enhanced Nutrient Removal (ENR) in order to meet more stringent discharge requirements. The county will be paying for a portion of the upgrade. The planned ENR upgrade would allow the WWTP to comply with the Bay-related nutrient caps. However, the upgrade will not provide additional design capacity. Discharge would still be limited to approximately 3.5 mgd.

The County has been working with a consultant to determine the best course of action to ensure capacity in the Freedom Area. Through this process, it has been decided that as the plant is being upgraded to ENR the County will contribute approximately \$1 million to deepen the reactors by 2 feet. This additional “capacity building” project will provide the technical ability for the plant to be expanded to reach 4.0 mgd which would realize the current service area within the next 10 years as well as 4.67 mgd which is the current assigned Maryland Tributary Strategy nutrient loading cap in the future.

The County is working to create a process that will evaluate future demand. When capacity of the WWTP reaches 85% it will trigger the County to move forward with an expansion to the plant.

See Table 18F for Freedom SSA sewage problem areas.

Table 18F: Freedom SSA Sewage Problem Areas

Location	Population (Where Applicable)	Nature Of Problem	Status
Gaither Area	383	Septic Problems, small lots, and limited soil capabilities	Under Study

Planned Projects and Recommendations

See table 18G for Freedom SSA priority projects.

Table 18G: Freedom SSA Priority Projects

Project Name	Planning Category	Description	Location	Capacity Added
Sykesville Sewer Line Replacement	Future (S-5) 10 years	Replace 28,000-30,000 feet of sewer lines concurrent with replacement of cast iron water lines in phases	Phase I – Main Street, Springfield Ave., MD 851; future phases – various locations in Sykesville	0 MGD
Relief Gravity Sewer Replacement	Priority (S-3) 5 years	Replace gravity sewer lines	Various locations	0 MGD
Upgrade WWTP	Priority (S-3) Immediate	Upgrade treatment process from BNR to ENR	1 mile east of Sykesville and south of Raincliffe Road	0 MGD
Expand WWTP	Priority (S-3) or Future (S-5) 5-10 years	Increase the capacity at the WWTP from 3.5 MGD to 4.0 MGD	1 mile east of Sykesville and south of Raincliffe Road	.500 MGD

Long-Term Recommendations (10+ years)

- ◆ Work with MES to complete an inflow and infiltration (I&I) study that would identify where reductions could result in regaining capacity
- ◆ Work with MES and the State to recapture a portion of the sewer capacity reserved for the State so that it can be used throughout the Freedom sewer service area
- ◆ Expand the WWTP to realize 4.67 mgd which is the current assigned Maryland Tributary Strategy nutrient loading cap in the future.

Hampstead Sewer Service Area

Current Conditions

Carroll County owns and operates the public sewer system that serves both the Town of Hampstead and adjoining areas in the county. The Hampstead SSA comprises approximately 1,572 acres, which are located in the northeast section of the County along MD 30 and serves 2,257 EDUs. See Map 22: Hampstead SSA. The plant discharges into North Piney Branch, within the headwaters of Loch Raven Reservoir.

The Hampstead sewer system consists of a collection system, six pumping stations, and a sewage treatment plant. The treatment plant is located southeast of the Town, near the boundary with Baltimore County. The treatment plant is accessed via a service road off of North Woods Trail.

The Hampstead WWTP provides advanced secondary treatment of domestic wastes using an activated sludge treatment process. Activated sludge plants use a variety of mechanisms and processes and dissolved oxygen to promote the growth of biological flocculants that substantially breaks down organic material. It also traps particulate material and can, under ideal conditions, convert ammonia to nitrite and nitrate ultimately to nitrogen gas. The plant has a design capacity of 0.900 mgd, with a three-year average flow from 2008-2010 of approximately 0.342 mgd, excluding estimated I&I.

Since the early 1990s, the plant has been the subject of litigation focused on alleged negative effects that the temperature of the plant's effluent may have on the receiving stream (Piney Run). As the plant was not previously subject to any temperature limitation, compliance violations were not found. However, as a result of the litigation and subsequent regulatory and policy changes, MDE modified the plant's NPDES permit. It placed a temperature limitation on the plant's effluent of 68° F (20° C) and added thermal monitoring requirements. The permit became effective on November 20, 2005.

When the temperature rises during the summer months, past monitoring data has shown that the temperature of the plant's effluent may exceed the permit limitation of the higher of 68° F (20° C) or upstream ambient temperature. As technical response to compliance, Carroll County has designed, but has not installed, chiller equipment, and has been issued a permit by MDE to construct the chiller system. Desiring to pursue an alternative that was both less costly and less energy consumptive, as well as potentially less environmentally invasive, Carroll County has decided to work with an engineer evaluate the different possible alternatives. With this evaluation, multiple alternatives are being investigated and a decision will be made by the end of 2014.

Map 22



Carroll County submitted an application for an ATL (Alternate Temperature Limit) in connection with its application for a renewal discharge permit. On, July 9, 2004, Carroll County submitted a Study Plan for ATL for review by MDE. On December 21, 2005, Carroll County submitted its Final Report in connection with its Study Plan to the MDE. MDE requested additional information resulting in Carroll County submitting a supplemental report to MDE on May 7, 2006.

Based on the analysis and documentation submitted to MDE requesting the ATL, Carroll County believes that it has demonstrated that the temperature of the treated effluent discharged thus far has done no harm to the thriving indigenous community of shellfish, fish, and wildlife in and on the Piney Run. MDE is currently reviewing Carroll County's request for an ATL, thus it remains pending.

Currently, the plant is being operated under a Consent Judgment Agreement that places any violations in abeyance until the resolution of the ATL process. In conjunction with that agreement, Carroll County implemented several projects designed to assess other impacts to the stream and any corrections that may be warranted:

1. A thermal study of stormwater outfalls upstream of the treatment plant discharge location was performed. This study identified potential retrofit opportunities, which are being considered by the Bureau of Resource Management. Wastewater temperature issues are being incorporated into the possible solutions.
2. Streamside buffers were planted along Piney Run on County property.

In each case, the work has made measurable improvements to the stream's ecology over time that will be long lasting.

Inventory of Existing Sewerage Treatment Plants, Interceptors, Sewage Pumping Stations, and Force Mains

See Tables 19A-19D for Hampstead SSA infrastructure.

Table 19A: Hampstead SSA Treatment Plant

WWTP Treatment Type	Points of Discharge	WWTP Design Capacity (mgd)	Average Flows (mgd)	Method of Sludge Disposal
Extended aeration	Piney Run	.900	.573	Sludge press; cake form is trucked to Northern Landfill
Discharge Permit Number: 88DP0594C NPDES Number: MD0022446				

Table 19B: Hampstead SSA Interceptors

Interceptor	Diameter (inches)	Average Day Flow (mgd)	Design Flow (mgd)
Main Interceptor	15	n/a	n/a

Table 19C: Hampstead SSA Pumping Stations

Pumping Station	Coordinate Location*	# of Pumps	Capacity of Each Pump (mgd)	Normal Pumping Capacity (mgd)	Average Day Pumping (mgd)
Eagle Ridge	N 393817.83 W76 7154.74	2	n/a	0.196	0.004
North Carroll Farms Station #20	N 713011.99 E 1352660.68	2	0.168	n/a	n/a
North Station #8	N 710613.53 E 1352919.14	2	0.040	n/a	0.025
Small Crossings Station #9	N 709347.37 E 1354734.57	2	0.018	n/a	n/a
Shiloh Station #11	N 704552.54 E 1349785.75	3	0.500	n/a	n/a
Roberts Field Station #14	N 701892.64 E 1358892.42	2	0.031	n/a	n/a
Hampstead WWTP	N 703565.58 E 1358927.42	3	0.900	n/a	n/a
Total		16	1.657	.196	.004

*Coordinate locations are Maryland State Plane 1983 Datum.

Table 19D: Hampstead SSA Force Mains

Force Main	Maximum Day Pumpage in MGD (date)	Diameter (inches)	Design Flow (mgd)
Shiloh Station #11	No Flow Meter	10	1.000
North Station #8	No Flow Meter	6	-
Small Crossings Station #9	No Flow Meter	4	-
Roberts Field #14	No Flow Meter	4	-
North Carroll Farms #20	No Flow Meter	4	-
Eagle Ridge	No Flow Meter	6	-
Total			1.000

*Provided Design Average Daily Flow for Design Flow.

Sludge Management

The Hampstead Sewage Treatment Plant generates approximately 1,022 wet tons of sludge per year. The wet sludge is processed through a screw press process and deposited in roll off dumpsters. Dry sludge is taken to the Northern Landfill for ultimate disposal. See Table 19E for Hampstead SSA Sludge Management.

Table 19E: Hampstead SSA Sludge Management

Quantity (tons/yr)	Quality	Method of Disposal/Use	Permit #s	Future Disposal Method	Problems
1,022 wet 174 dry (15% solid)	Digested liquid sludge, 1% solids, aerobic digestion	Dewatered sludge transported to Carroll County Northern Landfill	2008-SLF-2596 S-91-06-2595-BE	No change anticipated	None

Allocation Procedure

Sewage capacity is allocated on a “first come, first served” basis. The amount of the allocation is based on meter size (e.g., for residential units served by a 5/8-inch meter, the County allocates 225 gpd). Sewage flows are allocated to development following final approval of the record plat or site plan mylars by the County Bureau of Engineering. A maximum of 25 sewer hook-ups may be approved per quarter for each development.

As of 2011, the Board of County Commissioners has 41,850 gallons of the treatment plant’s capacity reserved for industrial uses.

Needs Analysis

Because much of the Hampstead sewer system dates to the 1970s, numerous components are showing their age. A continual process to update and upgrade the system is being undertaken. In particular, there are two clarifiers in use currently that treat 700,000 gallons of sewage. Ideally there should be two clarifiers to handle the *full* capacity of the wastewater treatment plant, *plus* two additional clarifiers that would create redundancy for the full system. However, clarifiers will not be needed once the wastewater treatment plant is upgraded to an ENR process; the need for and/or timing of adding clarifiers to the existing system would be dependent upon the timing of the ENR upgrade.

In 2009, the County hired a consultant to complete the *Hampstead Sewer System Preliminary Infiltration & Inflow Study*. The study identified specific locations where I&I were occurring throughout the Hampstead sewer system. It estimated that approximately 325,000 gallons (or 57 percent) of treatment capacity were being lost to I&I. The study also identified locations where improvements could be targeted to recapture the greatest amount of capacity. Based on these targeted improvements, it was estimated that approximately 105,000 gallons of capacity currently being lost to I&I could be recaptured. However, in 2011, some of these improvements were completed. Pipes leading into the WWTP and running under a tributary of North Piney Branch were lined, for a measured reduction in I&I of 100,800 gpd.

The County continues to work towards resolving the thermal limitations issue with MDE. Until these issues are resolved, several potential projects (including Enhanced Nutrient Removal upgrades) remain on hold. See Table 19F for Hampstead SSA sewage problem areas.

Table 19F: Hampstead SSA Sewage Problem Areas

Location	Population (Where Applicable)	Nature Of Problem	Status
Green mount	214	Septic Problems, small lots, and limited soil capabilities	Under Study

Planned Projects and Recommendations

See Table 19G for Hampstead SSA priority projects.

Project Name	Planning Category	Description	Location	Capacity Added
Hampstead Trade Center	Priority (S-3) 5 Years	Pumping station, 8" collector line, force main	Hampstead North Business Center	0 MGD
IDA Property	Future (S-5) 10 Years	Pumping station, 8" collector line, force main	IDA property west of MD 30.	0 MGD
Jos A. Bank	Priority (S-3) Immediate	Pumping Station	South Hampstead along MD 30	0 MGD
Upgrade WWTP	Priority (S-3) 5 Years	Upgrade treatment process to ENR	Existing WWTP	0 MGD
Hampstead Sewer Main Upgrade	Priority (S-3) 5 Years	Replace 4,750 feet of existing clay pipes per year starting in FY19	Throughout Town	0 MGD
West Hampstead Collector Sewer Main Repair	Priority (S-3) 5 Years	Repair the clay sewer mains	Carroll Street, Houcksville Road, Gill Avenue and Shiloh Road	0 MGD
Gravity Sewer Main	Priority (S-3) 5 Years	Install 2,600 feet of 10" force main on Houcksville Road near MD 30 and 3,100 feet northwest of the Hampstead WWTP	Houcksville Road to Treatment Plant	0 MGD
New Force main	Priority (S-5) 10 Years	Upgrade force main to 16" and any additional projects that need to occur with this upgrade.	Shiloh Pump Station to Blackrock Road	0 MGD

Long-Term Recommendations (10+ years)

- ◆ Implement the targeted improvements to the collection system recommended in the I&I study.
- ◆ Renovate/upgrade the control room at the WWTP
- ◆ Upgrade controls at the Influent Pumping Station at the WWTP
- ◆ Replace the generator at the WWTP with a bigger unit.
- ◆ Possibly install additional clarifiers at the WWTP
- ◆ Identify specific industrial areas for which Commissioner-reserved treatment capacity will be used, to avoid preemption of the capacity by other development.
- ◆ Implement any projects associated with the resolution of the thermal limitation issue, including possible discharge chillers or their alternatives.
- ◆ Undertake Enhanced Nutrient Removal upgrades to the wastewater treatment plant, pending resolution of the thermal limitation issue.

Manchester Sewer Service Area

Current Conditions

The Town of Manchester owns and operates its sewer system and limits service to the corporate limits. The Manchester SSA area comprises about 1,262 acres located in the northeast corner of the county along MD 30 and serves 1,461 EDUs. Manchester WWTP capacity is 0.500 mgd. Average flow is 0.356 mgd.

The existing sewer system became operational in 1969 and consists of a collection system, ten pumping stations, and a sewage treatment plant located east of Beaver Street. A spray irrigation facility is also utilized in the waste treatment process, and is located south of Manchester on Maple Grove Road. Sewage flow is primarily domestic, with a small amount of commercial waste.

The sewage treatment plant is a package secondary treatment facility utilizing contact stabilization with anaerobic digestion of sludge. The design capacity is 0.500 mgd, with a three-year average flow from 2008-2010 of approximately 0.357 mgd, excluding estimated I&I. Effluent from the treatment plant is pumped from the treatment plant via a 14-inch diameter force main to a 5.0 mg storage lagoon, and in turn, spray irrigated onto Town-owned irrigation fields. The Town of Manchester utilizes and harvests a crop of reed canary grass for nutrient uptake on the spray irrigation fields. The Town is allowed to spray irrigate March 1 through November 30. For the remaining 3 months, December 1 through February 28, the plant's effluent is discharged into George's Run, which is a tributary of Prettyboy Reservoir in Baltimore County. The Town is permitted to spray 0.5 mg of effluent per day. See Tables 20-A-20D for Manchester SSA infrastructure.

Inventory of Existing Wastewater Treatment Plants, Interceptors, Sewage Pumping Stations, and Force Mains

Table 20A: Manchester SSA Treatment Plant

WWTP Treatment Type	Points of Discharge	WWTP Design Capacity (mgd)	Flows Average/Peak	Method of Sludge Disposal
WWTP activated sludge contact stabilization with land application via spray irrigation	Land application via spray irrigation /George's Run (winter)	0.500	0.356/ 0.499 mgd	Stabilized sludge is dewatered onsite and is trucked to the C.C. Northern Landfill by the Town and by an independent hauler
Discharge Permit Number: OODP0642 NPDES Number: MD0022578				

Map 23

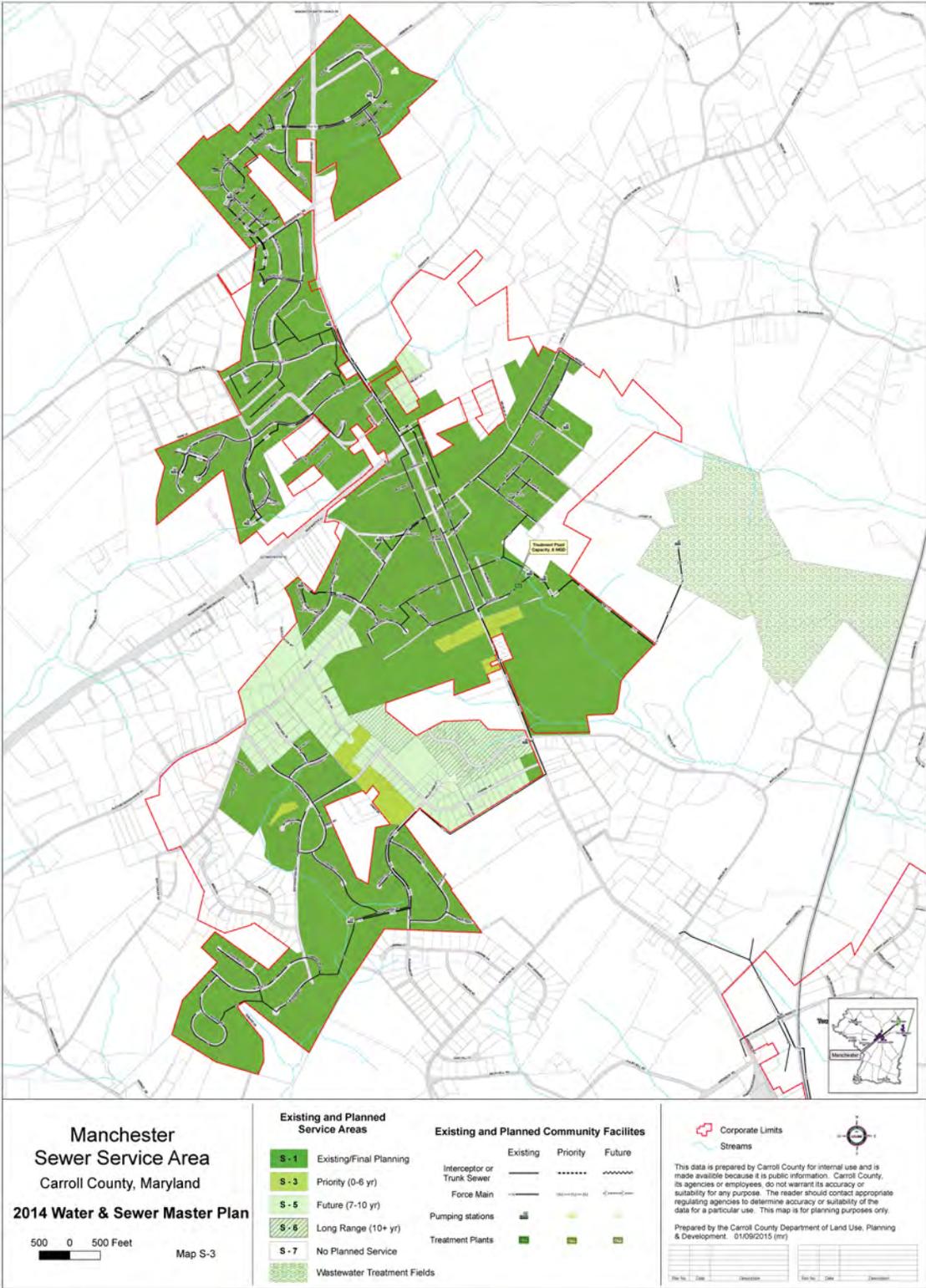


Table 20B: Manchester SSA Interceptors

Interceptor	Diameter (inches)	Average Day Flow (mgd)	Design Flow (mgd)
Main Influent line to WWTP	16	0.356	2.000
Northern Line	8	0.056	1.800
Westminster Street	8	Not metered	0.288
Hallie Hills #1	8	Not metered	0.518
Hallie Hills #2	8	Not metered	0.500
Coachman Way	8	Not metered	0.288
Victory Street	6	Not metered	0.072
Southern Line	8	0.038	1.000
Crossroads Overlook #1	8	Not metered	0.700
Crossroads Overlook #2	8	Not metered	0.288
Total		0.450	7.454

Table 20C: Manchester SSA Pumping Stations

Pumping Station	Coordinate Location*	# of Pumps	Capacity of Each Pump (mgd)	Normal Pumping Capacity (mgd)	Average Day Pumping (mgd)
Manchester WWTP	N 725574.11 E 1346217.60	2	2.000	0.250	0.237
Westminster Street	N 726009.53 E 1343736.75	2	0.144	Unknown (No Flow Meter)	0.030 (Est.)
Hallie Hills Station #1	N 3940.525 W7653.793	2	0.259	n/a No Flow Meter	0.030 (Est.)
Hallie Hills Station #2	N3940.790 W 7653.294	2	0.250	n/a No Flow Meter	0.014 (Est.)
Maple Grove Road (South Station)	N 725250.08 E 1346561.88	2	0.500	0.038	0.038
Michelle Road (North Station)	N 729472.59 E 1343058.31	4	0.450	0.056	0.056
Park Ave. Estates Station	N 725229.83 E 1342521.64	2	0.144	Unknown (No Flow Meter)	0.100(Est.)
Victory Street	N 727741.06 E 1347311.20	2	0.036	Unknown (No Flow Meter)	0.002 (Est.)
Effluent P.S. to Lagoon	N 725270.33 E 1346551.75	2	2.100	0.356	0.356
Manchester Farms	N 1343199.85 W 718901.51	4	0.430	n/a No Flow Meter	0.032 (Est.)
Crossroads Station #1	N 1341755.22 W 726143.27	2	0.350	n/a No Flow Meter	0.045 (Est.)
Crossroads Station #2	N 393976.50 W765398.70	2	0.144	n/a No Flow Meter	0.180 (Est.)
Irrigation Pump Station (Spray Fields)	N 725857.64 E 1348779.45	3	1.600	0.339	0.498
Total		31	8.407	1.039	1.618

*Coordinate locations are Maryland State Plane 1983 Datum.

Table 20D: Manchester SSA Force Mains

Force Main	Maximum Day Pumpage in MGD (date)	Diameter (inches)	Design Flow (mgd)
Westminster Street	Unknown (No Flow Meter)	4	0.300
Millie Way	Unknown (No Flow Meter)	4	0.030
Coachman Way	Unknown (No Flow Meter)	4	0.290
Christmas Tree Lane (Victory St.)	Unknown (No Flow Meter)	2	0.036
Lagoon	0.490 (05/4/09)	14	4.200
Sprayfields	0.498 (8/13/99)	10	1.600
Hanover Pike (North Station)	n/a	10	1.800
Hanover Pike (South Station)	n/a	10	2.000
Westminster Street (from Crossroads Station #1)	No Flow Meter	4	0.350
Susanann Drive	No Flow Meter	6	0.860
Main St. to Long Lane (North Station)	0.048	10	2.000
Westminster Street (Westminster St. Station)	Unknown	4	0.144/pump
Hallie Ave. to Millie Way (Hallie Hill Station)	Unknown	6	0.091
Hallie Ave West to Hallie Ave.	Unknown	6	0.145
Coachman Way (Park Ave. Station)	Unknown	4	0.144/pump
Christmas Tree Lane (Victory St. Station)	Unknown	2	.3600
Eff. Line to Lagoon (Eff. Pump Station)	0.534	14	2.100
Eff. Line to Sprayfields (Sprayfield Station)	0.499-Based on Lagoon Level	2-10	4.800
Westminster Street (Crossroads Station #1)	Unknown	6	0.350/pump
Overlook Court (Crossroads Station #2)	Unknown	4	0.144/pump
Susanann Drive (Manchester Farms Station)	Unknown	6	0.430/pump
WWTP	0.497 (12/20/09)	8	2.000
Total	2.566		24.174

*Provided Design Average Daily Flow for Design Flow.

Sludge Management

The Manchester Wastewater Treatment Plant generates approximately 1.6 million gallons of wet sludge per year. The stabilized sludge which is generated at the facility is dewatered via a belt-filter press. Dewatered sludge cake is then transported to the Carroll County Northern Landfill for disposal. The average amount of dewatered sludge transported is 23 tons per month, or 283.6 tons per year. See Table 20E for Manchester SSA Sludge Management.

Table 20E: Manchester SSA Sludge Management

Quantity	Quality	Method of Disposal/Use	Permit #s	Future Disposal Method	Problems
Average of 23 tons of dewatered sludge per month	Digested liquid sludge, 19% solids, aerobic digestion	Dewatered sludge transported to Carroll County Northern Landfill	S-02-06-4853L	Agricultural land application, composting	None

Allocation Procedure

Allocations are made on a “first-come, first-served” basis following approval of a site plan or subdivision. Flows for residential development are calculated at 375 gallons per dwelling unit per day. Commercial and industrial flows are calculated by the applicant’s engineers and reviewed by the Town.

In addition, Section 173 “Sewer” section of the Town Code requires that public facilities, including sewer, be adequate in order for the Planning Commission to approve a project at each stage of the development approval process.

Needs Analysis

No further expansion of the existing 0.500 mgd wastewater treatment plant capacity is contemplated or planned. The planned service area has been scaled to the remaining capacity of the existing facility, consistent with the Comprehensive Plan for Manchester and Environs, as amended. The Town’s sewer system experiences infiltration & inflow (I&I), which results in additional flows of approximately 33,254 gpd to the wastewater treatment plant. In an effort to reduce I&I, the Town conducted an I&I study to determine levels of inflow and made system improvements to address the problem. This will make the most efficient use of the system and allow available capacity to be allocated to the planned service area. Periodic monitoring and correction of future problem areas will continue to be necessary.

In the southwestern end of Town, there are existing homes and areas planned for development but sewer lines do not currently exist to serve them. Most notably, the existing homes on Charmil Drive are not served by public sewer. The sewer line that carries wastewater from Manchester Farms could, in the future, serve approximately 15 homes along the south side of Charmil Drive. However, service to the remaining homes in the Charmil Drive area would still require construction of additional sewer lines. See Table 20F: Manchester SSA sewage problem areas.

Table 20F: Manchester SSA Sewage Problem Areas

Location	Population (Where Applicable)	Nature Of Problem	Status
Charmil Drive	171	Groundwater contamination from failing septic systems in the area	Extend community sewer service to this area

Planned Projects and Recommendations

See Table 20G for Manchester SSA priority projects.

Table 20G: Manchester SSA Priority Projects

Project Name	Planning Category	Description	Location	Capacity Added
Infiltration/Inflow Improvements	Priority (S-3) 5 years	Continue to locate and remedy areas experiencing I&I problems	Various locations throughout the Town	.045 MGD*
Computer Mapping	Priority (S-3) Immediate	Develop computer mapping of complete wastewater collection system	Entire Town	0 MGD
Subsurface Discharge	Priority (S-3) 5 years	Design and explore feasibility of sub surface discharge in order to utilize the spray fields year round	Spray Irrigation Facility	0 MGD
Wastewater Treatment Plant Upgrades	Future (S-5) 10 years	Improvements to meet Enhanced Nutrient Removal goal	Existing WWTP	.250 MGD*

*These projects will be completed if grant funding becomes available

Long-Term Recommendations (10+ years)

- ♦ Explore options for providing public sewer service to existing developed areas in Town that currently are not served.

Mount Airy Sewer Service Area

Current Conditions

The Town of Mount Airy owns and operates the community sewer system, which is located in the southwest corner of the County. See Map 24: Mount Airy SSA. The Mount Airy SSA covers approximately 3,280 acres and serves 3,160 EDUs. See Map 24: Mount Airy SSA. Mount Airy WWTP design capacity is 1.2 mgd. Average flows are 0.640 mgd.

The plant discharges to the South Branch of the Patapsco River. No expansion is anticipated for Mount Airy's WWTP; however, the Town is upgrading the plant to ENR. Environmental factors limit the ability to further expand the plant beyond the current 1.2 mgd capacity.

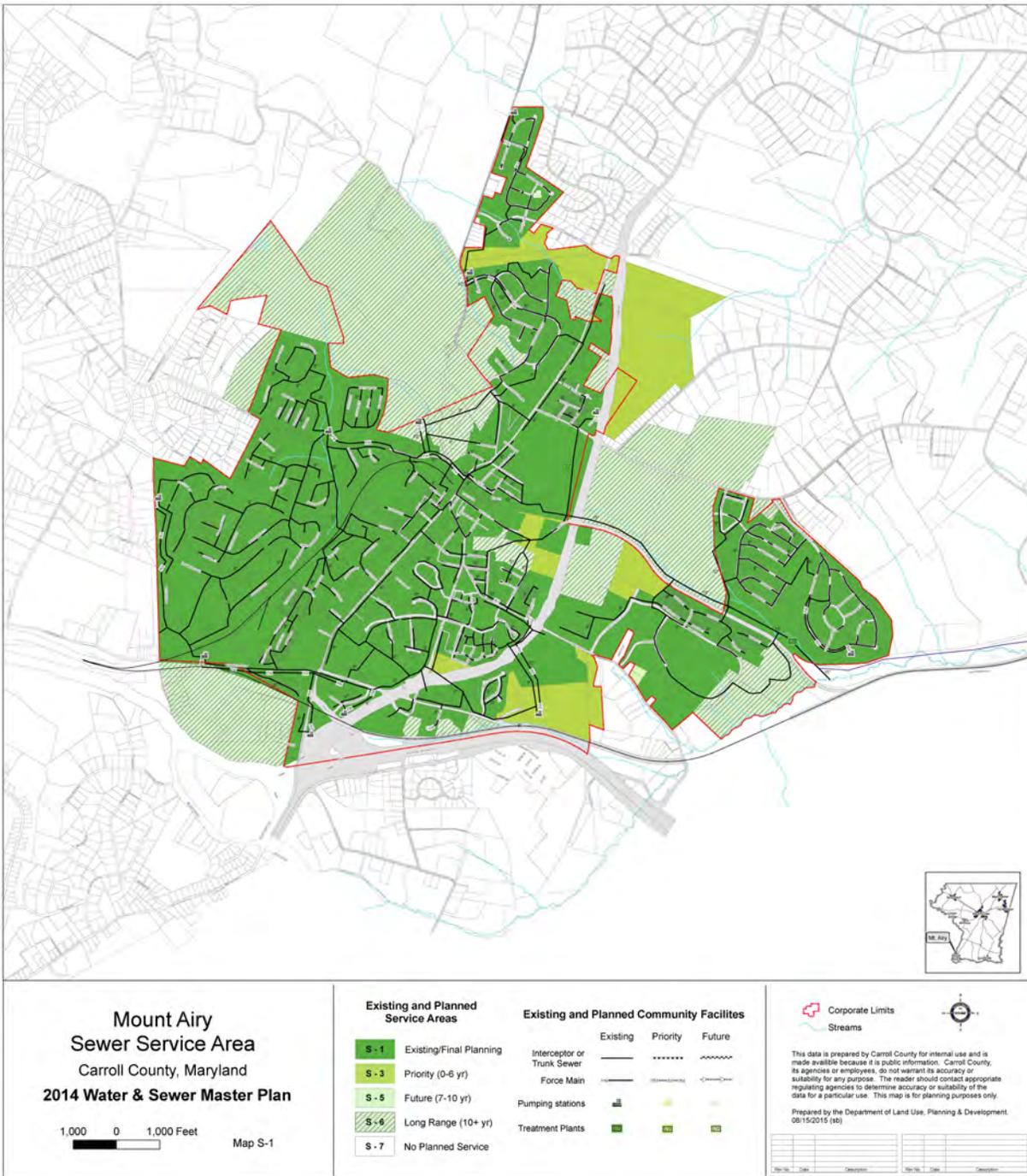
The Mount Airy sewer system includes eleven pumping stations, interceptors and collection lines ranging from 6-inch to 15-inch diameter, and a WWTP. The WWTP is located one mile east of MD 27 and south of Watersville Road. The plant discharges treated wastewater into the South Branch of the Patapsco River, and has a design capacity of 1.2 mgd, with a two-year average flow from 2007-2008 of approximately 0.693mgd, excluding estimated I&I.

The treatment process consists of the following: a bar screen, grit removal, BNR aeration system, clarifiers, ultraviolet lights, post aeration tank, solids process, sludge holding tank, and belt-filter press with lime stabilization. The Town is currently upgrading the existing WWTP to meet Enhanced Nutrient Removal goals for Total Nitrogen of 3.0 mg/l and Total Phosphorus of 0.3 mg/l.

In 2006, Mount Airy performed a full system I&I camera inspection of the original 1971 sewer system. The inspection revealed three major problems that have been corrected. Each year the Town continues to make I&I improvements to the collection system.

The estimates do not reflect factors unique to this municipal system that may have been considered in the CMP worksheet calculations.

Map 24



Inventory of Existing Wastewater Treatment Plants, Interceptors, Sewage Pumping Stations, and Force Mains

See Tables 21A-21D for Mount Airy SSA Infrastructure.

Table 21A: Mount Airy SSA Wastewater Treatment Plant

WWTP Treatment Type	Points of Discharge	WWTP Design Capacity (mgd)	Average Flows (mgd)	Method of Sludge Disposal
ENR	South Branch Patapsco River	1.200	0.640	Lime stabilized sludge is hauled to be land applied on farms and/or disposed of at Carroll County Landfill.

Mount Airy WWTP Discharge Permit Number: 00DP0641A NPDES Number: MD0022527A

Town of Mount Airy Water System Discharge Permit Number: 00HT9535 NPDES Number: MDG679535

Table 21B: Mount Airy SSA Interceptors

Interceptor	Diameter (inches)	Average Day Flow (mgd)	Design Flow (mgd)
Station 1 (2 interceptors)	8	0.375	0.936
Station 2	8	0.005	0.259
Station 3	8	0.055	0.720
Station 4 (3 interceptors)	8	0.175	0.576
Station 5 (3 interceptors)	10 (1) 8 (2)	0.350	0.936
Station 6	6	0.015	0.252
Station 8	8	0.030	0.288
Station 9	8	0.080	0.288
Station 10	8	0.025	0.374
Station 7	8	0.030	0.216
Wastewater Treatment Plant	15	0.722	1.200
Total		1.862	6.045

Table 21C: Mount Airy SSA Pumping Stations

Pumping Station	Coordinate Location*	# of Pumps	Capacity of Each Pump (mgd)	Normal Pumping Capacity (mgd)	Average Day Pumping (mgd)
Station 1	N 617782.66 E 1270540.77	4	0.936	n/a	0.300
Station 2	N 617320.16 E 1265265.77	2	0.259	n/a	0.002
Station 3	N 619051.41 E 1262790.77	2	0.720	n/a	0.056
Station 4	N 624213.91 E 1265703.27	4	0.576	n/a	0.157
Station 5	N 624488.91 E 1267753.27	2	0.936	n/a	0.250
Station 6	N 624632.66 E 1271809.52	2	0.252	n/a	0.008
Station 7	N 617782.66 E 1266084.52	2	0.216	n/a	0.014
Station 8	N 622676.41 E 1261740.77	2	0.288	n/a	0.021
Station 9	N 627882.66	2	0.288	n/a	0.013

Table 21C: Mount Airy SSA Pumping Stations

Pumping Station	Coordinate Location*	# of Pumps	Capacity of Each Pump (mgd)	Normal Pumping Capacity (mgd)	Average Day Pumping (mgd)
Station 10	E 1268847.02 N619113.35 E1277753.81	1	0.374	n/a	0.001
Station 11	N631608.62 E1269968.0	1	0.173	n/a	n/a
Total		24	3.103	n/a	0.822

*Coordinate locations are Maryland State Plane 1983 Datum.

Table 21D: Mount Airy SSA Force Mains

Force Main	Maximum Day Pumpage in MGD (date)	Diameter (inches)	Design Flow (mgd)
Station 1	0.601 (01-30-01)	10	0.936
Station 2	0.003 (11-20-01)	6	0.259
Station 3	0.069 (03-06-01)	8	0.720
Station 4	0.245 (03-29-01)	6	0.576
Station 5	0.534 (09-24-01)	10	0.936
Station 6	0.012 (07-24-01)	6	0.252
Station 7	0.023 (07-27-01)	6	0.216
Station 8	0.028 (03-29-01)	8	0.288
Station 9	0.020 (12-27-01)	8	0.288
Station 10	.002	6	0.374
Total	1.537		4.845

*Provided Design Average Daily Flow for Design Flow.

Sludge Management

The Mount Airy Sewage Treatment Plant produces 1,300 wet tons of sludge per year. The sludge is held in a 300,000- gallon aerobic digester. The sludge is then pumped to a belt-filter press. The sludge is then dewatered and lime stabilized.

The Town has a contract to land apply the lime stabilization sludge. The Town also has permits to dispose of sludge at Carroll County landfill during time that it cannot be land applied. See Table 21E for the Mount Airy SSA Sludge Management.

Table 21E: Mount Airy SSA Sludge Management

Quantity	Quality	Method of Disposal/Use	Permit #s	Future Disposal Method	Problems
1300 wet tons/ 150 dry tons	Lime Stabilization	Agricultural land use, landfill application	S-03-06-4513-L S-03-10-4982-L S-01-06-4789-A	Same	None

Allocation Procedure

Each building permit is reviewed for allocation needs and for conformance with the Town's Adequate Public Facilities Ordinance.

Needs Analysis

Mount Airy experiences infiltration and inflow (I&I) in its sewer system that was estimated at approximately 120,000 gpd in 2007. Every year the Town is making improvements to reduce the I&I and will continue to address this problem in upcoming years. Monitoring and correction of these problems will help to prevent unnecessary flows to the wastewater treatment plant and allow capacity to be used elsewhere in the service area.

The large tract of land known as the Harrison-Leishear property may have significant development potential in the near future. This area currently is not improved with any public sewer infrastructure, which would need to be in place for the property to realize its full development potential.

The total future wastewater demand assumes that everything within the GAB builds out according to the adopted land use plan. If this were to occur, the total future wastewater demand for the Mount Airy WWTP would be 1,064,000 gpd.

If Mount Airy were to build out according to the planned land uses adopted within the GAB, the Town would have sufficient capacity available with current wastewater flows.

The existing design capacity (1.2 mgd) of the Mount Airy WWTP represents the controlling limitation under current and future conditions.

Site constraints at the WWTP include a stream, floodplain, forest conservation, and a stormwater management facility; although, the design capacity of the existing plant is adequately sized to accommodate future growth. Due to the constraints referenced above the system may not be able to expand beyond the current 1.2 mgd.

The Mount Airy WWTP discharges approximately 3 river miles upstream of a Tier II segment of the South Branch of the Patapsco River. Given the high levels of treatment and large distance to the segment, the Tier II designation is not expected to represent a controlling limitation on the Mount Airy WWTP discharge.

The Mount Airy WWTP NPDES permit includes standard limits for secondary treatment facilities, and is fully protective of receiving waters. Limits for parameters, such as ammonia, were derived for local water quality protection and are expected to remain achievable even under higher effluent flows. See Table 21F for Mount Airy SSA Sewage Problem Areas.

Planned Projects and Recommendations

See Table 21G for Mount Airy SSA priority projects.

Table 21G: Mount Airy SSA Priority Projects

Project Name	Planning Category	Description	Location	Capacity Added
Infiltration/Inflow Reduction	Priority (S-3) Immediate	Monitor and make improvements	Entire System	0 MGD
Pumping Station	Priority (S-3) Immediate	New pumping station	NE corner of MD 27 and Watersville Road (Harrison-Leishear property)	0 MGD
Sewer Lines	Priority (S-3) Immediate	New sewer lines	NE corner of MD 27 and Watersville Road (Harrison-Leishear property)	0 MGD
Discharge Temp Reduction	Priority (S-3) 10 years	NPDES Permit Requirement	Mount Airy WWTP	0 MGD

New Windsor Sewer Service Area

Current Conditions

The Town of New Windsor owns the community sewer system, which is operated by the MES. Located in the west-central portion of the County, the New Windsor SSA covers approximately 945 acres and serves 555 EDUs. See Map 25: New Windsor SSA. Generally, the Town limits service to the area located within the Town's corporate boundary. New Windsor WWTP design capacity is 0.209 mgd. Average flows are 0.038 mgd.

The New Windsor wastewater system consists of collection lines, five pumping stations, and a wastewater treatment facility. The design capacity of the new wastewater treatment facility is 0.115 mgd. The three-year average flow (lagoon system) from 2008-2010 was approximately 0.038 mgd, excluding estimated I&I.

The new WWTP facility is located at the north end of Water Street. The treated effluent is discharged to Dickenson Run. Upgraded laboratory facilities provide more effective monitoring of the treatment process, including a computerized effluent flow meter. Influent is metered, and sewer rates are based on metered water use.

The Town has constructed a new 0.115 mgd treatment plant to replace the lagoon system. The plant is a Continuous Sequencing Batch Reactor Process (CSBR) system. The lagoons will be phased out and decommissioned. The Town will have them dredged, regraded, and converted to ballfields/recreational areas.

Inventory of Existing Wastewater Treatment Plants, Interceptors, Sewage Pumping Stations, and Force Mains

See Tables 22A-22D for New Windsor SSA infrastructure.

Table 22A: New Windsor SSA Treatment Plant

Service Area and/or WWTP Name	WWTP Treatment Type	Points of Discharge	WWTP Design Capacity (mgd)	Flows Average/Peak	Method of Sludge Disposal
New Windsor	Lagoons (4)*	Dickenson Run	0.094	0.038/- mgd	Lagoon only
New Windsor	CSBR*	Dickenson Run	0.115	n/a	-
Total			0.209	0.038	

Discharge Permit Number: 05DP0640 **NPDES Number:** MD0022586

* new plant is replacing lagoon system; lagoons to be phased out

Map 25

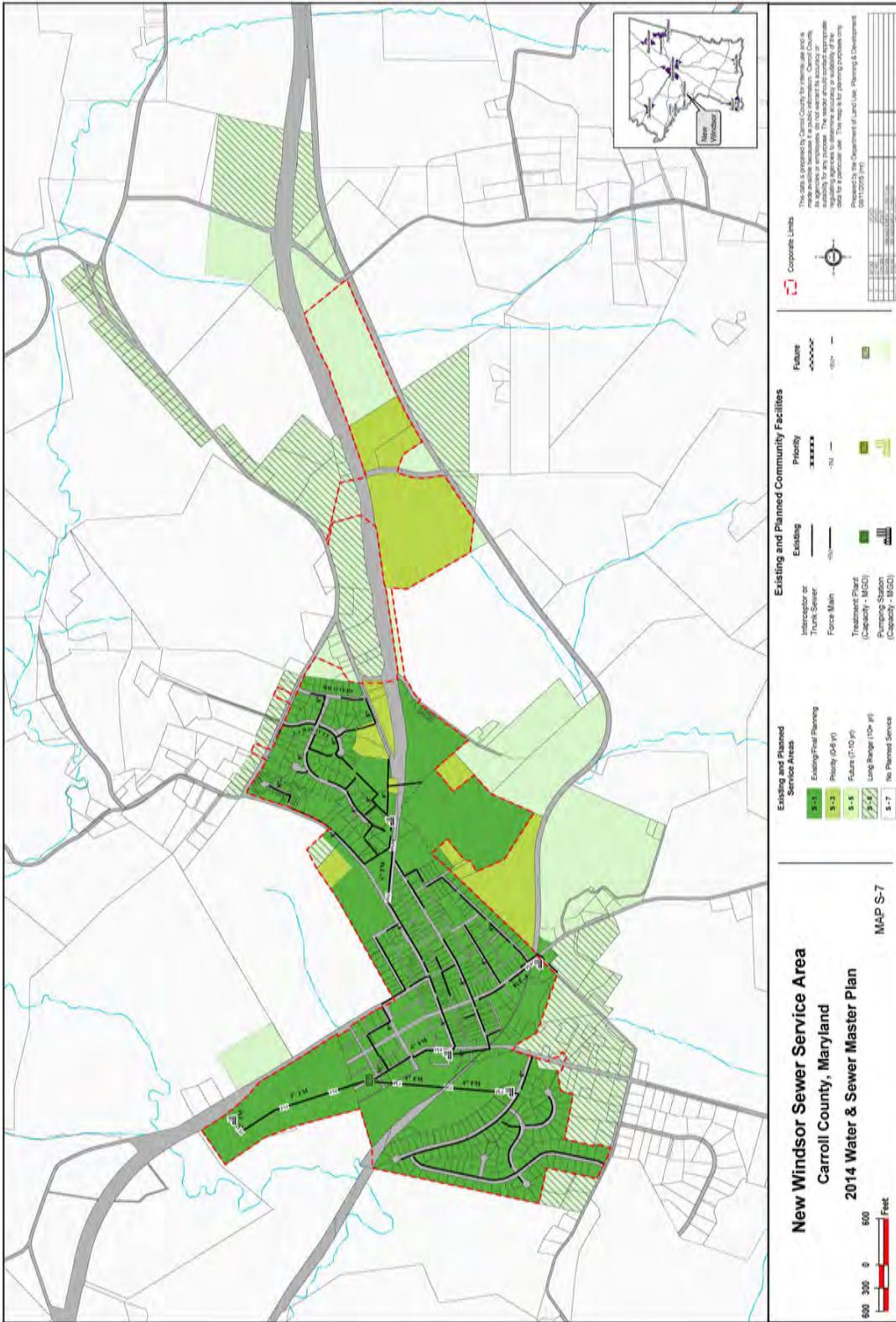


Table 22C: New Windsor SSA Pumping Stations

Pumping Station	Coordinate Location*	# of Pumps	Capacity of Each Pump (mgd)	Normal Pumping Capacity (mgd)	Average Day Pumping (mgd)
Coe Drive	N 1282398.94 E 682149.41	1	0.086	-	-
Main Street	N 1281218.44 E 683323.49	1	0.230	-	-
Blue Ridge	N 1284087.93 E 684060.74	1	0.456	-	-
New Windsor Middle School	N 1280371.56 E 686114.35	2	0.036	-	-
Atlee Ridge	N 1280737.26 E 682521.52	1	0.344	-	-
Total		6	1.152		

*Coordinate locations are Maryland State Plane 1983 Datum.

Table 22D: New Windsor SSA Force Mains

Force Main	Maximum Day Pumpage in MGD (date)	Diameter (inches)	Design Flow (mgd)
Coe Drive	-	4	-
Main Street	-	6	-
Atlee Ridge	-	4	-
Blue Ridge	-	6	-
New Windsor Middle School	-	2	-

*Provided Design Average Daily Flow for Design Flow.

Sludge Management

New Windsor's former lagoon wastewater treatment system has yet to generate an amount of sludge which would require dredging. The Town expects to apply for a disposal permit within the next six years. A study of sludge removal is now being prepared to determine the best disposal method. A fund will be established for monies set aside from the sewer rates in contemplation of this task. See Table 22E for New Windsor SSA sludge management.

Table 22E: New Windsor SSA Sludge Management

Quantity	Quality	Method of Disposal/Use	Permit #s	Future Disposal Method	Problems
None	-	Lagoon	-	Drying Bed, haul dried sludge to Northern Landfill, Haul liquid sludge to Westminster Septage Facility	-

Allocation Procedure

The Town of New Windsor usually provides sewer capacity on a “first come, first served” basis. Available capacity has been allocated to provide for the current development. Any expansion of the Town’s sewer facilities necessitated by development will be paid for by the developer.

Planned Projects and Recommendations

See Table 22G for New Windsor SSA priority projects.

Table 22G: New Windsor SSA Priority Projects

Project Name	Planning Category	Description	Location	Capacity Added
Wastewater Treatment Plant Upgrades	Future (S-5) 10 years	Improvements to meet Enhanced Nutrient Removal goal	Existing WWTP	0 MGD
Wastewater Treatment Plant Expansion	Future (S-5) 10 years	Expand WWTP to reach planned capacity of .250 MGD	Existing WWTP	.115 MGD
Coe Drive Sewage Pumping Station	Priority (S-3) Immediate	Replace existing aging pumping station with similar size modern station in same location.	Intersection of Coe Drive and High Street (MD 31)	0 MGD
Main Street Sewage Pumping Station	Priority (S-3) Immediate	Replace existing aging pumping station with similar size modern station in same location.	Intersection of Main and Water Streets	0 MGD

Long-Term Recommendations (10+ years)

- ◆ Pursue revision of NPDES permit to recognize increased capacity once plant upgrades and expansion are completed.
- ◆ Identify use or remediation options for lagoons once new WWTP is operational.
- ◆ Conduct an I&I study to determine current level of inflows from I&I to potentially regain some capacity; make system improvements to reduce I&I.
- ◆ Investigate reuse of Town’s treated effluent through spray irrigation at ballfields, for firefighting, industrial operations, or other appropriate uses.

Pleasant Valley Sewer Service Area

Current Conditions

The Pleasant Valley planned SSA, comprising approximately 35 acres, is located on both sides of Pleasant Valley Road between Richardson and Hughes Shop Roads. An estimated 50 residences, five businesses, and the Pleasant Valley Fire Department are located within the area, which is a designated Rural Village. See Map 27: Pleasant Valley SSA. The system is owned and operated by the County. Effluent is discharged into Bear Branch, which is in the Double Pipe Creek watershed. Pleasant Valley WWTP design capacity is 0.019 mgd. Average flows are 0.003 mgd.

In 1994, the County constructed a conventional gravity collection system. It consists of 2,850 linear feet of collection mains that intercept and convey flows from the individual house service laterals. Twelve manholes provide access to the collection mains for maintenance purposes. Flows are transported by gravity to the treatment plant.

The wastewater treatment facility is a Sequencing Batch Reactor (SBR) with a design capacity of 0.019 mgd, and a three-year average flow from 2008-2010 of approximately 0.004 mgd, excluding estimated I&I. The facility is located on the west side of Halter Road, south of Bear Branch.

The SBR system relies on the biological digestion of wastes contained in the wastewater to meet effluent discharge criteria. This system requires a sludge holding tank and a disinfection chamber to retain solids and to disinfect the reactor effluent.

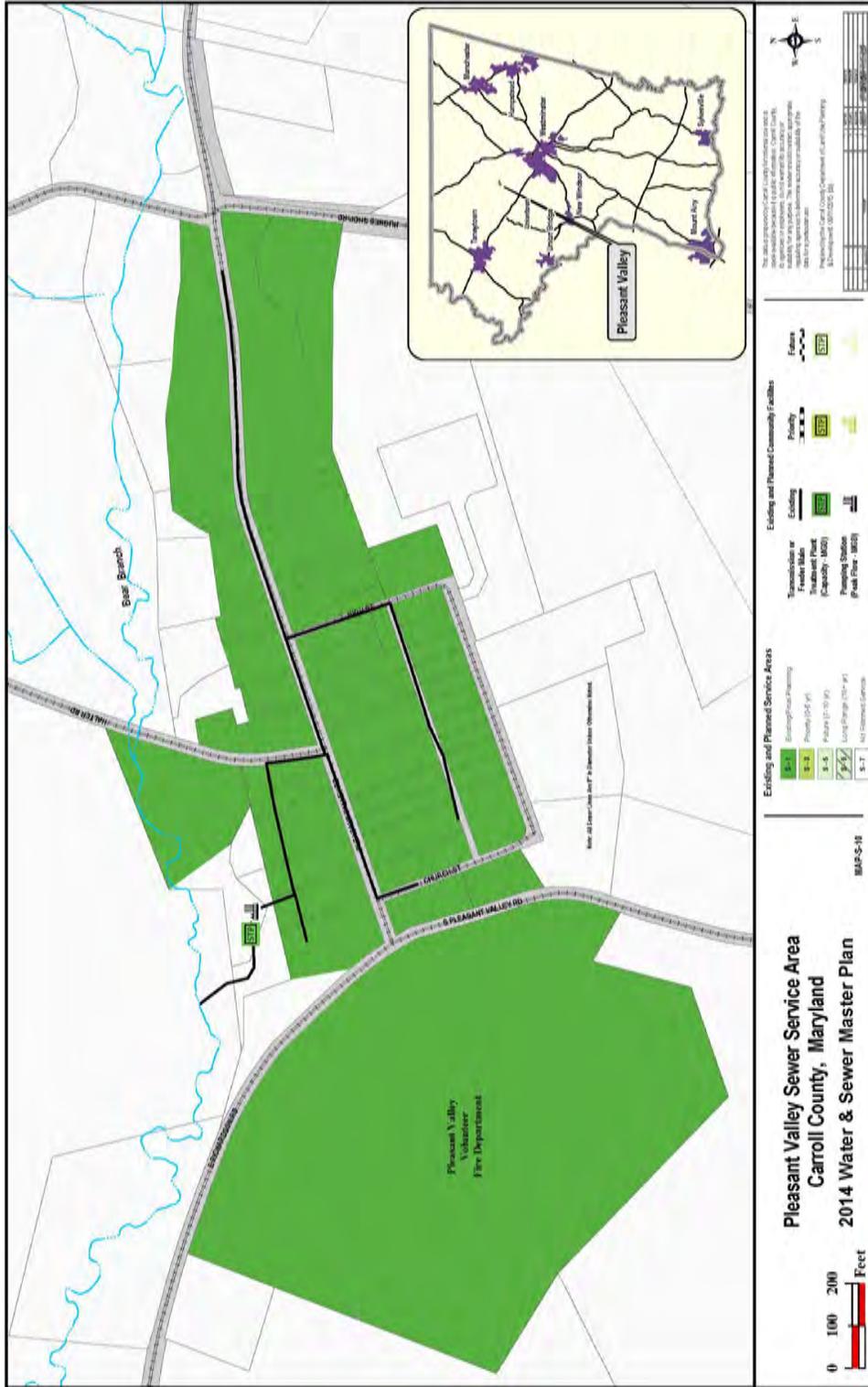
Inventory of Existing Wastewater Treatment Plants, Interceptors, Sewage Pumping Stations, and Force Mains

See Table 23A for Pleasant Valley SSA infrastructure.

Table 23A: Pleasant Valley SSA Treatment Plant

Service Area and/or WWTP Name	WWTP Treatment Type	Points of Discharge	WWTP Design Capacity (mgd)	Flows Average/Peak	Method of Sludge Disposal
Pleasant Valley	SBR	Bear Branch Big Pipe Creek	0.019	0.003/0.003 mgd	Transportation of Sludge
Discharge Permit Number: 09DP3044 NPDES Number: MD0066745					

Map 27



Sludge Management

The sludge is transported to the County-owned sludge facility at the Westminster Wastewater Treatment Plant. See Table 23B for Pleasant Valley SSA Sludge Management.

Table 23B: Pleasant Valley SSA Sludge Management

Quantity (tons/yr)	Quality	Method of Disposal/Use	Permit #s	Future Disposal Method	Problems
2.484 dry 359 wet	Aerobically digested	Hauled to the Westminster Septage facility	2008-STR-5384	n/a	n/a

Allocation Procedure

Connection to the system is available to those properties located within the service area. There is no Allocation Procedure due to the limited number of properties in the service area and system capacity.

Needs Analysis

Information does not currently exist to determine the amount of flow in Pleasant Valley that may be attributable to I&I. Projects aimed at reducing I&I could recapture any capacity being lost.

Planned Projects and Recommendations

There are no planned projects at this time.

Taneytown Sewer Service Area

Current Conditions

The City of Taneytown owns and operates the community sewer system and generally limits service to the area located within the City's corporate boundary. The entire planned sewer service area comprises approximately 3,135 acres and is situated in the northwest portion of the County and serves 2,815 EDUs. See Map 28: Taneytown SSA. The treated effluent is discharged to Piney Creek, which is in the Upper Monocacy River watershed. See Table 24E for Taneytown WWTP Design capacity is 1.1 mgd. Average flows are 0.827 mgd.

The Taneytown community sewer system is composed of collection lines, three pumping stations, and a WWTP. The City's WWTP was put into service in 2000. It has an average daily flow design capacity of 1.1 mgd, with a three-year average flow from 2010-2012 of approximately 0.423 mgd excluding estimated I&I. Hydraulically, the plant can treat a peak flow of 5.0 mgd. Sewage is treated via the sequence batch reaction process.

To meet new NPDES permit limits, the WWTP will be upgraded to meet enhanced nutrient removal (ENR) discharge limits. In 2010 a pilot study was conducted for the BioMag process and this process was the basis of design for the upgrade designed in 2013. Construction is scheduled to be complete in 2015.

Prior to the SHA MD 140 Streetscape project, the city performed CIPP lining rehabilitation of the sewer mains in Baltimore Street from Wilson Avenue to Harney Road. As part of the SHA MD 140 Streetscape project, the City replaced sewer lines that couldn't be lined and extended the sewer to Antrim Boulevard. Other recent sewer projects include the replacement of York Street Pumping Station and Force Main and rehabilitation and alignment of sewer main in Mill Avenue, both of which were completed in 2012.

Inventory of Existing Wastewater Treatment Plants, Interceptors, Sewage Pumping Stations, and Force Mains

See Tables 24A-24D for Taneytown SSA infrastructure.

Table 24A: Taneytown SSA Treatment Plant

WWTP Treatment Type	Points of Discharge	WWTP Design Capacity (mgd)	Average Flows (mgd)	Method of Sludge Disposal
Activated sludge/BNR	Piney Creek	1.100	0.827	Land application; occasionally hauled to landfill
Discharge Permit Number: 00DP0687A NPDES Number: MD0020672				

Map 28

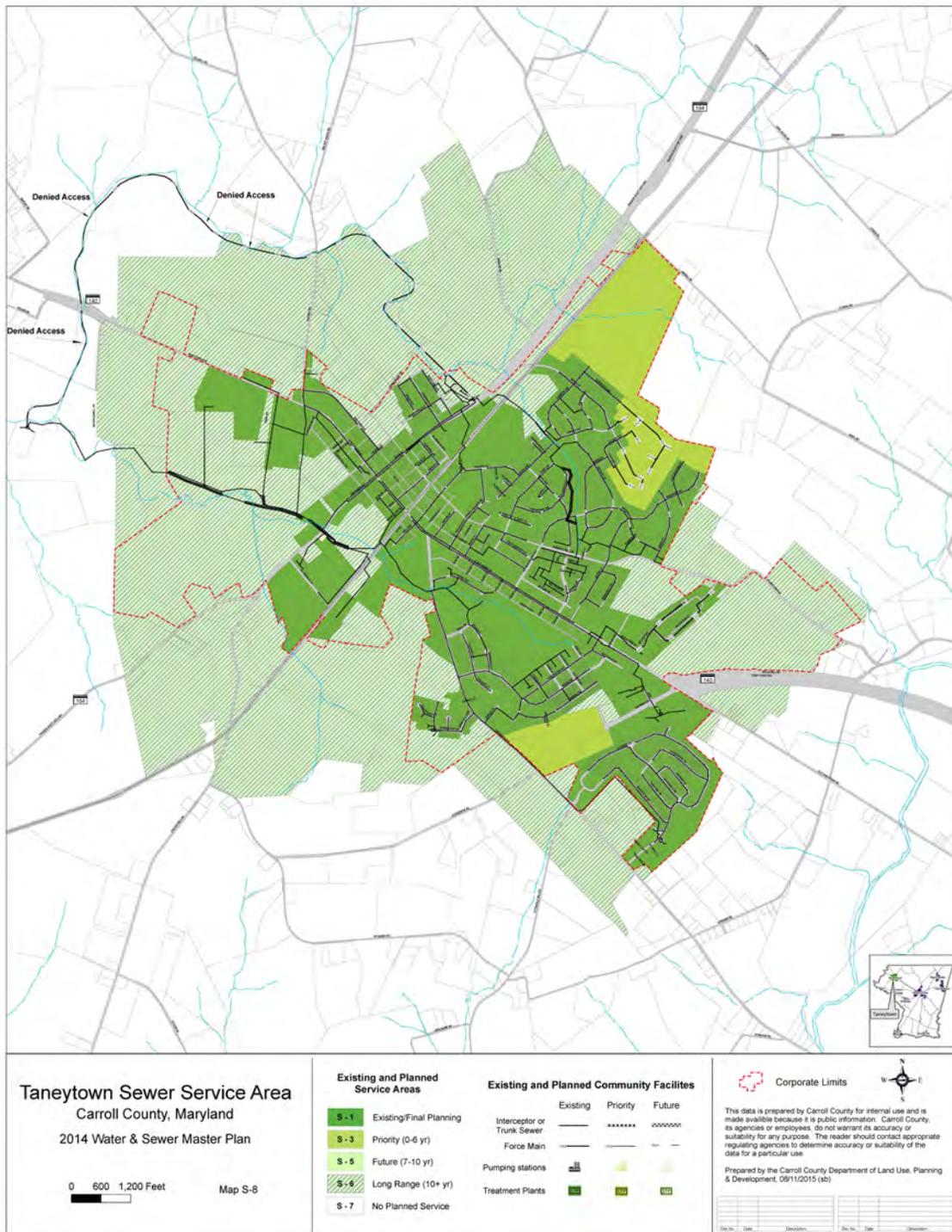


Table 24B: Taneytown SSA Interceptors

Service Area and/or WWTP Name	Interceptor	Diameter (inches)	Average Day Flow (mgd)	Design Flow (mgd)
Taneytown	Main	12, 15, 18	0.827	5.000

Table 24C: Taneytown SSA Pumping Stations

Pumping Station	Coordinate Location*	# of Pumps	Capacity of Each Pump (mgd)	Normal Pumping Capacity (mgd)	Average Day Pumping (mgd)
York Street	N 727472.49 E 1264460.76	3	1.152	2.304	0.2630
Wheatfields	N 720824.54 E 1263817.06	2	0.140	0.140	0.0094
Carroll Vista	N 718575.85 E 1268438.20	2	0.425	0.425	0.0370
Total		7	1.717	2.869	0.3094

*Coordinate locations are Maryland State Plane 1983 Datum.

Table 24D: Taneytown SSA Force Mains

Force Main	Maximum Day Pumpage in MGD (date)	Diameter (inches)	Design Flow (mgd)
York Street	2.055	12	2.304
Wheatfield's	0.053	4	0.140
Carroll Vista	0.294	6	0.425
Total			2.869

*Provided Design Average Daily Flow for Design Flow.

Sludge Management

Sludge is disposed of by land application, which is handled by an outside contractor (Enviro-Organic Technologies), which holds all permits for fields that are applied to. The material is Cake solids that are incorporated into the fields before the end of the day on which it is applied. If there are not any fields available the City holds a permit to dispose of the sludge at the Northern Municipal Landfill, which is hauled by same contractor. The WWTP disposed of 598.76 wet Tons of sludge from January 1, 2012 to December 31, 2012.

Quantity	Quality	Method of Disposal/Use	Permit #s	Future Disposal Method
598.76 wet Tons/year	18.12% solids	Dried sludge applied to farmland and if necessary hauled to Northern Municipal Landfill	2011-SLD-2288 permit for Landfill. All other Permit's for land application are held by the contractor (Enviro-Organic Technologies).	Under study

Allocation Procedure

On November 9, 1992, the Mayor and City Council adopted Ordinance 9-92, which established a new sewer allocation procedure. The ordinance, which became effective November 30, 1992, requires that the property owner, developer, or individual seeking site plan or subdivision approval obtain a sewer allocation, prior to final approval by the City, for any part of a proposed development project that will be recorded in the Land Records of Carroll County. The sewer allocation will be based upon approved regulations of the Maryland Department of the Environment. Sewer allocations are assigned and held in reserve at no charge for one year following the effective date of plan approval. The allocation may be renewed once for a one-year period only upon payment of a sewer allocation reservation fee. The fee is \$250 per lot or dwelling unit that does not possess a valid building permit. The fee is in addition to any other fee or charge that the City may assign.

The sewer allocation is effective for one year from the date of allocation. If actual construction on the development project has not commenced by the end of the one-year period, as evidenced by the possession of a valid building permit, the allocation expires unless renewed for the additional year. Once an allocation has expired, the owner, developer, or individual must reapply for a sewer allocation unless specified otherwise in a DRRA.

Needs Analysis

The area served by the sewer system is nearly the same as that served by the water supply system. The recorded sewage flows are substantially higher than the recorded water demand. This differential is the result of I&I of stormwater and groundwater into the sewer collection system. Part of the problem stems from the fact that the original collection system was installed with terra cotta clay pipe, much of which still remains in the system. This material tends to form cracks over time, which invites the flow of water from saturated soil into the pipe during storm events. The City has taken several steps in recent years to address this problem. It regularly inspects the lines with video equipment to identify and then correct any problems.

Depending on when and how much of the infiltration and inflow problem is corrected, the design capacity and permitted capacity of the WWTP may be insufficient to serve the Priority and Future service areas depicted in this plan.

See Table 24F for Taneytown SSA sewage problem areas.

Table 24F: Taneytown Sewage Problem Areas

Location	Population (Where Applicable)	Nature Of Problem	Status
Various locations throughout the City	n/a	Tree roots have penetrated the main sewer lines.	The city contracts a root control company to chemically treat these areas on an as needed basis. Pipe lining will be considered as a permanent fix.

Planned Projects and Recommendations

See Table 24G for Taneytown SSA priority projects.

Table 24G: Taneytown SSA Priority Projects

Project Name	Planning Category	Description	Location	Capacity Added
Sewer Lines	Future (S-5) 5 Year	Replacement and repair of existing sewer lines	Commerce Street, Windy Hills Drive, Roberts Mill Road	0 MGD
Wastewater Treatment Plant Upgrades	Priority (S-3) Immediate	Improvements to meet Enhanced Nutrient Removal goal	Existing WWTP	0 MGD
Meades Crossing Pump Station	Priority (S-3) Immediate	Construct a new Pump Station to convey development plans	Meades Crossing	.066 MGD
Belt Filter Press Replacement	Priority (S-3) Immediate	Replace belt filter press at WWTP	Existing WWTP	0 MGD

Long-Term Recommendations (10+ years)

- ◆ Continue CCTV inspection and assessment of collection system to priority systems to reduce I&I

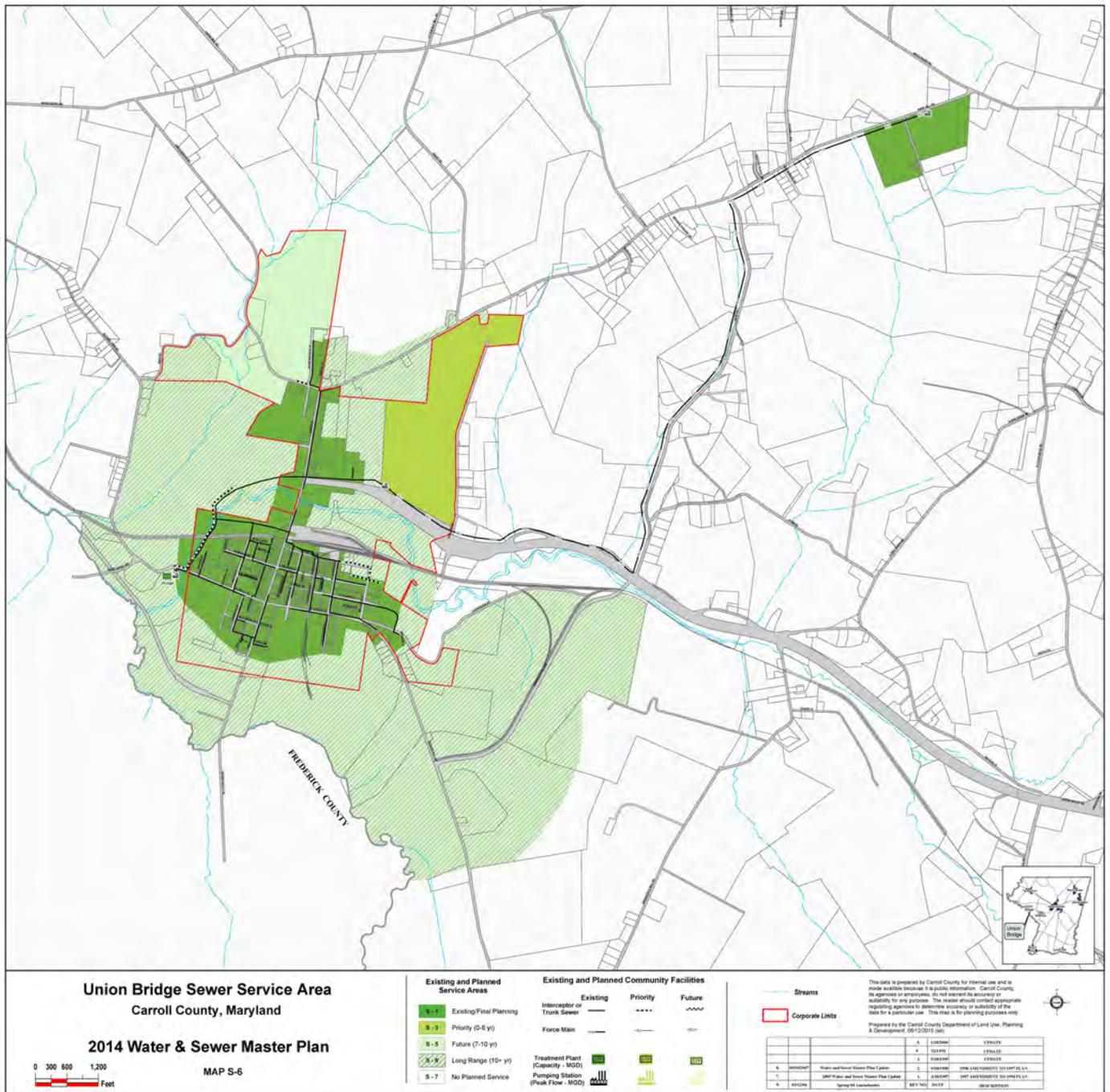
Union Bridge Sewer Service Area

Current Conditions

The Town of Union Bridge owns and operates the community sewer system. The service area is located in western Carroll County and covers approximately 1,406 acres and serves 410 EDUs. See Map 29: Union Bridge SSA. The Union Bridge WWTP discharges into Little Pipe Creek, which is in the Double Pipe Creek watershed. The Union Bridge sewer system consists of a collection system, one pumping station, and a WWTP. The WWTP has a design capacity of 0.200 mgd, with a three-year average flow from 2008-2010 of approximately 0.146 mgd, excluding estimated I&I. Individual service is not metered. Much of the system is gravity fed to a wet well from which all sewage is pumped into the plant.

The Town has a policy of only serving properties within its corporate limits, with the exception of Francis Scott Key High School, which is served with public sewer from the town to address on-site waste disposal problems.

Map 29



Inventory of Existing Wastewater Treatment Plants, Interceptors, Sewage Pumping Stations, and Force Mains

See Tables 25A-25C for Union Bridge SSA infrastructure.

Table 25A: Union Bridge SSA Treatment Plant

Service Area and/or WWTP Name	WWTP Treatment Type	Points of Discharge	WWTP Design Capacity (mgd)	Average Flows (mgd)	Method of Sludge Disposal
Union Bridge	Activated sludge	Little Pipe Creek	0.200	0.196	Transported to other WWTP
Discharge Permit Number: OODP0774 NPDES Number: MD0022454					

Table 25B: Union Bridge SSA Pumping Stations

Pumping Station	Coordinate Location*	# of Pumps	Capacity of Each Pump (mgd)	Normal Pumping Capacity (mgd)	Average Day Pumping (mgd)
WWTP (Locust Street)	N 1260314.15 E 692726.85	2	0.375 (total)	0.140	0.140
Francis Scott Key High School	N1274660.91 E701504.92	2	0.025	n/a	n/a
Total		4	0.400	0.140	0.140

*Coordinate locations are Maryland State Plane 1983 Datum.

Table 25C: Union Bridge SSA Force Mains

Force Main	Maximum Day Pumpage (mgd)	Diameter (inches)	Design Flow (mgd)
Locust Street	0.325	8	0.200
(FSK force main)	n/a	3 & 4	0.025
Total	0.325		0.225

*Provided Design Average Daily Flow for Design Flow.

Sludge Management

The Town's sludge is disposed of by transported it to the County-owned sludge facility at the Westminster Wastewater Treatment Plan. The Town transports 684 tons of wet sludge and 6.94 tons of dry sludge. See Table 25D for Union Bridge SSA sludge management.

Table 25D: Union Bridge SSA Sludge Management

Quantity (tons/yr)	Quality	Method of Disposal/Use	Permit #s	Future Disposal Method	Problems
684 wet	3% solids removed from digesters, no metal excess	Transported to another WWTP	S-92-06-3048-ABE	-	None
6.94 dry			S-92-06-3055-E		

Allocation Procedure

The allocation policy for available sewer capacity in Union Bridge is first come, first served allocation procedure for Town water services, subject to specific provisions in annexation agreements. Costs for expansion of sewer capacity due to new development are the responsibility of the developer. The Town also charges a sewer benefit-assessment fee for every new unit.

The Town of Union Bridge will only allocate capacity to within 0.020 mgd of the design and permitted capacity, which is 0.200 mgd. The purpose for this policy is to avoid planning to the limits of the wastewater treatment plant's capacity. If system use reaches within 0.020 mgd of the plant's capacity, developers will be responsible for providing and/or paying for the needed system improvements. No reservations or set-aside policies for businesses or residential developers are currently provided. However, such a policy may be considered by the Town.

Needs Analysis

Current estimates, based on MDE formulas used in the WRE for estimating I&I, suggest that 26 percent of flows in Union Bridge may be attributable to this problem. Projects aimed at reducing I&I could recapture this capacity. Union Bridge is currently doing work to recapture I&I throughout its system. The work is in its early stages so it is not possible to determine the total amount that will be recaptured through this process. Union Bridge has a 25,000 gpd deficit for buildout within 7-10 years. The town is hopeful that the recapturing of I&I will resolve the majority if not all of this deficit.

A preliminary expansion study was completed in February 2005. The study recommends that a new WWTP be constructed at a different location in order to locate the plant out of the floodplain. After reviewing four biological treatment processes, the Town will consider the Orbal System for final design consideration. The next phase of this project will be final design of a new treatment plant with a design capacity of 0.800 mgd. This phase of the project currently is not funded.

In addition, the Town may conduct a flow monitoring program to determine peak hourly flows and the amount of inflow to the sewer main along Little Pipe Creek. The Town is also reviewing the feasibility of and need to replace and enlarge this sewer main to serve new development. The cost of these improvements will be borne primarily by developers. See Table 25E for Union Bridge sewage problem areas.

Table 25E: Union Bridge SSA Sewage Problem Areas

Area Name	Location	Population (Where Applicable)	Nature Of Problem	Status
I&I	Throughout the system	1,042	I&I	Currently being studied

Planned Projects and Recommendations

See Table 25F for Union Bridge SSA priority projects

Table 25F: Union Bridge SSA Priority Projects

Project Name	Planning Category	Description	Location	Capacity Added
Infiltration/Inflow Reduction	Priority (S-3) Immediate	Begin an expanded program of infiltration/inflow reduction program	Throughout the system	TBD
West Broadway Street Reconstruction	Priority (S-3) Immediate	Replace existing sewer lines and sewer connections	West Broadway Street	TBD
WWTP Expansion 1	Priority (S-3) 5 Years	Developer driven expansion of the WWTP	Current WWTP	.046 MGD*
WWTP Expansion 2	Future (S-5) 10 Years	Developer driven expansion of the WWTP	Current WWTP	.069 MGD*

*WWTP Expansion 1 is driven by the demand generated from the Jackson Ridge Development
 *WWTP Expansion 2 is driven by the demand generated from the Villages of Union Bridge

Long-Term Recommendations (10+ years)

- ◆ Conduct a video survey of sewer lines to detect areas of infiltration/inflow or other problems.
- ◆ Acquire land for and construct new 0.8 mgd WWTP using proposed Orbal System.
- ◆ Improvements to meet Enhanced Nutrient Removal goal at the existing WWTP.
- ◆ Replace existing 10" sewer with a new 15-inch sanitary interceptor sewer from the WWTP to Manhole No. 6
- ◆ Construct 8" collector sewer lines North of MD 75 on the Phillips property.
- ◆ Explore options for using spray irrigation to create capacity at the WWTP if it is expanded.
- ◆ Investigate the potential to use WWTP treated effluent for Lehigh cooling operations.
- ◆ Projects may be contingent on Public Works Agreements and private sector development activity.

Westminster Sewer Service Area

Current Conditions

The community sewer system serving the Westminster area is owned and operated by the City of Westminster. Service is provided to the City, as well as areas beyond the corporate limits. The service area is centrally located in Carroll County and contains approximately 7,341 acres and serves 10,188 EDUs. See Map 30: Westminster SSA. The Westminster WWTP discharges into Little Pipe Creek, which is in the Double Pipe Creek watershed.

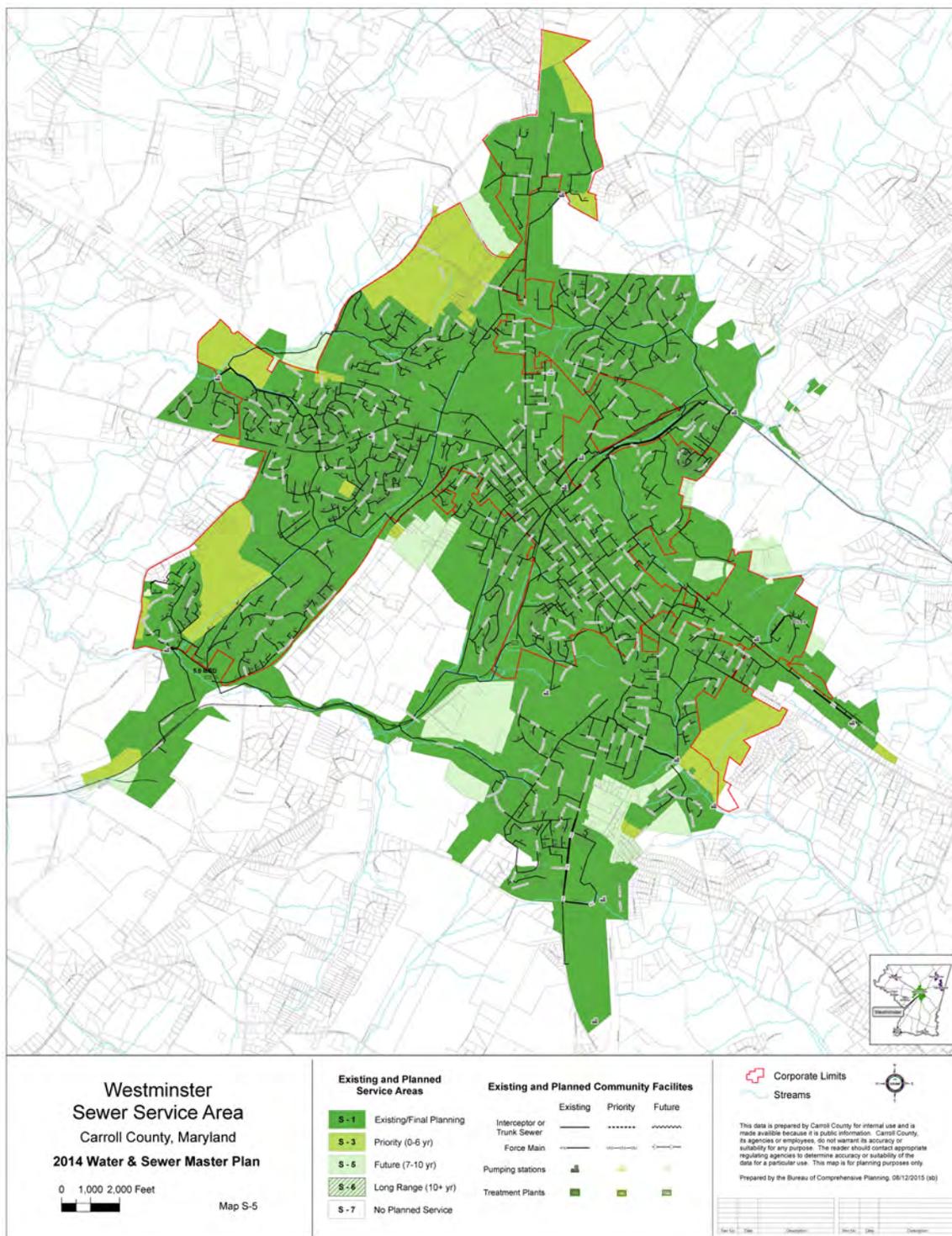
The Westminster sewer system was established in 1935. In 1973, a new WWTP was constructed along Little Pipe Creek, approximately three miles downstream from the old plant, which is no longer operational. Between 1991 and 1993, the plant was upgraded and its design capacity expanded to 5.0 mgd. In 1999, the WWTP was upgraded to include BNR technology. Most recently, the plant was improved with liquid chlorination/dechlorination capability.

The sewage collection system includes 11 pumping stations and approximately 65 miles of sewer mains. The City's WWTP provides secondary treatment through an activated sludge process with the addition of BNR. Design capacity was increased from 3.0 mgd to 5.0 mgd in 1993, with a three year adjusted average flow from 2008-2010 of approximately 3.080 mgd, excluding estimated I&I.

Infiltration and inflow problems have been evaluated through a Sewer System Evaluation Survey (SSES). Correction of these problems has reduced and/or stabilized the average daily flow to the plant. The City is working on an extensive investigation on the main interceptor that conveys flow to the plant to determine the amount of I&I and develop a cost-effective plan to reduce it. It is more cost-effective in the long-term to reduce I&I than it is to build new capacity. Additionally, Total Maximum Daily Load (TMDL) nutrient and other limits anticipated for Little Pipe Creek and the Monocacy River basin will compel improved management of the system to reduce the quantity and improve the quality of effluent.

A reclaimed water system is currently under consideration for the Wakefield Valley area, south of the City of Westminster. The system will provide non-potable water for industrial processes and fire protection. The system shall consist of necessary pump station(s) at the Westminster WWTP and dedicated reclaimed water lines to the vicinity of Avondale and Medford Roads to serve existing and future reclaimed water users. The system will result in decreased nutrient loads discharged from the Westminster WWTP as well as decreased demand for potable water.

Map 30



Inventory of Existing Wastewater Treatment Plants, Interceptors, Sewage Pumping Stations, and Force Mains

See Tables 26A-26D for Westminster SSA infrastructure.

Table 26A: Westminster SSA Treatment Plant

WWTP Treatment Type	Points of Discharge	WWTP Design Capacity (mgd)	Average Flows (mgd)	Method of Sludge Disposal
Activated sludge	Little Pipe Creek	5.000	4.823	Land application; disposed of at Carroll County Landfill when weather conditions prohibit land application

Cranberry WTP Discharge Permit Number: 01DP3184 **NPDES Number:** MD0067644
Westminster WTP Discharge Permit Number: 04DP0837 **NPDES Number:** MD0021831

Table 26B: Westminster SSA Interceptors

Interceptor	Diameter (inches)	Average Day Flow (mgd)	Design Flow (mgd)
Copp's Branch	18-30	Not metered	-
Meadow Branch	12	Not metered	-
Maryland 27	24-48	Not metered	-

Table 25C: Westminster SSA Pumping Stations

Pumping Station	Coordinate Location*	# of Pumps	Capacity of Each Pump (mgd)	Normal Pumping Capacity (mgd)	Average Day Pumping (mgd)
1 Sullivan Avenue	N 699738.85 E 1312599.55	2	0.374	0.051	0.051
3 John Street and Railroad Avenue to Monroe	N 696845.29 E 1314524.55	2	0.676	0.061	0.061
4 John Street and Carroll Street to MD 140	N 695828.31 E 1313919.20	2	0.640	0.036	0.036
5 Cranberry	N 698394.98 E 1319778.95	2	3.168	1.900	1.900
6 Vo-tech	N 681626.90 E 1315263.07	2	0.518	0.050	0.050
7 MD 140 to Hemlock Lane	N 687704.57 E 1323834.77	2	0.180	0.020	0.020
8 MD 140 and Old Baltimore Pike	N 690586.02 E 1320529.58	2	0.432	0.051	0.051
12 Airport Industrial Park	N 705925.48 E 1313822.35	2	0.864	0.066	0.066
13 Near Carroll Lutheran Village	N 690247.02 E 1300214.17	2	0.720	0.032	0.032
14 Near Roops Mill	N 699569.35 E 1301957.57	2	0.720	0.275	0.275
15 Poole Road	N 686433.34 E 1317793.41	2	0.720	0.209	0.209
Total			9.012	2.751	2.751

*Coordinate locations are Maryland State Plane 1983 Datum.

Table 26D: Westminster SSA Force Mains

Force Main	Maximum Day Pumpage in MGD (date)	Diameter (inches)	Design Flow (mgd)
Old Bachman Valley Road	Not metered as such. Unable to provide.	8	0.124
Bond St./MD 27	Not metered as such. Unable to provide.	16	3.168
John Street (2)	Not metered as such. Unable to provide.	8 & 8	0.097 & 0.092
MD 140 (2)	Not metered as such. Unable to provide.	6 & 6	0.026 & 0.062
The Greens	Not metered as such. Unable to provide.	10	0.103
Vo-Tech	Not metered as such. Unable to provide.	10	0.074
Sullivan Avenue	Not metered as such. Unable to provide.	6	0.054
Poole Road	Not metered as such. Unable to provide.	10	0.103
Carroll Lutheran Village	Not metered as such. Unable to provide.	10	0.062
Total			3.811 & 3.842

*Provided Design Average Daily Flow for Design Flow.

Sludge Management

Sludge from the wastewater treatment plant presently is hauled from the plant and applied to farmland or transported to a landfill in Virginia. As part of the most recent upgrade to the plant, the volume of sludge is now reduced by a dewatering process. In conjunction with upgrades being made to the wastewater treatment plant to add Enhanced Nutrient Removal, the City is investigating a sludge drying system. Dried sludge could then be transported and burned at a cement manufacturing facility in nearby Union Bridge, Maryland or used as a soil conditioner. See Table 26E for Westminster SSA sludge management.

Table 26E: Westminster SSA Sludge Management

Quantity (tons/yr)	Quality	Method of Disposal/Use	Permit #s	Future Disposal Method	Problems
4,456.76 wet	Digested and dewatered to 15% solids	Land application (March-November); Landfill disposal (December-February)	S-00-06-2424-L S-99-30-4608-T S-99-06-4530-A S-97-10-4318-A S-00-06-3823-A S-00-06-3820-A S-01-06-4066-A S-01-06-4085-A	Possible sludge drying system	None

Carroll County entered into an agreement with the City of Westminster in 1987 to construct, operate and maintain a septage receiving and pre-treatment facility at the Westminster WWTP. This facility opened in 1993. The septage facility receives and treats septage pumped from septic systems, holding tanks, and dry wells located throughout the County, and leachate removed from County landfills.

The septage and leachate is discharged by haulers who are authorized and licensed by the County. The septage facility is designed to receive average daily combined flows of 26,000 gallons with a peak daily combined flow not to exceed 39,000 gallons.

Following pre-treatment, which consists of removal of Biochemical Oxygen Demand (BOD), the solids are dewatered and the septage sludge cake is hauled by truck to the County Landfill. The liquid removed from the septage is treated in the City's Wastewater Treatment Plant and discharged in accordance with the City's NPDES permit.

All normal expenses associated with the operation and maintenance of the septage facility are the County's responsibility. The Board of County Commissioners in FY14 voted for a \$3.8M upgrade to the septage facility to produce cleaner effluent which will ensure that the City of Westminster's waste water treatment plant can meet enhanced nutrient removal requirements imposed by the Maryland Department of the Environment.

Allocation Procedure

Allocation of sewer service and available WWTP capacity for new development in and around the City of Westminster is regulated by an official policy which limits the number of lots to be recorded and building permits to be issued at 40 per year for each development project. There is no flow-based permit process in place. Once the treatment plant reaches 80 percent of its design capacity, the Mayor and Common Council is authorized to create an allocation policy.

Westminster's SSA presently extends outside its corporate limits. In August 2002, the Mayor and Common Council adopted Good Cause Waiver legislation for the extension of public water and sewer outside the corporate limits. That legislation requires new or redevelopment projects to be in compliance with the Town-County Agreement, which stipulates that for property contiguous to the corporate limits, the owner must initiate annexation of the property into the City in order for the property to be served. If the property does not meet the test for annexation, the owner must file a Good Cause Waiver application with the City. In order for the Mayor and Common Council to approve a Good Cause Waiver, the property must be identified as S-1 or S-3 in the Carroll County Water & Sewer Master Plan. If approved, the applicant must also execute an "Intent to Annex" agreement. The applicant must also obtain a sewer allocation from the City. These procedures provide control over the extension of City utilities outside the City limits.

Needs Analysis

The City is currently in the study and early design phase to add ENR technology to the City's WWTP. This \$25 million project will be partially funded by an anticipated \$16 million grant from MDE, with the balance of \$9 million to be funded by the City through an MDE water quality loan. The purpose of this project is to improve the treatment process and enhance the quality of the plant's discharge into Little Pipe Creek. The project will also improve the overall quality of the water entering the Chesapeake Bay.

The City is studying options to increase the design capacity at the plant. The facility is designed to handle 5.0 mgd. Adjusted average flows into the plant are 3.080 mgd. The existing I&I for the system is estimated to be 1.7 mgd, or 36 percent of total demand. The projected build-out demand is 5.790 mgd. It is anticipated that the City would seek to

expand its WWTP wastewater treatment plant, increasing its design capacity to 6.5 mgd. A final decision has not been made on the timing or size of the project.

The City is concerned that potential TMDL nutrient and other standards could limit the potential for future expansion. The City continues to operate its plant well within current NPDES permit limits. The planned ENR project incorporates state-of-the-art nutrient removal technology. Once this project is completed, this technology will limit future design and permitted capacity expansion to 6.5 mgd. As noted earlier, the City is also conducting a major study to identify and reduce I&I from the major interceptor that conveys flow to the plant. This project could be completed either in-lieu of or in concert with a future expansion project.

In order to comply with the current MDE consent order, the City regulates water for new projects through a water allocation policy. This allocation policy will likely be extended to sewer since the City has surpassed 80 percent of design capacity used in the WWTP. This allocation policy would be applied in conjunction with a major overhaul of the present water allocation process. The City is considering making the application for both water and sewer to be a combined process. The water allocation process has impacted sewer flows by constraining development.

Planned Projects and Recommendation

See Table 26F for Westminster SSA priority projects.

Table 26F: Westminster SSA Sewage Priority Projects

Project Name	Planning Category	Description	Location	Capacity Added
Sewer System Rehabilitation	Priority (S-3) Immediate	Rehabilitate leaking mains	Throughout the City's 65 miles of sewerage collection system	1.76 MGD
Rehabilitate Pump Station 15	Priority (S-3) 5 Years	Replace pumps	Poole Road off MD 97	0 MGD
Upgrade Pump Station 12	Priority (S-3) 5 Years	Install two new submersible pumps, a new wet well, valve vault, and piping	Old Bachman's Valley Rd. adjacent to West Branch Trade Center Industrial Park	0 MGD
WWTP Expansion	Priority (S-3) 5 Years	Expand Treatment Capacity	WWTP on MD Route 31	1.5 MGD
Enhanced Nutrient Removal	Priority (S-3) Immediate	Install new treatment technology	Wastewater Treatment Plant	0 MGD
Wakefield Valley Reclaimed Water System	Future (S-3) Immediate	Non-potable water system for industrial processes and fire protection.	Southern portion of Westminster, from Westminster WWTP on Route 31 to the Medford Road, Avondale area	.072 MGD
Upgrade of the Pre-treatment Septage Facility	Priority (S-3) Immediate	Upgrade the septage facility to produce cleaner effluent	Existing WWTP	0 MGD

Long-Term Recommendations (10+ years)

- ◆ Until WWTP upgrades are completed, explore options for using spray irrigation and industrial water reclamation to reduce effluent nutrient loads and maximize permitted capacity.
- ◆ Implement a system to track water demand for all known and potential development projects by modifying the allocation plan to include allocation of wastewater capacity.
- ◆ *Conduct an I&I study to determine current level of inflows from I&I to potentially regain some capacity; make system improvements to reduce I&I; adjust the capacity.*

Projected Sewer Supply Demands and Projected Capacity

The following table summarizes projected sewer demand over the next ten years. It incorporates planned capacity improvements that respond to the demand projections.

Area	Present Year						Priority Planning (0-6 Year)						Future Planning (7-10 Year)					
	Res. Pop. Ser. ¹	G P C D	Capacity Million Gal. Daily (MGD)				Res. Pop. Ser. ²	G P C D	Capacity Million Gal. Daily (MGD)				Res. Pop. Ser. ³	G P C D	Capacity Million Gal. Daily (MGD)			
			Res. Dem.	Oth. Dem.	Tot. Dem.	Ex. Cap.			Res. Dem.	Oth. Dem.	Tot. Dem.	Pl. Cap.			Res. Dem.	Oth. Dem.	Tot. Dem.	Pl. Cap.
Freedom/Sykesville	17,648	93	1.647	.143	1.790	2.600 ⁶	26,762	91	2.455	.302	2.757	3.100 ⁸	26,844	91	2.462	.315	2.777	3.100 ⁸
Hampstead	6,342	66	.431	.136	.567	0.900	6,971	69	.487	.369	.856	0.900	6,971	69	.580	.394	.974	0.900
Manchester	4,105	68	.274	.079	.353	0.500	5,518	73	.400	.095	.495	0.545 ⁷	6,187	72	.441	.093	.534	0.795 ⁸
Mount Airy ⁹	9,482	73	.595	.165	.760	1.200	9,914	67	.631	.397	1.028	1.200	9,914	68	.631	.397	1.028	1.200
New Windsor ¹⁰	1,399	39	.054	.009	.063	0.115	2,032	48	.095	.014	.109	0.115	2,617	52	.136	.103	.239	0.251
Taneytown ¹¹	6,701	104	.700	.153	.853	1.100	8,018	97	.803	.173	.976	1.100	8,018	95	.803	.173	.976	1.100
Union Bridge	1,042	166	.173	.001	.174	0.200	1,507	145	.219	.001	.220	0.246	2,200	131	.288	.001	.289	0.315
Westminster	23,636	175	4.148	.675	4.823	5.000	24,271	174	4.216	.989	5.205	8.335	25,925	169	4.394	1.07	5.464	8.335

⁵ See Appendix 3 Method for Projecting Water Supply and Sewer Demands. Note: Table 32 corresponds with MDE's required Table 32 and is therefore out of sequence with preceding and succeeding table numbers.

⁶ This number represents the Carroll County portion of the capacity

⁷ The WWTP capacity will only increase in Manchester if/when grant funding becomes available

⁸ The WWTP capacity will only increase in Manchester if/when grant funding becomes available

⁹ The Priority calculations are based on the Mount Airy's "pipeline" allocations and were provided to the County by the Town.

¹⁰ New Windsor's Priority and Future calculations are based on 165 gal per unit for residential demand.

¹¹ Mount Airy, Taneytown and Union Bridge do not have any properties in the Future Planning Category.

Unincorporated Sewer Service Areas

Current Conditions

Most of the private sewer systems that have relatively higher demand numbers are not intended to accommodate growth. They serve a specific purpose or population that is not expected to change significantly over time. The demand numbers and inventory of facilities provided in the tables that follow reflect this.

Approximately 260,076 acres or 90 percent of the total land, in Carroll County lie outside of any existing or planned public sewer service area. Properties located outside of a public sewer service area dispose of waste using private septic or sewer systems. These systems generally are not required to have discharge permits from MDE, primarily because they handle less than 5,000 gallons per day of sewage. However, there are some uses, such as schools, industries, mobile home parks and recreational facilities that are not in a public sewer service area and treat moderate amounts of sewage using a private, multi-use or community sewer system. These uses treat enough sewage that MDE has determined that a discharge permit is necessary. This section of the plan covers such uses. See Table 27A for unincorporated area future wastewater demand on the following page.

Table 27B: Unincorporated Area Future Wastewater Demand

SERVICE AREA	PRESENT YEAR						PRIORITY PLANNING (0-6 Year)						FUTURE PLANNING (7-10 Year)					
	POPULATION			GCPD	CAPACITY MILLION GAL. DAILY (MGD)		POPULATION			GCPD	CAPACITY MILLION GAL. DAILY (MGD)		POPULATION			GCPD	CAPACITY MILLION GAL. DAILY (MGD)	
	TOT.	SER.	UNS.		DEMAND	EXISTING CAPACITY	TOT.	SER.	UNS.		DEMAND	PLANNED CAPACITY	TOT.	SER.	UNS.		DEMAND	PLANNED CAPACITY
PUBLIC SCHOOLS¹																		
Charles Carroll Elementary		379		6.6	0.0025	0.0100		393		10.0	0.0039	0.0100		413	0	10.0	0.0041	0.0100
Francis Scott Key High		1,260		6.5	0.0082	0.0170												
Mechanicsville Elementary		652		2.0	0.0017	0.0170		745		10.0	0.0075	0.0170		770		10.0	0.0077	0.0170
Sandymount Elementary		635		3.8	0.0024	0.0120		638		10.0	0.0064	0.0120		655		10.0	0.0066	0.0120
Runnymede Elementary		690		2.3	0.0016	0.0250		788		10.0	0.0079	0.0250		809		10.0	0.0081	0.0250
PRIVATE COMMUNITY, MULTI-USE, OR PRIVATE SCHOOL																		
Ashley Mobile Home Park (MHP)	153	153	0	60	0.0092	0.0110	153	153	0	60	0.0092	0.0110	153	153	0	60	0.0092	0.0110
Bowling Brook Prep. School	149	149	0	53	0.0079	0.0250	523	523	0	66	0.0345	0.0350	523	523	0	66	0.0345	0.0350
Gaither Manor Apartments	400	400	0	60	0.0240	0.0450	400	400	0	60	0.0240	0.0450	400	400	0	60	0.0240	0.0450
Gerstell Academy	205	205	0	2.5	0.0005	0.0114	400	400	0	10	0.0040	0.0114	690	690	0	10	0.0059	0.0114
Golden Age Guest Home	50	50	0	100	0.0050	0.0056	50	50	0	100	0.0050	0.0056	50	50	0	100	0.0050	0.0056
Hillandale MHP	438	438	0	60	0.0263	0.0326	438	438	0	60	0.0263	0.0326	438	438	0	60	0.0263	0.0326
Lakeview MHP	99	99	0	75	0.0074	0.0074	99	99	0	75	0.0074	0.0074	99	99	0	75	0.0074	0.0074
Lakeview Nursing Home	60	60	0	100	0.0060	0.0070	60	60	0	100	0.0060	0.0070	60	60	0	100	0.0060	0.0070
Pheasant Ridge Estates MHP	303	303	0	60	0.0182	0.1125	303	303	0	60	0.0182	0.1125	303	303	0	60	0.0182	0.1125
Pleasant View Nursing Home	100	100	0	90	0.0090		100	100	0	90	0.0090		100	100	0	90	0.0090	
Ramblin' Pines Campground ²	468	468	0	57	0.0267	0.0267	468	468	0	57	0.0267	0.0267	468	468	0	57	0.0267	0.0267
Reservoir MHP	84	84	0	60	0.0050	0.0070	84	84	0	60	0.0050	0.0070	84	84	0	60	0.0050	0.0070
River Valley Ranch	477	477	0	50	0.0239	0.0250	477	477	0	50	0.0239	0.0250	477	477	0	50	0.0239	0.0250
Rock Brook MHP	123	123	0	60	0.0074	0.0090	123	123	0	60	0.0074	0.0090	123	123	0	60	0.0074	0.0090
Shields Todd Village MHP	234	234	0	60	0.0140	0.0150	234	234	0	60	0.0140	0.0150	234	234	0	60	0.0140	0.0150
Sullivan's MHP	123	123	0	60	0.0074	0.0090	123	123	0	60	0.0074	0.0090	123	123	0	60	0.0074	0.0090
Taylorville MHP	60	60	0	60	0.0036	0.0050	60	60	0	60	0.0036	0.0050	60	60	0	60	0.0036	0.0050
Westminster First Church of the Nazarene	-	-	-	-	-	-	2,230	2,230	0	2.5	0.0055	0.0055	2,230	2,230	0	2.5	0.0055	0.0055
PARKS																		
Camp Hashawha	120	120	0	75	0.0090	0.0090	120	120	0	75	0.0090	0.0090	120	120	0	75	0.0090	0.0090
Gillis Falls							500	500	0	10	0.0050	0.0050	500	500	0	10	0.0050	0.0050
Patapsco State	1,000	1,000	0	10	0.0100	0.0100	1,000	1,000	0	10	0.0100	0.0100	1,000	1,000	0	10	0.0100	0.0100
Piney Run	500	500	0	10	0.0050	0.0050	500	500	0	10	0.0050	0.0050	500	500	0	10	0.0050	0.0050
INDUSTRIAL - COMMERCIAL																		
Congoleum Industries	230	230	0			0.6500	230	230	0			0.6500	230	230	0			0.6500
Development Co. of America	530	530	0	10	0.0053		530	530	0	10	0.0053		530	530	0	10	0.0053	
Finksburg Plaza	500	500	0	20	0.0100	0.0100	500	500	0	20	0.0100	0.0100	500	500	0	20	0.0100	0.0100
Hampstead Industrial Center	472	472	0	30	0.01425	0.1500	600	600	0	24	0.01425	0.1500	1,000	1,000	0	15	0.0150	0.1500
Joseph A. Bank ³	250	250	0	18	0.0050	0.0050	-	-	-	-	-	-	-	-	-	-	-	-
North Carroll Shopping Plaza	400	400	0	20	0.0080	0.0080												
South Carroll Swim Club	1,234	1,234	0	3	0.0037	0.0150	1,234	1,234	0	10	0.0123	0.0150	1,234	1,234	0	10	0.0123	0.0150
PUBLIC COMMUNITY																		
Winfield Elementary/South Carroll High Schools		1,880		3.2	0.005	0.0500		2,000		12.5	0.0250	0.0500		2,000		12.5	0.0250	0.0500

¹ Includes staff at school² Data pertains to peak use generally during summer months³ Table reflects assumption that Jos. A. Bank will be connected to the Hampstead public sewer system before the Priority planning years.

Inventory of Existing Wastewater Treatment Plants, Interceptors, Sewage Pumping Stations, and Force Mains

See Table 27B for unincorporated area treatment plants; Table 27C for unincorporated area force mains– schools; and Table 27D: unincorporated area discharge permits.

Table 27C: Unincorporated Area Treatment Plants

Service Area and/or WWTP Name	WWTP Treatment Type	Points of Discharge	WWTP Design Capacity (mgd)	Flows Average/Peak
Industrial/Commercial				
Congoleum, Inc.	Trick filt. series, ponds	N. Branch Patapsco River	.65	.65
Development Co. of America	Evap. Pond	.10 mg pond	Unknown	.01
Finksburg Plaza		Sub-surface		.010
Hampstead Industrial Center	Extended aeration & activated sludge	East Branch Patapsco River	.15	.15
Joseph A Bank		Sub-surface	.005	.005
South Carroll Swim Club		Sub-surface		.004
Private Community, Multi-Use, or Private School				
Bowling Brook Prep. School	Package plant	Monocacy River	.025	.007/
Gaither Manor Apartments	E.A. + sand	Trib. to S. Branch Patapsco River	.045	.017/.020
Gerstell Academy		Sub-surface	.011	0.0005
Golden Age Guest Home	Land disposal		.005	
Mobile Home Parks				
Ashley Mobile Home Park (MHP)	Land disposal		.011	Unknown
Hillandale MHP	Land disposal		.033	Unknown
Lakeview Nursing Home	Land disposal		.007	Unknown
Pheasant Ridge Estates MHP	Package	S. Branch Patapsco	.112	.015/
Ramblin' Pines Campground	Land disposal		.027	Unknown
Reservoir MHP	Land disposal		.007	Unknown
River Valley Ranch	Land disposal		.025	Unknown
Rock Brook MHP	Land disposal		.009	Unknown
Shields Todd Village MHP	Land disposal		.015	Unknown
Sullivan's MHP	Land disposal		.009	Unknown
Taylorville MHP	Land disposal		.005	Unknown
Public Schools				
Winfield Elementary / South Carroll High	Sequential Batch Reactor	Piney Run	.050	.005/.014
Runnymede Elementary	Sequential Batch Reactor	Bear Branch	.025	.002/.018
Charles Carroll Elem.	Land disposal		.010	.003
Mechanicsville Elem.	Land disposal		.017	.002
Sandymount Elem.	Land disposal		.012	.002

Table 27C: Unincorporated Area Force Mains– Schools

Service Area and/or WWTP Name	Force Main	Maximum Day Pumpage in MGD (date)	Diameter (inches)	Design Flow (mgd)
Winfield Elementary/ South Carroll High	Old Liberty Road	.080 (10/20/01)	4	.050

Table 27D: Unincorporated Area Discharge Permits

Name	City	Permit	NPDES Number
Hampstead Industrial Center	Hampstead	02DP0022	MD0001881
Bowling Brook Preparatory School	Keymar	00DP3172	MD0067571
Congoleum Corporation	Finksburg	02DP0422	MD0001384
Gaither Manor Apartments WWTP	Sykesville	01DP0779	MD0022845
Gerstell Academy	Finksburg	98DP3276	
Pheasant Ridge WWTP	Mount Airy	99DP1016	MD0024546
Rivers Downs Development	Finksburg	97DP3222A	
Runnymede WWTP	Westminster	02DP2912	MD0065927
South Carroll High School WWTP	Eldersburg	98DP1028	MD0024589
South Carroll Swim Club	Westminster	01DP3382	
Todd Village Mobile Home Park	Finksburg	04DP3268	

Source: Maryland Department of the Environment, 2005

Sludge Management

Waste from individual septic systems, including community and multi-use sewer systems, is pumped by private contractors and hauled to the Westminster wastewater treatment plant or to other wastewater treatment plants outside the county.

Needs Analysis

At this time, the majority of the systems and problem areas noted in this section are not planned to be connected to a public sewer system. If service areas change and make connection to a public system more feasible, some of these areas could be connected to a public sewer system in the future. Remediation of individual problem areas will be the responsibility of private property owners, or in conjunction with public grant and loan programs.

A number of small communities have failing septic systems due to small lots or other geographic conditions. Identifying these areas allows for the possibility that solutions may be sought at some point in the future. See Table 27E for unincorporated sewage area problem areas.

Table 27E: Unincorporated Sewage Area Problem Areas

Area Name	Location	Population	Nature Of Problem	Status
Carrollton	E.D. #4		Small lots; soil limitations	
Cedarhurst	E.D #4		Small lots; soil limitations	
Detour - Keymar - Bruceville	E.D. #10	160	Failing septic systems; small lots; clay soils	Unknown at this time
Frizzellburg	E.D. #2			
Gaither	E.D # 14		Small lots; soil limitations	
Key View (Bark Hill)	E.D. #2	36	Failing septic systems; too rapid infiltration	Unknown at this time
Lineboro	E.D. #6		Small lots; soil limitations	
Linwood	E.D. #12		Small lots; soil limitations	
Marston	E.D. #11		Small lots; soil limitations	
Mayberry	E.D. #2		Small lots; soil limitations	
Melrose	E.D. #6		Small lots; soil limitations	
Middleburg - Feesersburg	E.D. #10	130	Failing septic systems; small lots; clay soils	Unknown at this time
Patapsco	E.D #4		Small lots; soil limitations	
Priestland	E.D #12		Small lots; soil limitations	
Rockbrook Trailer Park - Fairmount Rd.	E.D. #6	120	Trailer park without replacement area	Unknown at this time
Silver Run	E.D. #3		Small lots; soil limitations	
Snydersburg	E.D. #8		Failing septic systems; limited soil capabilities; small lots	Unknown at this time
Starner's Dam	E.D #1		Small lots; soil limitations	
Twin Arch Road	E.D. #13	50	Failing septic systems; high groundwater	Unknown at this time
Tyrone	MD 832, E.D. #2	50	Failing septic systems; small lots; clay soils	Unknown at this time
Union Mills	E.D. #3		Small lots; soil limitations	
Uniontown	E.D #2		Small lots; soil limitations	
Watersville			Small lots; soil limitations	
Woodbine	E.D #14		Small lots; soil limitations	

Planned Projects and Recommendations

No immediate or near future planned wastewater projects exist in the unincorporated part of the county at this time. However, the County plans to study options for addressing expiration of the Gaither Manor WWTP permit and options for future service to that area 10+ years out.

- **Section III: Financial Management Plan**

This section addresses the fiscal health of publicly owned community sewerage systems located throughout Carroll County.

The wastewater treatment systems serving Mount Airy, Manchester, Westminster, Union Bridge, New Windsor, and Taneytown are individually owned and operated by the respective municipalities. Costs and revenues are primarily generated by the users of each system.

The systems serving Hampstead and Pleasant Valley are owned and operated by Carroll County as an Enterprise Fund. A summary of the Utilities Enterprise Budget for FY11-16 Community Investment Plan can be found in Appendix 6. For purposes of fiscal accounting provided in this Section, the Freedom system is divided into two segments. The Freedom WTP is owned by the State of Maryland and is operated by MES. The sewage collection and conveyance network is owned and operated by the County as an Enterprise Fund. Since the treatment plant's flows are attributed to both the County and State institutions, the costs (or revenues) are shared by the County and MES. Costs are proportionate to the share of flows (for monthly maintenance) and the volume allocated to each user (for any upgrades costs). Currently, approximately 85 percent of the flows are generated by the County, 15 percent by MES. Consequently, 85 percent of costs (or revenues) accruing to the Freedom WTP are generated by the County, 15 percent by MES (including the Springfield Hospital Complex).

The sewage treatment system serving South Carroll High School was replaced in 1992 by a sequential batch reactor (SBR) sewage treatment plant to serve Winfield Elementary School in addition to the high school. The system is owned and operated by the Carroll County Department of Public Works, Bureau of Utilities. Operating costs are paid by the Board of Education to the Bureau of Utilities and are based on standard user fees. The Winfield Volunteer Fire Department is also connecting to the system and will be charged standard user fees.

APPENDIX 1: Definitions

Community Sewer System – A system, publicly or privately owned, serving two or more individual lots, for the collection and disposal of sewer or industrial wastes of a liquid nature, including various devices for the treatment of such sewage and industrial wastes.

Community Water Supply System – A system, publicly or privately owned, serving two or more individual lots, comprised of a source and the surrounding area from which water is supplied, and a distribution system, including treatment and storage facilities.

Comprehensive (or Master) Plan – A composite of maps and written text, the purpose of which is to guide the systematic and harmonious physical development of the County and its municipalities. For unincorporated areas, it is adopted by the Board of County Commissioners under the provisions of Article 66B; for incorporated areas, it is adopted by the Mayor and Council of each respective municipality under the provisions of Article 66B or 23A.

Water and Sewer Master Plan – A comprehensive plan providing throughout the County, including all municipalities, adequate water supply systems and sewer systems, publicly or privately owned, and comprising all amendments and revisions thereto.

Denied Access – Water and sewer infrastructure, existing or planned, which are located outside the water and sewer planned service areas, are automatically deemed “denied access” facilities for new connections by individual lots. This designation applies to all water and sewer facilities as of the date of adoption of the Carroll County Water & Sewer Master Plan.

Designated Growth Area – An area on the countywide master plan for which a more detailed comprehensive plan has been prepared. Most of the DGAs have a municipality at their center. These are the areas in the county where the majority of residential, commercial, and industrial development is concentrated, as they are generally also the areas where public and private services are available.

Individual Sewer System – A single system of sewers and piping, treatment tanks or other facilities, having a treatment capacity of 5,000 gpd or less, serving only a single lot, and disposing of sewage or industrial wastes of a liquid nature, in whole or in part, on or in the soil of the property, into any waters of this State, or by other methods.

Individual Water Supply System – A single system of piping, pumps, tanks, or other facilities, utilizing a source of ground or surface water to supply only a single lot and having a capacity of 5,000 gpd or less.

Interim Individual System – For areas located within the Existing/Final Planning or Priority Service Areas (W-1,3 or S-1,3), an individual sewer or water supply system which is permitted to serve a single lot only until the community water supply or sewer system becomes available, at which time the lot must connect to the community system within one year.

Lot – A piece or parcel of land occupied, or intended to be occupied, by a principal building and its accessory buildings and uses and which is part of a subdivision which is recorded in the Office of the Clerk of the Circuit Court of Carroll County, or is described by metes and bounds, the description of which has been so recorded.

Multi-Use Sewer System – A system which may be owned or operated by an individual or group of individuals under private or collective ownership, but is not publicly owned or operated. Such a system, which serves a single lot and a number of individuals, includes the collection and disposal of sewage or industrial wastes of a liquid nature, including various devices for the treatment of such wastes, and has a treatment capacity in excess of 5,000 gpd.

Multi-Use Water Supply System – A system which may be owned or operated by an individual or group of individuals under private or collective ownership, but is not publicly owned or operated. Such a system, which serves a single lot and a number of individuals, is comprised of piping, pumps, tanks, or other facilities, which utilize a source of ground or surface water and has a capacity in excess of 5,000 gpd.

Nonpoint Source – Pollution originating from land runoff where no specific outfall can be identified.

Plan Map – The Plan contains two series of maps of different scales for each of the water supply and sewer systems. One series, comprised of two generalized maps (a countywide water map and sewer map), at the scale of 1 inch = 1 mile, is for orientation purposes only. These maps identify the location of community and multi-use water supply and sewer systems. The other series of maps, ranging in scale from 1 inch = 400 feet to 1 inch = 1,000 feet, are the official map series for the community water supply and sewer systems.

Planned Service Area Category –

Existing/Final Planning Service Area (W-1, S-1) - Areas served by community water supply or sewer systems which are either existing, under construction, or have final plans which have been completed. Public water or sewer service is assumed to be existing or under construction if it is in operation or under construction (where actual work is progressing or a notice to proceed has been issued with a contract for such work). Final planning means a work or works of a community water supply or sewer system for which contract plans and specifications have been completed. In areas where service is not yet available, public water or sewer service will be placed in operation immediately after construction is completed. This category corresponds to the Existing (W-1, S-1) and Final (W-2, S-2) categories defined in COMAR.

Priority Service Area (W-3, S-3) - Areas that will likely be served by community water supply or sewer systems for which the beginning of construction is anticipated to start within two years, or capital facilities are scheduled for implementation within the next six years and are possible within the framework of the six-year capital program, or areas that are planned to be served by a community system and are located adjacent to existing facilities of the system. Properties within the Priority Service Area are required, as a prerequisite to development, to connect to the community systems at the time of development. This category corresponds to 1-3 years (W-3, S-3) and 3-6 year (W-4, S-4) categories defined in COMAR.

Future Service Area (W-5, S-5) - Areas where improvements to, expansion of, or construction of community water supply or sewer systems are planned for but are not anticipated to occur sooner than six years. The beyond six-year time frame is used to indicate that economic and other conditions and growth patterns may warrant extension of public services within the foreseeable future and should not be construed to mean that, immediately after six years, public facilities will be extended by the County or municipality. The W-5 and S-5 category is intended to be a planned future growth area rather than a programmed growth area. This category corresponds to the 7-10 year (W-5,-S-5) categories defined in COMAR.

Long Range Service Area (W-6, S-6) - Areas that are intended to be served by a public water and/or sewer system but not within the next 10 years.

No Planned Service Area (W-7, S-7) - Areas not intended to be served by a public water and/or sewer system. These areas rely on individual water supply and sewer systems indefinitely.

Private Water or Sewer System - A system which is owned, operated, maintained, and exclusively controlled by one or more individuals, corporations, or other business entities, and serves one or more lots and one or more users.

Public Water or Sewer System - A system which is owned, operated, maintained, and exclusively controlled by a political subdivision, and serves one or more lots and one or more users.

Sewer Service Area - That area served by, or potentially served by, a system of sanitary sewers connected to a treatment plant under the control of a single unit or agency. The service area defines the area within which land uses will connect to a community sewer system. Land uses that are beyond the service area boundary (i.e., are located in the No Planned Sewer Service Area) will be served by individual sewer systems. Connection to a community sewer system is therefore based upon the location of a specific land use relative to the sewer service area, irrespective of property boundaries or the location of existing or planned sewer facilities.

Water Service Area - That area served by, or potentially served by, a water distribution system under the control of a single unit or agency. The service area defines the area within which land uses will connect to a community water supply system. Land uses that are beyond the service area boundary (i.e., are located in the No Planned Water Service Area) will be served by individual water supply systems. Connection to a community water supply system is therefore based upon the location of a specific land use relative to the water service area, irrespective of property boundaries or the location of existing or planned water facilities.

APPENDIX 2: Proposed Projects for the Regional Areas Using Water Resources Element

Piney Run Reservoir

Piney Run is a 298-acre reservoir located in the south-central part of Carroll County. It was constructed in 1975 for three purposes: flood control, water supply, and recreation. To support the development of the lake toward its use as a water supply, the County established two monitoring programs.

In 2003, Carroll County initiated the development of a Watershed Management Plan for the Piney Run Watershed. In connection with that, Carroll County has undertaken the development of a Comprehensive Management Plan for the Piney Run Reservoir Watershed. This effort is comprised of two phases:

1. Phase 1 includes data collection and water quality modeling. The goal of Phase 1 is to collect data and model the Piney Run Reservoir using an integrated approach to establish baseline conditions within the reservoir and the watershed to support Phase 2 of this study.
2. Phase 2 will expand on the data collected and model developed in Phase 1 to characterize the watershed, analyze the model results, identify nutrient loading areas, and provide strategies for addressing physical, ecological, and social opportunities within the watershed. The goal of Phase 2 is to develop a comprehensive watershed management plan for the Piney Run Reservoir Watershed.

The intent of the Piney Run Watershed Management Plan development process is to identify problem areas and propose actions using Phase 1 modeling, previously collected data, and stakeholder involvement. Phase 2 is expected to involve interaction with stakeholders from outside County Government (farmers, recreational councils, local schools, citizens, etc.) to help define overall goals and to develop planning-level concepts and costs for project implementation that will assist with watershed management efforts. This work is being performed under the County's MS4 NPDES Program and stands to set the standard for future development of management plans in other watersheds within Carroll County.

Needs Analysis

Carroll County is committed to the development of a multi-resource public water supply system, utilizing both its ground and surface waters. Although ground and surface water are considered a single resource in Carroll County, two specific initiatives keyed toward the provision and protection of surface water has been undertaken. Another major initiative has been taken in concert with groundwater protection.

Planned Projects and Recommendations

The WRE included recommendations for regional water supplies that would help meet the water demands projected for the planned development of the county, its municipalities and their designated growth areas. The following projects are included in that document as regional water supply options that will address future demands and allow the County and its municipalities to be prepared for policy changes or other changes that would result in the need for additional available water capacity or other future scenarios.

- ◆ Piney Run Reservoir (as built): Safe yield 3.65 mgd with normal pool elevation of 524 ft; existing reservoir; to serve as regional source of supply for Mount Airy and Sykesville/Freedom Service Areas. Direct pumping of raw water from Piney Run to Liberty to augment 'flows' at Liberty Reservoir accompanied by an increase in withdrawal from Liberty OR
- ◆ Water treatment plant at Piney Run
- ◆ Piney Run Reservoir (expanded): Safe yield 4.11 mgd; increase capacity of existing reservoir by raising the spillway riser and emergency spillway; to serve as regional source of supply for Mount Airy and Sykesville/Freedom Service Areas.
- ◆ Gillis Falls Reservoir (as planned): Safe yield 3.85 with normal pool elevation of 610 ft.; planned reservoir; to serve as regional source of supply for Mount Airy and Sykesville/Freedom Service Areas.
- ◆ Surface water intake from Gillis Falls Area: Safe yield 0.85 mgd; develop new surface water intake on Carroll County-owned property near planned Gillis Falls Reservoir; 100-120 mg off-stream storage impoundment.
- ◆ Union Mills Reservoir: Safe yield 3.76 mgd with normal pool elevation of 610 ft.; planned reservoir; to serve as regional source of supply for Westminster, Hampstead, Taneytown, and Manchester Service Areas.
- ◆ Prettyboy Reservoir: Based on Baltimore City's plans to develop 120 mgd treatment plant for its Susquehanna River intake and the resulting increased system reliability, purchase excess capacity from Prettyboy Reservoir. Conceptual plans for a 3.0 mgd intake and 7.5 mile long, 16 inch raw water pipeline from Prettyboy Reservoir to a new 3.0 mgd WTP in Hampstead. Requires a high service pump station located at intake site.
- ◆ York Water Company: Interconnection with York Water Company (in Pennsylvania) to provide approximately 0.90 mgd of finished water to Manchester and Hampstead. Requires a purchase agreement among all parties. This option would require need and participation of Manchester. May not be necessary under normal operating conditions, but would provide ability to move water during extraordinary conditions, such as extreme drought. York County has asked that if a decision is made to proceed with this option, any water main running through Established Rural Areas of York County should only be for conveyance to the Towns of Manchester and Hampstead and not to serve the rural areas in York County. The only exception would be unless public health, safety, and welfare issues are identified to justify such service. York County also

requested that they be involved in any discussions or meetings with York Water Company related to this issue.

- ◆ Interconnection with Freedom: Interconnect with the Mount Airy and Sykesville/Freedom water system and purchase agreement to supply approximately 0.85; 9.7 miles.
- ◆ Interconnection with Fredrick County: Interconnect the Mount Airy and Fredrick County water system and purchase agreement to supply approximately 0.85 mgd (with a maximum agreement of 1.2 mgd).
- ◆ Lehigh Quarry (Union Bridge): Use Lehigh Quarry in Union Bridge as a raw-water reservoir to supply approximately 0.6 mgd to Union Bridge; due to contamination concerns, this option is more feasible once quarry operations cease.
- ◆ Lehigh Quarry (New Windsor): Use Lehigh Quarry near New Windsor as a raw-water reservoir to supply approximately 0.25 mgd to New Windsor; preferred method of transferring water to the WTP is via a release to the nearby stream, and a subsequent withdrawal at the treatment plant.
- ◆ Regional Connection to Westminster: Connect New Windsor to Westminster water supply; approximately 2 miles to raw water or 3 miles to treated water
- ◆ Regional Connection to Union Bridge: Connect New Windsor to Union Bridge water supply subsequent to Union Bridge connecting to the Union Bridge Lehigh Quarry
- ◆ Big Pipe Creek: Develop new surface water intake on Big Pipe Creek to serve Taneytown; safe yield 0.4 mgd; with 2.0 mgd intake and 125 mgd storage impound

• APPENDIX 3: Method for Projecting Water Supply and Sewer Demand

The methodology used in this Water & Sewer Master Plan to determine available capacity and projected demand is different than what was used to develop the Water Resources Element. The Water and Sewer Plan followed the requirements of COMAR while the Water Resources Element used the methodology set forth by the MDE Guidelines titled “Guidance Document: Water Supply/Wastewater Capacity Management Plans.” Due to the different methodologies and the two documents reflecting data from different time periods, the County recognizes that the information in these documents is not exactly the same.

Estimates and projections of population within the community planned water and sewer service areas and estimates and projections of water and sewer demand are summarized in Tables 20 (water) and 32 (sewerage). The estimates are based on current development that is connected to the relevant community system and actual flows generated by that development within the service area. The service areas are divided into three service categories (Existing/Final Planning, Priority, and Future Service Areas). Projections, which are calculated for average-day demand, are based on total buildout of the service area by category and the land uses and densities as permitted by current zoning. Projections in each successive service category are cumulative. Consequently, projections for the Future Service Area correspond to total population and demand projections for the entire planned service area.

Tables 20 and 32 divide the planned service areas into three phases (Present Year, Priority Planning, and Future Planning), which generally correspond to the three service area categories referenced above. Calculations by phase are summarized as follows:

Present Year – This column relates to developed areas located within the Existing/Final Planning Service Area that are served by the community water supply and/or sewerage system, and the actual water and sewer flows which are recorded by the utility. Projection of population and flows for the undeveloped areas of the Existing/Final Planning Service Area, as well as unserved developed areas, are included in the Priority Planning phase.

The Residential Population column is an estimate of the number of residents (including apartment dwellers) whose dwelling units are connected to the community system (Population Served).

The GCPD (gallons per capita per day) column is based on an estimate of actual Residential Demand divided by the Population Served.

The Capacity (in mgd) column includes:

1. An estimate of actual Residential Demand. This estimate is based on flows which are processed (actual flows) by the community sewerage or water supply system and is measured at the wastewater treatment plant (Table 32), or at the community system well as it is pumped from the ground (for water systems relying on wells and groundwater) or as metered at the reservoir (for water systems relying on surface water) (Table 20). To determine the portion of these actual flows that are attributable to residential demand, County staff collected this information for the Capacity Management Plans for each of the systems. The residential demand was given to the County as a

percentage of the total demand from the operators. This proportion is then applied to actual flows measured at the system (e.g., wastewater treatment plants, system wells, reservoirs) to derive an estimate of residential actual flows (Residential Demand).

2. An estimate of Other Demand, which is everything that is not residential (commercial, industrial, institutional, recreational, etc.). This estimate is generally the difference between actual flows measured at the system minus the estimated Residential Demand. Other Demand pertains to current development that is connected to the community system.

3. Total Demand is the total estimated flows that are processed by the community system as measured at the treatment plant, wells, and/or reservoir.

4. Existing Capacity represents the combined permitted flows for all water sources (e.g., wells, reservoirs) comprising the current water supply system (Table 20) and the current permitted capacity of the wastewater treatment plant (Table 32). For wastewater this includes I&I.

Priority Planning – This column combines the current served development from the Present Year column with infill development areas in the Existing/Final Planning , properties in the Priority Service Areas, and properties within the Priority Planning Area that are currently on well or septic that could potentially connect to the system.

The Residential Population column includes:

1. Population calculations that are made for the number of existing dwelling units that is located within the Existing/Final Planning and Priority Service Areas that are not currently served.

2. Population calculations that are based on the potential lot yield for infill development areas in the Existing/Final Planning , properties in the Priority Service Areas, and properties within the Priority Planning Area that are currently on well or septic that could potentially connect to the system. These calculations are based on the County's Buildable Land Inventory (BLI).

The projected number of dwelling units (both existing and future development) is multiplied by the average number of persons per household to derive population. The persons per household is estimated for each community and is based on 2010 Census data. The multipliers are as follows:

Community	Persons per Household
Freedom/Sykesville	2.82
Hampstead	2.81
Manchester	2.81
Mount Airy	3.00
New Windsor	2.52
Taneytown	2.85
Union Bridge	2.54
Westminster	2.32

The Population Served (under Present Year) is added to the existing and future population located within the Existing/Final Planning and Priority Service Areas. This number is then assigned as Population Served for the Priority Planning phase. It is assumed that all dwellings will be served at full buildout in this phase.

Water and sewer demand (Tables 20 and 32) is projected at 250 gallons per unit per day (unless otherwise indicated) for units added to the existing ones.

The Capacity column includes:

- a. Residential Demand is figured at 250 gallons per additional unit (unless otherwise indicated) added to the Existing Residential Demand.
- b. Other Demand for areas in the Priority Service Area are projected based on acreages of commercial and industrial zoning. Water and sewer demand are projected at 700 gallons per acre for Business zoning and at 800 gallons per acre for Industrial zoning. The Other Demand flow estimated in the Present Year column is added to the projected Other Demand in the Priority Service Area. The Other Demand of the Priority Planning phase is the sum of these two Other Demands.
- c. Total Demand is the sum of Residential Demand and Other Demand.
- d. Planned Capacity represents the utility's plans for expanding the capacity of the community system.

Future Planning – This column combines the current development from the Present Year column, existing (but unserved) and projected development within the Existing/Final Planning and Priority Service Areas, and existing (but unserved) and projected development within the Future Service Area. Once again, this includes properties that are currently on well and septic but could potentially one day hook into the system.

The method for projecting and summing population and demand data are the same as for the Priority Planning phase. Since the numbers are cumulative, the data contained in the Future Planning column pertain to the entire planned service area for the next 10 years.

Residential Buildable Land Inventory Table

BLI Estimates for CMP Worksheets for Triennial Update of WAS Plan

Water Service Area

BLI Medium-Range Calculations

Based on Land Use Designations in the Priority/Future and the No Service Areas based on Zoning in Existing/Final area

System	Exist/Final Service Area		TOTAL Add'l Lots to be Built	Priority + Future Service Areas		Potential Lot Yield (PLY)		TOTAL PLY	Priority + Future		TOTAL Priority & Future	No Planned Service		TOTAL Existing Improved Parcels within GAB	Future Outside DGA
	Existing Vacant Lots	PLY within Exist/Final		PLY within Priority	PLY within Future	PLY within No Planned Service	Total PLY		Priority + Future	Future =		Priority + Future	No Planned Service		
Freedom only			1,970	547	-	-	1,970	440	2	442	2,341	-	-	-	
Skensville**				1	-	-	1	2	-	2	2,343	-	-	-	
Freedom Total	183	1,807	1,870	548	-	-	1,870	442	2	442	2,341	-	-	-	
Hampstead	21	187	188	112	90	-	1,808	442	70	262	332	-	-	-	
Manchester	136	394	489	146	44	-	1,808	6	11	17	405	-	-	-	
Mt. Airy**	120	37	157	984	114	-	1,808	31	50	81	43	-	-	-	
New Windsor	5	108	113	137	185	-	1,808	16	84	100	100	-	-	-	
Tareyton	55	92	147	1,488	1,121	-	1,808	55	77	132	132	-	-	-	
Union Bridge	6	130	136	1,139	94	-	1,808	42	16	58	10	-	-	-	
Westminster	147	1,243	1,290	813	951	-	1,808	45	349	299	10	-	-	-	
Westminster			1,476-185=1,291	948+6=1,064-895=89	Priority	116	1,808	901-313=1,214-22=1,192	Future	349	299	-	-	-	
Bark Hill	2	0	2	0	0	0	2	0	0	0	0	0	0	0	
Pleasant Valley	0	0	0	0	0	0	0	0	0	0	0	0	0	0	

Sewer Service Area

BLI Medium-Range Calculations

Based on Land Use Designations in the Priority/Future and the No Service Areas based on Zoning in Existing/Final area

System	Exist/Final Service Area		TOTAL Add'l Lots to be Built	Priority + Future Service Areas		Potential Lot Yield (PLY)		TOTAL PLY	Priority + Future		TOTAL Priority & Future	No Planned Service		TOTAL Existing Improved Parcels within GAB	Future Outside DGA
	Existing Vacant Lots	PLY within Exist/Final		PLY within Priority	PLY within Future	PLY within No Planned Service	Total PLY		Priority + Future	Future =		Priority + Future	No Planned Service		
Freedom only			1,123	839	1	-	1,123	1,090	28	1,118	2,348	-	-	-	
Skensville**				40	-	-	40	46	-	46	2,348	-	-	-	
Freedom Total	125	1,072	1,197	899	1	-	1,197	1,135	28	1,164	2,348	-	-	-	
Hampstead	43	187	210	122	48	-	1,197	14	14	14	481	-	-	-	
Manchester	138	233	431	984	90	-	1,197	30	11	41	405	-	-	-	
Mt. Airy**	120	37	157	142	7	-	1,197	78	77	155	155	-	-	-	
New Windsor	5	98	101	1,422	1,082	-	1,197	27	16	43	10	-	-	-	
Tareyton	55	88	153	1,137	27	-	1,197	27	16	43	10	-	-	-	
Union Bridge	6	178	182	1,137	570	-	1,197	27	111	138	10	-	-	-	
Westminster	180	1,471	1,652	491	570	-	1,197	27	111	138	10	-	-	-	
Westminster			1,709-312=1,397	934+36=970-696=274	Priority	342	1,197	803-110=713-0=713	Future	111	138	-	-	-	
Pleasant Valley	0	0	0	0	0	0	0	0	0	0	0	0	0	0	

- BLI estimates from April 2010
- Existing/Final used zoning designations to determine BLI
- Priority, Future and No Service Areas used designated land uses to determine BLI

- Existing improved unserved used Sandy's updated Address Points (updated with 2009 U & O data in 3/2010)
- Joined to existing use of land and used all categories associated with residential
- Removed those residential address points known to be served

*21 Mar 2011 Pleasant Valley & Bark Hill added

As of 21 Mar 2011

- Commercial and Industrial Buildable Land Inventory Tables

Commercial & Industrial AC for Demand Estimates

Freedom

	Buildable Acres	Developed Acres	Total AC	GPD	Demand
Water - Infill					
Commercial Zoning	35.0		35.0	700	24,500
Industrial Zoning	134.4		134.4	800	107,520
Water - Priority					
Commercial LU		4.4	4.4	700	3,066
Industrial LU	312.7	321.0	633.7	800	506,960
Water - Future					
Commercial LU			-	700	-
Industrial LU			-	800	-
Water - No Planned Service					
Commercial LU		9.1	9.1	700	6,370
Industrial LU	-	-	-	800	-
Water - NPS-Outside GAB					
Commercial LU			-	700	-
Industrial LU	111.6	287.4	399.0	800	319,200
Sewer - Infill					
Commercial Zoning	31.0		31.0	700	21,700
Industrial Zoning	59.4		59.4	800	41,568
Sewer - Priority					
Commercial LU	4.0	5.0	9.0	700	6,300
Industrial LU	54.0	58.0	112.0	800	89,600
Sewer - Future					
Commercial LU		4.4	4.4	700	3,080
Industrial LU	136.0	-	136.0	800	109,582
Sewer- No Planned Service in GAB					
Commercial LU		9.2	9.2	700	6,440
Industrial LU	-	-	-	800	-
Sewer- NPS-Outside GAB					
Commercial LU			-	700	-
Industrial LU	111.6	287.4	399.0	800	319,200

Hampstead

	Buildable Acres	Developed Acres	Total AC	GPD	Demand
Water ~ Infill					
<i>Commercial Zoning</i>	17.0		17.0	700	11,900
<i>Industrial Zoning</i>	33.0	-	33.0	800	26,400
Water ~ Priority					
<i>Commercial LU</i>	7.0	4.0	11.0	700	7,700
<i>Industrial LU</i>	44.0	117.0	161.0	800	128,800
Water ~ Future					
<i>Commercial LU</i>	-	6.0	6.0	700	4,200
<i>Industrial LU</i>	11.0	6.0	17.0	800	13,600
Water ~ No Planned Service					
<i>Commercial LU</i>	-	-	-	700	-
<i>Industrial LU</i>	-	-	-	800	-
Water ~ NPS-Outside GAB					
<i>Commercial LU</i>	4.0	14.0	18.0	700	12,600
<i>Industrial LU</i>	121.0	90.0	211.0	800	168,800
Sewer ~ Infill					
<i>Commercial Zoning</i>	13.0		13.0	700	9,100
<i>Industrial Zoning</i>	6.0		6.0	800	4,800
<i>Groundwater Conservation</i>	6.6	-	6.6	352	2,323
Sewer ~ Priority					
<i>Commercial LU</i>	-	5.0	5.0	700	3,500
<i>Industrial LU</i>	220.0	27.6	247.6	800	198,064
<i>Groundwater Conservation</i>	44.0	-	44.0	352	15,488
Sewer~No Planned Service in GAB					
<i>Commercial LU</i>	13.0	-	13.0	700	9,100
<i>Industrial LU</i>	46.0	101.0	147.0	800	117,600
Sewer~ NPS-Outside GAB					
<i>Commercial LU</i>	7.0	-	7.0	700	4,900
<i>Industrial LU</i>	101.0	-	101.0	800	80,800
Sewer~ Existing-Outside GAB					
<i>Commercial LU</i>	2.0		2.0	700	1,400
<i>Industrial LU</i>	-	52.0	52.0	800	41,600
Sewer~ Priority-Outside GAB					
<i>Commercial LU</i>	-		-	700	-
<i>Industrial LU</i>	19.0	-	19.0	800	15,200

Manchester

	Buildable AC	Developed AC	Total AC	GPD	Demand
Water ~ Infill					
<i>Commercial Zoning</i>	12.5		12.5	700	8,750
<i>Industrial Zoning</i>	-		-	800	-
Water ~ Priority					
<i>Commercial LU</i>	4.5	5.3	9.8	700	6,860
<i>Industrial LU</i>	-	-	-	800	-
Water ~ Future					
<i>Commercial LU</i>	-		-	700	-
<i>Industrial LU</i>	-	-	-	800	-
Water ~ No Planned Service					
<i>Commercial LU</i>	45.0	21.0	66.0	700	46,200
<i>Industrial LU</i>	-	-	-	800	-
Water ~ NPS-Outside GAB					
<i>Commercial LU</i>	-	-	-	700	-
<i>Industrial LU</i>	-	-	-	800	-
Sewer ~ Infill					
<i>Commercial Zoning</i>	11.5		11.5	700	8,050
<i>Industrial Zoning</i>	-		-	800	-
Sewer ~ Priority					
<i>Commercial LU</i>	4.5	4.7	9.2	700	6,440
<i>Industrial LU</i>	-	-	-	800	-
Sewer ~ Future					
<i>Commercial LU</i>	-		-	700	-
<i>Industrial LU</i>	-	-	-	800	-
Sewer~No Planned Service in GAB					
<i>Commercial LU</i>	45.0	21.0	66.0	700	46,200
<i>Industrial LU</i>	-	-	-	800	-
Sewer~ NPS-Outside GAB					
<i>Commercial LU</i>	-	-	-	700	-
<i>Industrial LU</i>	-	-	-	800	-

Mount Airy

	Buildable AC	Developed AC	Total AC	GPD	Demand
Water ~ Infill					
<i>Commercial Zoning</i>	8.0		8.0	700	5,600
<i>Industrial Zoning</i>	31.0		31.0	800	24,800
Water ~ Priority					
<i>Commercial LU</i>	26.0	0.7	26.7	700	18,690
<i>Industrial LU</i>	34.0	12.0	46.0	800	36,800
Water ~ Future					
<i>Commercial LU</i>			-	700	-
<i>Industrial LU</i>	-	-	-	800	-
Water ~ No Planned Service					
<i>Commercial LU</i>	-	-	-	700	-
<i>Industrial LU</i>	-	-	-	800	-
Water ~ NPS-Outside GAB					
<i>Commercial LU</i>	-	-	-	700	-
<i>Industrial LU</i>	-	-	-	800	-
Sewer ~ Infill					
<i>Commercial Zoning</i>	8.0		8.0	700	5,600
<i>Industrial Zoning</i>	31.0		31.0	800	24,800
Sewer ~ Priority					
<i>Commercial LU</i>	26.0	0.7	26.7	700	18,690
<i>Industrial LU</i>	34.0	12.0	46.0	800	36,800
Sewer ~ Future					
<i>Commercial LU</i>			-	700	-
<i>Industrial LU</i>	-	-	-	800	-
Sewer-No Planned Service in GAB					
<i>Commercial LU</i>	-	-	-	700	-
<i>Industrial LU</i>	-	-	-	800	-
Sewer~ NPS-Outside GAB					
<i>Commercial LU</i>	-	-	-	700	-
<i>Industrial LU</i>	-	-	-	800	-

New Windsor

	Buildable AC	Developed AC	Total AC	GPD	Demand
Water - Infill					
<i>Commercial Zoning</i>	-	-	-	700	-
<i>Industrial Zoning</i>	12.0		12.0	800	9,600
Water - Priority					
<i>Commercial LU</i>	-	-	-	700	-
<i>Industrial LU</i>	2.5	19.8	22.3	800	17,840
Water - Future					
<i>Commercial LU</i>	-	-	-	700	-
<i>Industrial LU</i>	120.0		120.0	800	96,000
Water - No Planned Service					
<i>Commercial LU</i>	-	-	-	700	-
<i>Industrial LU</i>	-	1.6	1.6	800	1,280
Water - NPS-Outside GAB					
<i>Commercial LU</i>	-	-	-	700	-
<i>Industrial LU</i>	-	-	-	800	-
Sewer - Infill					
<i>Commercial Zoning</i>	-	-	-	700	-
<i>Industrial Zoning</i>	4.0		4.0	800	3,200
Sewer - Priority					
<i>Commercial LU</i>	-	-	-	700	-
<i>Industrial LU</i>	2.5		2.5	800	2,000
Sewer - Future					
<i>Commercial LU</i>	-	-	-	700	-
<i>Industrial LU</i>	134.0	53.0	187.0	800	149,600
Sewer-No Planned Service in GAB					
<i>Commercial LU</i>	-	-	-	700	-
<i>Industrial LU</i>	-	1.6	1.6	800	1,280
Sewer~ NPS-Outside GAB					
<i>Commercial LU</i>	-	-	-	700	-
<i>Industrial LU</i>	-	-	-	800	-

Taneytown

	Buildable AC	Developed AC	Total AC	GPD	Demand
Water ~ Infill					
<i>Commercial Zoning</i>	8.0		8.0	700	5,600
<i>Industrial Zoning</i>	4.0		4.0	800	3,200
Water ~ Priority					
<i>Commercial LU</i>	81.1	17.0	98.1	700	68,698
<i>Industrial LU</i>	181.0	67.0	248.0	800	198,400
Water ~ Future					
<i>Commercial LU</i>			-	700	-
<i>Industrial LU</i>	-	-	-	800	-
Water ~ No Planned Service					
<i>Commercial LU</i>	-	-	-	700	-
<i>Industrial LU</i>	-	-	-	800	-
Water ~ NPS-Outside GAB					
<i>Commercial LU</i>	-	-	-	700	-
<i>Industrial LU</i>	66.8	-	66.8	800	53,440
Sewer ~ Infill					
<i>Commercial Zoning</i>	15.0		15.0	700	10,500
<i>Industrial Zoning</i>	10.0		10.0	800	8,000
Sewer ~ Priority					
<i>Commercial LU</i>	74.1	17.0	91.1	700	63,798
<i>Industrial LU</i>	176.5	66.0	242.5	800	193,992
Sewer ~ Future					
<i>Commercial LU</i>	-	-	-	700	-
<i>Industrial LU</i>	-	-	-	800	-
Sewer~No Planned Service in GAB					
<i>Commercial LU</i>	-	-	-	700	-
<i>Industrial LU</i>	-	-	-	800	-
Sewer~ NPS-Outside GAB					
<i>Commercial LU</i>	-	-	-	700	-
<i>Industrial LU</i>	66.8	-	66.8	800	53,440

Union Bridge

	Buildable AC	Developed AC	Total AC	GPD	Demand
Water ~ Infill					
<i>Commercial Zoning</i>	-	-	-	700	-
<i>Industrial Zoning</i>	19.0	-	19.0	800	15,200
Water ~ Priority					
<i>Commercial LU</i>	-	-	-	700	-
<i>Industrial LU</i>	-	-	-	800	-
Water ~ Future					
<i>Commercial LU</i>	-	-	-	700	-
<i>Industrial LU</i>	-	-	-	800	-
Water ~ No Planned Service					
<i>Commercial LU</i>	-	-	-	700	-
<i>Industrial LU</i>	-	-	-	800	-
Water ~ NPS-Outside GAB					
<i>Commercial LU</i>	-	-	-	700	-
<i>Industrial LU</i>	-	-	-	800	-
Sewer ~ Infill					
<i>Commercial Zoning</i>	-	-	-	700	-
<i>Industrial Zoning</i>	3.0	-	3.0	800	2,400
Sewer ~ Priority					
<i>Commercial LU</i>	-	-	-	700	-
<i>Industrial LU</i>	-	-	-	800	-
Sewer ~ Future					
<i>Commercial LU</i>	-	-	-	700	-
<i>Industrial LU</i>	-	-	-	800	-
Sewer-No Planned Service in GAB					
<i>Commercial LU</i>	-	-	-	700	-
<i>Industrial LU</i>	-	-	-	800	-
Sewer~ NPS-Outside GAB					
<i>Commercial LU</i>	-	-	-	700	-
<i>Industrial LU</i>	-	-	-	800	-

Westminster

	Buildable AC	Developed AC	Total AC	GPD	Demand
Water ~ Infill					
<i>Commercial Zoning</i>	40.0		40.0	700	28,000
<i>Industrial Zoning</i>	149.0		149.0	800	119,200
Water ~ Priority					
<i>Commercial LU</i>	6.4	15.0	21.4	700	14,980
<i>Industrial LU</i>	50.0	103.0	153.0	800	122,400
Water ~ Future					
<i>Commercial LU</i>		16.0	16.0	700	11,200
<i>Industrial LU</i>	65.0	111.0	176.0	800	140,800
Water ~ No Planned Service					
<i>Commercial LU</i>	-	11.7	11.7	700	8,190
<i>Industrial LU</i>	285.0	308.0	593.0	800	474,400
Water ~ NPS-Outside GAB					
<i>Commercial LU</i>	-	-	-	700	-
<i>Industrial LU</i>	-	-	-	800	-
Sewer ~ Infill					
<i>Commercial Zoning</i>	17.0		17.0	700	11,900
<i>Industrial Zoning</i>	203.0		203.0	800	162,400
Sewer ~ Priority					
<i>Commercial LU</i>	6.4	15.0	21.4	700	14,980
<i>Industrial LU</i>	53.0	103.0	156.0	800	124,800
Sewer ~ Future					
<i>Commercial LU</i>	17.0	18.2	35.2	700	24,640
<i>Industrial LU</i>		70.0	70.0	800	56,000
Sewer~No Planned Service in GAB					
<i>Commercial LU</i>	-	8.0	8.0	700	5,600
<i>Industrial LU</i>	285.0	178.0	463.0	800	370,400
Sewer~ NPS-Outside GAB					
<i>Commercial LU</i>	-	-	-	700	-
<i>Industrial LU</i>	-	-	-	800	-

Appendix 4: Procedure for Obtaining Water or Sewer Extension



CARROLL COUNTY MARYLAND

225 N. Center Street
Westminster, Maryland 21157

DATE April 5, 1983	POLICY NUMBER 51-83 PW
SUPERSEDES POLICY NUMBER	PAGE 1 OF 2

PROCEDURE FOR OBTAINING WATER OR SEWER EXTENSIONS BY DEVELOPERS

Purpose: To provide procedures extending water and sewerage facilities to residential subdivisions or other type development whereby the responsibilities of the developer and County are clearly outlined as to acquisition of rights-of-way, preparation of plans and specifications, and payment of costs for such extensions.

1. The Developer shall show on his subdivision plat a 20-foot utility easement on the sides and back of each lot, unless otherwise noted, which shall be granted to the County by Deed of Easement.
2. The plans for construction and specifications of water and sewer system shall be furnished to the County by developers of all new subdivision wherein water or sewer systems are required. Developers shall have the right to select a certified engineer (with specific background in water and sewer design) from a list of engineers who have been pre-qualified by County, for the preparation, at their expense, of the plans and specifications, subject to their plans and specifications being reviewed for approval by the County's consulting engineer.
4. The developer shall pay for the County's engineering fees incurred in reviewing subdivision plans as they relate to public water and sewer plans.
5. The developer shall be responsible to secure all necessary rights-of-way and easements in a form satisfactory to County.
6. Where the proposed extension is not a planned or projected system included in the County Water & Sewer Master Plan at the time of execution of a Public Works Agreement and a transmission line is extended for the benefit of developer for furnishing of service to his subdivision, the developer shall pay the total cost of construction, plus overhead charges as established by County.
7. Where the proposed extension is a planned or projected system included in the County Water & Sewer Master Plan at the time of execution of the Public Works Agreement and transmission line is extended for the benefit of developer for furnishing of service to

DATE April 5, 1983	POLICY NUMBER 51-83 PW
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SUPERSEDES POLICY NUMBER	PAGE 1 OF 2
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CARROLL COUNTY MARYLAND

225 N. Center Street
Westminster, Maryland 21157

PROCEDURE FOR OBTAINING WATER OR SEWER
EXTENSIONS BY DEVELOPERS

his subdivision, County shall contribute an amount equal to the difference in actual construction costs, without regard to overhead or administrative expenses which results from subtracting the costs necessary to construct a transmission line to serve the developer's subdivision alone from those costs actually spent on the required system. County's contribution shall be made from area connection charges received from persons who connect as a result of the extension of the transmission line during a ten-year period measured from the date of execution of the Public Works Agreement. Payments to developer shall cease upon the expiration of the ten-year period, regardless of any remaining balance.

AREA OF RESPONSIBILITY Department of Public Works (Bureau of Utilities)	APPROVED BY: COUNTY COMMISSIONERS OF CARROLL COUNTY John L. Armacost, President Jeff Griffith, Vice-President William V. Lauterbach, Jr., Secretary DATE: April 5, 1983
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APPENDIX 5: Procedure for Water & Sewer Master Plan Amendments

1. Following the submission deadline, the Bureau of Planning will prepare a staff report to the Carroll County Planning and Zoning Commission for each requested amendment, including the specific changes to the Water/Sewer Plan involved with the amendment request and staff recommendations. During the preparation of the staff report, if the requested amendment is one that was generated by a municipality or the County and has not been reviewed by the Health Department of the Department of Public Works, the County Planning Department will send the application to the those agencies for review and comment. Those comments will be reflected in the staff report. Notification of the Planning Commission meeting at which the amendments will be discussed will be sent to the Town and staff (if applicable), any adjoining jurisdictions, Baltimore City (if applicable), and the applicant(s) for review and comment.
2. The Planning and Zoning Commission will consider the cycle amendment package during a regular monthly public meeting as determined in the Cycle Schedule. Following the presentation of the staff report, public involvement, and deliberation, the Planning and Zoning Commission will vote to certify or not certify each amendment as consistent with the Carroll County Master Plan. For those amendments that are certified as consistent by the Planning Commission, the Commission will forward the staff report and its action along with a recommendation on each amendment to the Board of County Commissioners.
3. If, at any time during the process, the applicant wishes to withdraw the application, a request to withdraw must be submitted in writing to the Planning Director. This should occur no later than two (2) weeks prior to the Planning and Zoning Commission's scheduled meeting to take action on the amendments.
4. After receipt of the Planning and Zoning Commission's action and recommendation, the Board of County Commissioners will schedule a public hearing in accordance with applicable state law. The public hearing should be scheduled no less than 30 days after the initial notification to stakeholders (see 1., above). The following stakeholders will be notified of the public hearing and the requested amendments under consideration at least 14 days prior to the hearing:
 - a. Biannual Updates – Mayors and staff of any towns with affected systems; adjoining jurisdictions; Baltimore City, if amendments apply to systems in the eastern portion of the County, state agencies, BMC, and the applicant(s).
 - b. Triennial Updates – Mayors and staff of each municipality in the County; adjoining jurisdictions; Baltimore City, state agencies, and BMC.

Additionally, the public will be notified through legal advertisements in local newspapers published two (2) times at least 14 days prior to the hearing). The staff reports and any attached maps/tables will be posted on the County website prior to the hearing as well.

5. Following the required notice, the Board of County Commissioners will conduct a public hearing on the cycle amendments.

6. The Board of Commissioners will deliberate on the amendments, taking all comments into consideration, and take action by resolution (drafted by County Planning staff) to adopt or deny each amendment in the amendment cycle. One resolution covering all of the amendments should be prepared and brought to the public hearing so that it can be signed if the amendments are adopted that day.
7. Following adoption by the Board of County Commissioners, the adopted amendments will be forwarded to Maryland Department of the Environment (MDE) for final approval. Notification of the Board's action will be sent the stakeholders notified in 4.a. and b. above.
8. The cycle amendments become effective upon approval by MDE. The Planning Department will make necessary changes to the Plan text and maps to reflect the MDE approved amendments. Notification of final approval/disapproval will be sent to the applicant(s) and Town(s), as appropriate.

APPENDIX 6: Carroll County FY 2013 – 2018 Community Investment Plan (Utilities Enterprise)

COMMUNITY INVESTMENT PLAN FOR FISCAL YEARS 2013 TO 2018
Adopted

	Fiscal Year					2018	Prior Allocation	Balance to Complete	Total Project Cost
	2013	2014	2015	2016	2017				
UTILITIES ENTERPRISE:									
Bark Hill Water Treatment Plant Improvements	\$0	\$0	\$0	\$0	\$158,000	\$0	\$0	\$0	\$158,000
Freedom District - Relief Sewer No. 2	0	0	97,000	555,000	0	0	0	0	652,000
Freedom District - Relief Sewer No. 4 (Stowden's Creek)	0	33,000	191,000	0	0	0	0	0	224,000
Freedom District - Relief Sewer No. 10 (Sykesville Interceptor)	0	273,000	0	0	0	0	36,000	0	309,000
Freedom WWTP Enhanced Nutrient Removal	3,200,000	3,200,000	0	0	0	0	2,100,000	0	8,500,000
Gravity Sewer Main - Houcksville Rd to Treatment Plant	0	0	0	131,000	0	606,000	0	0	737,000
Hampstead Gril Removal System	0	0	0	107,000	0	611,000	0	0	718,000
Hydrant Replacements	116,700	122,500	128,600	135,000	142,000	149,000	0	0	793,800
Liberty Road 8" Water Main - North Side	0	0	0	0	0	82,000	0	362,000	444,000
North Carroll Farms Pump Station Rehabilitation	0	170,500	0	0	0	0	0	0	170,500
North Pump Station Wet Well and Pump Rehabilitation	182,000	1,048,000	0	0	0	0	0	0	1,230,000
Sewer Main Lining	274,000	287,000	301,000	317,000	334,000	351,000	0	0	1,864,000
Sewer Manhole Rehabilitation	182,300	191,400	201,000	211,100	222,000	231,000	0	0	1,238,800
Sewer Studies	90,000	0	0	0	0	0	275,000	0	365,000
Stone Manor Pump Station Rehabilitation	0	0	0	0	0	0	0	0	281,000
Tank Painting, Repair and Rehabilitation	47,000	49,380	51,825	54,400	57,130	59,985	0	0	319,690
Town of Sykesville Water and Sewer Upgrades	0	0	0	0	0	1,900,000	0	9,400,000	11,300,000
Water Main Blow-Off Replacements	0	125,000	131,000	138,000	145,000	152,000	0	0	691,000
Water Main Loops	340,000	90,000	116,000	73,000	228,000	153,000	59,000	0	1,059,000
Water Meters	210,900	242,400	254,500	267,200	281,000	295,000	0	0	1,571,000
Water Service Line Replacement	0	0	0	170,000	179,000	188,000	0	0	537,000
Waters Edge Pump Station Rehabilitation	0	0	0	0	0	297,000	0	0	297,000
West Hampstead Collector Sewer Main Upgrade/ Repair	0	89,000	0	512,000	0	0	0	0	601,000
UTILITIES ENTERPRISE TOTAL:	\$4,662,900	\$5,921,150	\$1,471,925	\$2,670,700	\$2,027,130	\$5,074,985	\$2,470,000	\$9,762,000	\$34,060,790
SOURCES OF FUNDING:									
Bonds	\$0	\$0	\$0	\$0	\$0	\$0	\$150,000	\$0	\$150,000
Reallocated Enterprise Fund	99,115	0	0	0	0	0	0	0	99,115
Enterprise Fund - Utilities	1,729,785	2,782,150	1,183,925	2,115,700	1,746,130	5,074,985	2,159,000	9,762,000	26,553,675
Maintenance Fee	1,417,000	1,481,178	61,344	118,215	0	0	36,000	0	3,113,737
Area Connection Charges	1,417,000	1,657,822	226,656	436,785	0	0	125,000	0	3,863,263
UTILITIES ENTERPRISE TOTAL:	\$4,662,900	\$5,921,150	\$1,471,925	\$2,670,700	\$2,027,130	\$5,074,985	\$2,470,000	\$9,762,000	\$34,060,790